

FRONT DIFFERENTIAL CARRIER ASSEMBLY > REASSEMBLY

for Preparation [Click here](#)

1. INSTALL FRONT DIFFERENTIAL SIDE GEAR SHAFT BEARING RH

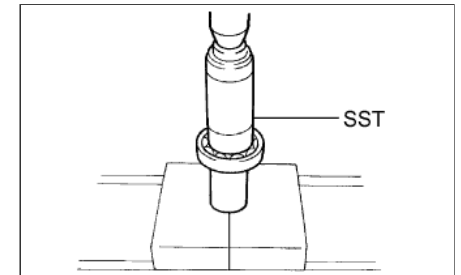
- a. Using SST and a press, press in the shaft bearing.

SST
09223-00010

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

HINT:

Install the snap ring securely.

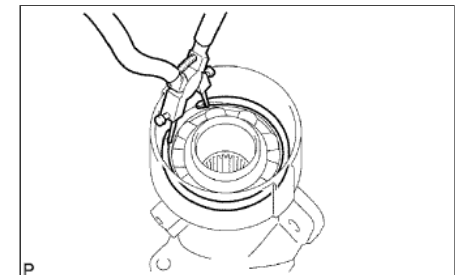


2. INSTALL DIFFERENTIAL SIDE GEAR SHAFT SUB-ASSEMBLY RH

- a. Install the shaft to the differential tube.
b. Using needle nose pliers, install the snap ring.

HINT:

Install the snap ring securely.



3. INSTALL DIFFERENTIAL SIDE GEAR SHAFT OIL SEAL

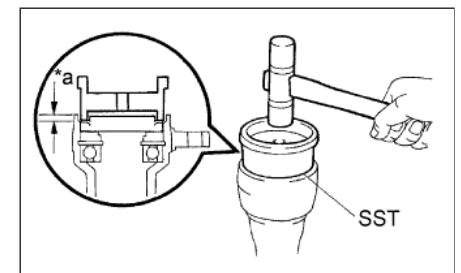
- a. Coat the lip of a new oil seal with MP grease.

Standard oil seal depth:
4.8 to 5.8 mm (0.189 to 0.228 in.)

Text in Illustration

*a	Oil Seal Depth
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- b. Using SST and a plastic-faced hammer, tap in the oil seal.

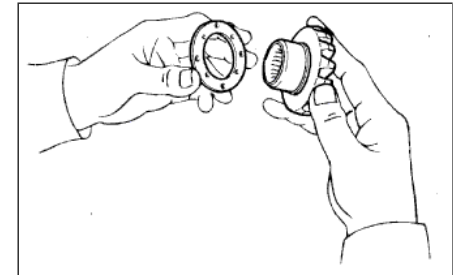


4. INSTALL DIFFERENTIAL CASE ASSEMBLY

a. Install the 2 thrust washers to the 2 side gears.

Standard Thrust Washer:

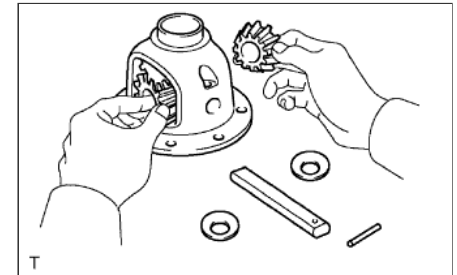
Thickness	Thickness
1.48 to 1.52 mm (0.0583 to 0.0598 in.)	1.73 to 1.77 mm (0.0681 to 0.0696 in.)
1.53 to 1.57 mm (0.0602 to 0.0618 in.)	1.78 to 1.82 mm (0.0701 to 0.0716 in.)
1.58 to 1.62 mm (0.0622 to 0.0637 in.)	1.83 to 1.87 mm (0.0720 to 0.0736 in.)
1.63 to 1.67 mm (0.0642 to 0.0657 in.)	1.88 to 1.92 mm (0.0740 to 0.0755 in.)
1.68 to 1.72 mm (0.0661 to 0.0677 in.)	-



b. Install the 2 side gears, 2 pinion gears, 2 side gear thrust washers, 2 pinion thrust washers and pinion shaft to the differential case.

HINT:

Align the holes of the differential case and pinion shaft.

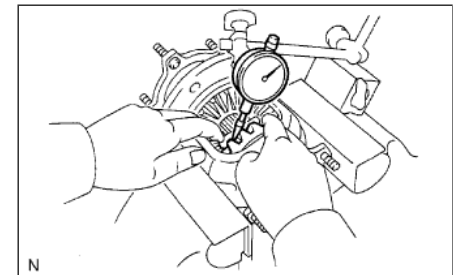


c. Measure the side gear backlash.

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

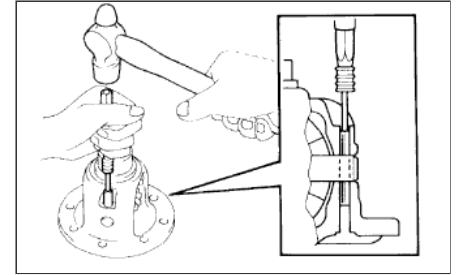
**Standard backlash:
0.15 mm (0.00591 in.) or less**

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



d. Using a 5 mm pin punch and hammer, tap in the straight pin through the differential case and hole of the pinion shaft.

e. Stake the differential case.



5. INSTALL DIFFERENTIAL RING GEAR

- Clean the contact surfaces of the differential case and ring gear.
- Heat the ring gear in water that is approximately 100°C (212°F).
- Carefully remove the ring gear from the boiling water.
- 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 with those of the differential case.

Text in Illustration

*1	Matchmark
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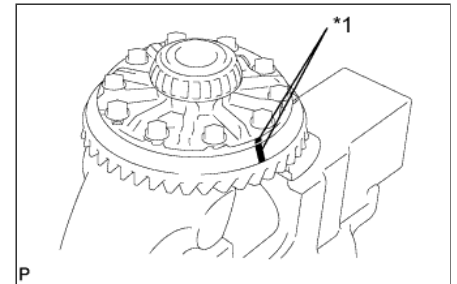
f. After the ring gear cools down, apply thread lock adhesive to the 10 set bolts and install them.

Adhesive:

Toyota Genuine Adhesive 1360K, Three Bond 1360K or equivalent

Torque:

115 N*m { 1173 kgf*cm , 85 ft.*lbf }



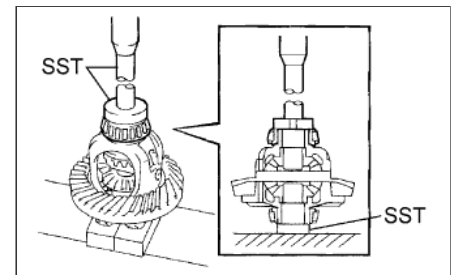
6. INSTALL FRONT DIFFERENTIAL CASE BEARING

a. Using SST and a press, press the 2 bearings (inner) into the differential case.

SST

09950-60010 (09951-00520, 09951-00610)

09950-70010 (09951-07150)



7. INSTALL FRONT DIFFERENTIAL CASE BEARING

HINT:

When replacing the 3 differential case bearings, install the 2 thinnest new washers onto each bearing. When reusing the bearings, install the new case washers to the same places they were removed from.

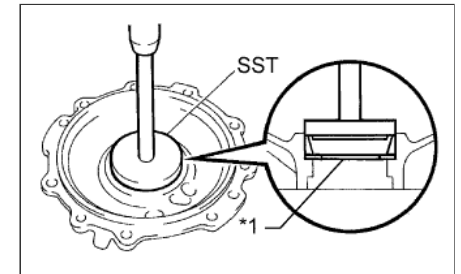
- a. Using SST and a press, press the case bearing (outer race) into the differential case bearing retainer.

SST

09950-60020 (09951-00810)
09950-70010 (09951-07150)

Text in Illustration

*1	Case Washer
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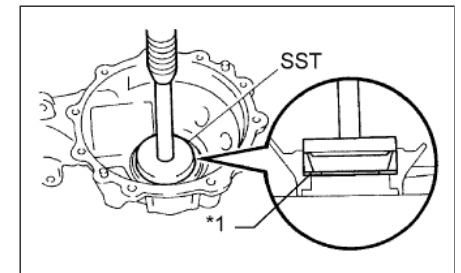
- b. Using SST and a press, press the case bearing (outer) into the differential carrier.

SST

09950-60020 (09951-00810)
09950-70010 (09951-07150)

Text in Illustration

*1	Case Washer
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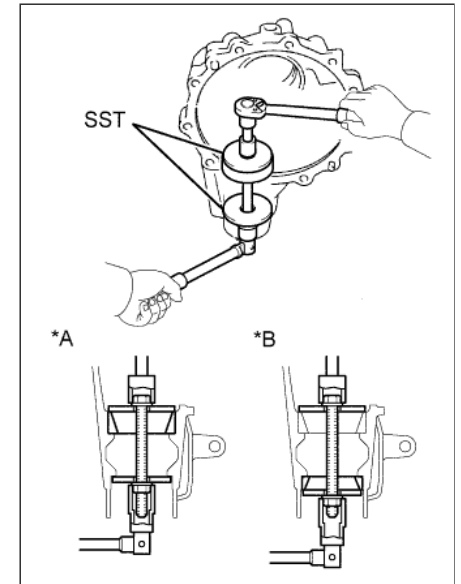


8. INSTALL FRONT DRIVE PINION REAR TAPERED ROLLER BEARING (OUTER)

- a. Using SST, install the front drive pinion rear tapered roller bearing (outer race).

SST

09950-60020 (09951-00720, 09951-00890)



9. INSTALL FRONT DRIVE PINION FRONT TAPERED ROLLER BEARING

- a. Using a brass bar and hammer, tap in the oil storage ring.
- b. Using SST, install the front drive pinion front tapered roller bearing (outer race).

SST
09950-60020 (09951-00720, 09951-00890)

Text in Illustration

*A	for Rear
*B	for Front

10. INSTALL FRONT DRIVE PINION FRONT TAPERED ROLLER BEARING

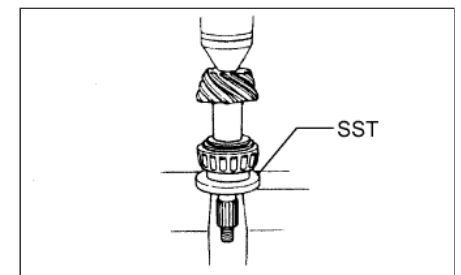
- a. Install the washer to the drive pinion.

HINT:

First, install a washer that has the same thickness as the removed washer, and then check the tooth contact pattern. Replace the washer with one of a different thickness if necessary.

- b. Using SST and a press, press the front bearing onto the drive pinion.

SST
09506-30012

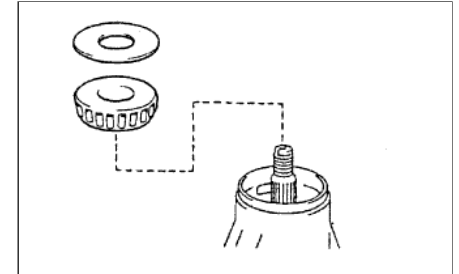


11. INSPECT DIFFERENTIAL DRIVE PINION PRELOAD

a. Install the drive pinion, roller bearing and oil slinger to the differential case.

HINT:

Install the spacer, oil storage ring and oil seal after adjusting the gear contact pattern.



b. Using SST, install the companion flange.

SST

09950-30012 (09951-03010, 09953-03010, 09954-03010, 09955-03030, 09956-03020)

Text in Illustration

*a	Turn
*b	Hold

NOTICE:

Before using SST (center bolt), apply hypoid gear oil to its threads and tip.

c. Adjust the drive pinion preload by tightening the companion flange nut.

d. Using SST to hold the flange in place, tighten the nut.

SST

09330-00021 (09330-00030)

Torque:

370 N*m{ 3773 kgf*cm , 273 ft.*lbf } or less

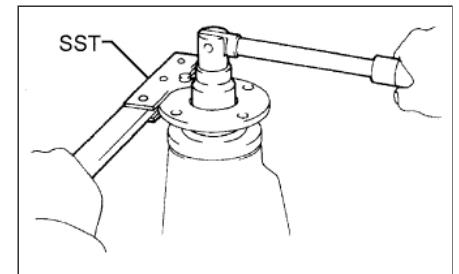
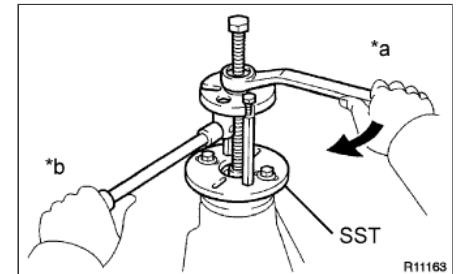
NOTICE:

- As there is no spacer, tighten the nut a little at a time. Be careful not to overtighten it.
- Apply hypoid gear oil LSD to the nut.

e. Using a torque wrench, measure the preload.

Standard Preload (at Starting):

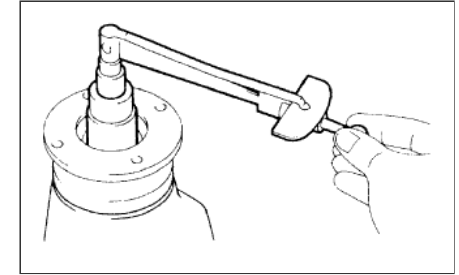
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Item	Specified Condition
New bearing	0.98 to 1.57 N*m (10 to 16 kgf*cm, 9 to 13 in.*lbf)
Used bearing	0.49 to 0.78 N*m (5 to 7 kgf*cm, 4.3 to 6 in.*lbf)

NOTICE:

For a more accurate measurement, rotate the bearing forward and backward several times before measuring.



12. INSTALL DIFFERENTIAL CASE ASSEMBLY

13. ADJUST DIFFERENTIAL RING GEAR BACKLASH

- a. Install the side bearing retainer with the 10 bolts.

Torque:

50 N*m { 510 kgf*cm , 37 ft.*lbf }

- b. Using SST and a dial indicator, measure the ring gear backlash.

SST

09564-32011

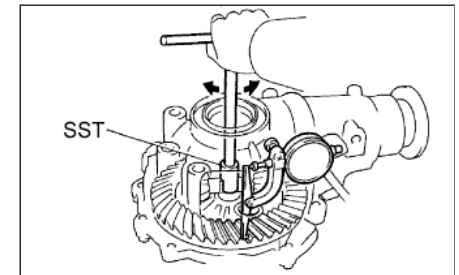
Standard backlash:

0.11 to 0.21 mm (0.00433 to 0.00826 in.)

If the backlash is not as specified, adjust it by either increasing or decreasing the number of washers on both sides equally.

HINT:

There should be no clearance between the plate washer and case. Make sure that the ring gear has backlash.



Standard Washer:

Thickness	Thickness	Thickness
1.57 to 1.59 mm (0.0618 to 0.0625 in.)	1.79 to 1.81 mm (0.0704 to 0.0712 in.)	2.01 to 2.03 mm (0.0791 to 0.0799 in.)
1.59 to 1.61 mm (0.0625 to 0.0633 in.)	1.81 to 1.83 mm (0.0712 to 0.0720 in.)	2.03 to 2.05 mm (0.0799 to 0.0807 in.)
1.61 to 1.63 mm (0.0633 to 0.0641 in.)	1.83 to 1.85 mm (0.0720 to 0.0728 in.)	2.05 to 2.07 mm (0.0807 to 0.0814 in.)
1.63 to 1.65 mm (0.0641 to 0.0649 in.)	1.85 to 1.87 mm (0.0728 to 0.0736 in.)	2.07 to 2.09 mm (0.0814 to 0.0822 in.)
1.65 to 1.67 mm (0.0649 to 0.0657 in.)	1.87 to 1.89 mm (0.0736 to 0.0744 in.)	2.09 to 2.11 mm (0.0822 to 0.0830 in.)
1.67 to 1.69 mm (0.0657 to 0.0665 in.)	1.89 to 1.91 mm (0.0744 to 0.0751 in.)	2.11 to 2.13 mm (0.0830 to 0.0838 in.)
1.69 to 1.71 mm (0.0665 to 0.0673 in.)	1.91 to 1.93 mm (0.0751 to 0.0759 in.)	2.13 to 2.15 mm (0.0838 to 0.0846 in.)
1.71 to 1.73 mm (0.0673 to 0.0681 in.)	1.93 to 1.95 mm (0.0759 to 0.0767 in.)	2.15 to 2.17 mm (0.0846 to 0.0854 in.)

1.73 to 1.75 mm (0.0681 to 0.0688 in.)	1.95 to 1.97 mm (0.0767 to 0.0776 in.)	-
1.75 to 1.77 mm (0.0688 to 0.0696 in.)	1.97 to 1.99 mm (0.0776 to 0.0783 in.)	-
1.77 to 1.79 mm (0.0696 to 0.0704 in.)	1.99 to 2.01 mm (0.0783 to 0.0791 in.)	-

14. INSPECT TOTAL PRELOAD

- a. Using a torque wrench, measure the preload with the teeth of the drive pinion and ring gear in contact.

Standard Total Preload (at Starting):

Item	Specified Condition
New bearing	1.2 to 2.45 N*m (13 to 24 kgf*cm, 11 to 21 in.*lbf)
Used bearing	0.71 to 1.66 N*m (8 to 16 kgf*cm, 7 to 14 in.*lbf)

If necessary, disassemble and inspect the differential.

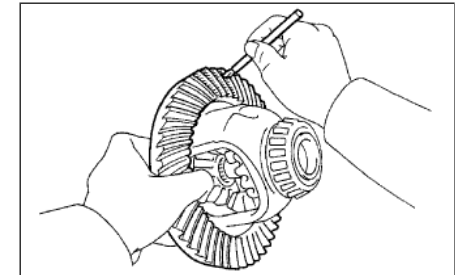
15. ADJUST TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION

- a. Remove the differential case bearing retainer and differential case.
- b. Coat 3 or 4 teeth at 3 different positions on the ring gear with Prussian blue.
- c. Install the differential case and differential case bearing retainer.

Torque:

50 N*m { 510 kgf*cm , 37 ft.*lbf }

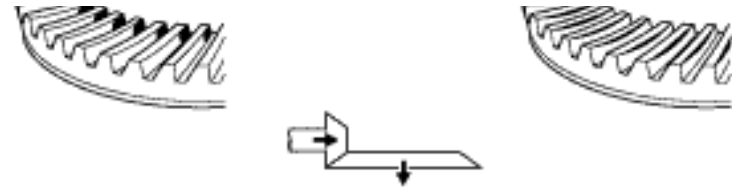
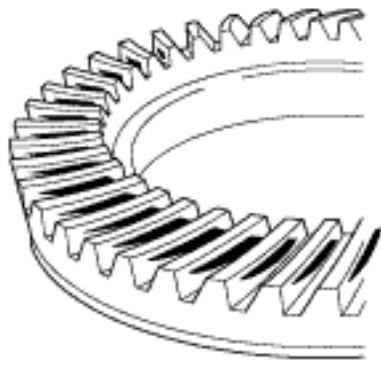
- d. Hold the companion flange firmly in place and rotate the ring gear in both directions.
- e. Remove the differential case bearing retainer and differential case.



- f. Inspect the tooth contact pattern.

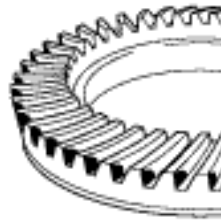


Proper Contact

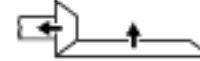
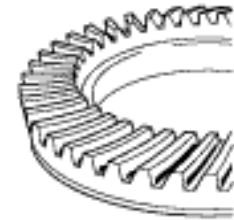


Select an adjusting washer that will shift the drive pinion closer to the ring gear.

Heel Contact



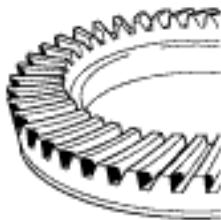
Flank Contact



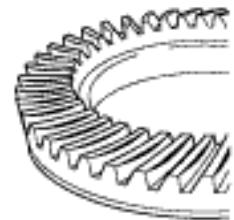
Select an adjusting washer that will shift the drive pinion away from the ring gear.

Coast Side

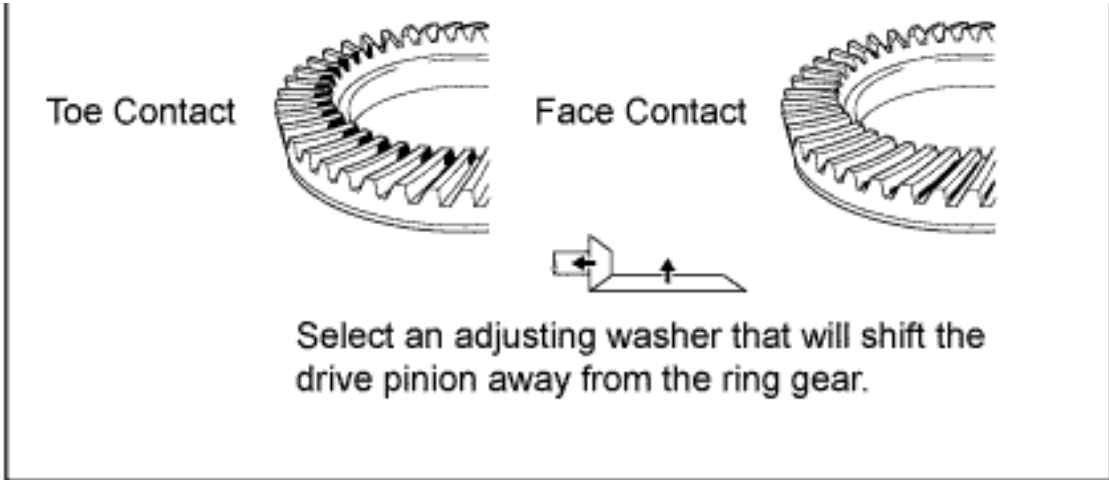
Heel Contact



Flank Contact



Select an adjusting washer that will shift the drive pinion closer to the ring gear.

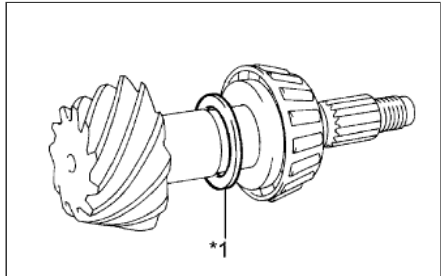


P

g. If the teeth are not contacting properly, use the following chart to select an appropriate washer.

Text in Illustration

*1	Drive Pinion Washer
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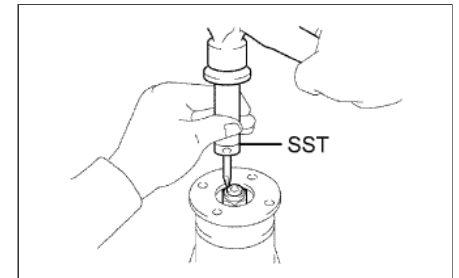
Standard Washer:

Thickness	Thickness	Thickness
1.69 to 1.71 mm (0.0665 to 0.0673 in.)	1.93 to 1.95 mm (0.0760 to 0.0767 in.)	2.17 to 2.19 mm (0.0854 to 0.0862 in.)
1.72 to 1.74 mm (0.0677 to 0.0685 in.)	1.96 to 1.98 mm (0.0772 to 0.0779 in.)	2.20 to 2.22 mm (0.0866 to 0.0874 in.)
1.75 to 1.77 mm (0.0689 to 0.0696 in.)	1.99 to 2.01 mm (0.0783 to 0.0791 in.)	2.23 to 2.25 mm (0.0878 to 0.0885 in.)
1.78 to 1.80 mm (0.0700 to 0.0708 in.)	2.02 to 2.04 mm (0.0795 to 0.0803 in.)	2.26 to 2.28 mm (0.0890 to 0.0897 in.)
1.81 to 1.83 mm (0.0713 to 0.0720 in.)	2.05 to 2.07 mm (0.0807 to 0.0814 in.)	2.29 to 2.31 mm (0.0902 to 0.0909 in.)
1.84 to 1.86 mm (0.0724 to 0.0732 in.)	2.08 to 2.10 mm (0.0819 to 0.0826 in.)	2.32 to 2.34 mm (0.0913 to 0.0921 in.)
1.87 to 1.89 mm (0.0736 to 0.0744 in.)	2.11 to 2.13 mm (0.0831 to 0.0838 in.)	-
1.90 to 1.92 mm (0.0748 to 0.0755 in.)	2.14 to 2.16 mm (0.0843 to 0.0850 in.)	-

16. REMOVE FRONT DRIVE PINION COMPANION FLANGE NUT

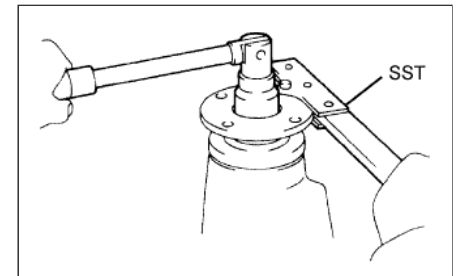
- a. Using SST and a hammer, unstake the nut.

SST
09930-00010



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

SST
09330-00021 (09330-00030)



17. REMOVE FRONT DRIVE PINION COMPANION FLANGE SUB-ASSEMBLY

- a. Using SST, remove the companion flange.

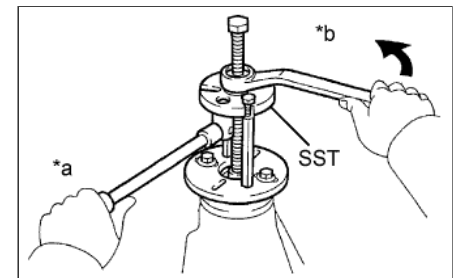
SST
09950-30012 (09951-03010, 09953-03010, 09954-03010, 09955-03030, 09956-03020)

Text in Illustration

*a	Hold
*b	Turn

NOTICE:

Before using SST (center bolt), apply hypoid gear oil to its threads and tip.



18. REMOVE FRONT DIFFERENTIAL DRIVE PINION OIL SLINGER

19. REMOVE FRONT DRIVE PINION REAR TAPERED ROLLER BEARING (INNER)

- a. Using SST and a press, remove the rear tapered roller bearing (inner) and washer from the drive pinion.

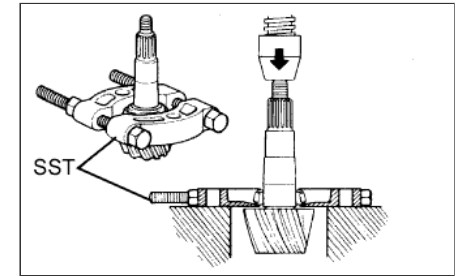
SST
09950-00020

NOTICE:

Do not drop the drive pinion.

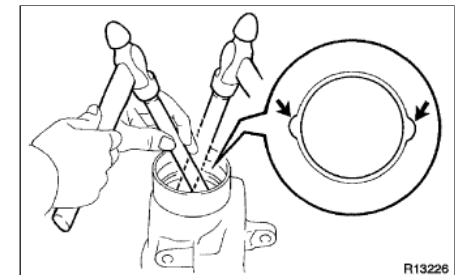
HINT:

If the drive gear or ring gear is damaged, replace them as a set.



20. REMOVE FRONT DRIVE PINION REAR TAPERED ROLLER BEARING (OUTER)

- a. Using a brass bar and hammer, remove the rear tapered roller bearing (outer).



21. INSTALL FRONT DIFFERENTIAL DRIVE PINION BEARING SPACER

- a. Install the bearing spacer.

22. INSTALL FRONT DIFFERENTIAL OIL STORAGE RING

- a. Using a brass bar and hammer, tap in a new oil storage ring.

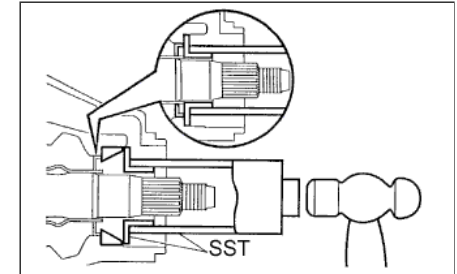
NOTICE:

Be careful not to damage the oil storage ring.

23. INSTALL FRONT DRIVE PINION REAR TAPERED ROLLER BEARING (OUTER)

- a. Using SST and a hammer, install the roller bearing (outer).

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



24. INSTALL FRONT DRIVE PINION REAR TAPERED ROLLER BEARING (INNER)

- a. Install the roller bearing (inner).

25. INSTALL FRONT DIFFERENTIAL DRIVE PINION OIL SLINGER

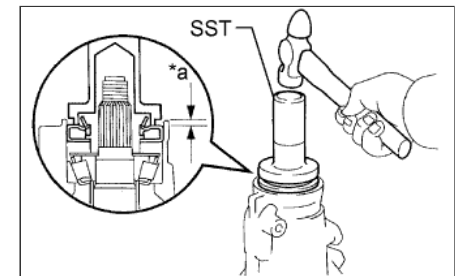
26. INSTALL FRONT DIFFERENTIAL CARRIER OIL SEAL

- a. Apply MP grease to the lip of a new oil seal.
- b. Using SST and a hammer, tap in the oil seal.

SST
09554-22010

Standard oil seal depth:
3.9 to 4.8 mm (0.154 to 0.188 in.)

*a	Oil Seal Depth
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27. INSTALL FRONT DIFFERENTIAL DUST DEFLECTOR

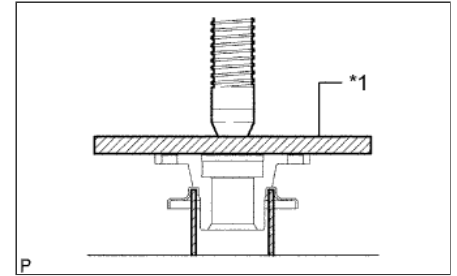
- a. Using a steel plate and press, press in a new dust deflector.

Text in Illustration

*1	Steel Plate
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NOTICE:

Do not damage the dust deflector.



28. INSTALL FRONT DRIVE PINION COMPANION FLANGE SUB-ASSEMBLY

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

SST

09950-30012 (09951-03010, 09953-03010, 09954-03010, 09955-03030, 09956-03020)

NOTICE:

Before using SST (center bolt), apply hypoid gear oil to its threads and tip.

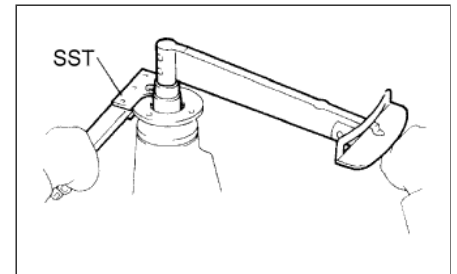
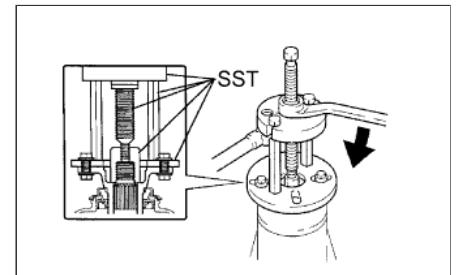
- c. Coat the threads of a new nut with hypoid gear oil LSD.
- d. Using SST to hold the companion flange in place, tighten the nut to the correct torque.

SST

09330-00021 (09330-00030)

Torque:

370 N*m{ 3773 kgf*cm , 273 ft.*lbf } or less



29. INSTALL DIFFERENTIAL SIDE BEARING RETAINER

- a. Remove any old FIPG material from the side bearing retainer.

NOTICE:

Do not drop oil on the contact surfaces of the differential carrier and side bearing retainer.

- b. Wipe off any residual FIPG material on the contact surface using gasoline or alcohol.

c. Apply seal packing to the side bearing retainer as shown in the illustration.

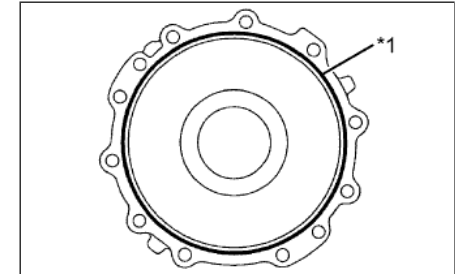
Seal packing:
Toyota Genuine Seal Packing 1281, Three Bond 1281 or equivalent

Text in Illustration

*1	Seal Packing
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HINT:

Install the side bearing retainer within 10 minutes of applying seal packing.



d. Install the side bearing retainer with the 10 bolts.

Torque:
50 N*m{ 510 kgf*cm , 37 ft.*lbf }

30. INSPECT DRIVE PINION PRELOAD

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

Standard Preload (at Starting):

Item	Specified Condition
New bearing	0.98 to 1.57 N*m (10 to 16 kgf*cm, 9 to 13 in.*lbf)
Used bearing	0.49 to 0.78 N*m (5 to 7 kgf*cm, 4.3 to 6 in.*lbf)

If the result not as specified, replace the bearing spacer.

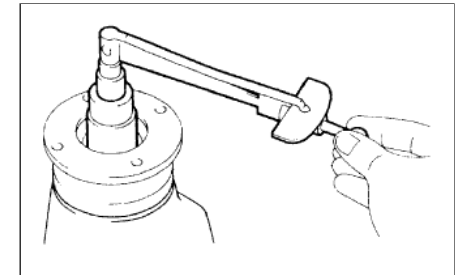
If the preload is less than the minimum, retighten the nut with 13 N*m (130 kgf*cm, 9 ft.*lbf) of torque at a time until the specified preload is reached.

Torque:
370 N*m{ 3773 kgf*cm , 273 ft.*lbf } or less

If the maximum torque is exceeded while retightening the nut, replace the bearing spacer and repeat the preload adjusting procedure.

HINT:

Do not loosen the pinion nut to reduce the preload.



31. INSPECT TOTAL PRELOAD

a. Using a torque wrench, measure the preload with the teeth of the drive pinion and ring gear in contact.

Standard Total Preload (at Starting):

Item	Specified Condition
New bearing	1.2 to 2.45 N*m (13 to 24 kgf*cm, 11 to 21 in.*lbf)

Used bearing	0.71 to 1.66 N*m (8 to 16 kgf*cm, 7 to 14 in.*lbf)
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If necessary, disassemble and inspect the differential.

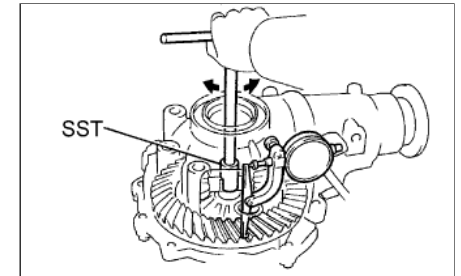
32. INSPECT DIFFERENTIAL RING GEAR BACKLASH

- a. Using SST and a dial indicator, measure the ring gear backlash.

SST
09564-32011

Standard backlash:
0.11 to 0.21 mm (0.0043 to 0.00826 in.)

If the backlash is not within the specification, adjust the side bearing preload.



33. INSPECT FRONT DRIVE PINION COMPANION FLANGE SUB-ASSEMBLY

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

Distance from center to runout measurement point:
30 mm (1.18 in.)

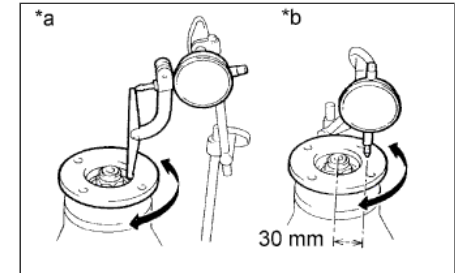
Maximum Runout:

Item	Specified Condition
Vertical runout	0.15 mm (0.00591 in.)
Lateral runout	0.15 mm (0.00591 in.)

Text in Illustration

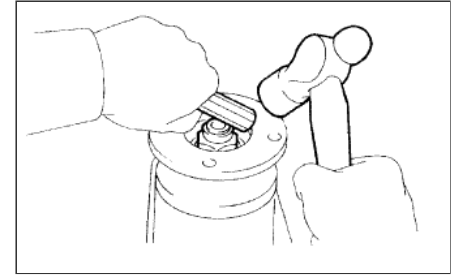
*a	Vertical runout
*b	Lateral runout

If the runout is more than the maximum, replace the companion flange.



34. STAKE FRONT DRIVE PINION COMPANION FLANGE NUT

- a. Using a chisel and hammer, stake the drive pinion nut.

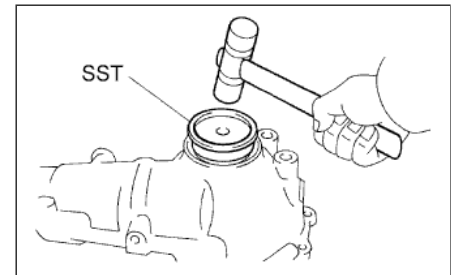


35. INSTALL DIFFERENTIAL SIDE GEAR SHAFT OIL SEAL

- a. Coat the lip of a new oil seal with MP grease.
- b. Using SST and a plastic-faced hammer, tap in the oil seal until its surface is flush with the differential carrier end.

SST
09608-32010

Standard oil seal depth:
-0.45 to 0.45 mm (-0.0177 to 0.0177 in.)

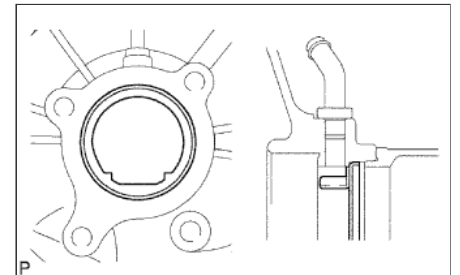


36. INSTALL FRONT DIFFERENTIAL SIDE BEARING RETAINER DEFLECTOR

- a. Using a brass bar and hammer, tap in the side bearing retainer deflector.

NOTICE:

Install the side bearing retainer deflector so that it is facing in the correct direction.



37. INSTALL FRONT DIFFERENTIAL TUBE ASSEMBLY

- a. Remove any old FIPG material from the contact surfaces of the differential and clutch case.

NOTICE:

Do not drop oil on the contact surfaces of the differential and clutch case.

- b. Wipe off any residual FIPG material on the contact surface using gasoline or alcohol.

c. Apply seal packing to the differential as shown in the illustration.

Seal packing:

Toyota Genuine Seal Packing 1281, Three Bond 1281 or equivalent

Text in Illustration

*1	Seal Packing
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HINT:

Install the differential tube within 10 minutes of applying seal packing.

d. Install the differential tube to the differential.

e. Clean the threads of the 4 bolts and retainer bolt holes with toluene or trichloroethylene.

f. Apply adhesive to 2 or 3 threads at the tip of each bolt.

Adhesive:

Toyota Genuine Adhesive 1324, Three Bond 1324 or equivalent

g. Using an E14 "TORX" socket wrench, install the 4 bolts.

Torque:

110 N*m { 1122 kgf*cm , 81 ft.*lbf }

