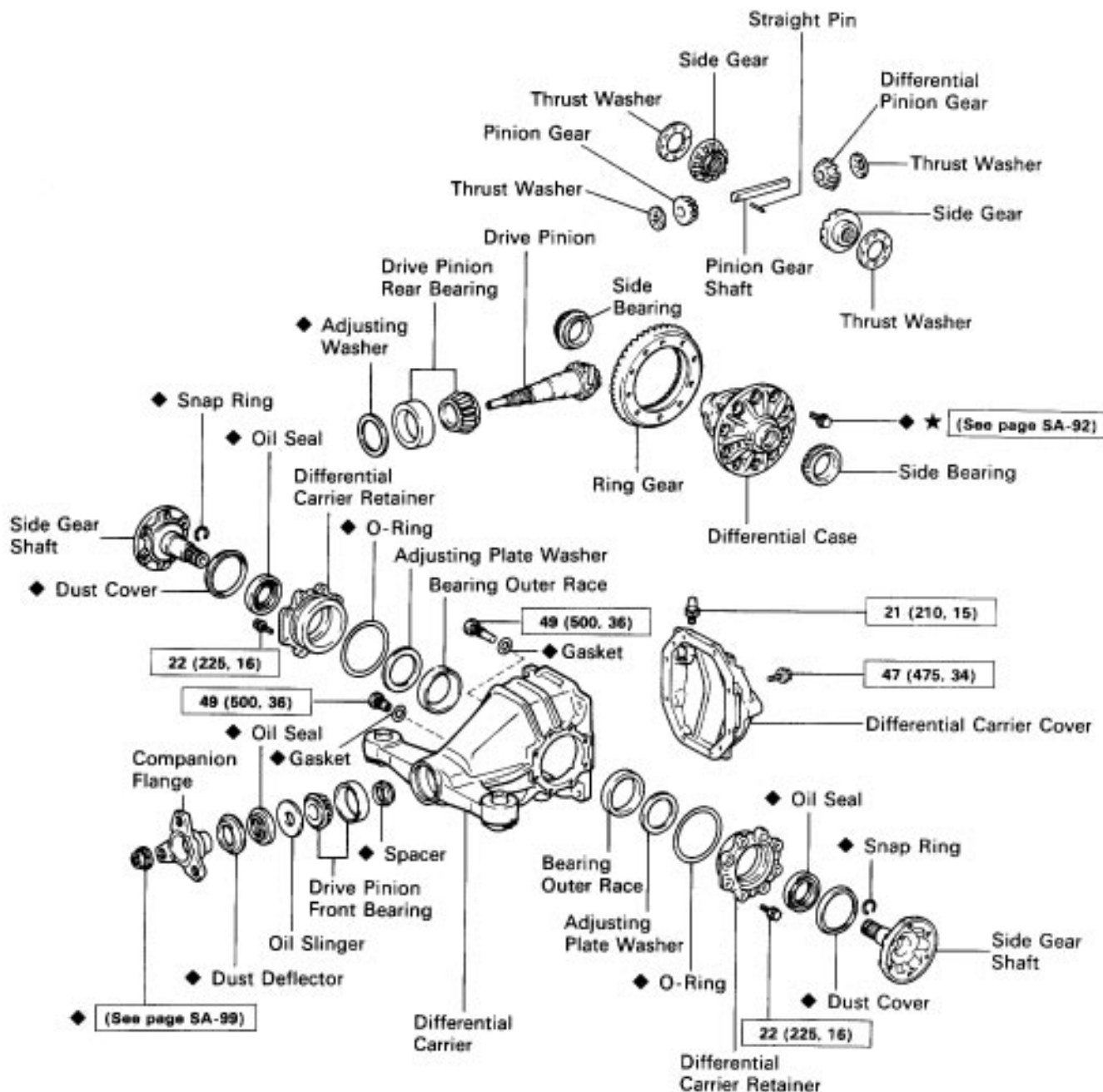


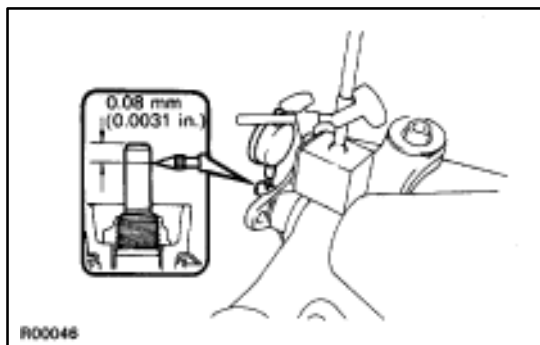
Differential Carrier COMPONENTS



N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

★ Precoated part



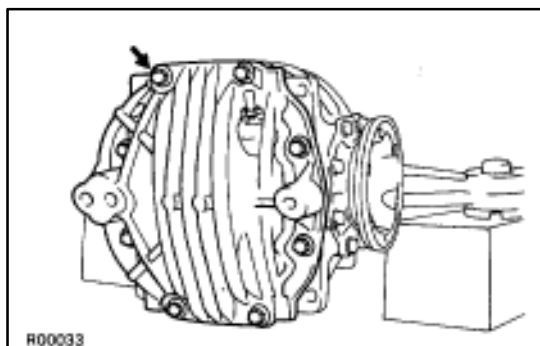
INSPECTION OF DIFFERENTIAL CARRIER

1. CHECK RUNOUT OF DRIVE PINION SHAFT

Measure the runout of the drive pinion shaft at a pinion 10 mm (0.39 in.) from the end of the shaft.

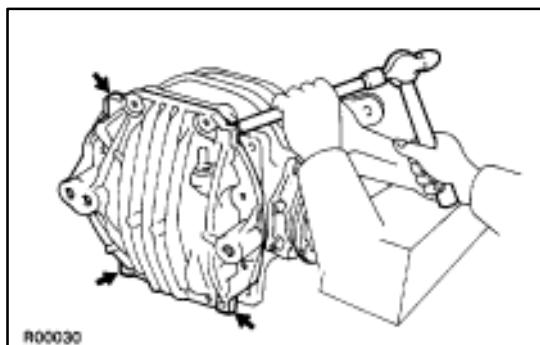
Maximum runout: 0.08 mm (0.0031 in.)

If the runout is greater than the maximum, replace the drive pinion and ring gear.

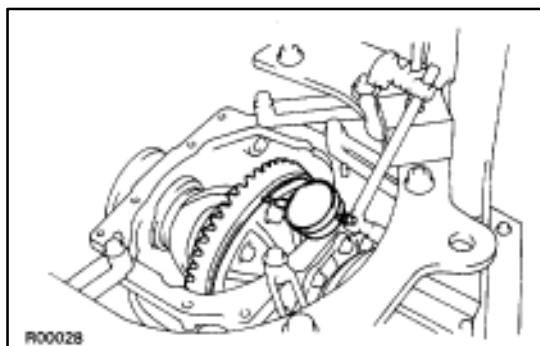


2. REMOVE DIFFERENTIAL CARRIER COVER

(a) Remove the eight bolts from the carrier cover.



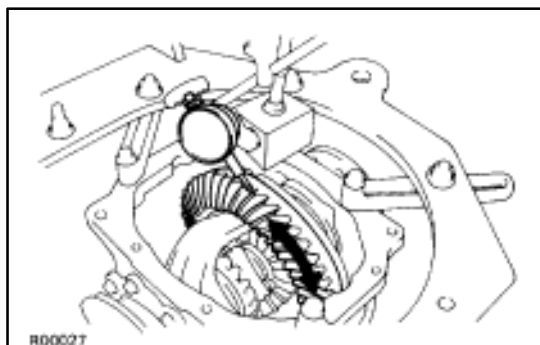
(b) Using a brass bar and hammer, separate the cover and carrier.



3. CHECK RING GEAR RUNOUT

Maximum runout: 0.05 mm (0.0020 in.)

If the runout is greater than the maximum, replace the drive pinion, ring gear and differential case.



4. CHECK RING GEAR BACKLASH

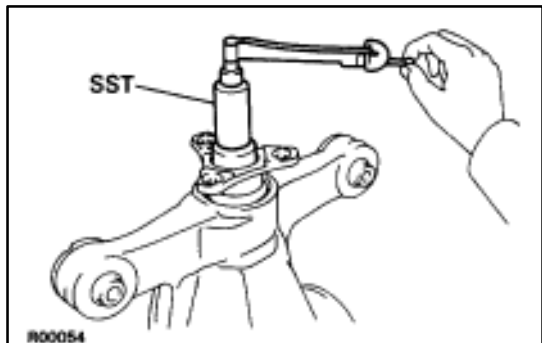
Measure the backlash of the ring gear at the three points at least and check that the average value is within the specification.

Backlash (average value):

0.08–0.13 mm (0.0031–0.0051 in.)

NOTICE: The difference between the maximum and minimum measured values must be 0.05 mm (0.0020 in.) or less.

If the backlash is not within the specification, adjust the backlash. (See page [SA-96](#))

**5. MEASURE DRIVE PINION PRELOAD**

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

Preload (at start): 0.5–0.8 N·m

(5–8 kgf·cm, 4.3–6.9 in.·lbf)

HINT: With vehicles which have run less than 8,000km (5,000 miles), the preload may be large.

SST 09229–55010

Maximum preload (at start): 1.3 N·m

(13 kgf·cm, 11.3 in.·lbf)

6. CHECK TOTAL PRELOAD

Using SST and a torque wrench, measure the total preload.

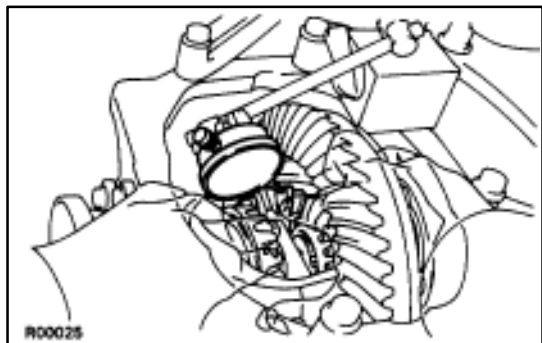
SST 09229–55010

Total preload (at start):

In addition to drive pinion preload

0.4–0.6 N·m (4–6 kgf·cm, 3.4–5.2 in.·lbf)

If necessary, disassemble and inspect the differential.

**7. CHECK PINION GEAR BACKLASH**

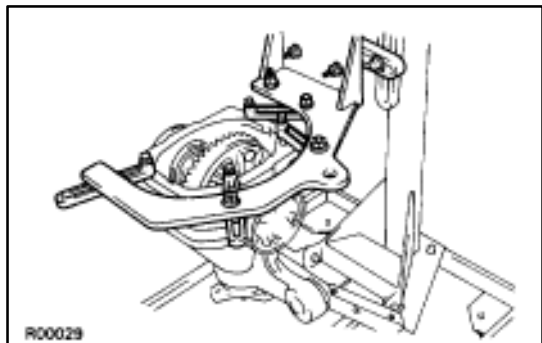
Measure the pinion gear backlash while holding one side gear toward the case.

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

If the backlash is not within the specification, install the correct thrust washer. (See page [SA-97](#))

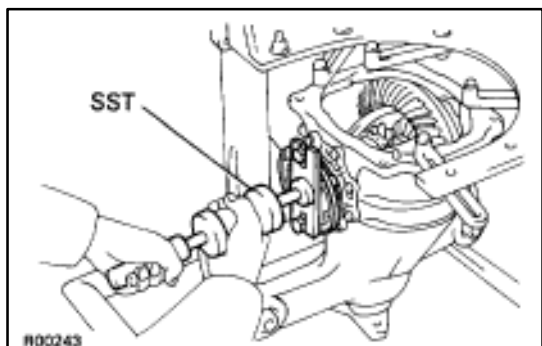
8. CHECK TOOTH CONTACT PATTERN

(See page [SA-97](#))



DISASSEMBLY OF DIFFERENTIAL CARRIER

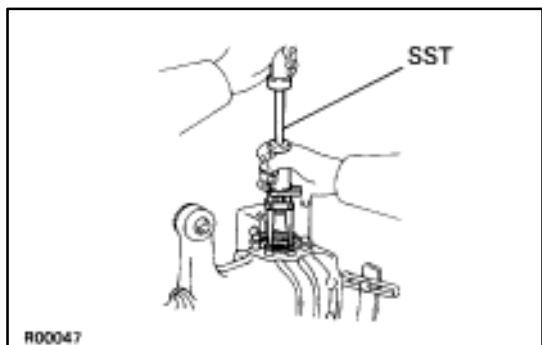
HINT: When fastening the differential carrier to an overhaul stand, etc., fasten it the four places on the ring gear side shown in the illustration.



1. REMOVE SIDE GEAR SHAFT

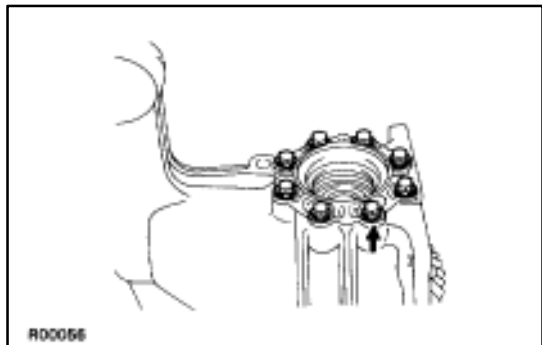
Using SST, a bolt and nut, remove the side gear shaft.
SST 09520-24010

NOTICE: Be careful not to damage the oil seal.



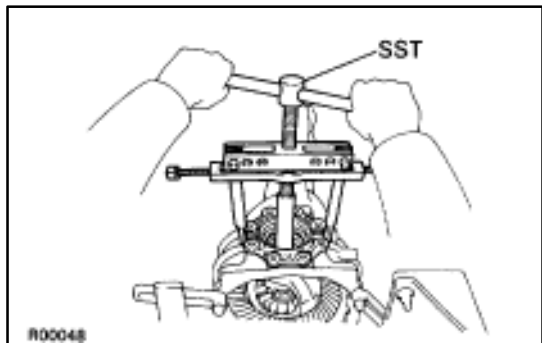
2. REMOVE SIDE GEAR SHAFT OIL SEALS

Using SST, remove the oil seals.
SST 09308-00010

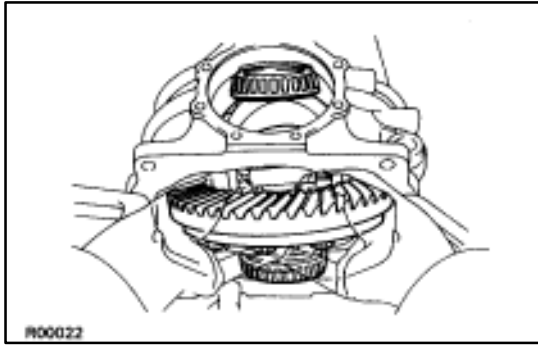


3. REMOVE DIFFERENTIAL CARRIER RETAINER

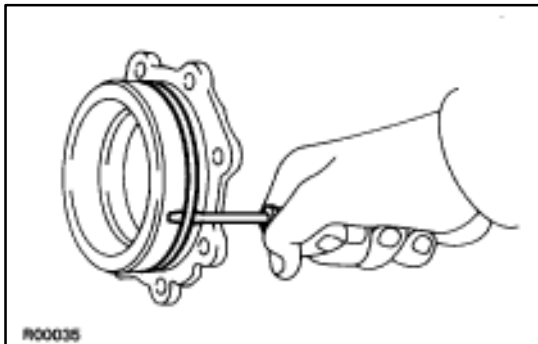
(a) Remove the eight bolts.



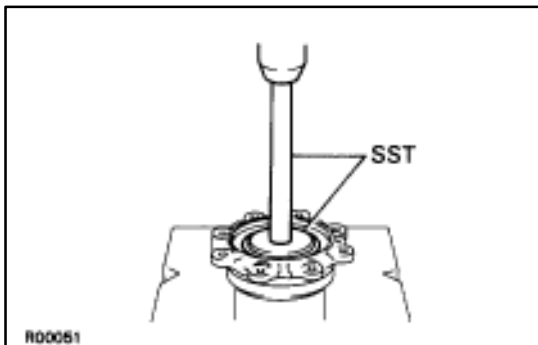
(b) Using SST, remove the carrier retainer.
SST 09950-20017

**4. REMOVE DIFFERENTIAL CASE**

Take the differential case out of the carrier while lifting the ring gear side as shown in the illustration.

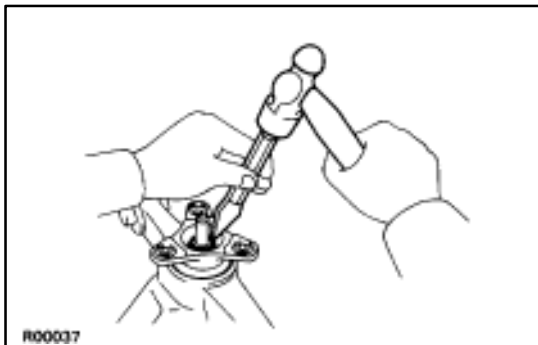
**5. REMOVE O-RING FROM DIFFERENTIAL CARRIER RETAINER**

Using a screwdriver, remove the O-ring.

**6. REMOVE SIDE BEARING OUTER RACE AND PLATE WASHER**

Using SST and a press, press out the outer races and washers.

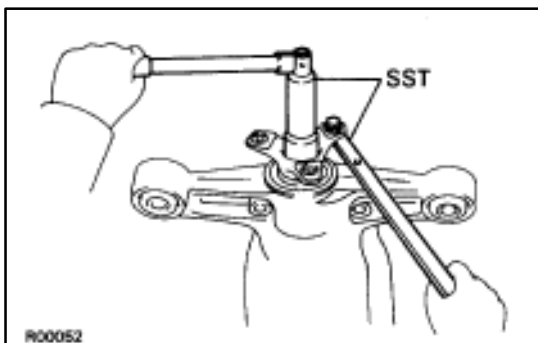
SST 09608-35014 (09608-06020, 09608-06110)

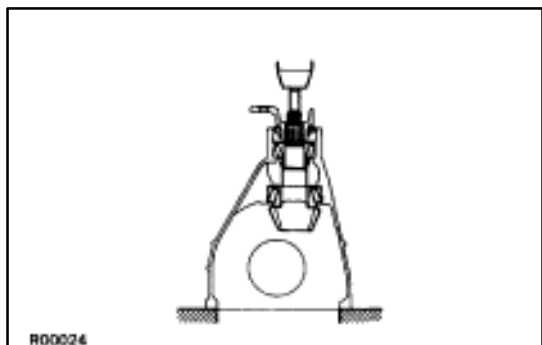
**7. REMOVE DRIVE PINION, SPACER AND COMPANION FLANGE**

(a) Using a hammer and chisel, loosen the staked part of the nut.

(b) Using SST, remove the nut.

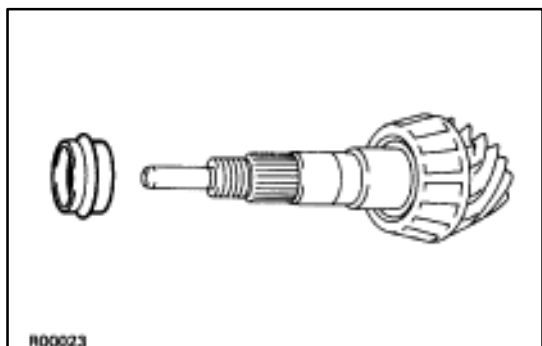
SST 09229-55010, 09330-00021



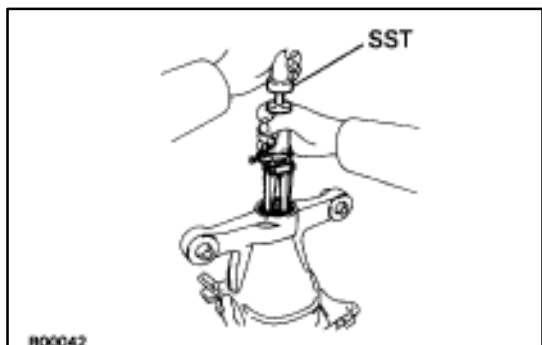


- (c) Using a press, remove the drive pinion with the rear bearing and remove the companion flange.

NOTICE: Be careful not to drop the drive pinion.



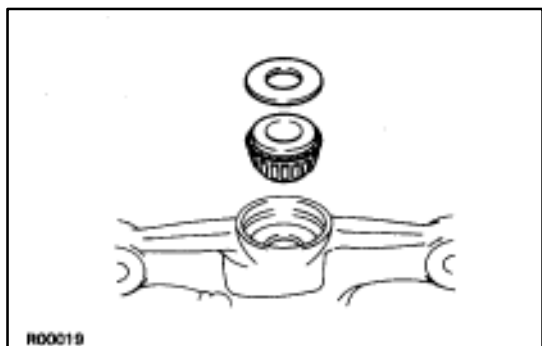
- (d) Remove the spacer from the drive pinion.



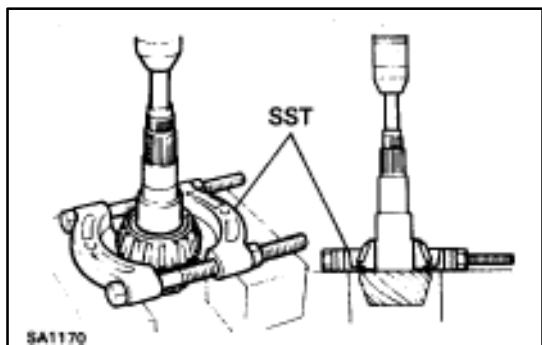
8. REMOVE OIL SEAL

Using SST, remove the oil seal.

SST 09308-00010



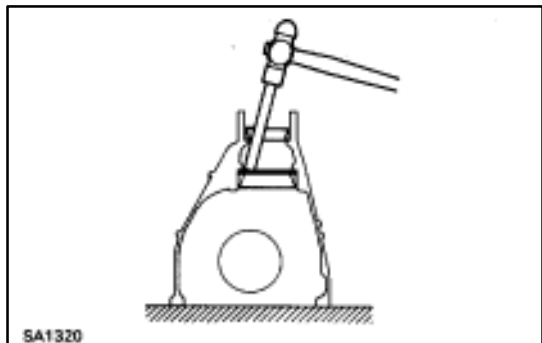
9. REMOVE OIL SLINGER AND FRONT BEARING



10. REMOVE REAR BEARING FROM DRIVE PINION

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

SST 09950-00020

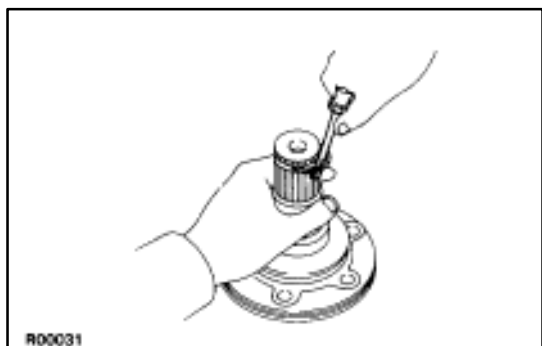


11. REMOVE FRONT AND REAR BEARING OUTER RACES AND ADJUSTING WASHER

NOTICE: Do not remove the outer race except when replacing the bearings.

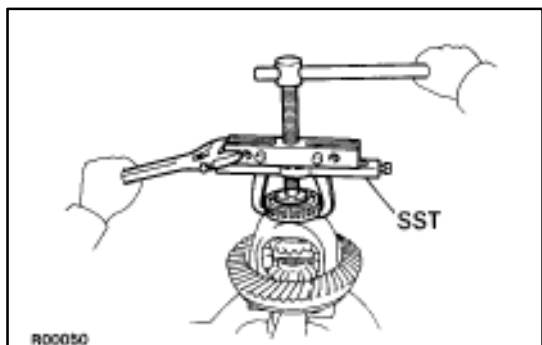
Using a brass bar and hammer, drive out the outer races and adjusting washer from the differential carrier.

HINT: Measure the adjusting washer and note the thickness for reassembly.



12. REMOVE LH AND RH SNAP RING FROM SIDE GEAR SHAFT

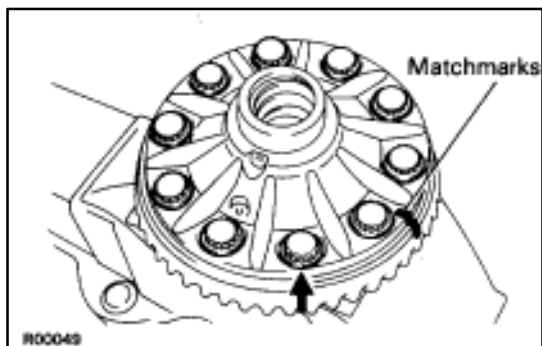
Using a screwdriver, remove the snap rings from the side gear shaft.



13. REMOVE SIDE BEARINGS

Using SST, remove the side bearings LH and RH from the differential case.

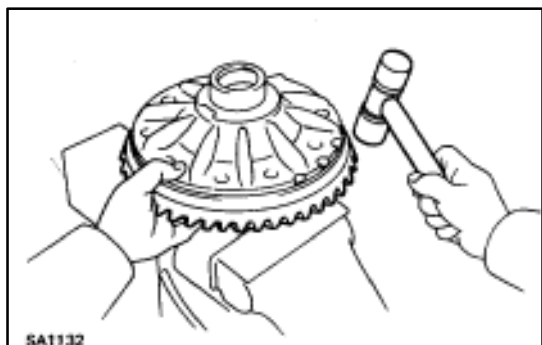
SST 09950-20017



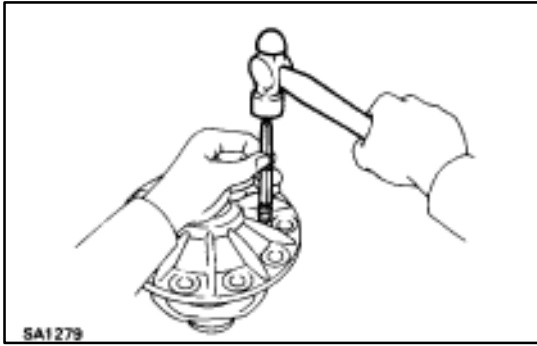
14. REMOVE RING GEAR

(a) Place matchmarks on the ring gear and differential case.

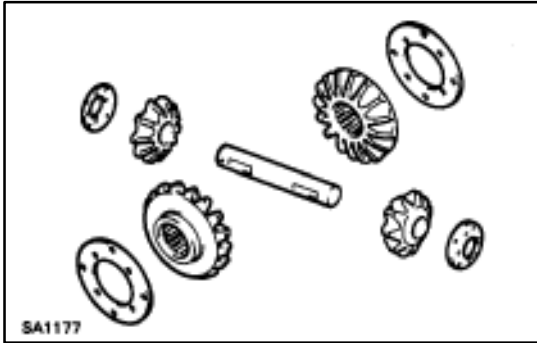
(b) Remove the ten ring gear set bolts.



(c) Using a plastic hammer, tap on the ring gear to separate it from the differential case.

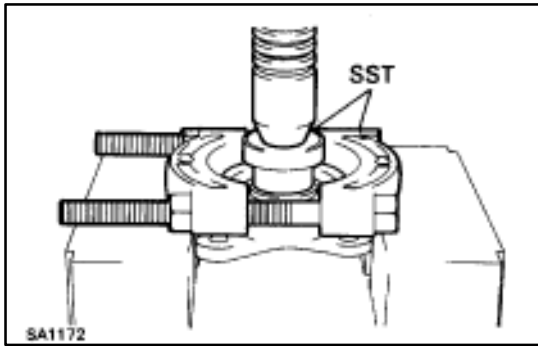
**15. DISASSEMBLE DIFFERENTIAL CASE**

(a) Using a hammer and punch, drive out the straight pin.



(b) Remove following parts from the differential case.

- Pinion shaft
- Two differential pinions
- Two pinion thrust washers
- Two side gears
- Two side gears thrust washers

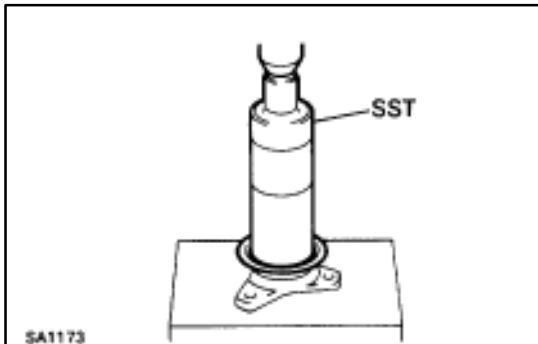


REPLACEMENT OF DUST DEFLECTOR AND DUST COVER

1. REPLACE COMPANION FLANGE DUST DEFLECTOR

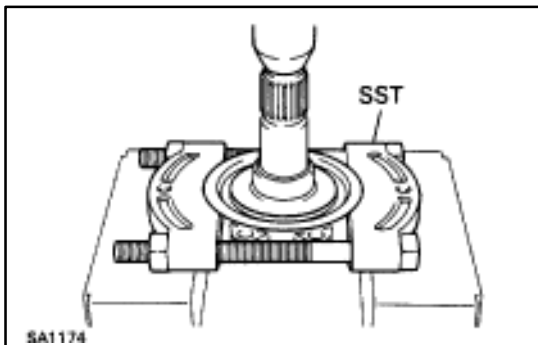
Using SST and a press, remove the dust deflector.

SST 09608-35014 (09608-06090), 09950-00020



(b) Using SST and a press, install a new dust deflector.

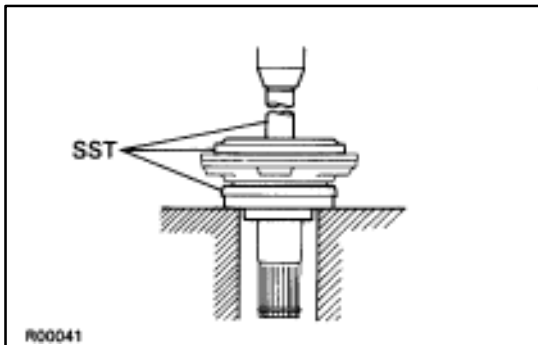
SST 09316-60010 (09316-00010)



2. REPLACE SIDE GEAR SHAFT DUST COVER

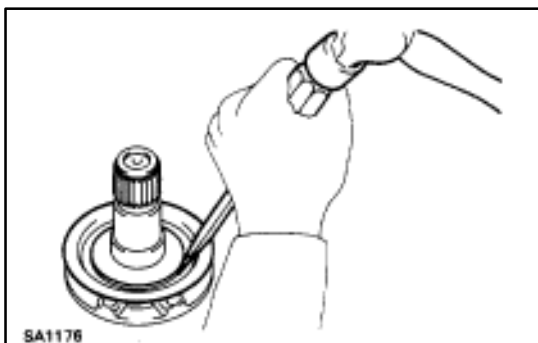
(a) Using SST and a press, remove the dust cover.

SST 09950-00020

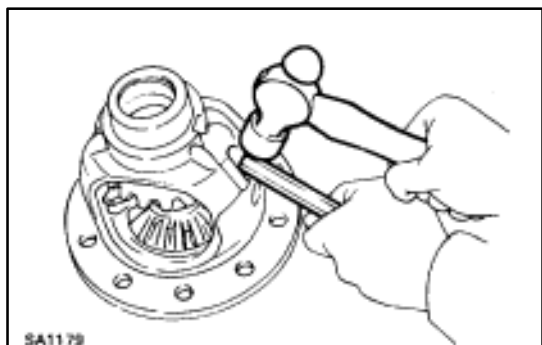
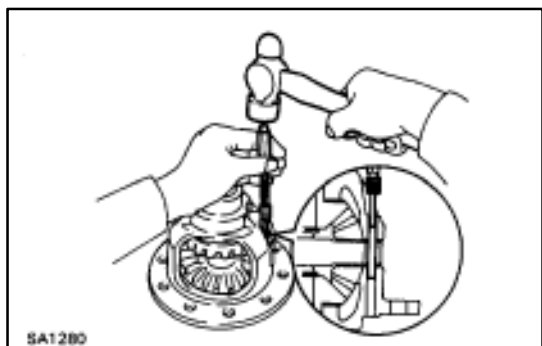
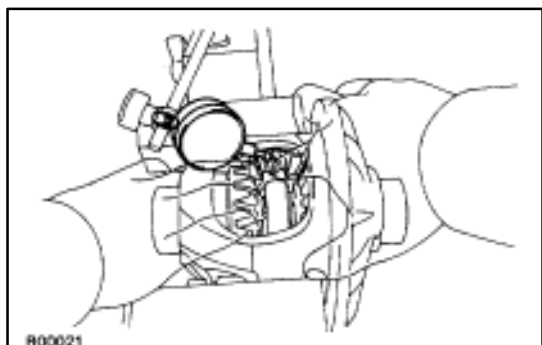
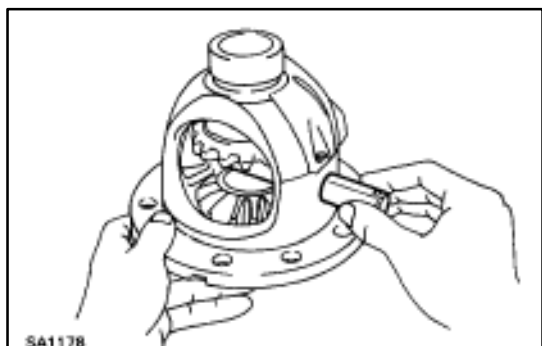
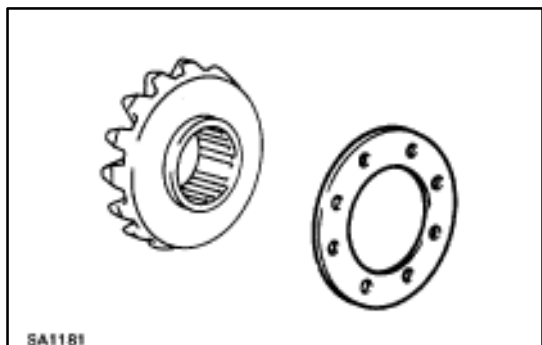


(b) Using SST and a press, install a new dust cover.

SST 09502-24010, 09608-35014 (09608-06020, 09608-06120)



HINT: If the dust cover does not fit tightly against the flange of the side gear shaft, use a screwdriver to drive it down tight.



ASSEMBLY OF DIFFERENTIAL CARRIER

1. ADJUST DIFFERENTIAL PINION GEAR BACKLASH

(a) Install the proper thrust washers on the side gears.

HINT: Using the table below, select thrust washers which will ensure that the backlash is within specification.

Thrust washer thickness
1.6 mm (0.063 in.)
1.7 mm (0.067 in.)
1.8 mm (0.071 in.)

(b) Install the side gears, pinion gears, pinion gear thrust washers and pinion shaft in the differential case.

HINT: Align the holes of the differential case and pinion shaft.

(c) Push the side gear shafts gently into the differential case by hand and install them.

(d) Measure the pinion gear backlash while holding one side gear toward the case.

Backlash: 0.05–0.20 mm

(0.0020–0.0079 in.)

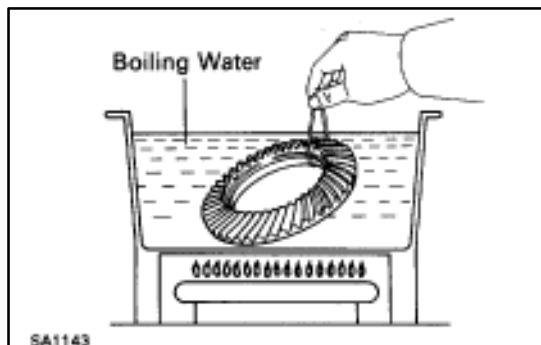
If the backlash is not within the specification, install the side gear thrust washers with different thicknesses.

(e) Remove the side gear shaft.

2. INSTALL RING GEAR ON DIFFERENTIAL CASE

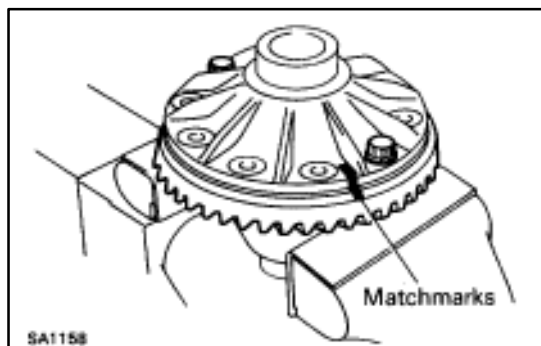
(a) Using a hammer and punch, install the straight pin through the differential case and hole of the pinion shaft.

(b) Stake the differential case.



3. INSTALL RING GEAR ON DIFFERENTIAL CASE

- Clean the contact surfaces of the differential case and the threads of the ring gear and differential case.
- Heat the ring gear in boiling water.

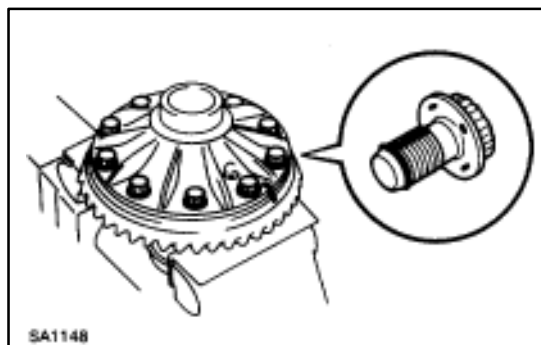


- After the moisture on the ring gear has completely evaporated, quickly install the ring gear to the differential case.

HINT: Align the matchmarks on the ring gear and the differential case.

- Tighten two of the bolts temporarily so that the bolt holes in the ring gear and differential case are no misaligned.

NOTICE: The ring gear set bolts should be tightened until the ring gear has cooled sufficiently.

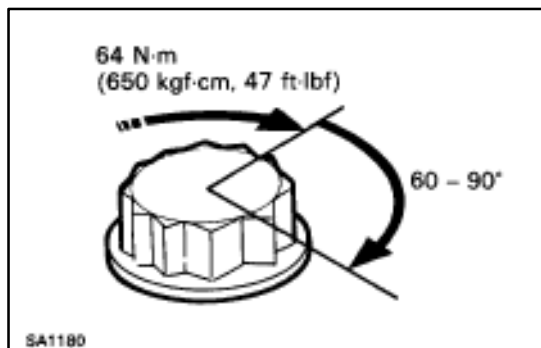


4. INSTALL RING GEAR SET BOLTS

- After the ring gear has cooled sufficiently, install ten new ring gear set bolts to which thread lock has been applied.

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

NOTICE: New ring gear set bolts should be used in every case.

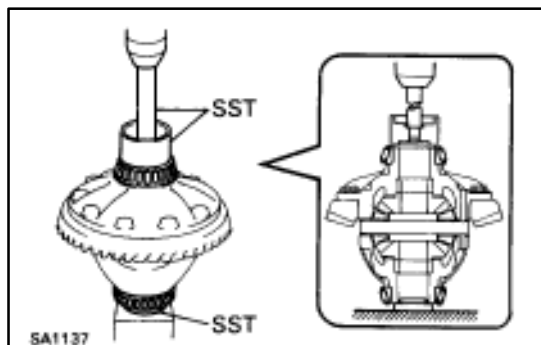


- First, torque the ten set bolts uniformly and a little at a time.

Torque: 64 N·m (650 kgf·cm, 47 ft·lbf)

- Then tighten the bolts an additional 60–90°.

NOTICE: Tighten the bolts in diagonally opposite pairs.



5. INSTALL SIDE BEARINGS

Using SST and a press, install the side bearings.

SST 09550-10012 (09252-10010, 09558-10010)
09710-30050

6. INSTALL DRIVE PINION BEARING OUTER RACES AND ADJUSTING WASHER

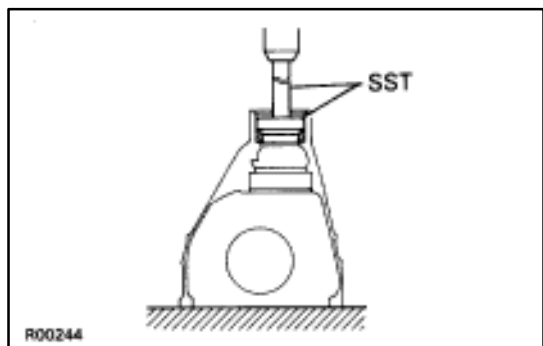
HINT: The adjusting washer is used for adjusting the tooth contact pattern. Forty-two types of washer with differential thicknesses are available.

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

When removing an adjusting washer, be sure to replace it with a new one.

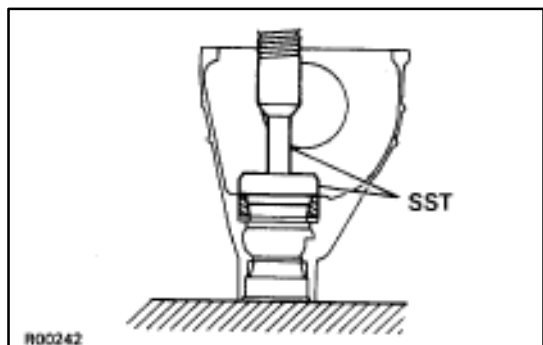
- (a) Using SST and a press, install a new adjusting washer and the front bearing outer race.

SST 09250-10011 (09250-10010, 09255-10011)



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

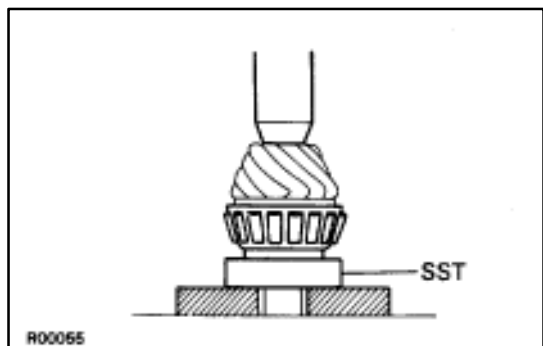
SST 09608-30012 (09608-04020, 09608-04100)



7. INSTALL REAR BEARING TO DRIVE PINION

Using SST and a press, install the rear bearing.

SST 09502-24010



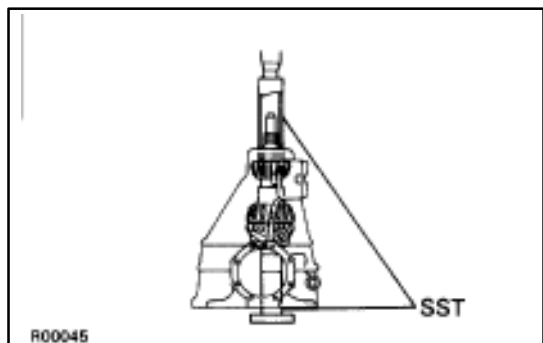
8. INSTALL DRIVE PINION AND FRONT BEARING

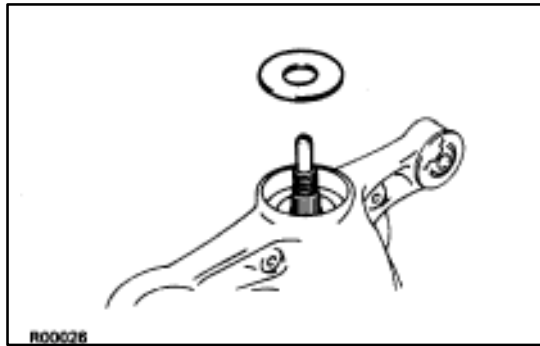
- (a) Install the drive pinion in the differential carrier.

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

SST 09316-60010 (09316-00010), 09608-30012 (09608-04030)

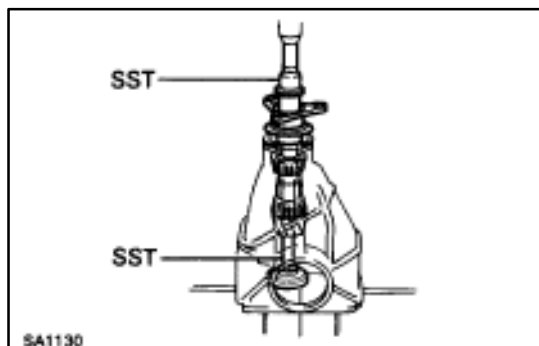
HINT: Assemble the spacer and oil seal after adjusting the tooth contact pattern.





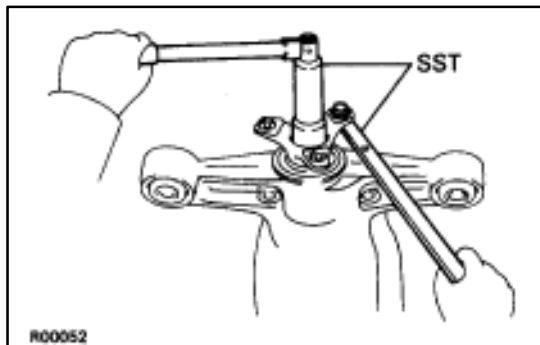
9. INSTALL OIL SLINGER AND COMPANION FLANGE

(a) Install the oil slinger.



(b) Using SST and a press, install the companion flange.

SST 09223-63010, 09325-40010



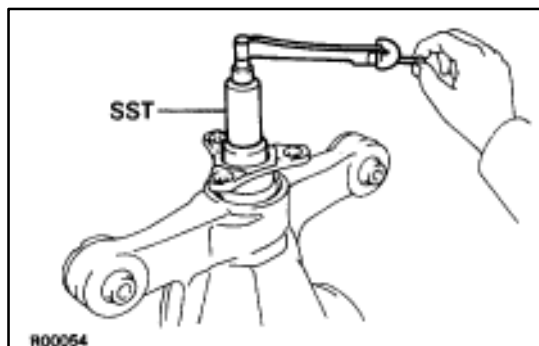
10. TEMPORARILY ADJUST DRIVE PINION PRELOAD

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

HINT: Using SST to hold the flange, tighten the nut.

SST 09229-50010, 09330-00021

NOTICE: As there is no spacer, tighten the nut a little at a time, being careful not to overtighten it.



(b) Using SST and a torque wrench, measure the drive pinion preload.

SST 09229-55010

Preload (at start):

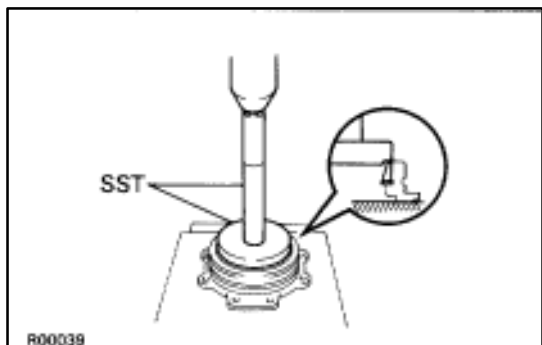
New bearing 1.2–1.8 N·m

(12.4–18.4 kgf·cm, 10.8–16.0 in.-lbf)

Reused bearing 0.5–0.8 N·m

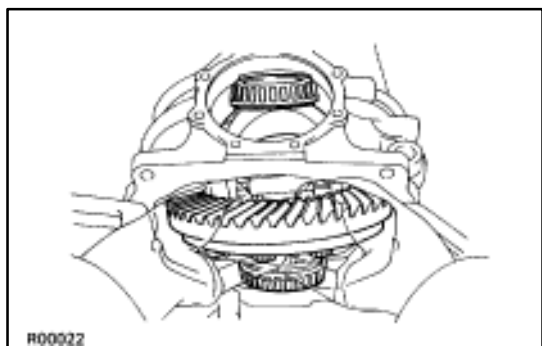
(5–8 kgf·cm, 4.3–6.9 in.-lbf)

HINT: For vehicle which have run 8,000 km (5,000 miles) or less, if the preload value measured disassembly is greater than the specification for a reused bearing, return the preload to the same as before disassembly.



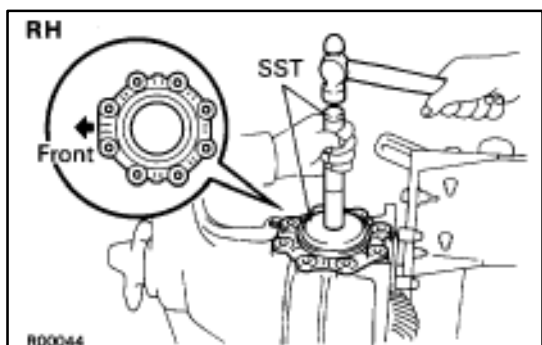
11. INSTALL SIDE BEARING OUTER RACE AND ADJUST WASHER

Using SST and a press, press the outer race and washer.
SST 09608-35014 (09608-06020, 09608-06210)



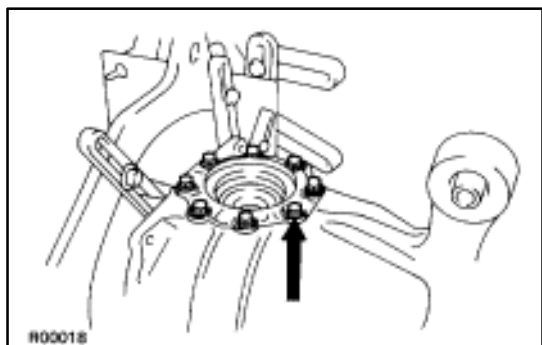
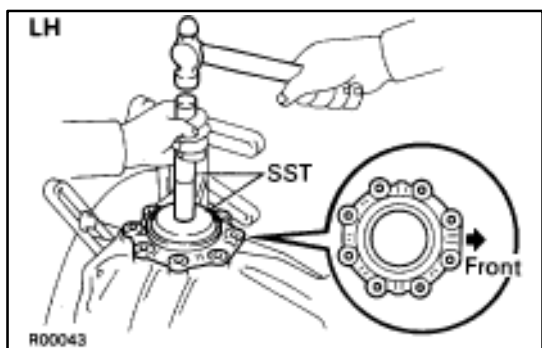
12. INSTALL DIFFERENTIAL CASE IN CARRIER

Install the drive side bearing in the differential carrier first, as shown in the illustration, then install the differential case.



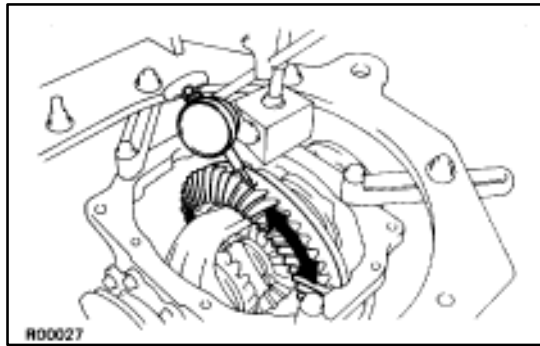
13. INSTALL DIFFERENTIAL CARRIER RETAINERS

(a) Using SST and hammer, install the bearing retainer.
SST 09608-35014 (09608-06020, 09608-06180)



(b) Tighten the eight bolts.

Torque: 22 N·m (225 kgf·cm, 16 ft·lbf)



14. CHECK RING GEAR BACKLASH

Using dial gauge, measure the backlash of the ring gear at three positions at least.

Backlash (average value):

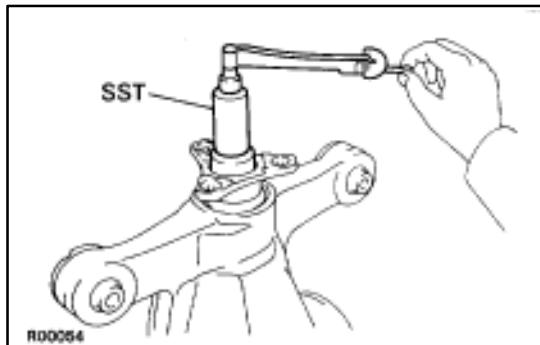
0.08–0.13 mm (0.0031–0.0051 in.)

NOTICE: The difference between the maximum and minimum measured values must be 0.05 mm (0.0020 in.) or less.

HINT: The measured values should be used for reference when selecting washers, so make a memo of the values.

If the backlash is not within the specification replace the washer on the ring gear side with one of a different thickness using the following procedure.

Adjusting Washer Thickness				mm (in.)	
No.	Thickness	No.	Thickness	No.	Thickness
02	2.02 (0.0795)	32	2.32 (0.0913)	62	2.62 (0.1031)
04	2.04 (0.0803)	34	2.34 (0.0921)	64	2.64 (0.1039)
06	2.06 (0.0811)	36	2.36 (0.0929)	66	2.66 (0.1047)
08	2.08 (0.0819)	38	2.38 (0.0937)	68	2.68 (0.1055)
10	2.10 (0.0827)	40	2.40 (0.0945)	70	2.70 (0.1063)
12	2.12 (0.0835)	42	2.42 (0.0953)	72	2.72 (0.1071)
14	2.14 (0.0843)	44	2.44 (0.0961)	74	2.74 (0.1079)
16	2.16 (0.0850)	46	2.46 (0.0969)	76	2.76 (0.1087)
18	2.18 (0.0858)	48	2.48 (0.0976)	78	2.78 (0.1094)
20	2.20 (0.0866)	50	2.50 (0.0984)	80	2.80 (0.1102)
22	2.22 (0.0974)	52	2.52 (0.0992)	82	2.82 (0.1110)
24	2.24 (0.0882)	54	2.54 (0.1000)	84	2.84 (0.1118)
26	2.26 (0.0890)	56	2.56 (0.1008)	86	2.86 (0.1126)
28	2.28 (0.0898)	58	2.58 (0.1016)		
30	2.30 (0.0906)	60	2.60 (0.1024)		



15. MEASURE TOTAL PRELOAD

Using SST and a torque wrench, measure the total preload.
SST 09229–55010

Total preload: In addition to drive pinion preload

New bearing 0.4–0.6 N·m

(4–6 kgf·cm, 3.5–5.2 in.·lbf)

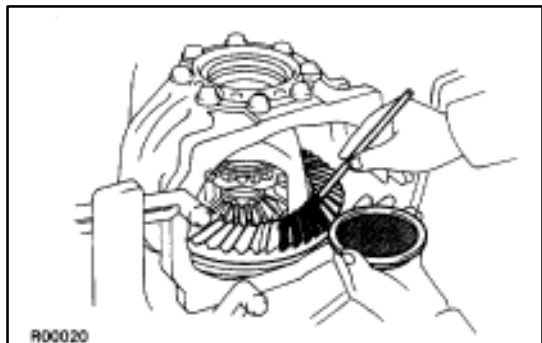
Redused bearing 0.2–0.5 N·m

(2–5 kgf·cm, 1.7–4.3 in.·lbf)

If the measure preload is less than specification, replace the washer of the ring gear's tooth surface side with a thicker one.

If the preload is greater than the specification, replace the washer of the ring gear's tooth surface side with thinner one.

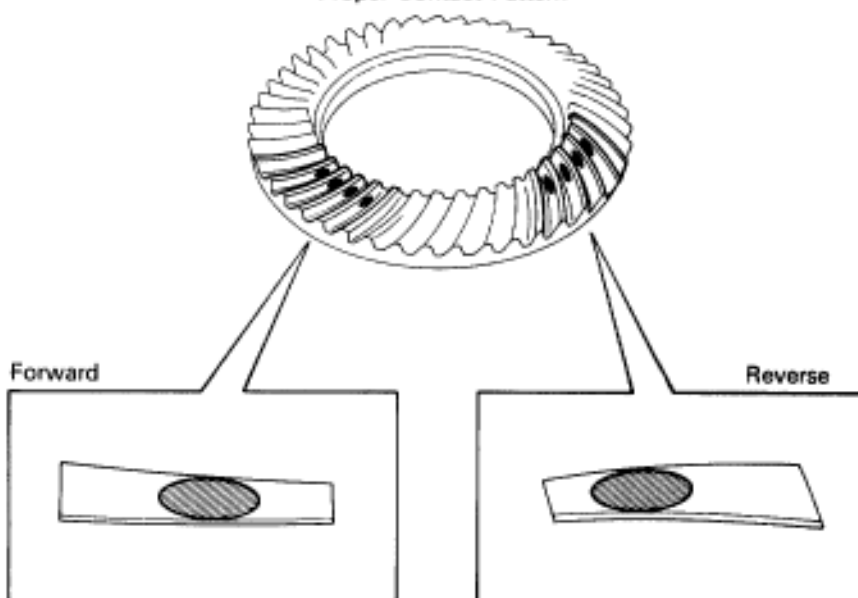
HINT: Changing the snap ring thickness by 0.02 mm (0.0008 in.) will change the total preload by approx. 0.1 N·m (1 kgf·cm, 0.9 in.·lbf).



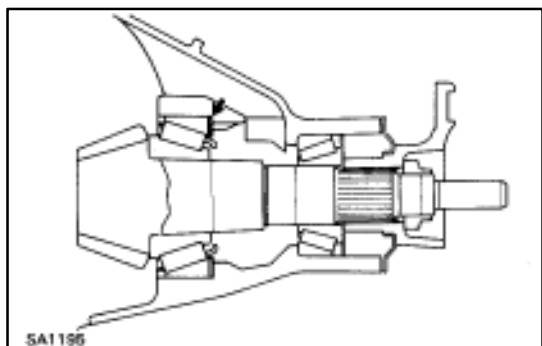
16. INSPECT TOOTH CONTACT PATTERN

- Coat three or four teeth at three different position on the ring gear with red lead.
- Hold the companion flange firmly and rotate the ring gear in both directions.
- Inspect the tooth contact pattern.

Proper Contact Pattern



SA1125











SA1195

If tooth contact pattern is not correct, replace the adjusting washer installed on the front of the drive pinion rear bearing to adjust it.

NOTICE: Be sure to always use a new part when replacing adjusting washer.

HINT: Refer to the table below for selection of the adjusting washer.

Tooth contact pattern		Adjusting washer selection	
Forward	Reverse		
 SA1117	 SA1121	+ 0.08 mm (+ 0.0031 in.)	Replacing the washer with one 0.08 mm (0.0031 in.) thicker will give proper contact pattern.
 SA1118	 SA1124	+ 0.14 mm (+ 0.0055 in.)	Replacing the washer with one 0.14 mm (0.0055 in.) thicker will give proper contact pattern.
 SA1119	 SA1123	– 0.08 mm (– 0.0031 in.)	Replacing the washer with one 0.08 mm (0.0055 in.) thinner will give proper contact pattern.
 SA1120	 SA1122	– 0.14 mm (– 0.0055 in.)	Replacing the washer with one 0.14 mm (0.0055 in.) thinner will give proper contact pattern.

HINT: Adjust washer in forty-two (different thicknesses in 0.01 mm (0.0004 in.) unit are available.

Adjusting washer thickness								mm (in.)
No.	Thickness	No.	Thickness	No.	Thickness	No.	Thickness	
87	1.87 (0.0736)	98	1.98 (0.0780)	09	2.09 (0.0823)	20	2.20 (0.0866)	
88	1.88 (0.0740)	99	1.99 (0.0783)	10	2.10 (0.0827)	21	2.21 (0.0870)	
89	1.89 (0.0744)	00	2.00 (0.0787)	11	2.11 (0.0831)	22	2.22 (0.0874)	
90	1.90 (0.0748)	01	2.01 (0.0791)	12	2.12 (0.0835)	23	2.23 (0.0878)	
91	1.91 (0.0752)	02	2.02 (0.0795)	13	2.13 (0.0839)	24	2.24 (0.0882)	
92	1.92 (0.0756)	03	2.03 (0.0799)	14	2.14 (0.0843)	25	2.25 (0.0886)	
93	1.93 (0.0760)	04	2.04 (0.0803)	15	2.15 (0.0846)	26	2.26 (0.0890)	
94	1.94 (0.0764)	05	2.05 (0.0807)	16	2.16 (0.0850)	27	2.27 (0.0894)	
95	1.95 (0.0768)	06	2.06 (0.0811)	17	2.17 (0.0854)	28	2.28 (0.0898)	
96	1.96 (0.0772)	07	2.07 (0.0815)	18	2.18 (0.0858)			
97	1.97 (0.0776)	08	2.08 (0.0819)	19	2.19 (0.0862)			

17. REMOVE DIFFERENTIAL RETAINER

(See page [SA-85](#))

18. REMOVE DIFFERENTIAL CASE

(See page [SA-86](#))

19. REMOVE DRIVE PINION

(See page [SA-87](#))

20. INSTALL SPACER ON DRIVE PINION

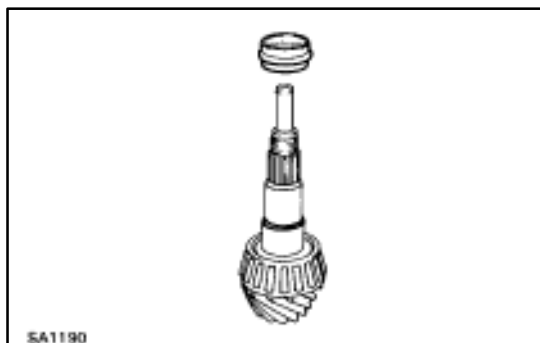
Install a new spacer on the drive pinion.

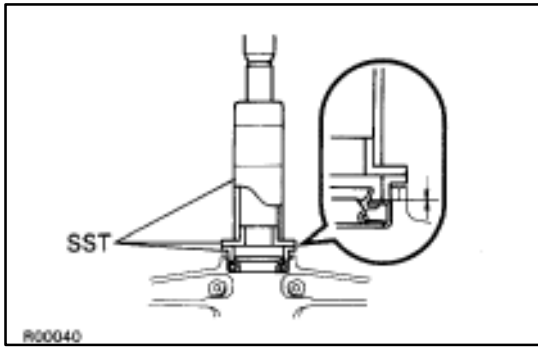
21. INSTALL DRIVE PINION AND FRONT BEARING

(See page [SA-93](#))

22. INSTALL OIL SLINGER

(See page [SA-94](#))

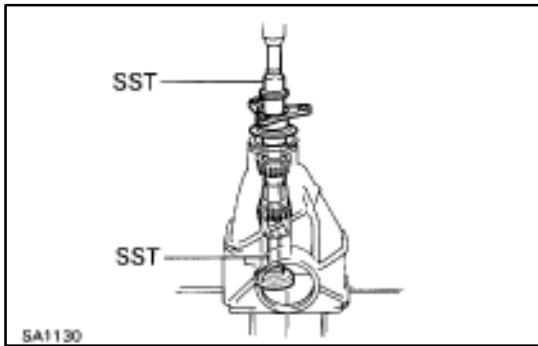




23. INSTALL OIL SEAL

- Apply the MP grease to a new oil seal's lip.
- Using SST, install a new oil seal until its end is flush with the surface of the differential carrier.

SST 09316-60010 (09316-00010, 09316-00040)
09502-12010

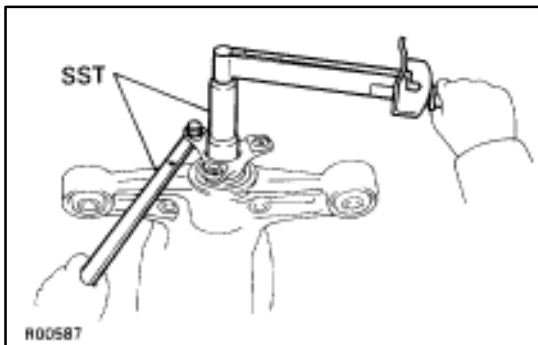


24. INSTALL COMPANION FLANGE

Using SST and a press, install the companion flange.

SST 09223-63010, 09325-40010

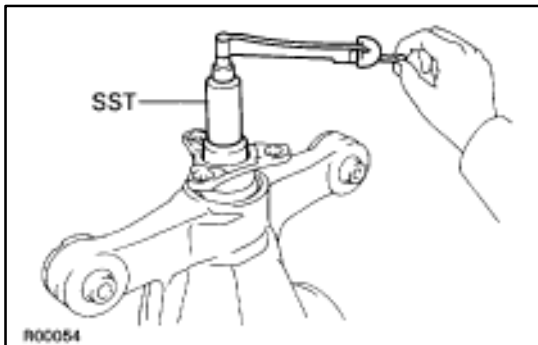
NOTICE: Be careful not to damage the oil seal.



25. ADJUST DRIVE PINION PRELOAD

- Coat the threads and flange of a new nut with hypoid gear oil for LSD.
- Using SST, tighten the nut.

SST 09229-55010, 09330-00021



- Using SST and a torque wrench, measure the drive pinion preload.

SST 09229-55010

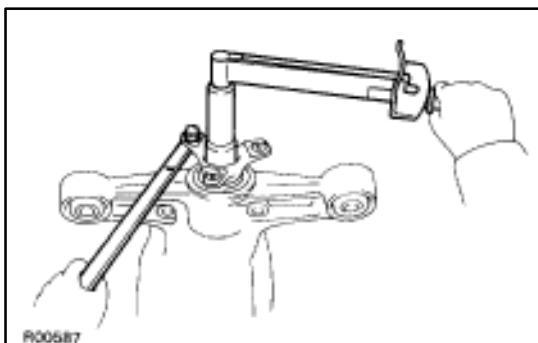
Preload (at starting):

New bearing 1.2–1.8 N·m

(12.4–18.4 kgf·cm, 10.8–16.0 in.·lbf)

Reused bearing 0.5–0.8 N·m

(5–8 kgf·cm, 4.3–6.9 in.·lbf)

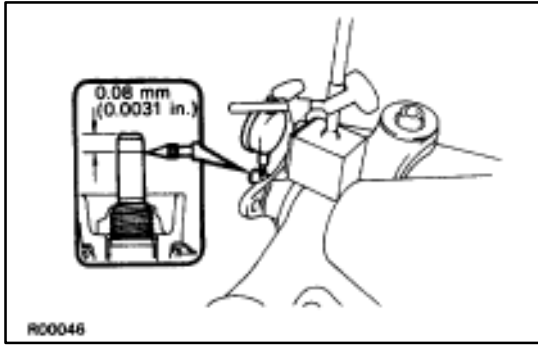


- If the preload is greater than the specification, replace the spacer.
- If the preload is less than the specification, retighten the nut 13 NVm (130 kgfVcm, 9 ftVlbf) at a time until the specified preload is reached.

Maximum torque: 490 N·m (5,000 kgf·cm, 362 ft·lbf)

If the maximum torque is exceeded while retightening the nut, replace the spacer and repeat the preload procedure.

Do not back off the nut to reduce the preload.

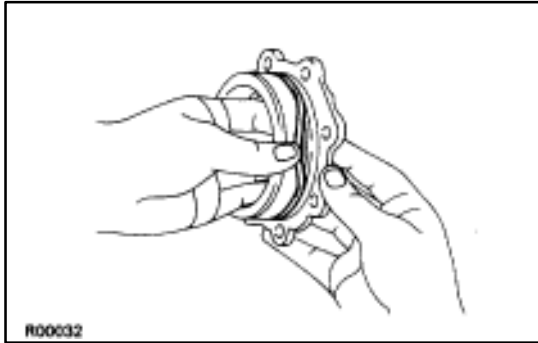
**26. CHECK RUNOUT OF DRIVE PINION SHAFT**

Measure the runout of the drive pinion shaft at a point 10 mm (0.39 in.) from the end of the shaft.

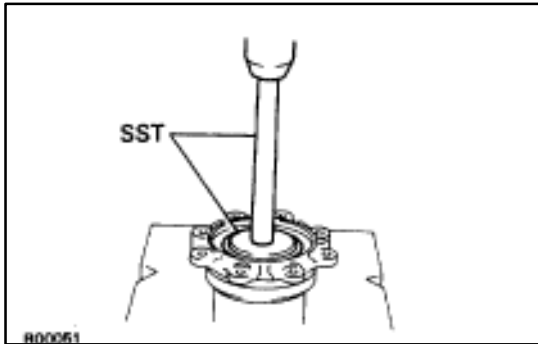
Maximum runout: 0.08 mm (0.0031 in.)

27. INSTALL DIFFERENTIAL CASE IN CARRIER

(See page [SA-95](#))

**28. INSTALL O-RING**

- (a) Coat a new O-ring with hypoid gear oil.
- (b) Install the O-ring to the carrier retainer.

**29. INSTALL OIL SEAL**

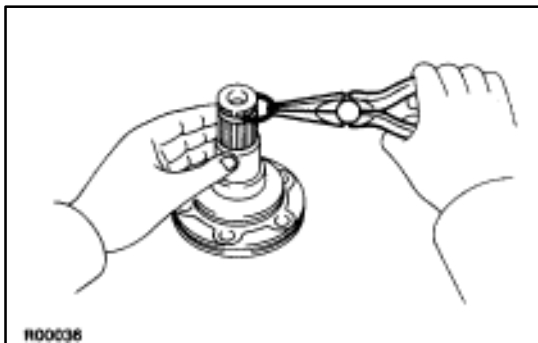
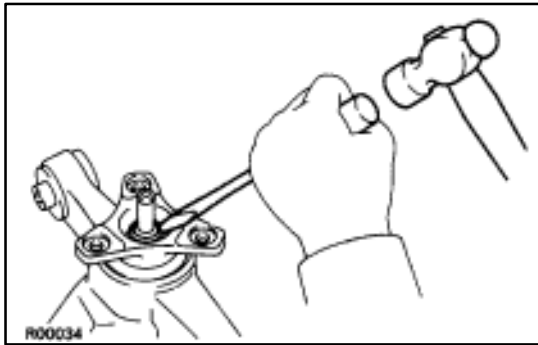
- (a) Using SST and a press, install a new oil seal to the carrier retainer.

SST 09608-32010, 09608-35014 (09608-06020)

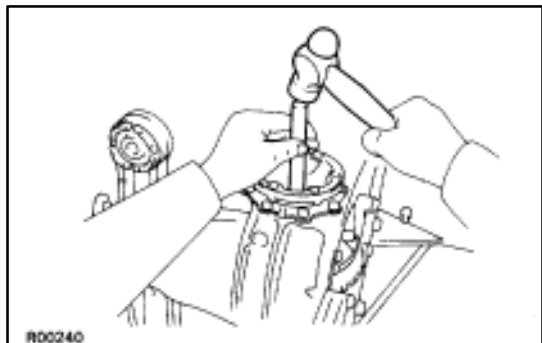
- (b) Coat the MP grease to the oil seal lip.

30. INSTALL SIDE BEARING RETAINER

(See page [SA-95](#))

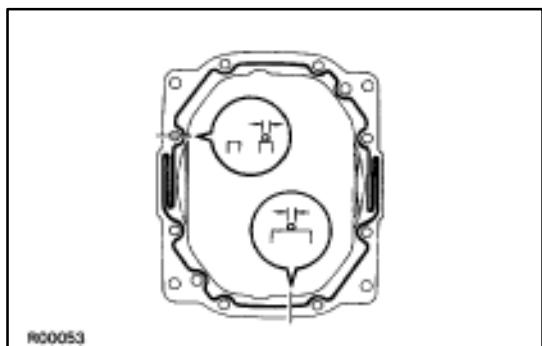
31. RECHECK BACKLASH, TOTAL PRELOAD AND TOOTH CONTACT PATTERN**32. STAKE DRIVE PINION NUT****33. INSTALL SNAP RING TO SIDE GEAR SHAFT**

- (a) Install a new snap ring to the shaft.
- (b) Coat the MP grease to the snap ring.

**34. INSTALL SIDE GEAR SHAFTS**

Using a hammer and brass bar install the side gear shafts.
HINT: Whether or not the side gear shaft is making contact with the pinion shaft can be known by the sound or feeling when driving it in.

NOTICE: Be careful not to damage the oil seal.

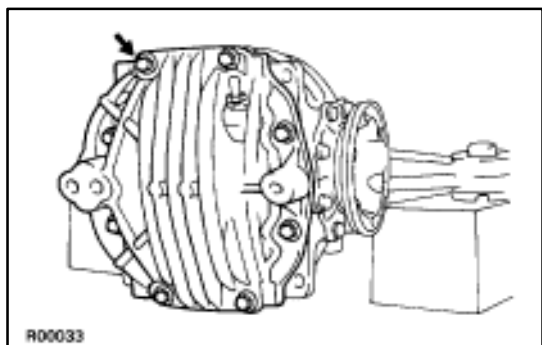
35. REMOVE DIFFERENTIAL CARRIER FROM OVERHAUL STAND, ETC.**36. INSTALL DIFFERENTIAL CARRIER COVER**

(a) Clean the contact surfaces of the carrier and cover of any residual packing material using cleaner.

(b) Coat the seal packing to the carrier or cover.

Seal packing: Part No. 08826-00110, THREE BOND 1389 or equivalent

NOTICE: After installing the cover, wait at least one hour before filling it with oil or running the vehicle.



(c) Install the carrier cover to the carrier with the eight bolts.

Torque: 47 N·m (475kgf·cm, 34 ft·lbf)

(d) Install the breather plug.

Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)