W55 AND W56 MANUAL TRANSMISSION

DESCRIPTION

MX00F–02

PRECAUTIONS

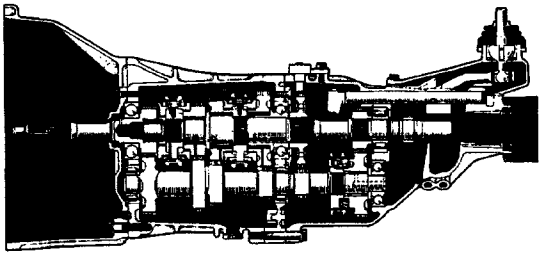
When working with FIPG material, you must be observe the following.

- **Using a razor blade and gasket scraper, remove all the old packing (FlPG) 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 seal packing in approx. 1 mm (0.04 in.) bead along the sealing surface.**
- **Parts must be assembly within 10 minutes of application. Otherwise, the packing (FIPG) material must be removed and reapplied.**

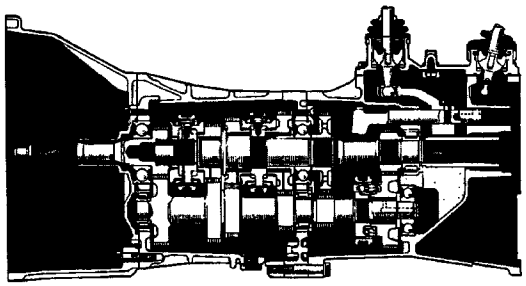
MT002–02

DESCRIPTION

- The W55 and W56 manual transmissions are three–shift type, having an input shaft, output shaft and counter gear. Power is transmitted from the input shaft to the counter gear, and then to the output shaft which is co–axially fitted to the input shaft. The input shaft and the output shaft are engaged directly to each other in the 4th gear position.
- The 1 st through 5th gears are constant mesh gears which use an inertia lock key type synchromesh mechanism. The reverse gear is a sliding mesh gear which is engaged by sliding the idler gear.
- W55 and W56 are manual transmissions use a single–cone synchromesh mechanism foi the reverse gear.



Q03080



Q03081

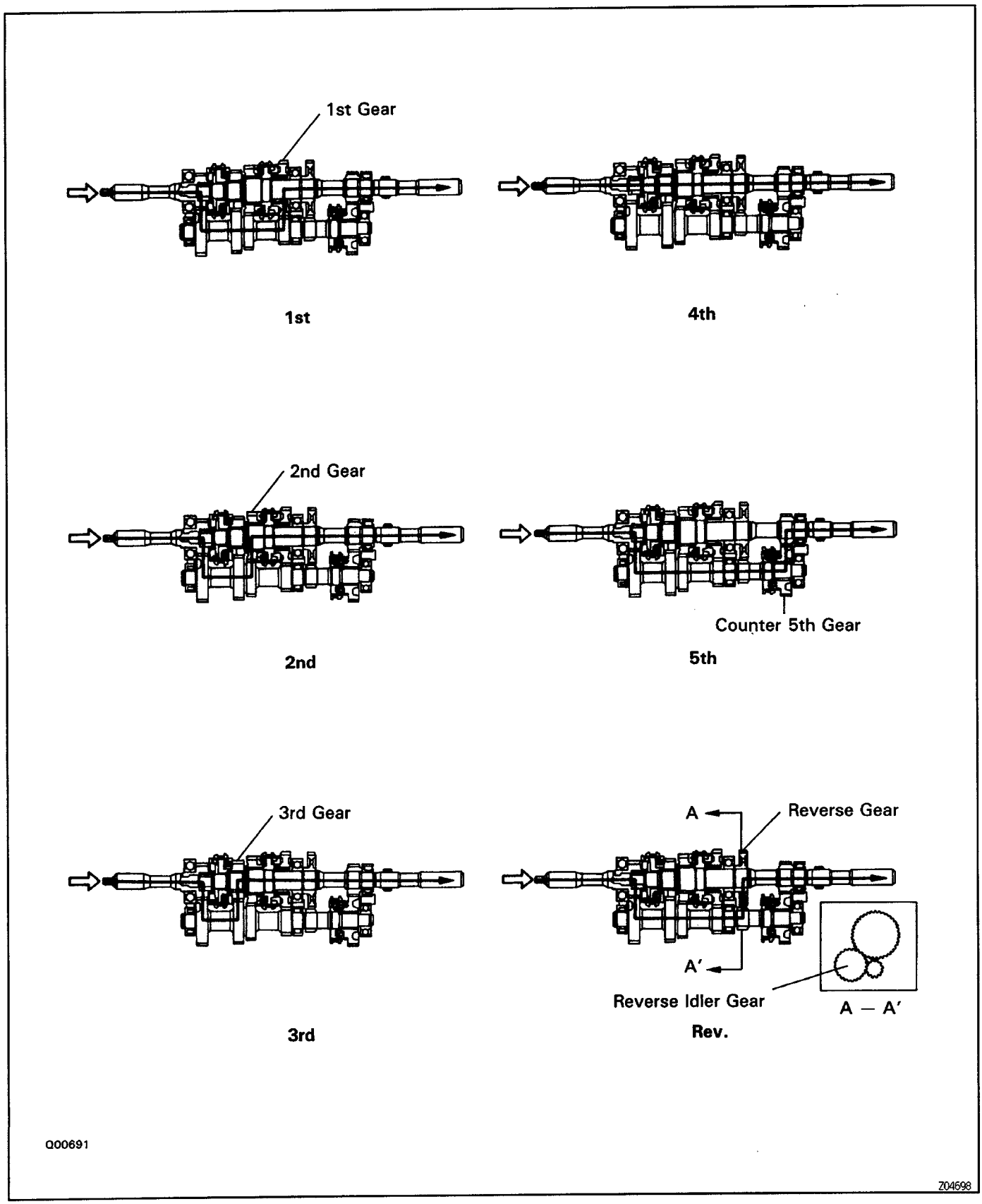
Type of Transmission		W55	W56
Type of Engine		22R–E	
Gear Ratio	1st	3.566	3.954
	2nd	2.056	2.141
	3rd	1.384	←
	4th	1.000	←
	5th	0.850	←
	Reverse	4.091	←
Oil Capacity		2.6 liters (2.7 US.qts, 2.3 Imp.qts)	2.9 liters (3.0 US.qts, 2.6 Imp–qts)
Oil Viscosity		SAE 75W–90 or 80W–90	
Oil Grade		API GL–4	

20469,

OPERATION

MT003–02

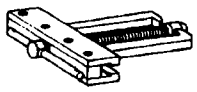
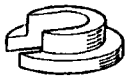
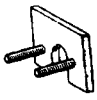
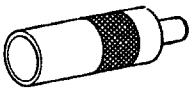
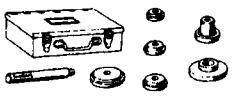
- **The illustrations below show the engagements of transmission gears.**

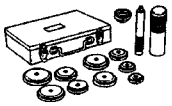
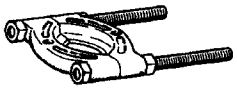
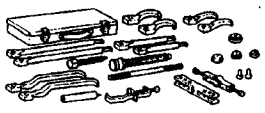


PREPARATION

SST (SPECIAL SERVICE TOOLS)

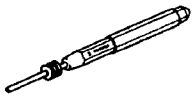
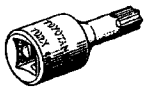
MT004–01

	09213–36020 Timing Gear Remover	
	09308–00010 Oil Seal Puller	
	09308–10010 Oil Seal Puller	
	09312–20011 Transmission Gear Remover & Replacer	
	(09313–00010) Reverse Gear Remover	
	(09313–00030) Rear Bearing Replacer	
	(09313–00040) Plate wAw	
	(09313–00050) Plate wBw	
	09316–60010 Transmission & Transfer Bearing Replacer	
	(09316–00010) Replacer Pipe	
	09325–20010 Transmission Oil Plug	
	09506–35010 Differential Drive Pinion Rear Bearing Replacer	
	09608–12010 Front Hub & Drive Pinion Bearing Replacer Set	

	(09608–00020) Remover & Replacer Handle	
		
	(09608–00050) Drive Pinion Front Bearing Cup Replacer	
		
	09608–20012 Front Hub & Drive Pinion Bearing Tool Set	
		
	(09608–00080) Replacer	
		
	(09608–03020) Handle	
		
	09608–35014 Axle Hub & Drive Pinion Bearing Tool Set	
		
	(09608–06020) Handle	
		
	(09608–06090) Front Hub Outer & Steering Worm Bearing Replacer	
		
	(09608–06100) Front Hub Outer Replacer	
		
	09950–00020 Bearing Remover	
		
	09950–00030 Bearing Remover Attachment	
		
	09950–20017 Universal Puller	
		

MT005–01

RECOMMENDED TOOLS

	09031–00030 Pin Punch	
	09905–00012 Snap Ring No. 1 Expander	
	09042–00020 Torx Socket t40	

MT006–01

EQUIPMENT

Dial indicator or dial indicator with magnetic base	
Torque wrench	

MT007–02

LUBRICANT

Item	Capacity	Classification
Manual transmission	2.6 liters (2.7 US qts, 2.3 Imp.qts)	API GL–4 SAE 75W–90 or 80W–90

MT008–01

SSM (SPECIAL SERVICE MATERIALS)

	08826–00090 Seal Packing 1281, Three bond 1281 or equivalent	Transmission case x Intermediate plate Front bearing retainer x Transmission case
	08833–00080 Adhesive 1344, THREE BOND 1344, LOCTITE 242 or equivalent	Straight screw plug Front bearing retainer bolt

TROUBLESHOOTING

MT009–01
You will find the troubles using the table well shown in this table, each number shows the priority of causes in troubles. Check each part in order. If necessary, replace these parts.

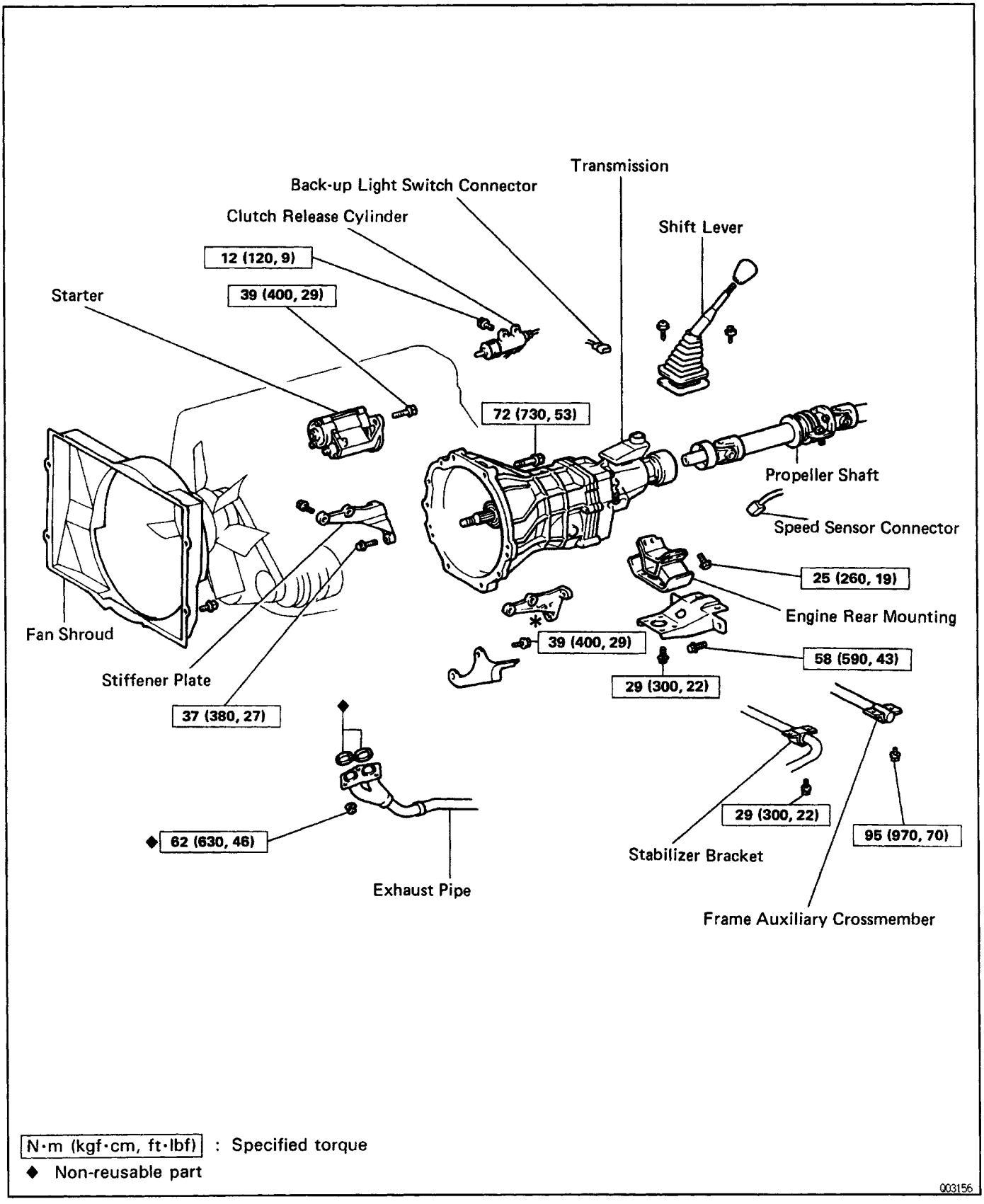
See page / Parts Name / Trouble	I	MT2–2	I	MT2–10	MT2–14	MT2–10	MT2–10,11	MT2–11	MT2–11	MT2–11	MT2–25,33	MT2–25,33				
	Oil (Level low)	Oil (Wrong)	Oil (Level too high)	Gasket (Damaged)	Oil seal (Worn or damaged)	O–Ring (Worn or damaged)	Locking ball spring (Damaged)	Shift fork (Worn)	Gear (Worn or damaged)	Bearing (Worn or damaged)	Synchronizer ring (Worn or damaged)	Shifting key spring (Damaged)				
Noise	1	2							3	3						
Oil leakage			1	2	2	3										
Hard to shift or will not shift											1	2				
Jumps out of gear							1	2	3	3						

V00794

ASSEMBLY REMOVAL AND INSTALLATION

TRANSMISSION REMOVAL AND INSTALLATION

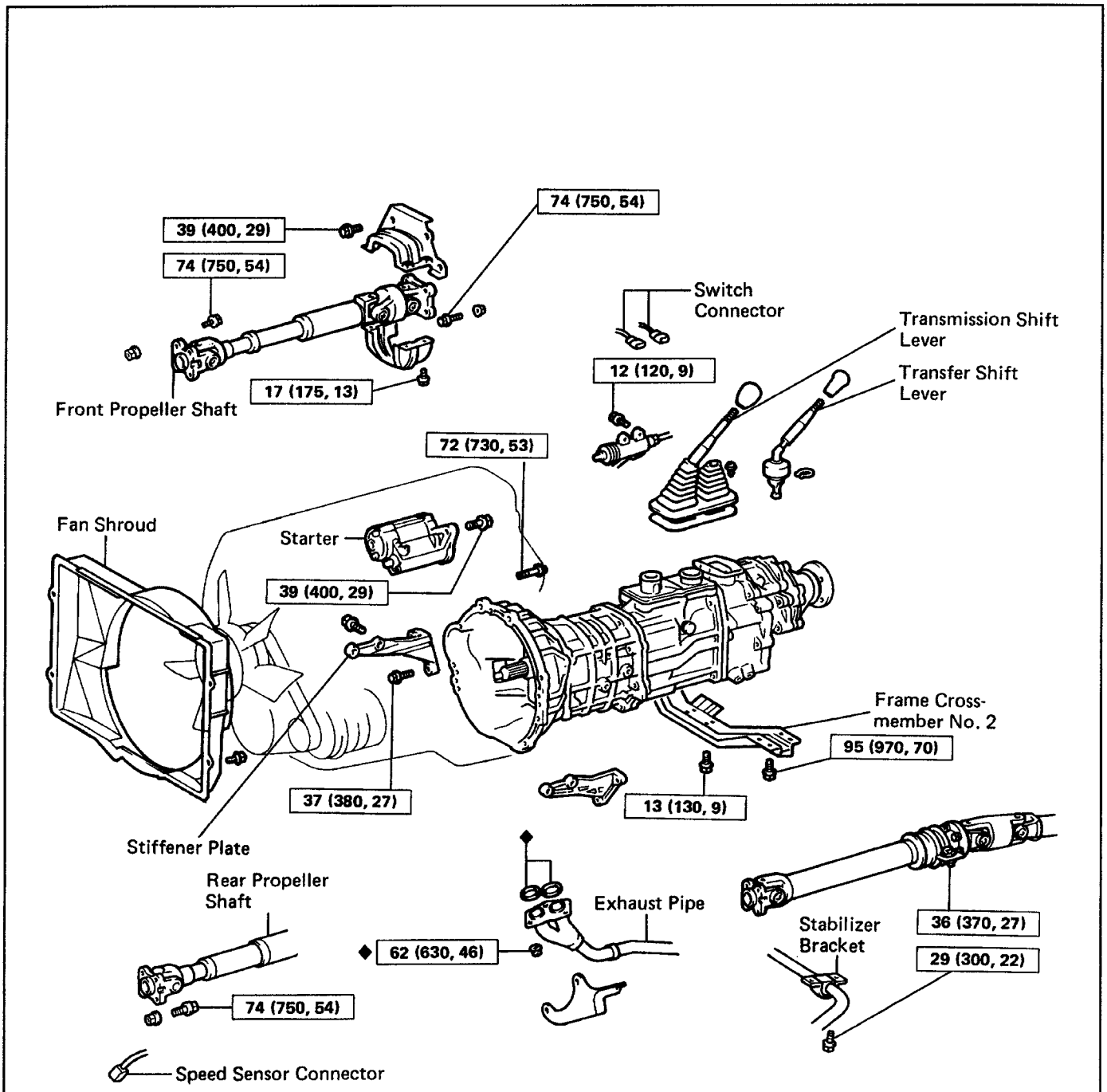
MT031–01



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non-reusable part

003156

TRANSMISSION WITH TRANSFER REMOVAL AND INSTALLTION

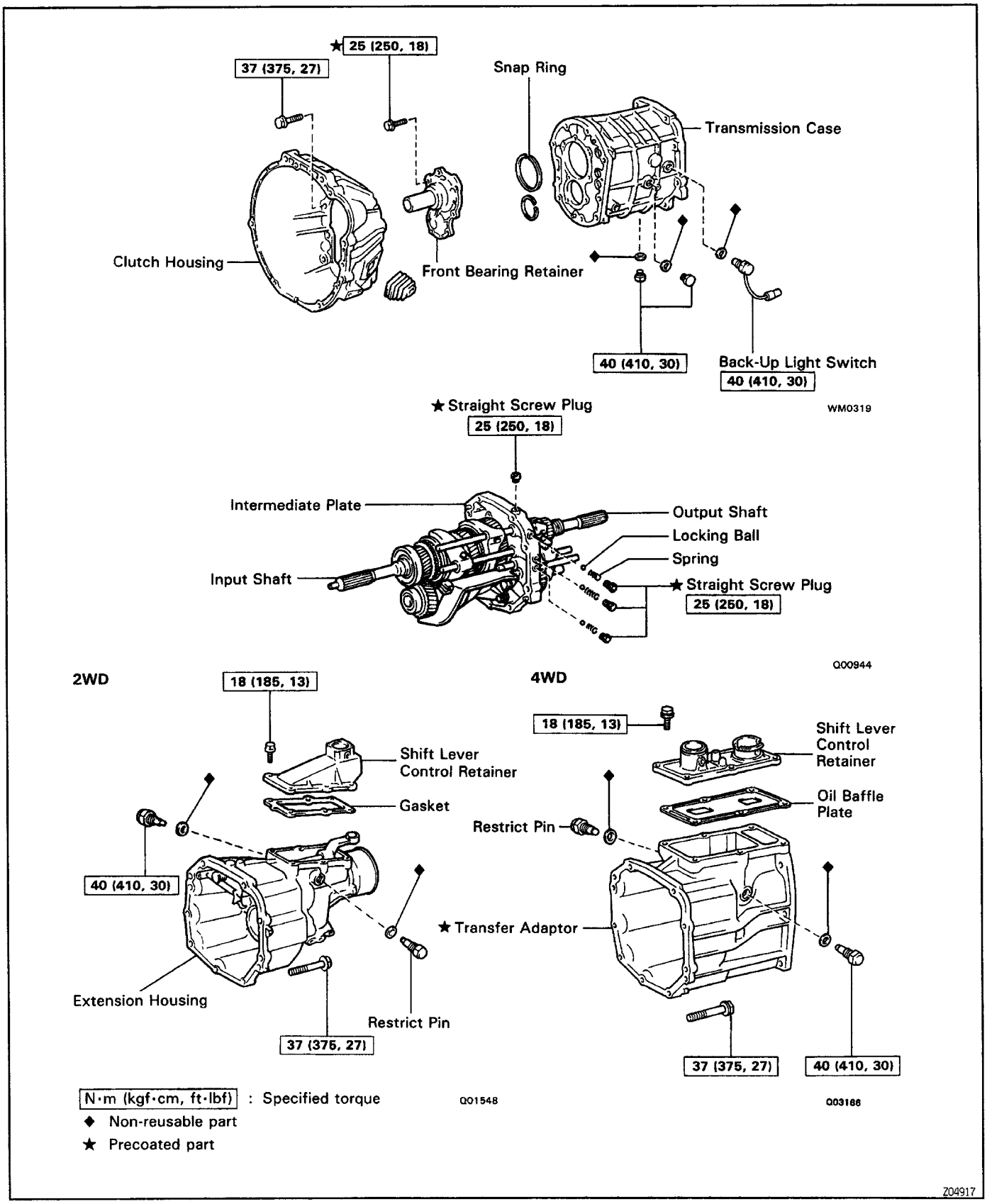


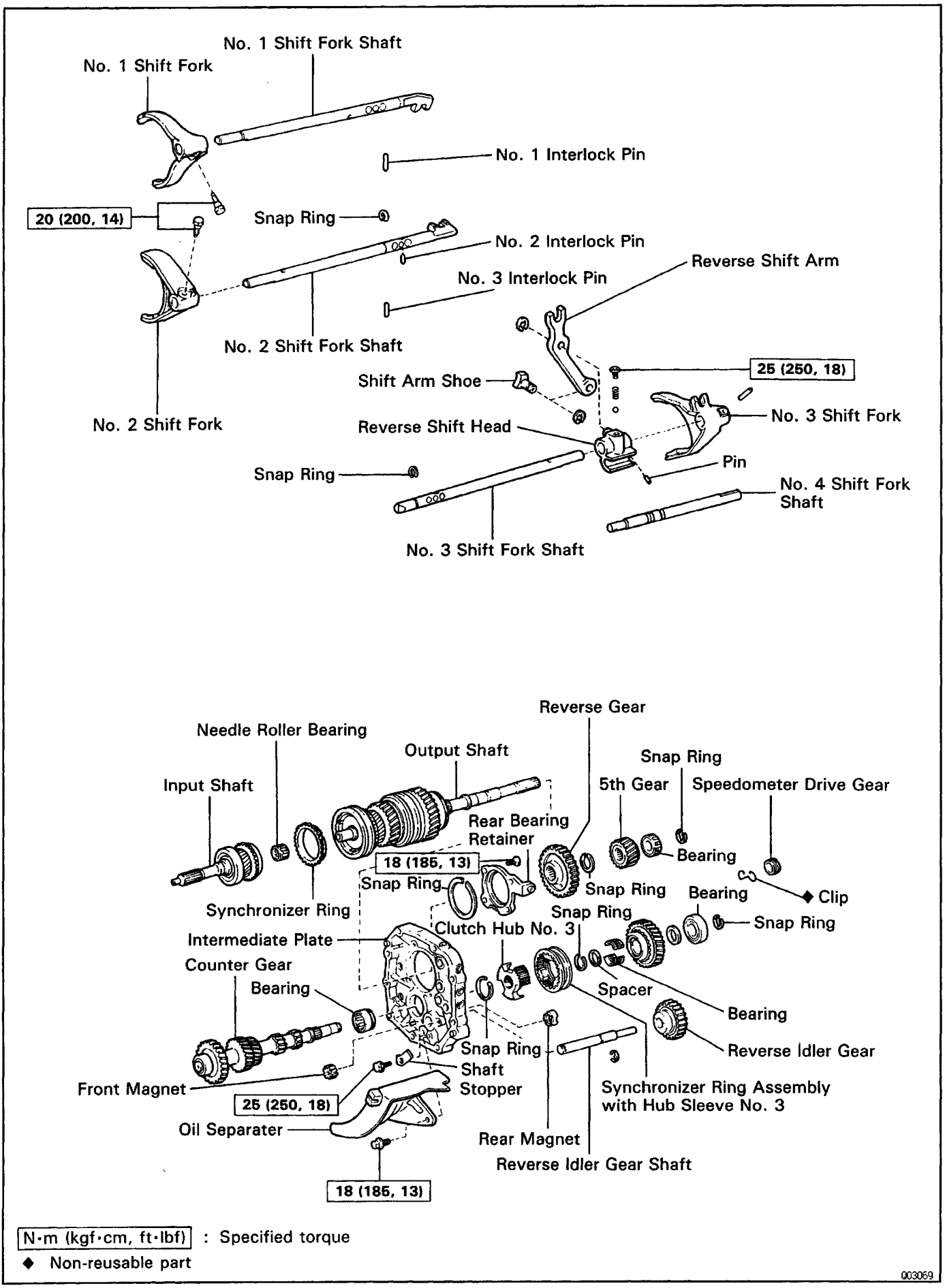
N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

COMPONENT PARTS REMOVAL MT00D–02

COMPONENTS

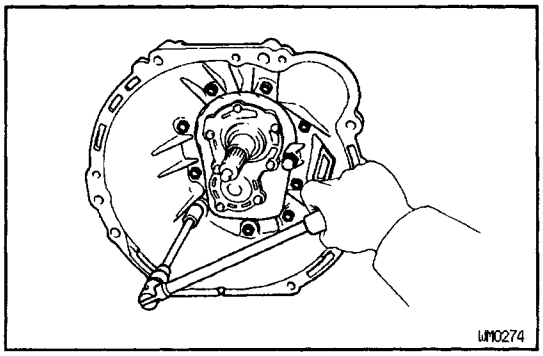




N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

003069



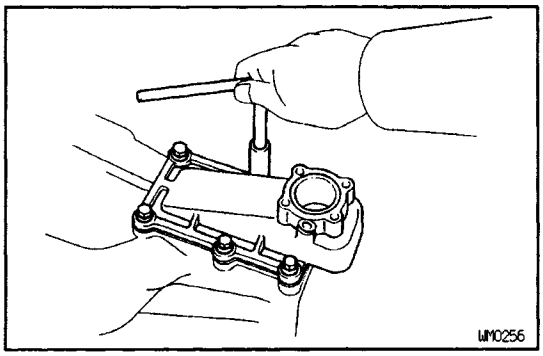
BASIC SUBASSEMBLY SEPARATION

MT00E–02

1. REMOVE BACK – UP LIGHT SWITCH, VEHICLE SPEED SENSOR (2WD) AND ENGINE REAR MOU–NTING

2. REMOVE CLUTCH HOUSING FROM TRANSMIS–SION CASE

Remove the nine bolts and clutch housing from the transmission case.

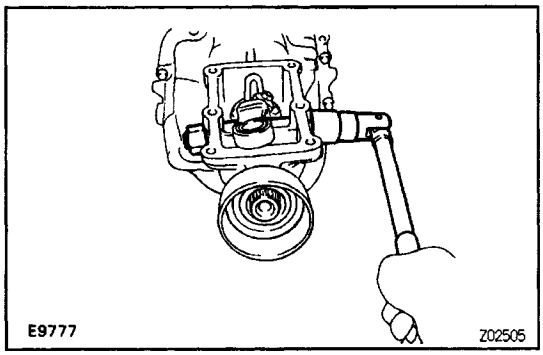


3. (2WD)

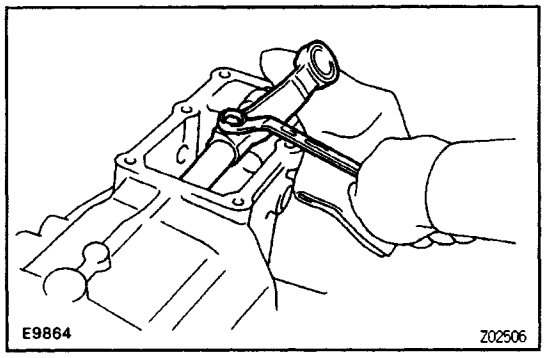
REMOVE EXTENSION HOUSING

(a) Remove the six bolts.

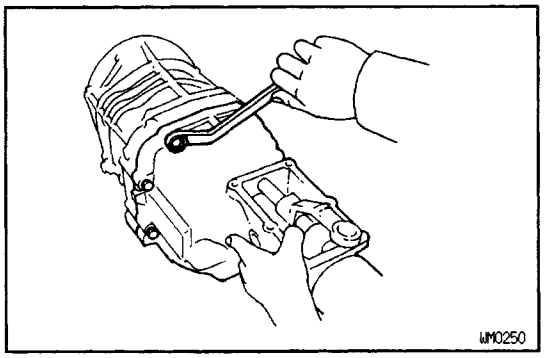
(b) Remove the shift lever retainer and oil baffle plate.



(c) Remove the two restrict pins.



(d) Remove the shift lever housing set bolt.

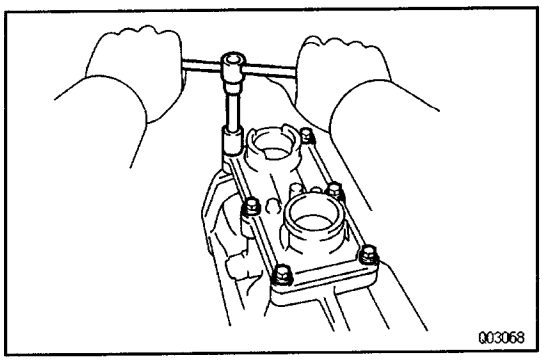


(e) Remove the nine bolts.

(f) Using a plastic hammer, tap the extension housing.

(g) Disengage the shift and select lever from the shift head.

(h) Pull out the extension housing.

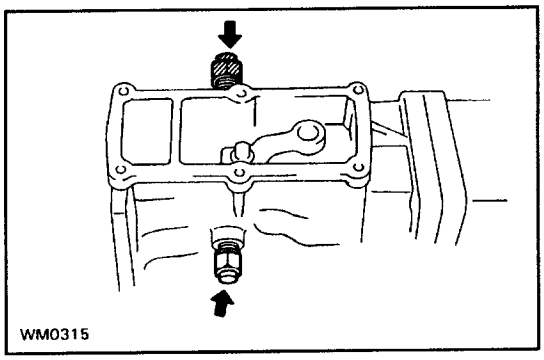


4. (4WD)

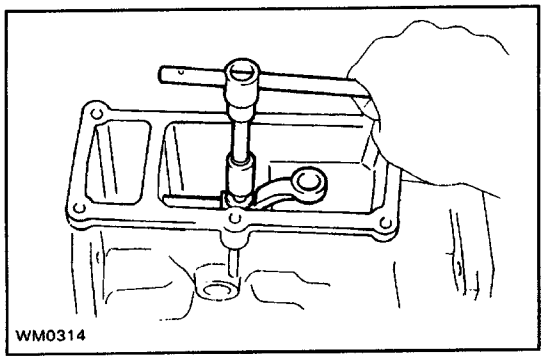
REMOVE TRANSFER ADAPTOR

(a) Remove the six bolts, shift lever retainer and gasket.

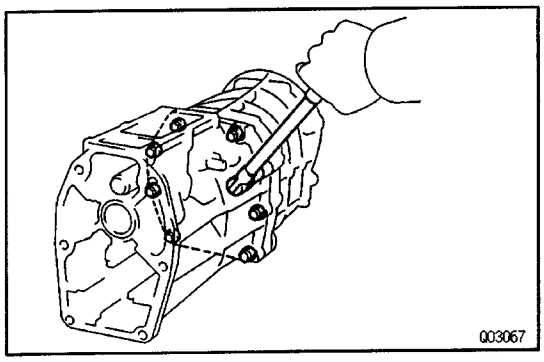
(b) Remove the select return spring from the shift lever retainer.



(c) Remove the two restrict pins and gaskets.



(d) Remove the shift lever housing set bolt.

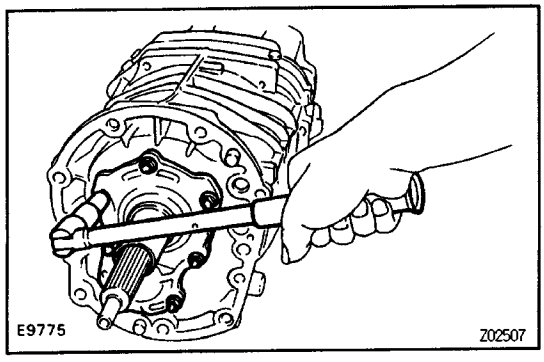


(e) Remove the nine bolts.

(f) Using a plastic hammer, tap the transfer adaptor.

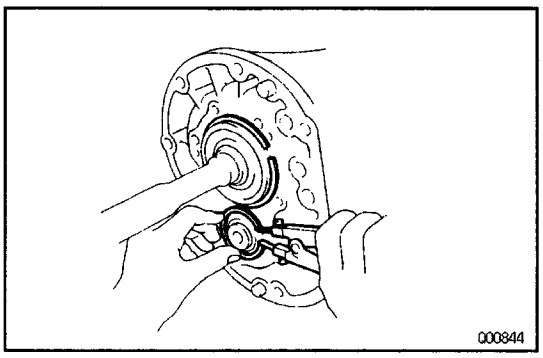
(g) Disengage the shift and select lever from the shift head.

(h) Pull out the transfer adaptor.

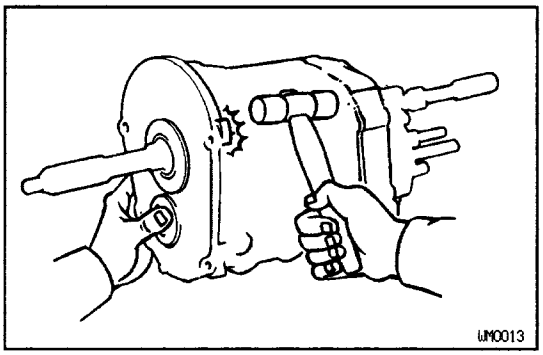


5. REMOVE FRONT BEARING RETAINER AND BEARING SNAP RINGS

(a) Remove the seven bolts and front bearing retainer.



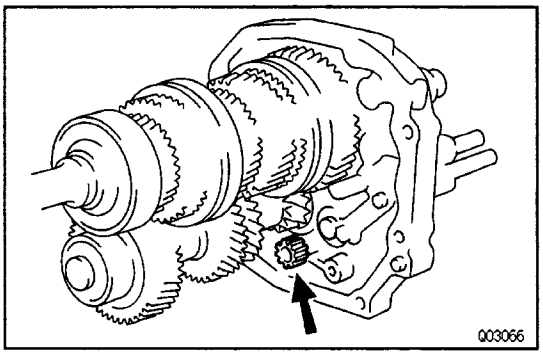
(b) Using a snap ring pliers, remove the two bearing snap rings.



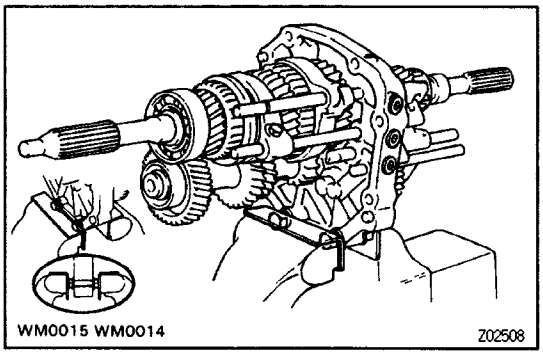
6. SEPARATE INTERMEDIATE PLATE FROM TRANSMISSION CASE

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

(b) Pull the transmission case from the intermediate plate.



7. REMOVE FRONT MAGNET

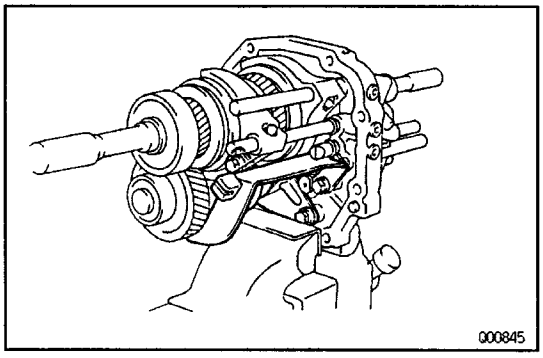


8. MOUNT INTERMEDIATE PLATE IN VISE

(a) Use two long clutch housing bolts, plate washers and suitable nuts as shown.

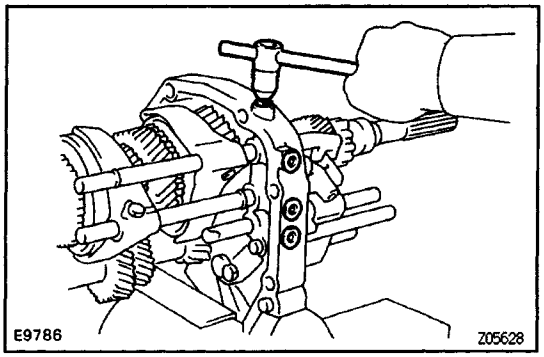
NOTICE: Install the plate washers in reverse of normal. Increase or decrease plate washers so that the bolt tip and the front tip surface of the nut are aligned.

(b) Mount the intermediate plate in a vise.



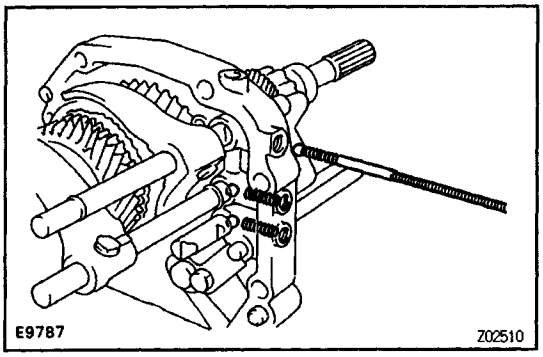
9. REMOVE OIL SEPARATOR

Remove the two bolts and oil receiver.

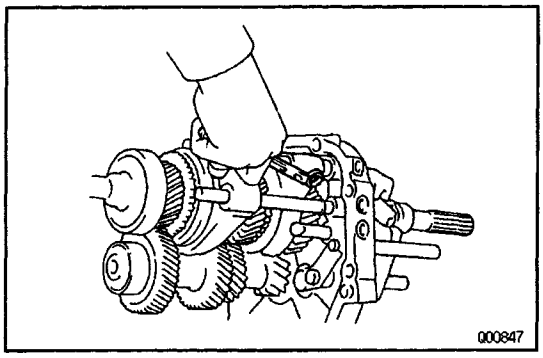


10. REMOVE LOCKING BALL AND SPRING

(a) Using a hexagon wrench, remove the four plugs.

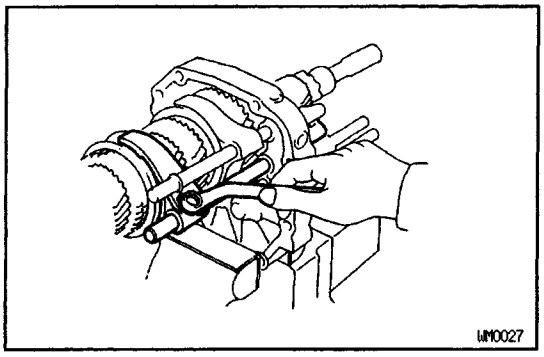


(b) Using a magnetic finger, remove the three springs and balls.

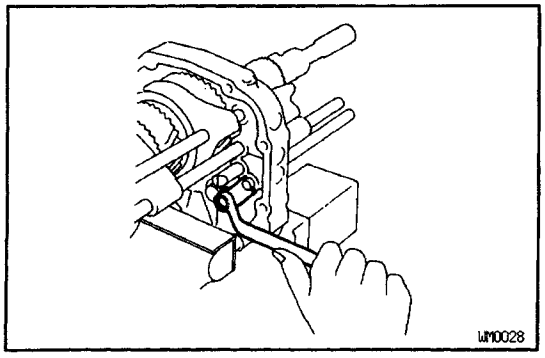


11. REMOVE SHIFT FORKS, SHIFT FORK SHAFTS AND REVERSE IDLER GEAR

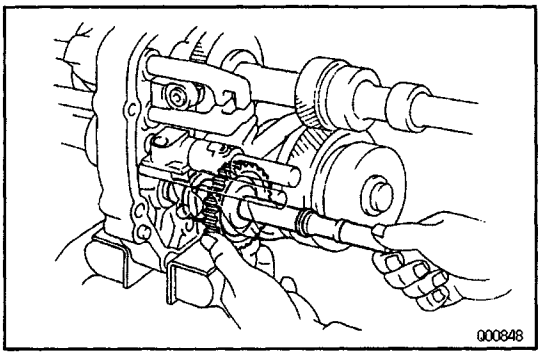
(a) Remove the No. 1 shift fork set bolt.



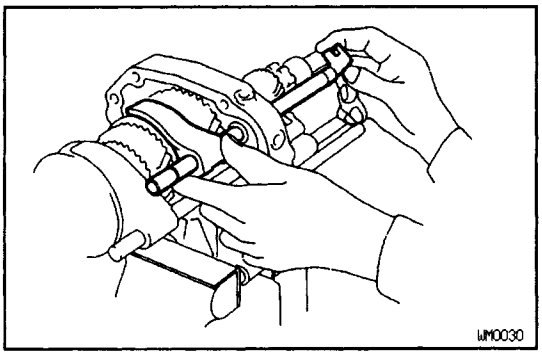
(b) Remove the No.2 shift fork set bolt.



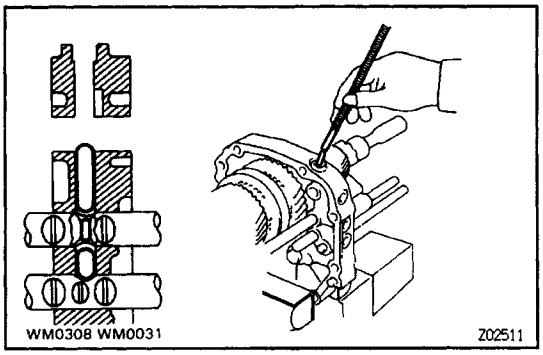
(c) Remove the reverse idler gear shift stopper.



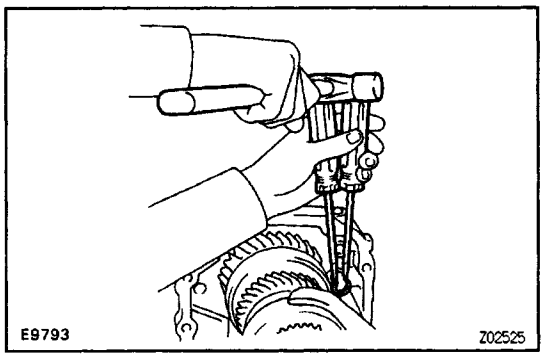
(d) Remove the reverse idler gear and shaft.



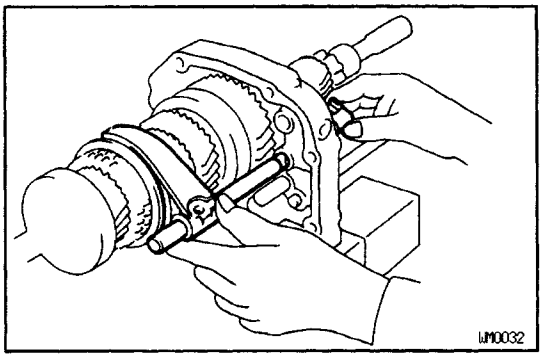
(e) Remove the No.1 shift fork and shaft.



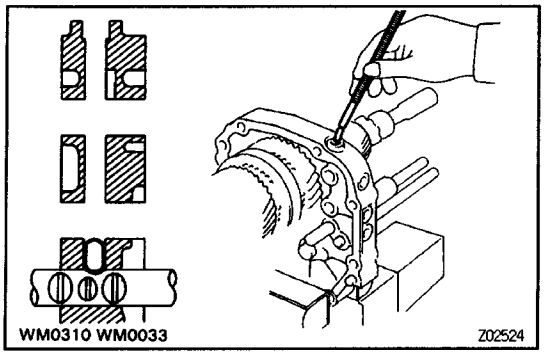
(f) Using a magnetic finger, remove the No–1 and No.2 interlock pins.



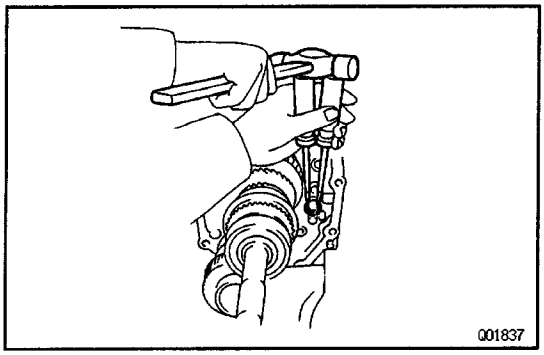
(g) Using two screwdrivers and a hammer, tap out the snap ring from the No.2 fork shaft.



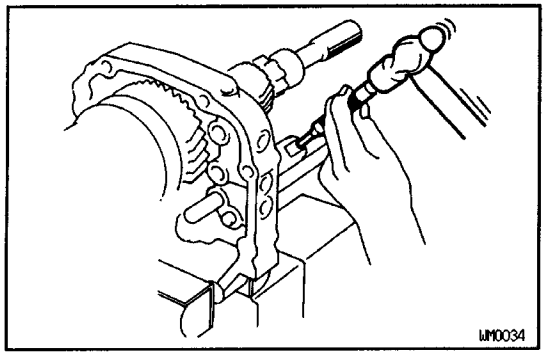
(h) Remove the No.2 shift fork and shaft.



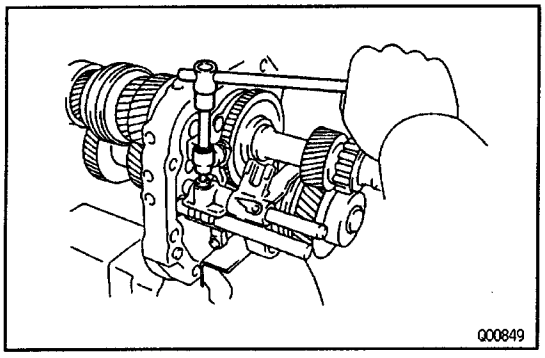
(i) Using a magnetic finger, remove the No.3 interlock pin.



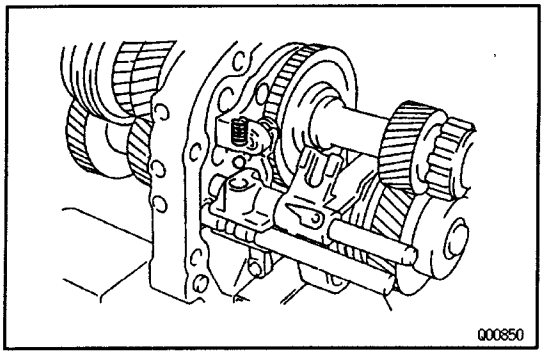
(j) Using two screwdrivers and a hammer, tap out the snap ring from the No.3 fork shaft.



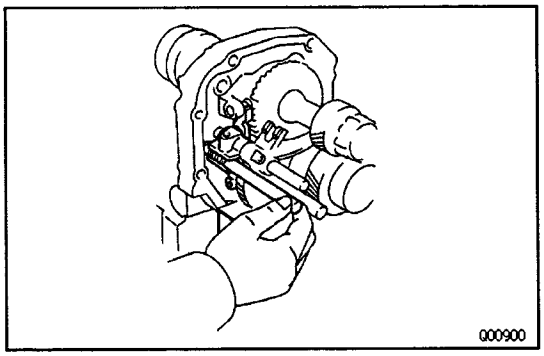
(k) Using a pin punch and hammer, drive out the slotted spring pin from the No.3 shift fork.



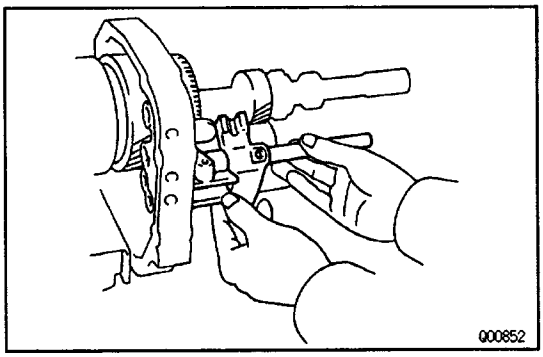
(l) Using a hexagon wrench, remove the plug.



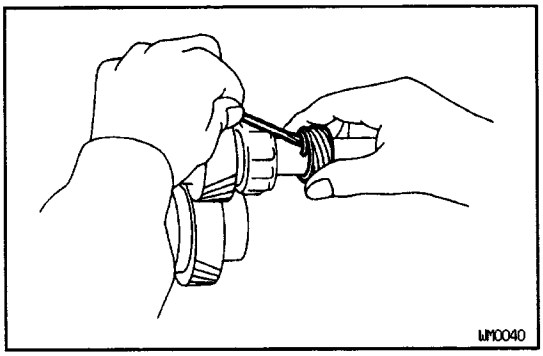
(m) Using a magnetic finger, remove the spring and ball.



(n) Pull out the No.4 shift fork shaft.
(o) Remove the interlock pin.

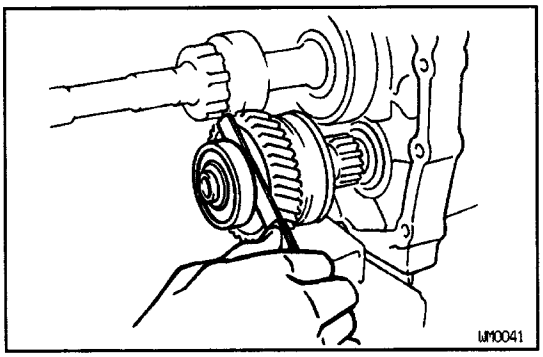


(p) Remove the No.3 shift fork, fork shaft and reverse shift arm with the pin.



12. (2WD)
REMOVE SPEED SENSOR DRIVE GEAR

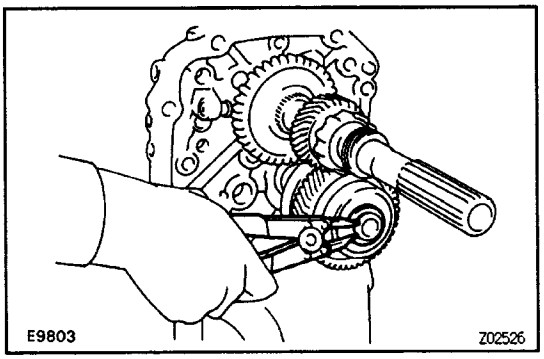
Pry out both ends of the clip and remove the drive gear.



13. INSPECT COUNTER FIFTH GEAR THRUST CLEARANCE

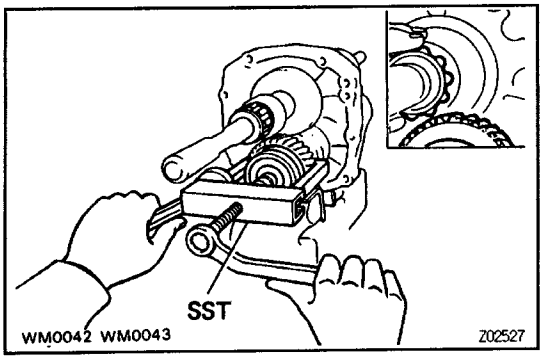
Using feeler gauge, measure the counter 5th gear thrust clearance.

Standard clearance:
0.10–0.41 mm (0.0039–0.0161 in.)
Maximum clearance:
0.46 mm (0.0181 in.)



14. REMOVE COUNTER REAR BEARING, SPACER, COUNTER FIFTH GEAR AND NEEDLE ROLLER BEARING

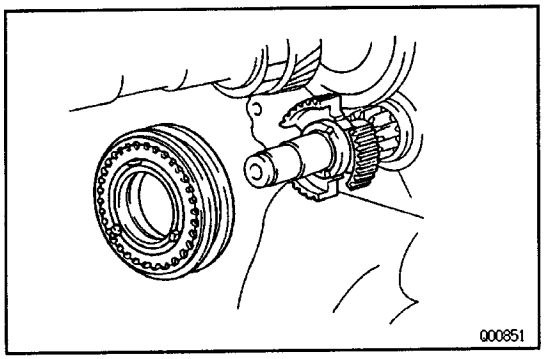
(a) Using a snap ring expander, remove the snap ring.



(b) Using SST, remove the rear bearing, spacer, 5th gear and bearing.
SST 09213–36020

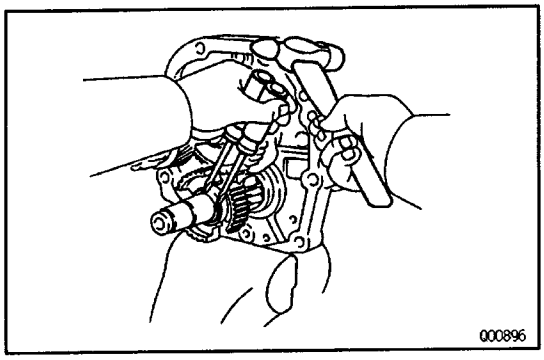
NOTICE: Be careful not to catch the output shaft rear bearing roller on the counter 5th gear.

(c) Remove the spacer.



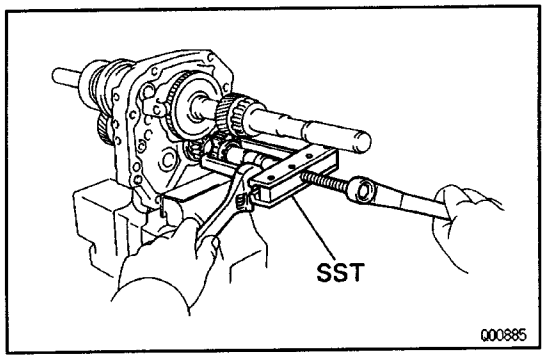
15. REMOVE SYNCHRONIZER RING ASSEMBLY WITH NO.3 HUB SLEEVE AND NO.3 CLUTCH HUB

(a) Remove the synchronizer ring assembly with No.3 hub sleeve from the No.3 clutch hub.



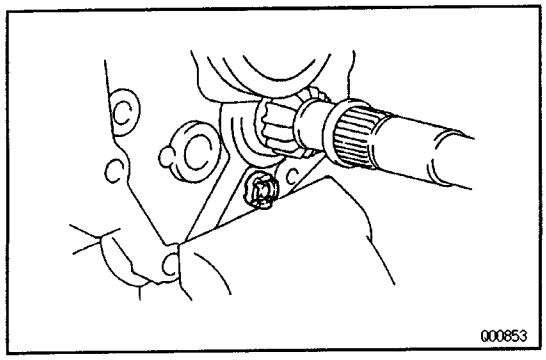
(b) Remove the spacer.

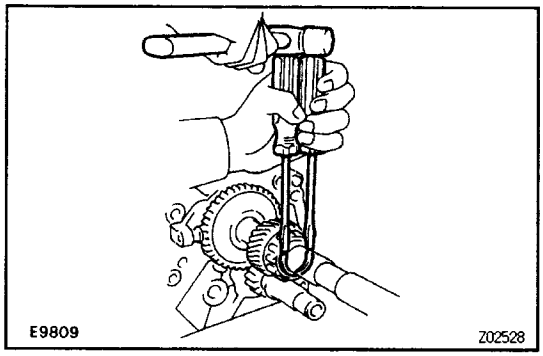
(c) Using two screwdrivers and a hammer, tap out the snap ring.



(d) Using SST, remove the No.3 clutch hub.
SST 09213–36020

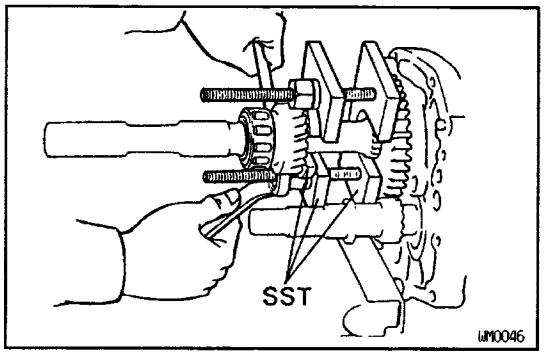
16. REMOVE REAR MAGNET



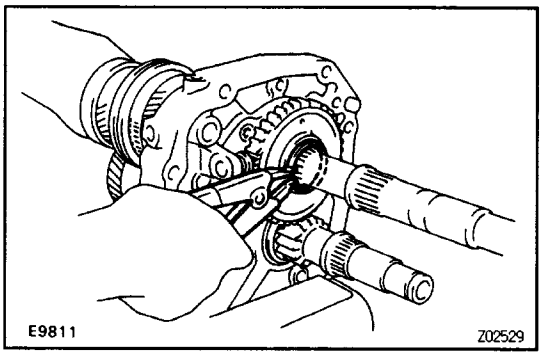


17. REMOVE OUTPUT SHAFT REAR BEARING AND FIFTH GEAR

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

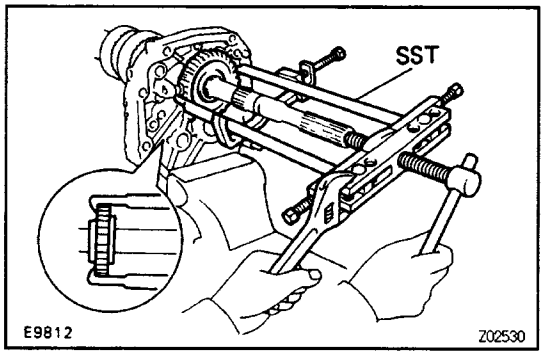


(b) Using SST, remove the rear bearing and 5th gear.
SST 09312–20011 (09313–00030, 09313–00040, 09313–00050)

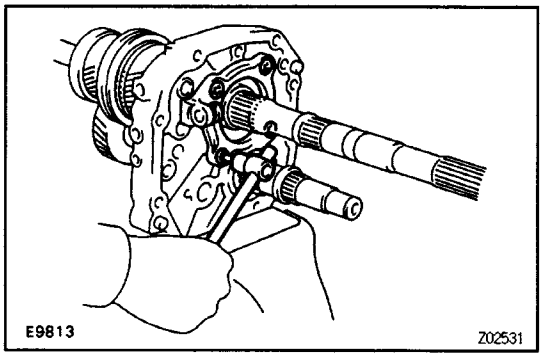


18. REMOVE REVERSE GEAR

(a) Using a snap ring expander, remove the snap ring.

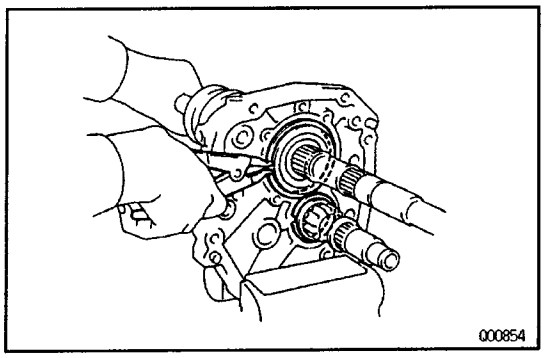


(b) Using SST, remove the reverse gear.
SST 09950–20017

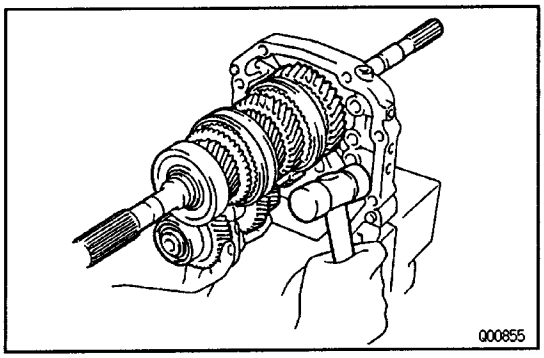


19. REMOVE CENTER BEARING RETAINER

(a) Using a torx socket wrench, unscrew the torx screws and remove the retainer.
Torx wrench T40 09042–00020



(b) Using a snap ring expander, remove the snap rings.



20. REMOVE OUTPUT SHAFT AND COUNTER GEAR AS A UNIT FROM INTERMEDIATE PLATE

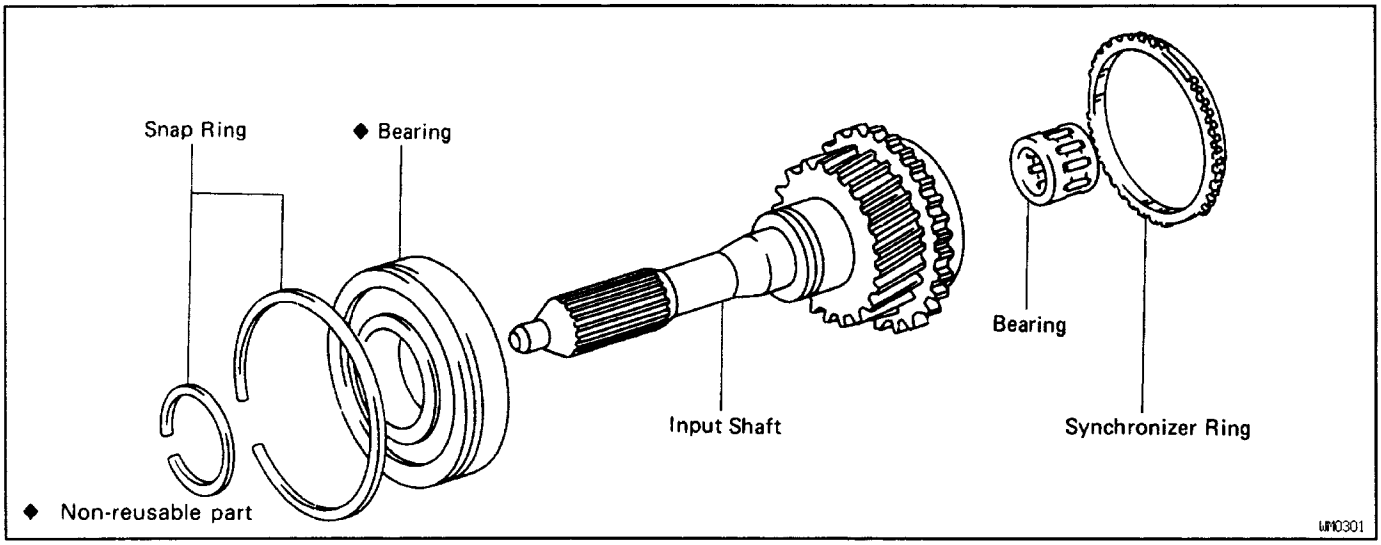
(a) Remove the output shaft, input shaft and counter gear as a unit from the intermediate plate by pulling on the counter gear and tapping on the intermediated plate with a plastic hammer.

(b) Remove the input shaft from the output shaft.

INPUT SHAFT

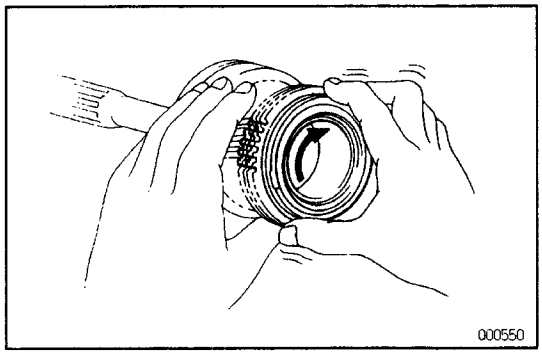
MT00F–02

COMPONENTS



MT00G–02

INPUT SHAFT INSPECTION



INSPECT SYNCHRONIZER RING

(a) Check for wear or damage.

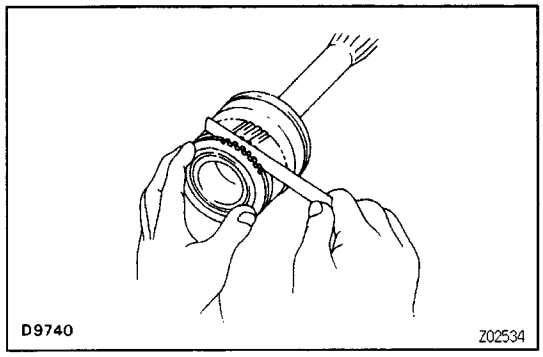
(b) Check the braking effect of the synchronizer ring.

Turn the synchronizer ring in one direction while pushing it to the gear cone and check that the ring is locked.

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

NOTICE:

- **Wash off completely the fine lapping compound after rubbing.**
- **Check again the braking effect of the synchronizer ring.**



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

Minimum clearance:

0.5 mm (0.020 in:)

HINT:

- When replacing either a synchronizer ring or gear, apply a small amount of fine 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.

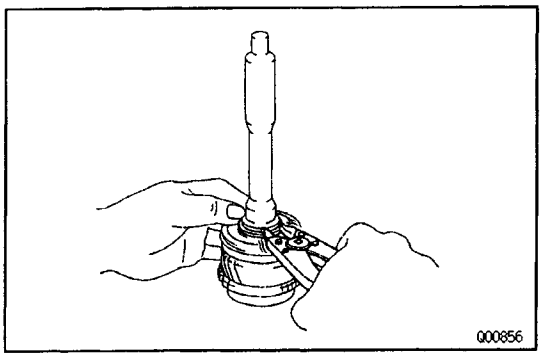
NOTICE: Wash off completely the fine lapping compound after rubbing.

MT00H–01

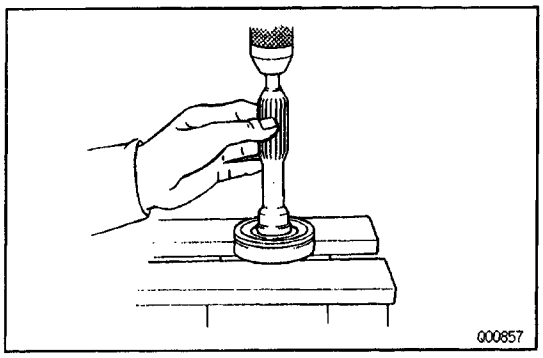
BEARING REPLACEMENT

IF NECESSARY, REPLACE INPUT SHAFT BEARING

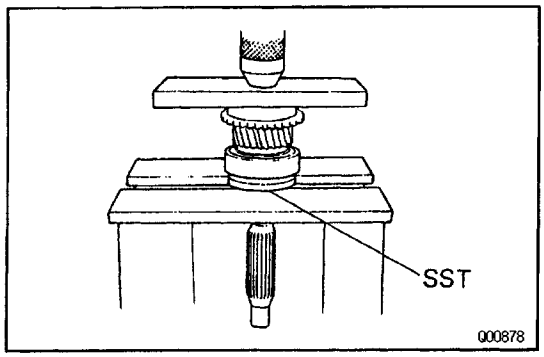
(a) Using a snap ring expander, remove the snap ring.

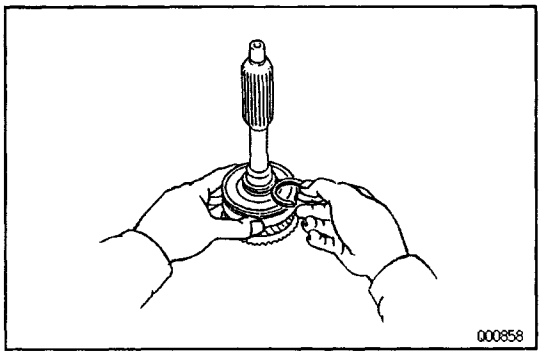


(b) Using a press, remove the bearing.



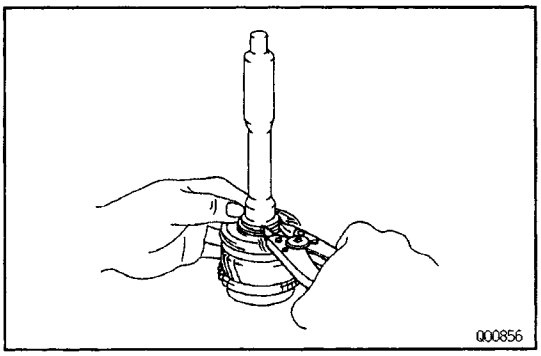
(c) Using SST and a press, install a new bearing.
SST 09506–35010





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

Mark	Thickness m m (in.)
1	2.05 – 2.10 (0.0807 – 0.0827)
2	2.10 – 2.15 (0.0827 – 0.0846)
3	2.15 – 2.20 (0.0846 – 0.0866)
4	2.20 – 2.25 (0.0866 – 0.0886)
5	2.25 – 2.30 (0.0886 – 0.0906)
11	2.30 – 2.35 (0.0906 – 0.0925)
12	2.35 – 2.40 (0.0925 – 0.0945)

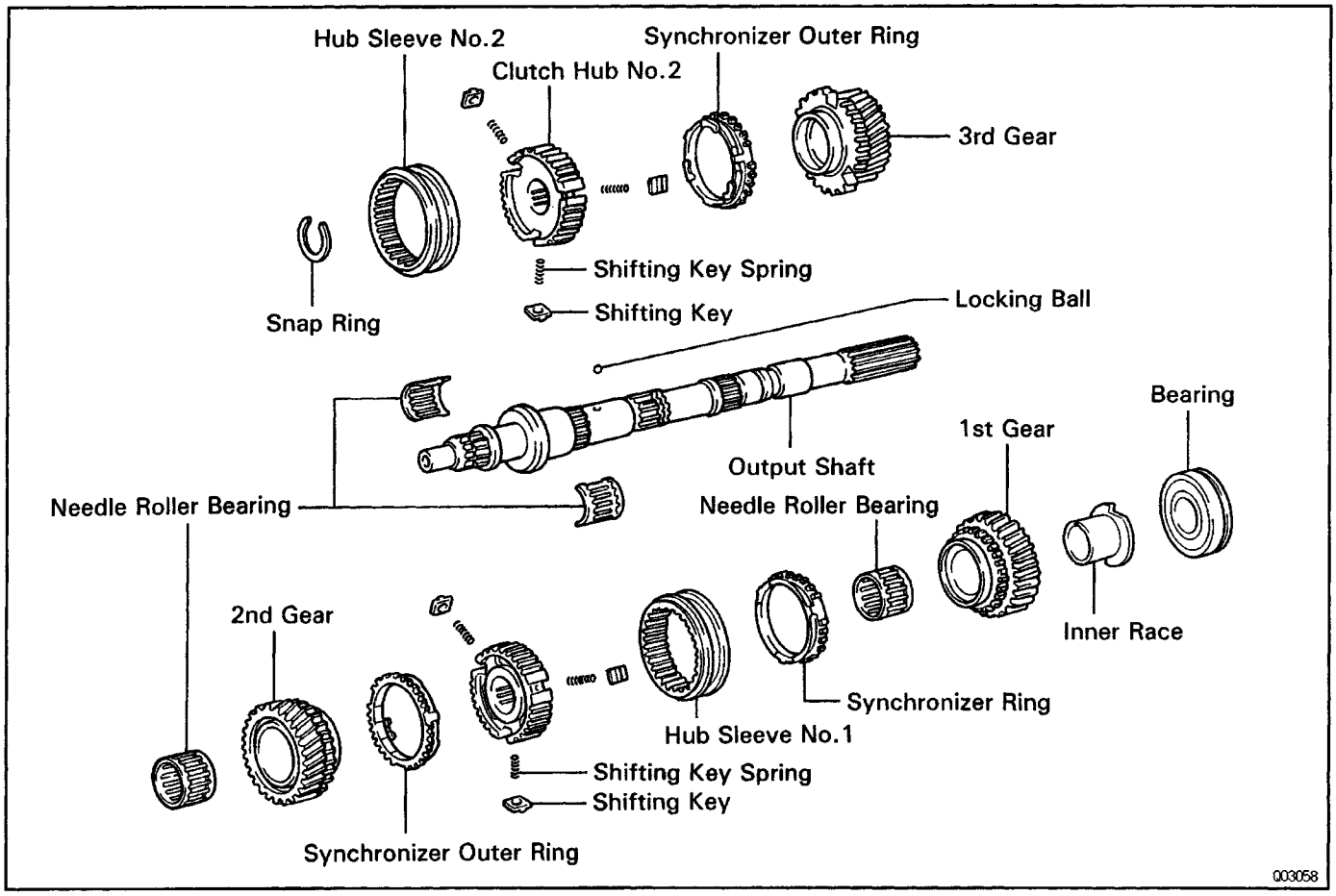


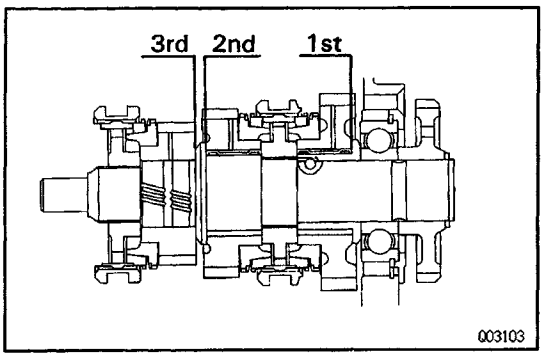
(e) Using a snap ring expander, install the snap ring.

OUTPUT SHAFT

MT00J–02

COMPONENTS





MT00K–02

OUTPUT SHAFT DISASSEMBLY

1. INSPECT EACH GEAR THRUST CLEARANCE

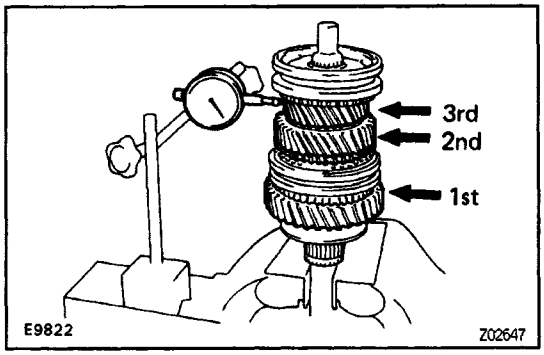
Using a feeler gauge, measure the thrust clearance of each gear.

Standard clearance:

0.10–0.25 mm (0.0039–0.0098 in.)

Maximum clearance:

0.30 mm (0.0118 in.)



2. INSPECT EACH GEAR OIL CLEARANCE

Using a dial indicator, measure the oil clearance of each gear.

Standard clearance:

1 st and 2nd gear

0.009–0.060 m m (0.0004–0.0024 in.)

3rd gear

0.015–0.066 mm (0.0006–0.0026 in.)

Maximum clearance:

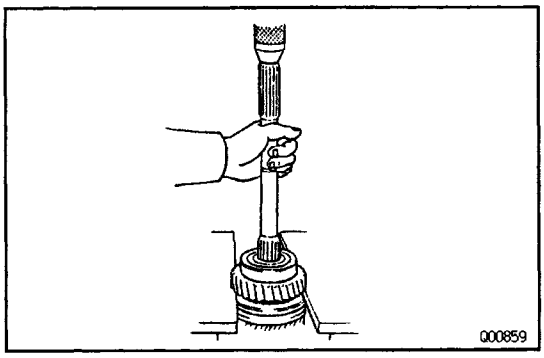
1st and 2nd gear

0.15 mm (0.0059 in.)

3rd gear

0.20 mm (0.0079 in.)

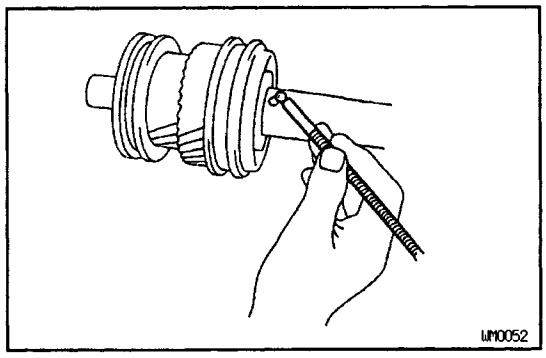
If the clearance exceeds the maximum, replace the gear, shaft or needle roller bearing.



3. REMOVE OUTPUT SHAFT CENTER BEARING AND FIRST GEAR ASSEMBLY

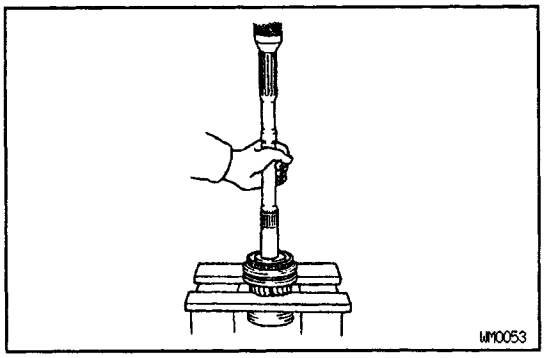
(a) Shift the No. 1 hub sleeve onto the 2nd gear.

(b) Using a press, remove the center bearing, 1st gear, needle roller bearing, inner race and synchronizer ring.



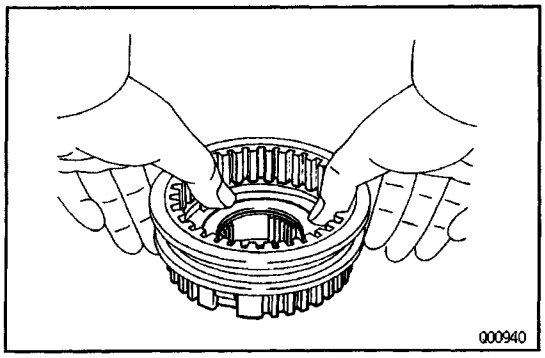
4. REMOVE LOCKING BALL

Using a magnetic finger, remove the locking ball.



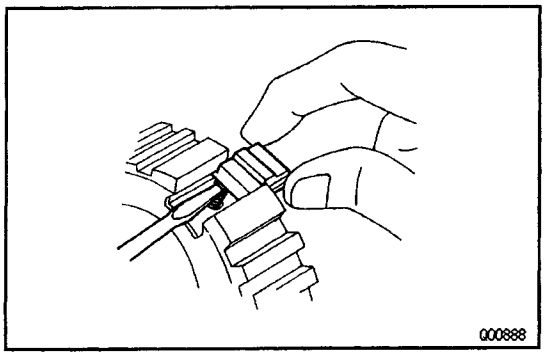
5. REMOVE NO.1 HUB SLEEVE ASSEMBLY, SECOND GEAR AND NEEDLE ROLLER BEARING

Using a press, remove the parts from the shaft as an assembly.

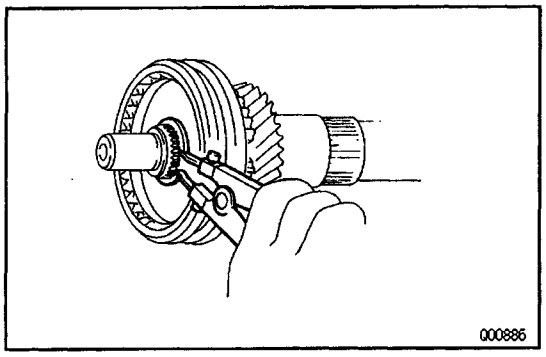


6. REMOVE NO.1 HUB SLEEVE, SHIFTING KEYS AND SPRINGS FROM CLUTCH HUB NO.1

(a) Remove the No. 1 clutch hub from the No. 1 hub sleeve.

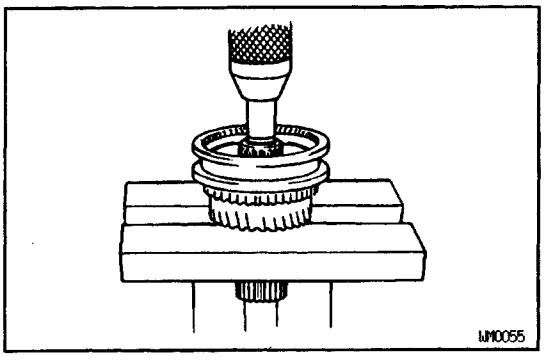


(b) Push the shifting key spring with screwdriver, remove the three shifting keys and key springs.

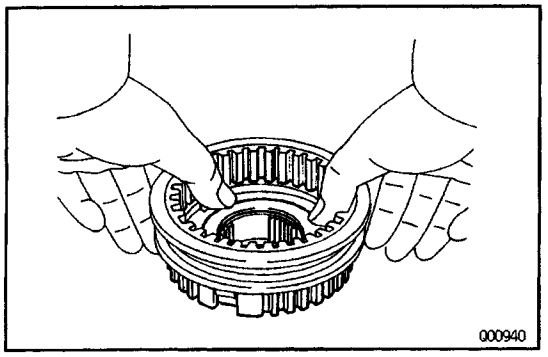


7. REMOVE NO. 2 HUB SLEEVE ASSEMBLY AND THIRD GEAR

(a) Using a snap ring expander, remove the snap ring.

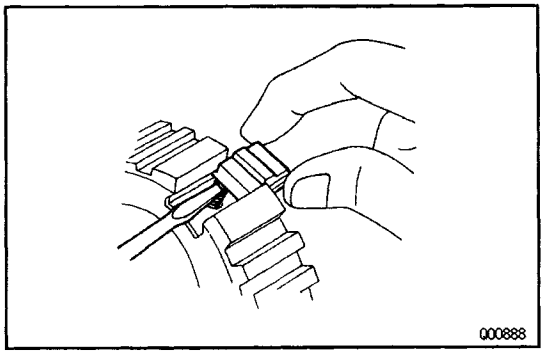


(b) Using a press, remove the No.2 hub sleeve, synchro–nizer ring and 3rd gear.

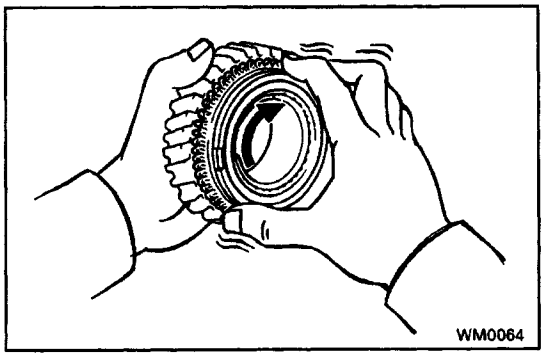


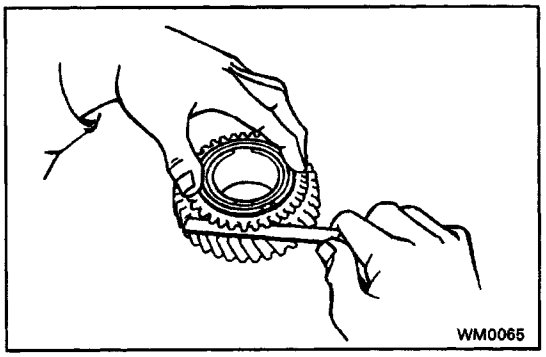
8. REMOVE NO.2 HUB SLEEVE, SHIFTING KEYS AND SPRINGS FROM NO.2 CLUTCH HUB

(a) Remove the No. 2 hub sleeve from the No. 2 hub sleeve.



(b) Push the shifting key spring with screwdriver, remove the three shifting keys and key springs.





OUTPUT SHAFT COMPONENT PARTS INSPECTION

MT032–01

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 pushing it to the gear cone and check that the ring is locked. If the braking effect is insufficient, lightly rub the synchronizer ring and gear cone by applying a small amount of fine lapping compound.

NOTICE:

- Wash off completely the fine lapping compound after rubbing.
- Check again the braking effect of the synchronizer ring.

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

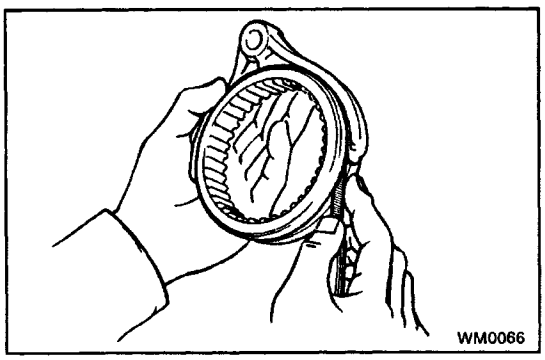
Minimum clearance:

0.5 mm (0.020 in.)

HINT:

- **When replacing either a synchronizer ring or apply a small amount of fine lapping compound between the synchronizer ring and gear cone. Lightly rub the synchronizer ring and gear together.**
- **When replacing both the synchronizer ring and gear, there is no need to apply any compound or to rub them together.**

NOTICE: Wash off completely the fine lapping compound after rubbing.



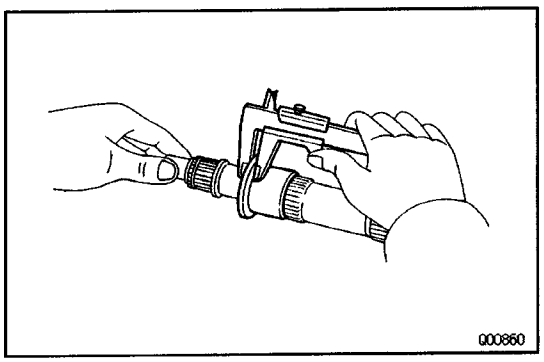
2. INSPECT CLEARANCE OF SHIFT FORKS AND HUB SLEEVES

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

Minimum clearance:

1.0 mm (0.039 in.)

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



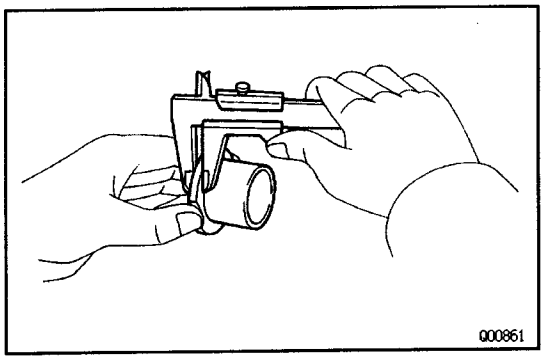
3. INSPECT OUTPUT SHAFT AND INNER RACE

(a) Using vernier calipers, measure the output shaft flange thickness.

Minimum thickness:

5.60 mm (0.2204 in.)

If the thickness exceeds the minimum, replace the output shaft.

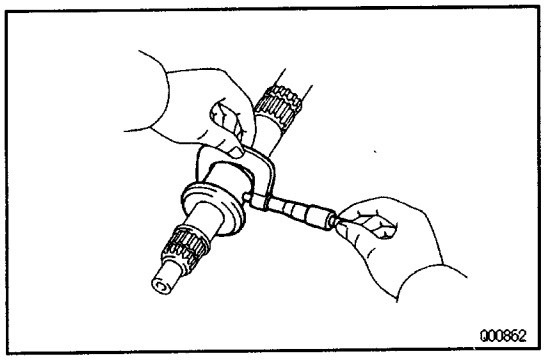


(b) Using vernier calipers, measure the inner race flange thickness.

Minimum thickness:

4.78 mm (0.1882 in.)

If the thickness exceeds the minimum, replace the inner race.



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

Minimum diameter:

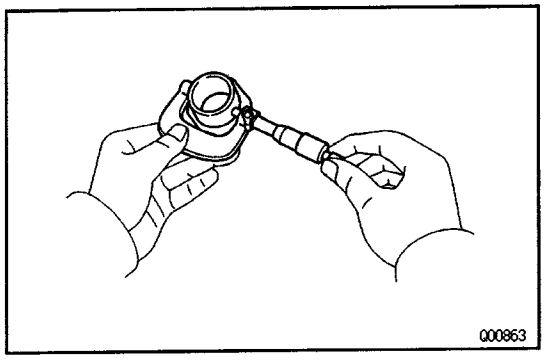
2nd gear

42.975 mm (1.6919 in.)

3rd gear

31.969 mm (1.2586 in.)

If the outer diameter exceeds the minimum, replace the output shaft.

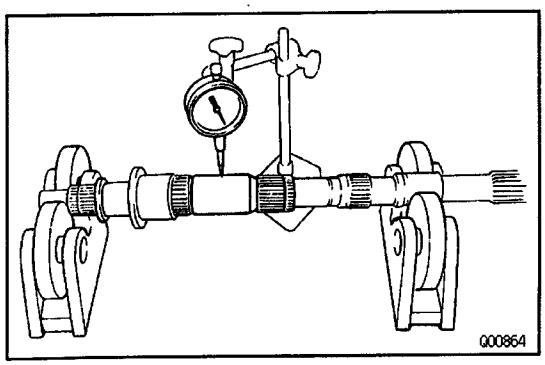


(d) Using a micrometer, measure the outer diameter of the inner race.

Minimum diameter:

42.975 mm (1.6919 in.)

If the outer diameter exceeds the minimum, replace the inner race.



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

Maximum runout:

0.06 mm (0.0024 in.)

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

MT00M–02

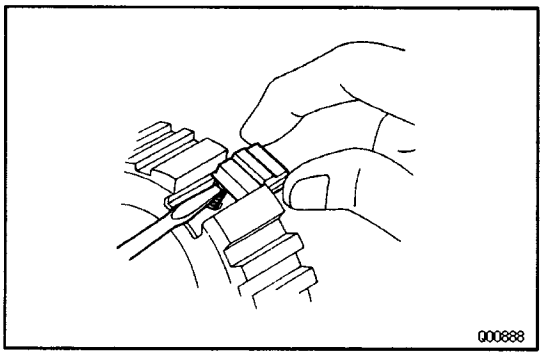
OUTPUT SHAFT ASSEMBLY

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

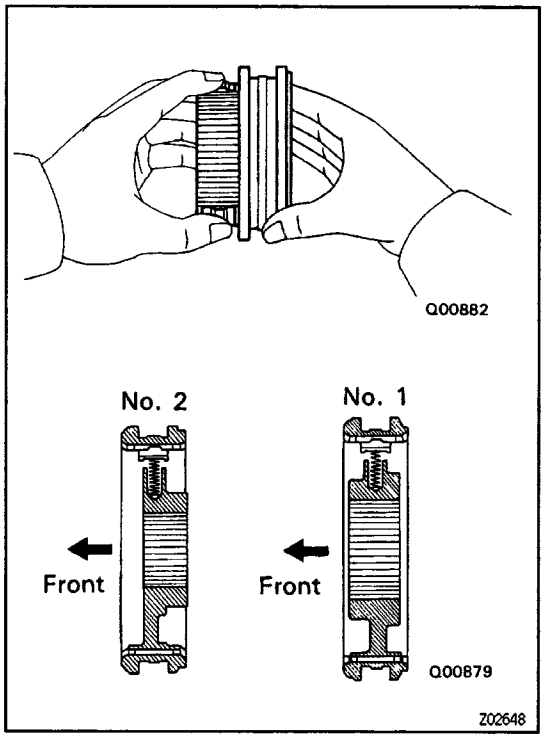
1. INSTALL NO.1 AND NO.2 CLUTCH HUB INTO HUB SLEEVE

(a) Install the three shifting key springs to the clutch hub.

(b) While pushing the shifting key spring with screw–driver, install the three shifting keys.



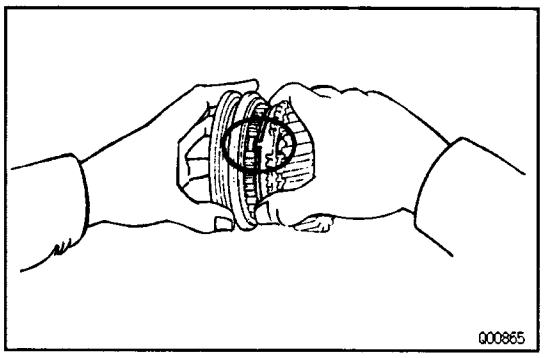
(c) While pushing the three shifting keys, install the clutch hub to the hub sleeve.



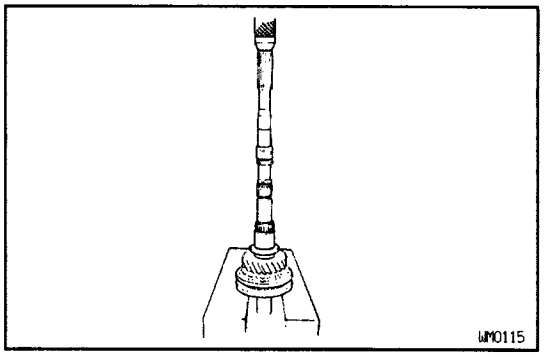
2. INSTALL THIRD GEAR AND NO.2 CLUTCH HUB ON OUTPUT SHAFT

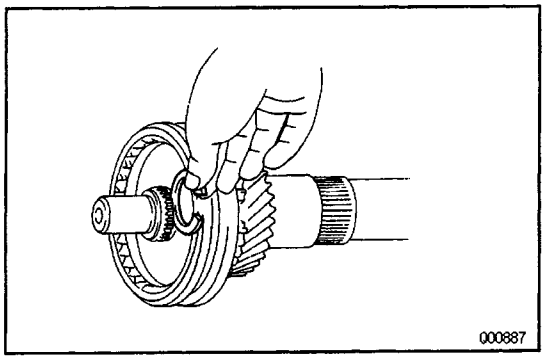
(a) Apply gear oil to the shaft.

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



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

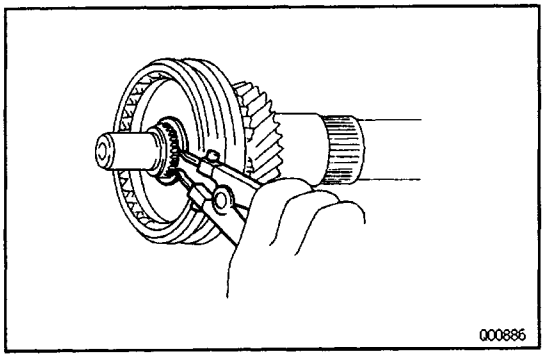




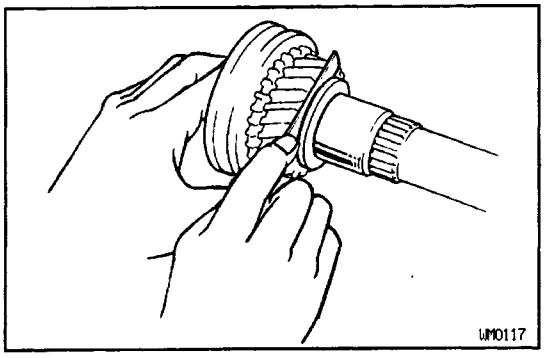
3. INSTALL SNAP RING

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

Mark	Thickness mm (in.)
C–1	1.75–1.80 (0.0689–0.0709)
D	1.80–1.85 (0.0709–0.0728)
11	1.86–1.91 (0.0732–0.0752)
12	1.92–1.97 (0.0756–0.0776)
13	1.98–2.03 (0.0780–0.0799)
14	2.04–2.09 (0.0803–0.0823)
15	2.10–2.15 (0.0827–0.0846)



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

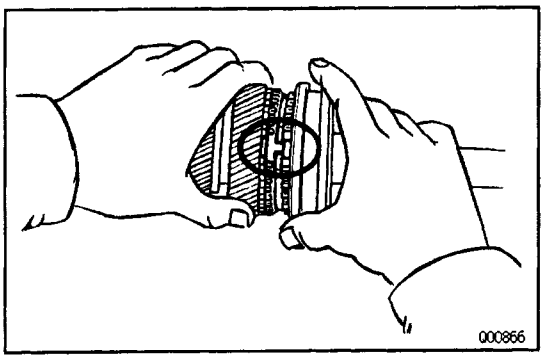


4. INSPECT THIRD GEAR THRUST CLEARANCE

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

Standard clearance:

0.10–0.25 m m (0.0039–0.0098 in.)

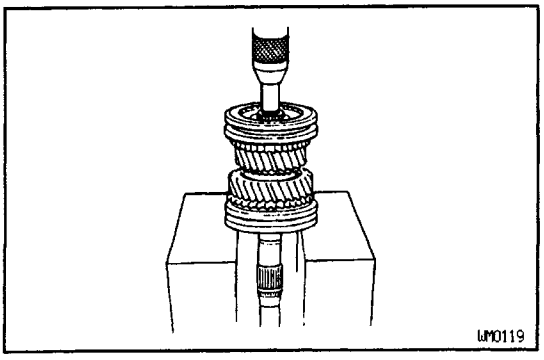


5. INSTALL SECOND GEAR AND NO.1 CLUTCH HUB

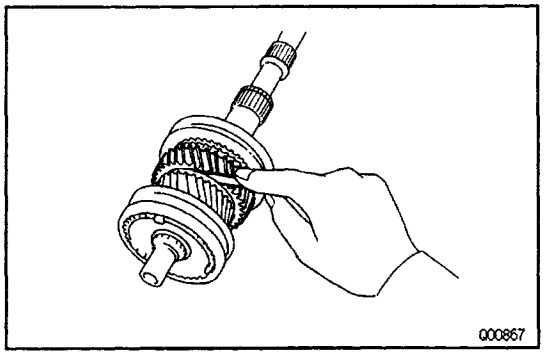
(a) Apply gear oil to the shaft and needle roller bearing.

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

(c) Install the needle roller bearing in the 2nd gear.



(d) Using a press, install the 2nd gear and No.1 clutch hub.

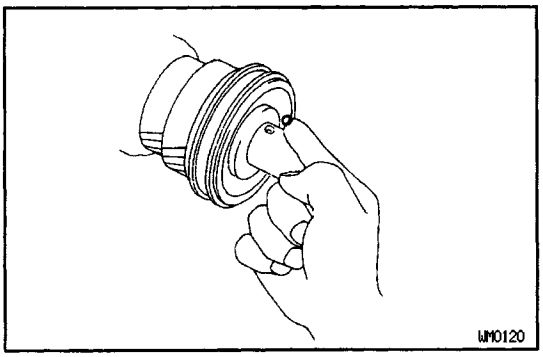


6. INSPECT SECOND GEAR THRUST CLEARANCE

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

Standard clearance:

0.10–0.25 mm (0.0039–0.0098 in.)

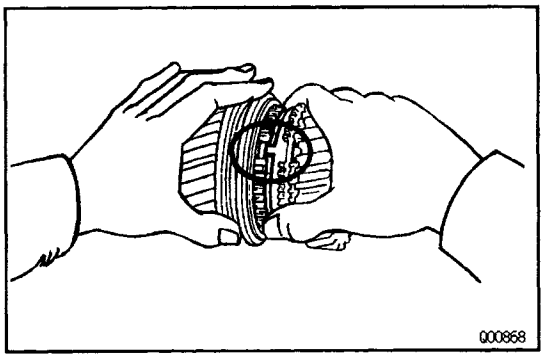


7. INSTALL LOCKING BALL AND FIRST GEAR ASSEMBLY

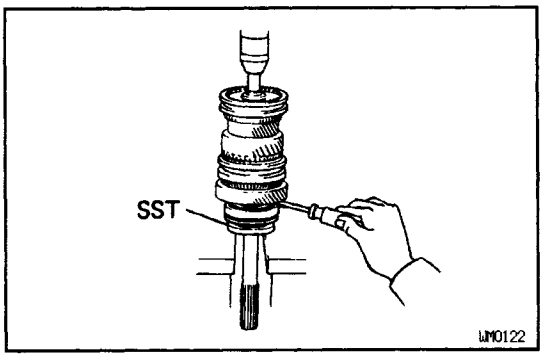
(a) Install the locking ball in the shaft.

(b) Apply gear oil to the bearing.

(c) Assembly the 1 st gear, synchronizer ring, needle roller bearing and bearing inner race.



(d) Install the assembly on the output shaft with the synchronizer ring slots aligned with the shifting keys and turn the inner race to align it with the locking ball.

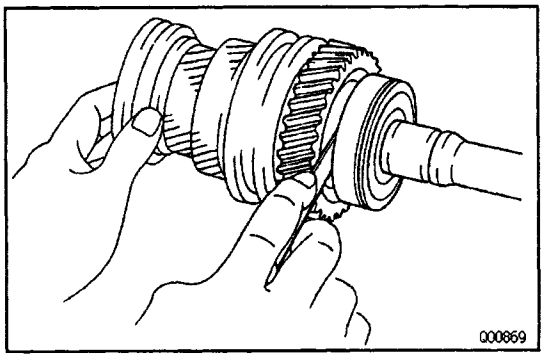


8. INSTALL OUTPUT SHAFT CENTER BEARING

Using SST and a press, install the bearing on the output shaft with the outer race snap ring groove toward the rear.

HINT: Hold the 1 st gear inner race to prevent it frorn falling.

SST 09506 –35010



9. INSPECT FIRST GEAR THRUST CLEARANCE

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

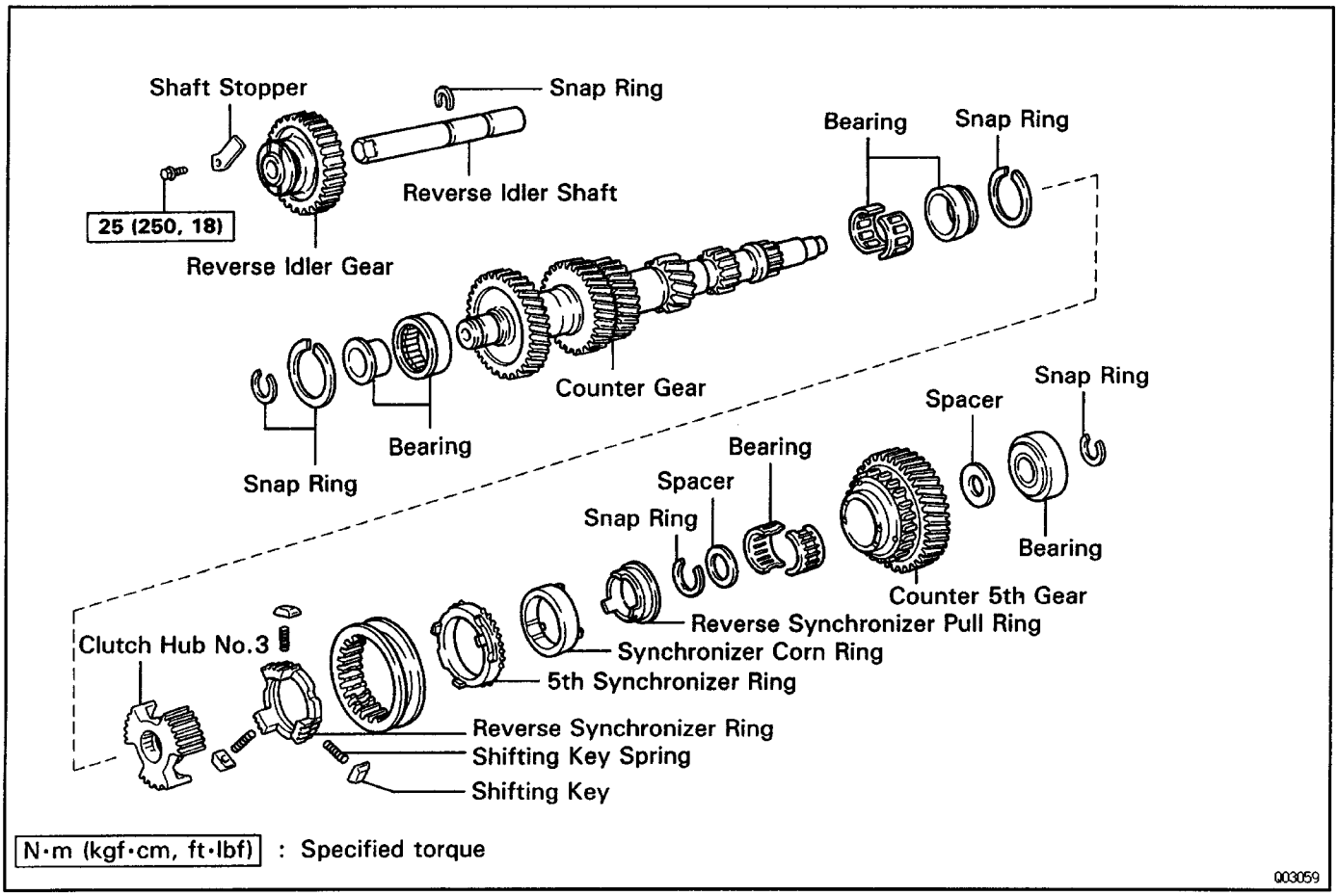
Standard clearance:

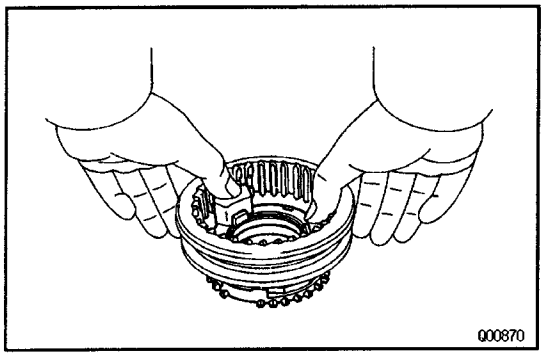
0.10–0.25 mm (0.0039–0.0098 in.)

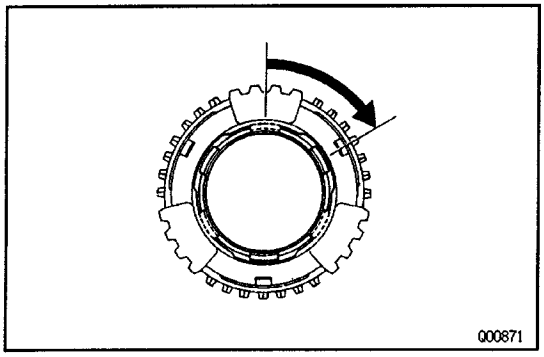
COUNTER GEAR AND REVERSE IDLER GEAR

MT00N–02

COMPONENTS







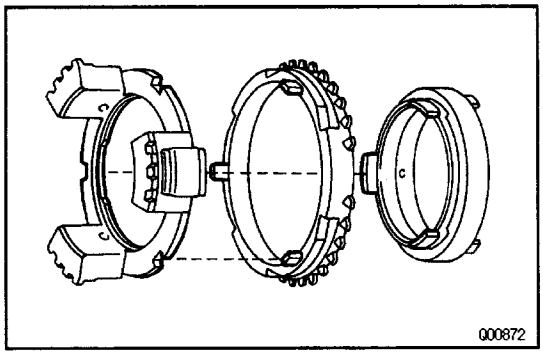
MT00P–02

COUNTER GEAR COMPONENT PARTS DISASSEMBLY

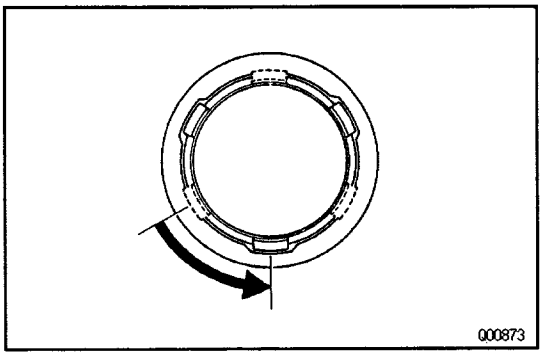
1. REMOVE NO.3 HUB SLEEVE, SHIFTING KEYS AND SPRINGS FROM SYNCHRONIZER RING

(a) Remove the synchronizer ring assembly from No.3 hub sleeve.

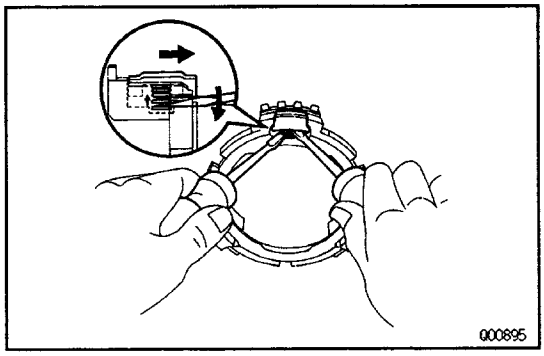
(b) Turn the reverse synchronizer pull ring.



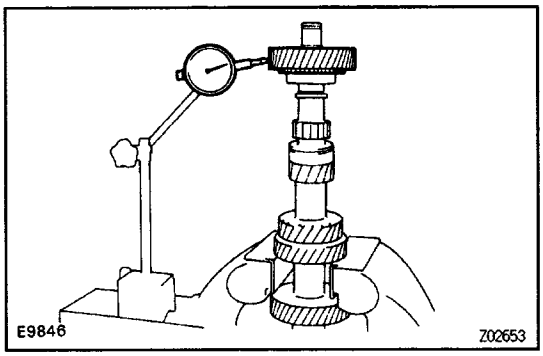
(c) Remove the reverse synchronizer ring and 5th syn–chronizer ring.



(d) Turn the reverse synchronizer pull ring, separate pull ring and corn ring.



(e) While pushing the shifting key spring to out slide with two screwdrivers, remove the shifting keys and key springs, from remove synchronizer ring.



COUNTER GEAR AND REVERSE IDLER GEAR COMPONENT PARTS INSPECTION MT00Q–02

1. INSPECT COUNTER 5TH GEAR OIL CLEARANCE

(a) Install the spacer, counter 5th gear and needle roller bearing to counter gear.

(b) Using a dial indicator, measure the counter 5th gear oil clearance.

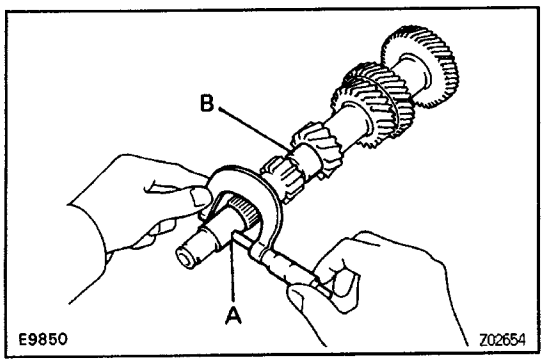
Standard clearance:

0.009–0.06 mm (0.0004–0.0024 in.)

Maximum clearance:

0.15 mm (0.0059 in.)

If the clearance exceeds the maximum, replace the counter gear or needle roller bearing or counter 5th gear.



2. INSPECT COUNTER GEAR

Using a micrometer, measure the outer diameter of the counter shaft journal.

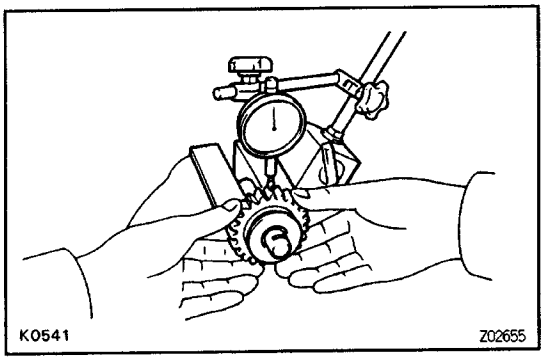
Minimum diameter:

Part A

26.975 mm (1.0620 in.)

Part B

29.95 mm (1.1791 in.)



3. INSPECT REVERSE IDLER GEAR OIL CLEARANCE

Using a dial indicator, measure the reverse idler gear oil clearance.

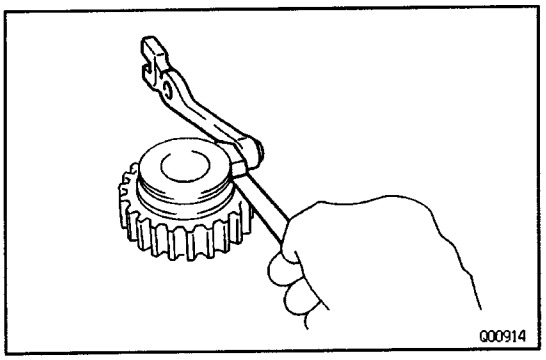
Standard clearance:

0.041–0.074 mm (0.0016–0.0029 in.)

Maximum clearance:

0.194 mm (0.0076 in.)

If the clearance exceeds the maximum, replace the gear or shaft.



4. INSPECT CLEARANCE OF REVERSE IDLER GEAR AND SHIFT ARM SHOE

Using a feeler gauge, measure the clearance between the reverse idler gear and shift arm shoe.

Standard clearance:

0.20–0.41 mm (0.008–0.0161 in.)

Maximum clearance:

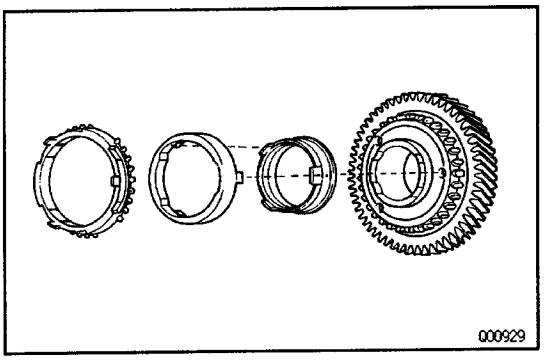
0.9 mm (0.0354 in.)

If the clearance exceeds the maximum, replace the shift arm shoe or reverse idler gear.

5. INSPECT FIFTH SYNCHRONIZER RING

(a) Check for wear or damage.

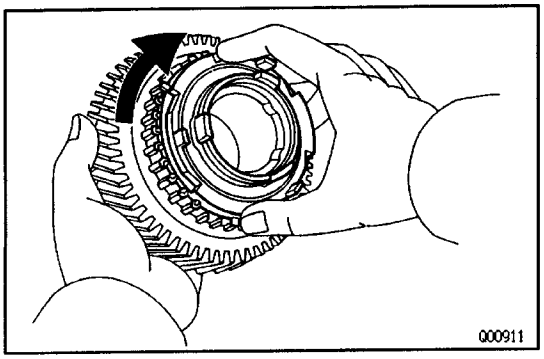
(b) Install the synchronizer pull ring, corn ring and outer ring to 5th gear.

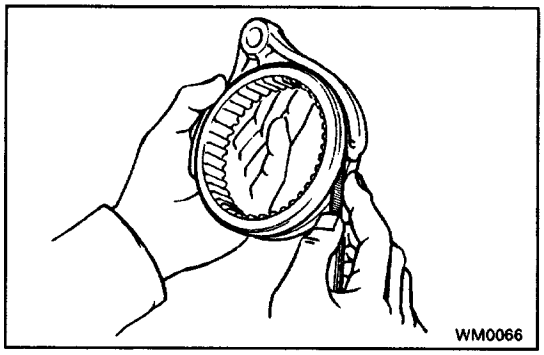


(c) Check the braking effect of the synchronizer ring.

Turn the synchronizer ring in one direction while pushing it to the gear cone and check that the ring i locked.

If the backing effect is insufficient, replace the syn–chronizer rings.





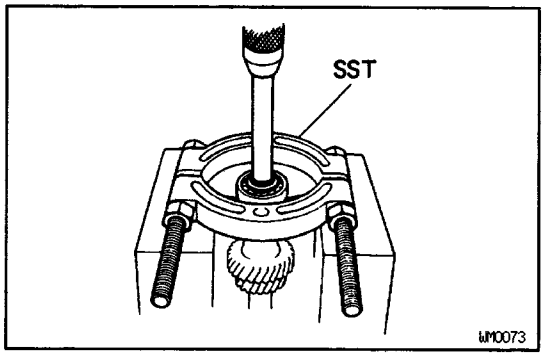
6. INSPECT CLEARANCE OF SHIFT FORKS AND HUB SLEEVES

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.



MT00R–02

BEARING REPLACEMENT

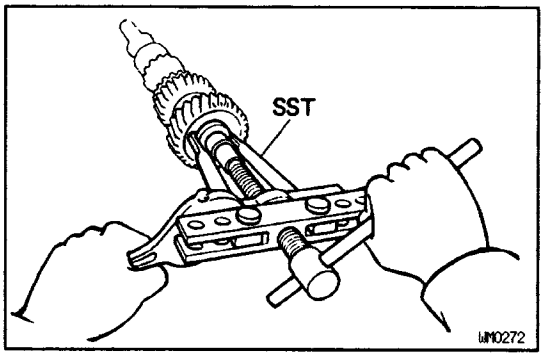
1. IF NECESSARY, REPLACE COUNTER GEAR FRONT BEARING AND SIDE RACE

(a) Using snap ring pliers, remove the snap ring.

(b) Using SST, press out the bearing.

SST 09950–00020

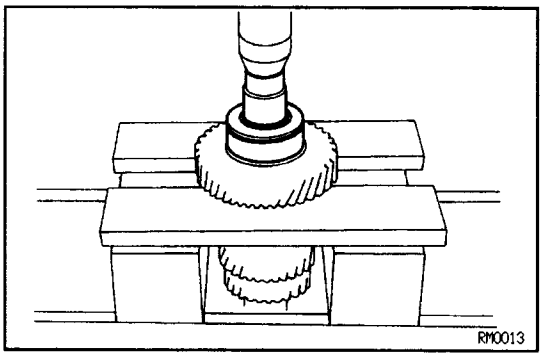
(c) Check the side race for wear or damage.



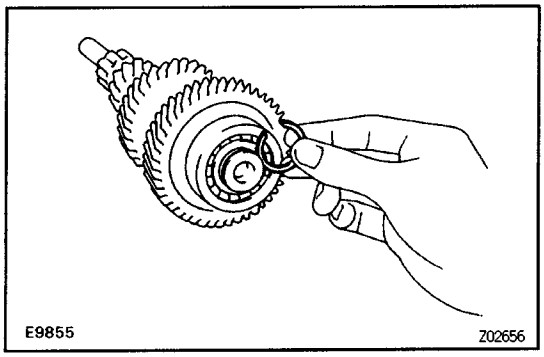
(d) If necessary, remove the side race.

Using SST and socket wrench, remove the side race.

SST 09950–20017

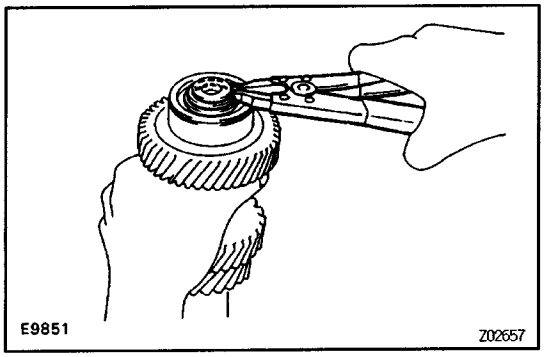


(e) Using a socket wrench, press in a new bearing, side race and inner race.

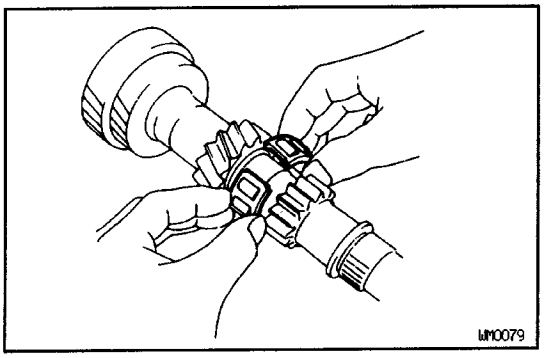


(f) Select a snap ring that will allow minimum axial play.

Mark	Thickness mm (in.)
A	2.05 – 2.10 (0.0807 – 0.0827)
B	2.10 – 2.15 (0.0827 – 0.0846)
C	2.15 – 2.20 (0.0846 – 0.0866)
D	2.20 – 2.25 (0.0866 – 0.0886)
E	2.25 – 2.30 (0.0886 – 0.0906)
F	2.30 – 2.35 (0.0906 – 0.0925)



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

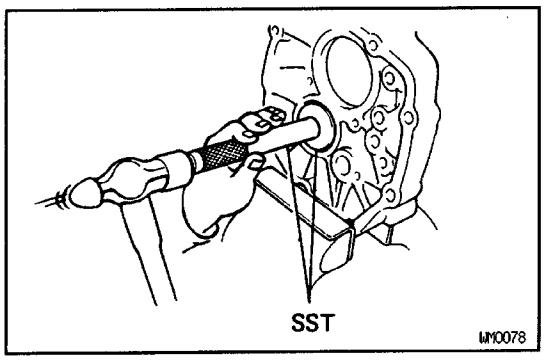


2. IF NECESSARY, REPLACE COUNTER GEAR CENTER BEARING

(a) Remove the bearing from the counter gear.

(b) Install a new bearing on the counter gear.

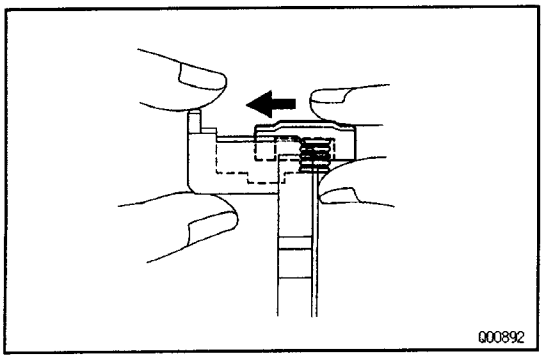
HINT: Engage the roller cages.



(c) Using SST, tap out the bearing outer race.

SST 09608–35014 (09608–06020, 09608–06090)

HINT: The outer race will be installed later, as the transmission is assembled.

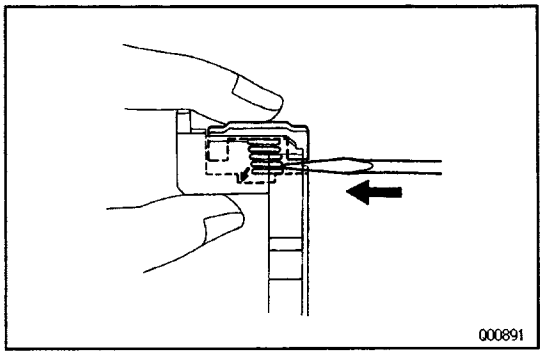


MT008–02

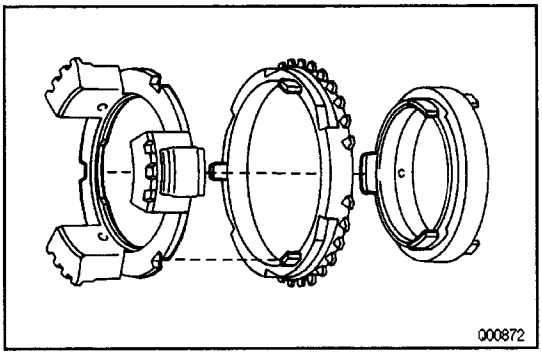
COUNTER GEAR COMPONENT PARTS ASSEMBLY

1. INSTALL SYNCHRONIZER RING ASSEMBLY TO NO.3 HUB SLEEVE

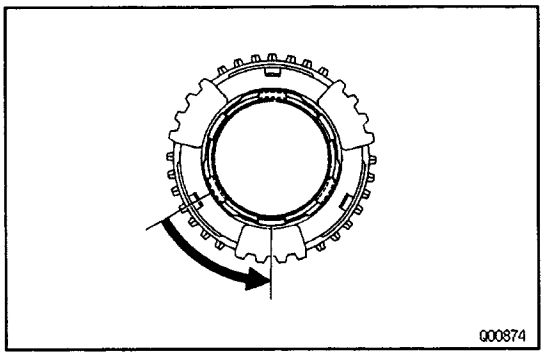
(a) Push the synchronizer spring, install the shifting key and key spring to reverse synchronizer ring.



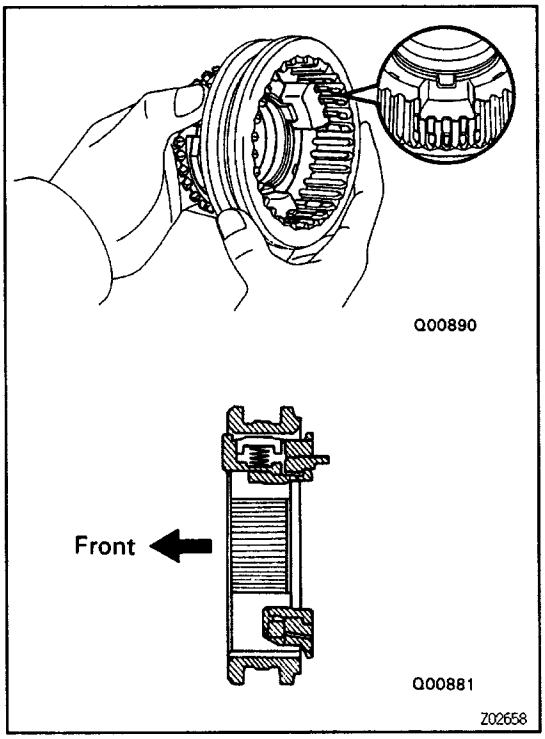
(b) Using a screwdriver, push the three key springs into the synchronizer ring spring gear.



(c) Install the synchronizer corn ring to reverse synchro–nizer pull ring.
(d) Install the 5th synchronizer ring.
(e) Install the reverse synchronizer ring.



(f) Turn the reverse synchronizer pull ring.

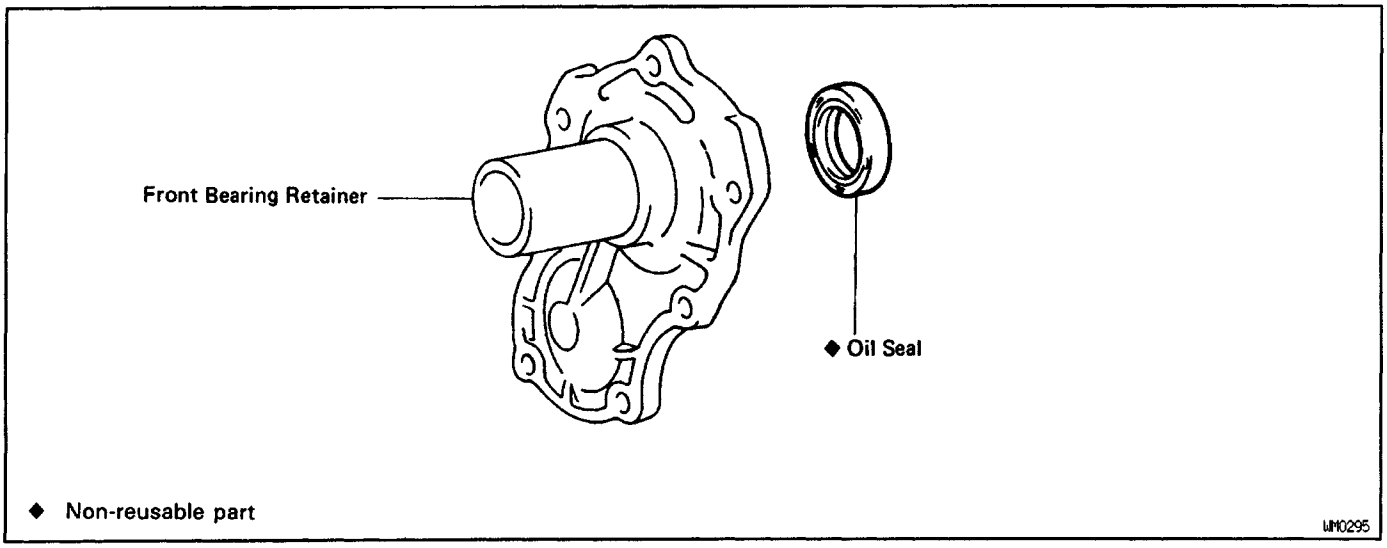


(g) While pushing three shifting keys, install the synch–ronizer ring assembly to No.3 hub sleeve.

FRONT BEARING RETAINER

MT00T–01

COMPONENT

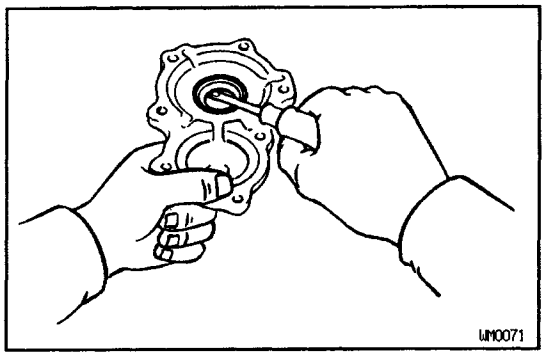


MT00U–02

OIL SEAL REPLACEMENT

IF NECESSARY, REPLACE FRONT BEARING RETAINER OIL SEAL

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

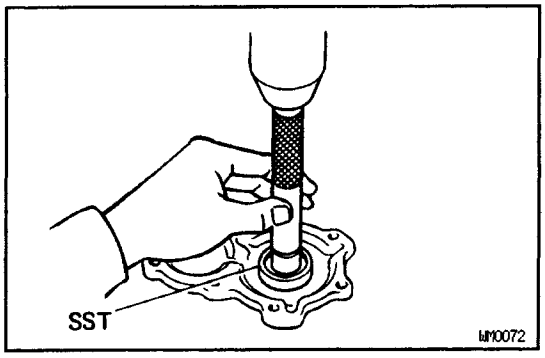


(b) Using SST and a press, install a new oil seal.

SST 09608–20012 (09608–03020, 09608–00080)

Drive in depth:

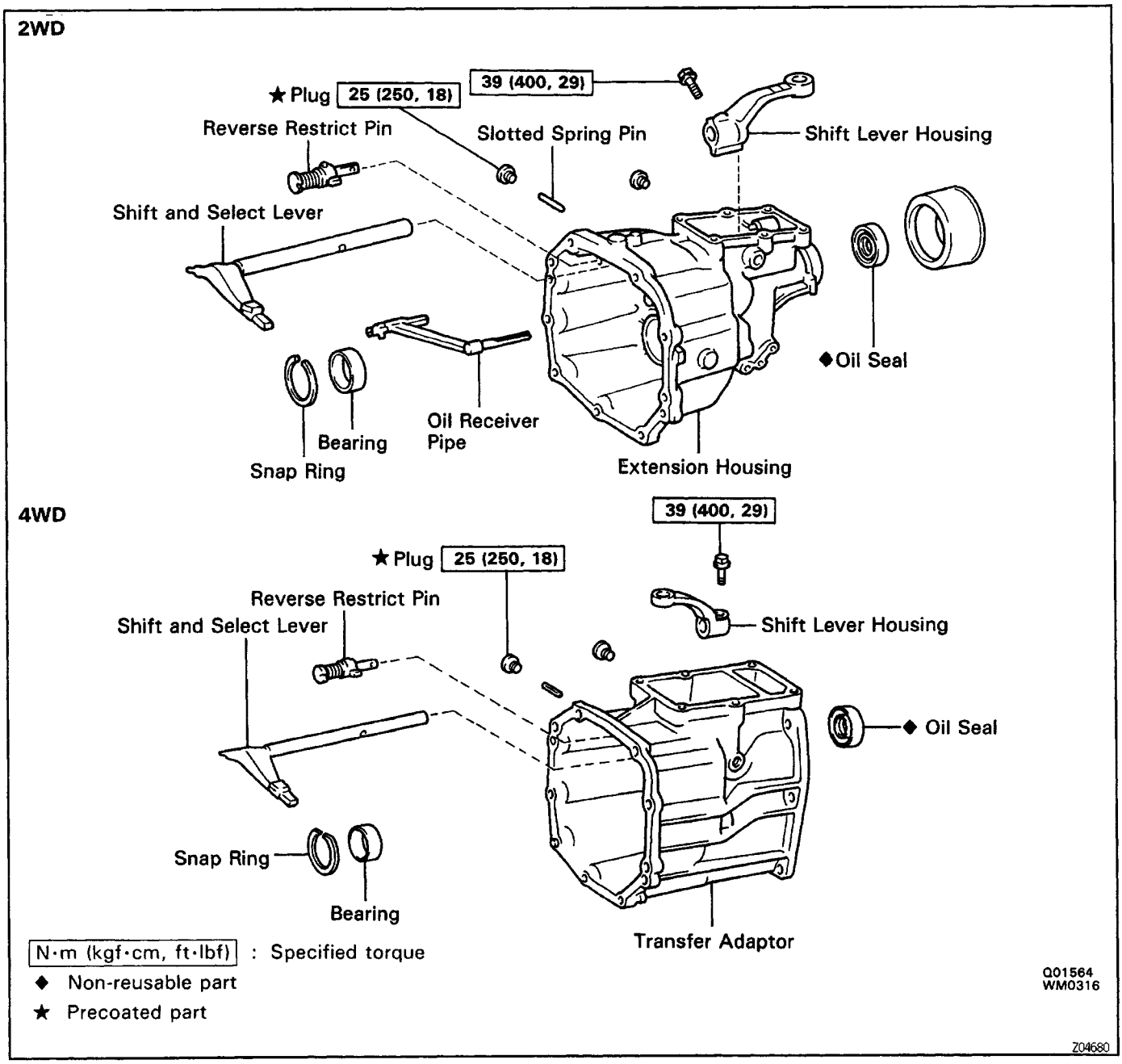
11.4–12.0 mm (0.449–0.472 in.) from retainer.



EXTENSION HOUSING AND TRANSFER ADAPTOR

MT00V–02

COMPONENT

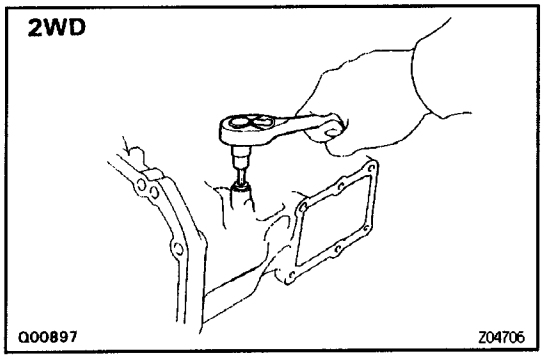


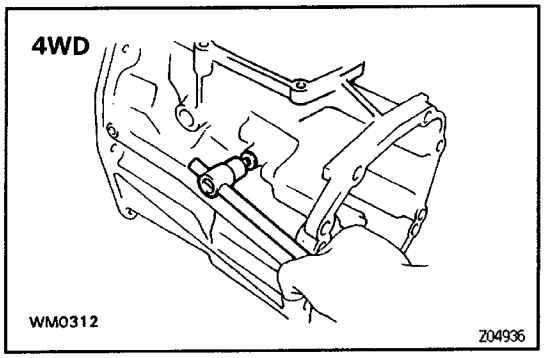
MT011-01

REVERSE RESTRICT PIN REPLACEMENT

1. REMOVE REVERSE RESTRICT PIN

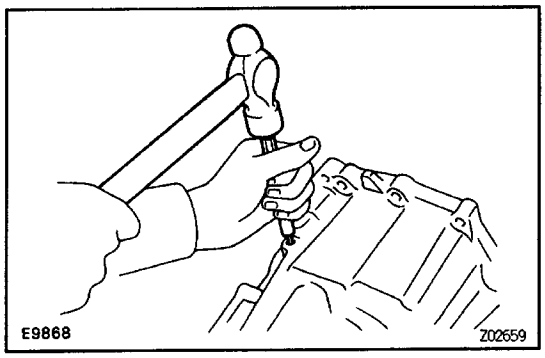
(a) Using a hexagon wrench, remove the screw plug.





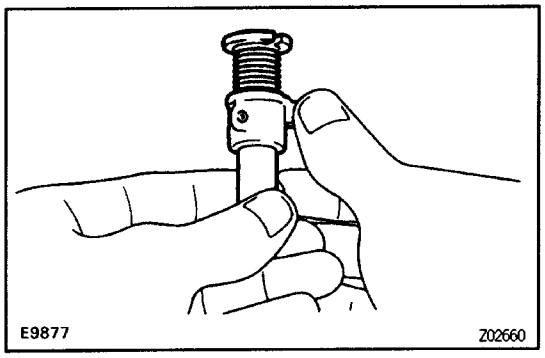
(b) Using a pin punch and hammer, drive out the slotted spring pin.

(c) Pull off the lever housing and slide out the shaft.



2. INSPECT REVERSE RESTRICT PIN

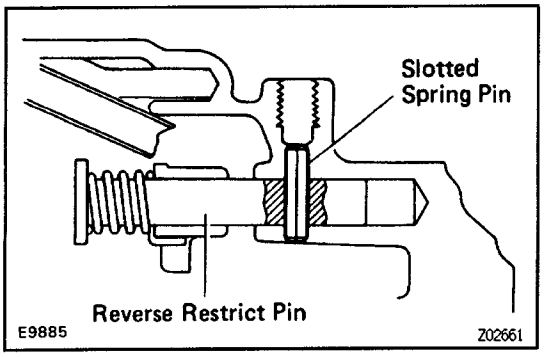
Turn and push the reverse restrict pin by hand while applying direction.

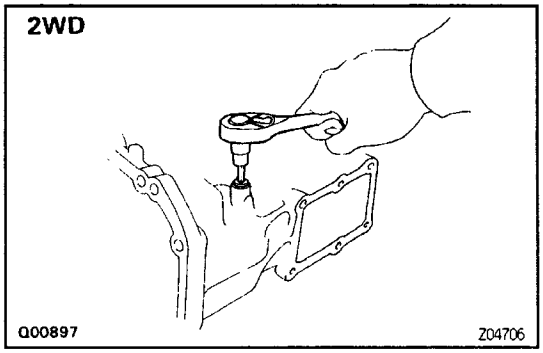


3. INSTALL REVERSE RESTRICT PIN

(a) Install the lever housing.

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





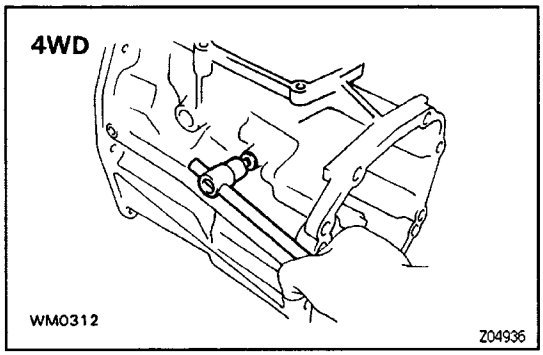
(c) Apply liquid sealer to the plug.

Sealant:

Part No. 08833–00080, THREE BOND 7344, LOC–TITE 242 or equivalent

(d) install and torque the screw plug.

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

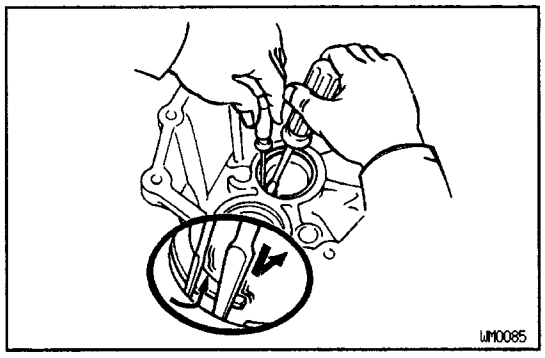


MT00X–02

BEARING REPLACEMENT

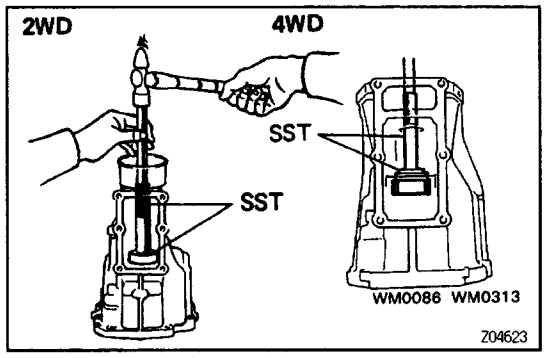
IF NECESSARY, REPLACE REAR BEARING OUT REAR RACE

(a) Using two screwdrivers, remove the snap ring.



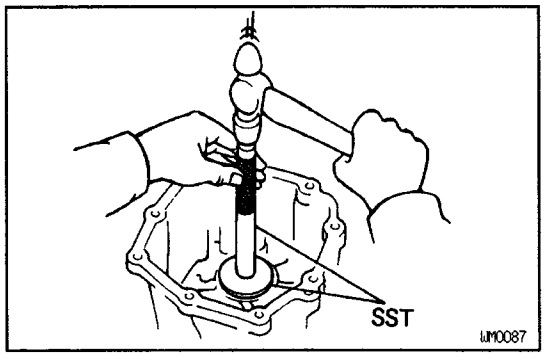
(b) Using SST and a hammer, tap out the outer race.

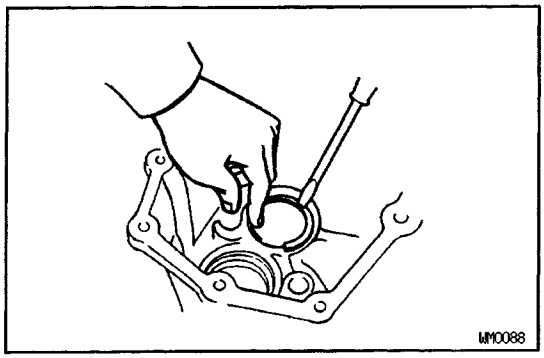
SST 09608–12010 (09608–00020, 09608–00050)



(c) Using SST, install a new outer race.

SST 09608–35014 (09608–06020, 09608–06100)





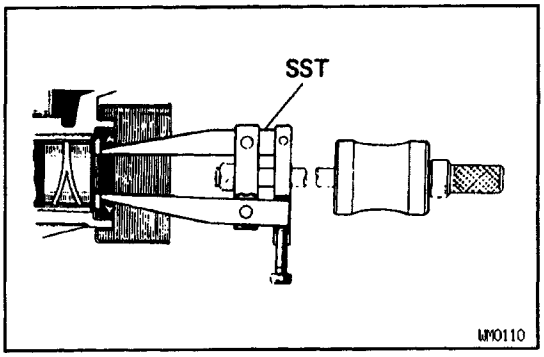
(d) Using a screwdriver, install the snap ring.

MT034–01

OIL SEAL REPLACEMENT

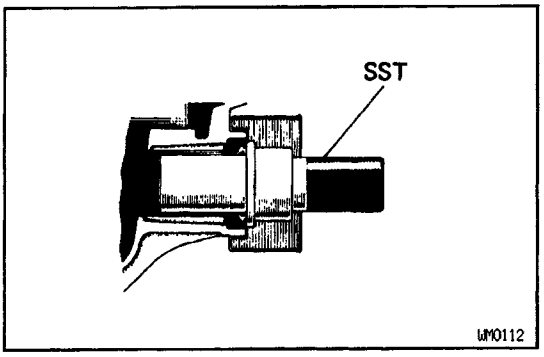
(2WD)

IF NECESSARY, REPLACE EXTENSION HOUSING OIL SEAL



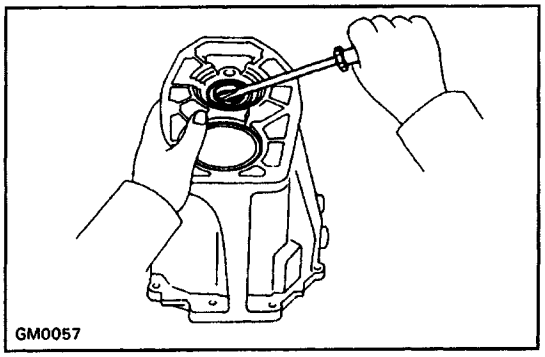
(a) Using SST, remove the oil seal.
SST 09308–00010 or
09308–10010
(w/ output shaft installed)

(b) Using SST, drive in a new oil seal.
SST 09325–20010

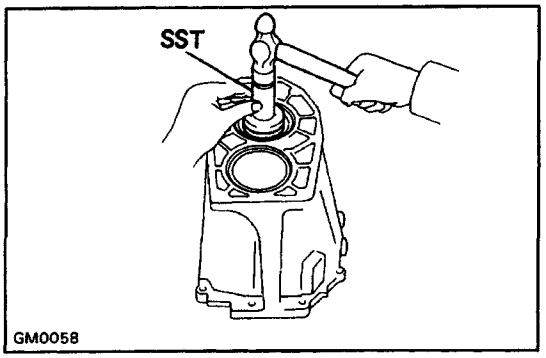


(4WD)

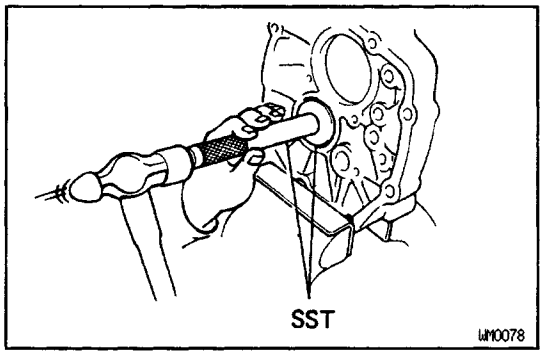
IF NECESSARY, REPLACE TRANSFER ADAPTOR OIL SEAL



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



(b) Using SST and a hammer, drive in a new oil seal.
SST 09325–12010



COMPONENT PARTS INSTALLATION

BASIC SUBASSEMBLY REASSEMBLY

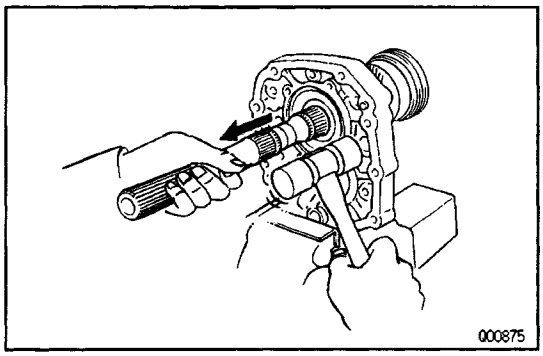
HINT: Coat all of the sliding and rotating surface with gear oil before assembly.

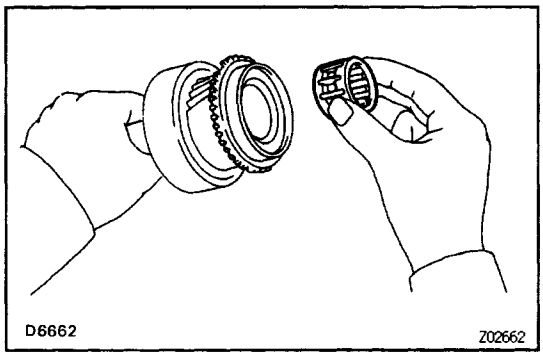
1. INSTALL OUTPUT SHAFT TO INTERMEDIATE PLATE

(a) Before installing the output shaft, use SST to remove the counter gear center bearing outer race.
SST 09608–35014 (09608–06020, 09608–06090)

HINT: Install the outer race after installing the counter gear.

(b) Install the output shaft into the intermediate plate by pulling on the output shaft and tapping on the inter–mediate plate.

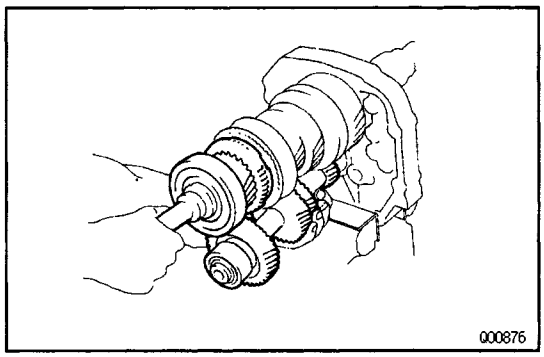




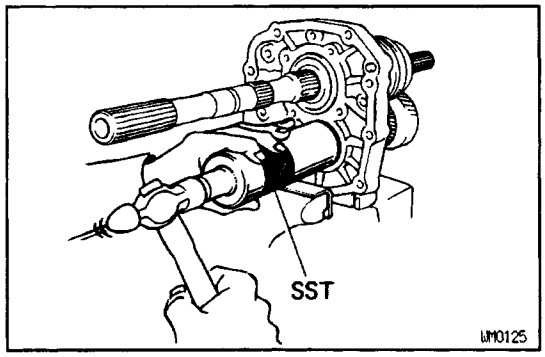
2. INSTALL INPUT SHAFT AND COUNTER GEAR

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

(b) Install the needle roller bearing to the input shaft.

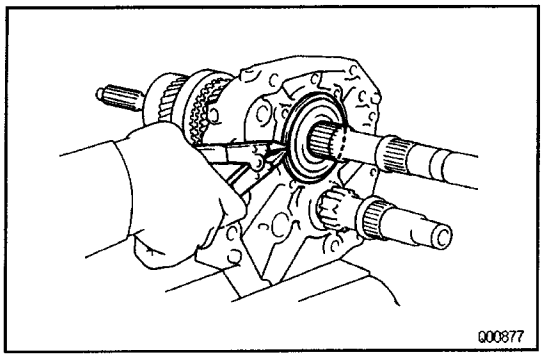


(c) Install the input shaft and counter gear together.



(d) Using SST and a hammer, instal) the counter gear center bearing outer race.
SST 09316–60010 (09316–00010)

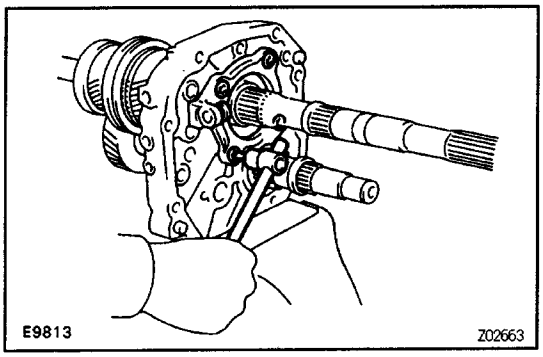
HINT: Be careful not to damage the bearing rollers.



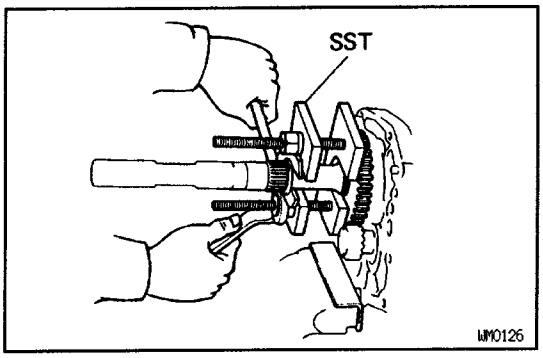
3. INSTALL BEARING RETAINER

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

HINT: Be sure the snap ring is flush with the intermediate plate surface.

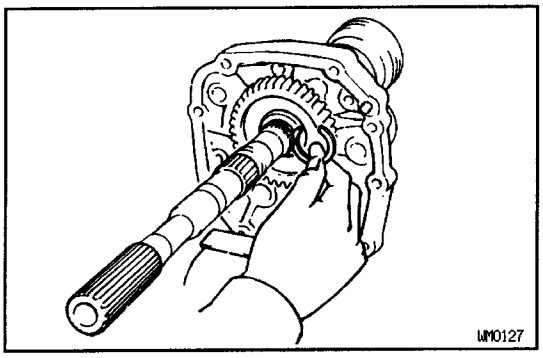


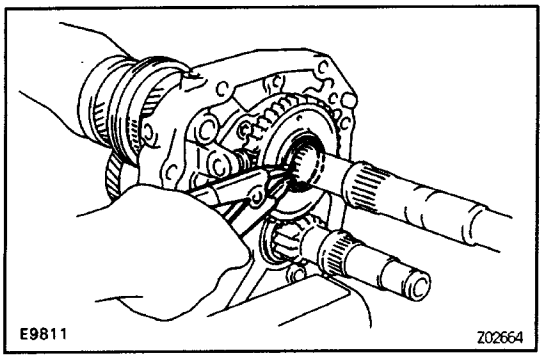
(b) Using a torx socket wrench, install and torque the screws.
Torx wrench T40 09042–00020
Torque: 18 N–m (185 kgf–cm, 13 ft–lbf)



4. INSTALL REVERSE GEAR

Using SST, install the reverse gear.
SST 09312–20011 (09313–00030, 09313–00040, 09313–00050)



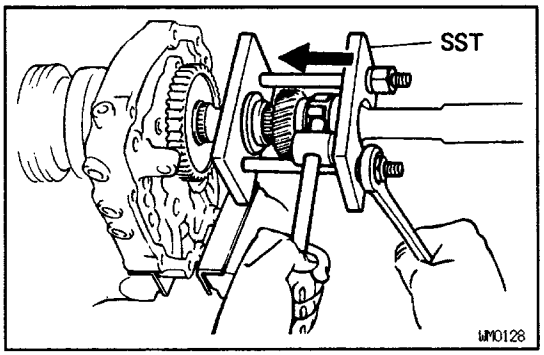


5. INSTALL SNAP RING

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

Mark	Thickness mm (in.)
5	2.25 – 2.30 (0.0886 – 0.0906)
11	2.30 – 2.35 (0.0906 – 0.0925)
12	2.35 – 2.40 (0.0925 – 0.0945)
13	2.40 – 2.45 (0.0945 – 0.0965)
14	2.45 – 2.50 (0.0965 – 0.0984)
15	2.50 – 2.55 (0.0984 – 0.1004)
16	2.55 – 2.60 (0.1004 – 0.1024)
17	2.61 – 2.66 (0.1028 – 0.1047)
18	2.67 – 2.72 (0.1051 – 0.1071)
19	2.73 – 2.78 (0.1075 – 0.1094)
20	2.79 – 2.84 (0.1098 – 0.1118)
21	2.85 – 2.90 (0.1122 – 0.1142)
22	2.91 – 2.96 (0.1146 – 0.1165)
23	2.97 – 3.02 (0.1169 – 0.1189)

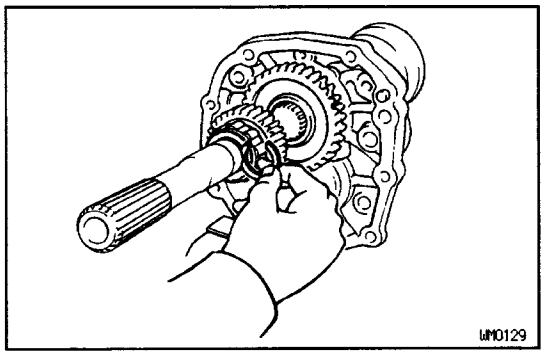
(b) Using a snap ring expander, install the snap ring.



6. INSTALL FIFTH GEAR AND OUTPUT SHAFT REAR BEARING

Using SST, install the 5th gear and rear bearing.
SST 09312–20011 (09313–00010, 09313–00030,

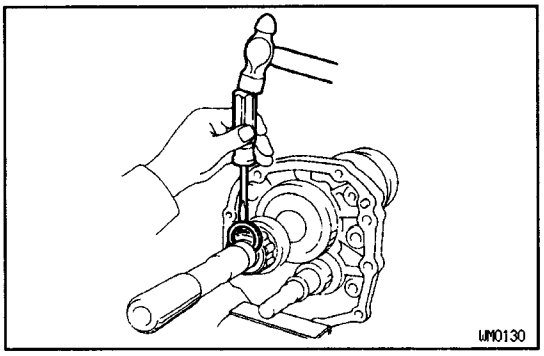
09313–00040, 09313–00050)



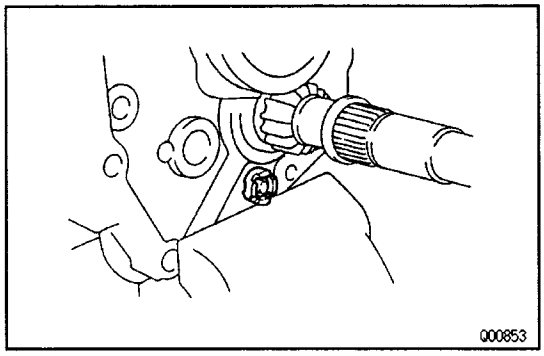
7. INSTALL SNAP RING

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

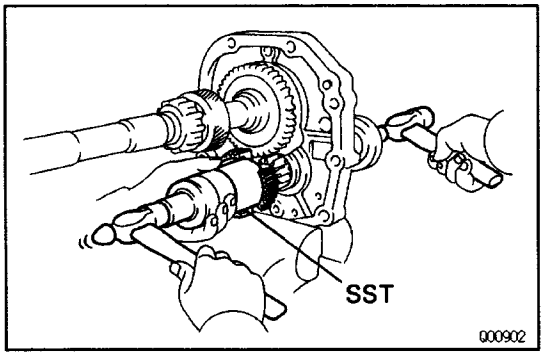
Mark	Thickness mm (in.)
8	2.31 – 2.36 (0.0909 – 0.0929)
9	2.37 – 2.42 (0.0933 – 0.0953)
10	2.43 – 2.48 (0.0957 – 0.0976)
11	2.49 – 2.54 (0.0980 – 0.1000)
12	2.55 – 2.60 (0.1004 – 0.1024)
13	2.61 – 2.66 (0.1028 – 0.1047)
14	2.68 – 2.73 (0.1055 – 0.1098)
15	2.74 – 2.79 (0.1079 – 0.1098)



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



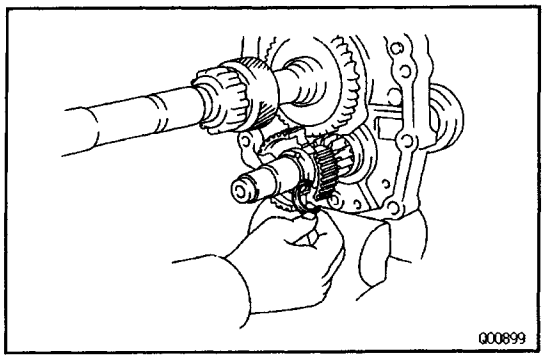
8. INSTALL REAR MAGNET



9. INSTALL NO.3 CLUTCH HUB

Using SST and a hammer, drive in No.3 clutch hub.
SST 09316–60010 (09316–00010, 09316–00070)

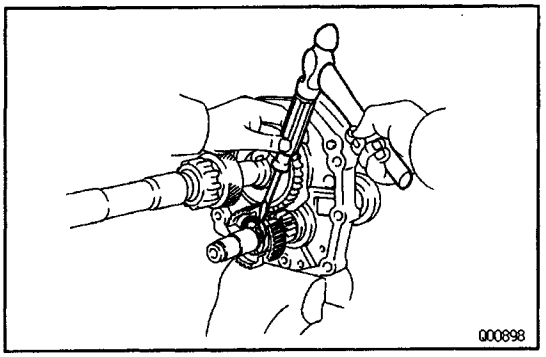
HINT: When installing the clutch hub, support the counter shaft in front with a 3–5 Ib hammer or equivalent.



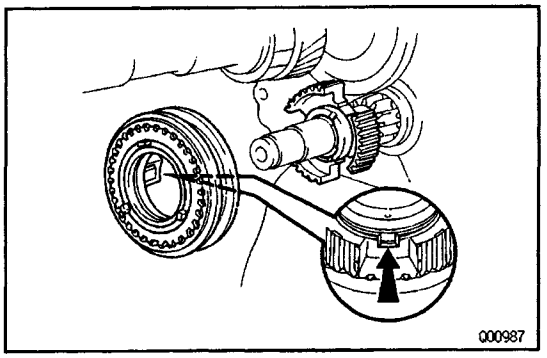
10. INSTALL SNAP RING

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

Mark	Thickness mm (in.)
2	2.06 – 2.11 (0.0811 – 0.0831)
3	2.12 – 2.17 (0.0835 – 0.0854)
4	2.18 – 2.23 (0.0858 – 0.0878)
5	2.24 – 2.29 (0.0882 – 0.0902)



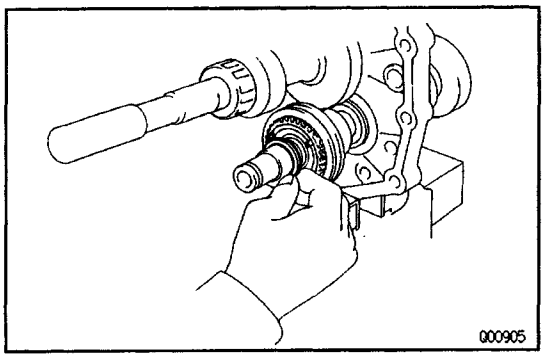
(b) Using a screwdriver and hammer, tap in the snap ring.



11. INSTALL NO.3 HUB SLEEVE ASSEMBLY

(a) Check for reverse synchronizer pull ring position.

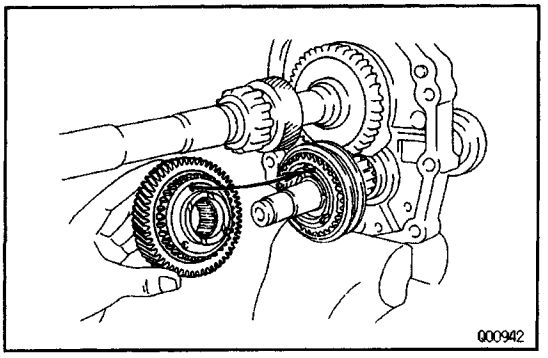
(b) Install the No.3 hub sleeve assembly to the No.3 clutch hub.



12. INSTALL SPACER, NEEDLE ROLLER BEARING AND COUNTER FIFTH GEAR

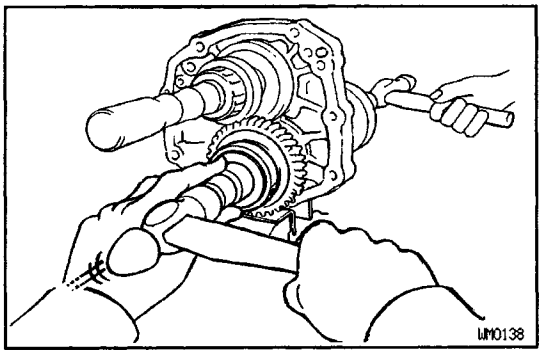
(a) Install the spacer.

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



(c) Install the needle roller bearing to the counter fifth gear.

(d) Install the counter 5th gear with 5th gear gaps aligned with synchronizer corn ring pin.

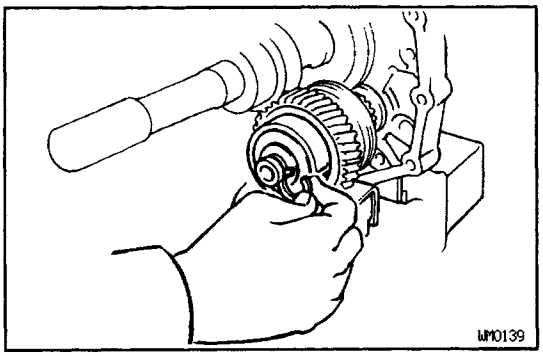


13. INSTALL SPACER AND BEARING

(a) Install the spacer.

(b) Using a socket wrench and hammer, drive in the bearing.

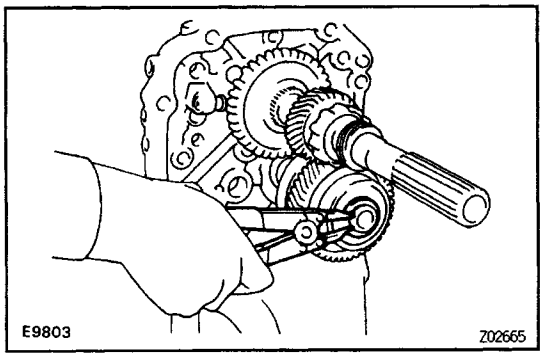
HINT: When driving in the bearing, support the counter shaft in front with a 3–5 lb hammer or equivalent.



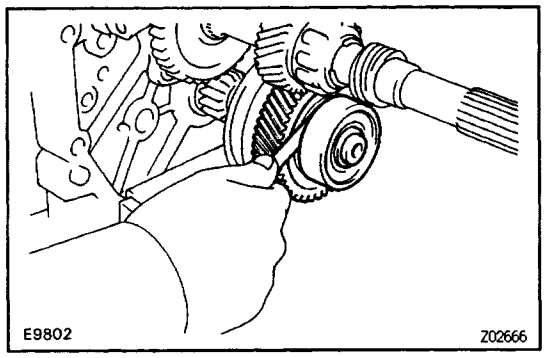
14. INSTALL SNAP RING

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

Mark	Thickness mm (in.)
1	1.90 – 1.95 (0.0748 – 0.0768)
2	1.96 – 2.01 (0.0772 – 0.0791)
3	2.02 – 2.07 (0.0795 – 0.0815)
4	2.08 – 2.13 (0.0819 – 0.0839)
5	2.14 – 2.19 (0.0843 – 0.0862)
6	2.20 – 2.25 (0.0866 – 0.0886)
7	2.26 – 2.31 (0.0890 – 0.0909)



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

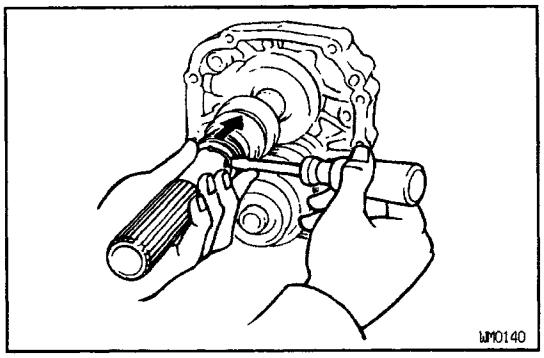


15. INSPECT COUNTER FIFTH GEAR THRUST CLEARANCE

Using a feeler gauge, measure the counter 5th gear thrust clearance.

Standard clearance:

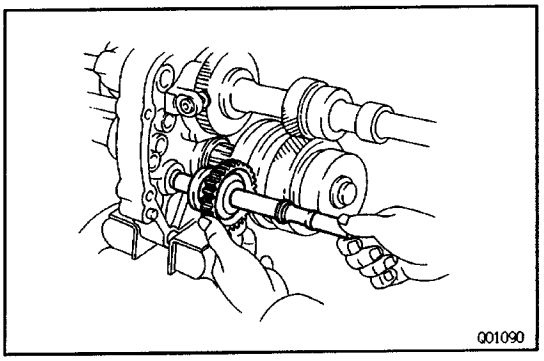
0.10–0.41 mm (0.0039–0.0161 in.)



16. INSTALL SPEED SENSOR DRIVE GEAR

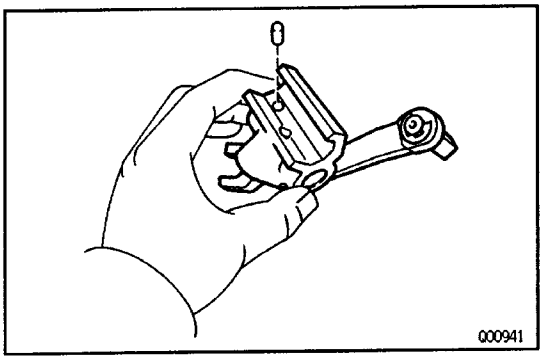
(a) Put a clip on the output shaft and install the drive gear clip into the slot.

(b) Slide the drive gear with clip and fit the clip into the holes.



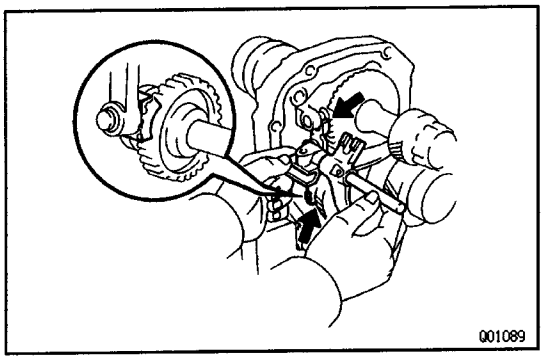
17. INSTALL SHIFT FORKS, SHIFT FORK SHAFTS AND REVERSE IDLER GEAR

(a) Install the reverse idler gear and shaft.



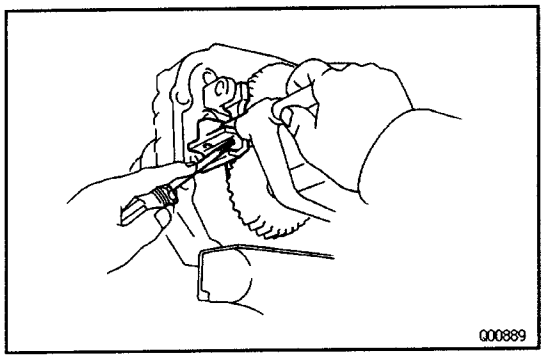
(b) Install the No.3 shift fork, No.3 fork shaft and reverse shift arm.

- Coat the pin with MP grease and insert it into the reverse shift head hole.
- Install the No.3 shift fork through the No.3 shift fork and reverse shift arm.
- Align the No.3 shift fork with the No.3 hub sleeve groove, put the reverse shift arm into the pivot of bearing retainer and align the reverse shift arm show with the reverse idler gear groove. Install No.3 the shift fork shaft to the intermediate plate.

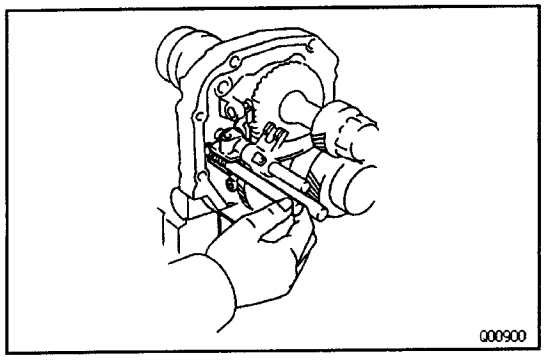


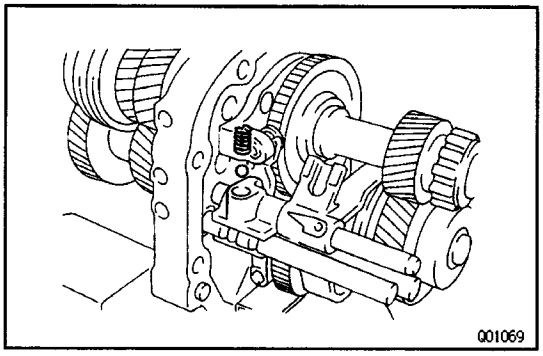
(c) Install the No.4 shift fork shaft.

- Push the pin, which was installed into the reverse shift arm hole, into the groove of No.3 shift fork shaft.

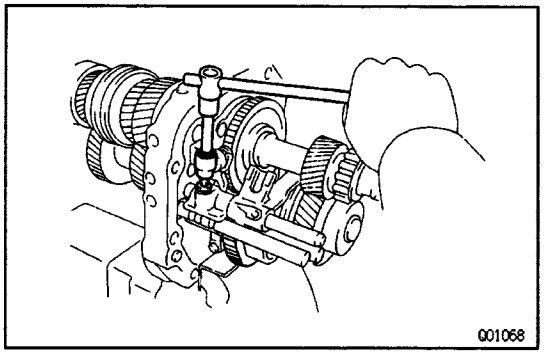


- Install the shift fork shaft No.4 to the intermeddle–ate plate.





(d) Install the ball and spring.



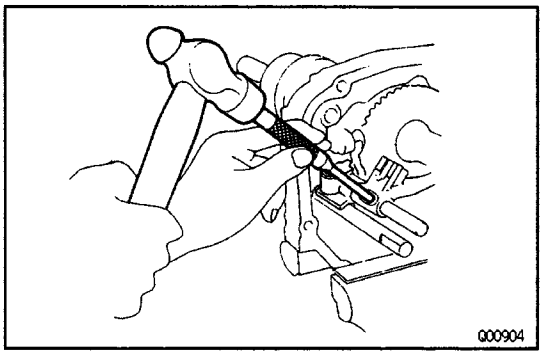
(e) Apply sealant to the plug.

Sealant:

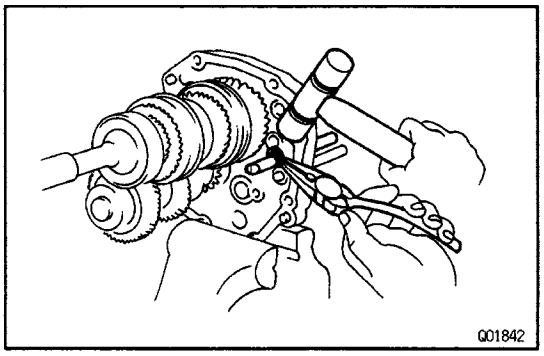
Part No.08833–00080, THREE BOND 1344, LOC–TITE 242 or equivalent

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

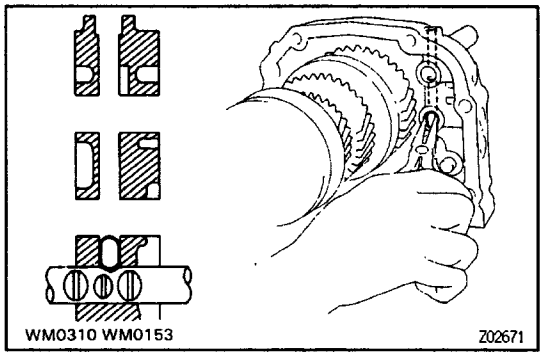
Torque: 25 N–m (250 kgf–cm, 18 ft–lbf)



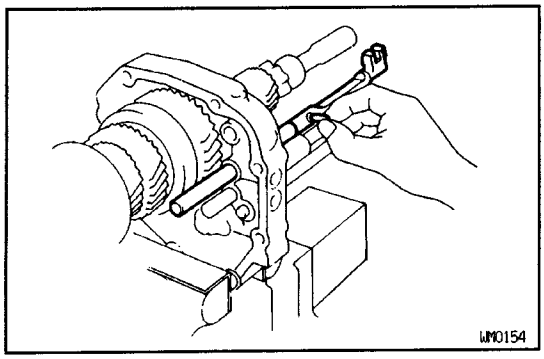
(g) Using a pin punch and hammer, drive in the slotted spring pin until it is flush with the No.3 shift fork.



(h) Install the snap ring to the No.3 fork shaft.

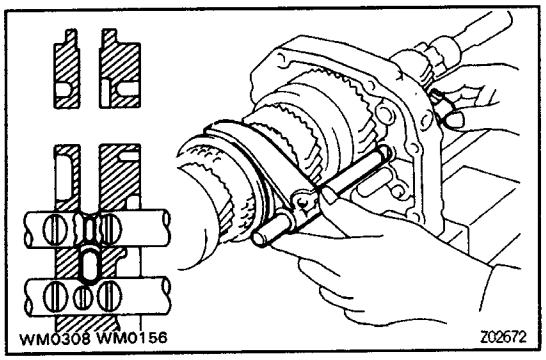


(i) Apply MP grease to the No.3 interlock pin and install the pin into the intermediate plate hole.

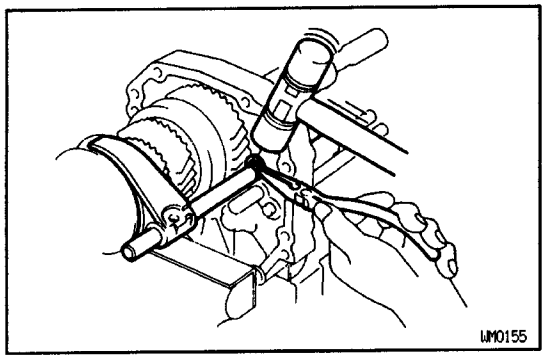


(j) Install the No.2 shift fork and fork shaft.

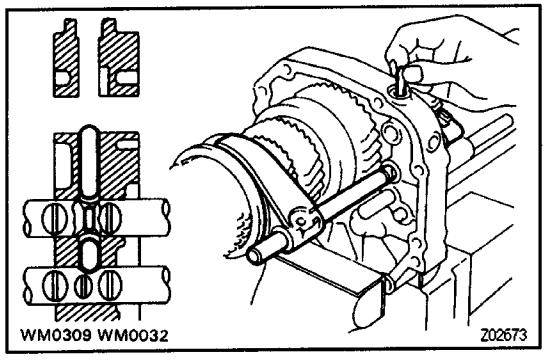
- Apply MP grease to No.2 interlock pin and install the pin into the shaft hole.



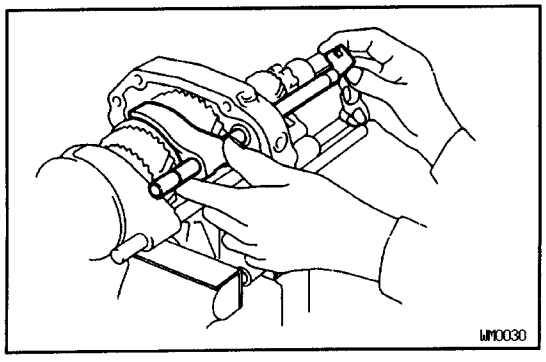
- Place the No.2 shift fork into the groove of No.2 hub sleeve.
- Install the No.2 fork shaft to the shift fork thr– ough the intermediate plate.



(k) Install the snap ring to the No.2 fork shaft.

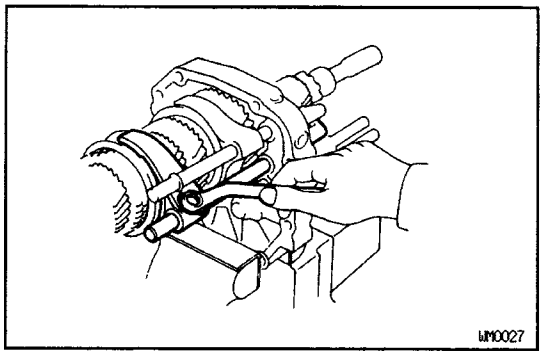


(l) Apply MP grease to the No.2 interlock pin and install the pin into the intermediate plate.



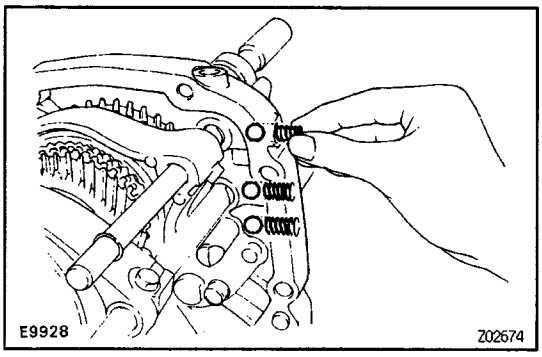
(m) Install the No.1 shift fork and fork shaft.

- Install the No.1 shift fork into the groove of No.1 hub sleeve.
- Install the No.1 fork shaft to the shift fork thr– ough the intermediate plate.



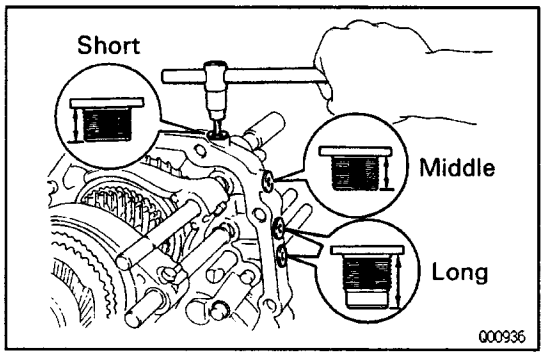
(n) Install and torque the No.1 and No.2 shift fork set bolts.

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



18. INSTALL LOCKING BALL AND SPRING

(a) Install the balls and spring into each hole.



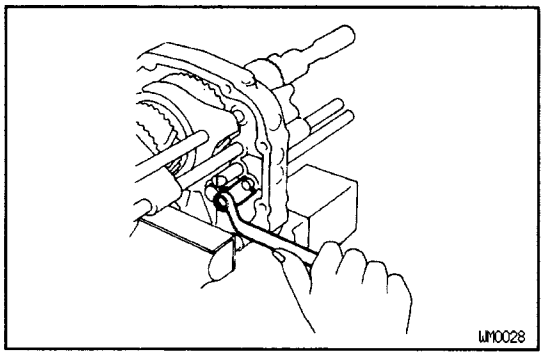
(b) Apply liquid sealer to the plug threads.

Sealant:

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

(c) Using a hexagon wrench, install the torque the four plugs.

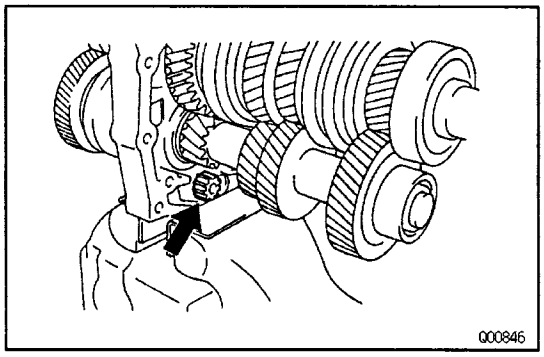
Torque: 25 N–m (250 kgf–cm, 18 ft–lbf)



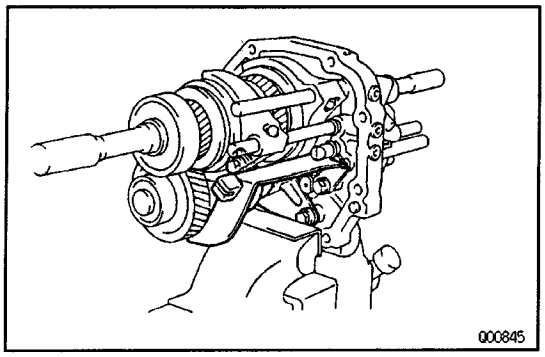
19. INSTALL REVERSE IDLER GEAR SHAFT STOPPER

Install the reverse idler gear shaft stopper and torque the bolt.

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



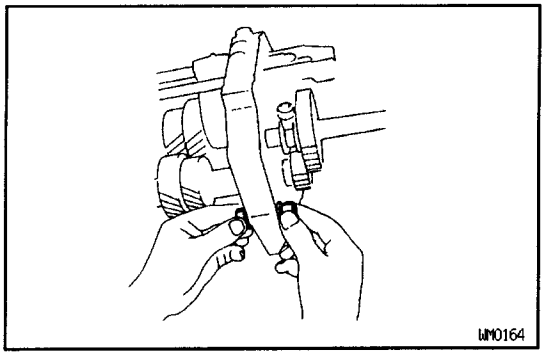
20. INSTALL FRONT MAGNET



21. INSTALL OIL SEPARATOR

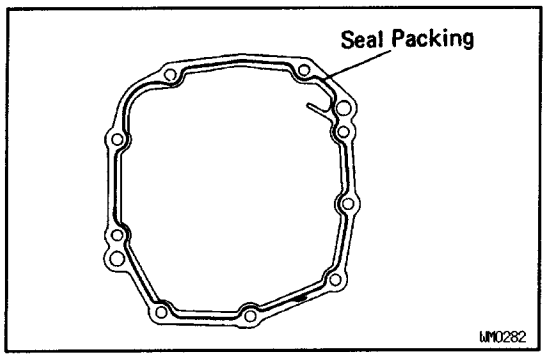
Install the oil receiver and torque the two bolts.

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



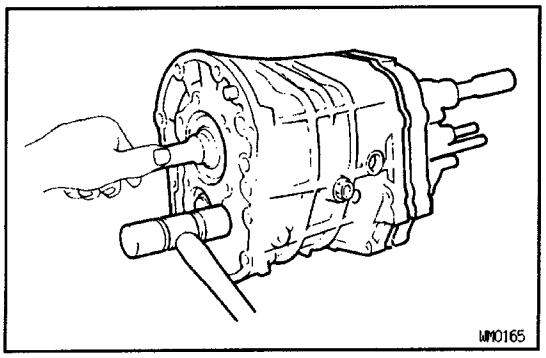
22. DISMOUNT INTERMEDIATE PLATE FROM VISE

(a) Dismount the intermediate plate from the vise.
(b) Remove the bolts, nuts, plate washers and gasket.

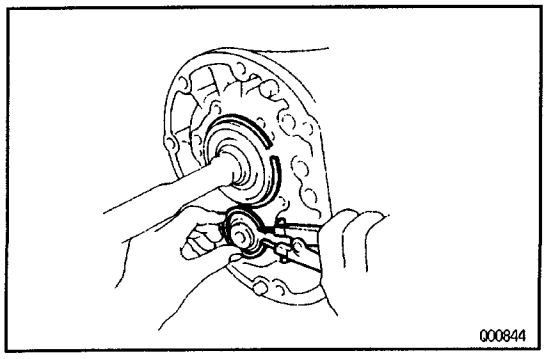


23. INSTALL TRANSMISSION CASE TO INTERMEDIATE PLATE

(a) Remove the any packing material and be careful not to drop oil on the contacting surface of the transmission case or intermediate plate.
(b) Apply seal packing to the transmission case as shown.
Seal packing:
Part No. 08826 – 00090, THREE BOND 1281 or equivalent

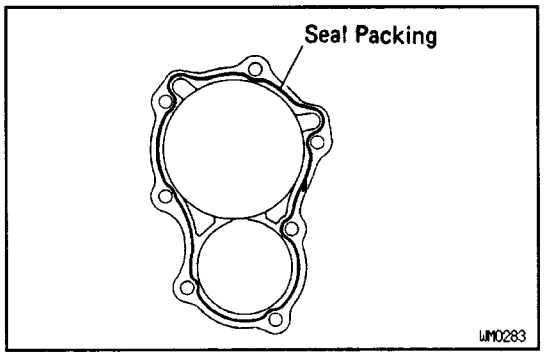


(c) Align the each bearing outer race and each shift fork shaft end with the case holes.
(d) Using a plastic hammer, tap on the case to install it.



24. INSTALL BEARING SNAP RINGS

Using a snap ring expander, install the two snap rings.



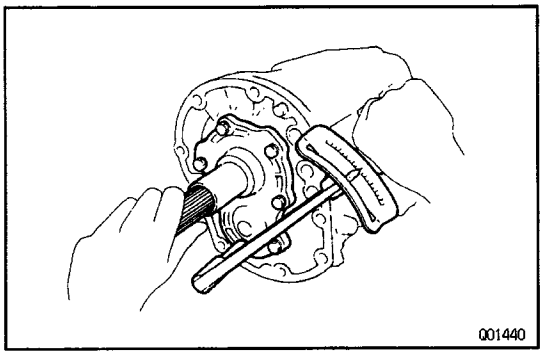
25. INSTALL FRONT BEARING RETAINER

(a) Remove the any packing material and be careful not to drop oil on the contacting surface of the front bearing retainer or transmission case.

(b) Apply seal packing to the retainer as shown, and install it to the transmission case.

Seal packing:

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



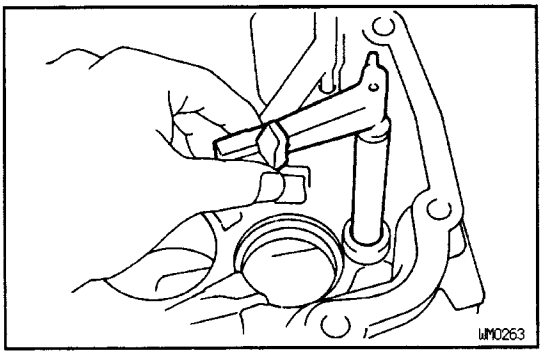
(c) Apply liquid sealer to the bolt threads.

Sealant:

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

(d) Install and torque the bolts.

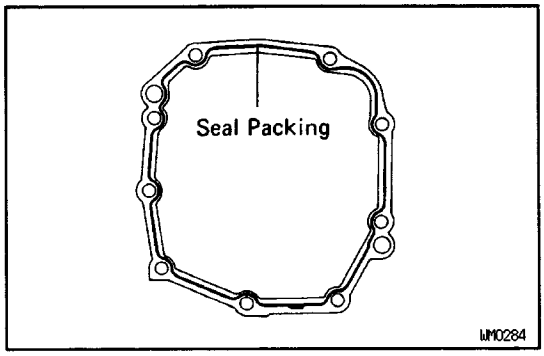
Torque: 25 N–m (250 kgf–cm, 18 ft–lbf)



26. (2WD)

INSTALL EXTENSION HOUSING

(a) Install the shift and select lever into the extension housing.

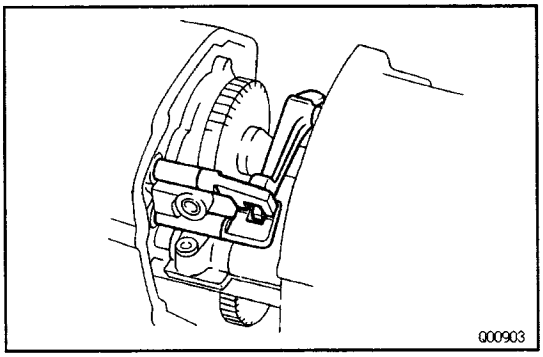


(b) Remove the any packing material and be careful not to drop oil on the contacting surface of the extension housing or intermediate plate.

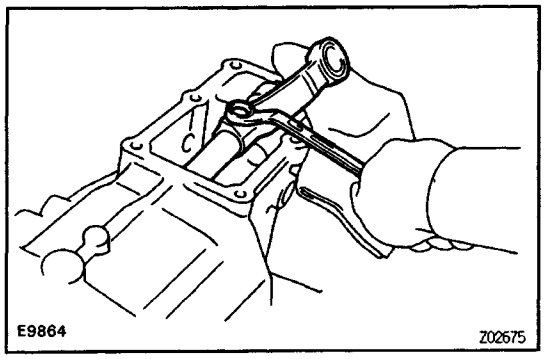
(c) Apply seal packing to the extension housing.

Seal packing:

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

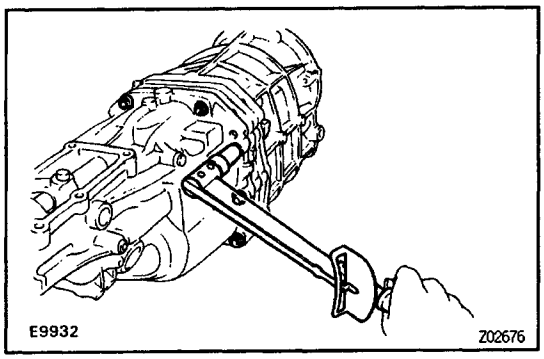


(d) Connect the shift and select lever to the shift fork shaft.



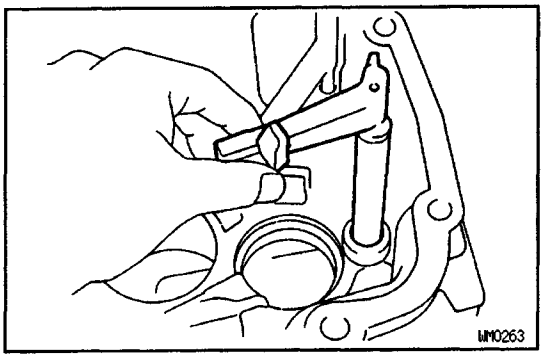
(e) Install the shift lever housing to the shift and select lever shaft, push in the extension housing.
(f) Install and torque the bolt.

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



(g) Install the nine bolts to the extension housing.
(h) Torque the bolts.

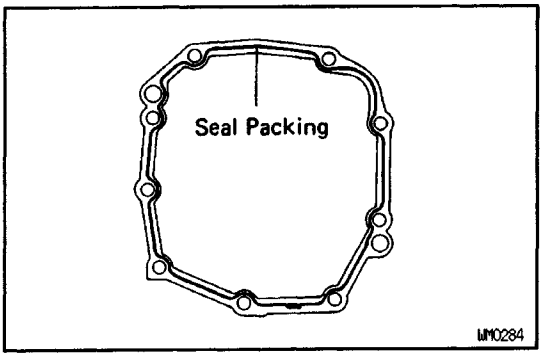
Torque: 37 N–m (375 kgf–cm, 27 ft–lbf)



27. (4WD)

INSTALL TRANSFER ADAPTOR

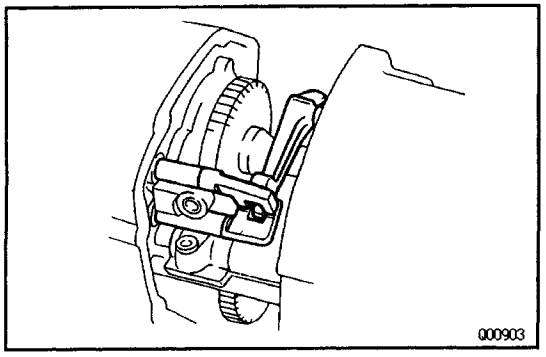
(a) Install the shift and select lever into the transfer adaptor.



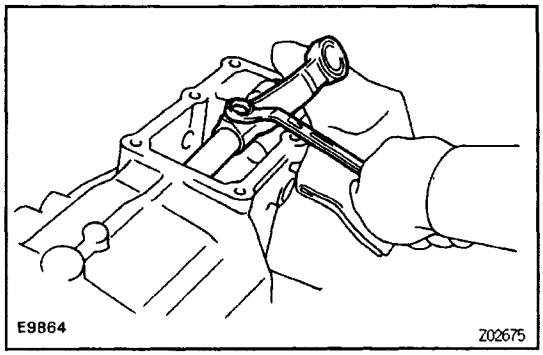
(b) Remove the any packing material and be careful not to drop oil on the contacting surface of the transfer adaptor or intermediate plate.
(c) Apply seal packing to the extension housing.

Seal packing:

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

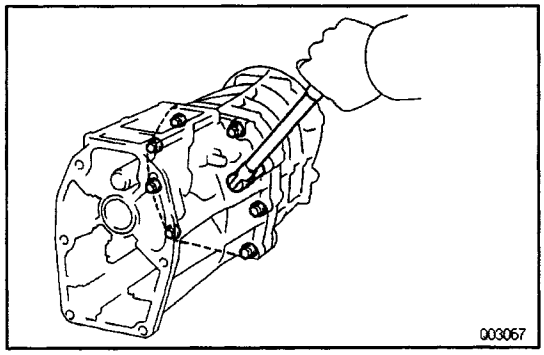


(d) Connect the shift and select lever to the shift fork shaft.



(e) Install the shift lever housing to the shift and select lever shaft, push in the transfer adaptor.
(f) Install and torque the bolt.

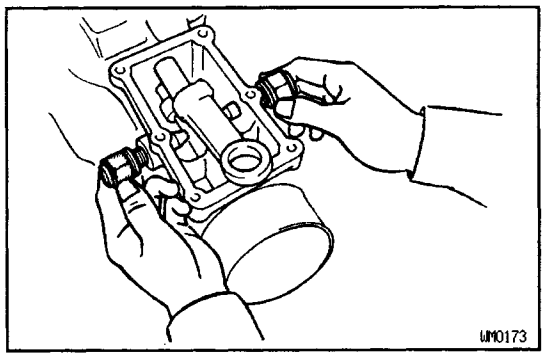
Torque: 39 N–m (400 kgf–cm, 29 ft–lbf)



(g) Install the nine bolts to the transfer adaptor.
(h) Torque the bolts.
Torque: 37 N–m (380 kgf–cm, 27ft¿lbf)

28. AFTER INSTALLING EXTENSION HOUSING, CHECK FOLLOWING ITEMS:

(a) Check to see that the input shaft and output shaft rotate smoothly.
(b) Check to see that shifting can be made smoothly to all positions.



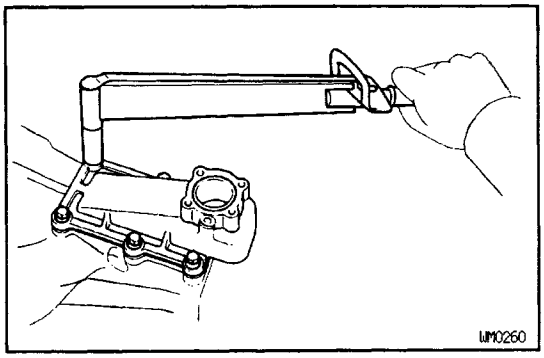
29. INSTALL RESTRICT PINS

(a) Install the restrict pins together with a gasket.

HINT: Install the black pin on the reverse gear/5th gear side.

(b) Torque the restrict pins.

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

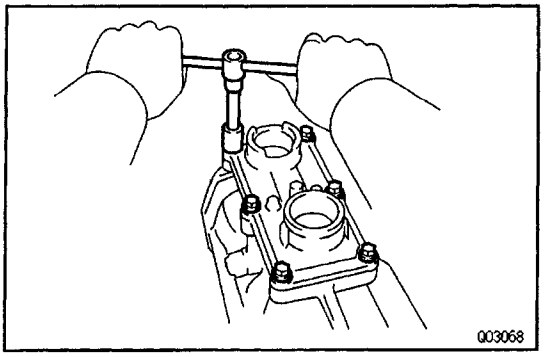


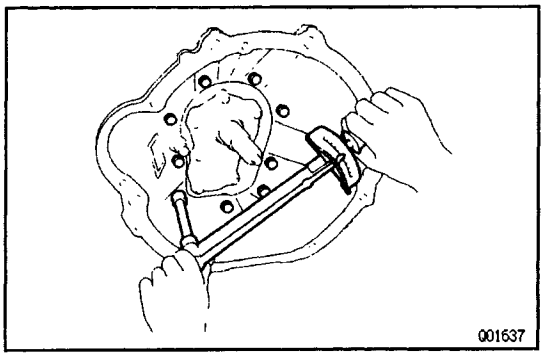
30. (2WD)

INSTALL SHIFT LEVER RETAINER

(a) Install the shift lever retainer with a oil baffle.
(b) Install and torque the six bolts.

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





31. INSTALL CLUTCH HOUSING

(a) Install the clutch housing.

(b) Install and torque the nine bolts.

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

32. INSTALL VEHICLE SPEED SENSOR

(a) Install the speed sensor.

(b) Install and torque the set bolt.

Torque: 13 N–m (130 kgf–cm, 9 ft–lbf)

33. INSTALL BACK–UP LIGHT SWITCH

(a) Install and torque the back–up light switch.

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

(b) Install the wire clamp.

SERVICE SPECIFICATIONS

MT010–02

SERVICE DATA

Output shaft 2nd gear journal diameter		
Limit	42.975 mm	1.6919 in.
Output shaft 3rd gear journal diameter		
Limit	31.969 mm	1.2586 in.
Output shaft flange thickness		
Limit	5.60 mm	0.2205 in.
Output shaft runout		
Limit	0.06 mm	0.0024 in.
1 st gear inner race flange thickness		
Limit	4.87 mm	0.1882 in.
1 st gear inner race outer diameter		
Limit	42.975 mm	1.6919 in.
Counter gear bearing journal diameter		
Limit	29.950 mm	1.1791 in.
Counter 5th gear journal diameter		
Limit	26.975 mm	1.6919 in.
1st, 2nd and 3rd Gear thrust clearance		
STD	0.10 – 0.25 mm	0.0039 – 0.0098 in.
Limit	0.30 mm	0.0118 in.
Counter 5th gear thrust clearance		
STD	0.10 – 0.41 mm	0.0039 – 0.0161 in.
Limit	0.46 mm	0.0181 in.
1 st, 2nd and counter 5th gear oil clearance		
STD	0.009 – 0.060 mm	0.0004 – 0.0024 in.
Limit	0.15 mm	0.0059 in.
3rd gear oil clearance		
STD	0.015 – 0.066 mm	0.0006 – 0.0026 in.
Limit	0.20 mm	0.0079 in.
Reverse idler gear to shift arm shoe		
STD	0.041 – 0.074 mm	0.0016 – 0.0029 in.
Limit	0.194 mm	0.0076 in.
Shift fork to hub sleeve clearance		
Limit	1.0 mm	0.039 in.
Synchronizer ring to 1 st and 4th gear clearance		
Limit	0.5 mm	0.020 in.
Synchronizer ring to 2nd and 3rd gear clearance		
Limit	0.7 mm	0.028 in.
Input shaft snap ring thickness		
Mark 1	2.05 – 2.10 mm	0.0807 – 0.0827 in.
Mark 2	2.10 – 2.15 mm	0.0827 – 0.0846 in.
Mark 3	2.15 – 2.20 mm	0.0846 – 0.0866 in.
Mark 4	2.20 – 2.25 mm	0.0866 – 0.0886 in.
Mark 5	2.25 – 2.30 mm	0.0886 – 0.0906 in.
Mark 11	2.30 – 2.35 mm	0.0906 – 0.0925 in.
Mark 12	2.35 – 2.40 mm	0.0925 – 0.0945 in.

Output shaft snap ring thickness			
No.2 clutch hub	Mark C–1	1.75 – 1.80 mm	0.0689 – 0.0709 in.
No.2 clutch hub	Mark 11	1.86 – 1.91 mm	0.0732 – 0.0752 in.
No.2 clutch hub	Mark 12	1.92 – 1.97 mm	0.0756 – 0.0776 in.
No.2 clutch hub	Mark 13	1.98 – 2.03 mm	0.0780 – 0.0799 in.
No.2 clutch hub	Mark 14	2.04 – 2.09 mm	0.0803 – 0.0823 in.
No.2 clutch hub	Mark 15	2.10 – 2.15 mm	0.0827 – 0.0846 in.
Rear bearing	Mark 8	2.31 – 2.36 mm	0.0909 – 0.0929 in.
Rear bearing	Mark 9	2.37 – 2.42 mm	0.0933 – 0.0953 in.
Rear bearing	Mark 10	2.43 – 2.48 mm	0.0957 – 0.0976 in.
Rear bearing	Mark 11	2.49 – 2.54 mm	0.0980 – 0.1000 in.
Rear bearing	Mark 12	2.55 – 2.60 mm	0.1004 – 0.1024 in.
Rear bearing	Mark 13	2.61 – 2.66 mm	0.1028 – 0.1047 in.
Rear bearing	Mark 14	2.68 – 2.73 mm	0.1055 – 0.1075 in.
Rear bearing	Mark 15	2.74 – 2.79 mm	0.1079 – 0.1098 in.
Reverse gear	Mark 5	2.25 – 2.30 mm	0.0886 – 0.0906 in.
Reverse gear	Mark 11	2.30 – 2.35 mm	0.0906 – 0.0925 in.
Reverse gear	Mark 12	2.35 – 2.40 mm	0.0925 – 0.0945 in.
Reverse gear	Mark 13	2.40 – 2.45 mm	0.0945 – 0.0965 in.
Reverse gear	Mark 14	2.45 – 2.50 mm	0.0965 – 0.0984 in.
Reverse gear	Mark 15	2.50 – 2.55 mm	0.0984 – 0.1004 in.
Reverse gear	Mark 16	2.55 – 2.60 mm	0.1004 – 0.1024 in.
Reverse gear	Mark 17	2.61 – 2.66 mm	0.1028 – 0.1047 in.
Reverse gear	Mark 18	2.67 – 2.72 mm	0.1051 – 0.1071 in.
Reverse gear	Mark 19	2.73 – 2.78 mm	0.1075 – 0.1094 in.
Reverse gear	Mark 20	2.79 – 2.84 mm	0.1098 – 0.1118 in.
Reverse gear	Mark 21	2.85 – 2.90 mm	0.1122 – 0.1142 in.
Reverse gear	Mark 22	2.91 – 2.96 mm	0.1146 – 0.1165 in.
Reverse gear	Mark 23	2.97 – 3.02 mm	0.1169 – 0.1189 in.
Counter gear snap ring thickness			
Front bearing	Mark A	2.05 – 2.10 mm	0.0807 – 0.0827 in.
Front bearing	Mark B	2.10 – 2.15 mm	0.0827 – 0.0846 in.
Front bearing	Mark C	2.15 – 2.20 mm	0.0846 – 0.0866 in.
Front bearing	Mark D	2.20 – 2.25 mm	0.0866 – 0.0886 in.
Front bearing	Mark E	2.25 – 2.30 mm	0.0886 – 0.0906 in.
Front bearing	Mark F	2.30 – 2.35 mm	0.0906 – 0.0925 in.
Front bearing	Mark G	2.35 – 2.40 mm	0.0925 – 0.0945 in.
No.3 clutch hub	Mark 2	2.06 – 2.11 mm	0.0811 – 0.0831 in.
No.3 clutch hub	Mark 3	2.12 – 2.17 mm	0.0835 – 0.0854 in.
No.3 clutch hub	Mark 4	2.18 – 2.23 mm	0.0858 – 0.0878 in.
No.3 clutch hub	Mark 5	2.24 – 2.29 mm	0.0882 – 0.0902 in.
Rear bearing	Mark 1	1.90 – 1.95 mm	0.0748 – 0.0768 in.
Rear bearing	Mark 2	1.96 – 2.01 mm	0.0772 – 0.0791 in.
Rear bearing	Mark 3	2.02 – 2.07 mm	0.0795 – 0.0815 in.
Rear bearing	Mark 4	2.08 – 2.13 mm	0.0819 – 0.0839 in.
Rear bearing	Mark 5	2.14 – 2.19 mm	0.0843 – 0.0862 in.
Rear bearing	Mark 6	2.20 – 2.25 mm	0.0866 – 0.0886 in.
Rear bearing	Mark 7	2.26 – 2.31 mm	0.0890 – 0.0909 in.

Oil seal drive in depth	
Front bearing retainer (from retainer end)	11.4 – 12.0 mm 0.449 – 0.472 in.

MT011–02

TORQUE SPECIFICATIONS

Part tightened	N·m	kgf·cm	ft·lbf
Transfer x Transfer adaptor	39	400	29
Engine rear mounting x Transmission	25	260	19
Transmission x Engine	72	730	53
Transmission x Stiffener plate	37	380	27
Transmission x Starter	39	400	29
Clutch tube bracket x Transmission	72	730	53
Frame auxiliary crossmember	95	970	70
Engine rear mounting bracket x Support member	58	590	43
Engine rear mounting bracket x Engine rear mounting	29	300	22
No.2 crossmember x Frame	95	970	70
No.2 crossmember x Engine rear mounting	13	130	9
Stabilizer bracket	29	300	22
Exhaust pipe x Exhaust manifold	62	630	46
Exhaust– pipe x bracket x Clutch housing Upper	19	195	14
Lower	69	700	51
Exhaust pipe clamp	19	195	14
Clutch release cylinder x Transmission	12	120	9
Front propeller shaft x Front differential	74	750	54
Front propeller shaft x Transfer	74	750	54
Rear propeller shaft x Transfer	74	750	54
Rear propeller shaft center bearing x Frame	37	370	27
Shift fork set bolt	20	200	14
Straight screw plug	25	250	18
Reverse idler gear shaft stopper bolt	25	250	18
Oil separator x Intermediate plate	18	185	13
Front bearing retainer set bolt	25	250	18
Extension housing x Intermediate plate or Transfer adaptor	37	375	27
Restrict pin	40	410	30
Shift lever housing x Shift and select lever shaft	39	400	29
Shift lever retainer x Extension housing or Transfer adaptor	18	185	13
Drain and filler plugs	40	410	30
Back–up light switch	40	410	30
Clutch housing x Transmission case	37	375	27
Rear bearing retainer x Intermediate plate	13	130	9