

2004 Toyota RAV4

2004 TRANSMISSION Manual Transaxle - RAV4

2004 TRANSMISSION

Manual Transaxle - RAV4

TROUBLESHOOTING

PROBLEM SYMPTOMS TABLE

Use **Fig. 1** 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	Suspect Area
Noise	1. Oil (Level low) 2WD 4WD Transfer 2. Oil (Wrong)) 2WD 4WD Transfer 3. Gear (Worn or damaged) 4. Bearing (Worn or damaged)
Oil leakage	1. Oil (Level too high) 2WD 4WD Transfer 2. Gasket (Damaged) 3. Oil seal (Worn or damaged) 4. O-Ring (Worn or damaged)
Hard to shift or will not shift	1. Control cable (Faulty) 2. Synchronizer ring (Worn or damaged) 3. Shift key spring (Damaged)
Jumps out of gear	1. Locking ball spring (Damaged) 2. Shift fork (Worn) 3. Gear (Worn or damaged) 4. Bearing (Worn or damaged)
Tight corner braking	1. Differential, Center differential (Faulty)

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Fig. 1: Problem Symptoms Table

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

MANUAL TRANSAXLE UNIT (2WD)

ON-VEHICLE REPAIR

REPLACE TRANSAXLE OIL

- a. Loosen the filler plug.
- b. Remove the drain plug.

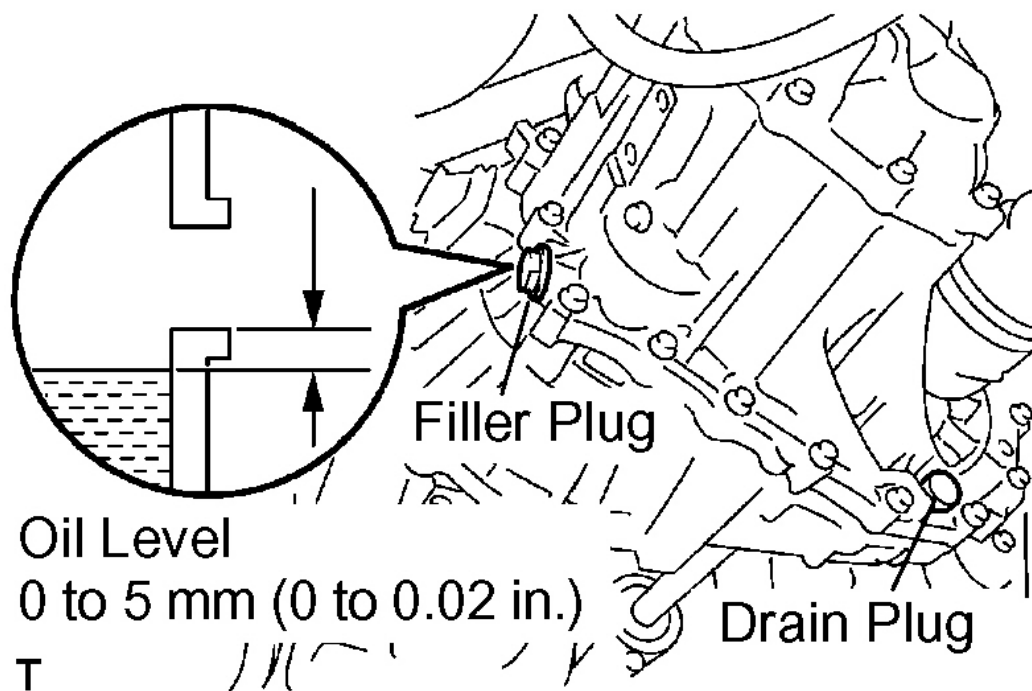
HINT:

Use a container to catch the transaxle oil.

- c. Remove the filler plug.
- d. Reinstall the drain plug.

Torque: 49 N.m (500 kgf.cm, 36 ft.lbf)

- e. Refill new transaxle oil as shown in **Fig. 2**.



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Fig. 2: Replacing Transaxle Oil

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

Oil grade: API GL-4 or GL-5

Viscosity: SAE 75W-90

Capacity: 2.5 liters (2.6 US qts, 2.2 Imp.qts)

- f. Reinstall the filler plug.

Torque: 49 N.m (500 kgf.cm, 36 ft.lbf)

COMPONENTS

2004 Toyota RAV4

2004 TRANSMISSION Manual Transaxle - RAV4

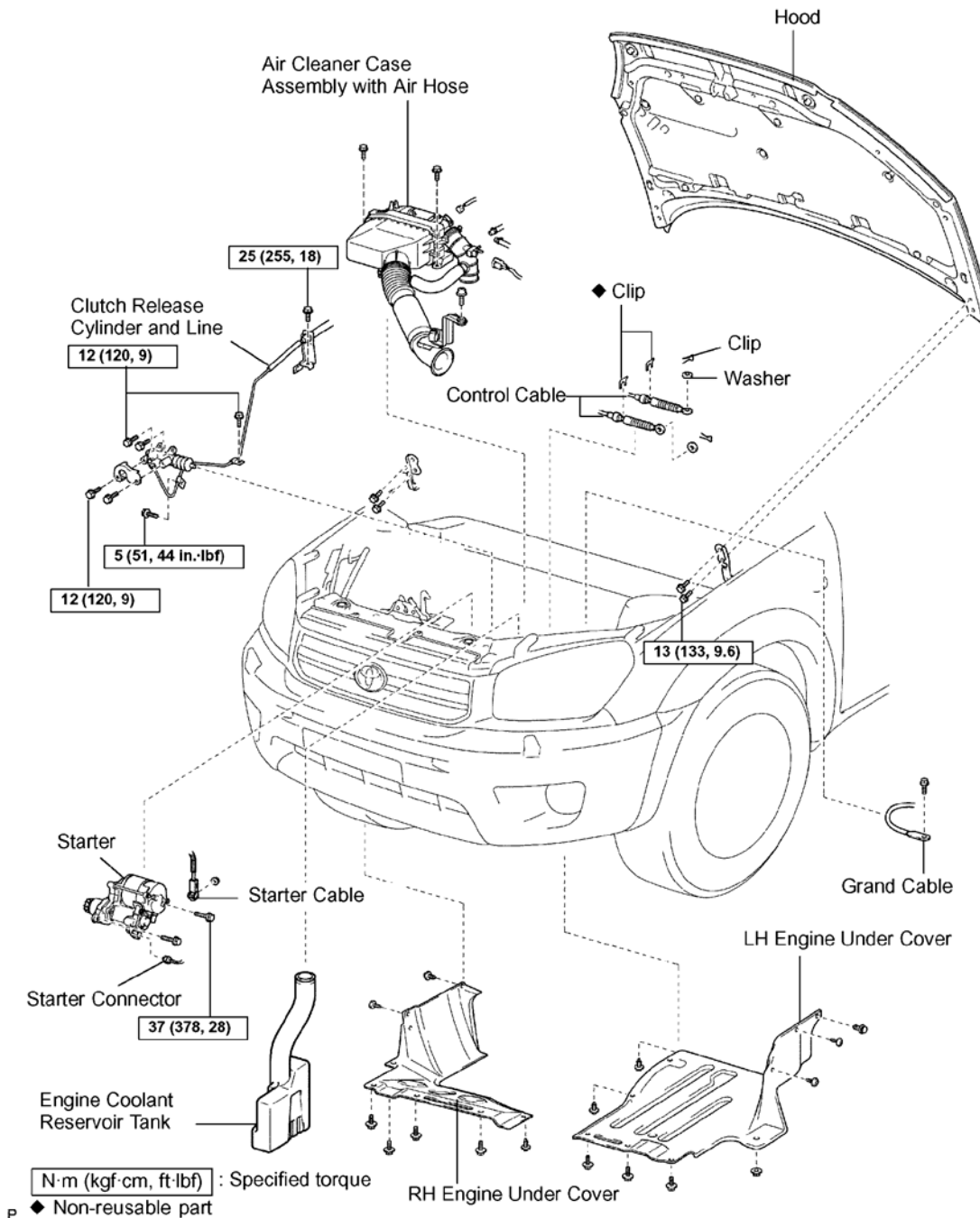


Fig. 3: Locating Manual Transaxle Unit 2WD Components (1 Of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2004 Toyota RAV4

2004 TRANSMISSION Manual Transaxle - RAV4

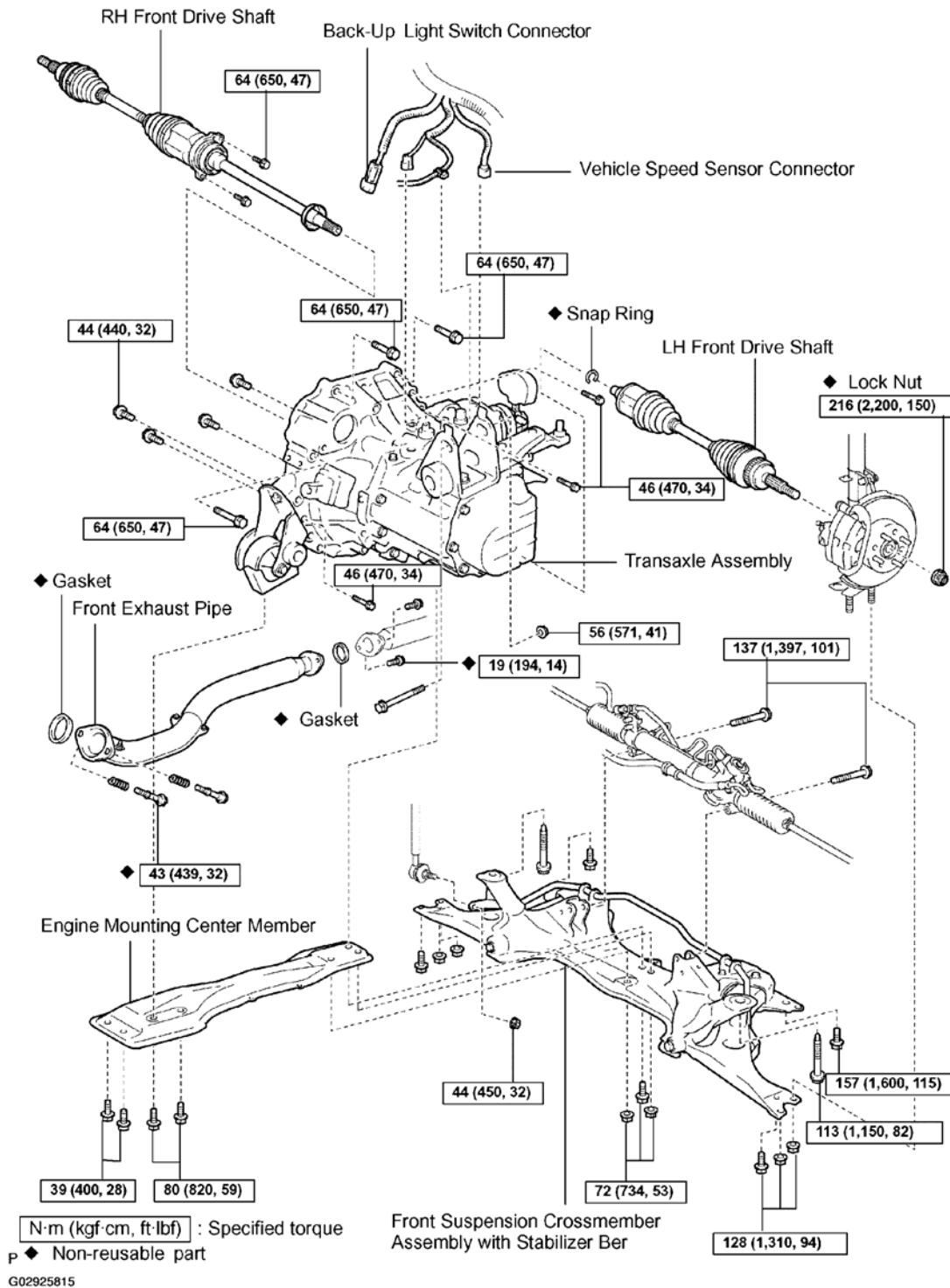


Fig. 4: Locating Manual Transaxle Unit 2WD Components (2 Of 2)

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

REMOVAL

1. REMOVE HOOD

Remove the 4 bolts and hood.

Torque: 13 N.m (133 kgf.cm, 9.6 ft.lbf)

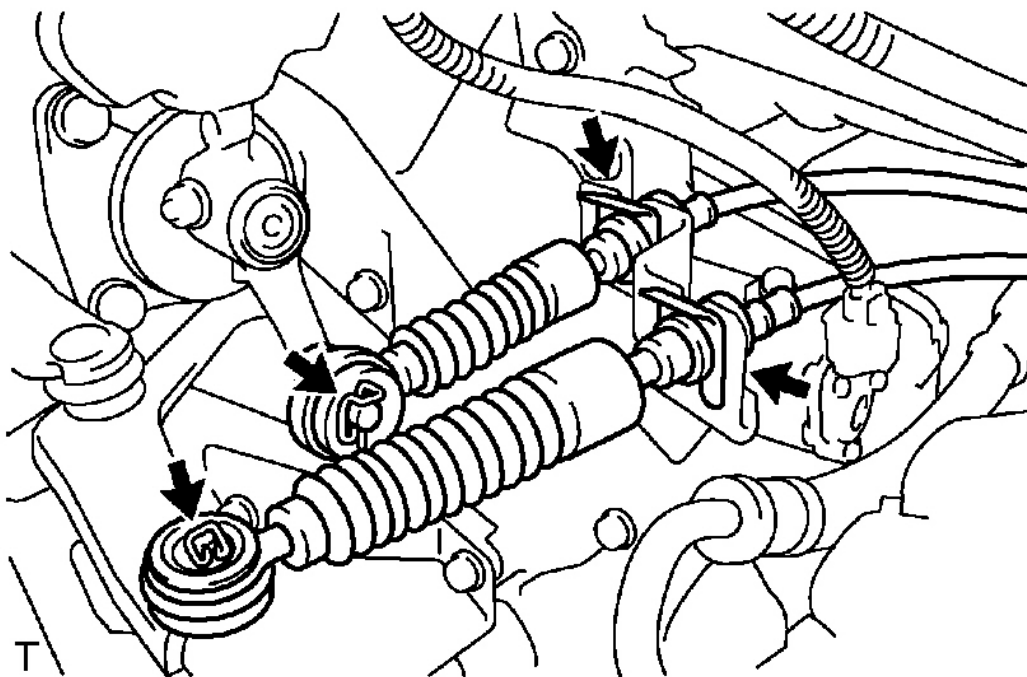
HINT:

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

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

2. REMOVE AIR CLEANER ASSEMBLY WITH AIR HOSE**3. REMOVE ENGINE COOLANT RESERVOIR TANK****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.

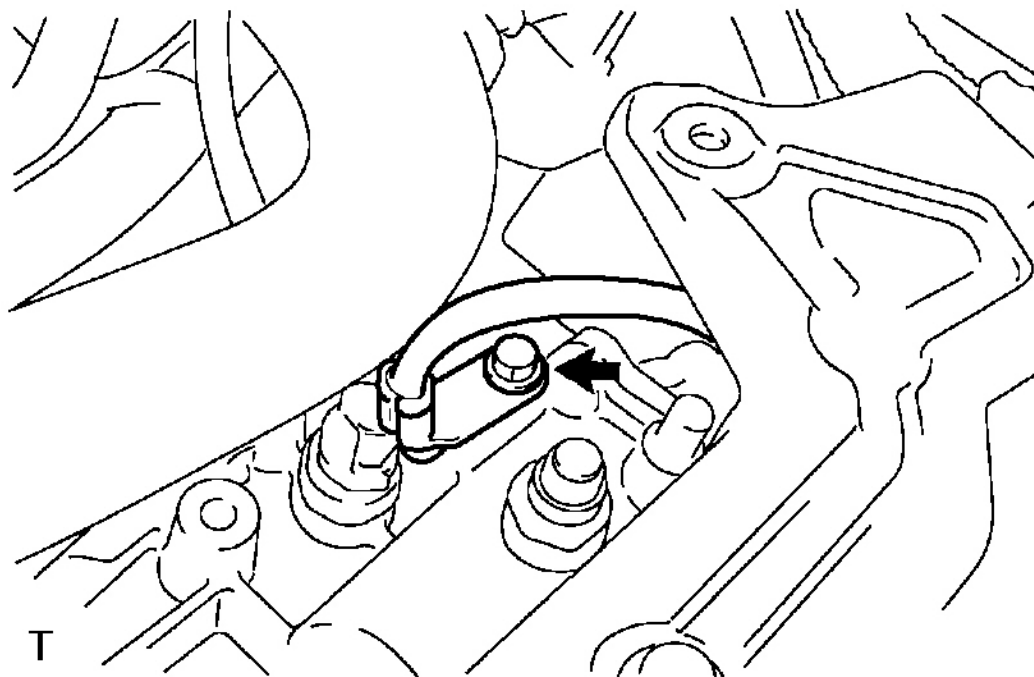


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Fig. 5: Removing Clips & Washers & Disconnecting Control Cable
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. **DISCONNECT VEHICLE SPEED SENSOR AND BACK-UP LIGHT SWITCH CONNECTORS**
6. **DISCONNECT GROUND CABLE FROM TRANSAXLE**

Remove the bolt and disconnect the ground cable.



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Fig. 6: Removing Bolt & Disconnecting Transaxle Ground Cable
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

7. **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)

8. **DISCONNECT CLUTCH RELEASE CYLINDER AND LINE**
 - a. Remove the 3 bolts.

Torque:

25 N.m (255 kgf.cm, 18 ft.lbf) for bolt A

12 N.m (120 kgf.cm, 9 ft.lbf) for bolt B

5 N.m (51 kgf.cm, 44 in.lbf) for bolt C

- b. Remove the 2 bolts and heat insulator.

Torque: 12 N.m (120 kgf.cm, 9 ft.lbf)

- c. Remove the 2 bolts and disconnect the release cylinder and line.

Torque: 12 N.m (120 kgf.cm, 9 ft.lbf)

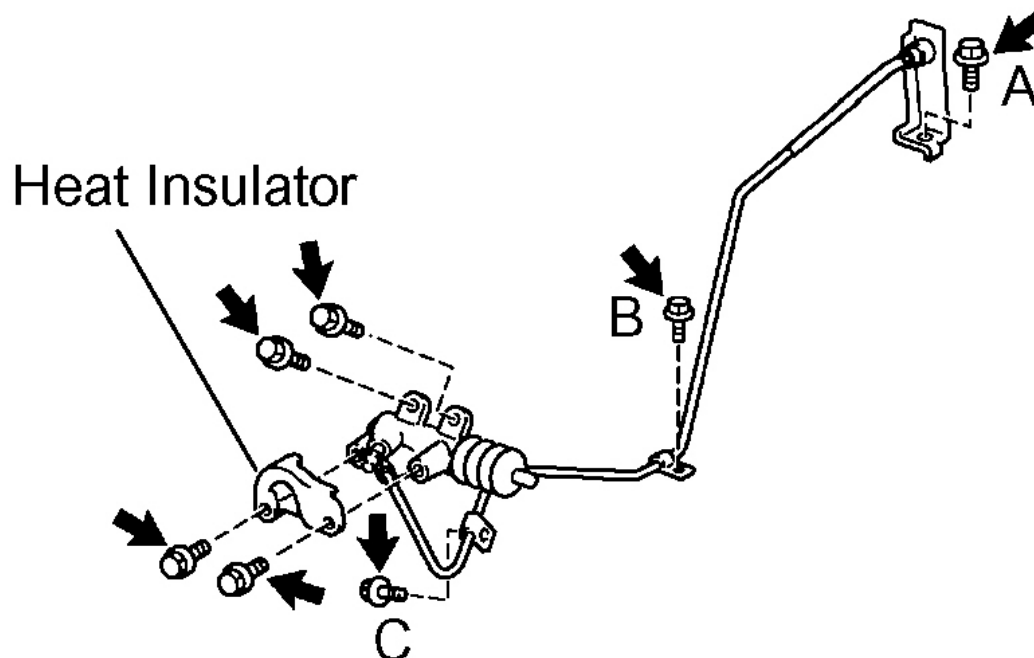


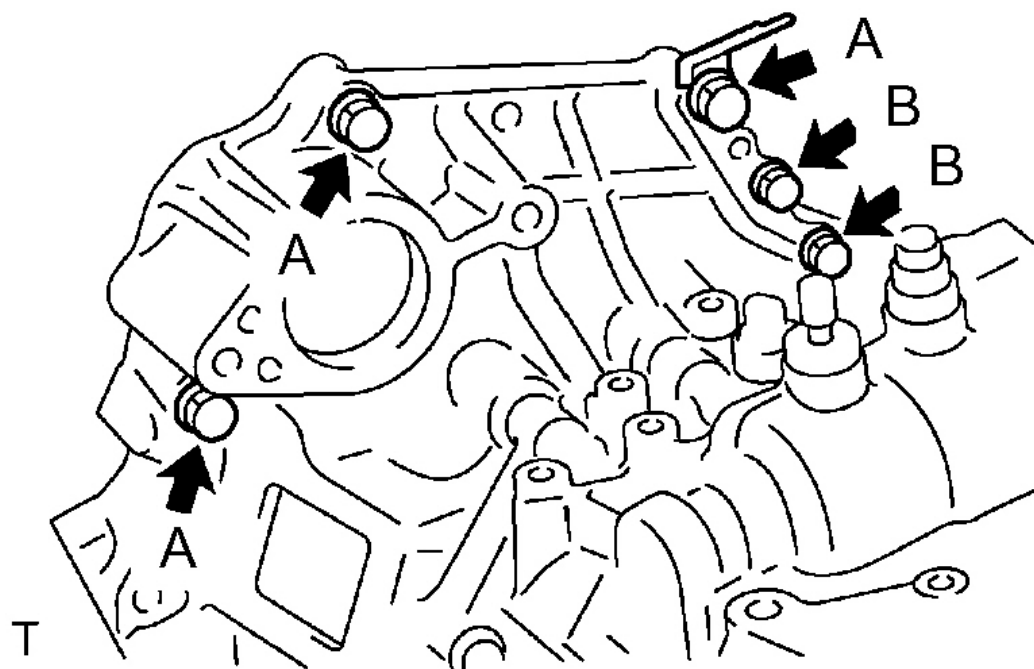
Fig. 7: Disconnecting Clutch Release Cylinder And Line
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

9. REMOVE 5 MOUNTING BOLTS OF TRANSAXLE UPPER SIDE

Torque:

64 N.m (650 kgf.cm, 47 ft.lbf) for bolt A

46 N.m (470 kgf.cm, 34 ft.lbf) for bolt B



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Fig. 8: Removing Mounting Bolts Of Transaxle Upper Side
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

10. **ATTACH ENGINE SUPPORT FIXTURE**

- a. Install the No. 2 engine hanger in the correct direction.

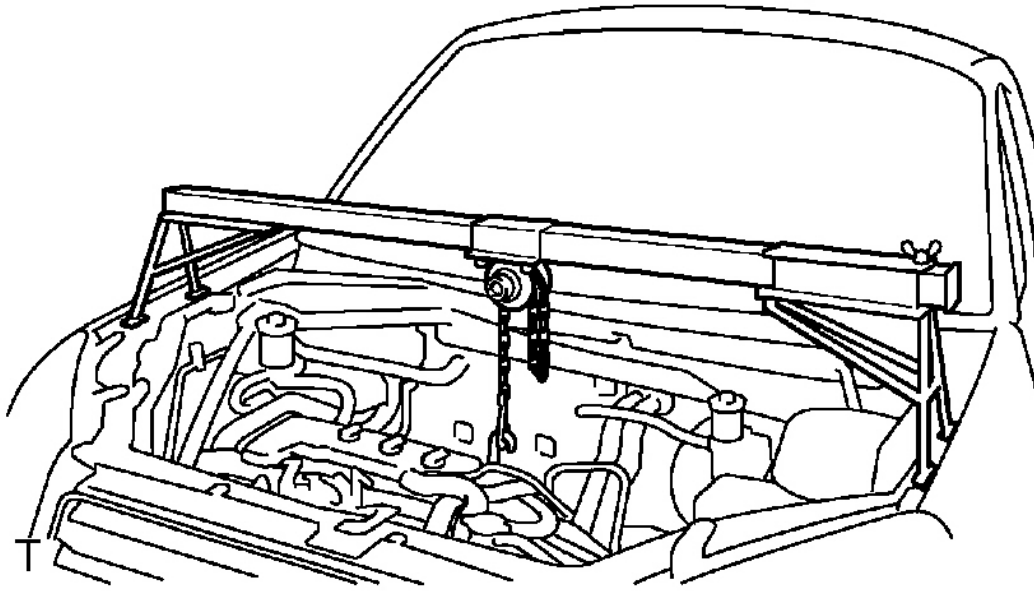
Parts No.:

No. 2 engine hanger: 12281-28010

Bolt: 91512-61020

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

- b. Using an engine sling device, attach the engine support fixture to the engine hangers.



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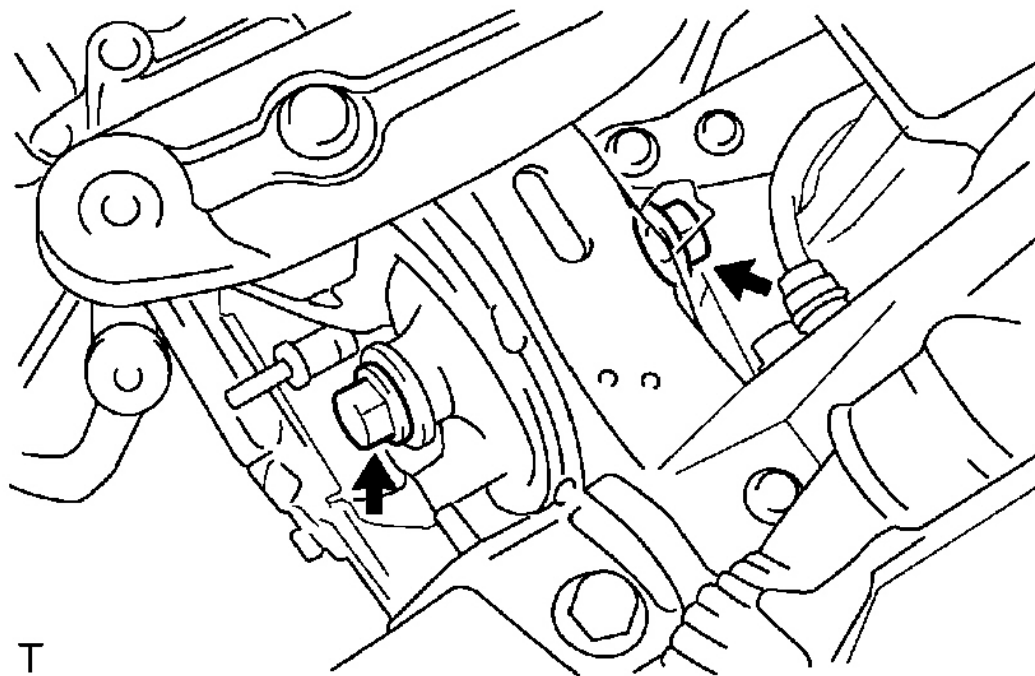
Fig. 9: Attaching Engine Support Fixture

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

11. DISCONNECT LEFT ENGINE MOUNTING INSULATOR FROM TRANSAXLE

Remove the through bolt and nut.

Torque: 56 N.m (571 kgf.cm, 41 ft.lbf)



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Fig. 10: Removing Through Bolt & Nut

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

12. **REMOVE LH AND RH ENGINE UNDER COVERS**
13. **DRAIN TRANSAXLE OIL (See ON-VEHICLE REPAIR)**
14. **REMOVE FRONT EXHAUST PIPE**
 - a. Remove the 2 bolts and springs from the exhaust manifold.

Torque: 43 N.m (439 kgf.cm, 32 ft.lbf)

- b. Remove the 2 bolts and 2 gaskets with pipe.

Torque: 19 N.m (194 kgf.cm, 14 ft.lbf)

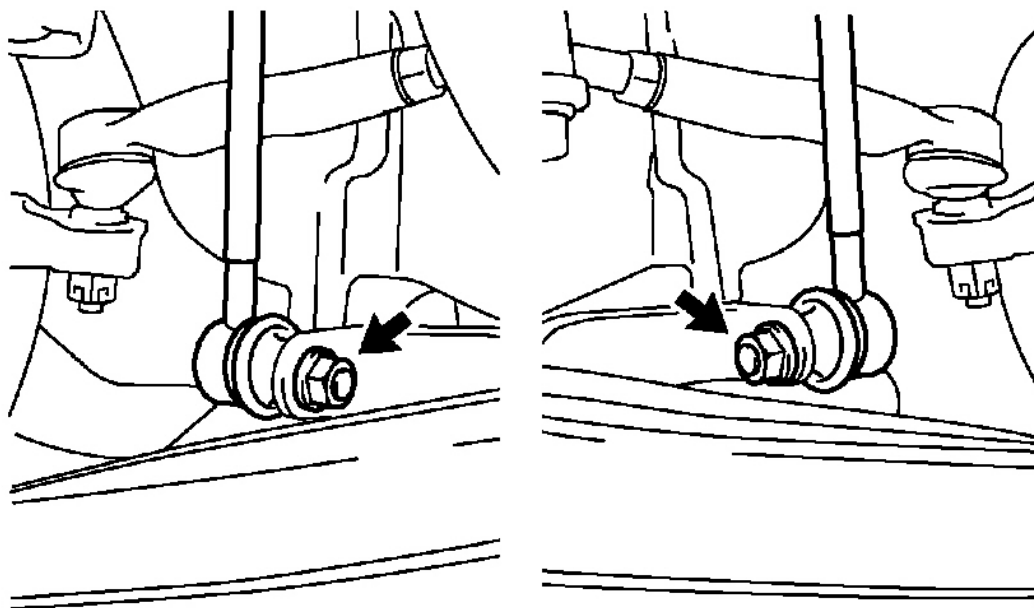
HINT:

At the time of installation, using the new gasket.

15. **REMOVE LH AND RH FRONT DRIVE SHAFTS (See REMOVAL)**
16. **DISCONNECT 2 STABILIZER BAR LINKS**

Remove the 2 nuts and disconnect the LH and RH stabilizer bar links.

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



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Fig. 11: Disconnecting Stabilizer Bar Links

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

17. **REMOVE FRONT SUSPENSION CROSSMEMBER ASSEMBLY WITH STABILIZER BAR**
 - a. Support the front suspension crossmember with a jack.
 - b. Remove the 2 set bolts of the PS gear assembly.

Torque: 137 N.m (1,397 kgf.cm, 101 ft.lbf)

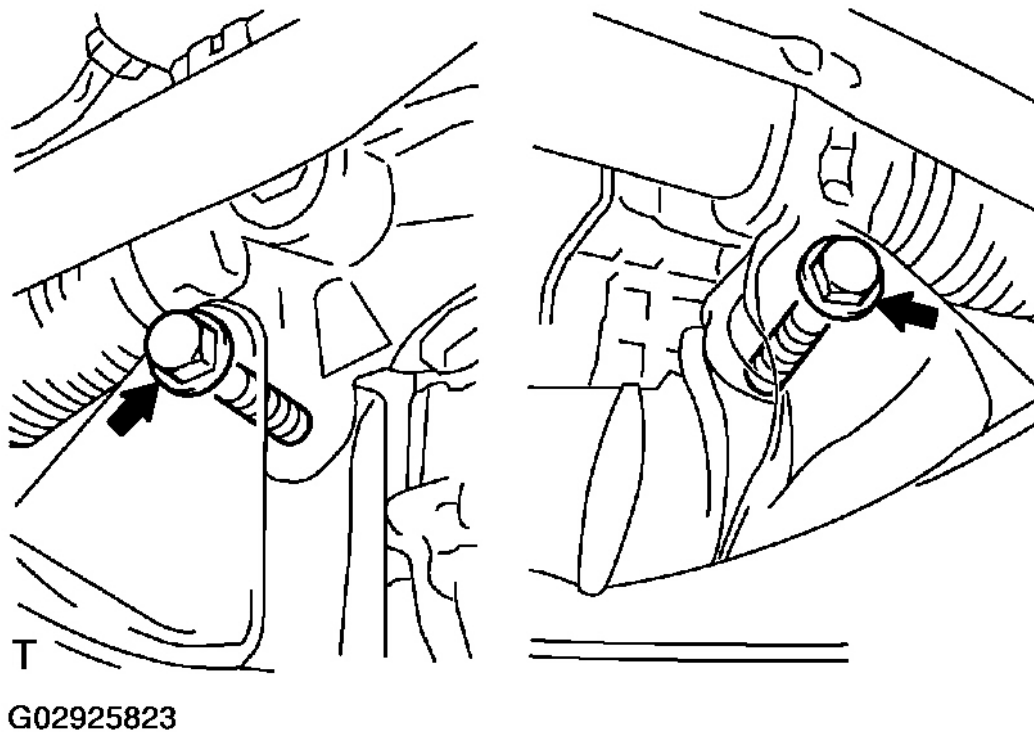


Fig. 12: Removing PS Gear Assembly Set Bolts

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

- c. Remove the 2 nuts, 5 bolts and front suspension crossmember assembly with the stabilizer bar.

Torque:

Bolt A: 113 N.m (1,150 kgf.cm, 82 ft.lbf)

Bolt B: 157 N.m (1,600 kgf.cm, 115 ft.lbf)

Bolt C: 72 N.m (734 kgf.cm, 53 ft.lbf)

Nut D: 72 N.m (734 kgf.cm, 53 ft.lbf)

18. REMOVE ENGINE MOUNTING CENTER MEMBER

Remove the 4 bolts and center member.

Torque:

Bolt E: 80 N.m (820 kgf.cm, 59 ft.lbf)

Bolt F: 39 N.m (400 kgf.cm, 28 ft.lbf)

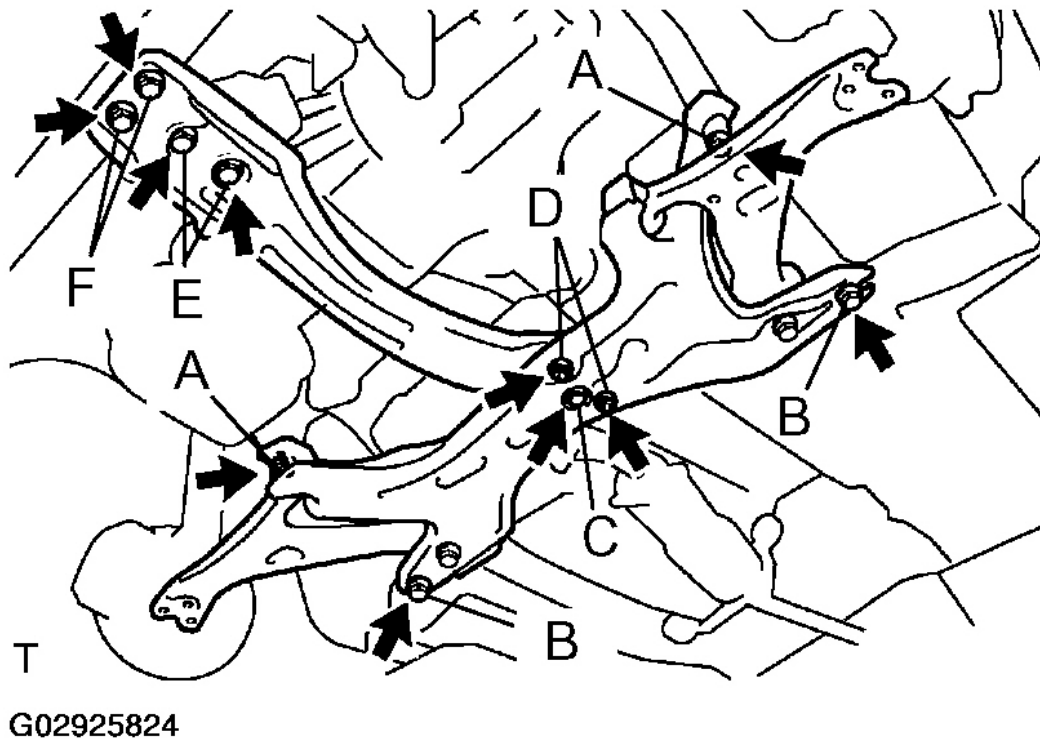


Fig. 13: Removing Nut, Bolts & Front Suspension Crossmember Assembly
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

19. JACK UP TRANSAXLE SLIGHTLY

Using a transmission jack, support the transaxle.

20. REMOVE 4 MOUNTING BOLTS OF TRANSAXLE LOWER SIDE

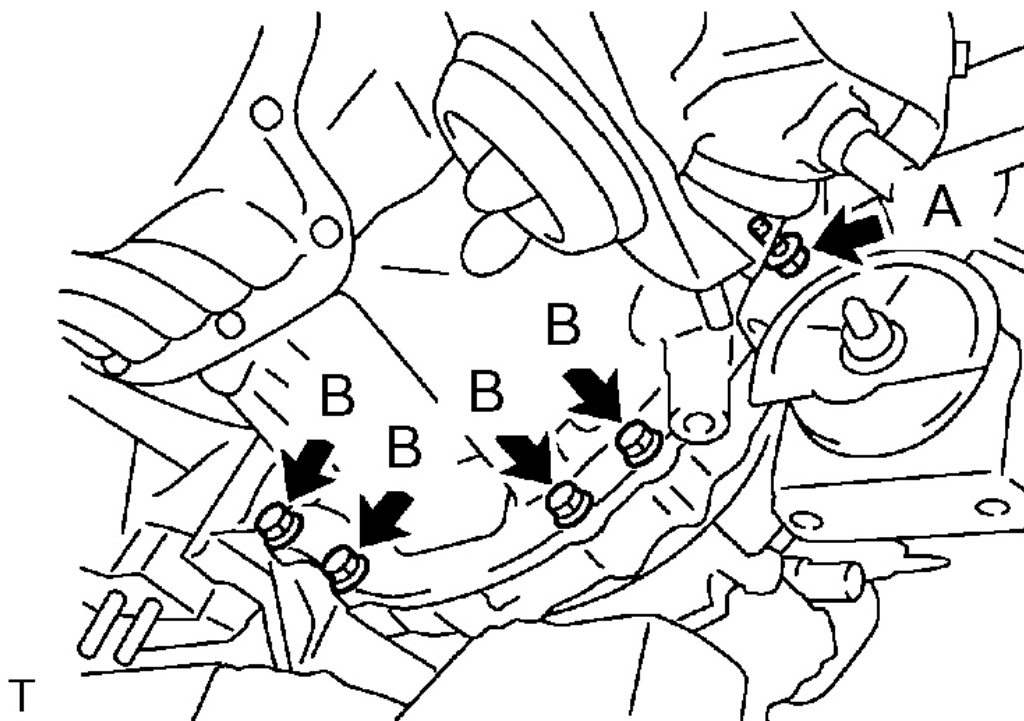
Torque:

46 N.m (470 kgf.cm, 34 ft.lbf) for bolt A

44 N.m (440 kgf.cm, 32 ft.lbf) for bolt B

21. REMOVE TRANSAXLE

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



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Fig. 14: Removing Bolts & Transaxle From Engine
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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 REMOVAL).

HINT:

After installation, check and inspect items as follows.

- Check the front wheel alignment (See **INSPECTION**).
- Do the road test.

MANUAL TRANSAXLE UNIT (4WD)

ON-VEHICLE REPAIR

REPLACE TRANSAXLE OIL

- a. Loosen the filler plug.
- b. Remove the drain plug.

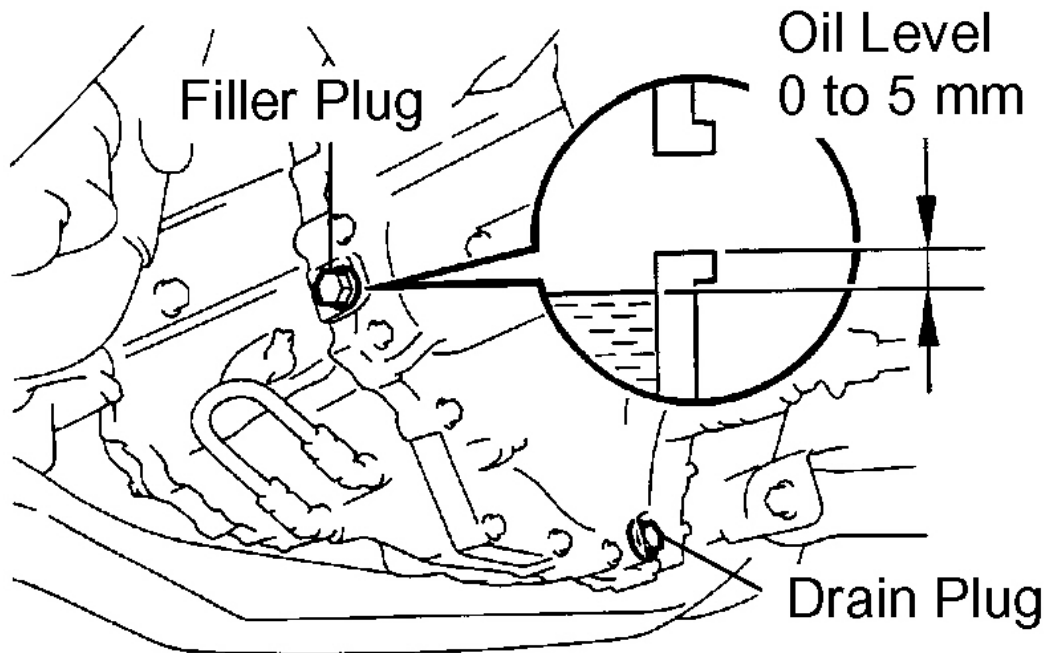
HINT:

Use a container to catch the transaxle oil.

- c. Remove the filler plug.
- d. Reinstall the drain plug.

Torque: 49 N.m (500 kgf.cm, 36 ft.lbf)

- e. Refill new transaxle oil as shown in **Fig. 15** .



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Fig. 15: Replacing Transaxle Oil

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

Oil grade: API GL-4 or GL-5

Viscosity: SAE 75W-90

Capacity: 3.4 liters (3.6 US qts, 3.0 Imp.qts)

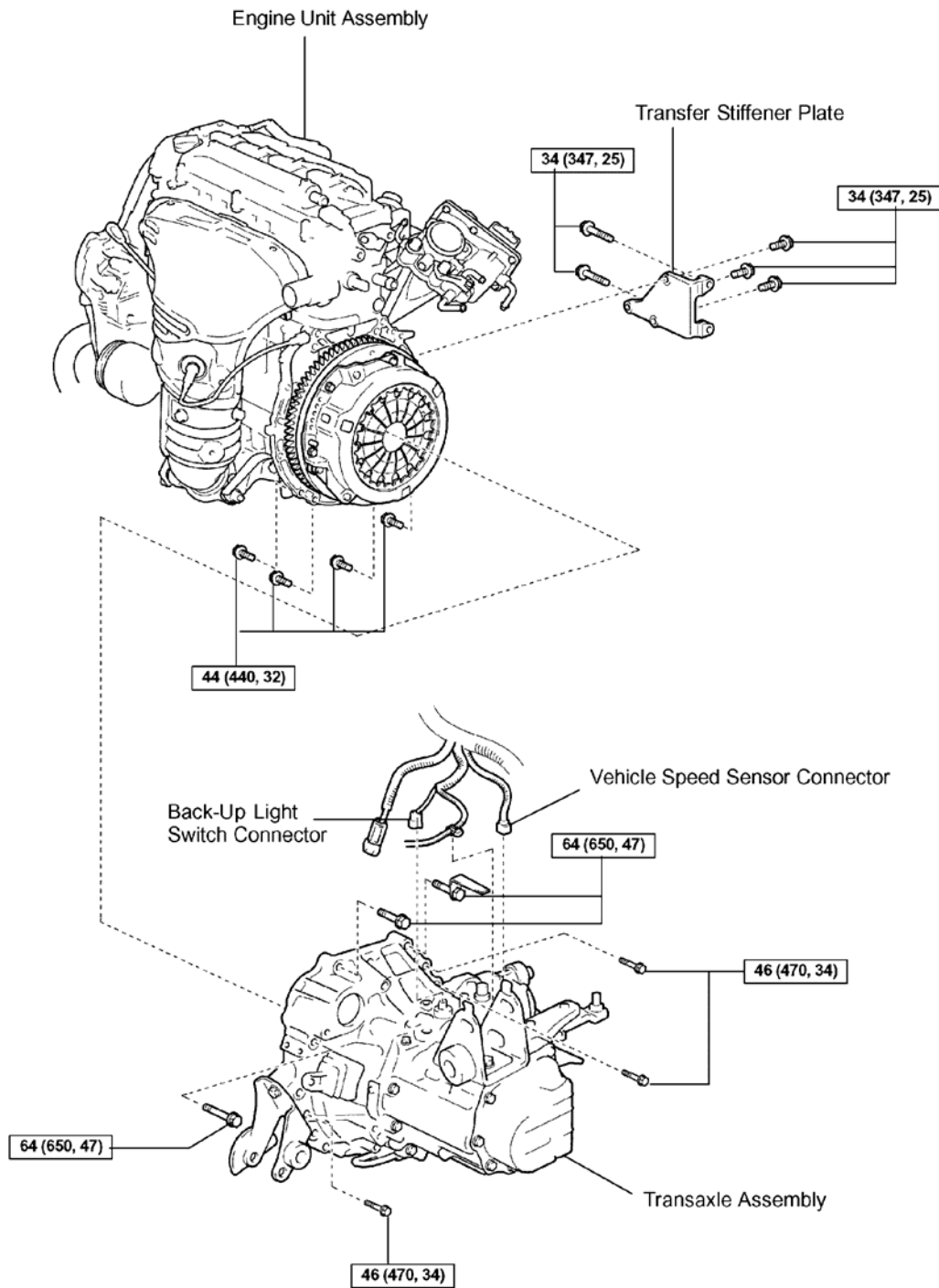
f. Reinstall the filler plug.

Torque: 49 N.m (500 kgf.cm, 36 ft.lbf)

COMPONENTS

2004 Toyota RAV4

2004 TRANSMISSION Manual Transaxle - RAV4



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

P ♦ Non-reusable part

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Fig. 16: Locating Manual Transaxle Unit (4WD) Components
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

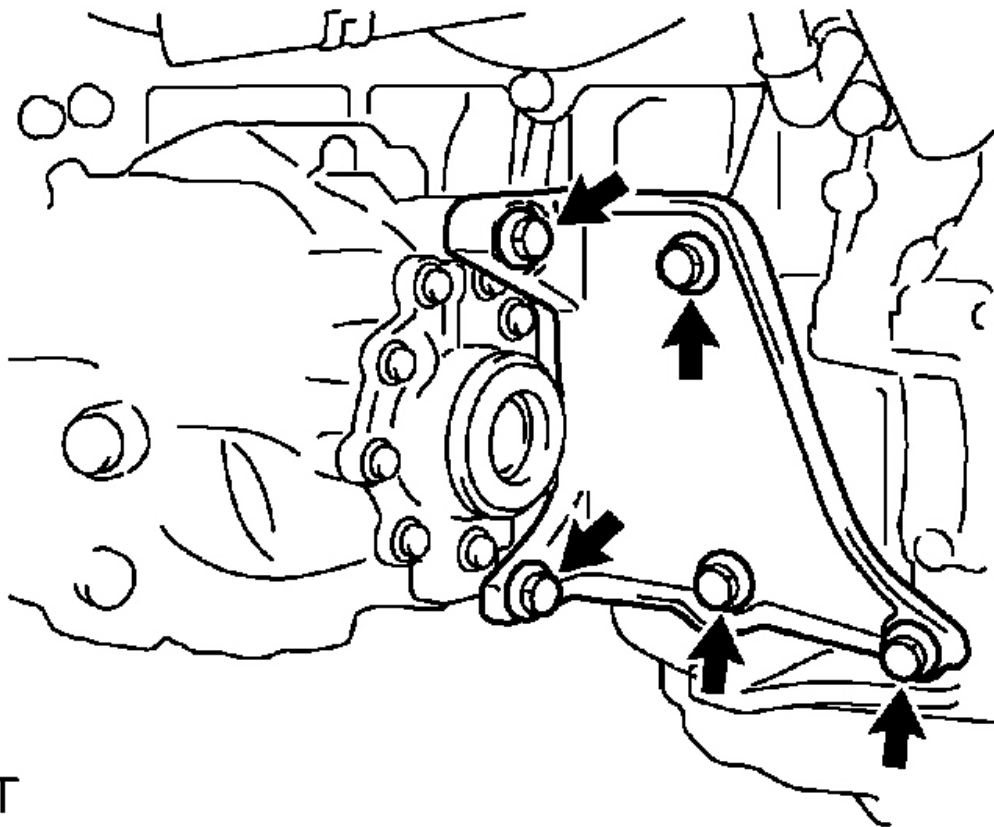
1. **REMOVE TRANSAXLE WITH ENGINE (See REMOVAL)**
2. **REMOVE TRANSAXLE CASE PROTECTOR**

Remove the 2 bolts and transaxle case protector.

Torque: 18 N.m (180 kgf.cm, 13 ft.lbf)

3. **DISCONNECT BACK-UP LIGHT SWITCH AND VEHICLE SPEED SENSOR CONNECTORS**
4. **REMOVE TRANSFER STIFFENER PLATE**

Remove the 5 bolts and stiffener plate.



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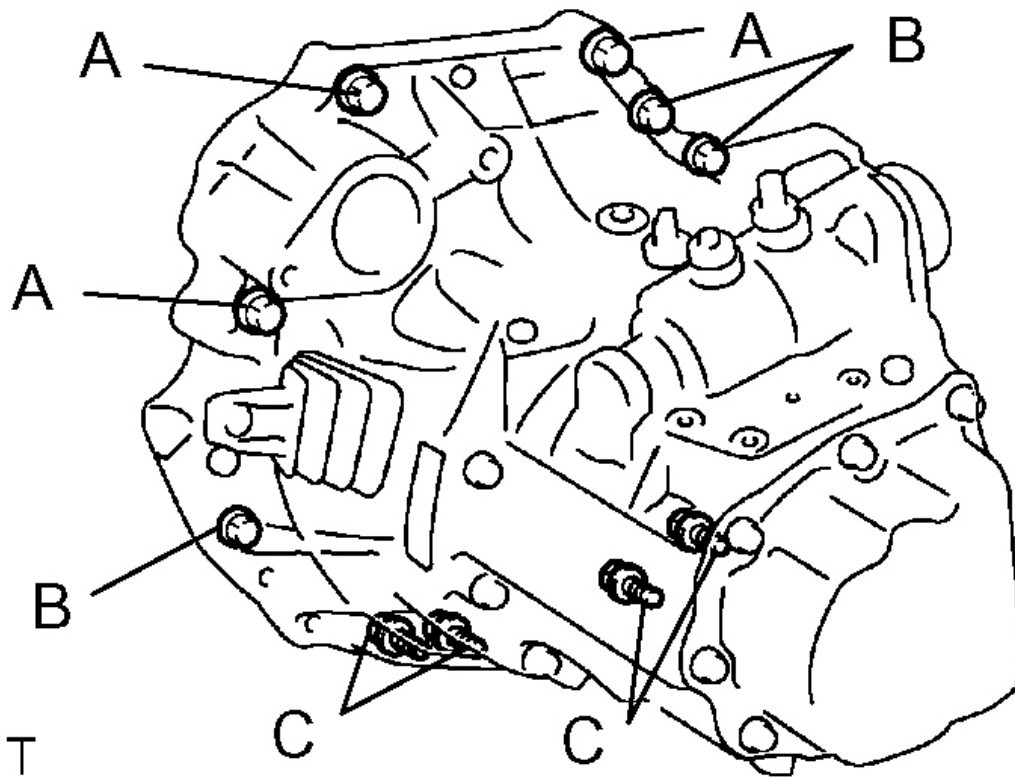
Fig. 17: Removing Stiffener Plate & Bolts

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

Torque: 34 N.m (347 kgf.cm, 25 ft.lbf)

5. REMOVE TRANSAXLE FROM ENGINE

Remove the 10 bolts, separate the engine and transaxle.



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Fig. 18: Separating Transaxle From Engine & Removing Bolts

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

Torque:

64 N.m (650 kgf.cm, 47 ft.lbf) for bolt A

46 N.m (470 kgf.cm, 34 ft.lbf) for bolt B

44 N.m (440 kgf.cm, 32 ft.lbf) for bolt C

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 REMOVAL).

HINT:

After installation, check and inspect items as follows.

- Check the front wheel alignment (See INSPECTION).
- Do the road test.

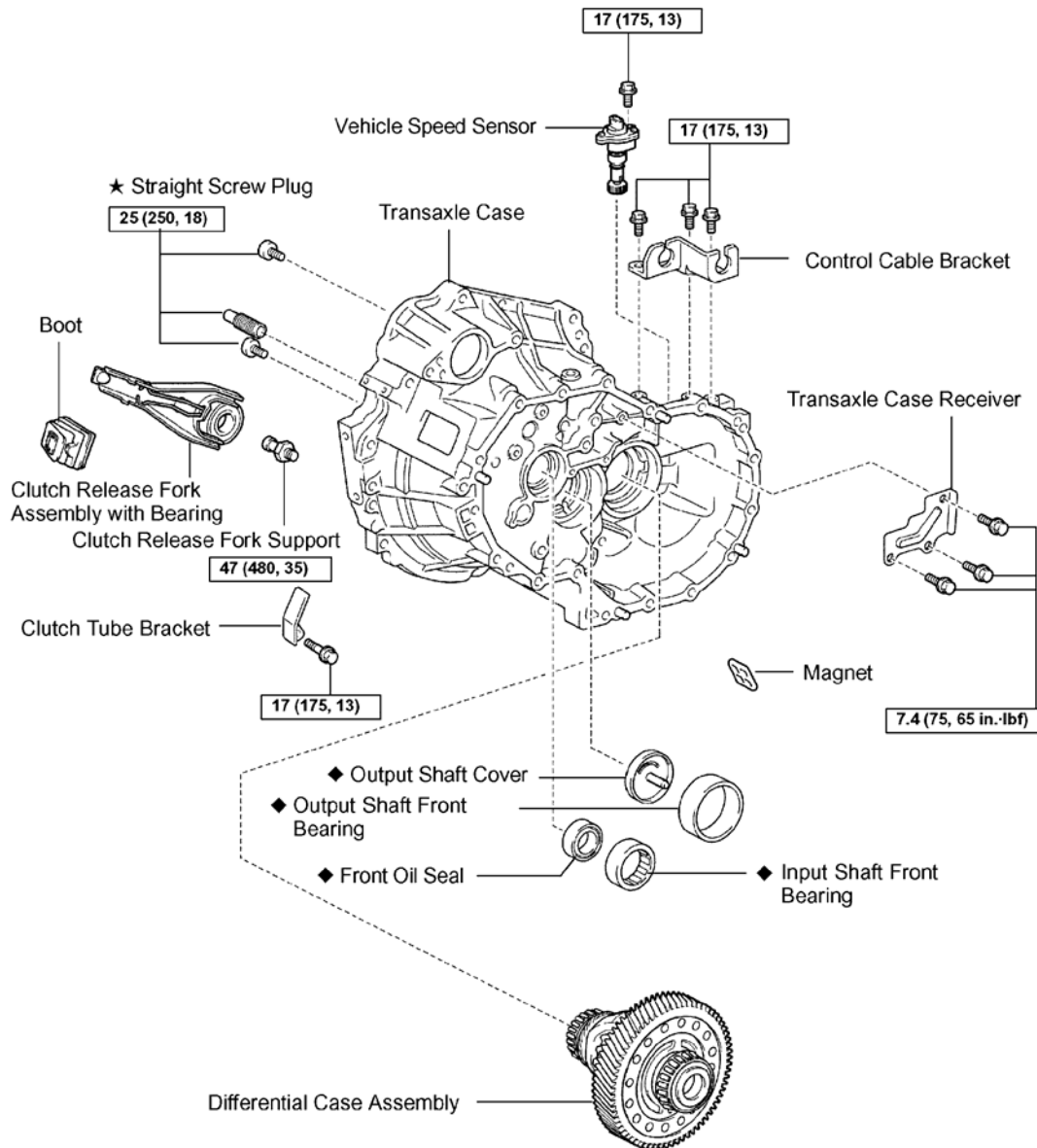
MANUAL TRANSAXLE ASSEMBLY

COMPONENTS

2004 Toyota RAV4

2004 TRANSMISSION Manual Transaxle - RAV4

2WD



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

◆ Non-reusable part

★ Precoated part

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Fig. 19: Identifying Manual Transaxle Assembly Components (1 Of 5)

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

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2004 TRANSMISSION Manual Transaxle - RAV4

4WD

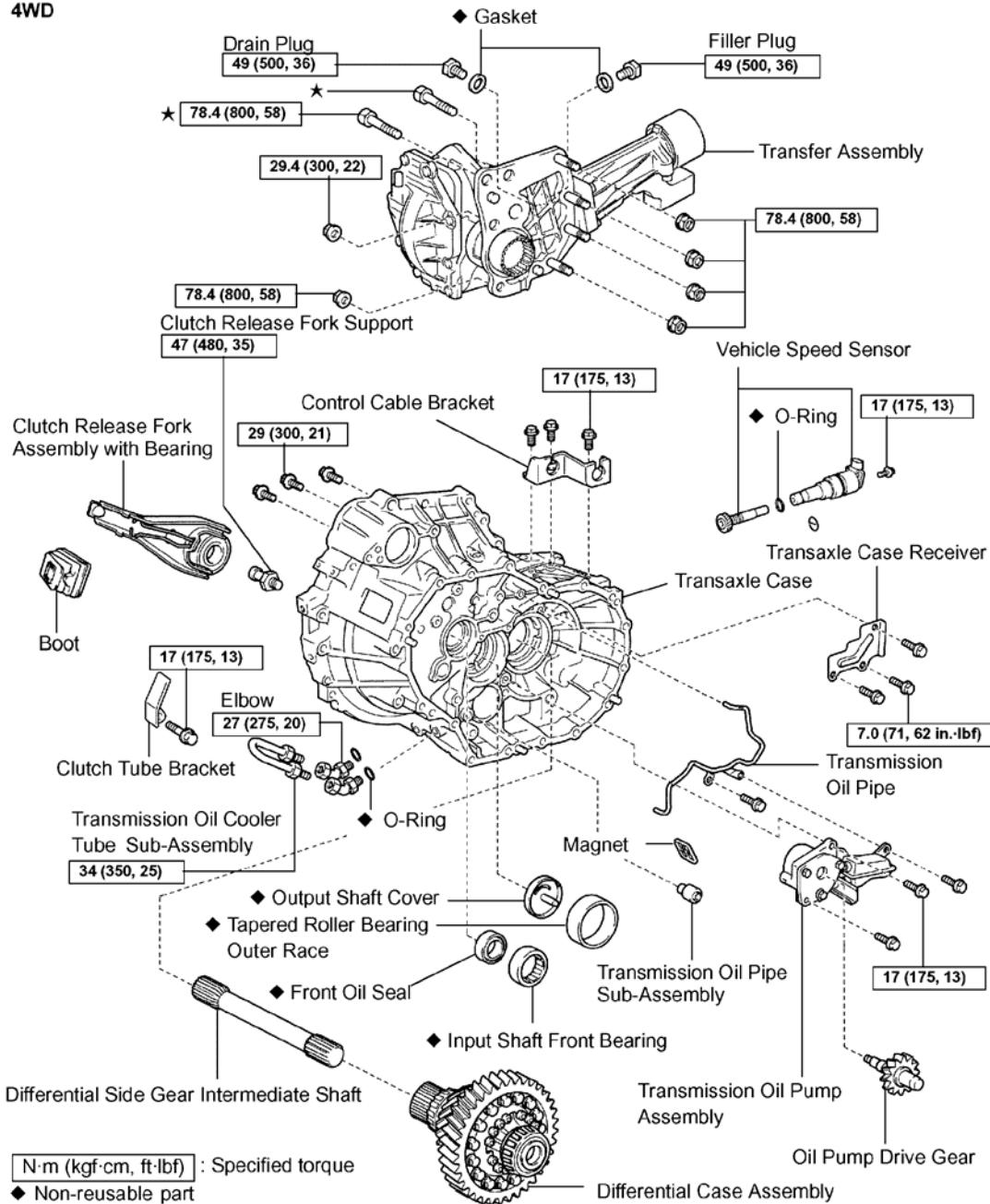


Fig. 20: Identifying Manual Transaxle Assembly Components (2 Of 5)

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

2004 Toyota RAV4

2004 TRANSMISSION Manual Transaxle - RAV4

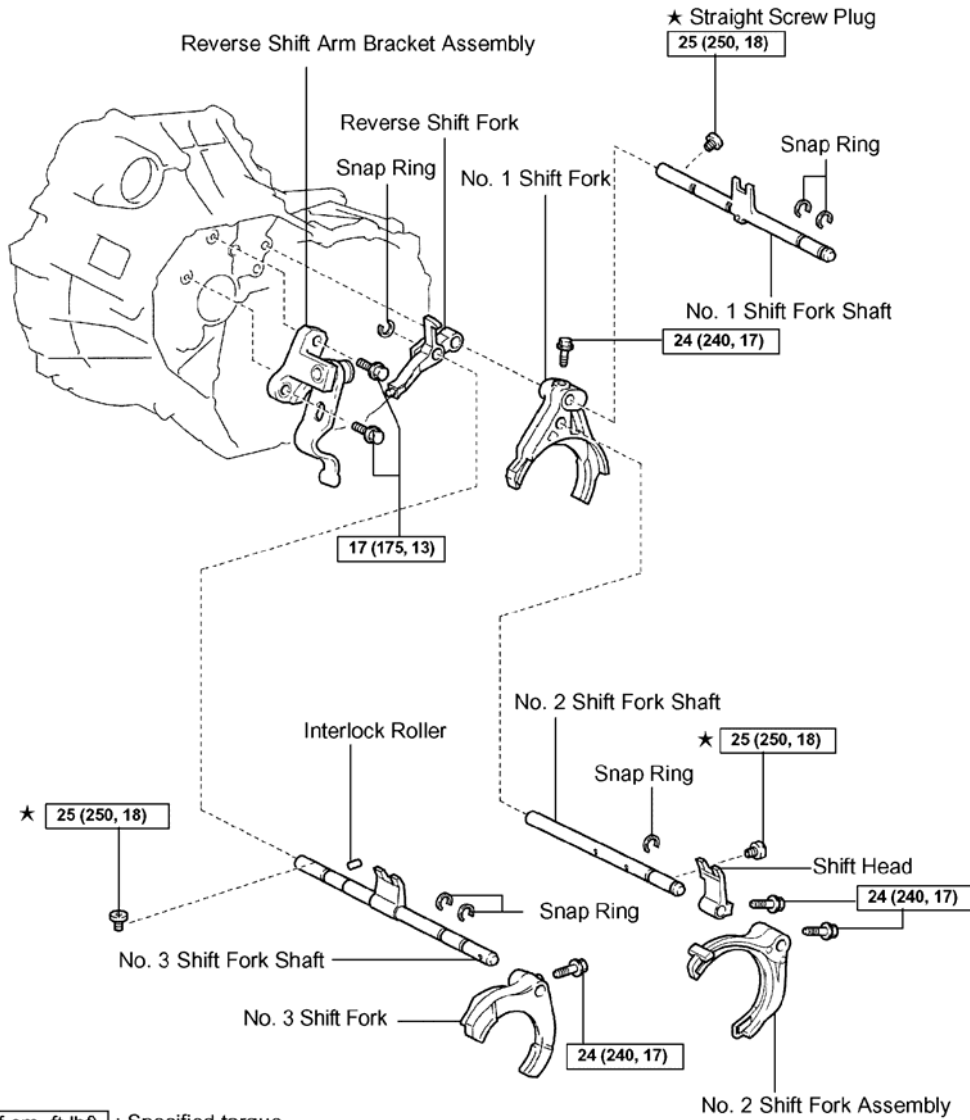
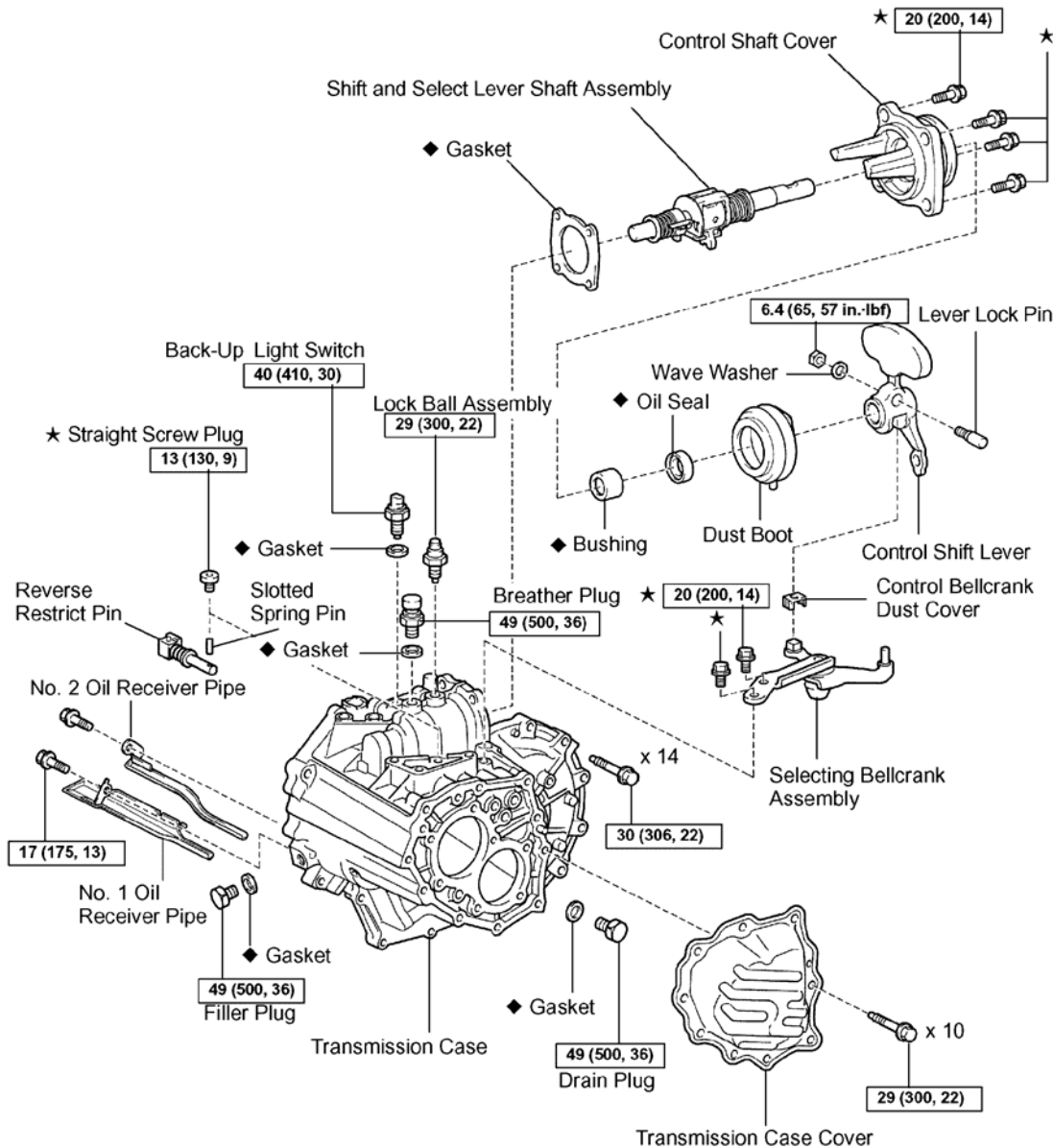


Fig. 21: Identifying Manual Transaxle Assembly Components (3 Of 5)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

◆ Non-reusable part

★ Precoated part

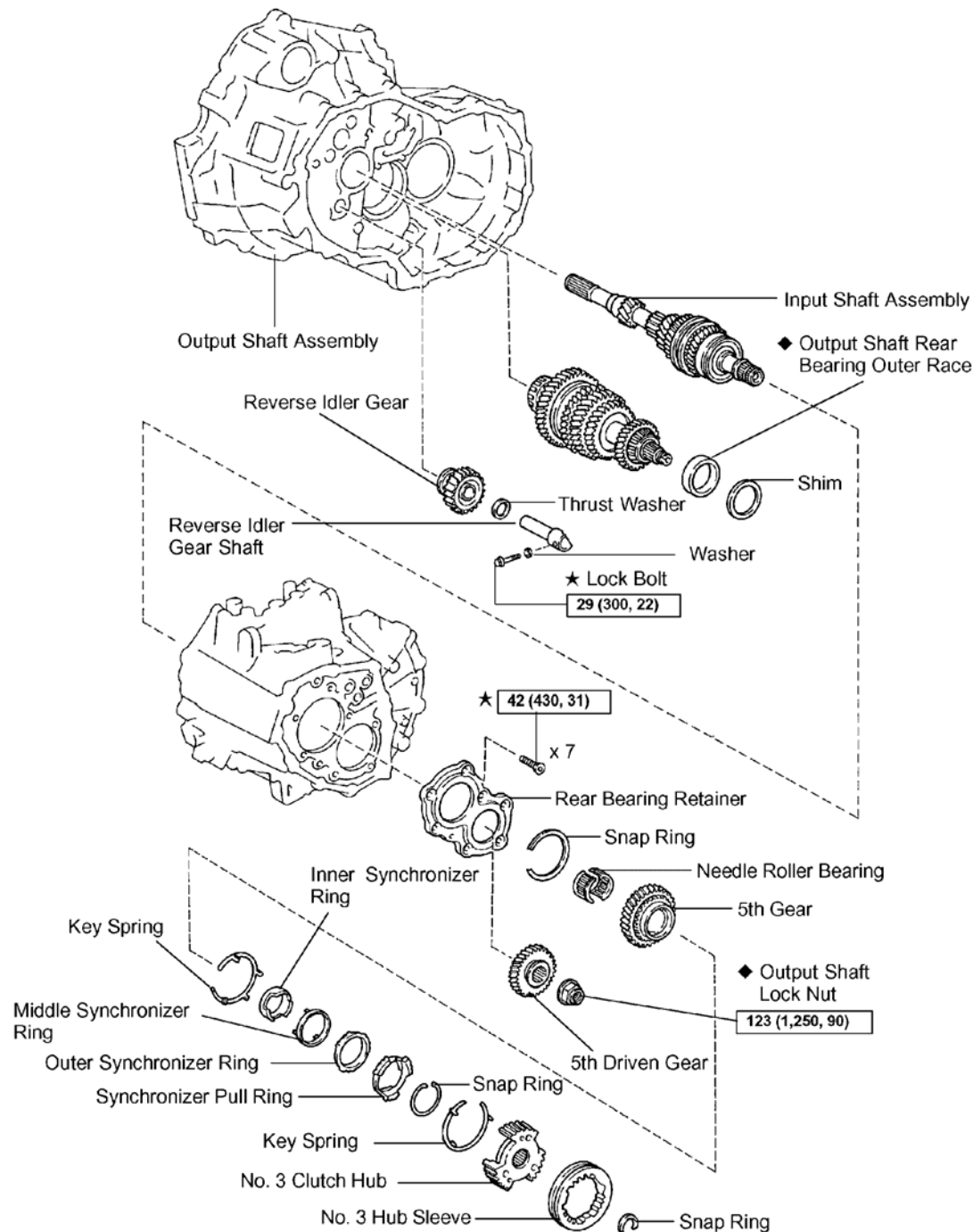
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Fig. 22: Identifying Manual Transaxle Assembly Components (4 Of 5)

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

2004 Toyota RAV4

2004 TRANSMISSION Manual Transaxle - RAV4



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

◆ Non-reusable part

★ Precoated part

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Fig. 23: Identifying Manual Transaxle Assembly Components (5 Of 5)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

DISASSEMBLY**1. REMOVE CLUTCH RELEASE FORK AND BEARING**

HINT:

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

Apply molybdenum disulphide lithium base grease (See **INSTALLATION**).

2. 4WD: REMOVE TRANSFER ASSEMBLY

- a. Remove the 2 bolts.

Sealant:

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

Torque: 78.4 N.m (800 kgf.cm, 58 ft.lbf)

- b. Remove the 6 nuts.

Torque:

78.4 N.m (800 kgf.cm, 58 ft.lbf) for 17 mm nut

29.4 N.m (300 kgf.cm, 22 ft.lbf) for 14 mm nut

- c. Using a plastic hammer, remove the transfer assembly from the transaxle.

HINT:

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

- Shift into the 4th gear, and install the transfer assembly while turning the input shaft of the transaxle.
- It is possible to apply FIPG either transaxle side or transfer side. In addition, be sure to apply it on the center of the seal.

FIPG:

Part No. 08826-00100, THREE BOND 1281 or equivalent

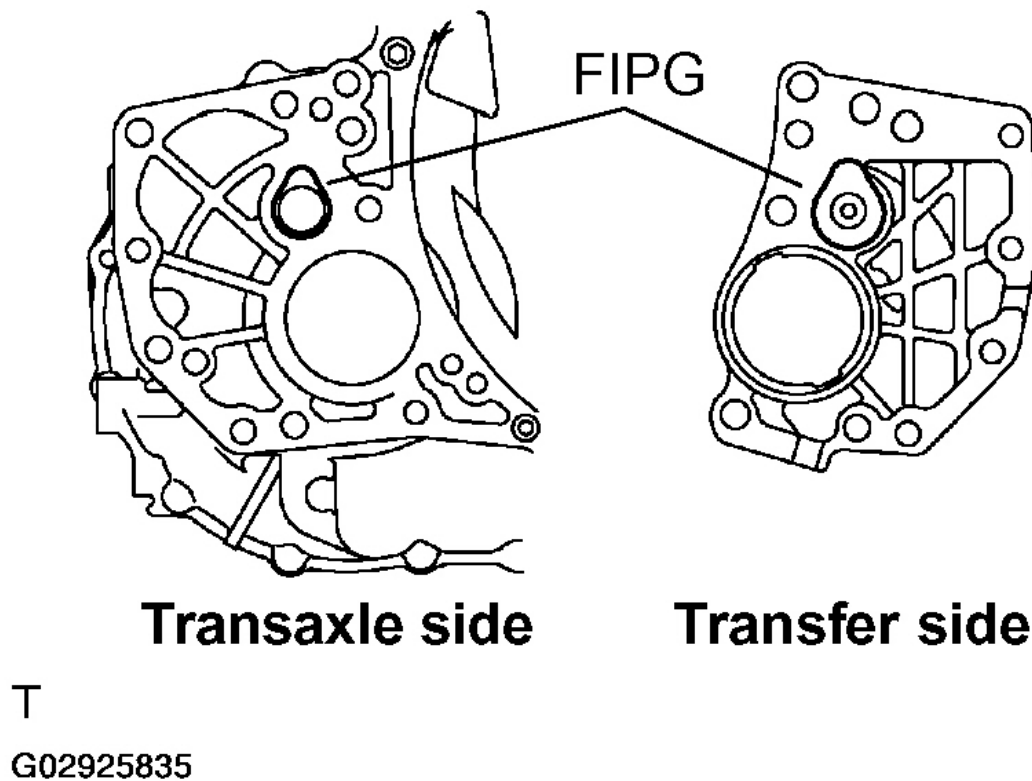


Fig. 24: Applying FIPG To Transaxle Side Or Transfer Side
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. **4WD: REMOVE DIFFERENTIAL SIDE GEAR INTERMEDIATE SHAFT**
4. **REMOVE FILLER PLUG AND DRAIN PLUG WITH 2 GASKETS**

Torque: 49 N.m (500 kgf.cm, 36 ft.lbf)

5. **REMOVE BACK-UP LIGHT SWITCH WITH GASKET**

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

6. **REMOVE BOLT AND VEHICLE SPEED SENSOR**

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

7. **REMOVE CONTROL CABLE BRACKET**

Remove the 3 bolts and control cable bracket.

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

8. REMOVE CLUTCH TUBE BRACKET

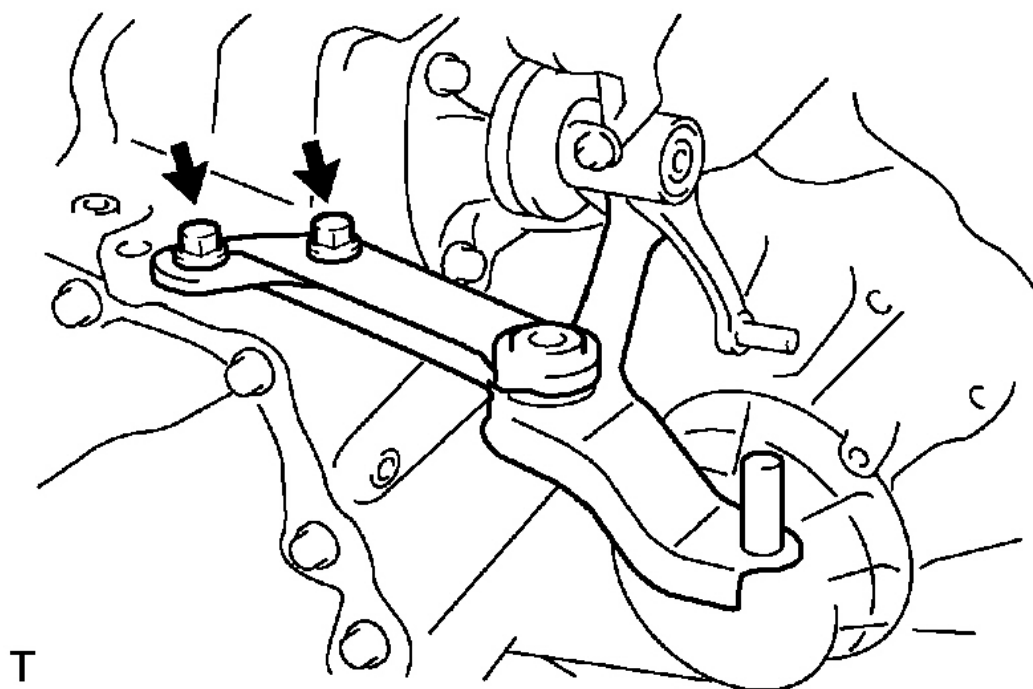
Remove the bolt and tube bracket.

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

9. REMOVE SELECTING BELLCRANK ASSEMBLY

Remove the 2 bolts and the selecting bellcrank assembly.

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



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Fig. 25: Removing Selecting Bellcrank Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

10. REMOVE CONTROL SHIFT LEVER AND DUST BOOT

- a. Remove the nut and wave washer.

Torque: 6.4 N.m (65 kgf.cm, 57 in.lbf)

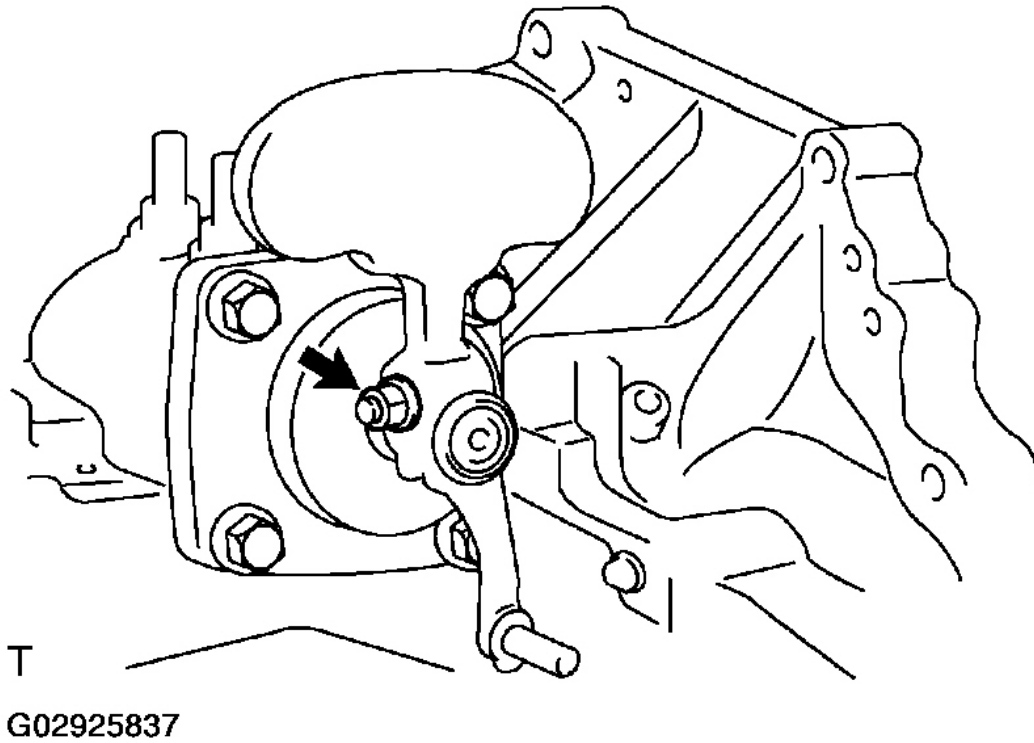


Fig. 26: Removing Nut & Wave Washer
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

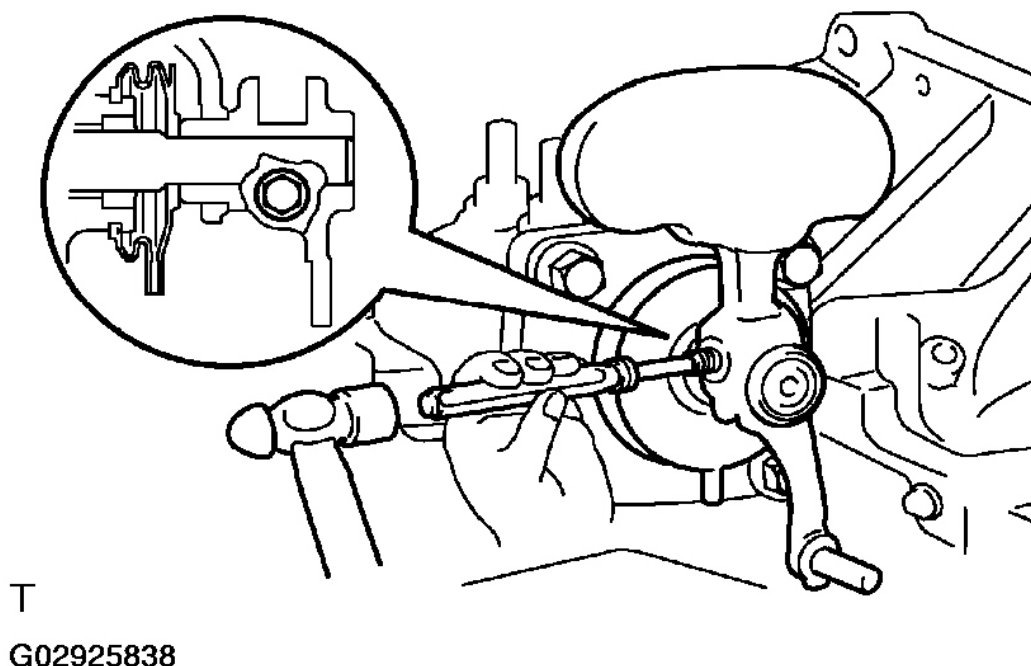


Fig. 27: Tapping Out Lever Lock Pin

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

NOTE: 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.

NOTE: 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 Fig. 27 .

11. REMOVE LOCK BALL ASSEMBLY AND SHIFT AND SELECT LEVER SHAFT ASSEMBLY

- 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, shift and select lever shaft assembly and gasket.

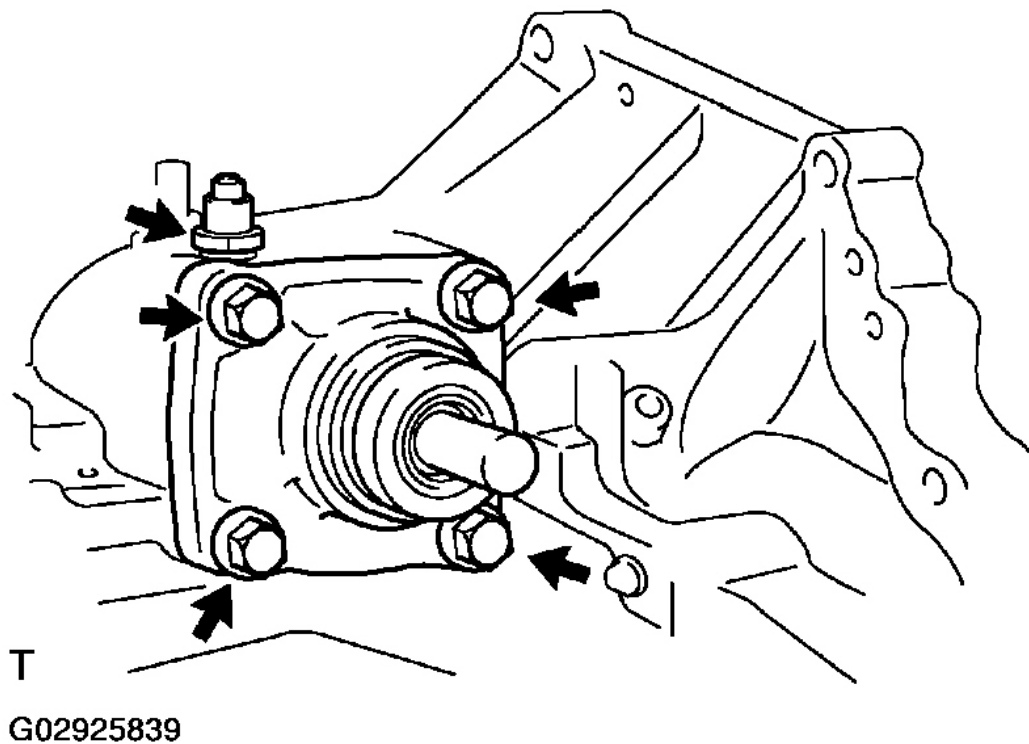


Fig. 28: Removing Lock Ball Assembly & Shift And Select Lever Shaft Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Sealant:

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

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

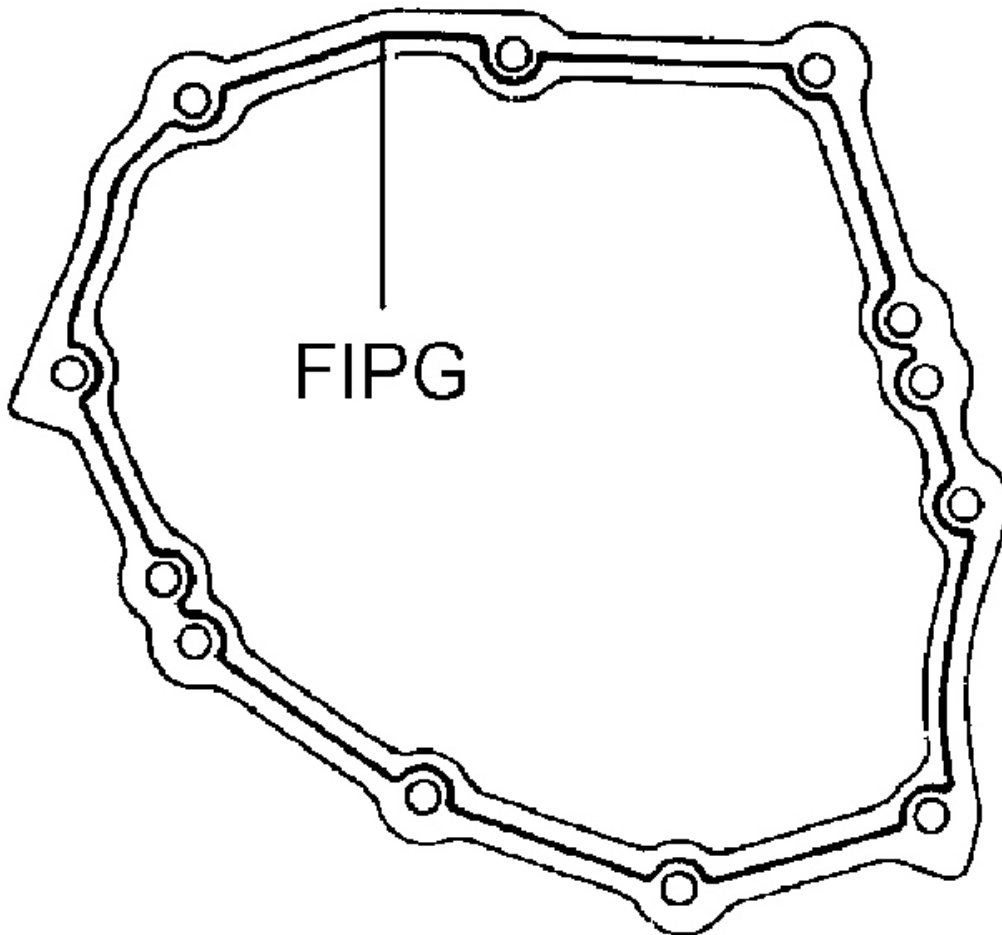
12. REMOVE CONTROL SHAFT COVER

Remove the control shaft cover from the shift and select lever shaft assembly.

NOTE: 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.

13. REMOVE TRANSMISSION CASE COVER

Remove the 10 bolts and transmission case cover.



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Fig. 29: Removing Transmission Case Cover & Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

FIPG:

Part No. 08826-00100, THREE BOND 1282B or equivalent

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

14. REMOVE BREATHER PLUG WITH GASKET

Torque: 49 N.m (500 kgf.cm, 36 ft.lbf)

15. REMOVE OUTPUT SHAFT LOCK NUT

- a. Unstake the lock nut.
- b. Engage the gear double meshing.
- c. Remove the lock nut.

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

- d. Disengage the gear double meshing.

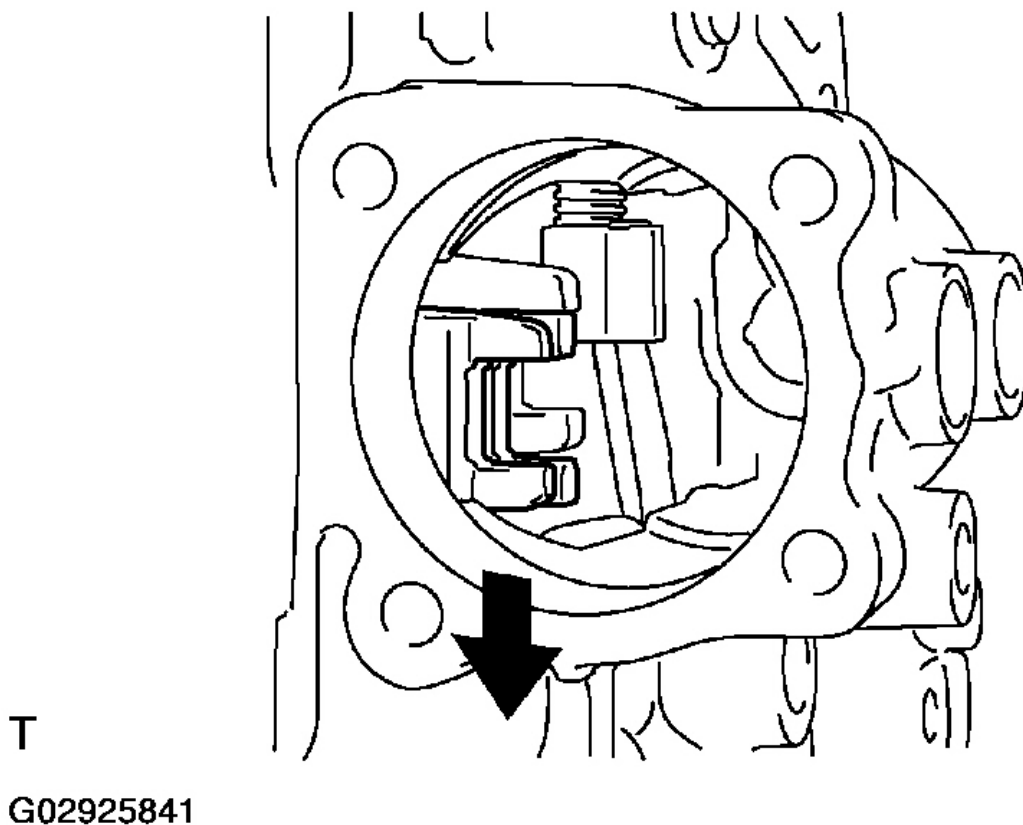


Fig. 30: Removing Output Shaft Lock Nut
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

- a. Remove the No. 3 shift fork set bolt.

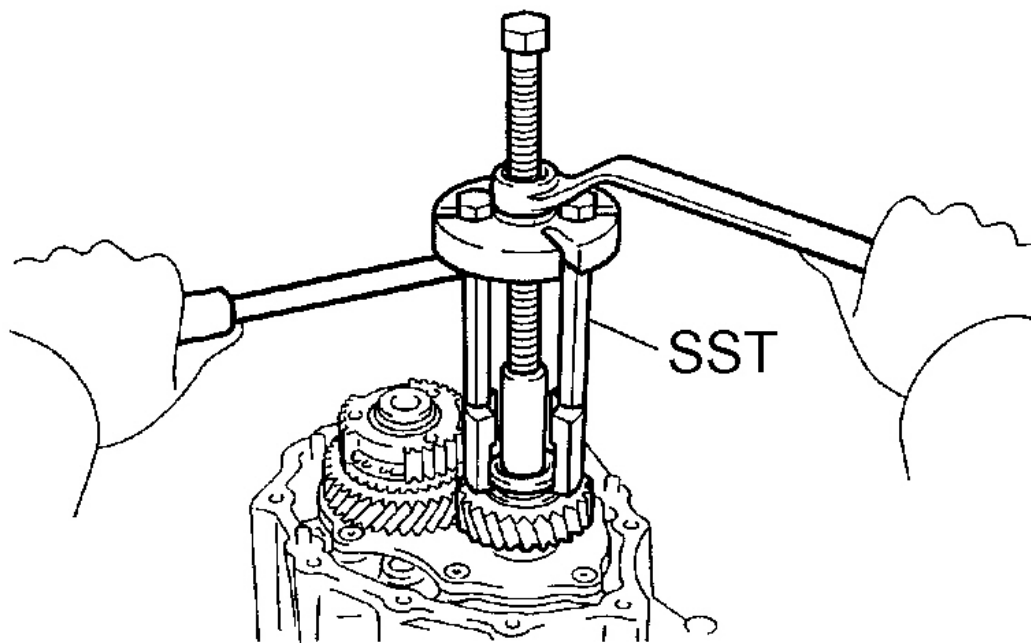
Torque: 24 N.m (240 kgf.cm, 17 ft.lbf)

- b. Remove the No. 3 hub sleeve and No. 3 shift fork.

17. REMOVE 5TH DRIVEN GEAR

Using SST, remove the 5th driven gear.

SST 09950-30012 (09951-03010, 09953-03010, 09954-03010, 09955-03011, 09956-03030)



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Fig. 31: Removing 5th Driven Gear

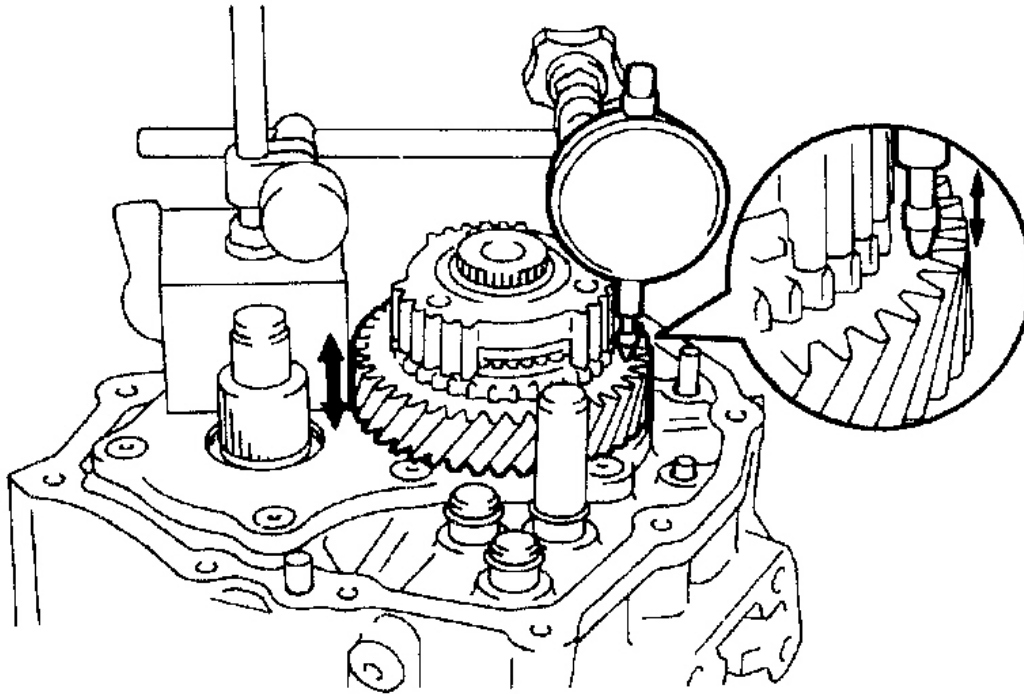
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

18. MEASURE 5TH GEAR THRUST CLEARANCE AND RADIAL CLEARANCE

- a. Using a dial indicator, measure the thrust clearance.

Maximum clearance:

0.65 mm (0.0256 in.)



G02925843

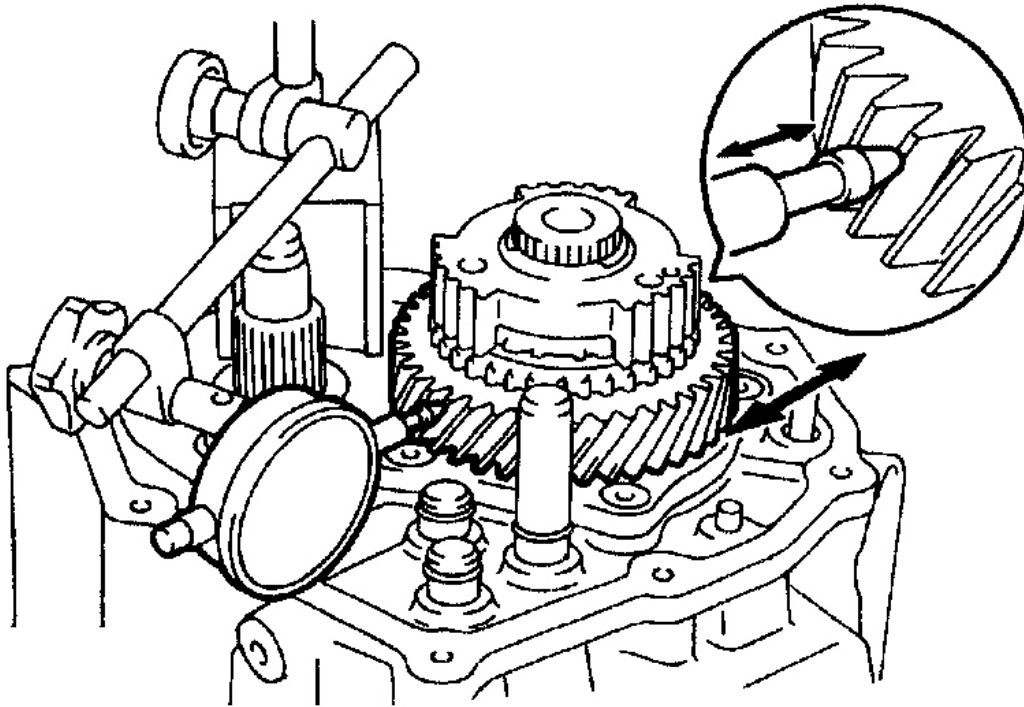
Fig. 32: Measuring Thrust Clearance

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

- b. Using a dial indicator, measure the radial clearance.

Maximum clearance:

0.050 mm (0.0020 in.)



G02925844

Fig. 33: Measuring Radial Clearance

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

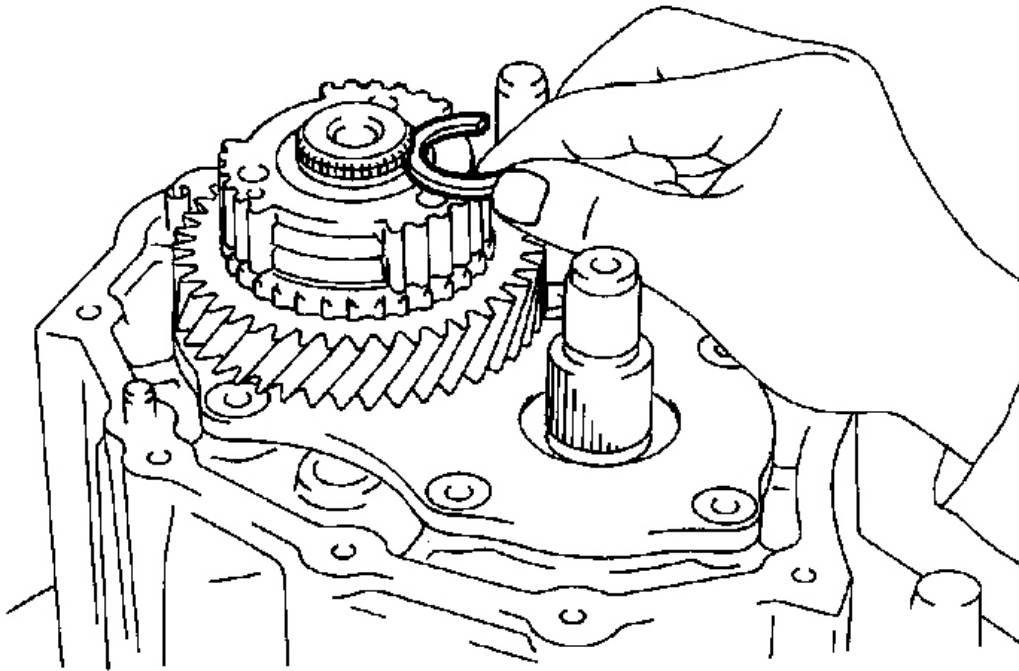
19. REMOVE NO. 3 CLUTCH HUB AND 5TH GEAR

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

HINT:

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

Select a snap ring that allows the minimum axial play.



G02925845

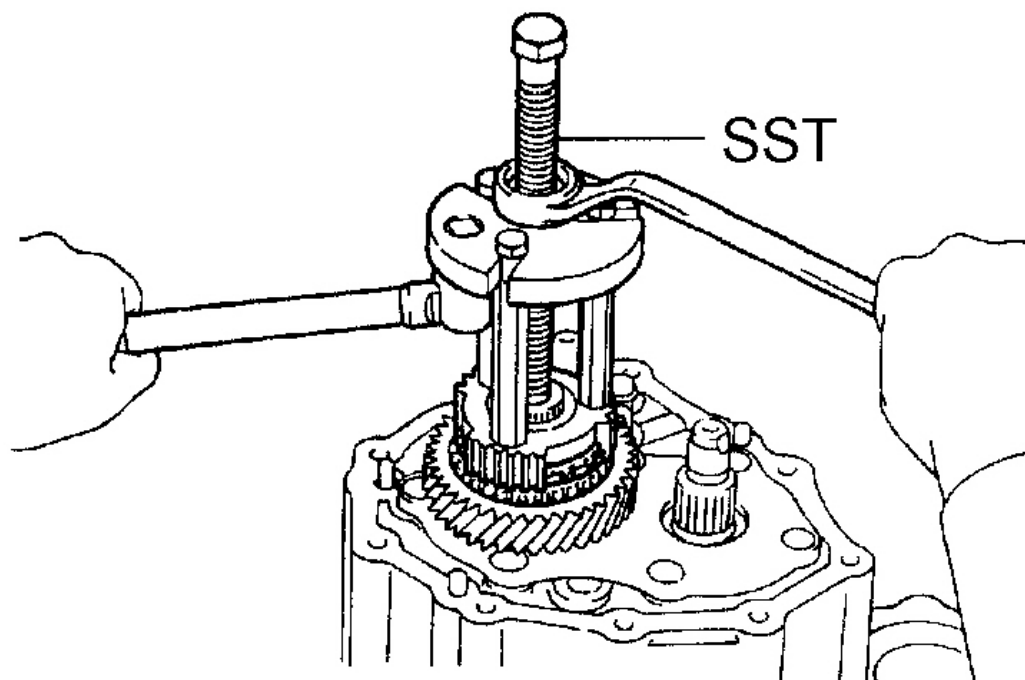
Fig. 34: Selecting Snap Ring Allowing Minimum Axial Play
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

SNAP RING THICKNESS

Mark	Thickness mm (in.)
a	1.75 (0.0689)
b	1.80 (0.0709)
c	1.85 (0.0729)
d	1.90 (0.0748)
e	1.95 (0.0768)
f	2.00 (0.0787)
g	2.05 (0.0807)
h	2.10 (0.0827)
j	2.15 (0.0847)

- b. Using SST, remove the No. 3 clutch hub with the synchronizer ring and 5th gear.

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



G02925846

Fig. 35: Removing No. 3 Clutch Hub With Synchronizer Ring & 5th Gear
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

20. REMOVE NEEDLE ROLLER BEARINGS

21. REMOVE REAR BEARING RETAINER

Using a torx socket wrench (T45), remove the 7 torx screws and rear bearing retainer.

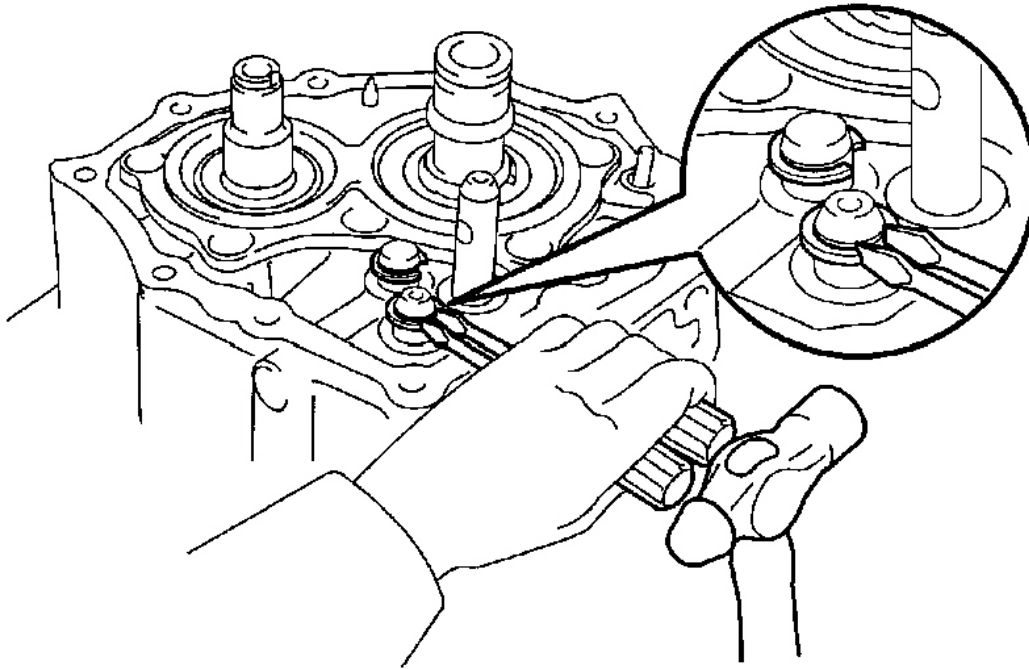
Sealant:

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

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

22. REMOVE SNAP RING

- a. Using a snap ring expander, remove the input shaft rear bearing snap ring.
- b. Using 2 screwdrivers and a hammer, remove the 2 snap rings.



G02925847

Fig. 36: Removing Snap Ring

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

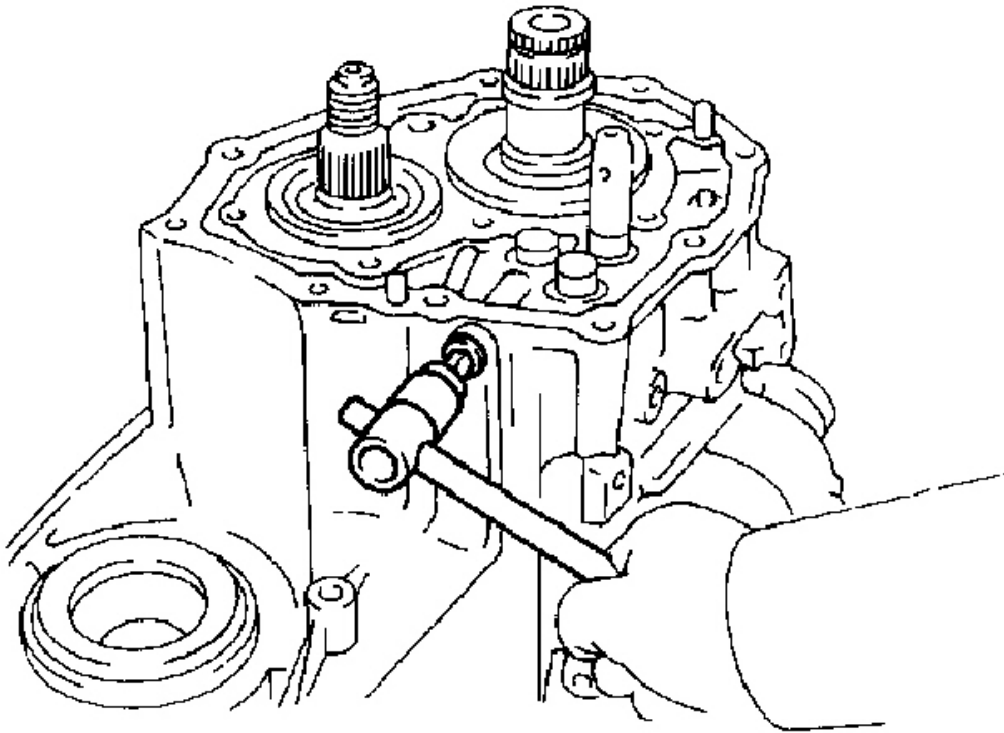
23. REMOVE STRAIGHT SCREW PLUG

Using a hexagon wrench (6 mm), remove the plug.

Sealant:

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

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



G02925848

Fig. 37: Removing Straight Screw Plug

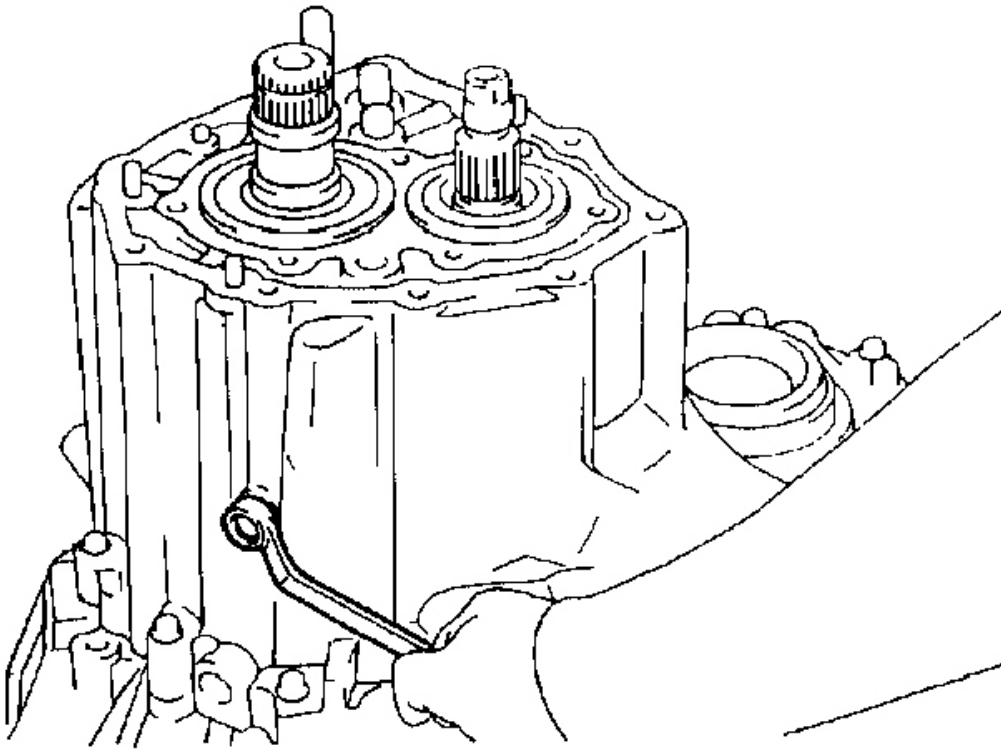
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

24. REMOVE REVERSE IDLER GEAR SHAFT LOCK BOLT AND WASHER

Sealant:

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

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



G02925849

Fig. 38: Removing Reverse Idler Gear Shaft Lock Bolt And Washer
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

25. REMOVE TRANSMISSION CASE

- a. Transaxle case side:

Remove the 3 bolts.

- b. Transmission case side:

Remove the 14 bolts and tap out the case with a plastic hammer.

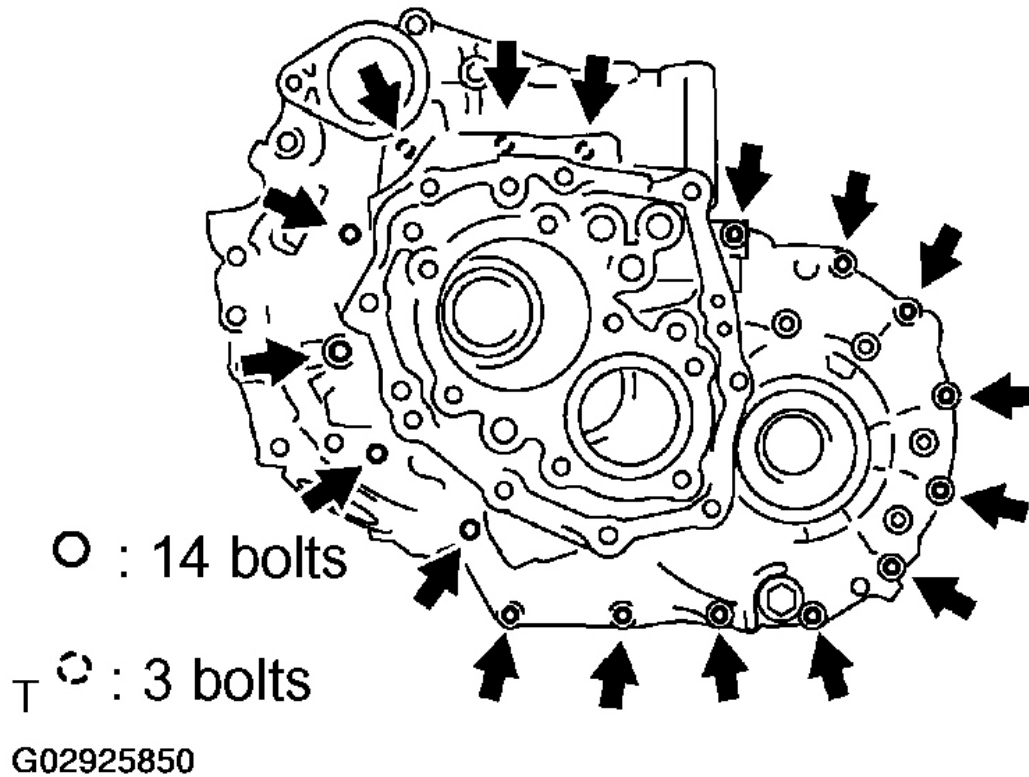


Fig. 39: Removing Transmission Case Bolts

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

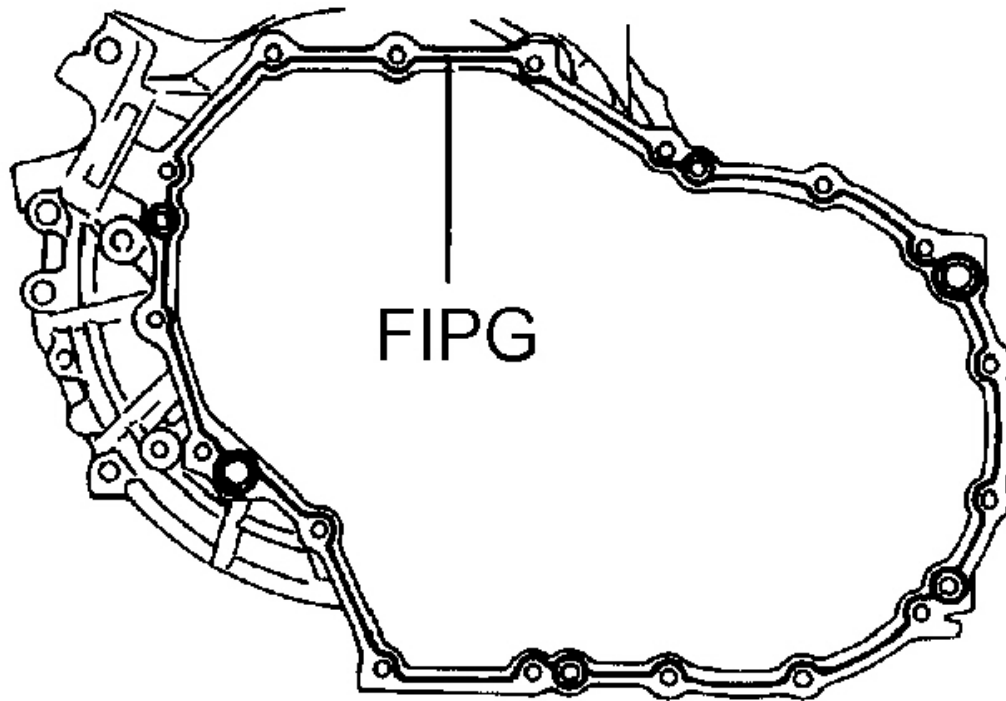
FIPG:

Part No. 08826-00100, THREE BOND 1282B or equivalent

Torque:

29 N.m (300 kgf.cm, 21 ft.lbf) for transaxle case side

30 N.m (306 kgf.cm, 22 ft.lbf) for transmission case side



G02925851

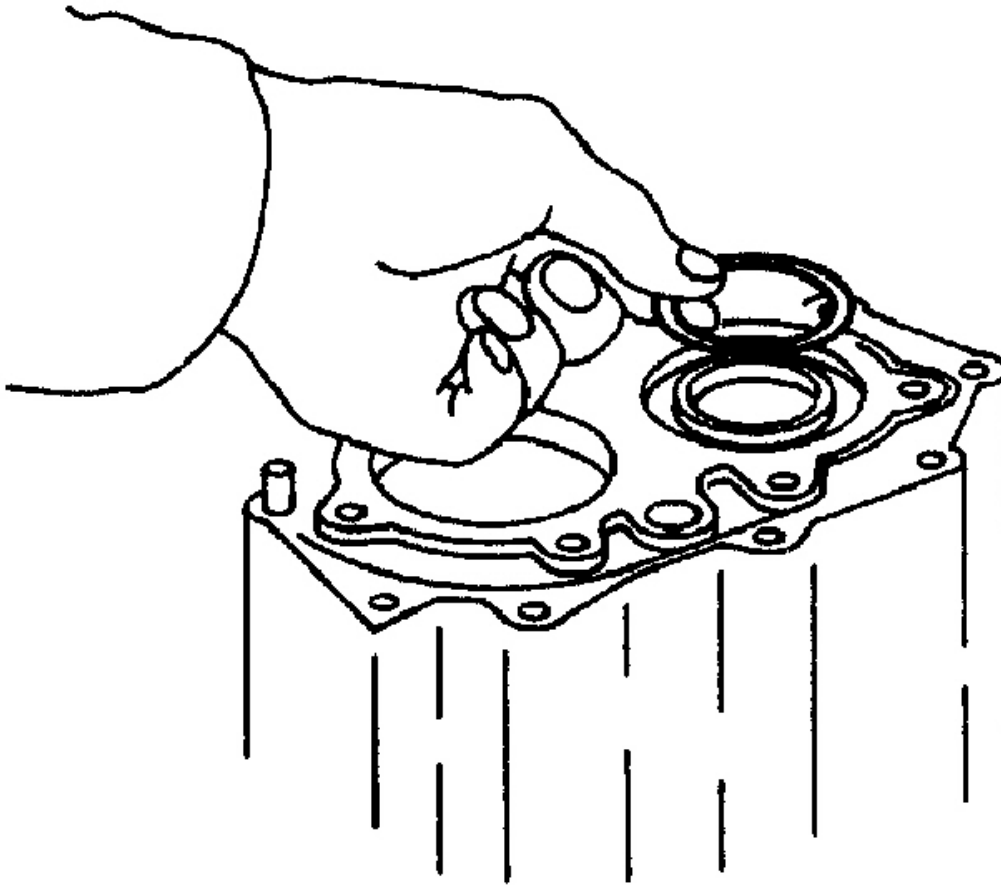
Fig. 40: Locating FIPG

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

26. REMOVE SHIM

HINT:

At the time of reassembly, please refer to the following item. Install the previously selected shim by adjusting output shaft preload (See **REASSEMBLY**).



G02925852

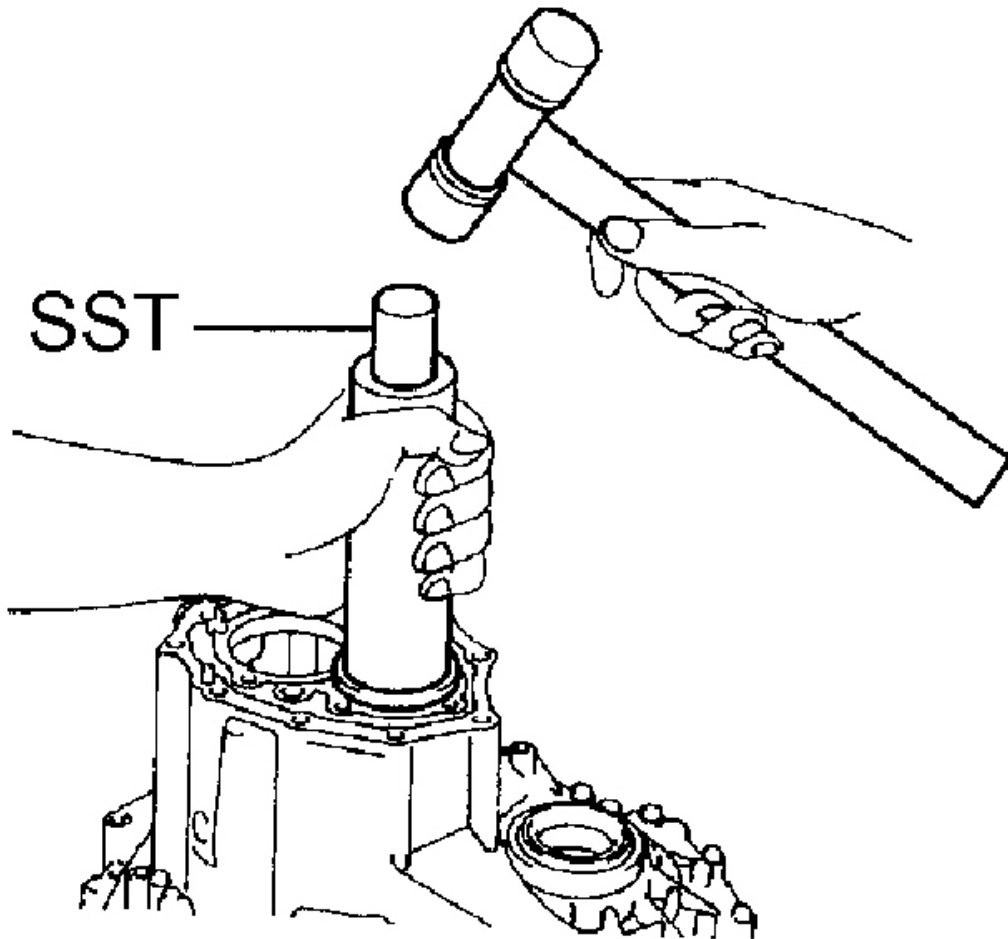
Fig. 41: Removing Shim

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

27. REMOVE OUTPUT SHAFT REAR BEARING OUTER RACE

Using SST and a hammer, remove the output shaft rear bearing outer race.

SST 09316-6001 1 (09316-00011)



G02925853

Fig. 42: Removing Output Shaft Rear Rearing Outer Race
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

28. REMOVE REVERSE SHIFT ARM BRACKET ASSEMBLY

Remove the 2 bolts and pull off the reverse shift arm and bracket.

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

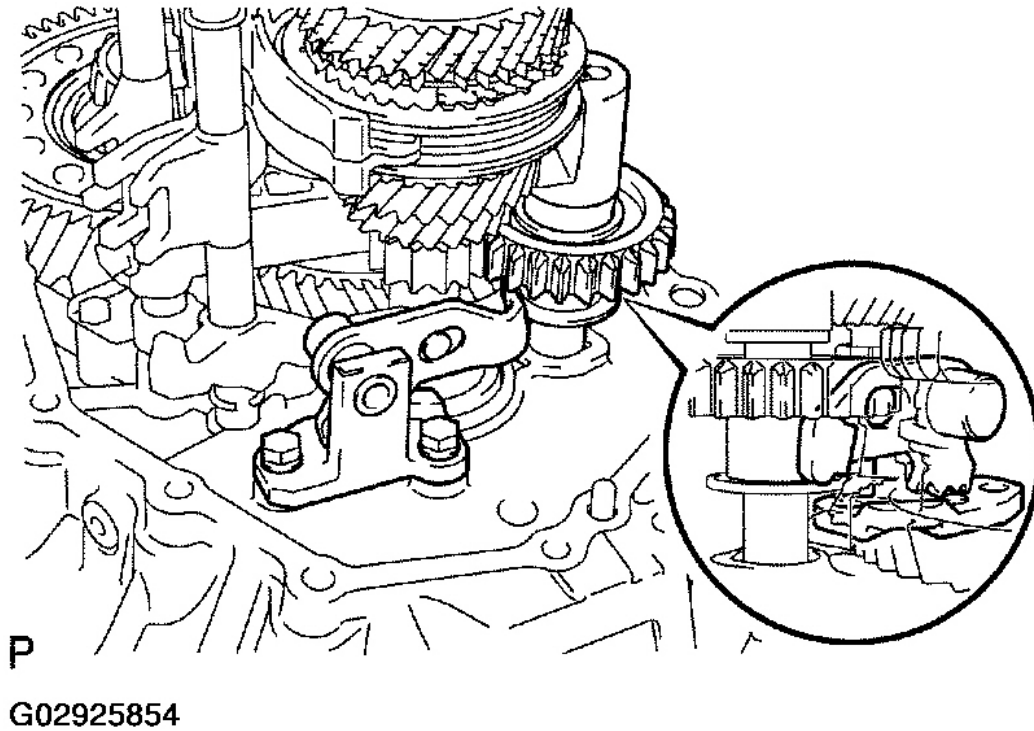


Fig. 43: Removing Reverse Shift Arm Bracket Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

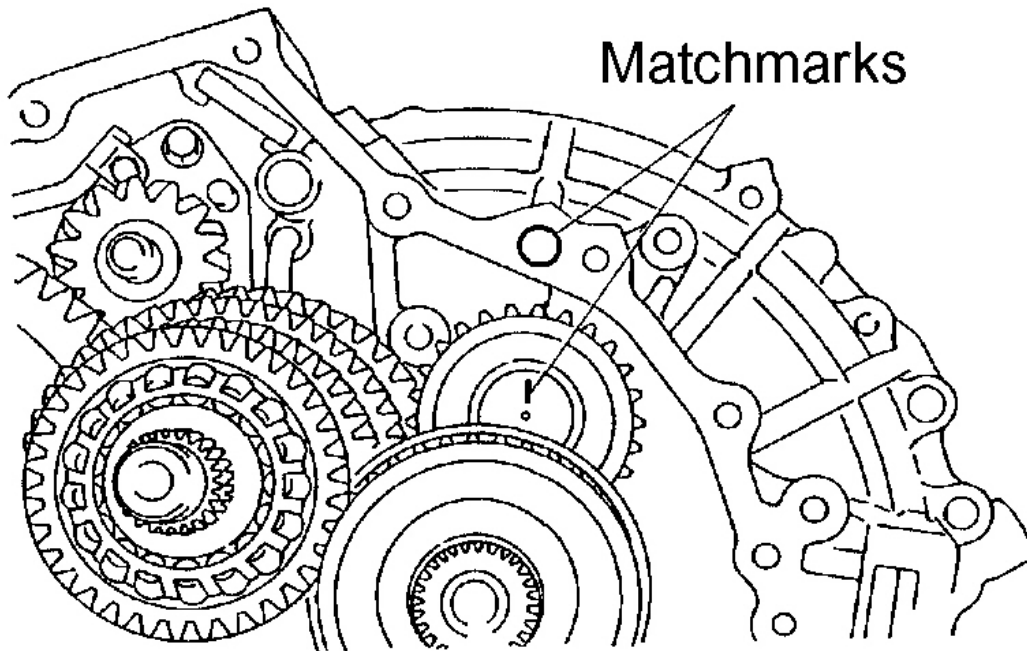
29. REMOVE REVERSE IDLER GEAR AND SHAFT

Pull out the shaft, remove the reverse idler gear and thrust washer.

HINT:

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

Align the matchmarks, as shown in **Fig. 44** .



G02925855

Fig. 44: Aligning Matchmarks

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

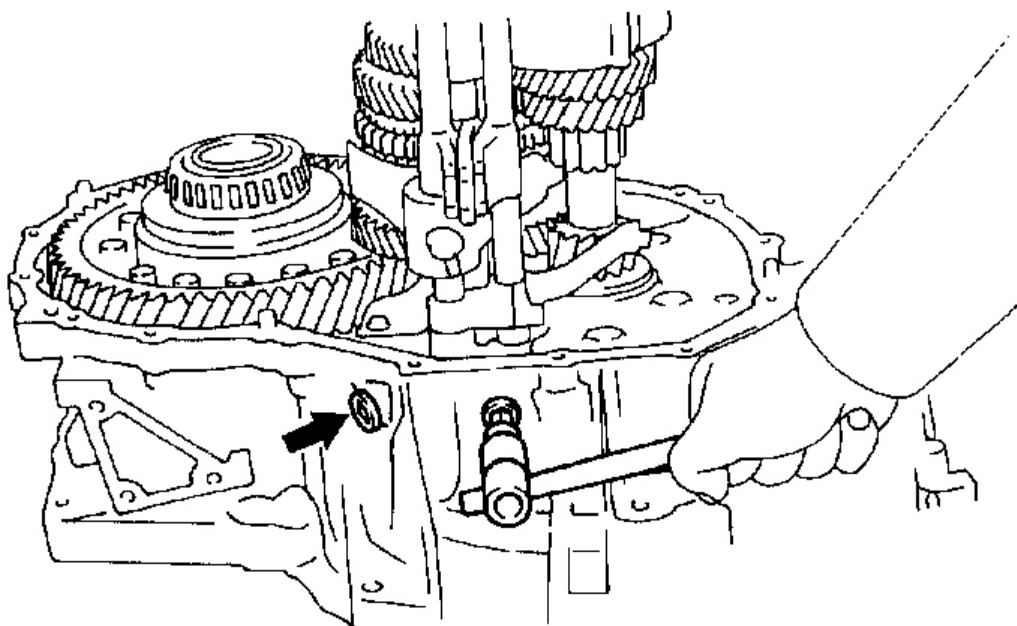
30. REMOVE STRAIGHT SCREW PLUGS

Using a hexagon wrench (6 mm), remove the 2 plugs.

Sealant:

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

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



G02925856

Fig. 45: Removing Straight Screw Plugs

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

31. REMOVE 3 SHIFT FORK SET BOLTS

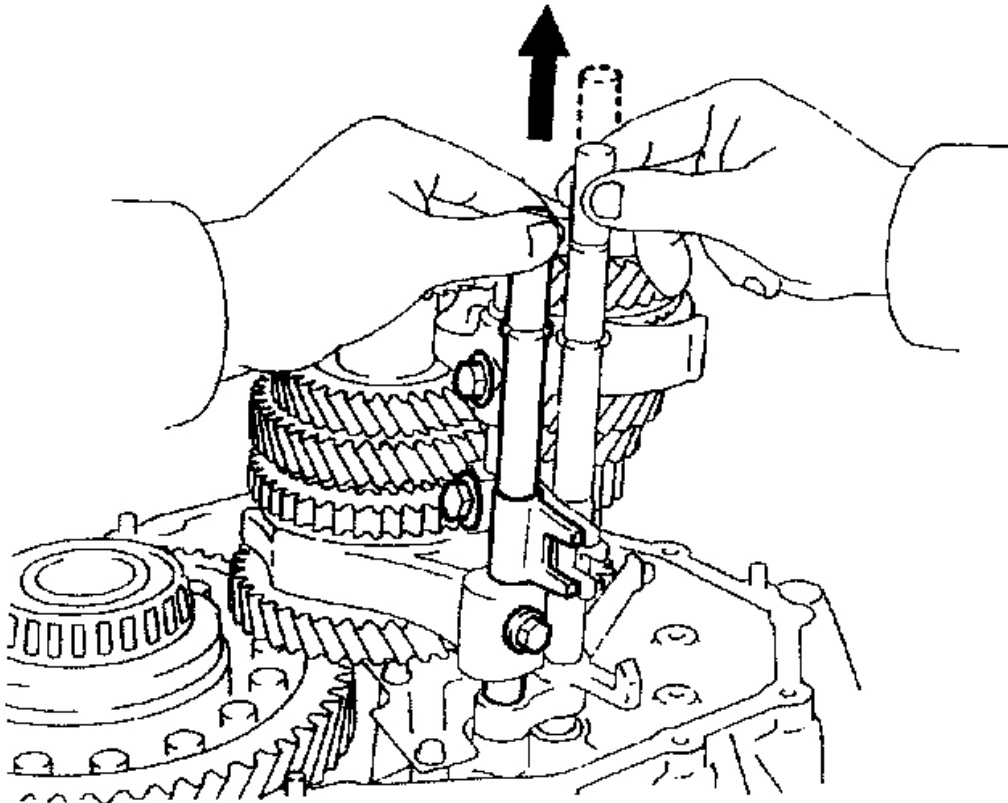
Torque: 24 N.m (240 kgf.cm, 17 ft.lbf)

32. REMOVE NO. 1 SHIFT FORK SHAFT

Pull up the No. 3 shift fork shaft, remove the No. 1 shift fork shaft.

HINT:

At the time of reassembly, please refer to the following item. When it is difficult to push the fork shaft through the reverse shift fork, pull up the No. 3 shift fork shaft.

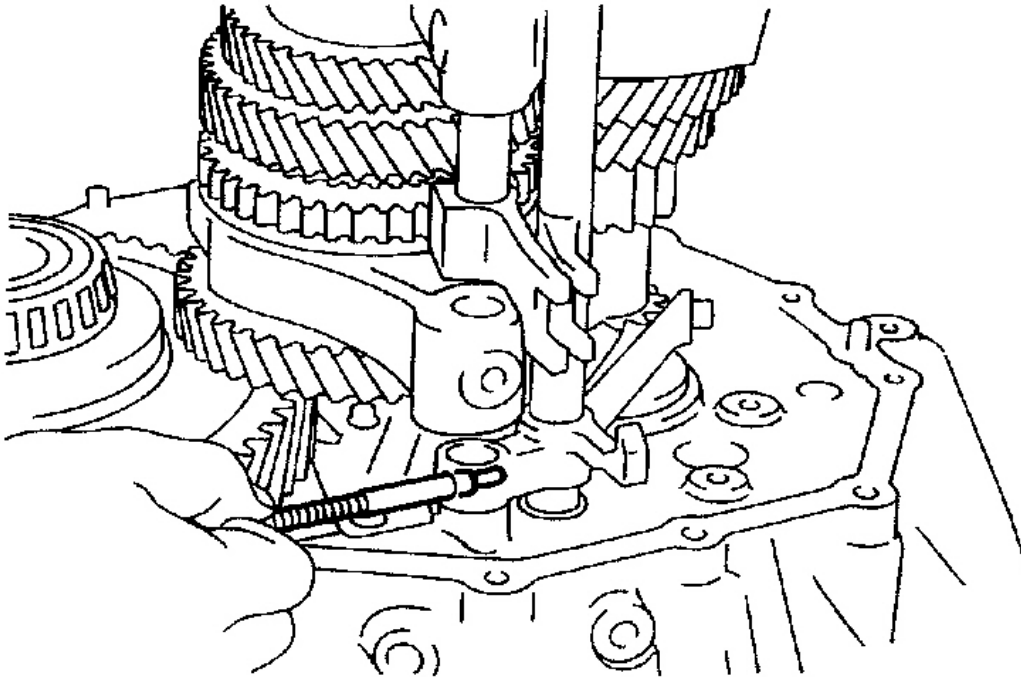


G02925857

Fig. 46: Pulling Up No. 3 Shift Fork Shaft
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

33. REMOVE INTERLOCK ROLLER

Using a magnetic finger, remove the interlock roller from the reverse shift fork.

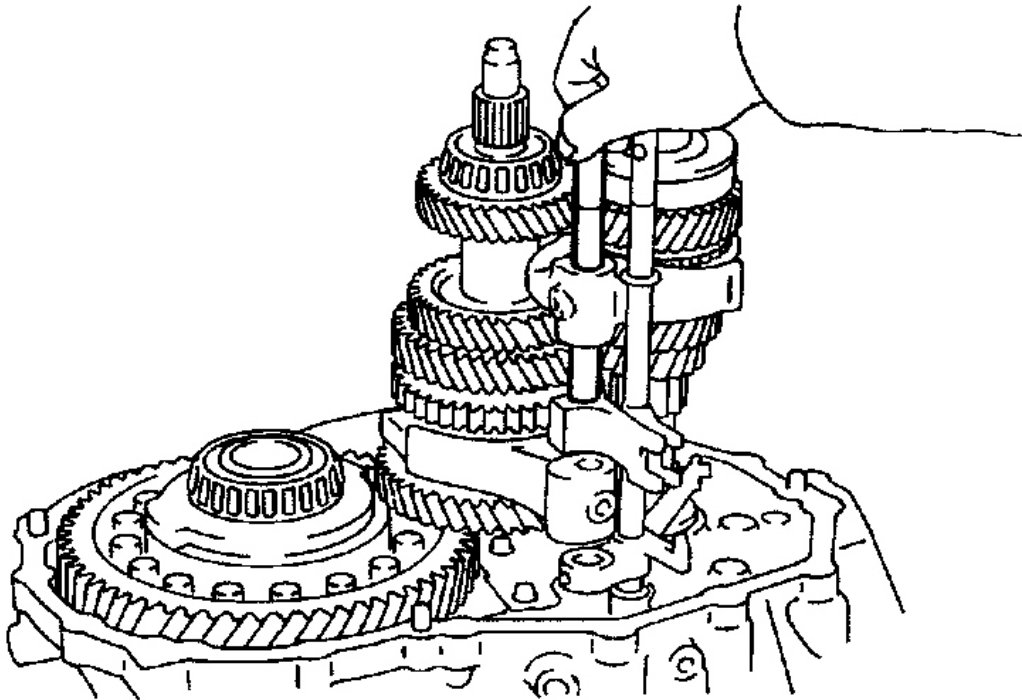


G02925858

Fig. 47: Removing Interlock Roller

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

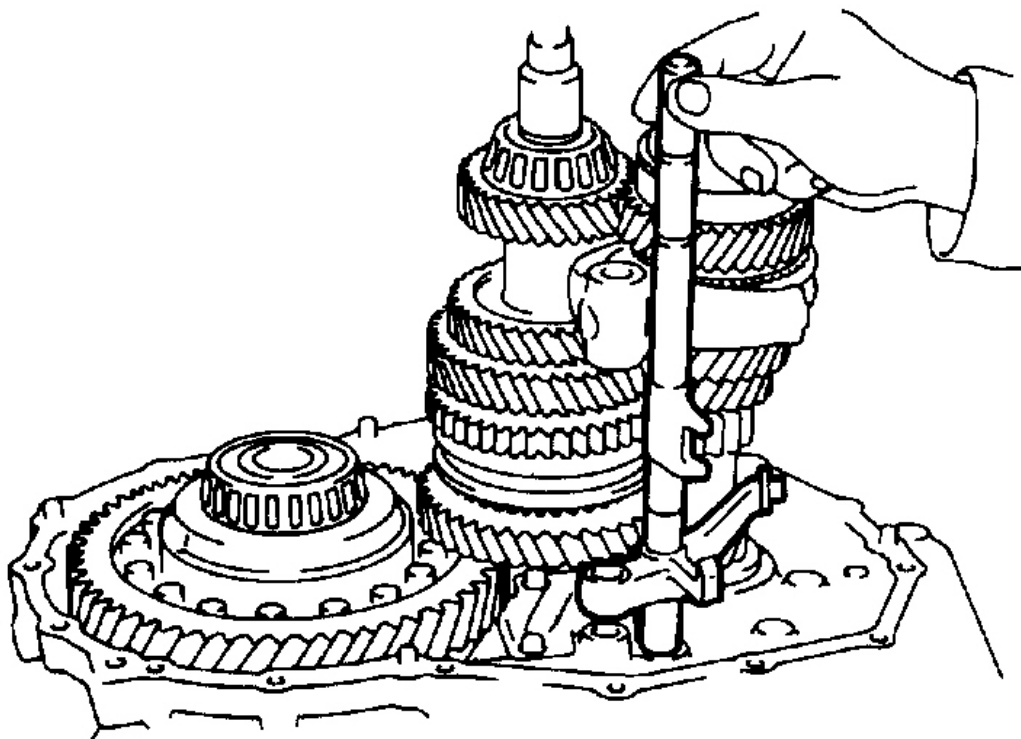
34. **REMOVE NO. 2 SHIFT FORK SHAFT, SHIFT HEAD AND NO. 1 SHIFT FORK**
 - a. Pull out the No. 2 shift fork shaft.
 - b. Remove the shift head and No. 1 shift fork.



G02925859

Fig. 48: Removing No. 2 Shift Fork Shaft Shift Head & No. 1 Shift Fork
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

35. **REMOVE NO. 3 SHIFT FORK SHAFT WITH REVERSE SHIFT FORK AND NO. 2 SHIFT FORK**
 - a. Pull out the No. 3 shift fork shaft with the reverse shift fork.
 - b. Remove the No. 2 shift fork.



G02925860

Fig. 49: Removing No.3 Shift Fork Shaft With Reverse Shift Fork & No. 2 Shift Fork
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

36. REMOVE SNAP RING

- a. Using 2 screwdrivers and a hammer, remove the snap ring and reverse shift fork from the No. 3 shift fork shaft.
- b. Using 2 screwdrivers and a hammer, remove the snap rings from the No. 1, No. 2 and No. 3 shift fork shafts.

37. REMOVE INPUT AND OUTPUT SHAFTS ASSEMBLY

- a. Leaning the output shaft to the differential side, remove the input shaft assembly.
- b. Lift up the differential case assembly, remove the output shaft assembly.

38. REMOVE DIFFERENTIAL CASE ASSEMBLY

39. REMOVE MAGNET FROM TRANSAXLE CASE

40. REMOVE 2 BOLTS, NO. 1 AND NO. 2 OIL RECEIVER PIPES

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

41. REMOVE STRAIGHT SCREW PLUG FROM TRANSAXLE CASE

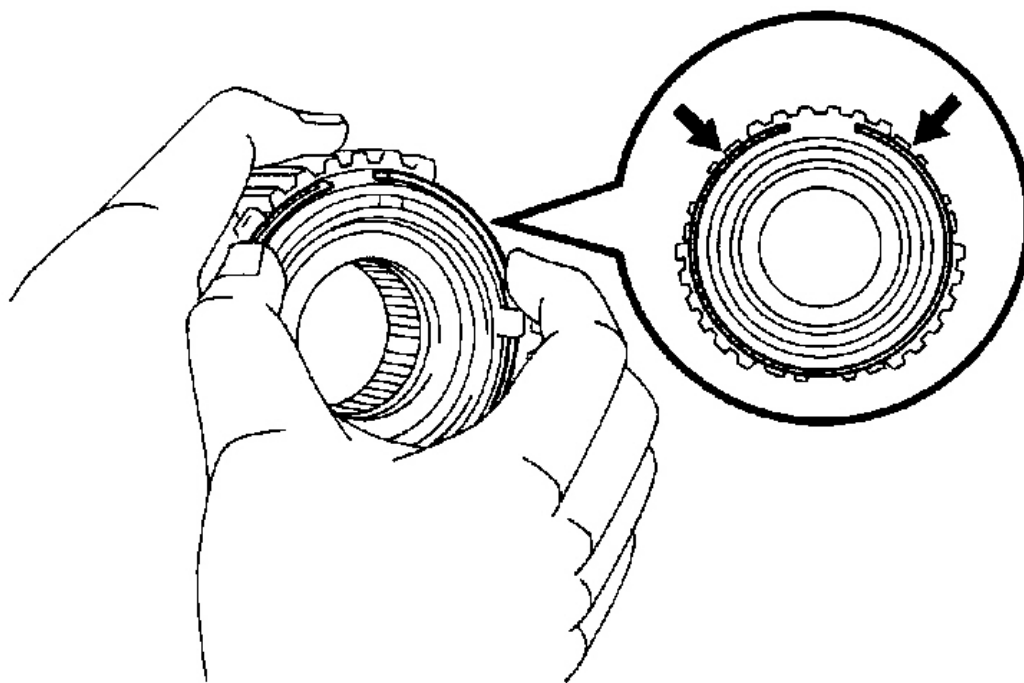
Sealant:

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

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

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

- a. Remove the No. 5 synchronizer ring with the key spring from the No. 3 clutch hub.



G02925861

Fig. 50: Removing No.5 Synchronizer Ring with Key Spring from No.3 Clutch Hub
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using a screwdriver, remove the snap ring.

HINT:

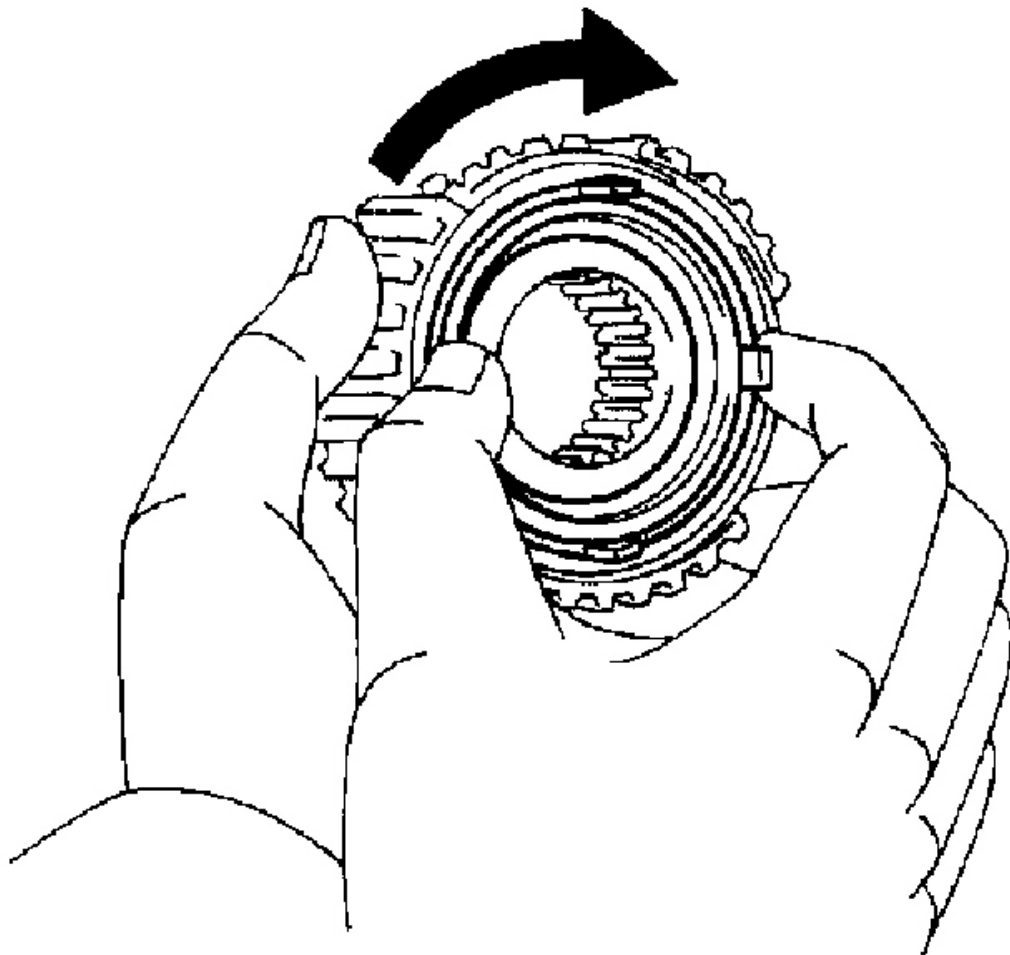
Wrap vinyl tape on the screwdriver to prevent damaging the synchronizer ring.

- c. Remove the synchronizer rings.

INSPECTION

1. INSPECT NO. 5 SYNCHRONIZER RING

- a. Check for wear or damage.



G02925862

Fig. 51: Checking No. 5 Synchronizer Ring For Wear Or Damage
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

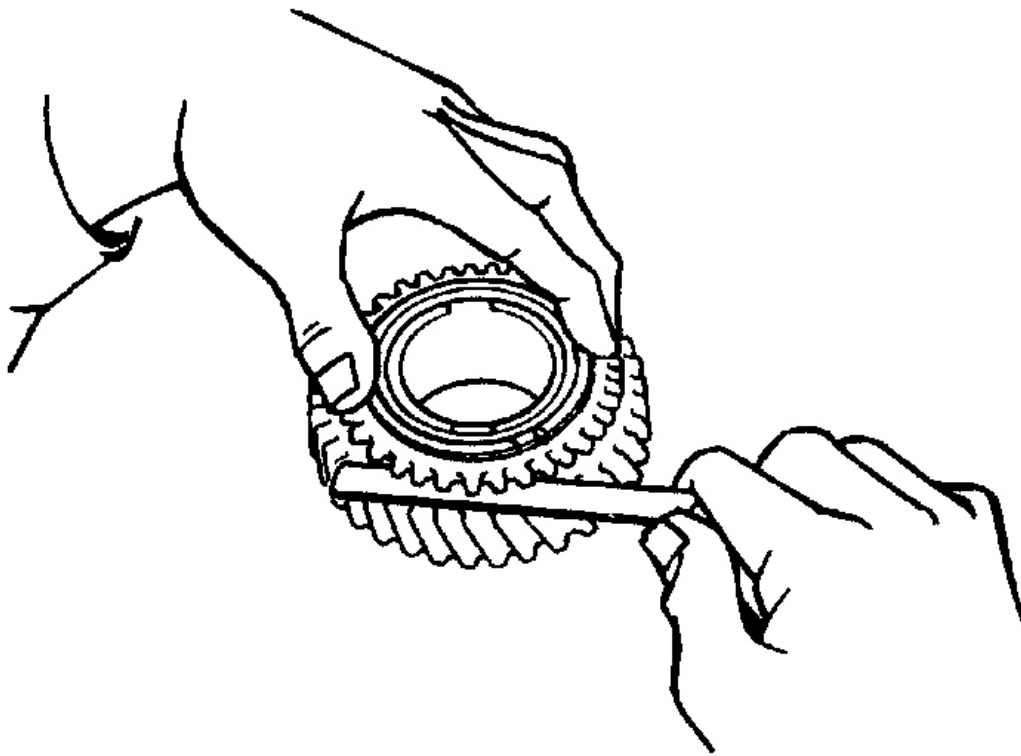
- b. Check the braking effect of the synchronizer ring.

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



G02925863

Fig. 52: Measuring Clearance Between Synchronizer Ring Back & Gear Spline End
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Minimum clearance: 0.7 mm (0.028 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.

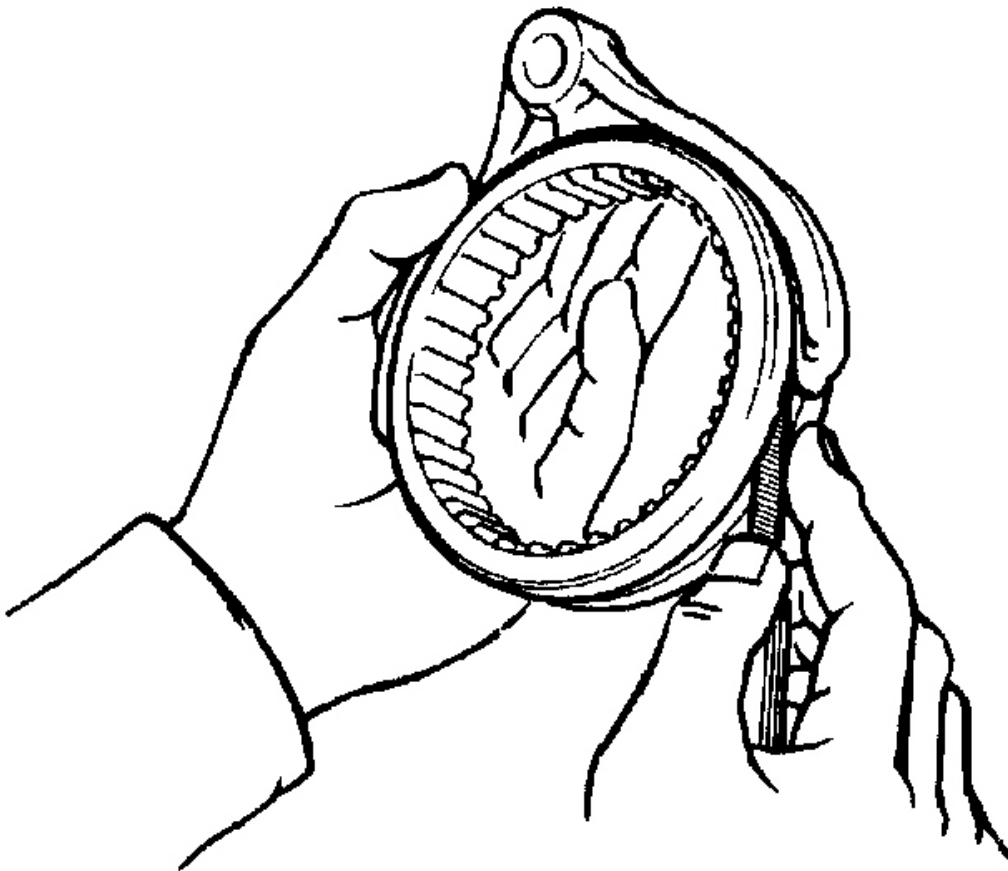
NOTE: Ensure the fine lapping compound is completely washed off after rubbing.

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

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

Maximum clearance: 0.35 mm (0.014 in.)

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



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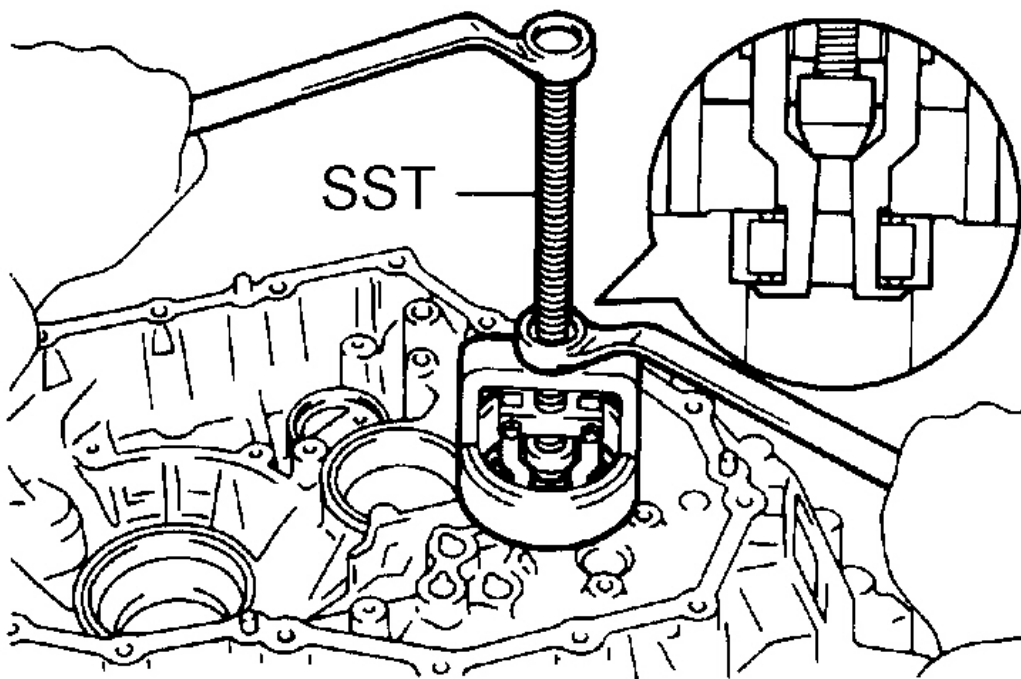
Fig. 53: Inspecting No. 3 Shift Fork & Hub Sleeve Clearance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REPLACEMENT

1. REPLACE INPUT SHAFT FRONT BEARING AND OIL SEAL

- a. Remove the 3 bolts and transaxle case receiver.
- b. Using SST, pull out the bearing.

SST 09612-65014 (09612-01040, 09612-01050)

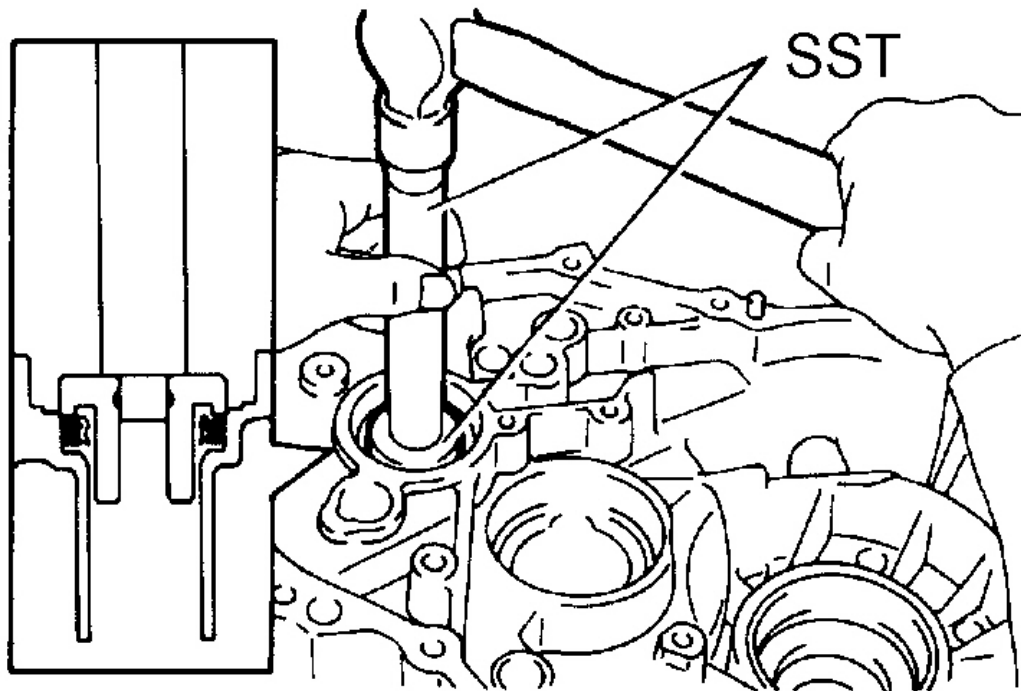


G02925865

Fig. 54: Pulling Out Bearing
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using a screwdriver, remove the oil seal.
- d. Using SST, drive in a new oil seal.

SST 09608-00081, 09950-70010 (09951-07150)



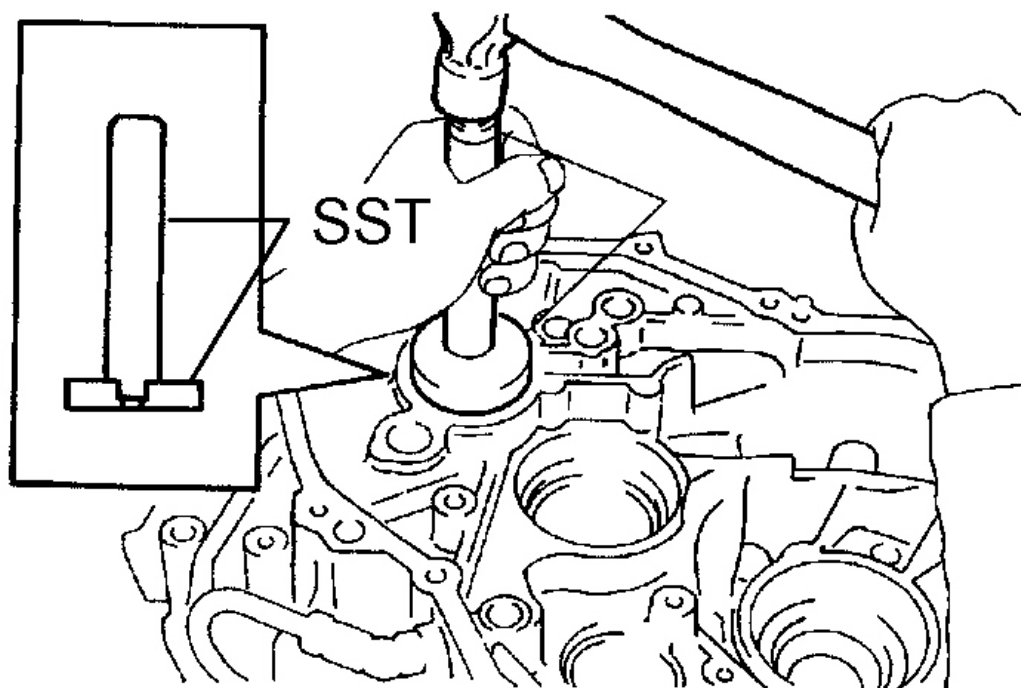
G02925866

Fig. 55: Driving In New Oil Seal

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

- e. Coat the lip of seal with MP grease.
- f. Using SST, drive in a new bearing.

SST 09950-60010 (09951-00580), 09950-70010 (09951-07150)



G02925867

Fig. 56: Driving In New Bearing

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

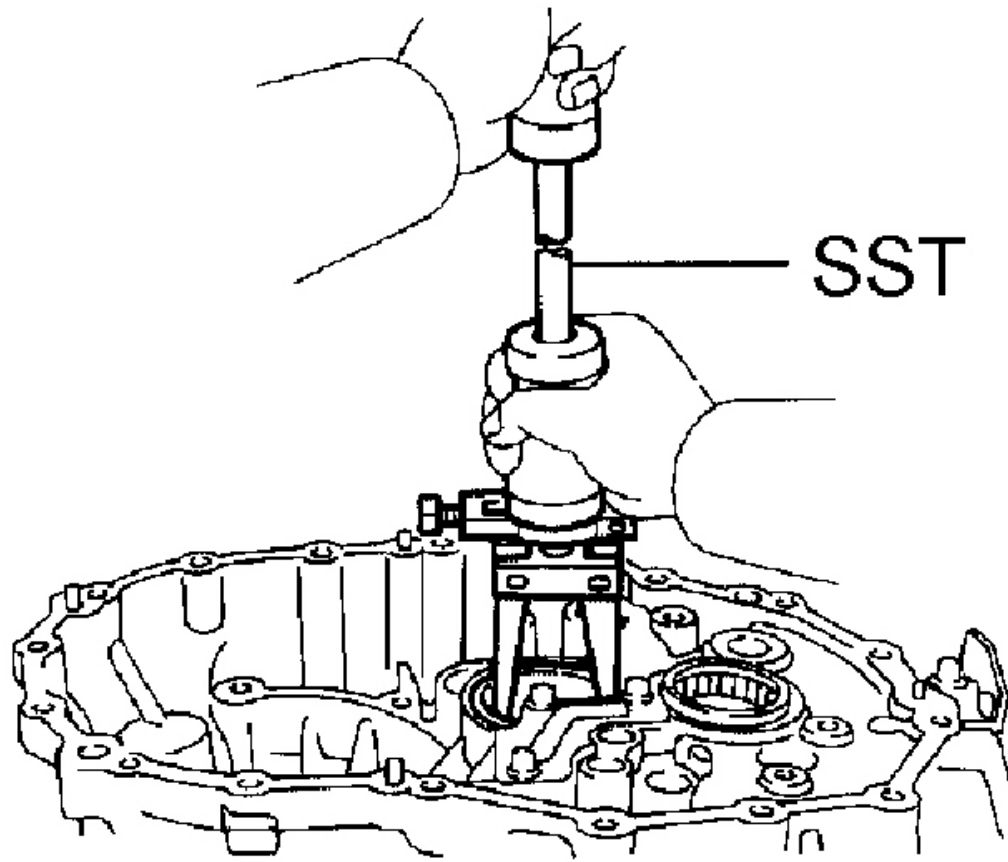
- g. Install the transaxle case receiver.
- h. Install and torque the 3 bolts.

Torque: 7.0 N.m (71 kgf.cm, 62 in.lbf)

2. REPLACE OUTPUT SHAFT FRONT BEARING OUTER RACE AND OUTPUT SHAFT FRONT COVER

- a. Using SST, pull out the output shaft front bearing outer race.

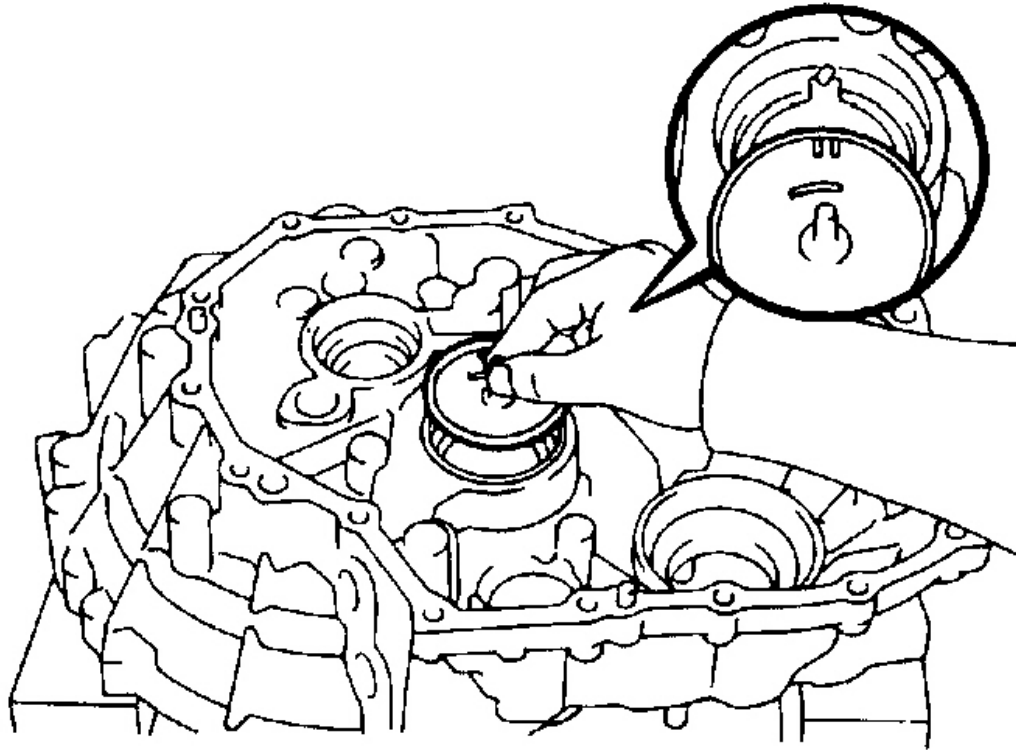
SST 09308-00010



G02925868

Fig. 57: Removing Output Shaft Front Bearing Outer Race
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the output shaft cover.
- c. Install a new output shaft cover.



G02925869

Fig. 58: Installing New Output Shaft Cover

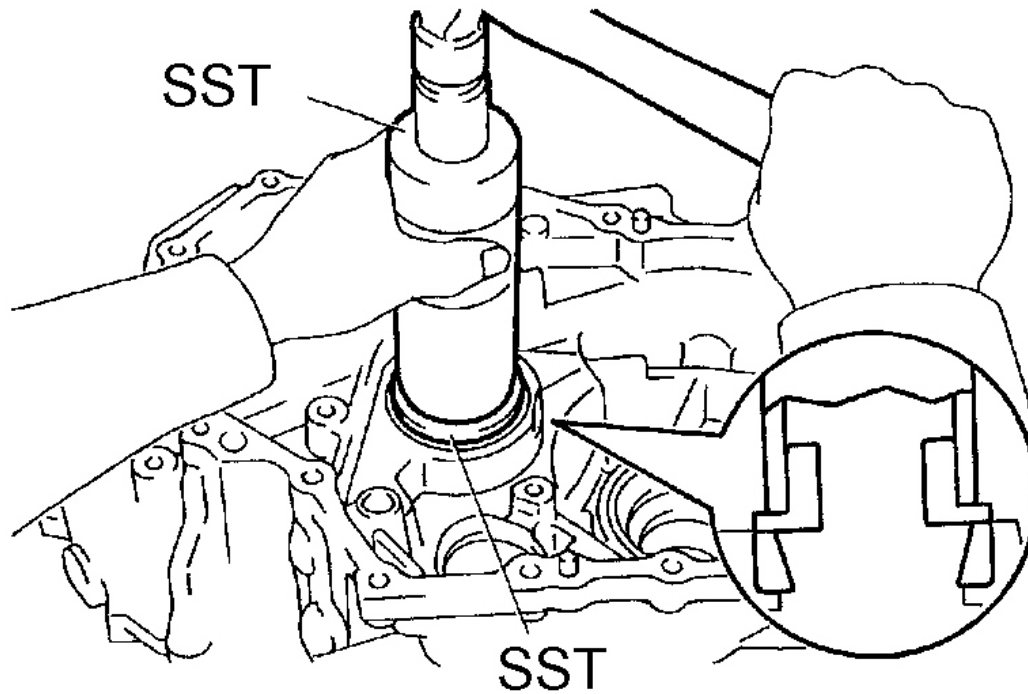
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

Install the output shaft cover projection into the case side groove.

- d. Using SST and a hammer, drive in a new output shaft front bearing outer race.

SST 09316-6001 1 (09316-00011, 09316-00021)

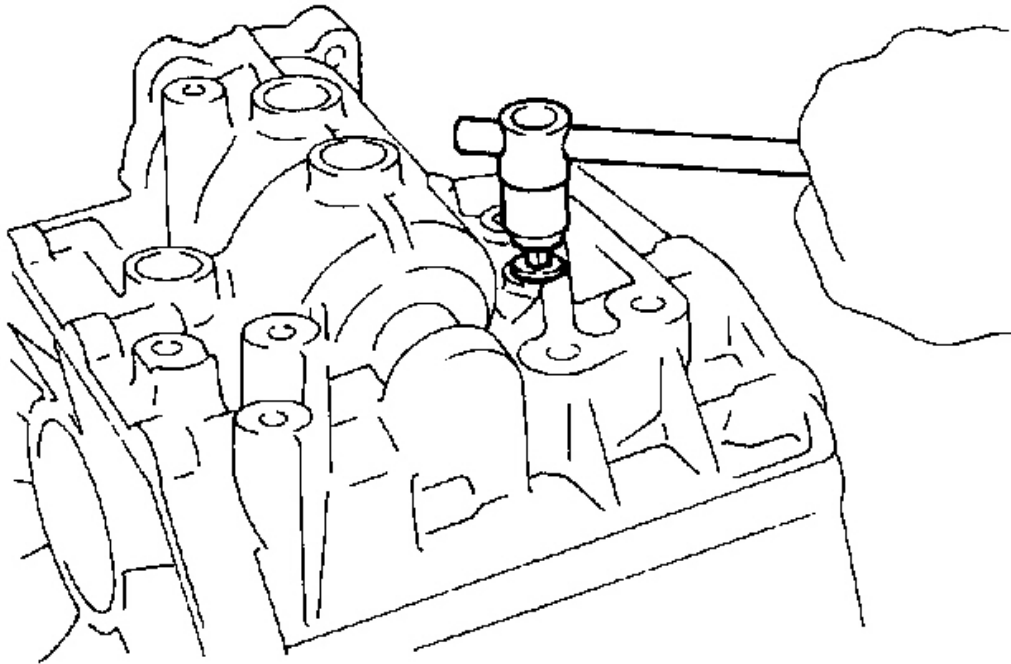


G02925870

Fig. 59: Installing New Output Shaft Front Bearing Outer Race
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. REPLACE REVERSE RESTRICT PIN

- a. Using a hexagon wrench (6 mm), remove the screw plug.

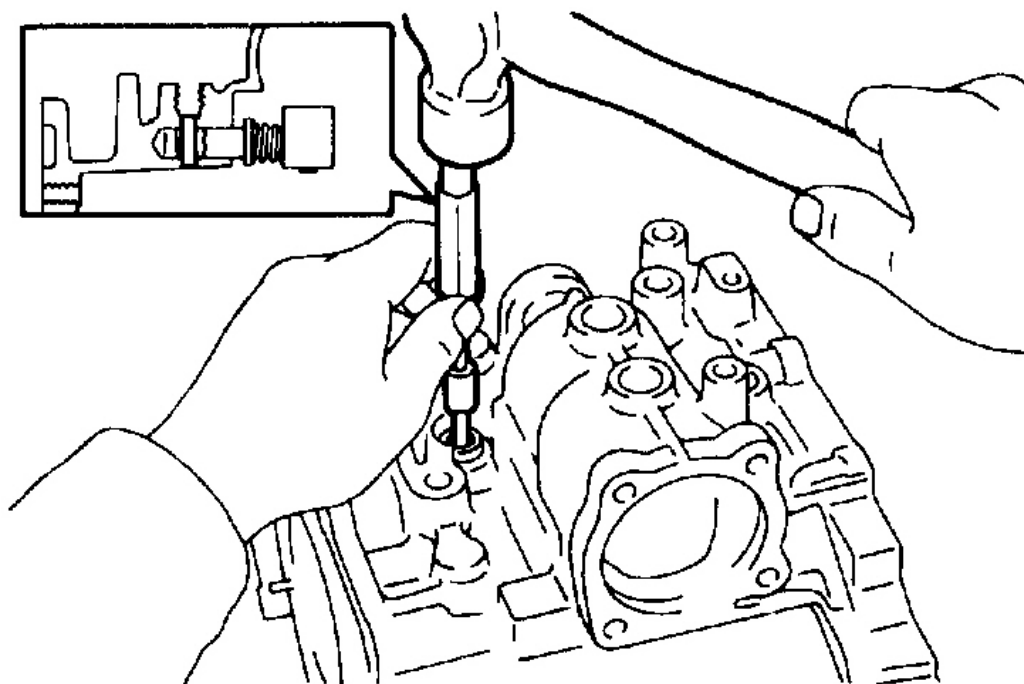


G02925871

Fig. 60: Removing Screw Plug

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

- b. Using a pin punch (5 mm) and hammer, drive out the slotted spring pin.
- c. Replace the reverse restrict pin.
- d. Using a pin punch (5 mm) and hammer, drive in the slotted spring pin.



G02925872

Fig. 61: Driving In Slotted Spring Pin

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

- e. Apply sealant to the screw plug threads.

Sealant:

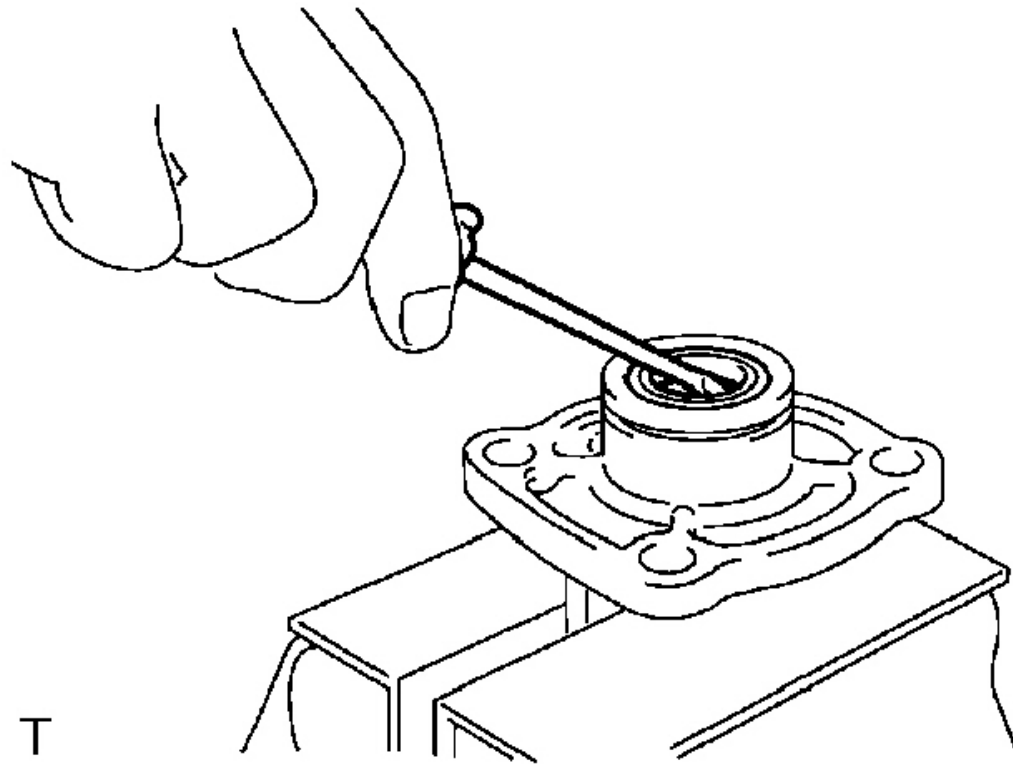
Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

- f. Using a hexagon wrench (6 mm), install and torque the screw plug.

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

4. REPLACE CONTROL SHAFT COVER OIL SEAL AND BUSHING

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



T

G02925873

Fig. 62: Prying Out Oil Seal

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)

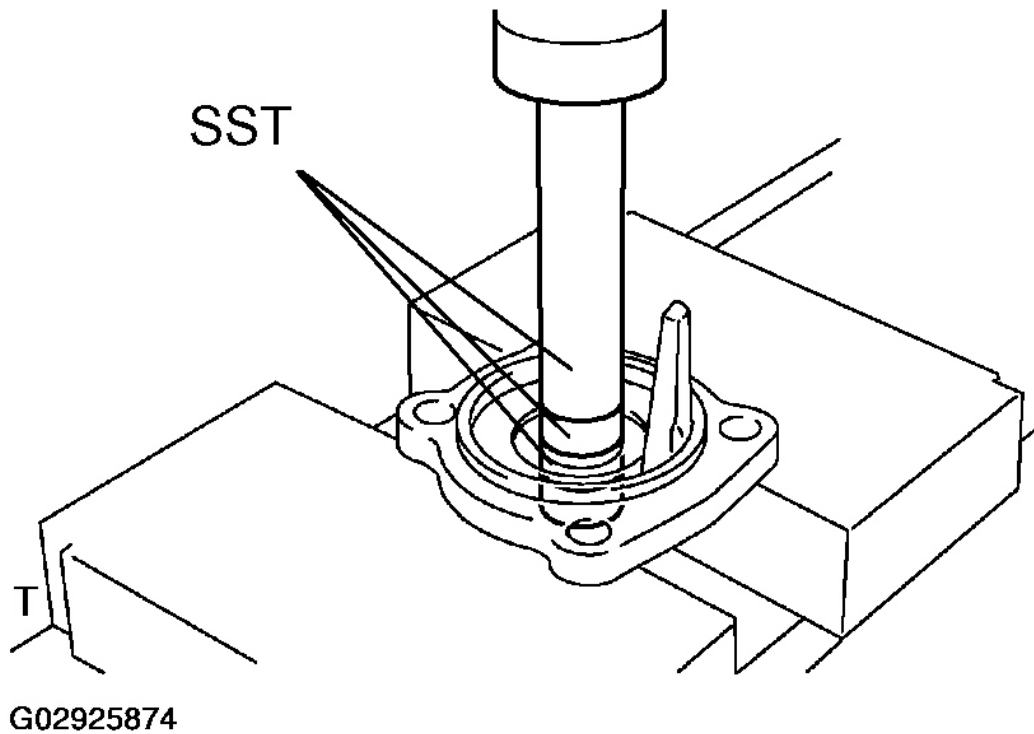


Fig. 63: Pressing Out Bushing

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: 0.65 +/- 0.25 mm (0.0256 +/- 0.0098 in.)

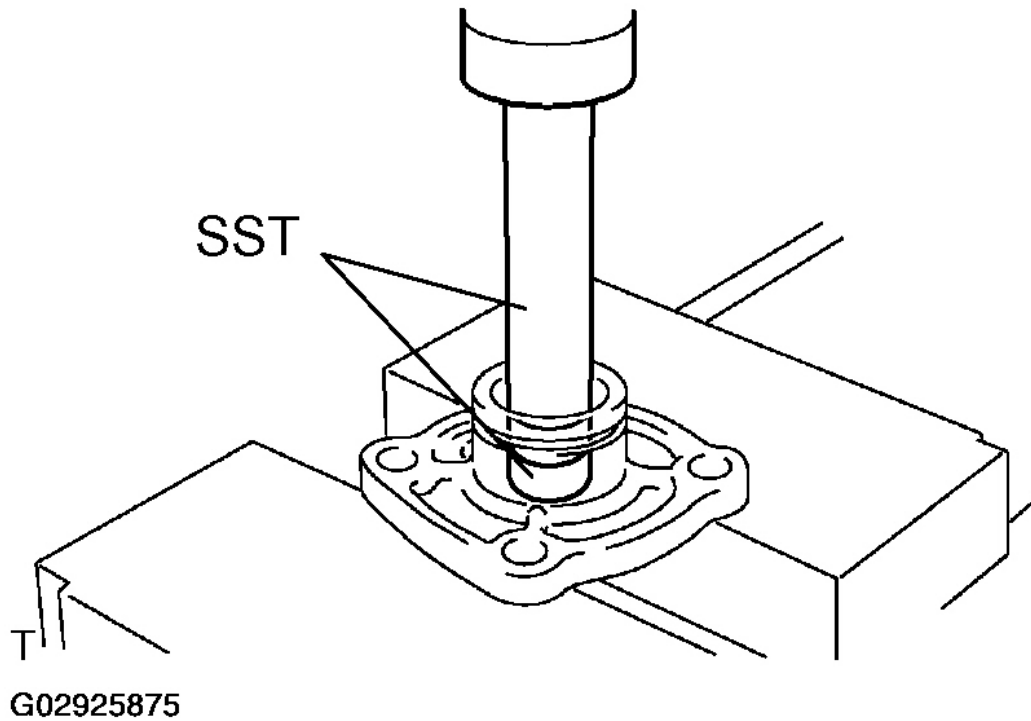


Fig. 64: Pressing In New Bushing

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: 0.70 +/- 0.50 mm (0.0276 +/- 0.0197 in.)

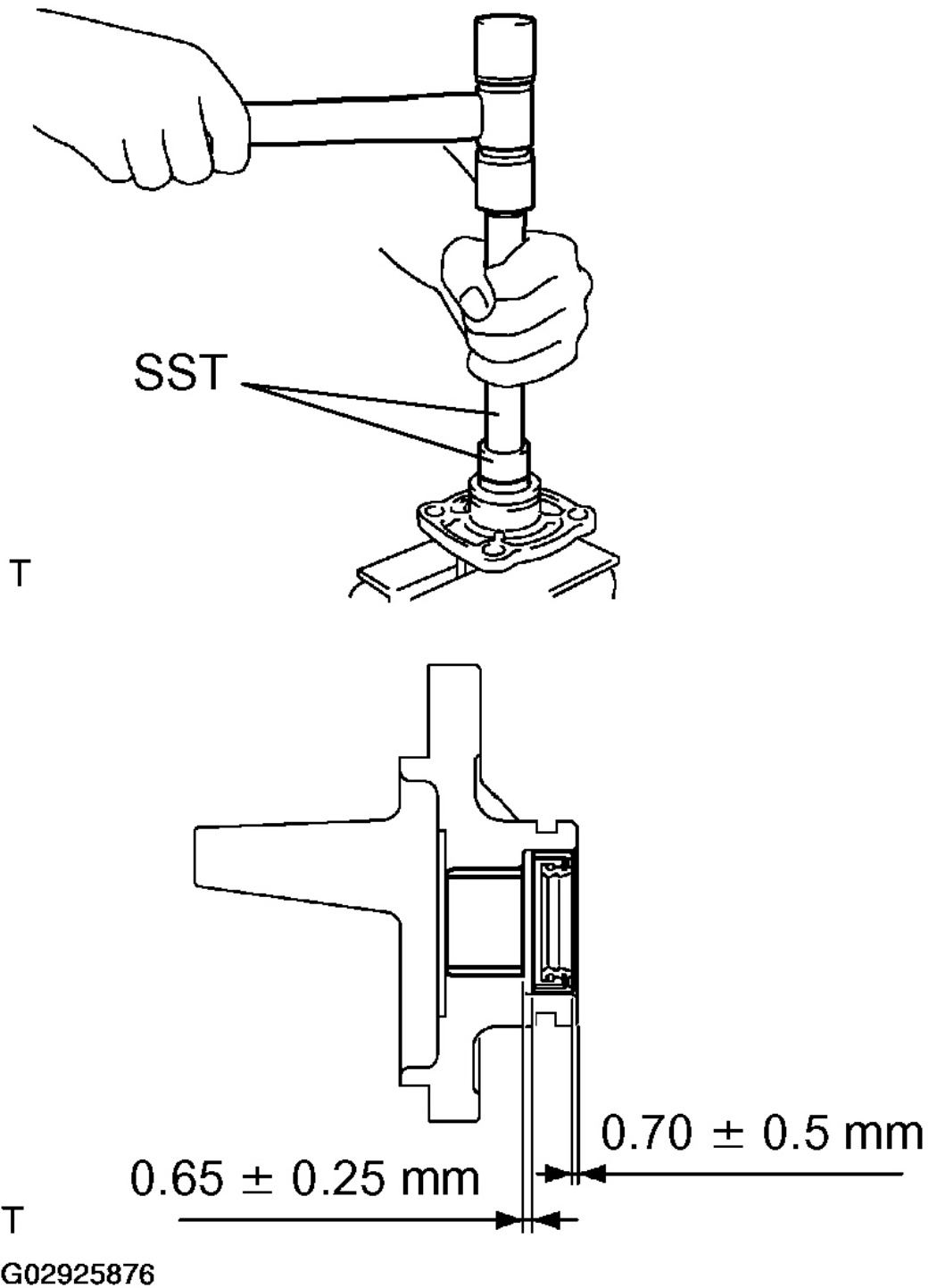


Fig. 65: Tapping In New Oil Seal
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REASSEMBLY

Reassembly is in the reverse order of disassembly (See **DISASSEMBLY**).

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

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

HINT:

- Before reassembly, select a shim by adjusting output shaft preload.
- Coat all of the sliding and rotating surfaces with gear oil before reassembly.

ADJUST OUTPUT SHAFT PRELOAD

- a. Install the output shaft assembly to the transaxle case.
- b. Install the transmission case to the transaxle case.

HINT:

If necessary, tap on the case with a plastic hammer.

- c. Install and torque the 17 bolts.

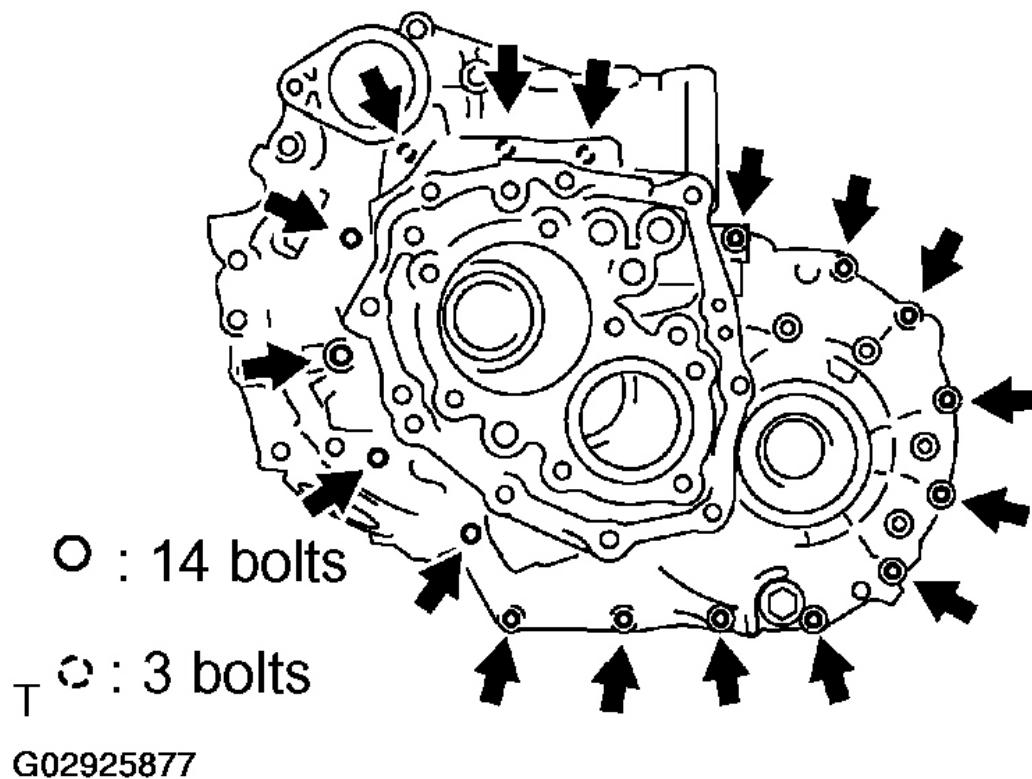


Fig. 66: Installing & Torquing Bolts

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

Torque:

29 N.m (300 kgf.cm, 21 ft.lbf) for transaxle case side

30 N.m (306 kgf.cm, 22 ft.lbf) for transmission case side

- d. Install the output shaft rear taper roller bearing outer race.
- e. Install the adjusting shim.

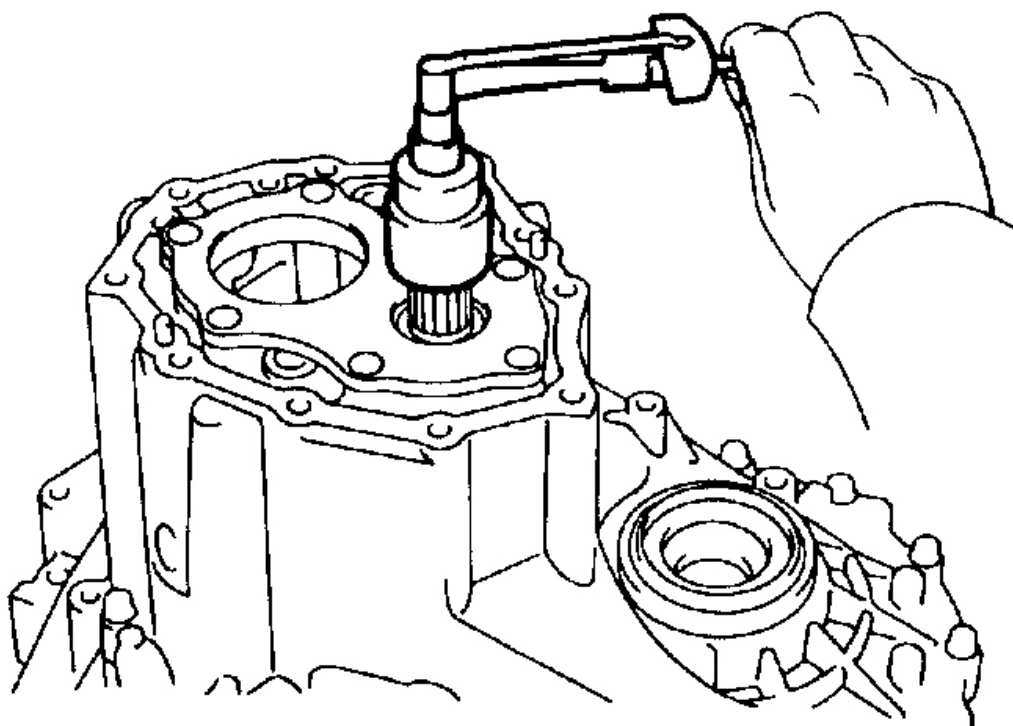
HINT:

When reusing the output shaft bearing, first install a shim of the same thickness as before. If installing a new taper roller bearing, first select and install a shim of lesser thickness than before.

- f. Install the rear bearing retainer.
- g. Using a torx wrench (T45), install and torque the 7 torx screws.

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

- h. Install a new lock nut to the output shaft.
- i. Turn the output shaft right and left 2 or 3 times to allow the bearing to settle.
- j. Using a torque wrench, measure the preload.



G02925878

Fig. 67: Measuring Preload Using Torque Wrench
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Preload (at starting):

New bearing

0.8 to 1.6 N.m (8 to 16 kgf.cm, 6.9 to 13.9 in.lbf)

Reused bearing

0.5 to 1.0 N.m (5 to 10 kgf.cm, 4.3 to 8.7 in.lbf)

2004 Toyota RAV4

2004 TRANSMISSION Manual Transaxle - RAV4

If the preload is not within the specification, select an appropriate adjusting shim.

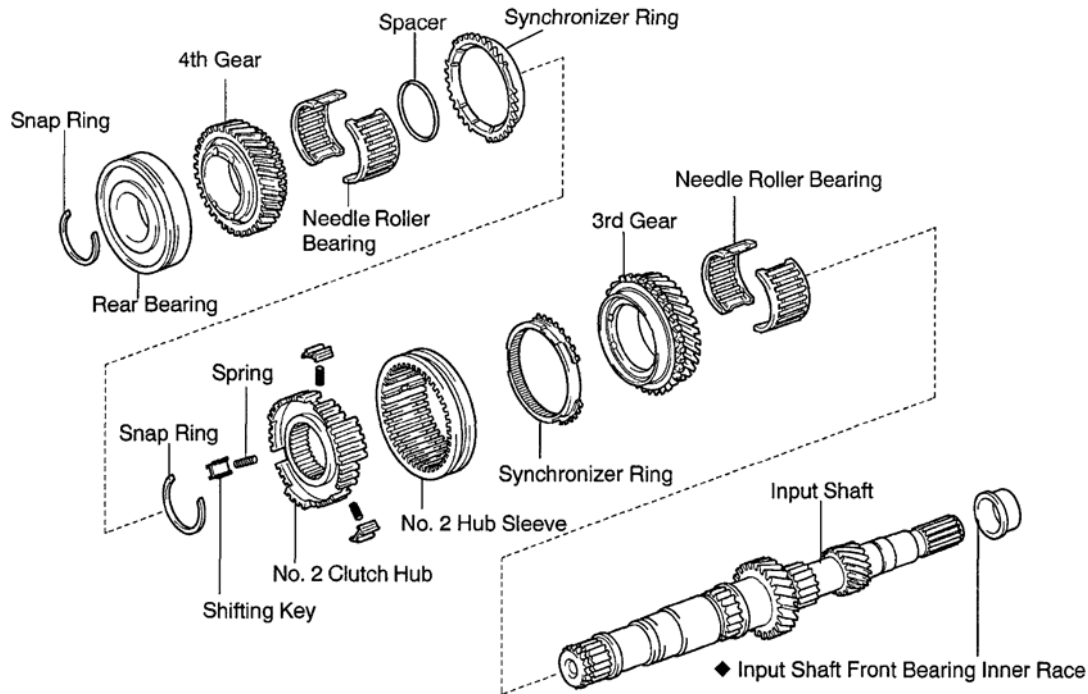
PRELOAD THICKNESS SPECIFICATION

Mark	Thickness mm (in.)
0	1.30 (0.0512)
1	1.35 (0.0531)
2	1.40 (0.0551)
3	1.45 (0.0571)
4	1.50 (0.0591)
5	1.55 (0.0610)
6	1.60 (0.0630)
7	1.65 (0.0650)
8	1.70 (0.0669)
9	1.75 (0.0689)
A	1.80 (0.0709)
B	1.85 (0.0728)
C	1.90 (0.0748)
D	1.95 (0.0768)
E	2.00 (0.0787)
F	2.05 (0.0807)
G	2.10 (0.0827)
H	2.15 (0.0846)
J	2.20 (0.0866)
K	2.25 (0.0886)
L	2.30 (0.0906)
M	2.35 (0.0925)
N	2.40 (0.0945)
P	2.45 (0.0965)
Q	2.50 (0.0984)

- k. Remove the lock nut.
- l. Remove the 5 parts. Removal is in the reverse order of installation.
 1. Remove the rear bearing retainer.
 2. Remove the shim.
 3. Remove the transmission case.
 4. Remove the output shaft assembly.
 5. Remove the output shaft rear bearing outer race.

INPUT SHAFT

COMPONENTS



◆ Non-reusable part
P
G02639849

Fig. 68: Exploded View Of Input Shaft Components
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

DISASSEMBLY

1. MEASURE 3RD AND 4TH GEARS THRUST CLEARANCE

Using a feeler gauge, measure the thrust clearance.

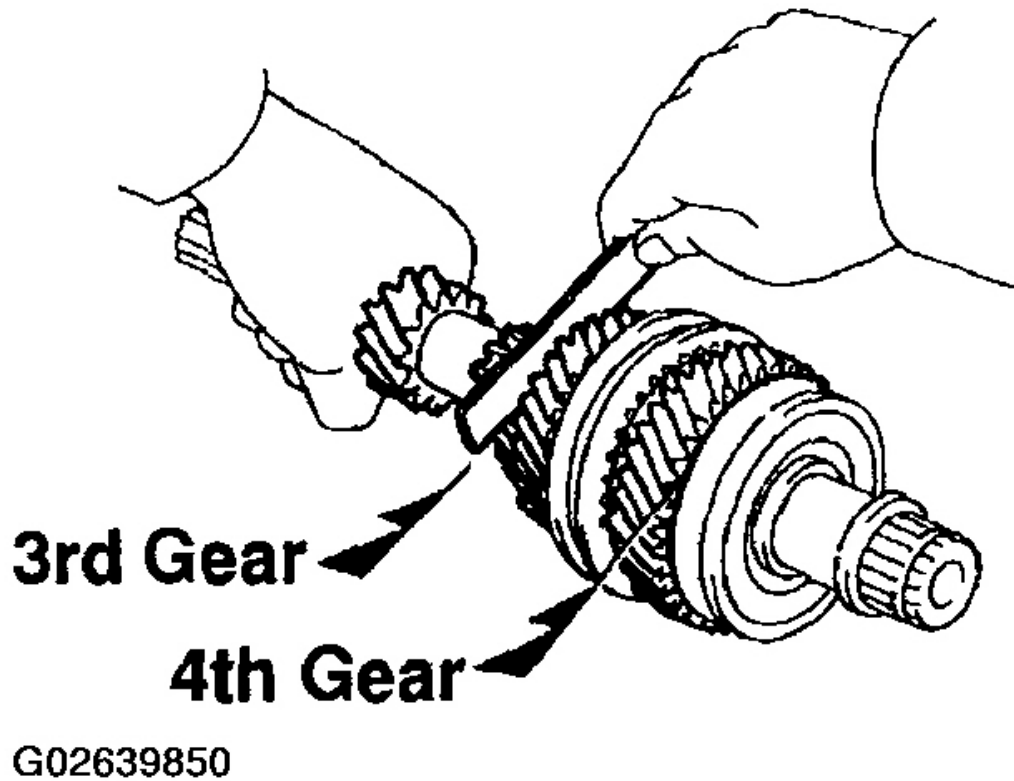


Fig. 69: Measuring Thrust Clearance

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

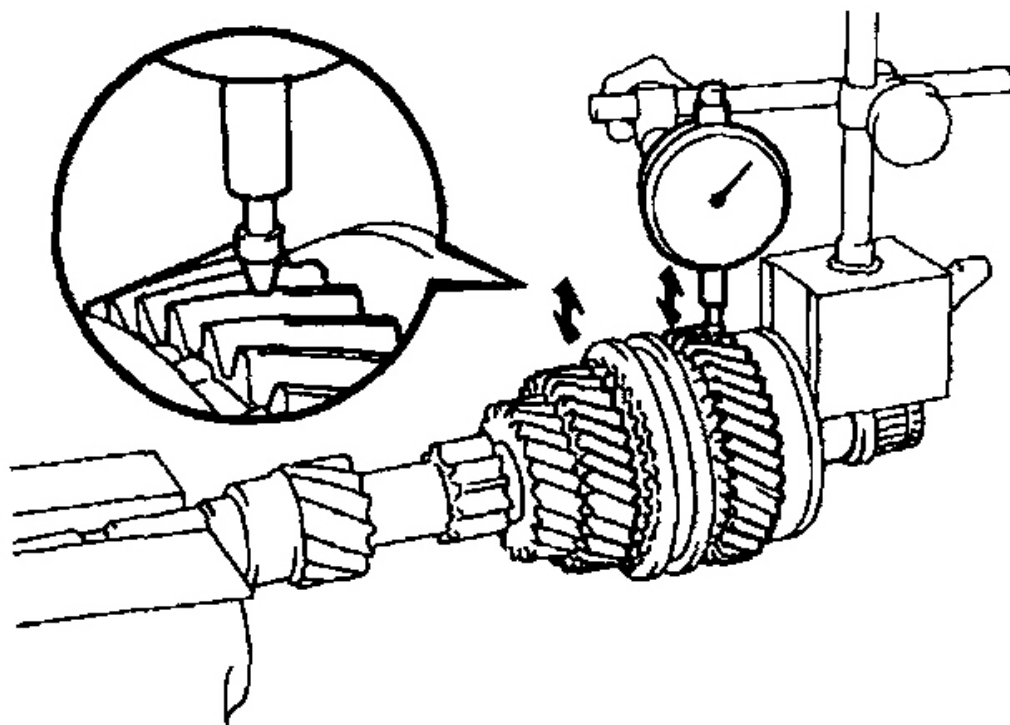
Maximum clearance:

3rd gear: 0.35 mm (0.0138 in.)

4th gear: 0.57 mm (0.0224 in.)

2. CHECK 3RD AND 4TH GEARS RADIAL CLEARANCE

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



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Fig. 70: Measuring Radial Clearance Between Gear & Shaft
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Maximum clearance:

3rd gear: 0.053 mm (0.0021 in.)

4th gear: 0.051 mm (0.0020 in.)

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

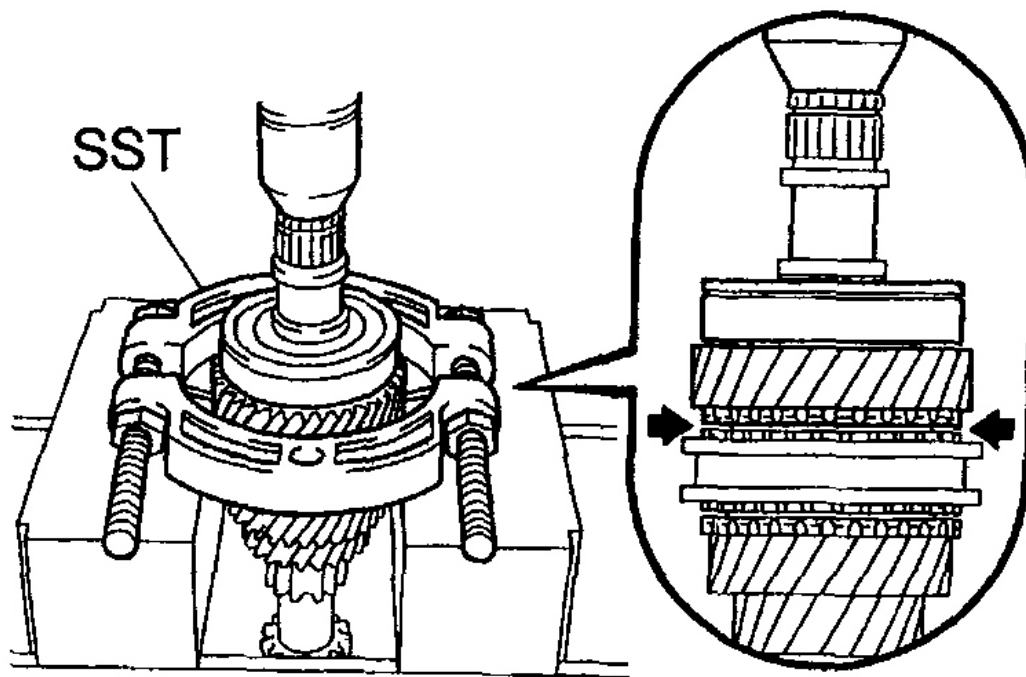
3. REMOVE SNAP RING

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

4. REMOVE REAR BEARING AND 4TH GEAR

Using SST and a press, remove the rear bearing and 4th gear.

SST 09950-00020



G02639852

Fig. 71: Removing Rear Bearing & 4th Gear

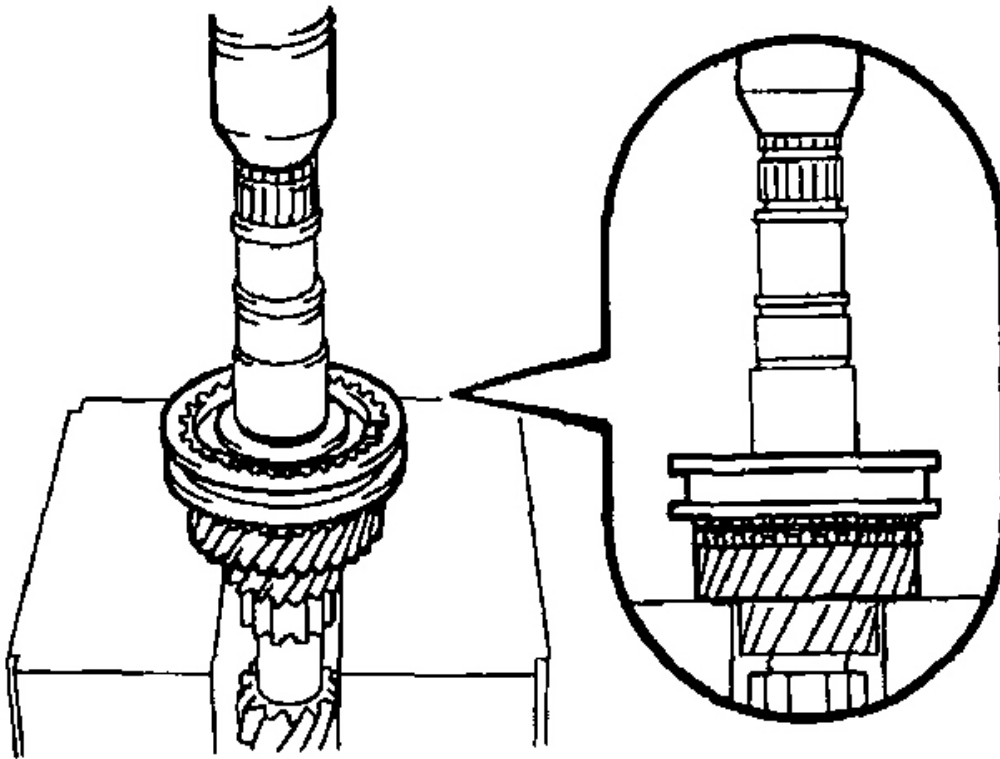
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. **REMOVE 2 NEEDLE ROLLER BEARINGS, SPACER AND SYNCHRONIZER RING**
6. **REMOVE SNAP RING**

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

7. **REMOVE NO. 2 HUB SLEEVE ASSEMBLY, SYNCHRONIZER RING AND 3RD GEAR**

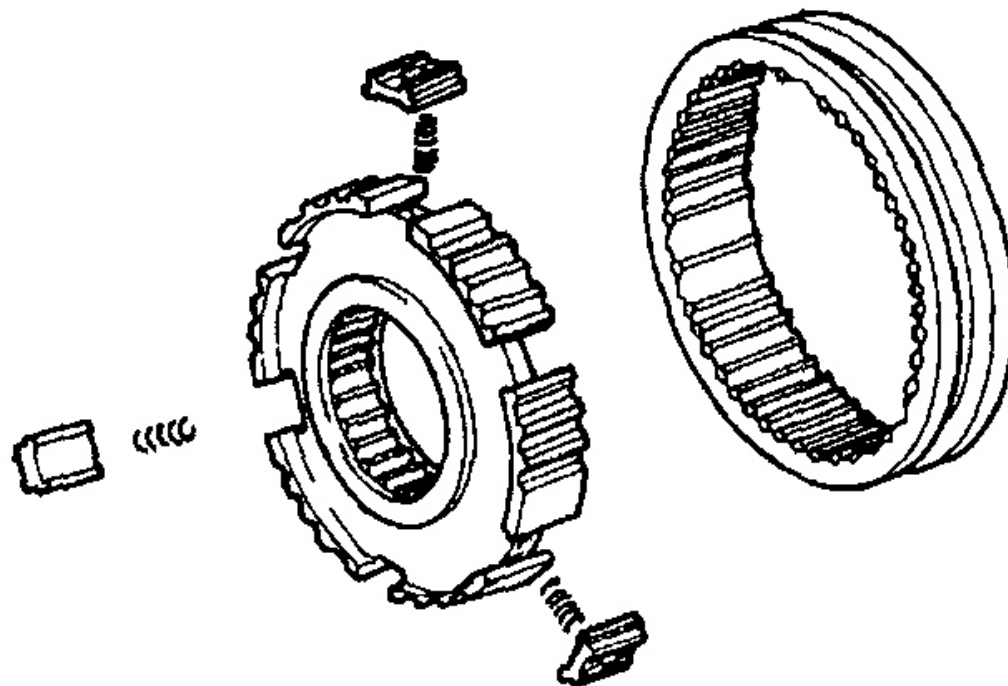
Using a press, remove the No. 2 hub sleeve assembly, synchronizer ring and 3rd gear.



G02639853

Fig. 72: Removing No. 2 Hub Sleeve Assembly, Synchronizer Ring & 3rd Gear
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

8. **REMOVE 2 NEEDLE ROLLER BEARINGS**
9. **DISASSEMBLY NO. 2 HUB SLEEVE ASSEMBLY**
 - a. Remove the No. 2 hub sleeve from the No. 2 clutch hub.
 - b. Remove the 3 shifting keys and springs from the No. 2 clutch hub.



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Fig. 73: Removing No. 2 Hub Sleeve From No. 2 Clutch Hub
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

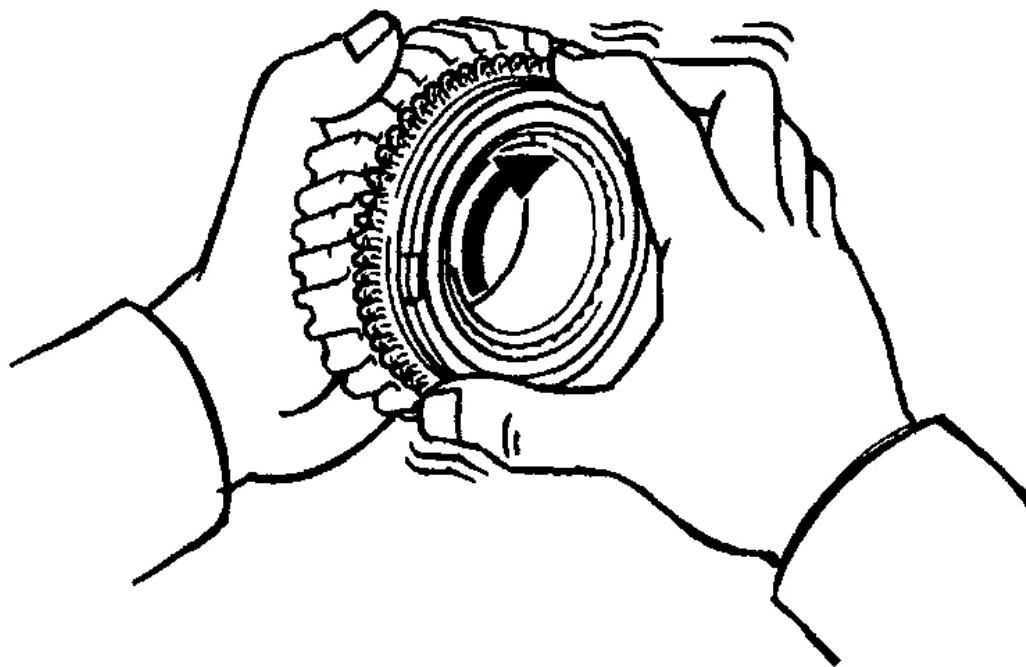
10. REMOVE INPUT SHAFT FRONT BEARING INNER RACE

Using a screwdriver and hammer, remove the input shaft front bearing inner race.

INSPECTION

1. INSPECT GEAR SYNCHRONIZER RING

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



G02639855

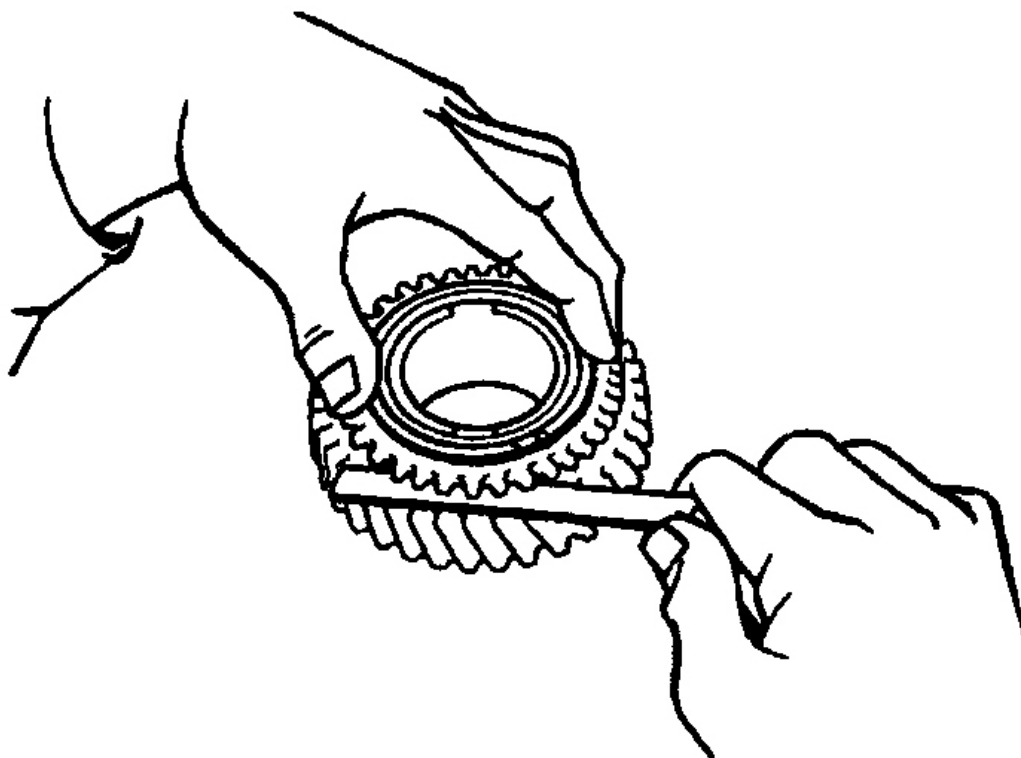
Fig. 74: Turning Synchronizer Ring

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

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



G02639856

Fig. 75: Measuring Clearance Between Synchronizer Ring Back And Spline End
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Minimum clearance:

3rd gear: 0.65 mm (0.0256 in.)

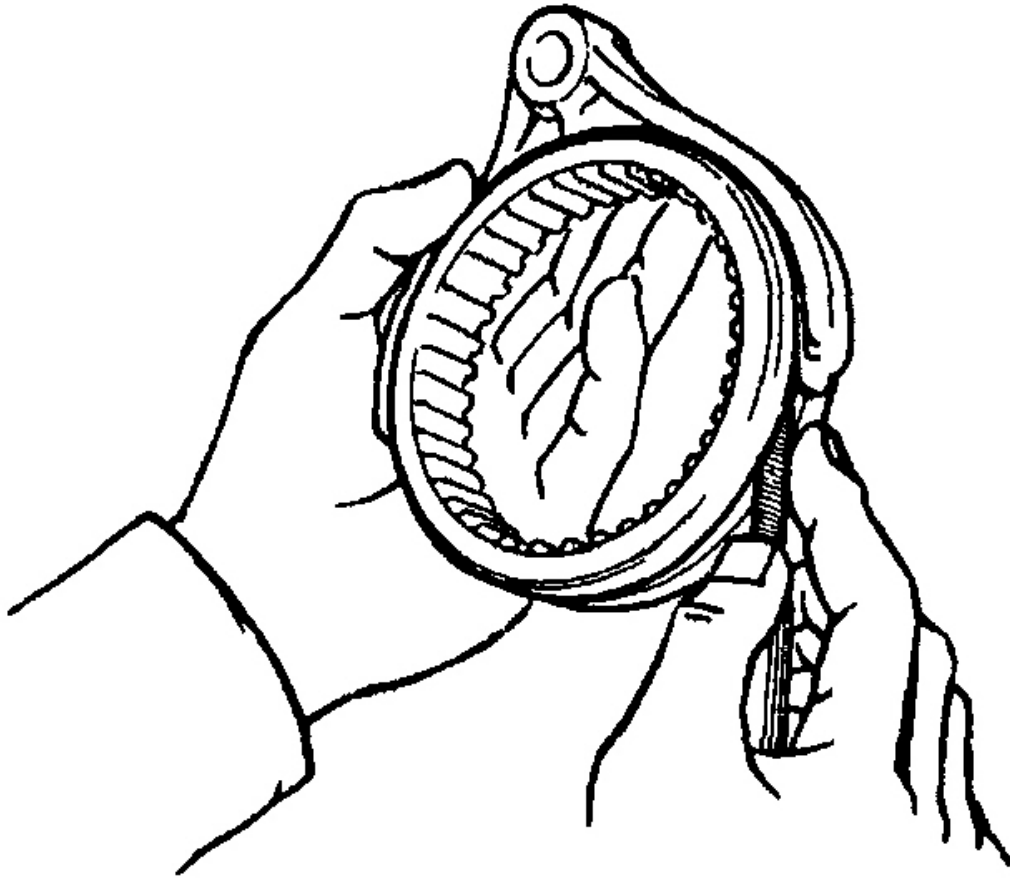
4th gear: 0.75 mm (0.0295 in.)

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.

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

2. MEASURE NO. 2 SHIFT FORK AND HUB SLEEVE CLEARANCE

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



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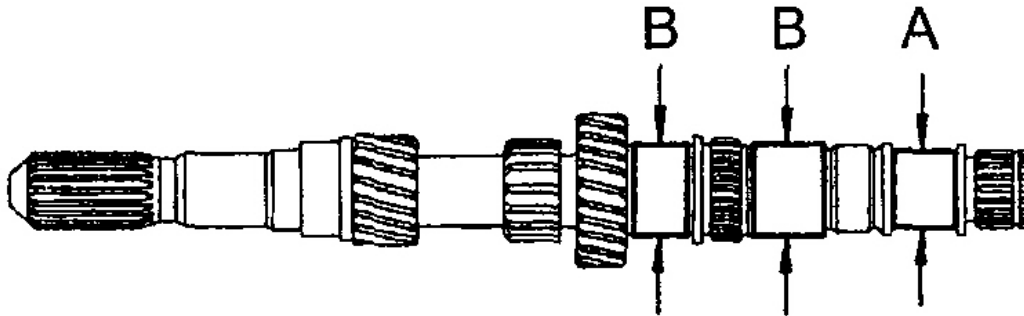
Fig. 76: Measuring Clearance Between Hub Sleeve And Shift Fork
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Maximum clearance: 0.69 mm (0.0272 in.)

If the clearance exceeds the maximum, replace the 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.



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Fig. 77: Measuring Outer Diameter Of Input Shaft Journal Surface
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

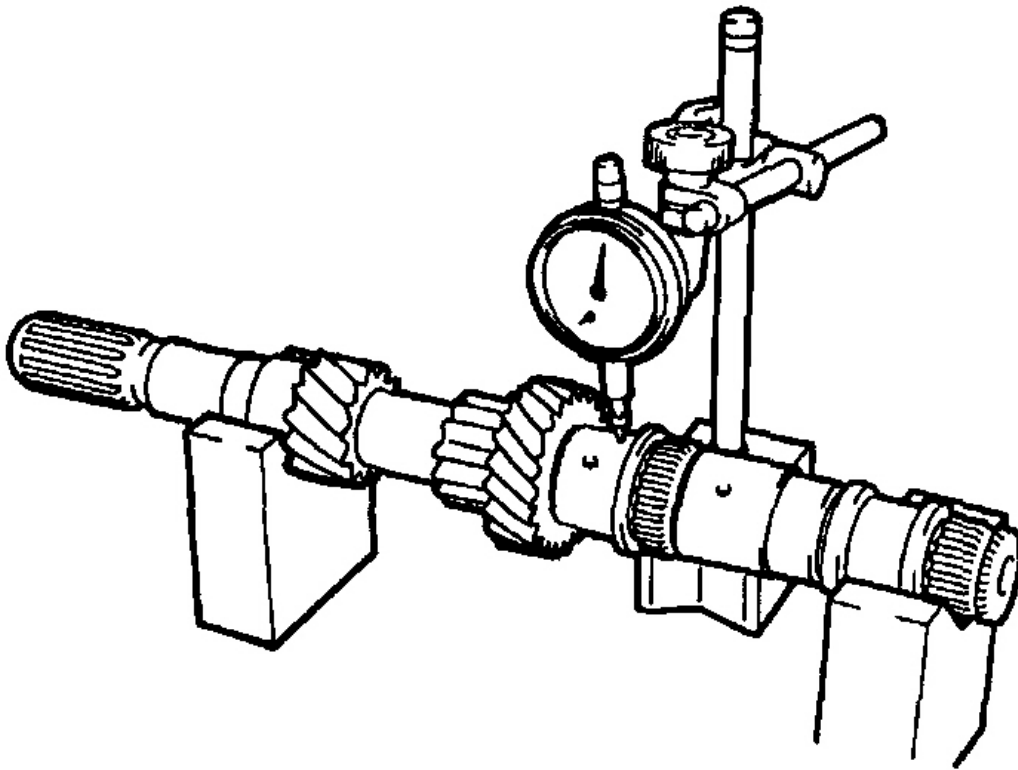
Minimum outer diameter:

Part A: 27.957 mm (1.1007 in.)

Part B: 35.984 mm (1.4167 in.)

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

Maximum runout: 0.03 mm (0.0012 in.)



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Fig. 78: Checking Shaft Runout

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

REASSEMBLY

HINT:

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

1. INSTALL INPUT SHAFT FRONT BEARING INNER RACE

Using SST and a press, install a new input shaft front bearing inner race.

SST 09608-00071

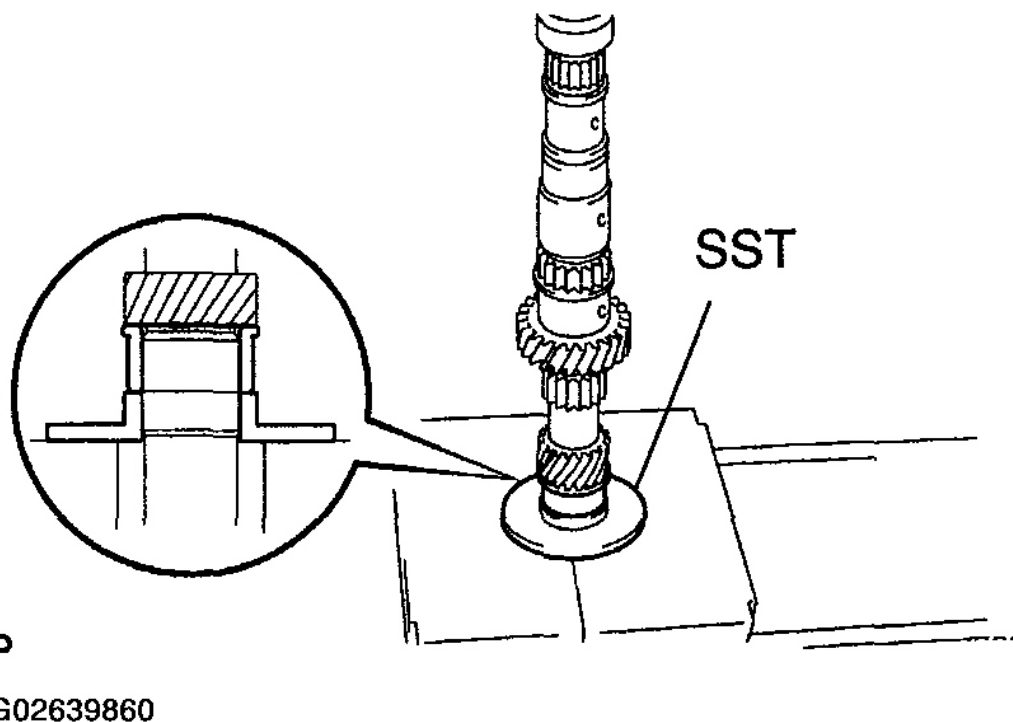
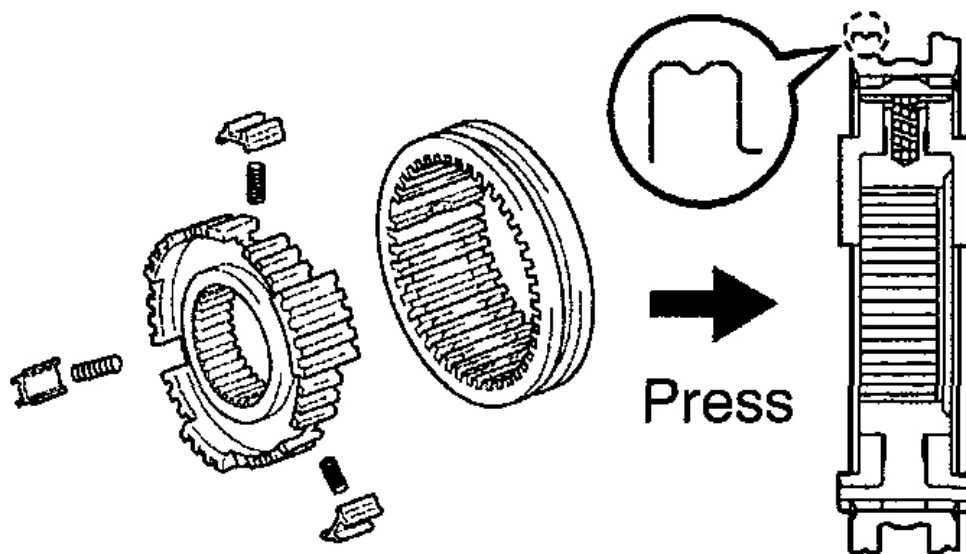


Fig. 79: Installing Input Shaft Front Bearing Inner Race
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

- a. Install the 3 springs and shifting keys to the clutch hub.
- b. Install the hub sleeve to the clutch hub.

NOTE: **Assembly the hub sleeve and clutch hub in the direction shown in Fig. 80 .**



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Fig. 80: Installing Springs And Shifting Keys To Clutch Hub
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. **INSTALL NEEDLE ROLLER BEARING, 3RD GEAR, SYNCHRONIZER RING AND NO. 2 HUB SLEEVE ASSEMBLY TO INPUT SHAFT**
 - a. Apply MP grease to the needle roller bearing and install it.
 - b. Install the 3rd gear.
 - c. Place the synchronizer ring on the gear and align the ring slots with the shifting keys.
 - d. Using SST and a press, install the No. 2 hub sleeve assembly.

SST 09506-35010

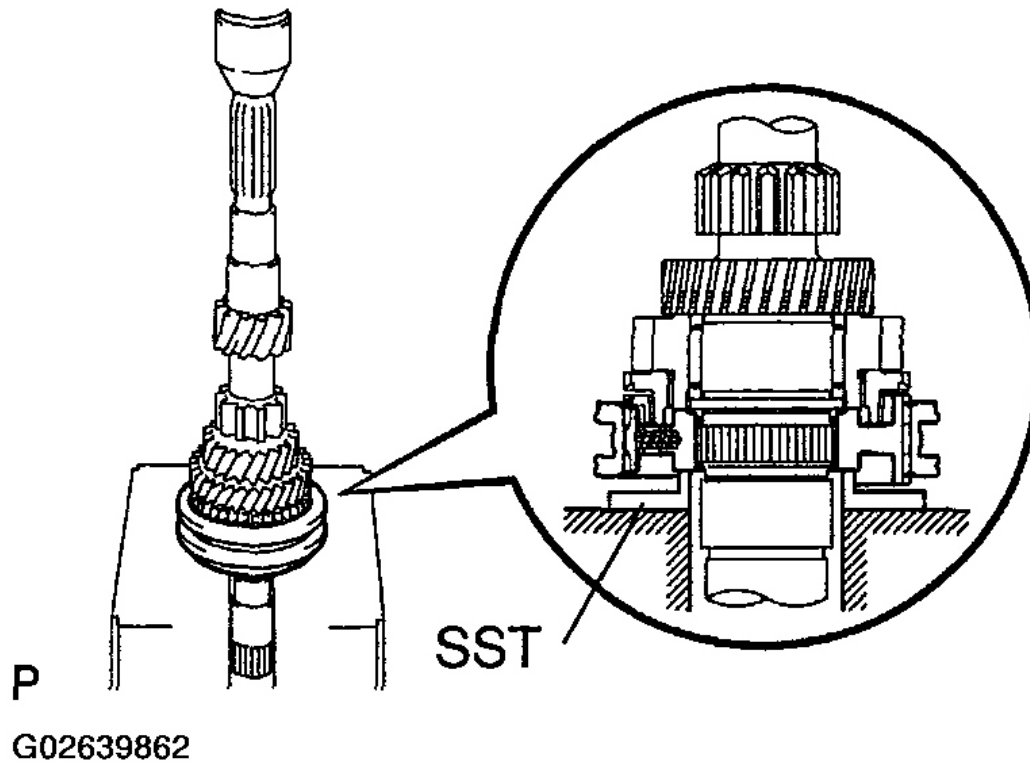


Fig. 81: Installing No. 2 Hub Sleeve Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. INSTALL SNAP RING

- a. Select a snap ring that allows the minimum axial play.

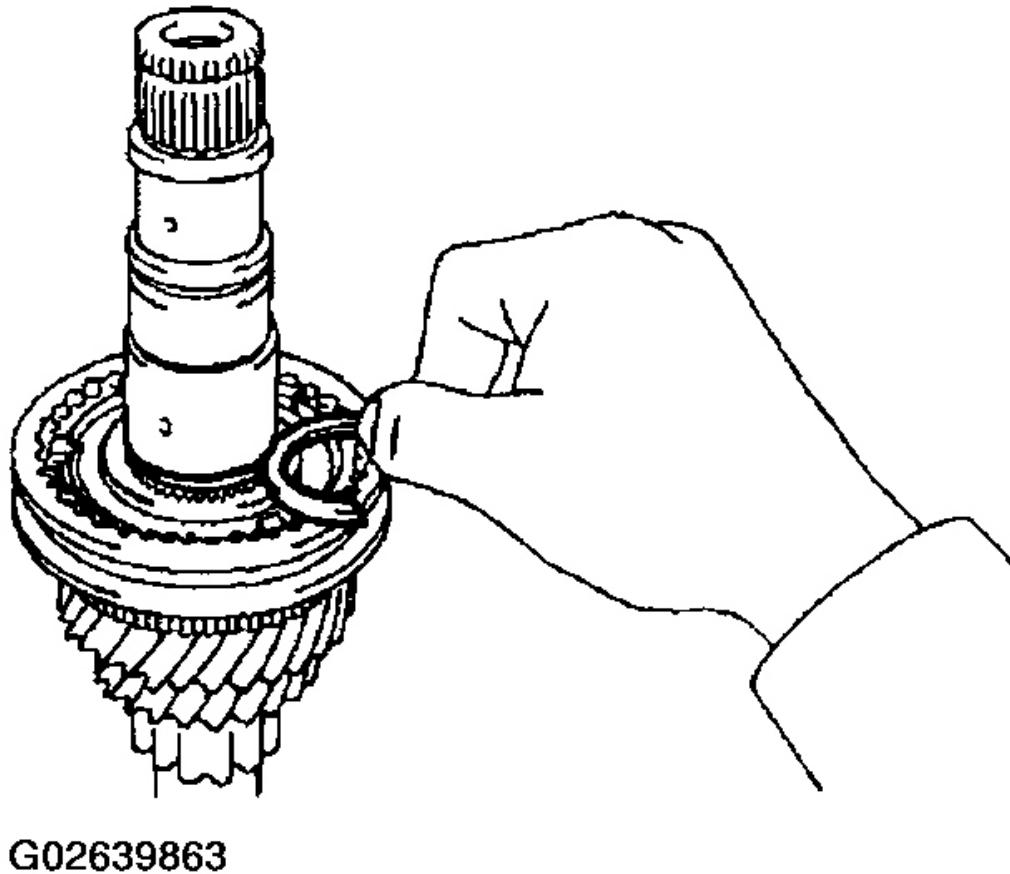


Fig. 82: Selecting Snap Ring

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

SNAP RING THICKNESS SPECIFICATION CHART

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
H	2.30 (0.0906)	M	2.50 (0.0984)
J	2.35 (0.0925)	N	2.55 (0.1004)
K	2.40 (0.0945)	P	2.60 (0.1024)
L	2.45 (0.0965)	-	-

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

5. **MEASURE 3RD GEAR THRUST CLEARANCE (See DISASSEMBLY)**
6. **INSTALL SPACER, SYNCHRONIZER RING, NEEDLE ROLLER BEARING, 4TH GEAR AND REAR BEARING**

- a. Install the spacer.
- b. Apply MP grease to the 2 needle roller bearings and install it.
- c. Place the synchronizer ring on the gear and align the ring slots with the shifting keys.
- d. Install the 4th gear.
- e. Using SST and a press, install the rear bearing.

SST 09309-36010

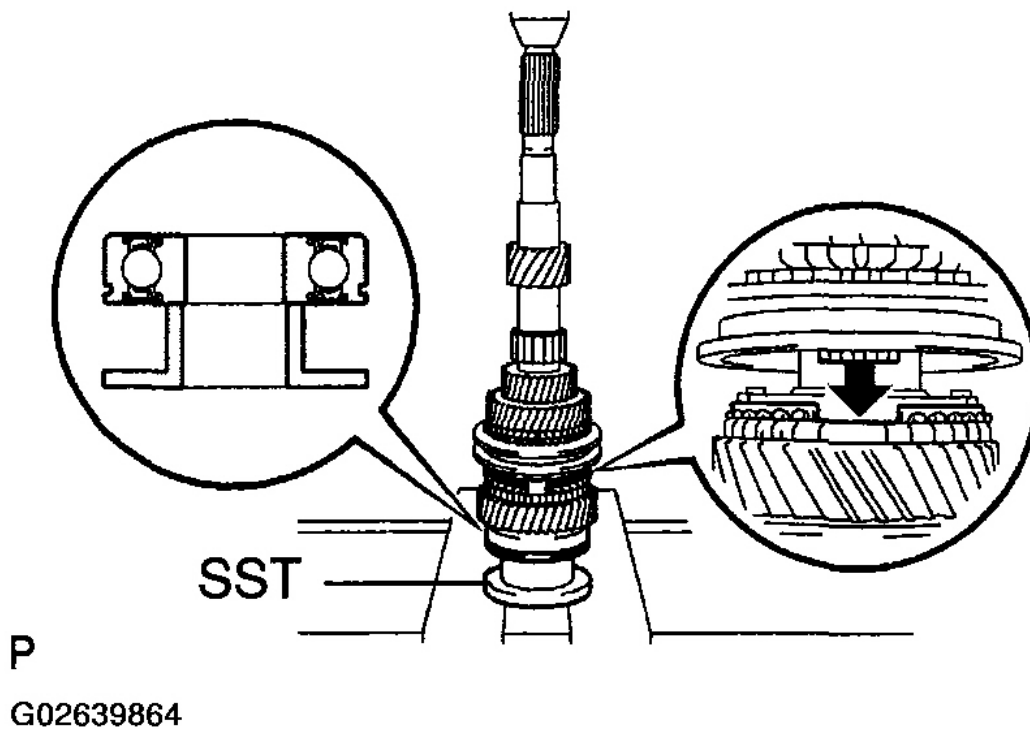
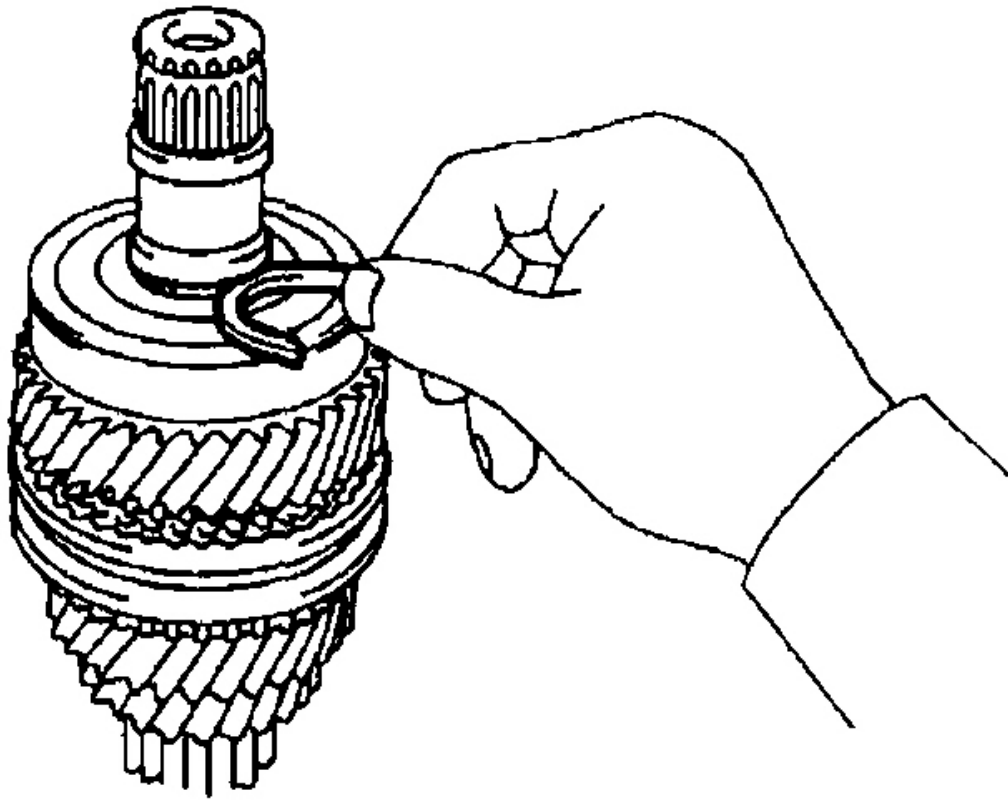


Fig. 83: Installing Rear Bearing

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

7. INSTALL SNAP RING

- a. Select a snap ring that allows the minimum axial play.



G02639865

Fig. 84: Selecting Snap Ring

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

SNAP RING THICKNESS SPECIFICATION CHART

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
1	2.35 (0.0925)	5	2.55 (0.1004)
2	2.40 (0.0945)	6	2.60 (0.1024)
3	2.45 (0.0965)	7	2.65 (0.1043)
4	2.50 (0.0984)	8	2.70 (0.1063)

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

8. MEASURE 4TH GEAR THRUST CLEARANCE (See DISASSEMBLY)**OUTPUT SHAFT**

COMPONENTS

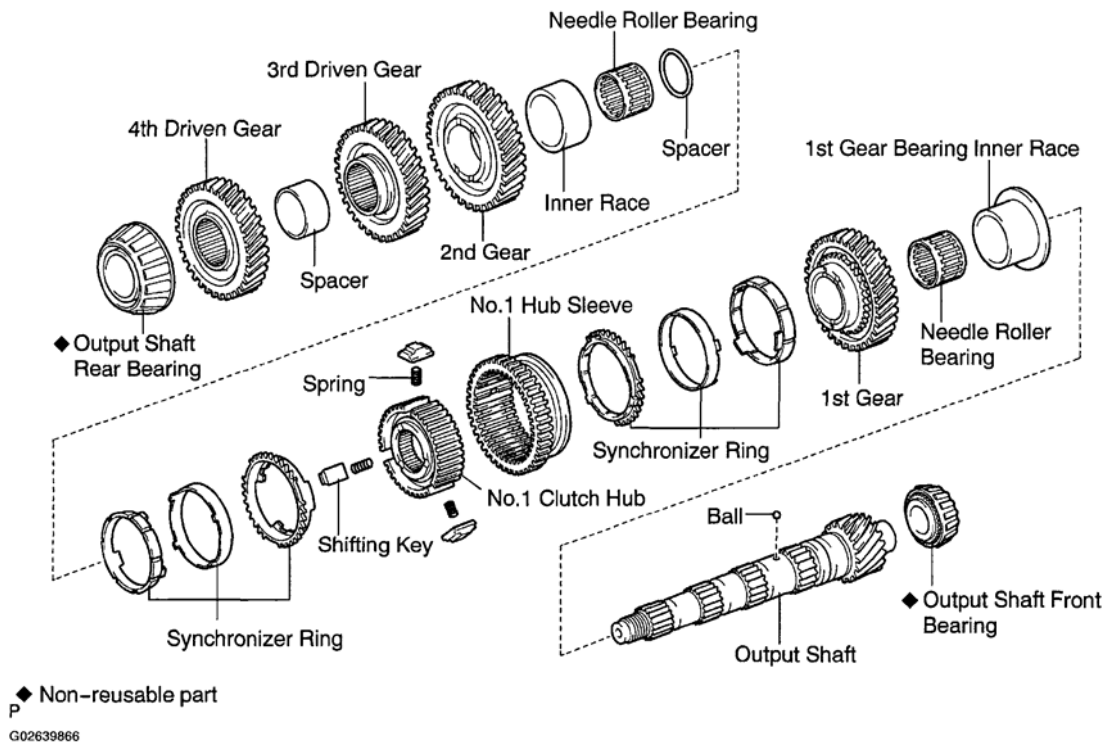
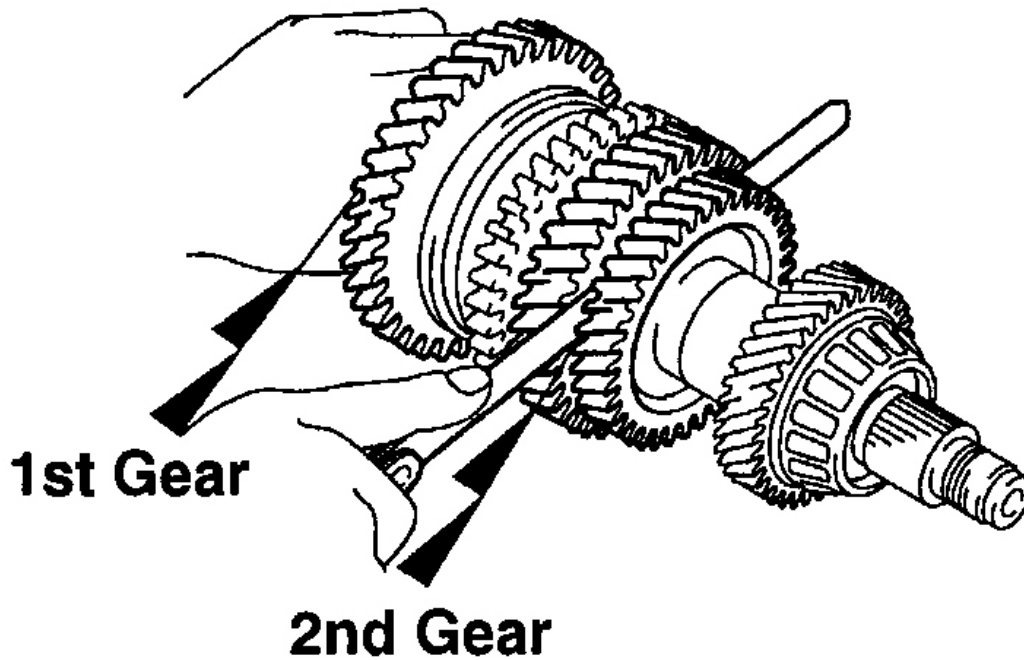


Fig. 85: Exploded View Of Output Shaft Components
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

DISASSEMBLY

1. MEASURE 1ST AND 2ND GEARS THRUST CLEARANCE

Using a feeler gauge, measure the thrust clearance.



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Fig. 86: Measuring Thrust Clearance

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

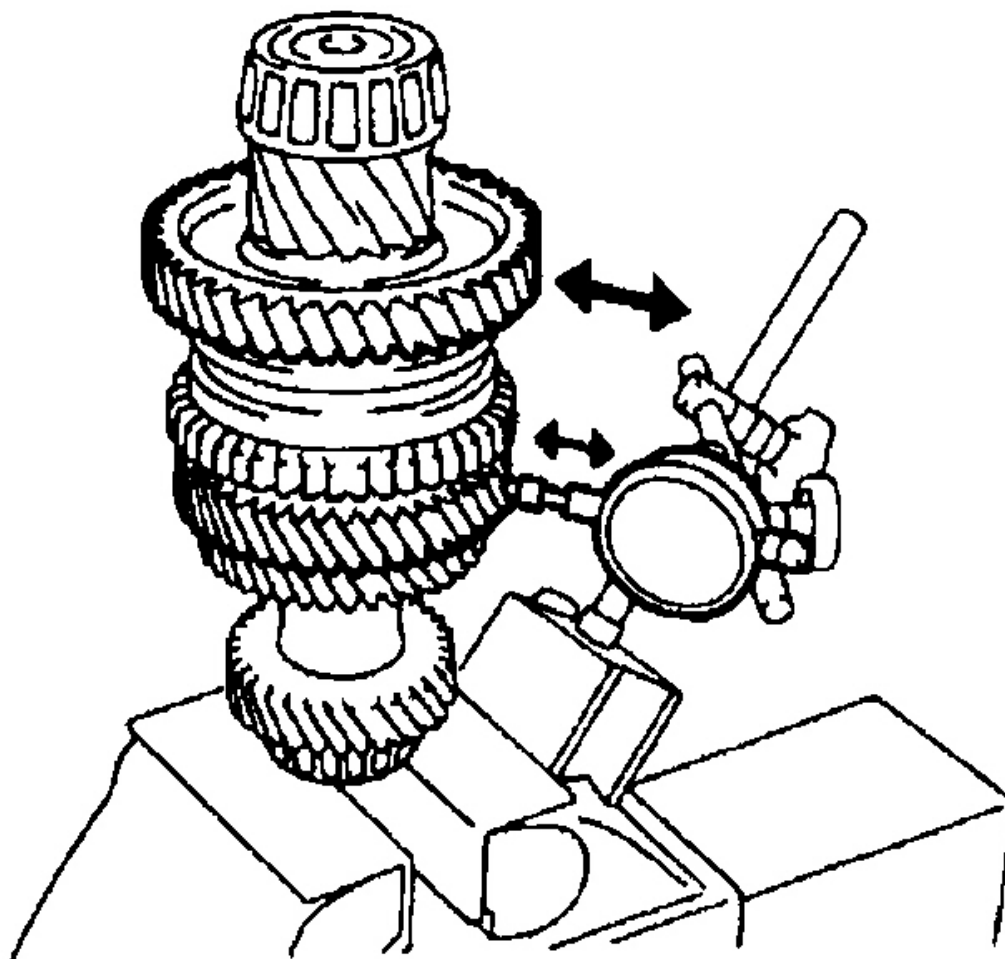
Maximum clearance:

1st gear: 0.40 mm (0.0157 in.)

2nd gear: 0.35 mm (0.0138 in.)

2. CHECK 1ST AND 2ND GEARS RADIAL CLEARANCE

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



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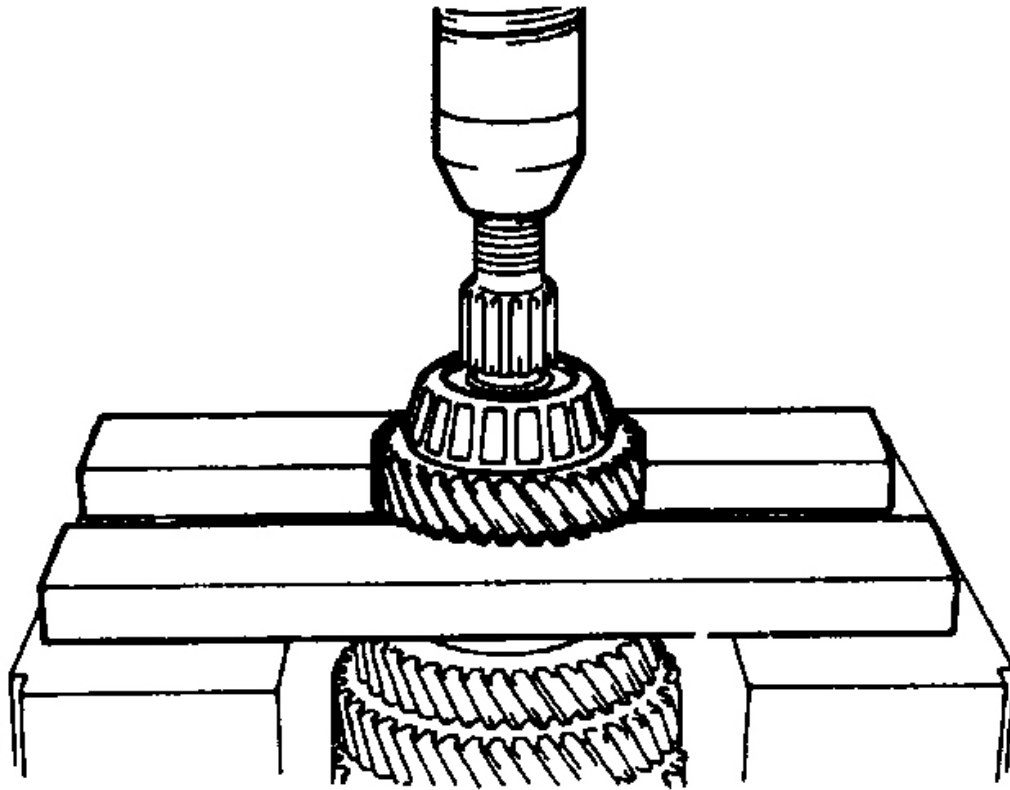
Fig. 87: Measuring Radial Clearance Between Gear And Shaft
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Maximum clearance:

1st and 2nd gears: 0.053 mm (0.0021 in.)

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

- 3. REMOVE OUTPUT SHAFT REAR BEARING, 4TH DRIVEN GEAR AND SPACER**
 - a. Using a press, remove the bearing and 4th driven gear.



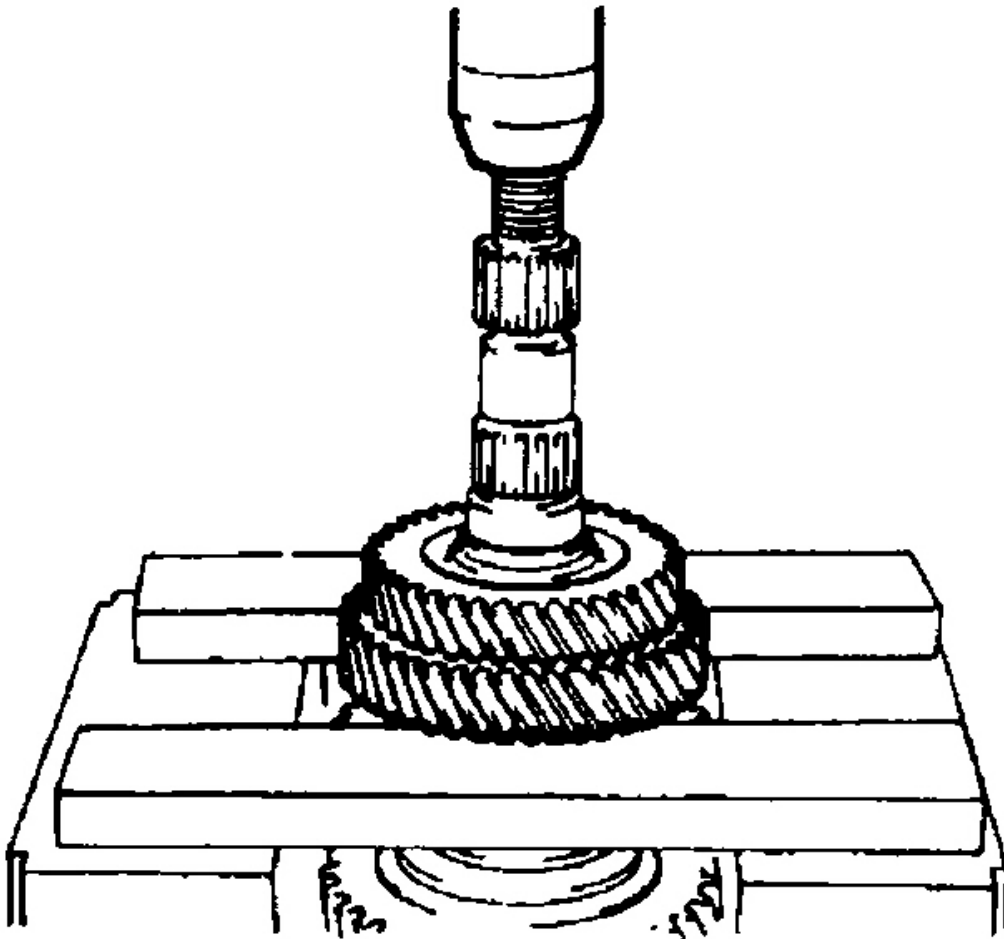
G02639869

Fig. 88: Removing Bearing And 4th Driven Gear
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

b. Remove the spacer.

4. REMOVE 3RD DRIVEN GEAR AND 2ND GEAR

Using a press, remove the 3rd driven gear and 2nd gear.

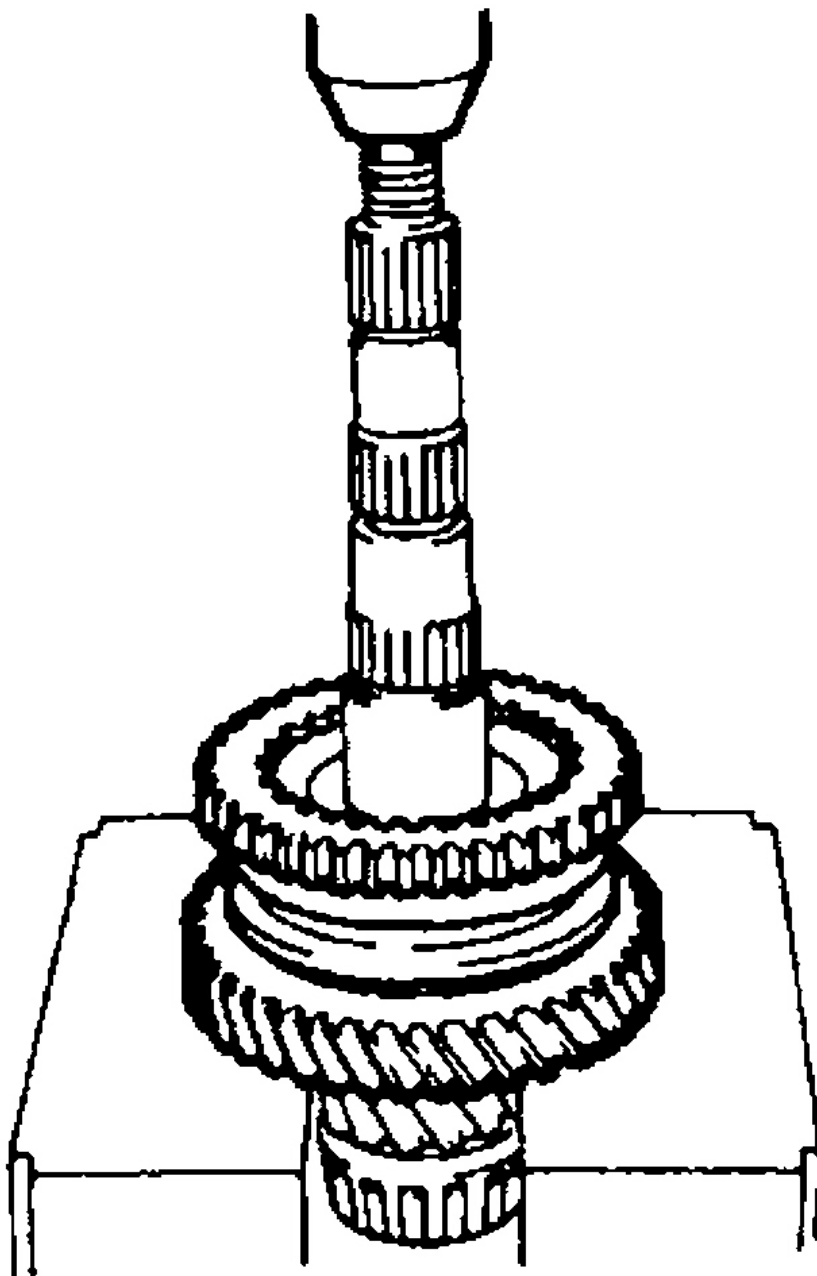


G02639870

Fig. 89: Removing 3rd Driven Gear And 2nd Gear
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. REMOVE NEEDLE ROLLER BEARING, SPACER AND SYNCHRONIZER RINGS
6. REMOVE INNER RACE AND BALL FROM OUTPUT SHAFT
7. REMOVE NO. 1 HUB SLEEVE ASSEMBLY AND 1ST GEAR

Using a press, remove the No. 1 hub sleeve and 1st gear.



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Fig. 90: Removing No. 1 Hub Sleeve & 1st Gear
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

8. REMOVE SYNCHRONIZER RINGS AND NEEDLE ROLLER BEARING

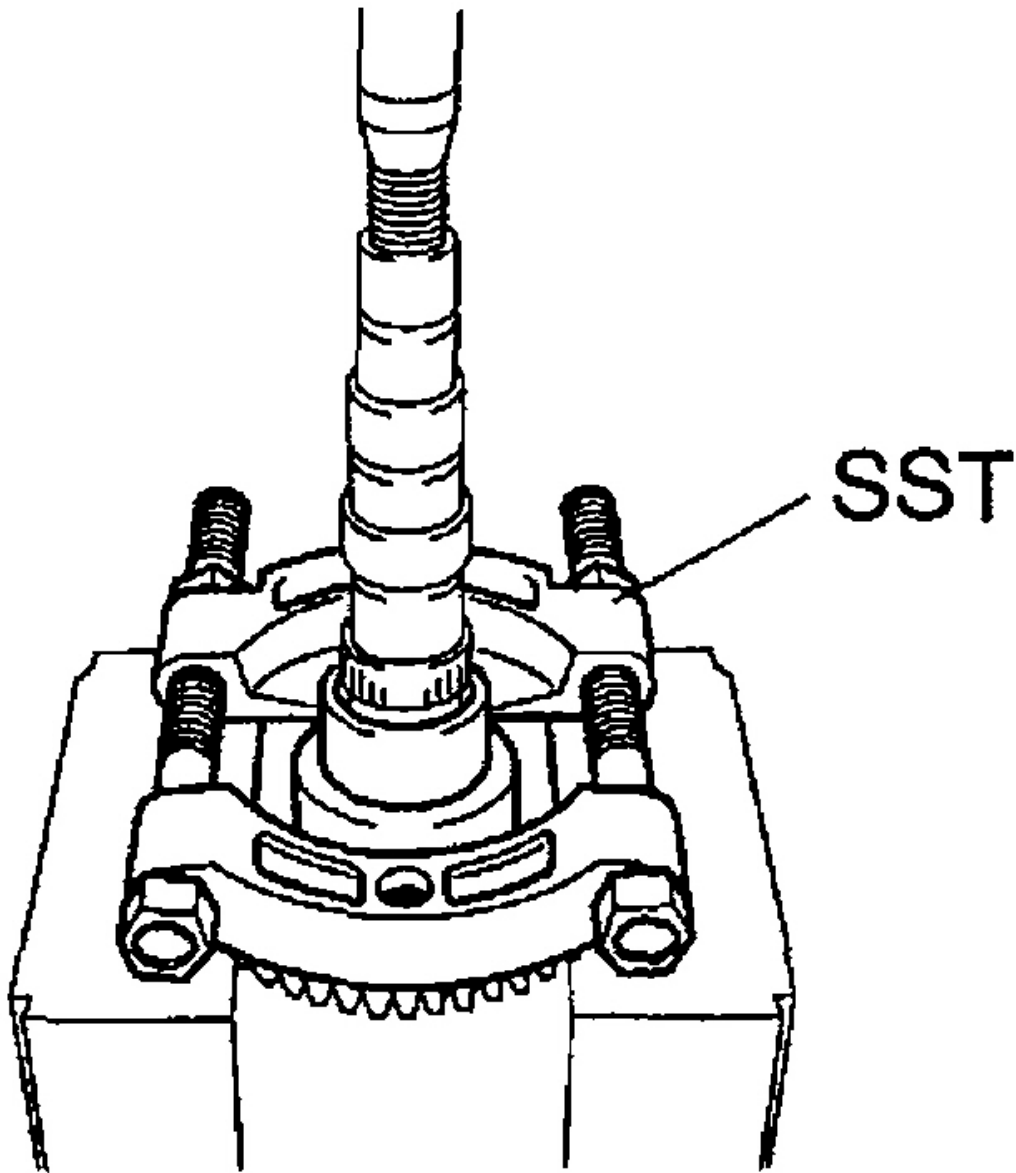
2004 Toyota RAV4

2004 TRANSMISSION Manual Transaxle - RAV4

9. REMOVE 1ST GEAR BEARING INNER RACE

Using SST and a press, remove the 1st gear bearing inner race.

SST 09950-00020



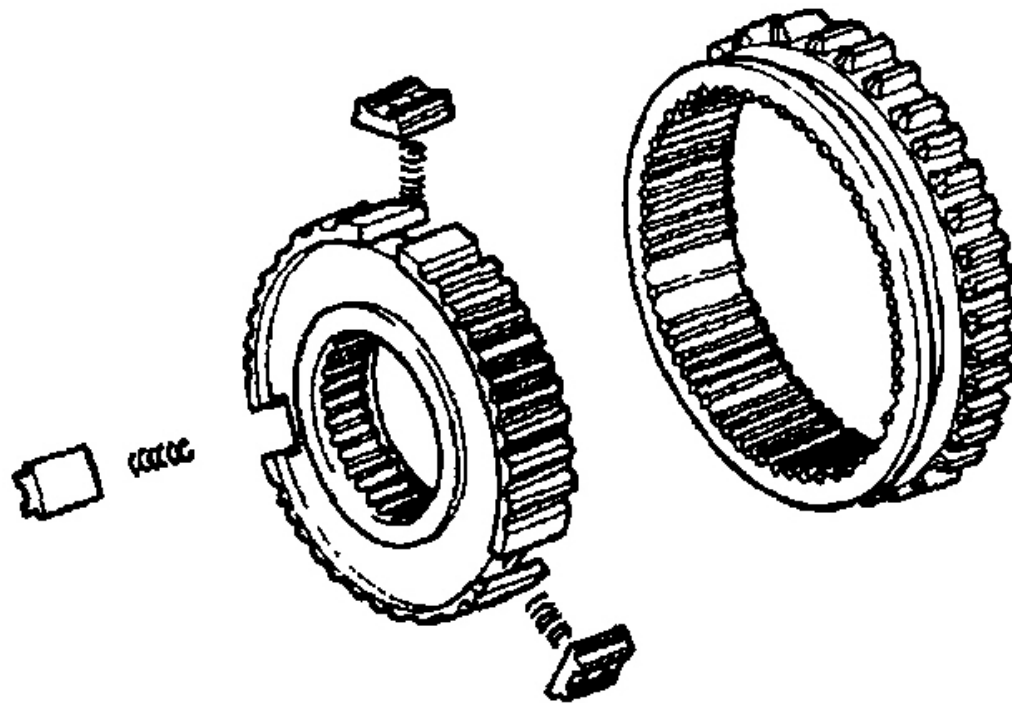
G02639872

Fig. 91: Removing 1st Gear Bearing Inner Race
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

10. DISASSEMBLY NO. 1 HUB SLEEVE ASSEMBLY

- a. Remove the No. 1 hub sleeve from the No. 1 clutch hub.

- b. Remove the 3 shifting keys and springs from the No. 1 clutch hub.



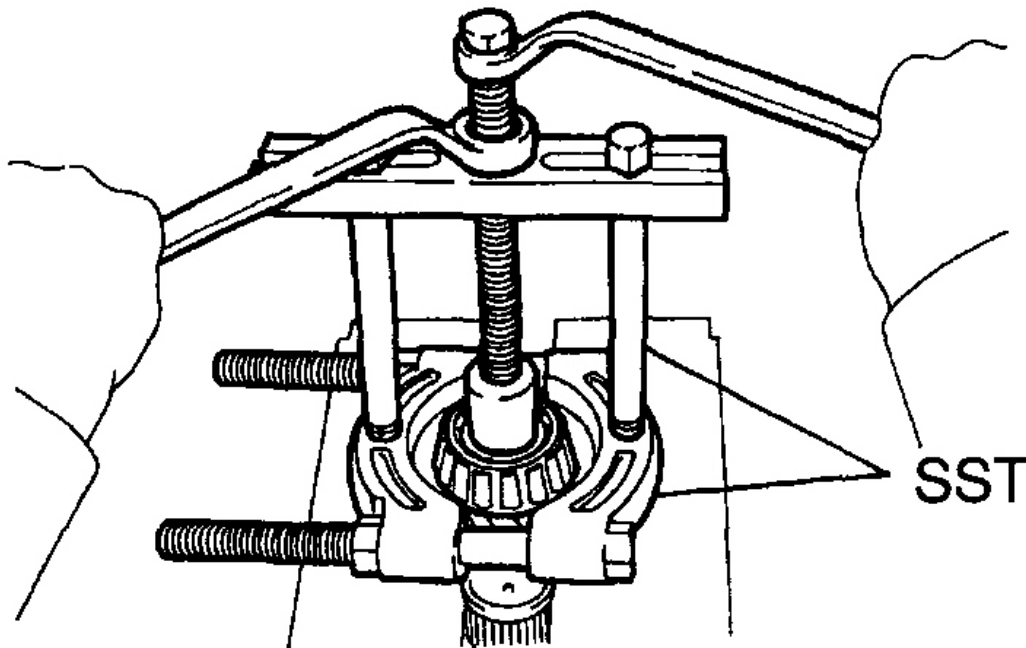
G02639873

Fig. 92: Removing Shifting Keys And Springs From No. 1 Clutch Hub
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

11. REMOVE OUTPUT SHAFT FRONT BEARING

Using SST, remove the output shaft front bearing.

SST 09950-00020,09950-00030



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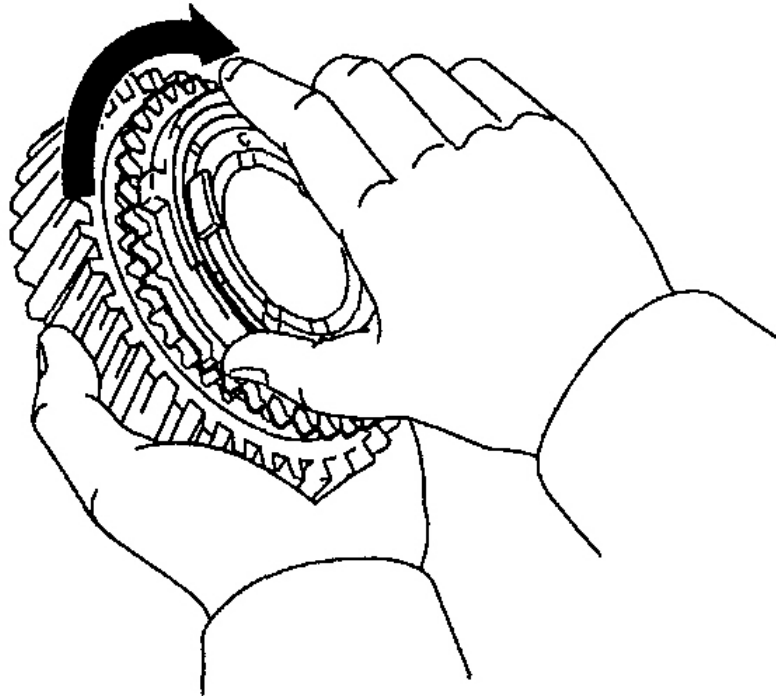
Fig. 93: Removing Output Shaft Front Bearing
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION

1. INSPECT GEAR SYNCHRONIZER RINGS

- Check for wear or damage.
- Check the braking effect of the synchronizer ring.

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



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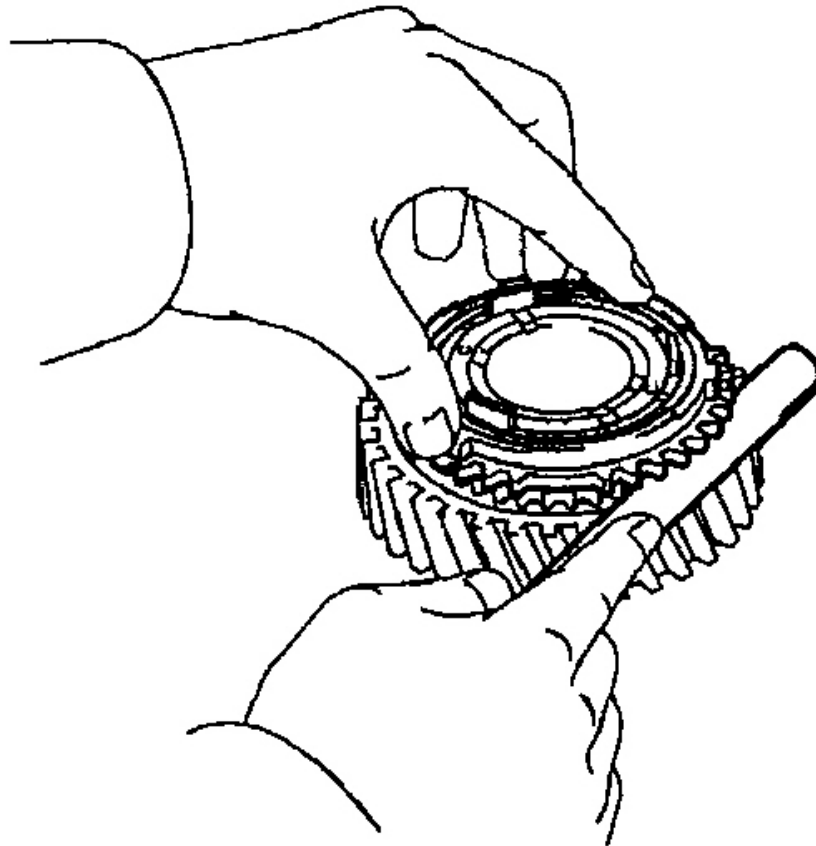
G02639875

Fig. 94: Turning Synchronizer Ring

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

If it does not lock, replace the synchronizer ring.

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



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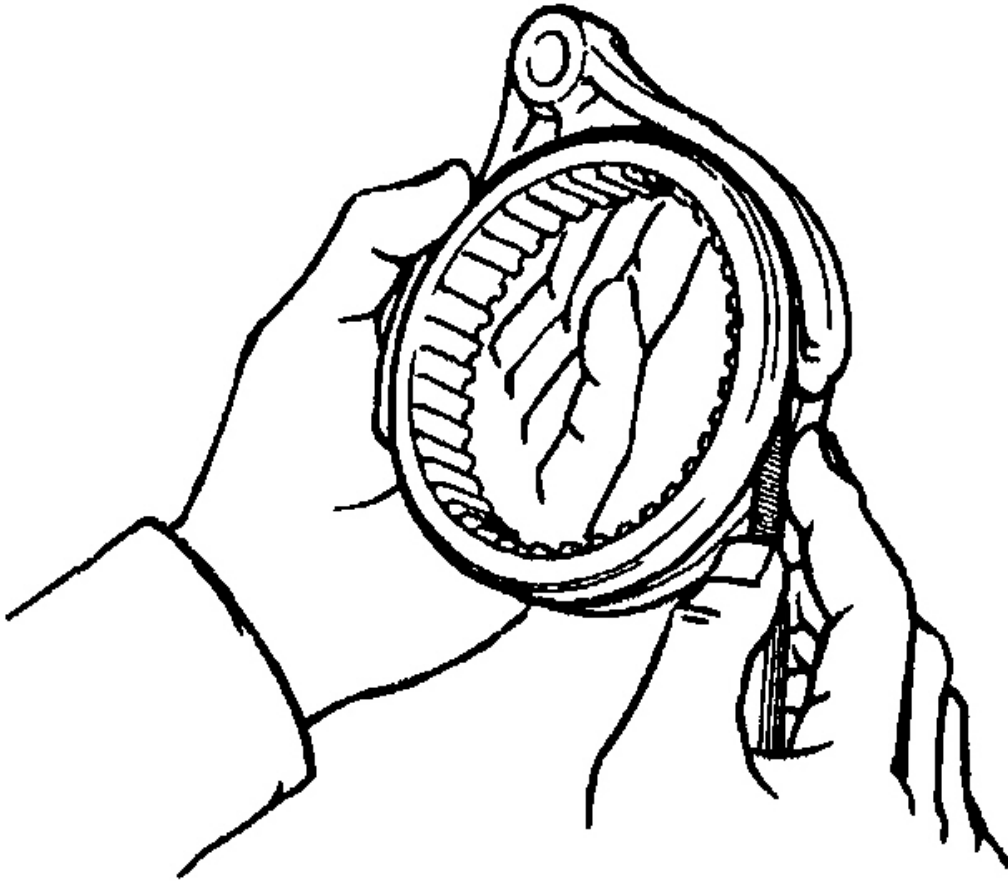
Fig. 95: Measuring Clearance Between Synchronizer Ring Back And Gear Spline End
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Minimum clearance: 0.7 mm (0.028 in.)

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

2. MEASURE NO. 1 SHIFT FORK AND HUB SLEEVE CLEARANCE

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



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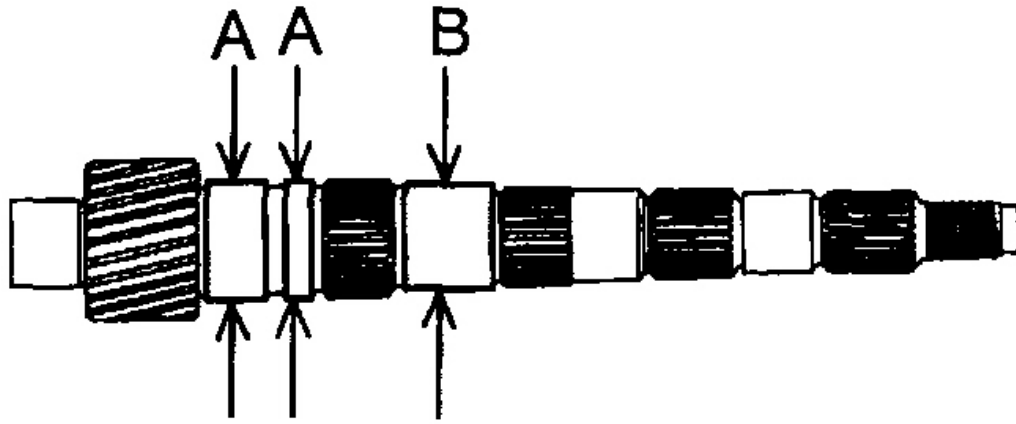
Fig. 96: Measuring Clearance Between Hub Sleeve And Shift Fork
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Maximum clearance: 0.35 mm (0.0138 in.)

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

3. 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.



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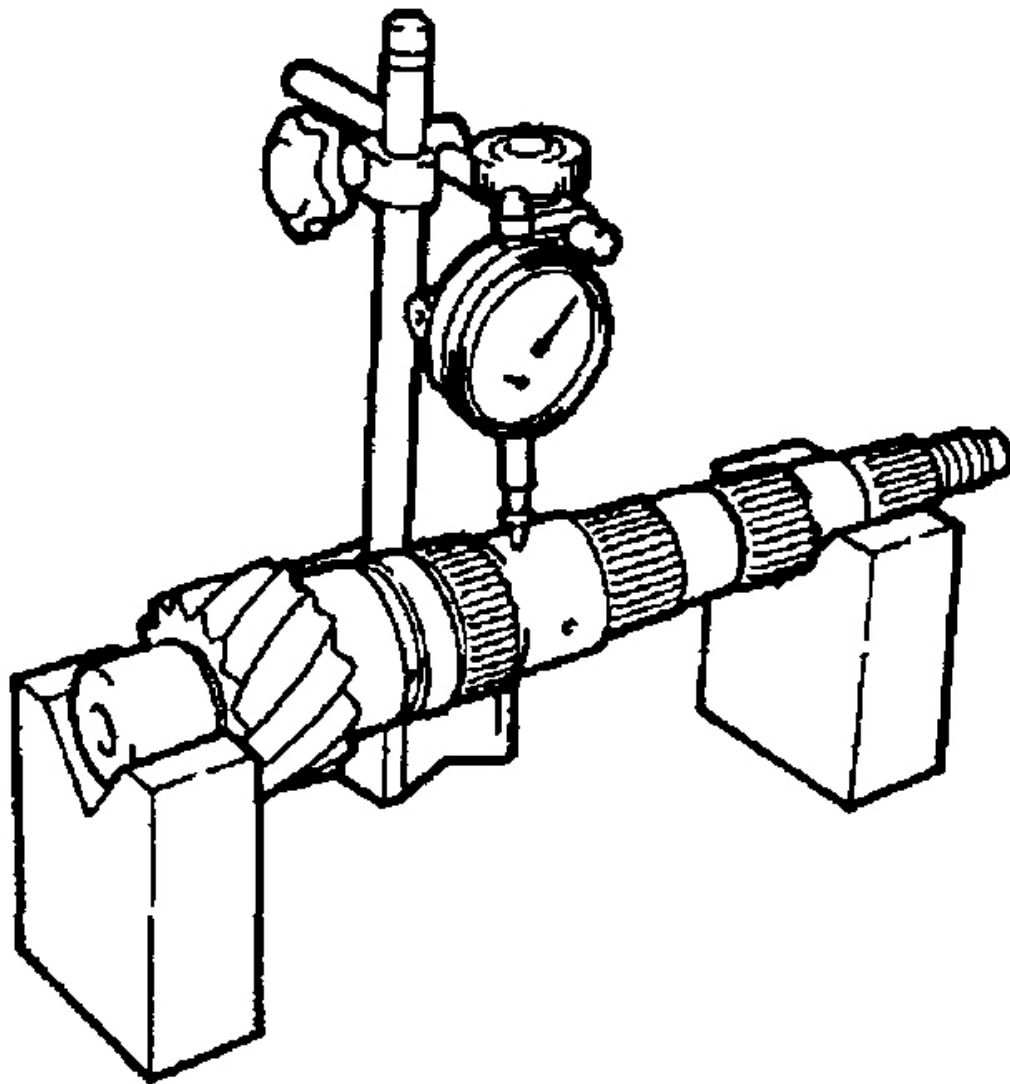
Fig. 97: Measuring Outer Diameter Of Output Shaft Journal Surface
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Minimum outer diameter:

Part A: 37.610 mm (1.4807 in.)

Part B: 34.502 mm (1.3583 in.)

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



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Fig. 98: Checking Shaft Runout

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

Maximum runout: 0.03 mm (0.0012 in.)

REASSEMBLY

HINT:

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

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

- a. Install the 3 springs and shifting keys to the clutch hub.

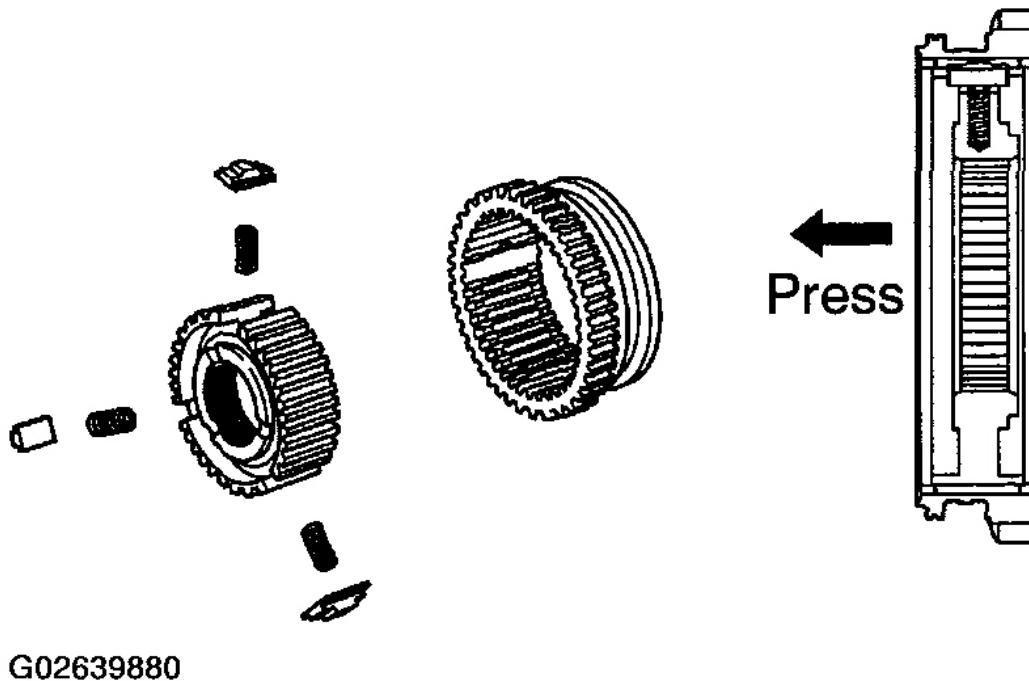


Fig. 99: Installing Springs And Shifting Keys To Clutch Hub
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Install the hub sleeve to the clutch hub.

NOTE: Assemble the clutch hub and hub sleeve in the direction shown in **Fig. 99** .

2. INSTALL 1ST GEAR BEARING INNER RACE

Using SST and a press, install the 1st gear bearing inner race.

SST 09506-35010

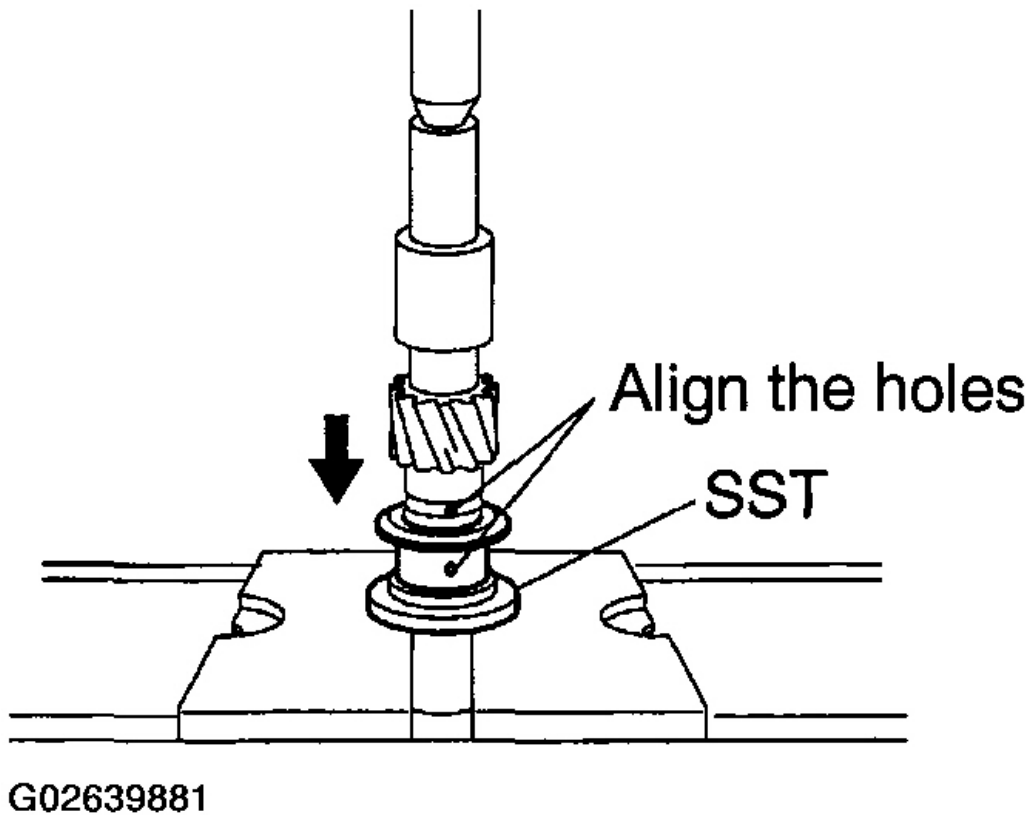
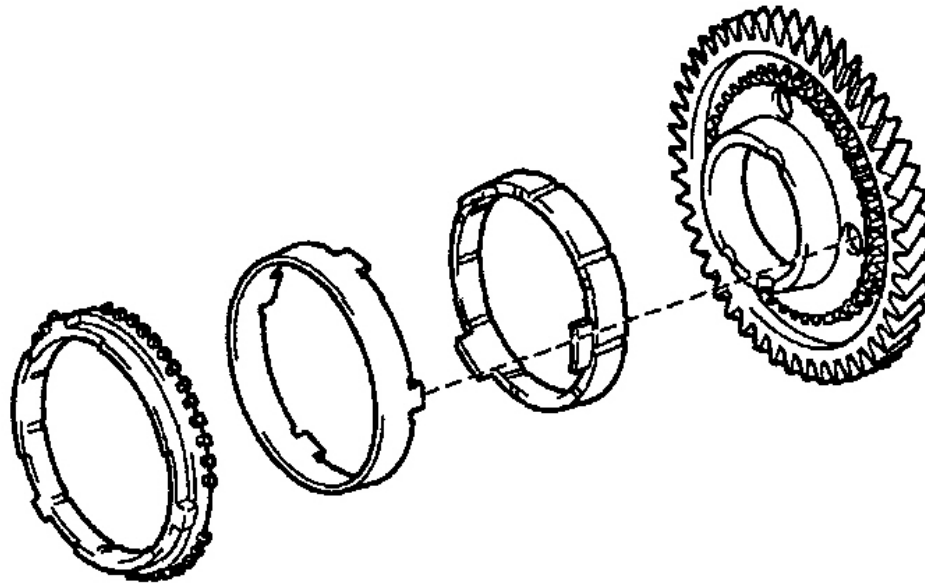


Fig. 100: Installing 1st Gear Bearing Inner Race
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

Align the hole of the output shaft and inner race.

3. **INSTALL NEEDLE ROLLER BEARING, 1ST GEAR, SYNCHRONIZER RINGS AND NO. 1 HUB SLEEVE TO OUTPUT SHAFT**
 - a. Apply MP grease to the needle roller bearing and install it.
 - b. Place the synchronizer rings on the 1st gear.



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Fig. 101: Placing Synchronizer Rings On 1st Gear
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Install the 1st gear.
- d. Using SST and a press, install the 1st gear and No. 1 hub sleeve.

SST 09316-60011 (09316-00041)

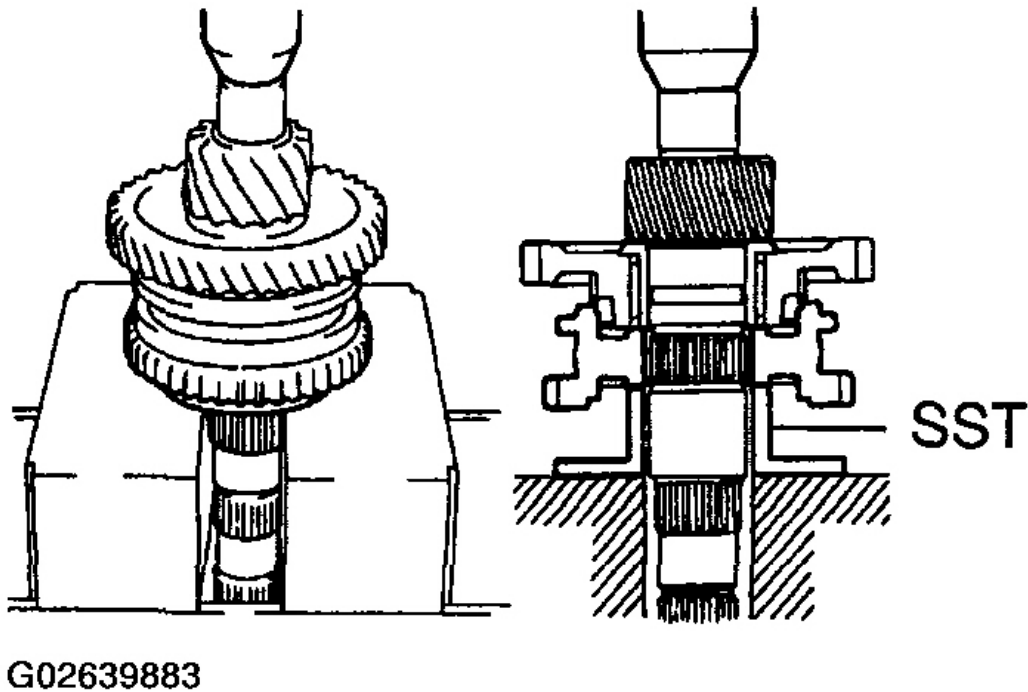
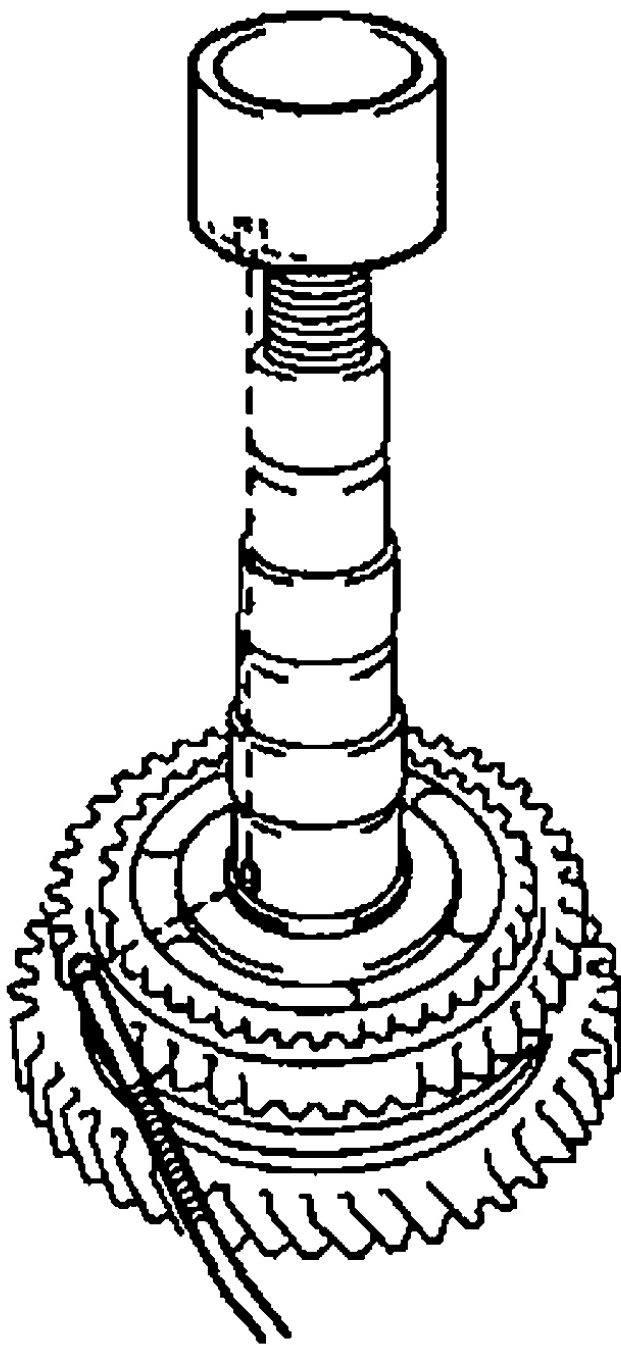


Fig. 102: Installing 1st Gear And No. 1 Hub Sleeve
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. MEASURE 1ST GEAR THRUST CLEARANCE (See DISASSEMBLY)
5. INSTALL BALL AND INNER RACE TO OUTPUT SHAFT

HINT:

Align the groove of the inner race and ball.



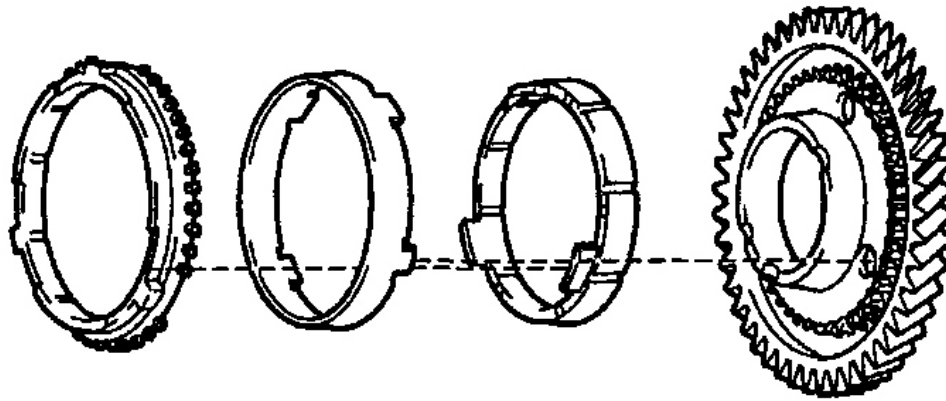
G02639884

Fig. 103: Aligning Groove Of Inner Race And Ball
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

6. INSTALL SPACER, NEEDLE ROLLER BEARING, SYNCHRONIZER RINGS, 2ND GEAR

AND 3RD DRIVEN GEAR

- a. Install the spacer.
- b. Apply MP grease to the needle roller bearing.
- c. Place the synchronizer rings on the 2nd gear.

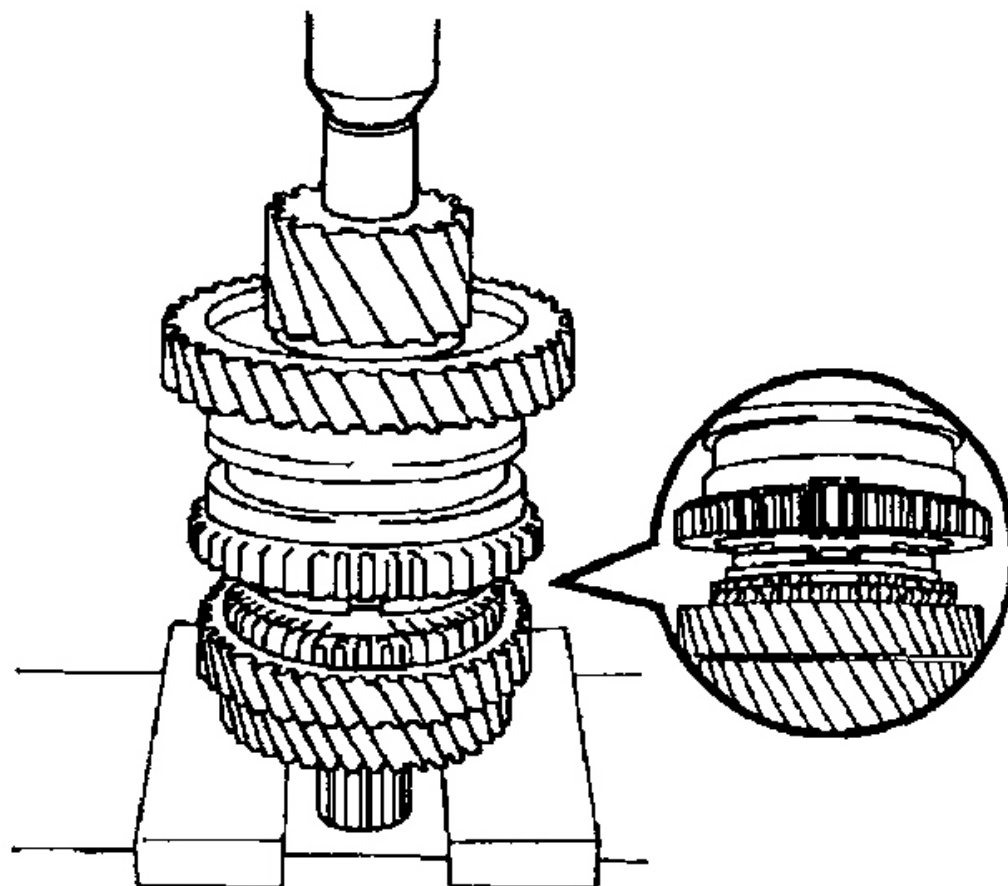


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G02639885

Fig. 104: Placing Synchronizer Rings On 2nd Gear
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Install the 2nd gear.
- e. Using a press, install the 3rd driven gear.



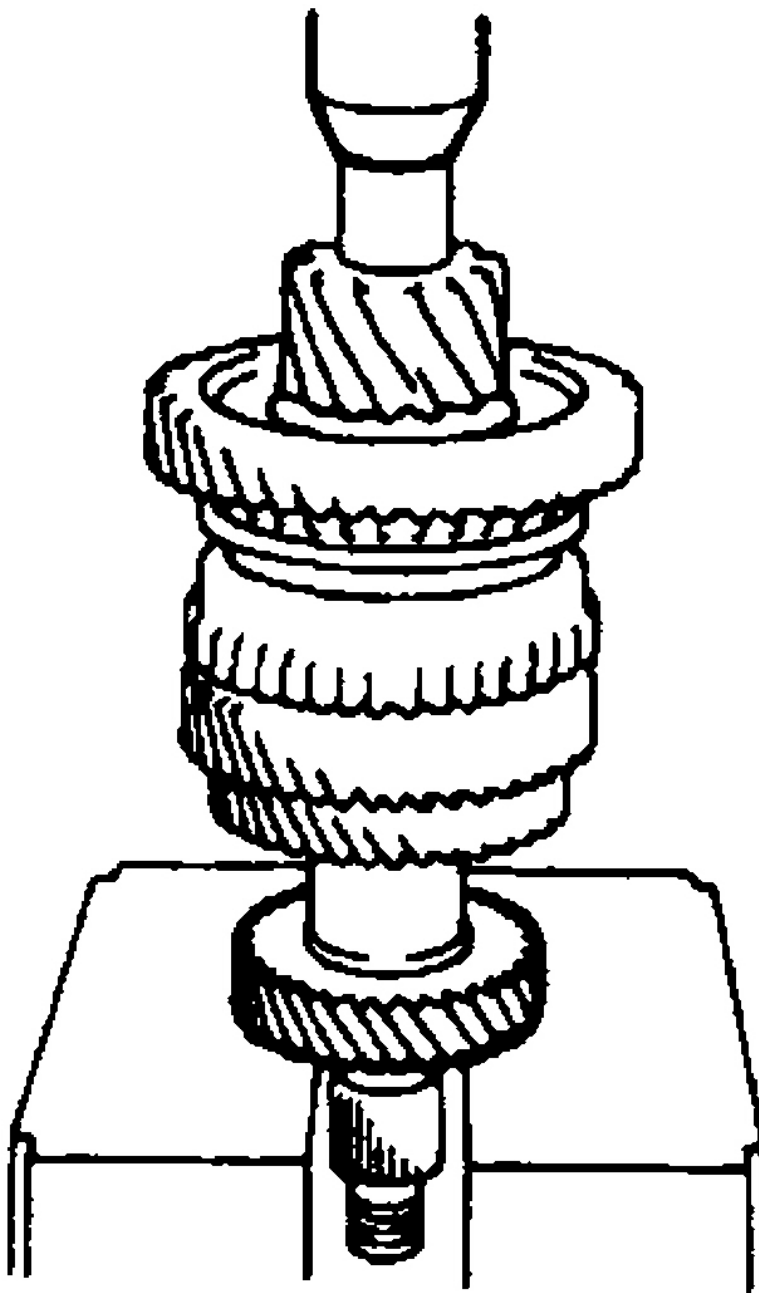
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Fig. 105: Installing 3rd Driven Gear

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

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

7. **MEASURE 2ND GEAR THRUST CLEARANCE** (See DISASSEMBLY)
8. **INSTALL SPACER AND 4TH DRIVEN GEAR**
 - a. Install the spacer.
 - b. Using a press, install the 4th driven gear.



G02639887

Fig. 106: Installing 4th Driven Gear
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

9. INSTALL OUTPUT SHAFT REAR BEARING

Using SST and a press, install a new bearing.

SST 09506-30012

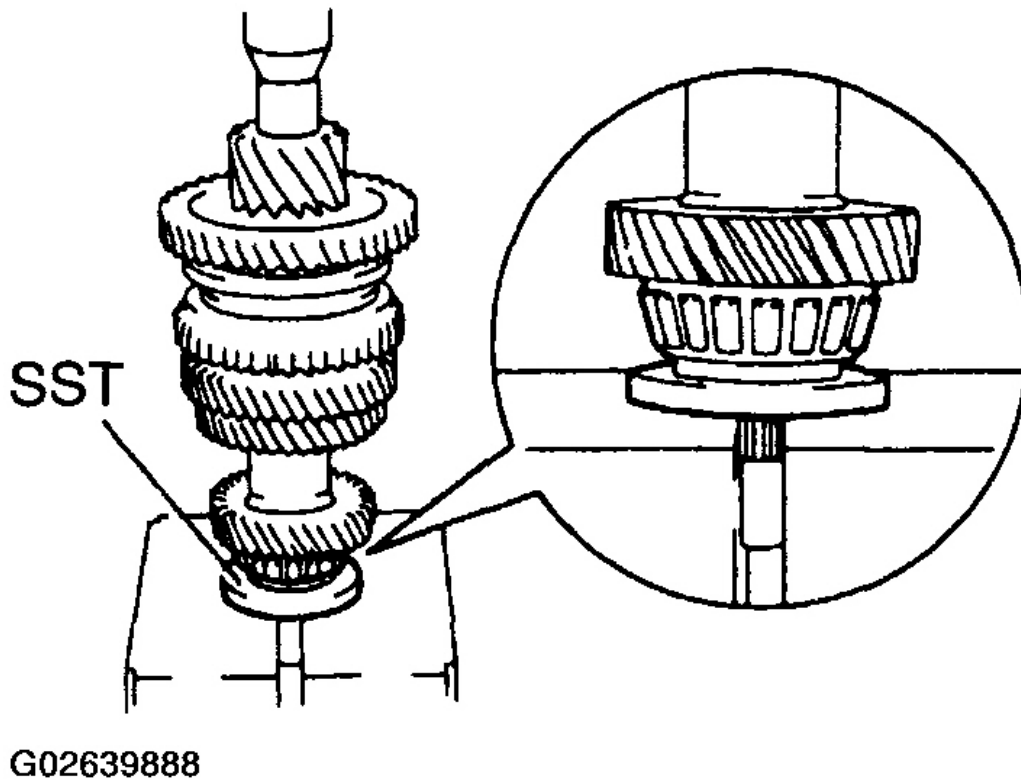


Fig. 107: Installing New Bearing

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

10. INSTALL OUTPUT SHAFT FRONT BEARING

Using SST and a press, install a new output shaft front bearing.

SST 09316-60011 (09316-00071)

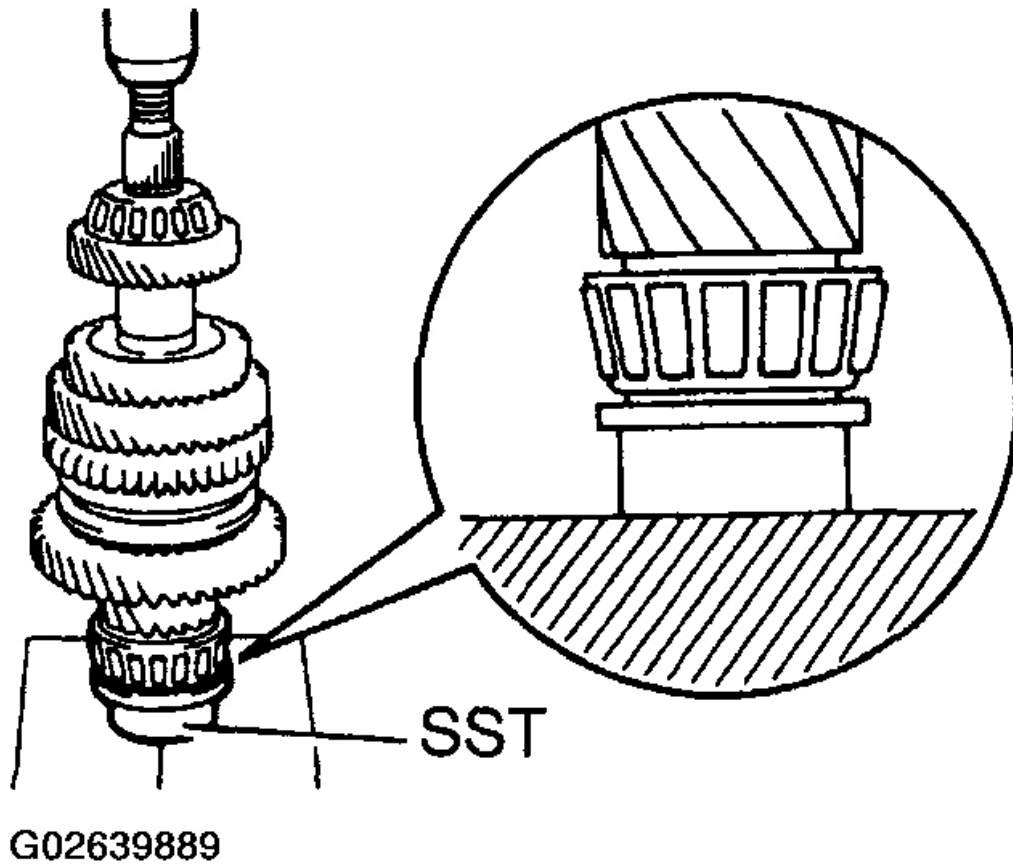


Fig. 108: Installing New Output Shaft Front Bearing
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

OIL PUMP (4WD)

COMPONENTS

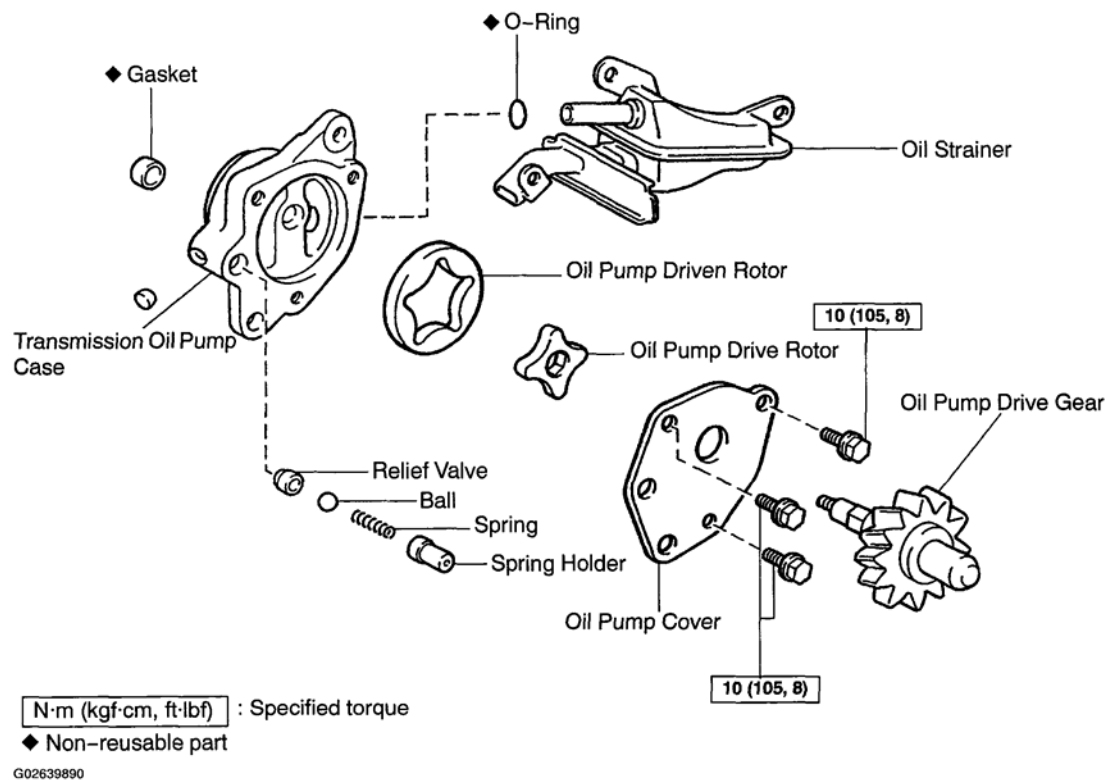


Fig. 109: Exploded View Of Oil Pump Components (4WD)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

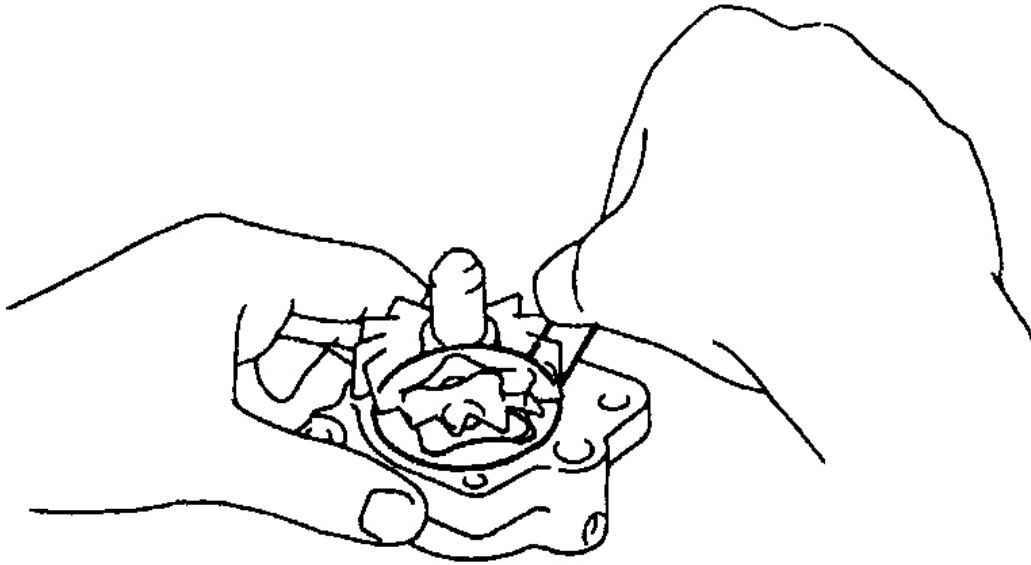
INSPECTION

1. CHECK ROTOR BODY CLEARANCE

- Install the oil pump drive gear to the drive rotor.
- Using a feeler gauge, measure the body clearance between the drive rotor and oil pump case.

Standard clearance:

0.10 to 0.16 mm (0.0039 to 0.0063 in.)



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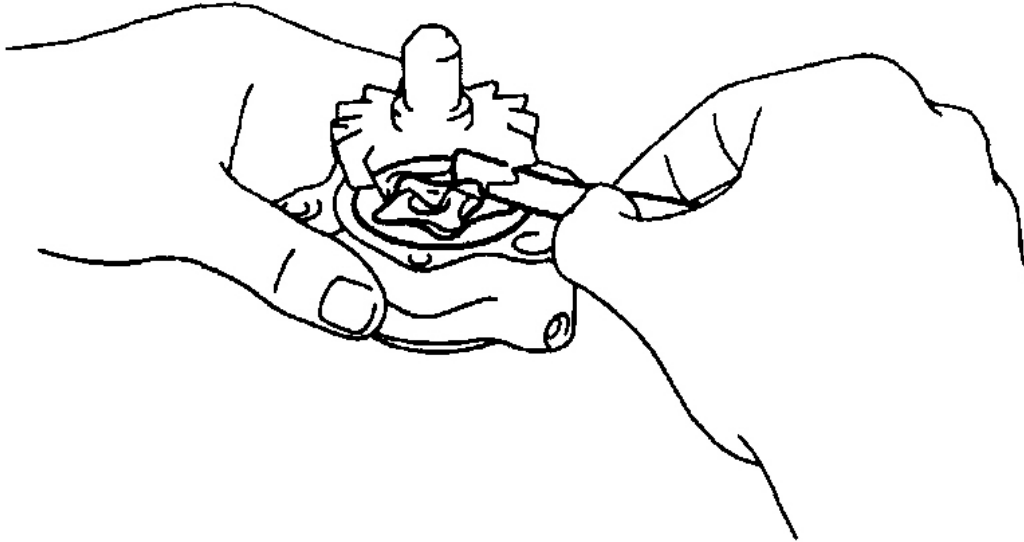
Fig. 110: Measuring Body Clearance Between Drive Rotor And Oil Pump Case
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. CHECK ROTOR TIP CLEARANCE

- Install the oil pump drive gear to the drive rotor.
- Using a feeler gauge, measure the tip clearance between the drive and driven rotors.

Standard clearance:

0.08 to 0.15 mm (0.0031 to 0.0059 in.)



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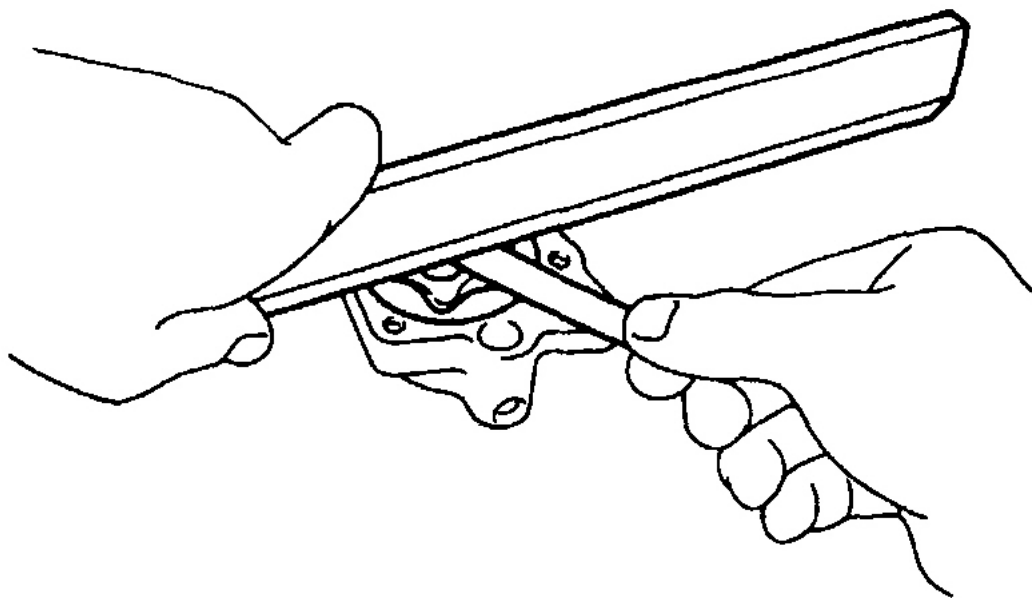
Fig. 111: Measuring Tip Clearance Between Drive And Driven Rotors
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. CHECK SIDE CLEARANCE

Using a precision straight edge and feeler gauge, measure the side clearance of both rotors.

Standard clearance:

0.03 to 0.08 mm (0.0012 to 0.0031 in.)

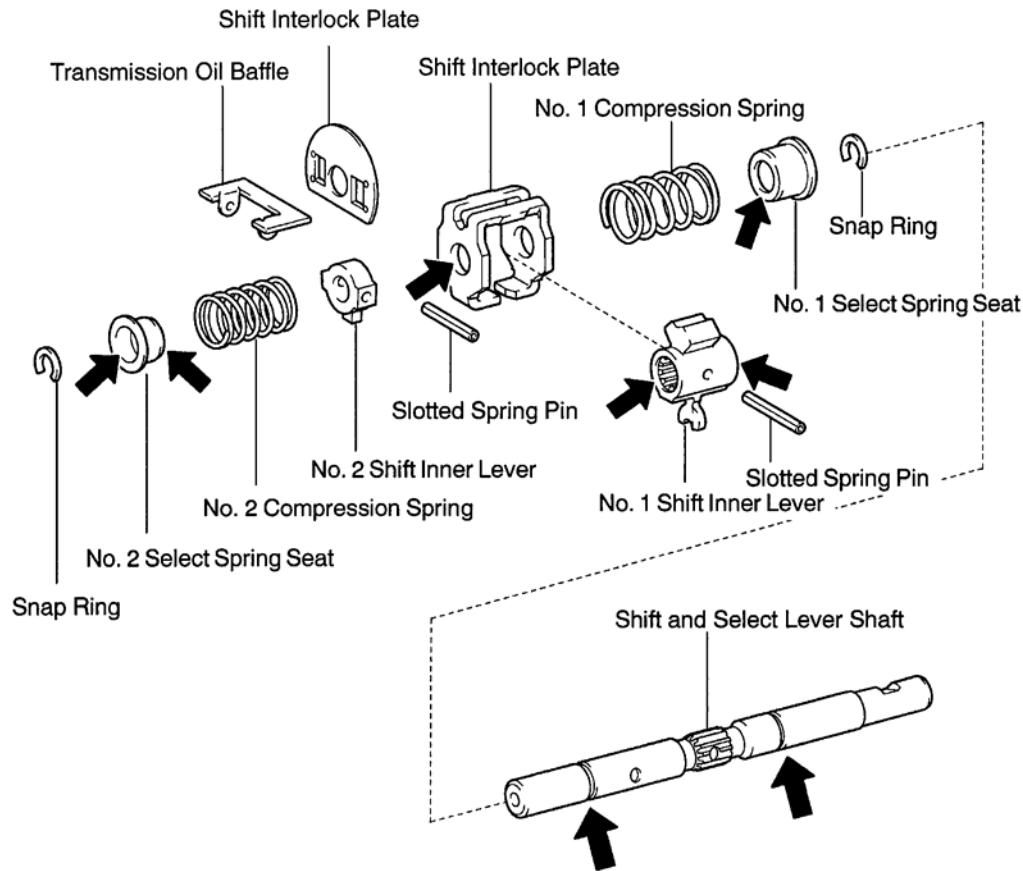


G02639893

Fig. 112: Measuring Side Clearance Of Both Rotors
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

SHIFT AND SELECT LEVER SHAFT

COMPONENTS



➡ Apply MP grease

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Fig. 113: Exploded View Of Shift And Select Lever Shaft Components

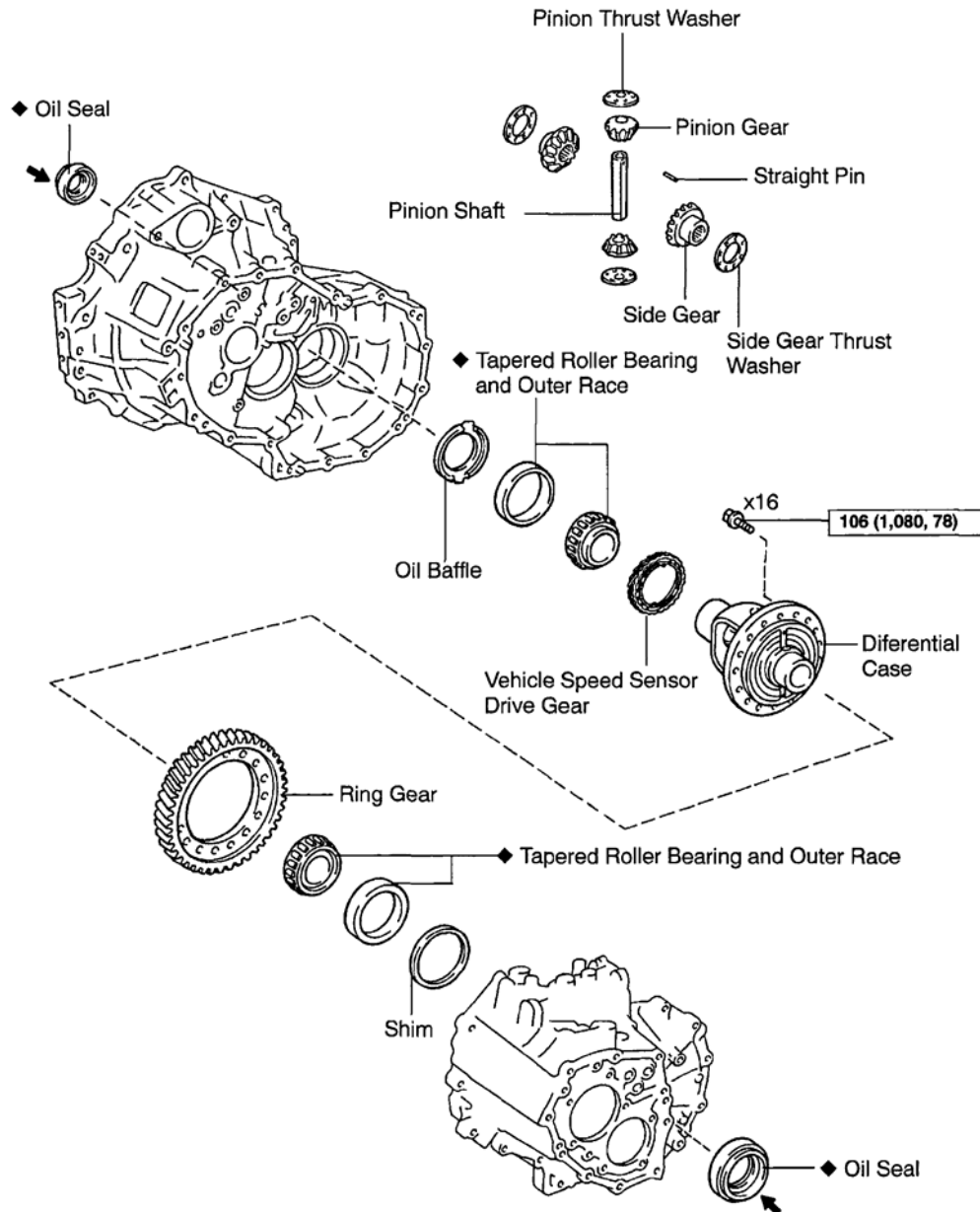
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

DIFFERENTIAL CASE (2WD)

COMPONENTS

2004 Toyota RAV4

2004 TRANSMISSION Manual Transaxle - RAV4



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

◆ Non-reusable part

N ← Apply MP grease

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Fig. 114: Exploded View Of Differential Case Components (2WD)

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

DISASSEMBLY

1. 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 (09951-00530)

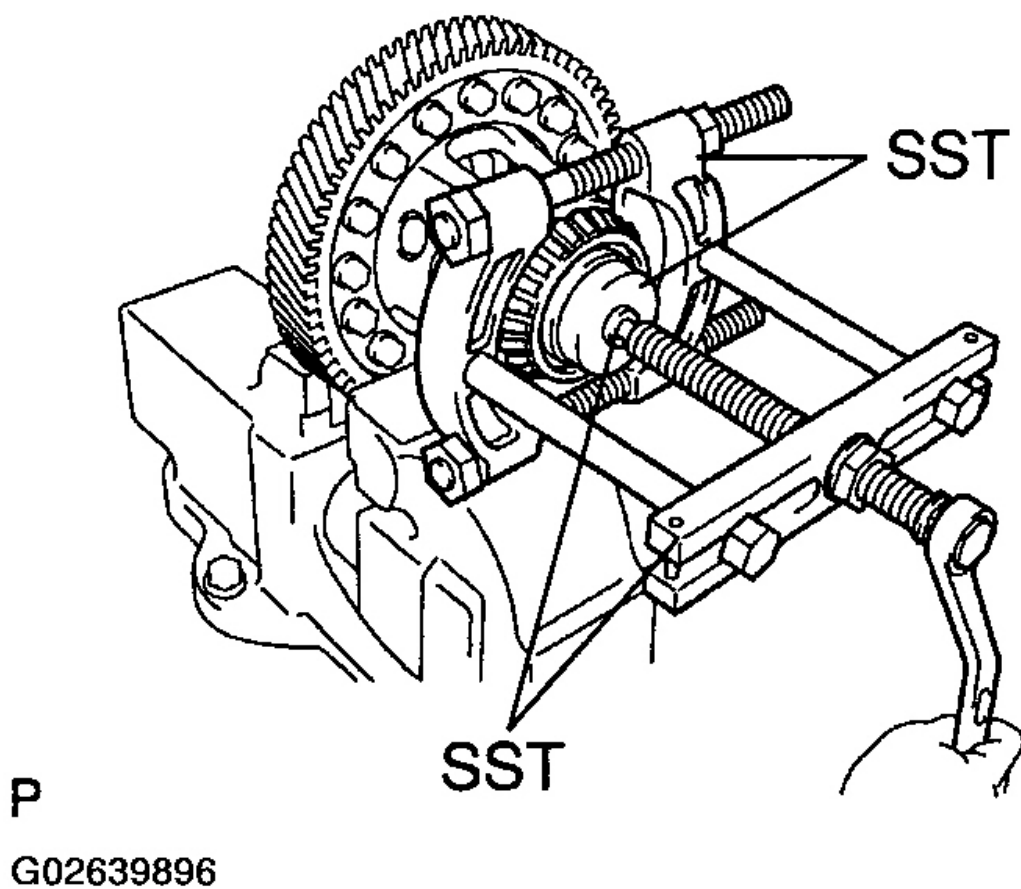


Fig. 115: Removing Tapered Roller Bearing

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

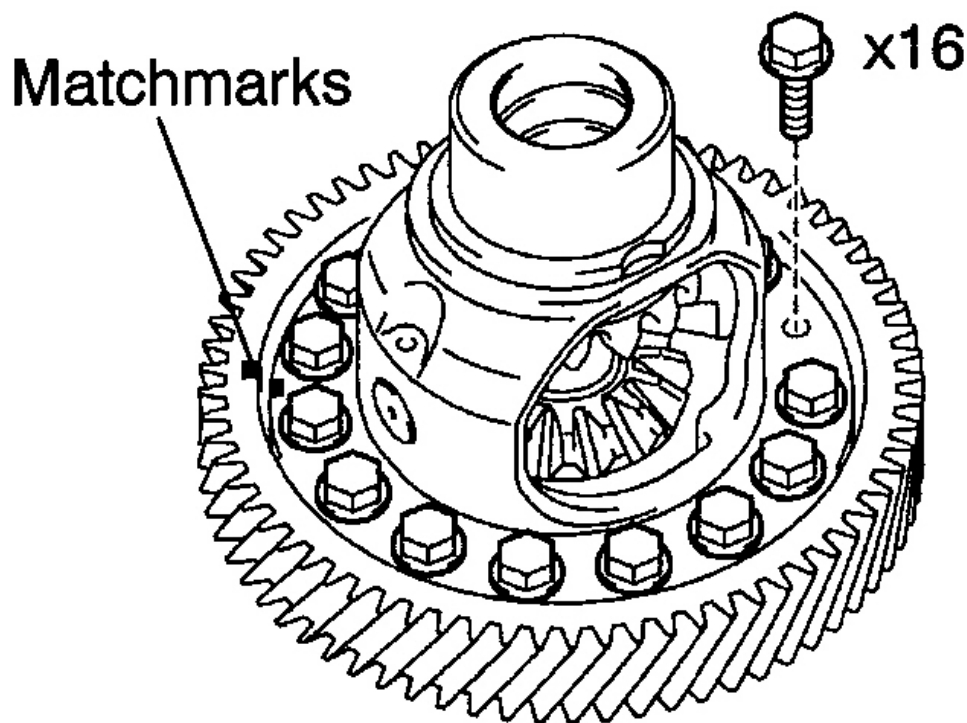
HINT:

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

- b. Remove the vehicle speed sensor drive gear.

2. REMOVE RING GEAR

- a. Place matchmarks on the ring gear and differential case.
- b. Remove the 16 bolts.
- c. Using a copper hammer, tap on the ring gear to remove it from the differential case.



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Fig. 116: Removing Bolts & Ring Gear

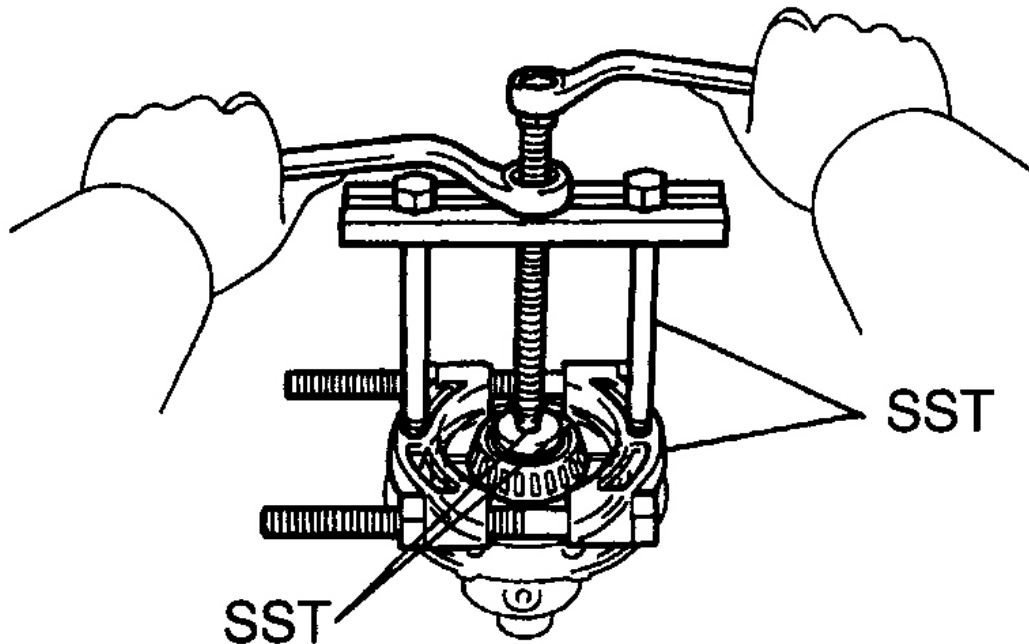
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. Ring gear side:

REMOVE TAPERED ROLLER BEARING FROM DIFFERENTIAL CASE

Using SST, remove the tapered roller bearing.

SST 09950-00020, 09950-00030, 09950-40011 (09957-04010), 09950-60010 (09951-00450)



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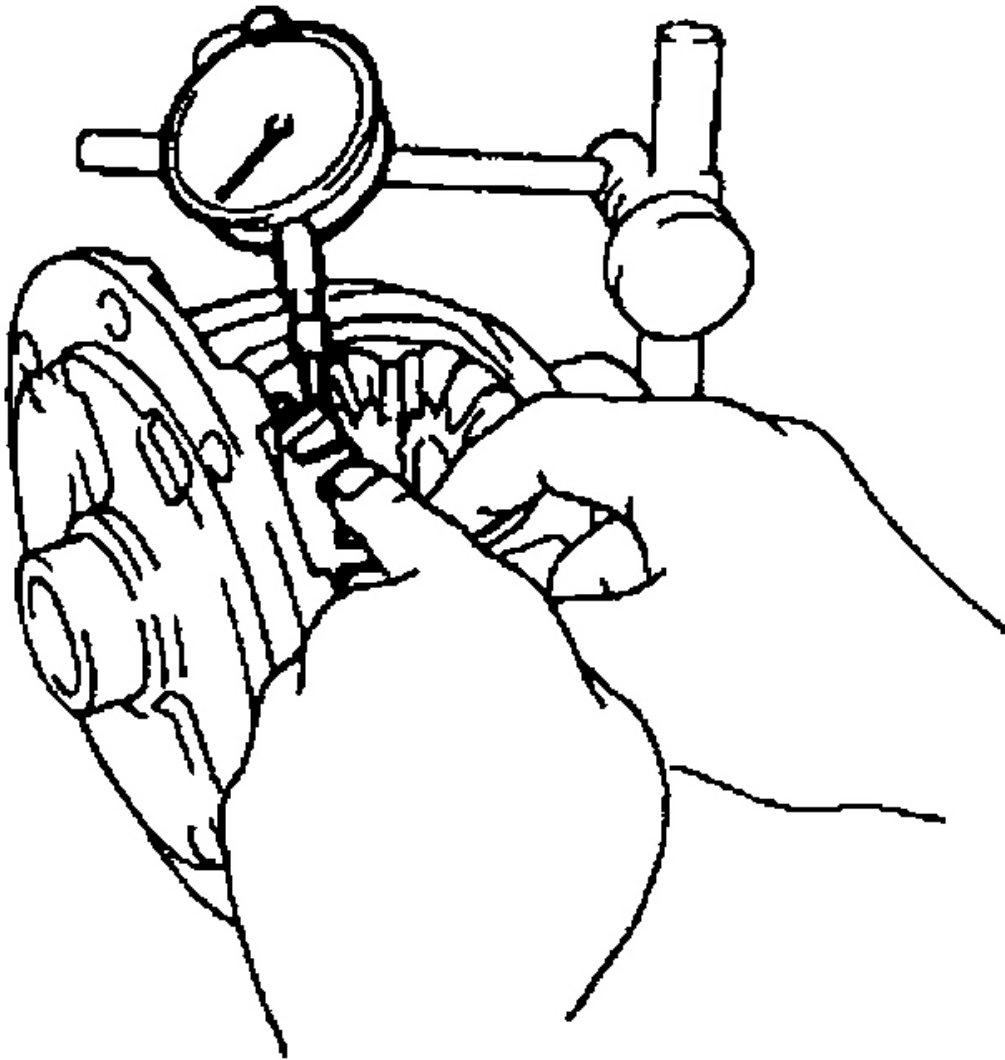
Fig. 117: Removing Tapered Roller Bearing
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

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

4. INSPECT SIDE GEAR BACKLASH

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



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Fig. 118: Measuring Backlash Of One Side Gear While Holding One Pinion Toward Differential Case

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

Standard backlash:

0.05 to 0.20 mm (0.0020 to 0.0079 in.)

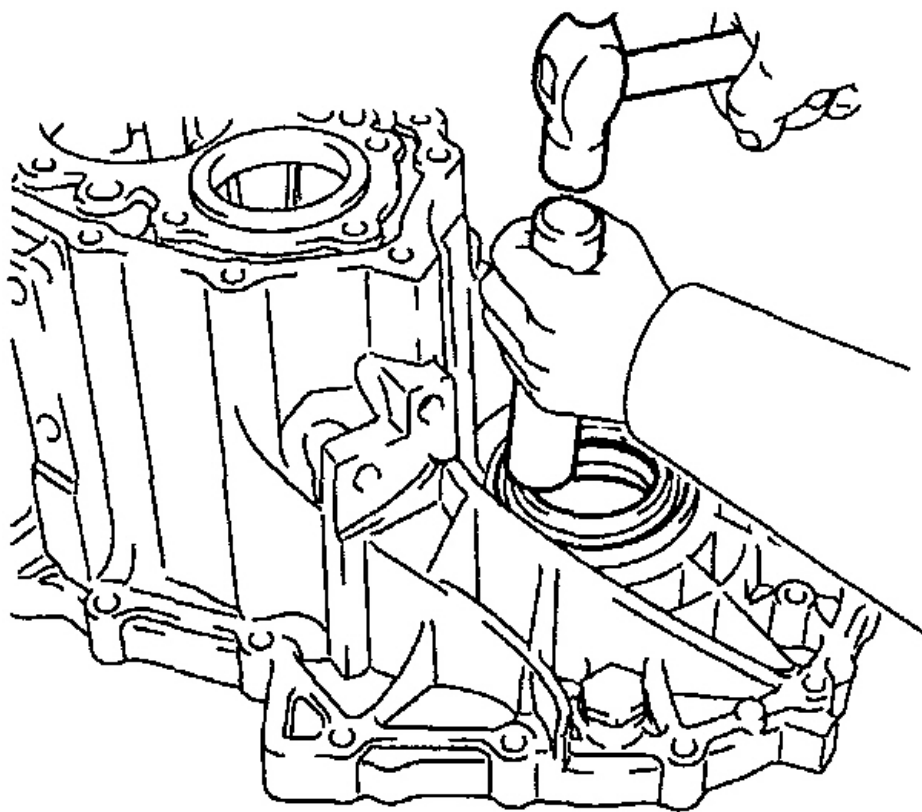
If the backlash is not within the specification, install the correct thrust washer to the side gears.

5. DISASSEMBLE DIFFERENTIAL CASE

- a. Using a pin punch and hammer, drive 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.

REPLACEMENT**1. Transmission Case Side:****REPLACE OIL SEAL AND TAPERED ROLLER BEARING OUTER RACE**

- a. Using a screwdriver and a hammer, remove the oil seal.
- b. Using a brass bar and hammer, drive out the tapered roller bearing outer race lightly and evenly.

**P****G02639900****Fig. 119: Removing Tapered Roller Bearing Outer Race**

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

- c. Remove the shim.
- d. Install the shim.

HINT:

First select and install a shim of lesser thickness than before.

- e. Using SST and a press, install a new tapered roller bearing outer race.

SST 09316-60011 (09316-00011, 09316-00041)

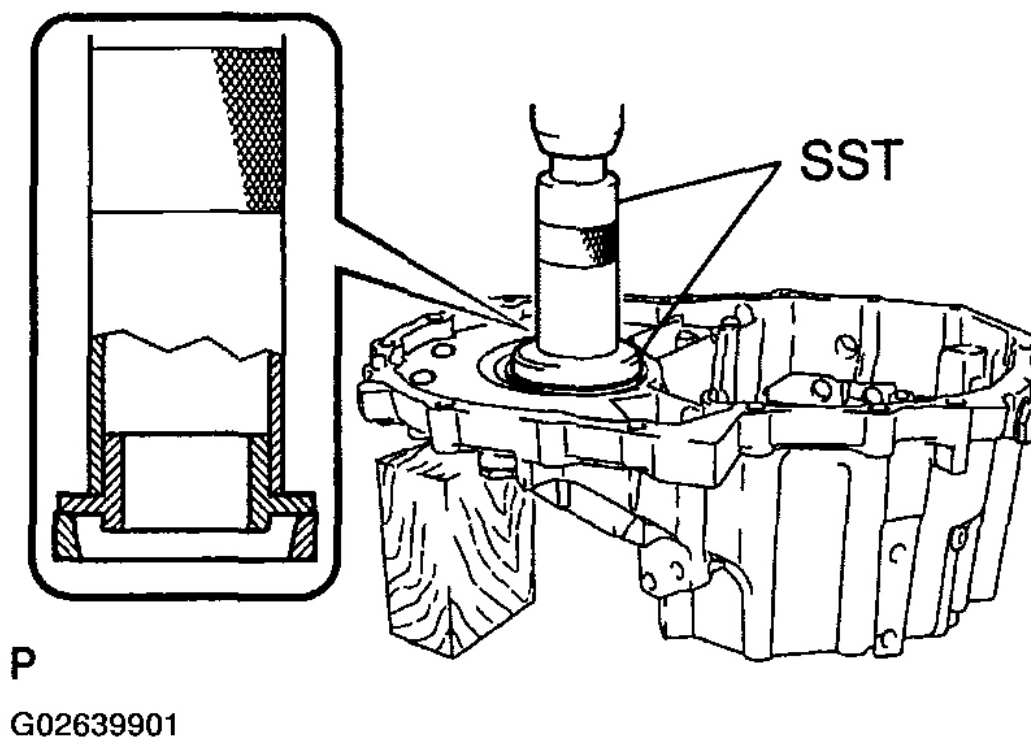


Fig. 120: Installing Tapered Roller Bearing Outer Race
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

- f. Using SST and a hammer, drive in a new oil seal.

SST 09316-60010 (09316-00011, 09316-00031)

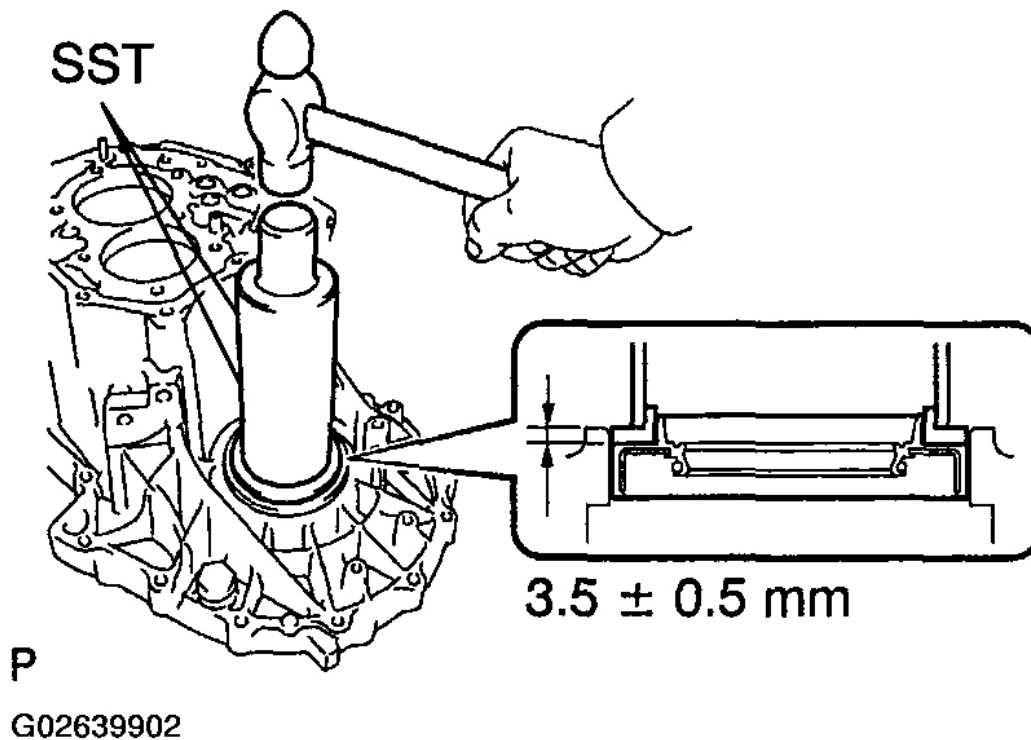


Fig. 121: Using SST And A Hammer To Drive In New Oil Seal
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Drive in depth: $3.5 \pm 0.5 \text{ mm}$ ($0.138 \pm 0.020 \text{ in.}$)

g. Coat the lip of oil seal with MP grease.

2. Transaxle Case Side:

REPLACE OIL SEAL AND TAPERED ROLLER BEARING OUTER RACE

- Using a screwdriver and hammer, drive out the oil seal from the transaxle case.
- Using SST, remove the tapered roller bearing outer race.

SST 09316-60011 (09316-00011, 09316-00021)

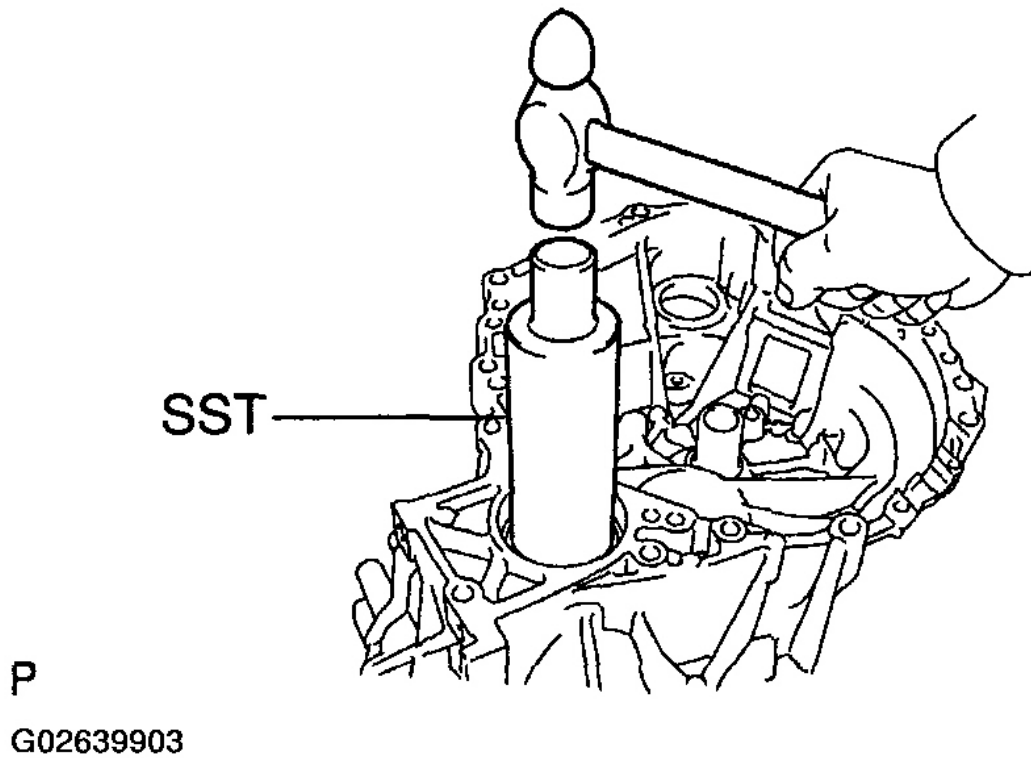


Fig. 122: Removing Tapered Roller Bearing Outer Race
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the oil baffle.
- d. Install the oil baffle.

HINT:

Install the oil baffle projection into the case side cutout.

- e. Using SST and a press, install a new tapered roller bearing outer race.

SST 09950-60020 (09951-00890), 09950-70010 (09951-00150)

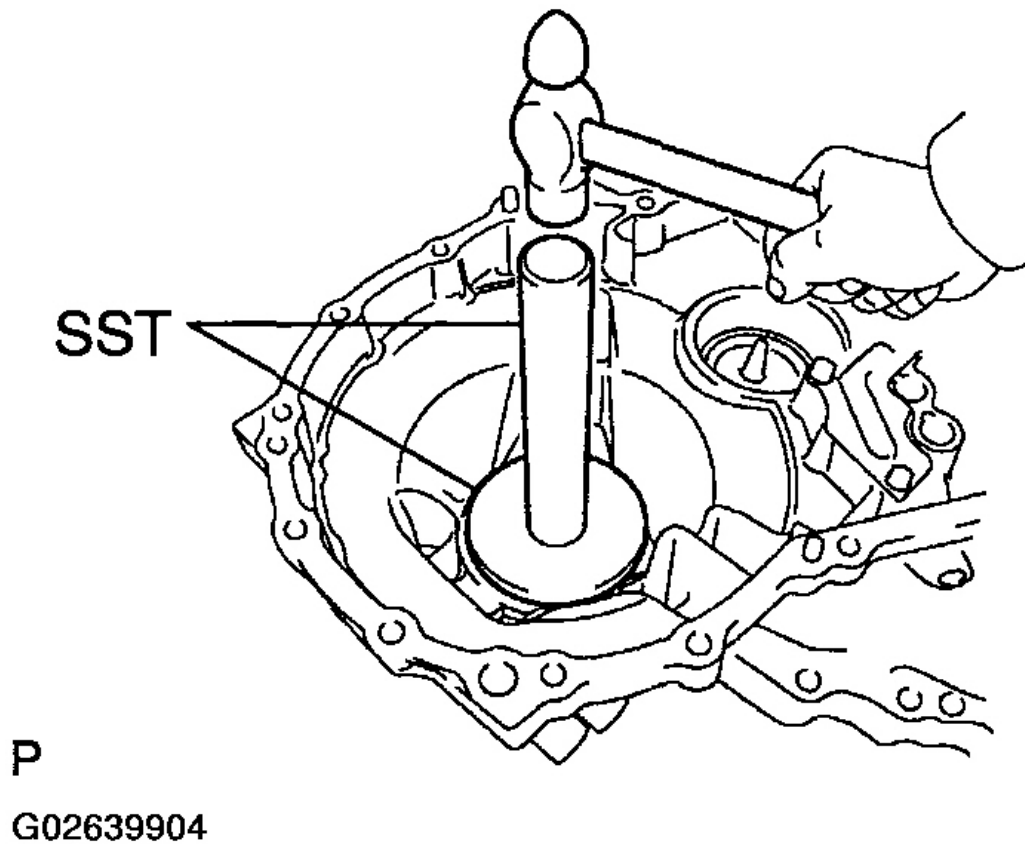


Fig. 123: Installing Tapered Roller Bearing Outer Race
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- f. Using SST and a hammer, drive in a new oil seal.

SST 09316-60011 (09316-00011, 09316-00041)

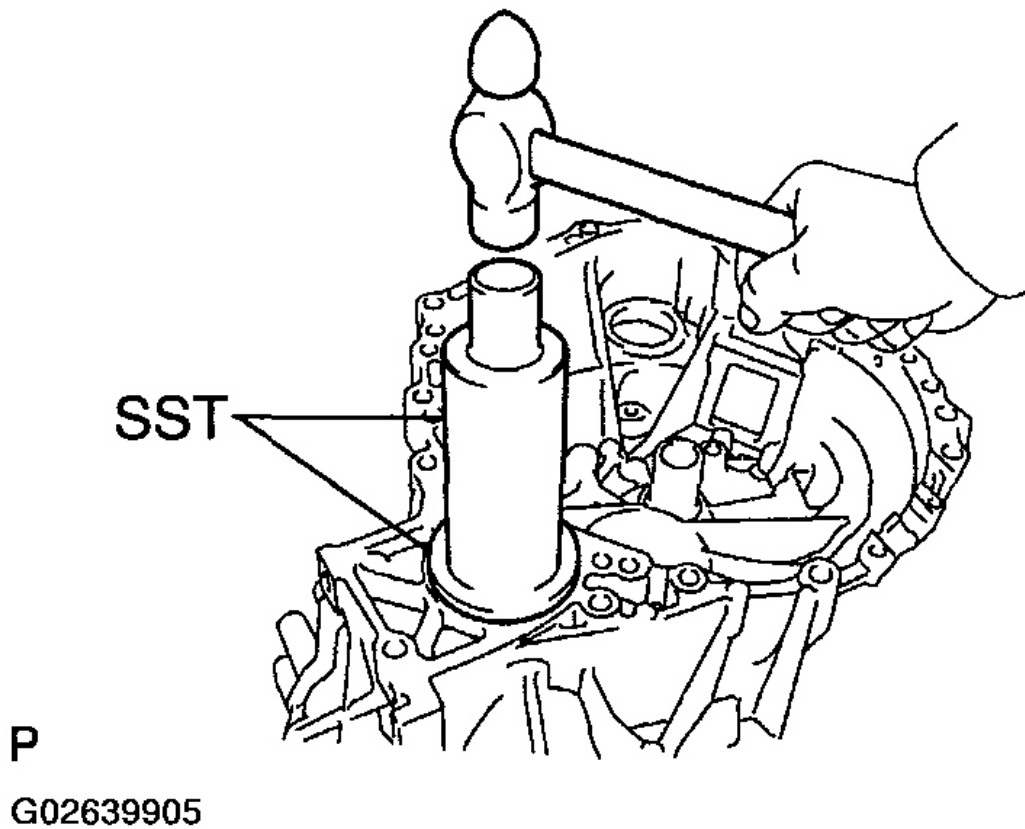


Fig. 124: Using SST And Hammer To Drive In New Oil Seal
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Drive in depth: 0 +/- 0.5 mm (0 +/- 0.020 in.)

- g. Coat the oil seal lip with MP grease.

REASSEMBLY

HINT:

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

1. ASSEMBLE DIFFERENTIAL CASE

- a. Install the correct thrust washers and side gears.

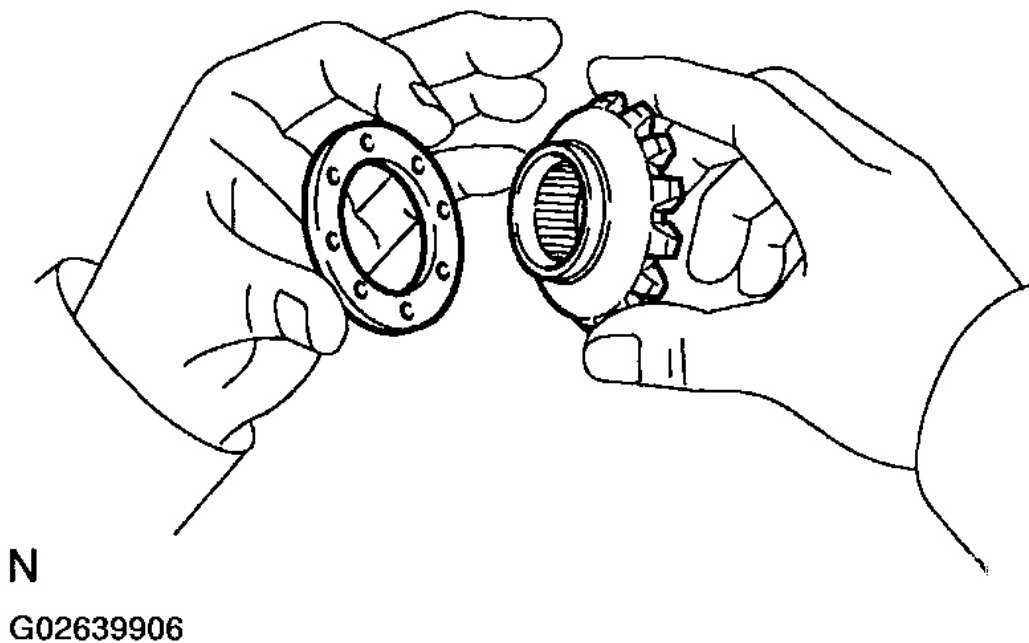


Fig. 125: Installing Correct Thrust Washers And Side Gears
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Refer to **THRUST WASHERS THICKNESS SPECIFICATION CHART** , select thrust washers which will ensure that the backlash is within the specification. Try to select washers of the same size for both sides.

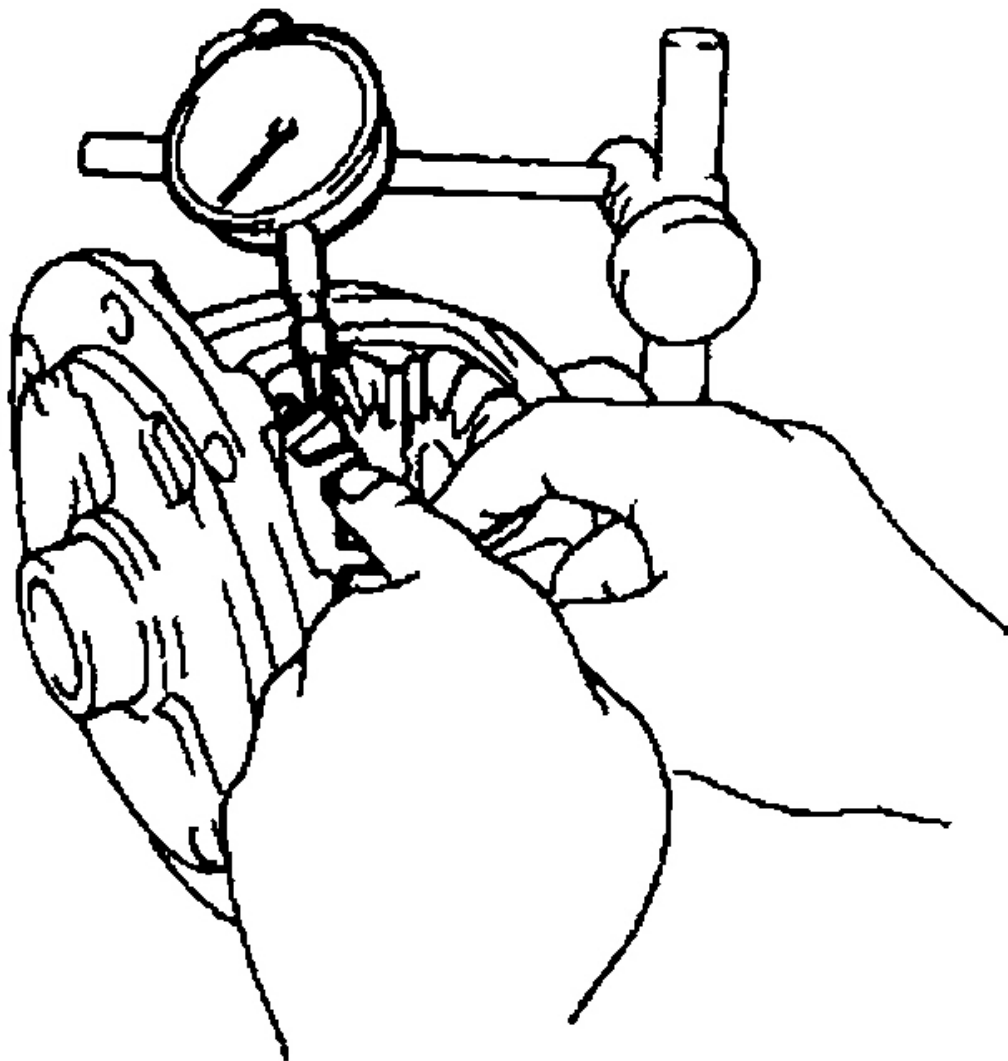
Standard backlash:

0.05 to 0.20 mm (0.0020 to 0.0079 in.)

THRUST WASHERS THICKNESS SPECIFICATION CHART

Thickness mm (in.)	Thickness mm (in.)
1.00 (0.0394)	1.20 (0.0472)
1.10 (0.0433)	1.30 (0.0512)

- Install the thrust washers and side gears in the differential case.
- Install the pinion shaft.
- Using a dial indicator, check the side gear backlash.



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Fig. 126: Measuring Side Gear Backlash
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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.)

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

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

2. 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 16 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: 106 N.m (1,080 kgf.cm, 78 ft.lbf)

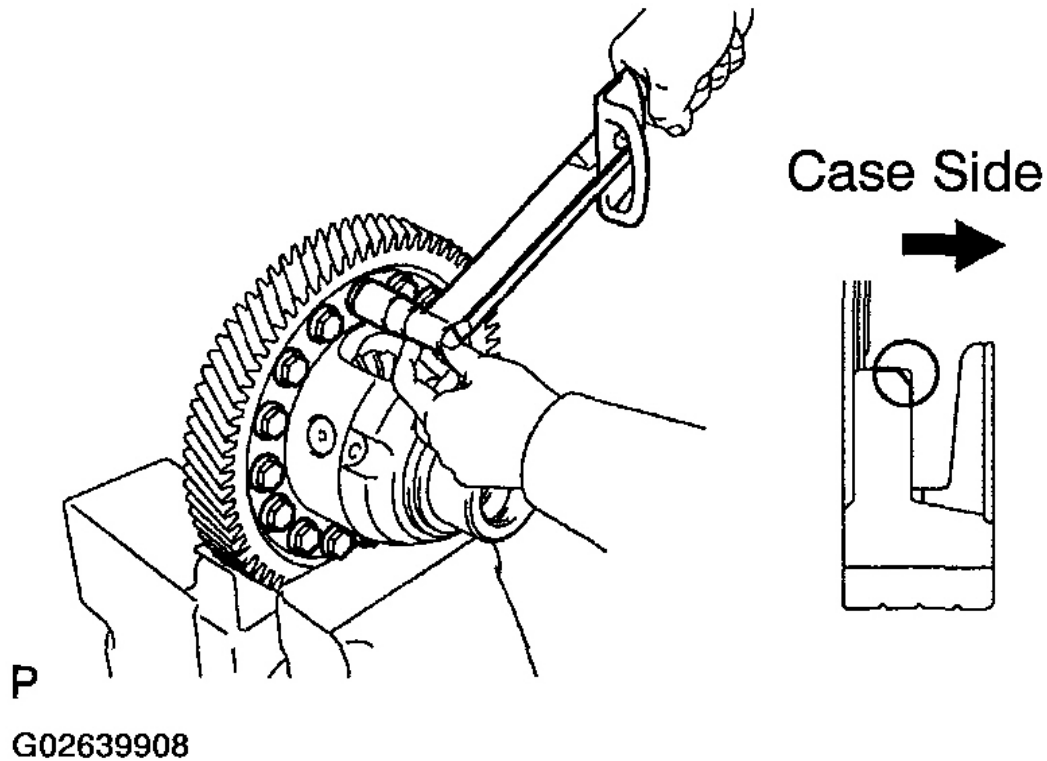


Fig. 127: Installing Ring Gear On Differential Case
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. Ring gear side:

INSTALL TAPERED ROLLER BEARING

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

SST 09316-60011 (09316-00011)

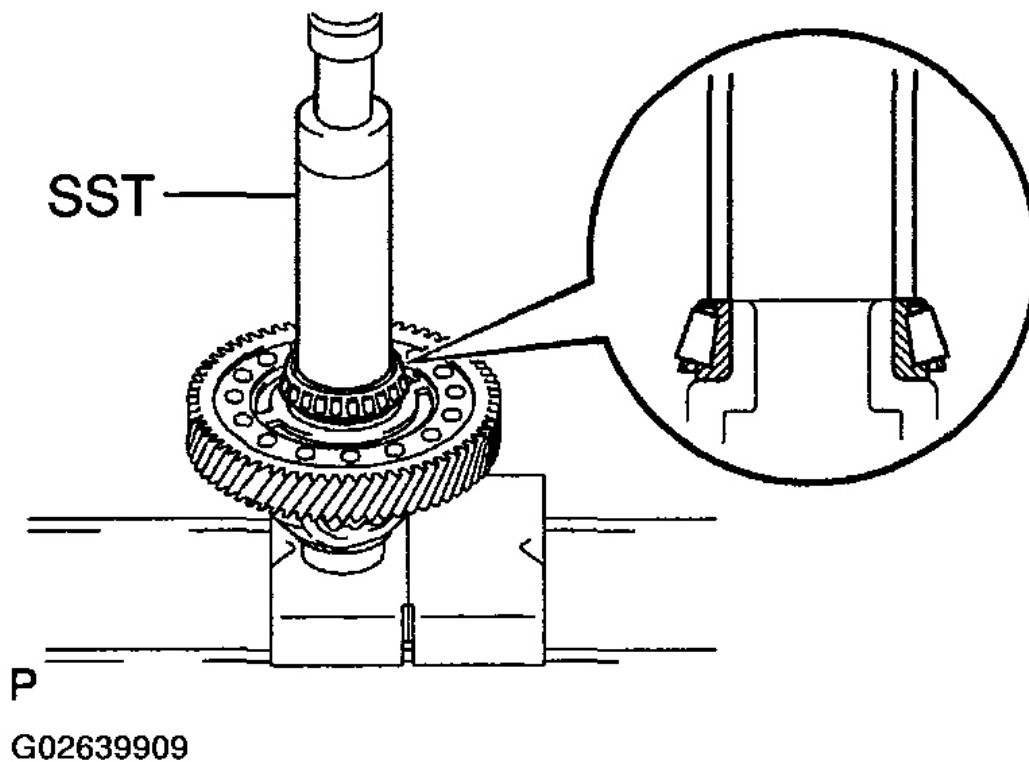


Fig. 128: Installing Tapered Roller Bearing

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

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.

4. Vehicle Speed sensor drive gear side:

INSTALL TAPERED ROLLER BEARING

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

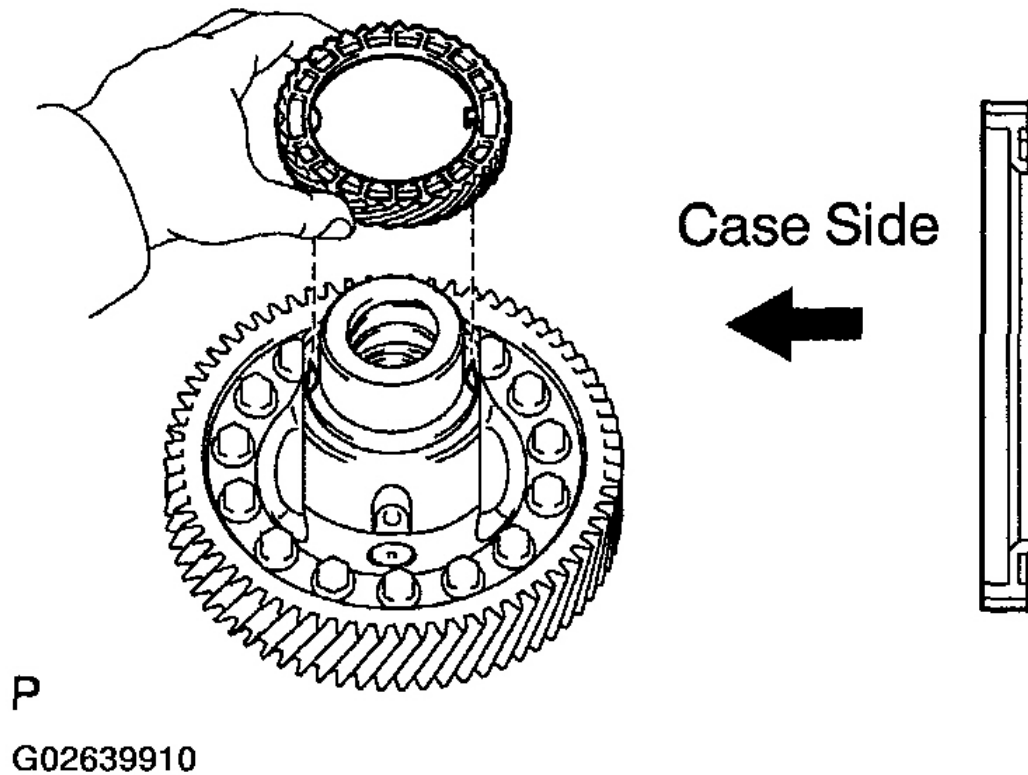


Fig. 129: Placing Vehicle Speed Sensor Drive Gear In Position
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: Be sure to install the vehicle speed sensor drive gear in the correct direction, as shown in Fig. 129 .

- b. Using SST, a steel plate and press, install a new tapered roller bearing.

SST 09316-20011, 09316-60011 (09316-00011)

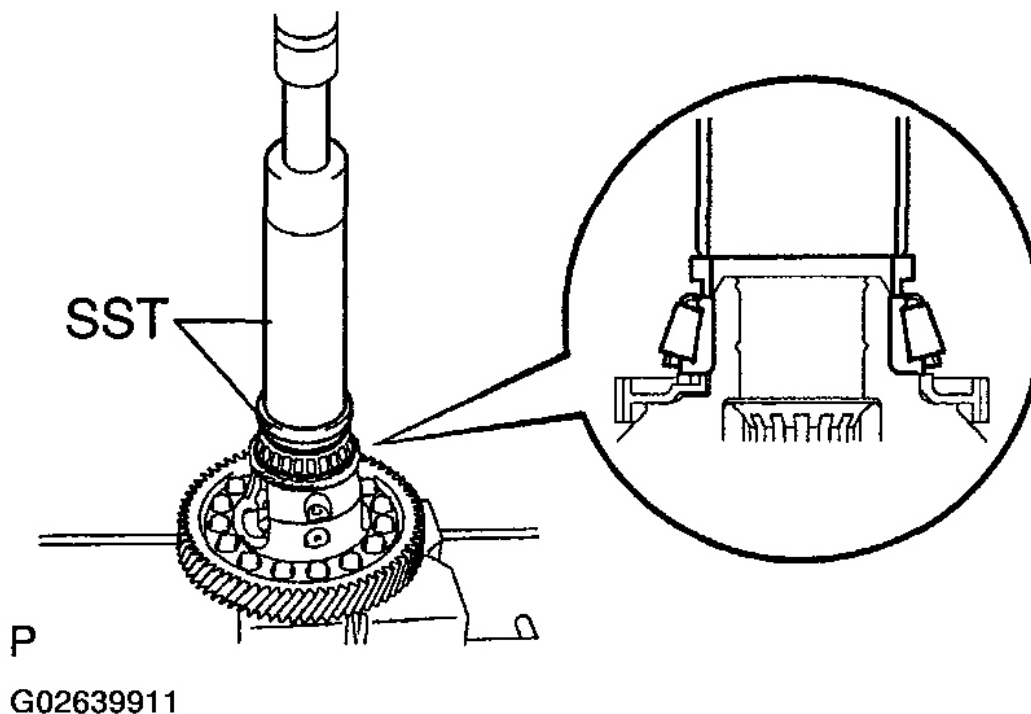


Fig. 130: Installing Tapered Roller Bearing
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

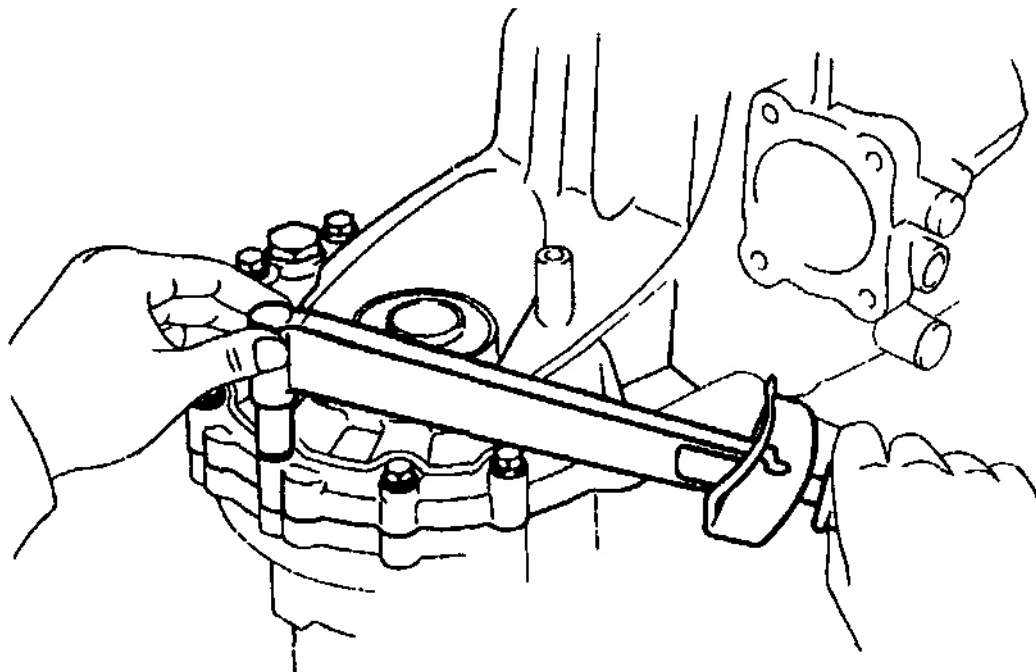
HINT:

Set SST to the bearing inner race securely.

5. INSPECT DIFFERENTIAL TAPERED ROLLER BEARING PRELOAD

NOTE: Perform this only when replacing the tapered roller bearing and outer race of the differential case.

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



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Fig. 131: Installing Differential Case Assembly To Transaxle Case
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Install the transmission case to the transaxle case with the 17 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

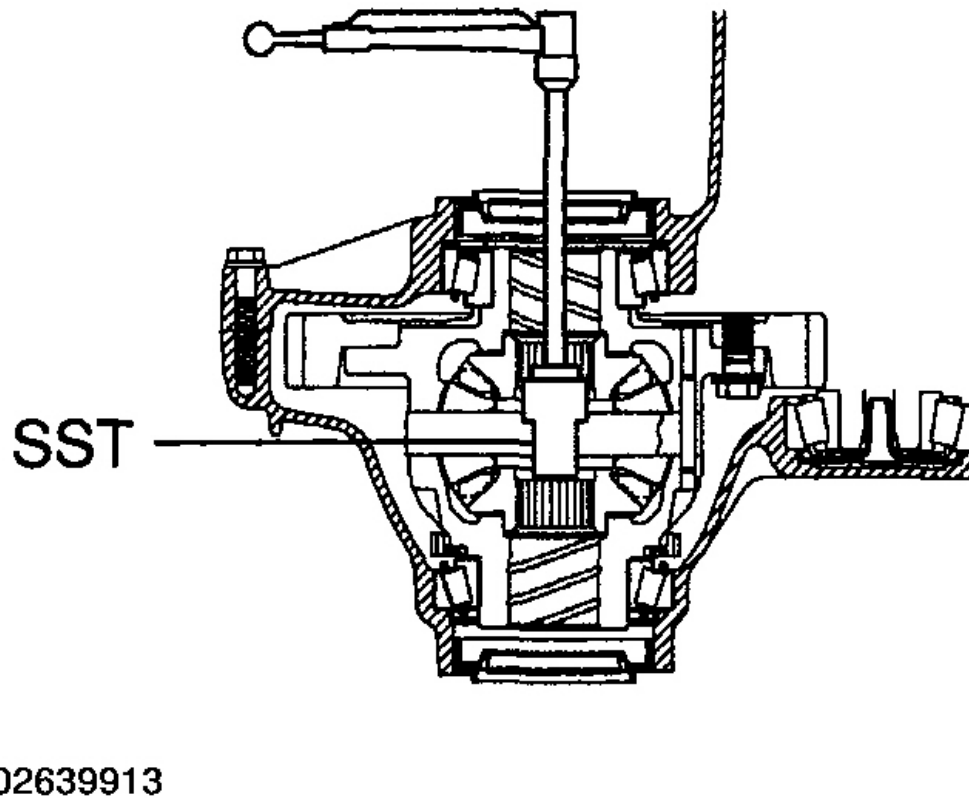


Fig. 132: Measuring Preload

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

Preload (at starting):

New bearing

0.8 to 1.6 N.m (8 to 16 kgf.cm, 6.9 to 13.9 in.lbf)

Reused bearing

0.5 to 1.0 N.m (5 to 10 kgf.cm, 4.3 to 8.7 in.lbf)

If the preload is not within the specification, remove the transmission case side outer race of the tapered roller bearing with SST (See **DISASSEMBLY**). Select an appropriate shim.

SHIM THICKNESS SPECIFICATION CHART

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)

2004 Toyota RAV4

2004 TRANSMISSION Manual Transaxle - RAV4

0	2.00 (0.0787)	9	2.45 (0.0965)
1	2.05 (0.0807)	A	2.50 (0.0984)
2	2.10 (0.0827)	B	2.55 (0.1004)
3	2.15 (0.0846)	C	2.60 (0.1024)
4	2.20 (0.0866)	D	2.65 (0.1043)
5	2.25 (0.0886)	E	2.70 (0.1063)
6	2.30 (0.0906)	F	2.75 (0.1083)
7	2.35 (0.0925)	G	2.80 (0.1102)
8	2.40 (0.0945)	H	2.85 (0.1122)

- e. Remove the 17 bolts and transmission case.
- f. Remove the differential case assembly.

DIFFERENTIAL CASE (4WD)

COMPONENTS

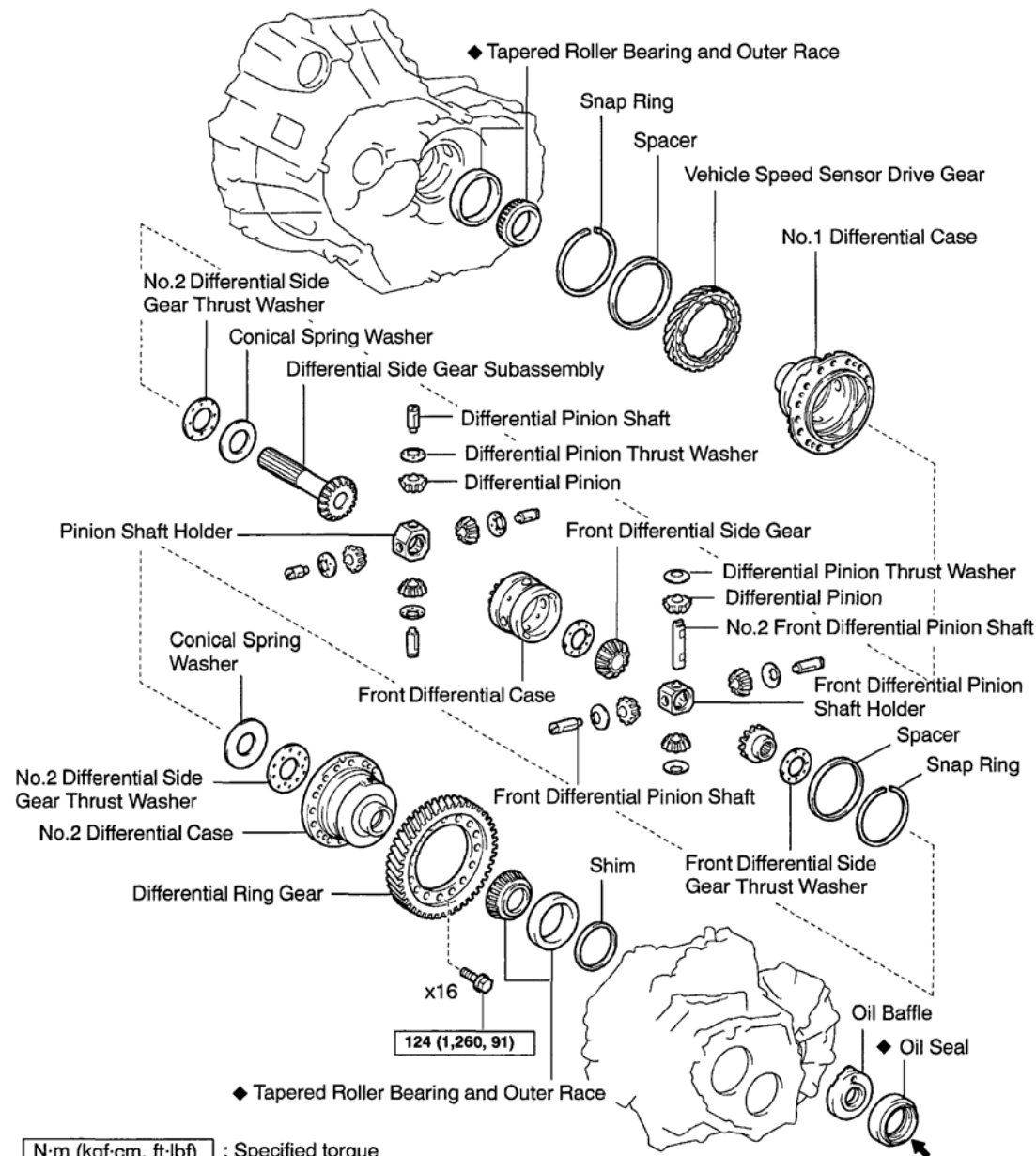


Fig. 133: Exploded View Of Differential Case Components (4WD)

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

DISASSEMBLY

1. REMOVE NO.2 DIFFERENTIAL CASE

- Remove the 16 bolts.
- Remove the No. 2 differential case upward.

2. REMOVE DIFFERENTIAL RING GEAR

- a. Place matchmarks on both the differential case and ring gear.

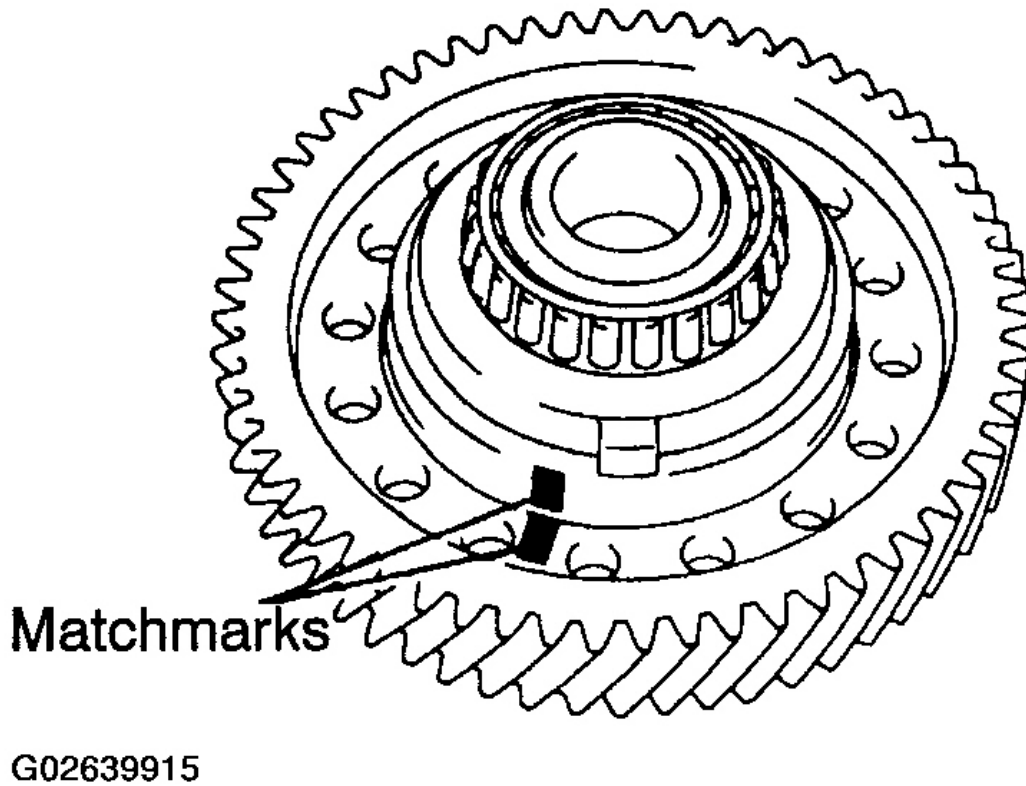
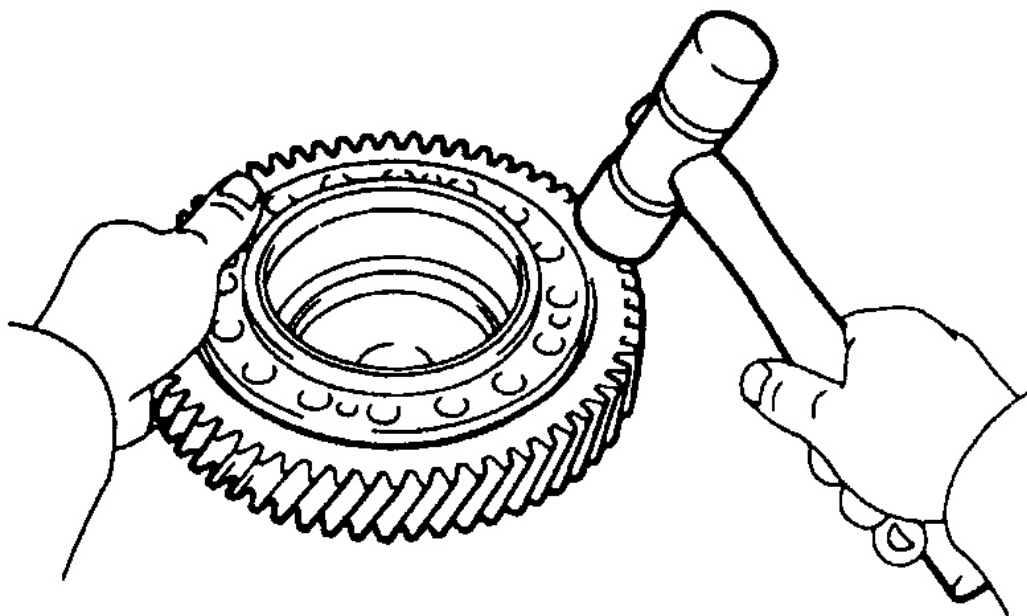


Fig. 134: Placing Matchmarks On Both Differential Case And Ring Gear
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

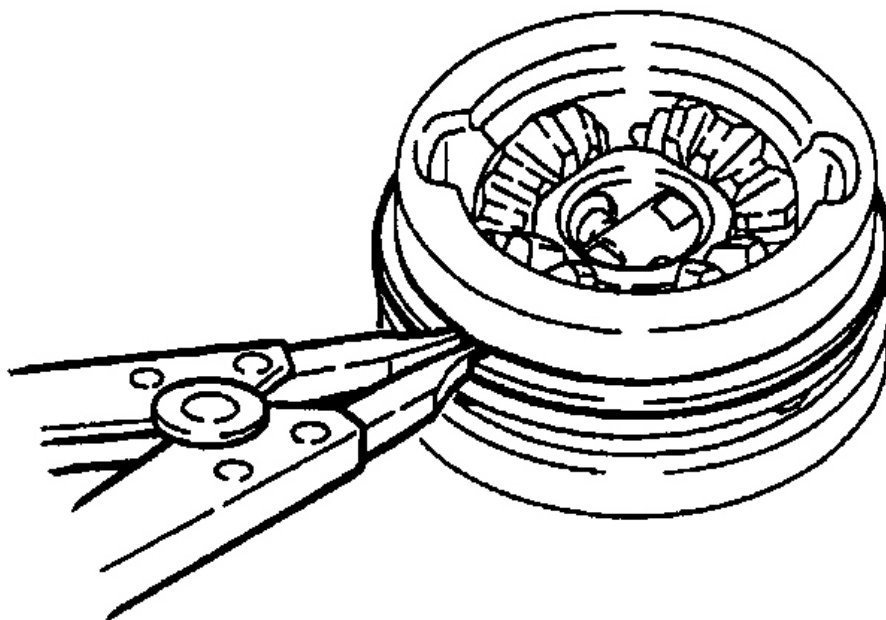
- b. Using a plastic hammer, tap out the ring gear.



G02639916

Fig. 135: Using Plastic Hammer To Tap Out Ring Gear
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. **REMOVE NO.2 DIFFERENTIAL SIDE GEAR THRUST WASHER AND CONICAL SPRING WASHER**
4. **REMOVE FRONT DIFFERENTIAL CASE ASSEMBLY**
5. **DISASSEMBLE FRONT DIFFERENTIAL CASE**
 - a. Remove the front differential side gear together with the thrust washer from the front differential case.
 - b. Remove the front differential side gear thrust washer from the side gear.
 - c. Using a snap ring expander, remove the snap ring and spacer.



N

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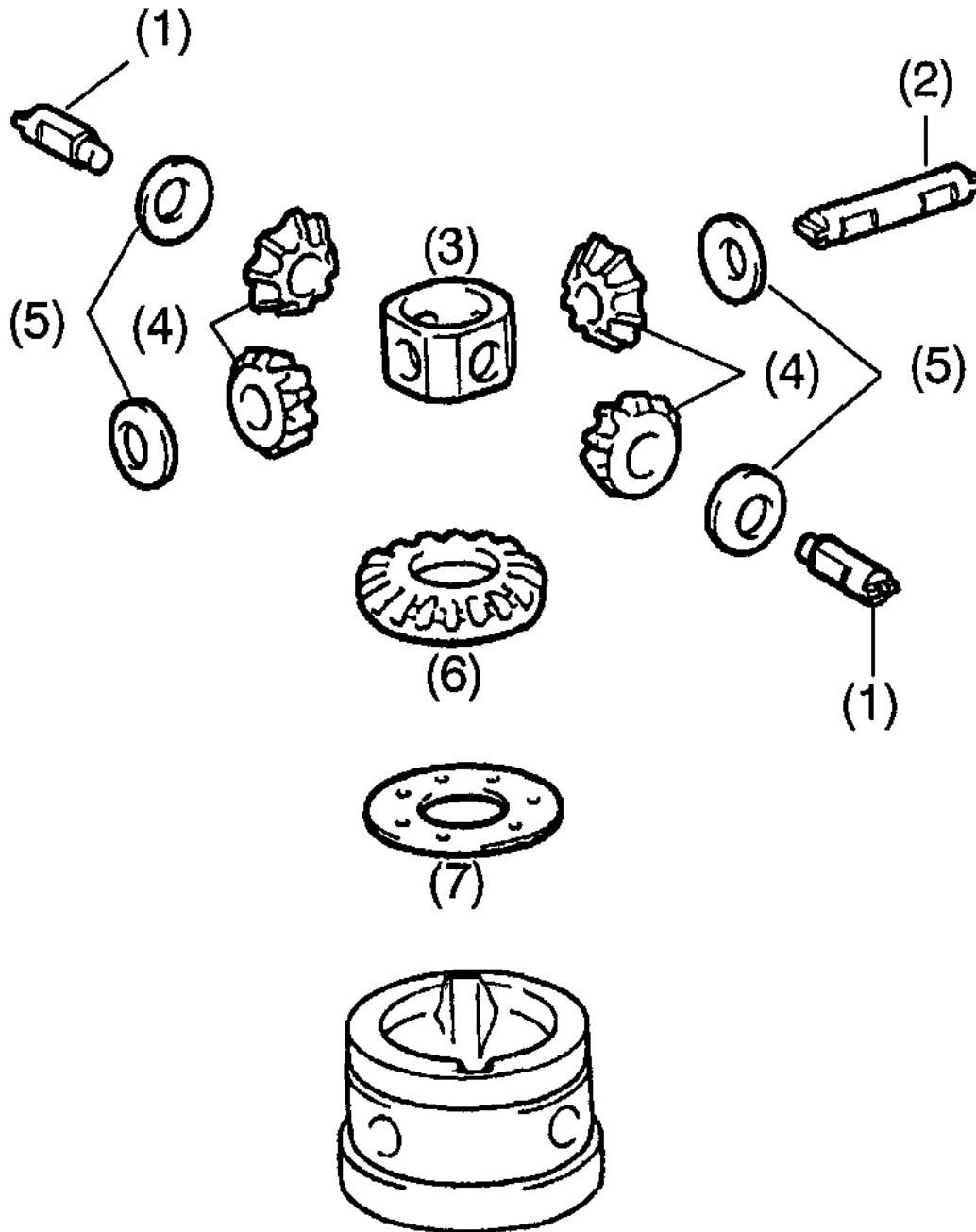
Fig. 136: Removing Snap Ring And Spacer

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

HINT:

Before removing the shaft snap ring, wrap vinyl tape around the case to prevent from damage.

- d. Remove the parts from the front differential case.
 1. Remove the 2 front differential pinion shafts.
 2. Remove the No. 2 front differential pinion shaft.
 3. Remove the front differential pinion shaft holder.
 4. Remove the 4 differential pinions.
 5. Remove the 4 differential pinion thrust washers.
 6. Remove the front differential side gear.
 7. Remove the front differential side gear thrust washer.



G02639918

Fig. 137: Exploded View Of Front Differential Case
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

6. REMOVE VEHICLE SPEED SENSOR DRIVE GEAR

- a. Using a snap ring expander, remove the snap ring.
- b. Remove the spacer and vehicle speed sensor drive gear.

7. DISASSEMBLE NO. 1 DIFFERENTIAL CASE

Remove the parts from the No. 1 differential case.

1. Remove the 4 differential pinion shafts.
2. Remove the pinion shaft holder.
3. Remove the 4 differential pinions.
4. Remove the 4 differential pinion thrust washers.
5. Remove the differential side gear subassembly.
6. Remove the conical spring washer.
7. Remove the No. 2 differential side gear thrust washer.

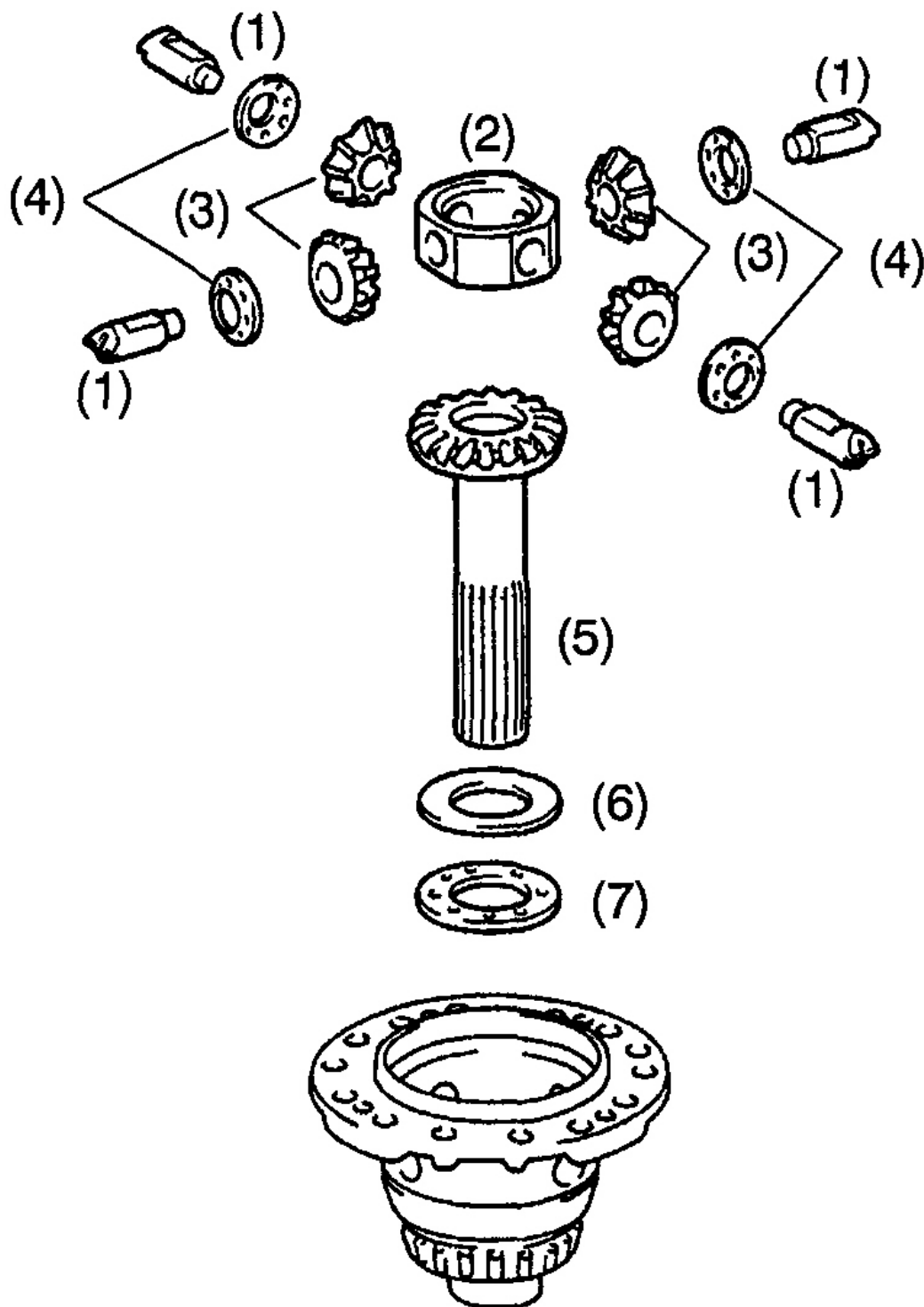


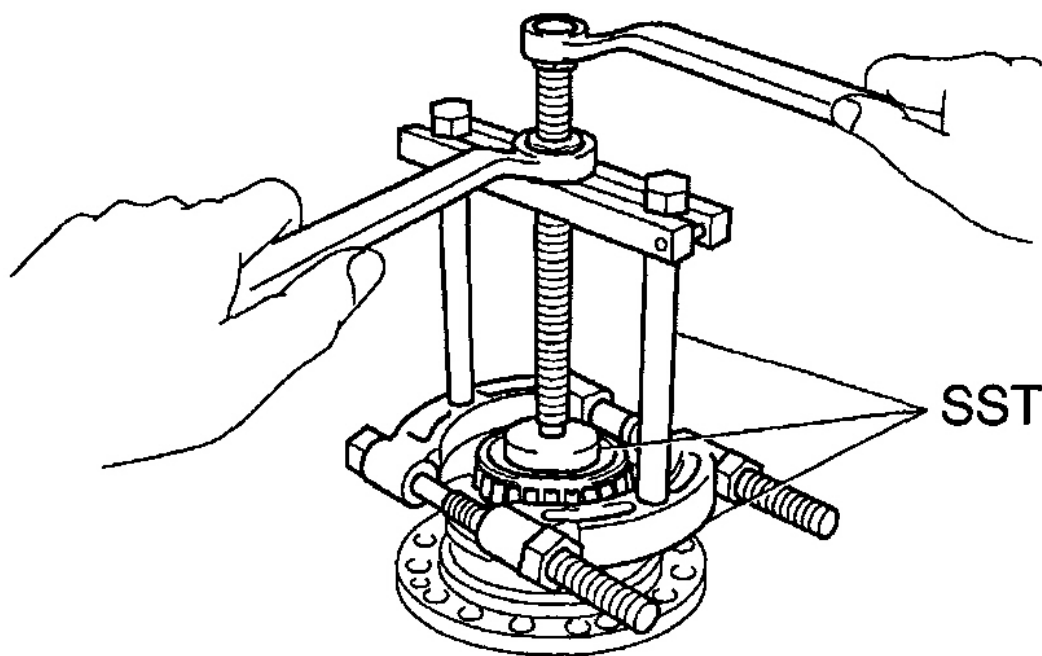
Fig. 138: Exploded View Of No. 1 Differential Case
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

8. No. 2 Differential Case Side:

REMOVE TAPERED ROLLER BEARING

Using SST, remove the tapered roller bearing.

SST 09950-00020, 09950-00030, 09950-60010 (09951-00520)



G02639920

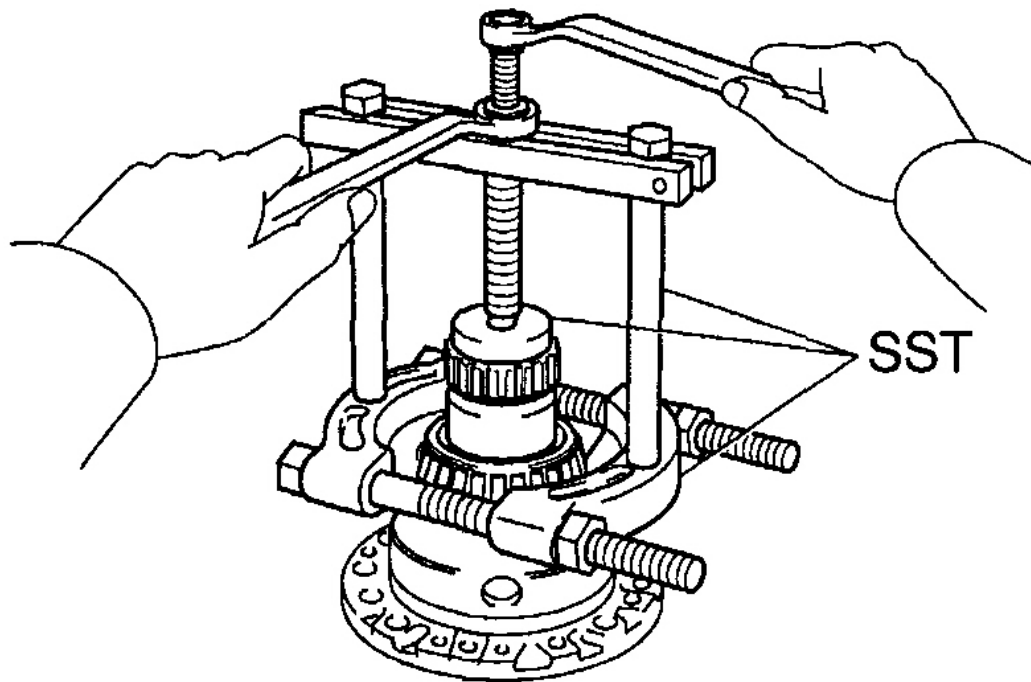
Fig. 139: Removing Tapered Roller Bearing
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

9. No. 1 Differential Case Side:

REMOVE TAPERED ROLLER BEARING

Using SST, remove the tapered roller bearing.

SST 09950-00020, 09950-00030, 09950-60010 (09951-00450)



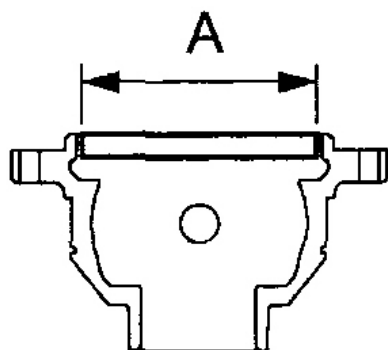
G02639921

Fig. 140: Removing Tapered Roller Bearing
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION

1. MEASURE NO.1 AND NO.2 DIFFERENTIAL CASES

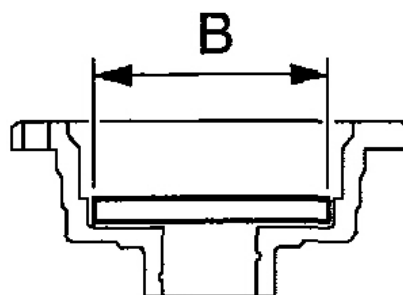
Using a cylinder gauge, measure the inner diameter of the No. 1 and No. 2 differential cases bushing.



No.1 Differential Case

T

G02639922



No.2 Differential Case

Fig. 141: Measuring Inner Diameter Of Differential Cases Bushing
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard diameter:

A: 104.000 to 104.035 mm (4.0945 to 4.0959 in.)

B: 97.000 to 97.035 mm (3.8189 to 3.8203 in.)

Maximum diameter:

A: 104.060 mm (4.0969 in.)

B: 97.060 mm (3.8213 in.)

2. MEASURE FRONT DIFFERENTIAL CASE

Using a micrometer, measure the outer diameter of the front differential case.

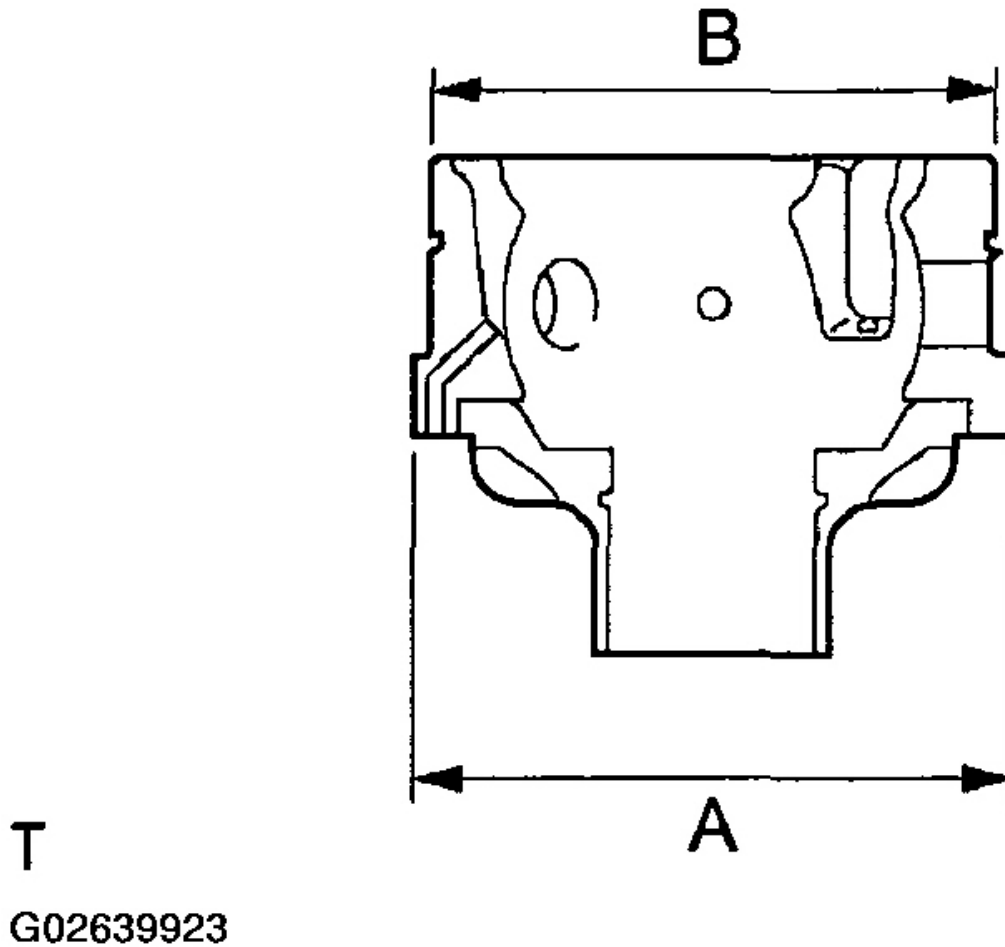


Fig. 142: Measuring Outer Diameter Of Front Differential Case
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard diameter:

A: 103.929 to 103.964 mm (4.0917 to 4.0931 in.)

B: 96.929 to 96.964 mm (3.8161 to 3.8175 in.)

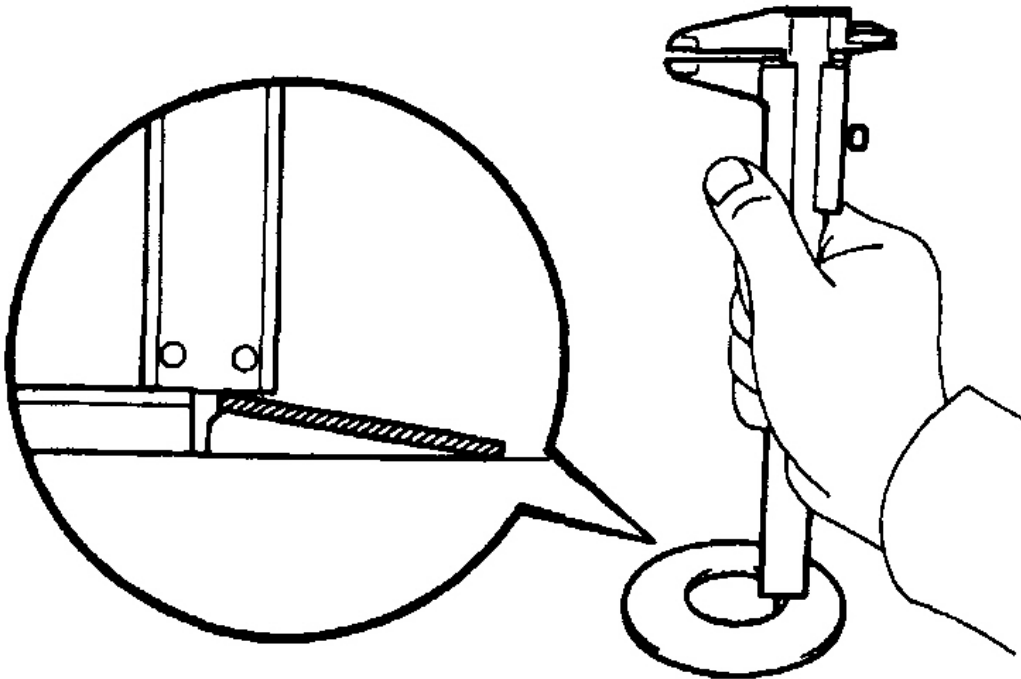
Minimum diameter:

A: 103.850 mm (4.0887 in.)

B: 96.850 mm (3.8130 in.)

3. MEASURE CONICAL SPRING WASHER

Using calipers, measure the height of the conical spring washer.



G02639924

Fig. 143: Measuring Height Of Conical Spring Washer
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard height:

No. 2 differential case side

2.60 to 2.80 mm (0.102 to 0.110 in.)

No. 1 differential case side

1.55 to 1.75 mm (0.061 to 0.069 in.)

Minimum height:

No. 2 differential case side

2.50 mm (0.098 in.)

No. 1 differential case side

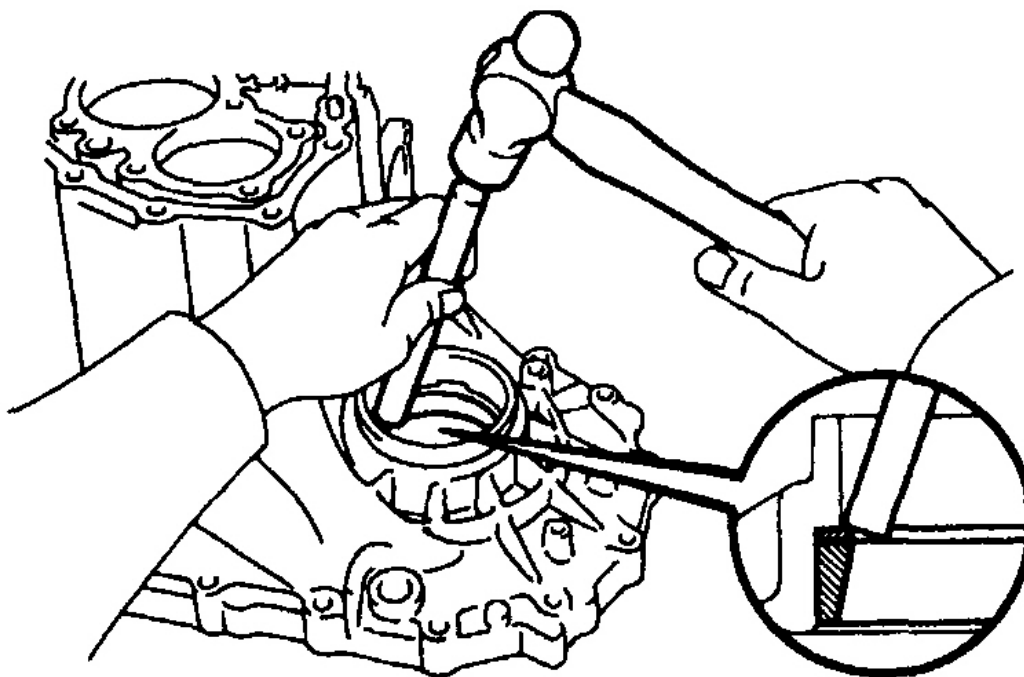
1.60 mm (0.063 in.)

REPLACEMENT

1. Transmission Case Side:

REPLACE OIL SEAL AND TAPERED ROLLER BEARING OUTER RACE

- a. Using a screwdriver and a hammer, remove the oil seal.
- b. Using a brass bar and hammer, drive out the tapered roller bearing outer race lightly and evenly.



G02639925

Fig. 144: Using Brass Bar And Hammer To Drive Out Tapered Roller Bearing Outer Race
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the shim.
- d. Install the shim.

HINT:

First select and install a shim of lesser thickness than before.

- e. Using SST and a press, install a new tapered roller bearing outer race.

SST 09316-60011 (09316-00011, 09316-00041)

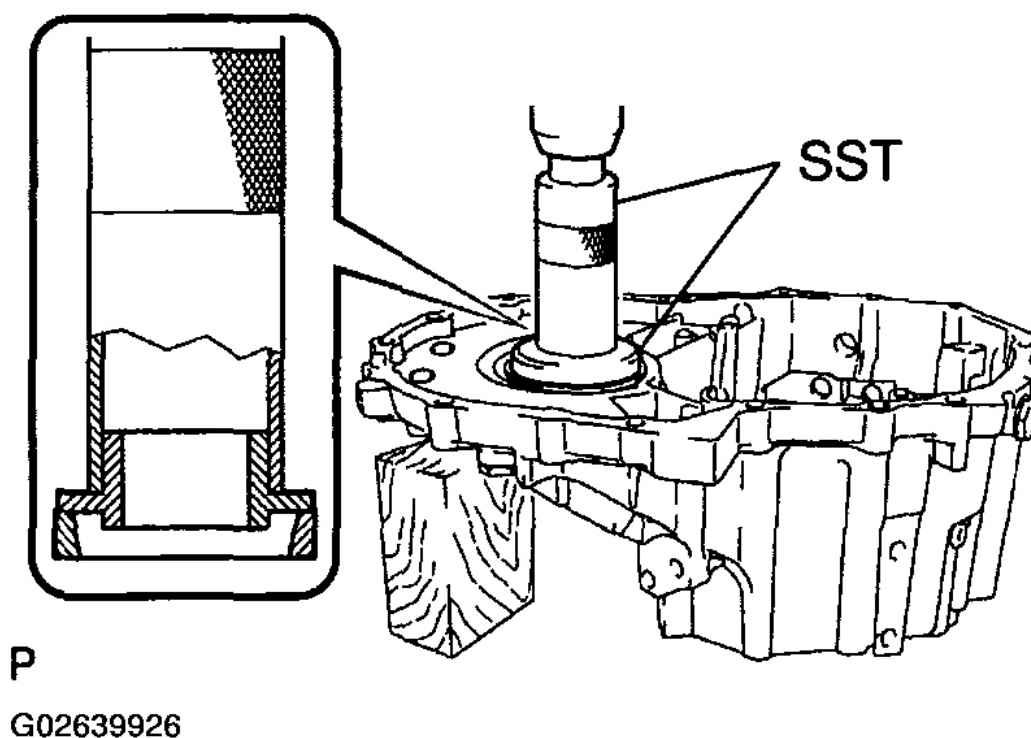


Fig. 145: Installing Tapered Roller Bearing Outer Race

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

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

- f. Using SST and a hammer, drive in a new oil seal.

SST 09316-60010 (09316-00011, 09316-00031)

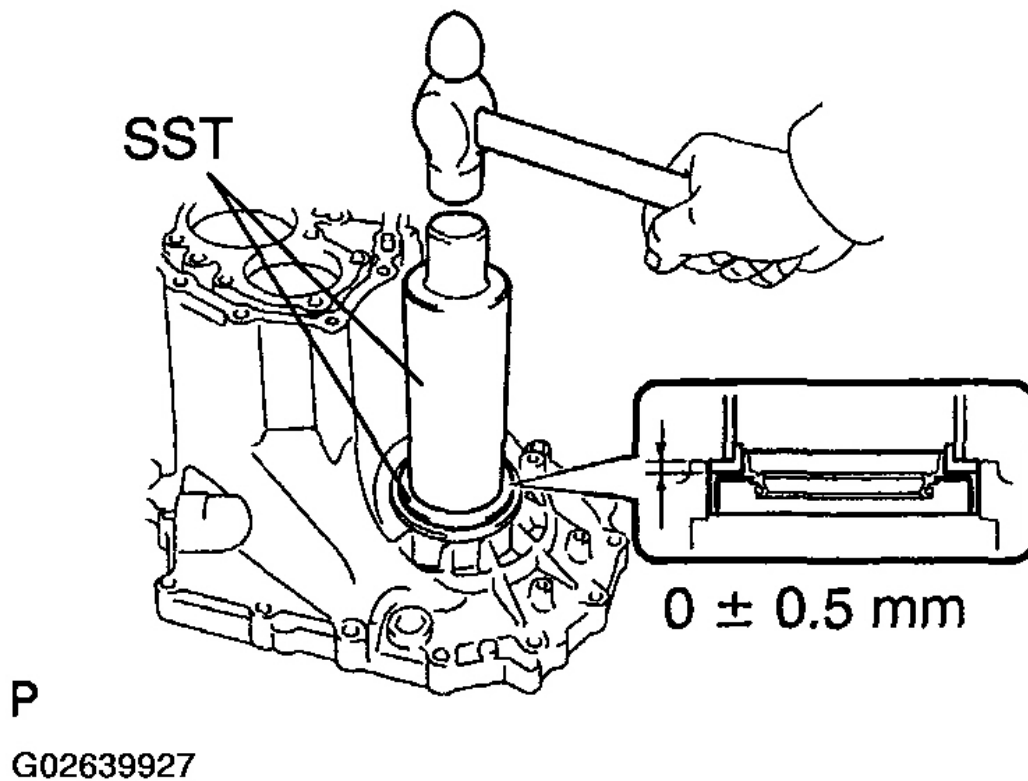


Fig. 146: Using SST And Hammer To Drive In New Oil Seal
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Drive in depth: 0 +/- 0.5 mm (0 +/- 0.020 in.)

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

2. Transaxle Case Side:

REPLACE OIL SEAL AND TAPERED ROLLER BEARING OUTER RACE

- a. Using a screwdriver and hammer, drive out the oil seal from the transaxle case.
- b. Using SST, remove the tapered roller bearing outer race.

SST 09316-60011 (09316-00011, 09316-00021)

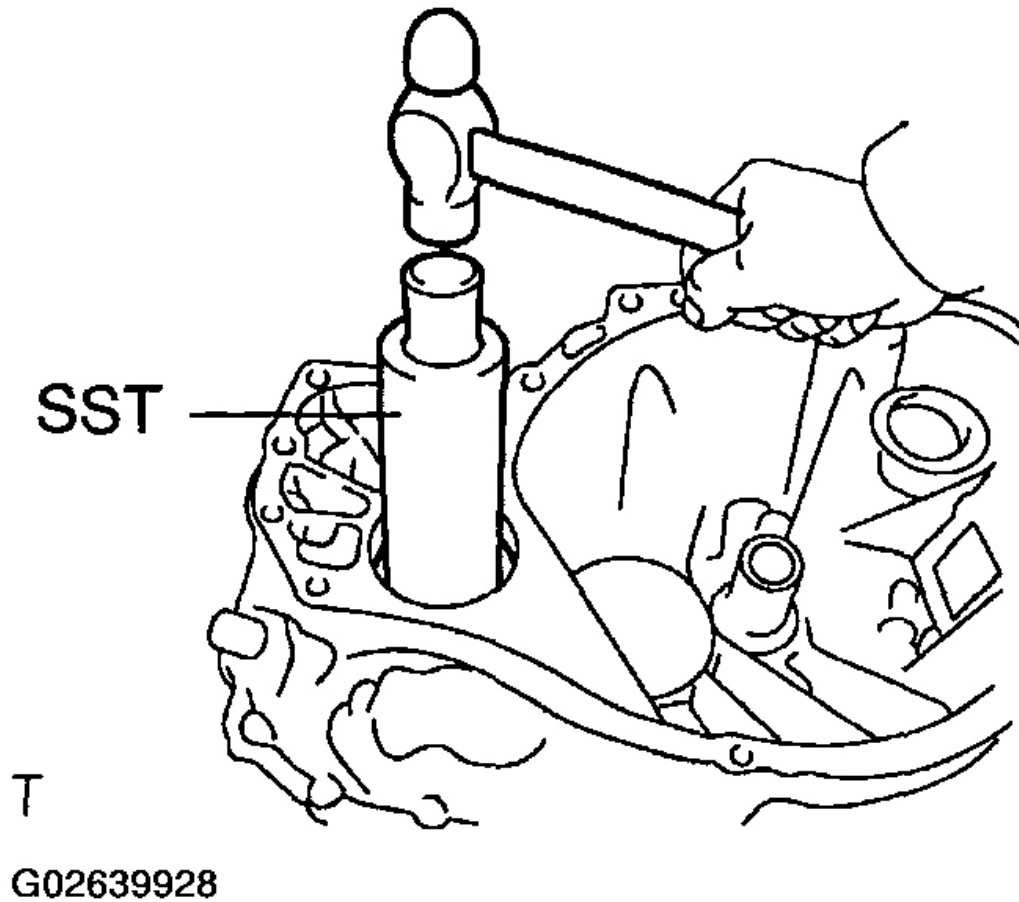


Fig. 147: Removing Tapered Roller Bearing Outer Race
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

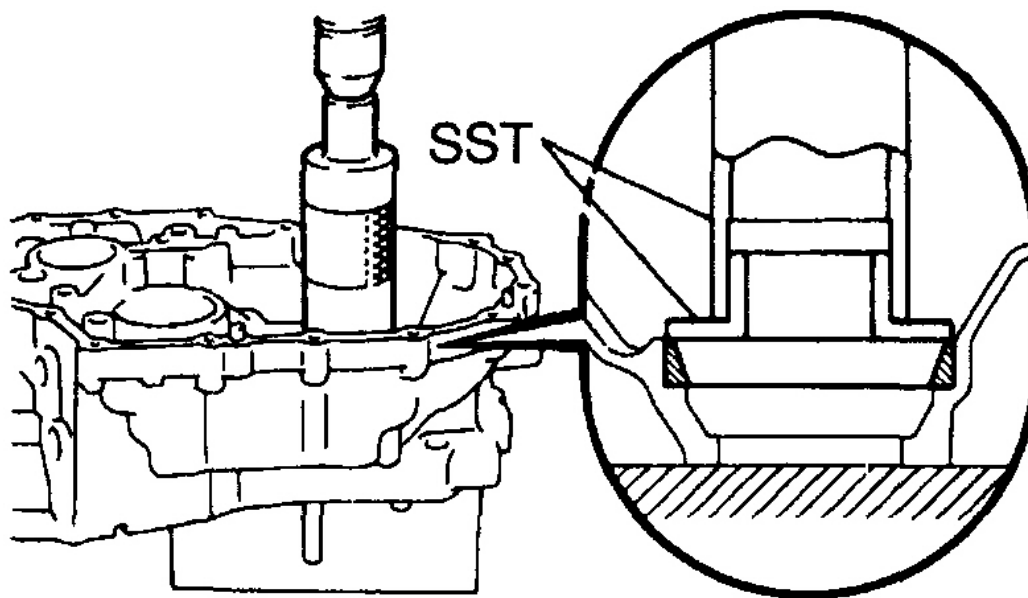
- c. Remove the oil baffle.
- d. Install the oil baffle.

HINT:

Install the oil baffle projection into the case side cutout.

- e. Using SST and a press, install the tapered roller bearing outer race.

SST 09316-60011 (09316-00011, 09316-00041).



G02639929

Fig. 148: Installing Tapered Roller Bearing Outer Race
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- f. Using SST and a hammer, drive in a new oil seal.

SST 09316-60011 (09316-00011, 09316-00041)

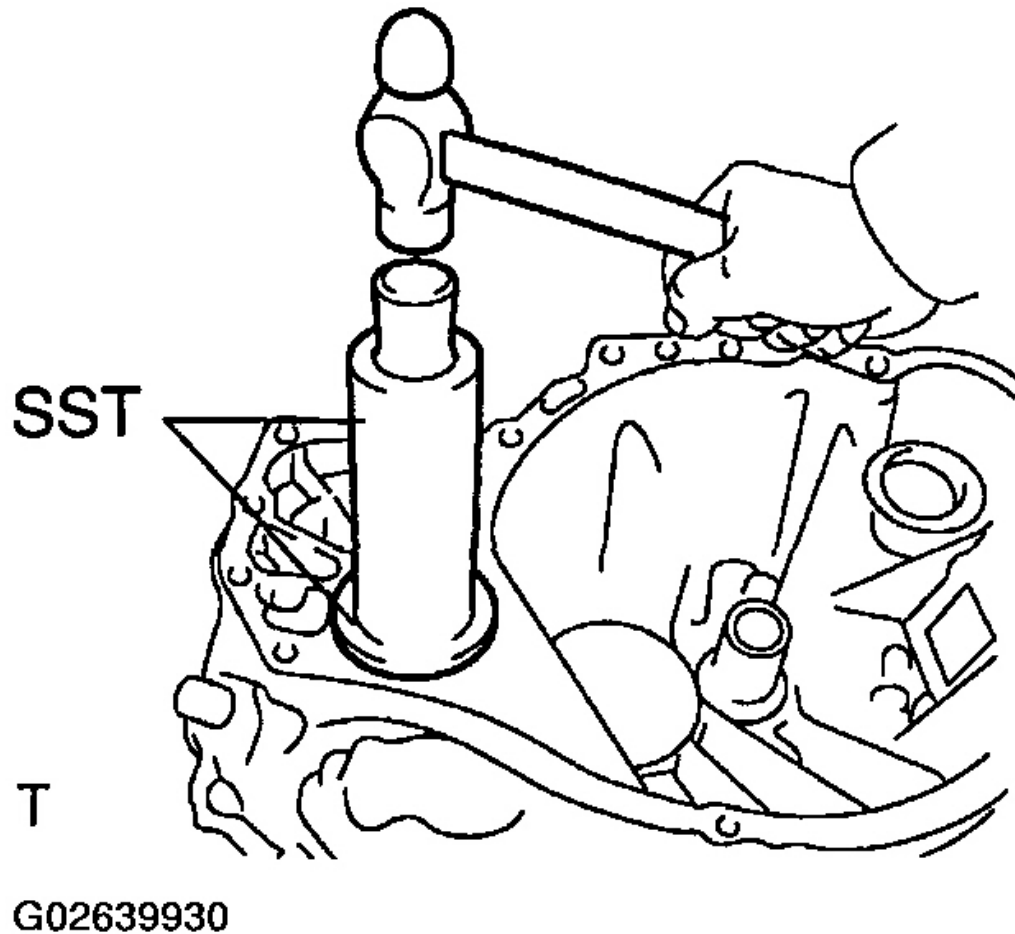


Fig. 149: Using SST And Hammer To Drive In New Oil Seal
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Drive in depth: 6.9 +/- 0.5 mm (0.272 +/- 0.020 in.)

- g. Coat the oil seal lip with MP grease.

REASSEMBLY

HINT:

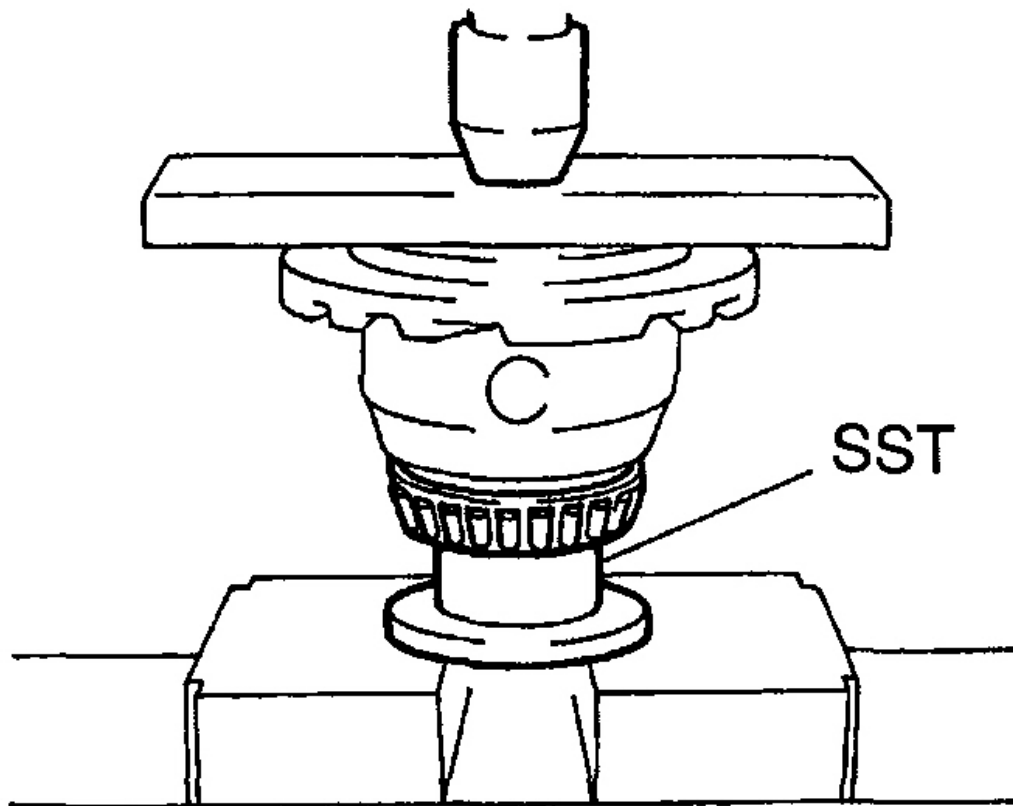
Coat all of the sliding and rotating surfaces with gear oil before reassembly.

1. No. 1 Differential Case Side:

INSTALL TAPERED ROLLER BEARING

Using SST, install a new tapered roller bearing.

SST 09316-20011



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Fig. 150: Installing Tapered Roller Bearing

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

2. No. 2 Differential Case Side:

INSTALL TAPERED ROLLER BEARING

Using SST, install a new tapered roller bearing.

SST 09316-20011

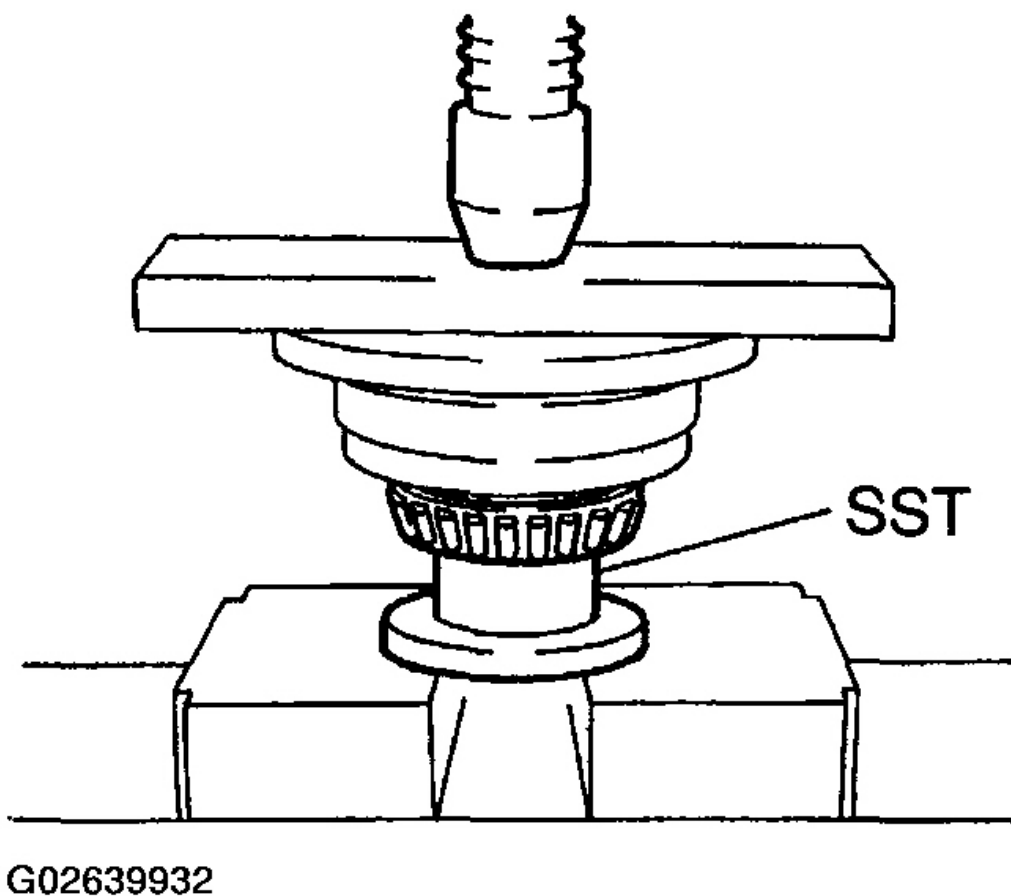


Fig. 151: Installing Tapered Roller Bearing

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

3. **CHECK AND ADJUST CENTER DIFFERENTIAL SIDE GEAR BACKLASH (DIFFERENTIAL SIDE GEAR SUB-ASSEMBLY SIDE)**
 - a. Install the parts to the No. 1 differential case.
 1. Install the No. 2 differential side gear thrust washer.
 2. Temporarily install a 1.0 mm (0.039 in.) thick thrust washer.
 3. Install the differential side gear subassembly.
 4. Install the pinion shaft holder.
 5. Install the 4 differential pinions.
 6. Install the 4 differential pinion thrust washers.
 7. Install the 4 differential pinion shafts.

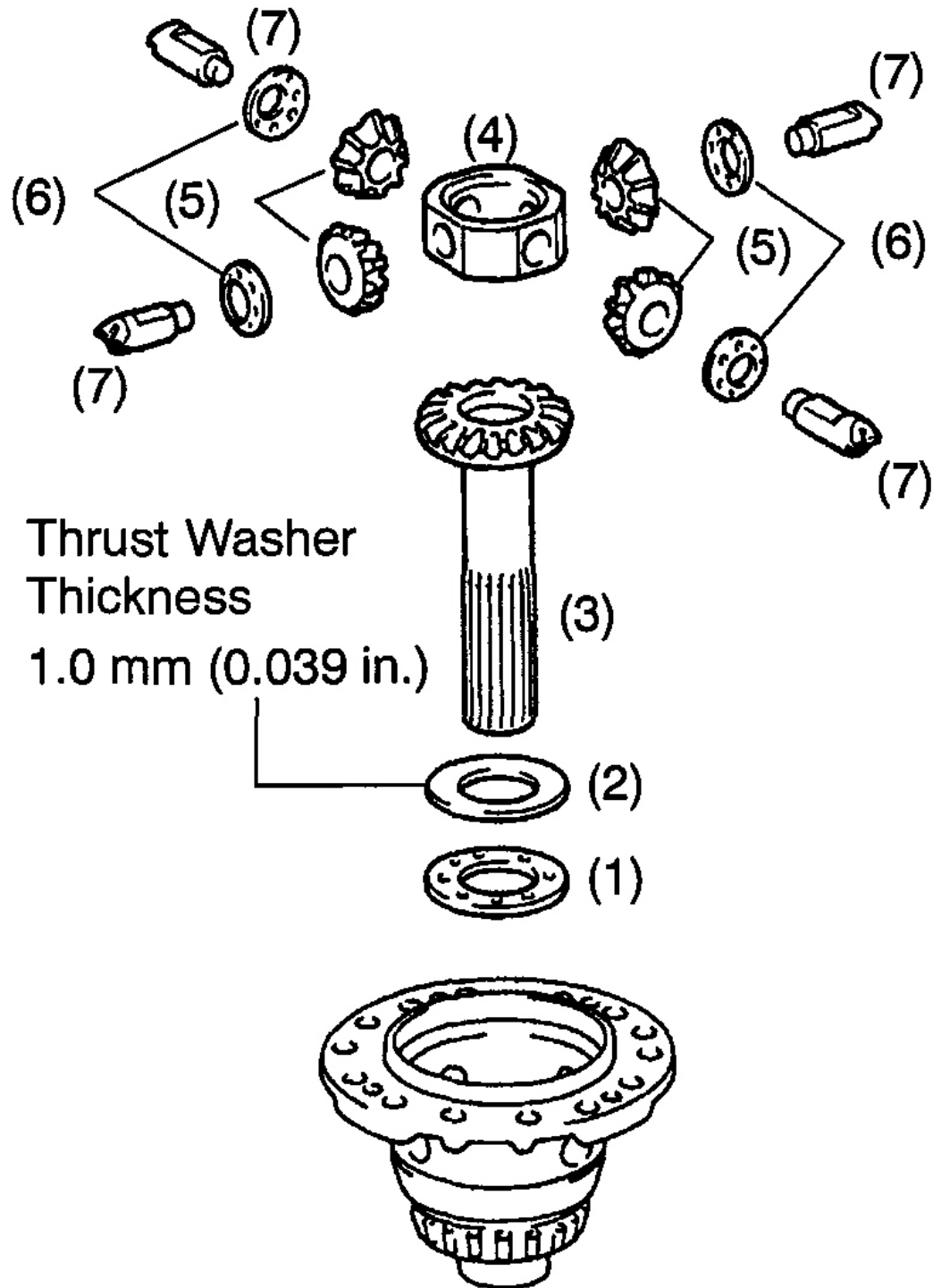


Fig. 152: Installing Parts Of No. 1 Differential Case
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

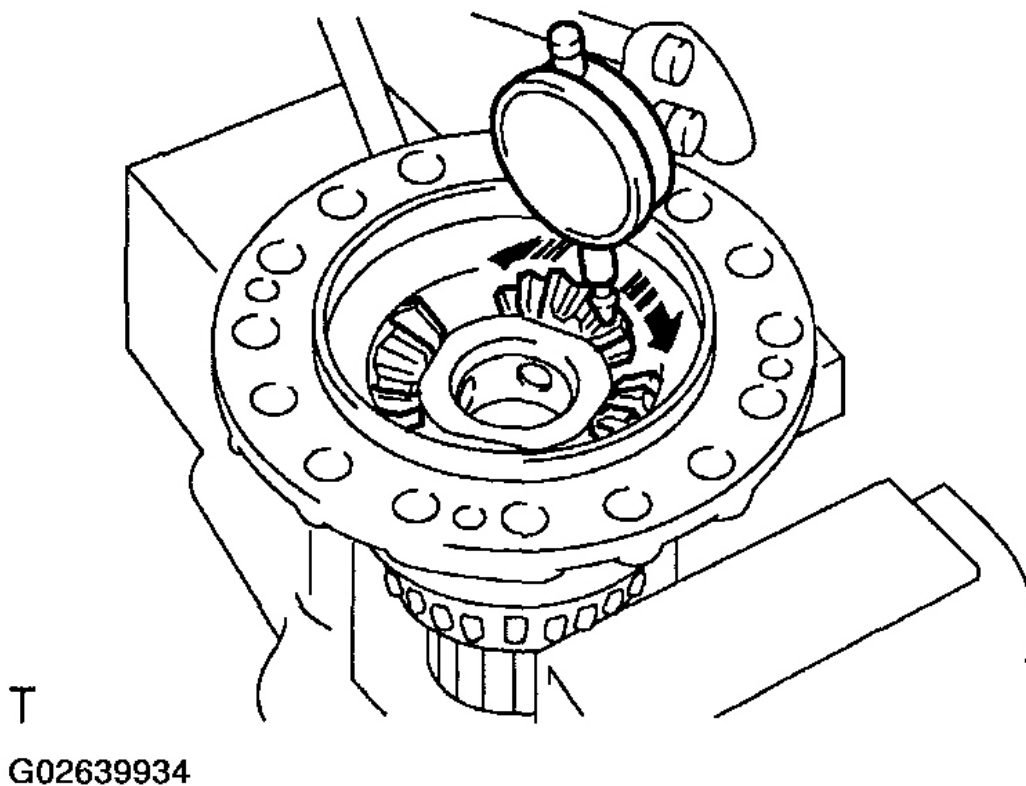


Fig. 153: Measuring Backlash Of One Pinion Gear
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard backlash:

0.05 to 0.20 mm (0.0020 to 0.0079 in.)

HINT:

Push the pinion gear of the right side of the differential case.

If the backlash is out of the specification, refer to **THRUST WASHER THICKNESS SPECIFICATION CHART** and select a thrust washer which will ensure that the backlash is

within the specification.

Thrust washer thickness: mm (in.)

THRUST WASHER THICKNESS SPECIFICATION CHART

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
MA	0.80 (0.0315)	MH	1.15 (0.0453)
MB	0.85 (0.0335)	MI	1.20 (0.0472)
MC	0.90 (0.0354)	MJ	1.25 (0.0492)
MD	0.95 (0.0374)	MK	1.30 (0.0512)
ME	1.00 (0.0394)	ML	1.35 (0.0531)
MF	1.05 (0.0413)	MN	1.40 (0.0551)
MG	1.10 (0.0433)	-	-

c. Disassemble the No. 1 differential case.

4. ASSEMBLE NO. 1 DIFFERENTIAL CASE

Install the parts to the No. 1 differential case.

1. Install the No. 2 side gear thrust washer (previously selected).
2. Install the conical spring washer.
3. Install the differential side gear subassembly.
4. Install the pinion shaft holder.
5. Install the 4 differential pinions.
6. Install the 4 differential pinion thrust washers.
7. Install the 4 differential pinion shafts.

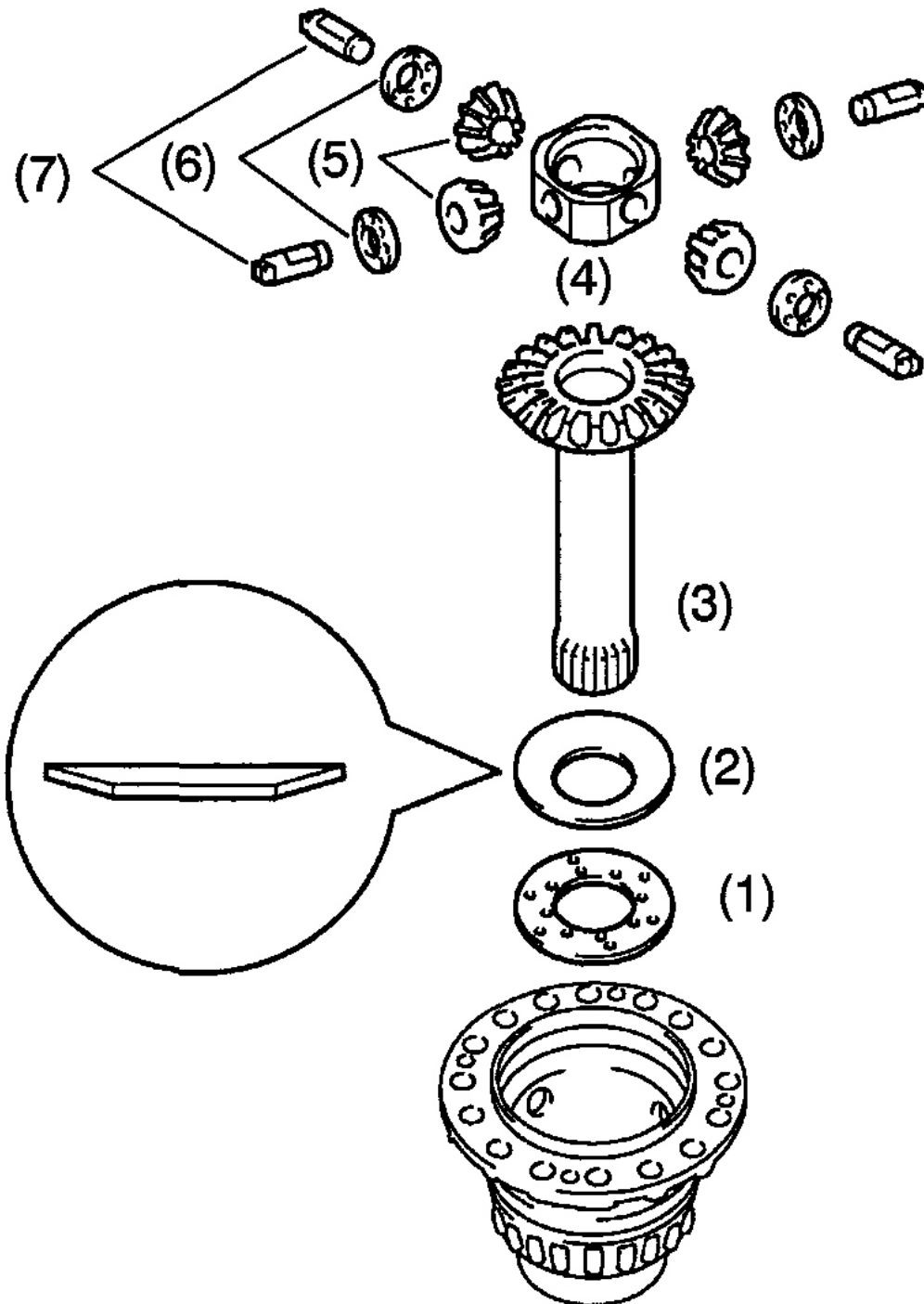


Fig. 154: Installing Parts Of No. 1 Differential Case
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

Ensure that the conical spring washer is installed correctly.

5. INSTALL VEHICLE SPEED SENSOR DRIVE GEAR

- a. Install the vehicle speed sensor drive gear and spacer.
- b. Using a snap ring expander, install the snap ring.

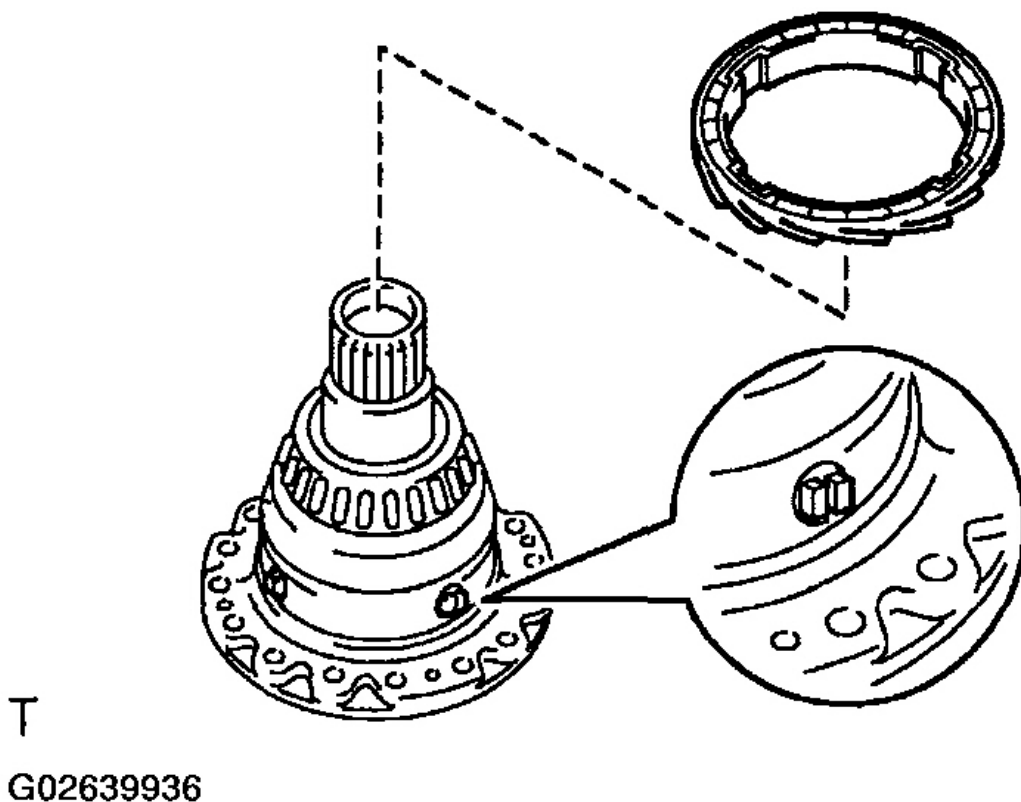


Fig. 155: Installing Snap Ring
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

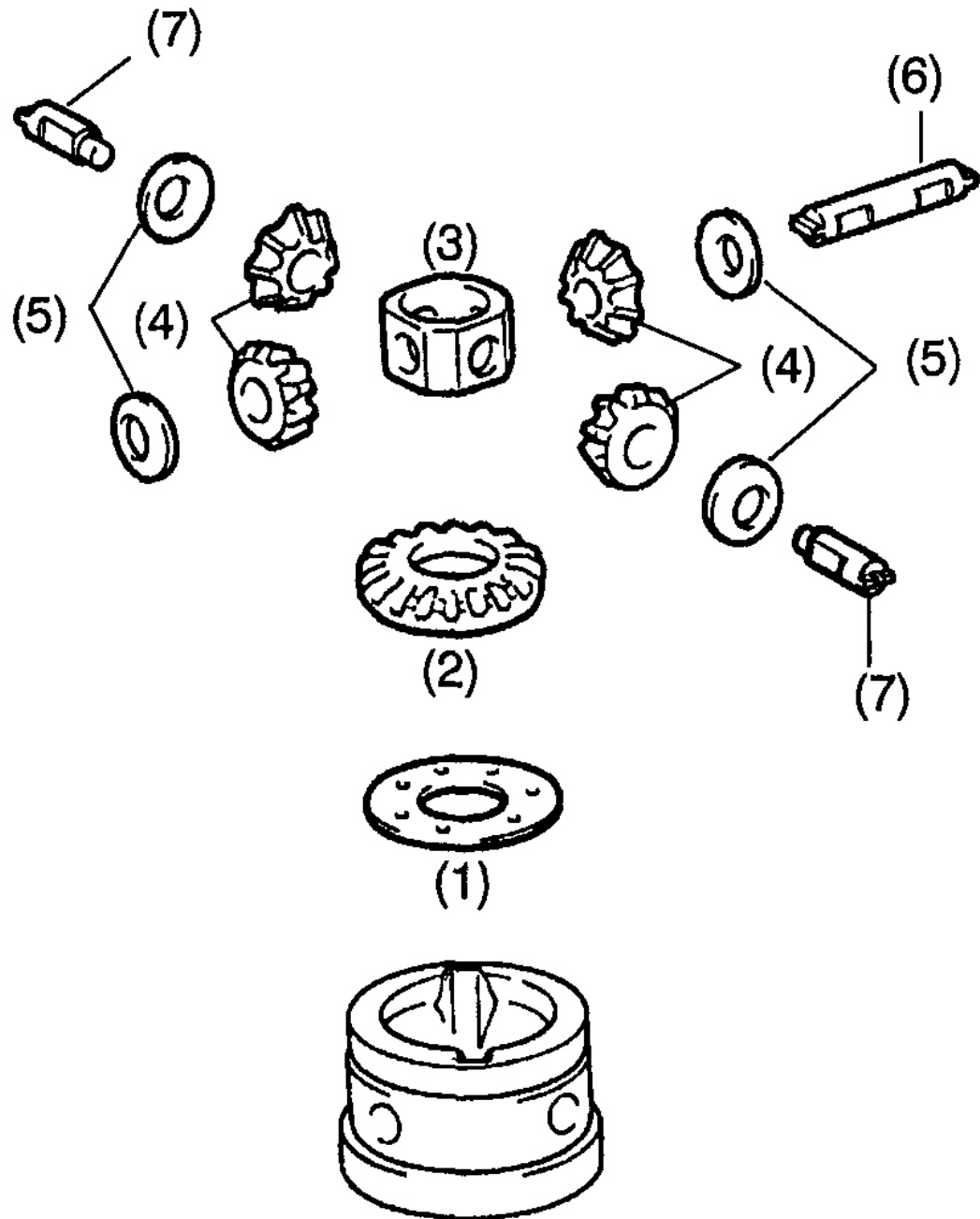
6. CHECK AND ADJUST FRONT SIDE GEAR BACKLASH (FRONT DIFFERENTIAL CASE SIDE)

- a. Install the parts to the front differential case.
 1. Install the front differential side gear thrust washer.

2004 Toyota RAV4

2004 TRANSMISSION Manual Transaxle - RAV4

2. Install the front differential side gear.
3. Install the front differential pinion shaft holder.
4. Install the 4 differential pinions.
5. Install the 4 differential pinion thrust washers.
6. Install the No. 2 front differential pinion shaft.
7. Install the 2 front differential pinion shafts.

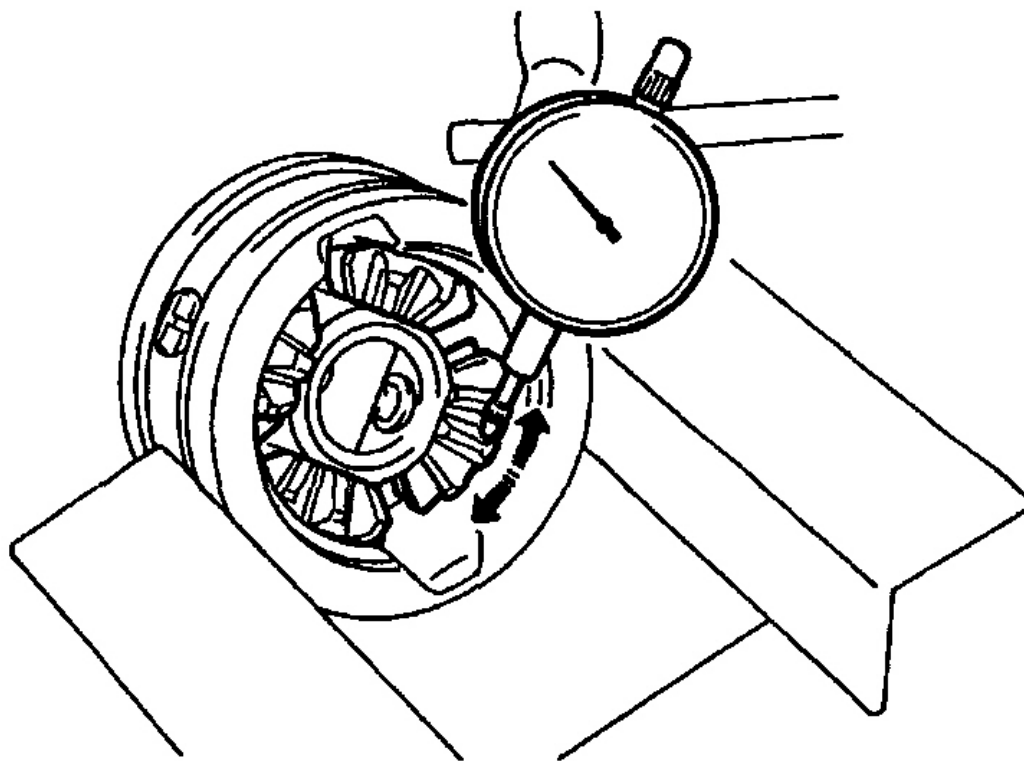


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Fig. 156: Installing Parts Of Front Differential Case
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using a dial indicator, measure the backlash of one pinion gear while holding the front differential

side gear toward the case.



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Fig. 157: Measuring Backlash Of One Pinion Gear
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Standard backlash:

0.05 to 0.20 mm (0.0020 to 0.0079 in.)

NOTE: Do not mount the surface of front differential case which contacts with bushing in a vise.

If the backlash is out of the specification, refer to **THRUST WASHER THICKNESS SPECIFICATION CHART** and select a thrust washer which will ensure that the backlash is within the specification.

Thrust washer thickness: mm (in.)

2004 Toyota RAV4

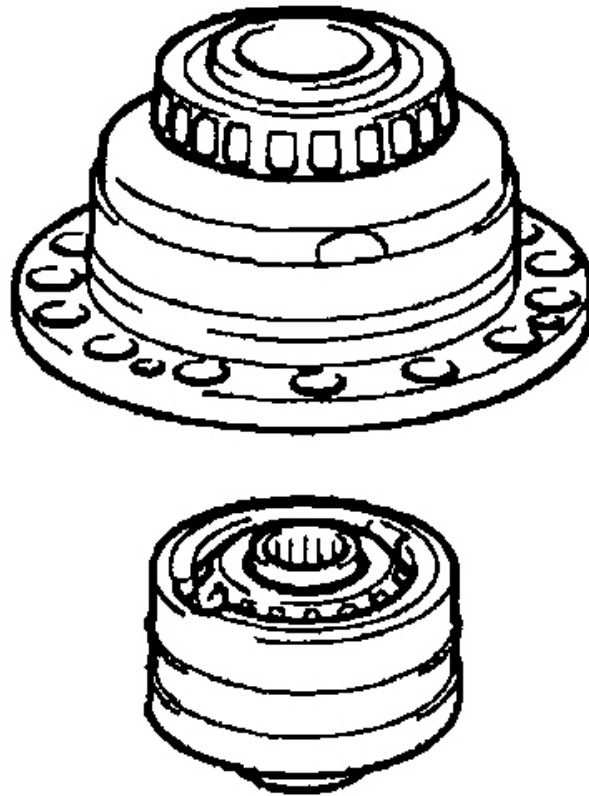
2004 TRANSMISSION Manual Transaxle - RAV4

THRUST WASHER THICKNESS SPECIFICATION CHART

Mark	Thickness mm (in.)
B	1.00 (0.0394)
C	1.05 (0.0413)
D	1.10 (0.0433)
E	1.15 (0.0453)
F	1.20 (0.0472)
G	1.25 (0.0492)

7. CHECK AND ADJUST FRONT DIFFERENTIAL SIDE GEAR THRUST CLEARANCE (NO. 2 DIFFERENTIAL CASE SIDE)

- Engage the side gear to the above mentioned front differential case.
- Install the differential case LH to the front differential case and measure its center.

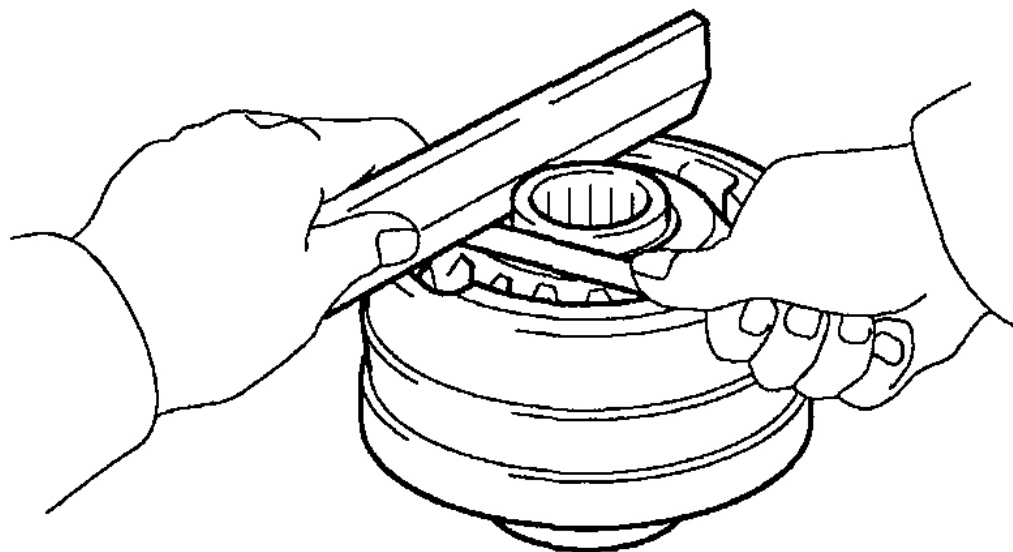


T

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Fig. 158: Installing Differential Case LH To Front Differential Case
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. After that, remove the differential case LH.
- d. Using a straight edge and feeler gauge, measure the clearance between the front differential case and the side gear.



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Fig. 159: Measuring Clearance Between Front Differential Case And Side Gear
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

t= Thrust washer thickness

L= Clearance

t= L - 0.16 to 0.27 mm (0.0063 to 0.0106 in.)

HINT:

Refer to **THRUST WASHER THICKNESS SPECIFICATION CHART** and select a thrust washer which will ensure that the clearance is within the specification.

Thrust washer thickness: mm (in.)

THRUST WASHER THICKNESS SPECIFICATION CHART

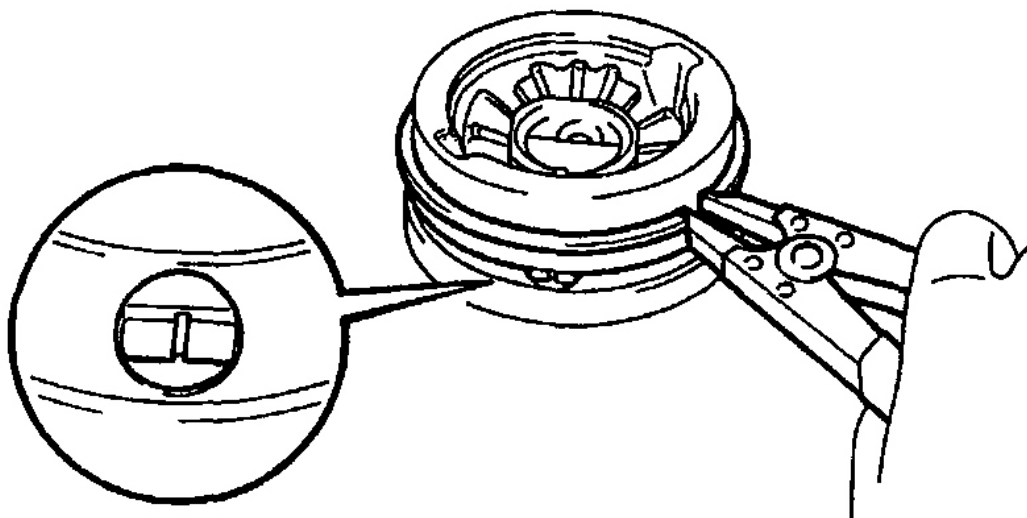
Mark	Thickness	Mark	Thickness.
A	0.95 (0.0373)	F	1.20 (0.0472)
B	1.00 (0.0393)	G	1.25 (0.0492)
C	1.05 (0.0413)	H	1.30 (0.0512)
D	1.10 (0.0433)	J	1.35 (0.0532)

E	1.15 (0.0453)	K	1.40 (0.0552)
---	---------------	---	---------------

If the clearance is not within the specified value, parts may have been assembled incorrectly, so check and reassemble it.

8. INSTALL SNAP RING

- a. Install the spacer.
- b. Using a snap ring expander, install the shaft snap ring, as shown in **Fig. 160**.



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Fig. 160: Installing Shaft Snap Ring

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

HINT:

Before installing the shaft snap ring, wrap vinyl tape around the case to avoid damaging the case.

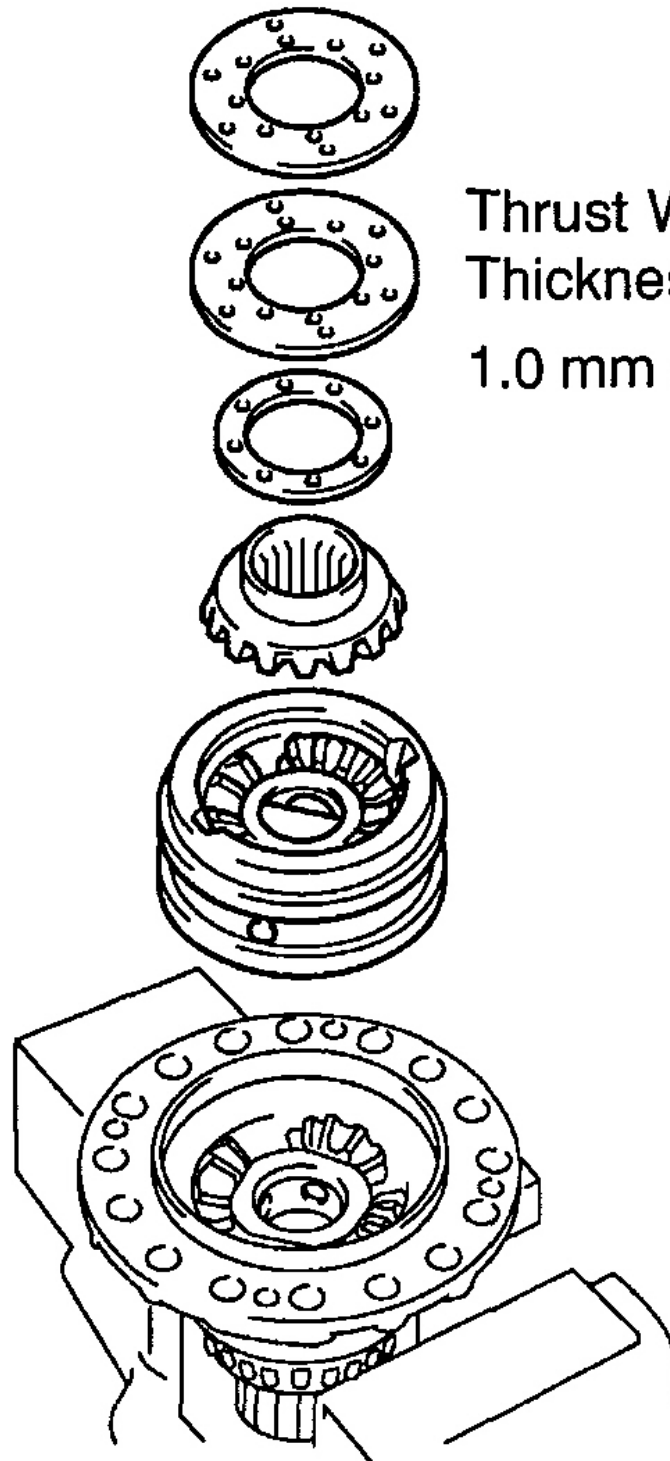
9. CHECK AND ADJUST CENTER DIFFERENTIAL SIDE GEAR THRUST CLEARANCE (FRONT DIFFERENTIAL CASE SIDE)

- a. Install the parts to the No. 2 differential case.
 1. Install the front differential case assembly.
 2. Install the front differential side gear.
 3. Install the front differential side gear thrust washer.
 4. Temporarily install a 1.0 mm (0.039 in.) thick No. 2 differential side gear thrust washer.

2004 Toyota RAV4

2004 TRANSMISSION Manual Transaxle - RAV4

5. Install the No. 2 differential side gear thrust washer.



Thrust Washer
Thickness
1.0 mm (0.039 in.)

T

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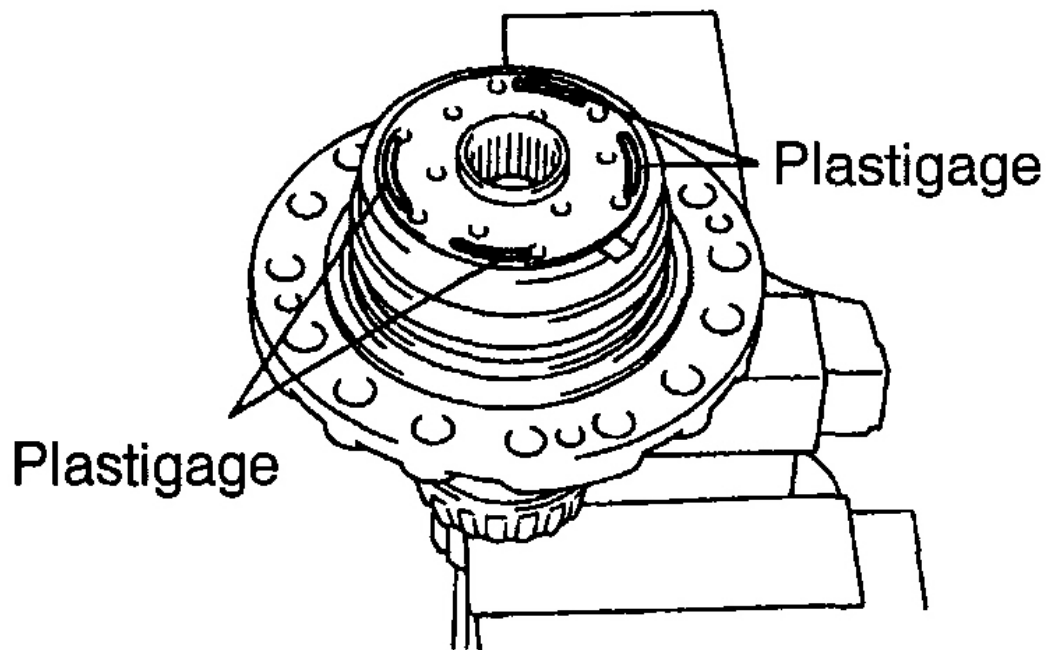
Fig. 161: Installing Parts Of No. 2 Differential Case
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

- Engage the front differential side gear and pinion gear of the No. 1 differential case.
 - The temporarily installed a 1.0 mm (0.039 in.) thick No. 2 side gear thrust washer is used for reference when checking backlash.
- b. Clean the contact surface of the No. 2 side gear thrust washer and No. 2 differential case.
- c. Apply plastigage on the No. 2 side gear thrust washer, as shown in **Fig. 162**.

HINT:

Apply the plastigage on the No. 2 side gear thrust washer in the 4 positions directly above the pinion shafts in the No. 1 differential case's position.

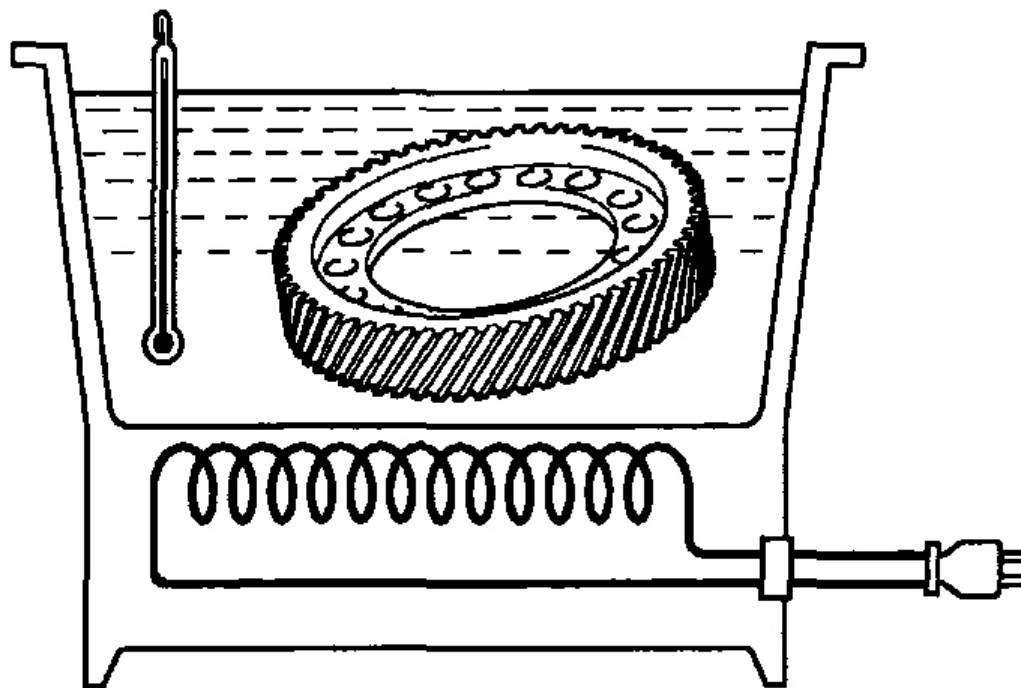


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Fig. 162: Applying Plastigage On No. 2 Side Gear Thrust Washer
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Install the ring gear.

1. Clean the contact surface of the differential left case.
2. Heat the ring gear to about 100°C (212°F) in boiling water.
3. Carefully take the ring gear out of the water.
4. Clean the contact surface of the ring gear with cleaning solvent.
5. Quickly install the ring gear on the differential case.



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Fig. 163: Installing Ring Gear

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

HINT:

Align the matchmarks on the No. 2 differential case and connect the ring gear.

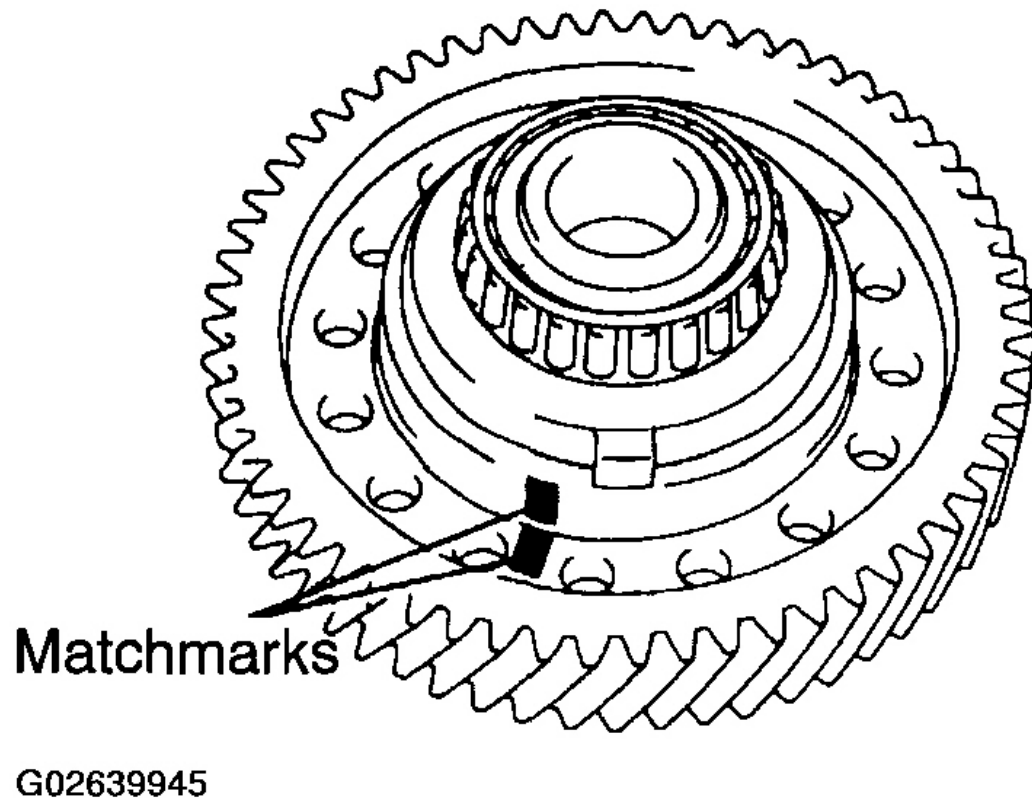
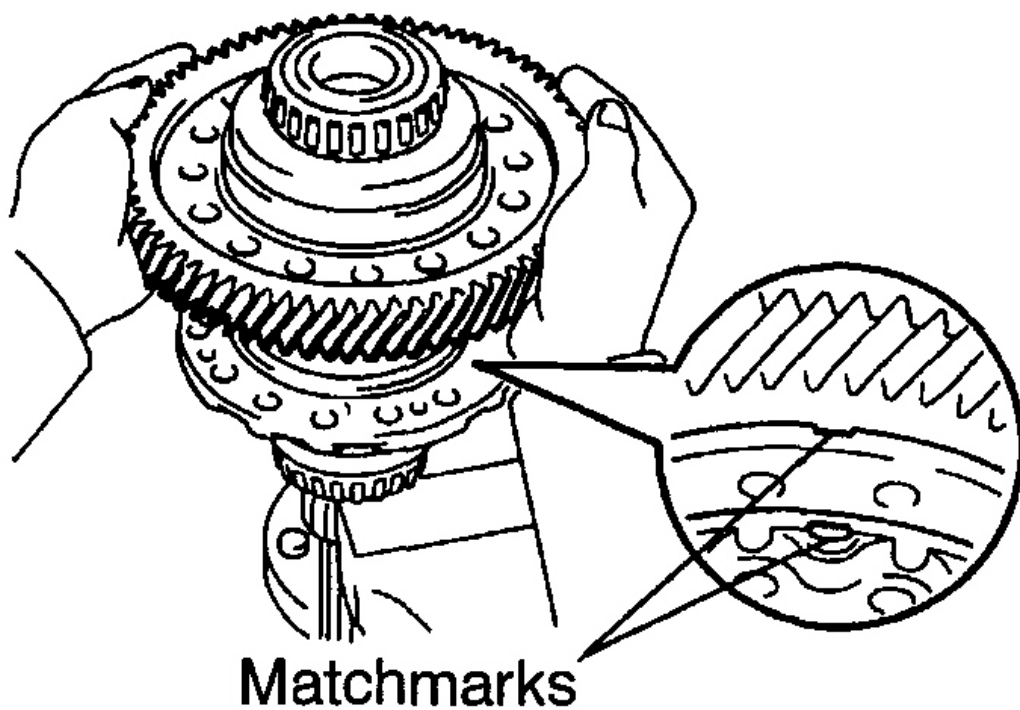


Fig. 164: Aligning Matchmarks On No. 2 Differential Case
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Install the No. 2 differential case downward.

HINT:

Align the matchmarks on the No. 1 differential case and contact the No. 2 differential case.



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Fig. 165: Aligning Matchmarks On No. 1 Differential Case And Contact No. 2 Differential Case

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

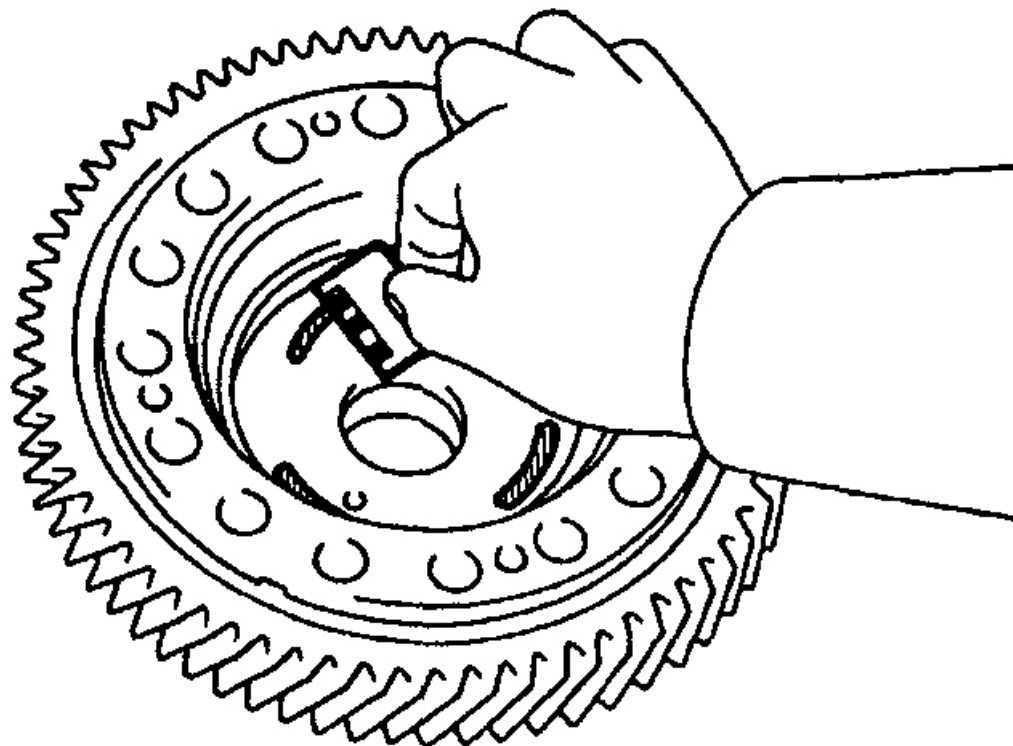
- f. Temporarily install the 4 service bolts.

Parts No:

Service bolt: 90105-08055

Torque: 33 N.m (337 kgf.cm, 24 ft.lbf)

- g. Remove the 4 service bolts and No. 2 differential case upward.
- h. Measure the Plastigage at its widest point.



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Fig. 166: Measuring Plastigage

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

Standard clearance: 0.16 to 0.25 mm (0.006 to 0.010 in.)

Refer to **THRUST WASHER THICKNESS SPECIFICATION CHART** , select the No. 2 thrust washer which will ensure that the backlash is within the specification. Try to select a washer of the same size.

Thrust washer thickness: mm (in.)**THRUST WASHER THICKNESS SPECIFICATION CHART**

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
0	0.80 (0.0315)	7	1.15 (0.0453)
1	0.85 (0.0335)	8	1.20 (0.0472)
2	0.90 (0.0354)	9	1.25 (0.0492)
3	0.95 (0.0374)	A	1.30 (0.0512)

2004 Toyota RAV4

2004 TRANSMISSION Manual Transaxle - RAV4

4	1.00 (0.0394)	B	1.35 (0.0531)
5	1.05 (0.0413)	C	1.40 (0.0551)
6	1.10 (0.0433)	-	-

- i. Remove the No. 2 differential case, No. 2 side gear thrust washer and (temporarily install) a 1.0 mm (0.039 in.) thick No. 2 side gear thrust washer.

10. ASSEMBLE NO.2 DIFFERENTIAL CASE

- a. Install the No. 2 side gear thrust washer (previously selected) and conical spring washer to the front differential case.

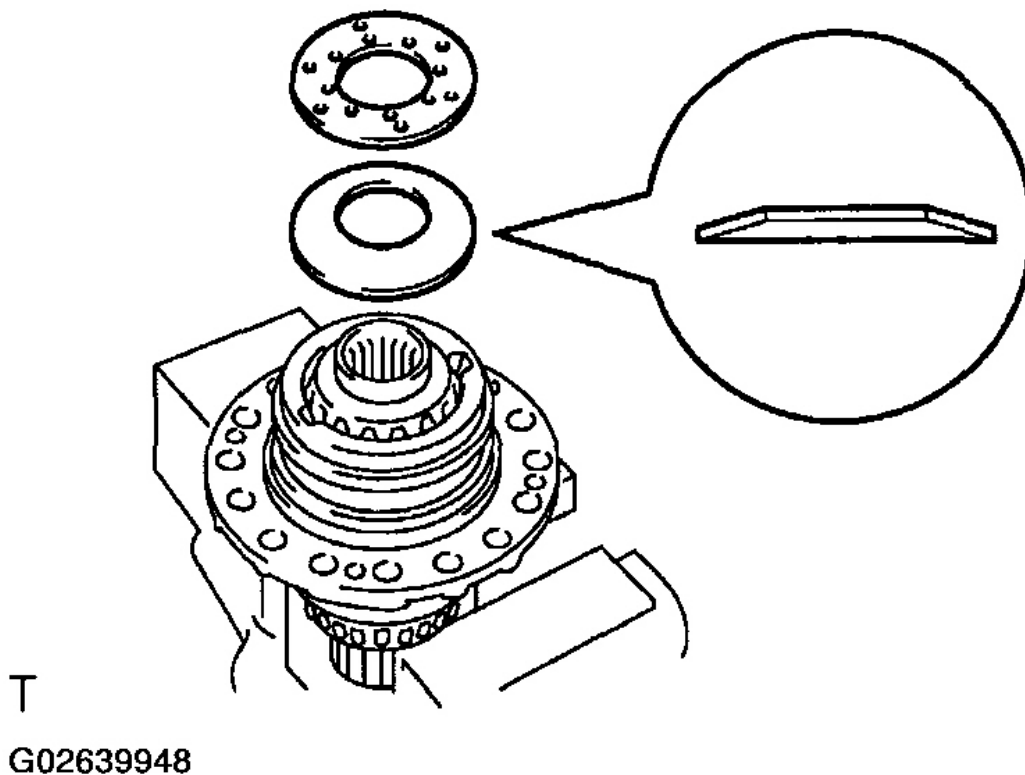


Fig. 167: Installing No. 2 Side Gear Thrust Washer And Conical Spring Washer To Front Differential Case

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

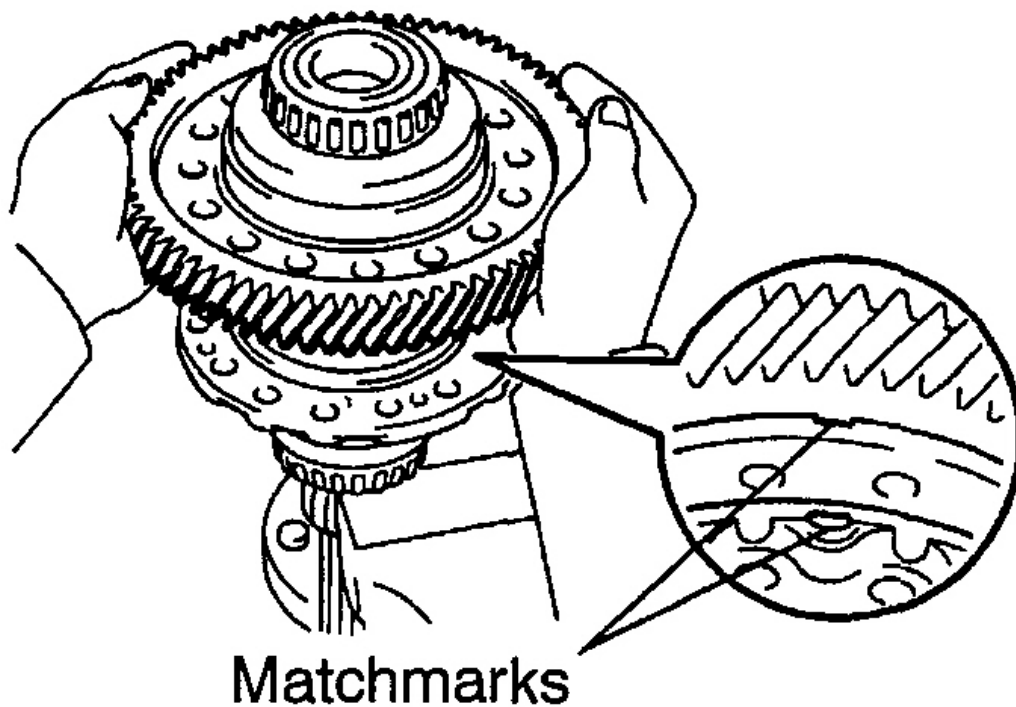
HINT:

Be careful not to mistake the direction of the conical spring washer.

- b. Install the No. 2 differential case to the No. 1 differential case.

HINT:

Align the matchmarks on the No. 2 differential case and connect the No. 1 differential case.



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Fig. 168: Aligning Matchmarks On No. 2 Differential Case And Connect No. 1 Differential Case

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

- c. Temporarily install the 4 service bolts.

Parts No:

Service bolt: 90105-08055

Torque: 33 N.m (337 kgf.cm, 24 ft.lbf)

11. ADJUST DIFFERENTIAL CASE SIDE BEARING PRELOAD

- a. Install the differential case assembly to the transaxle case.
- b. Install the transmission case.

HINT:

If necessary, tap on the transmission case with a plastic hammer.

- c. Install and torque the 17 bolts.

Torque:

29 N.m (300 kgf.cm, 21 ft.lbf) for transaxle case side

30 N.m (306 kgf.cm, 22 ft.lbf) for transmission case side

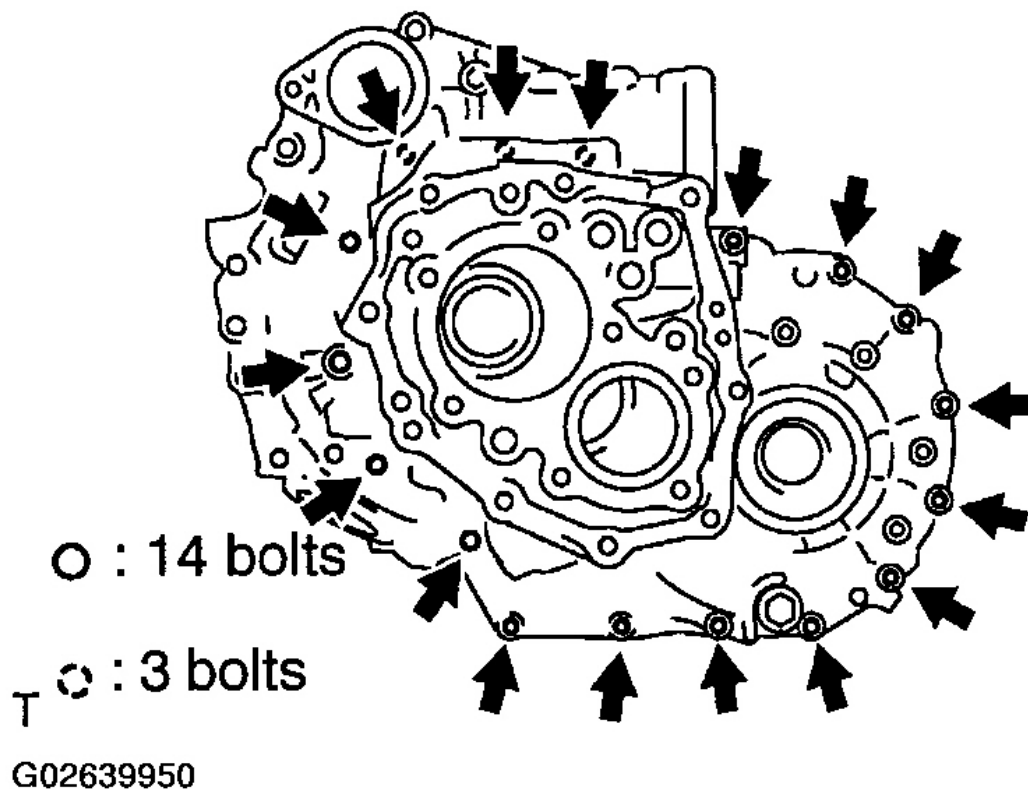
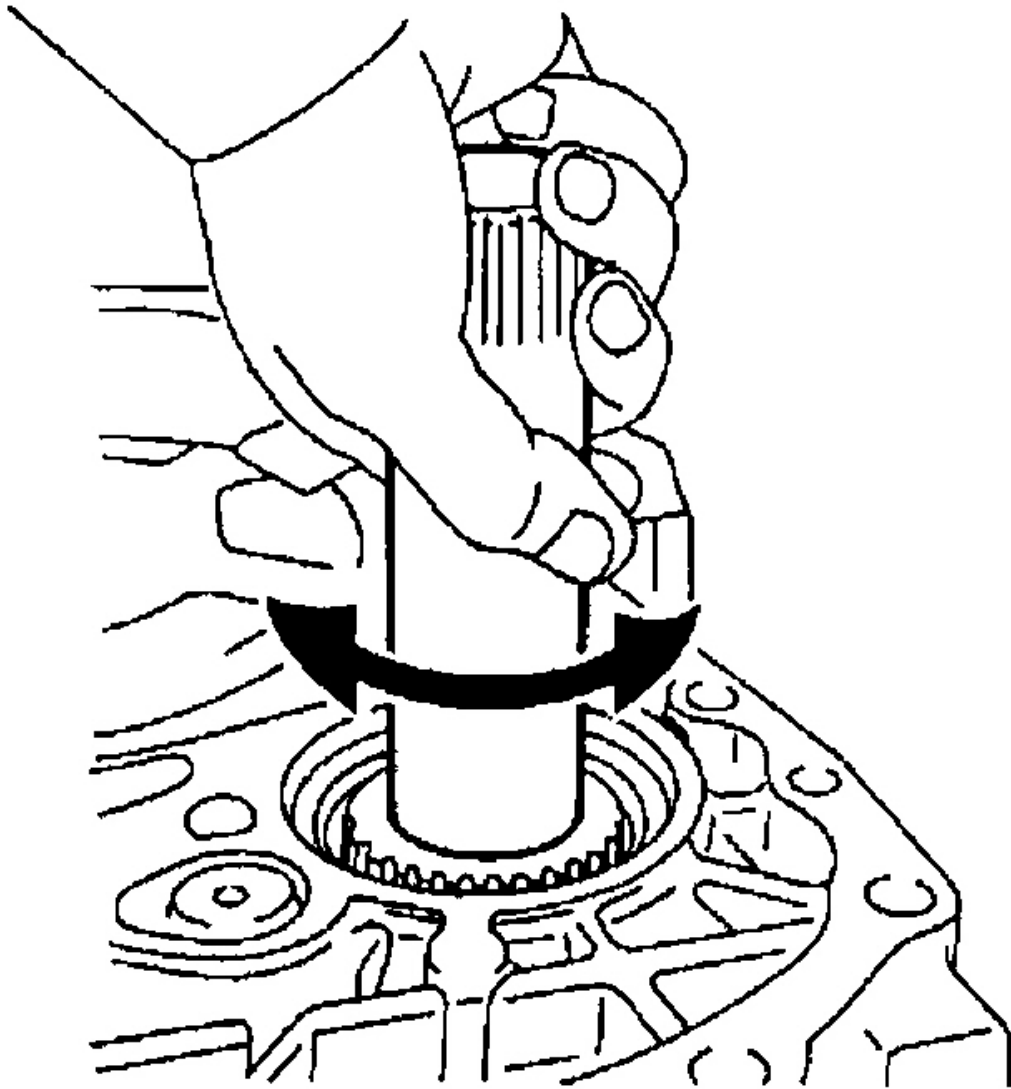


Fig. 169: Installing & Torquing Bolts

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

- d. Temporarily install the intermediate shaft.
e. Turn the intermediate shaft right and left 2 or 3 times to allow the bearing settle.



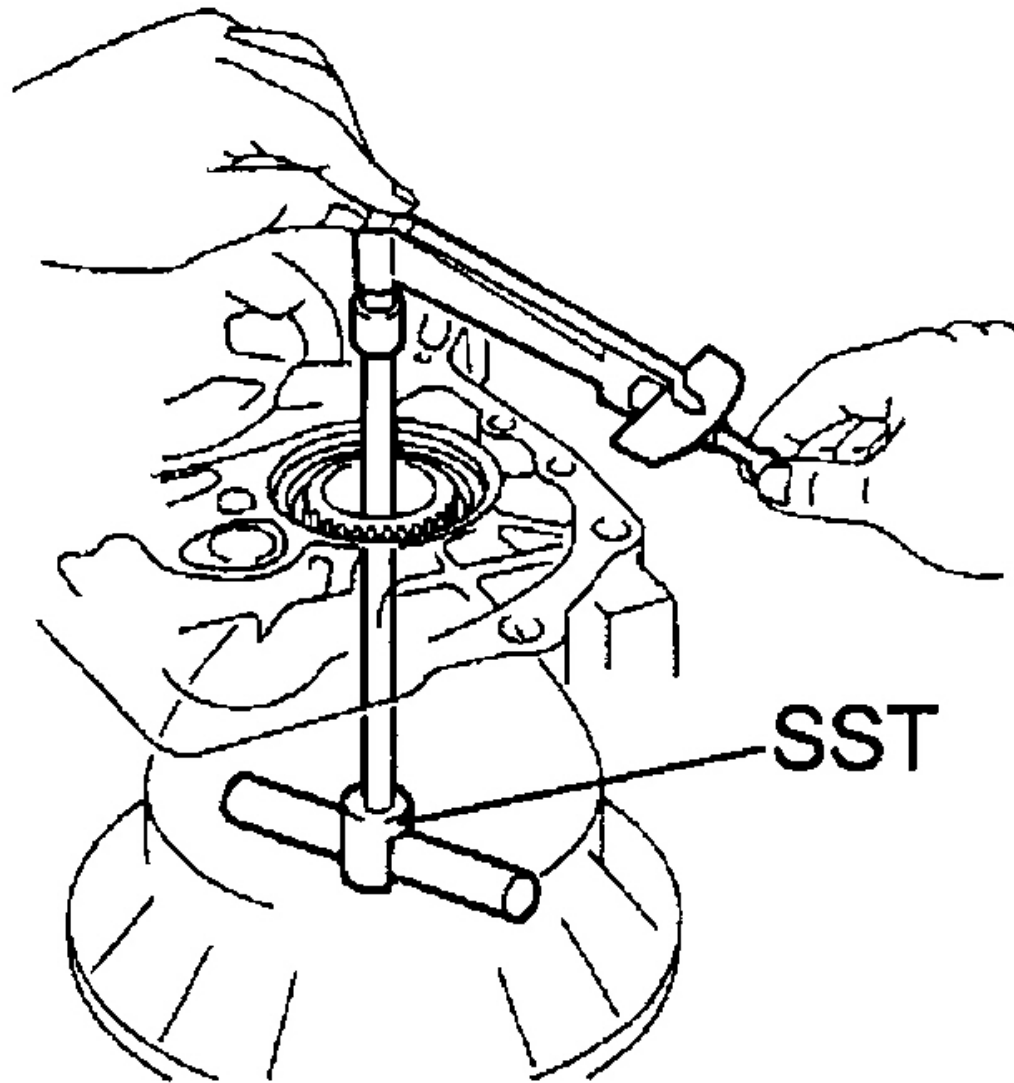
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Fig. 170: Turning Intermediate Shaft

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

- f. Remove the intermediate shaft.
- g. Using SST and a torque wrench, measure the differential preload.

SST 09564-32011



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Fig. 171: Measuring Differential Preload

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

Preload (at starting)

New bearing:

0.8 to 1.6 N.m (8.0 to 16.3 kgf.cm, 7.1 to 14.2 in.lbf)

2004 Toyota RAV4

2004 TRANSMISSION Manual Transaxle - RAV4

Reused bearing:

0.5 to 1.0 N.m (5.1 to 10.2 kgf.cm, 4.4 to 8.6 in.lbf)

If the preload is not within the specification, select an appropriate adjusting shim.

HINT:

The total preload will change about 5.1 N (0.5 kgf, 1.1 lbf) for every 0.05 mm change in adjusting shim thickness.

Thrust washer thickness: mm (in.)

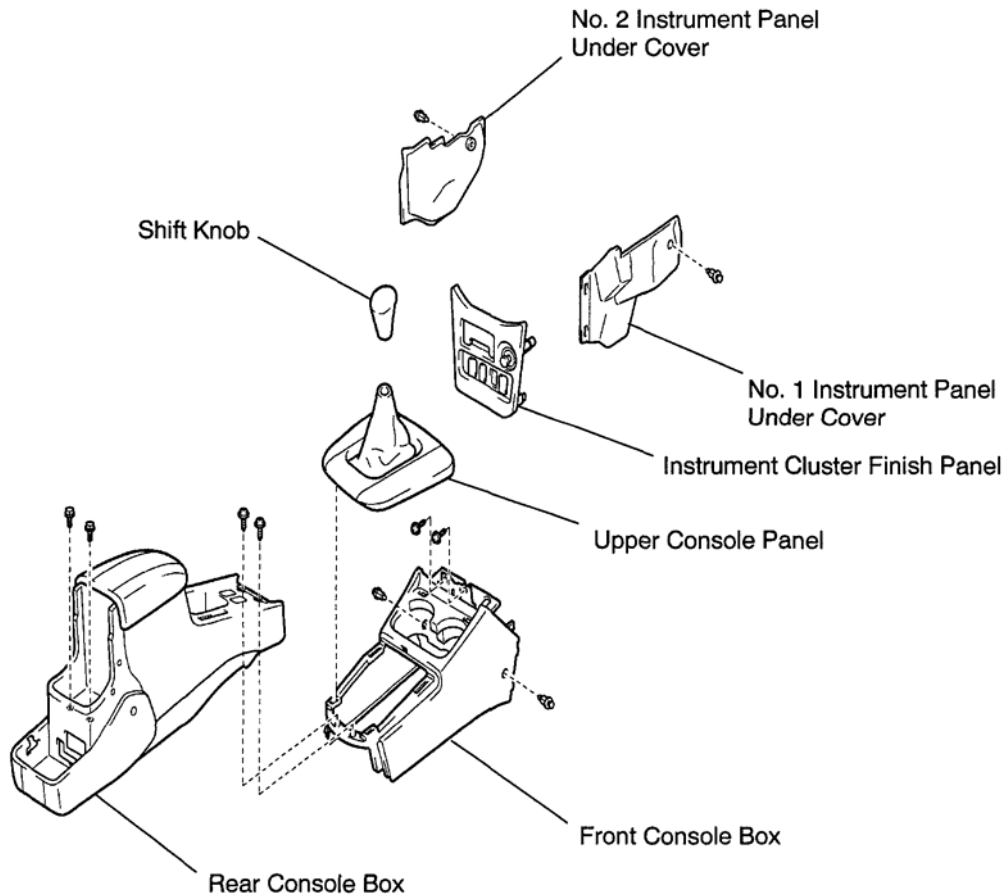
THRUST WASHER THICKNESS SPECIFICATION CHART

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
0	2.00 (0.0787)	9	2.45 (0.0965)
1	2.05 (0.0807)	A	2.50 (0.0984)
2	2.10 (0.0827)	B	2.55 (0.1004)
3	2.15 (0.0846)	C	2.60 (0.1024)
4	2.20 (0.0866)	D	2.65 (0.1043)
5	2.25 (0.0886)	E	2.70 (0.1063)
6	2.30 (0.0906)	F	2.75 (0.1083)
7	2.35 (0.0925)	G	2.80 (0.1102)
8	2.40 (0.0945)	H	2.85 (0.1122)

- h. Remove the 17 bolts, tap the transmission case with a plastic hammer and remove it.
- i. Remove the differential case assembly.

SHIFT LEVER AND CONTROL CABLE

COMPONENTS



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Fig. 172: Exploded View Of Shift Lever And Control Cable (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2004 Toyota RAV4

2004 TRANSMISSION Manual Transaxle - RAV4

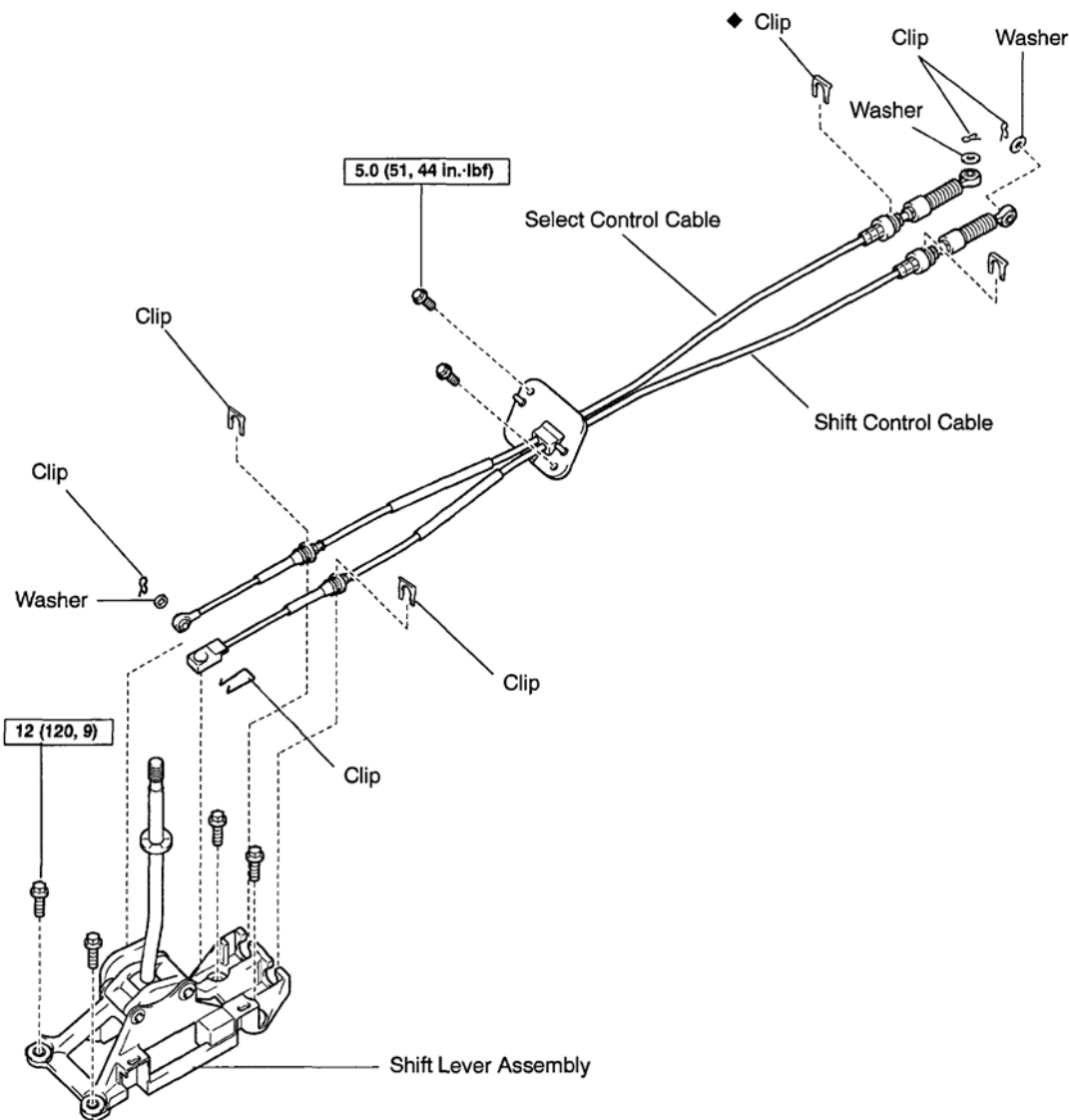


Fig. 173: Exploded View Of Shift Lever And Control Cable (2 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. **DISCONNECT CONTROL CABLES FROM TRANSAXLE**
 - a. Remove the 2 clips and 2 washers.
 - b. Remove the 2 clips and disconnect the 2 control cables.

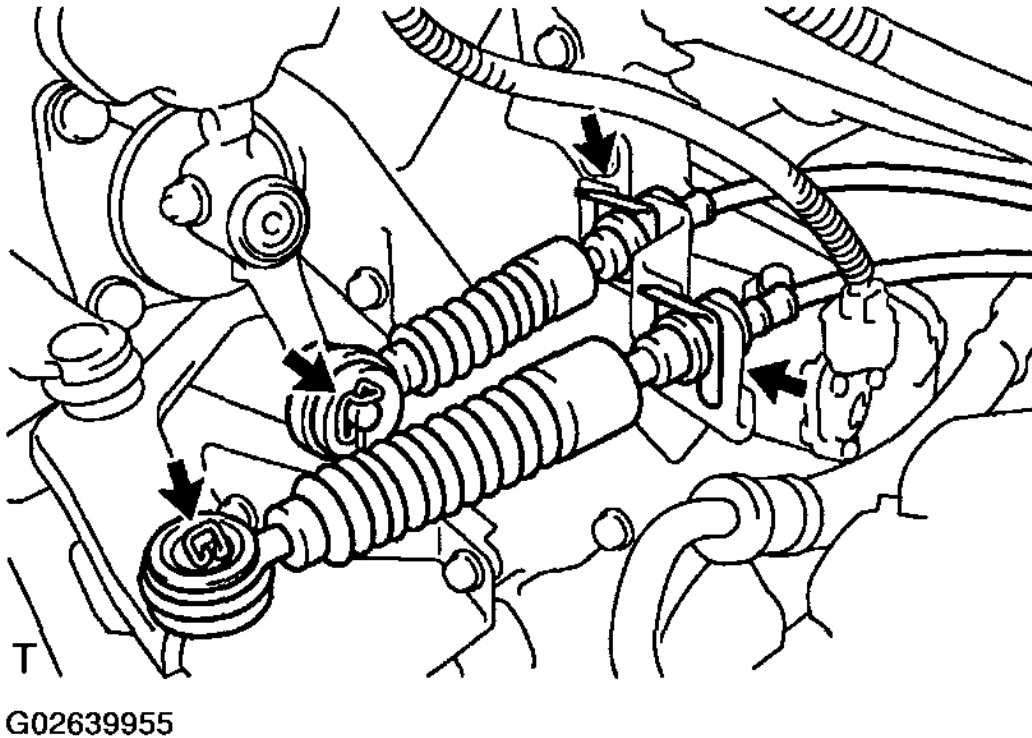


Fig. 174: Removing Clips & Washers & Disconnecting Control Cables From Transaxle
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. REMOVE SHIFT AND SELECT CONTROL CABLES

- a. Remove the front console box (See **REMOVAL**).
- b. Remove the No. 1 and No. 2 instrument panel under cover (See **REMOVAL**).
- c. Remove the 6 bolts and the shift lever and control cables assembly.

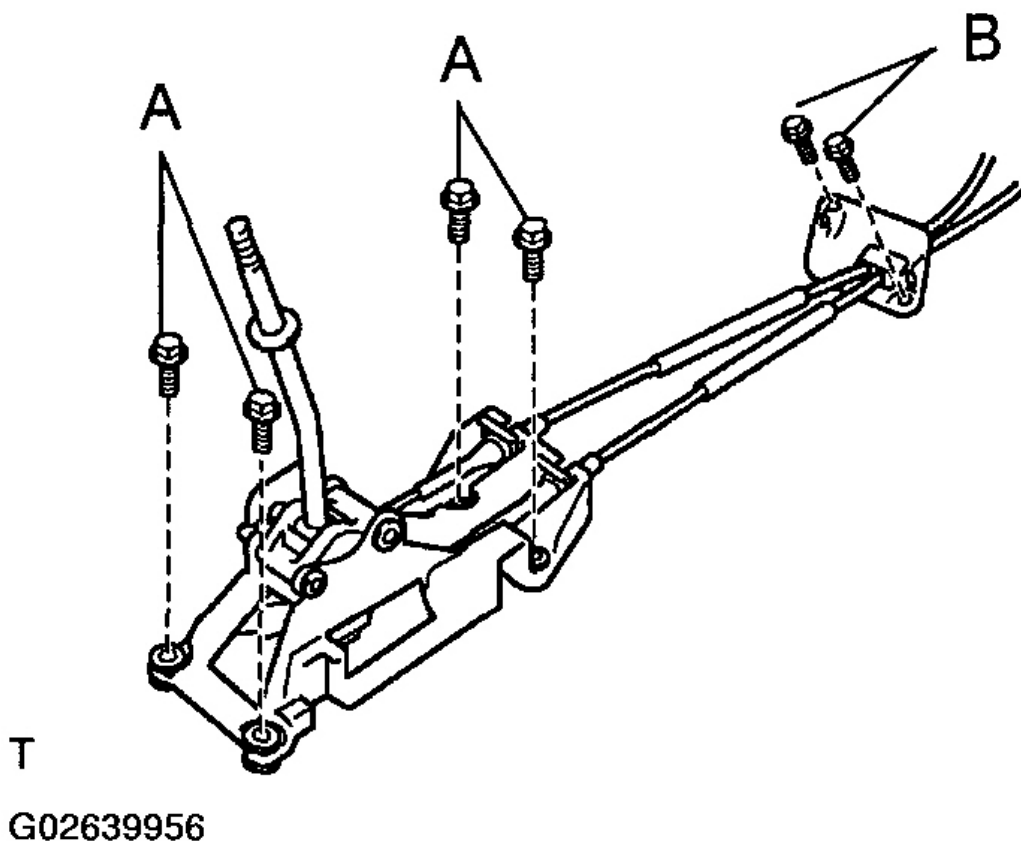


Fig. 175: Removing Bolts, Shift Lever And Control Cables Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

- d. Remove the shift and select control cables from the shift lever assembly.

INSTALLATION

Installation is in the reverse order of removal (See REMOVAL).

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

- When handling the cable, do not bend the cable less than R130°.
- 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.

TRANSFER (4WD)

ON-VEHICLE REPAIR

REPLACE TRANSFER OIL

- a. Loosen the filler plug.
- b. Remove the drain plug.

HINT:

Use a container to catch the transfer oil.

- c. Remove the filler plug.
- d. Reinstall the drain plug.

Torque: 49 N.m (500 kgf.cm, 36 ft.lbf)

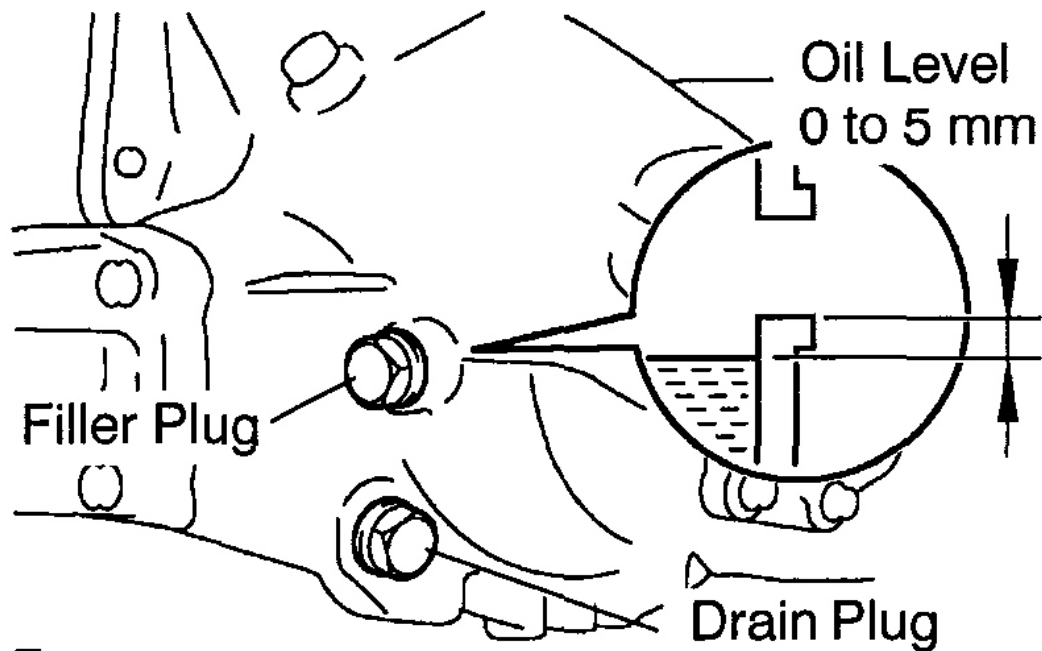
- e. Refill new transfer oil as shown in **Fig. 176** .

Oil grade: API GL-5

Viscosity: SAE 90

Capacity: 0.9 liters (0.95 US qts, 0.79 Imp.qts)

- f. Reinstall the filler plug.



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Fig. 176: Refilling New Transfer Oil & Reinstalling Filler Plug
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Torque: 49 N.m (500 kgf.cm, 36 ft.lbf)

COMPONENTS

2004 Toyota RAV4

2004 TRANSMISSION Manual Transaxle - RAV4

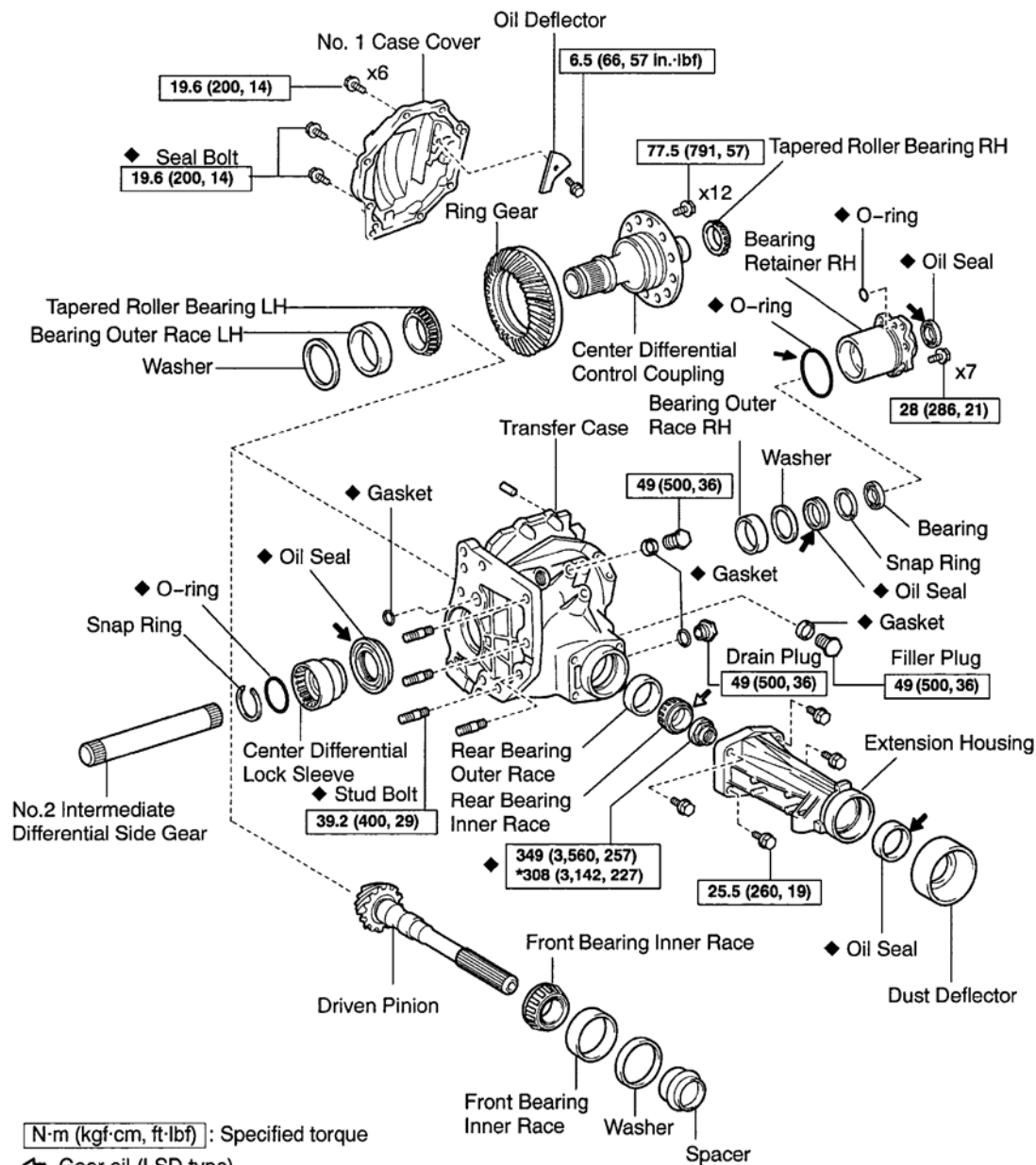
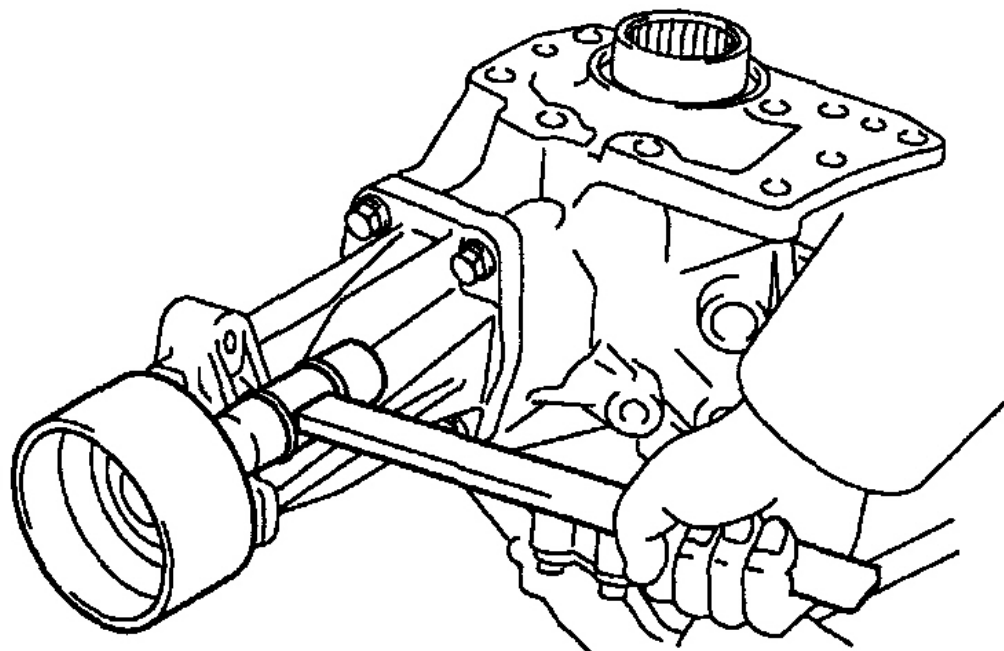


Fig. 177: Exploded View Of Transfer Components (4WD)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

DISASSEMBLY

1. REMOVE GASKET



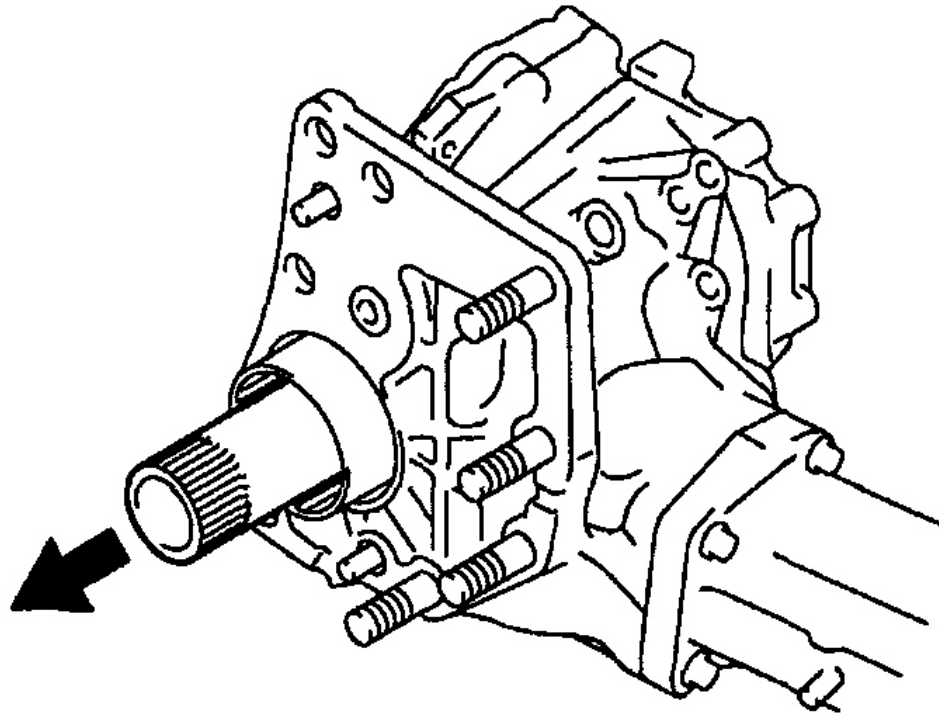
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Fig. 178: Removing Gasket

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

2. REMOVE NO.2 INTERMEDIATE DIFFERENTIAL SIDE GEAR



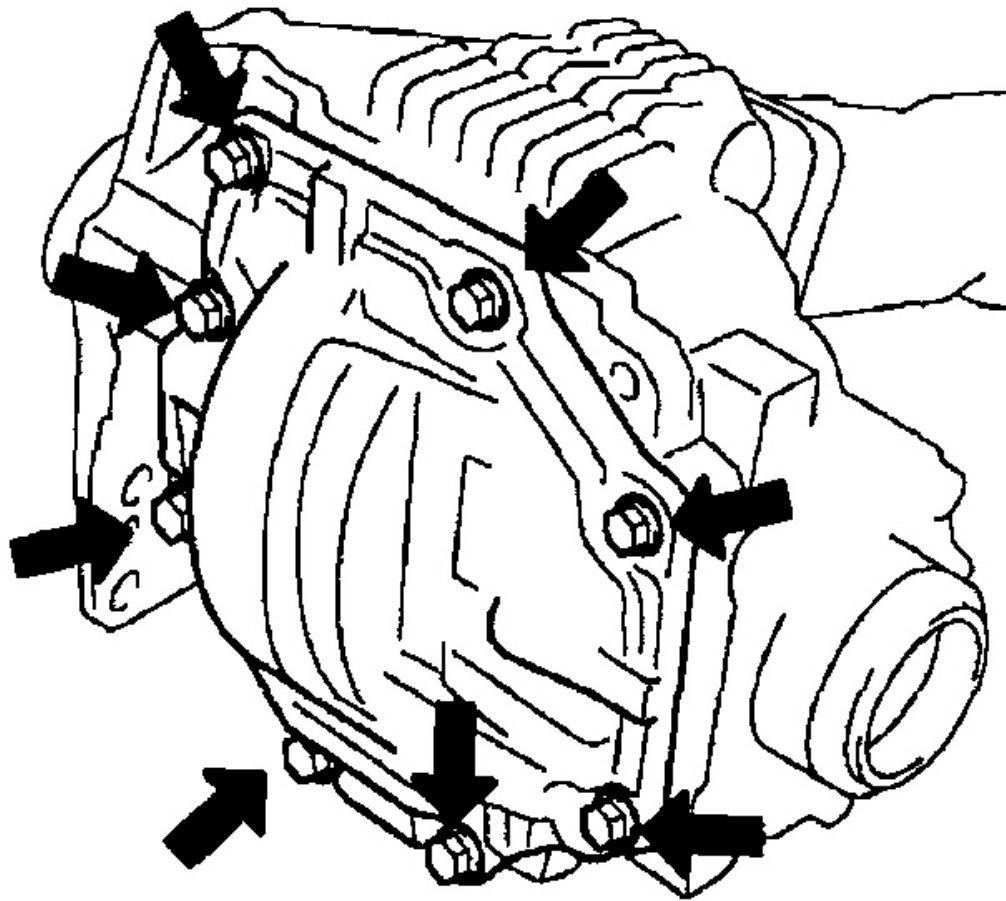
T

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Fig. 179: Removing No. 2 Intermediate Differential Side Gear
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. REMOVE NO.1 CASE COVER

- a. Remove the 8 bolts.

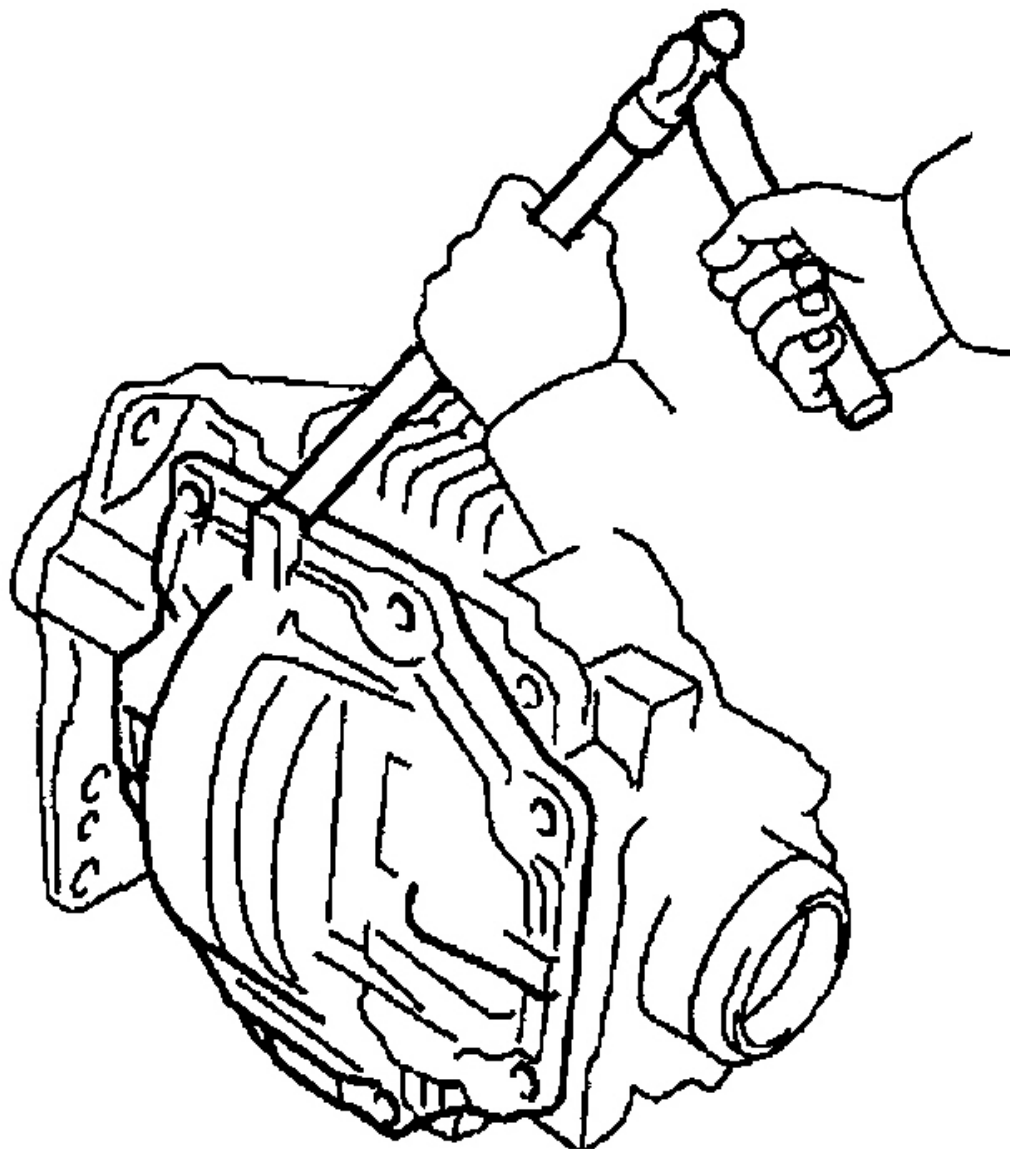


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Fig. 180: Removing Bolts Of No. 1 Case Cover
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using a brass bar and hammer, remove the No. 1 case cover.

NOTE: Be careful not to damage the transfer case and case cover No. 1.

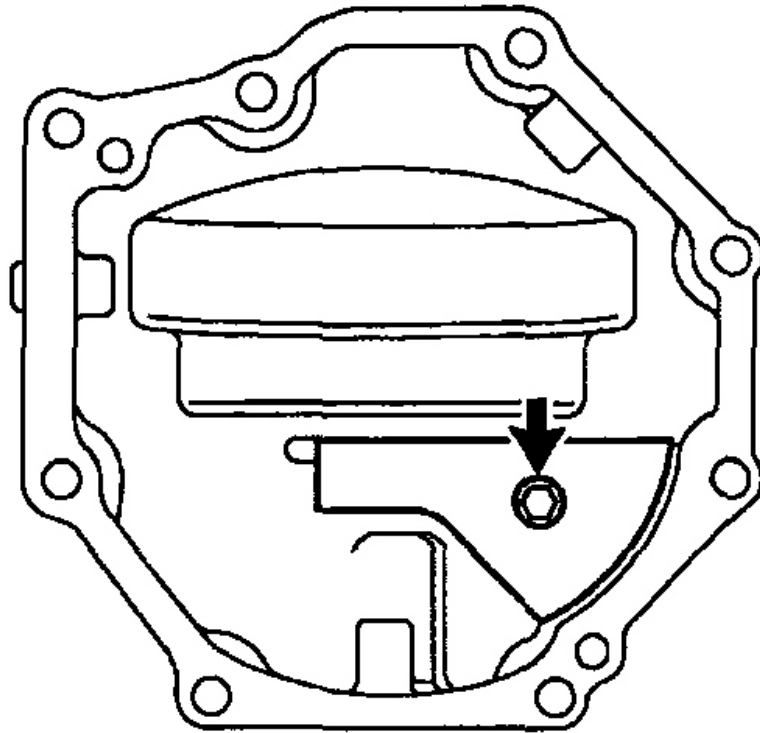


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Fig. 181: Removing No. 1 Case Cover

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

- c. Remove the bolt and breather oil deflector from the case cover No. 1.

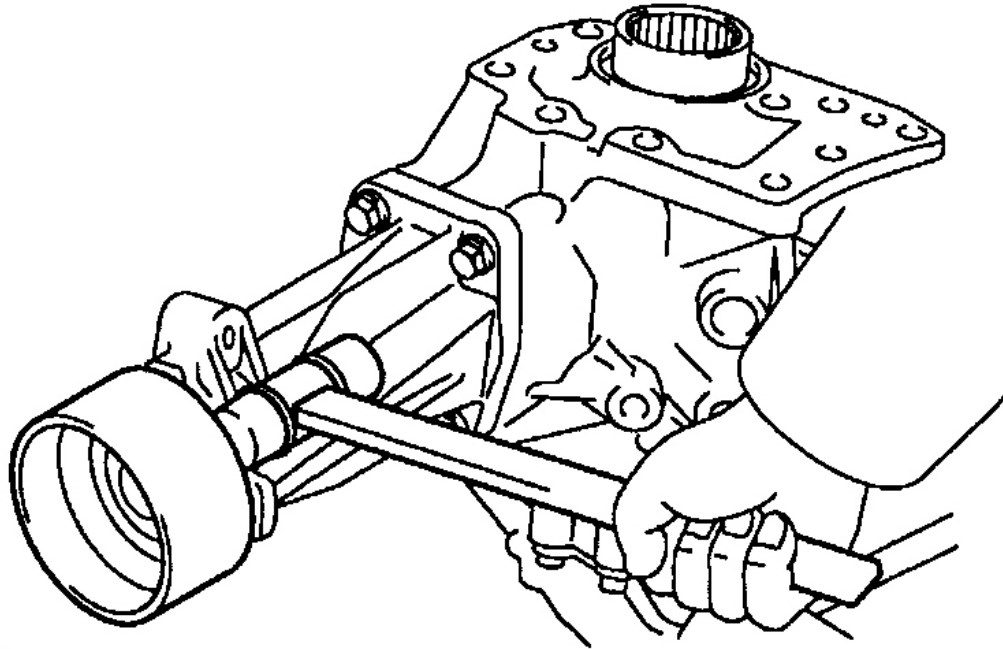


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Fig. 182: Removing Bolt & Breather Oil Deflector From Case Cover No. 1
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. REMOVE PIN
5. REMOVE STUD BOLT
6. INSTALL TRANSFER ON OVERHAUL ATTACHMENT
7. REMOVE EXTENSION HOUSING
 - a. Using a plastic hammer, remove the dust deflector from the extension housing.



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Fig. 183: Removing Dust Deflector From Extension Housing
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using SST, remove the oil seal from the extension housing.

SST 09308-00010

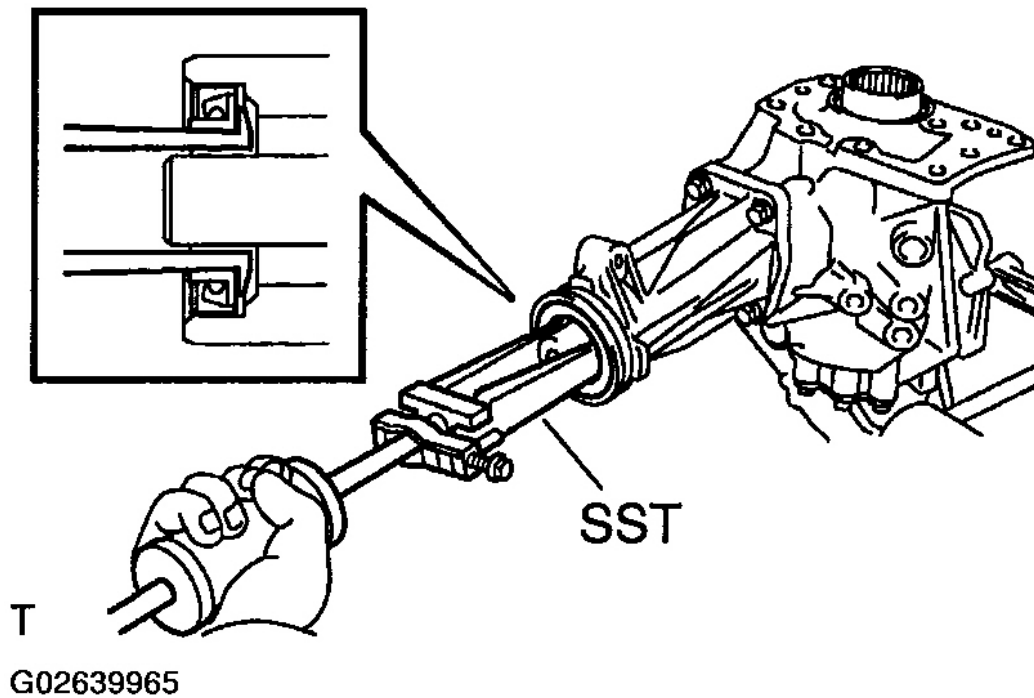
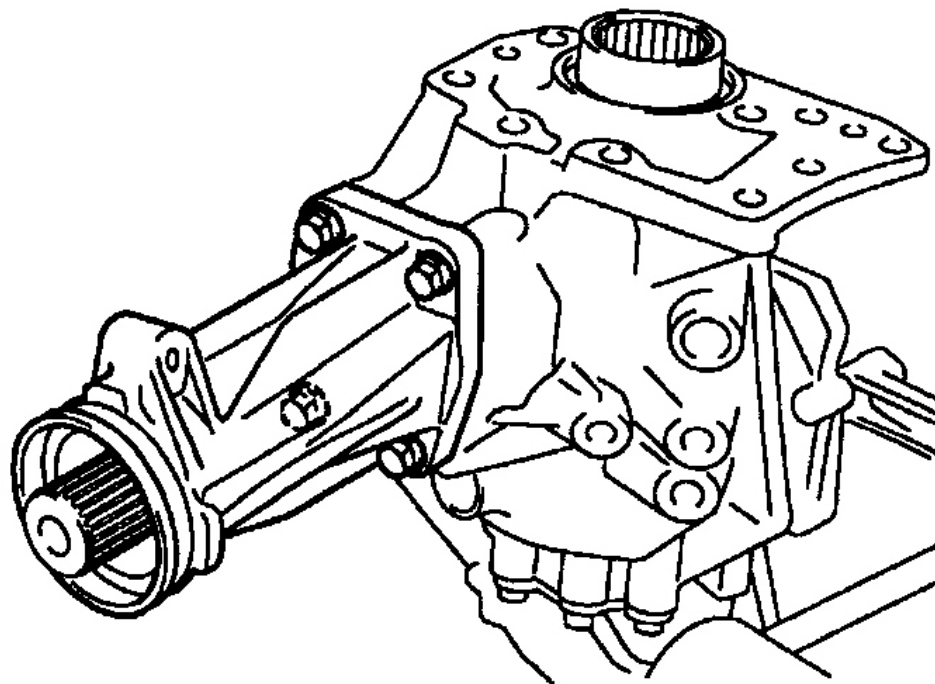


Fig. 184: Removing Oil Seal From Extension Housing
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: Be careful not to damage the extension housing.

- c. Remove the 4 bolts.



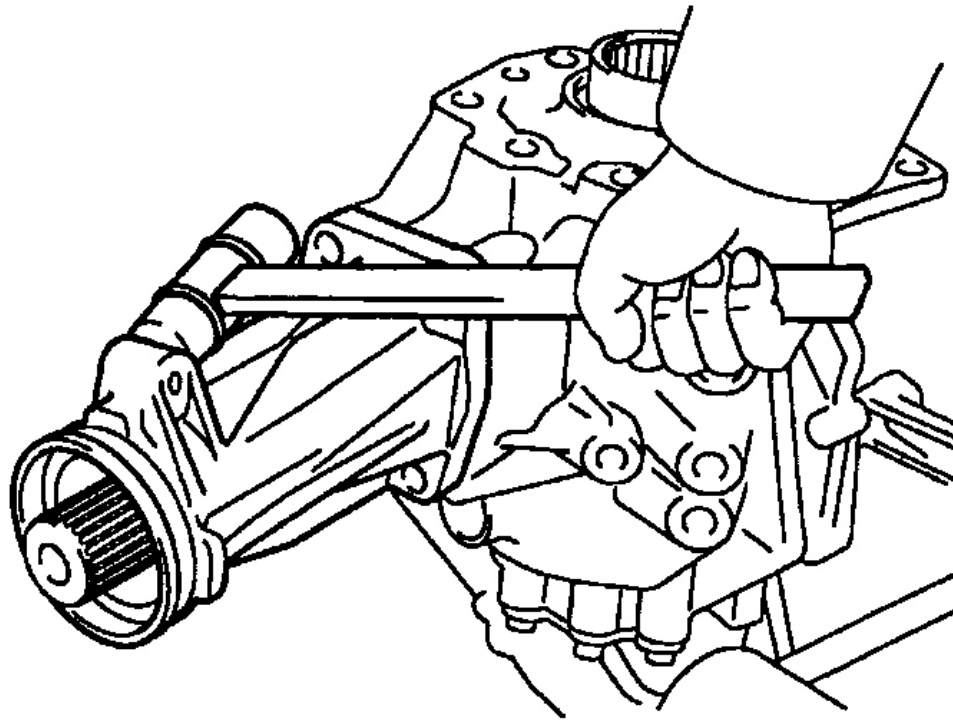
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G02639966

Fig. 185: Removing Bolts

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

- d. Using a plastic hammer, remove the extension housing.



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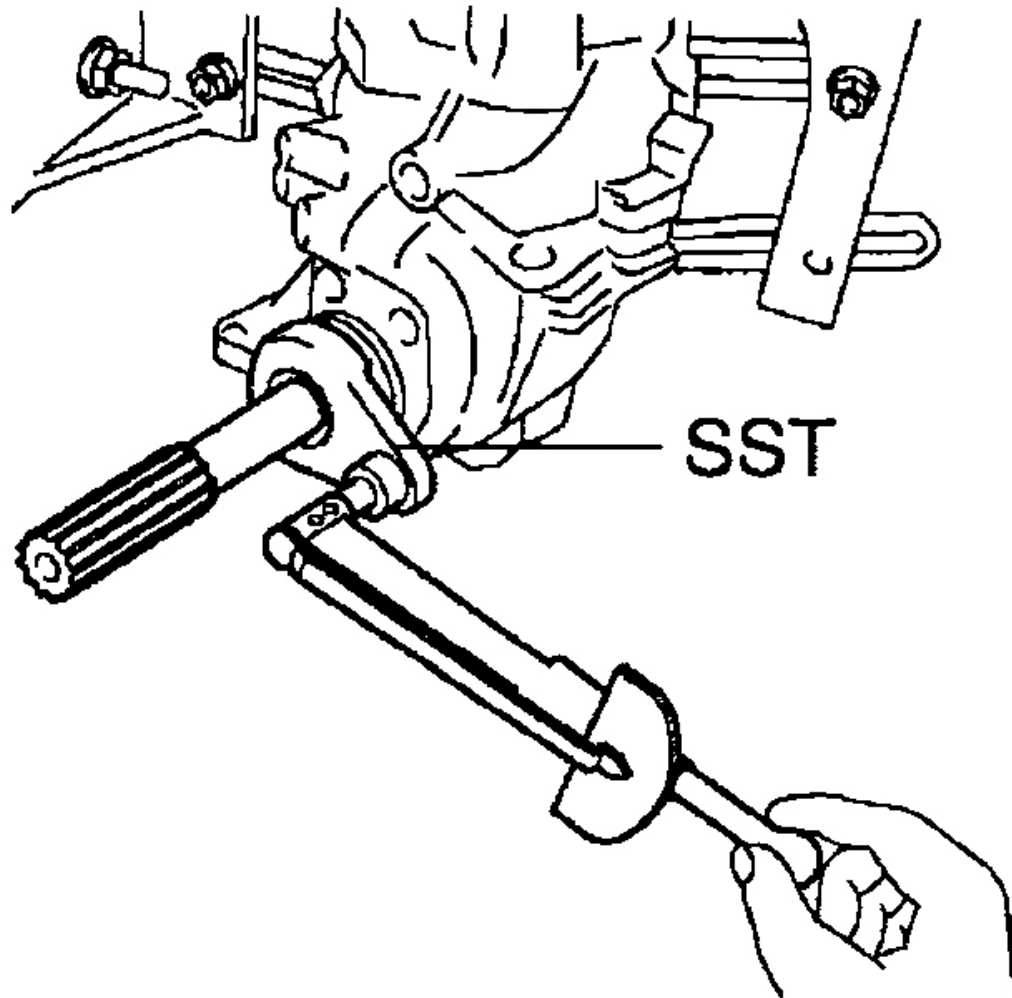
Fig. 186: Removing Extension Housing

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

8. CHECK PRELOAD

- a. Using SST and a torque wrench, measure the driven pinion preload of the backlash between the driven pinion and ring gear.

SST 09326-20011



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Fig. 187: Measuring Driven Pinion Preload Of Backlash Between Driven Pinion And Ring Gear

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

Preload (at starting):

0.9 to 1.3 N.m (9 to 13 kgf.cm, 7.8 to 12 in.lbf)

HINT:

- Using a torque wrench with a fulcrum length of 160 mm (6.3 in.).
 - This torque value is effective in case that SST is parallel to a torque wrench.
- b. Using SST and the torque wrench, measure the total preload.

SST 09326-20011

Total preload (at starting):

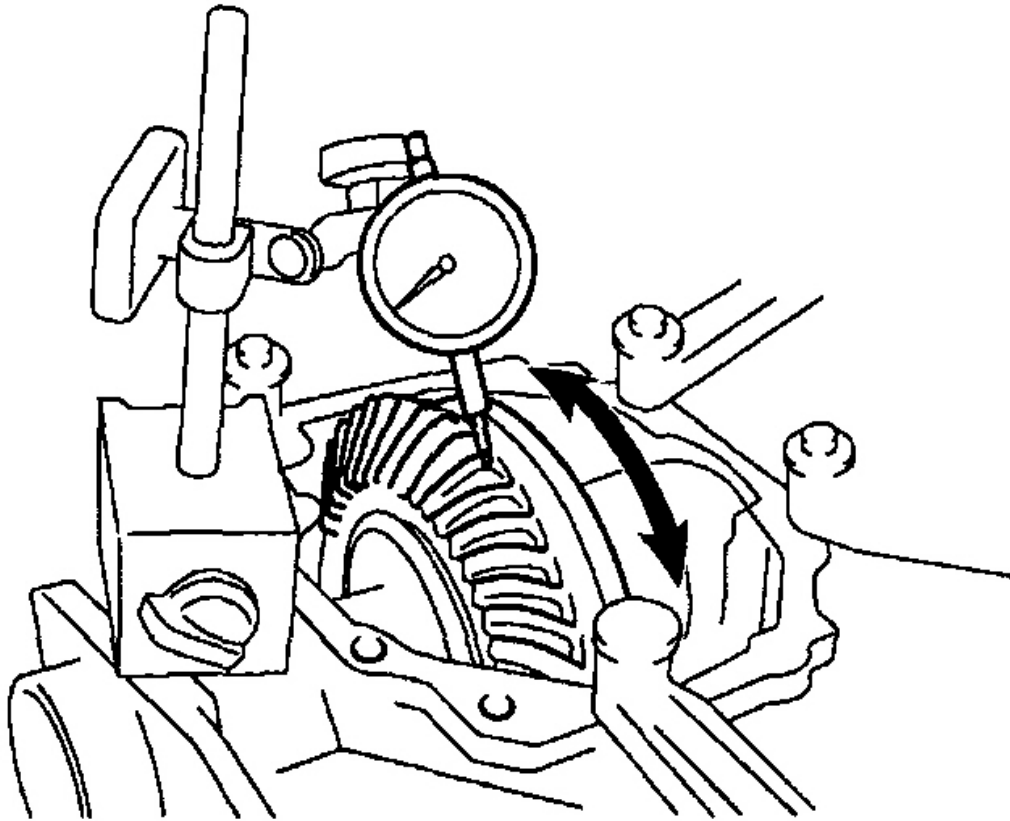
1.0 to 1.6 N.m (10 to 16 kgf.cm, 8.9 to 14 in.lbf)

HINT:

- Using a torque wrench with a fulcrum length of 160 mm (6.3 in.).
- This torque value is effective in case that SST is parallel to a torque wrench.

9. CHECK RING GEAR BACKLASH

Using a dial indicator, measure the ring gear backlash.



G02639969

Fig. 188: Measuring Ring Gear Backlash

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

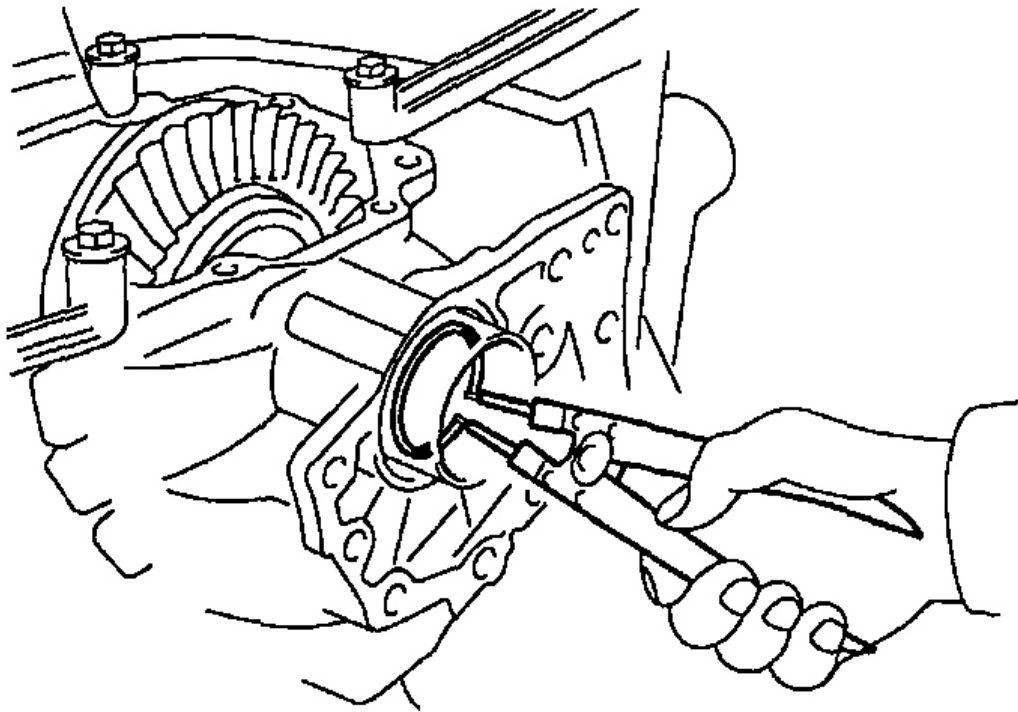
Backlash: 0.10 to 0.15 mm

10. CHECK TOOTH CONTACT

(See **REASSEMBLY**)

11. REMOVE CENTER DIFFERENTIAL LOCK SLEEVE

- a. Using a snap ring pliers, remove the shaft snap ring.



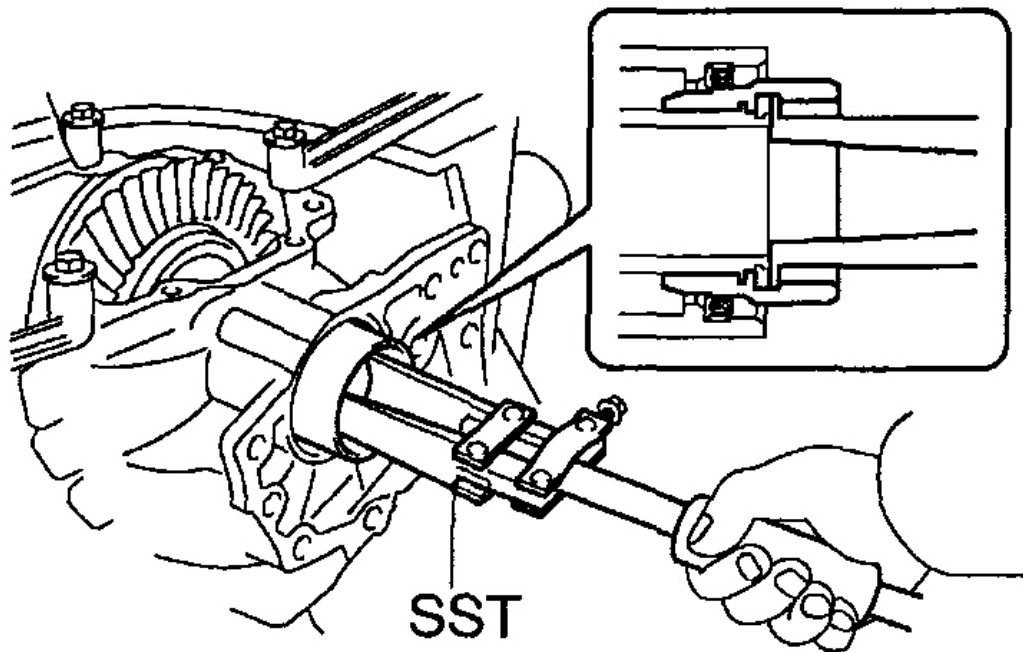
G02639970

Fig. 189: Removing Shaft Snap Ring

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

- b. Using SST, remove the center differential lock sleeve.

SST 09308-00010

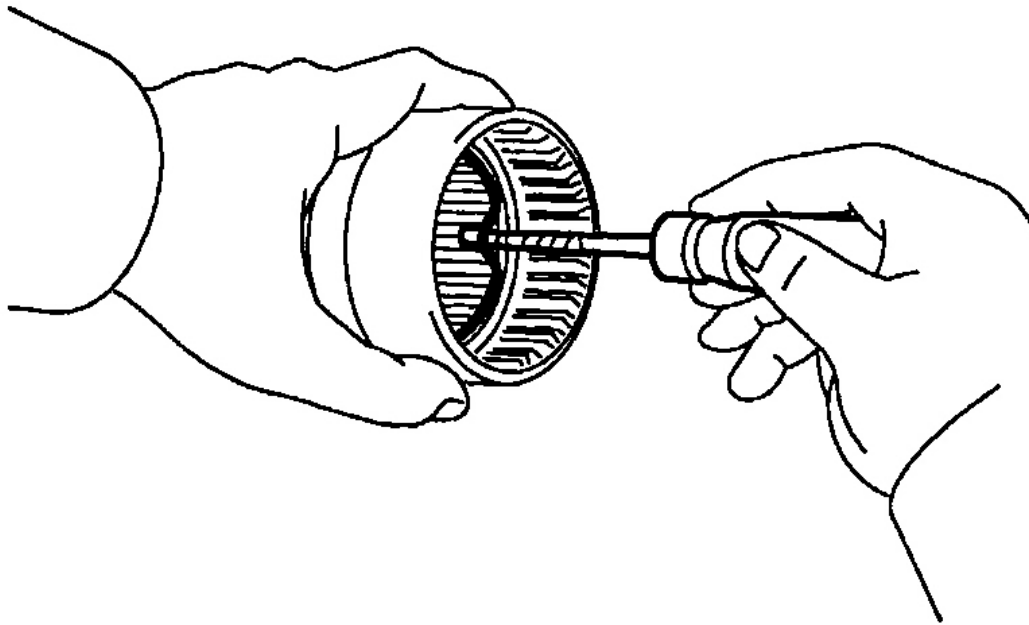


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Fig. 190: Removing Center Differential Lock Sleeve
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: Be careful not to damage the center differential lock sleeve.

- c. Using a screwdriver, remove the O-ring from the center differential lock sleeve.



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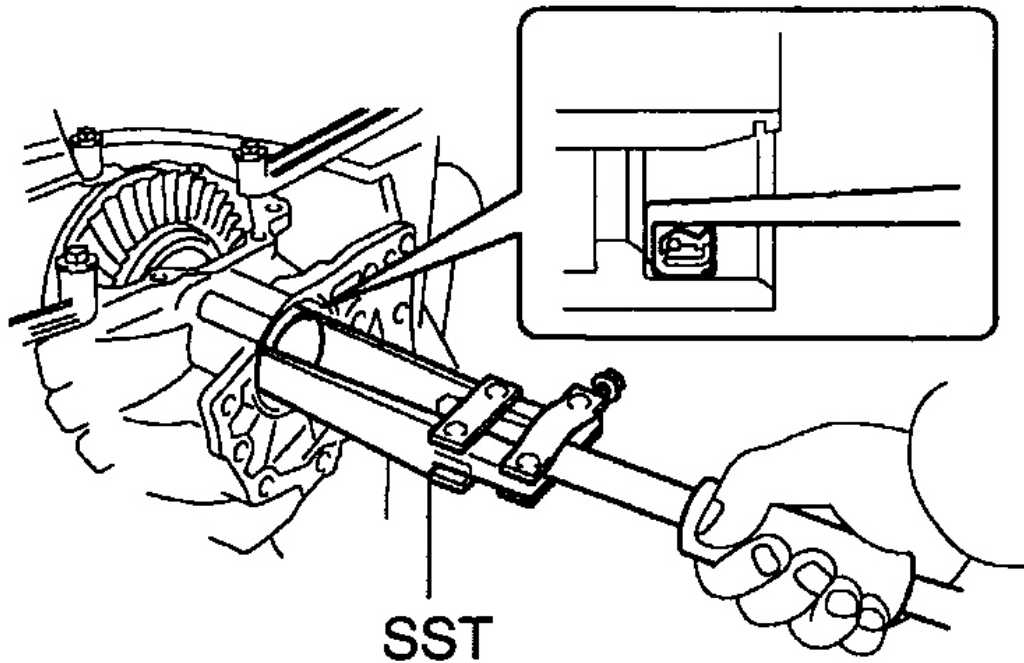
Fig. 191: Removing O-Ring From Center Differential Lock Sleeve
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: Be careful not to damage the center differential lock sleeve.

12. REMOVE OIL SEAL

Using SST, remove the oil seal from the transfer case.

SST 09308-00010



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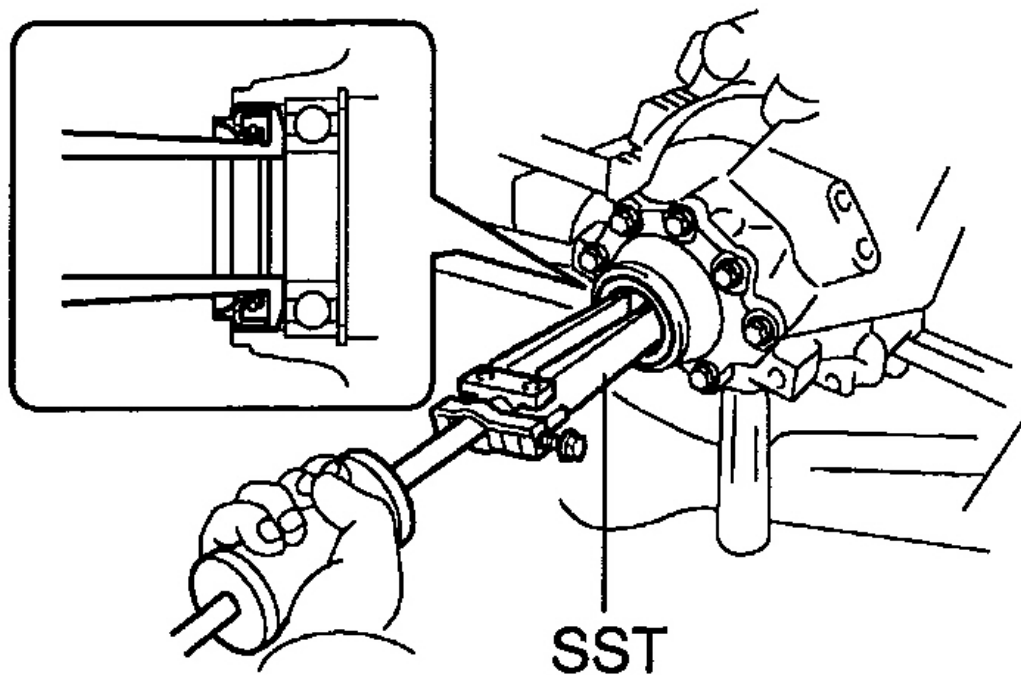
Fig. 192: Removing Oil Seal From Transfer Case
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: Be careful not to damage the transfer case.

13. REMOVE BEARING RETAINER RH

- a. Using SST, remove the oil seal from the bearing retainer RH.

SST 09308-00010



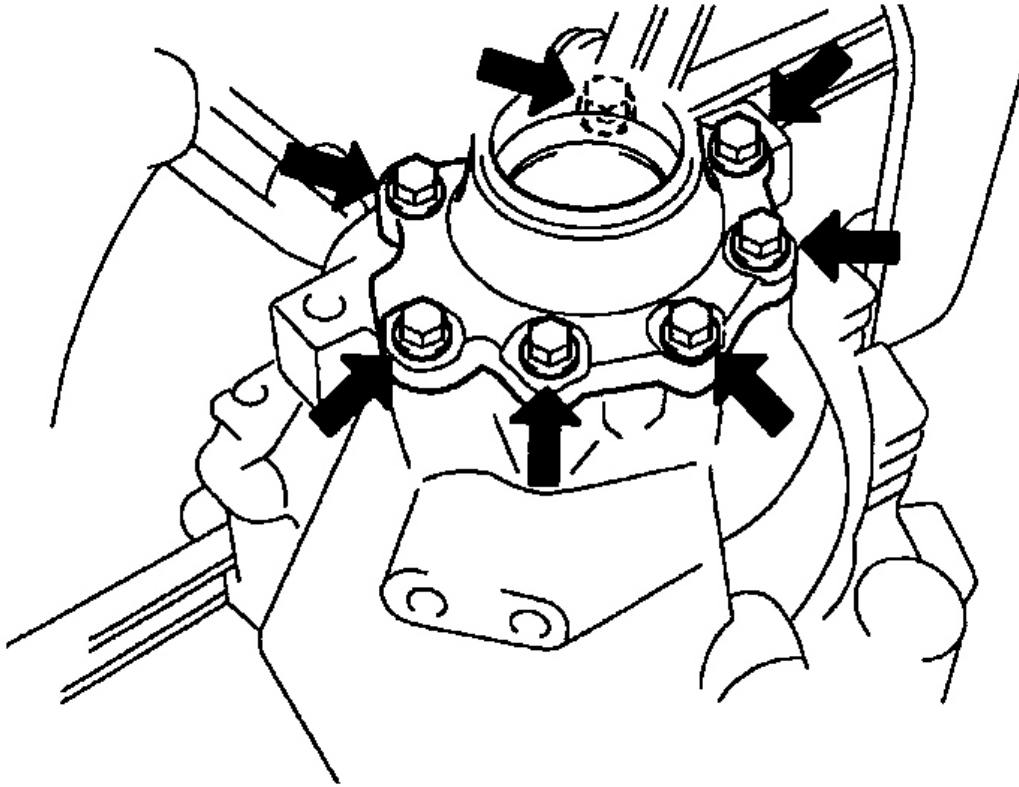
G02639974

Fig. 193: Removing Oil Seal From Bearing Retainer RH

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

NOTE: Be careful not to damage the bearing retainer.

- b. Remove the 7 bolts.



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Fig. 194: Removing Bolts

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

- c. Using a screwdriver and a hammer, make clearance by hitting between the bearing retainer RH and the transfer case.

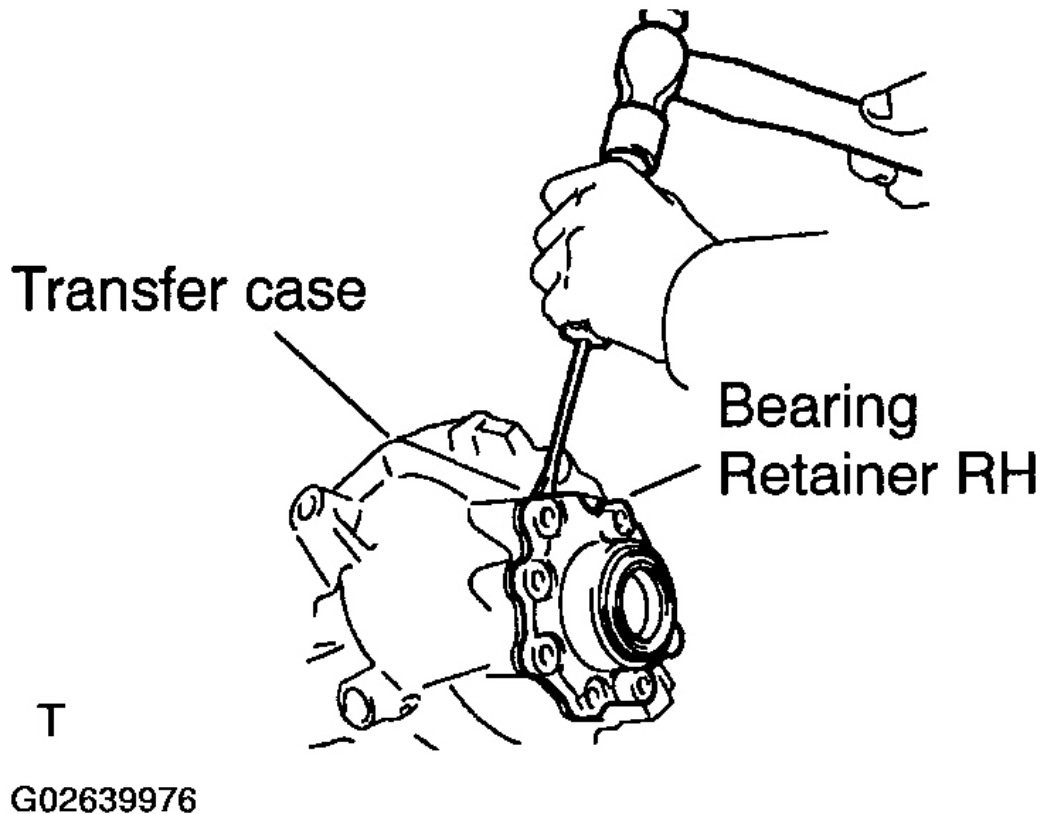


Fig. 195: Using Screwdriver And Hammer To Make Clearance By Hitting Between Bearing Retainer RH And Transfer Case

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

- d. Using SST, remove the bearing retainer RH from the transfer case.

SST 09520-10021

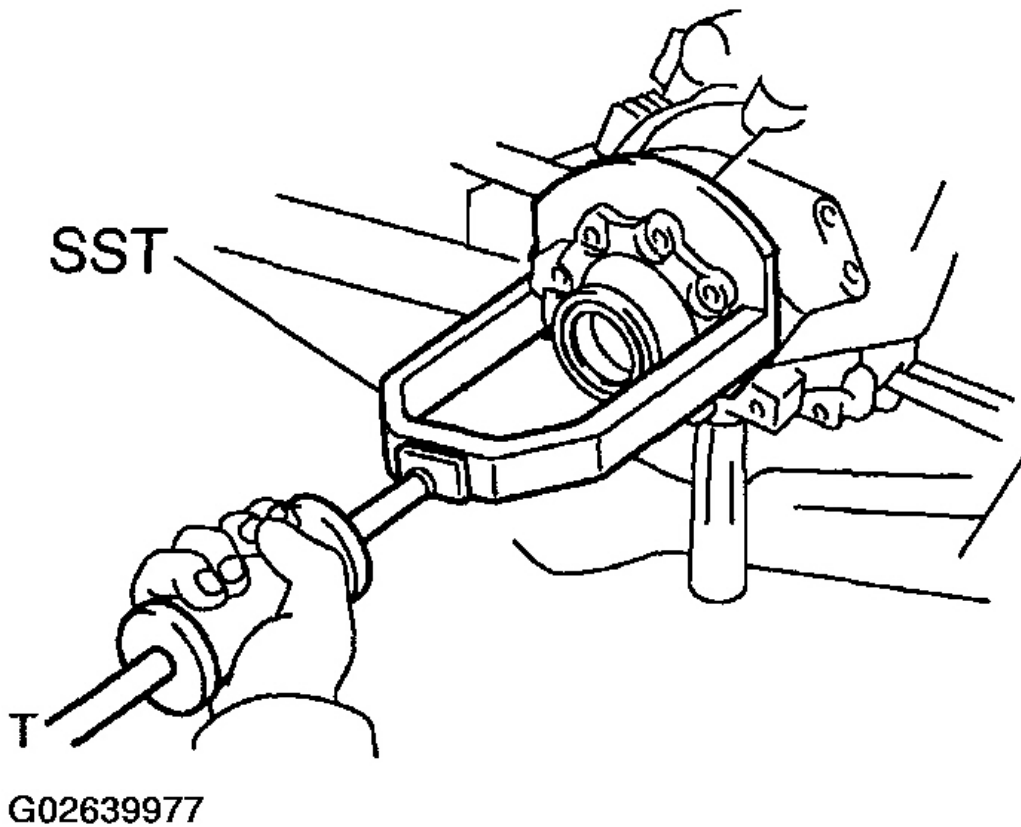
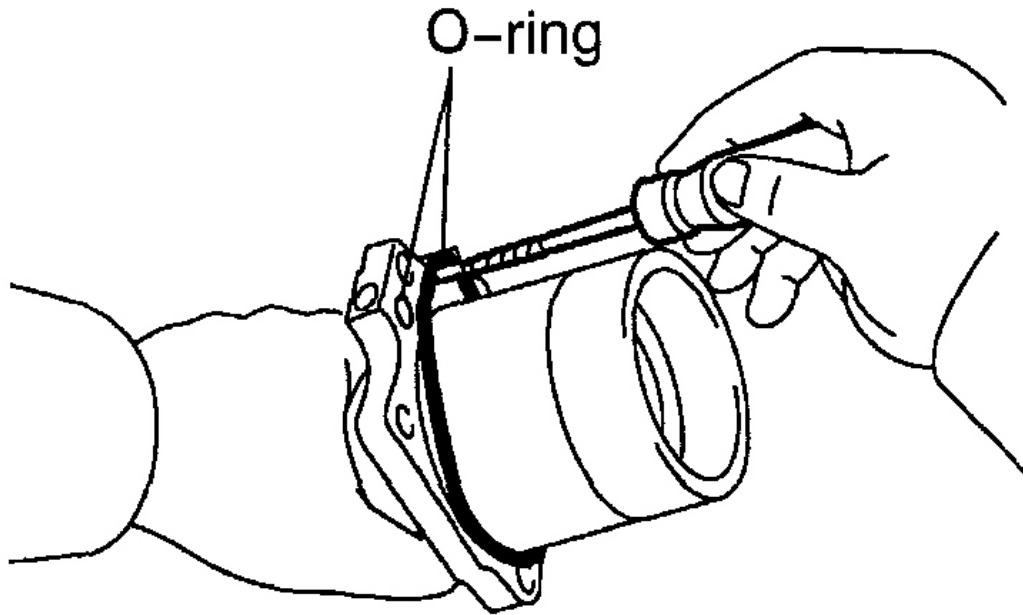


Fig. 196: Removing Bearing Retainer RH From Transfer Case
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Using a screwdriver, remove 2 O-rings from the bearing retainer RH.



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Fig. 197: Removing O-Rings From Bearing Retainer RH
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: Be careful not to damage the bearing retainer RH.

- f. Using soft jaws, hold the bearing retainer RH in a vise.
- g. Using SST, remove the outer race, washer and oil seal from the bearing retainer RH.

SST 09308-00010

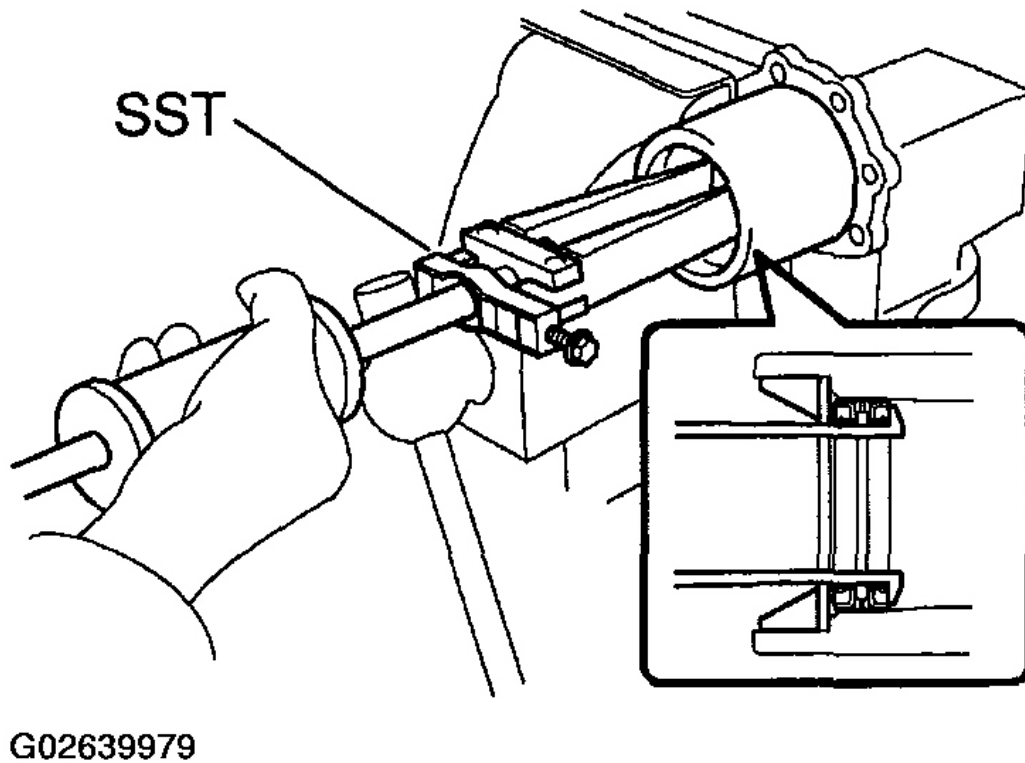
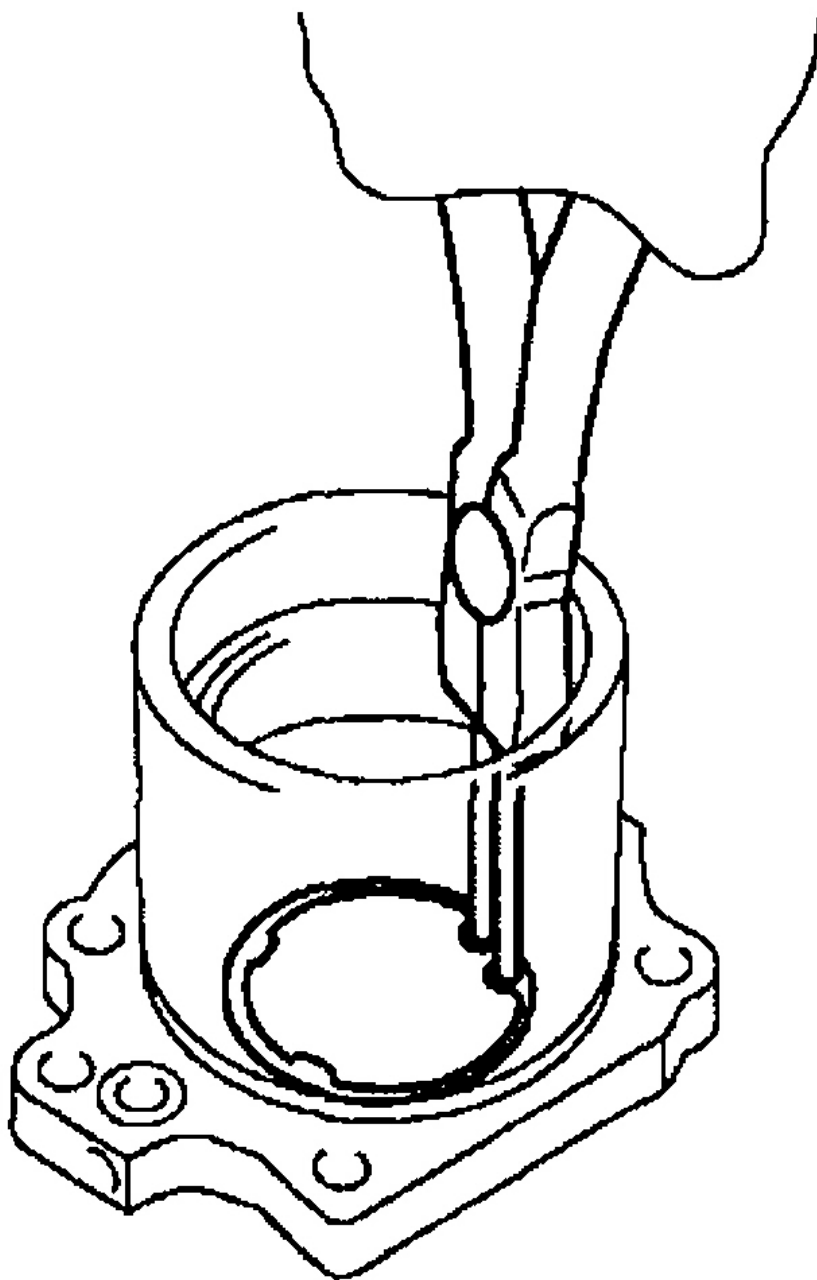


Fig. 198: Removing Outer Race, Washer & Oil Seal From Bearing Retainer RH
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: Be careful not to damage the bearing retainer RH.

- h. Using snap ring pliers, remove the snap ring.



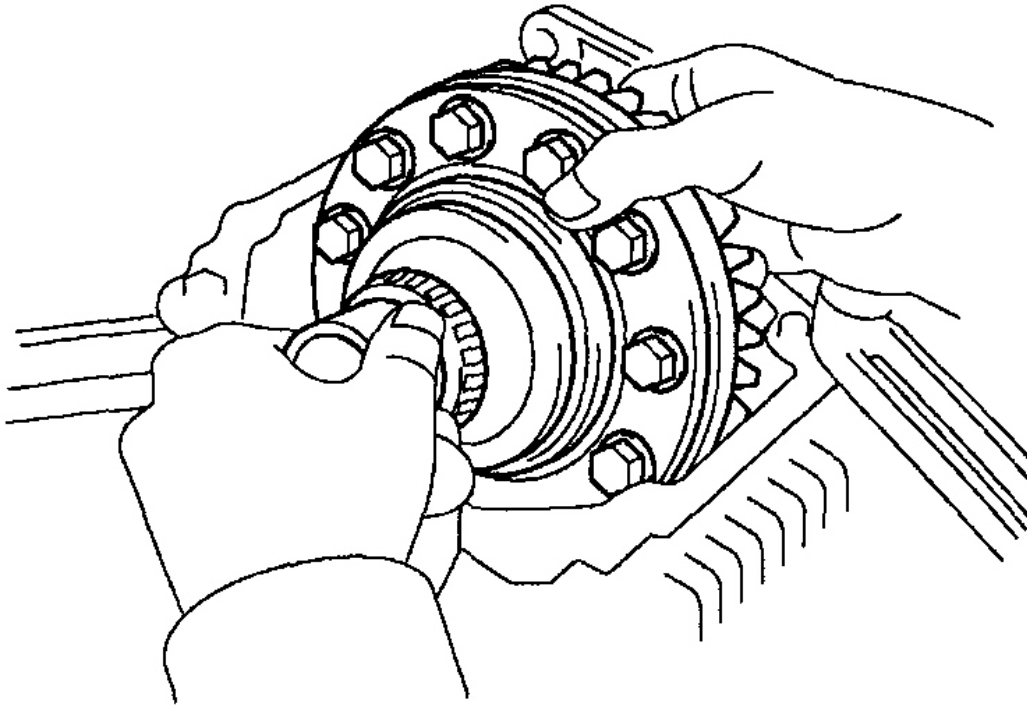
G02639980

Fig. 199: Removing Snap Ring

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

- i. Remove the side gear shaft holder bearing from the bearing retainer RH.

14. REMOVE CENTER DIFFERENTIAL CONTROL COUPLING ASSEMBLY



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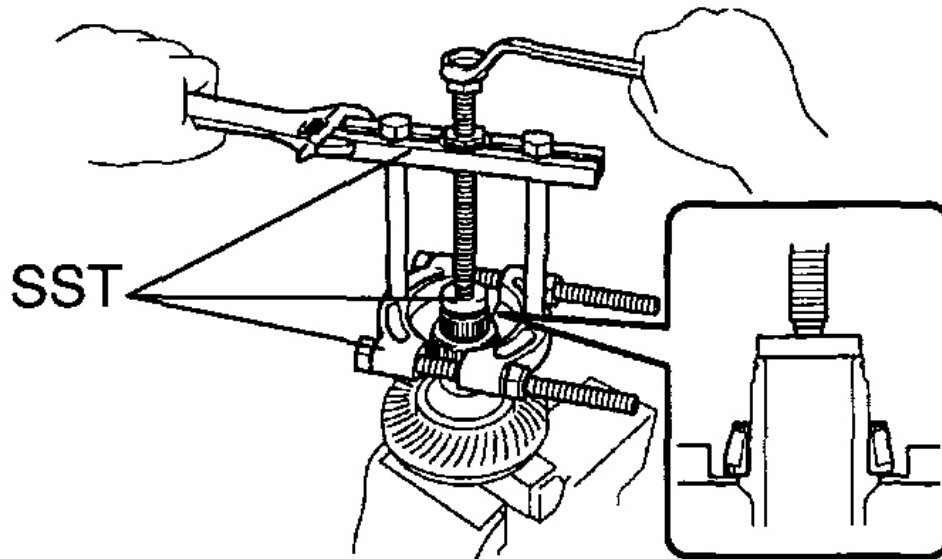
Fig. 200: Removing Center Differential Control Coupling Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

15. REMOVE TAPERED ROLLER BEARING LH AND RH

Using SST, remove the tapered roller bearing inner race LH and RH.

SST 09950-00020, 09950-00030, 09950-60010 (09951-00360)

LH



RH

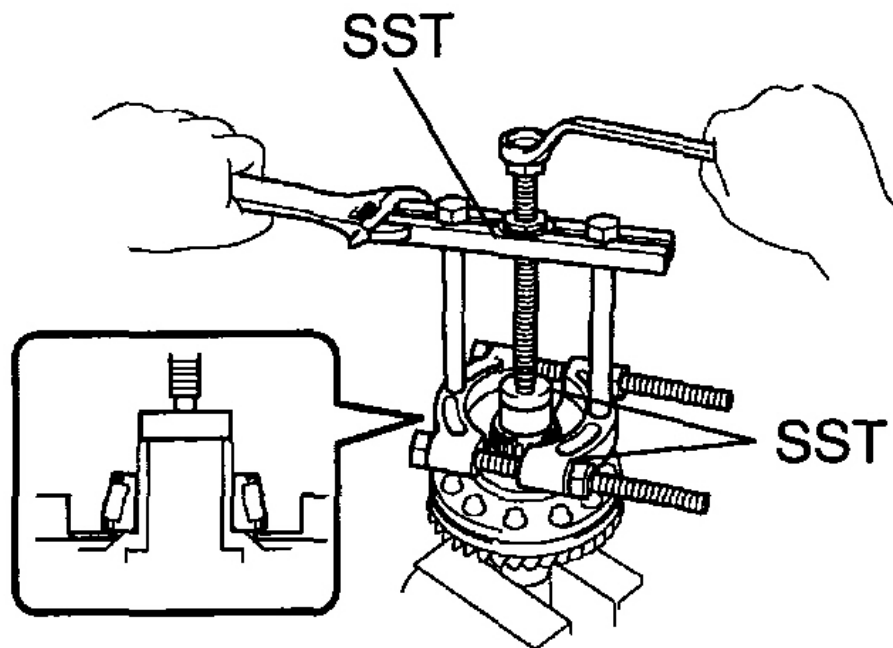
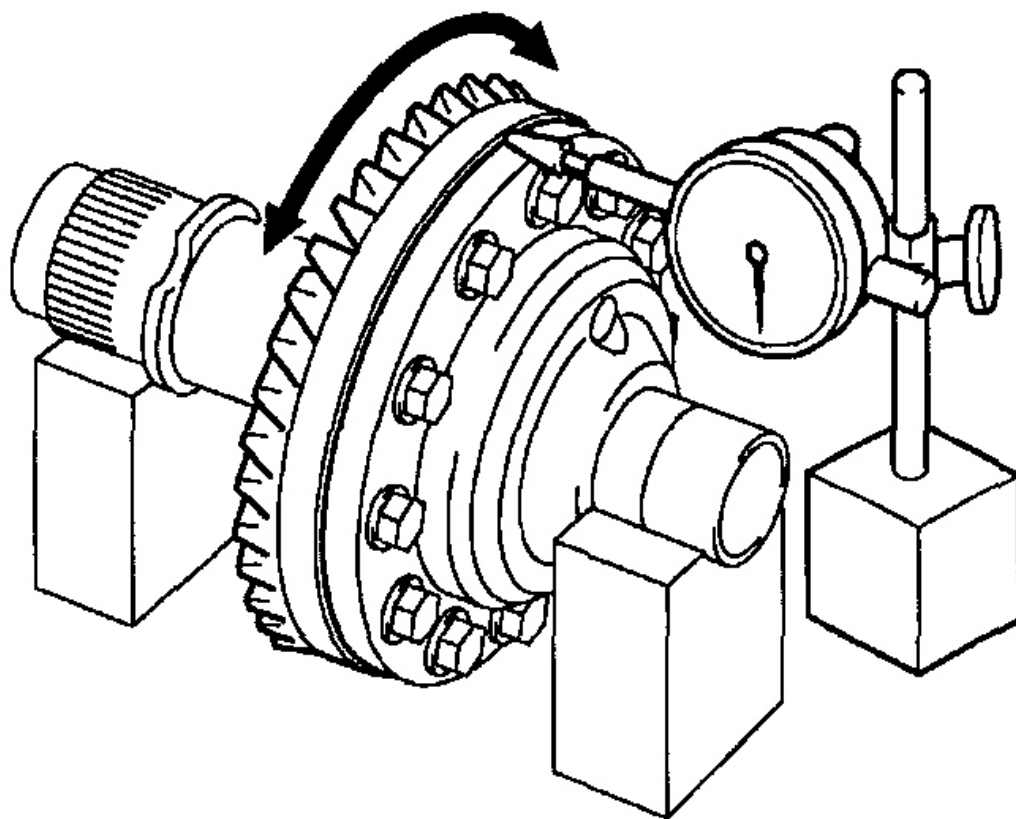


Fig. 201: Removing Tapered Roller Bearing Inner Race LH And RH
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

16. CHECK RING GEAR RUNOUT

Using a dial indicator, check the ring gear runout.

Maximum runout: 0.1 mm (0.004 in.)

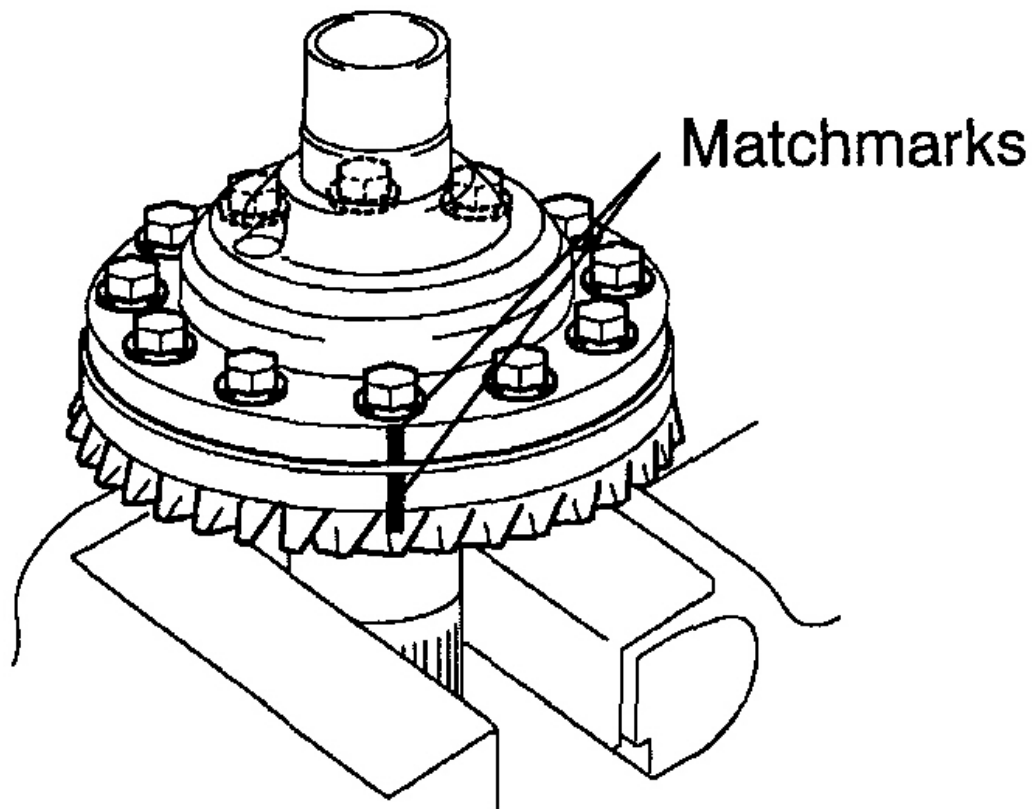


G02639983

Fig. 202: Checking Ring Gear Runout
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

17. REMOVE RING GEAR

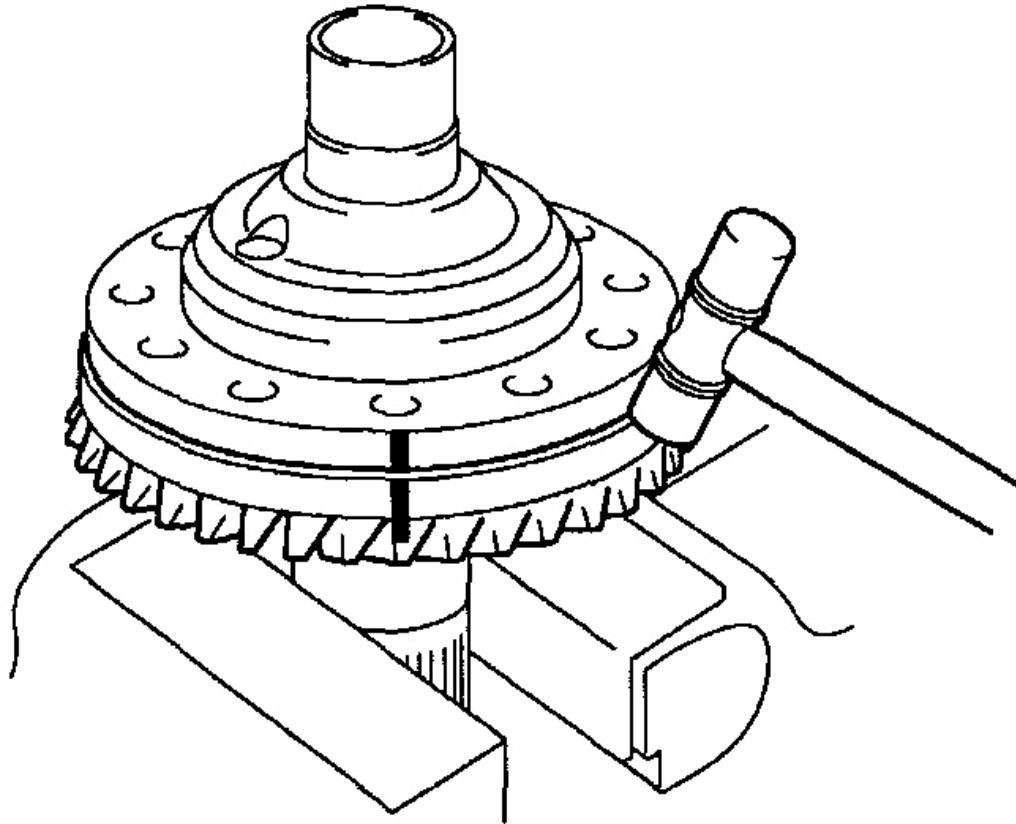
- a. Place matchmarks on both the ring gear and the center differential control coupling.



G02639984

Fig. 203: Placing Matchmarks On Both Ring Gear And Center Differential Control Coupling
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the 12 bolts.
- c. Using a plastic hammer, remove the ring gear.



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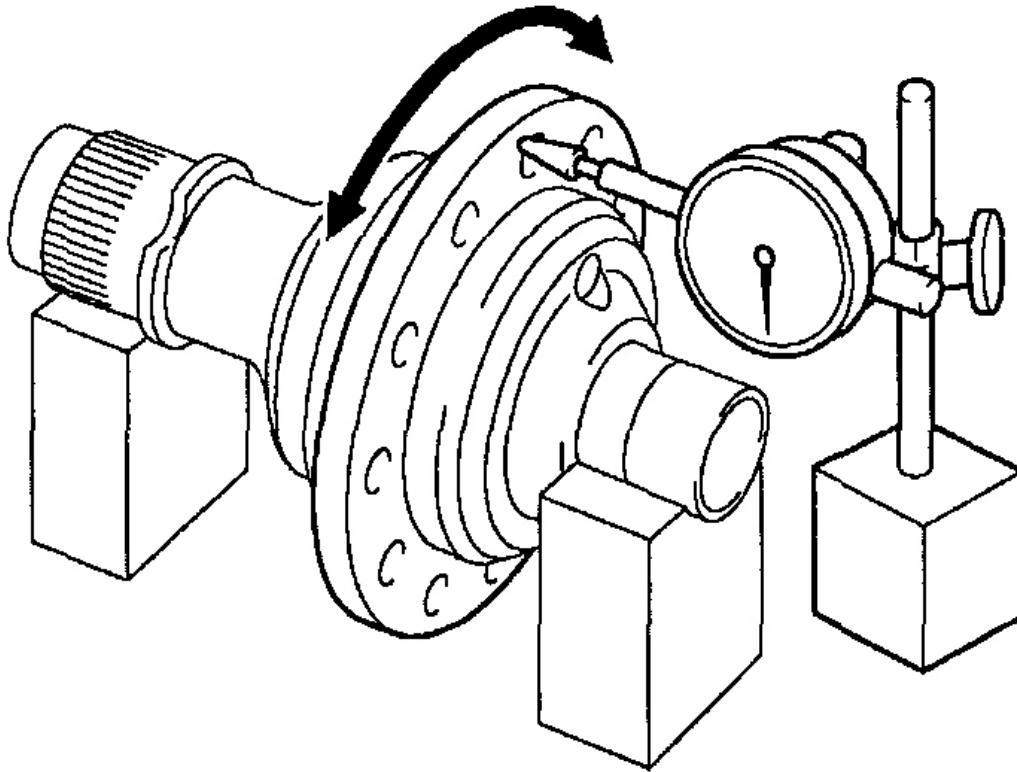
Fig. 204: Removing Ring Gear

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

18. CHECK CENTER DIFFERENTIAL CONTROL COUPLING RUNOUT

Using a dial indicator, check the center differential control coupling runout.

Maximum runout: 0.07 mm (0.0028 in.)



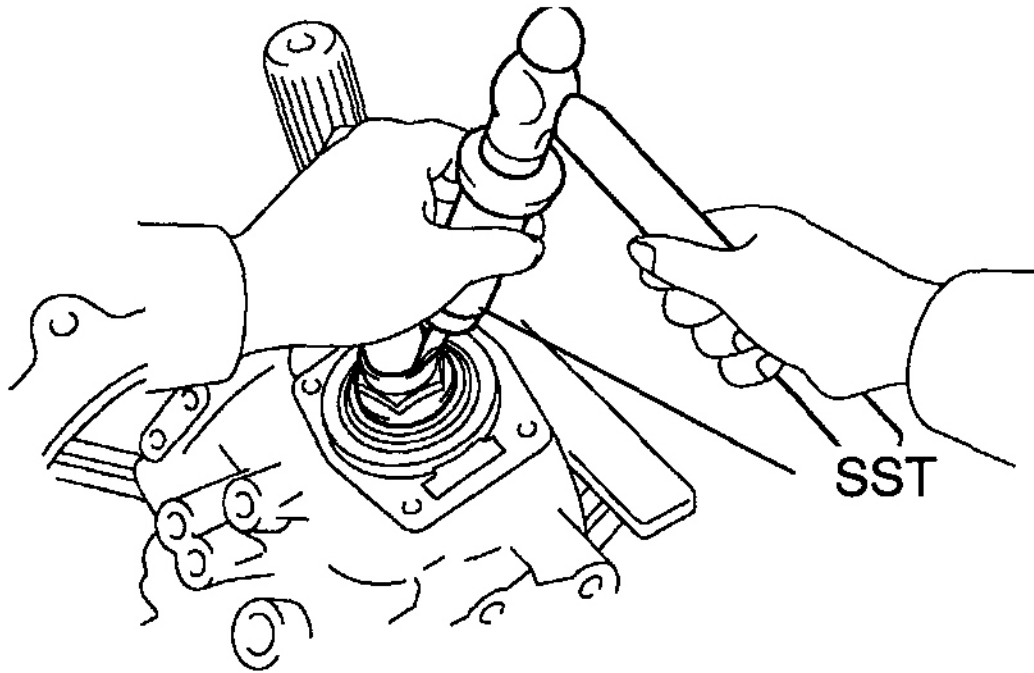
G02639986

Fig. 205: Checking Center Differential Control Coupling Runout
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

19. REMOVE DRIVEN PINION

- a. Using SST and a hammer, unstake the lock nut.

SST 09930-00010 (09931-00010, 09931-00020)

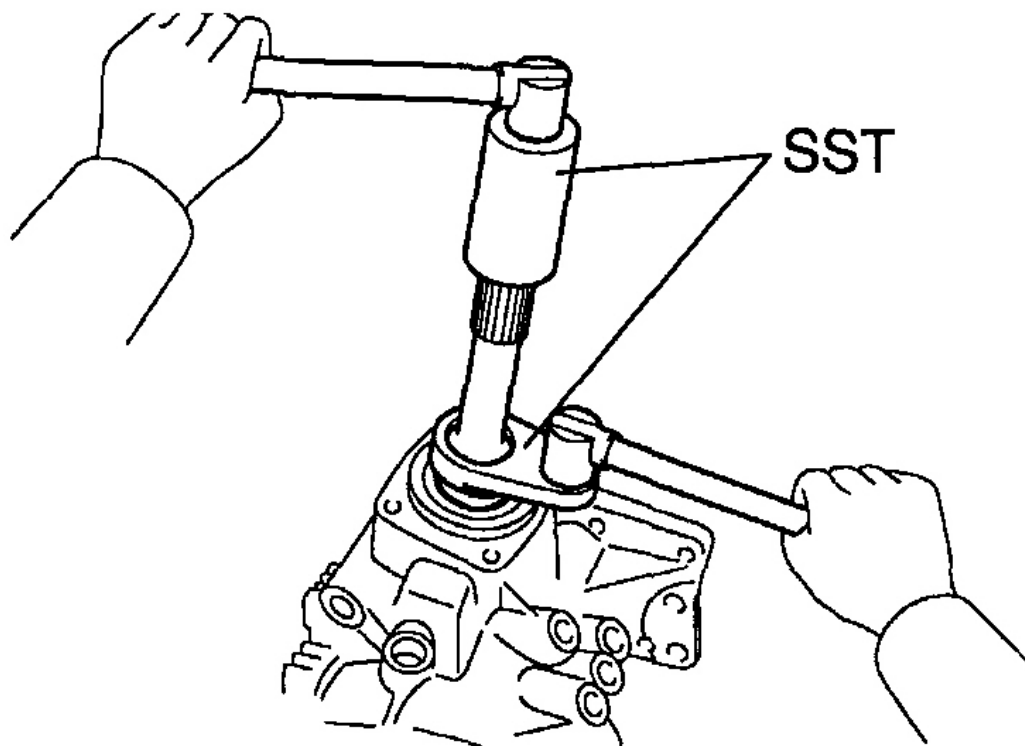


G02639987

Fig. 206: Using SST And Hammer To Unstake Lock Nut
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using SST, remove the lock nut.

SST 09326-20011, 09556-16030

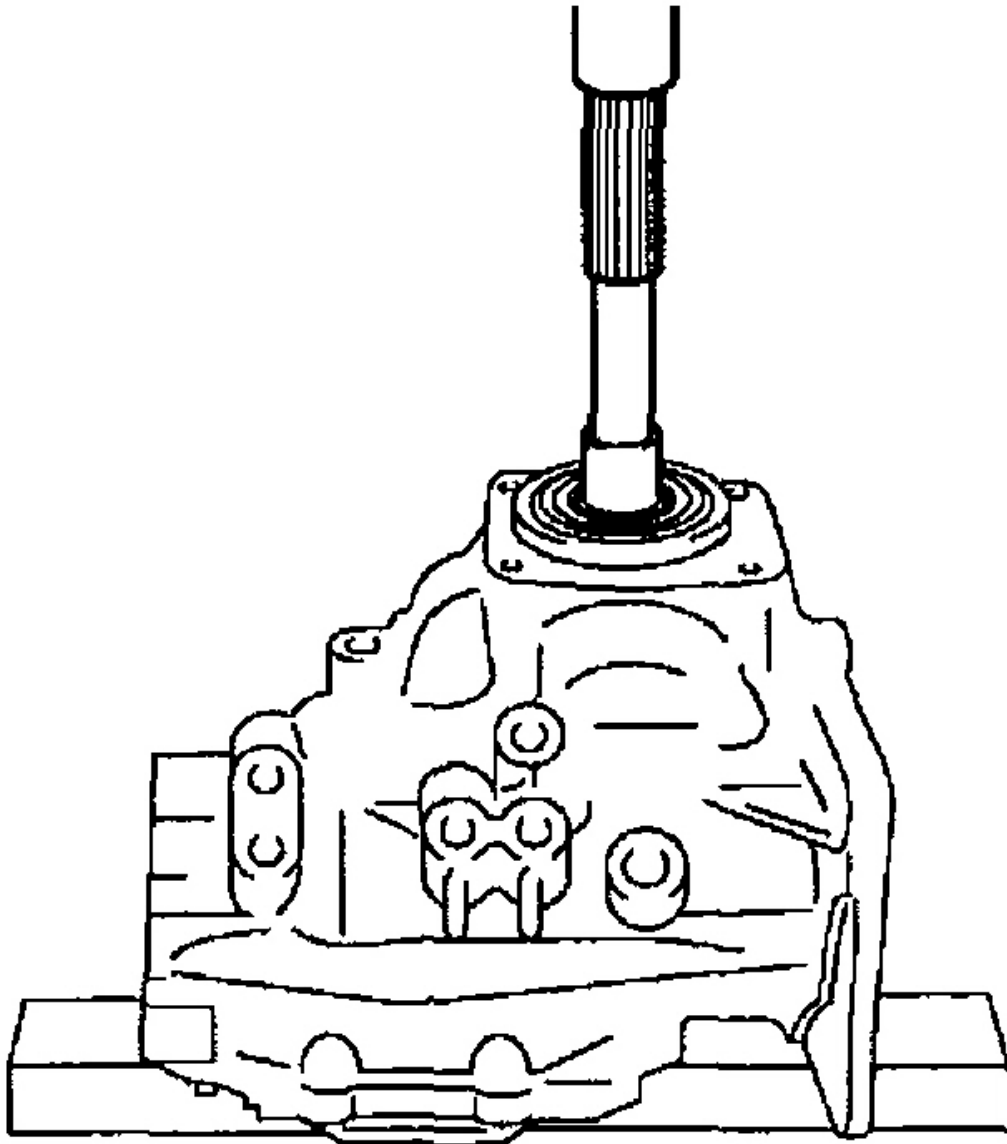


G02639988

Fig. 207: Removing Lock Nut

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

- c. Using a press, remove the driven pinion, the rear bearing inner race and the spacer.



G02639989

Fig. 208: Removing Driven Pinion, Rear Bearing Inner Race & Spacer
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

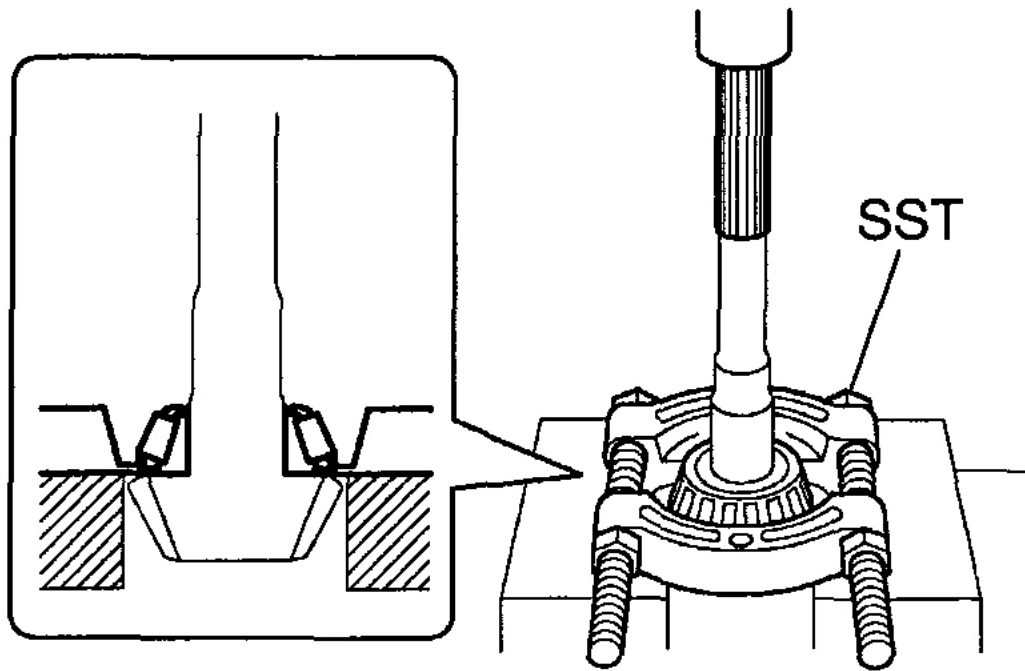
NOTE:

- Place a waste cloth inside the case to prevent the driven pinion from dropping.

- Keep the case level using a wood plate.

- d. Using SST and a press, remove the front bearing inner race from the driven pinion.

SST 09950-00020

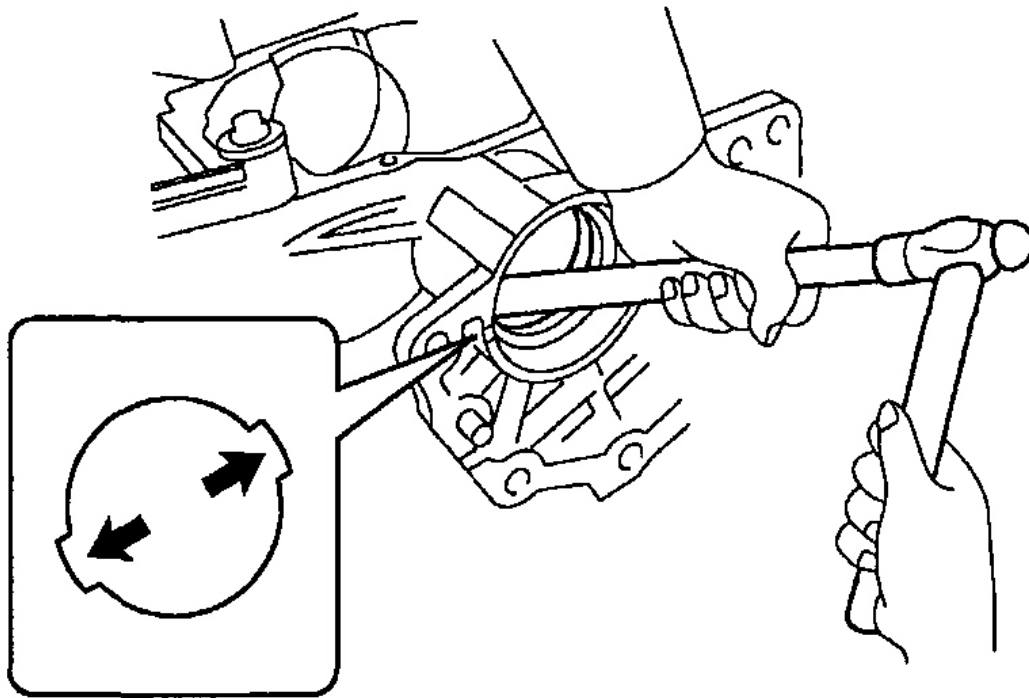


G02639990

Fig. 209: Removing Front Bearing Inner Race From Driven Pinion
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

20. REMOVE BEARING OUTER RACE LH

Using a brass bar and a hammer, remove the outer race and the washer.

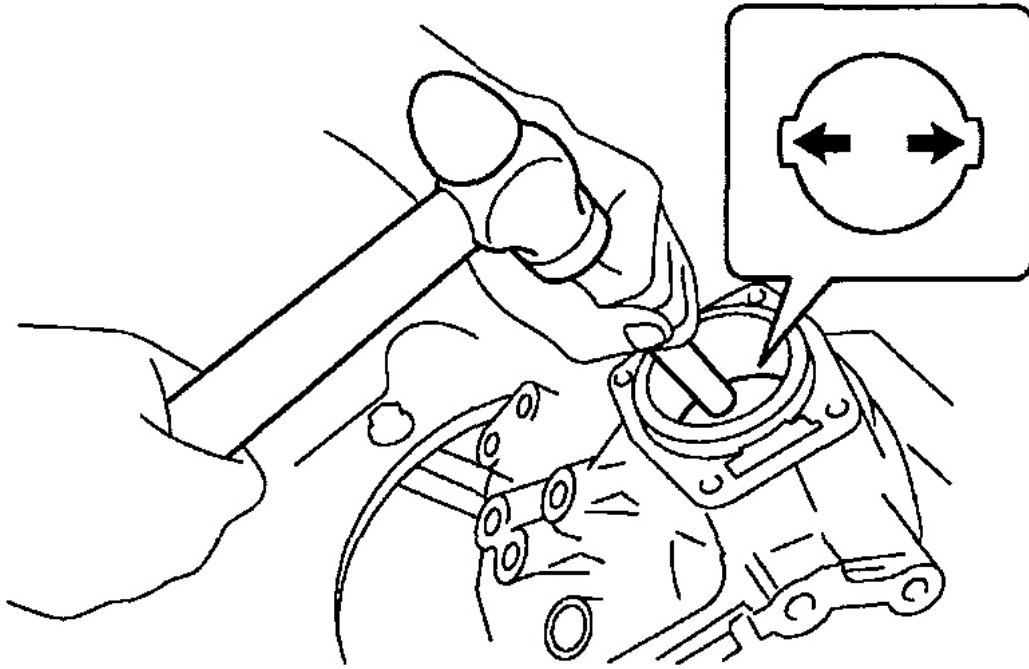


G02639991

Fig. 210: Removing Bearing Outer Race LH And Washer
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

21. REMOVE FRONT BEARING OUTER RACE

Using a brass bar and a hammer, remove outer race and washer.

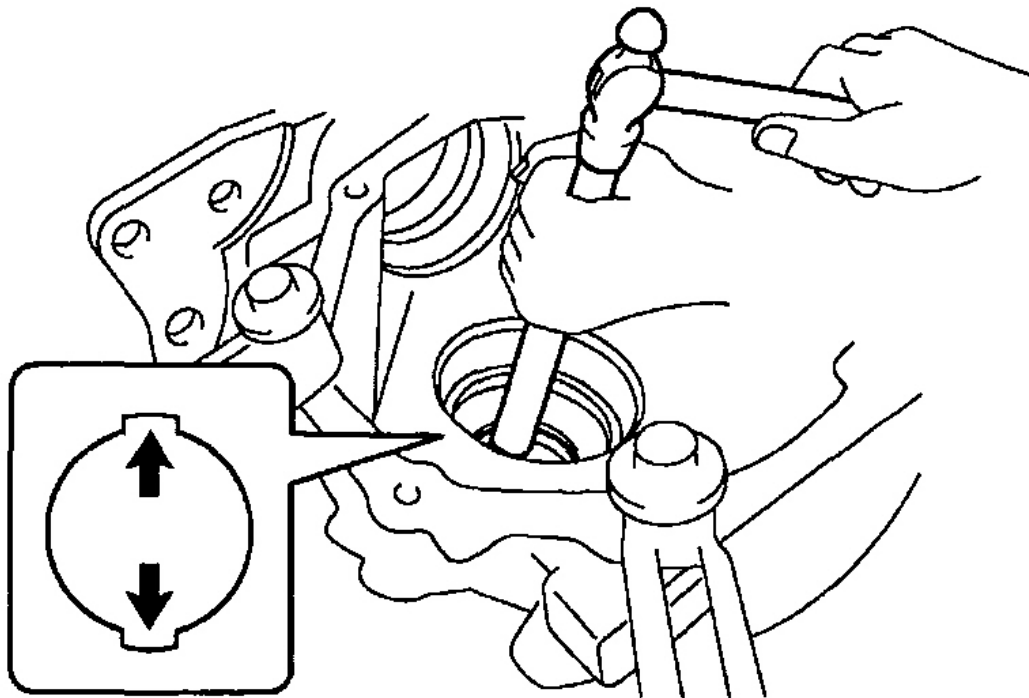


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Fig. 211: Removing Front Bearing Outer Race And Washer
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

22. REMOVE REAR BEARING OUTER RACE

Using a brass bar and a hammer, remove outer race.



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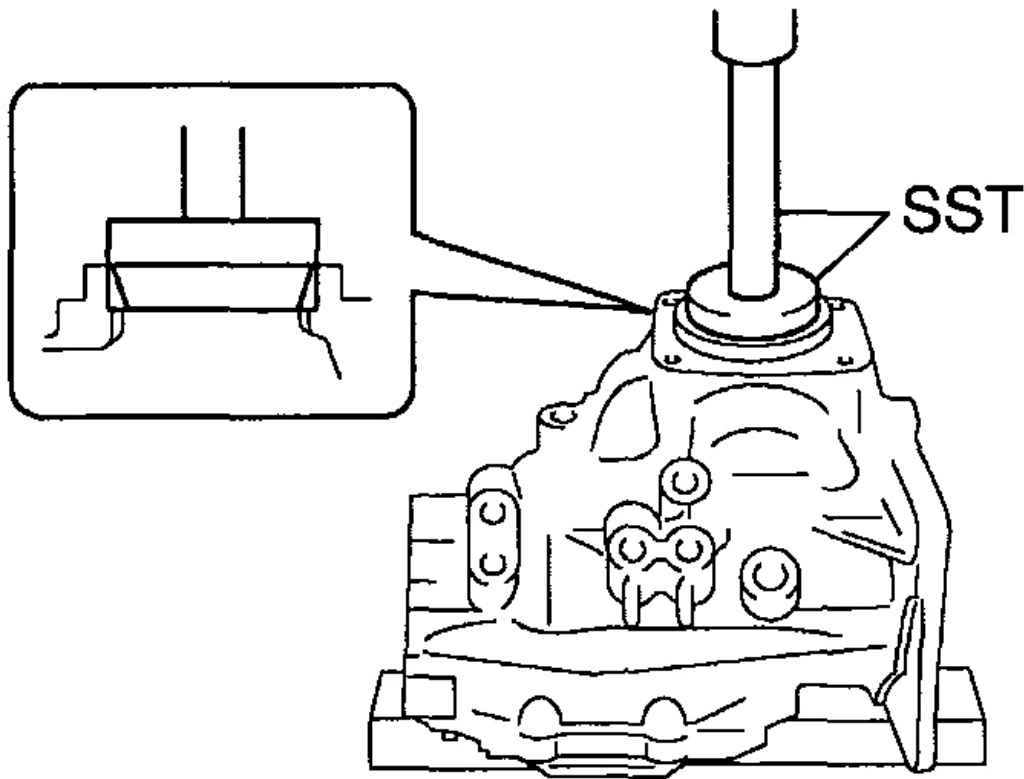
Fig. 212: Removing Rear Bearing Outer Race
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REASSEMBLY

1. INSTALL REAR BEARING OUTER RACE

Using SST and a press, install the outer race.

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



G02639994

Fig. 213: Installing Rear Bearing Outer Race
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSTALL FRONT BEARING OUTER RACE

- a. Install the washer to the transfer case.

HINT:

First install a washer of the same thickness as before.

- b. Using SST, bolt and nut, install outer race to the transfer case.

SST 09950-60010 (09951-00610, 09951-00620), 09950-60020 (09951-00790, 09951-00810)

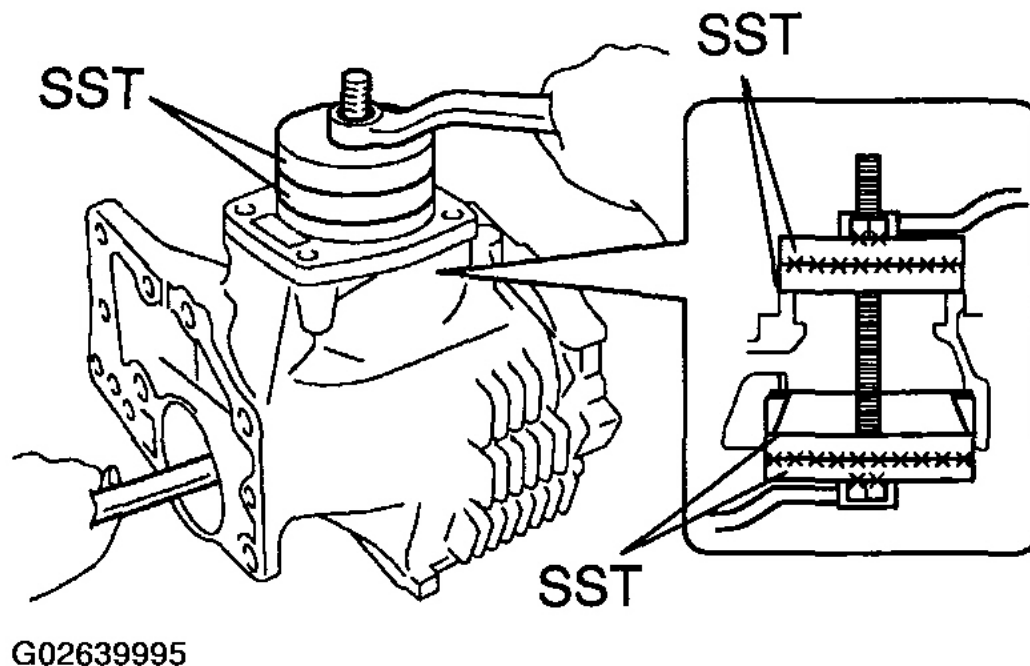


Fig. 214: Installing Front Bearing Outer Race To Transfer Case
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. INSTALL BEARING OUTER RACE LH

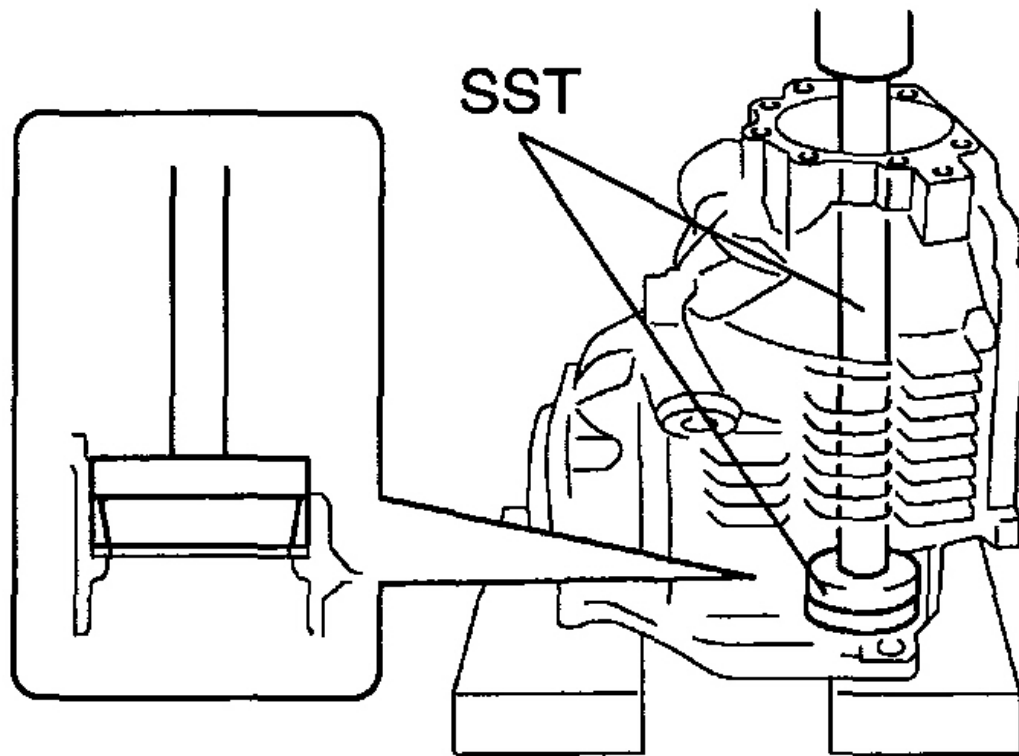
- a. Install the washer to the transfer case.

HINT:

First install a washer of the same thickness as before.

- b. Using SST and a press, install outer race to the transfer case.

SST 09950-60020 (09951-00710), 09950-70010 (09951-07200)



G02639996

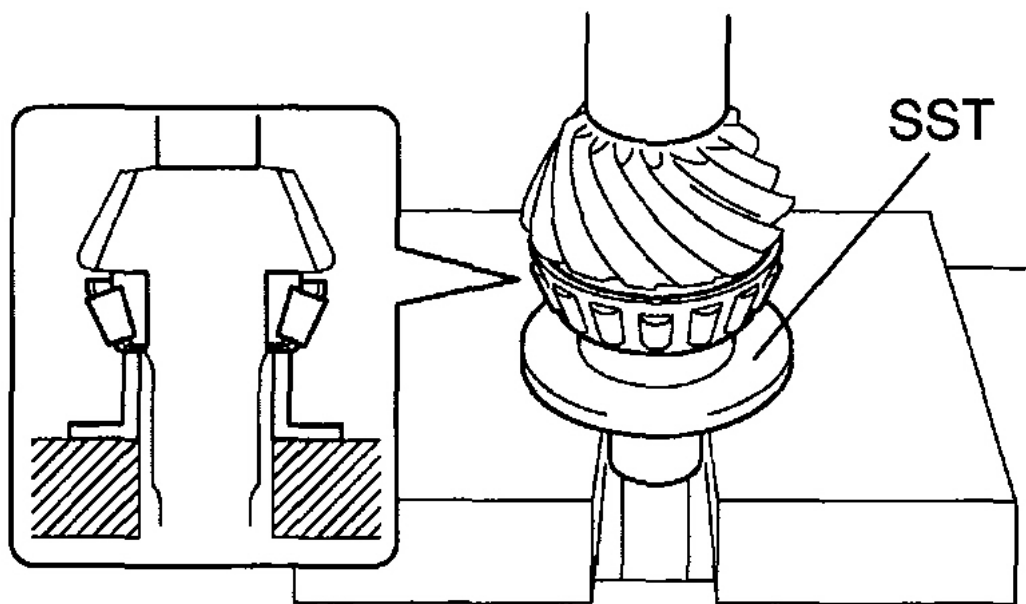
Fig. 215: Installing Bearing Outer Race LH To Transfer Case

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

4. INSTALL DRIVEN PINION

- a. Using SST and a press, install the front bearing inner race to the driven pinion.

SST 09316-60011 (09316-00041)

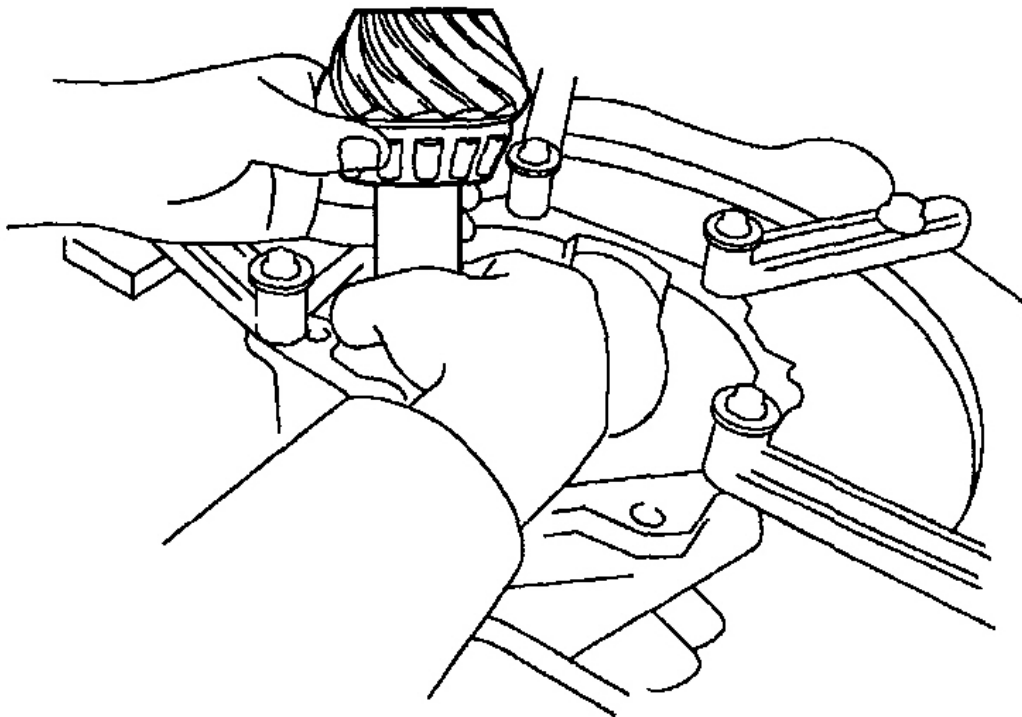


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Fig. 216: Installing Front Bearing Inner Race To Driven Pinion

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

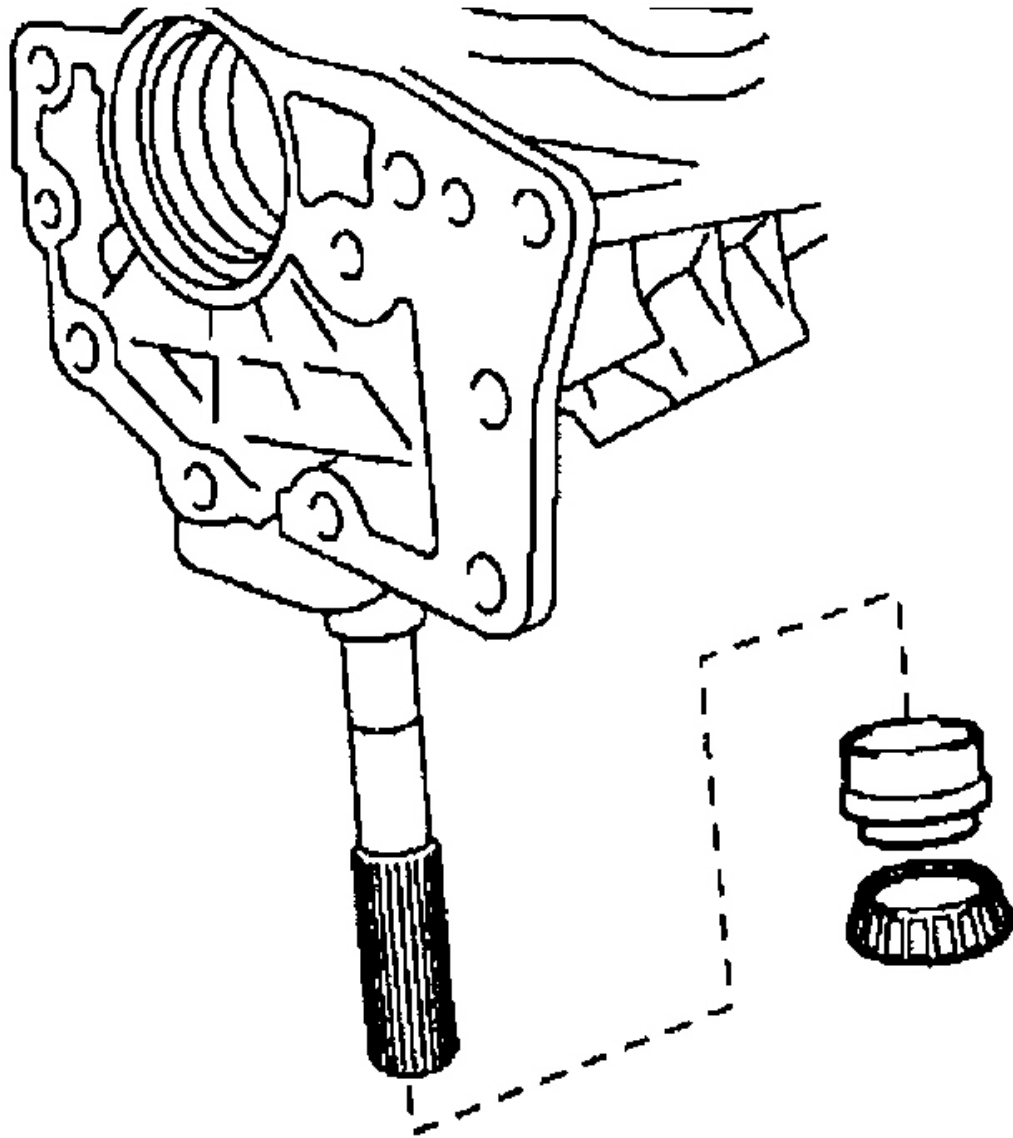
- b. Install the driven pinion to the transfer case.



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Fig. 217: Installing Driven Pinion To Transfer Case
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Install the new spacer and the rear bearing inner race to the driven pinion.



G02639999

Fig. 218: Installing Spacer And Rear Bearing Inner Race To Driven Pinion
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Coat gear oil (LSD type) to the thread of a new lock nut.
- e. Using SST, install the lock nut.

SST 09326-20011, 09556-16030

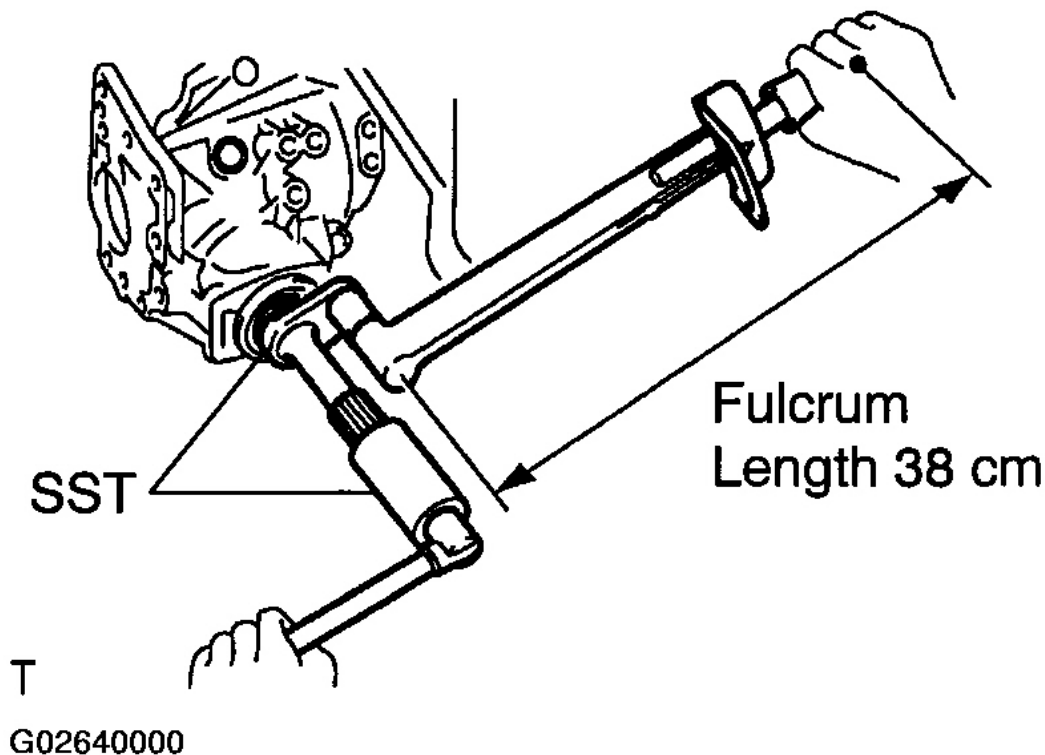


Fig. 219: Installing Lock Nut

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

Torque:

308 N.m (3,142 kgf.cm, 227 ft.lbf) for use with SST

349 N.m (3,560 kgf.cm, 257 ft.lbf)

HINT:

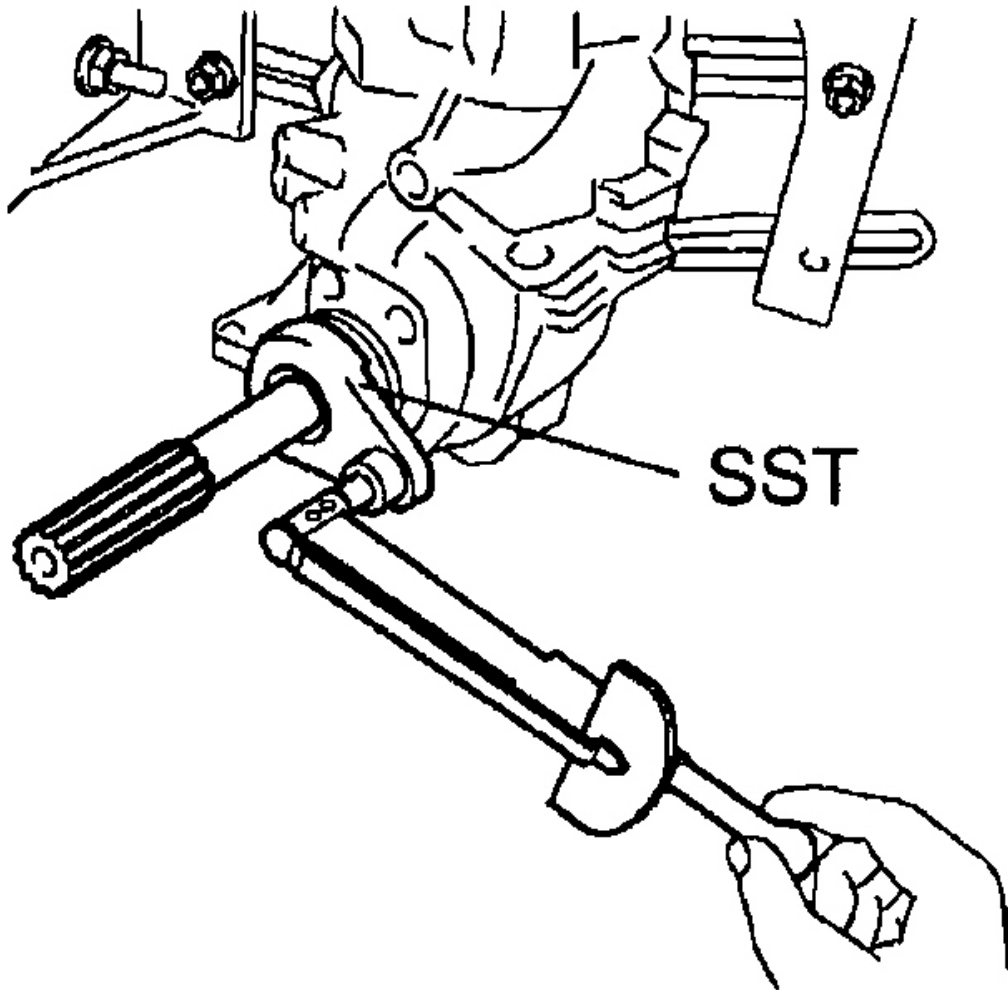
- Using a torque wrench with a fulcrum length of 380 mm (15.03 in.).
- This torque value is effective in case the SST is parallel to torque wrench.

NOTE: Do not tighten the nut until the final adjustment of the preload, tooth contact and backlash is completed.

5. CHECK DRIVEN PINION PRELOAD

Using SST and a torque wrench, measure the driven pinion preload.

SST 09326-2001



G02640001

Fig. 220: Measuring Driven Pinion Preload
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Preload (at starting):

New bearing:

0.9 to 1.4 N.m (9 to 14 kgf.cm, 7.8 to 12.4 in.lbf)

Reused bearing:

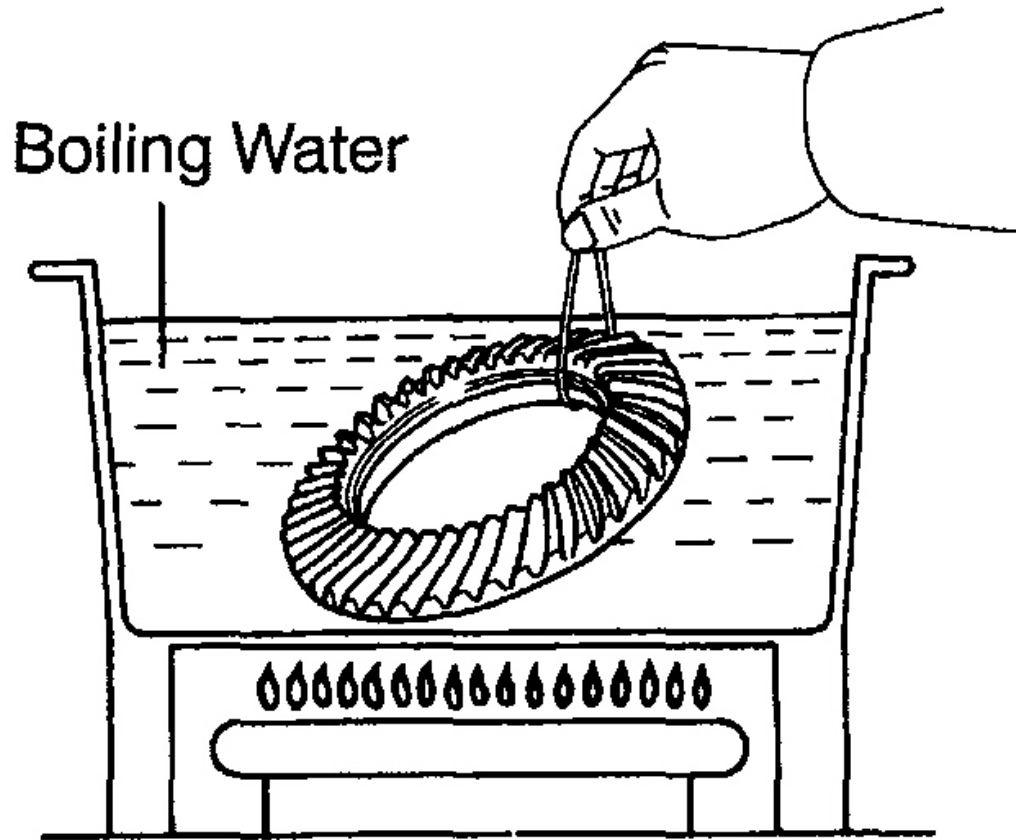
0.8 to 1.1 N.m (8 to 11 kgf.cm, 7.0 to 9.7 in.lbf)

HINT:

- Using a torque wrench with a fulcrum length of 160 mm (6.3 in.).
- This torque value is effective in case that SST is parallel to torque wrench.
- If the preload is not sufficient, adjust the driven pinion by tightening the lock nut by 5° to 10° and measuring the preload until the preload is within the standard value.
- If the preload is more than the standard value, replace the spacer with a new one.
- If the tightening torque for a driven pinion nut is more than the standard value, and the preload is not sufficient, loosen the lock nut, apply gear oil on the thread and bearing surface and adjust it as described above. When the tightening torque is less than the standard value, replace the spacer with a new one.

6. ASSEMBLE CENTER DIFFERENTIAL CONTROL COUPLING

- a. Clean the contact surface of the ring gear and center differential control coupling.
- b. Heat the ring gear in water and boil for 10 minutes.

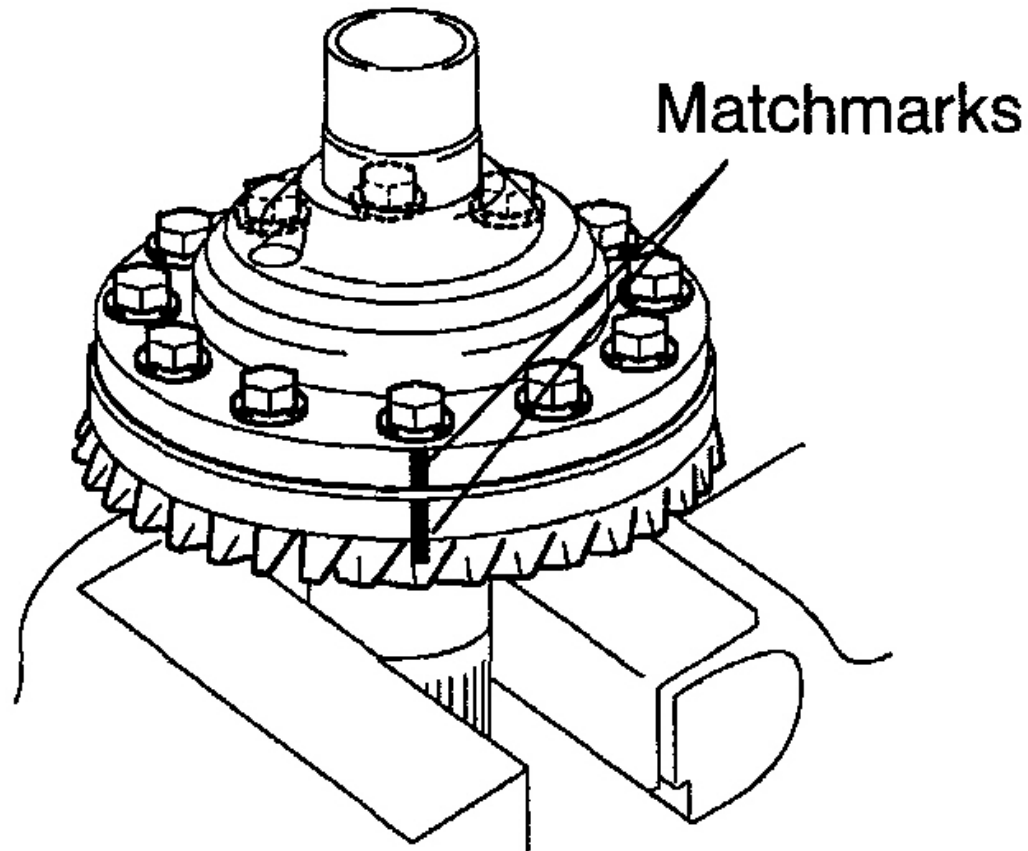


G02640002

Fig. 221: Heating Ring Gear In Boiling Water

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

- c. Carefully remove the ring gear from the water.
- d. After the moisture on the ring gear has completely evaporated, quickly install the ring gear to the center differential control coupling.



G02640003

Fig. 222: Installing Ring Gear To Center Differential Control Coupling
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

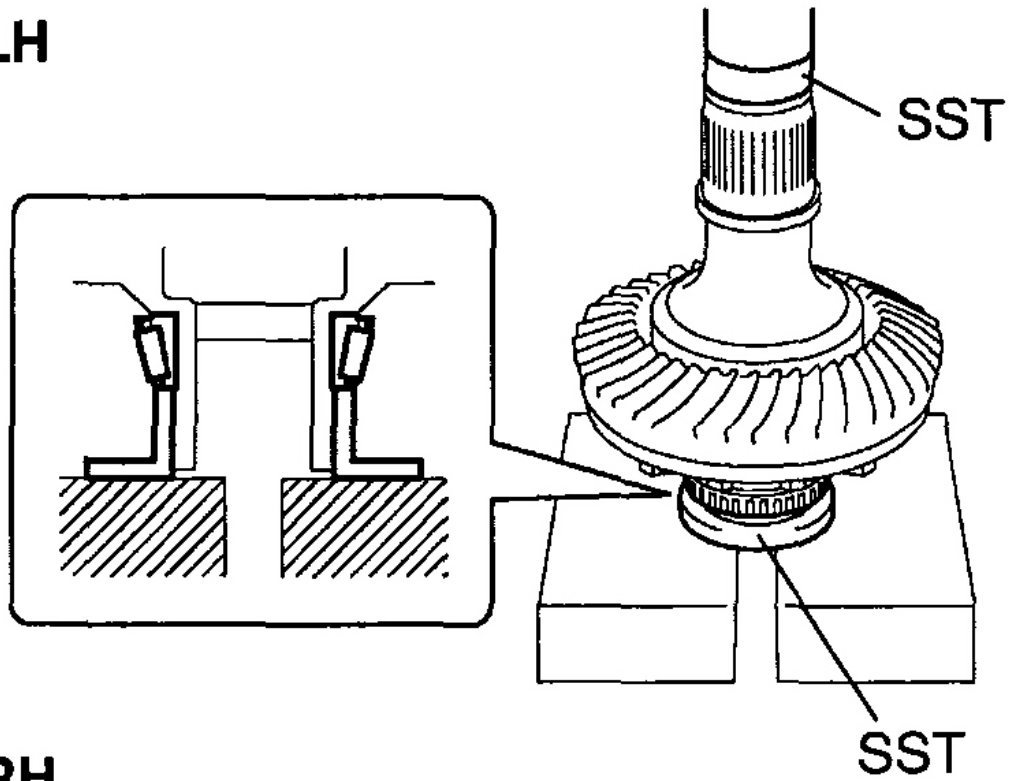
- e. Install the 12 bolts.

Torque: 77.5 N.m (791 kgf.cm, 57 ft.lbf)

- f. Using SST and a press, install the center differential case tapered roller bearing inner race LH and RH.

SST 09223-00010, 09506-35010, 09950-60010 (09951-00420)

LH



RH

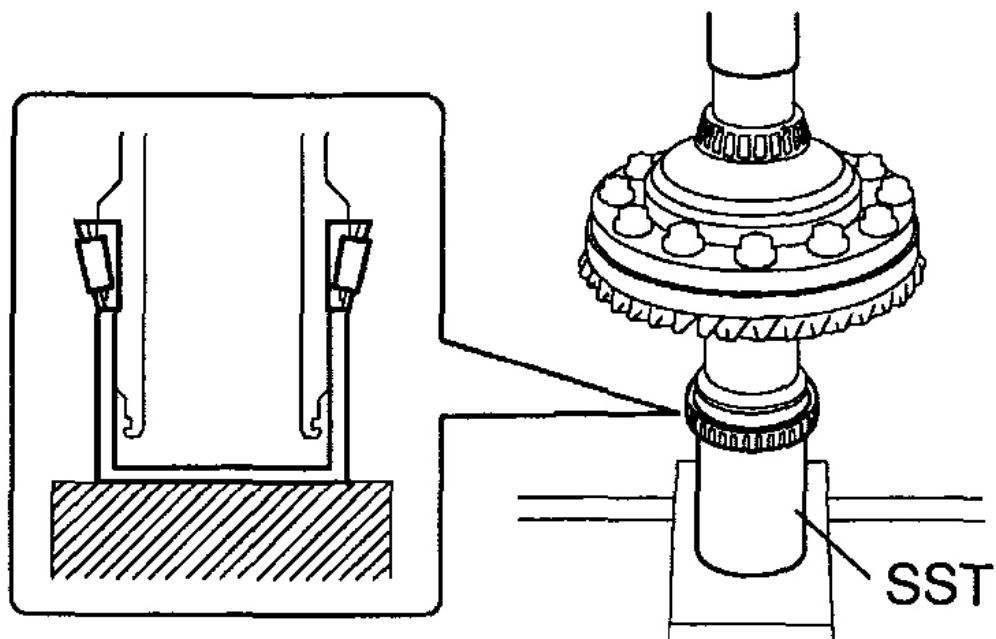
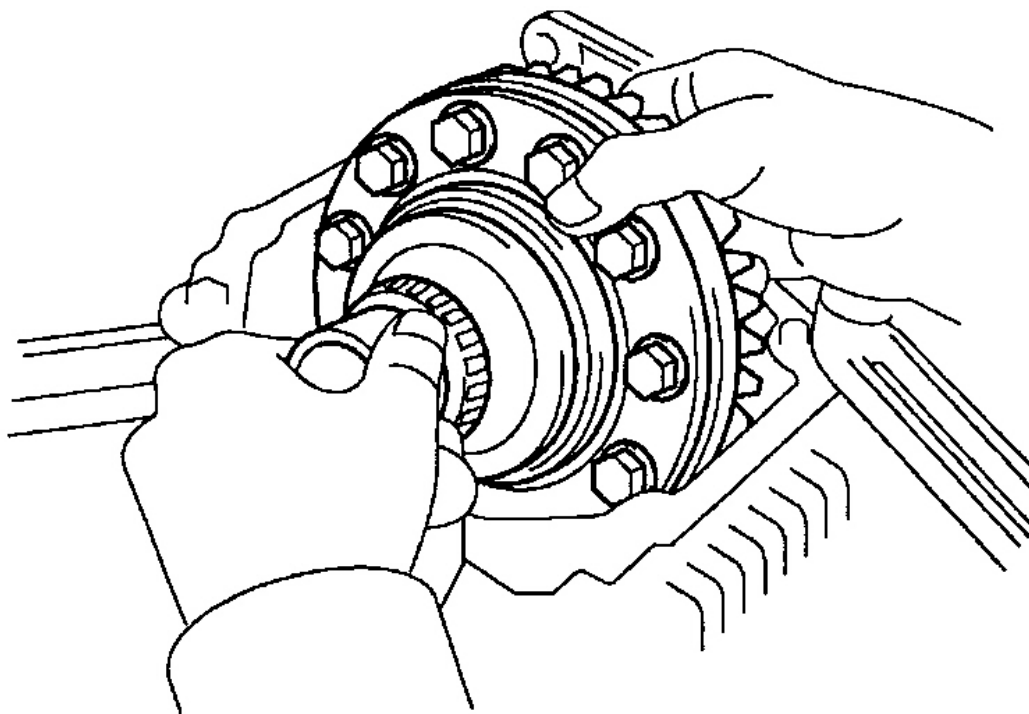


Fig. 223: Installing Center Differential Case Tapered Roller Bearing Inner Race LH And RH
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

7. INSTALL CENTER DIFFERENTIAL CONTROL COUPLING ASSEMBLY



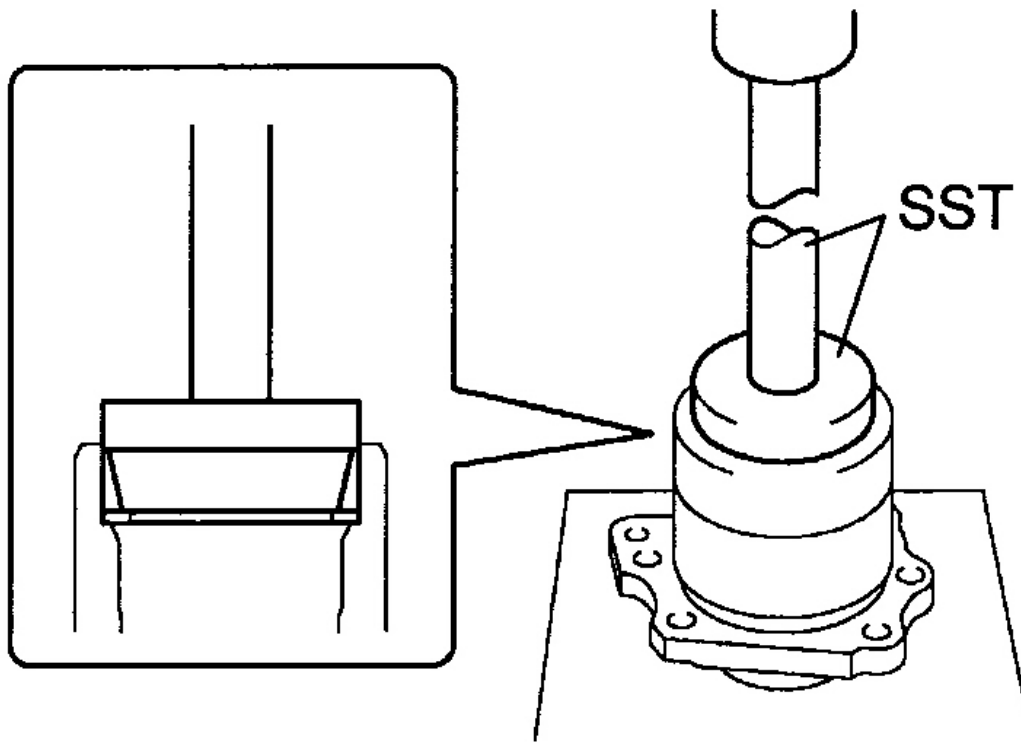
G02640005

Fig. 224: Installing Center Differential Control Coupling Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

8. INSTALL CENTER DIFFERENTIAL CASE TAPERED ROLLER BEARING OUTER RACE RH

- a. Install the washer to the bearing retainer RH.
- b. Using SST and a press, install the outer race to the bearing retainer RH.

SST 09550-60010 (09951-00620), 09950-70010 (09951-07150)



G02640006

Fig. 225: Installing Outer Race To Bearing Retainer RH
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

9. INSTALL BEARING RETAINER RH

- a. Place the transfer with the installation surface for the retainer upward.
- b. Do centering of the center differential control coupling assembly and the case.

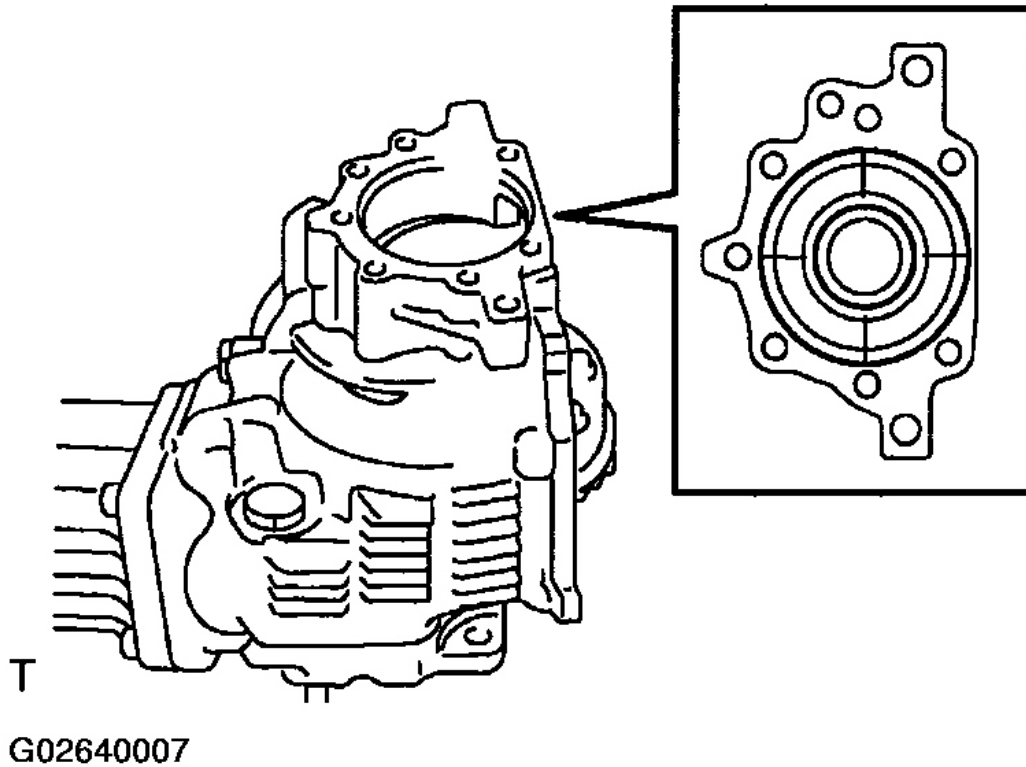


Fig. 226: Centering Center Differential Control Coupling Assembly & Case
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Insert the SST into the retainer.

SST 09387-00090

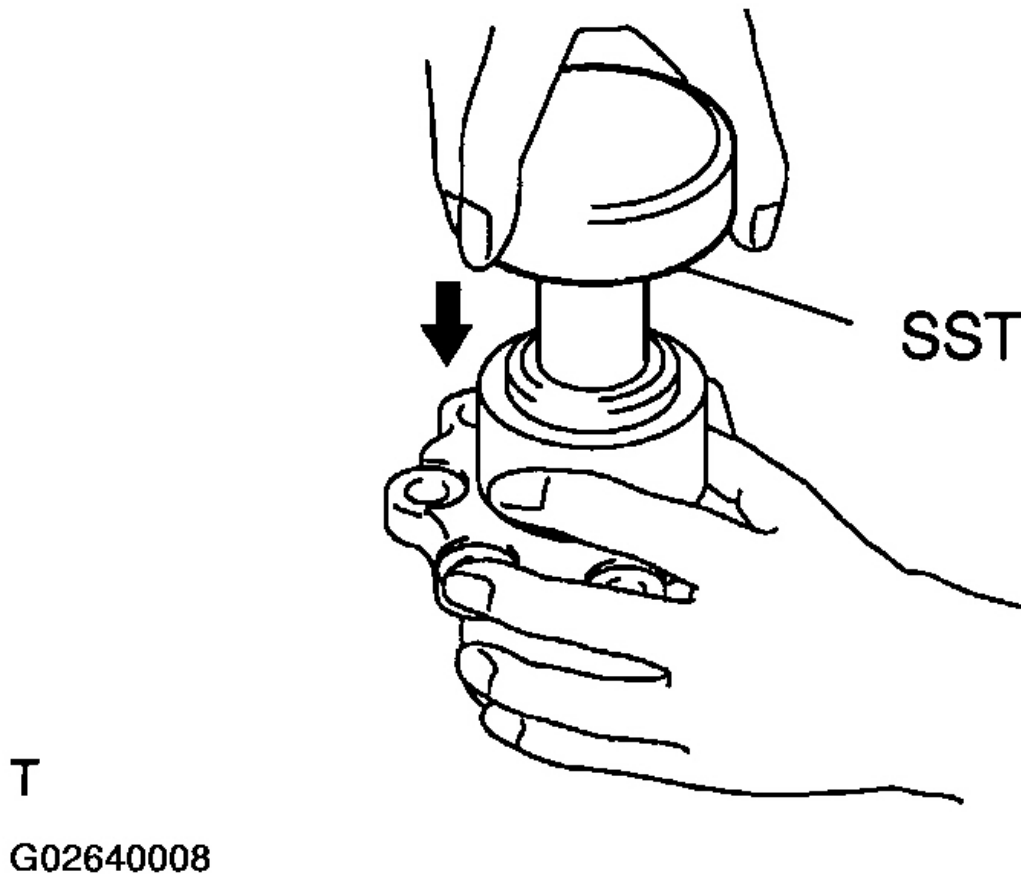


Fig. 227: Inserting SST Into Retainer

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

NOTE: Insert the SST straight down without making its tip interfere with the lip of the oil seal.

- d. Insert the retainer and the SST into the case together as a unit.

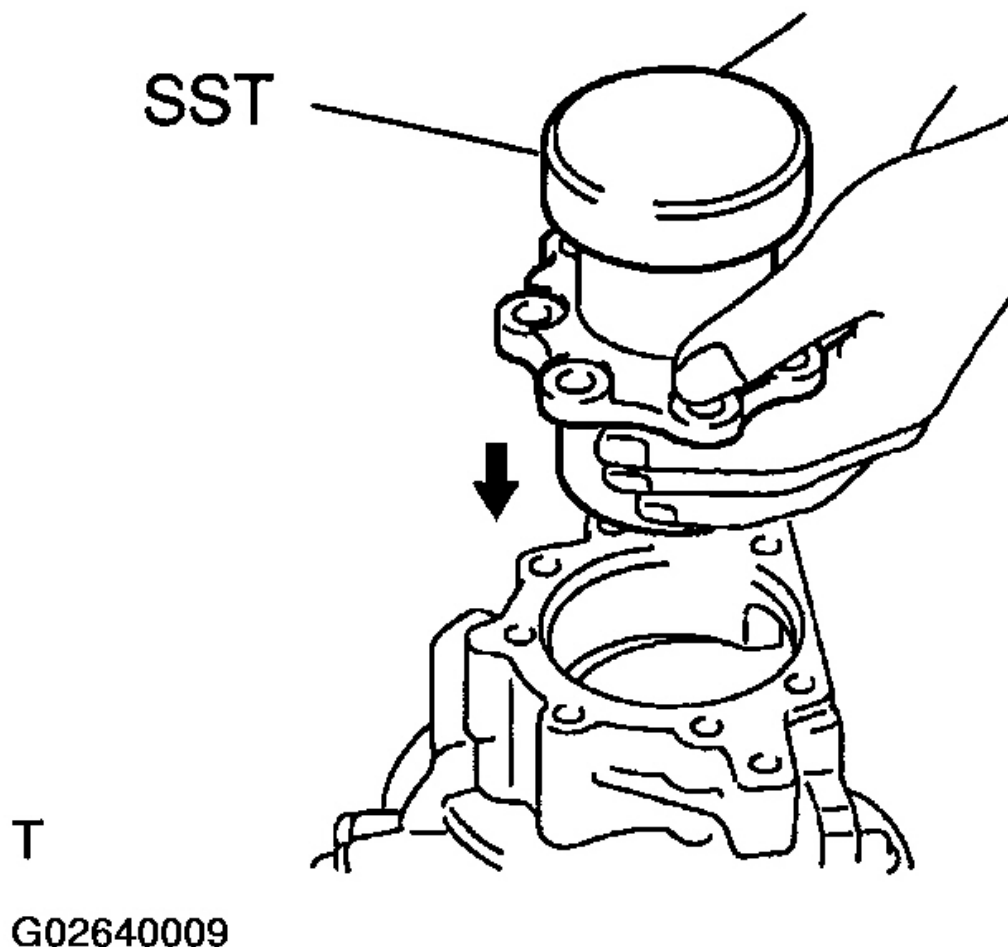


Fig. 228: Inserting Retainer And SST Into Case Together As Unit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE:

- Do not make the transfer case, bearing retainer RH and SST interfere with the center differential control coupling.
- Do not damage the retainer O-ring only after adjusting the backlash, tooth contact and total pre-loading.

HINT:

When the retainer cannot be inserted in the case, give a slight blow with a plastic hammer and insert it.

- e. After inserting the retainer in the case, remove the SST.

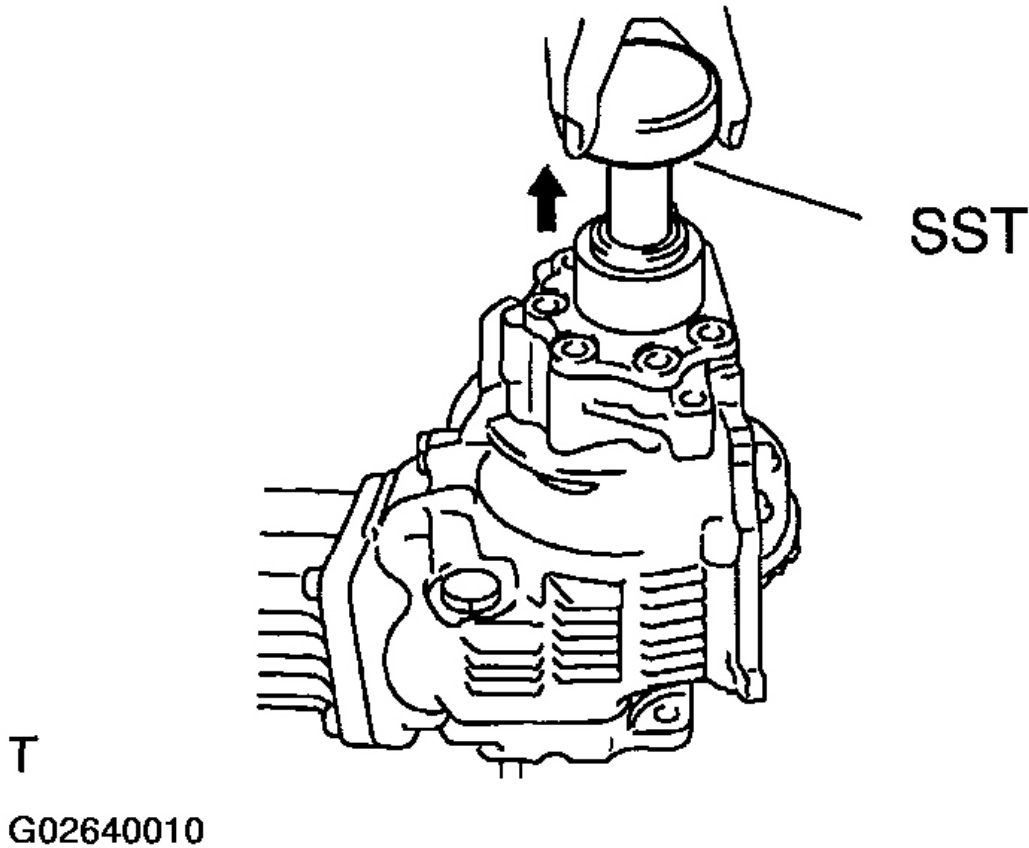


Fig. 229: Removing SST

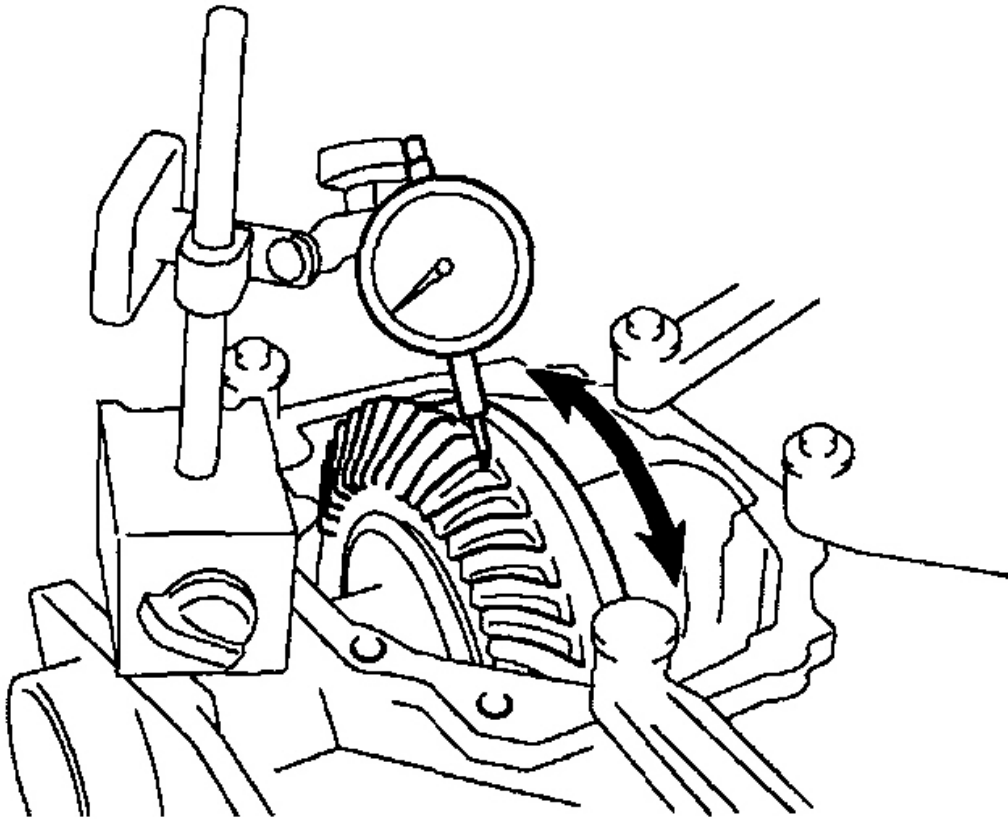
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- f. Install the 7 bolts.

Torque: 28 N.m (286 kgf.cm, 115 ft.lbf)

10. INSPECT BACKLASH

Using a dial indicator, measure the backlash of the ring gear at 3 positions at least.



G02640011

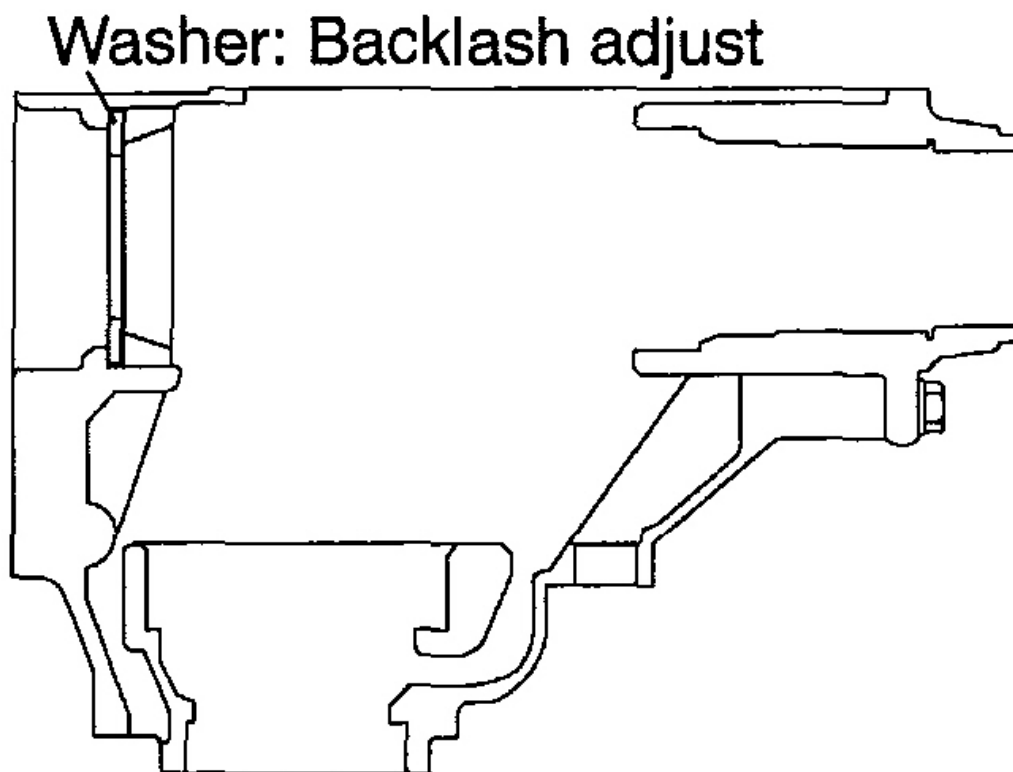
Fig. 230: Measuring Backlash Of Ring Gear
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Backlash: 0.10 to 0.15 mm (0.0039 to 0.0059 in.)

HINT:

The measure values should be used as reference when selecting washer, so take a note of the values.

If the backlash is not within the specification replace the washer on the ring gear side with one of a different thickness using the following procedure.



G02640012

Fig. 231: Identifying Washer For Backlash Adjusting
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Washer thickness: mm (in.)

WASHER THICKNESS SPECIFICATION CHART

Mark	Thickness	Mark	Thickness
AA	2.07 (0.0815)	FB	2.55 (0.1004)
AB	2.10 (0.0827)	FC	2.58 (0.1016)
AC	2.13 (0.0839)	GA	2.61 (0.1028)
BA	2.16 (0.0850)	GB	2.64 (0.1039)
BB	2.19 (0.0862)	GC	2.67 (0.1051)
BC	2.22 (0.0874)	HA	2.70 (0.1063)
CA	2.25 (0.0886)	HB	2.73 (0.1075)
CB	2.28 (0.0898)	HC	2.76 (0.1087)

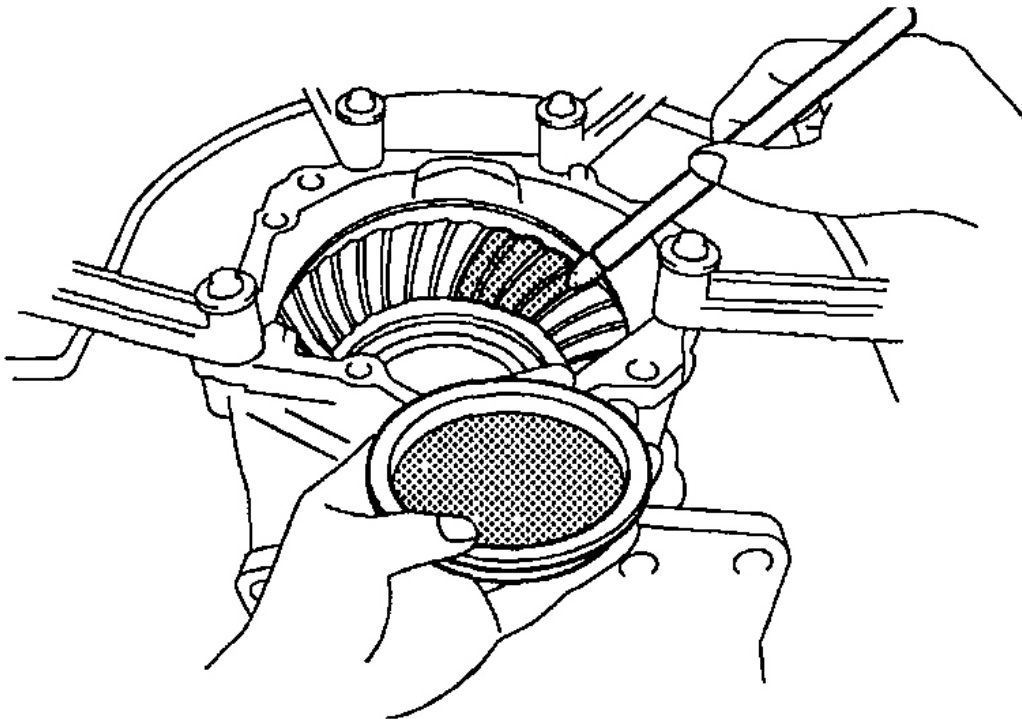
2004 Toyota RAV4

2004 TRANSMISSION Manual Transaxle - RAV4

CD	2.31 (0.0909)	JA	2.79 (0.1098)
DA	2.34 (0.0921)	JB	2.82 (0.1110)
DB	2.37 (0.0933)	JC	2.85 (0.1122)
DC	2.40 (0.0945)	KA	2.88 (0.1134)
EA	2.43 (0.0957)	KB	2.91 (0.1146)
EB	2.46 (0.0969)	KC	2.94 (0.1157)
EC	2.49 (0.0980)	LA	2.97 (0.1169)
FA	2.52 (0.0992)	LB	3.00 (0.1181)

11. INSPECT TOOTH CONTACT PATTERN

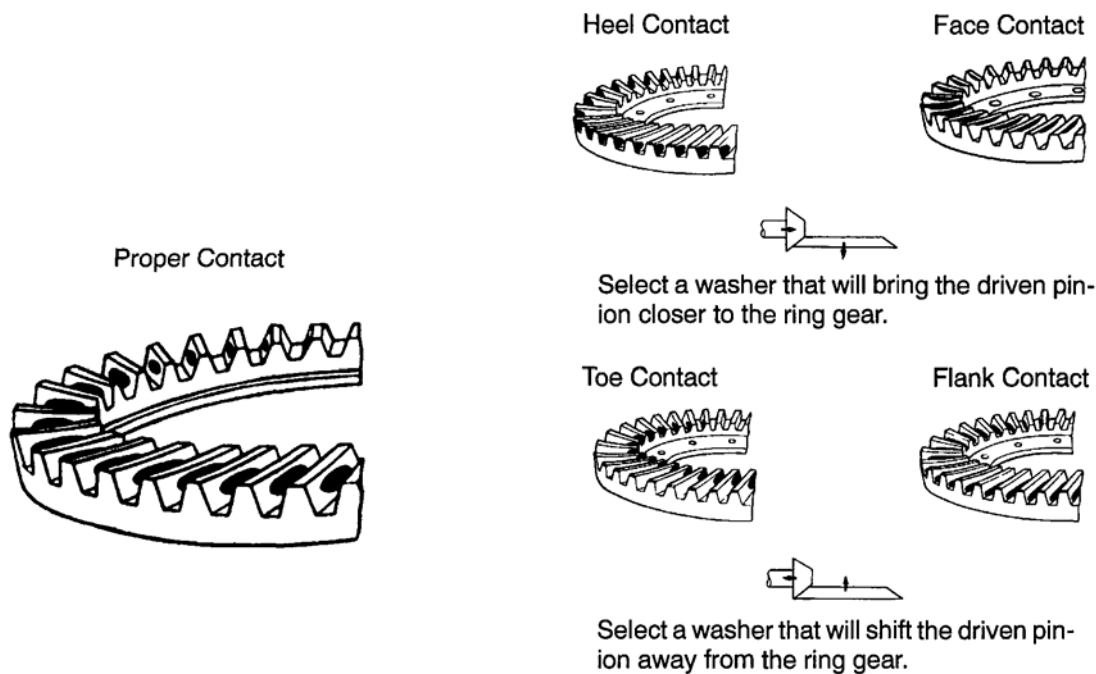
- Coat 3 or 4 teeth at the 4 different positions on the ring gear with red lead.



G02640013

Fig. 232: Coating Teeth On Ring Gear With Red Lead
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- Rotate the ring gear, inspect the teeth pattern.

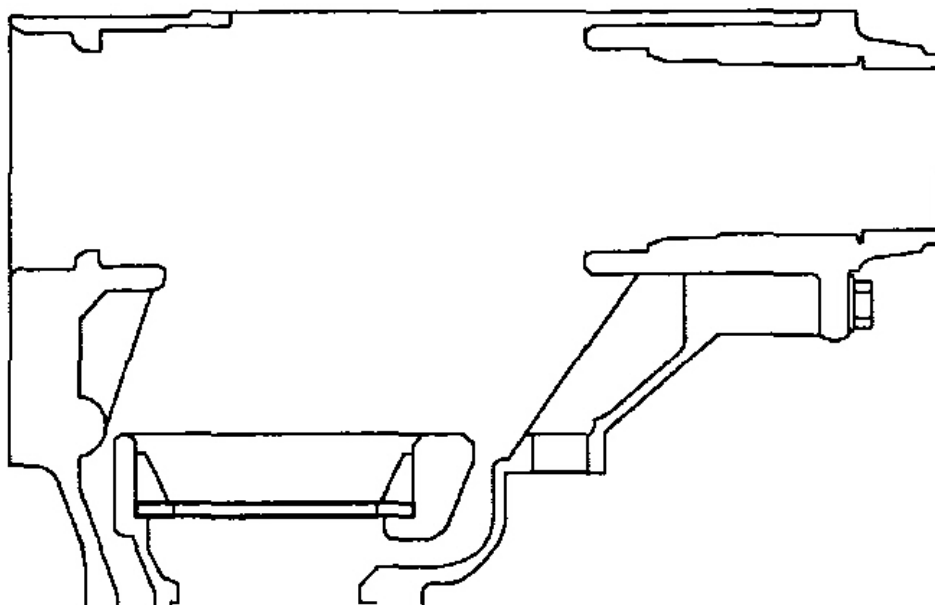


G02640014

Fig. 233: Inspecting Teeth Pattern

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

- c. If the teeth are not contacting properly, select the proper washer again.



Washer: Tooth contact adjust

G02640015

Fig. 234: Identifying Washer Tooth Contact Adjusting
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Washer thickness: mm (in.)

WASHER THICKNESS SPECIFICATION CHART

Mark	Thickness	Mark	Thickness
AA	1.20 (0.0472)	HC	1.43 (0.0563)
AB	1.21 (0.0476)	JA	1.44 (0.0567)
AC	1.22 (0.0480)	JB	1.45 (0.0571)
BA	1.23 (0.0484)	JC	1.46 (0.0575)
BB	1.24 (0.0488)	KA	1.47 (0.0579)
BC	1.25 (0.0492)	KB	1.48 (0.0583)
CA	1.26 (0.0496)	KC	1.49 (0.0587)
CB	1.27 (0.0500)	LA	1.50 (0.0591)
CC	1.28 (0.0504)	LB	1.51 (0.0594)
DA	1.29 (0.0508)	LC	1.52 (0.0598)
DB	1.30 (0.0512)	MA	1.53 (0.0602)

2004 Toyota RAV4

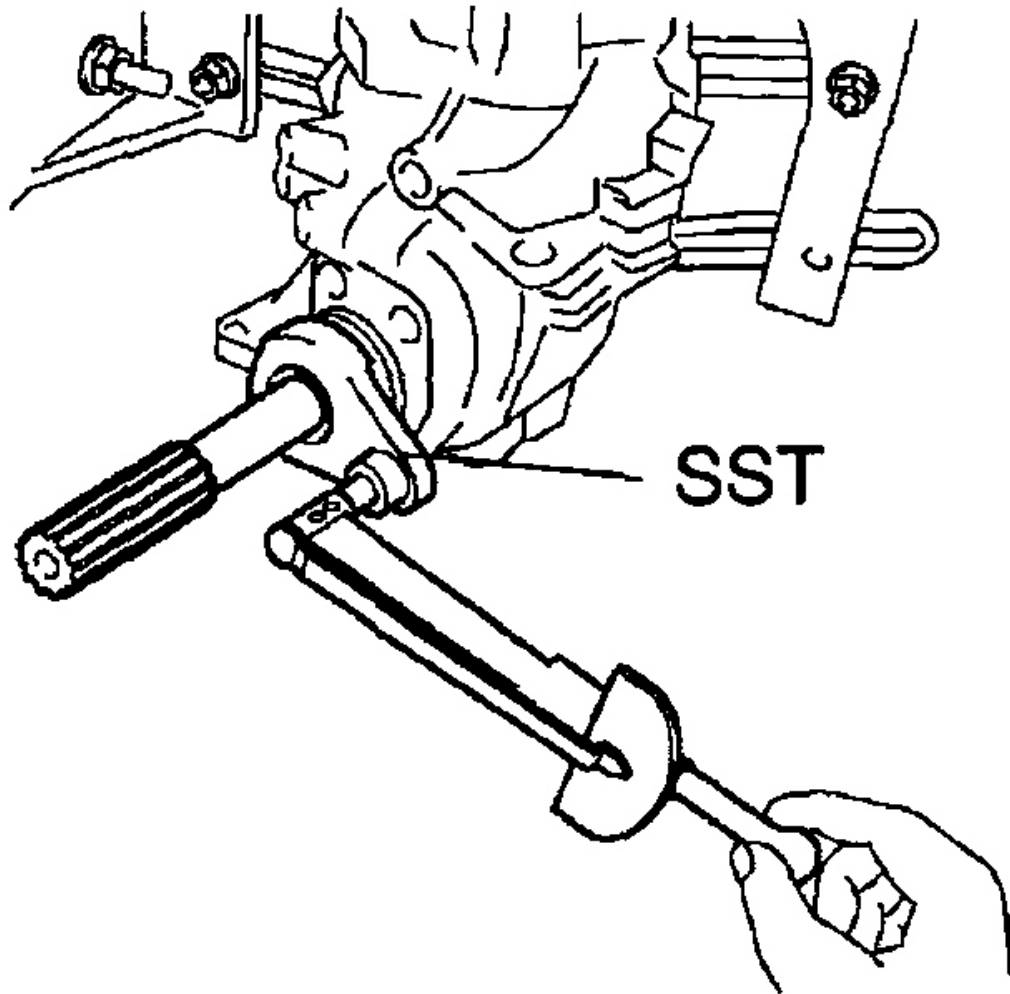
2004 TRANSMISSION Manual Transaxle - RAV4

DC	1.31 (0.0516)	MB	1.54 (0.0606)
EA	1.32 (0.0520)	MC	1.55 (0.0610)
EB	1.33 (0.0524)	NA	1.56 (0.0614)
EC	1.34 (0.0528)	NB	1.57 (0.0618)
FA	1.35 (0.0531)	NC	1.58 (0.0622)
FB	1.36 (0.0535)	PA	1.59 (0.0626)
FC	1.37 (0.0539)	PB	1.60 (0.0630)
GA	1.38 (0.0543)	PC	1.61 (0.0634)
GB	1.39 (0.0547)	QA	1.62 (0.0638)
GC	1.40 (0.0551)	QB	1.63 (0.0642)
HA	1.41 (0.0555)	QC	1.64 (0.0646)
HB	1.42 (0.0559)	RA	1.65 (0.0650)

12. ADJUST TOTAL PRELOAD

Using SST and a torque wrench, measure the total preload.

SST 09326-20011



G02640016

Fig. 235: Measuring Preload

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

Total preload:

New bearing:

Driven pinion preload + 0.2 to 0.4 N.m (2 to 4 kgf.cm, 1.8 to 3.5 in.lbf)

Reused bearing:

Driven pinion preload + 0.1 to 0.3 N.m (1 to 3 kgf.cm, 0.9 to 2.6 in.lbf)

HINT:

Using a torque wrench with a fulcrum length of 160 mm (6.3 in.).

HINT:

Turn the driven pinion counterclockwise and clockwise several times.

If the preload is not as specified, select a proper washer again.

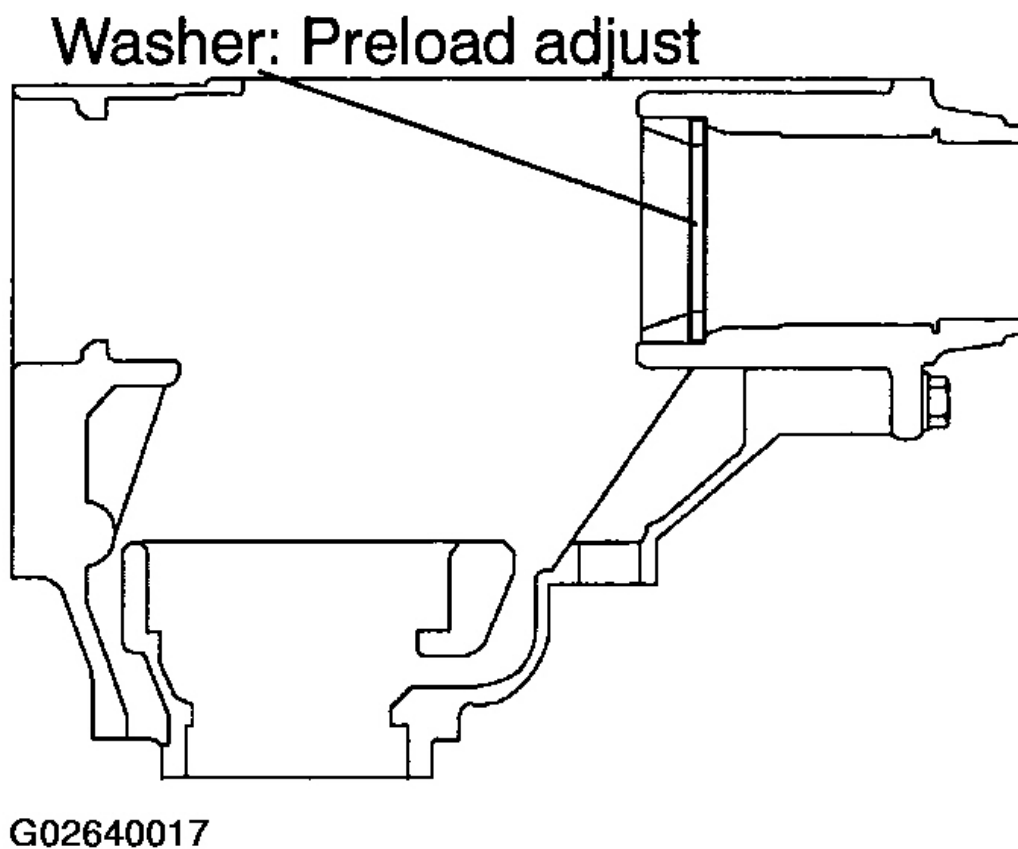


Fig. 236: Identifying Washer Preload Adjusting
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Washer thickness: mm (in.)

2004 Toyota RAV4

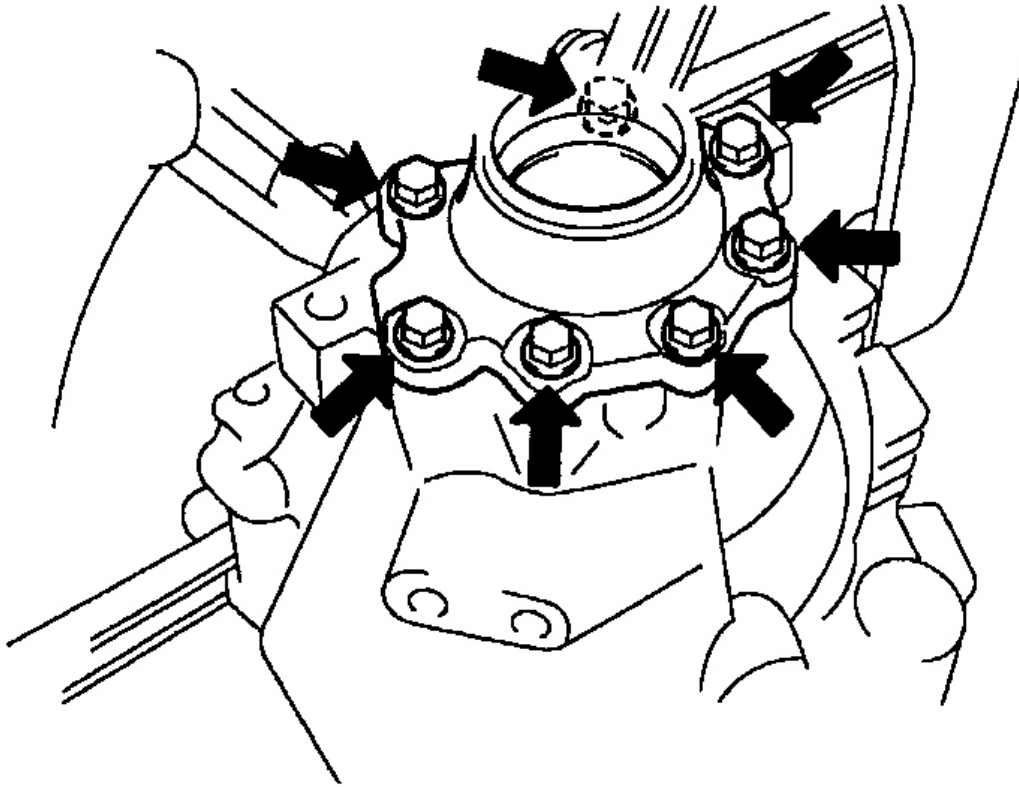
2004 TRANSMISSION Manual Transaxle - RAV4

WASHER THICKNESS SPECIFICATION CHART

Mark	Thickness	Mark	Thickness
AA	1.47 (0.0579)	GB	2.04 (0.0803)
AB	1.50 (0.0591)	GC	2.07 (0.0815)
AC	1.53 (0.0602)	HA	2.10 (0.0827)
BA	1.56 (0.0614)	HB	2.13 (0.0839)
BB	1.59 (0.0626)	HC	2.16 (0.0850)
BC	1.62 (0.0638)	JA	2.19 (0.0862)
CA	1.65 (0.0650)	JB	2.22 (0.0874)
CB	1.68 (0.0661)	JC	2.25 (0.0886)
CC	1.71 (0.0673)	KA	2.28 (0.0898)
DA	1.74 (0.0685)	KB	2.31 (0.0909)
DB	1.77 (0.0697)	KC	2.34 (0.0921)
DC	1.80 (0.0709)	LA	2.37 (0.0933)
EA	1.83 (0.0720)	LB	2.40 (0.0945)
EB	1.86 (0.0734)	LC	2.43 (0.0957)
EC	1.89 (0.0744)	MA	2.46 (0.0969)
FA	1.92 (0.0756)	MB	2.49 (0.0980)
FB	1.95 (0.0768)	MC	2.52 (0.0992)
FC	1.98 (0.0780)	NA	2.55 (0.1004)
GA	2.01 (0.0791)	NB	2.58 (0.1016)

13. REMOVE BEARING RETAINER RH

- Remove the 7 bolts.



G02640018

Fig. 237: Removing Bolts Of Bearing Retainer RH
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using a screwdriver and a hammer, make clearance by hitting between the bearing retainer RH and the transfer case.

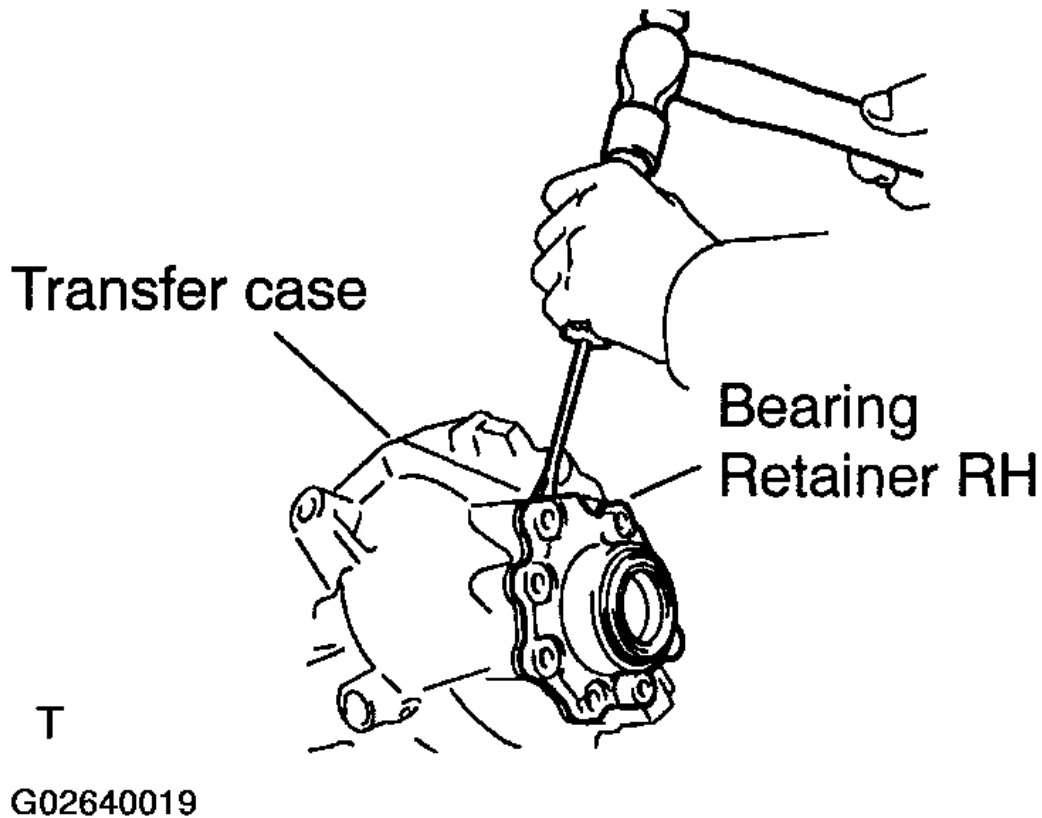


Fig. 238: Using Screwdriver And Hammer To Make Clearance By Hitting Between Bearing Retainer RH And Transfer Case

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

- c. Using SST, remove the bearing retainer RH from the transfer case.

SST 09520-10021

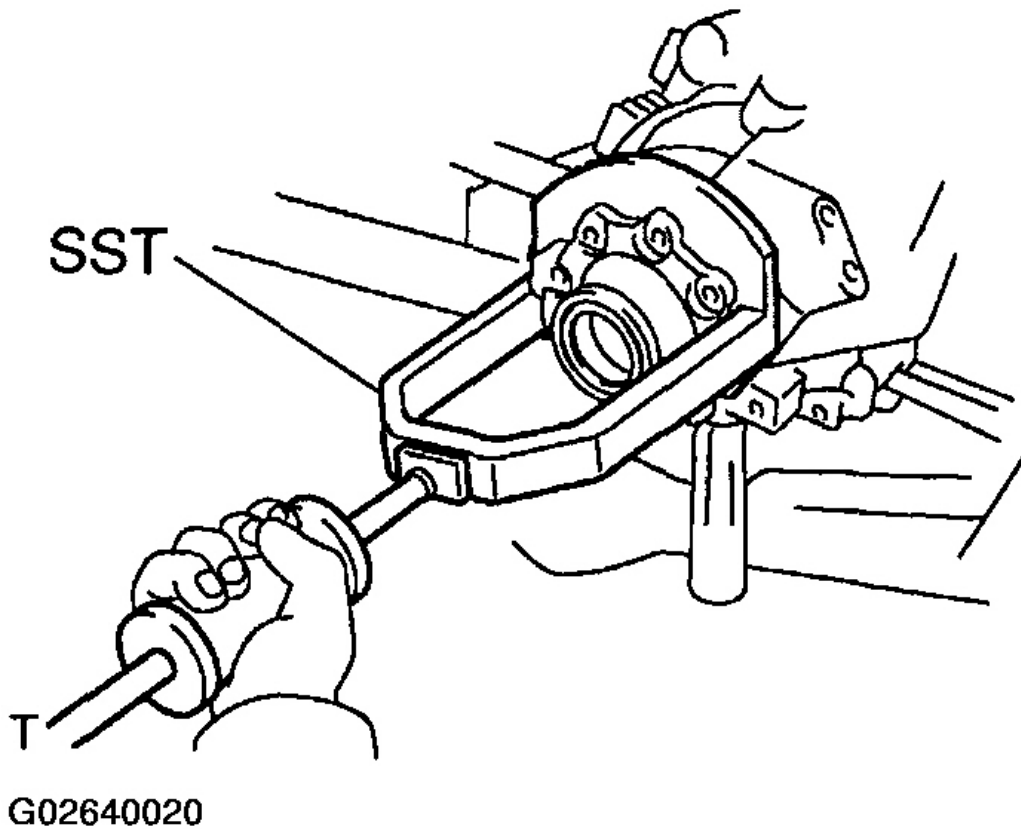


Fig. 239: Removing Bearing Retainer RH From Transfer Case
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Using SST, remove the outer race and washer from the bearing retainer RH.

SST 09308-00010

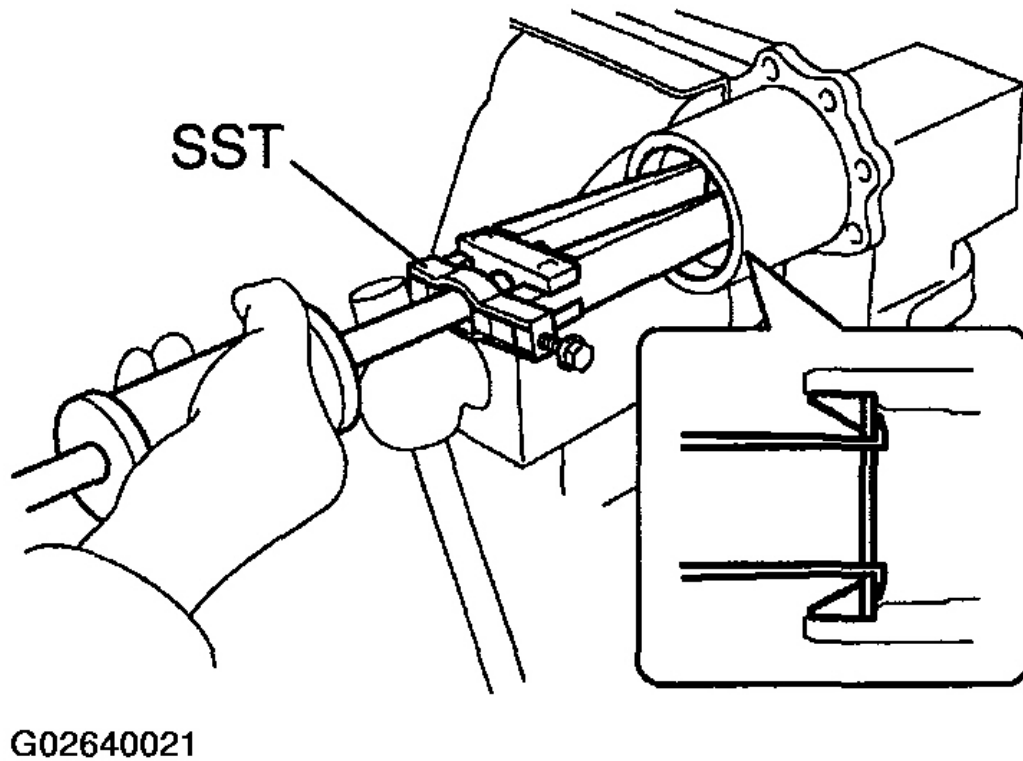
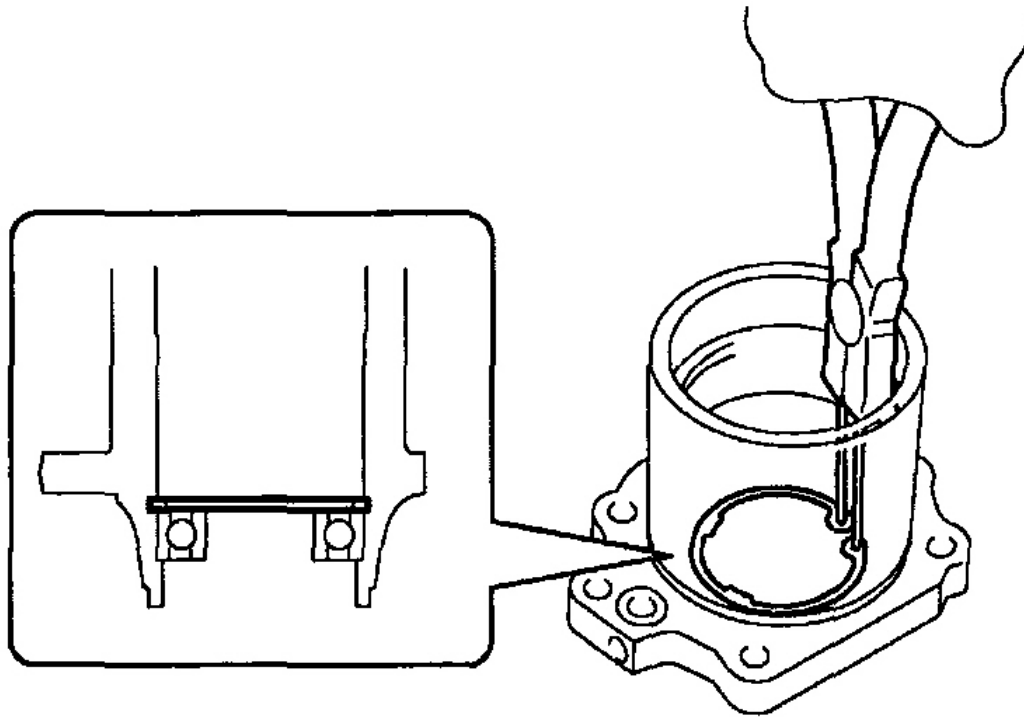


Fig. 240: Removing Outer Race And Washer From Bearing Retainer RH
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

14. ASSEMBLE BEARING RETAINER RH

- a. Install the side gear shaft holder bearing to the bearing retainer RH.
- b. Using snap ring pliers, install the snap ring.



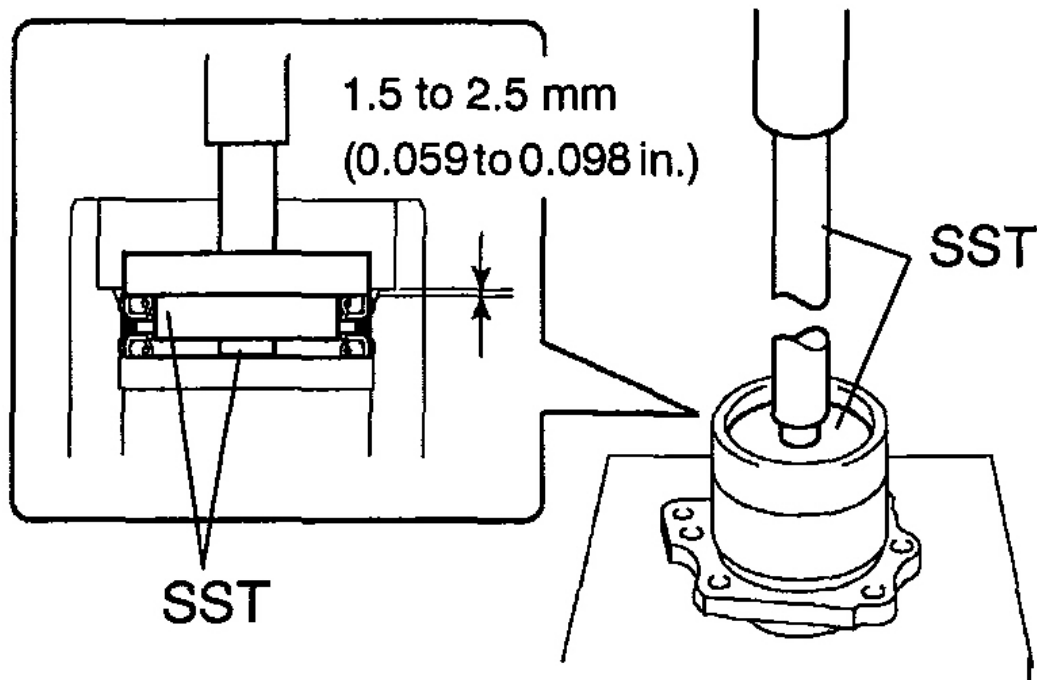
G02640022

Fig. 241: Installing Snap Ring

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

- c. Coat the oil seal lip with MP grease.
- d. Using SST and a press, install the oil seal to the bearing retainer RH.

SST 09950-60010 (09951-00370, 09951-00540, 09952-06010), 09950-70010 (09951-07150)

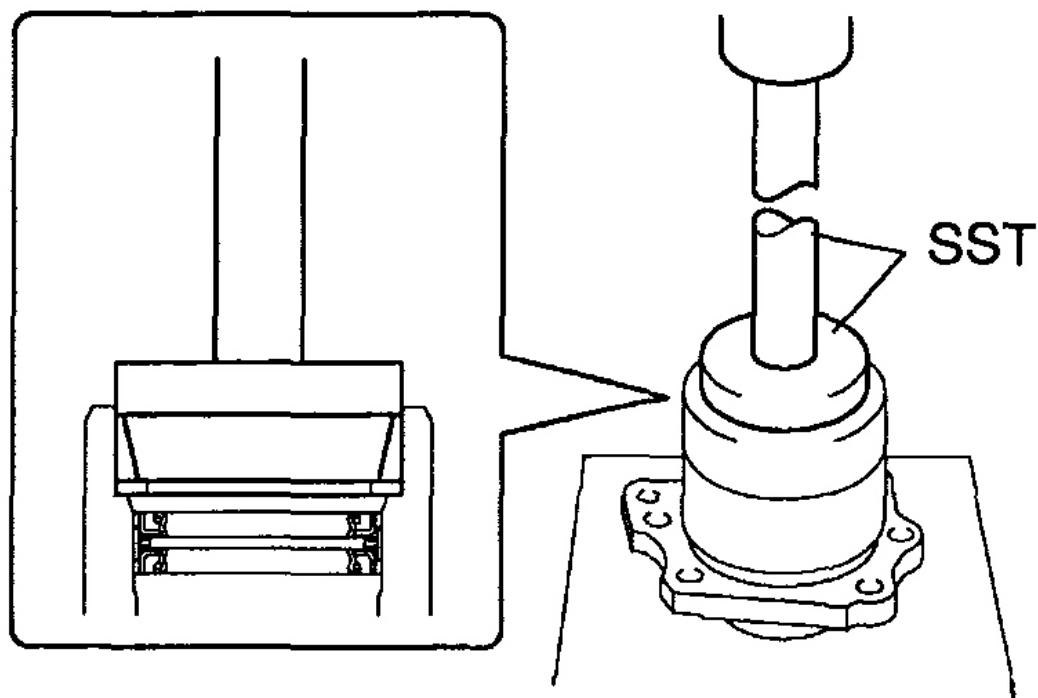


G02640023

Fig. 242: Installing Oil Seal To Bearing Retainer RH
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Install the washer.
- f. Using SST and a press, install the outer race to the bearing retainer RH

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



G02640024

Fig. 243: Installing Outer Race To Bearing Retainer RH
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- g. Coat new 2 O-rings with gear oil, and install them to the bearing retainer RH.

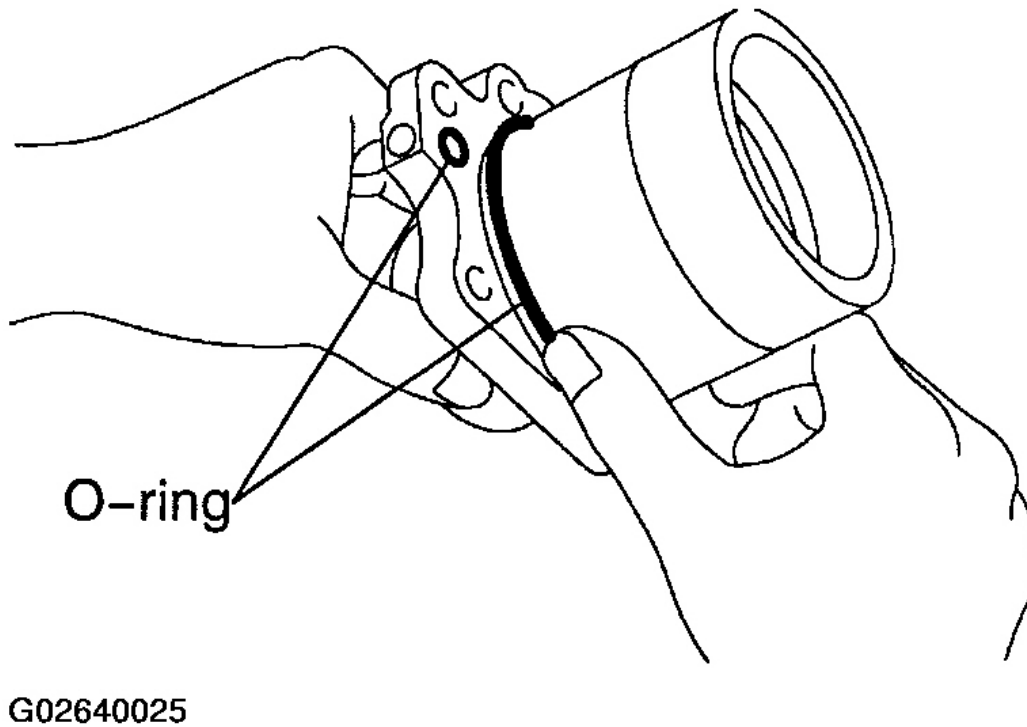


Fig. 244: Installing O-Rings To Bearing Retainer RH
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

15. INSTALL BEARING RETAINER RH

- a. Place the transfer with the installation surface for the retainer upward.

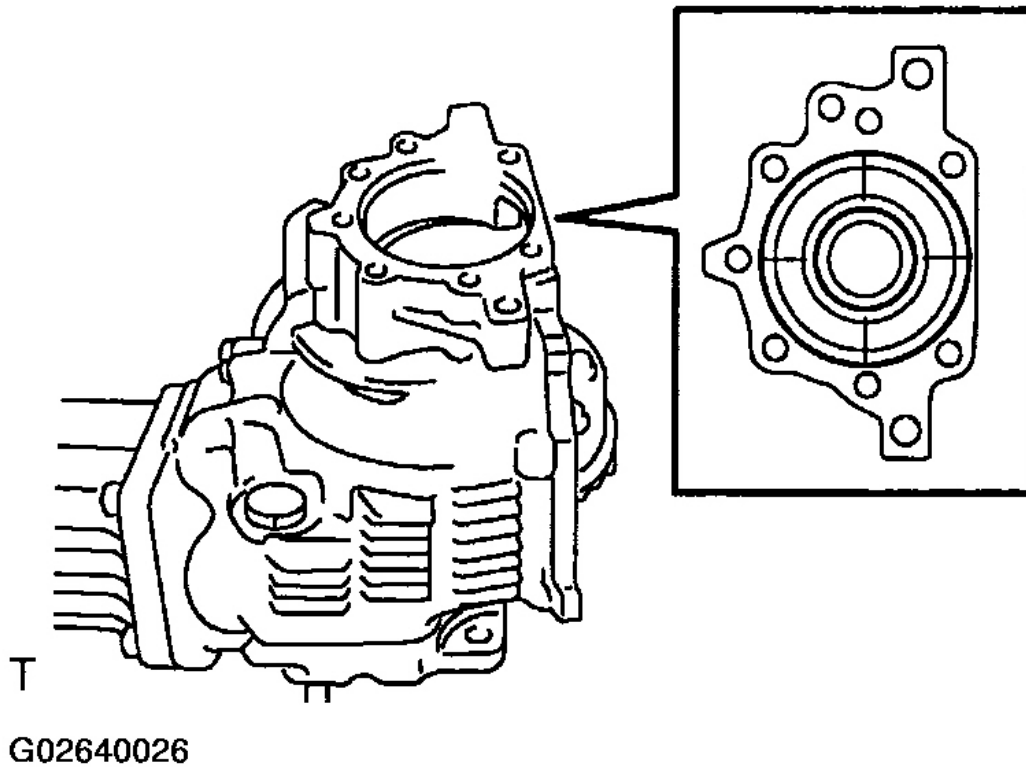


Fig. 245: Placing Transfer With Installation Surface For Retainer Upward
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Do centering of the center differential control coupling assembly and the case.
- c. Insert the SST into the retainer.

SST 09387-00090

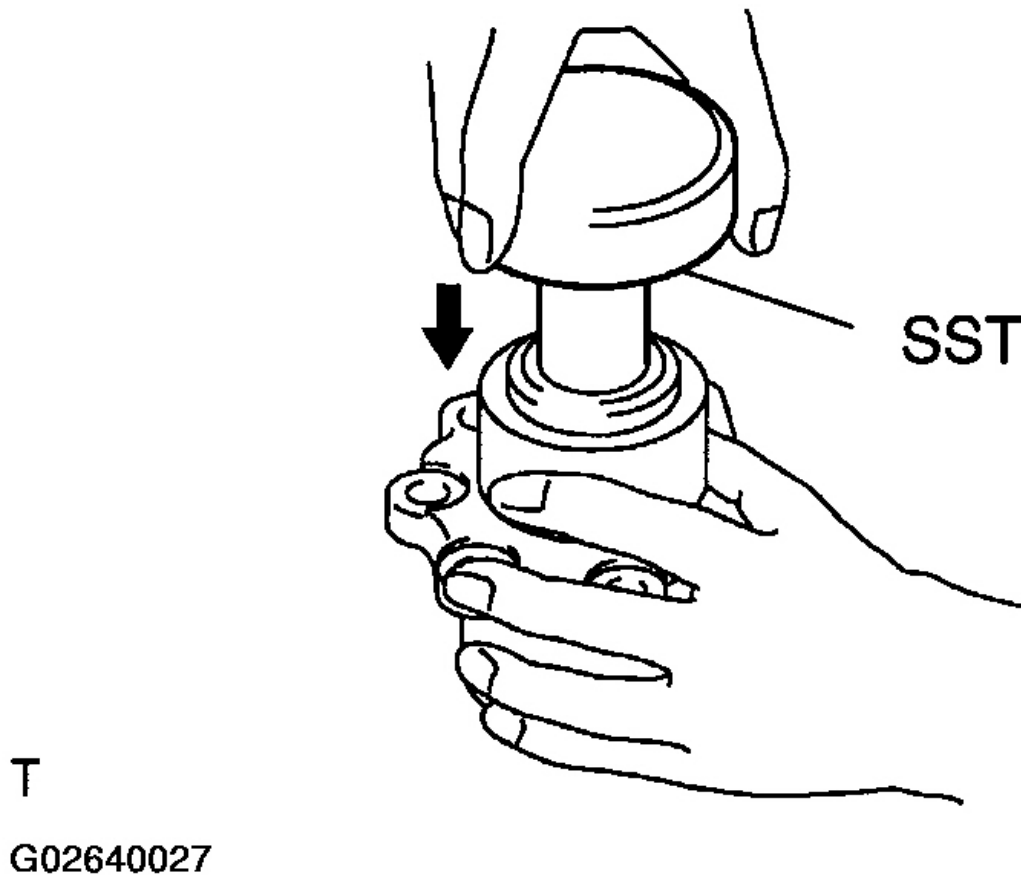


Fig. 246: Inserting SST Into Retainer

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

NOTE: Insert the SST straight down without making its tip interfere with the lip of the oil seal.

- d. Insert the retainer and the SST into the case together as a unit.

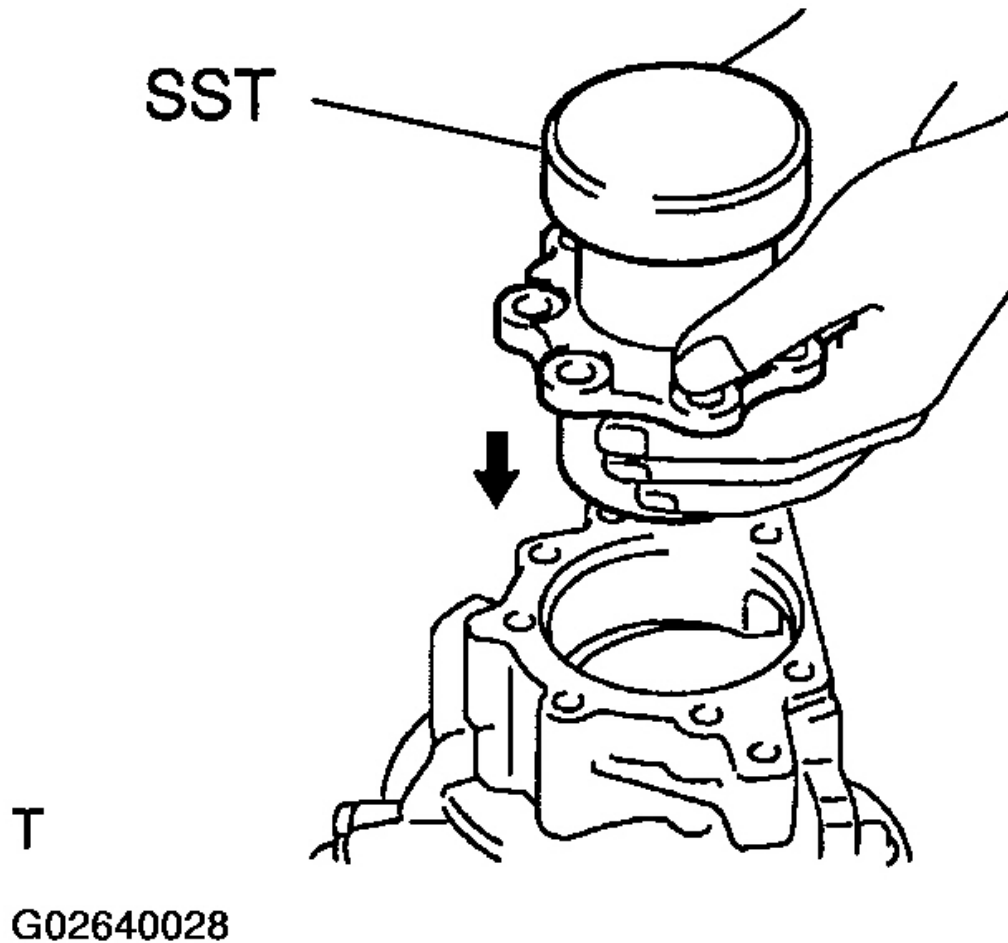
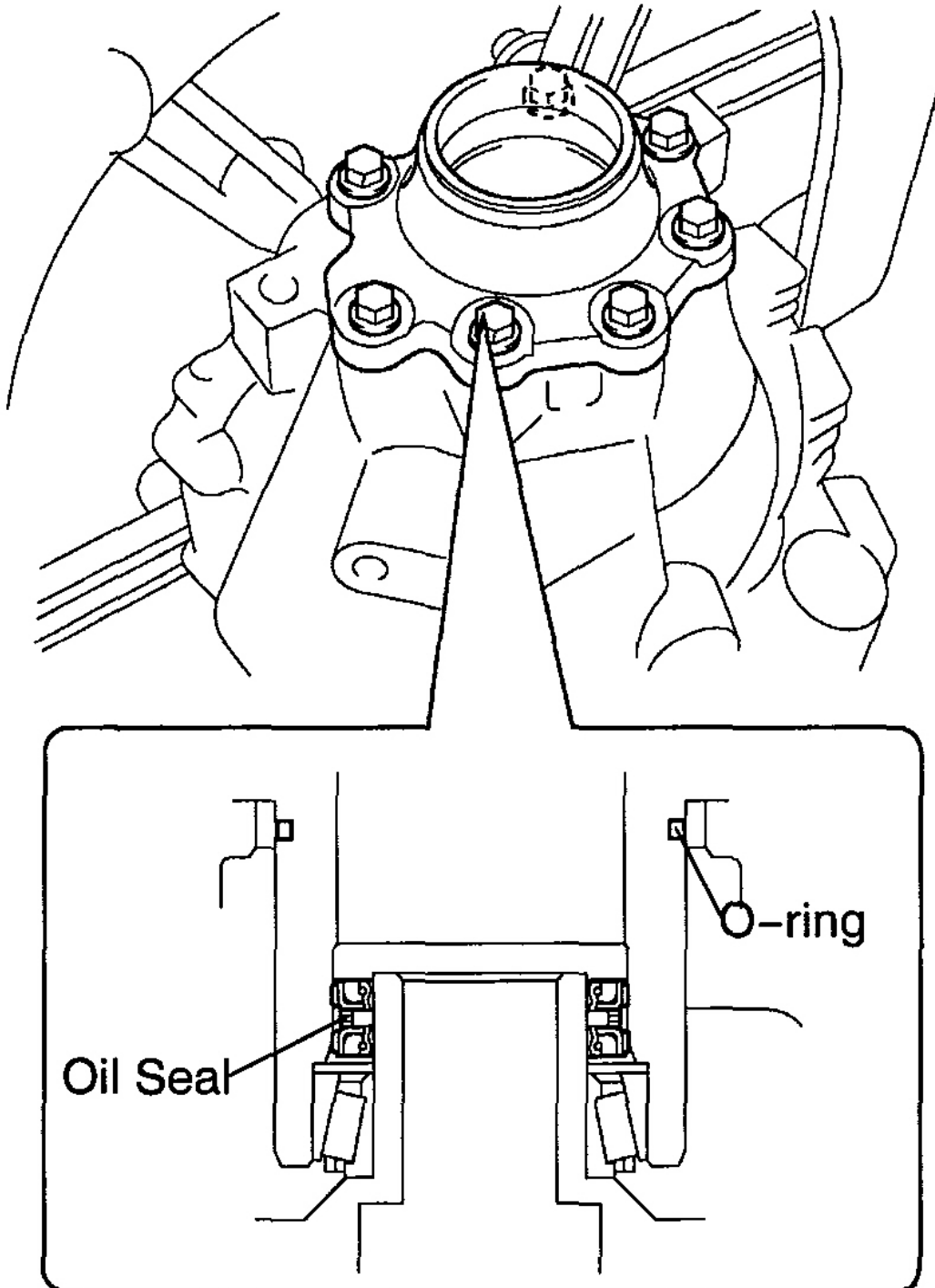


Fig. 247: Inserting Retainer & SST Into Case As Unit
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE:

- Do not strongly make the case and retainer interfered. Neither the SST or the center differential control coupling.
- Pay attention to the scratches and the curving up of the retainer O-ring only after adjusting the backlash, tooth contact and total pre-loading.



G02640029

Fig. 248: Identifying Oil Seal & O-Ring**Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.****HINT:**

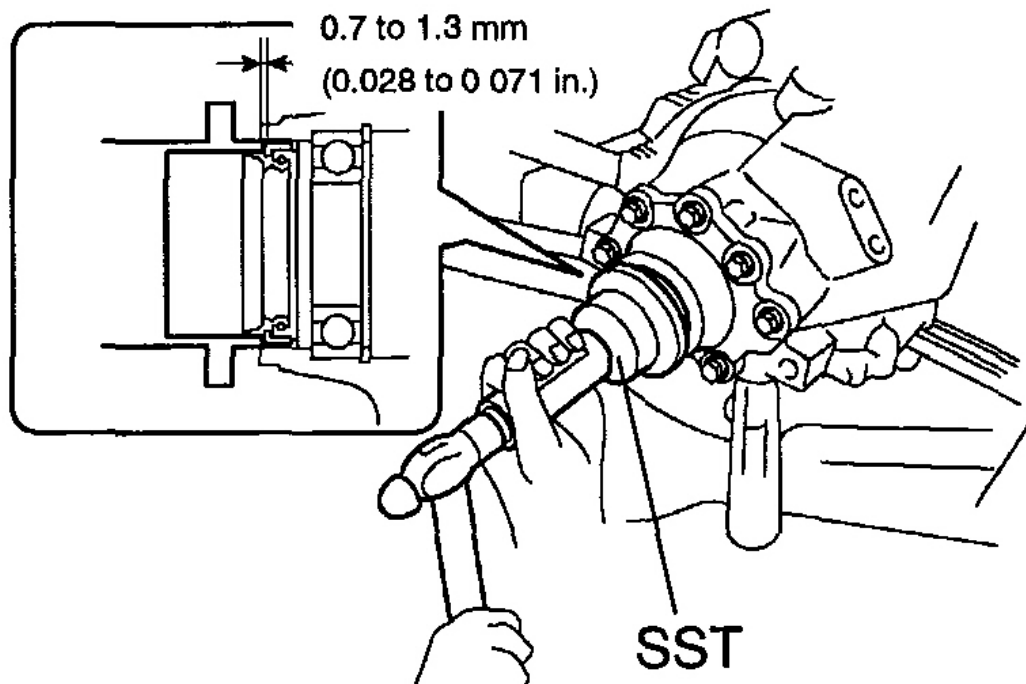
When the retainer cannot be inserted in the case, give a slight blow with a plastic hammer and insert it.

- e. After inserting the retainer in the case, remove the SST.
- f. Install the 7 bolts.

Torque: 28 N.m (286 kgf.cm, 115 ft.lbf)**NOTICE:****16. RECHECK TOTAL PRELOAD (See step 12)****17. INSTALL OIL SEAL**

- a. Coat the oil seal lip with MP grease.
- b. Using SST, install the oil seal to the bearing retainer RH.

SST 09223-46011

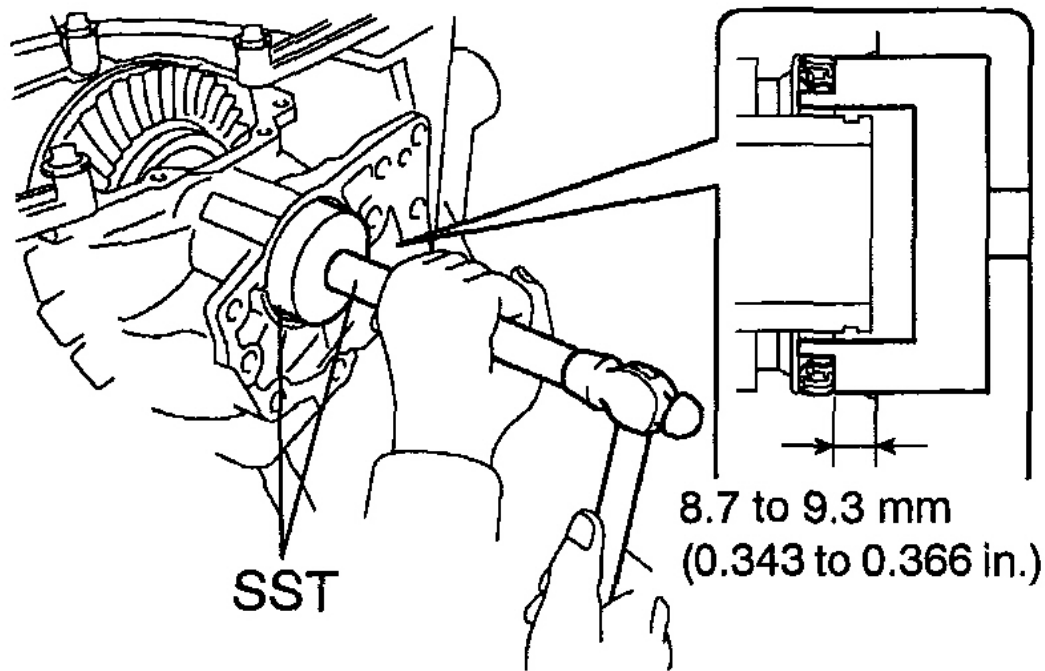


G02640030

Fig. 249: Installing Oil Seal To Bearing Retainer RH
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Coat the oil seal lip with MP grease.
- d. Using SST, install the oil seal to the transfer case.

SST 09387-00010, 09950-70010 (09951-07150)

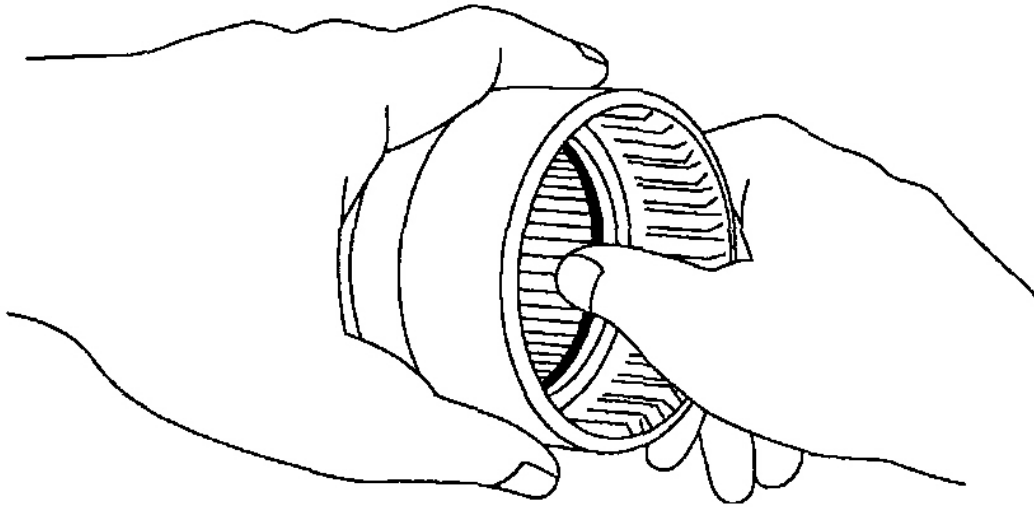


G02640031

Fig. 250: Installing Oil Seal To Transfer Case
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

18. INSTALL CENTER DIFFERENTIAL LOCK SLEEVE

- a. Coat new O-ring with gear oil, install it to the center differential lock sleeve.

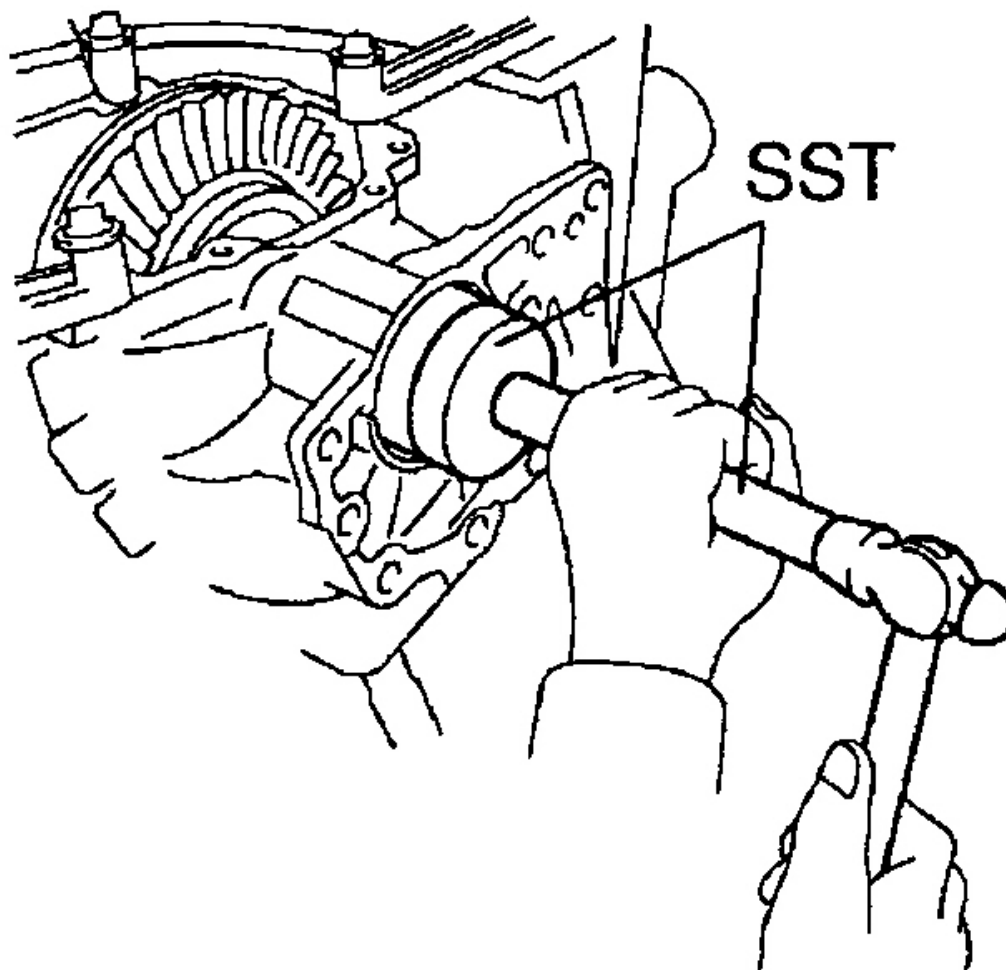


G02640032

Fig. 251: Installing O-Ring To Center Differential Lock Sleeve
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Using SST, install the center differential lock sleeve to the transfer case.

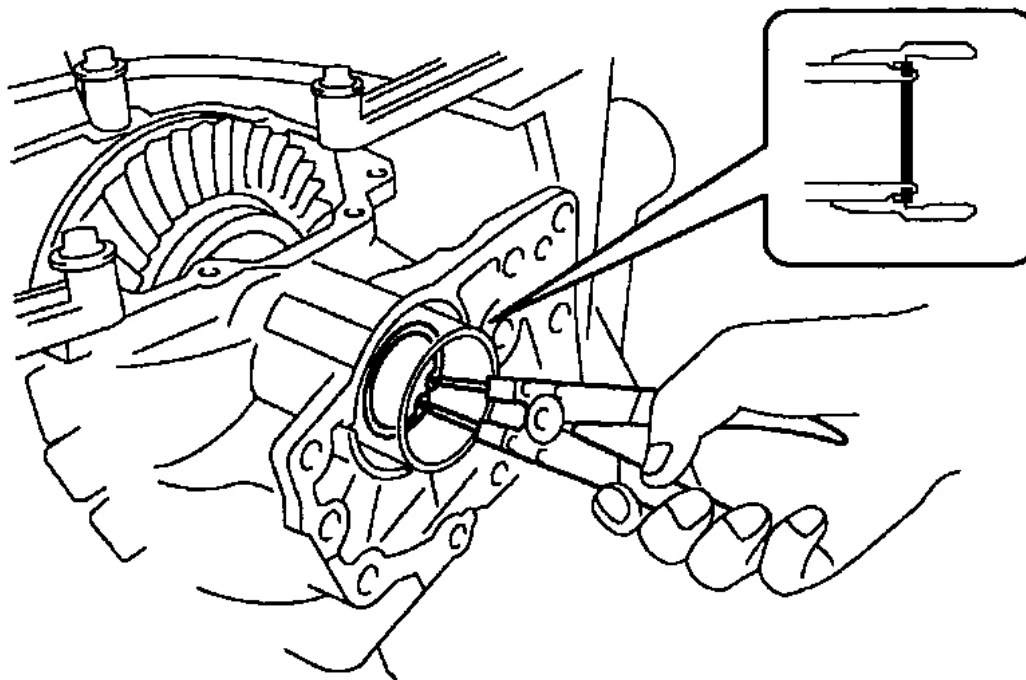
SST 09950-60010 (09951-00600), 09950-70010 (09951-07150)



G02640033

Fig. 252: Installing Center Differential Lock Sleeve To Transfer Case
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using snap ring pliers, install the snap ring.



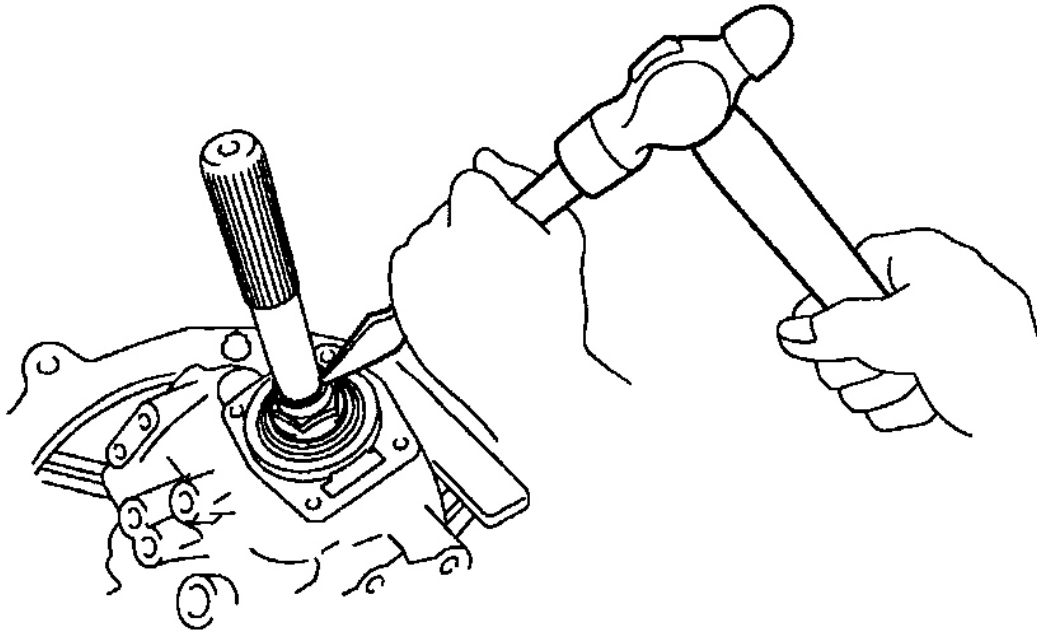
G02640034

Fig. 253: Installing Snap Ring

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

19. STAKE LOCK NUT

Using a chisel and a hammer, stake the lock nut.



G02640035

Fig. 254: Using Chisel And Hammer To Stake Lock Nut
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

20. INSTALL EXTENSION HOUSING

- a. Coat the oil seal lip with MP grease.
- b. Using SST, install the oil seal to the extension housing.

SST 09950-60010 (09951-00380, 09951-00590, 09952-06010) 09950-70010 (09951-07150)

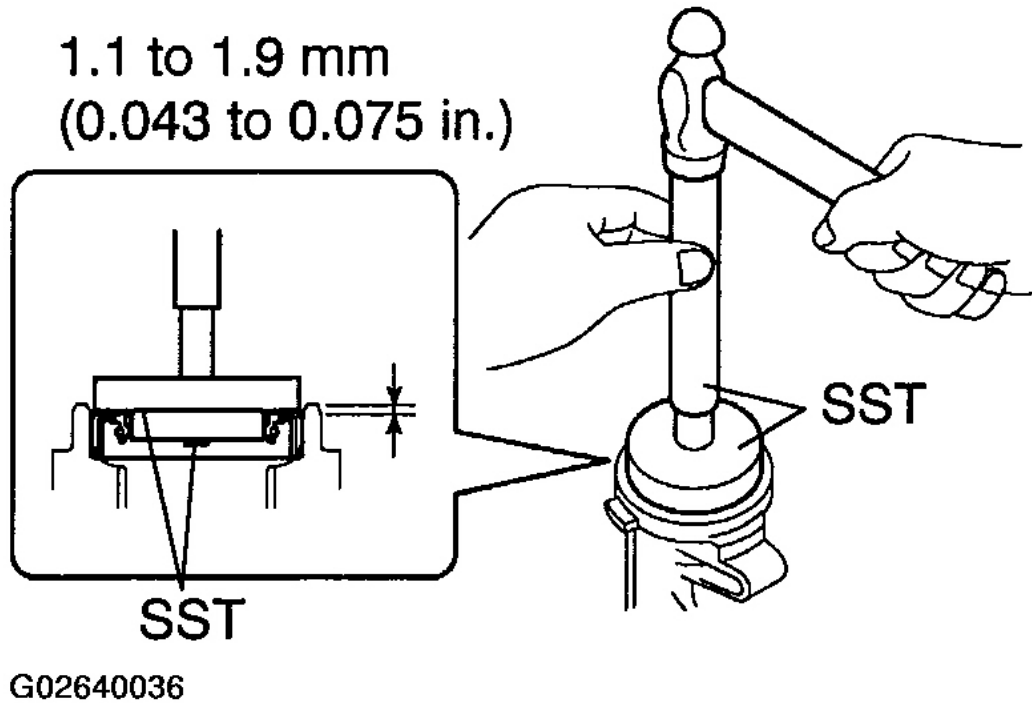
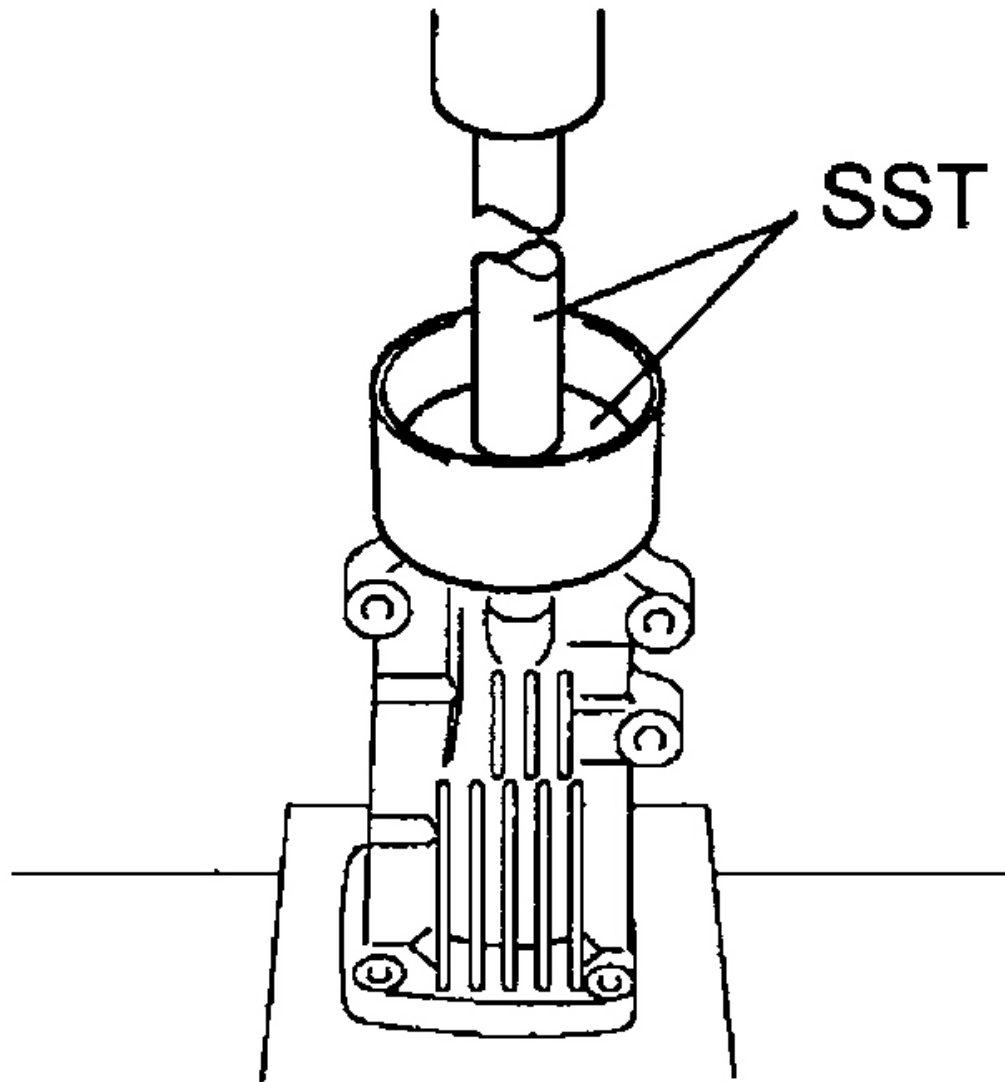


Fig. 255: Installing Oil Seal To Extension Housing
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using SST and a press, install the dust deflector to the extension housing.

SST 09950-60010 (09951-00640), 09950-70010 (09951-07150)



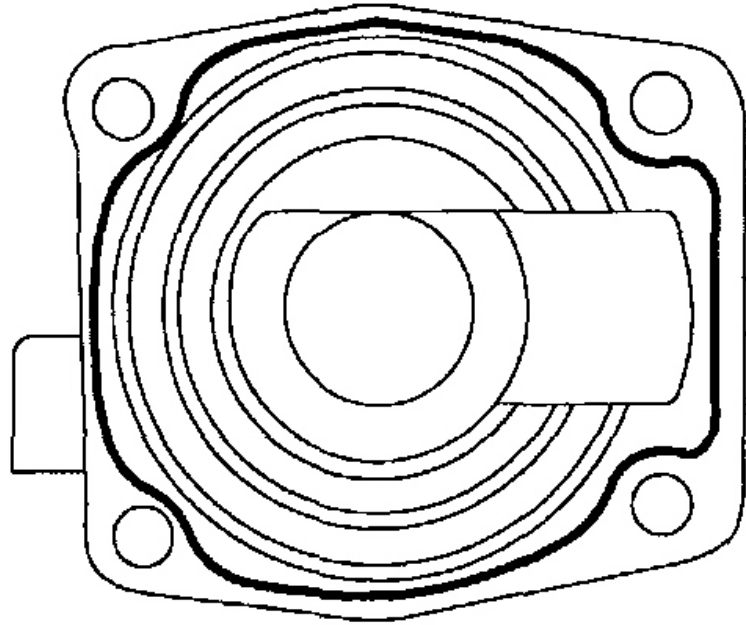
G02640037

Fig. 256: Installing Dust Deflector To Extension Housing
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Remove any FIPG material and be careful not to drop oil on the contacting surfaces of the extension housing and the transfer case.
- e. Apply FIPG to the extension housing.

FIPG:

Part No.08826-00100, THREE BOND 1281 or equivalent



Seal Bend Width 1.2 mm (0.047 in.)

G02640038

Fig. 257: Identifying Seal Bend Width

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

- f. Install the extension housing with 4 bolts.

Torque: 25.5 N.m (260 kgf.cm, 19 ft.lbf)

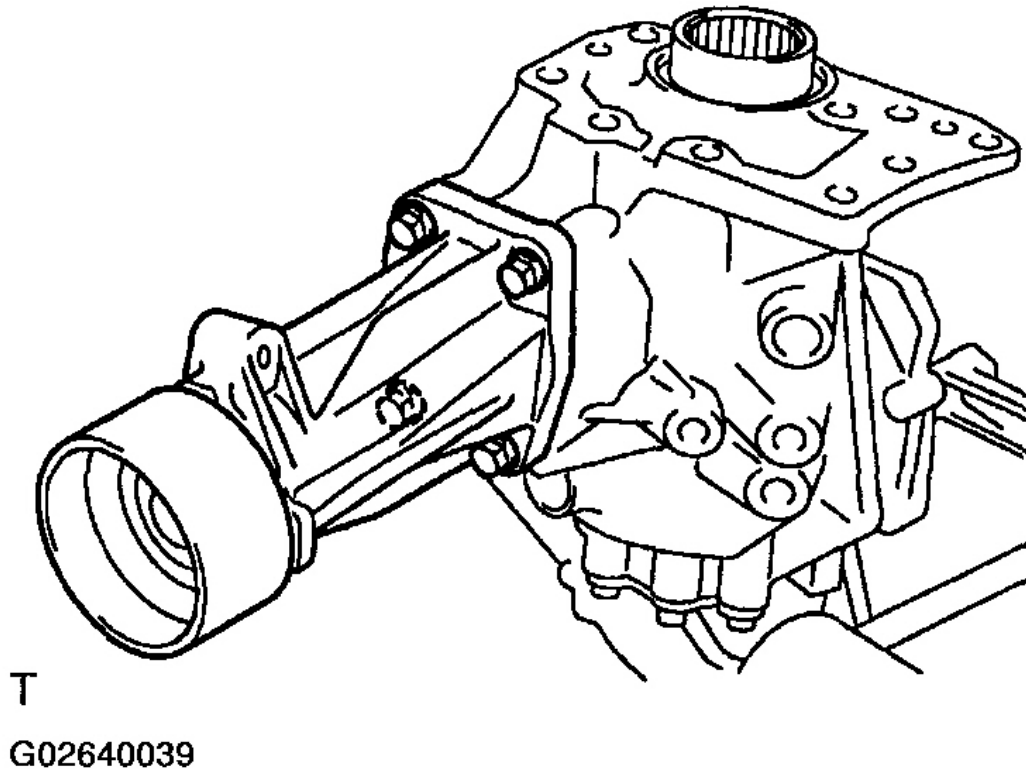
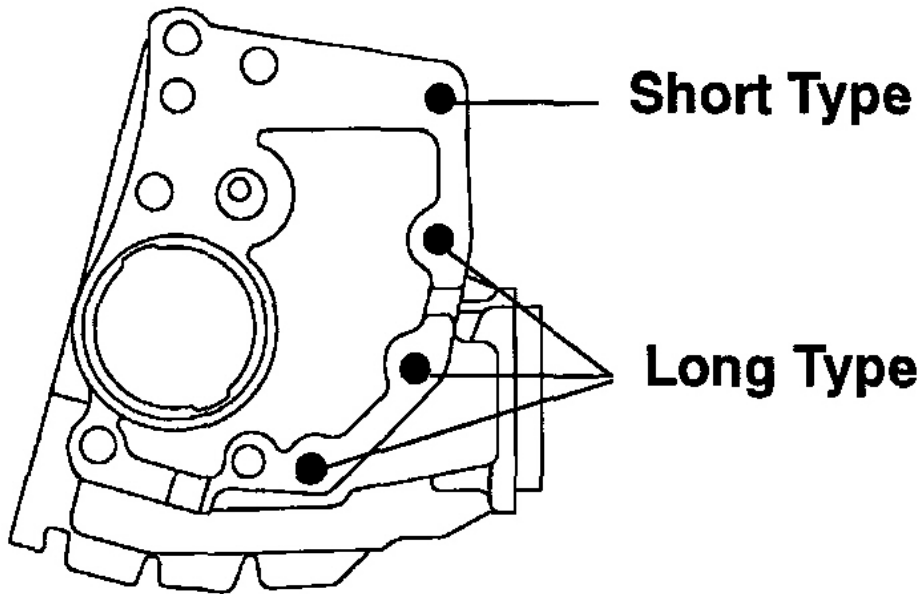


Fig. 258: Installing Bolts & Extension Housing
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

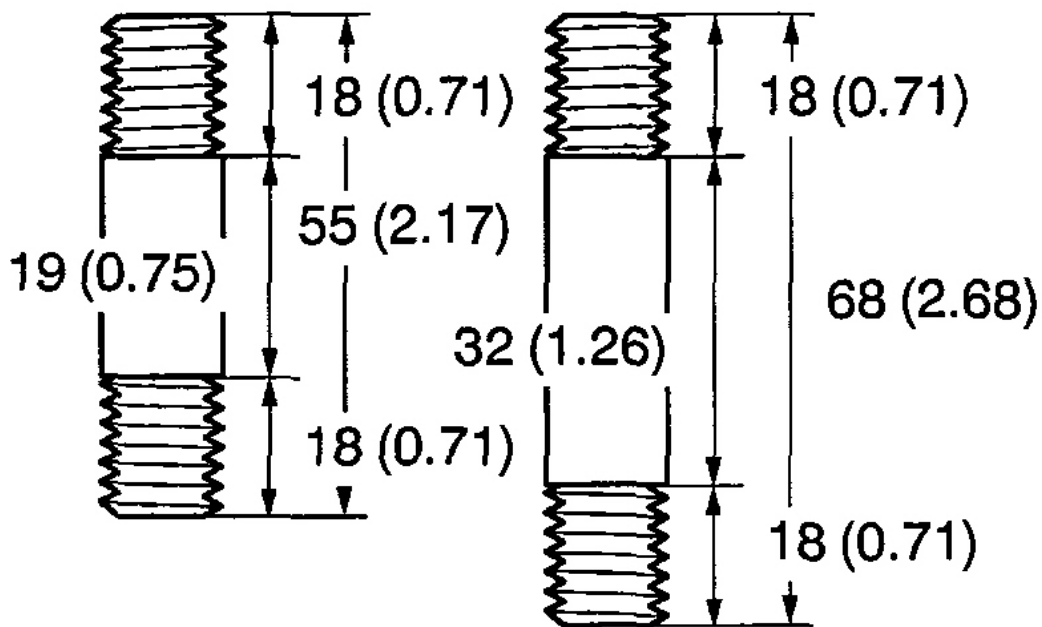
21. INSTALL STUD BOLT

Install the 4 new stud bolts to the transfer case.



Short Type

Long Type



T mm (in.)

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Fig. 259: Installing Stud Bolts To Transfer Case

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

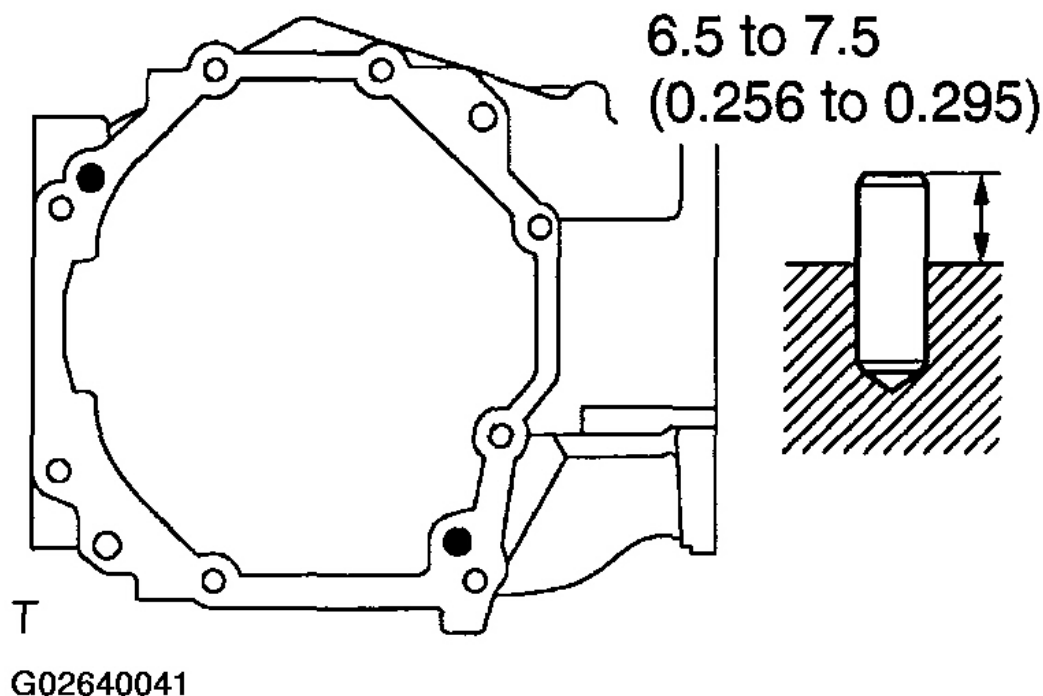
Torque: 39.2 N.m (400 kgf.cm, 29 ft.lbf)

HINT:

- From the bottom side of the stud bolt shown in **Fig. 259** it should be installed to the case.
- Install the stud bolt to the transfer case which has sealer applied on it.

22. INSTALL PIN

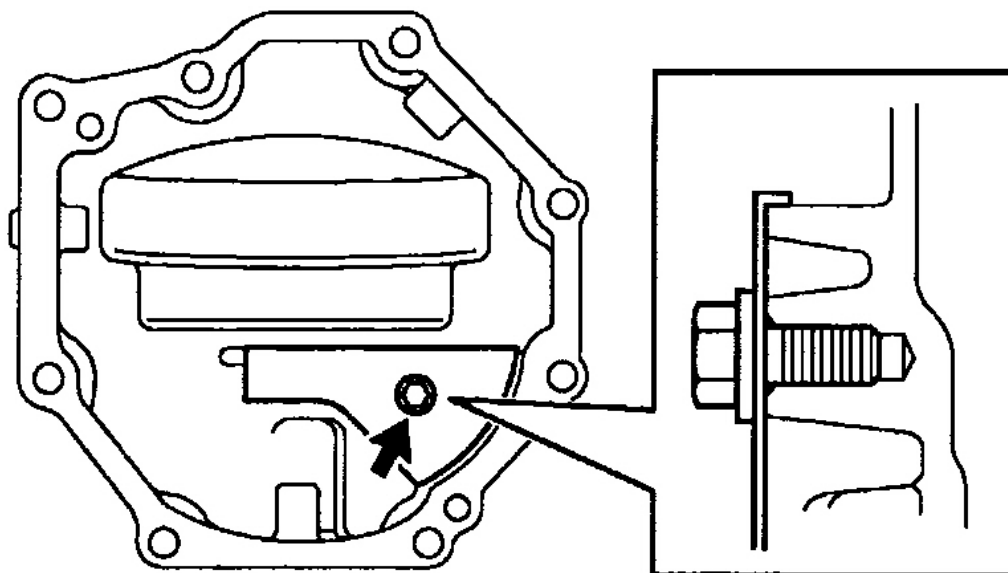
Using a plastic hammer, install the 4 pins.

**Fig. 260: Installing Pins**

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

23. REMOVE TRANSFER FROM OVERHAUL ATTACHMENT**24. INSTALL CASE COVER**

- a. Install the oil deflector with a bolt to the case cover.



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Fig. 261: Installing Bolt & Oil Deflector

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

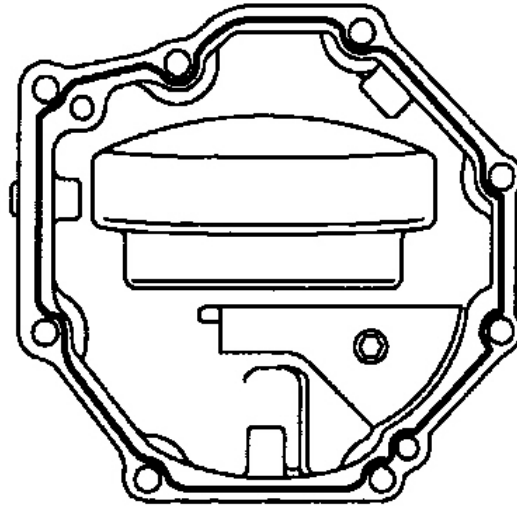
Torque: 6.5 N.m (66 kgf.cm, 58 in.lbf)

NOTE: Pay due attention to the direction of deflector bending.

- b. Remove any FIPG material and be careful not to drop oil on the contacting surfaces of the case cover and the transfer case.
- c. Apply FIPG to the case cover.

FIPG:

Part No.08826-00100, THREE BOND 1281 or equivalent



Seal Bend Width 1.2 mm (0.047 in.)

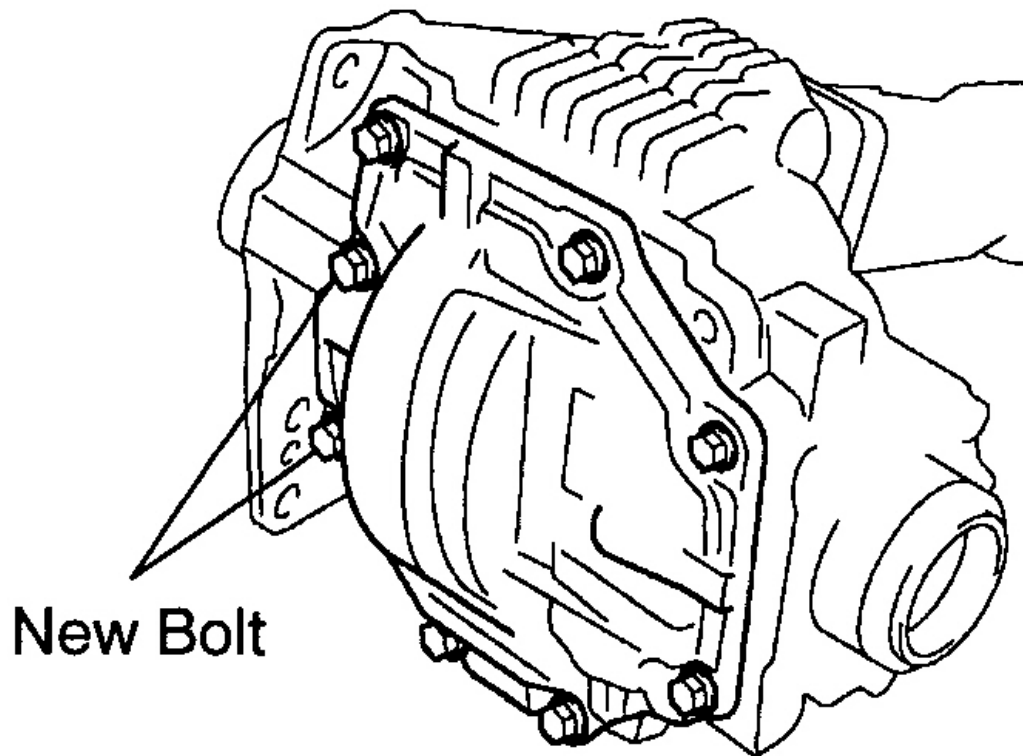
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Fig. 262: Identifying Seal Bend Width

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

- d. Install the No. 1 case cover with 2 new seal bolts and 6 bolts.



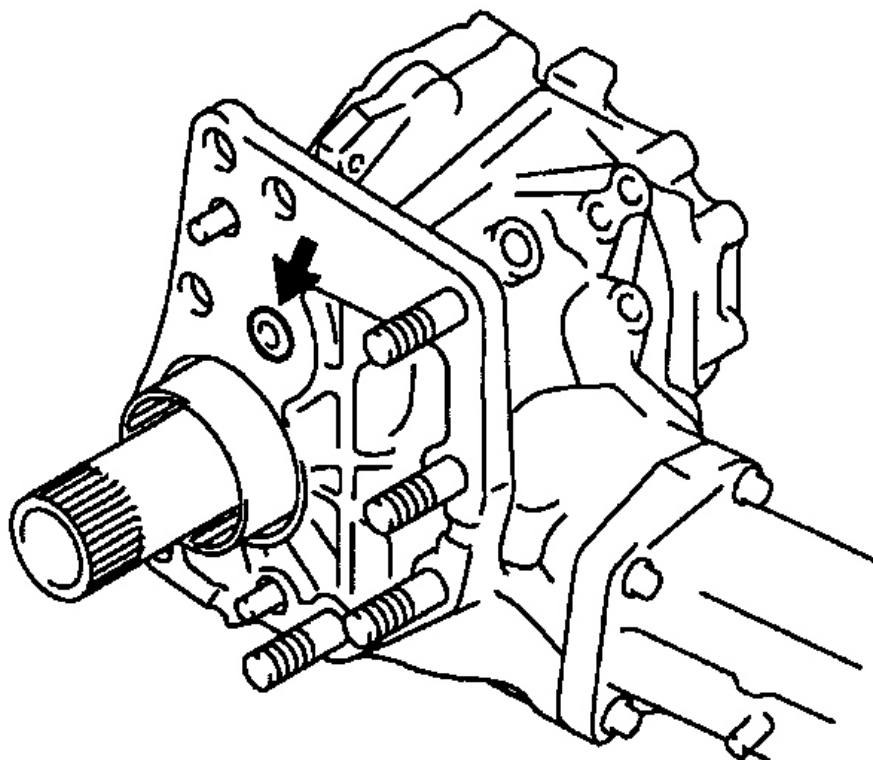
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Fig. 263: Installing No. 1 Case Cover With Seal Bolts & Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Torque: 19.6 N.m (200 kgf.cm, 14 ft.lbf)

25. **INSTALL INTERMEDIATE SHAFT**
26. **INSTALL GASKET**

Coat new gasket with ATF, install it to the transfer case.



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Fig. 264: Installing Gasket To Transfer Case
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.