

R150F MANUAL TRANSMISSION

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PRECAUTION

MT070-06

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

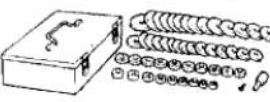
- Using a razor blade and gasket scraper, remove all the old FIPG material from the gasket surfaces.
- Thoroughly clean all components to remove all the loose material.
- Clean both sealing surfaces with a non-residue solvent.
- Apply FIPG in an approx. 1 mm (0.04 in.) wide bead along the sealing surface.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

PREPARATION

MT0HX-01

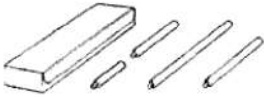
SST (SPECIAL SERVICE TOOLS)

MT

	09316-60011 Transmission & Transfer Bearing Replacer	
	(09316-00011) Replacer Pipe	Output shaft rear bearing Gear spline piece No.5
	(09316-00031) Replacer "B"	5th gear
	(09316-00071) Replacer "F"	Output shaft rear bearing Output shaft center bearing
	09506-35010 Differential Drive Pinion Rear Bearing Replacer	Input shaft bearing
	09950-00020 Bearing Remover	
	09950-40010 Puller B Set	Output shaft rear bearing
	09950-50010 Puller C Set	Gear spline piece No.5
	09950-60010 Replacer Set	
	(09951-00510) Replacer 51	Front bearing retainer oil seal

R150F MANUAL TRANSMISSION — PREPARATION

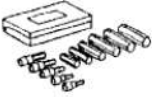
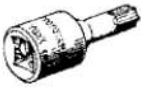
MT-3

	(09951-00570) Replacer 57	Transfer adaptor oil seal
	(09951-00620) Replacer 62	Counter rear bearing
	09950-70010 Handle Set	
	(09951-07150) Handle 150	

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RECOMMENDED TOOLS

MT0HY-01

	09031-00030 Pin Punch .	
	09040-00010 Hexagon Wrench Set .	
	09042-00020 Torx Socket T40 .	
	09905-00012 Snap Ring No.1 Expander .	

EQUIPMENT

MT0HZ-01

Dial indicator	
Calipers	
Micrometer	
Torque wrench	
Feeler gauge	
Magnetic finger	

LUBRICANT

MT0J0-02

Item	Capacity	Classification
Manual transmission oil	2.2 liters (2.3 US qts, 1.9 Imp. qts)	API GL-4 or GL-5 SAE 75W-90

SSM (SPECIAL SERVICE MATERIALS)

08826-00090	Seal Packing 1281, THREE BOND 1281 or equivalent (FIPG)	Intermediate plate x Transmission case Front bearing retainer x Transmission case
08833-00080	Adhesive 1344, THREE BOND 1344, LOCTITE 242 or equivalent	Straight screw plug Shift lever housing set bolt Front bearing retainer set bolt

TROUBLESHOOTING

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

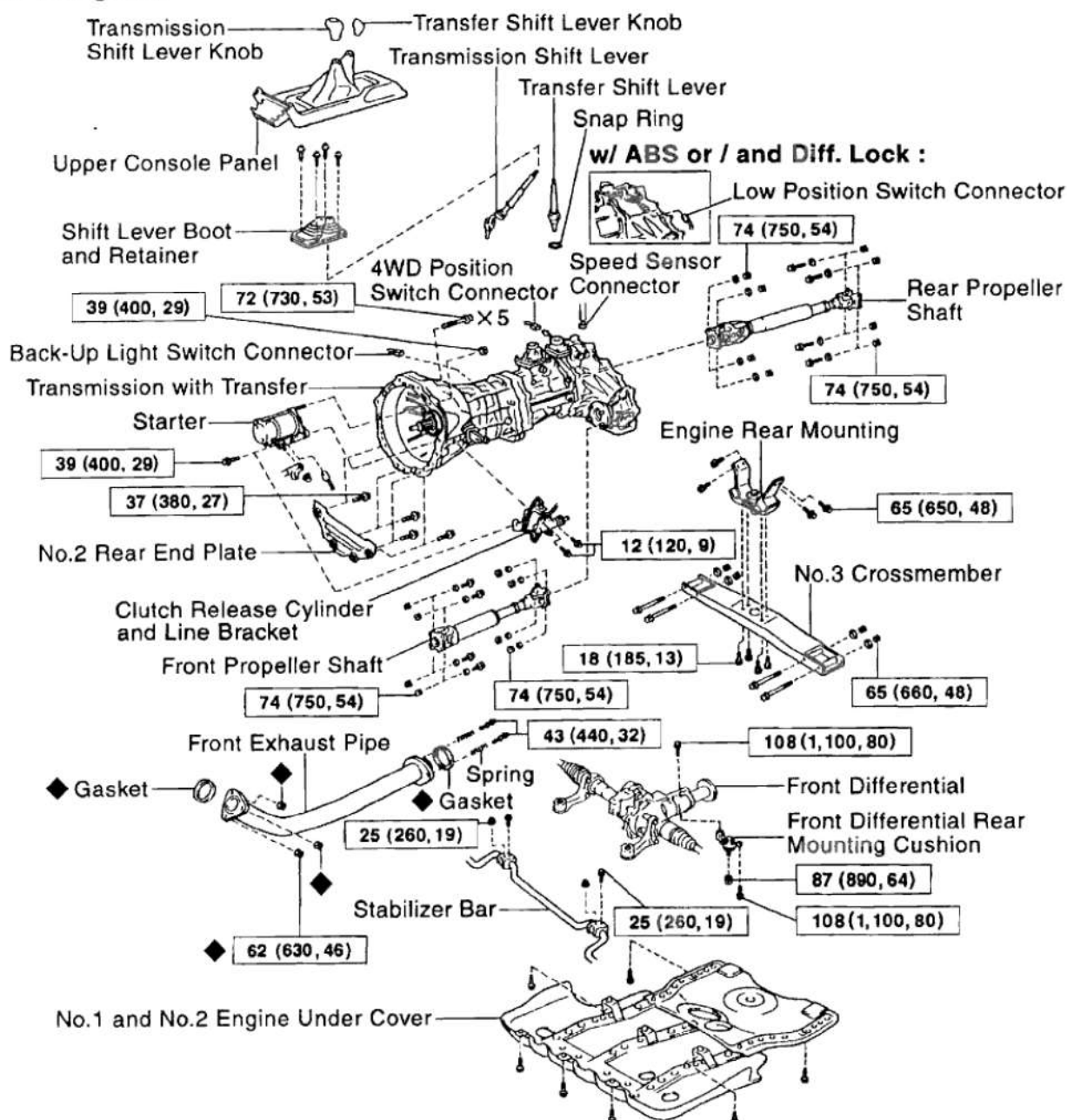
See Page	1	MT-3	1	MT-14	MT-14	1	1	MT-14	MT-14	MT-14	MT-14	22, 24 MT-31	MT-24, 31			
Parts Name	Oil (Level low)	Oil (Wrong)	Oil (Level too high)	Gasket (Damaged)	Oil seal (Worn or damaged)	O-Ring (Worn or damaged)	Control cable (Faulty)	Locking ball spring (Damaged)	Shift fork (Worn)	Gear (Worn or damaged)	Bearing (Worn or damaged)	Synchronizer ring (Worn or damaged)	Shifting key spring (Damaged)			
Trouble																
Noise	1	2								3	3					
Oil leakage			1	2	2	3										
Hard to shift or will not shift							1					2	3			
Jumps out of gear								1	2	3	3					

ASSEMBLY REMOVAL AND INSTALLATION (1KZ-T, 1KZ-TE)

COMPONENTS

MTGJ2-01

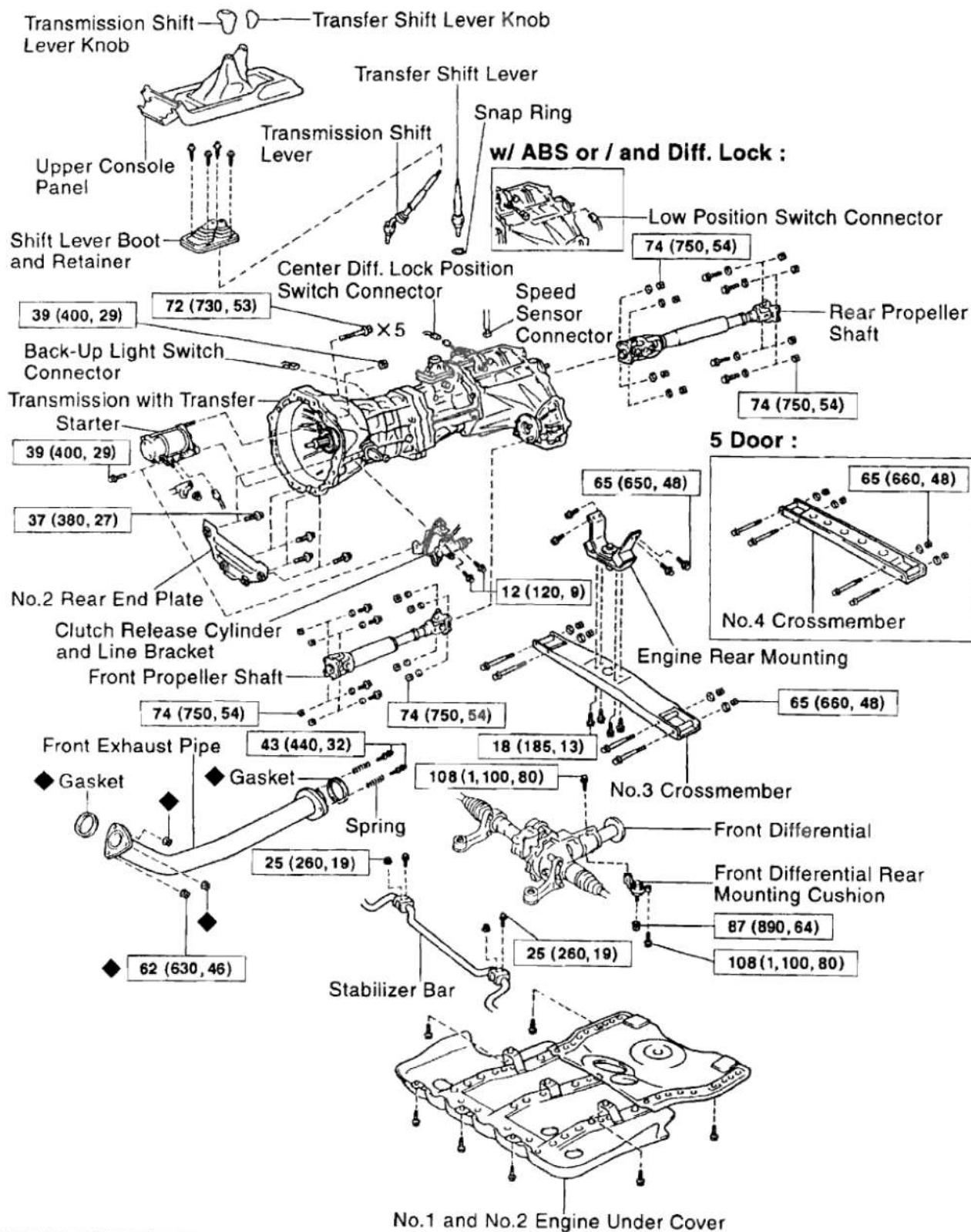
1KZ-T Engine :



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

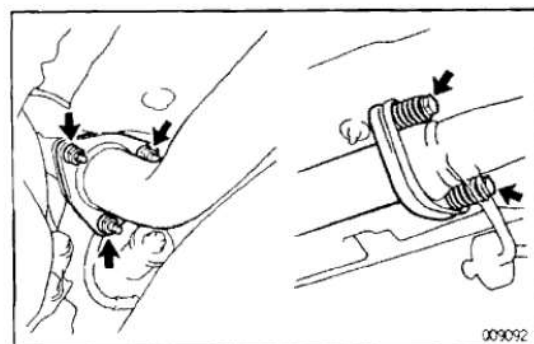
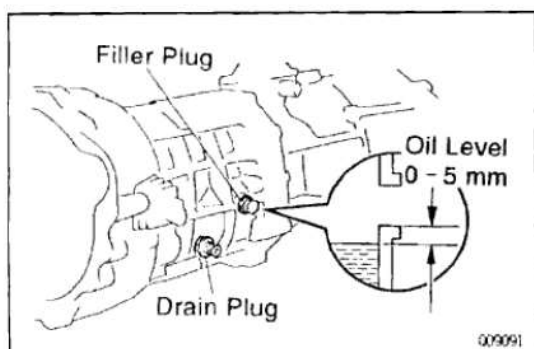
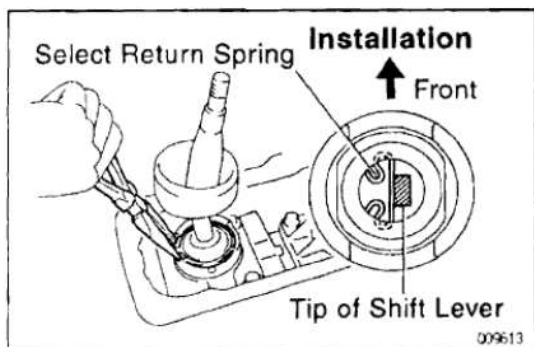
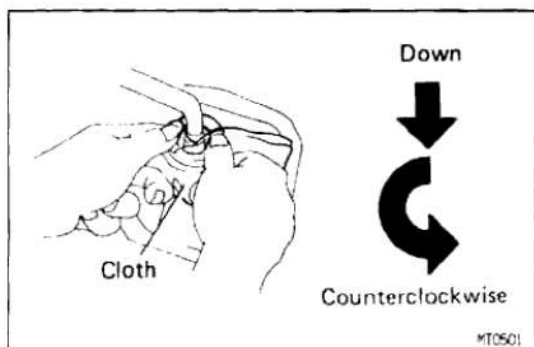
◆ Non-reusable part

1KZ-TE Engine :



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

◆ Non-reusable part



TRANSMISSION REMOVAL

1. REMOVE TRANSMISSION SHIFT LEVER

- Remove the upper console panel.
- Remove the 4 screws, shift lever boot and retainer.
- Cover the shift lever cap with a cloth.
- Pressing down on the shift lever cap and rotate it counterclockwise to remove.
- Pull out the shift lever.

INSTALLATION HINT: Apply MP grease to the tip of the shift lever.

2. REMOVE TRANSFER SHIFT LEVER

Using pliers, remove the snap ring and pull out the shift lever.

HINT: Shift the transfer shift lever to the "H4" (1KZ-T engine) or "HL" (1KZ-TE engine) position.

INSTALLATION HINT: Apply MP grease to the tip of the shift lever.

3. RAISE VEHICLE AND DRAIN TRANSMISSION OIL

Oil grade: API GL-4 or GL-5

Viscosity: SAE 75W-90

Capacity: 2.2 liters (2.3 US qts, 1.9 Imp. qts)

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

4. REMOVE NO.1 AND NO.2 ENGINE UNDER COVERS

5. REMOVE FRONT AND REAR PROPELLER SHAFTS

(See page PR-3)

6. REMOVE CLUTCH RELEASE CYLINDER

Remove the 2 bolts and release cylinder.

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

7. DISCONNECT THESE CONNECTORS:

- Back-up light switch connector
- Speed sensor connector
- 1KZ-T Engine:
 - 4WD position switch connector
- 1KZ-TE Engine:
 - Center diff. lock position switch connector
- w/ ABS or / and Diff. Lock:
 - Low position switch connector

8. REMOVE FRONT EXHAUST PIPE

- Remove the 3 nuts and gasket from the exhaust manifold.

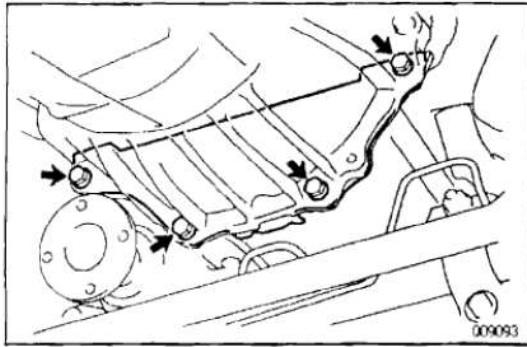
Torque: 62 N·m (630 kgf·cm, 46 ft·lbf)

- Remove the 2 bolts, springs, gasket and pipe.

Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)

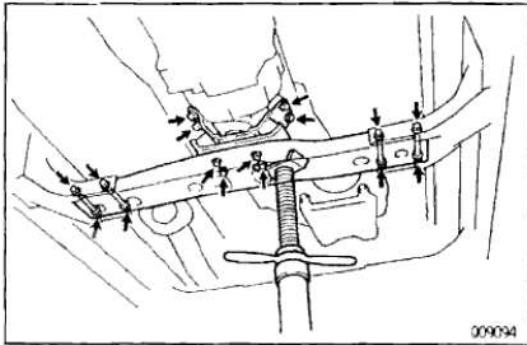
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**9. REMOVE NO.2 REAR END PLATE**

Remove the 4 bolts and No.2 rear end plate.

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

**10. REMOVE NO.3 CROSSMEMBER**

(a) Support the transmission rear side.

(b) Remove the 4 set bolts of the engine rear mounting.

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

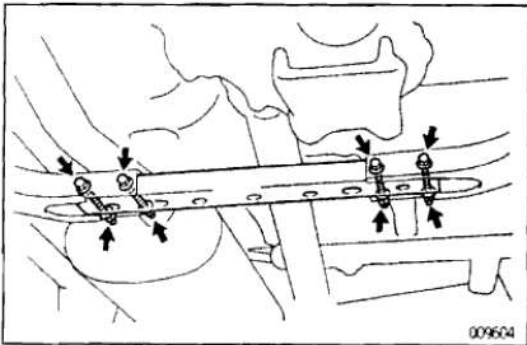
(c) Remove the 4 bolts, nuts and crossmember.

Torque: 65 N·m (660 kgf·cm, 48 ft·lbf)

11. REMOVE ENGINE REAR MOUNTING

Remove the 4 bolts and engine rear mounting from the transmission.

Torque: 65 N·m (650 kgf·cm, 48 ft·lbf)

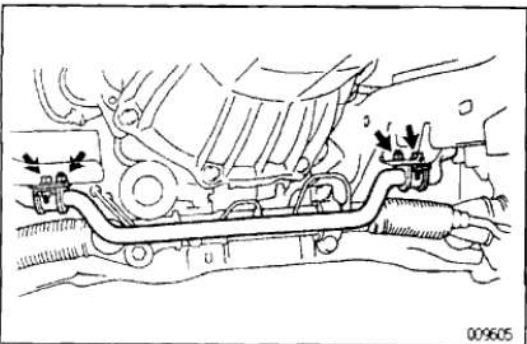
**12. 5 Door of 1KZ-TE Engine:****REMOVE NO.4 CROSSMEMBER**

Remove the 4 bolts, nuts and crossmember.

Torque: 65 N·m (660 kgf·cm, 48 ft·lbf)

13. JACK UP TRANSMISSION SLIGHTLY

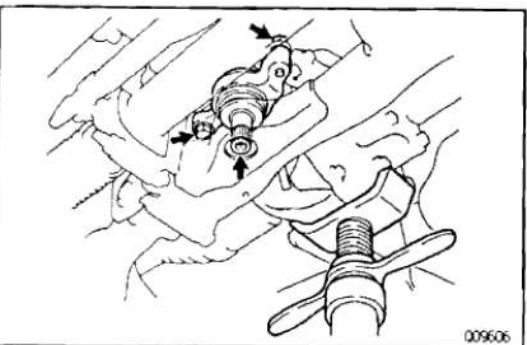
Using a transmission jack, support the transmission.

**14. DISCONNECT STABILIZER BAR**

(a) Remove the 2 set bolts and nuts of the stabilizer bar bracket.

Torque: 25 N·m (260 kgf·cm, 19 ft·lbf)

(b) Disconnect the stabilizer bar.

**15. REMOVE FRONT DIFFERENTIAL REAR MOUNTING CUSHION**

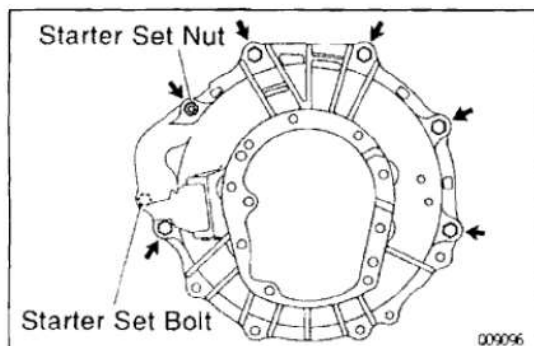
(a) Using a hexagon wrench, remove the nut.

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

(b) Remove the 2 bolts and rear mounting cushion.

Torque: 108 N·m (1,100 kgf·cm, 80 ft·lbf)

(c) Lift up the front differential to lower the companion flange side.



16. REMOVE STARTER

- (a) Remove the set bolt of the starter lower side with the clutch line bracket.

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

- (b) Disconnect the connector and wire, and remove the set nut of the starter upper side and starter.

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

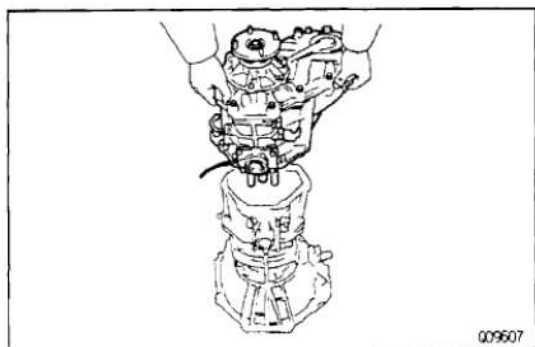
17. REMOVE TRANSMISSION WITH TRANSFER

- (a) Disconnect the wire harness from the transmission.
(b) Remove the 5 transmission mounting bolts from the engine.

Torque: 72 N·m (730 kgf·cm, 53 ft·lbf)

- (c) Pull out the transmission with the transfer down and toward the rear.

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18. REMOVE TRANSFER FROM TRANSMISSION

- (a) Disconnect the breather hose and remove the 8 transfer adaptor rear mounting bolts.

Torque: 24 N·m (240 kgf·cm, 17 ft·lbf)

- (b) Pull the transfer straight up and remove it from the transmission.

HINT: Take care not to damage the transfer adaptor oil seal with the transfer input gear spline.

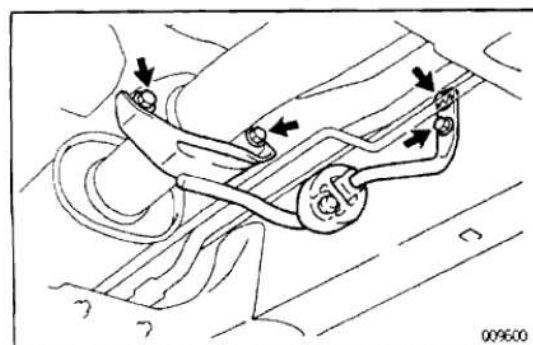
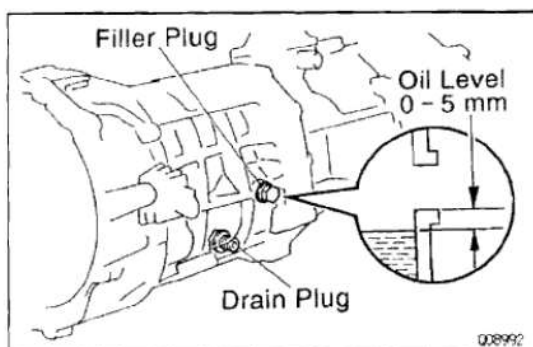
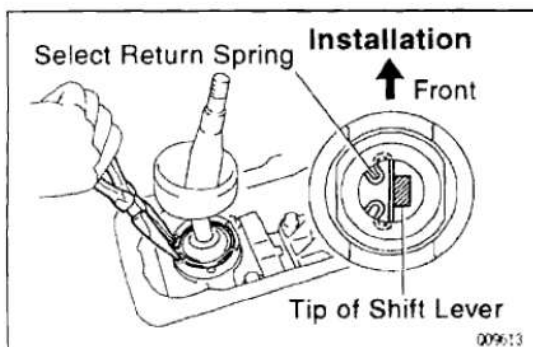
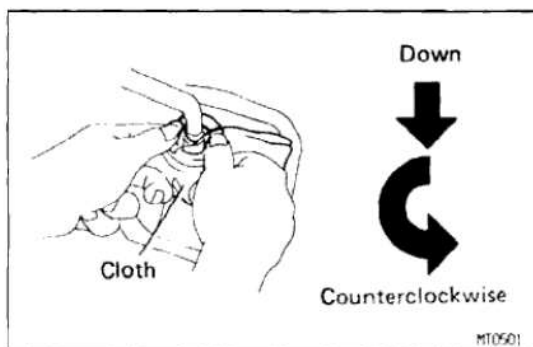
INSTALLATION HINT: Apply MP grease to the transfer adaptor oil seal.

MT03A-01

TRANSMISSION INSTALLATION

Installation is in the reverse order of removal.

HINT: After installation, do the road test.



TRANSMISSION REMOVAL

1. REMOVE TRANSMISSION SHIFT LEVER

- Remove the upper console panel.
- Remove the 4 screws, shift lever boot and retainer.
- Cover the shift lever cap with a cloth.
- Pressing down on the shift lever cap and rotate it counterclockwise to remove.
- Pull out the shift lever.

INSTALLATION HINT: Apply MP grease to the tip of the shift lever.

2. REMOVE TRANSFER SHIFT LEVER

Using pliers, remove the snap ring and pull out the shift lever.

HINT: Shift the transfer shift lever to the "HL" position.

INSTALLATION HINT: Apply MP grease to the tip of the shift lever.

3. RAISE VEHICLE AND DRAIN TRANSMISSION OIL

Oil grade: API GL-4 or GL-5

Viscosity: SAE 75W-90

Capacity: 2.2 liters (2.3 US qts, 1.9 Imp. qts)

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

4. REMOVE NO.1 AND NO.2 ENGINE UNDER COVERS

5. REMOVE FRONT AND REAR PROPELLER SHAFTS (See page PR-3)

6. REMOVE CLUTCH RELEASE CYLINDER AND LINE

Remove the 4 bolts and release cylinder and line.

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

7. DISCONNECT THESE CONNECTORS:

- Back-up light switch connector
- Speed sensor connector
- Center diff. lock position switch connector
- w/ ABS or / and Diff. Lock:
Low position switch connector

8. LHD:

REMOVE FRONT EXHAUST PIPE

- Disconnect the ring, remove the 2 bolts and support bracket.

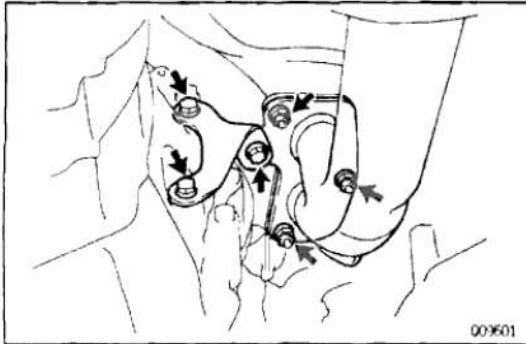
Torque: 19 N·m (190 kgf·cm, 14 ft·lbf)

- Remove the 2 bolts, bracket and gasket.

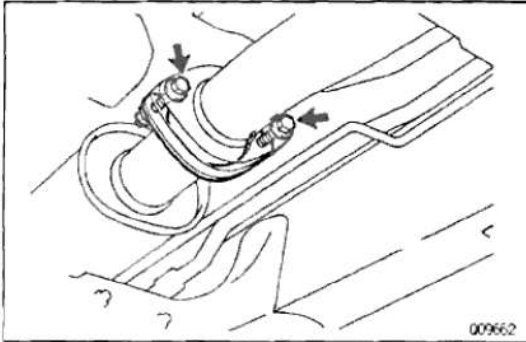
Torque: 48 N·m (490 kgf·cm, 35 ft·lbf)

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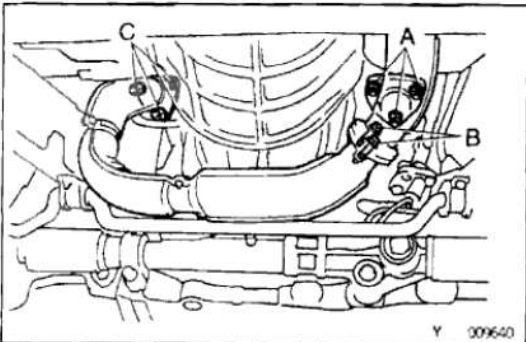
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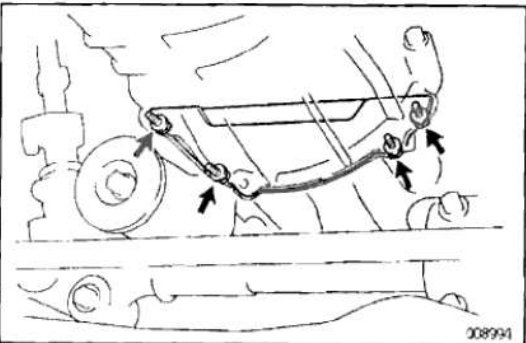
- (c) w/ Oxygen Sensor:
Disconnect the oxygen sensor connector.
- (d) Remove the 3 bolts and bracket.
Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)
- (e) Remove the 3 nuts, front exhaust pipe and 2 gaskets.
Torque: 62 N·m (630 kgf·cm, 46 ft·lbf)



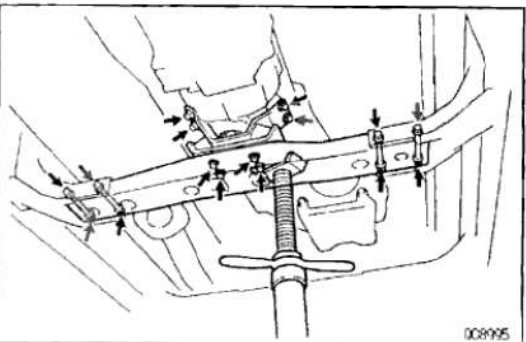
- 9. RHD:
REMOVE NO.1 AND NO.2 FRONT EXHAUST PIPES
- (a) Disconnect the ring, remove the 2 bolts and support bracket.
Torque: 19 N·m (190 kgf·cm, 14 ft·lbf)
- (b) Remove the 2 bolts, retainer and gasket.
Torque: 48 N·m (490 kgf·cm, 35 ft·lbf)
- (c) w/ Oxygen Sensor:
Disconnect the oxygen sensor connector.



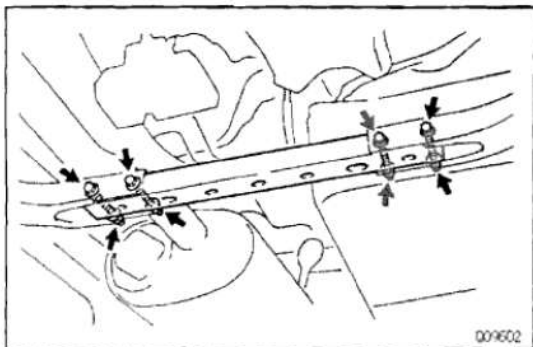
- (d) Remove the 3 nuts (A), 2 bolts (B), 2 gaskets and No.1 front exhaust pipe.
Torque:
Nut A: 62 N·m (630 kgf·cm, 46 ft·lbf)
Bolt B: 48 N·m (490 kgf·cm, 35 ft·lbf)
- (e) Remove the 3 nuts (C), gasket and No.2 front exhaust pipe.
Torque:
Nut C: 62 N·m (630 kgf·cm, 46 ft·lbf)



- 10. REMOVE REAR END PLATE
Remove the 4 bolts and rear end plate.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)



- 11. REMOVE NO.3 CROSSMEMBER
- (a) Support the transmission rear side.
- (b) Remove the 4 set bolts of the engine rear mounting.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)
- (c) Remove the 4 bolts, nuts and crossmember.
Torque: 65 N·m (660 kgf·cm, 48 ft·lbf)
- 12. REMOVE ENGINE REAR MOUNTING
Remove the 4 bolts and engine rear mounting from the transmission.
Torque: 65 N·m (650 kgf·cm, 48 ft·lbf)



13. 5 Door:

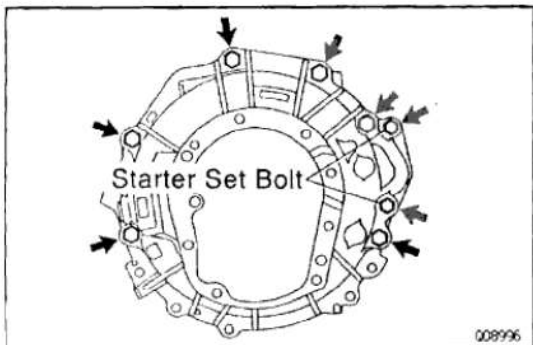
REMOVE NO.4 CROSSMEMBER

Remove the 4 bolts, nuts and crossmember.

Torque: 65 N·m (660 kgf·cm, 48 ft·lbf)

14. JACK UP TRANSMISSION SLIGHTLY

Using a transmission jack, support the transmission.



15. REMOVE STARTER

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

(b) Remove the 2 bolts and starter.

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

16. REMOVE TRANSMISSION WITH TRANSFER

(a) Disconnect the wire harness from the transmission.

(b) Remove the 6 transmission mounting bolts from the engine.

Torque: 72 N·m (730 kgf·cm, 53 ft·lbf)

(c) Pull out the transmission with the transfer down and toward the rear.

17. REMOVE TRANSFER FROM TRANSMISSION

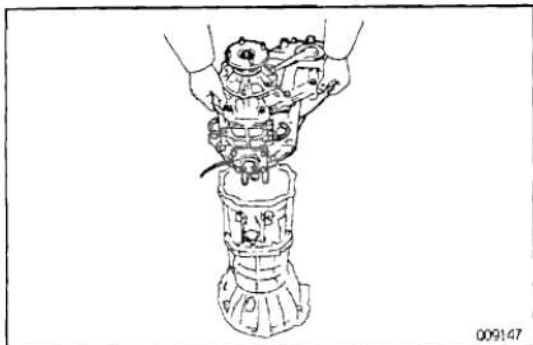
(a) Disconnect the breather hose and remove the 8 transfer adaptor rear mounting bolts.

Torque: 24 N·m (240 kgf·cm, 17 ft·lbf)

(b) Pull the transfer straight up and remove it from the transmission.

HINT: Take care not to damage the transfer adaptor oil seal with the transfer input gear spline.

INSTALLATION HINT: Apply MP grease to the transfer adaptor oil seal.



TRANSMISSION INSTALLATION

Installation is in the reverse order of removal.

HINT: After installation, do the road test.

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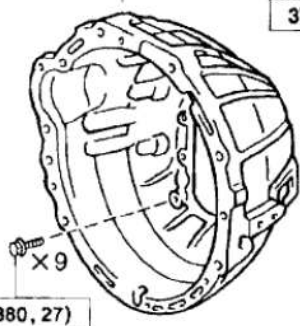
COMPONENT PARTS REMOVAL AND INSTALLATION

COMPONENTS

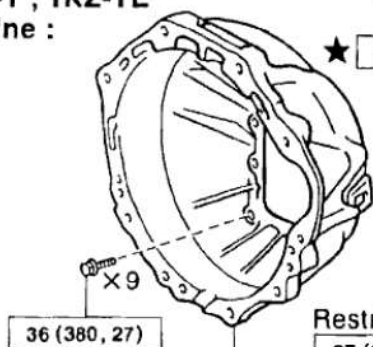
MT02D-0C

5VZ-FE Engine :

Clutch Housing



1KZ-T, 1KZ-TE Engine :



Clutch Housing

Back-Up Light Switch

44 (450, 32)

◆ Gasket

Drain Plug

37 (380, 27)

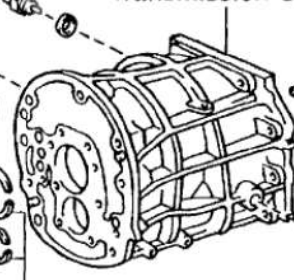
Front Bearing Retainer



Snap Ring

★ 17 (170, 12)

Transmission Case



★ Straight Screw Plug

19 (190, 14)

Spring

Ball

Intermediate Plate

Filler Plug

37 (380, 27)

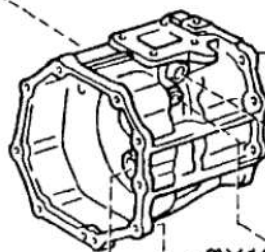
◆ Gasket



Control Shift Lever Retainer

◆ Oil Deflector

Transfer Adaptor



Restrict Pin

37 (380, 27)

★ Straight Screw Plug

19 (190, 14)

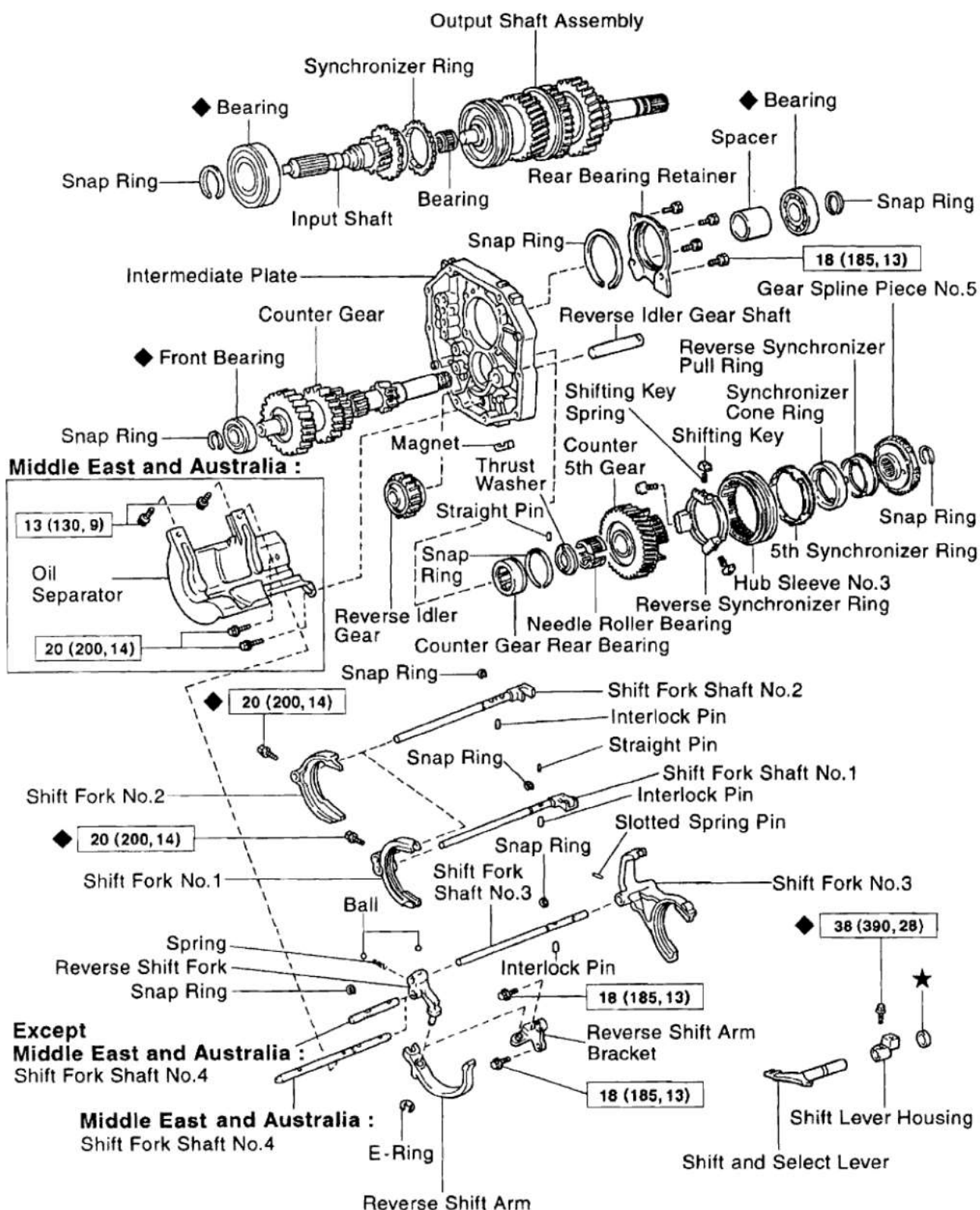
Oil Receiver

37 (380, 27)

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

◆ Non-reusable part

★ Precoated part



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

◆ Non-reusable part

★ Precoated part

BASIC SUBASSEMBLY SEPARATION

1. REMOVE BACK-UP LIGHT SWITCH

Torque: 44 N·m (450 kgf·cm, 32 ft·lbf)

2. REMOVE CLUTCH HOUSING

Remove the 9 bolts and clutch housing.

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

3. REMOVE CONTROL SHIFT LEVER RETAINER

Remove the 4 bolts, retainer and oil deflector.

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

4. REMOVE 2 RESTRICT PINS

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

5. REMOVE TRANSFER ADAPTOR

(a) Remove the shift lever housing set bolt.

Torque: 38 N·m (390 kgf·cm, 28 ft·lbf)

(b) Remove the 10 bolts.

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

(c) Using a plastic hammer, tap the transfer adaptor, remove the shift lever housing and shift and select lever.

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

6. REMOVE FRONT BEARING RETAINER

(a) Remove the 8 bolts.

Sealant: Part No.08833-000080, THREE BOND 1344, LOCTITE 242 or equivalent

Torque: 17 N·m (170 kgf·cm, 12 ft·lbf)

(b) Using a plastic hammer, tap the front bearing retainer.

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

7. REMOVE BEARING SNAP RING

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

8. SEPARATE INTERMEDIATE PLATE FROM TRANSMISSION CASE

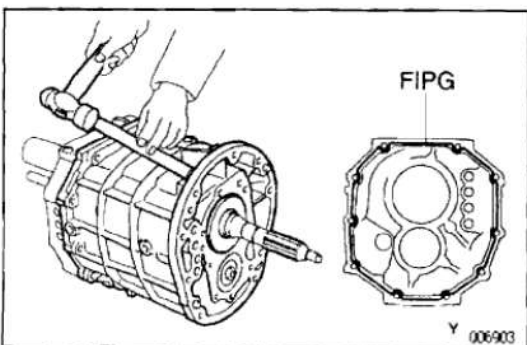
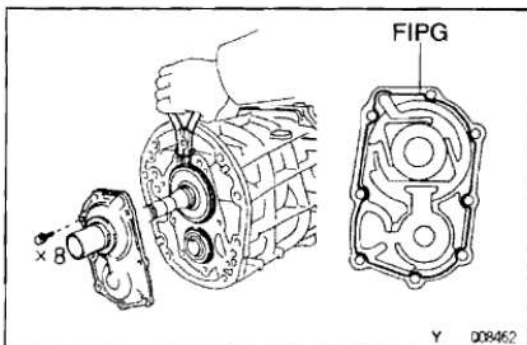
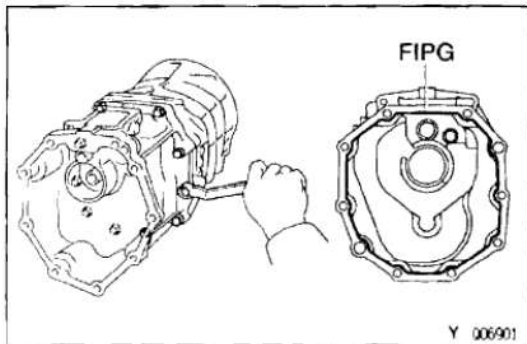
(a) Using a brass bar and hammer, carefully tap the transmission case.

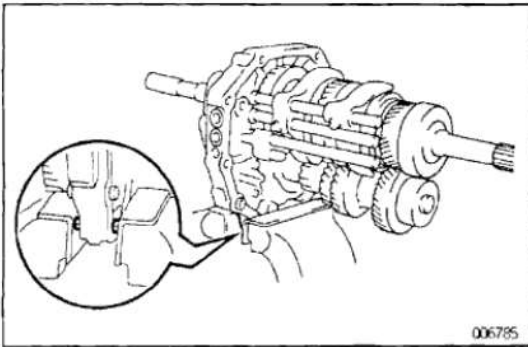
(b) Remove the transmission case from the intermediate plate.

INSTALLATION HINT: Align the each bearing outer race, each fork shaft end and reverse idler gear shaft end with the case installation holes.

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

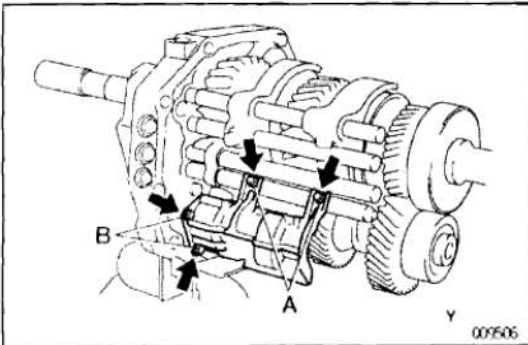
9. REMOVE MAGNET FROM INTERMEDIATE PLATE





10. MOUNT INTERMEDIATE PLATE IN VISE

- (a) Use the 2 clutch housing bolts, plate washers and suitable nuts, as shown.
INSTALLATION NOTICE: Increase or decrease plate washers so that the bolt tip does not protrude from the nut.
- (b) Mount the intermediate plate in a vise.



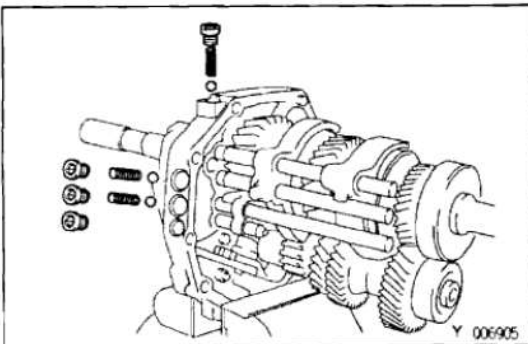
11. Middle East and Australia: REMOVE OIL SEPARATOR

Remove the 4 bolts and separator.

Torque:

Bolt A: 13 N·m (130 kgf·cm, 10 ft·lbf)

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



12. REMOVE STRAIGHT SCREW PLUG, LOCKING BALL AND SPRING

- (a) Using a hexagon wrench, remove the 4 plugs.
Sealant: Part No.08833 – 00080, THREE BOND 1344, LOCTITE 242 or equivalent
Torque: 19 N·m (190 kgf·cm, 14 ft·lbf)
- (b) Using a magnetic finger, remove the 3 springs and balls.

13. REMOVE SHIFT FORK SET BOLT

Remove the 2 bolts from the shift forks No.1 and No.2.

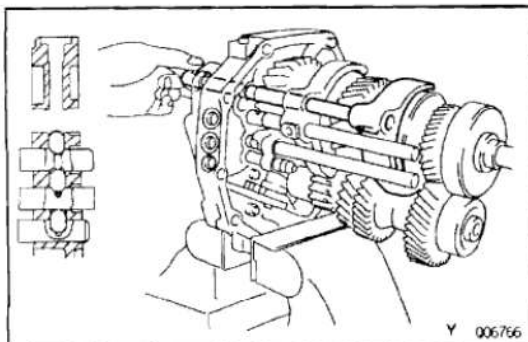
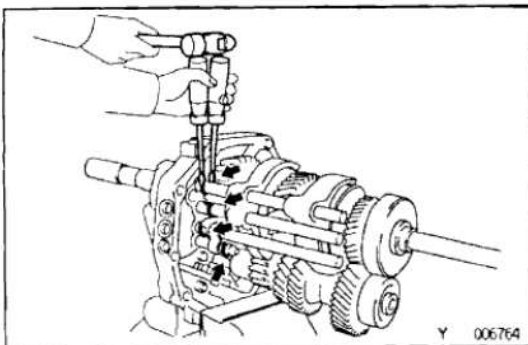
Torque: 20 N·m (200 kgf·cm, 14 ft·lbf)

14. REMOVE SLOTTED SPRING PIN

Using a pin punch and hammer, drive out the pin from the shift fork No.3.

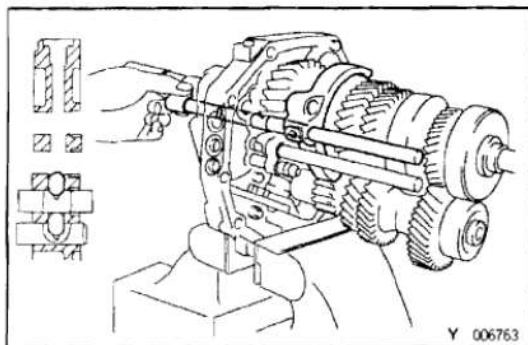
15. REMOVE SNAP RING

Using 2 screwdrivers and a hammer, tap out the 4 snap rings from each shift fork shaft.



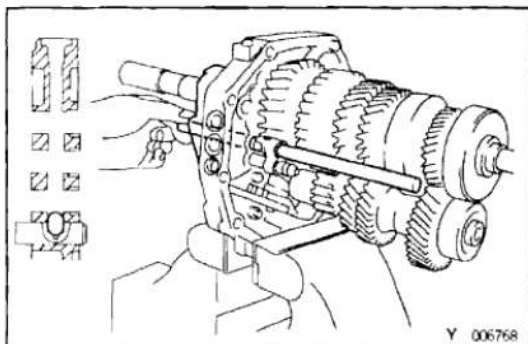
16. REMOVE SHIFT FORK SHAFT NO.2 AND SHIFT FORK NO.2

- (a) Pull out the shift fork shaft No.2 from the shift forks No.1, No.2 and intermediate plate.
- (b) Remove the shift fork No.2 from the groove of hub sleeve No.2.
- (c) Using a magnetic finger, remove the interlock pin from the intermediate plate.



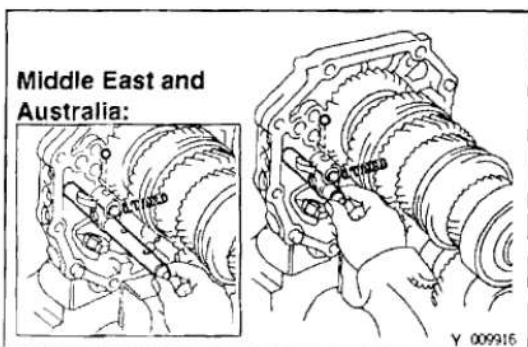
17. REMOVE SHIFT FORK SHAFT NO.1 AND SHIFT FORK NO.1

- Pull out the shift fork shaft No.1 with the straight pin from the shift fork No.1 and intermediate plate.
- Remove the shift fork No.1 from the groove of reverse gear.
- Using a magnetic finger, remove the interlock pin from the intermediate plate.



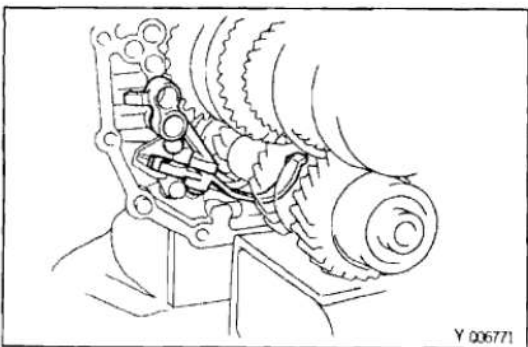
18. REMOVE SHIFT FORK SHAFT NO.3 AND SHIFT FORK NO.3

- Pull out the shift fork shaft No.3 from the shift fork No.3, reverse shift fork and intermediate plate.
- Remove the shift fork No.3 from the groove of hub sleeve No.3.
- Using a magnetic finger, remove the interlock pin from the intermediate plate.



19. REMOVE SHIFT FORK SHAFT NO.4

- Using a magnetic finger, remove the ball.
 - Pull out the shift fork shaft No.4 from the reverse shift fork and intermediate plate.
- REMOVAL NOTICE:** Take care of the ball in the reverse shift fork. It will spring out when you pull out the shift fork shaft No.4.
- Using a magnetic finger, remove the spring from the reverse shift fork.

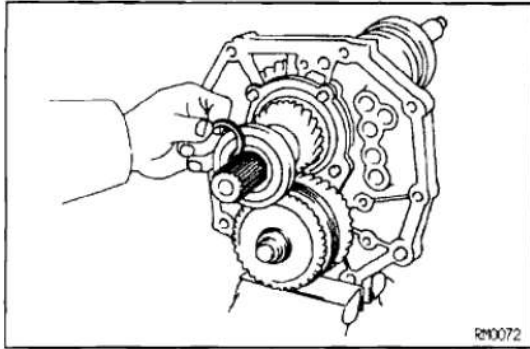


20. REMOVE REVERSE SHIFT FORK AND ARM

- Remove the reverse shift fork and arm.
INSTALLATION HINT: Align the reverse shift arm to the pivot of the reverse shift arm bracket.
- Using a screwdriver, remove the E-ring.
- Separate the reverse shift fork and arm.

21. REMOVE REVERSE SHIFT ARM BRACKET

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



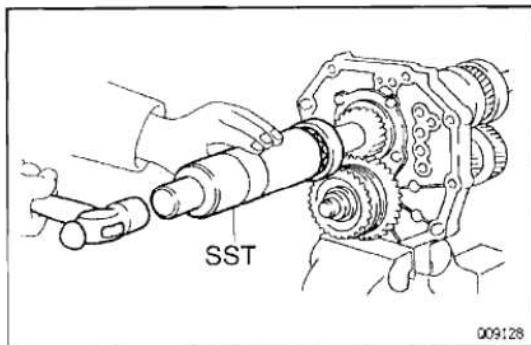
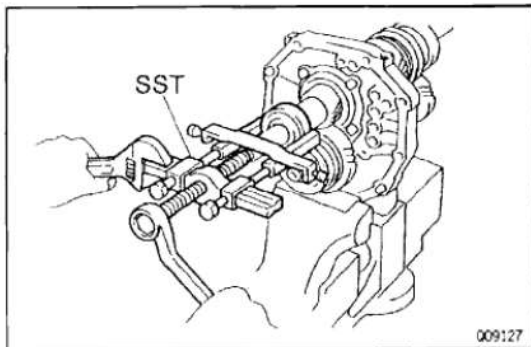
22. REMOVE OUTPUT SHAFT REAR BEARING

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

INSTALLATION HINT: Select a snap ring that will allow minimum axial play.

Mark	Thickness mm (in.)
A	2.65 — 2.70 (0.1043 — 0.1063)
B	2.70 — 2.75 (0.1063 — 0.1083)
C	2.75 — 2.80 (0.1083 — 0.1102)
D	2.80 — 2.85 (0.1102 — 0.1122)
E	2.85 — 2.90 (0.1122 — 0.1142)
F	2.90 — 2.95 (0.1142 — 0.1161)
G	2.95 — 3.00 (0.1161 — 0.1181)
H	3.00 — 3.05 (0.1181 — 0.1201)
J	3.05 — 3.10 (0.1201 — 0.1220)
K	3.10 — 3.15 (0.1220 — 0.1240)
L	3.15 — 3.20 (0.1240 — 0.1260)
M	3.20 — 3.25 (0.1260 — 0.1280)
N	3.25 — 3.30 (0.1280 — 0.1299)
P	3.30 — 3.35 (0.1299 — 0.1319)
Q	3.35 — 3.40 (0.1319 — 0.1339)
R	3.40 — 3.45 (0.1339 — 0.1358)
S	3.45 — 3.50 (0.1358 — 0.1378)

- (b) Using SST, remove the rear bearing.
SST 09950-40010



INSTALLATION HINT: Using SST and a hammer, drive in a new bearing.

SST 09316-60011

(09316-00011, 09316-00071)

23. REMOVE SPACER

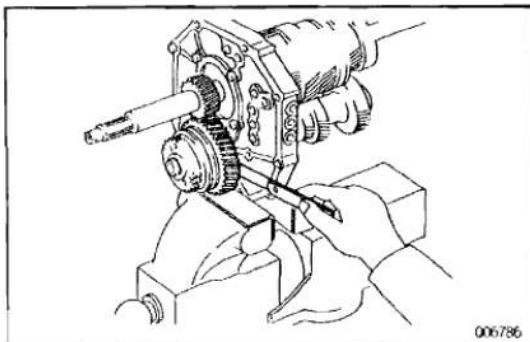
24. INSPECT COUNTER 5TH GEAR THRUST CLEARANCE

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

Standard clearance:

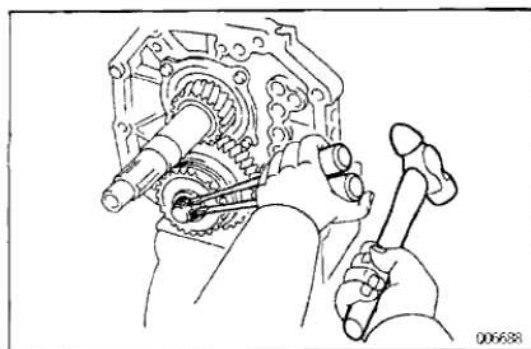
0.10 — 0.35 mm (0.0039 — 0.0138 in.)

Maximum clearance: 0.40 mm (0.0157 in.)



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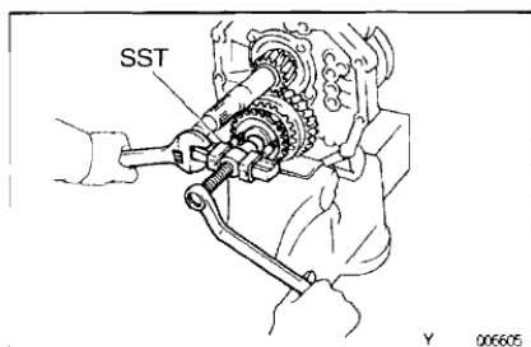


25. REMOVE GEAR SPLINE PIECE NO.5, SYNCHRONIZER RING, NEEDLE ROLLER BEARING AND COUNTER 5TH GEAR WITH HUB SLEEVE NO.3

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

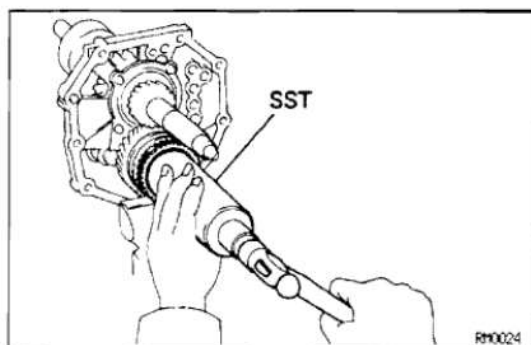
INSTALLATION HINT: Select a snap ring that will allow minimum axial play.

Mark	Thickness mm (in.)
A	2.80 - 2.85 (0.1102 - 0.1122)
B	2.85 - 2.90 (0.1122 - 0.1142)
C	2.90 - 2.95 (0.1142 - 0.1161)
D	2.95 - 3.00 (0.1161 - 0.1181)
E	3.00 - 3.05 (0.1181 - 0.1201)
F	3.05 - 3.10 (0.1201 - 0.1220)
G	3.10 - 3.15 (0.1220 - 0.1240)



- (b) Using SST, remove the gear spline piece No.5.
SST 09950-50010

- (c) Remove the counter 5th gear with the hub sleeve No.3.



INSTALLATION HINT:

- Using SST and a hammer, drive in the gear spline piece No.5 with the synchronizer ring slots aligned with the shifting keys.
SST 09316-60011 (09316-00011)
- When installing the gear spline piece No.5, support the counter gear in front with a 3-5 lb hammer or equivalent.

26. REMOVE THRUST WASHER AND BALL FROM COUNTER GEAR

27. REMOVE REAR BEARING RETAINER

Remove the 4 bolts and rear bearing retainer.

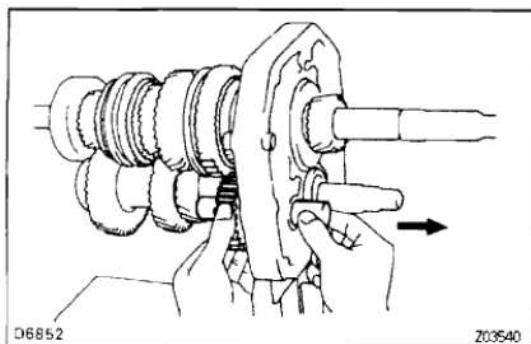
INSTALLATION HINT: Align the rear bearing retainer to the reverse idler gear shaft groove.

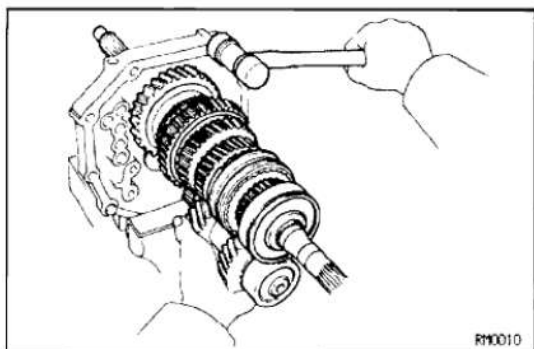
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

28. REMOVE REVERSE IDLER GEAR AND SHAFT

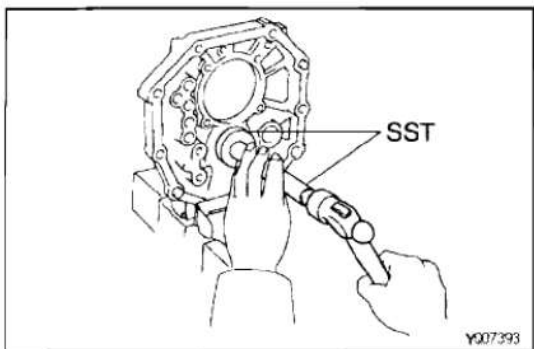
Pull out the shaft toward the rear.

INSTALLATION HINT: Align the reverse shift arm to the reverse idler gear shaft.





R10010



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29. REMOVE OUTPUT SHAFT CENTER BEARING SNAP RING

Using a snap ring expander, remove the snap ring.

30. REMOVE OUTPUT SHAFT AND COUNTER GEAR FROM INTERMEDIATE PLATE

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

31. REMOVE COUNTER REAR BEARING FROM INTERMEDIATE PLATE

Using SST and a hammer, remove the counter rear bearing.

SST 09950-60010 (09951-00620),
09950-70010 (09951-07150)

MT

BASIC SUBASSEMBLY REASSEMBLY

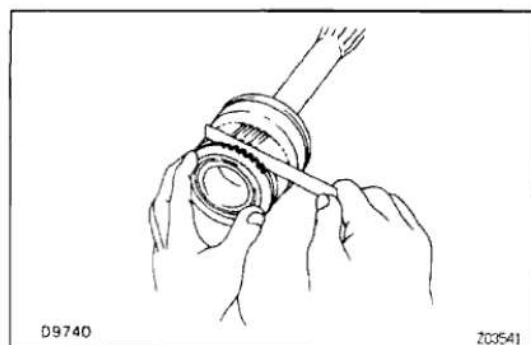
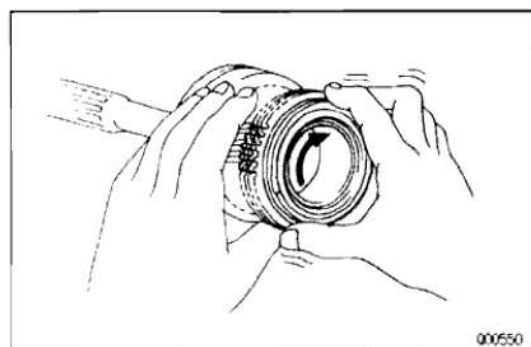
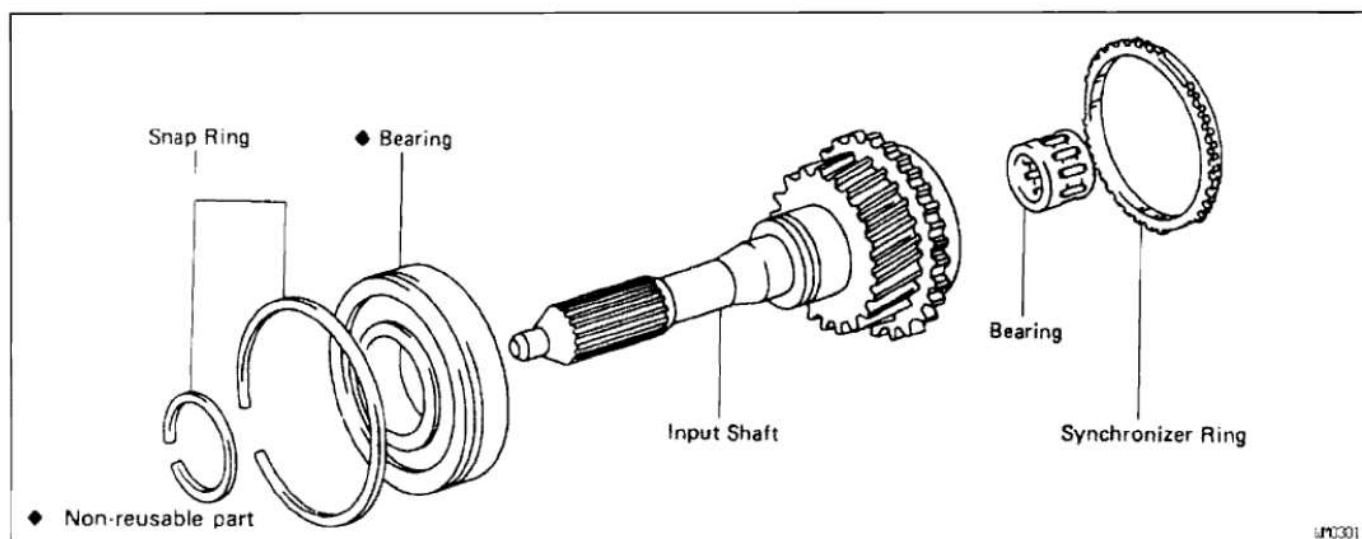
MT005-02

Reassembly is in the reverse order of separation.

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

INPUT SHAFT COMPONENTS

MT02F-06

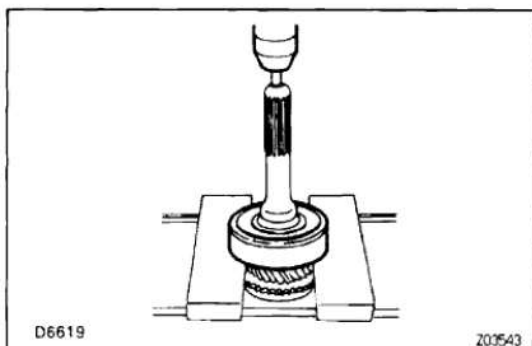


INPUT SHAFT INSPECTION

MT02G-0F

INSPECT SYNCHRONIZER RING

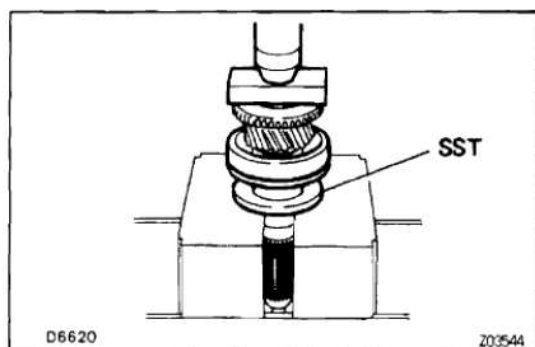
- Check for wear or damage.
- Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks. If the braking effect is insufficient, apply a small amount of fine lapping compound between the synchronizer ring and gear cone. Lightly rub the synchronizer ring and gear cone together.
NOTICE: Ensure the fine lapping compound is completely washed off after rubbing.
- Check again the braking effect of the synchronizer ring.
- Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.
Minimum clearance: 0.8 mm (0.031 in.)
If the clearance is less than the minimum, replace the synchronizer ring and gear cone by applying a small amount of fine lapping compound.
NOTICE: Ensure the fine lapping compound is completely washed off after rubbing.



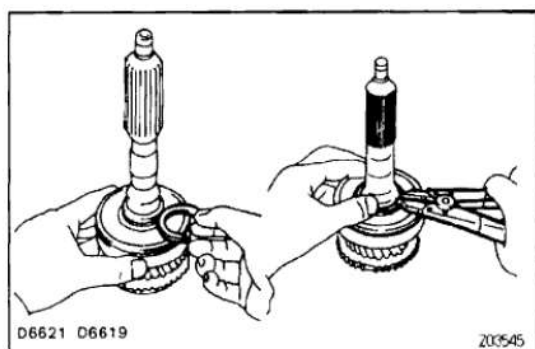
BEARING REPLACEMENT

IF NECESSARY, REPLACE INPUT SHAFT BEARING

- Using a snap ring expander, remove the snap ring.
- Using a press, remove the bearing.



- Using SST and a press, install a new bearing.
SST 09506-35010



- Select a snap ring that will allow minimum axial play.

Mark	Thickness mm (in.)
A	2.10 – 2.15 (0.0827 – 0.0846)
B	2.15 – 2.20 (0.0846 – 0.0866)
C	2.20 – 2.25 (0.0866 – 0.0886)
D	2.25 – 2.30 (0.0886 – 0.0906)
E	2.30 – 2.35 (0.0906 – 0.0925)
F	2.35 – 2.40 (0.0925 – 0.0945)
G	2.40 – 2.45 (0.0945 – 0.0965)

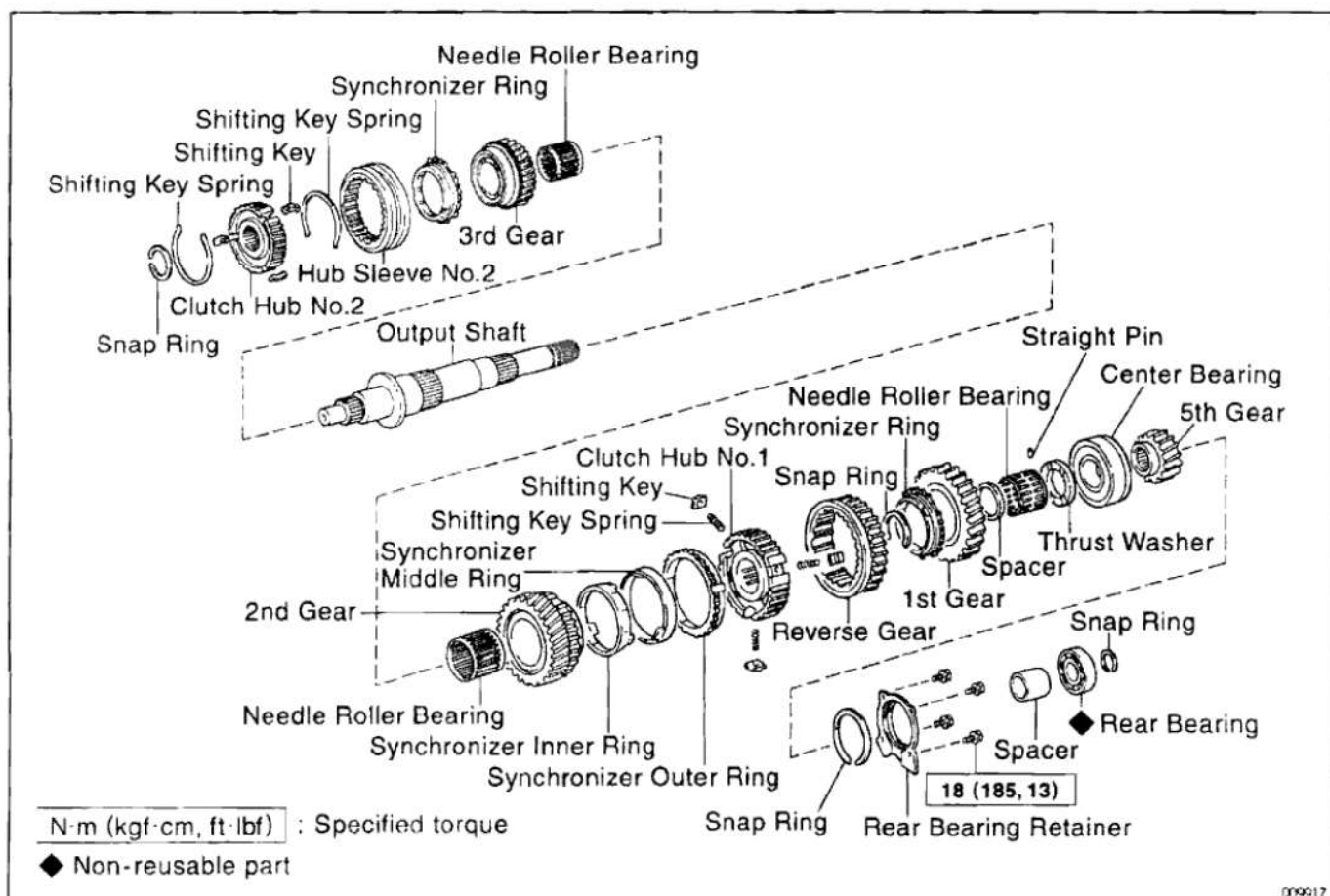
- Using a snap ring expander, install the snap ring.

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OUTPUT SHAFT COMPONENTS

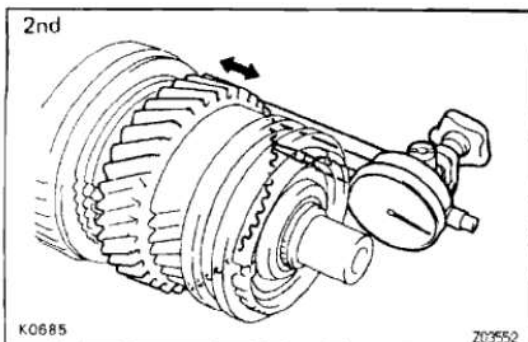
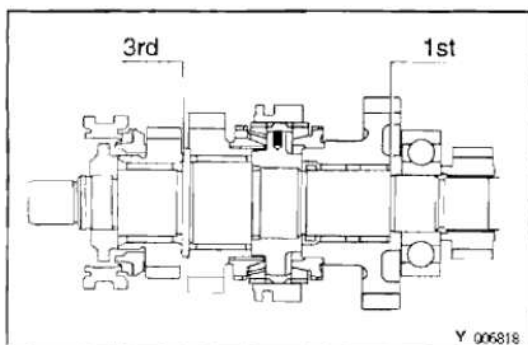
MT02J-06

MT



009917

MT06C-06



OUTPUT SHAFT DISASSEMBLY

1. INSPECT EACH GEAR THRUST CLEARANCE

Measure the thrust clearance of each gear.

Standard clearance:

1st gear: 0.15–0.45 mm (0.0059–0.0177 in.)

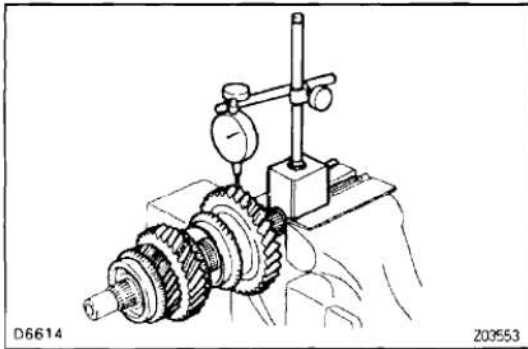
2nd and 3rd gears:

0.10–0.25 mm (0.0039–0.0098 in.)

Maximum clearance:

1st gear: 0.50 mm (0.0197 in.)

2nd and 3rd gears: 0.30 mm (0.0118 in.)



2. INSPECT EACH GEAR RADIAL CLEARANCE

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

Standard clearance:

1st gear: 0.020–0.073 mm (0.0008–0.0029 in.)

2nd and 3rd gears:

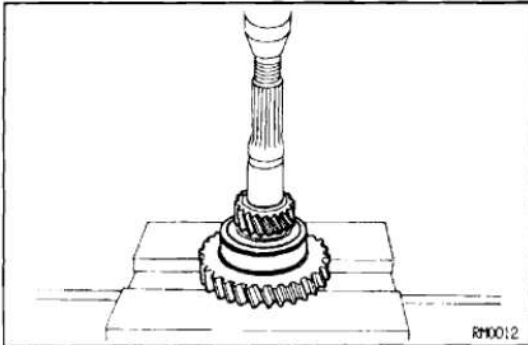
0.015–0.068 mm (0.0006–0.0027 in.)

Maximum clearance:

1st gear: 0.160 mm (0.0063 in.)

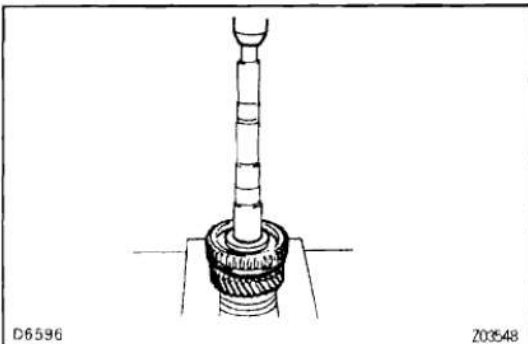
2nd and 3rd gears: 0.160 mm (0.0063 in.)

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



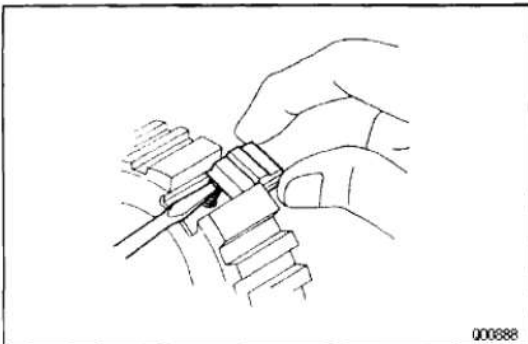
3. REMOVE 5 TH GEAR, OUTPUT SHAFT CENTER BEARING AND 1ST GEAR ASSEMBLY

- Using a press, remove the 5th gear, center bearing, thrust washer and 1st gear.
- Remove the synchronizer ring.
- Remove the straight pin and needle roller bearing.
- Remove the spacer.



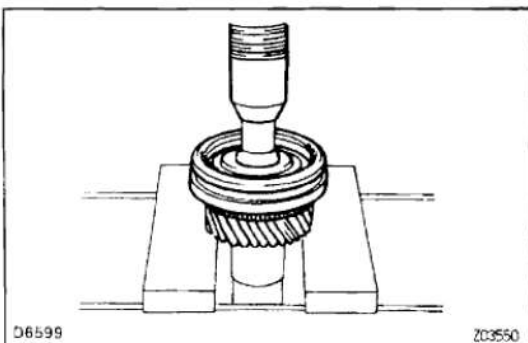
4. REMOVE REVERSE GEAR ASSEMBLY AND 2 ND GEAR ASSEMBLY

- Using 2 screwdrivers and a hammer, tap out the snap ring.
- Using a press, remove the reverse gear assembly and 2nd gear assembly.
- Remove the needle roller bearing.



5. REMOVE REVERSE GEAR, SHIFTING KEY AND SPRING FROM CLUTCH HUB NO.1

- Remove the reverse gear from the clutch hub No.1.
- Push the shifting key spring with a screwdriver, remove the 3 shifting keys and key springs.

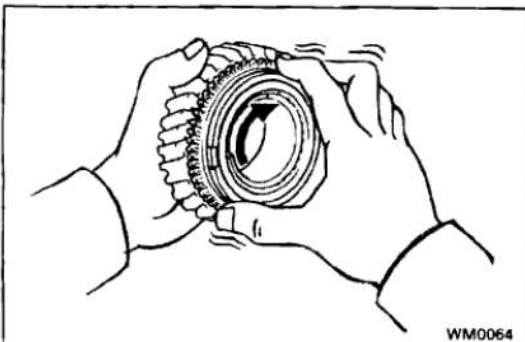
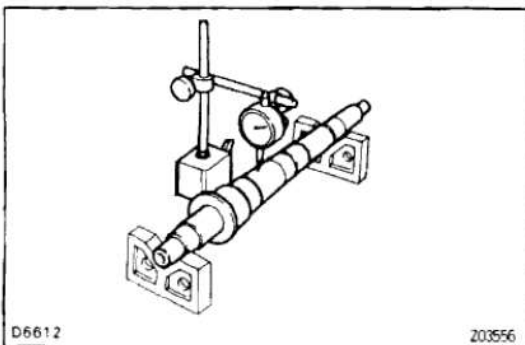
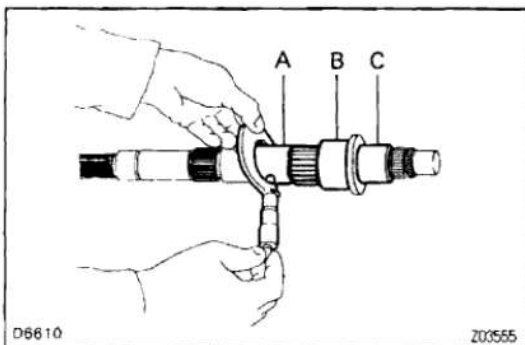
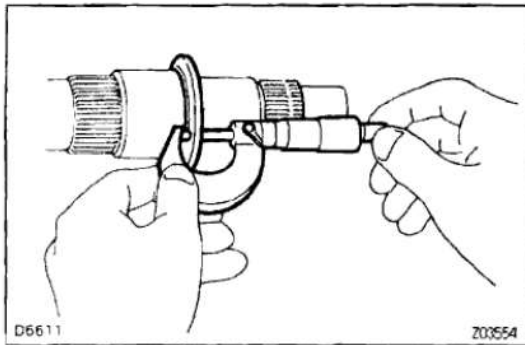


6. REMOVE HUB SLEEVE NO.2 ASSEMBLY AND 3RD GEAR ASSEMBLY

- Using a snap ring expander, remove the snap ring.
- Using a press, remove the hub sleeve No.2 assembly and 3rd gear assembly.
- Remove the needle roller bearing.

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

Using a screwdriver, remove the 3 shifting keys and 2 springs.



OUTPUT SHAFT COMPONENT PARTS INSPECTION

1. INSPECT OUTPUT SHAFT

- (a) Using a micrometer, measure the output shaft flange thickness.

Minimum thickness: 4.70 mm (0.1850 in.)

If the thickness is less than the minimum, replace the output shaft.

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

Minimum diameter:

A 1st gear: 38.860 mm (1.5299 in.)

B 2nd gear: 46.860 mm (1.8449 in.)

C 3rd gear: 37.860 mm (1.4905 in.)

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

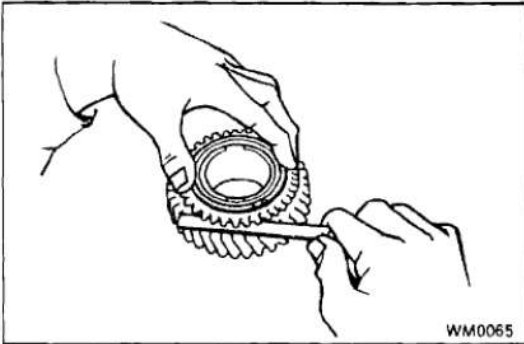
- (c) Using a dial indicator, check the shaft runout.

Maximum runout: 0.06 mm (0.0024 in.)

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

2. INSPECT 1ST AND 3RD GEARS SYNCHRONIZER RING

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



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

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

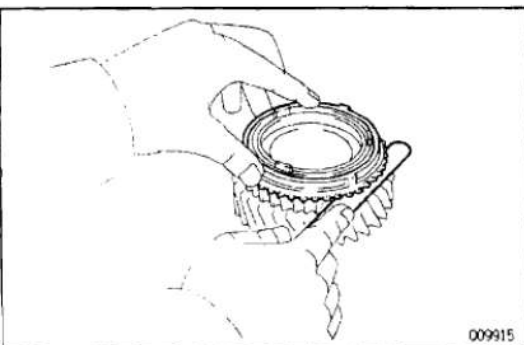
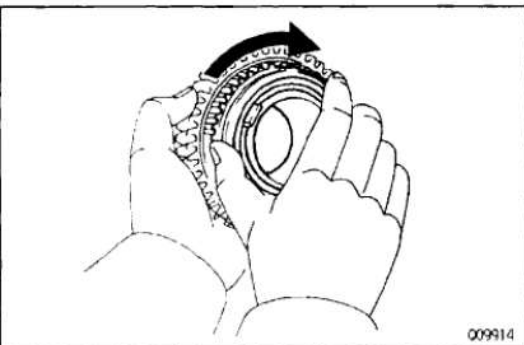
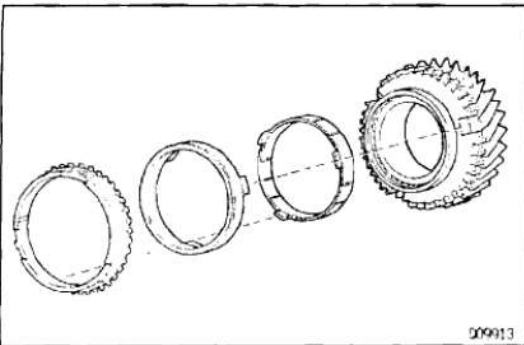
- (c) Check again the braking effect of the synchronizer ring.
- (d) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.
Minimum clearance: 0.8 mm (0.031 in.)

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

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

3. INSPECT 2ND GEAR SYNCHRONIZER RING

- (a) Check for wear or damage.
- (b) Install the synchronizer inner ring, middle ring and outer ring to each gear.
- (c) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks. If it does not lock, replace the synchronizer ring.



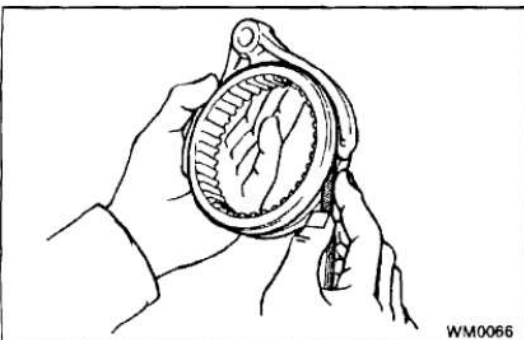
- (d) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.
Minimum clearance: 0.8 mm (0.031 in.)
If the clearance is less than the minimum, replace the synchronizer ring.

4. INSPECT SHIFT FORK AND HUB SLEEVE CLEARANCE

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

Maximum clearance: 1.0 mm (0.039 in.)

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



OUTPUT SHAFT ASSEMBLY

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

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

- (a) Install the clutch hub No.2 and shifting keys to the hub sleeve No.2.
- (b) Install the shifting key springs under the shifting keys. **NOTICE:** Position the key springs so that their end gaps are not in line.

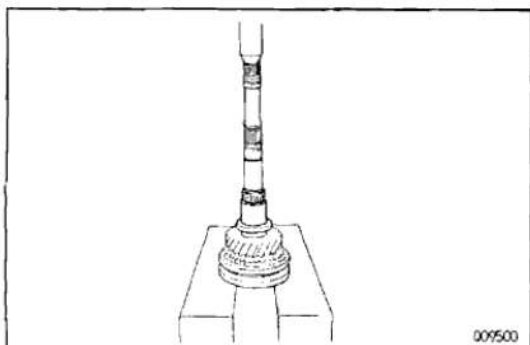
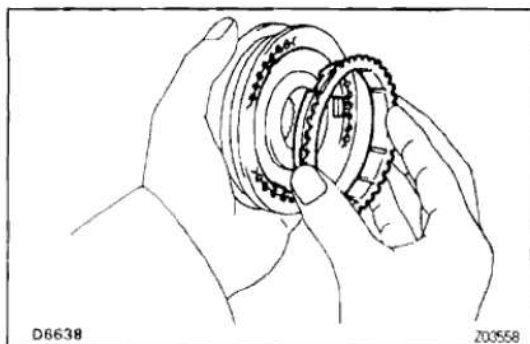
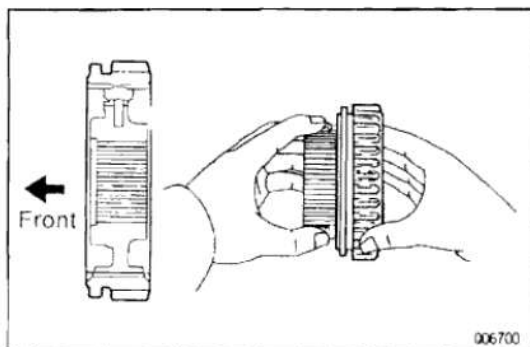
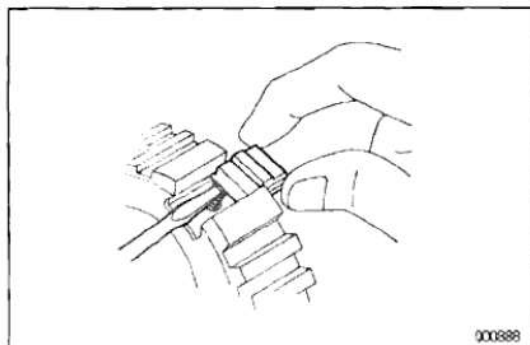
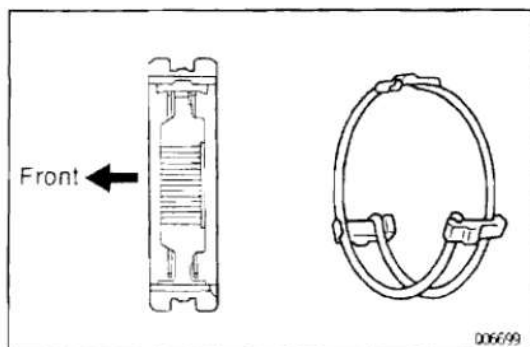
2. INSTALL CLUTCH HUB NO.1 INTO REVERSE GEAR

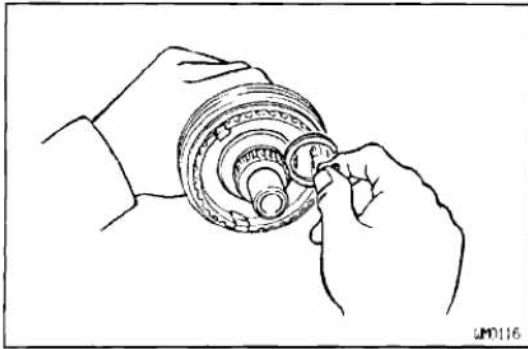
- (a) Install the 3 shifting key springs to the clutch hub No.1.
- (b) While pushing the shifting key spring with a screwdriver, install the 3 shifting keys.

- (c) While pushing the 3 shifting keys, install the clutch hub No.1 to the reverse gear, as shown.

3. INSTALL 3RD GEAR AND HUB SLEEVE NO.2 ON OUTPUT SHAFT

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





4. INSTALL SNAP RING

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

Mark	Thickness mm (in.)
A	1.80 – 1.85 (0.0709 – 0.0728)
B	1.85 – 1.90 (0.0728 – 0.0748)
C	1.90 – 1.95 (0.0748 – 0.0768)
D	1.95 – 2.00 (0.0768 – 0.0787)
E	2.00 – 2.05 (0.0787 – 0.0807)
F	2.05 – 2.10 (0.0807 – 0.0827)
G	2.10 – 2.15 (0.0827 – 0.0846)

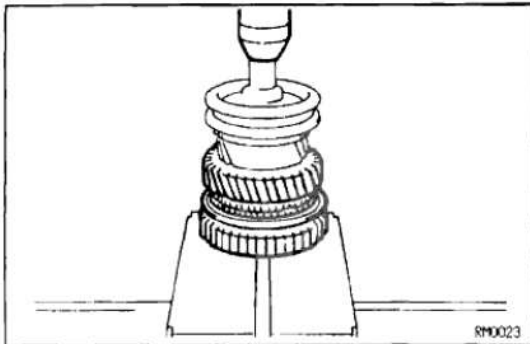
- (b) Using a snap ring expander, install the snap ring.

5. INSPECT 3RD GEAR THRUST CLEARANCE

(See page MT-24)

6. INSTALL 2ND GEAR AND REVERSE GEAR

- (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) Align the projection of the synchronizer inner ring with the slots of the clutch hub No.1.
 (d) Install the needle roller bearing in the 2nd gear.
 (e) Using a press, install the 2nd gear assembly and reverse gear assembly.



7. INSTALL SNAP RING

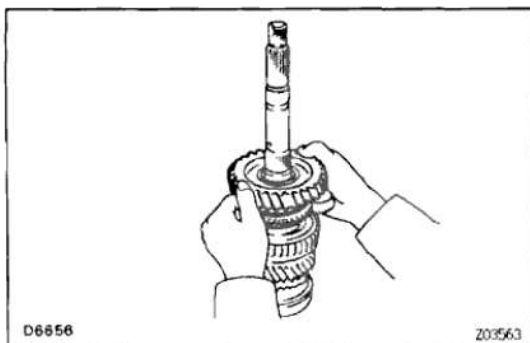
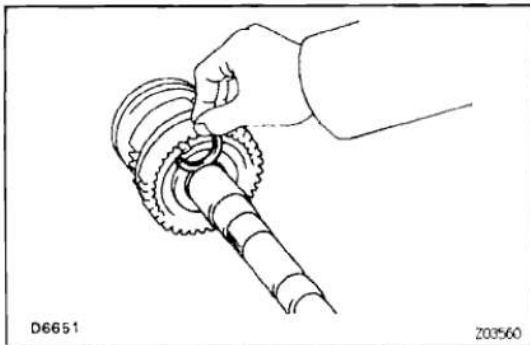
- (a) Select a snap ring that will allow minimum axial play.

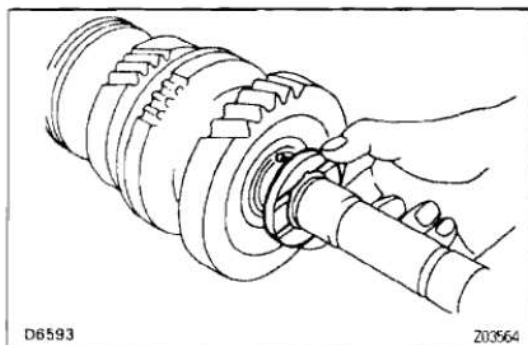
Mark	Thickness mm (in.)
A	2.30 – 2.35 (0.0906 – 0.0925)
B	2.35 – 2.40 (0.0925 – 0.0945)
C	2.40 – 2.45 (0.0945 – 0.0965)
D	2.45 – 2.50 (0.0965 – 0.0984)
E	2.50 – 2.55 (0.0984 – 0.1004)
F	2.55 – 2.60 (0.1004 – 0.1024)
G	2.60 – 2.65 (0.1024 – 0.1043)

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

8. INSTALL SPACER AND 1ST GEAR ASSEMBLY

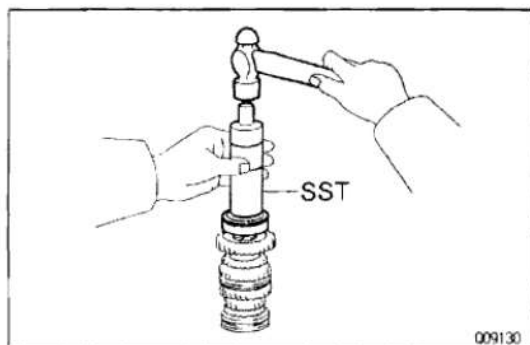
- (a) Install the spacer on the output shaft.
 (b) Apply gear oil to the needle roller bearing.
 (c) Assemble the 1st gear, synchronizer ring and needle roller bearing.
 (d) Install the assembly on the output shaft with the synchronizer ring slots aligned with the shifting keys.





9. INSTALL STRAIGHT PIN AND 1ST GEAR THRUST WASHER

Install the 1st gear thrust washer onto the output shaft with the straight pin aligned with the 1st gear thrust washer.



10. INSTALL OUTPUT SHAFT CENTER BEARING

Using SST and a hammer, drive in the bearing with the outer race snap ring groove toward the rear.

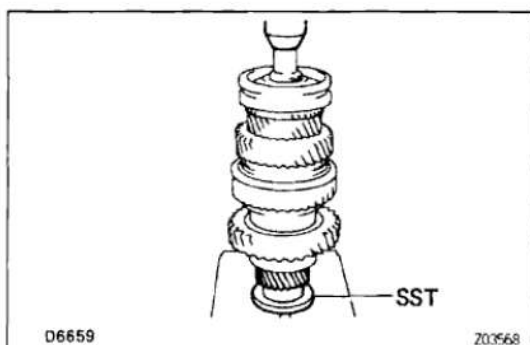
SST 09316-60011 (09316-00011, 09316-00071)

11. INSPECT 1ST GEAR THRUST CLEARANCE

(See page MT-24)

12. INSPECT 2ND GEAR THRUST CLEARANCE

(See page MT-24)



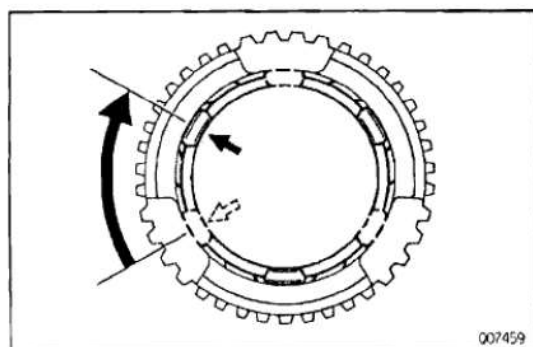
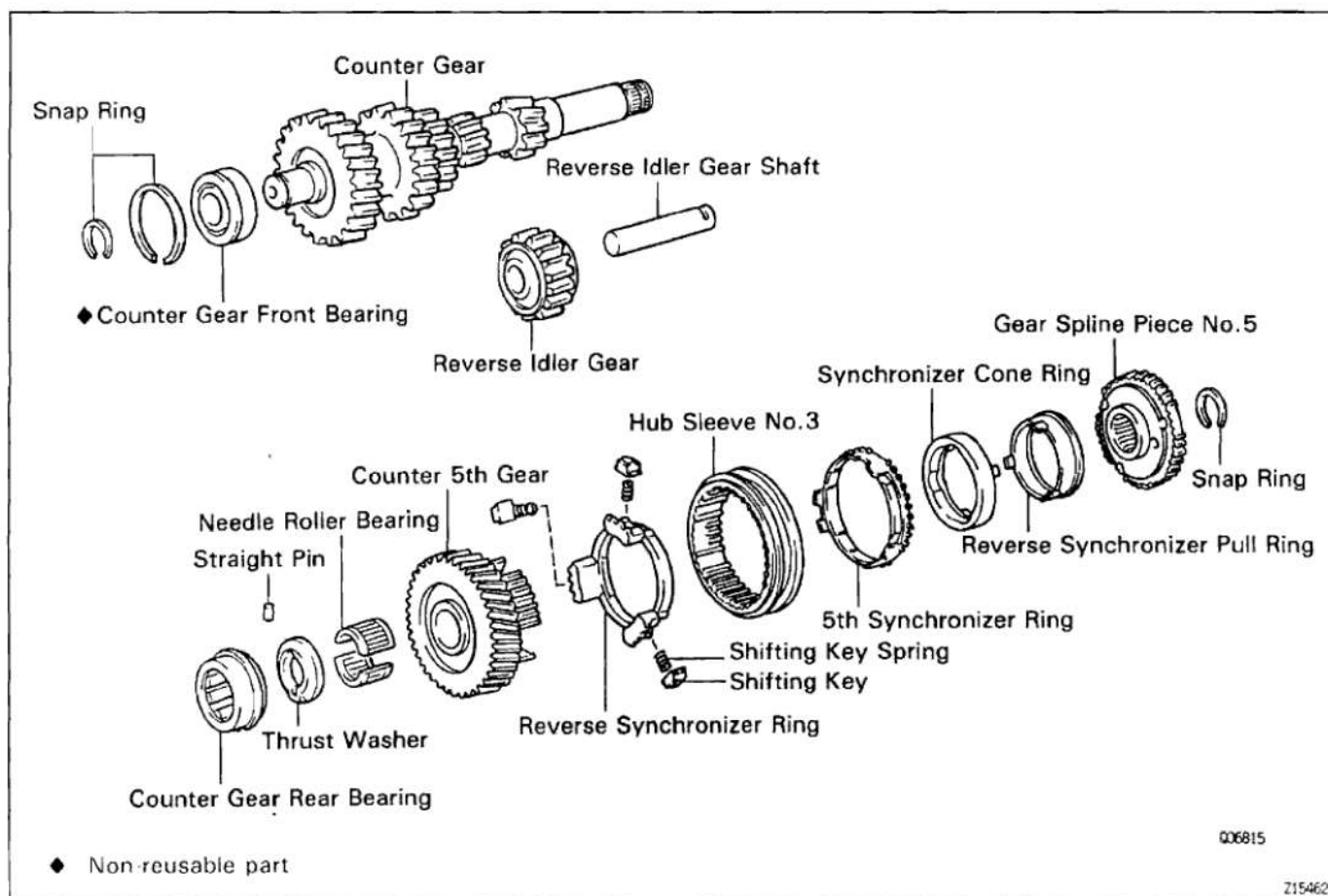
13. INSTALL 5TH GEAR

Using SST and a press, install the 5th gear.

SST 09316-60011 (09316-00031)

COUNTER GEAR AND REVERSE IDLER GEAR COMPONENTS

MT02N-06

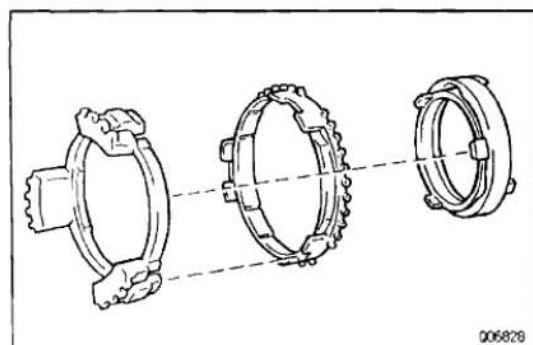


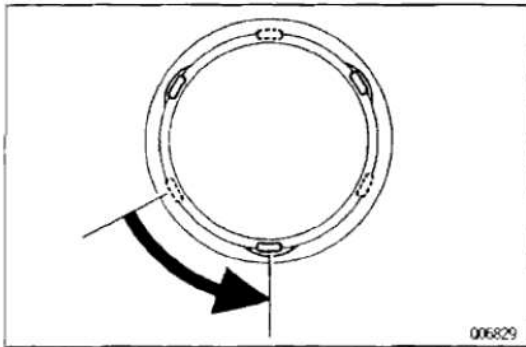
COUNTER GEAR COMPONENT PARTS DISASSEMBLY

MT08F-04

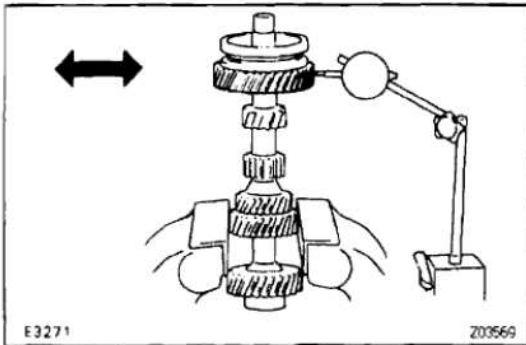
REMOVE HUB SLEEVE NO.3, SHIFTING KEY AND SPRING FROM SYNCHRONIZER RING

- Remove the synchronizer ring assembly from the hub sleeve No.3.
- Turn the reverse synchronizer pull ring.
- Remove the reverse synchronizer ring and 5th synchronizer ring from the synchronizer pull ring and cone ring.





- (d) Turn the reverse synchronizer pull ring, separate the pull ring and cone ring.
- (e) Push the shifting key and spring, and remove the 3 shifting keys and springs to the reverse synchronizer ring.



COUNTER GEAR AND REVERSE IDLER GEAR COMPONENT PARTS INSPECTION

1. INSPECT 5TH GEAR RADIAL CLEARANCE

- (a) Install the spacer, counter 5th gear and needle roller bearings.
- (b) Using a dial indicator, measure the counter 5th gear radial clearance.

Standard clearance:

0.015 — 0.068 mm (0.0006 — 0.0027 in.)

Maximum clearance: 0.160 mm (0.0063 in.)

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

2. INSPECT COUNTER GEAR

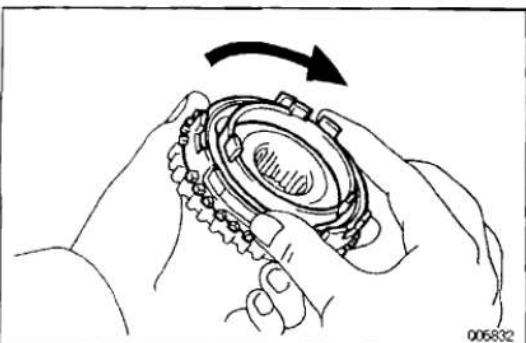
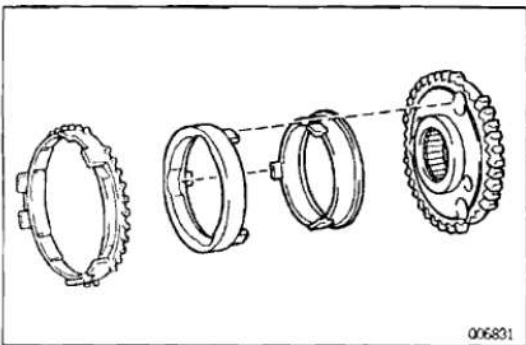
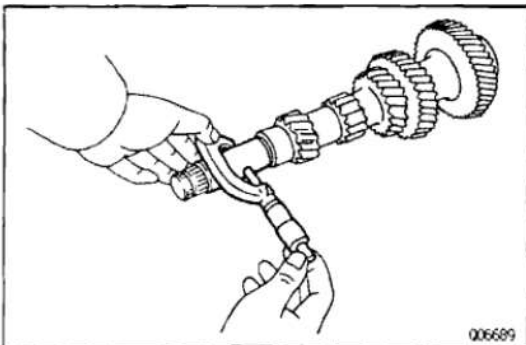
Using a micrometer, measure the outer diameter of the counter gear journal.

Minimum diameter: 27.860 mm (1.0968 in.)

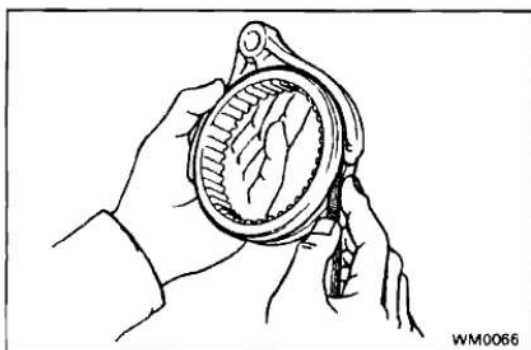
If the outer diameter is less than the minimum, replace the counter gear.

3. INSPECT 5TH SYNCHRONIZER RING

- (a) Check for wear or damage.
- (b) Install the synchronizer pull ring, cone ring and outer ring to the gear spline piece No.5.



- (c) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks. If it does not lock, replace the synchronizer ring.

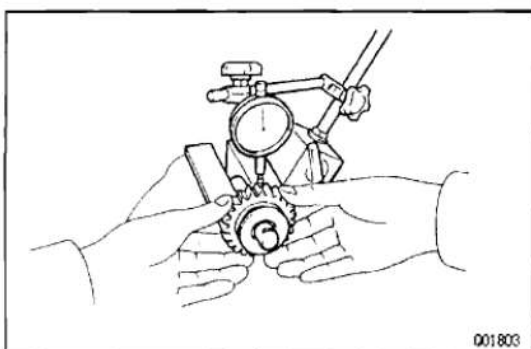


4. INSPECT SHIFT FORK AND HUB SLEEVE CLEARANCE

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

Maximum clearance: 1.0 mm (0.039 in.)

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



5. INSPECT REVERSE IDLER GEAR RADIAL CLEARANCE

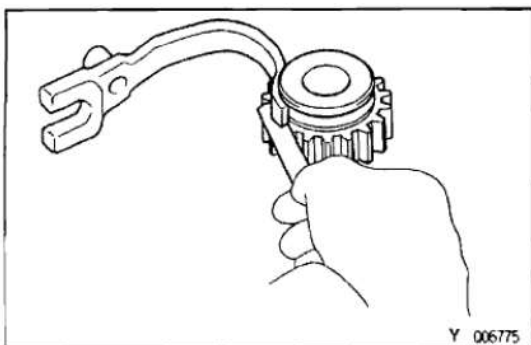
Using a dial indicator, measure the reverse idler gear radial clearance.

Standard clearance:

0.040–0.082 mm (0.0016–0.0032 in.)

Maximum clearance: 0.130 mm (0.0051 in.)

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



6. INSPECT REVERSE IDLER GEAR AND SHIFT ARM CLEARANCE

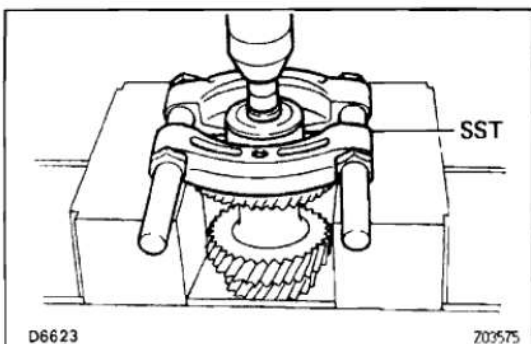
Using a feeler gauge, measure the clearance between the reverse idler gear and shift arm.

Standard clearance:

0.05–0.35 mm (0.0020–0.0138 in.)

Maximum clearance: 0.50 mm (0.0197 in.)

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



BEARING REPLACEMENT

MT02R-06

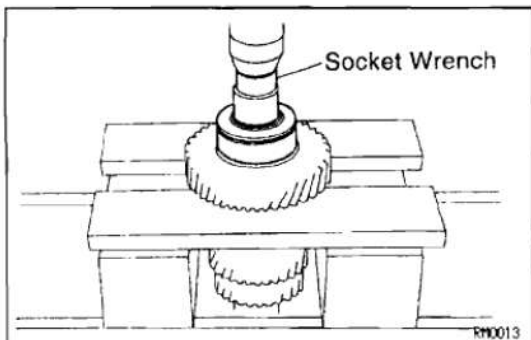
IF NECESSARY, REPLACE COUNTER GEAR FRONT BEARING

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

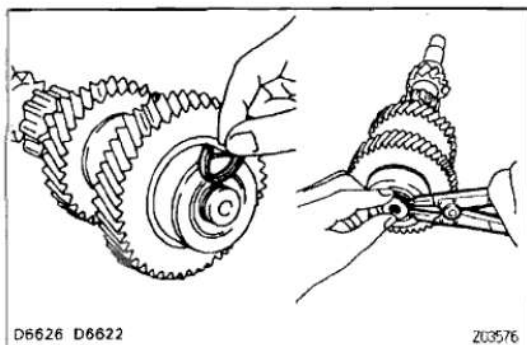
(b) Using SST and a press, remove the bearing.

SST 09950–00020

(c) Replace the side race.



(d) Using a socket wrench and press, install a new bearing and side race.



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

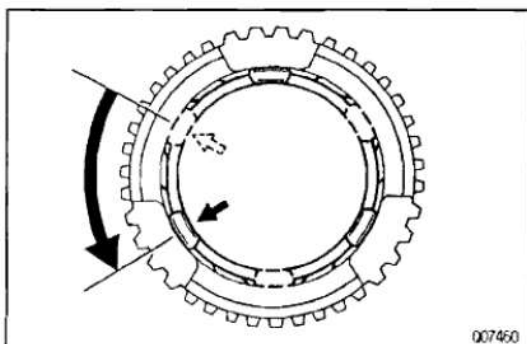
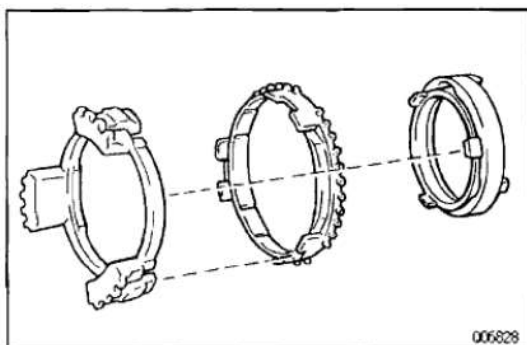
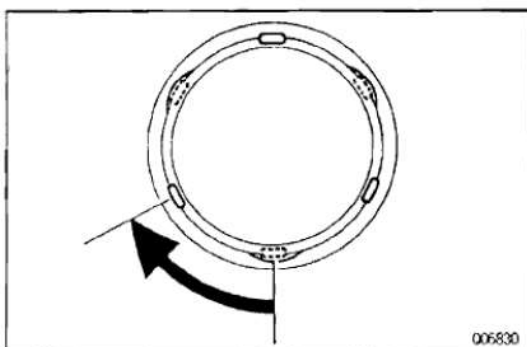
Mark	Thickness mm (in.)
A	2.00 – 2.05 (0.0787 – 0.0807)
B	2.05 – 2.10 (0.0807 – 0.0827)
C	2.10 – 2.15 (0.0827 – 0.0846)
D	2.15 – 2.20 (0.0846 – 0.0866)
E	2.20 – 2.25 (0.0866 – 0.0886)
F	2.25 – 2.30 (0.0886 – 0.0906)

- (f) Using a snap ring expander, install the snap ring. MT080-08

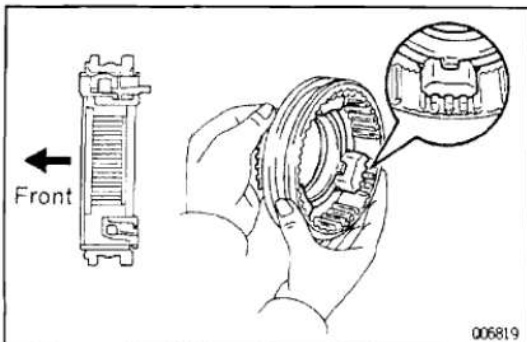
COUNTER GEAR COMPONENT PARTS ASSEMBLY

INSTALL SYNCHRONIZER RING ASSEMBLY TO HUB SLEEVE NO.3

- Put the key spring to the hole of the shifting key.
- Push the 3 shifting keys with the 3 key springs to the reverse synchronizer ring.
- Install the synchronizer cone ring to the reverse synchronizer pull ring and turn the pull ring.
- Install the 5th synchronizer ring.
- Install the reverse synchronizer ring.



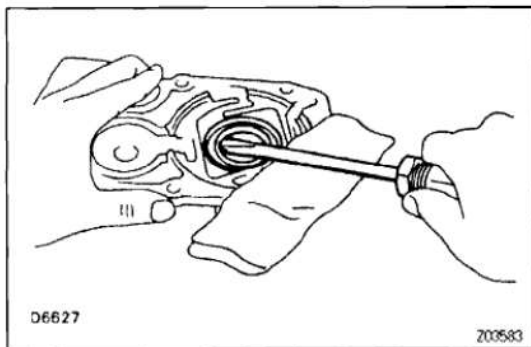
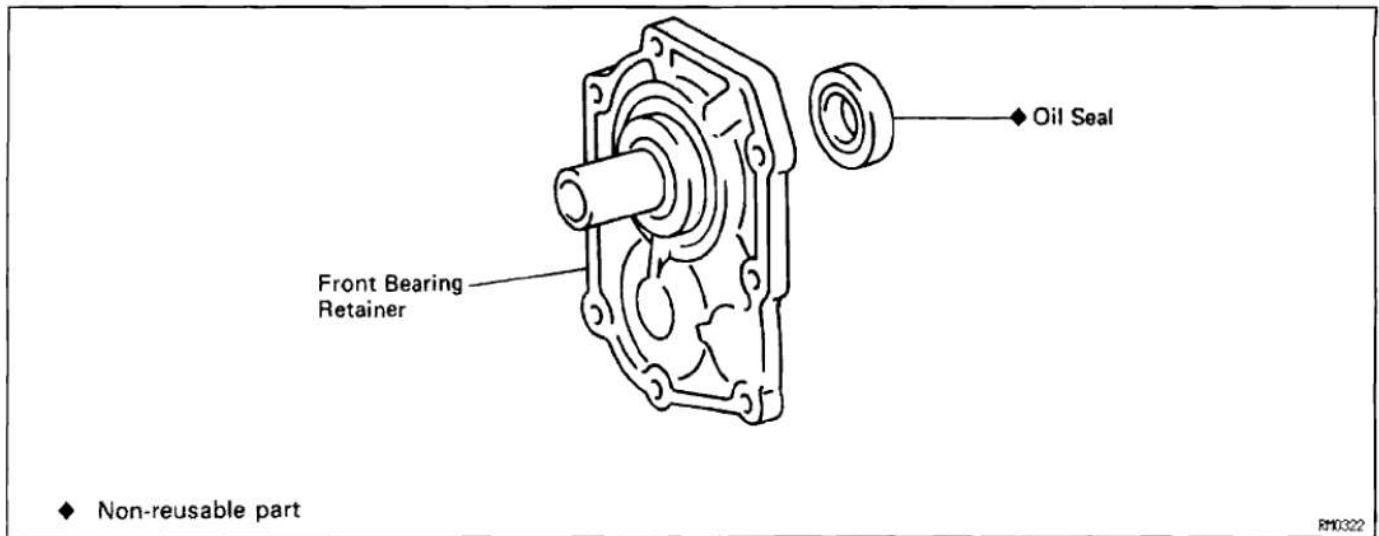
- (f) Turn the reverse synchronizer pull ring.



- (g) While pushing the 3 shifting keys, install the synchronizer ring assembly to the hub sleeve No.3.

FRONT BEARING RETAINER COMPONENTS

MT02T-04

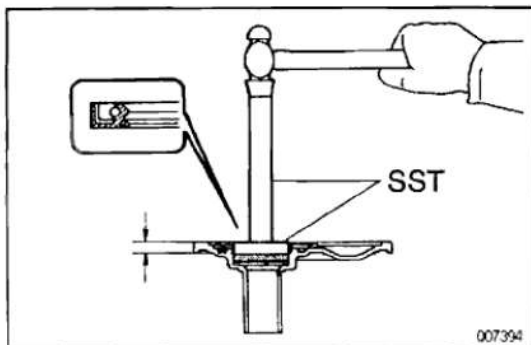


OIL SEAL REPLACEMENT

MT02U-04

IF NECESSARY, REPLACE FRONT BEARING RETAINER OIL SEAL

- (a) Using a screwdriver, pry out the oil seal.
- (b) Using SST and a hammer, drive in a new oil seal.
 SST 09950-60010 (09951-00510),
 09950-70010 (09951-07150)
Drive in depth: 11.7 ± 0.5 mm (0.461 ± 0.020 in.)
from retainer end

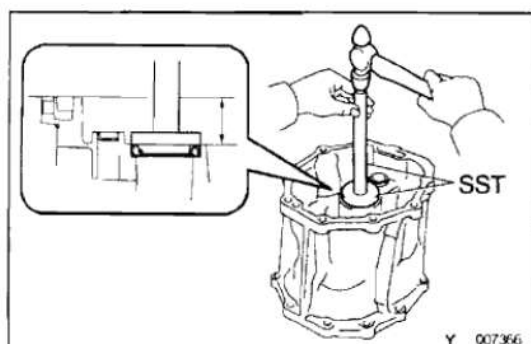
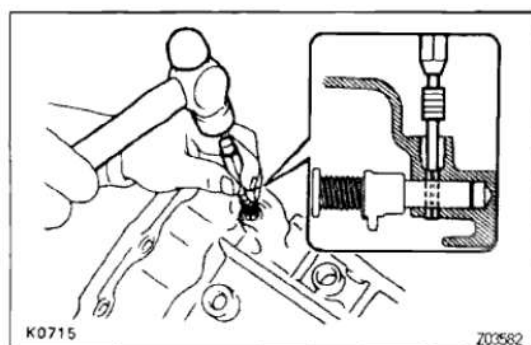
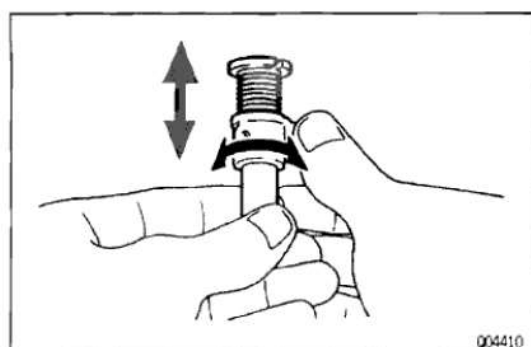
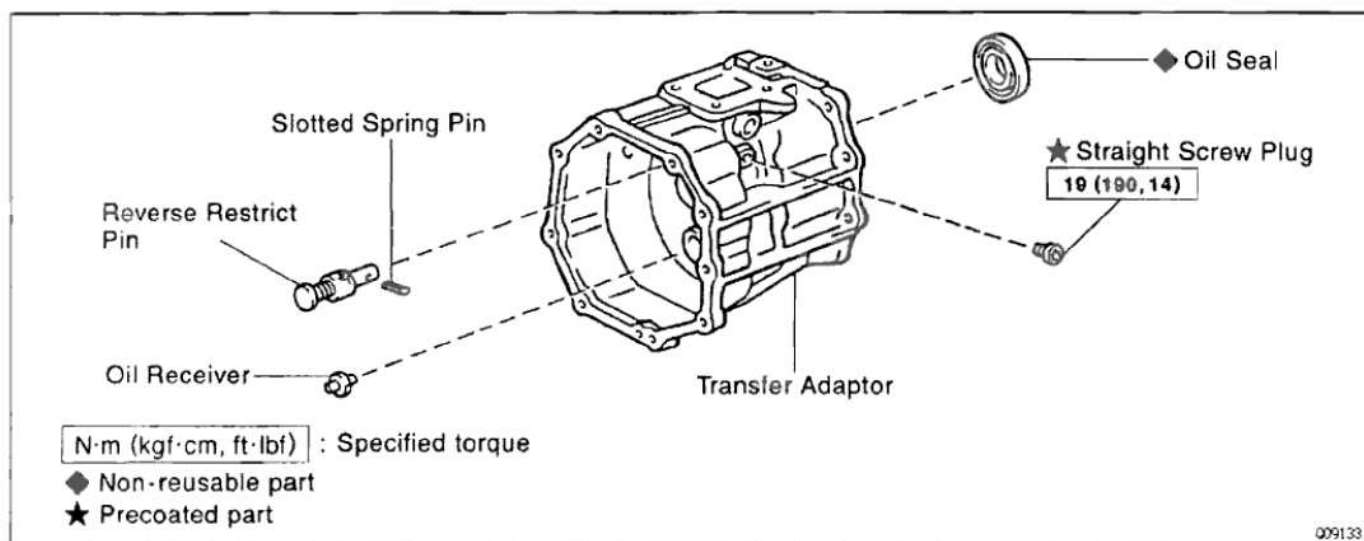


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TRANSFER ADAPTOR COMPONENTS

MT02V-0A



REVERSE RESTRICT PIN REPLACEMENT

MT08H-05

1. REMOVE REVERSE RESTRICT PIN

- Using a torx socket wrench (T40), remove the plug.
- Using a pin punch and hammer, drive out the slotted spring pin.
- Remove the reverse restrict pin.

2. INSPECT REVERSE RESTRICT PIN

Turn and push the reverse restrict pin by hand. Check for smooth operation.

3. INSTALL REVERSE RESTRICT PIN

- Install the reverse restrict pin to the transfer adaptor.
- Using a pin punch and hammer, drive in the slotted spring pin, as shown.
- Apply sealant to the plug threads.

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

- Using a torx socket wrench (T40), install and torque the plug.

Torque: 19 N·m (190 kgf·cm, 14 ft·lbf)

MT06M-01

OIL SEAL REPLACEMENT

IF NECESSARY, REPLACE TRANSFER ADAPTOR OIL SEAL

- Using a screwdriver, pry out the oil seal.
- Using SST and a hammer, drive in a new oil seal.
SST 09950–60010 (09951–00570),
09950–70010 (09951–07150)

Drive in depth: 45.6 ± 0.5 mm (1.795 ± 0.020 in.)

SERVICE SPECIFICATIONS

SERVICE DATA

MT02Z-0C

Output shaft 1st gear journal diameter	Min.	38.860 mm (1.5299 in.)
Output shaft 2nd gear journal diameter	Min.	46.860 mm (1.8449 in.)
Output shaft 3rd gear journal diameter	Min.	37.860 mm (1.4905 in.)
Output shaft flange thickness	Min.	4.70 mm (0.1850 in.)
Output shaft runout	Max.	0.06 mm (0.0024 in.)
Gear thrust clearance 1st	STD	0.15–0.45 mm (0.0059–0.0177 in.)
	Max.	0.50 mm (0.0197 in.)
Gear thrust clearance 2nd and 3rd	STD	0.10–0.25 mm (0.0039–0.0098 in.)
	Max.	0.30 mm (0.0118 in.)
Gear radial clearance 1st	STD	0.020–0.073 mm (0.0008–0.0029 in.)
	Max.	0.160 mm (0.0063 in.)
Gear radial clearance 2nd and 3rd	STD	0.015–0.068 mm (0.0006–0.0027 in.)
	Max.	0.160 mm (0.0063 in.)
Shift fork to hub sleeve clearance	Max.	1.0 mm (0.039 in.)
Synchronizer ring to gear clearance	Min.	0.8 mm (0.031 in.)
Input shaft snap ring thickness	Mark A	2.10–2.15 mm (0.0827–0.0846 in.)
	Mark B	2.15–2.20 mm (0.0846–0.0866 in.)
	Mark C	2.20–2.25 mm (0.0866–0.0886 in.)
	Mark D	2.25–2.30 mm (0.0886–0.0906 in.)
	Mark E	2.30–2.35 mm (0.0906–0.0925 in.)
	Mark F	2.35–2.40 mm (0.0925–0.0945 in.)
	Mark G	2.40–2.45 mm (0.0945–0.0965 in.)
Output shaft snap ring thickness Clutch hub No.1	Mark A	2.30–2.35 mm (0.0906–0.0925 in.)
	Mark B	2.35–2.40 mm (0.0925–0.0945 in.)
	Mark C	2.40–2.45 mm (0.0945–0.0965 in.)
	Mark D	2.45–2.50 mm (0.0965–0.0984 in.)
	Mark E	2.50–2.55 mm (0.0984–0.1004 in.)
	Mark F	2.55–2.60 mm (0.1004–0.1024 in.)
	Mark G	2.60–2.65 mm (0.1024–0.1043 in.)
Output shaft snap ring thickness Clutch hub No.2	Mark A	1.80–1.85 mm (0.0709–0.0728 in.)
	Mark B	1.85–1.90 mm (0.0728–0.0748 in.)
	Mark C	1.90–1.95 mm (0.0748–0.0768 in.)
	Mark D	1.95–2.00 mm (0.0768–0.0787 in.)
	Mark E	2.00–2.05 mm (0.0787–0.0807 in.)
	Mark F	2.05–2.10 mm (0.0807–0.0827 in.)
	Mark G	2.10–2.15 mm (0.0827–0.0846 in.)

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Output shaft snap ring thickness		
Rear	Mark A	2.65–2.70 mm (0.1043–0.1063 in.)
	Mark B	2.70–2.75 mm (0.1063–0.1083 in.)
	Mark C	2.75–2.80 mm (0.1083–0.1102 in.)
	Mark D	2.80–2.85 mm (0.1102–0.1122 in.)
	Mark E	2.85–2.90 mm (0.1122–0.1142 in.)
	Mark F	2.90–2.95 mm (0.1142–0.1161 in.)
	Mark G	2.95–3.00 mm (0.1161–0.1181 in.)
	Mark H	3.00–3.05 mm (0.1181–0.1201 in.)
	Mark J	3.05–3.10 mm (0.1201–0.1220 in.)
	Mark K	3.10–3.15 mm (0.1220–0.1240 in.)
	Mark L	3.15–3.20 mm (0.1240–0.1260 in.)
	Mark M	3.20–3.25 mm (0.1260–0.1280 in.)
	Mark N	3.25–3.30 mm (0.1280–0.1299 in.)
	Mark P	3.30–3.35 mm (0.1299–0.1319 in.)
	Mark Q	3.35–3.40 mm (0.1319–0.1339 in.)
	Mark R	3.40–3.45 mm (0.1339–0.1358 in.)
	Mark S	3.45–3.50 mm (0.1358–0.1378 in.)
Counter gear roller bearing journal diameter	Min.	27.860 mm (1.0968 in.)
Counter 5th gear thrust clearance	STD	0.10–0.35 mm (0.0039–0.0138 in.)
	Max.	0.40 mm (0.0157 in.)
Counter 5th radial clearance	STD	0.015–0.068 mm (0.0006–0.0027 in.)
	Max.	0.160 mm (0.0063 in.)
Reverse idler gear radial clearance	STD	0.040–0.082 mm (0.0016–0.0032 in.)
	Max.	0.130 mm (0.0051 in.)
Reverse idler gear to shift arm clearance	STD	0.05–0.35 mm (0.0020–0.0138 in.)
	Max.	0.50 mm (0.0197 in.)
Counter gear snap ring thickness		
Front	Mark A	2.00–2.05 mm (0.0787–0.0807 in.)
	Mark B	2.05–2.10 mm (0.0807–0.0827 in.)
	Mark C	2.10–2.15 mm (0.0827–0.0846 in.)
	Mark D	2.15–2.20 mm (0.0846–0.0866 in.)
	Mark E	2.20–2.25 mm (0.0866–0.0886 in.)
	Mark F	2.25–2.30 mm (0.0886–0.0906 in.)
Counter gear snap ring thickness		
Rear	Mark A	2.80–2.85 mm (0.1102–0.1122 in.)
	Mark B	2.85–2.90 mm (0.1122–0.1142 in.)
	Mark C	2.90–2.95 mm (0.1142–0.1161 in.)
	Mark D	2.95–3.00 mm (0.1161–0.1181 in.)
	Mark E	3.00–3.05 mm (0.1181–0.1201 in.)
	Mark F	3.05–3.10 mm (0.1201–0.1220 in.)
	Mark G	3.10–3.15 mm (0.1220–0.1240 in.)
Oil seal drive in depth		
Front bearing retainer (from retainer end)		11.7 ± 0.5 mm (0.461 ± 0.020 in.)
Transfer adaptor		45.6 ± 0.5 mm (1.795 ± 0.020 in.)

TORQUE SPECIFICATIONS

Part tightened		N·m	kgf·cm	ft·lbf
Transmission x Engine		72	730	53
Starter x Transmission		39	400	29
No.2 rear end plate x Transmission (1KZ-T, 1KZ-TE)		37	380	27
Rear end plate x Transmission (5VZ-FE)		18	185	13
Clutch release cylinder x Transmission		12	120	9
Front exhaust pipe x Exhaust manifold (1KZ-T, 1KZ-TE)		62	630	46
No.1 front exhaust pipe x Exhaust manifold (RHD of 5VZ-FE)		62	630	46
No.2 front exhaust pipe x Exhaust manifold (RHD of 5VZ-FE)		62	630	46
Front exhaust pipe x Center exhaust pipe (1KZ-T, 1KZ-TE)		43	440	32
Front exhaust pipe x Center exhaust pipe (5VZ-FE)		48	490	35
No.2 exhaust pipe support bracket x Frame (5VZ-FE)		19	190	14
No.1 front exhaust pipe x No.2 pipe (RHD of 5VZ-FE)		48	490	35
Front exhaust pipe bracket (LHD of 5VZ-FE)		44	450	33
No.3 crossmember x Engine rear mounting		18	185	13
No.3 crossmember x Frame		65	660	48
Engine rear mounting x Transmission		65	650	48
No.4 crossmember x Frame (5 door of 1KZ-TE, 5VZ-FE)		65	660	48
Stabilizer bar bracket x Frame (1KZ-T, 1KZ-TE)		25	260	19
Front differential rear mounting cushion (1KZ-T, 1KZ-TE)	Bolt	108	1,100	80
	Nut	87	890	64
Transmission x Transfer		24	240	17
Reverse shift arm bracket set bolt		18	185	13
Rear bearing retainer x Intermediate plate		18	185	13
Shift fork x Shift fork shaft		20	200	14
Oil separator x Shift fork shaft No.4 (Middle East and Australia)		13	130	10
Oil separator x Intermediate plate (Middle East and Australia)		20	200	14
Straight screw plug		19	190	14
Front bearing retainer x Transmission case		17	170	12
Transmission case x Transfer adaptor		37	380	27
Shift lever housing x Shift and select lever		38	390	28
Clutch housing x Transmission case		36	370	27
Back-up light switch		44	450	32
Restrict pin		37	380	27
Control shift lever retainer x Transfer adaptor		18	185	13
Filler and drain plug		37	380	27

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