

2004 DRIVELINE/AXLES

Rear Differential Carrier (4WD) - RAV4

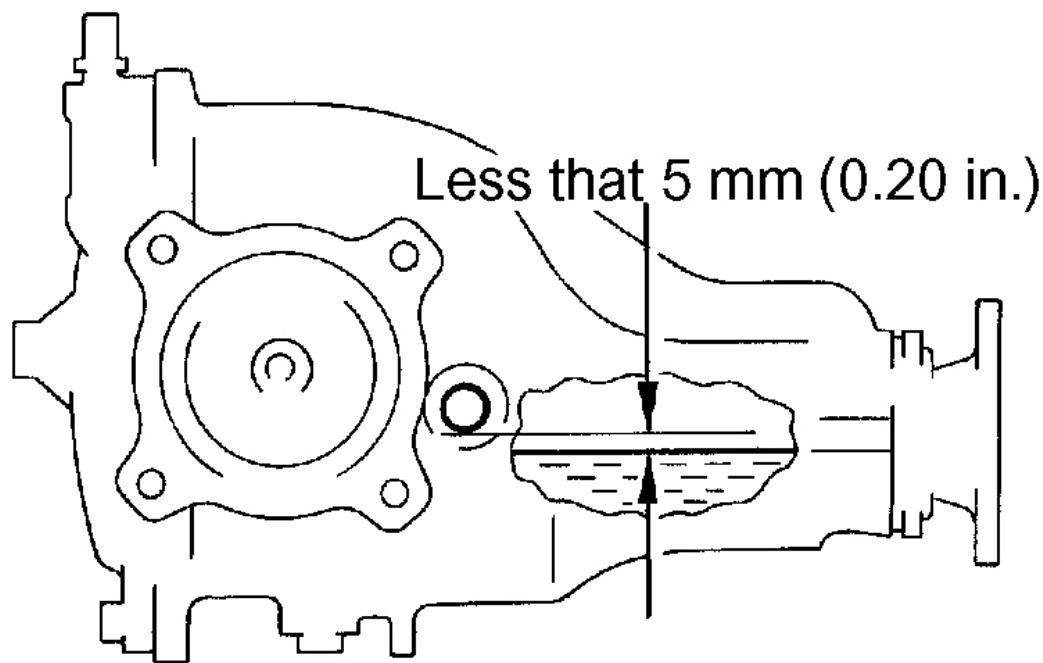
ON-VEHICLE REPAIR

REPLACE REAR DIFFERENTIAL OIL

- a. Remove the filler plug and gasket.
- b. Remove the drain plug and gasket, and drain the oil.
- c. Reinstall the drain plug with a new gasket.

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

- d. Fill new differential oil as shown in **Fig. 1** .



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Fig. 1: Identifying Differential Oil Level
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Capacity: 0.9 liter (1.0 US qts, 0.8 Imp. qts)

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Oil grade: Hypoid gear oil API GL-5

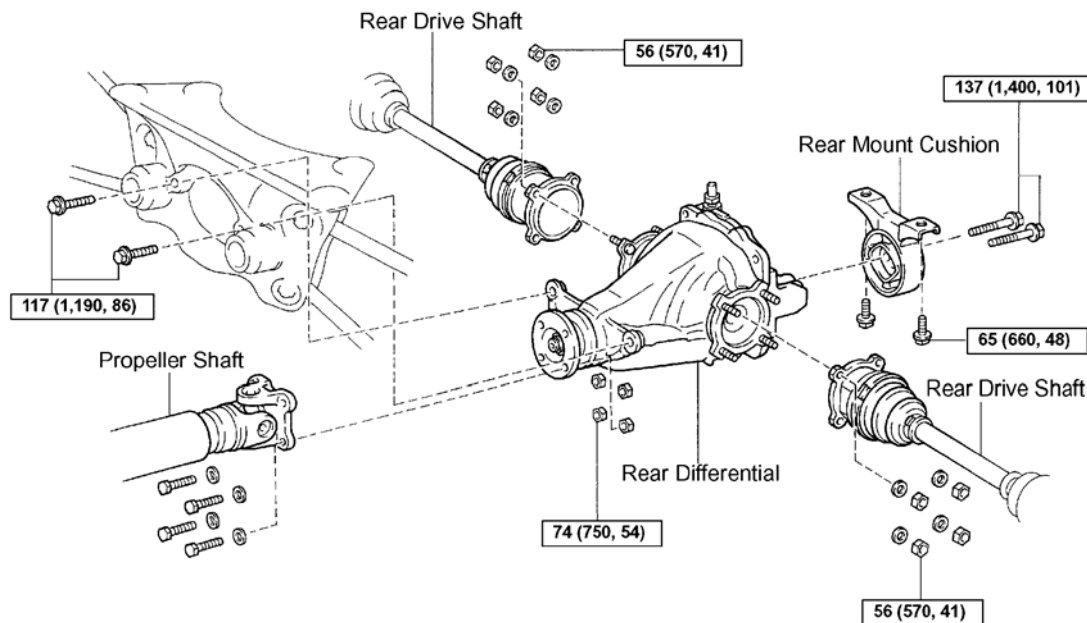
Recommended oil viscosity:

OIL VISCOSITY IDENTIFICATION

Above -18°C (0°F)	SAE 90
Below -18°C (0°F)	SAE 80W or 80W-90

- e. Reinstall the filler plug with a new gasket.

COMPONENTS



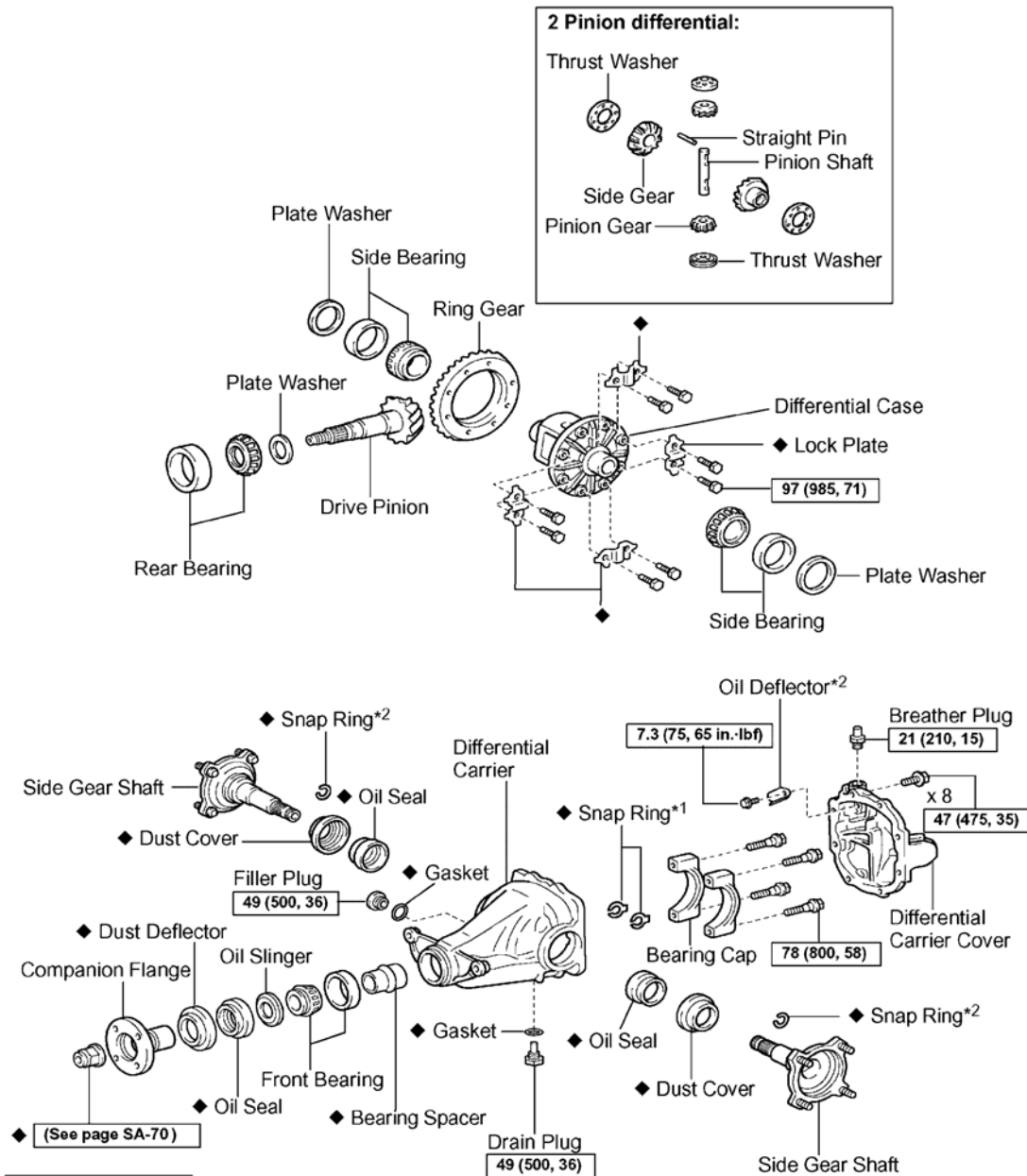
N·m (kgf·cm, ft·lbf) : Specified torque

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Fig. 2: Identifying Rear Differential Carrier Assembly (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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

◆ Non-reusable part

γ*1: 2 pinion differential *2: Torque sensing LSD

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Fig. 3: Identifying Rear Differential Carrier Assembly (2 Of 2)

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

REMOVAL

1. REMOVE DRIVE SHAFTS (See REMOVAL)

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HINT:

Support the drive shafts securely.

2. REMOVE PROPELLER SHAFT (See COMPONENTS)

HINT:

Support the propeller shaft securely.

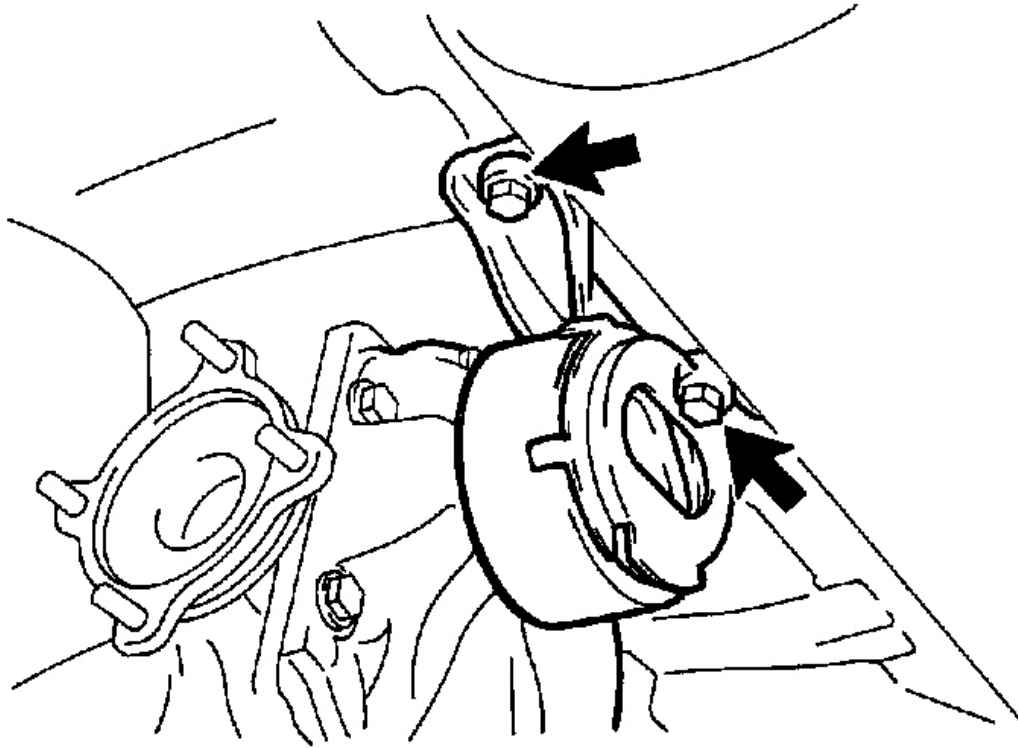
3. DRAIN DIFFERENTIAL OIL

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

4. REMOVE DIFFERENTIAL

- a. Support the differential with a jack.
- b. Remove the 2 rear mounting bolts.

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



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Fig. 4: Removing Rear Mounting Bolts

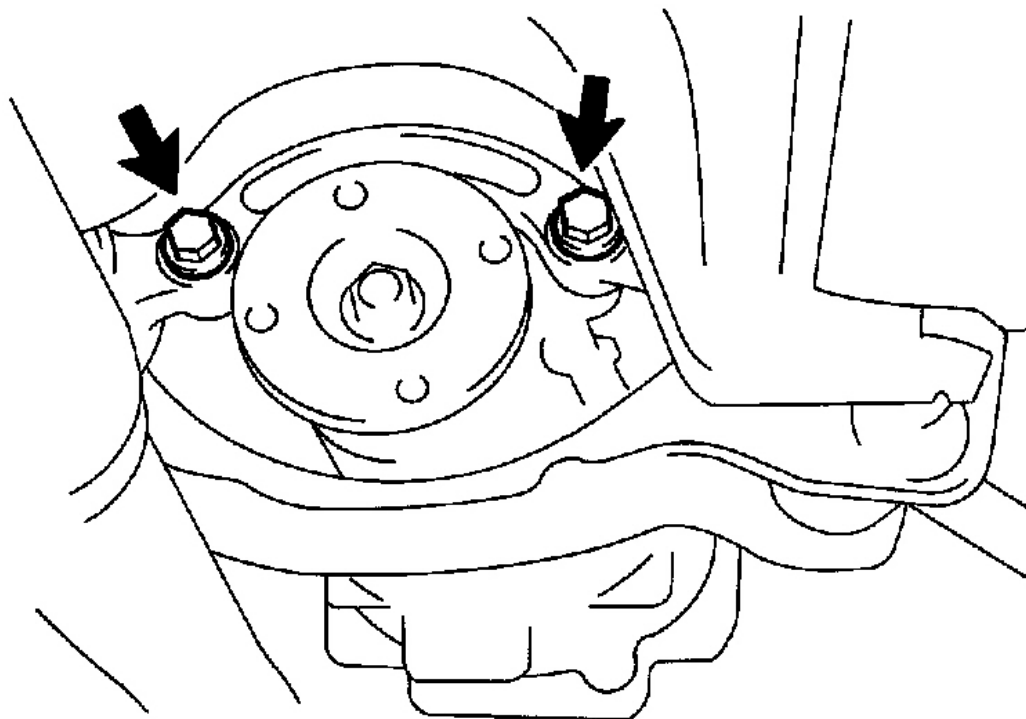
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the 2 front mounting bolts and differential.

Torque: 117 N.m (1,190 kgf.cm, 86 ft.lbf)

- d. Remove the 2 bolts and differential rear mount cushion from the differential.

Torque: 137 N.m (1,400 kgf.cm, 101 ft.lbf)



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Fig. 5: Removing Differential Rear Mount Cushion & Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

DISASSEMBLY

1. REMOVE DIFFERENTIAL CARRIER COVER

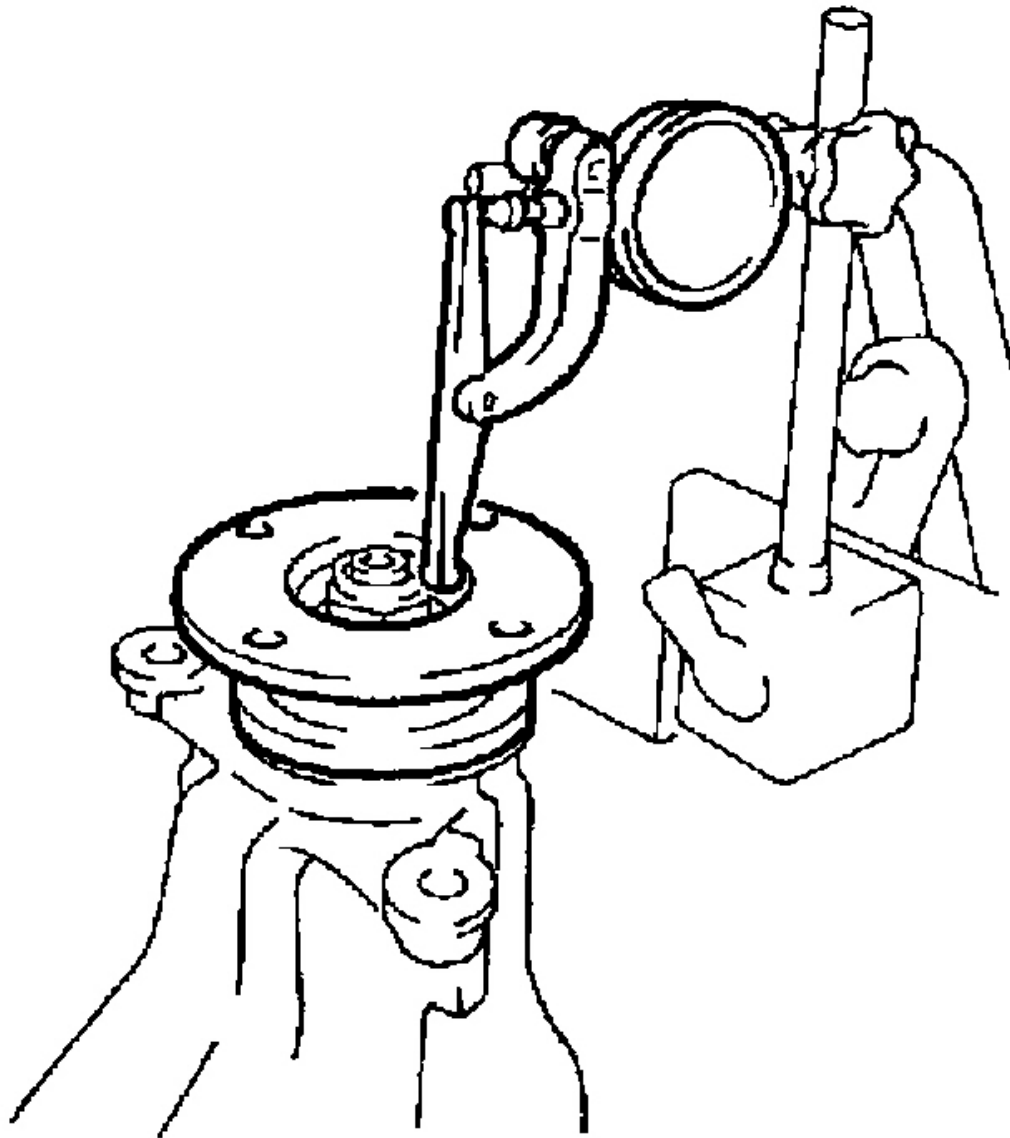
- Remove the 8 bolts from the carrier cover.
- Using a brass bar and a hammer, separate the cover from the carrier.
- Remove the breather plug from the differential carrier cover.
- Torque sensing LSD:

Remove the bolt and oil deflector from the differential.

2. CHECK RUNOUT OF COMPANION FLANGE

- Using a dial indicator, measure the runout of the companion flange vertically.

Maximum runout: 0.10 mm (0.0039 in.)

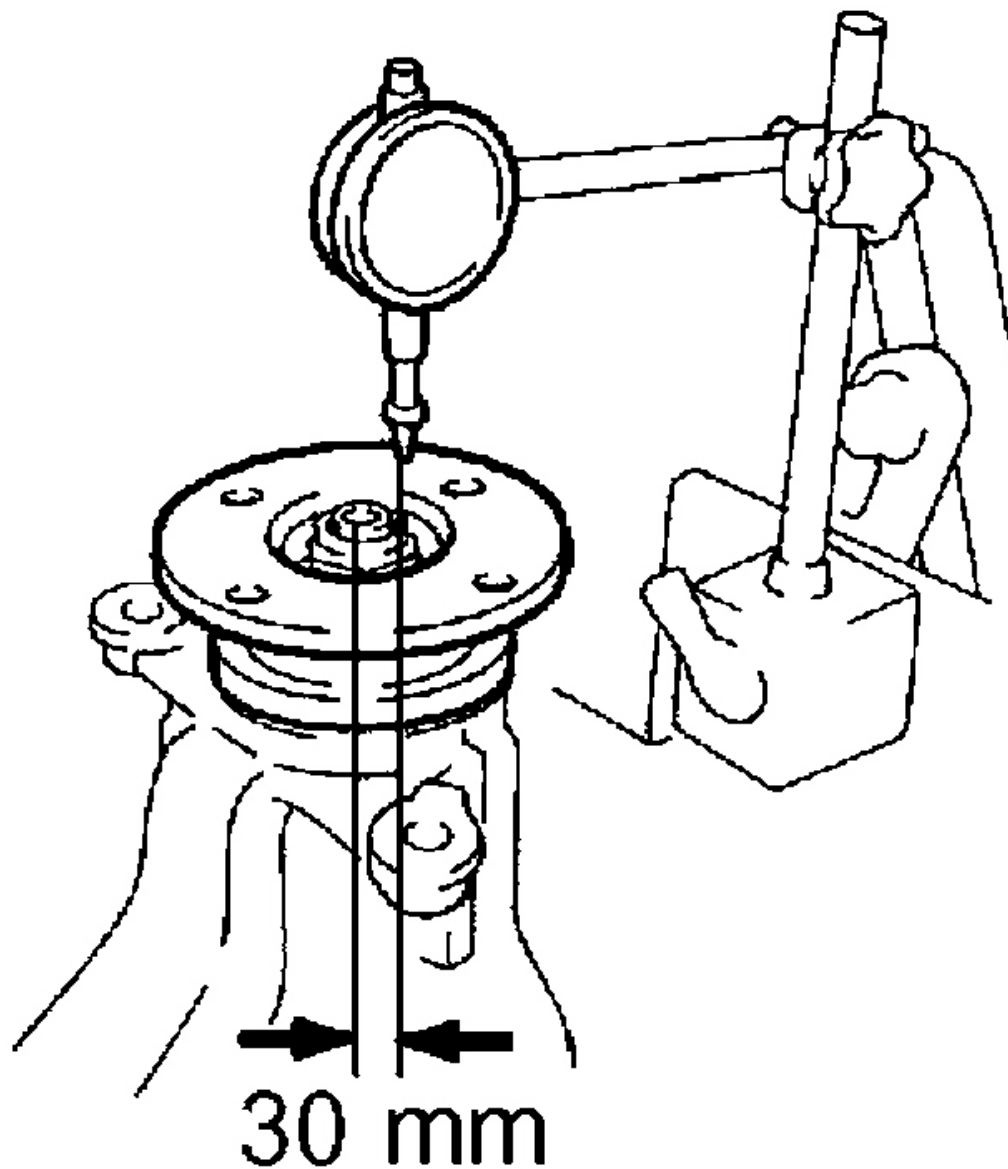


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Fig. 6: Measuring Runout Of Companion Flange Vertically
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Place a dial indicator on the place 30 mm (1.181 in.) apart from the center of the companion flange.
- c. Measure the runout of the companion flange horizontally.

Maximum runout: 0.10 mm (0.0039 in.)



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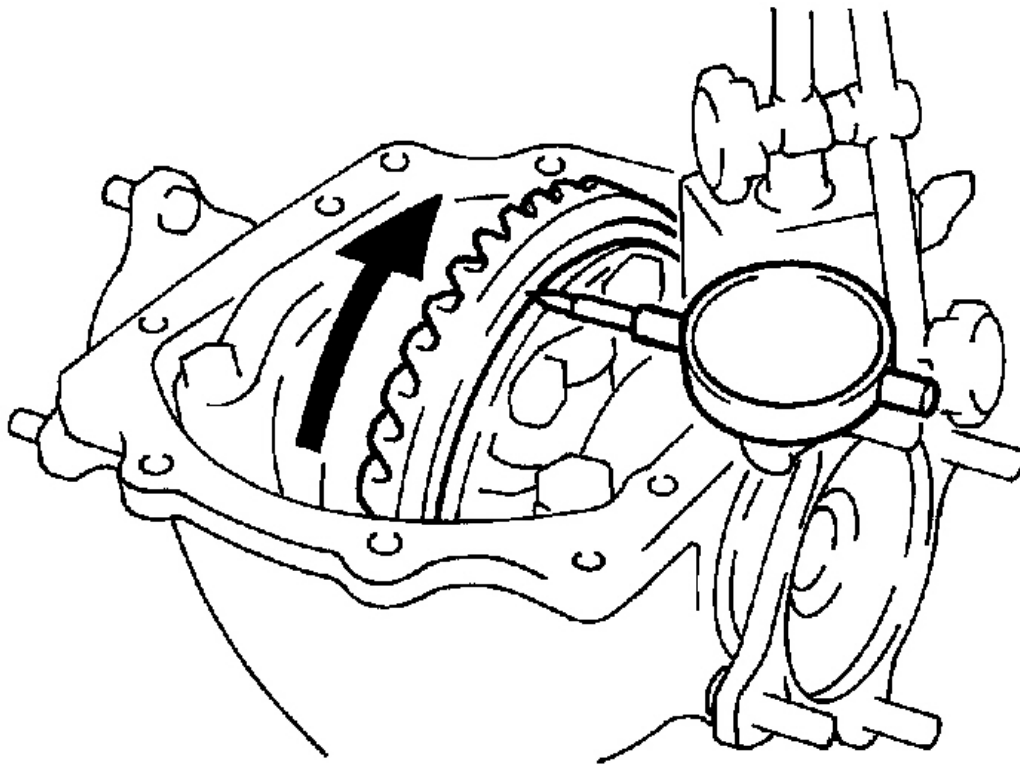
Fig. 7: Measuring Runout Of Companion Flange Horizontally
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- a. Check the runout.

Using a dial indicator, check the runout of the ring gear.

Maximum runout: 0.07 mm (0.0028 in.)

If the runout is greater than the maximum value, replace it with a new ring gear.



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Fig. 8: Measuring Runout Of Ring Gear

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

- b. Check the backlash.

Using a dial indicator, check the backlash of the ring gear.

Backlash: 0.13 - 0.18 mm (0.0051 - 0.0071 in.)

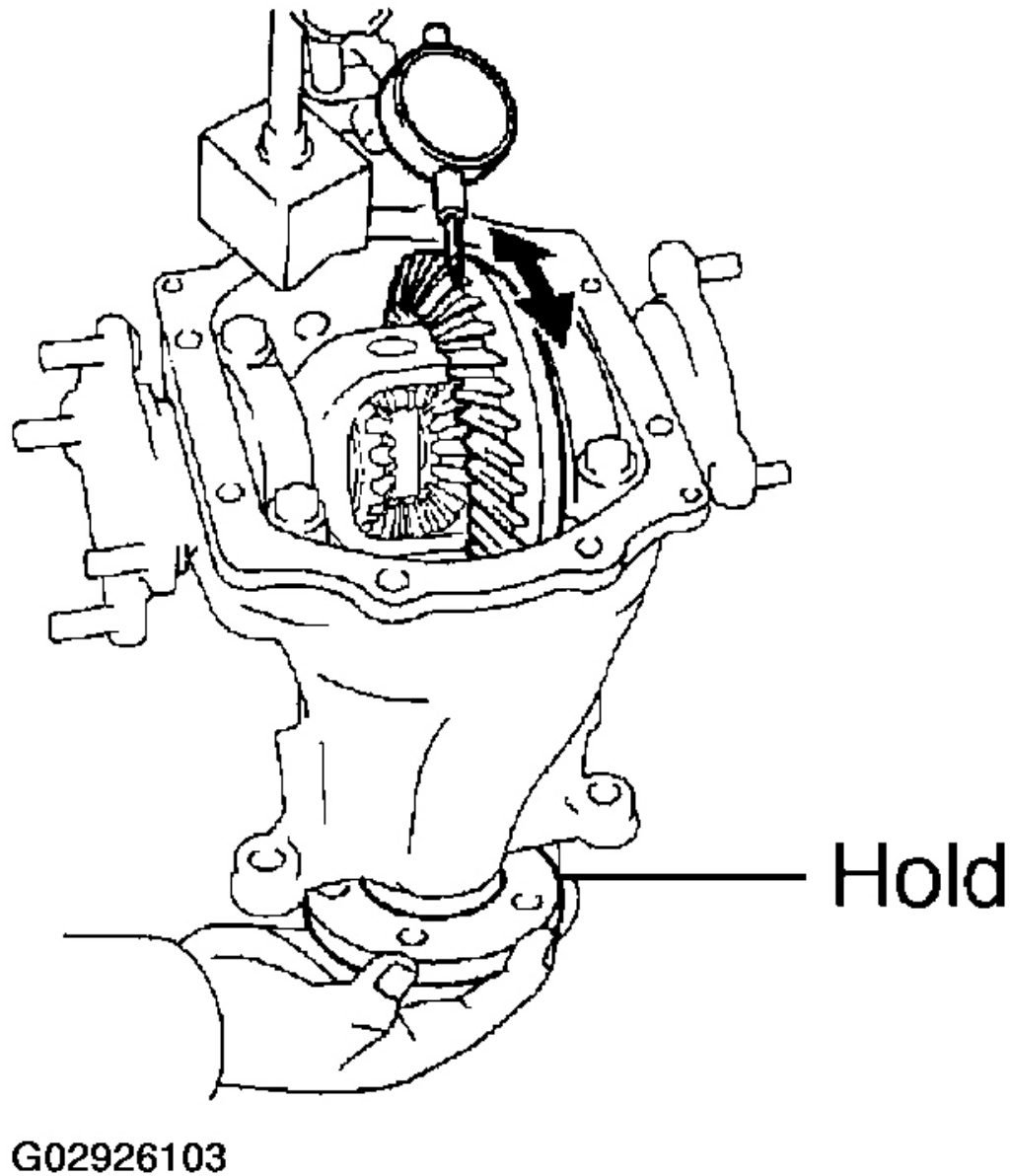


Fig. 9: Checking Backlash Of Ring Gear
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

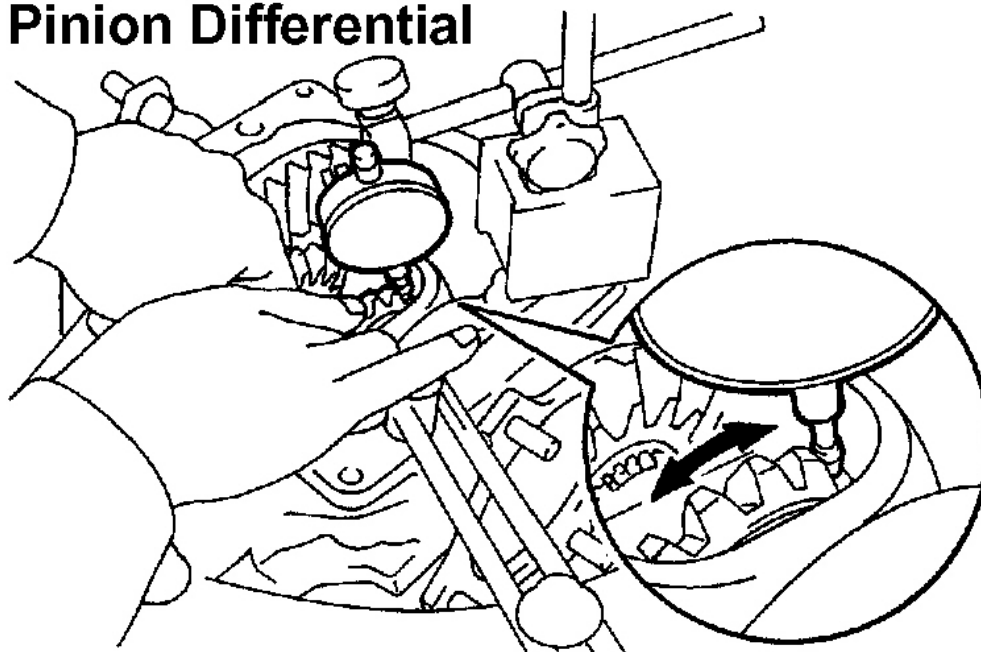
If the backlash is not within the specification, adjust the side bearing preload or repair as necessary.

4. **CHECK TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION (See REASSEMBLY)**

5. 2 pinion differential: CHECK BACKLASH OF SIDE GEAR

Using a dial indicator, check the backlash of the side gear with holding 1 pinion gear toward the differential case.

Backlash: 0.05 - 0.20 mm (0.0020 - 0.0079 in.)

2 Pinion Differential

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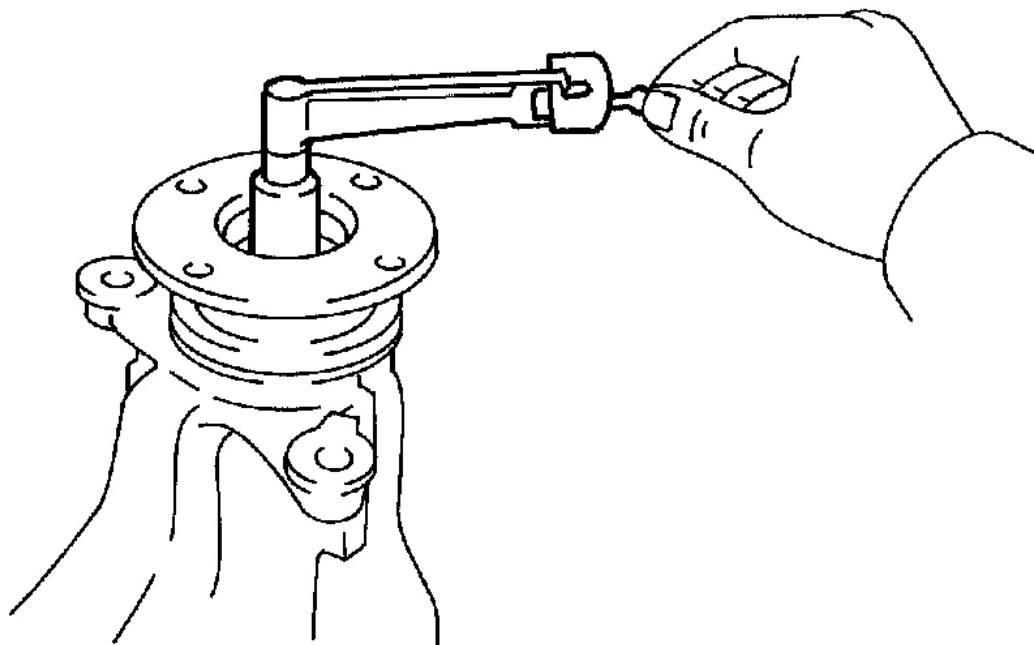
Fig. 10: Checking Backlash Of Side Gear

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

If the backlash is not within the specification, install the 2 side gear thrust washers of different thickness (See **REASSEMBLY**).

6. MEASURE DRIVE PINION PRELOAD

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



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Fig. 11: Measuring Drive Pinion Preload

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

Preload (at starting):

0.6 - 0.9 N.m (6 - 9 kgf.cm, 5.3 - 8.0 in.lbf)

7. CHECK TOTAL PRELOAD

Using a torque wrench, measure the preload.

Total preload (at starting):

Drive pinion preload plus

0.3 - 0.5 N.m (3 - 5 kgf.cm, 2.6 - 4.3 in.lbf)

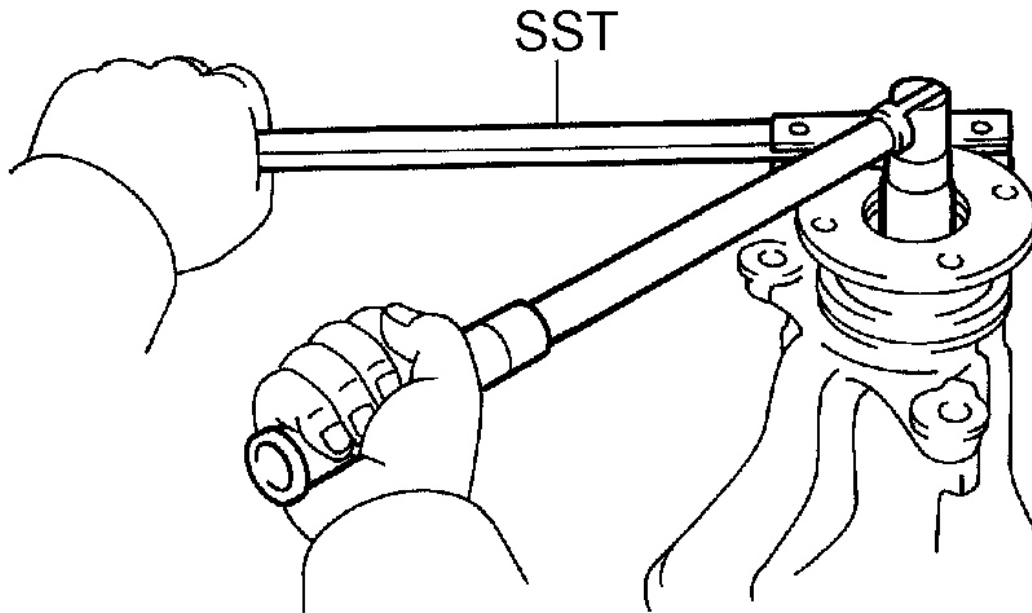
If necessary, disassemble and inspect the differential.

8. REMOVE COMPANION FLANGE

- a. Using a chisel and a hammer, unstake the staked part of the nut.

- b. Using SST to hold the flange, remove the nut.

SST 09330-00021



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Fig. 12: Removing Companion Flange Nut
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Using SST, remove the companion flange.

SST 09950-30012 (09951-03010, 09953-03010, 09954-03010, 09955-03040, 09956-03020)

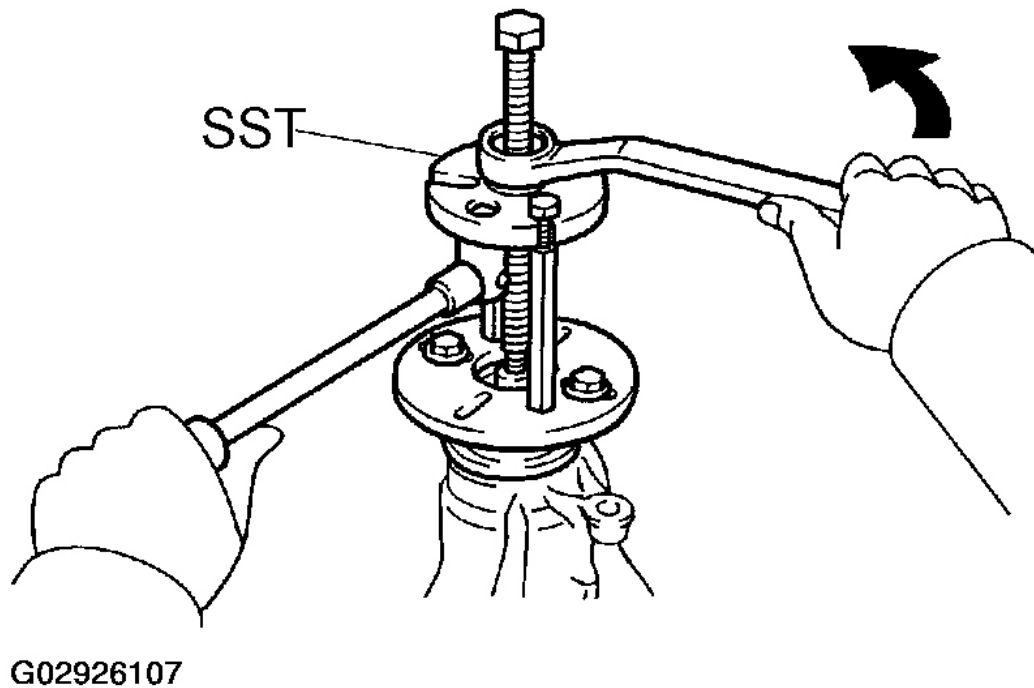


Fig. 13: Removing Companion Flange

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

9. REMOVE FRONT OIL SEAL AND OIL SLINGER

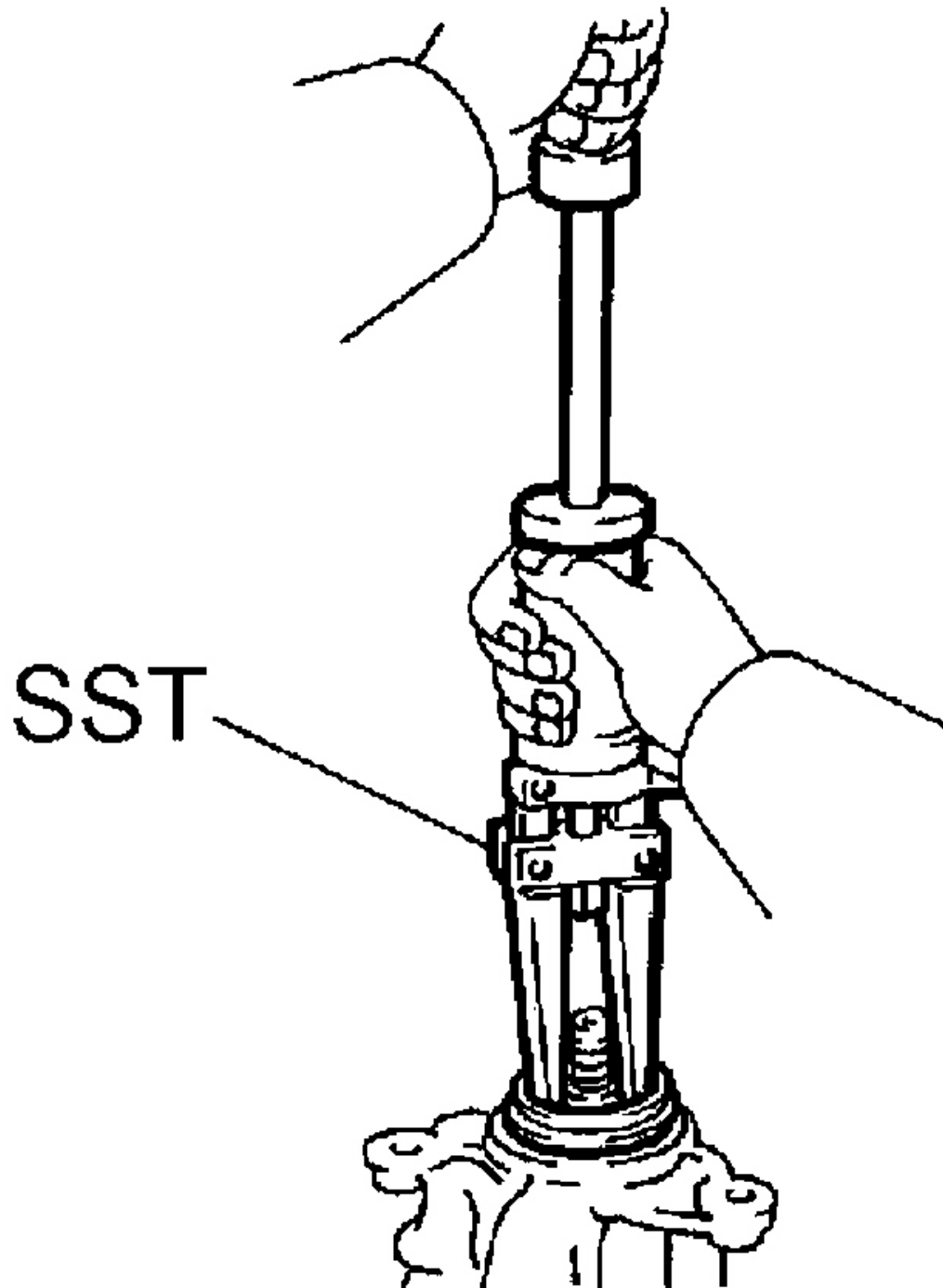
- a. Using SST, remove the oil seal from the differential carrier.

SST 09308-10010

- b. Remove the oil slinger.

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Fig. 14: Removing Oil Seal & Slinger

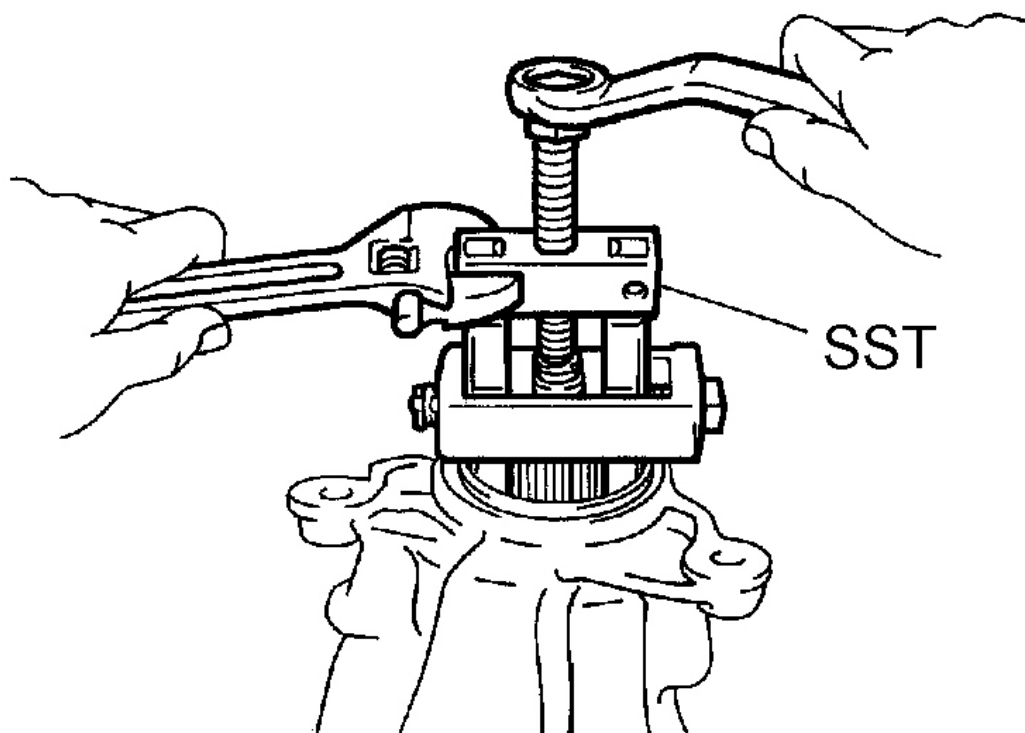
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

10. REMOVE FRONT BEARING AND BEARING SPACER

- a. Using SST, remove the front bearing from the drive pinion.

SST 09556-22010

- b. Remove the bearing spacer.



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Fig. 15: Removing Front Bearing & Bearing Spacer

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

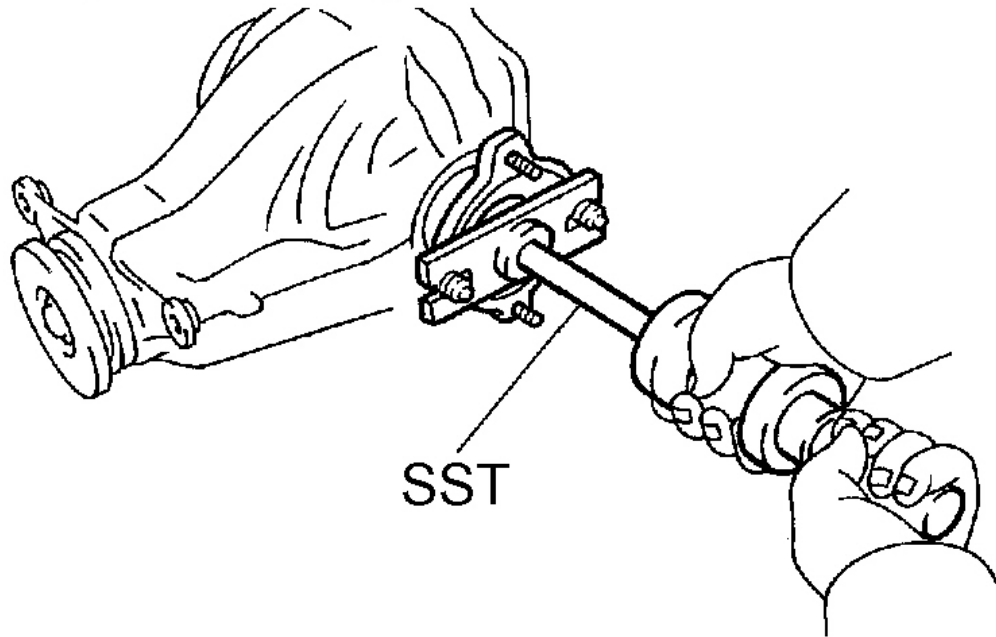
11. Torque sensing LSD: REMOVE SIDE GEAR SHAFTS

- a. Using SST, remove the 2 side gear shafts from the differential carrier.

SST 09520-24010 (09520-04010, 09520-32040)

- b. Using a screwdriver, remove the 2 snap rings from the 2 side gear shafts.

Torque Sensing LSD



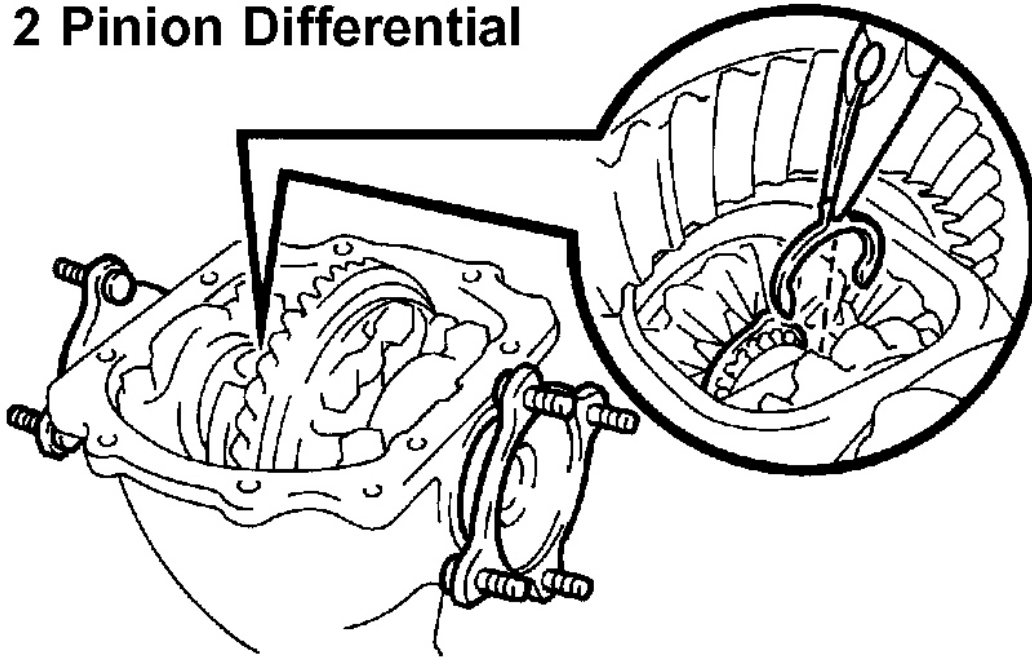
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Fig. 16: Removing Side Gear Shaft (Torque Sensing LSD)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

12. 2 pinion differential: REMOVE SIDE GEAR SHAFTS

- a. Using needle nose pliers, remove the 2 snap rings from the 2 side gear shafts.
- b. Remove the 2 side gear shafts.

2 Pinion Differential



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Fig. 17: Removing Side Gear Shaft (2 Pinion Differential)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

13. REMOVE SIDE GEAR SHAFT OIL SEALS

Using SST, remove the 2 oil seals from the housing.

SST 09308-10010

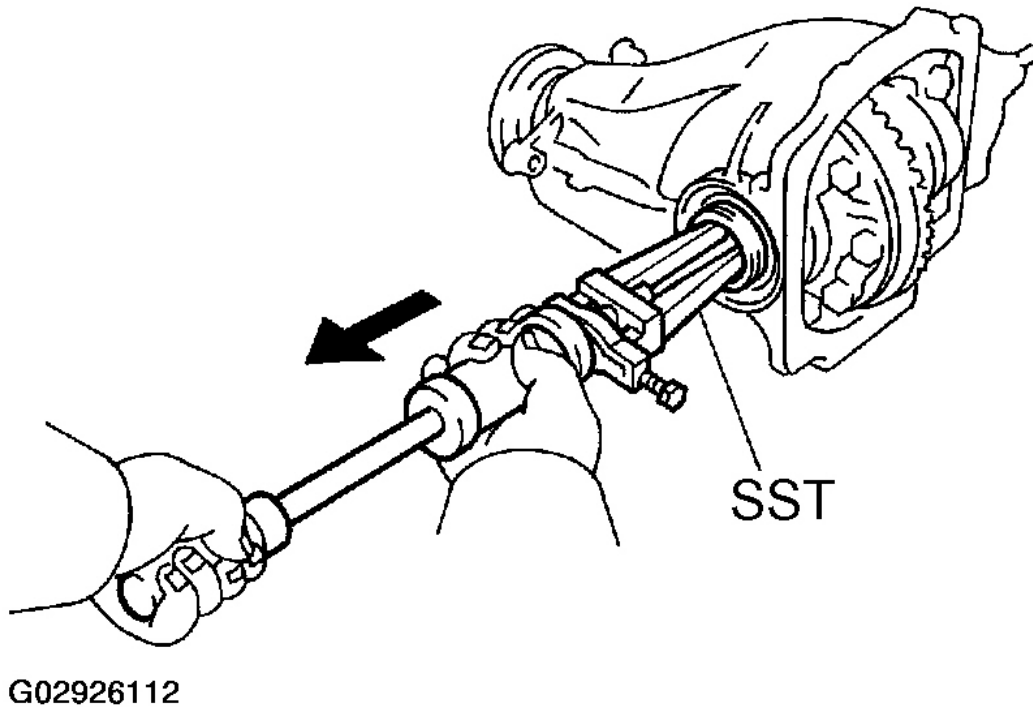
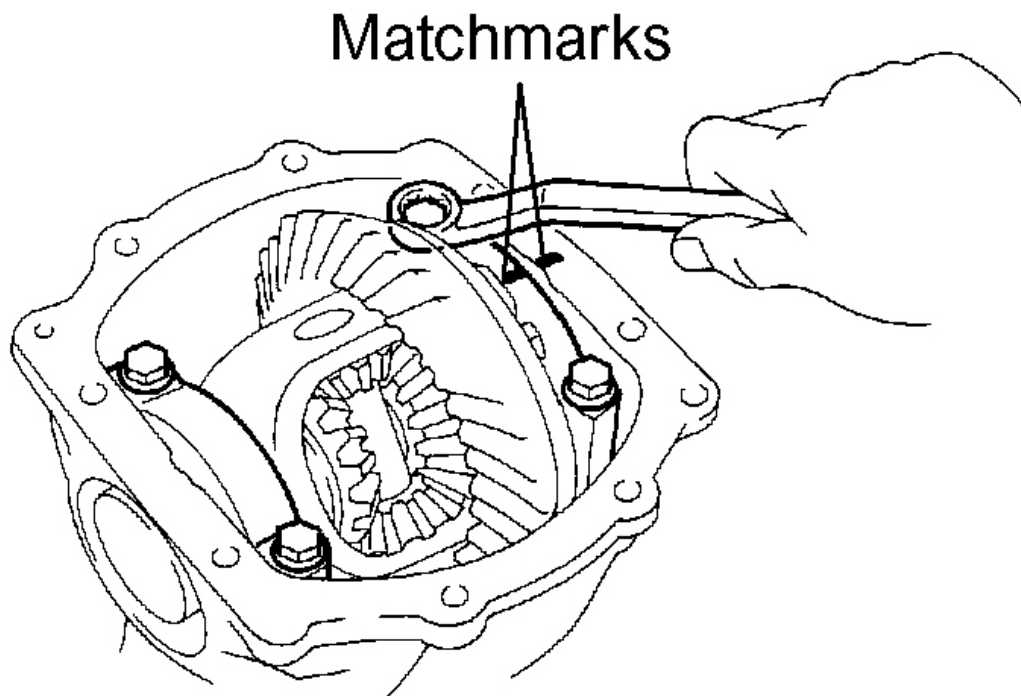


Fig. 18: Removing Side Gear Shaft Oil Seals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

14. REMOVE DIFFERENTIAL CASE

- a. Place matchmarks on the bearing cap and differential carrier.



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Fig. 19: Locating Matchmarks

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

- b. Remove the 4 bolts and 2 bearing caps.
- c. Using SST and a hammer, remove the 2 plate washers.

SST 09504-22012

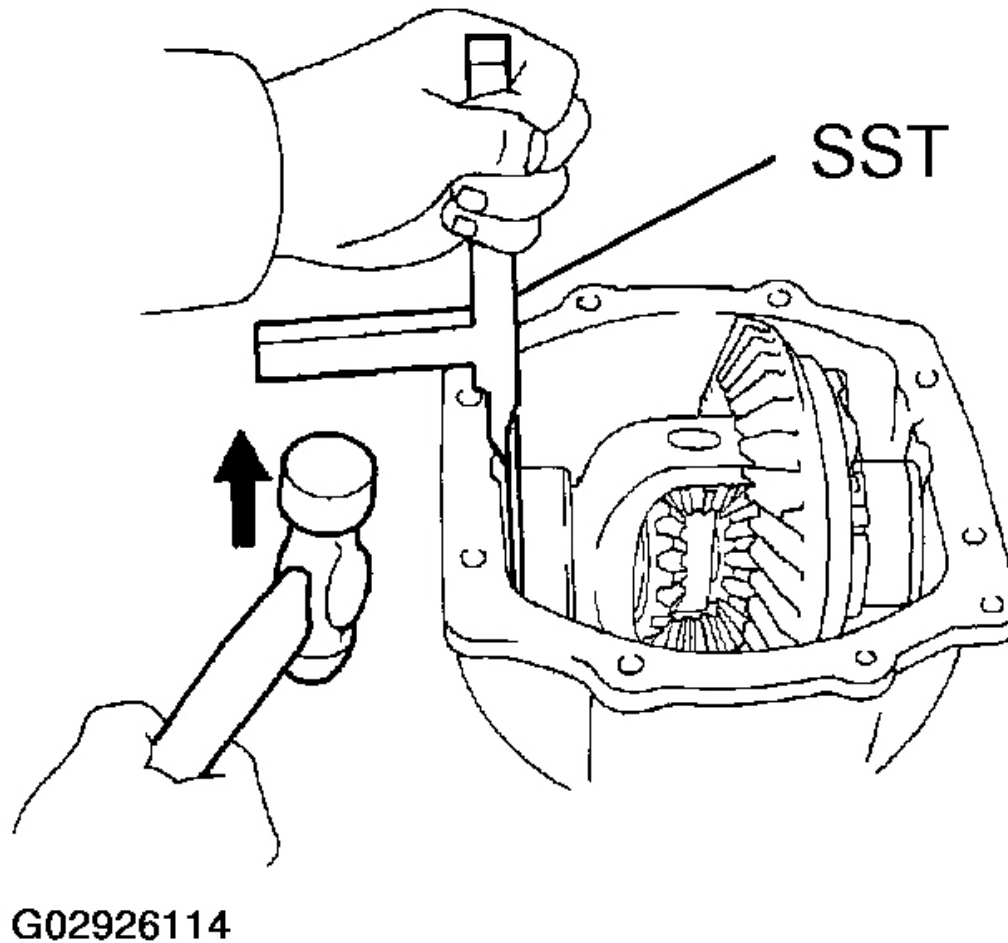


Fig. 20: Removing Plate Washers

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

HINT:

Measure the plate washer and note down the thickness.

- d. Remove the differential case and 2 bearing outer races from the carrier.

HINT:

Tag the 2 bearing outer races to show the location of reassembling.

15. REMOVE DRIVE PINION FROM DIFFERENTIAL CARRIER

16. REMOVE DRIVE PINION REAR BEARING

- a. Using SST and a press, remove the bearing from the drive pinion.

SST 09950-00020

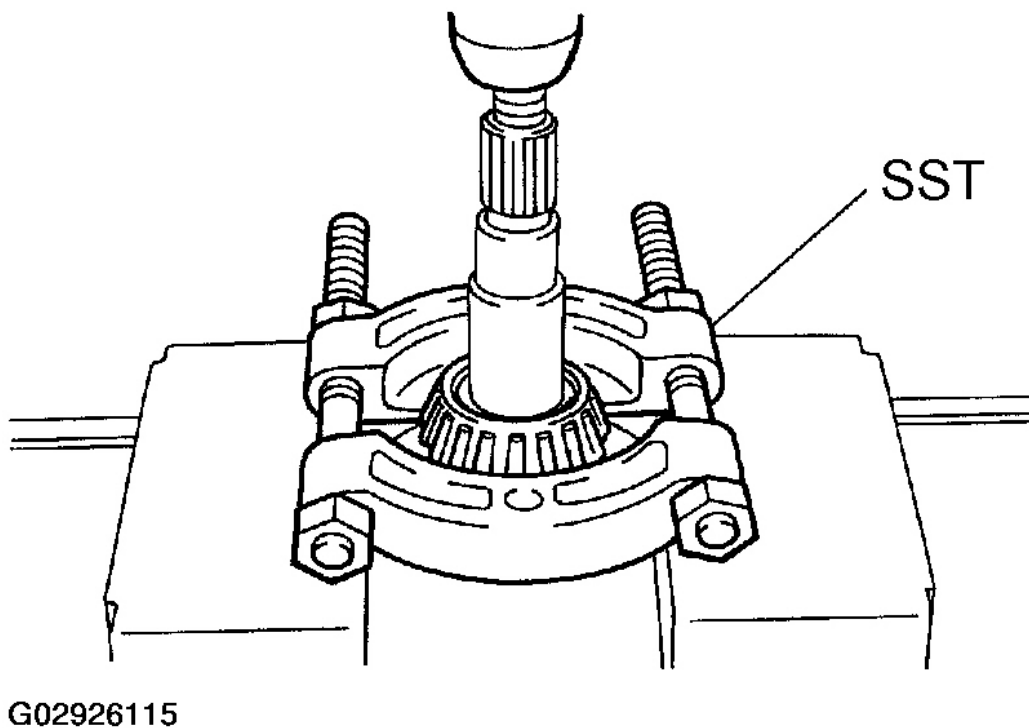


Fig. 21: Removing Drive Pinion Rear Bearing

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

HINT:

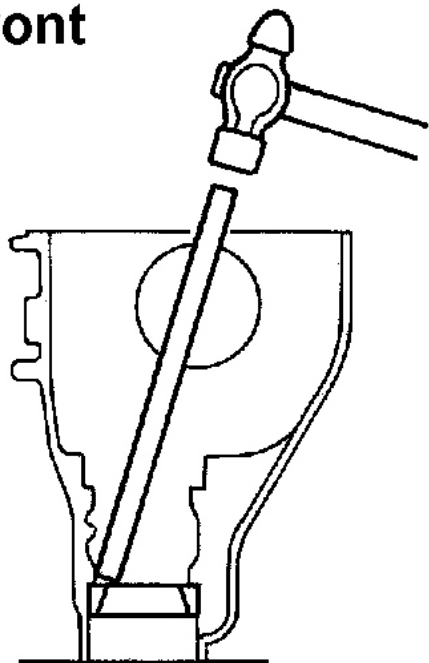
If the drive pinion and ring gear are damaged, replace them as a set.

- b. Remove the plate washer.

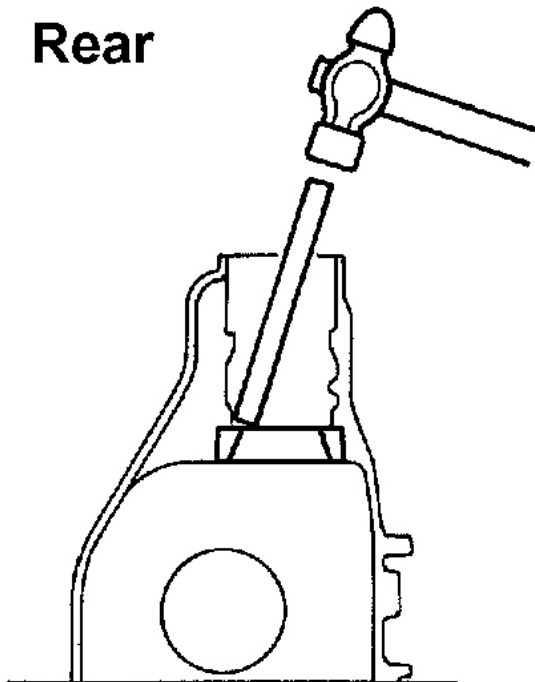
17. REMOVE FRONT AND REAR BEARING OUTER RACES

Using a brass bar and a hammer, remove the 2 outer races from the carrier.

Front



Rear



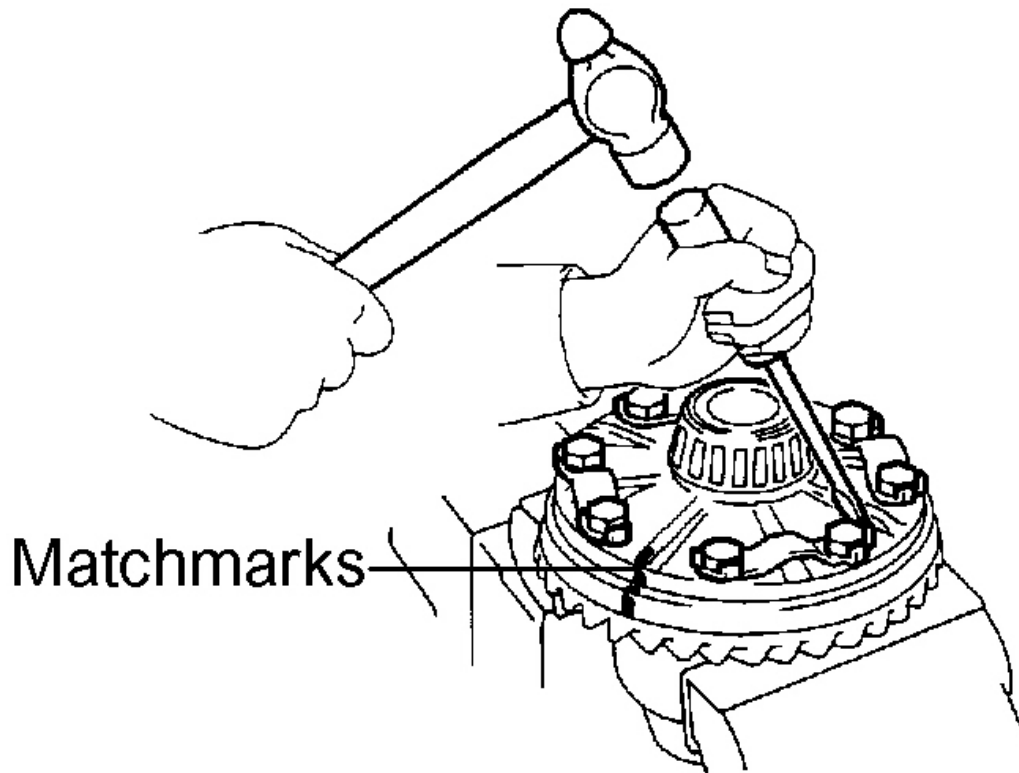
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Fig. 22: Removing Front & Rear Bearing Outer Races

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

18. REMOVE RING GEAR

- a. Place matchmarks on the ring gear and differential case.
- b. Using a screwdriver and a hammer, unstake the 4 lock plates.
- c. Remove the 8 ring gear set bolts and 4 lock plates.
- d. Using a plastic hammer, tap the ring gear to separate it from the differential case.



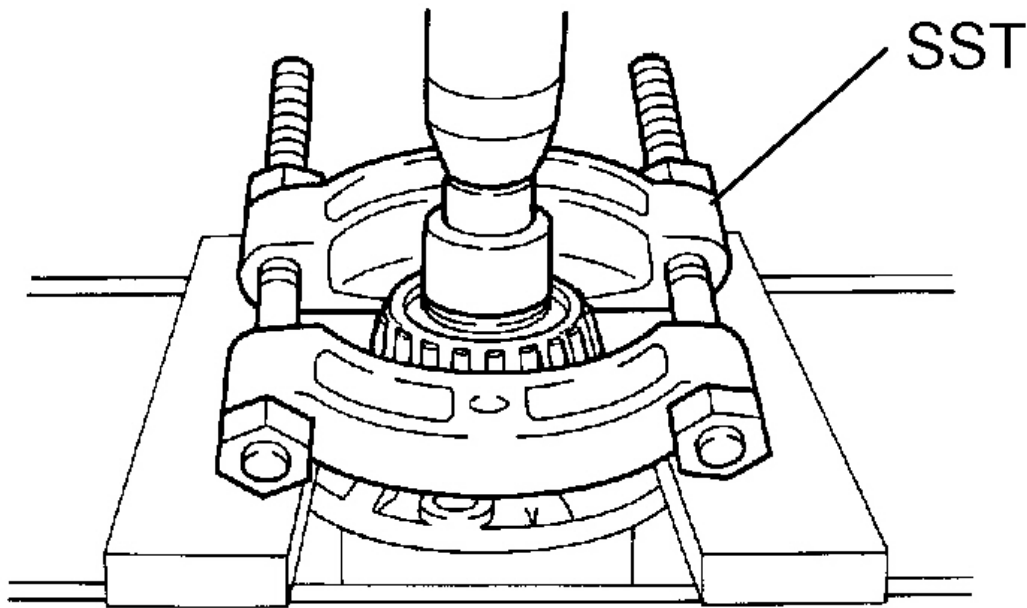
G02926117

Fig. 23: Removing Ring Gear & Locating Match Mark
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

19. REMOVE SIDE BEARINGS

Using SST and a press, remove the 2 side bearings from the differential case.

SST 09950-00020



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Fig. 24: Removing Side Bearings

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

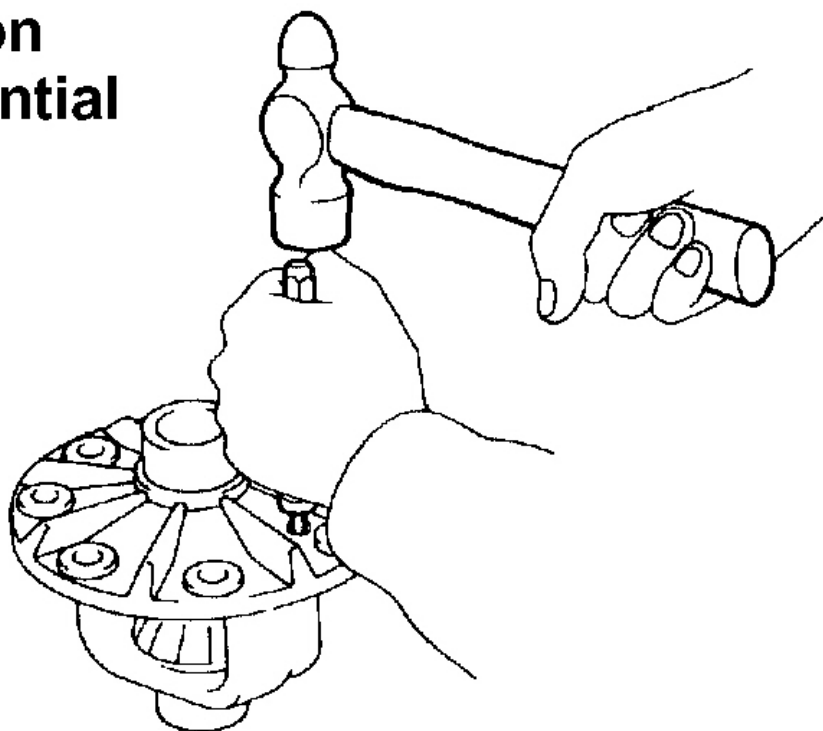
NOTE: Be careful not to drop the differential case.

20. 2 pinion differential: DISASSEMBLE DIFFERENTIAL CASE

NOTE: If equipped with torque sensing LSD, do not disassemble the differential case.

- a. Using a pin punch and a hammer, remove the straight pin.

2 Pinion Differential



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Fig. 25: Removing Straight Pin Using Pin Punch & Hammer
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the pinion shaft, 2 pinion gears, 2 pinion gear thrust washers, 2 side gears and 2 side gear thrust washers.

REPLACEMENT

1. REPLACE SIDE GEAR SHAFT DUST COVER

- a. Using a screwdriver and a hammer, remove the side gear shaft dust cover.
- b. Using a steel plate and a press, install a new dust cover to the side gear shaft.

NOTE: Be careful not to damage the dust cover.

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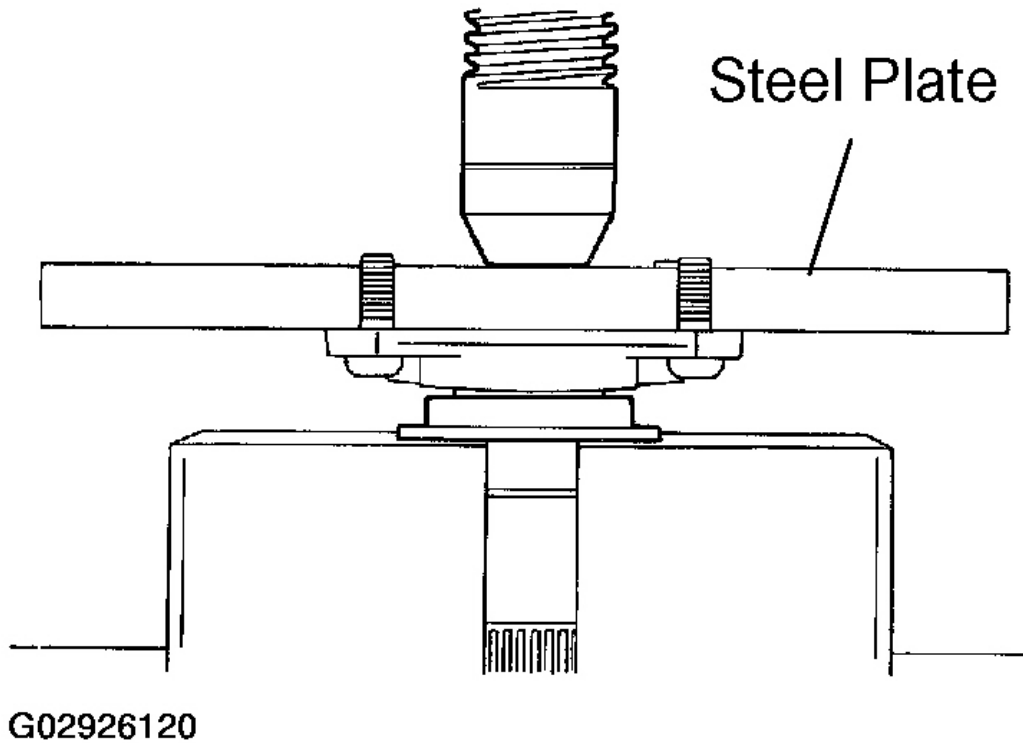


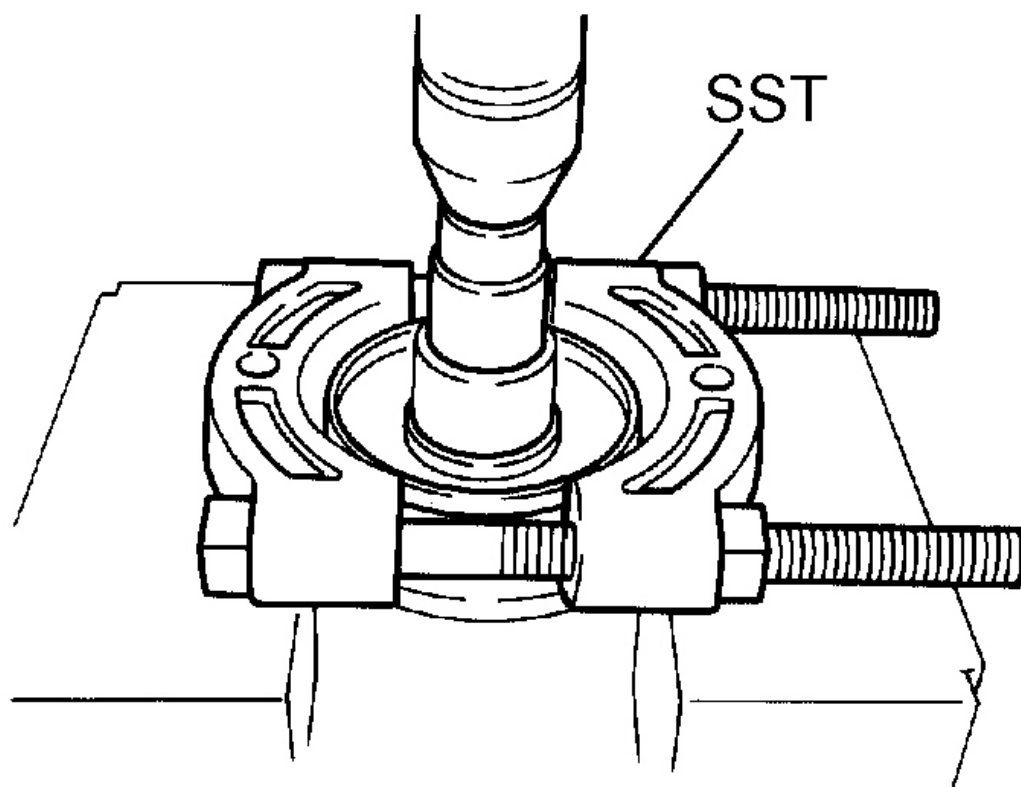
Fig. 26: Installing Dust Cover To Side Gear Shaft
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. REPLACE COMPANION FLANGE DUST DEFLECTOR

- Using SST and a press, remove the dust deflector.

SST 09950-00020

- Using a press, install a new dust deflector.



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Fig. 27: Replacing Companion Flange Dust Deflector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REASSEMBLY

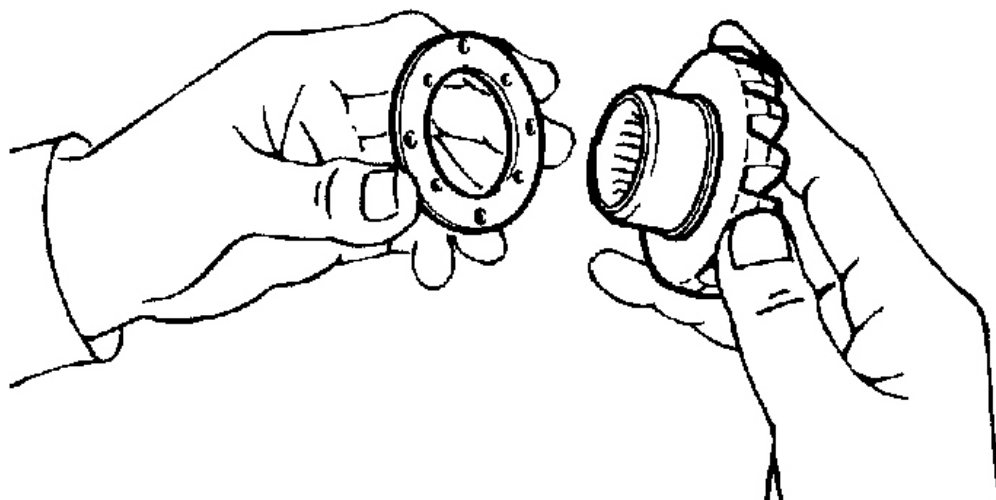
1. 2 pinion differential: REASSEMBLE DIFFERENTIAL CASE

- Install the 2 proper thrust washers on the 2 side gears.
- Install the 2 side gears, 2 pinion gears, 2 pinion gear thrust washers and pinion shaft in the differential case.

HINT:

Align the holes of the differential case and pinion shaft.

2 Pinion Differential



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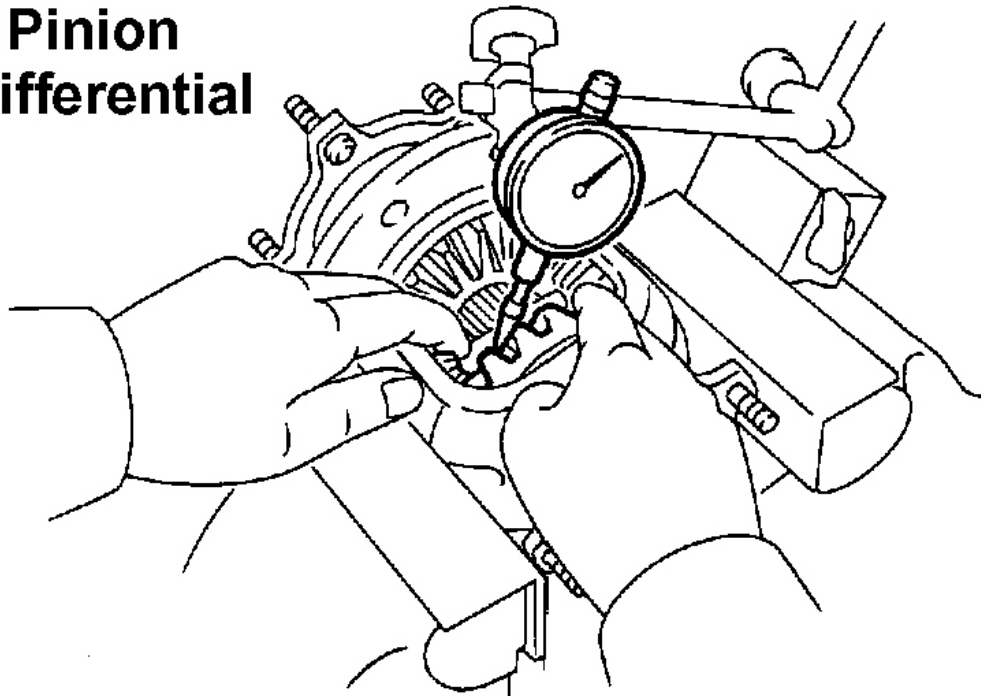
Fig. 28: Installing Thrust Washers & Side Gears

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

- c. Measure the side gear backlash.
 - 1. Install the 2 side gear shafts.
 - 2. Measure the side gear backlash with holding 1 pinion gear toward the differential case.

Backlash: 0.05 - 0.20 mm (0.0020 - 0.0079 in.)

2 Pinion Differential



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Fig. 29: Measuring Side Gear Backlash

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

If the backlash is not within the specification, install the 2 side gear thrust washers with different thicknesses.

HINT:

Refer to **THRUST WASHER THICKNESS IDENTIFICATION** and select 2 thrust washers which ensures that the backlash is within the specification.

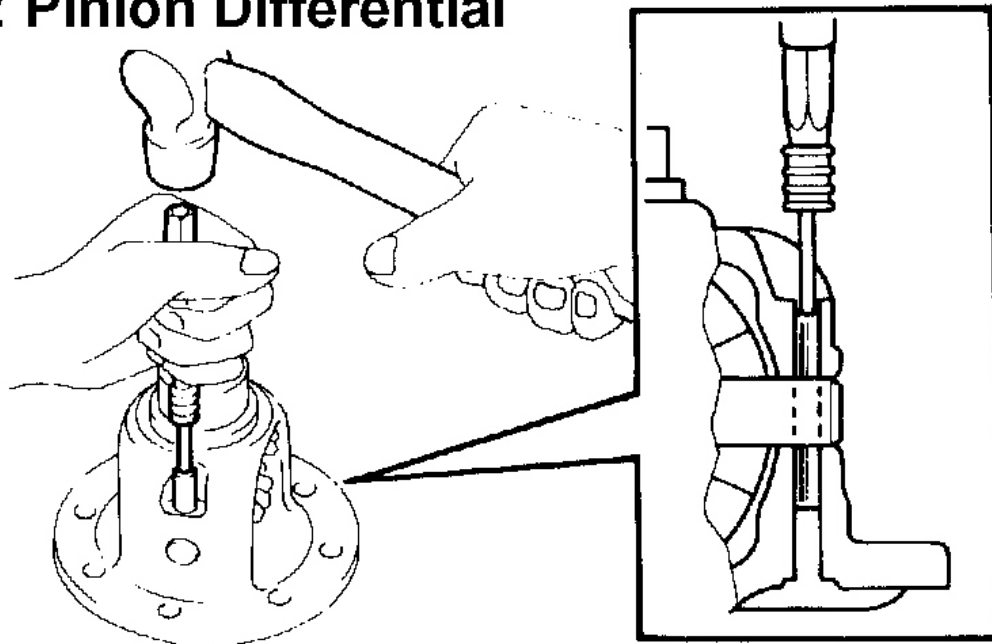
Thrust washer thickness [mm (in.)]

THRUST WASHER THICKNESS IDENTIFICATION [mm (in.)]

0.93 - 0.97 (0.0366 - 0.0382)	1.18 - 1.22 (0.0465 - 0.0480)
0.98 - 1.02 (0.0386 - 0.0402)	1.23 - 1.27 (0.0484 - 0.0500)
1.03 - 1.07 (0.0406 - 0.0421)	1.28 - 1.32 (0.0503 - 0.0520)
1.08 - 1.12 (0.0425 - 0.0441)	1.33 - 1.37 (0.0523 - 0.0539)
1.13 - 1.17 (0.0445 - 0.0461)	1.38 - 1.42 (0.0543 - 0.0559)

3. Remove the 2 side gear shafts.
- d. Using a pin punch and a hammer, install the straight pin through the differential case and hole of the pinion shaft.

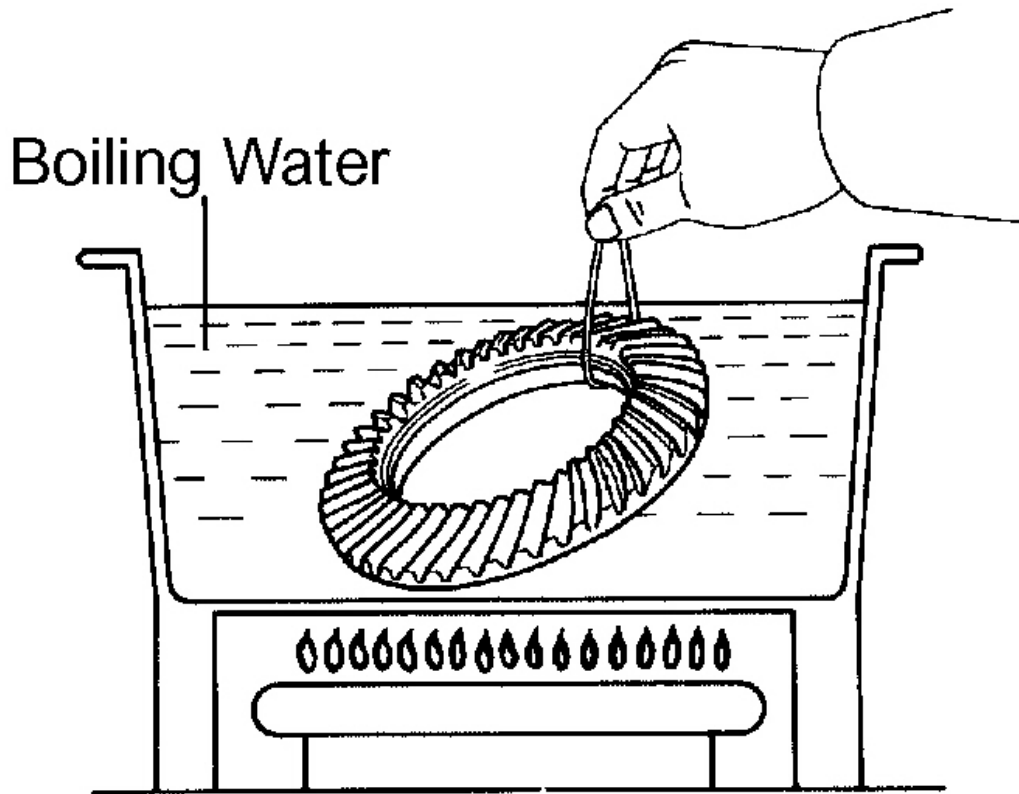
2 Pinion Differential



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Fig. 30: Installing Straight Pin Using Pin Pinch & Hammer
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Using a chisel and a hammer, stake the outside of the differential case pin hole.
- 2. INSTALL RING GEAR ON DIFFERENTIAL CASE**
- a. Clean the contact surfaces of the differential case and ring gear.
 - b. Heat the ring gear in boiling water.
 - c. Carefully remove the ring gear from the boiling water.

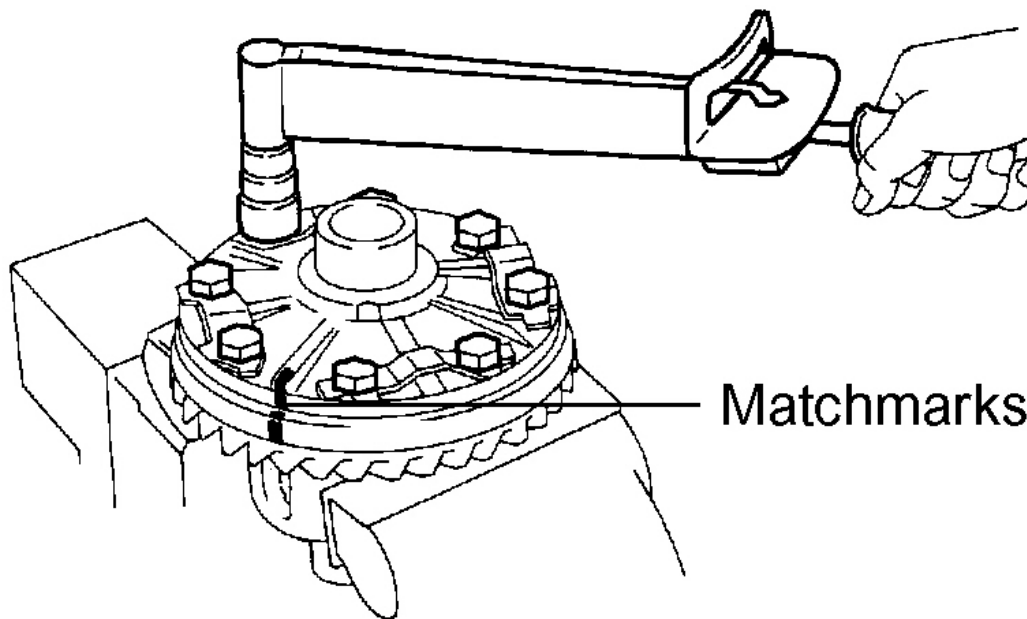


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Fig. 31: Heating Ring Gear In Boiling Water

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

- d. After the moisture on the ring gear has completely evaporated, quickly install the ring gear to the differential case.
- e. Align the matchmarks on the ring gear and differential case.



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Fig. 32: Aligning Matchmarks On Ring Gear & Differential Case
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- f. Temporarily install 4 new lock plates and the 8 bolts.
- g. After the ring gear cools down enough, torque the 8 bolts uniformly at a time.

Torque: 97 N.m (985 kgf.cm, 71 ft.lbf)

- h. Using a chisel and a hammer, raise up claws of the 4 lock plates.

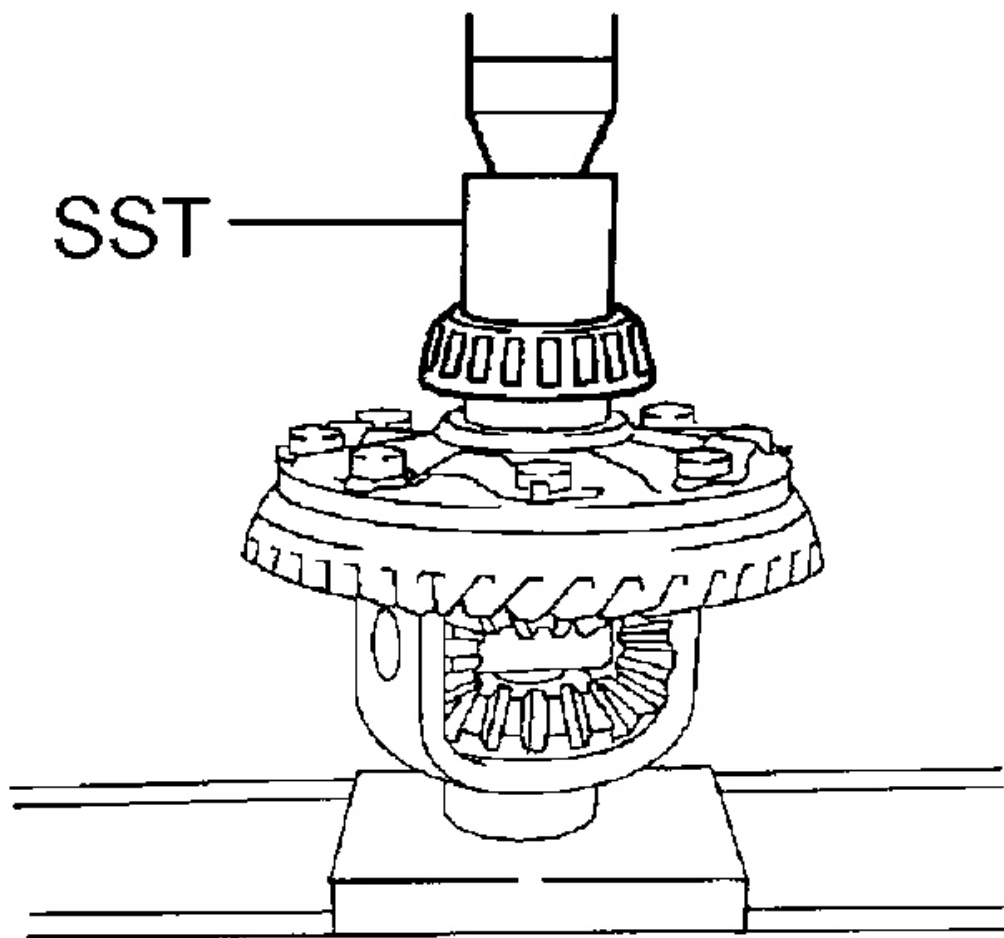
HINT:

- Bend one of the claws which touches the flat surface of the bolt so that the claw can contact the surface firmly.
- If one of the claws is divided into two due the protruding portion of the bolt, make the claw contact firmly with the tightening side of the bolt.

3. INSTALL SIDE BEARINGS

Using SST and a press, install the 2 side bearings into the differential case.

SST 09710-22021 (09710-01031)



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Fig. 33: Installing Side Bearings

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

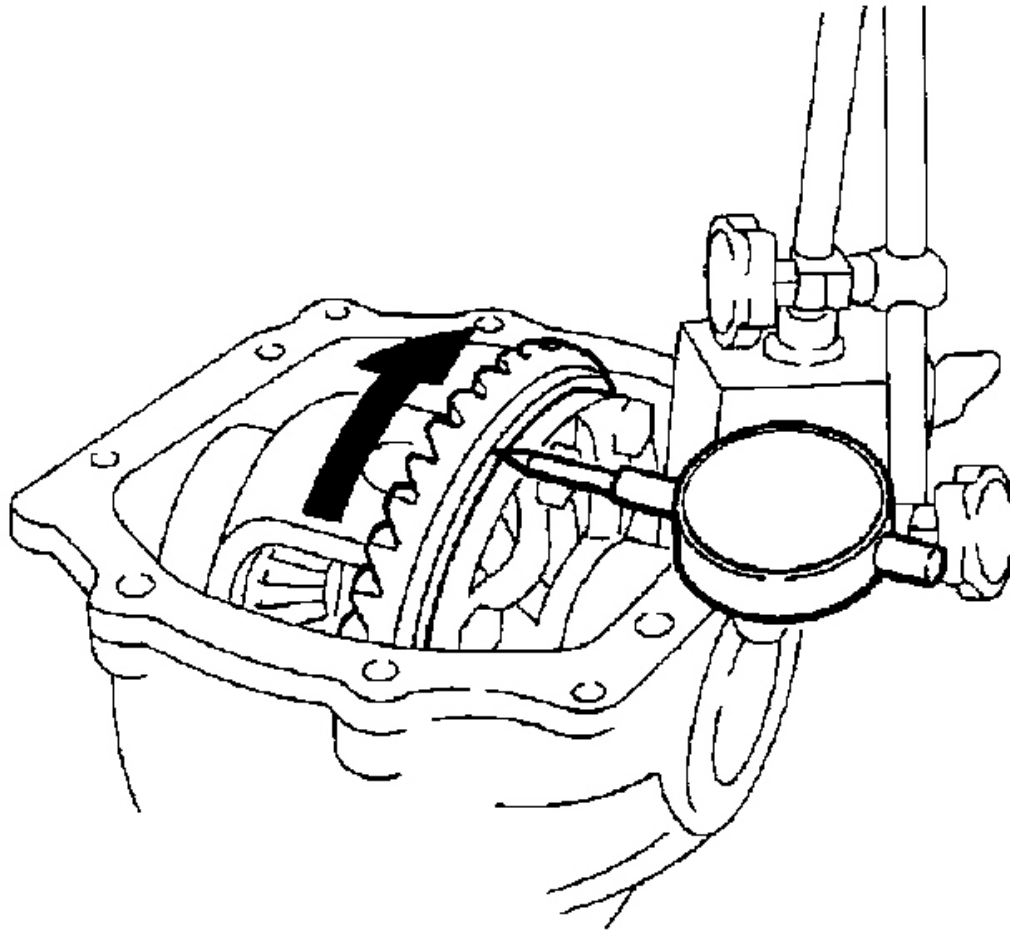
4. INSPECT RING GEAR RUNOUT

- a. Install the differential case on the carrier, and install the 2 plate washers so that there is no play in the bearing.
- b. Install the bearing caps.
- c. Using a dial indicator, measure the runout of the ring gear.

Maximum runout: 0.07 mm (0.0028 in.)

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Fig. 34: Measuring Runout Of Ring Gear

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

- d. Remove the 2 bearing caps, 2 plate washers and differential carrier.
5. **INSTALL FRONT AND REAR BEARING OUTER RACES**
 - a. Front side:

Using SST and a press, install the outer race to the carrier.

SST 09950-60020 (09951-00790), 09950-70010 (09951-07150)

- b. Rear side:

Using SST and a press, install the 2 outer races to the carrier.

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

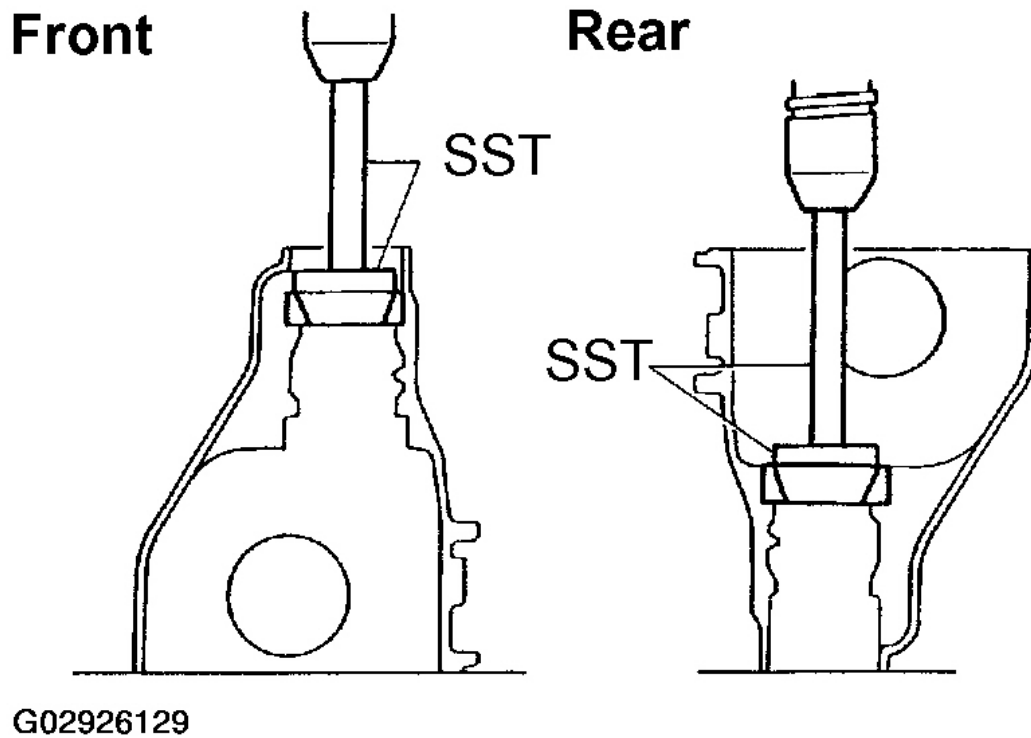


Fig. 35: Installing Front & Rear Bearing Outer Race
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

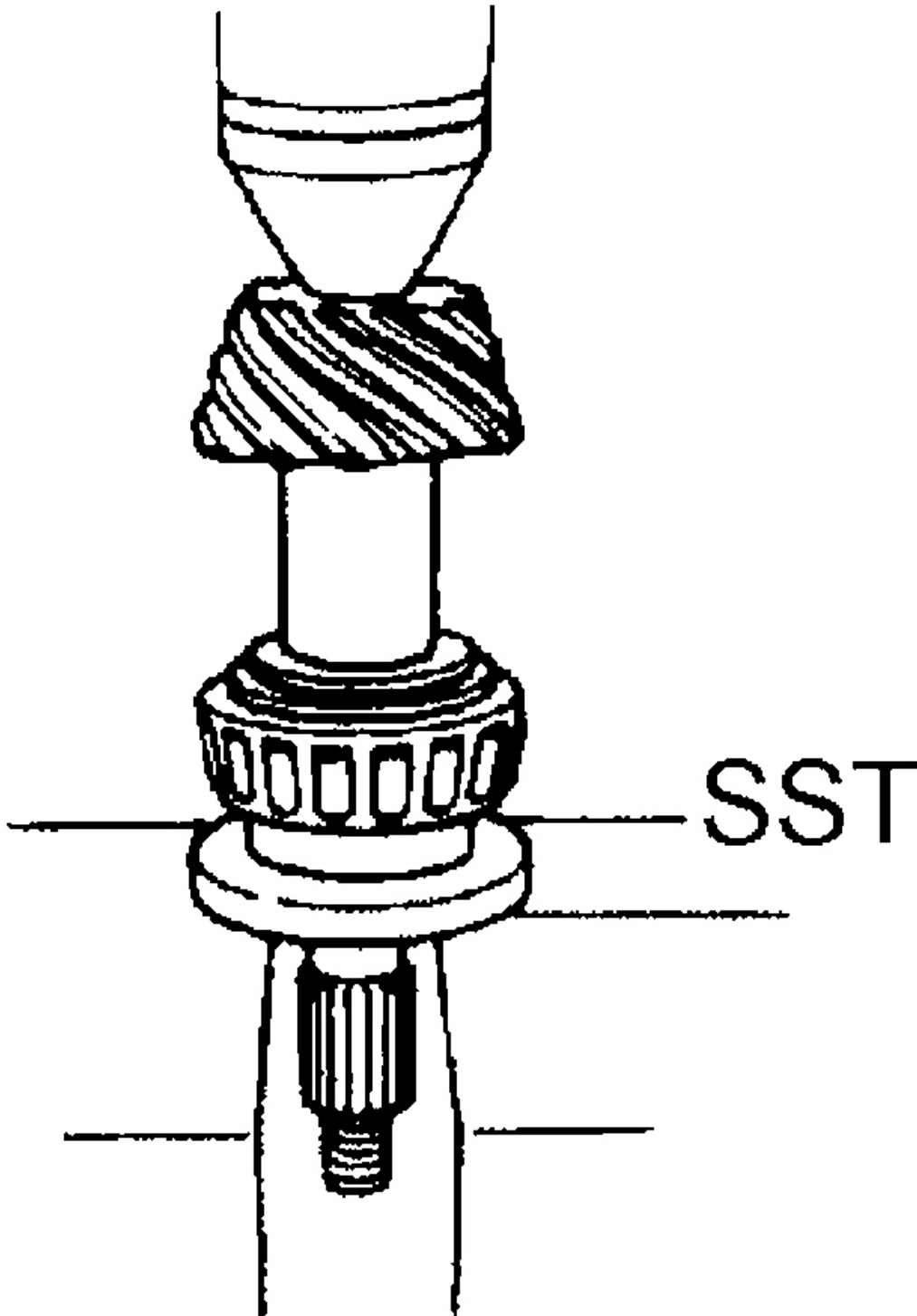
6. INSTALL DRIVE PINION REAR BEARING

- a. Install the removed plate washer on the drive pinion.
- b. Using SST and a press, install the rear bearing onto the drive pinion.

SST 09506-30012

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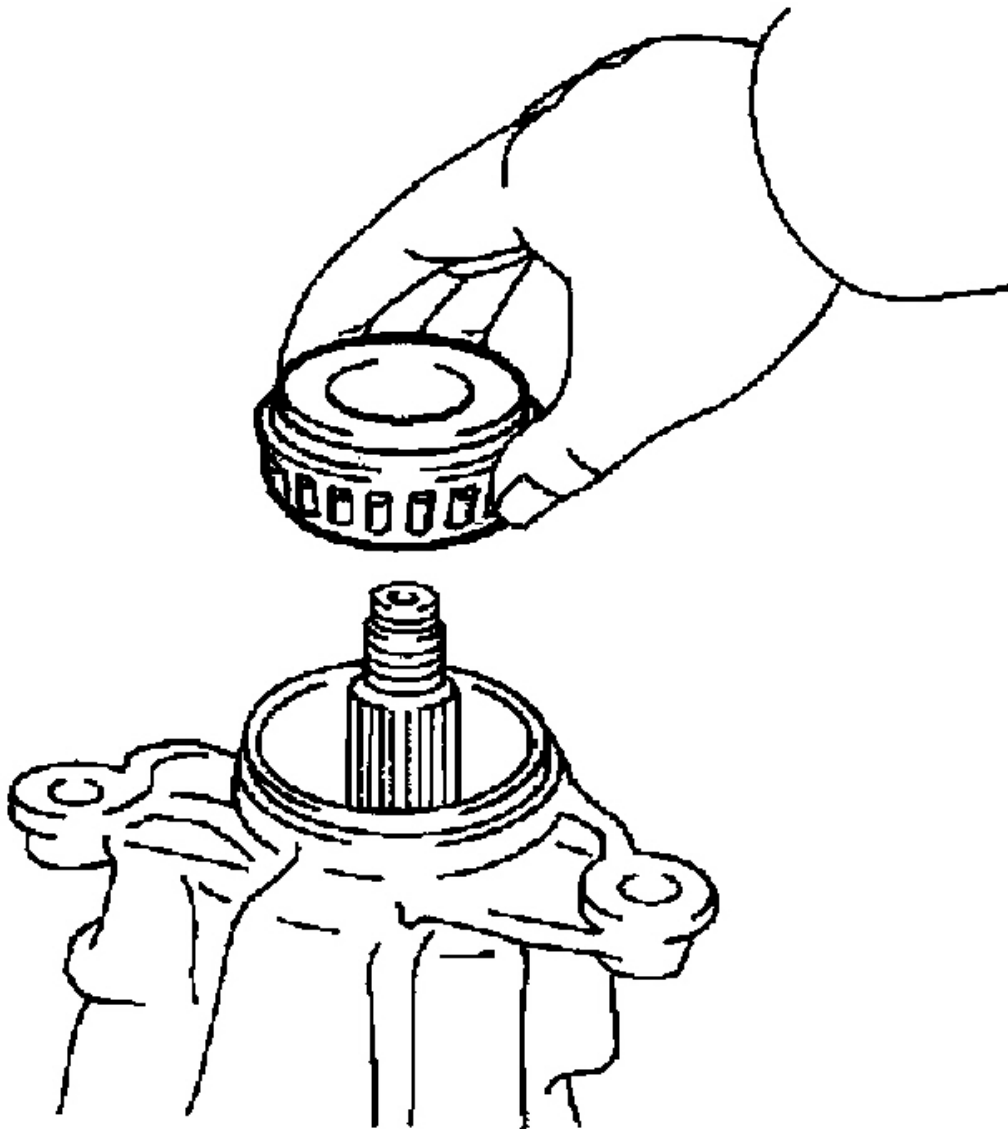
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Fig. 36: Installing Rear Bearing Into Drive Pinion

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

7. TEMPORARILY ADJUST DRIVE PINION PRELOAD

- a. Install the drive pinion and front bearing.



G02926131

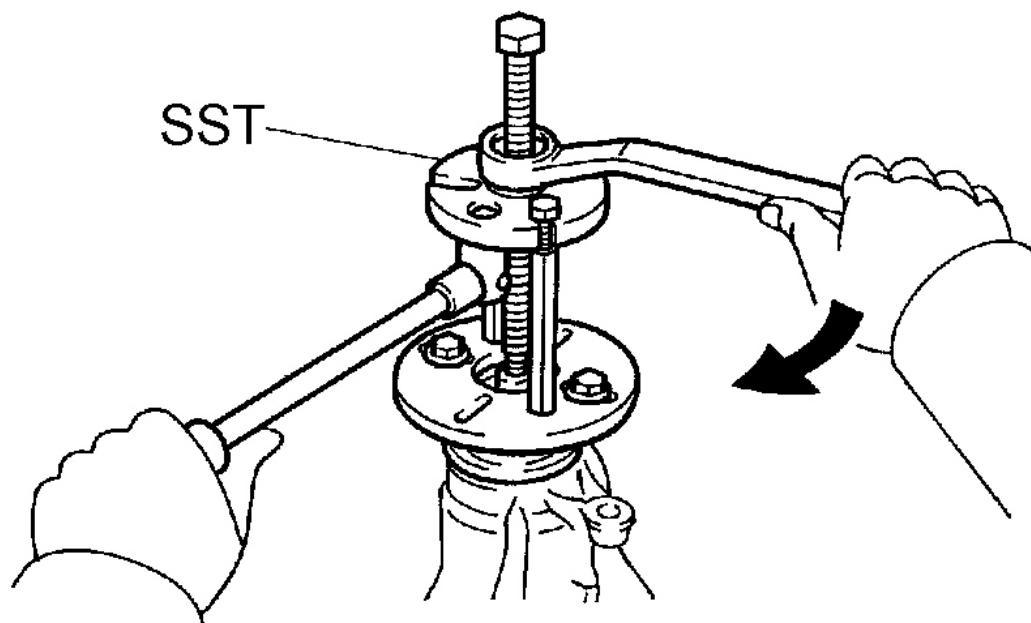
Fig. 37: Installing Drive Pinion & Front Bearing

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

HINT:

Assemble the spacer, oil slinger and oil seal after adjusting the gear contact pattern.

- b. Using SST, install the companion flange.



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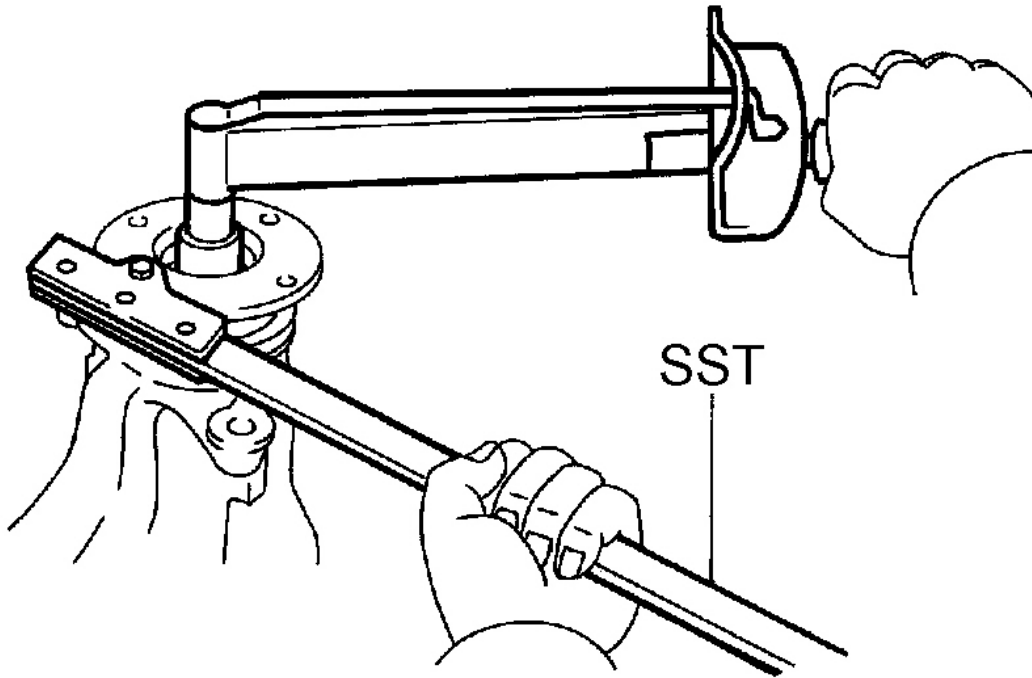
Fig. 38: Installing Companion Flange

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

SST 09950-30012 (09951-03010, 09953-03010, 09954-03010, 09955-03040, 09956-03020)

- c. Coat the threads of the nut with MP grease.
- d. Adjusting the drive pinion preload by tightening the companion flange nut.

Using SST to hold the flange, tighten the nut.



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Fig. 39: Tightening Flange Nut

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

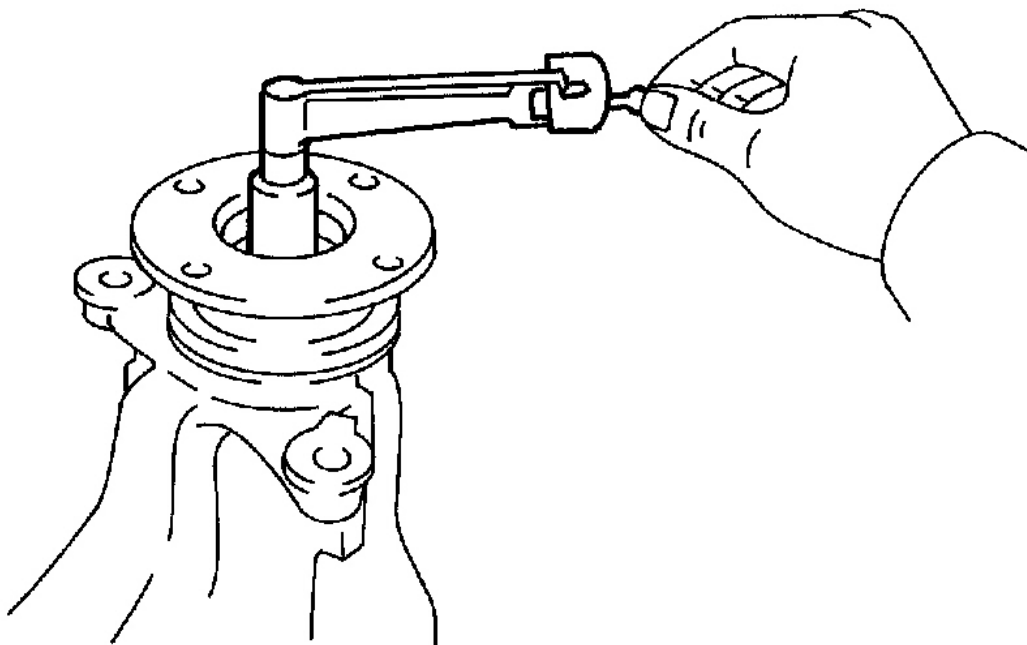
Torque:

108 - 235 N.m (1,100 - 2,400 kgf.cm, 80 - 173 ft.lbf)

SST 09330-00021

NOTE: Without a spacer, torque a little at a time, being careful not to over tighten it.

- e. Using a torque wrench, measure the preload.



G02926134

Fig. 40: Measuring Preload

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

Preload (at starting):**PRELOAD BEARING SPECIFICATION**

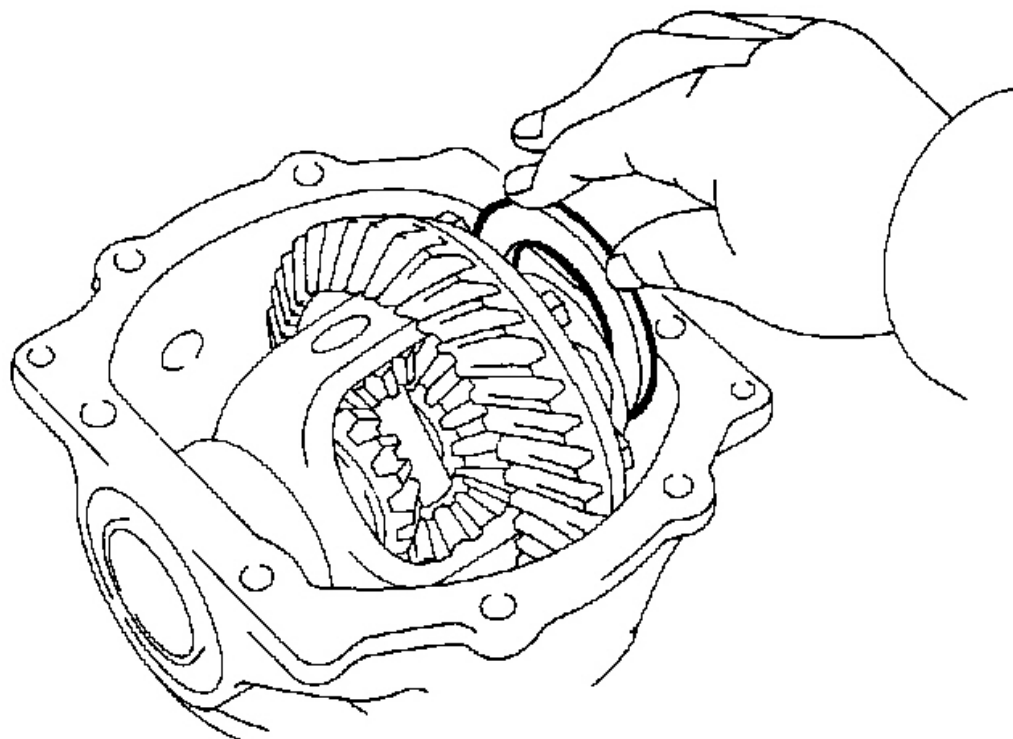
New bearing	1.1 - 1.7 N.m (11 - 17 kgf.cm, 9.5 - 14.7 in.lbf)
Reused bearing	0.6 - 0.9 N.m (6 - 9 kgf.cm, 5.2 - 7.8 in.lbf)

8. INSTALL DIFFERENTIAL CASE IN CARRIER

- Place the 2 bearing outer races on their respective bearings. Make sure the left and right races are not interchanged.
- Install the differential case in the carrier.

9. ADJUST RING GEAR BACKLASH

- Install only the plate washer on the ring gear back side.



G02926135

Fig. 41: Installing Plate Washer

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

- b. Make the washer and bearing fit by tapping the ring gear with a plastic hammer.
- c. Using a dial indicator, hold the companion flange and measure the ring gear backlash.

Backlash (reference):

0.13 - 0.18 mm (0.0051 - 0.0071 in.)

- d. Select a ring gear back side plate washer so that the backlash becomes 0.13 - 0.18 mm (0.0051 - 0.0071 in.).

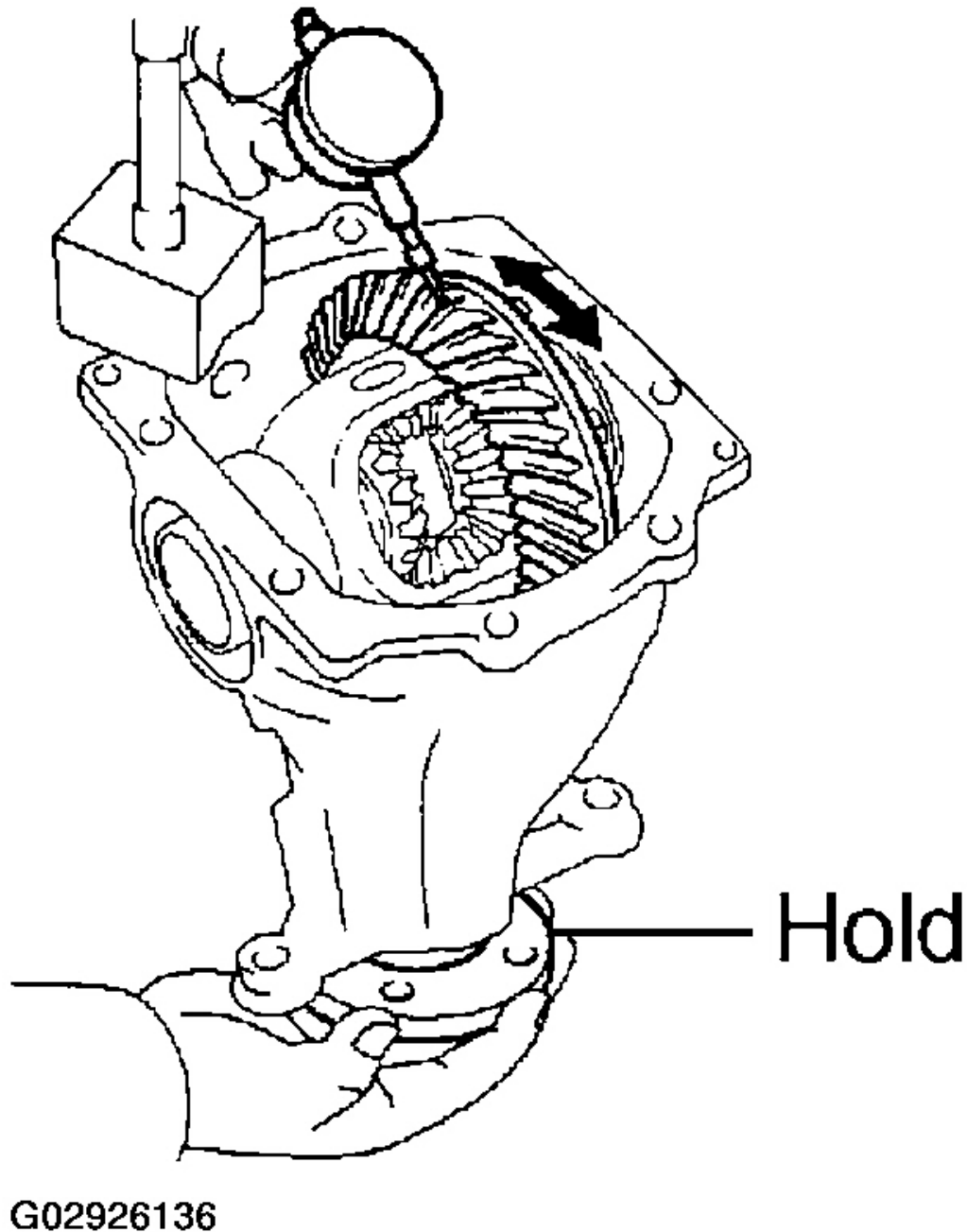
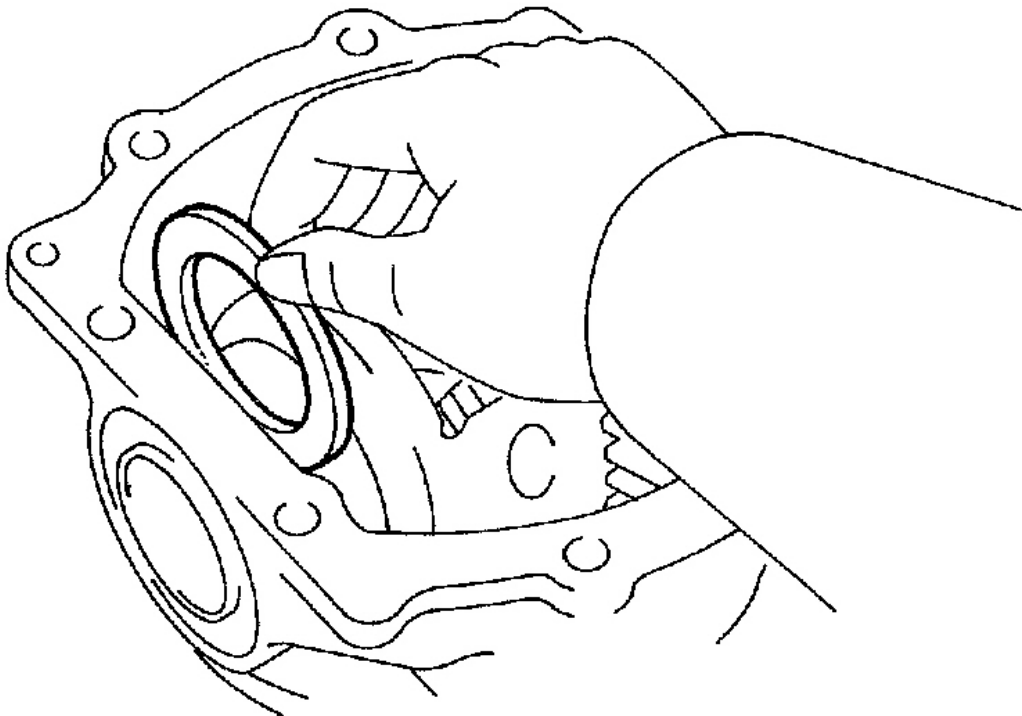


Fig. 42: Measuring Ring Gear Back Lash

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

- e. Select a ring gear teeth side washer so that there is no clearance between the outer race and case.

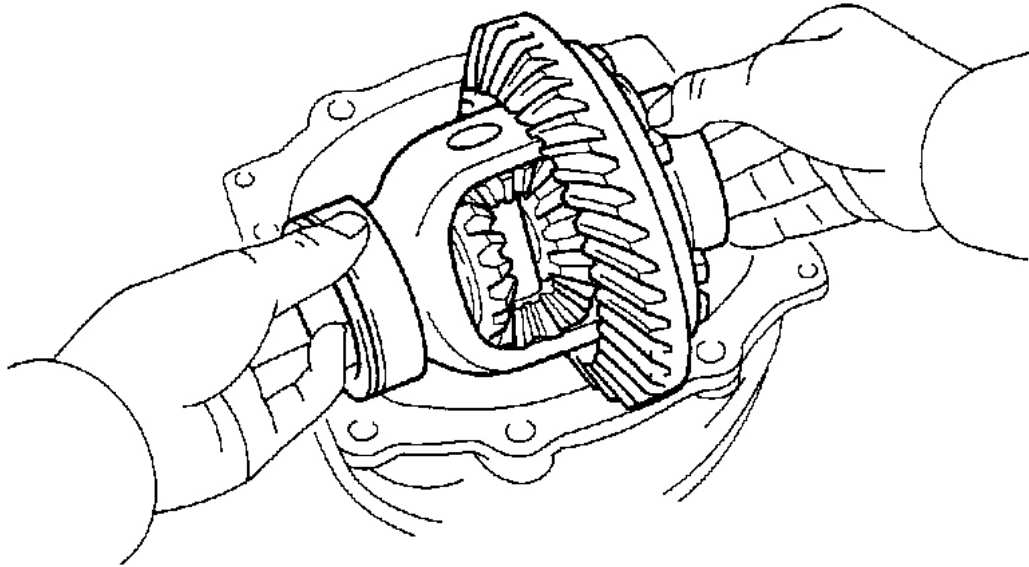
- f. Remove the plate washer and differential case.
- g. Install the plate washer into the ring gear back side.



G02926137

Fig. 43: Installing Plate Washer Into Ring Gear Back Side
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- h. Place the outer plate washer on the differential case together with the outer race, and install the differential case with the outer race into the carrier.

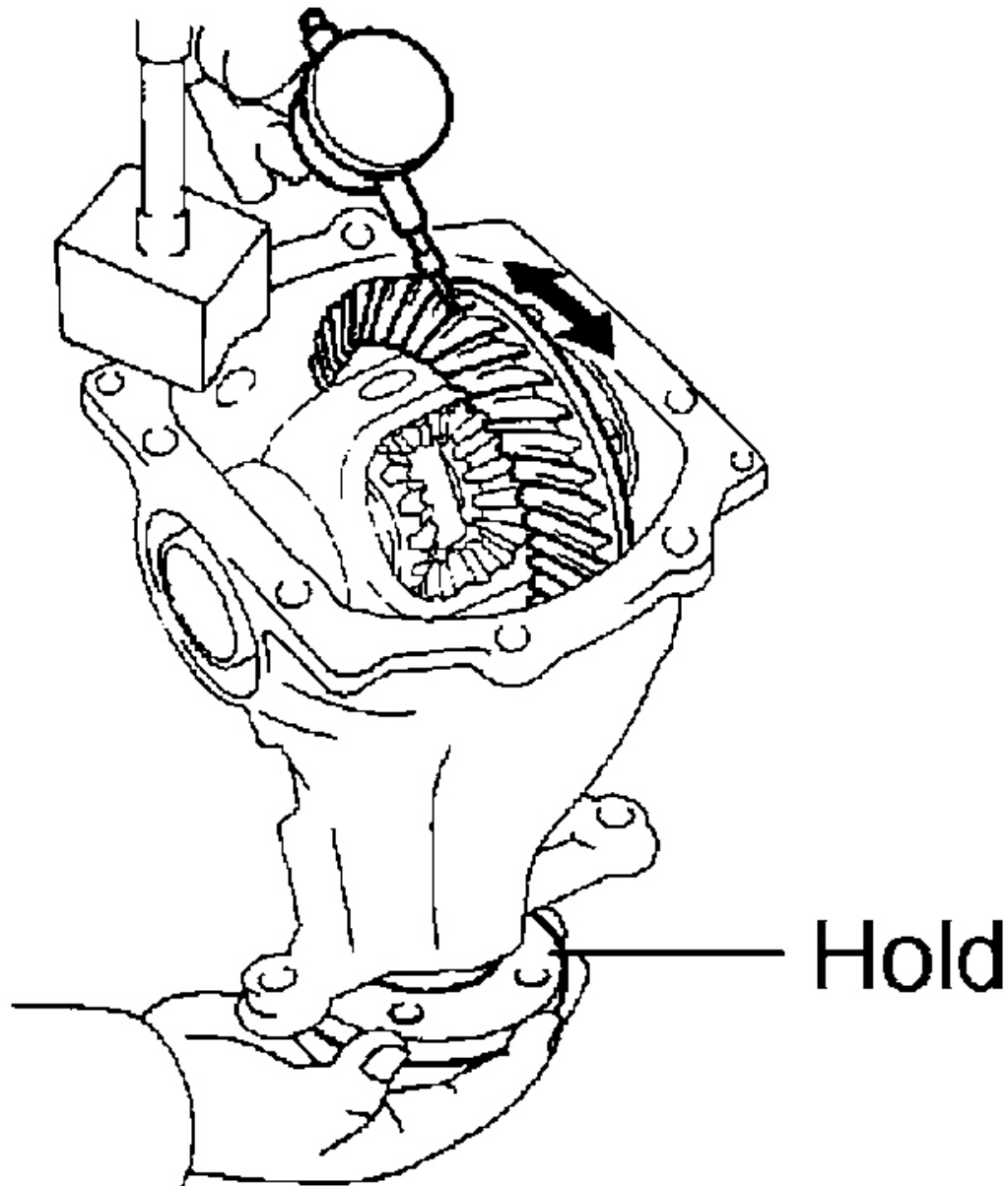


G02926138

Fig. 44: Installing Differential Case To Carrier
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- i. Using a plastic hammer, make the washer fit and bearing by tapping the ring gear.
- j. Using a dial indicator, measure the ring gear backlash during holding the companion flange.

Backlash: 0.13 - 0.18 mm (0.0051 - 0.0071 in.)



G02926139

Fig. 45: Measuring Ring Gear Backlash

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

If the value is not within the specification, adjust it by either increasing or decreasing the thickness of the washers on both sides by an equal amount.

2004 Toyota RAV4

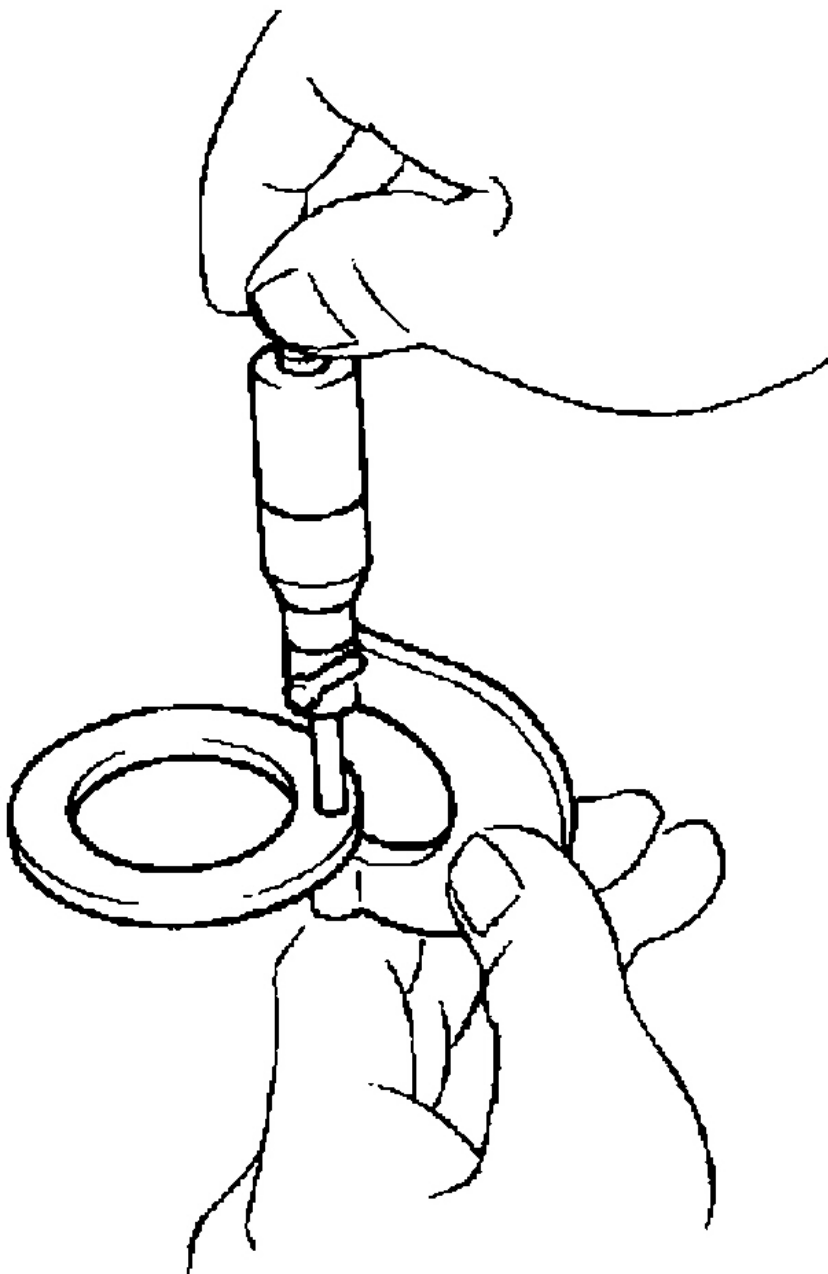
2004 DRIVELINE/AXLES Rear Differential Carrier (4WD) - RAV4

HINT:

There should be clearance between the plate washer and case. Ensure that there is the ring gear backlash.

10. **ADJUST SIDE BEARING PRELOAD**

- a. After adjusting the ring gear backlash as reference, remove the teeth side plate washer.
- b. Using a micrometer, measure the thickness of the removed plate washer.



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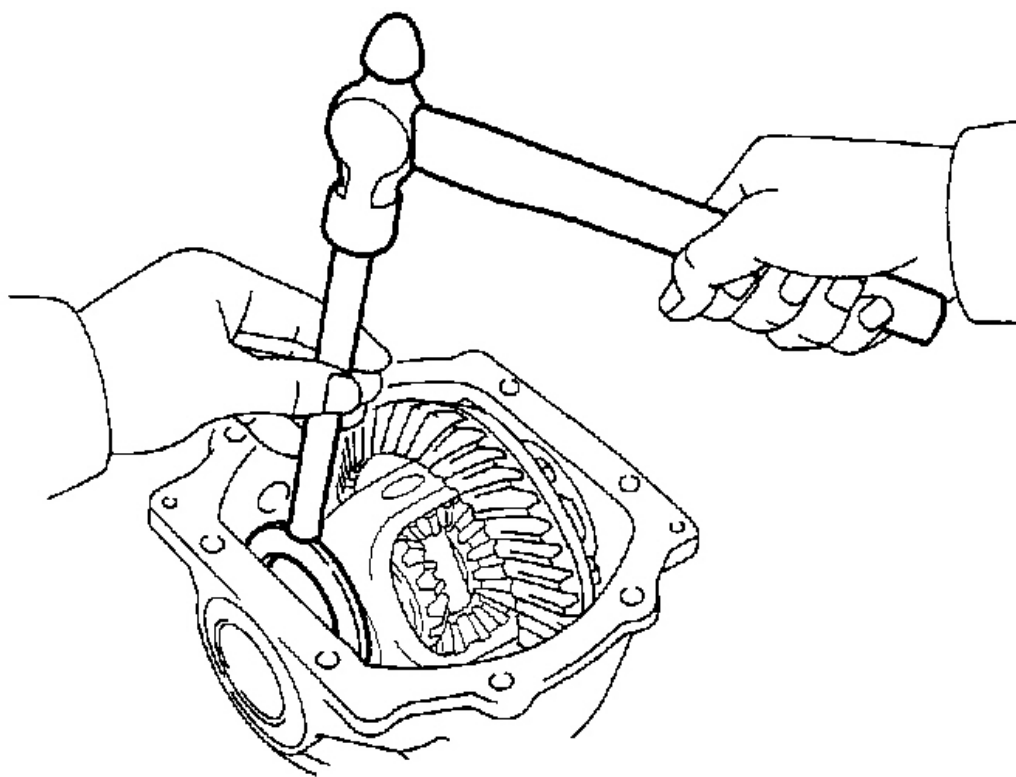
Fig. 46: Measuring Plate Washer Thickness Using Micrometer
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Install a new washer of 0.06 - 0.09 mm (0.0024 - 0.0035 in.) thicker than the removed washer.

HINT:

Select a washer which can be pressed in 2/3 of the way by finger.

- d. Using a brass bar and a hammer, tap the plate washer.

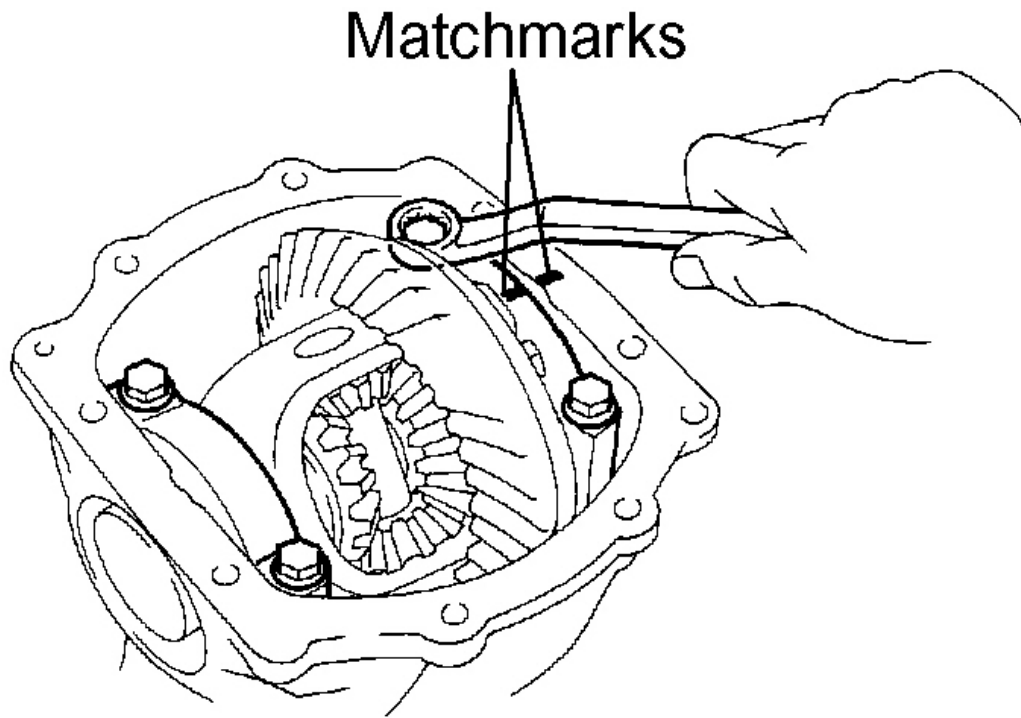


G02926141

Fig. 47: Tapping Plate Washer Using Brass Bar & Hammer
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- e. Align the matchmarks on the cap and carrier, and install the 2 bearing caps with the 4 bolts.

Torque: 78 N.m (800 kgf.cm, 58 ft.lbf)

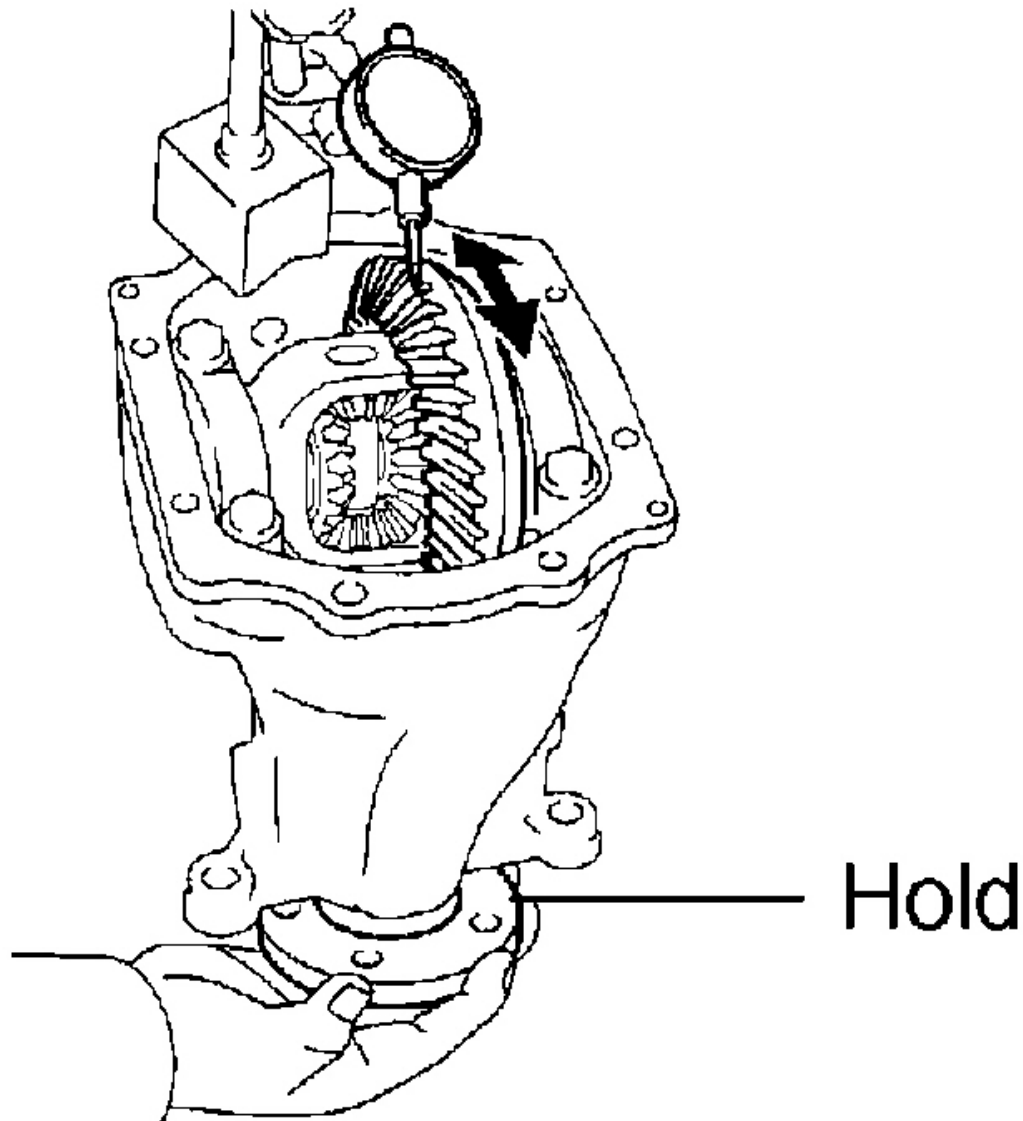


G02926142

Fig. 48: Aligning Match Mark On Cap & Carrier
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- f. Recheck the ring gear backlash.

Backlash: 0.13 - 0.18 mm (0.0051 - 0.0071 in.)



G02926143

Fig. 49: Measuring Ring Gear Backlash
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If the value is not within the specification, adjust it by either increasing or decreasing the washers thickness on both sides by equal amount.

HINT:

2004 Toyota RAV4

2004 DRIVELINE/AXLES Rear Differential Carrier (4WD) - RAV4

The backlash will change by about 0.02 mm (0.0008 in.) corresponding to 0.03 mm (0.0012 in.) change in the plate washer thickness.

Washer thickness:

WASHER THICKNESS SPECIFICATIONS

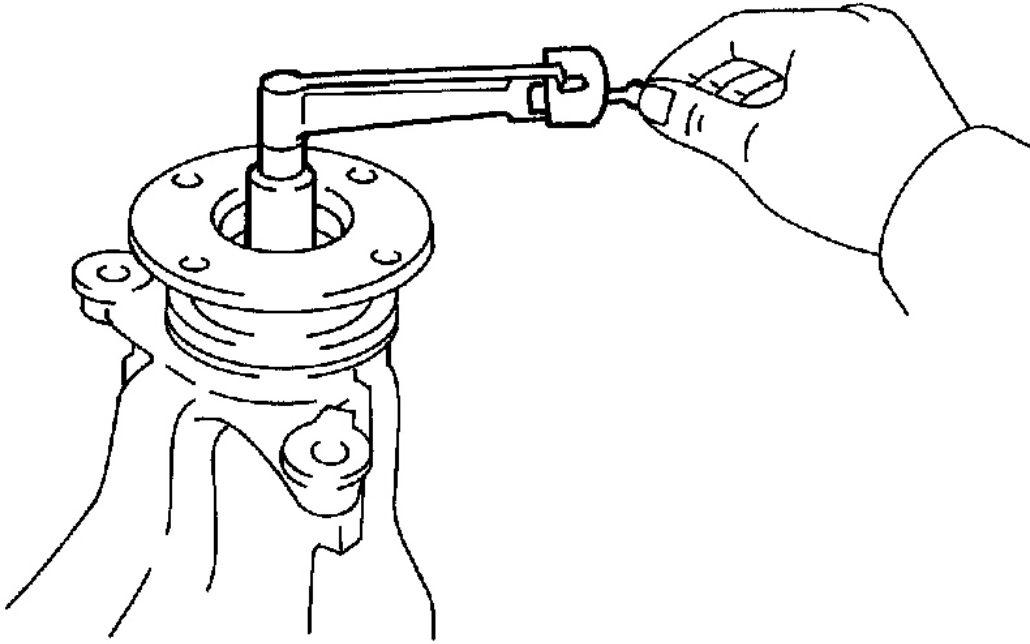
Thickness mm (in.)	Thickness mm (in.)	Thickness mm (in.)
2.21 - 2.23 (0.0870 - 0.0878)	2.57 - 2.59 (0.1012 - 0.1020)	2.93 - 2.95 (0.1154 - 0.1161)
2.24 - 2.26 (0.0882 - 0.0890)	2.60 - 2.62 (0.1024 - 0.1031)	2.96 - 2.98 (0.1165 - 0.1173)
2.27 - 2.29 (0.0894 - 0.0902)	2.63 - 2.65 (0.1035 - 0.1043)	2.99 - 3.01 (0.1177 - 0.1185)
2.30 - 2.32 (0.0906 - 0.0913)	2.66 - 2.68 (0.1047 - 0.1055)	3.02 - 3.04 (0.1189 - 0.1197)
2.33 - 2.35 (0.0917 - 0.0925)	2.69 - 2.71 (0.1059 - 0.1067)	3.05 - 3.07 (0.1201 - 0.1209)
2.36 - 2.38 (0.0929 - 0.0937)	2.72 - 2.74 (0.1071 - 0.1079)	3.08 - 3.10 (0.1213 - 0.1220)
2.39 - 2.41 (0.0941 - 0.0949)	2.75 - 2.77 (0.1083 - 0.1091)	3.11 - 3.13 (0.1224 - 0.1232)
2.42 - 2.44 (0.0953 - 0.0961)	2.78 - 2.80 (0.1094 - 0.1102)	3.14 - 3.16 (0.1236 - 0.1244)
2.45 - 2.47 (0.0965 - 0.0972)	2.81 - 2.83 (0.1106 - 0.1114)	3.17 - 3.19 (0.1248 - 0.1256)
2.48 - 2.50 (0.0976 - 0.0984)	2.84 - 2.86 (0.1118 - 0.1126)	3.20 - 3.22 (0.1260 - 0.1268)
2.51 - 2.53 (0.0988 - 0.0996)	2.87 - 2.89 (0.1130 - 0.1138)	-
2.54 - 2.56 (0.1000 - 0.1008)	2.90 - 2.92 (0.1142 - 0.1150)	-

11. MEASURE TOTAL PRELOAD

Using a torque wrench, measure the preload.

Total preload (at starting):

Drive pinion preload plus 0.3 - 0.5 N.m (3 - 5 kgf.cm, 2.6 - 4.3 in.lbf)

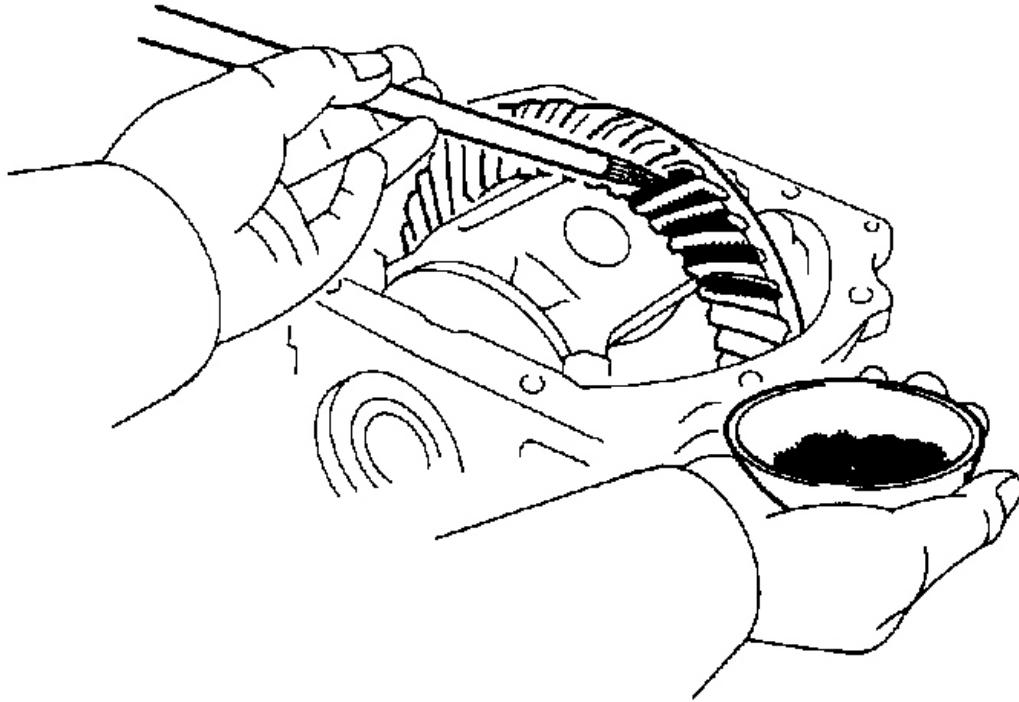


G02926144

Fig. 50: Measuring Preload

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

12. **INSPECT TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION**
 - a. Coat 3 or 4 teeth at 3 different positions on the ring gear with red lead primer.



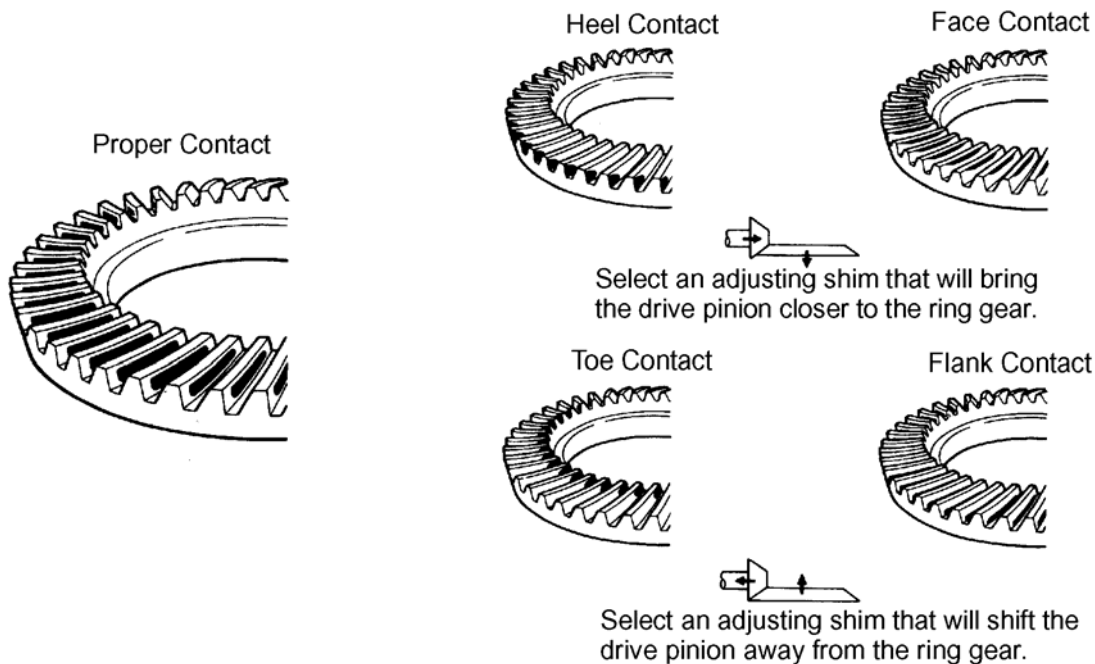
G02926145

Fig. 51: Coating Teeth On Ring Gear With Red Lead Primer
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Hold the companion flange firmly and rotate the ring gear in both directions.
- c. Inspect the tooth contact pattern.

2004 Toyota RAV4

2004 DRIVELINE/AXLES Rear Differential Carrier (4WD) - RAV4



G02926146

Fig. 52: Identifying Types Of Gear Contact

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

If the teeth are not contacting properly, use **WASHER THICKNESS IDENTIFICATION** to select a proper washer for correction.

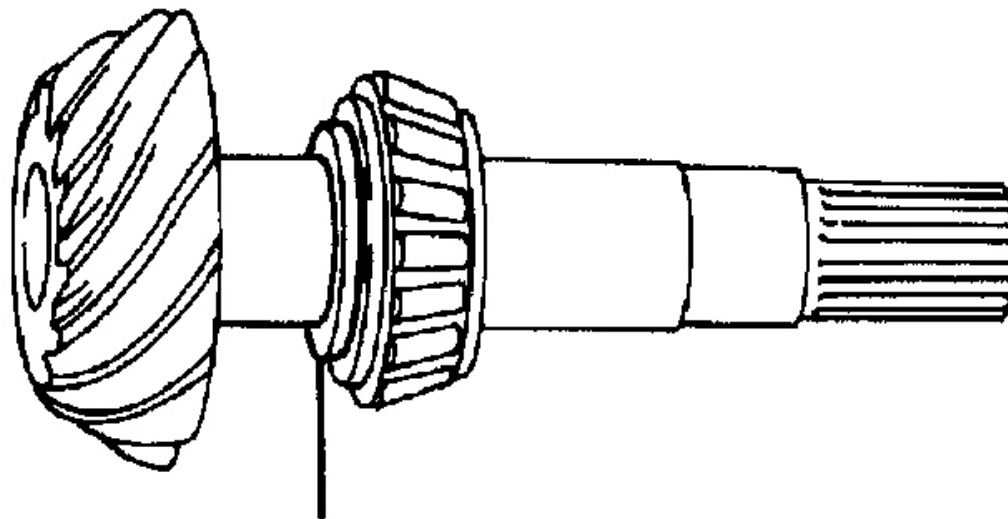


Plate Washer

G02926147

Fig. 53: Identifying Plate Washer

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

Washer thickness:

WASHER THICKNESS IDENTIFICATION

Thickness mm (in.)	Thickness mm (in.)	Thickness mm (in.)
2.26 - 2.28 (0.0890 - 0.0898)	2.41 - 2.43 (0.0949 - 0.0957)	2.56 - 2.58 (0.1008 - 0.1016)
2.29 - 2.31 (0.0902 - 0.0909)	2.44 - 2.46 (0.0961 - 0.0969)	2.59 - 2.61 (0.1020 - 0.1028)
2.32 - 2.34 (0.0913 - 0.0921)	2.47 - 2.49 (0.0972 - 0.0980)	2.62 - 2.64 (0.1031 - 0.1039)
2.35 - 2.37 (0.0925 - 0.0933)	2.50 - 2.52 (0.0984 - 0.0992)	2.65 - 2.67 (0.1043 - 0.1051)
2.38 - 2.40 (0.0937 - 0.0945)	2.53 - 2.55 (0.0996 - 0.1004)	2.68 - 2.70 (0.1055 - 0.1063)

13. **REMOVE COMPANION FLANGE (See REPLACEMENT)**
14. **REMOVE FRONT BEARING (See DISASSEMBLY)**
15. **INSTALL NEW BEARING SPACER AND FRONT BEARING**

Install a new bearing spacer and the front bearing on the drive pinion.

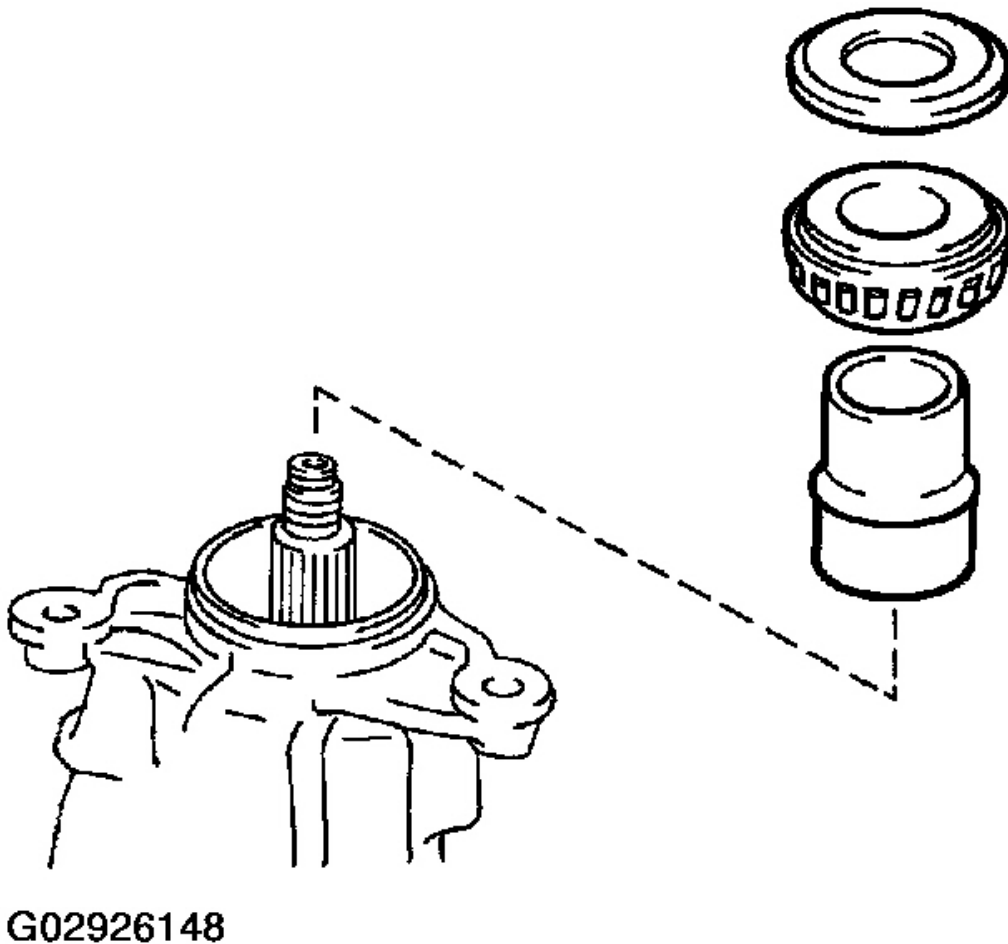
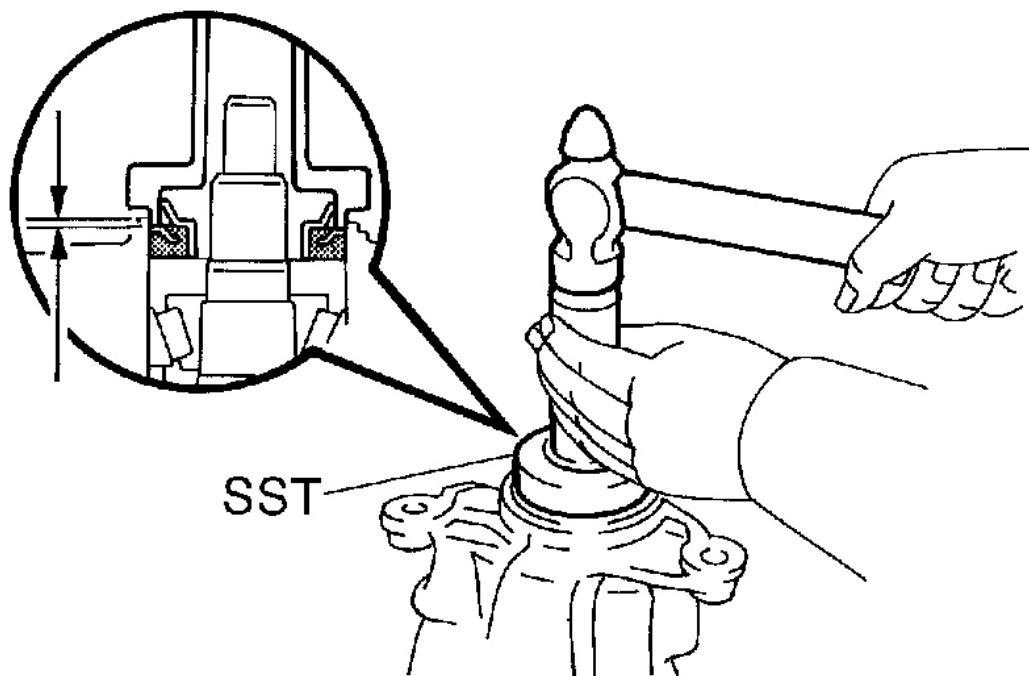


Fig. 54: Installing Spacer, Front Bearing & Drive Pinion
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

16. **INSTALL OIL SLINGER**
17. **INSTALL NEW FRONT OIL SEAL**
 - a. Using SST and a hammer, install a new oil seal.

SST 09554-22010



G02926149

Fig. 55: Installing Front Oil Seal

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

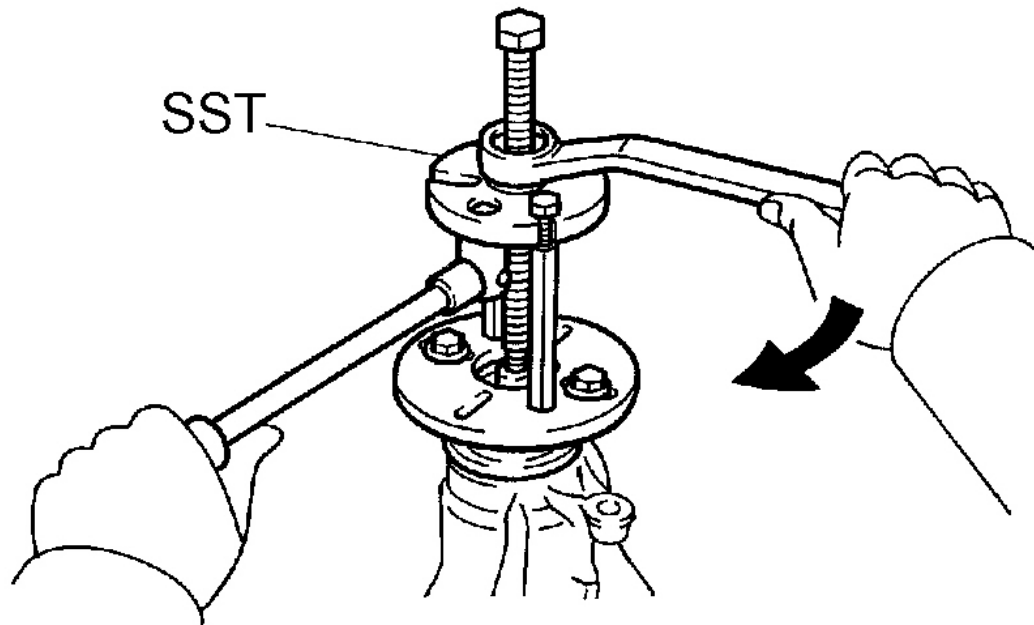
Oil seal drive in depth: 2.0 mm (0.079 in.)

- b. Apply MP grease to the oil seal lip.

18. INSTALL COMPANION FLANGE

- a. Using SST, install the companion flange on the drive pinion.

SST 09950-30012 (09951-03010, 09953-03010, 09954-03010, 09955-03040, 09956-03020)



G02926150

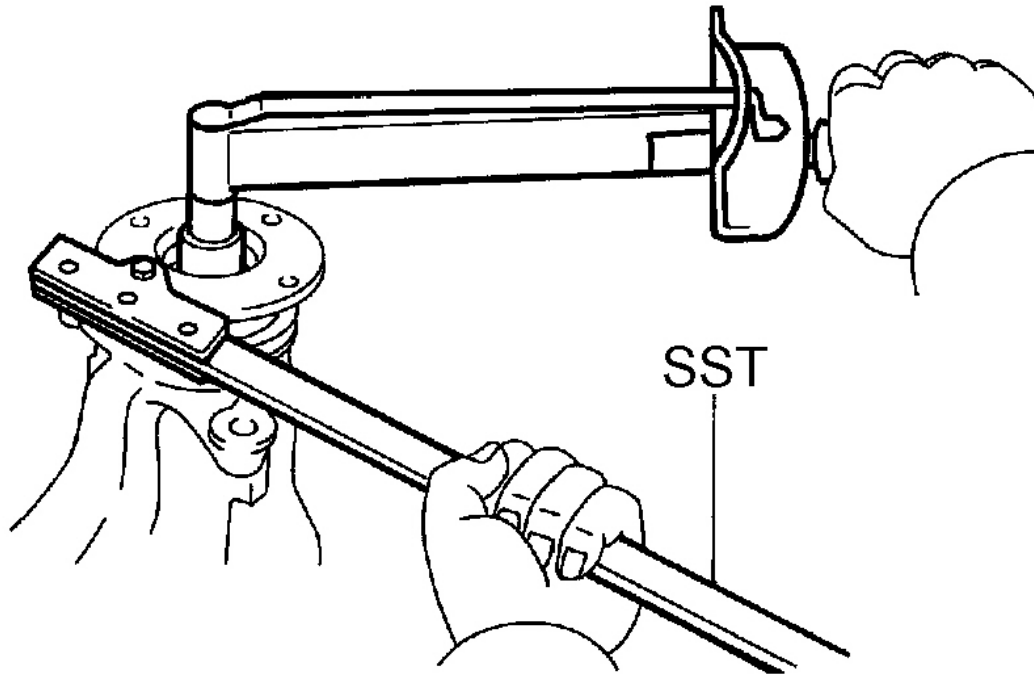
Fig. 56: Installing Companion Flange

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

- b. Coat the threads of a new nut with hypoid gear oil.
- c. Using SST to hold the flange, torque the nut.

SST 09330-00021

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



G02926151

Fig. 57: Holding Flange & Torquing Nut
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

19. CHECK DRIVE PINION PRELOAD

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

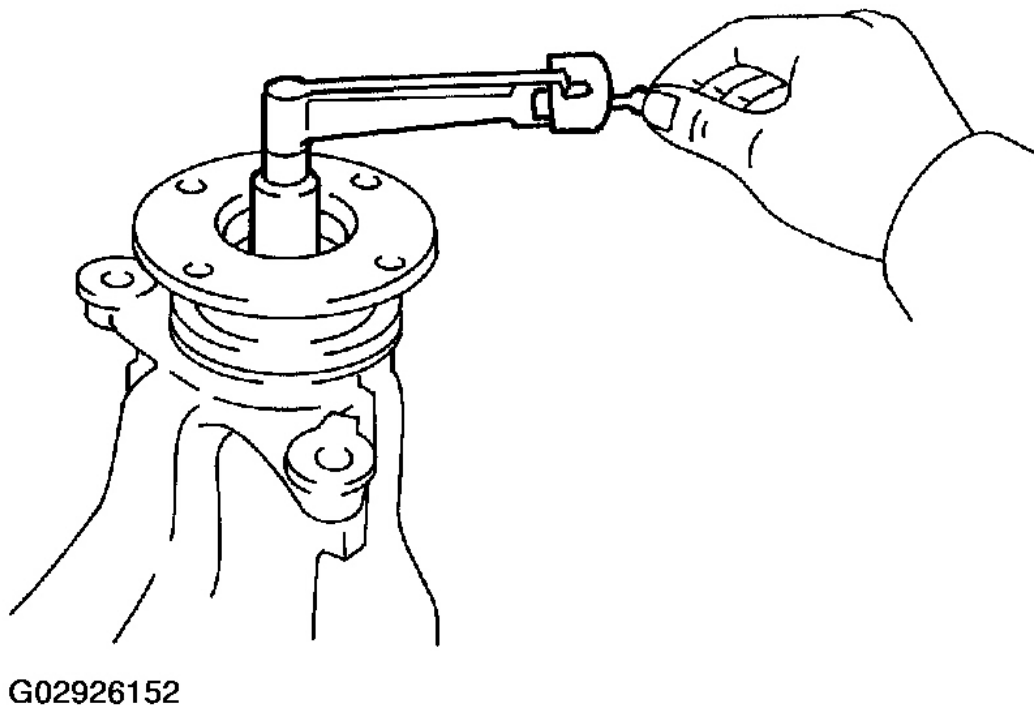


Fig. 58: Checking Drive Pinion Preload

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

Preload (at starting):

PRELOAD SPECIFICATIONS

New bearing	1.1 - 1.7 N.m (11 - 17 kgf.cm, 9.5 - 14.7 in.lbf)
Reused bearing	0.6 - 0.9 N.m (6 - 9 kgf.cm, 5.2 - 7.8 in.lbf)

If the preload is larger than the specification, replace the bearing spacer.

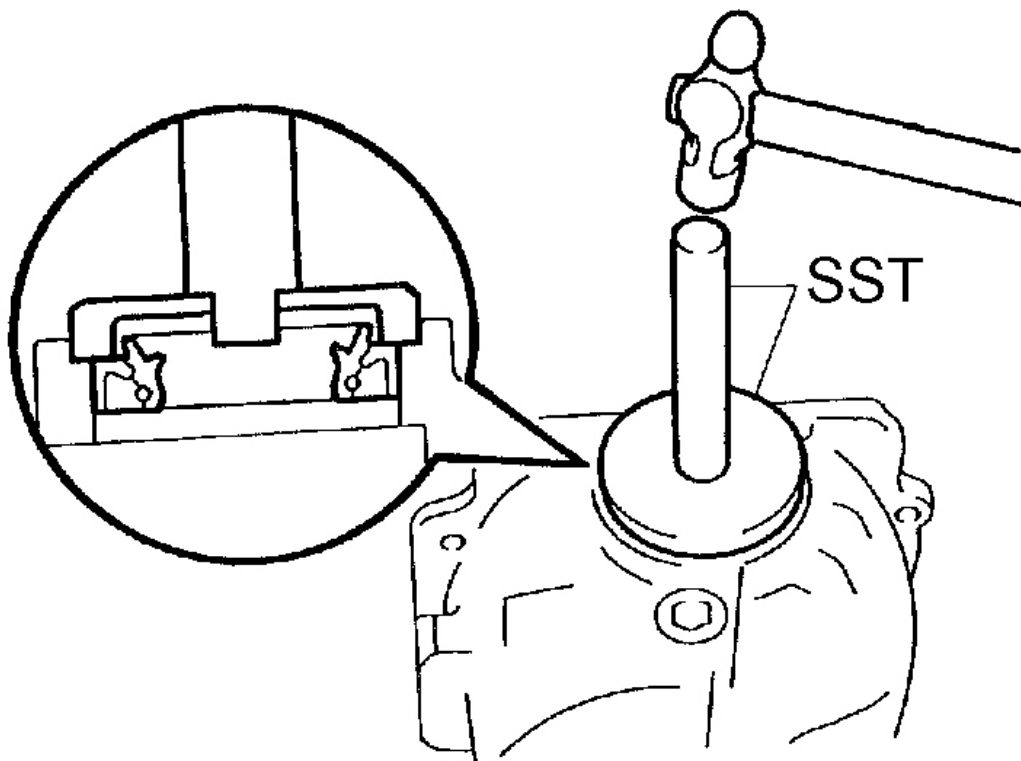
If the preload is less than the specification, retighten the nut 13 N.m (130 kgf.cm, 9 ft.lbf) of torque at a time until reaching the specified value.

Torque: 235 N.m (2,400 kgf.cm, 174 ft.lbf) or less

If the torque exceeds the maximum value while retighten the nut, replace the bearing spacer and repeat the preload procedure. Do not loosen the pinion nut to reduce the preload.

20. **RECHECK TOTAL PRELOAD (See DISASSEMBLY)**
21. **RECHECK RING GEAR BACKLASH (See DISASSEMBLY)**

22. **RECHECK TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION (See REASSEMBLY)**
 23. **CHECK COMPANION FLANGE RUNOUT (See DISASSEMBLY)**
 24. **STAKE DRIVE PINION NUT**
 25. **INSTALL SIDE GEAR SHAFT OIL SEALS**
 - a. Using SST and a hammer, install 2 oil seals until they are flush with the carrier end surface.
- SST 09550-00032, 09950-70010 (09951-07150)



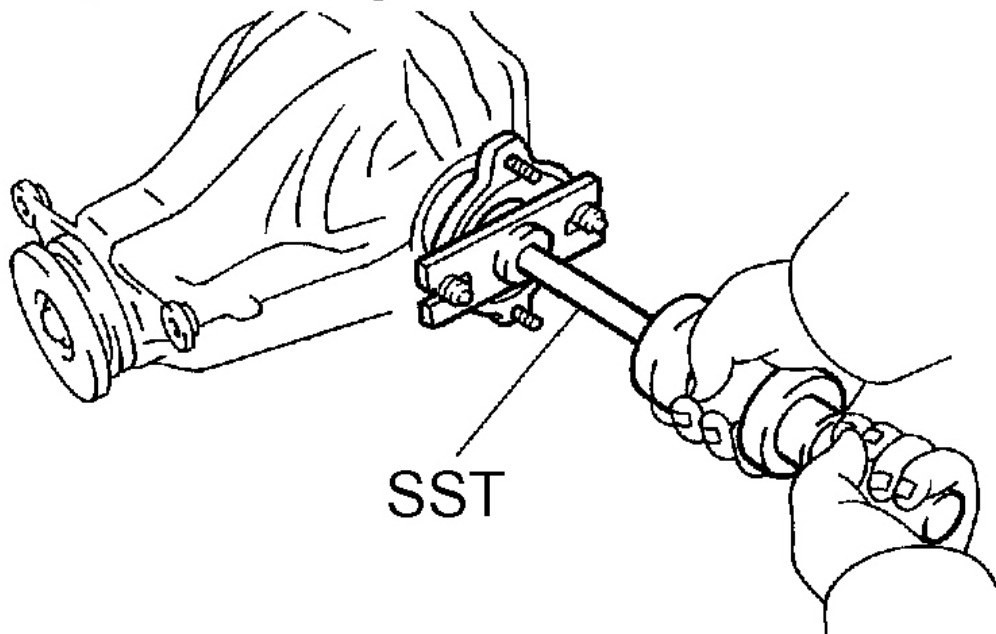
G02926153

Fig. 59: Installing Side Gear Shaft Oil Seals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Coat the oil seal lip with MP grease.
26. **Torque sensing LSD: INSTALL SIDE GEAR SHAFTS**
 - a. Install 2 new snap rings to the side gear shafts.
 - b. Using SST, install the 2 side gear shafts until they contacts the pinion shaft.

SST 09520-24010 (09520-04010, 09520-32040)

Torque Sensing LSD



G02926154

Fig. 60: Installing Side Gear Shafts (Torque Sensing LSD)

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

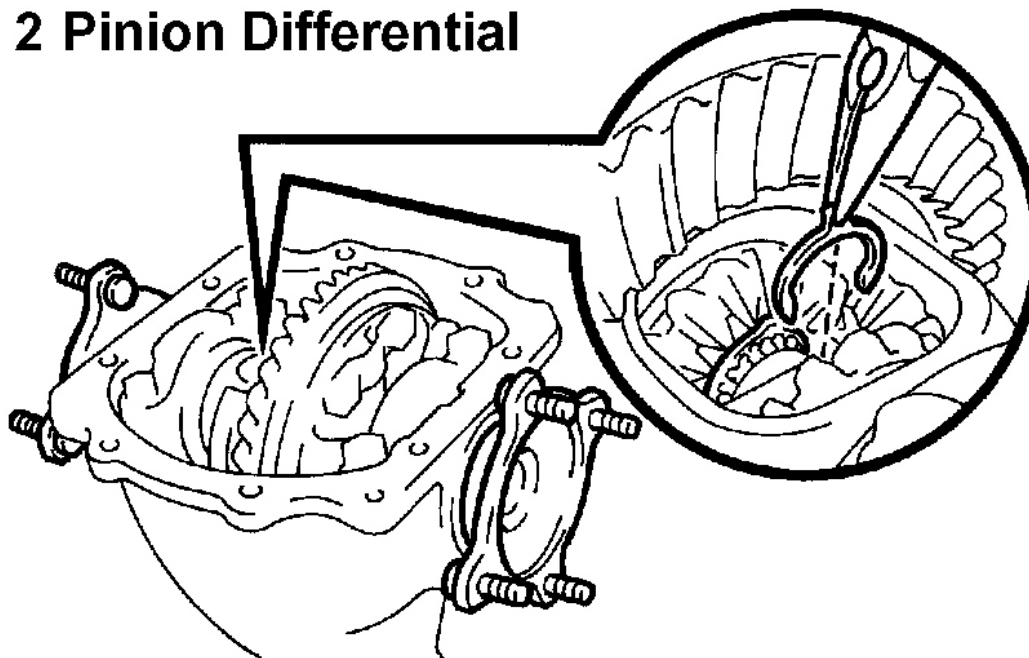
HINT:

Check that the shaft is fully inserted by the noise being made when it is tapped.

27. 2 pinion differential: INSTALL SIDE GEAR SHAFTS

- a. Install the 2 side gear shafts to the differential case.
- b. Using needle nose pliers, install 2 new snap rings to the 2 side gear shafts.

2 Pinion Differential



G02926155

Fig. 61: Installing Side Gear Shafts (2 Pinion Differential)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

28. INSTALL DIFFERENTIAL CARRIER COVER

- a. Torque sensing LSD:

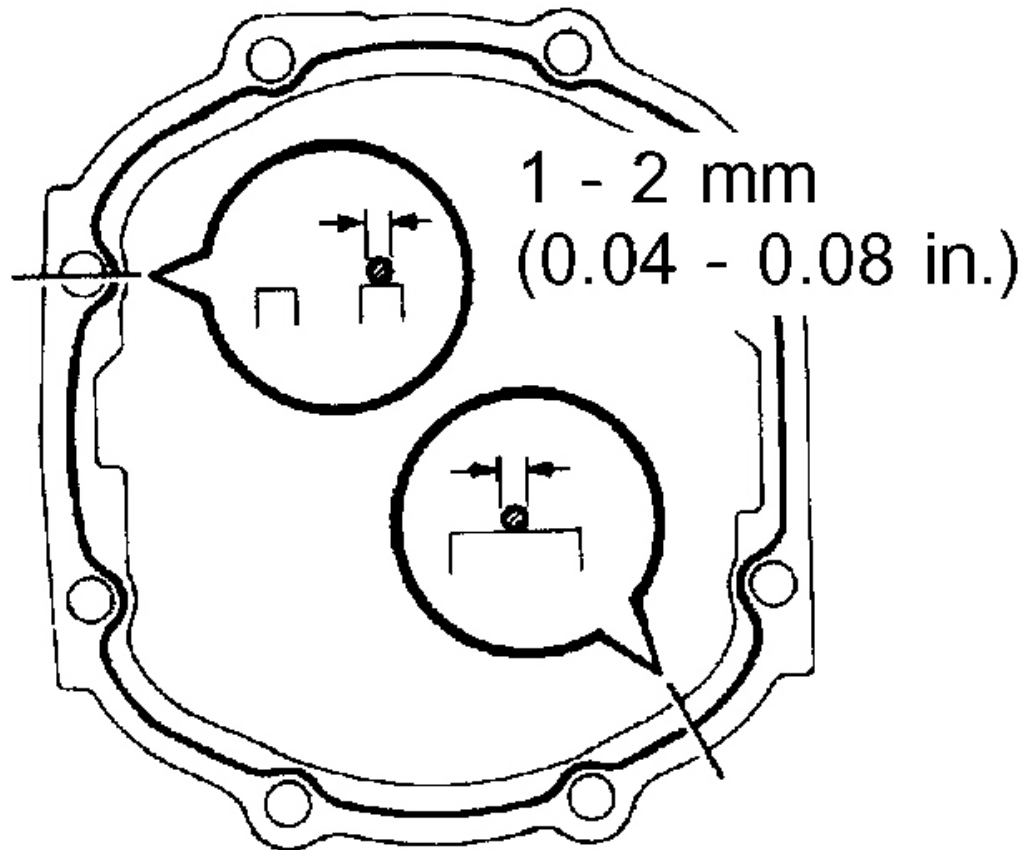
Install the oil deflector and bolt to the carrier cover.

Torque: 7.3 N.m (75 kgf.cm, 65 in.lbf)

- b. Install the breather plug to the carrier cover.

Torque: 21 N.m (210 kgf.cm, 15 ft.lbf)

- c. Clean contacting surfaces of any residual FIPG material by using gasoline or alcohol.
- d. Apply FIPG to the carrier.



G02926156

Fig. 62: Installing Differential Carrier Cover

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

FIPG:

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

HINT:

Install the carrier cover within 3 minutes after applying FIPG.

- e. Torque the 8 bolts.

Torque: 47 N.m (475 kgf.cm, 34 ft.lbf)

2004 Toyota RAV4

2004 DRIVELINE/AXLES Rear Differential Carrier (4WD) - RAV4

INSTALLATION

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

HINT:

After installation, fill the differential with differential oil (See REPLACE REAR DIFFERENTIAL OIL).