

# TROUBLESHOOTING

MX002-04

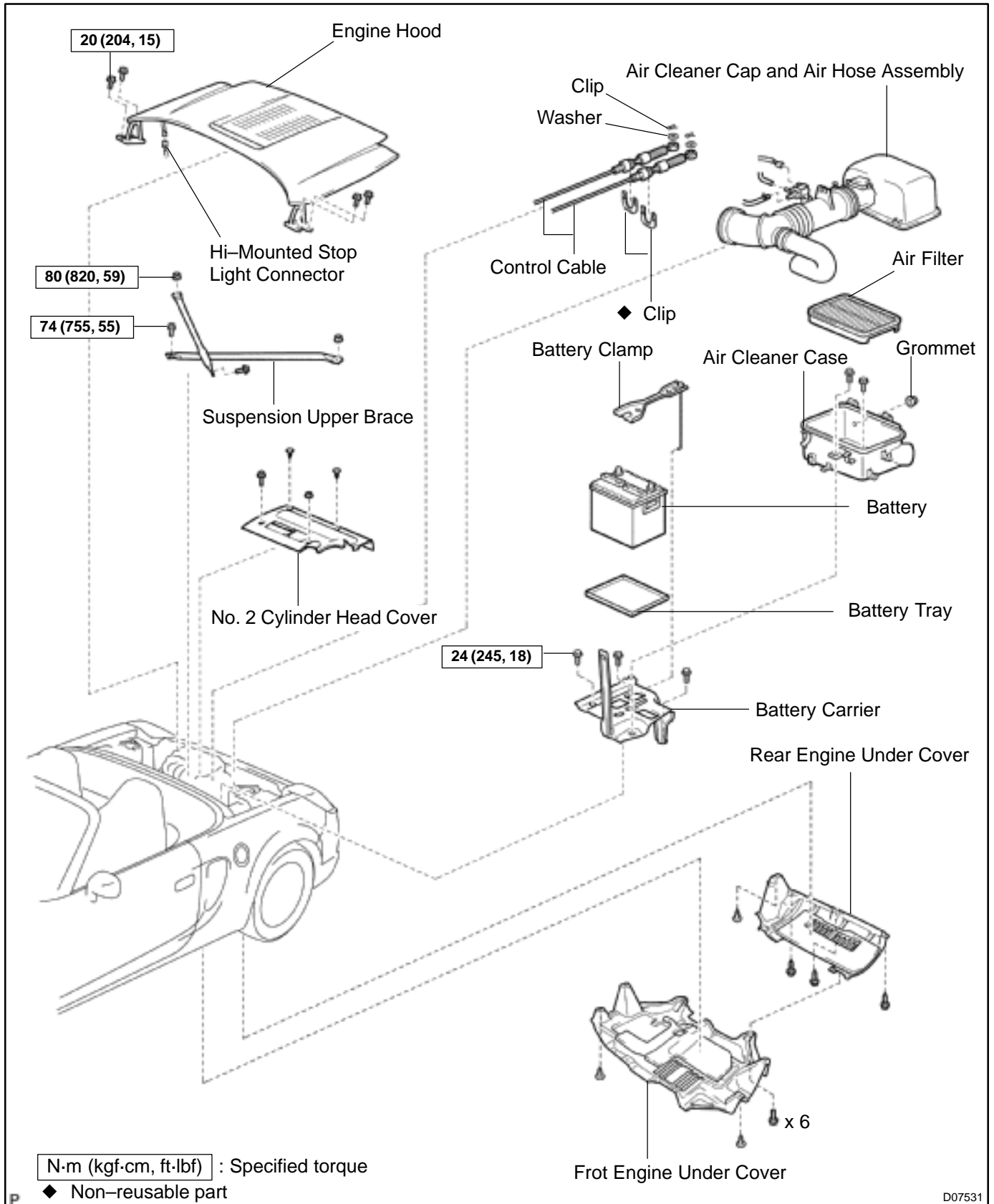
## PROBLEM SYMPTOMS TABLE

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

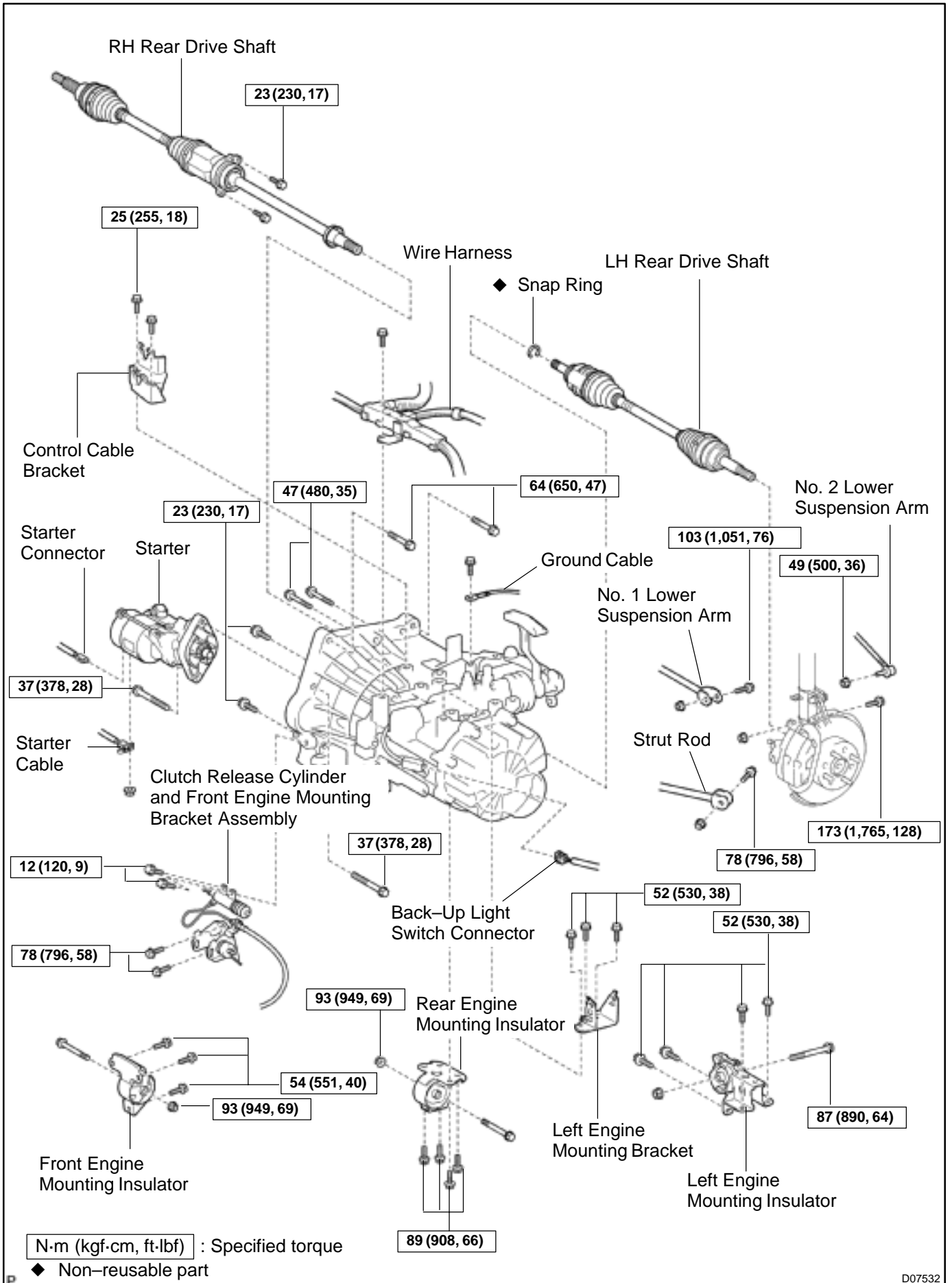
Symptom	Suspected Area	See page
Noise	<ol style="list-style-type: none"> <li>1. Oil (Level low)</li> <li>2. Oil (Wrong)</li> <li>3. Gear (Worn or damaged)</li> <li>4. Bearing (Worn or damaged)</li> </ol>	<p><a href="#">MX-4</a></p> <p><a href="#">MX-4</a></p> <p><a href="#">MX-10</a></p> <p><a href="#">MX-10</a></p>
Oil leakage	<ol style="list-style-type: none"> <li>1. Oil (Level too high)</li> <li>2. Gasket (Damaged)</li> <li>3. Oil seal (Worn or damaged)</li> <li>4. O-ring (Worn or damaged)</li> </ol>	<p><a href="#">MX-4</a></p> <p><a href="#">MX-4</a></p> <p><a href="#">MX-4</a></p> <p><a href="#">MX-4</a></p>
Hard to shift or will not shift	<ol style="list-style-type: none"> <li>1. Control cable (Faulty)</li> <li>2. Synchronizer ring (Worn or damaged)</li> <li>3. Shifting key spring (Damaged)</li> </ol>	<p><a href="#">MX-56</a></p> <p><a href="#">MX-4</a></p> <p><a href="#">MX-30</a></p> <p><a href="#">MX-39</a></p> <p><a href="#">MX-4</a></p> <p><a href="#">MX-30</a></p> <p><a href="#">MX-39</a></p>
Jumps out of gear	<ol style="list-style-type: none"> <li>1. Locking ball spring (Damaged)</li> <li>2. Gear shift fork (Worn)</li> <li>3. Gear (Worn or damaged)</li> <li>4. Bearing (Worn or damaged)</li> </ol>	<p><a href="#">MX-4</a></p> <p><a href="#">MX-4</a></p> <p><a href="#">MX-4</a></p> <p><a href="#">MX-4</a></p>

# MANUAL TRANSAXLE UNIT COMPONENTS

MX09F-02



D07531



D07532

## REMOVAL

### 1. REMOVE ENGINE HOOD

Remove the 4 bolts and engine hood.

**Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)**

HINT:

At the time of installation, please refer to the following item.  
Adjust the hood (See page [BO-9](#)).

### 2. REMOVE SUSPENSION UPPER BRACE

Remove the 2 bolts, 2 nuts and suspension upper brace.

**Torque:**

**74 N·m (755 kgf·cm, 55 ft·lbf) for bolt**

**80 N·m (816 kgf·cm, 59 ft·lbf) for nut**

### 3. REMOVE AIR CLEANER CAP AND AIR HOSE ASSEMBLY, AIR FILTER AND AIR CLEANER CASE

### 4. REMOVE BATTERY CARRIER

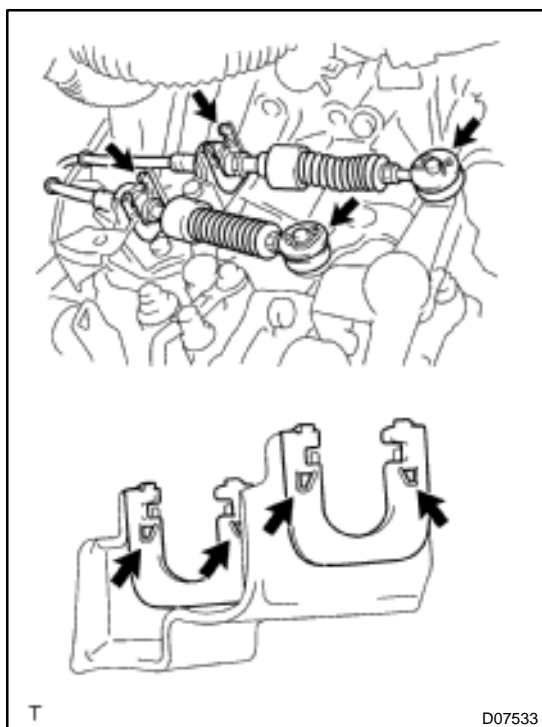
(a) Loosen the clamp nut, and remove the clamp, battery and tray.

(b) Remove the 3 bolts and battery carrier.

**Torque: 24 N·m (245 kgf·cm, 18 ft·lbf)**

### 5. DISCONNECT WIRE HARNESS FROM TRANSAXLE

### 6. DISCONNECT BACK-UP LIGHT SWITCH CONNECTOR



### 7. DISCONNECT CONTROL CABLES FROM TRANSAXLE

(a) Remove the 2 clips and 2 washers.

(b) Remove the 2 clips and disconnect the 2 control cables.

HINT:

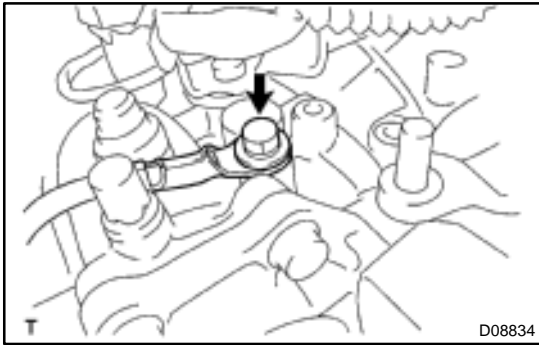
Remove the select cable from the bracket by pressing the projection of the clip.

### 8. REMOVE CONTROL CABLE BRACKET

Remove the 2 bolts and control cable bracket.

**Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)**





**9. DISCONNECT GROUND CABLE FROM TRANSAXLE**

Remove the bolt and disconnect the ground cable.

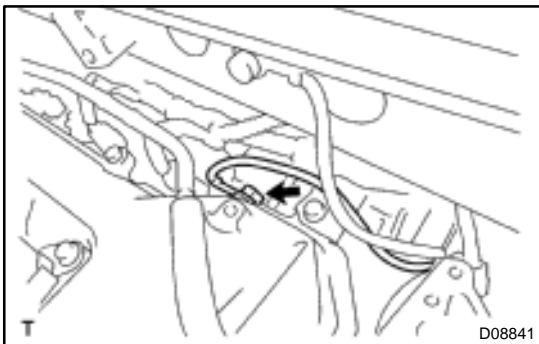


**10. REMOVE 2 MOUNTING BOLTS OF TRANSAXLE UPPER SIDE**

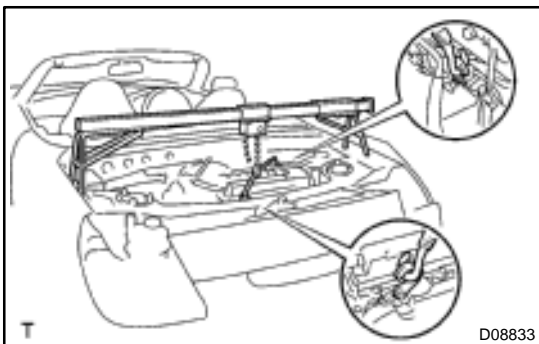
**Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)**

**11. ATTACH ENGINE SUPPORT FIXTURE**

(a) Remove the No. 2 cylinder head cover.



(b) Remove the bolt and disconnect the ground cable from the engine.



(c) Install the No. 1 and No. 2 engine hangers in the correct direction.

Parts No.:

No. 1 engine hanger: 12281-22021

No. 2 engine hanger: 12281-15040

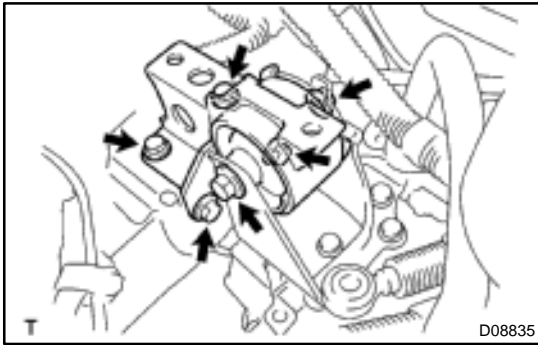
Bolt: 91512-B1016

**Torque: 38 N·m (387 kgf·cm, 28 ft·lbf)**

(d) Using an engine sling device, attach the engine support fixture to the engine hangers.

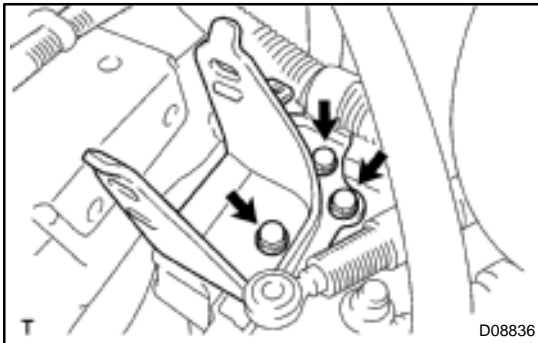
**NOTICE:**

**Do not attempt to hang the engine by hooking the chain to any other part.**



**12. REMOVE LEFT ENGINE MOUNTING INSULATOR**

- (a) Remove the through bolt and nut.  
**Torque: 87 N·m (887 kgf·cm, 64 ft·lbf)**
- (b) Remove the 4 bolts and mounting insulator.  
**Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)**



**13. REMOVE LEFT ENGINE MOUNTING BRACKET**

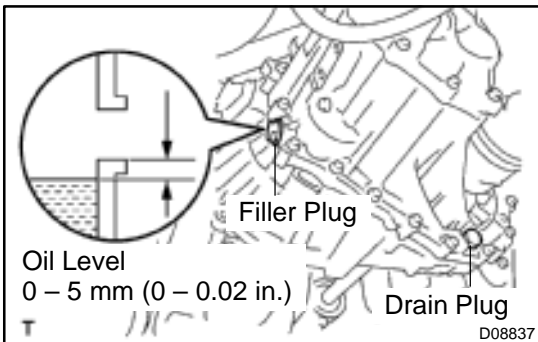
- Remove the 3 bolts and mounting bracket.  
**Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)**

**14. RAISE VEHICLE**

**NOTICE:**

Make sure that the vehicle is securely supported.

**15. REMOVE FRONT AND REAR ENGINE UNDER COVERS**



**16. DRAIN TRANSAXLE OIL**

Oil grade: API GL-4 or GL-5

Viscosity: SAE 75W-90

Capacity:

1.8 liters (2.0 US qts, 1.7 Imp. qts) for w/ LSD

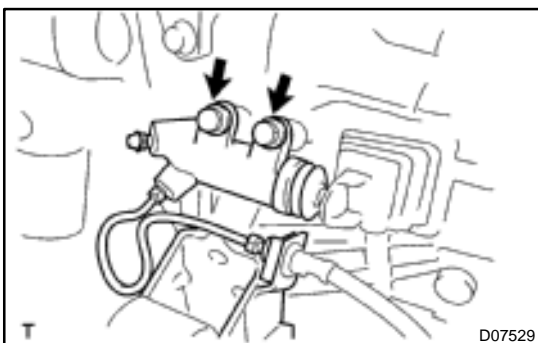
1.9 liters (2.2 US qts, 1.8 Imp. qts) for w/o LSD

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

**17. REMOVE LH AND RH REAR DRIVE SHAFTS  
(See page SA-41)**

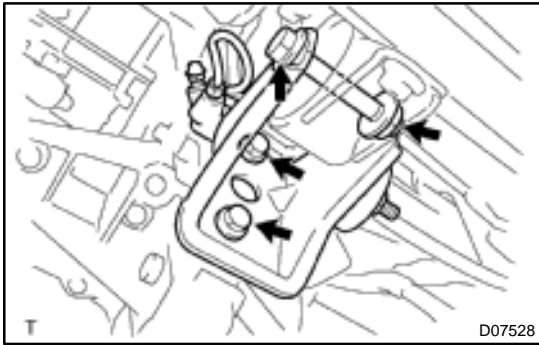
**18. JACK UP TRANSAXLE SLIGHTLY**

Using a transmission jack, support the transaxle.

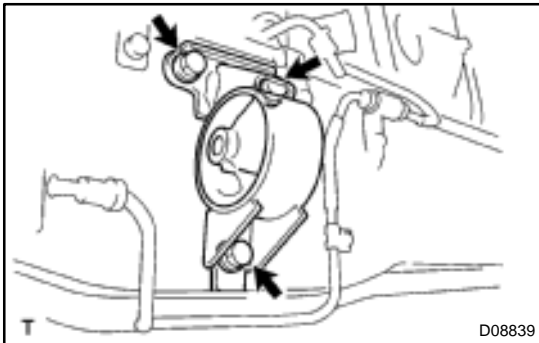


**19. DISCONNECT CLUTCH RELEASE CYLINDER AND FRONT ENGINE MOUNTING BRACKET ASSEMBLY**

- (a) Remove the 2 bolts.  
**Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)**

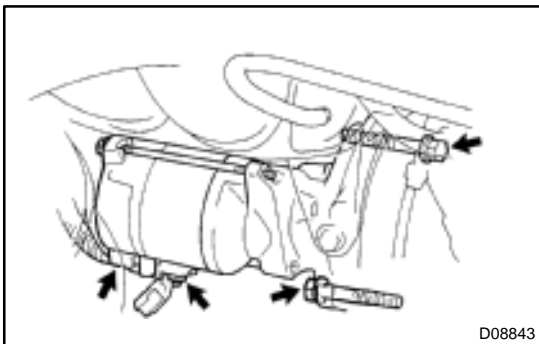


- (b) Remove the through bolt and nut.  
**Torque: 93 N·m (949 kgf·cm, 69 ft·lbf)**
- (c) Remove the 2 bolts and disconnect the release cylinder and bracket assembly from the transaxle.  
**Torque: 78 N·m (796 kgf·cm, 56 ft·lbf)**
- (d) Suspend the release cylinder and bracket assembly securely.



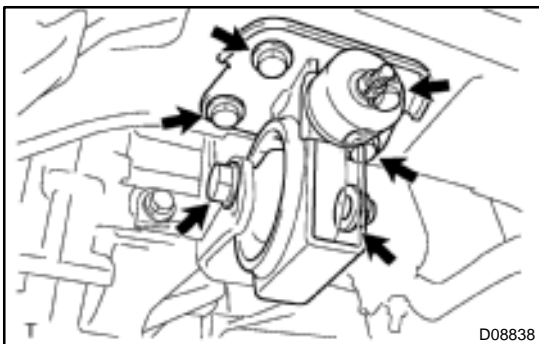
**20. REMOVE FRONT ENGINE MOUNTING INSULATOR**

Remove the 3 bolts and mounting insulator.  
**Torque: 54 N·m (551 kgf·cm, 40 ft·lbf)**



**21. REMOVE STARTER**

- (a) Disconnect the starter connector.
- (b) Remove the nut and disconnect the starter cable.
- (c) Remove the 2 bolts and starter.  
**Torque: 37 N·m (378 kgf·cm, 28 ft·lbf)**

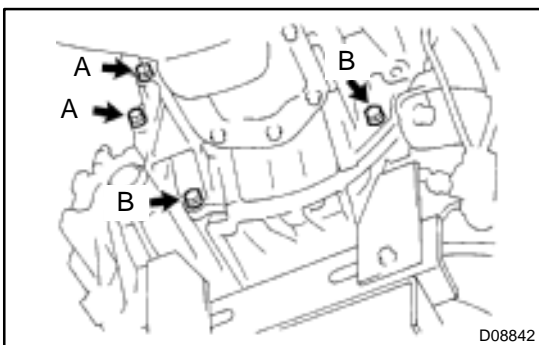


**22. REMOVE REAR ENGINE MOUNTING INSULATOR**

- (a) Remove the through bolt and nut.  
**Torque: 93 N·m (949 kgf·cm, 69 ft·lbf)**
- (b) Remove the 4 bolts and mounting insulator.  
**Torque: 89 N·m (908 kgf·cm, 66 ft·lbf)**

**NOTICE:**

Be sure to tighten the bolt at the upper end of the slot.



**23. REMOVE 4 MOUNTING BOLTS OF TRANSAXLE LOWER SIDE**

**Torque:**  
**47 N·m (480 kgf·cm, 35 ft·lbf) for bolt A**  
**23 N·m (230 kgf·cm, 17 ft·lbf) for bolt B**

**24. REMOVE TRANSAXLE**

Lower the engine left side, then slowly and carefully remove the transaxle from the engine.

**HINT:**

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

- Align the input shaft with the clutch disc and install the transaxle to the engine.
- Temporarily tighten the transaxle mounting bolts.

## INSTALLATION

Installation is in the reverse order of removal (See page [MX-4](#)).

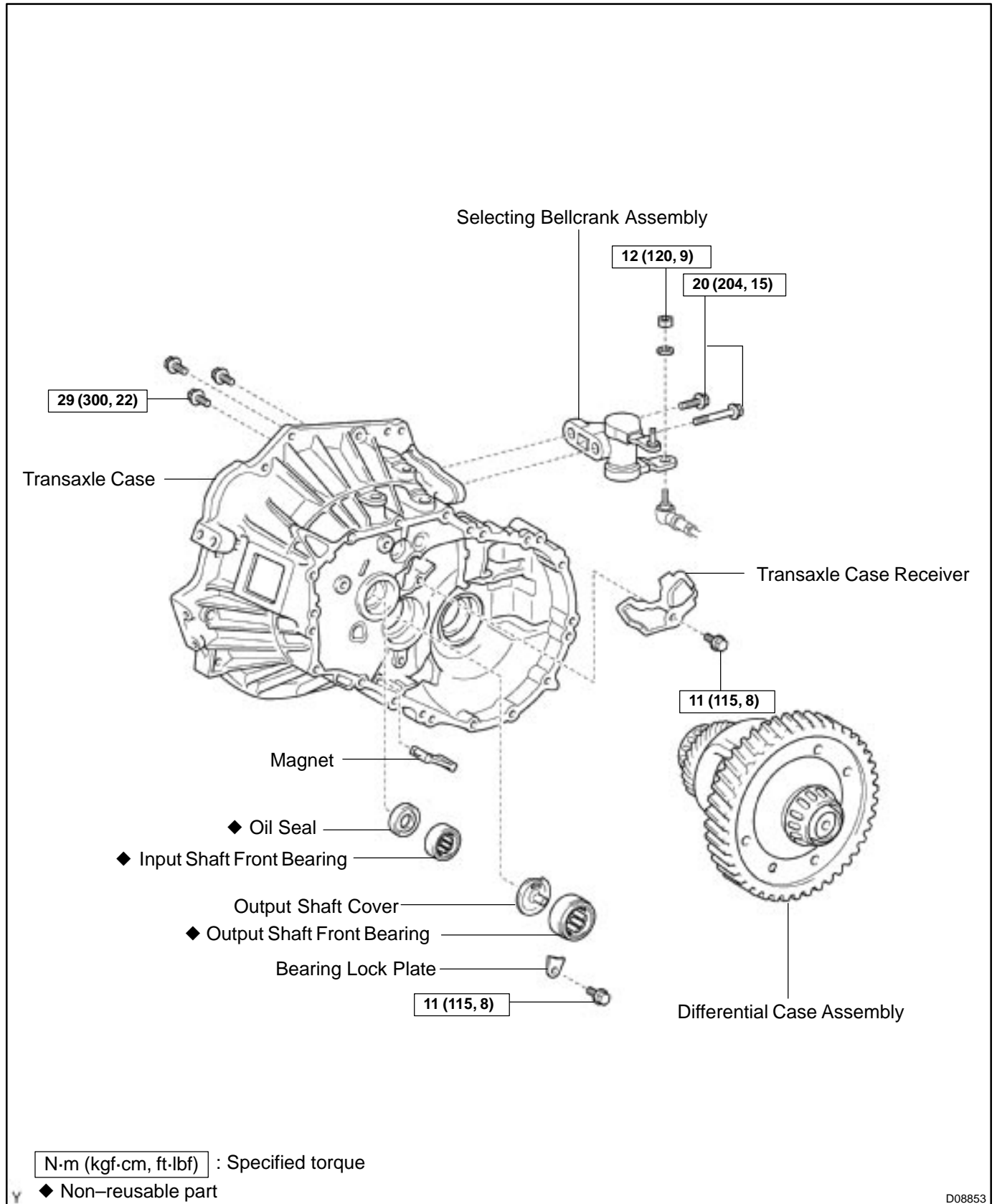
HINT:

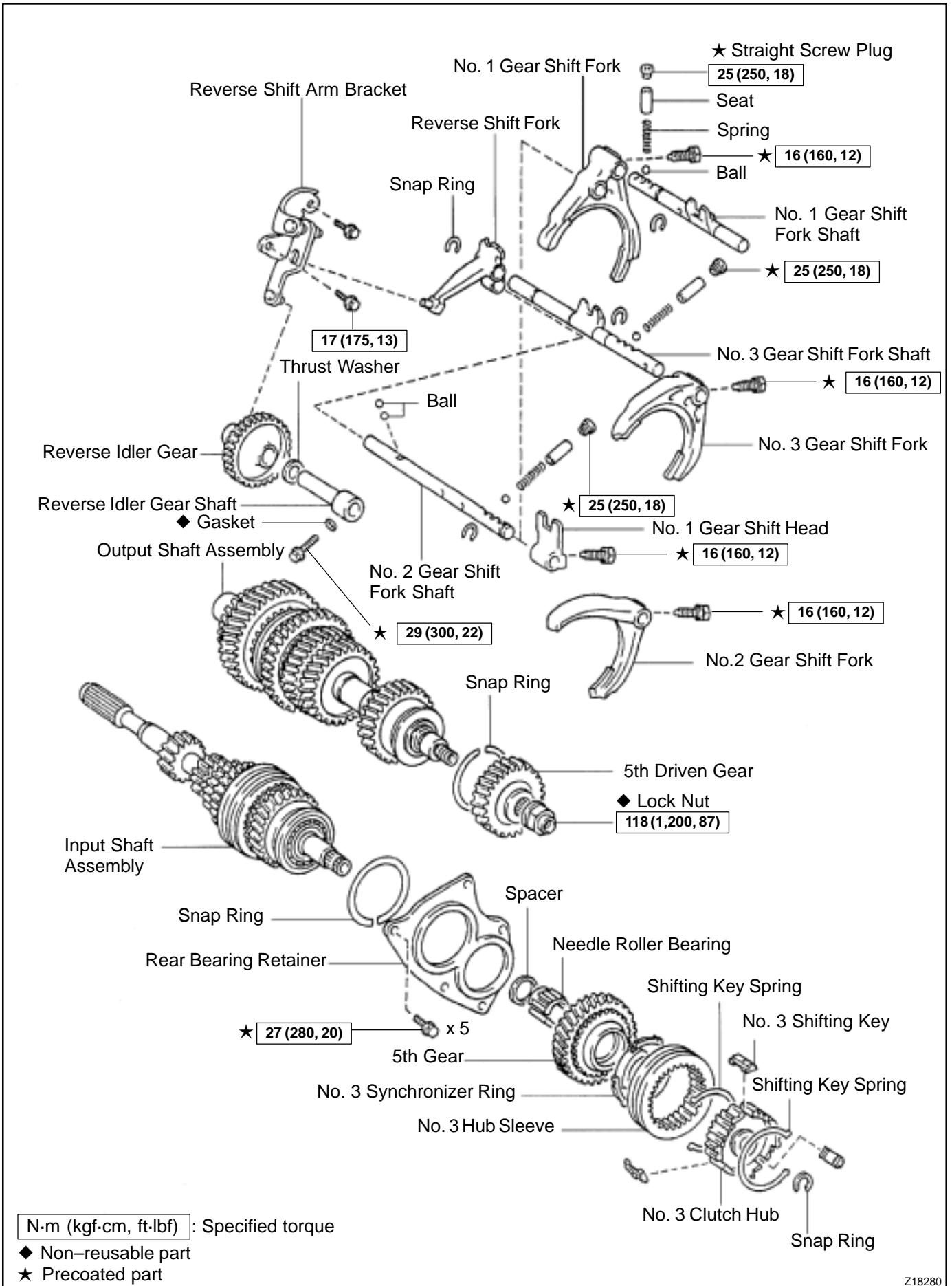
After installation, check and inspect items as follows.

- Rear wheel alignment (See page [SA-7](#)).
- Do the road test.

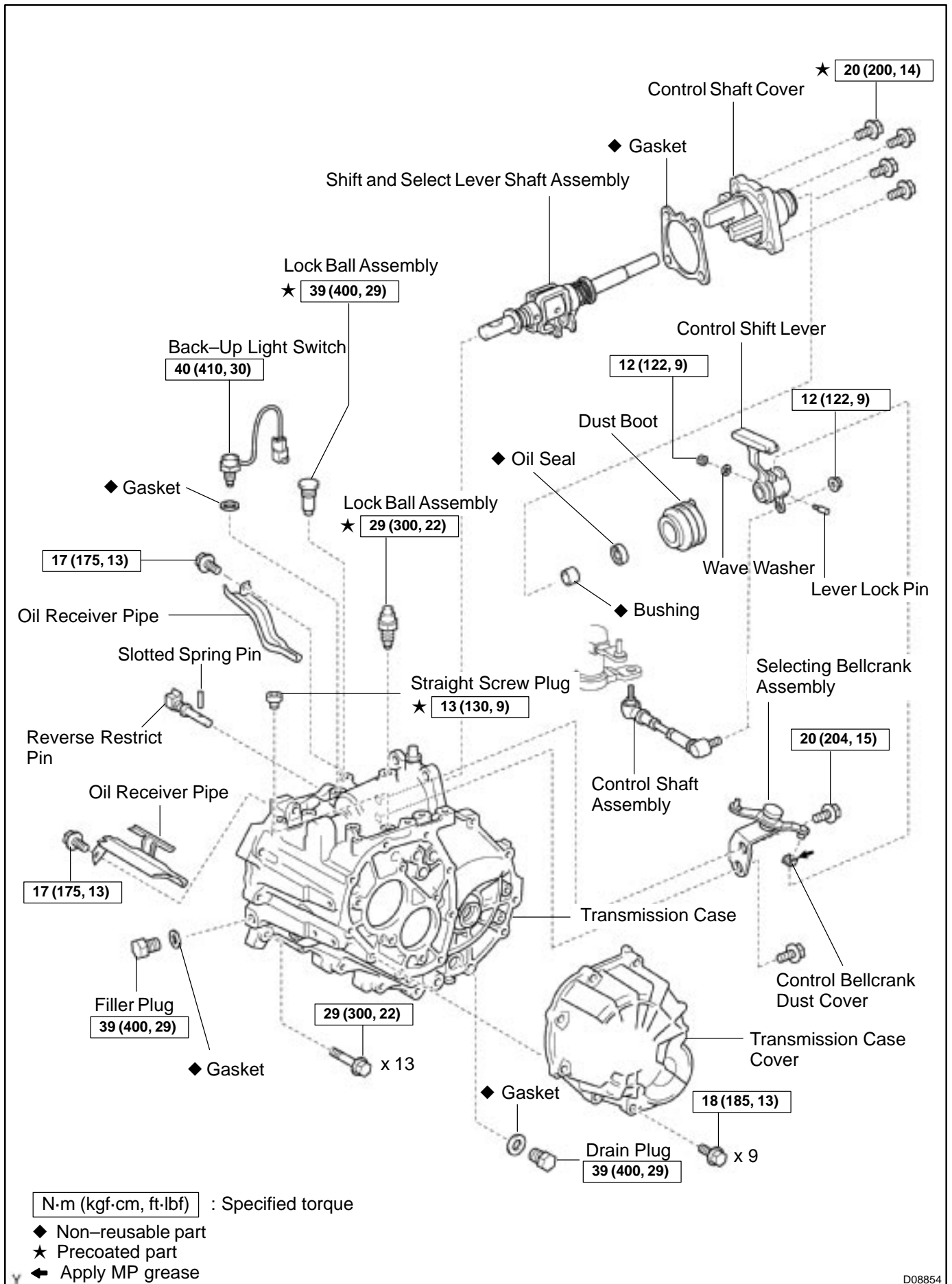
# MANUAL TRANSAXLE ASSEMBLY COMPONENTS

MX006-04





Z18280



D08854



## DISASSEMBLY

1. REMOVE FILLER PLUG AND DRAIN PLUG WITH GASKETS

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

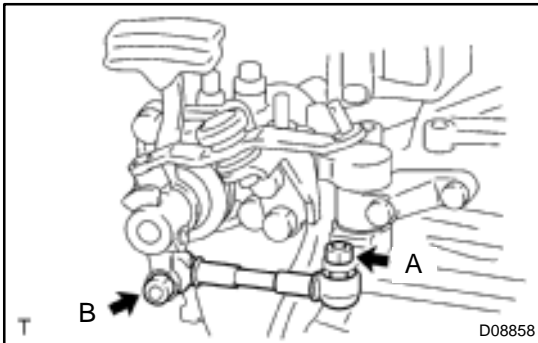
2. REMOVE BACK-UP LIGHT SWITCH WITH GASKET

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

3. REMOVE CONTROL CABLE BRACKET

Remove the 2 bolts and control cable bracket.

Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)



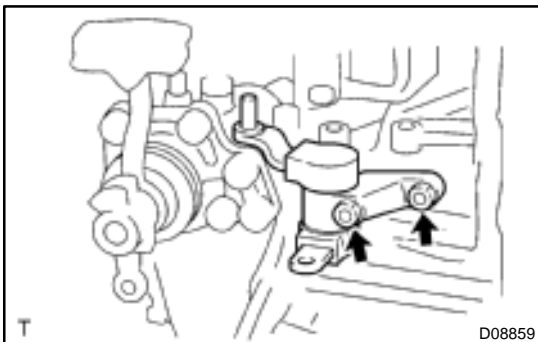
4. REMOVE CONTROL SHAFT ASSEMBLY

- (a) Remove the (A) nut and wave washer.

Torque: 12 N·m (122 kgf·cm, 9 ft·lbf)

- (b) Remove the (B) nut and the control shaft assembly.

Torque: 12 N·m (122 kgf·cm, 9 ft·lbf)



5. REMOVE SELECTING BELLCRANK ASSEMBLY

Remove the 2 bolts and the selecting bellcrank assembly.

Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)

### NOTICE:

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

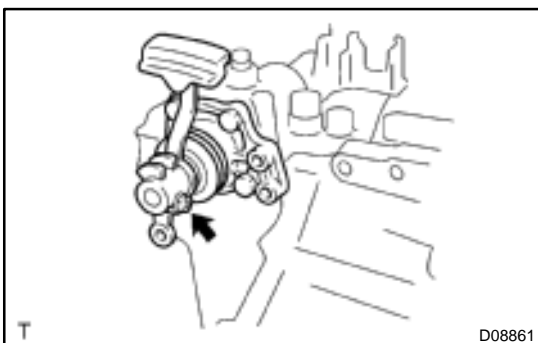
Fit the selecting bellcrank assembly pin part with the dust cover into a groove in the control shift lever.



6. REMOVE SHIFTING BELLCRANK ASSEMBLY

Remove the 2 bolts and the shifting bellcrank assembly.

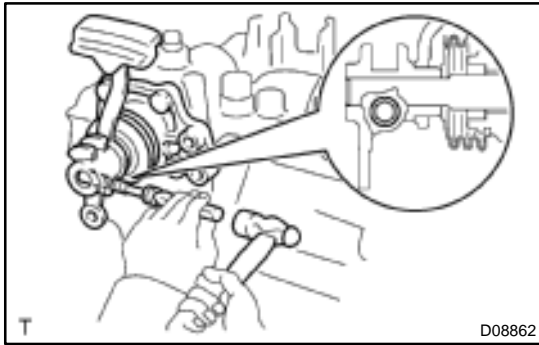
Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)



7. REMOVE CONTROL SHIFT LEVER AND DUST BOOT

- (a) Remove the nut and wave washer.

Torque: 12 N·m (122 kgf·cm, 9 ft·lbf)



- (b) Using a pin punch and a hammer, tap out the lever lock pin.

**NOTICE:**

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

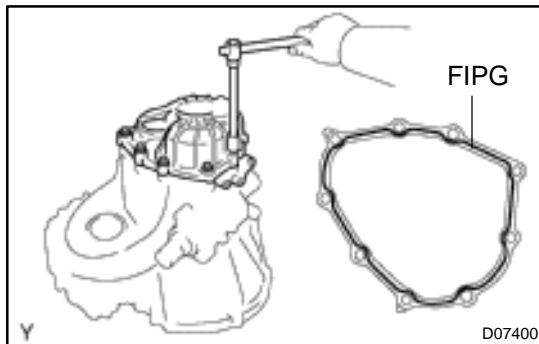
When fixing the lever lock pin, properly position the shaft groove.

- (c) Remove the control shift lever and dust boot.

**NOTICE:**

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

- Install the dust boot into a groove in the control shift lever.
- Be sure to install the dust boot in the correct direction, as shown in the illustration.

**8. REMOVE TRANSMISSION CASE COVER**

- (a) Remove the 9 bolts.

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

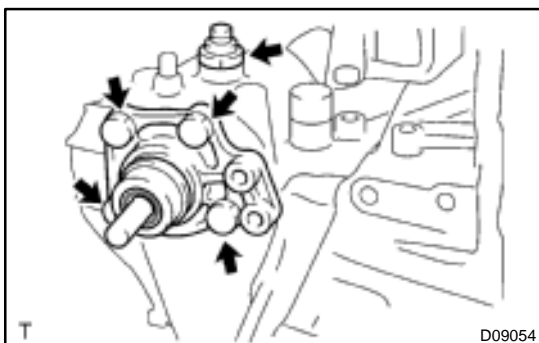
- (b) Using a brass bar and a hammer, carefully tap the projection of the transmission case cover to remove the transmission case cover from the transmission case.

**HINT:**

At the time of reassembly, please refer to the following item. Apply FIG to the transmission case cover as shown in the illustration.

**FIG:**

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

**9. REMOVE LOCK BALL ASSEMBLY AND CONTROL SHAFT COVER**

- (a) Remove the lock ball assembly.

**Sealant:**

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

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

- (b) Remove the 4 bolts, control shaft cover and gasket.

**Sealant:**

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

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

### 10. REMOVE SHIFT AND SELECT LEVER SHAFT ASSEMBLY

**NOTICE:**

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

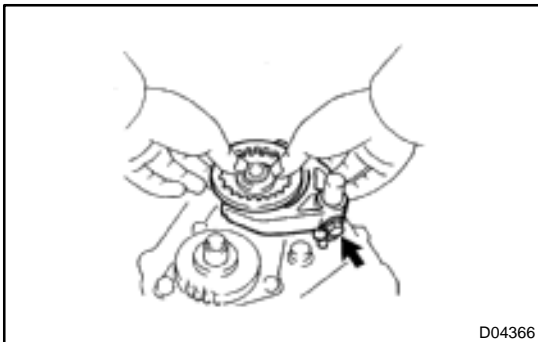
Set the claws of the shift interlock plate into the shift head part of the gear shift fork shaft securely.



### 11. REMOVE LOCK NUT

- (a) Engage the gear double meshing.
- (b) Using a chisel and a hammer, loosen the staked part of the nut.
- (c) Remove the lock nut.
- (d) Disengage the gear double meshing.

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



### 12. REMOVE NO. 3 HUB SLEEVE, NO. 3 CLUTCH HUB AND NO. 3 GEAR SHIFT FORK

- (a) Remove the bolt from the No. 3 gear shift fork.

**Torque: 16 N·m (160 kgf·cm, 12 ft·lbf)**

**Sealant:**

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

- (b) Remove the No. 3 hub sleeve and 3 shifting keys with the No. 3 gear shift fork.

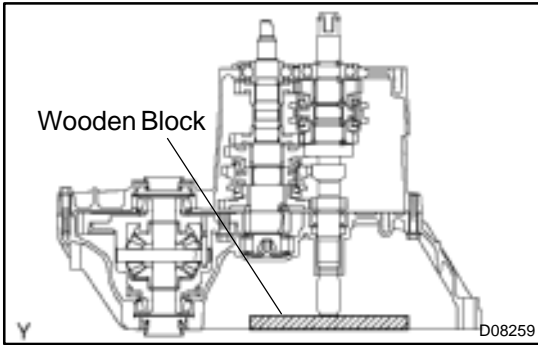
**HINT:**

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

- Assemble the No. 3 hub sleeve and No. 3 clutch hub. Install the No. 3 clutch hub and 3 shifting key springs to the No. 3 hub sleeve.
- Install the 2 shifting key springs under the 3 shifting keys.

**NOTICE:**

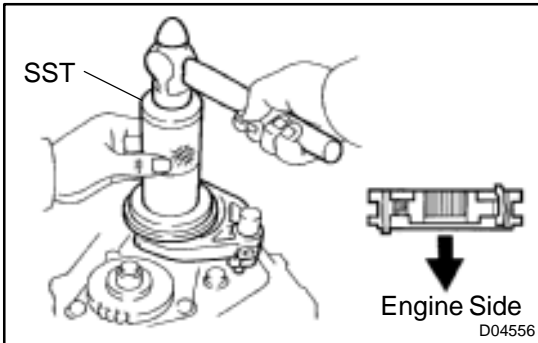
Position the key springs so that their end gaps are not aligned.



**HINT:**

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

- Before driving in the No. 3 hub sleeve and No. 3 clutch hub assembly, place the suitable sized wooden block on the rear side of the input shaft, as shown in the illustration. When driving it in, fix the input shaft firmly so that it is not pushed downward. Otherwise the input shaft rear radial ball bearing is overloaded, it might be damaged.

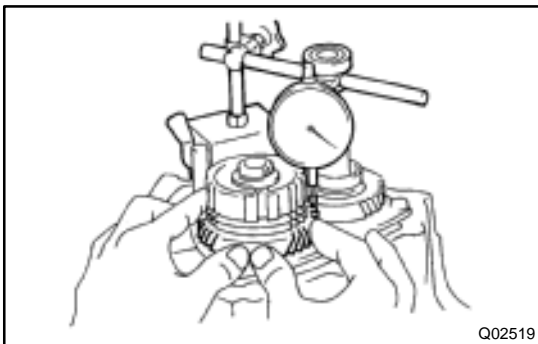


- Using SST and a hammer, tap in the No. 3 hub sleeve and No. 3 clutch hub assembly together with the No. 3 gear shift fork.

SST 09636-20010

**NOTICE:**

- Be sure to install the No. 3 hub sleeve and No. 3 clutch hub assembly in the correct direction, as shown in the illustration.
- Align the No. 3 synchronizer ring slots with the No. 3 shifting keys.



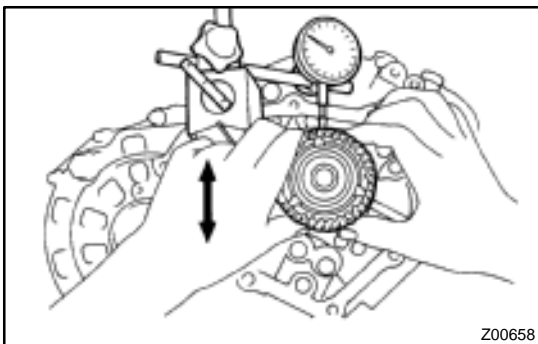
**13. INSPECT 5TH GEAR THRUST CLEARANCE**

Using a dial indicator, measure the thrust clearance.

**Standard clearance:**

**0.10 – 0.57 mm (0.0039 – 0.0224 in.)**

**Maximum clearance: 0.57 mm (0.0224 in.)**



**14. INSPECT 5TH GEAR RADIAL CLEARANCE**

Using a dial indicator, measure the radial clearance.

**Standard clearance:**

**KOYO made:**

**0.015 – 0.058 mm (0.0006 – 0.0023 in.)**

**NSK made:**

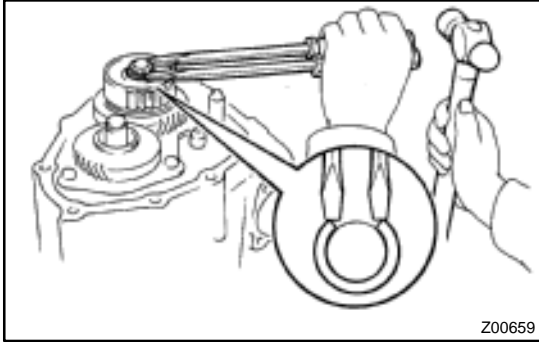
**0.015 – 0.056 mm (0.0006 – 0.0022 in.)**

**Maximum clearance:**

**KOYO made: 0.058 mm (0.0023 in.)**

**NSK made: 0.056 mm (0.0022 in.)**

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



Z00659

**15. REMOVE No. 3 CLUTCH HUB AND 5TH GEAR**

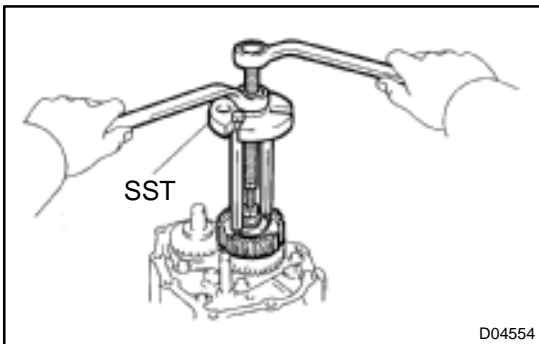
(a) Using 2 screwdrivers and a hammer, tap out the snap ring.

HINT:

At the time of reassembly, please refer to the following item. Select a snap ring from the table below that will make the thrust clearance of the No. 3 clutch hub less than 0.1 mm (0.0039 in.).

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	2.25 (0.0886)	E	2.49 (0.0980)
B	2.31 (0.0909)	F	2.55 (0.1004)
C	2.37 (0.0933)	G	2.61 (0.1028)
D	2.43 (0.0957)	-	-

(b) Using a screwdriver, pry out the shifting key spring from the No. 3 clutch hub.



D04554

(c) Install a bolt and washer to the tip of the input shaft and using SST, remove the No. 3 clutch hub.

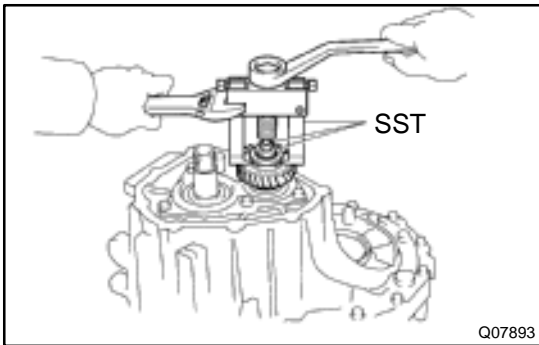
SST 09950-30011

HINT:

Select a bolt whose outer diameter is smaller than the screw hole of the input shaft so that it can be turned easily.

(d) Using a screwdriver, pry out the shifting key spring from the other side of the No. 3 clutch hub.

(e) Remove the No. 3 synchronizer ring, 5th gear, needle roller bearing and spacer.



Q07893

**16. REMOVE 5TH DRIVEN GEAR**

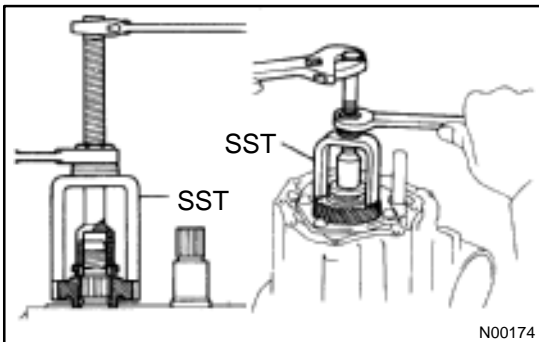
Using SST, remove the 5th driven gear.

SST 09628-62011, 09950-40011 (09957-04010), 09950-60010 (09951-00230)

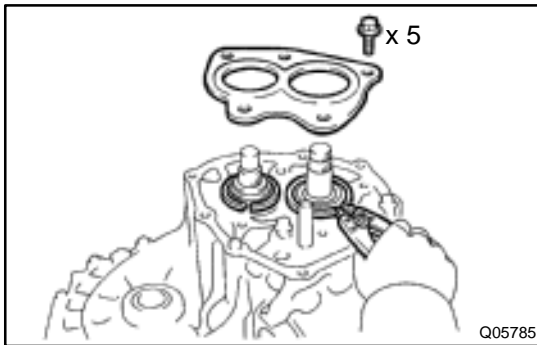
HINT:

At the time of reassembly, please refer to the following item. Using SST, install the 5th driven gear.

SST 09309-12020



N00174

**17. REMOVE REAR BEARING RETAINER**

Remove the 5 bolts and rear bearing retainer.

**Sealant:**

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

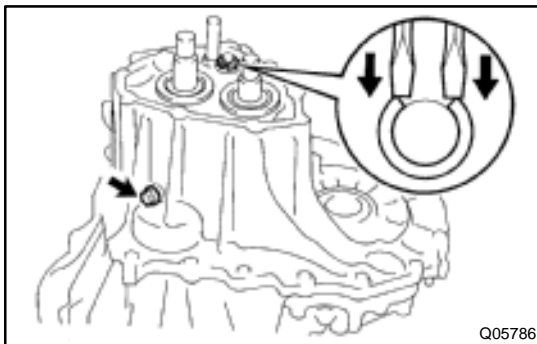
**Torque: 27 N·m (280 kgf·cm, 20 ft·lbf)**

**18. REMOVE BEARING SNAP RING**

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

**HINT:**

If it is difficult to remove and install the snap rings, pull up the shafts.

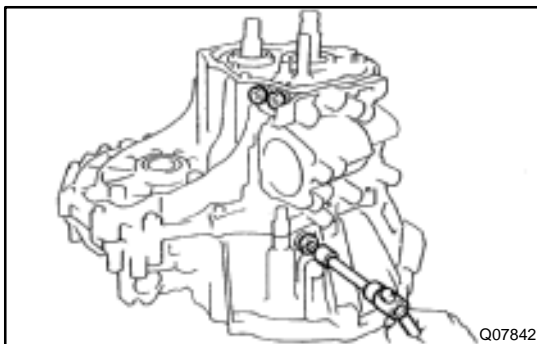
**19. REMOVE REVERSE IDLER GEAR SHAFT LOCK BOLT AND GASKET****Sealant:**

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

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

**20. REMOVE SNAP RING FROM NO. 2 SHIFT FORK SHAFT**

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

**21. REMOVE STRAIGHT SCREW PLUG, SEAT, SPRING AND BALL**

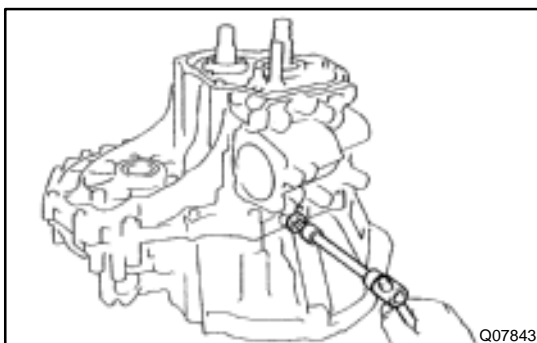
(a) Using a hexagon wrench, remove the 3 straight screw plugs.

**Sealant:**

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

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

(b) Using a magnetic finger, remove the 3 seats, springs and balls.

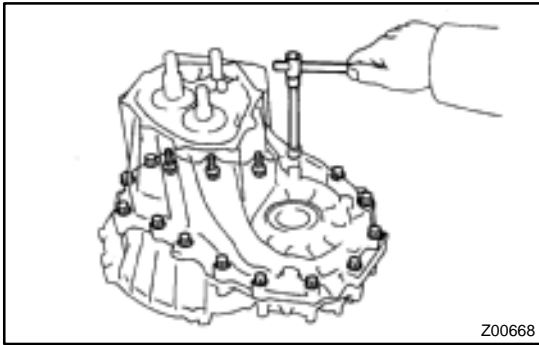
**22. REMOVE LOCK BALL ASSEMBLY**

Using a hexagon wrench, remove the lock ball assembly.

**Sealant:**

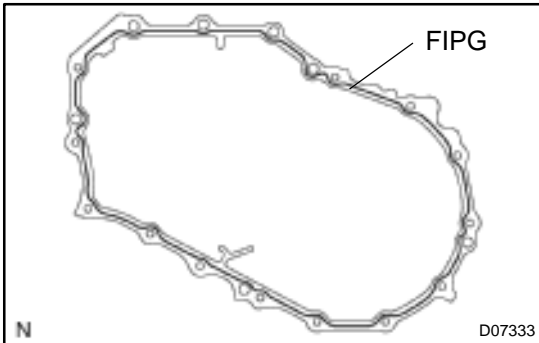
**Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent**

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



**23. REMOVE TRANSMISSION CASE**

- (a) Remove the 16 bolts.  
**Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)**
- (b) Using a plastic-faced hammer, carefully tap the projection of the transmission case to remove the transmission case from the transaxle case.

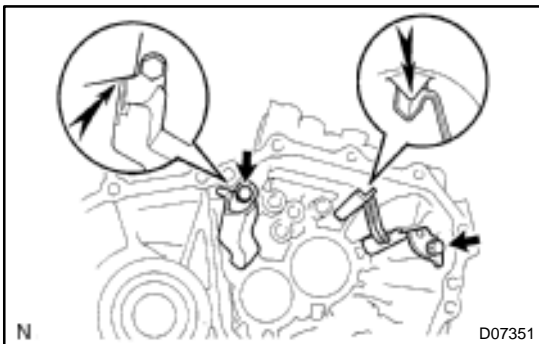


**HINT:**

At the time of reassembly, please refer to the following item. Apply FIPG to the transaxle case as shown in the illustration.

**FIPG:**

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



**24. REMOVE OIL RECEIVER PIPE**

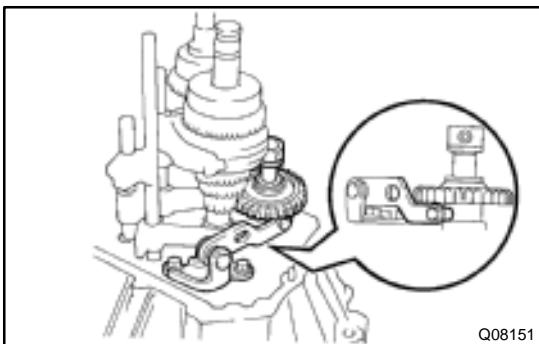
Remove the 2 bolts and 2 oil receiver pipes from the transmission case.

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

**NOTICE:**

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

- Prevent the oil receiver pipes from being deformed.
- Install the oil receiver pipes while placing it against the transmission case, as shown in the illustration.



**25. REMOVE REVERSE IDLER GEAR, THRUST WASHER AND SHAFT**

**26. REMOVE REVERSE SHIFT ARM BRACKET**

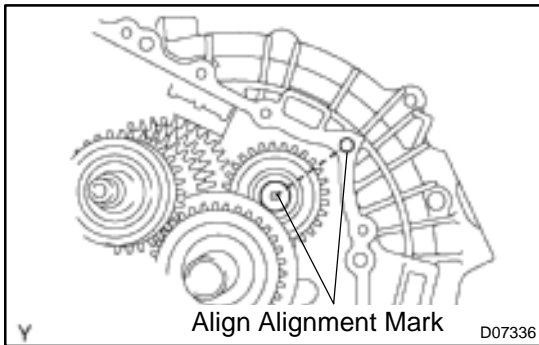
Remove the 2 bolts and reverse shift arm bracket.

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

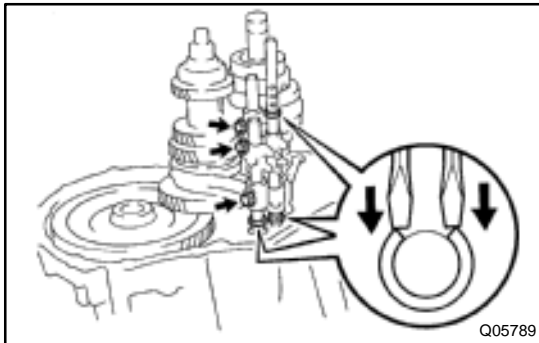
**NOTICE:**

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

- Set the pin on the top of the reverse shift arm into a groove on the reverse idler gear.
- Fit the claw of the reverse shift arm bracket with the notch of the input shaft front bearing.



- Install the reverse idler gear, thrust washer and shaft, as shown in the illustration.



**27. REMOVE GEAR SHIFT FORK AND GEAR SHIFT FORK SHAFT**

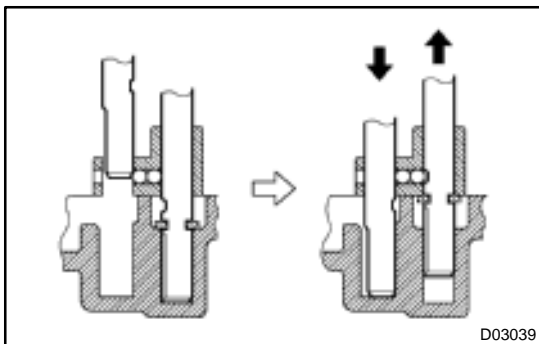
- Using 2 screwdrivers and a hammer, tap out the 3 snap rings from each gear shift fork shaft.
- Remove the 3 bolts from the No. 1 gear shift head, No. 1 and No. 2 gear shift forks.

**Sealant:**

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

**Torque: 16 N·m (160 kgf-cm, 12 ft-lbf)**

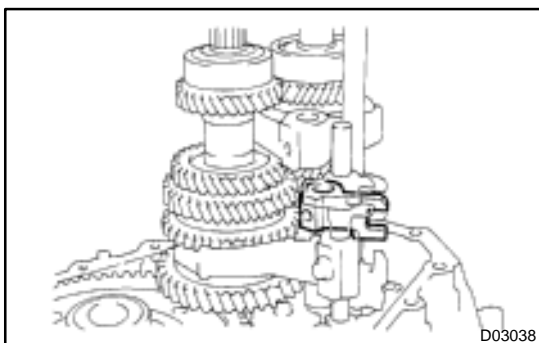
- Pull up the No. 3 gear shift fork shaft, remove the No. 2 gear shift fork shaft.



**NOTICE:**

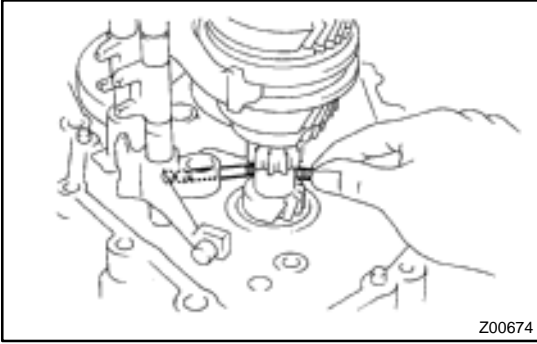
At the time of reassembly, please refer to the following item.

To avoid the interference of the 2 balls, lift up the No. 3 gear shift fork shaft at the position shown in the illustration.



- Remove the No. 1 gear shift head.





- (e) Using a magnetic finger, remove the 2 balls from the reverse shift fork.
- (f) Remove the No. 3 gear shift fork shaft and reverse shift fork.
- (g) Pull out the No. 1 gear shift fork shaft.
- (h) Remove the No. 1 and No. 2 gear shift forks.

**28. REMOVE INPUT AND OUTPUT SHAFTS TOGETHER FROM TRANSAXLE CASE**

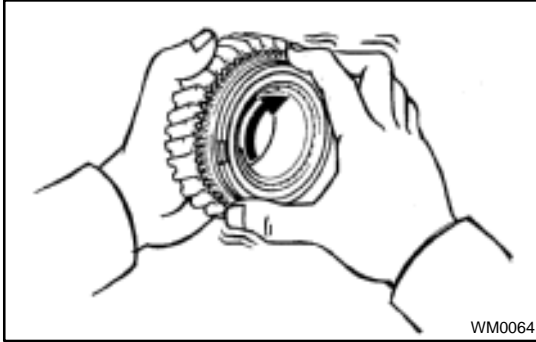
**29. REMOVE DIFFERENTIAL CASE ASSEMBLY**

**NOTICE:**

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

**Before reassembly, inspect the differential tapered roller bearing preload (See page [MX-50](#)).**

**30. REMOVE MAGNET FROM TRANSAXLE CASE**



## INSPECTION

### 1. INSPECT 5TH GEAR SYNCHRONIZER RING

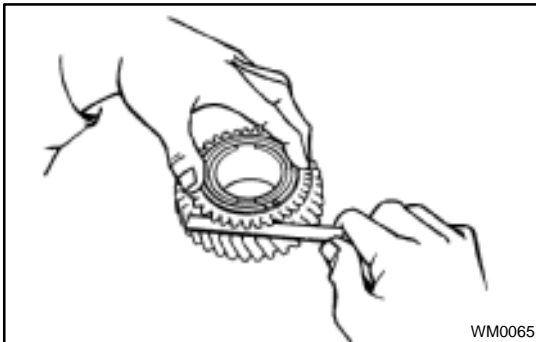
- (a) Check for wear or damage.
- (b) Check the braking effect of the synchronizer ring.  
Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

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

#### NOTICE:

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

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



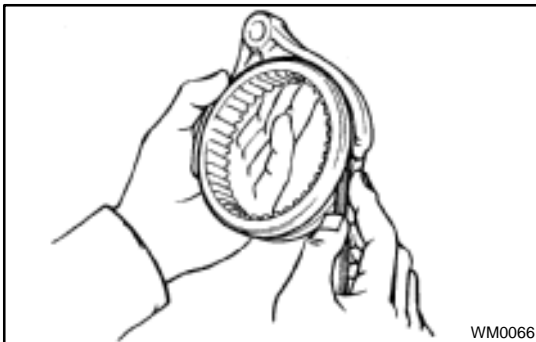
- (d) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.

**Minimum clearance: 0.75 mm (0.030 in.)**

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

#### NOTICE:

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



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

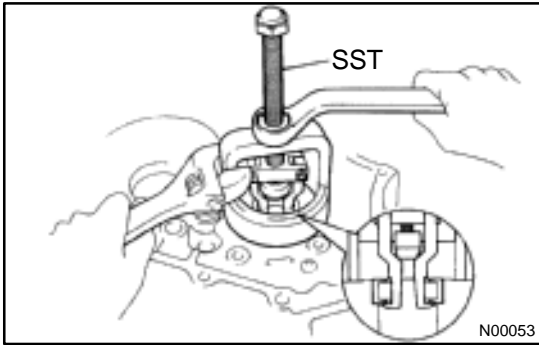
Using a feeler gauge, measure the clearance between the hub sleeve and gear shift fork.

**Maximum clearance: 0.5 mm (0.020 in.)**

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

### 3. REMOVE TRANSAXLE CASE RECEIVER

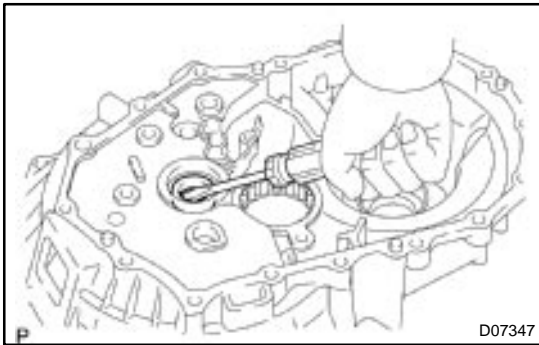
Remove the bolt and transaxle case receiver from the transaxle case.



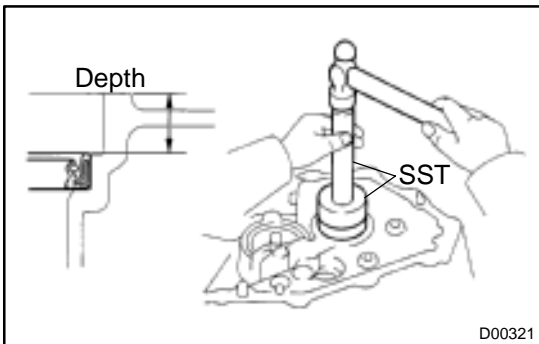
## REPLACEMENT

### 1. REPLACE INPUT SHAFT FRONT BEARING AND OIL SEAL

- (a) Using SST, remove the input shaft front bearing.  
SST 09612-65014



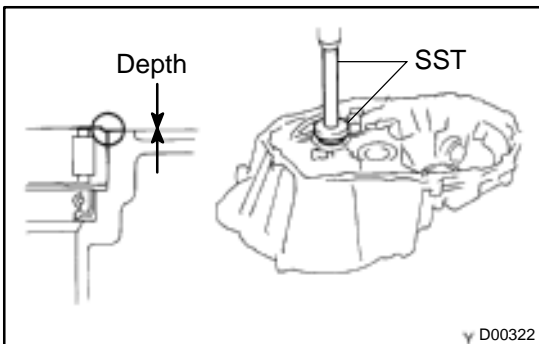
- (b) Using a screwdriver, pry out the oil seal.



- (c) Using SST and a hammer, tap in a new oil seal.  
SST 09950-60010 (09951-00360), 09950-70010 (09951-07150)

**Depth: 15.8 ± 0.2 mm (0.622 ± 0.008 in.)**

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

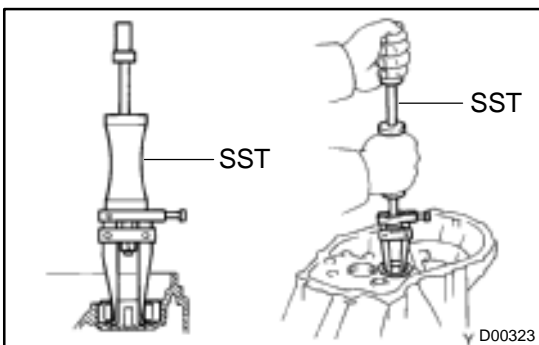


- (e) Using SST and a press, press in a new input shaft front bearing.  
SST 09950-60010 (09951-00400), 09950-70010 (09951-07150)

**Depth: 0 – 0.3 mm (0 – 0.012 in.)**

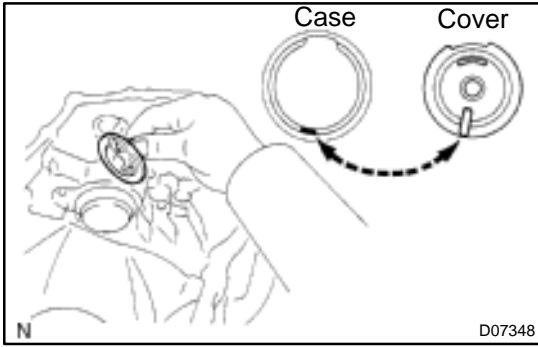
**NOTICE:**

**Be sure to install a new bearing in the correct direction, as shown in the illustration.**



### 2. REPLACE OUTPUT SHAFT FRONT BEARING AND OUTPUT SHAFT COVER

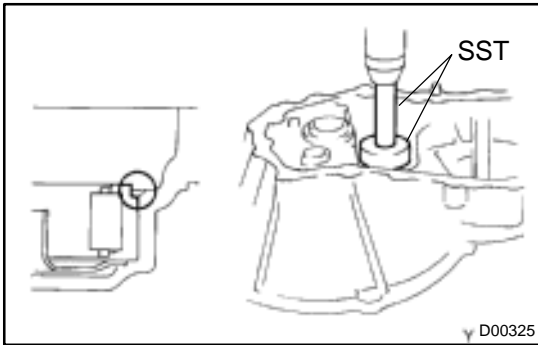
- (a) Remove the bolt and bearing lock plate.
- (b) Using SST, drive out the output shaft front bearing.  
SST 09308-00010



- (c) Remove the output shaft cover.
- (d) Install the output shaft cover.

**NOTICE:**

**Install the output shaft cover projection into the case side hollow.**



- (e) Using SST and a press, press in a new output shaft front bearing.  
SST 09950-60010 (09951-00560), 09950-70010 (09951-07150)

**NOTICE:**

- **Be sure to install a new bearing in the correct direction, as shown in the illustration.**
- **When replacing the output shaft front bearing, replace the output shaft front bearing inner race along with it.**

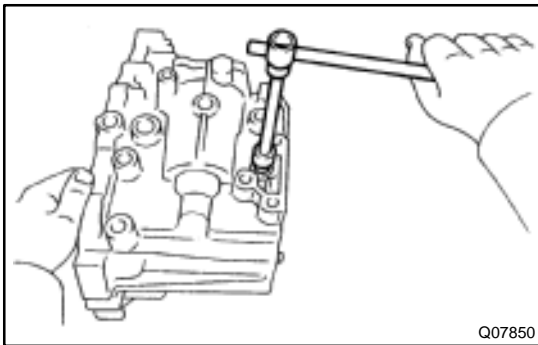
- (f) Install the bearing lock plate with the bolt.

**Torque: 11 N·m (115 kgf·cm, 8 ft·lbf)**

**3. INSTALL TRANSAXLE CASE RECEIVER**

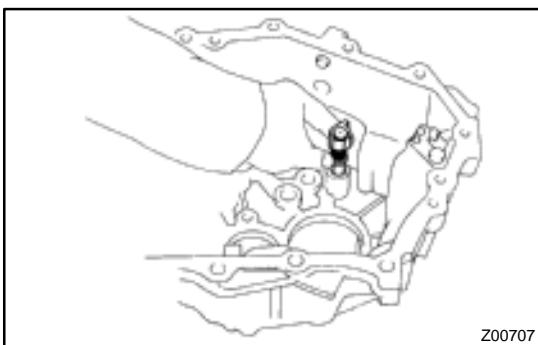
Install the transaxle case receiver to the transaxle case with the bolt.

**Torque: 11 N·m (115 kgf·cm, 8 ft·lbf)**



**4. REPLACE REVERSE RESTRICT PIN**

- (a) Using a hexagon wrench, remove the straight screw plug.
- (b) Using a pin punch and a hammer, tap out the slotted spring pin.

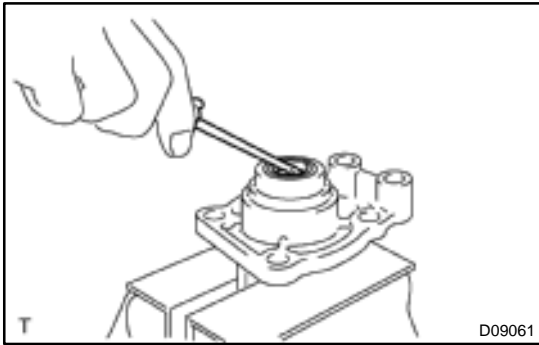


- (c) Replace the reverse restrict pin.
- (d) Using a pin punch and a hammer, tap in the slotted spring pin.
- (e) Apply sealant to the screw plug threads.

**Sealant:**

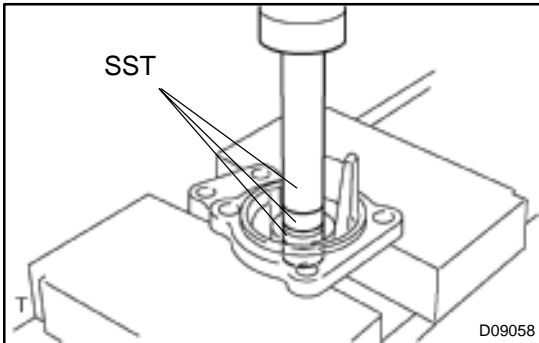
**Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent**

- (f) Using a hexagon wrench, install the straight screw plug.  
**Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)**

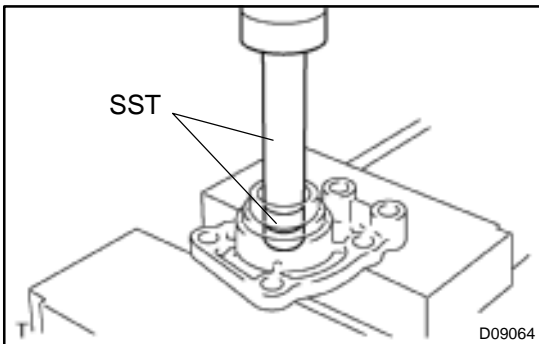


**5. REPLACE CONTROL SHAFT COVER OIL SEAL AND BUSHING**

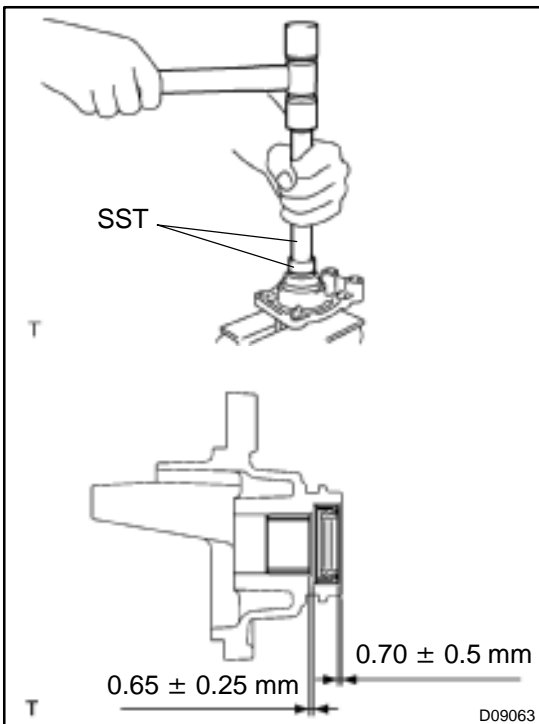
(a) Using a screwdriver, pry out the oil seal.



(b) Using SST and a press, press out the bushing.  
SST 09950-60010 (09951-00200, 09951-00210), 09950-70010 (09951-07150)



(c) Using SST and a press, press in a new bushing.  
SST 09950-60010 (09951-00200), 09950-70010 (09951-07150)  
**Depth: 0.65 ± 0.25 mm (0.0256 ± 0.0098 in.)**



(d) Using SST and a plastic-faced hammer, carefully tap in a new oil seal.  
SST 09950-60010 (09951-00270), 09950-70010 (09951-07150)  
**Depth: 0.70 ± 0.50 mm (0.0276 ± 0.0197 in.)**

## REASSEMBLY

Reassembly is in the reverse order of disassembly (See page [MX-13](#)).

### NOTICE:

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

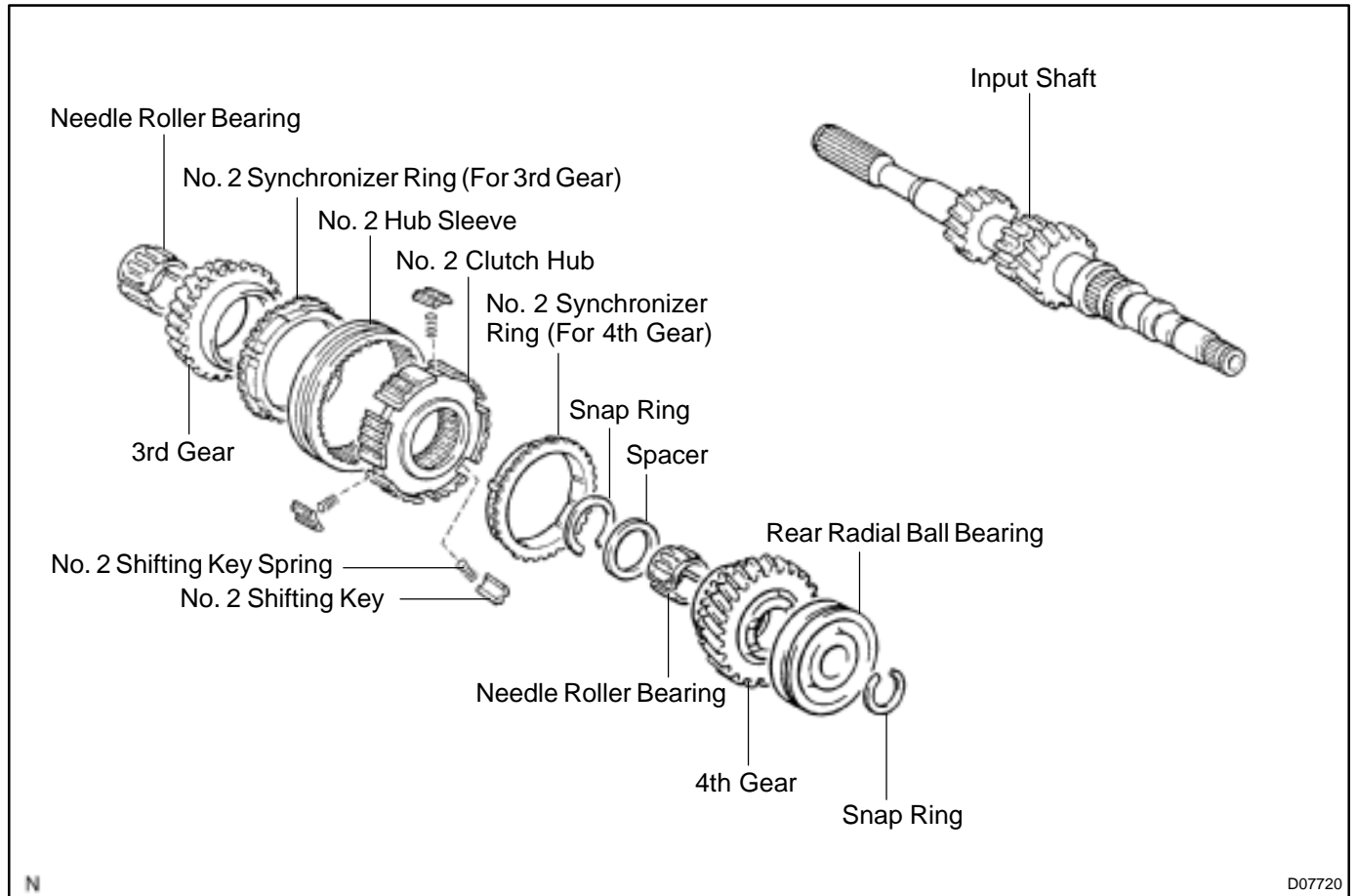
- Using a razor blade and gasket scraper, remove all old FIPG material from the gasket surfaces.
- Thoroughly clean all components to remove all loose material.
- Clean both sealing surfaces with a non-residue solvent.
- Apply FIPG in an approx. 1 mm (0.04 in.) wide bead along the sealing surface.
-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

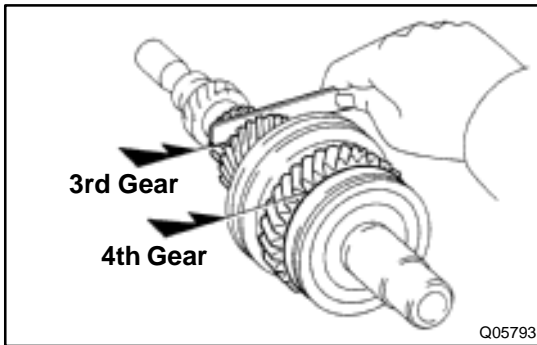
### HINT:

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

# INPUT SHAFT COMPONENTS

MX09K-02





## DISASSEMBLY

### 1. INSPECT 3RD AND 4TH GEARS THRUST CLEARANCE

Using a feeler gauge, measure the thrust clearance.

**Standard clearance:**

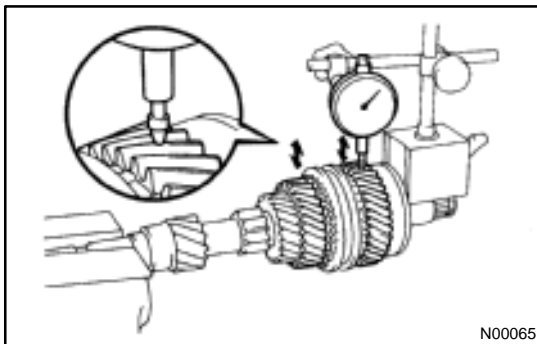
**3rd gear: 0.10 – 0.35 mm (0.0039 – 0.0138 in.)**

**4th gear: 0.10 – 0.55 mm (0.0039 – 0.0217 in.)**

**Maximum clearance:**

**3rd gear: 0.35 mm (0.0138 in.)**

**4th gear: 0.55 mm (0.0217 in.)**



### 2. INSPECT 3RD AND 4TH GEARS RADIAL CLEARANCE

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

**Standard clearance:**

**KOYO made:**

**0.015 – 0.058 mm (0.0006 – 0.0023 in.)**

**NSK made:**

**0.015 – 0.056 mm (0.0006 – 0.0022 in.)**

**Maximum clearance:**

**KOYO made: 0.058 mm (0.0023 in.)**

**NSK made: 0.056 mm (0.0022 in.)**

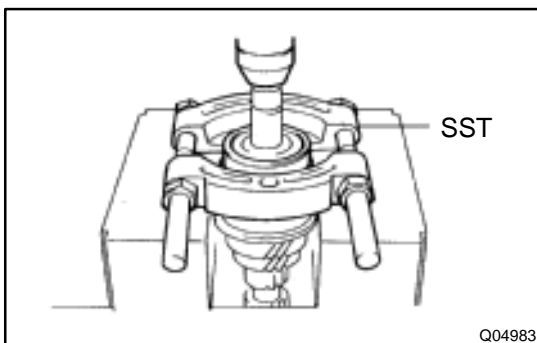
If the clearance exceeds the maximum, replace the gear, needle roller bearing or shaft.

### 3. REMOVE SNAP RING

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

**HINT:**

Take care not to damage the journal surface of the input shaft.



### 4. REMOVE REAR RADIAL BALL BEARING, 4TH GEAR, NEEDLE ROLLER BEARING, SPACER AND NO.2 SYNCHRONIZER RING (FOR 4TH GEAR)

(a) Using SST and a press, press out the rear radial ball bearing and 4th gear.

SST 09950-00020

**HINT:**

Support the input shaft assembly by hand so that it will not be dropped off.



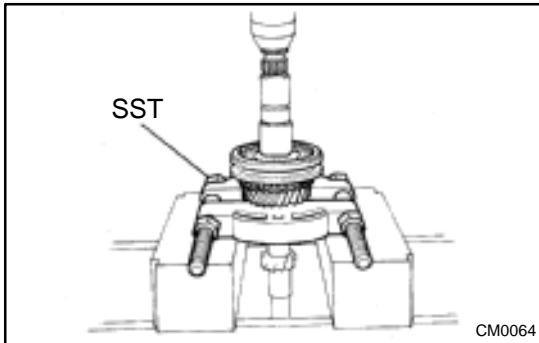
- (b) Remove the needle roller bearing, spacer and No. 2 synchronizer ring (for the 4th gear).

### 5. REMOVE SNAP RING

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

HINT:

Take care not to damage the journal surface of the input shaft.



### 6. REMOVE NO. 2 HUB SLEEVE, NO. 2 CLUTCH HUB ASSEMBLY, NO. 2 SYNCHRONIZER RING (FOR 3RD GEAR), 3RD GEAR AND NEEDLE ROLLER BEARING

- (a) Using SST and a press, press out the No. 2 hub sleeve, No. 2 clutch hub assembly, No. 2 synchronizer ring (for the 3rd gear) and 3rd gear.

SST 09950-00020

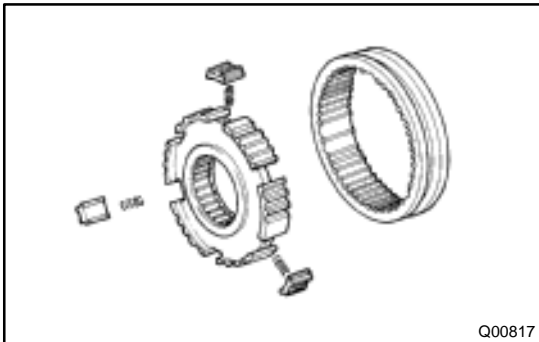
HINT:

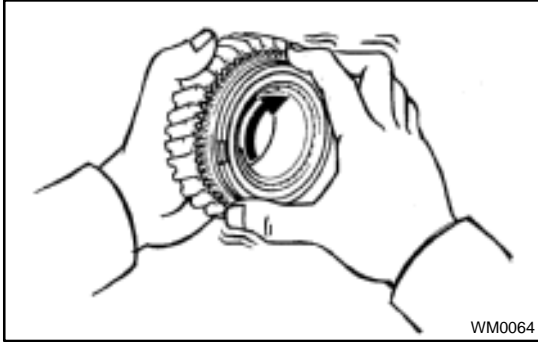
Support the input shaft by hand so that it will not be dropped off.

- (b) Remove the needle roller bearing.

### 7. DISASSEMBLE NO. 2 HUB SLEEVE AND NO. 2 CLUTCH HUB

- (a) Remove the No. 2 hub sleeve from the No. 2 clutch hub.  
 (b) Remove the 3 No. 2 shifting keys and 3 No. 2 shifting key springs from the No. 2 clutch hub.





## INSPECTION

### 1. INSPECT SYNCHRONIZER RING

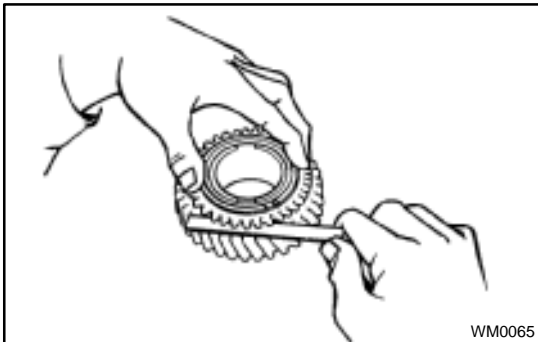
- (a) Check for wear or damage.
- (b) Check the braking effect of the synchronizer ring.  
Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

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

#### NOTICE:

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

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



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

#### Minimum clearance:

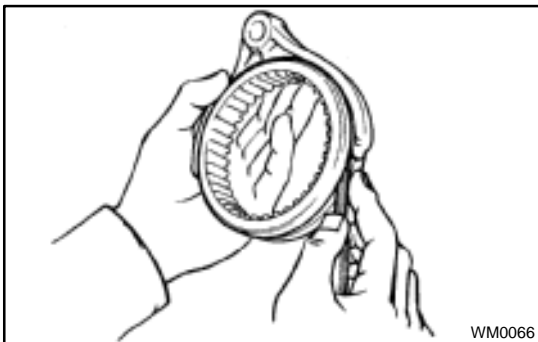
**3rd gear: 0.65 mm (0.0256 in.)**

**4th gear: 0.75 mm (0.0295 in.)**

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

#### NOTICE:

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

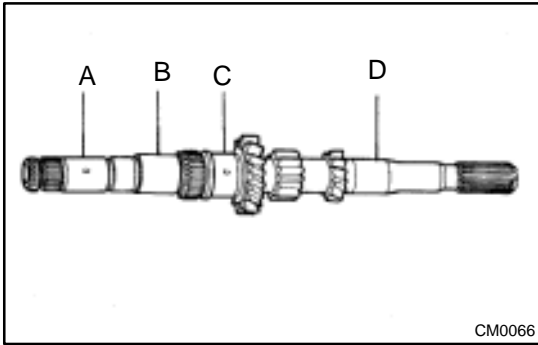


### 2. INSPECT NO. 2 GEAR SHIFT FORK AND NO. 2 HUB SLEEVE CLEARANCE

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

**Maximum clearance: 0.35 mm (0.014 in.)**

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



**3. INSPECT INPUT SHAFT**

- (a) Check the input shaft for wear or damage.
- (b) Using a micrometer, measure the outer diameter of the input shaft journal surface.

**Minimum outer diameter:**

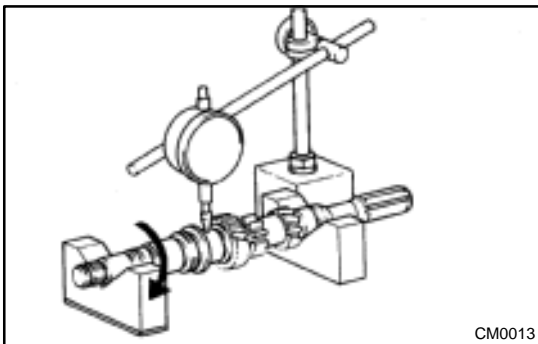
**Part A: 24.885 mm (0.9797 in.)**

**Part B: 28.985 mm (1.1411 in.)**

**Part C: 30.985 mm (1.2199 in.)**

**Part D: 24.985 mm (0.9837 in.)**

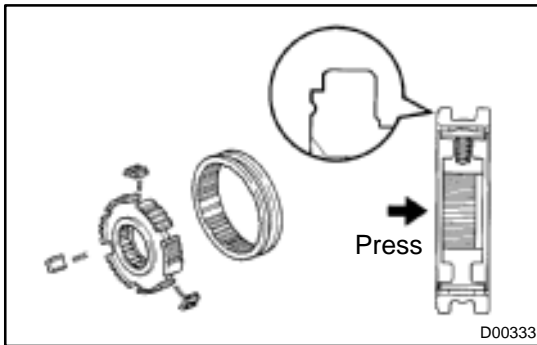
If the outer diameter is less than the minimum, replace the input shaft.



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

**Maximum runout: 0.03 mm (0.0012 in.)**

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



## REASSEMBLY

### HINT:

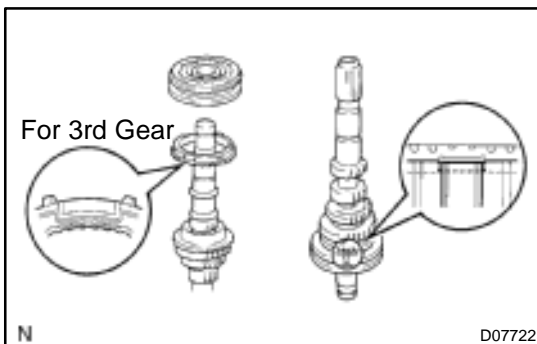
Coat all of the sliding and rotating surfaces with gear oil before reassembly.

### 1. ASSEMBLE NO. 2 HUB SLEEVE AND NO. 2 CLUTCH HUB

- (a) Install the 3 No. 2 shifting key springs and 3 No. 2 shifting keys to the No. 2 clutch hub.
- (b) Install the No. 2 hub sleeve to the No. 2 clutch hub.

### NOTICE:

Assemble the No. 2 hub sleeve and No. 2 clutch hub in the direction shown in the illustration.



### 2. INSTALL NEEDLE ROLLER BEARING, 3RD GEAR, NO. 2 SYNCHRONIZER RING (FOR 3RD GEAR), NO. 2 HUB SLEEVE AND NO. 2 CLUTCH HUB ASSEMBLY

- (a) Apply gear oil to the needle roller bearing and install it.
- (b) Install the 3rd gear and No. 2 synchronizer ring (for the 3rd gear).

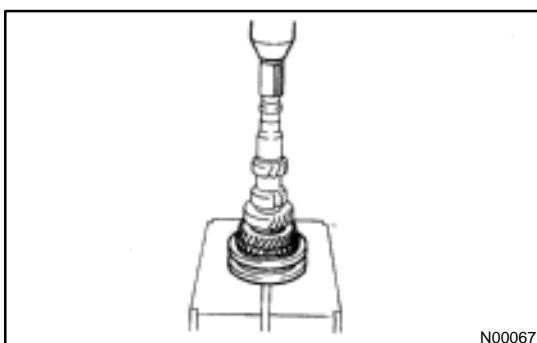
### NOTICE:

Distinguish the No. 2 synchronizer ring (for the 3rd gear) by the teeth on the synchronizer ring.

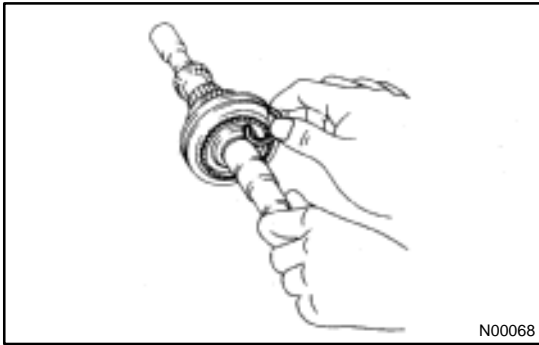
- (c) Install the No. 2 hub sleeve and No. 2 clutch hub assembly so that the No. 2 synchronizer ring slots and No. 2 shifting keys are aligned.

### NOTICE:

Be sure to install the No. 2 hub sleeve and No. 2 clutch hub assembly in the correct direction, as shown in the illustration.



- (d) Using a press, press in the No. 2 hub sleeve and No. 2 clutch hub assembly.



**3. INSTALL SNAP RING**

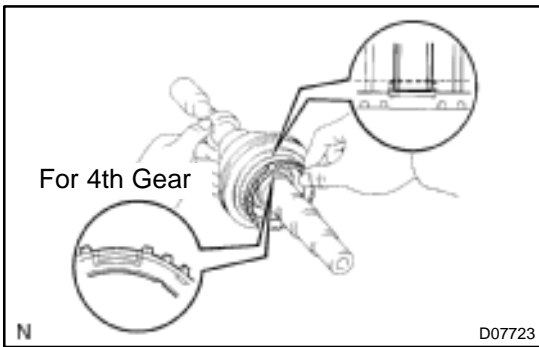
- (a) Select a snap ring from the table below that will make the thrust clearance of the No. 2 clutch hub less than 0.1 mm (0.0039 in.).

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
0	2.30 (0.0906)	3	2.48 (0.0976)
1	2.36 (0.0929)	4	2.54 (0.1000)
2	2.42 (0.0953)	5	2.60 (0.1024)

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

Take care not to damage the journal surface of the input shaft.

**4. INSPECT 3RD GEAR THRUST CLEARANCE  
(See page MX-28)**

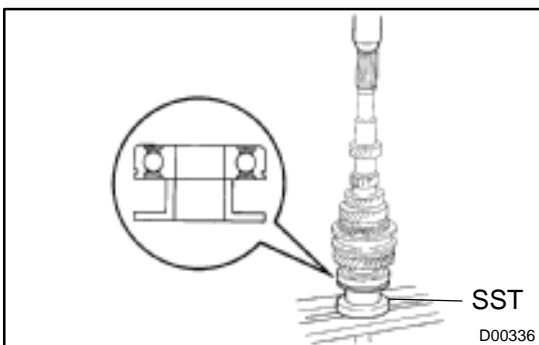


**5. INSTALL SPACER, NEEDLE ROLLER BEARING, No. 2 SYNCHRONIZER RING (FOR 4TH GEAR), 4TH GEAR AND REAR RADIAL BALL BEARING**

- (a) Install the spacer.
- (b) Apply gear oil to the needle roller bearings and install it.
- (c) Place the No. 2 synchronizer ring (for the 4th gear) on the No. 2 hub sleeve assembly and align the No. 2 synchronizer ring slots with the No. 2 shifting keys.
- (d) Install the 4th gear.

**NOTICE:**

**Distinguish the No. 2 synchronizer ring (for the 4th gear) by the teeth on the synchronizer ring.**



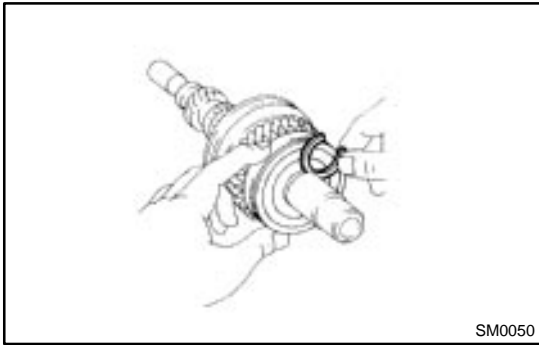
- (e) Using SST and a press, press in the rear radial ball bearing.  
SST 09608-00071

**NOTICE:**

**Be sure to install the rear radial ball bearing in the correct direction, as shown in the illustration.**

**HINT:**

Set SST to the bearing inner race securely.



**6. INSTALL SNAP RING**

- (a) Select a snap ring from the table below that will make the thrust clearance of the rear radial ball bearing less than 0.1 mm (0.0039 in.).

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	2.29 (0.0902)	D	2.47 (0.0972)
B	2.35 (0.0925)	E	2.53 (0.0996)
C	2.41 (0.0949)	F	2.59 (0.1020)

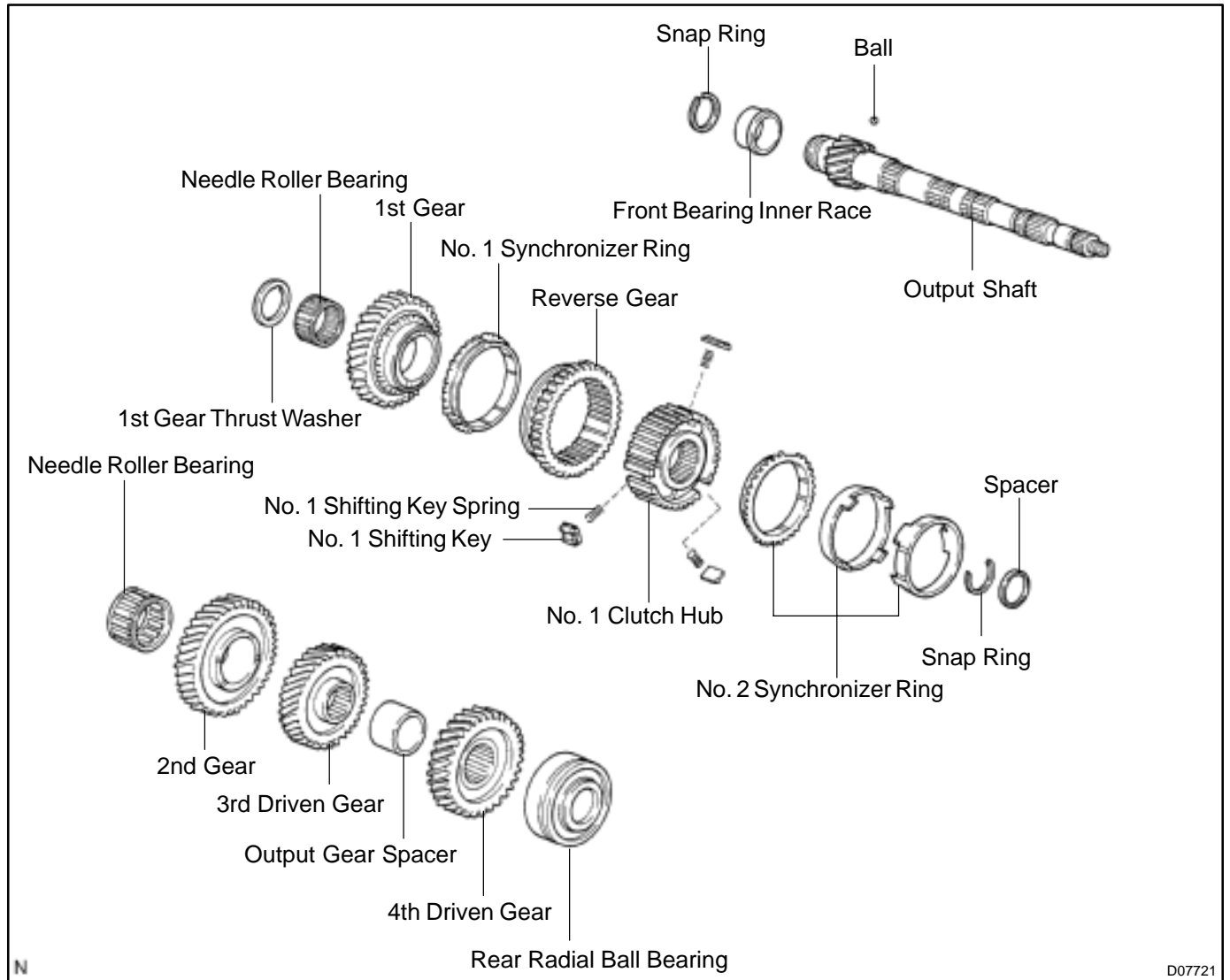
- (b) Using a screwdriver and hammer, tap in the snap ring.  
HINT:

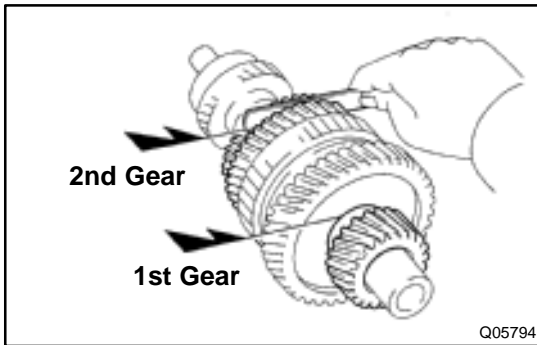
Take care not to damage the journal surface of the input shaft.

**7. INSPECT 4TH GEAR THRUST CLEARANCE**  
(See page [MX-28](#))

# OUTPUT SHAFT COMPONENTS

MX090-02





## DISASSEMBLY

### 1. INSPECT 1ST AND 2ND GEARS THRUST CLEARANCE

Using a feeler gauge, measure the thrust clearance.

#### Standard clearance:

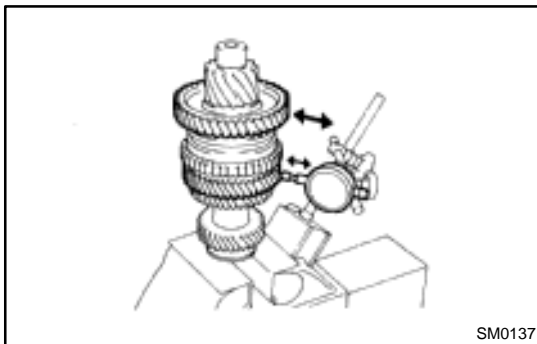
1st gear: 0.10 – 0.40 mm (0.0039 – 0.0157 in.)

2nd gear: 0.10 – 0.55 mm (0.0039 – 0.0217 in.)

#### Maximum clearance:

1st gear: 0.40 mm (0.0157 in.)

2nd gear: 0.55 mm (0.0217 in.)



### 2. INSPECT 1ST AND 2ND GEARS RADIAL CLEARANCE

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

#### Standard clearance:

##### KOYO made:

0.015 – 0.058 mm (0.0006 – 0.0023 in.)

##### NSK made:

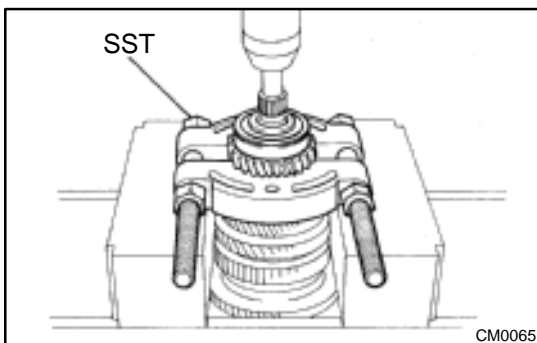
0.015 – 0.056 mm (0.0006 – 0.0022 in.)

#### Maximum clearance:

KOYO made: 0.058 mm (0.0023 in.)

NSK made: 0.056 mm (0.0022 in.)

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



### 3. REMOVE REAR RADIAL BALL BEARING, 4TH DRIVEN GEAR AND OUTPUT GEAR SPACER FROM OUTPUT SHAFT

- (a) Using SST and a press, press out the rear radial ball bearing and 4th driven gear.

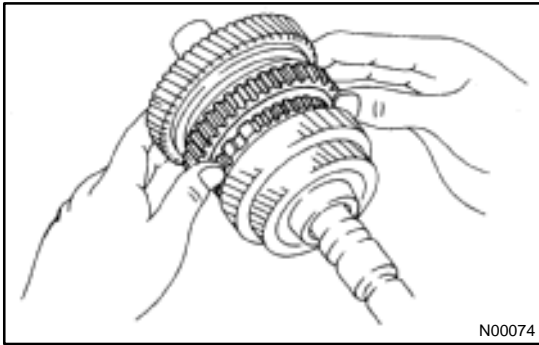
SST 09950-00020

#### HINT:

Support the output shaft assembly by hand so that it will not be dropped off.

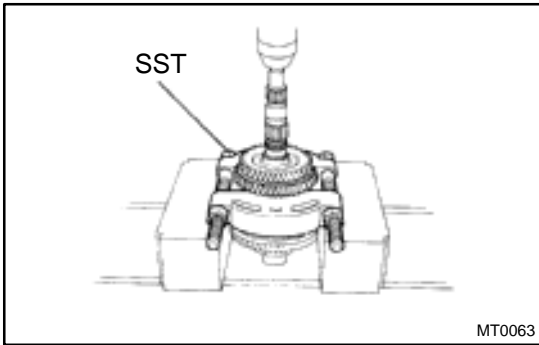
- (b) Remove the output gear spacer.





**4. REMOVE 3RD DRIVEN GEAR, 2ND GEAR, NEEDLE ROLLER BEARING, SPACER AND NO. 2 SYNCHRONIZER RING**

- (a) Shift the reverse gear into the 1st gear.



- (b) Using SST and a press, press out the 3rd driven gear and 2nd gear.

SST 09950-00020

**HINT:**

Support the output shaft assembly by hand so that it will not be dropped off.

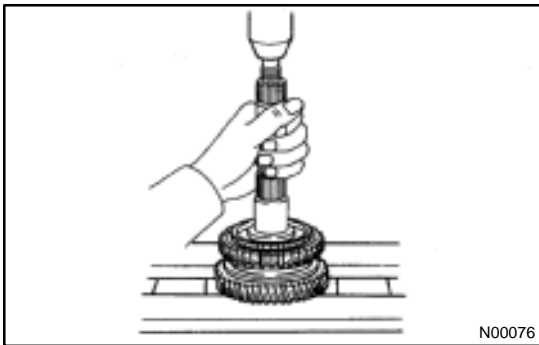
- (c) Remove the needle roller bearing, spacer and No. 2 synchronizer ring.

**5. REMOVE SNAP RING**

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

**HINT:**

Take care not to damage the journal surface of the output shaft.



**6. REMOVE REVERSE GEAR, NO. 1 CLUTCH HUB ASSEMBLY, NO. 1 SYNCHRONIZER RING, 1ST GEAR, NEEDLE ROLLER BEARING, 1ST GEAR THRUST WASHER AND BALL**

- (a) Using a press, press out the reverse gear, No. 1 clutch hub assembly, No. 1 synchronizer ring and 1st gear.

**HINT:**

Support the output shaft assembly by hand so that it will not be dropped off.

- (b) Remove the needle roller bearing and 1st gear thrust washer.

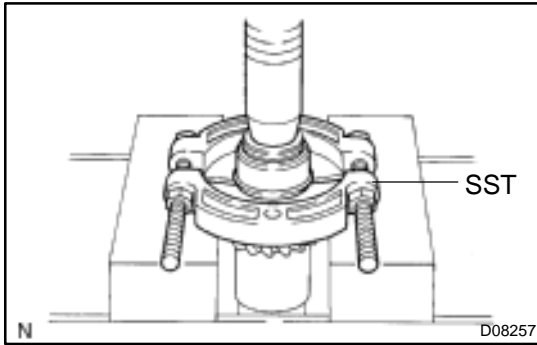
- (c) Using a magnetic finger, remove the ball.

**7. REMOVE SNAP RING**

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

**HINT:**

Take care not to damage the journal surface of the output shaft.



#### 8. REMOVE FRONT BEARING INNER RACE

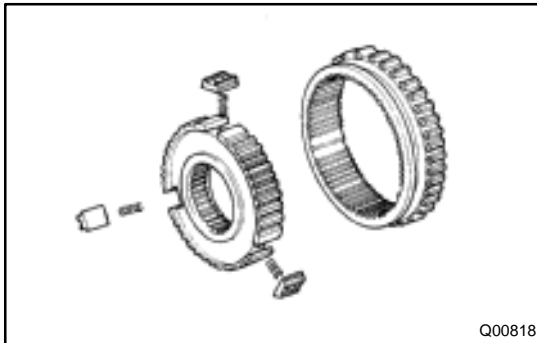
Using SST and a press, press out the front bearing inner race.  
SST 09950-00020

#### NOTICE:

**When replacing the front bearing inner race, replace the output shaft front bearing along with it.**

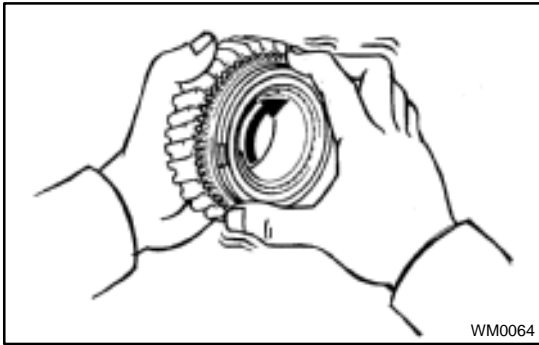
#### HINT:

Support the output shaft by hand so that it will not be dropped off.



#### 9. DISASSEMBLE REVERSE GEAR AND NO.1 CLUTCH HUB

- (a) Remove the reverse gear from the No. 1 clutch hub.
- (b) Remove the 3 No. 1 shifting keys and 3 No. 1 shifting key springs from the No. 1 clutch hub.



## INSPECTION

### 1. INSPECT NO. 1 SYNCHRONIZER RING

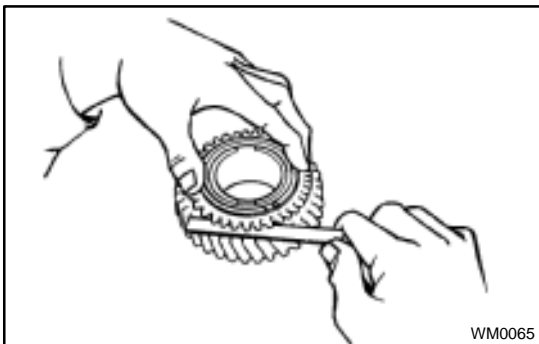
- (a) Check for wear or damage.
- (b) Check the braking effect of the synchronizer ring.  
Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

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

**NOTICE:**

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

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



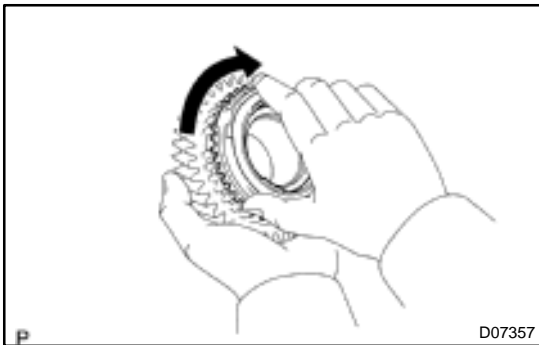
- (d) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.

**Minimum clearance: 0.75 mm (0.0295 in.)**

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

**NOTICE:**

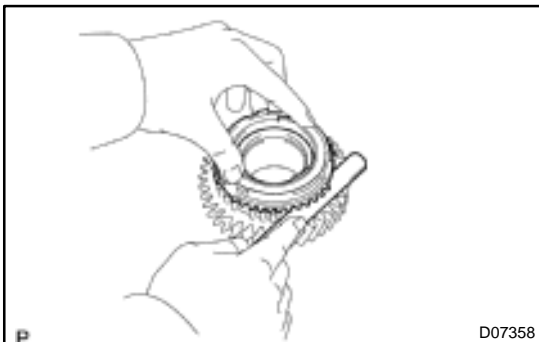
**Ensure the fine lapping compound is completely washed off after rubbing.**



### 2. INSPECT NO. 2 SYNCHRONIZER RING

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

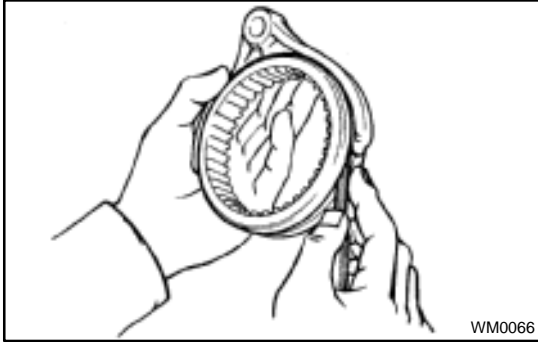
If the braking effect is insufficient, replace the synchronizer ring.



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

**Minimum clearance: 0.70 mm (0.0276 in.)**

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

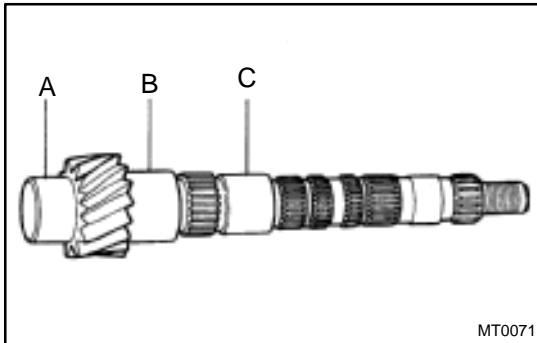


### 3. INSPECT NO. 1 GEAR SHIFT FORK AND REVERSE GEAR CLEARANCE

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

**Maximum clearance: 0.35 mm (0.014 in.)**

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



### 4. INSPECT OUTPUT SHAFT

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

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

**Minimum outer diameter:**

**Part A: 32.985 mm (1.2986 in.)**

**Part B: 37.985 mm (1.4955 in.)**

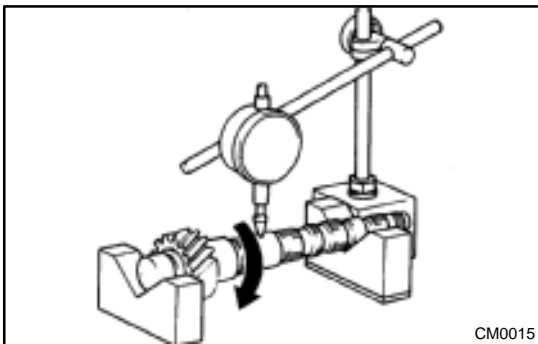
**Part C: 31.985 mm (1.2592 in.)**

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

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

**Maximum runout: 0.03 mm (0.0012 in.)**

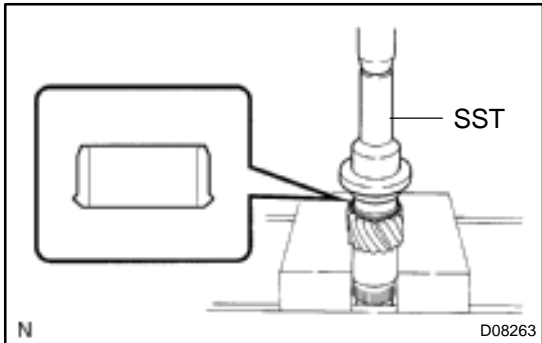
If the runout exceeds the maximum, replace the output shaft.



# REASSEMBLY

**HINT:**

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



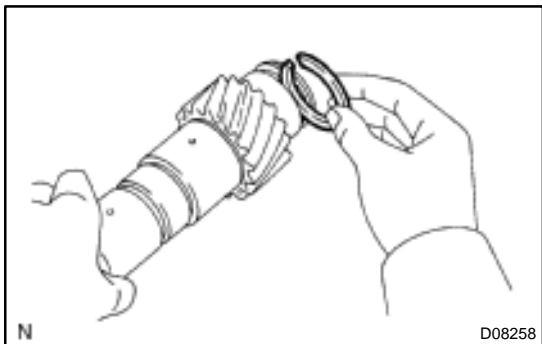
**1. INSTALL FRONT BEARING INNER RACE**

Using SST and a press, press in the front bearing inner race.

SST 09223-50010

**NOTICE:**

Be sure to install the front bearing inner race in the correct direction, as shown in the illustration.



**2. INSTALL SNAP RING**

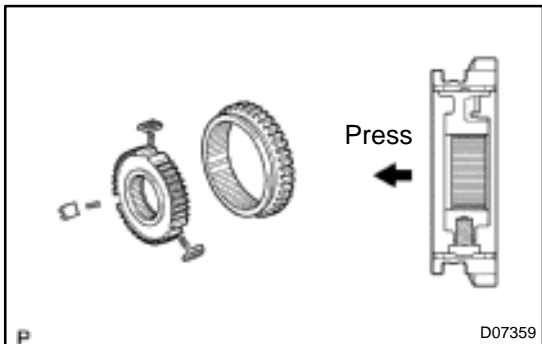
(a) Select a snap ring from the table below that will make the thrust clearance of the front bearing inner race less than 0.1 mm (0.0039 in.).

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
7	1.85 (0.0728)	3	2.05 (0.0807)
8	1.90 (0.0748)	4	2.10 (0.0827)
1	1.95 (0.0768)	5	2.15 (0.0846)
2	2.00 (0.0787)	6	2.20 (0.0866)

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

**HINT:**

Take care not to damage the journal surface of the output shaft.



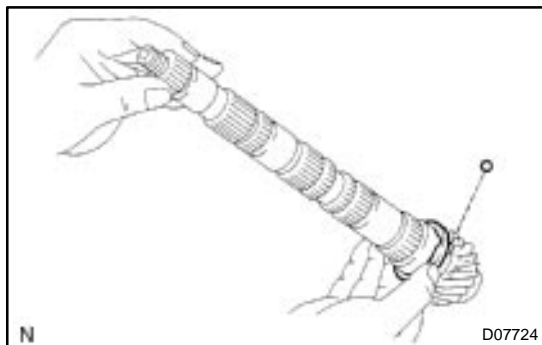
**3. ASSEMBLE REVERSE GEAR AND NO.1 CLUTCH HUB**

(a) Install the 3 No. 1 shifting key springs and 3 No. 1 shifting keys to the No. 1 clutch hub.

(b) Install the No. 1 clutch hub to the reverse gear.

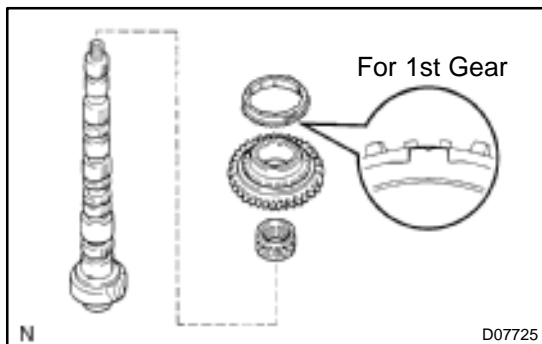
**NOTICE:**

Assemble the reverse gear and No. 1 clutch hub in the direction shown in the illustration.



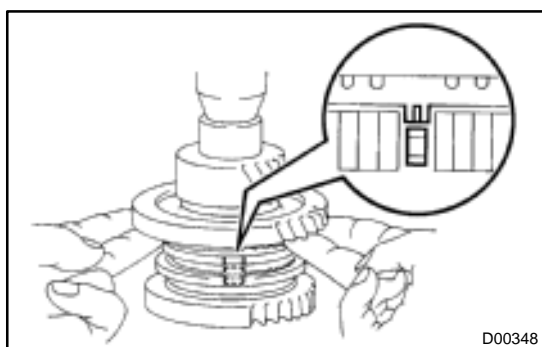
**4. INSTALL BALL, 1ST GEAR THRUST WASHER, NEEDLE ROLLER BEARING, 1ST GEAR, NO. 1 SYNCHRONIZER RING AND REVERSE GEAR AND NO. 1 CLUTCH HUB ASSEMBLY**

- (a) Using a magnetic finger, install the ball to the output shaft.
- (b) Fit the 1st gear thrust washer groove securely over the locking ball when installing the thrust washer on the output shaft.

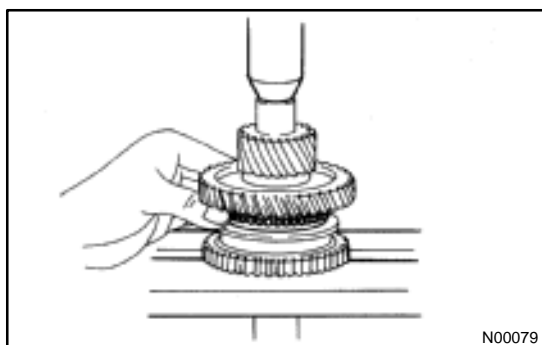


- (c) Apply gear oil to the needle roller bearing and install it.
- (d) Install the 1st gear and No. 1 synchronizer ring.

**NOTICE:**  
Distinguish the No. 1 synchronizer ring by the teeth on the synchronizer ring.



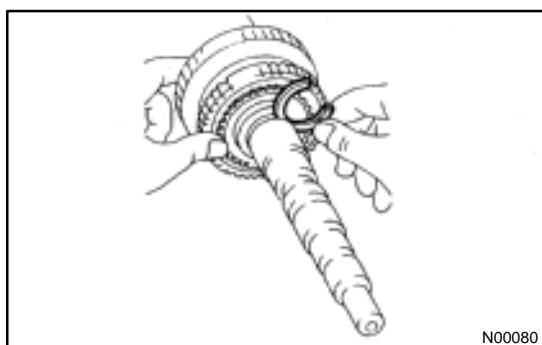
- (e) Place the reverse gear and No. 1 clutch hub assembly and align the No. 1 synchronizer ring slots with the No. 1 shifting keys.



- (f) Using a press, press in the reverse gear and No. 1 clutch hub assembly.

**NOTICE:**

- Be sure to install the reverse gear and No. 1 clutch hub assembly in the correct direction, as shown in the illustration.
- When installing, make sure that the ball is placed in a groove of the 1st gear thrust washer.



**5. INSTALL SNAP RING**

- (a) Select a snap ring from the table below that will make the thrust clearance of the No. 1 clutch hub less than 0.1 mm (0.0039 in.).

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	2.50 (0.0984)	D	2.68 (0.1055)
B	2.56 (0.1008)	E	2.74 (0.1079)
C	2.62 (0.1031)	F	2.80 (0.1102)

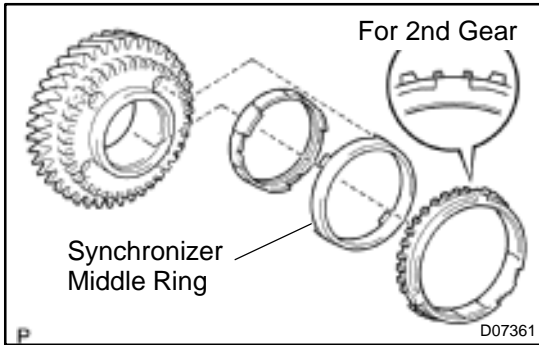
- (b) Using a screwdriver and a hammer, tap in the snap ring.

HINT:

Take care not to damage the journal surface of the output shaft.

6. INSPECT 1ST GEAR THRUST CLEARANCE

(See page MX-36)

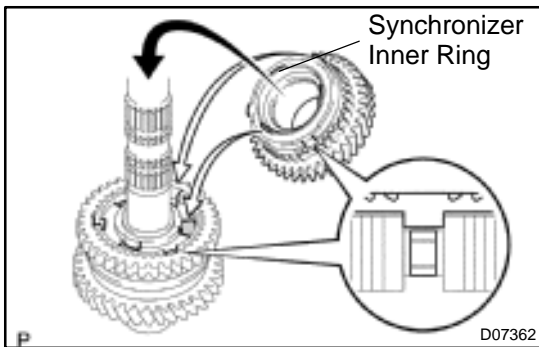


7. INSTALL SPACER, NEEDLE ROLLER BEARING, NO. 2 SYNCHRONIZER RING, 2ND GEAR AND 3RD DRIVEN GEAR

- (a) Install the spacer.
- (b) Apply gear oil to the needle roller bearing and install it.
- (c) Place the No. 2 synchronizer ring on the 2nd gear.

NOTICE:

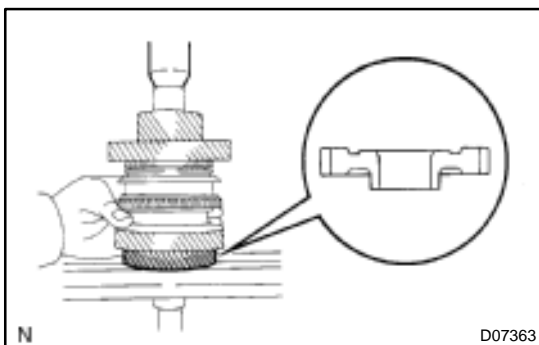
- Properly fit the synchronizer middle ring claws into the holes in the 2nd gear.
- Distinguish the No. 2 synchronizer ring by the teeth on the synchronizer ring.



- (d) Place the 2nd gear with the No. 2 synchronizer ring and align the No. 2 synchronizer ring slots with the No. 1 shifting keys.

NOTICE:

Fit the synchronizer inner ring claws into the slots in the No. 1 clutch hub.



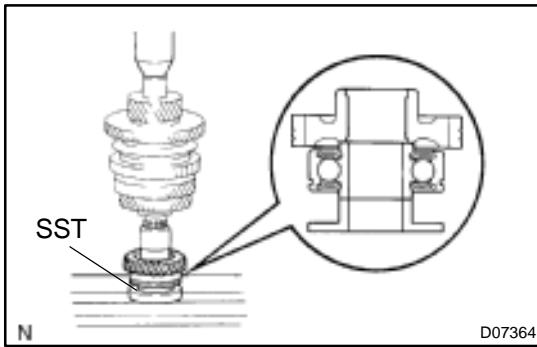
- (e) Using a press, press in the 3rd driven gear.

NOTICE:

Be sure to install the 3rd driven gear in the correct direction, as shown in the illustration.

8. INSPECT 2ND GEAR THRUST CLEARANCE

(See page MX-36)



### 9. INSTALL OUTPUT GEAR SPACER, 4TH DRIVEN GEAR AND REAR RADIAL BALL BEARING

- (a) Install the output gear spacer.
- (b) Using SST and a press, press in the 4th driven gear and rear radial ball bearing.

SST 09608-00071

#### NOTICE:

Be sure to install the 4th driven gear and rear radial ball bearing in the correct direction, as shown in the illustration.

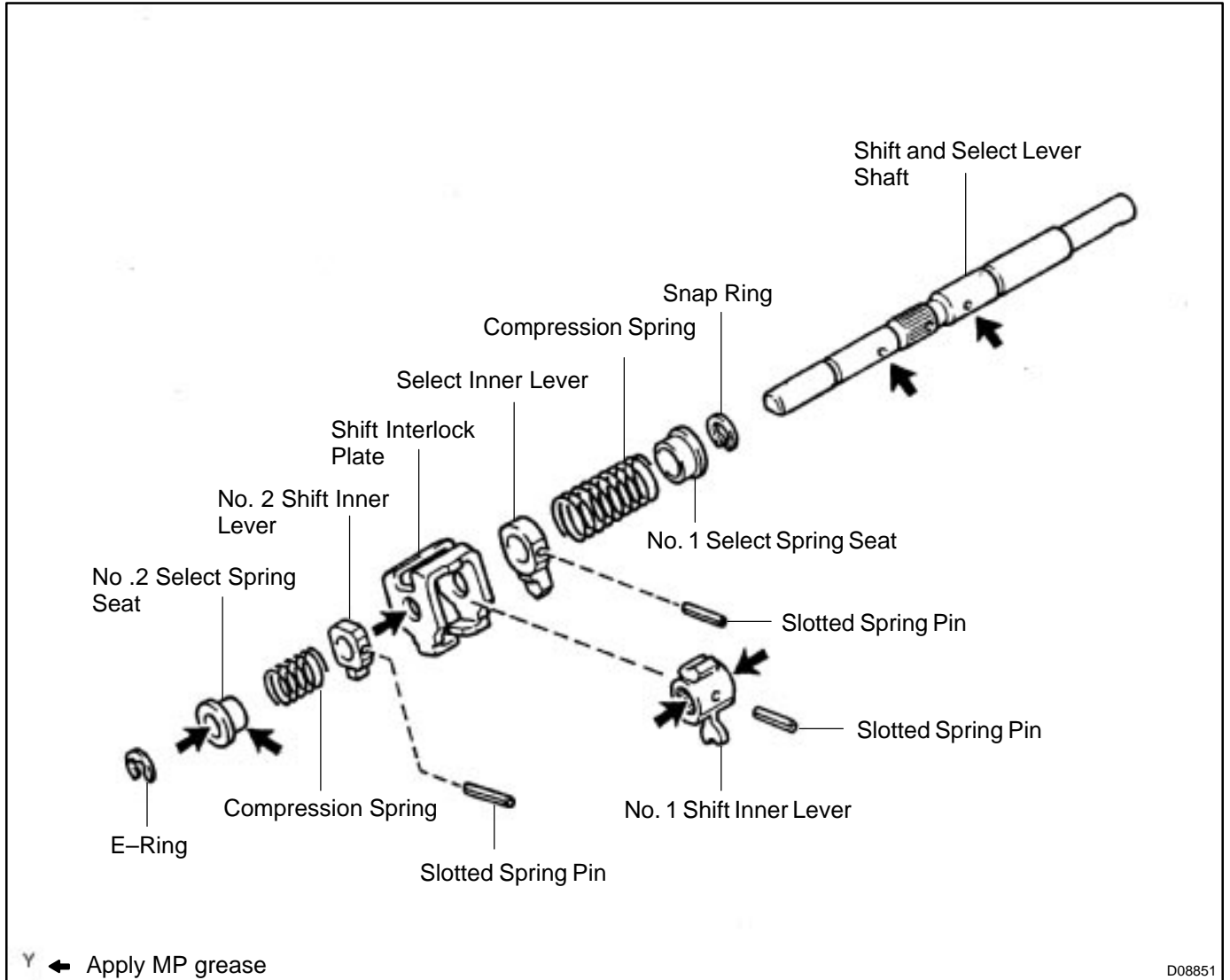
#### HINT:

Set SST to the bearing inner race securely.



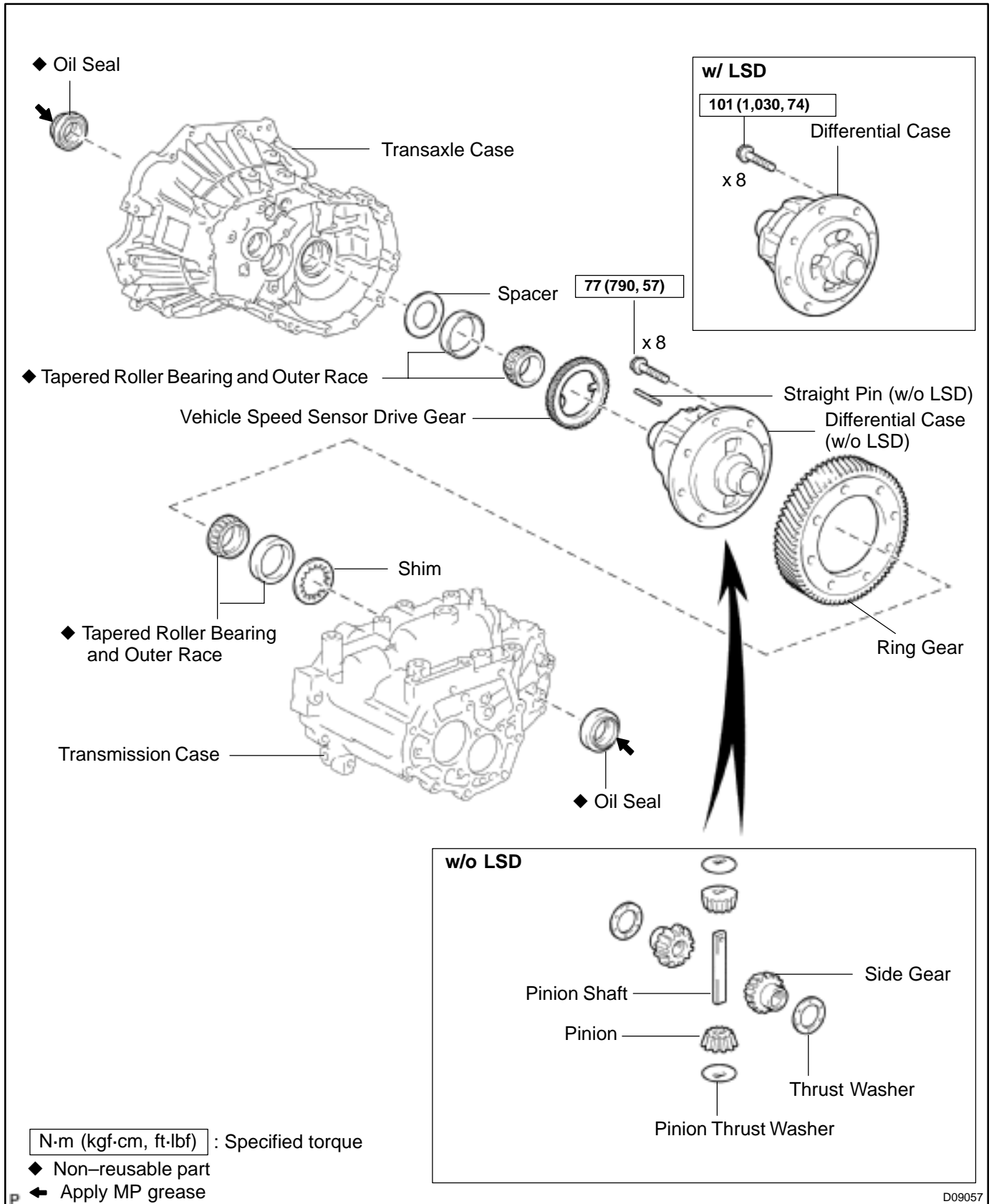
# SHIFT AND SELECT LEVER SHAFT COMPONENTS

MX001-04

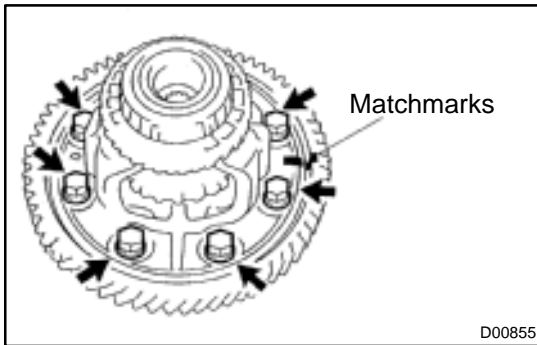


# DIFFERENTIAL CASE COMPONENTS

MX09S-02



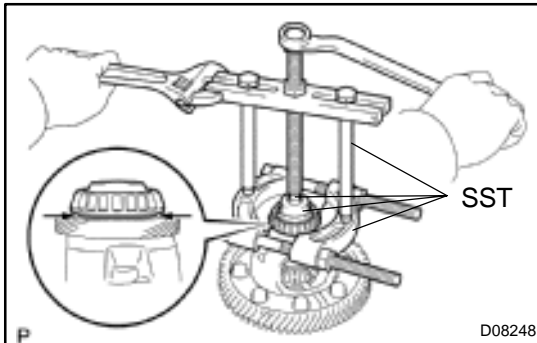
D09057



## DISASSEMBLY

### 1. REMOVE RING GEAR

- Place matchmarks on the ring gear and differential case.
- Remove the 8 bolts.
- Using a copper hammer, tap out the ring gear.



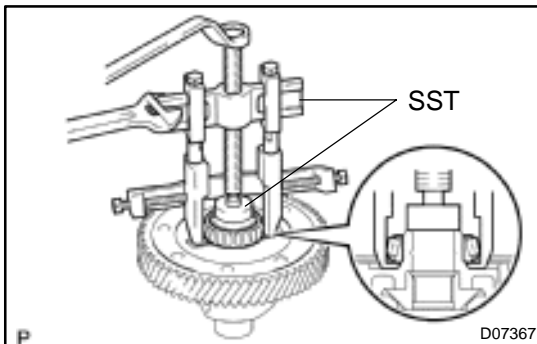
### 2. Vehicle Speed Sensor Drive Gear Side: REMOVE TAPERED ROLLER BEARING FROM DIFFERENTIAL CASE

- Using SST, remove the tapered roller bearing.  
SST 09950-00020, 09950-00030, 09950-40011  
(09957-04010), 09950-60010 (09951-00350)

#### HINT:

Set the claw of SST to the bearing inner race securely.

- Remove the vehicle speed sensor drive gear.



### 3. Ring Gear Side:

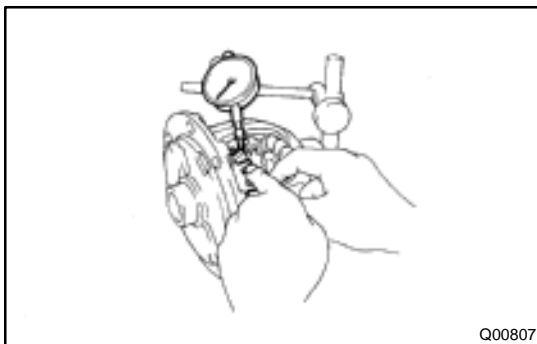
#### REMOVE TAPERED ROLLER BEARING FROM DIFFERENTIAL CASE

Using SST, remove the tapered roller bearing.

SST 09950-40011, 09950-60010 (09951-00350)

#### HINT:

Set the claw of SST to the bearing inner race at the position where the differential case is indented.



### 4. Only w/o LSD:

#### INSPECT SIDE GEAR BACKLASH

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

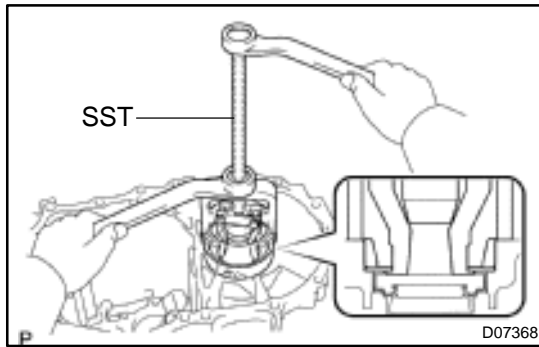
#### Standard backlash:

**0.05 – 0.20 mm (0.0020 – 0.0079 in.)**

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

### 5. DISASSEMBLE DIFFERENTIAL CASE

- Using a pin punch and a hammer, tap out the straight pin.
- Remove the pinion shaft from the differential case.
- Remove the 2 pinions and side gears with the 4 thrust washers from each gear.



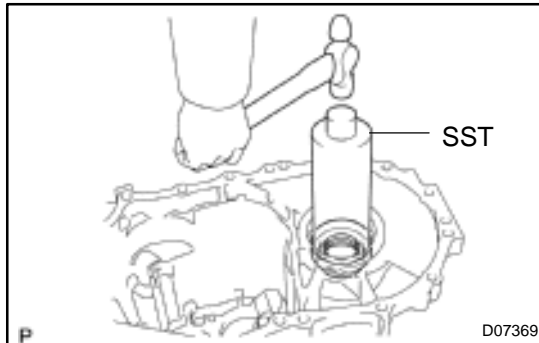
## REPLACEMENT

### 1. Transmission Case Side:

#### REPLACE OIL SEAL AND TAPERED ROLLER BEARING OUTER RACE

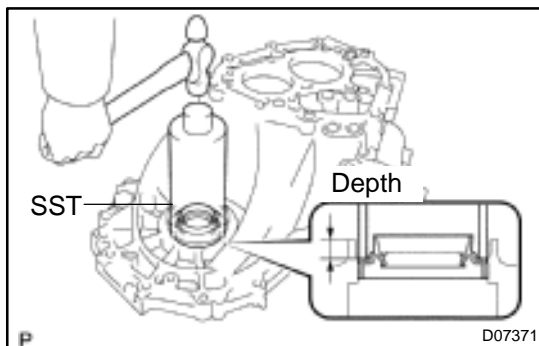
- (a) Using SST, remove the tapered roller bearing outer race and shim.

SST 09612-65014



- (b) Using SST and a hammer, tap out the oil seal.

SST 09226-10010



- (c) Using SST and a hammer, tap in a new oil seal.

SST 09226-10010

**Depth: 9.9 ± 0.3 mm (0.390 ± 0.012 in.)**

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

- (e) Place the shim into the differential case.

#### HINT:

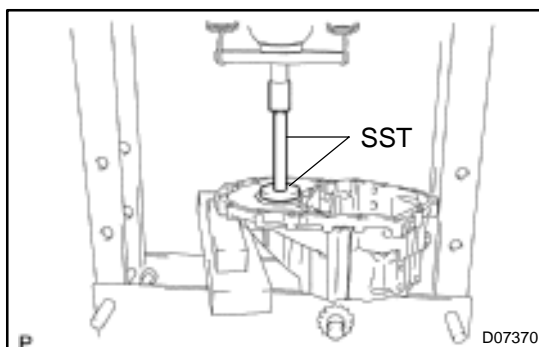
In case that the tapered roller bearing is new, install the shim by selecting among the thin ones. In case that the tapered roller bearing is a used one, its better to install the shim which has the same thickness before disassembling.

- (f) Using SST and a press, press in a new tapered roller bearing outer race.

SST 09950-60020 (09951-00710), 09950-70010 (09951-07150)

#### NOTICE:

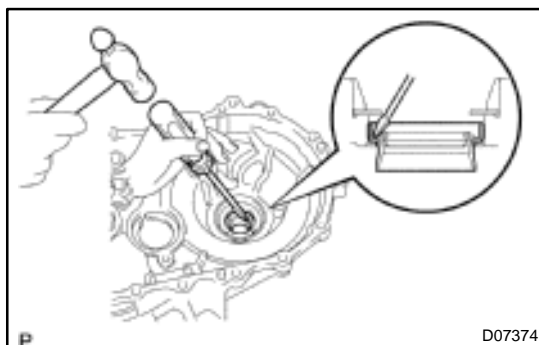
**When replacing the tapered roller bearing outer race, replace the tapered roller bearing along with it.**

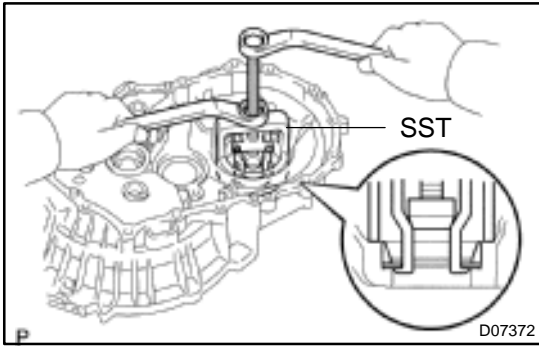


### 2. Transaxle Case Side:

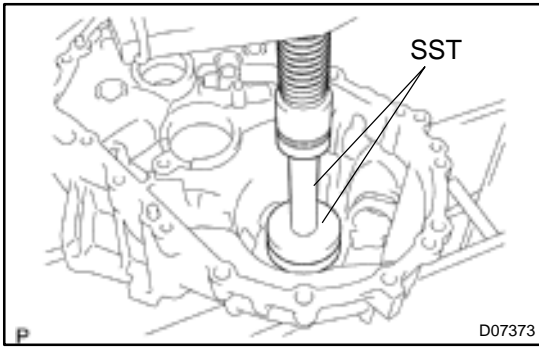
#### REPLACE OIL SEAL AND TAPERED ROLLER BEARING OUTER RACE

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





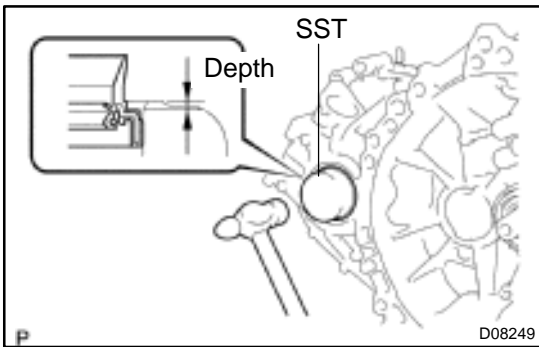
- (b) Using SST, remove the tapered roller bearing outer race and spacer.  
SST 09612-65014
- (c) Place the spacer into the differential case.



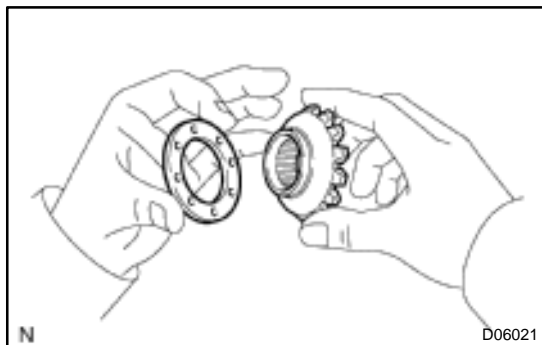
- (d) Using SST and a press, press in a new tapered roller bearing outer race.  
SST 09950-60020 (09951-00680), 09950-70010 (09951-07150)

**NOTICE:**

**When replacing the tapered roller bearing outer race, replace the tapered roller bearing along with it.**



- (e) Using SST and a hammer, tap in a new oil seal.  
SST 09710-28021 (09710-08041)  
**Depth: 1.9 ± 0.3 mm (0.075 ± 0.012 in.)**
- (f) Coat the lip of the oil seal with MP grease.



## REASSEMBLY

### 1. ASSEMBLE DIFFERENTIAL CASE

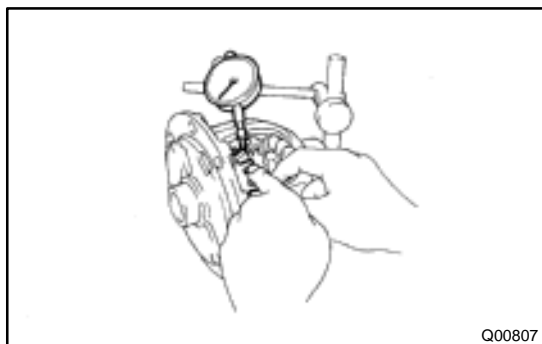
- (a) Install the correct thrust washers and side gears. Refer to the table below, select thrust washers which will ensure that the backlash is within the specification. Try to select washers of the same size for both sides.

**Standard backlash:**

**0.05 – 0.20 mm (0.0020 – 0.0079 in.)**

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

- (b) Install the thrust washers and side gears in the differential case.  
 (c) Install the pinion shaft.



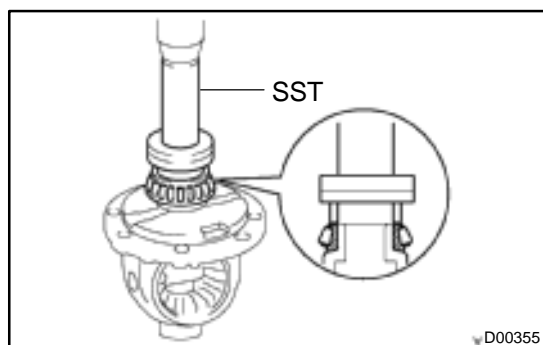
- (d) Using a dial indicator, check the side gear backlash. Measure the side gear backlash while holding one pinion toward the differential case.

**Standard backlash:**

**0.05 – 0.20 mm (0.0020 – 0.0079 in.)**

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

- (e) Using a pin punch and a hammer, tap in the straight pin through the differential case and hole in the pinion shaft.  
 (f) Using a chisel and a hammer, caulk the pin holes around the circumference of the differential case.



### 2. Ring Gear Side:

#### INSTALL TAPERED ROLLER BEARING

Using SST and a press, press in a new tapered roller bearing.

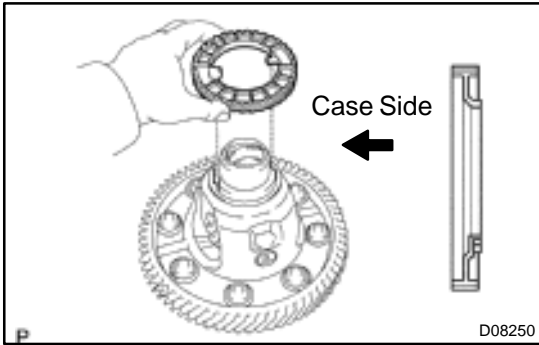
SST 09350-32014 (09351-32120, 09351-32140)

#### NOTICE:

**When replacing the tapered roller bearing outer race, replace the tapered roller bearing along with it.**

#### HINT:

Set SST to the bearing inner race securely.

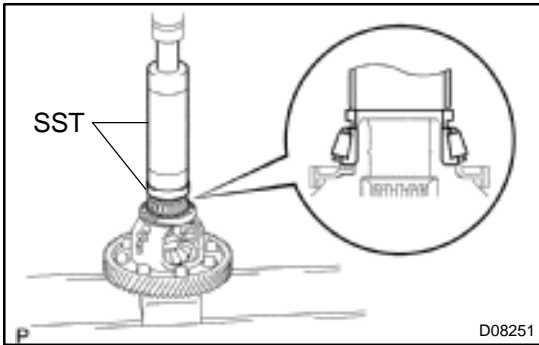


**3. Vehicle Speed Sensor Drive Gear Side:  
INSTALL TAPERED ROLLER BEARING**

- (a) Place the vehicle speed sensor drive gear in position to stop turning, and install the vehicle speed sensor drive gear.

**NOTICE:**

**Be sure to install the vehicle speed sensor drive gear in the correct direction, as shown in the illustration.**



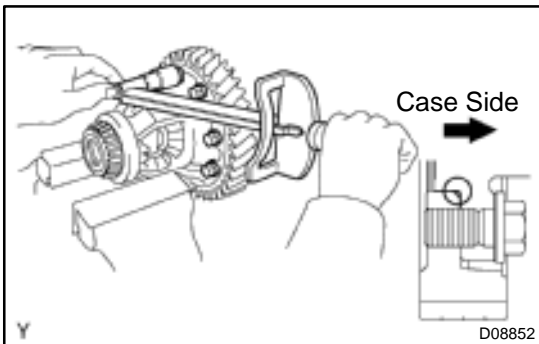
- (b) Using SST and a press, press in a new side bearing.  
SST 09316-60011 (09316-00011), 09350-32014 (09351-32120)

**NOTICE:**

**When replacing the tapered roller bearing outer race, replace the tapered roller bearing along with it.**

**HINT:**

Set SST to the bearing inner race securely.



**4. INSTALL RING GEAR ON DIFFERENTIAL CASE**

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

**HINT:**

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

- (e) Temporarily install the 8 set bolts.

**CAUTION:**

**The ring gear set bolts should not be tightened until the ring gear has cooled sufficiently.**

- (f) After the ring gear has cooled sufficiently, torque the ring gear set bolts uniformly at a time.

**Torque:**

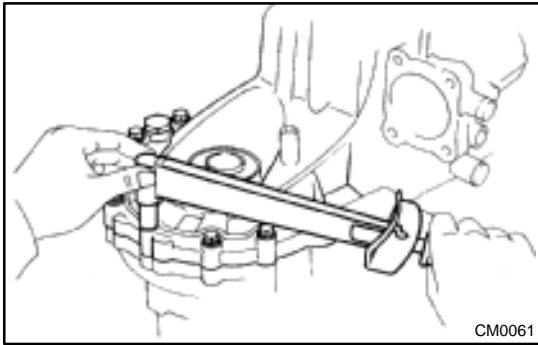
w/o LSD: 77 N·m (790 kgf·cm, 57 ft·lbf)

w/ LSD: 101 N·m (1,030 kgf·cm, 74 ft·lbf)

**5. INSPECT DIFFERENTIAL TAPERED ROLLER BEARING PRELOAD (IN CASE THAT w/o LSD)**

**NOTICE:**

- Perform this only when replacing the tapered roller bearing and outer race of the differential case.
- The thickness of the shim installed on the transmission should be selected from the thin ones.



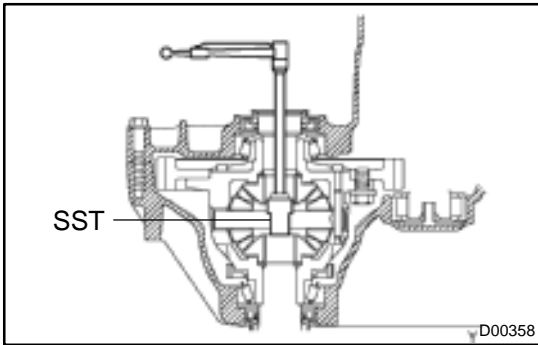
- (a) Install the differential case assembly to the transaxle case.

**NOTICE:**

**Place it gently to protect the diff side bearing from being damaged.**

- (b) Install the transmission case to the transaxle case with the 16 bolts.

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



- (c) Using SST and a torque wrench, turn the differential case assembly right and left 2 or 3 times to allow the bearings to settle.

SST 09564-32011

- (d) Using SST and a torque wrench, measure the preload.

SST 09564-32011

**Preload (at starting):**

**New bearing**

**0.78 – 1.57 N·m (7.96 – 16.0 kgf·cm, 0.58 – 1.16 in.-lbf)**

**Reused bearing**

**0.49 – 0.98 N·m (5.0 – 10.0 kgf·cm, 0.36 – 0.72 in.-lbf)**

If the preload is not within the specification and when there is a clearance, remove the transmission case side outer race of the tapered roller bearing with SST (See page MX-47), and select the thick shim. Then, exchange the shim and measure the preload again.

**HINT:**

The preload will change by about 0.3 – 0.4 N·m (3 – 4 kgf·cm, 2.6 – 3.5 in.-lbf) corresponding to a change of 0.05 mm (0.0020 in.) in shim thickness.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
AA	2.10 (0.0827)	LL	2.60 (0.1024)
BB	2.15 (0.0846)	MM	2.65 (0.1043)
CC	2.20 (0.0866)	NN	2.70 (0.1063)
DD	2.25 (0.0886)	PP	2.75 (0.1083)
EE	2.30 (0.0906)	QQ	2.80 (0.1102)
FF	2.35 (0.0925)	RR	2.85 (0.1122)
GG	2.40 (0.0945)	SS	2.90 (0.1142)
HH	2.45 (0.0965)	TT	2.95 (0.1161)
JJ	2.50 (0.0984)	UU	3.00 (0.1181)
KK	2.55 (0.1004)	–	–

**6. INSPECT DIFFERENTIAL TAPERED ROLLER BEARING PRELOAD (IN CASE THAT w/ LSD)**

**NOTICE:**

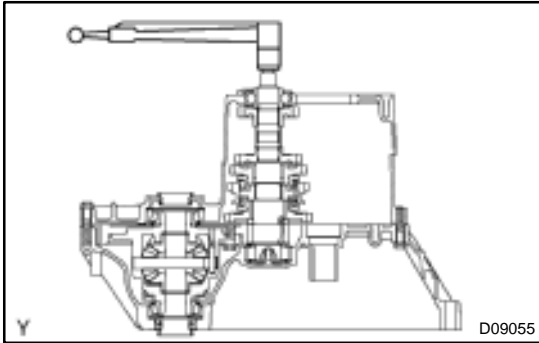
- Perform this only when replacing the tapered roller bearing and outer race of the differential case.
- The thickness of the shim installed on the transmission should be selected from the thin ones.



- (a) Assemble the differential case assembly and output shaft assembly on the transaxle case, then on top of that, assemble the transmission case with the 16 bolts.

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

- (b) Install the snap ring in the outer groove of the output shaft center bearing.



- (c) Using a socket wrench (27 mm) and a torque wrench, turn the output shaft right and left 2 or 3 times to allow the bearings to settle.

- (d) Using a socket wrench (27 mm) and a torque wrench, measure the preload.

**Preload (at starting):**

**New bearing**

**0.17 – 0.35 N·m (1.73 – 3.57 kgf·cm, 0.13 – 0.26 in.-lbf)**

**Reused bearing**

**0.11 – 0.22 N·m (1.12 – 2.24 kgf·cm, 0.08 – 0.16 in.-lbf)**

If the preload is not within the specification and when there is a clearance, remove the transmission case side outer race of the tapered roller bearing with SST (See page MX-47), and select the thick shim. Then, exchange the shim and measure the preload again.

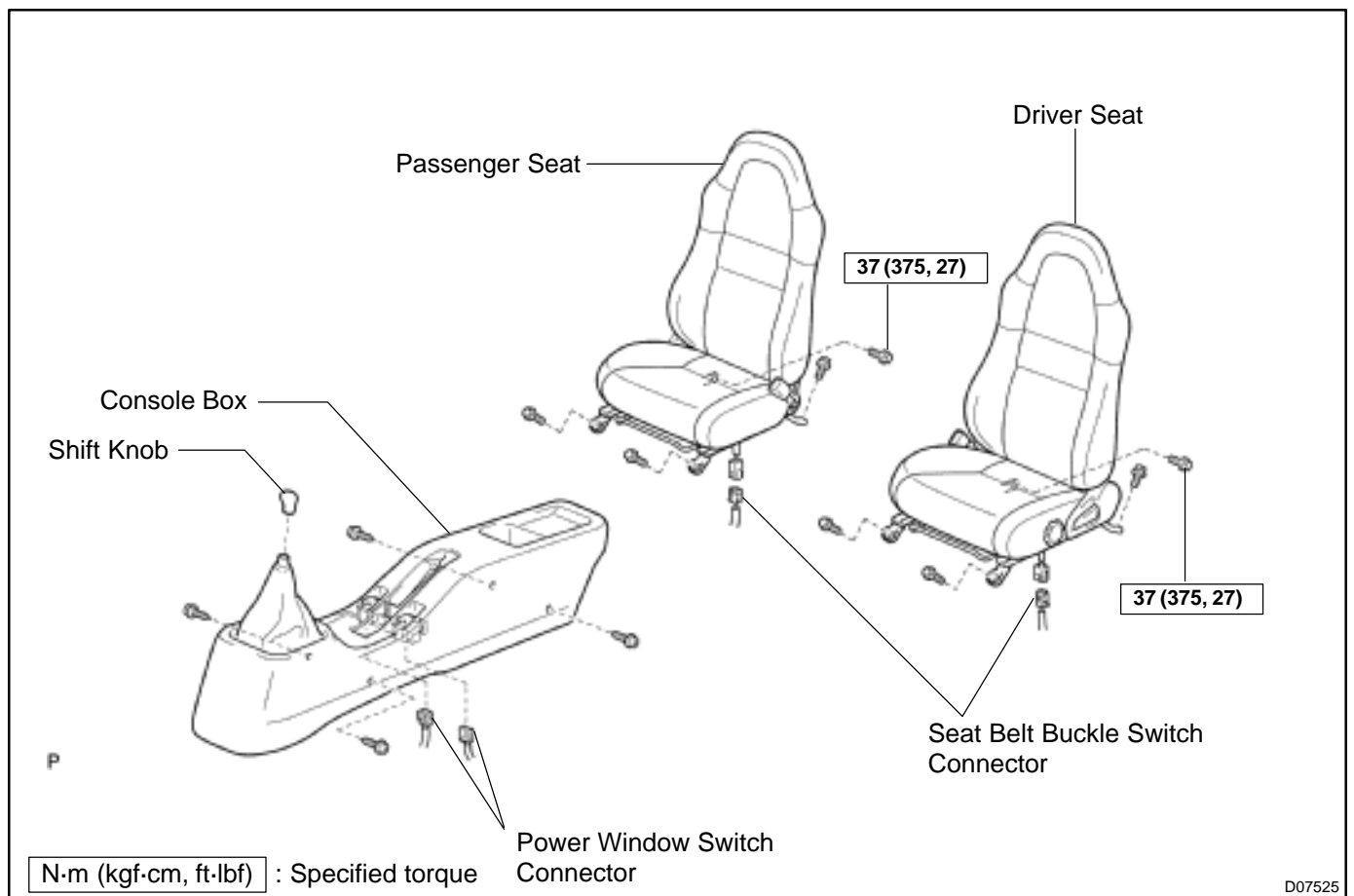
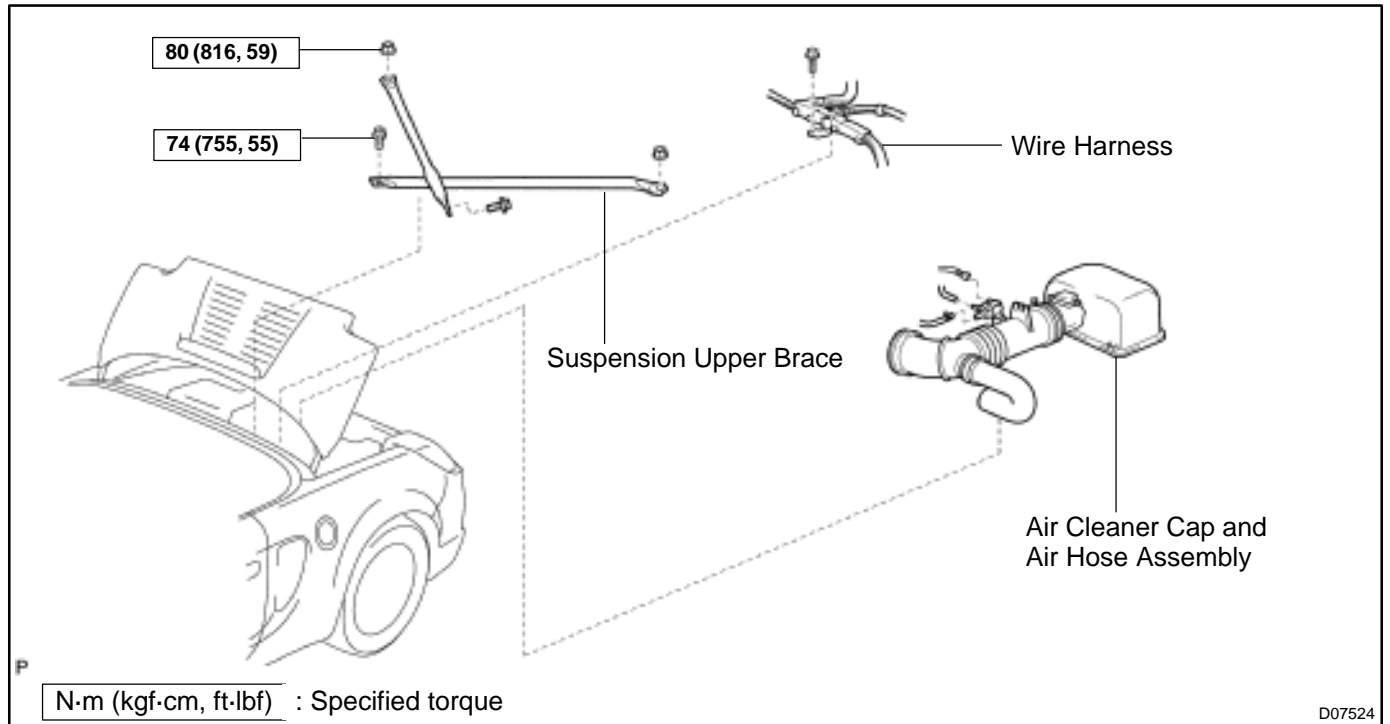
HINT:

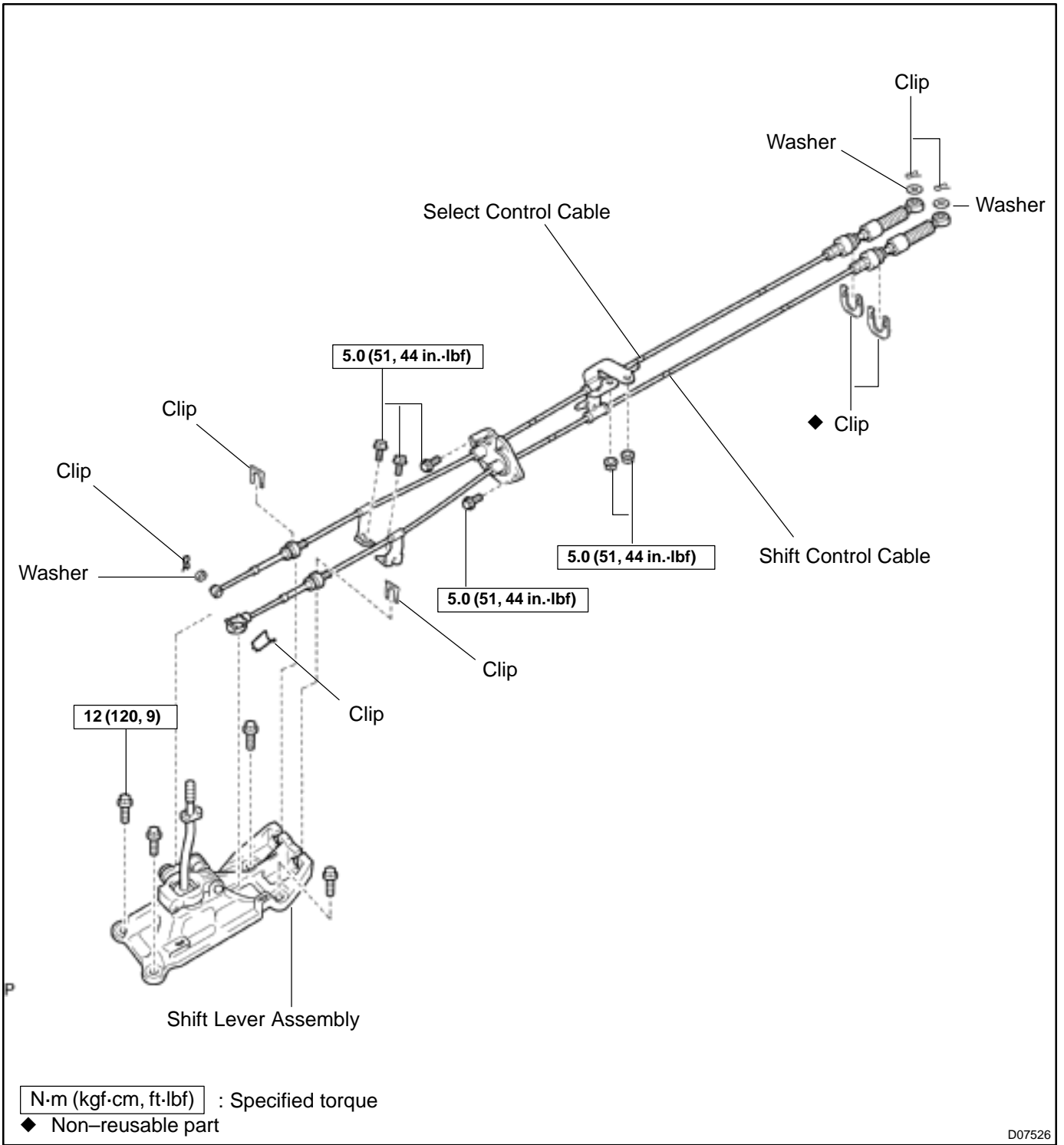
The preload will change by about 0.3 – 0.4 N·m (3 – 4 kgf·cm, 2.6 – 3.5 in.-lbf) corresponding to a change of 0.05 mm (0.0020 in.) in shim thickness.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
AA	2.10 (0.0827)	LL	2.60 (0.1024)
BB	2.15 (0.0846)	MM	2.65 (0.1043)
CC	2.20 (0.0866)	NN	2.70 (0.1063)
DD	2.25 (0.0886)	PP	2.75 (0.1083)
EE	2.30 (0.0906)	QQ	2.80 (0.1102)
FF	2.35 (0.0925)	RR	2.85 (0.1122)
GG	2.40 (0.0945)	SS	2.90 (0.1142)
HH	2.45 (0.0965)	TT	2.95 (0.1161)
JJ	2.50 (0.0984)	UU	3.00 (0.1181)
KK	2.55 (0.1004)	–	–

# SHIFT LEVER AND CONTROL CABLE COMPONENTS

MX09V-02





## REMOVAL

### 1. REMOVE SUSPENSION UPPER BRACE

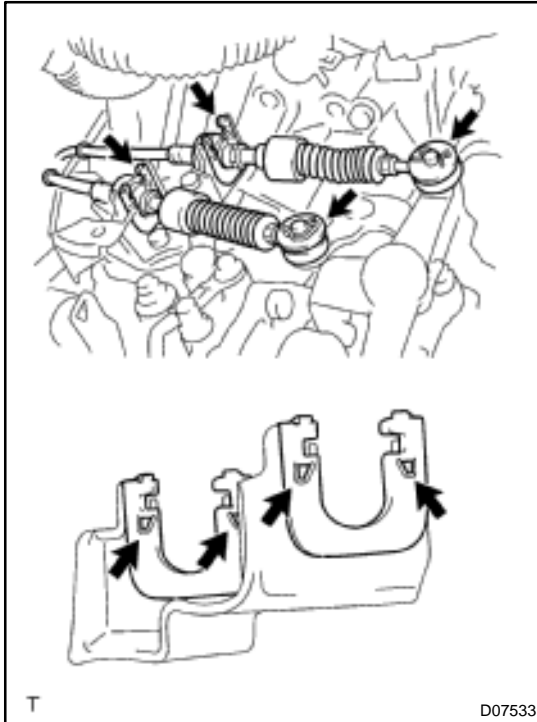
Torque:

74 N·m (755 kgf·cm, 55 ft·lbf) for bolt

80 N·m (816 kgf·cm, 59 ft·lbf) for nut

### 2. REMOVE AIR CLEANER CAP AND AIR HOSE ASSEMBLY

### 3. DISCONNECT WIRE HARNESS



### 4. DISCONNECT CONTROL CABLES FROM TRANSAXLE

(a) Remove the 2 clips and 2 washers.

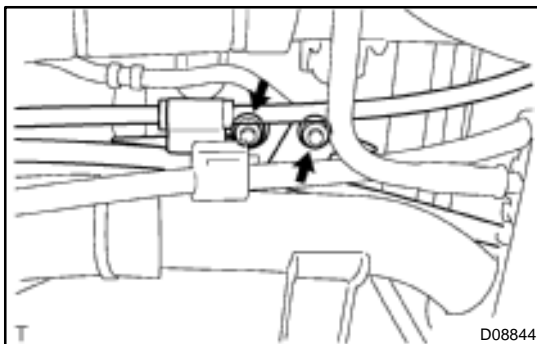
(b) Remove the 2 clips and disconnect the 2 control cables.

HINT:

Remove the select cable from the bracket by pressing the projection of the clip.

### 5. REMOVE SHIFT AND SELECT CONTROL CABLES

(a) Remove the fuel tank (See page [SF-29](#)).

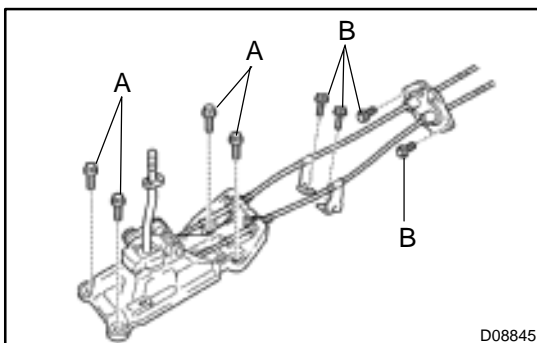


(b) Remove the 2 nuts.

**Torque: 5.0 N·m (51 kgf·cm, 44 in.-lbf)**

(c) Remove the driver and passenger seats (See page [BO-49](#)).

(d) Remove the console box (See page [BO-41](#)).



(e) Remove the 8 bolts and the shift lever and control cables assembly.

**Torque: 12 N·m (120 kgf·cm, 9 ft·lbf) for bolt A**

**Torque: 5.0 N·m (51 kgf·cm, 44 in.-lbf) for bolt B**

(f) Remove the shift and select control cables from the shift lever assembly.

## INSTALLATION

Installation is in the reverse order of removal (See page [MX-56](#)).

### NOTICE:

When installing the 2 control cables, you must observe the following items.

- When handling the cable, do not bend the cable less than  $R130^\circ$ .
- Pay thorough attention not to damage the boots.
- When installing, do not apply force but install it gently.
- After finishing the installation, check the cable for twist. If there is any irregularity, adjust it.
- Never reuse the board-type clip to fix the control cable.

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## 2004 TRANSMISSION

### SEQUENTIAL MANUAL TRANSMISSION - MR2

## SEQUENTIAL MANUAL TRANSMISSION SYSTEM

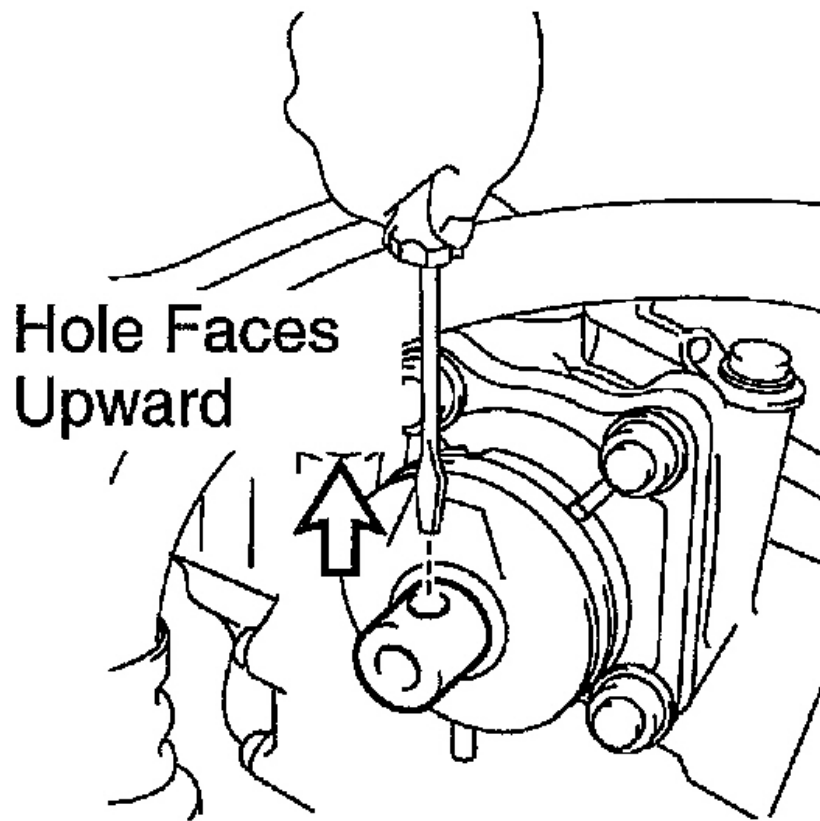
### PRECAUTION

#### 1. MAINTENANCE PRECAUTIONS

- a. Confirm that the gear is in the N position before making the maintenance of the SMT system.

If the gear can not be shifted into the N position (due to abnormalities of the system etc.):

- Check that there is a hole of 7 mm (0.27 in.) in the vehicles rear side of the shift and select lever shaft of the transmission.
  - Then move the lever into the N position by inserting a screwdriver or something into the hole.
  - When the hole faces upward then as shown in the illustration, the gear is in the N position.
- b. Be sure to follow the items bellow, before removing the SMT system.
    - Perform a cleaning of the connecting part of the SMT system hose and HPU, as there may be some dirt or foreign objects sticking to the part.
    - Reduce the pressure inside the accumulator to 0 bar (See **PRE-CHECK** ).



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**Fig. 1: Moving Lever Into N Position By Inserting Screwdriver**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. When removing the parts touching the sequential M/T fluid, cover the removed place with a vinyl bag in order not to let foreign objects in.
- d. Do not reuse the O-ring, exchange all the removed parts with new ones.
- e. Please perform the initial learning of the SMT system when exchange the following parts (See **PRE-CHECK**):
  - HPU assembly
  - GSA assembly
  - Clutch disc and cover
  - Transmission assembly
  - Shift stroke sensor
  - Select stroke sensor

- Clutch stroke sensor

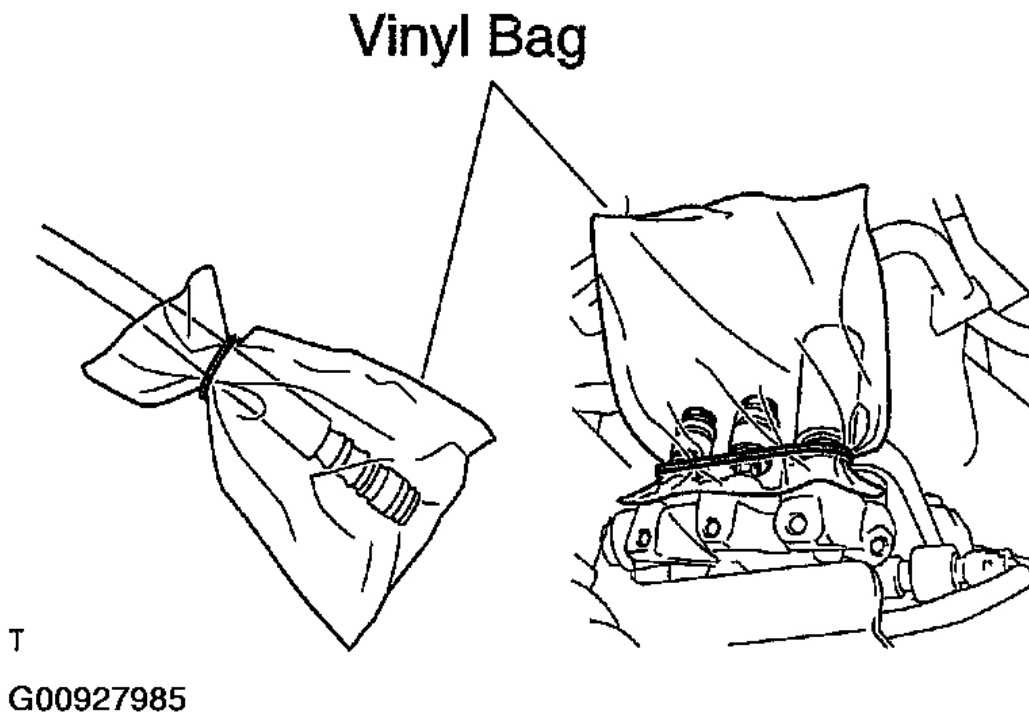
## 2. PRECAUTIONS FOR SEQUENTIAL M/T FLUID

- Do not use other fluid than one which is sequential M/T fluid.

**Fluid type: Sequential M/T fluid or equivalent**

**Parts No.: 08886-02206**

- Do not reuse the fluid which is once spilled or once let out.



**Fig. 2: Precaution Diagram With Vinyl Bag**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

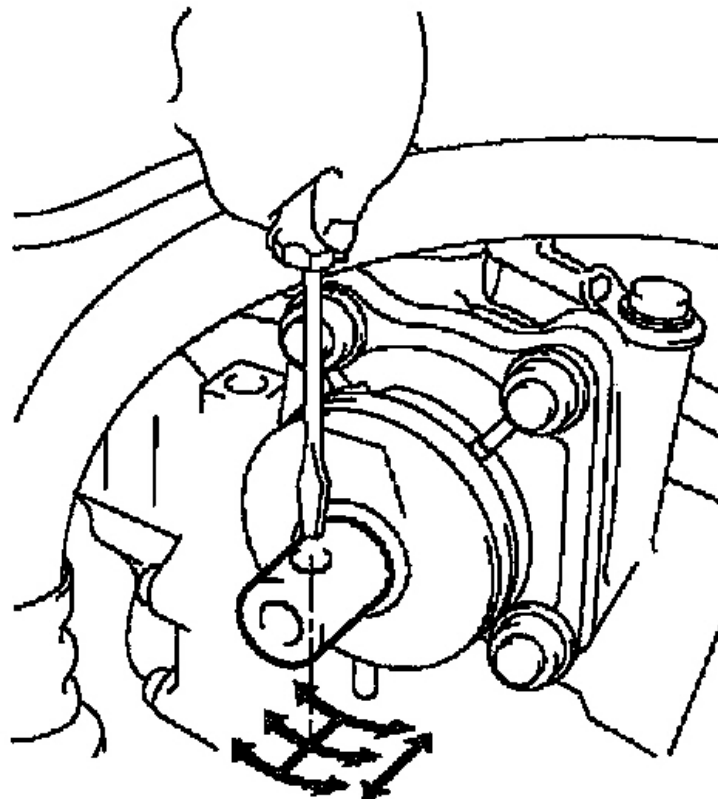
## ON-VEHICLE INSPECTION

### CHECK SHIFT AND SELECT LEVER SHAFT BY DIRECTLY MOVING IT

- Reduce the pressure inside accumulator to the 0 bar (See **PRE-CHECK** )
- Remove the suspension upper brace.
- Remove the air cleaner cap and air hose assembly (See **REMOVAL** ).
- Disconnect the wire harness.
- Check that there is a hole of 7 mm (0.27 in.) in the vehicles rear side of the shift and select lever shaft of the transmission.



- f. Inserting a screwdriver or something into the hole.



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**Fig. 3: Precaution Diagram Inserting A Screwdriver Or Something Into Hole**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- g. Check that the lever is moved smoothly into each shift position, as shown in the illustration.

If the lever cannot be moved smoothly into each shift position, refer to the See **TROUBLESHOOTING**.

- h. Shift and select lever shaft into the N position.  
i. Reconnect the wire harness.  
j. Reinstall the air cleaner cap and air hose assembly (See **REMOVAL** ).  
k. Reinstall the suspension upper brace.

**Torque:**

**74 N.m (755 kgf.cm, 55 ft.lbf) for bolt**

**80 N.m (816 kgf.cm, 59 ft.lbf) for nut**

- l. Turn the ignition switch ON.
- m. After 20 seconds have passed, turn the ignition switch OFF.

## TROUBLESHOOTING

### PROBLEM SYMPTOMS TABLE

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

Symptom	Suspected Area
Noise	<ol style="list-style-type: none"><li>1. Oil (Level low)</li><li>2. Oil (Wrong)</li><li>3. Gear (Worn or damaged)</li><li>4. Bearing (Worn or damaged)</li></ol>
Transmission oil leakage	<ol style="list-style-type: none"><li>1. Oil (Level too high)</li><li>2. Gasket (Damaged)</li><li>3. Oil seal (Worn or damaged)</li><li>4. O-ring (Worn or damaged)</li></ol>
Hard to shift or will not shift	<ol style="list-style-type: none"><li>1. Synchronizer ring (Worn or damaged)</li><li>2. Shifting key spring (Damaged)</li><li>3. Shift lever assembly (Worn or damaged)</li></ol>
Jump-out of gear	<ol style="list-style-type: none"><li>1. Locking ball spring (Damaged)</li><li>2. Gear shift fork (Worn)</li><li>3. Gear (Worn or damaged)</li><li>4. Bearing (Worn or damaged)</li></ol>

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**Fig. 4: Problem Symptoms Table**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

For the troubleshooting of the SMT system, please refer to the **PROBLEM SYMPTOMS TABLE** .

## SEQUENTIAL MANUAL TRANSMISSION UNIT

### ON-VEHICLE REPAIR

#### REPLACE TRANSMISSION OIL

- a. Remove the filler plug.
- b. Remove the drain plug, and drain the transmission oil.

---

**HINT:**

Use a container to catch the transmission oil.

- c. Reinstall the drain plug.

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

w/ LSD	2.1 liters (2.2 US qts, 1.85 Imp. qts)
w/o LSD	2.3 liters (2.4 US qts, 2.0 Imp. qts)

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**Fig. 5: Capacity Specification Chart**

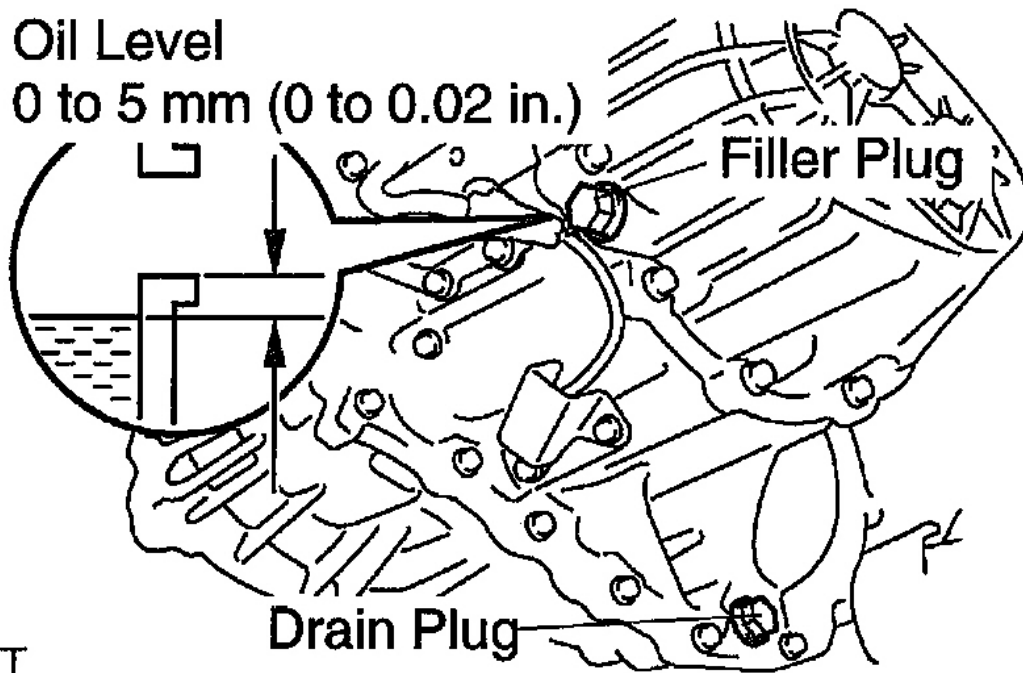
**Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.**

- d. Refill new transmission oil as shown in the illustration.

**Oil grade: API GL-4 or GL-5**

**Viscosity: SAE 75W-90**

**Capacity:**



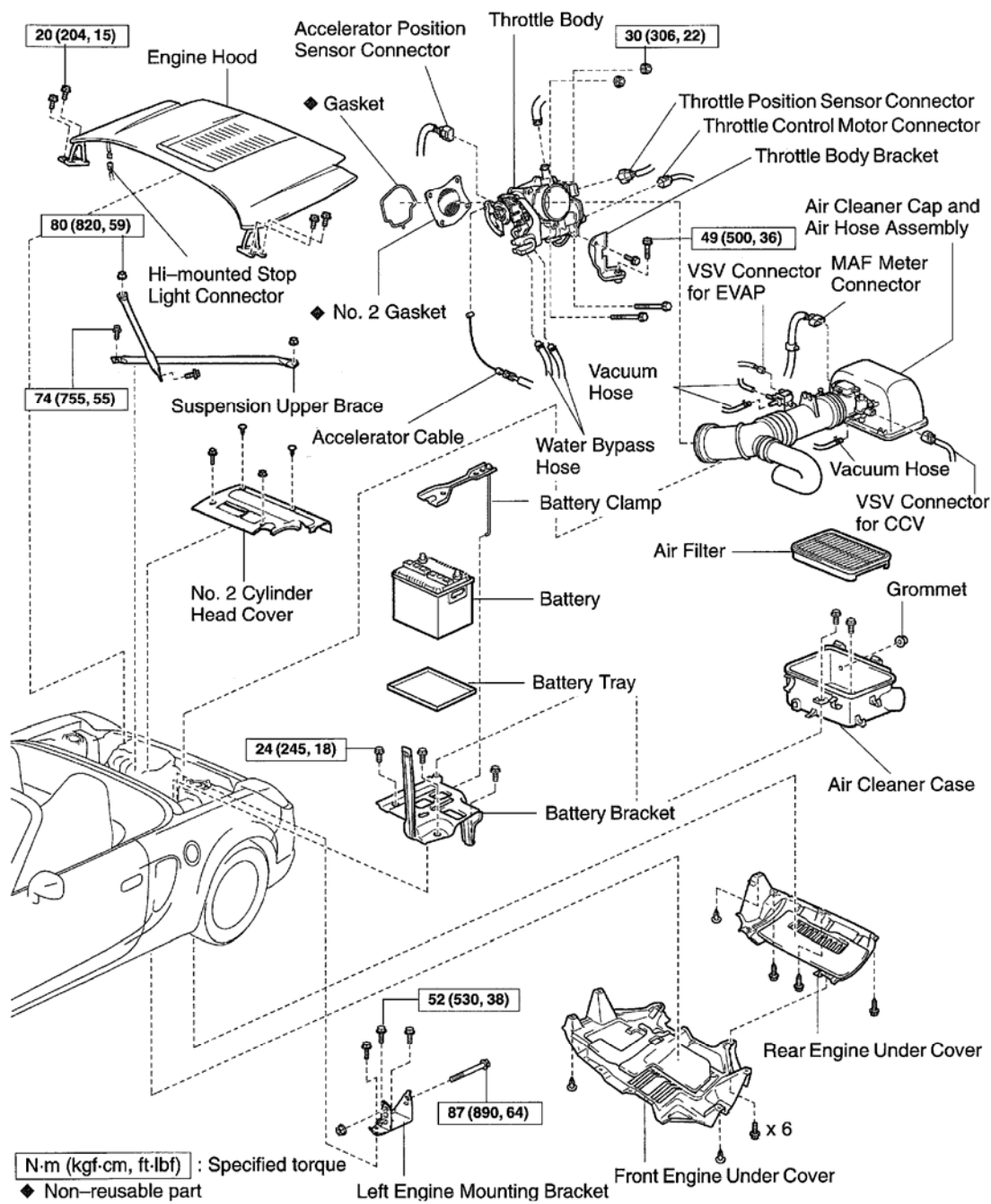
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**Fig. 6: Removing Drain Plug, And Drain Transmission Oil**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

e. Reinstall the filler plug.

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

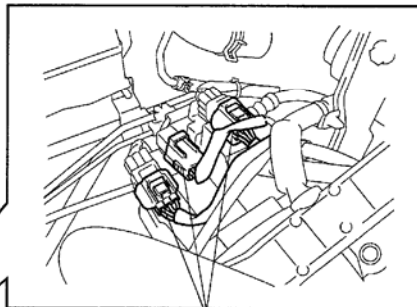
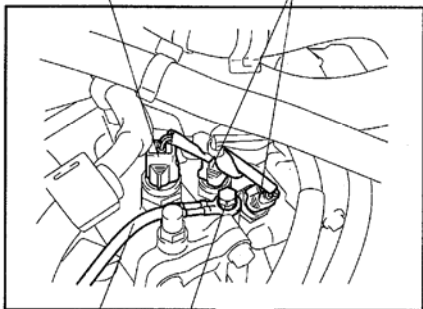
## COMPONENTS



**Fig. 7: Identifying Sequential Manual Transmission Component (1 Of 4)**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

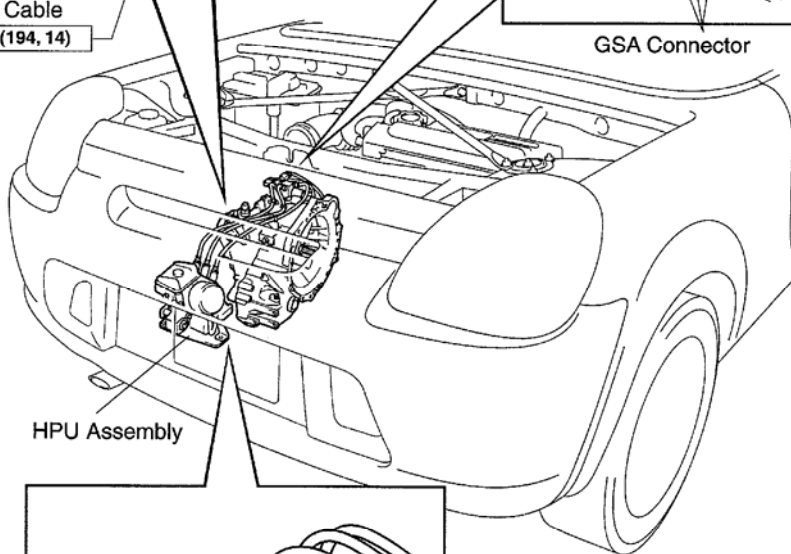
PNP Switch Connector

Back-up Light Switch Connector

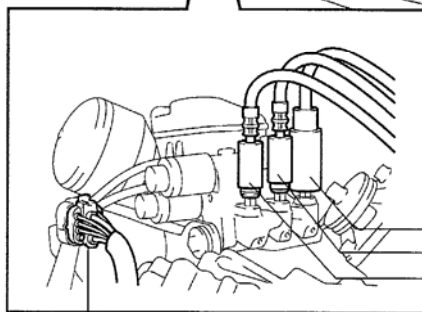


Ground Cable  
19 (194, 14)

GSA Connector



HPU Assembly



SMT System Return Hose (Color: Red)  
SMT System Master Hose (Color: Gold)  
SMT System Clutch Hose (Color: Blue)

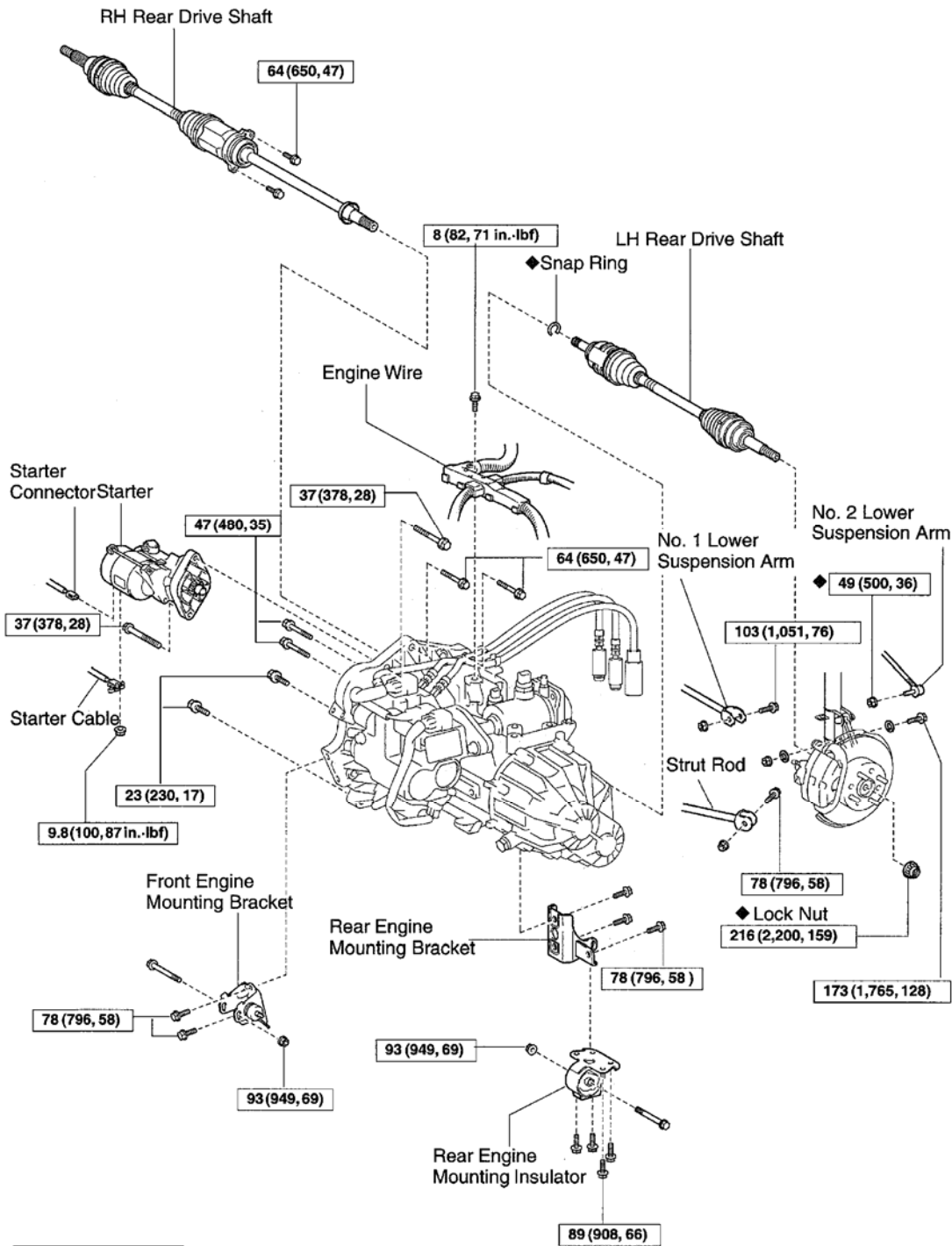
HPU Connector

P

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

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**Fig. 8: Identifying Sequential Manual Transmission Component (2 Of 4)**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

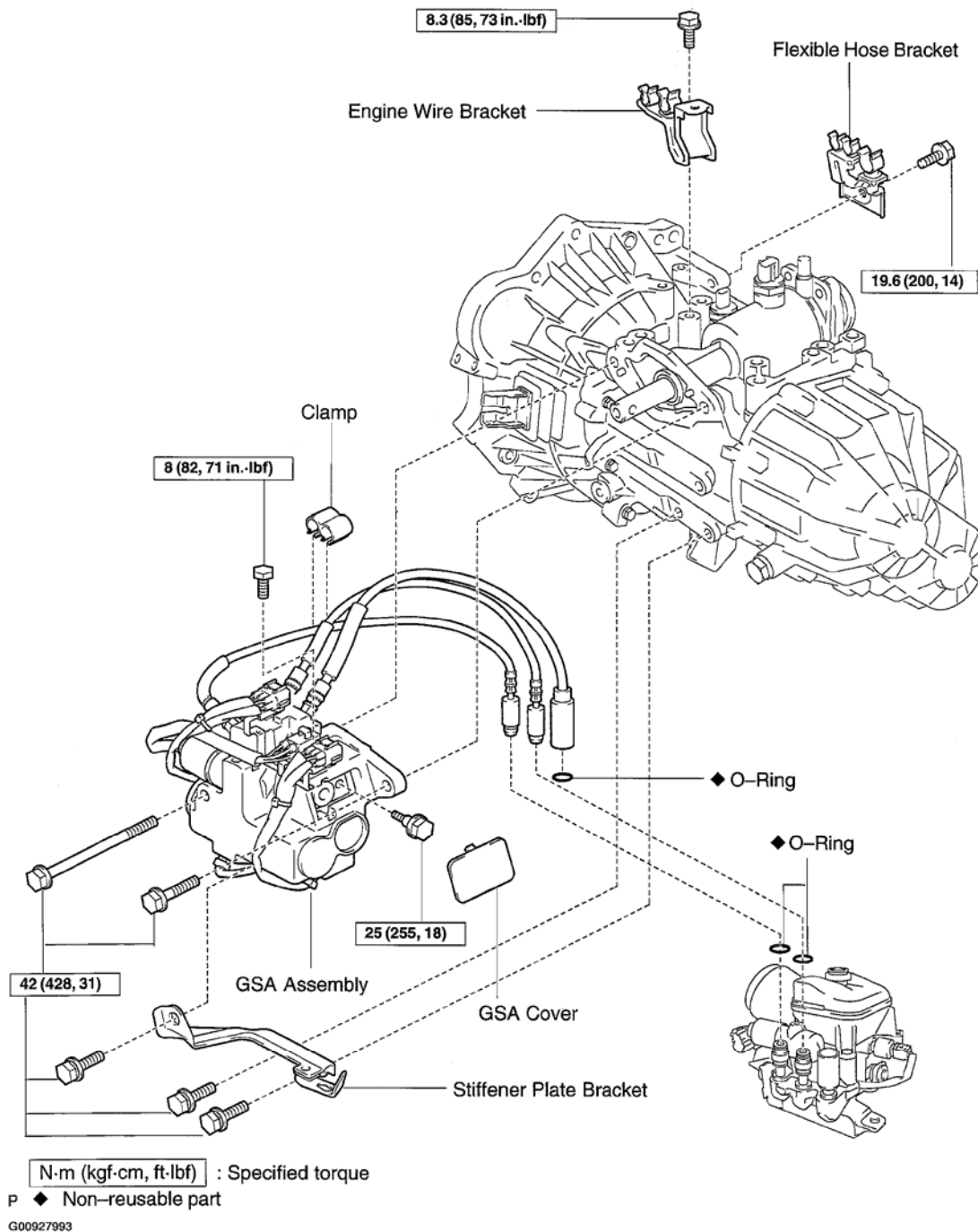


N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

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**Fig. 9: Identifying Sequential Manual Transmission Component (3 Of 4)**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



**Fig. 10: Identifying Sequential Manual Transmission Component (4 Of 4)**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**REMOVAL**

1. **CONFIRM THAT GEAR IS IN N POSITION (See SEQUENTIAL MANUAL TRANSMISSION SYSTEM)**



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2. **REDUCE ACCUMULATOR PRESSURE (See PRE-CHECK )**

3. **REMOVE ENGINE HOOD**

Remove the 4 bolts and engine hood.

4. **REMOVE SUSPENSION UPPER BRACE**

Remove the 2 bolts, 2 nuts and suspension upper brace.

5. **REMOVE AIR CLEANER CAP AND AIR HOSE ASSEMBLY, AIR FILTER AND AIR CLEANER CASE (See REMOVAL )**

6. **REMOVE FRONT AND REAR ENGINE UNDER COVERS**

7. **DISCONNECT SMT SYSTEM HOSES**

a. Disconnect the SMT system return hose.

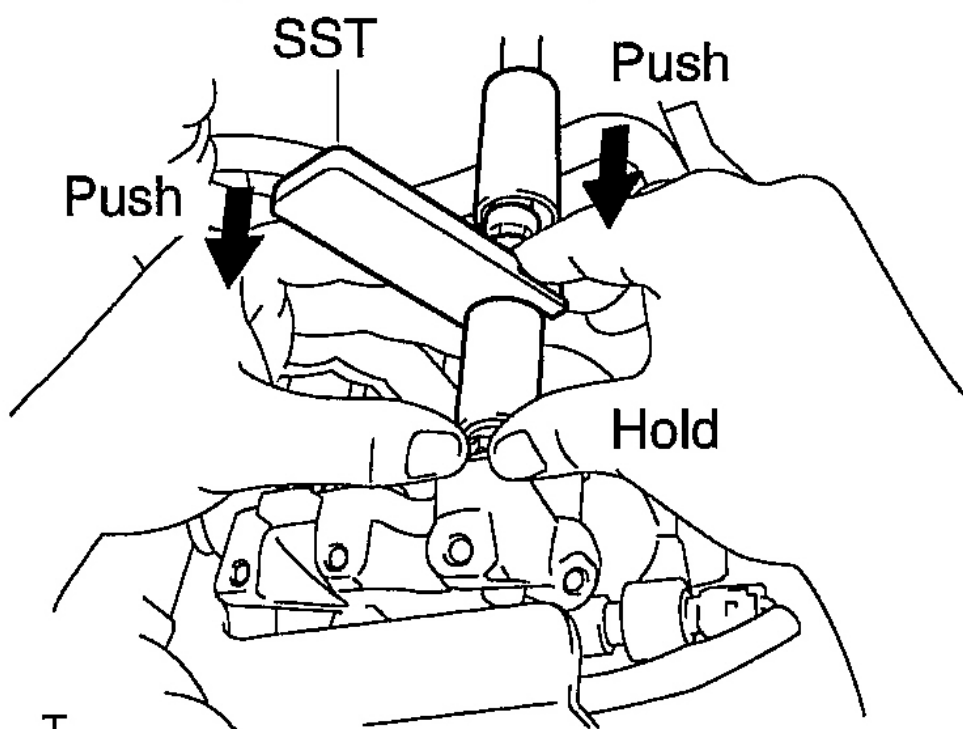
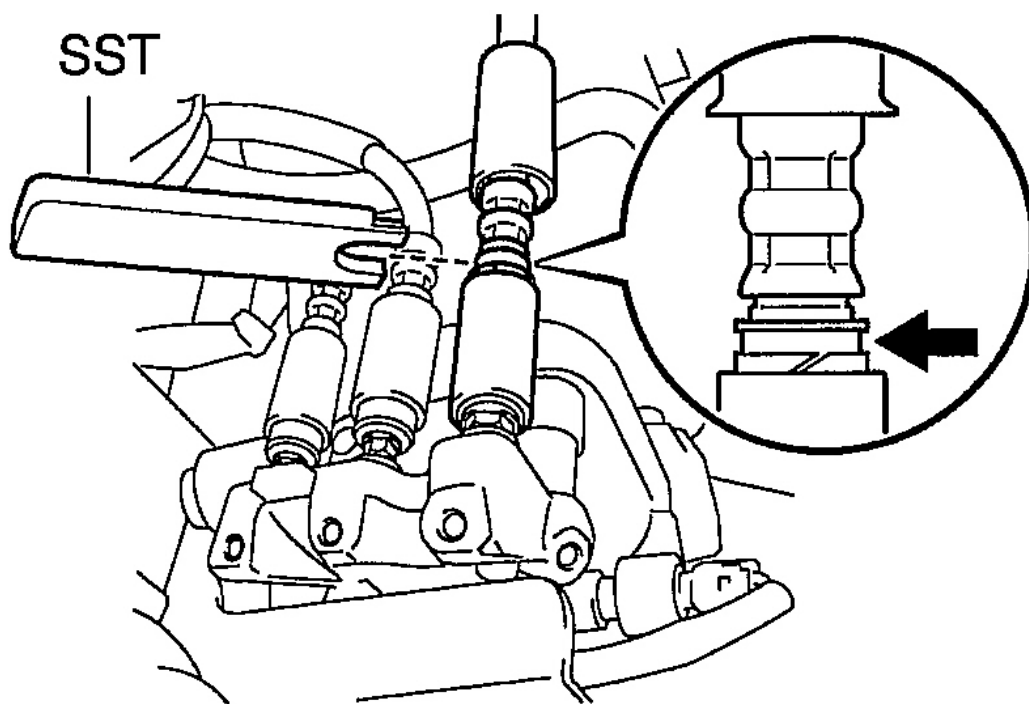
1. Hold the system return hose with the SST as shown in the illustration.

SST 09340-00010

2. Then disconnect the system return hose by pushing the SST downward until a click sound is heard.

**HINT:**

Put force equally and horizontally against the system hose with the SST.



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**Fig. 11: Disconnecting SMT System Return Hose**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Disconnect the SMT system clutch hose and SMT system master hose.

HINT:

The way of removing the 2 SMT system hoses is the same.

- 1. Hold the system clutch and master hoses with the SST as shown in the illustration.

SST 09340-00010

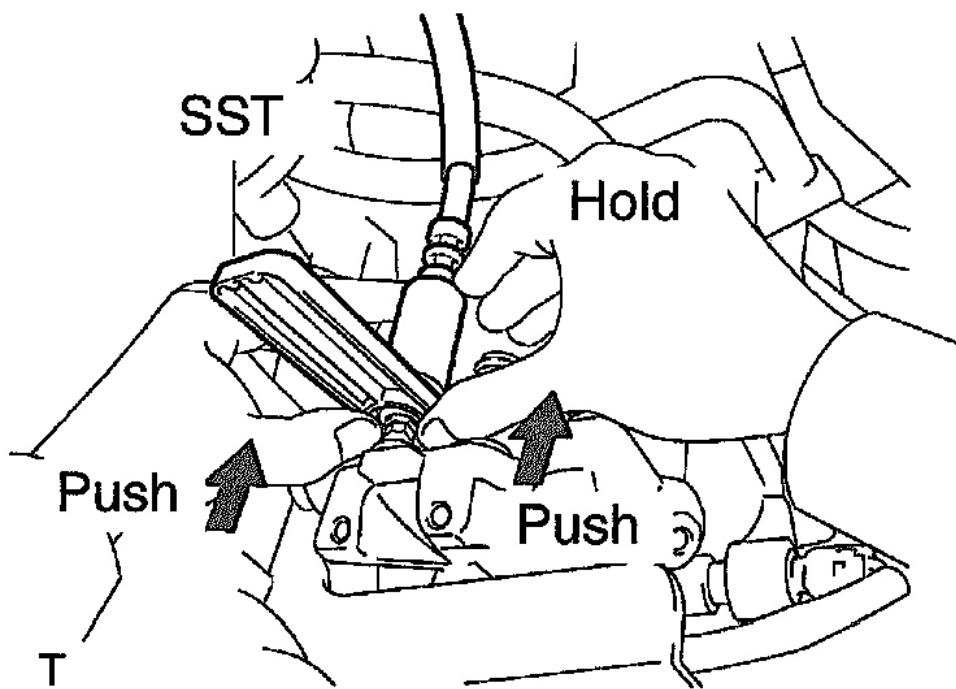
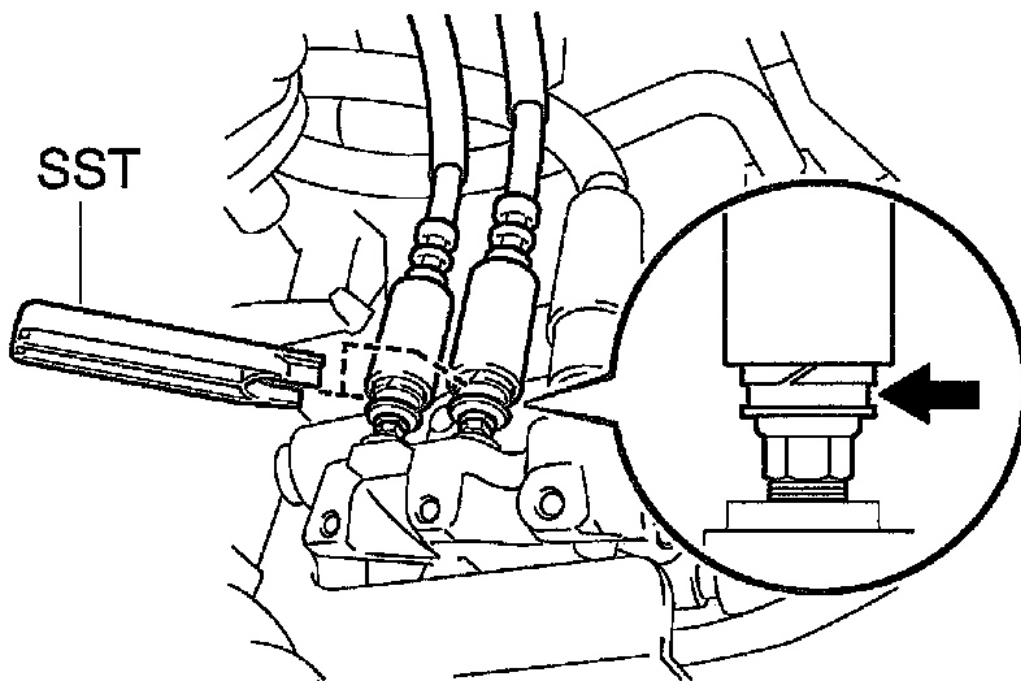
- 2. Then disconnect the system clutch and master hoses by pushing the SST upward until a click sound is heard.

HINT:

Put force equally and horizontally against the system hose with the SST.

**8. REMOVE BATTERY BRACKET**

- a. Loosen the clamp nut, and remove the clamp, battery and tray.
- b. Remove the 3 bolts and battery bracket.

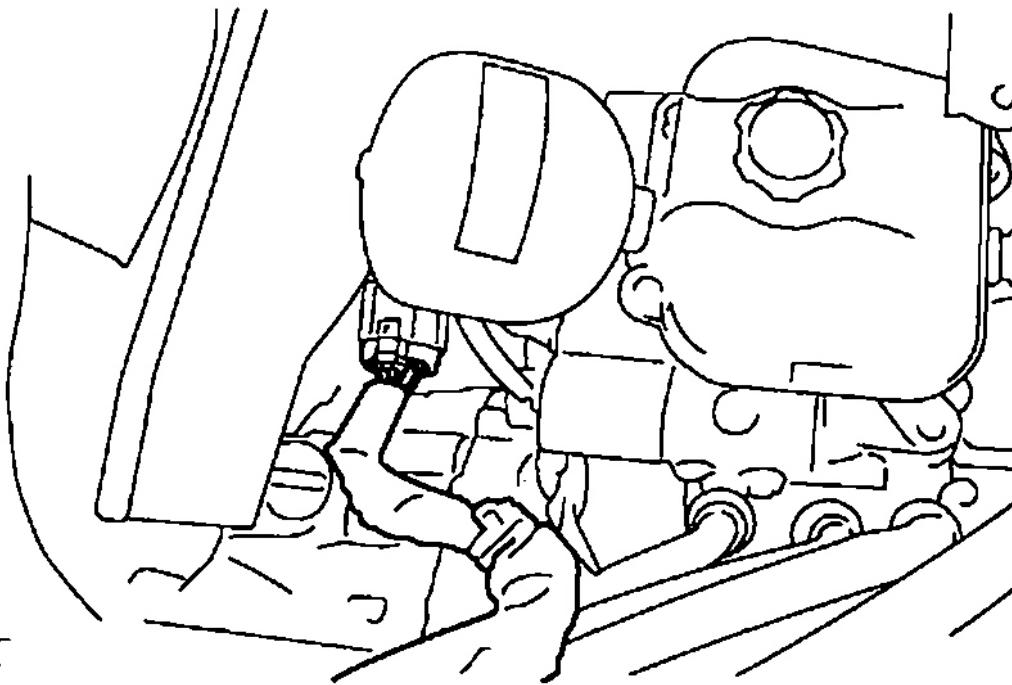


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**Fig. 12: Disconnecting System Clutch And Master Hoses By Pushing SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

9. DISCONNECT HPU CONNECTOR

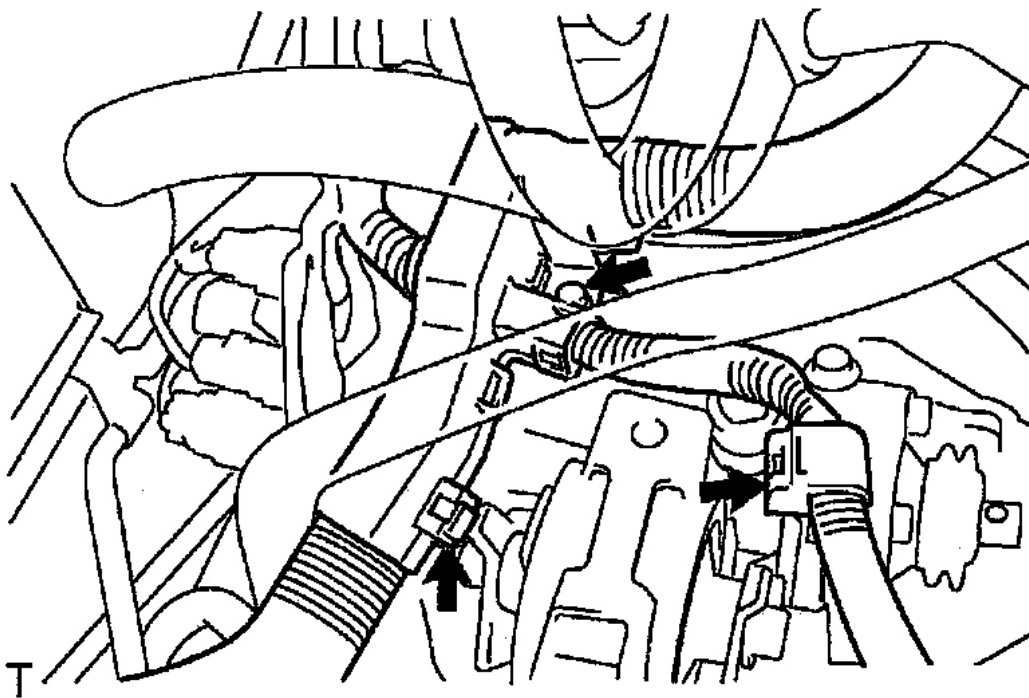


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**Fig. 13: Identifying HPU Connector**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

10. DISCONNECT ENGINE WIRE FROM TRANSMISSION
- a. Disconnect the 2 clamps.
  - b. Remove the bolt, and disconnect the engine wire.



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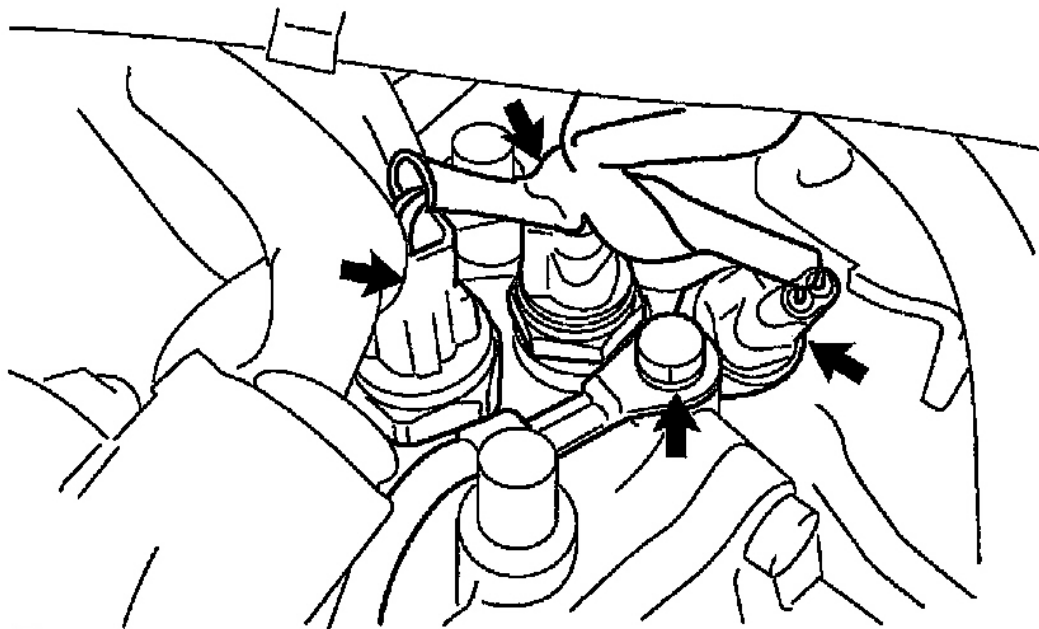
**Fig. 14: Disconnecting Engine Wire And Bolt**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**11. DISCONNECT GROUND CABLE FROM TRANSMISSION**

Remove the bolt and disconnect the ground cable.

**12. DISCONNECT PNP SWITCH CONNECTOR AND 2 BACK-UP LIGHT SWITCH CONNECTORS**

**13. REMOVE THROTTLE BODY (See REMOVAL )**

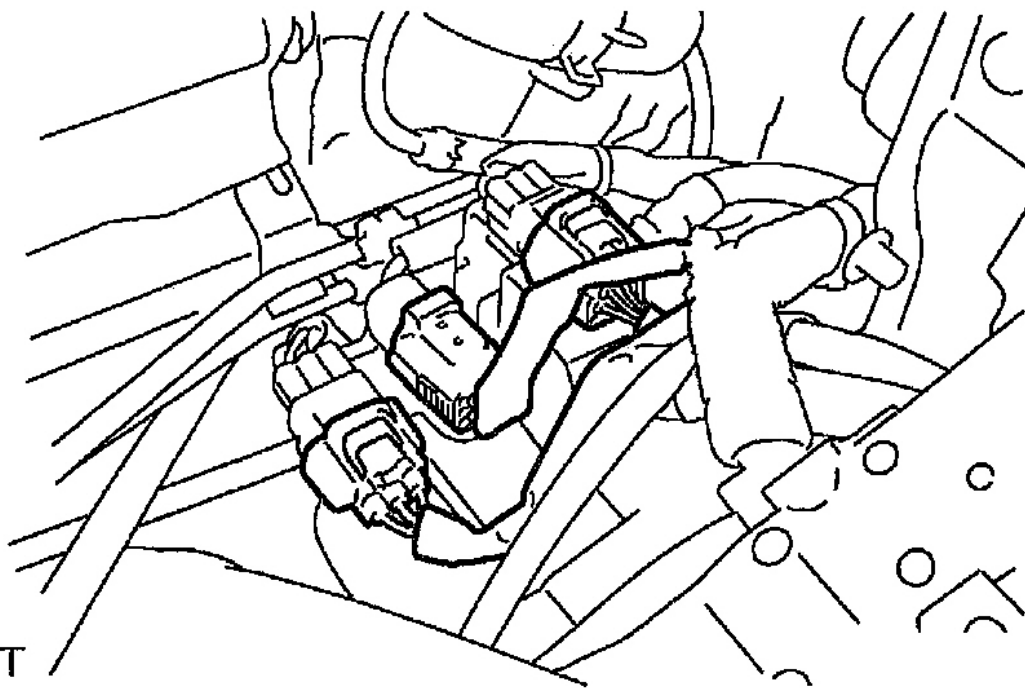


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**Fig. 15: Removing Bolt And Disconnecting Ground Cable**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

14. DISCONNECT GSA CONNECTORS



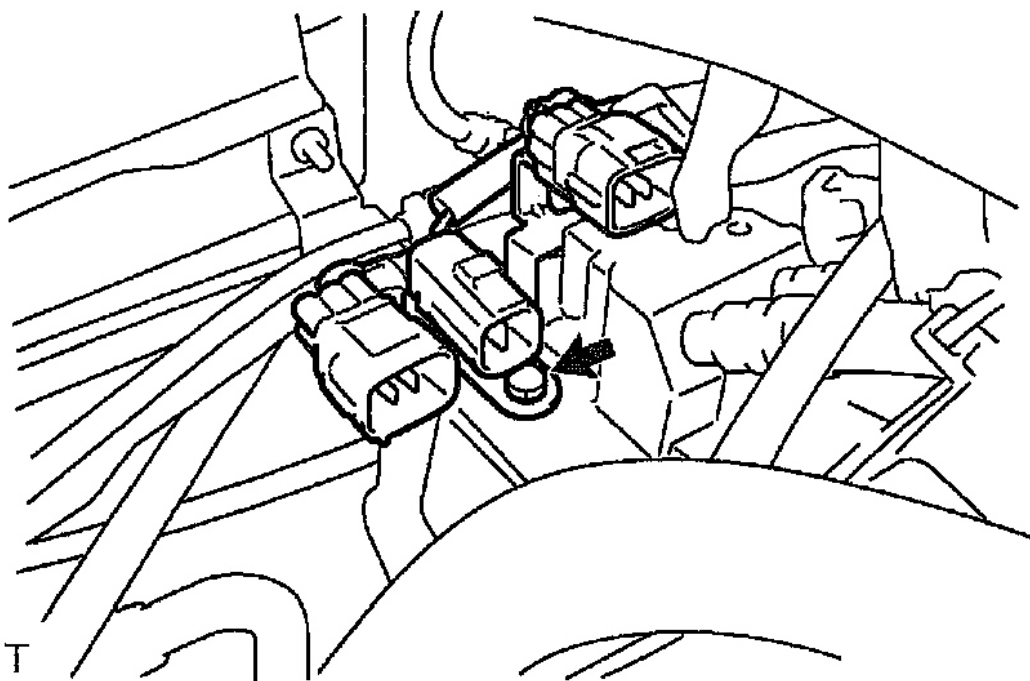
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**Fig. 16: Identifying GSA Connectors**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**15. DISCONNECT GSA CONNECTOR BRACKET**

Remove the bolt and disconnect the GSA connector bracket.





G00928000

**Fig. 17: Disconnecting GSA Connector Bracket And Bolt**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

16. REMOVE 2 MOUNTING BOLTS OF TRANSMISSION UPPER SIDE



G00928001

**Fig. 18: Removing Mounting Bolts Of Transmission Upper Side**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**17. ATTACH ENGINE SUPPORT FIXTURE**

- a. Install the No. 1 engine hanger with the bolt in the correct direction.

Part the No.:

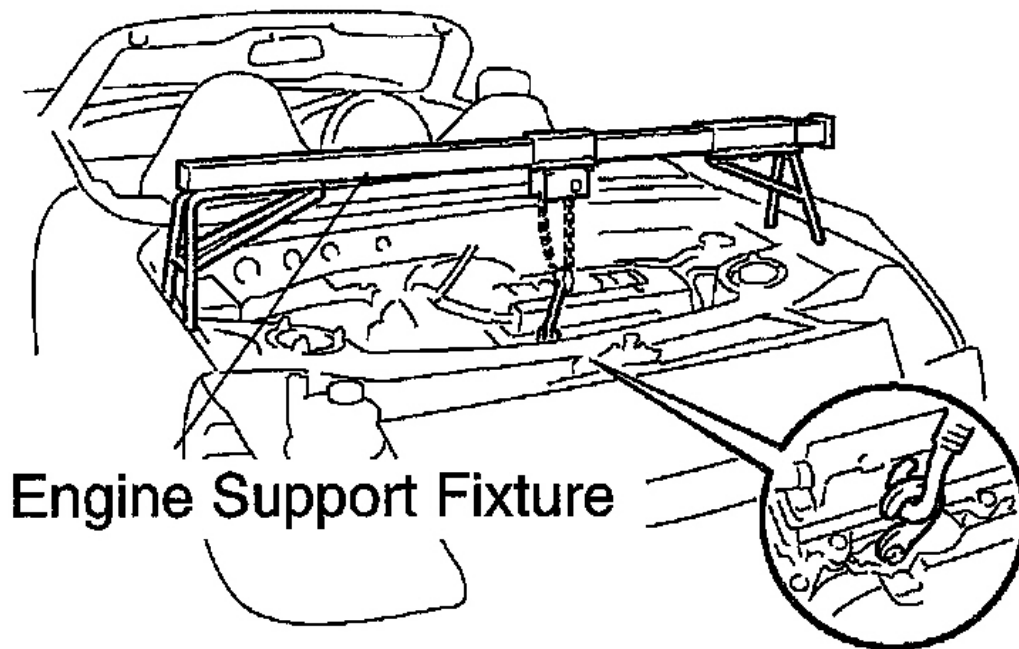
No. 1 engine hanger	12281-15040
Bolt	91642-81025

G00928002

**Fig. 19: Engine Hanger Description Table**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**Torque: 38 N.m (387 kgf.cm, 28 ft.lbf)**

- b. Attach the engine support fixture to the engine hanger.



Engine Support Fixture

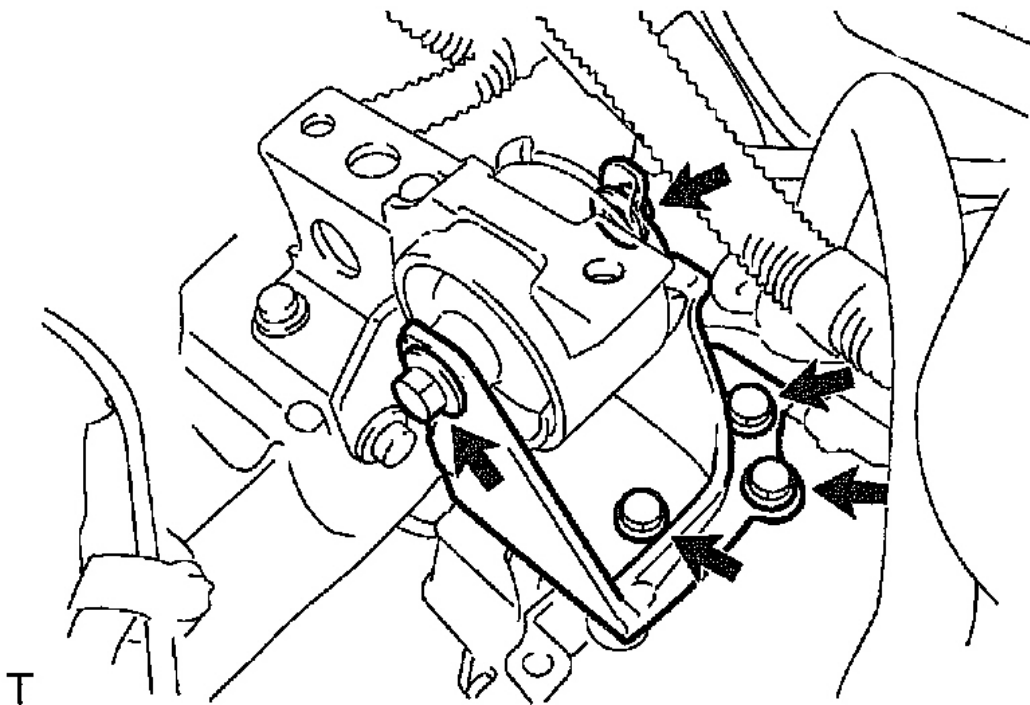
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G00928003

**Fig. 20: Attaching Engine Support Fixture To Engine Hanger**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

18. **REMOVE LEFT ENGINE MOUNTING BRACKET**
  - a. Remove the through bolt and nut.
  - b. Remove the 3 bolts and mounting bracket.

**NOTE:**        **Make sure that the vehicle is securely supported.**



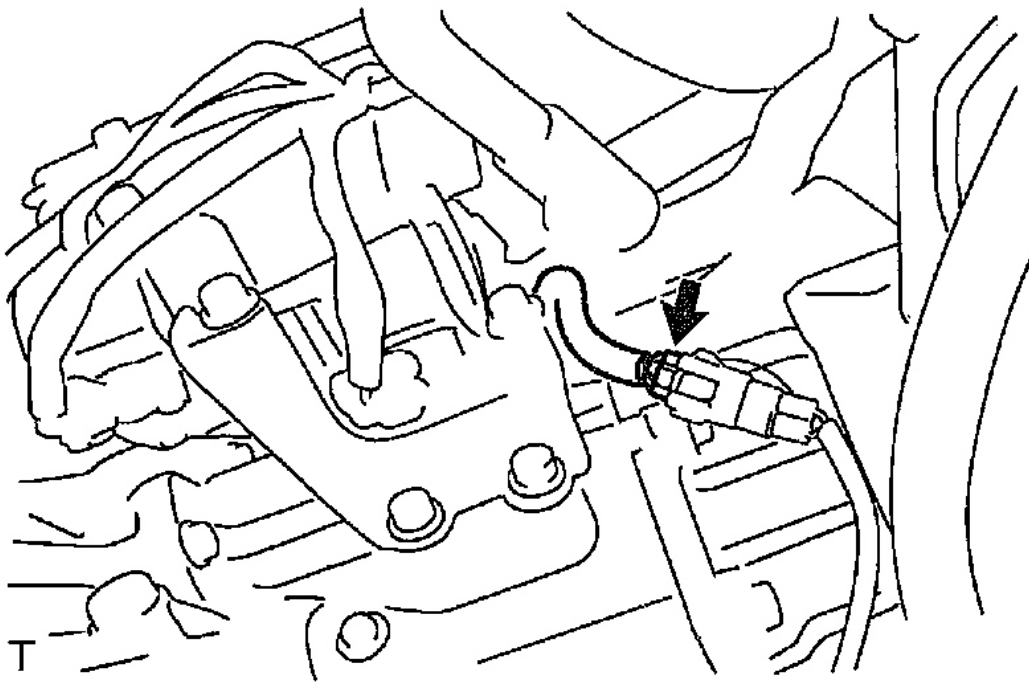
G00928004

**Fig. 21: Removing Bolts And Mounting Bracket**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

19. **DISCONNECT INPUT SENSOR CONNECTOR**
20. **DRAIN TRANSMISSION OIL (See SEQUENTIAL MANUAL TRANSMISSION UNIT)**
21. **JACK UP TRANSMISSION SLIGHTLY**

Using a transmission jack, support the transmission.

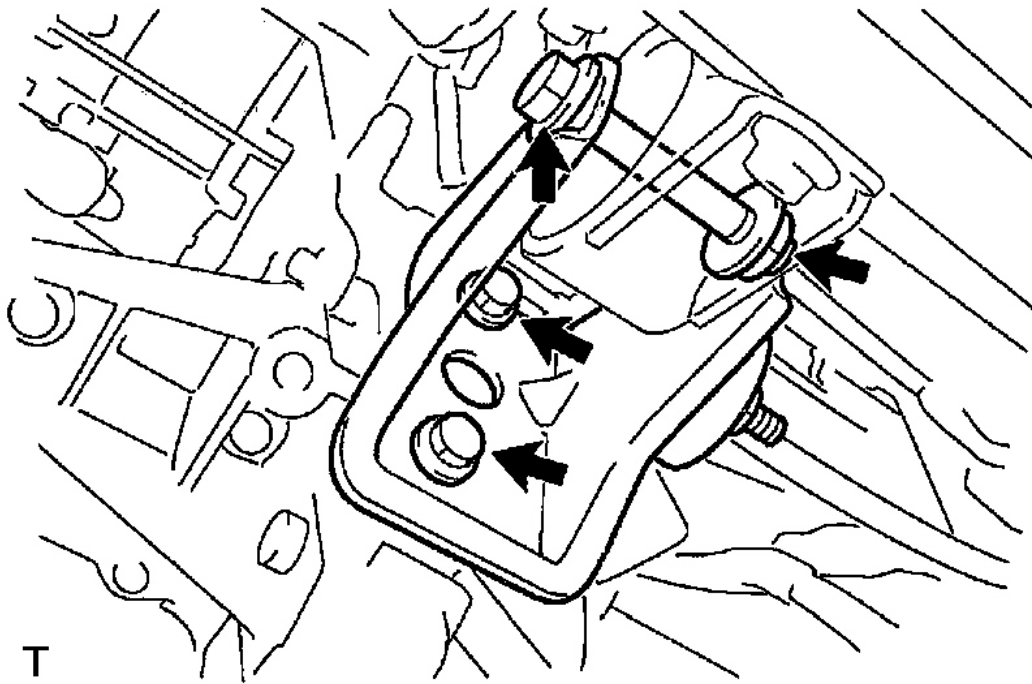
22. **REMOVE REAR DRIVE SHAFTS (See REMOVAL )**



G00928005

**Fig. 22: Disconnecting Input Sensor Connector**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

23. **REMOVE FRONT ENGINE MOUNTING BRACKET**
- a. Remove the through bolt and nut.
  - b. Remove the 2 bolts and front engine mounting bracket from the transmission.



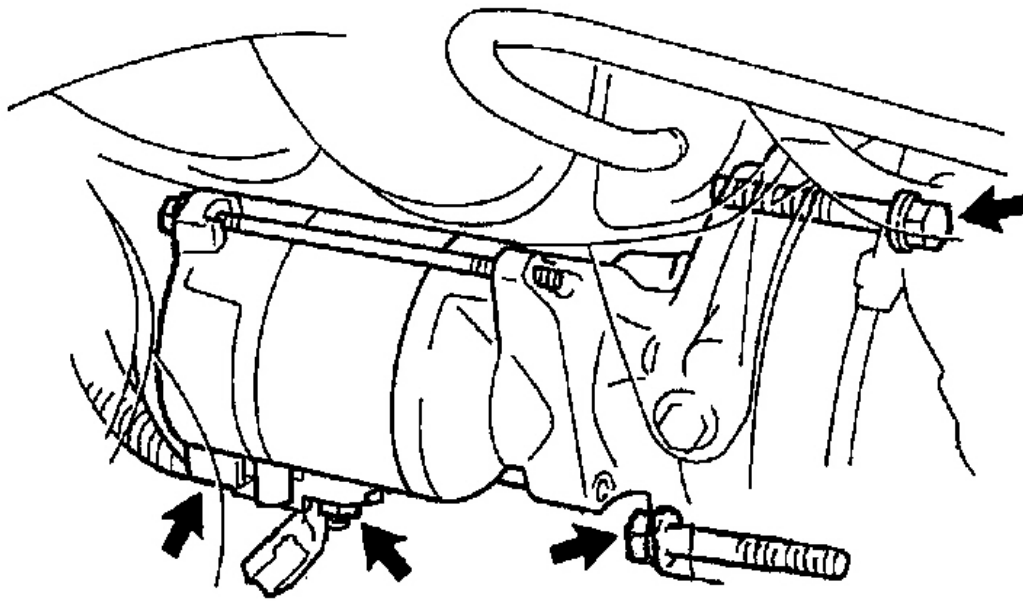
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G00928006

**Fig. 23: Removing Bolts And Front Engine Mounting Bracket From Transmission**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**24. REMOVE STARTER**

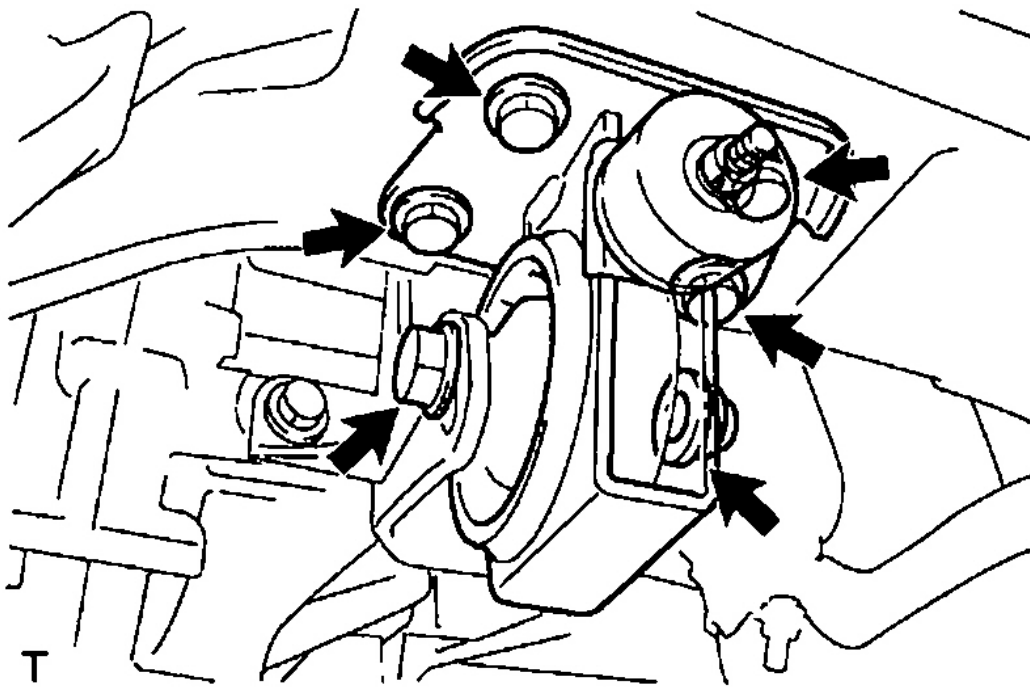
- a. Disconnect the starter connector.
- b. Remove the nut and disconnect the starter cable.
- c. Remove the 2 bolts and starter.



G00928007

**Fig. 24: Removing Bolts And Starter**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

25. **REMOVE REAR ENGINE MOUNTING INSULATOR**
  - a. Remove the through bolt and nut.
  - b. Remove the 4 bolts and mounting insulator.



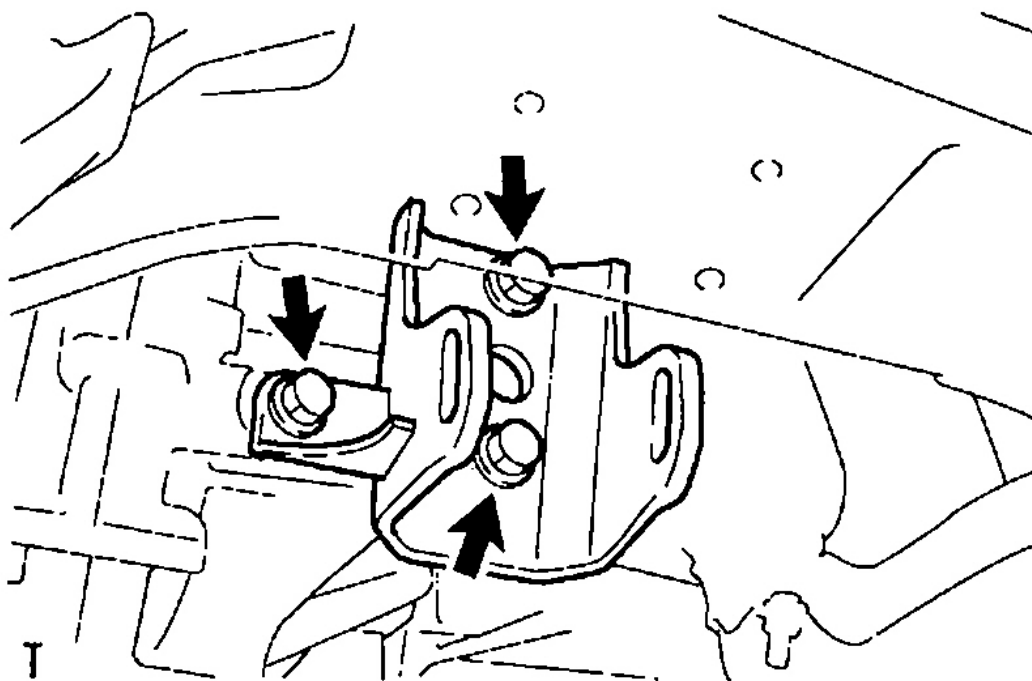
G00928008

**Fig. 25: Removing Bolts And Mounting Insulator**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**26. REMOVE REAR ENGINE MOUNTING BRACKET**

Remove the 3 bolts and mounting bracket.



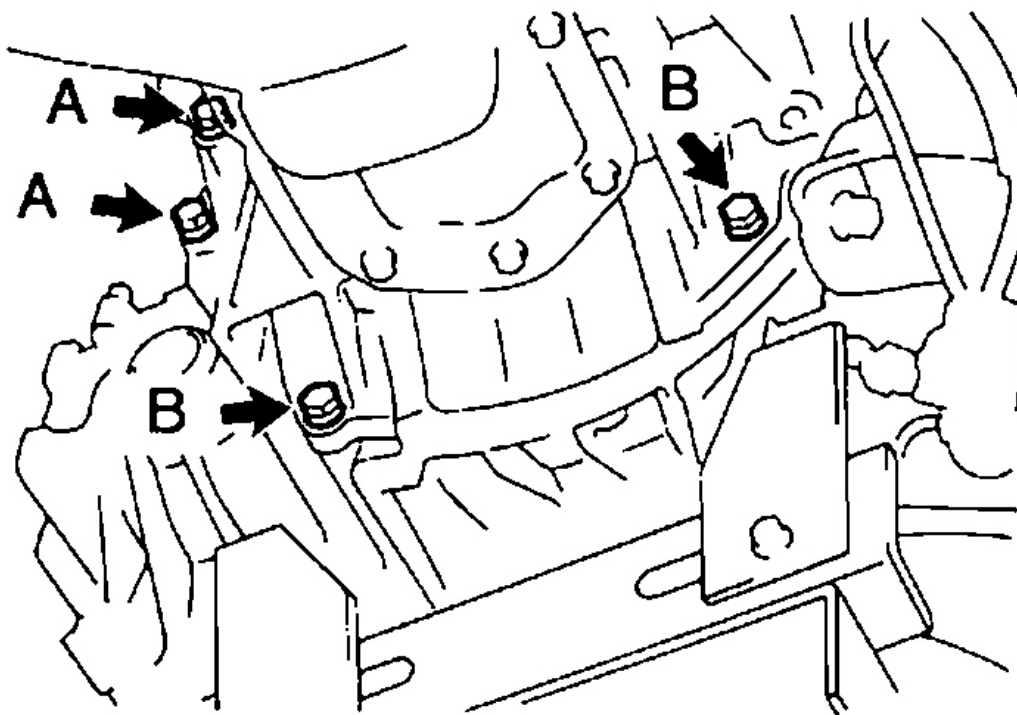


G00928009

**Fig. 26: Removing Bolts And Mounting Bracket**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

27. **REMOVE 4 MOUNTING BOLTS OF TRANSMISSION LOWER SIDE**
28. **REMOVE TRANSMISSION**

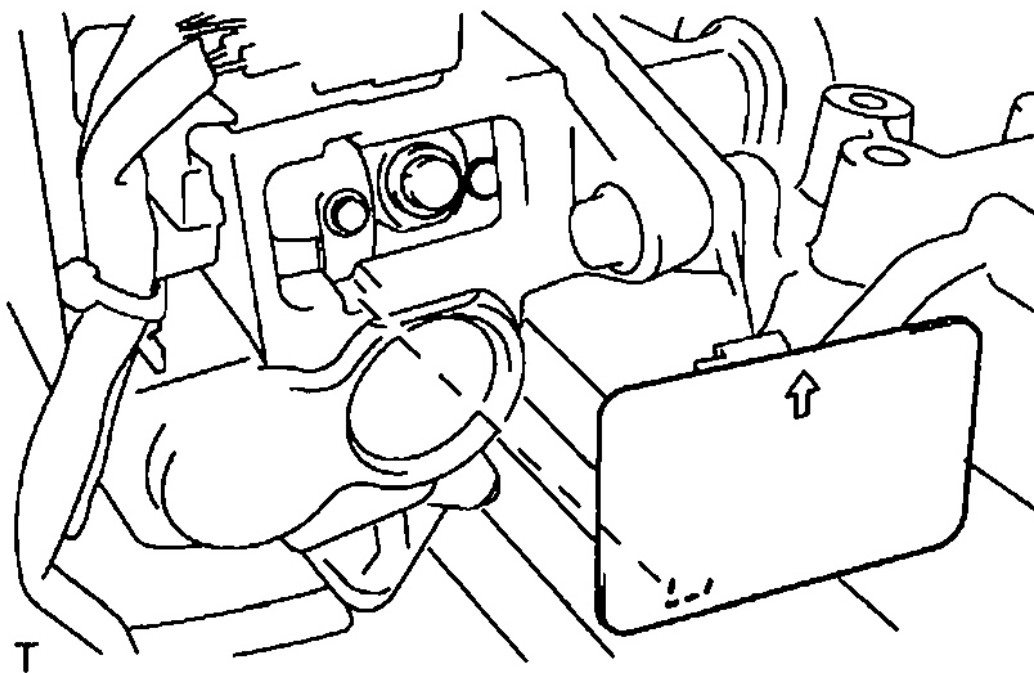
Lower the engine left side, then slowly and carefully remove the transaxle from the engine.



G00928010

**Fig. 27: Removing Mounting Bolts Of Transmission Lower Side**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

29. **REMOVE GSA ASSEMBLY FROM TRANSMISSION**
  - a. Remove the GSA cover.



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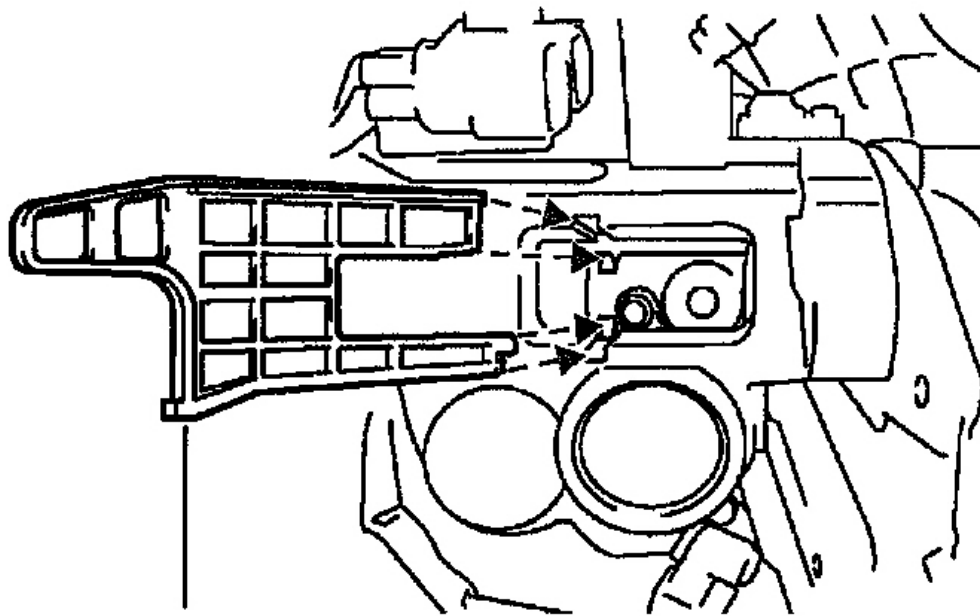
**Fig. 28: Removing GSA Cover**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Install the actuator link fixing plate to the GSA.

Part the No.:

Actuator link fixing plate: 33963-0W010

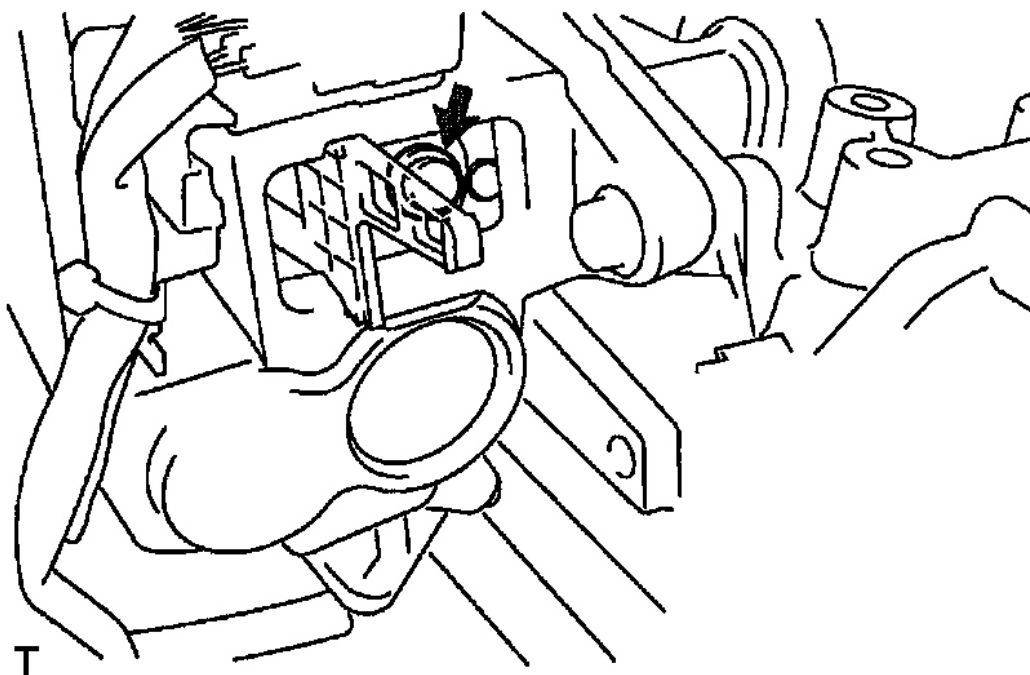


**T Actuator Link Fixing Plate**

G00928012

**Fig. 29: Installing Actuator Link Fixing Plate To GSA**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the bolt.



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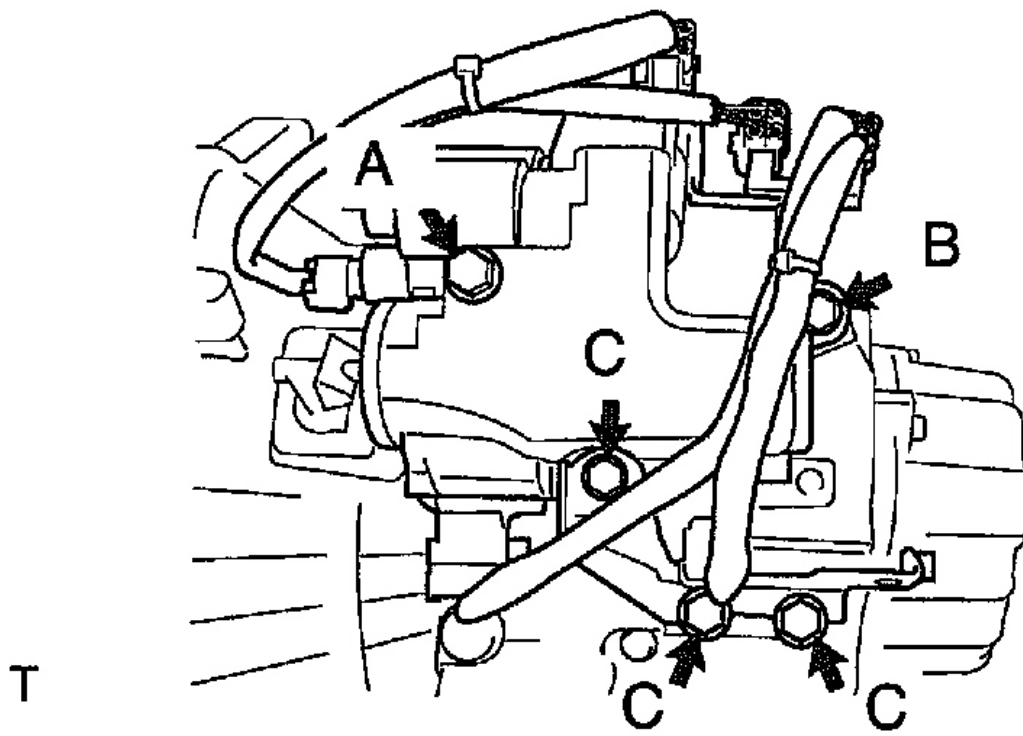
**Fig. 30: Removing Bolt**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Remove the 3 C bolts and stiffener plate.
- e. Remove the A and B bolt.

**NOTE:** Because the B bolt is tensed up by the release cylinder cable of the GSA assembly, hold the GSA assembly not to damage the bolt's thread when removing the B bolt.

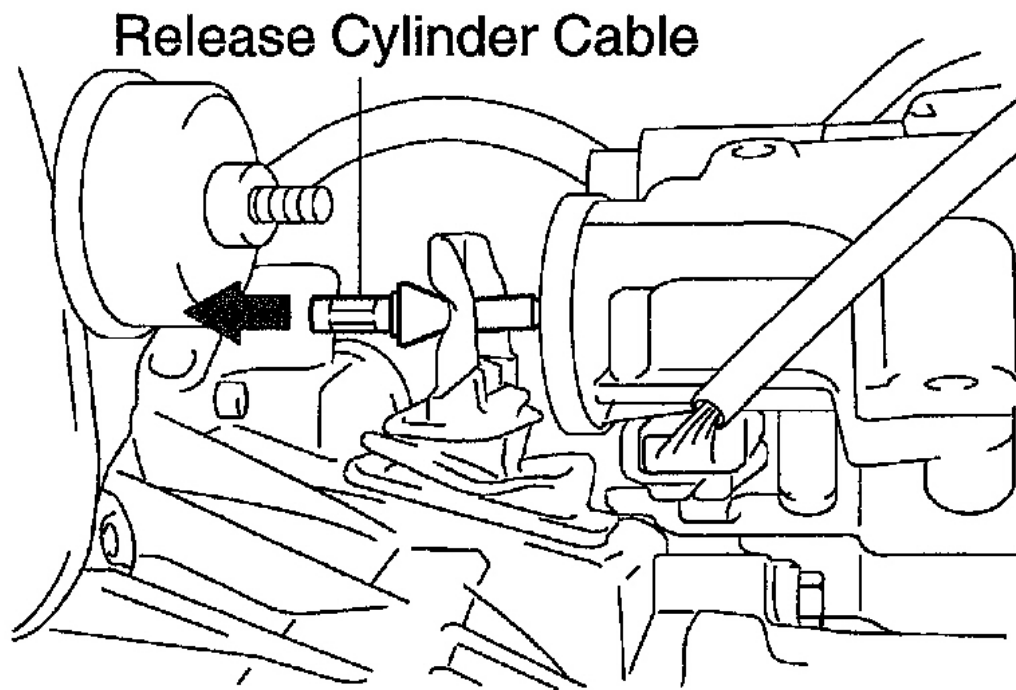
- f. Take out the GSA assembly from the transmission assembly.



G00928014

**Fig. 31: Removing Bolt From Transmission Assembly**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- g. Pulling the release cylinder cable while the GSA assembly is close to the clutch fork, separate the cable from the clutch fork.

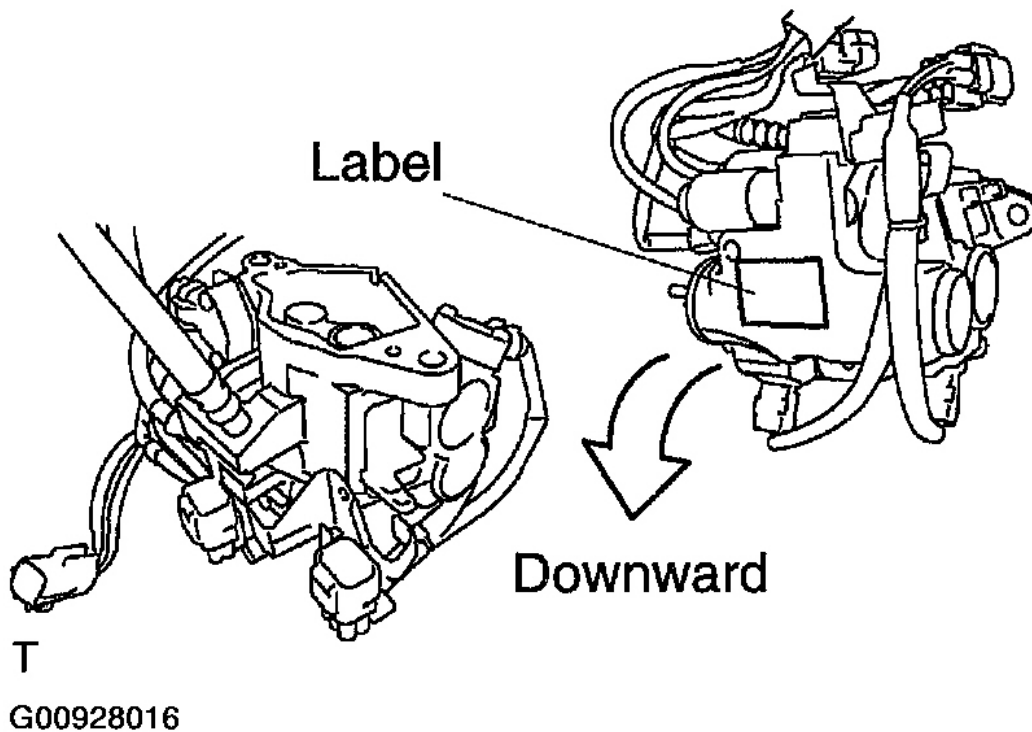


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**Fig. 32: Releasing Cylinder Cable**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

Place the GSA assembly as shown in the illustration after the GSA assembly is removed.



**Fig. 33: Placing GSA Assembly Label**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## INSTALLATION

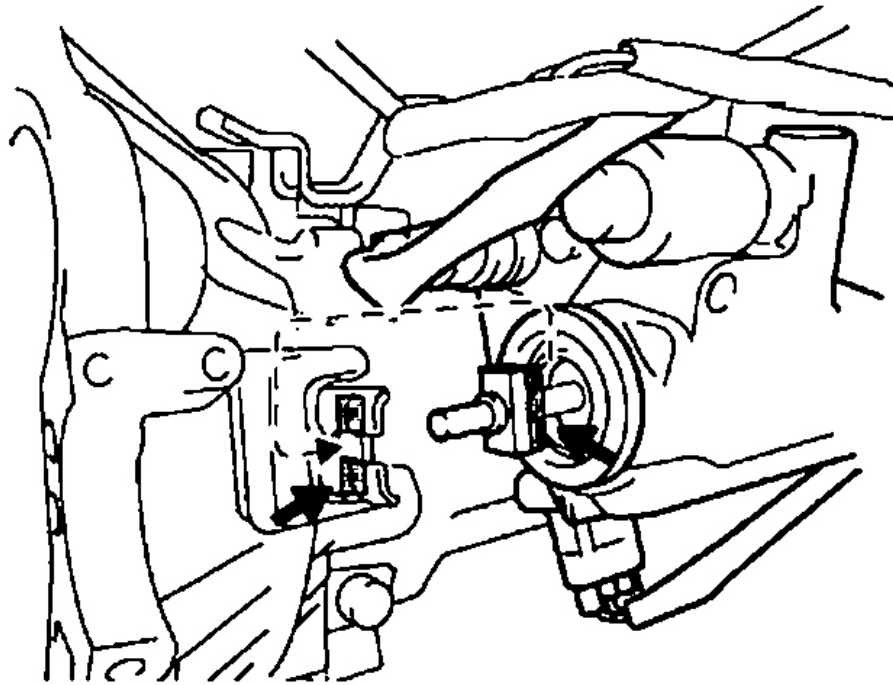
### 1. INSTALL GSA ASSEMBLY TO TRANSMISSION

- a. Apply release hub grease to the release fork and clutch cable.

**Sealant: Part No. 08887-01806, RELEASE HUB GREASE or equivalent**

- b. Pay attention to combine the clutch cable and clutch fork.



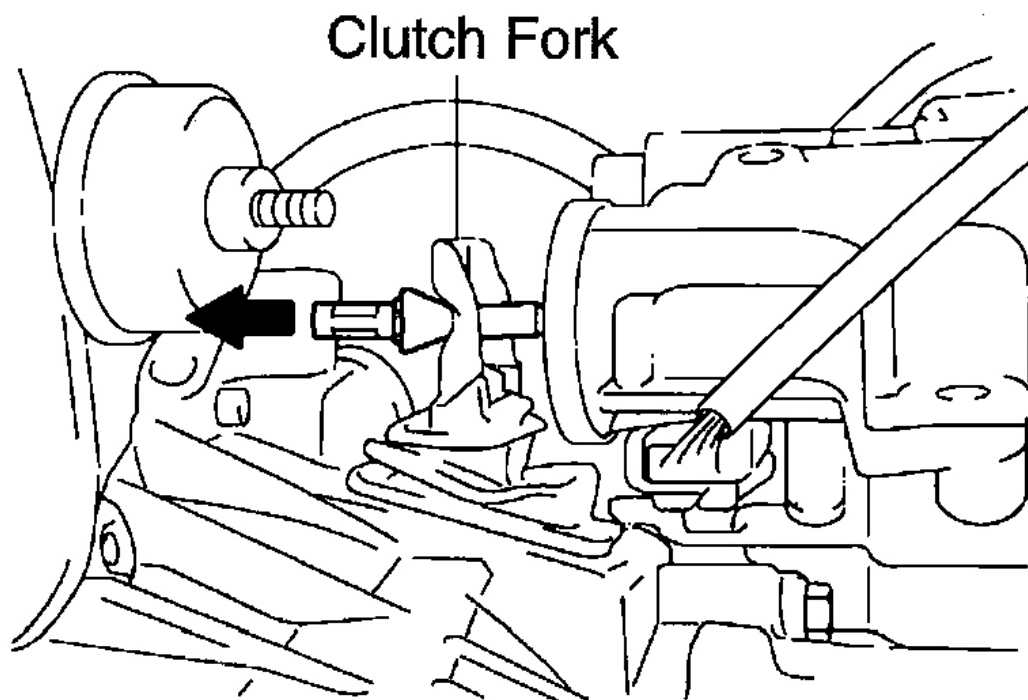


↑ → Release hub grease

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**Fig. 34: Releasing Hub Grease To Release Fork And Clutch Cable**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Pulling the clutch fork, install the GSA assembly.



G00928018

**Fig. 35: Pulling Clutch Fork**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Temporarily tighten the A and B bolts.

**NOTE:**

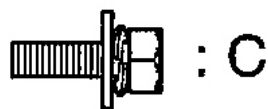
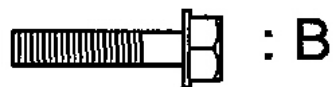
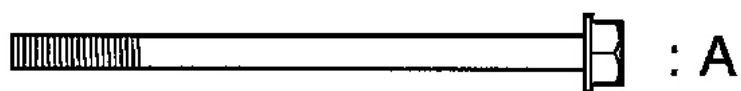
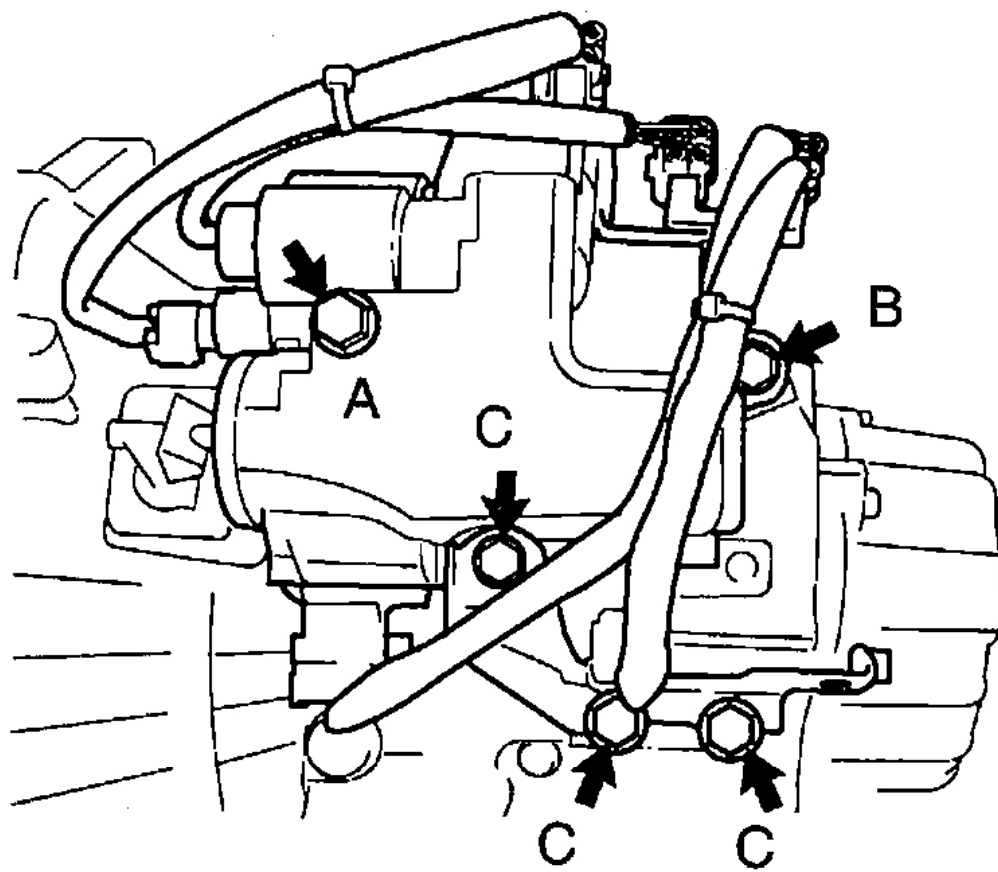
- Because the B bolt is tensed up by the release cylinder cable of the GSA assembly, hold the GSA assembly not to damage the bolt's thread when install the B bolt.
- Install the B bolt before the A bolt.

- e. Install the stiffener plate bracket with the 3 C bolts.

**Torque: 42 N.m (428 kgf.cm, 31 ft.lbf)**

- f. Tighten the A and B bolts.

**Torque: 42 N.m (428 kgf.cm, 31 ft.lbf)**



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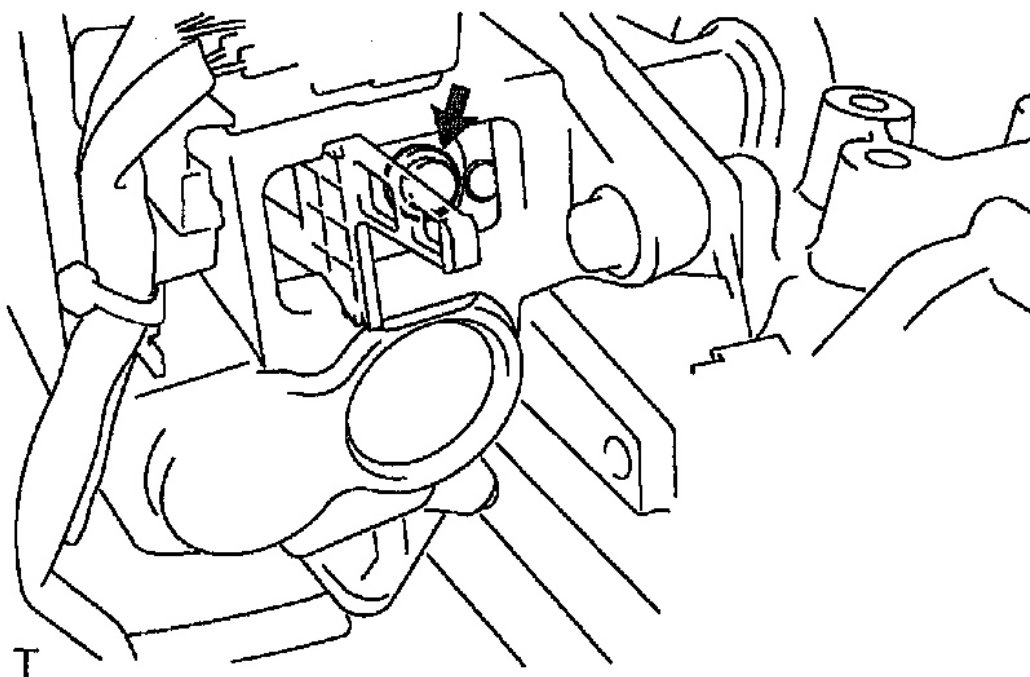
**Fig. 36: Tightening Bolts**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

g. Install the bolt.

**Torque: 25 N.m (255 kgf.cm, 18 ft.lbf)**

h. Remove the actuator link fixing plate from the GSA assembly.



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**Fig. 37: Installing Bolts**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

i. Install the GSA cover as shown in the illustration.

**2. INSTALL REAR ENGINE MOUNTING BRACKET TO TRANSMISSION**

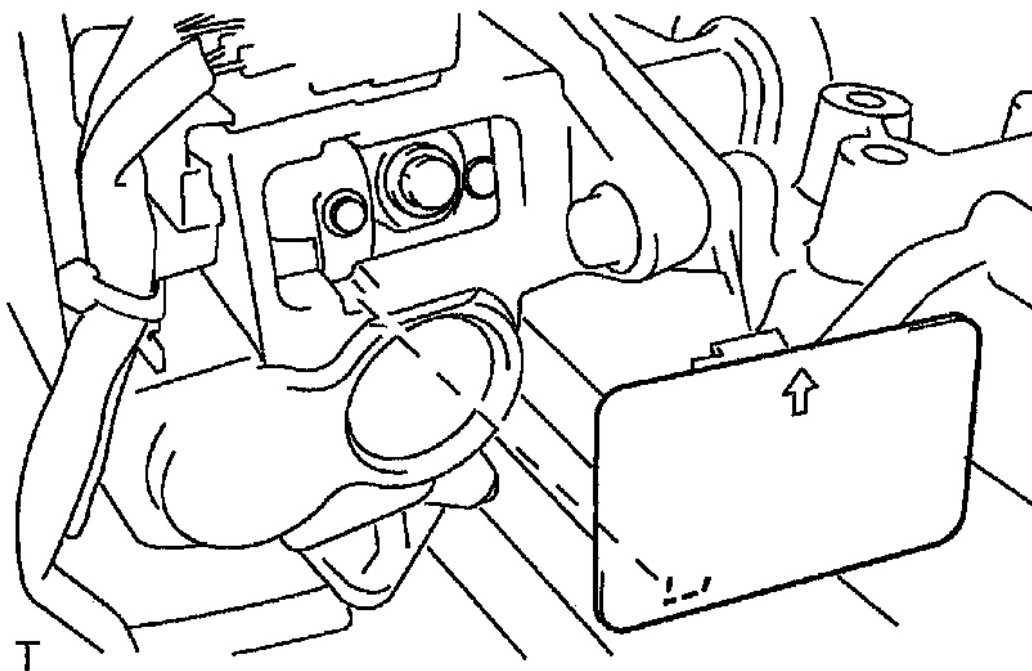
**3. INSTALL TRANSMISSION TO ENGINE**

a. Using a transmission jack, lift up the transmission.

b. Lower the engine left side.

c. Align the input shaft with the clutch disc, then slowly and carefully install the transmission to the engine.

d. Temporarily tighten the 4 mounting bolts of the transmission lower side.

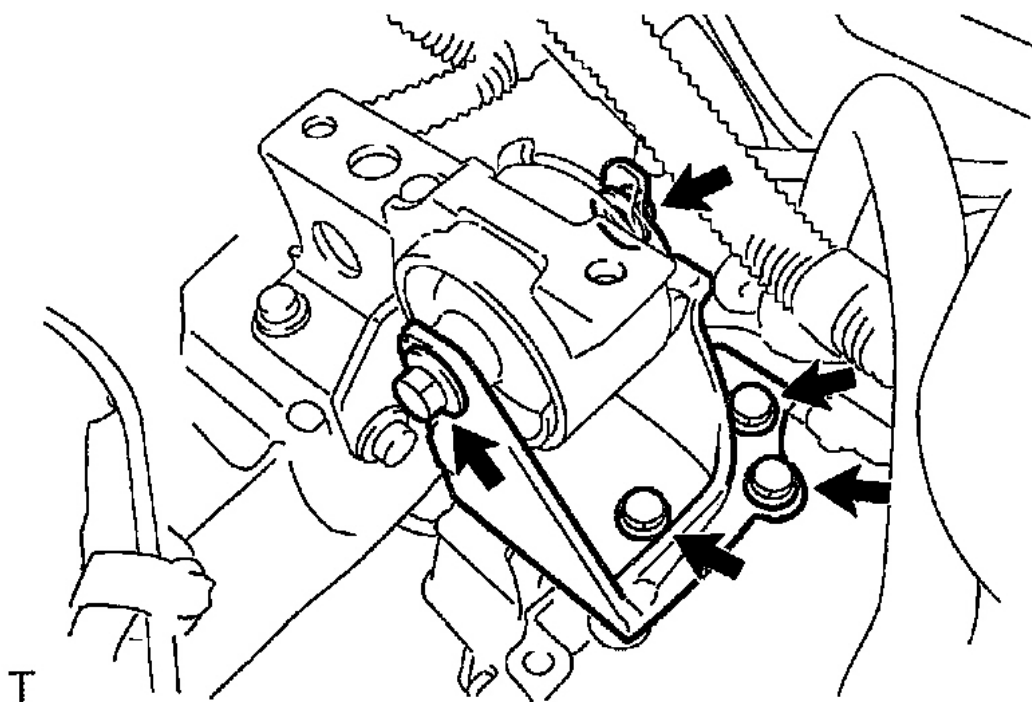


G00928021

**Fig. 38: Installing GSA Cover**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. **INSTALL LEFT ENGINE MOUNTING BRACKET**
  - a. Install the mounting bracket to the transmission with the 3 bolts.  
**Torque: 52 N.m (530 kgf.cm, 38 ft.lbf)**
  - b. Install the through bolt and nut.  
**Torque: 87 N.m (887 kgf.cm, 64 ft.lbf)**
5. **REMOVE ENGINE SUPPORT FIXTURE**



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**Fig. 39: Installing Bolt And Nut**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**6. INSTALL 2 MOUNTING BOLTS OF TRANSMISSION UPPER SIDE**

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



G00928023

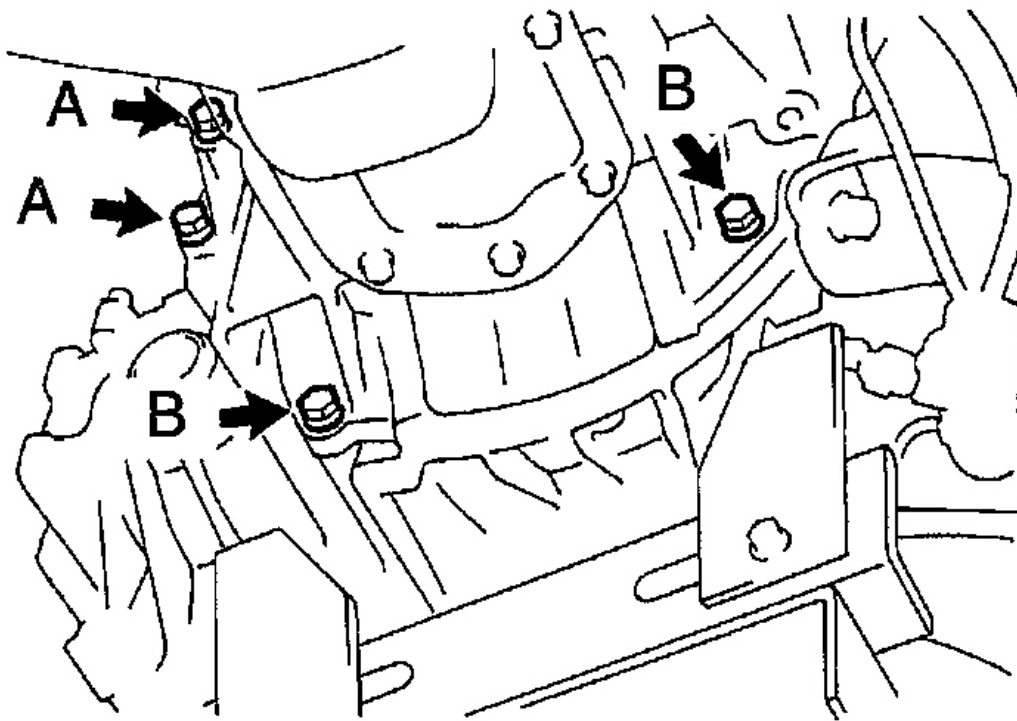
**Fig. 40: Installing Mounting Bolts Of Transmission Upper Side**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**7. TIGHTEN 4 MOUNTING BOLTS OF TRANSMISSION LOWER SIDE**

**Torque:**

**47 N.m (480 kgf.cm, 35 ft.lbf) for bolt A**

**23 N.m (230 kgf.cm, 17 ft.lbf) for bolt B**



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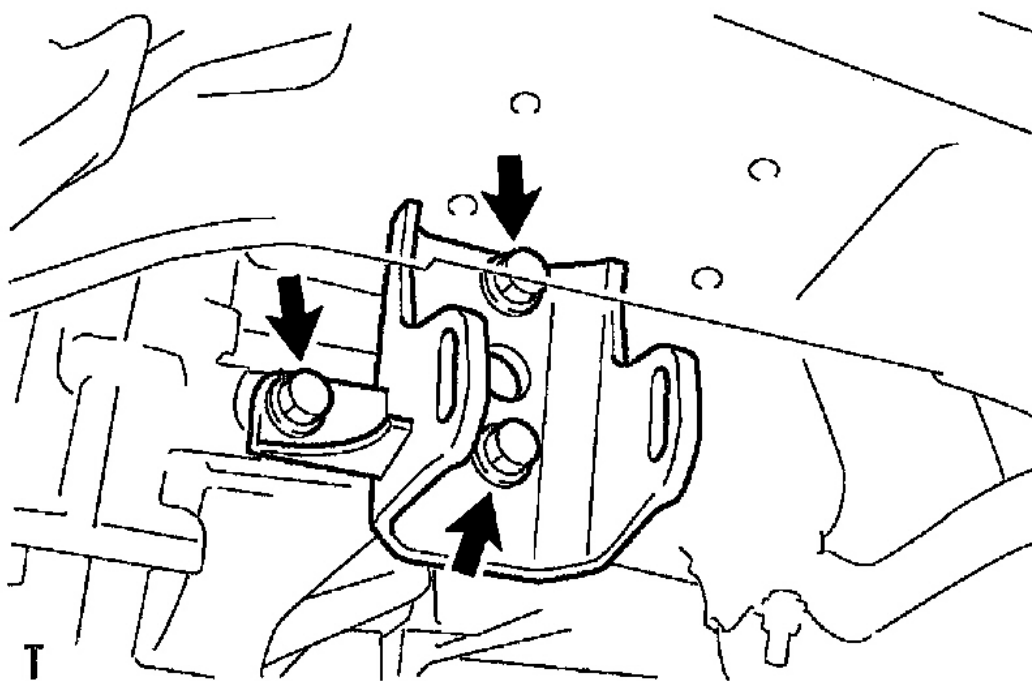
**Fig. 41: Tightening Mounting Bolts Of Transmission Lower Side**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**8. INSTALL REAR ENGINE MOUNTING BRACKET**

Install the mounting bracket with the 3 bolts.

**Torque: 78 N.m (796 kgf.cm, 58 ft.lbf)**





G00928025

**Fig. 42: Installing Mounting Bracket With Bolts**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**9. INSTALL REAR ENGINE MOUNTING INSULATOR**

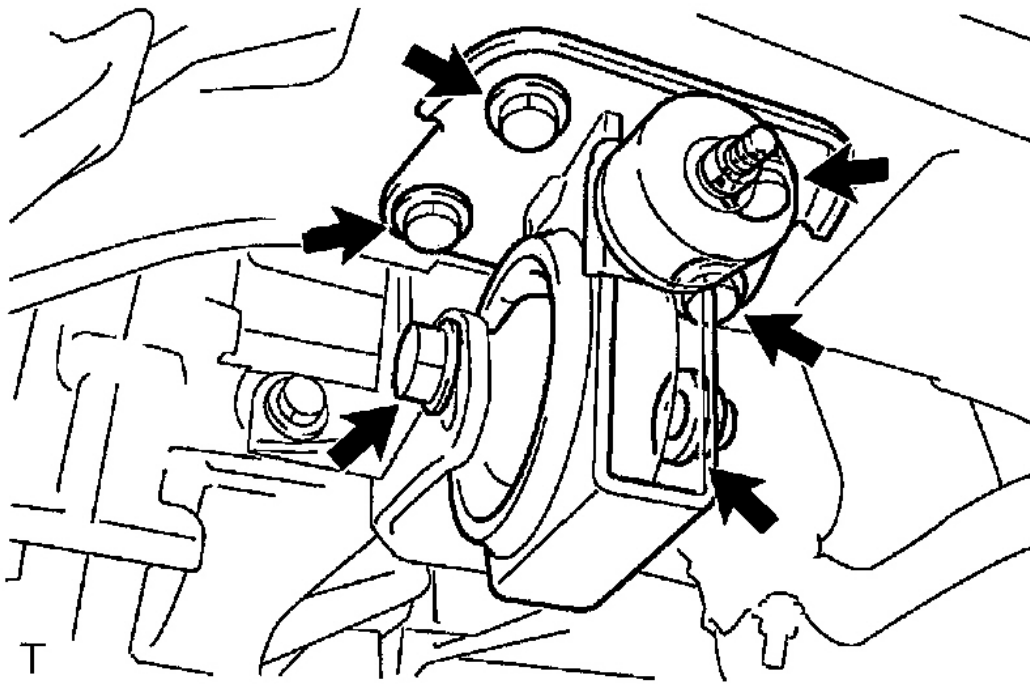
- a. Install the mounting insulator with the 4 bolts.

**Torque: 89 N.m (908 kgf.cm, 66 ft.lbf)**

- b. Install the through bolt and nut.

**Torque: 93 N.m (949 kgf.cm, 69 ft.lbf)**

**NOTE:** Be sure to tighten the bolt at the upper end of the slot.

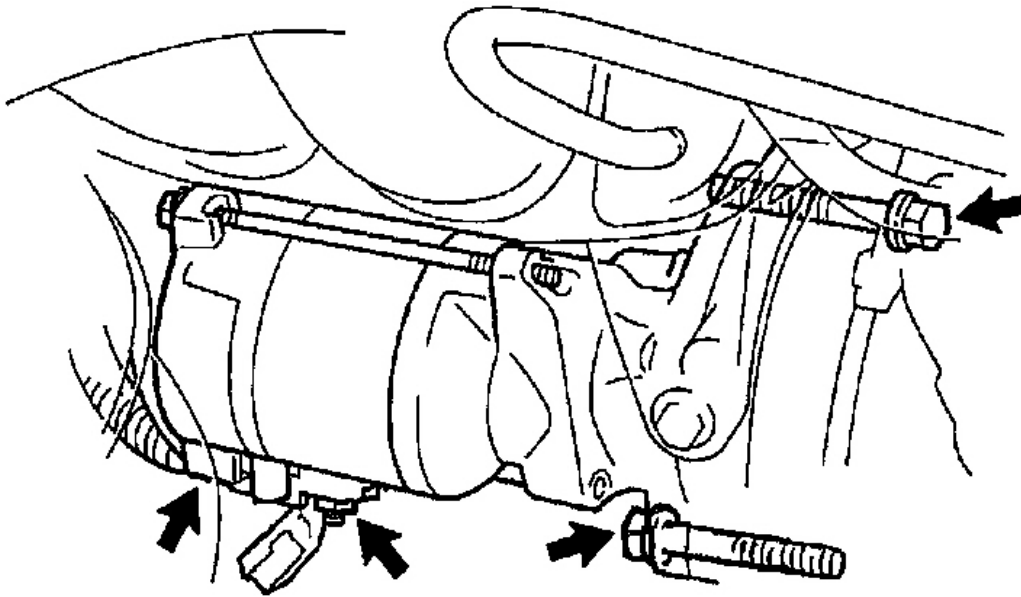


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**Fig. 43: Installing Mounting Insulator With Bolts**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**10. INSTALL STARTER**

- a. Install the starter with the 2 bolts.  
**Torque: 37 N.m (378 kgf.cm, 28 ft.lbf)**
- b. Connect the starter cable with the nut.  
**Torque: 9.8 N.m (100 kgf.cm, 87 in..lbf).**
- c. Connect the starter connector.



G00928027

**Fig. 44: Installing Starter With Bolts**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**11. INSTALL FRONT ENGINE MOUNTING BRACKET**

- a. Install the front engine mounting bracket to the transmission with the 2 bolts.

**Torque: 78 N.m (796 kgf.cm, 56 ft.lbf)**

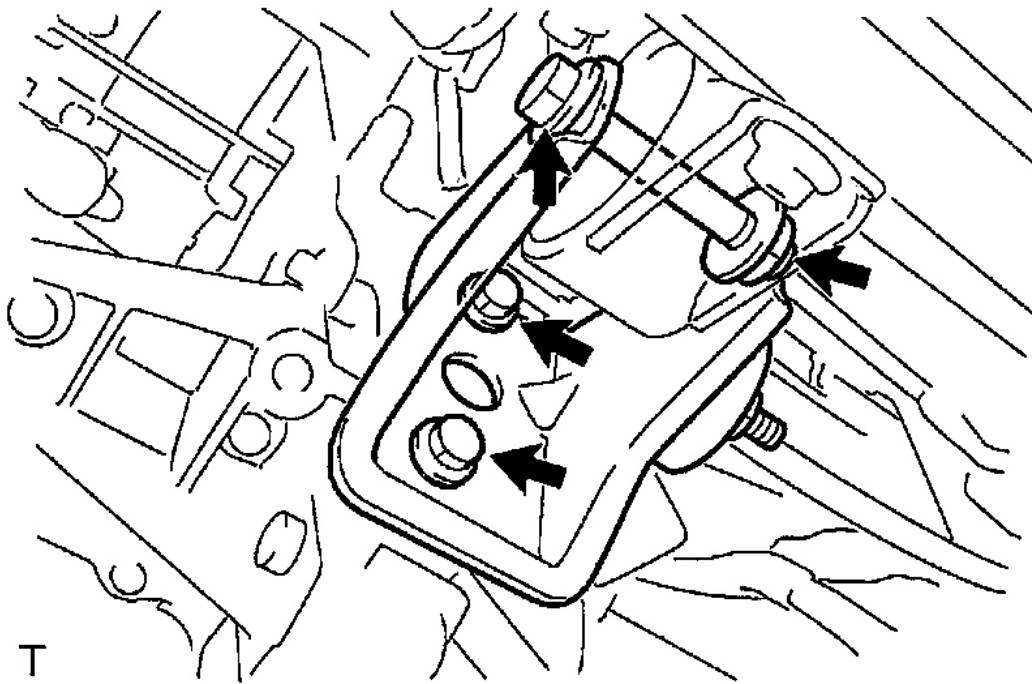
- b. Instal the through bolt and nut.

**Torque: 93 N.m (949 kgf.cm, 69 ft.lbf)**

**12. REMOVE TRANSMISSION JACK**

**13. INSTALL REAR DRIVE SHAFTS (See INSTALLATION )**

**14. REFILL TRANSMISSION OIL (See SEQUENTIAL MANUAL TRANSMISSION UNIT)**

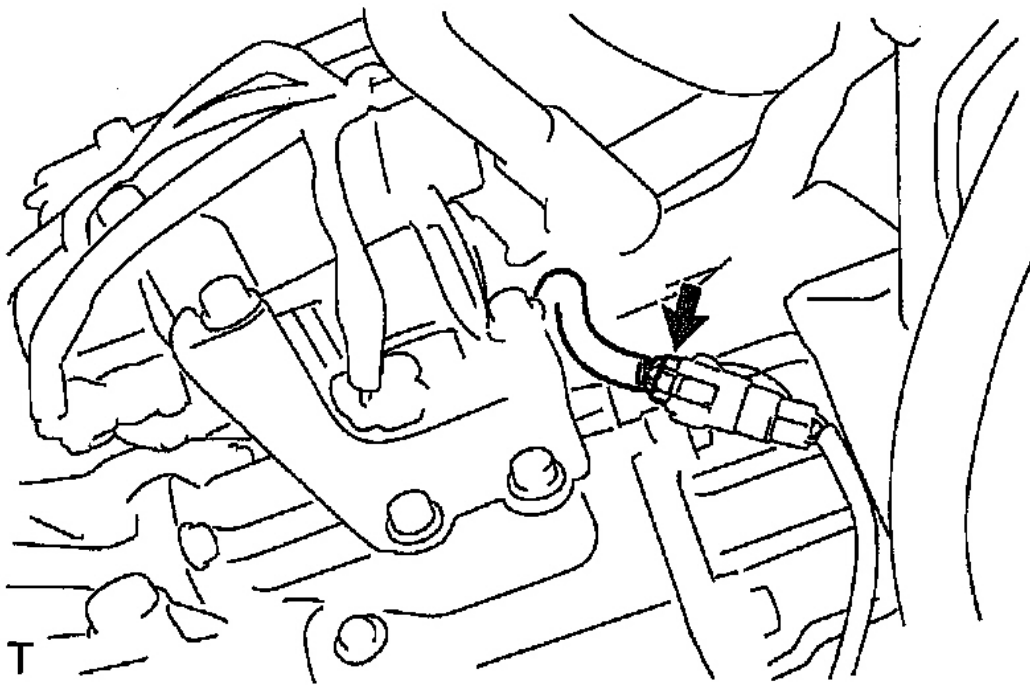


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**Fig. 45: Installing Front Engine Mounting Bracket To Transmission With Bolts**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

15. CONNECT INPUT SENSOR CONNECTOR



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**Fig. 46: Connecting Input Sensor Connector**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

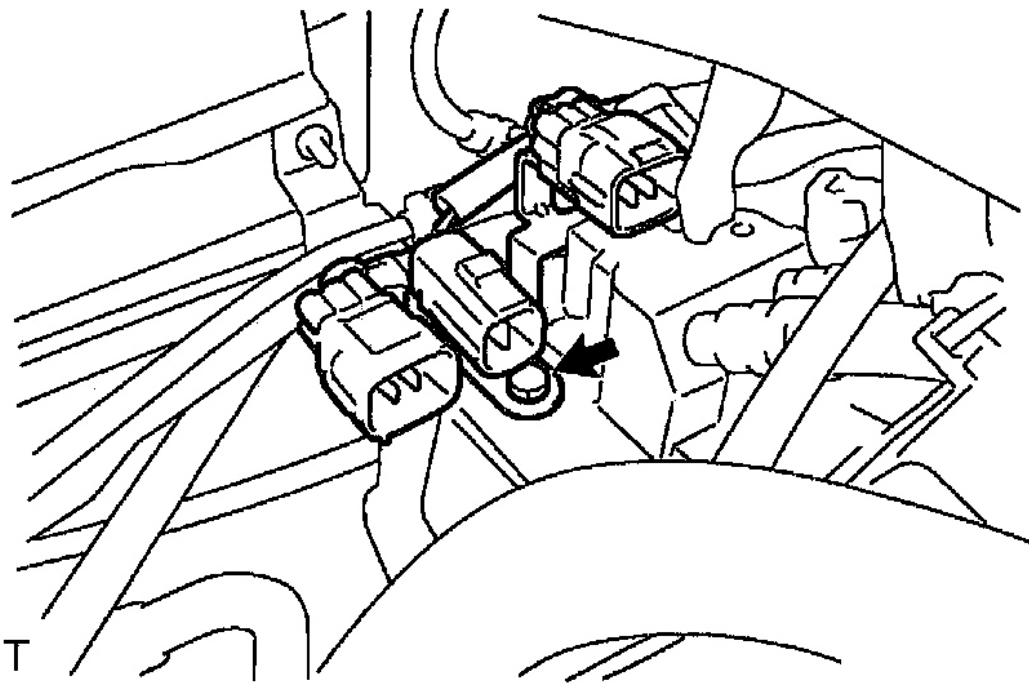
**16. INSTALL GSA CONNECTOR BRACKET**

Install the connector bracket with the bolt.

**Torque: 8 N.m (82 kgf.cm, 71 in..lbf)**

**17. CONNECT GSA CONNECTORS**

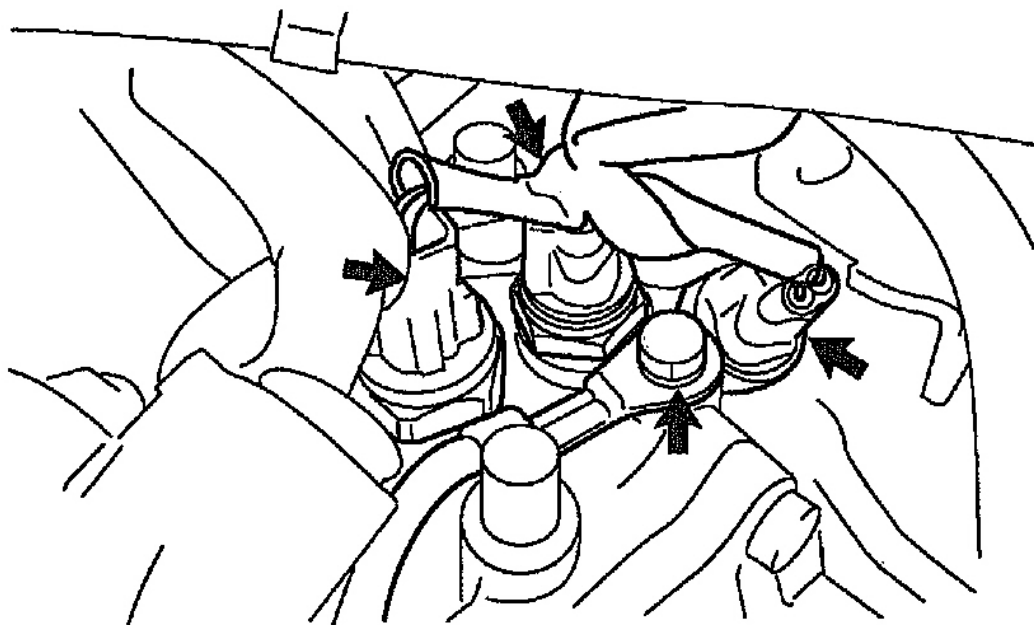
**18. INSTALL THROTTLE BODY (See INSTALLATION)**



G00928030

**Fig. 47: Install connector bracket with bolt**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

19. **CONNECT PNP SWITCH CONNECTOR AND 2 BACKUP LIGHT SWITCH CONNECTORS**
20. **CONNECT GROUND CABLE TO TRANSMISSION**  
Torque: 19 N.m (195 kgf.cm, 14 ft.lbf)



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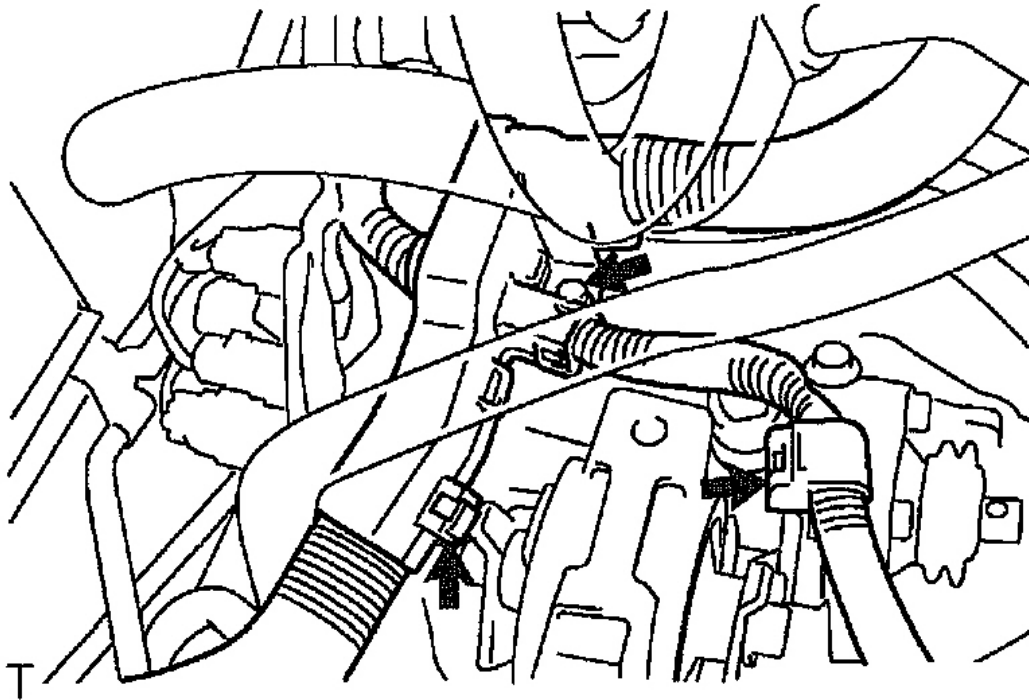
G00928031

**Fig. 48: Connecting Ground Cable To Transmission**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**21. CONNECT ENGINE WIRE TO TRANSMISSION**

- a. Connect the 2 clamps.
- b. Install the engine wire with the bolt.

**Torque: 8 N.m (82 kgf.cm, 71 in..lbf)**

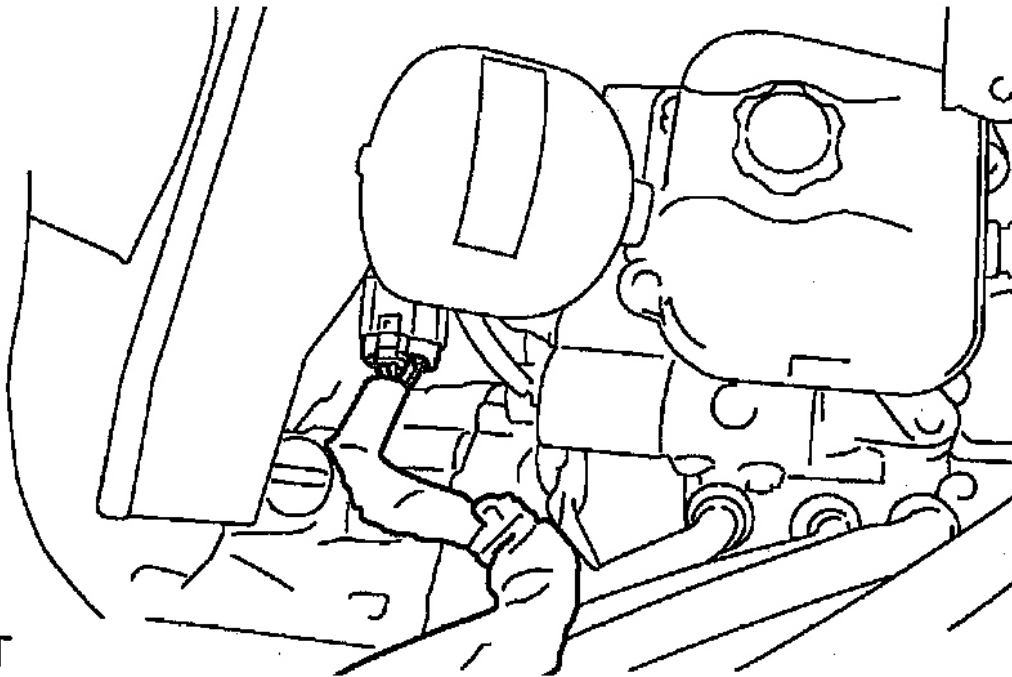


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**Fig. 49: Installing Engine Wire With Bolt**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

22. **CONNECT HPU CONNECTOR**
23. **INSTALL BATTERY BRACKET**
  - a. Install the battery carrier with the 3 bolts.  
**Torque: 24 N.m (245 kgf.cm, 18 ft.lbf)**
  - b. Install the battery tray and also the battery with the battery clamp.





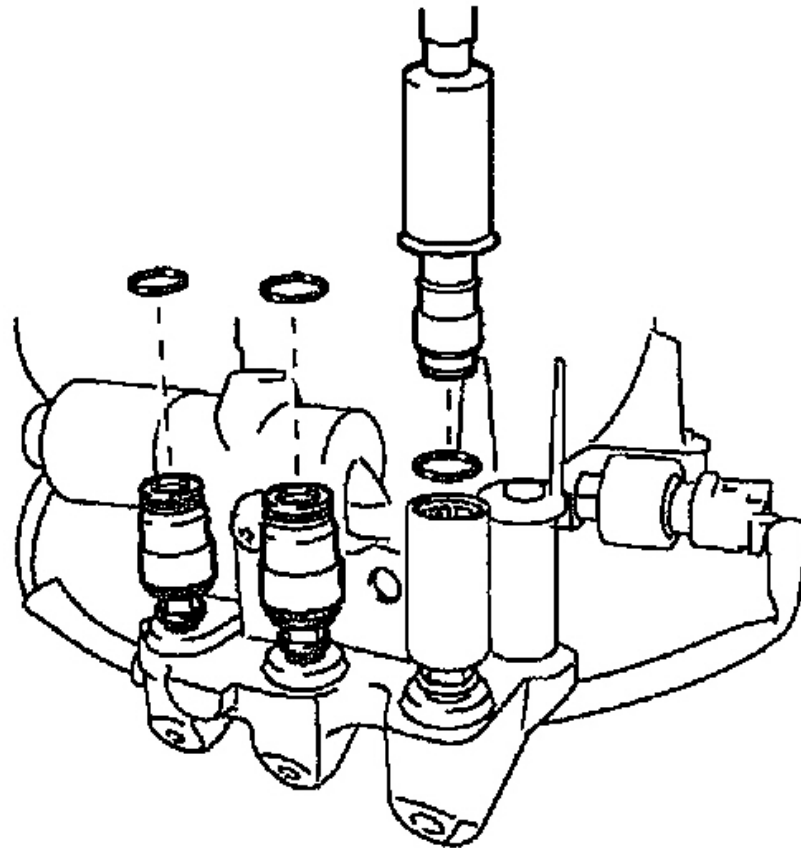
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**Fig. 50: Installing Battery Tray And Battery Clamp**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**24. CONNECT SMT SYSTEM HOSES**

- a. Apply a light coat of sequential M/T fluid to the 3 new O-rings.
- b. Install the 3 new O-rings.



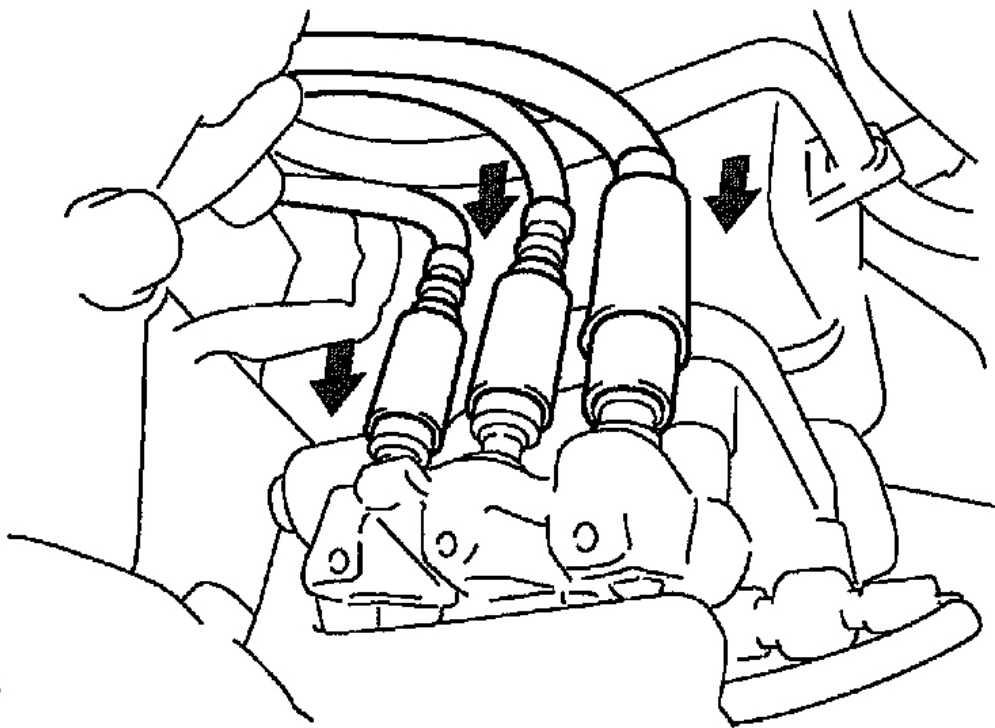
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**Fig. 51: Installing New O-Rings**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Connect the 3 SMT system hoses by pushing downward until click sound is heard.
- 25. **CHECK SMT SYSTEM FLUID LEVEL** (See PRE-CHECK )
- 26. **INSTALL AIR CLEANER CAP AND AIR HOSE ASSEMBLY, AIR FILTER AND AIR CLEANER CASE** (See REMOVAL )



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**Fig. 52: Connecting SMT System Hoses By Pushing Downward**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**27. INSTALL SUSPENSION UPPER BRACE**

Install the suspension upper brace with the 2 bolts and 2 nuts.

**Torque:**

**74 N.m (755 kgf.cm, 55 ft.lbf) for bolt**

**80 N.m (816 kgf.cm, 59 ft.lbf) for nut**

**28. INSTALL ENGINE HOOD**

- a. Install the engine hood with the 4 bolts.

**Torque: 20 N.m (204 kgf.cm, 15 ft.lbf)**

- b. Adjust the hood (See **ADJUSTMENT** ).

**29. PERFORM INITIAL LEARNING OF SMT SYSTEM (See **PRE-CHECK** )**

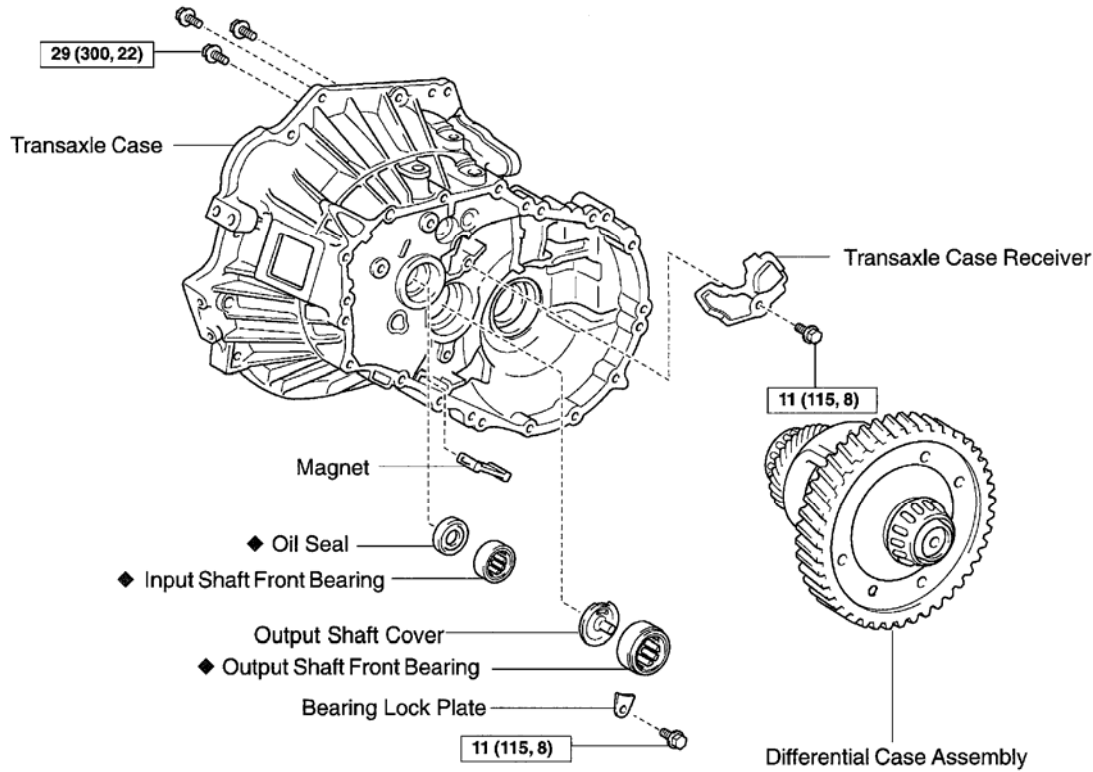
**30. CHECK FOR LEAK**

**31. CHECK AND INSPECT ITEM AS FOLLOWS**

- a. Check the rear wheel alignment (See WHEEL ALIGNMENT ).
- b. Do the road test.

## SEQUENTIAL MANUAL TRANSMISSION ASSEMBLY

### COMPONENTS

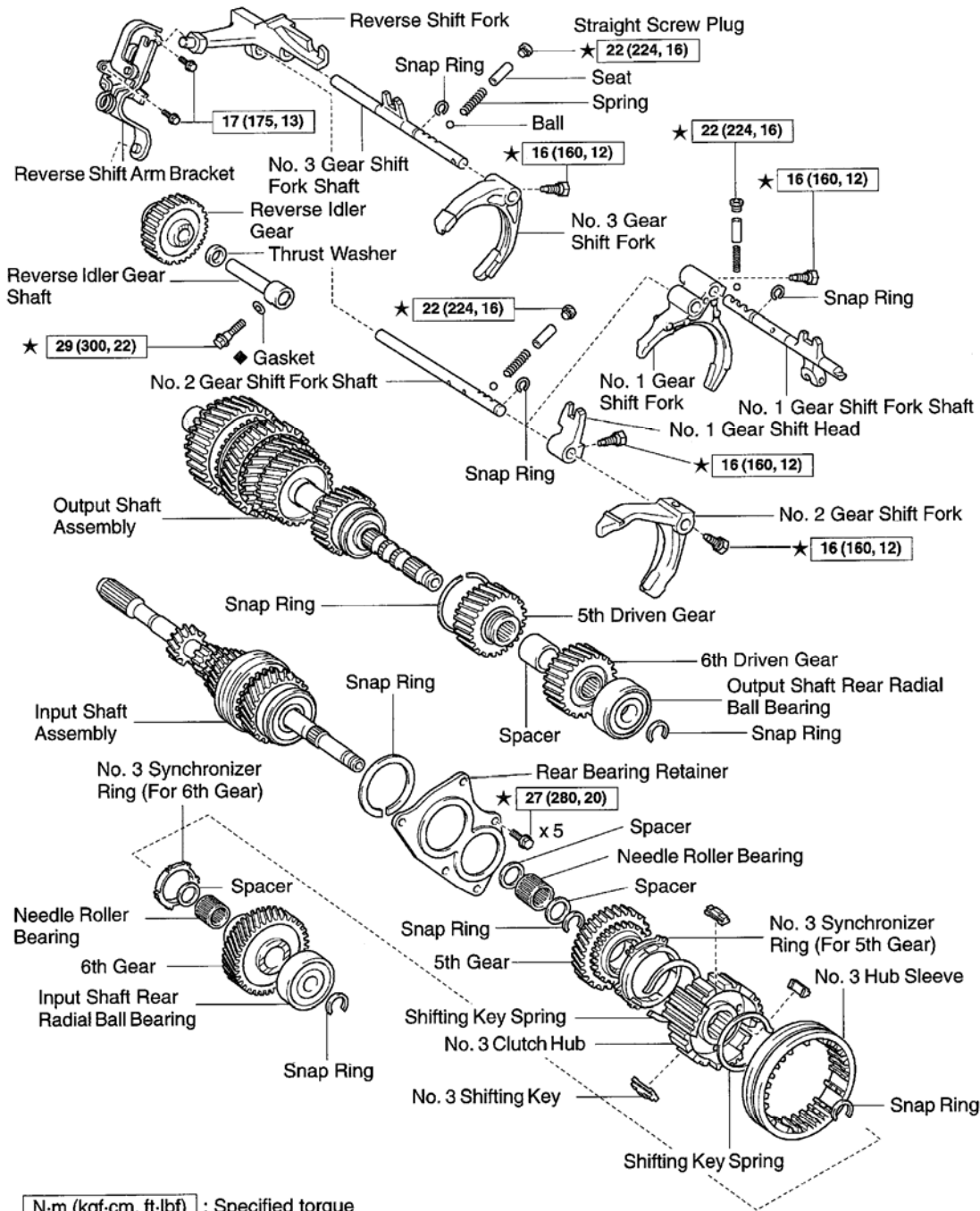


N-m (kgf-cm, ft-lbf) : Specified torque

◆ Non-reusable part

G00928036

**Fig. 53: Identifying Sequential Manual Transmission Components (1 Of 3)**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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

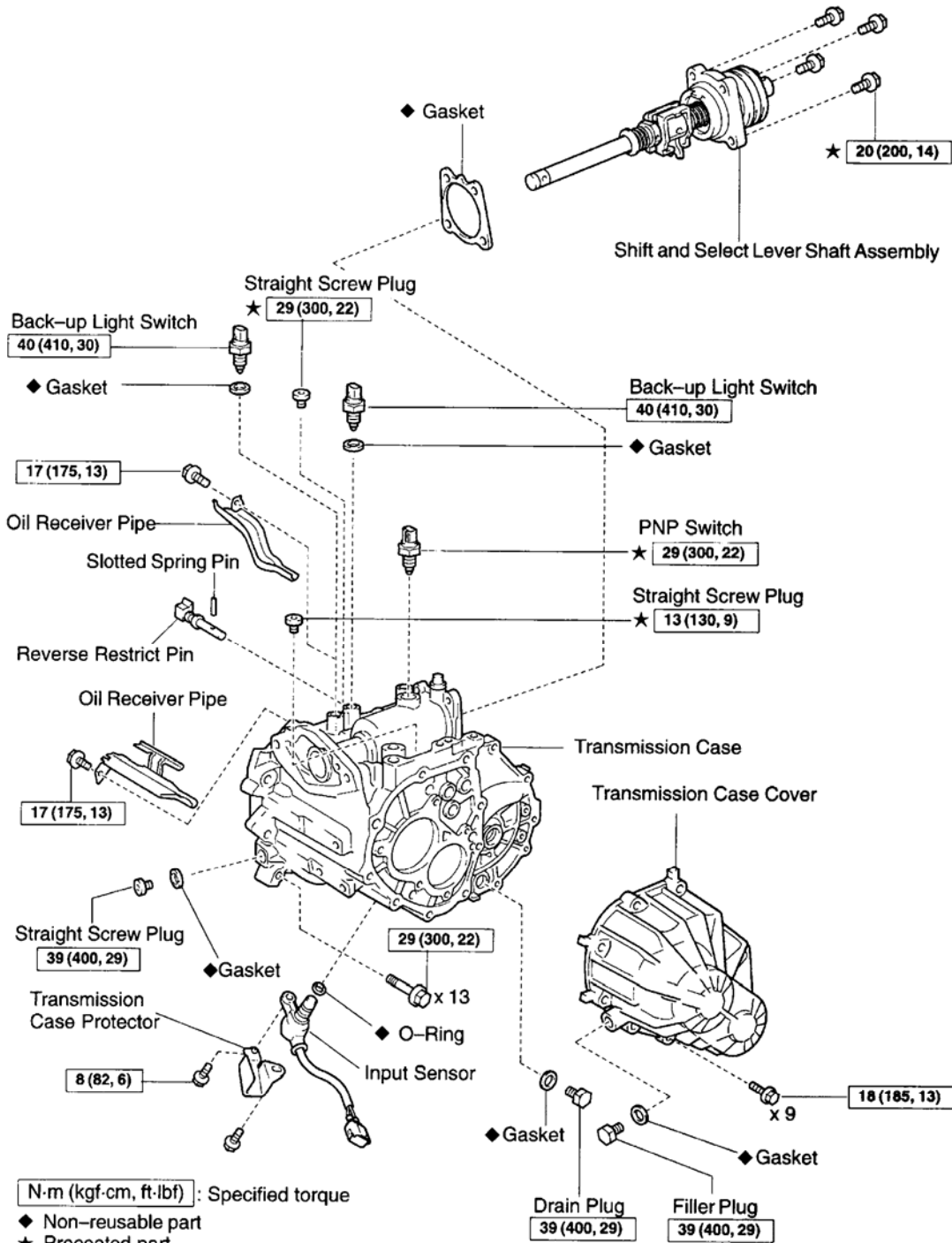
◆ Non-reusable part

★ Precoated part

Y

G00928037

**Fig. 54: Identifying Sequential Manual Transmission Components (2 Of 3)**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



G00928038

**Fig. 55: Identifying Sequential Manual Transmission Components (3 Of 3)**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**DISASSEMBLY**

1. REMOVE FILLER PLUG AND DRAIN PLUG WITH GASKETS

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

2. REMOVE 2 BACK-UP LIGHT SWITCHES WITH GASKETS

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

3. REMOVE SHIFT AND SELECT LEVER SHAFT ASSEMBLY

**NOTE:** At the time of reassembly, set the claws of the shift interlock plate into the shift head part of the gear shift fork shaft securely.

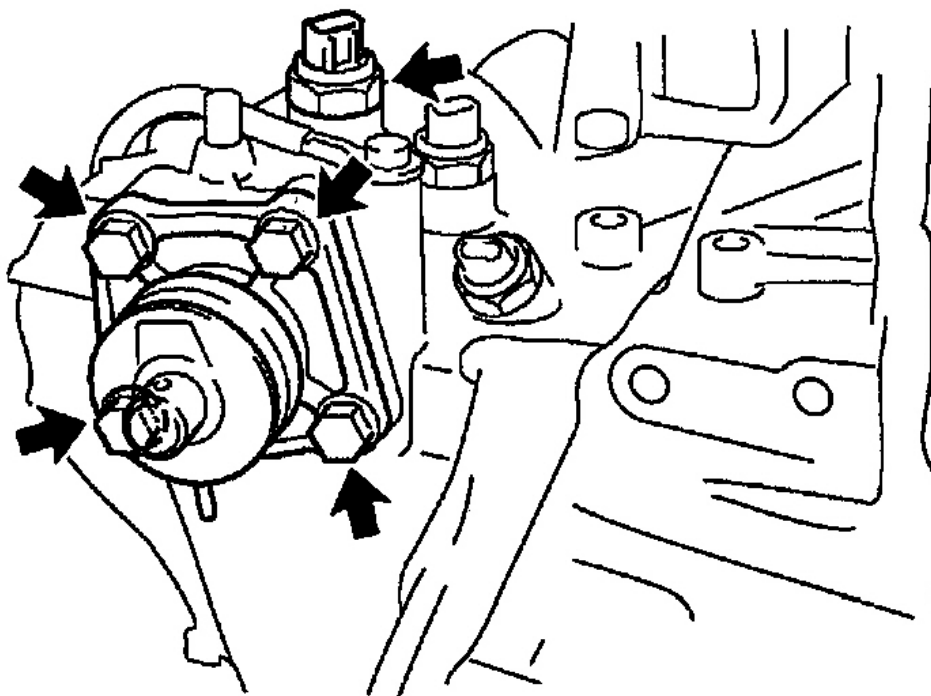
- a. Remove the neutral start switch.

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

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

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

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



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**Fig. 56: Removing Bolts, Shift And Select Lever Shaft Assembly And Gasket**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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#### 4. REMOVE TRANSMISSION CASE COVER

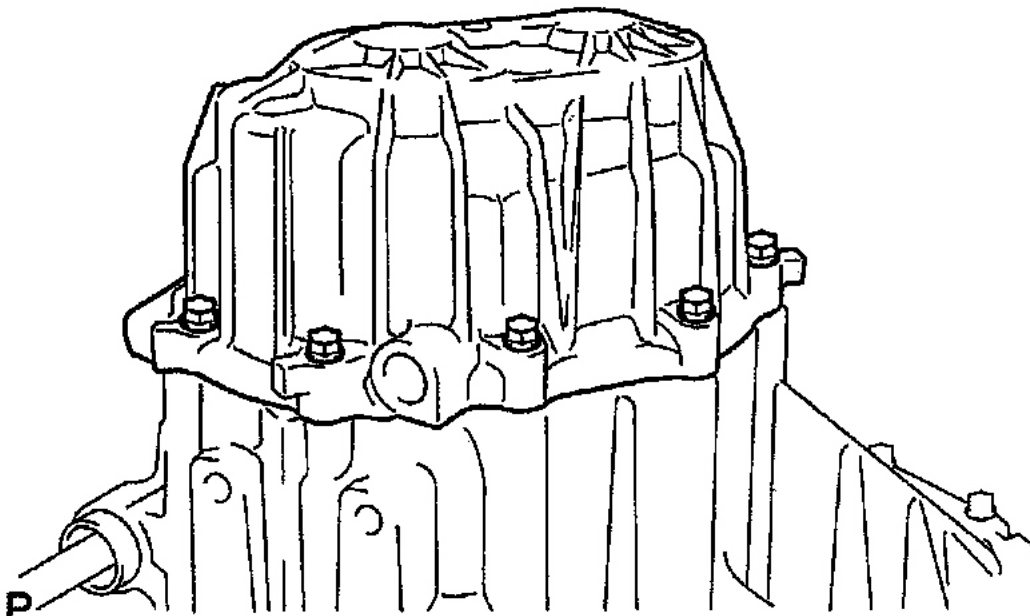
- a. Remove the 9 bolts.

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

- b. Using a brass bar and a hammer, carefully tap the projection of the transmission case cover to remove the transmission case cover from the transmission case.

HINT:

At the time of reassembly, apply FIPG to the transmission case cover as shown in the illustration.

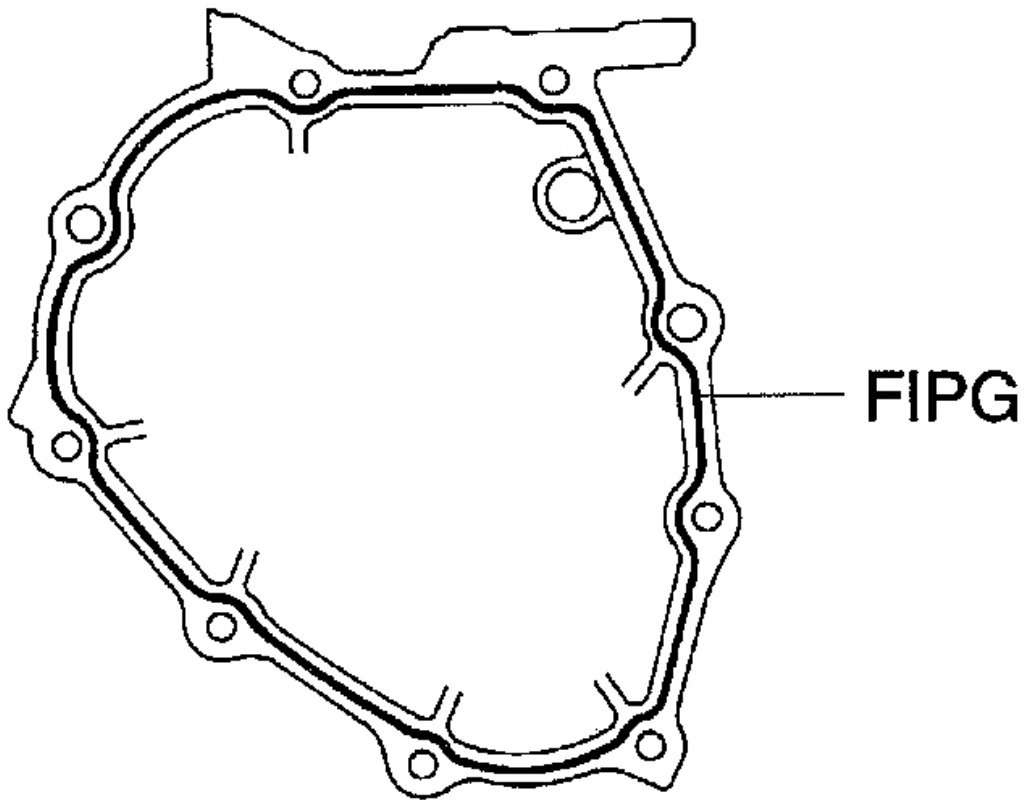


G00928040

**Fig. 57: Removing Transmission Case Cover**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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





**G00928041**

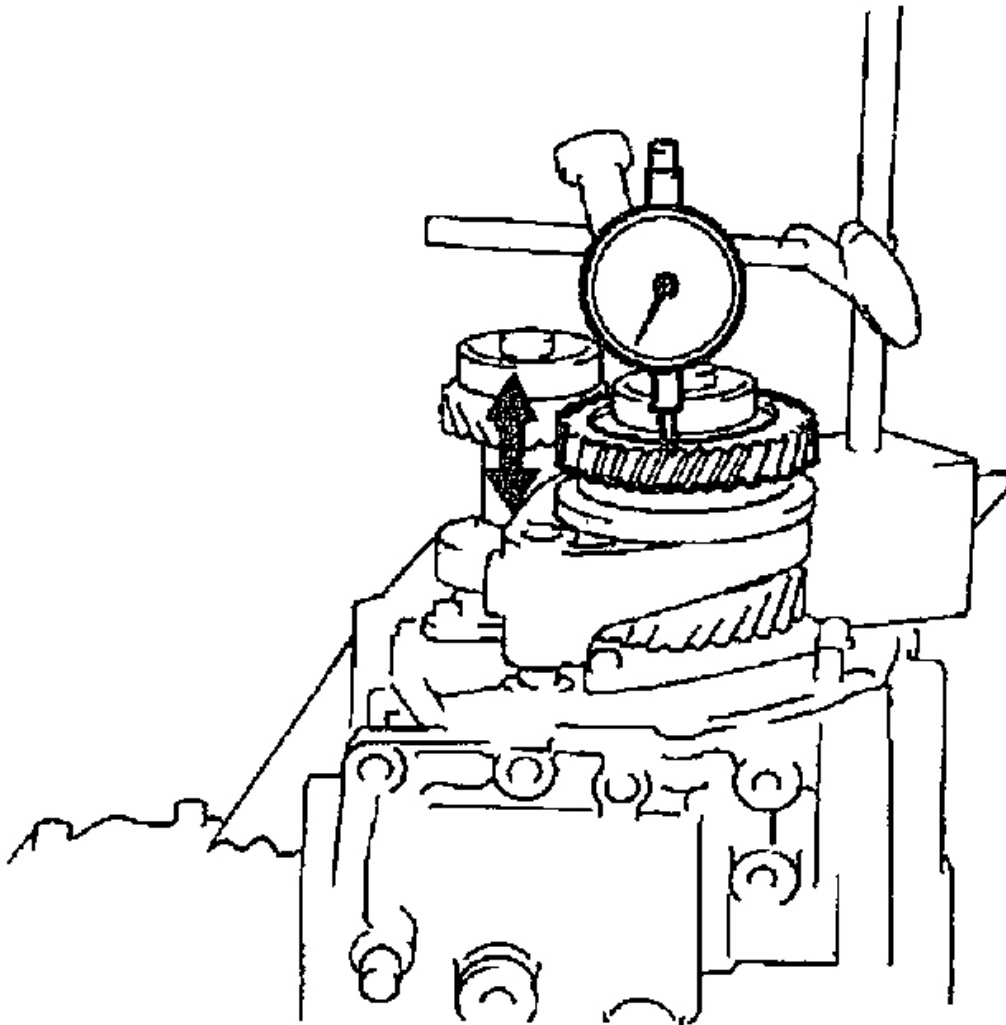
**Fig. 58: Applying FIPG To Transmission Case Cover**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**5. INSPECT 6TH GEAR THRUST CLEARANCE**

Using a dial indicator, measure the thrust clearance.

**Standard clearance: 0.10 to 0.60 mm (0.0039 to 0.0236 in.)**

**Maximum clearance: 0.60 mm (0.0236 in.)**



G00928042

**Fig. 59: Measuring Thrust Clearance Using Dial Indicator**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**6. INSPECT 6TH GEAR RADIAL CLEARANCE**

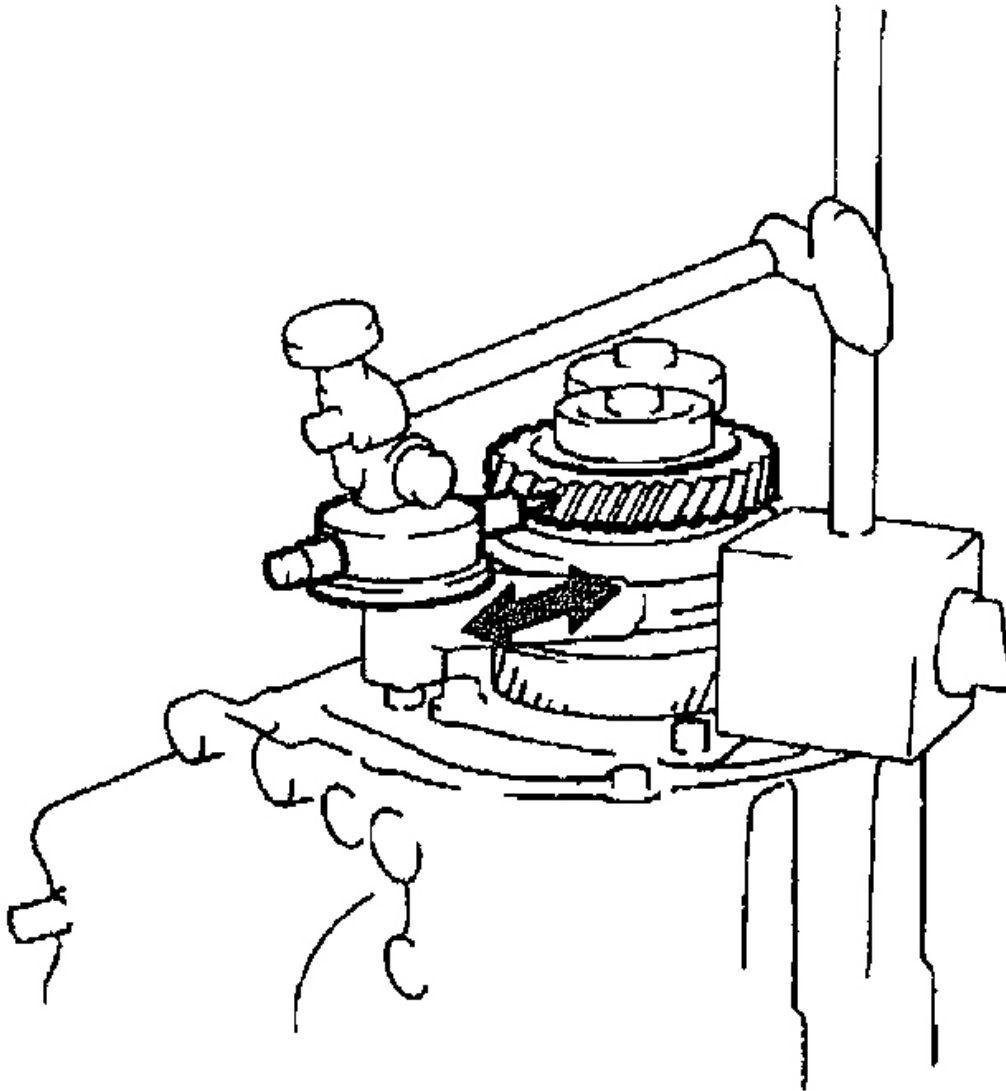
Using a dial indicator, measure the radial clearance.

**Standard clearance: 0.009 to 0.050 mm (0.0003 to 0.0020 in.)**

**Maximum clearance: 0.050 mm (0.0020 in.)**

---

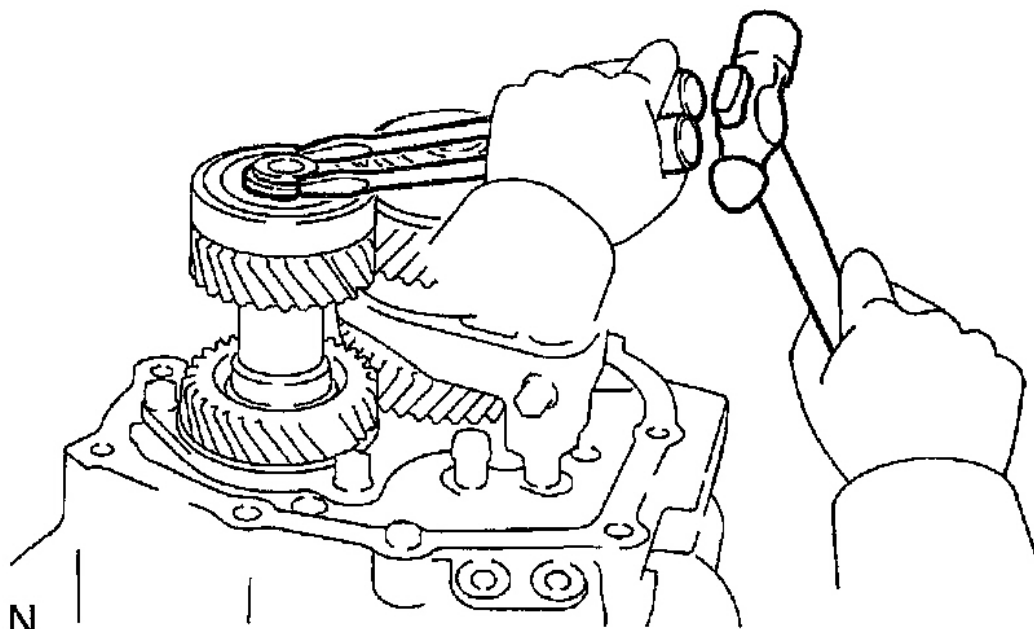
If the clearance exceeds the maximum, replace the gear, needle roller bearing or shaft.



G00928043

**Fig. 60: Measuring Radial Clearance Using Dial Indicator**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

7. **REMOVE OUTPUT SHAFT REAR RADIAL BALL BEARING, 6TH DRIVEN GEAR AND SPACER**
  - a. Using 2 screwdrivers and a hammer, tap out the snap ring.



G00928044

**Fig. 61: Identifying Tap Out Snap Ring Using Screwdrivers And Hammer**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

At the time of reassembly, please refer to the following item. Select a snap ring from the figure below that will make the thrust clearance of the output shaft rear radial ball bearing less than 0.1 mm (0.0039 in.).

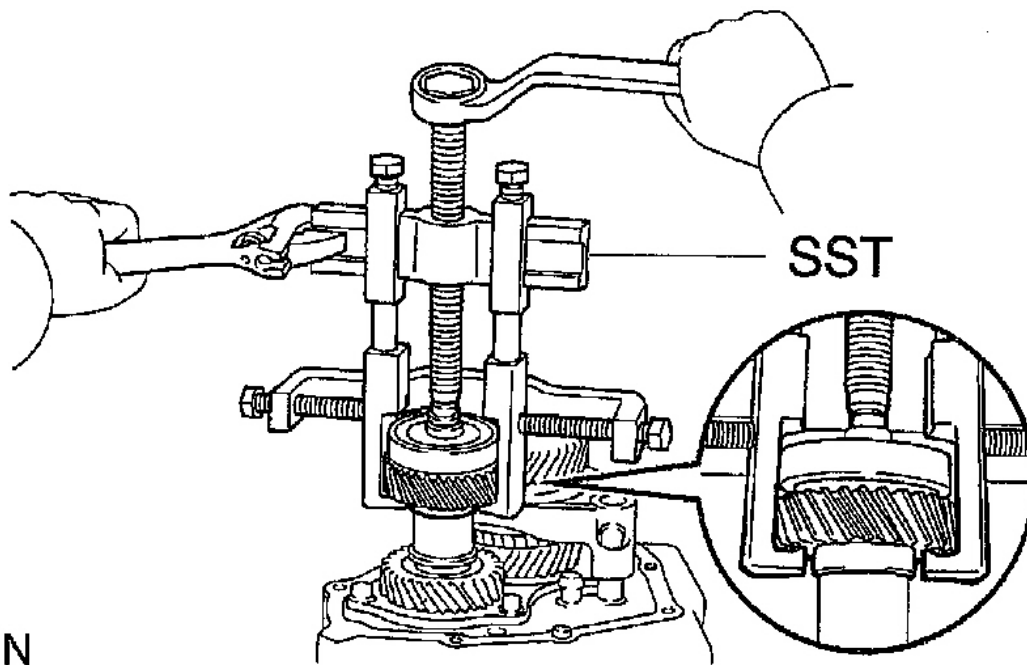
Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
B	2.31 (0.0909)	H	2.67 (0.1051)
C	2.37 (0.0933)	J	2.73 (0.1075)
D	2.43 (0.0957)	K	2.79 (0.1098)
E	2.49 (0.0980)	L	2.85 (0.1122)
F	2.55 (0.1004)	M	2.91 (0.1146)
G	2.61 (0.1028)	-	-

G00928045

**Fig. 62: Thickness Specification Chart**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using SST, remove the rear radial ball bearing and 6th driven gear.

SST 09950-40011 (09951-04010, 09952-04010, 09953-04030, 09954-04010, 09955-04021, 09957-04010, 09958-04011)



N

G00928046

**Fig. 63: Removing Rear Radial Ball Bearing And 6Th Driven Gear Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

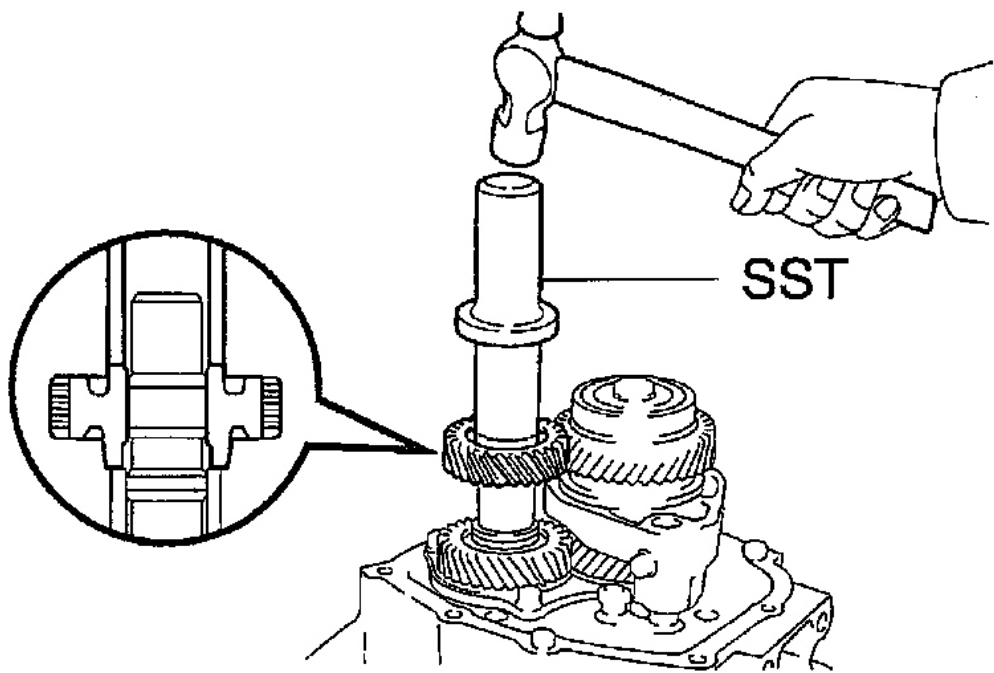
HINT:

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

- Using SST and a hammer, drive in the 6th driven gear.

SST 09325-12010

**NOTE:** Be sure to install the 6th driven gear in the correct direction, as shown in the illustration.



N

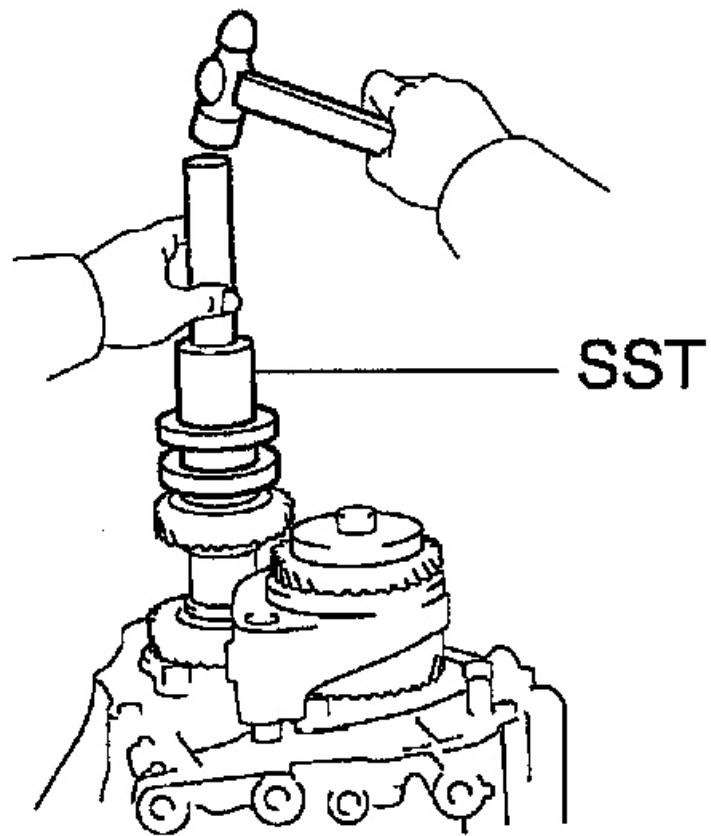
G00928047

**Fig. 64: Identifying Drive In 6Th Driven Gear Using SST And Hammer**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- Set SST to the rear radial ball bearing inner race securely, drive in the bearing with a hammer.

SST 09517-12010

- c. Remove the spacer.



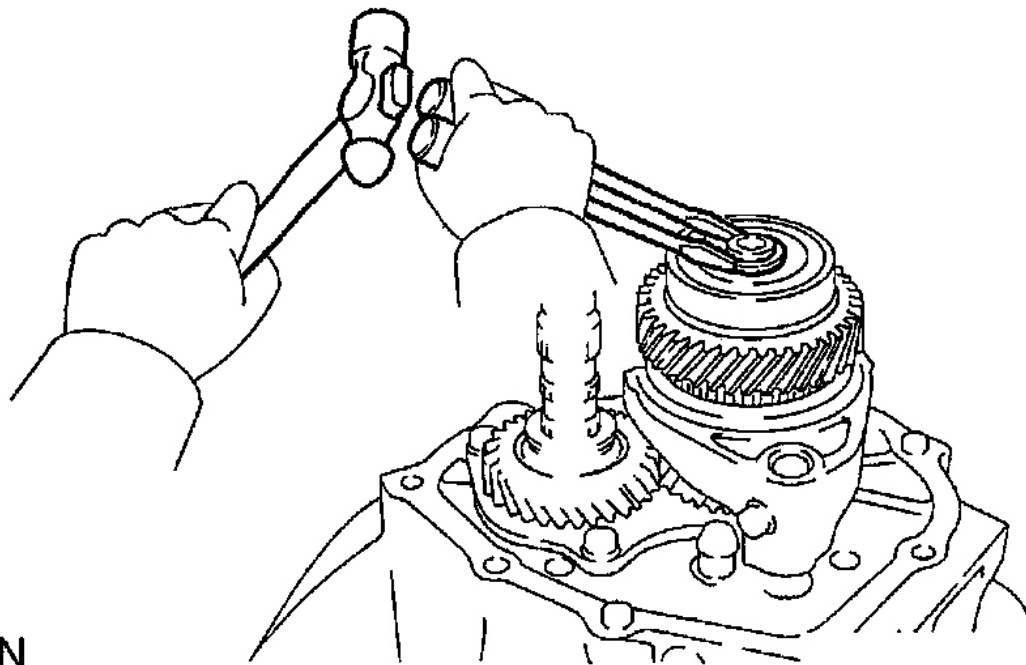
Y

G00928048

**Fig. 65: Removing Spacer Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

8. **REMOVE INPUT SHAFT REAR RADIAL BALL BEARING AND 6TH GEAR**
  - a. Using 2 screwdrivers and a hammer, tap out the snap ring.





N

G00928049

**Fig. 66: Identifying Tap Out Snap Ring Using Screwdrivers And Hammer,**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

At the time of reassembly, please refer to the following item. Select a snap ring from the figure below that will make the thrust clearance of the No. 3 clutch hub less than 0.1 mm (0.0039 in.).

---

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	1.70 (0.0669)	G	2.00 (0.0787)
B	1.75 (0.0689)	H	2.05 (0.0807)
C	1.80 (0.0709)	J	2.10 (0.0827)
D	1.85 (0.0728)	K	2.15 (0.0846)
E	1.90 (0.0748)	L	2.20 (0.0866)
F	1.95 (0.0768)	M	2.25 (0.0886)

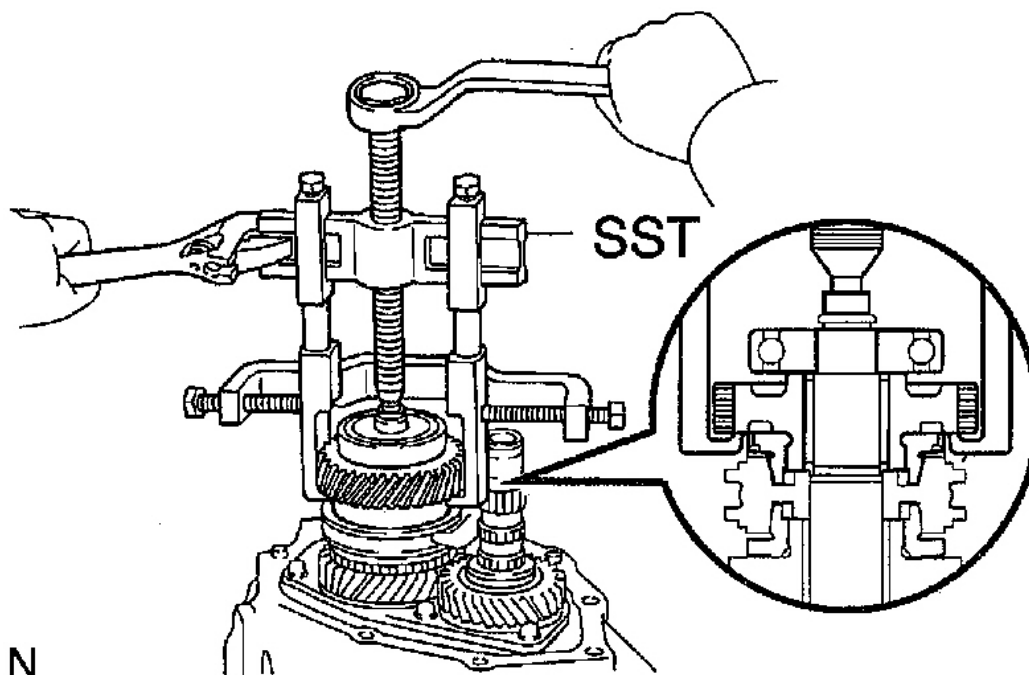
G00928050

**Fig. 67: Thickness Specification Chart**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using SST, remove the rear radial ball bearing and 6th gear.

SST 09950-40011 (09951-04010, 09952-04010, 09953-04030, 09954-04010, 09955-04021, 09957-04010, 09958-04011)



N  
G00928051

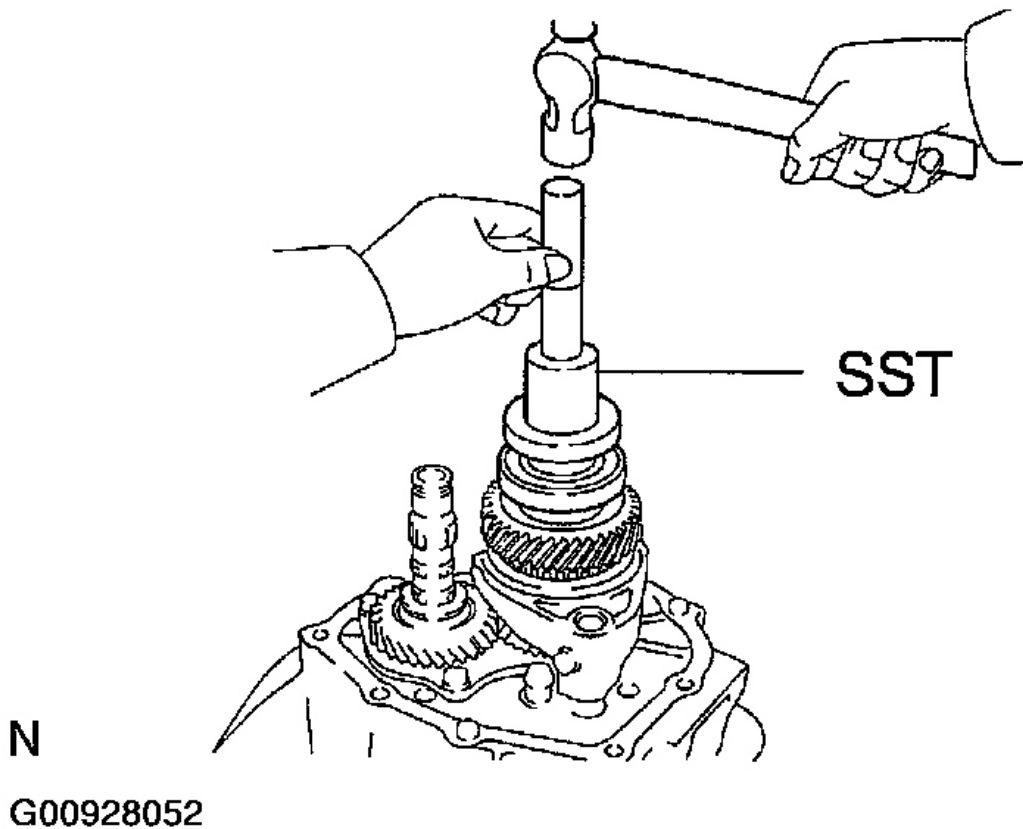
**Fig. 68: Removing Rear Radial Ball Bearing And 6Th Gear Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**HINT:**

At the time of reassembly, please refer to the following item. Set SST to the rear radial ball bearing inner race securely, drive in the bearing with a hammer.

SST 09517-12010

- c. Remove the needle roller bearing and spacer.

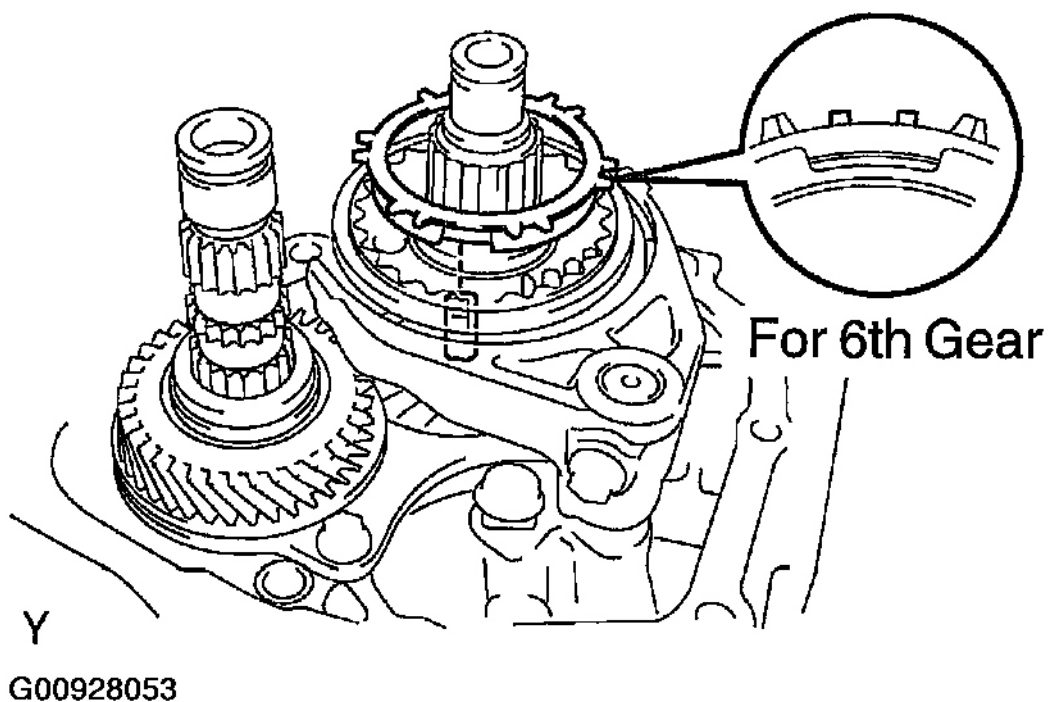


**Fig. 69: Removing Needle Roller Bearing And Spacer Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**9. REMOVE NO. 3 SYNCHRONIZER RING (FOR 6TH GEAR)**

**NOTE:** At the time of reassembly, please refer to the following items.

- Align the No. 3 synchronizer ring slots with the No. 3 shifting keys.
- Distinguish the No. 3 synchronizer ring (for the 6th gear) by the teeth on the synchronizer ring.

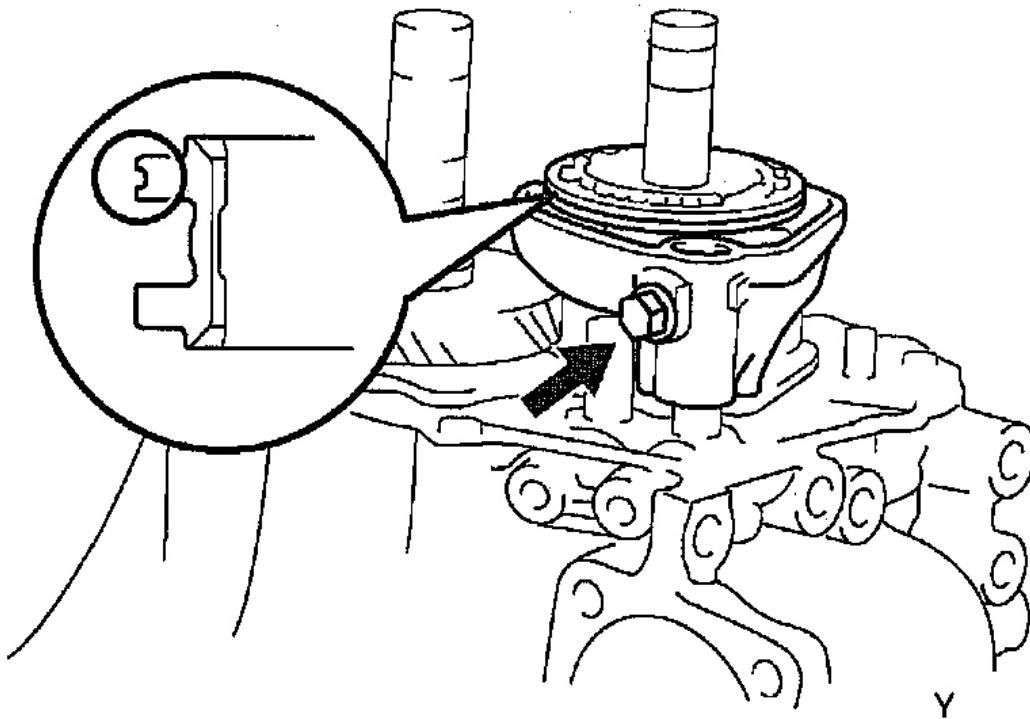


**Fig. 70: Removing Synchronizer Ring (For 6Th Gear)**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Remove the bolt, No. 3 gear shift fork and No. 3 hub sleeve.

**Sealant: Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent**  
**Torque: 16 N.m (160 kgf.cm, 12 ft.lbf)**



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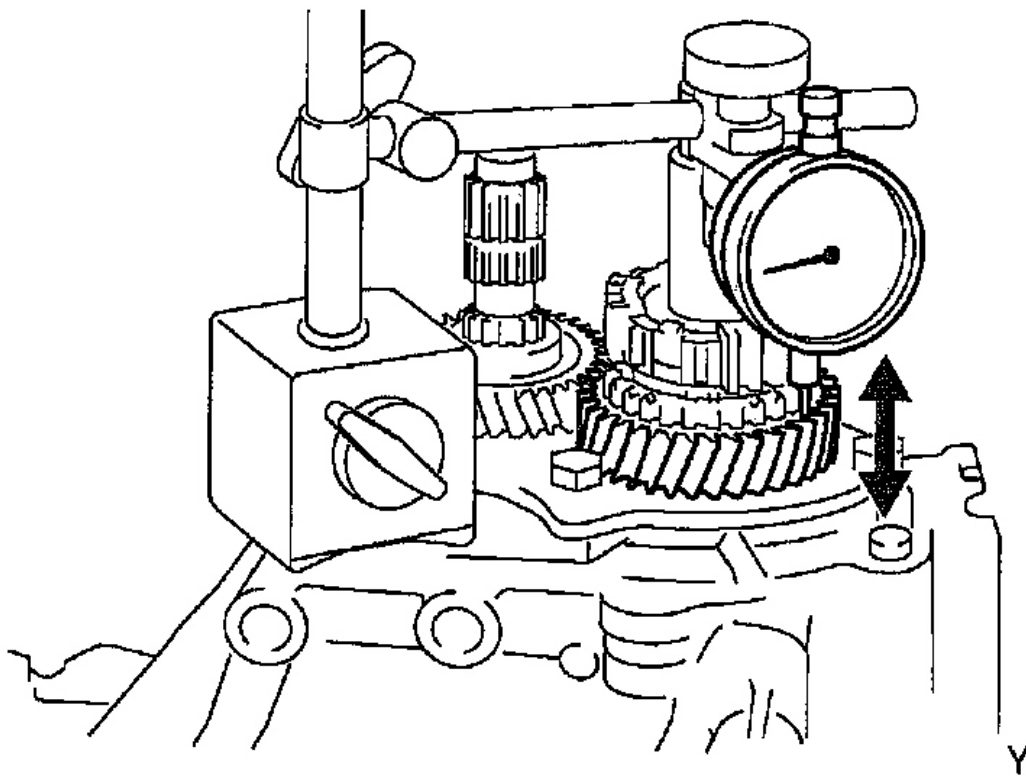
**Fig. 71: Removing Bolt, Gear Shift Fork And Hub Sleeve**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**11. INSPECT 5TH GEAR THRUST CLEARANCE**

Using a dial indicator, measure the thrust clearance.

**Standard clearance: 0.10 to 0.62 mm (0.0039 to 0.0244 in.)**

**Maximum clearance: 0.62 mm (0.0244 in.)**



G00928055

**Fig. 72: Measuring Thrust Clearance Using Dial Indicator**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

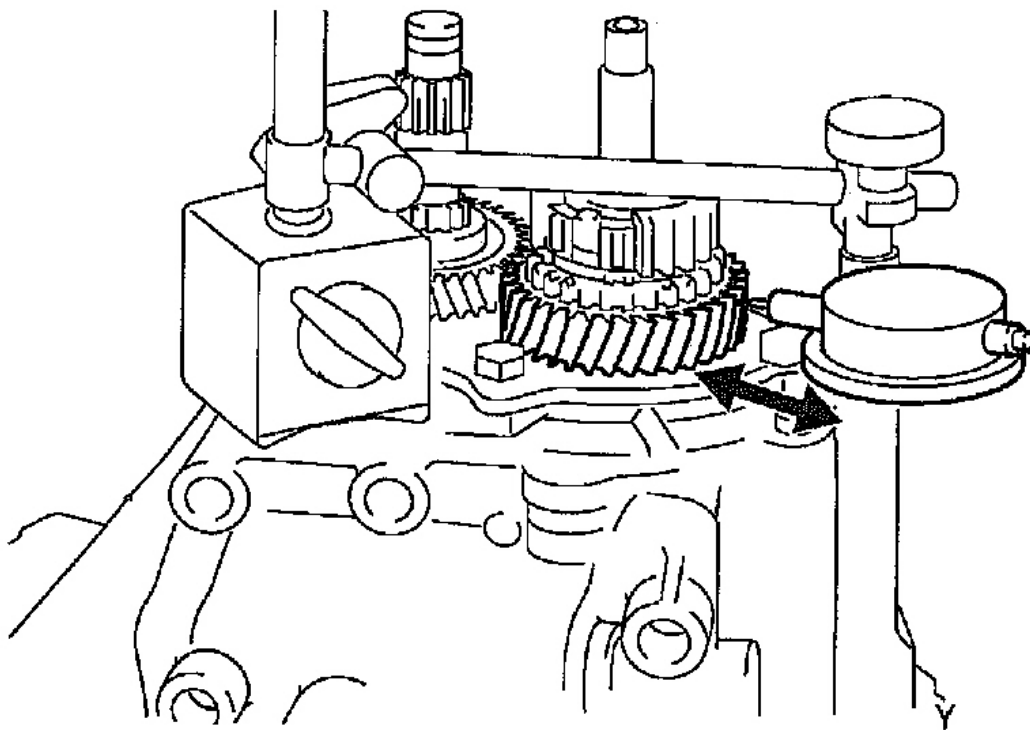
## 12. INSPECT 5TH GEAR RADIAL CLEARANCE

Using a dial indicator, measure the radial clearance.

**Standard clearance: 0.015 to 0.056 mm (0.0006 to 0.0022 in.)**

**Maximum clearance: 0.056 mm (0.0022 in.)**

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



G00928056

**Fig. 73: Measuring Radial Clearance Using Dial Indicator**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

13. **REMOVE 5TH GEAR, NO. 3 SYNCHRONIZER RING (FOR 5TH GEAR) AND NO. 3 CLUTCH HUB ASSEMBLY**
  - a. Using 2 screwdrivers and a hammer, tap out the snap ring.



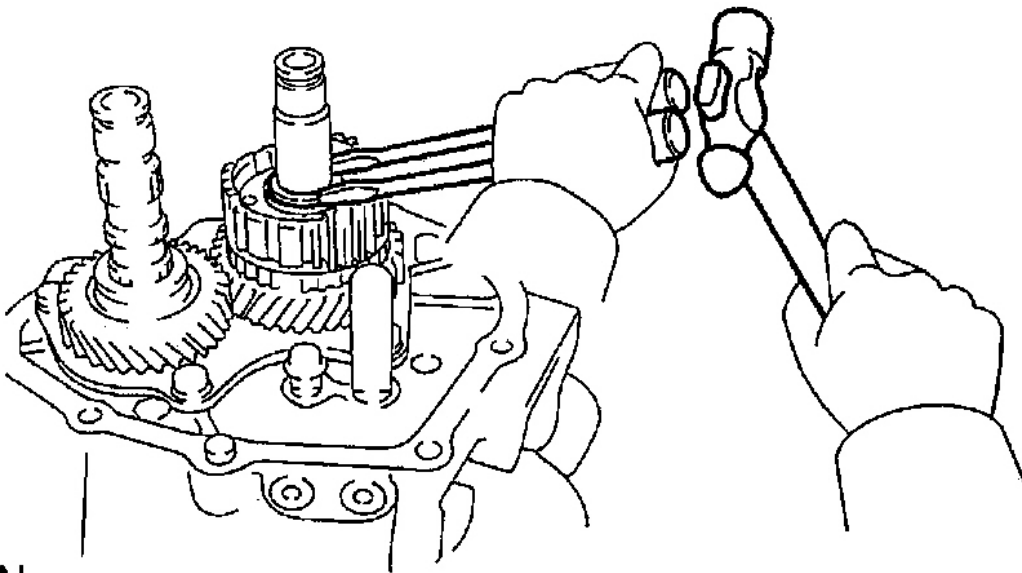
Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	1.75 (0.0689)	F	2.00 (0.0787)
B	1.80 (0.0709)	G	2.05 (0.0807)
C	1.85 (0.0728)	H	2.10 (0.0827)
D	1.90 (0.0748)	J	2.15 (0.0846)
E	1.95 (0.0768)	-	-

G00928057

**Fig. 74: Identifying Tap Out Snap Ring Using Screwdrivers And Hammer**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

At the time of reassembly, please refer to the following item. Select a snap ring from the figure below that will make the thrust clearance of the No. 3 clutch hub less than 0.1 mm (0.0039 in.).



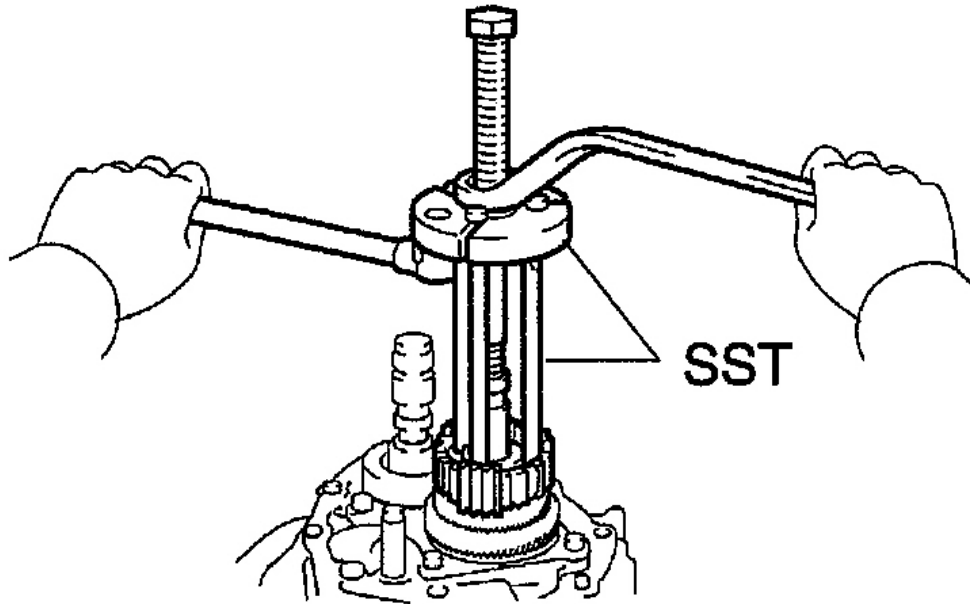
N

G00928058

**Fig. 75: Thickness Specification Chart**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

b. Using SST, remove the No. 3 clutch hub assembly.

SST 09950-30012 (09951-03010, 09953-03010), 09950-50013 (09954-05031)



P

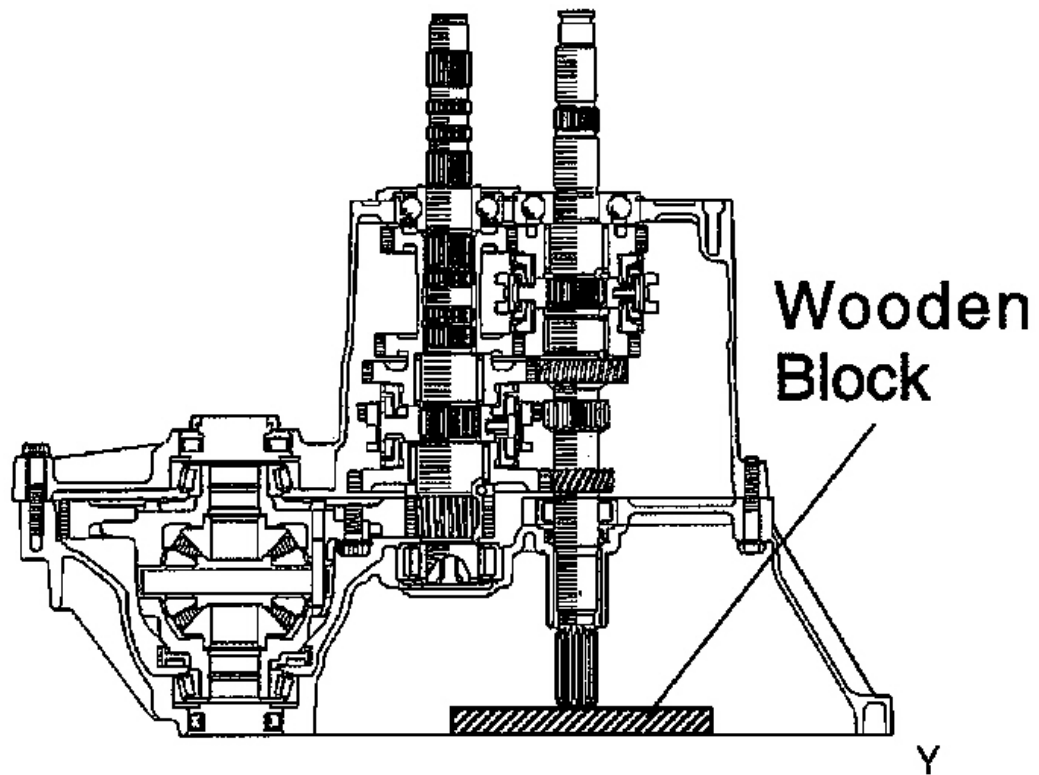
G00928059

**Fig. 76: Removing Clutch Hub Assembly Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

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

- Before driving in the No. 3 clutch hub assembly and input shaft rear radial ball bearing, place the suitable sized wooden block on the rear side of the input shaft, as shown in the illustration. When driving them in, fix the input shaft firmly so that it is not pushed downward. Otherwise the input shaft center bearing is overloaded, it might be damaged.



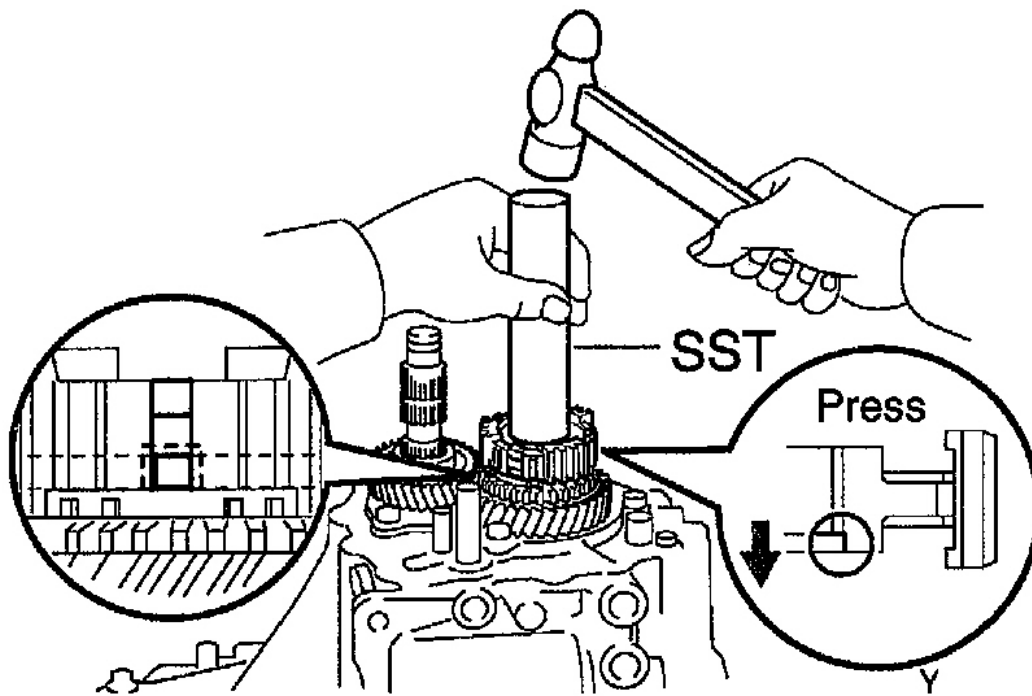
G00928060

**Fig. 77: Placing Suitable Sized Wooden Block**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

SST 09612-22011

**NOTE:**

- Align the No. 3 synchronizer ring slots with the No. 3 shifting keys.
- Be sure to install the No. 3 clutch hub assembly in the correct direction, as shown in the illustration.



G00928061

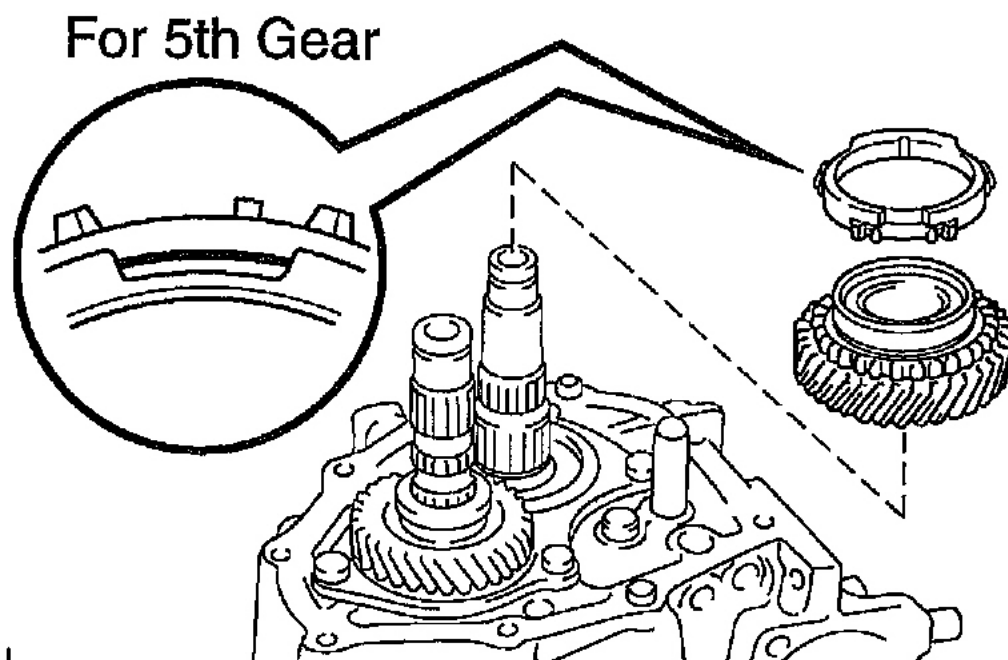
**Fig. 78: Identifying Drive In Clutch Hub Assembly Using SST And Hammer**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the No. 3 synchronizer ring (for the 5th gear) and 5th gear from the input shaft.

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

**Distinguish the No. 3 synchronizer ring (for the 5th gear) by the teeth on the synchronizer ring.**

- d. Using 2 screwdrivers and a hammer, tap out the snap ring.
- e. Remove the needle roller bearing and 2 spacers.



N

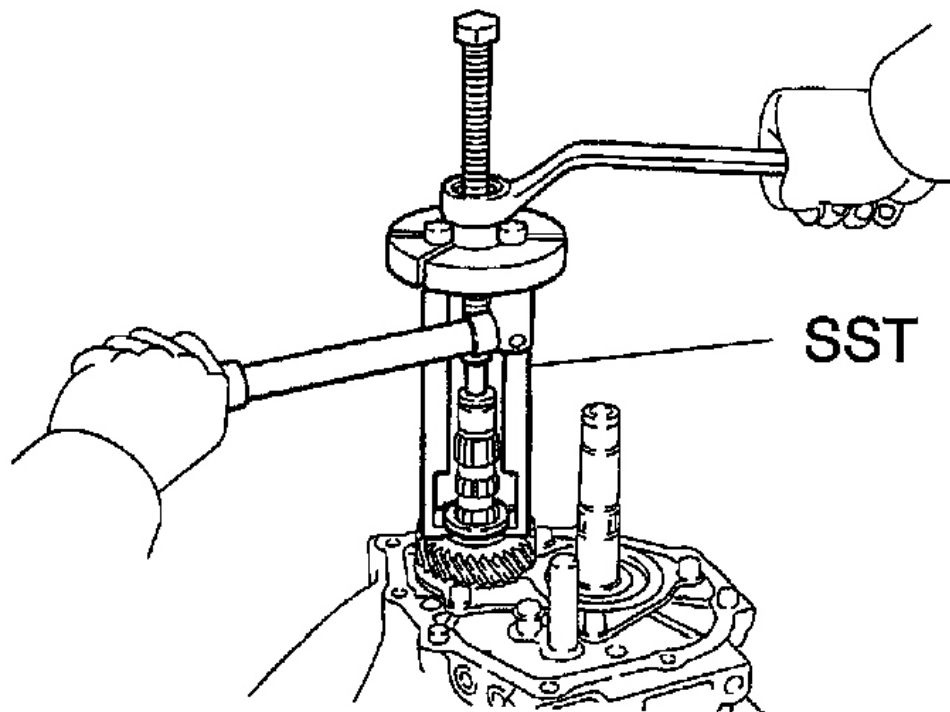
G00928062

**Fig. 79: Removing Synchronizer Ring And 5Th Gear From Input Shaft**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

14. **REMOVE 5TH DRIVEN GEAR**

Using SST, remove the 5th driven gear.

SST 09950-30012 (09951-03010, 09953-03010, 09954-03010, 09955-03021)



N

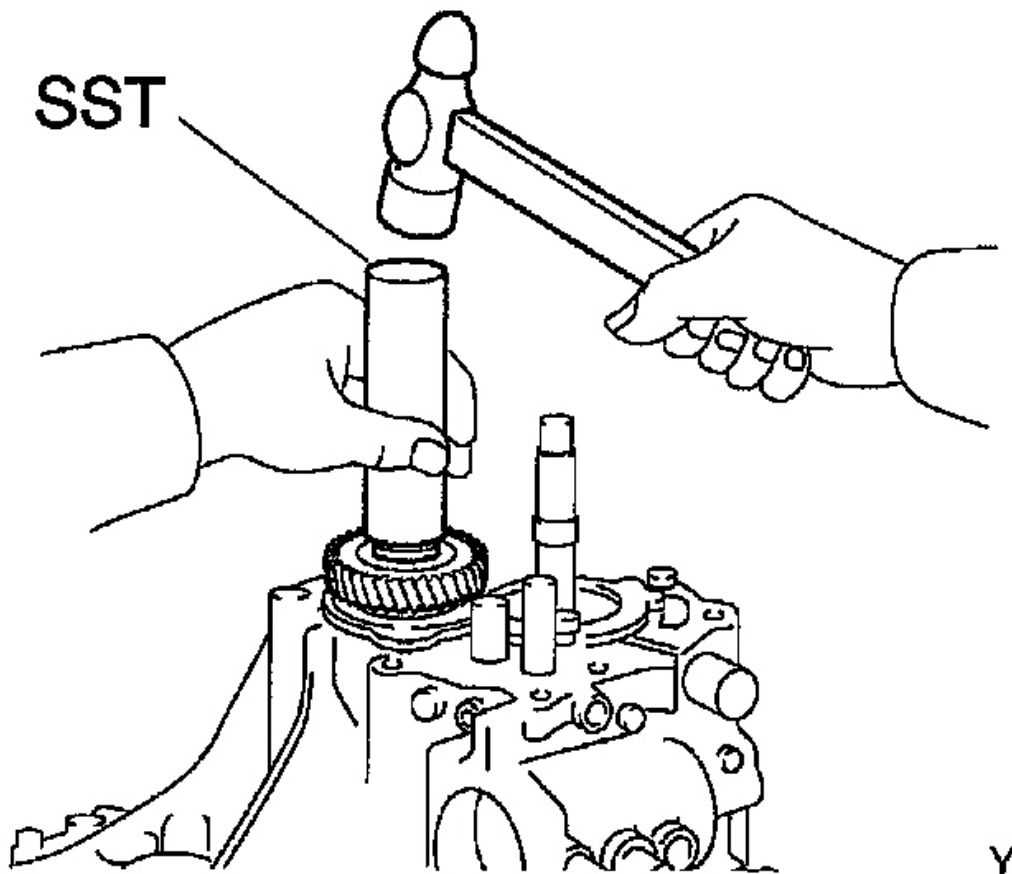
G00928063

**Fig. 80: Removing 5Th Driven Gear Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

At the time of reassembly, please refer to the following item. Using SST and a hammer, drive in the 5th driven gear.

SST 09612-22011



G00928064

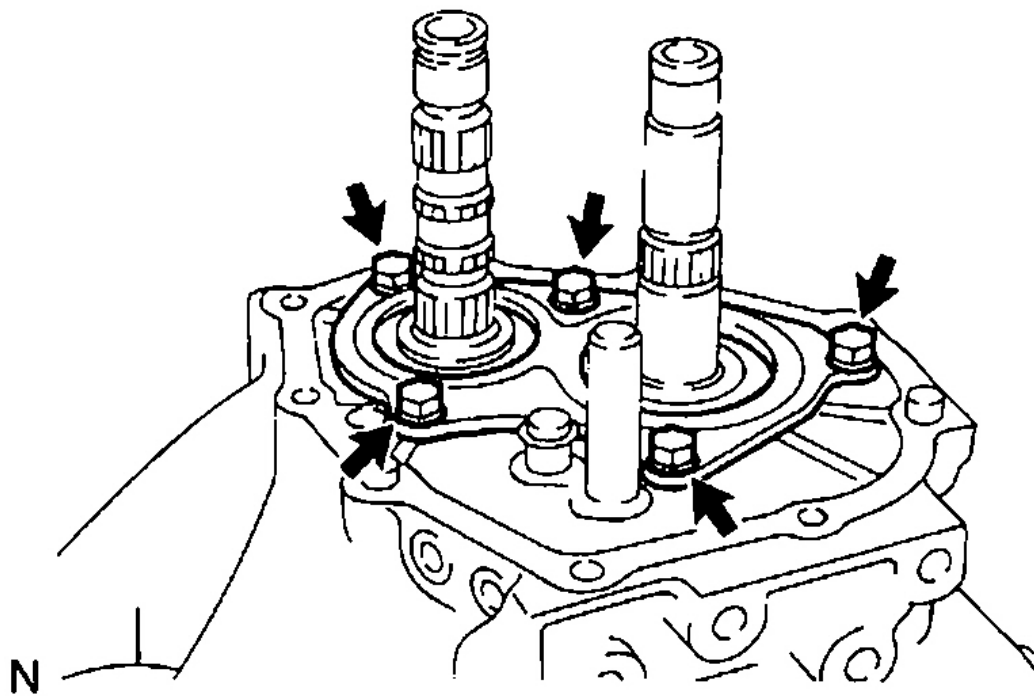
**Fig. 81: Assembling Drive In 5Th Driven Gear Using SST And Hammer**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**15. REMOVE REAR BEARING RETAINER**

Remove the 5 bolts and rear bearing retainer.

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

**Torque: 27 N.m (280 kgf.cm, 20 ft.lbf)**



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**Fig. 82: Removing 5 Bolts And Rear Bearing Retainer**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

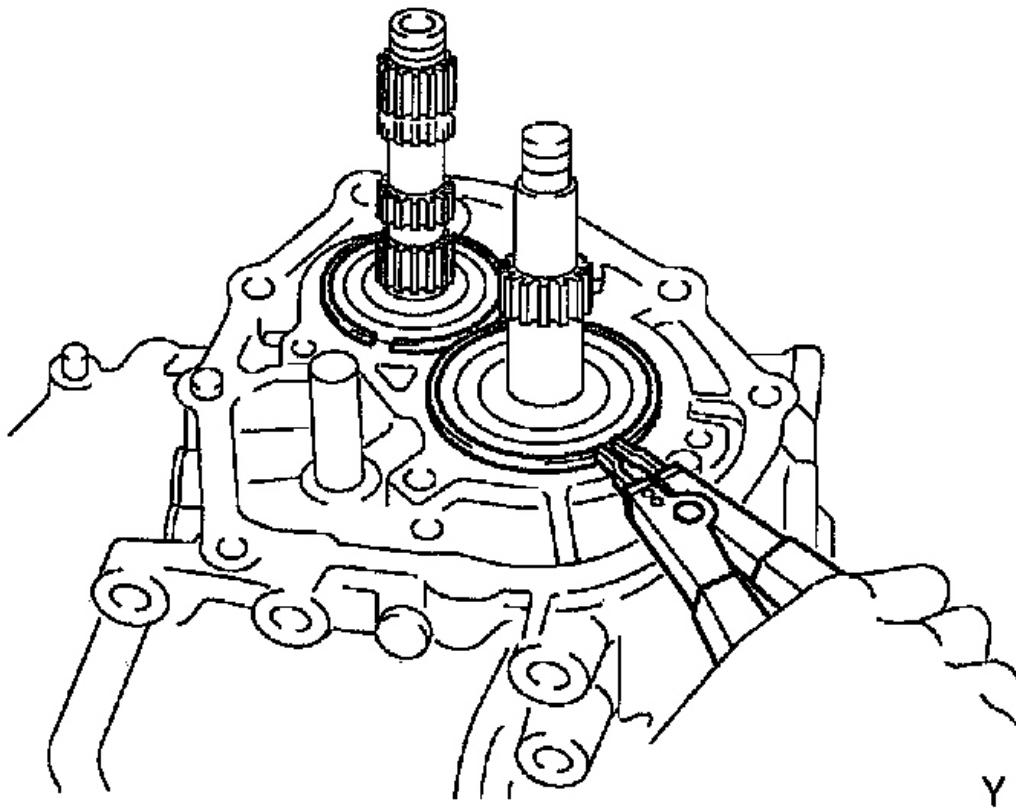
**16. REMOVE BEARING SNAP RING**

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

HINT:

If it is difficult to remove and install the snap rings, pull up the shafts.



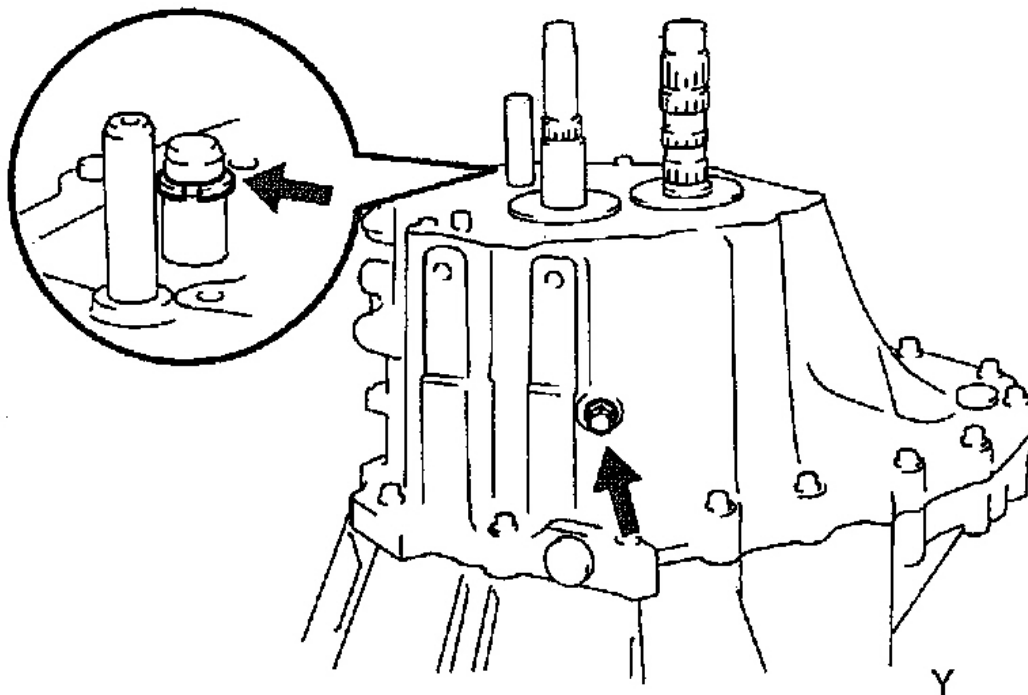


G00928066

**Fig. 83: Removing Snap Rings Using Snap Ring Expander**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

17. **REMOVE REVERSE IDLER GEAR SHAFT LOCK BOLT AND GASKET**  
Sealant: Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent  
Torque: 29 N.m (300 kgf.cm, 22 ft.lbf)
18. **REMOVE SNAP RING FROM NO. 2 SHIFT FORK SHAFT**

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



G00928067

**Fig. 84: Removing Reverse Idler Gear Shaft Lock Bolt And Gasket**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

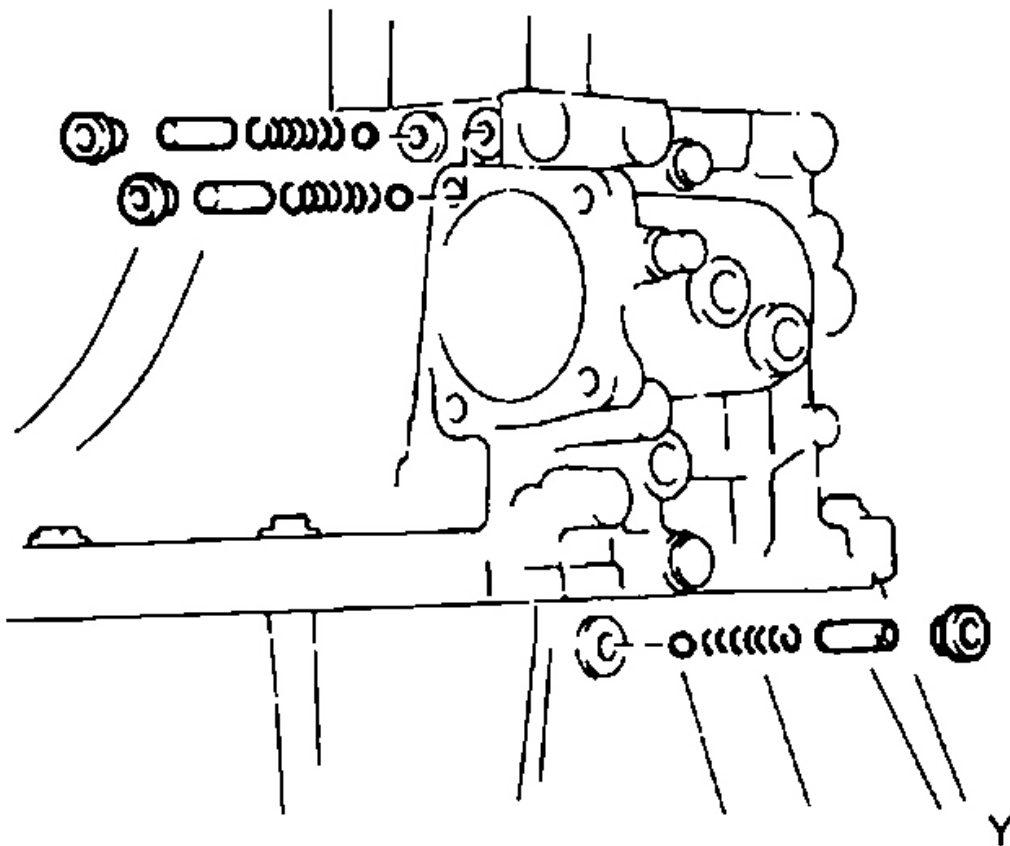
**19. REMOVE STRAIGHT SCREW PLUG, SEAT, SPRING AND BALL**

- a. Using a hexagon wrench, remove the 3 straight screw plugs.

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

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

- b. Using a magnetic finger, remove the 3 seats, springs and balls.



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**Fig. 85: Removing Seats, Springs And Balls Using Magnetic Finger**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## 20. REMOVE STRAIGHT SCREW PLUG

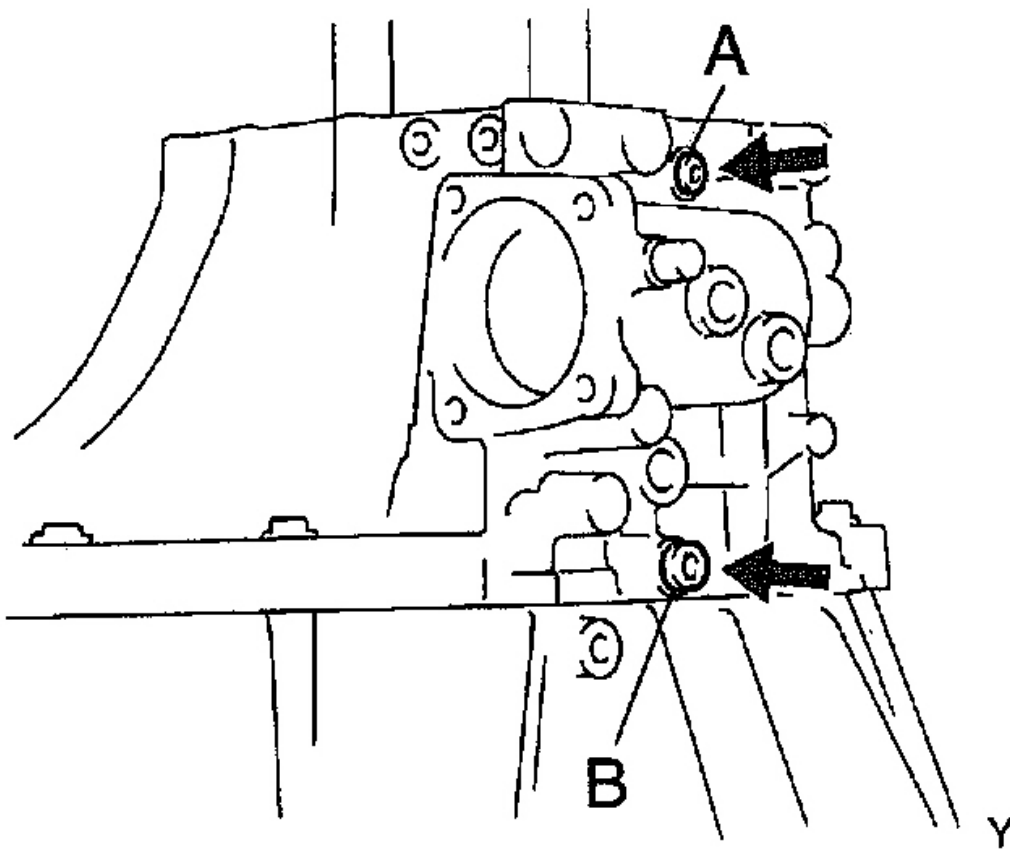
Using a hexagon wrench, remove the 2 straight screw plugs.

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

**Torque:**

**Plug A: 13 N.m (130 kgf.cm, 9 ft.lbf)**

**Plug B: 29 N.m (300 kgf.cm, 22 ft.lbf)**



G00928069

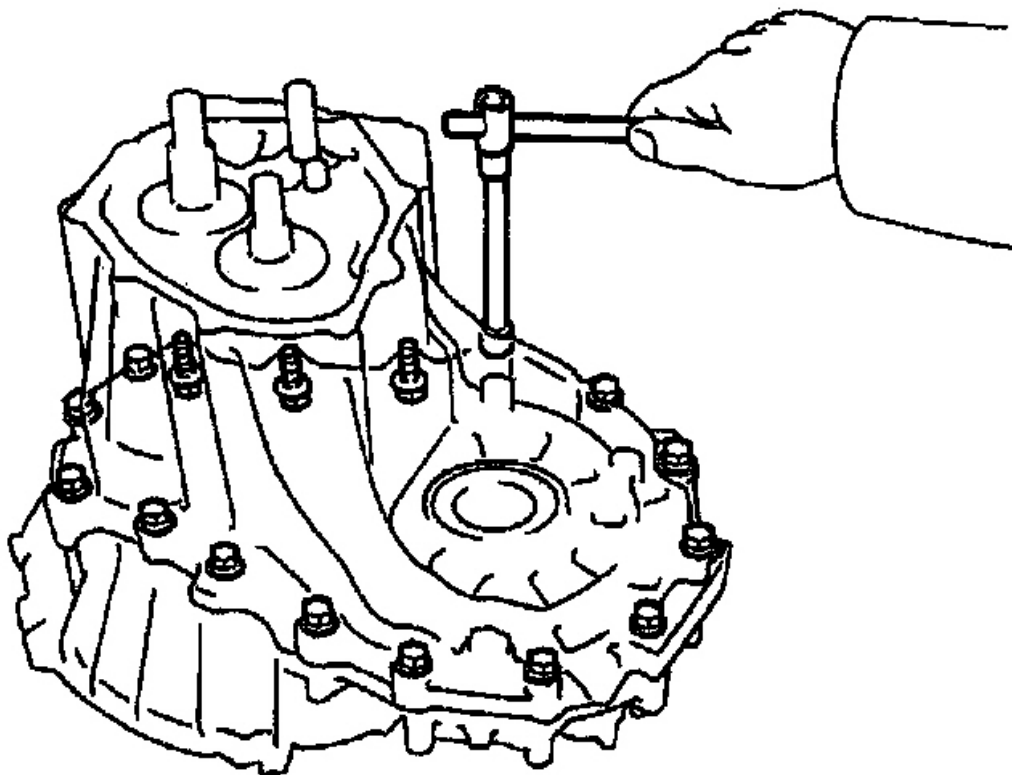
**Fig. 86: Removing Straight Screw Plugs**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**21. REMOVE TRANSMISSION CASE**

- a. Remove the 16 bolts.

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

- b. Using a plastic-faced hammer, carefully tap the projection of the transmission case to remove the transmission case from the transaxle case.



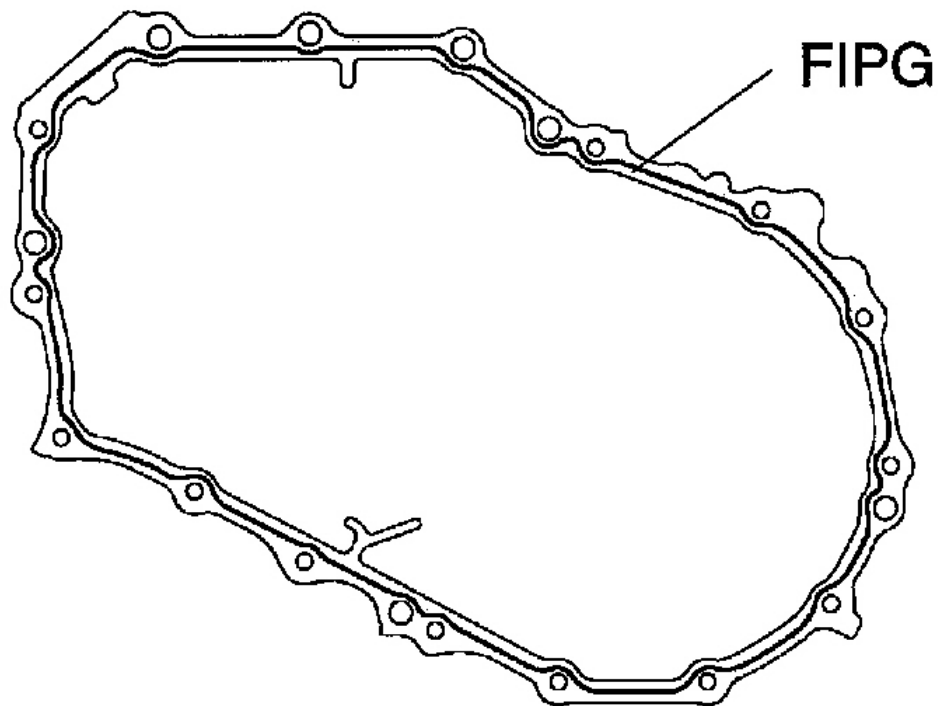
G00928070

**Fig. 87: Removing Transmission Case Bolts**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

At the time of reassembly, apply FIPG to the transaxle case as shown in the illustration.

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



N

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**Fig. 88: Applying FIPG To Transaxle Case**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

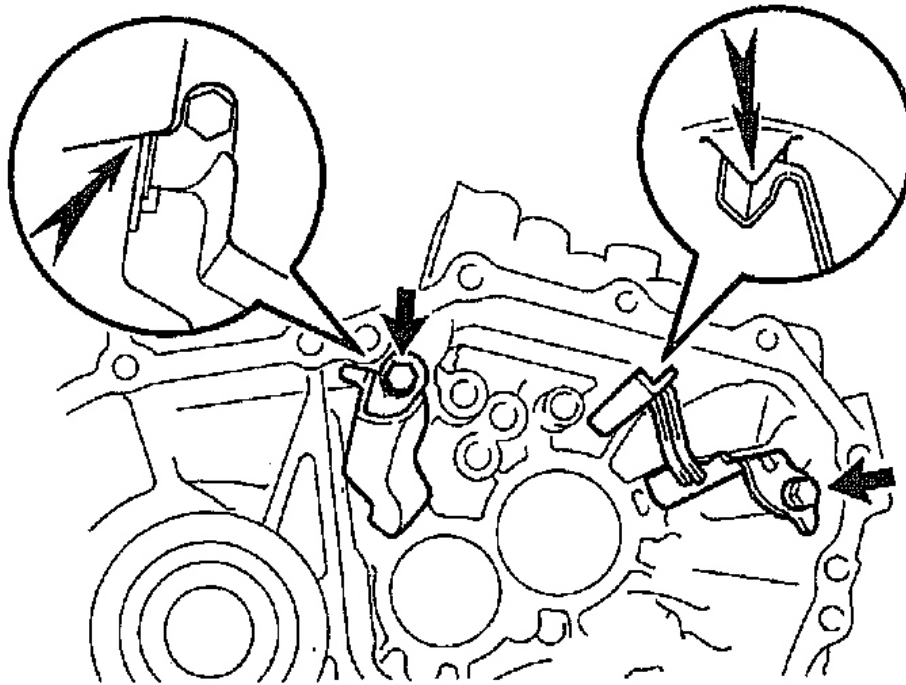
## 22. REMOVE OIL RECEIVER PIPE

Remove the 2 bolts and 2 oil receiver pipes from the transmission case.

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

**NOTE:** At the time of reassembly, please refer to the following items.

- Prevent the oil receiver pipes from being deformed.
- Install the oil receiver pipes while placing it against the transmission case, as shown in the illustration.



N

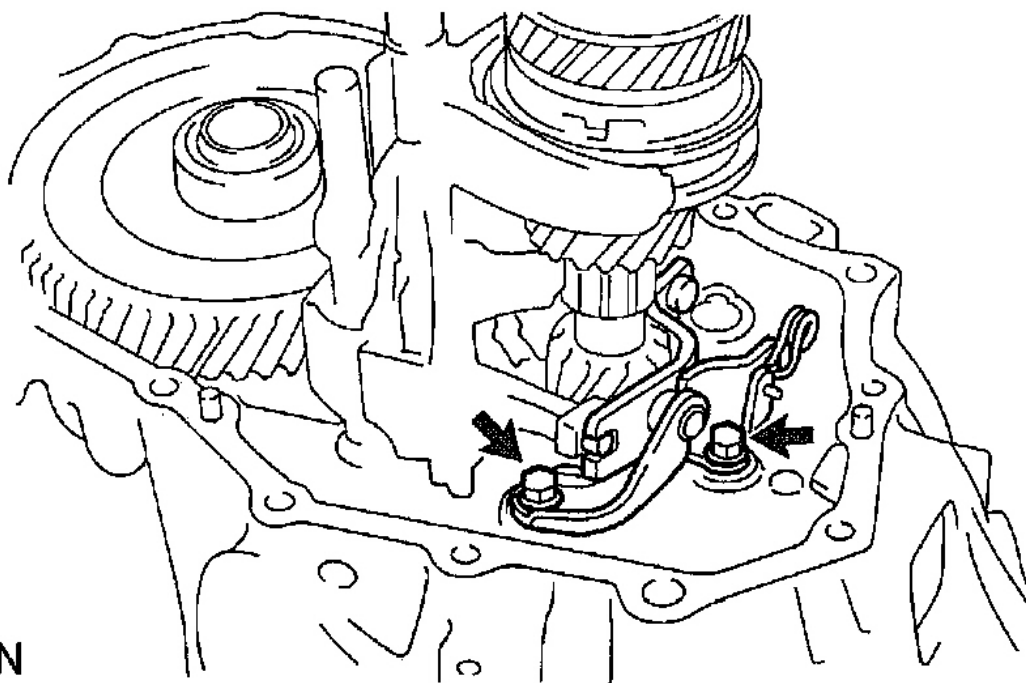
G00928072

**Fig. 89: Removing Bolts And Oil Receiver Pipes From Transmission Case**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**23. REMOVE REVERSE SHIFT ARM BRACKET**

Remove the 2 bolts and reverse shift arm bracket.

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



N

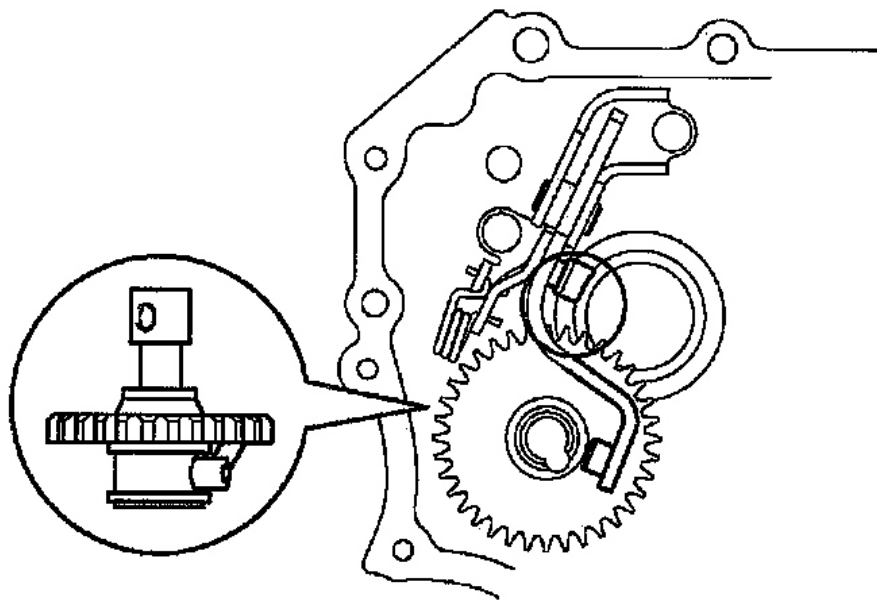
G00928073

**Fig. 90: Removing Bolts And Reverse Shift Arm Bracket**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**NOTE:** At the time of reassembly, please refer to the following items.

- Set the pin on the top of the reverse shift arm into a groove on the reverse idler gear.
- Fit the claw of the reverse shift arm bracket with the notch of the input shaft front bearing.





Y

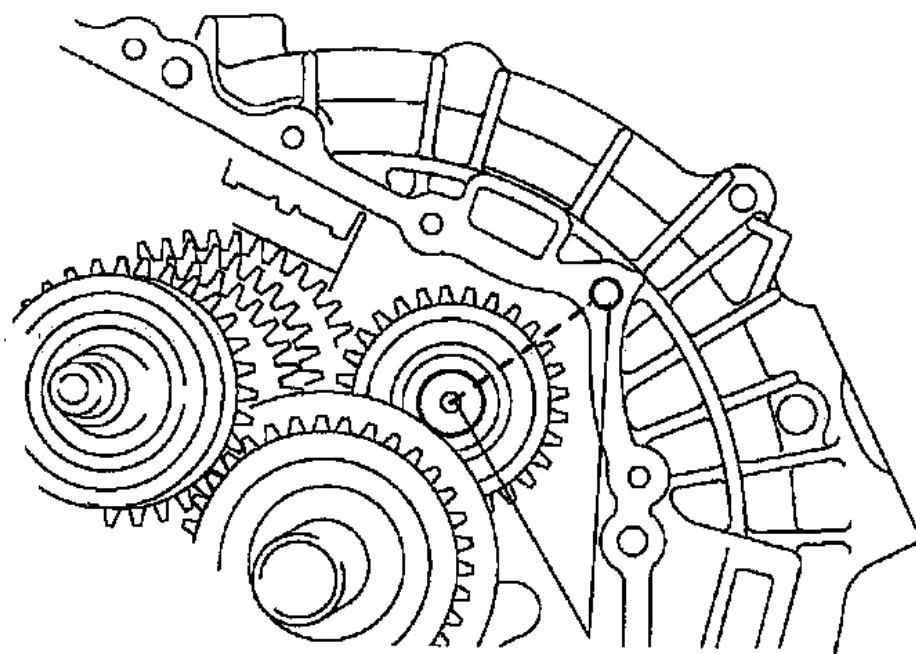
G00928074

**Fig. 91: Fitting Claw Of Reverse Shift Arm Bracket**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**24. REMOVE REVERSE IDLER GEAR, THRUST WASHER AND SHAFT**

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

**Install the reverse idler gear, thrust washer and shaft, as shown in the illustration.**



Y

**Align Alignment Mark**

G00928075

**Fig. 92: Installing Reverse Idler Gear, Thrust Washer And Shaft**

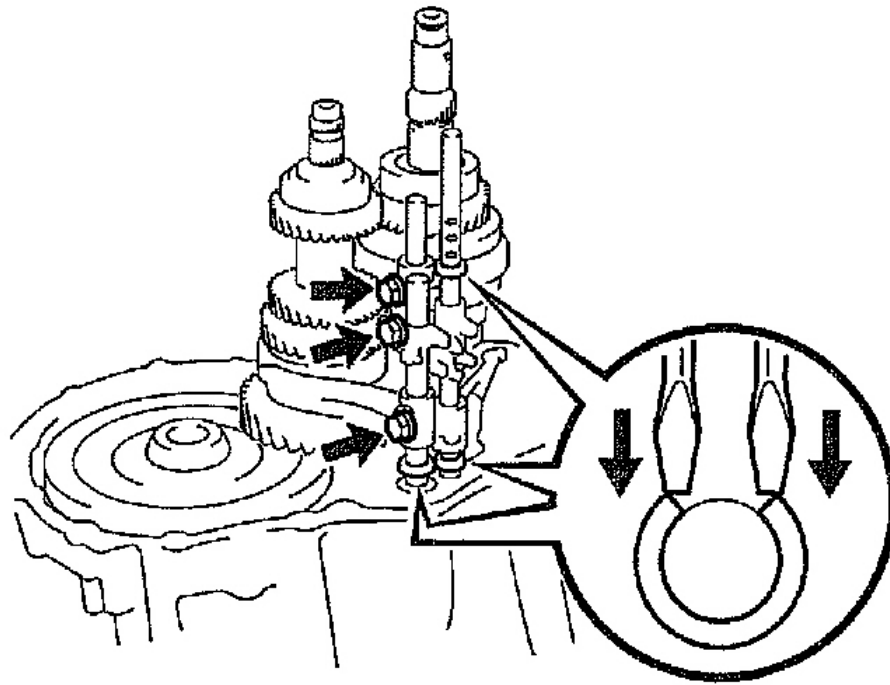
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**25. REMOVE GEAR SHIFT FORK AND GEAR SHIFT FORK SHAFT**

- a. Using 2 screwdrivers and a hammer, tap out the 3 snap rings from each gear shift fork shaft.
- b. Remove the 3 bolts from the No. 1 gear shift head, No. 1 and No. 2 gear shift forks.

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

**Torque: 16 N.m (160 kgf.cm, 12 ft.lbf)**



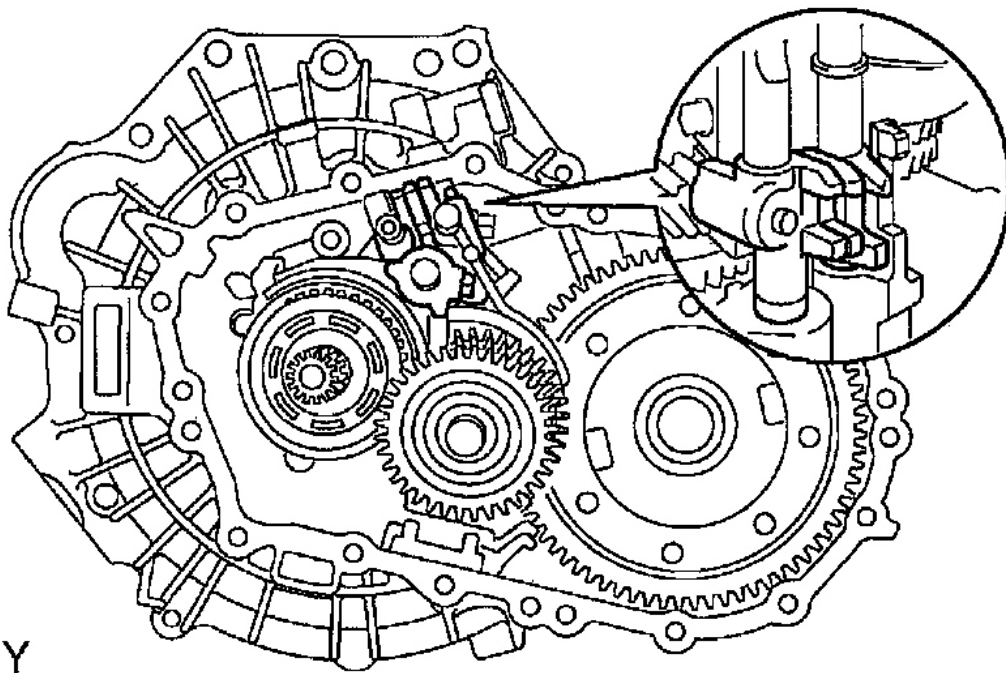
P

G00928076

**Fig. 93: Removing Bolts From Gear Shift Head**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

Make sure that the 3 gear shift heads are positioned, as shown in the illustration.



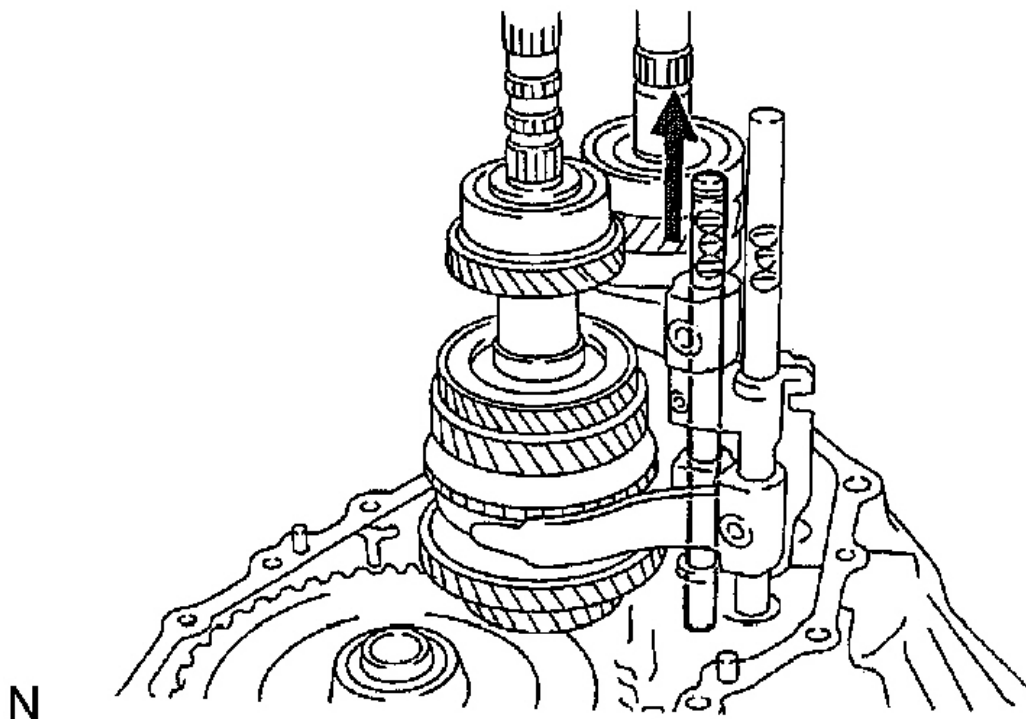
Y

G00928077

**Fig. 94: Reassembling Gear Shift Heads**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**26. REMOVE NO. 2 GEAR SHIFT FORK SHAFT**

Remove the No. 2 gear shift fork shaft from the No. 2 gear shift fork, No. 1 gear shift head, No. 1 gear shift fork, reverse shift fork and transaxle case.



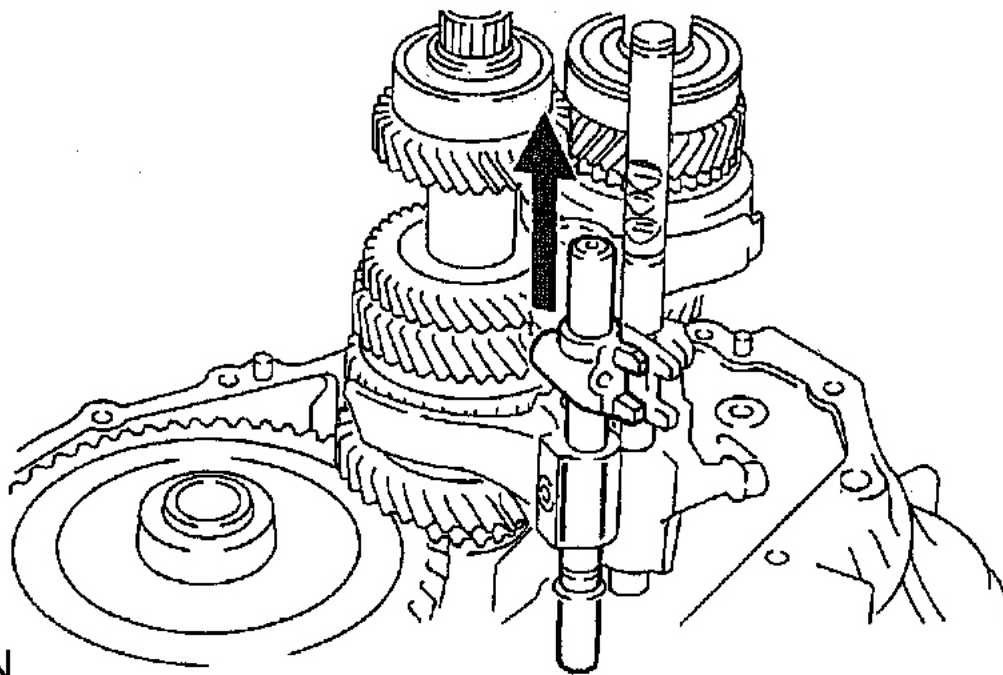
N

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**Fig. 95: Removing No. 2 Gear Shift Fork Shaft**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**27. REMOVE NO. 1 GEAR SHIFT FORK SHAFT**

Remove the No. 1 gear shift fork shaft from the No. 1 gear shift fork and transaxle case.

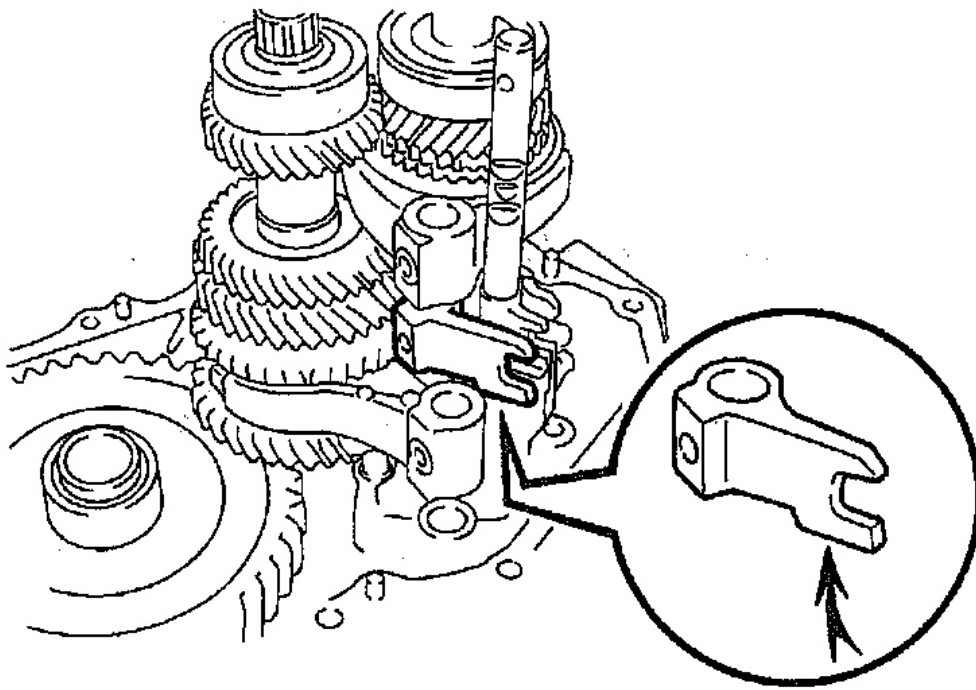


N

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**Fig. 96: Removing No. 1 Gear Shift Fork Shaft**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

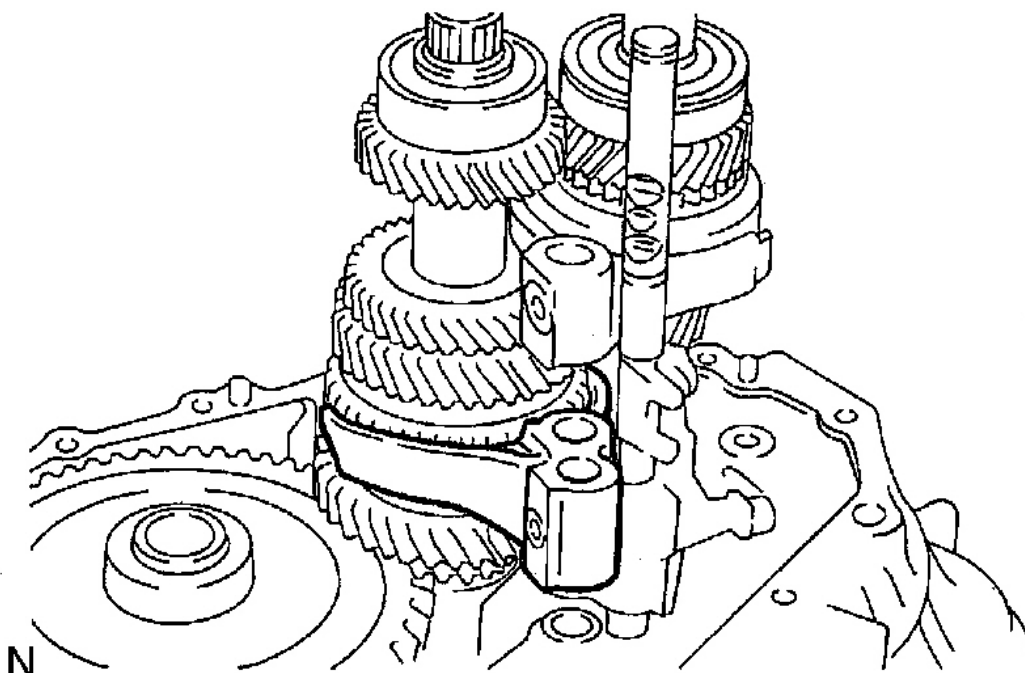
28. REMOVE NO. 1 GEAR SHIFT HEAD



N  
G00928080

**Fig. 97: Removing No. 1 Gear Shift Head**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

29. REMOVE NO. 1 GEAR SHIFT FORK FROM REVERSE GEAR GROOVE



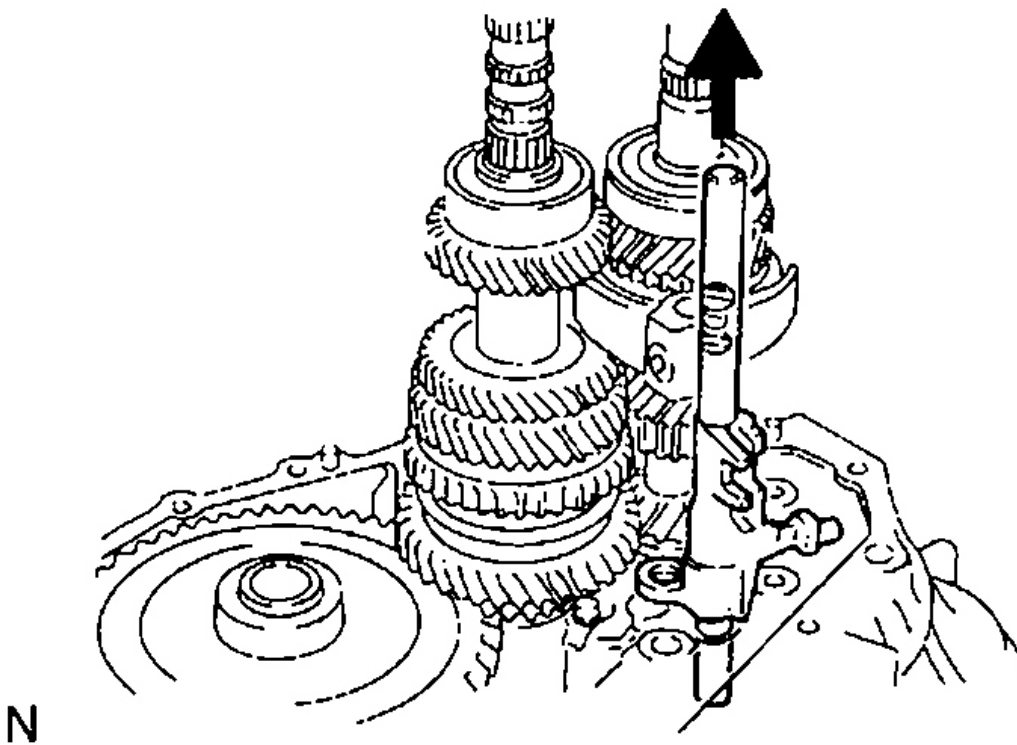
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**Fig. 98: Removing No. 1 Gear Shift Fork From Reverse Gear Groove**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

30. **REMOVE NO. 3 GEAR SHIFT FORK SHAFT AND REVERSE SHIFT FORK**
  - a. Remove the No. 3 gear shift fork shaft from the reverse shift fork and transaxle case.
  - b. Remove the reverse shift fork.





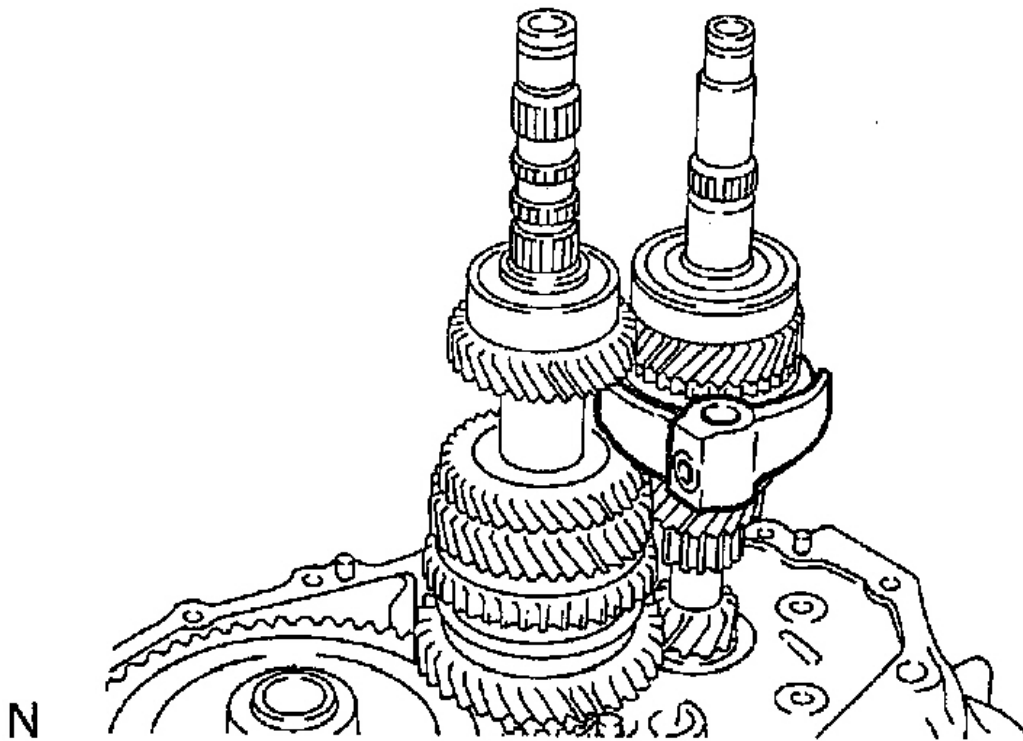
N

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**Fig. 99: Removing Reverse Shift Fork**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

31. REMOVE NO.2 GEAR SHIFT FORK FROM NO.2 HUB SLEEVE GROOVE
32. REMOVE INPUT AND OUTPUT SHAFTS TOGETHER FROM TRANSAXLE CASE
33. REMOVE DIFFERENTIAL CASE ASSEMBLY

**NOTE:** At the time of reassembly, please refer to the following item.  
Before reassembly, inspect the differential tapered roller bearing preload.  
(See REASSEMBLY)



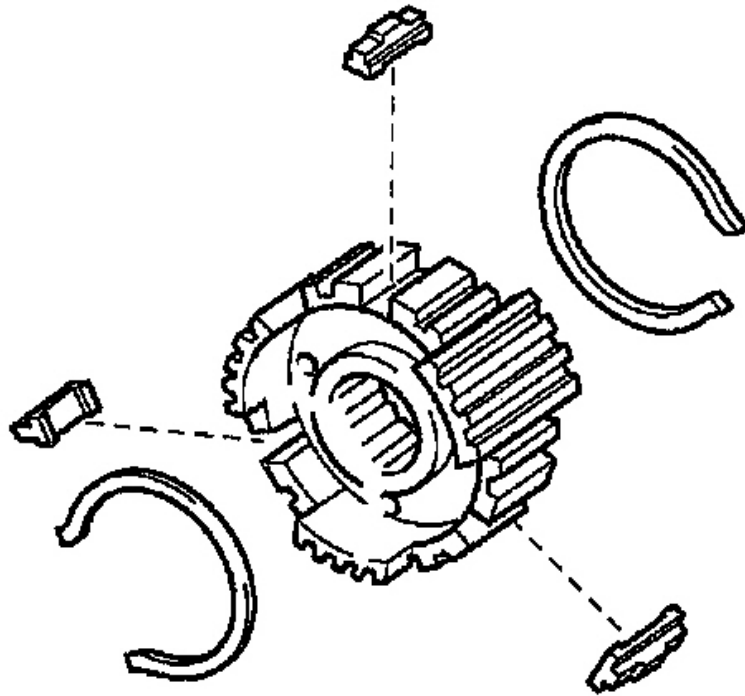
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**Fig. 100: Removing No.2 Gear Shift Fork From No.2 Hub Sleeve Groove**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

34. **REMOVE MAGNET FROM TRANSAXLE CASE**
35. **REMOVE TRANSAXLE CASE RECEIVER**
  - a. Remove the bolt and transaxle case receiver from the transaxle case.
36. **DISASSEMBLE NO. 3 CLUTCH HUB ASSEMBLY**
  - a. Using a screwdriver, remove the 2 shifting key springs.

**NOTE:** At the time of reassembly, please refer to the following item.  
Position the shifting key springs so that their end gaps are not aligned.

- b. Remove the 3 No. 3 shifting keys from the No. 3 clutch hub.



Y

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**Fig. 101: Disassembling No. 3 Clutch Hub Assembly**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## INSPECTION

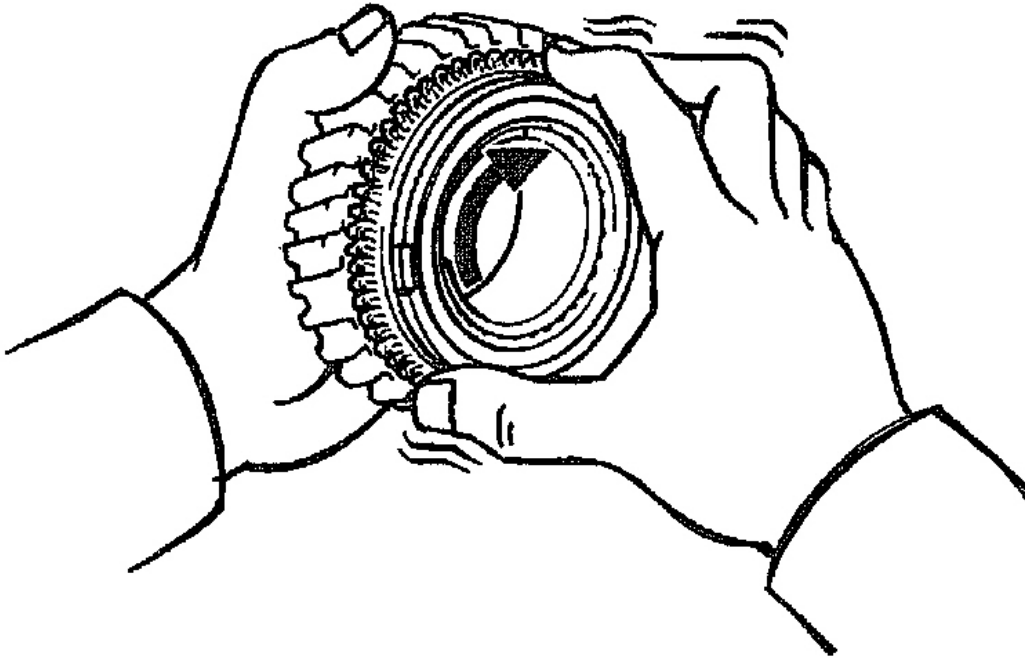
### 1. INSPECT 5TH AND 6TH GEARS SYNCHRONIZER RING

- 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 the fine lapping compound between the synchronizer ring and gear cone. Lightly rub the synchronizer ring and gear cone together.

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

- 
- c. Check again the braking effect of the synchronizer ring.



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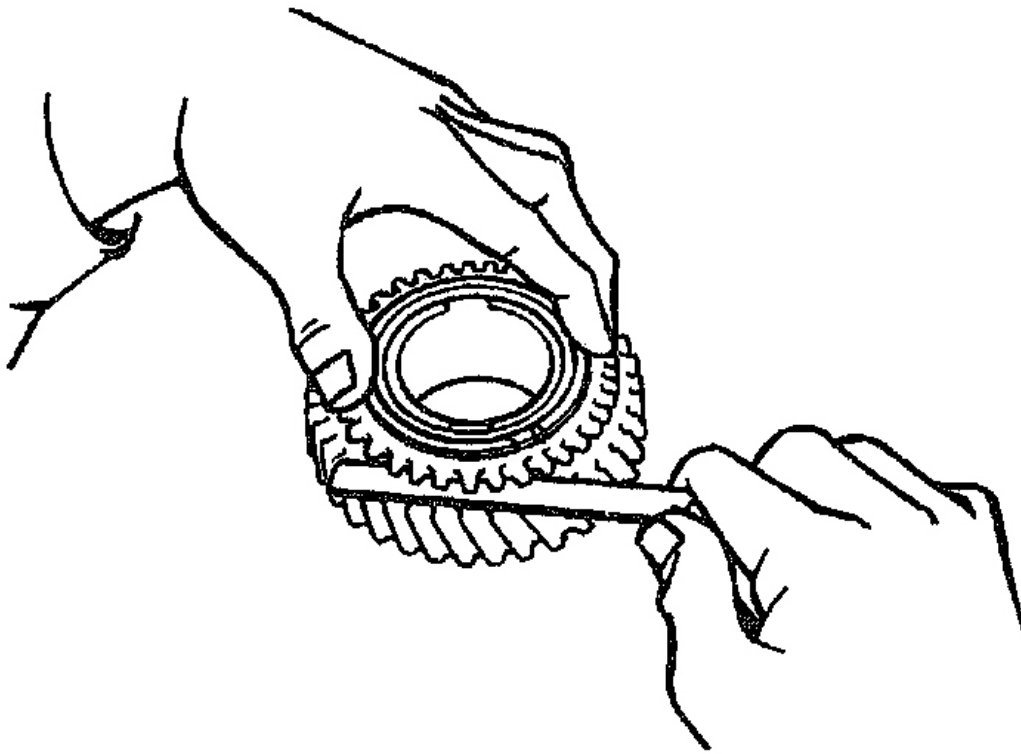
**Fig. 102: Checking Braking Effect Of Synchronizer Ring**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

**Minimum clearance: 0.75 mm (0.0295 in.)**

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

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



G00928086

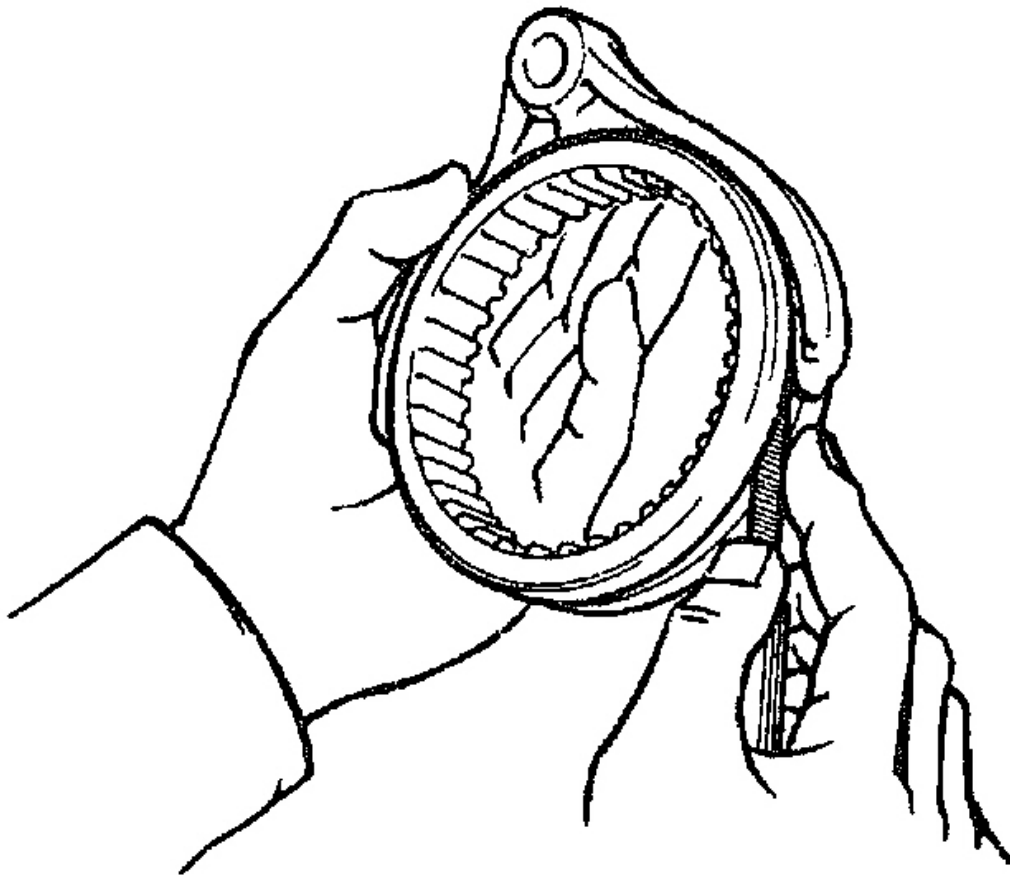
**Fig. 103: Measuring Clearance Between Synchronizer Ring Back And Gear Spline End**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## 2. INSPECT GEAR SHIFT FORK AND HUB SLEEVE CLEARANCE

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

**Maximum clearance: 0.89 mm (0.035 in.)**

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



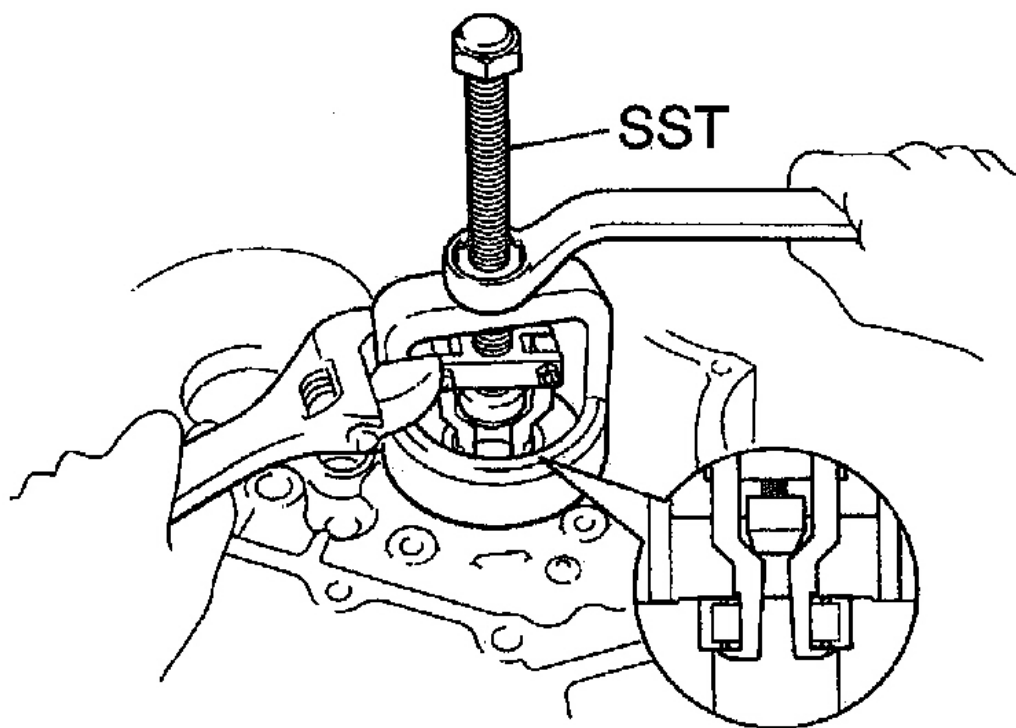
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**Fig. 104: Measuring Clearance Between Hub Sleeve And Gear Shift Fork**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## REPLACEMENT

1. **REPLACE INPUT SHAFT FRONT BEARING AND OIL SEAL**
  - a. Using SST, remove the input shaft front bearing.

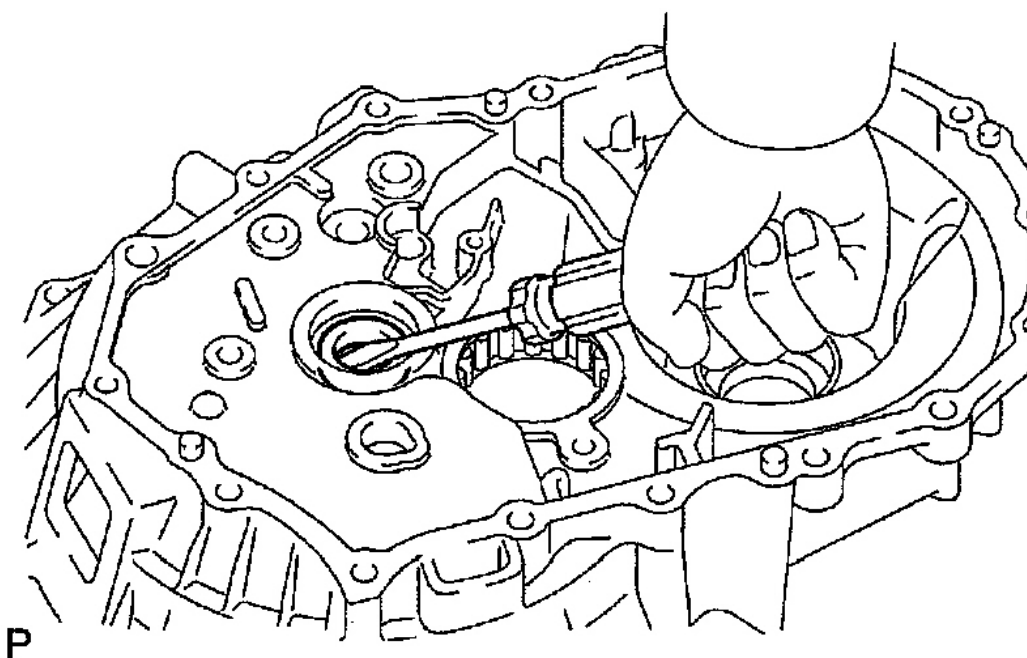
SST 09612-65014



G00928088

**Fig. 105: Removing Input Shaft Front Bearing Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using a screwdriver, pry out the oil seal.



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**Fig. 106: Prying Out Oil Seal Using Screwdriver**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

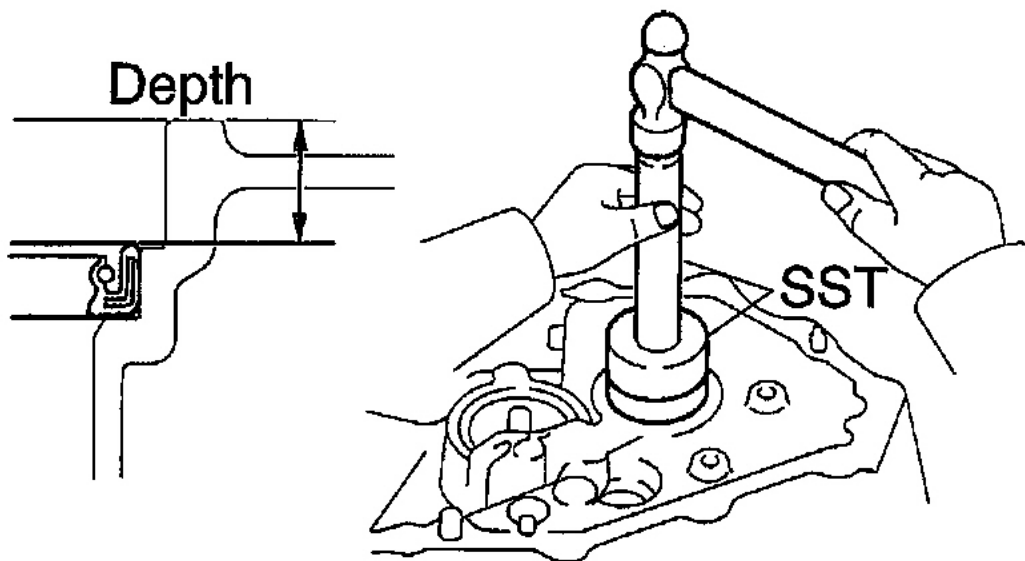
- c. Using SST and a hammer, tap in a new oil seal.

SST 09950-60010 (09951-00360), 09950-70010 (09951-07150)

**Depth: 15.8 +/- 0.2 mm (0.622 +/- 0.008 in.)**

- d. Coat the lip of the oil seal with MP grease.





G00928090

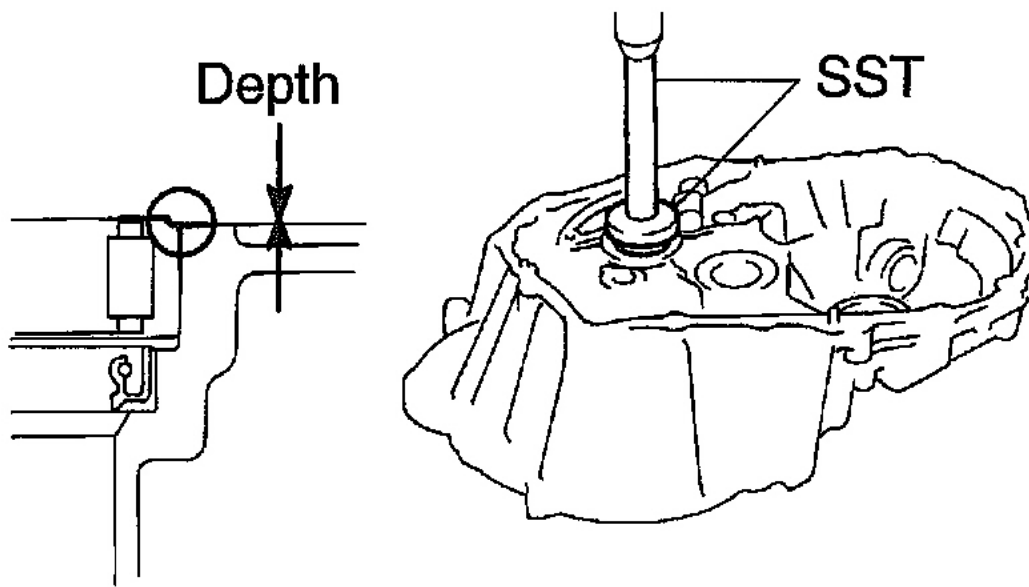
**Fig. 107: Identifying Tap In A New Oil Seal Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Using SST and a press, press in a new input shaft front bearing.

SST 09950-60010 (09951-00400), 09950-70010 (09951-07150)

**Depth: 0 to 0.3 mm (0 to 0.012 in.)**

**NOTE:** Be sure to install a new bearing in the correct direction, as shown in the illustration.

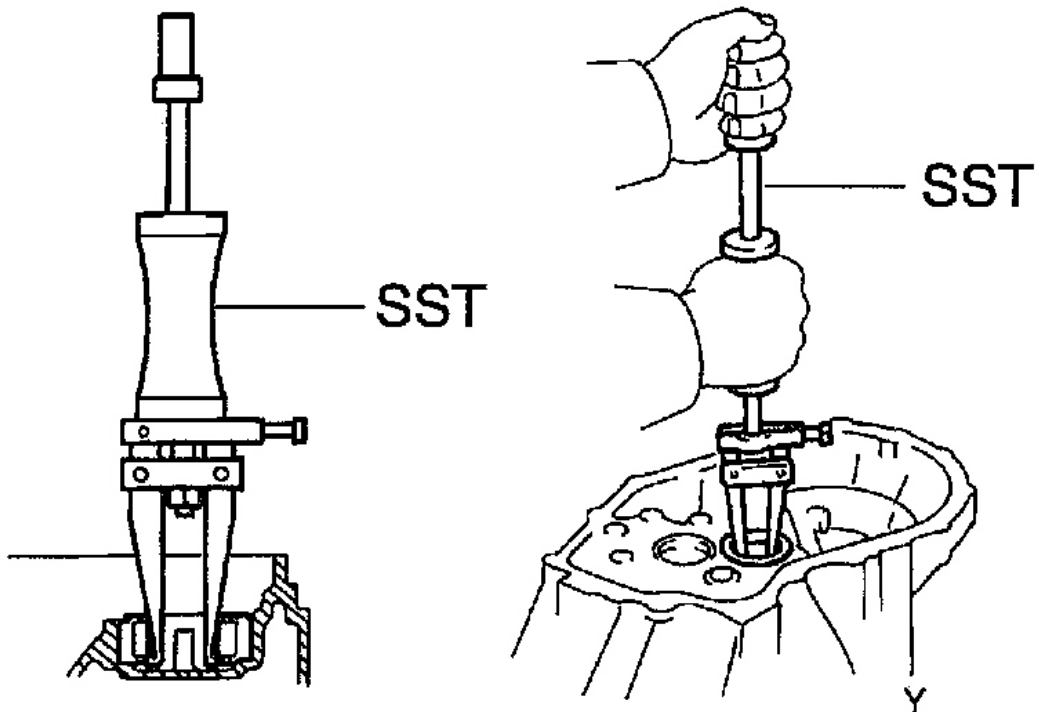


G00928091

**Fig. 108: Pressing New Input Shaft Front Bearing**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. **REPLACE OUTPUT SHAFT FRONT BEARING AND OUTPUT SHAFT COVER**
  - a. Remove the bolt and bearing lock plate.
  - b. Using SST, drive out the output shaft front bearing.

SST 09308-00010

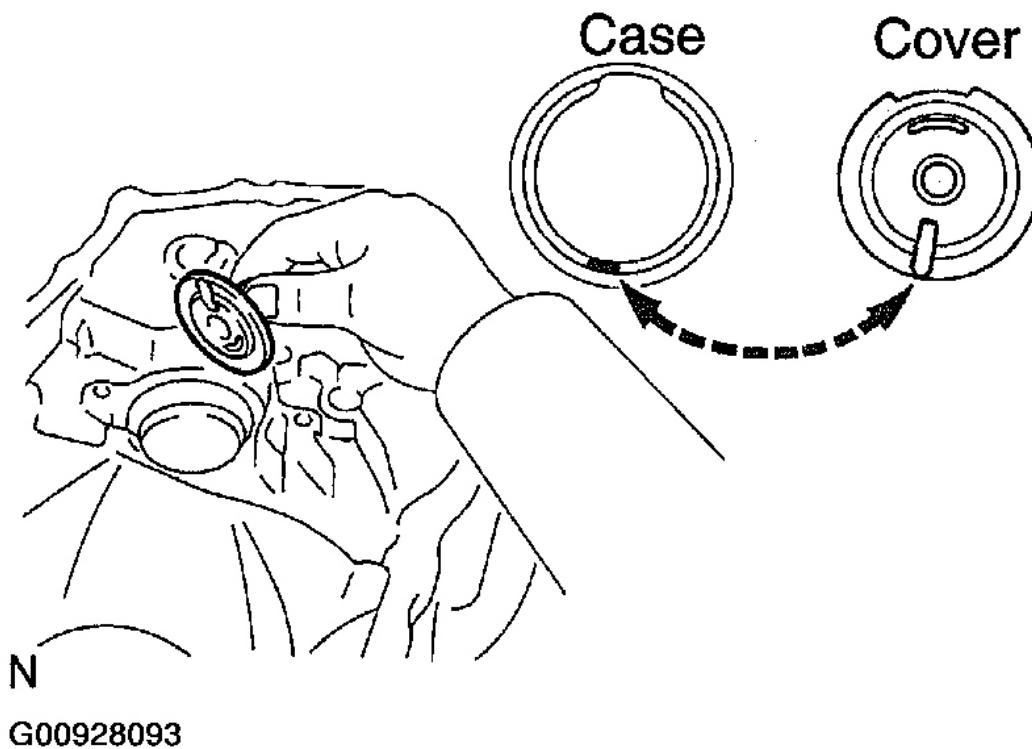


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**Fig. 109: Identifying Drive Out Output Shaft Front Bearing Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the output shaft cover.
- d. Install the output shaft cover.

**NOTE:** Install the output shaft cover projection into the case side hollow.



**Fig. 110: Installing Output Shaft Cover**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Using SST and a press, press in a new output shaft front bearing.

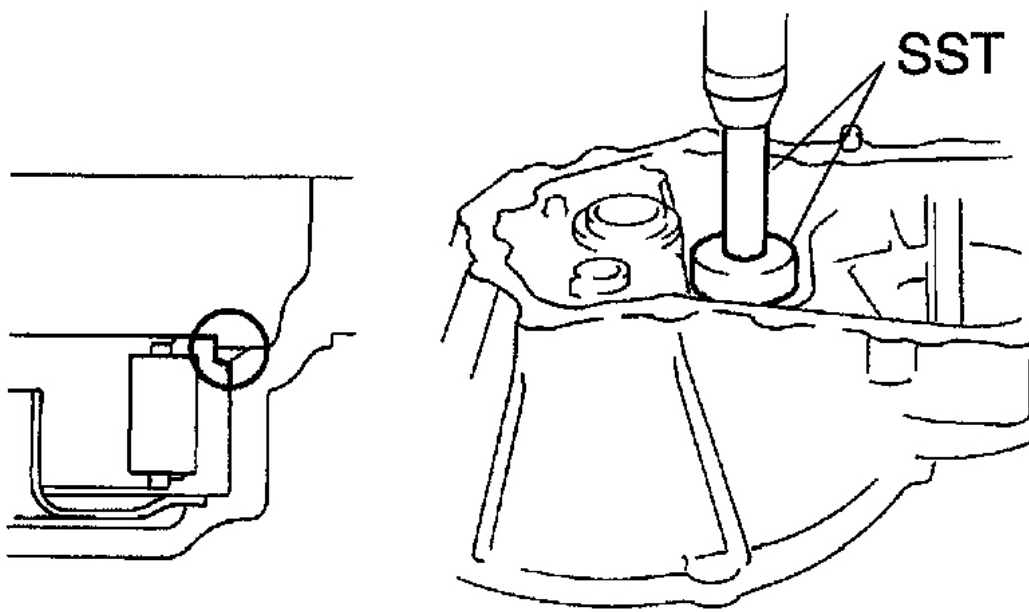
SST 09950-60010 (09951-00560), 09950-70010 (09951-07150)

**NOTE:**

- Be sure to install a new bearing in the correct direction, as shown in the illustration.
- When replacing the output shaft front bearing, replace the output shaft front bearing inner race along with it.

- f. Install the bearing lock plate with the bolt.

**Torque: 11 N.m (115 kgf.cm, 8 ft.lbf)**



G00928094

**Fig. 111: Pressing New Output Shaft Front Bearing**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

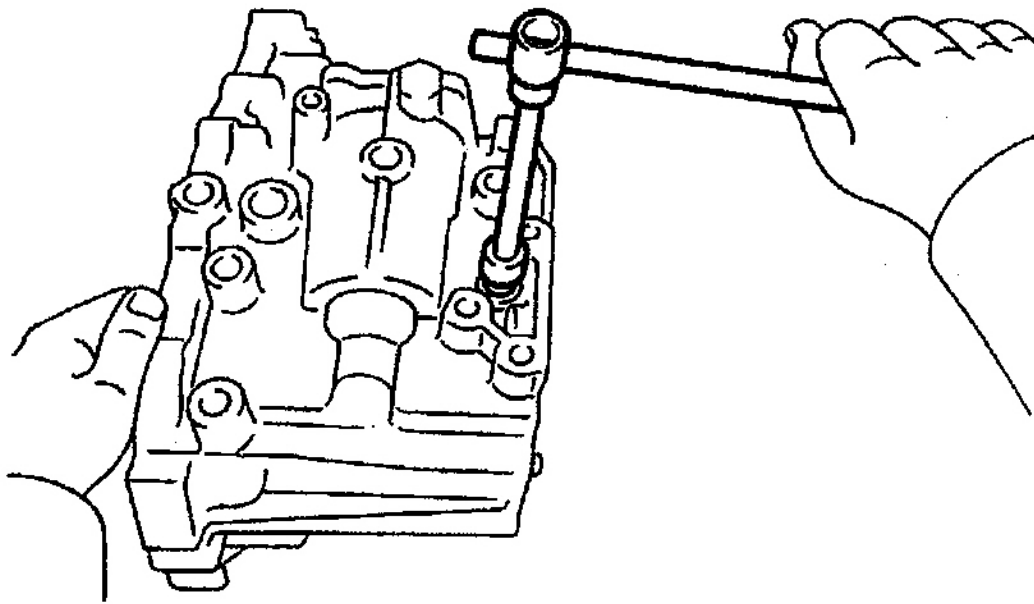
**3. INSTALL TRANSAXLE CASE RECEIVER**

Install the transaxle case receiver to the transaxle case with the bolt.

**Torque: 11 N.m (115 kgf.cm, 8 ft.lbf)**

**4. REPLACE REVERSE RESTRICT PIN**

- a. Using a hexagon wrench, remove the straight screw plug.
- b. Using a pin punch and a hammer, tap out the slotted spring pin.



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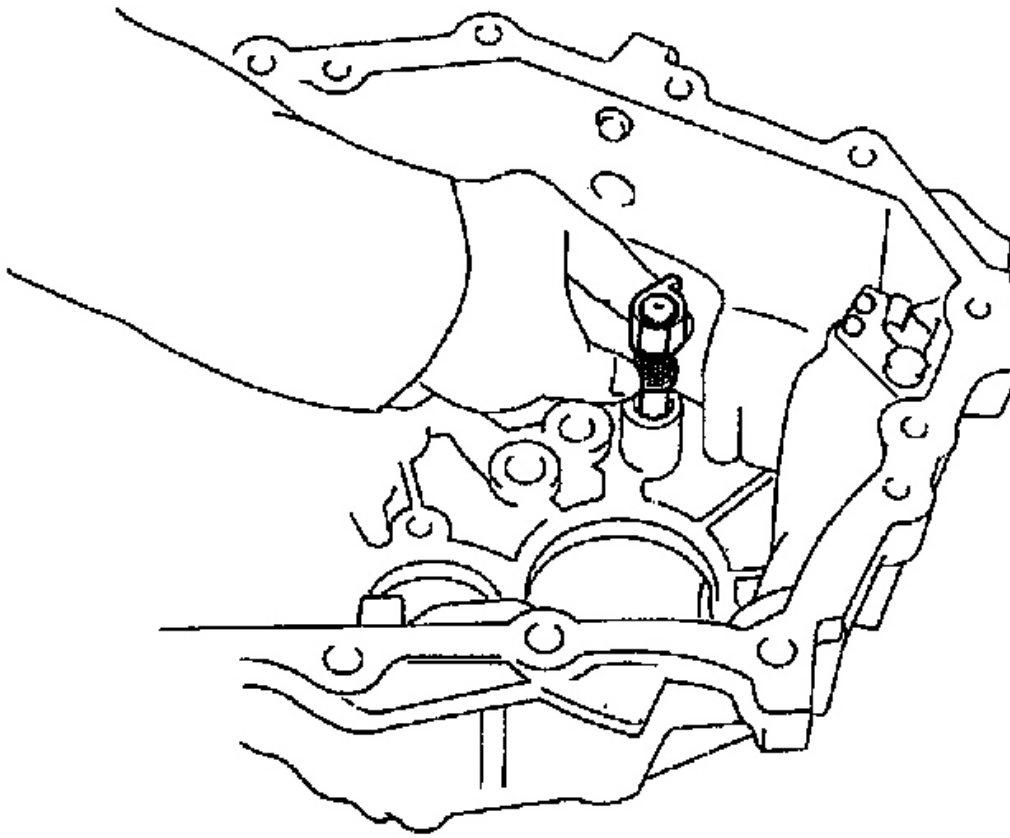
**Fig. 112: Removing Straight Screw Plug Using Hexagon Wrench**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Replace the reverse restrict pin.
- d. Using a pin punch and a hammer, tap in the slotted spring pin.
- e. Apply sealant to the screw plug threads.

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

- f. Using a hexagon wrench, install the straight screw plug.

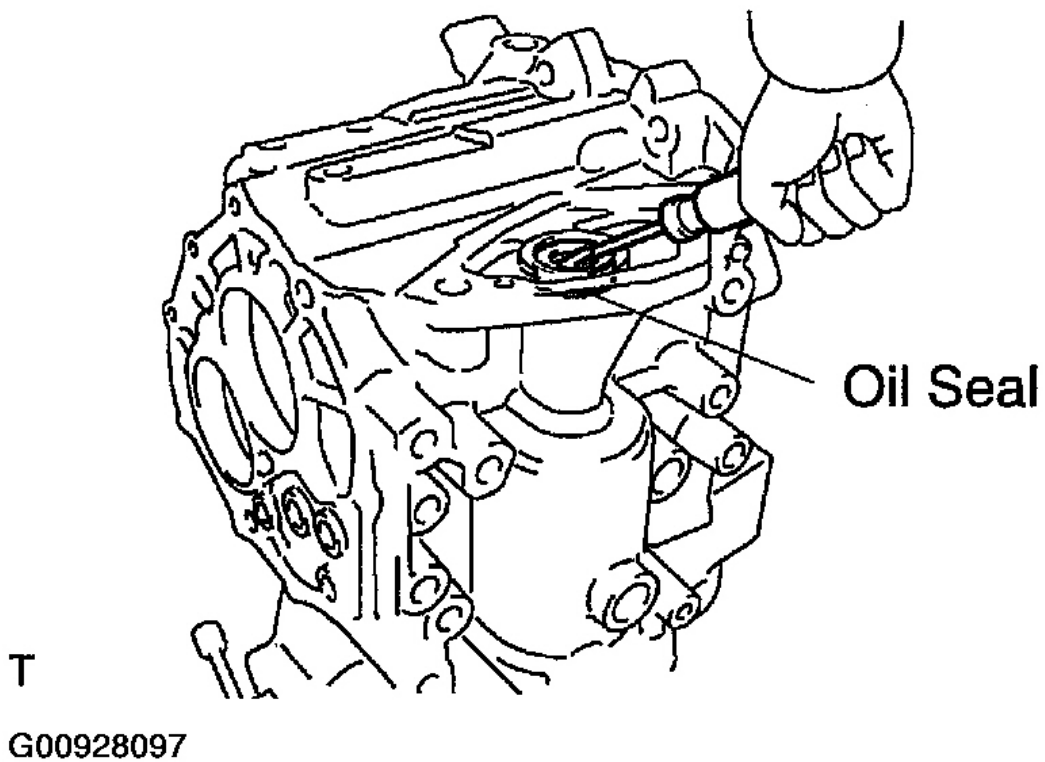
**Torque: 13 N.m (130 kgf.cm, 9 ft.lbf)**



**G00928096**

**Fig. 113: Replacing Reverse Restrict Pin**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- 5. REPLACE CONTROL SHAFT OIL SEAL AND BUSHING**
  - a. Using screwdriver, pry out the oil seal.

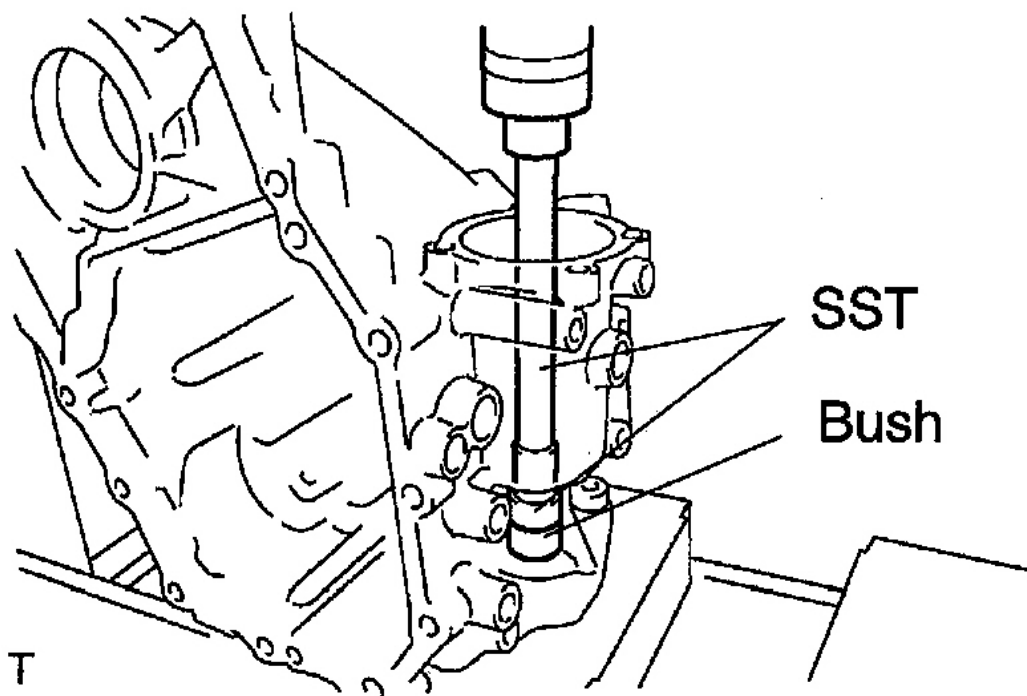


**Fig. 114: Prying Out Oil Seal Using Screwdriver**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using SST and a press, press out the bushing.

SST 09043-38100, 09950-60010 (09951-00180)





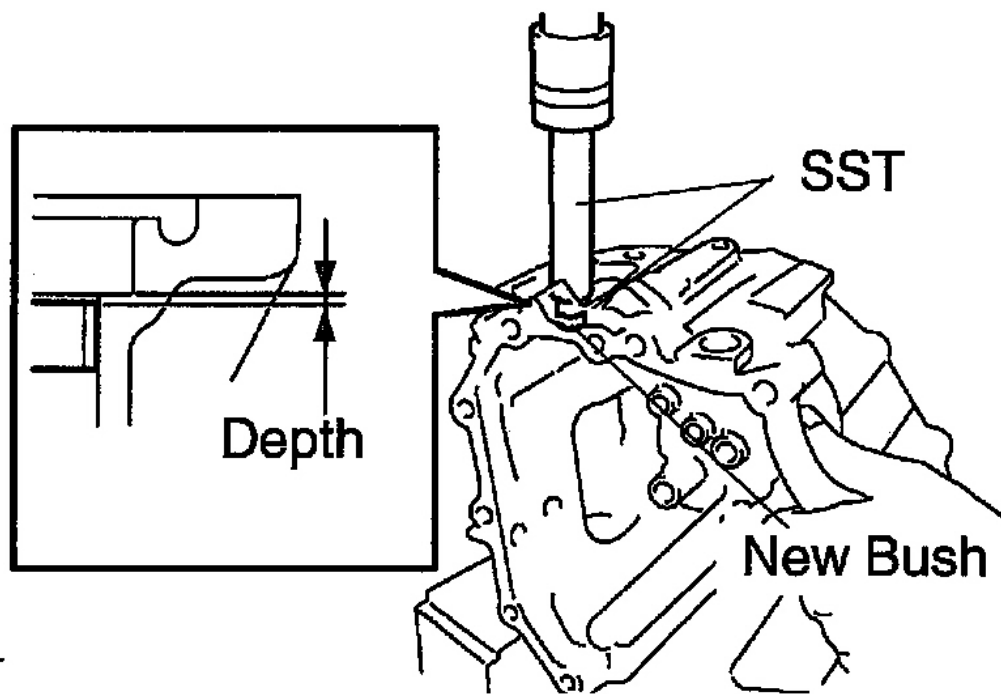
G00928098

**Fig. 115: Pressing Out Bushing Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using SST and a press, press in a new bushing.

SST 09950-60010 (09951-00180), 09950-70010 (09951-07150)

**Depth: 0.8 mm (0.031 in.)**



T

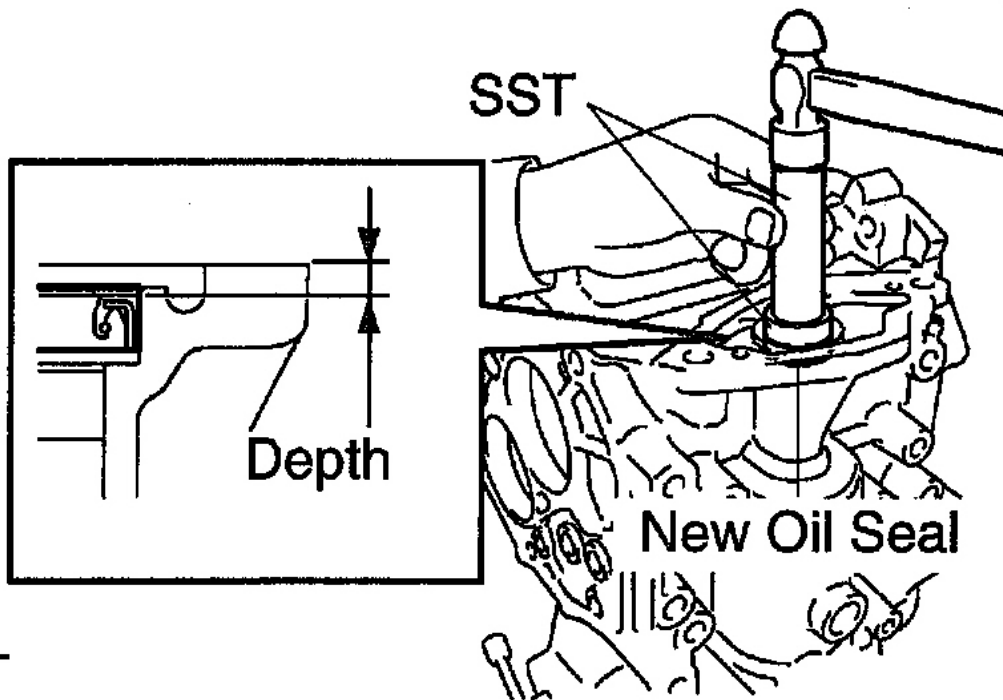
G00928099

**Fig. 116: Pressing New Bushing Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Using SST and a plastic-faced hammer, carefully tap in a new oil seal.

SST 09950-60010 (09951-00270), 09950-70010 (09951-07150)

**Depth: 4.5 +/- 0.3 mm (0.177 +/- 0.012 in.)**



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**Fig. 117: Identifying Tap In A New Oil Seal Using Plastic-Faced Hammer**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

#### REASSEMBLY

Reassembly is in the reverse order of disassembly (See DISASSEMBLY).

**NOTE:** When working with FIPG material, you must observe the followings.

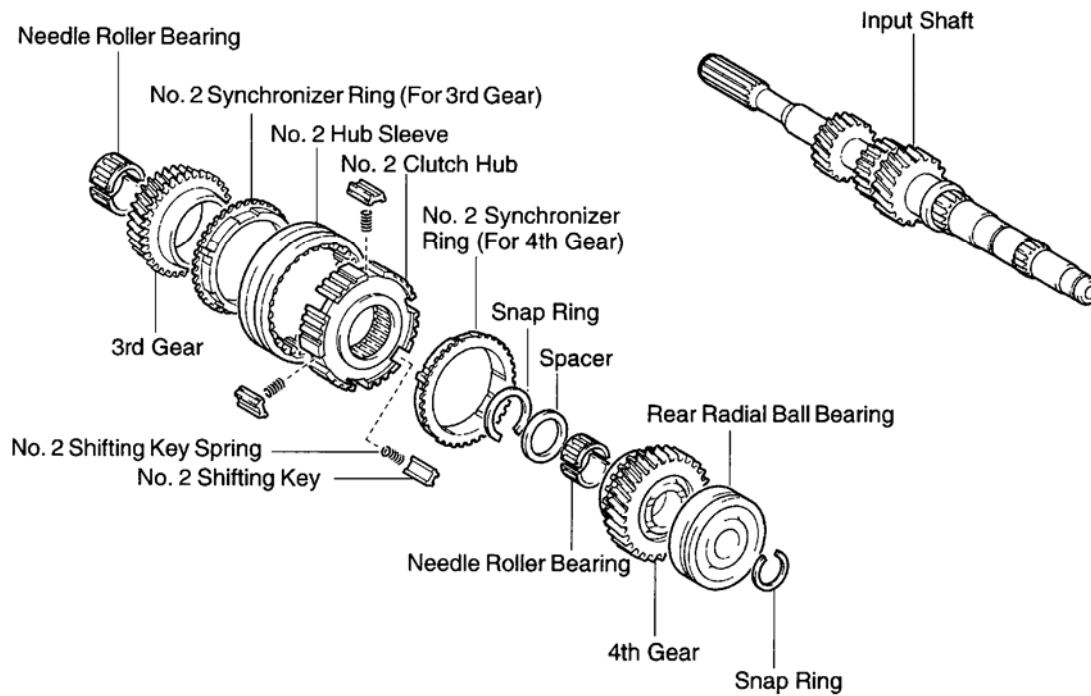
- Using a razor blade and gasket scraper, remove all old FIPG material from the gasket surfaces.
- Thoroughly clean all components to remove all loose material.
- Clean both sealing surfaces with a non-residue solvent.
- Apply FIPG in an approx. 1 mm (0.04 in.) wide bead along the sealing surface.
-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

HINT:

Before assembly, coat all of the sliding and rotating surfaces with gear oil.

## INPUT SHAFT

### COMPONENTS



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**Fig. 118: Identifying Input Shaft Components**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

### DISASSEMBLY

#### 1. INSPECT 3RD AND 4TH GEARS THRUST CLEARANCE

Using a feeler gauge, measure the thrust clearance.

3rd gear	0.10 to 0.35 mm (0.0039 to 0.0138 in.)
4th gear	0.10 to 0.55 mm (0.0039 to 0.0217 in.)

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**Fig. 119: Measuring Thrust Clearance Using Feeler Gauge**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard clearance:

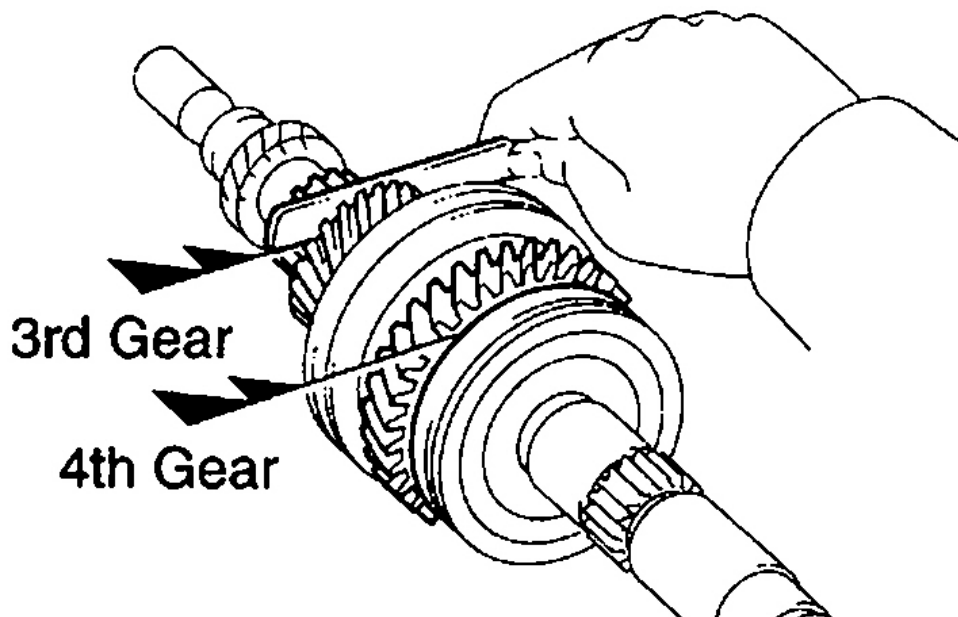
3rd gear	0.35 mm (0.0138 in.)
4th gear	0.55 mm (0.0217 in.)

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**Fig. 120: Standard Clearance Specification Table**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Maximum clearance:



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**Fig. 121: Maximum Clearance Specification Table**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## 2. INSPECT 3RD AND 4TH GEARS RADIAL CLEARANCE

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

KOYO made	0.015 to 0.058 mm (0.0006 to 0.0023 in.)
NSK made	0.015 to 0.056 mm (0.0006 to 0.0022 in.)

G00928105

**Fig. 122: Measuring Radial Clearance Between Gear And Shaft**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**Standard clearance:**

**3rd gear**

KOYO made	0.009 to 0.050 mm (0.0004 to 0.0020 in.)
NSK made	0.009 to 0.050 mm (0.0004 to 0.0020 in.)

G00928106

**Fig. 123: Standard Clearance 3rd Gear Specification Table**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**4th gear**

KOYO made	0.058 mm (0.0023 in.)
NSK made	0.056 mm (0.0022 in.)

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**Fig. 124: Standard Clearance 4th Gear Specification Table**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**Maximum clearance:**

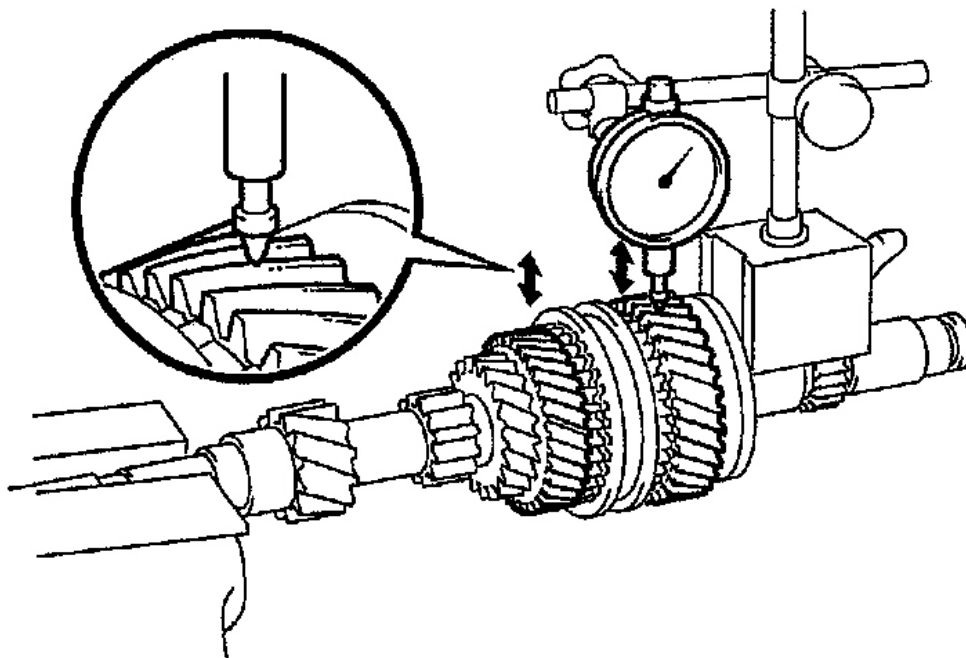
**3rd gear**

KOYO made	0.050 mm (0.0020 in.)
NSK made	0.050 mm (0.0020 in.)

G00928108

**Fig. 125: Maximum Clearance 3Rd Gear Specification Table**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4th gear



**P**

G00928109

**Fig. 126: Maximum Clearance 4Th Gear Specification Table**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

**3. REMOVE SNAP RING**

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

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**NOTE: Take care not to damage the journal surface of the input shaft.**

**4. REMOVE REAR RADIAL BALL BEARING, 4TH GEAR, NEEDLE ROLLER BEARING, SPACER AND NO.2 SYNCHRONIZER RING (FOR 4TH GEAR)**

- a. Using SST and a press, press out the rear radial ball bearing and 4th gear.

SST 09950-00020

HINT:

Support the input shaft assembly by hand so that it will not be dropped off.

- b. Remove the needle roller bearing, spacer and No. 2 synchronizer ring (for the 4th gear).

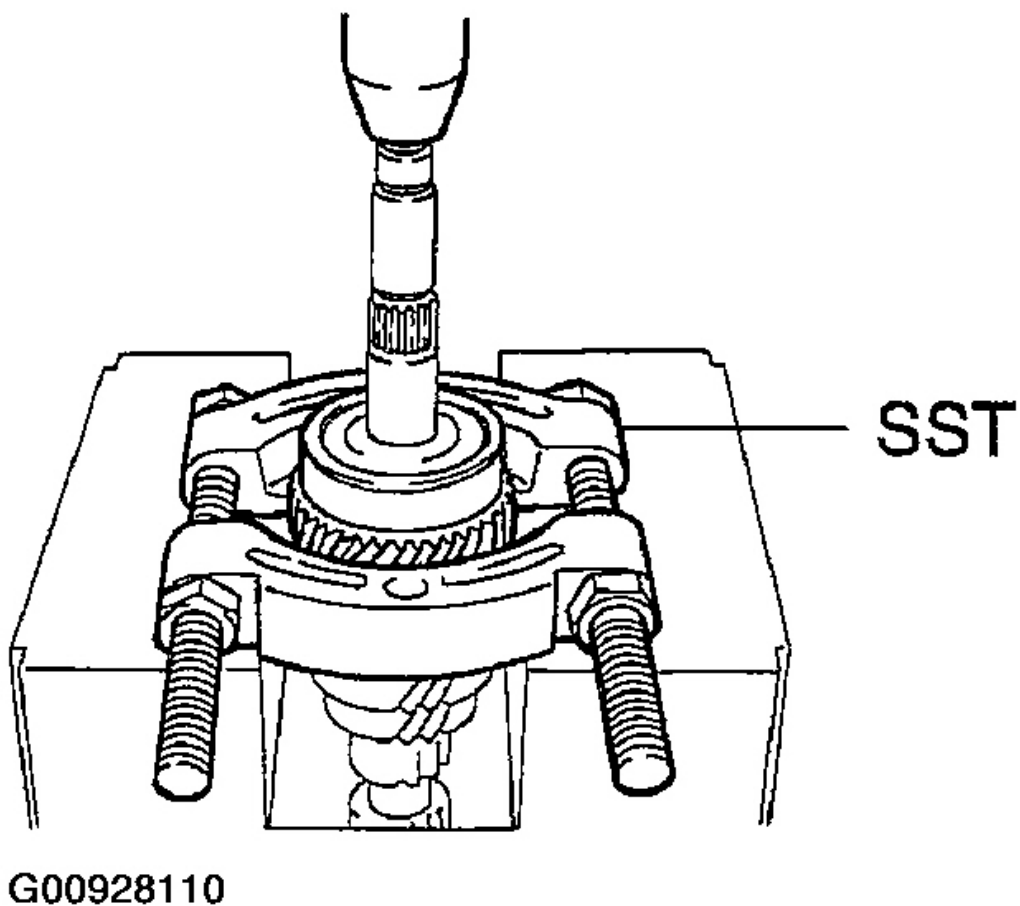
**5. REMOVE SNAP RING**

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

HINT:

Take care not to damage the journal surface of the input shaft.





**Fig. 127: Identifying Tap Out Snap Ring Using Screwdrivers And Hammer**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

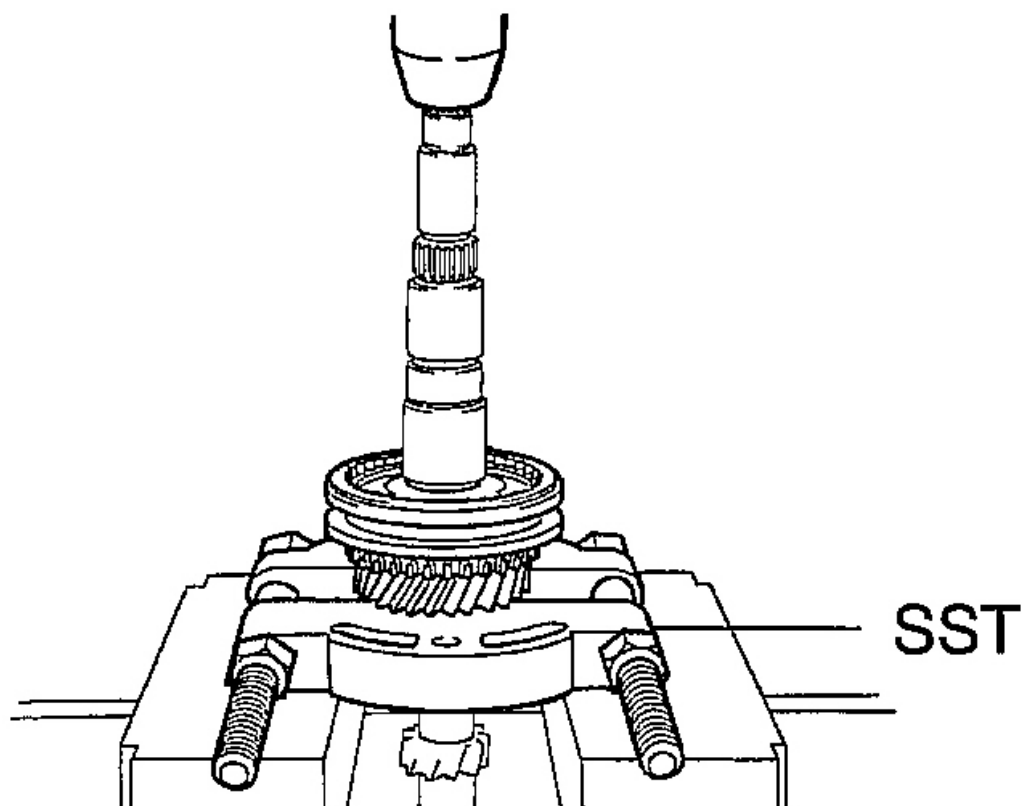
**6. REMOVE NO.2 HUB SLEEVE, NO.2 CLUTCH HUB ASSEMBLY, NO. 2 SYNCHRONIZER RING (FOR 3RD GEAR), 3RD GEAR AND NEEDLE ROLLER BEARING**

- a. Using SST and a press, press out the No. 2 hub sleeve, No. 2 clutch hub assembly, No. 2 synchronizer ring (for the 3rd gear) and 3rd gear.

SST 09950-00020

HINT:

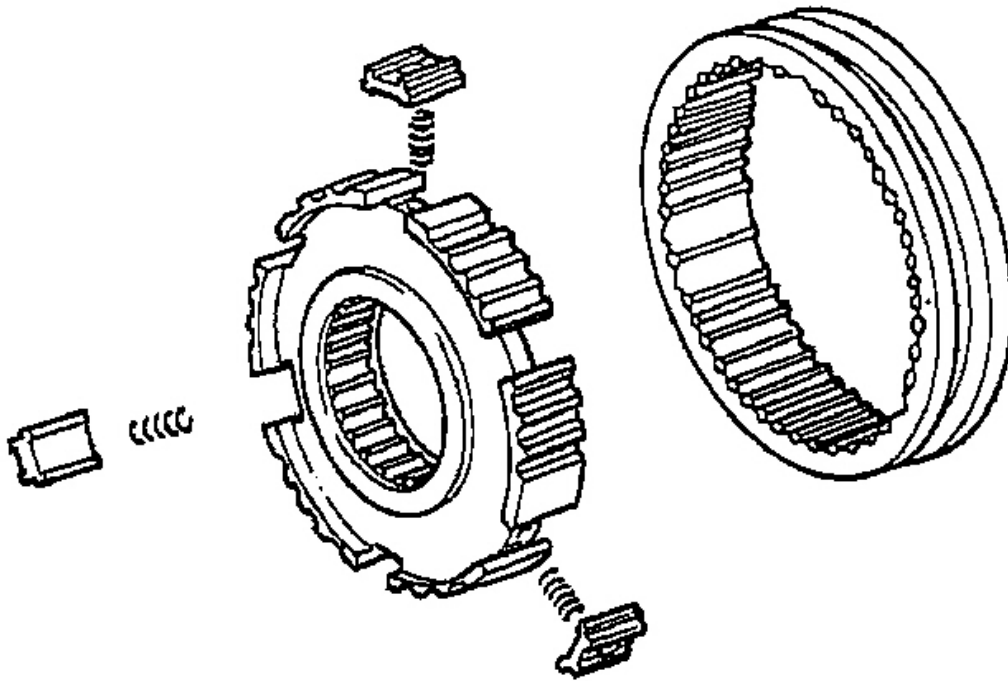
Support the input shaft by hand so that it will not be dropped off.



G00928111

**Fig. 128: Pressing Out No. 2 Hub Sleeve Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the needle roller bearing.
- 7. DISASSEMBLE NO. 2 HUB SLEEVE AND NO. 2 CLUTCH HUB**
- a. Remove the No. 2 hub sleeve from the No. 2 clutch hub.
  - b. Remove the 3 No. 2 shifting keys and 3 No. 2 shifting key springs from the No. 2 clutch hub.



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**Fig. 129: Removing No. 2 Shifting Keys And No. 2 Shifting Key Springs**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

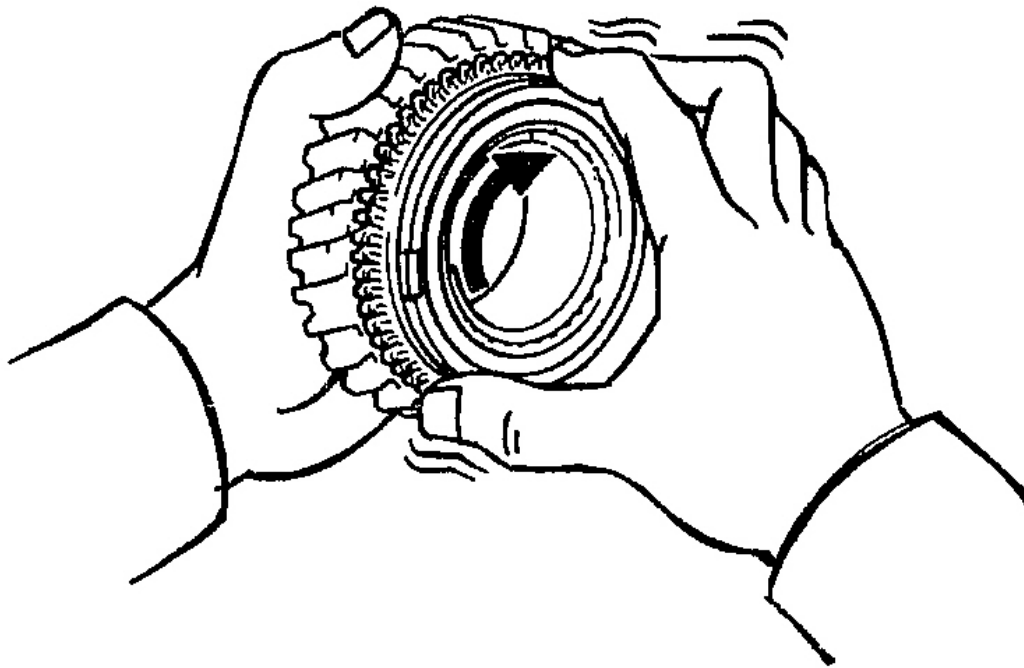
## INSPECTION

### 1. INSPECT SYNCHRONIZER RING

- a. Check for wear or damage.
- b. Check the braking effect of the synchronizer ring.

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

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



G00928113

**Fig. 130: Checking Braking Effect Of Synchronizer Ring**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**NOTE:** 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**

3rd gear	0.65 mm (0.0256 in.)
4th gear	0.75 mm (0.0295 in.)

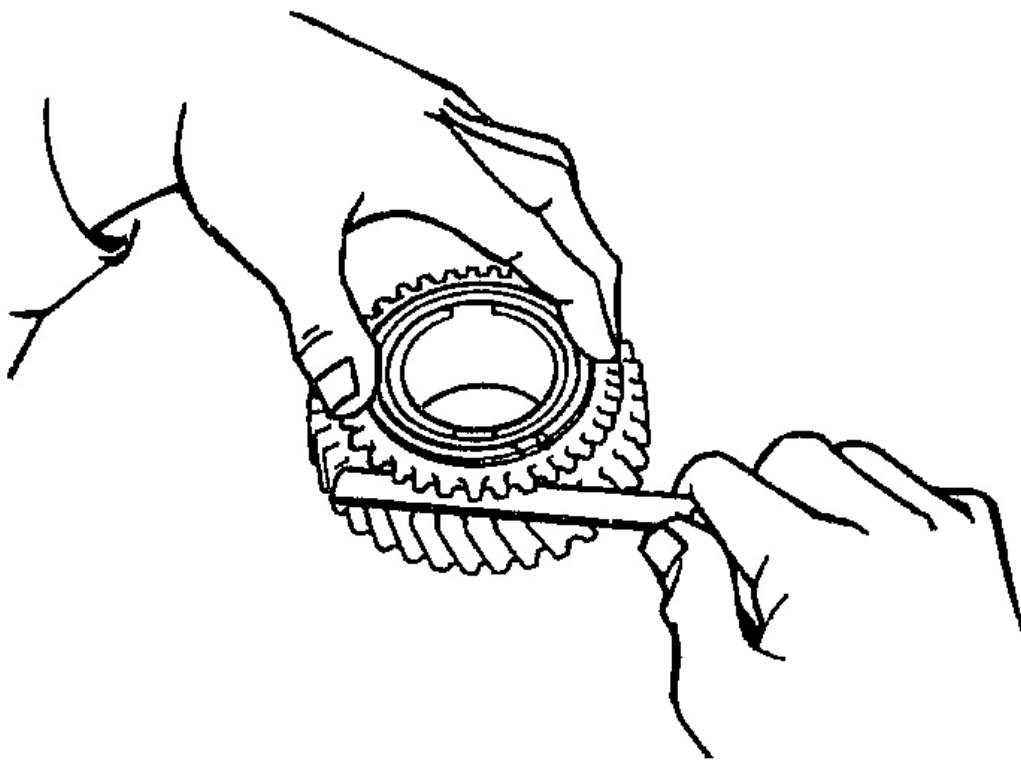
G00928114

**Fig. 131: Minimum Clearance Specification Table**

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Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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



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**Fig. 132: Measuring Clearance Between Synchronizer Ring Back And Gear Spline End**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

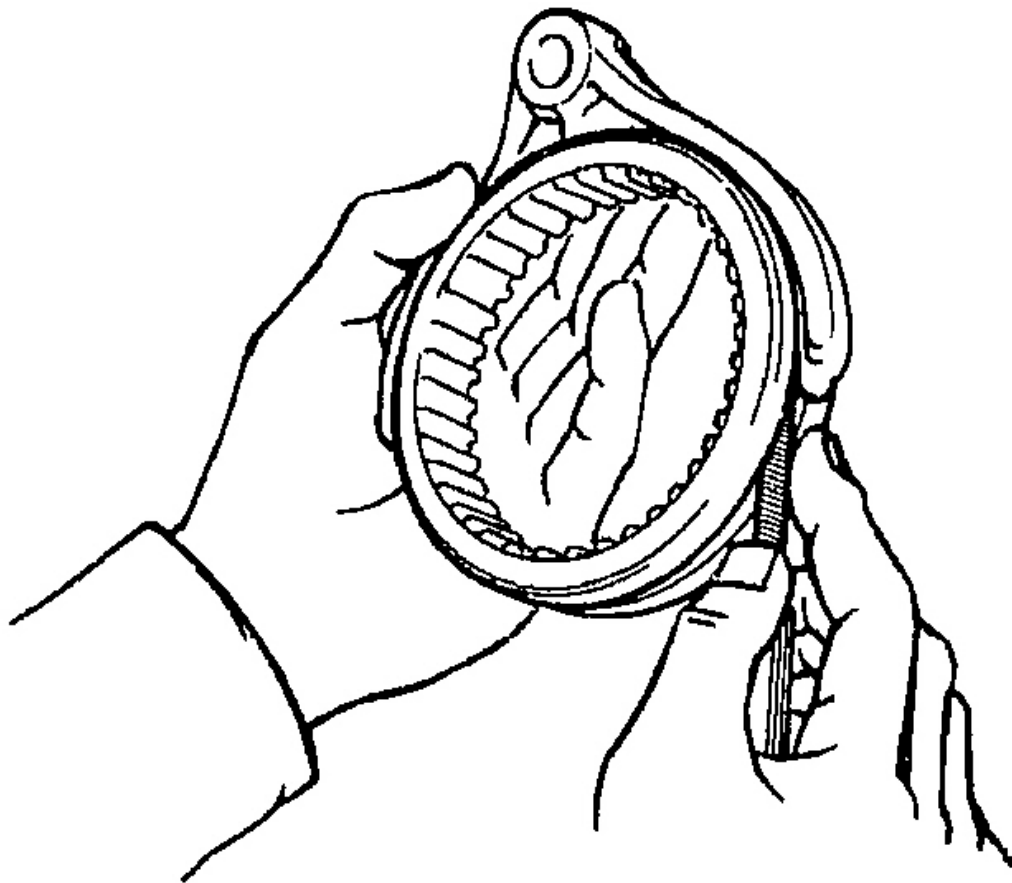
**NOTE:** Ensure the fine lapping compound is completely washed off after rubbing.

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

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

**Maximum clearance: 0.35 mm (0.014 in.)**

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



G00928116

**Fig. 133: Measuring Clearance Between Hub Sleeve And Gear Shift Fork**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**3. INSPECT INPUT SHAFT**

- a. Check the input shaft for wear or damage.
- b. Using a micrometer, measure the journal diameter.

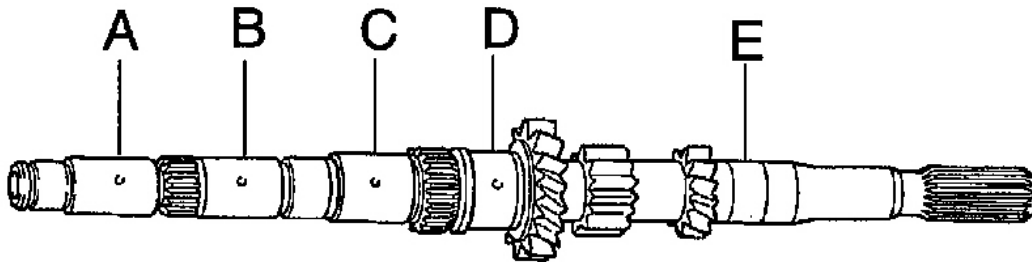
**Minimum journal diameter:**

Part A	21.991 mm (0.8658 in.)
Part B	24.885 mm (0.9797 in.)
Part C	28.991 mm (1.1414 in.)
Part D	30.985 mm (1.2199 in.)
Part E	24.985 mm (0.9837 in.)

G00928117

**Fig. 134: Minimum Journal Diameter Specification Chart**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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



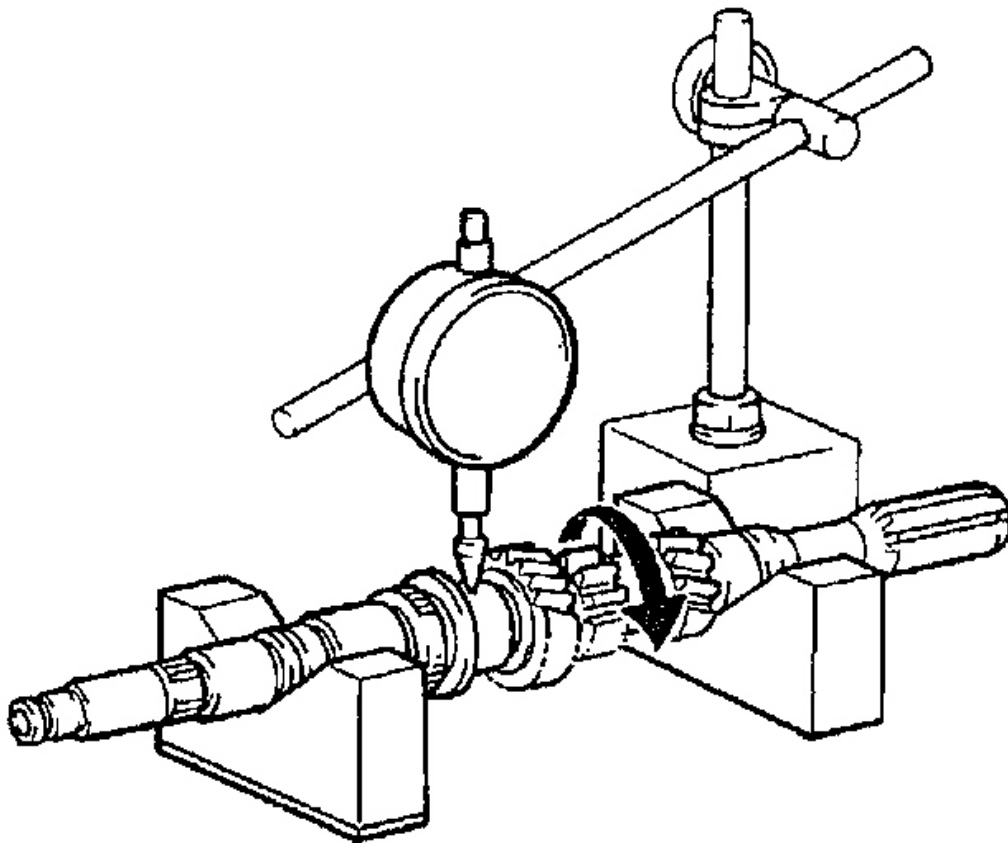
G00928118

**Fig. 135: Checking Input Shaft For Wear Or Damage**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- Using a dial indicator, check the shaft runout.

**Maximum runout: 0.03 mm (0.0012 in.)**

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



G00928119

**Fig. 136: Checking Shaft Runout Using Dial Indicator**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## REASSEMBLY

### HINT:

Before reassembly, coat all of the sliding and rotating surfaces with gear oil.

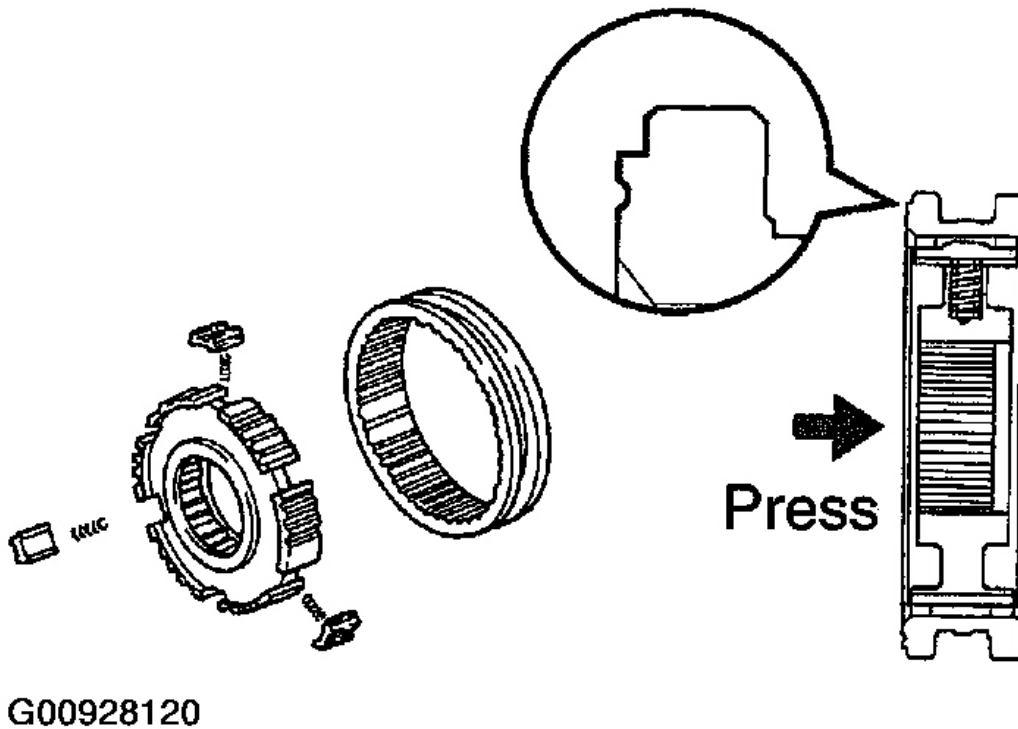
#### 1. ASSEMBLE NO. 2 HUB SLEEVE AND NO. 2 CLUTCH HUB

- a. Install the 3 No. 2 shifting key springs and 3 No. 2 shifting keys to the No. 2 clutch hub.
- b. Install the No. 2 hub sleeve to the No. 2 clutch hub.

**NOTE:** Assemble the No. 2 hub sleeve and No. 2 clutch hub in the direction



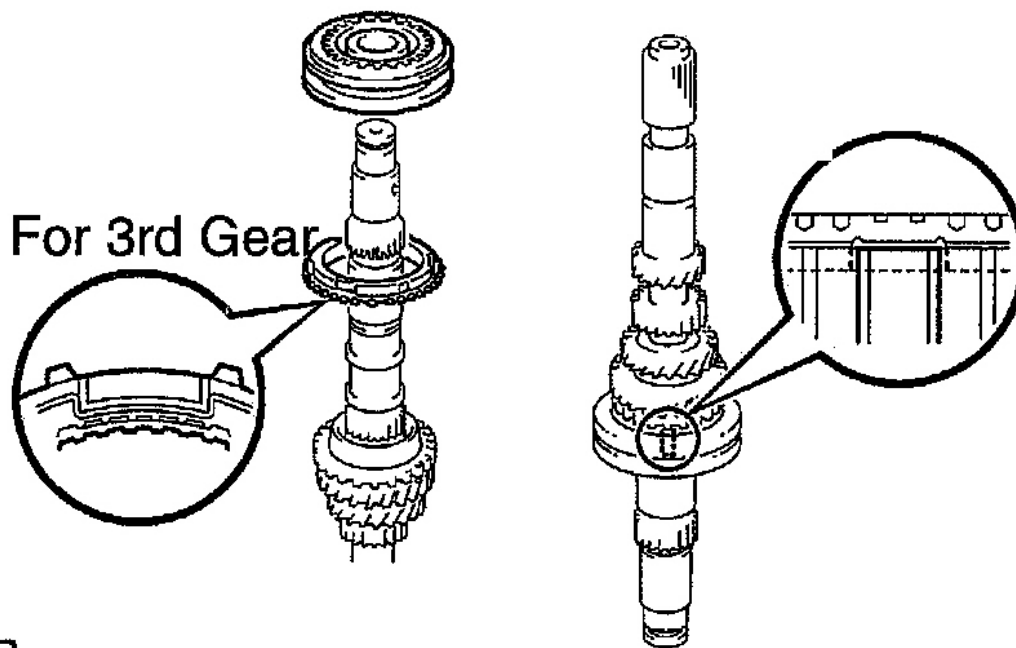
shown in the illustration.



**Fig. 137: Installing No. 2 Hub Sleeve To No. 2 Clutch Hub**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. **INSTALL NEEDLE ROLLER BEARING, 3RD GEAR, NO. 2 SYNCHRONIZER RING (FOR 3RD GEAR), NO. 2 HUB SLEEVE AND NO. 2 CLUTCH HUB ASSEMBLY**
  - a. Apply gear oil to the needle roller bearing and install it.
  - b. Install the 3rd gear and No. 2 synchronizer ring (for the 3rd gear).

**NOTE:** Distinguish the No. 2 synchronizer ring (for the 3rd gear) by the teeth on the synchronizer ring.



P

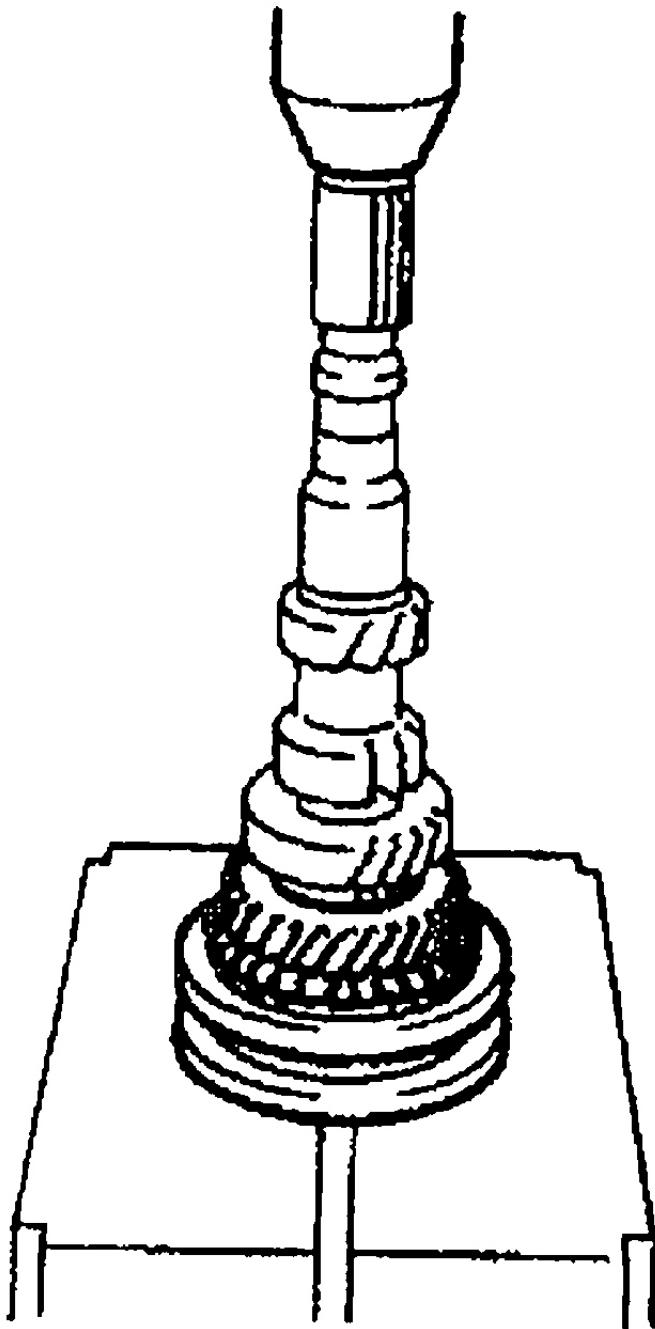
G00928121

**Fig. 138: Installing 3Rd Gear And No. 2 Synchronizer Ring**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Install the No. 2 hub sleeve and No. 2 clutch hub assembly so that the No. 2 synchronizer ring slots and No. 2 shifting keys are aligned.

**NOTE:** Be sure to install the No. 2 hub sleeve and No. 2 clutch hub assembly in the correct direction, as shown in the illustration.

- d. Using a press, press in the No. 2 hub sleeve and No. 2 clutch hub assembly.



G00928122

**Fig. 139: Pressing No. 2 Hub Sleeve And No. 2 Clutch Hub Assembly**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**3. INSTALL SNAP RING**

- a. Select a snap ring from the table below that will make the thrust clearance of the No. 2 clutch hub

---

less than 0.1 mm (0.004 in.).

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
0	2.30 (0.0906)	3	2.48 (0.0976)
1	2.36 (0.0929)	4	2.54 (0.1000)
2	2.42 (0.0953)	5	2.60 (0.1024)

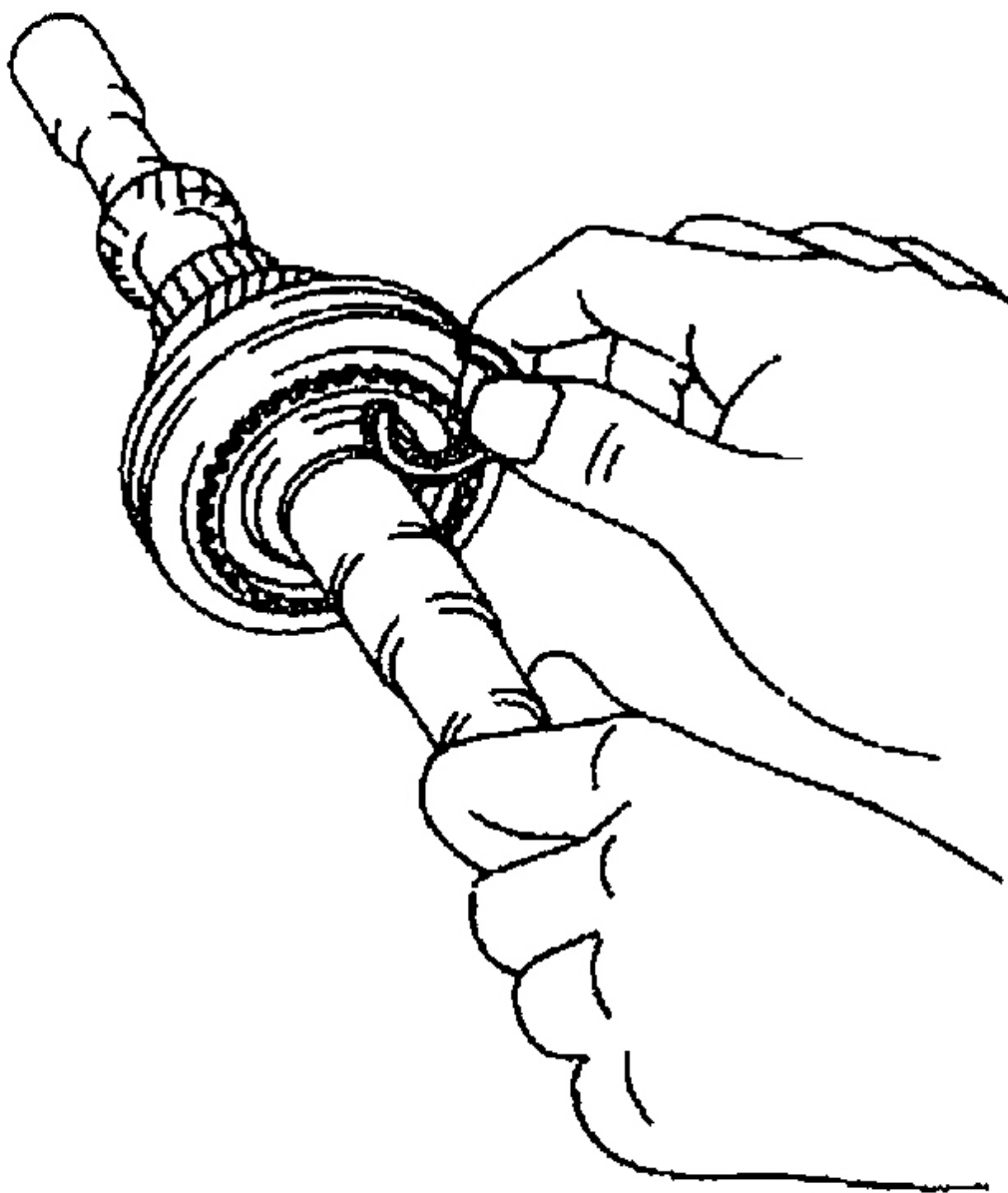
G00928123

**Fig. 140: Thickness Specification Chart**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

**NOTE:** Take care not to damage the journal surface of the input shaft.

4. **INSPECT 3RD GEAR THRUST CLEARANCE (See DISASSEMBLY)**



G00928124

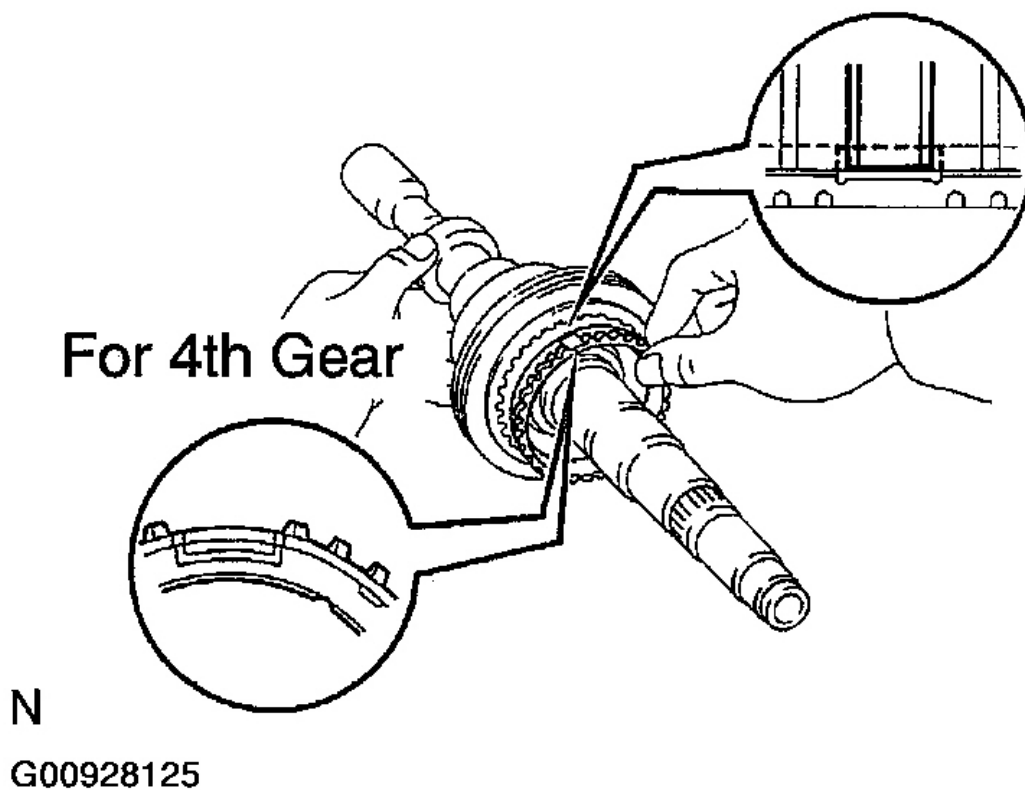
**Fig. 141: Installing Snap Ring**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. **INSTALL SPACER, NEEDLE ROLLER BEARING, No. 2 SYNCHRONIZER RING (FOR 4TH GEAR), 4TH GEAR AND REAR RADIAL BALL BEARING**

- a. Install the spacer.
- b. Apply gear oil to the needle roller bearings and install it.
- c. Place the No. 2 synchronizer ring (for the 4th gear) on the No. 2 hub sleeve assembly and align the No. 2 synchronizer ring slots with the No. 2 shifting keys.
- d. Install the 4th gear.

**NOTE:** Distinguish the No. 2 synchronizer ring (for the 4th gear) by the teeth on the synchronizer ring.



**Fig. 142: Installing 4Th Gear**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Using SST and a press, press in the rear radial ball bearing.

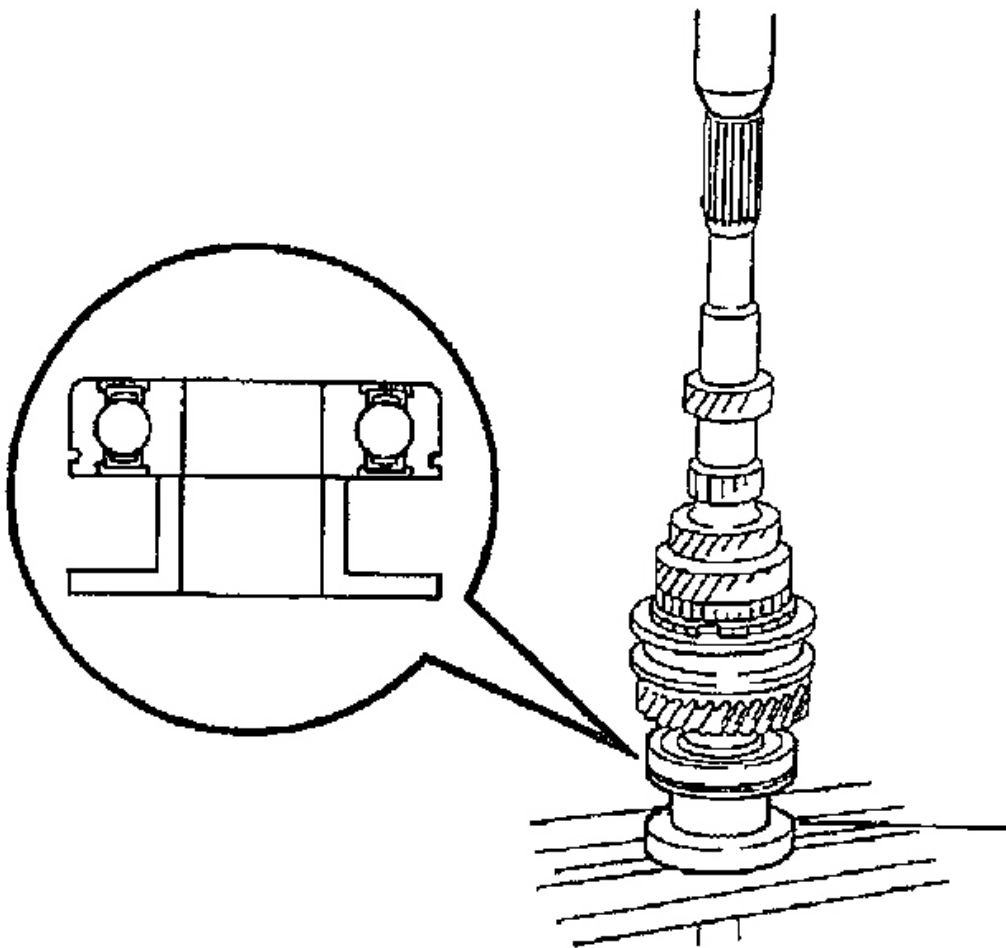
SST 09608-00071

**NOTE:** Be sure to install the rear radial ball bearing in the correct direction, as shown in the illustration.

---

HINT:

Set SST to the bearing inner race securely.



G00928126

**Fig. 143: Pressing Rear Radial Ball Bearing**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**6. INSTALL SNAP RING**

- a. Select a snap ring from the table below that will make the thrust clearance of the rear radial ball bearing less than 0.1 mm (0.0039 in.).

---

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	2.29 (0.0902)	D	2.47 (0.0972)
B	2.35 (0.0925)	E	2.53 (0.0996)
C	2.41 (0.0949)	F	2.59 (0.1020)

G00928127

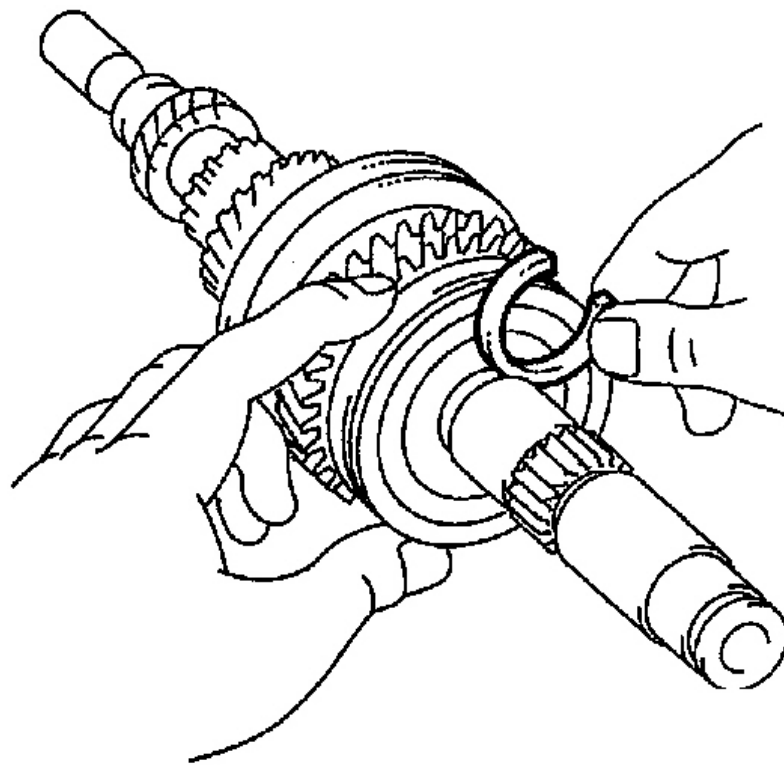
**Fig. 144: Thickness Specification Chart**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

**NOTE:** Take care not to damage the journal surface of the input shaft.

7. **INSPECT 4TH GEAR THRUST CLEARANCE** (See DISASSEMBLY)





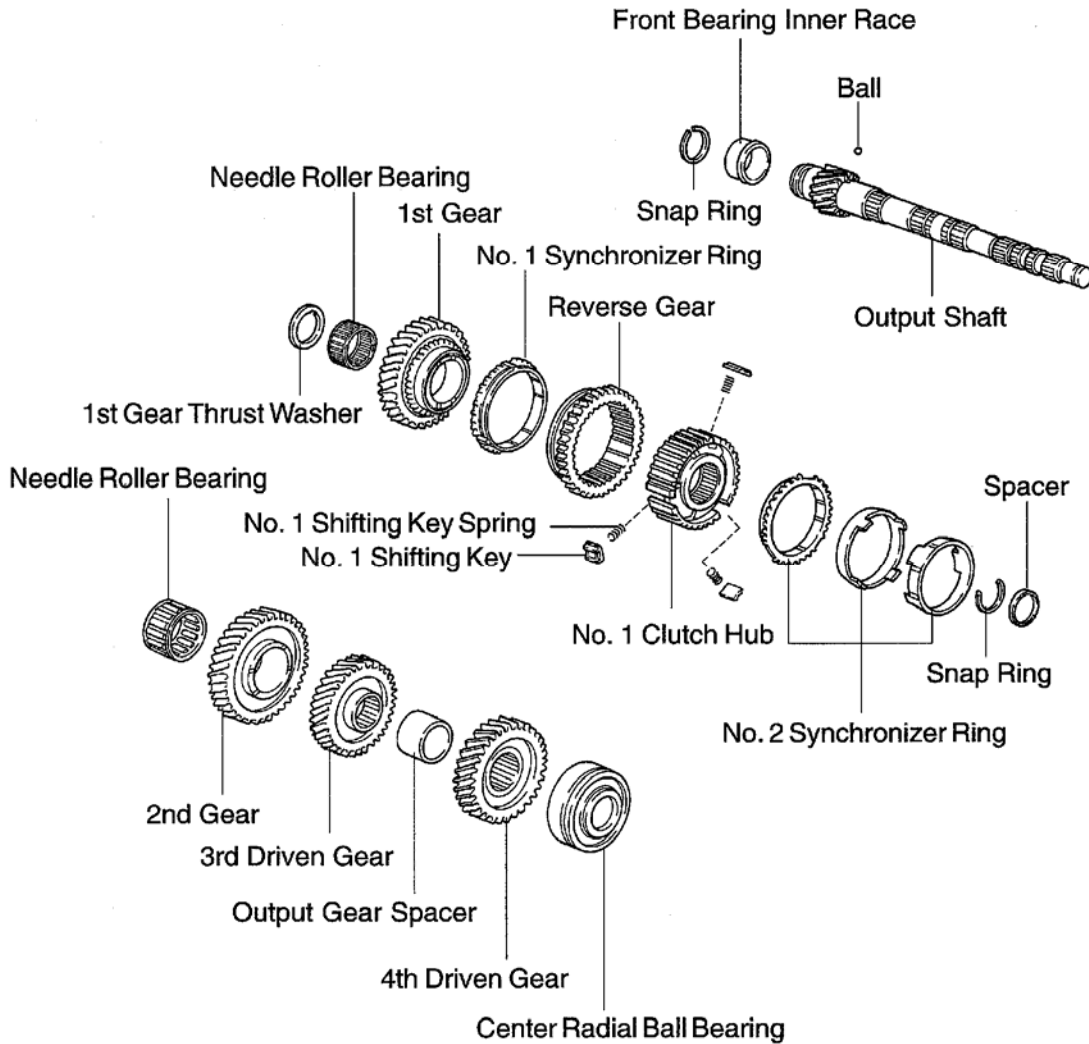
**P**

**G00928128**

**Fig. 145: Installing Snap Ring**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## **OUTPUT SHAFT**

### **COMPONENTS**



N  
G00928129

**Fig. 146: Identifying Output Shaft Components**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**DISASSEMBLY**

**1. INSPECT 1ST AND 2ND GEARS THRUST CLEARANCE**

Using a feeler gauge, measure the thrust clearance.

**Standard clearance:**

---

1st gear	0.10 to 0.40 mm (0.0039 to 0.0157 in.)
2nd gear	0.10 to 0.55 mm (0.0039 to 0.0217 in.)

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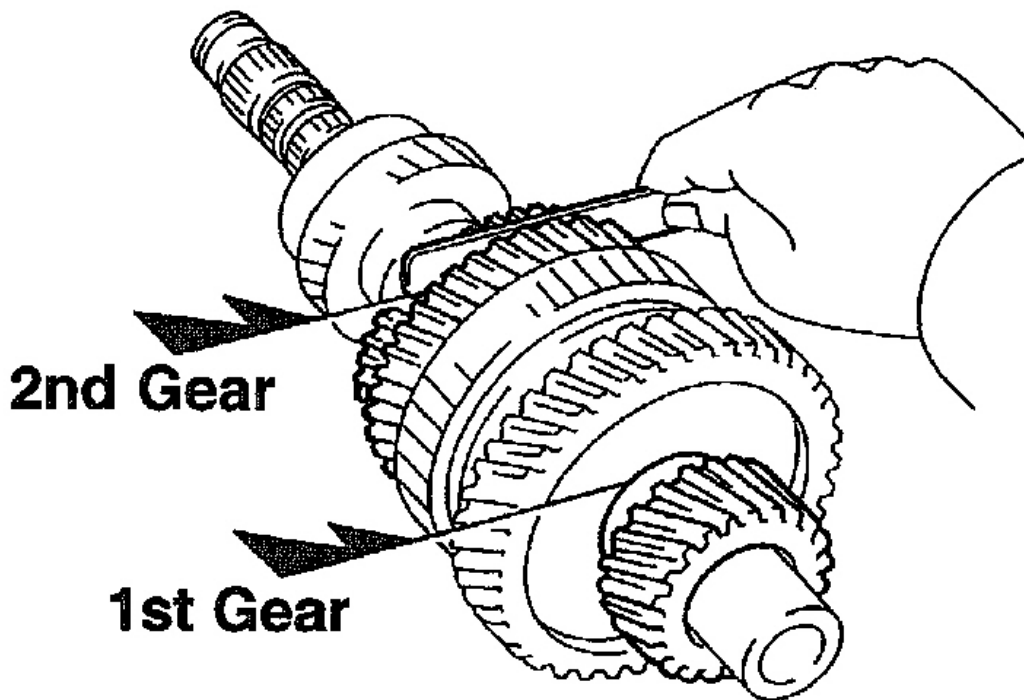
**Fig. 147: Standard Clearance Specification Chart**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**Maximum clearance:**

1st gear	0.40 mm (0.0157 in.)
2nd gear	0.55 mm (0.0217 in.)

G00928131

**Fig. 148: Maximum Clearance Specification Chart**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



G00928132

**Fig. 149: Measuring Thrust Clearance Using Feeler Gauge**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**2. INSPECT 1ST AND 2ND GEARS RADIAL CLEARANCE**

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

**Standard clearance:**

KOYO made	0.015 to 0.058 mm (0.0006 to 0.0023 in.)
NSK made	0.015 to 0.056 mm (0.0006 to 0.0022 in.)

G00928133

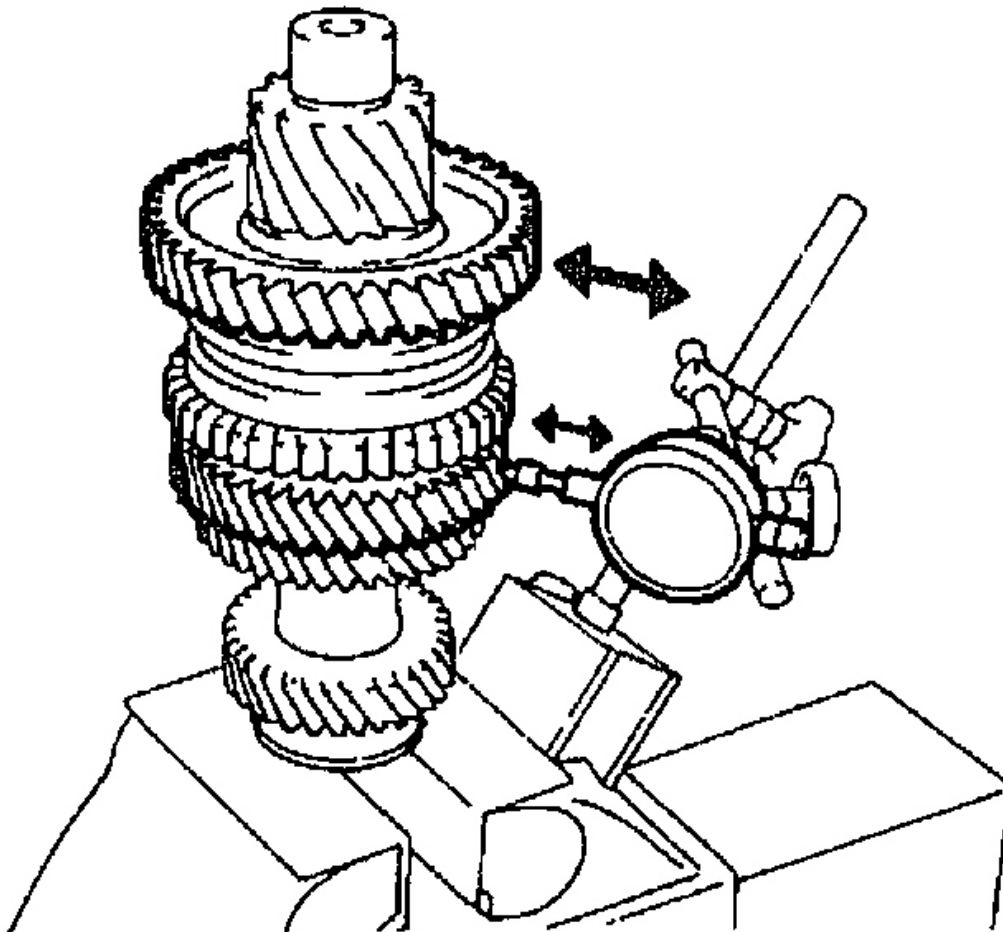
**Fig. 150: Standard Clearance Specification Chart**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Maximum clearance:

KOYO made	0.058 mm (0.0023 in.)
NSK made	0.056 mm (0.0022 in.)

G00928134

**Fig. 151: Maximum Clearance Specification Chart**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



G00928135

**Fig. 152: Measuring Radial Clearance Between Gear And Shaft**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

3. **REMOVE REAR RADIAL BALL BEARING, 4TH DRIVEN GEAR AND OUTPUT GEAR SPACER FROM OUTPUT SHAFT**

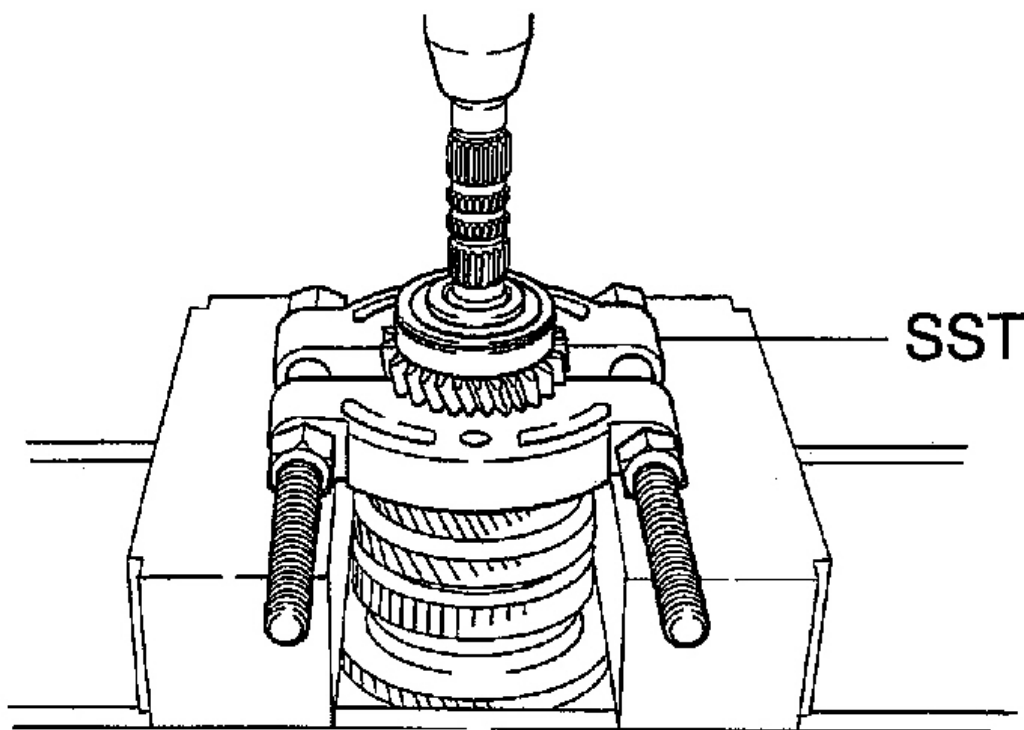
- a. Using SST and a press, press out the rear radial ball bearing and 4th driven gear.

SST 09950-00020

HINT:

Support the output shaft assembly by hand so that it will not be dropped off.

- b. Remove the output gear spacer.



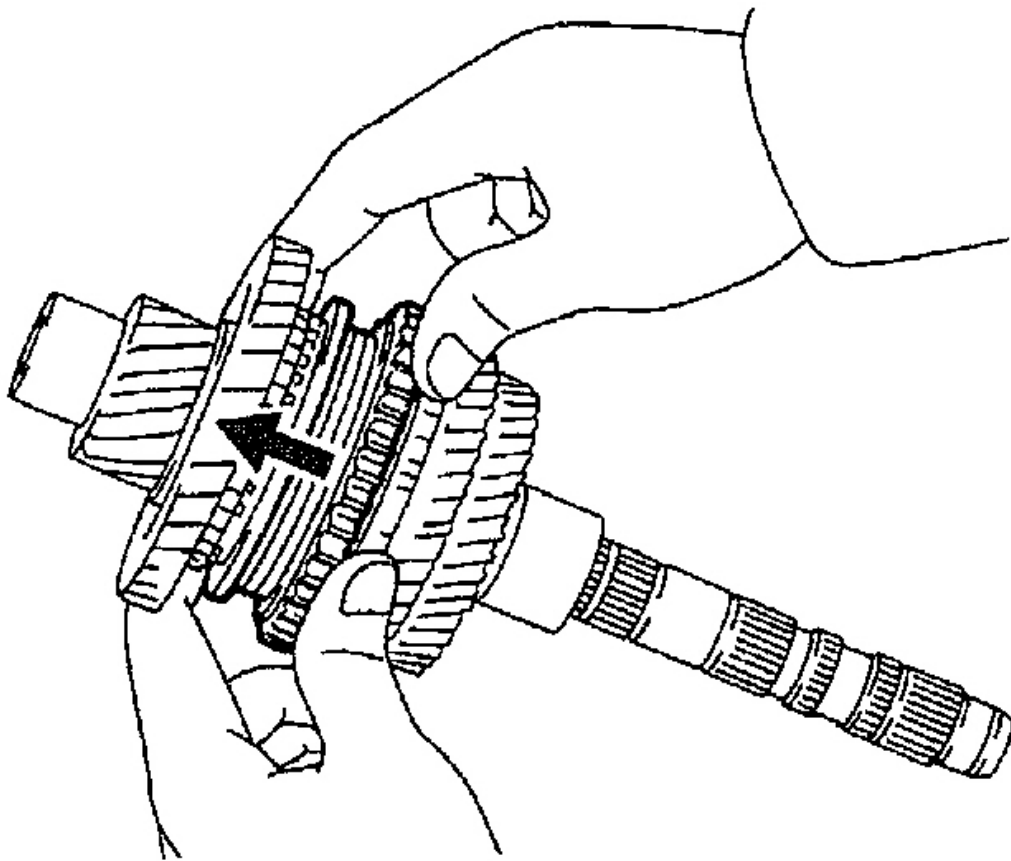
G00928136

**Fig. 153: Pressing Out Rear Radial Ball Bearing And 4Th Driven Gear Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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4. **REMOVE 3RD DRIVEN GEAR, 2ND GEAR, NEEDLE ROLLER BEARING, SPACER AND NO. 2 SYNCHRONIZER RING**

- a. Shift the reverse gear into the 1st gear.



**G00928137**

**Fig. 154: Shifting Reverse Gear Into 1st Gear**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using SST and a press, press out the 3rd driven gear and 2nd gear.

SST 09950-00020

HINT:

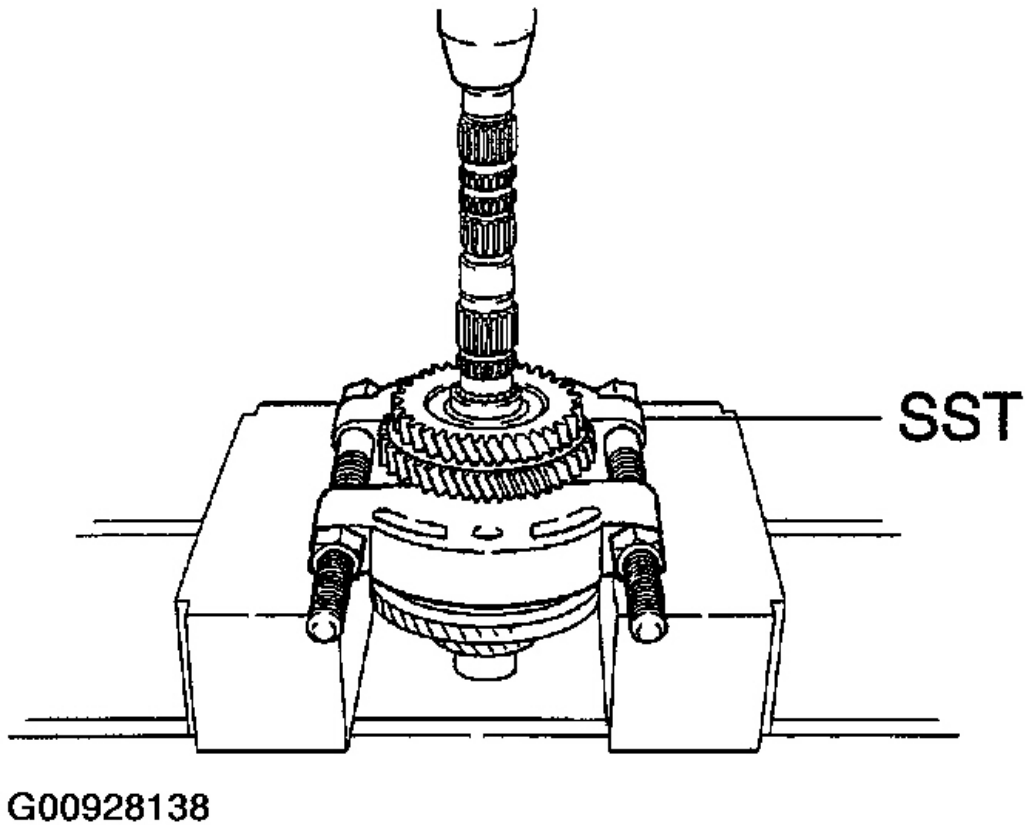
Support the output shaft assembly by hand so that it will not be dropped off.

c. Remove the needle roller bearing, spacer and No. 2 synchronizer ring.

**5. REMOVE SNAP RING**

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

**NOTE:** Take care not to damage the journal surface of the output shaft.



**Fig. 155: Pressing Out 3Rd Driven Gear And 2Nd Gear Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**6. REMOVE REVERSE GEAR, NO. 1 CLUTCH HUB ASSEMBLY, NO. 1 SYNCHRONIZER RING, 1ST GEAR, NEEDLE ROLLER BEARING, 1ST GEAR THRUST WASHER AND BALL**

a. Using a press, press out the reverse gear, No. 1 clutch hub assembly, No. 1 synchronizer ring and 1st gear.

**HINT:**



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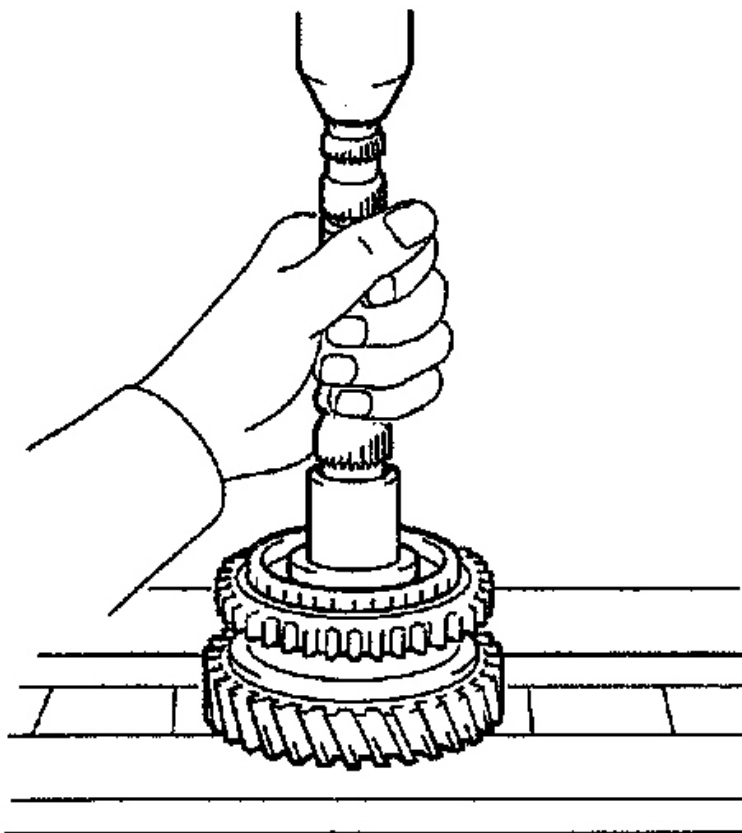
Support the output shaft assembly by hand so that it will not be dropped off.

- b. Remove the needle roller bearing and 1st gear thrust washer.
- c. Using a magnetic finger, remove the ball.

7. **REMOVE SNAP RING**

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

**NOTE:** Take care not to damage the journal surface of the output shaft.



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**Fig. 156: Pressing Out Reverse Gear, No. 1 Clutch Hub Assembly**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

8. **REMOVE FRONT BEARING INNER RACE**

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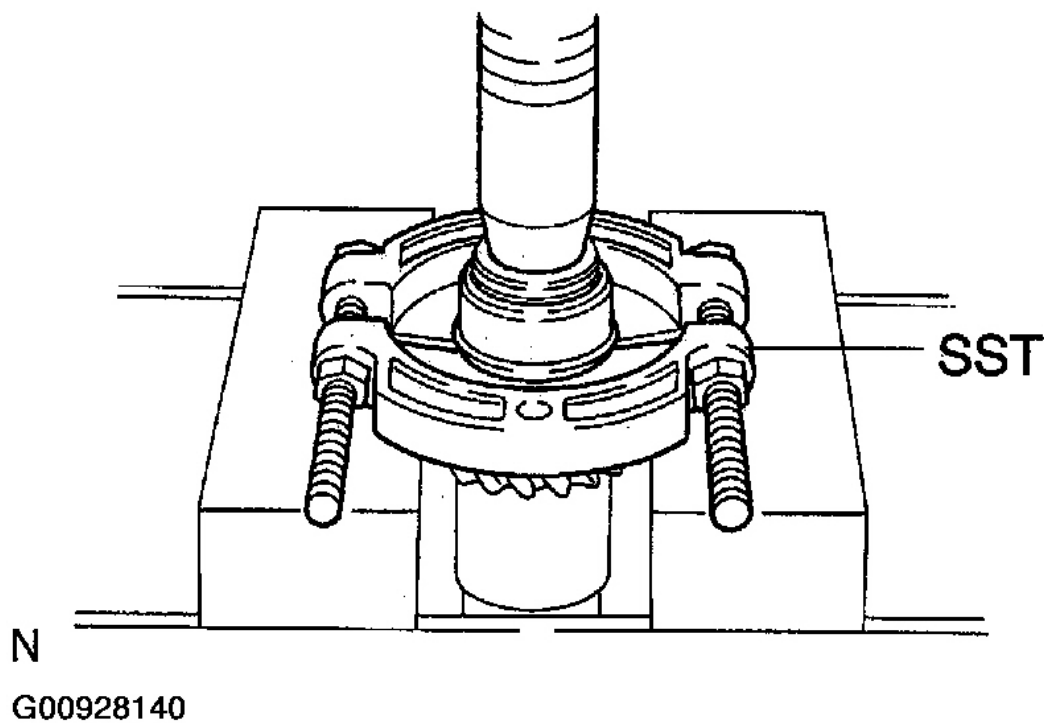
Using SST and a press, press out the front bearing inner race.

SST 09950-00020

**NOTE:** When replacing the front bearing inner race, replace the output shaft front bearing along with it.

HINT:

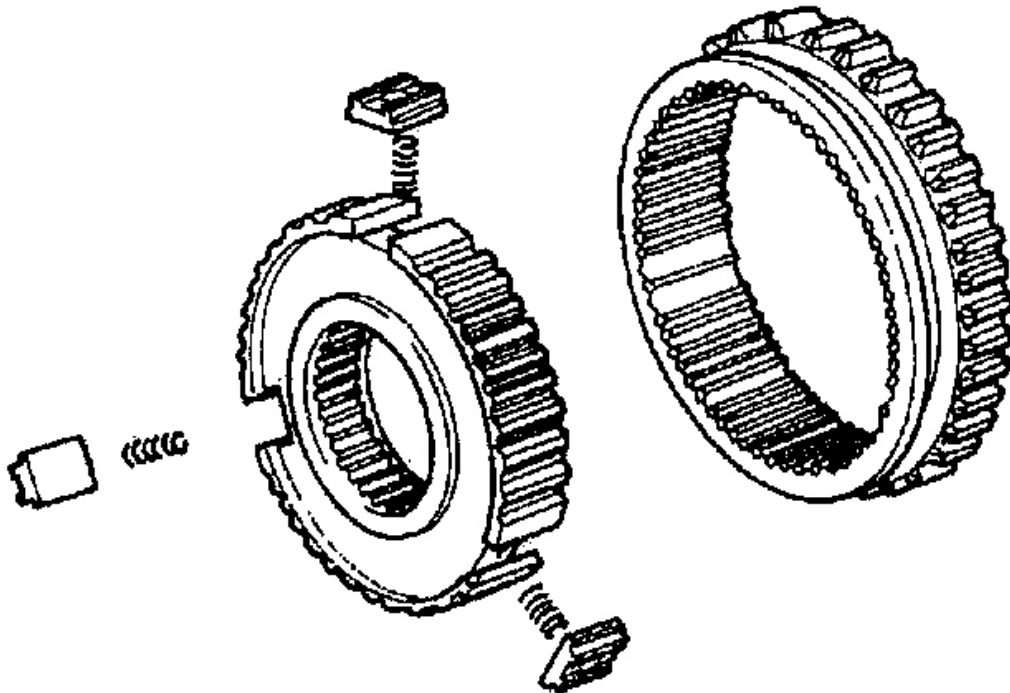
Support the output shaft by hand so that it will not be dropped off.



**Fig. 157: Pressing Out Front Bearing Inner Race Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**9. DISASSEMBLE REVERSE GEAR AND NO. 1 CLUTCH HUB**

- a. Remove the reverse gear from the No. 1 clutch hub.
- b. Remove the 3 No. 1 shifting keys and 3 No. 1 shifting key springs from the No. 1 clutch hub.



G00928141

**Fig. 158: Removing Reverse Gear From No. 1 Clutch Hub**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## INSPECTION

### 1. INSPECT NO. 1 SYNCHRONIZER RING

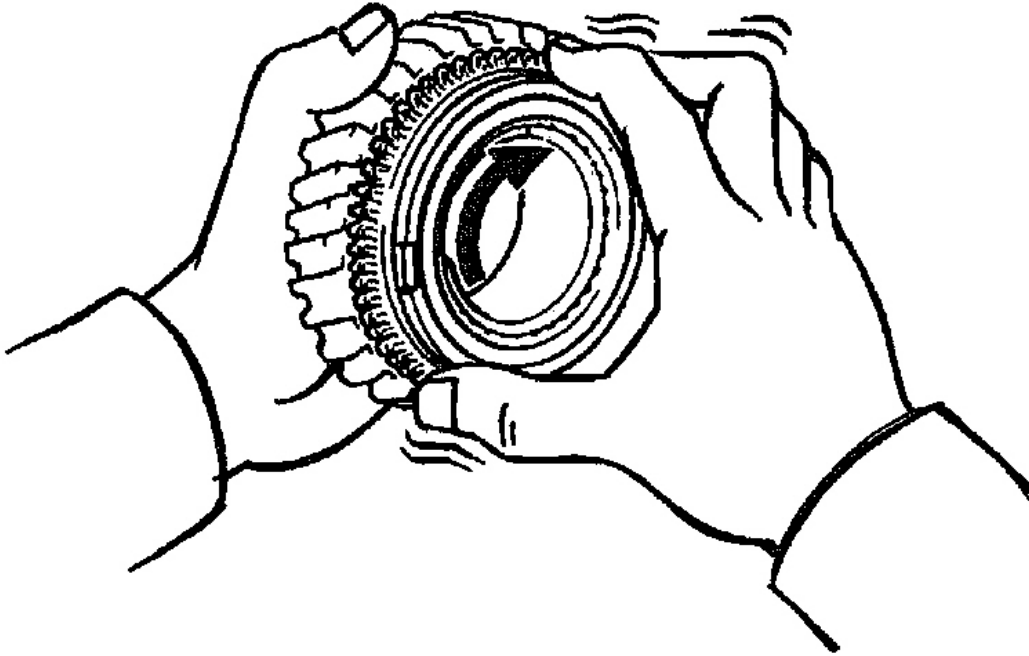
- a. Check for wear or damage.
- b. Check the braking effect of the synchronizer ring.

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

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

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

- 
- c. Check again the braking effect of the synchronizer ring.



G00928142

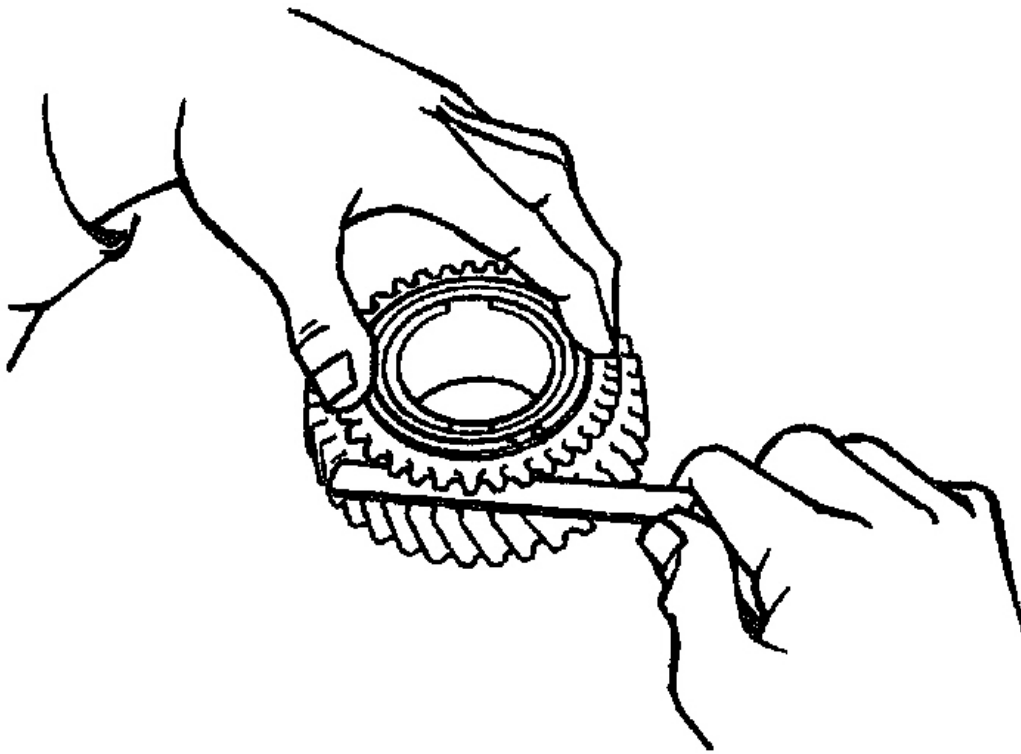
**Fig. 159: Removing Reverse Gear From No. 1 Clutch Hub**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

**Minimum clearance: 0.75 mm (0.0295 in.)**

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

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



G00928143

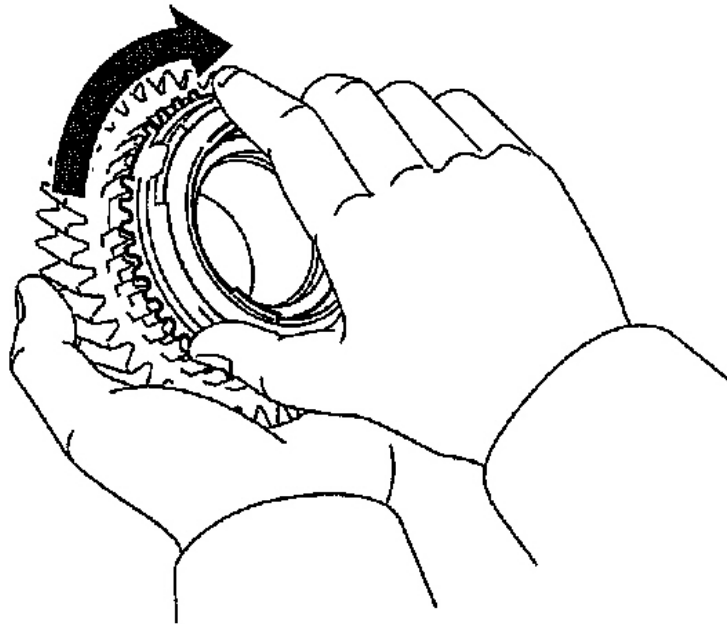
**Fig. 160: Measuring Clearance Between Synchronizer Ring Back And Gear Spline End**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## 2. INSPECT NO. 2 SYNCHRONIZER RING

- a. Check for wear or damage.
- b. Check the braking effect of the synchronizer ring.

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

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



**P**

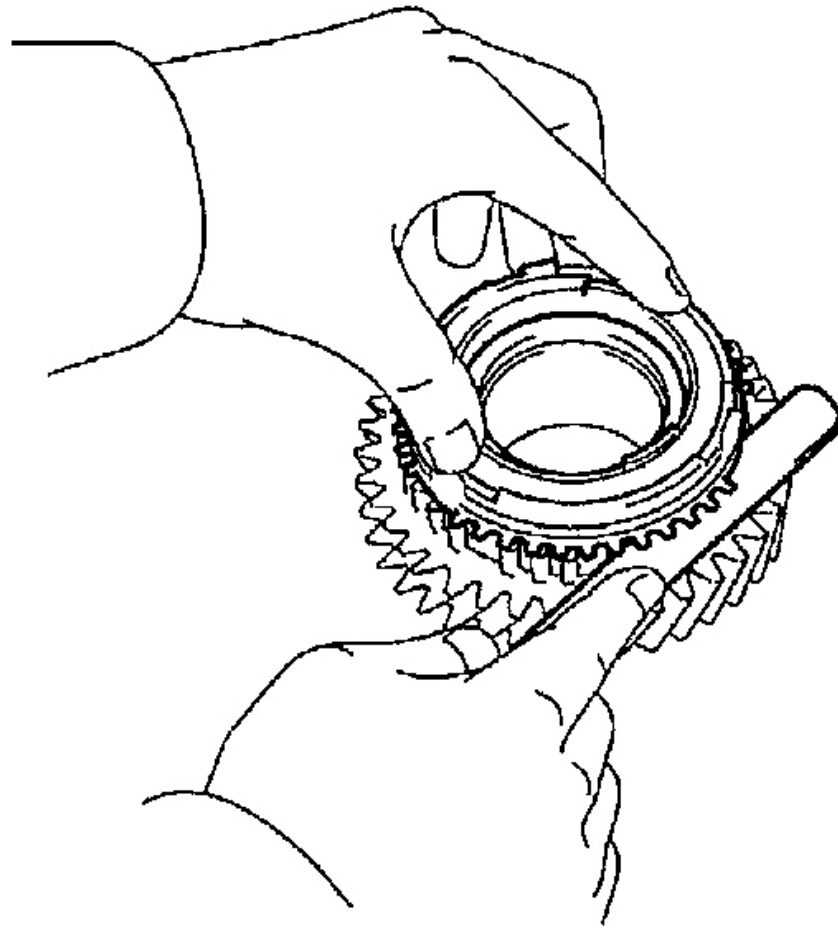
**G00928144**

**Fig. 161: Checking Braking Effect Of Synchronizer Ring**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

**Minimum clearance: 0.70 mm (0.0276 in.)**

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



**P**

**G00928145**

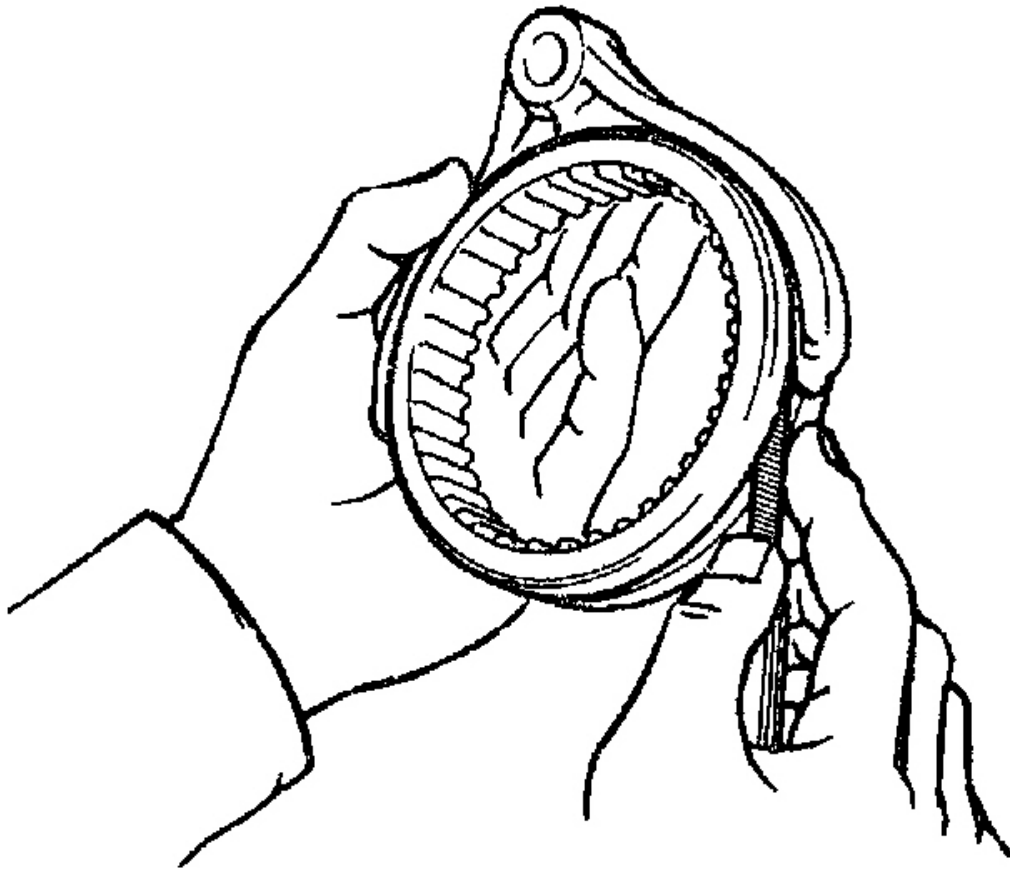
**Fig. 162: Measuring Clearance Between Synchronizer Ring Back And Gear Spline End**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**3. INSPECT NO. 1 GEAR SHIFT FORK AND REVERSE GEAR CLEARANCE**

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

**Maximum clearance: 0.35 mm (0.014 in.)**

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



G00928146

**Fig. 163: Measuring Clearance Between Reverse Gear And Gear Shift Fork**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**4. INSPECT OUTPUT SHAFT**

- a. Check the output shaft for wear or damage.
- b. Using a micrometer, measure the journal diameter.

**Minimum journal diameter:**

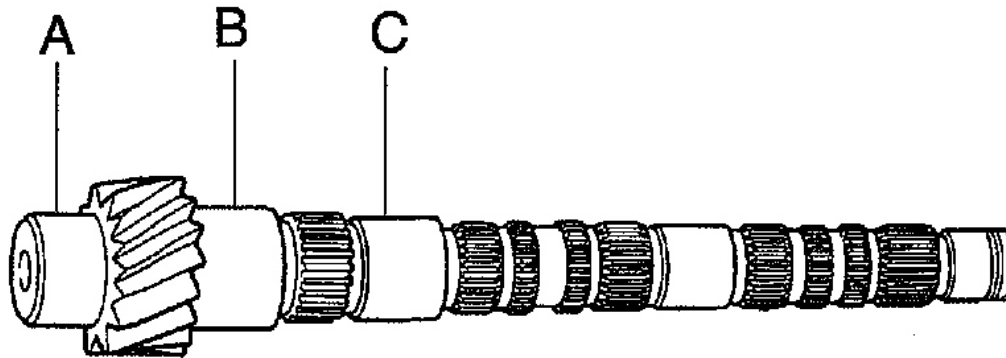


Part A (Roller bearing)	32.985 mm (1.2986 in.)
Part B (1st gear)	37.985 mm (1.4955 in.)
Part C (2nd gear)	31.985 mm (1.2592 in.)

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**Fig. 164: Minimum Journal Diameter Specification Chart**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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



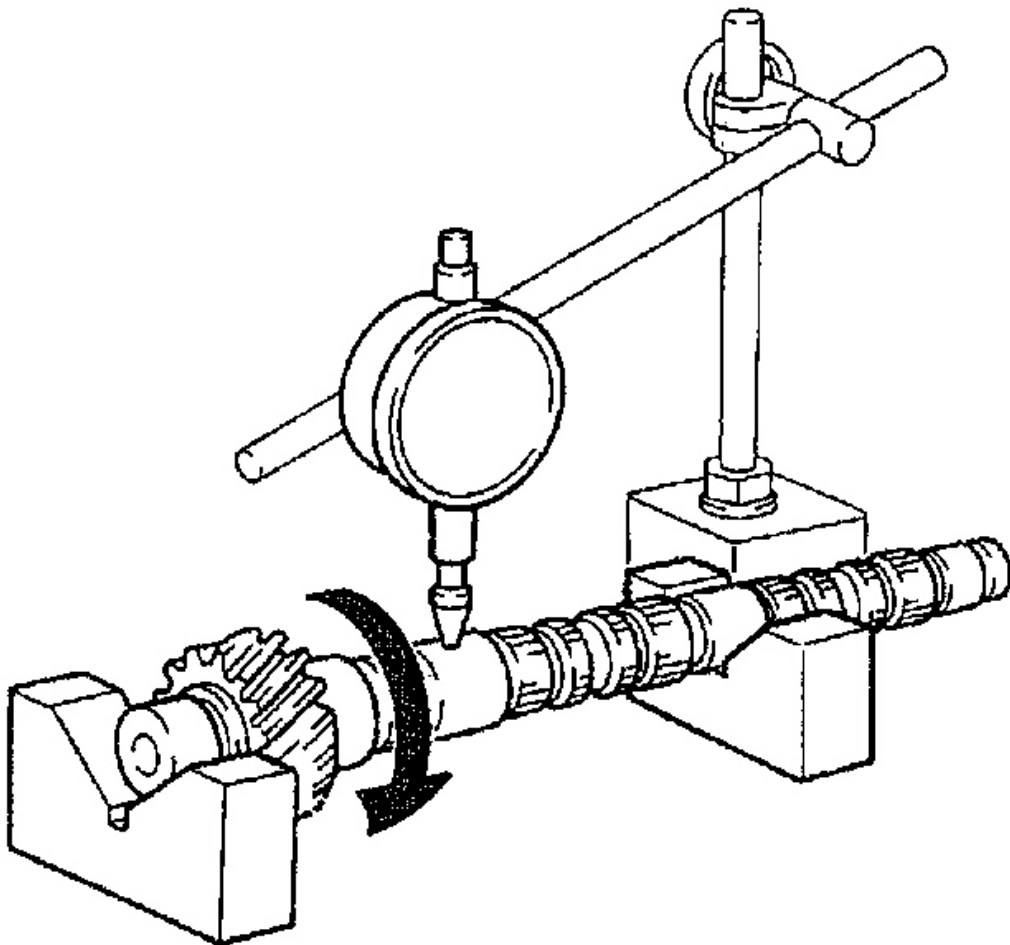
G00928148

**Fig. 165: Checking Output Shaft For Wear Or Damage**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

**Maximum runout: 0.03 mm (0.0012 in.)**

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



G00928149

**Fig. 166: Checking Shaft Runout Using Dial Indicator**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## REASSEMBLY

### HINT:

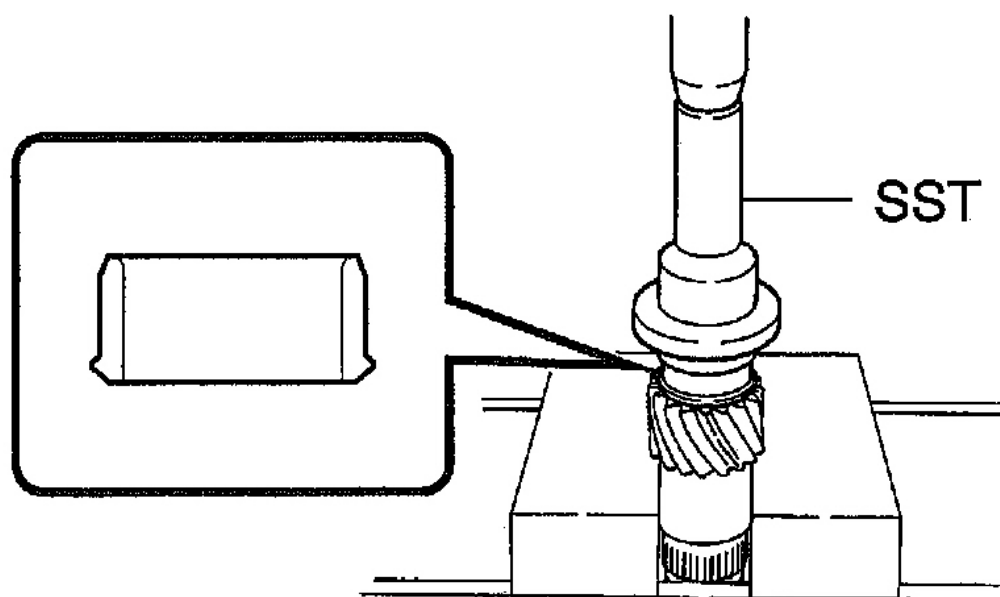
Before reassembly, coat all of the sliding and rotating surfaces with gear oil.

#### 1. INSTALL FRONT BEARING INNER RACE

Using SST and a press, press in the front bearing inner race.

SST 09223-50010

**NOTE:** Be sure to install the front bearing inner race in the correct direction, as shown in the illustration.



**N**

G00928150

**Fig. 167: Pressing Front Bearing Inner Race Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## 2. INSTALL SNAP RING

- a. Select a snap ring from the table below that will make the thrust clearance of the front bearing inner race less than 0.1 mm (0.0039 in.).

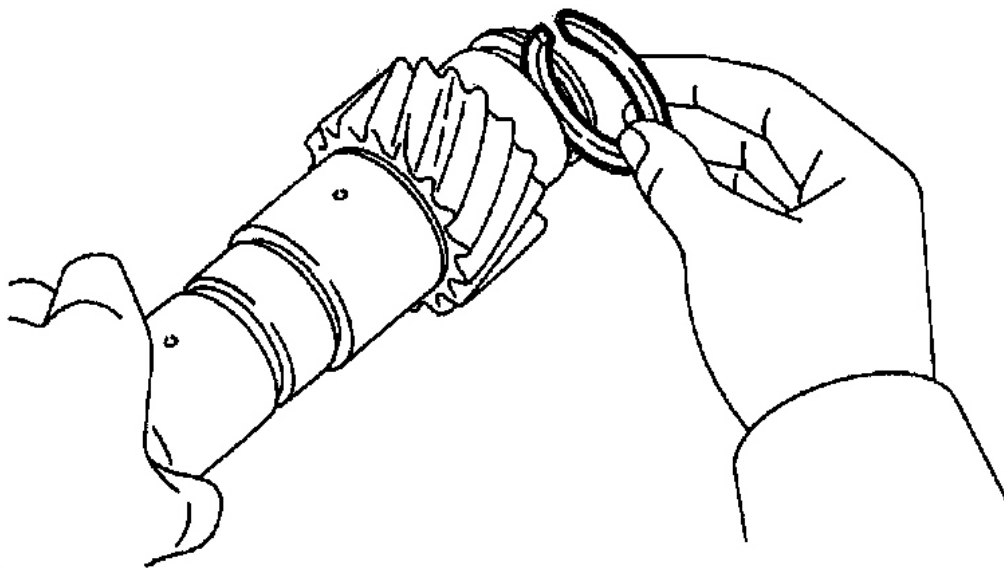
Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
7	1.85 (0.0728)	3	2.05 (0.0807)
8	1.90 (0.0748)	4	2.10 (0.0827)
1	1.95 (0.0768)	5	2.15 (0.0846)
2	2.00 (0.0787)	6	2.20 (0.0866)

G00928151

**Fig. 168: Thickness Specification Chart**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

**NOTE:** Take care not to damage the journal surface of the output shaft.



N

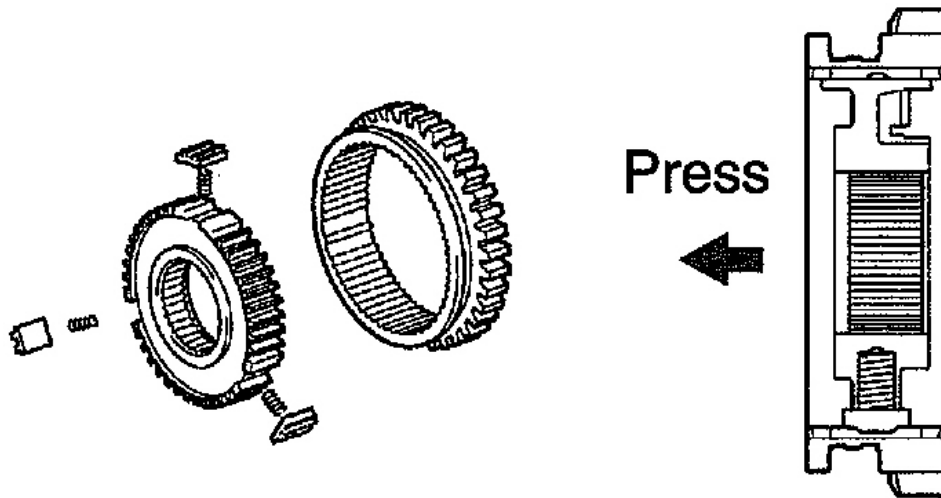
G00928152

**Fig. 169: Installing Snap Ring**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**3. ASSEMBLE REVERSE GEAR AND NO. 1 CLUTCH HUB**

- a. Install the 3 No. 1 shifting key springs and 3 No. 1 shifting keys to the No. 1 clutch hub.
- b. Install the No. 1 clutch hub to the reverse gear.

**NOTE:** Assemble the reverse gear and No. 1 clutch hub in the direction shown in the illustration.

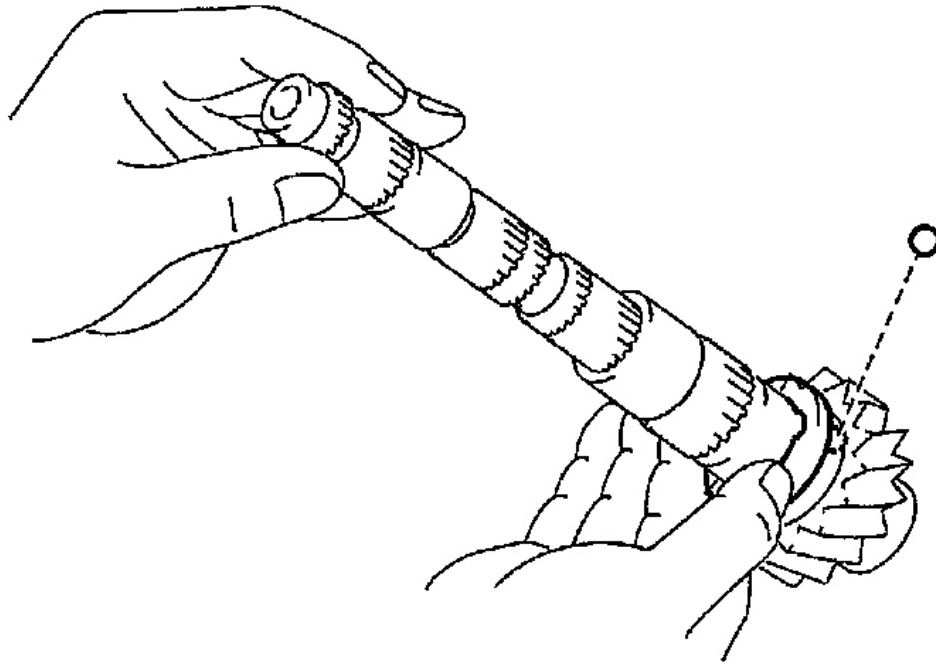


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**G00928153**

**Fig. 170: Installing No. 1 Clutch Hub To Reverse Gear**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. **INSTALL BALL, 1ST GEAR THRUST WASHER, NEEDLE ROLLER BEARING, 1ST GEAR, NO. 1 SYNCHRONIZER RING AND REVERSE GEAR AND NO. 1 CLUTCH HUB ASSEMBLY**
  - a. Using a magnetic finger, install the ball to the output shaft.
  - b. Fit the 1st gear thrust washer groove securely over the locking ball when installing the thrust washer on the output shaft.



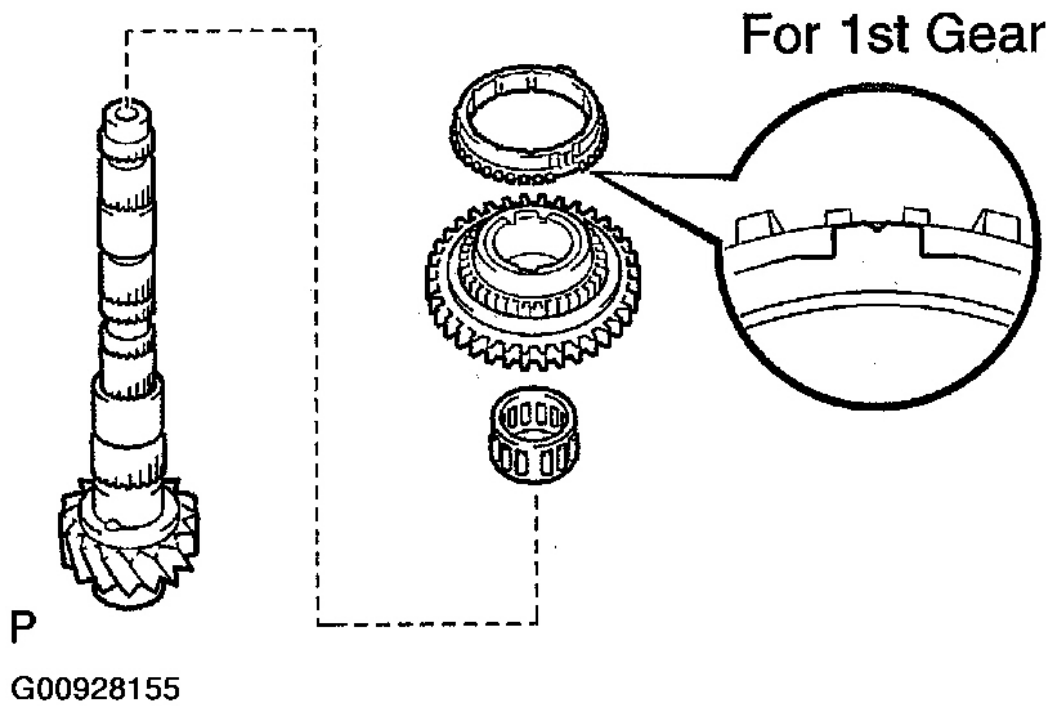
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**Fig. 171: Installing Ball To Output Shaft**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

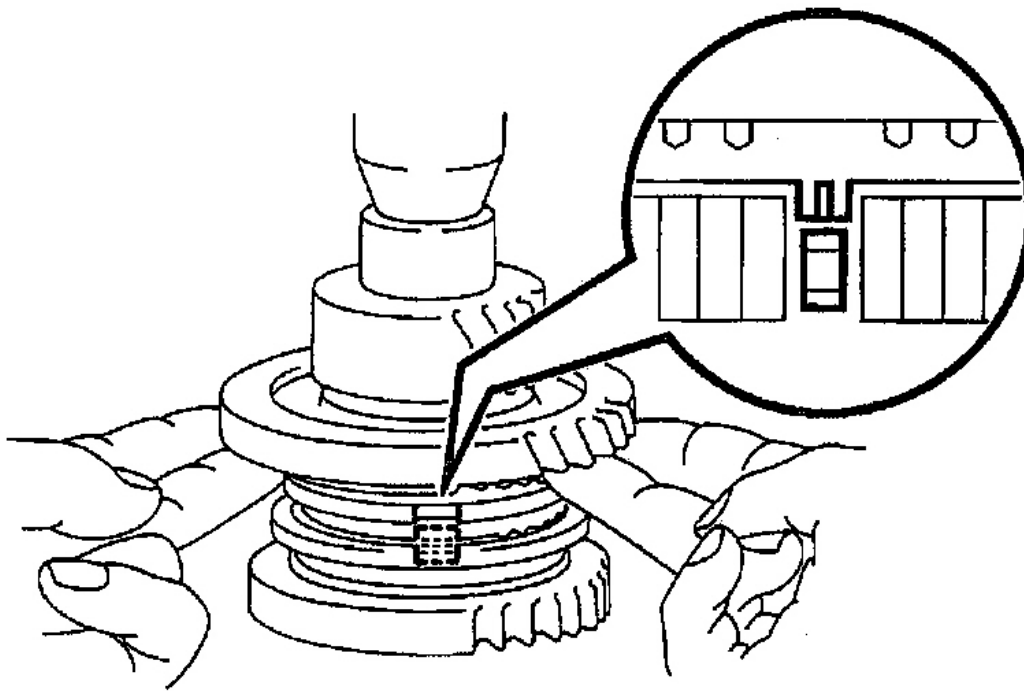
- c. Apply gear oil to the needle roller bearing and install it.
- d. Install the 1st gear and No. 1 synchronizer ring.

**NOTE:** Distinguish the No. 1 synchronizer ring by the teeth on the synchronizer ring.



**Fig. 172: Installing Ball, 1St Gear Thrust Washer, Needle Roller Bearing**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Place the reverse gear and No. 1 cluck hub assembly and align the No. 1 synchronizer ring slots with the No. 1 shifting keys.



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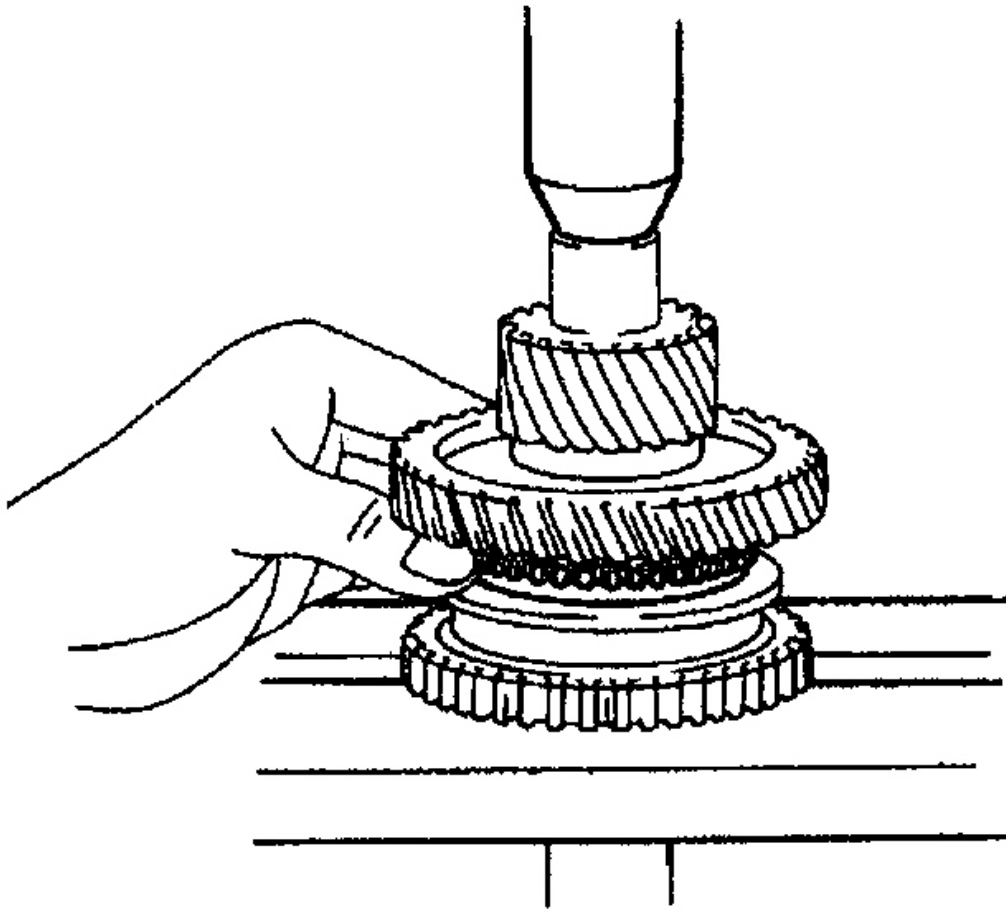
**Fig. 173: Placing Reverse Gear And No. 1 Cluck Hub Assembly**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- f. Using a press, press in the reverse gear and No. 1 clutch hub assembly.

**NOTE:**

- Be sure to install the reverse gear and No. 1 clutch hub assembly in the correct direction, as shown in the illustration .
- When installing, make sure that the ball is placed in a groove of the 1st gear thrust washer .





G00928157

**Fig. 174: Pressing Reverse Gear And No. 1 Clutch Hub Assembly**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**5. INSTALL SNAP RING**

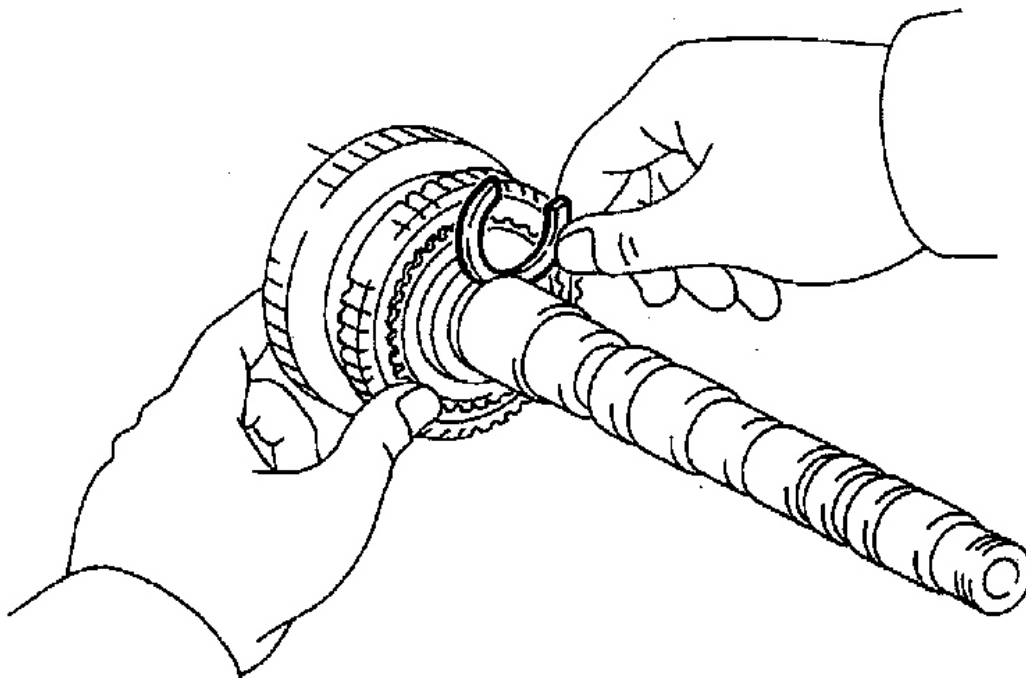
- a. Select a snap ring from the table below that will make the thrust clearance of the No. 1 clutch hub less than 0.1 mm (0.004 in.).

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	2.50 (0.0984)	D	2.68 (0.1055)
B	2.56 (0.1008)	E	2.74 (0.1079)
C	2.62 (0.1031)	F	2.80 (0.1102)

G00928158

**Fig. 175: Thickness Specification Chart**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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



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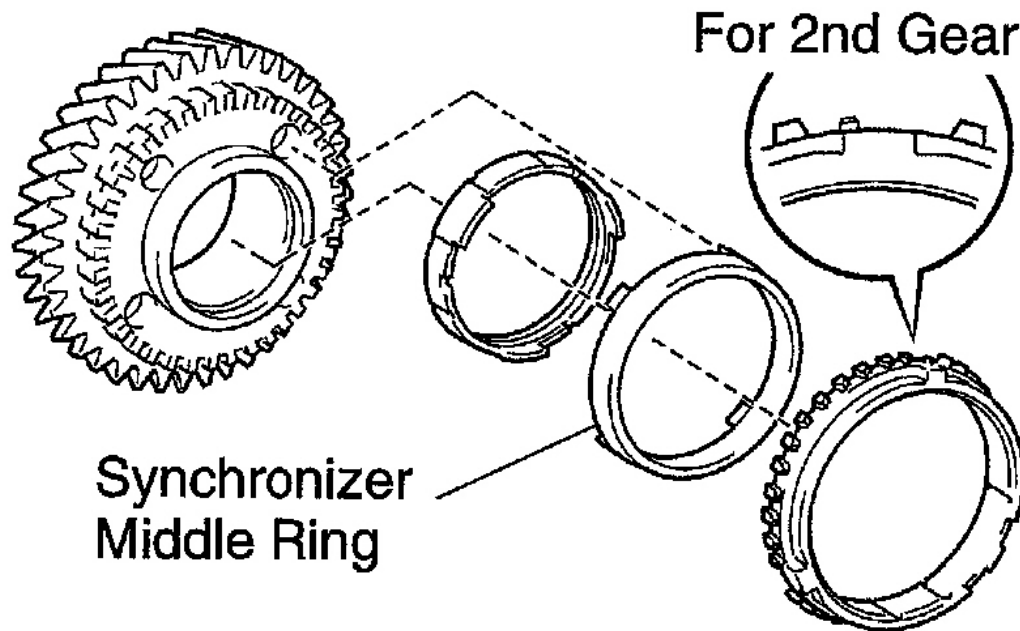
**Fig. 176: Installing Snap Ring**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**NOTE:** Take care not to damage the journal surface of the output shaft.

- 
6. **INSPECT 1ST GEAR THRUST CLEARANCE (See DISASSEMBLY)**
7. **INSTALL SPACER, NEEDLE ROLLER BEARING, NO. 2 SYNCHRONIZER RING, 2ND GEAR AND 3RD DRIVEN GEAR**
- Install the spacer.
  - Apply gear oil to the needle roller bearing and install it.
  - Place the No. 2 synchronizer ring on the 2nd gear.

**NOTE:**

- Properly fit the synchronizer middle ring claws into the holes in the 2nd gear.
- Distinguish the No. 2 synchronizer ring by the teeth on the synchronizer ring.



**P**

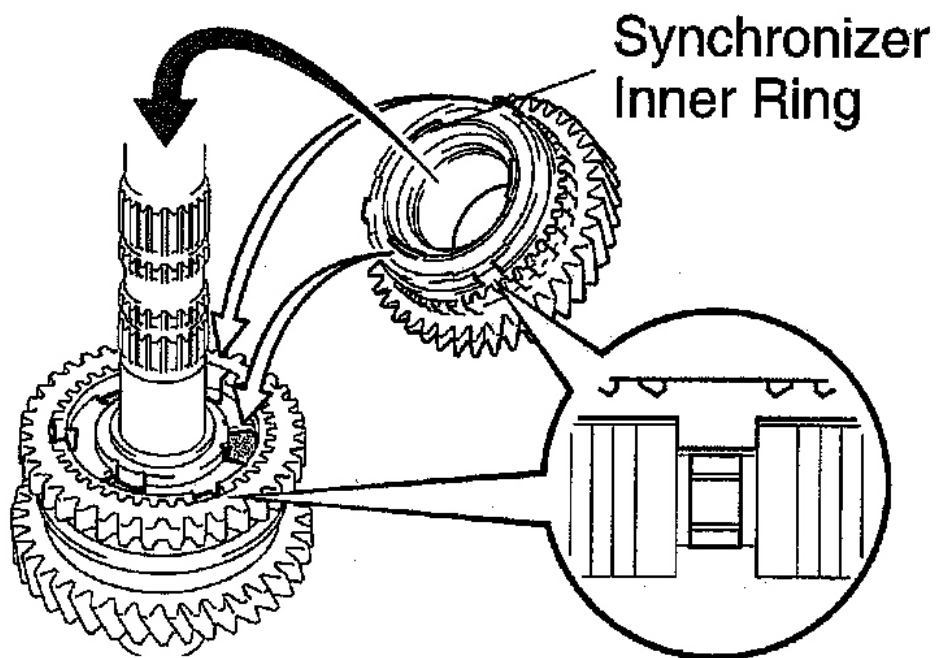
G00928160

**Fig. 177: Placing No. 2 Synchronizer Ring On 2Nd Gear**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- Place the 2nd gear with the No. 2 synchronizer ring and align the No. 2 synchronizer ring slots with the No. 1 shifting keys.

**NOTE:**

**Fit the synchronizer inner ring claws into the slots in the No. 1 clutch hub.**



P

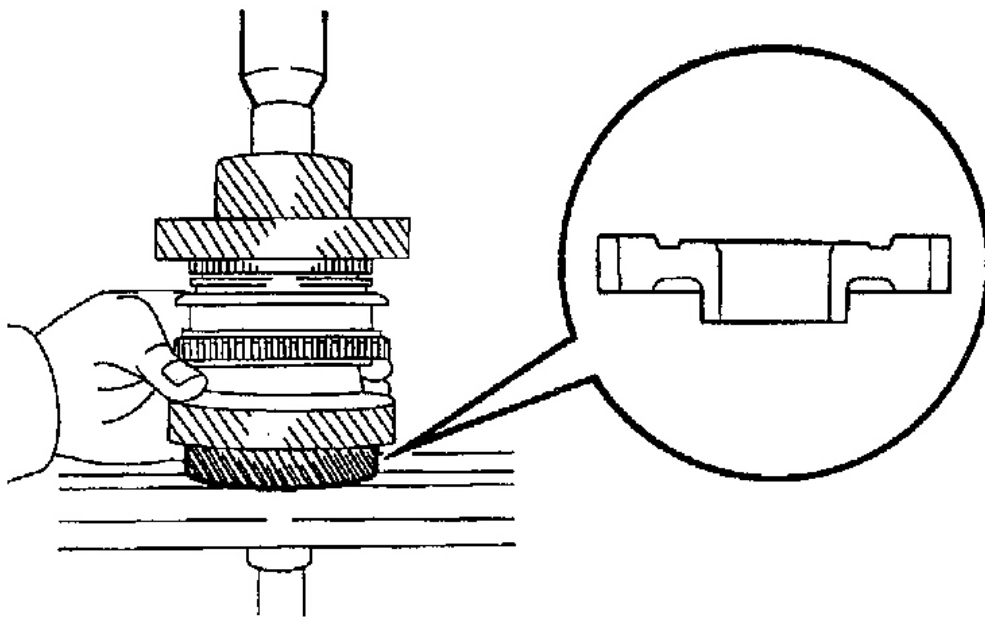
G00928161

**Fig. 178: Placing 2Nd Gear With No. 2 Synchronizer Ring**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Using a press, press in the 3rd driven gear.

**NOTE:** Be sure to install the 3rd driven gear in the correct direction, as shown in the illustration

8. **INSPECT 2ND GEAR THRUST CLEARANCE** (See DISASSEMBLY)



N

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**Fig. 179: Pressing 3Rd Driven Gear**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

9. **INSTALL OUTPUT GEAR SPACER, 4TH DRIVEN GEAR AND REAR RADIAL BALL BEARING**

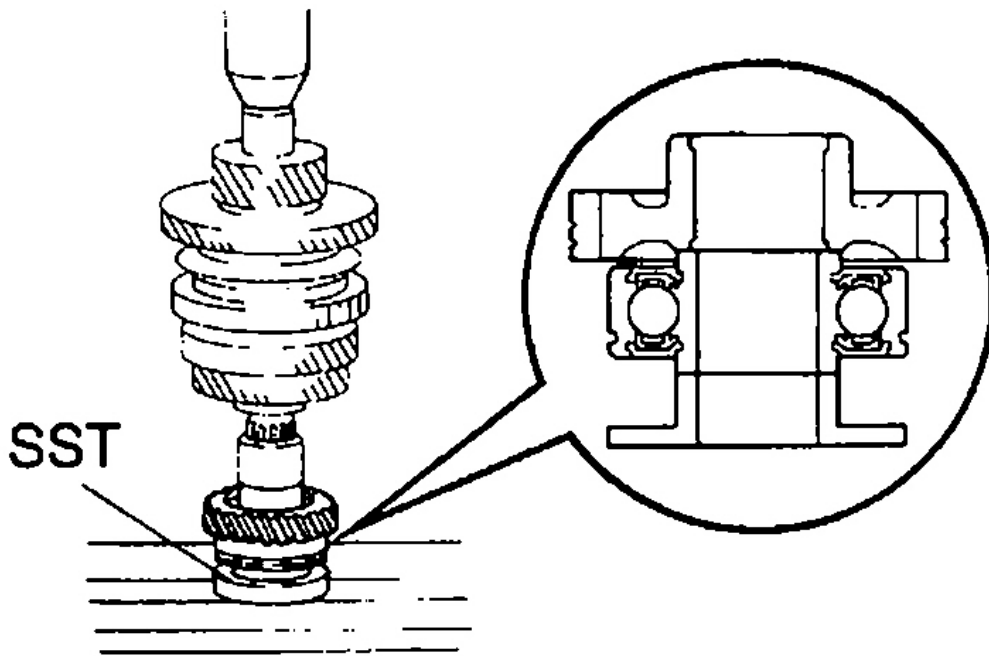
- a. Install the output gear spacer.
- b. Using SST and a press, press in the 4th driven gear and rear radial ball bearing.

SST 09608-00071

**NOTE:** Be sure to install the 4th driven gear and rear radial ball bearing in the correct direction, as shown in the illustration.

**HINT:**

Set SST to the bearing inner race securely.

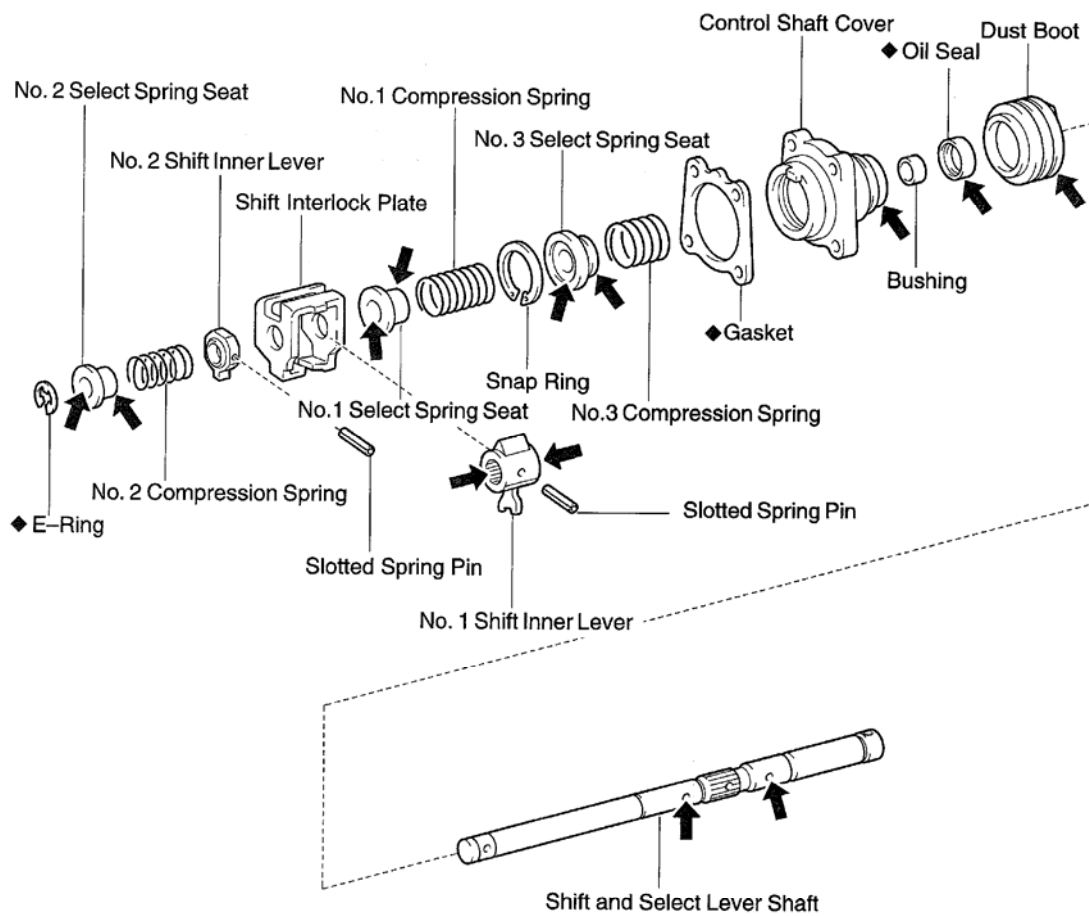


G00928163

**Fig. 180: Pressing 4Th Driven Gear And Rear Radial Ball Bearing Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## SHIFT AND SELECT LEVER SHAFT

COMPONENTS



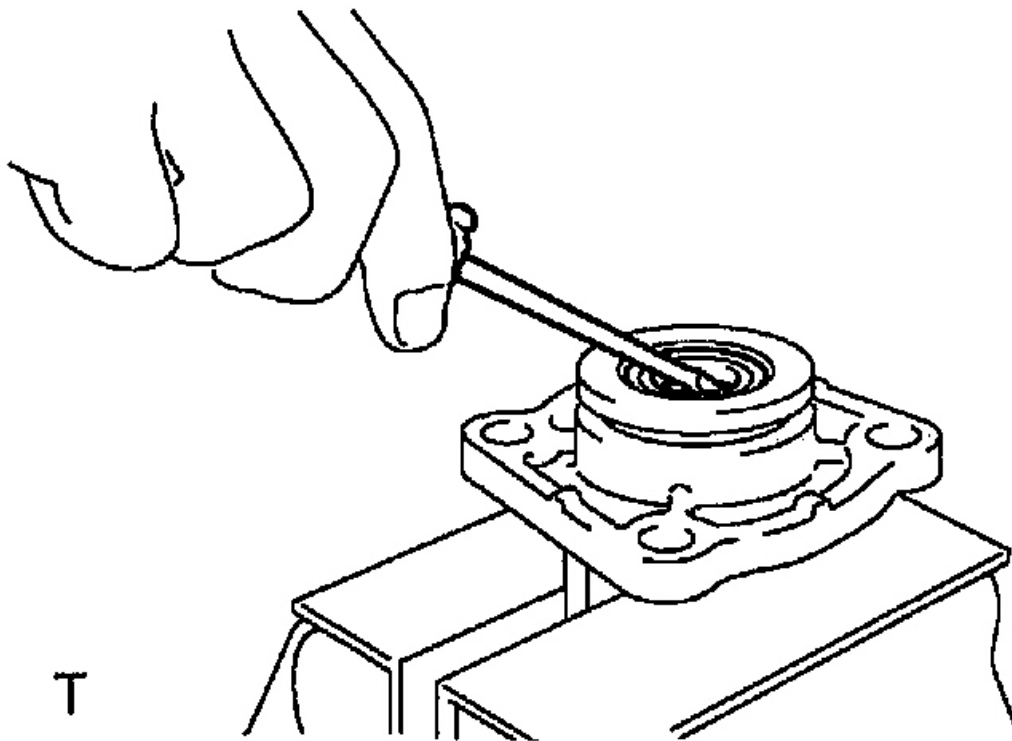
◆ Non-reusable part  
 P → Apply MP grease  
 G00928164

**Fig. 181: Identifying Shift And Select Lever Shaft Components**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**REPLACEMENT**

**REPLACE CONTROL SHAFT COVER OIL SEAL AND BUSHING**

- a. Using a screwdriver, pry out the oil seal.



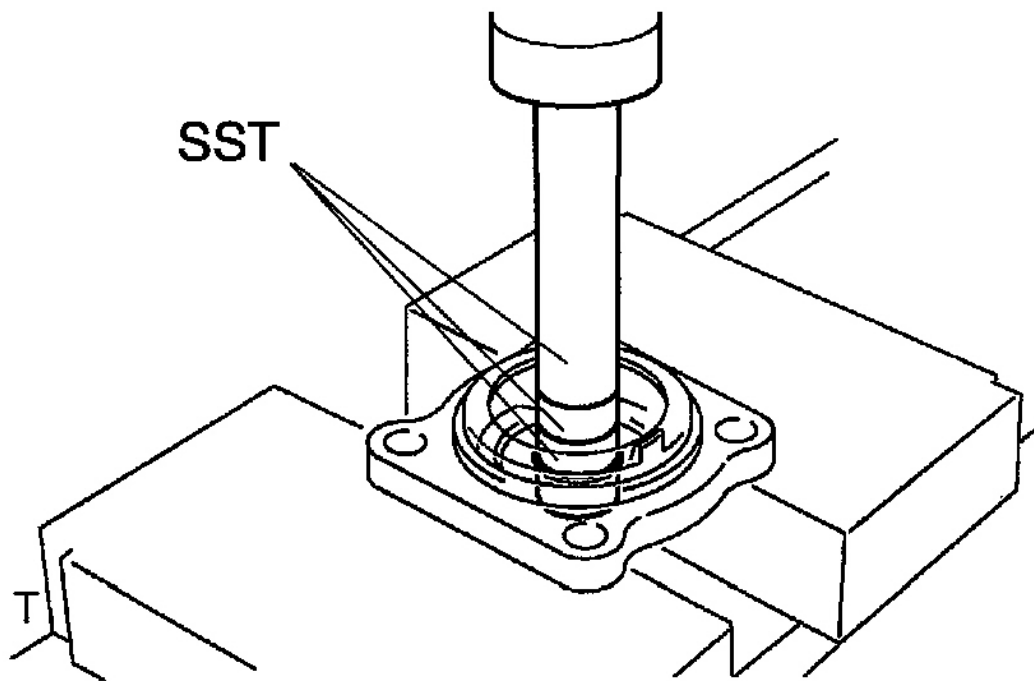
T  
G00928165

**Fig. 182: Prying Out Oil Seal Using Screwdriver**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using SST and a press, press out the bushing.

SST 09950-60010 (09951-00200, 09951-00210), 09950-70010 (09951-07150)





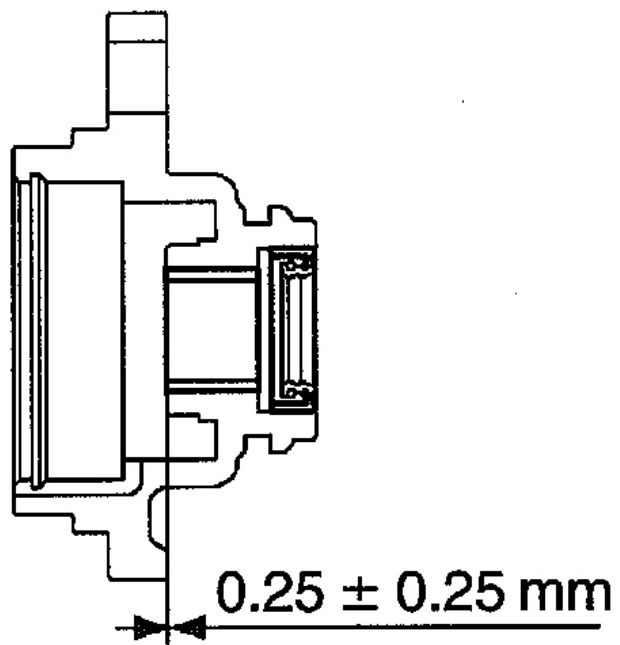
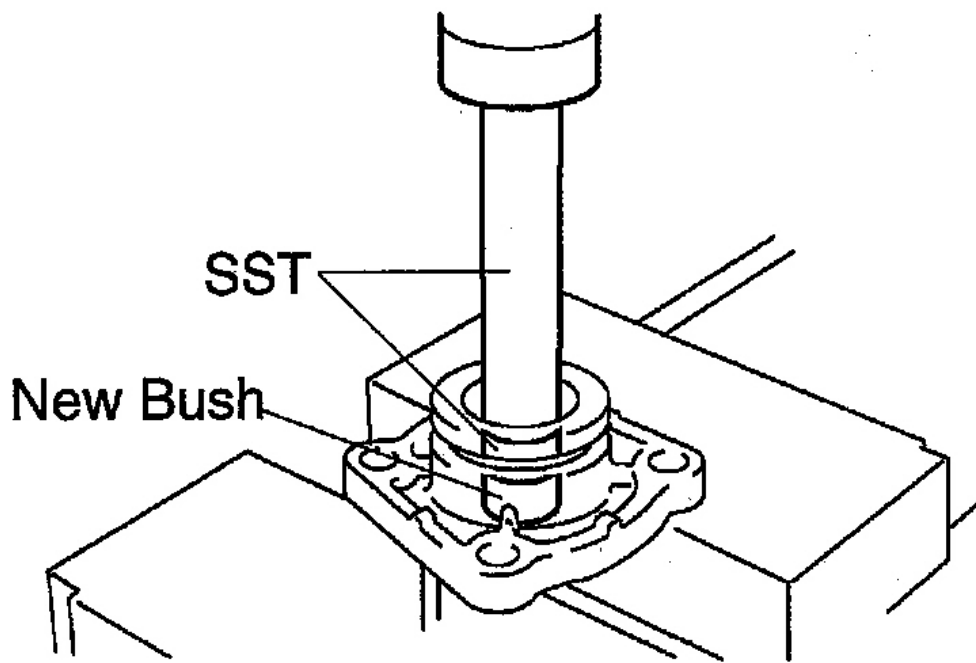
G00928166

**Fig. 183: Pressing Out Bushing Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using SST and a press, press in a new bushing.

SST 09950-60010 (09951-00200), 09950-70010 (09951-07150)

**Depth: 0.25 +/- 0.25 mm (0.0098 +/- 0.0098 in.)**



T

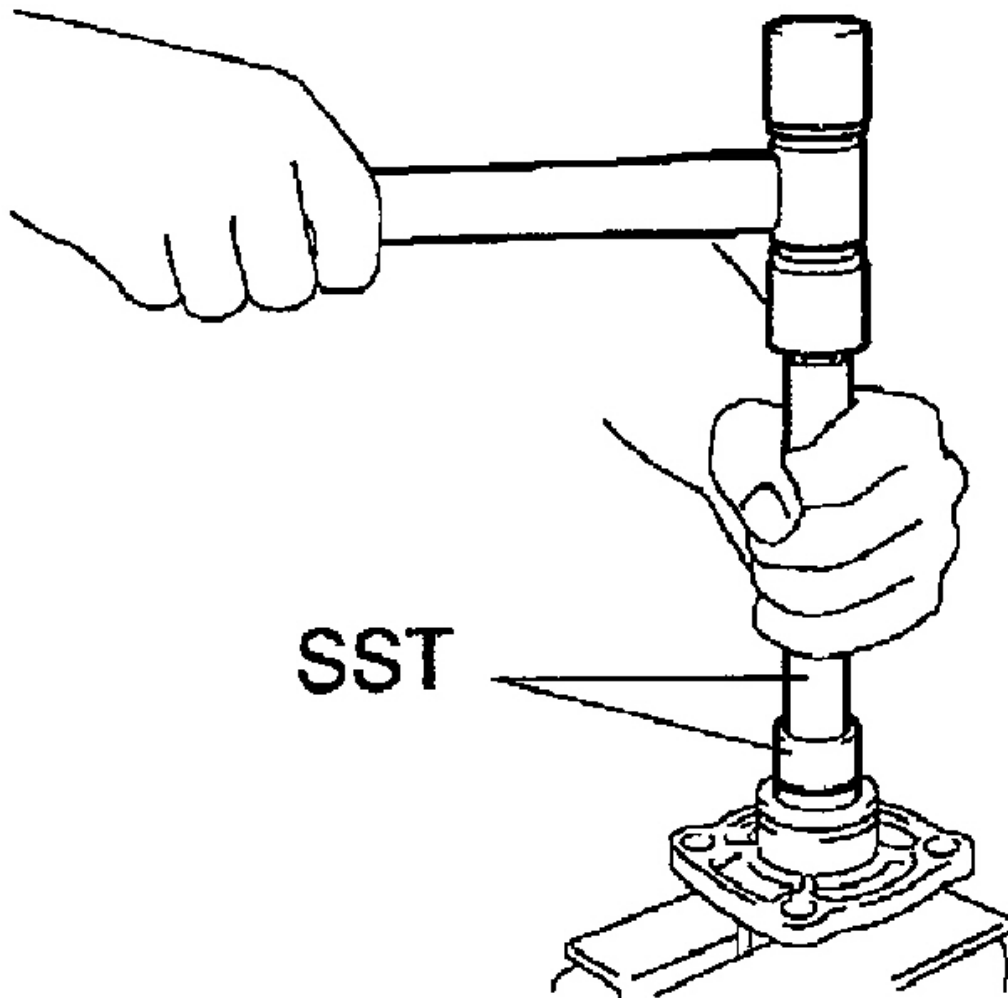
G00928167

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**Fig. 184: Pressing New Bushing Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Using SST and a plastic-faced hammer, carefully tap in a new oil seal.

SST 09950-60010 (09951-00270), 09950-70010 (09951-07150)

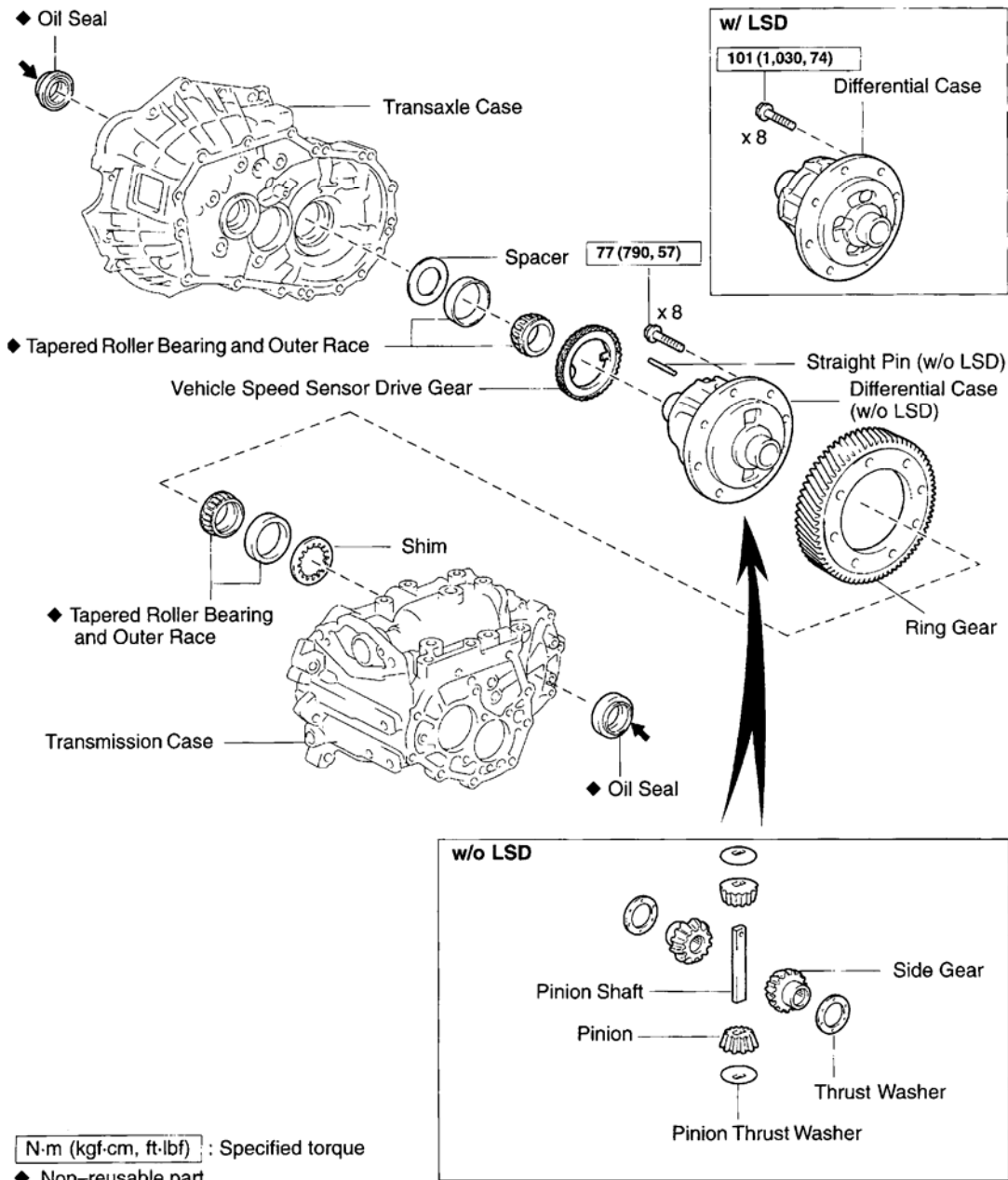


G00928168

**Fig. 185: Identifying Tap In A New Oil Seal Using Plastic-Faced Hammer**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

# DIFFERENTIAL CASE

## COMPONENTS



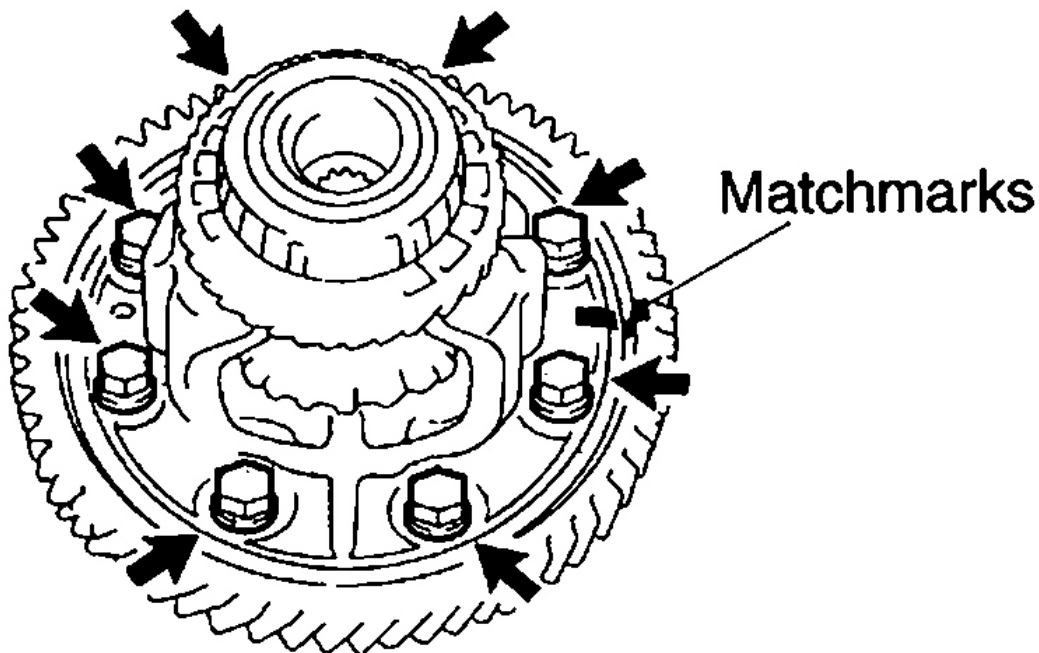
**Fig. 186: Identifying Differential Case Components**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## DISASSEMBLY

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## 1. REMOVE RING GEAR

- a. Place matchmarks on the ring gear and differential case.
- b. Remove the 8 bolts.
- c. Using a copper hammer, tap out the ring gear.



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**Fig. 187: Removing Bolts**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## 2. Vehicle Speed Sensor Drive Gear Side: REMOVE TAPERED ROLLER BEARING FROM DIFFERENTIAL CASE

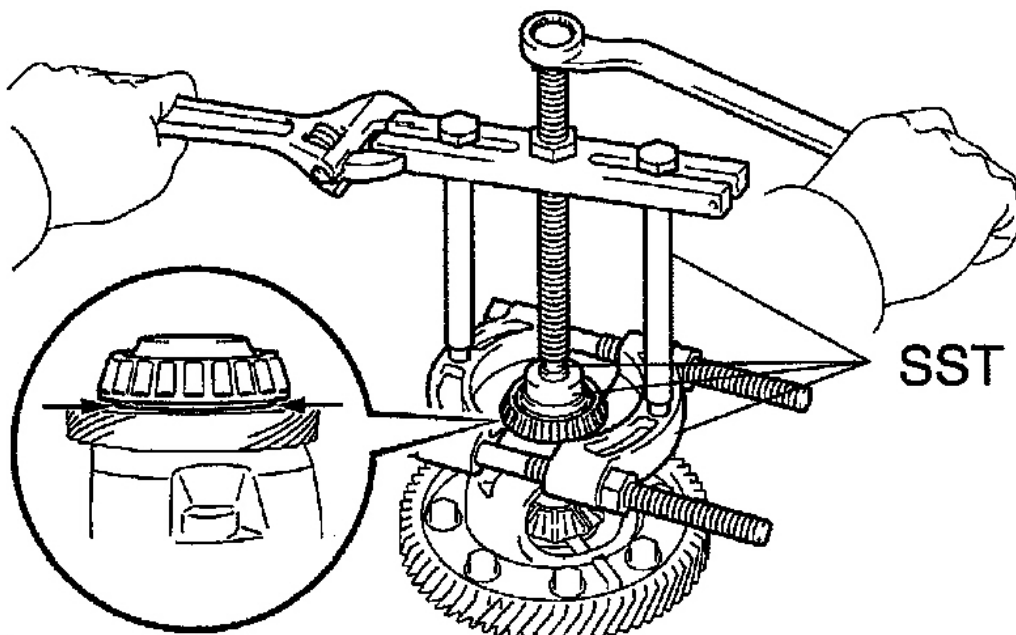
- a. Using SST, remove the tapered roller bearing.

SST 09950-00020, 09950-00030, 09950-40011 (09957-04010), 09950-60010 (09951- 00350)

HINT:

Set the claw of SST to the bearing inner race securely.

- b. Remove the vehicle speed sensor drive gear.



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**Fig. 188: Removing Tapered Roller Bearing Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

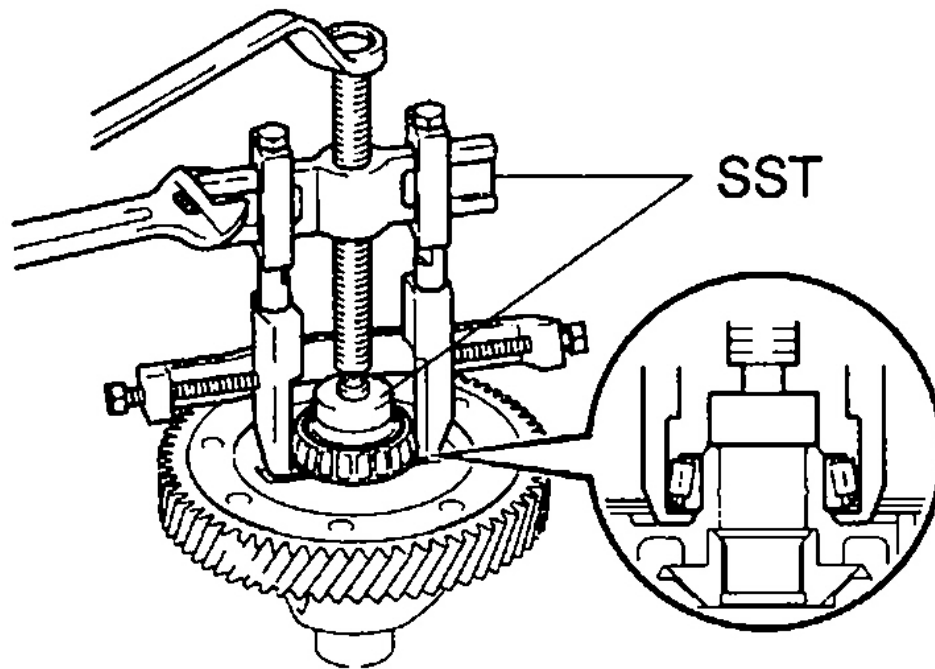
**3. Ring Gear Side: REMOVE TAPERED ROLLER BEARING FROM DIFFERENTIAL CASE**

Using SST, remove the tapered roller bearing.

SST 09950-40011, 09950-60010 (09951-00350)

HINT:

Set the claw of SST to the bearing inner race at the position where the differential case is indented.



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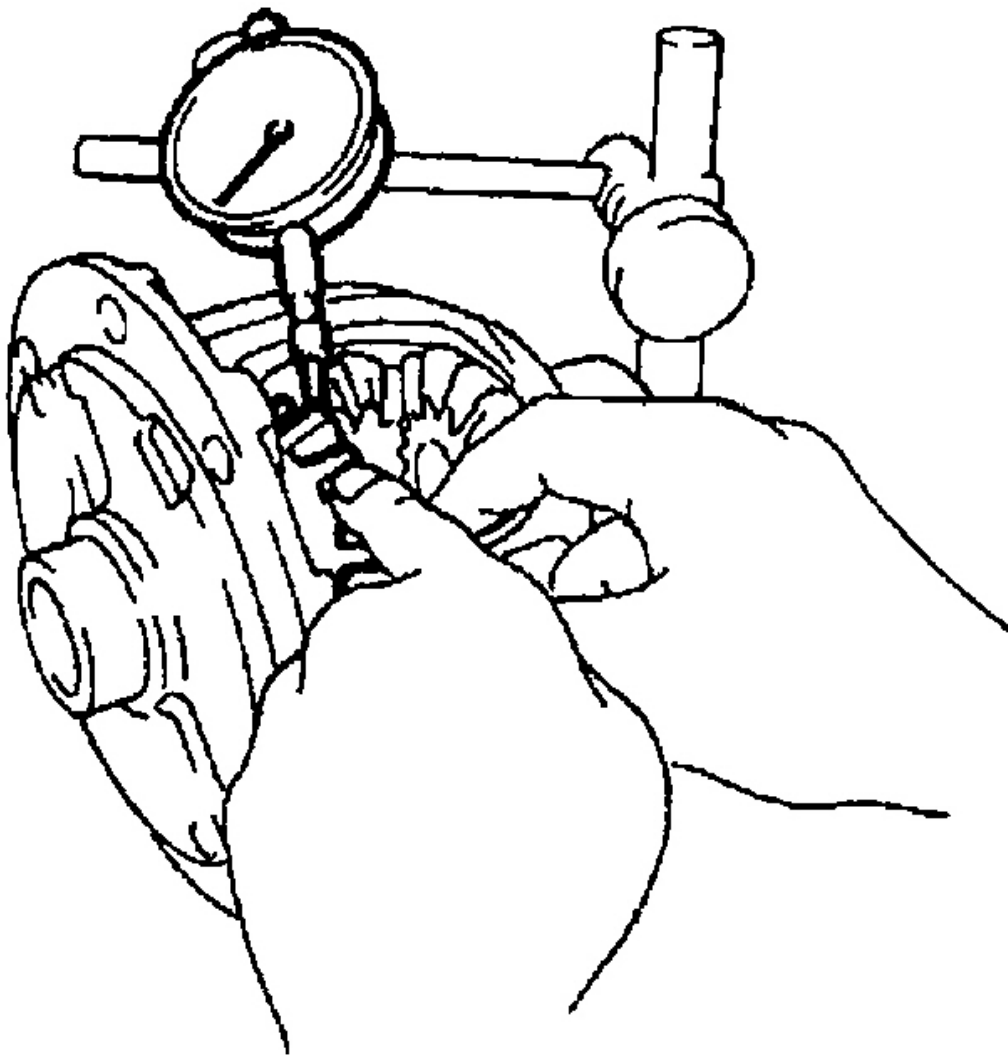
**Fig. 189: Removing Tapered Roller Bearing Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**4. Only w/o LSD:INSPECT SIDE GEAR BACKLASH**

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

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

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



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**Fig. 190: Measuring Backlash Of One Side Gear**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**5. DISASSEMBLE DIFFERENTIAL CASE**

- a. Using a pin punch and a hammer, tap out the straight pin.
- b. Remove the pinion shaft from the differential case.
- c. Remove the 2 pinions and side gears with the 4 thrust washers from each gear.



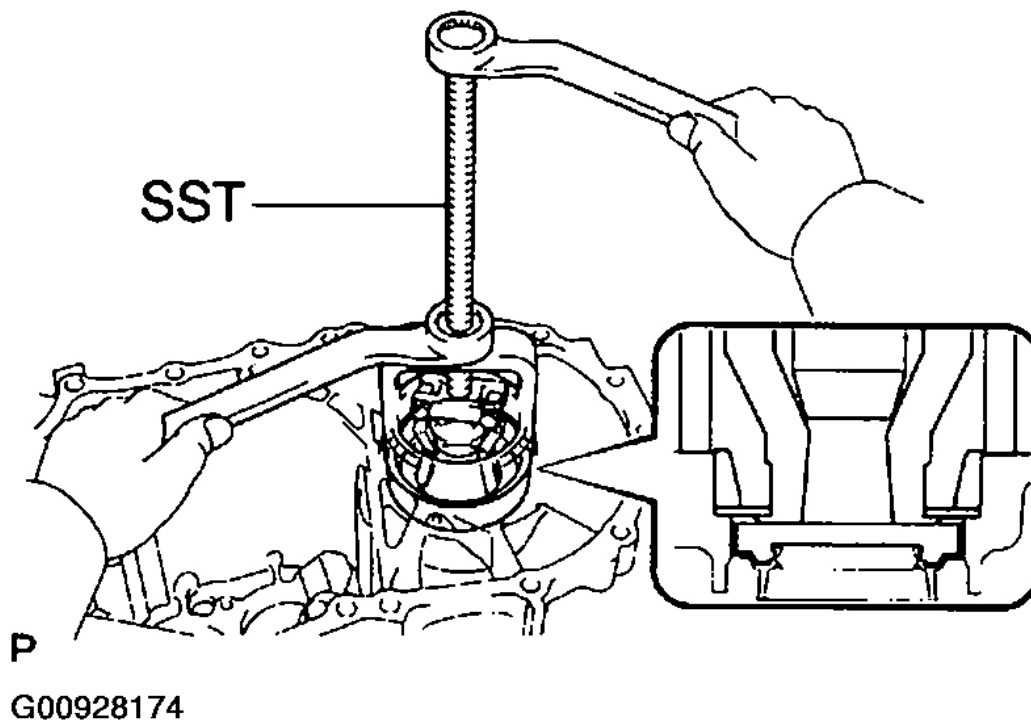
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## REPLACEMENT

### 1. Transmission Case Side:REPLACE OIL SEAL AND TAPERED ROLLER BEARING OUTER RACE

- a. Using SST, remove the tapered roller bearing outer race and shim.

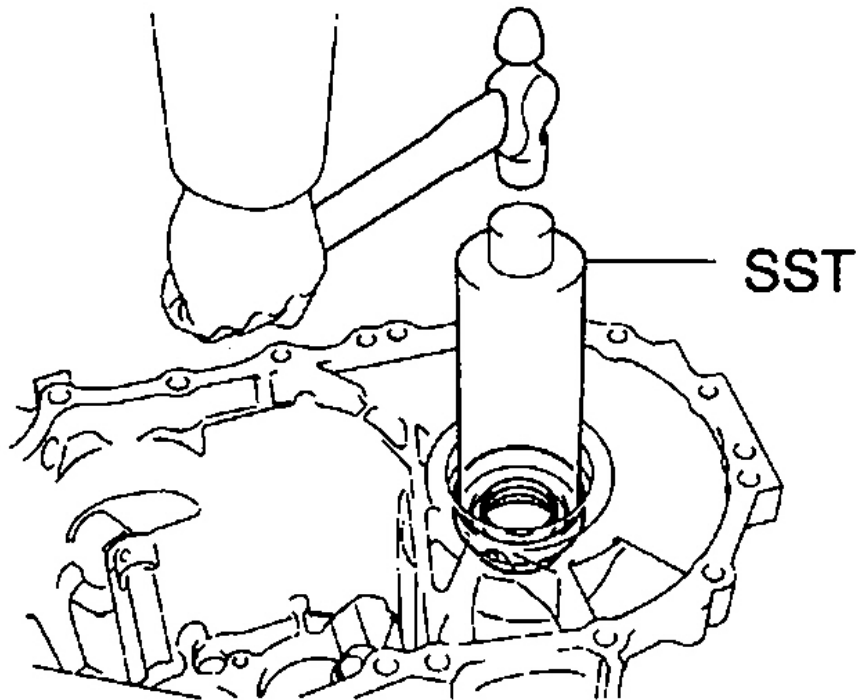
SST 09612-65014



**Fig. 191: Removing Tapered Roller Bearing Outer Race And Shim Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using SST and a hammer, tap out the oil seal.

SST 09226-10010



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**Fig. 192: Identifying Tap Out Oil Seal Using SST And Hammer**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using SST and a hammer, tap in a new oil seal.

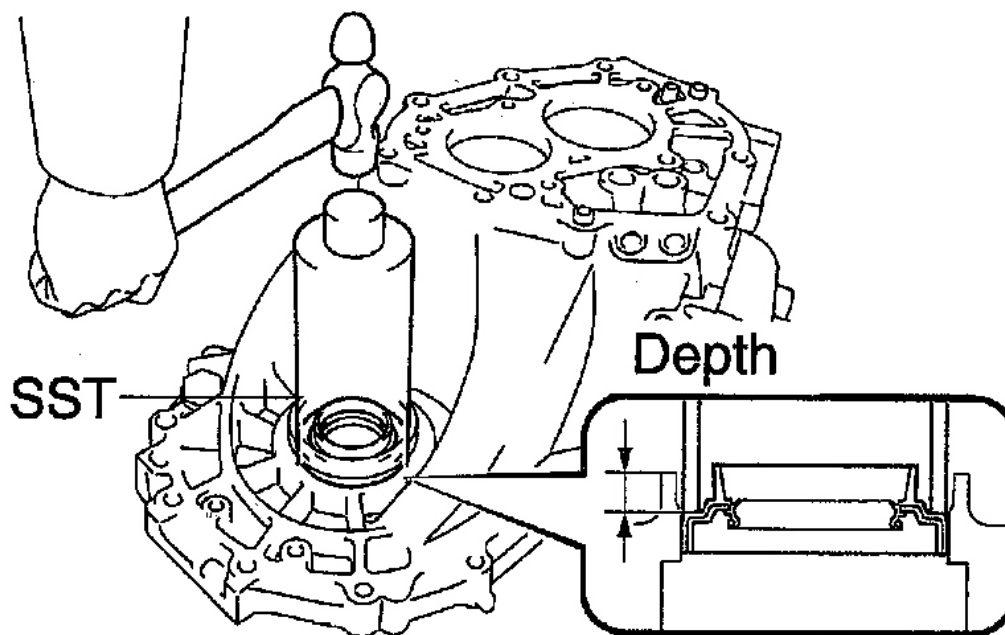
SST 09226-10010

**Depth: 9.9 +/- 0.3 mm (0.390 +/- 0.012 in.)**

- d. Coat the lip of the oil seal with MP grease.  
e. Place the shim into the differential case.

HINT:

In case that the tapered roller bearing is new, install the shim by selecting among the thin ones. In case that the tapered roller bearing is a used one, its better to install the shim which has the same thickness before disassembling.



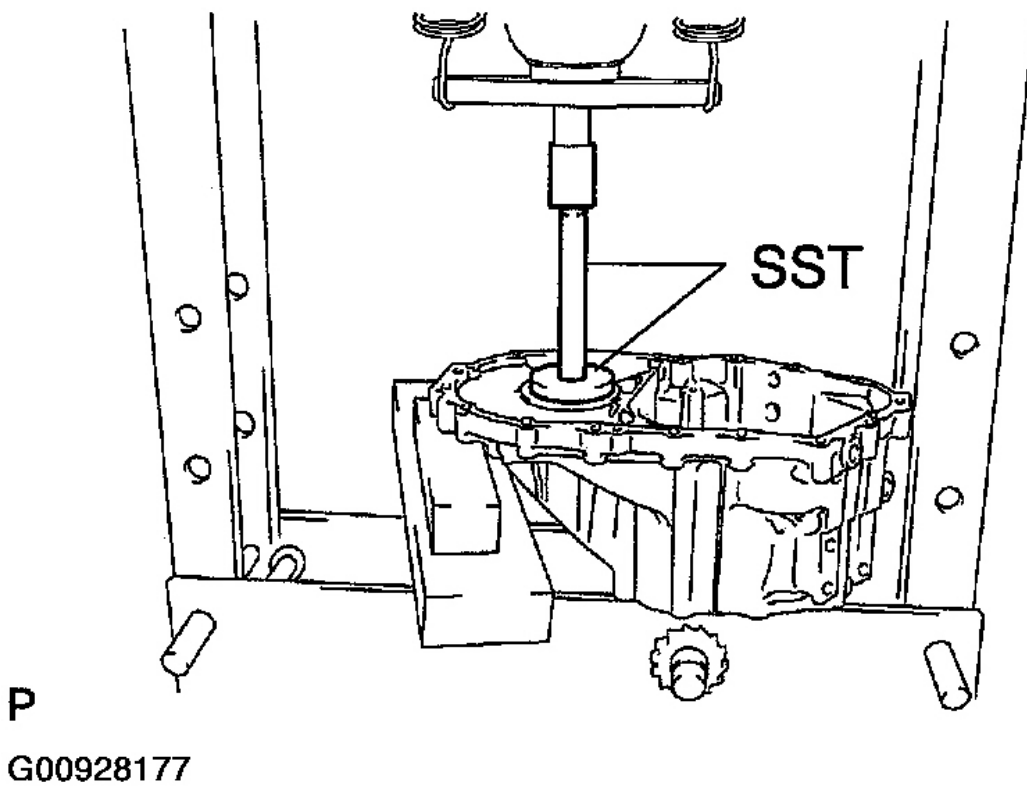
P  
G00928176

**Fig. 193: Identifying Tap Out Oil Seal Using SST And Hammer**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- f. Using SST and a press, press in a new tapered roller bearing outer race.

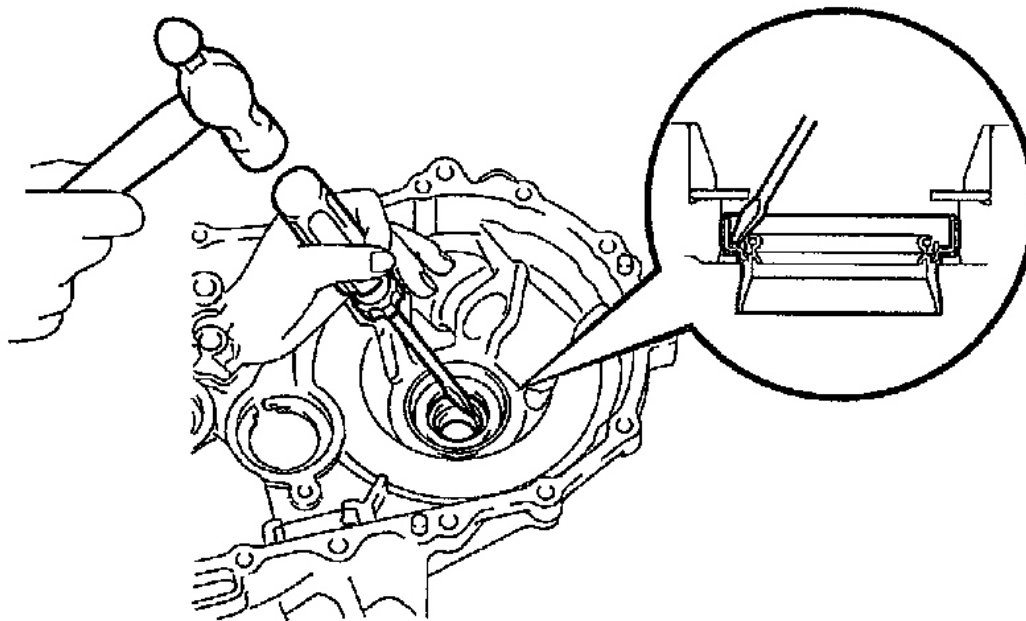
SST 09950-60020 (09951-00710), 09950-70010 (09951-07150)

**NOTE:** When replacing the tapered roller bearing outer race, replace the tapered roller bearing along with it.



**Fig. 194: Pressing New Tapered Roller Bearing Outer Race Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. **Transaxle Case Side: REPLACE OIL SEAL AND TAPERED ROLLER BEARING OUTER RACE**
  - a. Using a screwdriver and a hammer, tap out the oil seal.



**P**

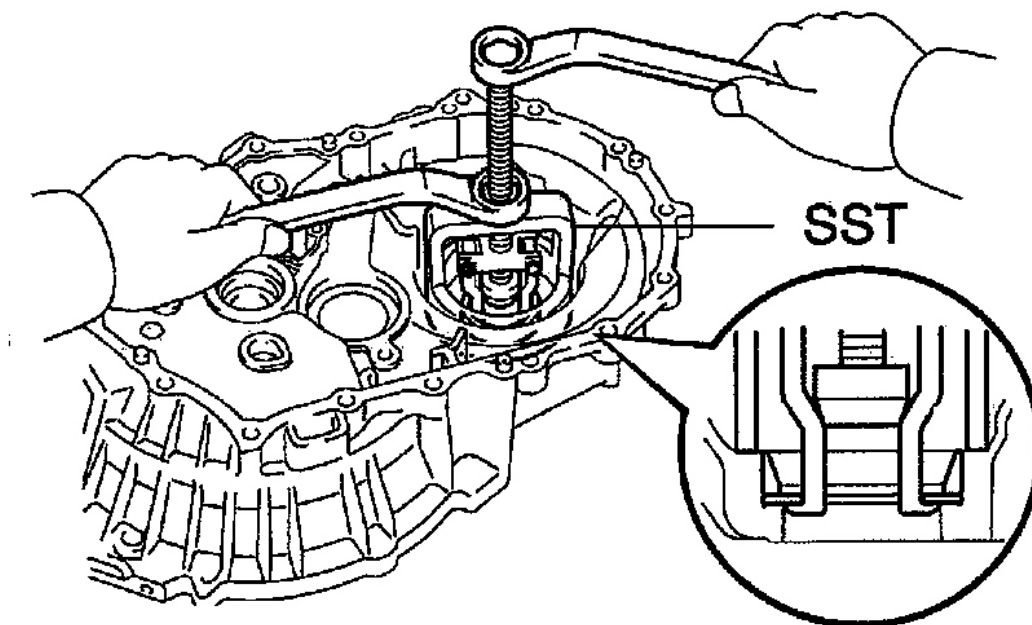
**G00928178**

**Fig. 195: Identifying Tap Out Oil Seal Using Screwdriver And Hammer**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using SST, remove the tapered roller bearing outer race and spacer.

SST 09612-65014

- c. Place the spacer into the differential case.



**P**

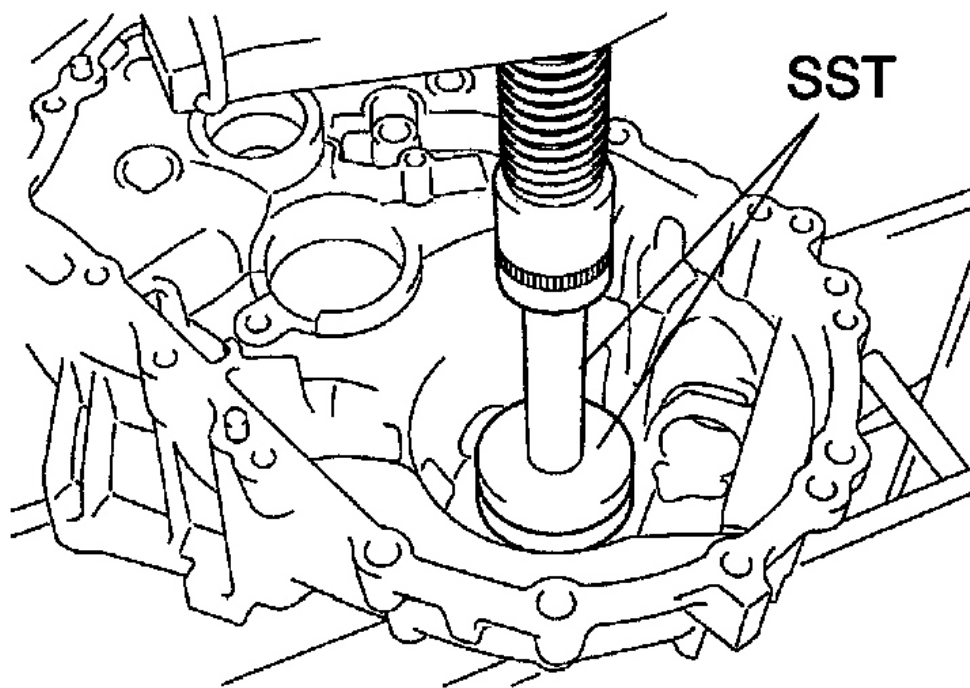
G00928179

**Fig. 196: Removing Tapered Roller Bearing Outer Race And Spacer Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Using SST and a press, press in a new tapered roller bearing outer race.

SST 09950-60020 (09951-00680), 09950-70010 (09951-07150)

**NOTE:** When replacing the tapered roller bearing outer race, replace the tapered roller bearing along with it.



P

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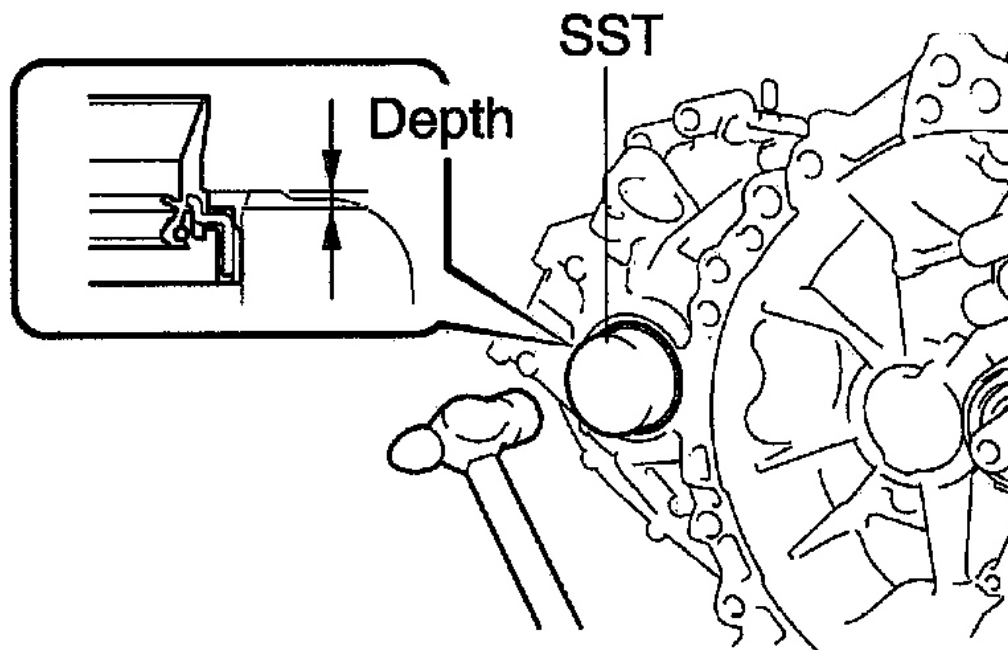
**Fig. 197: Pressing New Tapered Roller Bearing Outer Race Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Using SST and a hammer, tap in a new oil seal.

SST 09710-28021 (09710-08041)

**Depth: 1.9 +/- 0.3 mm (0.075 +/- 0.012 in.)**

- f. Coat the lip of the oil seal with MP grease.



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**Fig. 198: Identifying Tap In A New Oil Seal Using SST And Hammer**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## REASSEMBLY

### 1. ASSEMBLE DIFFERENTIAL CASE

- a. Install the correct thrust washers and side gears. Refer to the **Fig. 199** below, select thrust washers which will ensure that the backlash is within the specification. Try to select washers of the same size for both sides.

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

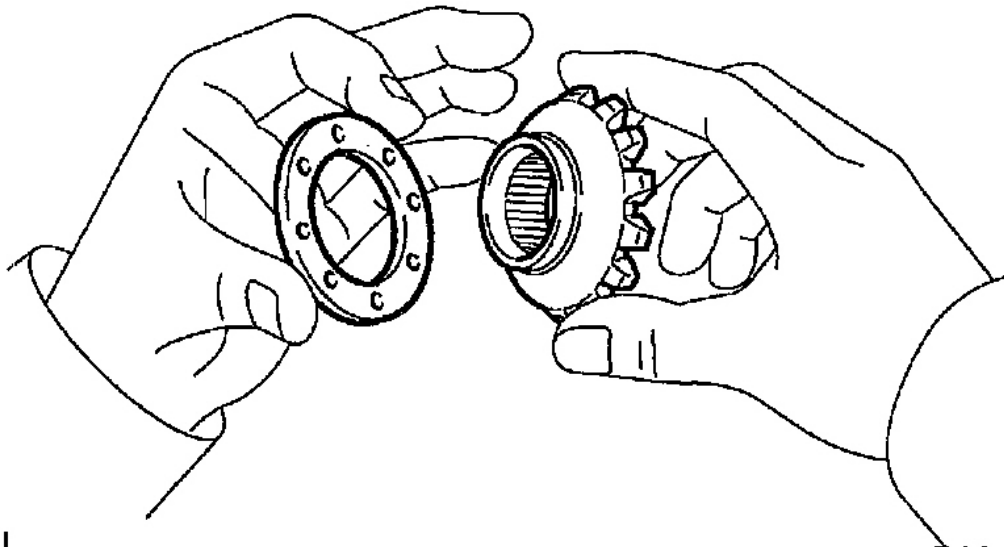


Thickness mm (in.)	Thickness mm (in.)
0.95 (0.0374)	1.10 (0.0433)
1.00 (0.0394)	1.15 (0.0453)
1.05 (0.0413)	1.20 (0.0472)

G00928182

**Fig. 199: Thickness Specification Chart**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Install the thrust washers and side gears in the differential case.
- c. Install the pinion shaft.



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**Fig. 200: Installing Correct Thrust Washers And Side Gears**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

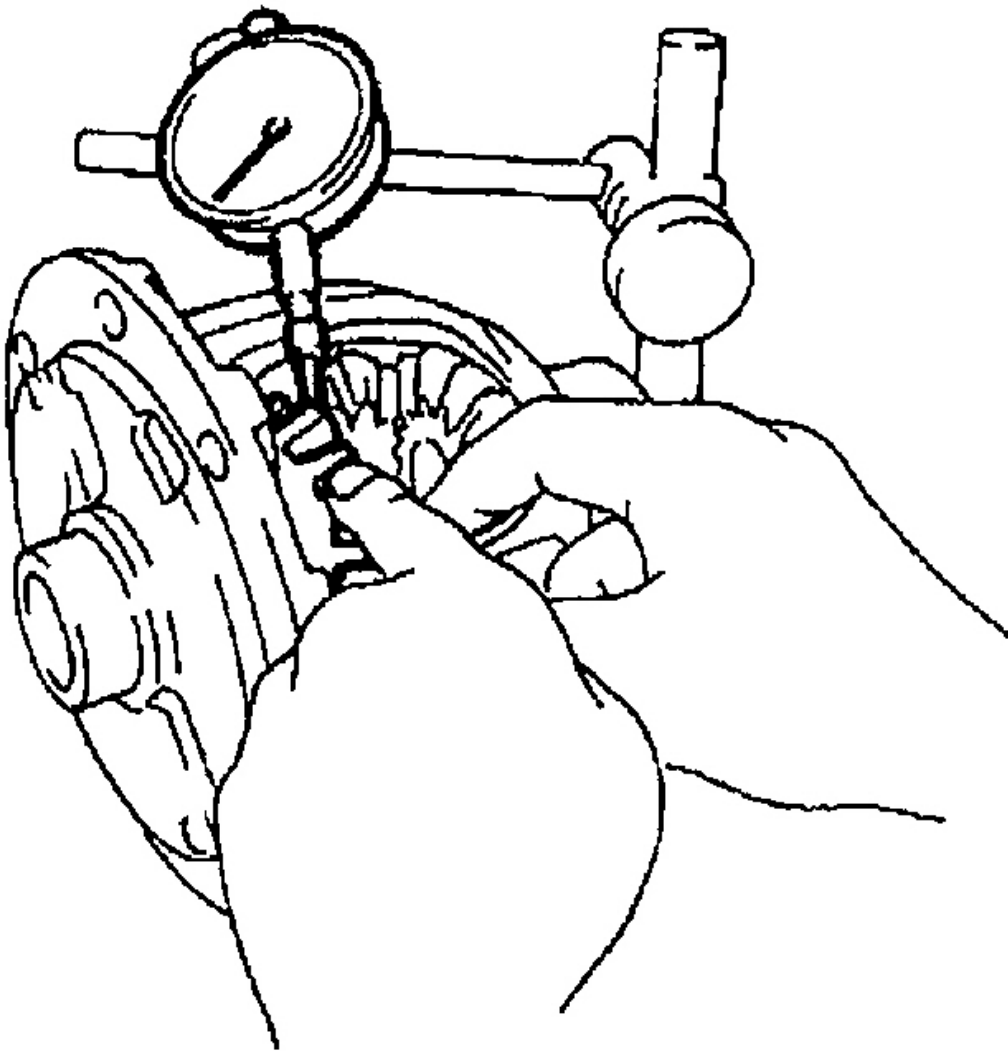
- d. Using a dial indicator, check the side gear backlash. Measure the side gear backlash while holding one pinion toward the differential case.

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

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

- e. Using a pin punch and a hammer, tap in the straight pin through the differential case and hole in the pinion shaft.
- f. Using a chisel and a hammer, caulk the pin holes around the circumference of the differential case.



G00928184

**Fig. 201: Checking Side Gear Backlash Using Dial Indicator**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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## 2. Ring Gear Side:INSTALL TAPERED ROLLER BEARING

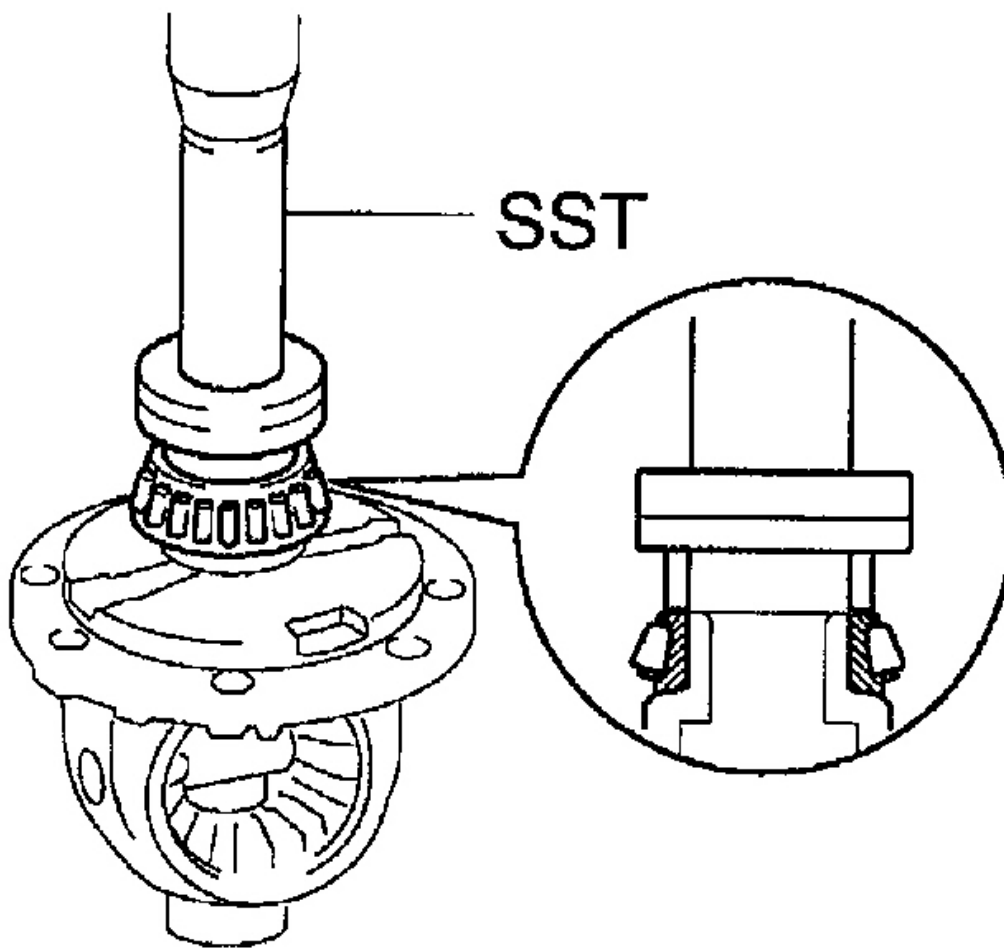
Using SST and a press, press in a new tapered roller bearing.

SST 09350-32014 (09351-32120, 09351-32140)

**NOTE:**        **When replacing the tapered roller bearing outer race, replace the tapered roller bearing along with it.**

HINT:

Set SST to the bearing inner race securely.



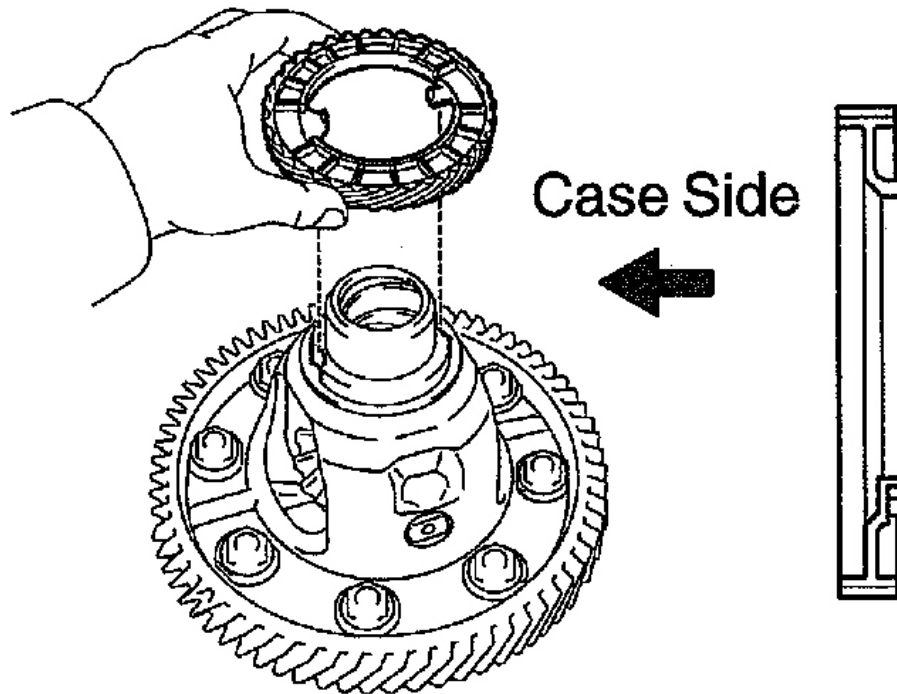
G00928185

**Fig. 202: Pressing New Tapered Roller Bearing Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**3. Vehicle Speed Sensor Drive Gear Side:INSTALL TAPERED ROLLER BEARING**

- a. Place the vehicle speed sensor drive gear in position to stop turning, and install the vehicle speed sensor drive gear.

**NOTE:** Be sure to install the vehicle speed sensor drive gear in the correct direction, as shown in the illustration.



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**Fig. 203: Installing Tapered Roller Bearing**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

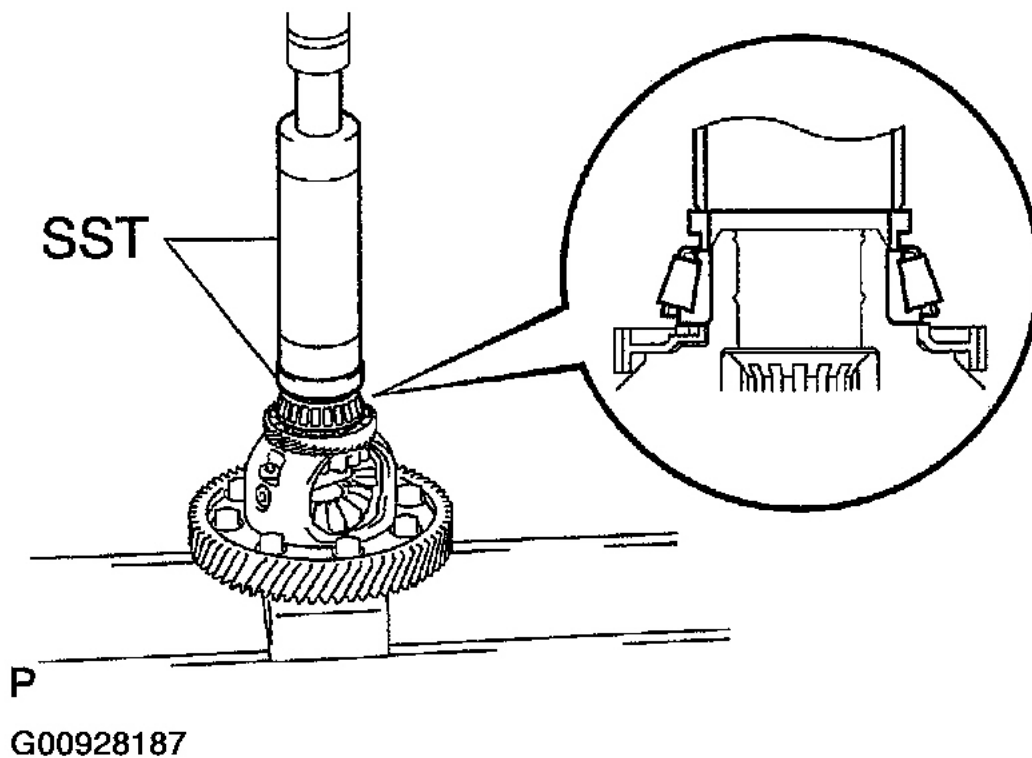
- b. Using SST and a press, press in a new side bearing.

SST 09316-60011 (09316-00011), 09350-32014 (09351-32120)

**NOTE:** When replacing the tapered roller bearing outer race, replace the tapered roller bearing along with it.

**HINT:**

Set SST to the bearing inner race securely.



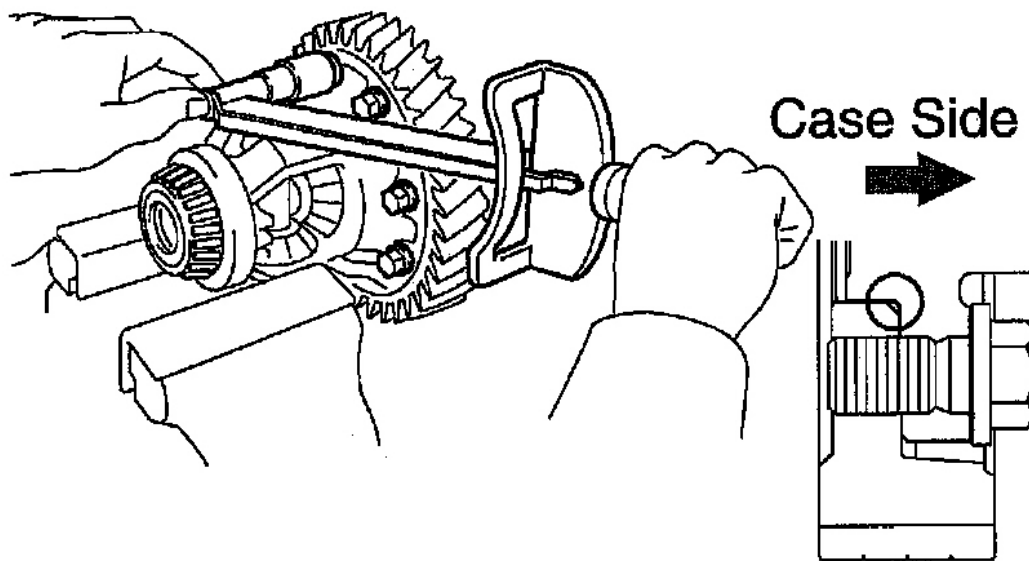
**Fig. 204: Pressing New Side Bearing Using SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**4. INSTALL RING GEAR ON DIFFERENTIAL CASE**

- a. Clean the contact surface of the differential case.
- b. Heat the ring gear in boiling water.
- c. Carefully take the ring gear out of the water.
- d. After the moisture on the ring gear has completely evaporated, quickly install the ring gear to the differential case.

**HINT:**

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



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**Fig. 205: Installing Ring Gear To Differential Case**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Temporarily install the 8 set bolts.

**CAUTION:** The ring gear set bolts should not be tightened until the ring gear has cooled sufficiently.

- f. After the ring gear has cooled sufficiently, torque the ring gear set bolts uniformly at a time.

**Torque:**

**Torque Specification**

w/o LSD	77 N.m (790 kgf.cm, 57 ft.lbf)
w/LSD	101 N.m (1,030 kgf.cm, 74 ft.lbf)

**5. INSPECT DIFFERENTIAL TAPERED ROLLER BEARING PRELOAD (IN CASE THAT w/o LSD)**

**NOTE:**

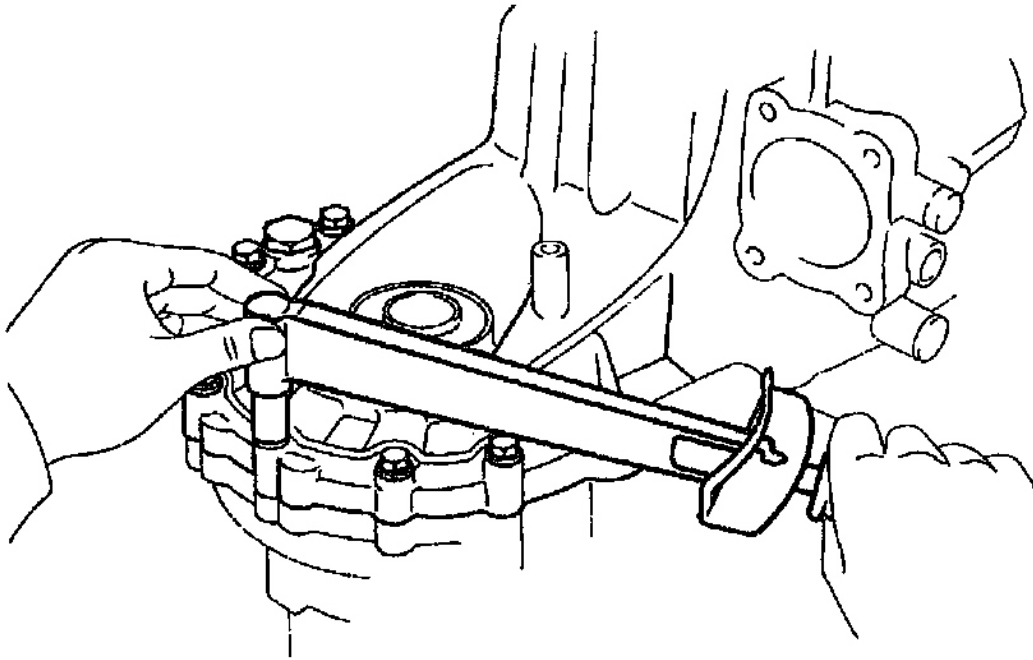
- Perform this only when replacing the tapered roller bearing and outer race of the differential case.
- The thickness of the shim installed on the transmission should be selected from the thin ones.

- 
- a. Install the differential case assembly to the transaxle case.

**NOTE:** Place it gently to protect the diff side bearing from being damaged.

- b. Install the transmission case to the transaxle case with the 16 bolts.

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



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**Fig. 206: Installing Differential Case Assembly To Transaxle Case**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using SST and a torque wrench, turn the differential case assembly right and left 2 or 3 times to allow the bearings to settle.

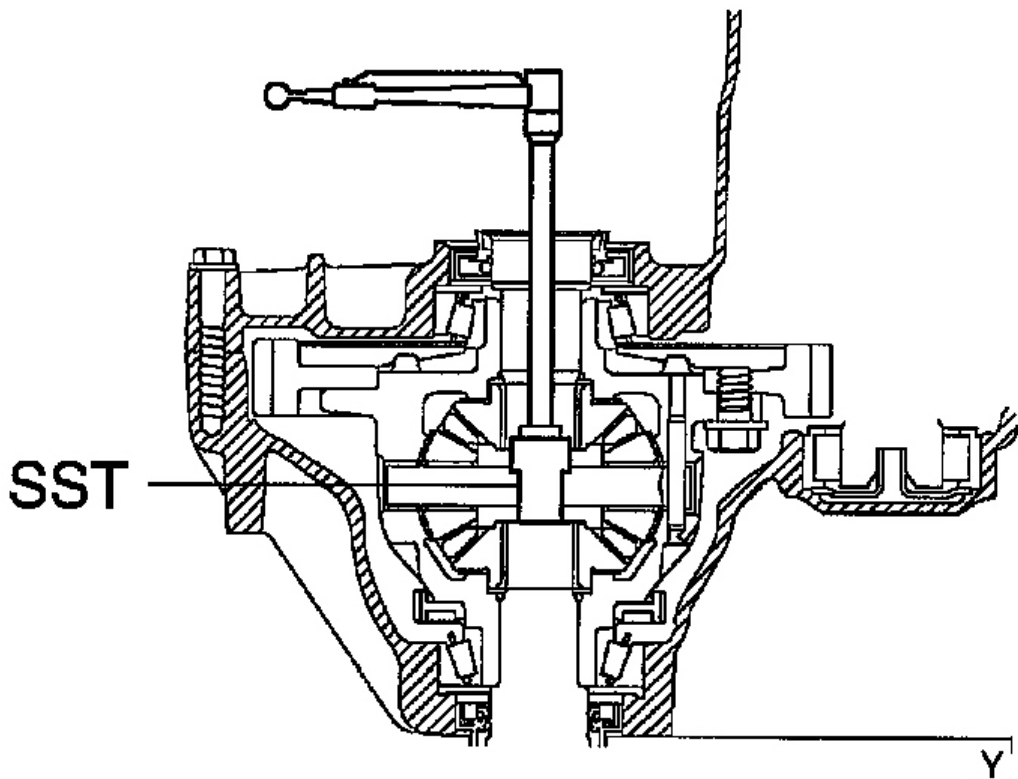
SST 09564-32011

- d. Using SST and a torque wrench, measure the preload.

SST 09564-32011

**Preload (at starting):**





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**Fig. 207: Measuring Preload Using SST And Torque Wrench**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

New bearing	0.78 to 1.57 N·m (7.96 to 16.0 kgf·cm, 0.58 to 1.16 in.·lbf)
Reused bearing	0.49 to 0.98 N·m (5.0 to 10.0 kgf·cm, 0.36 to 1.72 in.·lbf)

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**Fig. 208: Preload Specification Chart**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If the preload is not within the specification and when there is a clearance, remove the transmission case side outer race of the tapered roller bearing with SST (See **DISASSEMBLY**), and select the thick shim. Then, exchange the shim and measure the preload again.

HINT:

The preload will change by about 0.3 to 0.4 N.m (3 to 4 kgf.cm, 2.6 to 3.5 in. .lbf) corresponding to a change of 0.05 mm (0.0020 in.) in shim thickness.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
AA	2.10 (0.0827)	LL	2.60 (0.1024)
BB	2.15 (0.0846)	MM	2.65 (0.1043)
CC	2.20 (0.0866)	NN	2.70 (0.1063)
DD	2.25 (0.0886)	PP	2.75 (0.1083)
EE	2.30 (0.0906)	QQ	2.80 (0.1102)
FF	2.35 (0.0925)	RR	2.85 (0.1122)
GG	2.40 (0.0945)	SS	2.90 (0.1142)
HH	2.45 (0.0965)	TT	2.95 (0.1161)
JJ	2.50 (0.0984)	UU	3.00 (0.1181)
KK	2.55 (0.1004)	-	-

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**Fig. 209: Thickness Specification Chart**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

6. **INSPECT DIFFERENTIAL TAPERED ROLLER BEARING PRELOAD (IN CASE THAT w/ LSD)**

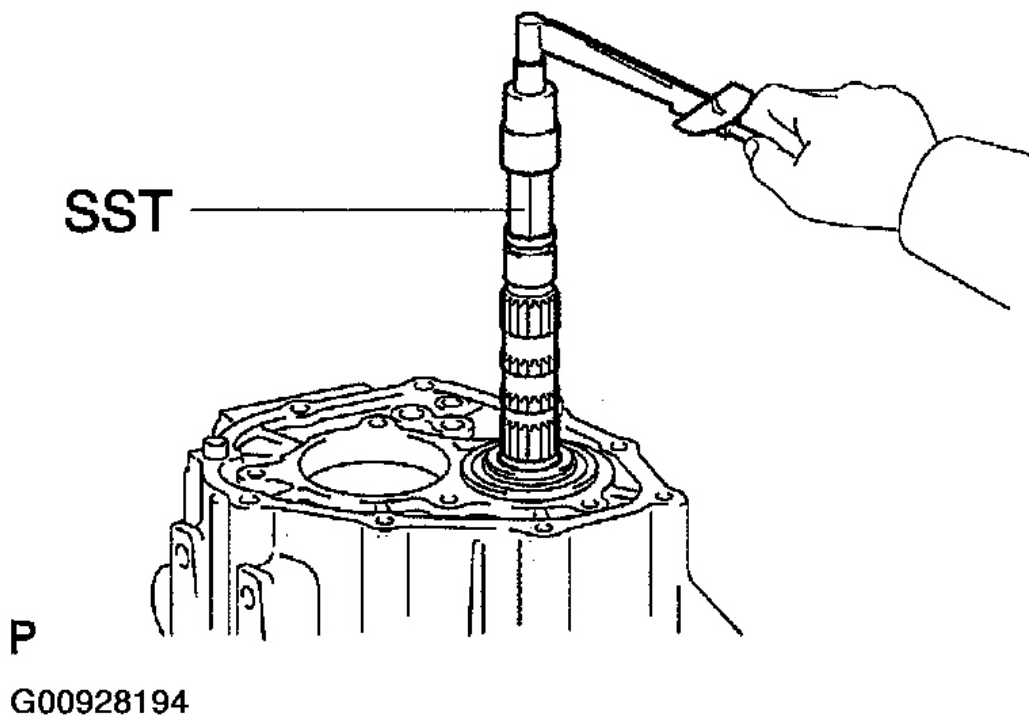
**NOTE:**

- **Perform this only when replacing the tapered roller bearing and outer race of the differential case.**
- **The thickness of the shim installed on the transmission should be selected from the thin ones.**

- a. Assemble the differential case assembly and output shaft assembly on the transaxle case, then on top of that, assemble the transmission case with the 16 bolts.

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

- b. Install the snap ring in the outer groove of the output shaft center bearing.



**Fig. 210: Turning Output Shaft Using Socket Wrench And Torque Wrench**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using a socket wrench (27 mm) and a torque wrench, turn the output shaft right and left 2 or 3 times to allow the bearings to settle.
- d. Using a socket wrench (27 mm) and a torque wrench, measure the preload.

**Preload (at starting):**

New bearing	0.17 to 0.35 N·m (1.73 to 3.57 kgf·cm, 0.13 to 0.26 in.·lbf)
Reused bearing	0.11 to 0.22 N·m (1.12 to 2.24 kgf·cm, 0.08 to 0.16 in.·lbf)

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**Fig. 211: Preload Specification Chart**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If the preload is not within the specification and when there is a clearance, remove the transmission case side outer race of the tapered roller bearing with SST (See **DISASSEMBLY**), and select the thick shim.

Then, exchange the shim and measure the preload again.

HINT:

The preload will change by about 0.3 to 0.4 N.m (3 to 4 kgf.cm, 2.6 to 3.5 in..lbf) corresponding to a change of 0.05 mm (0.0020 in.) in shim thickness.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
AA	2.10 (0.0827)	LL	2.60 (0.1024)
BB	2.15 (0.0846)	MM	2.65 (0.1043)
CC	2.20 (0.0866)	NN	2.70 (0.1063)
DD	2.25 (0.0886)	PP	2.75 (0.1083)
EE	2.30 (0.0906)	QQ	2.80 (0.1102)
FF	2.35 (0.0925)	RR	2.85 (0.1122)
GG	2.40 (0.0945)	SS	2.90 (0.1142)
HH	2.45 (0.0965)	TT	2.95 (0.1161)
JJ	2.50 (0.0984)	UU	3.00 (0.1181)
KK	2.55 (0.1004)	-	-

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**Fig. 212: Thickness Specification Chart**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## INPUT SENSOR

### REPLACEMENT

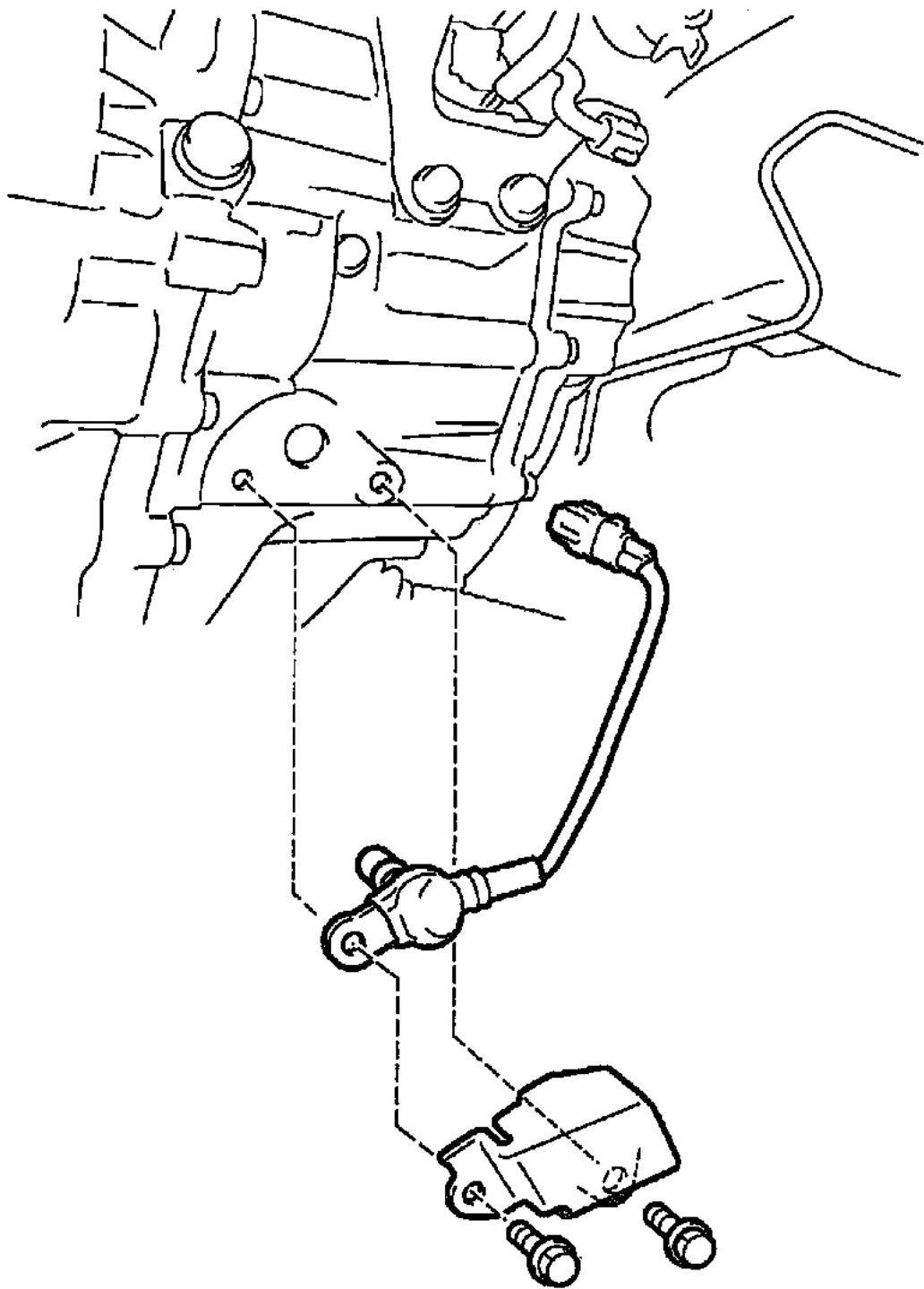
#### REPLACE INPUT SENSOR

- a. Remove the front and rear engine under covers.
- b. Remove the filler plug.
- c. Disconnect the connector clamp and input sensor connector.
- d. Remove the 2 bolts and transmission case protector.
- e. Remove the input sensor.

HINT:

Use a container to catch the transmission oil.

- 
- f. Install a new input sensor.
  - g. Install the transmission case protector with the 2 bolts.  
**Torque: 8.0 N.m (82 kgf.cm, 6 ft.lbf)**
  - h. Install the front and rear engine under covers.



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**Fig. 213: Removing Input Sensor**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- i. Add the transmission oil by the prescribed quantity since the oil drains when the input sensor has been removed.

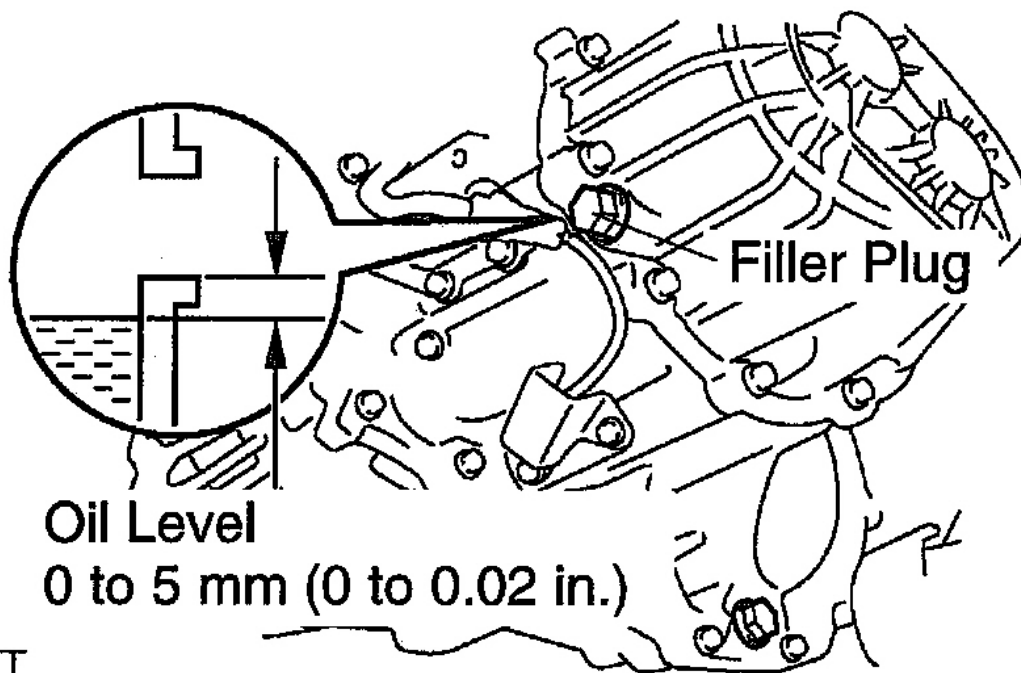
**Oil grade: API GL-4 or GL-5**

**Viscosity: SAE 75W-90**

- j. Reinstall the filler plug.

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

- k. Check for leak.



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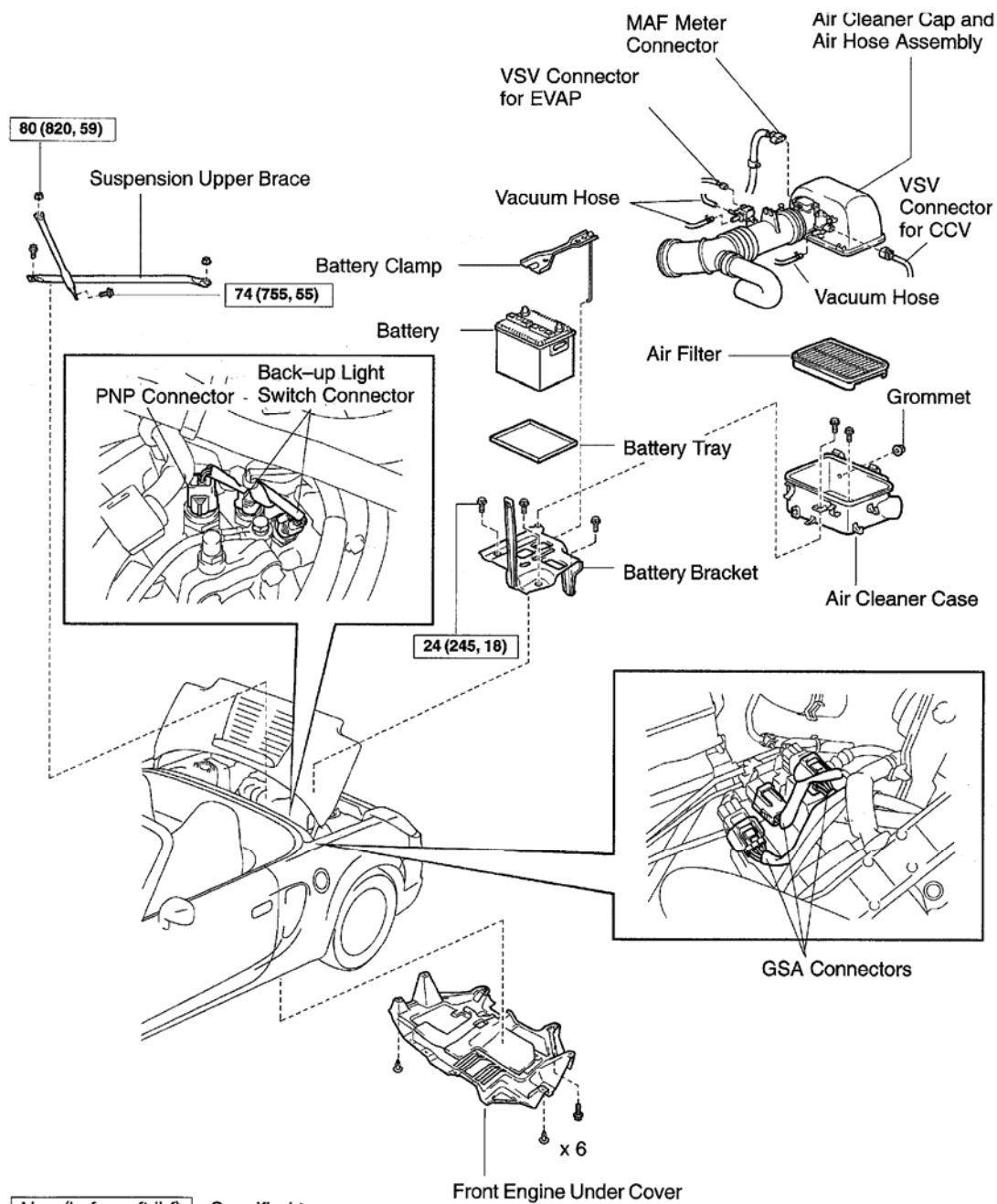
G00928198

**Fig. 214: Reinstalling Filler Plug**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**GEAR SHIFT ACTUATOR**

**COMPONENTS**

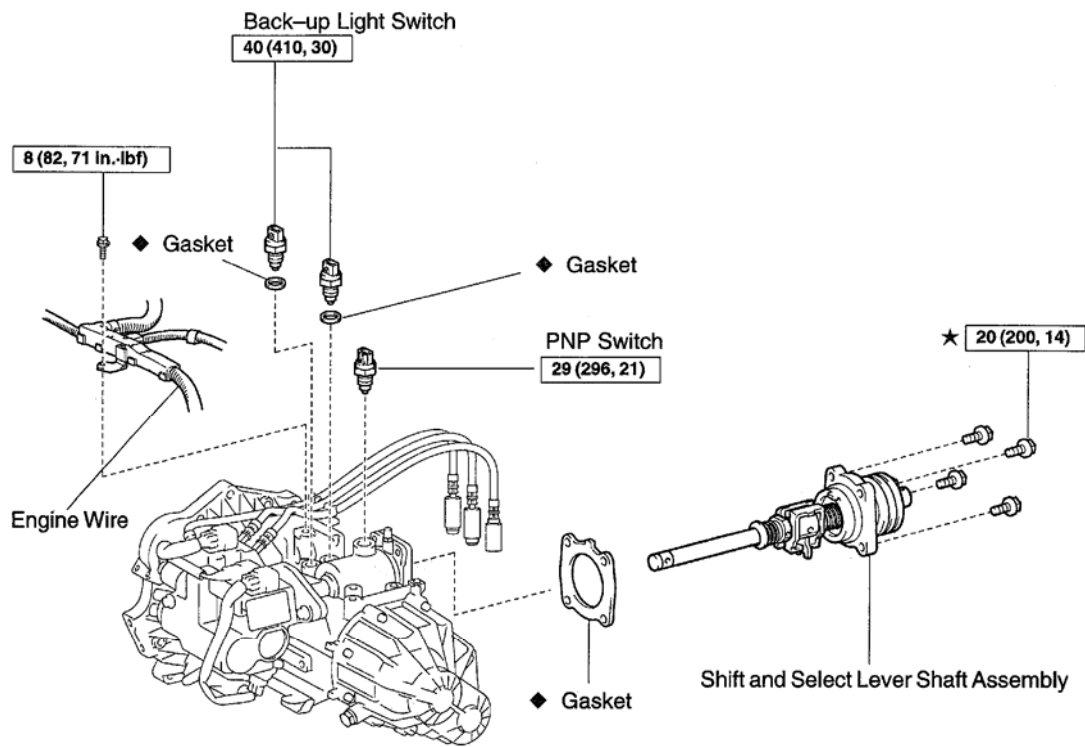


$\rho$  N·m (kgf·cm, ft·lbf) : Specified torque

G00928199

**Fig. 215: Identifying Gear Shift Actuator Components (1 Of 4)**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.





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

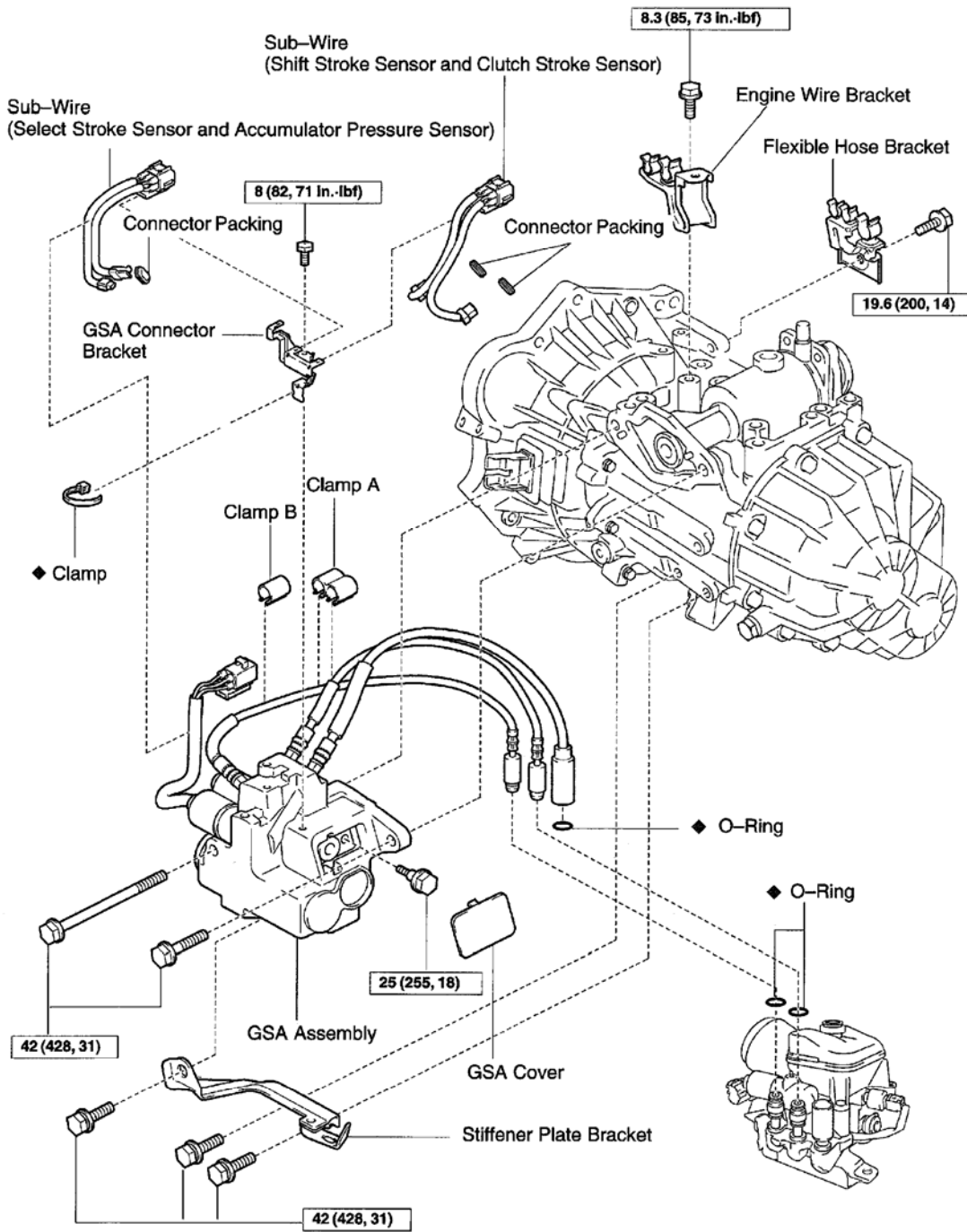
◆ Non-reusable part

★ Precoated part

G00928200

**Fig. 216: Identifying Gear Shift Actuator Components (2 Of 4)**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

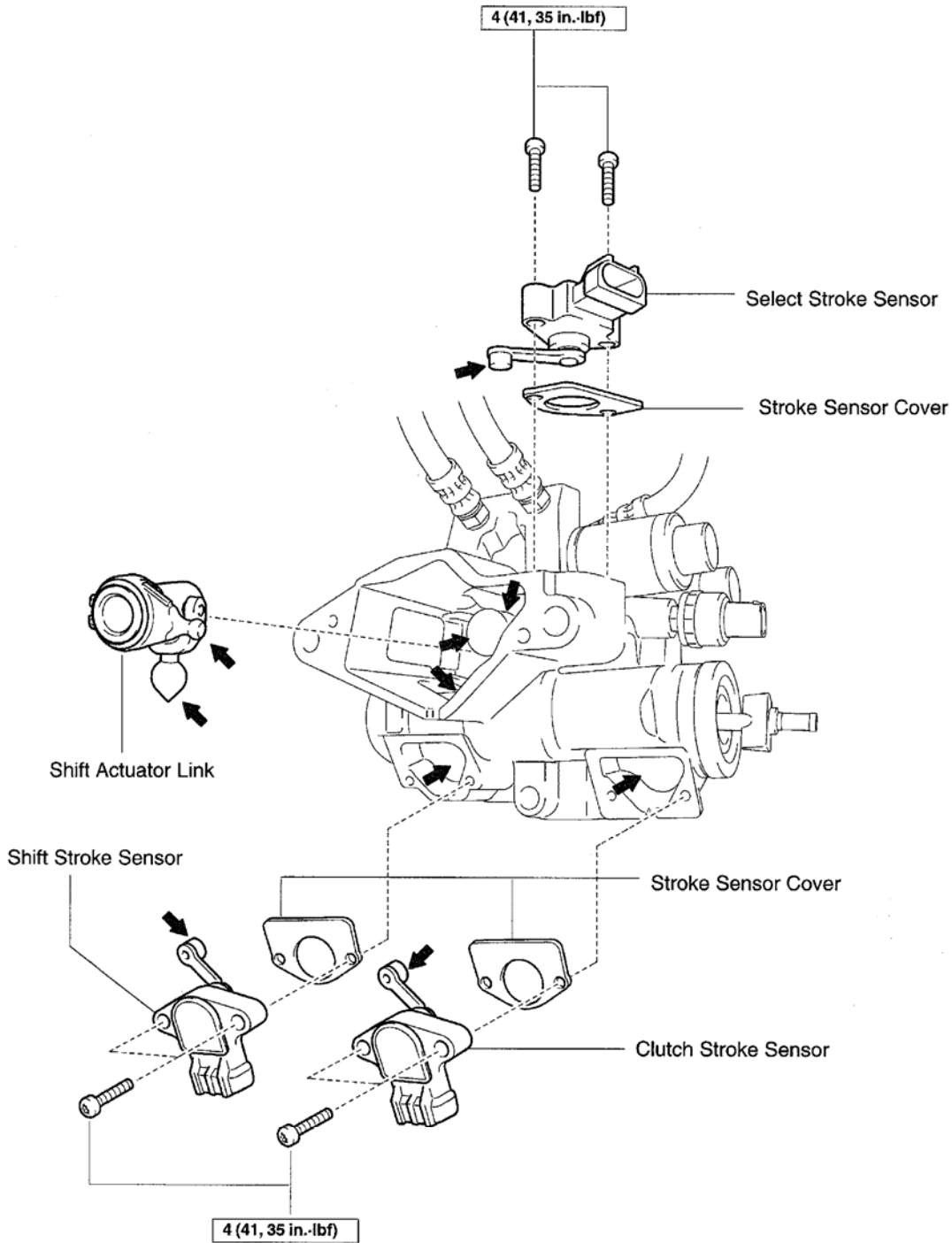


N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

G00928201

**Fig. 217: Identifying Gear Shift Actuator Components (3 Of 4)**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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

p → Apply sequential M/T grease

G00928202

**Fig. 218: Identifying Gear Shift Actuator Components (4 Of 4)**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

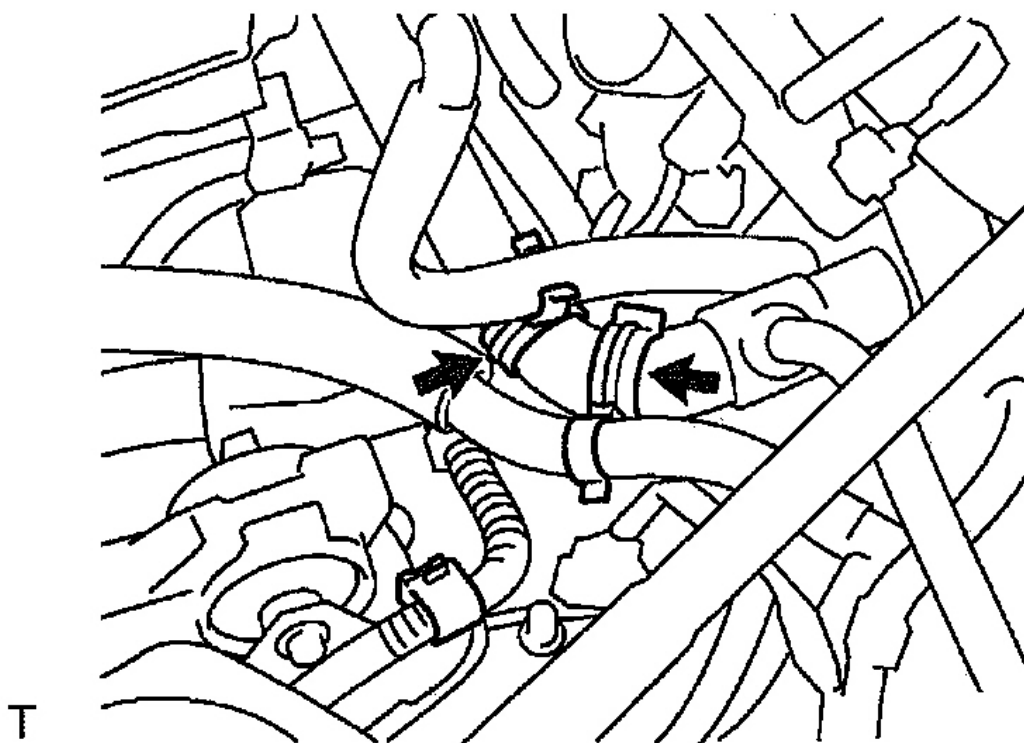
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## REMOVAL

1. **CONFIRM THAT GEAR IS IN N POSITION (See SEQUENTIAL MANUAL TRANSMISSION SYSTEM)**
2. **REDUCE ACCUMULATOR PRESSURE (See PRE-CHECK )**
3. **REMOVE SUSPENSION UPPER BRACE**

Remove the 2 bolts, 2 nuts and suspension upper brace.

4. **REMOVE AIR CLEANER CAP AND AIR HOSE ASSEMBLY, AIR FILTER AND AIR CLEANER CASE (See REMOVAL )**
5. **REMOVE FRONT ENGINE UNDER COVER**
6. **REMOVE BATTERY BRACKET**
  - a. Loosen the clamp nut, and remove the clamp, battery and tray.
  - b. Remove the 3 bolts and battery bracket.
7. **DISCONNECT ENGINE WIRE FROM TRANSMISSION**
  - a. Disconnect the 2 hose clamps and engine wire clamp.

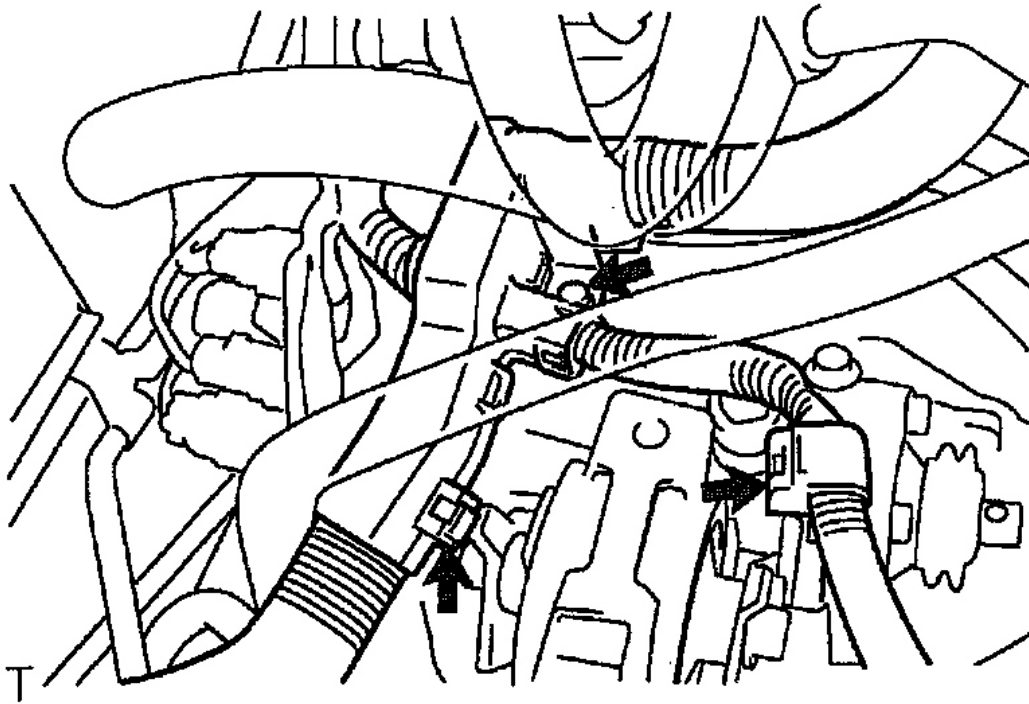


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**Fig. 219: Disconnecting Hose Clamps And Engine Wire Clamp**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

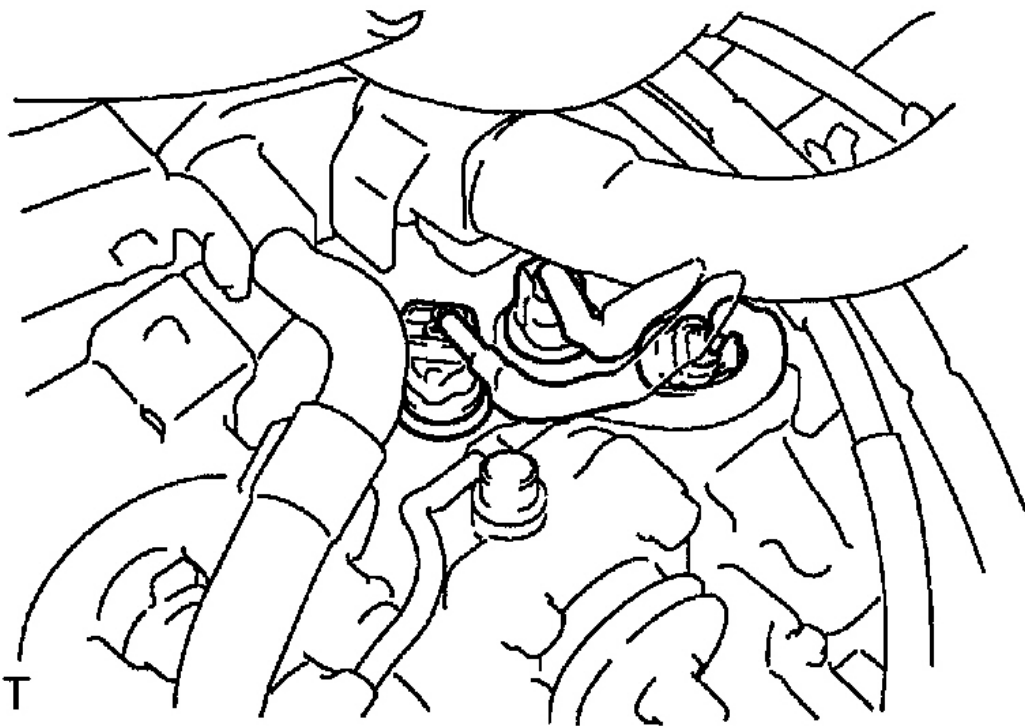
- b. Disconnect the 2 engine wire clamps.
- c. Remove the bolt, and disconnect the engine wire.



G00928204

**Fig. 220: Disconnecting Engine Wire Clamps**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

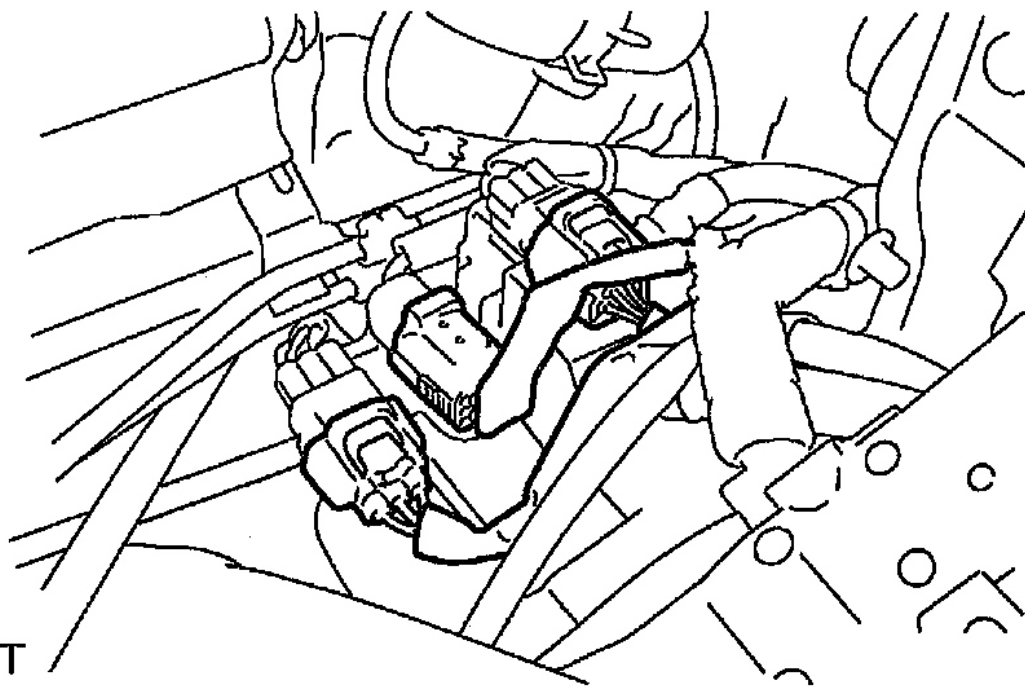
8. **DISCONNECT PNP SWITCH CONNECTOR AND 2 BACK-UP LIGHT SWITCH CONNECTORS**



G00928205

**Fig. 221: Identifying PNP Switch Connector And Back-Up Light Switch Connectors**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**9. DISCONNECT GSA CONNECTORS**



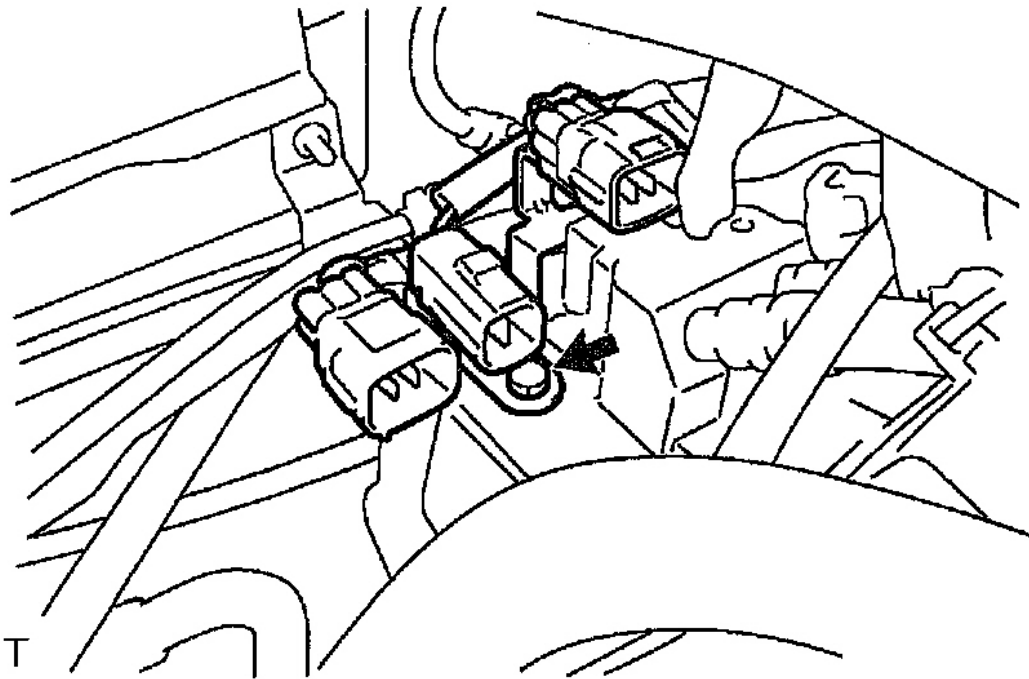
G00928206

**Fig. 222: Identifying GSA Connectors**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**10. DISCONNECT GSA CONNECTOR BRACKET**

Remove the bolt and disconnect the GSA connector bracket.





G00928207

**Fig. 223: Removing Bolt And Disconnecting GSA Connector Bracket**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**11. DISCONNECT SMT SYSTEM HOSES**

- a. Disconnect the SMT system return hose.

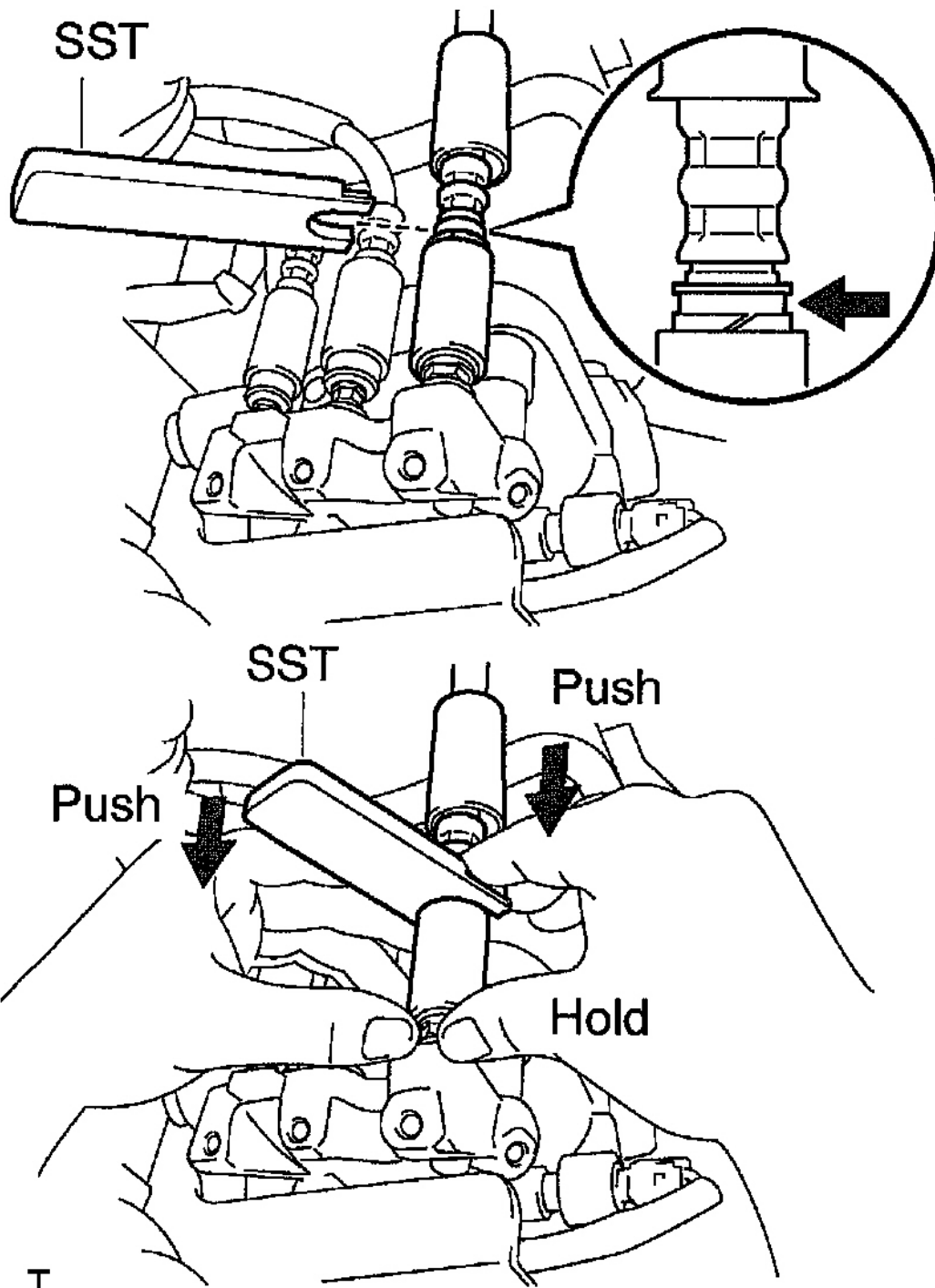
Hold the system return hose with the SST as shown in the illustration.

SST 09340-00010

Then disconnect the system return hose by pushing the SST downward until a click sound is heard.

**HINT:**

Put force equally and horizontally against the system hose with the SST.



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G00928208

**Fig. 224: Holding System Return Hose With SST**

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**Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.**

- b. Disconnect the SMT system clutch hose and SMT system master hose.

**HINT:**

The way of removing the 2 SMT system hoses is the same.

Hold the system clutch and master hoses with the SST as shown in the illustration.

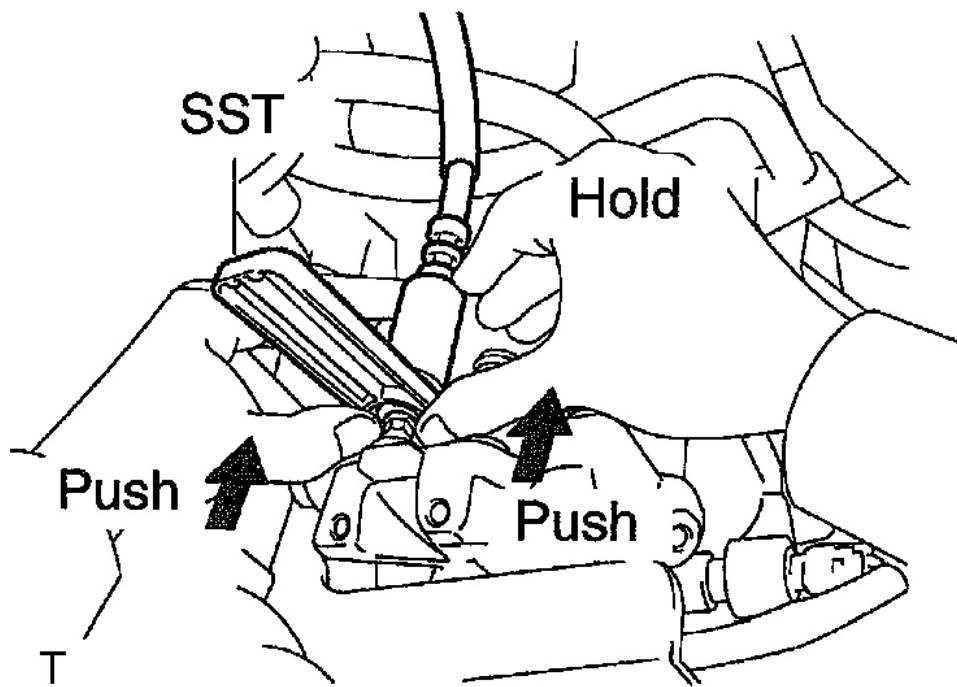
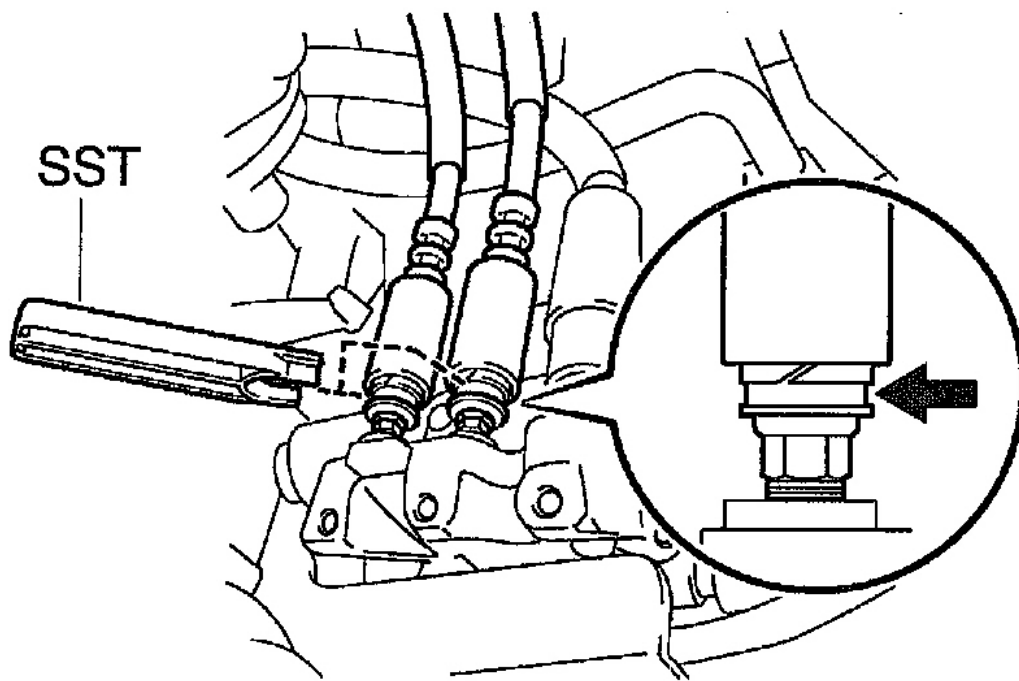
SST 09340-00010

Then disconnect the system clutch and master hoses by pushing the SST upward until a click sound is heard.

**HINT:**

Put force equally and horizontally against the system hose.

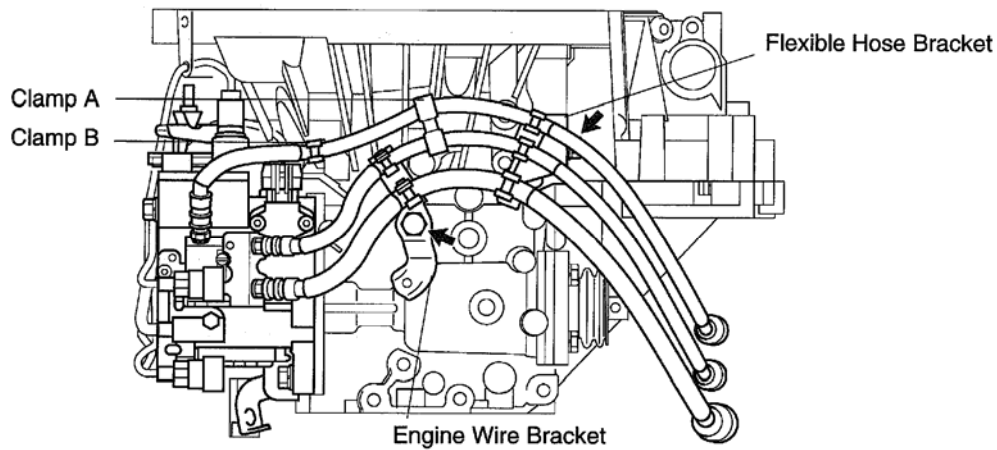
- c. Disconnect the 3 SMT system hoses from the flexible hose bracket.
- d. Remove the bolt and flexible hose bracket.
- e. Remove the clamp A from the 2 SMT system hoses.
- f. Disconnect the 2 SMT system hoses from the engine wire bracket.
- g. Remove the bolt and engine wire bracket.
- h. Disconnect the other SMT system hose from the clamp B.



G00928209

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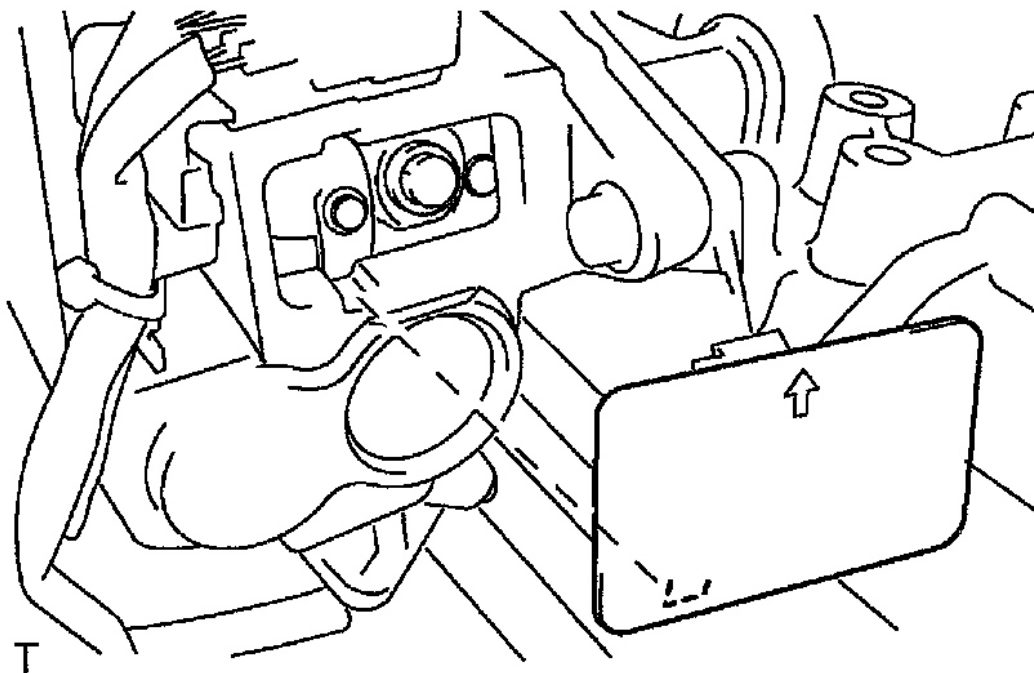
**Fig. 225: Holding System Clutch And Master Hoses With SST**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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G00928210

**Fig. 226: Disconnecting SMT System Hose From Clamp**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

12. REMOVE GSA ASSEMBLY FROM TRANSMISSION
  - a. Remove the GSA cover.



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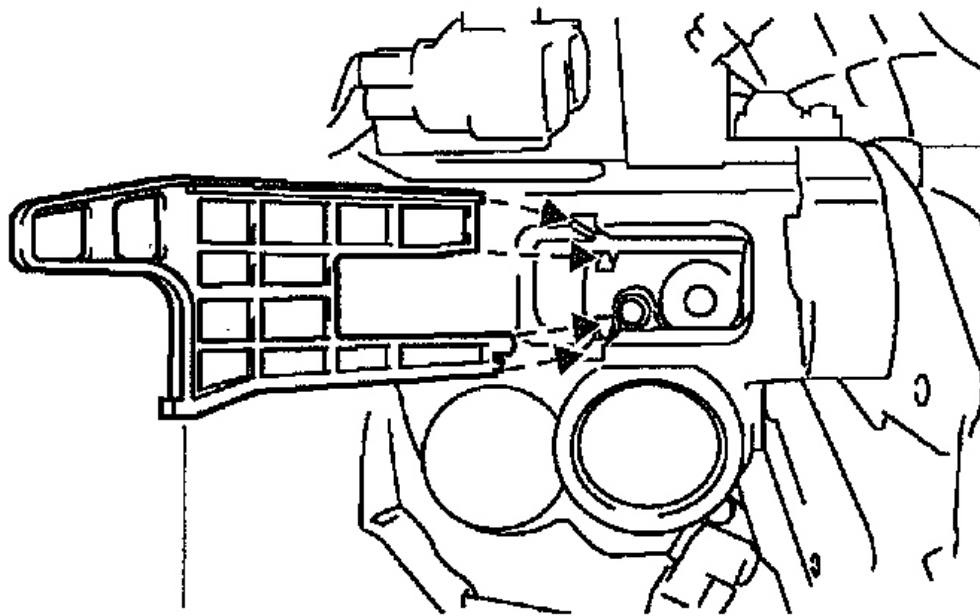
**Fig. 227: Removing GSA Cover**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Install the actuator link fixing plate to the GSA.

Part the No.:

Actuator link fixing plate: 33963-0W010

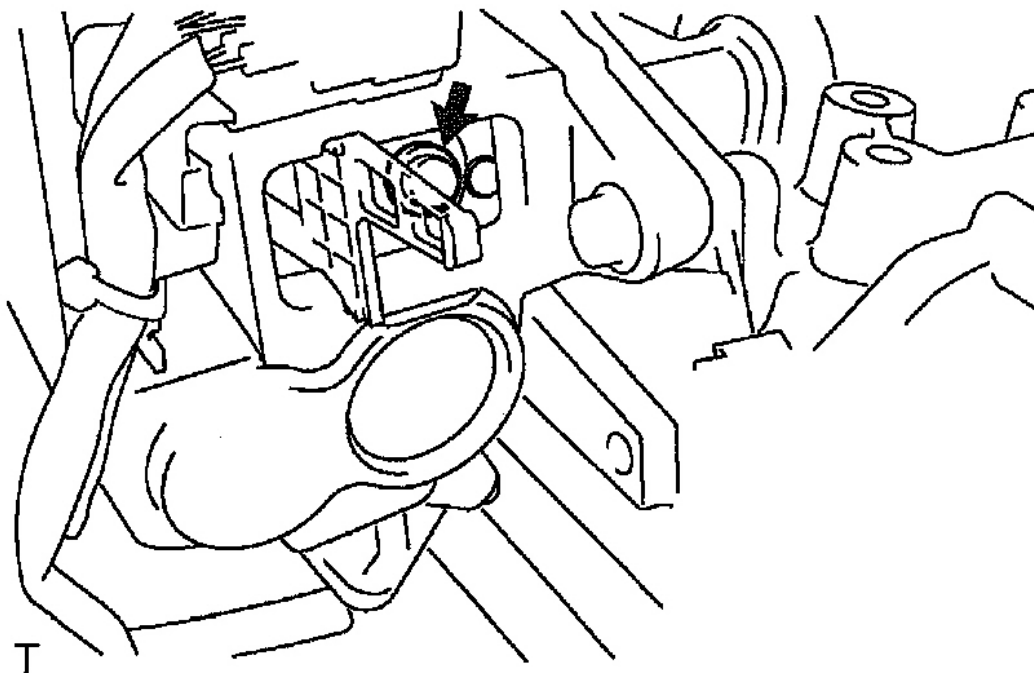


T Actuator Link Fixing Plate

G00928212

**Fig. 228: Installing Actuator Link Fixing Plate To GSA**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the bolt.



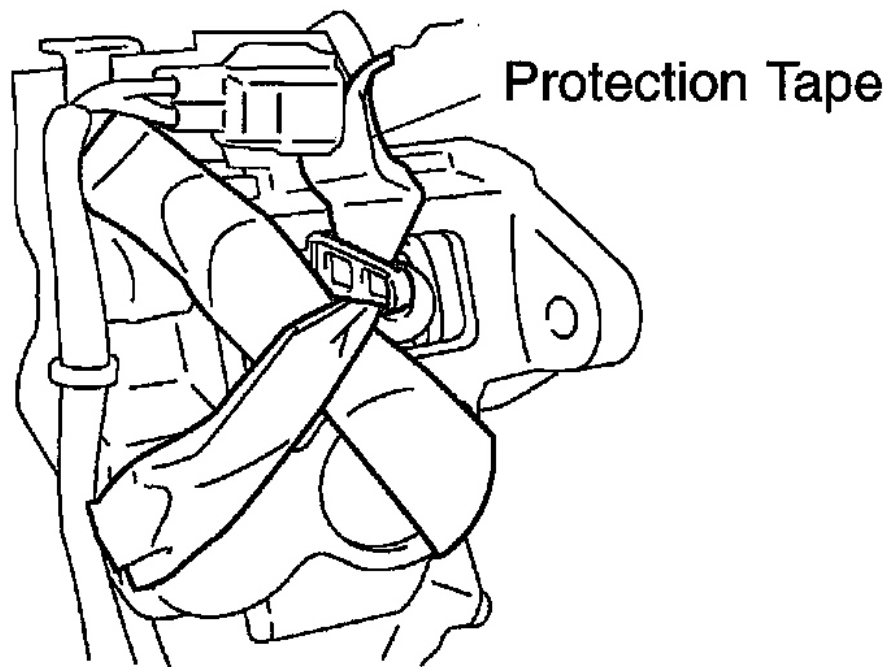
T  
G00928213

**Fig. 229: Removing Bolt**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Fix the actuator link fixing plate with protection tape in order for the fixing plate not to slip off.



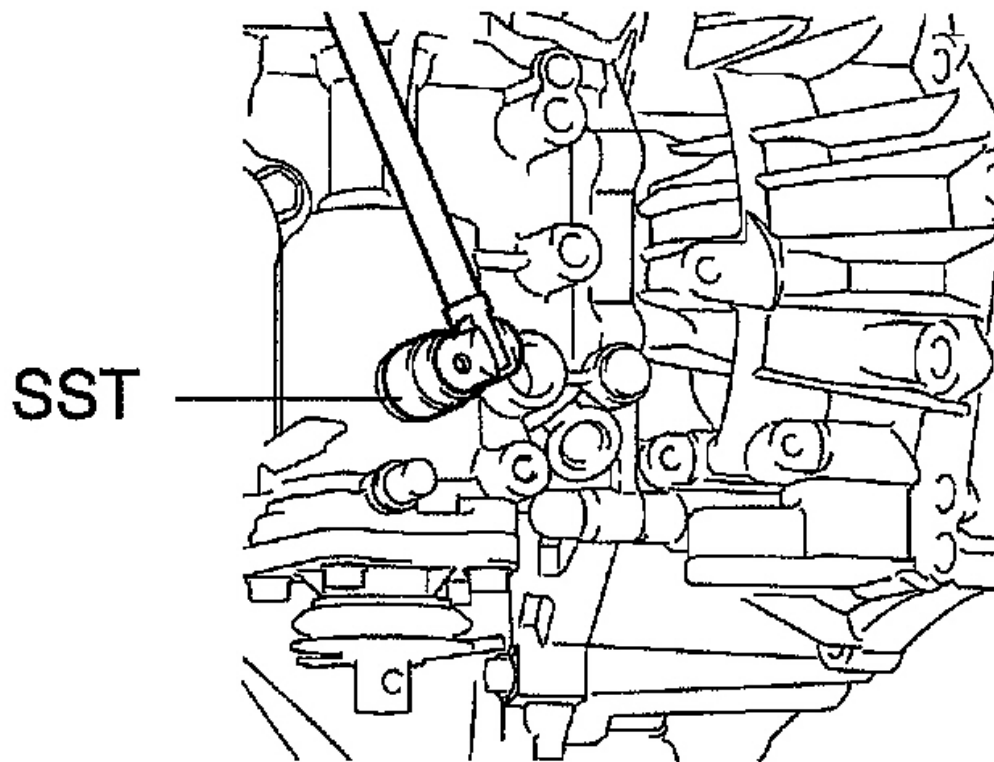


T  
G00928214

**Fig. 230: Fixing Actuator Link Fixing Plate With Protection Tape**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Using SST, remove the neutral start switch from the transmission assembly.

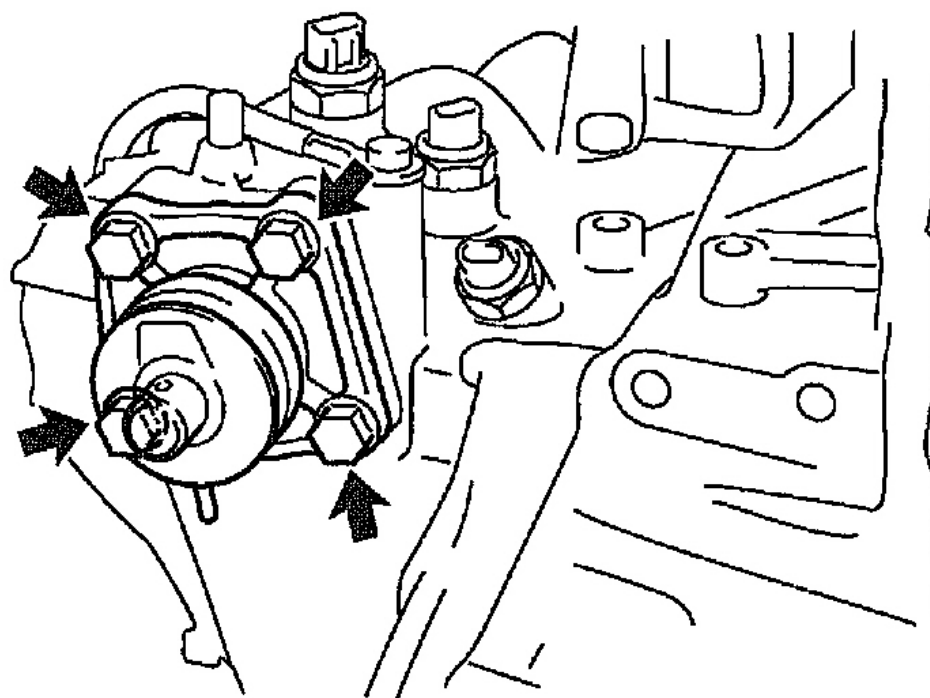
SST 09817-16011



G00928215

**Fig. 231: Removing Neutral Start Switch From Transmission Assembly**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- f. Remove the 4 bolts, shift and select lever shaft assembly and gasket from the transmission assembly.



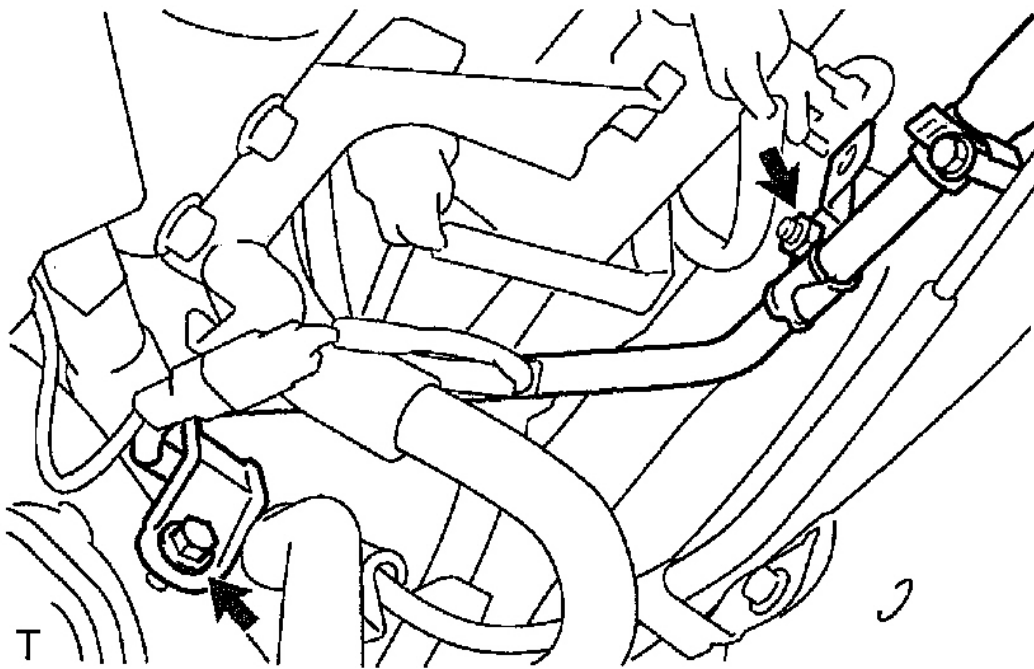
T

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**Fig. 232: Removing Bolts, Shift And Select Lever Shaft Assembly**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- g. Remove the bolt and nut, so that the fuel tank inlet pipe can move.

**NOTE:** Open the fuel filler opening lid beforehand, so that the tip of the fuel tank inlet pipe will not deform the fuel filler opening lid.

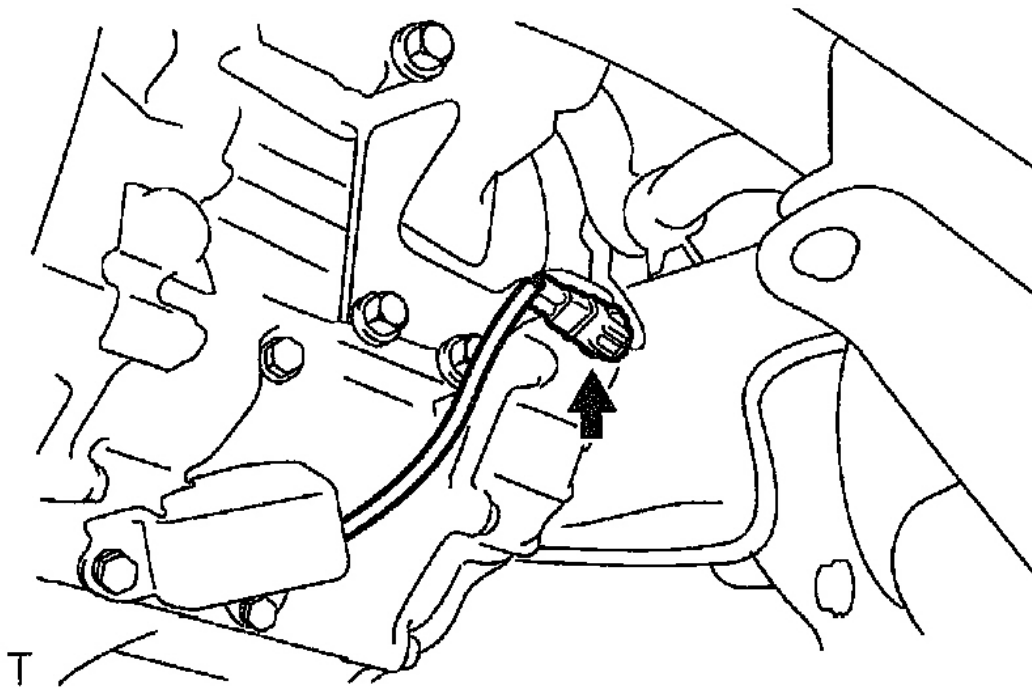


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**Fig. 233: Removing Bolt And Nut**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- h. Disconnect the connector clamp and input sensor connector.



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**Fig. 234: Disconnecting Connector Clamp And Input Sensor Connector**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- i. Remove the 3 C bolts and stiffener plate.
- j. Loosen the A bolt.

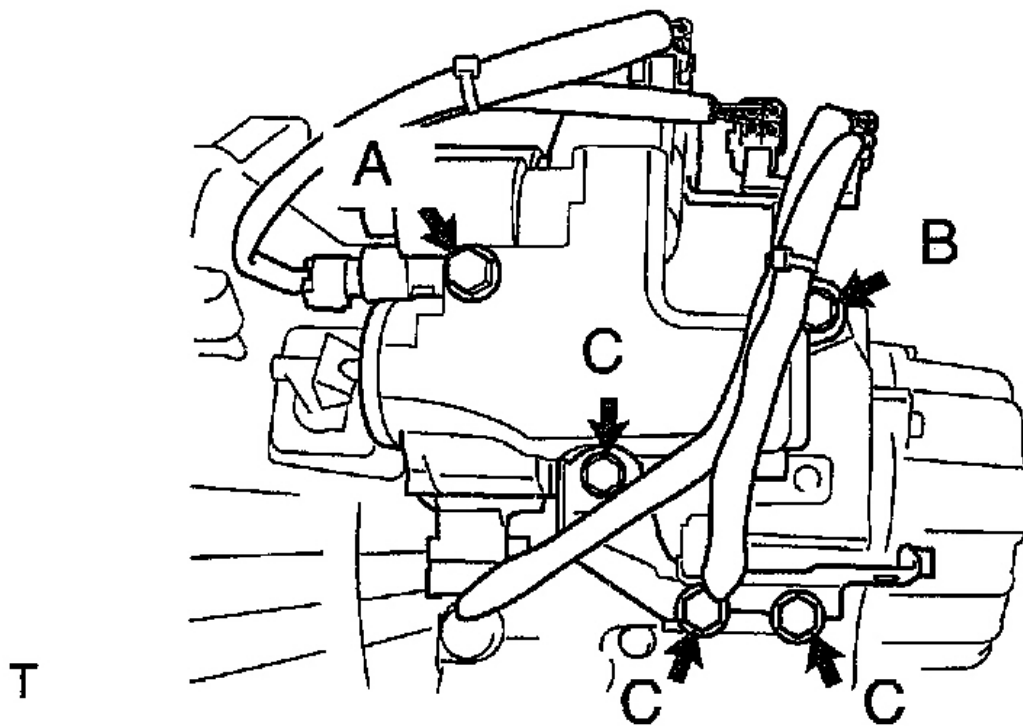
HINT:

Do not separate the A bolt from the GSA assembly.

- k. Remove the B bolt.

**NOTE:** Because the B bolt is tensed up by the release cylinder cable of the GSA assembly, hold the GSA assembly not to damage the bolt's thread when removing the B bolt.

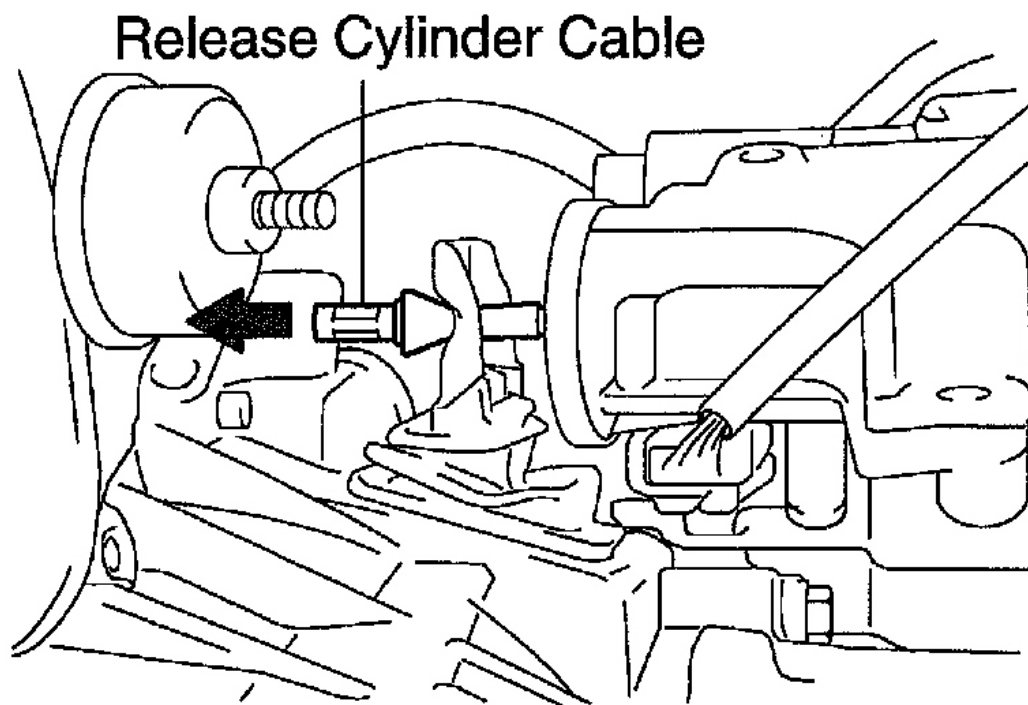
- l. Take out the GSA assembly from the transmission assembly.



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**Fig. 235: Removing Bolts And Stiffener Plate**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- m. Pulling the release cylinder cable while the GSA assembly is close to the clutch fork, separate the cable from the clutch fork.



**G00928220**

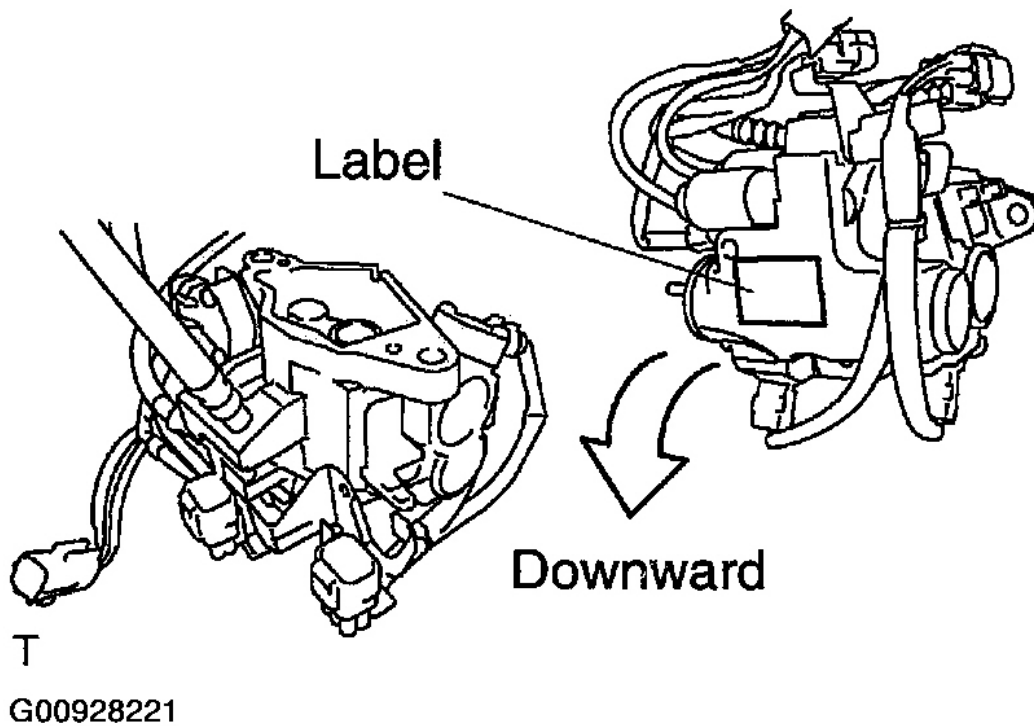
**Fig. 236: Releasing Cylinder Cable**

**Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.**

**HINT:**

Place the GSA assembly as shown in the illustration after the GSA assembly is removed.

- n. Remove the protection tape and actuator link fixing plate.



**Fig. 237: Placing GSA Assembly Label**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## REPLACEMENT

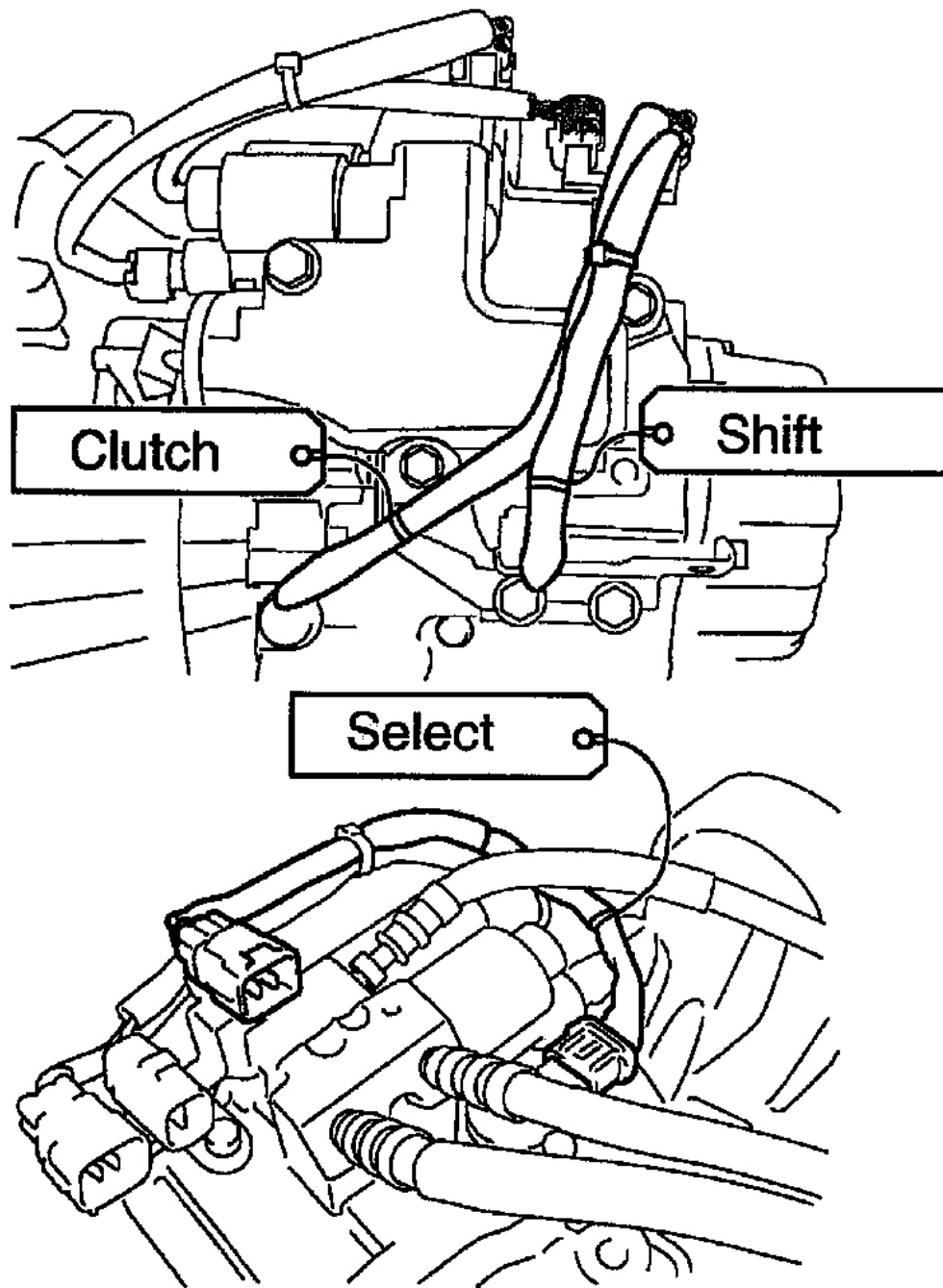
1. **REPLACE 3 STROKE SENSORS (SELECT, CLUTCH AND SHIFT)**
  - a. Disconnect the 3 stroke sensor connectors and 3 connector packings.

HINT:

Place markings on each sub-wire before removing the sub-wires.

- b. Disconnect the 2 sub-wires from the GSA connector bracket.





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**Fig. 238: Disconnecting Sub-Wires From GSA Connector Bracket**

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**Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.**

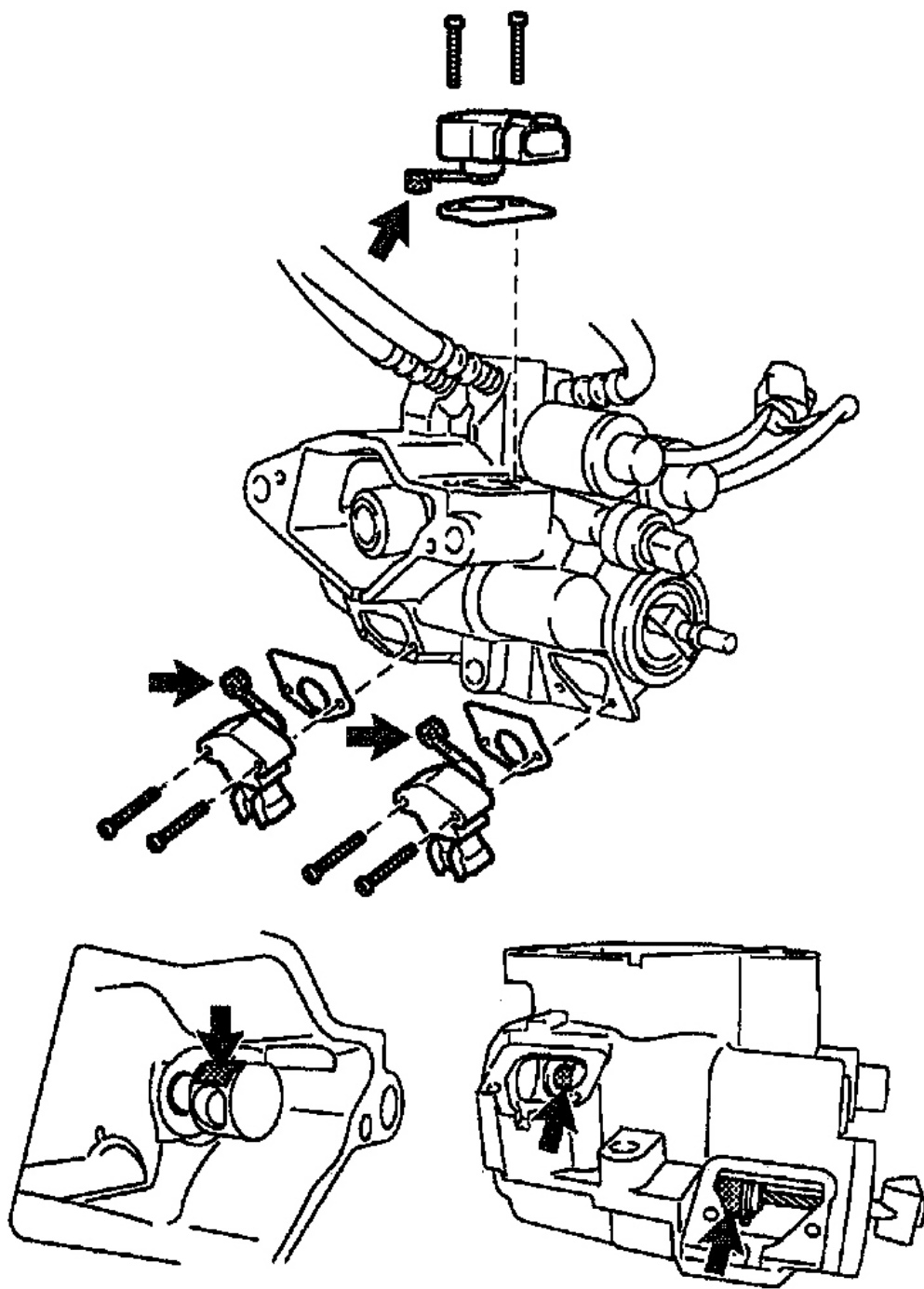
HINT:

The way of replacing the 3 stroke sensors is the same.

- c. Using a torx socket wrench (T25), remove the 2 torx bolts, sensor cover and stroke sensor.
- d. Apply sequential M/T grease to a new stroke sensor and the piston ring in the GSA.
- e. Using a torx socket wrench (T25), install the stroke sensor and sensor cover with the 2 torx bolts.

**Torque: 2.2 N.m (22 kgf.cm, 19 in..lbf)**

- f. Install the 3 connector packings to each stroke sensor connector.
- g. Connect the 3 stroke sensor connectors.



T ← : Apply sequential M/T grease

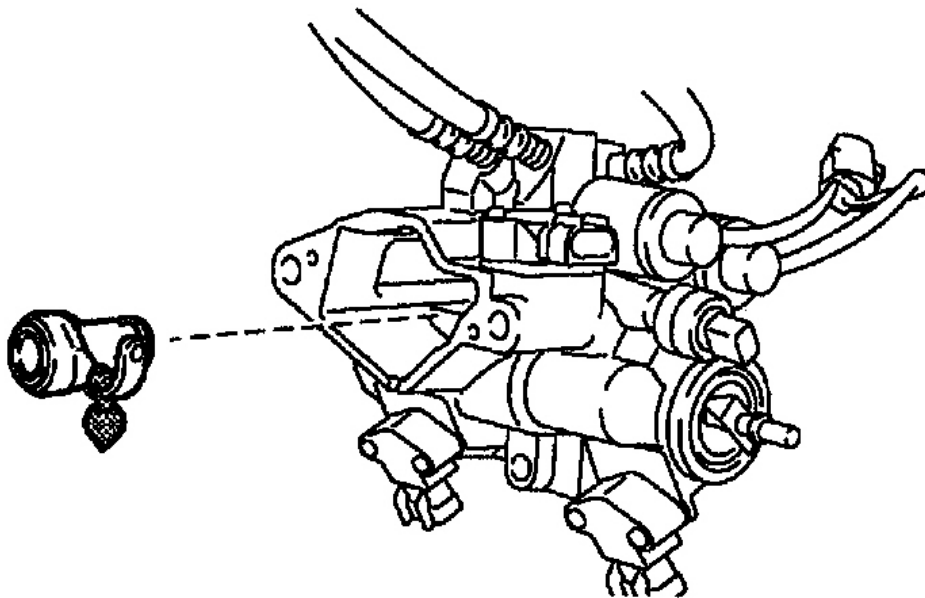
G00928223

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**Fig. 239: Removing Torx Bolts, Sensor Cover And Stroke Sensor**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**2. REPLACE SHIFT ACTUATOR LINK**

- a. Remove the shift actuator link from the GSA.
- b. Apply sequential M/T grease to a new shift actuator link as shown in the illustration.
- c. Install the shift actuator link to the GSA.



**T ■ : Apply sequential M/T grease**

**G00928224**

**Fig. 240: Applying Sequential M/T Grease To A New Shift Actuator Link**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

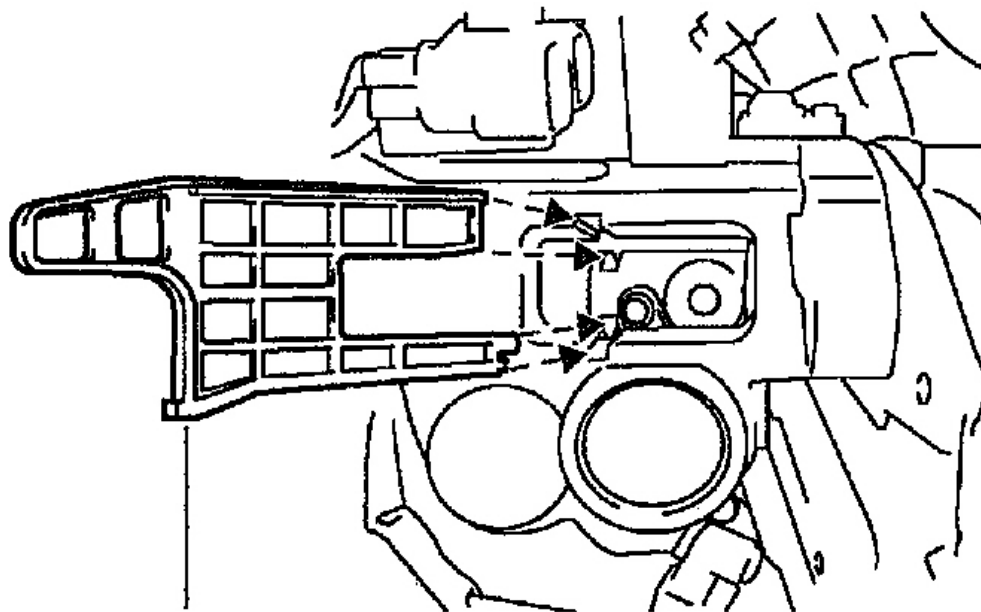
**INSTALLATION**

**1. INSTALL GSA ASSEMBLY TO TRANSMISSION**

- a. Install actuator link fixing plate to the GSA assembly.

Part the No.:

Actuator link fixing plate: 33963-0W010

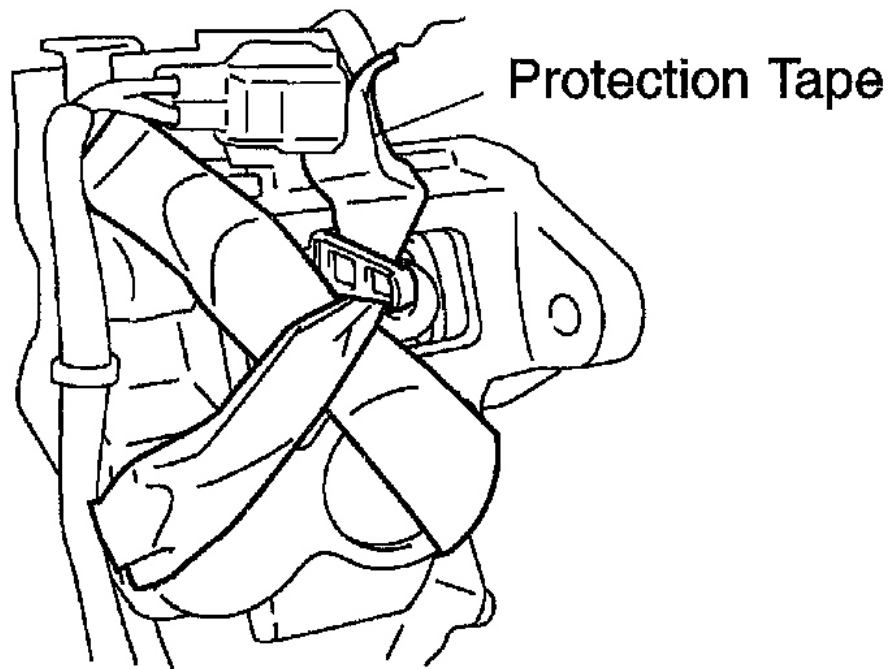


T **Actuator Link Fixing Plate**

G00928225

**Fig. 241: Installing Actuator Link Fixing Plate To GSA Assembly**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

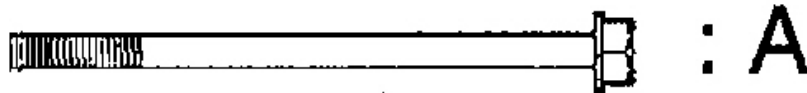
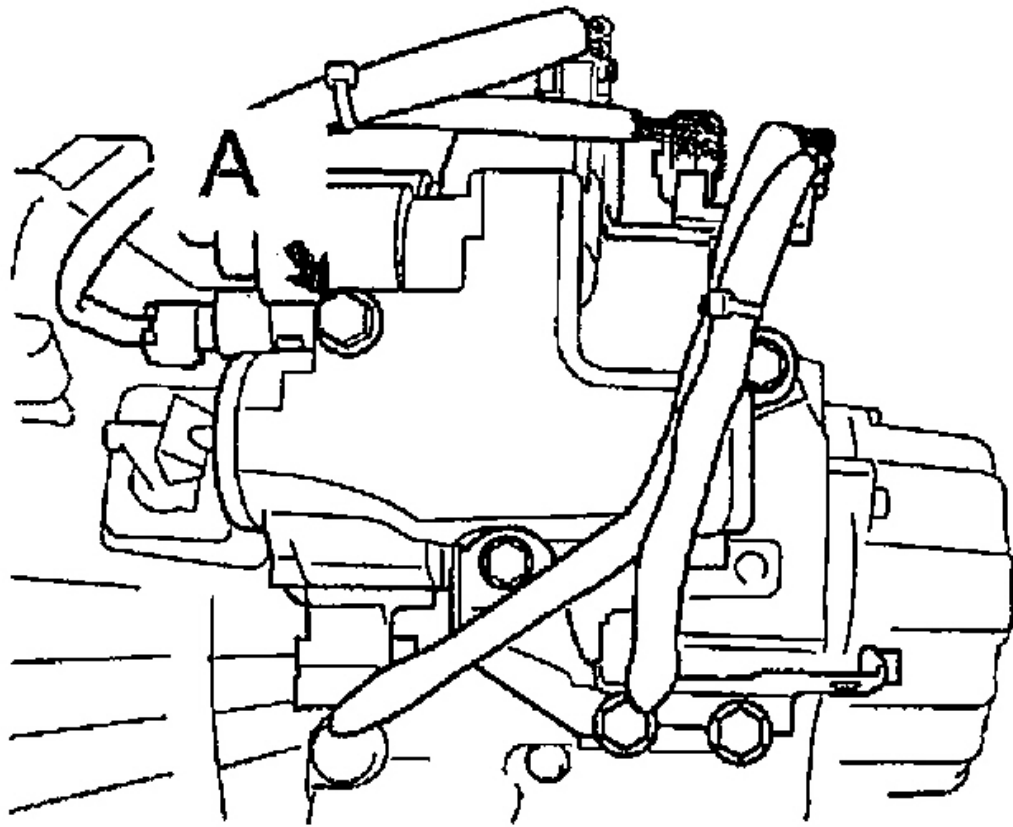
- b. Fix the actuator link fixing plate with protection tape in order for the fixing plate not to slip off.



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**Fig. 242: Fixing Actuator Link Fixing Plate With Protection Tape**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

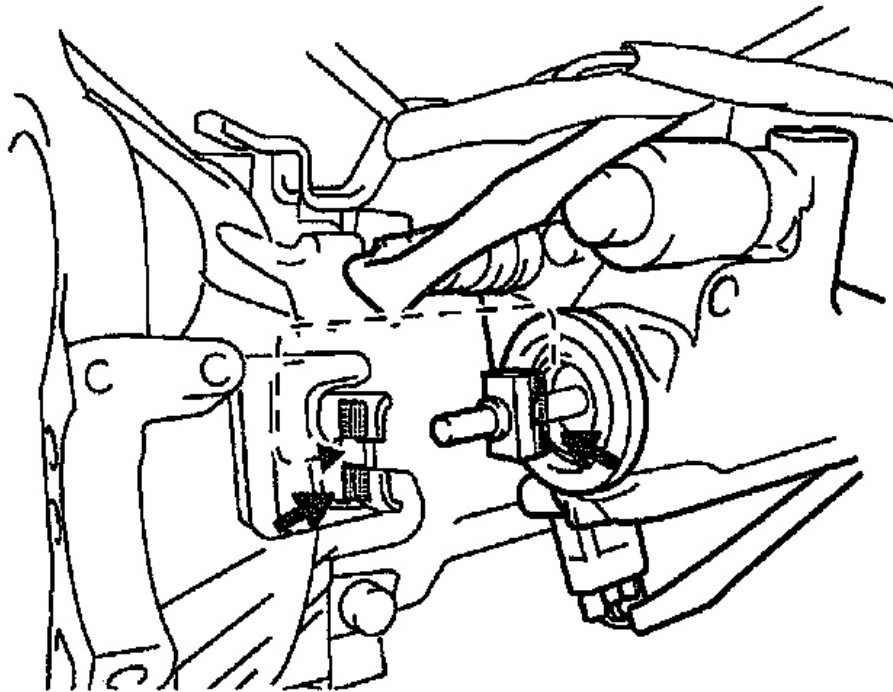
- c. Attach the A bolt to the GSA assembly.



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**Fig. 243: Attaching Bolt To GSA Assembly**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Apply release hub grease to the release fork and clutch cable.  
**Sealant: Part No. 08887-01806, RELEASE HUB GREASE or equivalent**
- e. Pay attention to combine the clutch cable and clutch fork.



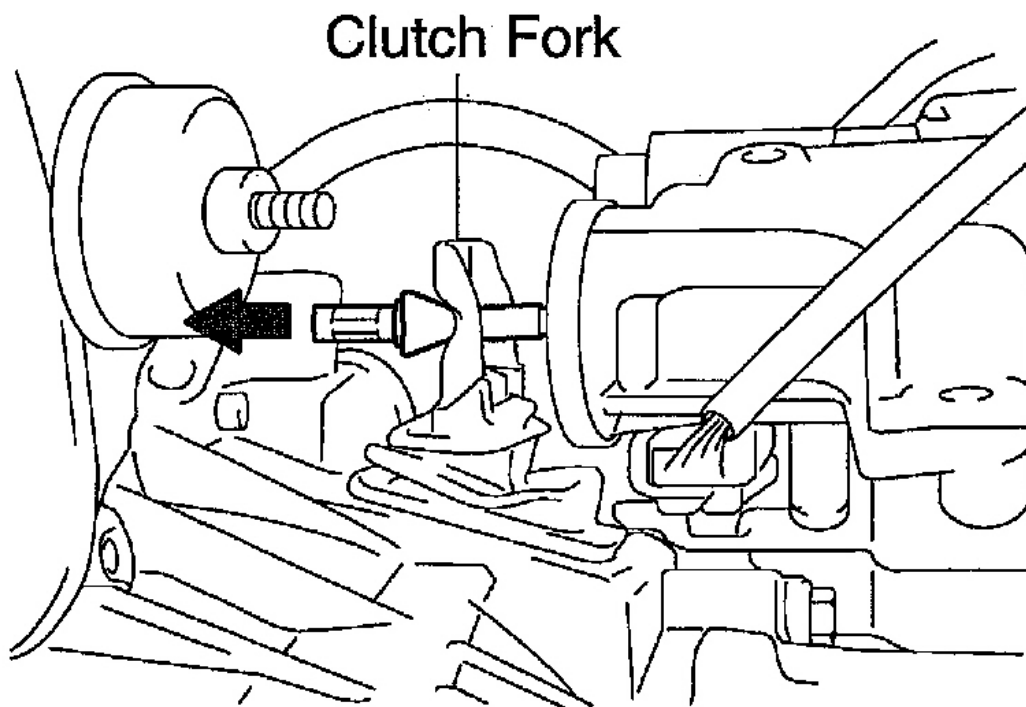
↑ → Release hub grease

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**Fig. 244: Releasing Hub Grease To Release Fork And Clutch Cable**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- f. Pulling the clutch fork, install the GSA assembly.





G00928229

**Fig. 245: Pulling Clutch Fork**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- g. Temporarily tighten the A and B bolts.

**NOTE:**

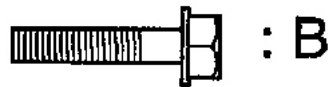
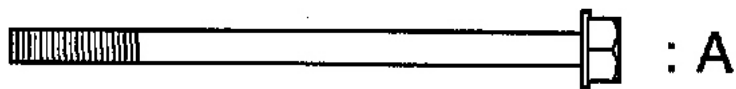
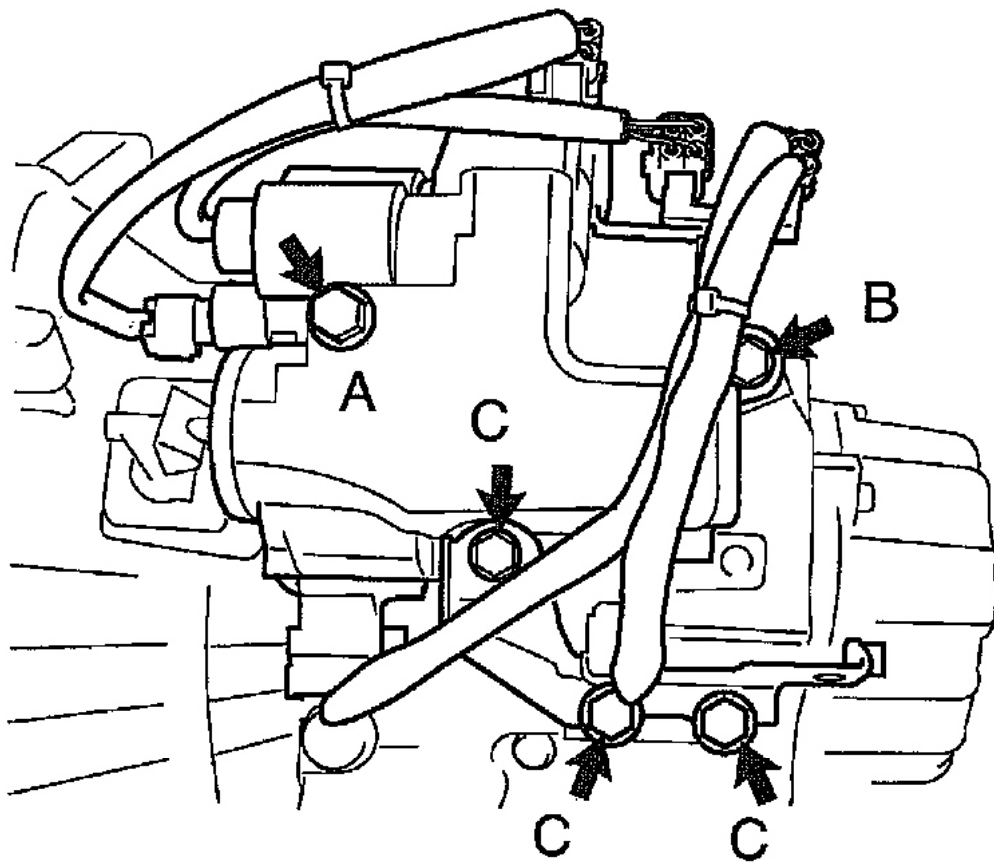
- Because the B bolt is tensed up by the release cylinder cable of the GSA assembly, hold the GSA assembly not to damage the bolt's thread when install the B bolt.
- Install the B bolt before the A bolt.

- h. Install the stiffener plate bracket with the 3 C bolts.

**Torque: 42 N.m (428 kgf.cm, 31 ft.lbf)**

- i. Tighten the A and B bolts.

**Torque: 42 N.m (428 kgf.cm, 31 ft.lbf)**



T  
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**Fig. 246: Tightening Bolts**

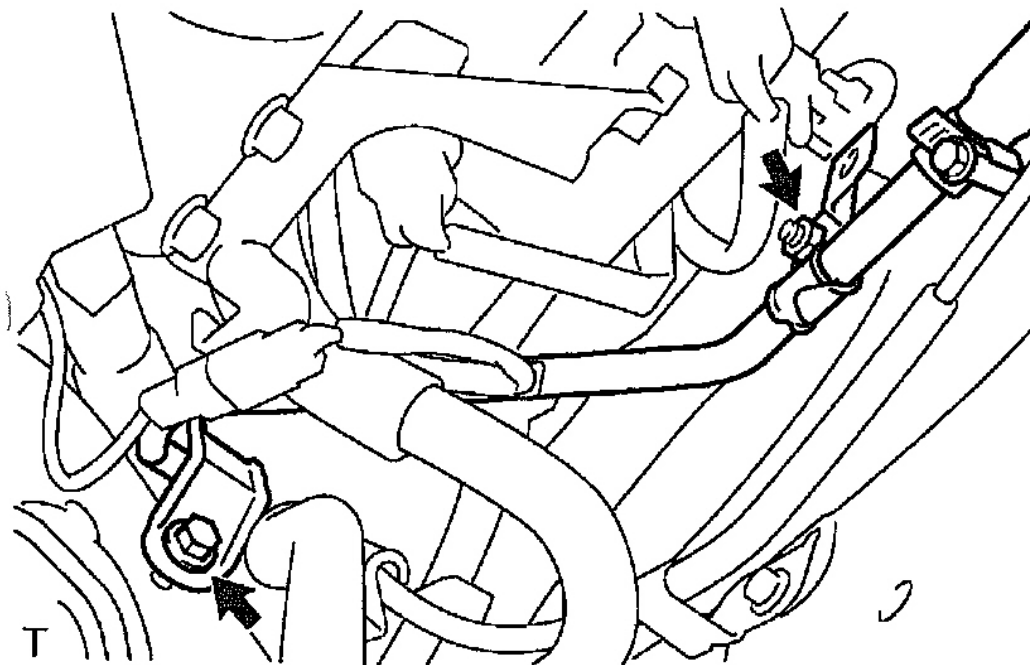
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- j. Attach the fuel tank inlet pipe, and install the bolt and nut.

**Torque:**

**Bolt: 27 N.m (275 kgf.cm, 20 ft.lbf)**

**Nut: 8.5 N.m (87 kgf.cm, 75 in..lbf)**

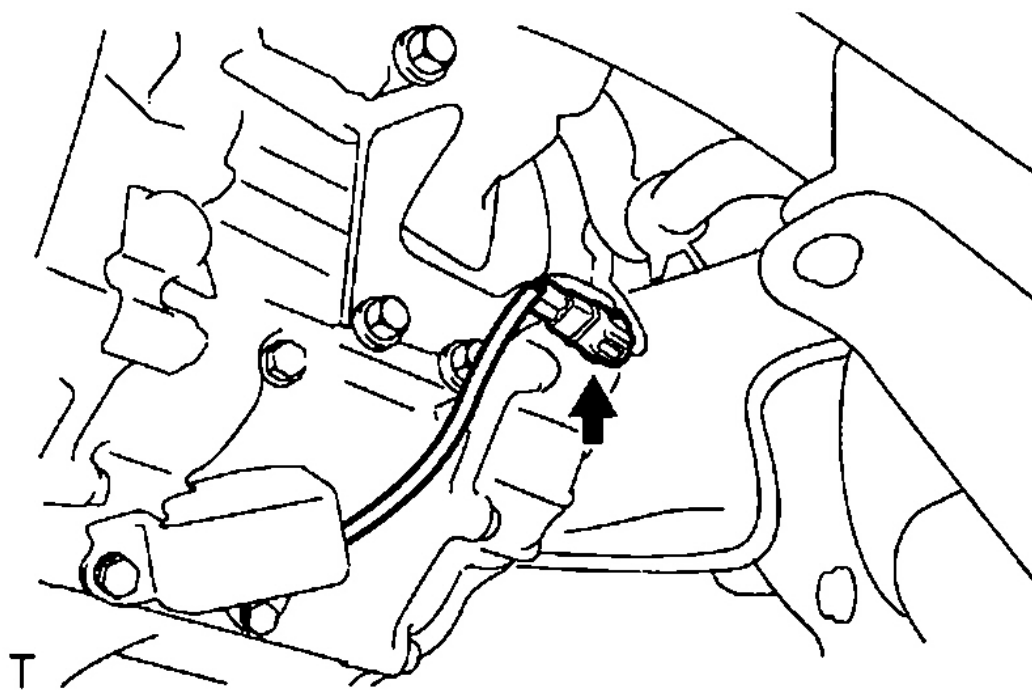


G00928231

**Fig. 247: Attaching Fuel Tank Inlet Pipe**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

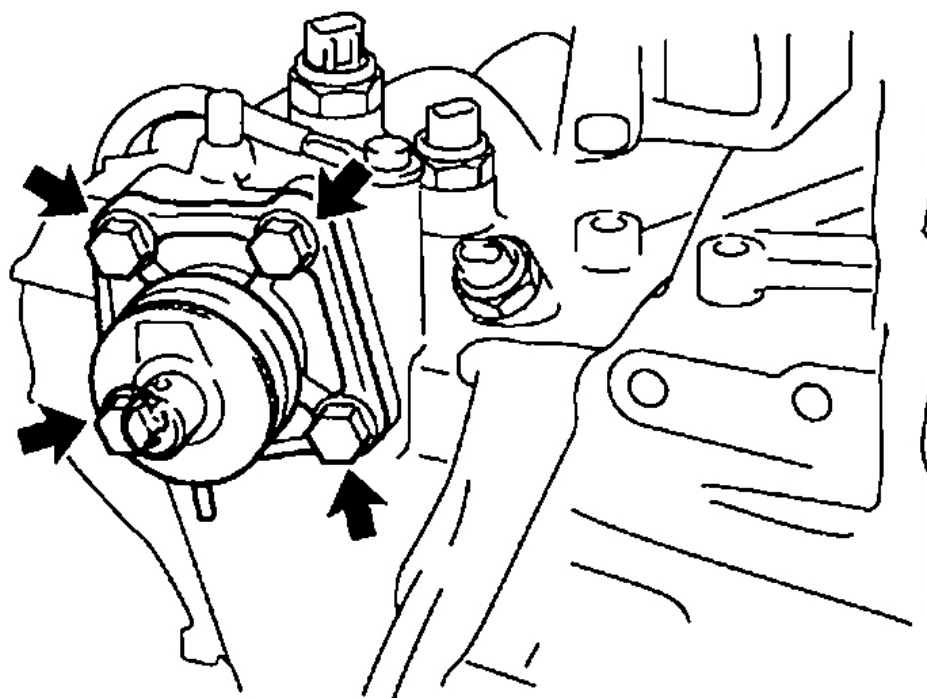
- k. Connect the connector clamp and input sensor connector.



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**Fig. 248: Connecting Connector Clamp And Input Sensor Connector**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

1. Install the shift and select lever shaft assembly, gasket and 4 bolts to the transmission assembly.  
**Torque: 20 N.m (200 kgf.cm, 14 ft.lbf)**



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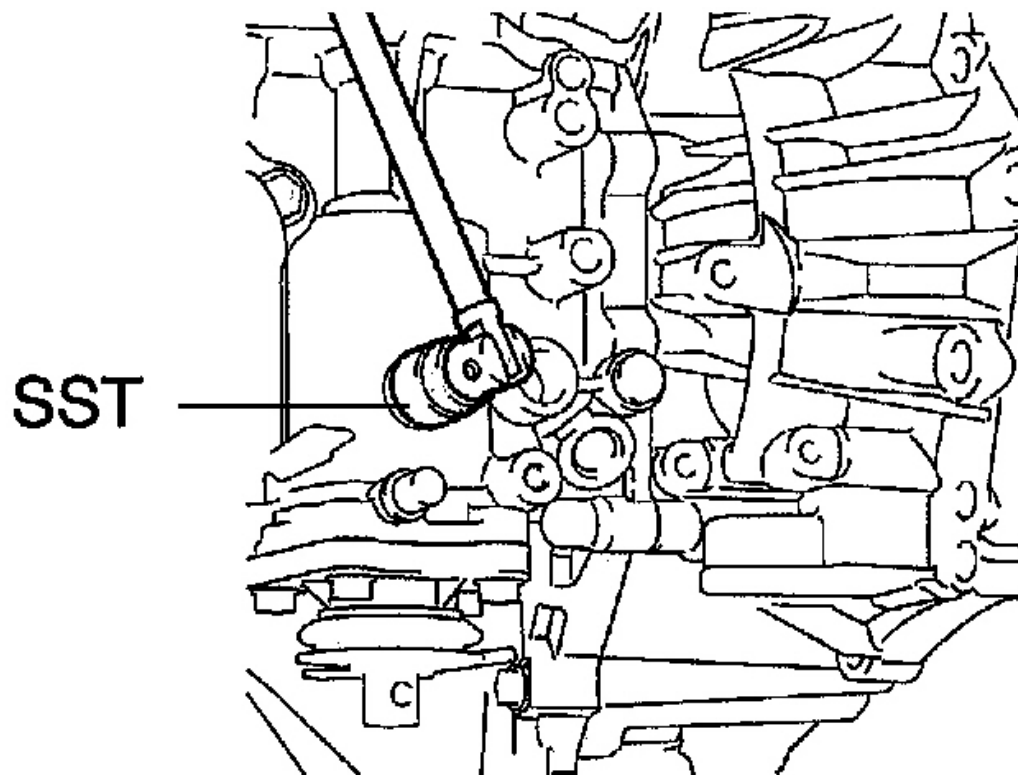
**Fig. 249: Installing Shift And Select Lever Shaft Assembly, Gasket And Bolts**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- m. Using SST, install the neutral start switch to the transmission assembly.

SST 09817-16011

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

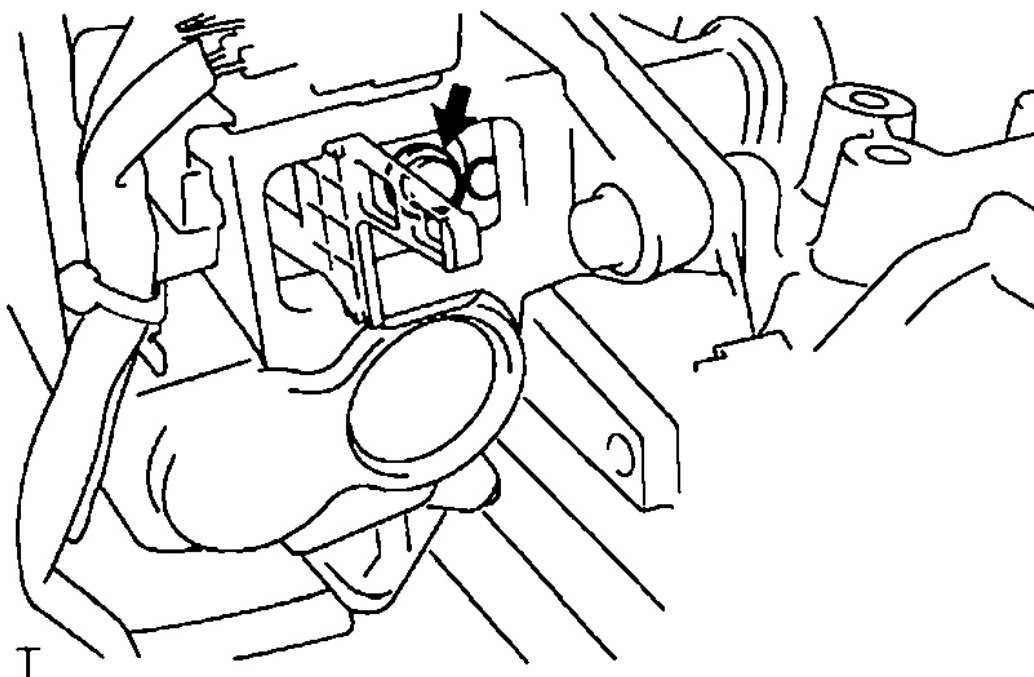
- n. Remove the protection tape from the actuator link fixing plate.



G00928234

**Fig. 250: Installing Neutral Start Switch To Transmission Assembly**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- o. Install the bolt.  
**Torque: 25 N.m (255 kgf.cm, 18 ft.lbf)**
- p. Remove the actuator link fixing plate from the GSA assembly.

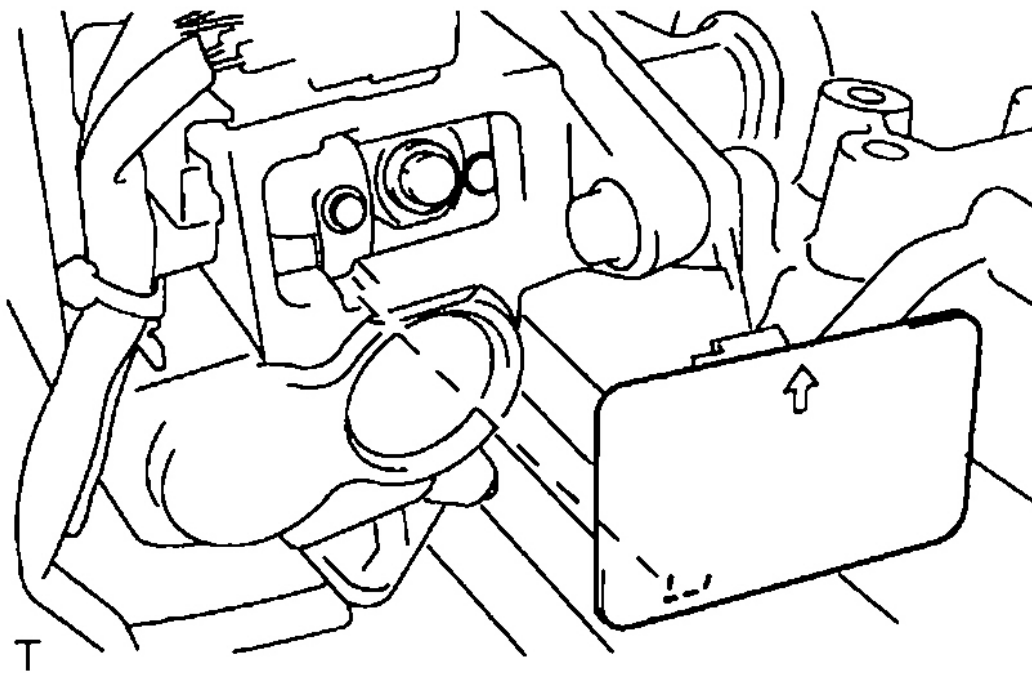


G00928235

**Fig. 251: Installing Bolt**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- q. Install the GSA cover as shown in the illustration.



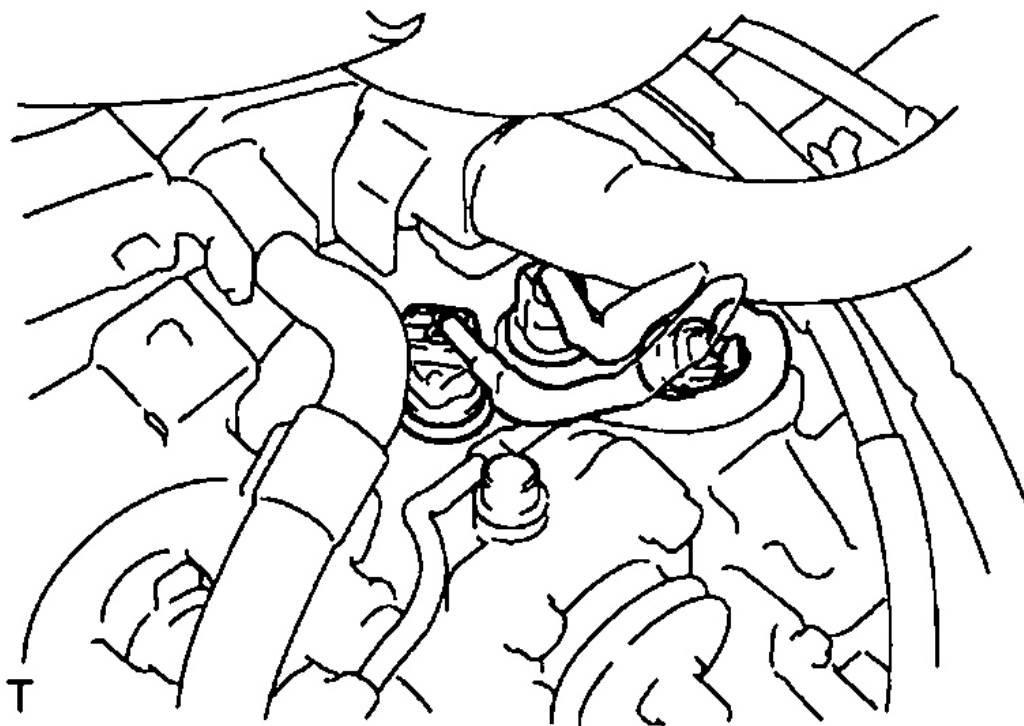
G00928236

**Fig. 252: Installing GSA Cover**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

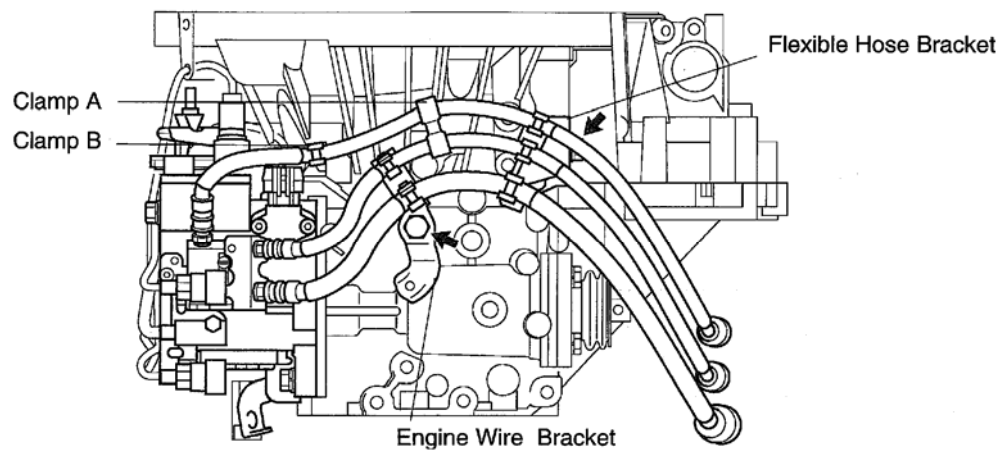
2. **CONNECT PNP SWITCH CONNECTOR AND 2 BACKUP LIGHT SWITCH CONNECTORS**
3. **CONNECT SMT SYSTEM HOSES**
  - a. Install the engine wire bracket and bolt.  
**Torque: 8.3 N.m (85 kgf.cm, 73 in..lbf)**
  - b. Install the flexible hose bracket and bolt.  
**Torque: 19.6 N.m (200 kgf.cm, 14 ft.lbf)**
  - c. Connect the SMT system hose to the clamp B.
  - d. Connect the 2 SMT system hoses to the engine wire bracket.
  - e. Install the clamp A to the 2 SMT system hoses.
  - f. Connect the 3 SMT system hoses to the flexible hose bracket.





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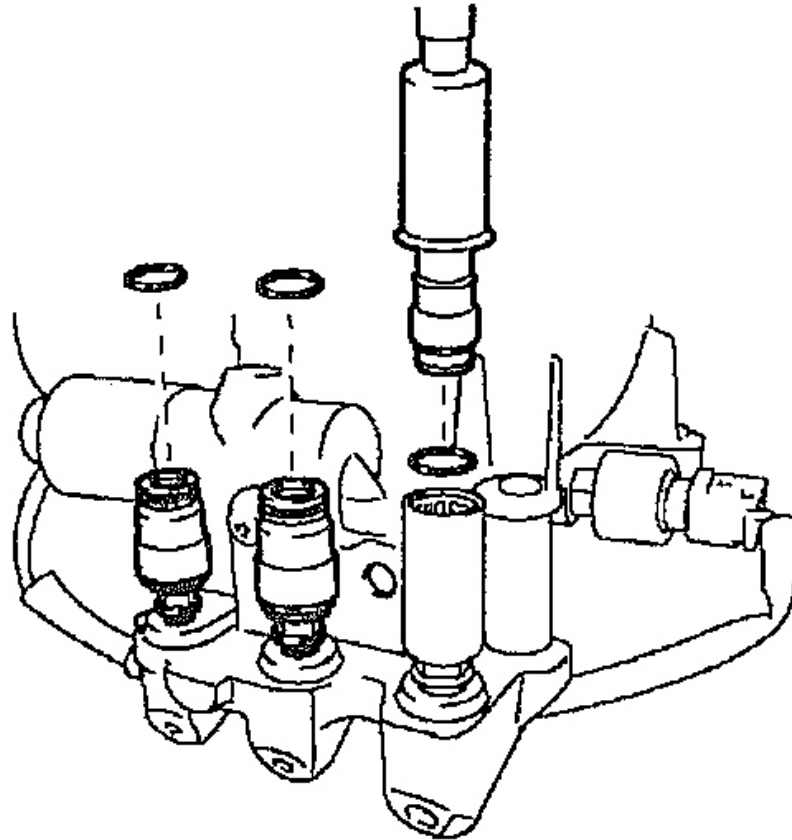
**Fig. 253: Installing Flexible Hose Bracket And Bolt**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



G00928238

**Fig. 254: Connecting SMT System Hose To Clamp**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- 
- g. Apply a light coat of sequential M/T fluid to the 3 new O-rings.
  - h. Install the 3 new O-rings.

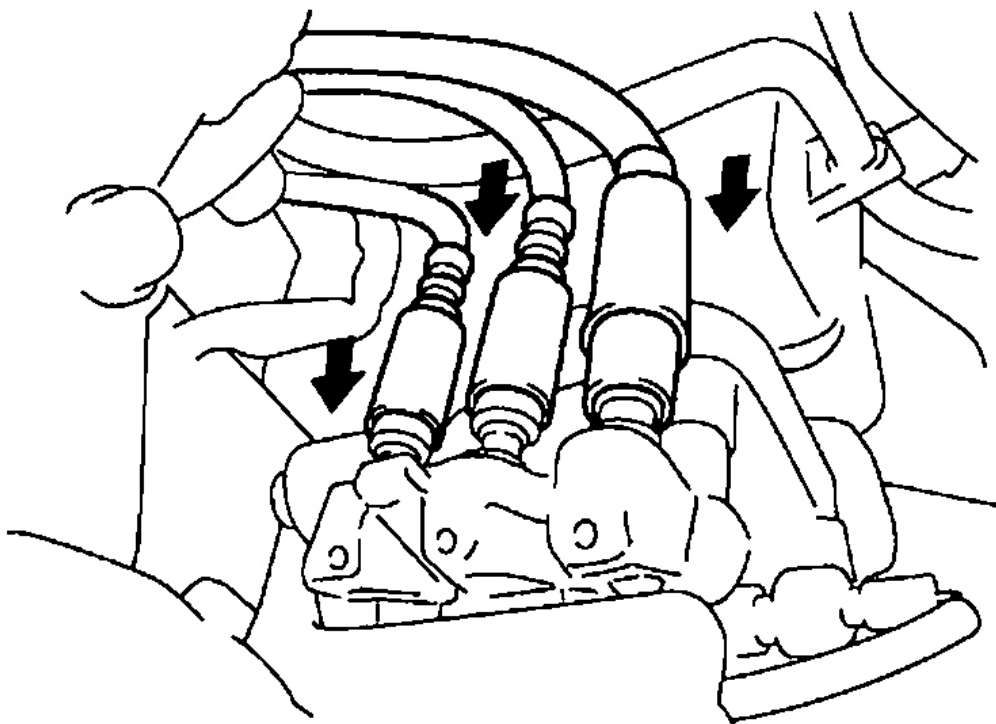


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**Fig. 255: Installing New O-Rings**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- i. Connect the 3 SMT system hoses by pushing the hoses downward until a click sound is heard.



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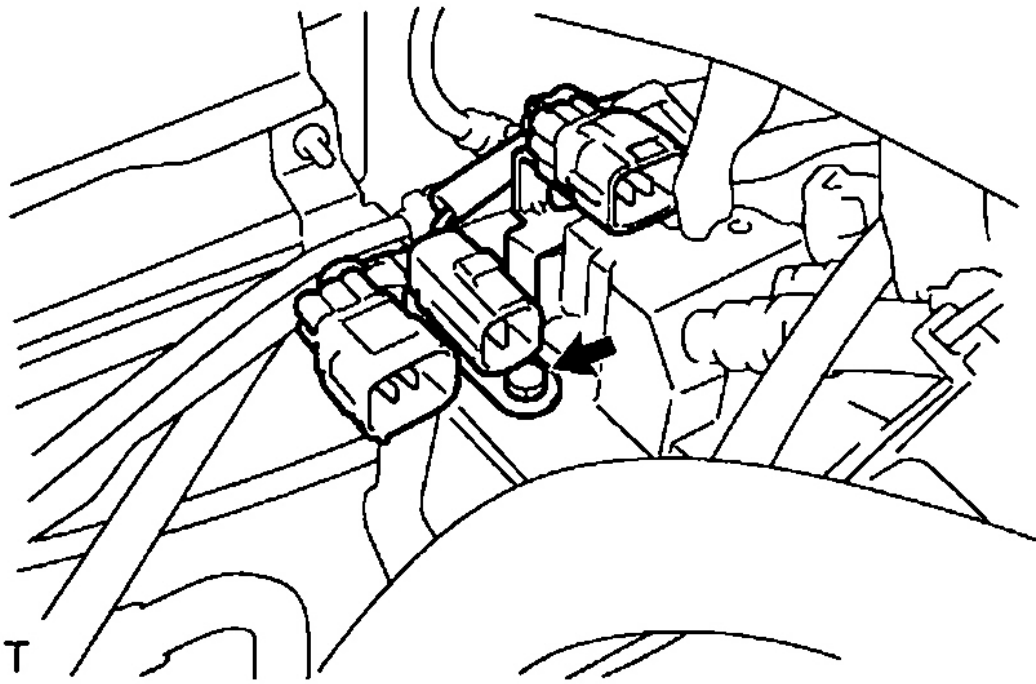
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**Fig. 256: Connecting SMT System Hoses By Pushing**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**4. INSTALL GSA CONNECTOR BRACKET**

Install the connector bracket with the bolt.

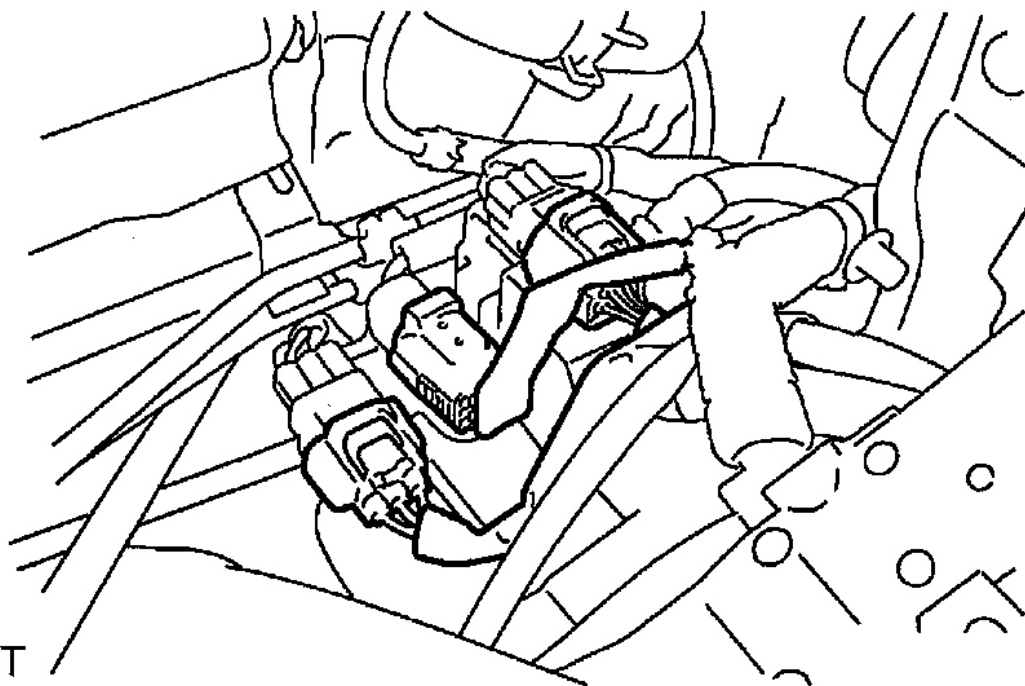
**Torque: 8 N.m (82 kgf.cm, 71 in..lbf)**



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**Fig. 257: Installing Connector Bracket With Bolt**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. CONNECT GSA CONNECTORS

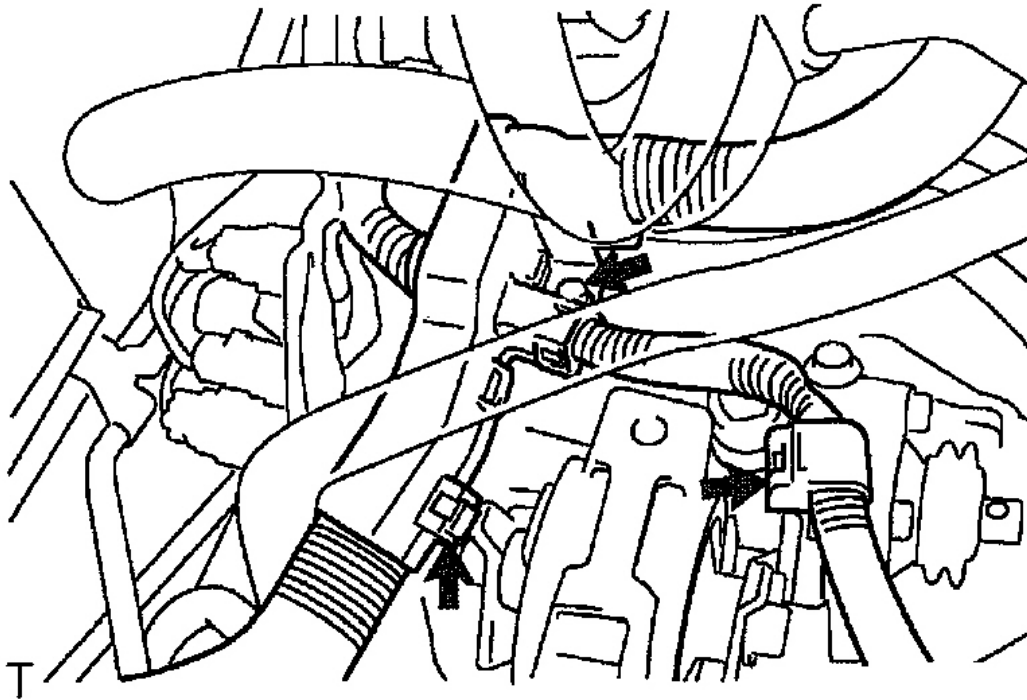


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**Fig. 258: Identifying GSA Connectors**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

6. **CONNECT ENGINE WIRE TO TRANSMISSION**
  - a. Connect the 2 clamps.
  - b. Install the bolt and engine wire.



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**Fig. 259: Installing Bolt And Engine Wire**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Connect the 2 hose clamps and engine wire clamp.
7. **INSTALL BATTERY BRACKET**
  - a. Install the battery carrier with the 3 bolts.  
**Torque: 24 N.m (245 kgf.cm, 18 ft.lbf)**
  - b. Install the battery tray and also the battery with the battery clamp.
8. **INSTALL FRONT ENGINE UNDER COVER**
9. **CHECK SMT SYSTEM FLUID LEVEL (See PRE-CHECK )**
10. **INSTALL AIR CLEANER CAP AND AIR HOSE ASSEMBLY, AIR FILTER AND AIR CLEANER CASE (See REMOVAL )**
11. **INSTALL SUSPENSION UPPER BRACE**

Install the suspension upper brace with the 2 bolts and 2 nuts.

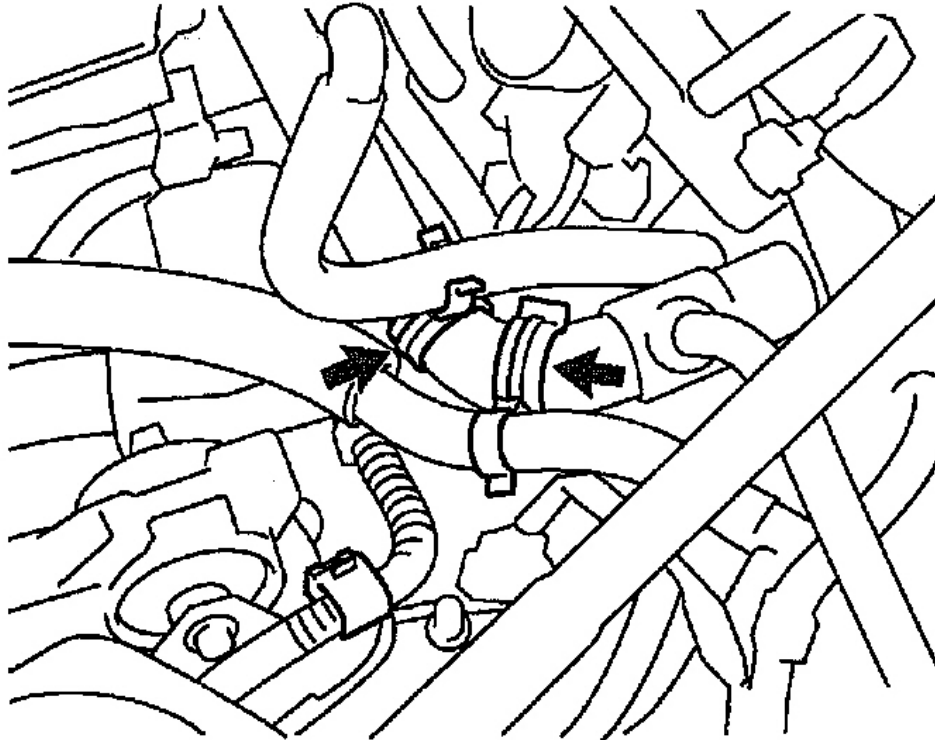
**Torque:**

**74 N.m (755 kgf.cm, 55 ft.lbf) for bolt**

---

80 N.m (816 kgf.cm, 59 ft.lbf) for nut

12. **PERFORM INITIAL LEARNING OF SMT SYSTEM (See PRE-CHECK )**
13. **CHECK FOR SMT FLUID LEAKS**
14. **CHECK ROAD TEST**



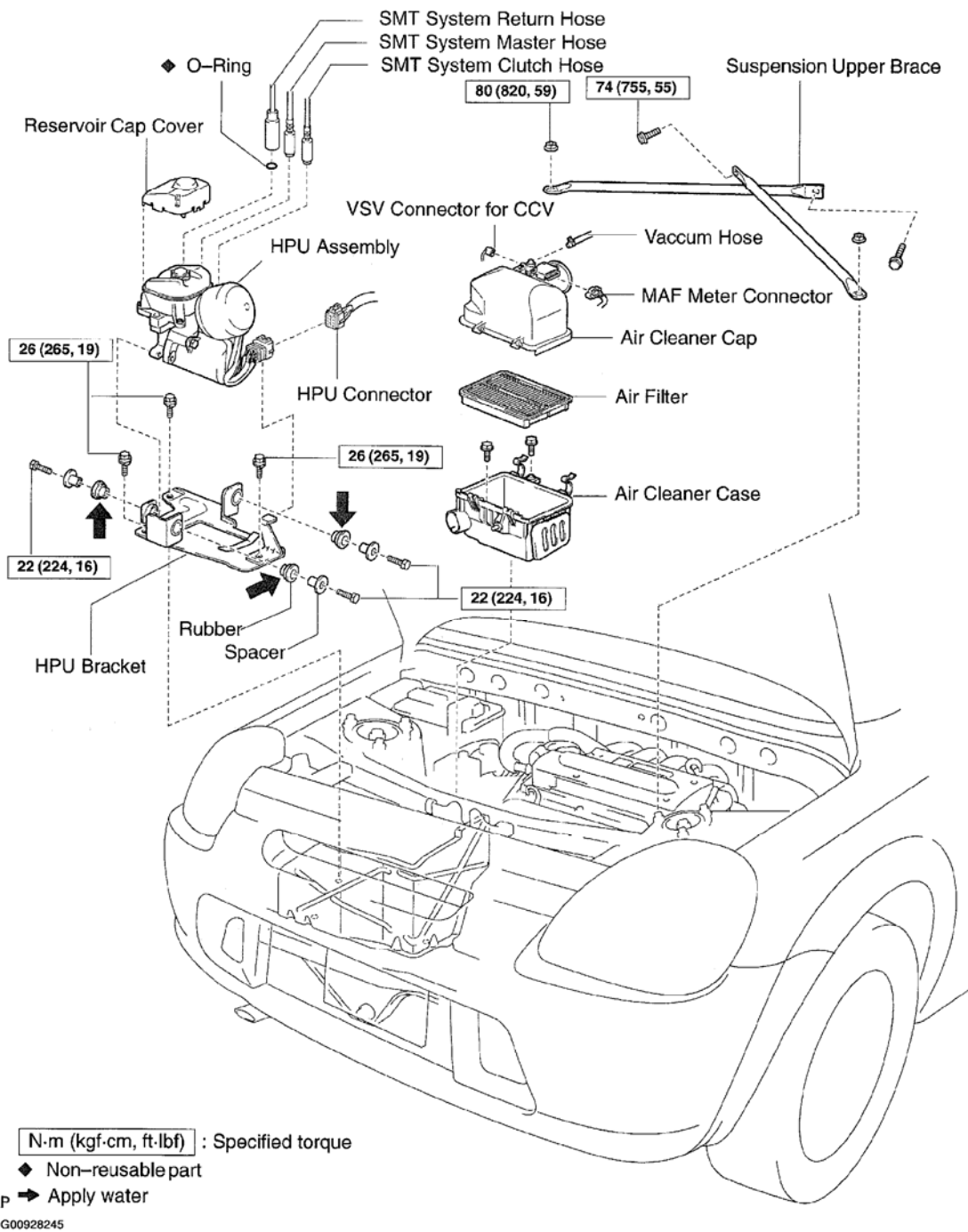
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**Fig. 260: Connecting Hose Clamps And Engine Wire Clamp**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

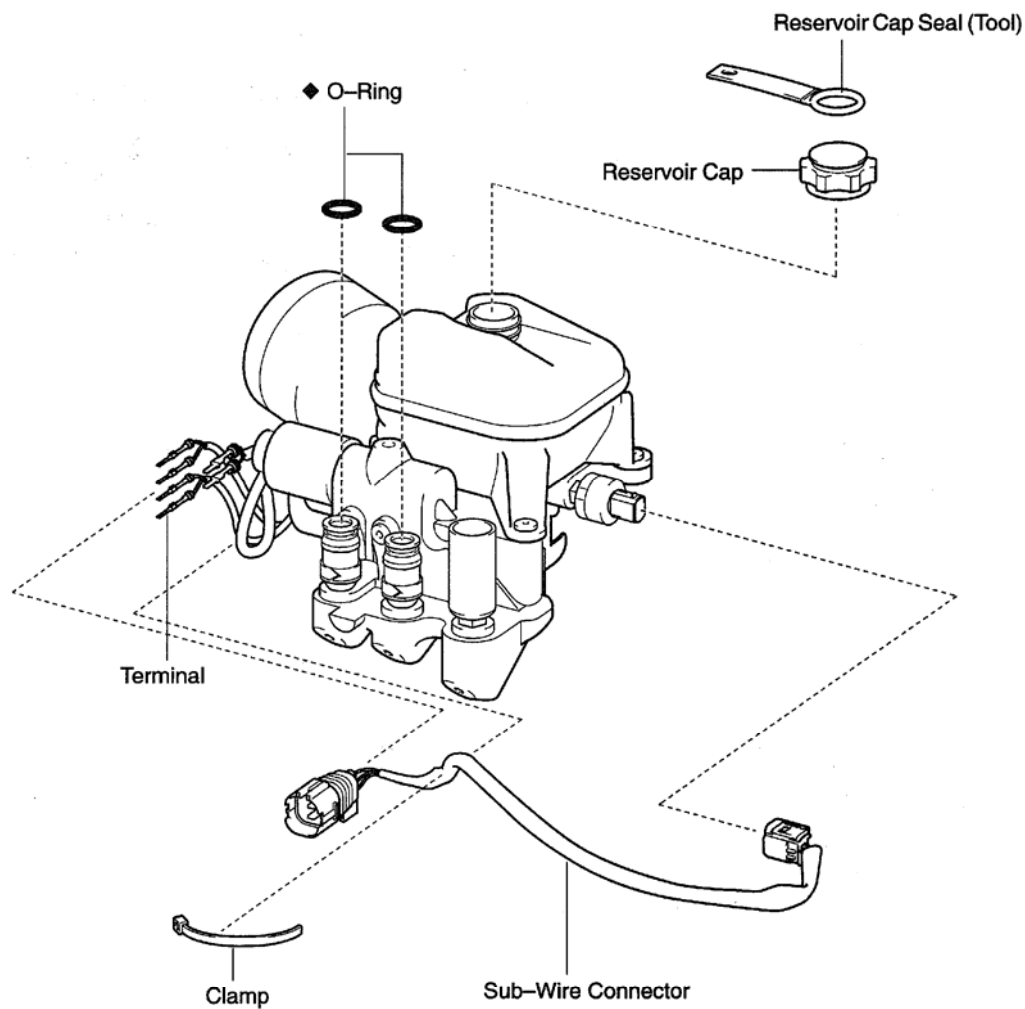
## HYDRAULIC POWER UNIT

### COMPONENTS



**Fig. 261: Identifying Hydraulic Power Components (1 Of 2)**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.





p ♦ Non-reusable part  
G00928246

**Fig. 262: Identifying Hydraulic Power Components (2 Of 2)**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**REMOVAL**

1. **CONFIRM THAT GEAR IS IN N POSITION (See SEQUENTIAL MANUAL TRANSMISSION SYSTEM)**
2. **REDUCE ACCUMULATOR PRESSURE (See PRE-CHECK )**
3. **REMOVE SUSPENSION UPPER BRACE**

Remove the 2 bolts, 2 nuts and suspension upper brace.

---

4. **REMOVE AIR CLEANER CAP, AIR FILTER AND AIR CLEANER CASE**

- a. Disconnect the MAF meter connector, VSV connector for CCV and vacuum hose.
- b. Disconnect the 2 clamps, and remove the air cleaner cap.
- c. Remove the air filter.
- d. Remove the 2 bolts and air cleaner case.

5. **DISCONNECT SMT SYSTEM HOSES (See REMOVAL)**

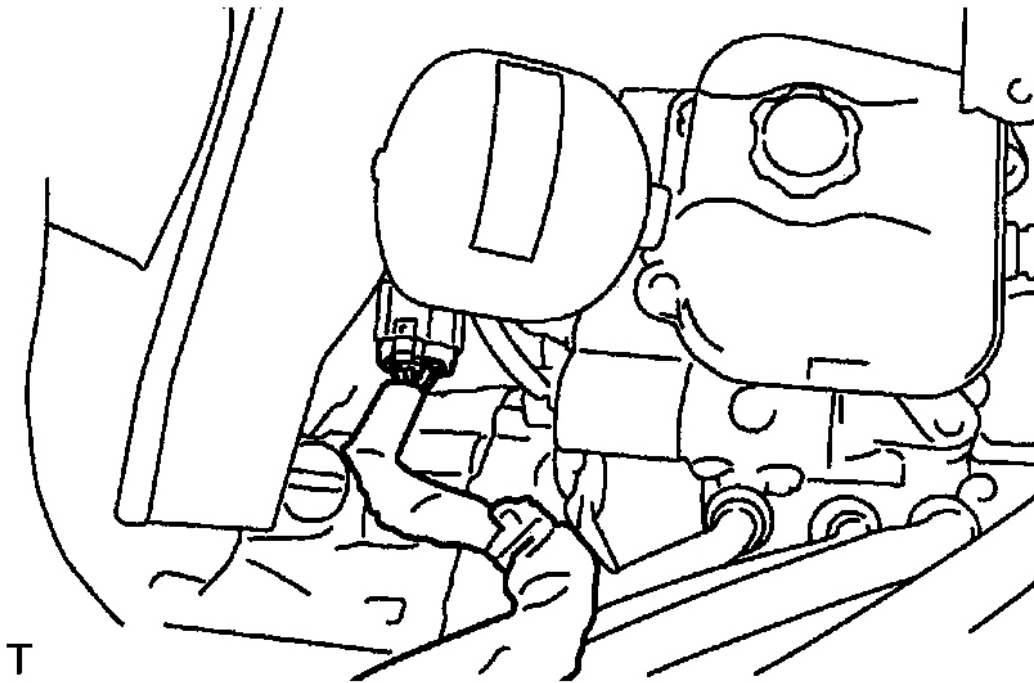
6. **REMOVE HPU ASSEMBLY**

- a. Remove the reservoir cap cover from the HPU assembly.
- b. Install a reservoir cap seal.

Part the No.:

Reservoir cap seal: 90080-30087

- c. Disconnect the HPU connector from the HPU assembly.



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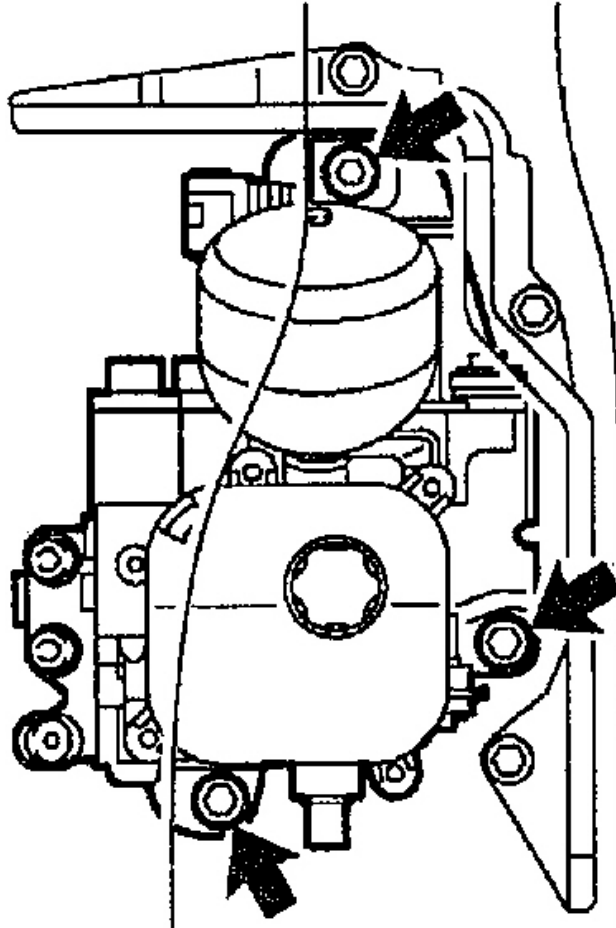
**Fig. 263: Disconnecting HPU Connector From HPU Assembly**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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d. Remove the 3 bolts and the HPU assembly.

**7. REMOVE HPU BRACKET FROM HPU**

Remove the 3 bolts and HPU bracket.



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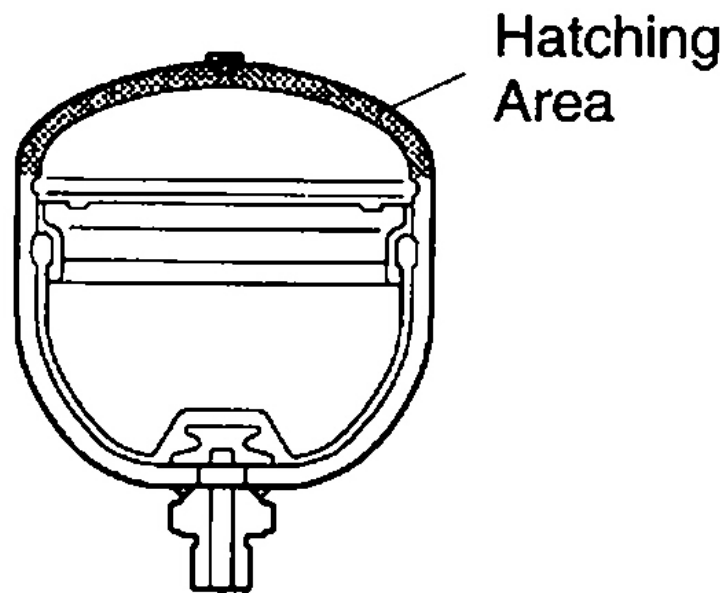
**Fig. 264: Removing Bolts And HPU Assembly**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**DISPOSAL**

**DISPOSAL ACCUMULATOR**

- a. Remove the accumulator from the HPU.
- b. Place the accumulator in a vise.
- c. Using a saw, discharge the gas inside by making a hole in the hatching area.

- CAUTION:**
- The gas discharging is colorless, odorless and harmless.
  - Saw a hole while covering the saw with a shop rug because chips may fly up.>



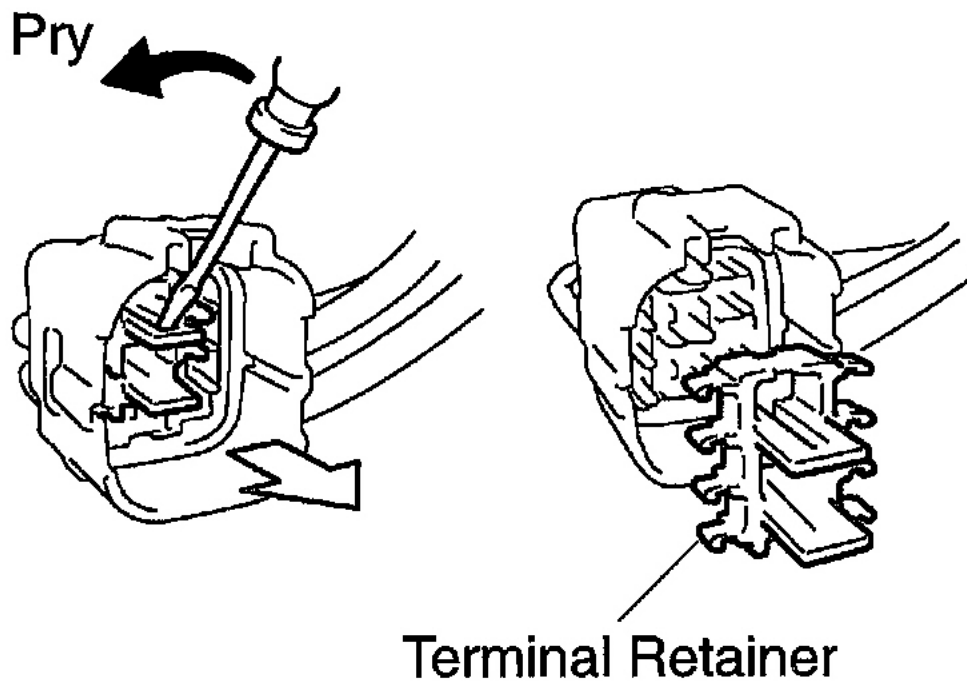
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**Fig. 265: Identifying Hatching Area**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## REPLACEMENT

1. **REPLACE SUB-WIRE**
  - a. Using small screwdrivers, pry out the terminal retainer.
  - b. Cut off the clamp which is attached to the sub-wire.



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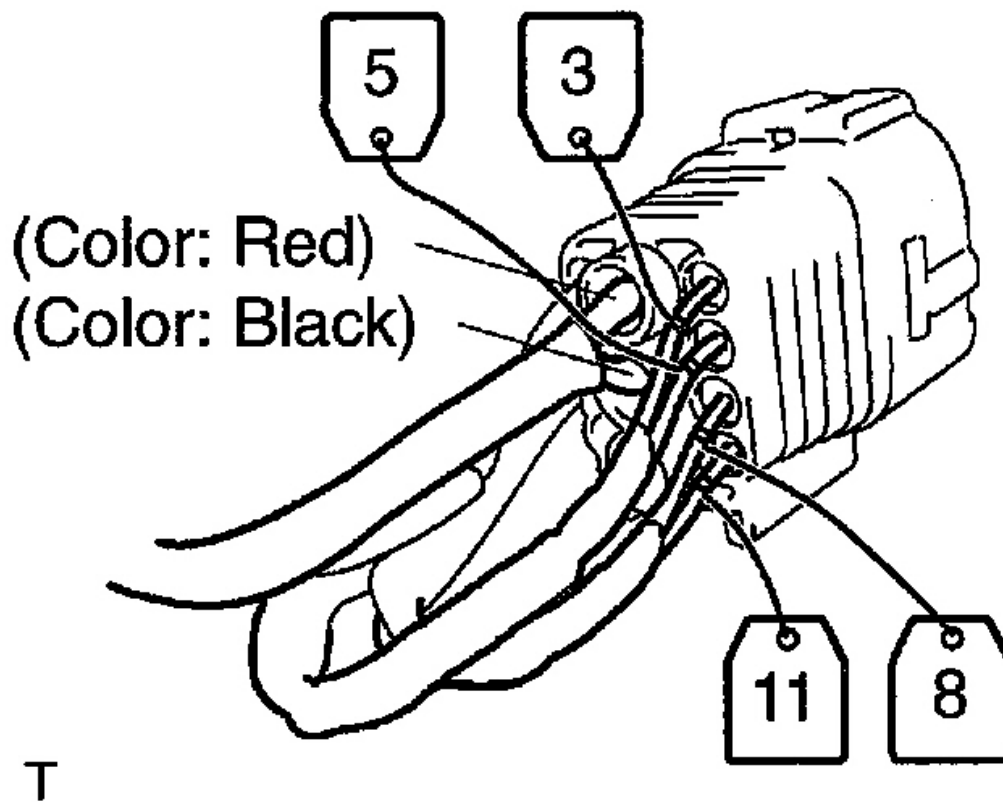
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Terminal Retainer

**Fig. 266: Prying Out Terminal Retainer Using Small Screwdrivers**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

Place markings on each terminal before removing the terminals.



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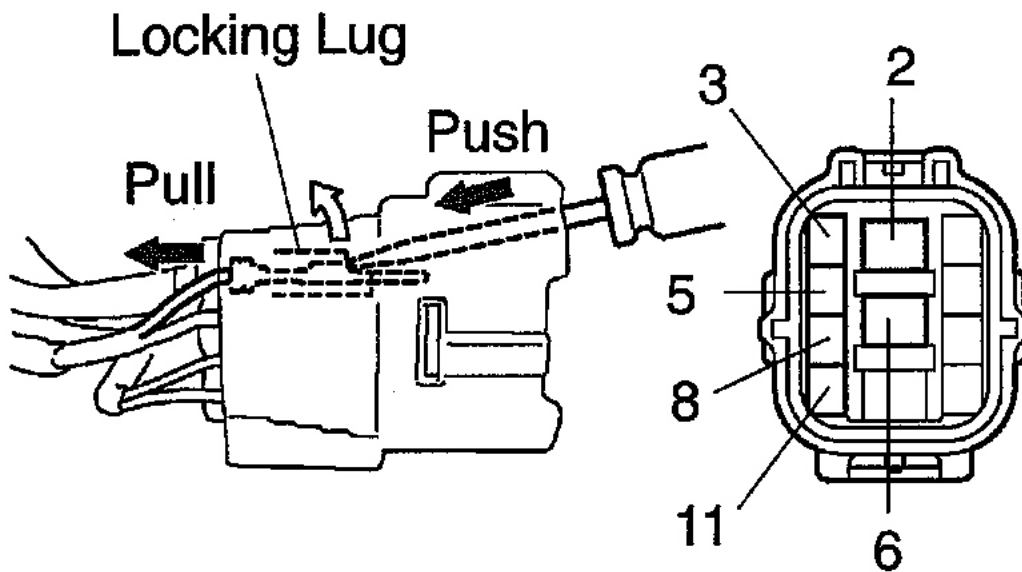
**Fig. 267: Placing Markings On Terminals**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Release the locking lug of the 6 terminals when pull the 6 terminals out from the rearward.

**NOTE:** Pull the 6 terminals put one by one with much care.

- d. Disconnect the sub-wire connector from the accumulator pressure sensor.
- e. Connect the sub-wire connector to the accumulator pressure sensor.
- f. Connect the 6 terminals to the sub-wire connector.
- g. Install the terminal retainer.
- h. Attach the clamp to the sub-wire.



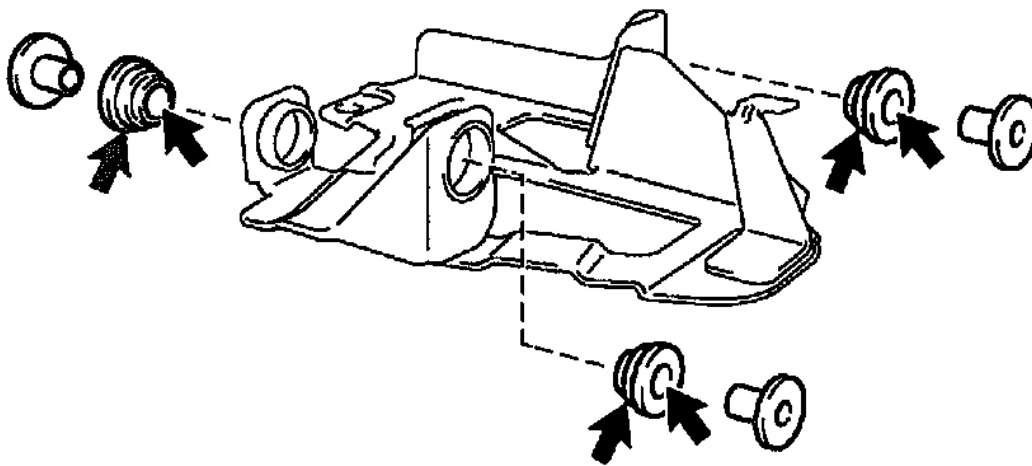
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**Fig. 268: Connecting Terminals To Sub-Wire Connector**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**2. REPLACE RUBBERS**

- a. Remove the 3 rubbers and 3 spacer tubes from the HPU bracket.
- b. Apply water to 3 new rubbers.
- c. Install the 3 rubbers and 3 spacer tubes to the HPU bracket.



T → : Apply water

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**Fig. 269: Removing Rubbers And Spacer Tubes From HPU Bracket**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## INSTALLATION

### 1. INSTALL HPU BRACKET TO HPU

Install the HPU bracket with the 3 bolts.

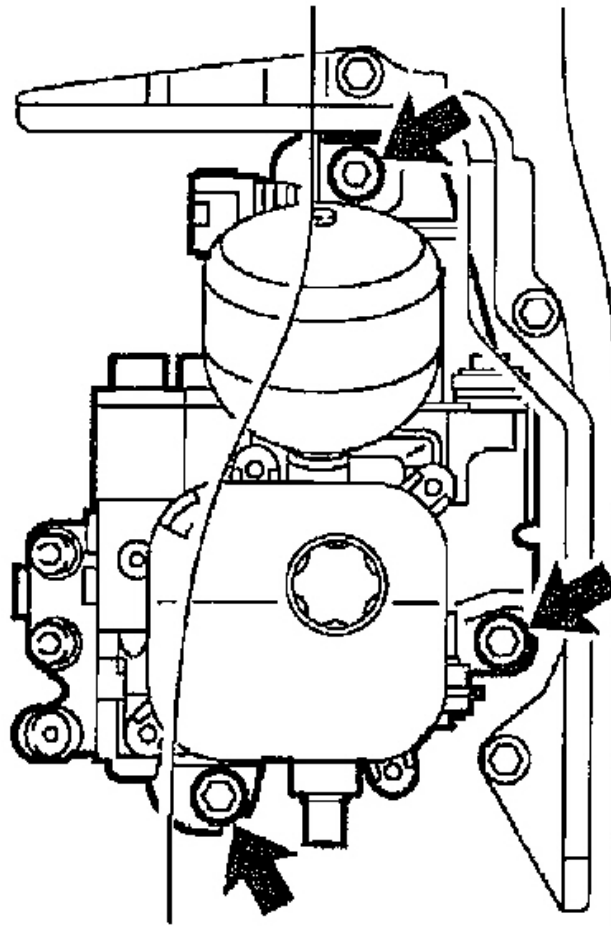
**Torque: 22 N.m (224 kgf.cm, 16 ft.lbf)**

### 2. INSTALL HPU ASSEMBLY

a. Install the HPU assembly with the 3 bolts.

**Torque: 26 N.m (265 kgf.cm, 19 ft.lbf)**





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**Fig. 270: Installing HPU Assembly With Bolts**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Connect the HPU connector to the HPU.
- c. Remove the reservoir cap seal.
- d. Install the reservoir cap cover to the HPU.
3. **CONNECT SMT SYSTEM HOSES (See INSTALLATION )**

**NOTE:** Exchange the O-ring of 3 system hoses with new one.

4. **CHECK SMT SYSTEM FLUID LEVEL (See PRE-CHECK )**

---

5. **INSTALL AIR CLEANER CASE, AIR FILTER AND AIR CLEANER CAP**

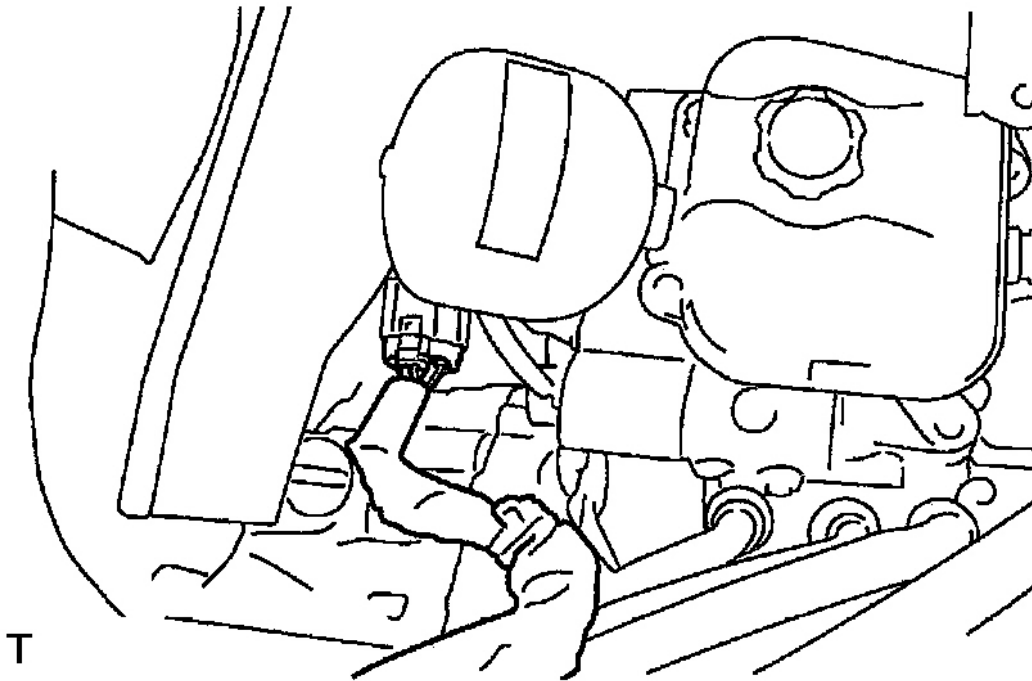
- a. Install the air cleaner case with the 2 bolts.
- b. Install the air filter.
- c. Attach the air cleaner cap to the air cleaner case, and install the 2 clamps.
- d. Connect the MAF meter connector, VSV connector for CCV and vacuum hose.

6. **INSTALL SUSPENSION UPPER BRACE**

Install the suspension upper brace with the 2 bolts and 2 nuts.

7. **PERFORM INITIAL LEARNING OF SMT SYSTEM (See PRE-CHECK )**

8. **CHECK FOR LEAK**



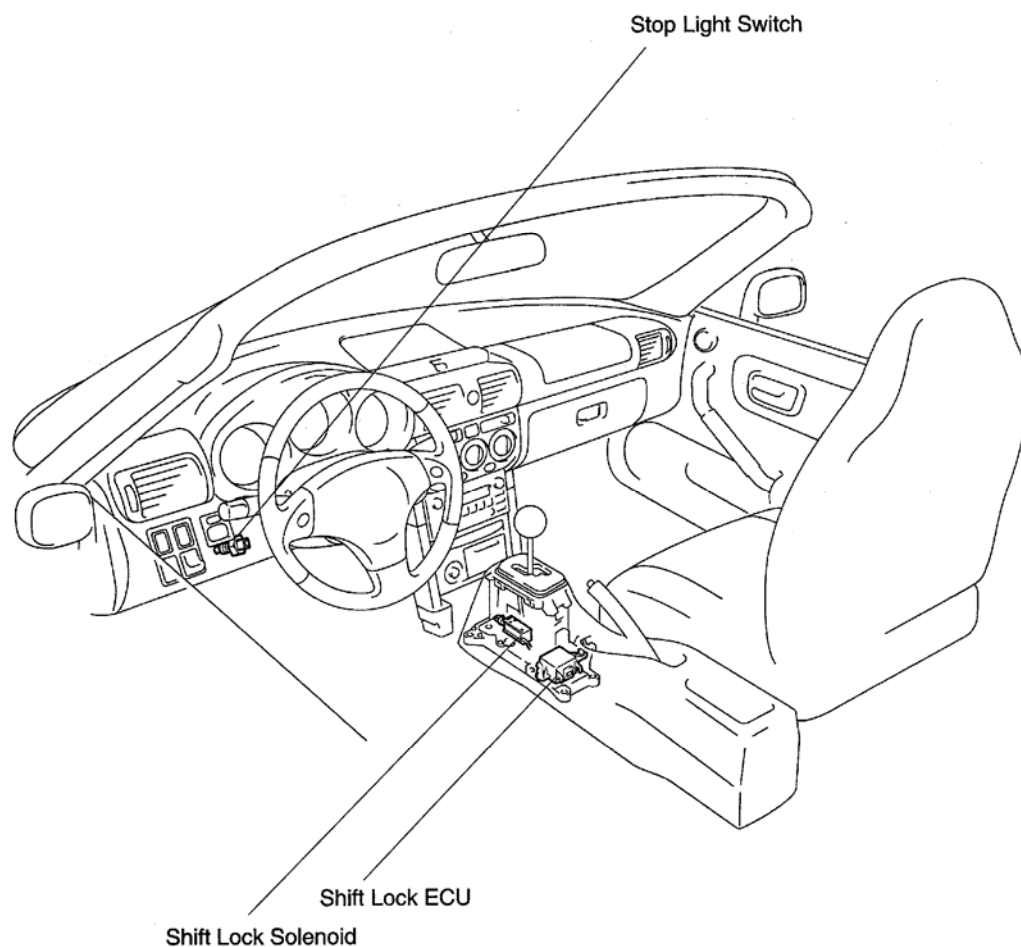
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**Fig. 271: Removing Reservoir Cap Seal**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## **SHIFT LOCK SYSTEM**

### **LOCATION**



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**Fig. 272: Locating Shift Lock System Location**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

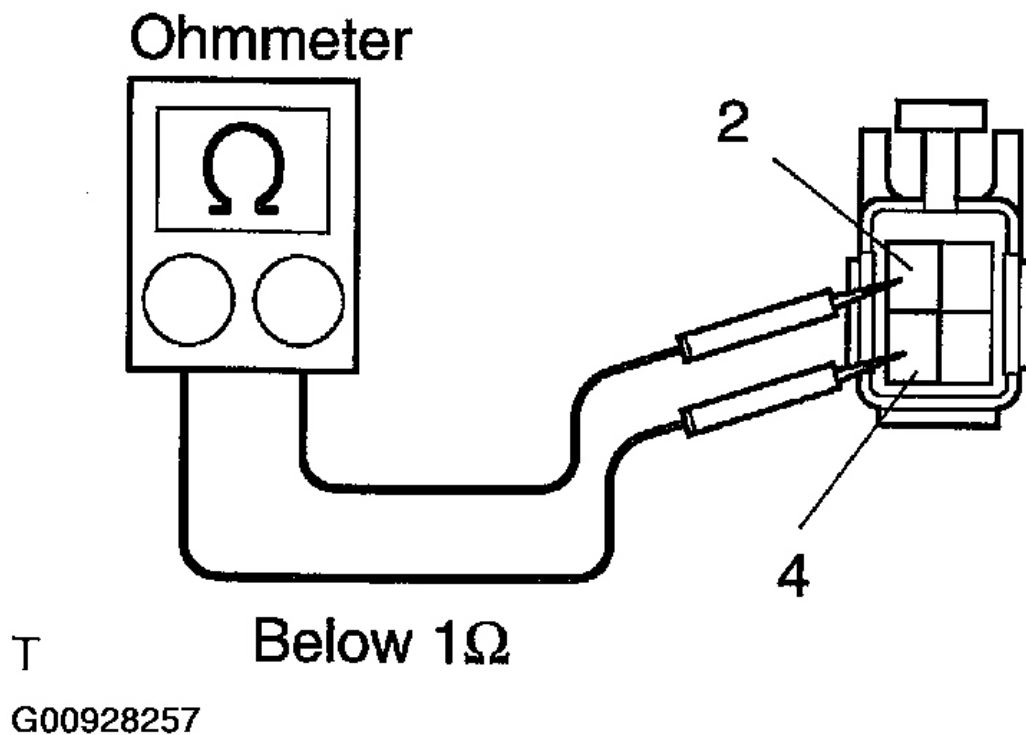
## INSPECTION

### 1. INSPECT SHIFT LOCK ECU

- a. Remove the shift lock ECU (See **DISASSEMBLY**).
- b. Using an ohmmeter, check the resistance between the terminals 2 and 4.

**Standard: Below 1ohms**

If the result is not as specified, replace the shift lock ECU.



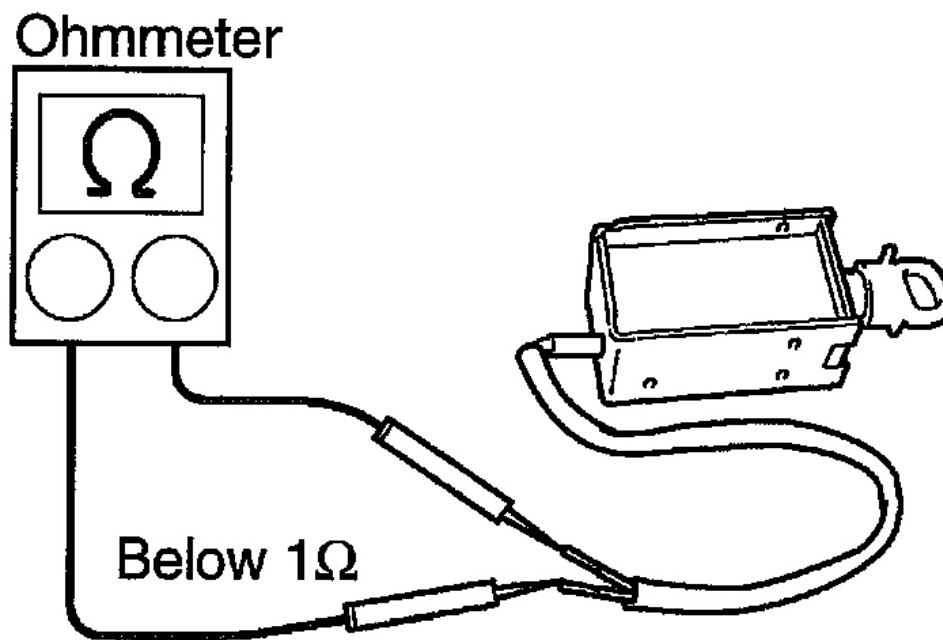
**Fig. 273: Checking Resistance Between Terminals 2 And 4**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## 2. INSPECT SHIFT LOCK SOLENOID

- a. Remove the shift lock solenoid (See **DISASSEMBLY**).
- b. Inspect the shift lock solenoid operation.
  - a. Using an ohmmeter, check the resistance between the terminals.

**Standard: Below 1ohms**

If the result is not as specified, replace the shift lock solenoid.



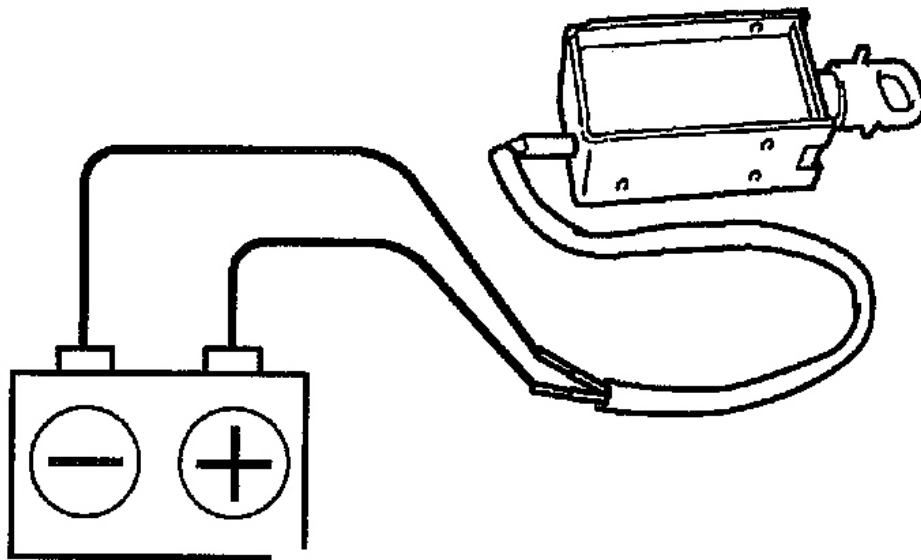
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**Fig. 274: Checking Resistance Between Terminals**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Check the solenoid operating sound when connecting the battery voltage across the terminals.

If the solenoid does not operate, replace the shift lock solenoid.



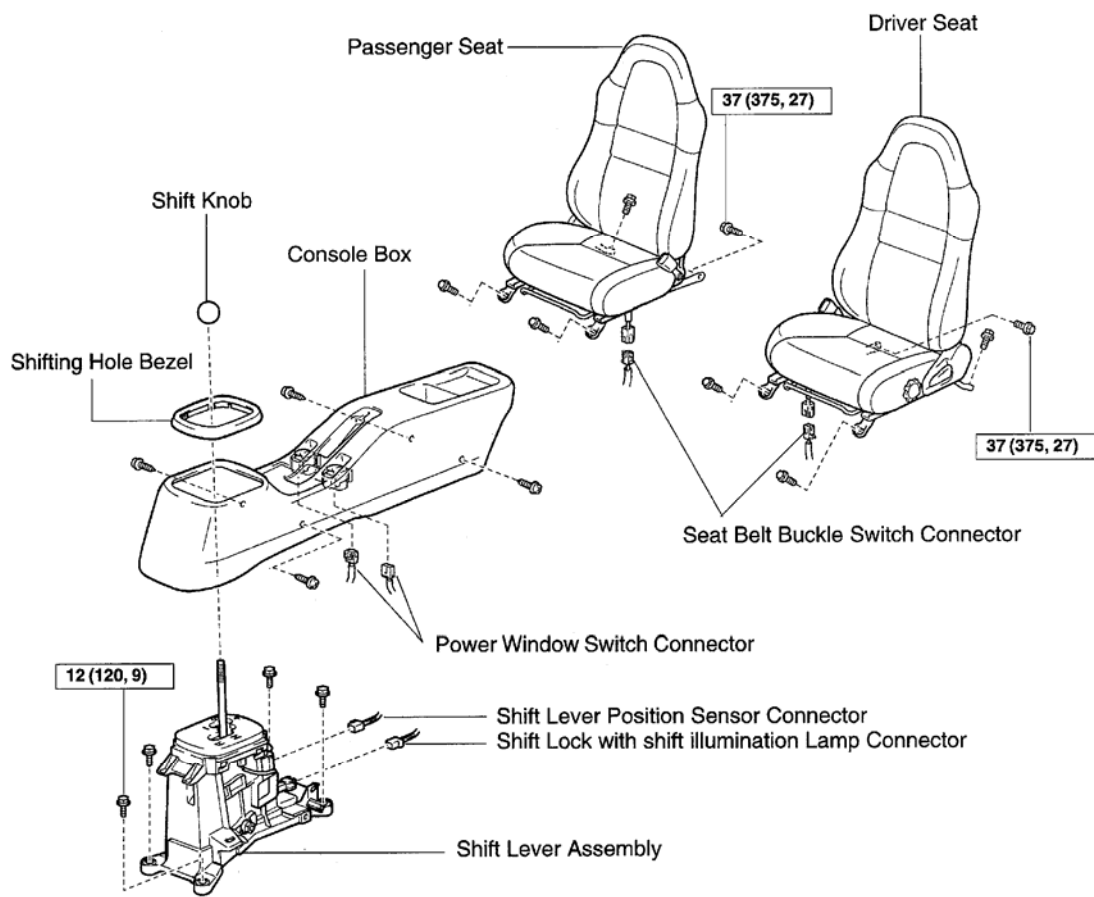
T Battery

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**Fig. 275: Checking Solenoid Operating With Battery Voltage**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## SHIFT LEVER

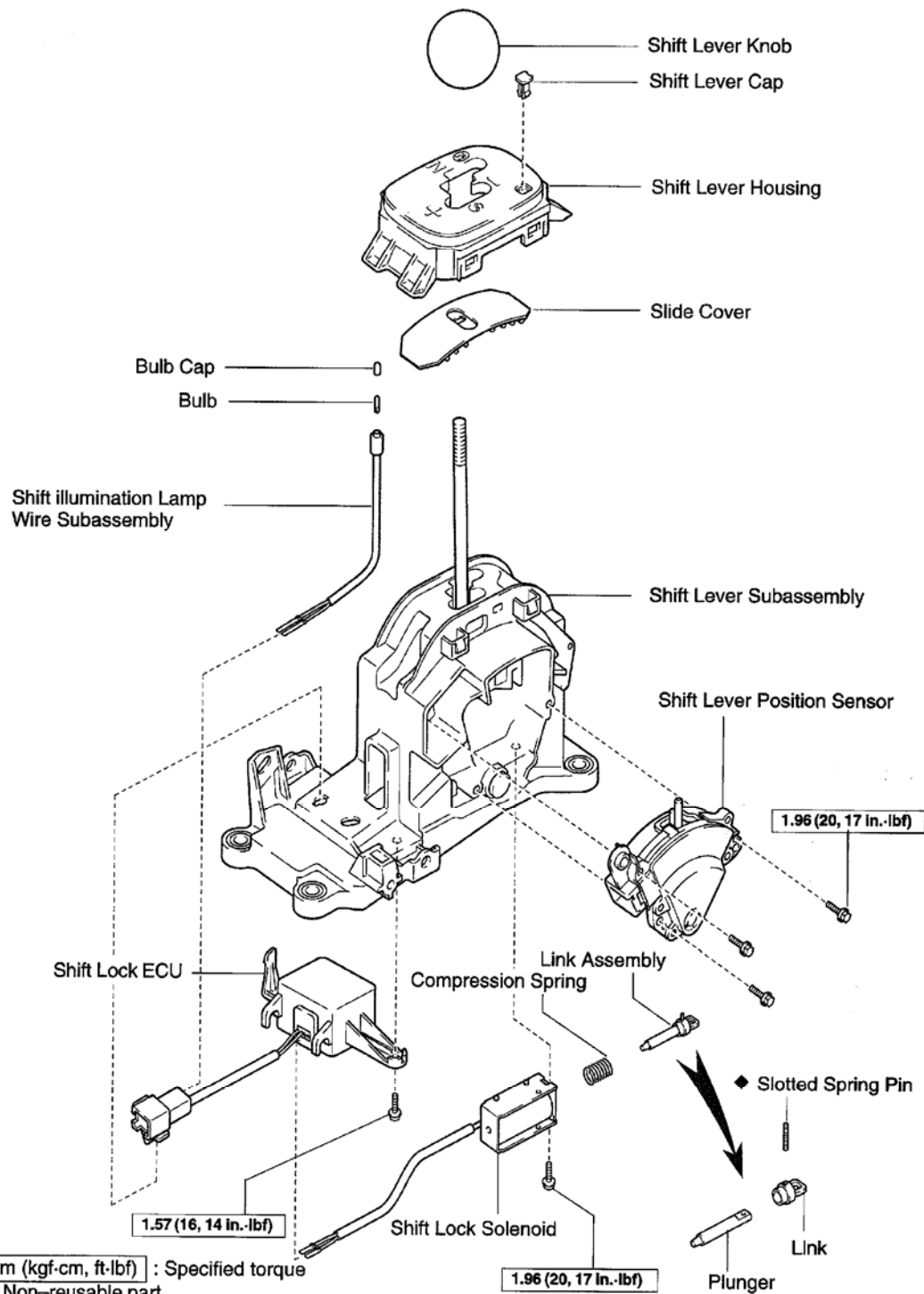
### COMPONENTS



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

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**Fig. 276: Identifying Shift Lever Components (1 Of 2)**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



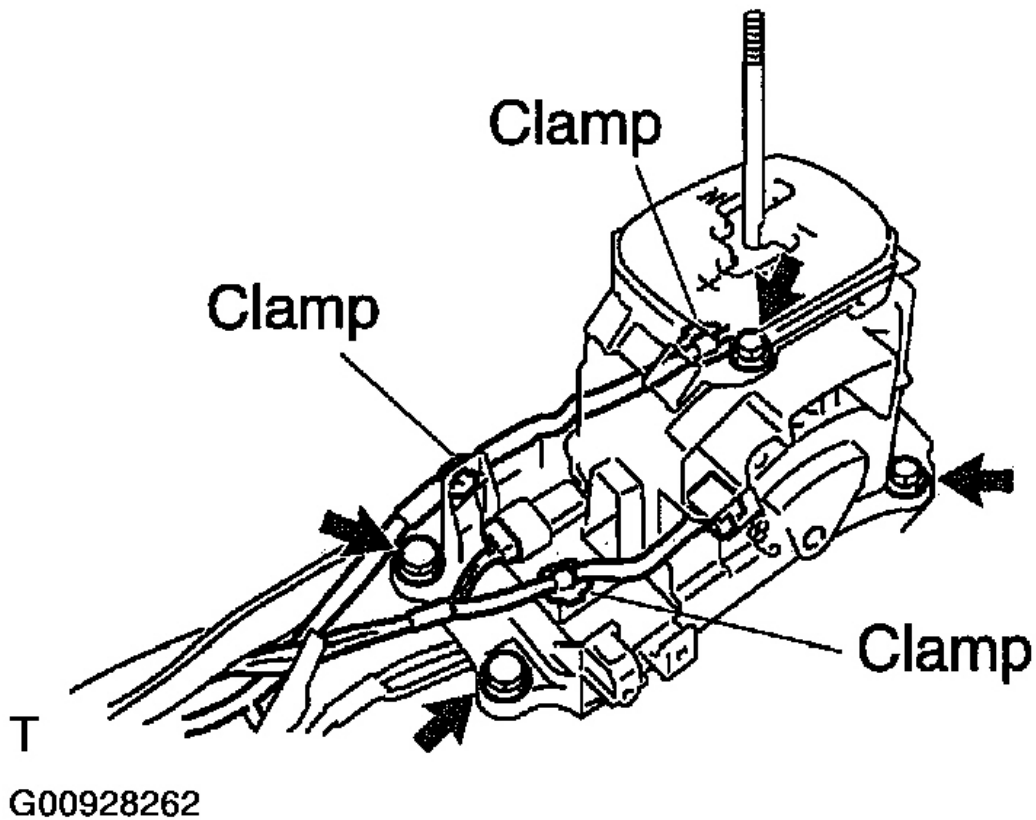
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**Fig. 277: Identifying Shift Lever Components (2 Of 2)**  
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**REMOVAL**



1. **REMOVE DRIVER AND PASSENGER SEATS** (See )
2. **REMOVE CONSOLE BOX** (See )
3. **REMOVE SHIFT LEVER**
  - a. Remove the shift knob.
  - b. Remove the 3 clamps.
  - c. Disconnect the shift lever position sensor connector.
  - d. Disconnect the shift lock with shift illumination lamp connector.
  - e. Remove the 4 bolts and shift lever.



**Fig. 278: Removing Shift Lever And Bolts**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

#### **DISASSEMBLY**

1. **REMOVE SHIFT LEVER KNOB**
2. **REMOVE SHIFT LEVER HOUSING**

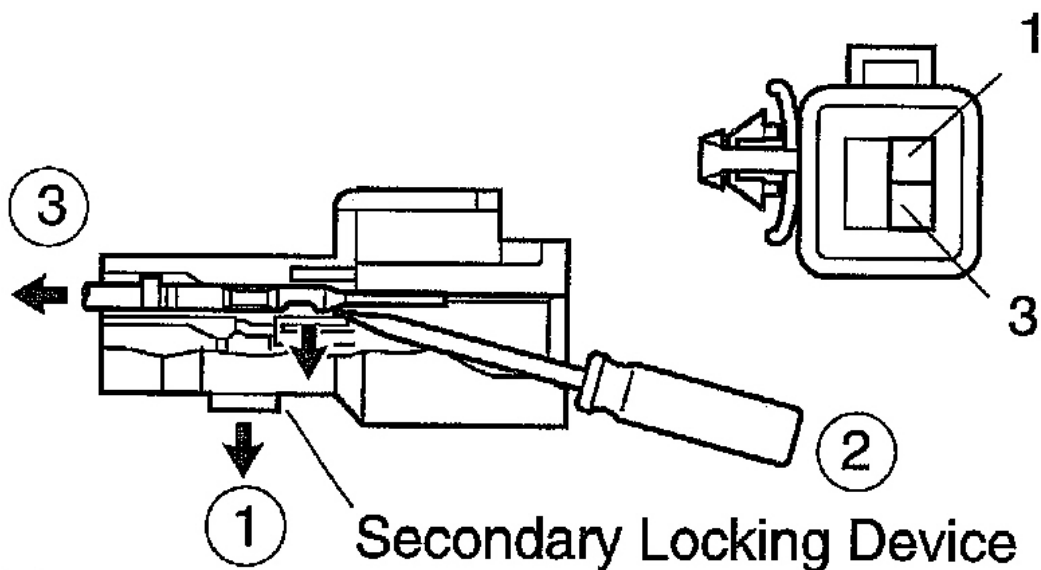
3. **REMOVE SLIDE COVER**

4. **REMOVE SHIFT POSITION SENSOR**

Remove the 3 bolt and shift position sensor.

5. **REMOVE SHIFT ILLUMINATION LAMP WIRE SUBASSEMBLY**

- a. Disconnect the clamp from the shift lever assembly.
- b. Using a small screwdriver, release the secondary locking device.
- c. Using a small screwdriver, release the locking log of terminals 1 and 3, and pull the terminals out of the rearward.
- d. Remove the shift illumination lamp wire subassembly from the shift lever subassembly.
- e. Remove the bulb from the shift illumination lamp wire subassembly.



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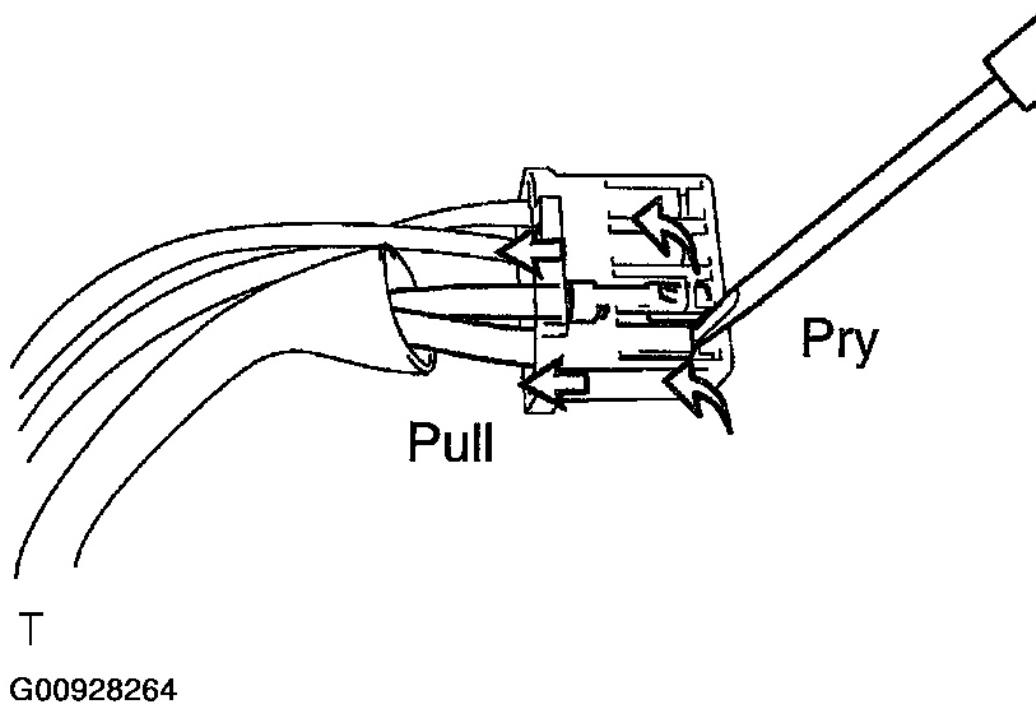
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**Fig. 279: Releasing Secondary Locking Device Using Small Screwdriver**

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

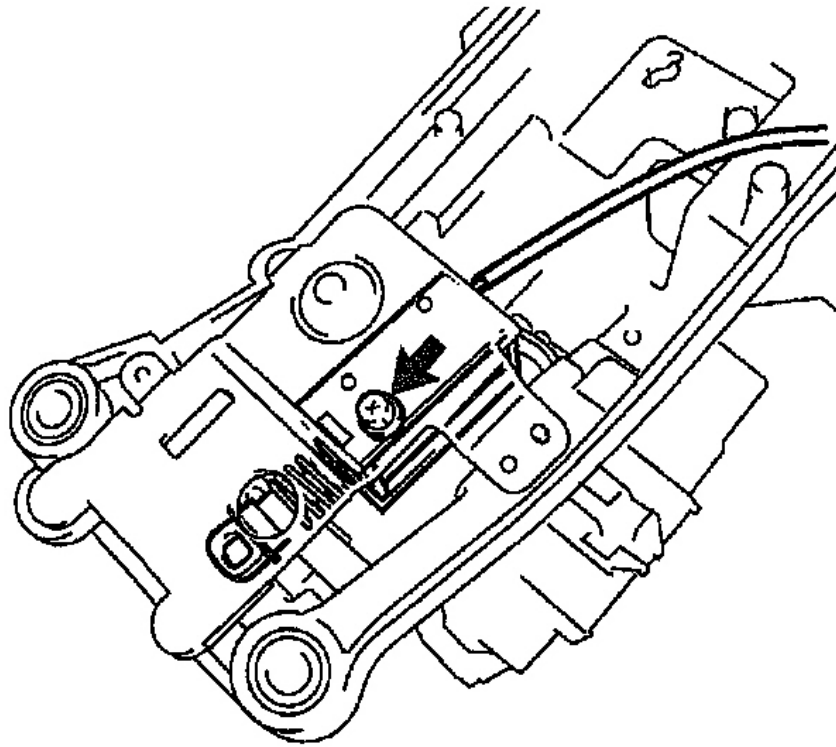
6. **REMOVE SHIFT LOCK SOLENOID**

- a. Disconnect the connector from the shift lock ECU.
- b. Using a small screwdriver, release the locking log of the 2 terminals and pull the terminals out of the rearward.
- c. Reconnect the connector to the shift lock ECU.



**Fig. 280: Pulling Terminals Out Of Rearward Using Small Screwdriver**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Remove the bolt and shift lock solenoid assembly.
- e. Remove the link assembly and compression spring from the shift lock solenoid.

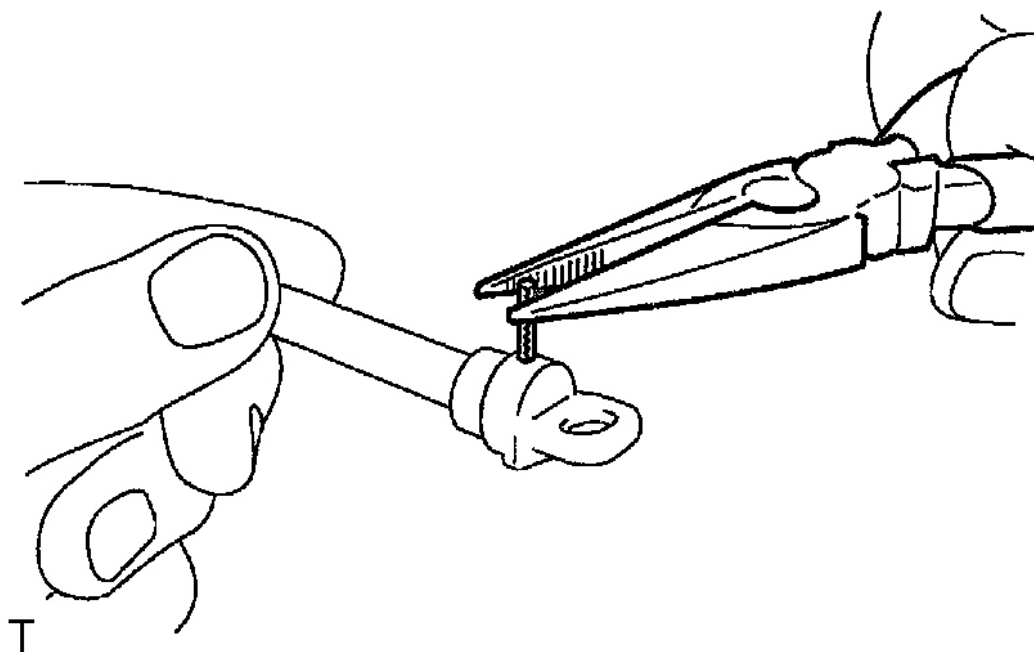


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**Fig. 281: Removing Bolt And Shift Lock Solenoid Assembly**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- f. Using long-nose pliers, pull out the slotted spring pin from the link assembly.
- g. Remove the link from the plunger.

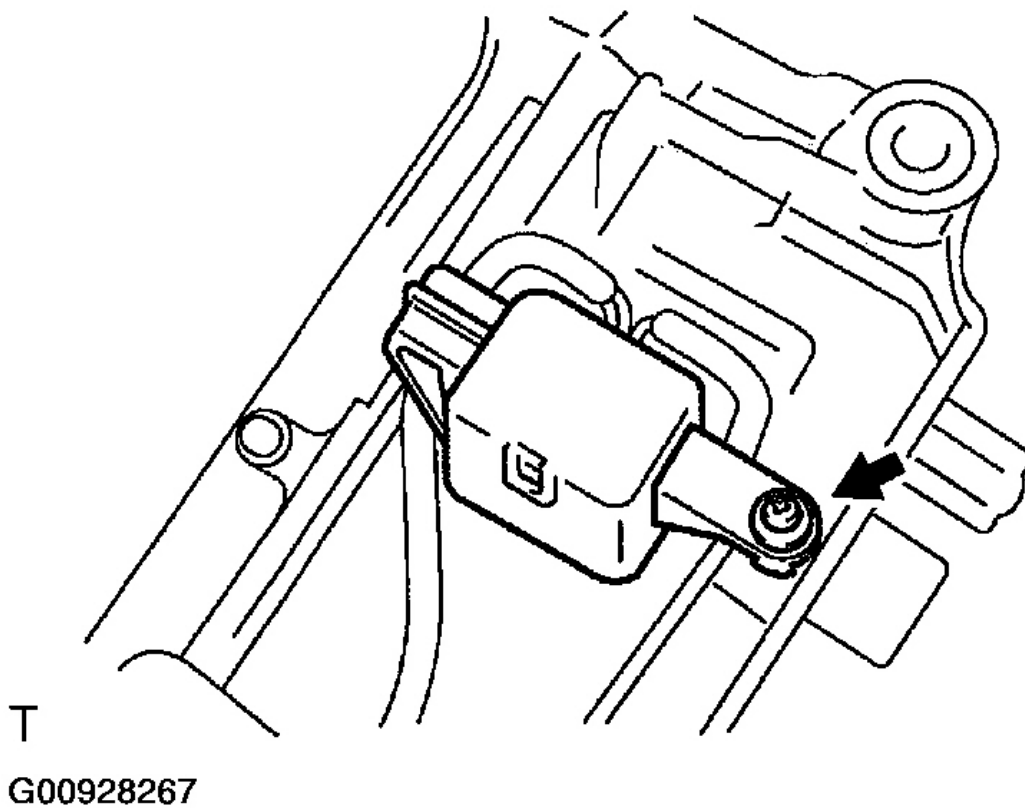


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**Fig. 282: Pulling Out Slotted Spring Pin Using Long-Nose Pliers**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**7. REMOVE SHIFT LOCK ECU**

Remove the bolt and shift lock ECU.

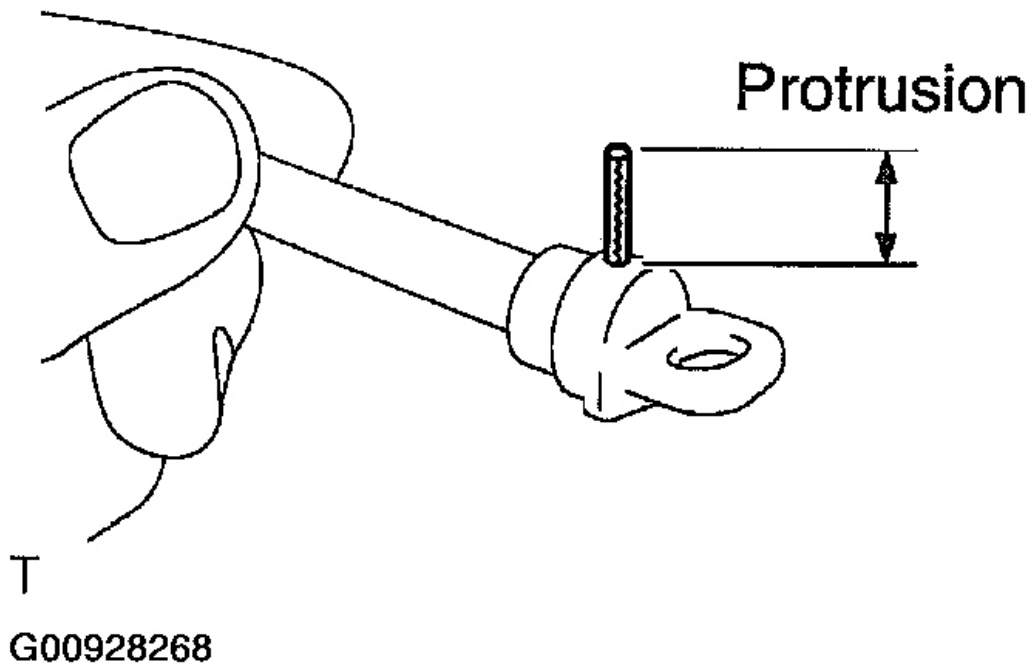


**Fig. 283: Removing Bolt And Shift Lock ECU**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

## REASSEMBLY

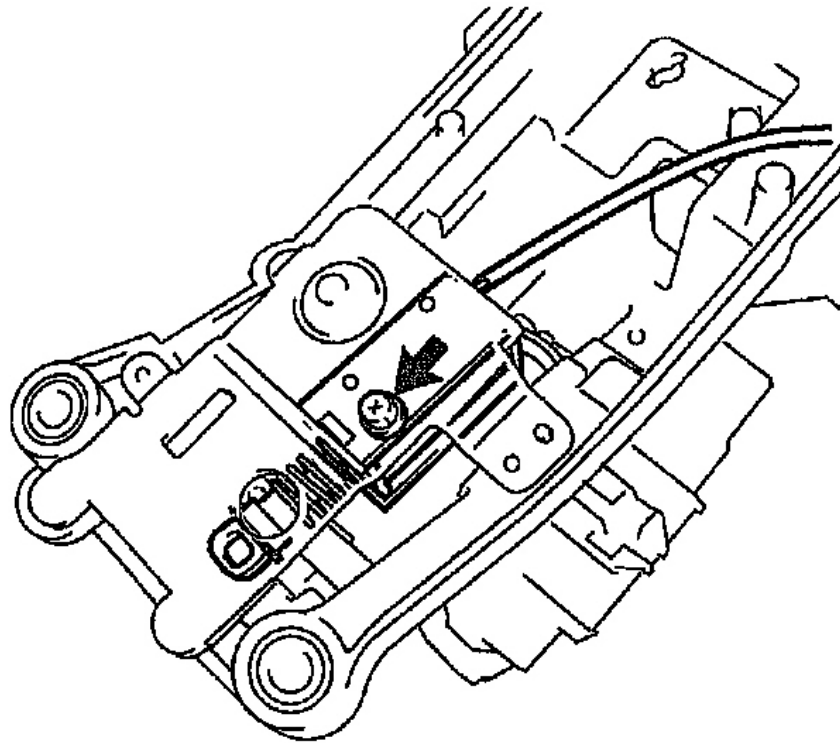
### 1. INSTALL SHIFT LOCK SOLENOID

- a. Install the link to the plunger.
- b. Using a plastic-faced hammer, tap in a new slotted spring pin.  
**Protrusion: 6 mm (0.24 in.)**
- c. Install the compression spring and the link assembly to the shift lock solenoid.



**Fig. 284: Installing Compression Spring And Link Assembly To Shift Lock Solenoid**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Install the shift lock solenoid assembly with the bolt.
- e. Disconnect the connector from the shift lock ECU.



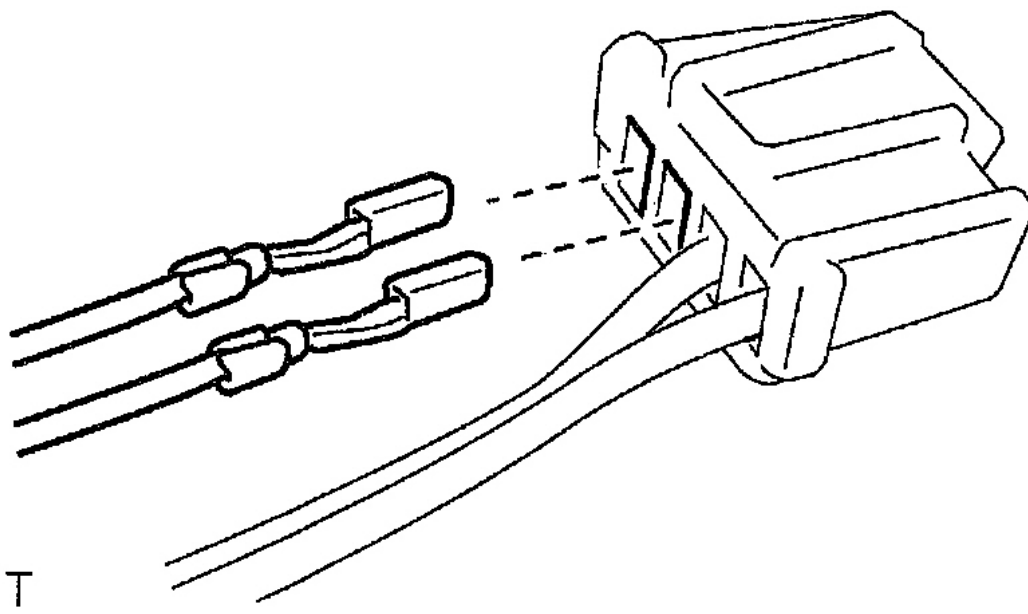
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**Fig. 285: Disconnecting Connector From Shift Lock ECU**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- f. Connect the 2 terminals to the connector.
- g. Reconnect the connector to the shift lock ECU.





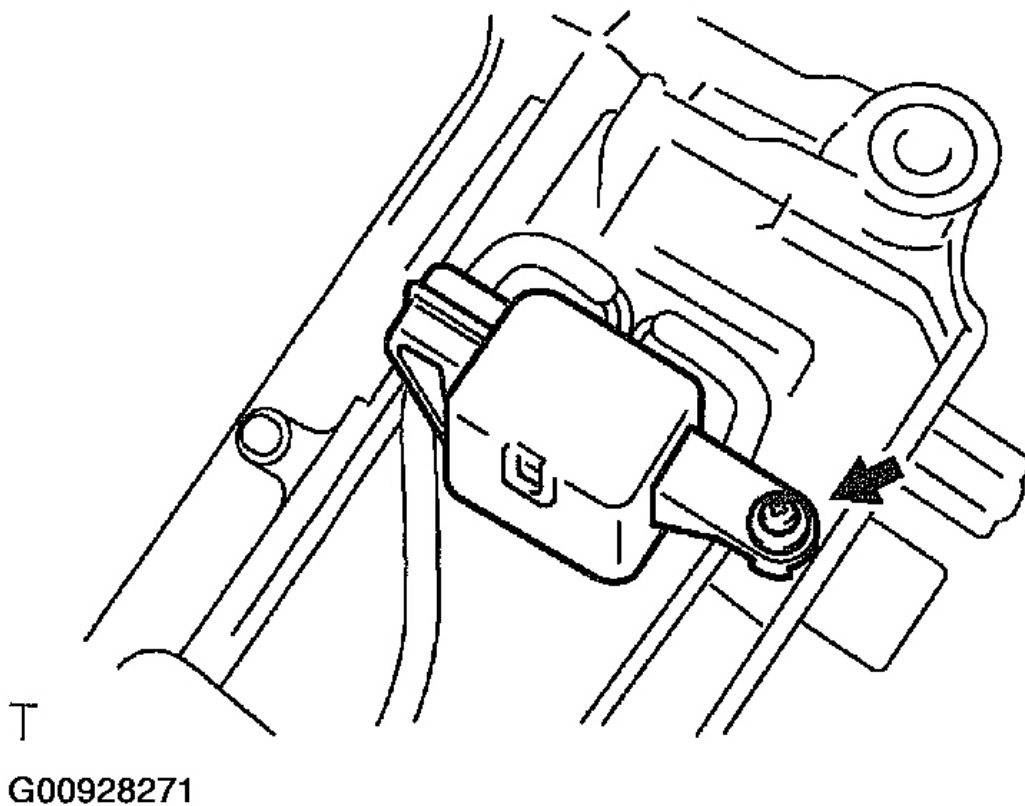
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**Fig. 286: Reconnecting Connector To Shift Lock ECU**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**2. INSTALL SHIFT LOCK ECU**

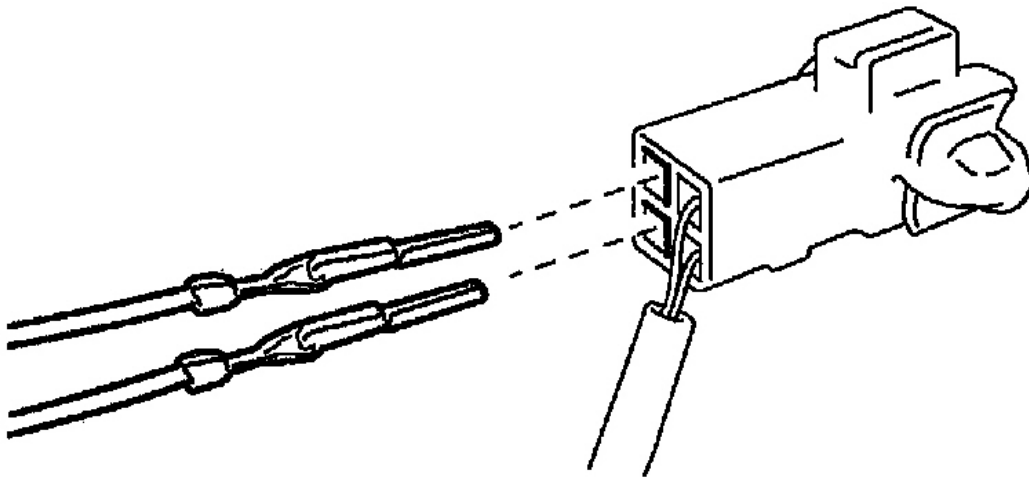
Install the shift lock ECU with the bolt.



**Fig. 287: Installing shift lock ECU with bolt**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

**3. INSTALL SHIFT ILLUMINATION LAMP WIRE SUBASSEMBLY**

- a. Connect the 2 terminals to the connector.
- b. Lock the secondary locking device.
- c. Connect the clamp to the shift lever assembly.
- d. Install the bulb to the shift illumination lamp wire subassembly.
- e. Install the shift illumination lamp wire subassembly to the shift lever subassembly.



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**Fig. 288: Connecting Terminals To Connector**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

#### 4. INSTALL SHIFT POSITION SENSOR

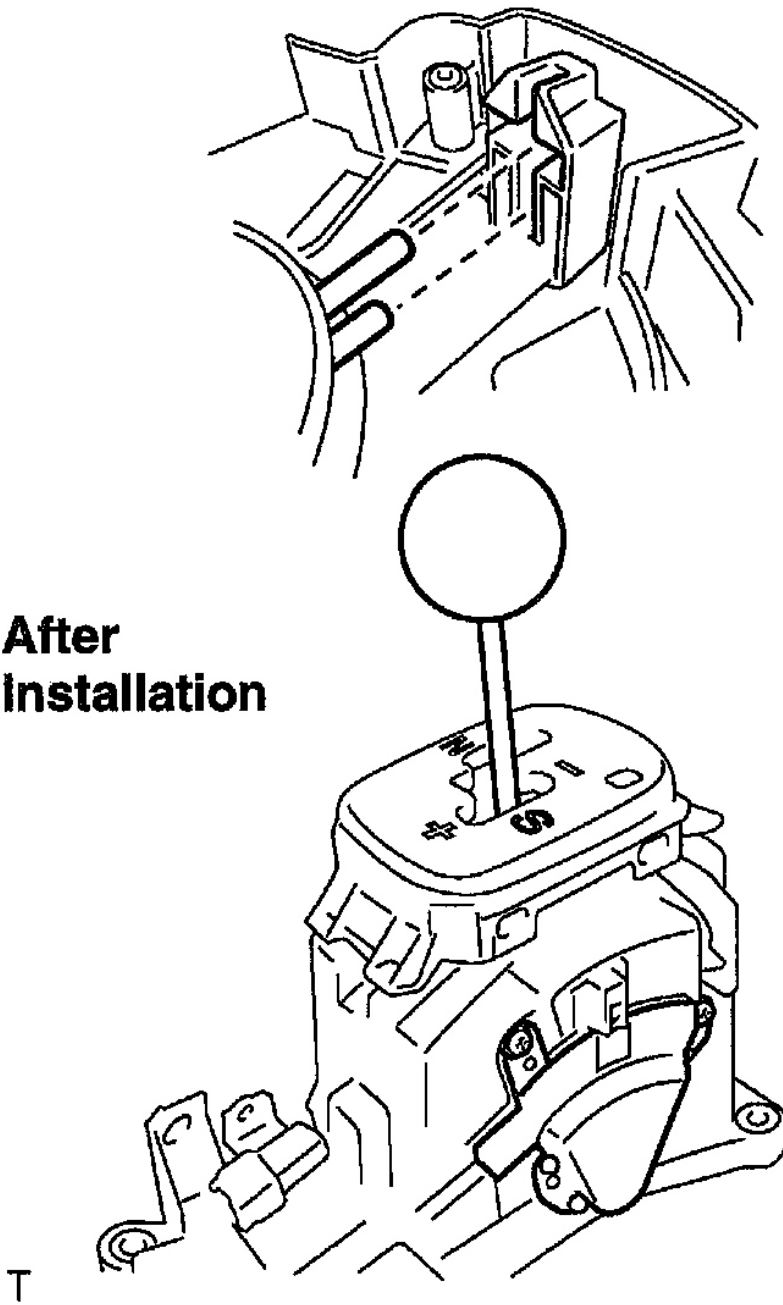
Install the shift position sensor with the 3 bolts.

HINT:

Move the shift lever into the S position as shown in the illustration, and then install the shift position sensor.

---

**After  
Installation**



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**Fig. 289: Installing Shift Position Sensor**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

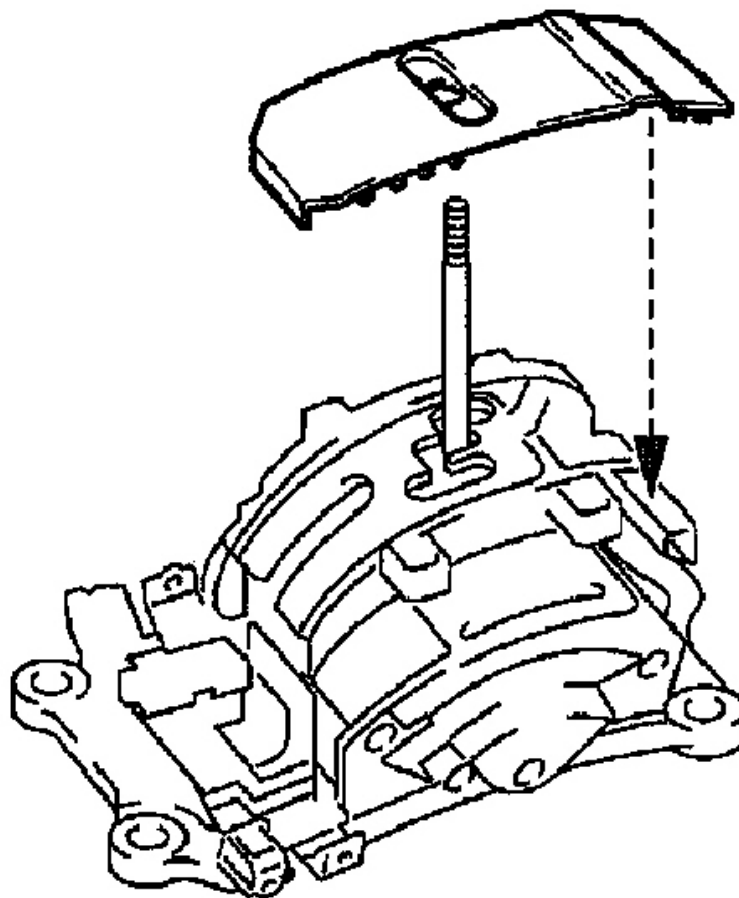
**5. INSTALL SLIDE COVER**

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HINT:

Since the slide cover has a characteristic of direction-oriented, be sure to install it as shown in the illustration.

6. **INSTALL SHIFT LEVER HOUSING**
7. **INSTALL SHIFT LEVER KNOB**



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**Fig. 290: Installing Slide Cover**  
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

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**Installation is in the reverse order of removal (See REMOVAL).**

HINT:

After installation, check and inspect item as follows.

- When the shift lever is in the R, N and S positions and the ignition switch is ON, the shift lever is able to move.
- When the shift lever is in the R, N and S positions and the ignition switch is OFF or ACC, the shift lever has been locked.
- Perform the test drive of the vehicle.