

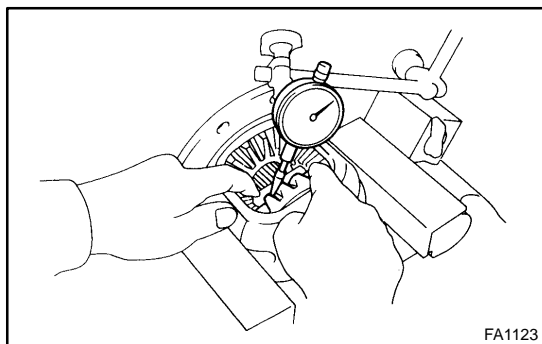
## REASSEMBLY

### 1. ASSEMBLE DIFFERENTIAL CASE

- Install the 2 thrust washers to the side gears.
- Install the 2 side gears with the thrust washers, 2 pinion gears, 2 pinion gear thrust washers and pinion shaft.

HINT:

Align the holes for the straight pin in the differential case and pinion shaft.



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

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

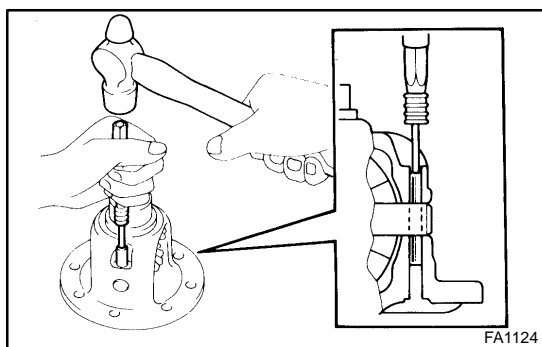
If the backlash is not within the specified value, replace the side gear thrust washer with an appropriate thickness.

HINT:

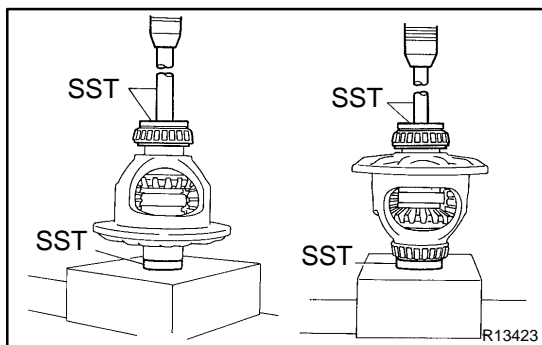
Refer to the following table to select thrust washers which will ensure that the backlash is within the specified value.

#### Washer thickness:

Thickness mm (in.)	Thickness mm (in.)
1.50 (0.0590)	1.75 (0.0689)
1.55 (0.0610)	1.80 (0.0709)
1.60 (0.0630)	1.85 (0.0728)
1.65 (0.0650)	1.90 (0.0748)
1.70 (0.0669)	–



- Using a pin punch and hammer, install the straight pin through the holes in the differential case and pinion shaft.
- Using a chisel and hammer, stake the outside of the differential case pin hole.



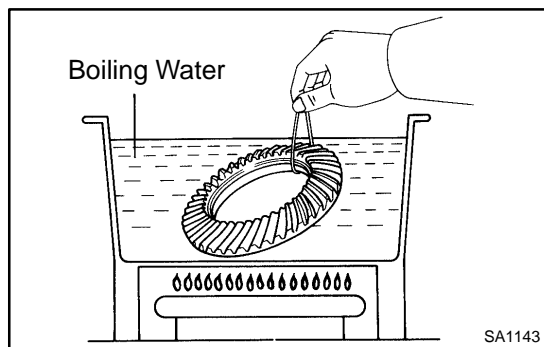
### 2. INSTALL SIDE BEARINGS

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

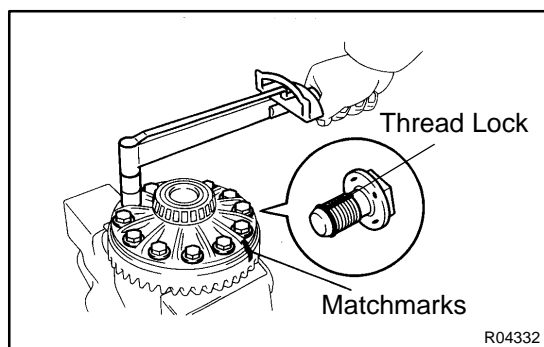
SST 09950-60010 (09951-00480, 09951-00640)  
09950-70010 (09951-07150)

### 3. INSTALL RING GEAR ON DIFFERENTIAL CASE

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



- (b) Heat the ring gear to about 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) After the ring gear has cooled sufficiently, torque the set bolts to which thread lock has been applied.

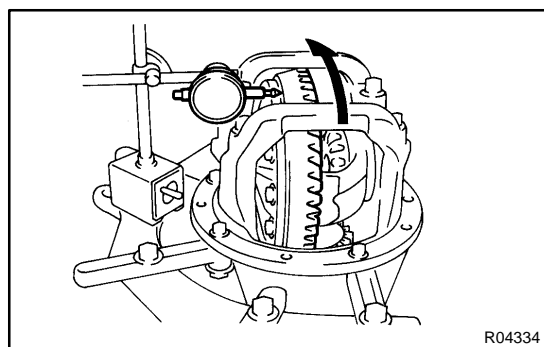
**Thread lock:**

**Part No. 08833-00100, THREE BOND 1360K or equivalent.**

**Torque: 125 N·m (1,270 kgf·cm, 92 ft·lbf)**

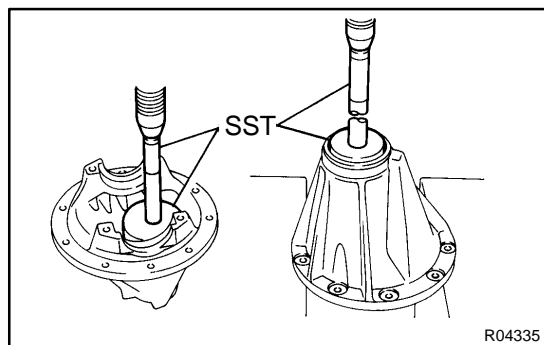
#### 4. INSPECT RING GEAR RUNOUT

- (a) Install the differential case into the carrier and install the plate washers to where there is no play in the bearing (See step 8.).
- (b) Install the bearing cap (See step 11.).



- (c) Using a dial indicator, measure the runout of the ring gear.
- (d) Remove the bearing caps and differential case.

**Maximum runout: 0.05 mm (0.0020 in.)**



#### 5. INSTALL DRIVE PINION BEARING OUTER RACES AND ADJUSTING WASHER

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

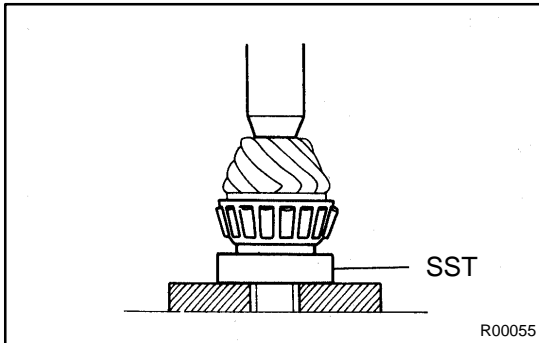
SST 09950-60020 (09951-00710),  
09950-70010 (09951-07150)

- (b) Using SST and a press, install a new adjusting washer and a new rear bearing outer race to the carrier.

SST 09950-60020 (09951-00910),  
09950-70010 (09951-07150)

**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 a different thickness if necessary.

**6. INSTALL DRIVE PINION REAR BEARING**

Using SST and a press, install the rear bearing onto the drive pinion.

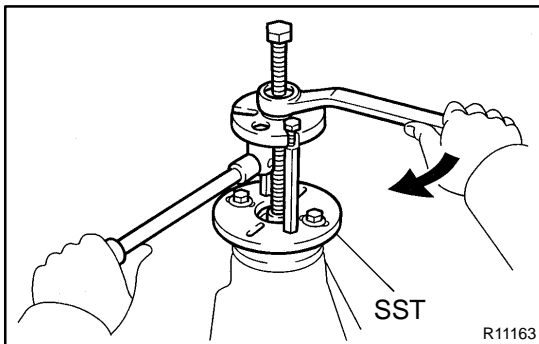
SST 09506-35010

**7. TEMPORARILY ADJUST DRIVE PINION PRELOAD**

(a) Install the drive pinion and front bearing.

**HINT:**

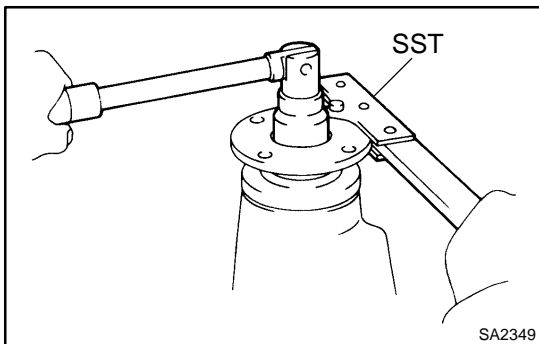
After adjusting the ring gear tooth contact pattern, assemble the spacer, washers and oil seal.



(b) Using SST, install the companion flange.

SST 09950-30012 (09951-03010, 09953-03010, 09954-03010, 09955-03030, 09956-03050)

(c) Coat the threads of the nut with hypoid gear oil.



(d) Adjust the drive pinion preload by tightening the companion flange nut.

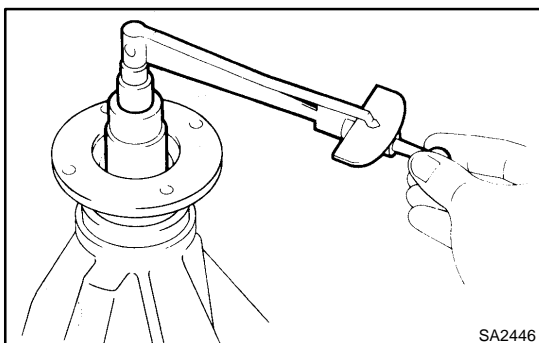
**HINT:**

Using SST to hold the flange, torque the nut.

SST 09330-00021

**NOTICE:**

**As there is no spacer, tighten the nut a little at a time and be careful not to overtighten it.**



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

**Preload (at starting):****New bearing**

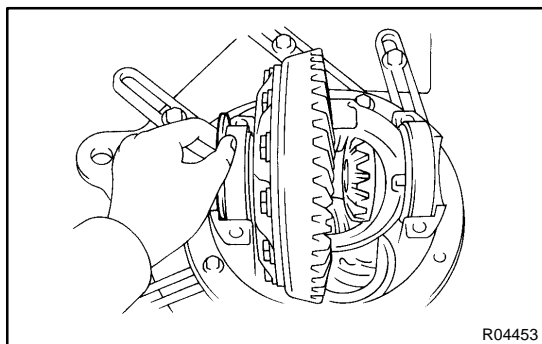
1.3 – 1.9 N·m (13 – 19 kgf·cm, 11.4 – 16.7 in.-lbf)

**Reused bearing**

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

**8. INSTALL DIFFERENTIAL CASE IN CARRIER**

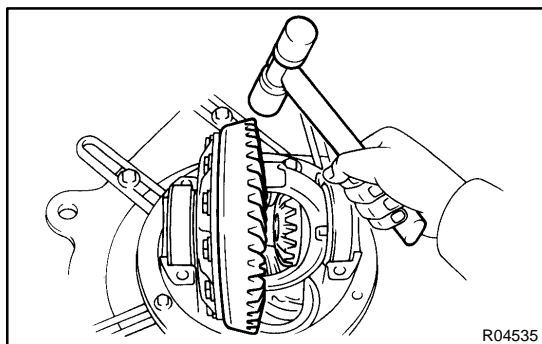
- (a) Place the 2 bearing outer races on their respective bearings. Make sure the right and left races are not interchanged.
- (b) Install the differential case in the carrier.

**9. ADJUST RING GEAR BACKLASH**

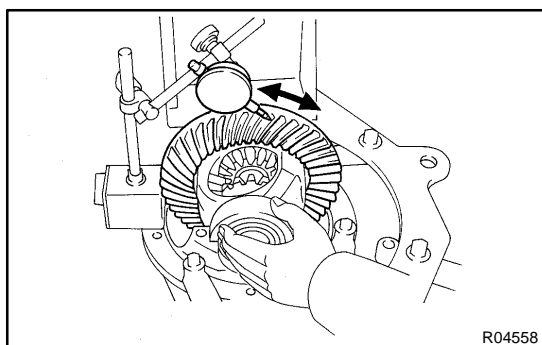
- (a) Install the plate washer on the ring gear back side.

**HINT:**

Make sure that the ring gear has backlash.



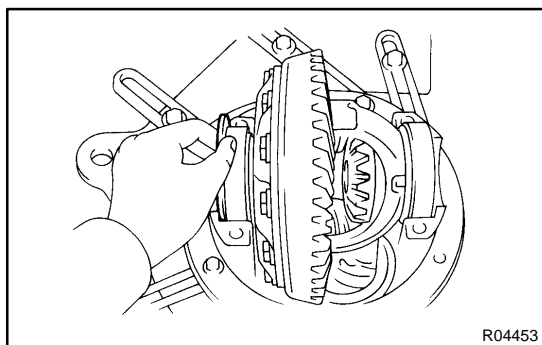
- (b) Tap on the ring gear with a plastic hammer so that the washer fits to the bearing.



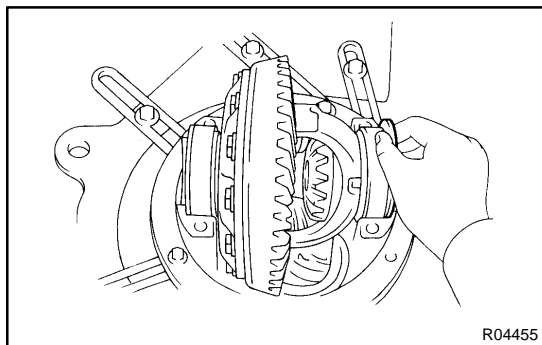
- (c) Using a dial indicator, while holding the companion flange, measure the ring gear backlash.

**Backlash (reference):**

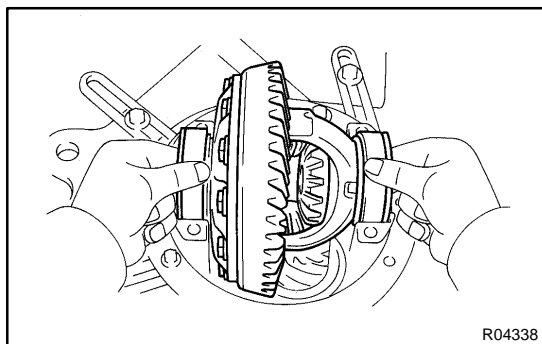
**0.13 – 0.18 mm (0.0051 – 0.0071 in.)**



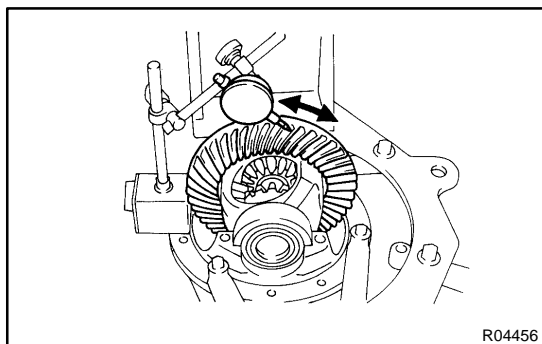
- (d) Select a plate washer for back side ring gear using the backlash as a reference.



- (e) Select a ring gear teeth side plate washer so that there is no clearance between the outer race and case.
- (f) Remove the 2 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, while holding the companion flange, measure the ring gear backlash.

**Backlash: 0.13 – 0.18 mm (0.0051 – 0.0071 in.)**

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

**HINT:**

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

Make sure that there is a ring gear backlash.

#### 10. ADJUST SIDE BEARING PRELOAD

- (a) Remove the ring gear teeth side plate washer and using a micrometer, measure the thickness.
- (b) Using the backlash as a reference, install a new washer that is 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.

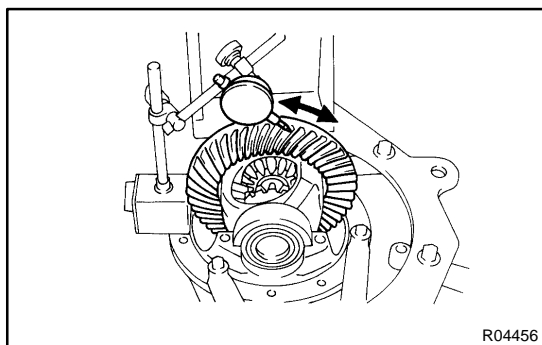
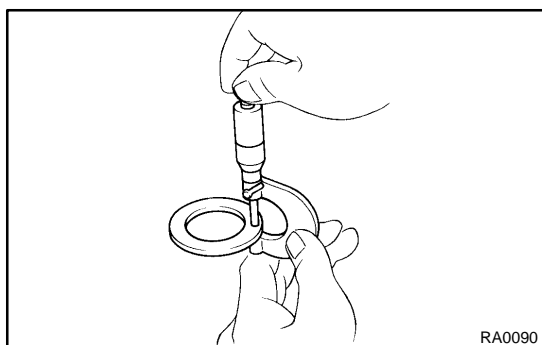
- (c) Using a plastic hammer, install the plate washer.
- (d) Recheck the ring gear backlash.

**Backlash: 0.13 – 0.18 mm (0.0051 – 0.0071 in.)**

If the backlash is not within the specified value, adjust it by either increasing or decreasing the thickness of washers on both sides by 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.



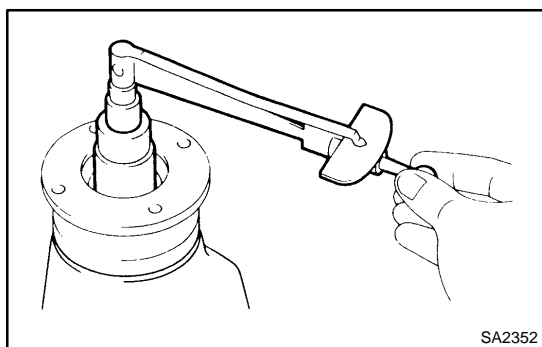
**Washer thickness:**

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
58	2.58 (0.1015)	90	2.90 (0.1142)	22	3.22 (0.1268)
60	2.60 (0.1024)	92	2.92 (0.1150)	24	3.24 (0.1276)
62	2.62 (0.1031)	94	2.94 (0.1157)	26	3.26 (0.1283)
64	2.64 (0.1039)	96	2.96 (0.1165)	28	3.28 (0.1291)
66	2.66 (0.1047)	98	2.98 (0.1173)	30	3.30 (0.1299)
68	2.68 (0.1055)	00	3.00 (0.1181)	32	3.32 (0.1307)
70	2.70 (0.1063)	02	3.02 (0.1189)	34	3.34 (0.1315)
72	2.72 (0.1071)	04	3.04 (0.1197)	36	3.36 (0.1323)
74	2.74 (0.1079)	06	3.06 (0.1205)	38	3.38 (0.1331)
76	2.76 (0.1087)	08	3.08 (0.1213)	40	3.40 (0.1339)
78	2.78 (0.1094)	10	3.10 (0.1220)	42	3.42 (0.1346)
80	2.80 (0.1102)	12	3.12 (0.1228)	44	3.44 (0.1354)
82	2.82 (0.1110)	14	3.14 (0.1236)	46	3.46 (0.1362)
84	2.84 (0.1118)	16	3.16 (0.1244)	48	3.48 (0.1370)
86	2.86 (0.1126)	18	3.18 (0.1252)		–
88	2.88 (0.1134)	20	3.20 (0.1260)		–

**11. INSTALL BEARING CAP**

- Align the matchmarks on the cap and carrier.
- Install and torque the 4 bolts.

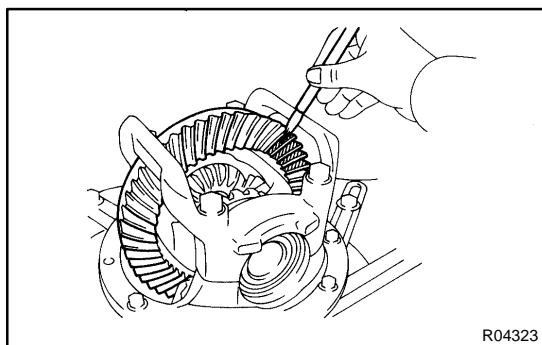
**Torque: 113 N·m (1,150 kgf·cm, 83 ft·lbf)**

**12. MEASURE TOTAL PRELOAD**

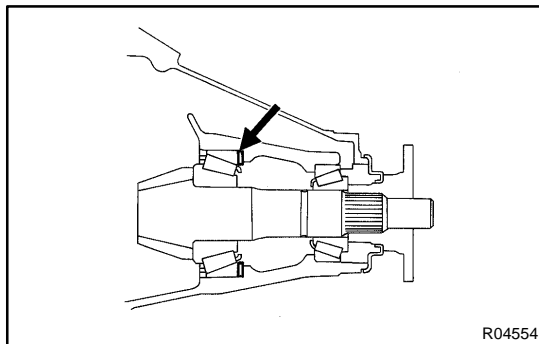
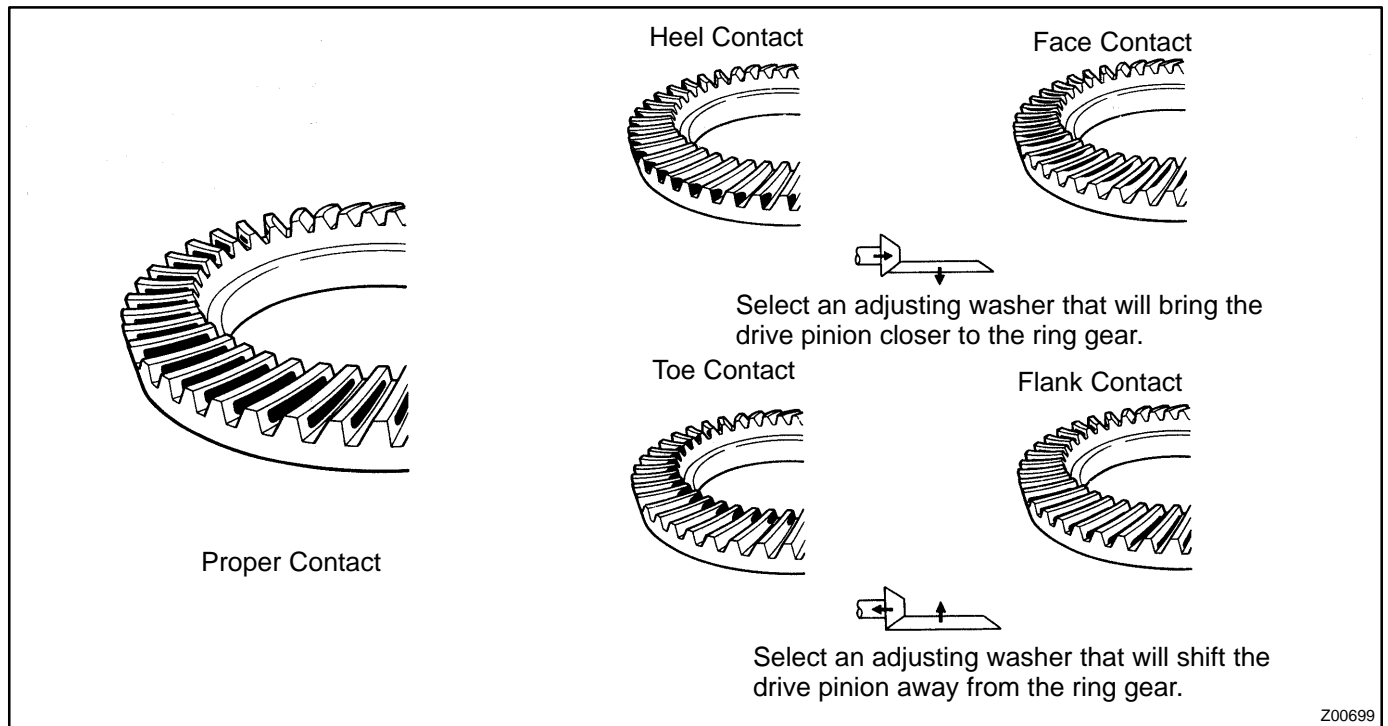
Using a torque wrench, measure the total preload with the teeth of the drive pinion and ring gear in contact.

**Total preload (at starting):**

**Drive pinion preload plus 0.4 – 0.6 N·m (4 – 6 kgf·cm, 3.5 – 5.2 in·lbf)**

**13. INSPECT TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION**

- Coat 3 or 4 teeth at three 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 teeth pattern.



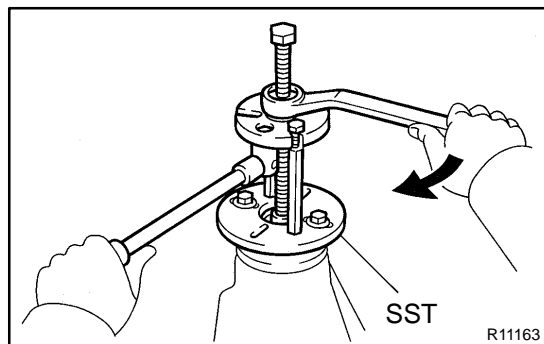
If the teeth are not contacting properly, use the following table to select a proper washer for correction.

#### Washer thickness:

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
87	1.87 (0.0736)	01	2.01 (0.0791)	15	2.15 (0.0846)
88	1.88 (0.0740)	02	2.02 (0.0795)	16	2.16 (0.0850)
89	1.89 (0.0744)	03	2.03 (0.0799)	17	2.17 (0.0854)
90	1.90 (0.0748)	04	2.04 (0.0803)	18	2.18 (0.0858)
91	1.91 (0.0752)	05	2.05 (0.0807)	19	2.19 (0.0862)
92	1.92 (0.0756)	06	2.06 (0.0811)	20	2.20 (0.0866)
93	1.93 (0.0760)	07	2.07 (0.0815)	21	2.21 (0.0870)
94	1.94 (0.0764)	08	2.08 (0.0819)	22	2.22 (0.0874)
95	1.95 (0.0768)	09	2.09 (0.0823)	23	2.23 (0.0878)
96	1.96 (0.0772)	10	2.10 (0.0827)	24	2.24 (0.0882)
97	1.97 (0.0776)	11	2.11 (0.0831)	25	2.25 (0.0886)
98	1.98 (0.0780)	12	2.12 (0.0835)	26	2.26 (0.0890)
99	1.99 (0.0783)	13	2.13 (0.0839)	27	2.27 (0.0894)
00	2.00 (0.0787)	14	2.14 (0.0843)	28	2.28 (0.0898)

14. REMOVE COMPANION FLANGE (See page SA-107)
15. REMOVE FRONT BEARING (See page SA-107)
16. INSTALL NEW BEARING SPACER, 2 WASHERS AND FRONT BEARING

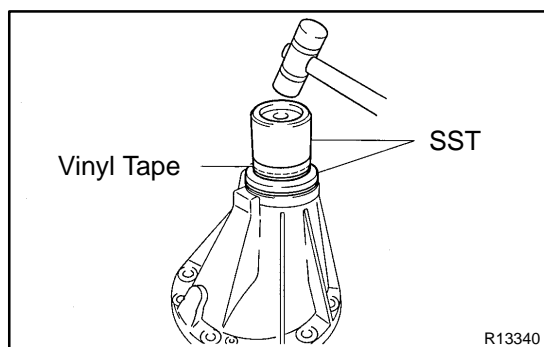
- (a) Install a new bearing spacer and 2 washers, and place the front bearing.



- (b) Using SST and the companion flange, install the front bearing then remove the companion flange.  
SST 09950-30012 (09951-03010, 09953-03010, 09954-03010, 09955-03030, 09956-03050)

#### 17. INSTALL NEW OIL SEAL

- (a) Coat a new oil seal lip with MP grease.



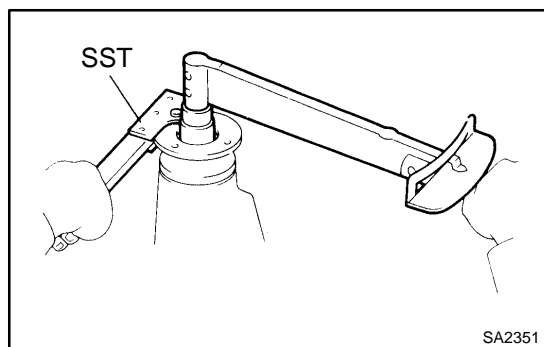
- (b) Using SST and a plastic hammer, install the oil seal until its surface is flush with the differential carrier end.  
SST 09316-12010, 09649-17010

#### HINT:

Connect 2 SST with vinyl tape.

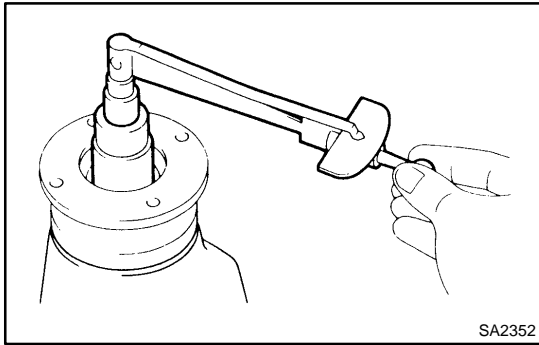
#### 18. INSTALL COMPANION FLANGE

- (a) Place the companion flange.
- (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: 147 N·m (1,500 kgf·cm, 109 ft·lbf)**



**19. ADJUST DRIVE PINION PRELOAD**

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

**Preload (at starting):****New bearing**

**1.3 – 1.9 N·m (13 – 19 kgf·cm, 11.4 – 16.7 in.-lbf)**

**Reused bearing**

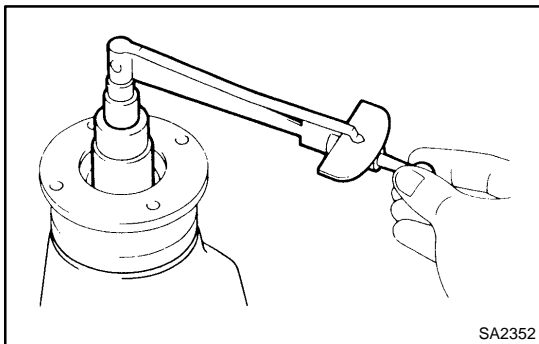
**0.5 – 0.8 N·m (5 – 8 kgf·cm, 4.3 – 6.9 in.-lbf)**

If the preload is greater than the specified value, replace the bearing spacer.

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

**Torque: 451 N·m (4,600 kgf·cm, 333 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.

**20. CHECK TOTAL PRELOAD**

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

**Total preload (at starting):**

**Drive pinion preload plus 0.4 – 0.6 N·m (4 – 6 kgf·cm, 3.5 – 5.2 in.-lbf)**

**21. CHECK RING GEAR BACKLASH**

Using a dial indicator, measure the ring gear backlash.

**Backlash: 0.13 – 0.18 mm (0.0051 – 0.0071 in.)**

**22. RECHECK TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION (See step 13.)****23. CHECK COMPANION FLANGE RUNOUT (See page [SA-107](#))****24. STAKE DRIVE PINION NUT**