

(VF3B)**PRECAUTION**

TROOP-GH

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 approx. 1 mm (0.04 in.) wide bead along the sealing surface.
- Parts must be assembled within 10 minutes of application. Otherwise, the FIPG material must be removed and reapplied.

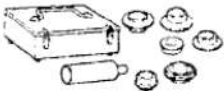
If the vehicle is equipped with a mobile communication system, refer to the precautions in the IN section.

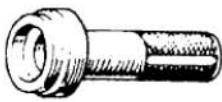
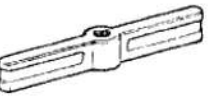
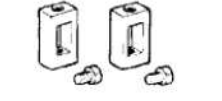
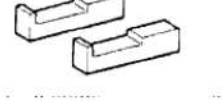
PREPARATION

TROOP-GH

SST (SPECIAL SERVICE TOOLS)

TR

	09223-15020 Oil Seal & Bearing Replacer	Planetary gear outer bearing
	09304-12012 Input Shaft Front Bearing Replacer	Shift fork shaft oil seal
	09316-20011 Transfer Bearing Replacer	Rear output shaft bearing
	09316-60011 Transmission & Transfer Bearing Replacer	
	(09316-00011) Replacer Pipe	Rear output shaft bearing Front case oil seal
	(09316-00021) Replacer "A"	Driven sprocket front and rear bearing
	(09316-00071) Replacer "F"	Rear output shaft bearing
	09330-00021 Companion Flange Holding Tool	Companion flange
	09515-30010 Rear Wheel Bearing Replacer	Planetary gear outer bearing

	09554-22010 Differential Oil Seal Replacer	Extension housing oil seal
	09554-30011 Differential Oil Seal Replacer	Planetary gear outer bearing
	09555-55010 Differential Drive Pinion Bearing Replacer	Driven sprocket rear bearing Rear output shaft bearing Planetary gear outer bearing
	09612-65014 Steering Worm Bearing Puller	
	(09612-01030) Claw "C"	Planetary gear inner bearing
	(09612-01050) Hanger Pin with Nut	Planetary gear inner bearing
	09950-40010 Puller B Set	
	(09951-04020) Hanger 200	Companion flange
	(09952-04010) Slide Arm	Companion flange
	(09953-04030) Center Bolt 200	Companion flange
	(09954-04010) Arm 25	Companion flange
	(09955-04050) Claw No.5	Companion flange
	(09957-04010) Attachment	Companion flange
	(09958-04010) Holder	Companion flange

	09950-60010 Replacer Set	
	(09951-00220) Replacer 22	Companion flange oil seal
	(09951-00350) Replacer 35	Companion flange oil seal
	(09951-00570) Replacer 57	Planetary gear inner bearing
	(09951-00590) Replacer 59	Front bearing retainer oil seal
	(09952-06010) Adapter	Companion flange oil seal
	09950-70010 Handle Set	Front bearing retainer oil seal Planetary gear outer bearing Planetary gear inner bearing Companion flange oil seal
	(09951-07100) Handle 100	

RECOMMENDED TOOLS

MT013-00

	09031-00030 Pin Punch .	
	09905-00012 Snap Ring No.1 Expander .	

EQUIPMENT

MX027-18

Calipers	
Dial indicator	
Micrometer	
Torque wrench	
Feeler gauge	
Steel straight edge	

TR

cardiagn.com

LUBRICANT

Item	Capacity	Classification
Transfer oil	1.2 liter (1.3 US qts, 1.1 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)	Front case x Rear case Rear companion flange Extension housing x Rear case Front retainer x Front case
08833-00080	Adhesive 1344, THREE BOND 1344, LOCTITE 242 or equivalent	Straight screw plug Extension housing set bolt Front retainer set bolt

TR TROUBLESHOOTING

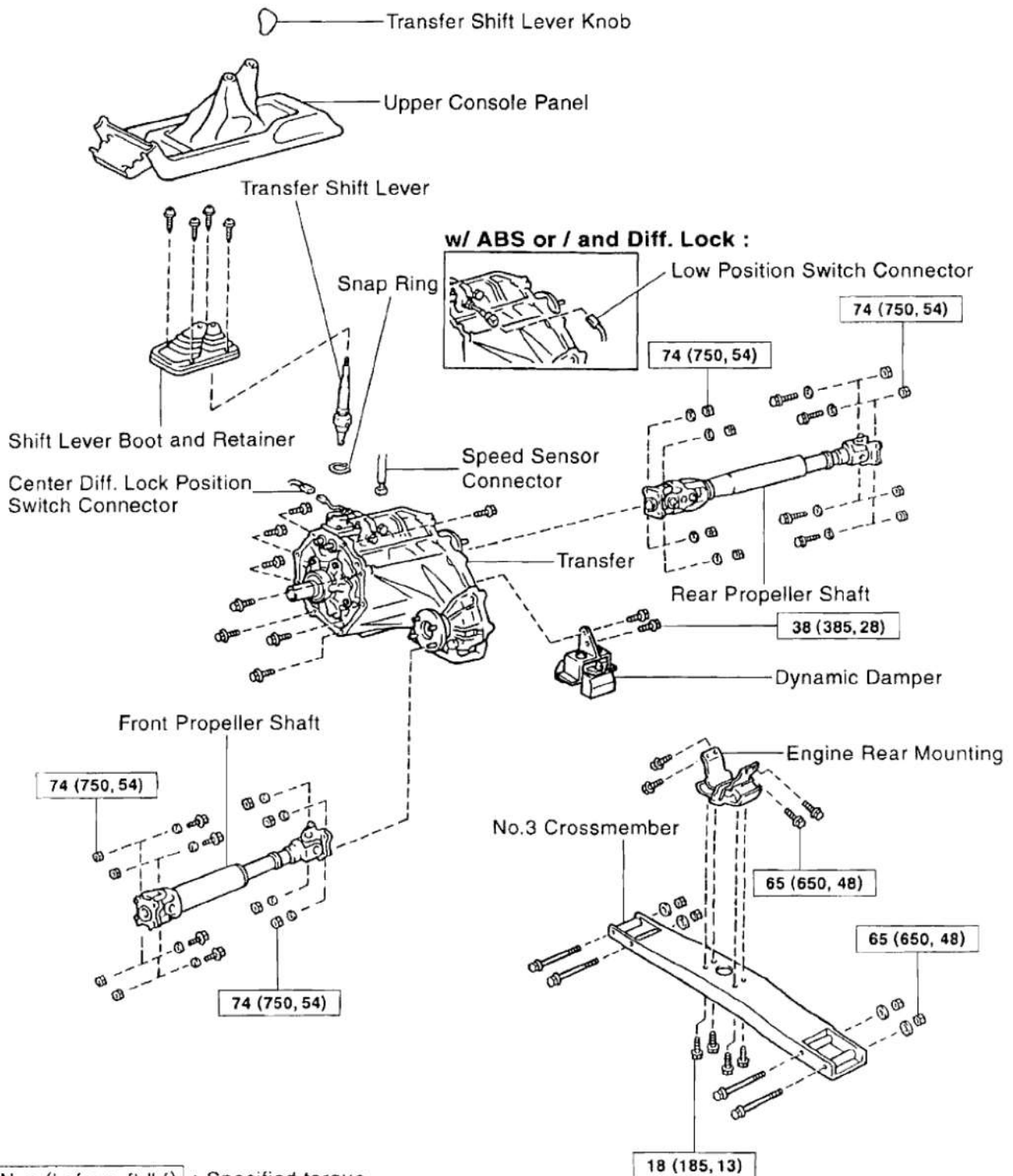
Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

See Page	TR-43,44	TR-38	TR-38	TR-38	TR-70	TR-43,44
Parts Name	Transfer faulty	Wrong oil grade	Oil level low	Oil level too high	Oil seal, O-ring or gasket worn or damaged	Center differential or transfer faulty
Trouble						
Noise	3	2	1			
Oil leakage				1	2	
Tight corner braking						1

ASSEMBLY REMOVAL AND INSTALLATION COMPONENTS

TR06C-01

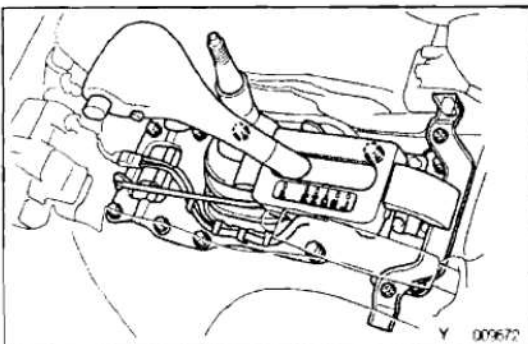
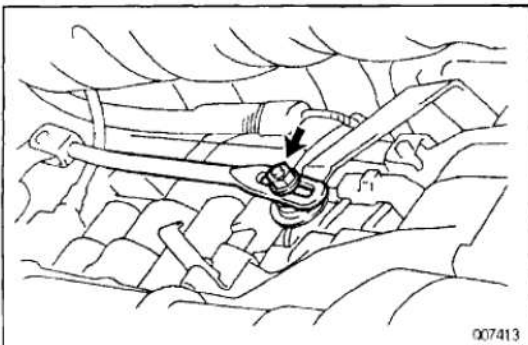
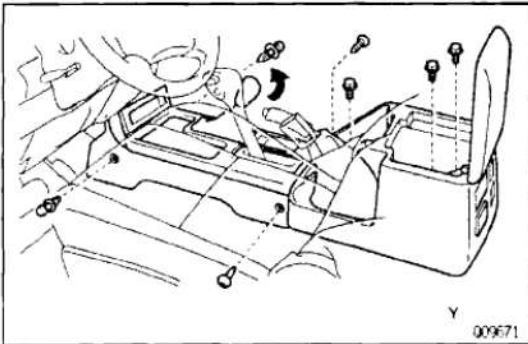
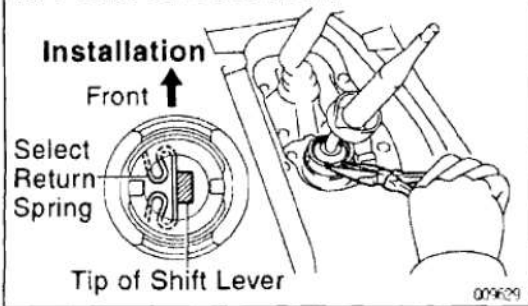
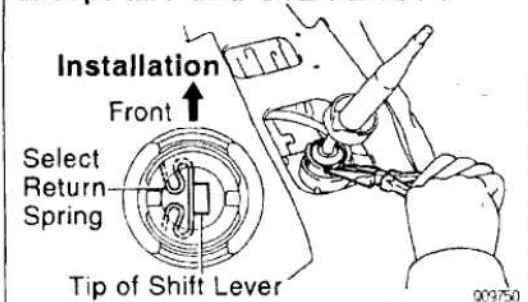
M/T



TR

cardiagn.com

009956

M/T and 5VZ-FE A/T :**Except M/T and 5VZ-FE A/T :****TRANSFER REMOVAL****1. REMOVE TRANSFER SHIFT LEVER****M/T and 5VZ-FE A/T:**

- Remove the front console box.
- Remove the 4 screws, shift lever boot and retainer.
- Using pliers, remove the snap ring and pull out the shift lever.

HINT:

- Apply MP grease to the transfer adaptor oil seal.
- Shift the 2 shift fork shafts to the HL position.
- After installation, road test the vehicle.

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

Except M/T and 5VZ-FE A/T:

- Remove the 3 bolts and rear console box and disconnect the connectors.
- Remove the upper console panel and disconnect the connectors.
- Remove the upper console cover.
- Remove the 2 clips, screws and lower console box.
- Remove the nut and washer and disconnect the shift control rod.

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

- Remove the 2 screw and bracket.
- Disconnect the connector and remove the 10 screws and transmission shift lever assembly.

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

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

2. REMOVE BREATHER HOSE

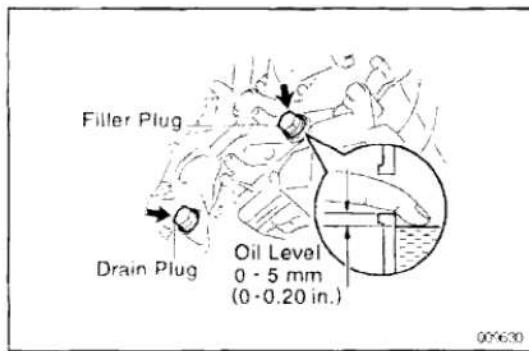
Disconnect the breather hose from transfer upper cover and transmission control retainer.

Hose depth:

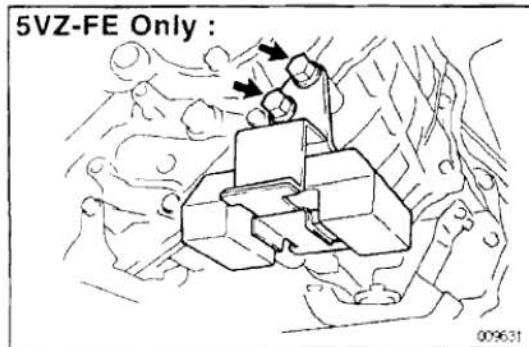
13 mm (0.51 in.) or more

TR

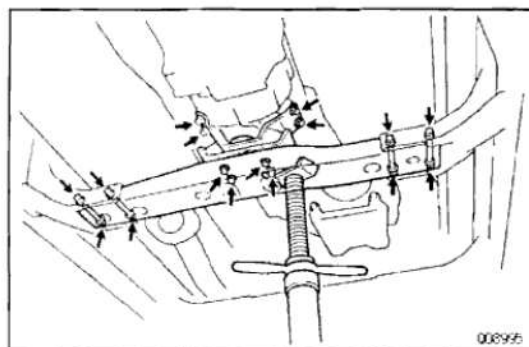
cardiagn.com



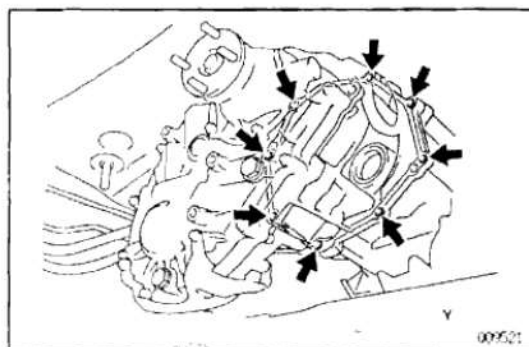
3. **RAISE VEHICLE AND DRAIN TRANSFER OIL**
Oil grade: API GL-4 or GL-5
Viscosity: SAE 75W-90
Capacity: 1.2 liter (1.3 US qts, 1.1 Imp.qts)
4. **REMOVE FRONT AND REAR PROPELLER SHAFT**
(See page PR-3)



5. **5VZ-FE Only:**
REMOVE DYNAMIC DAMPER
Remove the 2 bolts and dynamic damper.
Torque: 38 N·m (385 kgf·cm, 28 ft·lbf)



6. **REMOVE CROSSMEMBER**
 - (a) Support the transmission rear side with a jack.
 - (b) Remove the 4 set bolts of the engine rear mounting.
Torque: 19 N·m (190 kgf·cm, 14 ft·lbf)
 - (c) Remove the 4 bolts, nuts and crossmember.
Torque: 65 N·m (660 kgf·cm, 48 ft·lbf)



7. **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)
8. **DISCONNECT VEHICLE SPEED SENSOR AND TRANSFER INDICATOR SWITCH CONNECTORS**
9. **REMOVE TRANSFER FROM TRANSMISSION**
 - (a) Remove the 8 bolts of the transfer adaptor mounting.
Torque: 24 N·m (240 kgf·cm, 17 ft·lbf)
 - (b) Pull out the transfer down and toward the rear.
HINT: Be careful not to damage the adaptor rear oil seal with the transfer input gear spline.

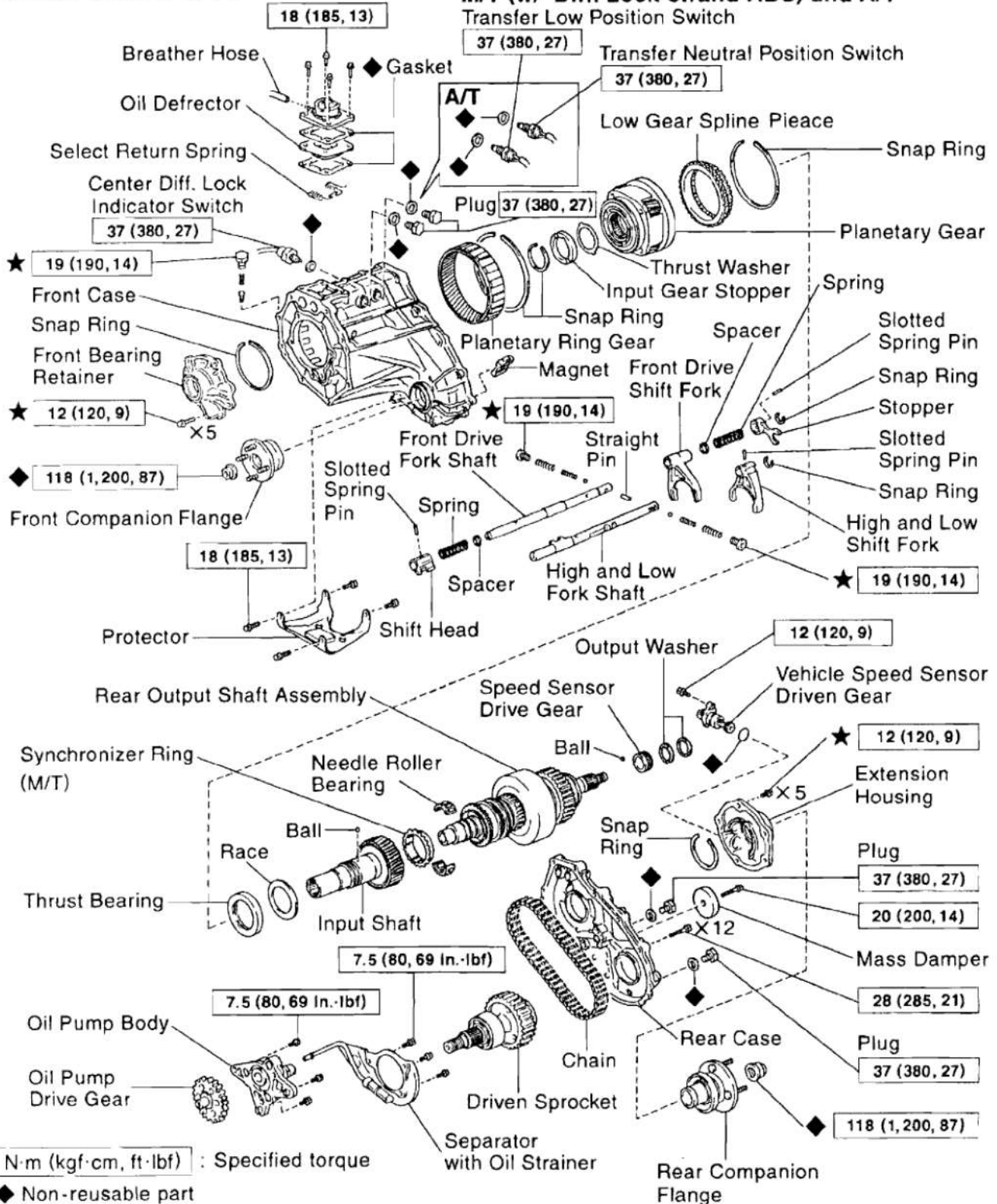
TRANSFER INSTALLATION

Installation is in the reverse order of removal.

COMPONENT PARTS REMOVAL AND INSTALLATION COMPONENTS

TROBE-01

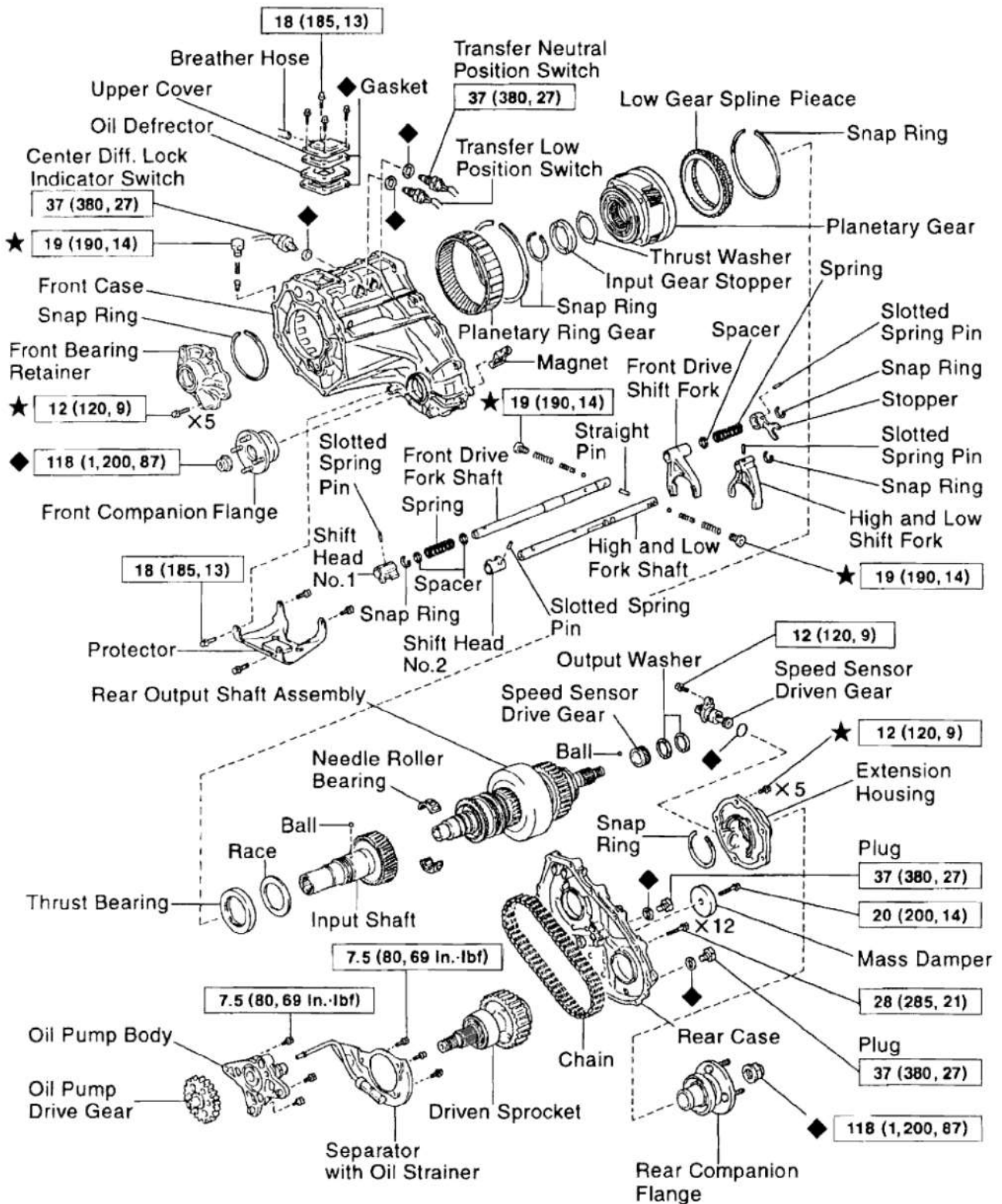
M/T and 5VZ-FE A/T :

M/T (w/ Diff. Lock or/and ABS) and A/T
Transfer Low Position Switch

TR

cardiagn.com

Except M/T and 5VZ-FE A/T :



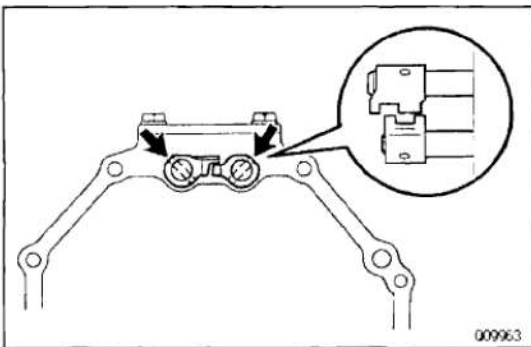
N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

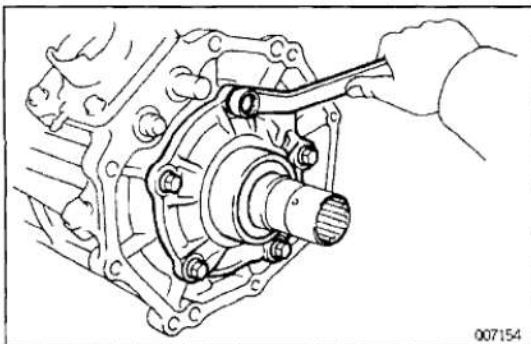
★ Precoated part

COMPONENT PARTS REMOVAL

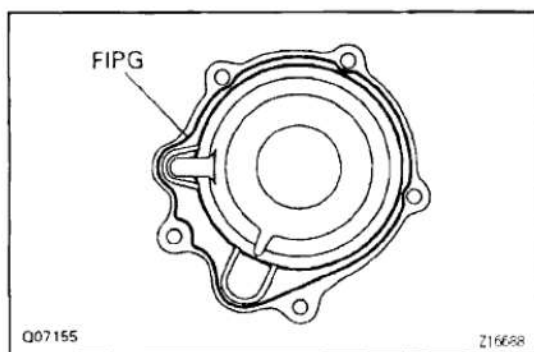
1. **REMOVE SPEED SENSOR DRIVEN GEAR**
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)
2. **REMOVE CENTER DIFF. LOCK INDICATOR SWITCH**
Torque: 37 N·m (380 kgf·cm, 27 ft·lbf)
3. **M/T (w/ Diff. Lock or/and ABS) and A/T:
REMOVE LOW POSITION SWITCH**
Torque: 37 N·m (380 kgf·cm, 27 ft·lbf)
4. **A/T:
REMOVE NEUTRAL POSITION SWITCH**
Torque: 37 N·m (380 kgf·cm, 27 ft·lbf)
5. **REMOVE PLUGS OF FRONT CASE**
Torque: 37 N·m (380 kgf·cm, 27 ft·lbf)
INSTALLATION HINT: Check the following items.
 - The input and output shafts rotate smoothly.
 - Shifting can be made smoothly to all positions.
6. **REMOVE PROTECTOR**
Remove the 4 bolts.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)
7. **REMOVE MASS DAMPER**
Remove the bolt.
Torque: 20 N·m (200 kgf·cm, 14 ft·lbf)



8. **Except M/T and 5VZ-FE A/T:
REMOVE SHIFT GEAR HEAD NO.1 AND NO.2**
 - (a) Using a pin punch and hammer, drive out the 2 slotted spring pins.
 - (b) Remove the 2 shift gear heads.



9. **REMOVE FRONT BEARING RETAINER**
 - (a) Remove the 5 bolts.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)
INSTALLATION HINT: Apply liquid sealer to the bolts.
Sealant: Part No. 08833 - 00080, THREE BOND 1344,
LOCTITE 242 or equivalent
 - (b) Using a plastic hammer, tap the front bearing retainer and remove it.

**INSTALLATION HINT:**

- Remove any FIPG material and be careful not to drop oil on the contacting surfaces of the front bearing retainer.
- Apply FIPG to the front bearing retainer, as shown.

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

10. Except M/T and 5VZ-FE A/T:**REMOVE UPPER COVER AND OIL DEFLECTOR**

Remove the 4 bolts, upper cover and oil deflector.

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

INSTALLATION HINT: Install 2 new gasket and oil deflector.

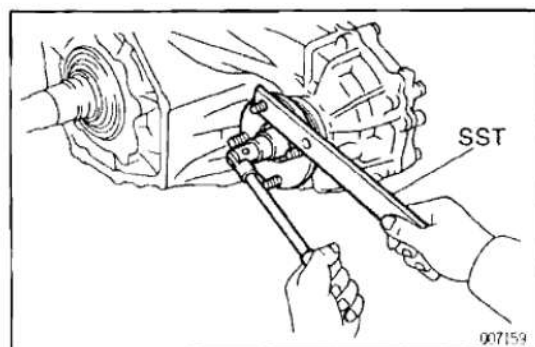
11. M/T and 5VZ-FE A/T:**REMOVE CONTROL RETAINER AND OIL DEFLECTOR**

- (a) Remove the 4 bolts, control retainer and oil deflector.

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

INSTALLATION HINT: Install 2 new gasket and control retainer.

- (b) Remove the select return spring from the control retainer.

**12. REMOVE FRONT COMPANION FLANGE**

- (a) Using a chisel and hammer, loosen the staked part of the nut.

INSTALLATION HINT: Stake a new lock nut.

- (b) Using SST to hold the flange, remove the companion flange lock nut.

SST 09330-00021

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

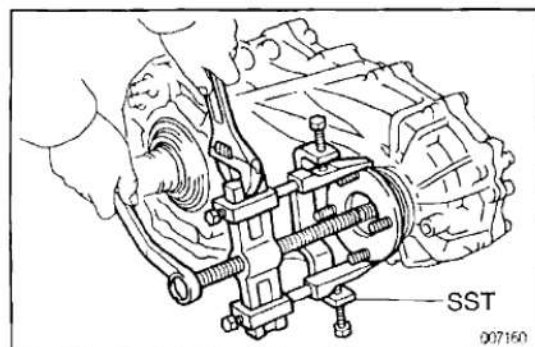
- (c) Using SST, remove the companion flange.

SST 09950-40010 (09951-04020, 09952-04010, 09953-04030, 09954-04010, 09955-04050, 09958-04010)

INSTALLATION HINT: The diameter of the front companion flange is smaller than that of the rear companion flange.

13. REMOVE REAR COMPANION FLANGE

Remove the rear companion flange in the same way as the front companion flange.



14. REMOVE EXTENSION HOUSING

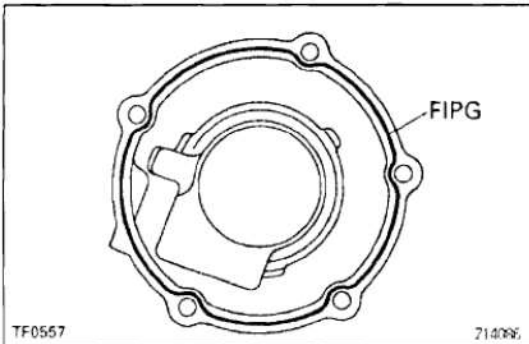
- (a) Remove the 5 bolts.

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

INSTALLATION HINT: Apply liquid sealer to the bolts.

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

- (b) Using a plastic hammer, tap the extension housing and remove it.

**INSTALLATION HINT:**

- Remove any FIPG material and be careful not to drop oil on the contacting surfaces of the extension housing.
- Apply FIPG to the extension housing, as shown. FIPG: Part No.08826 — 00090, THREE BOND 1281 or equivalent

15. REMOVE SPEED SENSOR DRIVE GEAR

- (a) Remove the 2 output washers and speed sensor drive gear.

INSTALLATION HINT: Make sure to install the speed sensor drive gear in the correct direction.

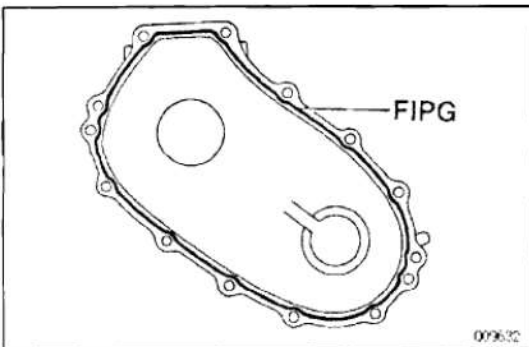
- (b) Using a magnetic finger, remove the ball from the rear output shaft.

16. SEPARATE FRONT CASE AND REAR CASE

- (a) Remove the 12 bolts.

Torque: 28 N·m (285 kgf·cm, 21 ft·lbf)

- (b) Using a screwdriver, separate the front case and rear case.

**INSTALLATION HINT:**

- Shift the high and low clutch sleeve to low side (rear side) and assemble the front case and rear case.
- Remove any FIPG material and be careful not to drop oil on the contacting surfaces of the rear case.
- Apply FIPG to the rear case, as shown. FIPG: Part No.08826 — 00090, THREE BOND 1281 or equivalent

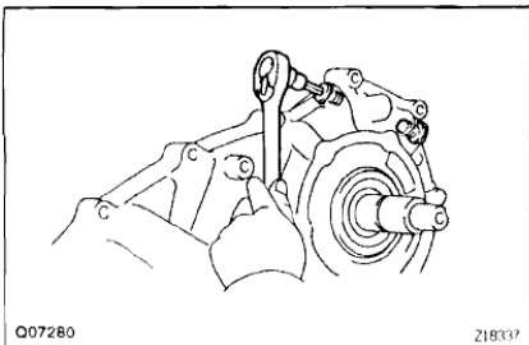
17. REMOVE STRAIGHT SCREW PLUG, SPRING AND LOCKING BALL

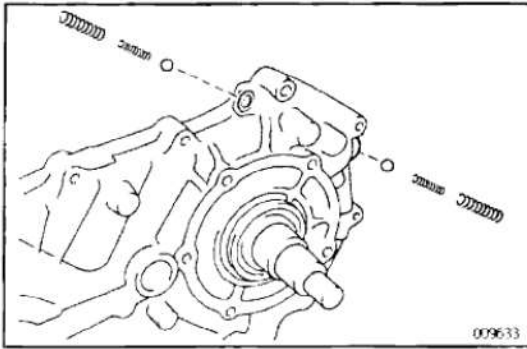
- (a) Using a hexagon wrench, remove the 2 screws.

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

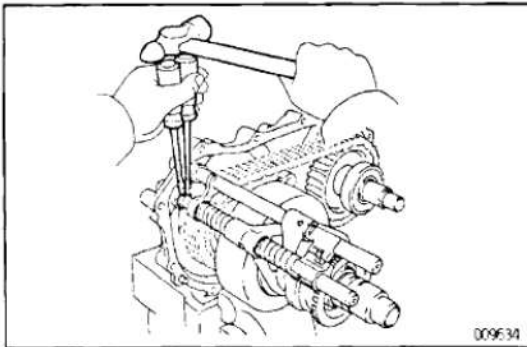
INSTALLATION HINT: Apply liquid sealer to the plugs.

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



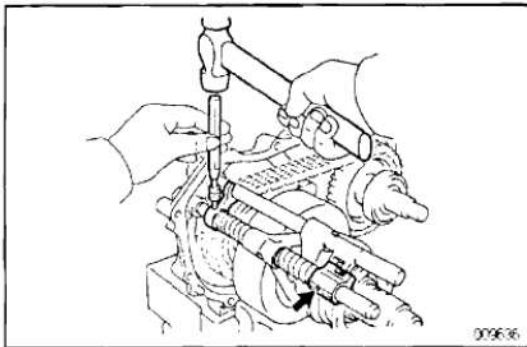


- (b) Using a magnetic finger, remove the 4 springs and 2 balls from the 2 both holes.



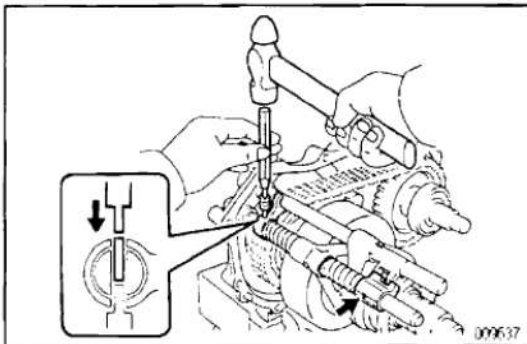
**18. M/T and 5VZ—FE A/T:
REMOVE FRONT DRIVE FORK SHAFT, SHIFT
HEAD, SHIFT FORK, 2 SPRINGS, STOPPER AND 2
SPACERS**

- (a) Mount the rear case in a vise.
NOTICE: Be careful not to damage the sealing surface.
- (b) Using 2 screwdrivers and a hammer, remove the snap ring.

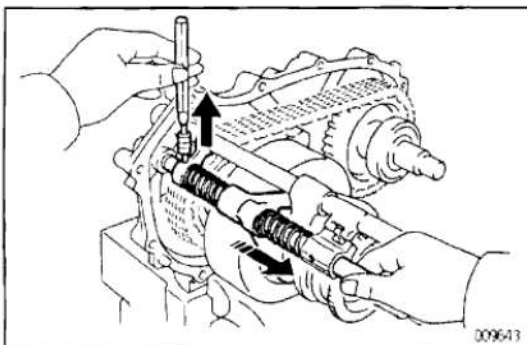


- (c) Using a pin punch and hammer, drive out the 2 slotted spring pins.

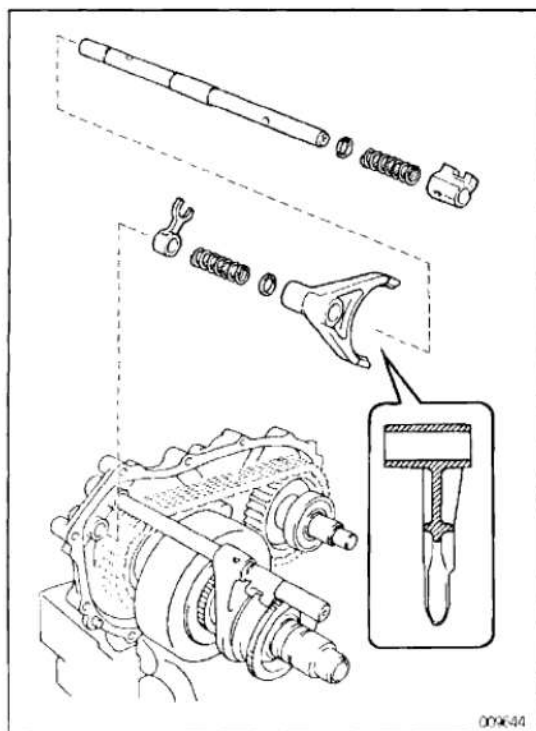
HINT: Keep the pin punch inserted in the shaft hole so that the shaft will not spring loose when the pin is removed from the front drive fork shaft.



INSTALLATION HINT: When installing the pin in the front drive fork shaft, push the shaft towards the rear case and install the pin while the spring is compressed.



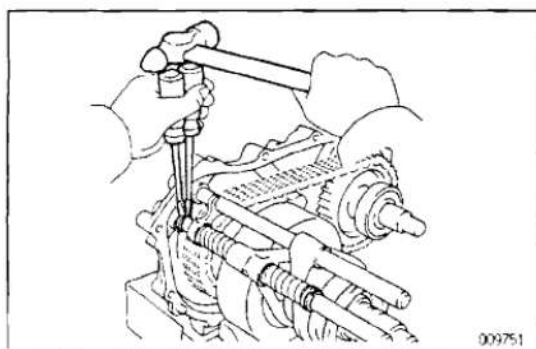
- (d) Hold the front drive fork shaft in place by hand, when removing the pin punch.



- (e) Remove the front drive fork shaft, shift head, shift fork, 2 springs, stopper and 2 spacers.

INSTALLATION HINT:

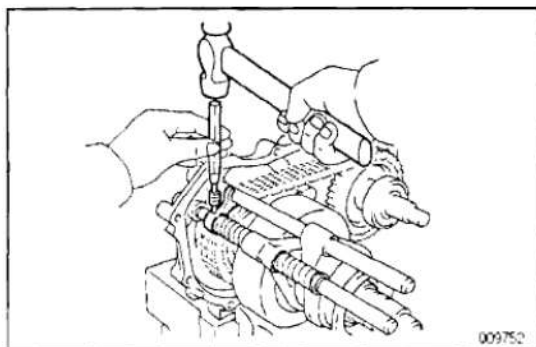
- Place the front drive shift fork into the groove of the diff. lock sleeve.
- Make sure to install the shift fork, shift head and stopper in the correct direction.



Except M/T and 5VZ—FE A/T:

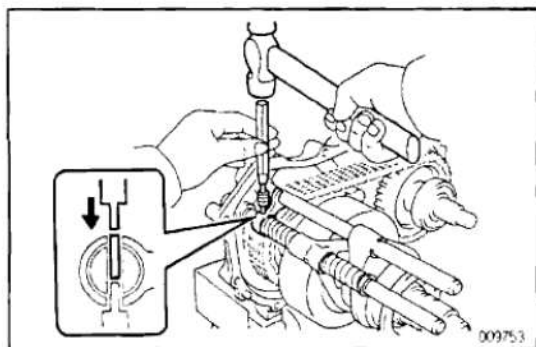
REMOVE FRONT DRIVE FORK SHAFT, SHIFT FORK, 2 SPRINGS, STOPPER AND 3 SPACERS

- (a) Mount the rear case in a vise.
NOTICE: Be careful not to damage the sealing surface.
- (b) Using 2 screwdrivers and a hammer, remove the 2 snap rings.

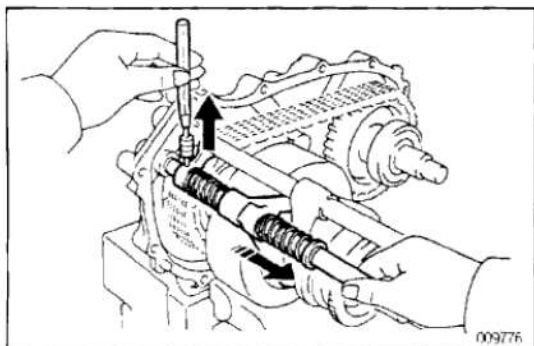


- (c) Using a pin punch and hammer, drive out the slotted spring pin.

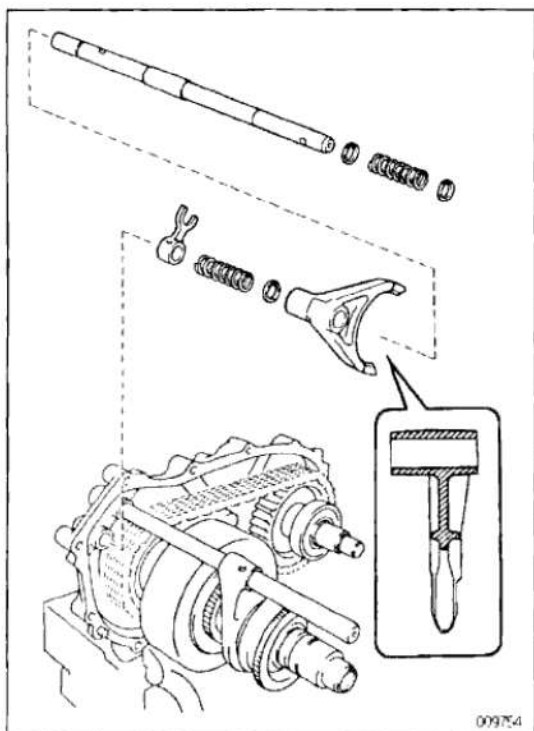
HINT: Keep the pin punch inserted in the shaft hole so that the shaft will not spring loose when the pin is removed from the front drive fork shaft.



INSTALLATION HINT: When installing the pin in the front drive fork shaft, push the shaft towards the rear case and install the pin while the spring is compressed.



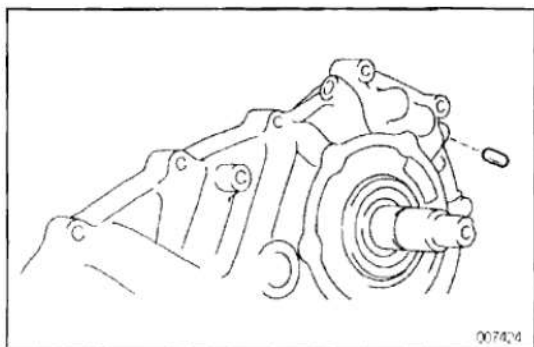
- (d) Hold the front drive fork shaft in place by hand, when removing the pin punch.



- (e) Remove the front drive fork shaft, shift fork, 2 springs, stopper and 3 spacers.

INSTALLATION HINT:

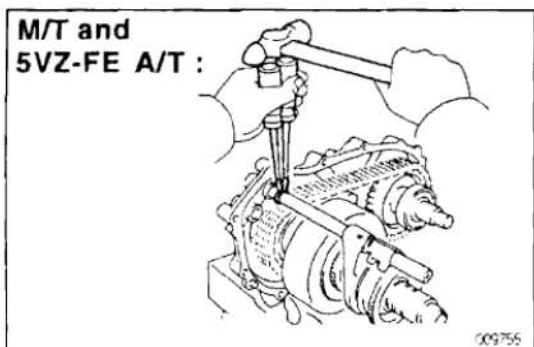
- Place the front drive shift fork into the groove of the diff. lock sleeve.
- Make sure to install the shift fork and stopper in the correct direction.



19. REMOVE STRAIGHT PIN

Using a magnetic finger, remove the straight pin.

INSTALLATION HINT: Apply gear oil to the straight pin and insert it into the case hole.

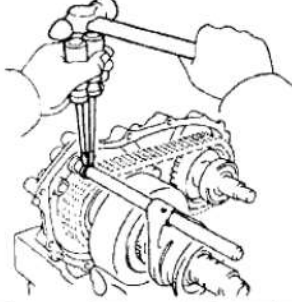


**M/T and
5VZ-FE A/T :**

20. REMOVE HIGH AND LOW FORK SHAFT AND SHIFT FORK

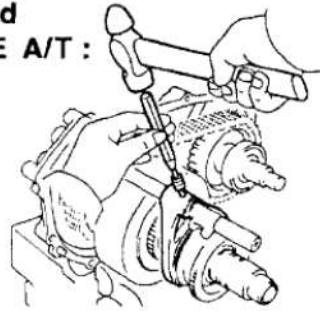
- (a) Using 2 screwdrivers and a hammer, remove the snap ring.

Except M/T and 5VZ-FE A/T :



009756

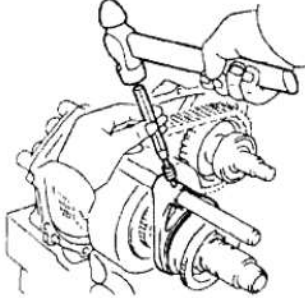
M/T and 5VZ-FE A/T :



009757

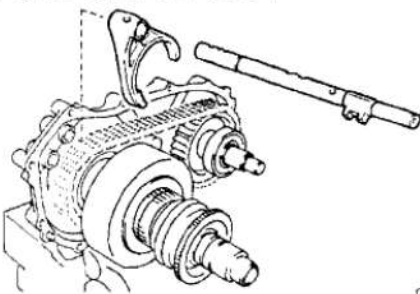
- (b) Using a pin punch and hammer, drive out the slotted spring pin.

Except M/T and 5VZ-FE A/T :



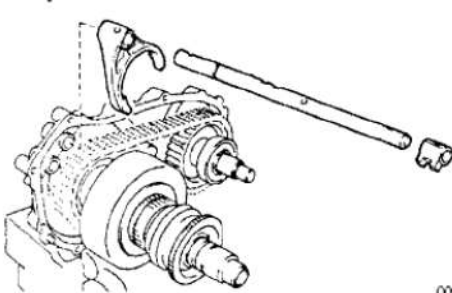
009758

M/T and 5VZ-FE A/T :



009759

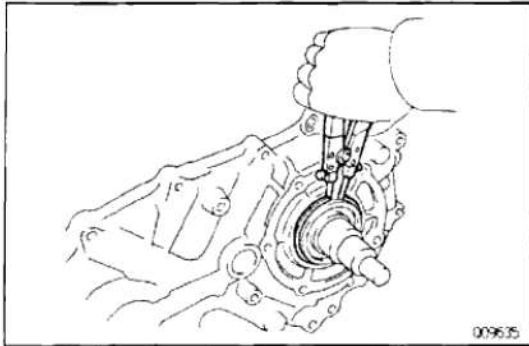
Except M/T and 5VZ-FE A/T :



009760

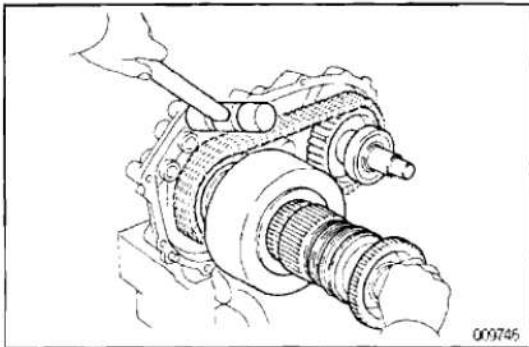
INSTALLATION HINT:

- Place the high and low shift fork into the groove of the clutch sleeve.
- Make sure to install the shift fork in the correct direction.



21. REMOVE REAR OUTPUT SHAFT, DRIVEN SPROCKET AND CHAIN

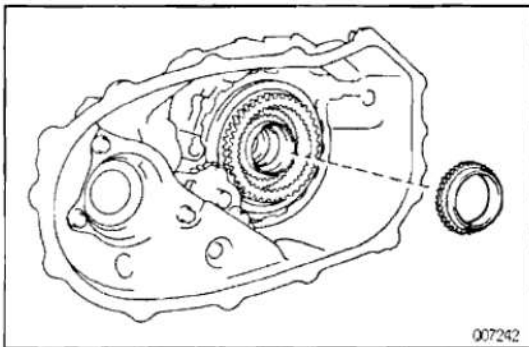
- (a) Using a snap ring expander, remove the snap ring.



- (b) Using a plastic hammer, tap the rear case with pulling the rear output shaft and driven sprocket.

INSTALLATION HINT: If necessary, heat the rear case to about 50 – 80 °C (122 – 176 °F).

- (c) Remove the chain.

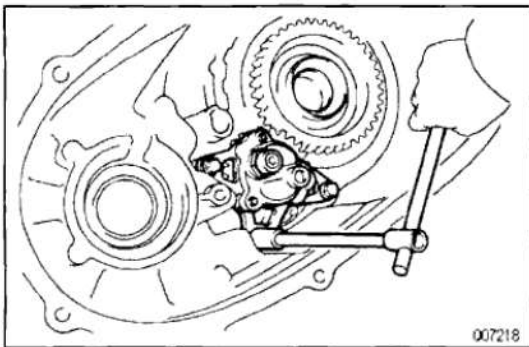


22. M/T:

REMOVE SYNCHRONIZER RING FROM INPUT SHAFT

INSTALLATION HINT:

- Apply MP grease to the synchronizer ring.
- Align the synchronizer ring slots with the shifting keys, and install it on the high and low clutch hub.



23. REMOVE SEPARATOR WITH OIL STRAINER AND MAGNET

Remove the 3 bolts and separator with the oil strainer and magnet.

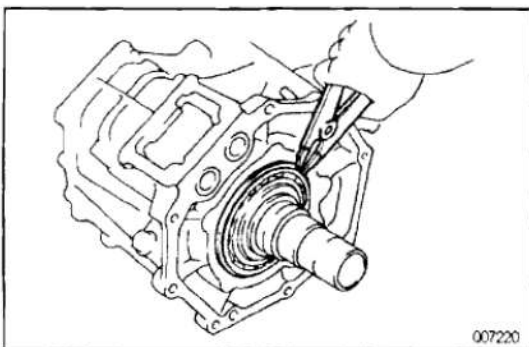
Torque: 7.5 N·m (80 kgf·cm, 69 in.lbf)

24. REMOVE OIL PUMP BODY ASSEMBLY

Remove the 3 bolts and the oil pump body assembly.

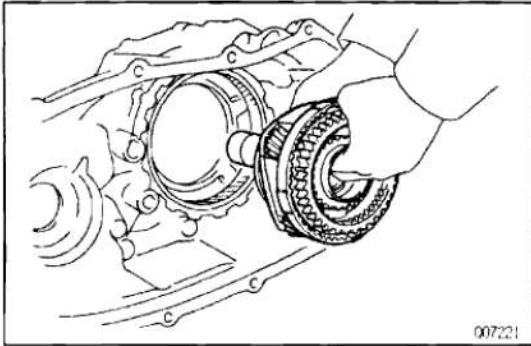
Torque: 7.5 N·m (80 kgf·cm, 69 in.lbf)

25. REMOVE OIL PUMP DRIVE GEAR



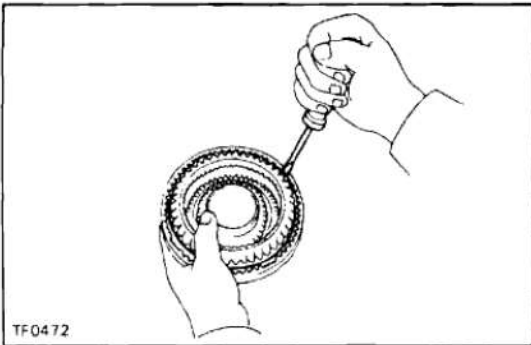
26. REMOVE PLANETARY GEAR ASSEMBLY WITH INPUT SHAFT

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



- (b) Pull out the planetary gear assembly with the input shaft.

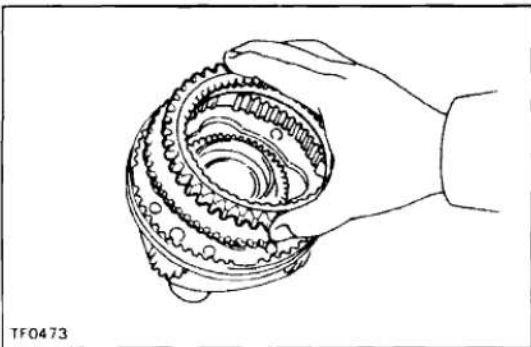
INSTALLATION HINT: If necessary, heat the front case to about 50 – 80 °C (122 – 176 °F).



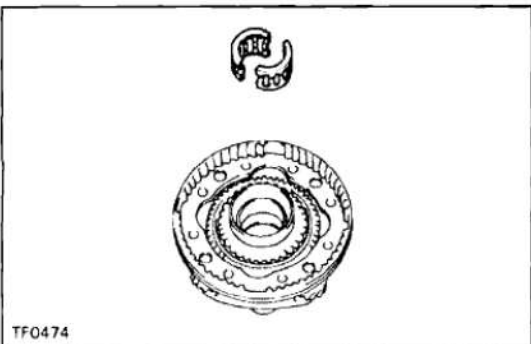
27. REMOVE LOW GEAR SPLINE PIECE

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

INSTALLATION HINT: Make sure the end gap of the snap ring is not aligned with cutout portion of the planetary carrier.

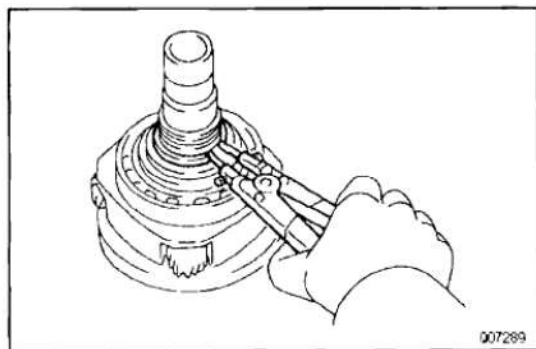


- (b) Remove the low gear spline piece.



28. REMOVE NEEDLE ROLLER BEARING FROM INPUT SHAFT

INSTALLATION HINT: Apply gear oil to the needle roller bearing.

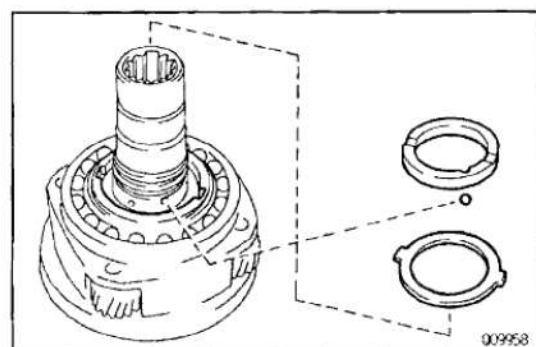


29. REMOVE INPUT SHAFT STOPPER AND THRUST BEARING

- (a) Using a snap ring expander, remove the snap ring.
INSTALLATION HINT: Select a snap ring that will allow 0.05–0.15 mm (0.0020–0.0059 in.) axial play.

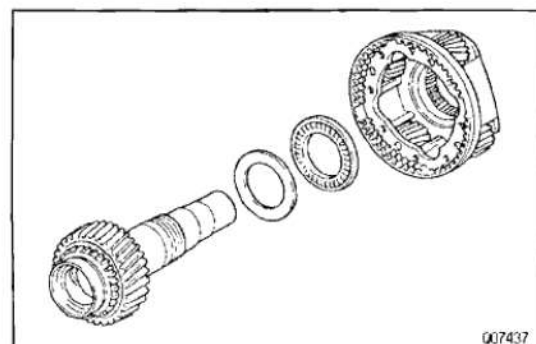
Mark	Thickness mm (in.)
A	2.10 – 2.15 (0.0827 – 0.0846)
B	2.15 – 2.20 (0.0846 – 0.0866)
C	2.20 – 2.25 (0.0866 – 0.0886)
D	2.25 – 2.30 (0.0886 – 0.0906)
E	2.30 – 2.35 (0.0906 – 0.0925)
F	2.35 – 2.40 (0.0925 – 0.0945)
G	2.40 – 2.45 (0.0945 – 0.0965)
H	2.45 – 2.50 (0.0965 – 0.0984)
J	2.50 – 2.55 (0.0984 – 0.1004)
K	2.55 – 2.60 (0.1004 – 0.1024)
L	2.60 – 2.65 (0.1024 – 0.1043)
M	2.65 – 2.70 (0.1043 – 0.1063)
N	2.70 – 2.75 (0.1063 – 0.1083)
P	2.75 – 2.80 (0.1083 – 0.1102)
Q	2.80 – 2.85 (0.1102 – 0.1122)
R	2.85 – 2.90 (0.1122 – 0.1142)
S	2.90 – 2.95 (0.1142 – 0.1161)
T	2.95 – 3.00 (0.1161 – 0.1181)
U	3.00 – 3.05 (0.1181 – 0.1201)

TR

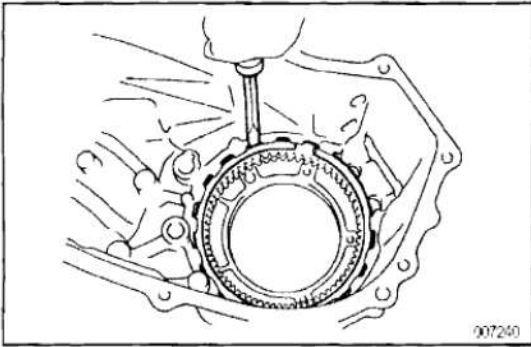


- (b) Remove the input gear stopper, thrust washer and ball.

INSTALLATION HINT: Apply gear oil to the input gear stopper and thrust washer.



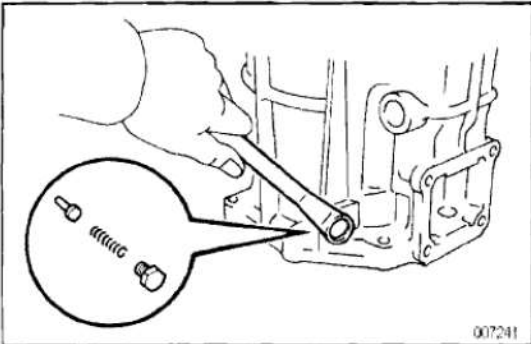
30. REMOVE INPUT SHAFT, THRUST RACE AND THRUST BEARING



31. REMOVE PLANETARY RING GEAR

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

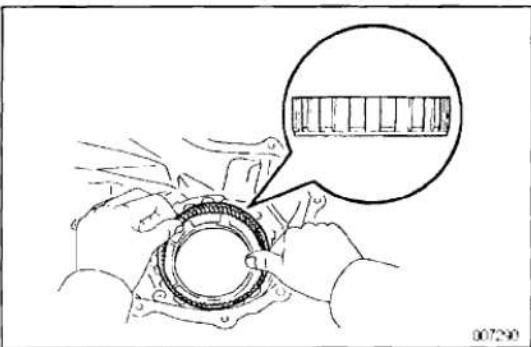
INSTALLATION HINT: Make sure the end gap of the snap ring is not aligned with the upper side of the case.



- (b) Remove the plug, spring and pin.

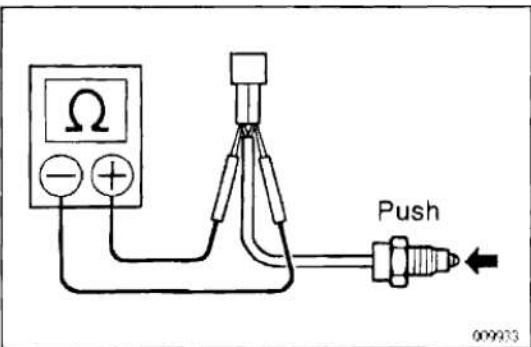
Torque: 19N·m (190 kgf·cm, 14 ft·lbf)

INSTALLATION HINT: Apply liquid sealer to the plug.
Sealant: Part No. 08833 — 00080, THREE BOND 1344, LOCTITE 242 or equivalent



- (c) Remove the planetary ring gear.

INSTALLATION HINT: Make sure to install the ring gear in the correct direction.



32. INSPECT SWITCHES

Check that there is continuity between terminals as shown.

Switch Position	Specified Condition
Push	Continuity (0Ω)
Free	No continuity (∞Ω)

If continuity is not as specified, replace the switch.

COMPONENT PARTS INSTALLATION

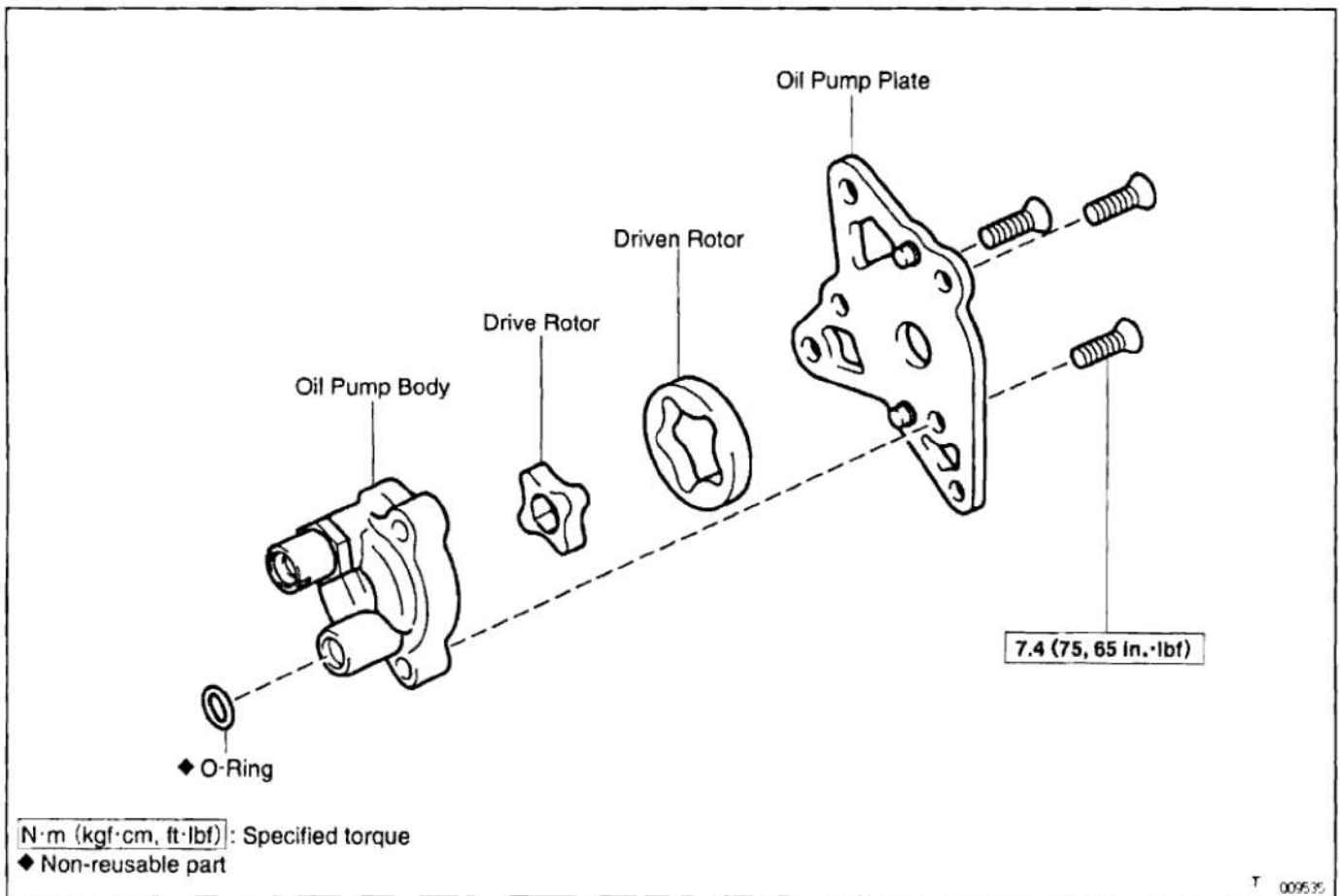
TR05G-01

Installation is in the reverse order of removal.

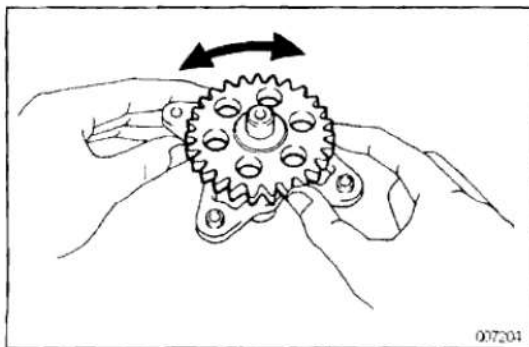
HINT: Coat all of the sliding and rotating surfaces with gear oil before assembly.

OIL PUMP BODY COMPONENTS

TR02V-06



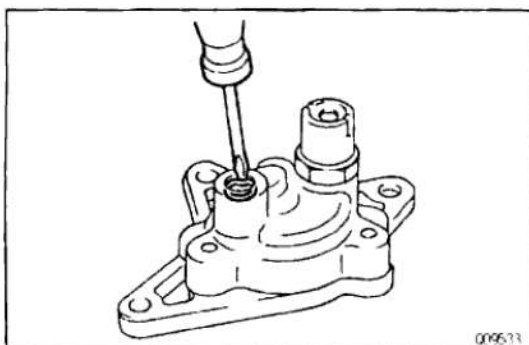
T 009535



OIL PUMP BODY DISASSEMBLY

1. CHECK OIL PUMP OPERATION

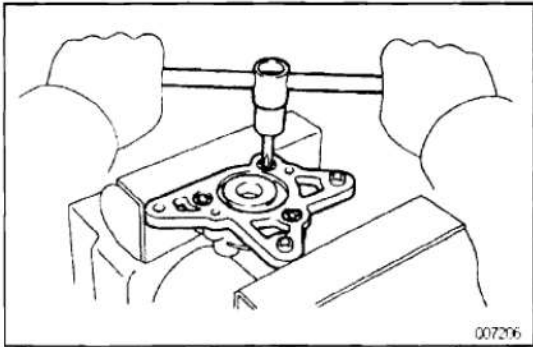
Install the oil pump drive gear to the drive rotor and check that the drive rotor turns smoothly.



2. REMOVE O-RING

Remove the O-ring from the oil pump body.

INSTALLATION HINT: Coat a new O-ring with gear oil and install it to the oil pump body.

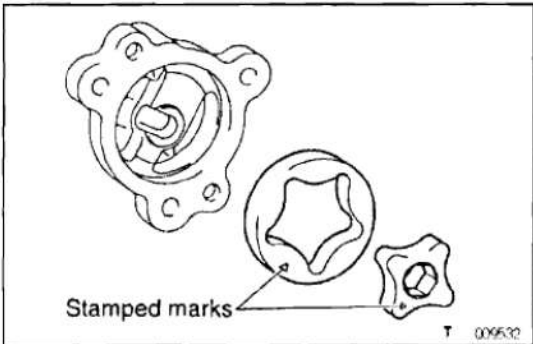


3. REMOVE OIL PUMP PLATE

- (a) Using a torx socket wrench T30, remove the 3 torx screws.

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

- (b) Remove the oil pump plate.

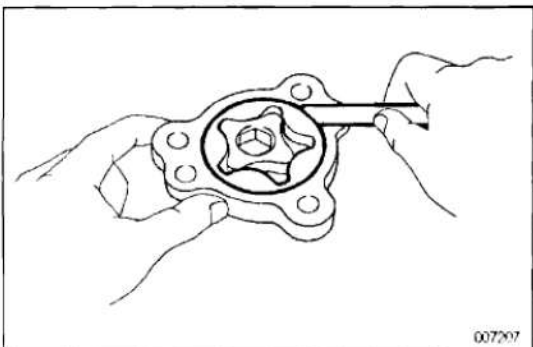


4. REMOVE DRIVE ROTOR AND DRIVEN ROTOR

INSTALLATION HINT:

- Apply gear oil to both rotors.
- Align the stamped marks facing them upward.

TR



OIL PUMP BODY INSPECTION

TMOX-00

1. INSPECT DRIVEN ROTOR BODY CLEARANCE

Push the driven rotor to one side of the body. Using a feeler gauge, measure the clearance.

Standard clearance:

0.09 – 0.16 mm (0.0035 – 0.0063 in.)

Maximum clearance: 0.16 mm (0.0063 in.)

If the clearance exceeds the maximum, replace the drive rotor, driven rotor or pump body.

2. INSPECT BOTH ROTOR TIPS CLEARANCE

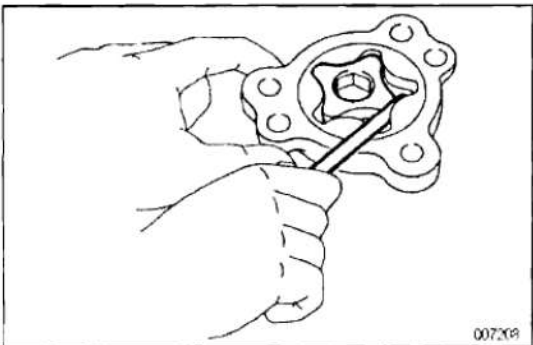
Using a feeler gauge, measure the clearance between both rotor tips.

Standard clearance:

0.05 – 0.15 mm (0.0020 – 0.0059 in.)

Maximum clearance: 0.15 mm (0.0059 in.)

If the clearance exceeds the maximum, replace the drive rotor, driven rotor or pump body.



3. INSPECT BOTH ROTORS SIDE CLEARANCE

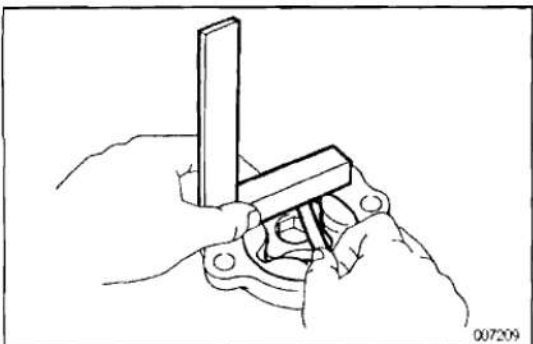
Using a steel straight edge and feeler gauge, measure the clearance between the rotors and straight edge.

Standard clearance:

0.03 – 0.10 mm (0.0012 – 0.0039 in.)

Maximum clearance: 0.10 mm (0.0039 in.)

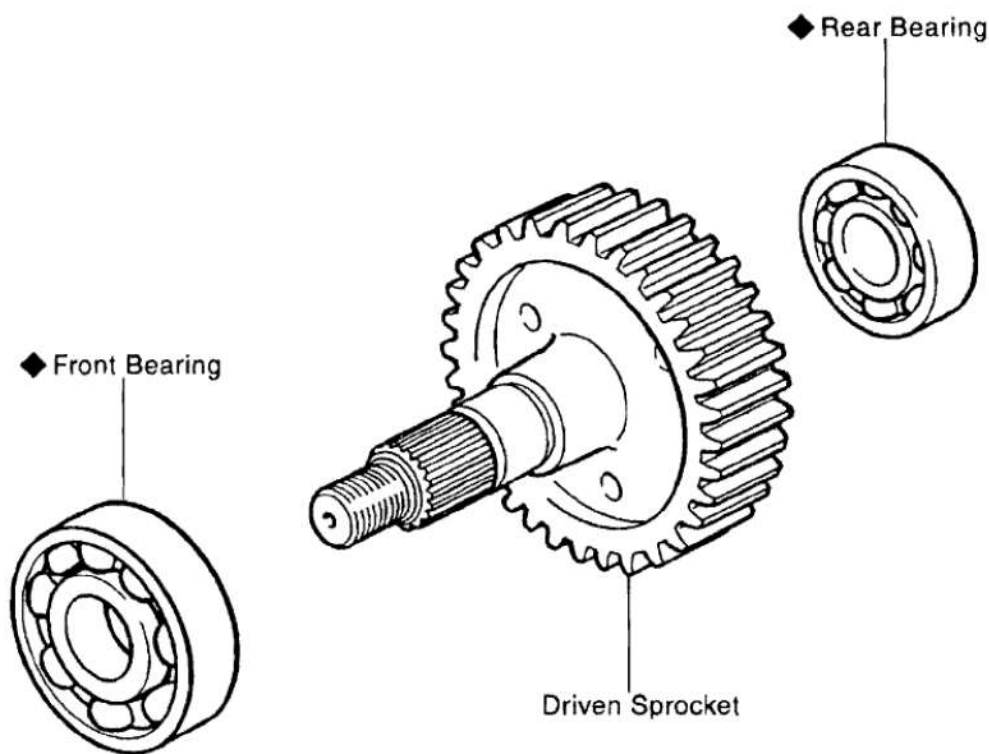
If the clearance exceeds the maximum, replace the drive rotor, driven rotor or pump body.



OIL PUMP BODY ASSEMBLY

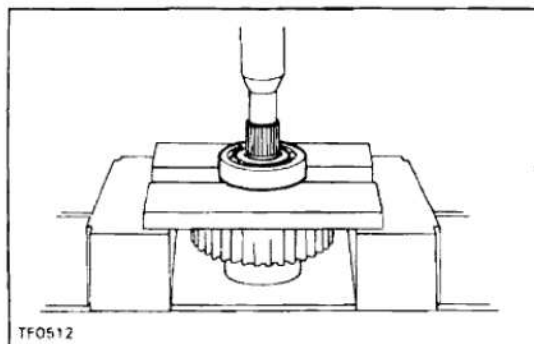
Assembly is in the reverse order of disassembly.

DRIVEN SPROCKET COMPONENTS



009748

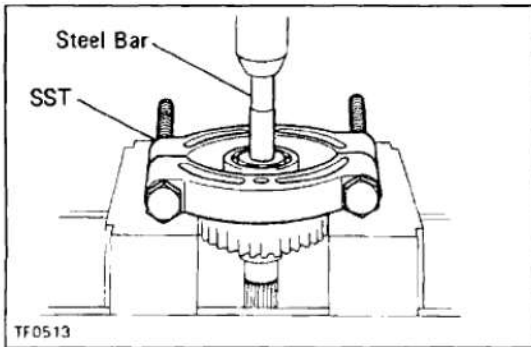
cardiagn.com



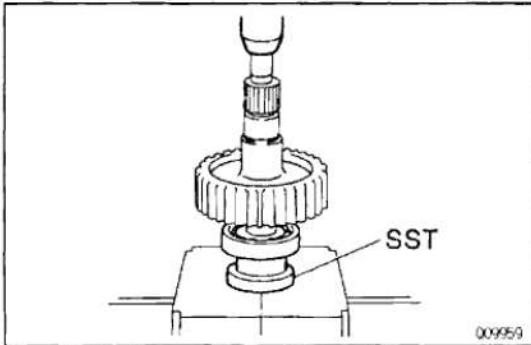
DRIVEN SPROCKET DISASSEMBLY

1. REMOVE FRONT BEARING

Using a press, remove the front bearing.

**2. REMOVE REAR BEARING**

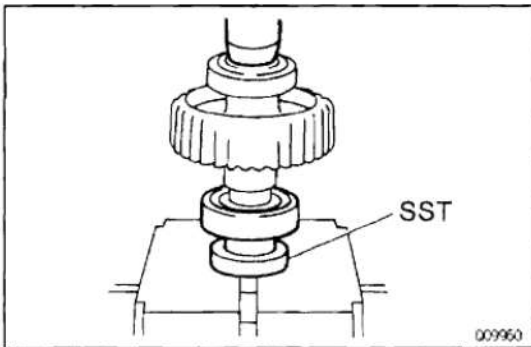
Using SST and a press, remove the rear bearing.
SST 09555-55010

**DRIVEN SPROCKET ASSEMBLY**

TR011-0A

1. INSTALL REAR BEARING

Using SST and a press, install a new rear bearing.
SST 09316-00021

**2. INSTALL FRONT BEARING**

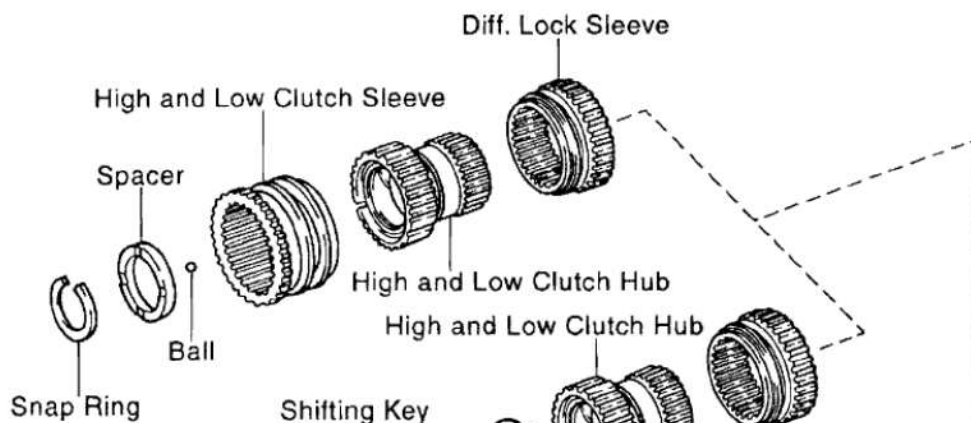
Using SST and a press, install a new front bearing.
SST 09316-00021

TR

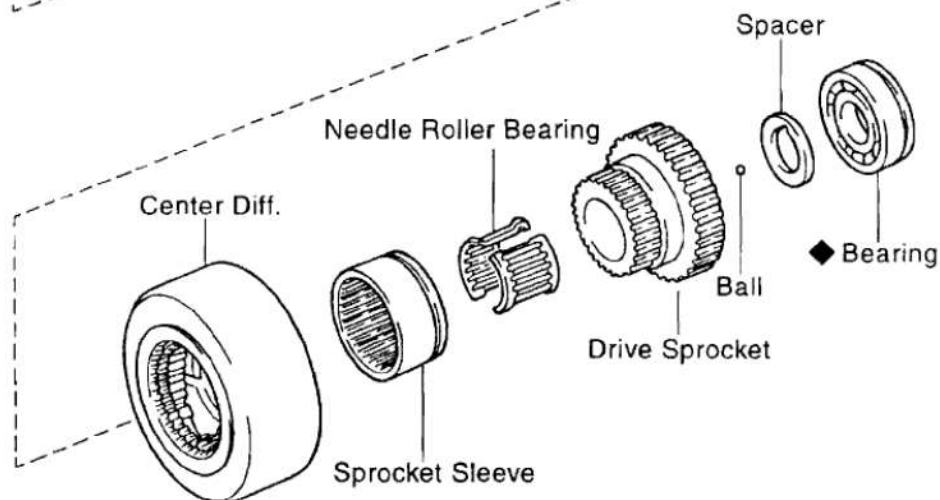
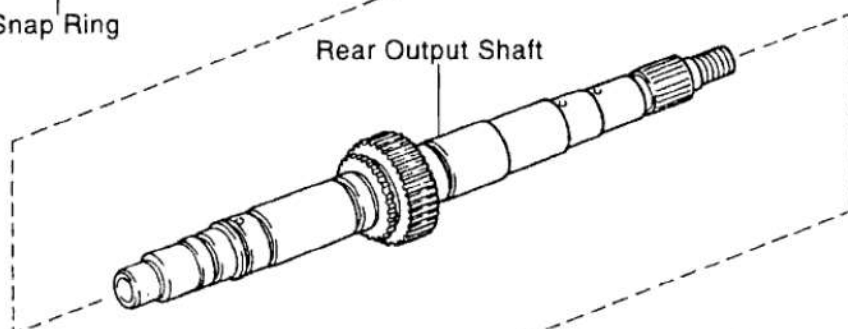
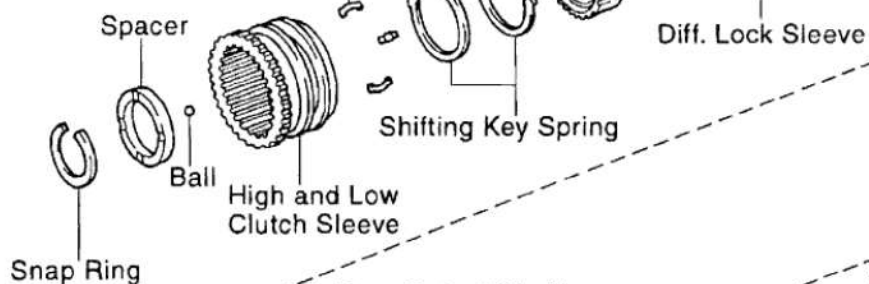
REAR OUTPUT SHAFT COMPONENTS

TR06J-01

A/T

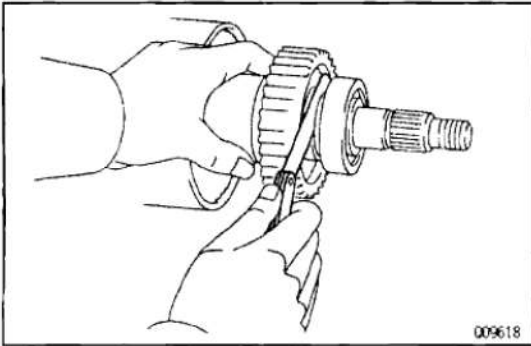


M/T



◆ Non-reusable part

909823



REAR OUTPUT SHAFT DISASSEMBLY

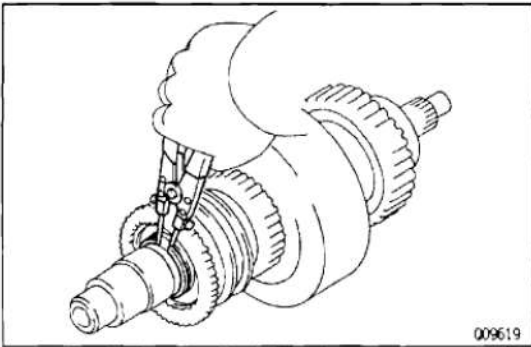
1. **INSPECT DRIVE SPROCKET THRUST CLEARANCE**
Using a feeler gauge, measure the drive sprocket thrust clearance.

Standard clearance:

0.10 – 0.25 mm (0.0039 – 0.0098 in.)

Maximum clearance: 0.25 mm (0.0098 in.)

If the clearance exceeds the maximum, replace the drive sprocket.



2. **REMOVE HIGH AND LOW CLUTCH SLEEVE, CLUTCH HUB AND DIFF. LOCK SLEEVE**

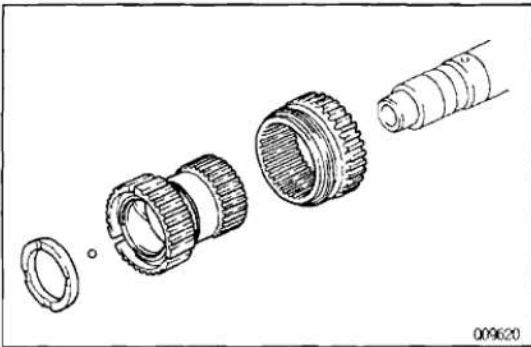
(a) Using a snap ring expander, remove the snap ring.

(b) M/T:

Remove the clutch sleeve, 2 key springs and 3 shifting keys.

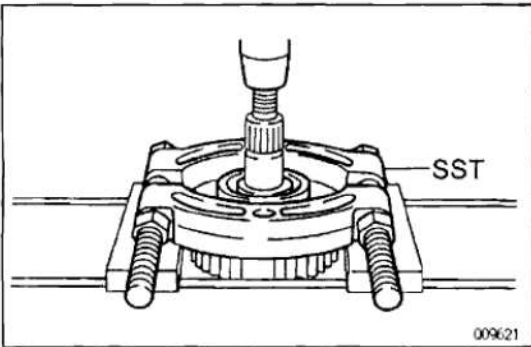
A/T:

Remove the clutch sleeve.



(c) Remove these parts.

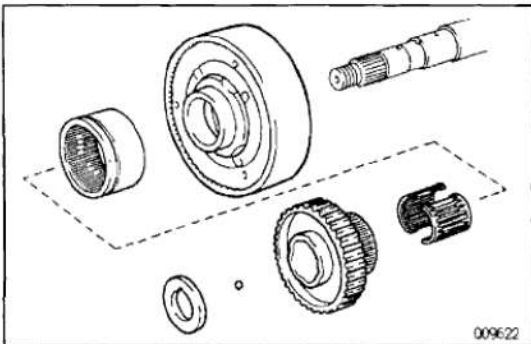
- Spacer and ball.
- Clutch hub and diff. lock sleeve.



3. **REMOVE BEARING, SPACER, DRIVE SPROCKET, SPROCKET SLEEVE AND CENTER DIFF.**

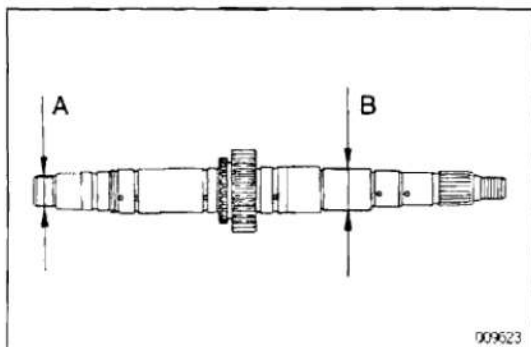
(a) Using SST and a press, remove the bearing.

SST 09555–55010



(b) Remove these parts.

- Spacer and ball
- Drive sprocket and needle roller bearing
- Sprocket sleeve and center diff.



009623

REAR OUTPUT SHAFT INSPECTION

1. INSPECT REAR OUTPUT SHAFT

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

Minimum diameter:

Part A: 27.98 mm (1.1016 in.)

Part B: 36.98 mm (1.4561 in.)

If the clearance exceeds the minimum, replace the rear output shaft.

2. INSPECT DRIVE SPROCKET RADIAL CLEARANCE

Using a dial indicator, measure the radial clearance between the center diff., sprocket sleeve, drive sprocket and shaft with the needle roller bearing installed.

Standard clearance:

0.010 — 0.055 mm (0.0004 — 0.0022 in.)

Maximum clearance: 0.055 mm (0.0022 in.)

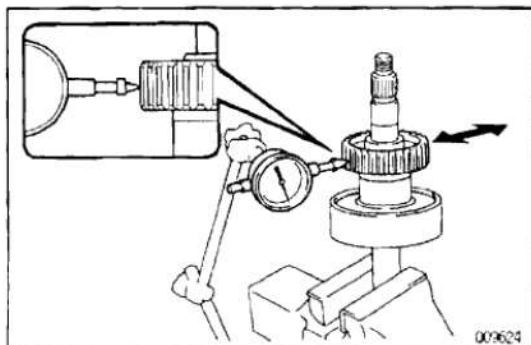
If the clearance exceeds the maximum, replace the drive sprocket, rear output shaft or needle roller bearing.

3. INSPECT FRONT DRIVE SHIFT FORK AND DIFF. LOCK SLEEVE CLEARANCE

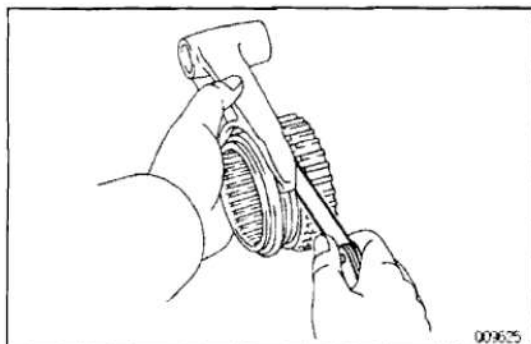
Using a feeler gauge, measure the clearance between the front drive shift fork and diff. lock sleeve.

Maximum clearance: 1.0 mm (0.039 in.)

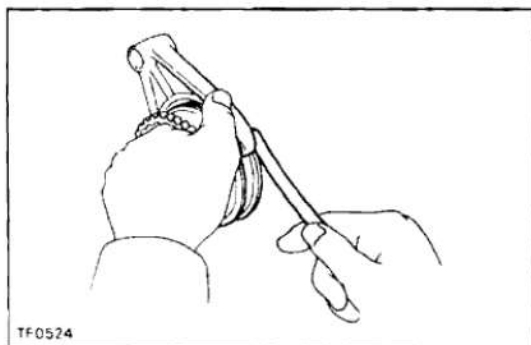
If the clearance exceeds the maximum, replace the shift fork or diff. lock sleeve.



009624



009625



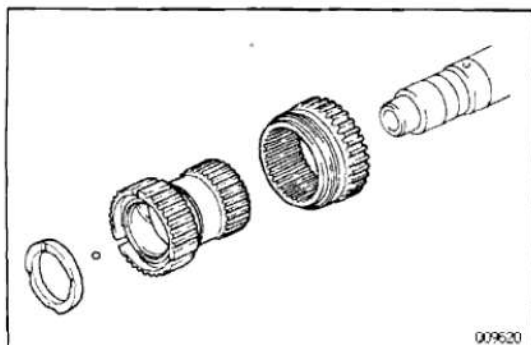
TF0524

4. INSPECT HIGH AND LOW SHIFT FORK AND CLUTCH SLEEVE CLEARANCE

Using a feeler gauge, measure the clearance between the high and low shift fork and clutch sleeve.

Maximum clearance: 1.0 mm (0.039 in.)

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

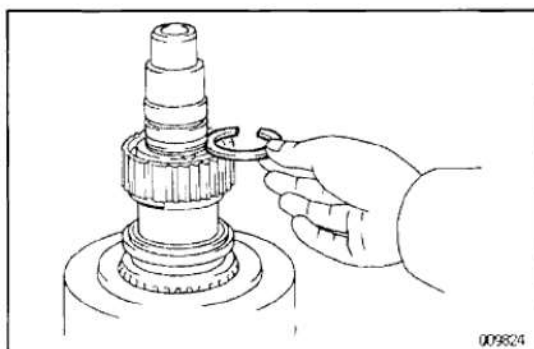


009620

REAR OUTPUT SHAFT ASSEMBLY

1. INSTALL DIFF. LOCK SLEEVE, CLUTCH HUB, SPACER AND BALL

- Install the diff. lock sleeve, clutch hub.
- Install the spacer and ball.

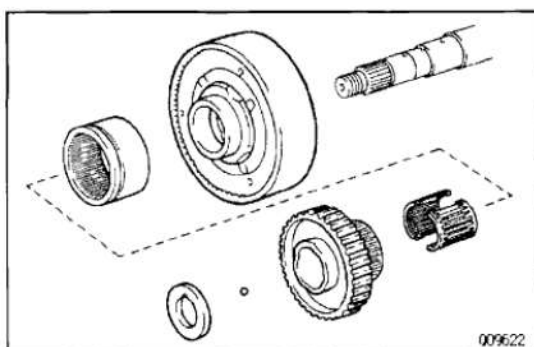


2. INSTALL SNAP RING

Select a snap ring that will allow minimum axial play and install it to the shaft.

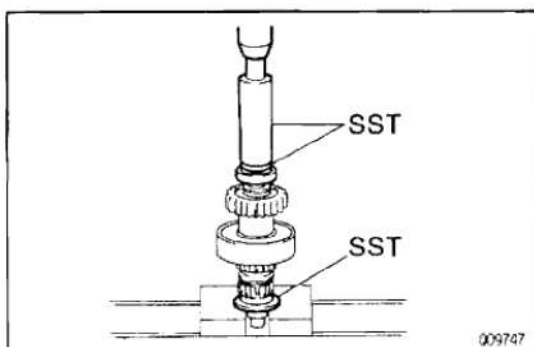
Mark	Thickness mm (in.)
A	2.10 – 2.15 (0.0827 – 0.0846)
B	2.15 – 2.20 (0.0846 – 0.0866)
C	2.20 – 2.25 (0.0866 – 0.0886)
D	2.25 – 2.30 (0.0886 – 0.0906)
E	2.30 – 2.35 (0.0906 – 0.0925)
F	2.35 – 2.40 (0.0925 – 0.0945)
G	2.40 – 2.45 (0.0945 – 0.0965)
H	2.45 – 2.50 (0.0965 – 0.0984)
J	2.50 – 2.55 (0.0984 – 0.1004)
K	2.00 – 2.05 (0.0787 – 0.0807)
L	2.05 – 2.10 (0.0807 – 0.0827)

TR

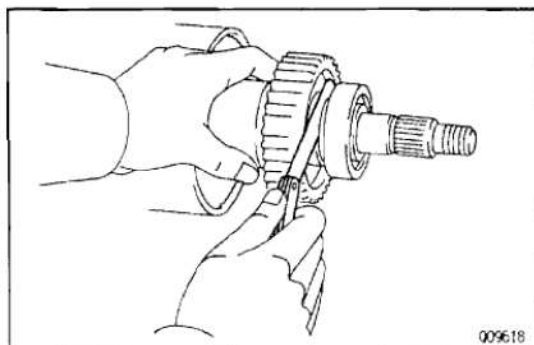


3. INSTALL CENTER DIFF., SPROCKET SLEEVE, DRIVE SPROCKET, SPACER AND BEARING

- Apply gear oil to the shaft and needle roller bearing.
- Install the center diff. and sprocket sleeve.
- Install the needle roller bearing in the drive sprocket.
- Install the drive sprocket, ball and spacer.



- Using SST and a press, install a new bearing with the outer race snap ring groove toward the rear.
SST 09316-60010 (09316-00011, 09316-00071, 09316-20011)



4. INSPECT DRIVE SPROCKET THRUST CLEARANCE

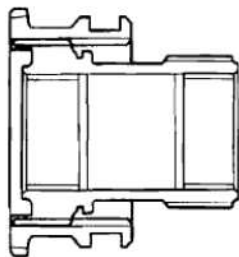
Using a feeler gauge, measure the drive sprocket thrust clearance.

Standard clearance:

0.10 – 0.25 mm (0.0039 – 0.0098 in.)

A/T

Front



009625

5. INSTALL CLUTCH HUB ONTO HIGH AND LOW CLUTCH SLEEVE

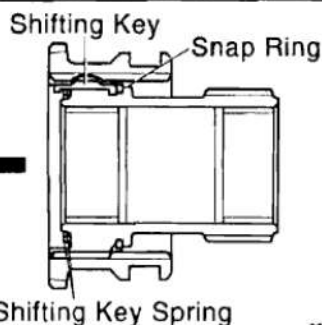
A/T:

Install the clutch hub onto the high and low clutch sleeve.

HINT: Make sure to install the clutch sleeve in the correct direction.

M/T

Front



009627

(a) M/T:

Install the clutch hub onto the high and low clutch sleeve.

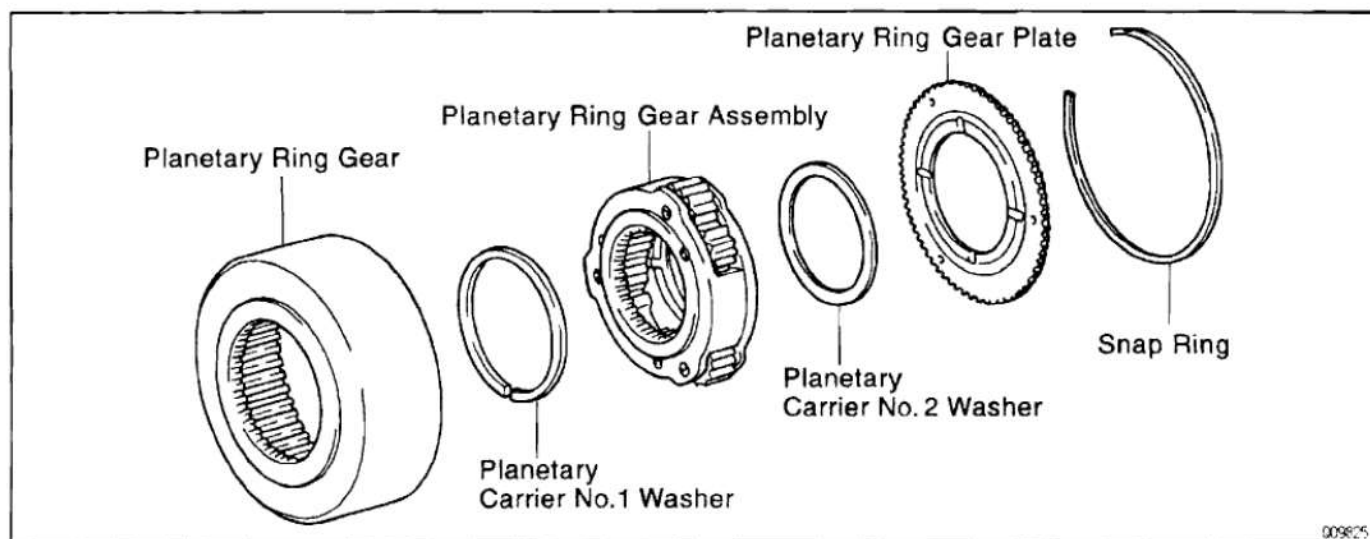
HINT: Make sure to install the clutch sleeve in the correct direction.

(b) Install the 2 shifting key springs under the 3 shifting keys.

NOTICE: Install the key springs positioned so that their end gaps are not in line.

CENTER DIFFERENTIAL COMPONENTS

TROAM-01



009625

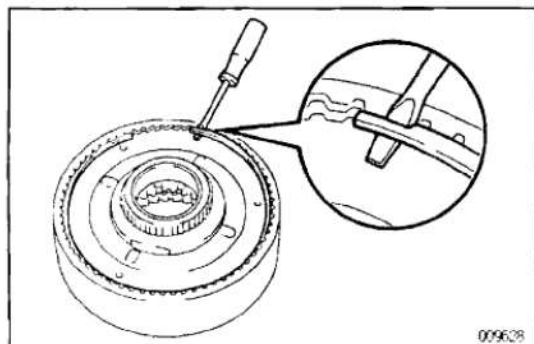
CENTER DIFFERENTIAL DISASSEMBLY

TROAM-01

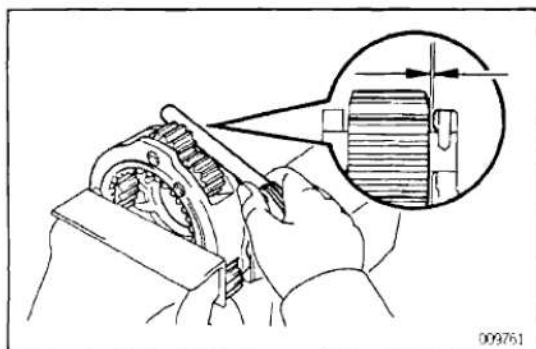
1. REMOVE PLANETARY RING GEAR PLATE

Using a screwdriver, remove the snap ring and ring gear plate.

2. SEPARATE PLANETARY GEAR ASSEMBLY, RING GEAR, CARRIER NO.1 AND NO.2 WASHER



009628



CENTER DIFFERENTIAL INSPECTION

1. INSPECT PLANETARY GEAR ASSEMBLY THRUST CLEARANCE

Using a feeler gauge, measure the planetary gear thrust clearance.

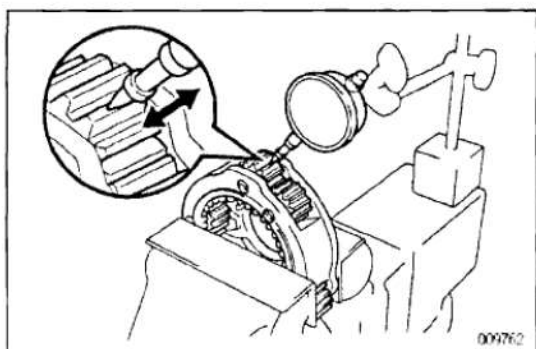
Standard clearance:

0.15 – 0.70 mm (0.0059 – 0.0276 in.)

Maximum clearance:

0.70 mm (0.0276 in.)

If the clearance exceeds the maximum, replace the planetary gear assembly.



2. INSPECT PLANETARY GEAR ASSEMBLY RADIAL CLEARANCE

Using a dial indicator, measure the planetary gear radial clearance.

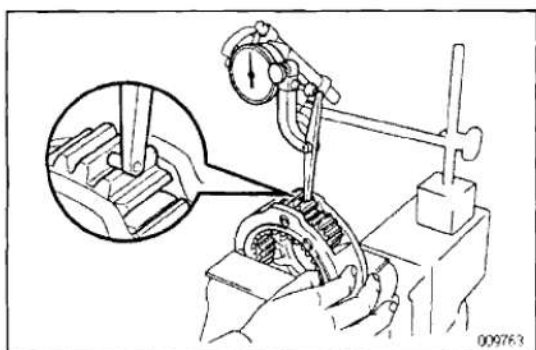
Standard clearance:

0.009 – 0.038 mm (0.0004 – 0.0015 in.)

Maximum clearance:

0.038 mm (0.0015 in.)

If the clearance exceeds the maximum, replace the planetary gear.



3. INSPECT PLANETARY GEAR ASSEMBLY BACKLASH

Using a dial indicator, measure the planetary gear backlash.

HINT: Push the pinion gear inner.

Standard clearance:

0.15 – 0.70 mm (0.0059 – 0.0276 in.)

Maximum clearance:

0.70 mm (0.0276 in.)

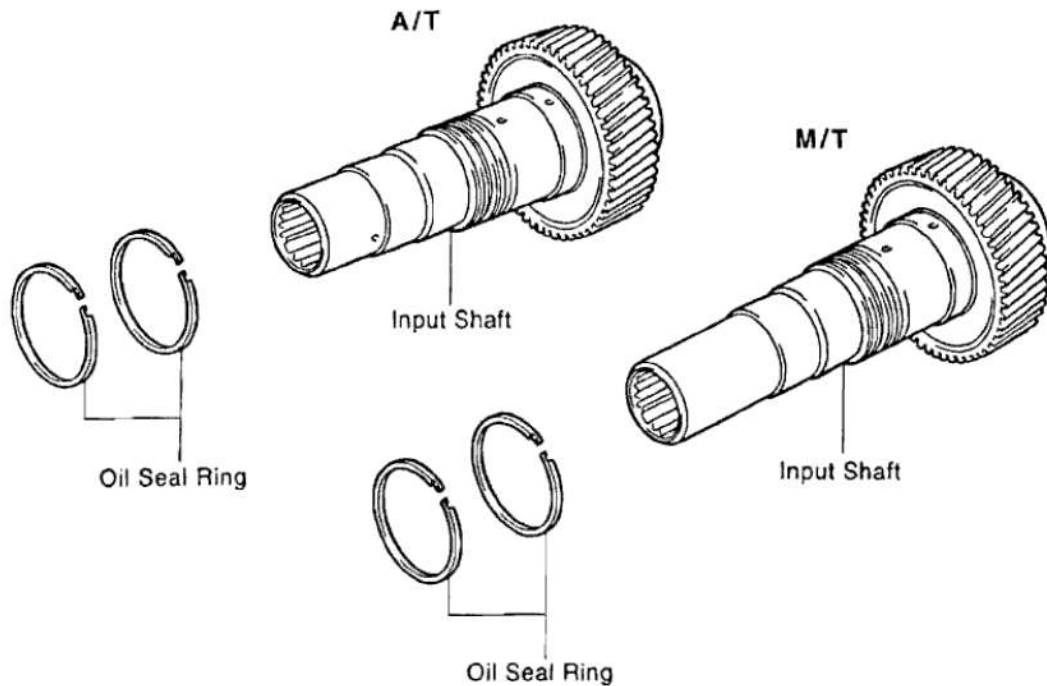
If the backlash exceeds the maximum, replace the planetary gear.

CENTER DIFFERENTIAL ASSEMBLY

Assembly is in the reverse order of disassembly.

INPUT SHAFT COMPONENTS

TR018-08



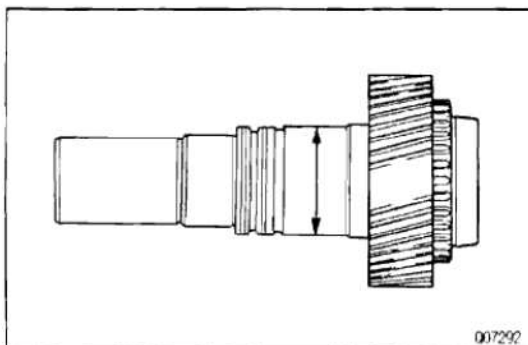
007303

INPUT SHAFT DISASSEMBLY

TR04L-08

REMOVE OIL SEAL RINGS

Remove the 2 oil seal rings.

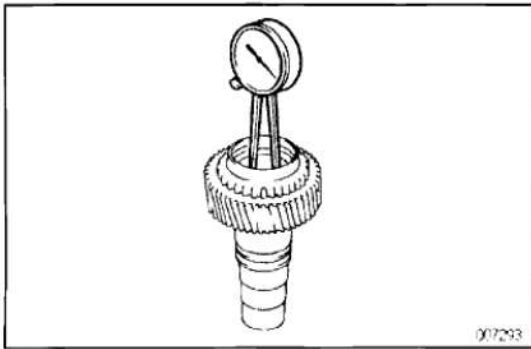


INPUT SHAFT INSPECTION

TR018-09

1. INSPECT INPUT SHAFT

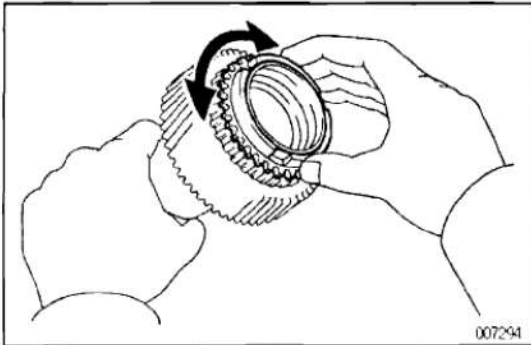
- (a) Using a micrometer, measure the outer diameter of the input shaft journal surface.
Minimum diameter: 47.59 mm (1.8736 in.)



- (b) Using a dial indicator, measure the inside diameter of the input shaft bushing.

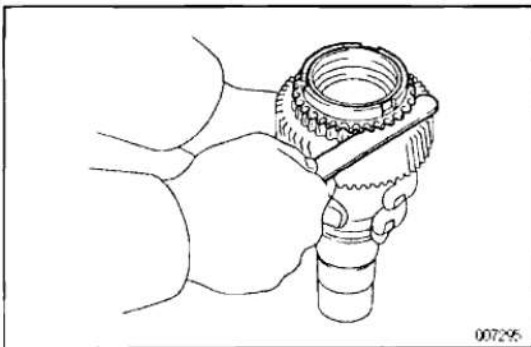
Maximum inside diameter: 39.14 mm (1.5409 in.)

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



2. M/T: INSPECT SYNCHRONIZER RING

- (a) Turn the ring and push it in to check the braking action.



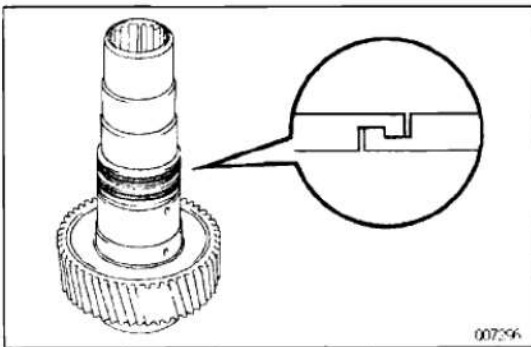
- (b) Measure the clearance between the synchronizer ring back and the input shaft spline end.

Standard clearance:

1.05 – 1.85 mm (0.0413 – 0.0728 in.)

Minimum clearance: 0.80 mm (0.0315 in.)

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



INPUT SHAFT ASSEMBLY

INSTALL OIL SEAL RINGS

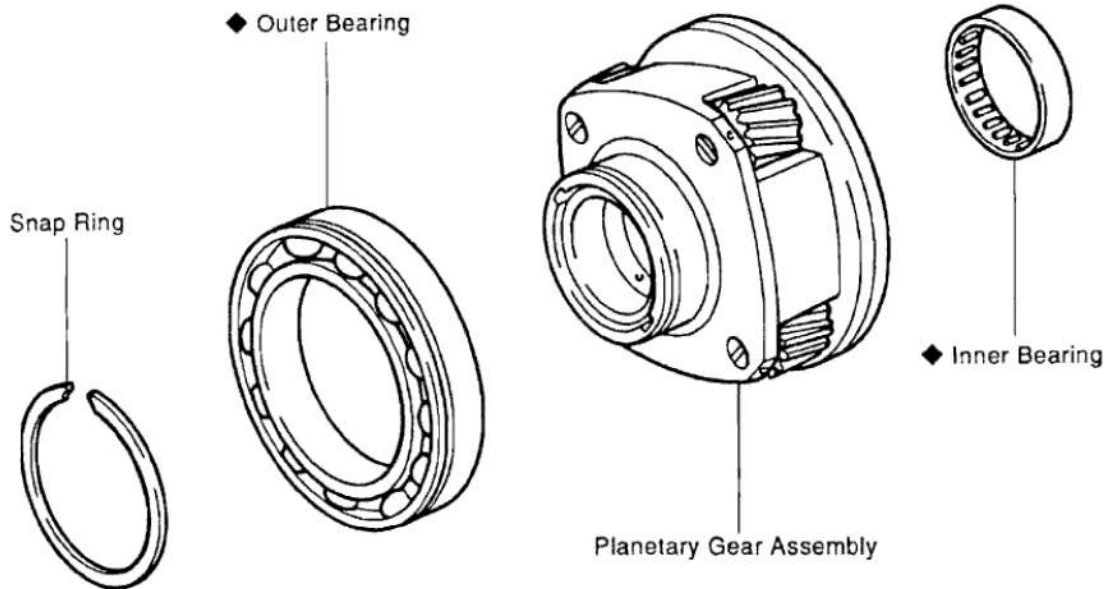
Install the 2 oil seal rings.

HINT:

- Apply gear oil to the oil seal ring.
- Hang securely to eliminate clearance.

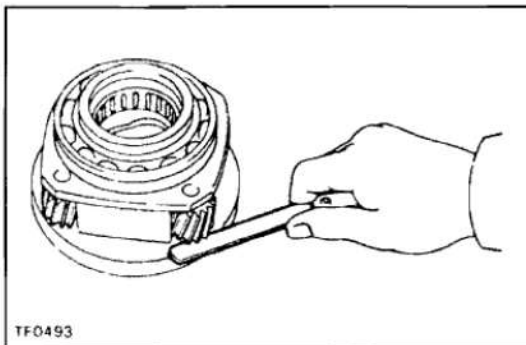
PLANETARY GEAR COMPONENTS

TR01A-06



007455

TR08K-04



PLANETARY GEAR INSPECTION

1. INSPECT PINION GEAR THRUST CLEARANCE

Using a feeler gauge, measure the planetary pinion gear thrust clearance.

Standard clearance:

0.11 – 0.84 mm (0.0043 – 0.0331 in.)

Maximum clearance: 0.84 mm (0.0331 in.)

If the clearance exceeds the maximum, replace the planetary gear assembly

2. INSPECT PLANETARY PINION GEAR RADIAL CLEARANCE

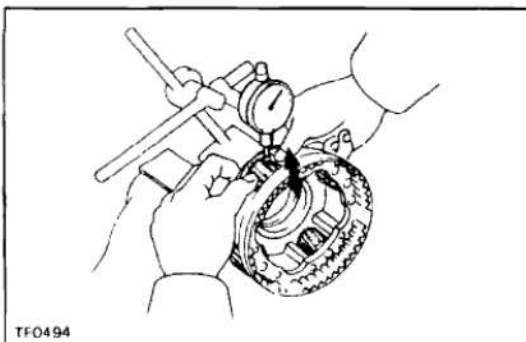
Using a dial indicator, measure the radial clearance of the planetary pinion gear.

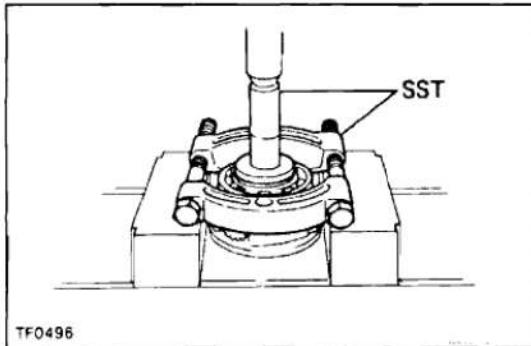
Standard clearance:

0.009 – 0.038 mm (0.0004 – 0.0015 in.)

Maximum clearance: 0.038 mm (0.0015 in.)

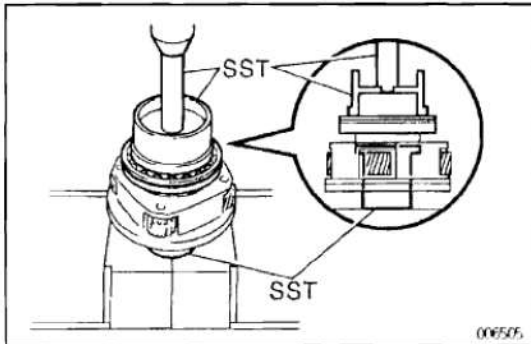
If the clearance exceeds the maximum, replace the planetary gear assembly.



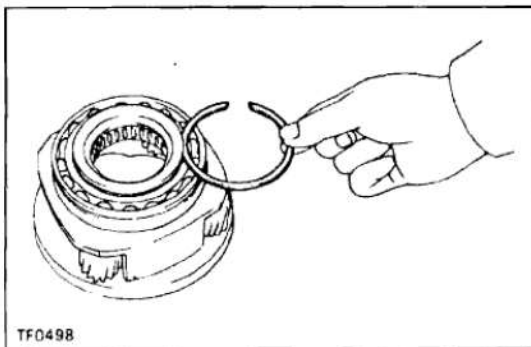


3. IF NECESSARY, REPLACE PLANETARY GEAR OUTER BEARING

- Using a snap ring expander, remove the snap ring.
- Using SST and a press, remove the outer bearing.
SST 09554-30011, 09555-55010



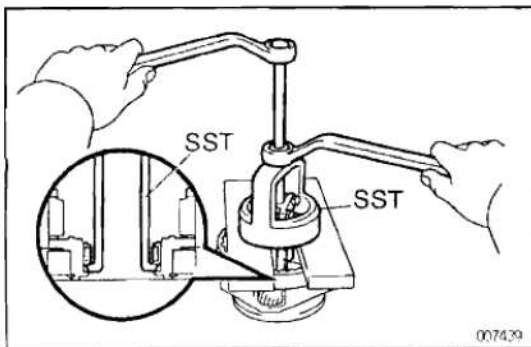
- Using SST and a press, install a new bearing with the groove faced forward.
SST 09223-15020, 09515-30010, 09950-70010
(09951-07100)



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

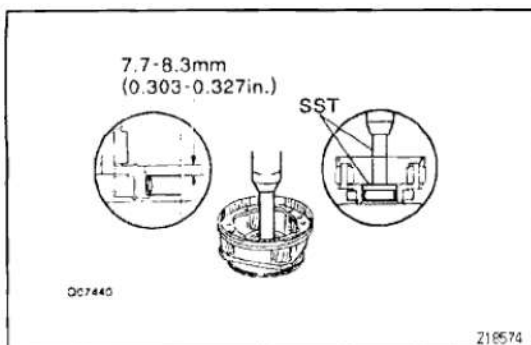
Mark	Thickness mm (in.)
1	1.45 - 1.50 (0.0571 - 0.0591)
2	1.50 - 1.55 (0.0591 - 0.0610)
3	1.55 - 1.60 (0.0610 - 0.0630)
4	1.60 - 1.65 (0.0630 - 0.0650)
5	1.65 - 1.70 (0.0650 - 0.0669)

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



4. IF NECESSARY, REPLACE PLANETARY GEAR THRUST INNER BEARING

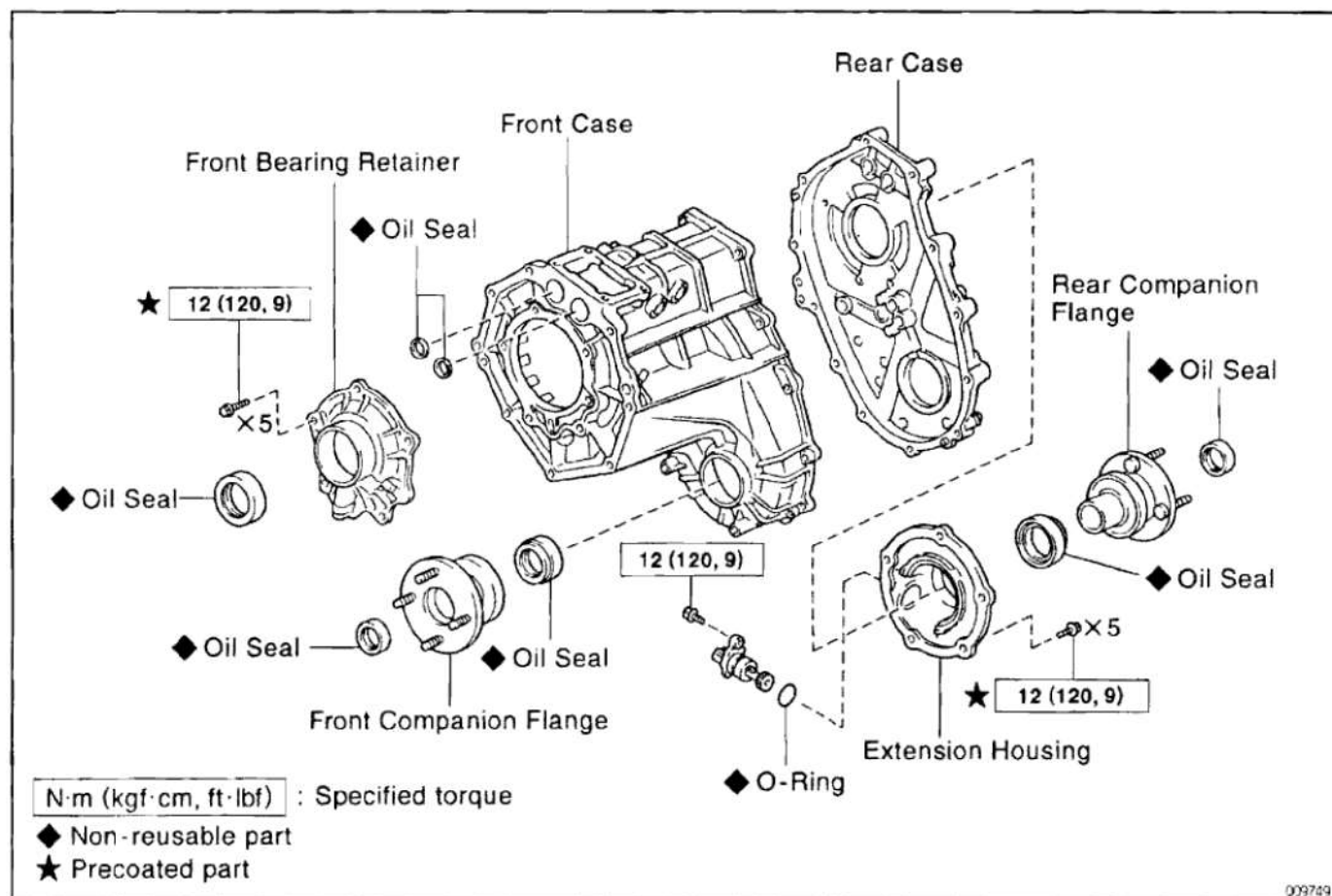
- Using SST and a press, remove the inner bearing.
SST 09612-65014 (09612-01030, 09612-01050)
NOTICE: Hang the SST securely to the clearance between the thrust inner bearing and planetary gear.



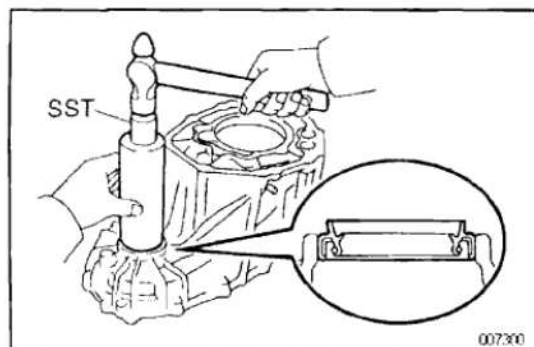
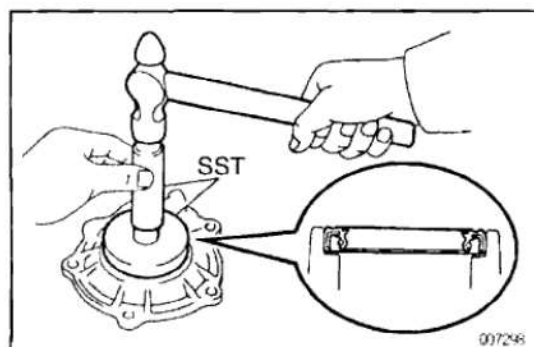
- Using SST and a press, install a new bearing.
SST 09950-60010 (09951-00570),
09950-70010 (09951-07100)
Bearing depth: 7.7 - 8.3 mm (0.303 - 0.327 in.)

OIL SEALS COMPONENTS

TMDIC--04



009749



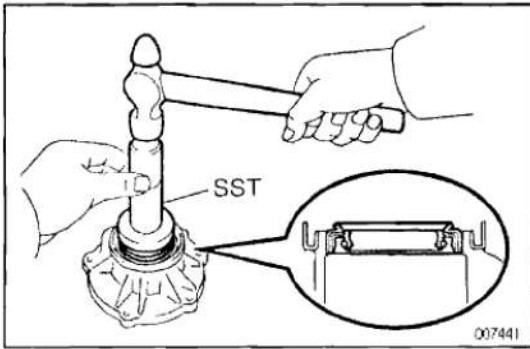
OIL SEALS REPLACEMENT

1. REPLACE FRONT BEARING RETAINER OIL SEAL

- (a) Using a screwdriver and hammer, drive out the oil seal.
- (b) Using SST and a hammer, drive in a new oil seal until its surface is flush with the retainer upper surface.
SST 09950-60010 (09951-00590),
09950-70010 (09951-07100)

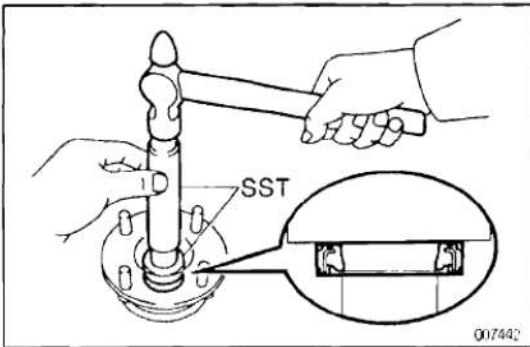
2. REPLACE FRONT CASE OIL SEAL

- Using a screwdriver and hammer, drive out the oil seal.
- Using SST and a hammer, drive in a new oil seal until its surface is flush with the case upper surface.
SST 09316-60011 (09316-00011)
- Coat the lip of the oil seal with MP grease.



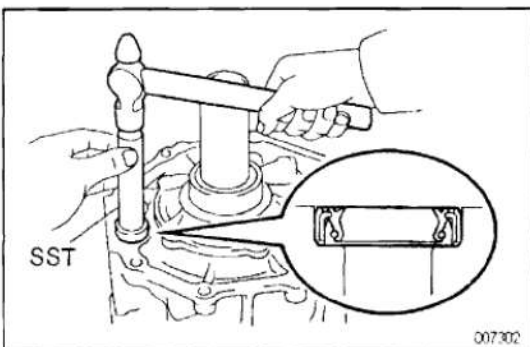
3. REPLACE EXTENSION HOUSING OIL SEAL

- Using a screwdriver and hammer, drive out the oil seal.
- Using SST and a hammer, drive in a new oil seal until its surface is flush with the housing upper surface.
SST 09554-22010
- Coat the lip of the oil seal with MP grease.



4. REPLACE FRONT AND REAR COMPANION FLANGE OIL SEALS

- Using a screwdriver and hammer, drive out the oil seals from the 2 flanges.
- Using SST and a hammer, drive in a new oil seal.
SST 09950-60010 (09951-00220, 09951-00350, 09952-06010), 09950-70010 (09951-07100)
- Coat the lip of the oil seal with MP grease.



5. REPLACE SHIFT FORK SHAFT OIL SEALS

- Using a screwdriver, pry out the oil seal.
- Using SST and a hammer, drive in a new oil seal.
SST 09304-12012

Oil seal depth:

–0.5 ~ 0.5 mm (–0.020 ~ 0.020 in.)

SERVICE SPECIFICATIONS

SERVICE DATA

TR01F-0C

Breather hose	Hose depth		13 mm	0.51 in.
Oil pump body	Body clearance	STD	0.09 — 0.16 mm	0.0035 — 0.0063 in.
		Max	0.16 mm	0.0063 in.
	Tip clearance	STD	0.05 — 0.15 mm	0.0020 — 0.0059 in.
		Max	0.15 mm	0.0059 in.
	Side clearance	STD	0.03 — 0.10 mm	0.0012 — 0.0039 in.
		Max	0.10 mm	0.0039 in.
Rear output shaft assembly	Drive sprocket thrust clearance	STD	0.10 — 0.25 mm	0.0039 — 0.0098 in.
		Max	0.25 mm	0.0098 in.
	Rear output shaft journal diameter			
	Part A	Min	27.98 mm	1.1016 in.
	Part B	Min	36.98 mm	1.4561 in.
	Drive sprocket radial clearance	STD	0.010 — 0.055 mm	0.0004 — 0.0022 in.
		Max	0.055 mm	0.0022 in.
	Front drive shift fork to center diff. lock sleeve clearance	Max	1.0 mm	0.039 in.
	High and low shift fork to sleeve clearance	Max	1.0 mm	0.039 in.
	Rear output shaft snap ring thickness	Mark		
		A	2.10 — 2.15 mm	0.0827 — 0.0846 in.
		B	2.15 — 2.20 mm	0.0846 — 0.0866 in.
		C	2.20 — 2.25 mm	0.0866 — 0.0886 in.
		D	2.25 — 2.30 mm	0.0886 — 0.0906 in.
		E	2.30 — 2.35 mm	0.0906 — 0.0925 in.
		F	2.35 — 2.40 mm	0.0925 — 0.0945 in.
		G	2.40 — 2.45 mm	0.0945 — 0.0965 in.
		H	2.45 — 2.50 mm	0.0965 — 0.0984 in.
		J	2.50 — 2.55 mm	0.0984 — 0.1004 in.
		K	2.00 — 2.05 mm	0.0787 — 0.0807 in.
		L	2.05 — 2.10 mm	0.0807 — 0.0827 in.
Center differential	Planetary gear assembly thrust clearance	STD	0.15 — 0.70 mm	0.0059 — 0.0276 in.
		Max	0.70 mm	0.0276 in.
	Planetary gear assembly radial clearance	STD	0.009 — 0.038 mm	0.0004 — 0.0015 in.
		Max	0.038 mm	0.0015 in.
	Planetary gear assembly backlash	STD	0.15 — 0.70 mm	0.0059 — 0.0276 in.
		Max	0.70 mm	0.0276 in.

TR

Input shaft	Input shaft journal outer diameter		Min	47.59 mm	1.8736 in.
	Input shaft bushing diameter		Max	39.14 mm	1.5409 in.
	Synchronizer ring to sprocket clearance		STD	1.05 — 1.85 mm	0.0413 — 0.0728 in.
			Min	0.80 mm	0.0315 in.
	Input shaft snap ring thickness		Mark		
			A	2.10 — 2.15 mm	0.0827 — 0.0846 in.
			B	2.15 — 2.20 mm	0.0846 — 0.0866 in.
			C	2.20 — 2.25 mm	0.0866 — 0.0886 in.
			D	2.25 — 2.30 mm	0.0886 — 0.0906 in.
			E	2.30 — 2.35 mm	0.0906 — 0.0925 in.
			F	2.35 — 2.40 mm	0.0925 — 0.0945 in.
			G	2.40 — 2.45 mm	0.0945 — 0.0965 in.
			H	2.45 — 2.50 mm	0.0965 — 0.0984 in.
			J	2.50 — 2.55 mm	0.0984 — 0.1004 in.
			K	2.55 — 2.60 mm	0.1004 — 0.1024 in.
			L	2.60 — 2.65 mm	0.1024 — 0.1043 in.
			M	2.65 — 2.70 mm	0.1043 — 0.1063 in.
			N	2.70 — 2.75 mm	0.1063 — 0.1083 in.
			P	2.75 — 2.80 mm	0.1083 — 0.1102 in.
			Q	2.80 — 2.85 mm	0.1102 — 0.1122 in.
			R	2.85 — 2.90 mm	0.1122 — 0.1142 in.
			S	2.90 — 2.95 mm	0.1142 — 0.1161 in.
			T	2.95 — 3.00 mm	0.1161 — 0.1181 in.
			U	3.00 — 3.05 mm	0.1181 — 0.1201 in.
Planetary gear	Pinion gear thrust clearance		STD	0.11 — 0.84 mm	0.0043 — 0.0331 in.
			Max	0.84 mm	0.0331 in.
	Pinion gear radial clearance		STD	0.009 — 0.038 mm	0.0004 — 0.0015 in.
			Max	0.038 mm	0.0015 in.
	Outer bearing snap ring thickness		Mark		
			1	1.45 — 1.50 mm	0.0571 — 0.0591 in.
			2	1.50 — 1.55 mm	0.0591 — 0.0610 in.
			3	1.55 — 1.60 mm	0.0610 — 0.0630 in.
			4	1.60 — 1.65 mm	0.0630 — 0.0650 in.
			5	1.65 — 1.70 mm	0.0650 — 0.0669 in.
	Thrust inner bearing depth			7.7 — 8.3 mm	0.303 — 0.327 in.
Oil seal	Shift fork shaft oil seal depth			−0.5 ~ 0.5 mm	−0.020 ~ 0.020 in.

TORQUE SPECIFICATIONS

Part tightened	N·m	kgf·cm	ft·lbf
Transmission control rod x Shift lever	13	130	10
Dynamic damper	38	385	28
Crossmember x Engine rear mounting	19	190	14
Crossmember x Frame	65	660	48
Transfer adaptor x Transfer	24	240	17
Speed sensor driven gear set bolt	12	120	9
Center diff. lock indicator switch	37	380	27
Low position switch	37	380	27
Neutral position switch	37	380	27
Plug x Front case	37	380	27
Protector	18	185	13
Mass damper	20	200	14
Front bearing retainer	12	120	9
Control retainer	18	185	13
Upper cover and oil deflector	18	185	13
Companion flange lock nut	118	1,200	87
Extension housing	12	120	9
Front case x Rear case	28	285	21
Straight screw plug for shift fork shaft	19	190	14
Separator with oil strainer x Front case	7.5	80	69 in·lbf
Oil pump body x Front case	7.5	80	69 in·lbf
Straight screw plug for ring gear	19	190	14
Oil pump plate x Oil pump body	7.4	75	65 in·lbf

TR