# REAR AXLE AND SUSPENSION

# TROUBLESHOOTING

| Problem | Possible cause | Remedy | P |
|---|---|---|---|
| Oil leak at rear axle | Oil seals worn or damaged | Replace oil seal | RA |
| | Bearing retainer loose | Replace retainer | |
| | Rear axle housing cracked | Repair as necessary | |
| Oil leak at pinion shaft | Oil level too high or wrong grade | Drain and replace oil | |
| | Oil seal worn or damaged | Replace oil seal | RA |
| | Companion flange loose or damaged | Tighten or replace flange | RA |
| Oil leak at side gear shaft | Oil level too high or wrong grade | Drain and replace oil | |
| | Oil seal worn or damaged | Replace oil seal | RA |
| | Side gear shaft loose or damaged | Tighten or replace shaft | RA |
| Noises in rear axle | Oil level low or wrong grade | Drain and replace oil | |
| | Excessive backlash between pinion and ring or side gear | Check backlash | RA |
| | Ring, pinion or side gears worn or chipped | Inspect gears | RA |
| | Pinion shaft bearing worn | Replace bearing | RA |
| | Axle shaft bearing worn | Replace bearing | RA |
| | Differential bearing loose or worn | Tighten or replace bearings | RA |
| Bottoming | Vehicle overloaded | Check loading | |
| | Shock absorber worn out | Replace shock absorber | RA |
| | Springs weak | Replace spring | RA |

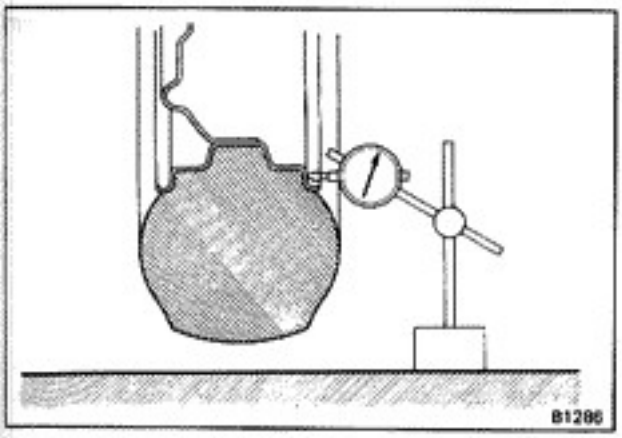
# REAR WHEEL ALIGNMENT

## 1. MAKE FOLLOWING CHECKS AND CORRECT ANY PROBLEMS

(a) Check the tires for wear and proper inflation.

Cold tire inflation pressure: kg/cm² (psi, kPa

| Tire | Front | Rear |
|---|---|---|
| 225/60 HR 14 | 1.9 (27,186) | 1.9 (27,186) |



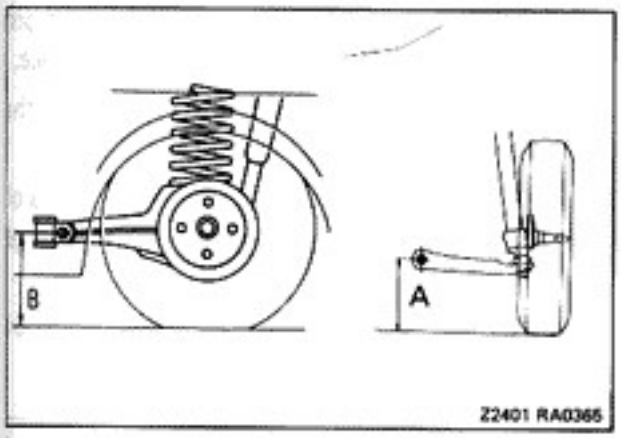

(b) Check the rear wheel bearings for looseness.

(c) Check wheel runout.

**Lateral runout: Less than 1.0 mm (0.039 in.)**

(d) Check the rear suspension for looseness.

(e) Check that the rear absorbers work properly by the standard bounce test.

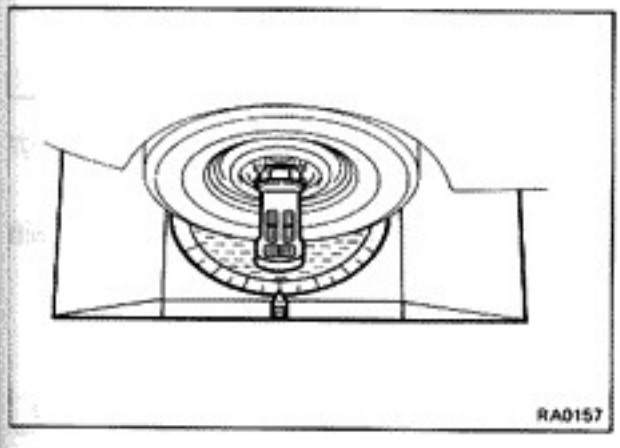



## 2. MEASURE VEHICLE HEIGHT

Vehicle height mm (in.)

| Tire | Front (A) | Rear (B) |
|---|---|---|
| 225/60 HR 14 | 223.0 (8.780) | 263.0 (10.354) |

If height of the vehicle is not as specified, try to level the vehicle by shaking it down. If the height of the vehicle is still not correct, check for bad springs and worn or loose suspension parts.



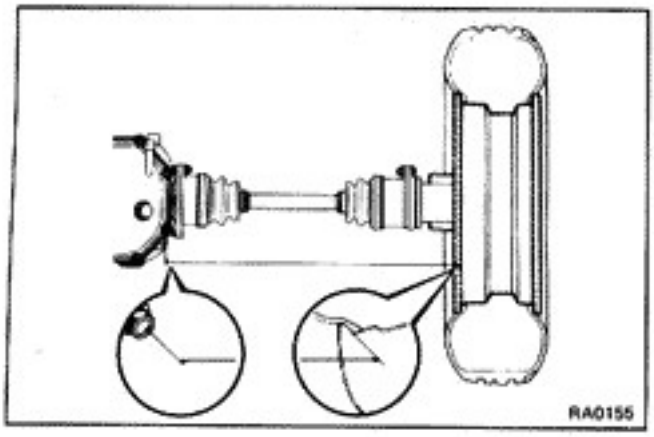

## 3. INSTALL WHEEL ALIGNMENT EQUIPMENT

Follow the specific instructions of the equipment manufacturer.

## 4. INSPECT CAMBER

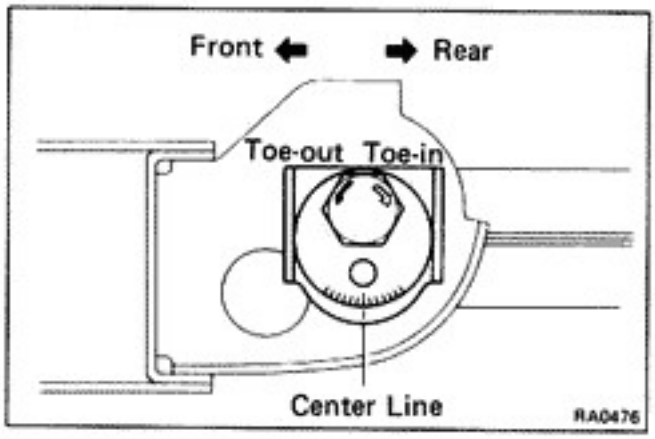
Inspect the camber with a wheel alignment tester.

**Inspection standard: −10′ ± 45′**

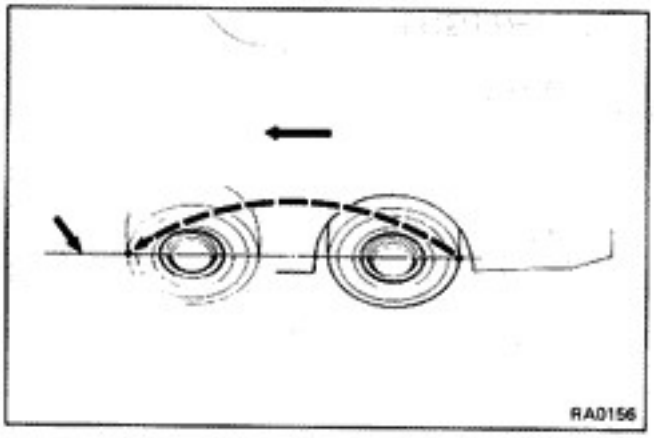



## 5. ADJUST TOE-IN

(a) Measure the distance between each disc whee the differential carrier cover bolt of the suspe member and confirm that both are the same.




(b) If the distances are not the same but within 5 (0.20 in.), adjust with the toe-in adjusting bolt.




(c) Move the vehicle forward a few meters with the wheels in the straight-ahead position on a level pl

(d) Mark on each center of rear tread and measur distance between marks of the right and left tires

(e) Advance the vehicle till the marks on the rear sid the tires come to the measuring heights of the g on the front sides.

NOTE: Toe-in should be measured at the same poi the tire and at the same level.

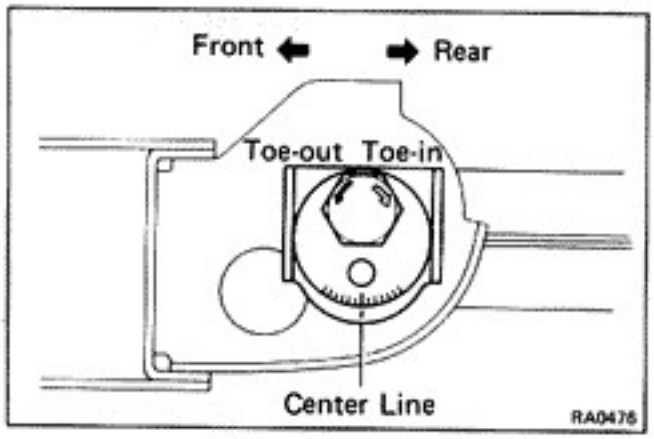
| | Inspection standard | Adjustment standa |
|---|---|---|
| Toe-in | 0 ± 2 mm (0 ± 0.08 in.) | 0 ± 1 mm (0 ± 0.04 in.) |

(f) If not within specification, turn the left and adjusting bolts an equal amount to adjust.

NOTE: The toe-in will change about 1 mm (0.04 in.) each graduation of the cam (one side).

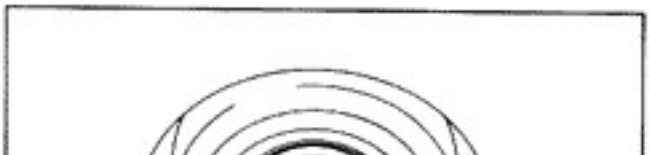
(g) Tighten the bolts after adjustment the toe-in.

**Torque: 1,325 kg-cm (96 ft-lb, 130 N·m)**



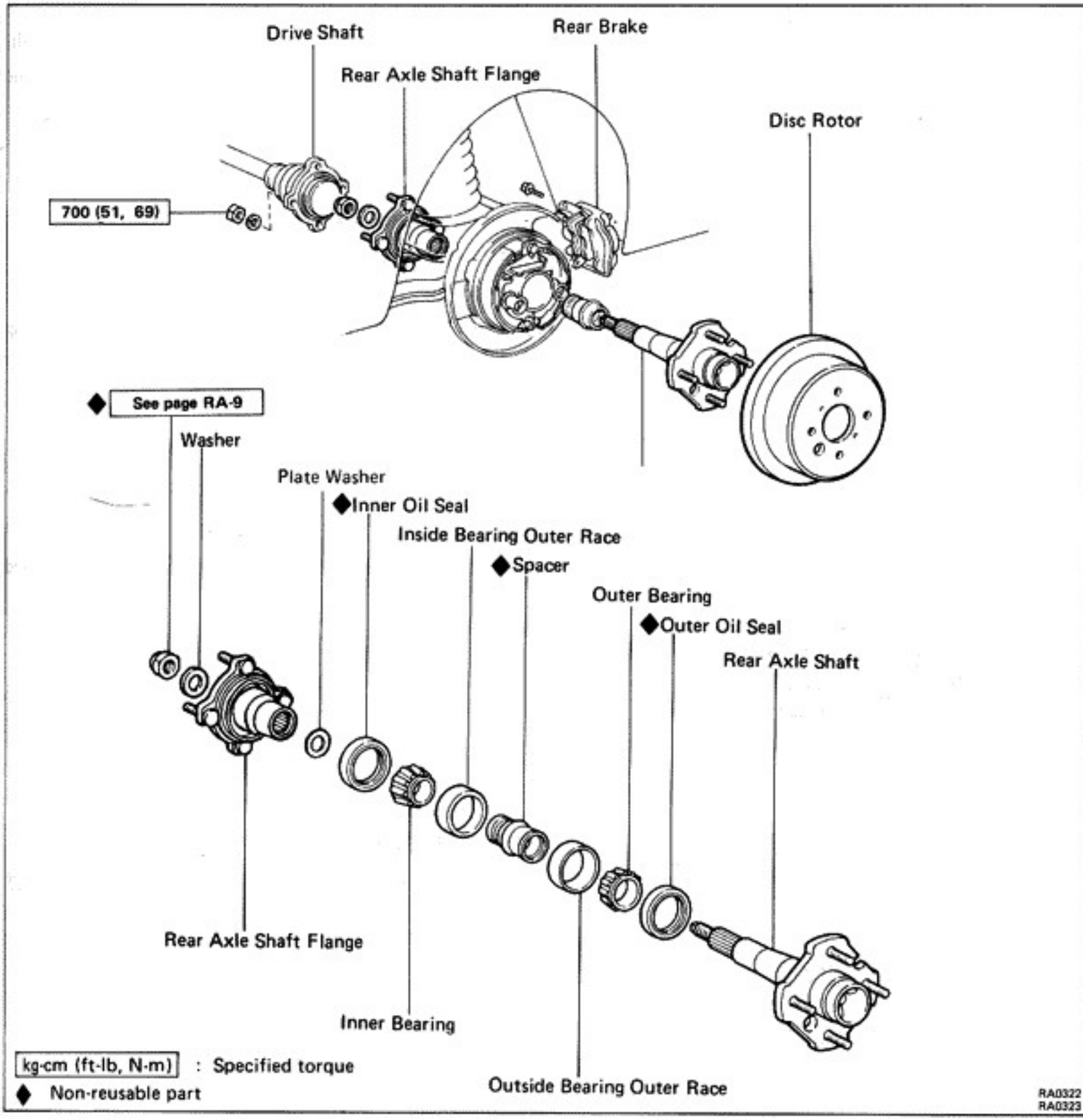

## 6. INSPECT SIDE SLIP WITH SIDE SLIP TESTER

**Side slip limit: Less than 3.0 mm per meter (0.118 in. per 3.3 ft)**



# IRS TYPE REAR AXLE SHAFT

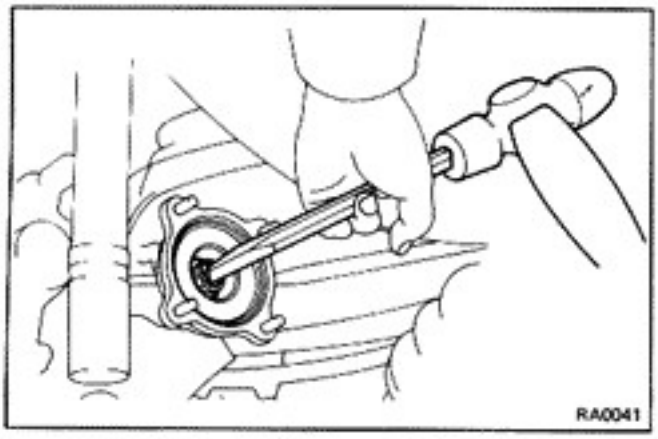
## COMPONENTS




RA0322
RA0323

## REMOVAL OF REAR AXLE SHAFT

1. REMOVE REAR WHEEL
2. DISCONNECT DRIVE SHAFT




**4. REMOVE AXLE FLANGE NUT**

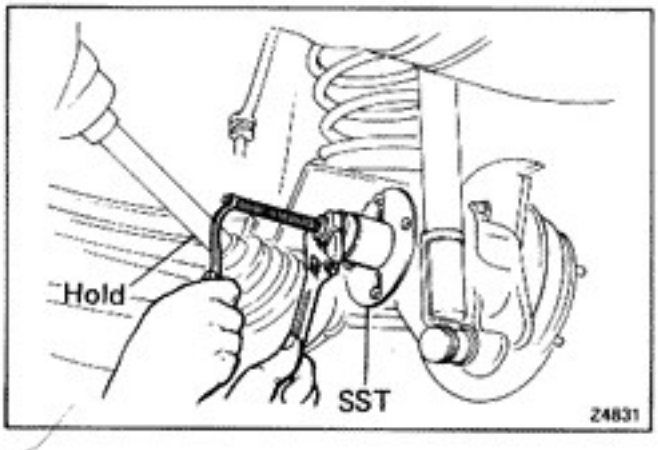
(a) Using a hammer and chisel, loosen the staked pa
the nut.

(b) Remove the nut and washer.

NOTE: Be sure to remove the washer from the axle s

If not, the axle flange cannot be removed with SST i
next step.

SST 09557-22022

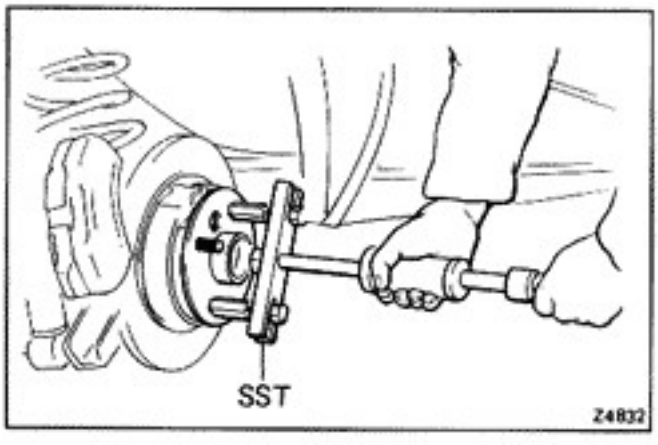



**5. REMOVE AXLE FLANGE**

Using SST, disconnect the axle flange and the washer.

SST 09557-22022

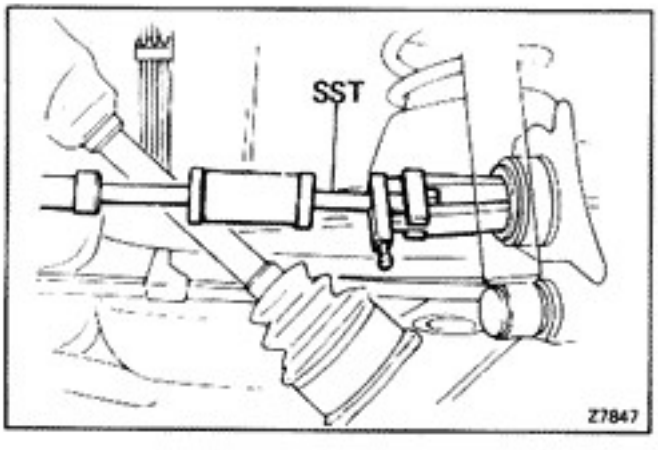
NOTE: Be careful not to lose the plate washer on th
of the flange bearing side.




**6. REMOVE REAR AXLE SHAFT AND SPACER**

Using SST, pull out the rear axle shaft with the oil sea
outer bearing.

SST 09520-00031

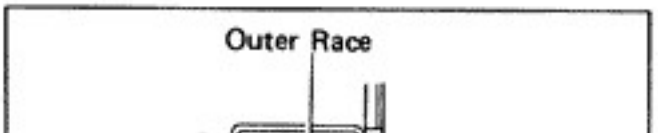



**7. REMOVE INNER OIL SEAL AND BEARING**

(a) Using SST, pull out the inner oil seal from rear
housing.

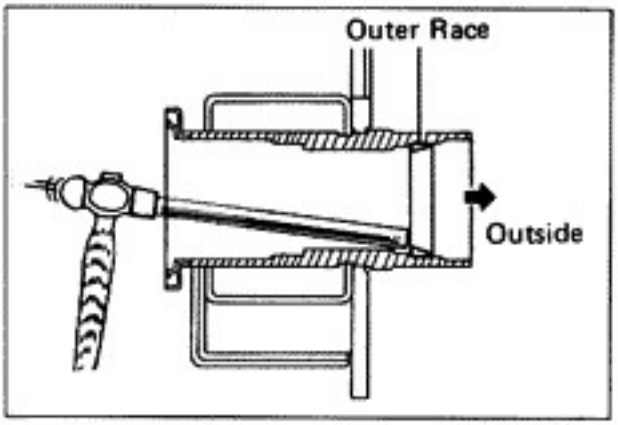
SST 09308-00010

(b) Remove the inner bearing.



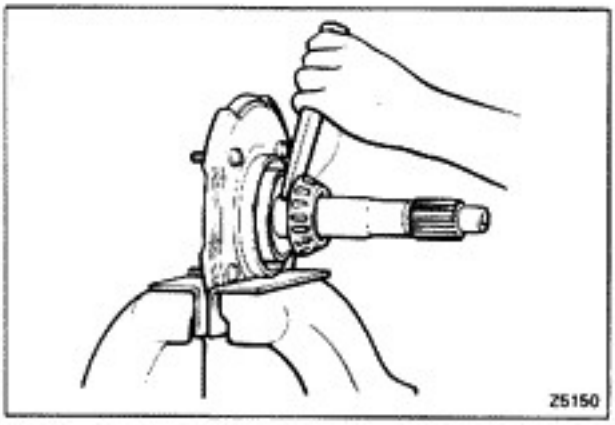

**8. REMOVE INSIDE BEARING OUTER RACE**

(a) Using a brass bar, remove the bearing outer race
the rear axle housing.




**9. REMOVE OUTSIDE BEARING OUTER RACE**

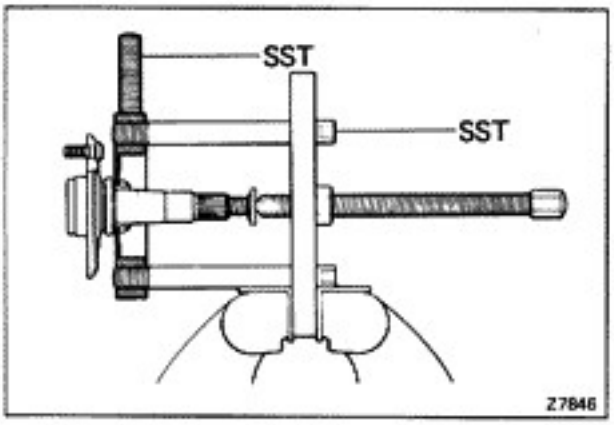
Using a brass bar, remove the axle shaft outer bearing race from the axle housing.




**10. REMOVE OUTSIDE BEARING AND OIL SEAL**

(a) Using a chisel, open a clearance between the hub and bearing.

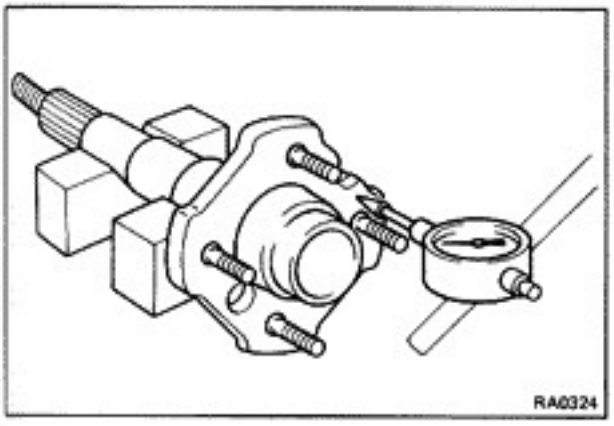
**CAUTION: Be careful not to damage the bearing or shaft.**




(b) Using SST, remove the outer bearing from the rear axle shaft.

SST 09950-00020 and 09950-00030

(c) Remove the oil seal from axle shaft.




## INSPECTION AND REPLACEMENT OF REAR AXLE SHAFT COMPONENTS

**1. INSPECT REAR AXLE SHAFT AND FLANGE FOR WEAR, DAMAGE OR RUNOUT**

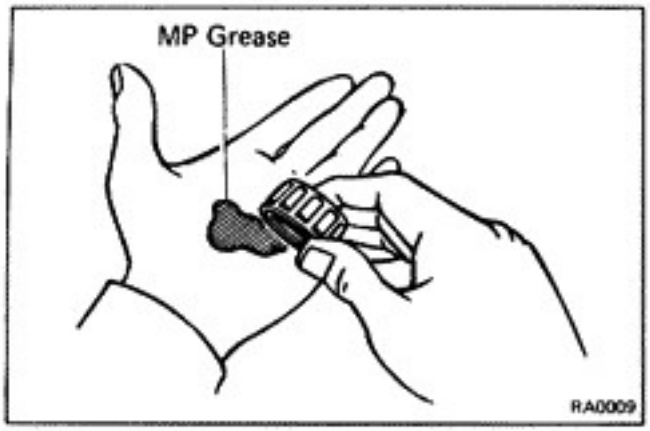
**Maximum flange runout: 0.1 mm (0.004 in.)**

If the rear axle flange is damaged or worn, or if runout is greater than maximum, replace the rear axle shaft.

**2. CLEAN AND INSPECT BEARINGS AND RACES**

(a) Clean with solvent and dry with low-pressure compressed air.

(b) Inspect inner and outer bearings and races for wear

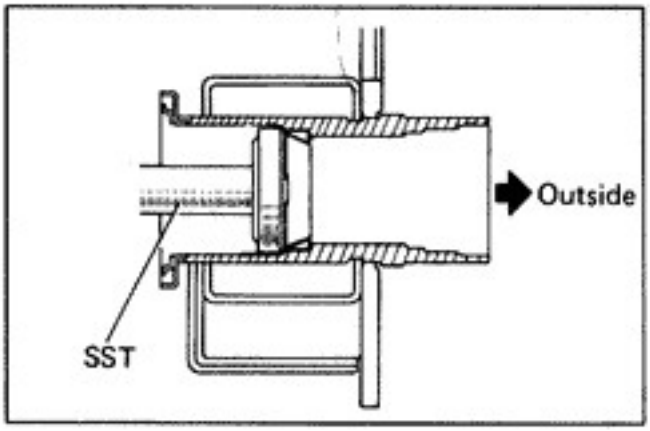



**3. PACK BEARINGS WITH MP GREASE NO. 2**

- Use a pressure bearing lubricator if available.

OR

- Place bearings in a handful of grease. Force grease the bearing until completely filled.

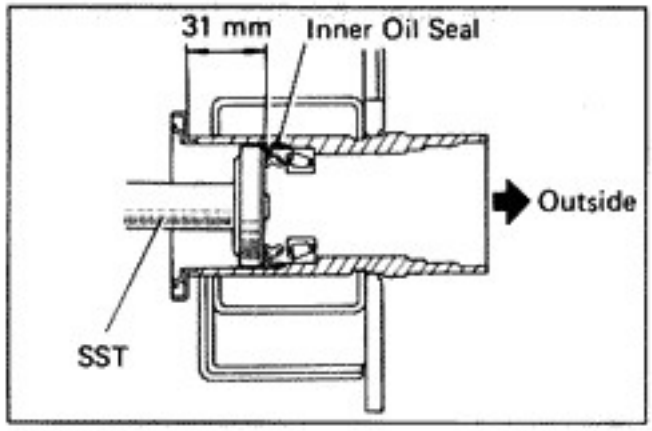



**4. INSTALL INSIDE BEARING OUTER RACE**

(a) Using SST, install the bearing inside outer race in rear axle housing.

SST 09550-22011 (09550-00020, 09550-00040)

(b) Install the bearing.

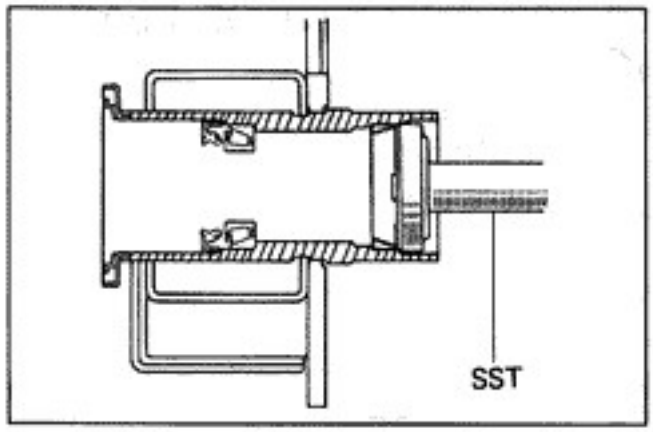



**5. INSTALL NEW INNER OIL SEAL**

(a) Using SST, drive in a new oil seal to a depth o mm (1.22 in.).

SST 09550-22011 (09550-00020, 09550-00040)

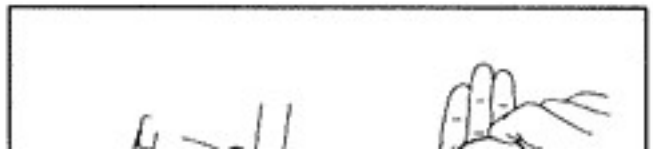
(b) Apply MP grease No. 2 to the oil seal lip.




**6. INSTALL OUTSIDE BEARING OUTER RACE**

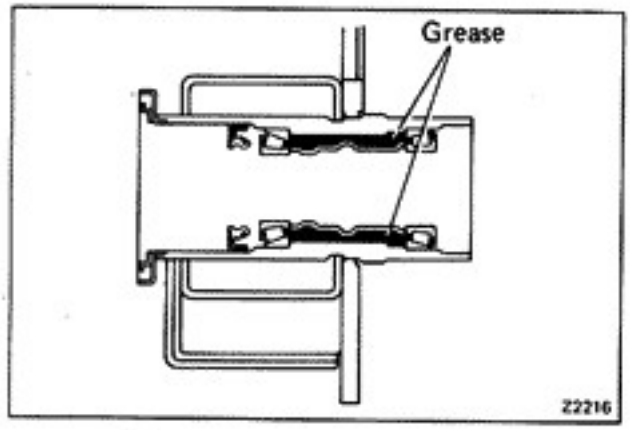
Using SST, install the bearing outside outer race in rear axle housing.

SST 09550-22011 (09550-00020, 09550-00050)



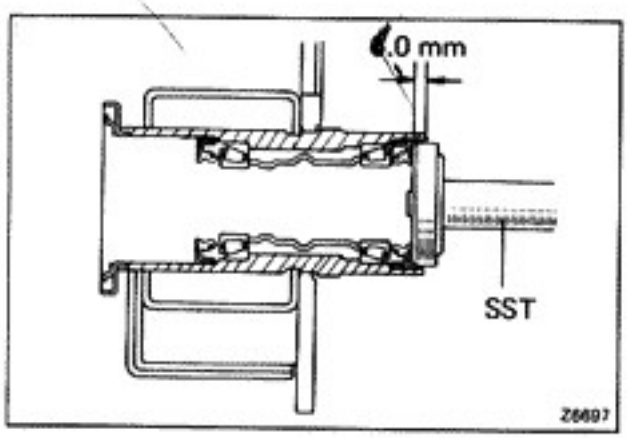
**7. PACK INSIDE OF REAR AXLE HOUSING WITH GREASE NO. 2**

**8. COAT OUTSIDE OF NEW SPACER WITH MP GRE**




10. **INSTALL NEW OUTER BEARING AND NEW OUTER OIL SEAL**

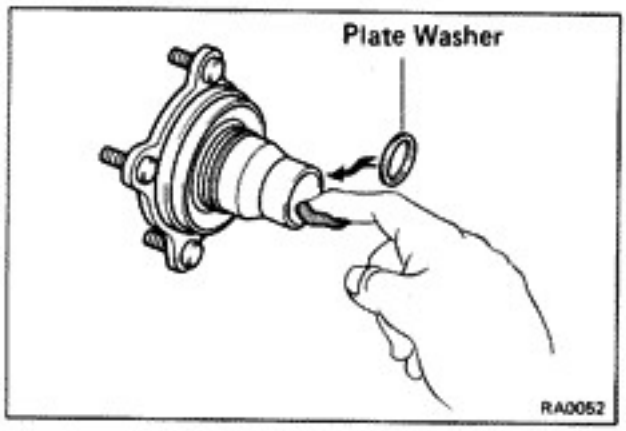
(a) Install the bearing.




(b) Using SST, drive in a new oil seal to a depth of 6.0 mm (0.236 in.).

SST 09950-22011 (09550-00020, 09550-00050)

(c) Apply MP grease No. 2 to the oil seal lip.




## INSTALLATION OF REAR AXLE SHAFT

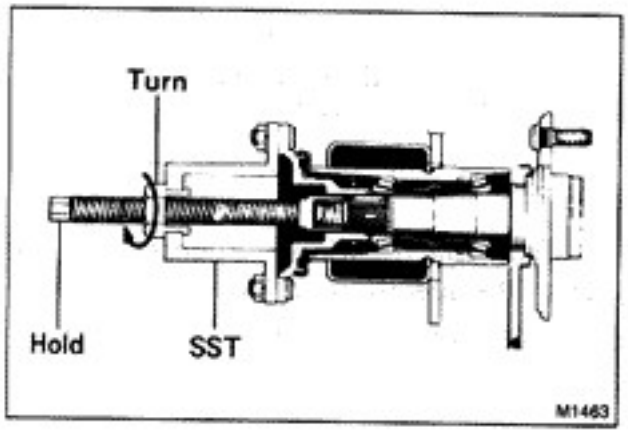
(See page RA-5)

1. **INSTALL REAR AXLE SHAFT AND FLANGE**

(a) Install the rear axle shaft into the housing.

(b) Install the flange with plate washer.

NOTE: Before assembly, apply a thin coat of grease to the flange.




(c) When installing the axle shaft and flange, use SST and tighten to the point where the flange and shaft deflector tip are aligned.

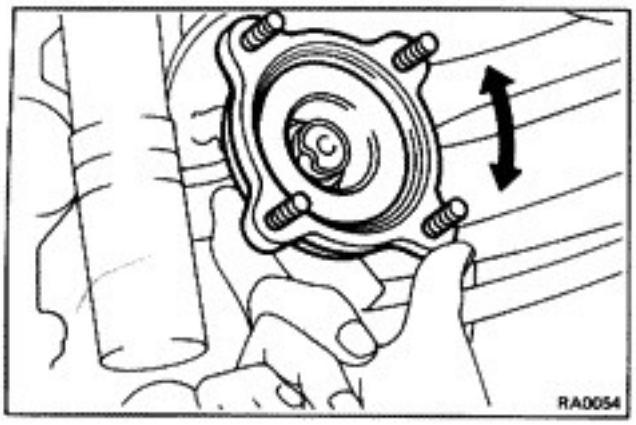
SST 09557-22022

NOTE: Do not allow grease to get on the shaft threads.

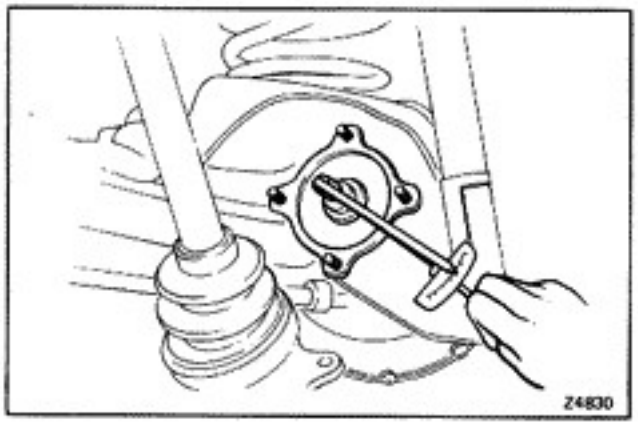
2. **ADJUST PRELOAD**

(a) Install the new axle shaft flange nut.

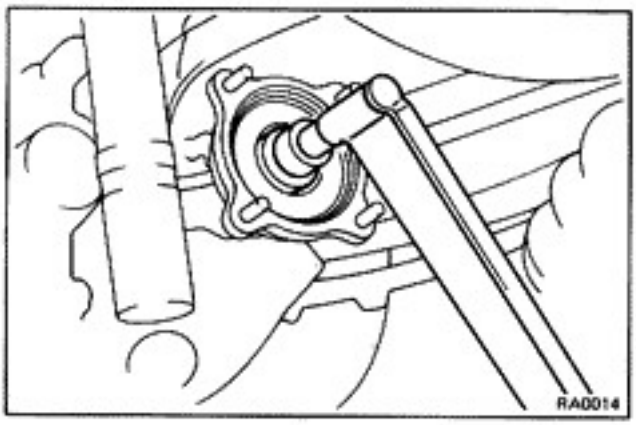
(b) Using a bar to hold the shaft, tighten and torque the nut.




(c) Revolve the shaft back and forth to snug it down

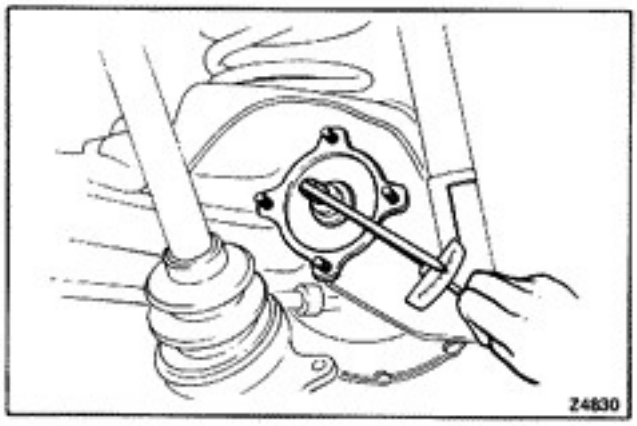



(d) Measure the rotation torque (initial resistan while turning the side gear shaft.




(e) Torque the nuts.

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




(f) Using a torque wrench, check the preload rotation

**Preload (rotation): Add initial resistance torque**
**1 – 4 kg-cm (0.9 – 3.5 in.-lb, 0.1 – 0.4 N·m)**

NOTE: Turn the flange one turn per 6 seconds measure the preload.

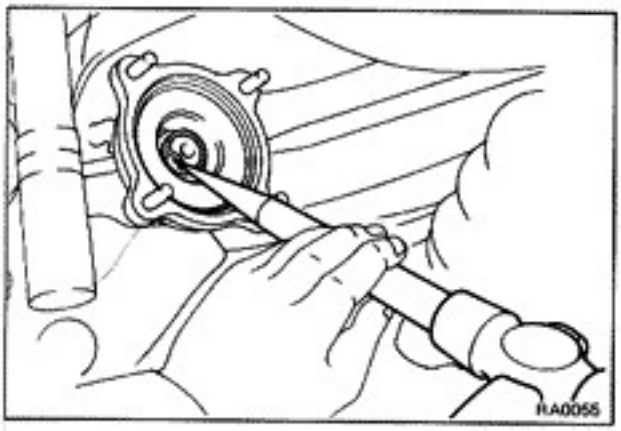
If preload is less than specification, retighten the 5 – 10° at a time until the specified preload is reached.

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

**3. IF THERE IS EXCESS PRELOAD, CORRECT IN FOLLOWING PROCEDURE**

(a) Remove the axle flange.

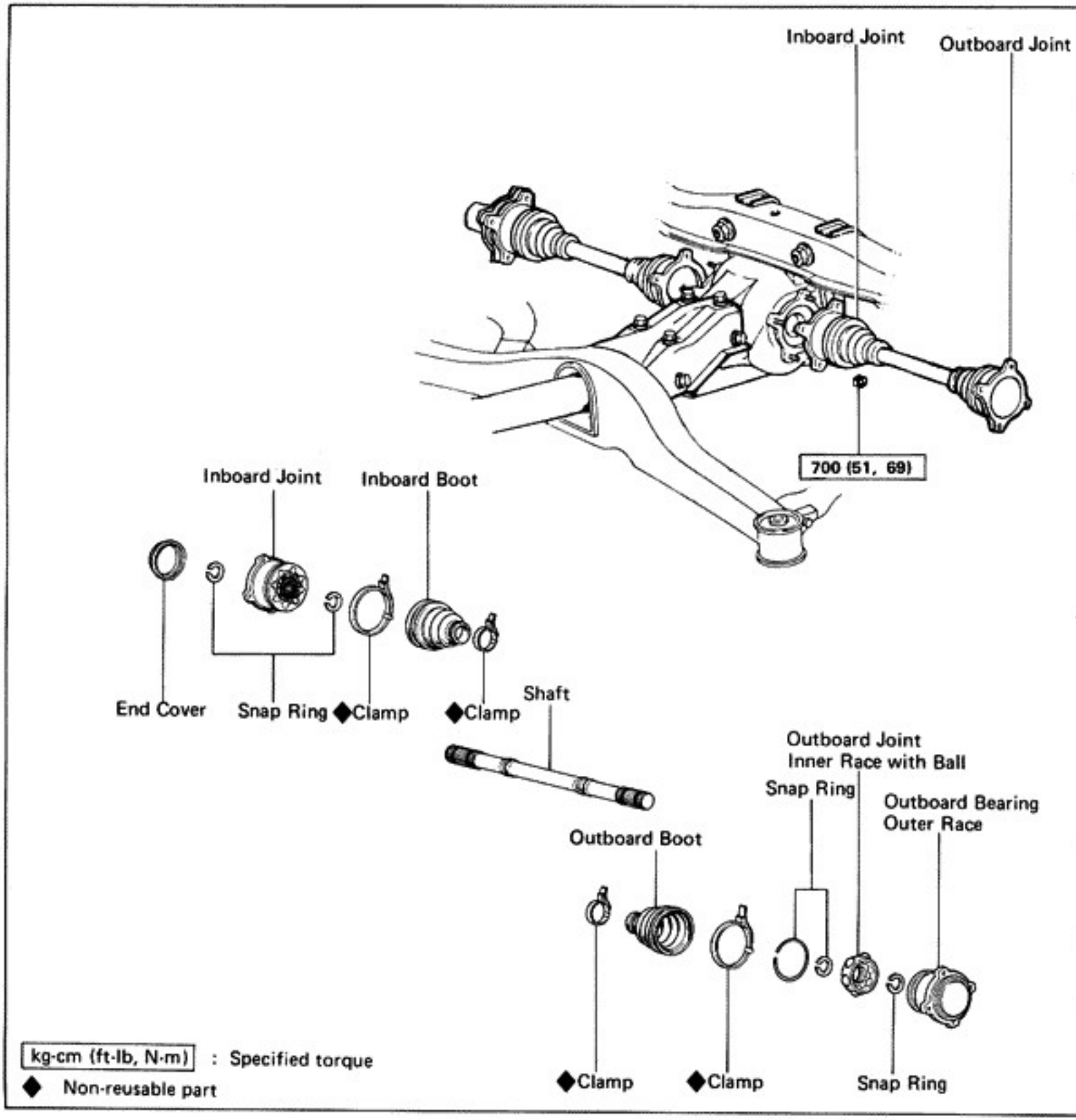
(b) Remove the rear axle shaft and spacer.




4. STAKE NUT WITH PUNCH
5. INSTALL REAR BRAKE
6. CONNECT DRIVE SHAFT
   Torque: 700 kg-cm (51 ft-lb, 69 N·m)
7. INSTALL REAR WHEEL

# REAR DRIVE SHAFT

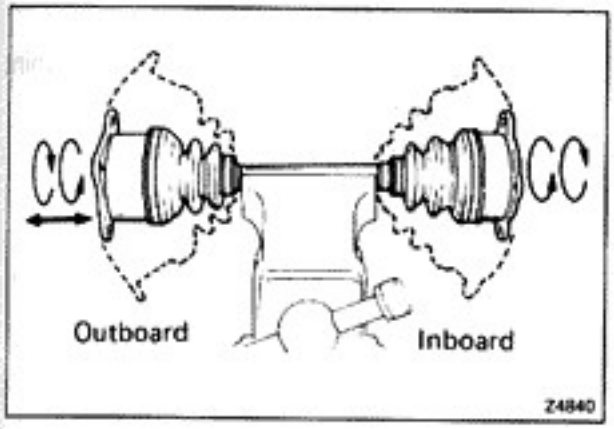
## COMPONENTS




## REMOVAL OF REAR DRIVE SHAFT

### REMOVE DRIVE SHAFT

NOTE: Be careful not to damage the boots.

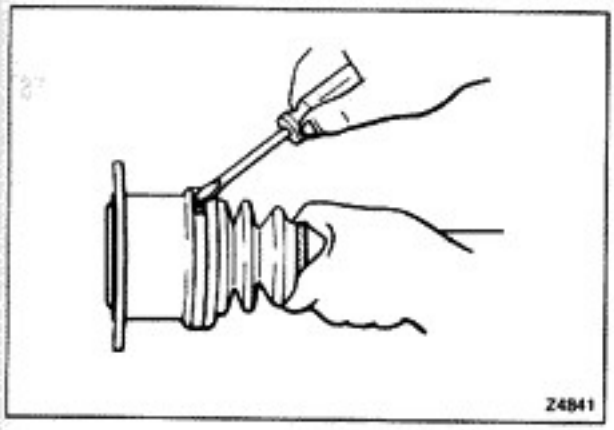



## DISASSEMBLY OF REAR DRIVE SHAFT

### 1. CHECK BOOT AND CLAMP

(a) Check to see that the outboard joint slides smoothly in the thrust direction.
Check to see that there is no remarkable play in the radial direction of the outboard joint.

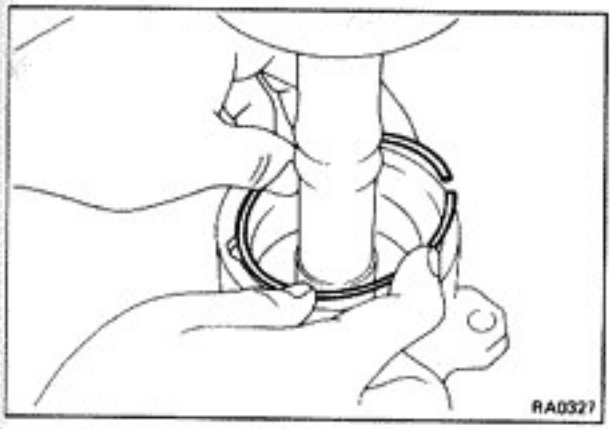
(b) Check to see that there is no remarkable play in the radial direction of the inboard joint.




### 2. DISASSEMBLE FOUR BOOT CLAMPS OF OUTBOARD AND INBOARD JOINTS

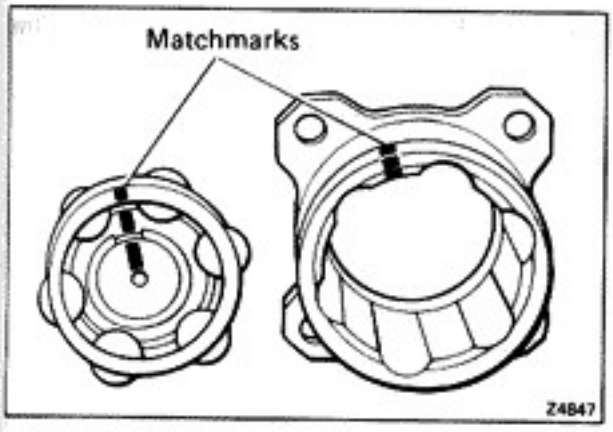
NOTE: Slide the clamp toward the drive shaft and remove it.

### 3. SLIDE BOOTS AT CENTER OF SHAFT




### 4. REMOVE OUTBOARD JOINT OUTER RACE

(a) Remove the snap ring.




(b) Place matchmarks on the outer race and drive shaft.

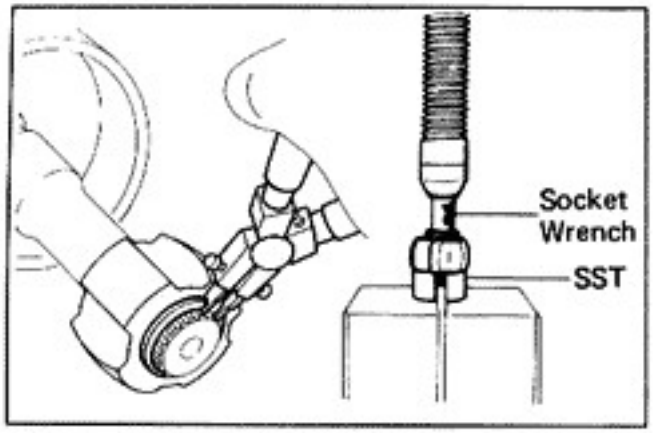
NOTE: Do not use a punch.

(c) Remove the outer race to the drive shaft.

NOTE: If the end cover is damaged or worn, replace it.

### 5. REMOVE OUTBOARD JOINT INNER RACE

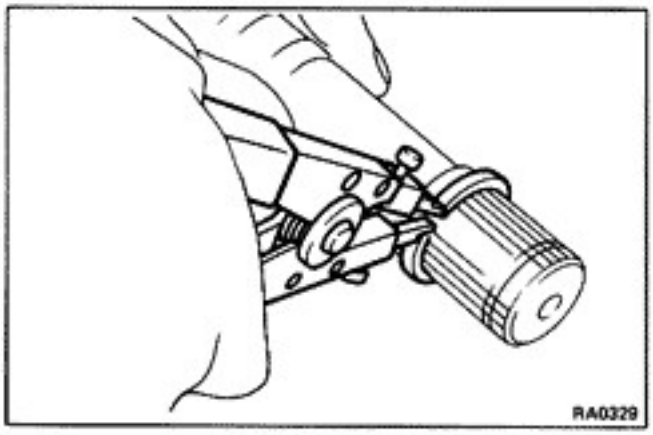
(a) Using a plastic hammer, remove the balls by lightly tapping on the outer circumference of the cage in the shaft axial direction.




(c) Using snap ring pliers, remove the snap ring.

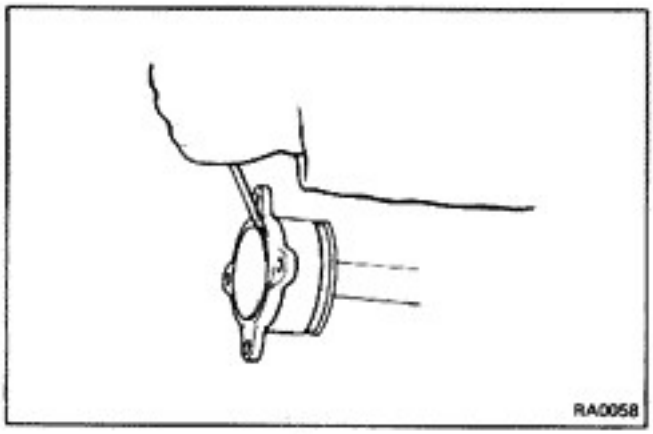
(d) Using SST and a press, remove the outboard inner race from the drive shaft.

SST 09726-10010 (09726-00030)



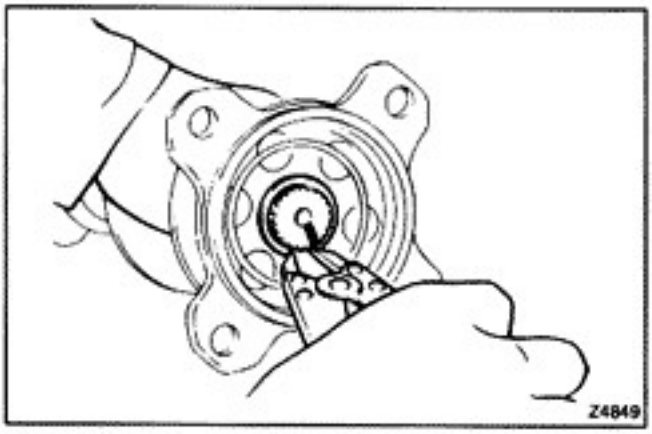

(e) Using snap ring pliers, remove the snap ring.

**6. REMOVE OUTBOARD AND INBOARD JOINT BOO**



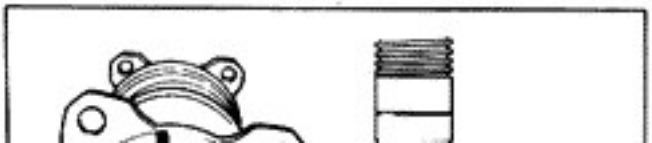

**7. DISASSEMBLE INBOARD JOINT**

(a) Using a screwdriver, remove the end plate fron inboard joint.




(b) Place matchmarks on the inboard joint and shaft.

(c) Using snap ring pliers, remove the snap ring.

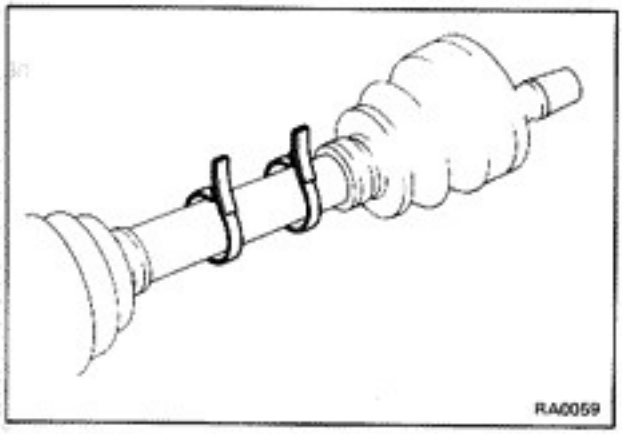


(d) Using SST and a press, remove the inboard from the drive shaft.

SST 09726-10010 (09726-00030)

## INSPECTION OF REAR DRIVE SHAFT COMPONENTS

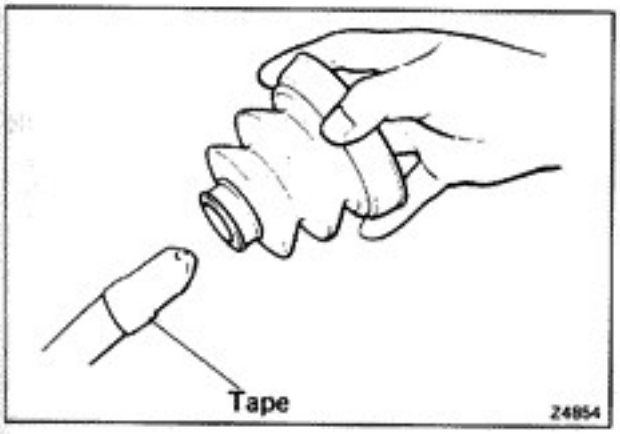
1. AFTER REMOVAL CHECK BOOTS FOR DAMAGE
2. CLEAN ALL PARTS
3. CHECK ALL PARTS FOR CRACKS, WEAR OR DAMAGE AND REPLACE AS NECESSARY




## ASSEMBLY OF REAR DRIVE SHAFT

(See page RA-12)

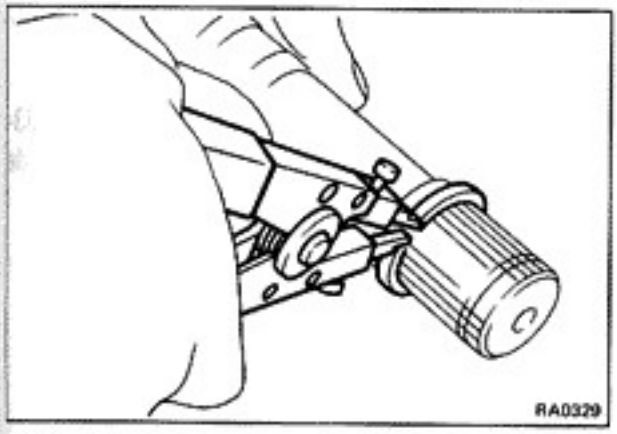
1. ASSEMBLE NEW CLAMPS ONTO DRIVE SHAFT



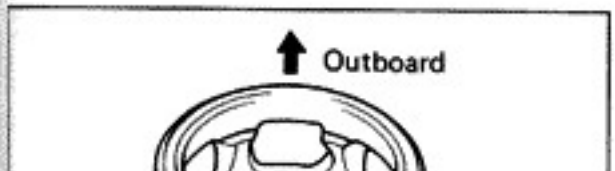

2. ASSEMBLE BOOT ONTO DRIVE SHAFT

**CAUTION: Wrap the shaft serrations with vinyl tape so as to prevent damage to the boot.**

(a) Place the outboard and inboard boots and new clamps on the shaft.



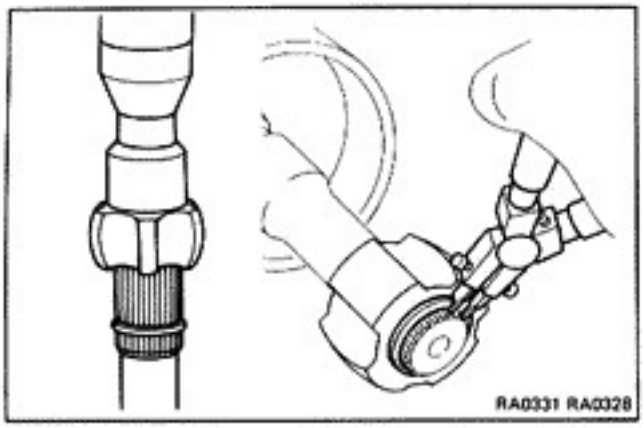

(b) Install a new snap ring.




3. INSTALL OUTBOARD JOINT INNER RACE

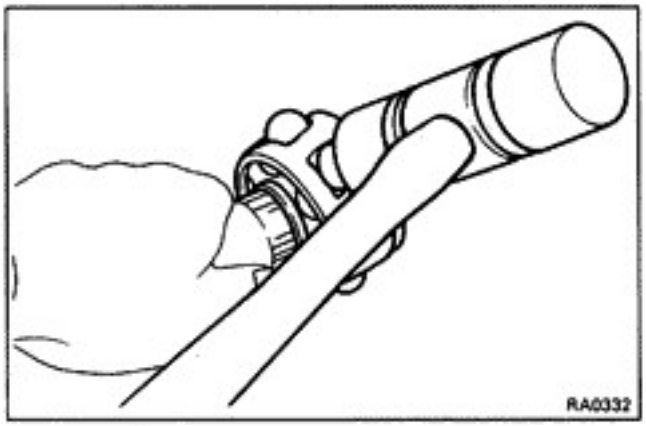
(a) Place the cage onto shaft.

NOTE: The larger diameter end should face toward the outboard side.



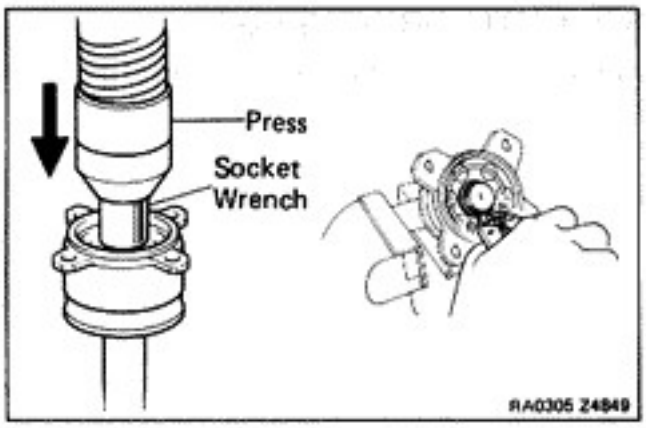

(b) Align the matchmarks and, using a press and soc wrench, install the inner race onto the shaft.

(c) Using snap ring pliers, install the snap ring.




(d) Lightly tap in the balls with a plastic hammer.

NOTE: Coat the inner race, the cage and balls with grease supplied in the boot kit.

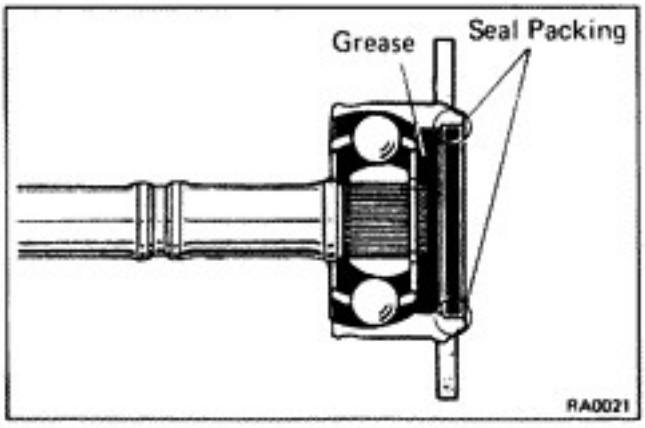



## 4. ASSEMBLE INBOARD JOINT

(a) Align the matchmarks placed before assembly.

(b) Using a press and socket wrench, inboard joint o drive shaft.

(c) Using snap ring pliers, install new snap ring.



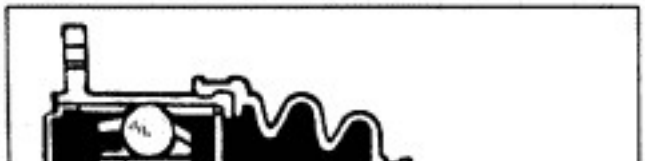

(d) Pack 60g (0.13 lb) of grease into the flange side.

NOTE: Use the grease supplied in the kit.

(e) Apply seal packing THREE BOND 1344 (08 00080) or LOCKTITE No. 242 around inboard of the end plate.

(f) Install it to the inboard joint.

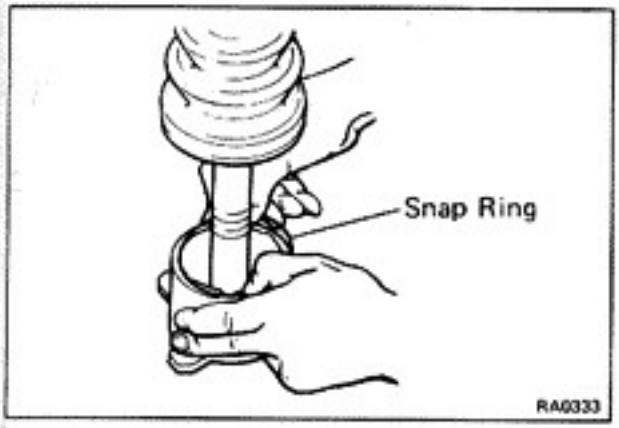
NOTE: Install the end plate by tapping around it.



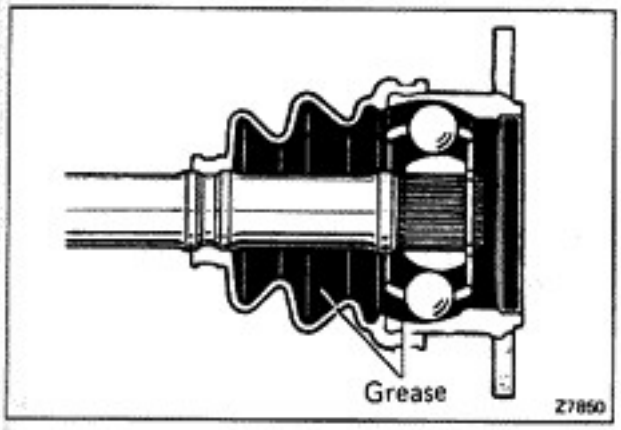
## 5. APPLY GREASE OUTBOARD AND INBOARD

NOTE: Use the grease supplied in the boot kit.

(a) Apply grease into the outer race and boot.




(b) Install the snap ring to the outer race.

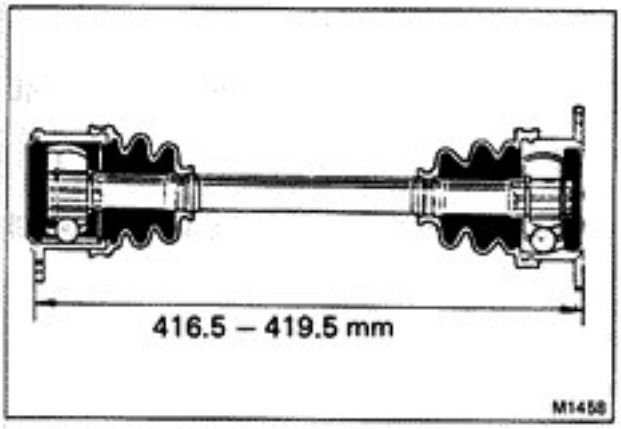



(c) Apply grease into the inboard joint.

**Inboard joint: Pack in 60g (0.13 lb) of grease**

**Inboard boot: Pack in 60g (0.13 lb) of grease**

NOTE: Use the grease supplied in the boot kit.




**6. ASSEMBLY BOOT CLAMPS**

(a) Clamp the boots in a position permitting the following shaft dimension.

**Shaft dimension: 416.5 – 419.5 mm (16.398 – 16.516 in.)**

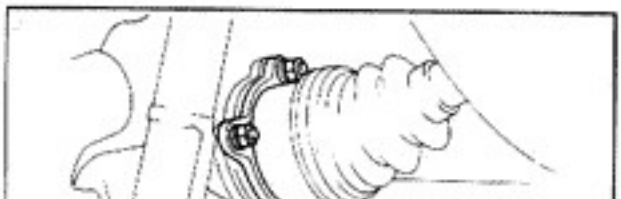
(b) Lock the clamps.

NOTE: Position the lock between the flange bolt holes.

(c) Turn both joints and stretch the boot to check that it does not deform.

## INSTALLATION OF REAR DRIVE SHAFT

(See page RA-12)

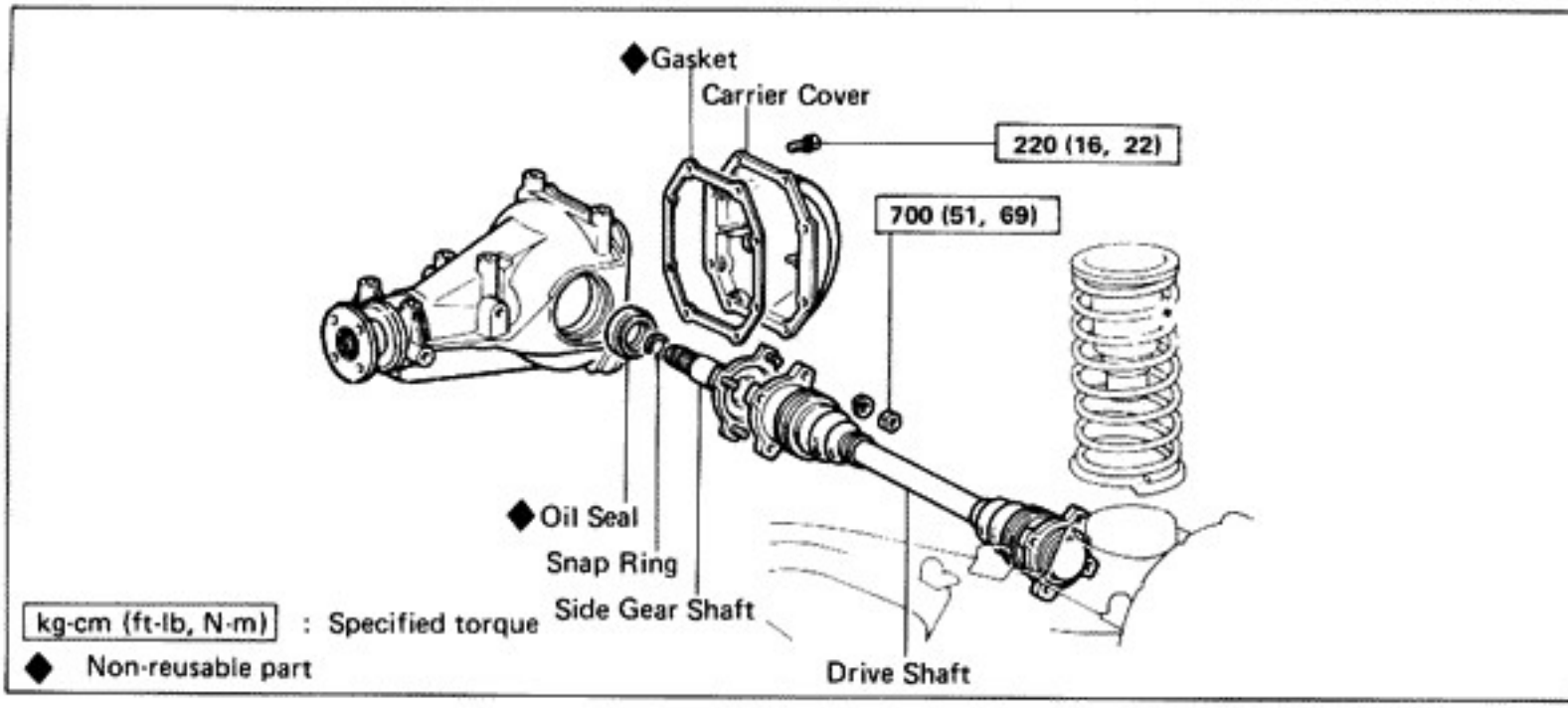


### INSTALL DRIVE SHAFT

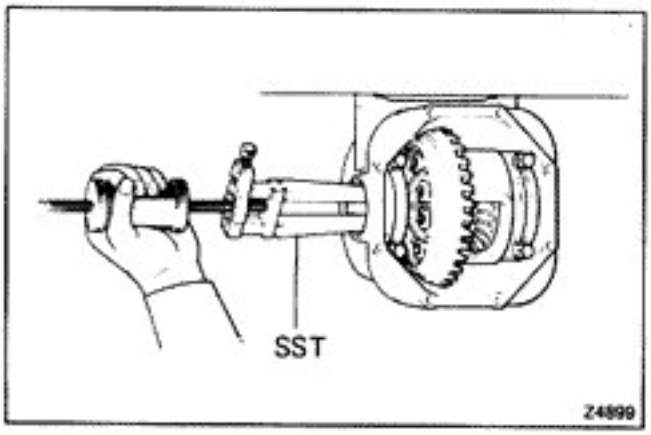
(a) Install the drive shaft with the narrow distance between the flange and boot band at the differential side.

# IRS TYPE DIFFERENTIAL

## ON-VEHICLE REPLACEMENT OF SIDE GEA SHAFT OIL SEAL




1. DRAIN OUT DIFFERENTIAL OIL
2. DISCONNECT DRIVE SHAFT FROM DIFFERENT
3. REMOVE CARRIER COVER
4. REMOVE SIDE GEAR SHAFT (See step 2 on page RA
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)

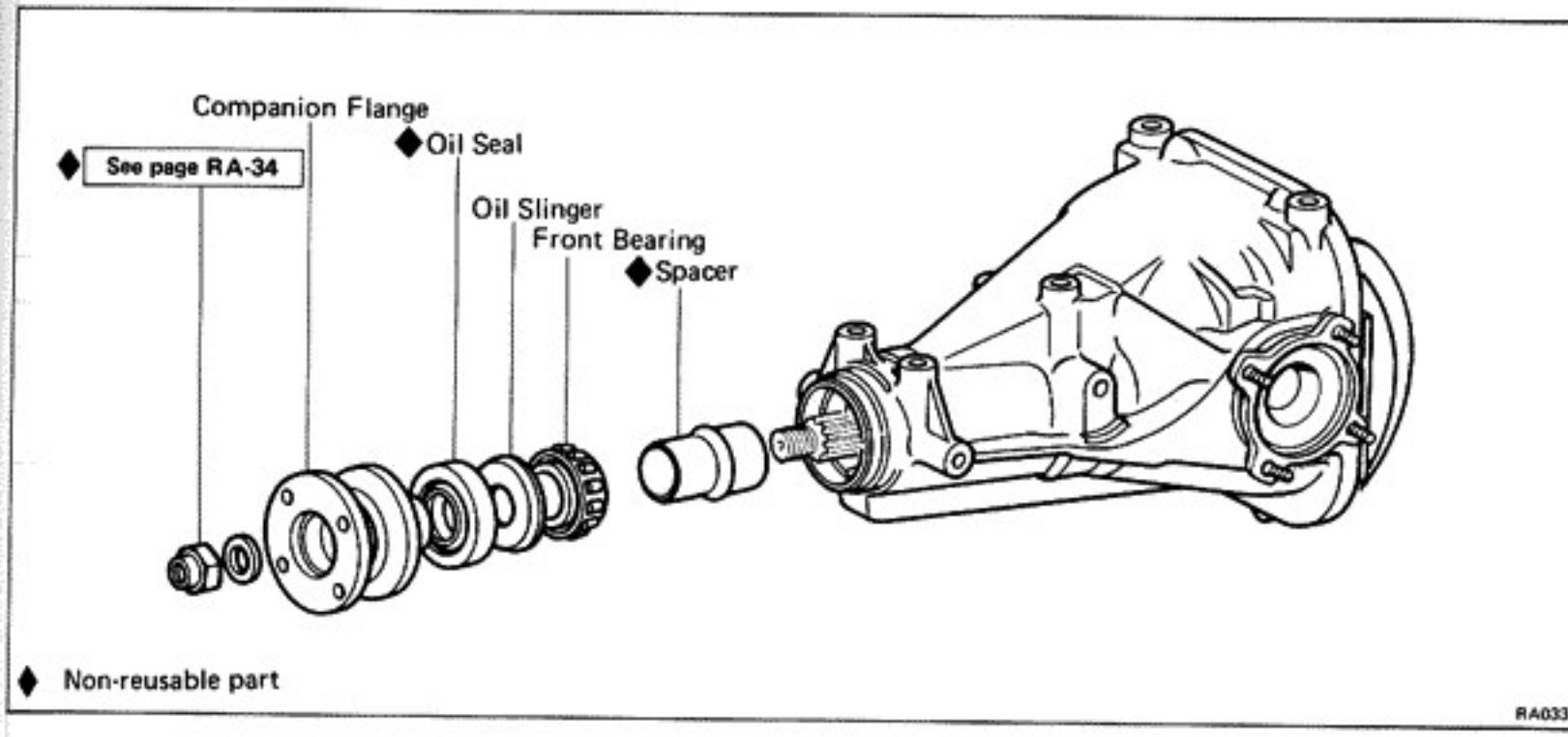


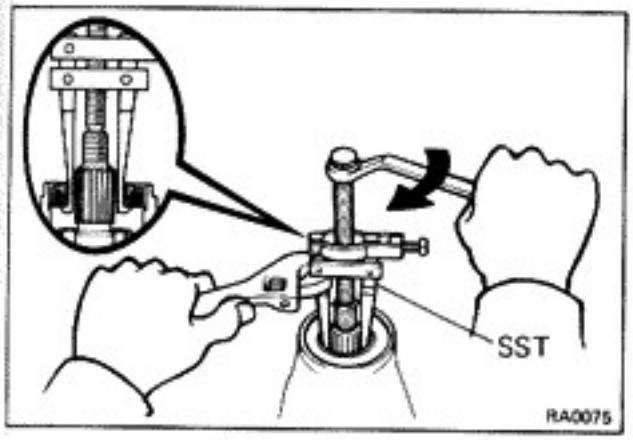

7. INSTALL SIDE GEAR SHAFT (See step 17 on page RA-36)
8. MEASURE SIDE GEAR SHAFT RUNOUT (See step 18 on page RA-36)
9. INSTALL CARRIER COVER (See step 19 on page RA
10. CONNECT DRIVE SHAFT (See step 4 on page RA-3

11. INSTALL DRAIN PLUG AND FILL DIFFERENT WITH GEAR OIL

    Hypoid gear oil: w/LSD use LSD oil only

## REPLACEMENT OF FRONT OIL SEAL COMPONENTS



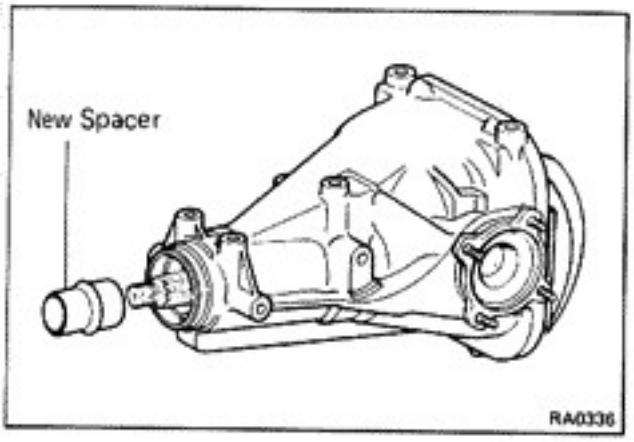




1. **REMOVE DIFFERENTIAL (See page RA-20)**

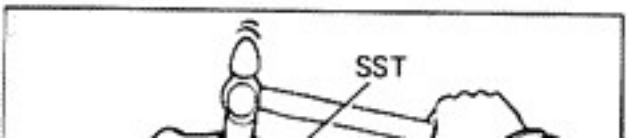
2. **REMOVE COMPANION FLANGE (See step 10 on page RA-24)**

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.

7. INSTALL COMPANION FLANGE
(See step 12 on page RA-34)

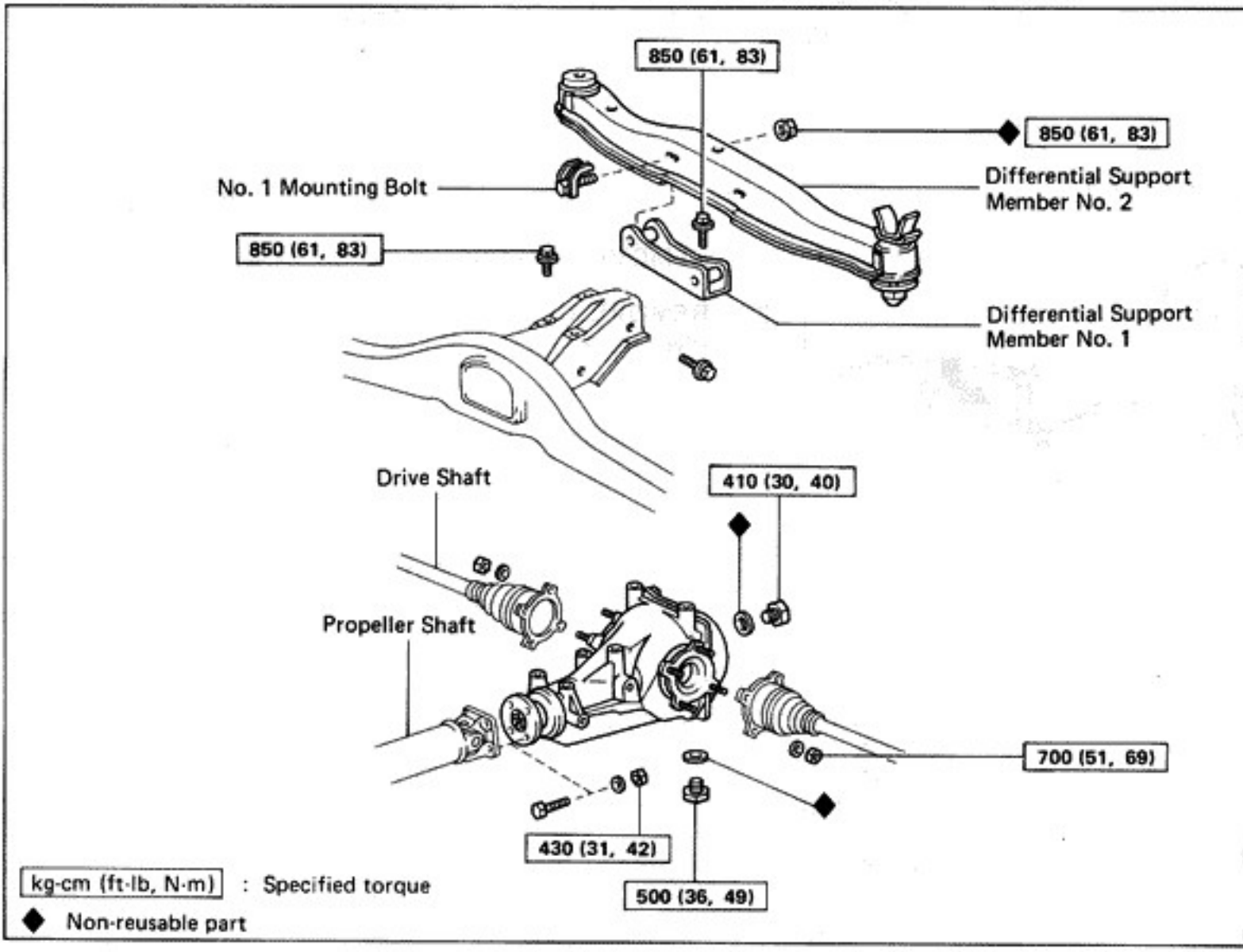
8. CHECK FRONT BEARING PRELOAD
(See step 13 on page RA-35)

9. CHECK DEVIATION OF COMPANION FLANGE
(See step 14 on page RA-35)

10. STAKE DRIVE PINION NUT

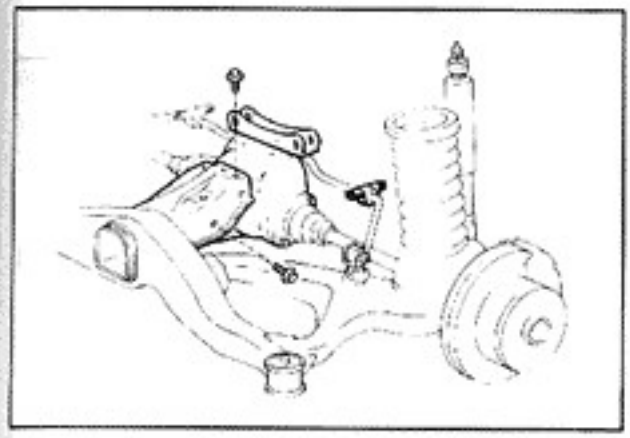
11. INSTALL DIFFERENTIAL (See page RA-36)

## REMOVAL OF DIFFERENTIAL



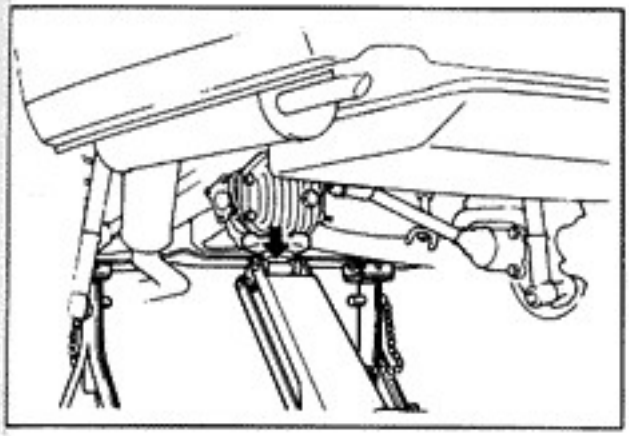

1. REMOVE DRAIN PLUG AND DRAIN DIFFEREN
OIL

2. DISCONNECT REAR DRIVE SHAFT



## 5. REMOVE DIFFERENTIAL

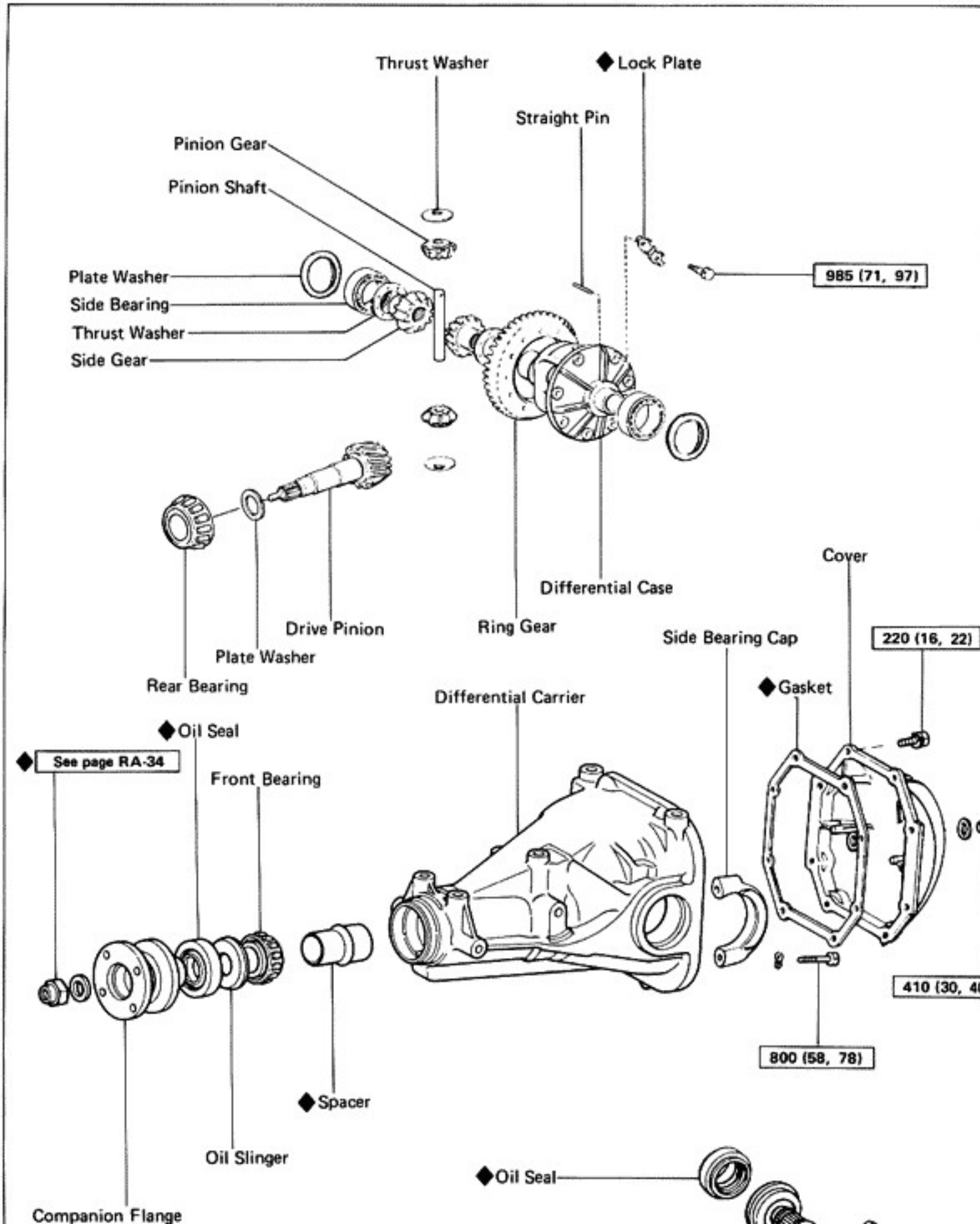
(a) Jack up differential and remove the carrier bolts.



(b) Lower the differential carrier with a jack.

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

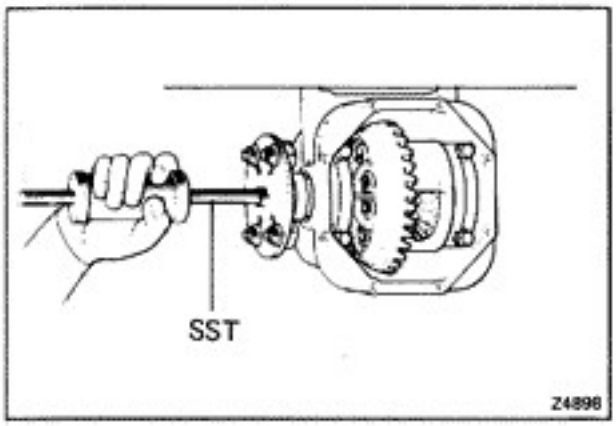
## COMPONENTS


Thrust Washer
◆Lock Plate
Straight Pin
Pinion Gear
Pinion Shaft
Plate Washer
Side Bearing
Thrust Washer
Side Gear
985 (71, 97)
Drive Pinion
Plate Washer
Rear Bearing
Ring Gear
Differential Case
Cover
Side Bearing Cap
220 (16, 22)
◆Gasket
Differential Carrier
◆Oil Seal
◆ See page RA-34
Front Bearing
410 (30, 4
800 (58, 78)
◆Spacer
Oil Slinger
Companion Flange
◆Oil Seal

## DISASSEMBLY OF DIFFERENTIAL

1. REMOVE DIFFERENTIAL CARRIER COVER

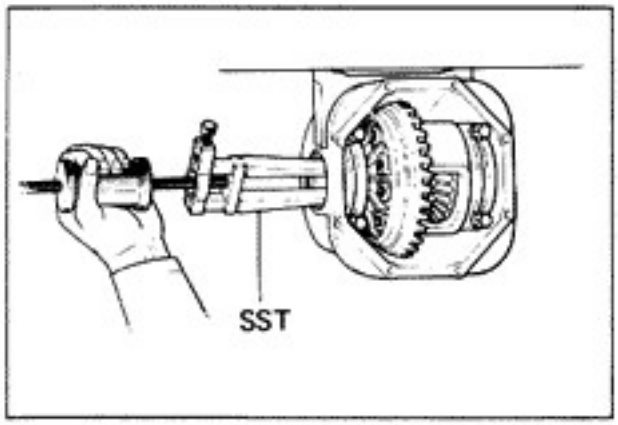
Remove the eight bolts, cover and gasket.




2. REMOVE SIDE GEAR SHAFT

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

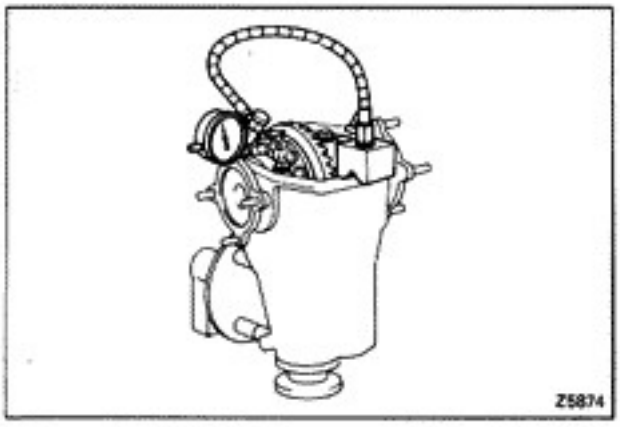
SST 09520-22011




3. REMOVE SIDE GEAR SHAFT OIL SEAL

Using SST, remove the oil seal.

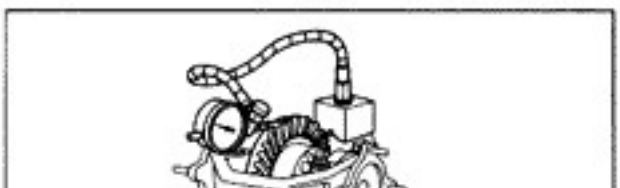
SST 09308-00010




4. CHECK RING GEAR RUNOUT

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

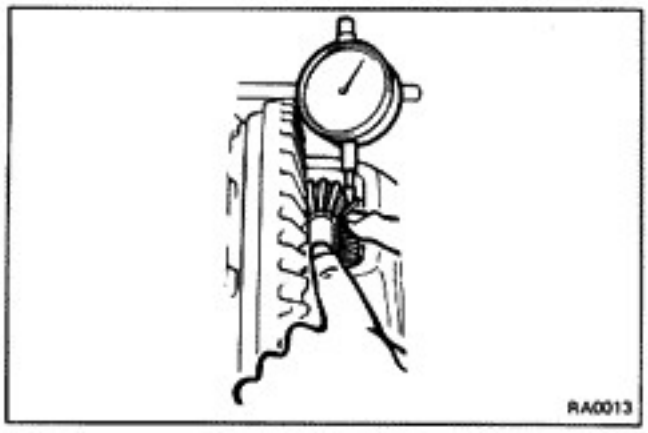
**Maximum runout: 0.07 mm (0.0028 in.)**



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.)**

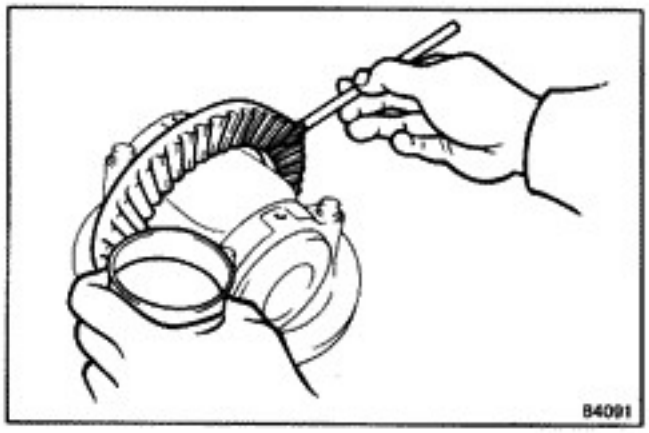



**6. CHECK SIDE GEAR BACKLASH**

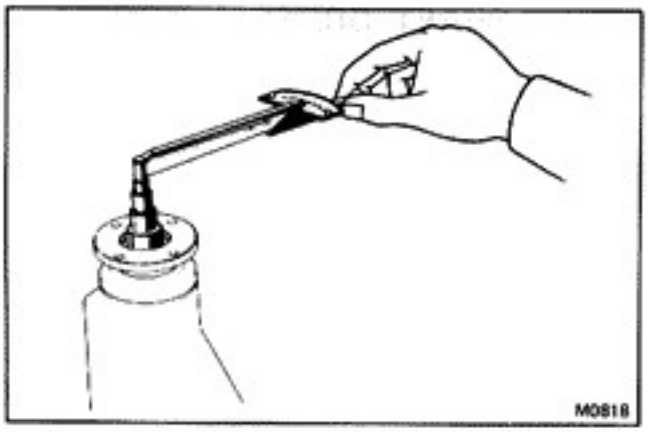
Measure the side gear backlash while holding one pi
gear toward the case.

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

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




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




**8. MEASURE DRIVE PINION PRELOAD**

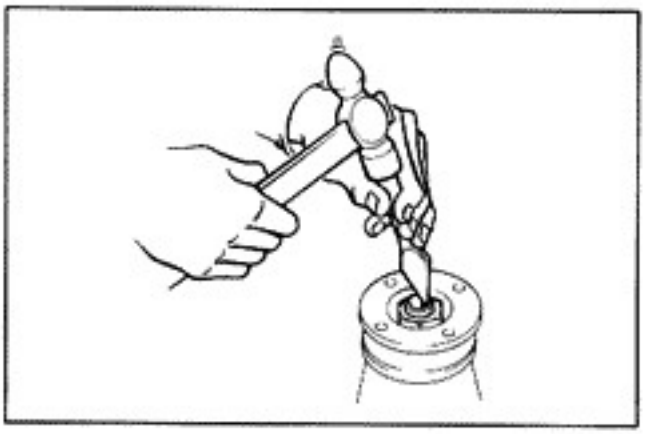
Using a torque wrench, measure the preload of the back
between the drive pinion and ring gear.

**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)**

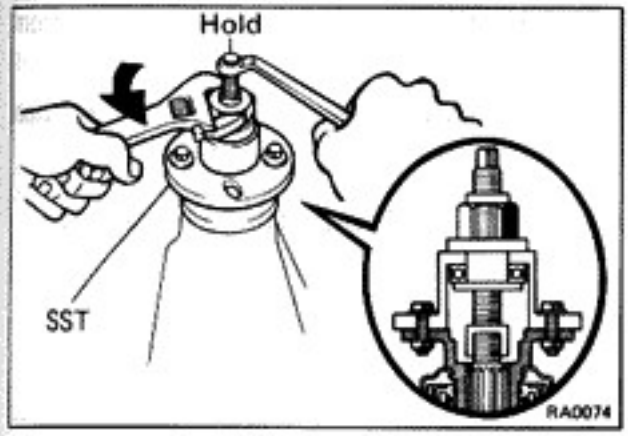


**10. REMOVE COMPANION FLANGE**

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

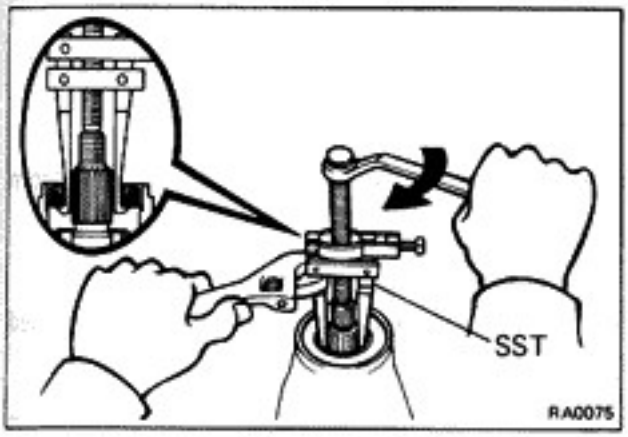
(b) Using SST to hold the flange, remove the nut.

SST 09330-00021




(c) Using SST, remove the companion flange.

SST 09557-22022

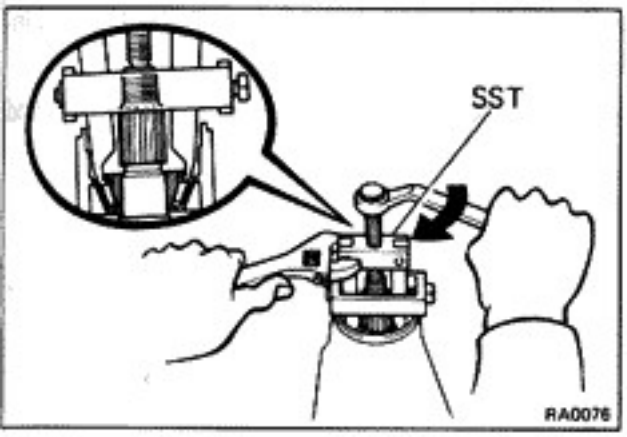



**11. REMOVE OIL SEAL AND OIL SLINGER**

(a) Using SST, remove the oil seal from the housing.

SST 09308-10010

(b) Remove the oil slinger.



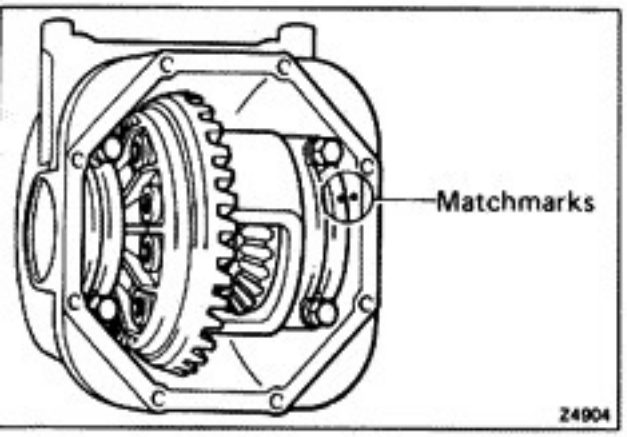

**12. REMOVE FRONT BEARING AND BEARING SPACER**

(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


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

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

14. REMOVE DRIVE PINION FROM DIFFERENTIAL CARRIER

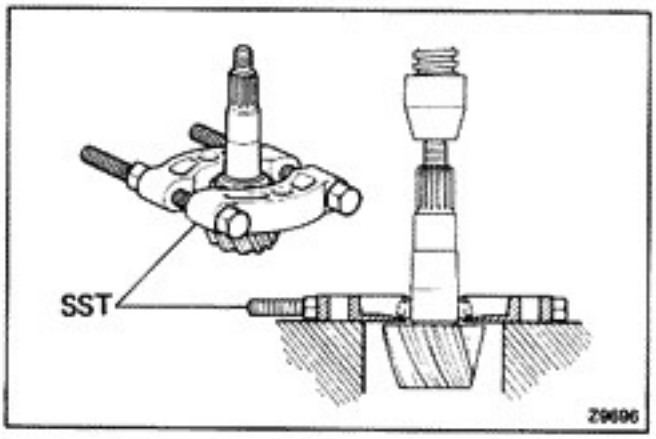
## INSPECTION AND REPLACEMENT OF DIFFERENTIAL

1. REPLACE DRIVE PINION REAR BEARING

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

SST 09950-00020

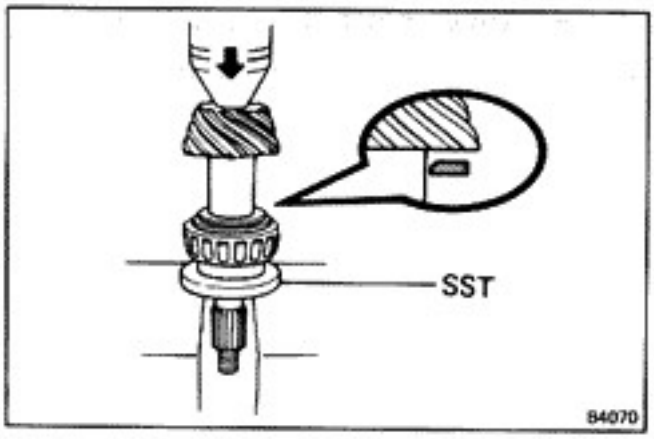
NOTE: If the drive pinion or ring gear are dam
replace them as a set.




(b) Install the washer on the drive pinion with the ch
fered end facing the pinion gear.

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

SST 09506-30011

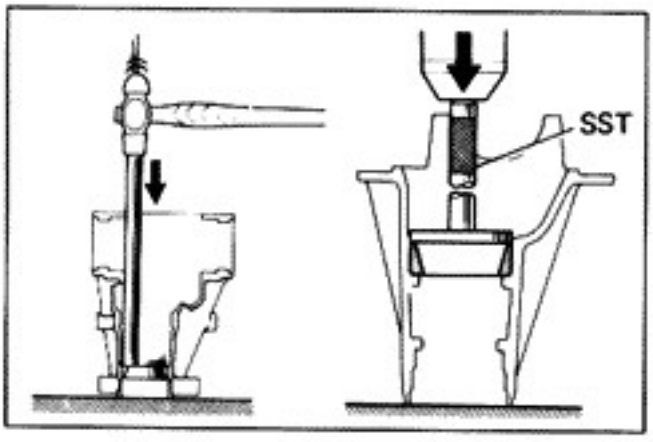



2. REPLACE DRIVE PINION FRONT AND REAR BEARING OUTER RACE

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

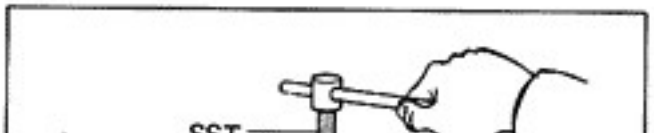
(b) Using SST, drive in a new outer race.

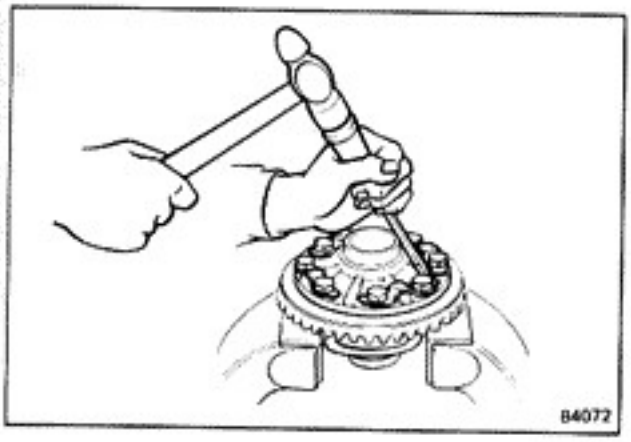
SST 09608-35014
(09608-06020, 09608-06110, 09608-06120)




3. REMOVE SIDE BEARINGS FROM DIFFERENT CASE

Using SST, pull the side bearing from the differential c



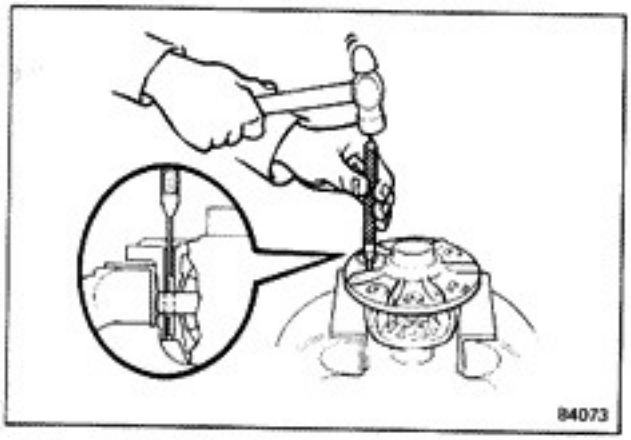



## 4. REMOVE RING GEAR

(a) Remove the ring gear set bolts and lock plates.

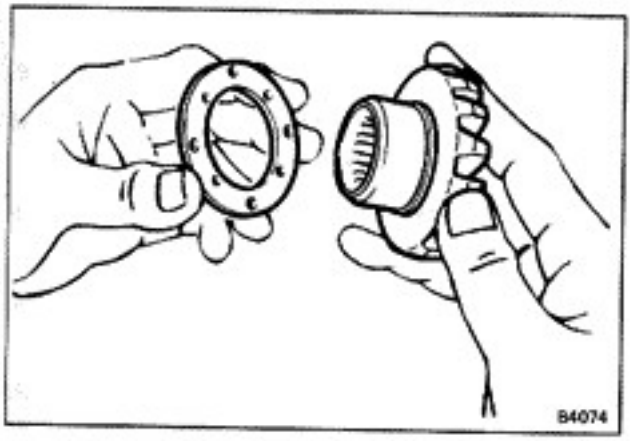
(b) Place matchmarks on the ring gear and differenti case.

(c) Using a plastic or copper hammer, tap on the rin 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 gear and two thrust washers.




## 6. ASSEMBLE DIFFERENTIAL CASE

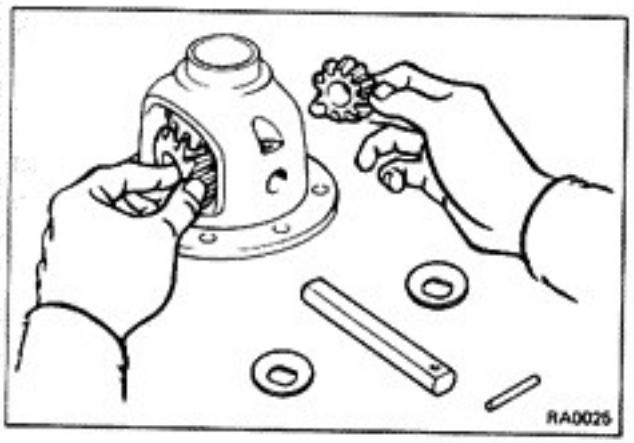
(a) Install correct thrust washer and side gears.
Select thrust washers from the table below that wil ensure the backlash is within specification. Try to select washers of the same thickness for both sides

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

Thrust washer thickness mm (in.)

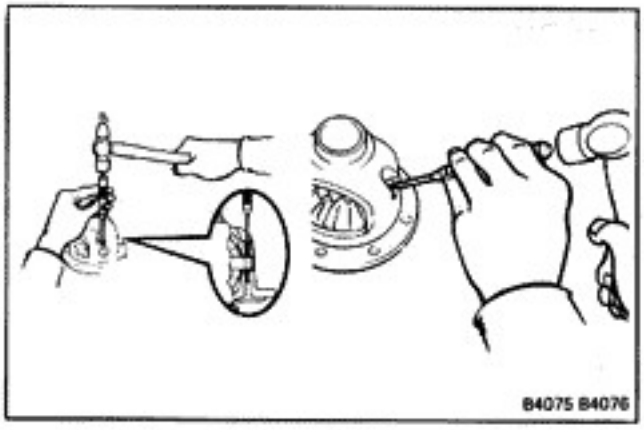
| Thickness | |
|---|---|
| 0.96 – 1.04 | (0.0378 – 0.0409) |
| 1.06 – 1.14 | (0.0417 – 0.0449) |
| 1.16 – 1.24 | (0.0457 – 0.0488) |
| 1.26 – 1.34 | (0.0496 – 0.0528) |

Install thrust washers and side gears in the differential case.



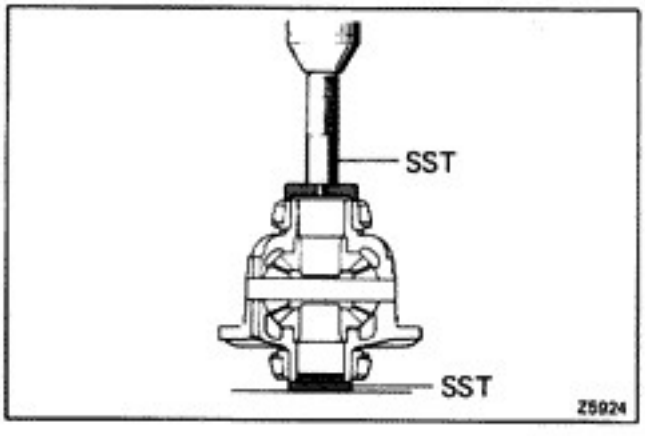

(b) Check the side gear backlash.

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




(c) Install straight pin.

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




## 7. INSTALL NEW SIDE BEARING

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

SST 09550-10012
(09252-10010, 09557-10010, 09558-10010)

## 8. INSTALL RING GEAR ON DIFFERENTIAL CAS

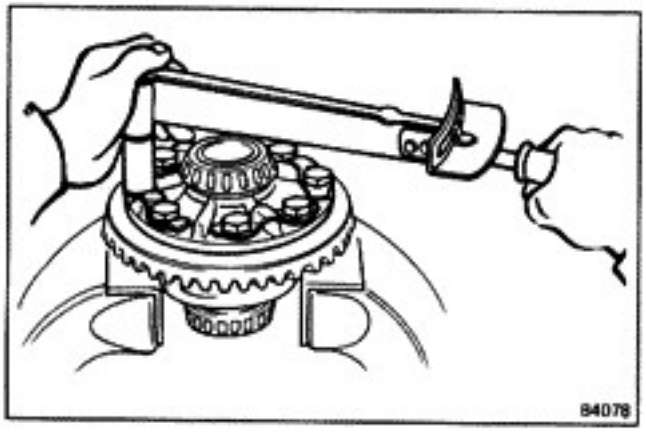
(a) Clean the contact surface of the differential

(b) Heat the ring gear to about 100°C (212°F) in a bath.

(c) Clean the contact surface of the ring gear with c ing solvent.

(d) Then quickly install the ring gear on the differe case.

(e) Align the marks on the ring gear and differential




**CAUTION: Do not heat the ring gear more than 11 (230°F).**

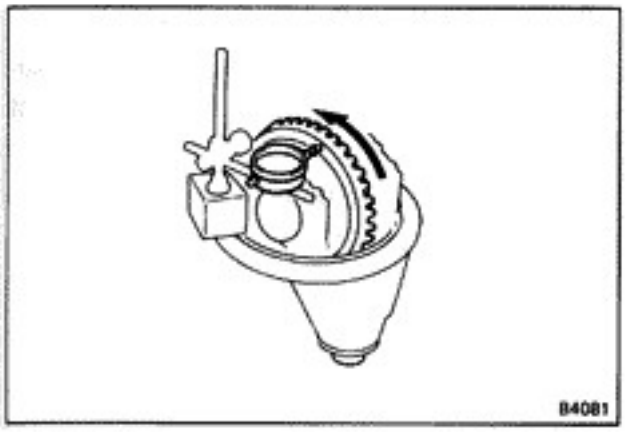
(f) Coat the ring gear set bolts with gear oil.

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

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

(h) Using a hammer and drift punch, stake the plates.

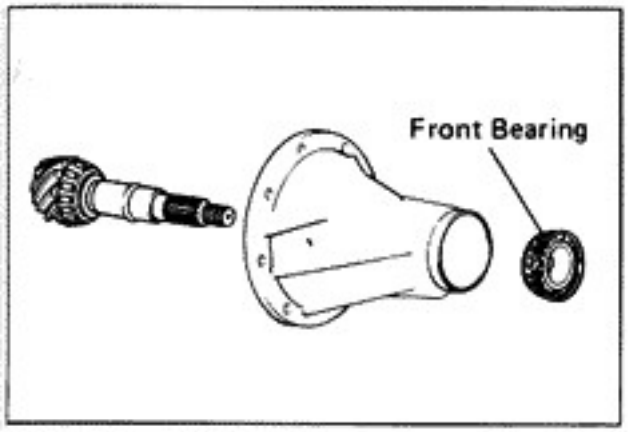
NOTE: Stake one claw flush with the flat surface of nut. For the claw contacting the protruding portion of




(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

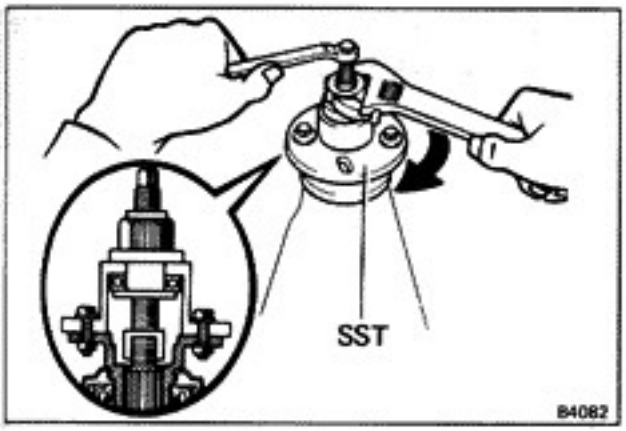
**(See page RA-22)**

### 1. TEMPORARILY ADJUST DRIVE PINION PRELOAD

(a) Install the following parts.

- Drive pinion
- Front bearing

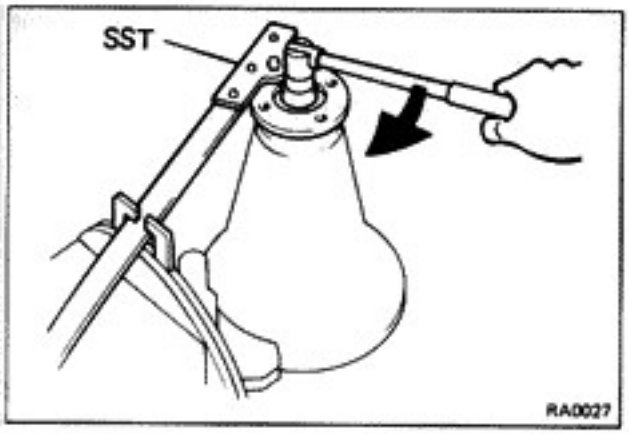
NOTE: Assemble the spacer, oil slinger and oil seal after adjusting the gear contact pattern.




(b) Install the companion flange with SST.

Coat the threads of the nut with MP grease.

SST 09557-22022

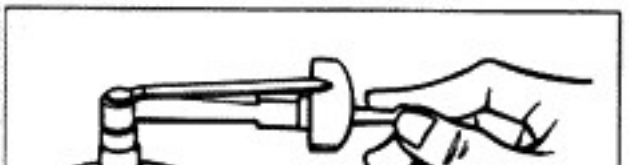



(c) Adjust the drive pinion preload by tightening the companion flange nut.

Using SST to hold the flange, tighten the nut.

SST 09330-00021

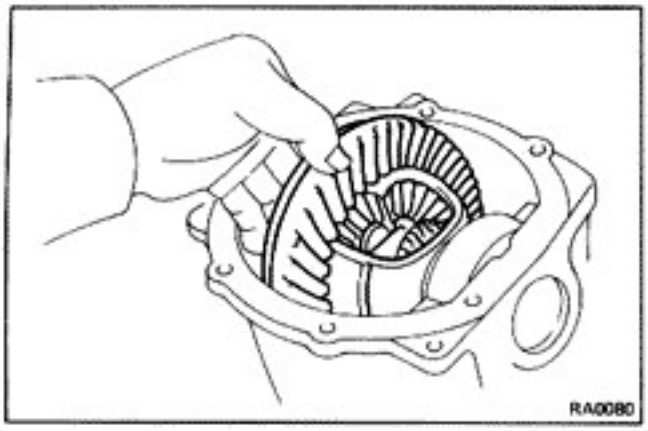
**CAUTION: As there is no spacer, tighten a little at a time, being careful not to overtighten it.**



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

**Preload:**

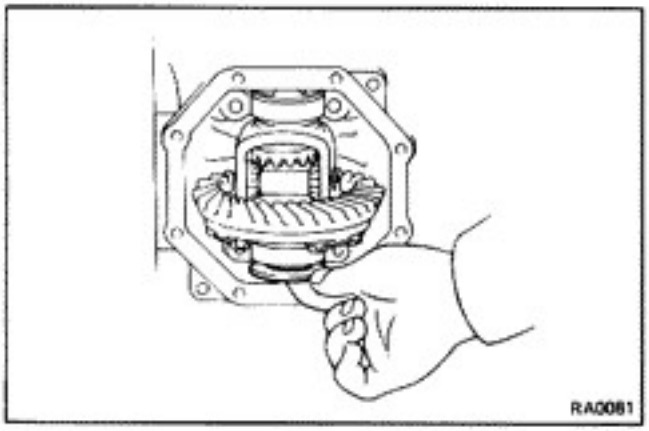
| | |
|---|---|
| New bearing | **12 – 19 kg-cm** |
| | **(10.4 – 16.5 in.-lb, 1.2 – 1.9 N·m)** |




## 2. INSTALL DIFFERENTIAL CASE IN CARRIER

(a) Place the bearing outer races on their respective b
ings. Make sure the left and right outer races are
interchanged.

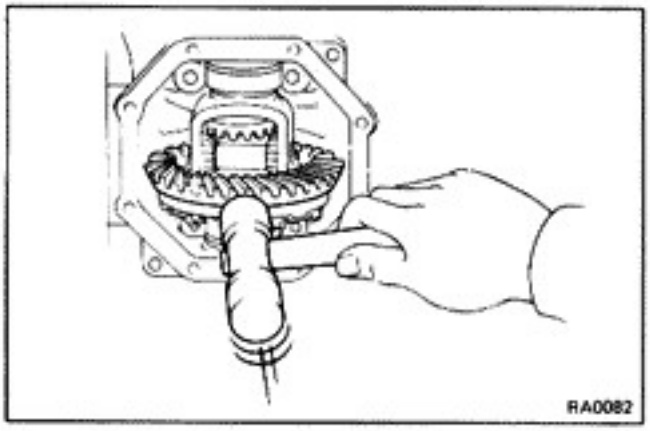
(b) Install the differential case in the carrier.



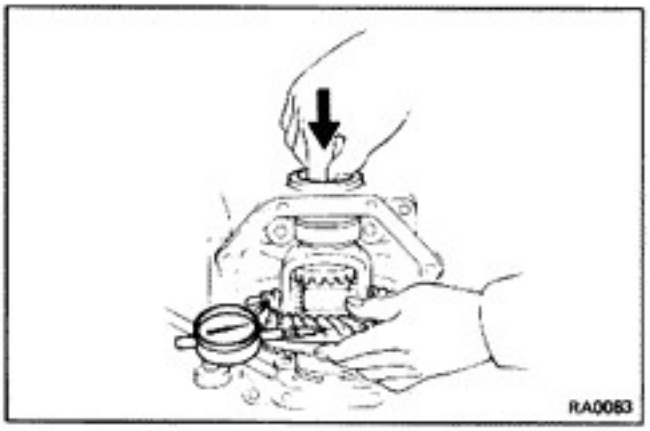

## 3. ADJUST RING GEAR BACKLASH

(a) Install only the plate washer on the ring gear b
side.

NOTE: Insure that the ring gear has a backlash.

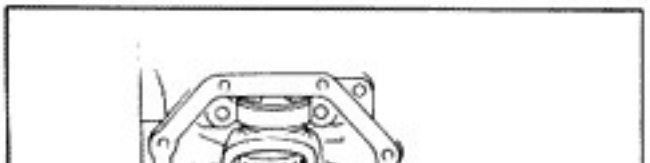



(b) Snug down the washer and bearing by tapping on
ring gear with a plastic hammer.

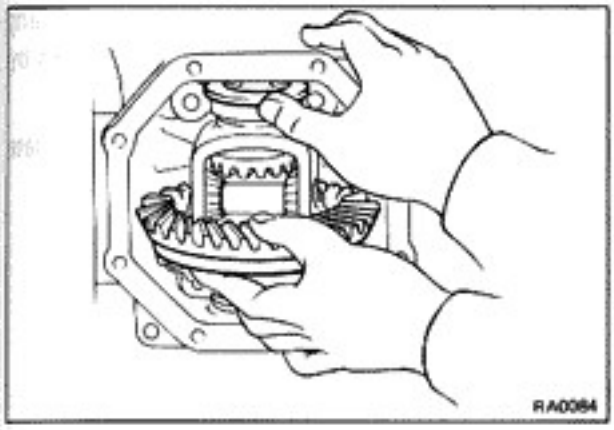



(c) Hold the side bearing boss on the teeth surface of
ring gear and measure the backlash.

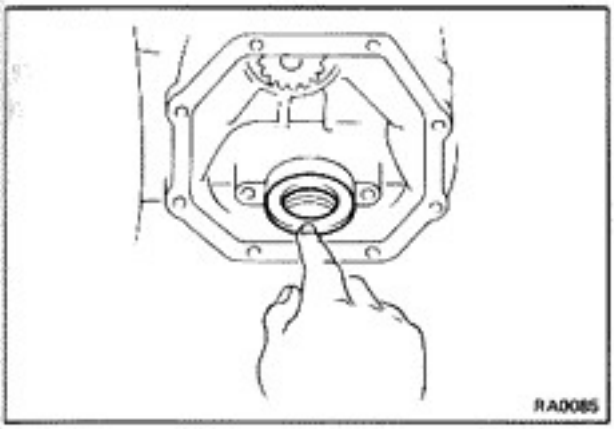
**Backlash (reference): 0.10 mm (0.0039 in.)**



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

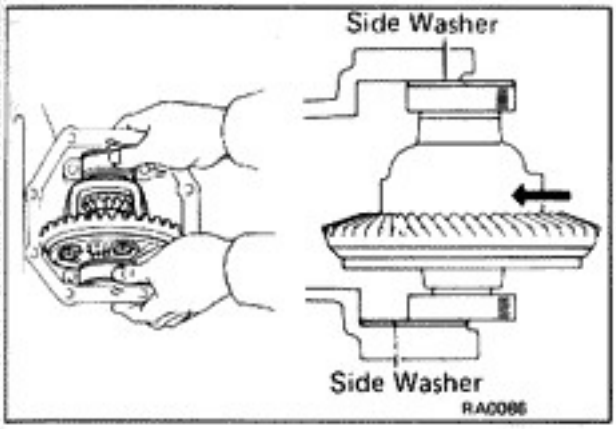



(e) Select a ring gear teeth side washer of a thickness which eliminates any clearance between the outer race and case.

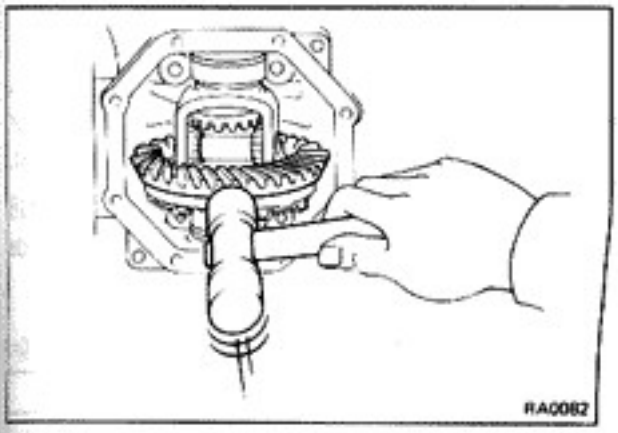



(f) Remove the plate washers and differential case.

(g) Install the plate washer into the lower part of the carrier.



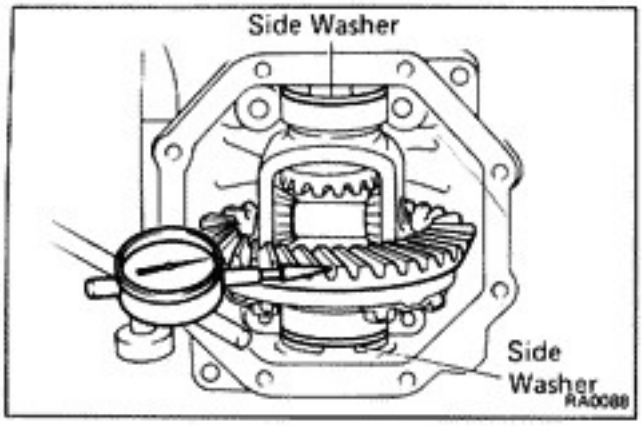

(h) Place the other plate washer onto the differential case together with the outer race, and install the differential case with the outer race into the carrier.




(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.

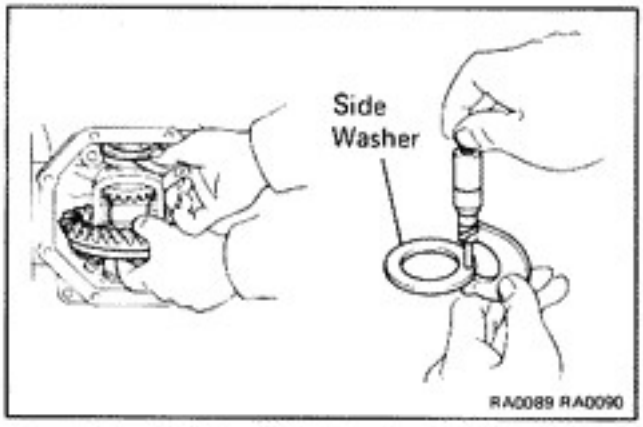
**Backlash: 0.13 – 0.18 mm (0.0051 – 0.0071 in.)**




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

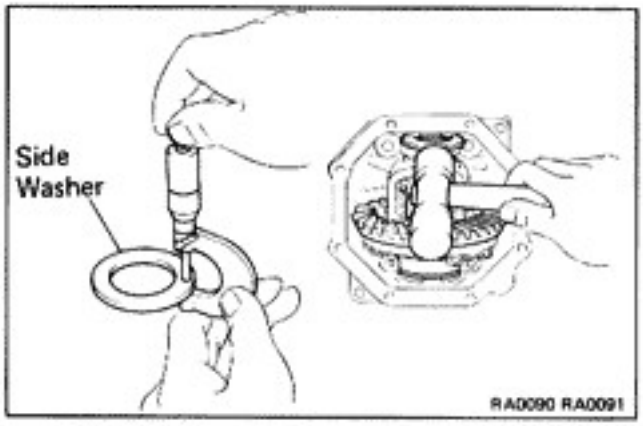
NOTE: There should be no clearance between the washer and case.

Insure that there is ring gear backlash.




## 4. ADJUST SIDE BEARING PRELOAD

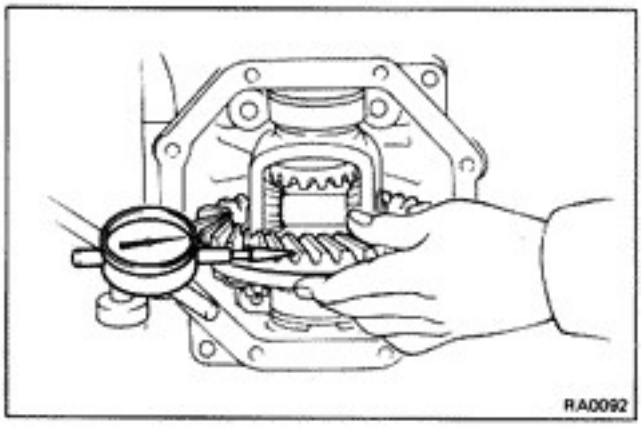
(a) After adjustment with the backlash as refer remove the ring gear teeth plate washer and me the thickness.




(b) Install a new washer of 0.06 – 0.09 mm (0.00 0.0035 in.) thicker than the washer removed.

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

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




(d) Recheck the ring gear backlash.

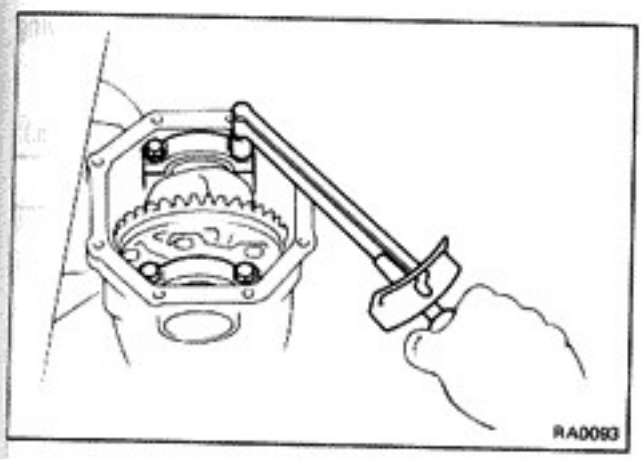
**Backlash: 0.13 – 0.18 mm (0.0051 – 0.0071 in.)**

(e) If not within standard, adjust by either increasi decreasing the washers on both sides by equal am

NOTE: The backlash will change about 0.02 mm (0. in.) with 0.03 mm (0.0012 in.) alteration of the washer.


Washer thickness

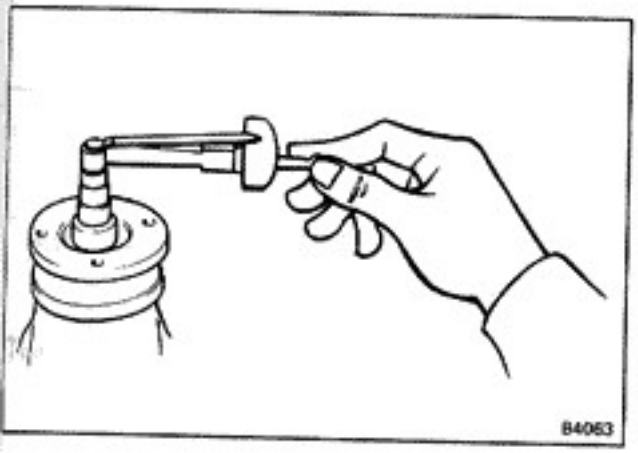
| Thickness | Thickness |
|---|---|
| 2.57 – 2.59 (0.1012 – 0.1020) | 2.93 – 2.95 (0.1154 – 0.11 |
| 2.60 – 2.62 (0.1024 – 0.1031) | 2.96 – 2.98 (0.1165 – 0.11 |
| 2.63 – 2.65 (0.1035 – 0.1043) | 2.99 – 3.01 (0.1177 – 0.11 |
| 2.66 – 2.68 (0.1047 – 0.1055) | 3.02 – 3.04 (0.1189 – 0.11 |
| 2.69 – 2.71 (0.1059 – 0.1067) | 3.05 – 3.07 (0.1201 – 0.12 |
| 2.72 – 2.74 (0.1071 – 0.1079) | 3.08 – 3.10 (0.1213 – 0.12 |
| 2.75 – 2.77 (0.1083 – 0.1091) | 3.11 – 3.13 (0.1224 – 0.12 |
| 2.78 – 2.80 (0.1094 – 0.1102) | 3.14 – 3.16 (0.1236 – 0.12 |
| 2.81 – 2.83 (0.1106 – 0.1114) | |




**5. INSTALL SIDE BEARING CAPS**

Align the marks on the cap and carrier.

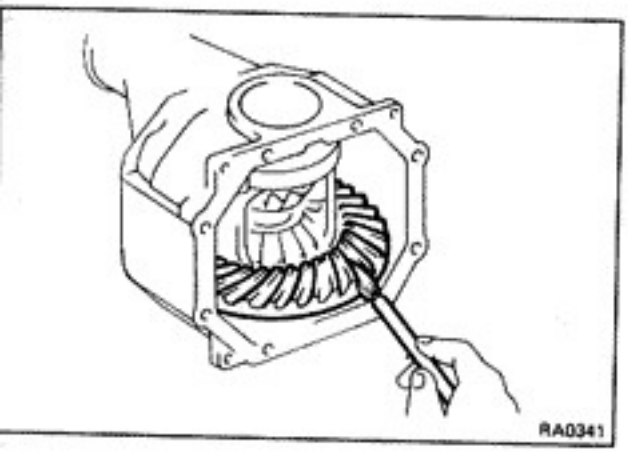
**Torque: 800 kg-cm (58 ft-lb, 78 N·m)**




**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)**



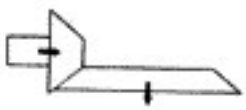

**7. INSPECT TOOTH CONTACT BETWEEN RING GEA AND DRIVE PINION**

(a) Coat 3 or 4 teeth at three different positions on th ring gear with red lead.

(b) Hold the companion flange firmly and rotate the rin gear in both directions.

(c) Inspect the tooth pattern.

Heel Contact



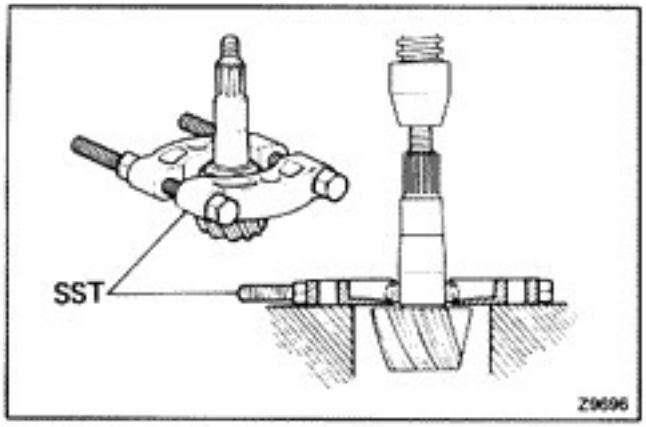
Face Contact

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

Proper Contact

Toe Contact

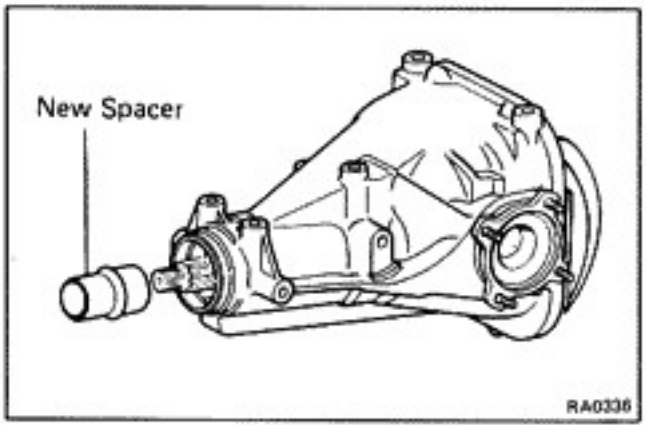
Flank Contact




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

Washer thickness mm

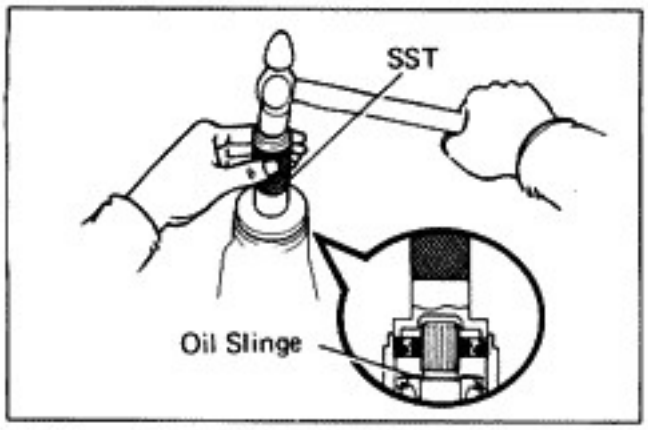
| Thickness | Thickness |
|---|---|
| 2.24 (0.0882) | 2.51 (0.0988) |
| 2.27 (0.0894) | 2.54 (0.1000) |
| 2.30 (0.0906) | 2.57 (0.1012) |
| 2.33 (0.0917) | 2.60 (0.1024) |
| 2.36 (0.0929) | 2.63 (0.1035) |
| 2.39 (0.0941) | 2.66 (0.1047) |
| 2.42 (0.0953) | 2.69 (0.1059) |
| 2.45 (0.0965) | 2.72 (0.1071)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



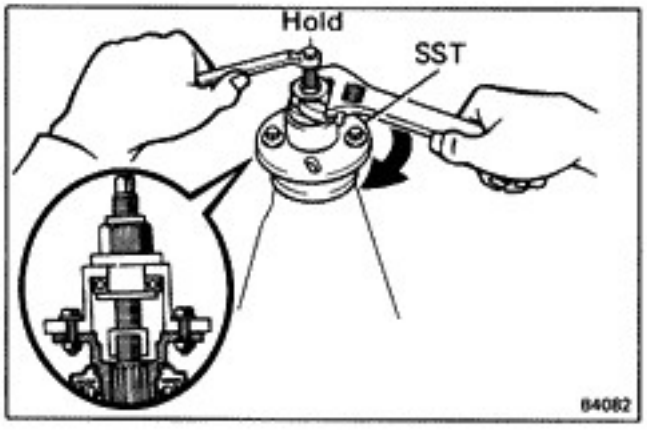

8. **REMOVE COMPANION FLANGE**
**(See step 10 on page RA-24)**

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

10. **INSTALL NEW BEARING SPACER AND FR BEARING**
(a) Install a new bearing spacer on the shaft.
(b) Install the front bearing on the shaft.

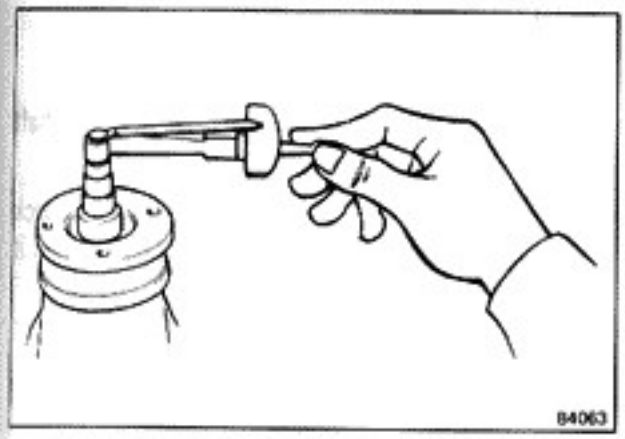



11. **INSTALL OIL SLINGER AND NEW OIL SEAL**
(a) Install the oil slinger facing as shown.
(b) Using SST, drive in a new oil seal.
SST 09316-60010
**Oil seal drive in depth: 1.5 mm (0.059 in.)**
(c) Apply MP grease to the oil seal lip.




12. **INSTALL COMPANION FLANGE**
(a) Using SST, install the companion flange on the sh
SST 09557-22022

(b) Coat the threads of a new nut with MP grease.
(c) Using SST to hold the flange, tighten the nut.
SST 09330-00021




## 13. CHECK FRONT BEARING PRELOAD

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

**Preload:**

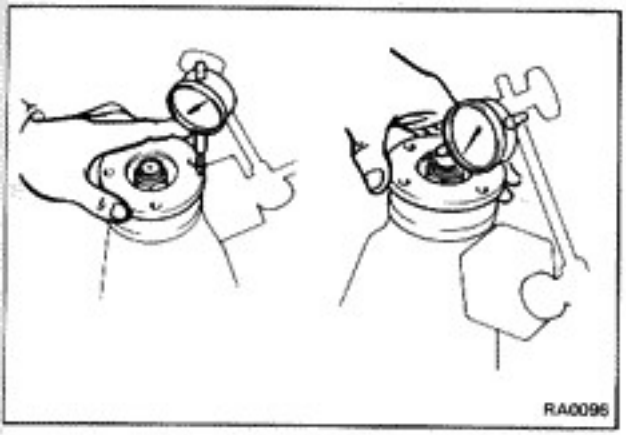
| | |
|---|---|
| **New bearing** | **12 – 19 kg-cm (10.4 – 16.5 in.-lb, 1.2 – 1.9 N·m)** |
| **Reused bearing** | **6 – 10 kg-cm (5.2 – 8.7 in.-lb, 0.6 – 1.0 N·m)** |

(a) If preload is greater than specification, replace the bearing spacer.

(b) 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)**



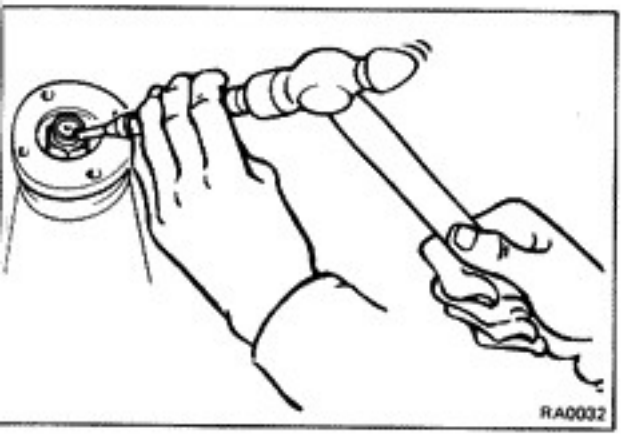

## 14. CHECK RUNOUT OF COMPANION FLANGE

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

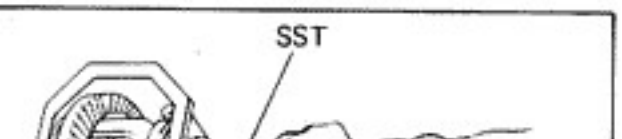
If the runout is greater than the maximum, inspect the bearings.

**Maximum lateral runout: 0.10 mm (0.0039 in.)**

**Maximum radial runout: 0.10 mm (0.0039 in.)**



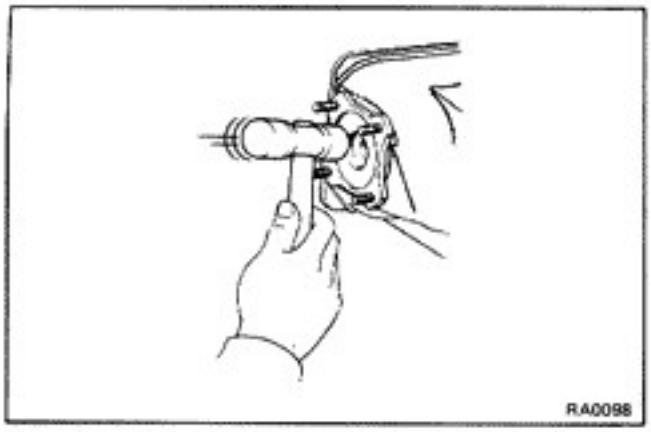

## 15. STAKE DRIVE PINION NUT




## 16. INSTALL SIDE GEAR SHAFT OIL SEAL

(a) Coat the oil seal lip with MP grease No. 2.

(b) Using SST, drive in the oil seal until it is flush with

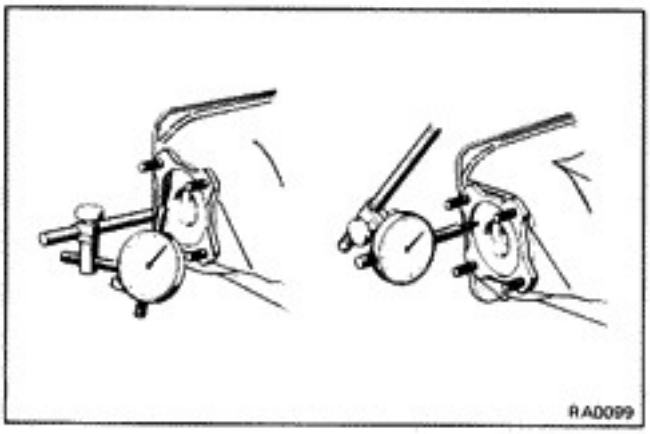



17. INSTALL SIDE GEAR SHAFT

(a) Before installing the shaft, replace the snap ring.

(b) Using a plastic hammer, drive in the side gear until it contacts the pinion shaft.

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

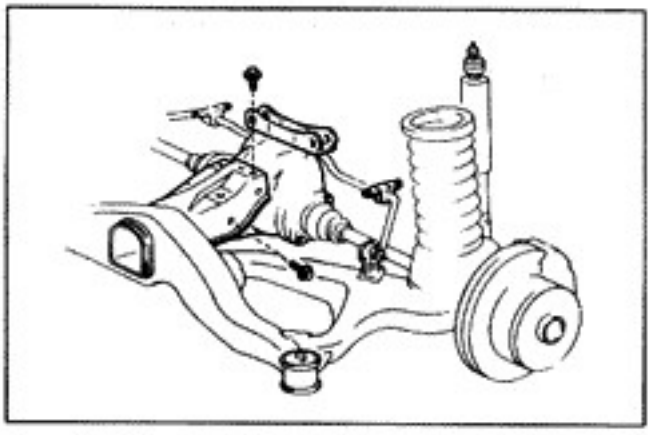



18. MEASURE SIDE GEAR SHAFT RUNOUT

**Maximum runout: 0.20 mm (0.0079 in.)**

If the runout is greater than the maximum, replace the 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 ca 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 FR COMPANION FLANGE

4. CONNECT DRIVE SHAFT

**Torque: 700 kg-cm (51 ft-lb, 69 N·m)**

5. INSTALL DRAIN PLUG AND FILL DIFFERENT WITH GEAR OIL

**Hypoid gear oil: w/LSD use LSD oil only**

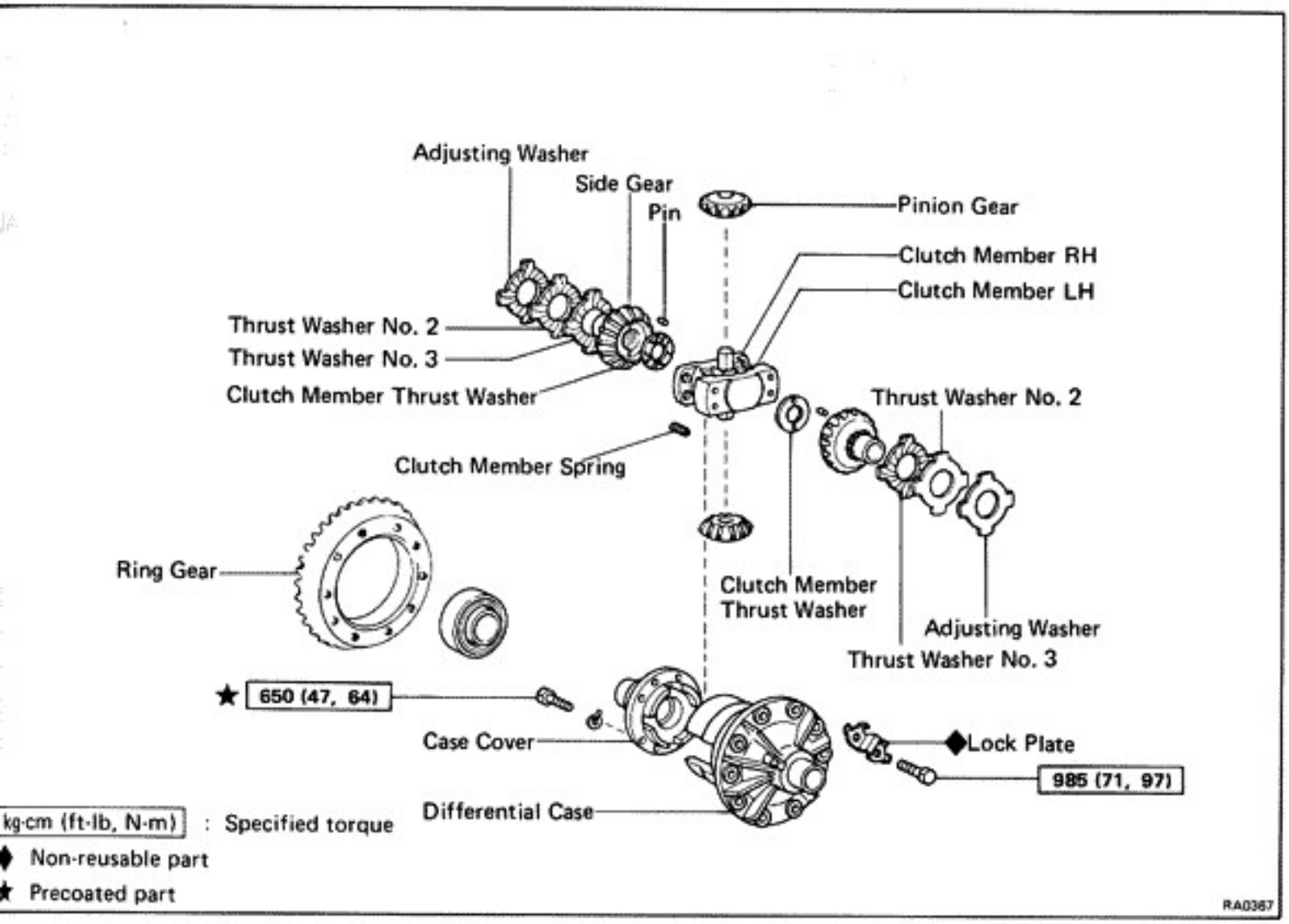
# LIMITED SLIP DIFFERENTIAL

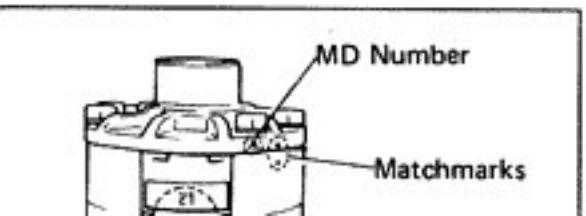
## Preparation of disassembly

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.

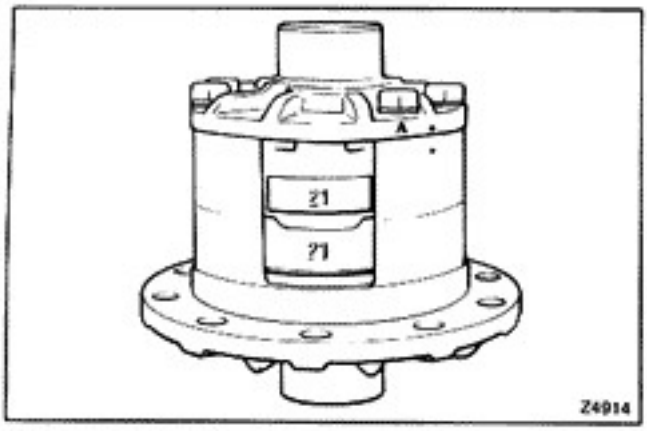
## COMPONENTS



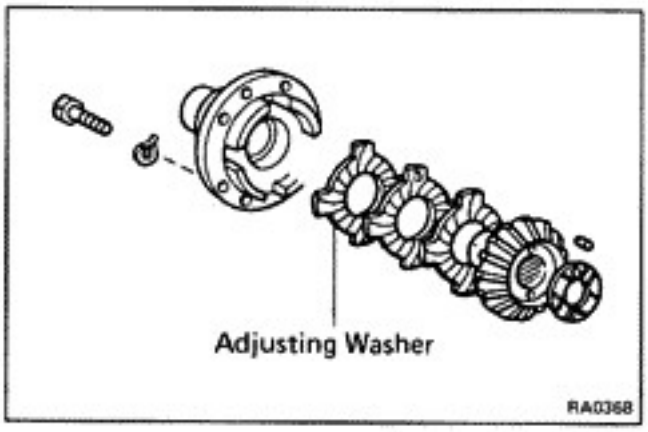

## DISASSEMBLY OF LIMITED SLIP DIFFERENTIAL

1. PUT MATCHMARKS ON CASE AND CASE COVER



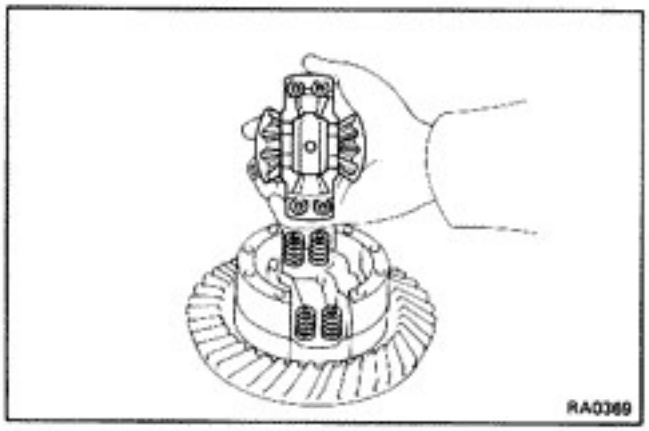

3. **REMOVE CASE BOLTS AND CASE COVER WITH GEAR**

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



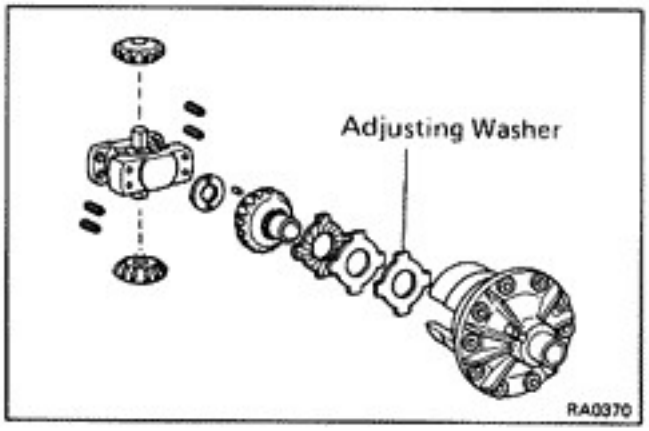

4. **REMOVE FOLLOWING PARTS FROM CASE CO**

(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 DIFFEREN CASE:**

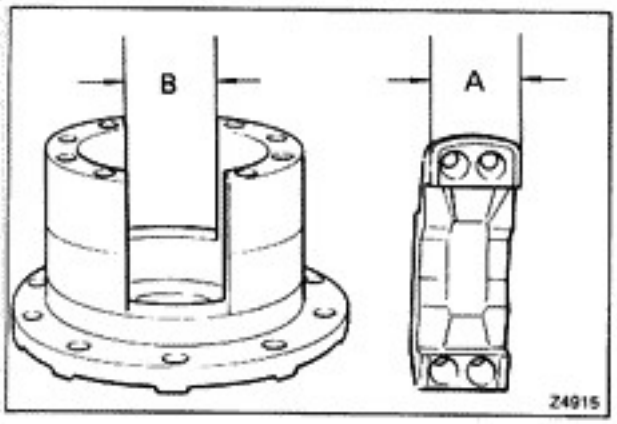
(a) Clutch member RH with pinion gear




(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




2. CHECK CLUTCH MEMBER LH AND DIFFERENTIAL CASE

Check the clearance between left clutch member and differential case.

Specifications mm (in.)

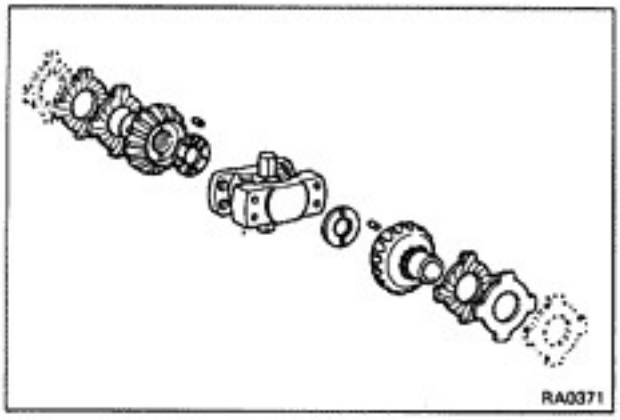
| | | |
|---|---|---|
| Clutch member (A) | 41.975–42.000 | (1.6526–1.6535) |
| Differential case (B) | 42.000–42.025 | (1.6535–1.6545) |
| Clearance | 0–0.050 | (0–0.0020) |

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.

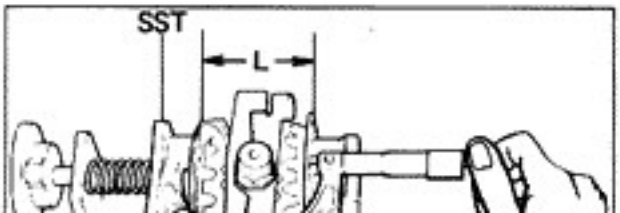



(b) Assemble the following parts to SST.

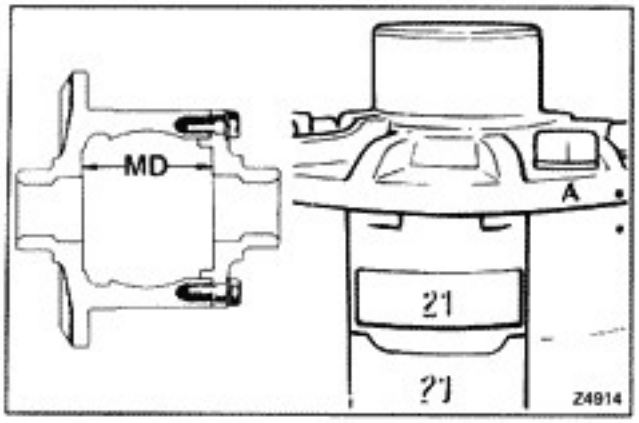
SST 09411-22011

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



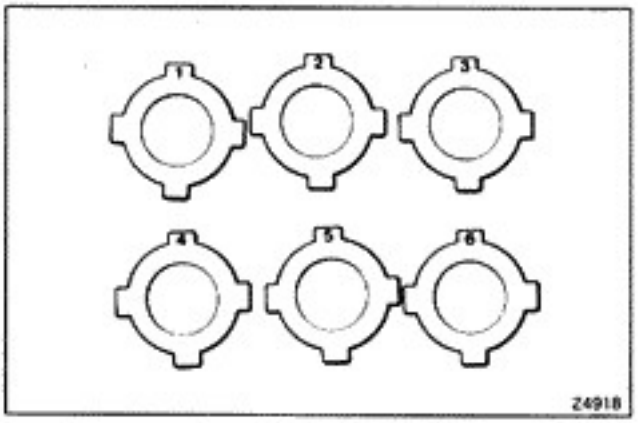

(c) Loosen the nut of SST and hold the parts with spring tension.




(e) Differential case mounting dimension (MD) has be classified and code letters are punched on t differential case.

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) |



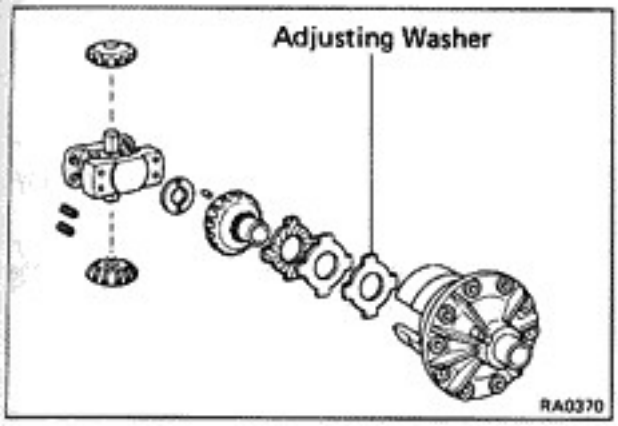

(f) Select the adjusting washers by combining the dime sion "MD" (mark punched on case) and dimensi "L" in the adjusting washer selection table.

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) |

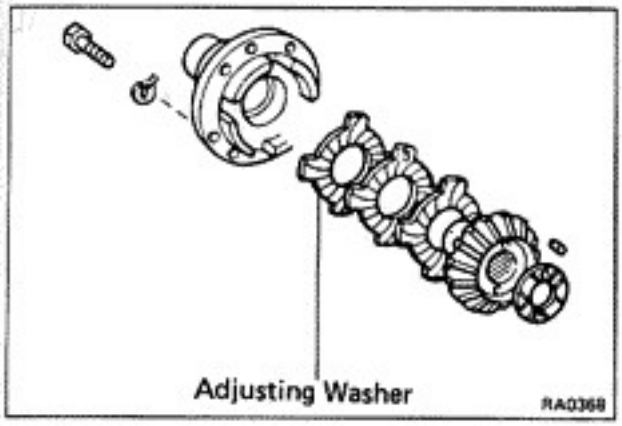
Adjusting washer selection table

| Measured assembled distance of thrust washer No. 1 and No. 2, etc. (mm) | Differential case code mark A | B | C | D | E | Measured assembled distance of thrust washer No. 1 and No. 2, etc. (in.) |
|---|---|---|---|---|---|---|
| 70.91 | | | | | | 2.7917 |
| .92 | | | | | | 2.7921 |
| .93 | | | | | | 2.7925 |
| .94 | | | | | | 2.7929 |
| .95 | | | | ⑥+⑤ | | 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 | | | ④+④ | | | 2.7980 |
| .08 | | | | | | 2.7984 |
| .09 | | | | | | 2.7988 |
| .10 | | ④+③ | | | | 2.7992 |
| .11 | | | | | | 2.7996 |
| .12 | | | | | | 2.8000 |
| .13 | | | | | | 2.8004 |
| .14 | | | | | | 2.8008 |
| .15 | | | | | | 2.8012 |
| .16 | | | | | | 2.8016 |
| .17 | | | ③+③ | | | 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 |

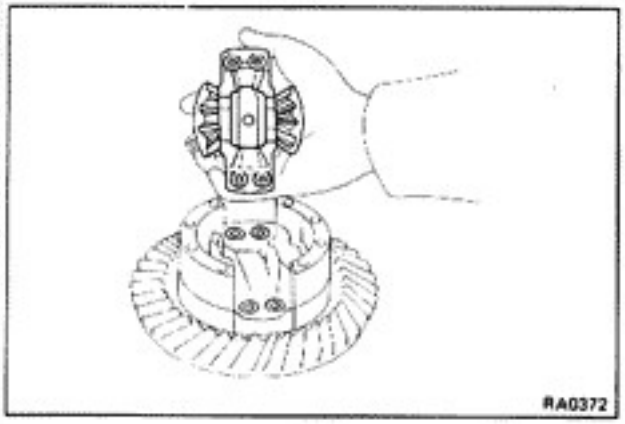



(g) Install following parts onto the differential case.
- Adjusting washer
- Thrust washer No. 2
- Thrust washer No. 3
- Side gear
- Clutch member thrust washer
- Clutch member LH

NOTE: Do not install the clutch member spring.
- Clutch member RH with pinion gear

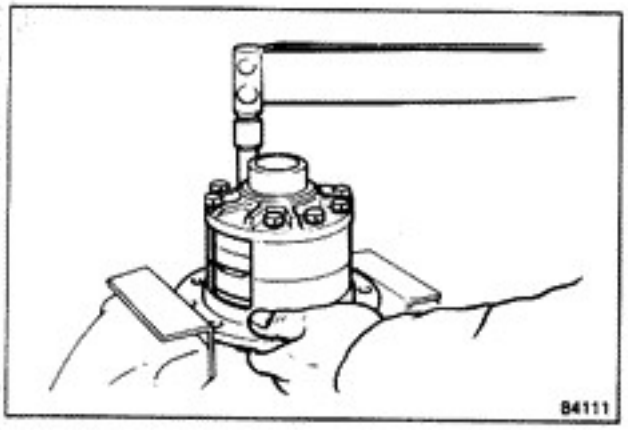



(h) Install following parts onto the differential case cover.
- Adjusting washer
- Thrust washer No. 2
- Thrust washer No. 3
- Side gear
- Clutch member thrust washer




(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.

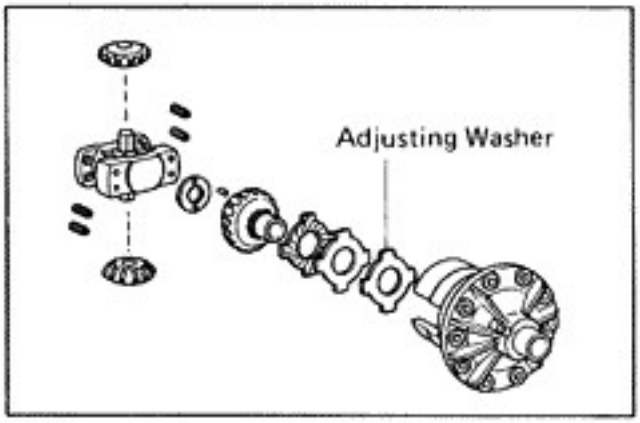
## ASSEMBLY OF DIFFERENTIAL CASE

(See page RA-37)

1. **WASH DIFFERENTIAL CASE ASSEMBLY**

Wash the differential case and bolts with trichloroet lene.

NOTE: Other cleaning solvent may be used if it has same degreasing effect as trichloroethylene.




2. **INSTALL FOLLOWING PARTS ON TO DIFFERENTI CASE**

NOTE: Coat the parts with gear oil for LSD.

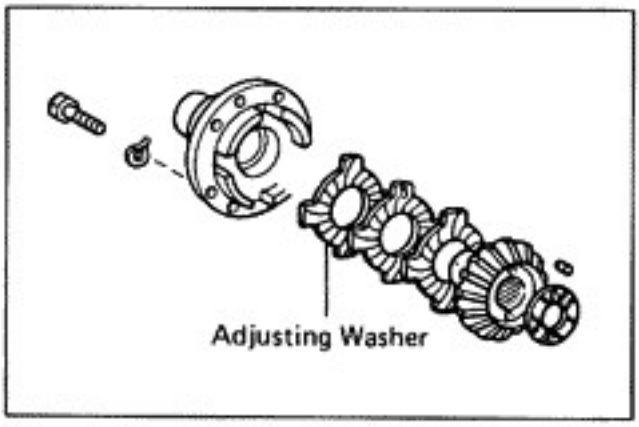
- Adjusting washer

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.

- Clutch member LH
- Clutch member spring
- Clutch member RH with pinion gear



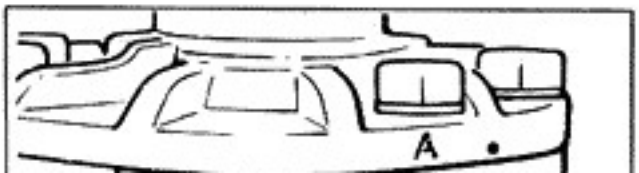

3. **INSTALL FOLLOWING PART ONTO DIFFERENTI CASE COVER**

- Adjusting washer

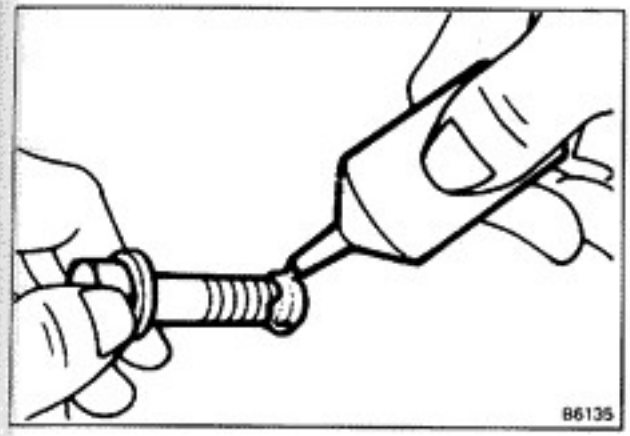
NOTE: Face the oil groove toward the clutch plate.

- 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.

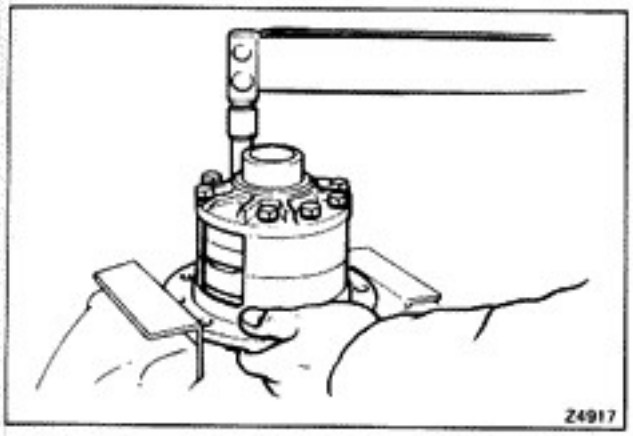
NOTE: Use Lock-Tight as the retaining compound.

NOTE: Method of applying Lock-Tight.

(1) Apply Lock-Tight Primer T to the case threads an the mounting bolts, and allow to dry thoroughly.

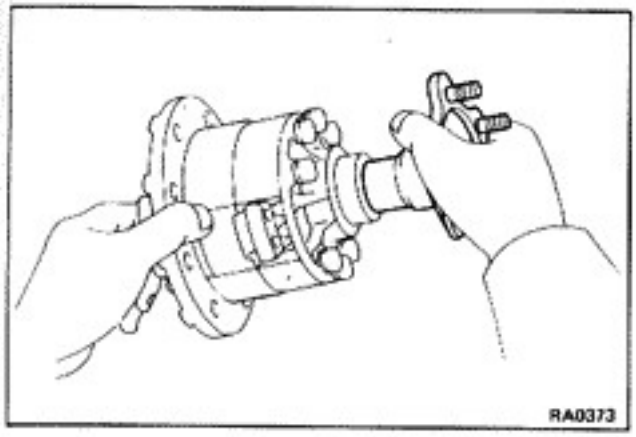
(2) Apply Lock-Tight to the case threads and the bolt and install the bolts.

(3) Allow to stand at least 3 hours after tightening th 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 mean and check to see that they turn smoothly.

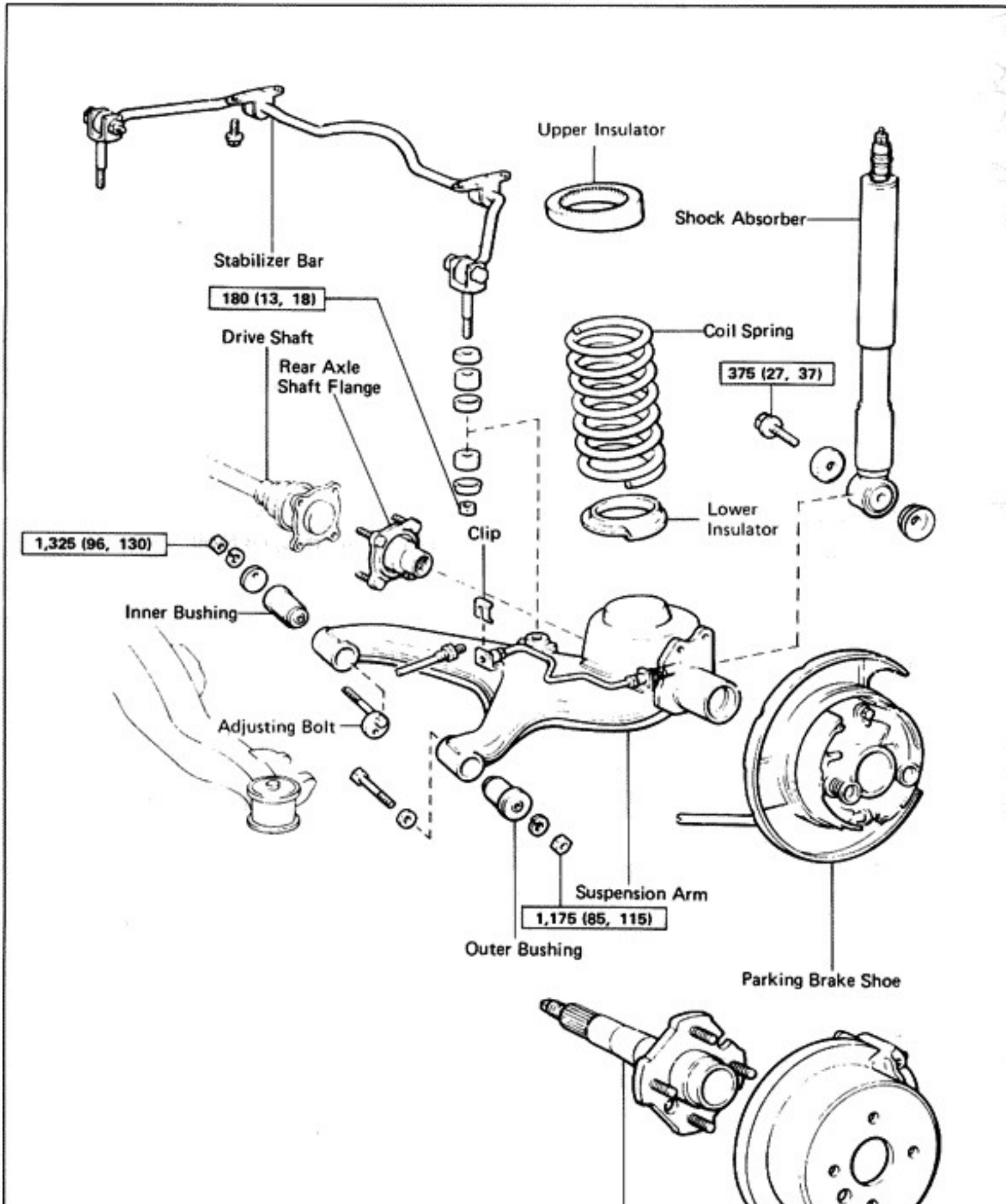
**6. INSTALL SIDE BEARING (See page RA-28)**

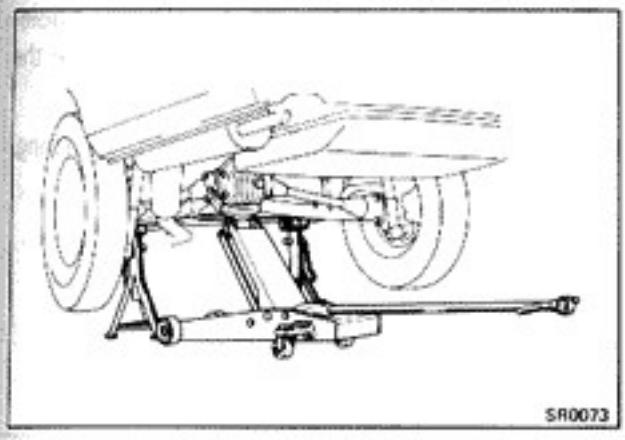
## INSTALLATION OF DIFFERENTIAL

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

# IRS TYPE REAR SUSPENSION

## COMPONENTS



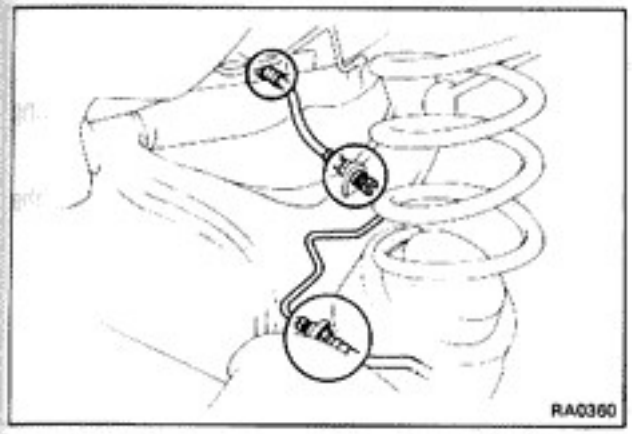



# Coil Spring and Rear Shock Absorber

## REMOVAL OF COIL SPRING AND SHOCK ABSORBER

### 1. JACK UP VEHICLE

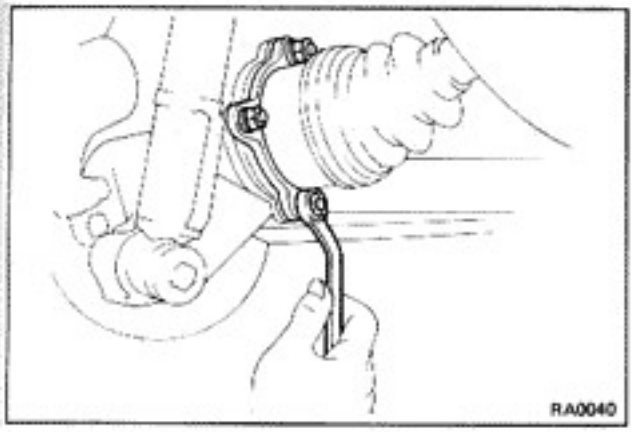
Jack up the differential carrier assembly and support th rear suspension member with stands.




### 2. REMOVE BRAKE HOSE CLIPS

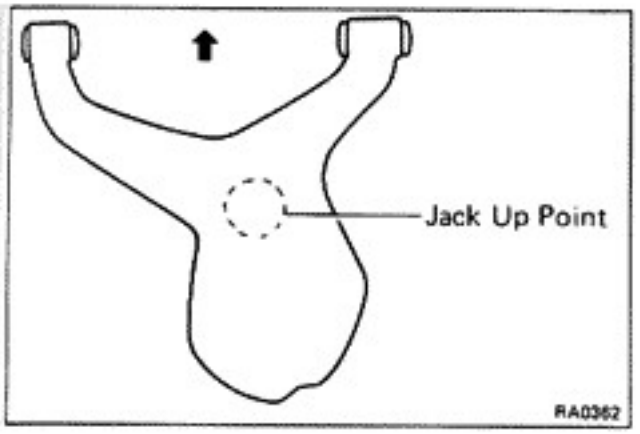
### 3. REMOVE STABILIZER BAR END

Disconnect the nut, cushion and retainer from suspensio arm.




### 4. REMOVE DRIVE SHAFT

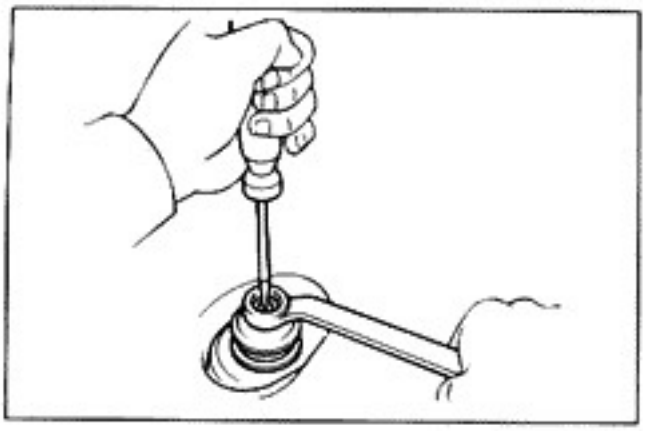
Remove the nut holding the rear drive shaft.




### 5. LEAVE A JACK UNDER SUSPENSION ARM

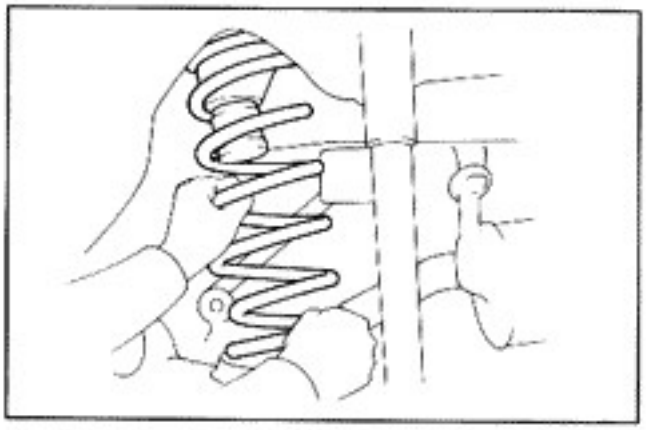
### 6. REMOVE REAR SHOCK ABSORBER

(a) Remove the bolt holding the shock absorber to th rear suspension arm and disconnect the shock absorber



(b) If replacing the shock absorber, remove the nut h
ing the shock absorber to the body, and remove
shock absorber.

NOTE: Use a screwdriver to keep the shaft from turn

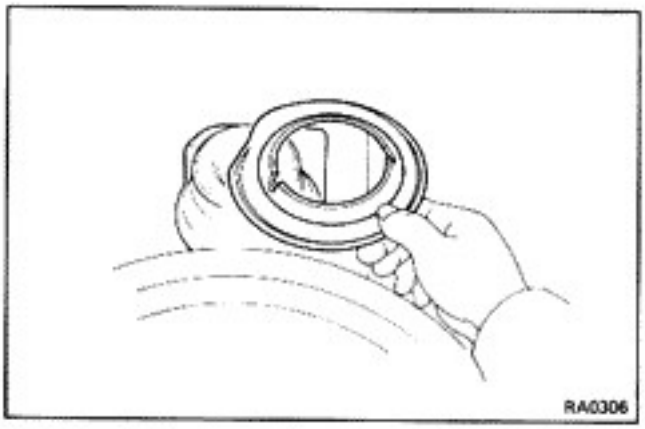


### 7. REMOVE REAR COIL SPRING

(a) Start to lower the rear suspension arm.

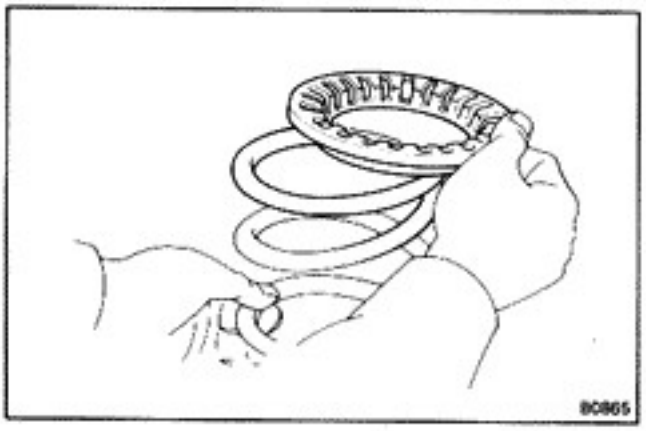
NOTE: Be careful not to pull the brake line and par
brake cable.

(b) While lowering the rear suspension arm, remove
coil spring and upper and lower insulators.




## INSTALLATION OF COIL SPRING AND SHOCK ABSORBER

### 1. PUT LOWER INSULATOR ON REAR SUSPENSION ARM

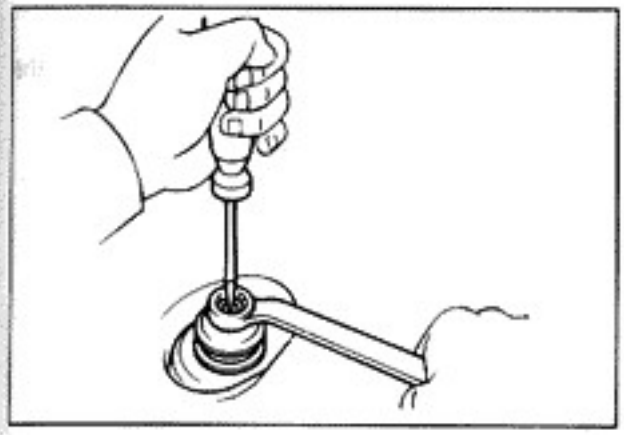



### 2. PUT UPPER INSULATOR ON COIL SPRING

### 3. INSTALL COIL SPRING

### 4. CHECK POSITION OF LOWER INSULATOR

(a) Jack up the rear suspension arm.

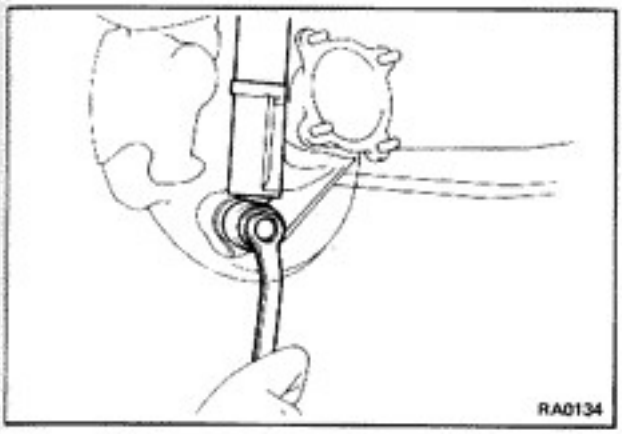


5. **INSTALL SHOCK ABSORBER**

(a) Connect the shock absorber to the body with the nuts. Hold the shaft with a screwdriver.

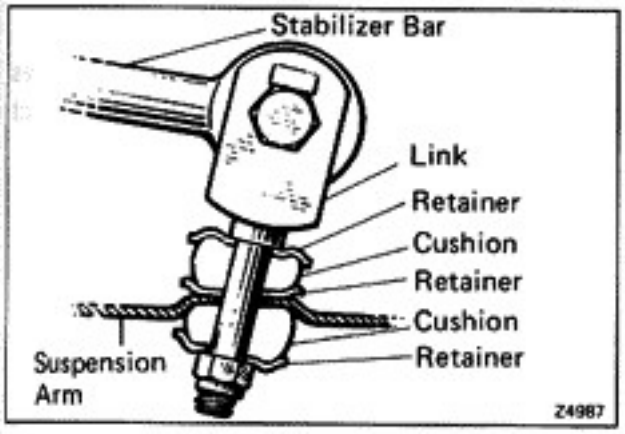
Torque the nut.

**Torque: 250 kg-cm (18 ft-lb, 25 N·m)**




(b) Connect the shock absorber to the rear suspension arm with the bolt. Torque the bolt.

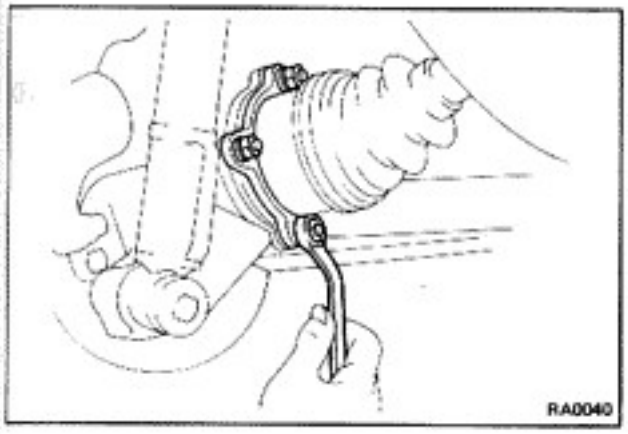
**Torque: 375 kg-cm (27 ft-lb, 37 N·m)**




6. **CONNECT STABILIZER BAR END TO REAR SUSPENSION**

Connect the cushion, retainer to the rear suspension arm with the nut. Torque the nut.

**Torque: 180 kg-cm (13 ft-lb, 18 N·m)**

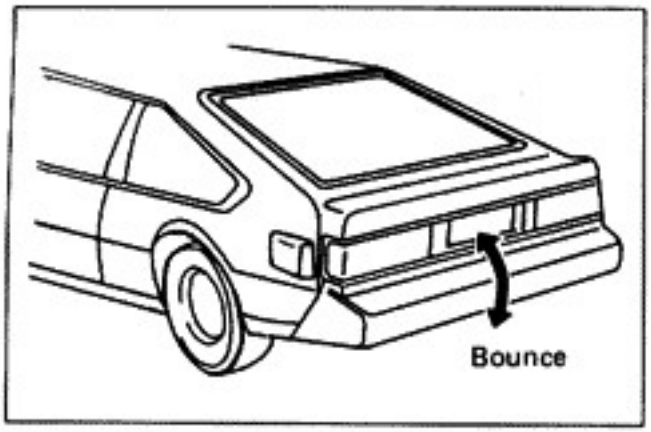



7. **INSTALL DRIVE SHAFT**

Connect the drive shaft to the rear axle shaft with the nuts.

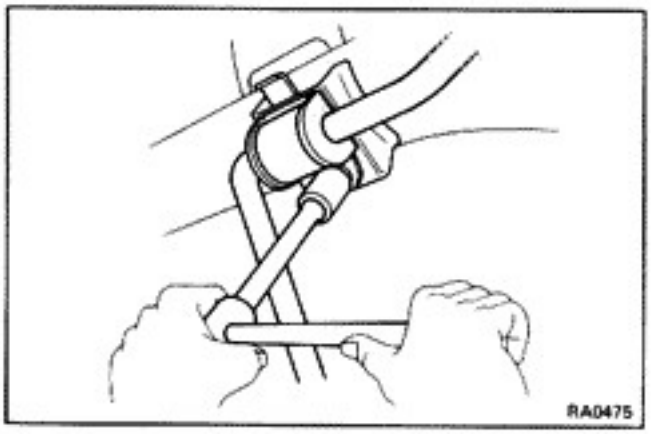
**Torque: 700 kg-cm (51 ft-lb, 69 N·m)**

8. **INSTALL BRAKE HOSE CLIPS**




**9. REMOVE STAND**

Remove the stands and bounce the car to stabilize suspension.

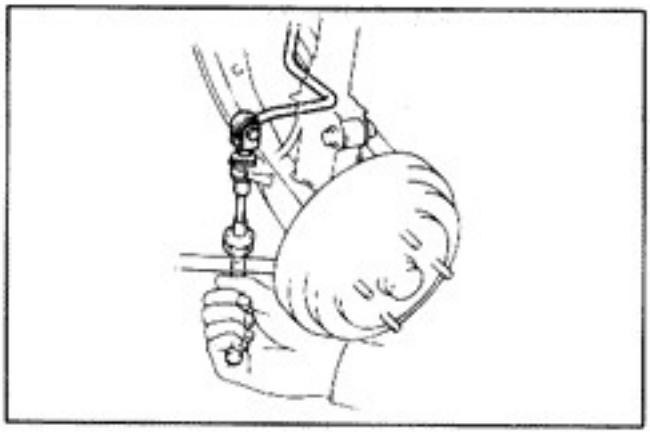



# Rear Stabilizer Bar

(See page RA-44)

## REMOVAL OF REAR STABILIZER BAR

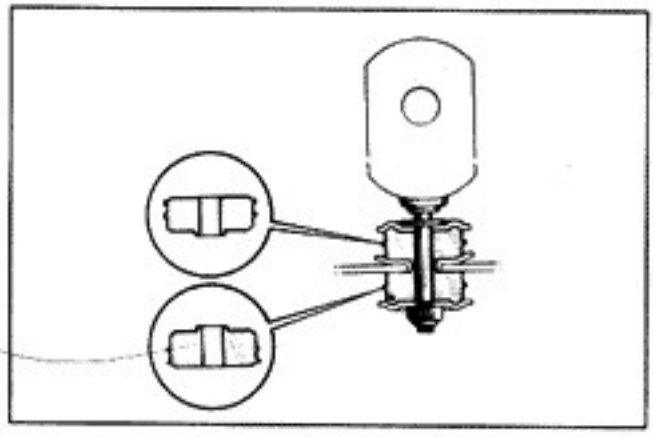
**1. REMOVE STABILIZER BAR BRACKETS**



**2. REMOVE STABILIZER BAR FROM ARMS**

Remove the nuts, cushions, and links holding both si of the stabilizer bar from suspension arms, and disconn the stabilizer bar.

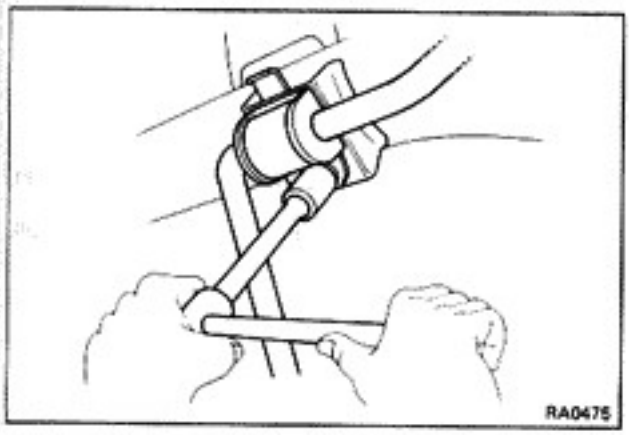
## INSTALLATION OF REAR STABILIZER BAR



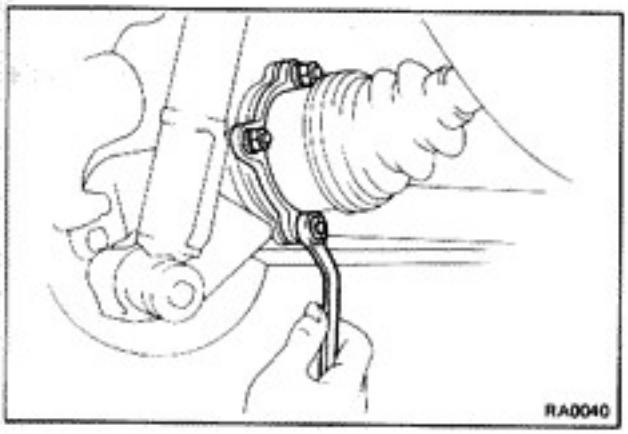
**1. ASSEMBLE STABILIZER LINK SUBASSEMBLY A INSTALL LINK TO ARM**

**2. INSTALL STABILIZER BAR TO LINK**

Connect the stabilizer bar on both sides of the link w bolts, collars, cushions and nut.




3. INSTALL STABILIZER BAR BRACKET TO DIFFERENTIAL SUPPORT MEMBER

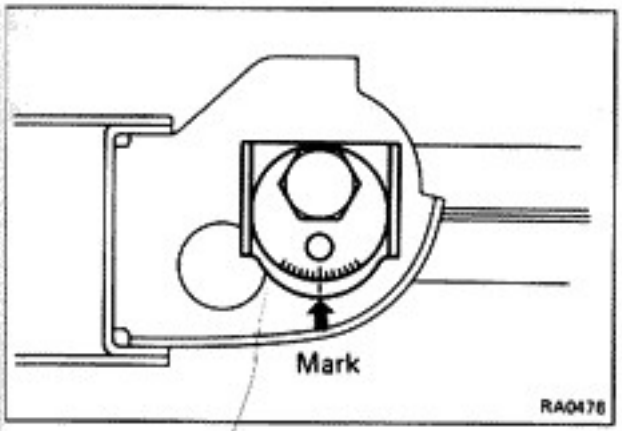



# Rear Suspension Arm

(See page RA-44)

## REMOVAL OF REAR SUSPENSION ARM

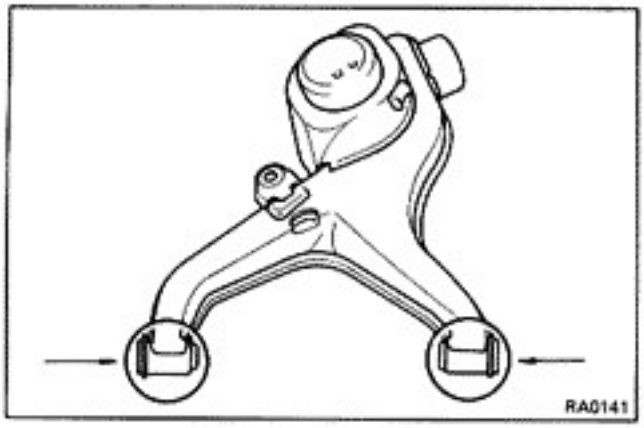
1. DISCONNECT STABILIZER BAR FROM LOWER ARM
2. DISCONNECT REAR DRIVE SHAFT
3. REMOVE REAR AXLE SHAFT FLANGE
4. REMOVE BRAKE DRUM OR DISC ROTOR
5. REMOVE REAR AXLE SHAFT
6. REMOVE BACKING PLATE OR DUST COVER
7. DISCONNECT BRAKE LINE
8. DISCONNECT SHOCK ABSORBER FROM LOWER ARM
9. REMOVE COIL SPRING




10. REMOVE REAR SUSPENSION ARM AND LOWER CONTROL BUSHING

NOTE: Remember where the complete mark is when removing the suspension arm.

(a) Remove the two mounting bolts.
(b) Remove the camber adjusting cam.
(c) Remove the suspension arm.

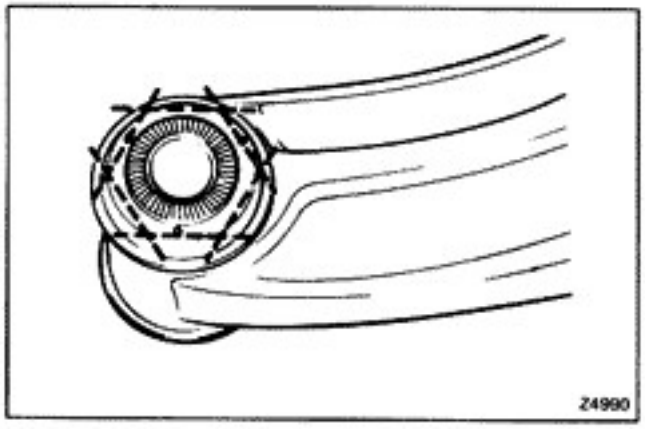



## REPLACEMENT OF REAR SUSPENSION ARM BUSHING

### 1. CHECK ARM AND BUSHING

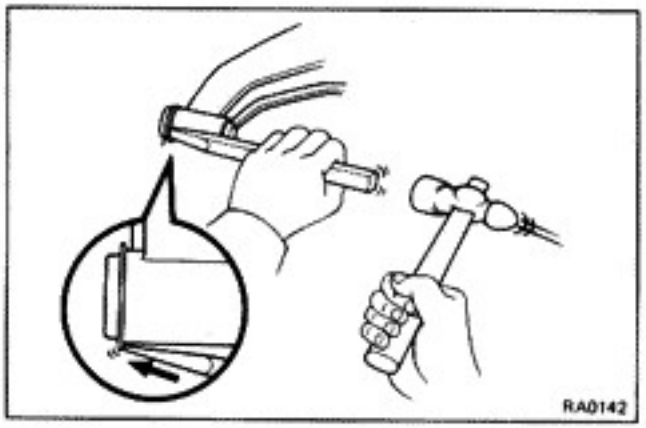
(a) Check the bushing for wear, cracks or deteriorat

(b) Check the arm for damage, cracks or deformat



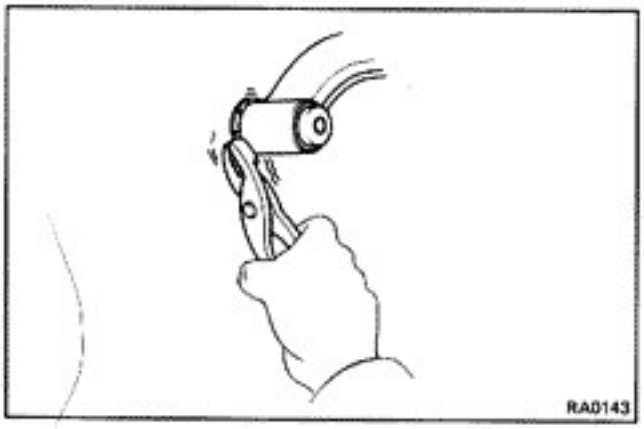

### 2. REPLACE INNER AND OUTER BUSHING

(a) Cut off the flange tip of the bushing as shown in figure.



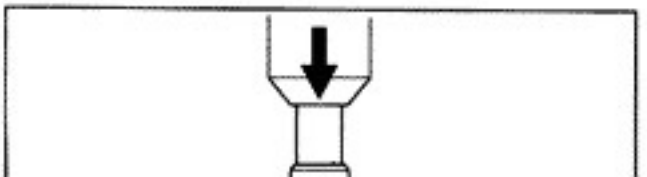

(b) Bend the remaining portions inward with a chisel.

NOTE: Be careful not to damage the flange.



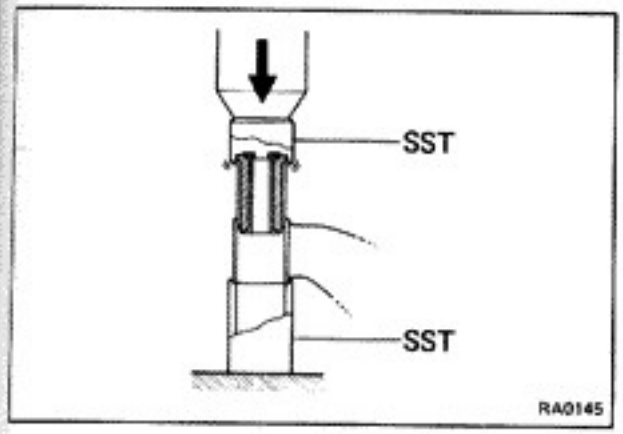

(c) Bend in the flange tips and pull off the flange wi pair of pliers.

Bend the remaining flange portion so the SST ca installed to the lower arm.



(d) Using SST, press out the outer bushing from the

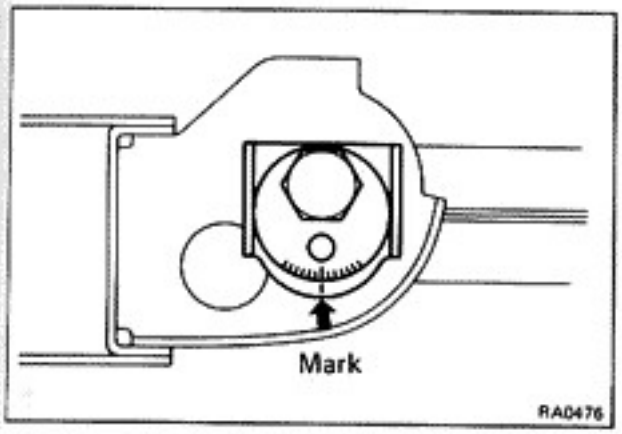
SST 09710-22041
(09710-02040, 09710-02050, 09710-02060)




(e) Using SST, press the outer and inner bushings into the arm.

SST 09710-22041 (09751-02050, 09751-02060)

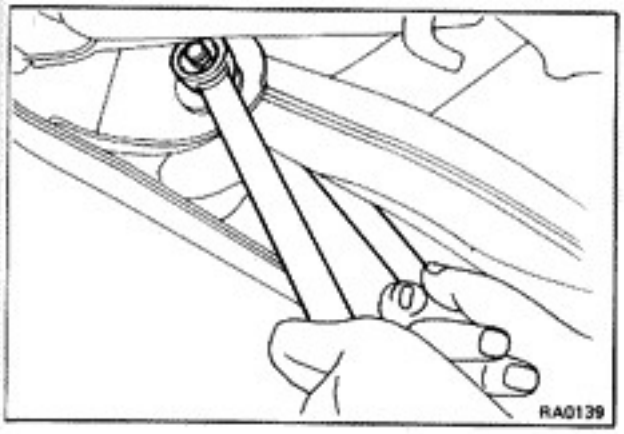
NOTE: Do not allow grease or oil to get on the bushings.




## INSTALLATION OF REAR SUSPENSION ARM

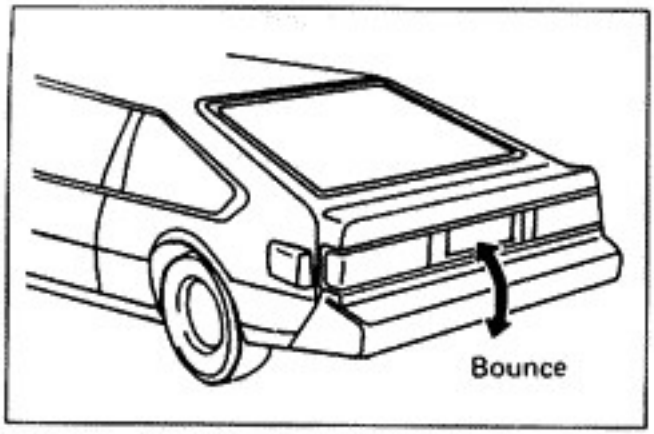
1. INSTALL ARM

(a) Align the complete mark at the same position it was before removal.



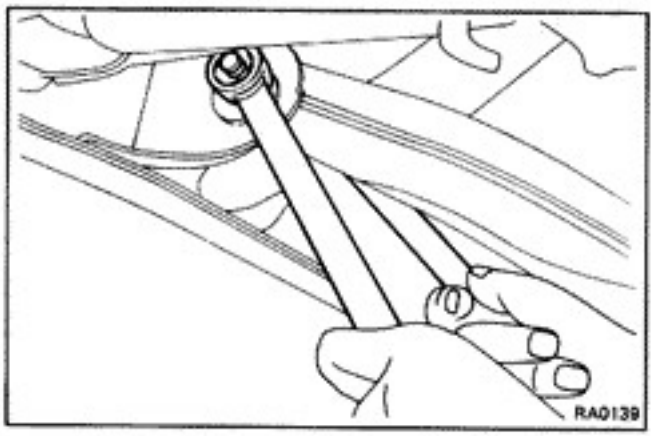

(b) Provisionally tighten the suspension arm.

2. INSTALL COIL SPRING
3. INSTALL SHOCK ABSORBER
4. INSTALL BACKING PLATE OR DUST COVER
5. CONNECT BRAKE LINE
6. CONNECT PARKING BRAKE CABLE
7. INSTALL REAR AXLE SHAFT
8. INSTALL BRAKE DRUM OR DISC ROTOR
9. CONNECT REAR DRIVE SHAFT
10. CONNECT STABILIZER BAR TO LOWER ARM



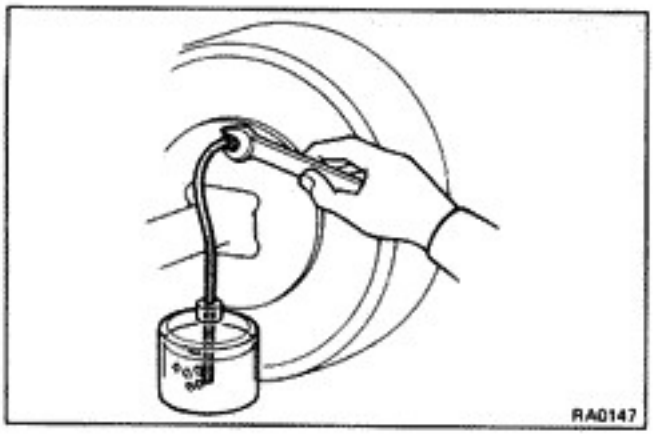

11. LOWER VEHICLE

Lower the vehicle and bounce it several times.




12. TIGHTEN SUSPENSION ARM

Torque: Inside 1,325 kg-cm (96 ft-lb, 130 N·m)
Outside 1,175 kg-cm (85 ft-lb, 115 N·m)

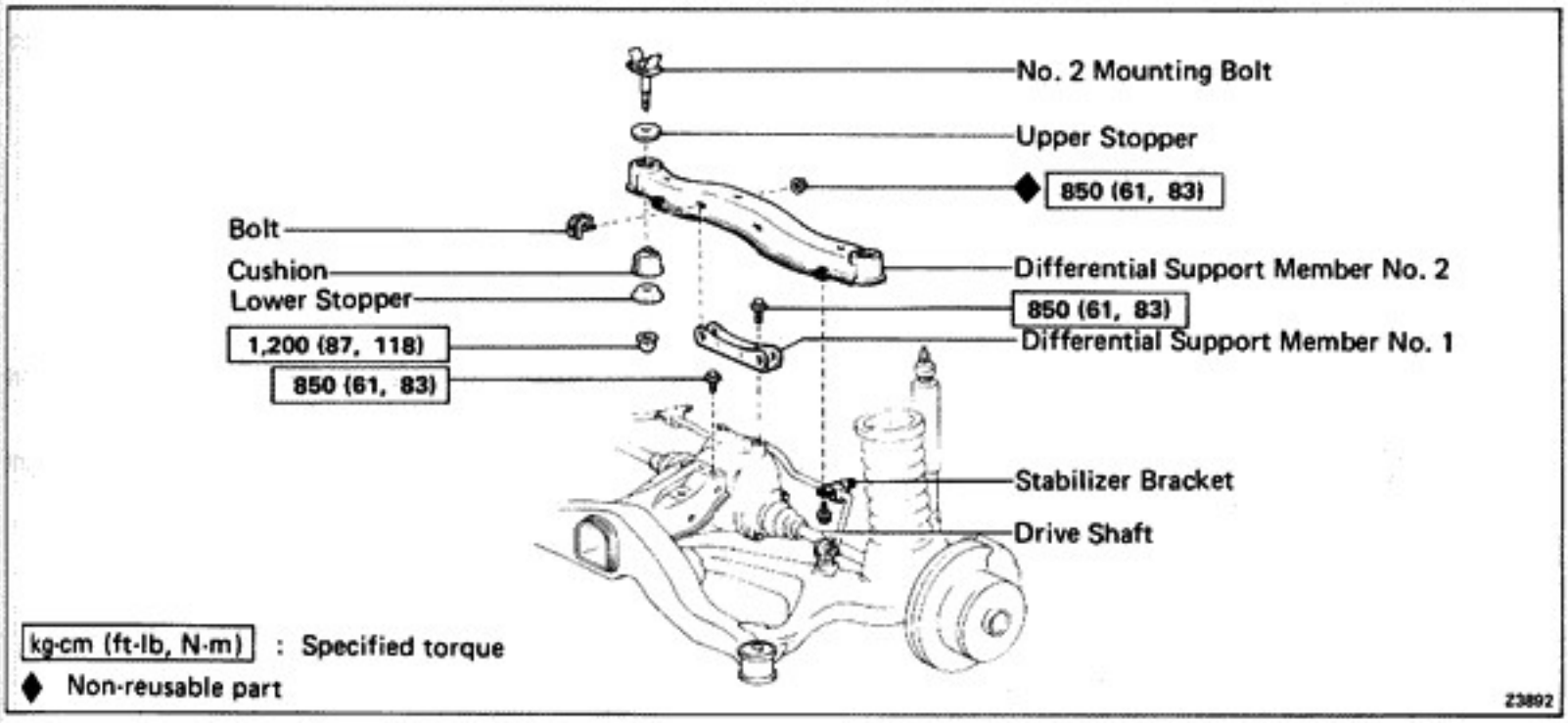


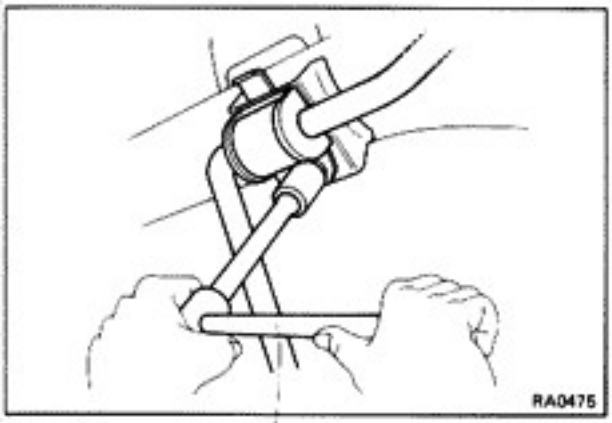

13. CHECK AND ADJUST REAR WHEEL ALIGNME
(See page RA-3)

14. BLEED BRAKE LINE

# DIFFERENTIAL SUPPORT MEMBER

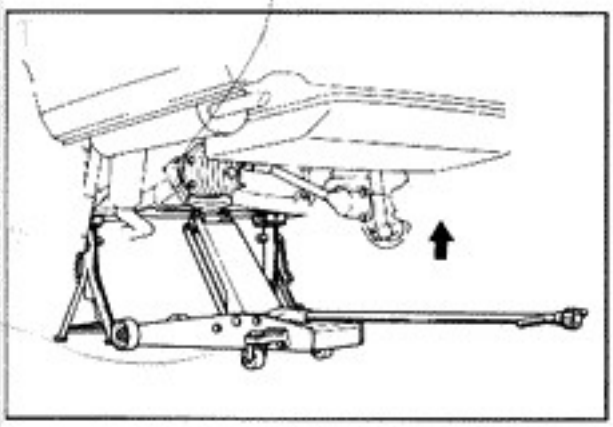
## COMPONENTS



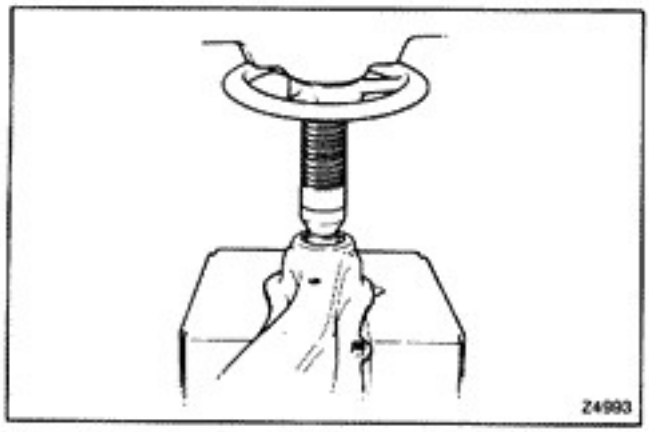

## REMOVAL OF DIFFERENTIAL SUPPORT MEMBER

1. REMOVE STABILIZER BRACKET
2. REMOVE DIFFERENTIAL SUPPORT MEMBER NO. 1 MOUNTING BOLT NUTS
3. DISCONNECT DRIVE SHAFT FROM DIFFERENTIAL



4. REMOVE DIFFERENTIAL CARRIER BOLTS

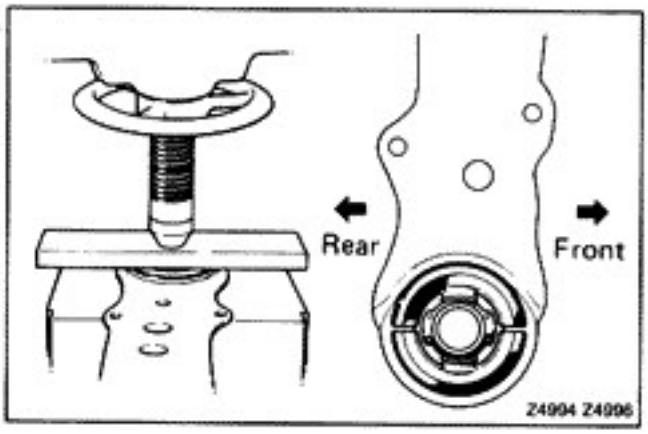
5. REMOVE DIFFERENTIAL SUPPORT MEMBER
   (a) Remove the No. 2 mounting bolt nuts and lower stopper.
   (b) Remove the differential support member with the upper stopper.




## REPLACEMENT OF DIFFERENTIAL SUPPOR MEMBER CUSHION

### 1. REMOVE CUSHION

Using a press, press out the cushion from the supp member.



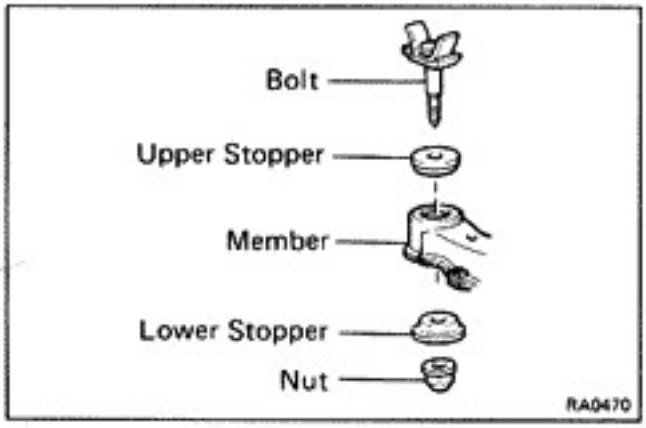

### 2. INSTALL NEW CUSHION

Using a press, press the new cushion into the sup member.

NOTE: Assemble the cushion with the recesses at r angle to the support member.

### 3. CHECK DIFFERENTIAL SUPPORT MEMBER

If the support member is damaged or worn, replace it.




## INSTALLATION OF DIFFERENTIAL SUPPOR MEMBER

### 1. INSTALL SUPPORT MEMBER

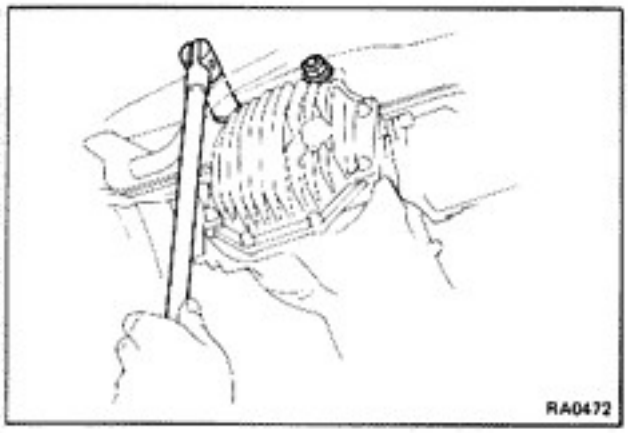
(a) Put upper stopper on member.

(b) Install the support member and lower stopper w nuts.

NOTE: Hand tighten the nuts.

### 2. INSTALL DIFFERENTIAL CARRIER BOLT

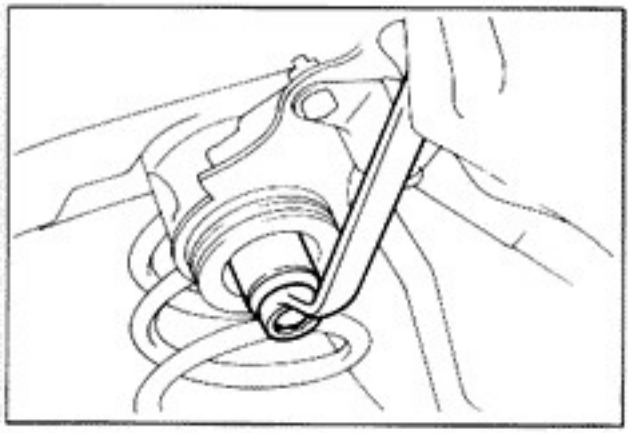
Install the differential carrier bolts.




3. **INSTALL DIFFERENTIAL SUPPORT MEMBER MOUNTING BOLT NO. 1**

Install the No. 1 mounting bolts to the support member with nuts. Torque the nuts.

**Torque: 850 kg-cm (61 ft-lb, 83 N·m)**



4. **TIGHTEN SUPPORT MEMBER NUTS**

Torque the nuts.

**Torque: 1,200 kg-cm (87 ft-lb, 118 N·m)**

5. **CONNECT DRIVE SHAFT**

6. **INSTALL STABILIZER BAR BRACKET**
**(See page RA-49)**