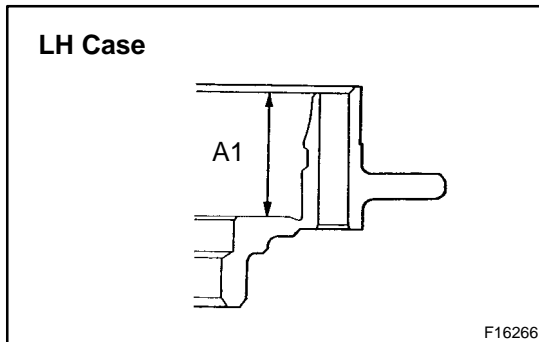


REASSEMBLY

HINT:

- When reusing the side gear, thrust washers and clutch plates, skip the STEP 1.
- Using a shop rag, clean off any foreign object from the parts.
- Apply all of the sliding and rotating surfaces with LSD oil.



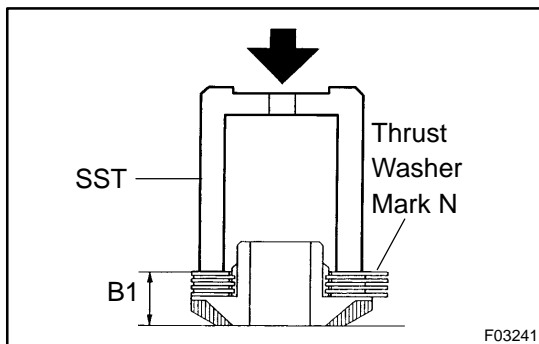
1. LH side:

SELECT ADJUSTING SHIM(S)

- Measure the differential case dimension "A1", as shown in the illustration.
- Install the thrust washers (face their fine side to the side gear) and clutch plates on the side gear.

HINT:

Install the new thrust washer (Mark N) instead of the thrust washers (Mark A – M) to the differential case side.



- Using SST to press down the thrust washers and clutch plates with about pressure of 10 kgf (22 lbf), measure dimension "B1", as shown in the illustration.

SST 09649-17010

- Referring to the following selection table on the next page, select the proper adjusting shim(s).

Adjusting shim thickness =

$$A1 - B1 - 16.175 \text{ mm (0.63681 in.)}$$

LH Side

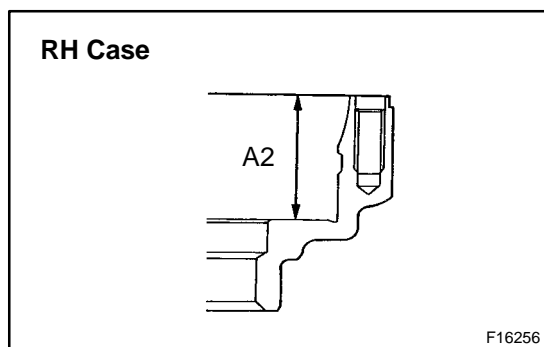
A1mm \ B1mm	41.48	41.50	41.52	41.54	41.56	41.58	41.60	41.62	41.64	41.66	41.68	41.70	41.72
24.66													
24.68											C+C+E		
24.70													
24.72											C+C+D		
24.74													
24.76											C+C+C		
24.78													
24.80										E+E			
24.82										D+E			
24.84													
24.86								D+D					
24.88													
24.90								C+D					
24.92													
24.94								C+C					
24.96													
24.98							B+C						
25.00						B+B							
25.02													
25.04					E								
25.06													
25.08				D									
25.10													
25.12			C										
25.14		B											
25.16													
25.18		A											
25.20													
25.22	#												
25.24													

Reassemble another type shim or check the backlash after assembling A shim.

HINT:

Three or two adjusting shims can be used together if the total of their thickness meets one of the above combinations, even if the combination does not exist in the above table.

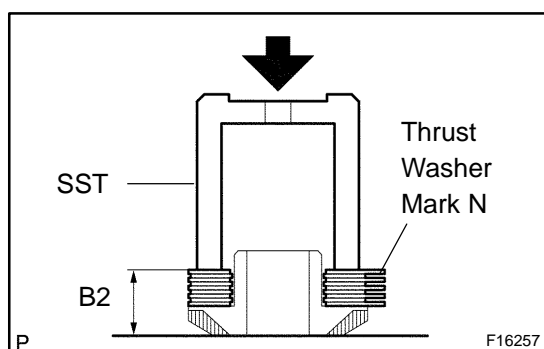
	Adjusting shim mark and thickness mm (in.)
A	0.15 (0.0059)
B	0.20 (0.0079)
C	0.25 (0.0098)
D	0.30 (0.0118)
E	0.35 (0.0138)

**2. RH side:****SELECT ADJUSTING SHIM(S)**

- Measure the differential case dimension "A2", as shown in the illustration.
- Install the thrust washers (face their fine side to the side gear) and clutch plates on the side gear.

HINT:

Install the new thrust washer (Mark N) instead of the thrust washers (Mark A – M) to the differential case side.



- Using SST to press down the thrust washers and clutch plates with about pressure of 10 kgf (22 lbf), measure dimension "B2", as shown in the illustration.
SST 09649-17010
- Referring to the following selection table on the next page, select the proper adjusting shim(s).

Adjusting shim thickness =

$$A2 - B2 - 16.175 \text{ mm (0.63681 in.)}$$

RH Side

A2mm \ B2mm	44.88	44.90	44.92	44.94	44.96	44.98	45.00	45.02	45.04	45.06	45.08	45.10	45.12
28.00											D+D+D		
28.02													
28.04													
28.06											C+C+E		
28.08													
28.10										C+C+D			
28.12													
28.14									C+C+C				
28.16													
28.18									E+E				
28.20								D+E					
28.22													
28.24								D+D					
28.26													
28.28							C+D						
28.30						C+C							
28.32													
28.34					B+C								
28.36													
28.38					B+B								
28.40													
28.42					E								
28.44													
28.46				D									
28.48			C										
28.50													
28.52			B										
28.54													
28.56		A											
28.58													
28.60													
28.62													
28.64													
28.66		#											
28.68													
28.70													
28.72	Less												

Reassemble another type shim or check the backlash after assembling A shim.

HINT:

Three or two adjusting shims can be used together if the total of their thickness meets one of the above combinations, even if the combination does not exist in the above table.

	Adjusting shim mark and thickness mm (in.)
A	0.15 (0.0059)
B	0.20 (0.0079)
C	0.25 (0.0098)
D	0.30 (0.0118)
E	0.35 (0.0138)

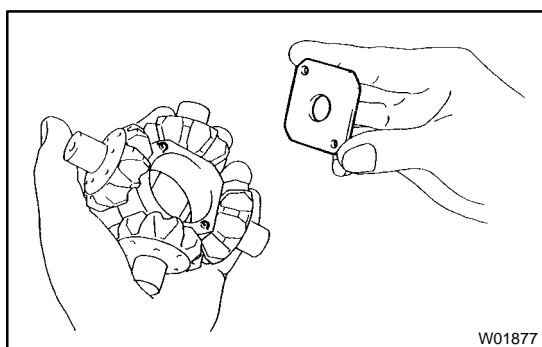
3. CHECK SIDE GEAR BACKLASH

- (a) Install the clutch plates, thrust washers and side gear to the LH and RH differential cases.

HINT:

If necessary, install the adjusting shim(s).

- (b) Install the 4 pinion gears and thrust washers to the spider.

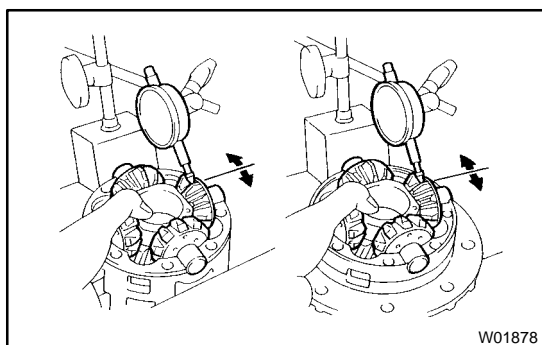


- (c) Align the spring LH retainer holes with the spider knock pins and install the LH retainer.

- (d) Install the pinion gear and spider to the differential LH case.

HINT:

Install the spider to the LH case tightly and do not move the spring retainer.

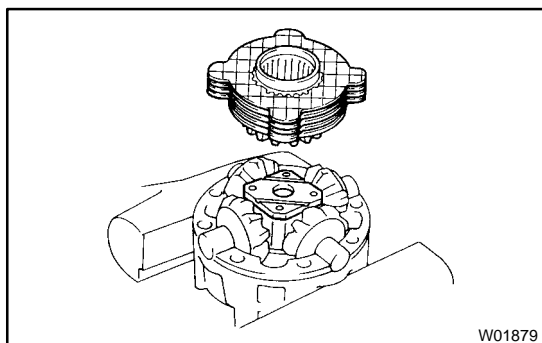


- (e) Using a dial indicator, check the side gear backlash while holding the side gear and spider.

Backlash: 0.05 – 0.20 mm (0.0019 – 0.0079 in.)

HINT:

- Measure at all 4 locations.
 - Measure the backlash at the LH case and at the RH case.
- If the backlash is not within the specification, select the adjusting shim(s).

**4. ASSEMBLE DIFFERENTIAL CASE**

- (a) Reinstall the spider and spring LH retainer to the differential LH case.

HINT:

Install the spider to the LH case tightly and do not move the spring retainer.

- (b) Install the compression spring and spring RH retainer.
- (c) Install the side gear, thrust washers and clutch plates.
- (d) Align the matchmarks and assemble the RH and LH cases.

HINT:

Be careful not to drop the side gear and check the pinion and side gear alignment.

- (e) Tighten the 8 bolts uniformly, a little at a time.

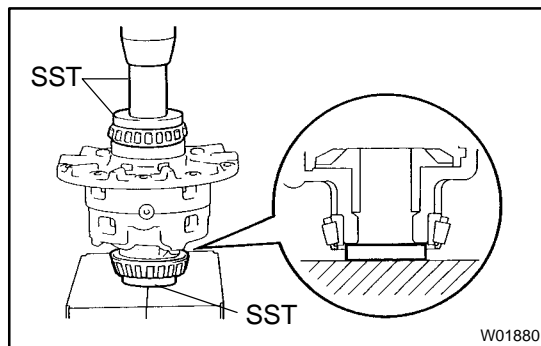
Torque: 47 N·m (480 kgf·cm, 35 ft·lbf)

5. MEASURE ROTATION TORQUE OF DIFFERENTIAL CASE

While holding one of the side gears, measure the rotation torque of the other gear.

Rotation torque (standard):

27.5 – 43.0 N·m (281 – 439 kgf·cm, 20 – 32 ft·lbf)



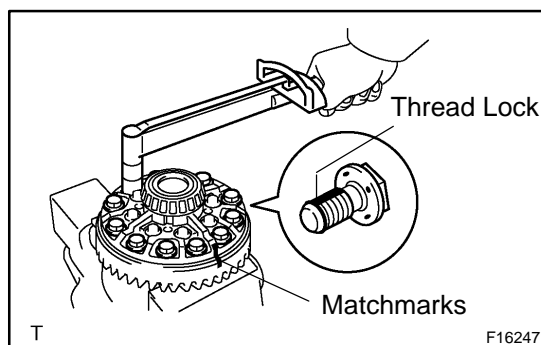
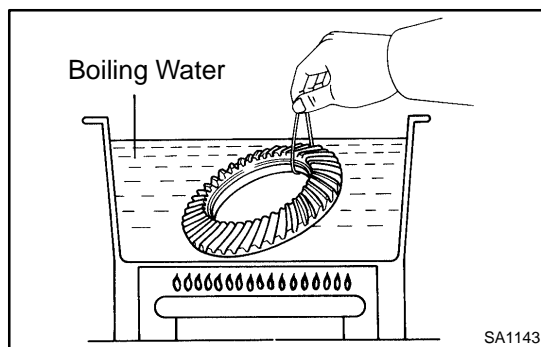
6. INSTALL SIDE BEARINGS

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)

7. INSTALL RING GEAR ON DIFFERENTIAL CASE

- (a) 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.

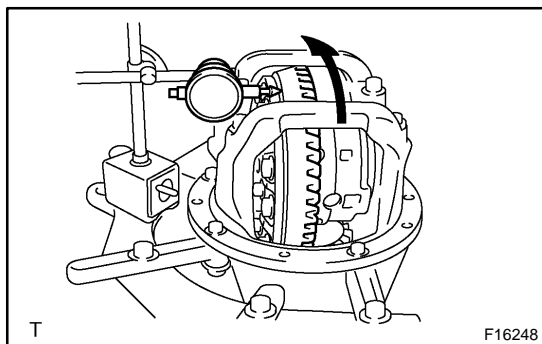
Thread lock:

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

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

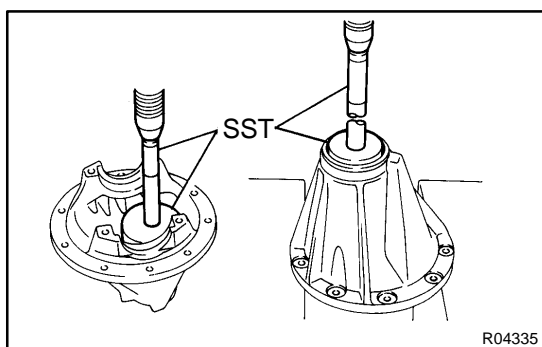
8. INSPECT RING GEAR RUNOUT

- (a) Install the differential case into the carrier and install the plate washers to where there is no play in the bearing (See step 12.).
- (b) Install the bearing cap (See step 15.).



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

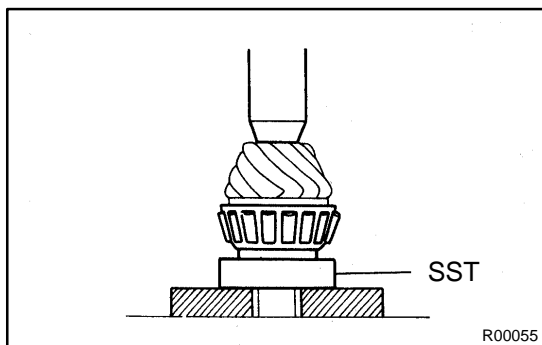
Maximum runout: 0.05 mm (0.0020 in.)

**9. 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.

**10. INSTALL DRIVE PINION REAR BEARING**

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

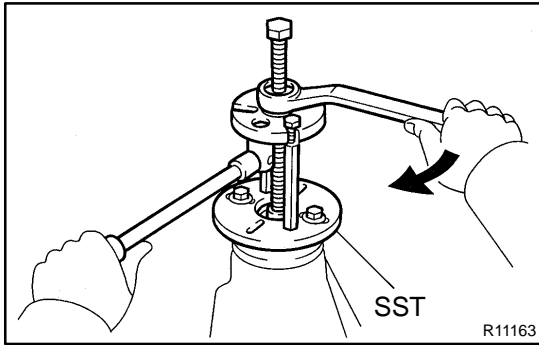
SST 09506-35010

11. TEMPORARILY ADJUST DRIVE PINION PRELOAD

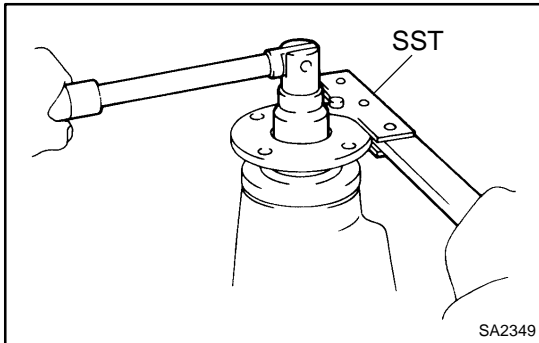
- (a) Install the drive pinion and front bearing.

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.

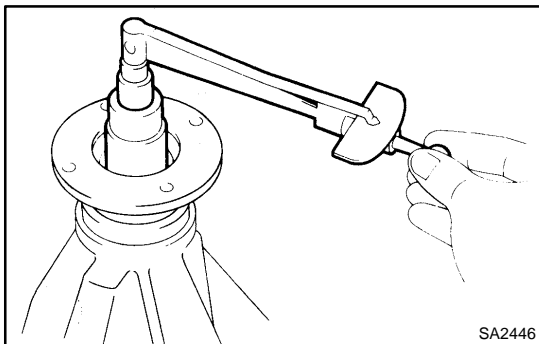
HINT:

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**

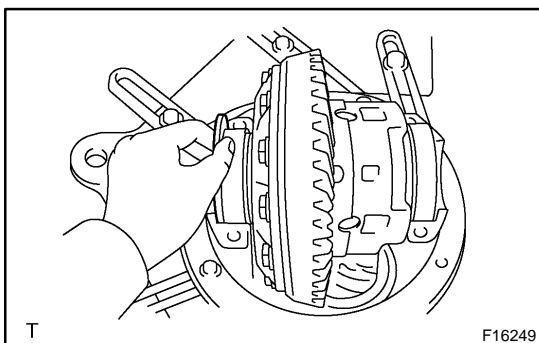
1.3 – 1.9 N·m (13 – 19 kgf·cm, 11.4 – 16.7 in.-lbf)

Reused bearing

0.6 – 0.9 N·m (6.1 – 9.2 kgf·cm, 5.3 – 8.0 in.-lbf)

12. INSTALL DIFFERENTIAL CASE IN CARRIER

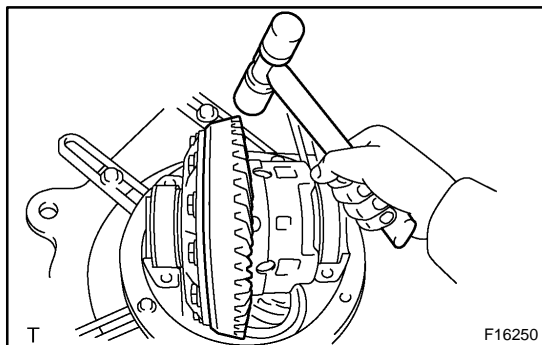
- (a) Place the 2 bearing outer races on their respective bearings. Make sure the right and left races are not interchanged.
- (b) Install the differential case in the carrier.

**13. ADJUST RING GEAR BACKLASH**

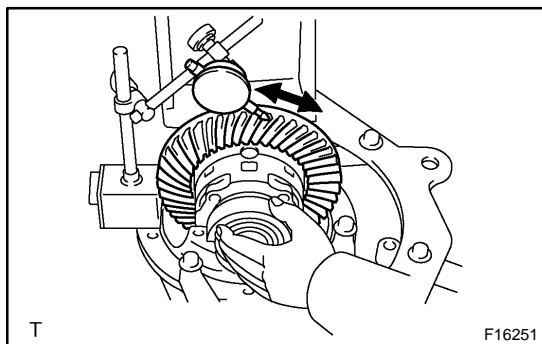
- (a) Install the plate washer on the ring gear back side.

HINT:

Make sure that the ring gear has backlash.



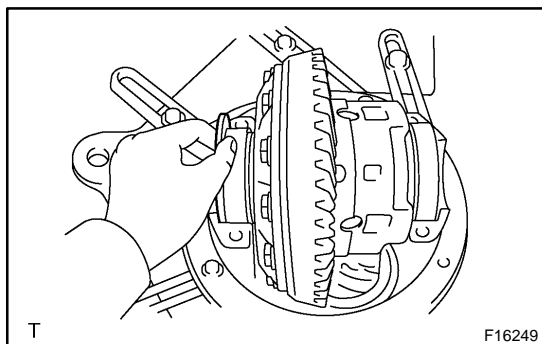
- (b) Tap on the ring gear with a plastic hammer so that the washer fits to the bearing.



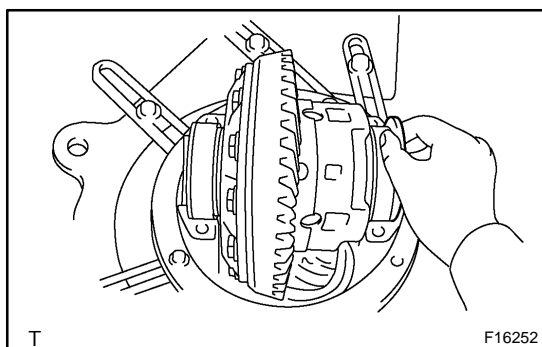
- (c) Using a dial indicator, while holding the companion flange, measure the ring gear backlash.

Backlash (reference):

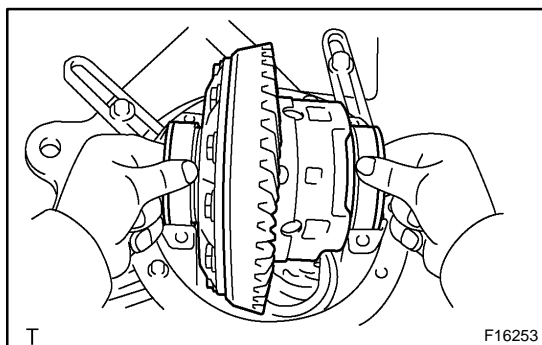
0.13 – 0.18 mm (0.0051 – 0.0071 in.)



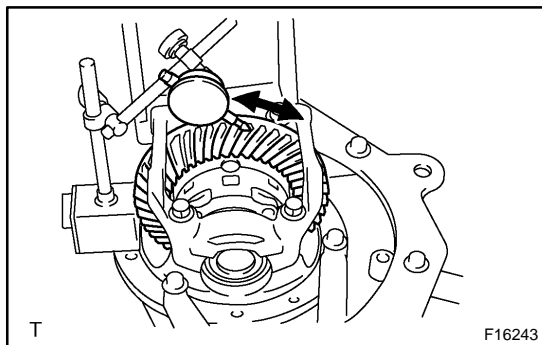
- (d) Select a plate washer for back side ring gear using the backlash as a reference.



- (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.

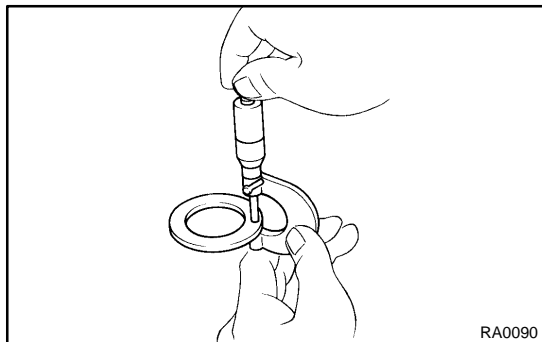
Backlash: 0.13 – 0.18 mm (0.0051 – 0.0071 in.)

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



14. 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.

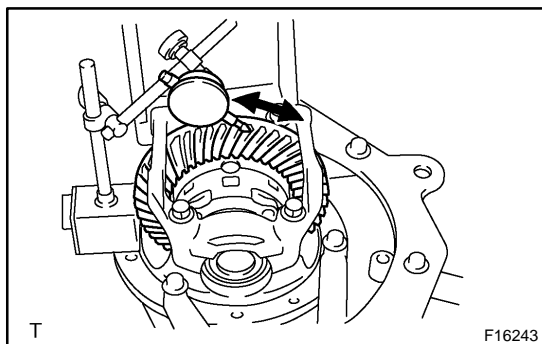
- (d) Recheck the ring gear backlash.

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 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.



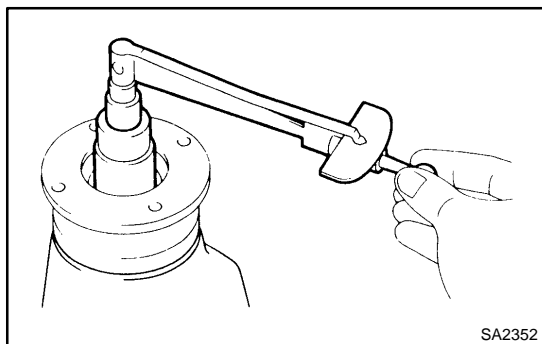
Washer thickness:

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)		–

15. INSTALL BEARING CAP

- (a) Align the matchmarks on the cap and carrier.
- (b) Install and torque the 4 bolts.

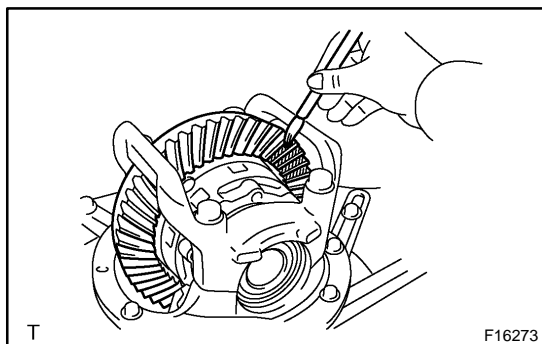
Torque: 113 N·m (1,150 kgf·cm, 83 ft·lbf)

**16. MEASURE TOTAL PRELOAD**

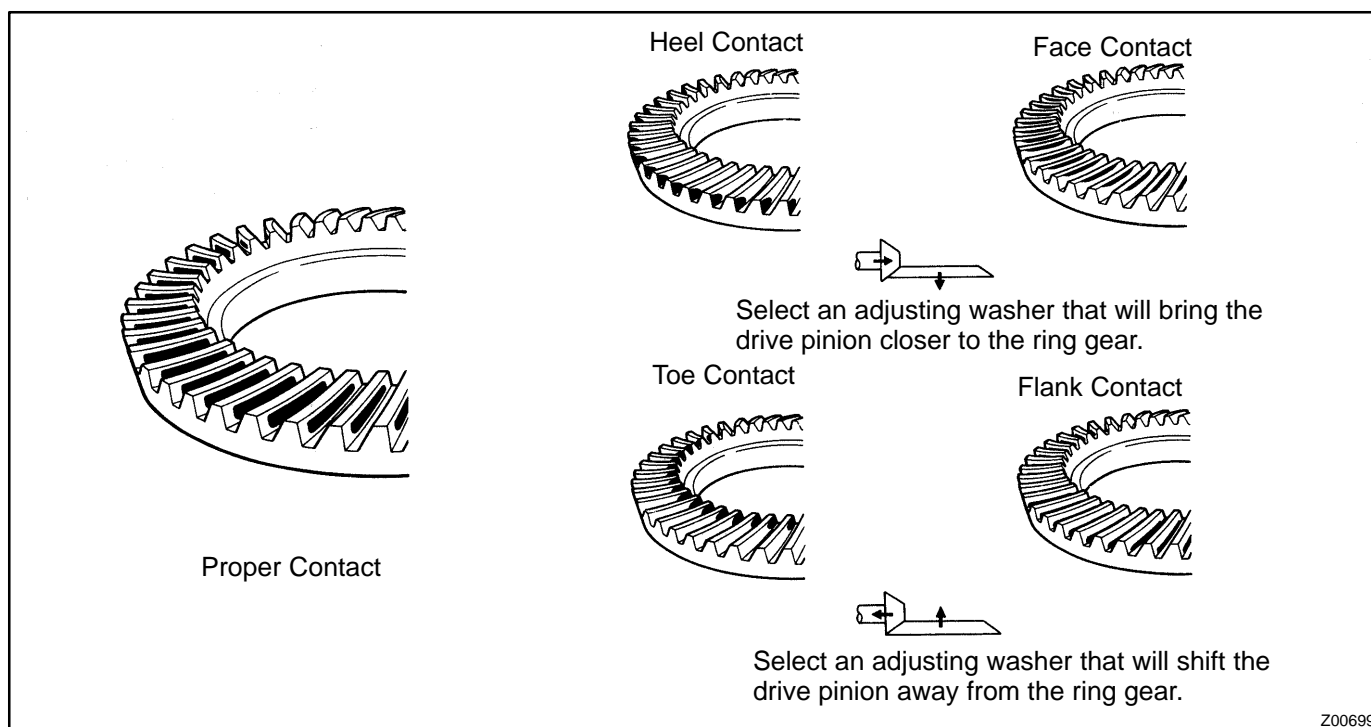
Using a torque wrench, measure the total preload with the teeth of the drive pinion and ring gear in contact.

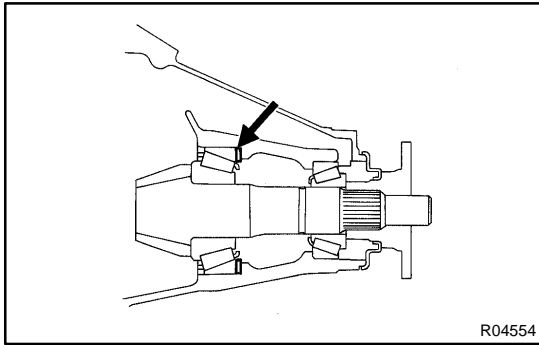
Total preload (at starting):

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

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

- (a) Coat 3 or 4 teeth at three different positions on the ring gear with red lead primer.
- (b) Hold the companion flange firmly and rotate the ring gear in both directions.
- (c) Inspect the teeth pattern.





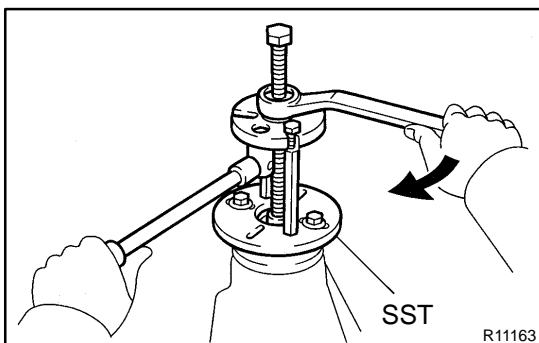
If the teeth are not contacting properly, use the following table to select a proper washer for correction.

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)

18. REMOVE COMPANION FLANGE (See page [SA-126](#))
19. REMOVE FRONT BEARING (See page [SA-126](#))
20. INSTALL NEW BEARING SPACER, 2 WASHERS AND FRONT BEARING

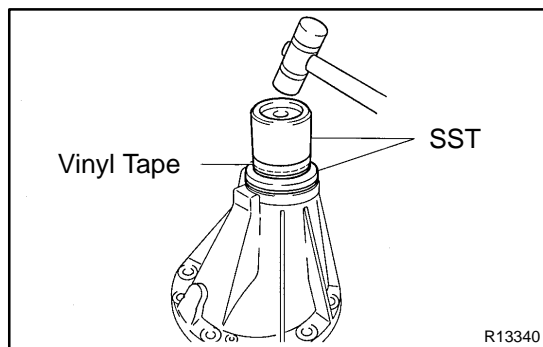
- (a) Install a new bearing spacer and 2 washers, and place the front bearing.



- (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)

21. INSTALL NEW OIL SEAL

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



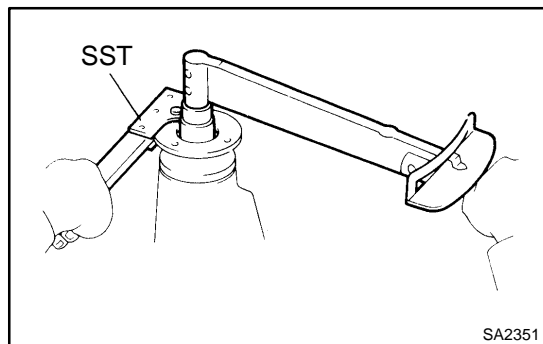
- (b) Using SST and a plastic hammer, install the oil seal until its surface is flush with the differential carrier end.
SST 09316-12010, 09649-17010

HINT:

Connect 2 SST with vinyl tape.

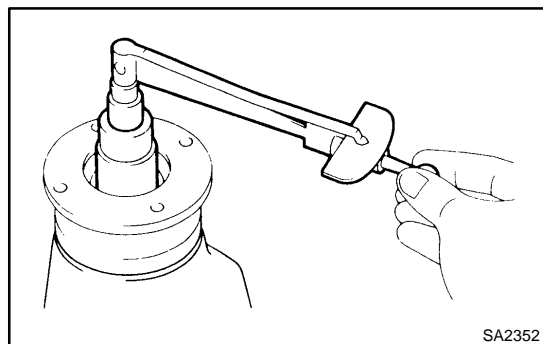
22. INSTALL COMPANION FLANGE

- (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)



23. 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

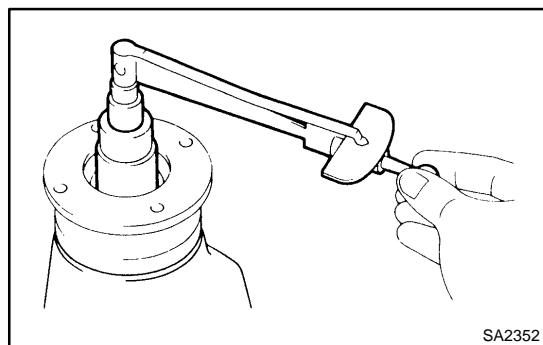
0.6 – 0.9 N·m (6.1 – 9.2 kgf·cm, 5.3 – 8.0 in·lbf)

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.



24. 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)

25. CHECK RING GEAR BACKLASH

Using a dial indicator, measure the ring gear backlash.

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

26. RECHECK TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION (See step 17.)
27. CHECK COMPANION FLANGE RUNOUT (See page [SA-126](#))
28. STAKE DRIVE PINION NUT