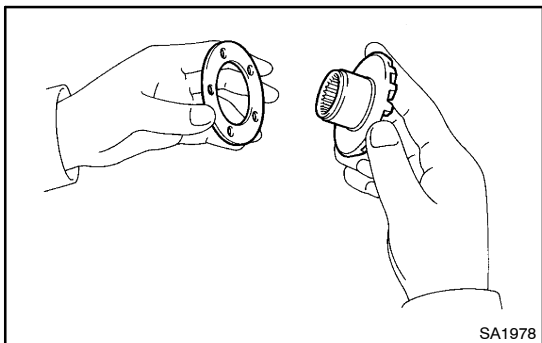


## REASSEMBLY

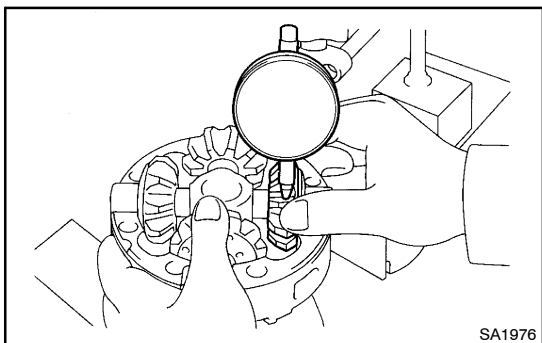
### HINT:

- Using a shop rag, clean off any foreign object from the parts.
- Apply all of the sliding and rotating surfaces with hypoid gear oil.



### 1. MEASURE SIDE GEAR BACKLASH AND ASSEMBLE DIFFERENTIAL CASE

- Install the 2 side gear thrust washers to the side gears.
- Install the 2 side gears to the RH case.
- Install the 4 pinion gears and pinion gear thrust washers to the spider.
- Install the pinion gears with the spider to the RH case.



- Using a dial indicator, holding the side gear and spider, measure the side gear backlash,  
**Backlash: 0.05 – 0.20 mm (0.0020 – 0.0079 in.)**

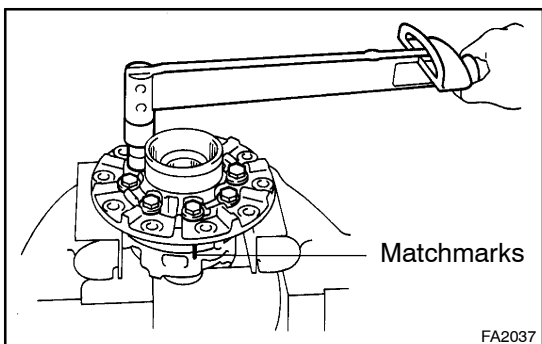
### HINT:

- Measure at all 4 locations.
- Measure the backlash at the RH case and at the LH case.

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

### Thrust washer thickness

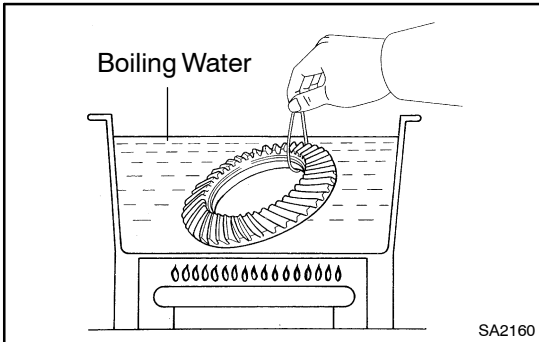
| Thickness mm (in.) | Thickness mm (in.) |
|--------------------|--------------------|
| 0.9 (0.035)        | 1.2 (0.047)        |
| 1.0 (0.039)        | 1.3 (0.051)        |
| 1.1 (0.043)        | –                  |



- Align the matchmarks on the LH and RH cases.
- Torque the 8 bolts uniformly a little at a time.  
**Torque: 47 N·m (480 kgf·cm, 35 ft·lbf)**

## 2. INSTALL RING GEAR ON DIFFERENTIAL CASE

- (a) Clean the contact surfaces of the differential case and ring gear.



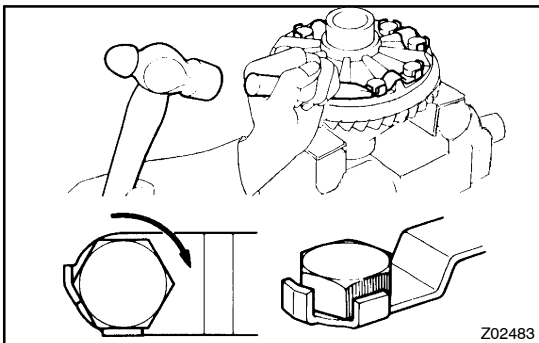
- (b) Heat the ring gear to approx. 100°C (212°F) in boiling water.
- (c) Carefully take the ring gear out of the boiling water.
- (d) After the moisture on the ring gear has completely evaporated, quickly install the ring gear to the differential case.

HINT:

Align the matchmarks on the ring gear and differential case.

- (e) Temporarily install 5 new lock plates and 10 bolts so that the bolt holes in the ring gear and differential case are not misaligned.
- (f) After the ring gear has cooled sufficiently, torque the 10 ring gear set bolts.

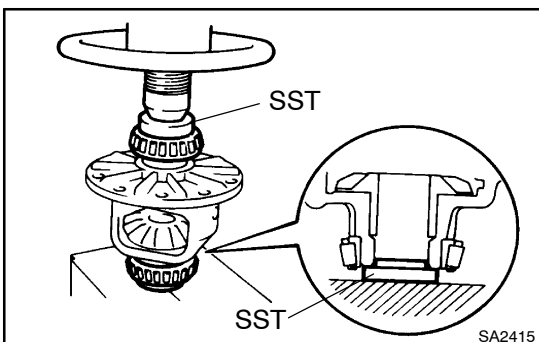
**Torque: 97 N·m (985 kgf·cm, 71 ft·lbf)**



- (g) Using a chisel and hammer, stake the 5 lock plates.

HINT:

Stake the claws of the lock plates to fix the bolts. For the claw contacting the protruding portion of the bolt, stake only the half of it along the tightening direction.



## 3. INSTALL SIDE BEARINGS

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

SST 09223-15020, 09950-60010 (09951-00480)

**4. CHECK RING GEAR RUNOUT**

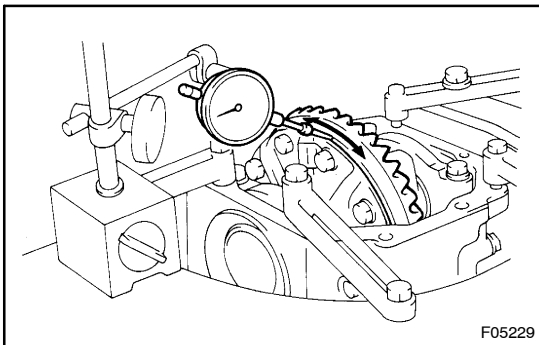
- (a) Place the bearing outer races on their respective bearings. Check that the left and right outer races are not interchanged.
- (b) Install the assembled plate washers onto the side bearing.
- (c) Install the differential case in the differential carrier.

**HINT:**

If it is difficult to install the differential case into the carrier, replace the plate washer with a thinner one.

However, select a plate washer that allows no clearance between it and the carrier.

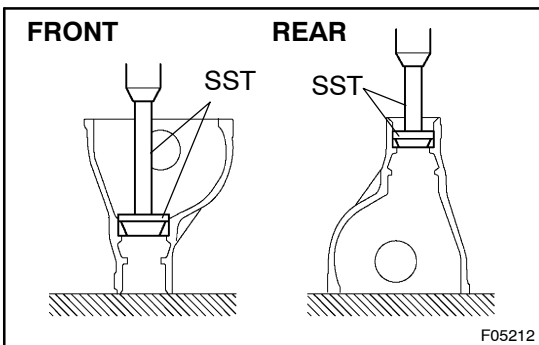
- (d) Align matchmarks on the bearing cap and differential carrier.
- (e) Install and uniformly tighten the 4 bolts a little at a time.



- (f) Using a dial indicator, measure the ring gear runout.

**Maximum runout: 0.07 mm (0.0028 in.)**

- (g) Remove the differential carrier.

**5. INSTALL DRIVE PINION FRONT AND REAR BEARING OUTER RACES**

- (a) Using SST and a press, install the front bearing outer race.

SST 09950-60020 (09951-00780), 09950-70010 (09951-07150)

- (b) Using SST and a press, install the rear bearing outer race.

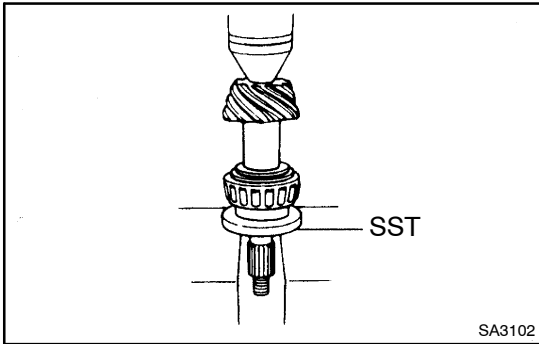
SST 09950-60020 (09951-00710), 09950-70010 (09951-07150)

**6. INSTALL DRIVE PINION FRONT BEARING**

- (a) Install the washer on the drive pinion.

**HINT:**

First fit a washer with the same thickness as the washer which was removed, then after checking the tooth contact pattern, replace the washer with one of a different thickness if necessary.



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

SST 09506-30012

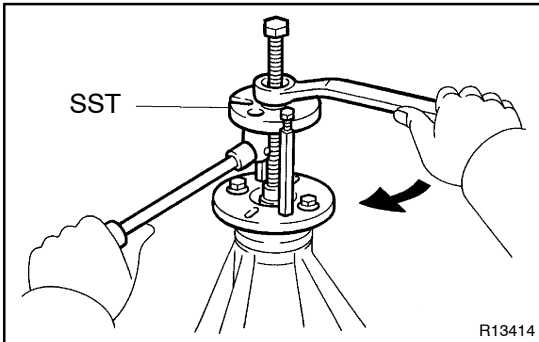
## 7. TEMPORARILY ADJUST DRIVE PINION PRELOAD

- (a) Install the drive pinion and rear bearing.

HINT:

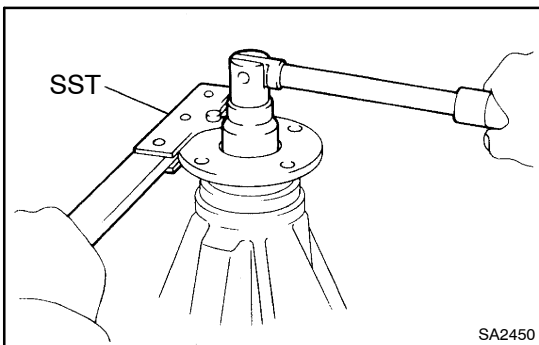
Assemble the spacer and oil seal after adjusting the gear contact pattern.

- (b) Install the oil slinger.



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

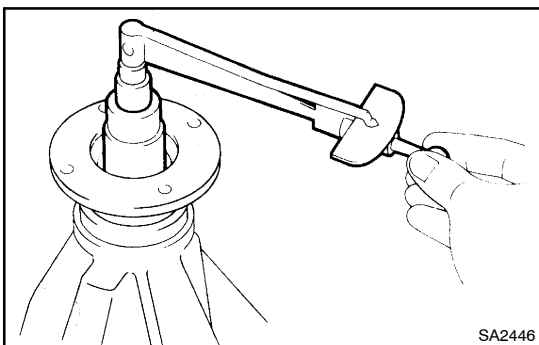
SST 09950-30010, (09951-03010, 09953-03010, 09954-03010, 09955-03030, 09956-03020)



- (d) Using SST to hold the flange and adjust the drive pinion preload by tightening the nut.

**NOTICE:**

- Coat the nut and threads of the drive pinion with gear oil.
- As there is no spacer, tighten the nut a little at a time, being careful not to overtighten.



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

**Preload (at starting):**

**New bearing**

**1.0 – 1.6 N·m (10 – 16 kgf·cm, 8.7 – 13.9 in.·lbf)**

**Reused bearing**

**0.5 – 0.8 N·m (5 – 8 kgf·cm, 4.3 – 6.9 in.·lbf)**

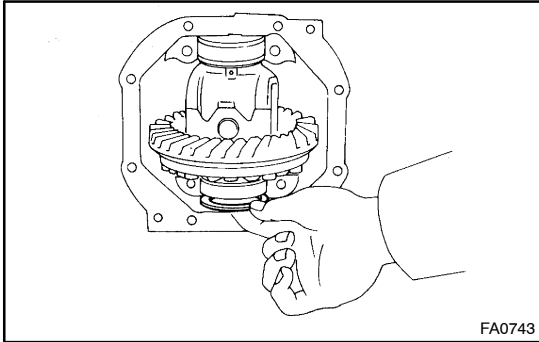
HINT:

Measure the total preload after turning the bearing clockwise and counterclockwise several times to make the bearing smooth.

## 8. INSTALL DIFFERENTIAL CASE IN DIFFERENTIAL CARRIER

- (a) Place the bearing outer races on their respective bearings. Check that the left and right outer races are not interchanged.

- (b) Install the differential case in the differential carrier.

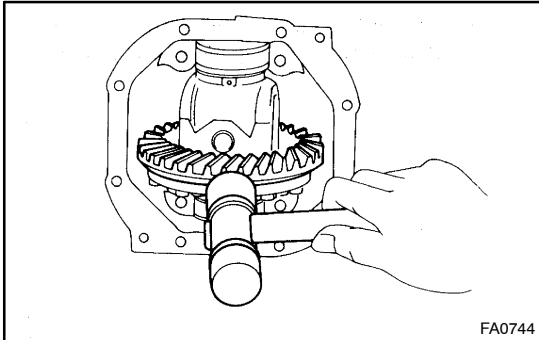


## 9. ADJUST RING GEAR BACKLASH

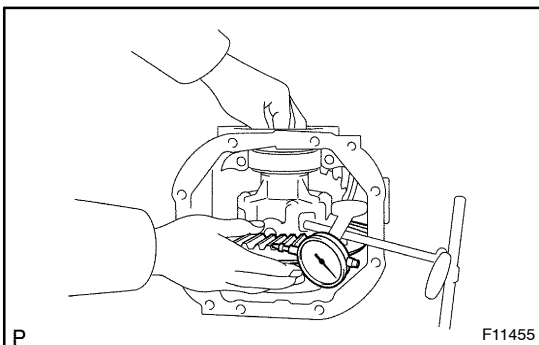
(a) Install the plate washer on the ring gear back side.

HINT:

Make sure that the ring gear has backlash.

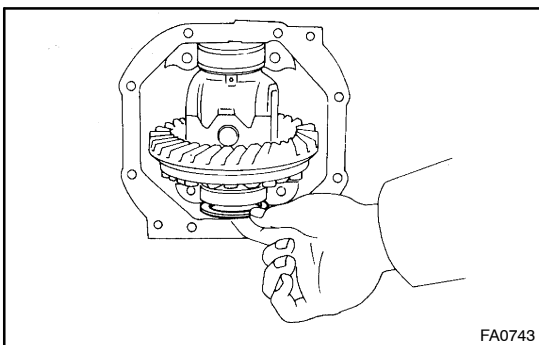


(b) Tap on the ring gear with a plastic hammer so that the washer fits to the bearing.



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

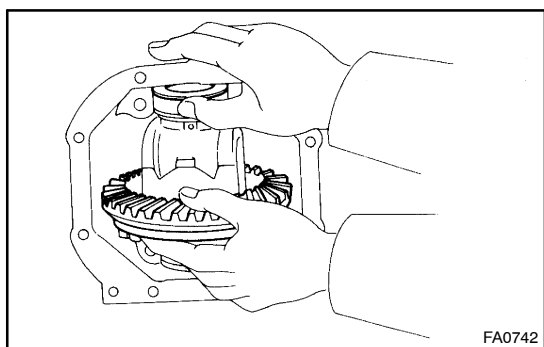
**Backlash (Reference): 0.13 mm (0.0051 in.)**



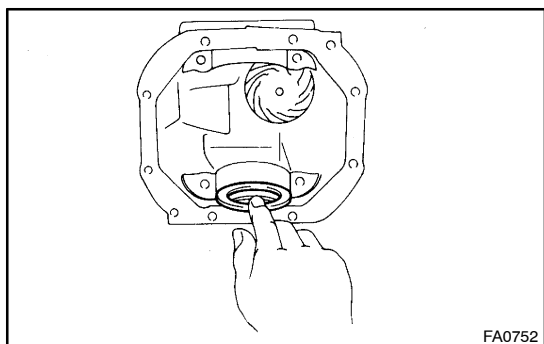
(d) Select a plate washer for back side ring gear, using the backlash as reference.

## Side plate washer thickness

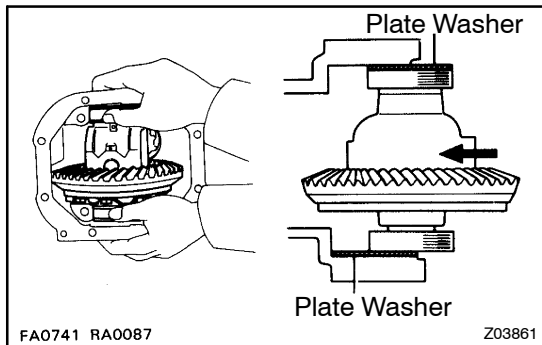
| Thickness mm (in.) | Thickness mm (in.) |
|--------------------|--------------------|
| 2.58 (0.1016)      | 3.04 (0.1197)      |
| 2.60 (0.1024)      | 3.06 (0.1205)      |
| 2.62 (0.1031)      | 3.08 (0.1213)      |
| 2.64 (0.1039)      | 3.10 (0.1220)      |
| 2.66 (0.1047)      | 3.12 (0.1228)      |
| 2.68 (0.1055)      | 3.14 (0.1236)      |
| 2.70 (0.1063)      | 3.16 (0.1244)      |
| 2.72 (0.1071)      | 3.18 (0.1252)      |
| 2.74 (0.1079)      | 3.20 (0.1260)      |
| 2.76 (0.1087)      | 3.22 (0.1268)      |
| 2.78 (0.1094)      | 3.24 (0.1276)      |
| 2.80 (0.1102)      | 3.26 (0.1283)      |
| 2.82 (0.1110)      | 3.28 (0.1291)      |
| 2.84 (0.1118)      | 3.30 (0.1299)      |
| 2.86 (0.1126)      | 3.32 (0.1307)      |
| 2.88 (0.1134)      | 3.34 (0.1315)      |
| 2.90 (0.1142)      | 3.36 (0.1323)      |
| 2.92 (0.1150)      | 3.38 (0.1331)      |
| 2.94 (0.1157)      | 3.40 (0.1339)      |
| 2.96 (0.1165)      | 3.42 (0.1346)      |
| 2.98 (0.1173)      | 3.44 (0.1354)      |
| 3.00 (0.1181)      | 3.46 (0.1362)      |
| 3.02 (0.1189)      | 3.48 (0.1370)      |



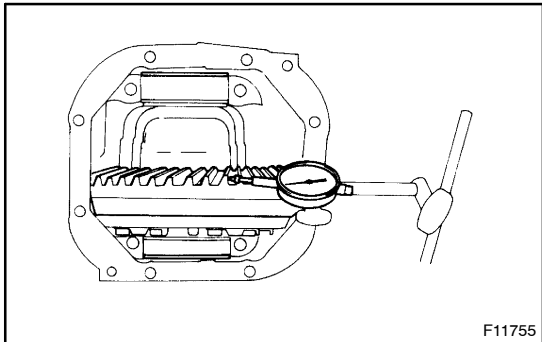
- (e) Select a ring gear teeth side plate washer so that is no clearance between the outer race and case.



- (f) Remove the plate washers and differential case.  
 (g) Install the plate washer into the ring gear back side of the carrier.



- (h) Place the other plate washer onto the differential case together with the outer race, and install the differential case with the outer race into the carrier.
- (i) Tap on the ring gear with a plastic hammer so that the washers fit to the bearing.



- (j) Using a dial indicator, measure the ring gear backlash.

**Backlash: 0.13 – 0.18 mm (0.0051 – 0.0070 in.)**

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

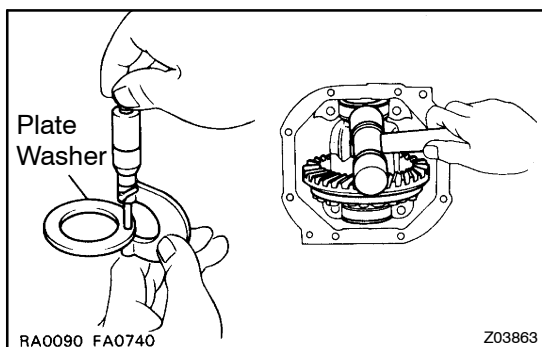
**HINT:**

There should be no clearance between the plate washer and case.

Make sure that there is ring gear backlash.

#### 10. ADJUST SIDE BEARING PRELOAD

- (a) Remove the ring gear teeth side plate washer and measure the thickness.



- (b) Using the backlash as a reference, install a new washer of 0.06 – 0.09 mm (0.0024 – 0.0035 in.) thicker than the washer removed.

**HINT:**

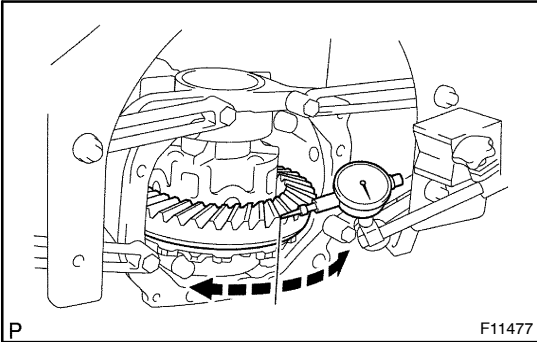
Select a washer which can be pressed in 2/3 of the way with your finger.

- (c) Using a plastic hammer, install the plate washer.
- (d) Align matchmarks on the bearing cap and differential carrier.
- (e) Tighten the 4 bolts.

**Torque: 85 N·m (870 kgf·cm, 63 ft·lbf)**

**HINT:**

Turn the ring gear several times to make the side bearings smooth.



- (f) Using a dial indicator, adjust the ring gear backlash until it is within the specification.

**Backlash: 0.13 – 0.18 mm (0.0051 – 0.0070 in.)**

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

**HINT:**

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.

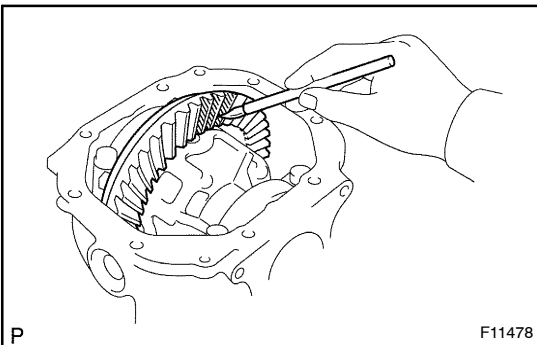
## 11. MEASURE TOTAL PRELOAD

Using a torque wrench, measure the total preload.

**Total preload (at starting):**

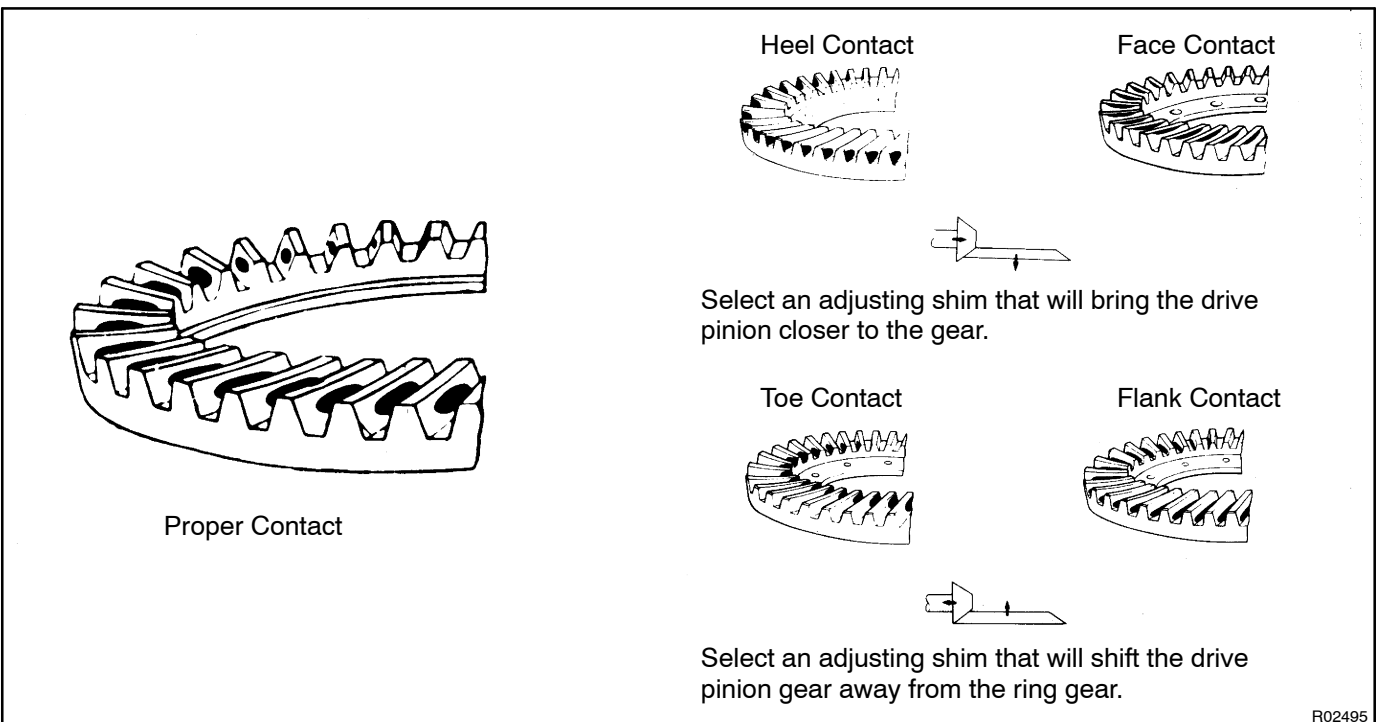
**Drive pinion preload plus**

**0.4 – 0.6 N·m (4 – 6 kgf·cm, 3.5 – 5.2 in.·lbf)**



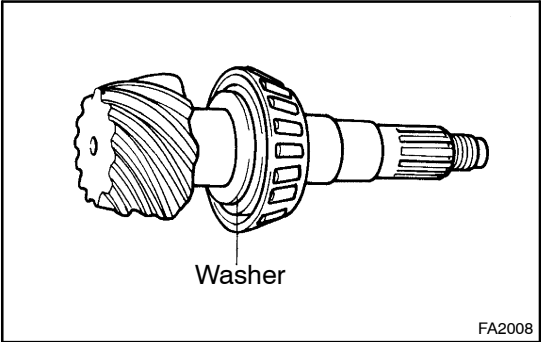
## 12. INSPECT TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION

- Coat 3 or 4 teeth at 3 different positions on the ring gear with red lead primer.
- Hold the companion flange firmly and rotate the ring gear in both directions.
- Inspect the tooth contact pattern.



R02495



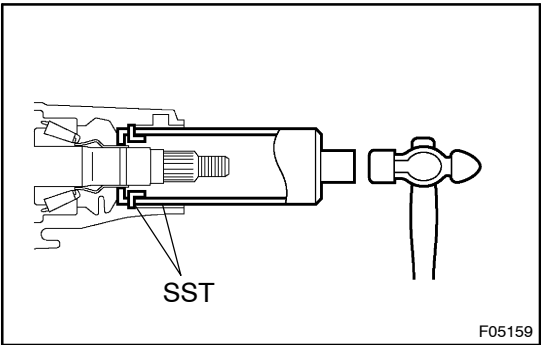


If the teeth are not contacting properly, use the following table to select a proper washer for correction.

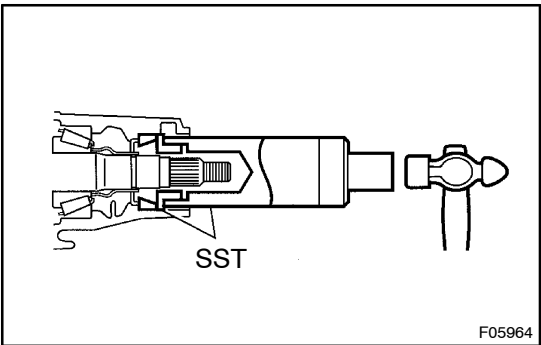
**Washer thickness**

| Thickness mm (in.) | Thickness mm (in.) |
|--------------------|--------------------|
| 1.70 (0.0669)      | 2.03 (0.0799)      |
| 1.73 (0.0681)      | 2.06 (0.0811)      |
| 1.76 (0.0693)      | 2.09 (0.0822)      |
| 1.79 (0.0704)      | 2.12 (0.0835)      |
| 1.82 (0.0717)      | 2.15 (0.0847)      |
| 1.85 (0.0729)      | 2.18 (0.0858)      |
| 1.88 (0.0740)      | 2.21 (0.0870)      |
| 1.91 (0.0752)      | 2.24 (0.0882)      |
| 1.94 (0.0764)      | 2.27 (0.0894)      |
| 1.97 (0.0776)      | 2.30 (0.0906)      |
| 2.00 (0.0787)      | 2.33 (0.0918)      |

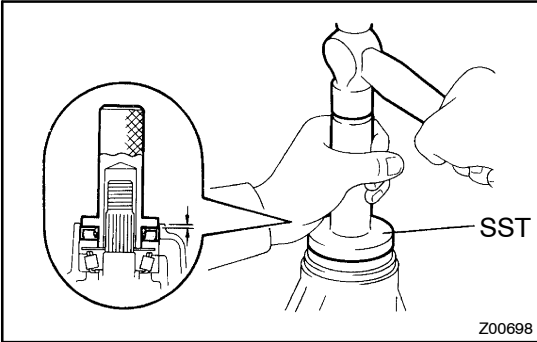
- 13. REMOVE COMPANION FLANGE (See page SA-2)
- 14. REMOVE OIL SLINGER
- 15. REMOVE REAR BEARING (See page SA-2)
- 16. REMOVE REAR BEARING OUTER RACE (See page SA-2)



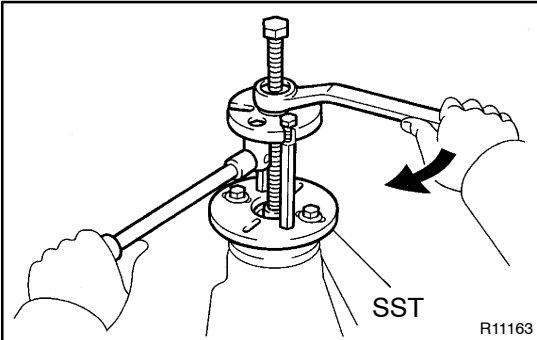
- 17. INSTALL BEARING SPACER AND OIL STORAGE RING
  - (a) Install a new bearing spacer.
  - (b) Using SST and a hammer, install a new oil storage ring. SST 09316-60011 (09316-00011), 09506-35010



- 18. INSTALL REAR BEARING OUTER RACE
  - Using SST and a hammer, install the bearing outer race. SST 09316-60011 (09316-00011), 09506-35010
- 19. INSTALL REAR BEARING AND OIL SLINGER
- 20. INSTALL OIL SEAL
  - (a) Coat the hypoid gear oil to a new oil seal periphery.

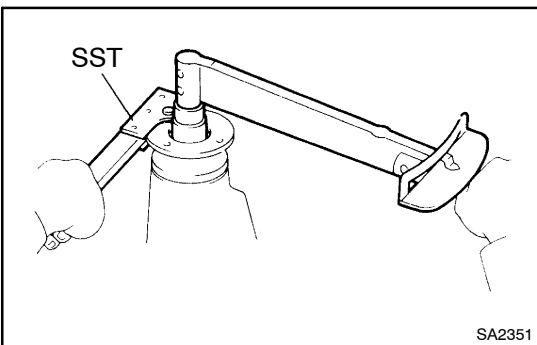


- (b) Using SST and a hammer, install a new oil seal.  
SST 09554-30011  
**Oil seal drive in depth: 1.5 mm (0.059 in.)**
- (c) Coat MP grease to the oil seal lip.

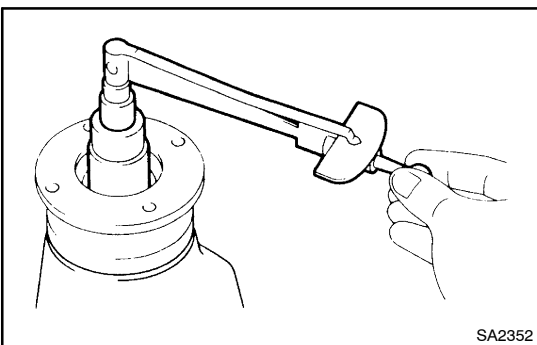


## 21. INSTALL COMPANION FLANGE

- (a) Using SST, install the companion flange.  
SST 09950-30010 (09951-03010, 09953-03010, 09954-03010, 09955-03030, 09956-03020)
- (b) Coat the thread of a new nut with hypoid gear oil LSD.



- (c) Using SST to hold the flange, tighten the nut.  
SST 09330-00021  
**Torque: 108 N·m (1,100 kgf·cm, 80 ft·lbf)**



## 22. ADJUST DRIVE PINION PRELOAD

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

**Preload (at starting):**

**New bearing**

**1.0 – 1.6 N·m (10 – 16 kgf·cm, 8.7 – 13.9 in·lbf)**

**Reused bearing**

**0.5 – 0.8 N·m (5 – 8 kgf·cm, 4.3 – 6.9 in·lbf)**

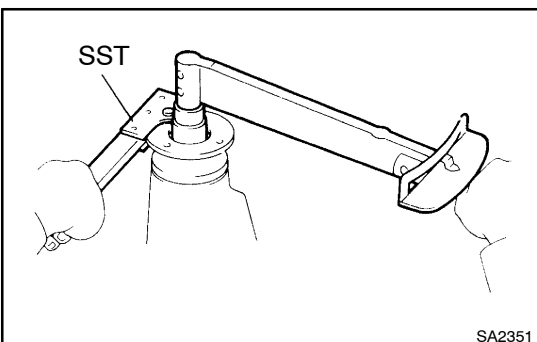
If the preload is greater than the specification, replace the bearing spacer.

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

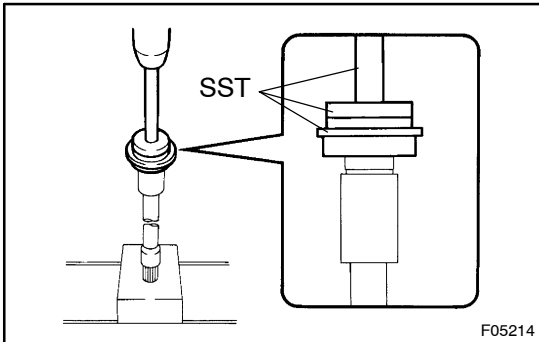
SST 09330-00021

**Torque: 338 N·m (3,447 kgf·cm, 249 ft·lbf) or less**

If the maximum torque is exceeded while retightening the nut, replace the bearing spacer and repeat the preload procedure. Do not loosen the pinion nut to reduce the preload.



23. □ RECHECK TOTAL PRELOAD (See page SA-2)
24. RECHECK RING GEAR BACKLASH (See page SA-2)
25. RECHECK TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION (See page SA-8)
26. CHECK RUNOUT OF COMPANION FLANGE (See page SA-2)
27. STAKE DRIVE PINION NUT



## 28. INSTALL SIDE GEAR BEARING

Using SST and a press, install the bearing to side gear shaft.  
 SST 09502-12010, 09950-60020 (09951-00730),  
 09950-70010 (09951-07100)

## 29. INSTALL DIFFERENTIAL TUBE ASSEMBLY

- (a) Clean surfaces with FIPG material attached to using gasoline or alcohol.
- (b) Apply FIPG to the differential tube.

### FIPG:

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

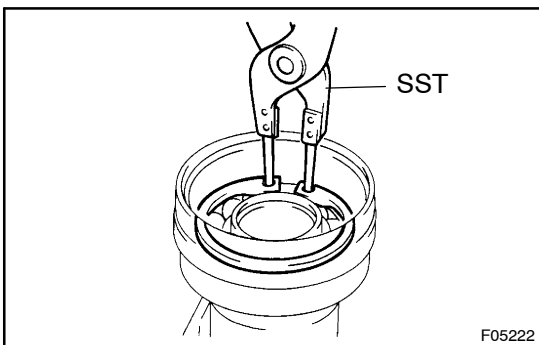
### HINT:

Install the differential tube within 10 minutes after applying FIPG.

- (c) Install the differential tube with 4 bolts to the differential tube.

**Torque: 105 N·m (1,070 kgf·cm, 77 ft·lbf)**

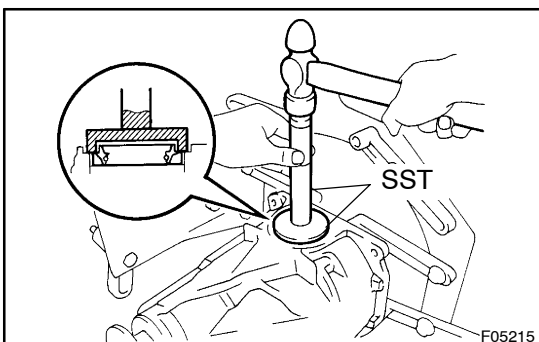
- (d) Install the side gear shaft.
- (e) Using a snap ring expander, install the snap ring.



- (f) Using SST, install the snap ring.  
 SST 09350-30020 (09350-07060)

## 30. INSTALL SIDE GEAR SHAFT OIL SEALS

- (a) Coat the hypoid gear oil to a new oil seal periphery.

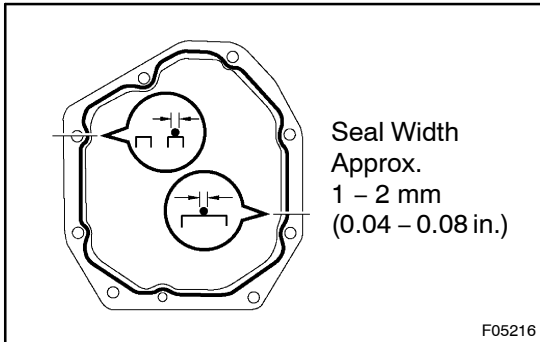


- (b) Using SST and a hammer, install 2 new oil seals.  
 SST 09550-00032, 09950-70010 (09951-07150)
- (c) Coat MP grease to the oil seal lip.

## 31. REMOVE DIFFERENTIAL CARRIER FROM OVERHAUL STAND, ETC.

**32. INSTALL DIFFERENTIAL CARRIER COVER**

- (a) Install the oil deflector with 2 bolts to the carrier cover.  
**Torque: 7.3 N·m (74 kgf·cm, 64 in·lbf)**
- (b) Install the breather plug to the carrier cover.
- (c) Remove any old FIPG material and be careful not to drop oil on the contact surfaces of the differential carrier and carrier cover.
- (d) Clean surfaces with FIPG with material attached to using gasoline or alcohol.



- (e) Apply FIPG to the carrier cover, as shown.

**FIPG:**

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

**HINT:**

Install the carrier cover within 10 minutes after applying FIPG.

- (f) Install the differential carrier cover with the 9 bolts.

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