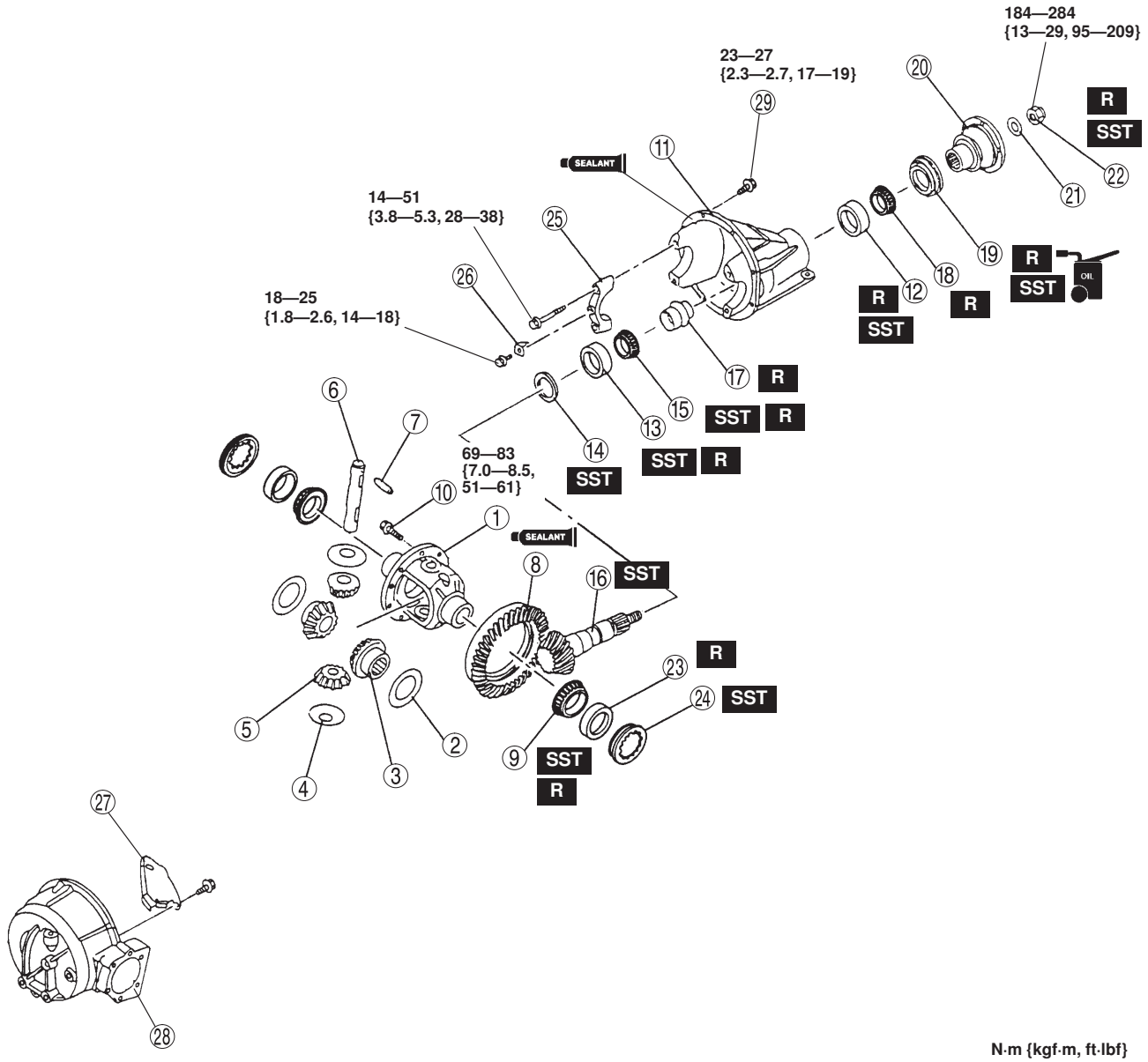
FRONT DIFFERENTIAL ASSEMBLY

Caution
- **Clean away the old sealant before applying the new sealant.**
- **Install the differential carrier within 10 minutes after applying sealant.**
- **Allow the sealant to set at least 30 minutes after installation before filling the differential with the specified oil.**

- Assemble in the order indicated in the table.



N·m {kgf·m, ft·lbf}

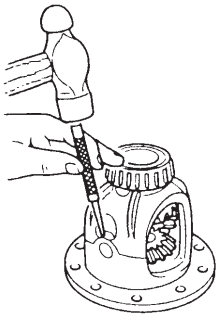
1	Gear case + Assembly Note
2	Thrust washer + Assembly Note
3	Side gear
4	Thrust washer
5	Pinion gear
6	Pinion shaft
7	Knock pin
8	Ring gear + Assembly Note

9	Side bearing inner race + Assembly Note
10	Bolt
11	Carrier
12	Front Bearing outer Race + Assembly Note
13	Rear bearing outer race + Assembly Note
14	Spacer + Assembly Note
15	Rear bearing inner race + Assembly Note

16	Drive pinion + Assembly Note
17	Collapsible spacer
18	Front bearing inner race
19	Oil seal + Assembly Note
20	Companion flange
21	Washer
22	Locknut + Assembly Note
23	Side bearing outer race + Assembly Note
24	Adjusting screw + Assembly Note
25	Bearing cap + Assembly Note
26	Lock plate
27	Baffle plate
28	Differential casing
29	Bolt

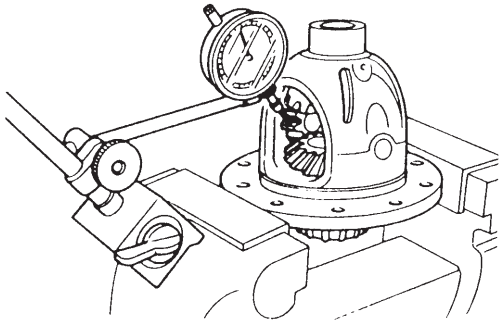
Gear Case Assembly Note

- Assemble the side gears, thrust washer, pinion gears, pinion shaft and knock pin.
  After assembling the knock pin, make a crimp so that the pin will not come out of the gear case.



Thrust Washer Assembly Note

1. Set a dial gauge to the pinion gear as shown in the figure.
2. Secure one of the side gears.
3. Move the pinion gear and measure the backlash at the end of the pinion gear.



Standard backlash
0—0.1 mm {0—0.004 in}

4. If the backlash exceeds the standard, use the thrust washers to adjust.

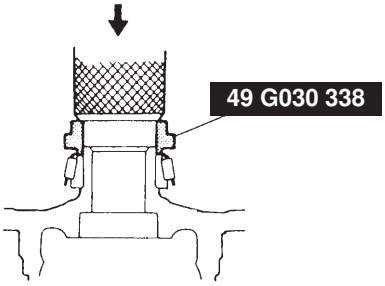
Ring Gear Assembly Note

1. Coat the ring gear and gear case facing surfaces with locking agent.
2. Install the ring gear and tighten the bolt to the specified torque.

Side Bearing Inner Race Assembly Note

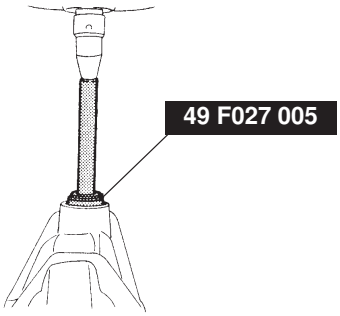
Caution
- **Bearings should be assembled to the original positions.**

- Press the side bearings into the gear case using the **SST**.



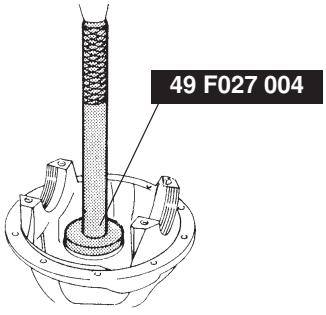
Front Bearing Outer Race Assembly Note

- Press the front bearing outer race into the carrier using the **SST** and a press.



Rear Bearing Outer Race Assembly Note

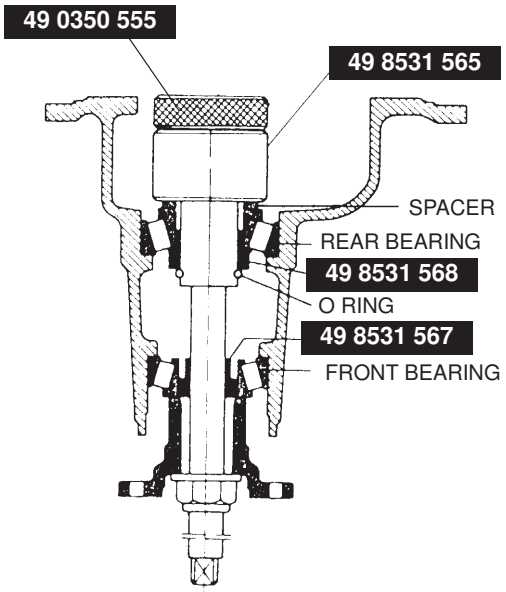
- Press the rear bearing outer race into the carrier using the **SST** and a press.



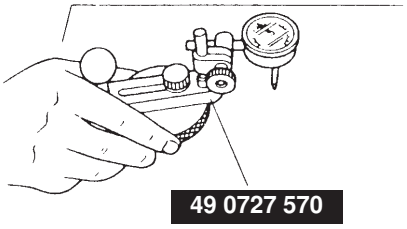
Spacer Assembly Note
Pinion height adjustment

Notes
- Use the same spacer and nut.
- Be careful to install collars A and B in the correct position and facing in the correct direction.

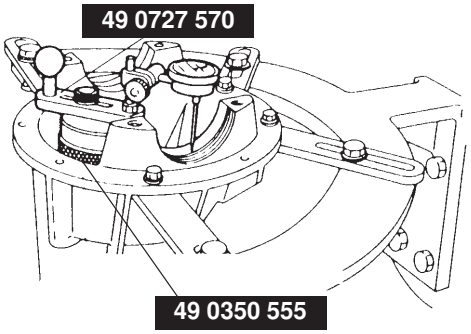
1. Assemble the spacer, rear bearing inner race and **SST** (49 8531 568) on to the **SST** (49 8531 565). Secure the collar with the O-ring. Then install this to the carrier.
2. Assemble the front bearing inner race, **SST** (49 8531 567), companion flange, washer and nut to the **SST** (49 8531 565).
3. Tighten the nut to the extent that the **SST** (49 8531 565) can be turned by hand.



4. Place the **SST** on the surface plate and set the dial indicator to zero.



5. Place the **SST** (49 0350 555) on top of the **SST** (49 8531 565), and then set the **SST** (49 0727 570) on top of the **SST** (49 0350 555).
6. Place the measuring probe of the dial indicator so that it contacts the place where the side bearing is installed in the carrier. Then measure left and right side of the lower position.

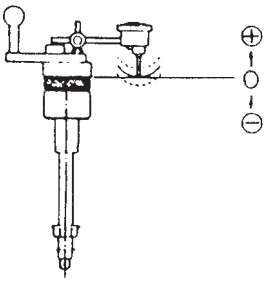


7. Add the two (left and right) values obtained by the measurements taken in Step 6 and then divide the total by 2. From this result, subtract the result obtained by dividing the number inscribed on the end surface of the drive pinion by 100. (If there is no figure inscribed, use 0.) This is the pinion height adjustment value.

Note
- For example, the measured results obtained at Step 6 are 0.06 mm and 0.04 mm, and the figure inscribed on the end of the drive pinion is –2:

$$\frac{0.06+0.04}{2} - \frac{-2}{100} = 0.07 = \text{pinion height adjustment value}$$

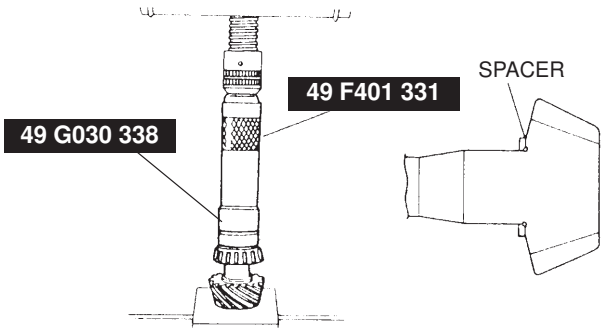
Therefore, replace it with a spacer **0.07 mm {0.003 in}** thicker than the currently used one.



Rear Bearing Inner Race Assembly Note

Caution
- **Press in until the force required suddenly increases.**
- **Install the spacer selected for the pinion height adjustment, confirm that the installation direction is correct.**

- Press the rear bearing inner race in using the **SSTs**.



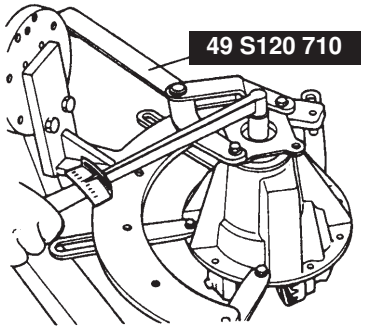
Drive Pinion Assembly Note
Drive pinion preload adjustment

Caution
- **Do not install the oil seal.**

1. Install the drive pinion, spacer, front bearing, collapsible spacer and companion flange to the carrier, and temporarily tighten the locknut.
2. Adjust the preload of the drive pinon bearing as follows.
   (1) Turn the companion flange by hand to seat the bearing.
   (2) Use a torque wrench to tighten the locknut temporarily tightened in Step 1, and confirm that the specified preload can be obtained within the specified tightening torque range. The torque applied at this time will be used after the oil seal is installed.

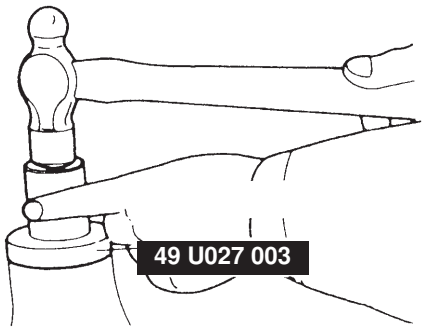
Locknut tightening torque
128—284 N·m {13—29 kgf·m, 95—209 ff·lbf}

Drive pinion preload
0.9—13.4 N·m {9—14 kgf·cm, 7.9—12.1 in·lbf}



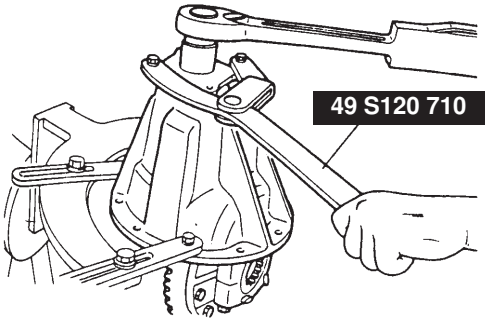
   (3) If the specified preload can't be obtained within the specified tightening torque range, replace the collapsible spacer and inspect again.
   (4) Remove the locknut, washer and companion flange.

Oil Seal Assembly Note
- Apply differential oil to the oil seal lip and press the oil seal in until it touches the end of the differential carrier using the **SST**.

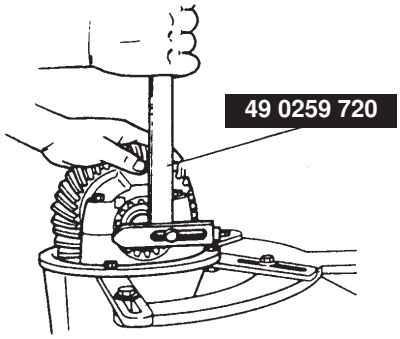


Locknut Assembly Note
1. Assemble the companion flange and washer.
2. Tighten the new locknut using the **SST** with the determined torque while performing drive pinion preload adjustment.
3. Verify that the preload is within the specification.

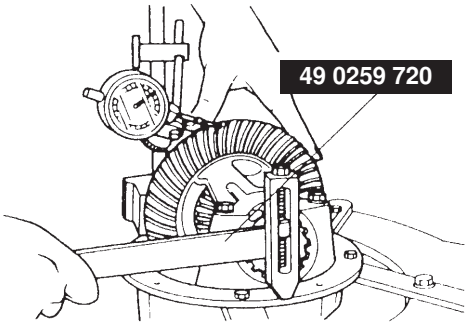
Preload
0.9—1.3 N·m {9—14 kgf·cm, 7.9—12.1 in·lbf}



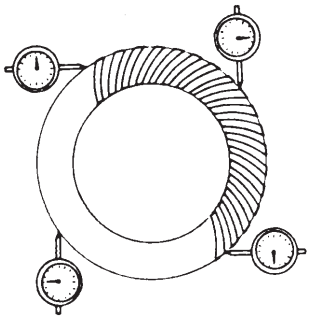
Side Bearing Outer Race, Adjusting Screw, Bearing Cap Assembly Note
Ring gear backlash adjustment
1. Install the differential gear component to the carrier. After loosely tightening the bearing outer race and bearing cap mounting bolts, completely tighten the adjustment screw by hand. Then, while turning the ring gear, alternately tighten the left and right adjustment screws using the **SST**.



2. Adjust the drive pinion, ring gear backlash and the side bearing preload as follows.
   (1) Mark the ring gear at four points at **approx. 90°** intervals and mount a dial indicator to the carrier so that the feeler comes in contact at a 90° angle with one of the ring gear teeth.
   (2) Turn both bearing adjusters equally until the backlash becomes **0.09—0.11 mm {0.0035—0.0043 in}** using the **SST**.

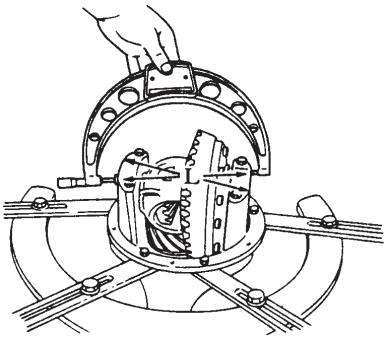


(3) Inspect for the backlash at the three other marked points and make sure that the minimum backlash is more than **0.05 mm {0.002 in}** and difference of the maximum and minimum backlash value is less than **0.07 mm {0.0028 in}**.



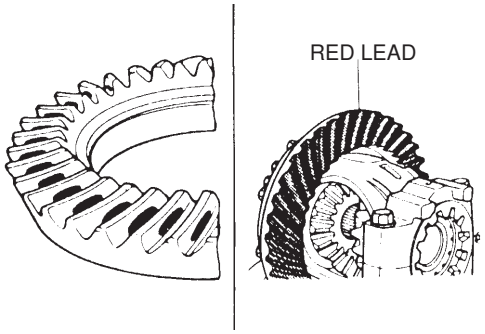
(4) After adjusting the backlash, tighten the adjustment screws equally until the distance between both pilot sections on the bearing caps (L) become as specified.

Bearing cap bolt tightening torque
38—51 N·m {3.8—5.3 kgf·m, 28—38 ft·lbf}

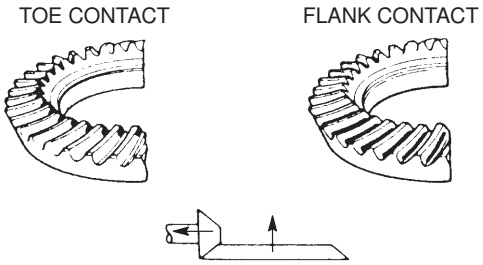


Standard distance
185.43—185.50 mm {7.300—7.303 in}

3. The inspection and adjustment procedure is as follows:
   (1) Coat both surfaces of 6—8 teeth of the ring gear uniformly with a thin red lead coating.
   (2) While moving the ring gear back and forth by hand, rotate the drive pinion several times and inspect the tooth contact.
   (3) If the tooth contact is good, wipe off the red lead coating.
   (4) If it is not good, adjust the pinion height, then adjust the backlash.



Toe and flank contact
Replace the spacer with a thinner one, and move the drive pinion outward.



Heel and face contact
Replace the spacer with a thicker one.
Bring the drive pinion inward.