

Toyota 7.5" Limited Slip Carrier Rebuild and Parts List

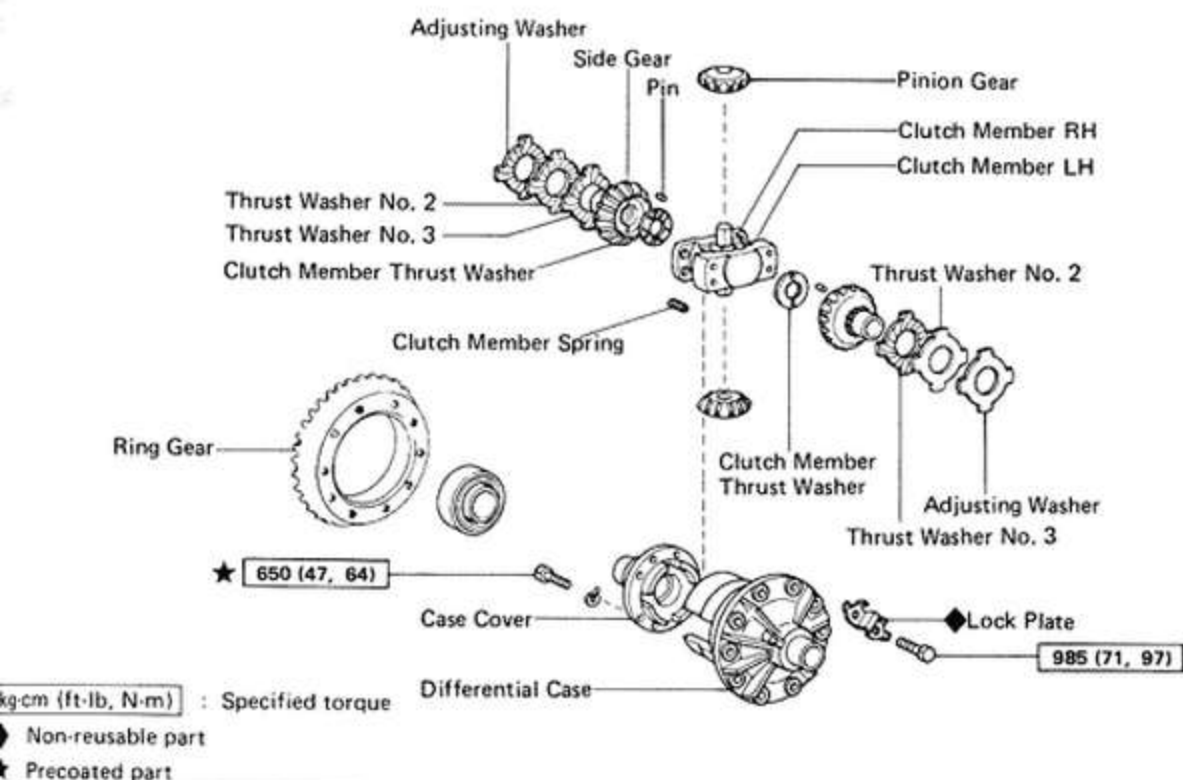
LIMITED SLIP DIFFERENTIAL

Preparation of disassembly

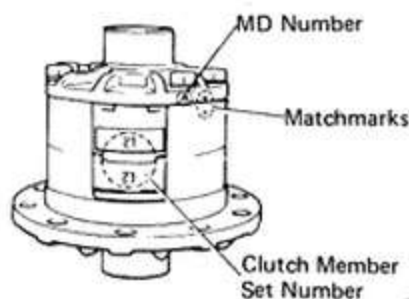
1. REMOVE DIFFERENTIAL (See page RA-20)
2. DISASSEMBLE DIFFERENTIAL CASE FROM CARRIER (See page RA-25)
3. DISASSEMBLE SIDE BEARING (See page RA-26)

NOTE: If the side gear or clutch member has been replaced, be sure to replace the thrust washer contacting this part. Any disassembled part that is to be reused must be reassembled to its former location.

COMPONENTS



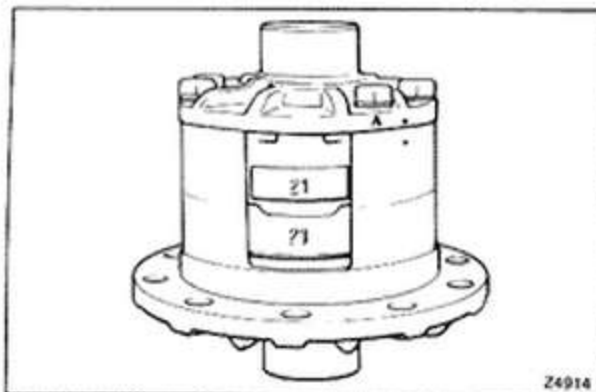
RA0367



Z4914

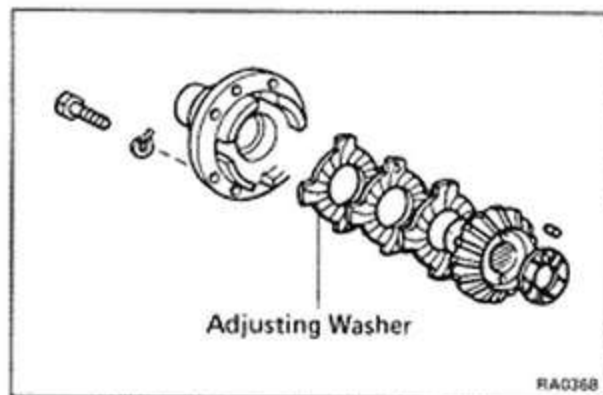
DISASSEMBLY OF LIMITED SLIP DIFFERENTIAL

1. PUT MATCHMARKS ON CASE AND CASE COVER
2. CHECK CASE COVER MARKS AND CLUTCH MEMBER RH, LH SET NUMBER



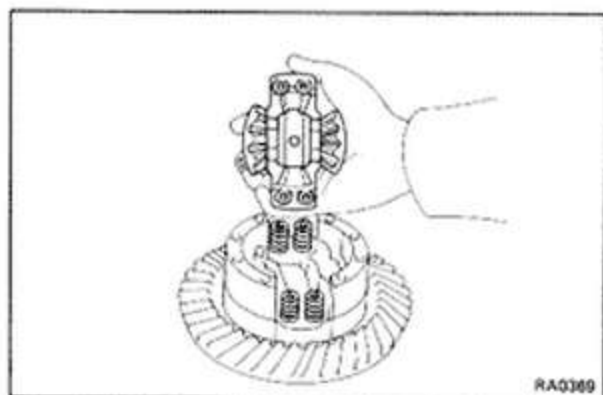
3. REMOVE CASE BOLTS AND CASE COVER WITH SIDE GEAR

NOTE: Case cover bolts have been treated with retaining compound making it difficult to loosen them. Removal will be made easier by heating the assembly to around 150 °C (302° F) in an oil heater or similar means.



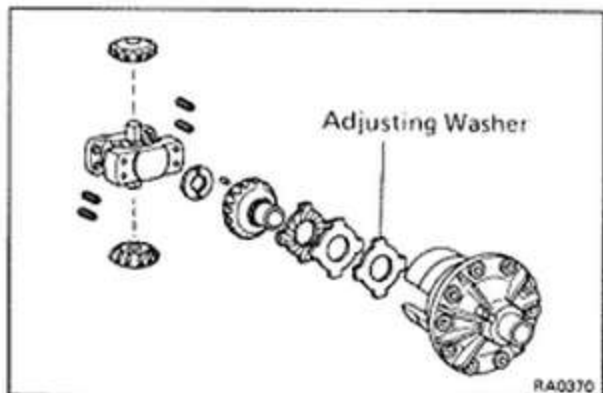
4. REMOVE FOLLOWING PARTS FROM CASE COVER:

- (a) Clutch member thrust washer
- (b) Side gear
- (c) Thrust washer No. 3
- (d) Thrust washer No. 2
- (e) Adjusting washer



5. REMOVE FOLLOWING PARTS FROM DIFFERENTIAL CASE:

- (a) Clutch member RH with pinion gear
- (b) Clutch member spring
- (c) Clutch member LH
- (d) Side gear and clutch member thrust washer
- (e) Thrust washer No. 3
- (f) Thrust washer No. 2
- (g) Adjusting washer

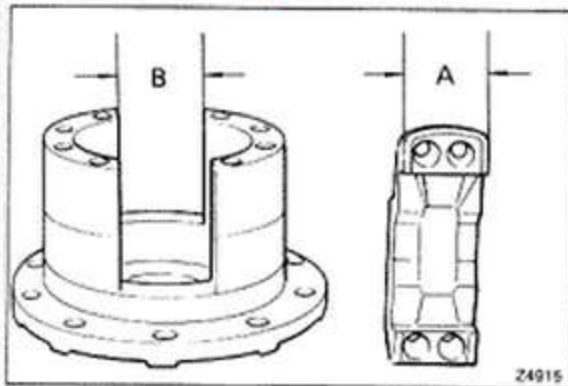


INSPECTION AND ADJUSTMENT OF DIFFERENTIAL CASE

1. REPLACE PARTS THAT ARE DAMAGED OR WORN

The next 3 pages is only to achieve clutch stack clearanc of .0012"-.0059". Manual from the Weir MaxGrip kit has an easier procedure. Start by adding extra shim, measure how much cap is proud of the body, then do a subtract to find what the clearance would have been without the added shim.

The side gear shim from the open diff is a great aid for the measurement.



2. CHECK CLUTCH MEMBER LH AND DIFFERENTIAL CASE

Check the clearance between left clutch member and differential case.

	Specifications	mm (in.)
Clutch member (A)	41.975–42.000	(1.6526–1.6535)
Differential case (B)	42.000–42.025	(1.6535–1.6545)
Clearance	0–0.050	(0–0.0020)

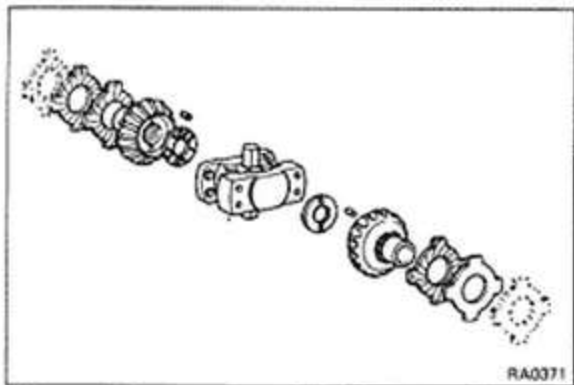
3. ADJUST SIDE GEAR THRUST CLEARANCE

NOTE: Adjust the axial clearance inside the differential case by selecting a proper thickness adjusting washer as follows.

Standard clearance:

0.03 – 0.15 mm (0.0012 – 0.0059 in.)

(a) Clean the parts.



(b) Assemble the following parts to SST.

SST 09411-22011

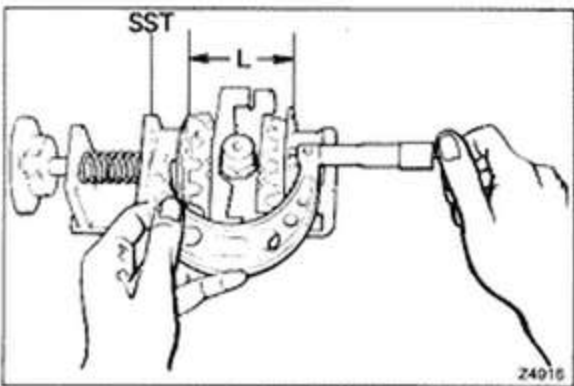
NOTE: Do not assemble the adjusting washers and clutch member springs.

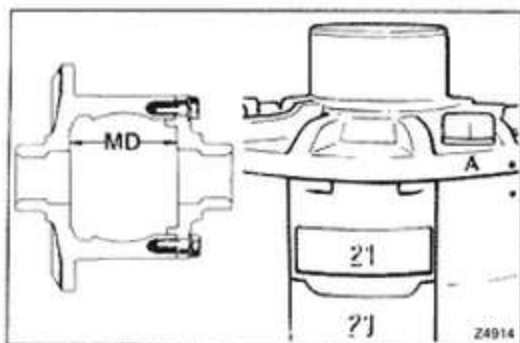
- (1) Side gear thrust washer No. 2
- (2) Side gear thrust washer No. 3
- (3) Side gear
- (4) Clutch member thrust washer
- (5) Clutch member LH
- (6) Clutch member RH
- (7) Clutch member thrust washer
- (8) Side gear
- (9) Side gear thrust washer No. 3
- (10) Side gear thrust washer No. 2

(c) Loosen the nut of SST and hold the parts with spring tension.

(d) Using a micrometer, measure dimension "L".

NOTE: Properly align the parts to be measured and measure dimension "L" several times. Take the average of the readings.





- (e) Differential case mounting dimension (MD) has been classified and code letters are punched on the differential case.

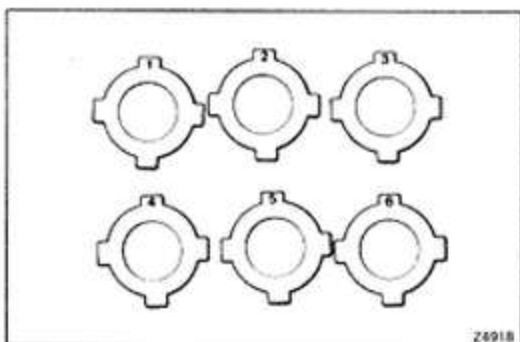
Mounting dimension mm (in.)

	Mounting dimension	mm (in.)
A	74.98-75.01	(2.9520-2.9531)
B	75.01-75.04	(2.9531-2.9543)
C	75.04-75.07	(2.9543-2.9555)
D	75.07-75.10	(2.9555-2.9567)
E	75.10-75.13	(2.9567-2.9579)

- (f) Select the adjusting washers by combining the dimension "MD" (mark punched on case) and dimension "L" in the adjusting washer selection table.

Adjusting washer sizes mm (in.)

Mark	Thickness	Mark	Thickness
1	1.80 (0.0709)	4	1.95 (0.0768)
2	1.85 (0.0728)	5	2.00 (0.0787)
3	1.90 (0.0748)	6	2.05 (0.0807)



Adjusting washer selection table

Differential case code mark

	A	B	C	D	E	
70.91						2.7917
92					(5)+(4)	2.7921
93						2.7925
94						2.7929
95				(5)+(3)		2.7933
96						2.7937
97						2.7941
98			(5)+(5)			2.7945
99						2.7949
71.00						2.7953
01						2.7957
02						2.7961
03						2.7965
04			(5)+(4)			2.7968
05						2.7972
06						2.7976
07						2.7980
08						2.7984
09						2.7988
10						2.7992
11						2.7996
12						2.8000
13						2.8004
14						2.8008
15						2.8012
16						2.8016
17			(3)+(1)			2.8020
18						2.8024
19						2.8028
20						2.8031
21						2.8035
22			(3)+(2)			2.8039
23						2.8043
24						2.8047
25			(2)+(2)			2.8051
26						2.8055
27						2.8059
28	(2)+(1)					2.8063
29						2.8067
30						2.8071
31	(0)+(0)					2.8075
32						2.8079

Recommend using method from Weir manual instead of this table. Both achieves the same end results.

"L" Measured assembled distance of thrust washer No. 1 and No. 2, etc. (mm)

"L" Measured assembled distance of thrust washer No. 1 and No. 2, etc. (in.)

Adjusting washer selection table

Differential case code mark

A

B

C

D

E

"L" Measured assembled distance of thrust washer No. 1 and No. 2, etc. (mm)

70.91

.92

.93

.94

.95

.96

.97

.98

.99

71.00

.01

.02

.03

.04

.05

.06

.07

.08

.09

.10

.11

.12

.13

.14

.15

.16

.17

.18

.19

.20

.21

.22

.23

.24

.25

.26

.27

.28

.29

.30

.31

.32

(6)+(4)

(5)+(5)

(5)+(5)

(5)+(4)

(4)+(4)

(4)+(3)

(3)+(3)

(3)+(2)

(2)+(2)

(2)+(1)

(1)+(1)

2.7917

2.7921

2.7925

2.7929

2.7933

2.7937

2.7941

2.7945

2.7949

2.7953

2.7957

2.7961

2.7965

2.7968

2.7972

2.7976

2.7980

2.7984

2.7988

2.7992

2.7996

2.8000

2.8004

2.8008

2.8012

2.8016

2.8020

2.8024

2.8028

2.8031

2.8035

2.8039

2.8043

2.8047

2.8051

2.8055

2.8059

2.8063

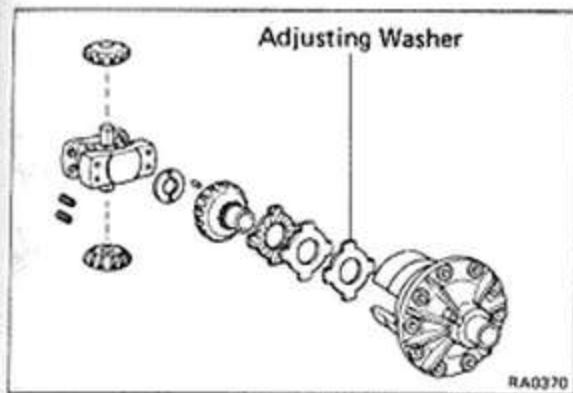
2.8067

2.8071

2.8075

2.8079

"L" Measured assembled distance of thrust washer No. 1 and No. 2, etc. (in.)

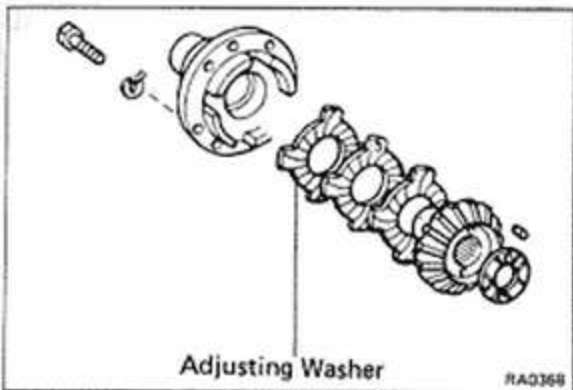


(g) Install following parts onto the differential case.

- Adjusting washer
- Thrust washer No. 2
- Thrust washer No. 3
- Side gear
- Clutch member thrust washer
- Clutch member LH

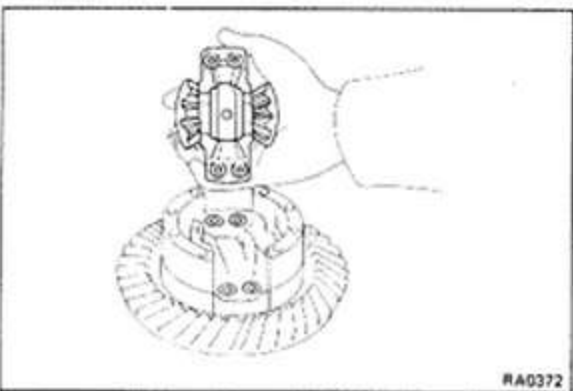
NOTE: Do not install the clutch member spring.

- Clutch member RH with pinion gear



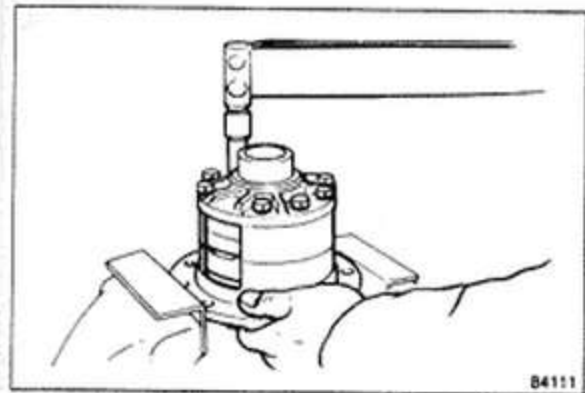
(h) Install following parts onto the differential case cover.

- Adjusting washer
- Thrust washer No. 2
- Thrust washer No. 3
- Side gear
- Clutch member thrust washer

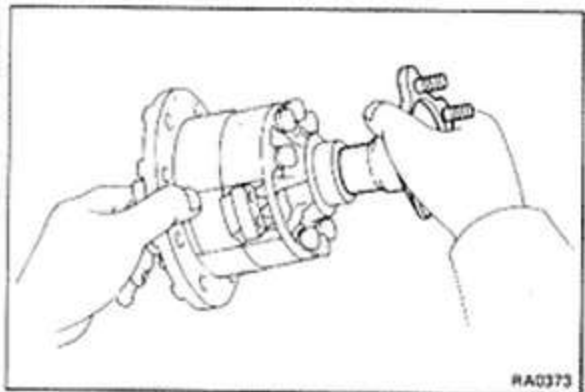


(i) Temporarily assemble the selected thrust washers together with the other "L" dimension measured parts into the case.

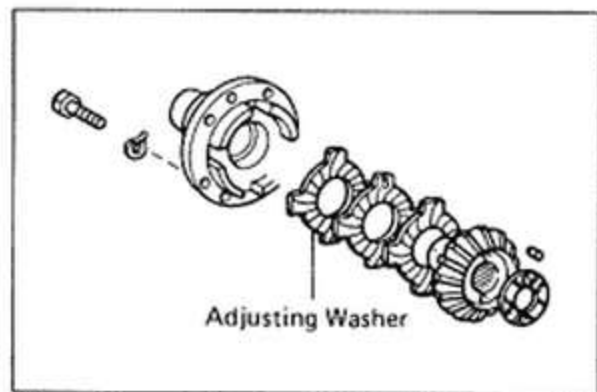
NOTE: Do not assemble the spring.



- (j) Tighten the bolts to specified torque.
Torque: 650 kg-cm (47 ft-lb, 64 N-m)



- (k) Turn the side gears with the side gear shaft or other means and check to see that they turn smoothly.
- NOTE: Remove the snap ring from side gear shaft. Reselect thrust washers if the side gear does not turn smoothly.
- (l) Disassemble the differential case.



3. INSTALL FOLLOWING PART ONTO DIFFERENTIAL CASE COVER

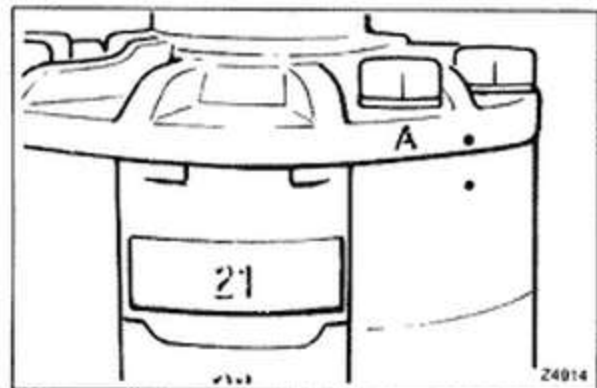
- Adjusting washer

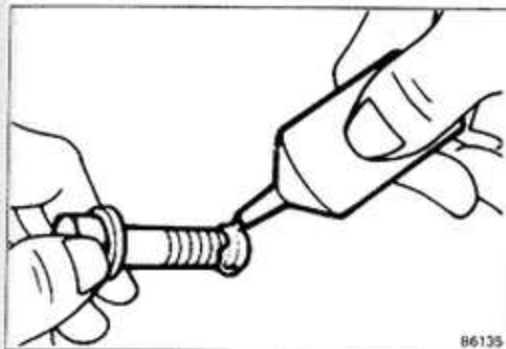
NOTE: Face the oil groove toward the clutch plate.

- Thrust washer No. 2
- Thrust washer No. 3
- Side gear
- Clutch member thrust washer

NOTE: Face the oil groove toward the clutch member.

Align the marks on the case and case cover.





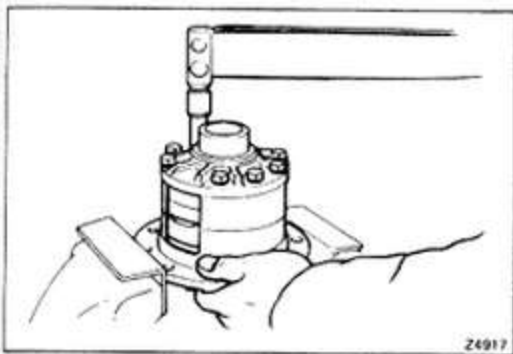
4. INSTALL CASE COVER BOLTS

- (a) Apply retaining compound to the bolts.

NOTE: Use Lock-Tight as the retaining compound.

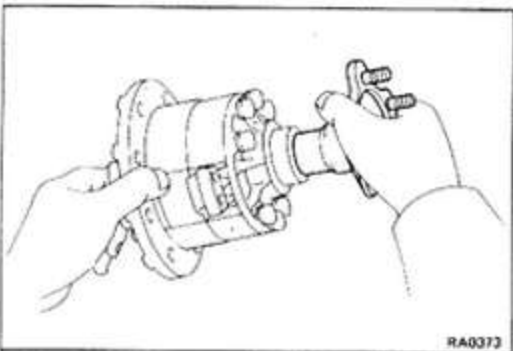
NOTE: Method of applying Lock-Tight.

- (1) Apply Lock-Tight Primer T to the case threads and the mounting bolts, and allow to dry thoroughly.
- (2) Apply Lock-Tight to the case threads and the bolts and install the bolts.
- (3) Allow to stand at least 3 hours after tightening the bolts. [In cold weather, heat to 30 – 50°C (86 – 122°F) before letting stand.]



- (b) Tighten the bolts evenly and gradually.

Torque: 650 kg-cm (47 ft-lb, 64 N·m)



5. CHECK SIDE GEAR THRUST CLEARANCE

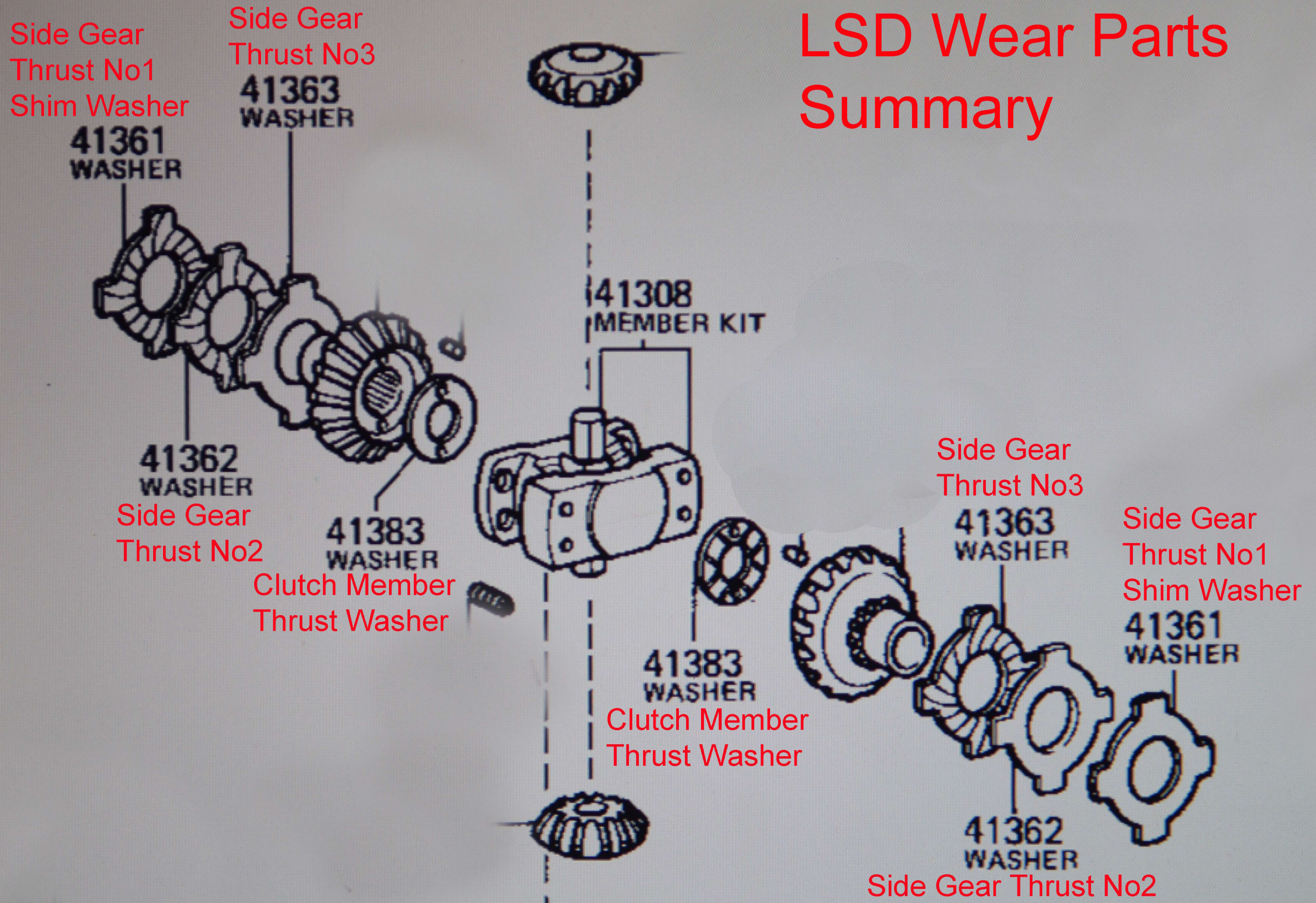
Turn the side gear with side gear shaft or other means and check to see that they turn smoothly.

6. INSTALL SIDE BEARING (See page RA-28)

INSTALLATION OF DIFFERENTIAL

1. INSTALL DIFFERENTIAL CASE IN CARRIER
(See page RA-30)
2. INSTALL DIFFERENTIAL
(See page RA-36)

LSD Wear Parts Summary



LSD Clutch and Thrust Washer Parts

No	PNC# (SUB)	Q' ty	Part Number	Q' ty	ProdDate	Part Name	Models(Description)
01	41362	01	41361-22101-	02	8108-8512	WASHER, REAR DIFFERENTIAL SIDE GEAR THRUST, NO.2	AA63,RA63,MA61*..EUR
02	41363	01	41361-22091-	02	8108-8512	WASHER, REAR DIFFERENTIAL SIDE GEAR THRUST, NO.3	AA63,RA63,MA61*..EUR
03	41383	01	41383-22011-	02	8108-8512	WASHER, CLUTCH MEMBER THRUST	AA63,RA63,MA61*..EUR

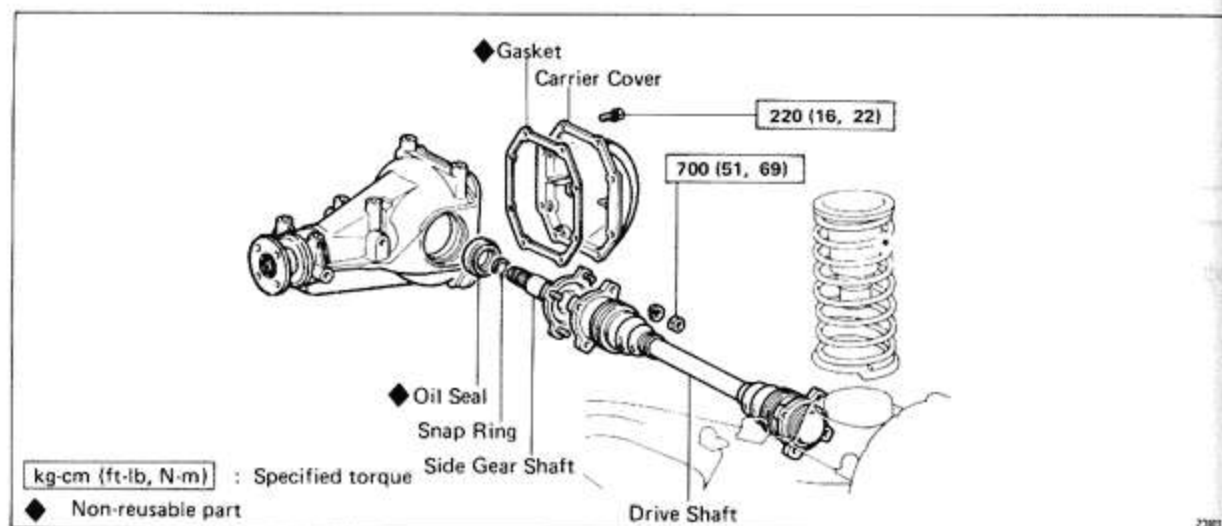
Shims for Preloading LSD Clutch

Part Number	Q'ty	ProdDate	Part Name	Models(Description)
41361-22051-	02	8108-8512	WASHER, REAR DIFFERENTIAL SIDE GEAR THRUST NO.1	AA63,RA63,MA61*...EUR T=1.80,W/LSD
41361-22061-	02	8108-8512	WASHER, REAR DIFFERENTIAL SIDE GEAR THRUST NO.1	AA63,RA63,MA61*...EUR T=1.85,W/LSD
41361-22071-	02	8108-8512	WASHER, REAR DIFFERENTIAL SIDE GEAR THRUST NO.1	AA63,RA63,MA61*...EUR T=1.90,W/LSD
41361-22081-	02	8108-8512	WASHER, REAR DIFFERENTIAL SIDE GEAR THRUST NO.1	AA63,RA63,MA61*...EUR T=1.95,W/LSD
41361-22101-	02	8108-8512	WASHER, REAR DIFFERENTIAL SIDE GEAR THRUST NO.1	AA63,RA63,MA61*...EUR T=2.00,W/LSD
41361-22111-	02	8108-8512	WASHER, REAR DIFFERENTIAL SIDE GEAR THRUST NO.1	AA63,RA63,MA61*...EUR T=2.05,W/LSD

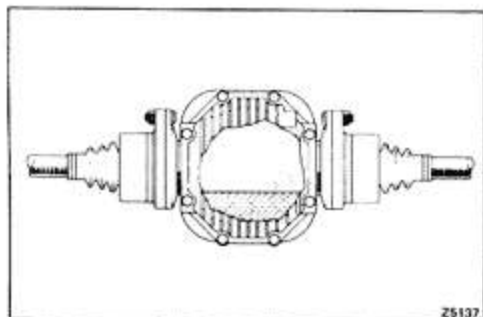
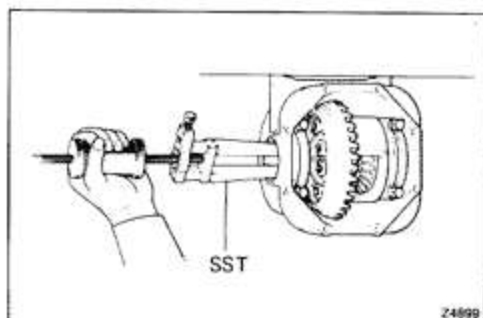
Toyota 7.5" Differential Removal, Install and Rebuild and Parts List

IRS TYPE DIFFERENTIAL

ON-VEHICLE REPLACEMENT OF SIDE GEAR SHAFT OIL SEAL



1. DRAIN OUT DIFFERENTIAL OIL
2. DISCONNECT DRIVE SHAFT FROM DIFFERENTIAL
3. REMOVE CARRIER COVER
4. REMOVE SIDE GEAR SHAFT (See step 2 on page RA-23)
5. REMOVE SIDE GEAR SHAFT OIL SEAL (See step 3 on page RA-23)
6. INSTALL SIDE GEAR SHAFT OIL SEAL (See step 16 on page RA-35)
7. INSTALL SIDE GEAR SHAFT (See step 17 on page RA-36)
8. MEASURE SIDE GEAR SHAFT RUNOUT (See step 18 on page RA-36)
9. INSTALL CARRIER COVER (See step 19 on page RA-36)
10. CONNECT DRIVE SHAFT (See step 4 on page RA-36)



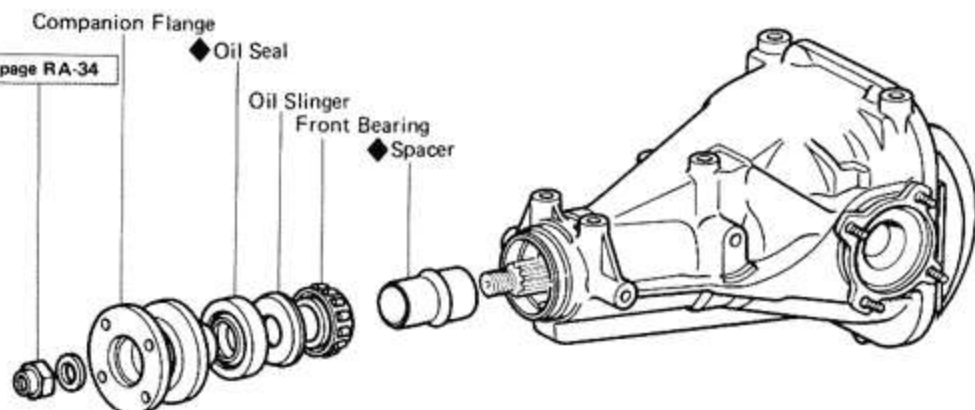
11. INSTALL DRAIN PLUG AND FILL DIFFERENTIAL WITH GEAR OIL

Hypoid gear oil: w/LSD use LSD oil only
 SAE 90 above – 18°C (0°F)
 SAE 80W or 80W – 90
 at temperature below – 18°C (0°F)

Capacity: 1.2 liters (1.3 US qts, 1.1 Imp. qts)

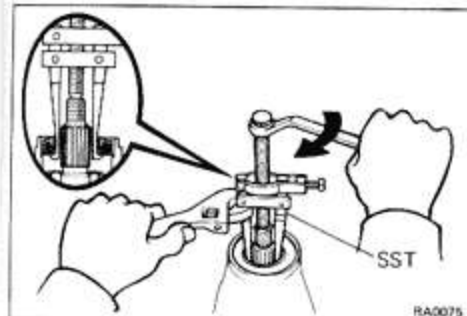
Install a filler plug.

REPLACEMENT OF FRONT OIL SEAL COMPONENTS

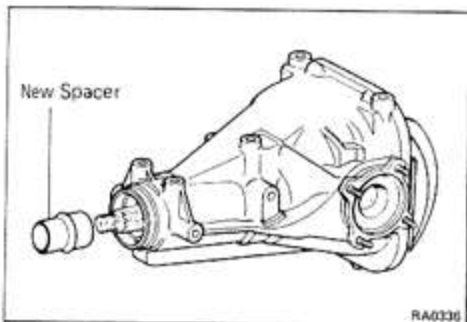


◆ Non-reusable part

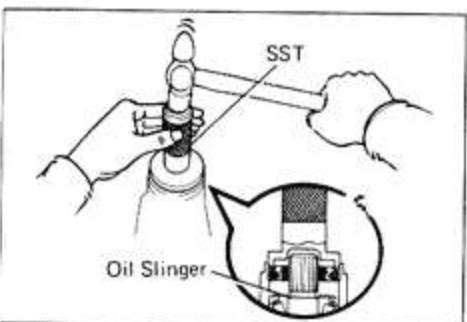
RA0335



RA0075



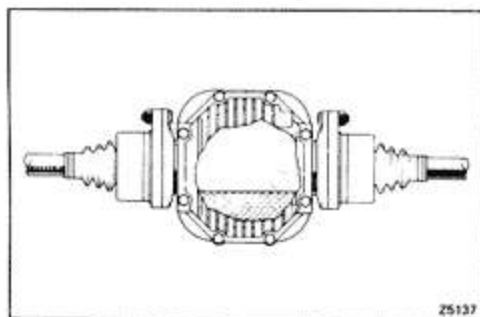
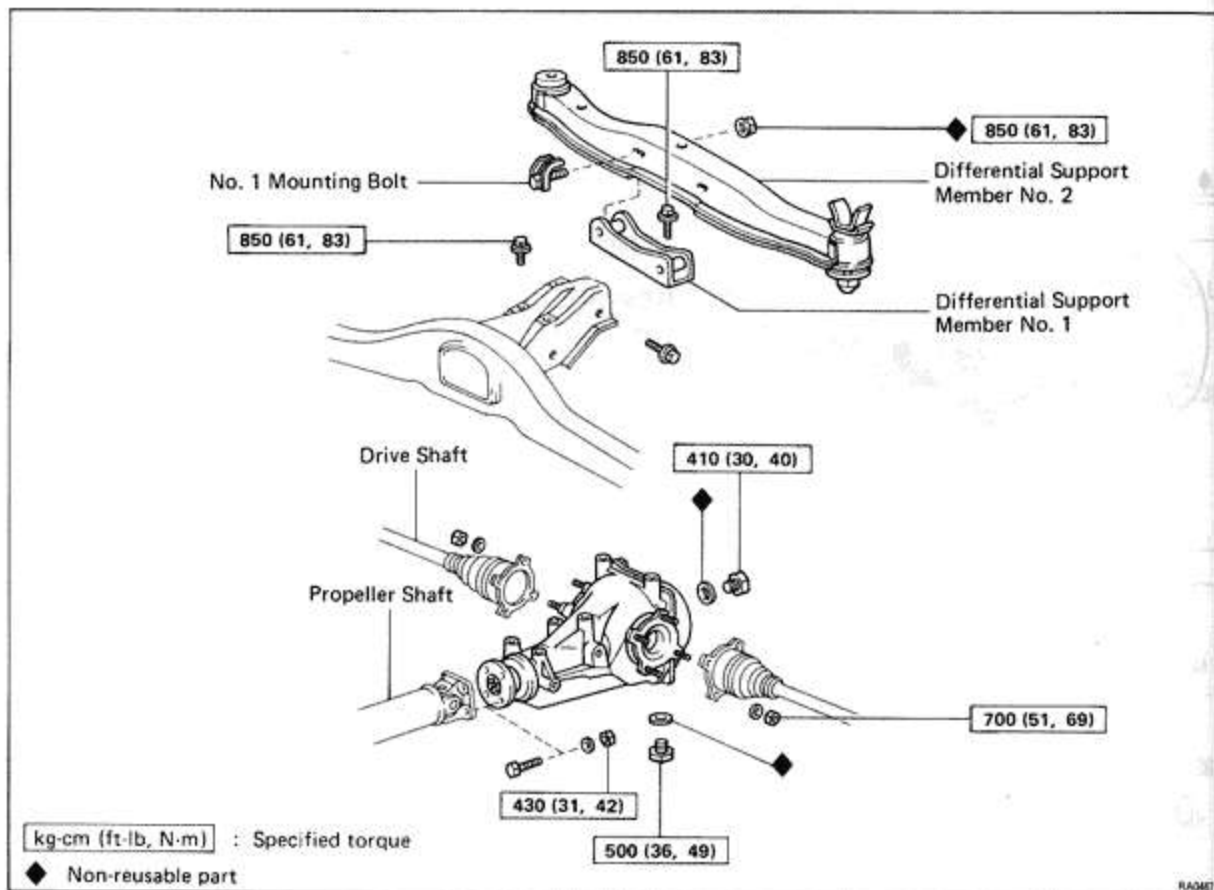
RA0336



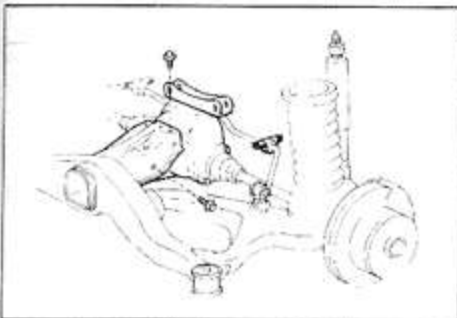
1. REMOVE DIFFERENTIAL (See page RA-20)
2. REMOVE COMPANION FLANGE
(See step 10 on page RA-24)
3. REMOVE OIL SEAL
 - (a) Using SST, remove the oil seal from the housing.
SST 09308-10010
 - (b) Remove the oil slinger.
4. REMOVE FRONT BEARING AND BEARING SPACER
(See step 12 on page RA-25)
5. INSTALL NEW BEARING SPACER AND FRONT BEARING
 - (a) Install a new bearing spacer on the shaft.
 - (b) Install the front bearing on the shaft.
6. INSTALL OIL SLINGER AND NEW OIL SEAL
 - (a) Install the oil slinger facing as shown.
 - (b) Using SST, drive in a new oil seal.
SST 09316-60010
Oil seal drive in depth: 1.5 mm (0.059 in.)
 - (c) Apply MP grease to the oil seal lip.

7. INSTALL COMPANION FLANGE
(See step 12 on page RA-34)
8. CHECK FRONT BEARING PRELOAD
(See step 13 on page RA-35)
9. CHECK DEVIATION OF COMPANION FLANGE
(See step 14 on page RA-35)
10. STAKE DRIVE PINION NUT
11. INSTALL DIFFERENTIAL (See page RA-36)

REMOVAL OF DIFFERENTIAL

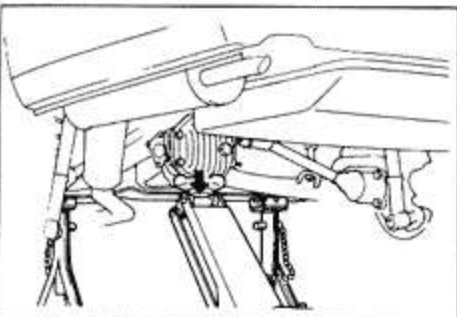


1. REMOVE DRAIN PLUG AND DRAIN DIFFERENTIAL OIL
2. DISCONNECT REAR DRIVE SHAFT
3. DISCONNECT PROPELLER SHAFT FLANGE FROM COMPANION FLANGE
4. REMOVE DIFFERENTIAL SUPPORT MEMBER NO.1 MOUNTING BOLT (See page RA-53)



5. REMOVE DIFFERENTIAL

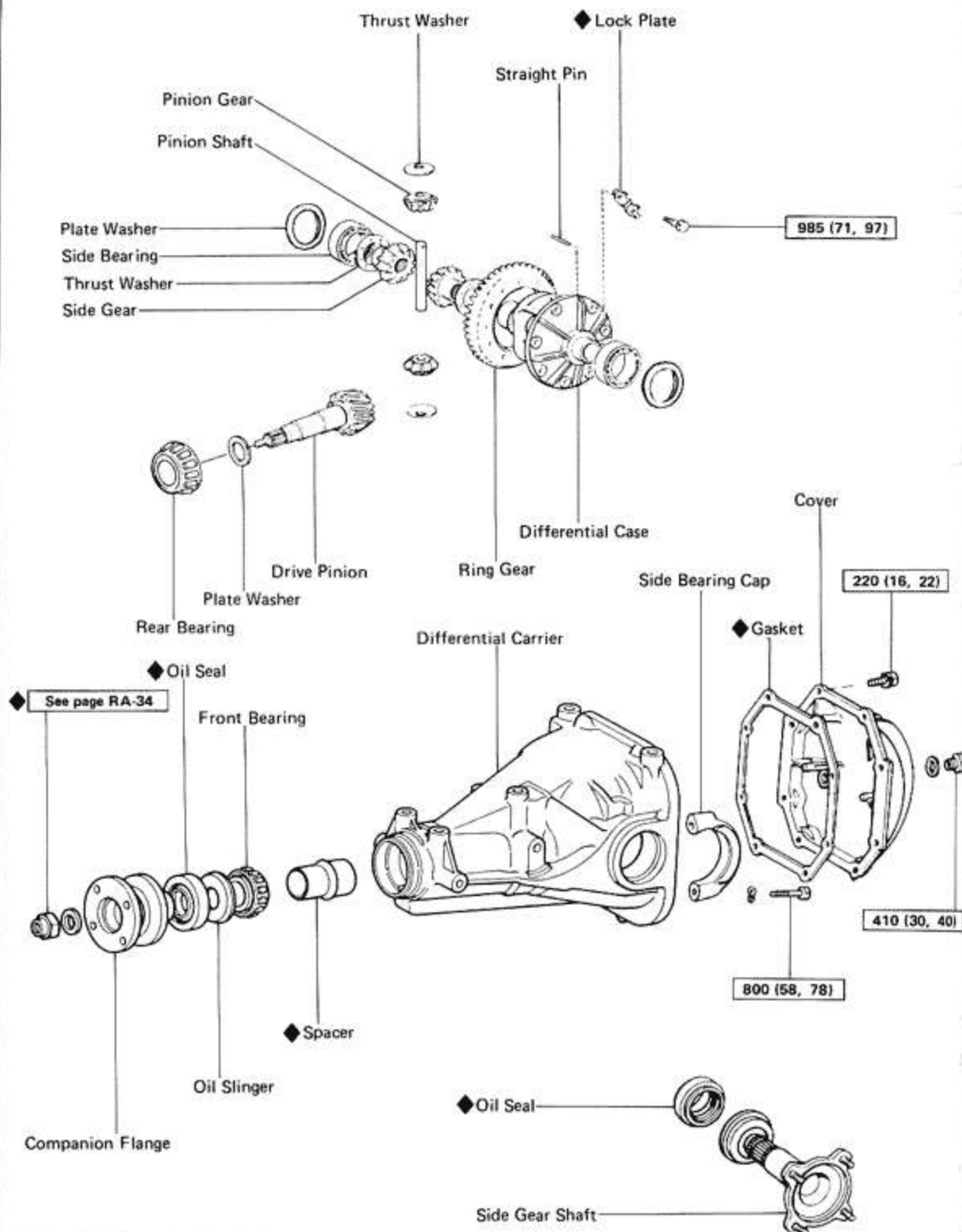
- (a) Jack up differential and remove the carrier bolts.



- (b) Lower the differential carrier with a jack.

NOTE: When lowering the carrier, be careful that the differential does not separate.

COMPONENTS

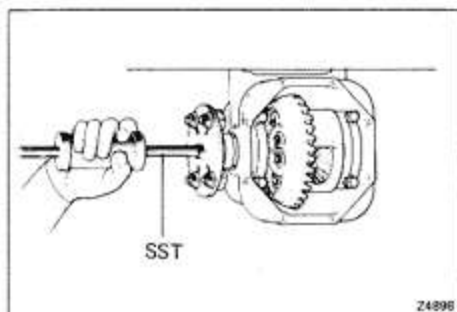


kg-cm (ft-lb, N-m) : Specified torque

◆ Non-reusable part

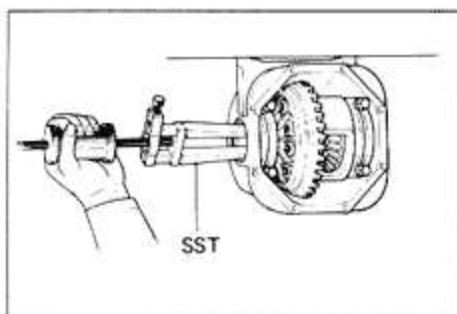
DISASSEMBLY OF DIFFERENTIAL**1. REMOVE DIFFERENTIAL CARRIER COVER**

Remove the eight bolts, cover and gasket.

**2. REMOVE SIDE GEAR SHAFT**

Using SST, remove the side gear shaft from the differential carrier.

SST 09520-22011

**3. REMOVE SIDE GEAR SHAFT OIL SEAL**

Using SST, remove the oil seal.

SST 09308-00010

**4. CHECK RING GEAR RUNOUT**

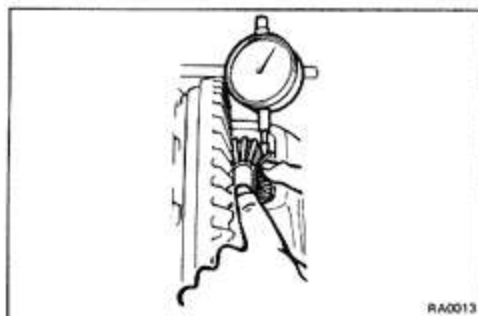
If the runout is greater than maximum, install a new ring gear.

Maximum runout: 0.07 mm (0.0028 in.)

**5. CHECK RING GEAR BACKLASH**

If the backlash is not within specification, adjust the side bearing preload or repair as necessary. (See page RA-32)

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

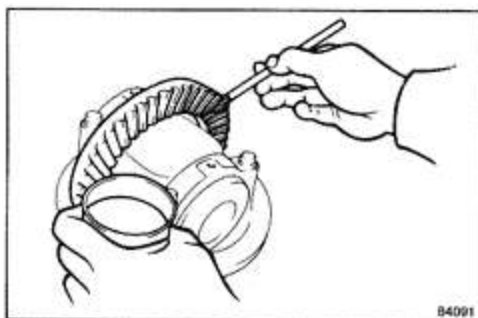


6. CHECK SIDE GEAR BACKLASH

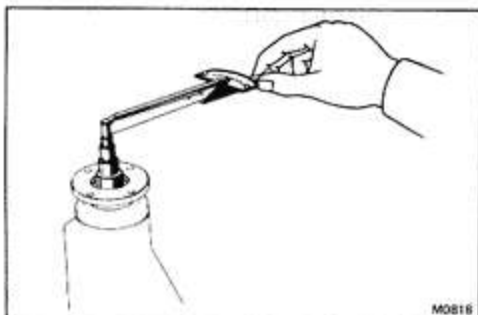
Measure the side gear backlash while holding one pinion gear toward the case.

Standard backlash: 0.05 – 0.20 mm
(0.0020 – 0.0079 in.)

If the backlash is out of specification, install the correct thrust washer. (See step 6 on page RA-27)



7. CHECK TOOTH CONTACT (See page RA-33)



8. MEASURE DRIVE PINION PRELOAD

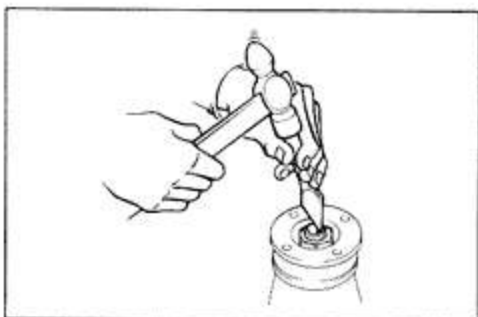
Using a torque wrench, measure the preload of the backlash between the drive pinion and ring gear.

Preload (starting): 6 – 10 kg-cm
(5.2 – 8.7 in.-lb, 0.6 – 1.0 N-m)

9. CHECK TOTAL PRELOAD

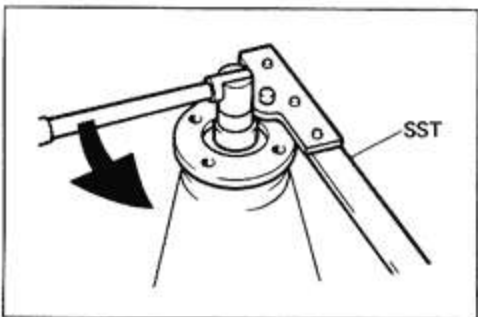
Using a torque wrench, measure the total preload.

Total preload: In addition to drive pinion preload
4 – 6 kg-cm (3.5 – 5.2 in.-lb, 0.4 – 0.6 N-m)

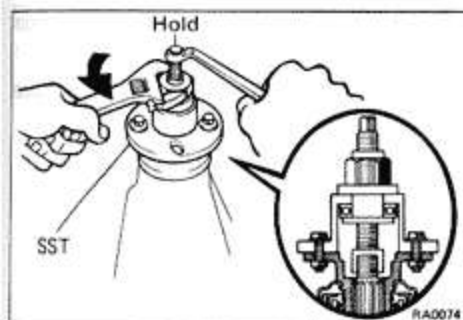


10. REMOVE COMPANION FLANGE

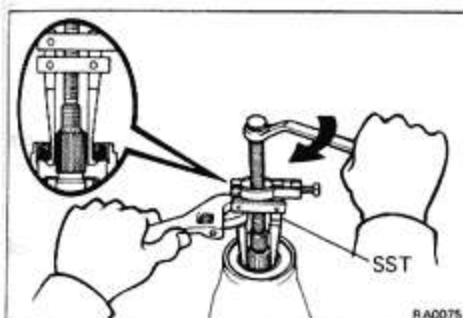
(a) Using a hammer and chisel, loosen the staked part of the nut.



(b) Using SST to hold the flange, remove the nut.
SST 09330-00021

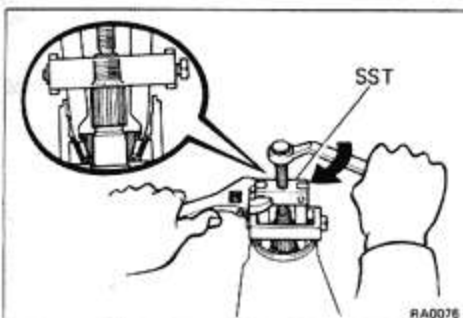


- (c) Using SST, remove the companion flange.
SST 09557-22022



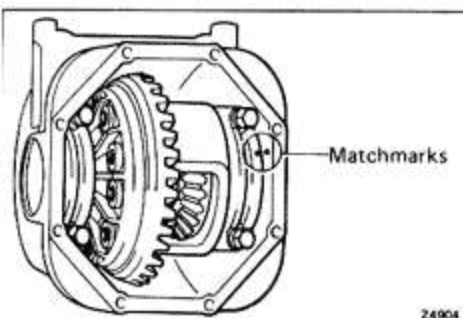
11. REMOVE OIL SEAL AND OIL SLINGER

- (a) Using SST, remove the oil seal from the housing.
SST 09308-10010
(b) Remove the oil slinger.



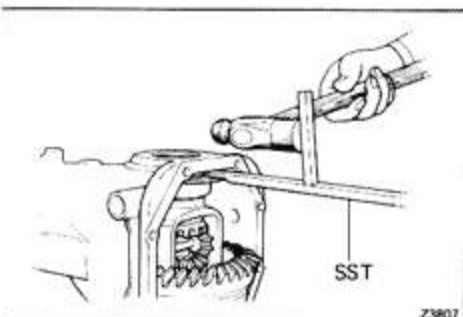
12. REMOVE FRONT BEARING AND BEARING SPACER

- (a) Using SST, remove the front bearing from the housing.
SST 09556-30010
(b) Remove the bearing spacer.
If the front bearing is damaged or worn, replace the bearing.



13. REMOVE DIFFERENTIAL CASE AND RING GEAR

- (a) Place matchmarks on the bearing cap and differential carrier.
(b) Remove the two bearing caps.



- (c) Remove the two side bearing preload adjusting plate washers with SST.
SST 09504-22010

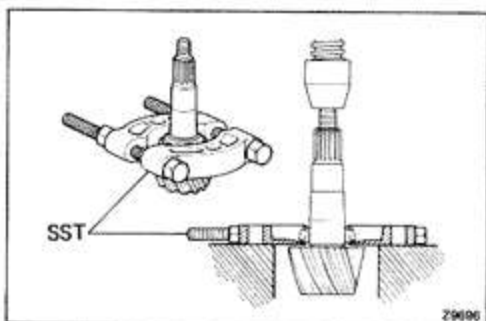
NOTE: Measure the adjusting plate washer and note the thickness.



- (d) Remove the differential case bearing outer race from the carrier.

NOTE: Tag the bearing outer races to show the location for reassembly.

14. REMOVE DRIVE PINION FROM DIFFERENTIAL CARRIER



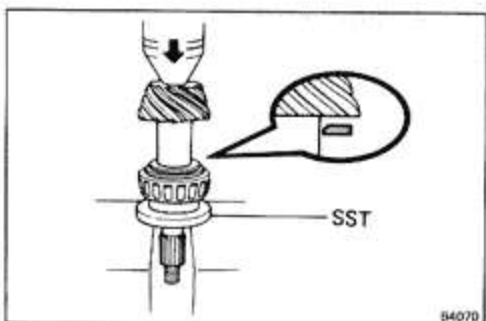
INSPECTION AND REPLACEMENT OF DIFFERENTIAL

1. REPLACE DRIVE PINION REAR BEARING

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

SST 09950-00020

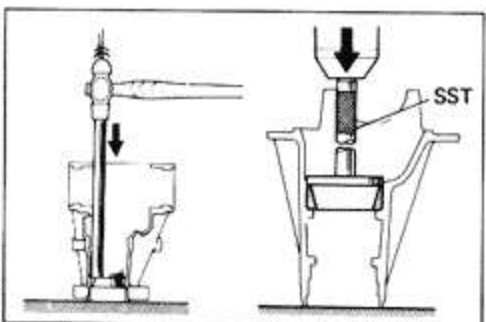
NOTE: If the drive pinion or ring gear are damaged replace them as a set.



- (b) Install the washer on the drive pinion with the chamfered end facing the pinion gear.

- (c) Using SST and a press, press the reused washer and rear bearing onto the drive pinion.

SST 09506-30011



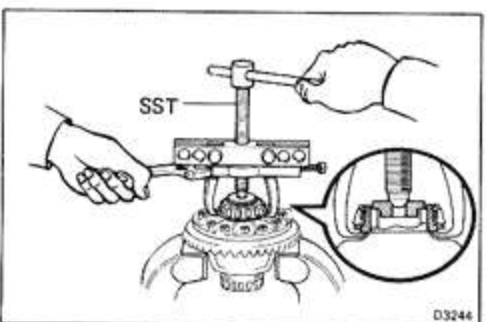
2. REPLACE DRIVE PINION FRONT AND REAR BEARING OUTER RACE

- (a) Using a hammer and brass bar, drive out the outer race.

- (b) Using SST, drive in a new outer race.

SST 09608-35014

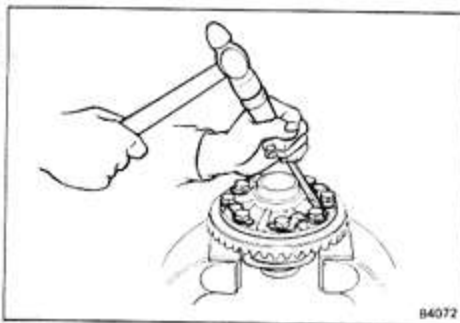
(09608-06020, 09608-06110, 09608-06120)



3. REMOVE SIDE BEARINGS FROM DIFFERENTIAL CASE

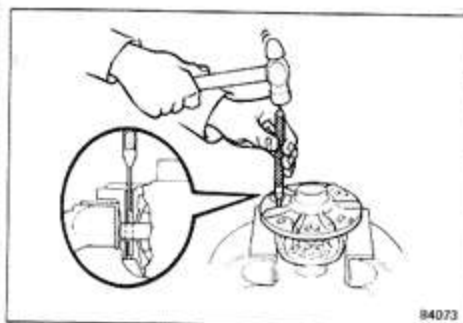
Using SST, pull the side bearing from the differential case.

SST 09950-20016



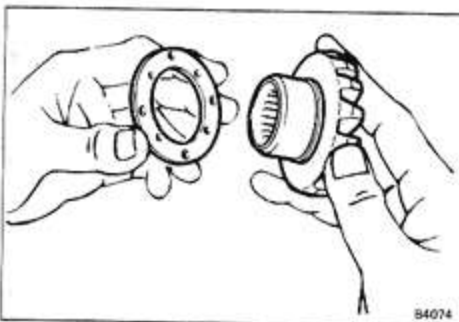
4. REMOVE RING GEAR

- Remove the ring gear set bolts and lock plates.
- Place matchmarks on the ring gear and differential case.
- Using a plastic or copper hammer, tap on the ring gear to separate it from the differential case.



5. DISASSEMBLE DIFFERENTIAL CASE

Using a hammer and punch, drive out the straight pin. Remove the pinion shaft, two pinion gears, two side gears and two thrust washers.



6. ASSEMBLE DIFFERENTIAL CASE

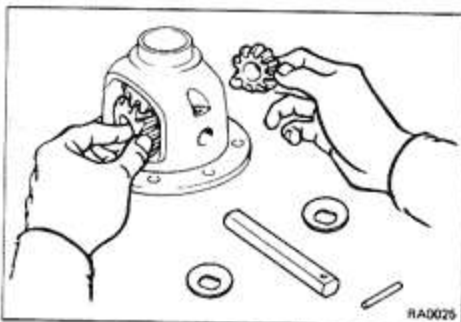
- Install correct thrust washer and side gears. Select thrust washers from the table below that will ensure the backlash is within specification. Try to select washers of the same thickness for both sides.

Standard backlash: 0.05 – 0.20 mm
(0.0020 – 0.0079 in.)

Thrust washer thickness mm (in.)

Thickness	
0.96 – 1.04	(0.0378 – 0.0409)
1.06 – 1.14	(0.0417 – 0.0449)
1.16 – 1.24	(0.0457 – 0.0488)
1.26 – 1.34	(0.0496 – 0.0528)

Install thrust washers and side gears in the differential case.

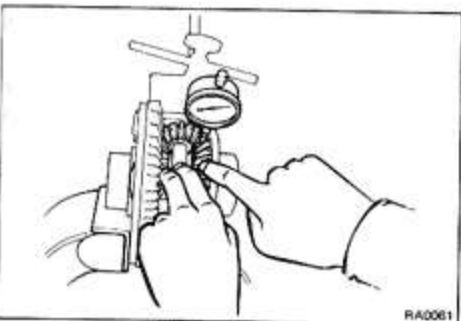


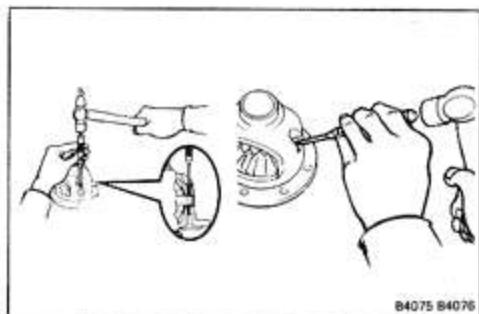
- Check the side gear backlash.

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

Standard backlash: 0.05 – 0.20 mm
(0.0020 – 0.0079 in.)

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

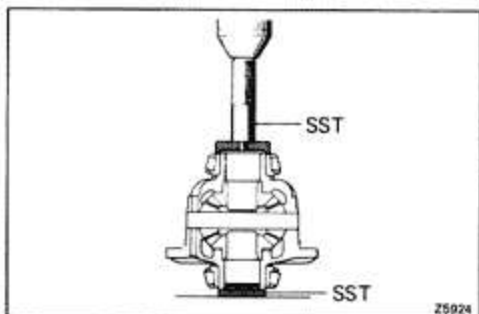




B4075 B4076

(c) Install straight pin.

- Using a hammer and punch, drive the straight pin through the case and hole in the pinion shaft.
- Stake the pin and differential case.



Z5924

7. INSTALL NEW SIDE BEARING

Using SST and a press, drive a new side bearing into the differential case.

SST 09550-10012

(09252-10010, 09557-10010, 09558-10010)

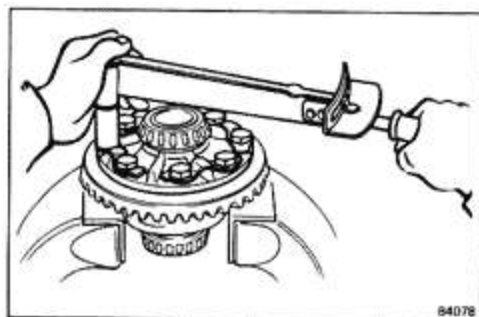
8. INSTALL RING GEAR ON DIFFERENTIAL CASE

- (a) Clean the contact surface of the differential case.
- (b) Heat the ring gear to about 100°C (212°F) in an oil bath.
- (c) Clean the contact surface of the ring gear with cleaning solvent.
- (d) Then quickly install the ring gear on the differential case.
- (e) Align the marks on the ring gear and differential case.

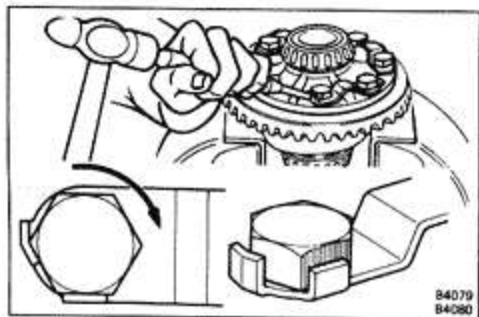
CAUTION: Do not heat the ring gear more than 110°C (230°F).

- (f) Coat the ring gear set bolts with gear oil.
- (g) Install the lock plates and set bolts. Tighten the set bolts uniformly, a little at a time. Torque the bolts.

Torque: 985 kg-cm (71 ft-lb, 97 N-m)

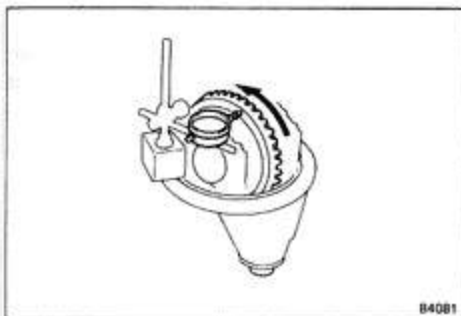


B4078

B4079
B4080

- (h) 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 only the half on the tightening side.



B4081

- (i) Check the ring gear runout.

Maximum runout: 0.07 mm (0.0028 in.)

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

ASSEMBLY OF DIFFERENTIAL

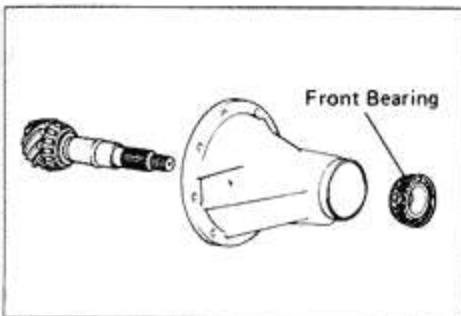
(See page RA-22)

1. TEMPORARILY ADJUST DRIVE PINION PRELOAD

- (a) Install the following parts.

- Drive pinion
- Front bearing

NOTE: Assemble the spacer, oil slinger and oil seal after adjusting the gear contact pattern.

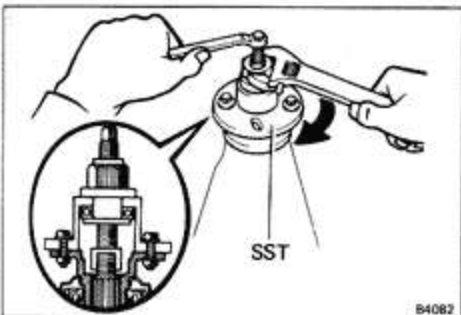


Front Bearing

- (b) Install the companion flange with SST.

Coat the threads of the nut with MP grease.

SST 09557-22022



SST

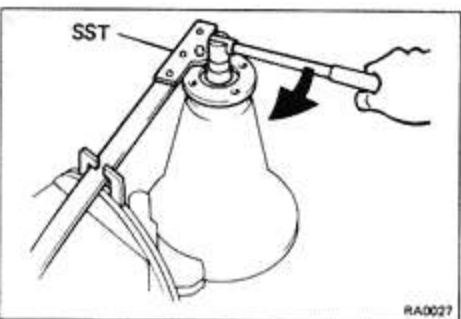
B4082

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

Using SST to hold the flange, tighten the nut.

SST 09330-00021

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



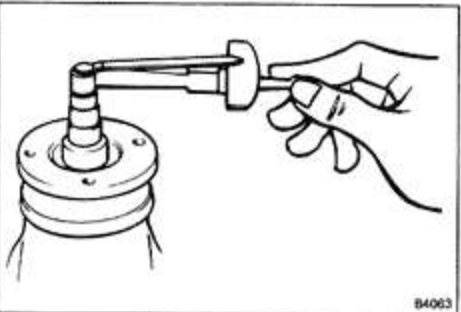
SST

RA0027

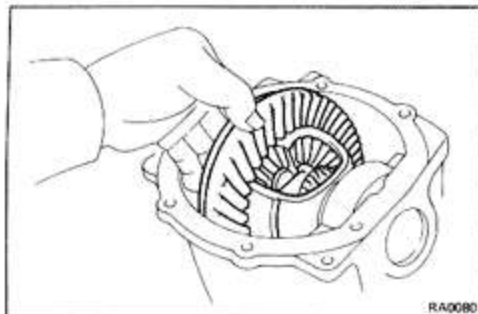
- (d) Using a torque wrench, measure the preload.

Preload:

New bearing	12 – 19 kg-cm (10.4 – 16.5 in.-lb, 1.2 – 1.9 N-m)
Reused bearing	6 – 10 kg-cm (5.2 – 8.7 in.-lb, 0.6 – 1.0 N-m)

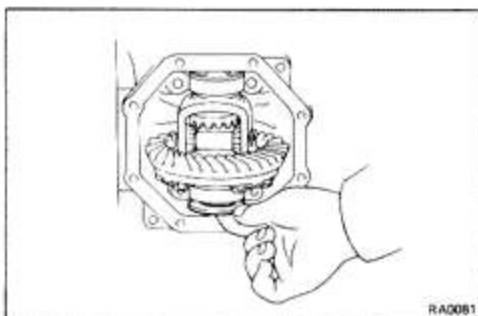


B4083



2. INSTALL DIFFERENTIAL CASE IN CARRIER

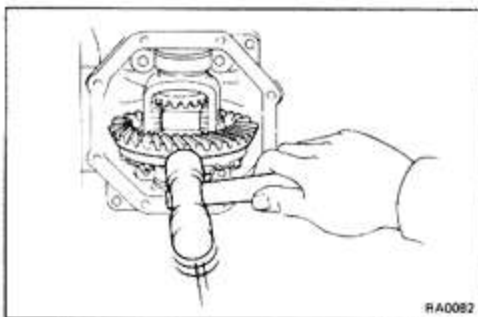
- Place the bearing outer races on their respective bearings. Make sure the left and right outer races are not interchanged.
- Install the differential case in the carrier.



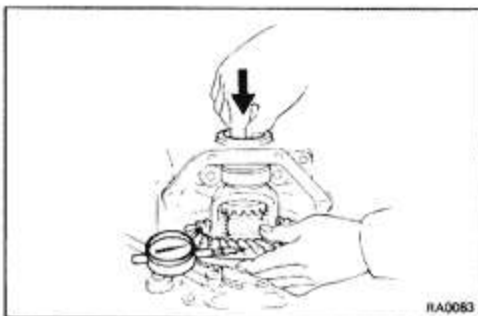
3. ADJUST RING GEAR BACKLASH

- Install only the plate washer on the ring gear back side.

NOTE: Insure that the ring gear has a backlash.

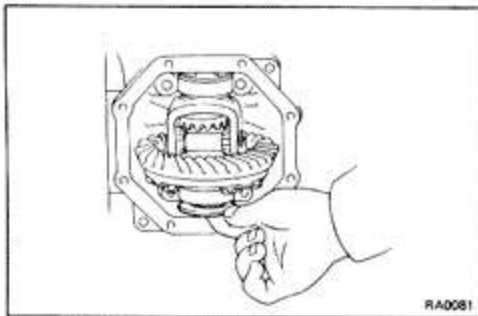


- Snug down the washer and bearing by tapping on the ring gear with a plastic hammer.



- Hold the side bearing boss on the teeth surface of the ring gear and measure the backlash.

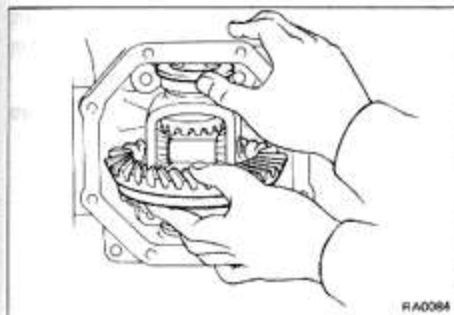
Backlash (reference): 0.10 mm (0.0039 in.)



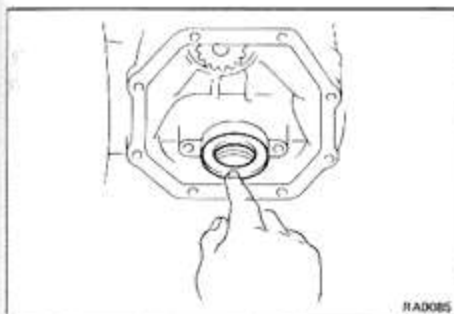
- Select a ring gear back plate washer using the backlash as reference. (See page RA-32)

Note:

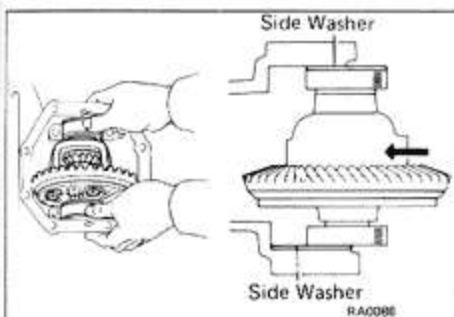
(You gain about .027" of backlash for every 1mm of added shim.)
Measure first before buying shims.



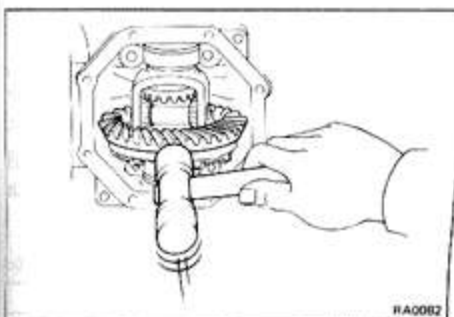
- (e) Select a ring gear teeth side washer of a thickness which eliminates any clearance between the outer race and case.



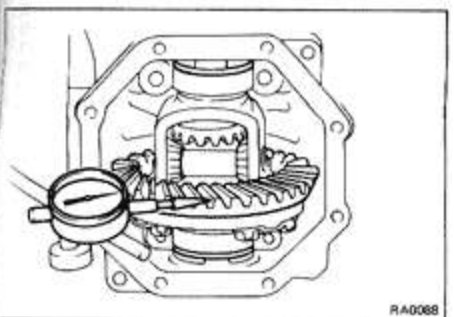
- (f) Remove the plate washers and differential case.
(g) Install the plate washer into the lower part of the carrier.



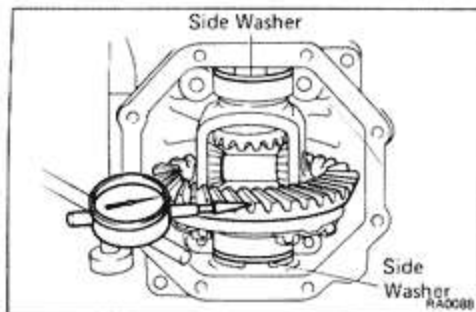
- (h) Place the other plate washer onto the differential case together with the outer race, and install the differential case with the outer race into the carrier.



- (i) Using a plastic hammer, snug down the washer and bearing by tapping the ring gear.



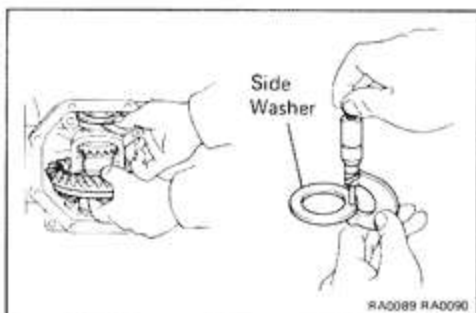
- (j) Using a dial indicator, measure the ring gear backlash.
Backlash: 0.13 – 0.18 mm (0.0051 – 0.0071 in.)



- (k) If not within specification, adjust by either increasing or decreasing the number of washers on both sides by an equal amount.

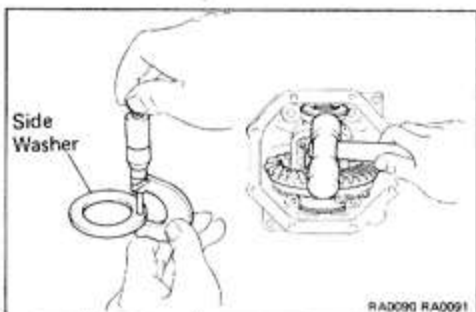
NOTE: There should be no clearance between the plate washer and case.
Insure that there is ring gear backlash.

(You gain about .027" of backlash for every 1mm of added shim.)



4. ADJUST SIDE BEARING PRELOAD

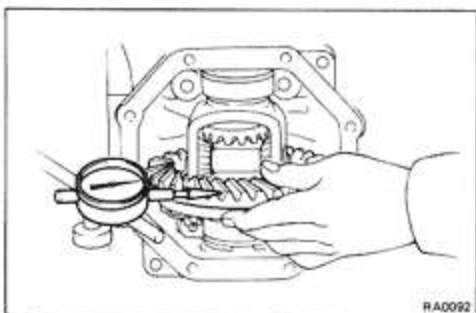
- (a) After adjustment with the backlash as reference, remove the ring gear teeth plate washer and measure the thickness.



- (b) Install a new washer of 0.06 – 0.09 mm (0.0024 – 0.0035 in.) thicker than the washer removed.

NOTE: Select a washer which can be pressed in 2/3 of the way by finger.

- (c) Using a plastic hammer, tap in the side washer.

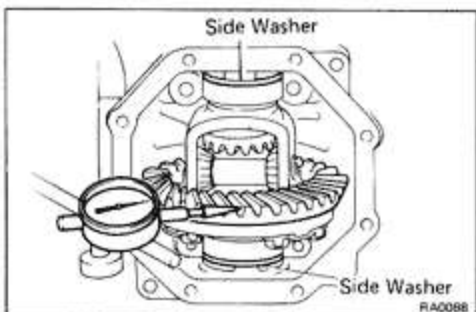


- (d) Recheck the ring gear backlash.

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

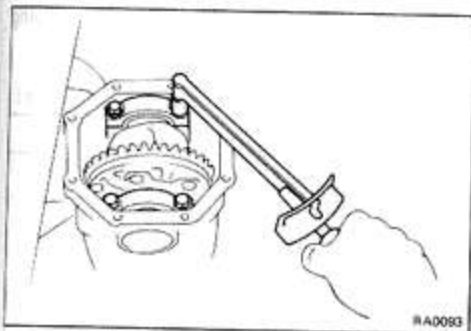
- (e) If not within standard, adjust by either increasing or decreasing the washers on both sides by equal amount.

NOTE: The backlash will change about 0.02 mm (0.0008 in.) with 0.03 mm (0.0012 in.) alteration of the side washer.



Washer thickness mm (in.)

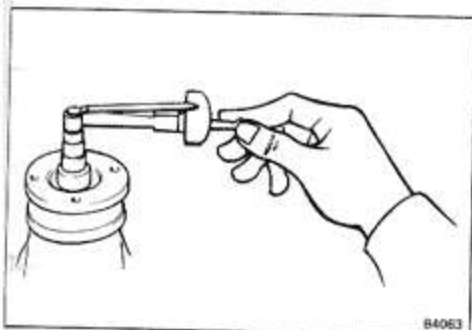
Thickness	Thickness
2.57 – 2.59 (0.1012 – 0.1020)	2.93 – 2.95 (0.1154 – 0.1161)
2.60 – 2.62 (0.1024 – 0.1031)	2.96 – 2.98 (0.1165 – 0.1173)
2.63 – 2.65 (0.1035 – 0.1043)	2.99 – 3.01 (0.1177 – 0.1185)
2.66 – 2.68 (0.1047 – 0.1055)	3.02 – 3.04 (0.1189 – 0.1197)
2.69 – 2.71 (0.1059 – 0.1067)	3.05 – 3.07 (0.1201 – 0.1209)
2.72 – 2.74 (0.1071 – 0.1079)	3.08 – 3.10 (0.1213 – 0.1220)
2.75 – 2.77 (0.1083 – 0.1091)	3.11 – 3.13 (0.1224 – 0.1232)
2.78 – 2.80 (0.1094 – 0.1102)	3.14 – 3.16 (0.1236 – 0.1244)
2.81 – 2.83 (0.1106 – 0.1114)	3.17 – 3.19 (0.1248 – 0.1256)
2.84 – 2.86 (0.1118 – 0.1126)	3.20 – 3.22 (0.1260 – 0.1268)
2.87 – 2.89 (0.1130 – 0.1138)	3.23 – 3.25 (0.1272 – 0.1280)
2.90 – 2.92 (0.1142 – 0.1150)	



5. INSTALL SIDE BEARING CAPS

Align the marks on the cap and carrier.

Torque: 800 kg-cm (58 ft-lb, 78 N-m)

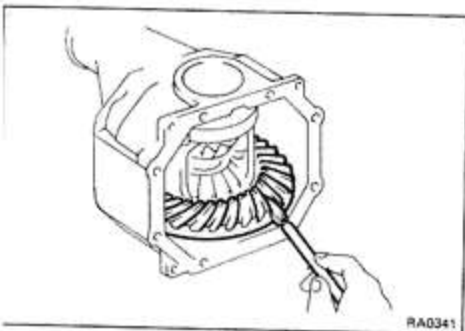


6. MEASURE TOTAL PRELOAD

Using a torque wrench, measure the total preload.

Total preload: In addition to drive pinion preload
4 – 6 kg-cm (3.5 – 5.2 in.-lb, 0.4 – 0.6 N-m)

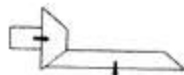
Pinion gear pattern check below not needed if only diff carrier is changed, and pinion is left alone. Check needed if pinion bearing has also been changed, or if gear is changed.



7. INSPECT TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION

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

Heel Contact

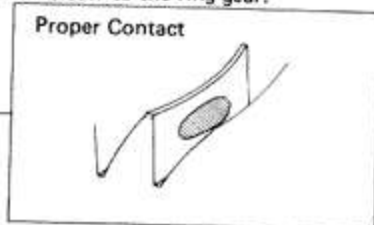


Face Contact



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

Proper Contact



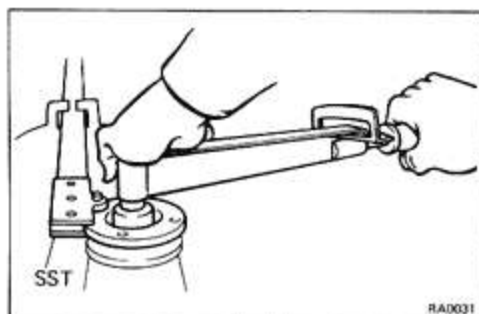
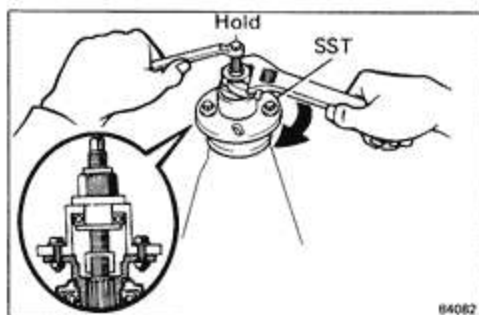
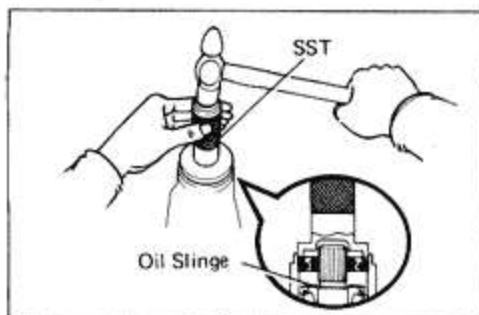
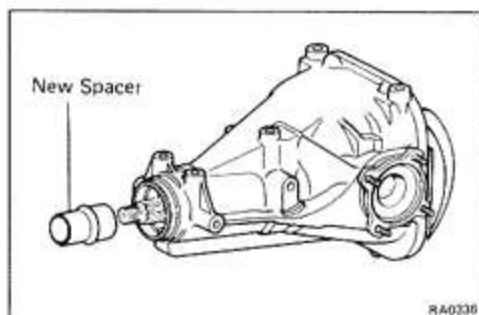
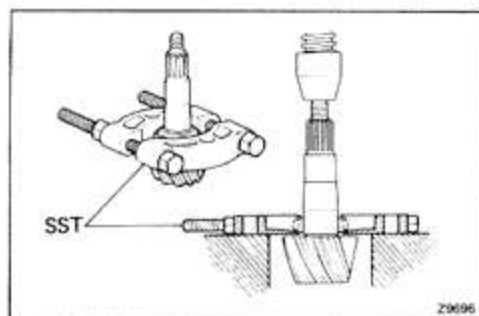
Toe Contact



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	
2.24 (0.0882)	2.51 (0.0988)	
2.27 (0.0894)	2.54 (0.1000)	
2.30 (0.0906)	2.57 (0.1012)	
2.33 (0.0917)	2.60 (0.1024)	
2.36 (0.0929)	2.63 (0.1035)	
2.39 (0.0941)	2.66 (0.1047)	
2.42 (0.0953)	2.69 (0.1059)	
2.45 (0.0965)	2.72 (0.1071)	
2.48 (0.0976)		

8. REMOVE COMPANION FLANGE (See step 10 on page RA-24)

9. REMOVE FRONT BEARING AND BEARING SPACER (See step 12 on page RA-25)

10. INSTALL NEW BEARING SPACER AND FRONT BEARING

- Install a new bearing spacer on the shaft.
- Install the front bearing on the shaft.

11. INSTALL OIL SLINGER AND NEW OIL SEAL

- Install the oil slinger facing as shown.
- Using SST, drive in a new oil seal.

SST 09316-60010

Oil seal drive in depth: 1.5 mm (0.059 in.)

- Apply MP grease to the oil seal lip.

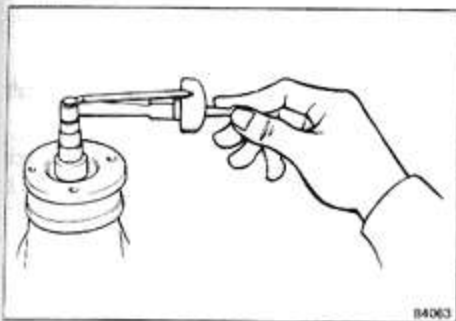
12. INSTALL COMPANION FLANGE

- Using SST, install the companion flange on the shaft.
SST 09557-22022

- Coat the threads of a new nut with MP grease.

- Using SST to hold the flange, tighten the nut.
SST 09330-00021

Torque: 1,100 kg-cm (80 ft-lb, 108 N·m)



13. CHECK FRONT BEARING PRELOAD

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

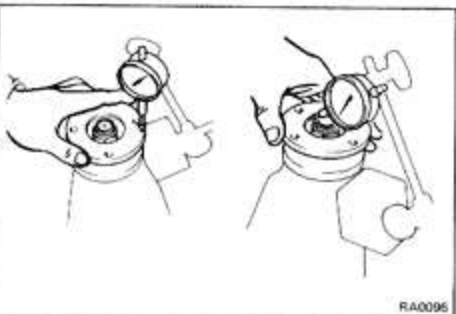
Preload:

New bearing	12 – 19 kg-cm (10.4 – 16.5 in.-lb, 1.2 – 1.9 N-m)
Reused bearing	6 – 10 kg-cm (5.2 – 8.7 in.-lb, 0.6 – 1.0 N-m)

- If preload is greater than specification, replace the bearing spacer.
- If the preload is less than specification, retighten the nut 130 kg-cm (9 ft-lb, 13 N-m) at a time until the specified preload is reached.

If the maximum torque is exceeded while retightening the nut, replace the bearing spacer and repeat the preload procedure. Do not back off the pinion nut to reduce the preload.

Maximum torque: 2,400 kg-cm (174 ft-lb, 235 N-m)



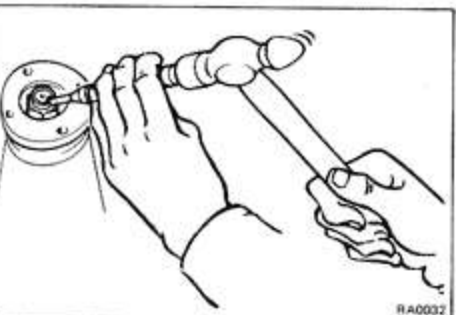
14. CHECK RUNOUT OF COMPANION FLANGE

Using a dial indicator, measure the lateral and radial runout of the companion flange.

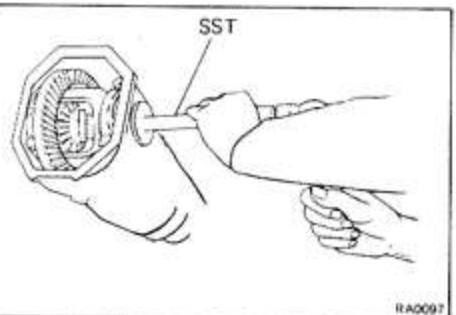
If the runout is greater than the maximum, inspect the bearings.

Maximum lateral runout: 0.10 mm (0.0039 in.)

Maximum radial runout: 0.10 mm (0.0039 in.)



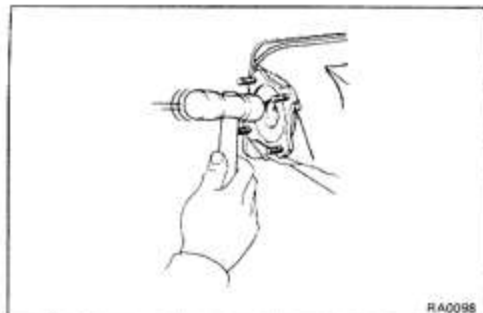
15. STAKE DRIVE PINION NUT



16. INSTALL SIDE GEAR SHAFT OIL SEAL

- Coat the oil seal lip with MP grease No. 2.
- Using SST, drive in the oil seal until it is flush with the carrier end surface.

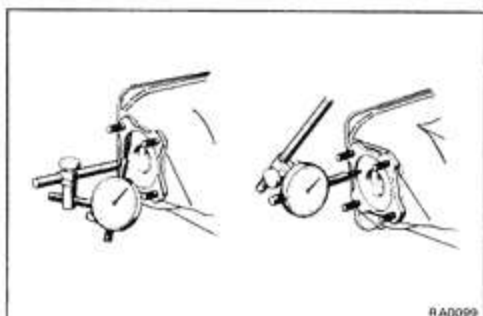
SST 09550-22011 (09550-00020 and 09550-00030)



17. INSTALL SIDE GEAR SHAFT

- Before installing the shaft, replace the snap ring.
- Using a plastic hammer, drive in the side gear shaft until it contacts the pinion shaft.

NOTE: As the LSD cannot be checked visually, check that the shaft is fully inserted by confirming the sound it makes when it is tapped.

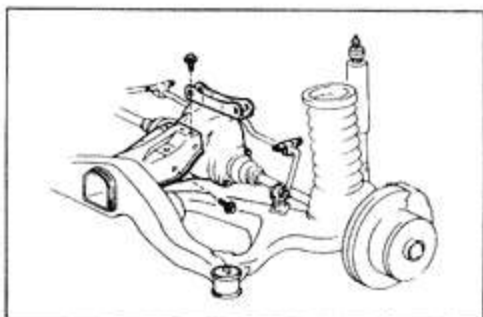


18. MEASURE SIDE GEAR SHAFT RUNOUT

Maximum runout: 0.20 mm (0.0079 in.)

If the runout is greater than the maximum, replace the side gear shaft.

19. INSTALL DIFFERENTIAL CARRIER COVER



INSTALLATION OF DIFFERENTIAL

(See page RA-20)

1. INSTALL DIFFERENTIAL

Support the differential with a jack and install the carrier bolt.

Torque: 850 kg-cm (61 ft-lb, 83 N·m)

2. INSTALL DIFFERENTIAL SUPPORT MEMBER MOUNTING BOLT NO. 1 (See page RA-55)

Torque: 850 kg-cm (61 ft-lb, 83 N·m)

Lower the differential and remove the jack.

3. CONNECT PROPELLER SHAFT FLANGE FROM COMPANION FLANGE

4. CONNECT DRIVE SHAFT

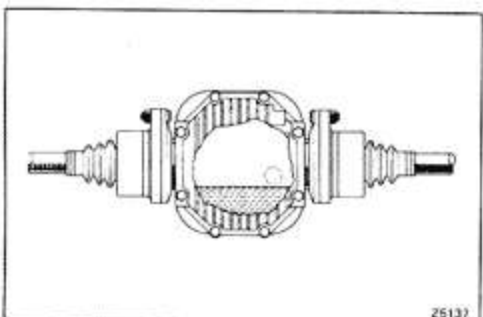
Torque: 700 kg-cm (51 ft-lb, 69 N·m)

5. INSTALL DRAIN PLUG AND FILL DIFFERENTIAL WITH GEAR OIL

Hypoid gear oil: w/LSD use LSD oil only
 SAE 90 above – 18°C (0°F)
 SAE 80W or 80W – 90
 at temperature below – 18°C (0°F)

Capacity: 1.2 liters (1.3 US qts, 1.1 Imp. qts)

Install a filler plug.



No	PNC# (SUB)	Q' ty	Part Number	Q' ty	ProdDate	Part Name	Models(Description)
92			90201-65007-	02	8208-8512	WASHER, PLATE (FOR REAR DIFFERENTIAL SIDE GEAR SHAFT)	AA63,RA61,63,65*,MA61*..EUR T=2.57-2.59
93			90201-65008-	02	8208-8512	WASHER, PLATE (FOR REAR DIFFERENTIAL SIDE GEAR SHAFT)	AA63,RA61,63,65*,MA61*..EUR T=2.60-2.62
94			90201-65009-	02	8208-8512	WASHER, PLATE (FOR REAR DIFFERENTIAL SIDE GEAR SHAFT)	AA63,RA61,63,65*,MA61*..EUR T=2.63-2.65
95			90201-65010-	02	8208-8512	WASHER, PLATE (FOR REAR DIFFERENTIAL SIDE GEAR SHAFT)	AA63,RA61,63,65*,MA61*..EUR T=2.66-2.68
96			90201-65011-	02	8208-8512	WASHER, PLATE (FOR REAR DIFFERENTIAL SIDE GEAR SHAFT)	AA63,RA61,63,65*,MA61*..EUR T=2.69-2.71

No	PNC# (SUB)	Q' ty	Part Number	Q' ty	ProdDate	Part Name	Models(Description)
97			90201-65012-	02	8208-8512	WASHER, PLATE (FOR REAR DIFFERENTIAL SIDE GEAR SHAFT)	AA63,RA61,63,65*,MA61*..EUR T=2.72-2.74
98			90201-65013-	02	8208-8512	WASHER, PLATE (FOR REAR DIFFERENTIAL SIDE GEAR SHAFT)	AA63,RA61,63,65*,MA61*..EUR T=2.75-2.77
99			90201-65014-	02	8208-8512	WASHER, PLATE (FOR REAR DIFFERENTIAL SIDE GEAR SHAFT)	AA63,RA61,63,65*,MA61*..EUR T=2.78-2.80
00			90201-65015-	02	8208-8512	WASHER, PLATE (FOR REAR DIFFERENTIAL SIDE GEAR SHAFT)	AA63,RA61,63,65*,MA61*..EUR T=2.81-2.83
01			90201-65016-	02	8208-8512	WASHER, PLATE (FOR REAR DIFFERENTIAL SIDE GEAR SHAFT)	AA63,RA61,63,65*,MA61*..EUR T=2.84-2.86
02			90201-65017-	02	8208-8512	WASHER, PLATE (FOR REAR DIFFERENTIAL SIDE GEAR SHAFT)	AA63,RA61,63,65*,MA61*..EUR T=2.87-2.89

No	PNC# (SUB)	Q' ty	Part Number	Q' ty	ProdDate	Part Name	Models(Description)
03			90201-65018-	02	8208-8512	WASHER, PLATE (FOR REAR DIFFERENTIAL SIDE GEAR SHAFT)	AA63,RA61,63,65*,MA61*..EUR T=2.90-2.92
04			90201-65019-	02	8208-8512	WASHER, PLATE (FOR REAR DIFFERENTIAL SIDE GEAR SHAFT)	AA63,RA61,63,65*,MA61*..EUR T=2.93-2.95
05			90201-65020-	02	8208-8512	WASHER, PLATE (FOR REAR DIFFERENTIAL SIDE GEAR SHAFT)	AA63,RA61,63,65*,MA61*..EUR T=2.96-2.98
06			90201-65021-	02	8208-8512	WASHER, PLATE (FOR REAR DIFFERENTIAL SIDE GEAR SHAFT)	AA63,RA61,63,65*,MA61*..EUR T=2.99-3.01
07			90201-65022-	02	8208-8512	WASHER, PLATE (FOR REAR DIFFERENTIAL SIDE GEAR SHAFT)	AA63,RA61,63,65*,MA61*..EUR T=3.02-3.04
08			90201-65023-	02	8208-8512	WASHER, PLATE (FOR REAR DIFFERENTIAL SIDE GEAR SHAFT)	AA63,RA61,63,65*,MA61*..EUR T=3.05-3.07

No	PNC# (SUB)	Q' ty	Part Number	Q' ty	ProdDate	Part Name	Models(Description)
09			90201-65024-	02	8208-8512	WASHER, PLATE (FOR REAR DIFFERENTIAL SIDE GEAR SHAFT)	AA63,RA61,63,65*,MA61*..EUR T=3.08-3.10
10			90201-65025-	02	8208-8512	WASHER, PLATE (FOR REAR DIFFERENTIAL SIDE GEAR SHAFT)	AA63,RA61,63,65*,MA61*..EUR T=3.11-3.13
11			90201-65026-	02	8208-8512	WASHER, PLATE (FOR REAR DIFFERENTIAL SIDE GEAR SHAFT)	AA63,RA61,63,65*,MA61*..EUR T=3.14-3.16
12			90201-65027-	02	8208-8512	WASHER, PLATE (FOR REAR DIFFERENTIAL SIDE GEAR SHAFT)	AA63,RA61,63,65*,MA61*..EUR T=3.17-3.19
13			90201-65028-	02	8208-8512	WASHER, PLATE (FOR REAR DIFFERENTIAL SIDE GEAR SHAFT)	AA63,RA61,63,65*,MA61*..EUR T=3.20-3.22
14			90201-65029-	02	8208-8512	WASHER, PLATE (FOR REAR DIFFERENTIAL SIDE GEAR SHAFT)	AA63,RA61,63,65*,MA61*..EUR T=3.23-3.25