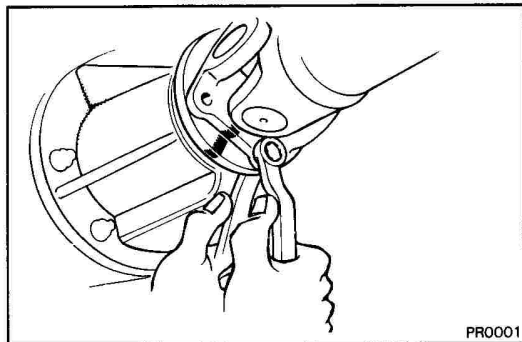
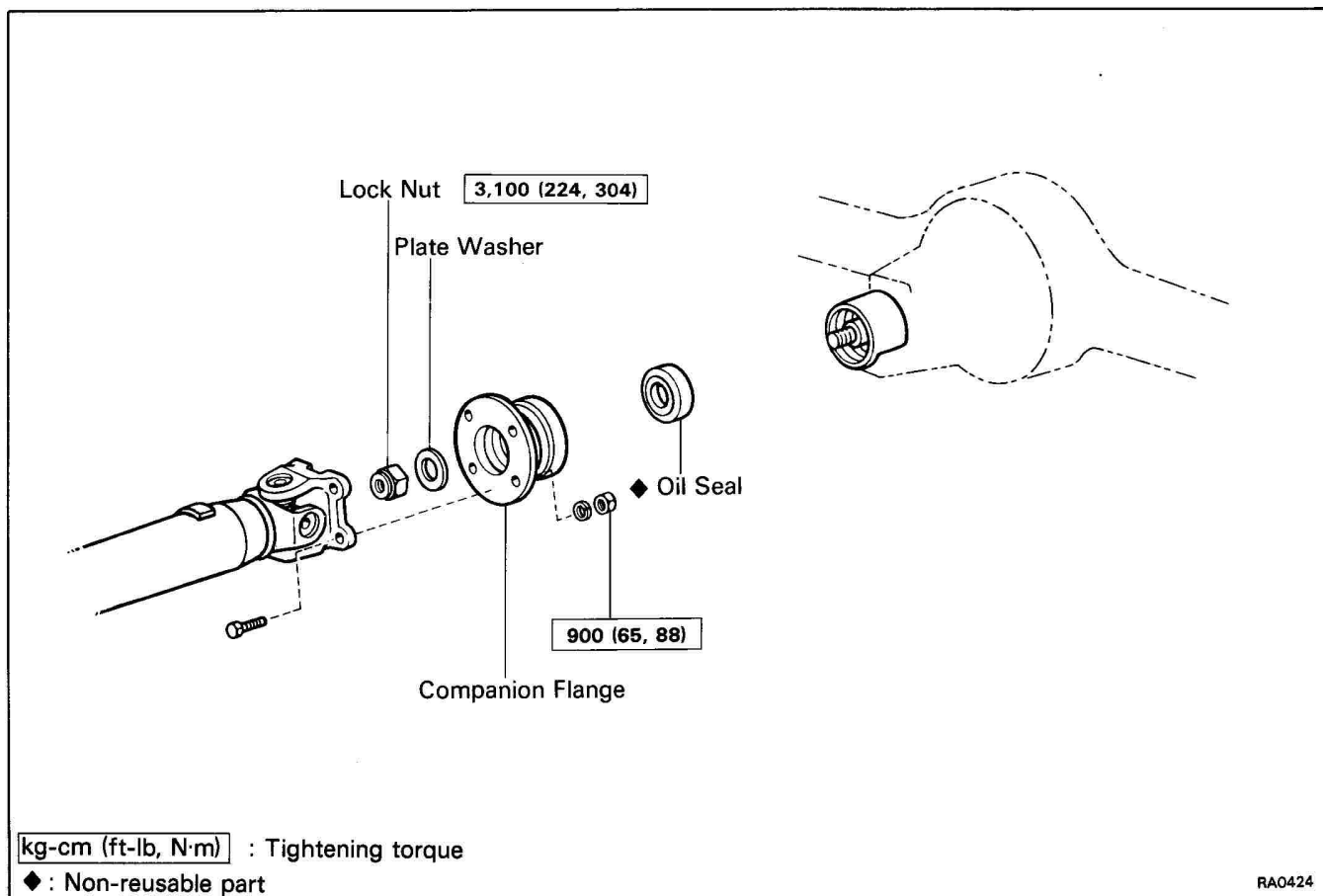


DIFFERENTIAL

10.5 in. Type

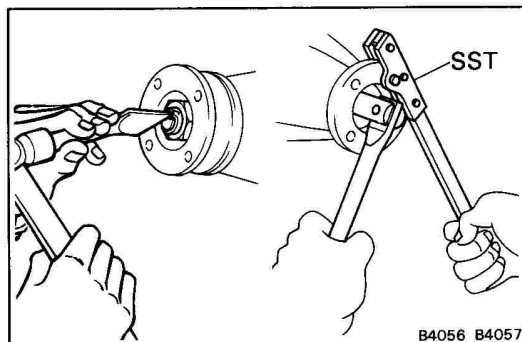
COMPONENTS



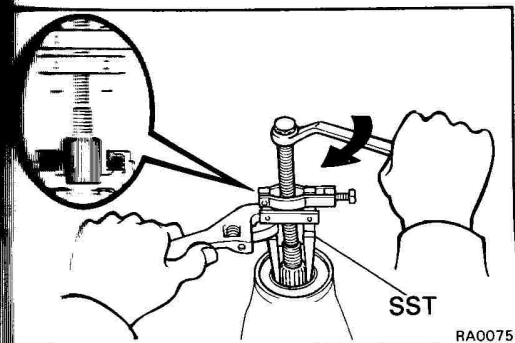
ON-VEHICLE REPLACEMENT OF OIL SEAL

1. DISCONNECT PROPELLER SHAFT FLANGE FROM COMPANION FLANGE

- (a) Put matchmarks on the flanges.
- (b) Remove the four bolts and nuts.



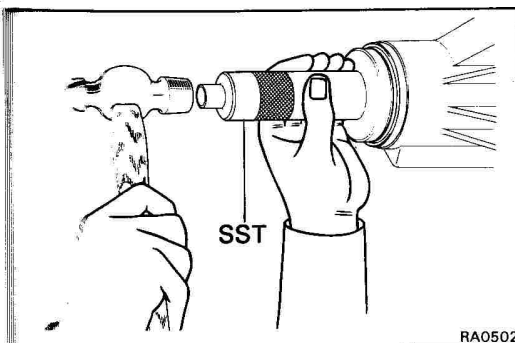
2. REMOVE COMPANION FLANGE (See step 1 on page RA-23) SST 09330-00020



3. REMOVE OIL SEAL

Using SST, remove the oil seal.

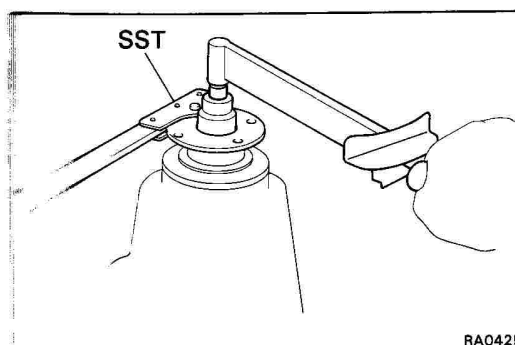
SST 09308-10010



4. INSTALL NEW OIL SEAL

Using SST, install the new oil seal.

SST 09316-60010

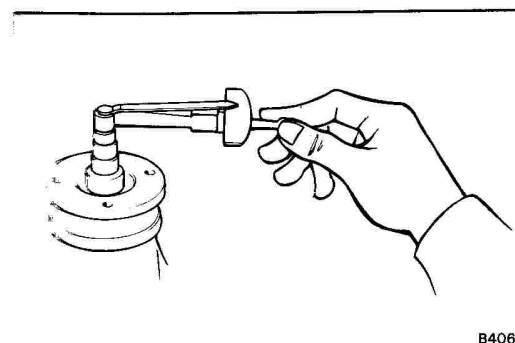


5. INSTALL COMPANION FLANGE

- Install the companion flange on the drive pinion.
- Coat the threads of a new nut with gear oil.
- Using SST to hold the flange, install and tighten the nut.

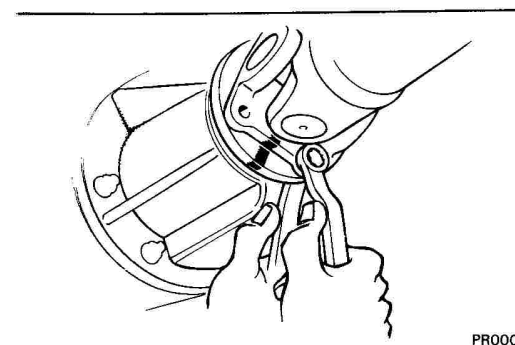
SST 09330-00020

Torque: 3,100 kg-cm (224 ft-lb, 304 N·m)



6. CHECK DRIVE PINION PRELOAD (See step 4 on page RA-22)

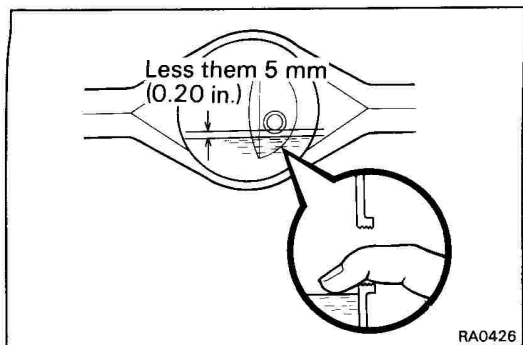
7. STAKE NUT



8. CONNECT PROPELLER SHAFT FLANGE TO COMPANION FLANGE

- Align the matchmarks on the flanges and connect the flanges with four bolts and nuts.
- Torque four bolts and nuts.

Torque: 900 kg-cm (65 ft-lb, 88 N·m)



9. CHECK DIFFERENTIAL OIL LEVEL

Fill with gear oil if necessary.

Oil grade: API GL-5 hypoid gear oil

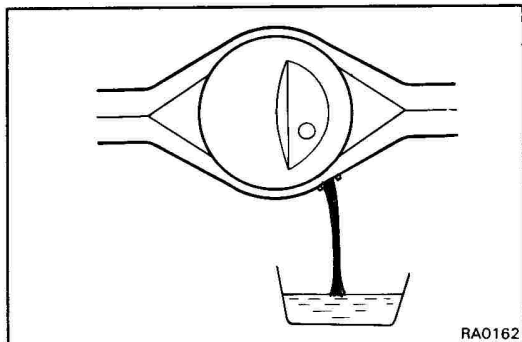
Viscosity: Above -18°C (0°F) SAE 90

Below -18°C (0°F) 80W or 80W-90

Capacity: 3.8 liters (4.0 US qts, 3.3 Imp. qts)

10. INSTALL AND TIGHTEN FILLER PLUG

Torque: 500 kg-cm (36 ft-lb, 49 N·m)



REMOVAL OF DIFFERENTIAL

1. REMOVE DRAIN PLUG AND DRAIN DIFFERENTIAL OIL

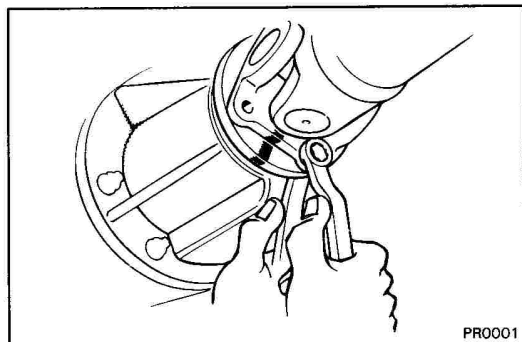
2. REMOVE REAR AXLE SHAFT (See page RA-3)

3. DISCONNECT PROPELLER SHAFT FLANGE FROM COMPANION FLANGE

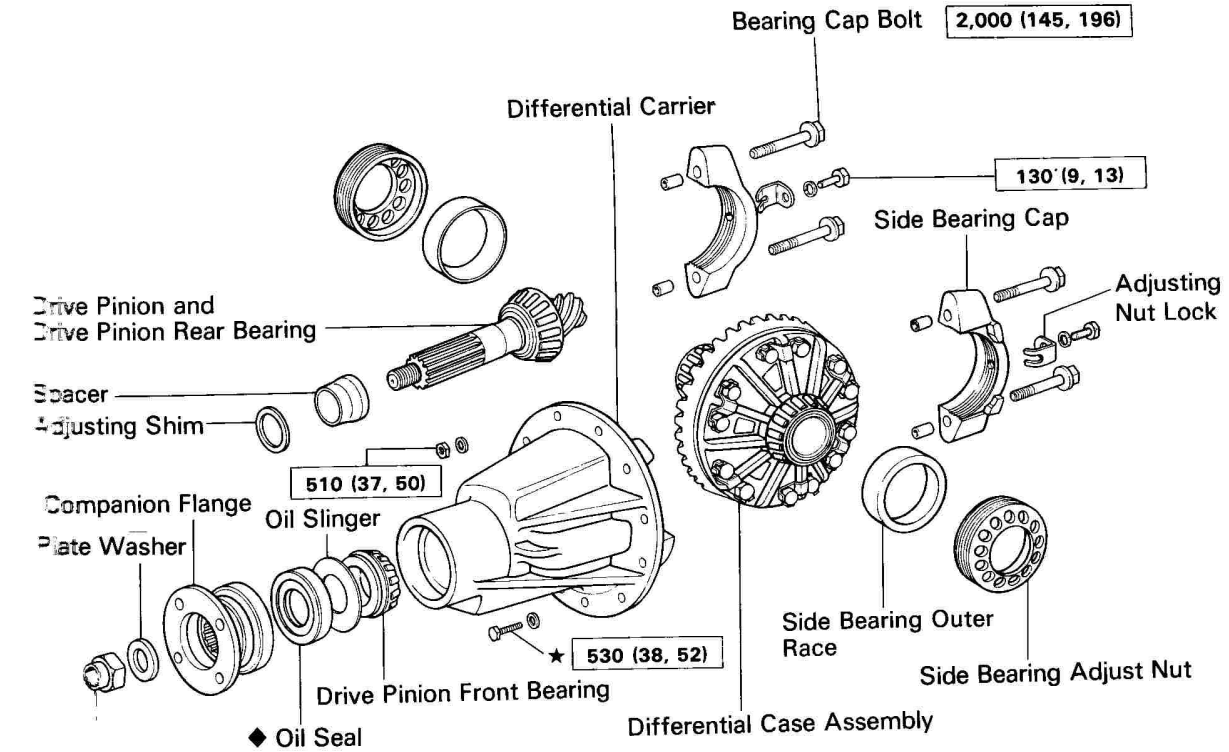
- (a) Place matchmarks on the flanges.
- (b) Remove the four bolts and nuts.

4. REMOVE DIFFERENTIAL CARRIER ASSEMBLY

- (a) Remove four nuts and eight bolts.
- (b) Pull off the differential carrier assembly.

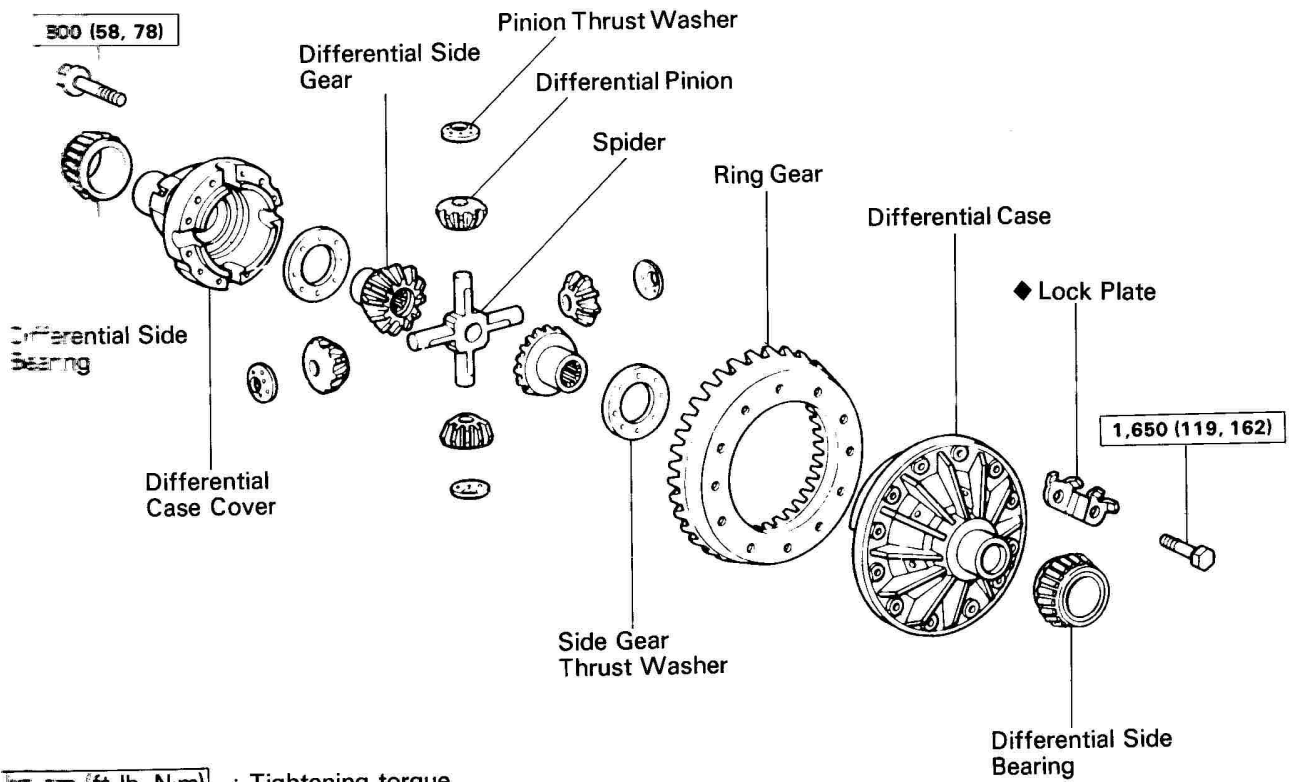


COMPONENTS



◆ Lock Nut
3 100 (224, 304)

Differential Case Assembly



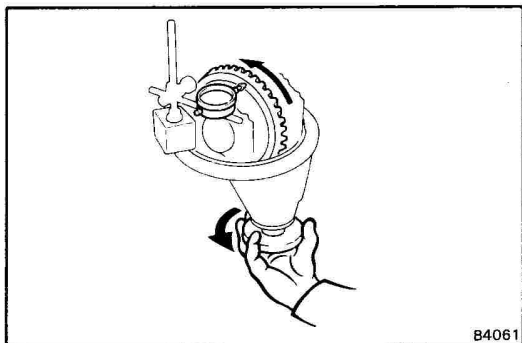
kg-m (ft-lb, N·m) : Tightening torque

- ◆ Non-reusable part
- ★ Precoated part

PRE-INSPECTION

NOTE: If the differential is noisy, perform the following pre-inspection before disassembling, to determine the cause of the noise.

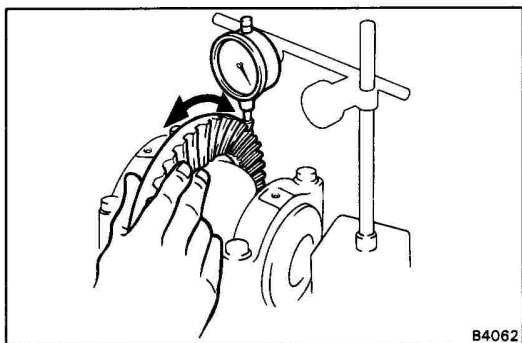
If the differential has severe problems, disassemble and repair as necessary.



1. CHECK RING GEAR RUNOUT

If the runout is greater than the maximum allowable, replace.

Maximum runout: 0.1 mm (0.004 in.)

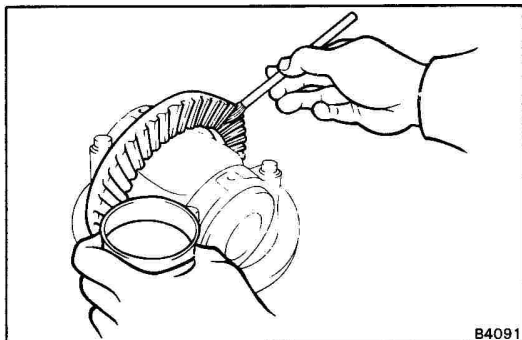


2. CHECK RING GEAR BACKLASH

If the backlash is not within specifications, adjust the side bearing preload or repair as necessary.

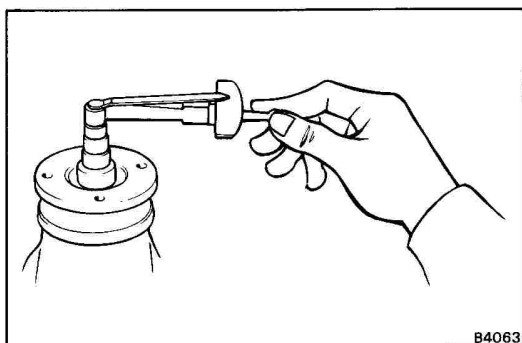
Backlash: 0.15 – 0.20 mm (0.0059 – 0.0079 in.)

NOTE: Measure the backlash at three or four places and confirm that the values are the same.



3. CHECK TOOTH CONTACT (See step 6 on page RA-30)

Note the tooth contacting position.



4. MEASURE DRIVE PINION PRELOAD

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

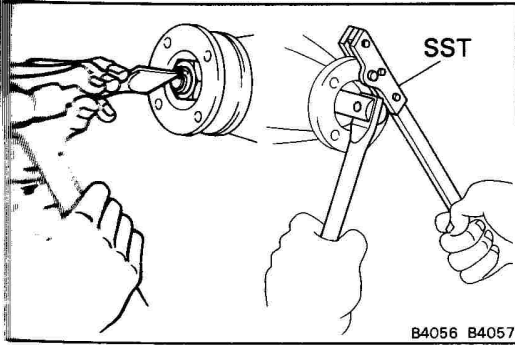
Drive pinion preload (at starting):

8 – 13 kg-cm (6.9 – 11.3 in.-lb, 0.8 – 1.3 N·m)

5. MEASURE TOTAL PRELOAD

**Total preload: Add drive pinion preload
(at starting) 2 – 4 kg-cm**

(1.7 – 3.5 in.-lb, 0.2 – 0.4 N·m)

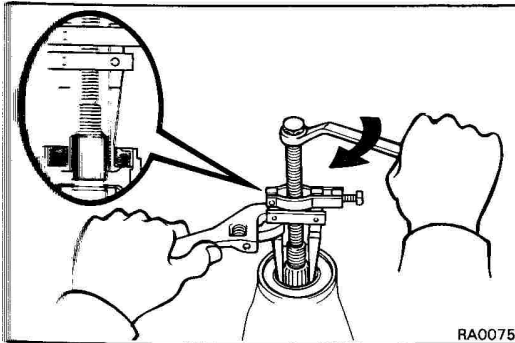


DISASSEMBLY OF DIFFERENTIAL

(See page RA-11)

1. REMOVE COMPANION FLANGE

- Using a hammer and chisel, loosen the staked part of the nut.
- Using SST to hold the flange, remove the nut.
SST 09330-00020
- Remove the companion flange from the drive pinion.

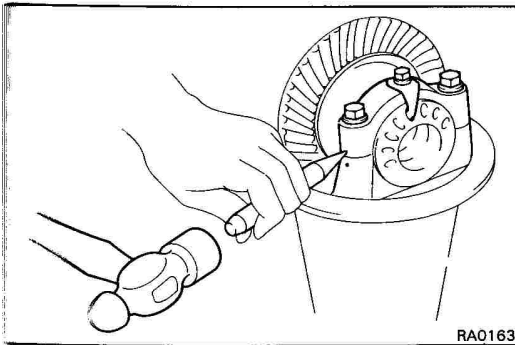


2. REMOVE OIL SEAL FROM DIFFERENTIAL CARRIER

Using SST, remove the oil seal from the differential carrier.

SST 09308-10010

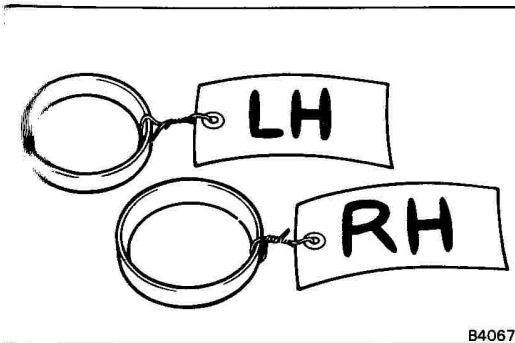
3. REMOVE OIL SLINGER, FRONT BEARING, SHIM AND SPACER



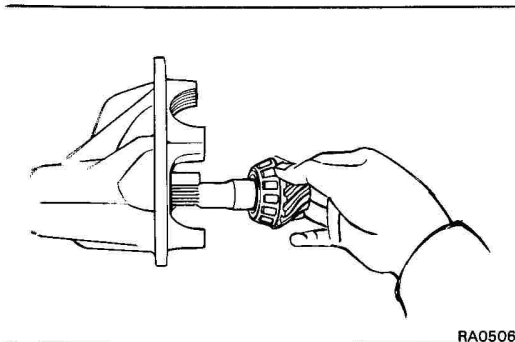
4. REMOVE DIFFERENTIAL CASE AND RING GEAR

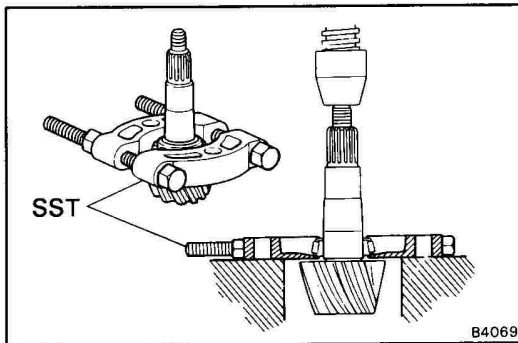
- Place matchmarks on the bearing cap and differential carrier.
- Remove the two adjusting nut locks.
- Remove the two bearing caps and two adjusting nuts.
- Remove the bearing outer races.
- Remove the differential case from the carrier.

NOTE: Tag the disassembled parts to show the location for reassembly.



5. REMOVE DRIVE PINION FROM DIFFERENTIAL CARRIER



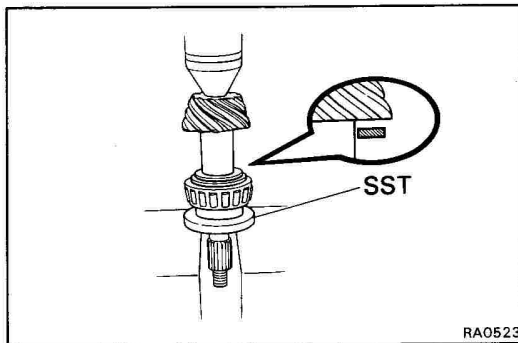


INSPECTION AND REPLACEMENT OF DIFFERENTIAL COMPONENTS

1. REPLACE DRIVE PINION REAR BEARING

- (a) Using a press and SST, press out the rear bearing from the drive pinion.

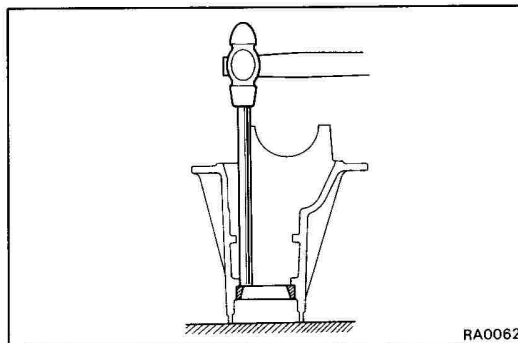
SST 09950-00020



- (b) Install the reused washer on the drive pinion.

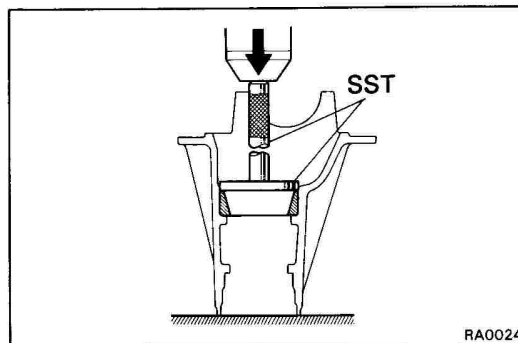
- (c) Using a press and SST, press a new bearing in to the drive pinion.

SST 09316-60010



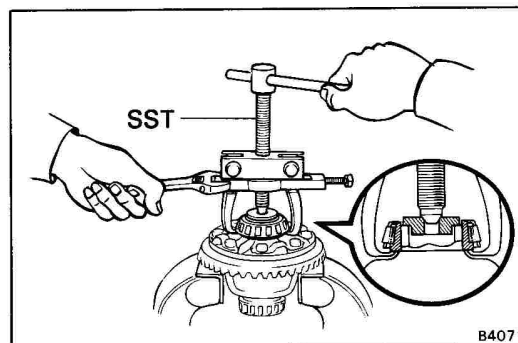
2. REPLACE DRIVE PINION FRONT AND REAR BEARING OUTER RACES

- (a) Using a hammer and a brass bar, tap out the front and rear bearing outer races from the differential carrier.



- (b) Using a press and SST, press new front and rear bearing outer races into the differential carrier.

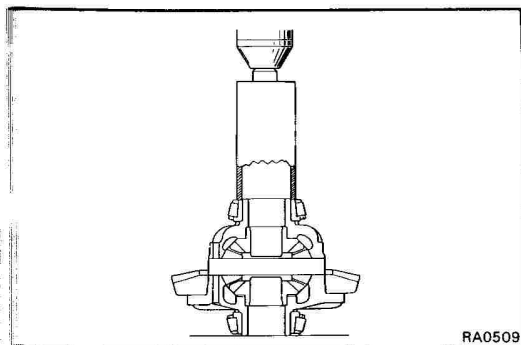
SST 09608-35013



3. REPLACE SIDE BEARINGS

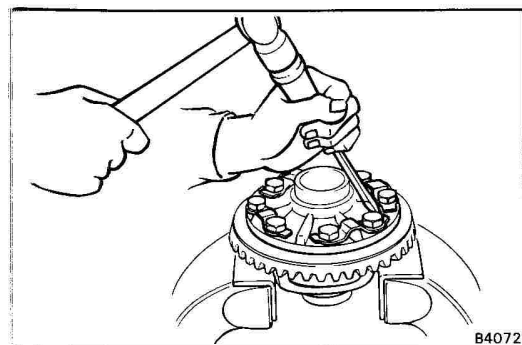
- (a) Using SST, remove the side bearing from the differential case.

SST 09950-20015



- (b) Using a press and SST, press in a new side bearing to the differential case.

SST 09316-60010

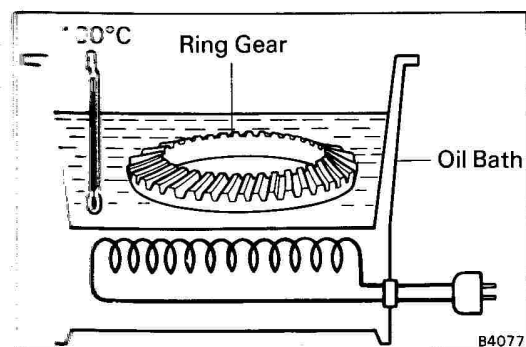


4. REPLACE RING GEAR

- (a) Unstake the lock plates.
(b) Remove the ring gear set bolts and lock plates.
(c) Using a copper hammer, tap on the ring gear to separate it from the differential case.

CAUTION: Be careful not to damage the side bearing.

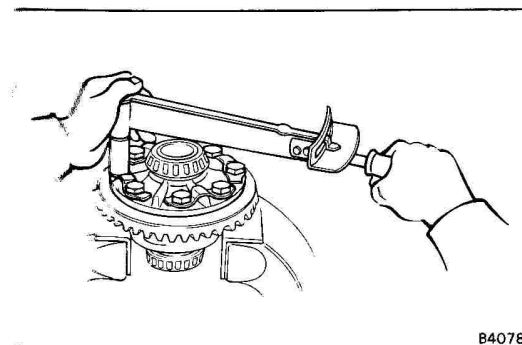
NOTE: Replace the ring gear and drive pinion as a set.



- (d) Clean the contact surface of the differential case.
(e) Heat a new ring gear to about 100°C (212°F) in an oil bath.

CAUTION: Do not heat the ring gear more than 110°C (230°F).

- (f) Clean the contact surface of the ring gear with cleaning solvent.

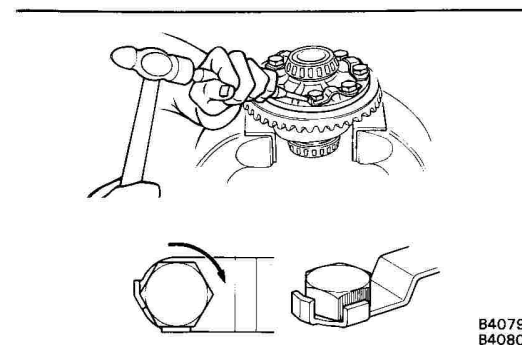


- (g) Then quickly install the ring gear on the differential case.

- (h) Coat the ring gear set bolts with gear oil.

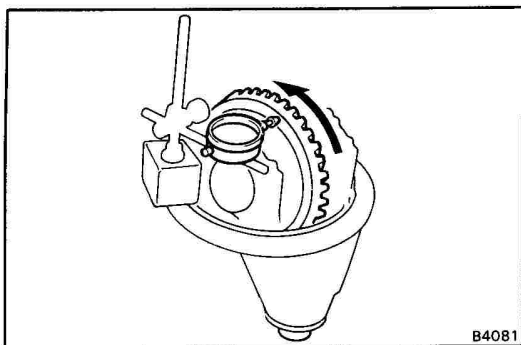
- (i) Install the lock plates and set bolts. Tighten the set bolts uniformly, a little at a time.
Torque the bolts.

Torque: 1,650 kg-cm (119 ft-lb, 162 N·m)



- (j) Using a hammer and drift punch, stake the lock plates.

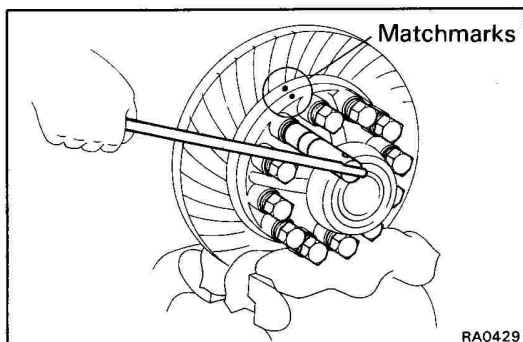
NOTE: Stake one claw flush with the flat surface of the nut. For the claw contacting the protruding portion of the nut, stake (bend) only the half on the tightening side.



(k) Check the ring gear runout.

Maximum runout: 0.10 mm (0.0039 in.)

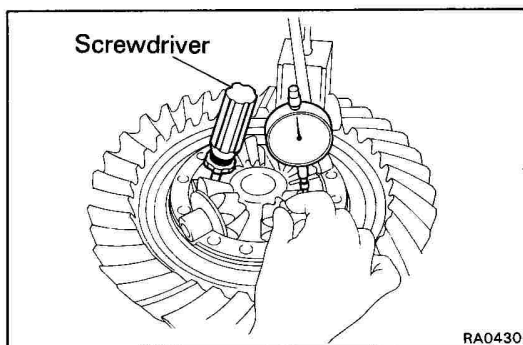
Temporarily install the differential case onto the carrier and tighten the adjusting nut just to where there is no play in the bearing.



5. REPLACE SIDE GEAR, PINION AND THRUST WASHER

(a) Place the matchmarks on the differential case and case cover.

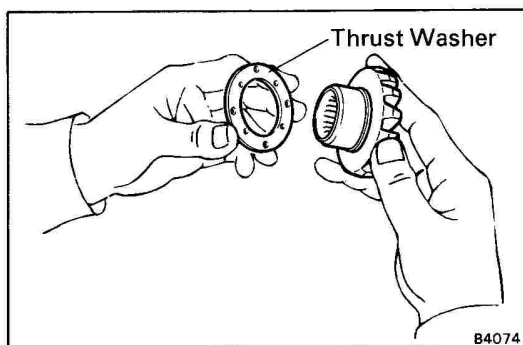
(b) Protect the ring gear with a cloth, and secure it in a vise and remove the bolts.



(c) Measure the side gear backlash at the ring gear side and at another place.

**Standard backlash: 0.02 – 0.20 mm
(0.0008 – 0.0079 in.)**

NOTE: Using a screwdriver, lock the side gear.

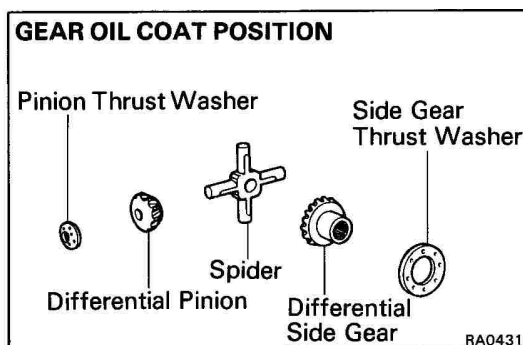


(d) If the backlash is not within specification, install a thrust washer of a different thickness.

NOTE: Use washers of the same thickness on both the right and left sides.

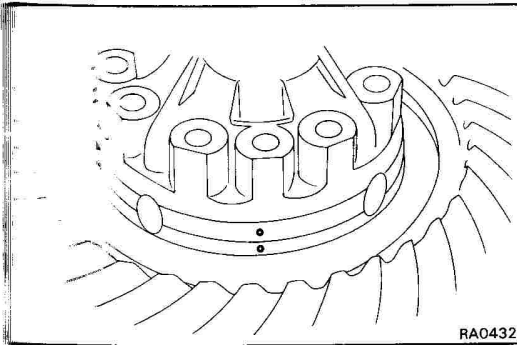
Thrust washer thickness mm (in.)

Thickness		Thickness	
1.60	(0.0630)	1.90	(0.0748)
1.75	(0.0689)	2.05	(0.0807)

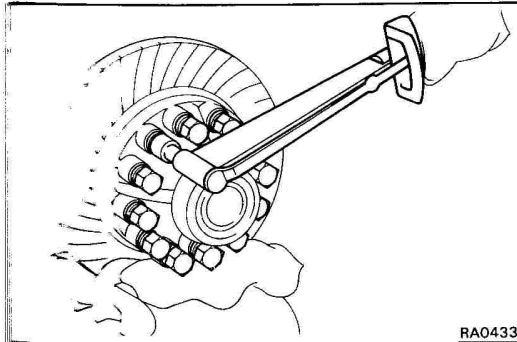


(e) Install the case cover with the side gear and other parts assembled to it.

NOTE: Apply gear oil as shown before installing.



(f) Align the matchmarks.



(g) Tighten the bolts uniformly, a little at a time.

Torque: 800 kg-cm (58 ft-lb, 78 N·m)

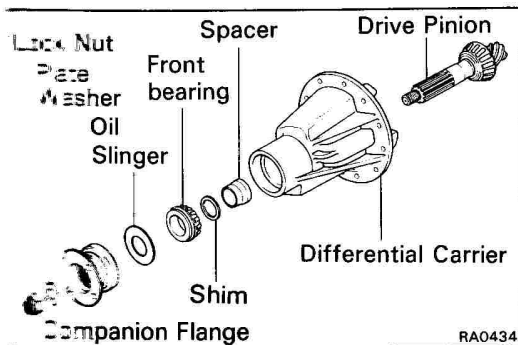
ASSEMBLY OF DIFFERENTIAL

(See page RA-21)

1. ADJUST DRIVE PINION PRELOAD

(a) Install the drive pinion to the differential carrier.

NOTE: Apply gear oil to the drive pinion rear bearing before installing.



(b) Install the following parts:

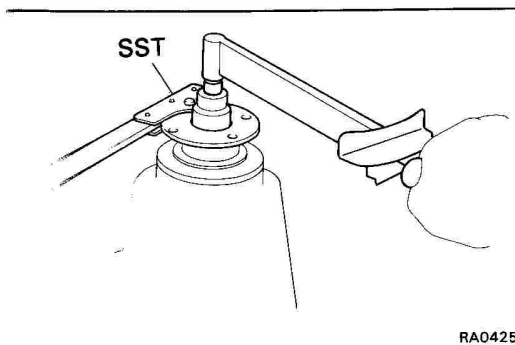
- Spacer
- Shim
- Front bearing
- Oil slinger
- Companion flange

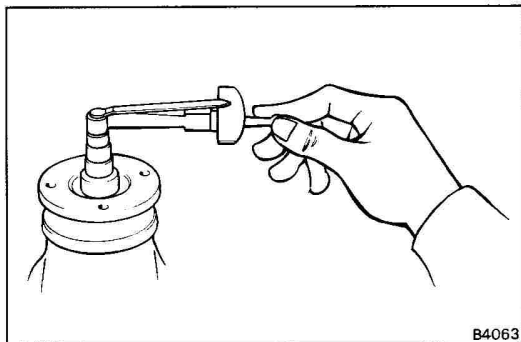
NOTE:

- Apply gear oil to the drive pinion front bearing before installing.
 - Install the oil seal after adjusting the total preload.
- (c) Install the plate washer.
- (d) Coat the threads of a new lock nut with gear oil.
- (e) Using SST, hold the flange. Install and tighten a new lock nut.

SST 09330-00020

Torque: 3,100 kg-cm (224 ft-lb, 304 N·m)





- (f) Using a torque meter, measure the drive pinion preload.

Preload (at starting):

New bearing 19 – 55 kg-cm
(16.5 – 47.7 in.-lb, 1.9 – 5.4 N·m)

Reused bearing 8 – 13 kg-cm
(6.9 – 11.3 in.-lb, 0.8 – 1.3 N·m)

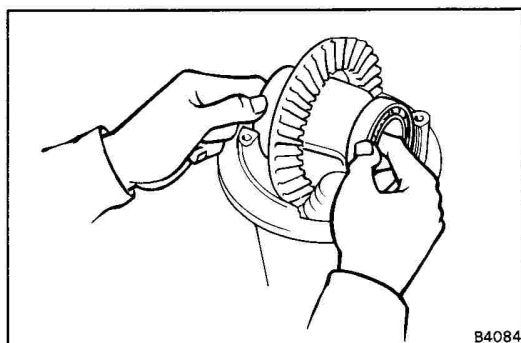
NOTE: Measure the preload after snugging the bearing down by rotating it left and right several times.

- (g) If the preload is not within standard, adjust by increasing or decreasing the number of shims.

Adjusting shim thickness mm (in)

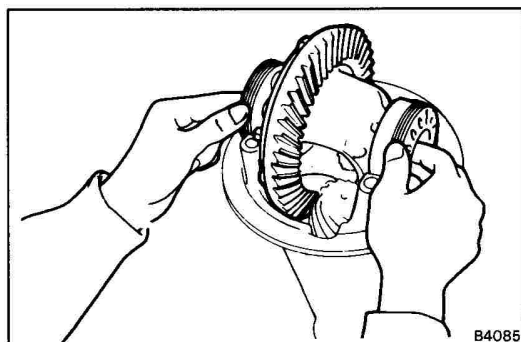
Group A		Group B	
1.90 (0.0748)	2.50 (0.0984)	1.80 (0.0709)	1.86 (0.0732)
2.00 (0.0787)	2.60 (0.1024)	1.81 (0.0713)	1.87 (0.0736)
2.10 (0.0827)	2.70 (0.1063)	1.82 (0.0717)	1.88 (0.0740)
2.20 (0.0866)	2.80 (0.1102)	1.83 (0.0720)	1.89 (0.0744)
2.30 (0.0906)	2.90 (0.1142)	1.84 (0.0724)	
2.40 (0.0945)	3.00 (0.1181)	1.85 (0.0728)	

NOTE: Use a washer from both Group A and Group B to adjust.



2. INSTALL DIFFERENTIAL CASE IN CARRIER

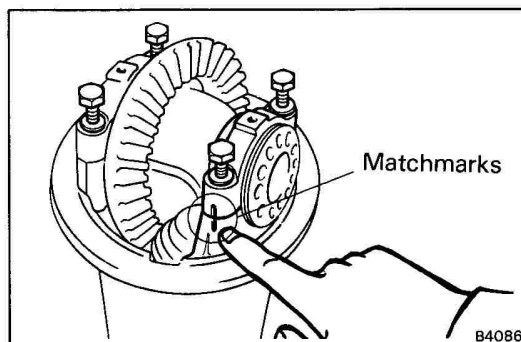
- (a) Place the bearing outer races on their respective bearings. Make sure the left and right outer races are not interchanged.
- (b) Install the case in the carrier.



3. INSTALL ADJUSTING NUTS

Install the adjusting nuts on their respective carrier, making sure the nuts are threaded properly.

NOTE: Make sure that there is backlash between the ring gear and drive pinion.



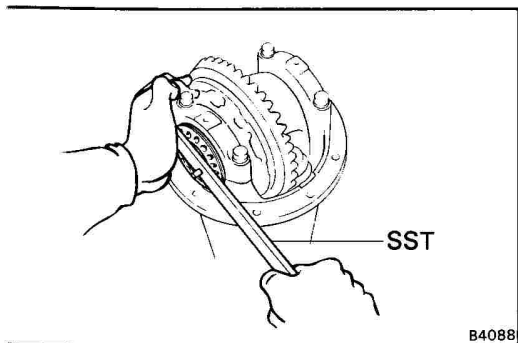
4. INSTALL BEARING CAPS

Align the matchmarks on the cap and carrier.

Screw in the two bearing cap bolts two or three turns and press down the bearing cap by hand.

NOTE: If the bearing cap does not fit tightly, on the carrier, the adjusting nut threads are not meshed properly.

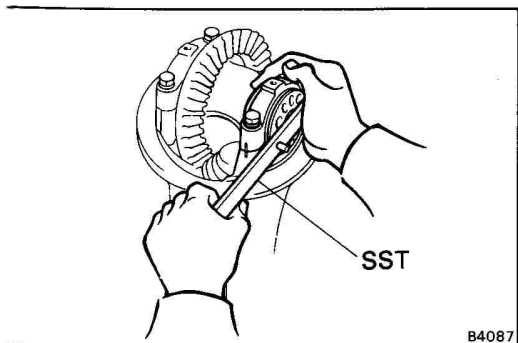
Reinstall adjusting nuts if necessary.



5. ADJUST SIDE BEARING PRELOAD

- (a) Tighten the bearing cap bolts until their heads touch the bearing cap.
- (b) Using SST, tighten the adjusting nut on the ring gear side until the ring gear has a backlash of about 0.2 mm (0.008 in.)

SST 09504-00011

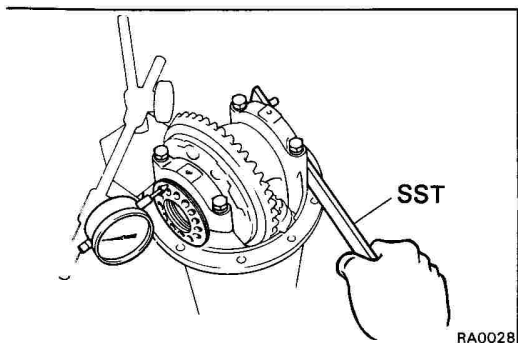


- (c) Using SST, firmly tighten the adjusting nut on the drive pinion side.

SST 09504-00011

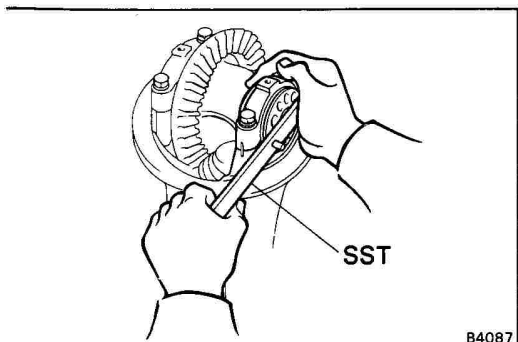
- (d) Using SST, loosen the adjusting nut on the drive pinion side.

SST 09504-00011



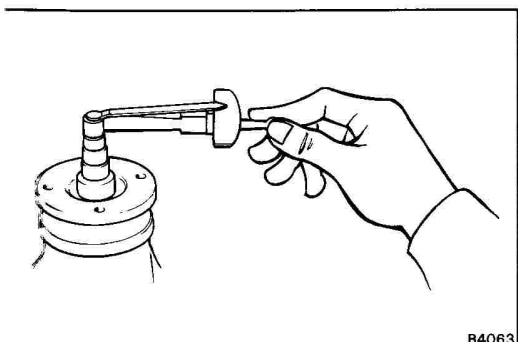
- (e) Place a dial indicator on the top of the adjusting nut on the ring gear side.

- (f) Adjust the side bearing for zero preload by tightening the other adjusting nut until the pointer on the indicator bearing to move.



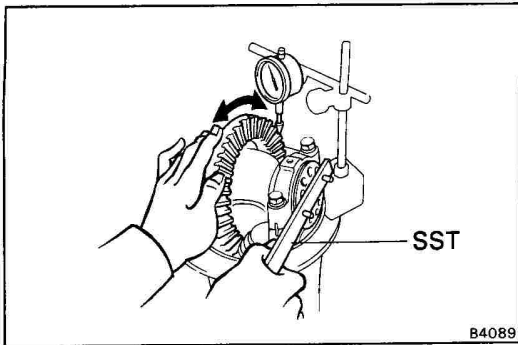
- (g) Using SST, tighten the adjusting nut 2 notches from the nonpreload position.

SST 09504-00011



- (h) Using a torque meter, measure the total preload.

Total preload: Add drive pinion preload
(at starting) 2 – 4 kg-cm
(1.7 – 3.5 in.-lb, 0.2 – 0.4 N·m)

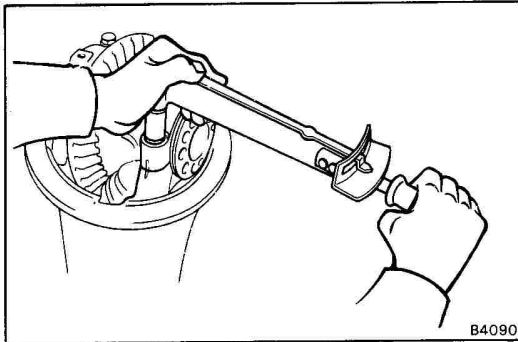


- (i) Using a dial indicator, adjust the ring gear backlash until it is within specification.

SST 09504-00011

Backlash: 0.15 – 0.20 mm (0.0059 – 0.0079 in.)

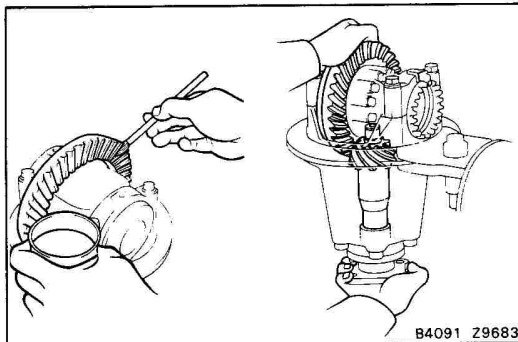
NOTE: The backlash is adjusted by turning the left and right adjusting nuts equal amounts. For example, loosen the nut on the left side one notch and tighten the nut on the right side one notch.



- (j) Torque the bearing cap bolts.

Torque: 2,000 kg-cm (145 ft-lb, 196 N·m)

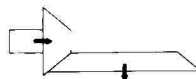
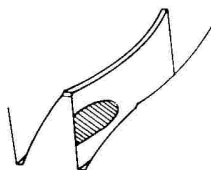
- (k) Recheck the total preload and ring gear backlash.



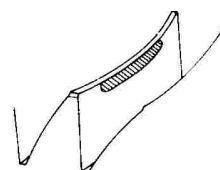
6. INSPECT TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION

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

Heel Contact

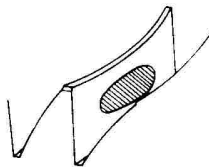


Face Contact

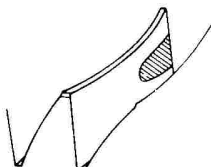


Select an adjusting shim that will bring the drive pinion closer to the ring gear.

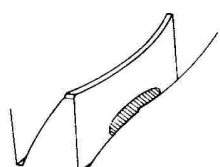
Proper Contact



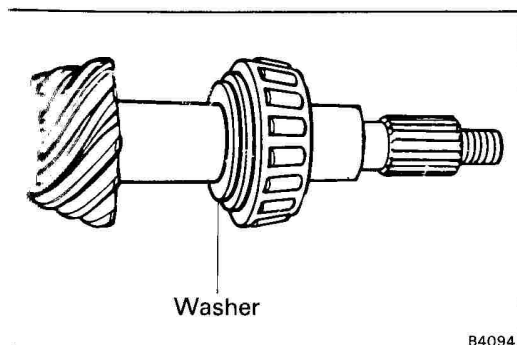
Toe Contact



Flank Contact



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

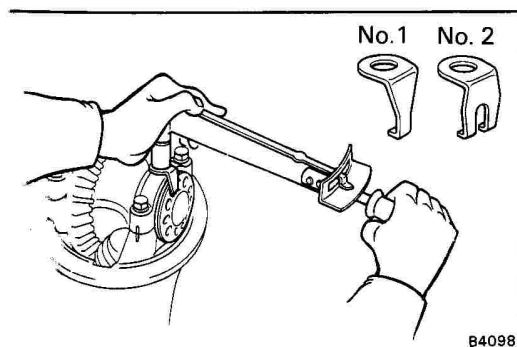


If the teeth are not contacting properly, use the following chart to select a proper washer for correction.

Washer thickness mm (in.)

Thickness		Thickness	
1.05	(0.0413)	1.35	(0.0531)
1.10	(0.0433)	1.40	(0.0551)
1.15	(0.0453)	1.45	(0.0571)
1.20	(0.0472)	1.50	(0.0591)
1.25	(0.0492)	1.55	(0.0610)
1.30	(0.0512)		

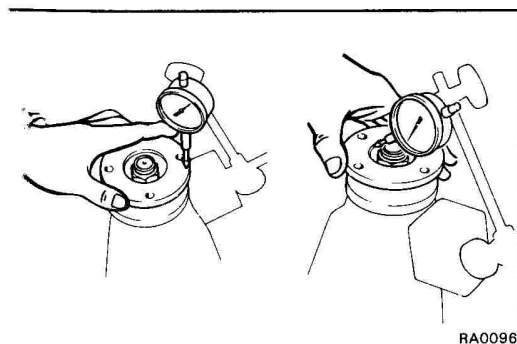
NOTE: Recheck the ring gear backlash, if backlash is not within standard, repeat the procedure from step 5.



7. INSTALL ADJUSTING NUT LOCKS

- Select either lock No. 1 or No. 2 whichever fits on the adjusting nuts.
- Install the locks on the bearing caps.

Torque: 130 kg-cm (9 ft-lb, 13 N·m)



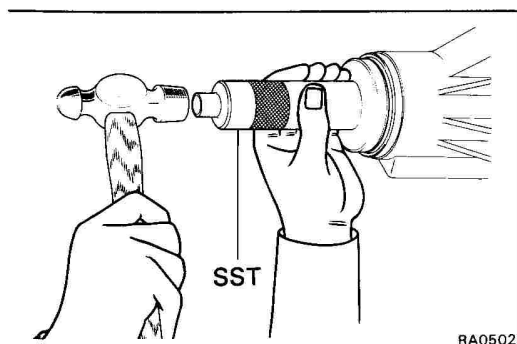
8. INSPECT COMPANION FLANGE RUNOUT

Max. Surface runout: 0.10 mm (0.004 in.)

Max. Shaft runout: 0.10 mm (0.004 in.)

If necessary, replace the companion flange.

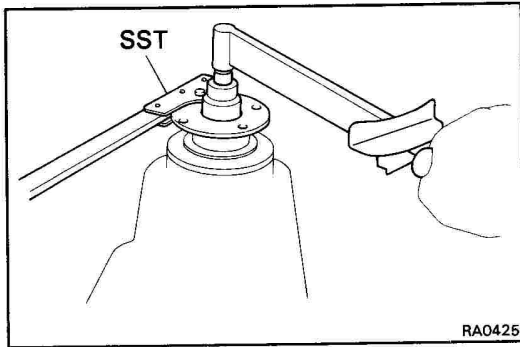
9. REMOVE COMPANION FLANGE (See step 1 on page RA-23)



10. INSTALL OIL SEAL

Using SST, drive in the oil seal.

SST 09316-60010

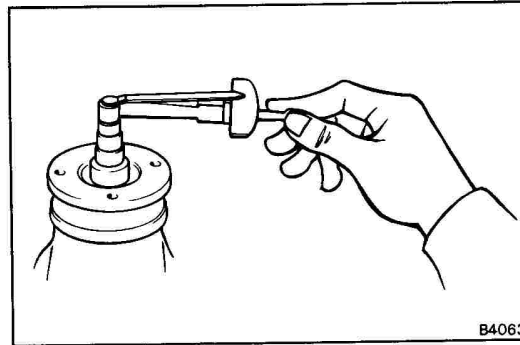


11. INSTALL COMPANION FLANGE

- (a) Install the companion flange on the drive pinion.
- (b) Coat the threads of a new nut with gear oil.
- (c) Using SST to hold the flange, tighten and torque the nut.

SST 09330-00020

Torque: 3,100 kg-cm (224 ft-lb, 304 N·m)



- (d) Recheck the drive pinion and total preload.

Drive pinion preload (at starting):

New bearing 19 – 55 kg-cm

(16.5 – 47.7 in.-lb, 1.9 – 5.4 N·m)

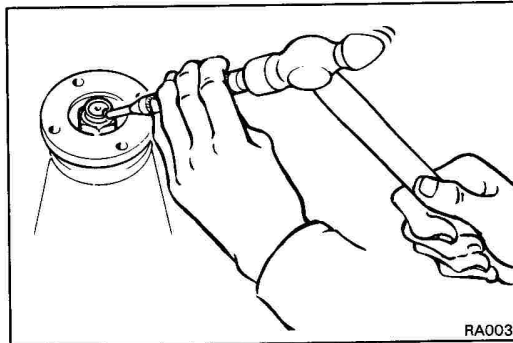
Reused bearing 8 – 13 kg-cm

(6.9 – 11.3 in.-lb, 0.8 – 1.3 N·m)

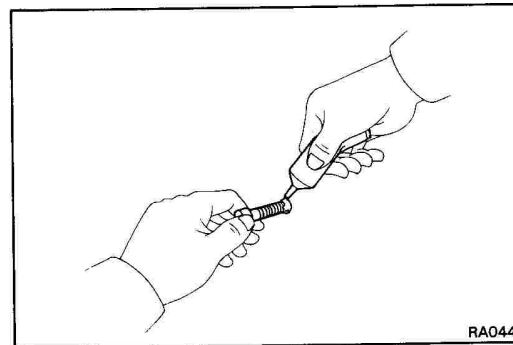
Total preload: Add drive pinion preload

(at starting) 2 – 4 kg-cm

(1.7 – 3.5 in.-lb, 0.2 – 0.4 N·m)



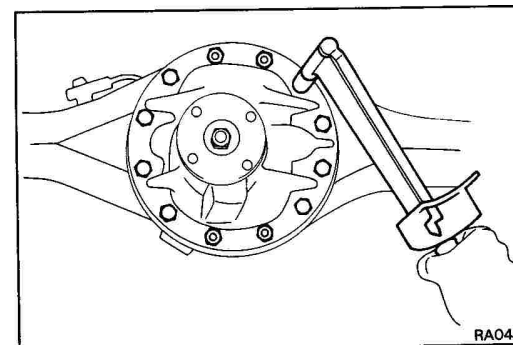
- (e) Stake the nut.



INSTALLATION OF DIFFERENTIAL

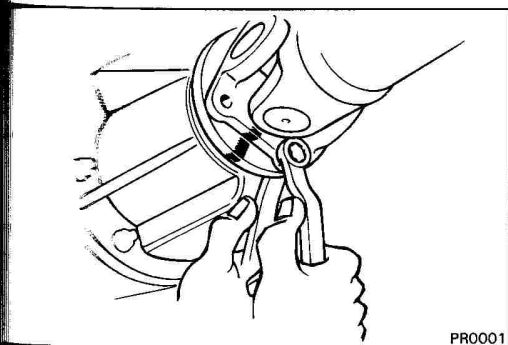
1. INSTALL DIFFERENTIAL CARRIER ASSEMBLY

- (a) Apply liquid sealer to both sides of a new gasket and the set bolt threads.



- (b) Install the differential carrier assembly in the axle housing and install the four nuts and eight bolts.
- (c) Tighten the nuts and bolts diagonally, a little at a time.

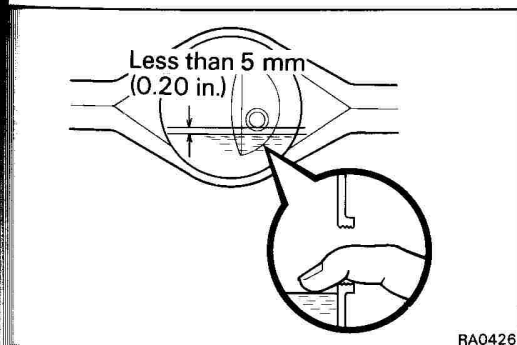
Torque: 530 kg-cm (38 ft-lb, 52 N·m)



2. CONNECT PROPELLER SHAFT FLANGE TO COMPANION FLANGE

Torque: 900 kg-cm (65 ft-lb, 88 N·m)

3. INSTALL REAR AXLE SHAFT
(See page RA-4)



4. INSTALL DRAIN PLUG AND FILL DIFFERENTIAL WITH GEAR OIL

Oil grade: API GL-5 hypoid gear oil

Viscosity: Above - 18°C (0°F) SAE90

Below - 18°C (0°F) 80W or 80W -90

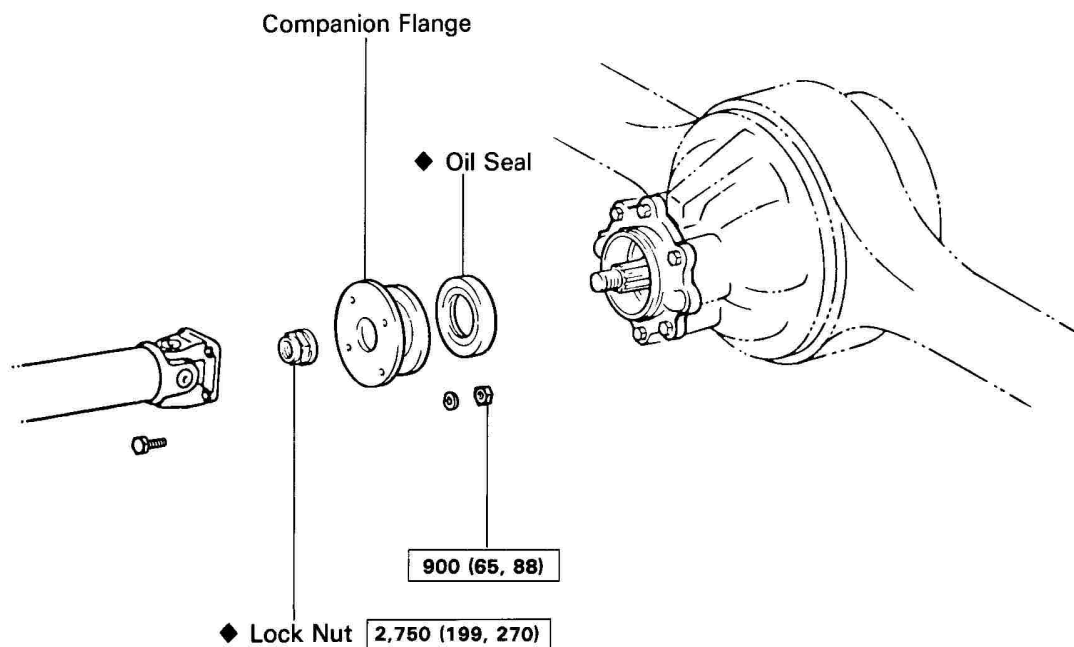
Capacity: 3.8 liters (4.0 US qts, 3.3 Imp. qts)

Torque: 500 kg-cm (36 ft-lb, 49 N·m)

5. INSTALL AND TIGHTEN FILLER PLUG

Torque: 500 kg-cm (36 ft-lb, 49 N·m)

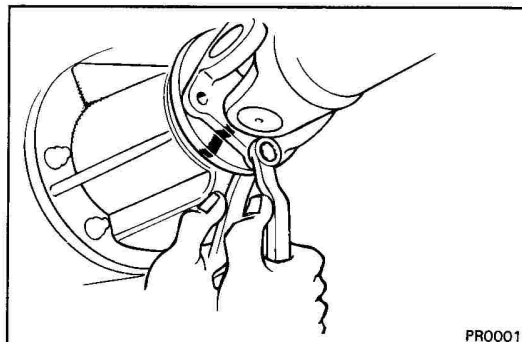
12 in. Type COMPONENTS



kg-cm (ft-lb, N-m) : Tightening torque

◆ : Non-reusable part

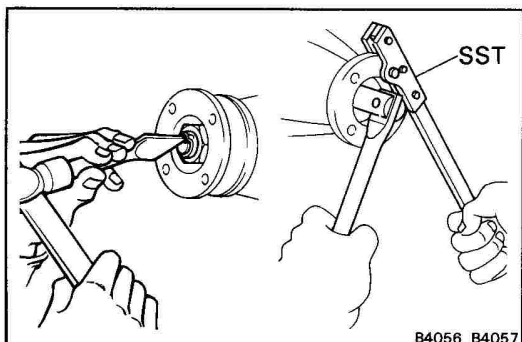
RA05C*



ON-VEHICLE REPLACEMENT OF OIL SEAL

1. DISCONNECT PROPELLER SHAFT FLANGE FROM COMPANION FLANGE

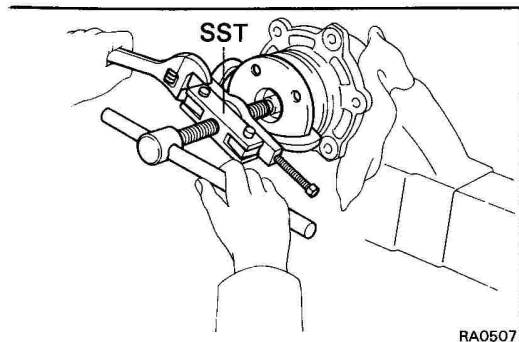
- Put matchmarks on the flanges.
- Remove the four bolts and nuts.



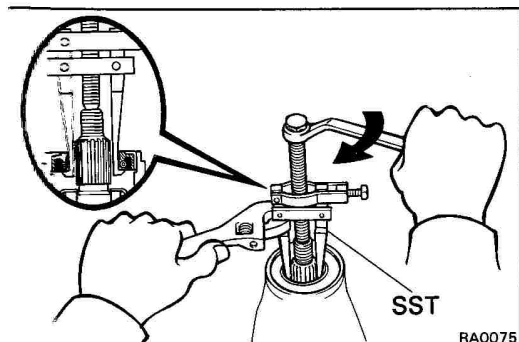
2. REMOVE COMPANION FLANGE

- Using a hammer and chisel, loosen the staked part of the nut.
- Using SST to hold the flange, remove the nut.

SST 09330-00020

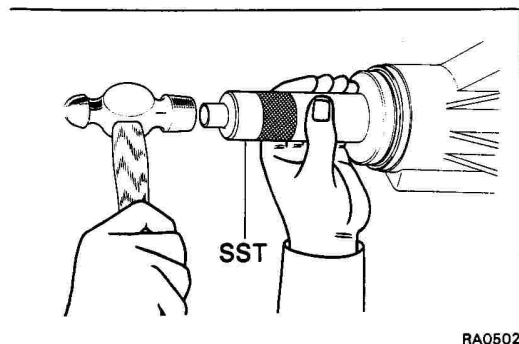


- (c) Using SST, remove the companion flange.
SST 09950-20015



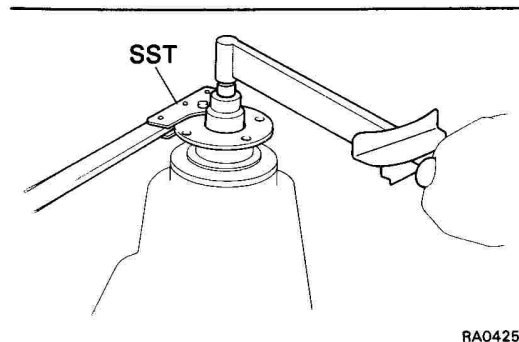
3. REMOVE OIL SEAL

- Using SST, remove the oil seal.
SST 09308-10010



4. INSTALL NEW OIL SEAL

- Using SST, install a new oil seal.
SST 09316-60010

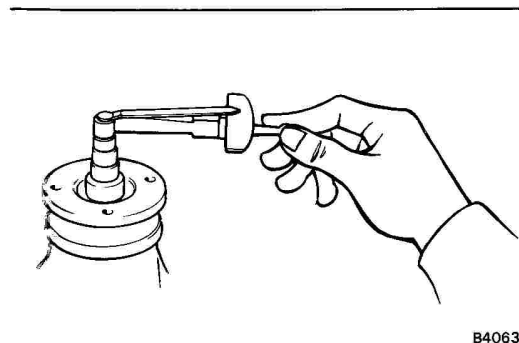


5. INSTALL COMPANION FLANGE

- (a) Install the companion flange on the drive pinion.
(b) Coat the threads of a new nut with gear oil.
(c) Using SST to hold the flange, install and tighten the nut.

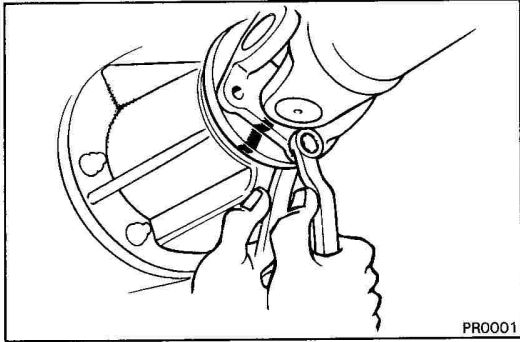
SST 09330-00020

Torque: 2,750 kg-cm (199 ft-lb, 270 N·m)



6. CHECK DRIVE PINION PRELOAD (See step 4 on page RA-22)

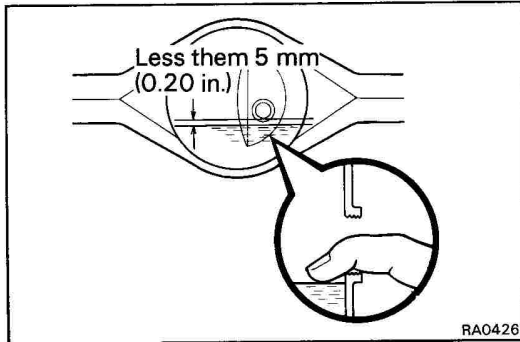
7. STAKE NUT



8. CONNECT PROPELLER SHAFT FLANGE TO COMPANION FLANGE

- (a) Align the matchmarks on the flanges and connect the flanges with four bolts and nuts.
- (b) Torque the four bolts and nuts.

Torque: 900 kg-cm (65 ft-lb, 88 N·m)



9. CHECK DIFFERENTIAL OIL LEVEL

Fill with gear oil if necessary.

Oil grade: API GL-5 hypoid gear oil

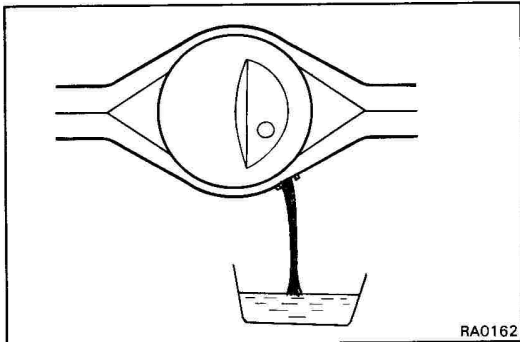
Viscosity: Above -18°C (0°F) SAE 90

Below -18°C (0°F) 80W or 80W-90

Capacity: 5.0 liters (5.3 US qts, 4.4 Imp. qts)

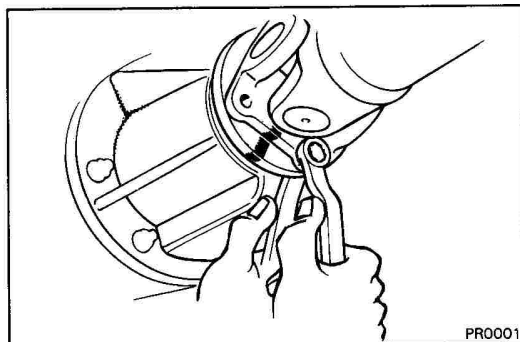
10. INSTALL AND TIGHTEN FILLER PLUG

Torque: 500 kg-cm (36 ft-lb, 49 N·m)



REMOVAL OF DIFFERENTIAL

1. REMOVE DRAIN PLUG AND DRAIN DIFFERENTIAL OIL
2. REMOVE REAR AXLE SHAFT
(See page RA-3)



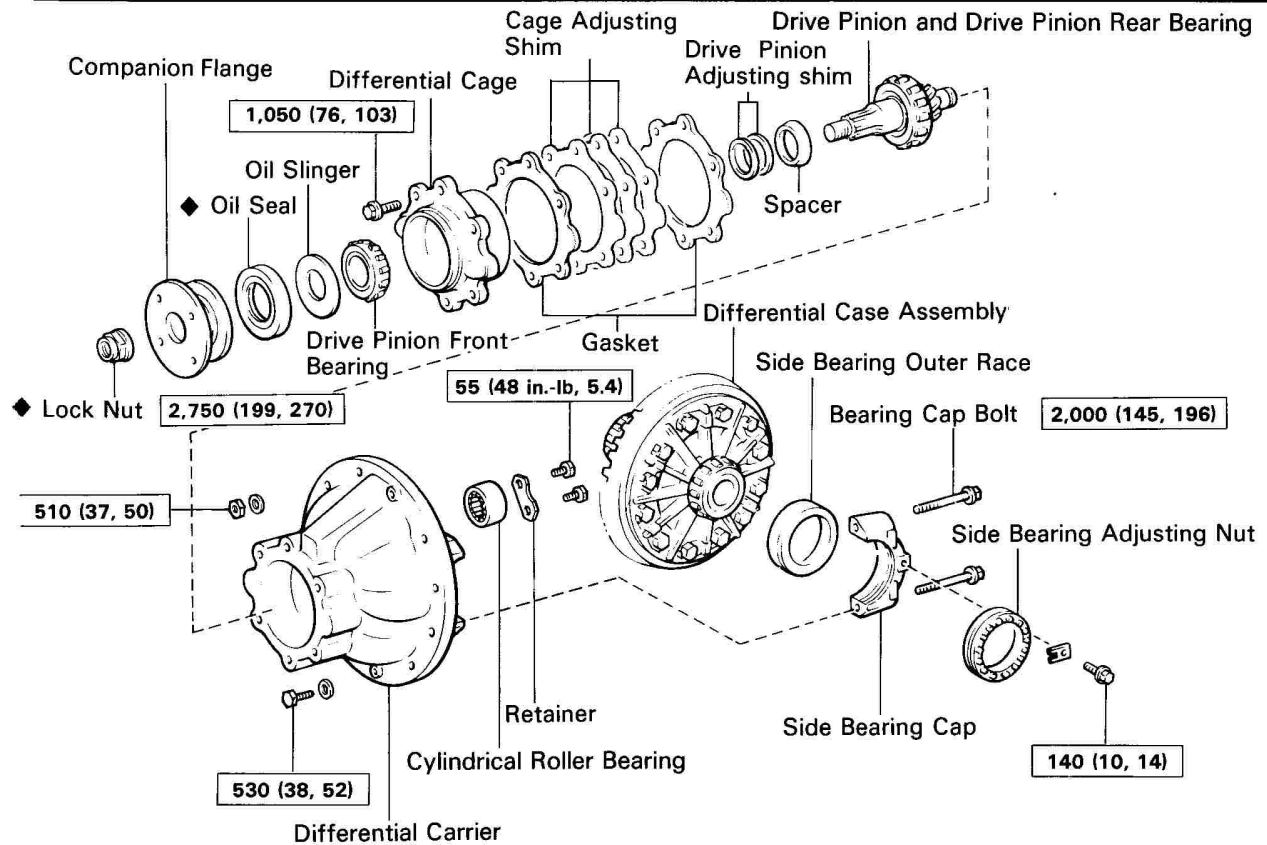
3. DISCONNECT PROPELLER SHAFT FLANGE FROM COMPANION FLANGE

- (a) Place alignment marks on the flanges.
- (b) Remove the four bolts and nuts.

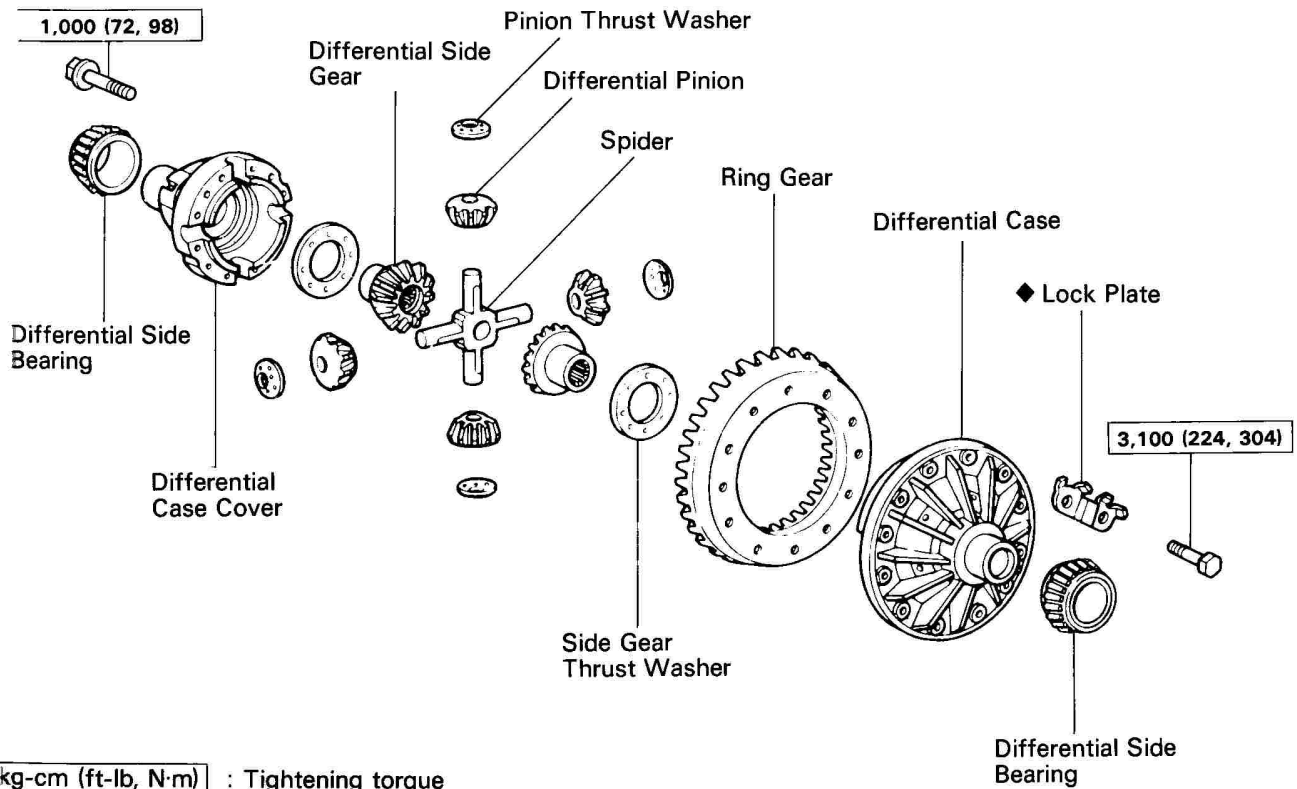
4. REMOVE DIFFERENTIAL CARRIER ASSEMBLY

- (a) Remove the four nuts and eight bolts.
- (b) Pull off the differential carrier assembly.

COMPONENTS



[Differential Case Assembly]



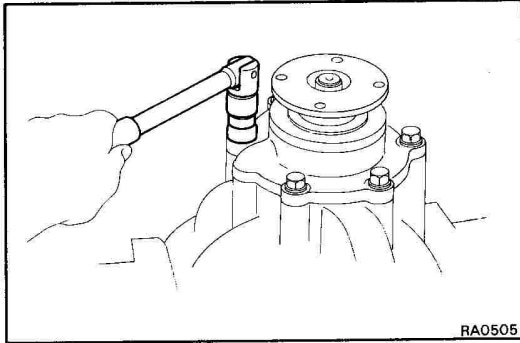
kg-cm (ft-lb, N·m) : Tightening torque

◆ : Non-reusable part

RA0504
RA0580

PRE-INSPECTION

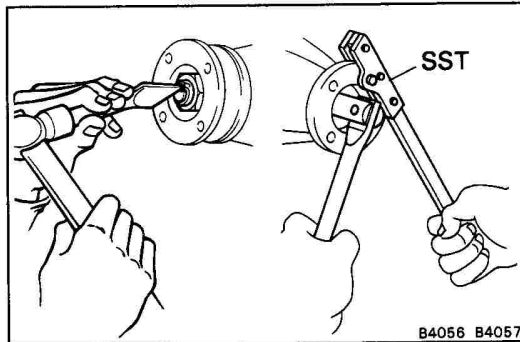
(See page RA-22)

**DISASSEMBLY OF DIFFERENTIAL**

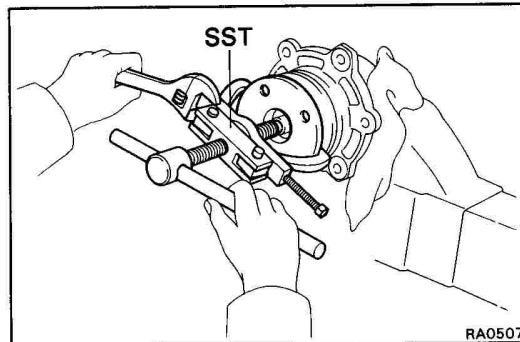
(See page RA-37)

1. REMOVE DRIVE PINION CAGE WITH DRIVE PINION

- (a) Remove the six cage bolts.
- (b) Remove the drive pinion cage with the drive pinion.

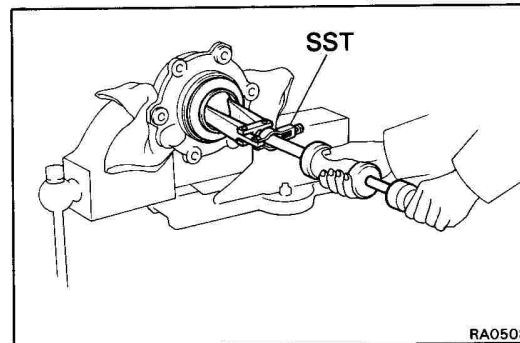
**2. REMOVE DRIVE PINION FROM DRIVE PINION CAGE**

- (a) Using a hammer and chisel, loosen the staked part of the nut.
- (b) Using SST to hold the flange, remove the nut.
SST 09330-00020



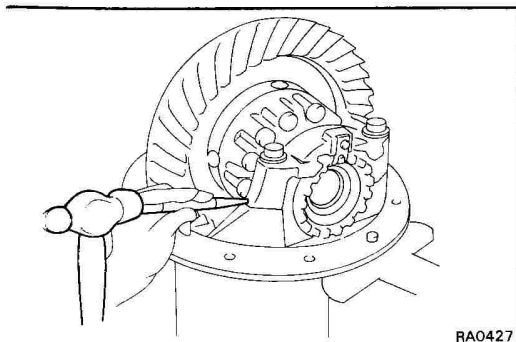
- (c) Using SST, remove the companion flange from the drive pinion.
SST 09950-20015

- (d) Remove the drive pinion from the cage.

3. REMOVE SHIM AND SPACER**4. REMOVE OIL SEAL FROM DRIVE PINION CAGE**

- Using SST, remove the oil seal from the cage.
SST 09308-00010

5. REMOVE OIL SLINGER AND FRONT BEARING

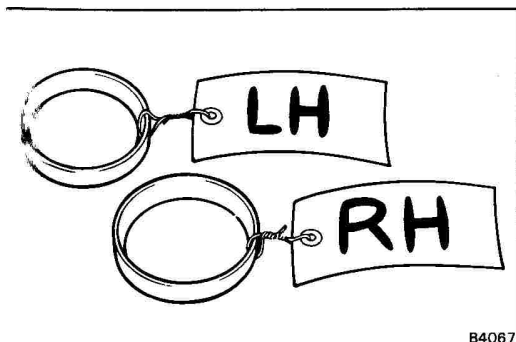


RA0427

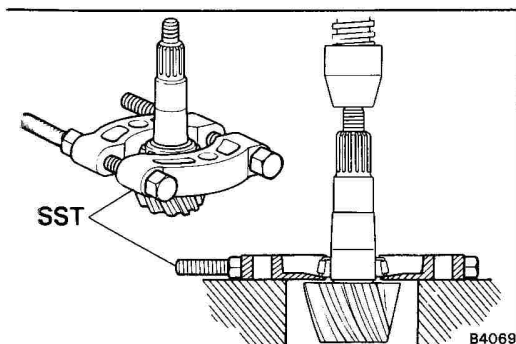
6. REMOVE DIFFERENTIAL CASE AND RING GEAR

- Place matchmarks on the bearing cap and differential carrier.
- Remove the two adjusting nut locks.
- Remove the two bearing caps and two adjusting nuts.
- Remove the differential case with the bearing outer race.

NOTE: Tag the disassembled parts to show the location for reassembly.



B4067



B4069

INSPECTION AND REPLACEMENT OF DIFFERENTIAL COMPONENTS

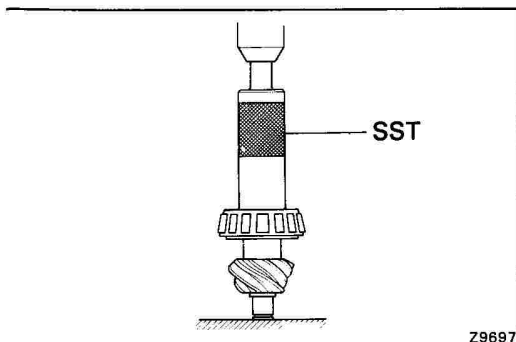
1. REPLACE DRIVE PINION REAR BEARING

- Using a press and SST, press out the rear bearing from the drive pinion.

SST 09950-00020

- Using a press and SST, press in the new bearing to the drive pinion.

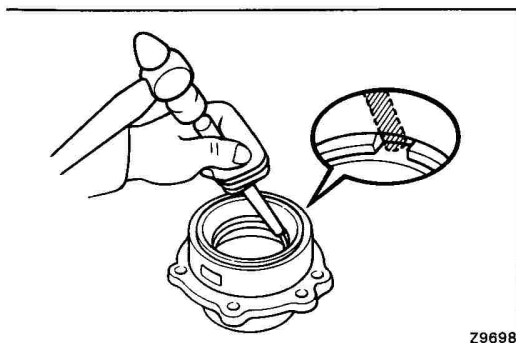
SST 09316-60010



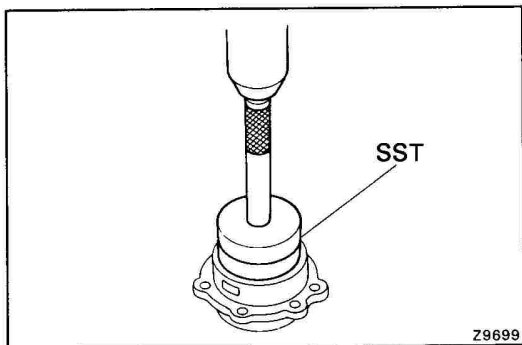
Z9697

2. REPLACE DRIVE PINION FRONT AND REAR BEARING

- Using a hammer and a brass bar, drive out the front and rear bearing outer races from the cage.

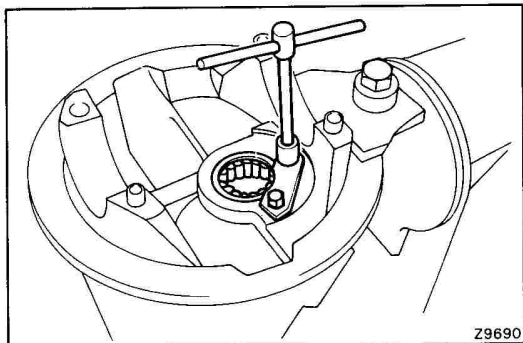


Z9698



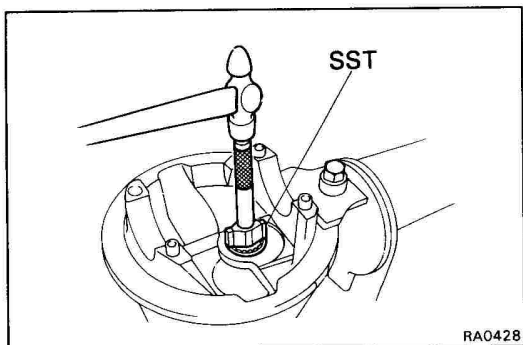
- (b) Using a press and SST, press new front and rear bearing outer races into the cage.

SST Front side 09218-56010
Rear side 09550-55010



3. REPLACE CYLINDRICAL ROLLER BEARING

- (a) Remove the cylindrical roller bearing retainer from the carrier.



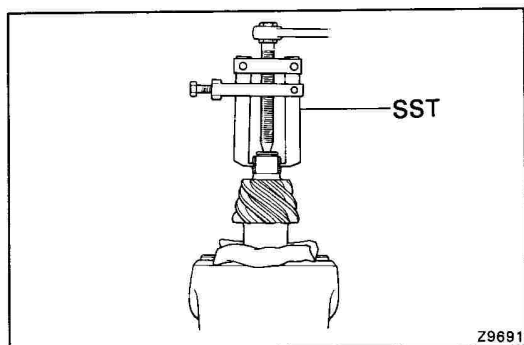
- (b) Using SST, drive out the cylindrical roller bearing.

- (c) Using SST, drive in the cylindrical roller bearing.

SST 09608-35013

- (d) Install the cylindrical roller bearing retainer.

Torque: 55 kg-cm (48 in-lb, 5.4 N·m)

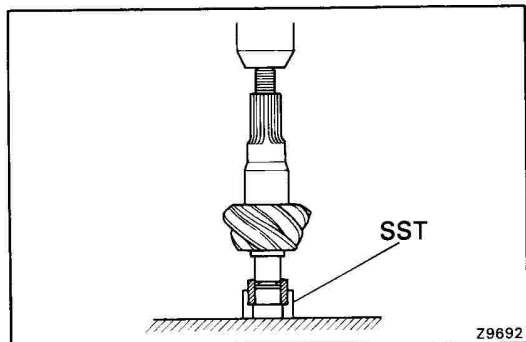


- (e) Remove the snap ring from the drive pinion.

- (f) Using a grinder, make a groove in the inner race.

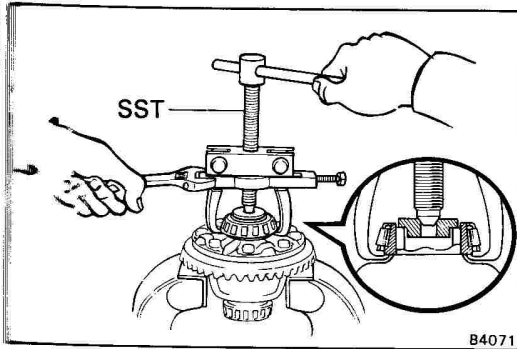
- (g) Using SST, remove the inner race.

SST 09286-46011



- (h) Using a press and SST, install the inner race.

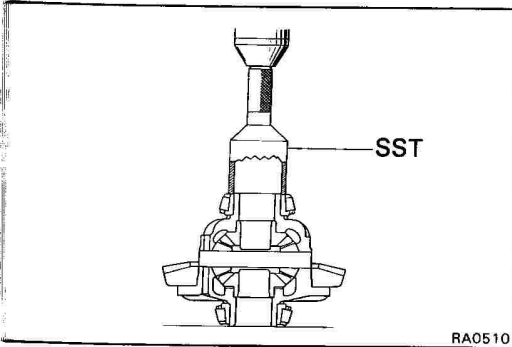
SST 09710-22020



4. REPLACE SIDE BEARINGS

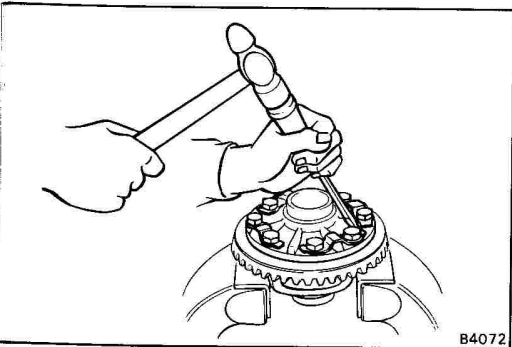
- (a) Using SST, remove the side bearing from the differential case.

SST 09950-20015



- (b) Using a press and SST, press in a new side bearing to the differential case.

SST 09214-76011

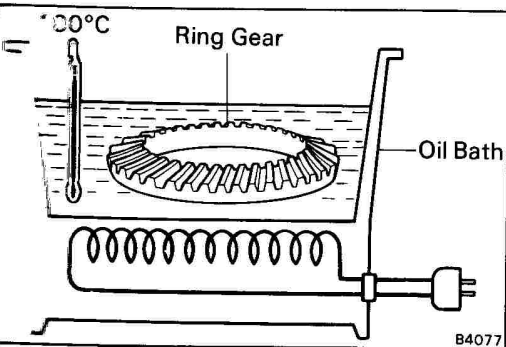


5. REPLACE RING GEAR

- (a) Unstake the lock plates.
(b) Remove the ring gear set bolts and lock plates.
(c) Using a copper hammer, tap on the ring gear to separate it from the differential case.

CAUTION: Be careful not to damage the side bearing.

NOTE: Replace the ring gear and drive pinion as a set.

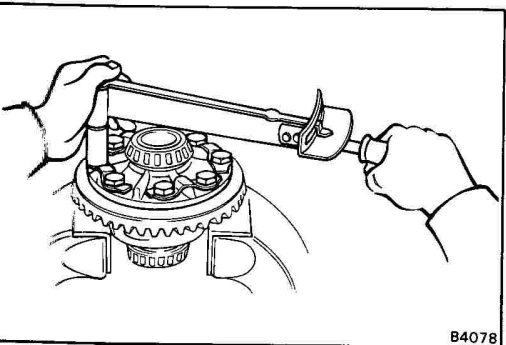


- (d) Clean the contact surface of the differential case.

- (e) Heat a new ring gear to about 100°C (212°F) in an oil bath.

CAUTION: Do not heat the ring gear more than 110°C (230°F).

- (f) Clean the contact surface of the ring gear with cleaning solvent.

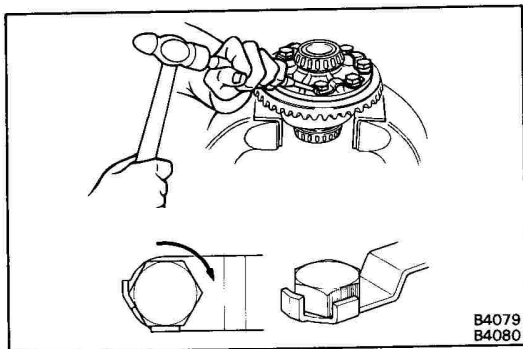


- (g) Then quickly install the ring gear on the differential case.

- (h) Coat the ring gear set bolts with gear oil.

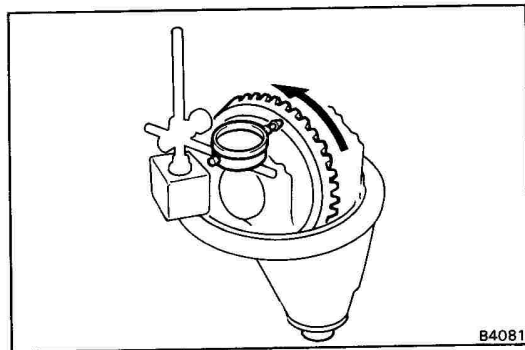
- (i) Install the lock plates and set bolts. Tighten the set bolts uniformly, a little at a time.
Torque the bolts.

Torque: 3,100 kg-cm (224 ft-lb, 304 N·m)



- (j) Using a hammer and drift punch, stake the lock plates.

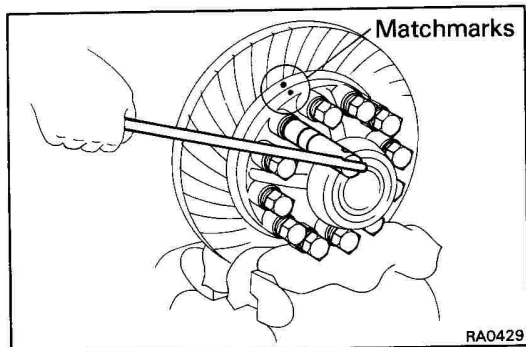
NOTE: Stake one claw flush with the flat surface of the nut. For the claw contacting the protruding portion of the nut, stake (bend) only the half on the tightening side.



- (k) Check the ring gear runout.

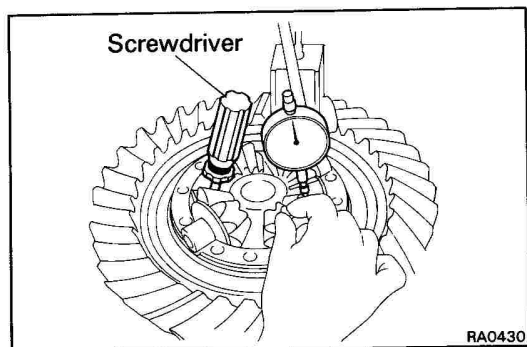
Maximum runout: 0.10 mm (0.0039 in.)

Temporarily install the differential case onto the carrier and tighten the adjusting nut just to where there is no play in the bearing.



6. REPLACE SIDE GEAR, PINION AND THRUST WASHER

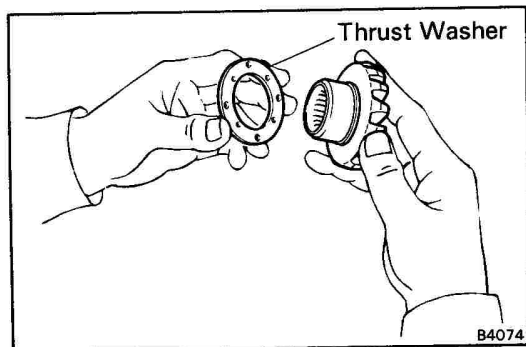
- (a) Place the matchmarks on the differential case and case cover.
(b) Protect the ring gear with a cloth, secure it in a vise and remove the bolts.



- (c) Measure the side gear backlash at the ring gear side and at another place.

**Standard backlash: 0.02 – 0.20 mm
(0.0008 – 0.0079 in.)**

NOTE: Using a screwdriver, lock the side gear.



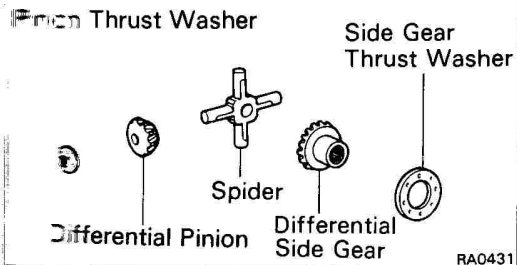
- (d) If the backlash is not within specification, install a thrust washer of a different thickness.

NOTE: Use washers of the same thickness on both the right and left sides.

Thrust washer thickness mm (in.)

Thickness		Thickness	
1.40	(0.0551)	1.60	(0.0630)
1.50	(0.0591)	1.70	(0.0669)

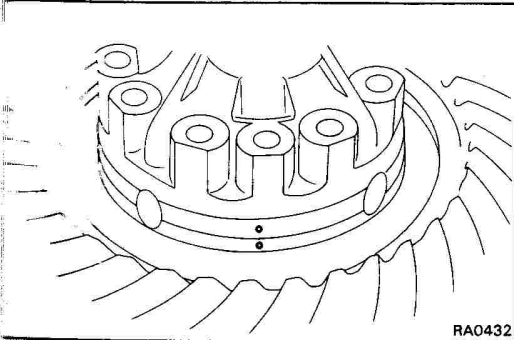
GEAR OIL COAT POSITION



RA0431

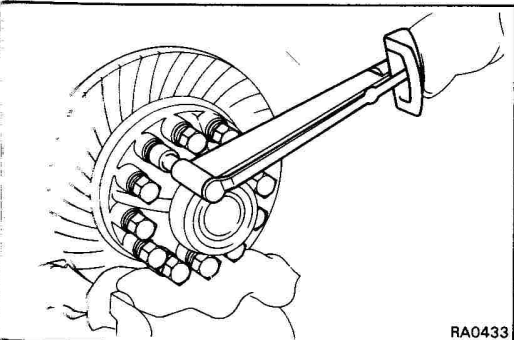
- (e) Install the case cover with the side gear and other parts assembled to it.

NOTE: Apply gear oil as shown before installing.



RA0432

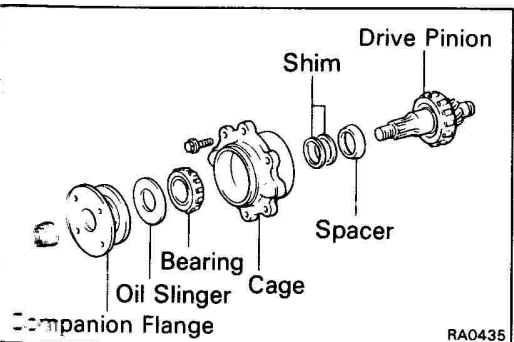
- (f) Align the matchmarks.



RA0433

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

Torque: 1,000 kg-cm (72 ft-lb, 98 N·m)



RA0435

ASSEMBLY OF DIFFERENTIAL

(See page RA-37)

1. ADJUST DRIVE PINION PRELOAD

- (a) Install the drive pinion to cage.

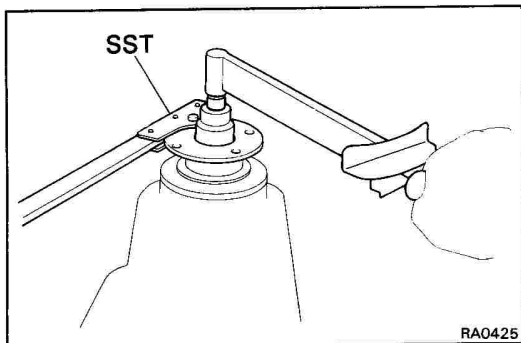
NOTE: Apply gear oil to the drive pinion rear bearing before installing.

- (b) Install the following parts:

- Spacer
- Shim
- Front bearing
- Oil slinger
- Companion flange

NOTE:

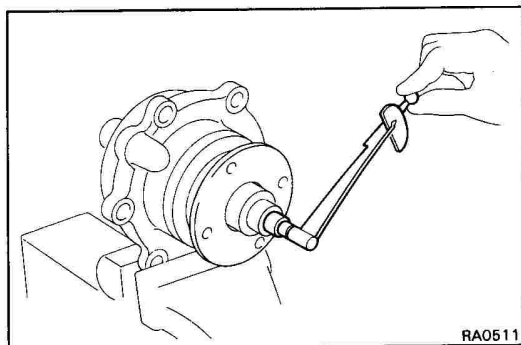
- Apply gear oil to the drive pinion front bearing before installing.
- Install the oil seal after adjusting the drive pinion preload.
- (c) Coat the threads of a new lock nut with gear oil.



- (d) Using SST, hold the flange, install and tighten a new lock nut.

SST 09330-00020

Torque: 2,750 kg-cm (199 ft-lb, 270 N·m)



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

Preload (at starting):

New bearing 15 – 51 kg-cm
(13.0 – 44.3 in.-lb, 1.5 – 5.0 N·m)

Reused bearing 8 – 13 kg-cm
(6.9 – 11.3 in.-lb, 0.8 – 1.3 N·m)

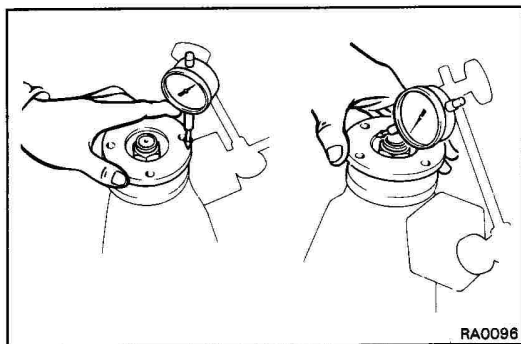
NOTE: Measure the preload after snugging the bearing down by rotating it left and right several times.

- (f) If the preload is not within standard, adjust by increasing or decreasing the number of shims.

Adjusting shim thickness mm (in)

Group A			Group B	
1.90 (0.0748)	2.40 (0.0945)	2.90 (0.1142)	1.80 (0.0709)	1.85 (0.0728)
2.00 (0.0787)	2.50 (0.0984)	3.00 (0.1181)	1.81 (0.0713)	1.86 (0.0732)
2.10 (0.0827)	2.60 (0.1024)	3.10 (0.1220)	1.82 (0.0717)	1.87 (0.0736)
2.20 (0.0866)	2.70 (0.1063)	3.20 (0.1260)	1.83 (0.0720)	1.88 (0.0740)
2.30 (0.0906)	2.80 (0.1102)	3.30 (0.1299)	1.84 (0.0724)	1.89 (0.0744)

NOTE: Use a washer from both Group A and Group B to adjust.

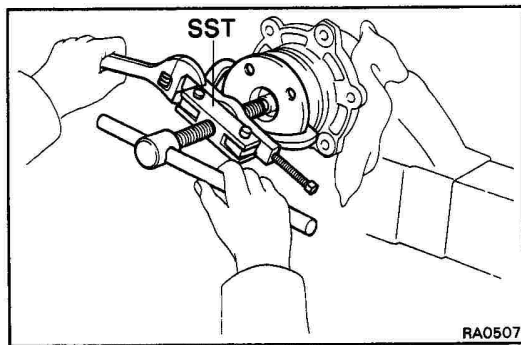


2. INSPECT COMPANION FLANGE RUNOUT

Max. Surface runout: 0.10 mm (0.004 in.)

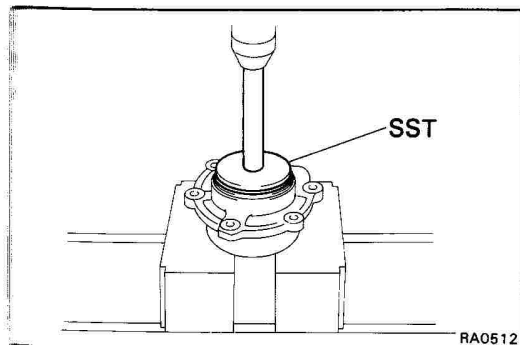
Max. Shaft runout: 0.10 mm (0.004 in.)

If necessary, replace the companion flange.



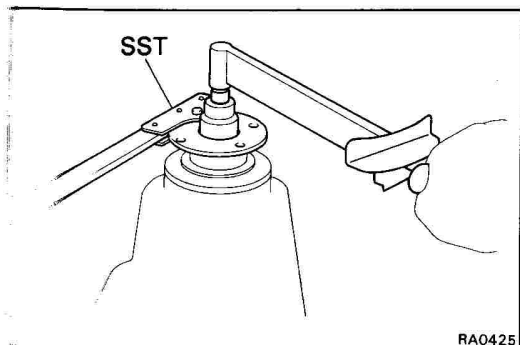
3. REMOVE COMPANION FLANGE (See step 2 on page RA-34)

SST 09950-20015



4. INSTALL OIL SEAL

Using a press and SST, press in a new oil seal to the cage, SST 09608-35013

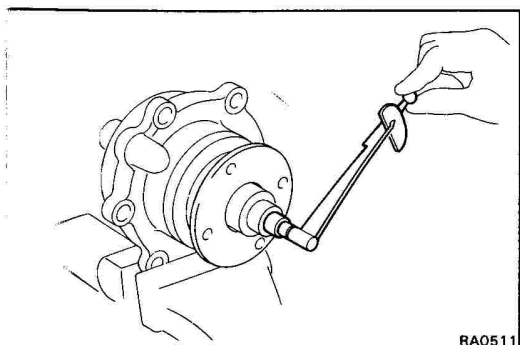


5. INSTALL COMPANION FLANGE

- Install the companion flange on the drive pinion.
- Coat the threads of a new nut with gear oil.
- Using SST to hold the flange, tighten and torque the nut.

SST 09330-00020

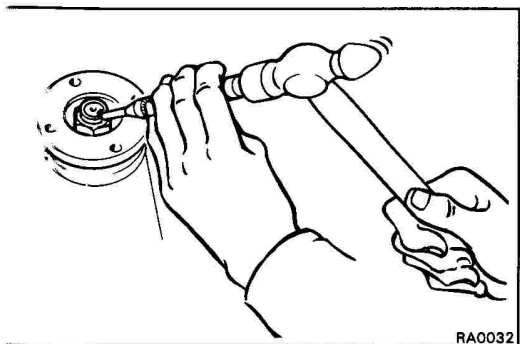
Torque: 2,750 kg-cm (199 ft-lb, 270 N·m)



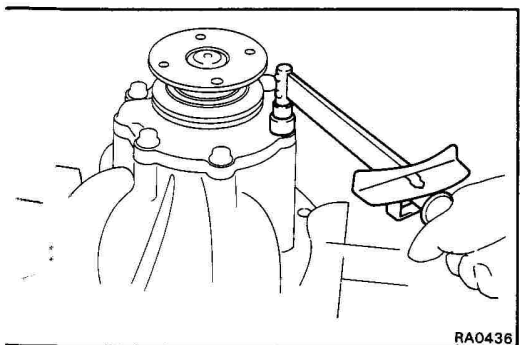
- Recheck the drive pinion and total preload.

Preload (at starting):

New bearing	15 – 51 kg-cm (13.0 – 44.3 in.-lb, 1.5 – 5.0 N·m)
Reused bearing	8 – 13 kg-cm (6.9 – 11.3 in.-lb, 0.8 – 1.3 N·m)



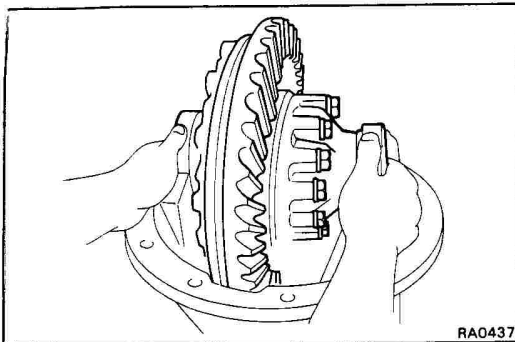
- Stake the nut.



6. INSTALL DRIVE PINION CAGE TO DIFFERENTIAL CARRIER

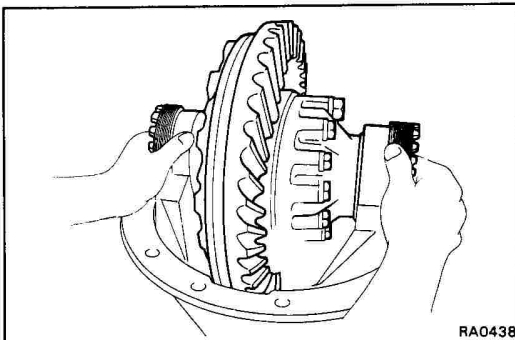
Install the gasket, previous shim and the cage to the differential carrier.

Torque: 1,050 kg-cm (76 ft-lb, 103 N·m)



7. INSTALL DIFFERENTIAL CASE IN CARRIER

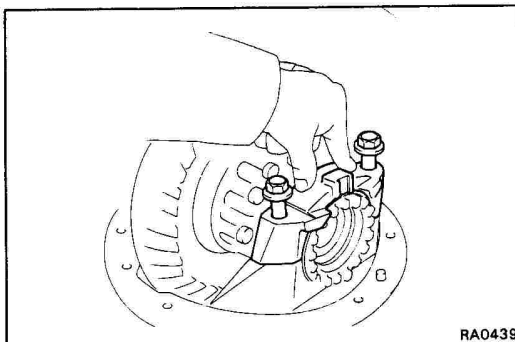
- (a) Place the bearing outer races on their respective bearings. Make sure the left and right outer races are not interchanged.
- (b) Install the case in the carrier.



8. INSTALL ADJUSTING NUTS

- (a) Install the adjusting nuts on their respective carriers, making sure they are threaded properly.

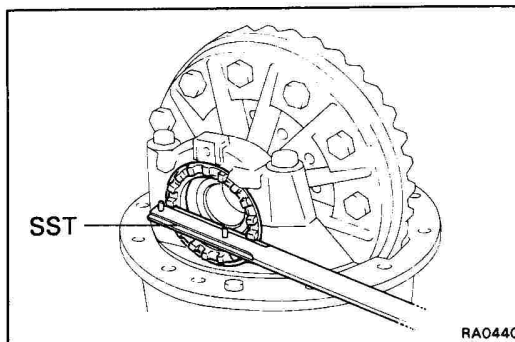
NOTE: Make sure that there is backlash between the ring gear and drive pinion.



9. INSTALL BEARING CAPS

Align the matchmarks, cap, and carrier. Screw in the two bearing cap bolts two or three turns, and press down the bearing cap by hand.

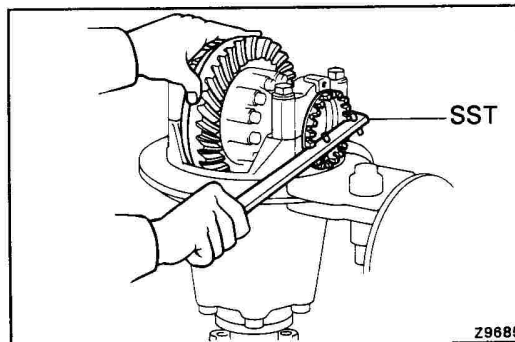
NOTE: If the bearing cap does not fit tightly on the carrier, the adjusting nut threads are not meshed properly. Reinstall adjusting nuts if necessary.



10. ADJUST SIDE BEARING PRELOAD

- (a) Tighten the bearing cap bolts until their head touch the bearing cap.
- (b) Using SST, tighten the adjusting nut on the ring gear side until the ring gear has a backlash of about 0.2 mm (0.008 in.).

SST 09504-00011

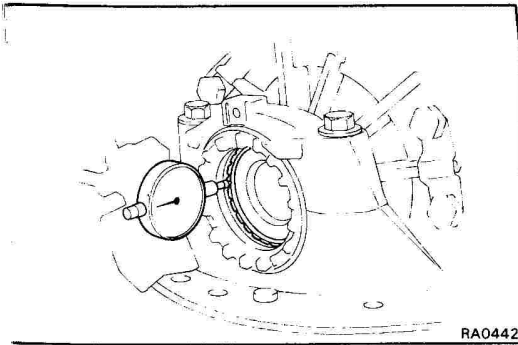


- (c) Using SST, firmly tighten the adjusting nut on the drive pinion side.

SST 09504-00011

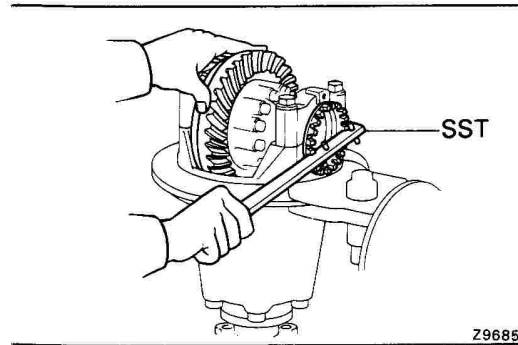
- (d) Using SST, loosen the adjusting nut on the drive pinion side.

SST 09504-00011



RA0442

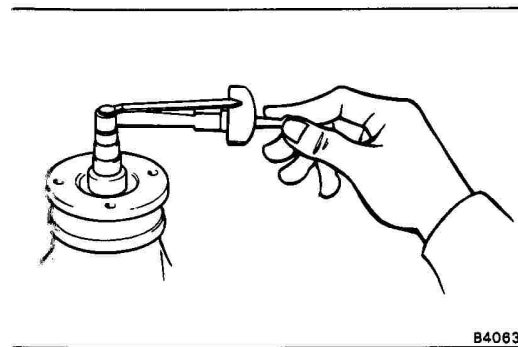
- (e) Place a dial indicator on the top of the bearing inner race on the ring gear side.
- (f) Adjust the side bearing for zero preload by tightening the other adjusting nut until the pointer on the indicator begins to move.



Z9685

- (g) Using SST, tighten the adjusting nut 2 notches from the nonpreload position.

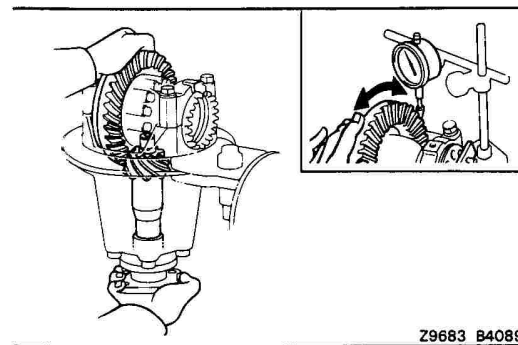
SST 09504-00011



B4083

- (h) Using a torque meter, measure the total preload.

Total preload: Add drive pinion preload
(at starting) 2 – 4 kg-cm
 (1.7 – 3.5 in.-lb, 0.2 – 0.4 N·m)

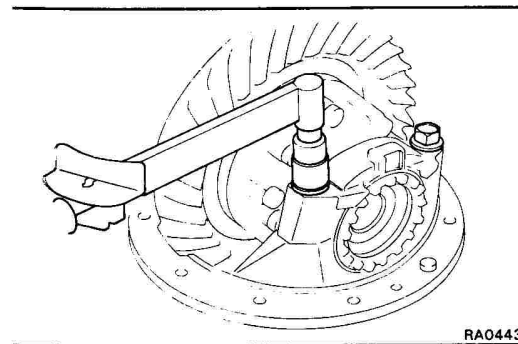


Z9683 B4089

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

Backlash: 0.15 – 0.20 mm (0.0059 – 0.0079 in.)

NOTE: The backlash is adjusted by turning the left and right adjusting nuts equal amounts. For example, loosen the nut on the left side one notch and tighten the nut on the right side one notch.

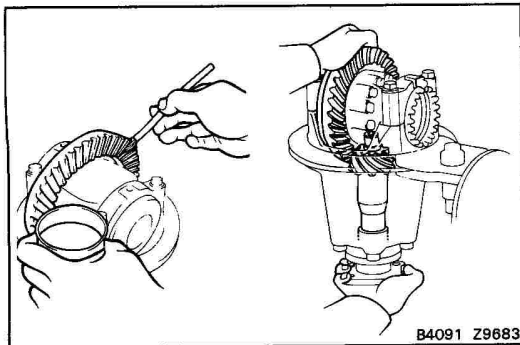


RA0443

- (j) Torque the bearing cap bolts.

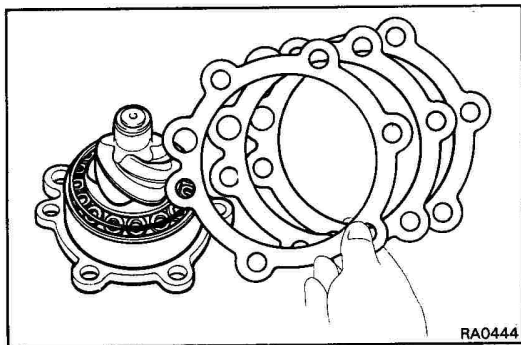
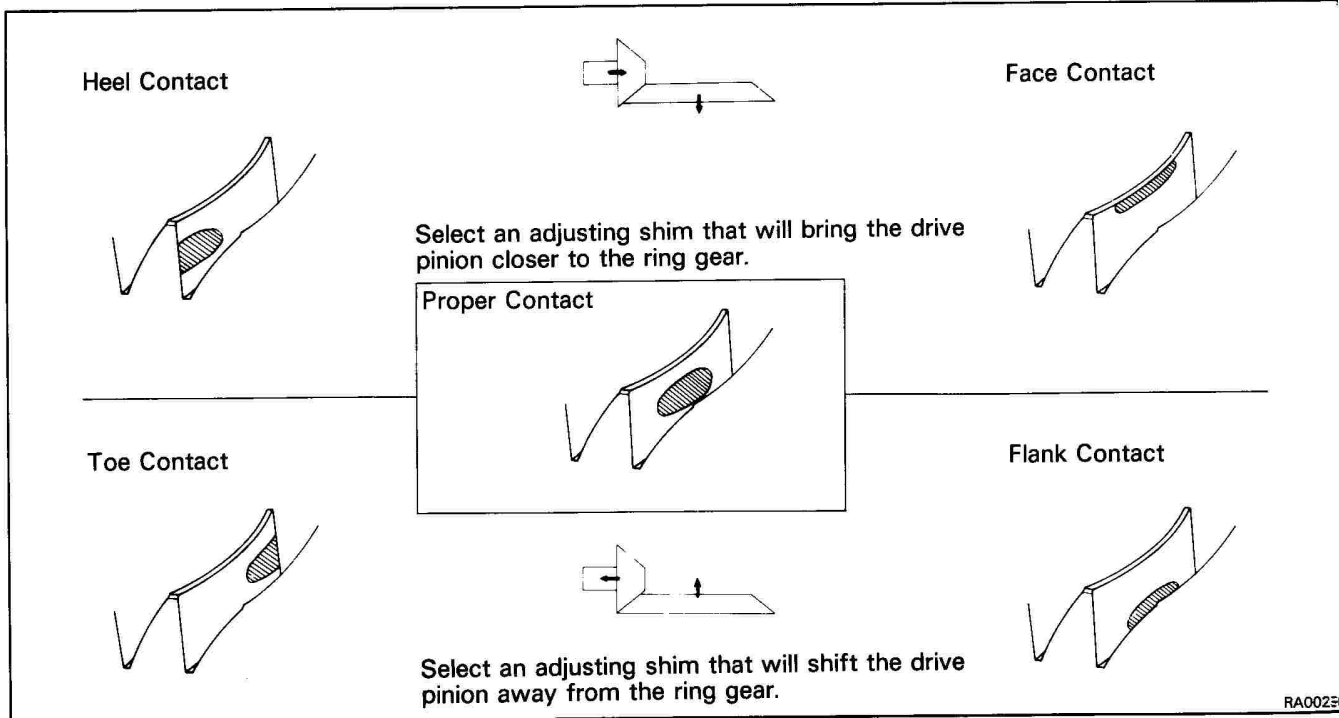
Torque: 2,000 kg-cm (145 ft-lb, 196 N·m)

- (k) Recheck the total preload and ring gear backlash.



11. INSPECT TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION

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

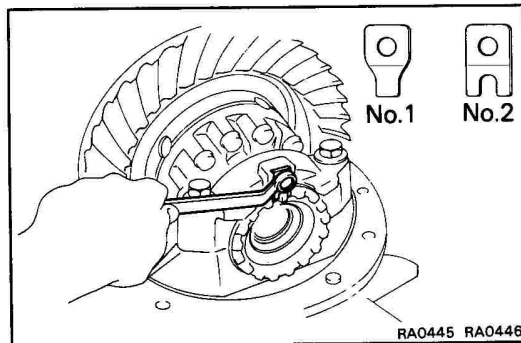


If the teeth are not contacting properly, correct with a proper cage adjusting shim.

Shim thickness mm (in.)

Thickness		Thickness	
0.10	(0.0039)	0.25	(0.0098)
0.15	(0.0059)	0.45	(0.0177)

NOTE: Recheck the ring gear backlash. If backlash is not within standard, repeat the procedure from step 10.



12. INSTALL ADJUSTING NUT LOCKS

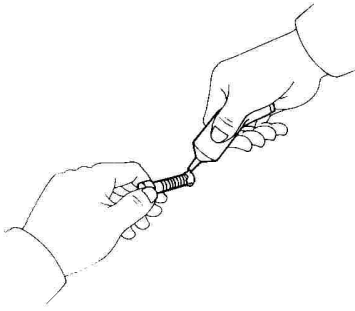
- Select either lock No. 1 or No. 2 whichever fits on the adjusting nuts.
- Install the lock on the bearing caps.

Torque: 140 kg-cm (10 ft-lb, 14 N·m)

INSTALLATION OF DIFFERENTIAL

1. INSTALL DIFFERENTIAL CARRIER ASSEMBLY

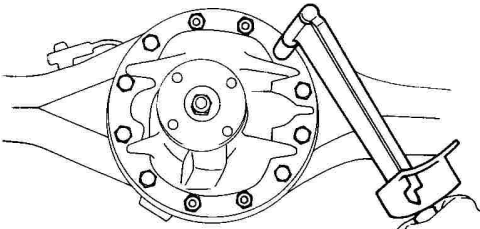
- (a) Apply liquid sealer to both sides of a new gasket and the set bolt threads.



RA0447

- (b) Install the differential carrier assembly in the axle housing and install the four nuts and eight bolts.
- (c) Tighten the nuts and bolts diagonally, a little at a time.

Torque: 530 kg-cm (38 ft-lb, 52 N·m)



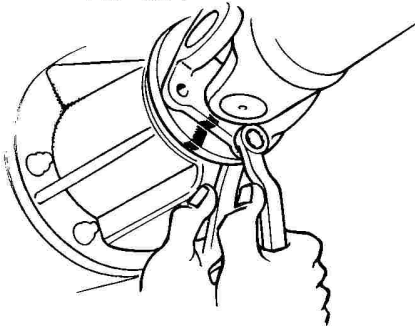
RA0448

2. CONNECT PROPELLER SHAFT FLANGE TO COMPANION FLANGE

Torque: 900 kg-cm (65 ft-lb, 88 N·m)

3. INSTALL REAR AXLE SHAFT

(See page RA-4)



PR0001

4. INSTALL DRAIN PLUG AND FILL DIFFERENTIAL WITH GEAR OIL

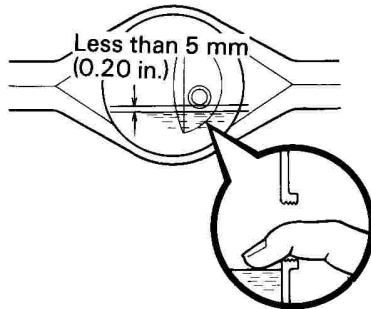
Oil grade: API GL-5 hypoid gear oil

Viscosity: Above -18°C (0°F) SAE90

Below -18°C (0°F) 80W or 80W-90

Capacity: 5.0 liters (5.3 US qts, 4.4 Imp. qts)

Torque: 500 kg-cm (36 ft-lb, 49 N·m)



RA0426

5. INSTALL AND TIGHTEN FILLER PLUG

Torque: 500 kg-cm (36 ft-lb, 49 N·m)