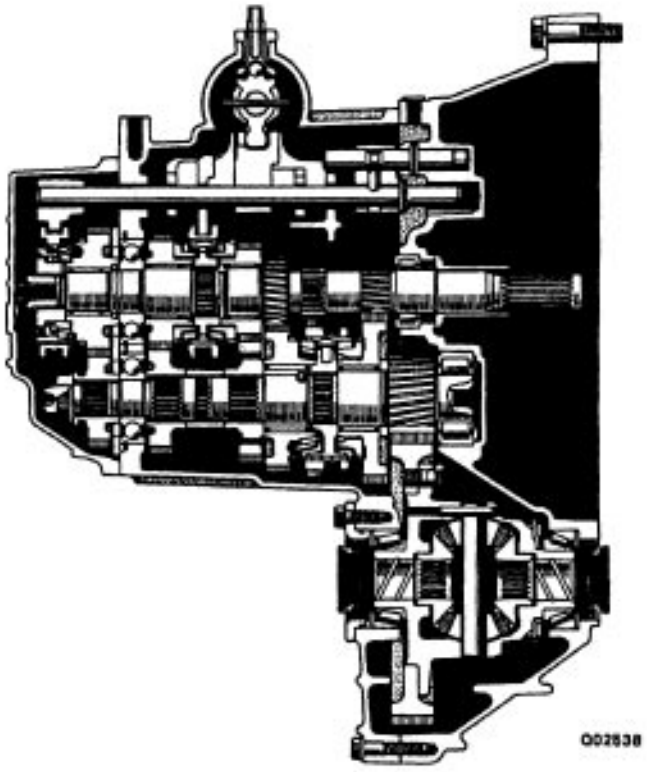
MANUAL TRANSAXLE

DESCRIPTION

GENERAL

- A triple–cone type synchromesh mechanism is used in the 2nd gear to improve the shift feeling characteristics. This helps to reduce the shifting effort.
- A reverse synchromesh mechanism is used to suppress gear engagement noise in reverse gear shifting.

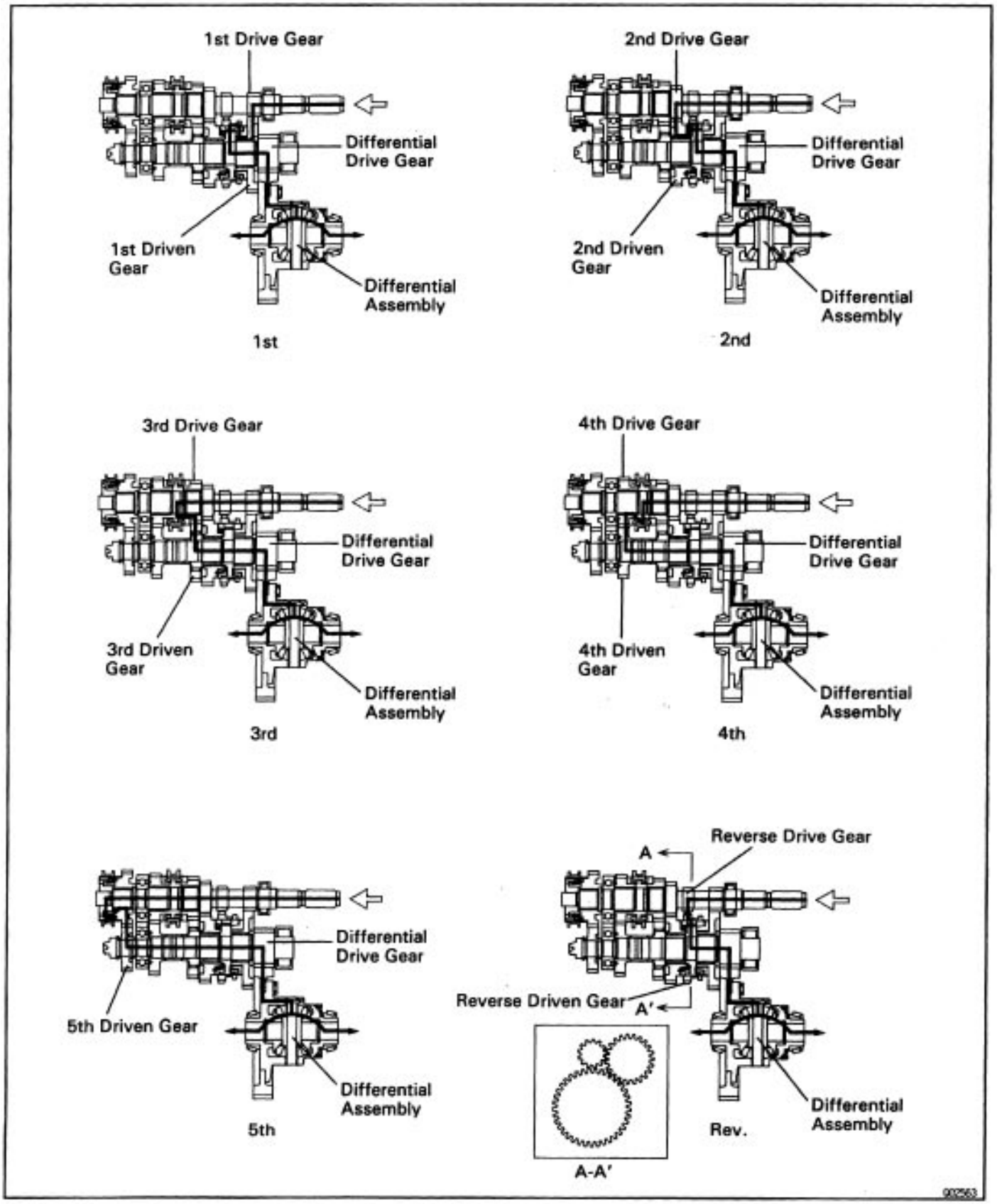


V04838

Type of Transaxle		S51
Type of Engine		5S–FE
Gear Ratio	1st gear	3.538
	2nd gear	1.960
	3rd gear	1.250
	4th gear	0.945
	5th gear	0.731
	Reverse gear	3.153
Differential Gear Ratio		3.944
Oil Capacity		2.6 liters (2.7 US qts, 2.3 Imp. qts)
Oil Viscosity		SAE 75W–90
Oil Grade		API GL–3, GL–4 or GL–5

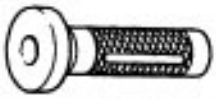
OPERATION

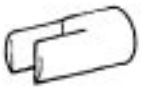
The illustration below show the engagements of transaxle gears.



PREPARATION

SST (SPECIAL SERVICE TOOLS)

	09308–00010 Oil Seal Puller	Input shaft front bearing Output shaft front bearing
	09309–12020 5th Driven Gear Replacer	
	09310–17010 Transaxle Gear Remover & Replacer	
	(09310–07010) Plate	
	(09310–07020) Center Bolt	
	(09310–07030) Set Bolt	
	09310–35010 Countershaft Bearing Replacer	Input shaft front bearing Output shaft front bearing
	09316–60010 Transmission & Transfer Bearing Replacer	
	(09316–00010) Replacer Pipe	
	(09316–00040) Replacer 'C'	
	09350–32014 TOYOTA Automatic Transmission Tool Set	Differential side bearing
	(09351–32120) Overdrive Bearing Replacer	
	(09351–32130) Handle	

	(09351–32150) Oil Seal Replacer	Differential side bearing Oil seal (Transaxle case side)
	09502–10012 Differential Side Bearing Puller	
	09564–32011 Differential Preload Adaptor	
	09608–12010 Front Hub & Drive Pinion Bearing Replacer Set	
	(09608–00070) Drive Pinion Rear Bearing Cone Replacer	Input shaft rear bearing 4th drive gear and rear bearing
	09608–20012 Front Nub & Drive Pinion Bearing Tool Set	
	(09608–00080) Replacer	Input shaft front oil seal Control shaft cover oil seal
	(09608–03020) Handle	
	(09608–03060) Replacer	Differential taper roller bearing outer race
	09612–22011 Tilt Handle Bearing Replacer	Output shaft rear bearing No.3 clutch hub
	09950–00020 Bearing Remover	
	09950–00030 Bearing Remover Attachment	
	09950–20017 Universal Puller	

RECOMMENDED TOOLS

	09025–00010 Small Torque Wrench	Differential preload
	09031–00030 Pin Punch	
	09905–00012 Snap Ring No. 1 Expander	

EQUIPMENT

Dial indicator	
Torque wrench	
Feeler gauge	

LUBRICANT

Item	Capacity	Classification
Manual transaxle oil	2.6 liters (2.7 US qts, 2.3 Imp.qts)	API GL–3, GL–4 or GL–5 SAE 75W–90

SSM (SPECIAL SERVICE MATERIALS)

08826–00090 Seal Packing 1281, THREE BOND 1281 or equivalent (FIPG)	Transmission case x Transaxle case Transmission case x Case cover
08833–00080 Adhesive 1344, THREE BOND 1344, LOCTITE 242 or equivalent	Straight screw plug Control shaft cover bolt

TROUBLESHOOTING

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.

See Page / Parts Nacre / Trouble	Oil (Level low)	Oil (Wrong)	Oil (Level too high)	Gasket (Damaged)	Oil seal (Worn or damaged)	O–Ring (Worn or damaged)	Control cable (Faulty)	Locking ball spring (Damaged)	Shift fork (Worn)	Gear (Worn or damaged)	Bearing (Worn or damaged)	Synchronizer ring (Worn or damaged)	Shifting key spring (Damaged)			
	MX–2		MX–20	MX–20	MX–20	MX–20	MX–70	MX–20	MX–20	MX–20	MX–20	MX–33, 40	MX–33,40			
Noise	1	2								3	3					
Oil leakage			1	2	2	3										
Hard to shift or will not shift							1					2	3			
Jumps out of gear								1	2	3	3					

V00310

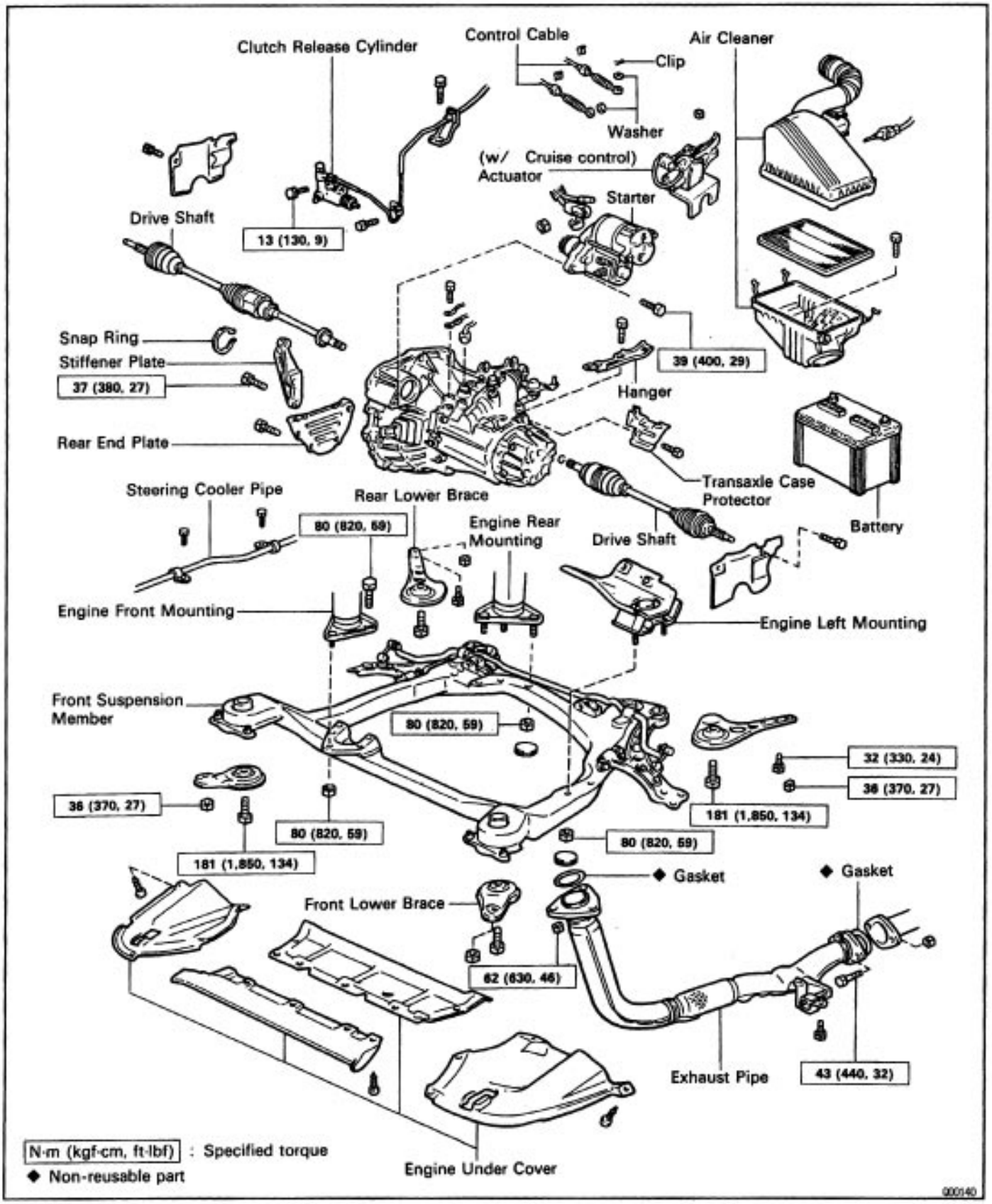
PRECAUTION

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

- 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 the 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.

ASSEMBLY REMOVAL AND INSTALLATION

Remove and install the parts as shown below.



TRANSAXLE REMOVAL

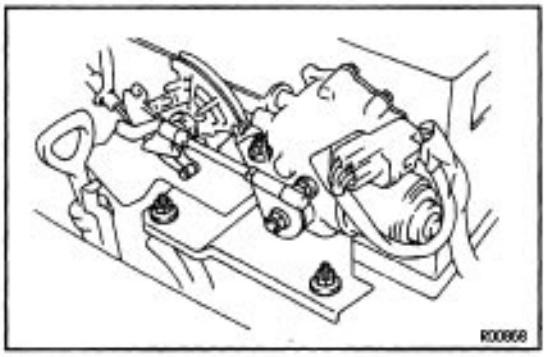
1. DISCONNECT NEGATIVE (–) TERMINAL CABLE FROM BATTERY

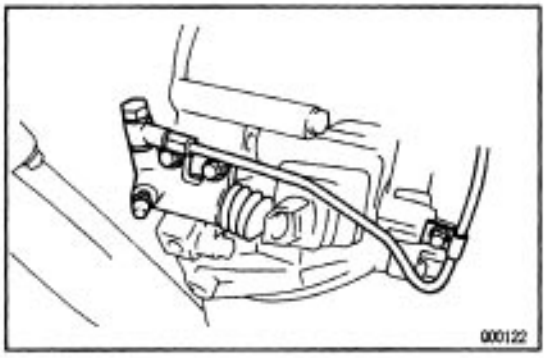
CAUTION: Work must be started after 90 seconds from the time the ignition switch 1: turned to the 'LOCK' position and the negative (–) terminal cable is disconnected from the battery.

2. REMOVE AIR CLEANER CASE ASSEMBLY WITH AIR HOSE

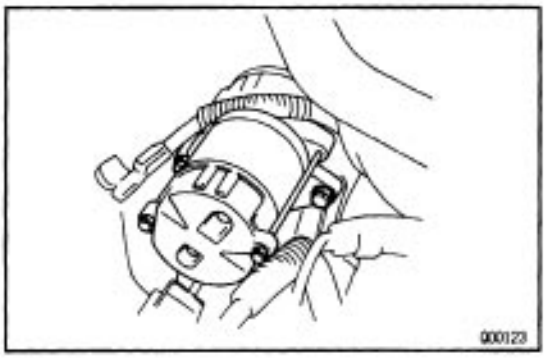
3. REMOVE CRUISE CONTROL ACTUATOR

(a) Remove the cruise control actuator cover.
(b) Disconnect the connector.
(c) Remove the 3 nuts and cruise control actuator with bracket.



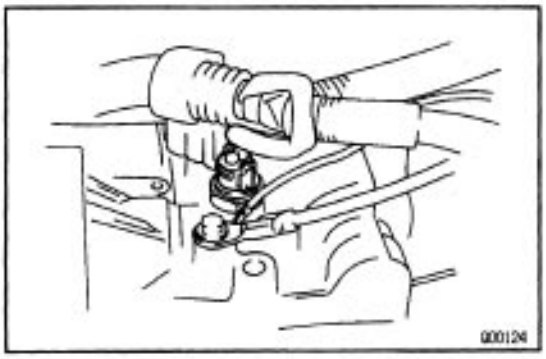


4. REMOVE CLUTCH RELEASE CYLINDER AND TUBE CLAMP

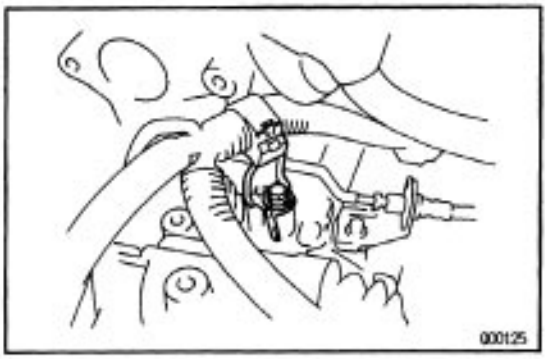


5. REMOVE STARTER

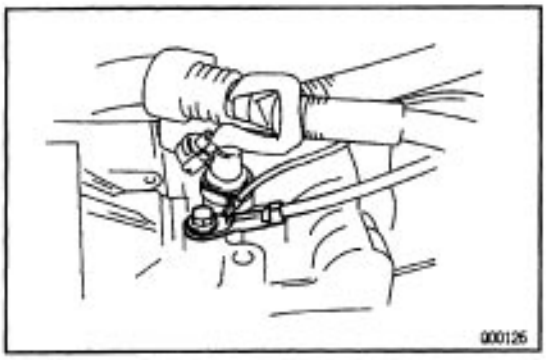
(a) Disconnect the connector and wire from the starter.
(b) Remove the 2 bolts and starter.



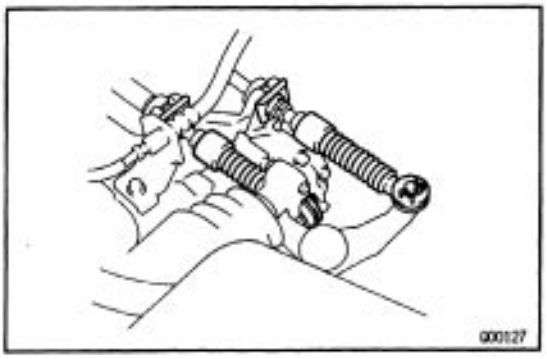
6. DISCONNECT BACK–UP LIGHT SWITCH CONNECTOR



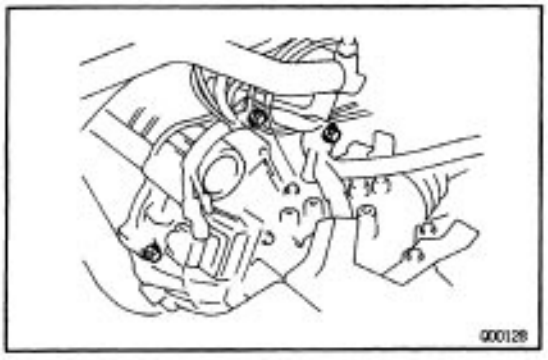
7. DISCONNECT WIRES CLAMP



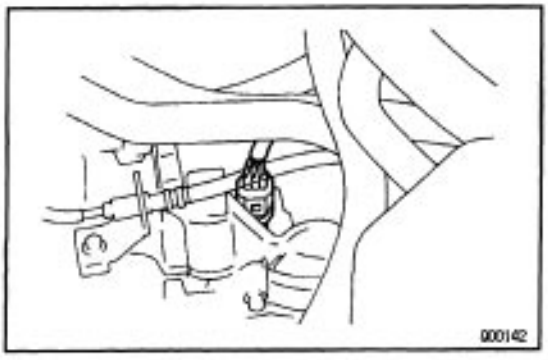
8. REMOVE EARTH CABLES



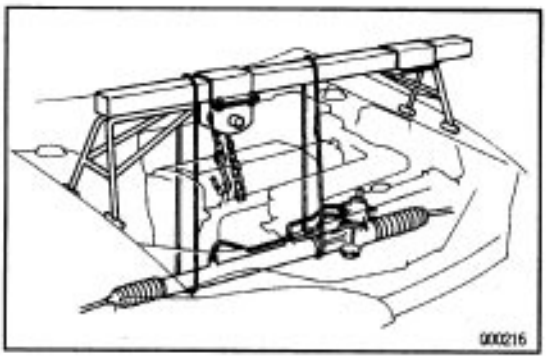
9. DISCONNECT CONTROL CABLES
(a) Remove the clips and washers.
(b) Remove the clips from the cables.



10. REMOVE TRANSAXLE MOUNTING THREE BOLTS OF TRANSAXLE CASE UPPER SIDE

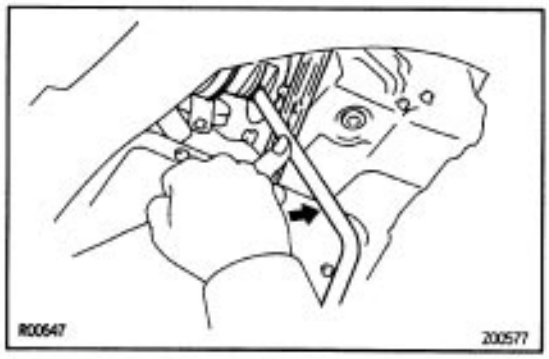


11. DISCONNECT VEHICLE SPEED SENSOR CONNECTOR



12. INSTALL ENGINE SUPPORT FIXTURE

13. TIE STEERING GEAR HOUSING TO ENGINE SUPPORT FIXTURE BY CORD OR EQUIVALENT



14. REMOVE FRONT WHEEL

15. RAISE VEHICLE

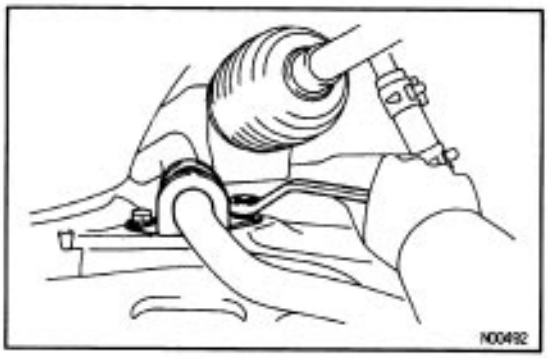
NOTICE: Be sure the vehicle is securely supported.

16. REMOVE UNDER COVERS AND SIDE COVERS

17. DRAIN TRANSAXLE OIL

18. REMOVE DRIVE SHAFT

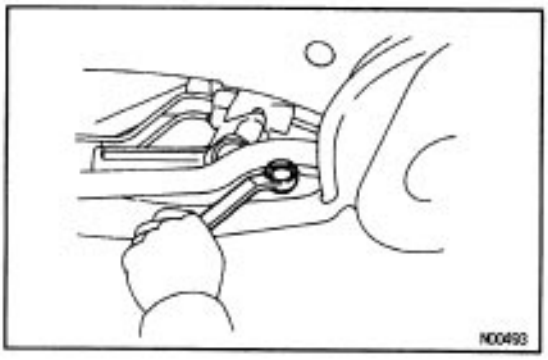
(See page SA–38)



19. DISCONNECT STEERING GEAR HOUSING FROM FRONT SUSPENSION MEMBER

(a) Remove the 4 bolts.

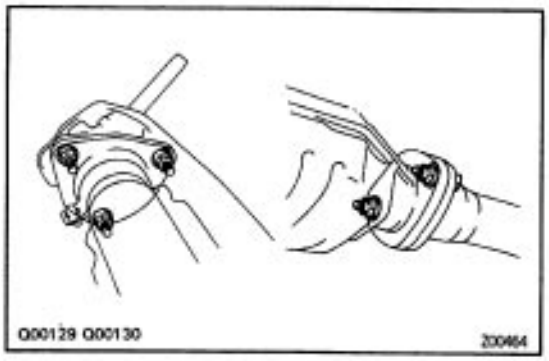
(b) Remove the stabilizer bar bush bracket.



(c) Remove the 2 set bolts and nuts.

(d) Disconnect the steering gearbox from the suspension member.

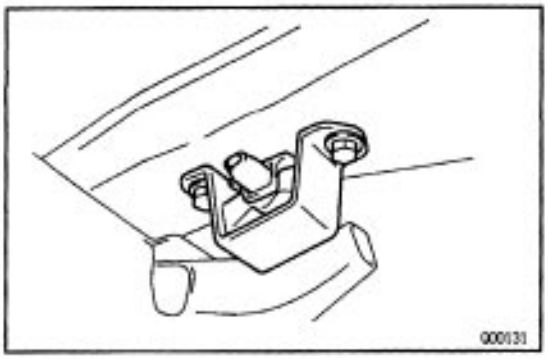
HINT: Suspend the steering gear box with cord.



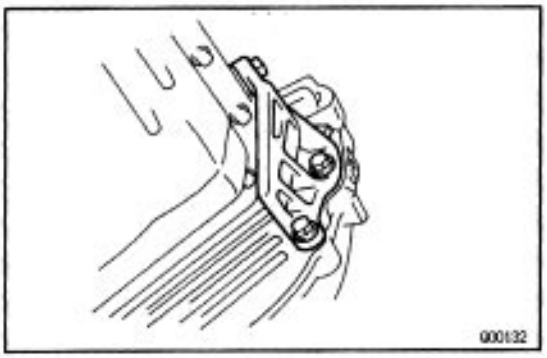
20. REMOVE EXHAUST PIPE

(a) Remove the 3 nuts.

(b) Remove the 2 bolts and nuts.

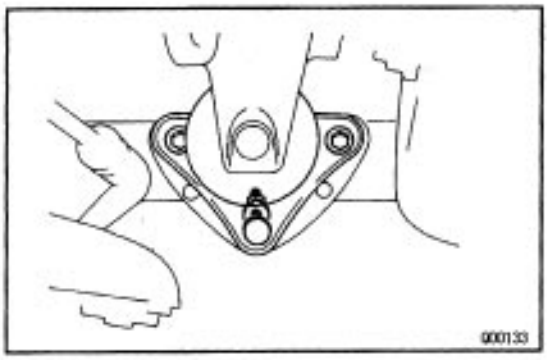


(c) Remove 2 bolts and exhaust pipe.



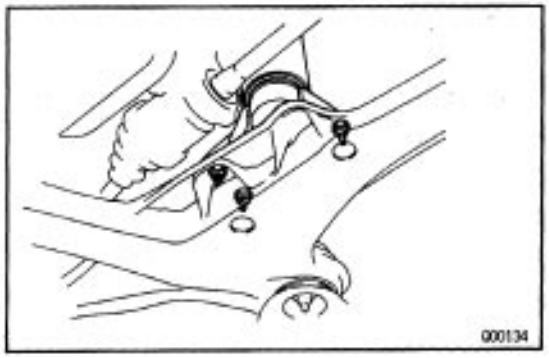
21. REMOVE STIFFENER PLATE

Remove the 3 bolts and the stiffener plate.



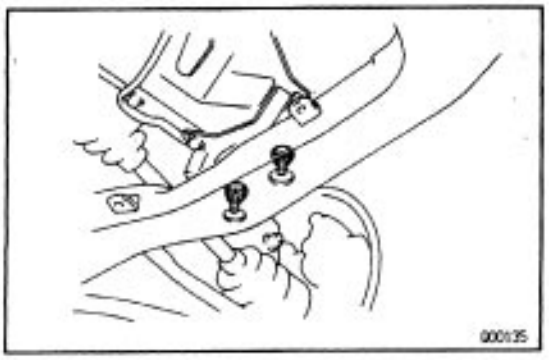
22. DISCONNECT ENGINE FRONT MOUNTING FROM SUSPENSION MEMBER

Remove the 2 bolts and a nut.



23. DISCONNECT ENGINE REAR MOUNTING FROM FRONT SUSPENSION MEMBER

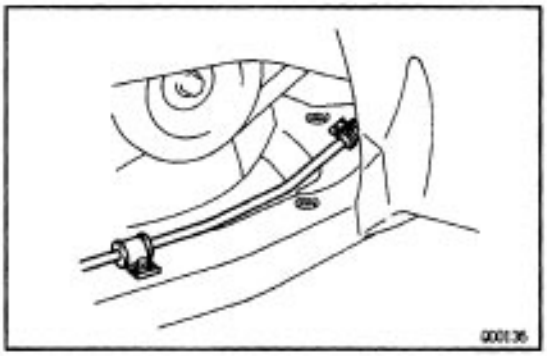
(a) Remove the 2 hole plugs.
(b) Remove the 3 nut.



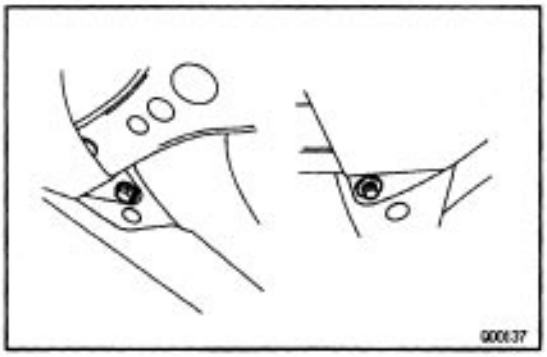
24. REMOVE ENGINE LEFT MOUNTING

(a) Raise the transaxle and engine slightly with a jack and wooden block in between.
(b) Remove the 2 hole plugs and nuts.

(c) Remove the 3 bolts and engine left mounting.

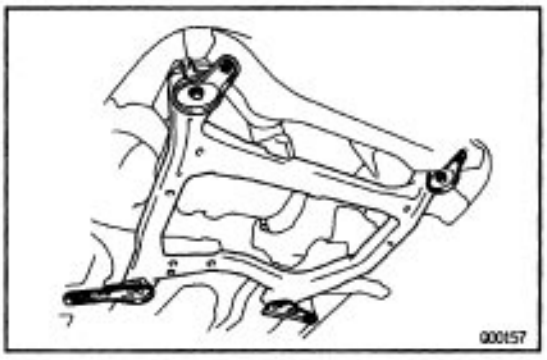


25. DISCONNECT STEERING COOLER PIPE FROM SUSPENSION MEMBER

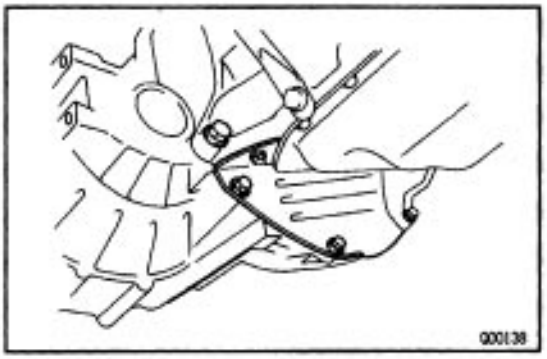


26. REMOVE FRONT SUSPENSION MEMBER

(a) Remove the 2 fender liner set screws.

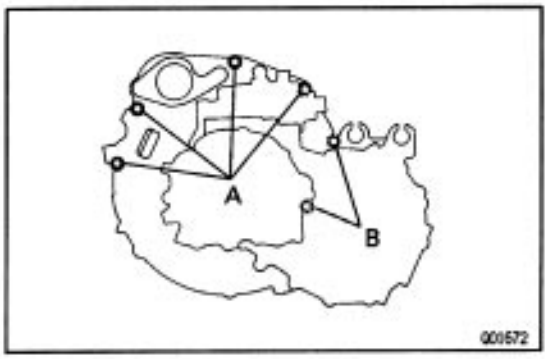


(b) Remove the 2 bolts and 4 nuts.
(c) Remove the 4 bolts.
(d) Remove the 2 front lower brace, rear lower brace and front suspension member.



27. REMOVE TRANSAXLE

(a) Remove the transaxle mounting bolts from the engine.
(b) Lower the engine left side and remove the transaxle from the engine.



TRANSAXLE INSTALLATION (See page MX–9)

1. INSTALL TRANSAXLE TO ENGINE

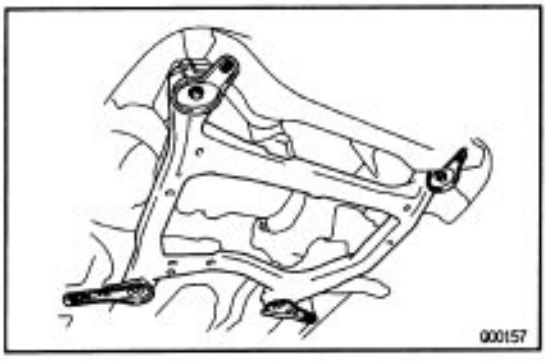
Align the input shaft spline with the clutch disc and install the transaxle to the engine.

Bolt A

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

Bolt B

Torque: 46 N–m (470 kgf–cm, 34 ft–lbf)



2. INSTALL FRONT SUSPENSION MEMBER

(a) Install the front suspension member, rear lower brace, front lower brace and 4 bolts.

(b) Torque the 4 bolts.

Torque: 181 N–m (1,850 kgf–cm, 134 ft–lbf)

(c) Install and torque the 2 bolts and 4 nuts.

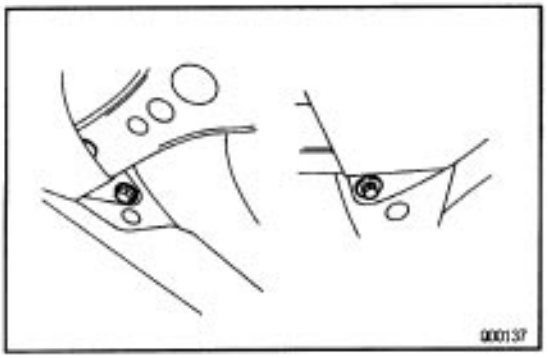
Bolt

Torque: 32 N–m (330 kgf–cm, 24 ft–lbf)

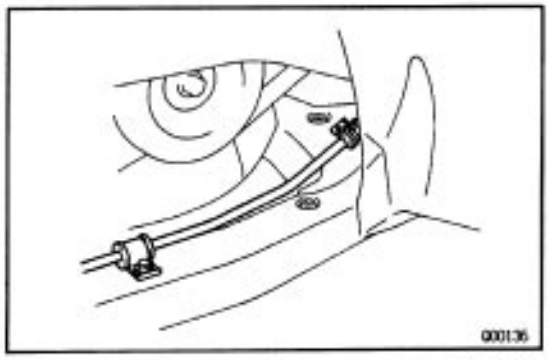
Nut

Torque: 36 N–m (370 kgf–cm, 27 ft–lbf)

(d) Install the 2 fender liner set screws.



3. CONNECT STEERING COOLER PIPE TO FRONT SUSPENSION MEMBER

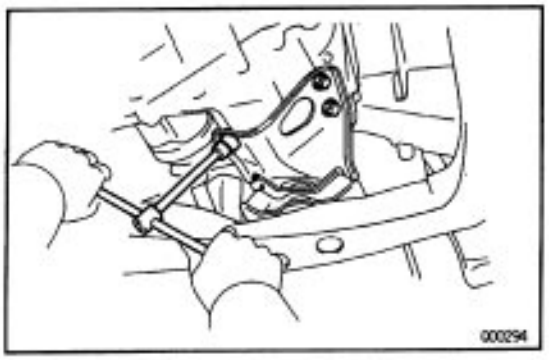


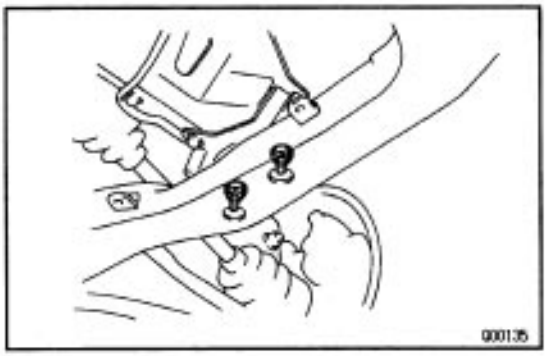
4. INSTALL ENGINE LEFT MOUNTING

(a) Install the engine left mounting.

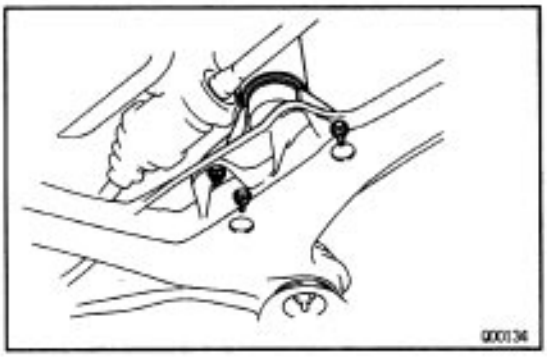
(b) Install and torque the 3 bolts.

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

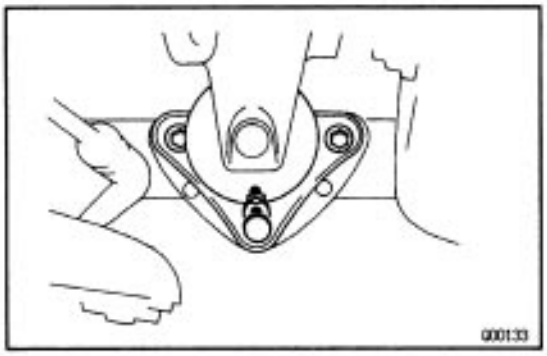




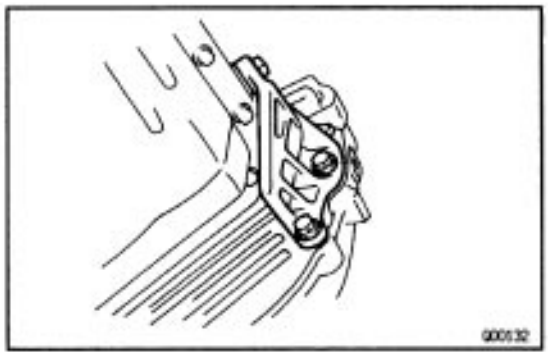
(c) Install and torque the 2 nuts.
Torque: 80 N–m (820 kgf–cm, 59 ft–lbf)
(d) Install the 2 hole plugs.



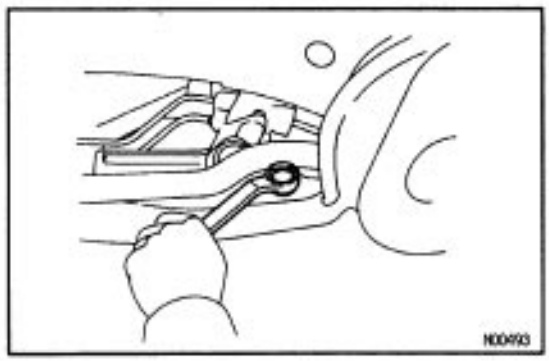
5. CONNECT ENGINE REAR MOUNTING TO FRONT SUSPENSION MEMBER
(a) Install and torque the 3 nuts.
Torque: 80 N–m (820 kgf–cm, 59 ft–lbf)
(b) Install the 2 hole plugs.



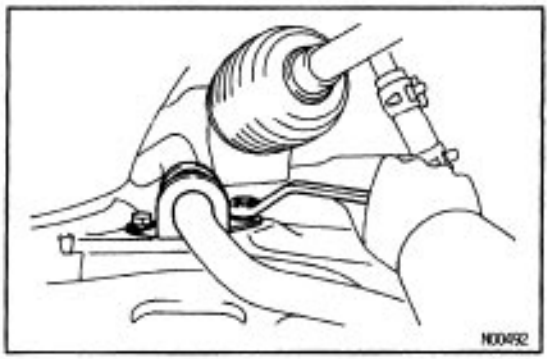
6. CONNECT ENGINE FRONT MOUNTING TO FRONT SUSPENSION MEMBER
Install and torque the 2 bolts and a nut.
Torque: 80 N–m (820 kgf–cm, 59 ft–lbf)



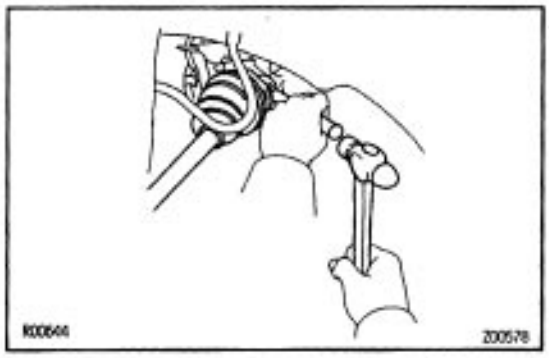
7. INSTALL STIFFENER PLATE
Torque: 37 N–m (380 kgf–cm, 27 ft–lbf)



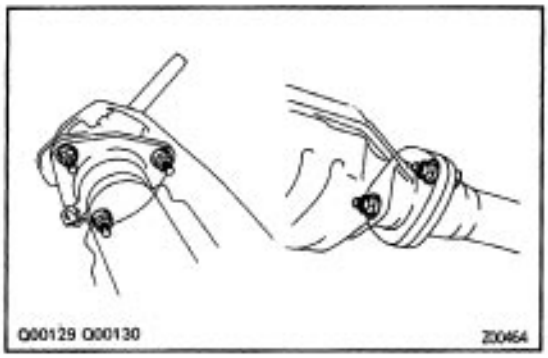
8. CONNECT STEERING GEAR HOUSING TO FRONT SUSPENSION MEMBER
(a) Connect the steering gear housing to the front sus–pension member.
(b) Install and torque the 2 set bolts and nuts.
Torque: 181 N–m (1,850 kgf–cm, 134 ft–lbf)



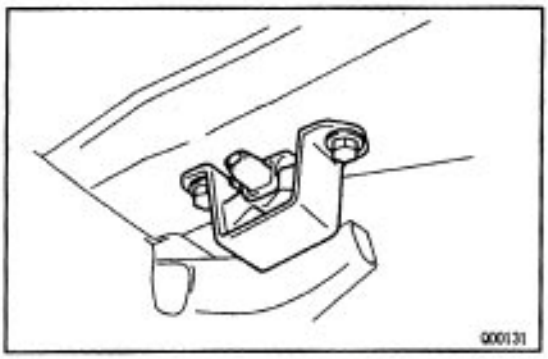
(c) Install the stabilizer bar bush bracket.
(d) Install and torque the 4 bolts.
Torque: 19 N–m (195 kgf–cm, 14 ft–lbf)



9. INSTALL DRIVE SHAFT
(See page SA–40)



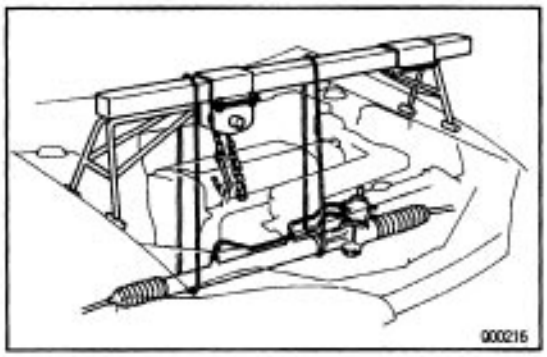
10. INSTALL EXHAUST FRONT PIPE
(a) Install the exhaust front pipe.
(b) Install and torque the 2 bolts and nuts.
Front side
Torque: 62 N–m (630 kgf–cm, 46 ft–lbf)
Rear side
Torque: 43 N–m (440 kgf–cm, 32 ft–lbf)



(c) Connect the exhaust front pipe to the front suspen–sion member.
(d) Torque the 2 bolts.

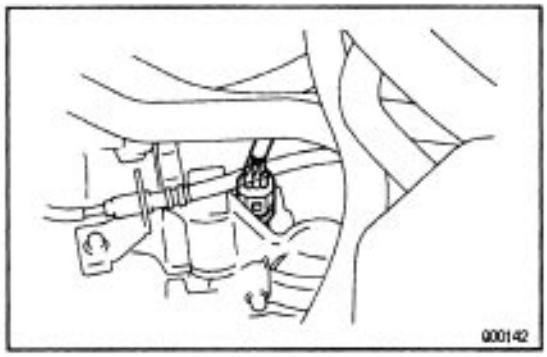
11. FILL TRANSAXLE WITH GEAR OIL
Oil:
Gear oil super (08885–02106) or equivalent
Recommended oil
oil grade:
API GL–3, GL–4 or GL–5
Viscosity:
SAE 75 W–90
Above –18° C (0° F) SAE 90
Below –18° C (0° F) SAE 75 W
Capacity:
2.6 liters (2.7 US qts, 2.3 Imp.qts)

12. INSTALL UNDER COVERS AND SIDE COVERS
13. INSTALL FRONT WHEEL AND LOWER VEHICLE
Torque: 103 N–m (1,050 kgf–cm, 76 ft–lbf)

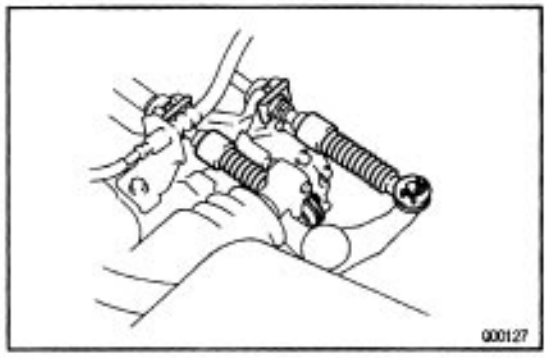


14. UNTIE STEERING GEAR HOUSING FROM ENGINE SUPPORT FIXTURE

15. REMOVE ENGINE SUPPORT FIXTURE



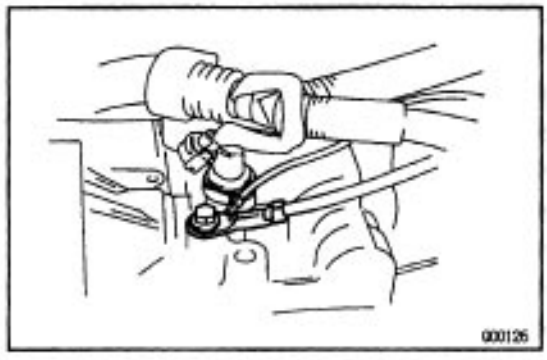
16. CONNECT VEHICLE SPEED SENSOR CONNECTOR



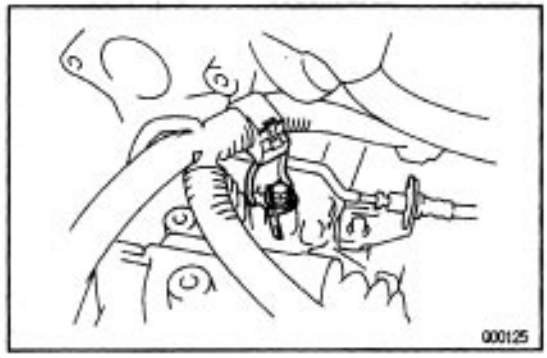
17. CONNECT CONTROL CABLES

(a) Install the clips to the cables

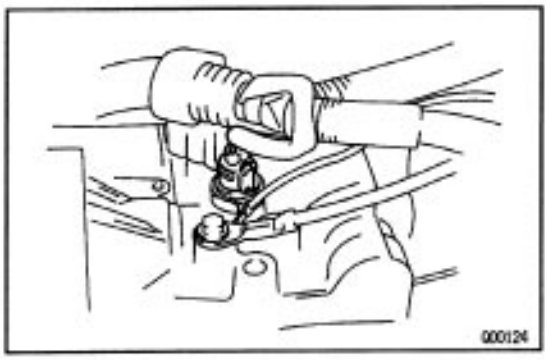
(b) Connect the cables to the linkage with washers and clips.



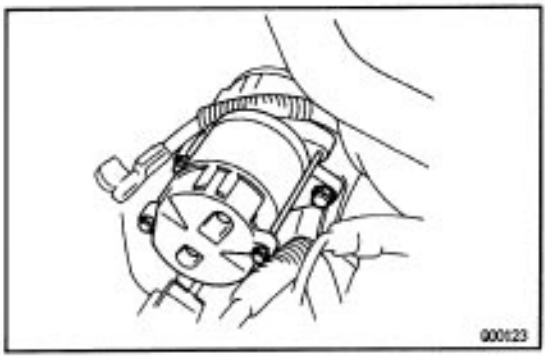
18. INSTALL EARTH CABLES



19. CONNECT WIRE HARNESS CLAMP



20. CONNECT BACK – UP LIGHT SWITCH CONNECTOR



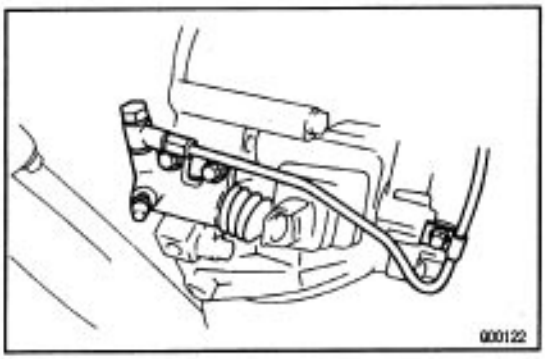
21. INSTALL STARTER

(a) Install the starter.

(b) Install and torque the 2 bolts.

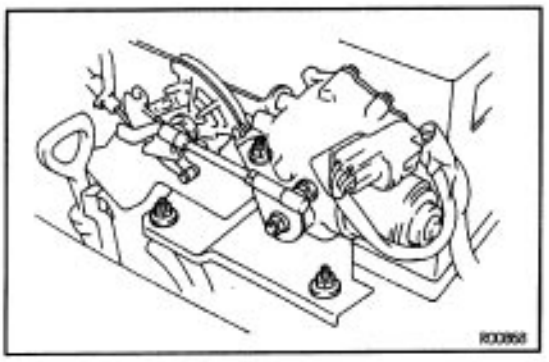
Torque: 39 N–m (400 kgf–cm, 29 ft–lbf)

(c) Connect the connector and wire to the starter.



22. INSTALL CLUTCH RELEASE CYLINDER AND TUBE CLAMP

Torque: 13 N–m (130 kgf–cm, 9 ft–lbf)



23. INSTALL CRUISE CONTROL ACTUATOR

(a) Install the cruise control actuator bracket with the 3 nuts.

(b) Connect the connector.

(c) Install the cruise control actuator cover.

24. INSTALL AIR CLEANER CASE ASSEMBLY WITH AIR HOSE

25. CONNECT NEGATIVE (–) TERMINAL CABLE TO BATTERY

26. INSPECT FRONT WHEEL ALIGNMENT

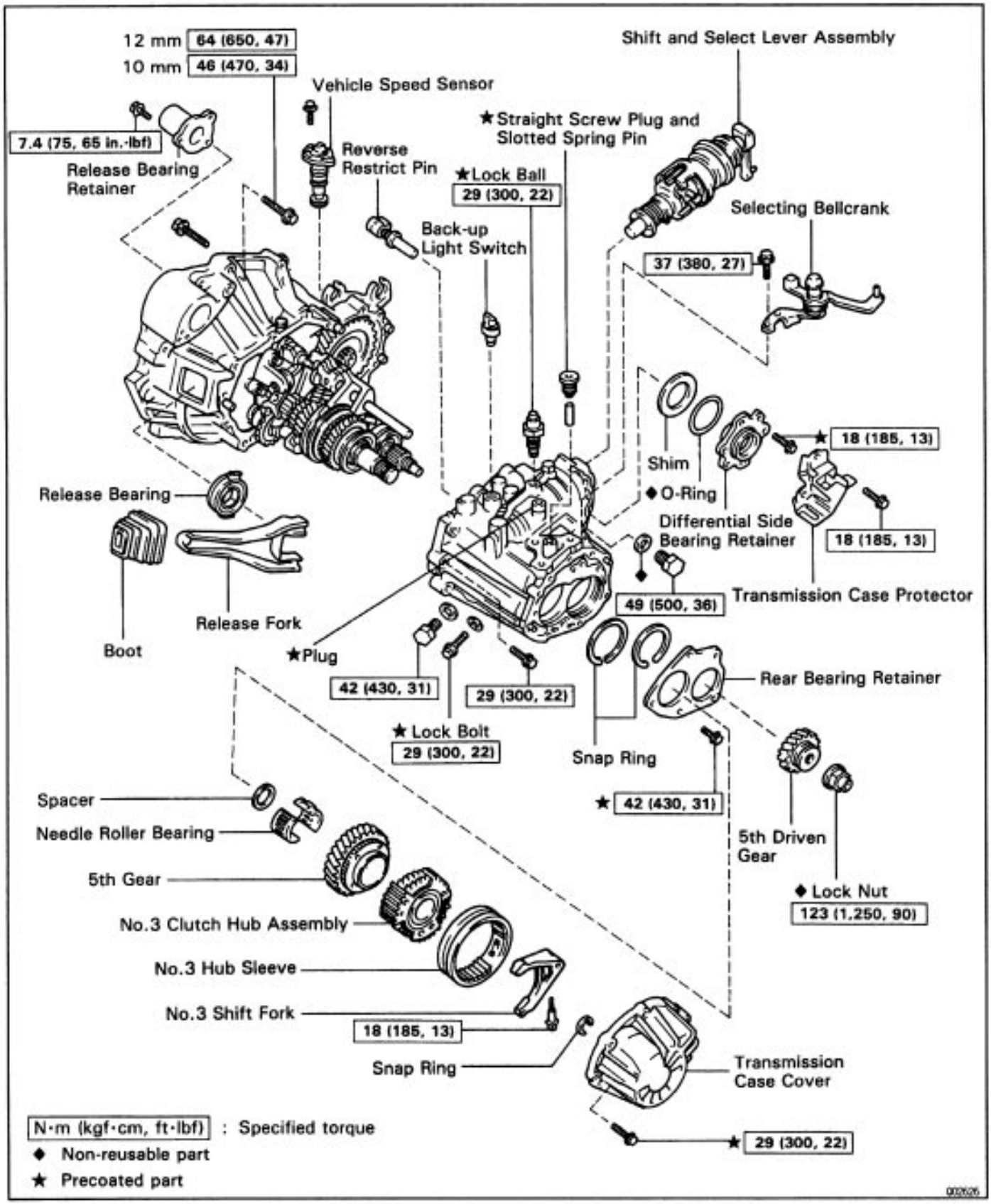
(See page SA–4)

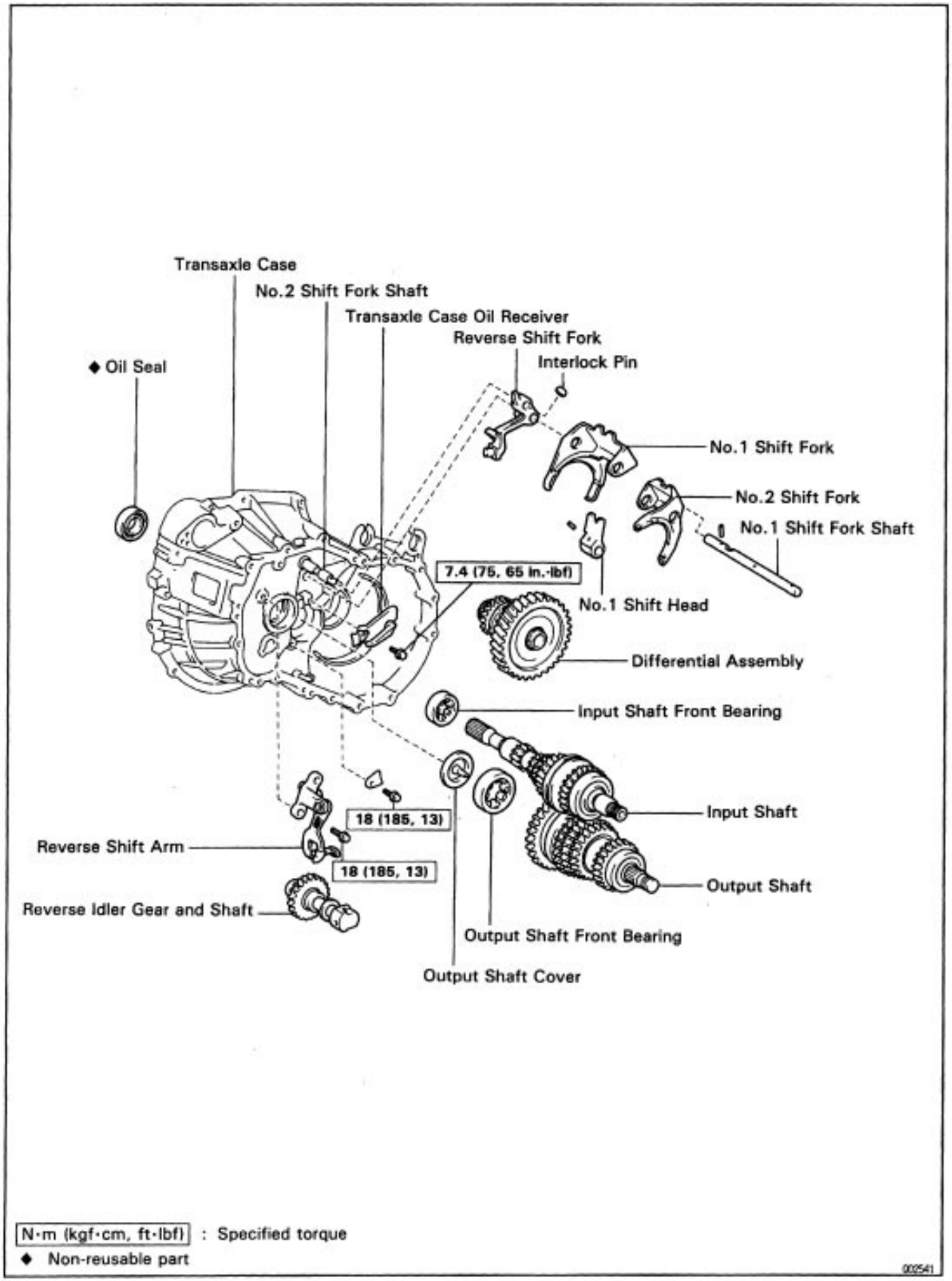
27. PERFORM ROAD TEST

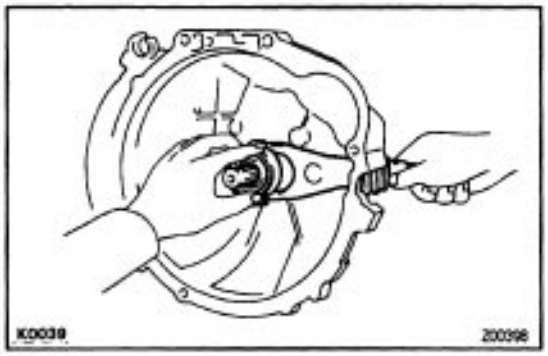
Check for abnormal noise and smooth shifting.

COMPONENT PARTS REMOVAL

COMPONENTS

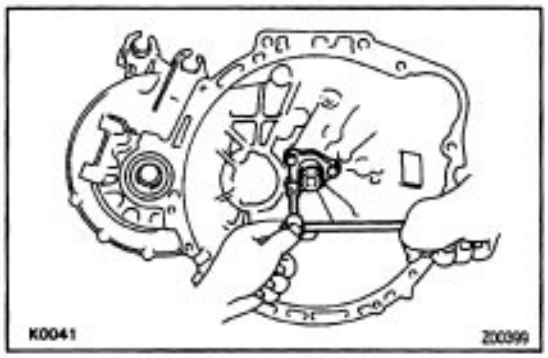



Transaxle Case
No.2 Shift Fork Shaft
Transaxle Case Oil Receiver
Reverse Shift Fork
Interlock Pin
◆ Oil Seal
No.1 Shift Fork
No.2 Shift Fork
No.1 Shift Fork Shaft
7.4 (75, 65 in.-lbf)
No.1 Shift Head
Differential Assembly
Input Shaft Front Bearing
Input Shaft
18 (185, 13)
Reverse Shift Arm
18 (185, 13)
Output Shaft
Reverse Idler Gear and Shaft
Output Shaft Front Bearing
Output Shaft Cover
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non-reusable part
002541

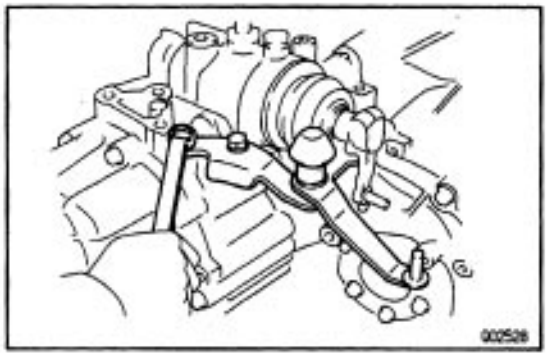


BASIC SUBASSEMBLY SEPARATION
(See page MX–20 and MX–21)

1. REMOVE RELEASE FORK, BEARING BACK – UP LIGHT SWITCH AND VEHICLE SPEED SENSOR

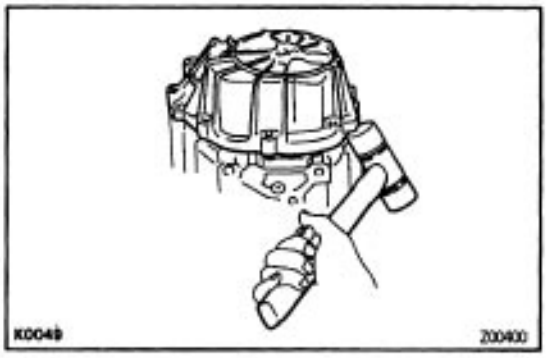


2. REMOVE RELEASE BEARING RETAINER



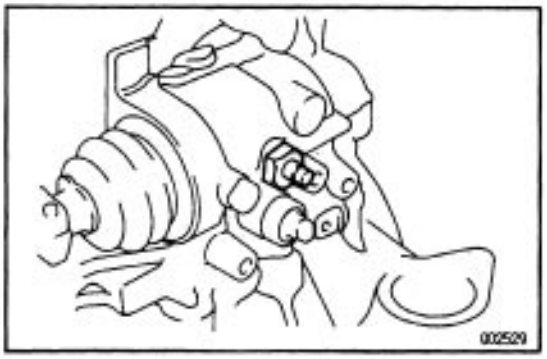
3. REMOVE ENGINE MOUNT BRACKET AND SELECTING BELLCRANK

(a) Remove the 3 bolts and engine mount bracket.
(b) Remove the 2 bolts and selecting bellcrank.



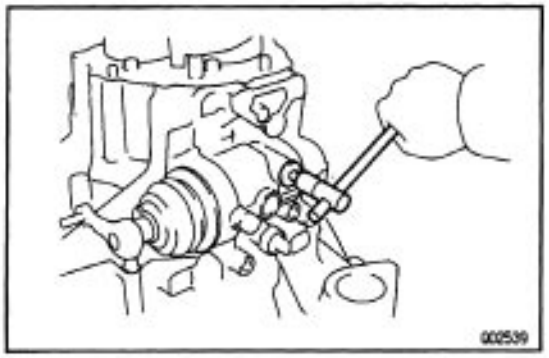
4. REMOVE TRANSMISSION CASE COVER

(a) Remove the 8 bolts.
(b) Using a plastic hammer, tap off the transmission case cover.

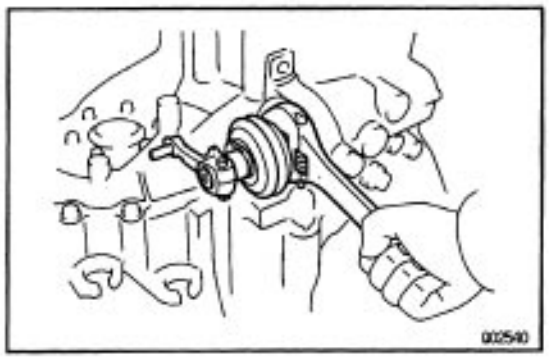


5. REMOVE LOCK BALL ASSEMBLY AND PLUG

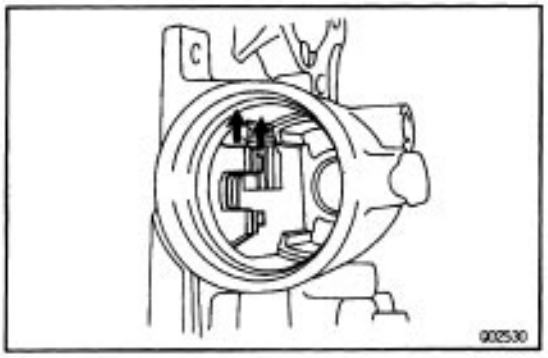
(a) Remove the lock ball.



(b) Using a hexagon wrench, remove the plug.



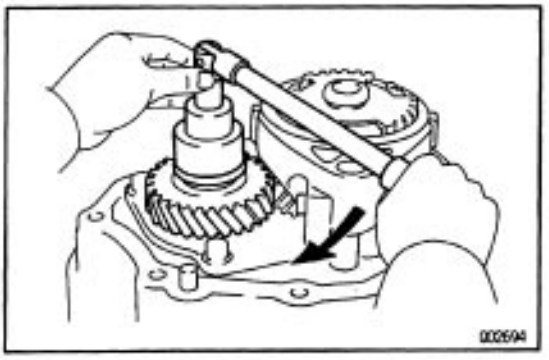
6. REMOVE SHIFT AND SELECT LEVER ASSEMBLY



7. REMOVE OUTPUT SHAFT LOCK NUT

(a) Unstake the nut.

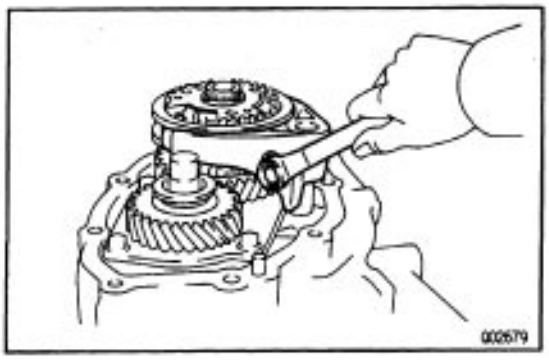
(b) Engage the gear double meshing.



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

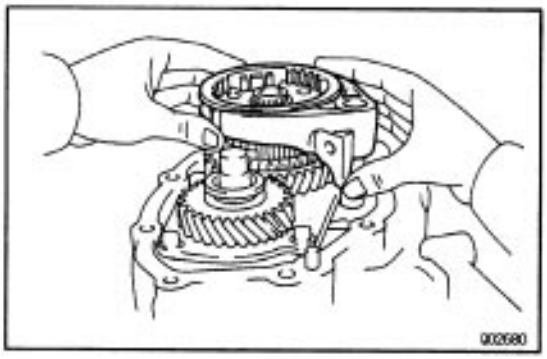
HINT: The lock nut has LH threads.

(d) Disengage the gear double meshing.

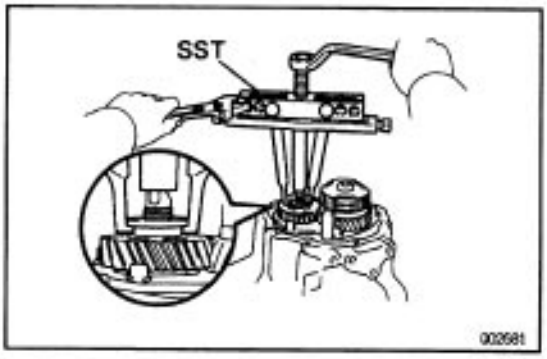


8. REMOVE NO.3 HUB SLEEVE AND NO.3 SHIFT FORK

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

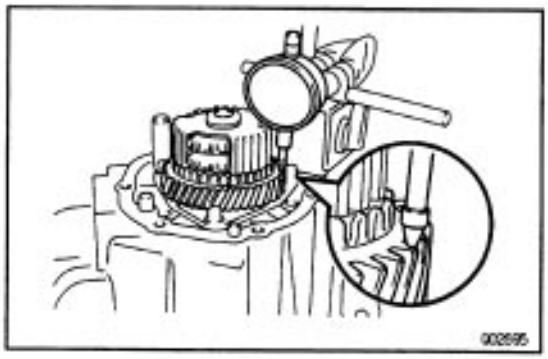


(b) Remove the No.3 hub sleeve and No.3 shift fork.



9. REMOVE 5TH DRIVEN GEAR

Using SST, remove the 5th driven gear.
SST 09950–20017



10. MEASURE 5TH GEAR THRUST CLEARANCE

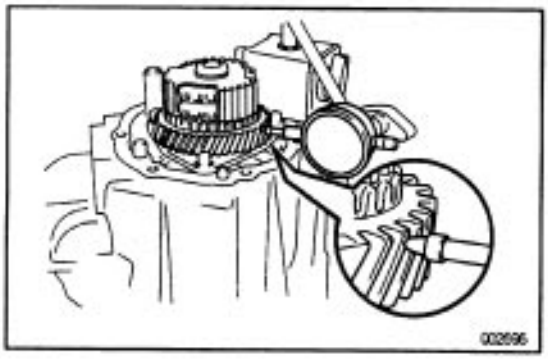
Using a dial indicator, measure the thrust clearance.

Standard clearance:

0.20–0.40 mm (0.0079–0.0157 In.)

Maximum clearance:

0.45 mm (0.0177 in.)



11. MEASURE 5TH GEAR RADIAL CLEARANCE

Using a dial indicator, measure the radial clearance.

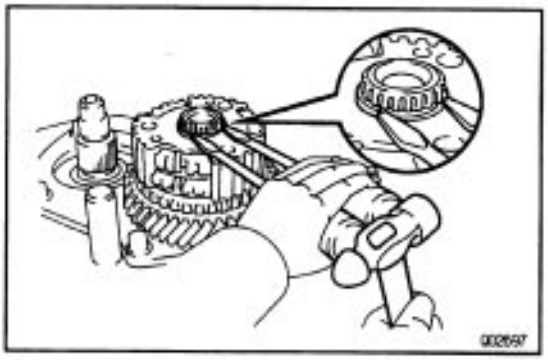
Standard clearance:

0.009–0.050 m m (0.0004–0.0020 in.)

Maximum clearance:

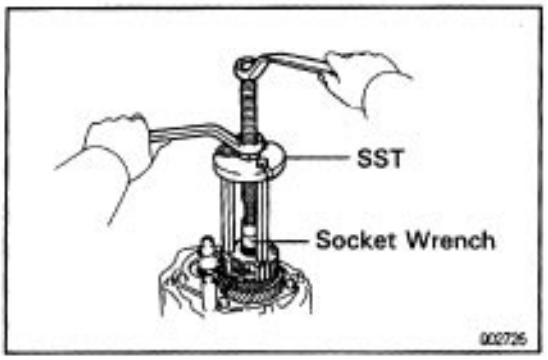
0.07 mm (0.0028 in.)

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



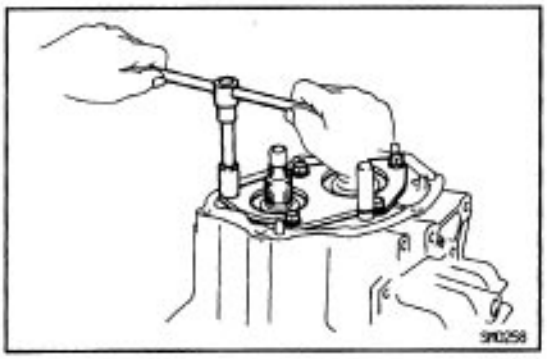
12. REMOVE NO.3 CLUTCH HUB AND 5TH GEAR

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

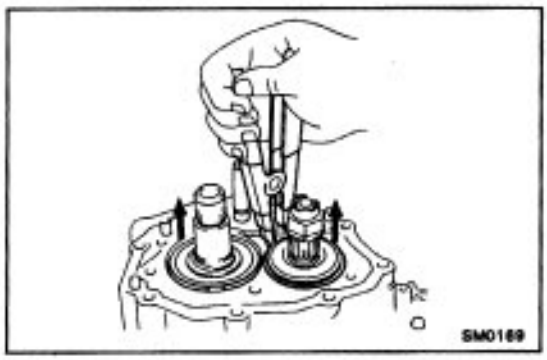


(b) Using SST, remove the No–3 clutch hub with synchronizer ring.
SST 09310–17010 (09310–07010, 09310–07020. 09310–07030)
(c) Remove the 5th gear.

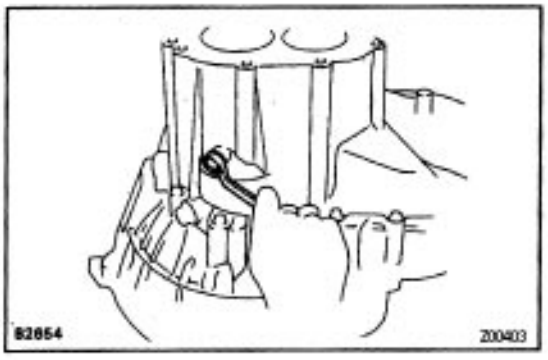
13. REMOVE NEEDLE ROLLER BEARING



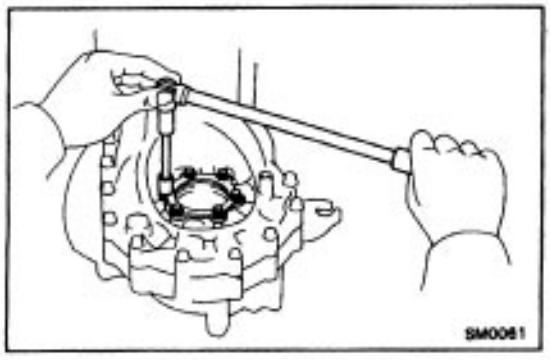
14. REMOVE REAR BEARING RETAINER



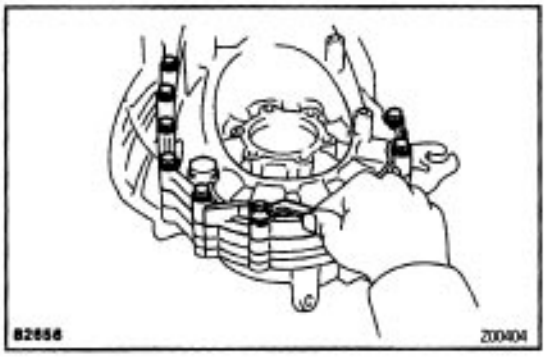
15. REMOVE BEARING SNAP RINGS
Using a snap ring expander, remove the 2 snap rings.
HINT: If it is difficult to remove the snap rings, pull up the shafts.



16. REMOVE REVERSE IDLER GEAR SHAFT LOCK BOLT



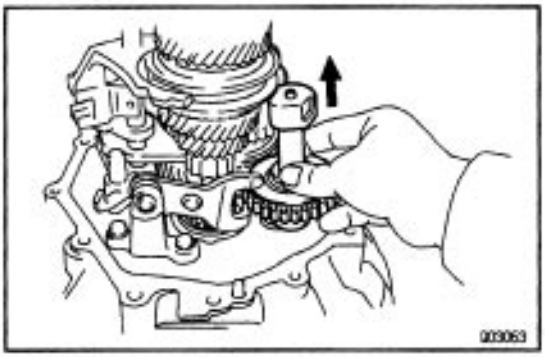
17. REMOVE DIFFERENTIAL SIDE BEARING RETAINER AND SHIM



18. REMOVE TRANSMISSION CASE

(a) Remove the 17 bolts.

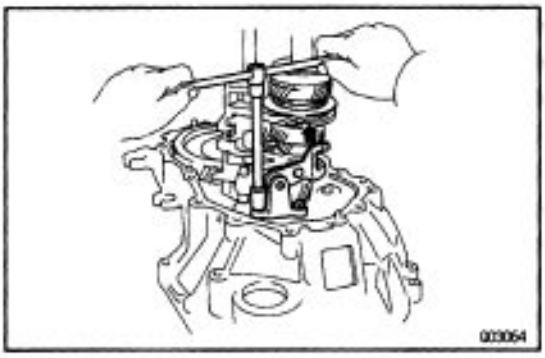
(b) Using a plastic hammer, tap off the transmission case.



19. REMOVE REVERSE IDLER GEAR AND SHAFT

(a) Pull out the shaft.

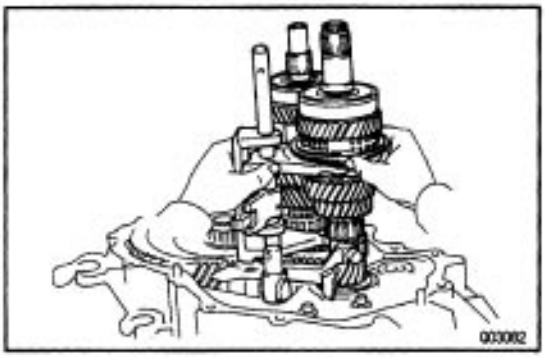
(b) Remove the idler gear and thrust washer.



20. REMOVE REVERSE SHIFT ARM

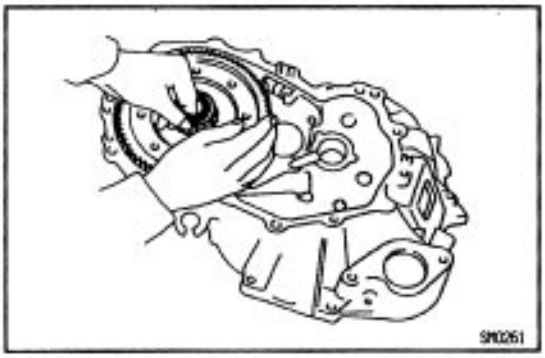
(a) Shift the fork shaft into reverse.

(b) Remove the 2 bolts and pull off the reverse shift arm.

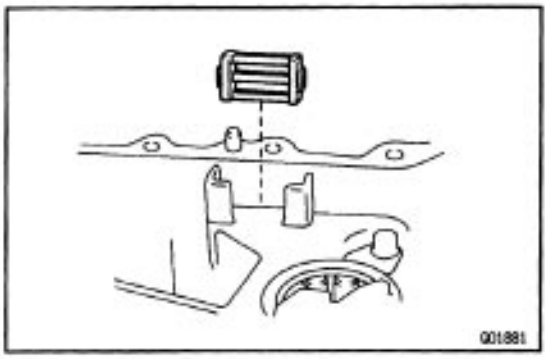


21. REMOVE NO.1 SHIFT FORK SHAFT, NO.1 SHIFT HEAD, NO.1 AND NO.2 SHIFT FORKS, REVERSE SHIFT FORK WITH INTERLOCK PIN, INPUT AND OUTPUT SHAFTS ASSEMBLY

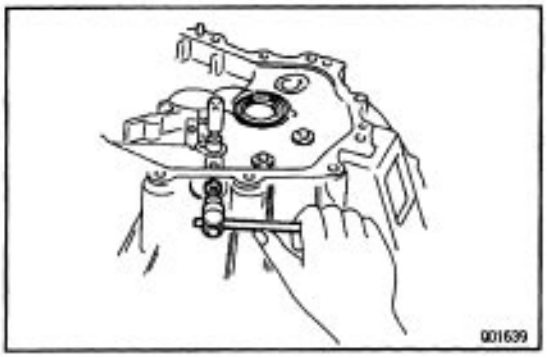
Remove the input shaft assembly and output shaft assembly together with the No. 1 fork shaft, shift head and shift forks with the interlock pin from the trans–axle case.



22. REMOVE DIFFERENTIAL CASE ASSEMBLY

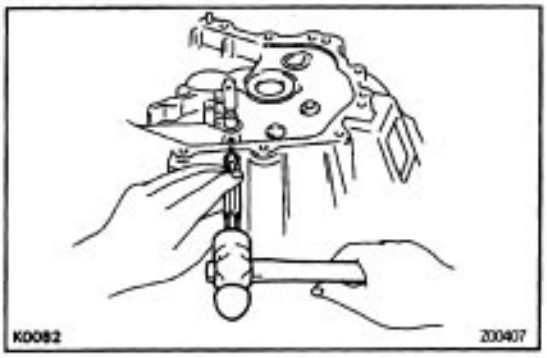


23. REMOVE MAGNET FROM TRANSAXLE CASE



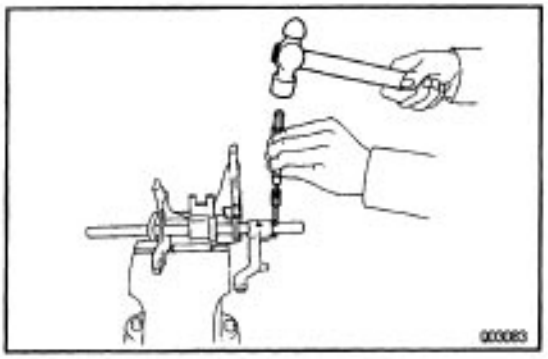
24. REMOVE NO.2 FORK SHAFT

(a) Using a hexagon wrench, remove the straight screw plug.



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

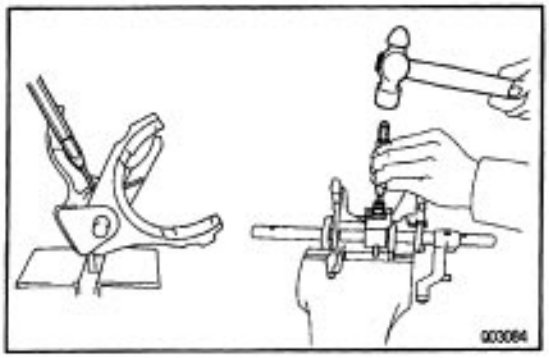
(c) Pull out the shaft.



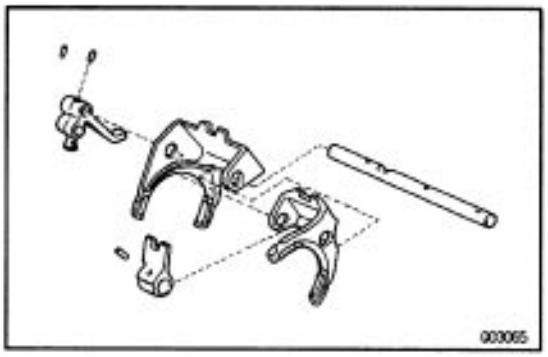
25. SEPARATE NO.1 FORK SHAFT, NO.1 SHIFT HEAD, NO.1, NO.2 SHIFT FORKS AND REVERSE SHIFT FORK

(a) Mount the shift forks to the vise.

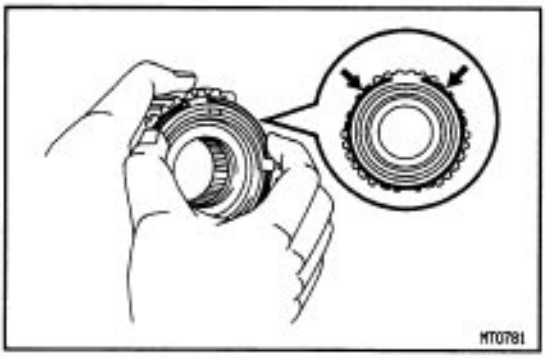
(b) Using a pin punch and hammer, drive out the slotted spring pin from the No.1 fork shaft.



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

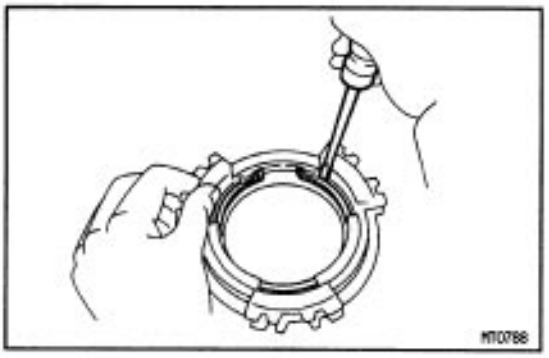


(d) Separate the No.1 shift fork shaft, No.1 shift head, No.1, No.2 shift forks and reverse shift fork.

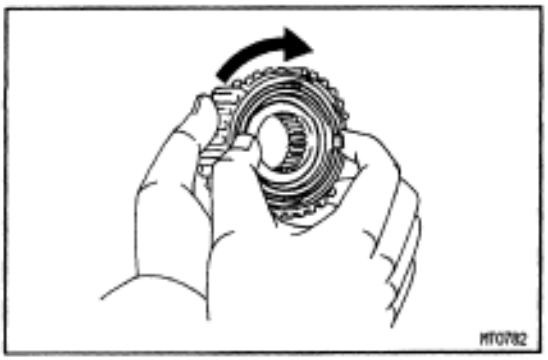


26. REMOVE NO.5 SYNCHRONIZER RING WITH KEY SPRING FROM NO.3 CLUTCH HUB

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



COMPONENT PARTS INSPECTION

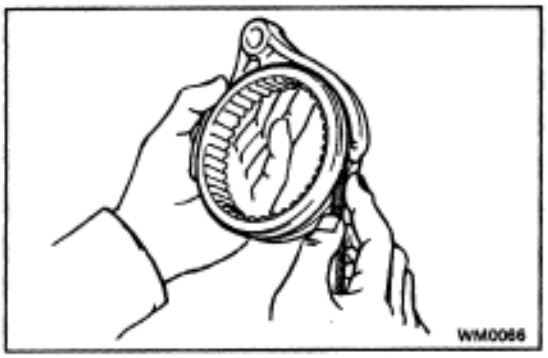
1. INSPECT N0.5 SYNCHRONIZER RINGS

(a) Check for wear or damage.

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

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

If the braking effect is insufficient, replace the syn–chronizer ring.



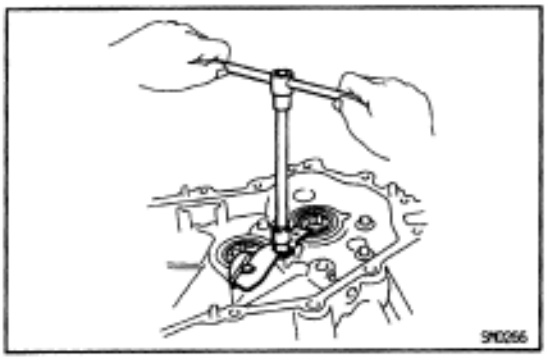
2. INSPECT CLEARANCE OF NO.3 SHIFT FORK AND NO.3 HUB SLEEVE

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

Maximum clearance:

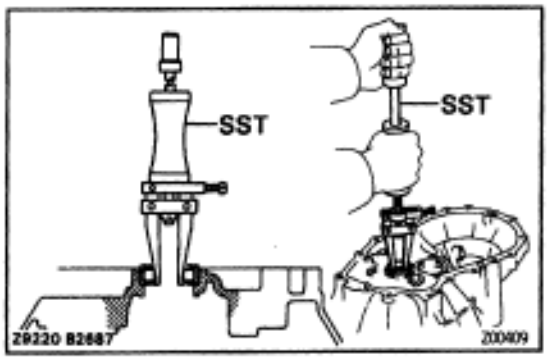
1.0 mm (0.039 in.)

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



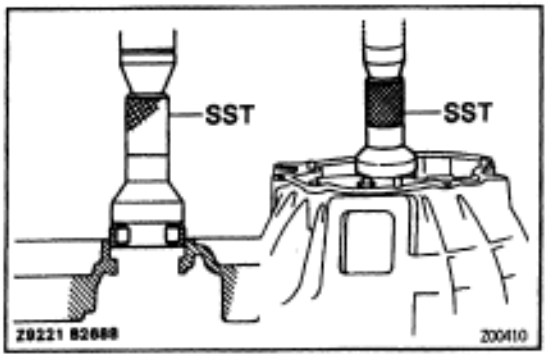
3. IF NECESSARY, REPLACE INPUT SHAFT FRONT BEARING

(a) Remove the bolt and transaxle case receiver.



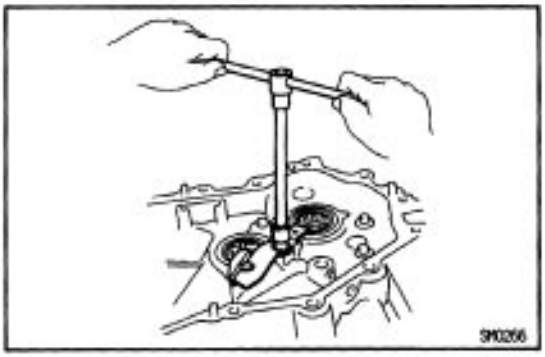
(b) Using SST, pull out the bearing.

SST 09308–00010

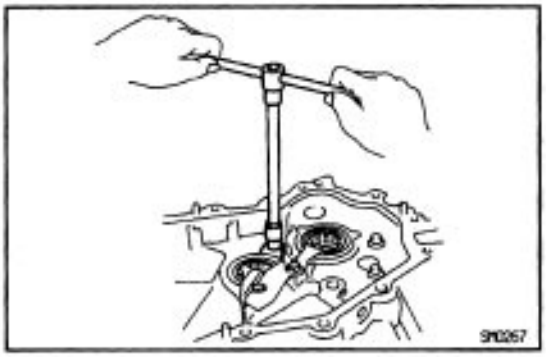


(c) Using SST, press in a new bearing.

SST 09310–35010

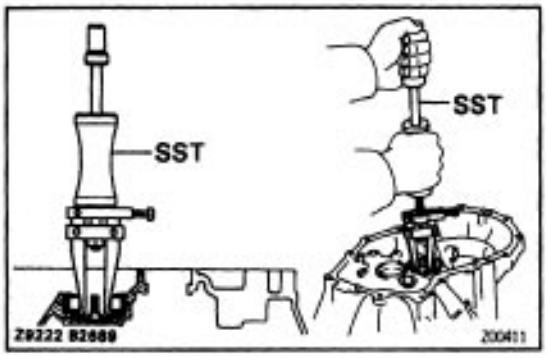


(d) Install the transaxle case receiver and torque the bolt.
Torque: 7.4 N–m (75 kgf–cm, 65 in–lbf)

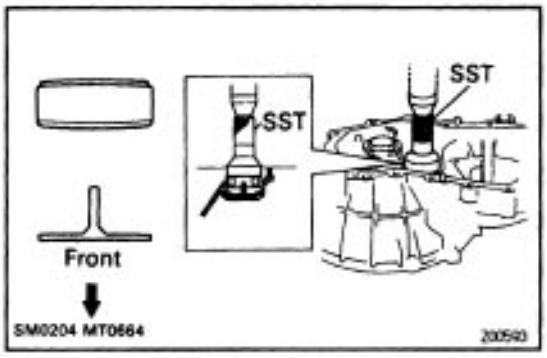


4. IF NECESSARY, REPLACE OUTPUT SHAFT FRONT BEARING

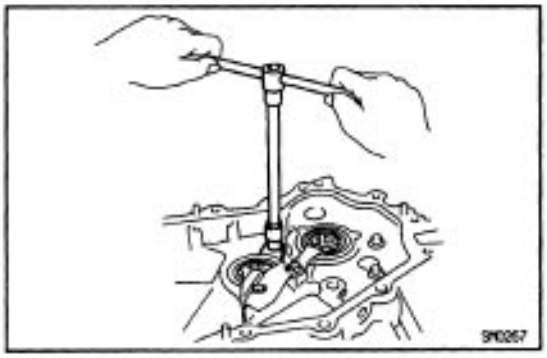
(a) Remove the bolt and bearing lock plate.



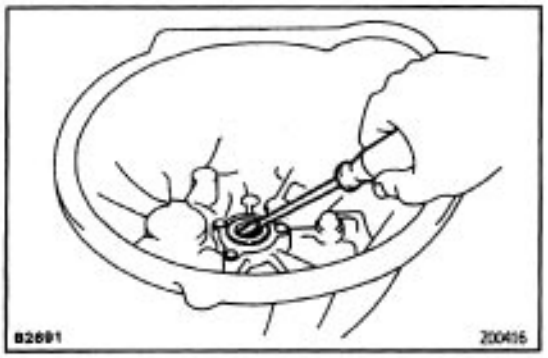
(b) Using SST, pull out the bearing.
SST 09308–00010



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

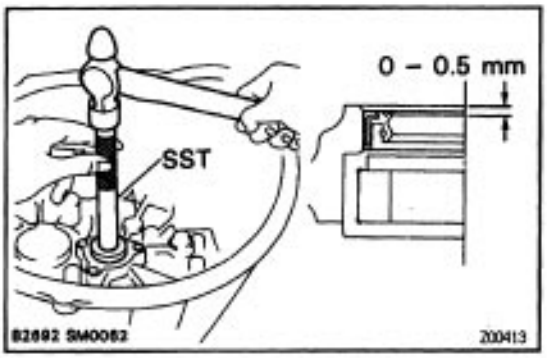


(d) Install the bearing lock plate and torque the bolt.
Torque: 18 N–m (185 kgf–cm, 13 ft–lbf)



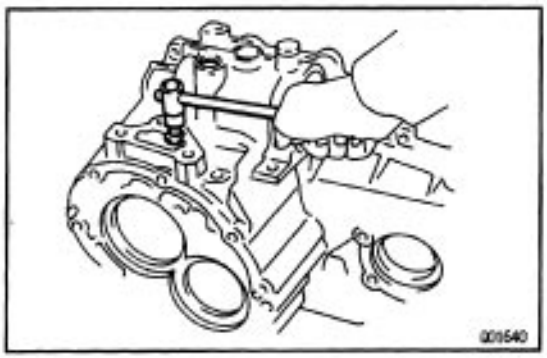
5. IF NECESSARY, REPLACE INPUT SHAFT FRONT OIL SEAL

(a) Using a screwdriver, pry out the oil seal.



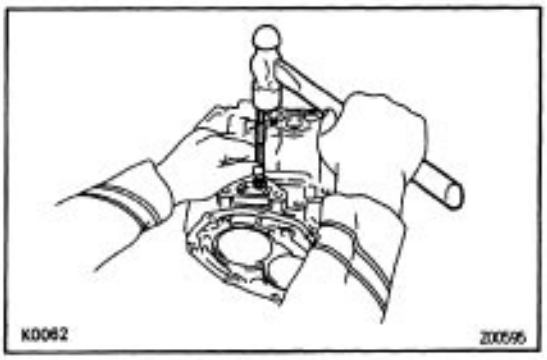
(b) Using SST, drive in a new oil seal.
SST 09608–20012 (09608–00080, 09608–03020)
Drive in depth:
0–0.5 mm (0–0.012 in.)

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

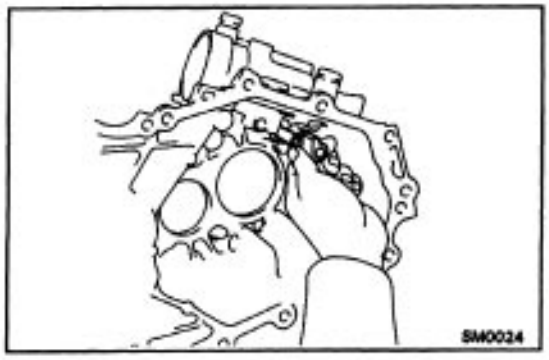


6. IF NECESSARY, REPLACE REVERSE RESTRICT PIN

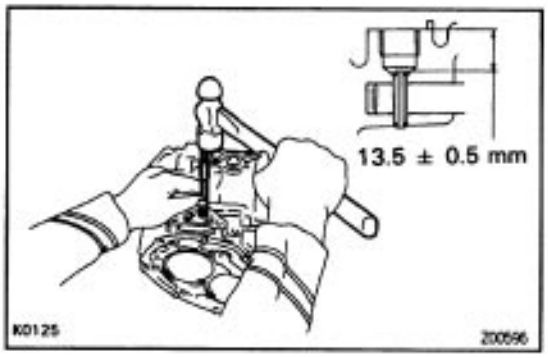
(a) Using a hexagon wrench, remove the straight screw plug.



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



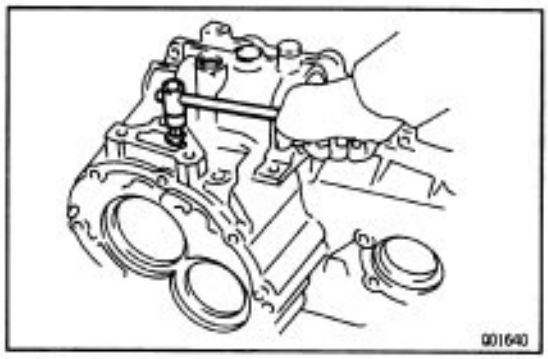
(c) Replace the reverse restrict pin.



(d) Using a pin punch and hammer, drive in the slotted spring pin.

Drive In depth:

13.5 ± 0.5 mm (0.531 t 0.020 in.)



(e) Apply sealant to the plug threads.

Sealant:

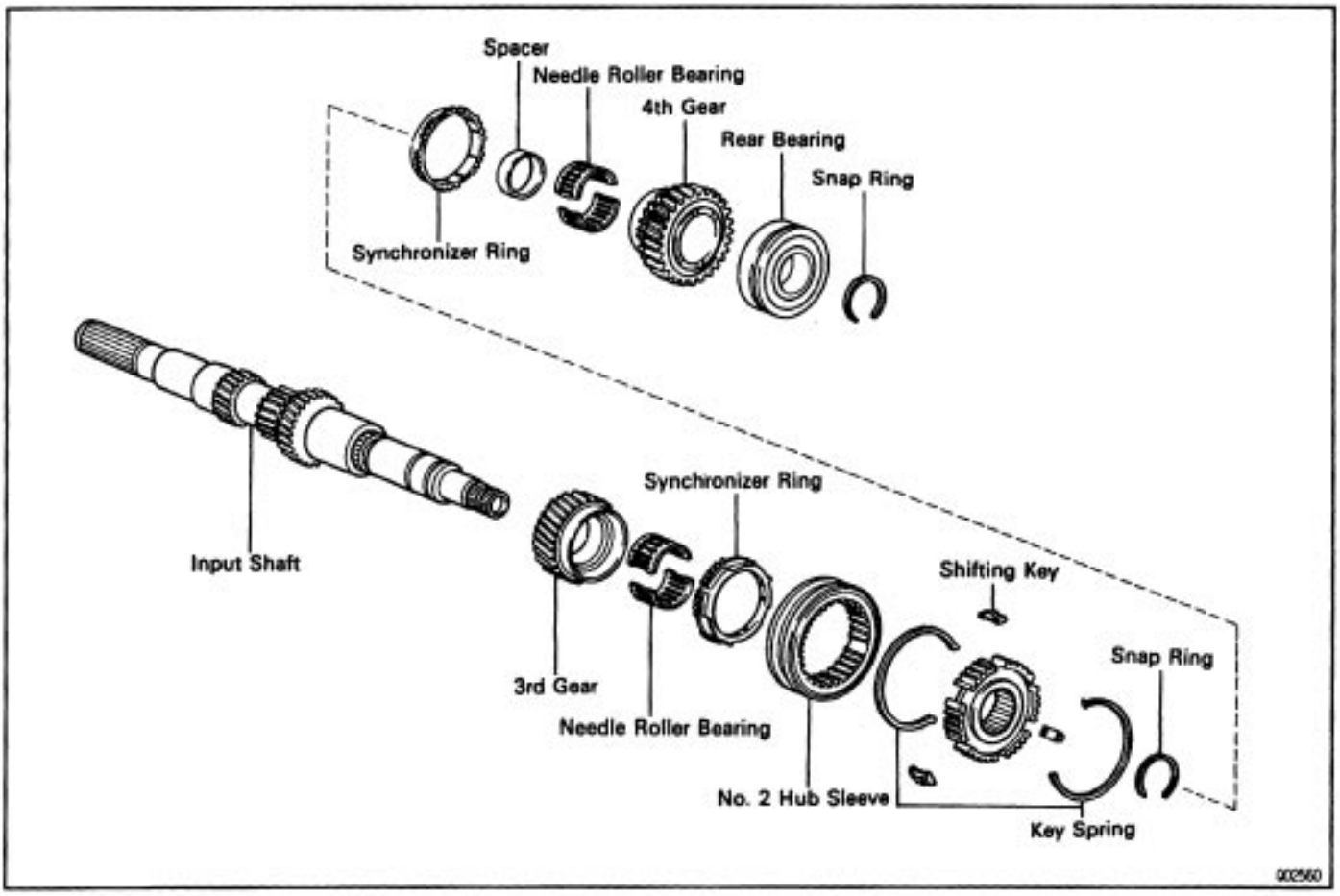
Part No.08833 – 00080, THREE BOND 1344, LOC–TITE 242 or equivalent

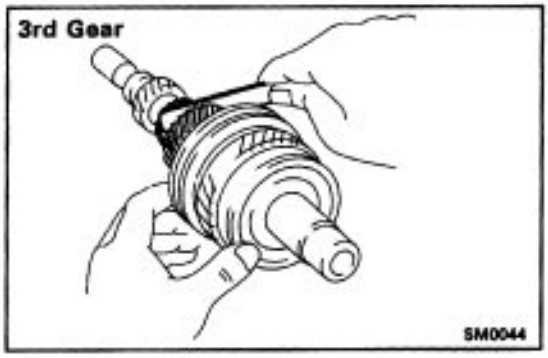
(f) Using a hexagon wrench, install and torque the straight screw plug.

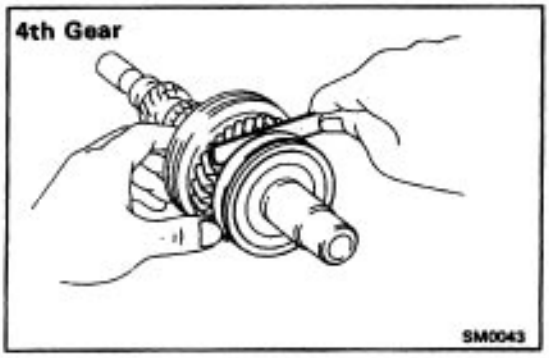
Torque: 13 N–m (130 kgf–cm, 9 ft–lbf)

INPUT SHAFT

COMPONENTS







INPUT SHAFT DISASSEMBLY

1. INSPECT 3RD AND 4TH GEAR 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.)

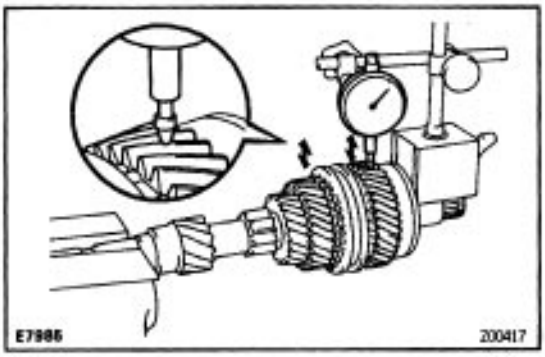
Maximum clearance:

3rd gear

0.30 mm (0.0118 in.)

4th gear

0.50 mm (0.0197 in.)



2. INSPECT 3 RD AND 4 TH GEAR RADIAL CLEARANCE

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

Standard clearance:

0.009–0.053 mm (0.0004–0.0021 in.)

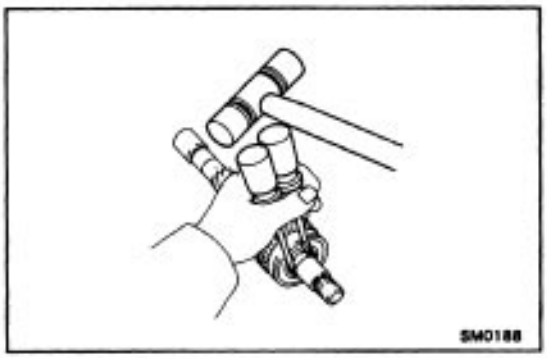
Maximum clearance:

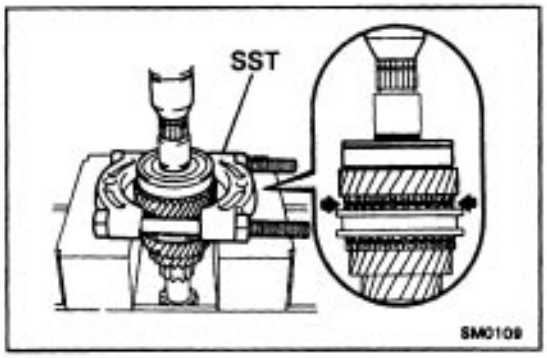
0.070 mm (0.0028 in.)

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.

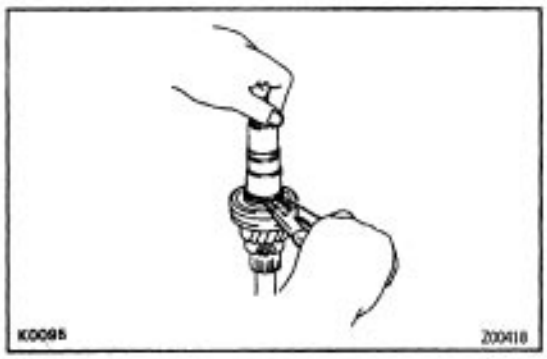




4. REMOVE REAR BEARING, 4 TH GEAR, NEEDLE ROLLER BEARINGS, SPACER AND SYNCHRONIZER RING FROM INPUT SHAFT

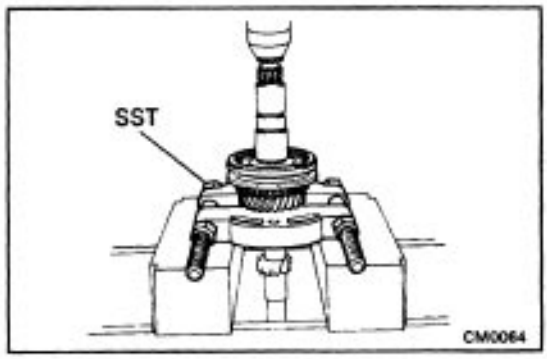
(a) Using SST and a press, remove the 4th gear and rear bearing.
SST 09950–00020

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



5. REMOVE SNAP RING

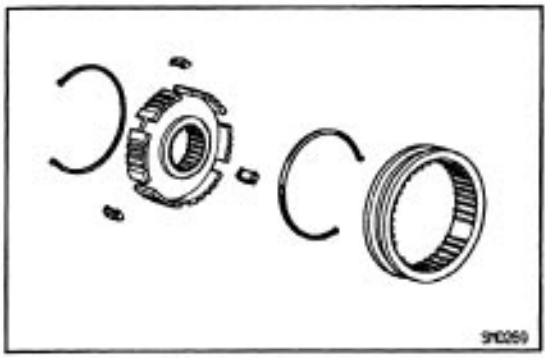
Using a snap ring expander, remove the snap ring.



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

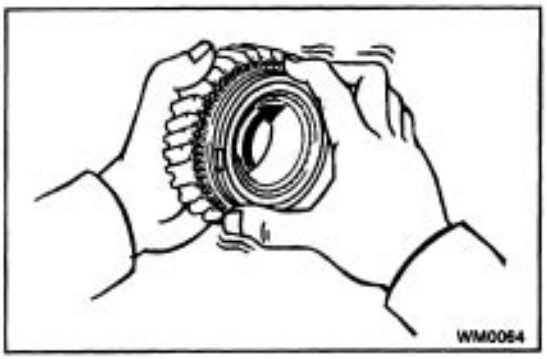
Using SST and a press, remove the No.2 hub sleeve, 3rd gear, synchronizer ring and needle roller bearings.
SST 09950–00020

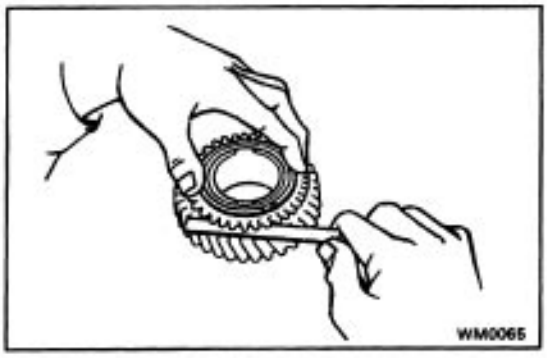
NOTICE: Be careful not to confuse the synchronizer ring for 3rd gear and synchronizer ring for 4th gear.



7. REMOVE N0.2 HUB SLEEVE, SHIFTING KEYS AND SPRINGS FROM NO.2 CLUTCH HUB

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





INPUT SHAFT COMPONENTS INSPECTION

1. INSPECT SYNCHRONIZER RINGS

(a) Check for wear or damage.

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

Turn the synchronizer ring in one direction while push–ing it to the gear cone. Check that the ring locks.

If the braking effect is¿insufficient, apply a small amount of fine lapping compound between the syn–chronizer ring and gear cone.

Lightly rub the synchronizer ring and gear cone to–gether.

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

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

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

Minimum clearance:

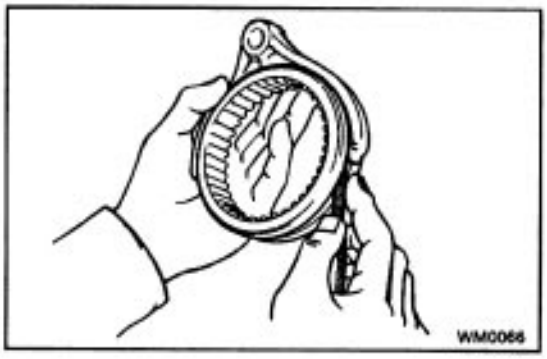
0.6 mm (0.024 fn.)

HINT:

- When replacing either a synchronizer ring or gear, apply a small amount of fine lapping com–pound between the synchronizer ring and gear cone.

  Lightly rub the synchronizer ring and gear cone together.
- When replacing both the synchronizer ring and gear, there is no need to apply any compound or to rub them to-gether.

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



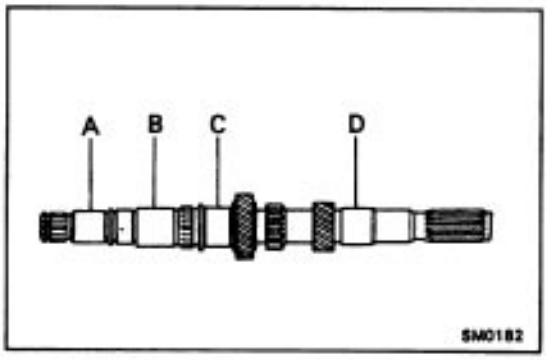
2. INSPECT CLEARANCE OF N0.2 SHIFT FORK AND HUB SLEEVE

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.)

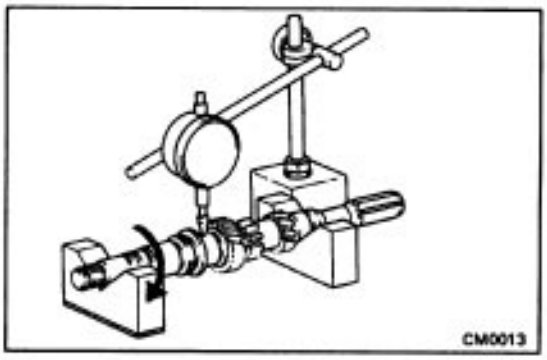
Part C

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.

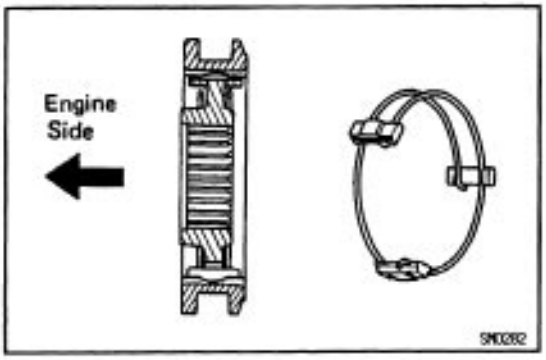


(c) Using a dial indicator, check the shaft runout.

Maximum runout:

0.05 mm (0.0020 in.)

If the outer diameter exceeds the maximum, replace the input shaft.



INPUT SHAFT ASSEMBLY
(See page MX–33)

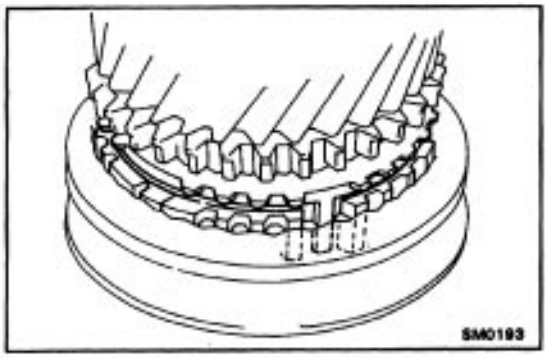
HINT: Coat all of the sliding and rotating surface with gear oil before assembly.

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: Install the key springs positioned so that their and gaps are not line.

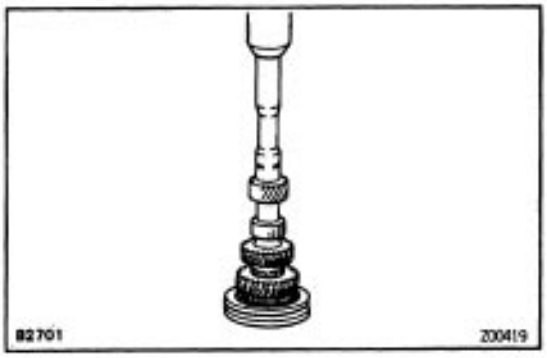


2. INSTALL 3RD GEAR, NEEDLE ROLLER BEARINGS. SYNCHRONIZER RING AND NO.2 HUB SLEEVE ASSEMBLY TO INPUT SHAFT

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

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

NOTICE: Do not install the synchronizer ring for 4th gear.

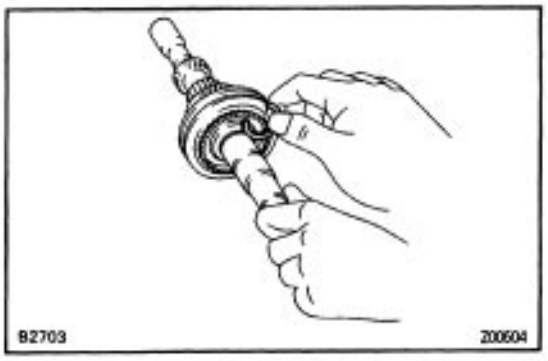


(c) Using a press, install the 3rd gear and No.2 hub sleeve.

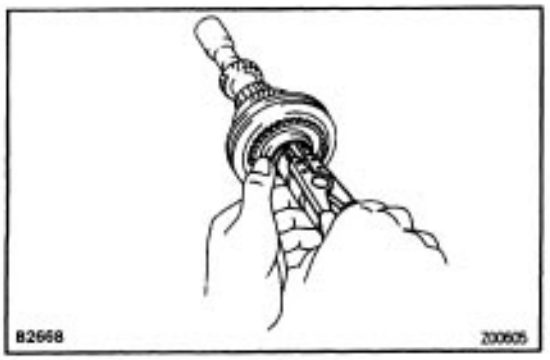
3. INSTALL SNAP RING

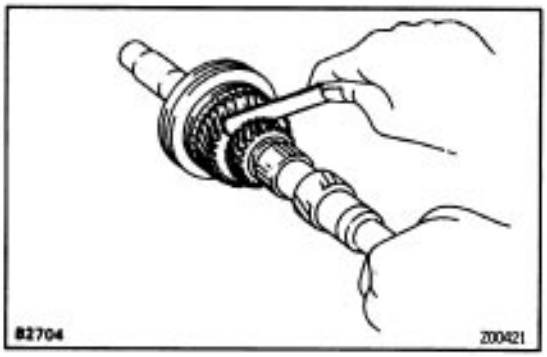
(a) Select a snap ring that will allow minimum axial play.

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.



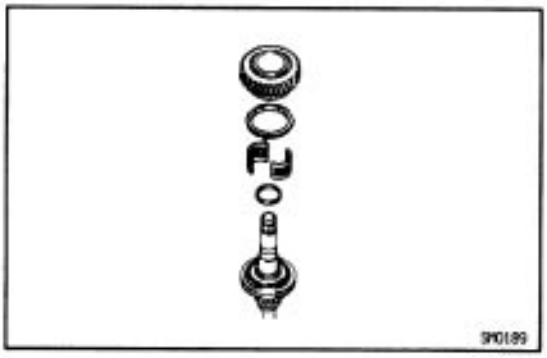


4. INSPECT 3RD GEAR THRUST CLEARANCE

Using a feeler gauge, measure the 3rd gear thrust clearance.

Standard clearance:

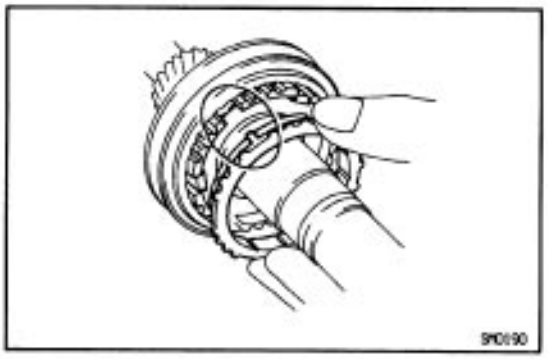
0.10–0.25 mm (0.0039–0.0098 in.)



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

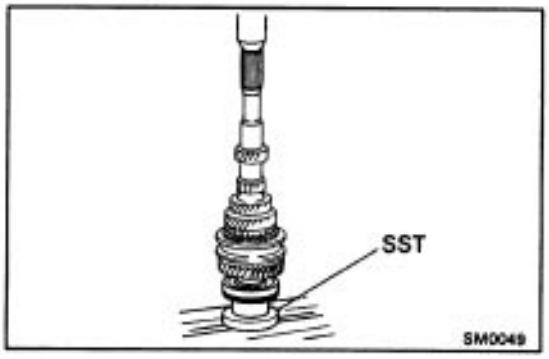
(a) Apply gear oil to the needle roller bearings.

(b) Install the spacer and needle roller bearings.



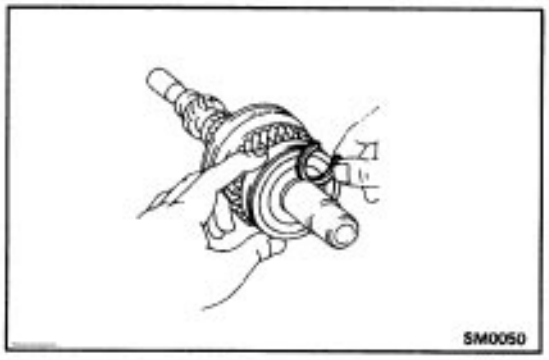
(c) Place the synchronizer ring on the gear.

HINT: Align the ring slots with the shifting keys, and the ring projections with the hub slots.



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

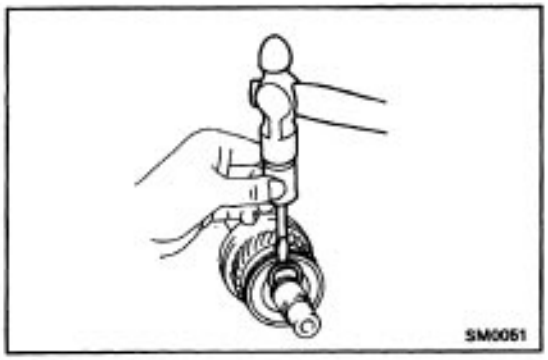
SST 09608–12010 (09608–00070)



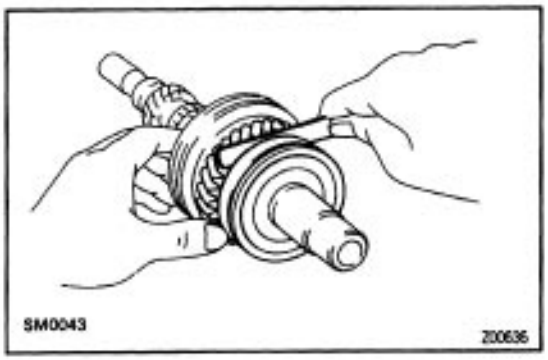
6. INSTALL SNAP RING

(a) Select a snap ring that will allow 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

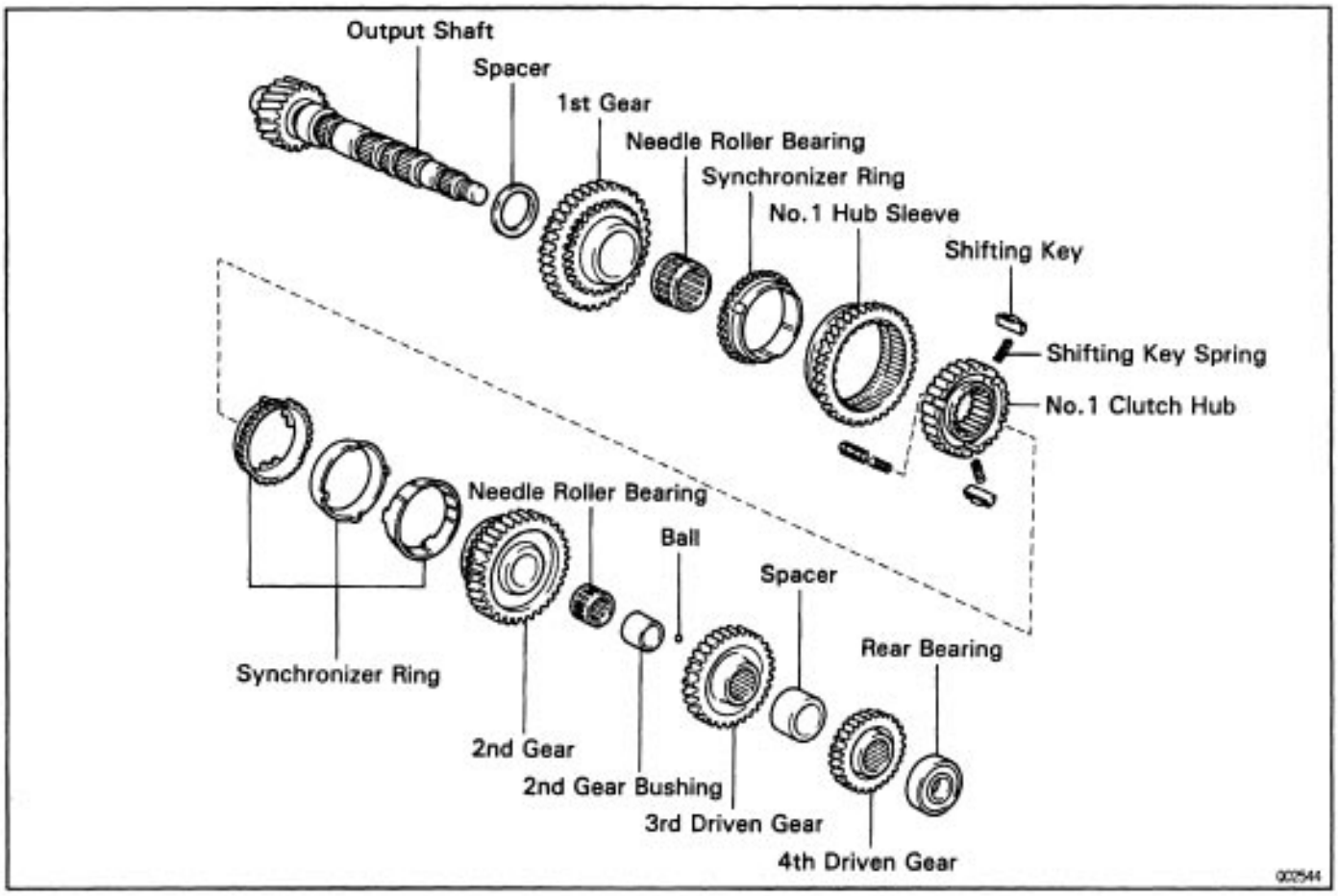
Using a feeler gauge, measure 4th gear thrust clear–ance.

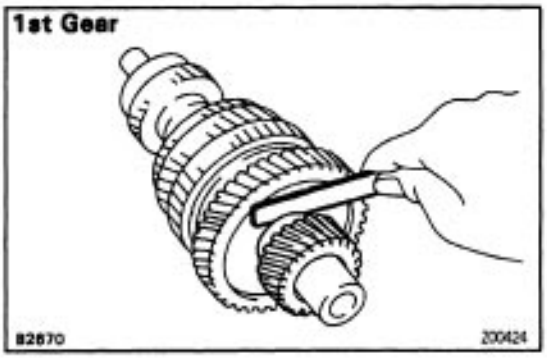
Standard clearance:

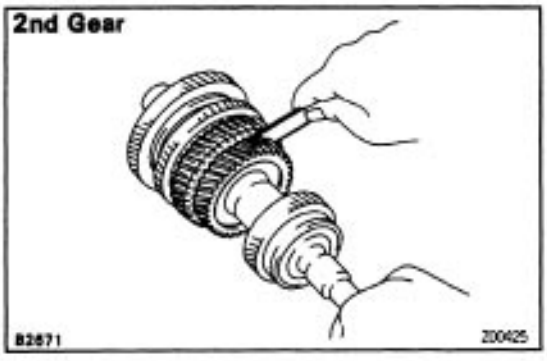
0.20–0.45 mm (0.0079–0.0177 in.)

OUTPUT SHAFT

COMPONENTS







OUTPUT SHAFT DISASSEMBLY

1. INSPECT 1ST AND 2ND GEAR 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.)

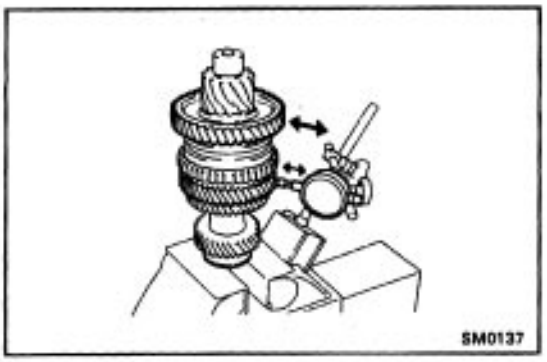
Maximum clearance:

1st gear

0.35 mm (0.0138 in.)

2nd gear

0.50 mm (0.0197 in.)



2. INSPECT 1 ST AND 2 ND GEAR RADIAL CLEARANCE

Using dial indicator, measure the radial clearance be–tween the gear and shaft.

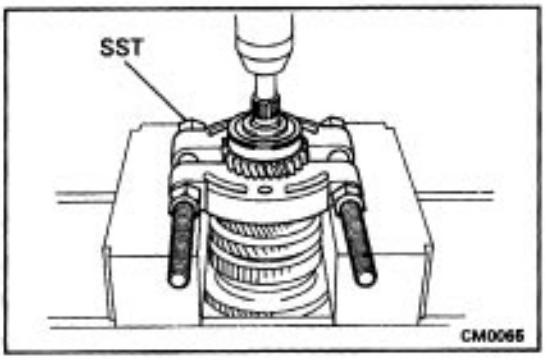
Standard clearance:

0.009–0–053 m m (0.0004–0.0021 In.)

Maximum clearance:

0.070 mm (0.0028 In.)

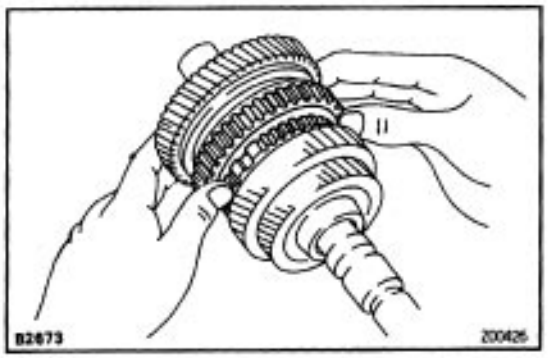
If the clearance exceeds the maximum, replace the gear, needle roller bearing or shaft.



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

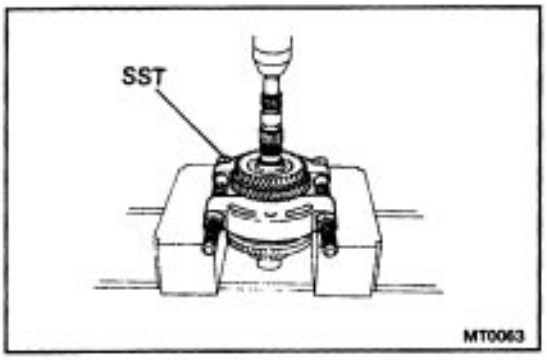
(a) Using SST and a press, remove the rear ball bearing and 4th driven gear.
SST 09950–00020

(b) Remove the output gear spacer and bait.



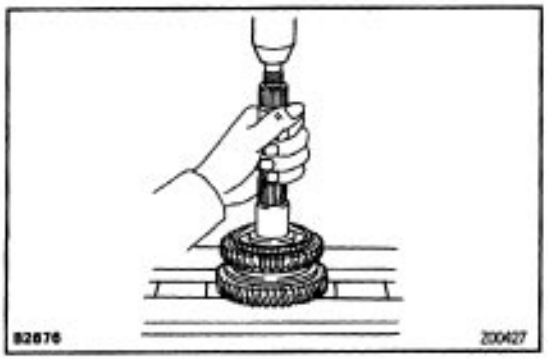
4. REMOVE 3RD DRIVEN GEAR, 2ND GEAR, NEEDLE ROLL-ER BEARING AND SYNCHRONIZER RING

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



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

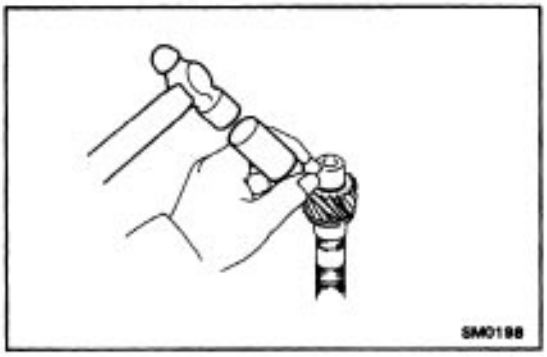
(c) Remove the needle roller bearing and synchronizer rings.



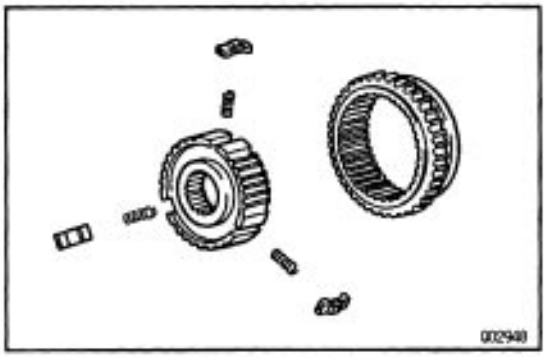
5. REMOVE NO.1 HUB SLEEVE ASSEMBLY, 1ST GEAR, SYN-CHRONIZER RING, NEEDLE ROLLER BEARING, THRUST WASHER AND LOCKING BALL

(a) Using a press, remove the No.1 hub sleeve, 1st gear and synochronizer ring.

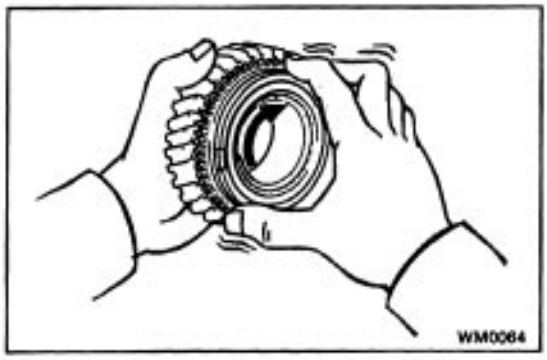
(b) Remove the needle roller bearing and locking ball.

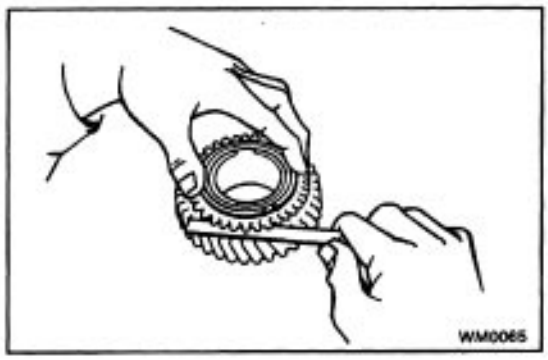


(c) Using a screwdriver and hammer, drive out the thrust washer.



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





OUTPUT SHAFT COMPONENT PARTS INSPECTION

MX071–04

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 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 the gear spline end.

Minimum clearance:

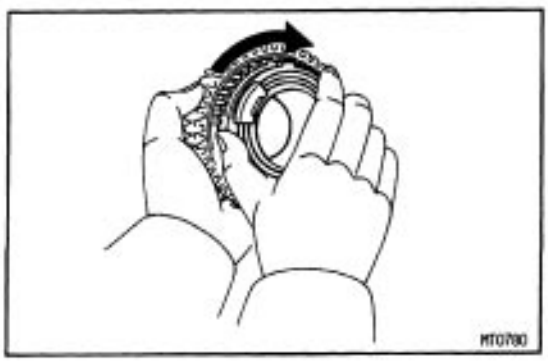
0.6 mm (0.024 in.)

HINT:

- When replacing either a synchronizer ring or gear, apply a small amount of fine lapping compound between the synchronizer ring and gear cone.

  Lightly rub the synchronizer ring and gear cone together.
- When replacing both the synchronizer ring and gear, there is no need to apply any compound or to rub them together.

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

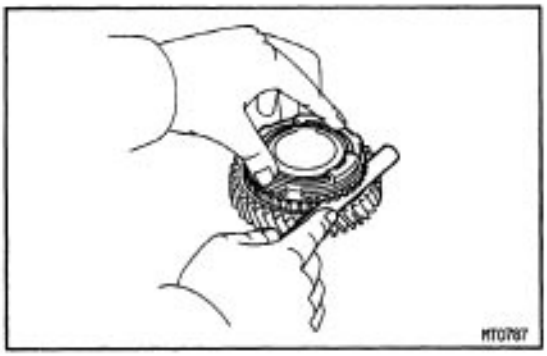


2. INSPECT 2ND GEAR SYNCHRONIZER RING

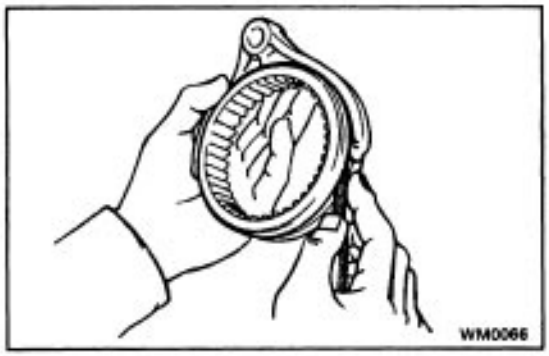
(a) Check for wear or damage.

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

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



(c) 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 limit, replace the synchronizer ring.



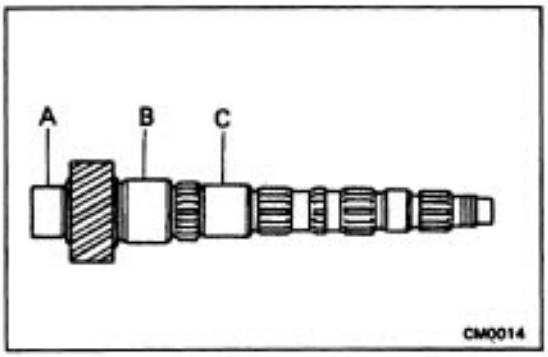
3. INSPECT SHIFT FORKS AND HUB SLEEVES CLEARANCE

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 OUTPUT SHAFT

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

Minimum outer diameter:

Part A

31.970 mm 11.2587 In.)

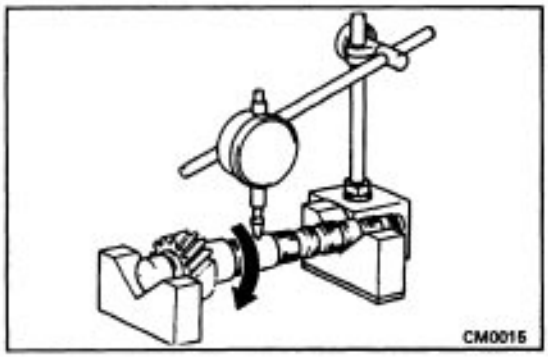
Part B

37.970 mm (1.4949 In.)

Part C

31.990 mm 11.2594 In.)

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

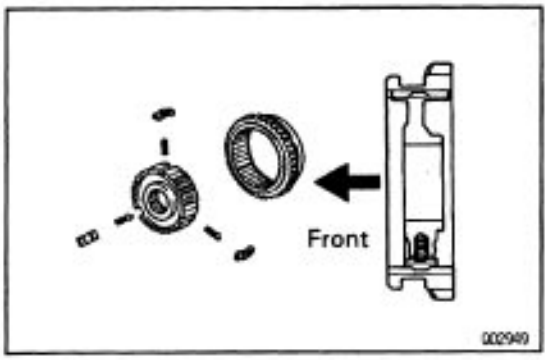


(b) Using a dial indicator, check the shaft runout.

Maximum runout:

0.05 mm (0.0020 in.)

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



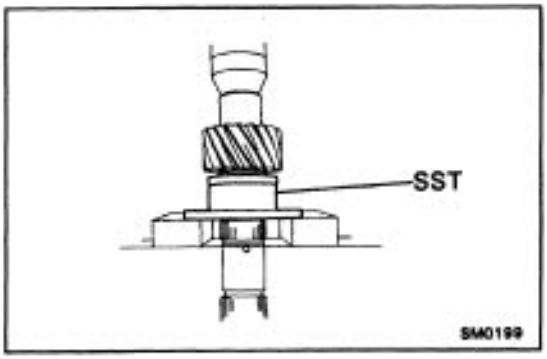
OUTPUT SHAFT ASSEMBLY
(See page MX–40)

HINT: Coat all of the sliding and rotating surface with gear oil before assembly.

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.

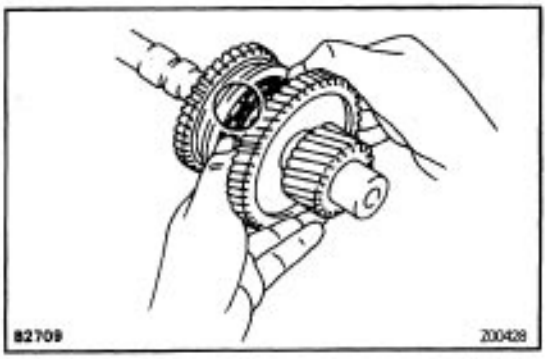


HINT: Direct identification groove of the hub sleeve to front of the transmission.

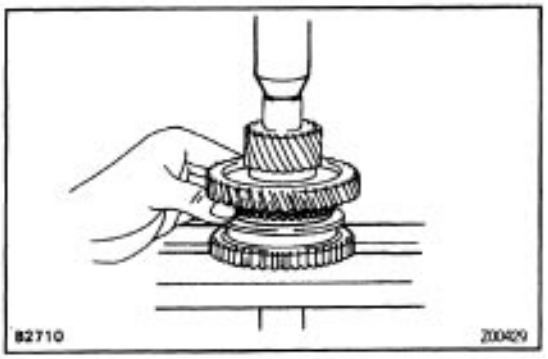
2. INSTALL THRUST WASHER, 1 ST GEAR, NEEDLE ROLLER BEARING, SYNCHRONIZER RING AND NO.1 HUB SLEEVE TO OUTPUT SHAFT

(a) Using SST and a press, install the thrust washer.
SST 09316–60010 (09316–00040)

(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.



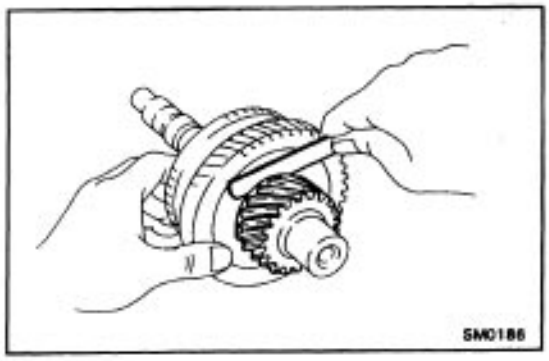
(d) Using a press, install the 1 st gear and No. 1 hub sleeve.

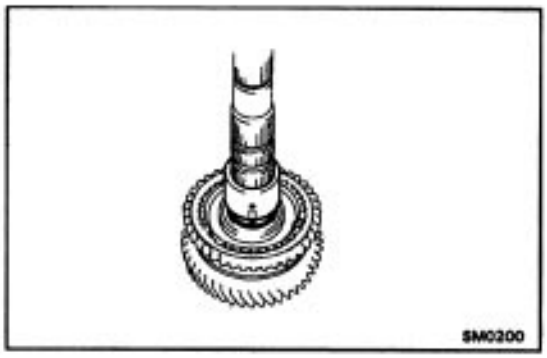
3. INSPECT 1ST GEAR THRUST CLEARANCE

Using a feeler gauge, measure the 1st gear thrust clearance.

Standard clearance:

0.10–0.29 mm (0.0039–0.0114 in.)

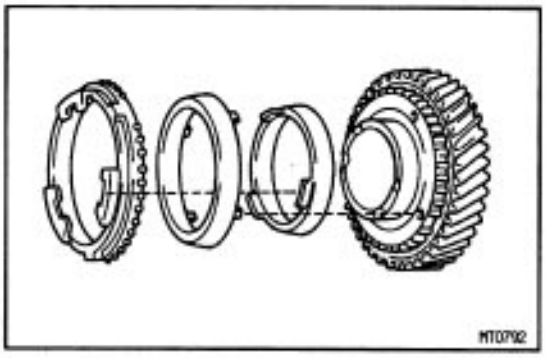




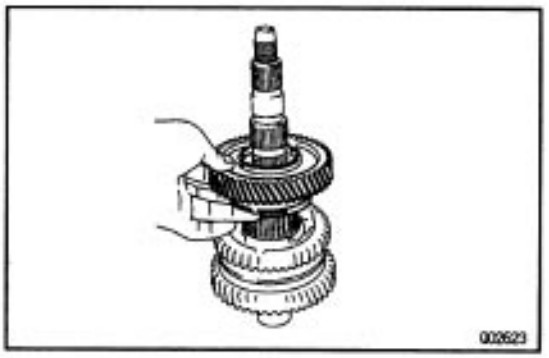
4. INSTALL SYNCHRONIZER RINGS, 2 ND GEAR, NEEDLE ROLLER BEARING AND 3RD DRIVEN GEAR

(a) Install the ball.

(b) Fit the 2nd gear bushing groove securely over the ball when installing the 2nd gear bushing on the shaft.



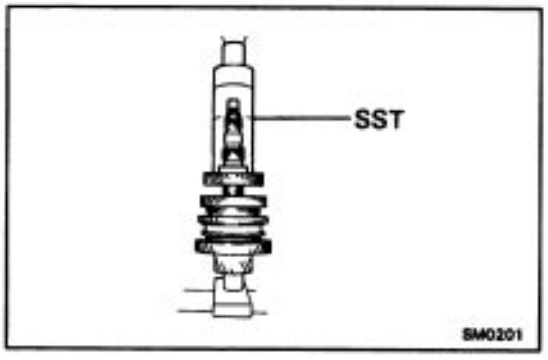
(c) Place the synchronizer rings on the 2nd gear.



(d) Apply gear oil to the needle roller bearing and install it.

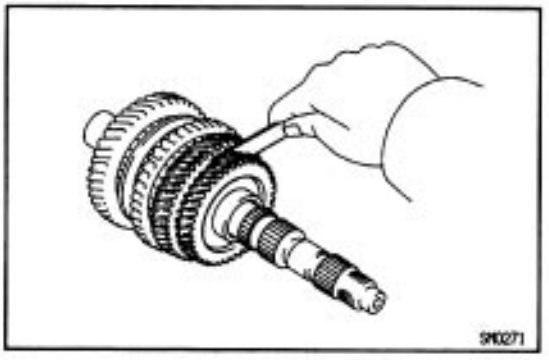
(e) Install the 2nd gear.

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



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

SST 09316–60010 (09316–00010)

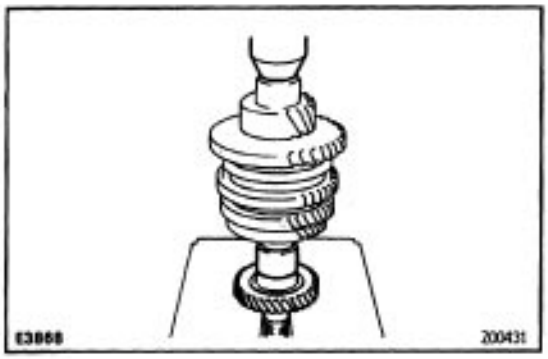


5. INSPECT 2ND GEAR THRUST CLEARANCE

Using a feeler gauge, measure the 2nd gear thrust clearance.

Standard clearance:

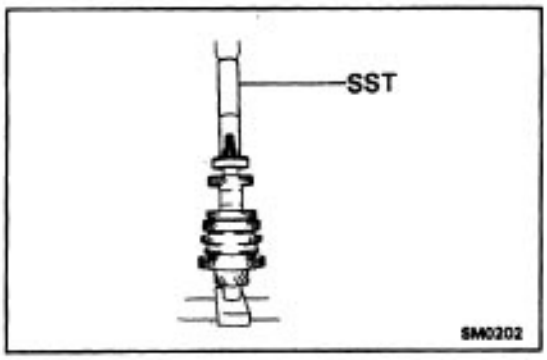
0.20–0.44 mm (0.0079–0.0173 in.)



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.



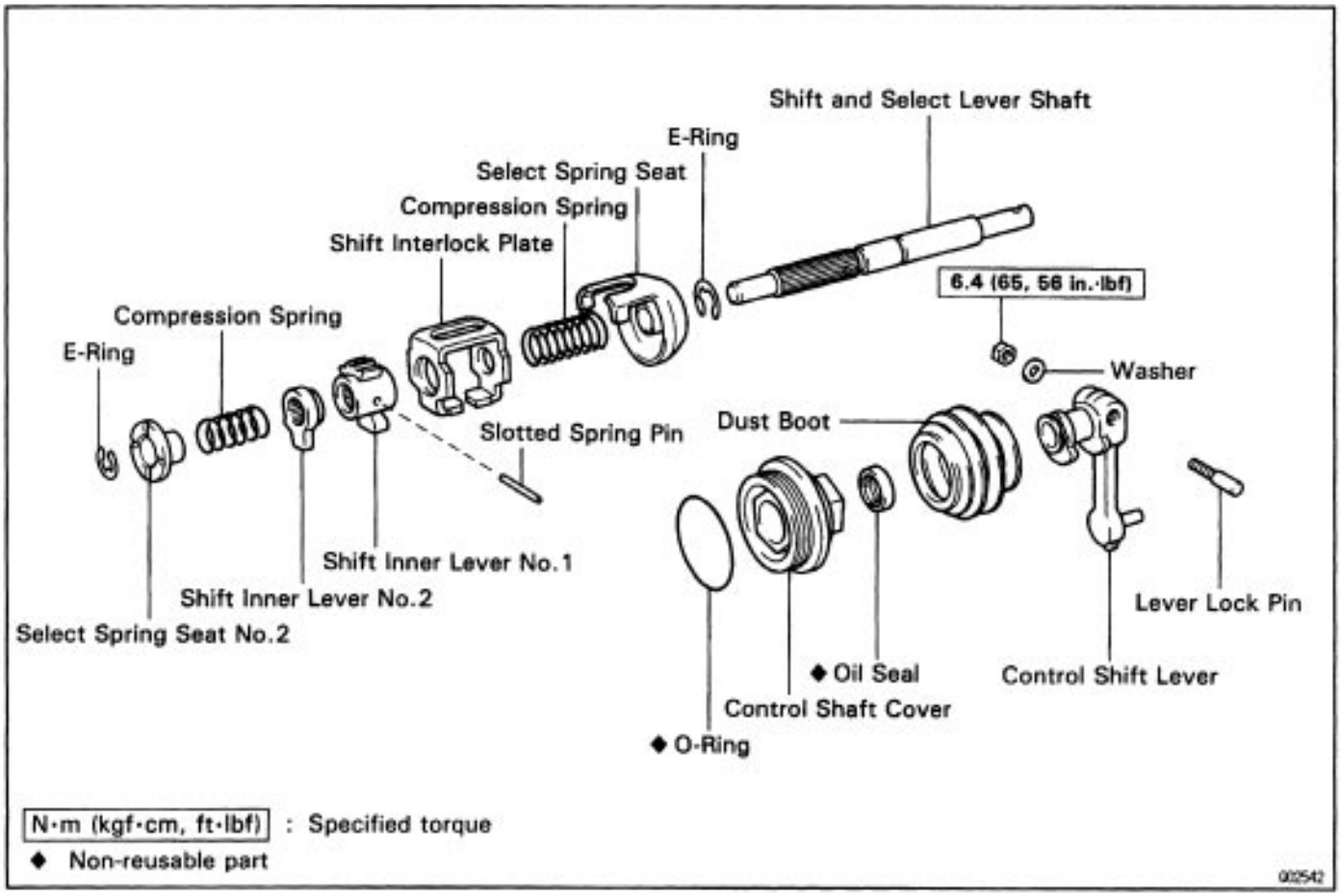
7. INSTALL REAR BEARING

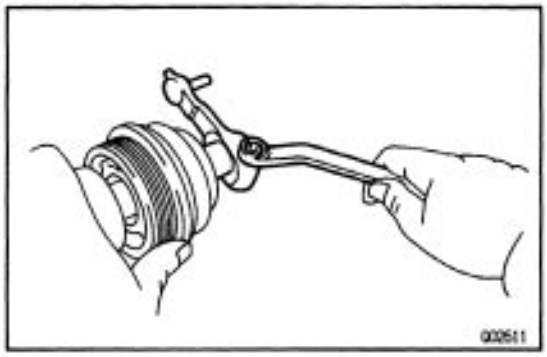
Using SST and a press, install the rear bearing.

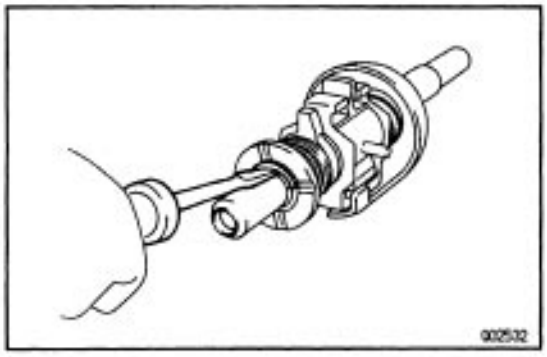
SST 09612–22011

SHIFT AND SELECT LEVER SHAFT

COMPONENTS







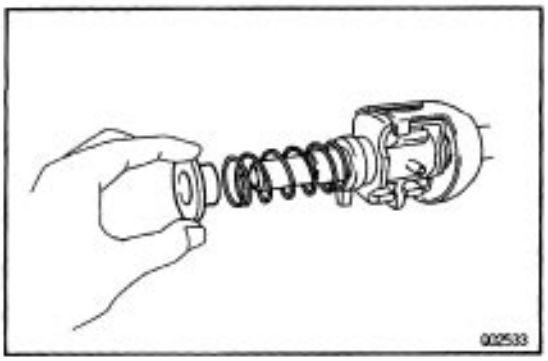
SHIFT AND SELECT LEVER SHAFT DISASSEMBLY

1. REMOVE CONTROL SHIFT LEVER, DUST BOOT AND CONTROL SHAFT COVER

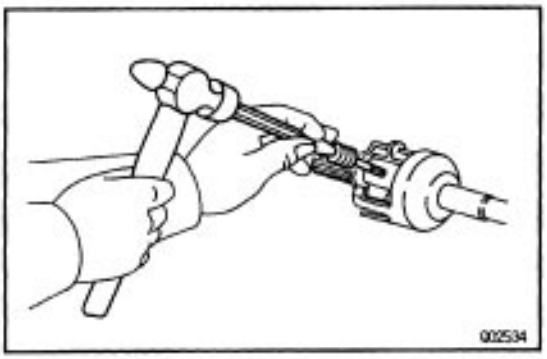
(a) Remove the nut and washer.
(b) Remove the lever lock pin.
(c) Remove the control shift lever.
(d) Remove the dust boot.
(e) Remove the control shaft cover.

2. REMOVE SELECT SPRING SEAT NO.2 AND SHIFT INNER LEVER NO.2

(a) Using a screwdriver, pry out the E–ring.

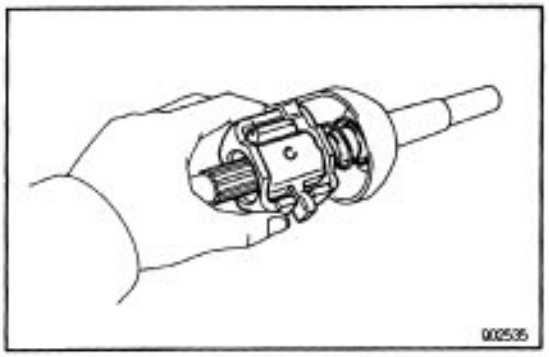


(b) Remove the reverse restrict pin holder, spring and shift inner lever No.2.

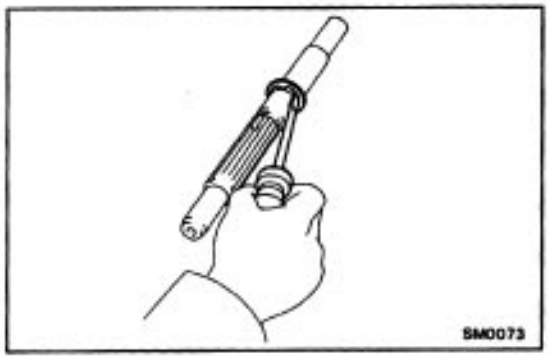


3. REMOVE SHIFT INTERLOCK PLATE, SHIFT INNER LEVER NO.1 AND SELECT SPRING SEAT

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



(b) Remove the shift interlock plate, shift inner lever No.1 and select spring seat.



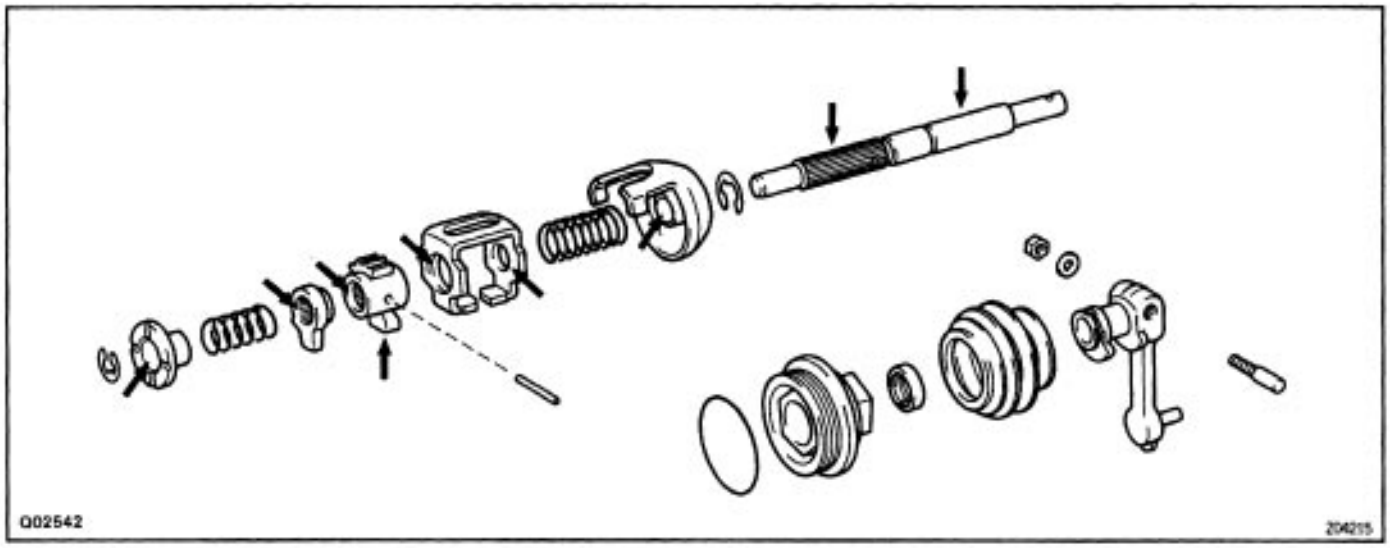
4. REMOVE E – RING FROM SHIFT AND SELECT LEVER SHAFT

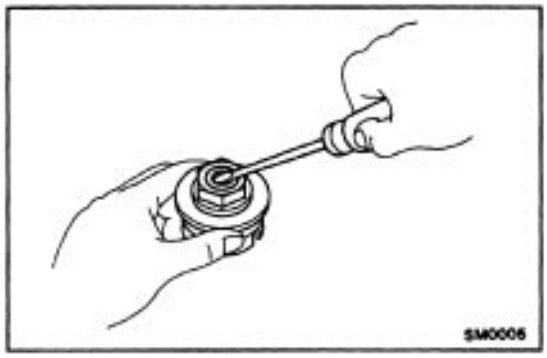
Using a screwdriver, pry out the E–ring.

SHIFT AND SELECT LEVER SHAFT ASSEMBLY

(See page MX–48)

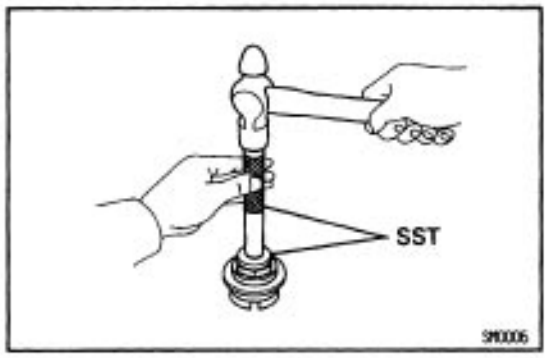
1. APPLY MP GREASE TO PARTS, AS SHOWN





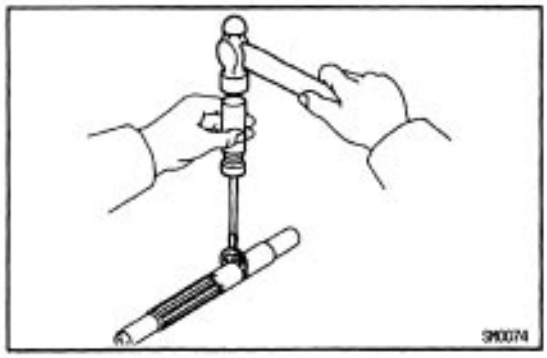
2. IF NECESSARY, REPLACE CONTROL SHAFT COVER OIL SEAL

(a) Using a screwdriver, pry out the oil seal.

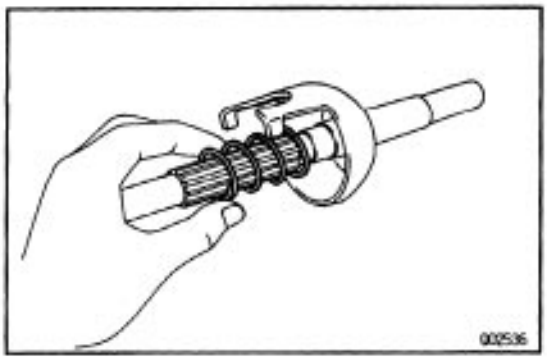


(b) Using SST and a hammer, tap in a new oil seal until its surface is flush with the shaft cover surface.
SST 09608–20012 (09608–00080, 09608–03020)

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

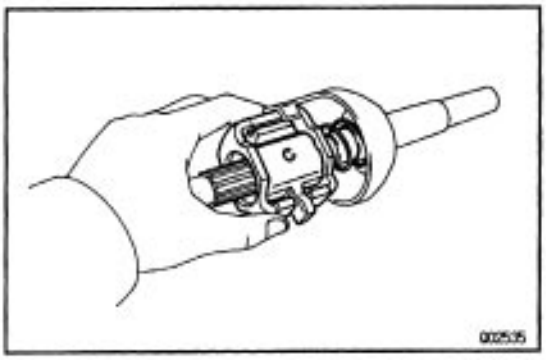


3. INSTALL E–RING TO SHIFT AND SELECT LEVER SHAFT



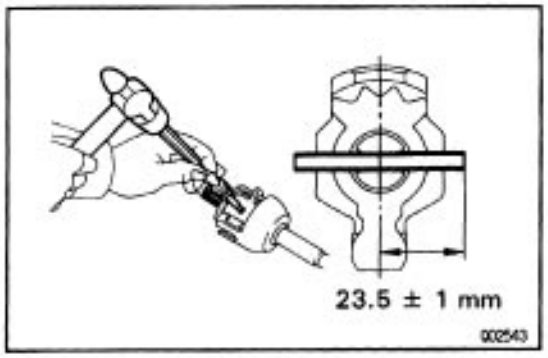
4. INSTALL SELECT SPRING SEAT, SHIFT INNER LEVER NO.1 AND SHIFT INTERLOCK PLATE

(a) Install the select spring seat and Spring.



(b) Install the shift inner lever No. 1 with the shift interlock plate.

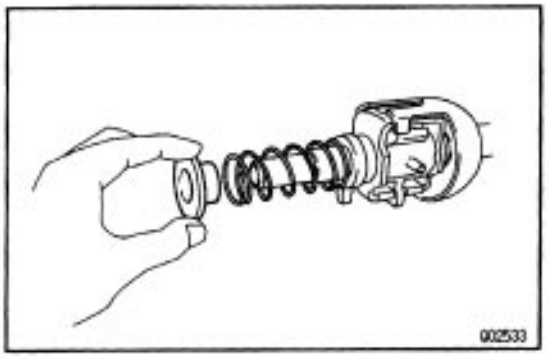
HINT: One of the spline teeth of the shift and select lever shaft has been eliminated. Therefore, be certain to correctly align this portion to the matching portions on the parts during assembly.



(c) Using a pin punch and hammer, drive in the slotted spring pin.

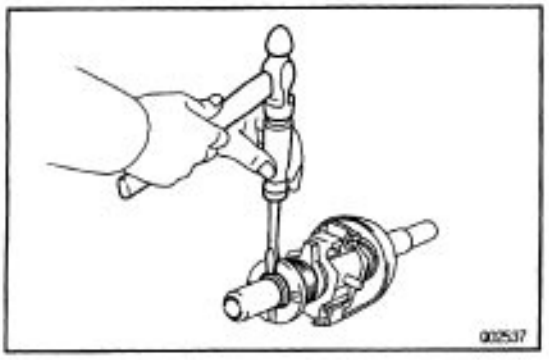
Drive in depth:

23.5 ± 1.0 mm (0.925 ± 0.039 in.)

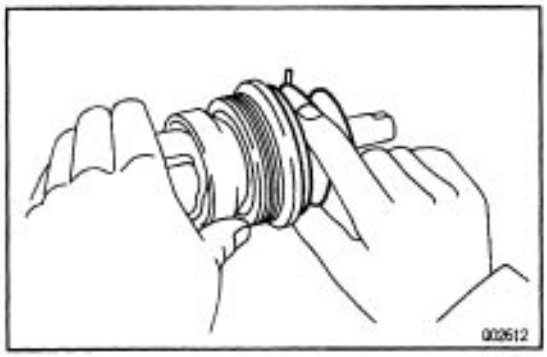


6. INSTALL SHIFT INNER LEVER NO.2 AND SELECT SPRING SEAT NO.2

(a) Install the shift inner lever No.2, spring and select spring seat No.2.



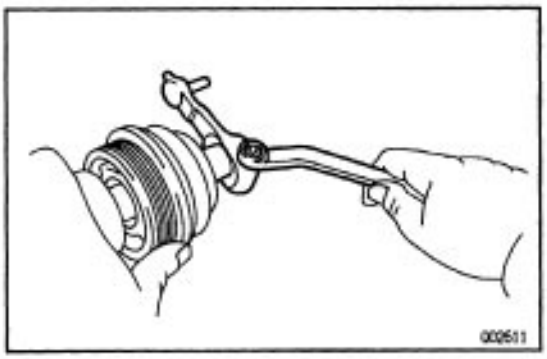
(b) Using a screwdriver and hammer, tap in the E–ring.



6. INSTALL CONTROL SHAFT COVER, DUST BOOT AND CONTROL SHIFT LEVER

(a) Install the control shaft cover and dust boot.

HINT: Make sure to install the boot in correct direc–tion. Position the air bleed of the boot downward.



(b) Install the control shift lever.

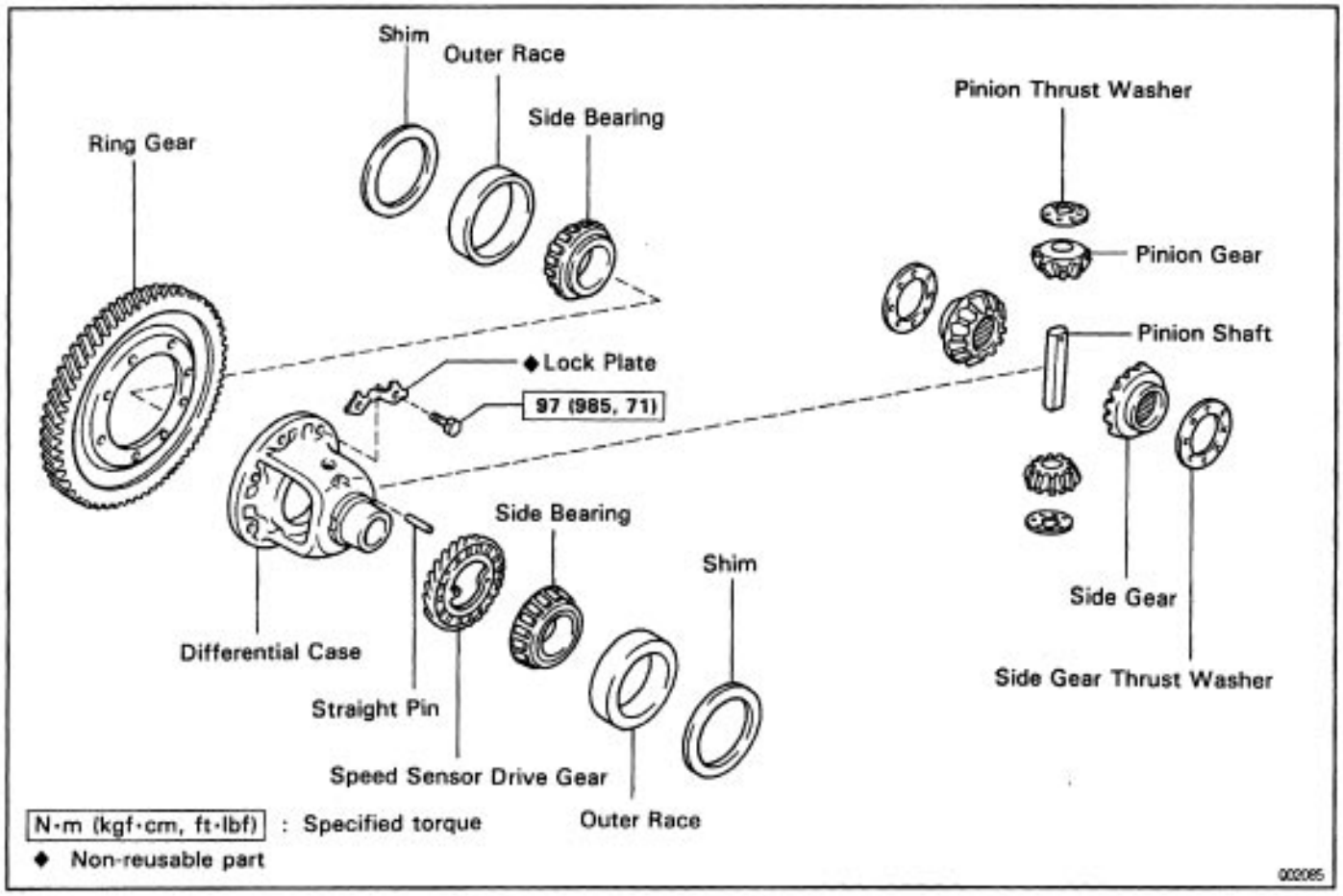
(c) Install the lever lock pin to the control shift lever.

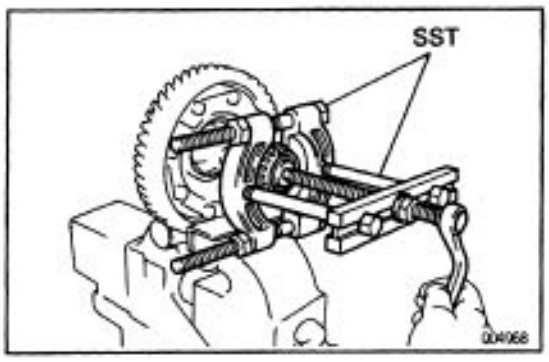
(d) Install the washer and lock nut.

Torque: 6.4 N–m (65 kgf–cm, 56 in.–lbf)

DIFFERENTIAL CASE

COMPONENTS





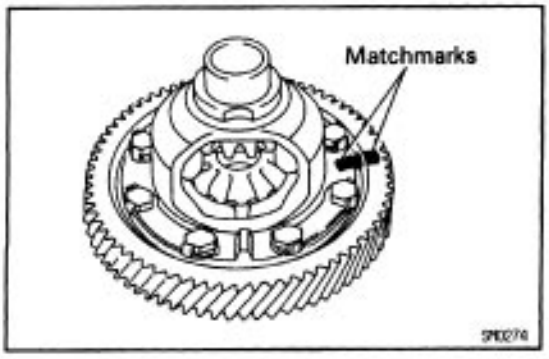
DIFFERENTIAL CASE DISASSEMBLY

1. REMOVE SIDE BEARING FROM DIFFERENTIAL CASE (SPEED SENSOR DRIVE GEAR SIDE)

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

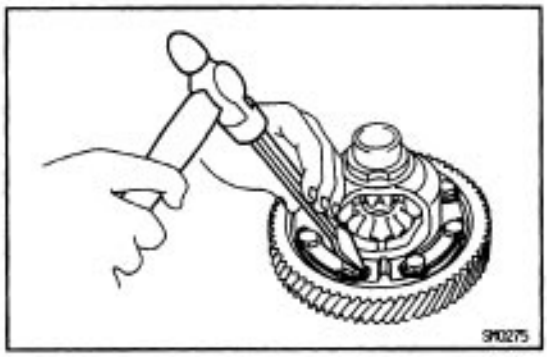
SST 09950–00020, 09950–00030

(b) Remove the speed sensor drive gear.

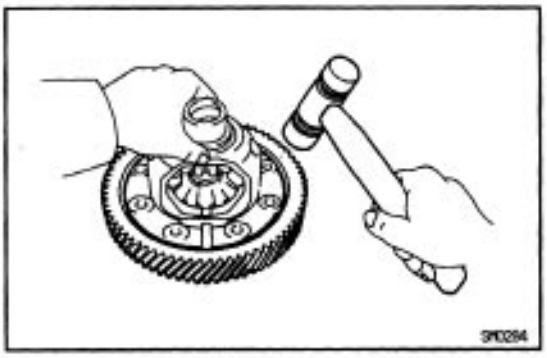


2. REMOVE RING GEAR

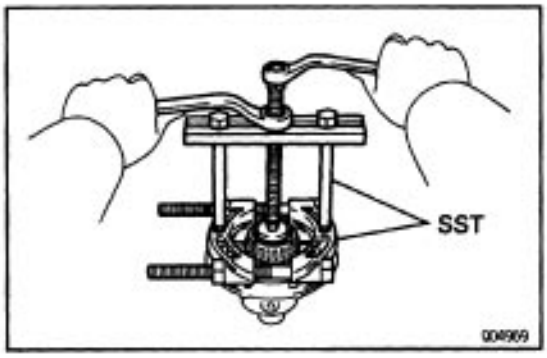
(a) Place matchmarks on the ring gear and the case.



(b) Using a chisel and hammer, unstake the lock plates.
(c) Remove the 8 bolts and 4 lock plates.

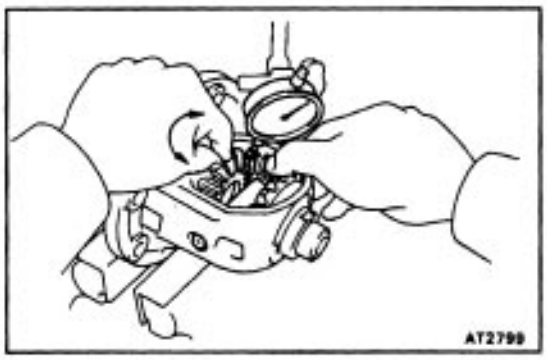


(d) Using a copper hammer, tap on the ring gear to remove it from the case.



3. REMOVE SIDE BEARING FROM DIFFERENTIAL CASE (RING GEAR SIDE)

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



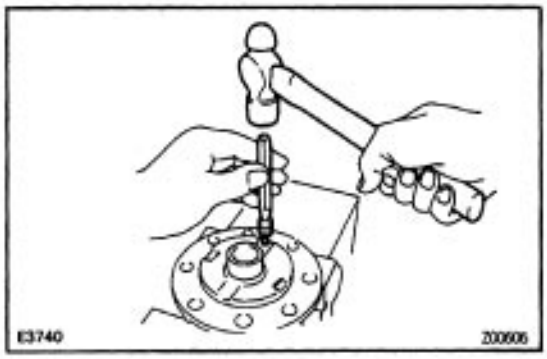
4. INSPECT SIDE GEAR BACKLASH

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

Standard backlash:

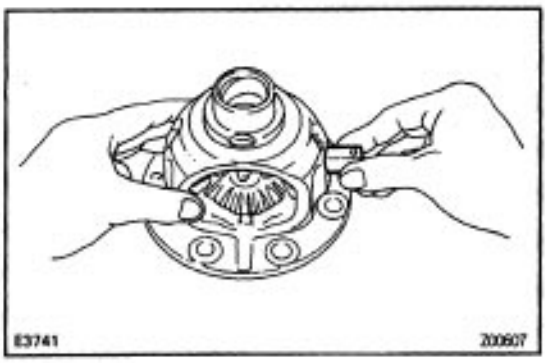
0.05–0.20 mm (0.0020–0.0079 In.)

If the backlash does not meet specification, install the correct thrust washer to the side gears.

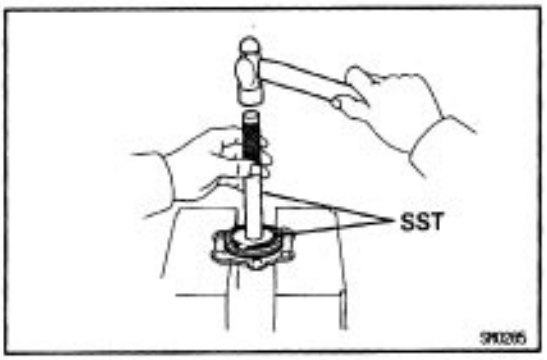


6. DISASSEMBLY DIFFERENTIAL CASE

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

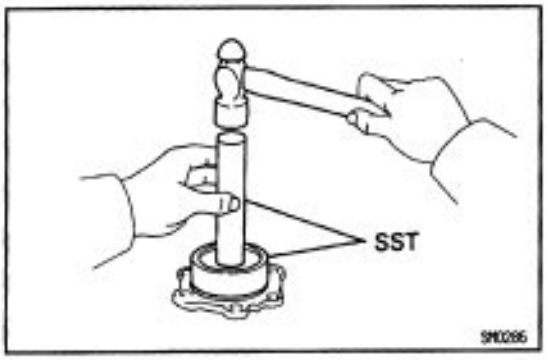


(b) Remove the pinion shaft from the case.
(c) Remove the 2 pinions and 2 side gears with the 4 thrust washers from each gear.

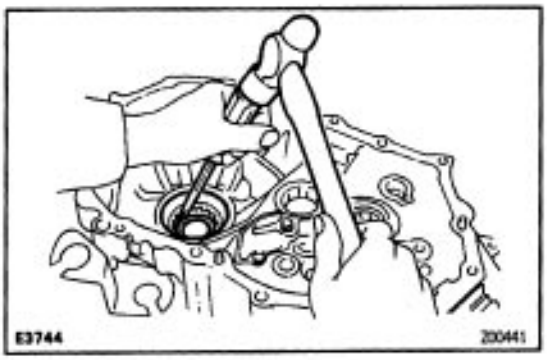


6. TRANSMISSION CASE SIDE:
IF NECESSARY, REPLACE DIFFERENTIAL SIDE BEARING RETAINER OIL SEAL

(a) Using SST and a hammer, drive out the oil seal from the retainer.
SST 09608–20012 (09608–03020, 09608–03060)

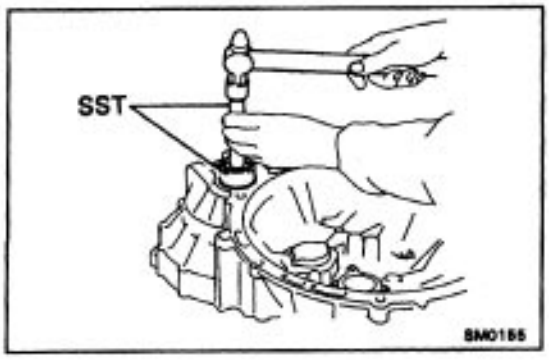


(b) Using SST and a hammer, drive in a new oil seal until its surface is flush with the case surface.
SST 09350–32014 (09351–32130, 09351–32150)
(c) Coat the lip of the oil seal with MP grease.

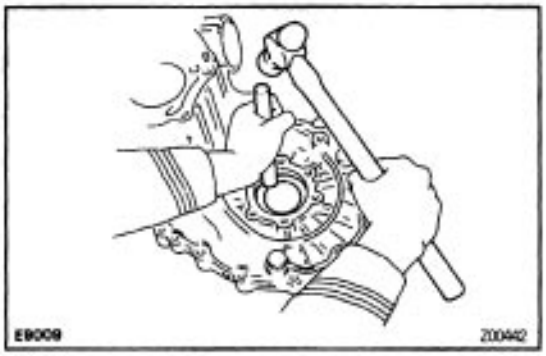


7. TRANSAXLE CASE SIDE:
IF NECESSARY, REPLACE SIDE OIL SEAL

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



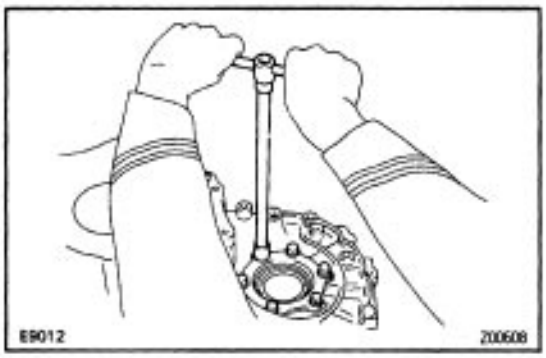
(b) Using SST and a hammer, drive in a new oil seal until its surface is flush with the case surface.
SST 09350–32014 (09351–32130, 09351–32150)
(c) Coat the lip of oil seal with MP grease.



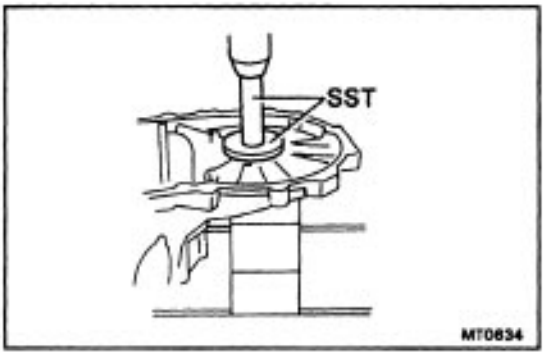
8. TRANSMISSION CASE SIDE:

IF NECESSARY, REPLACE SIDE BEARING OUTER RACE

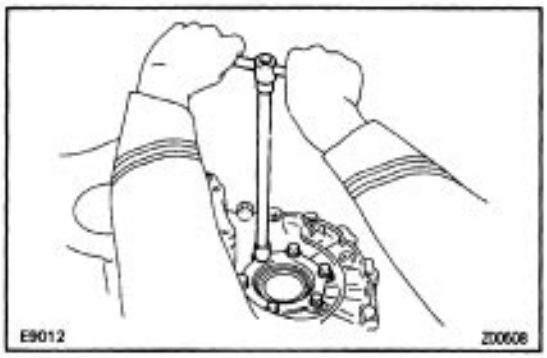
(a) Using a brass bar and hammer, drive out the bearing outer race.



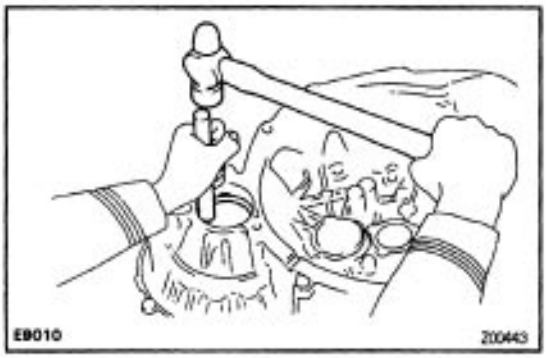
(b) Install the bearing retainer without an O–ring.
(c) Install and torque the bearing retainer bolts.
Torque: 18 N–m (185 kgf–cm, 13 ft–lbf)



(d) Place the thinnest shim into the case.
(e) Using SST and a press, install a new bearing outer race.
SST 09608–20012 (09608–03020, 09608–03060)



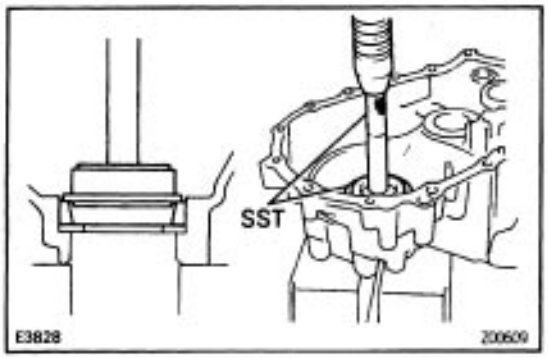
(f) Remove the retainer bolts.
(g) Remove the bearing retainer and shim.



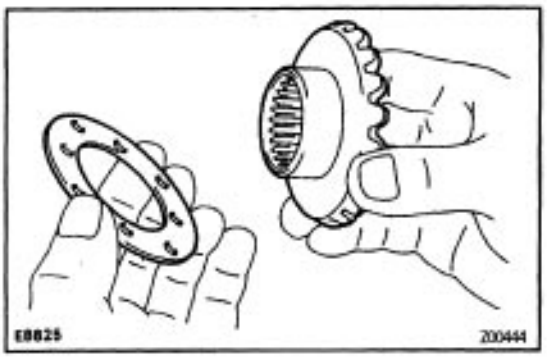
9. TRANSAXLE CASE SIDE:

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 09608–20012 (09608–03020, 09608–03060)



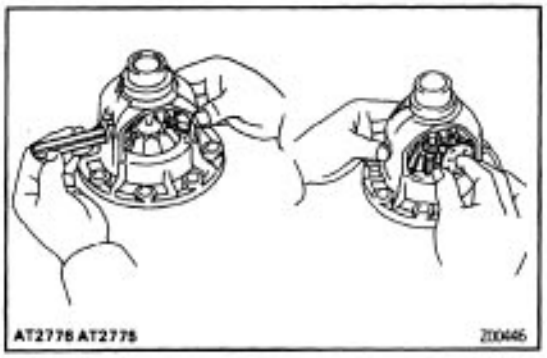
DIFFERENTIAL CASE ASSEMBLY (See page MX–53)

1. ASSEMBLY DIFFERENTIAL CASE

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

Standard backlash:

0.05–0.20 mm (0.0020–0.0079 in.)

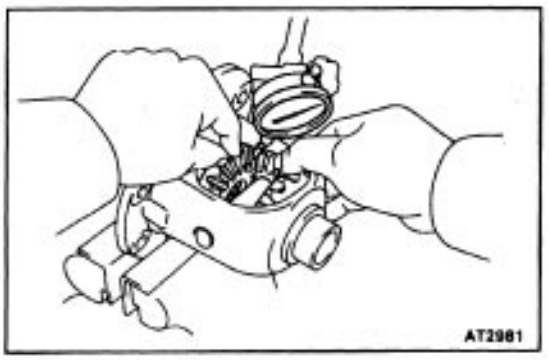


Thickness mm (in.)	Thickness mm (in.)
0.95 (0.0374)	1.10 (0.0433)
1.00 (0.0394)	1.15 (0.0453)
1.05 (0.0413)	1.20 (0.0472)

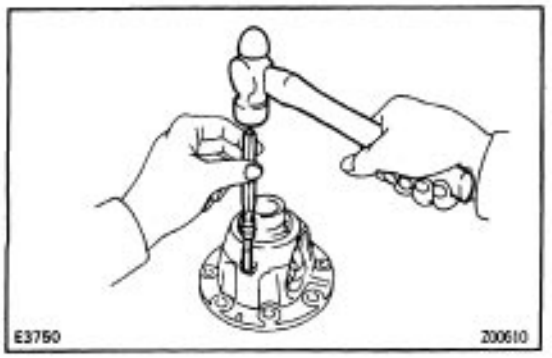
Install the thrust washers and side gears in the differential case.
(b) Install the pinion shaft.
(c) Inspect the side gear backlash.
Measure the side gear backlash while holding one pinion gear toward the case.

Standard backlash:

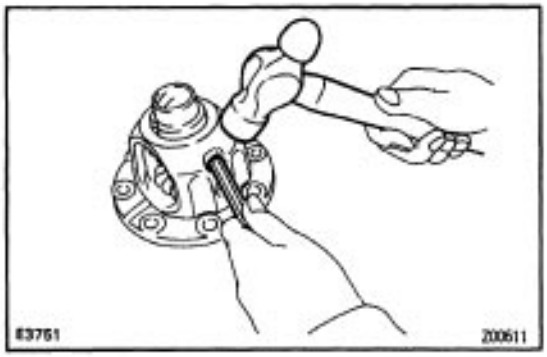
0.05–0.20 mm (0.0020–0.0079 in.)



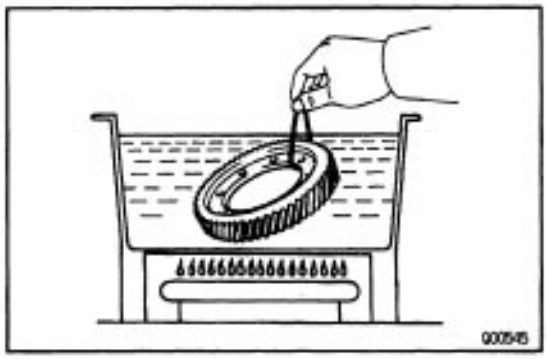
If the backlash is not within specification, install a thrust washer of different thickness.



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



(a) 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 remove the ring gear from the water.
(d) After moisture on the ring gear has completely evapo–rated, quickly install the ring gear to the differential case.

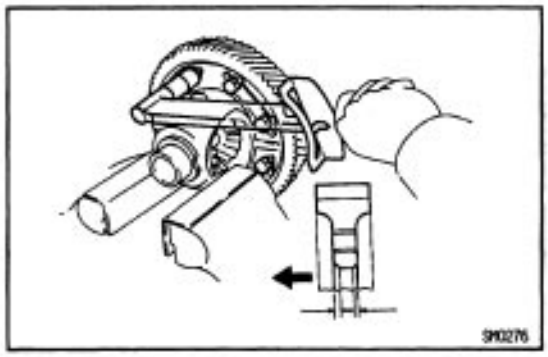
HINT: Align the matchmarks on the differential case and contact the ring gear.

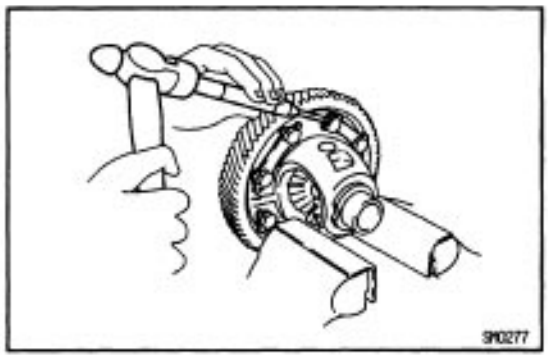
(e) Temporarily install the 8 bolts and 4 lock plates.

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.

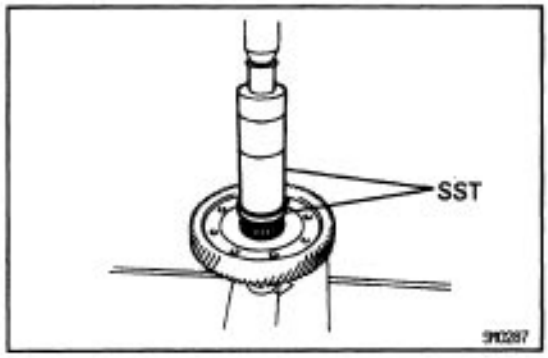
Torque: 90 N–m (920 kgf–cm, 67 ft–lbf)





(g) Using a pin punch and hammer, stake the lock plates.

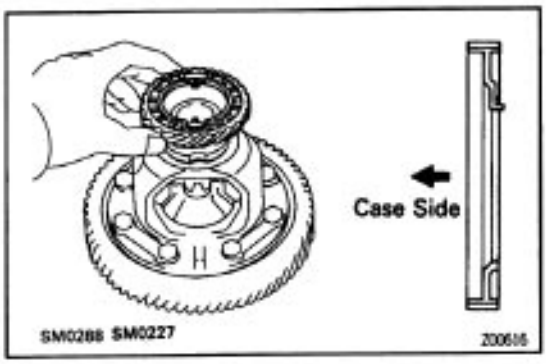
HINT: Stake one claw flush with the flat surface of the bolt. For the claw contacting the protruding portion of the bolt, stake only the tightened side.



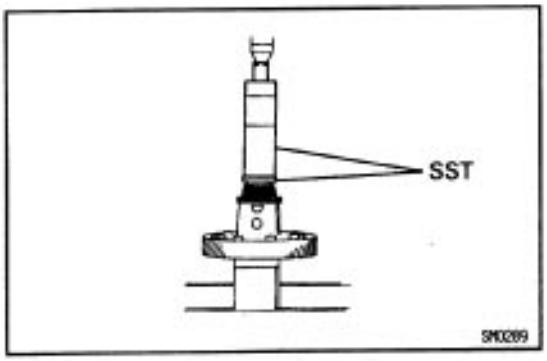
3. INSTALL SIDE BEARING TO DIFFERENTIAL CASE

(a) Using SST and a press, install the side bearing to the transmission case side.

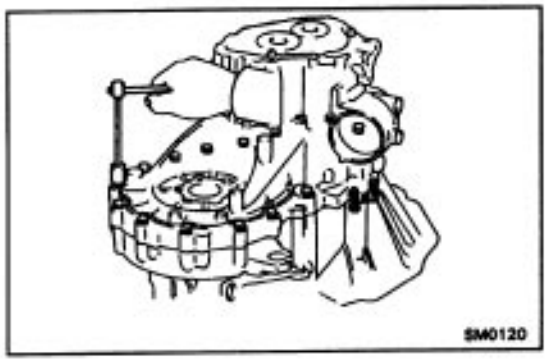
SST 09316–60010 (09316–00010)
09350–32014 (09351–32120)



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

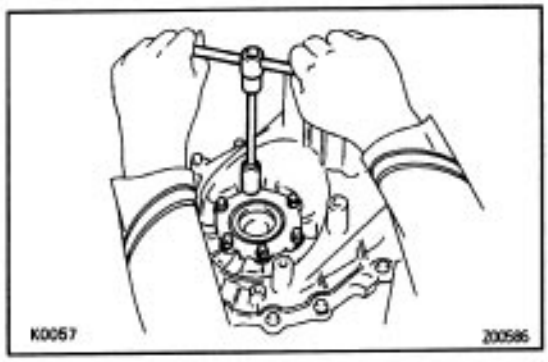


(c) Using SST and a press, install the side bearing to the transaxle case side.
SST 09316–60010 (09316–00010)
09350–32014 (09351–32120)
NOTICE: Install the black cage bearing on the speed sensor drive gear side.

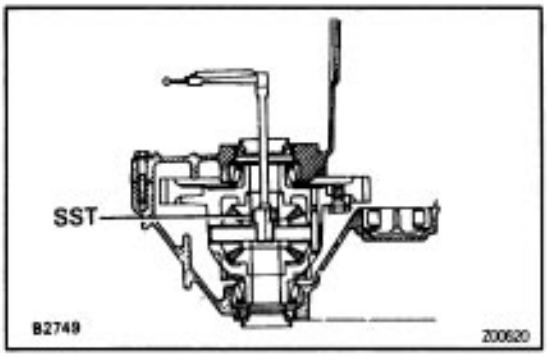


4. ADJUST DIFFERENTIAL CASE SIDE BEARING PRE–LOAD

(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)

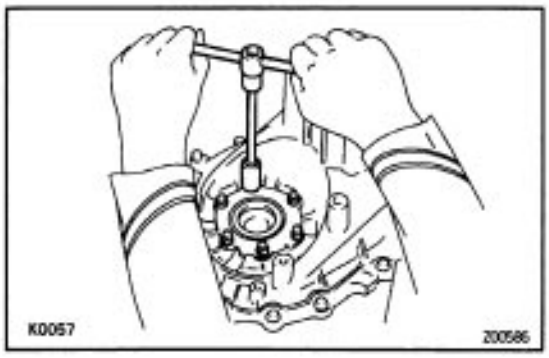


(d) Install the shim into the transmission case.
(e) Install the bearing retainer without an O–ring.
(f) Install and torque the retainer bolts.
Torque: 18 N–m (185 kgf–cm, 13 ft–lbf)

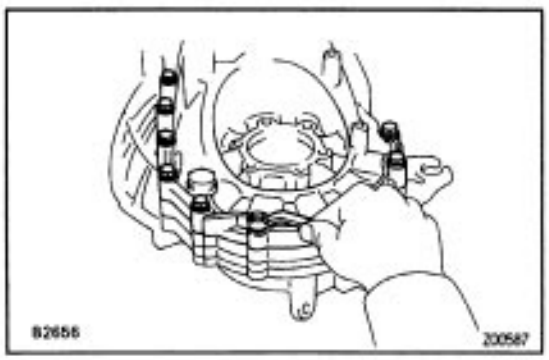


(g) Using SST and torque meter, measure the preload.
SST 09564–32011
Preload (at starting):
0.8–1.6 N–m (8–16 kgf–cm,6.9–13.9 in.–lbf)
If the preload is not within specification, remove the transmission case side bearing retainer.
Select another shim.
HINT: The preload will change about 0.3–0.4 N–m (3–4 kgf–cm, 2.6–3.5 in.–lbf) with each 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 retainer bolts.
(i) Remove the bearing retainer and shim.



(j) Remove the case bolts.
(k) Remove the transmission case.

COMPONENT PARTS INSTALLATION

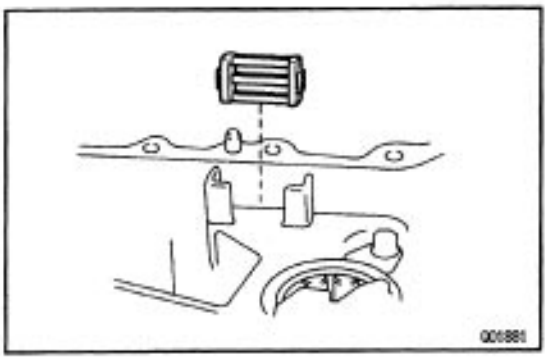
BASIC SUBASSEMBLY REASSEMBLY

(See page MX–20 and MX–21)

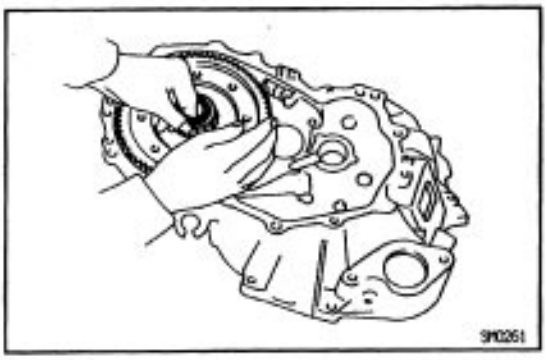
HINT: Coat all of the sliding and rotating surface with gear oil before assembly.

1. INSPECT DIFFERENTIAL SIDE BEARING PRELOAD

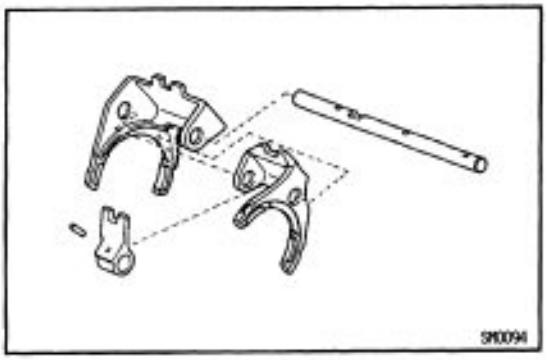
(See step 4 on page MX–59)



2. INSTALL MAGNET TO TRANSAXLE CASE

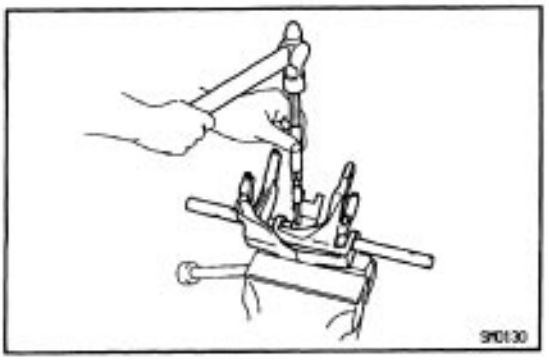


3. INSTALL DIFFERENTIAL CASE ASSEMBLY



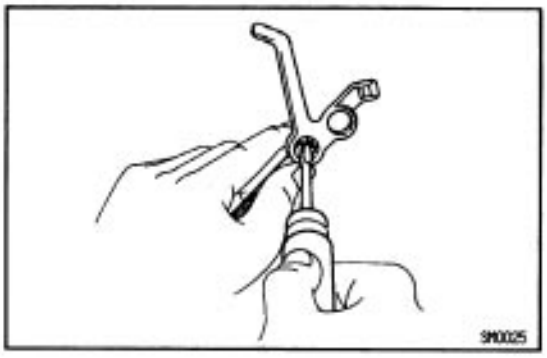
4. . ASSEMBLE NO.1 SHIFT FORK SHAFT, NO.1 SHIFT HEAD, NO.1 AND NO.2 SHIFT FORKS

(a) Assemble the No.1 shift fork shaft, No.1 shift head, No.1 and No.2 shift forks.



(b) Mount the shift forks to the vise.

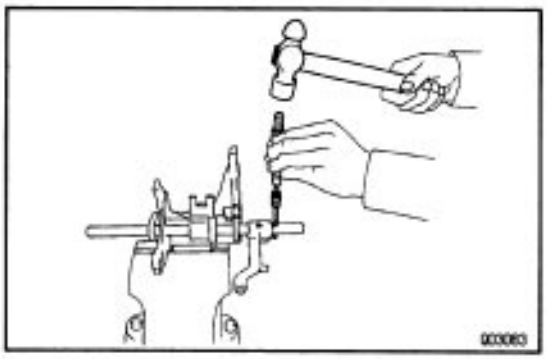
(c) Using a pin punch and hammer, drive in the slotted spring pin to the No.1 fork shaft as shown in the figure.



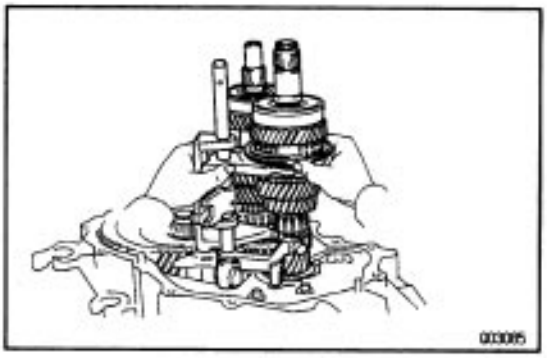
(d) Coat the interlock pin with MP grease.
(e) Using a screwdriver, install the interlock pin into the reverse shift fork hole.
(f) Install the reverse shift fork to the No.1 shift fork shaft.

HINT: When installing the reverse shift fork with inter–lock pin to the No.1 shift fork shaft, make sure the interlock pin does not drop out.

NOTICE: Be careful not to damage the bushing.

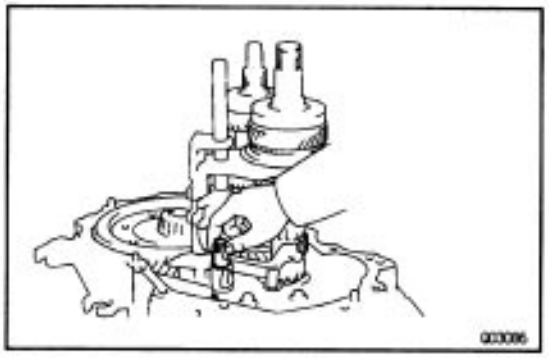


(g) Using a pin punch and hammer, drive in the slotted spring pin to the No.1 fork shaft.



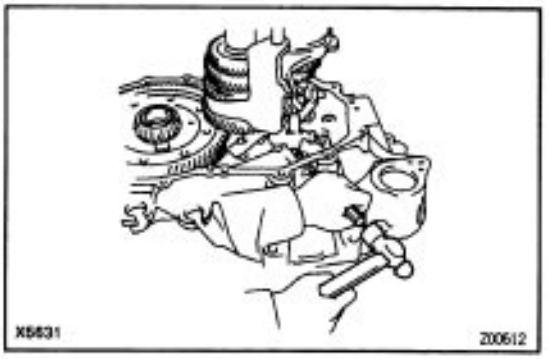
5. INSTALL NO.1 SHIFT FORK SHAFT, NO.1 SHIFT HEAD, NO.1, NO.2 SHIFT FORKS, REVERSE SHIFT FORK WITH INTERLOCK PIN, INPUT AND OUTPUT SHAFT ASSEMBLY

Install the input and output shaft assembly together with the No.1 fork shaft, shift head and shift forks with the interlock pin to the transaxle case.

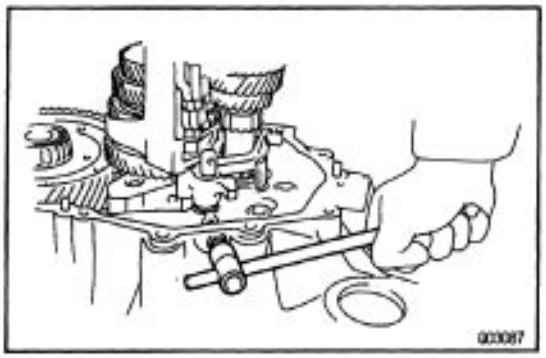


6. INSTALL NO.2 FORK SHAFT

(a) Install the No.2 fork shaft to the transaxle case thr–ough the reverse shift fork.



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



(c) Apply sealant to the plug threads.

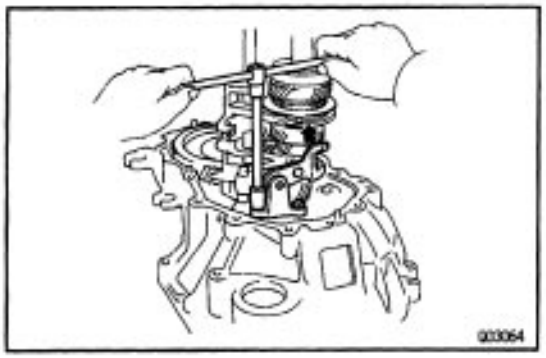
Sealant:

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

(d) Using a hexagon wrench, install the straight screw plug.

Torque: 13 N–m (130 k9f¿cm, 9 ft–lbf)

7. INSTALL REVERSE SHIFT ARM



(a) Put the reverse shift fork pivot into the reverse shift arm and install the reverse shift arm to the transaxle case.

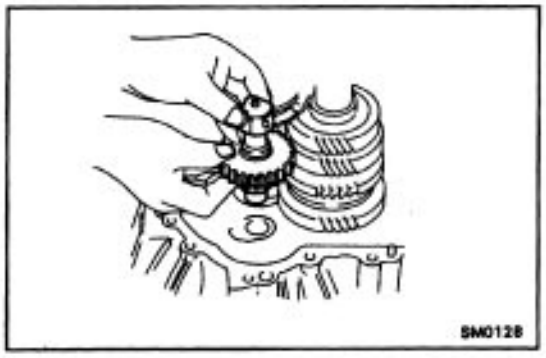
(b) Shift the reverse shift arm into the reverse.

(c) Install and torque the 2 bolts.

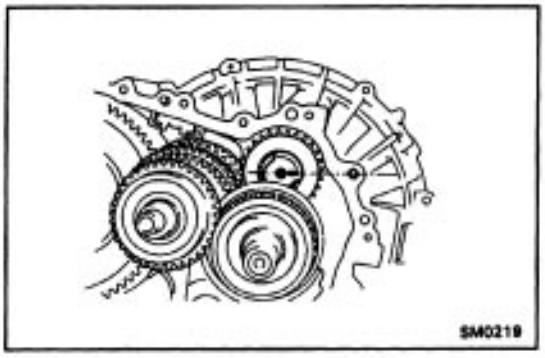
Torque: 18 N–m (185 kgf–cm, 13 ft–lbf)

(d) Shift the reverse shift arm to the neutral position.

8. INSTALL REVERSE IDLER GEAR AND SHAFT

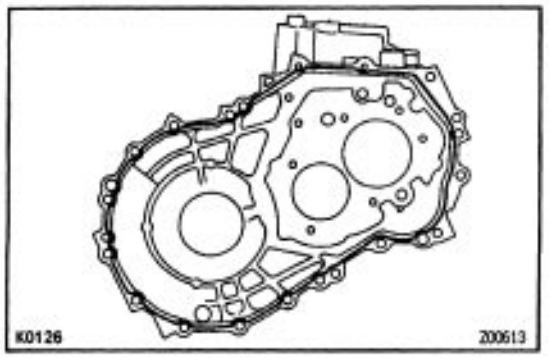


(a) Install the washer and reverse idler gear to the shaft.



(b) Install the reverse idler gear and shaft as shown.

9. INSTALL TRANSMISSION CASE

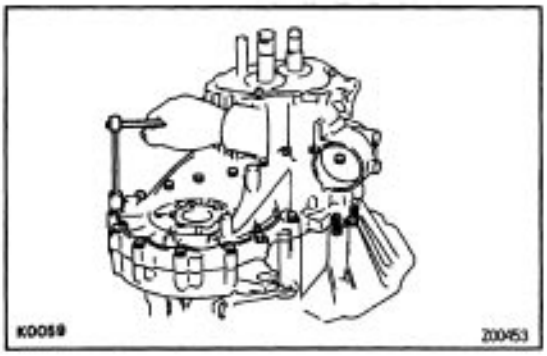


(a) Remove any FIPG material and be careful not to drop oil on the contacting surface of the transaxle case or transmission case.

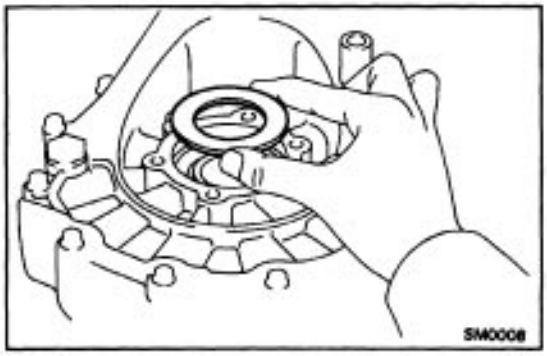
(b) Apply FIPG to the transmission case as shown.

FIPG:

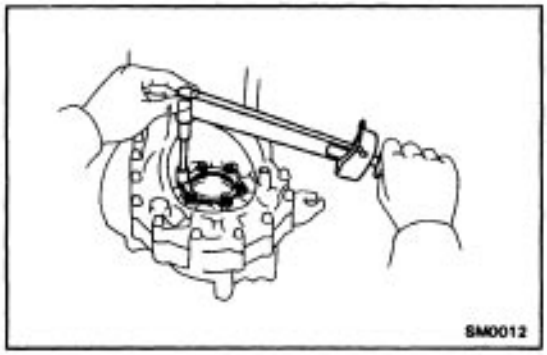
Part No.08833–00090, THREE BOND 1281 or equivalent



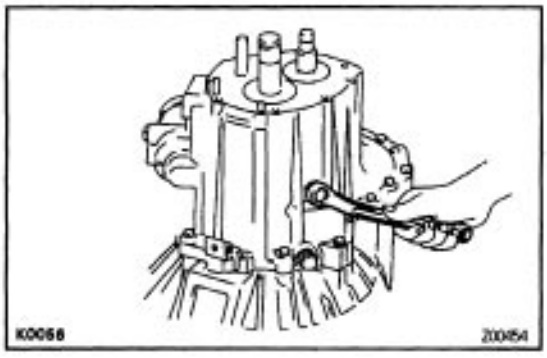
(c) Install and torque the 17 bolts.
Torque: 29 N–m (300 kgf–cm, 22 ft–lbf)



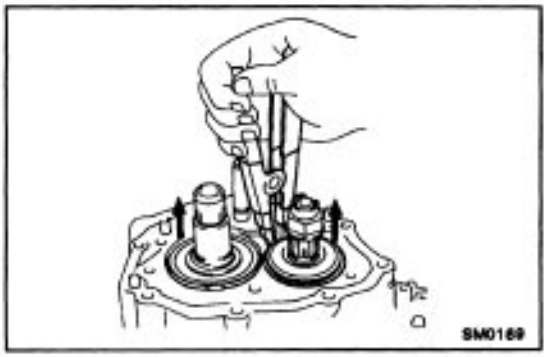
10. INSTALL SHIM AND SIDE BEARING RETAINER WITH O–RING
(a) Install a new O–ring on the retainer.
(b) Instal) the shim and retainer.



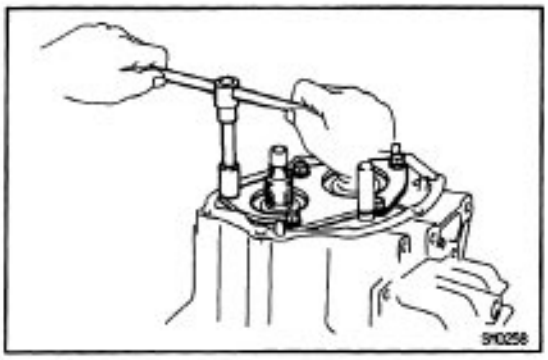
(c) Apply sealant to the bolt threads.
Sealant:
Part No.08833–00080, THREE BOND 1344, LOC–TITE 242 or equivalent
(d) Install and torque the 6 bolts.
Torque: 18 N–m (185 kgf–cm, 13 ft–lbf)



11. INSTALL AND TORQUE REVERSE IDLER GEAR SHAFT LOCK BOLT
Torque: 29 N–m (300 kgf–cm, 22 ft–lbf)



12. INSTALL BEARING SNAP RINGS
Using a snap ring expander, install the 2 snap rings.
HINT: If it is difficult to install the snap ring, pull up the shafts.



13. INSTALL REAR BEARING RETAINER

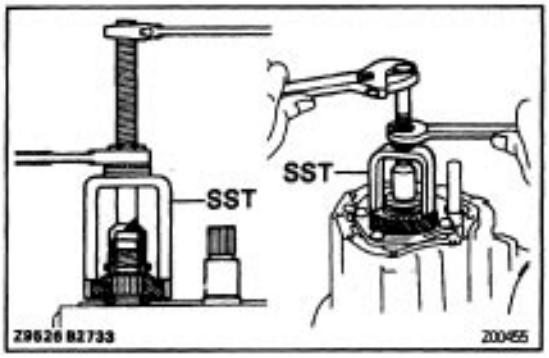
(a) Apply sealant to the bolt threads.

Sealant:

Part No.08833–00070, THREE BOND 1324 or equivalent

(b) Install and torque the 5 bolts.

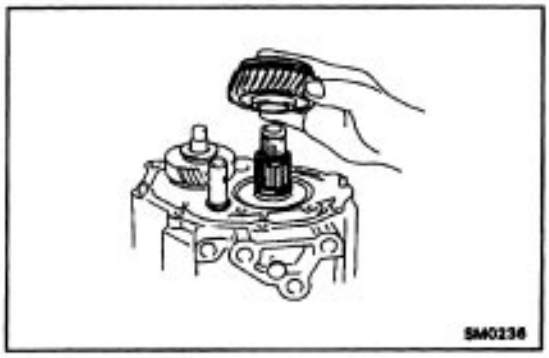
Torque: 42 N–m (430 kgf–cm, 31 ft–lbf)



14. INSTALL 5TH DRIVEN GEAR

Using SST, install the 5th driven gear.

SST 09309–12020

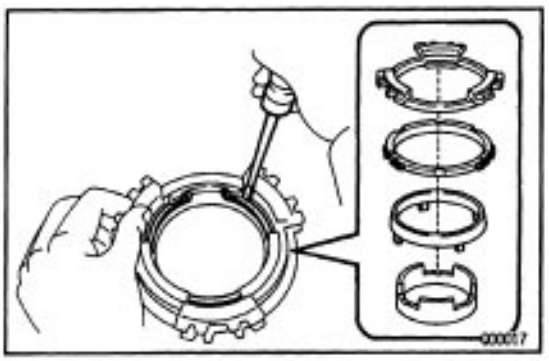


15. INSTALL SPACER, NEEDLE ROLLER BEARINGS, 5TH GEAR AND SYNCHRONIZER RING

(a) Install the spacer.

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

(c) Install the 5th gear with the needle roller bearings and synchronizer ring.

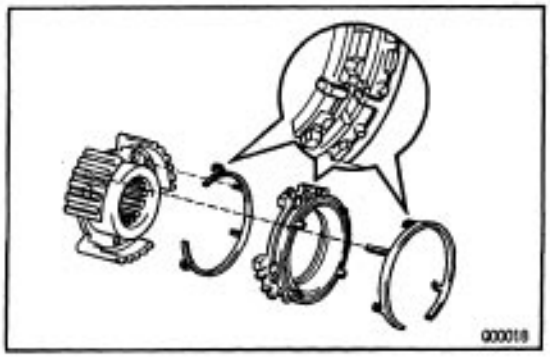


16. INSTALL NO.5 SYNCHRONIZER RINGS WITH KEY SPRING TO NO.3 CLUTCH HUB

(a) Assemble the No.5 synchronizer rings.

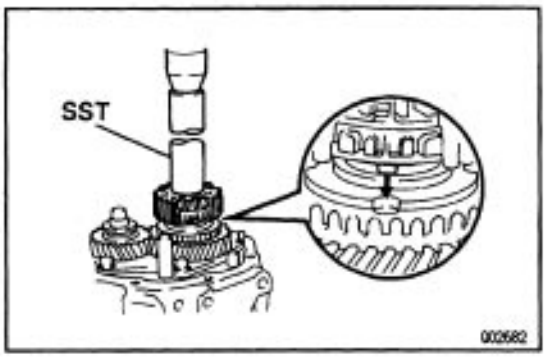
(b) Using a screwdriver, install the snap ring.

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



(c) Install the No.5 synchronizer rings with key springs to the No.3 clutch hub.

HINT: Align the holes of the clutch hub with key spring.

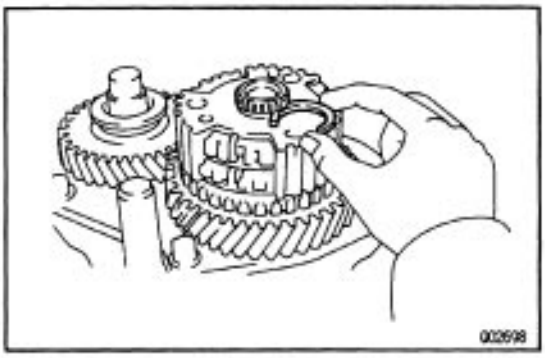


17. INSTALL N0.3 CLUTCH HUB

Using SST and a press, install the No.3 clutch hub assembly.

SST 09612–22011

NOTICE: Align the holes of the 5th gear and synchronizer ring.

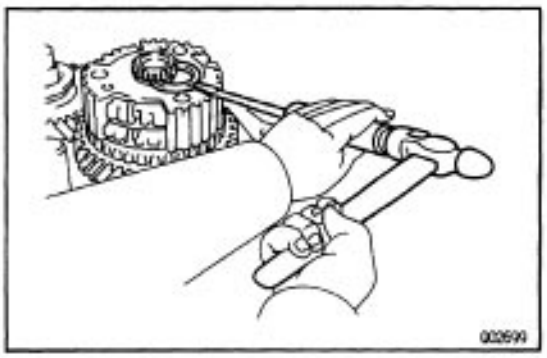


18. INSTALL SHIFTING KEY RETAINER AND SNAP RING

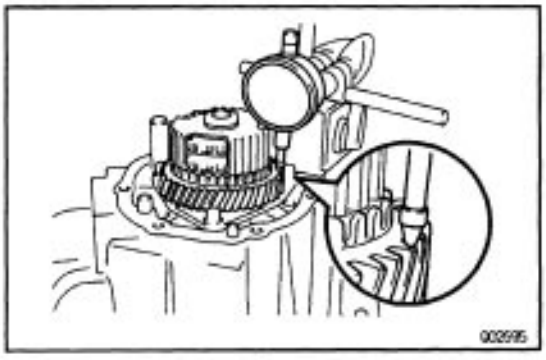
(a) Install the retainer.

(b) Select a snap ring that will allow 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)		



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

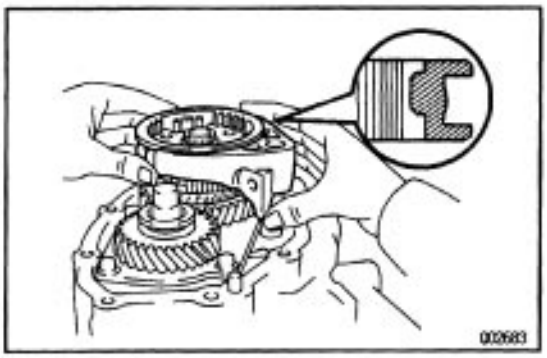


19. INSPECT 6TH GEAR THRUST CLEARANCE

Using a dial indicator, measure the thrust clearance.

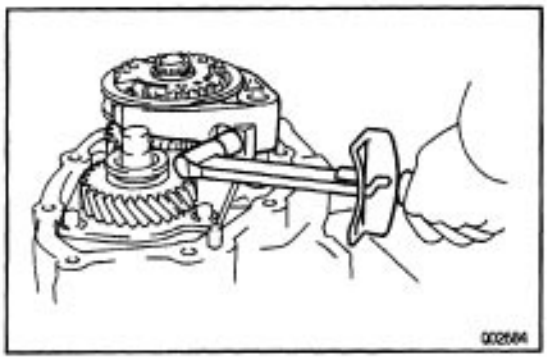
Standard clearance:

0.20–0.40 mm (0.0079–0.0157 in.)



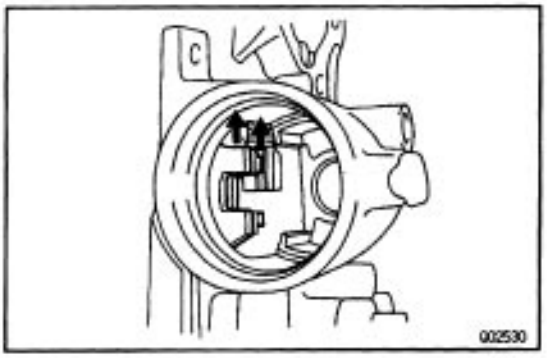
20. INSTALL NO. 3 HUB SLEEVE WITH NO. 3 SHIFT FORK

(a) Install No.3 hub sleeve with No.3 shift fork to the No.3 clutch hub.



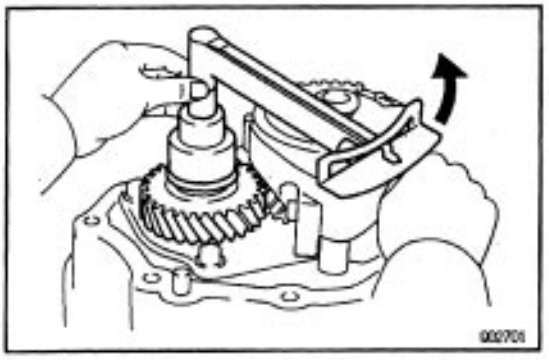
(b) Install and torque the set bolt.

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



21. INSTALL OUTPUT SHAFT LOCK NUT

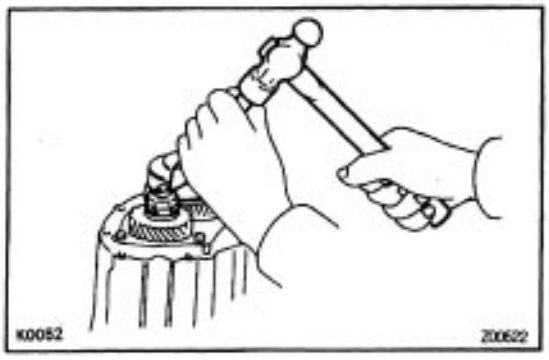
(a) Engage the gear double meshing.



(b) Install and torque the new lock nut.

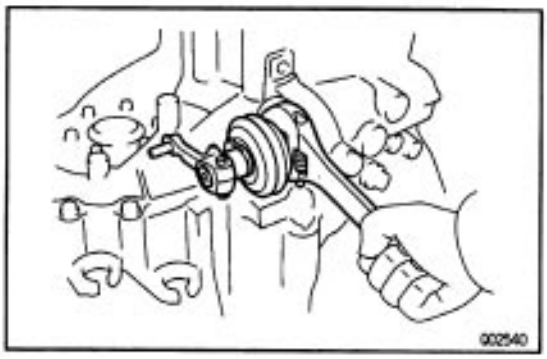
Torque: 123 N–m (1,250 kgf–cm. 90 ft–lbf)

HINT: The lock nut has LH threads.



(c) Stake the lock nut.

(d) Disengage the gear double meshing.



22. INSTALL SHIFT AND SELECT LEVER ASSEMBLY

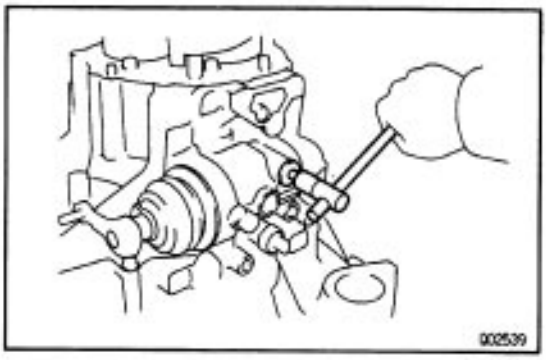
(a) Apply FIPG to the underside of the flanged portion of the control shaft cover.

FIPG:

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

(b) Install the shift and select lever assembly and torque the control shaft cover.

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



23. INSTALL PLUG

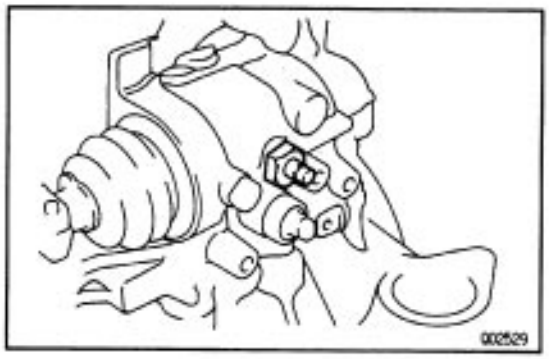
(a) Apply sealant to plug threads.

Sealant:

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

(b) Using a hexagon wrench, install and torque the plug.

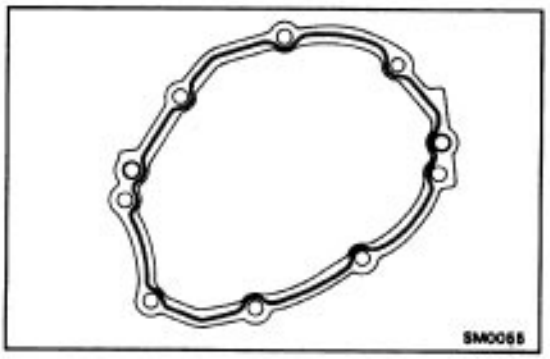
Torque: 23 N–m (230 kgf–cm, 17 ft–lbf)



24. INSTALL LOCK BALL

Install and torque the No.1 lock ball.

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



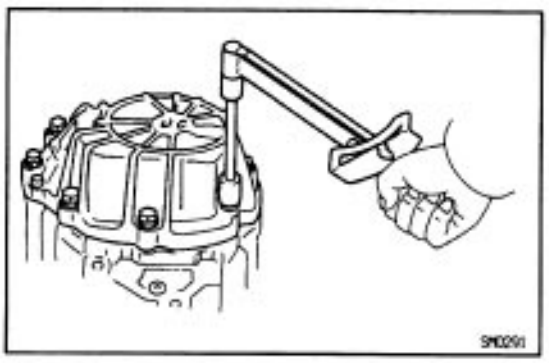
25. INSTALL TRANSMISSION CASE COVER

(a) Remove the FIPG material and be careful not to drop oil on the contacting surface of the transmission case or tranmission case cover.

(b) Apply FIPG to the transmission case cover as shown.

FIPG:

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



(c) Install the transmission case cover.

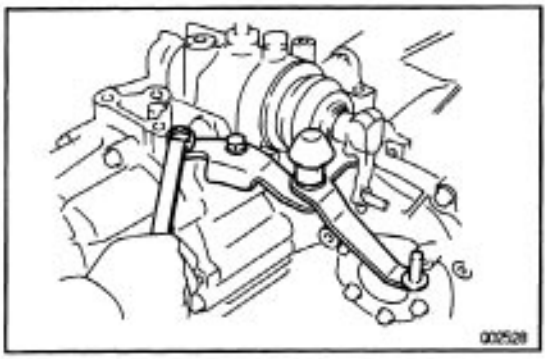
(d) Apply sealant to the bolt threads.

Sealant:

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

(e) Install and torque the 8 bolts.

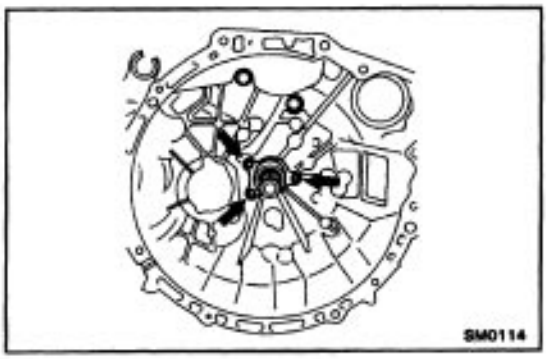
Torque: 29 N–m (300 kgf–cm, 22 ft–lbf)



26. INSTALL SELECTING BELLCRANK AND ENGINE MOUNT BRACKET

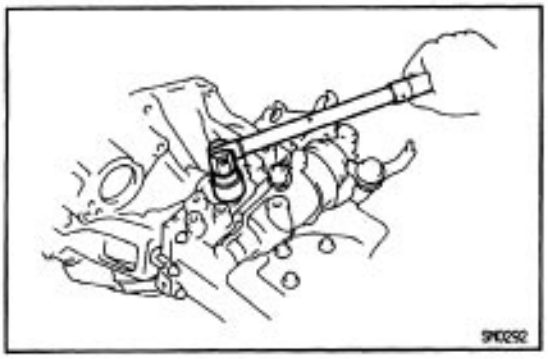
(a) Install the selecting bellcrank and 2 bolts.
Torque: 37 N–m (380 kgf–cm. 27 ft–lbf)

(b) Install the engine mount bracket and torque the 3 bolts.
Torque: 52 N–m (530 kgf–cm, 38 ft–lbf)



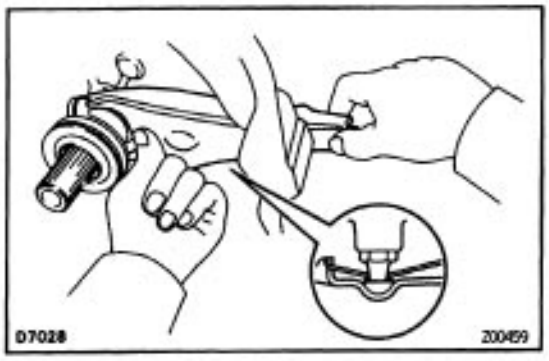
27. INSTALL RELEASE BEARING RETAINER

Install the release bearing retainer and torque the 3 bolts.
Torque: 7.4 N–m (75 kgf–cm, 65 in.¿lbf)



28. INSTALL BACK–UP LIGHT SWITCH
Torque: 44 N–m 1450 kgf–cm, 33 ft.–lbf

29. INSTALL VEHICLE SPEED SENSOR



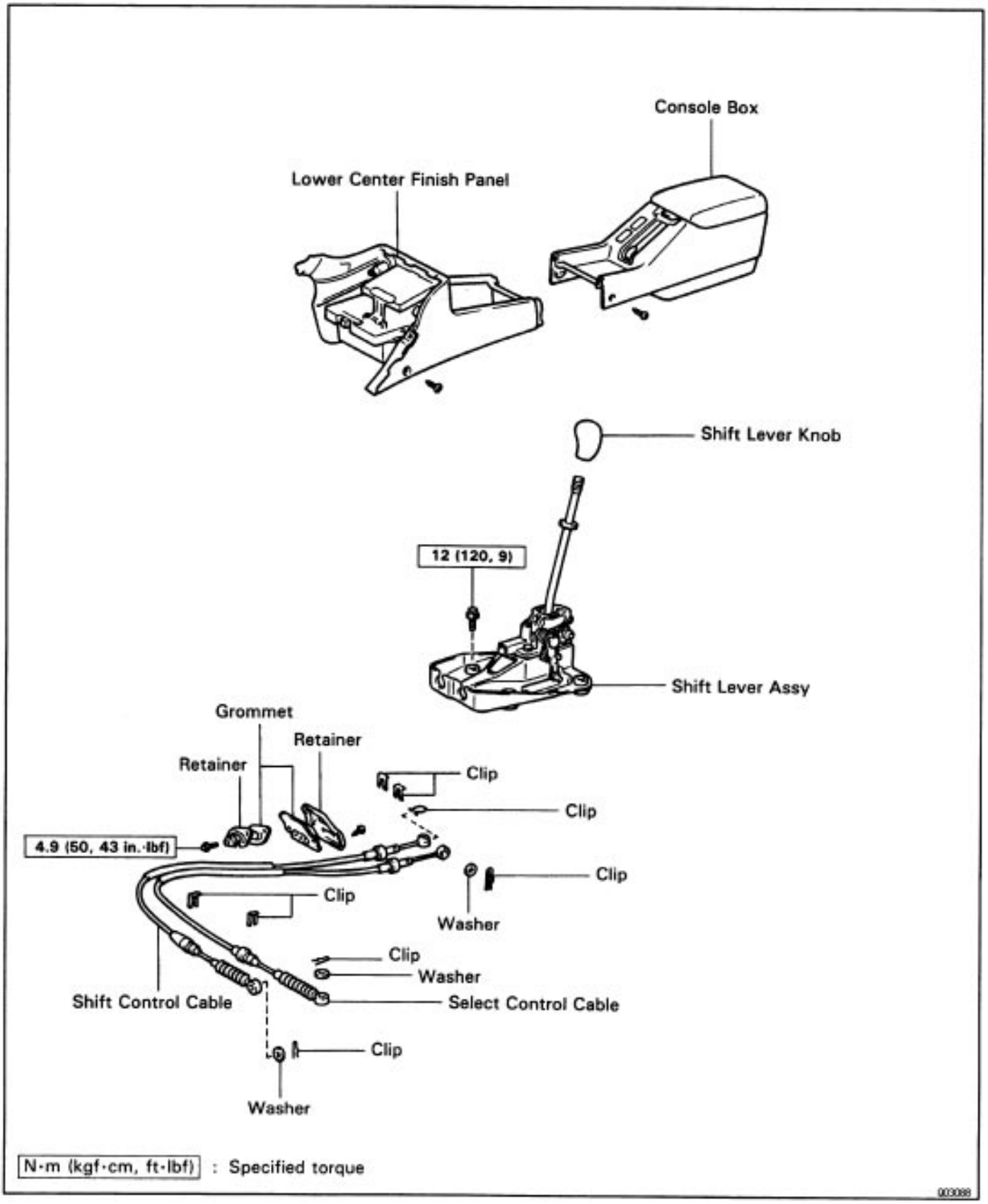
30. INSTALL RELEASE FORK AND BEARING

(a) Apply molybdenum disulphide lithium base grease to the following parts:
- Input shaft spline
- Release fork contact surface

(b) Apply MP grease to the front surface of the release bearing.

SHIFT LEVER AND CONTROL CABLE

COMPONENTS



SERVICE SPECIFICATIONS

SERVICE DATA

Input shaft	
Roller bearing journal diameter	
Limit	29.970 mm (1.1799 in.)
3rd gear journal diameter	
Limit	33.090 mm (1.3028 in.)
4th gear journal diameter	
Limit	32.470 mm (1.2783 in.)
5th gear journal diameter	
Limit	26.970 mm (1.0618 in.)
Runout	
Limit	0.05 mm (0.0020 in.)
Output shaft	
Roller bearing journal diameter	
Limit	31.970 mm (1.2587 in.)
1 st gear journal diameter	
Limit	37.970 mm (1.4949 in.)
2nd gear journal diameter	
Limit	31.990 mm (1.2594 in.)
Runout	
Limit	0.05 mm (0.0020 in.)
Gear thrust clearance 1 st	
STD	0.10–0.29 mm (0.0039–0.0114 in.)
Limit	0.35 mm (0.0138 in.)
Gear thrust clearance 2nd	
STD	0.20–0.44 mm (0.0079–0.0173 in.)
Limit	0.50 mm (0.0197 in.)
Gear thrust clearance 3rd	
STD	0.10–0.25 mm (0.0039–0.0098 in.)
Limit	0.30 mm (0.0118 in.)
Gear thrust clearance 4th	
STD	0.20–0.45 mm (0.0079–0.0177 in.)
Limit	0.50 mm (0.0197 in.)
Gear thrust clearance 5th	
STD	0.20–0.40 mm (0.0079–0.0157 in.)
Limit	0.45 mm (0.0177 in.)
Gear radial clearance 1 st, 2nd, 3rd and 4th	
STD	0.009–0.053 mm (0.0004–0.0021 in.)
Limit	0.070 mm (0.0028 in.)
Gear radial clearance 5th	
STD	0.009–0.050 mm (0.0004–0.0020 in.)
Limit	0.070 mm (0.0028 in.)
Shift fork to hub sleeve clearance	
Limit	1.0 mm (0.039 in.)
Synchronizer ring to gear clearance 1 at, 3rd and 4th	
Limit	0.6 mm (0.024 in.)

Synchronizer ring to gear clearance 2nd		
Limit		0.7 mm (0.028 in.)
Input shaft snap ring thickness		
No.2 clutch hub	Mark 1	1.95 – 2.00 mm (0.0768 – 0.0787 in.)
No.2 clutch hub	Mark 2	2.00 – 2.05 mm (0.0787 – 0.0807 in.)
No.2 clutch hub	Mark 3	2.05 – 2.10 mm (0.0807 – 0.0827 in.)
No.2 clutch hub	Mark 4	2.10 – 2.15 mm (0.0827 – 0.0846 in.)
No.2 clutch hub	Mark 5	2.15 – 2.20 mm (0.0846 – 0.0866 in.)
No.2 clutch hub	Mark 6	2.20 – 2.25 mm (0.0866 – 0.0886 in.)
No.3 clutch hub	Mark 13	2.20 – 2.25 mm (0.0866 – 0.0886 in.)
No.3 clutch hub	Mark 14	2.25 – 2.30 mm (0.0886 – 0.0906 in.)
No.3 clutch hub	Mark 15	2.30 – 2.35 mm (0.0906 – 0.0925 in.)
No.3 clutch hub	Mark 16	2.35 – 2.40 mm (0.0925 – 0.0945 in.)
No.3 clutch hub	Mark 17	2.40 – 2.45 mm (0.0945 – 0.0965 in.)
No.3 clutch hub	Mark 18	2.45 – 2.50 mm (0.0965 – 0.0984 in.)
No.3 clutch hub	Mark 19	2.50 – 2.55 mm (0.0984 – 0.1004 in.)
No.3 clutch hub	Mark 20	2.55 – 2.60 mm (0.1004 – 0.1024 in.)
No.3 clutch hub	Mark 21	2.60 – 2.65 mm (0.1024 – 0.1043 in.)
No.3 clutch hub	Mark 22	2.65 – 2.70 mm (0.1043 – 0.1063 in.)
No.3 clutch hub	Mark 23	2.70 – 2.75 mm (0.1063 – 0.1083 in.)
No.3 clutch hub	Mark 24	2.75 – 2.80 mm (0.1083 – 0.1102 in.)
No.3 clutch hub	Mark 25	2.80 – 2.85 mm (0.1102 – 0.1122 in.)
No.3 clutch hub	Mark 26	2.85 – 2.90 mm (0.1122 – 0.1142 in.)
No.3 clutch hub	Mark 27	2.90 – 2.95 mm (0.1142 – 0.1161 in.)
Rear bearing		
	Mark A	2.15 – 2.20 mm (0.0846 – 0.0866 in.)
	Mark B	2.20 – 2.25 mm (0.0866 – 0.0886 in.)
	Mark C	2.25 – 2.30 mm (0.0886 – 0.0906 in.)
	Mark D	2.30 – 2.35 mm (0.0906 – 0.0925 in.)
	Mark E	2.35 – 2.40 mm (0.0925 – 0.0945 in.)
Differential side bearing adjusting shim thickness		
	Mark 1	1.90 mm (0.0748 in.)
	Mark 2	1.95 mm (0.0768 in.)
	Mark 3	2.00 mm (0.0787 in.)
	Mark 4	2.05 mm (0.0807 in.)
	Mark 5	2.10 mm (0.0827 in.)
	Mark 6	2.15 mm (0.0846 in.)
	Mark 7	2.20 mm (0.0866 in.)
	Mark 8	2.25 mm (0.0886 in.)
	Mark 9	2.30 mm (0.0906 in.)
	Mark 10	2.35 mm (0.0925 in.)
	Mark 11	2.40 mm (0.0945 in.)
	Mark 12	2.45 mm (0.0965 in.)
	Mark 13	2.50 mm (0.0984 in.)
	Mark 14	2.55 mm (0.1004 in.)
	Mark 15	2.60 mm (0.1024 in.)
	Mark 16	2.65 mm (0.1043 in.)
	Mark 17	2.70 mm (0.1063 in.)

	Mark 18	2.75 mm (0.1083 in.)
	Mark 19	2.80 mm (0.1102 in.)
Shift lever preload adjusting shim thickness		
	Mark A	0.5 mm (0.020 in.)
	Mark B	0.6 mm (0.024 in.)
	Mark C	0.7 mm (0.028 in.)
	Mark D	0.8 mm (0.031 in.)
	Mark E	0.9 mm (0.035 in.)
	Mark F	1.0 mm (0.039 in.)
	Mark G	1.1 mm (0.043 in.)
	Mark H	1.2 mm (0.047 in.)
	Mark J	1.3 mm (0.051 in.)
	Mark K	1.4 mm (0.055 in.)
	Mark L	1.5 mm (0.059 in.)
	Mark M	1.6 mm (0.063 in.)
	Mark N	1.7 mm (0.067 in.)
Differential case side bearing preload (at starting)		0.8 – 1.6 N·m (8 – 16 kgf·cm, 6.9 – 13.9 in.·lbf)
Differential pinion to side gear backlash		0.05 – 0.20 mm (0.0020 – 0.0079 in.)
Differential side gear thrust washer thickness		
	None Mark	0.95 mm (0.0374 in.)
	None Mark	1.00 mm (0.0394 in.)
	None Mark	1.05 mm (0.0413 in.)
	None Mark	1.10 mm (0.0433 in.)
	None Mark	1.15 mm (0.0453 in.)
	None Mark	1.20 mm (0.0472 in.)

TORQUE SPECIFICATIONS

Part tightened	N-m	kgf-cm	ft-lbf
Transmission case x Transaxle case	29	300	22
Transmission case x Case cover	29	300	22
Transmission case protector	18	185	13
Rear bearing retainer	42	430	31
Output shaft front bearing lock plate	18	185	13
Input shaft oil receiver	7.4	75	65 in.-lbf
5th driven gear lock nut	123	1,250	90
Reverse idler shaft lock bolt	29	300	22
Control shaft cover	37	375	27
Control shift lever x lever shaft	6.4	65	56 in.-lbf
Ring gear x Differential case	90	920	67
Selecting bellcrank x Transmission case	37	380	27
Reverse shift arm bracket	18	185	13
No.3 shift fork x Shift fork shaft	18	185	13
Lock ball assembly	29	300	22
Plug	23	230	17
Filler plug	49	500	36
Drain plug	49	500	36
Back–up light switch	44	450	33
Side bearing retainer	18	185	13
Clutch release bearing retainer	7.4	75	65 in.-lbf
Straight screw plug (Shift fork shaft)	13	130	9
Straight screw plug (Reverse restrict pin)	13	130	9
Transaxle x Engine (12mm bolt)	64	650	47
Transaxle x Engine (l0 mm bolt)	46	470	34
Engine left mounting x Transmission case	52	530	38
Engine left mounting x Sub frame	80	820	59
Engine front mounting x Sub frame	80	820	59
Engine rear mounting x Sub frame	80	820	59
Sub frame x Body	181	1,850	134
Lower brace x Body (Bolt)	32	330	24
Lower brace x Body (Nut)	36	370	27
Exhaust front pipe x Catalytic converter	62	630	46
Exhaust front pipe x Exhaust center pipe	43	440	32
Stiffener plate x Clutch housing	37	380	27
Stiffener plate x Engine	37	380	27
Steering gear housing x Sub frame	181	1,850	134
Stabilizer bar bush bracket x Sub frame	19	195	14
Starter x Clutch housing	39	400	29
Clutch release cylinder x Clutch housing	13	130	9