

# Driveshaft and Axe

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## GENERAL

## SPECIFICATIONS

EIJB0015

## PROPELLER SHAFT

ITEMS		SPECIFICATION
Length x O.D mm(in)		2022 x 76.2 (79.6 x 3)
Front mm(in)		967 x 76.2 (38 x 3)
Rear mm(in)		1055 x 76.2 (41.5 x 3)
Clearance between snap ring and groove		
Wall of yoke		0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)
Runout		0.5 mm (0.020 in) or less

NOTE) Propeller shaft length indicates the length between the center point of each joint.

## DRIVESHAFT

Joint type		2.0L (M/T)	2.4L (M/T)	2.7L(A/T)	Rear (2.4L, 2.7L))
Outer		B.J.	B.J.	B.J.	B.J.
Inner		T.J.	T.J.	D.O.J.	D.O.J.
Maximum permissible joint angle	Outer	45.3°	46.5°	46°	46°
	Inner	23°	23°	22°	22°

B.J. : Birfield joint

D.O.J. : Double offset joint

T.J. : Tripod joint

Limit		
Hub end play	mm (in)	0.008 (0.0003) or less
Wheel bearing torque	Nm (kg·cm, lb·in)	1.88 (18.8, 1.4)

## DIFFERENTIAL

Reduction gear type		Hypoid gear (7.0 in)
Reduction gear ratio		3.800
Final drive gear backlash	mm (in)	0.08 ~ 0.13 (0.003 ~ 0.005)
Differential gear backlash	mm (in)	0 ~ 0.076 (0 ~ 0.003)

## TORQUE SPECIFICATIONS

EIJB0020

Items	Nm	Kg•cm	lb•ft
<b>Propeller shaft</b>			
Yoke flange mounting nut	50–60	500–600	37–44
Center bearing mounting nut	40–50	400–500	29–37
Center bearing to flange mounting	40–50	400–500	29–37
Self locking nut	100–120	1000–1200	73–88
D.O.J. mounting nut	30–40	300–400	22–29
Pinion mounting nut	230–250	2300–2500	168–183
Driveshaft nut	200–260	2000–2600	146–190
Brake caliper to knuckle	65–75	650–750	48–55
Front lower arm ball joint self locking nut	100–120	1000–1200	73–88
Wheel nut	90–110	900–1100	66–83
Knuckle to front strut assemble	100–120	1000–1200	73–88
Stabilizer bar link mounting nut	40–50	400–500	61–37
Tie rod end to knuckle mounting nut	24–34	240–340	18–25
Front axle dust cover mounting	7–11	70–110	5–8
Rear wheel bearing flange nut	200–260	2000–2600	146–253
Rear brake caliper mounting bolt	50–60	500–600	37–44
Trailing arm to rear spindle mounting bolt	80–90	800–900	58–66
Differential mounting rear bracket	80–100	800–1000	58–73
Differential carrier mounting bracket	70–80	700–800	51–58
Differential pinion nut	190–250	1900–2500	139–183

**CAUTION**

**Replace the self-locking nuts with new ones after removal.**

## LUBRICATIONS

EIJB0035

ITEMS	SPECIFIED LUBRICANTS	QUANTITY
Universal joint	ALVANIA EP #2	Required
D.O.J. assembly	REAMAX FS NO.1	95±5 gr.
Center bearing	ALVANIA EP #2	Required
T.J.-B.J. Type driveshaft		
2.0L M/T		
B.J. boot grease	CENTOPLEX 278M/136K	110±6 gr. (joint : 55±3 gr. boot : 55±3 gr.)
T.J. boot grease	KLK TJ 41-182	120±6 gr. (joint : 75±3 gr. boot : 45±3 gr.)
2.4L M/T		
B.J. boot grease	CENTOPLEX 278M/136K	115±6 gr. (joint : 60±3 gr. boot : 55±3 gr.)
T.J. boot grease	KLK TJ 41-182	145±6 gr. (joint : 100±3 gr. boot : 45±3 gr.)
D.O.J.-B.J. Type driveshaft (2.7 A/T)		
B.J. boot grease	CENTOPLEX 278M/136K	135±6 gr. (joint : 70±3 gr. boot : 65±3 gr.)
D.O.J. boot grease	AMBLYGON TA 10/2A	105±6 gr. (joint : 65±3 gr. boot : 40±3 gr.)
D.O.J.-B.J. Type driveshaft (Rear driveshaft)		
B.J. boot grease	CENTOPLEX 278M/136K	115±6 gr. (joint : 60±3 gr. boot : 55±3 gr.)
D.O.J. boot grease	AMBLYGON TA 10/2A	100±6 gr. (joint : 60±3 gr. boot : 40±3 gr.)
Differential carrier	Hipoid gear oil (API GL-5, SEA 80W/90, SHELL SPIRAX AX Equivalent)	1.1 L

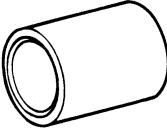
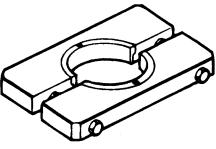
## SEALANTS AND ADHESIVES

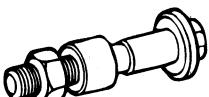
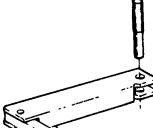
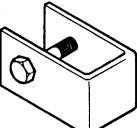
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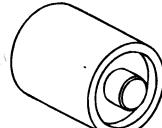
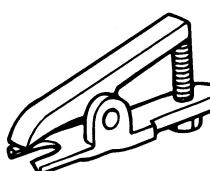
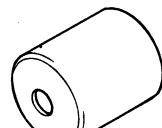
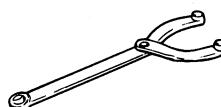
Items	Specified sealants and adhesives
Threaded holes of the drive gear	LOCTITE #262 or equivalent
Differential cover installation surface (to gear carrier)	THREEBOND #1215 or equivalent

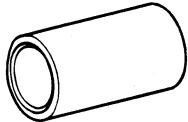
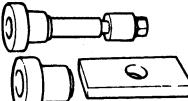
## SPECIAL TOOL

EIJB0050

Tool (Number and Name)	Illustration	Use
09493-43000 Universal joint remover and installer	 D9343000	Removal and installation of the journal bearing (Use with 09432-43100)
09493-43100 Universal joint remover adapter	 Collar D9343100	Removal and installation of the journal bearing (Use with 09452-43000)
09455-21000 Bearing and gear puller	 D5521000	<ul style="list-style-type: none"> <li>Removal of the center bearing</li> <li>Removal of the wheel bearing inner race</li> </ul> (Use with 09545-34100)
09216-21100 Mount bushing remover installer	 D1621100	Removal of the rear hub tone wheel (Use with 09457-34000)
09216-22100 Mount bushing remover and installer	 B1622100	<ul style="list-style-type: none"> <li>Removal of the front wheel bearing outer race (Use with 09532-32000)</li> <li>Installation of the rear hub tone wheel</li> </ul>
09457-34000 Removing plate	 D5734000	Removal of the rear hub tone wheel (Use with 09216-21100)

Tool (Number and Name)	Illustration	Use
09457-21000 Oil seal installer	 E1721000	Installation of the differential drive pinion oil seal (Use with 09500-21000)
09451-21500 Front hub remover and installer	 HFR49-3	Removal and installation of the front hub (Use with 09517-29000 and 09517-3A000)
09517-29000 Knuckle arm bridge	 E1729000	Removal and installation of the front hub (Use with 09517-3A000 and 09517-21500)
09527-4A000 Removing plate	 E274A000	Removal of the differential drive pinion rear bearing
09517-3A000 Knuckle arm bridge adapter	 E173A000	Removal of the front hub (Use with 09517-21500 and 09517-29000)
09517-43001 Bearing puller	 D9-8	<ul style="list-style-type: none"> <li>• Removal of the rear hub bearing</li> <li>• Removal of the differential side bearing</li> </ul>
09532-11600 Preload socket	 HFR49-10	Measurement of the front wheel bearing starting torque (Use with torque wrench)

Tool (Number and Name)	Illustration	Use
09532-32000 Bearing installer	 E3232000	<ul style="list-style-type: none"> <li>Removal of the front wheel bearing outer race (Use with 09216-22100)</li> <li>Installation of the differential drive pinion front bearing outer race (Use with 09500-21000)</li> </ul>
09545-34100 Lower arm bushing remover and installer	 E4534100	Removal of the hub
09568-34000 Ball joint puller	 HFR49-1	Disconnection of the tie rod
09545-26000 Lower arm bushing remover installer	 E4526000	Installation of the hub
09532-32100B Oil seal installer	 E3231200	Installation of the drive pinion rear bearing outer race (Use with 09500-11000)
09517-43401 Working base	 E1743401	Support for the differential carrier
09517-21700 End yoke holder	 E1721700	Removal of the differential self locking nut

Tool (Number and Name)	Illustration	Use
09500-26000 Pinion height gauge tube	 E004A100	Measurement of the drive pinion height
09500-43131 Pinion height gauge	 E0043131	

## TROUBLESHOOTING

EIJB0060

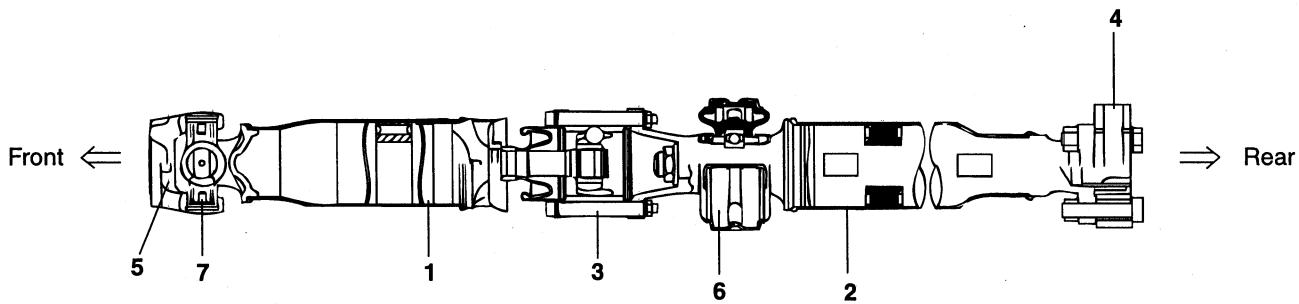
Trouble Symptom	Probable cause	Remedy
Noise at start	Worn journal bearing or center bearing Worn sleeve yoke spline or center yoke spline Loose propeller shaft installation	Replace Replace Retighten
Noise and vibration at high speed	Unbalanced propeller shaft Improper snap ring selection Worn journal bearing center bearing	Replace Adjust the clearance Replace
Vehicle pulls to one side	Scoring of drive shaft ball joint Wear, rattle or scoring of wheel bearing Defective front suspension and steering	Replace Replace Adjust or replace
Vibration	Wear, damage or bending of drive shaft Drive shaft rattle and hub serration Wear, rattle or scratching of wheel bearing	Replace Replace Replace
Shimmy	Defective wheel balance Bent wheel Defective front suspension and steering	Adjust or replace Replace Adjust or replace
Excessive noise	Wear, damage or bending of drive shaft Rattle of drive shaft and worn hub splines Rattle of drive shaft and worn side gear splines Wear, rattle or scoring of wheel bearing Loose hub nut Defective front suspension and steering	Replace Replace Replace Replace Adjust or replace Adjust or replace
Bent cage	Cage damage due to improper handling or tool usage	Replace bearing
Galling	Metal tears on roller end due to overheating, lubricant problem or overloading	Replace bearing Check seals, check for proper lubrication
Cracked inner race	Race cracked due to improper fit, cocking or poor bearing seats	Replace bearing
Etching	Bearing surfaces appear gray or grayish black in color with related etching away of material, usually at roller spacing	Replace bearing Check seals, check for proper lubrication
Brinelling	Surface indentations on the race surface caused by rollers either overloading or vibrating while the bearing is not rotating	Replace bearing
Heat discoloration	Heat discoloration is dark blue resulting from over-load or no lubricant (Yellow or brown color is normal)	Replace bearing Check seals and other parts
Fatigue spalling	Flaking of surface metal resulting from fatigue	Replace bearing Clean all related parts

## PROPELLER SHAFT ASSEMBLY

### PROPELLER SHAFT

#### COMPONENTS

EIJB0070



1. Front propeller shaft
2. Rear propeller shaft
3. D.O.J. assembly
4. Rubber coupling
5. Flange yoke
6. Center bearing assembly
7. Universal joint assembly

#### Removal steps

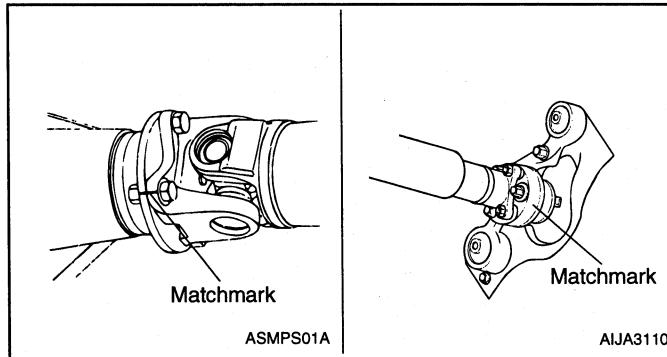
1. Front propeller shaft assembly
2. Rear propeller shaft assembly
3. Center bearing bracket

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### REMOVAL

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1. After making a matchmark on the companion flange and flange yoke, and another matchmark on the differential companion flange and rubber coupling, remove the propeller shaft.



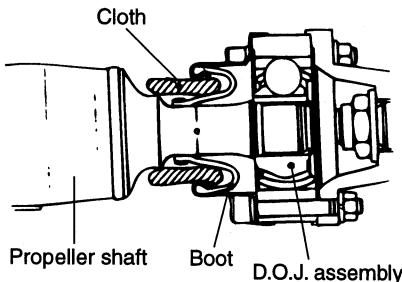
ASMP01A

AIJA3110

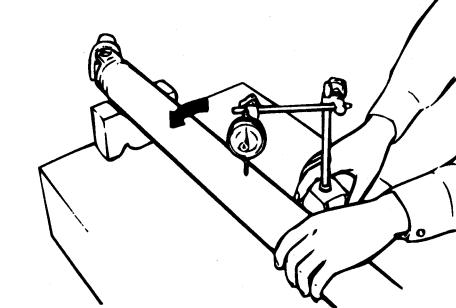
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**NOTE**

When removing the propeller shaft, be careful not to damage the boot. Insert a piece of cloth into the boot to prevent it from being damaged.



A7PS0280



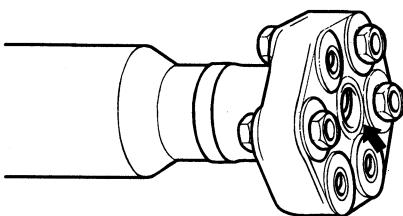
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**INSTALLATION**

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1. Apply the grease to the rubber coupling centering device.

Recommended grease : ALVANIA EP #2 (8-10 gr.)

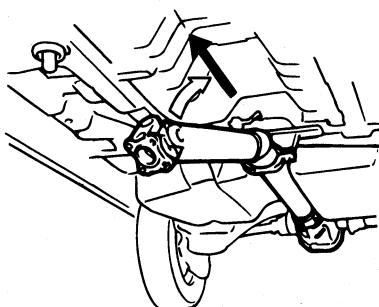


EJA3120

2. Insert the rubber coupling centering device to the differential drive pinion slightly.

**NOTE**

Align the propeller shaft for reassembly. Support the center bearing assembly.

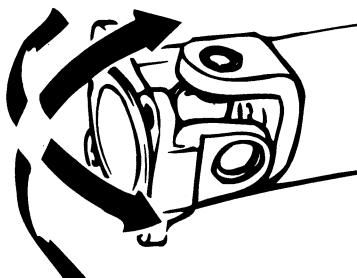


EJA3130

**INSPECTION**

EIJB0090

1. Check the propeller shaft yokes for wear, damage or cracks.
2. Check the propeller shaft for bends, twisting or damage.
3. Check the universal joints for smooth operation in all directions.

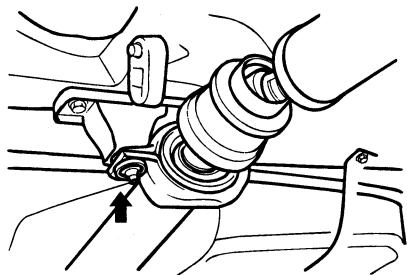


AU49-05B

4. Check the center bearing for smooth movement.
5. Check the center bearing mounting rubber for damage or deterioration.
6. Check the rubber coupling for damage or deterioration.
7. Measure the propeller shaft runout with a dial indicator.

Limit : 0.5 mm (0.02 in.)

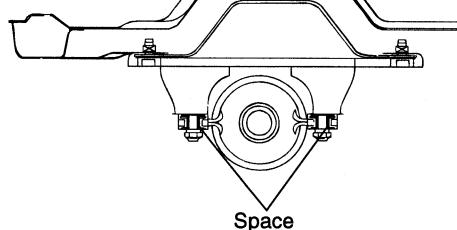
3. Temporarily install the center bearing mounting bracket.



EJJA3140

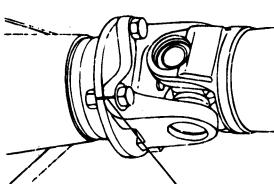
### NOTE

- Install the center bearing mounting bracket so the mark "R" faces toward the vehicle's rear.
- Install the flange so that it faces upward as shown in the illustration.



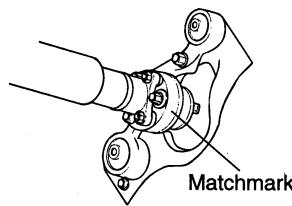
AIJA3150

4. Align the matchmarks on the companion flange and flange yoke and the differential companion flange and rubber coupling. Install the propeller shaft.



Matchmark

ASMPS01A



Matchmark

AIJA3110

ASMPS300

### NOTE

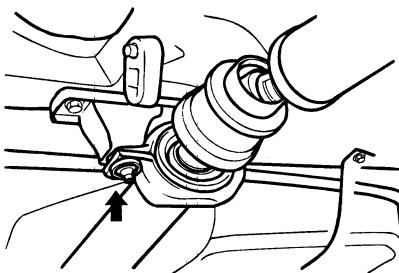
#### Specified torque :

- Transfer flange to flange yoke : 50-60 Nm (500-600kgf·cm, 37-44lb·ft)
- Differential companion flange to rubber coupling : 100-120 Nm (1000-1200kgf·cm, 73-88lb·ft)

5. Tighten the center bearing mounting bracket to the specified torque.

#### Specified torque :

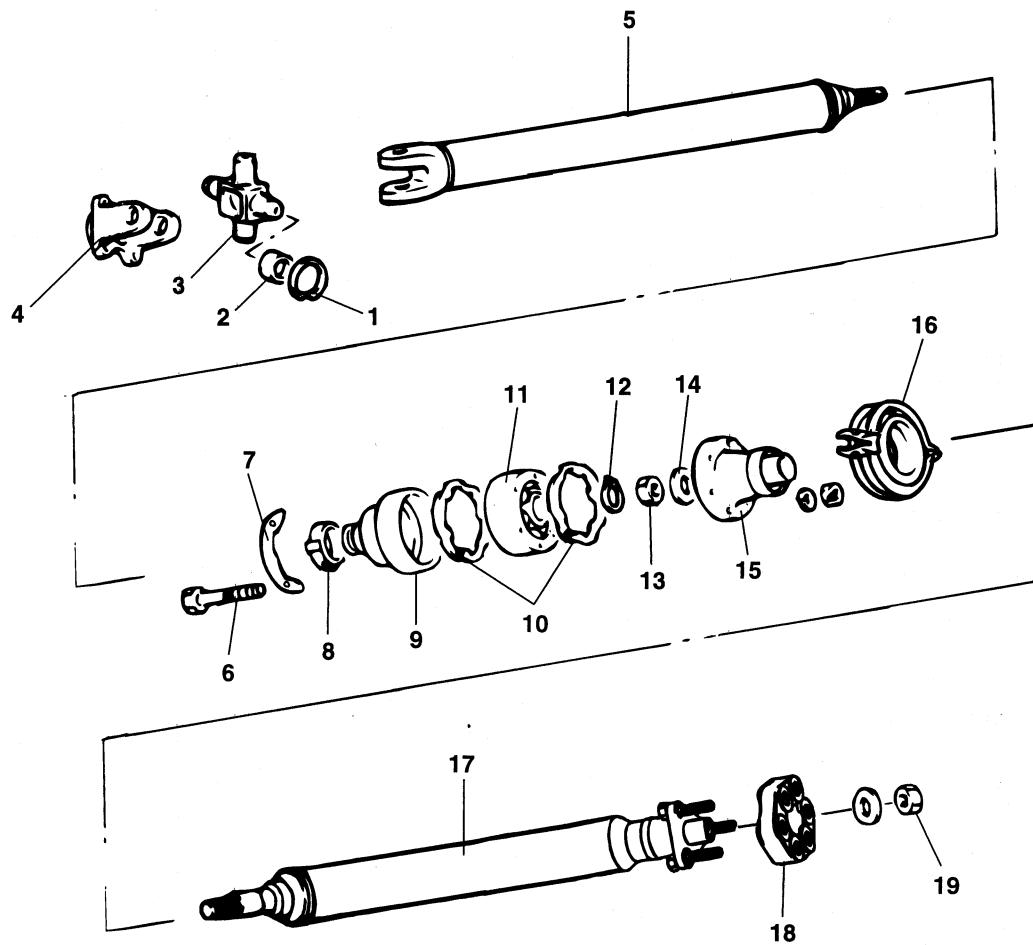
40-50 Nm (400-500 kgf·cm, 29-37 lb·ft)



EJJA3140

## DISASSEMBLY

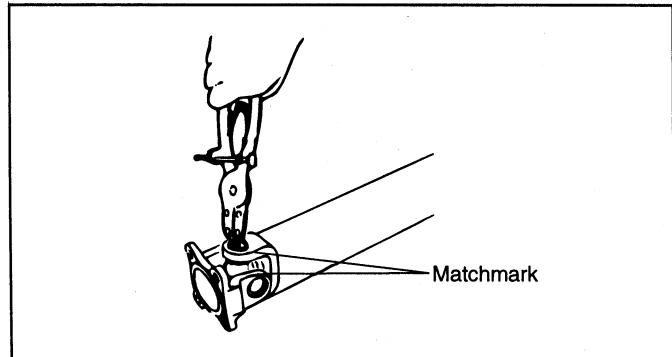
EIJB0110



1. Snap ring	11. D.O.J. joint assembly
2. Journal bearing	12. Snap ring
3. Journal	13. Nut
4. Flange yoke	14. Washer
5. Front propeller shaft	15. Companion flange
6. Bolt	16. Center bearing assembly
7. Washer	17. Rear shaft assembly
8. Boot band	18. Rubber coupling
9. D.O.J. boot	19. Bolt
10. Rubber packing	

## 1. REMOVAL OF SNAP RINGS

- Make matchmarks on the yoke and universal joint that are to be disassembled.
- Remove the snap ring from the yoke with a snap ring pliers.



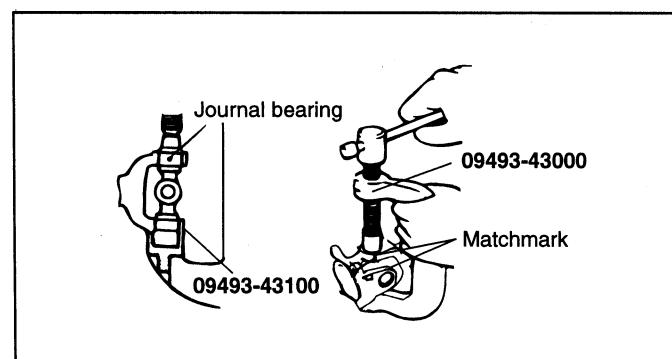
A7PS0320

## 2. REMOVAL OF JOURNAL BEARINGS

Remove the journal bearings from the yoke with a special tool.

### CAUTION

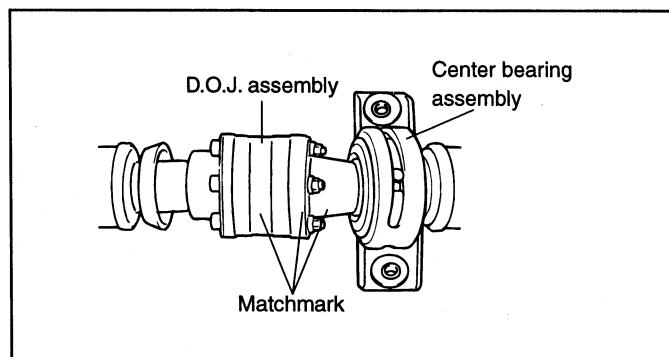
**Do not tap the journal bearings to remove them, because this will cause imbalance of the propeller shaft.**



TU49-06C

## 3. REMOVAL OF D.O.J. ASSEMBLY INSTALLATION BOLTS

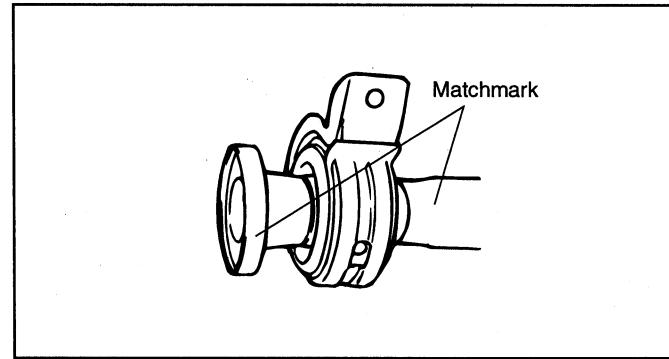
- Place matchmarks on the companion flange and D.O.J. assembly.
- Remove the D.O.J. installation bolts and separate the D.O.J. assembly from the companion flange.



AIJA3170

## 4. REMOVAL OF SELF-LOCKING NUT/COMPANION FLANGE

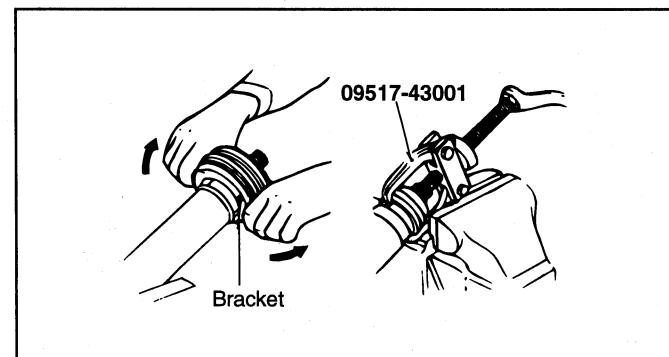
- Place matchmarks on the companion flange and the rear propeller shaft.
- Remove the companion flange from the rear propeller shaft.



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## 5. REMOVAL OF CENTER BEARING ASSEMBLY

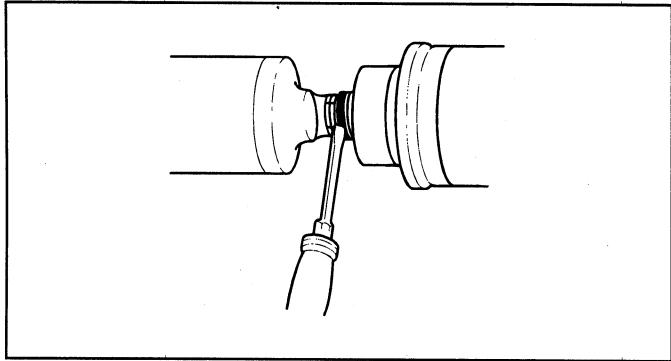
- Remove the center bearing bracket.
- Pull out the center bearing with a puller.



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## 6. REMOVAL OF D.O.J. ASSEMBLY

- Remove the D.O.J. boot from the D.O.J. assembly

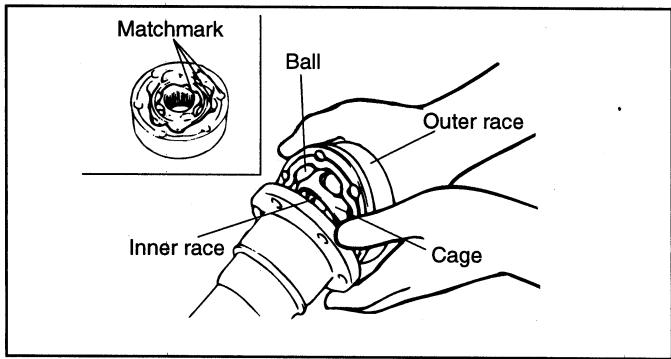


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- Put matchmarks on the mating parts with a scribe.

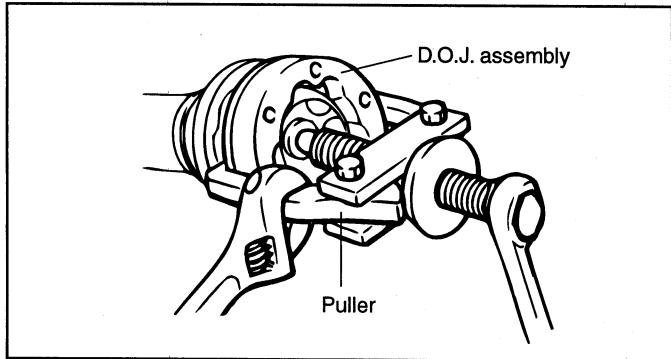
## NOTE

Note the positions of balls so that they can be reinstalled in their original positions.



AIJA3210

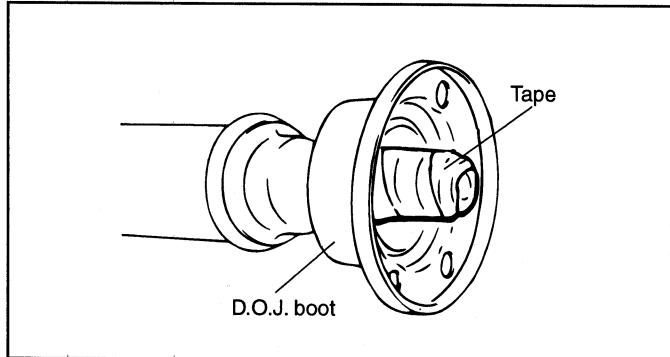
- Remove the D.O.J. assembly from the front propeller shaft with a commercially available puller.



AIJA3220

## 7. REMOVAL OF D.O.J. BOOT

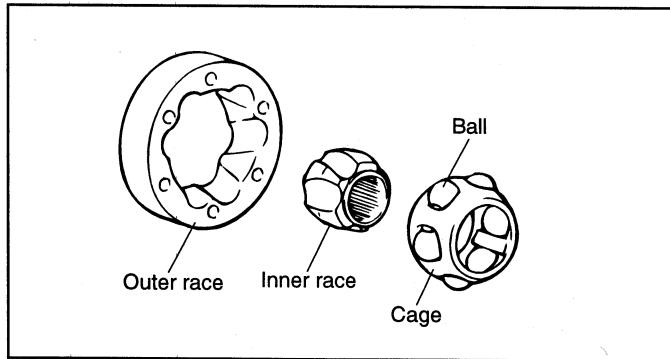
When reusing the D.O.J. boot, apply adhesive tape to the splined section of the propeller shaft before removing.



AIJA3230

INSPECTION EJJB0120

- Check the propeller shaft splines for wear or damage.
- Check the ball grooves in the inner and outer races for uneven wear, damage or rust.
- Check the ball surfaces for rust, wear or damage.
- Check the cage for rust or damage.



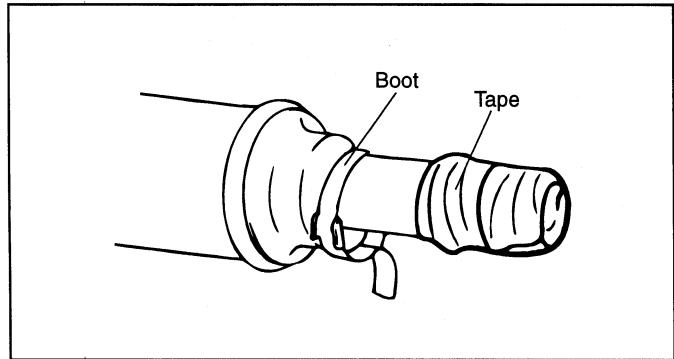
AIJA3240

## REASSEMBLY

EIJB0130

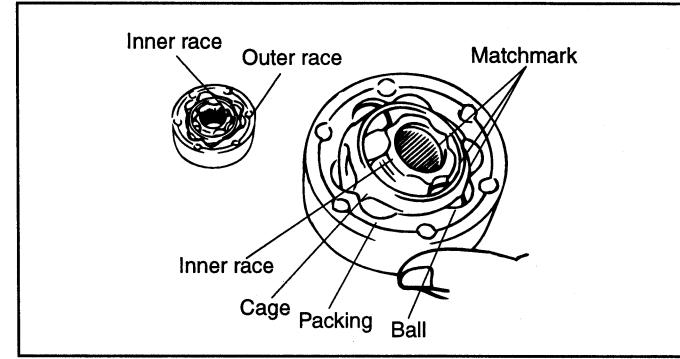
### 1. INSTALLATION OF D.O.J. BOOT

Wrap the splined end of the propeller shaft with adhesive tape.



AIJA3250

- c. Assemble the inner race and cage in the outer race with their mating marks aligned.
- d. Install the remaining balls in their original positions.
- e. Check that the outer and inner race rotate smoothly.

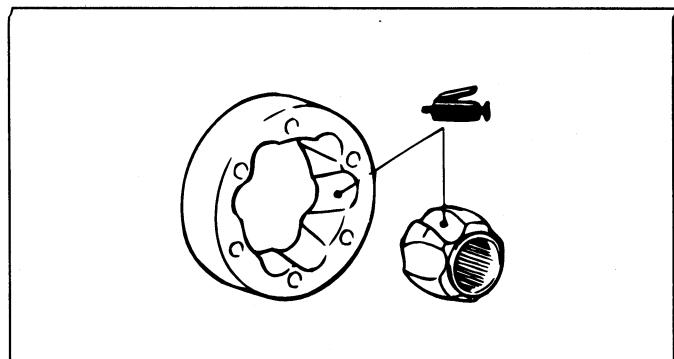


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### 2. INSTALLATION OF D.O.J. ASSEMBLY

- a. Apply a thin coat of the specified grease to the ball grooves of the inner and outer races.

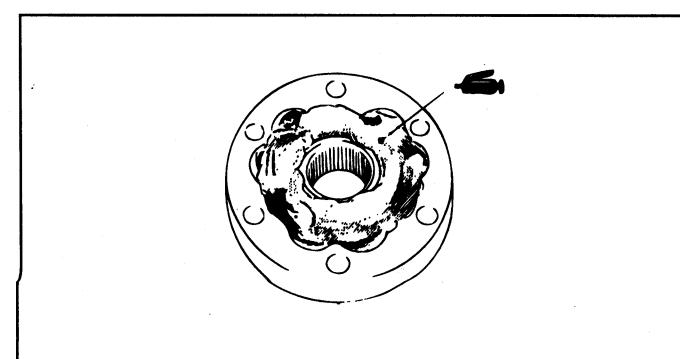
Specified grease : REAMAX FS NO.1



EIJ3260

- f. Apply the specified grease to the D.O.J. assembly.

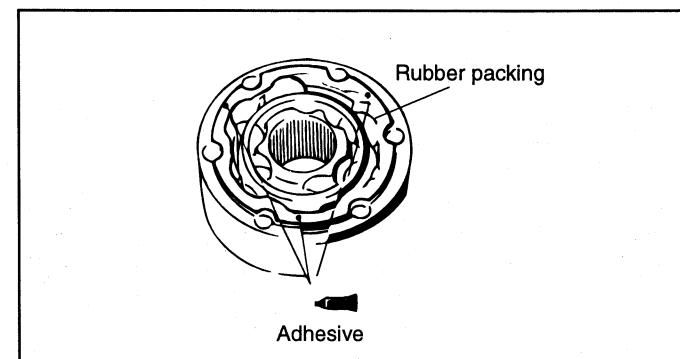
Specified grease : REAMAX FS NO.1 (95±5gr.)



EIJ3280

- b. Put the cage on the inner race with the matchmarks aligned and install two balls, one in a groove and the other in the groove opposite to that groove. Both balls should be placed in the grooves where they were before disassembly.
- g. Apply a small amount of specified adhesive in three places, equally divided, on the surface of the D.O.J. ball groove stepped section and then fit the rubber packing.

Specified adhesive : 3M ATD Part No.8121 or 3M ATD Part No.8155 or equivalent

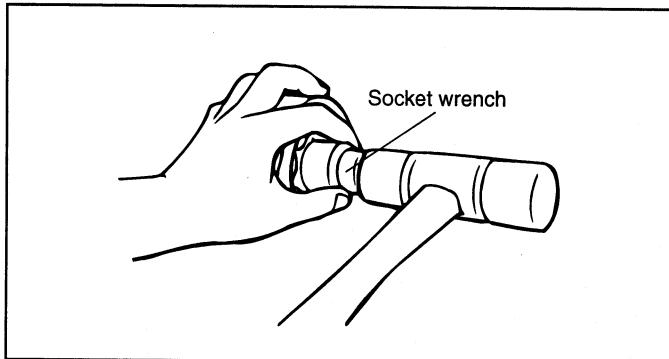


AIJA3290

h. Install the D.O.J. assembly on the propeller shaft while aligning the bolt holes, and hammer the joint assembly using a socket wrench or to install the inner race completely.

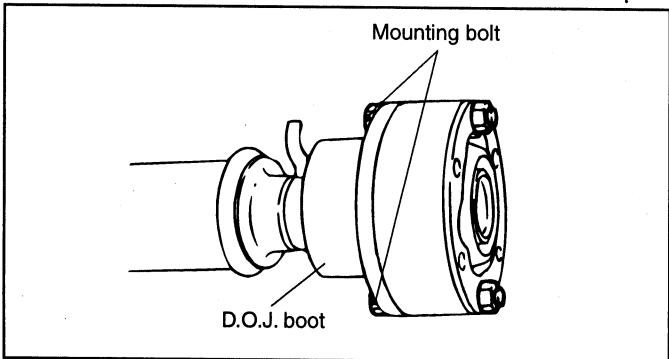
#### NOTE

Be sure that the grooves of the D.O.J. assembly face toward the D.O.J. boot.



AIJA3300

i. Realign the bolt holes in the boot and D.O.J. assembly utilizing the mounting bolts, and fit the boot on the joint assembly.  
 j. Fit the rubber packing on the companion flange according to the same procedure as in step (g).

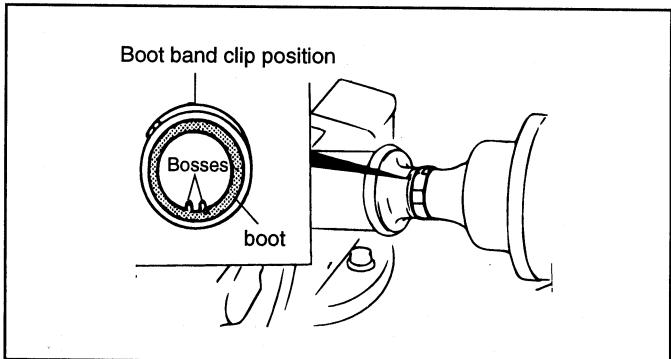


AIJA3310

### 3. INSTALLATION OF BOOT BAND

#### CAUTION

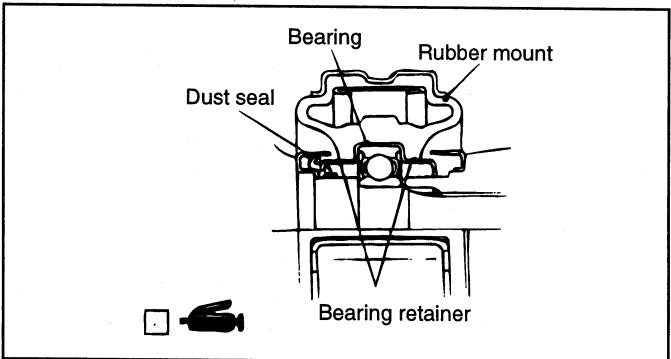
Position the boot band clip on the side opposite to the bosses which are provided in the boot for ventilation. Be sure to remove grease, if present, from around the bosses because the grease obstructs the ventilation.



AIJA3320

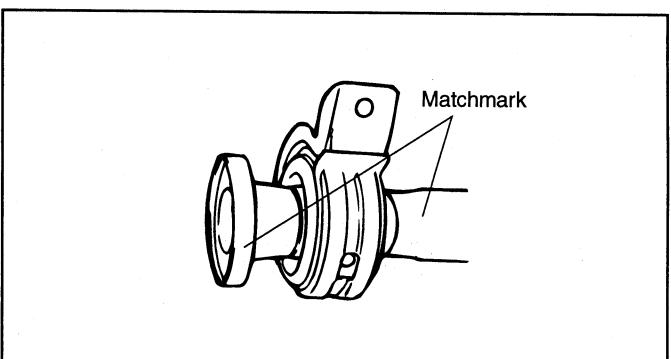
### 4. INSTALLATION OF CENTER BEARING ASSEMBLY / COMPANION FLANGE / SELF-LOCKING NUT

- Install the bearing and retainer to the groove of the center bearing bracket.
- Install the dust seal of the center bearing assembly to the front propeller shaft so that it faces forward.



AIJA3330

- Align the matchmarks on the companion flange and rear propeller shaft.

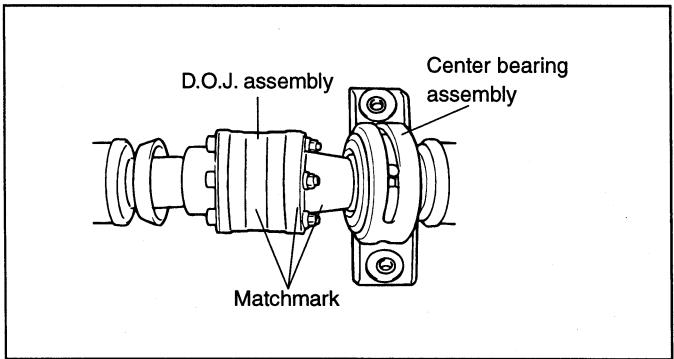


AIJA3180

d. Press-fit the center bearing assembly with the companion flange after tightening the self-locking nut.

**5. INSTALLATION OF D.O.J. ASSEMBLY INSTALLATION BOLTS**

- Align the matchmarks on the companion flange and D.O.J. assembly.
- Secure the companion flange and D.O.J. assembly by tightening installation bolts.
- Check for grease leakage at the D.O.J. boot and companion flange.



AIJA3170

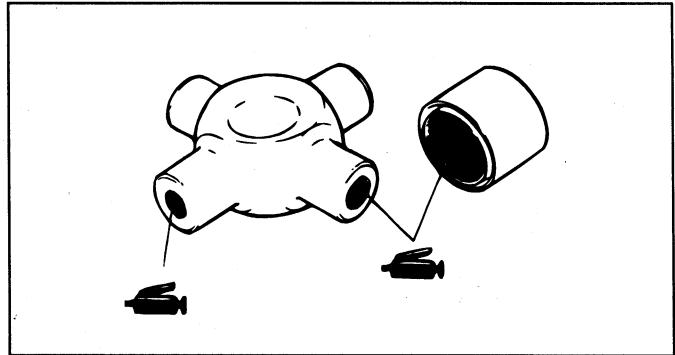
**7. INSTALLATION OF JOURNAL AND JOURNAL BEARING**

- Apply the specified grease to the following parts of the universal joint kit. :
  - Shafts and grease sums of the journal.
  - Dust seal lips.
  - Needle roller bearings.

Specified grease : ALVANIA EP GRADE NO.2

**CAUTION**

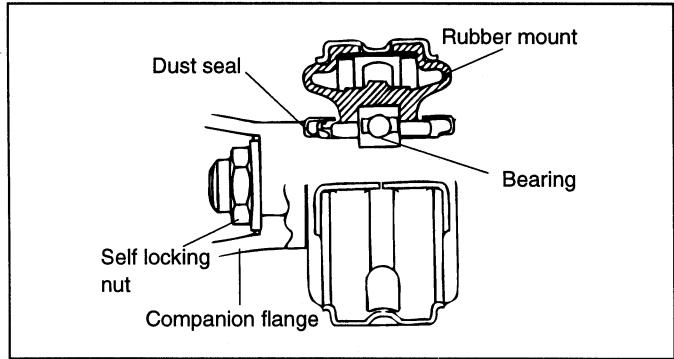
Use of excessive amounts of grease may result in difficulty in assembling the unit and incorrect selection of snap rings.



EIJIA3350

**6. INSTALLATION OF CENTER BEARING ASSEMBLY**

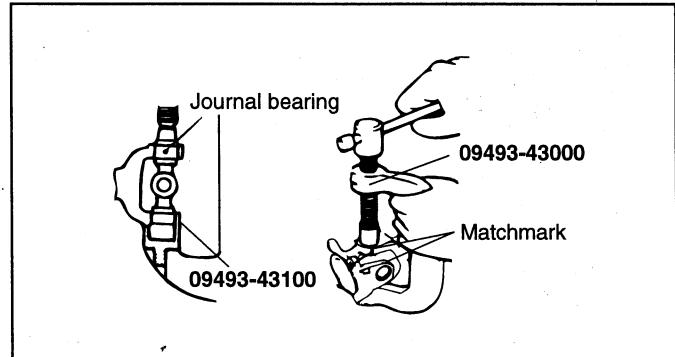
- Install the bearing and retainer to the rubber mount groove of the center bearing bracket.
- Install the dust seal of the center bearing assembly so that it faces forward.



AIJA3340

- Press-fit the journal bearings in the yoke according to the following procedures:

- Install the base to the special tool.
- Insert both bearings in the yoke. Hold and press-fit them using the special tool.



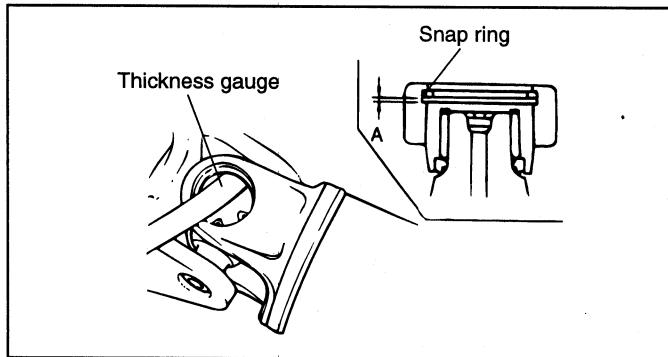
TU49-06C

## 8. INSTALLATION OF SNAP RINGS

- a. Install snap rings of the same thickness onto both sides of each yoke.
- b. Press the bearing and journal into one side using a brass bar.
- c. Measure the clearance between the snap ring and the groove wall of the yoke with a feeler gauge. If the clearance exceeds the standard value, replace the snap rings.

Standard value : 0.02-0.06 mm

Snap ring thickness mm	Identification color
1.28	-
1.31	Yellow
1.34	Blue
1.37	Purple
1.40	Brown



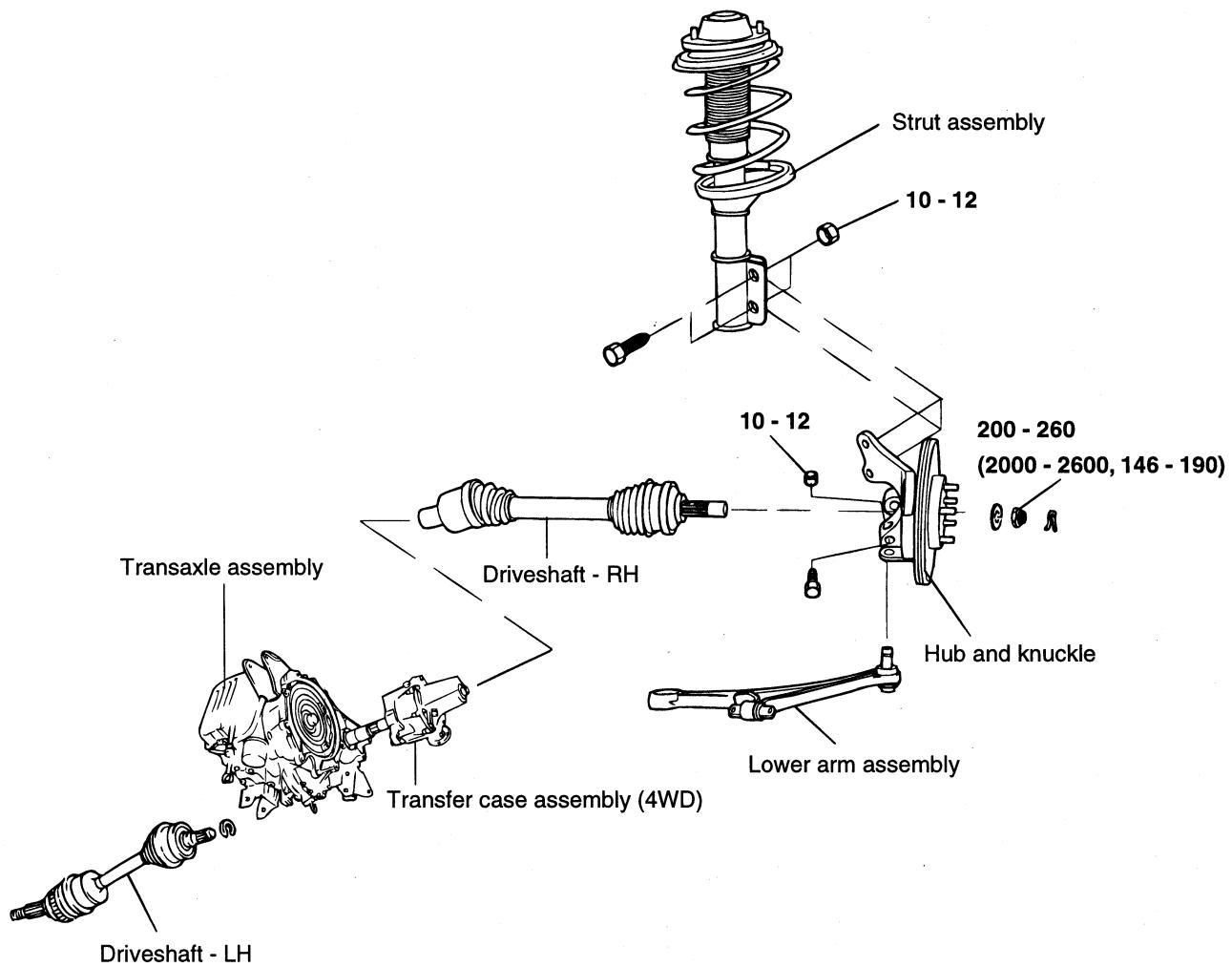
AIJA3360

## DRIVESHAFT

### FRONT DRIVESHAFT ASSEMBLY

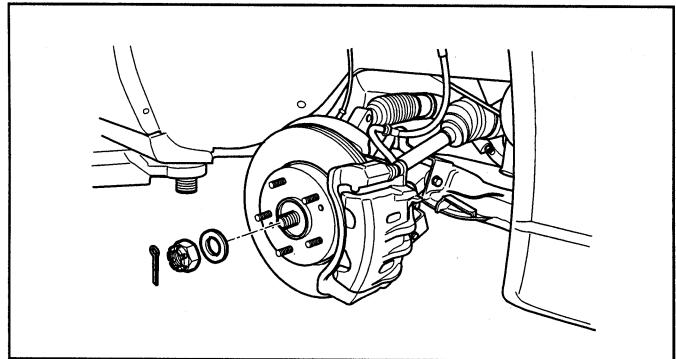
#### COMPONENTS

EJJB0140

**TORQUE : Nm (kg·cm, lb·ft)**

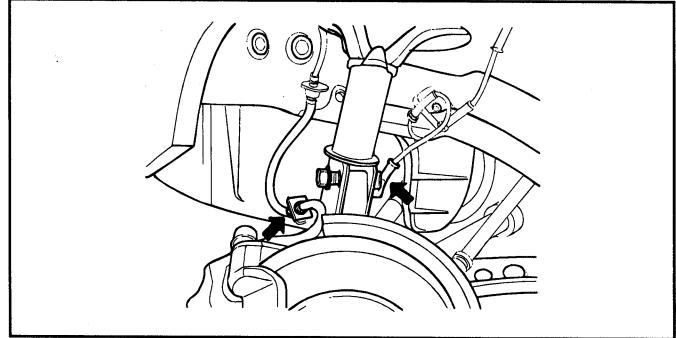
REMOVAL EIJB0150

1. Remove the aluminum wheel cover using a flat-blade screwdriver.
2. Raise the vehicle and remove the wheel.
3. Remove the split pin and driveshaft nut.



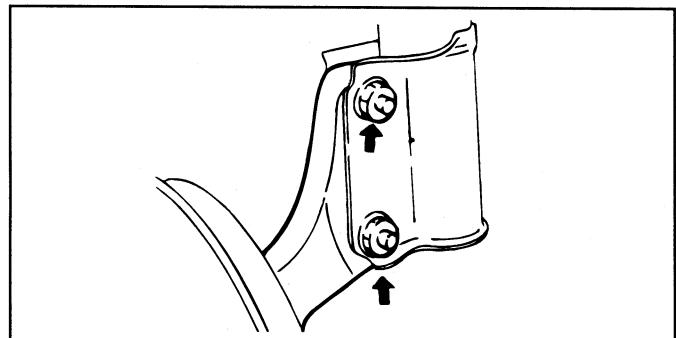
KGX7002A

4. Drain the transaxle oil.
5. Detach the wheel speed sensor cable from the bracket (for vehicles equipped with ABS).
6. Detach the brake hose cable from the bracket.



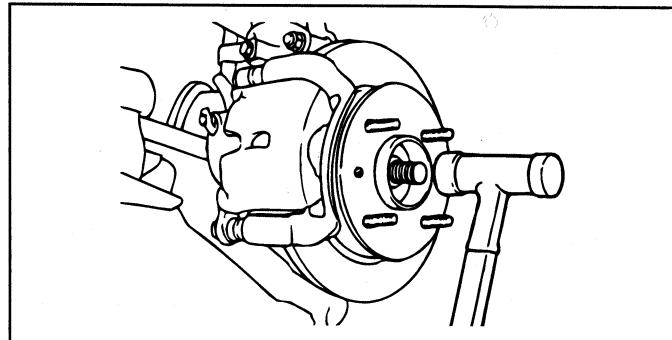
EIHA002A

7. Remove two flange bolts and detach the knuckle from the strut.



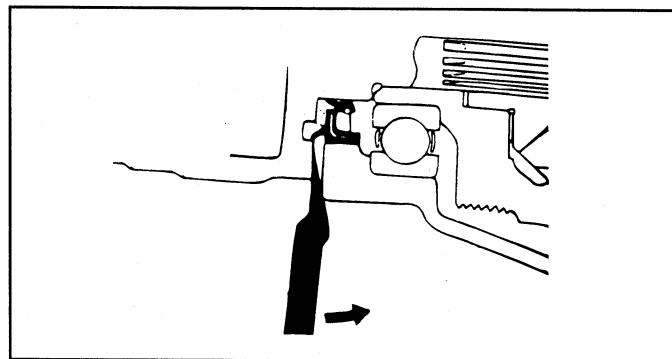
S5SS012B

8. Separate the driveshaft from the axle hub by tapping it lightly with a plastic hammer.



EIHA210B

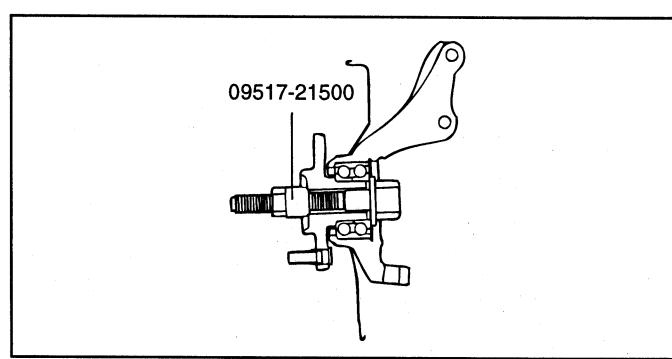
9. Drive off the driveshaft from the transaxle or transfer inner shaft using a hammer and brass bar.



D9Y008-1

## CAUTION

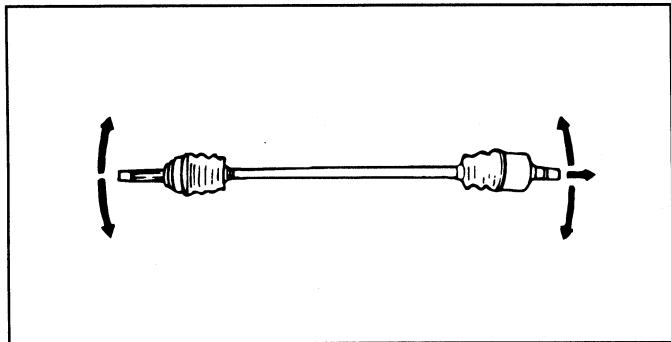
1. Use a pry bar so you do not damage the joint.
2. If you pull the driveshaft by excessive force, components inside the joint kit can be displaced causing the boot to be torn and the bearing to be damaged.
3. Plug the transaxle case opening with an oil seal cap in order to avoid contamination.
4. Support the driveshaft properly.
5. Replace the retainer ring each time the driveshaft is removed from the transaxle case.
6. While loosening the driveshaft nut, do not allow vehicle weight to be concentrated on the wheel bearing. If the vehicle moves, hold the wheel bearing using the special tool.



S5DS007F

**INSPECTION** EIHA2200

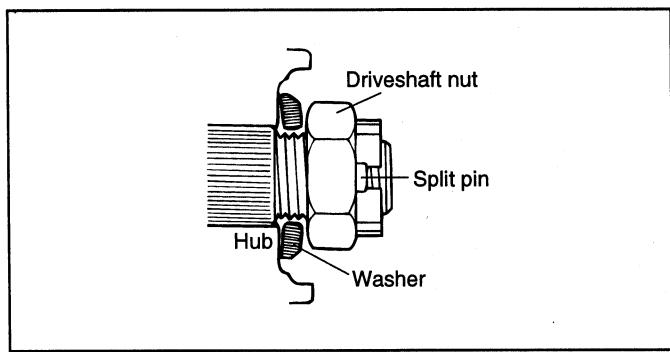
1. Check the driveshaft boots for damage and deterioration.
2. Check the splines for wear and damage.
3. Check the ball joints for wear and operating condition.
4. Check the dynamic damper for damage and deterioration



EIA9211A

**INSTALLATION** EIJB0170

1. Coat the driveshaft splines and sliding surface of the differential case with gear oil.
2. Before installing the driveshaft, set the gap in the circlip facing downward.
3. After installation, check that the driveshaft cannot be removed by hand.
4. Install the washer under the driveshaft nut with the convex side outward as shown in the illustration.

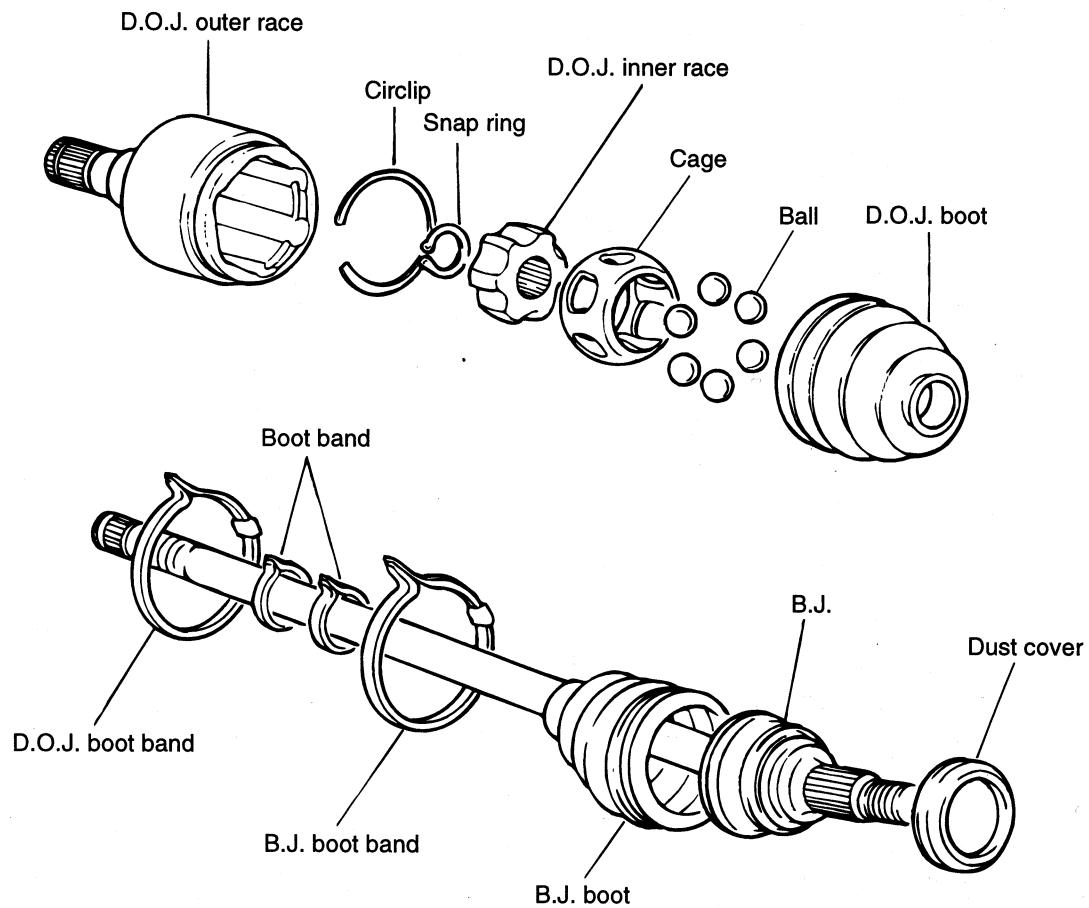


EIA9212A

## FRONT DRIVESHAFT (DOJ-BJ TYPE)

## COMPONENTS

EIJB0220



TORQUE : Nm (kg·cm, lb·ft)

## DISASSEMBLY

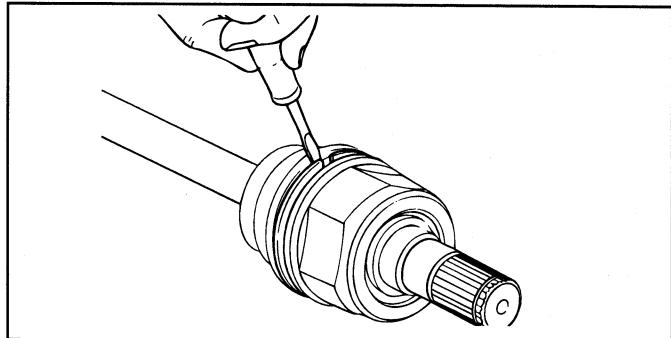
EIJB0230

## CAUTION

1. Do not disassemble the B.J. assembly.
2. Special grease must be applied to the driveshaft joint.
3. The boot band should always be replaced with a new one.
1. Remove the D.O.J. boot bands and pull the D.O.J. boot from the D.O.J. outer race.

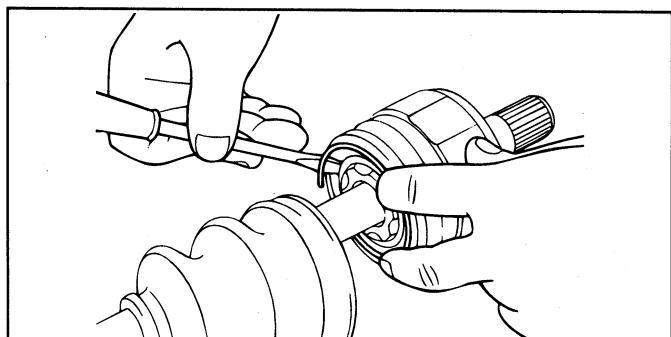
## CAUTION

Be careful not to damage the boot.



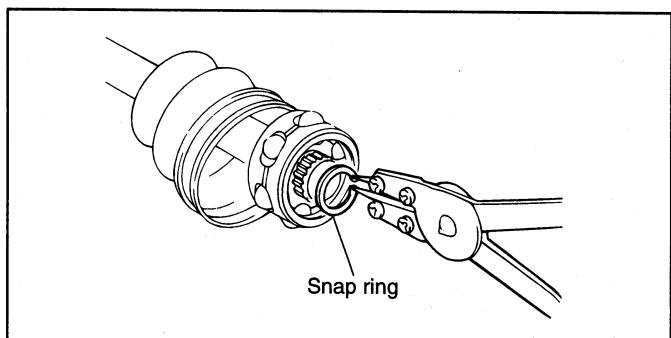
EIDA251A

2. Remove the circlip with a flat-blade screwdriver.



EIDA251B

3. Pull out the driveshaft from the D.O.J. outer race.
4. Remove the snap ring and take out the inner race, cage and balls as an assembly.

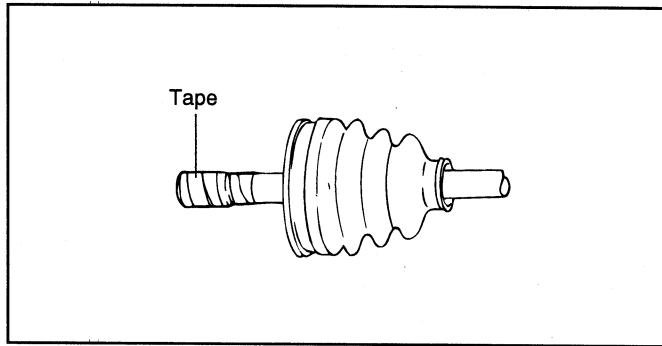


EIDA251C

5. Clean the inner race, cage and balls without disassembling.
6. Remove the B.J. boot bands and pull out the D.O.J. boot and B.J. boot.

## CAUTION

If the boot is to be reused, wrap tape around the driveshaft splines to protect the boot.



EIDA251D

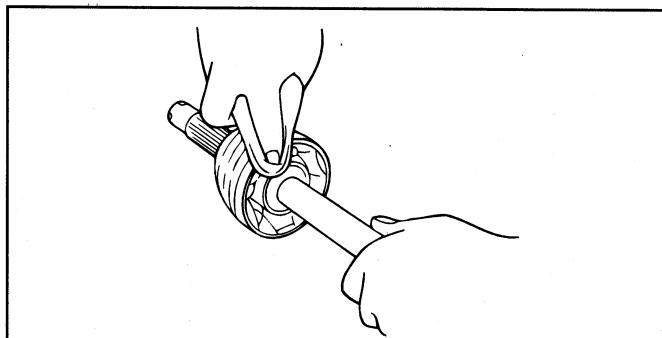
## INSPECTION

EIJB0240

1. Check D.O.J. outer race, inner race, cage and balls for rust or damage.
2. Check the splines for wear.
3. Check that there is no water, foreign material, or rust in the B.J. boot.

## CAUTION

When the B.J. assembly is to be reused, do not routinely wipe out the grease. Check that there are foreign substances in the grease. If necessary, clean the B.J. assembly and replace the grease.



EIDA252A

## REASSEMBLY EJBO250

1. Wrap tape around the driveshaft splines to prevent damage to the boots.
2. Apply the specified grease to the driveshaft and install the boots.

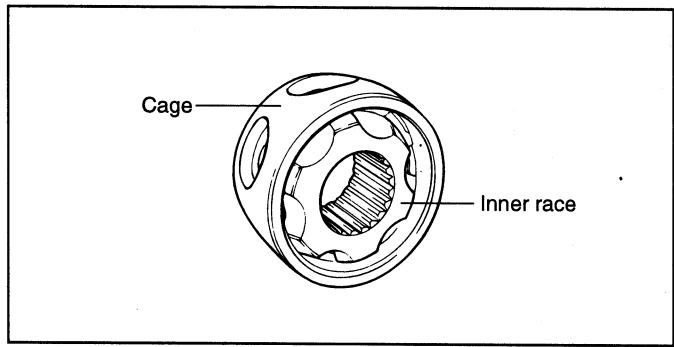
Recommended lubricant :

B.J. Boot grease :  
CENTOPLEX 278M/136K (MS511-50)  
D.O.J. Boot grease :  
AMBLYGON TA10/2A (MS511-50)

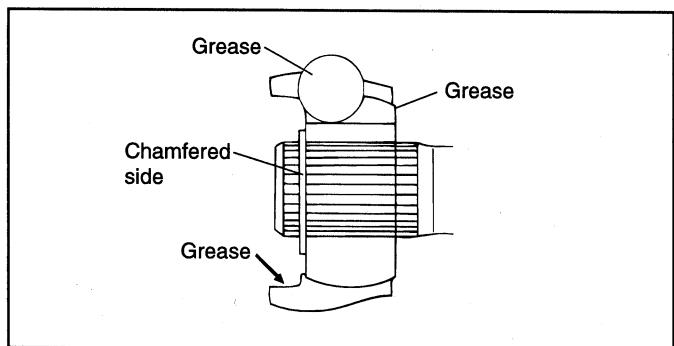
3. Apply the specified grease to the inner race and cage. Install the cage so that it is offset on the race as shown.

## NOTE

Use the grease included in the repair kit.



4. Apply the specified grease to the cage and fit the balls into the cage.
5. Install the chamfered side of the cage as shown in the illustration, and then install the inner race onto the driveshaft. Install the snap ring.



6. Apply the specified grease to the B.J. outer race and install the outer race onto the driveshaft.

B.J. boot grease gr.

Total :  $135 \pm 6$  gr.

In the joint :  $70 \pm 3$  gr.

In the boot :  $65 \pm 3$  gr.

7. Apply the specified grease to the D.O.J. outer race and install the circlip.

D.O.J. boot grease gr.

Total :  $105 \pm 6$  gr.

In the joint :  $65 \pm 3$  gr.

In the boot :  $40 \pm 3$  gr.

8. Tighten the D.O.J. boot bands.

9. Add the specified grease to the B.J., using as much as was wiped away at inspection.

10. Install the boots.

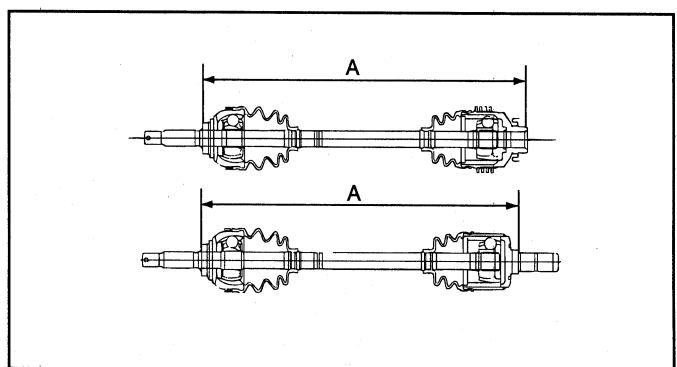
11. Tighten the B.J. boot bands.

12. To control the volume of air in the D.O.J. boot, keep the specified distance between the boot bands when they are tightened.

Standard value (A)	mm (in.)
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LH side	RH side
---------	---------

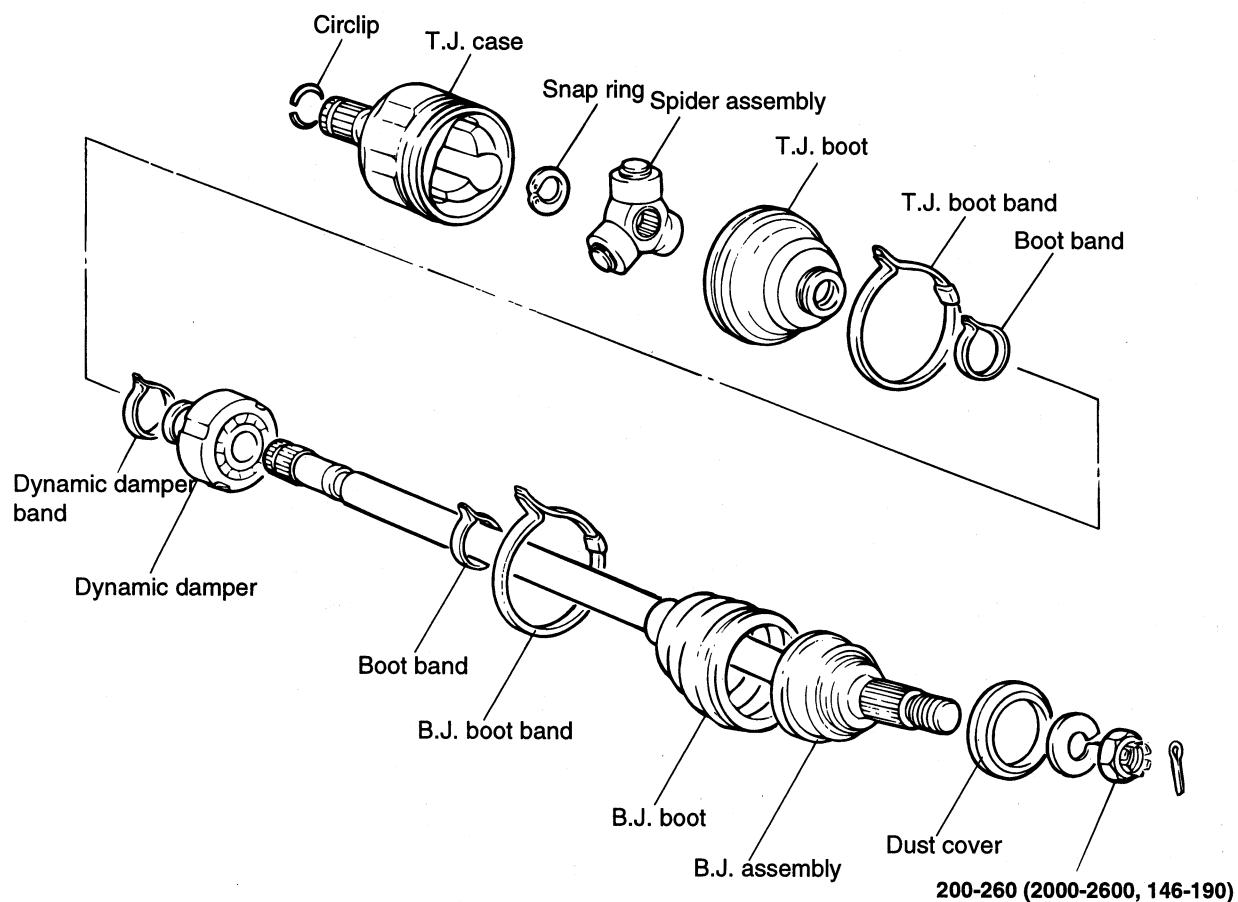
$509.2 \pm 2$ (20.05 $\pm$ 0.08)	$530 \pm 2$ (20.87 $\pm$ 0.08)
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## FRONT DRIVESHAFT (T.J-BJ TYPE)

## COMPONENTS

EIJB0180



TORQUE : Nm (kg·cm, lb·ft)

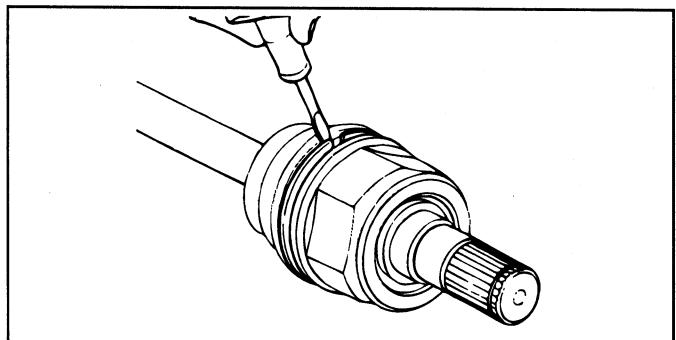
## DISASSEMBLY EJJB0190

## NOTE

1. Do not disassemble the B.J. assembly.
2. Special grease is used on the driveshaft joint. Do not substitute with another type of grease.
3. The boot band should always be replaced with a new one.
1. Remove the T.J. boot bands and pull the T.J. boot from the T.J. case.

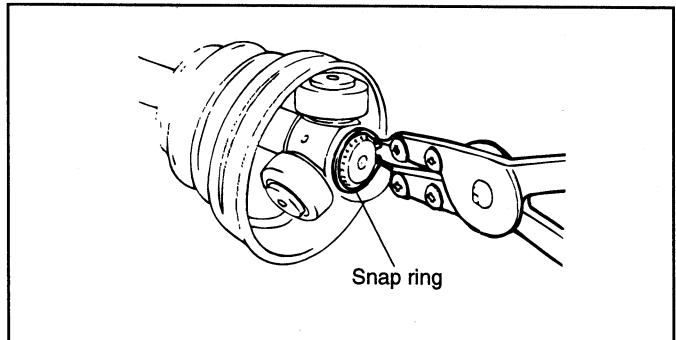
## NOTE

Be careful not to damage the boot.



EIDA301A

2. Remove the snap ring and spider assembly from the driveshaft.

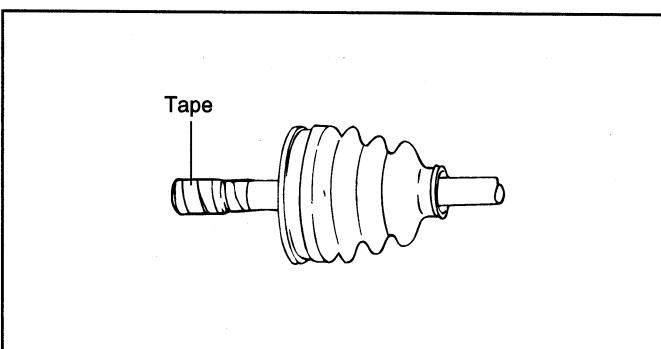


EIDA301B

3. Clean the spider assembly.
4. Remove the B.J. boot bands and pull out the T.J. boot and B.J. boot.

## NOTE

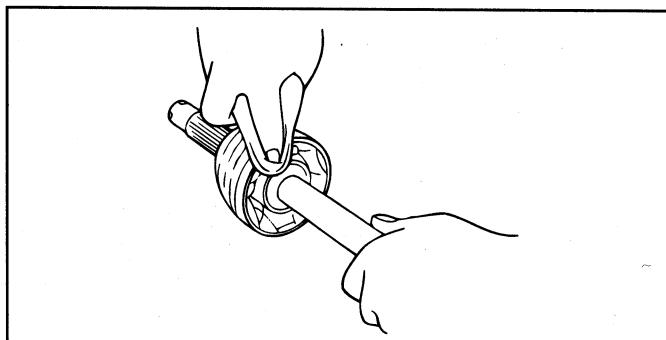
If the boot is to be reused, wrap tape around the drive shaft splines to protect the boot.



EIDA251D

## INSPECTION EIDA3020

1. Check the driveshaft spline for wear or damage.
2. Check for entry of water and/or foreign material into the B.J.
3. Check the spider assembly for roller rotation, wear or corrosion.
4. Check the groove inside the T.J. case for wear or corrosion.
5. Check the dynamic damper for damage or cracking.



EIDA252A

## REASSEMBLY EJJB0215

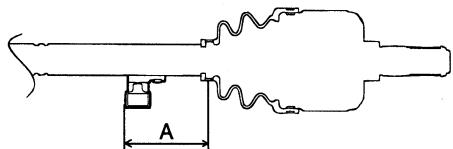
1. Wrap tape around the driveshaft splines (T.J. side) to prevent damage to the boots.
2. Apply the specified grease to the driveshaft and install the boots.

## Recommended lubricant

B.J. Boot grease :  
Centoplex 278M/136K (MS511-50)  
T.J. Boot grease :  
Oneluber MK (MS511-50)

3. To install the dynamic damper, keep the B.J. shaft in a straight line and secure the dynamic damper in the direction illustrated, and then install the small boot band.

Standard value (A) : 160mm (6.3 in.)



EIHA005A

4. Apply the specified grease into the T.J. boot and install the boot.

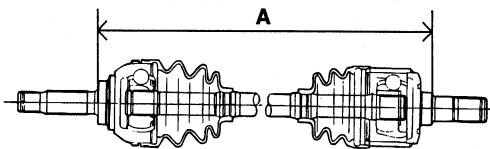
T.J. boot grease gr.

Total	120±6gr. (2.0L M/T)	145±6gr. (2.4L M/T)
In the boot	75±3gr.	100±3gr.
In the joint	45±3gr.	45±3gr.

STANDARD VALUE (A)

	2.0L M/T	2.4L M/T (2WD)	2.4L M/T (4WD)
LH	529.2±2 (20.83±0.08)	530±2 (20.9±0.08)	531±2 (20.91±0.08)
RH	818.2±2 (32.21±0.08)	820±2 (32.3±0.08)	533.7±2 (21.01±0.08)

\* Unit : mm (in.)



EIDA253D

5. Tighten the T.J. boot bands.

6. Add the specified grease to the B.J. as much as was wiped out during inspection.

7. Install the boots.

8. Tighten the B.J. boot bands.

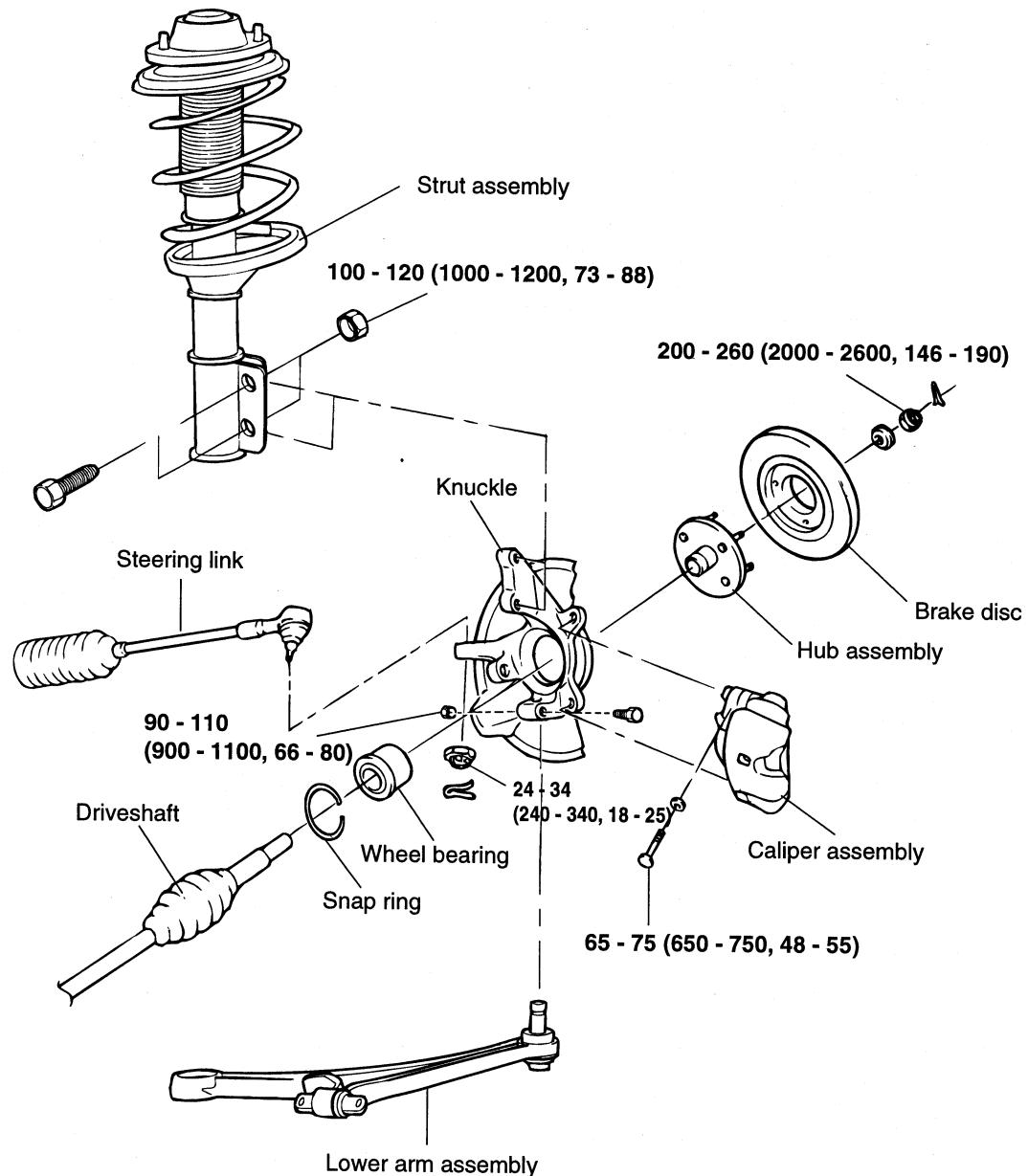
9. To control the air in the T.J. boot, maintain the specified distance between the boot bands when they are tightened.

## FRONT AXLE

## FRONT HUB/KNUCKLE

## COMPONENTS

EJUB0260

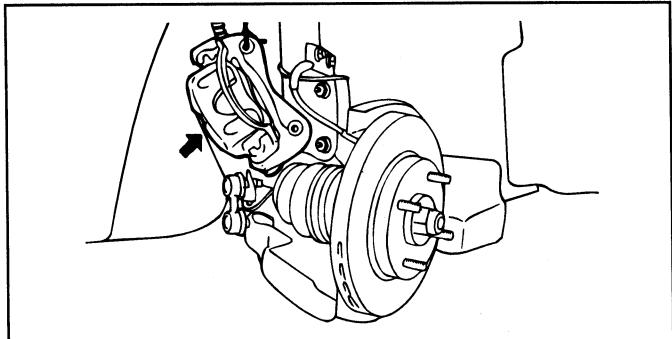


TORQUE : Nm (kg·cm, lb·ft)

**REMOVAL**

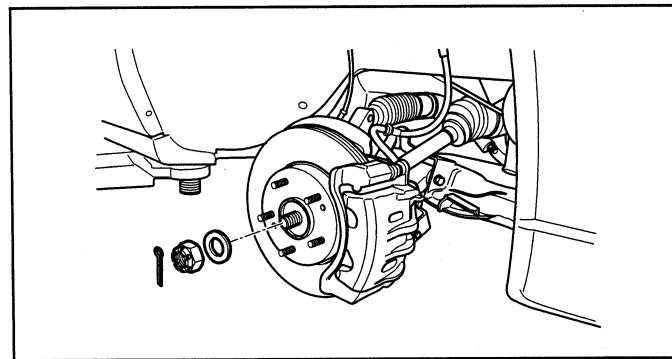
EIJB0270

1. Raise the vehicle and remove the front wheel.
2. Remove the wheel speed sensor from the knuckle.
3. Remove the brake caliper and suspend it with a wire.



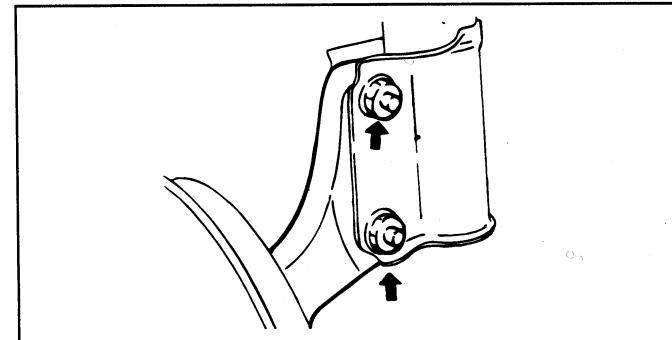
S5DS018A

4. Remove the split pin and driveshaft nut from the front hub.



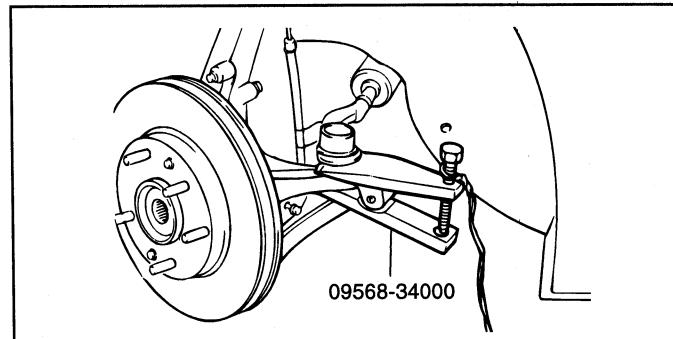
KGX7002A

5. Remove the strut and the two bolts mounting the knuckle.



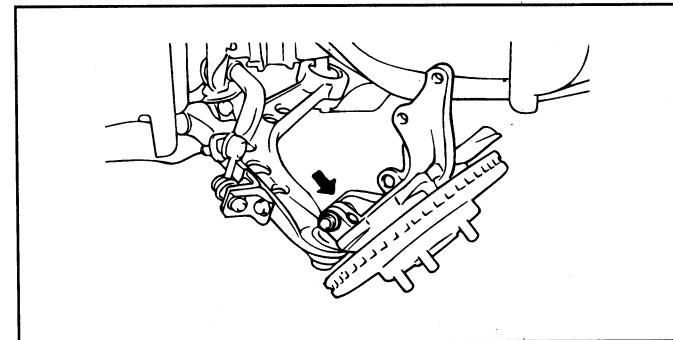
S5SS012B

6. Disconnect the tie rod end ball joint from the knuckle using the special tool.



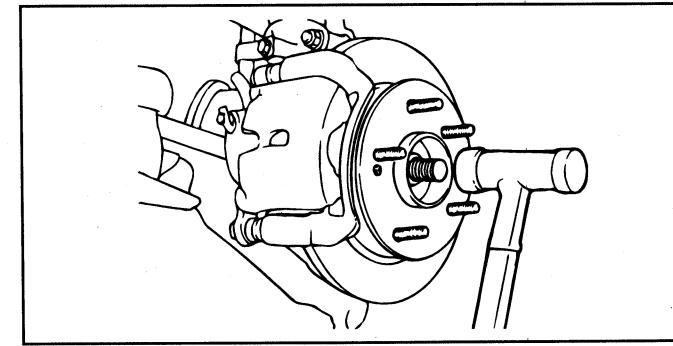
EIHA018A

7. Remove the lower arm ball joint mounting bolt.



EIHA009A

8. Using a plastic hammer, drive out the axle hub from the driveshaft.

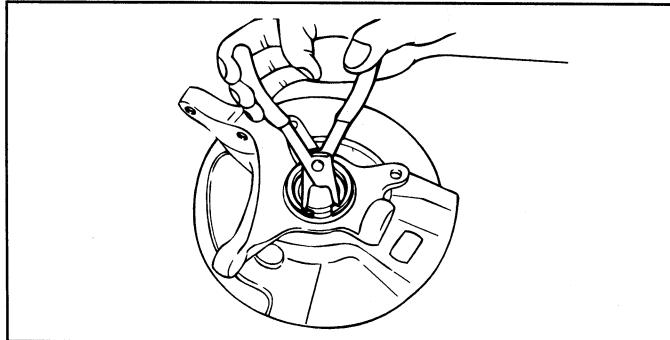


EIHA010A

9. Remove the front axle assembly.

**DISASSEMBLY** EIJB0280

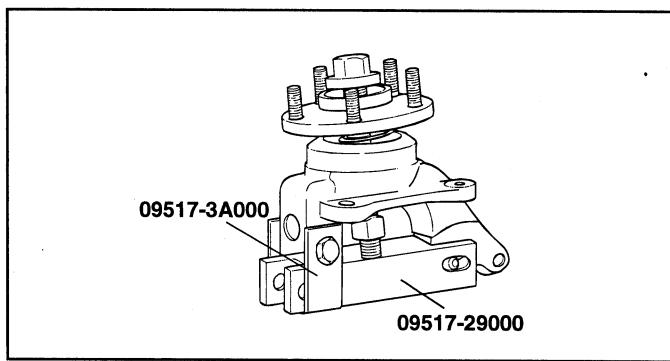
1. Remove the brake disc from the hub.
2. Remove the snap ring.



V5DS016A

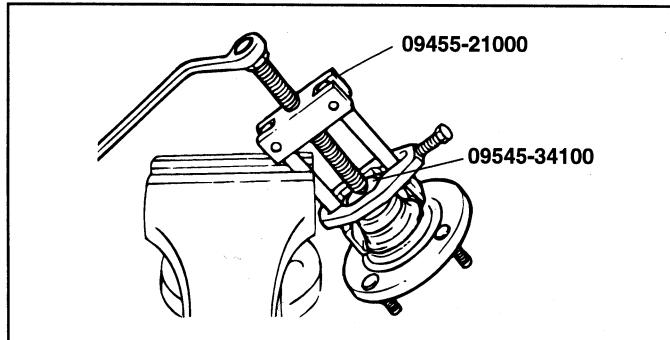
3. Remove the hub from the knuckle using the special tool.

- Install the special tool to the hub and knuckle.
- Tighten the nut of the special tool to disconnect the hub from the knuckle.



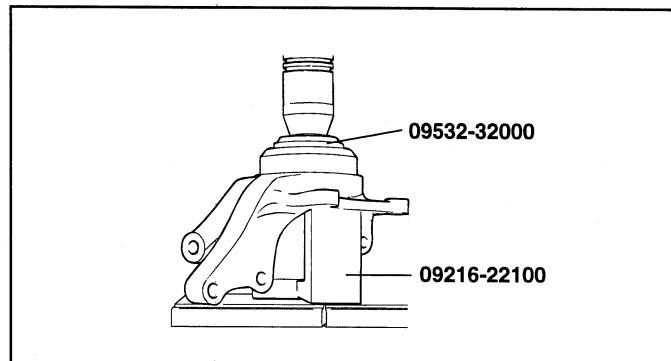
EIJA013C

4. Using the special tool, remove the wheel bearing inner race from the hub.



S5DS020C

5. Using the special tool, remove the wheel bearing outer race from the knuckle.



KSMDS17C

**INSPECTION** EIHA4120

1. Check the hub for cracks and check the splines for wear.
2. Check the hub bolts for cracks and damage.
3. Check the brake disc for scoring and damage.
4. Check the knuckle for cracks.
5. Check the bearings for defects.

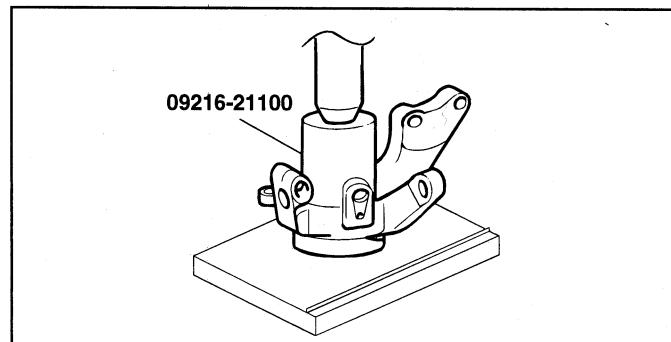
**REASSEMBLY** EIJB0300

1. Apply a thin coat of multi-purpose grease to the surface of the knuckle and bearing.
2. Using the special tool, press the bearing onto the knuckle.

Press-in load [kg(f), (lb(f))] : 4500-5000 (9921-11023)

**NOTE**

- Do not press against the outer race of the wheel bearing because that can cause damage to the bearing assembly.
- Always use a new bearing assembly.



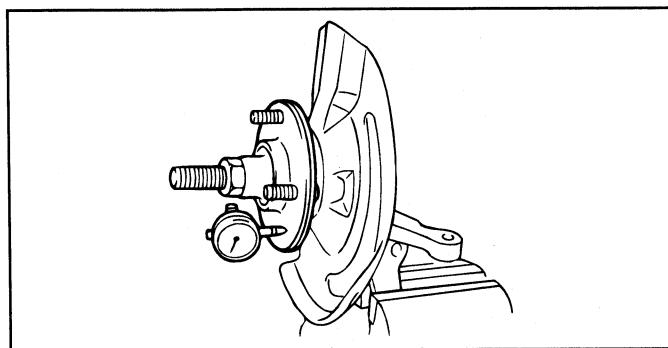
EIHA012A

3. Install the snap ring into the groove of the knuckle.
4. Install the backing plate to the knuckle.
5. Press the hub onto the knuckle using a special tool.

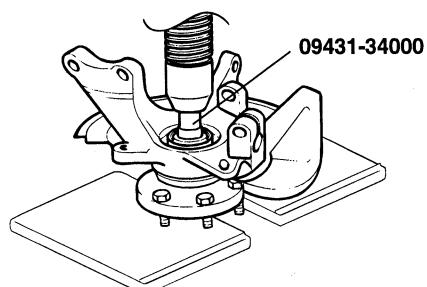
Press-in load [kg(f), (lb(f))] : 2000-2500(4409-5512)

#### NOTE

**Do not press against the outer race of the wheel bearing because this can cause damage to the bearing assembly.**



S5DS022E

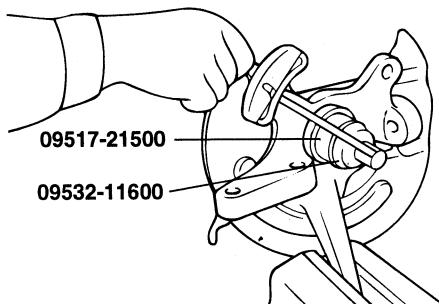


EIHA013A

6. Rotate the hub several times while seating the bearing.
7. Measure the wheel bearing starting torque.

Wheel bearing starting torque [Limit]:

1.88 Nm (18.8kg.cm, 16.64lb.in) or less



S5DS022D

8. Measure the end play of the hub by installing a dial gauge and verify that it is within specifications.

Hub end play : 0.008 mm (0.0003 in.) or less

9. Remove the dial gauge.

10. Install the disc to the hub.

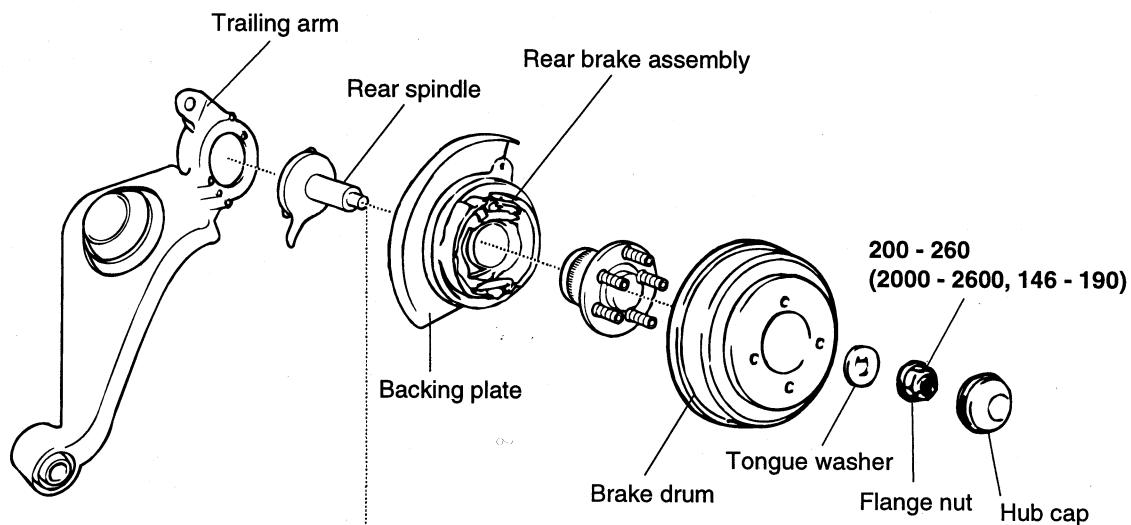
## REAR AXLE

## REAR AXLE/HUB

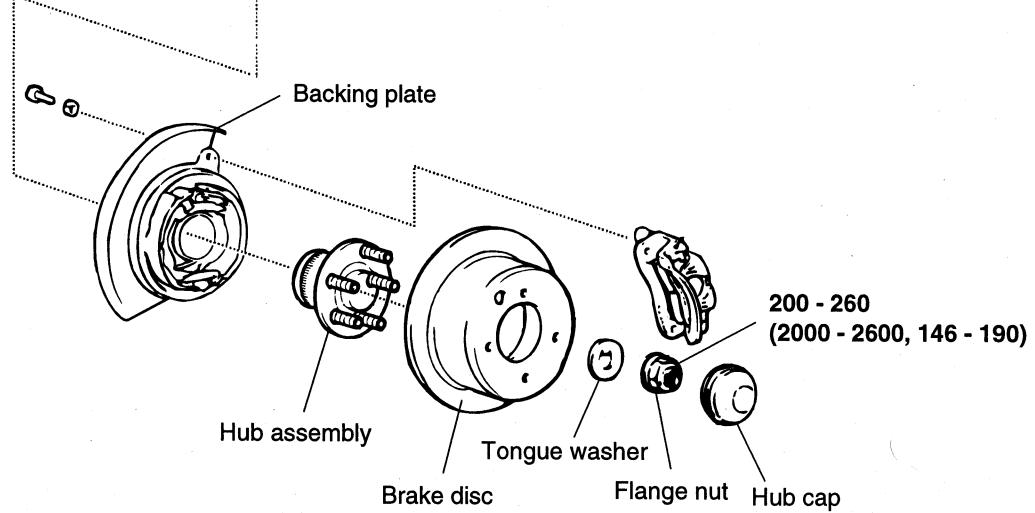
## COMPONENTS

EIJB0310

## &lt;DRUM BRAKE&gt;



## &lt;DISC BRAKE&gt;

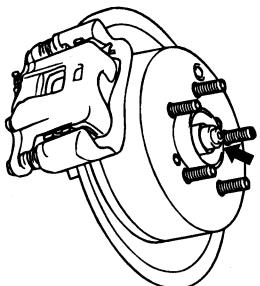


TORQUE : Nm (kg·cm, lb·ft)

**REMOVAL**

EIJB0320

1. Jack the vehicle up and remove the wheel.
2. After unstaking the flange nut, remove the nut and tongue washer.



EIJA005A

3. Remove the drum.
4. Remove the brake line.
5. Remove the parking brake assembly.
6. Remove the parking brake cable.
7. Remove four bolts mounting the spindle to the trailing arm complete and disconnect the spindle, backing plate and rear hub assembly.

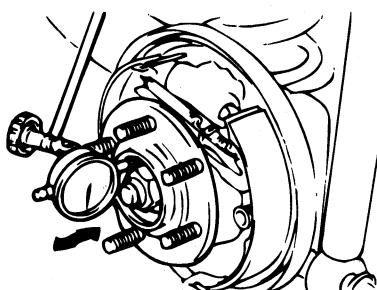
**INSPECTION**

EIJB0330

1. Check the rear hub assembly for wear and damage.
2. Check the spindle for cracks and damage.
3. Check the backing plate for excessive transformation and damage.

**MEASUREMENT OF THE END PLAY OF THE WHEEL BEARING**

1. Install a dial gauge to the surface of the hub as shown in the illustration.



EIHA019A

2. Check the axial motion of the hub.

Limit value : 0.05mm or less

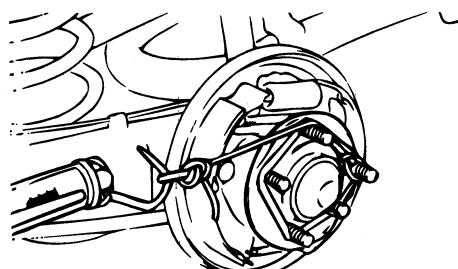
3. If the end play is over the limit, loosen the flange nut and tighten it again to the specified torque. Then measure it again.
4. If the end play is beyond the limit, replace the rear hub assembly.

**MEASURING THE STARTING TORQUE OF THE HUB**

1. Rotate the hub several times to seat the bearing.
2. After suspending the spring balance to the hub bolt, check the scale for spring balance, pulling it at a 90° angle.

Starting torque of rear hub rotation :

27N (6.1 lbs) or less



EIHA020A

3. If the starting torque is over the limit, loosen the flange nut and tighten it again to the specified torque. Then measure it again.
4. If the starting torque is beyond the limit, replace the rear hub assembly.

**INSTALLATION**

EIJB0340

1. Installation is the reverse of removal.

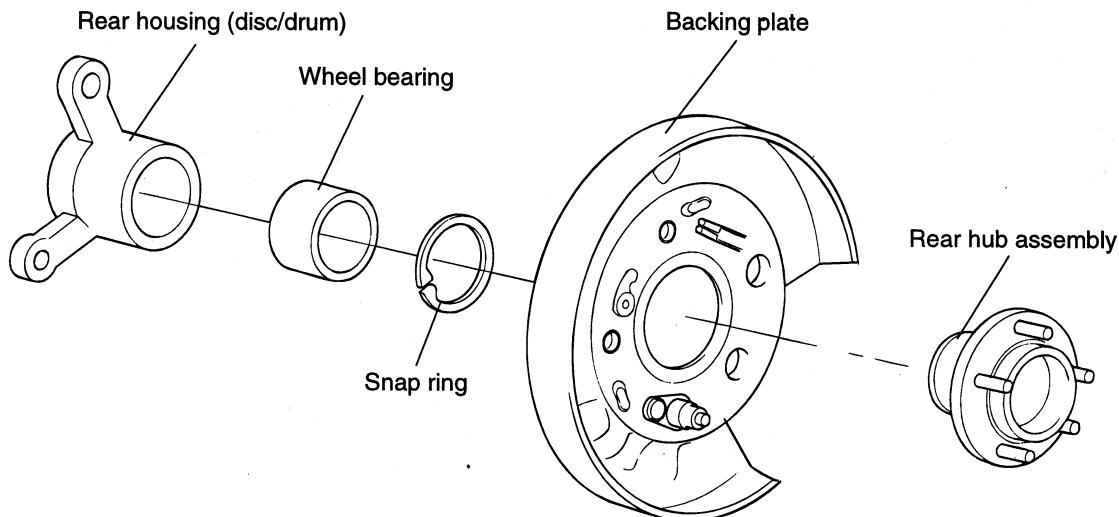
**NOTE**

- Don't re-use a hub assembly after it has been disassembled.
- After replacing the rear hub assembly, refill the brake fluid and bleed the brake line.

## REAR AXLE/HUB (4WD)

## COMPONENTS

EIJB0350



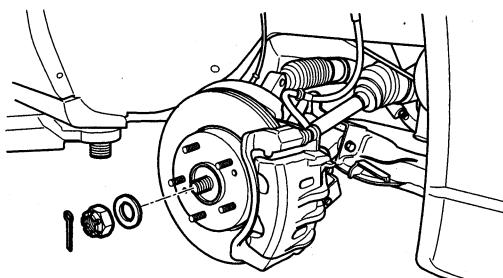
\* NOTE : This vehicle is full time 4WD

AIJA014C

## REMOVAL

EIJB0360

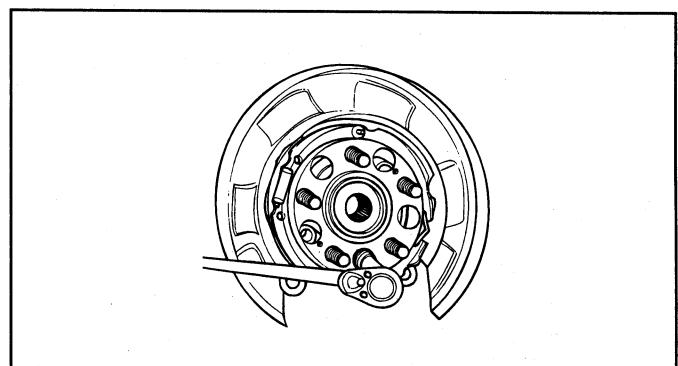
1. Raise the vehicle and remove the wheel and tire.
2. Remove the split pin and flange nut.



KGX7002A

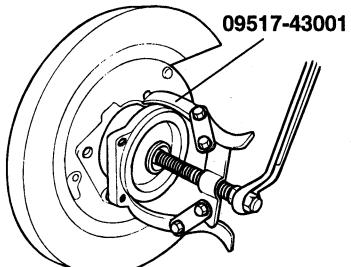
3. Remove the brake disc.

4. Detach the wheel speed sensor (for a vehicle equipped with ABS)
5. Remove the parking brake assembly.
6. Remove four(4) the rear housing mounting nuts.



EIJA014D

7. Using the special tool, remove the rear hub assembly from the rear housing



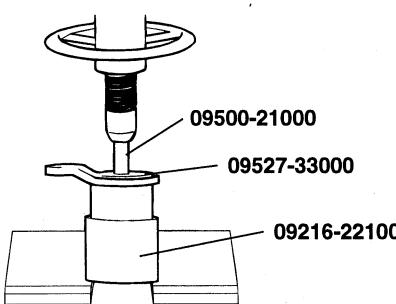
EIJA014E

8. Using snap ring pliers, remove the wheel bearing snap ring.



EIJA014G

9. Using the special tool, remove the wheel bearing inner race from the rear housing.



EIJA014F

## INSPECTION

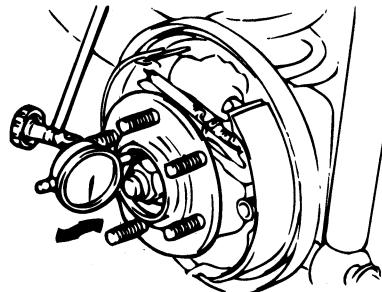
EIJB0370

1. Check the hub for cracks and splines for wear.
2. Check the hub bolts for cracks and damage.
3. Check the brake disc for scoring and damage.
4. Check the rear housing for cracks.
5. Check the wheel bearing for defects.

## MEASUREMENT OF THE END PLAY OF THE WHEEL BEARING

1. Install a dial gauge as shown in the illustration.
2. Check for axial motion (end play).

Limit value : 0.05mm or less



EIHA019A

3. If the end play is over the limit, loosen the flange nut and tighten it again to the specified torque. Then measure it again.
4. If the end play is beyond the limit, replace the rear hub assembly.

## INSTALLATION

EIJB0380

1. Apply a thin coat of multi-purpose grease to the contact surface of the rear housing and bearing.
2. Using the special tool (09216-22100, 09532-32000) press in the bearing to the spindle.

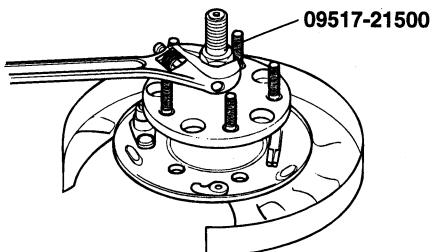
Press-in load [kg(f), lb(f)] : 4500-5000 (9921-11023)

## NOTE

1. Do not press the outer race of the bearing because that can cause damage to the bearing assembly.
2. When installing a bearing assembly, always use a new one.
3. Install the snap ring.
4. After fitting the backing plate to the rear housing, press in the hub onto the rear housing using the special tool.

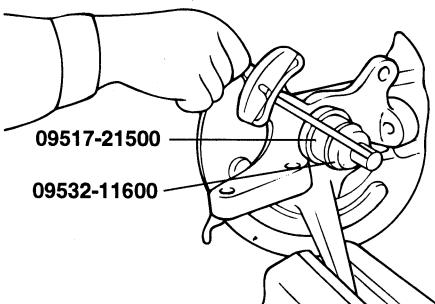
## NOTE

- Do not press the outer race of the wheel bearing because this can cause damage to the bearing assembly.



EJJA014H

5. Rotate the hub several times to seat the bearing.
6. Measure the wheel bearing starting torque.



S5DS022D

7. Measure the end play of the hub by installing a dial gauge and check that it is within specifications.

Hub end play : 0.008 mm (0.0003 in.) or less

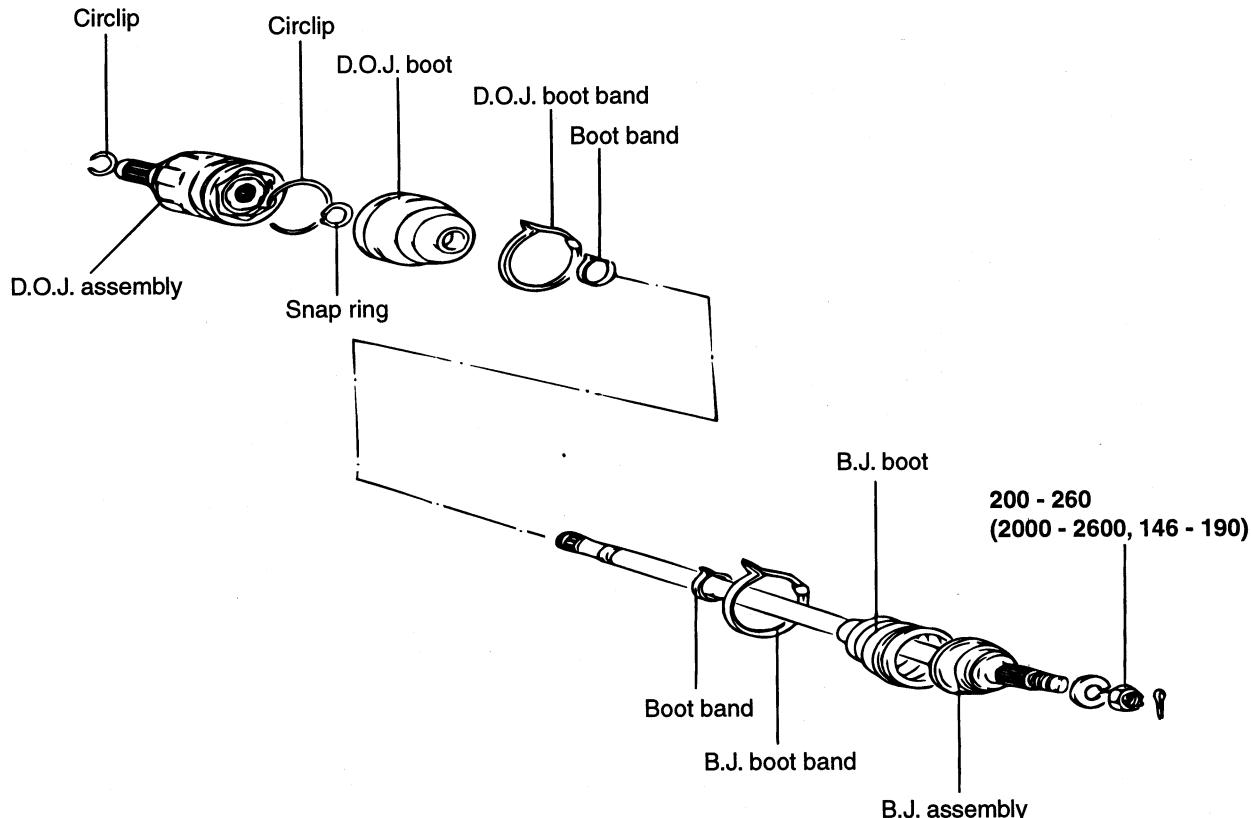
8. Remove the dial gauge and install the rear axle assembly to the trailing arm.

## REAR DRIVESHAFT ASSEMBLY

### REAR DRIVESHAFT (DOJ-BJ TYPE)

#### COMPONENTS

EIJB0390



\* NOTE : This vehicle is full time 4WD

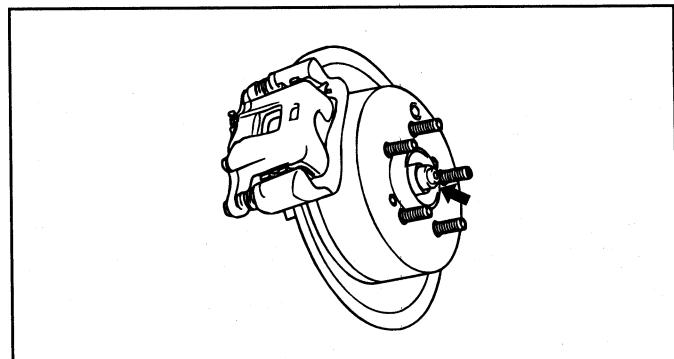
**TORQUE : Nm (kg·cm, lb·ft)**

AIJA011A

#### REMOVAL

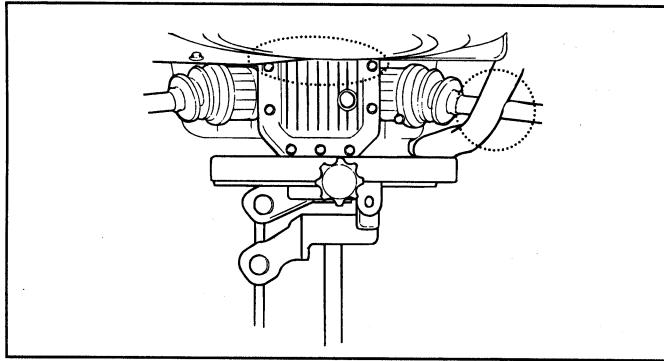
EIJB0400

1. Remove the aluminum wheel cover using a flat-blade screwdriver.
2. Raise the vehicle and remove the wheel.
3. Remove the split pin from the rear hub and driveshaft nut.



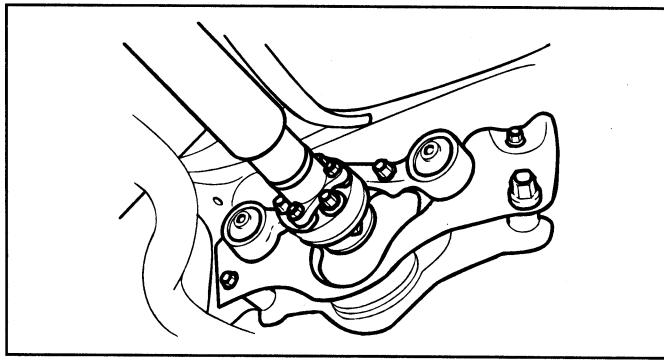
EIJA005A

4. Remove the spare tire and support the hanger of the main muffler to avoid interference with the differential carrier in removing the R.H. driveshaft.



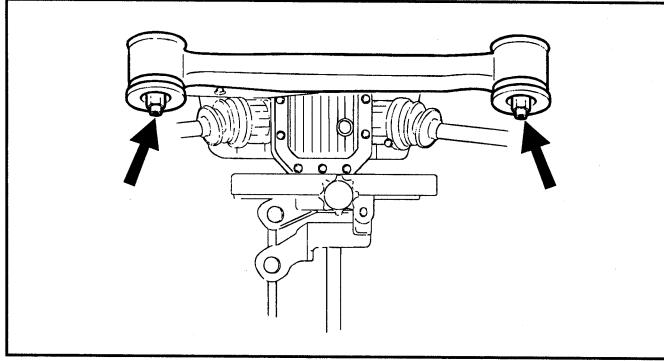
EIJA006A

5. After making matchmarks on the propeller rubber coupling and differential flange, remove the mounting bolts and nuts.



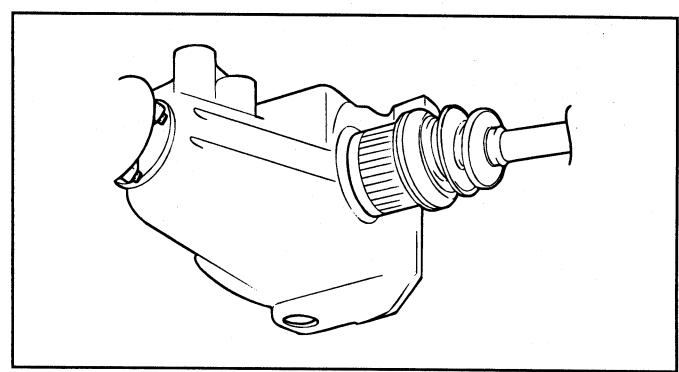
EIJA007A

6. Remove the differential mounting bolts and nuts while the differential carrier is supported by jack.



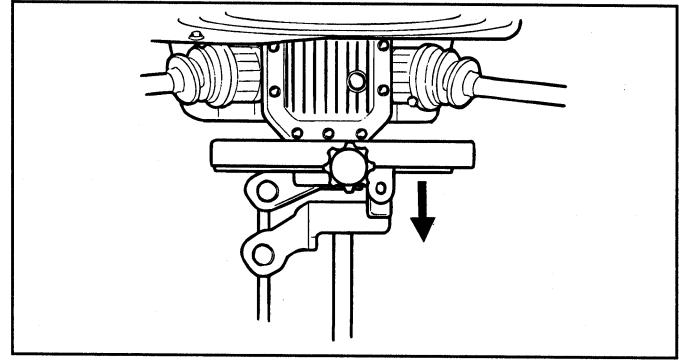
EIJA008A

7. Remove the driveshaft from the differential carrier by inserting a pry bar between the differential carrier and the driveshaft.



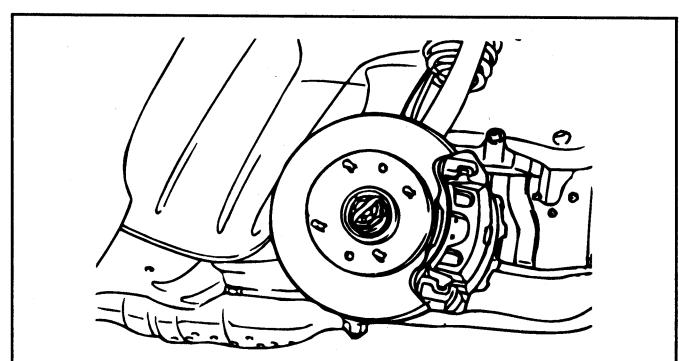
EIJA009A

8. After lowering the jack, move the differential carrier to the rear, and then remove it.



EIJA008B

9. Using a plastic hammer, disconnect the rear driveshaft from the rear axle hub.



HEW49004

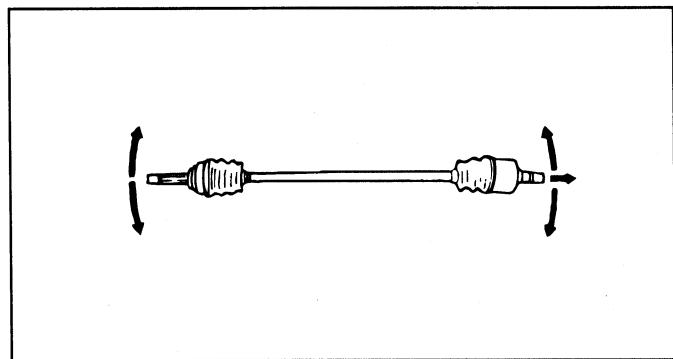
**CAUTION**

1. Use a pry bar to avoid damage to the joint.
2. If you pull the driveshaft with excessive force, components inside the joint can be loosened and cause the boot to be torn or the bearing to be damaged.
3. Plug the transaxle case opening with an oil seal cap in order to avoid contamination.
4. Support the driveshaft properly.
5. While loosening the driveshaft nut, do not let the vehicle weight bear on the wheel bearing.

**INSPECTION**

EIJB0410

1. Check the driveshaft boots for damage and deterioration.
2. Check the splines for wear and damage.
3. Check the ball joints for wear and operating condition.



S5DS008A

**INSTALLATION**

EIJB0420

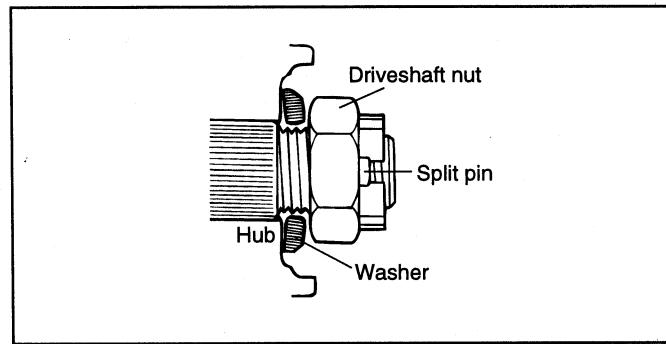
1. Installation is the reverse of removal

**NOTE**

1. Tighten the components below to the specified torque as follows.

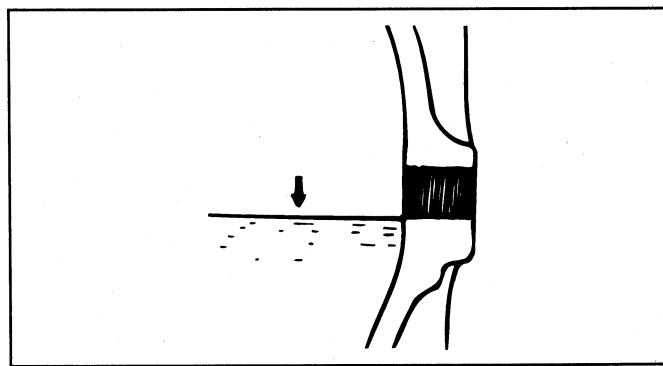
Items	Torque Nm (kg•cm, lb•ft)
Rear driveshaft nut	200-260 (2000-2600, 146-253)
Differential mounting rear bracket bolt	80-100 (800-1000, 58-73)
Rear differential mounting complete	70-80 (700-800, 51-58)

2. Install the washer under the driveshaft nut with the convex side outward, as shown in the illustration, and tighten the nut.



EIA9212A

3. Check the quantity of oil in the differential carrier and fill if it is insufficient.



EIJAA010A

## DISASSEMBLY

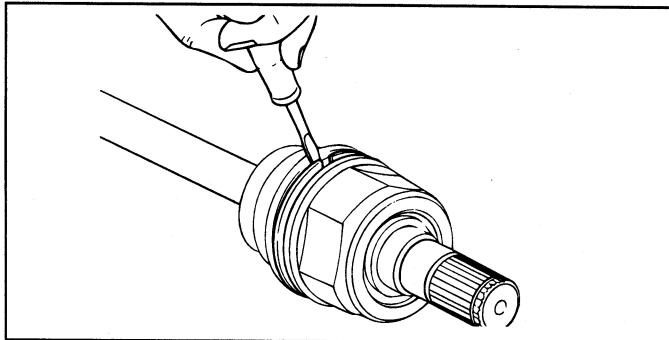
EIJB0430

## CAUTION

1. Do not disassemble the B.J. assembly.
2. Special grease must be applied to the driveshaft joint. Do not substitute with another type of grease.
3. The boot band should be replaced with a new one.
1. Remove the D.O.J. boot bands and pull the D.O.J. boot from the D.O.J. outer race.

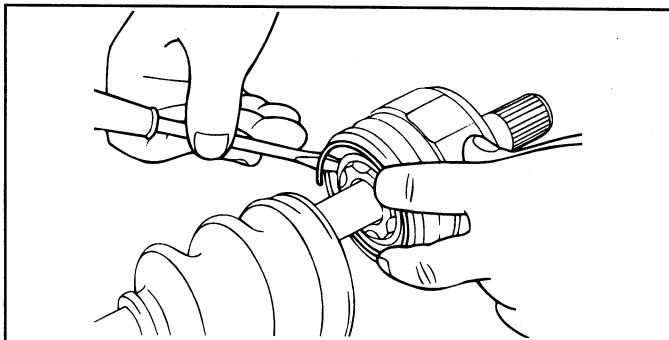
## CAUTION

Be careful not to damage the boot.



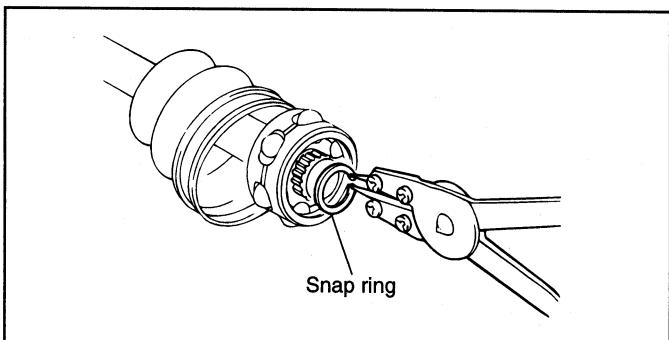
EIDA251A

2. Remove the circlip with a flat-blade screwdriver.



EIDA251B

3. Pull out the driveshaft from the D.O.J. outer race.
4. Remove the snap ring and take out the inner race, cage and balls as an assembly.

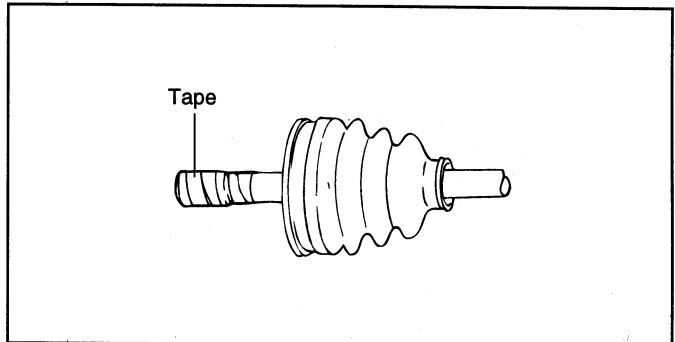


EIDA251C

5. Clean the inner race, cage and balls without disassembling.
6. Remove the B.J. boot bands and pull out the D.O.J. boot and B.J. boot.

## CAUTION

If the boot is to be reused, wrap tape around the driveshaft splines to protect the boot.



EIDA251D

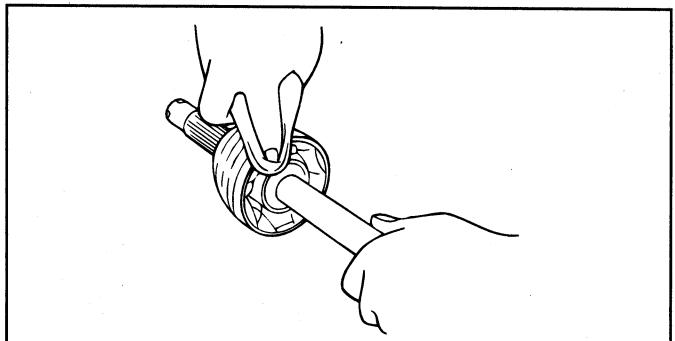
## INSPECTION

EIJB0440

1. Check the D.O.J. outer race, inner race, cage and balls for rust or damage.
2. Check the splines for wear.
3. Check for water, foreign material, or rust in the B.J. boot.

## CAUTION

When the B.J. assembly is to be reused, do not wipe out the grease. Check that there are no foreign substances in the grease. If necessary, clean the B.J. assembly and replace the grease.



EIDA252A

## REASSEMBLY

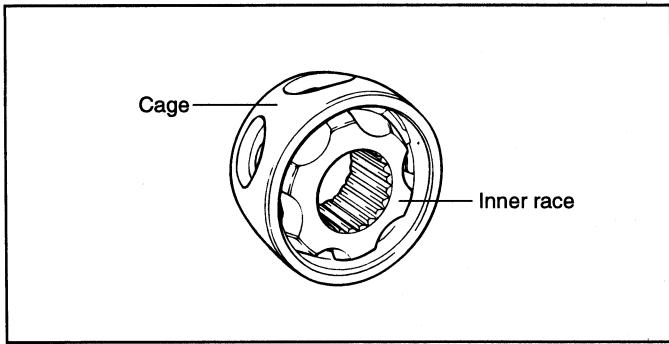
EIJB0455

1. Wrap tape around the driveshaft splines (D.O.J. side) to prevent damage to the boots.
2. Apply the specified grease to the driveshaft and install the boots.

Recommended lubricant :

B.J. Boot grease : Centoplex 273/136K  
 D.O.J. Boot grease : Amblygon TA10/12A

3. Apply the specified grease to the inner race and cage. Install the cage so that it is offset on the race as shown in the illustration.

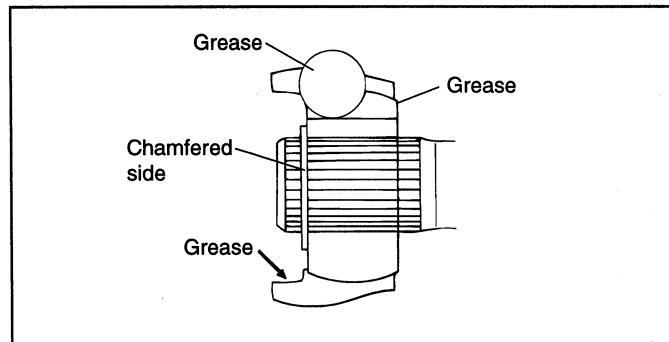


EIDA253B

## NOTE

Use the grease included in the repair kit.

4. Apply the specified grease to the cage and fit the balls into the cage.
5. Install the chamfered side as shown in the illustration, and then install the inner race on the drive shaft. Install the snap ring.



EIDA253C

6. Apply the specified grease to the B.J. outer race and install the outer race onto the driveshaft.

B.J. boot grease gr.

Total :  $115 \pm 6$  gr.In the joint :  $60 \pm 3$  gr.In the boot :  $55 \pm 3$  gr.

7. Apply the specified grease to the D.O.J. outer race and install the circlip.

D.O.J. boot grease gr.

Total :  $100 \pm 6$  gr.In the joint :  $60 \pm 3$  gr.In the boot :  $40 \pm 3$  gr.

8. Tighten the D.O.J. boot bands.

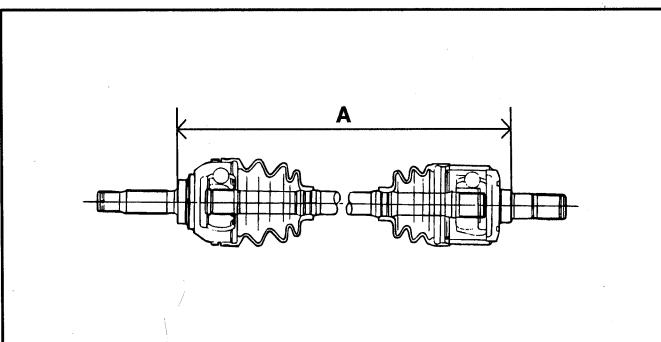
9. Add the specified grease to the B.J. as much as was wiped out at inspection.

10. Install the boots.

11. Tighten the B.J. boot bands.

12. To control the air in the D.O.J. boot, keep the specified distance between the boot bands when they are tightened.

Standard value (A)

2.4 M/T :  $680.2 \pm 2$  mm (26.78  $\pm$  0.08 in.)2.7 A/T :  $681.7 \pm 2$  mm (26.8  $\pm$  0.08 in.)

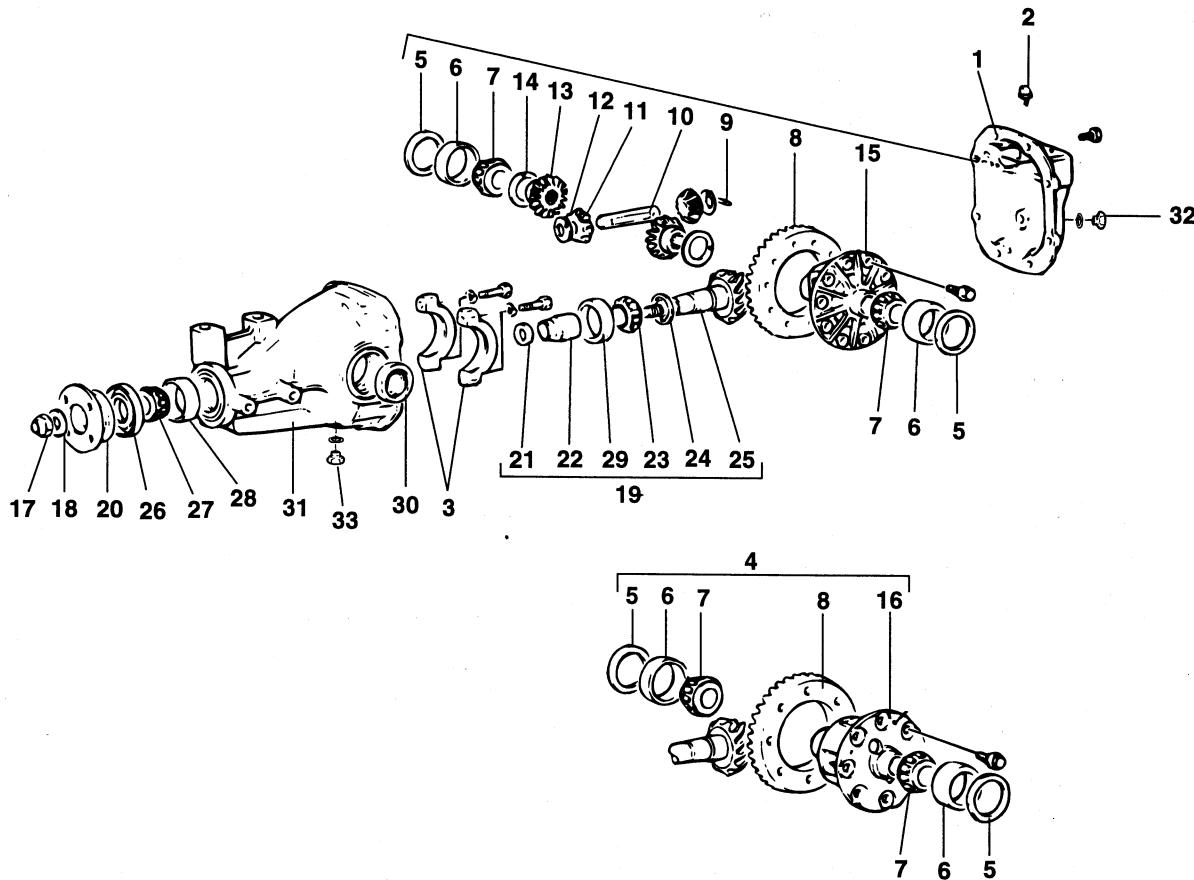
EIDA253D

## DIFFERENTIAL CARRIER ASSEMBLY

### DIFFERENTIAL CARRIER

#### COMPONENTS

EIJB0460

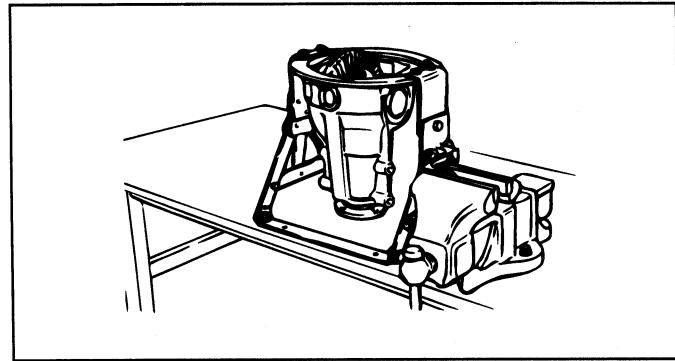


- 1. Differential cover
- 2. Vent plug
- 3. Bearing cap
- 4. Differential case assembly
- 5. Side bearing spacer
- 6. Side bearing outer race
- 7. Side bearing inner race
- 8. Drive gear
- 9. Lock pin <for conventional differential>
- 10. Pinion shaft
- 11. Pinion gear
- 12. Pinion washer
- 13. Side gear
- 14. Side gear spacer
- 15. Differential case
- 16. Limited slip differential case assembly
- 17. Self-locking nut
- 18. Washer
- 19. Drive pinion assembly
- 20. Companion flange
- 21. Drive pinion front shim (for preload adjustment)
- 22. Drive pinion spacer
- 23. Drive pinion rear bearing inner race
- 24. Drive pinion rear shim (for pinion height adjustment)
- 25. Drive pinion
- 26. Oil seal
- 27. Drive pinion front bearing inner race
- 28. Drive pinion front bearing outer race
- 29. Drive pinion rear bearing outer race
- 30. Oil seal
- 31. Gear carrier
- 32. Filler plug
- 33. Drain plug

## INSPECTION BEFORE DISASSEMBLY

EIJB0470

Hold the special tool in a vice, and mount the differential carrier on the special tool.



E7FS0600

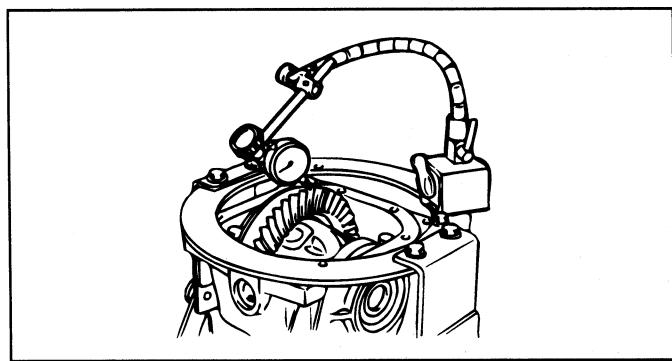
### FINAL DRIVE GEAR BACKLASH

1. Fix the drive gear so it cannot move and measure the final drive gear backlash with a dial indicator.

#### NOTE

**Measure at four points or more on the circumference of the drive gear.**

Standard value : 0.08-0.13 mm (0.003-0.005 in.)



H7FA0690

2. If the backlash is beyond the standard value, adjust by using the side bearing spacer.

#### NOTE

**After adjustment, inspect the contact of the final drive gear.**

### DRIVE GEAR RUNOUT

Check the back-face lash as follows:

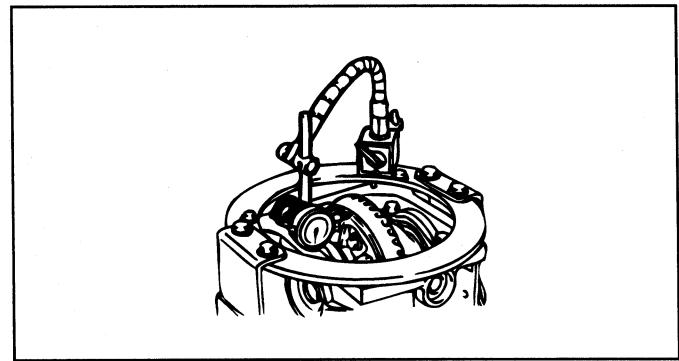
1. Place a dial gauge on the back-face of the drive gear and measure the runout.

Limit : 0.05 mm (0.0020 in.)

2. If the runout is beyond the limit, check that there are no foreign substances between the drive gear and differential case and, that the bolts fixing the drive gear are not loose.
3. If nothing is wrong in check (2), adjust the drive gear depth and remeasure.

#### NOTE

**If these adjustments are impossible, replace the case or install a new drive gear/drive pinion as a set.**



H7FA0700

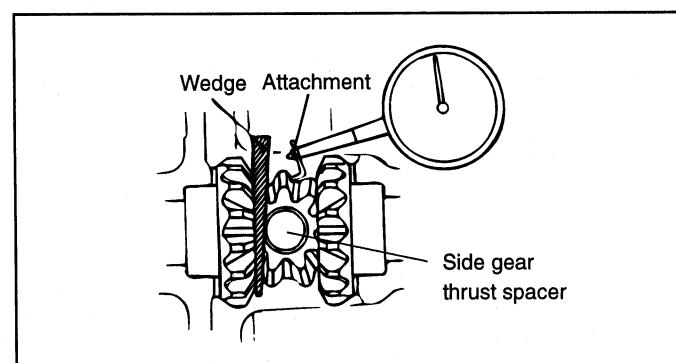
### DIFFERENTIAL GEAR BACKLASH

1. Fix the side gear with a wedge so it cannot move and measure the differential gear backlash with a dial indicator on the pinion gear.

#### NOTE

**Take the measurements at two places (4 places for LSD) on the pinion gear.**

Standard value : 0-0.076 mm (0-0.003 in.)  
Limit : 0.2 mm (0.008 in.)



A7FA0710

2. If the backlash exceeds the limit, adjust using side bearing spacers.

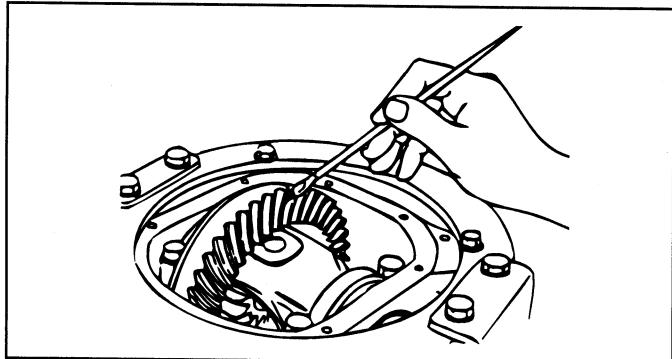
#### NOTE

**If adjustment is impossible, replace the side gear and pinion gears as a set.**

**FINAL DRIVE GEAR TOOTH CONTACT**

Check the final drive gear tooth contact by following the steps below :

1. Apply a thin, uniform coat of machine blue to both surfaces of the drive gear teeth.



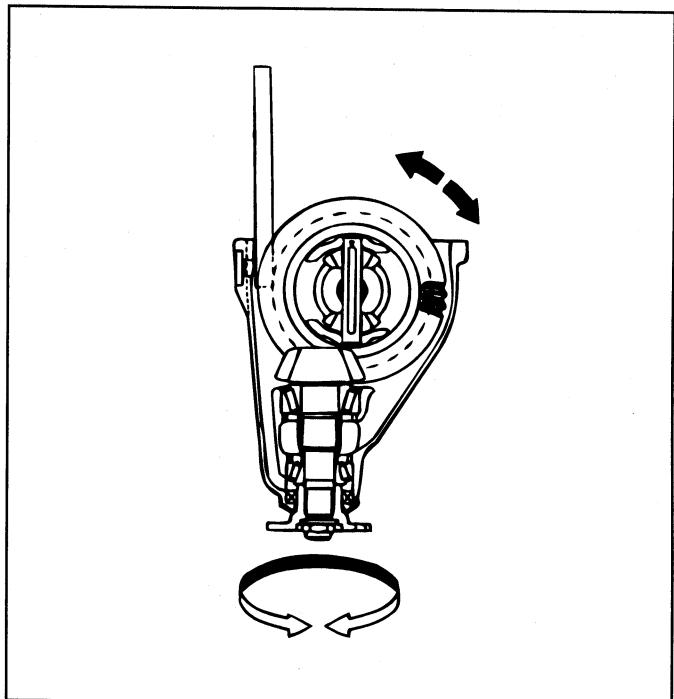
H7FA0720

2. Insert a brass rod between the differential carrier and the differential case, and then rotate the companion flange by hand (once in the normal direction, and then once in the reverse direction) while applying a load to the drive gear so that some torque (approximately 25-30 kg•cm) is applied to the drive pinion.

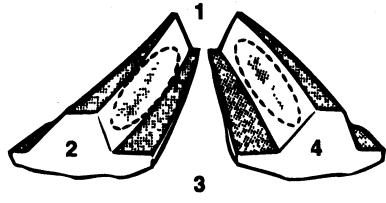
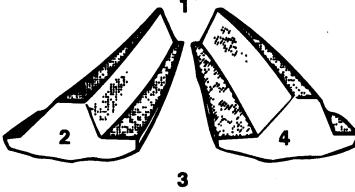
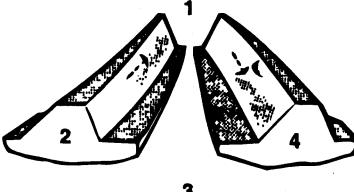
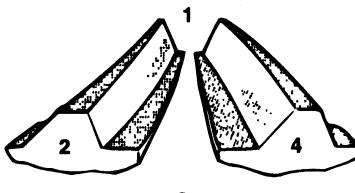
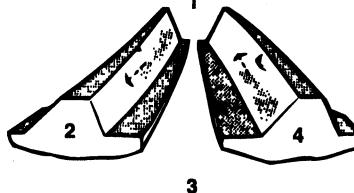
**CAUTION**

If the drive gear is rotated too much, the tooth contact pattern will become unclear and difficult to check.

3. Check the tooth contact pattern.



E1JA001B

<p><b>Standard tooth contact pattern</b></p> <ol style="list-style-type: none"> <li>1. Narrow tooth side</li> <li>2. Drive-side tooth surface (the side receiving power during acceleration)</li> <li>3. Wide tooth side</li> <li>4. Coast-side tooth surface (the side receiving power during coast-down)</li> </ol>	 <p>EIJA0011</p>
<p><b>Problem</b></p>	<p><b>Solution</b></p>
<p>Tooth contact pattern resulting from excessive pinion height</p>  <p>EIJA0012</p> <p>The drive pinion is positioned too far from the center of the drive gear.</p>	 <p>EIJA0013</p> <p>Increase the thickness of the pinion height adjusting shim, and position the drive pinion closer to the center of the drive gear. Also, for backlash adjustment, reposition the drive gear further from the drive pinion.</p>
<p>Tooth contact pattern resulting from insufficient pinion height</p>  <p>EIJA0014</p> <p>The drive pinion is positioned too close to the center of the drive gear.</p>	 <p>EIJA0015</p> <p>Decrease the thickness of the pinion height adjusting shim, and position the drive pinion further from the center of the drive gear. Also, for backlash adjustment, reposition the drive gear closer to the drive pinion.</p>

**NOTE**

- **Tooth contact pattern** is a method for judging the result of the adjustment of drive pinion height and final drive gear backlash. The adjustment of drive pinion height and final drive gear backlash should be repeated until the tooth contact patterns are similar to the standard tooth contact pattern.
- **When you cannot obtain a correct pattern, the drive gear and drive pinion have exceeded their limits. Both gears should be replaced as a set.**

**DISASSEMBLY**

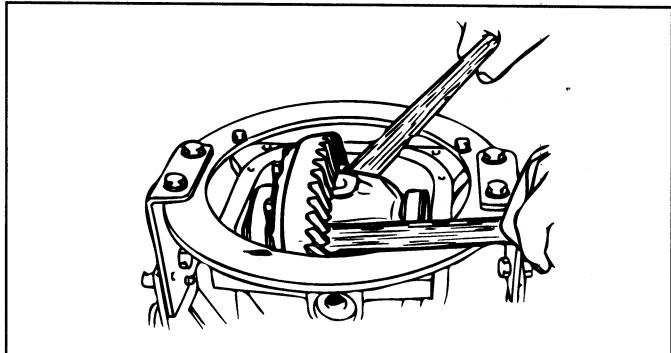
EIJB0480

**1. REMOVAL OF THE DIFFERENTIAL CASE ASSEMBLY****CAUTION**

Remove the differential case assembly slowly and carefully. Be careful so that the side bearing outer race is not dropped.

**NOTE**

Keep the right and left side bearings separate so that they are not mixed during reassembly.



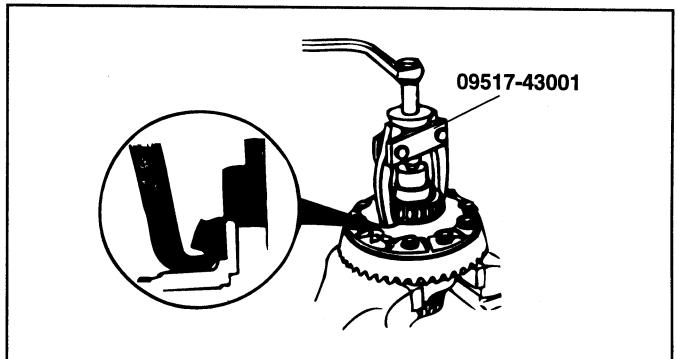
H7FA0740

**2. REMOVAL OF THE SIDE BEARING INNER RACES**

Fit the nut on top of the differential case, and then use the special tool to remove the side bearing inner race.

**NOTE**

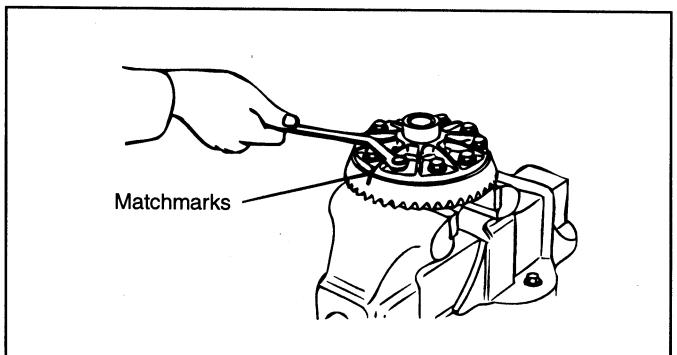
Attach the prongs of the special tool to the inner race of the side bearing through the notched section in the differential case.



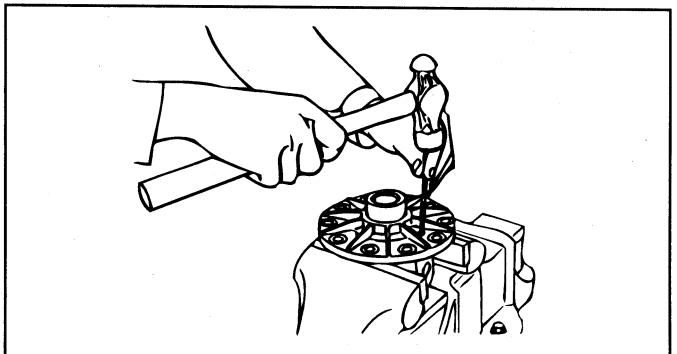
H7FA0750

**3. REMOVAL OF DRIVE GEAR**

- a. Make the matchmarks to the differential case and the drive gear.
- b. Loosen the drive gear attaching bolts in diagonal sequence to remove the drive gear.

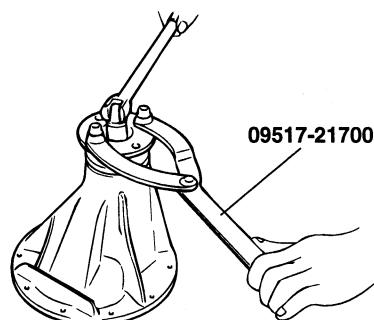


A7FA0760

**4. REMOVAL OF LOCK PIN (FOR CONVENTIONAL DIFFERENTIAL)**

H7FA0770

## 5. REMOVAL OF SELF-LOCKING NUT



H7RA1100

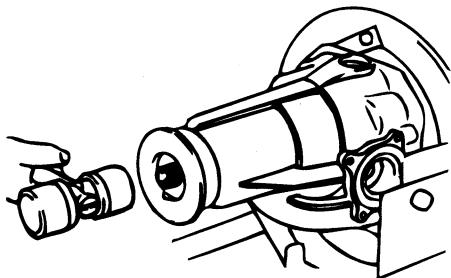
## 6. REMOVAL OF DRIVE PINION

- Make the matchmarks to the drive pinion and companion flange.

## CAUTION

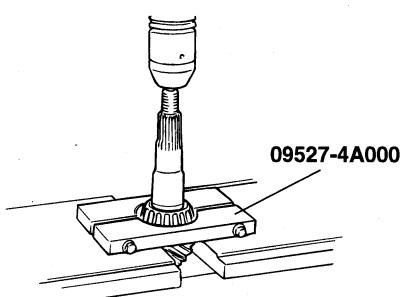
Matchmarks should not be made to the contact surfaces of the companion flange and the propeller shaft.

- Drive out the drive pinion together with the drive pinion spacer and drive pinion front shims.



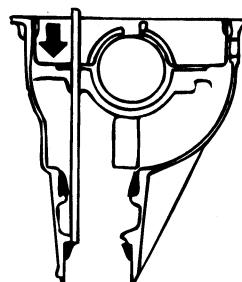
H7FA0790

## 7. REMOVAL OF DRIVE PINION REAR BEARING INNER RACE



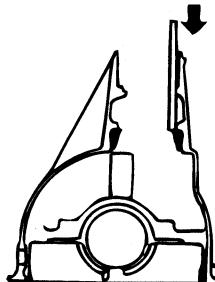
H7RA1090

## 8. REMOVAL OF OIL SEAL / DRIVE PINION FRONT BEARING INNER RACE / DRIVE PINION FRONT BEARING OUTER RACE



H7FA0810

## 9. REMOVAL OF DRIVE PINION REAR BEARING OUTER RACE



H7FA0820

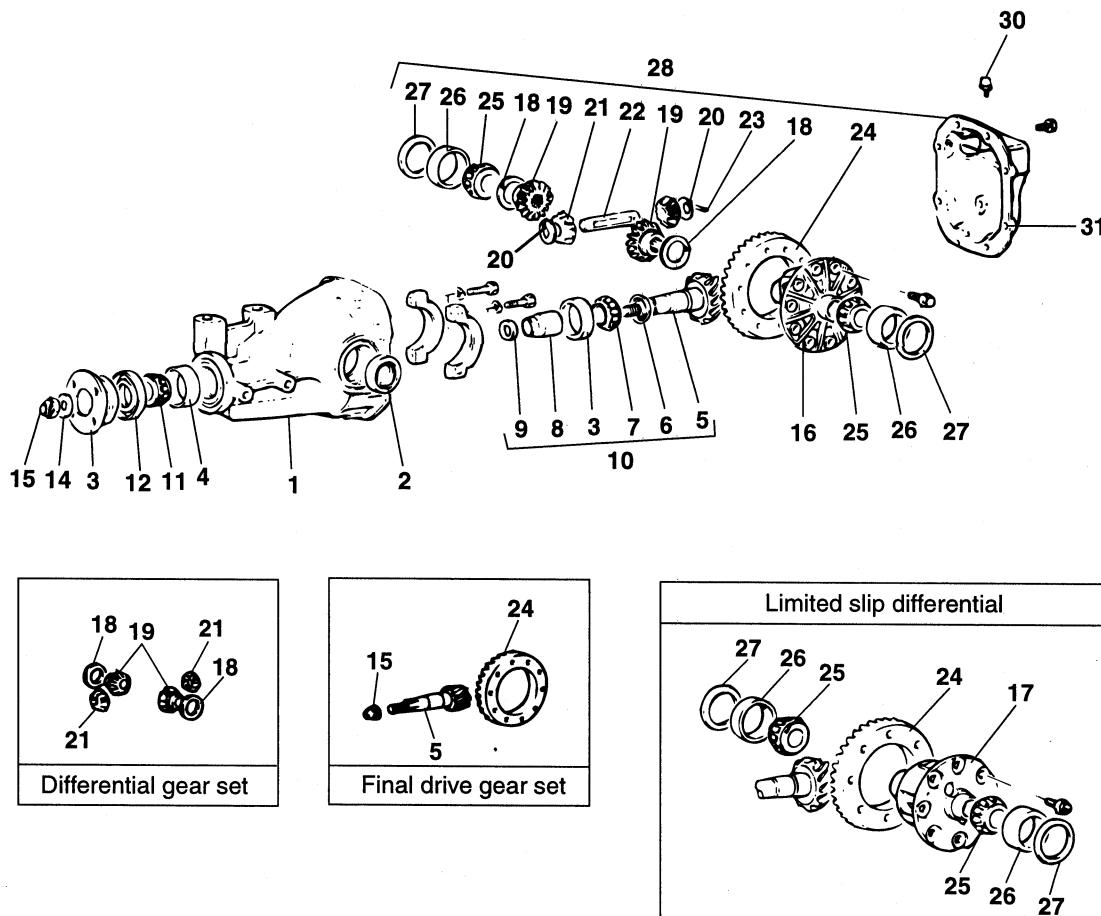
## INSPECTION

EIJB0490

- Check the companion flange for wear or damage.
- Check the bearings for wear or discoloration.
- Check the gear carrier for cracks.
- Check the drive pinion and drive gear for wear or cracks.
- Check the side gears, pinion gears and pinion shaft for wear or damage.
- Check the side gear spline for wear or damage.

## REASSEMBLY

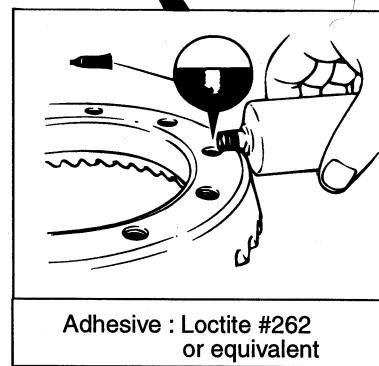
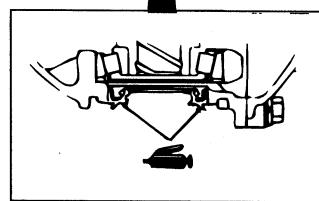
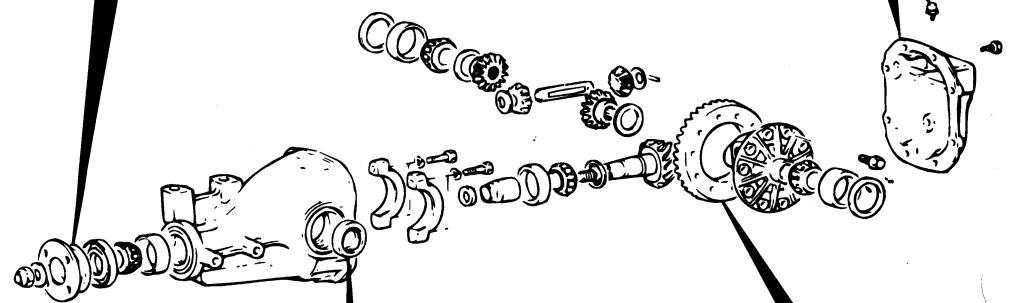
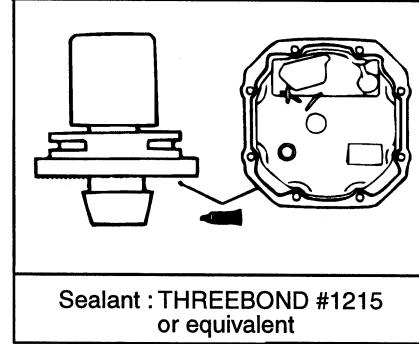
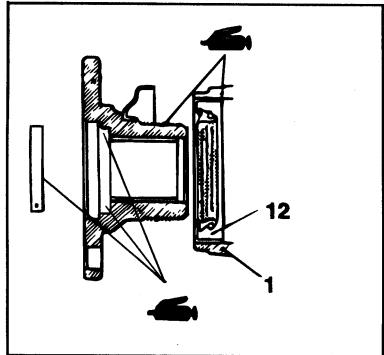
EIJB0500



## Reassembly steps

1. Gear carrier
2. Oil seal
3. Drive pinion rear bearing outer race
4. Drive pinion front bearing outer race  
(Adjustment of pinion height)
5. Drive pinion
6. Drive pinion rear shim  
(for pinion height adjustment)
7. Drive pinion rear bearing inner race
8. Drive pinion spacer  
(Adjustment of drive pinion preload)
9. Drive pinion front shim  
(for preload adjustment)
10. Drive pinion assembly
11. Drive pinion front bearing inner race
12. Oil seal
13. Companion flange
14. Washer
15. Self-locking nut
16. Differential case
17. Limited slip differential case assembly  
(Adjustment of differential gear backlash)
18. Side gear spacer
19. Side gear
20. Pinion washer
21. Pinion gear
22. Pinion shaft
23. Lock pin (for conventional differential)
24. Drive gear
25. Side bearing inner race
26. Side bearing outer race
27. Side bearing spacer
28. Differential case assembly
29. Bearing cap
30. Vent plug
31. Differential cover

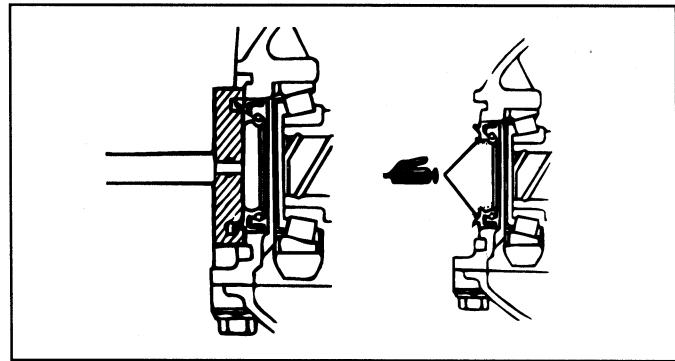
## LUBRICATION AND ADHESIVE POINTS



## SERVICE POINTS OF REASSEMBLY

## 1. PRESS-FITTING OF OIL SEAL

- With the special tool, press fit the oil seal to the end of the gear carrier.
- Apply multipurpose grease to the oil seal lip.

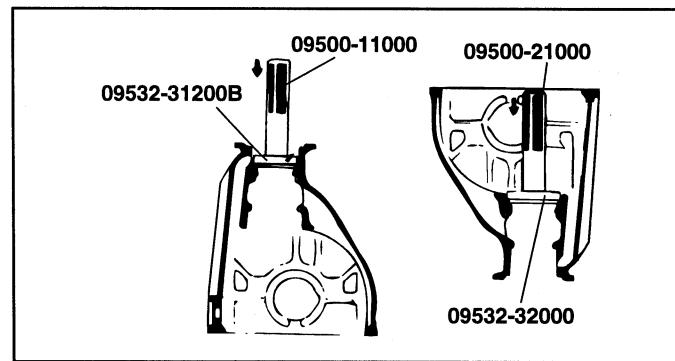


EIJA005B

- Install the drive pinion rear bearing outer race and drive pinion front bearing outer race using the special tool.

## CAUTION

Be careful not to press in the outer race when it is inclined.



EIJA005C

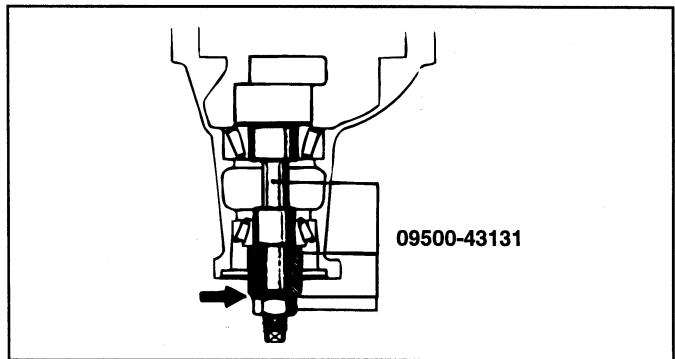
## ADJUSTMENT OF PINION HEIGHT

Adjust the drive pinion height according to the following procedures:

- Install the drive pinion inner and outer bearing races to the special tool in sequence shown in the illustration.

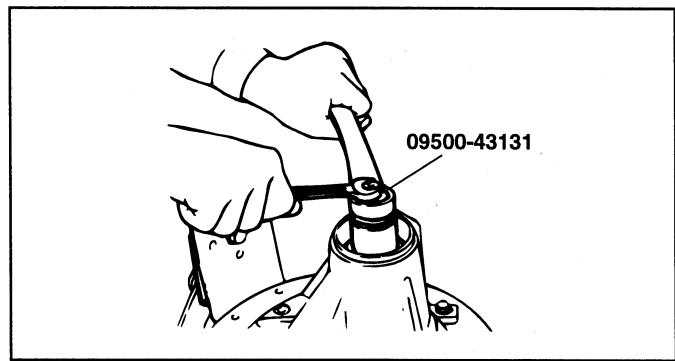
## NOTE

Apply a thin coat of the multipurpose grease on the mating face of the washer of the special tool.



EIJA005D

- Tighten the nut of the special tool slowly until the standard value of drive pinion turning torque is obtained.



EIJA005E

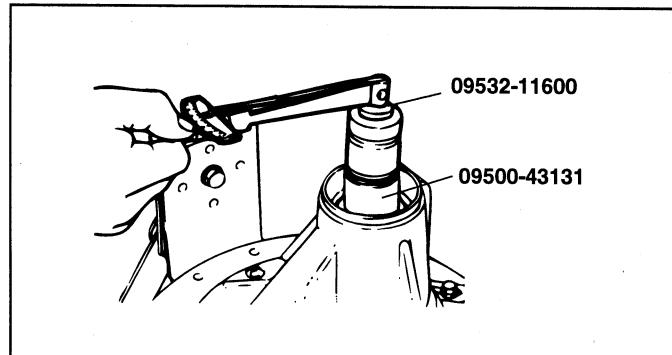
- Measure the drive pinion turning torque (without the oil seal) using the special tool.

## STANDARD VALUE :

Bearing division	Bearing lubrication	Rotation torque Nm (kg·cm)
New	None (with anti-rust agent)	0.6-0.9 (6-9)
New or reused	Oil application	0.4-0.5 (4-5)

**NOTE**

- **Gradually tighten the nut of the special tool while checking the drive pinion turning torque.**
- **Because the special tool cannot be turned one rotation, turn it several times within the range that it can be turned. After obtaining smooth bearing operation, measure the rotation torque.**

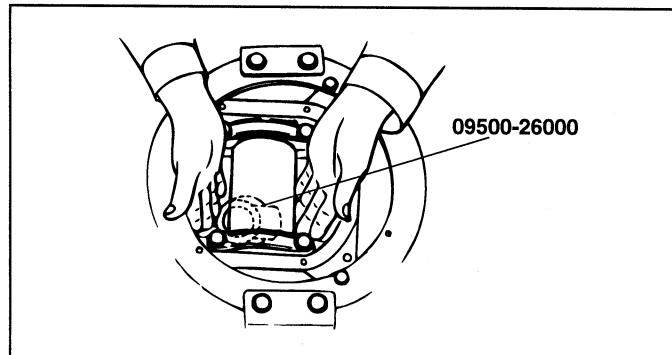


EIJA006C

4. Position the special tool in the side bearing seat of the gear carrier and select a drive pinion rear shim of a thickness which corresponds to the gap between the special tools.

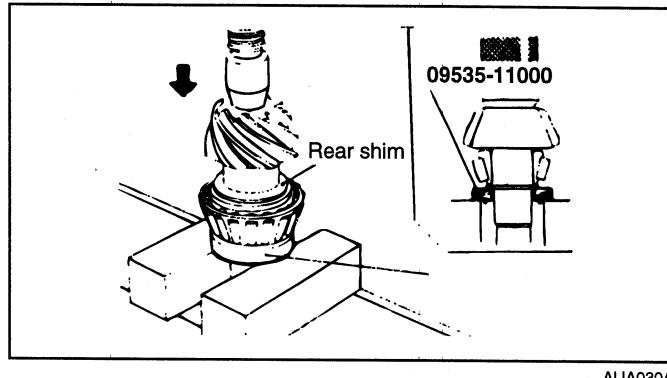
**NOTE**

- **Clean the side bearing seat thoroughly. When positioning the special tool, confirm that the cut-out sections of the special tool touch the side bearing seat very closely.**
- **When selecting the drive pinion rear shims, use the fewest number of shims necessary.**



EIJA006B

5. Fit the selected drive pinion rear shim(s) to the drive pinion, and press-fit the drive pinion rear bearing inner race using the special tool.



AIJA030A

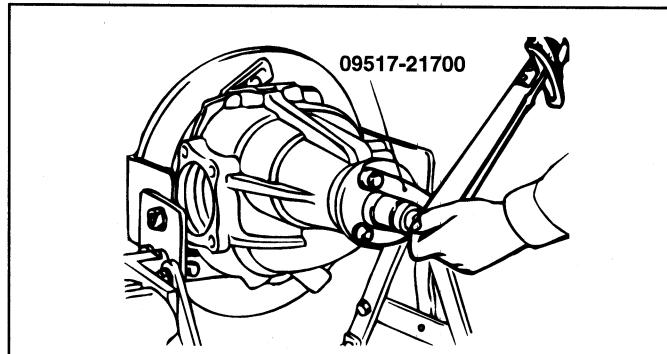
**ADJUSTMENT OF DRIVE PINION PRELOAD**

Adjust the drive pinion turning torque according to the following procedures :

1. Fit the drive pinion front shim(s) between the drive pinion spacer and the drive pinion front bearing inner race.
2. Tighten the companion flange to the specified torque using the special tool.

**NOTE**

**Do not install the oil seal.**



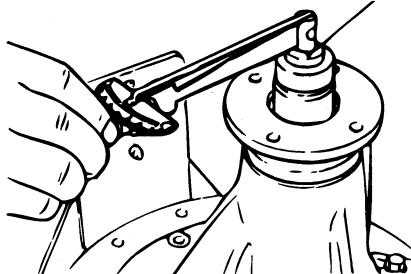
H7FA0930

3. Measure the drive pinion turning torque. (without the oil seal using the special tool)

**STANDARD VALUE :**

Bearing use	Bearing lubrication	Rotation torque Nm (kg•cm)
New	None (with anti-rust agent)	0.6-0.9 (6-9)
New or reused	Oil application	0.4-0.5 (4-5)

09532-11600



H7FA0940

4. If the drive pinion turning torque is not within the range of the standard value, adjust the turning torque by replacing the drive pinion front shim(s) or the drive pinion spacer.

**NOTE**

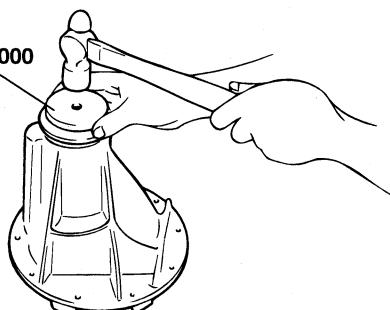
**When selecting the drive pinion front shim pack use the minimum number of shims.**

5. Remove the companion flange and drive pinion once again.

Insert the oil seal into the gear carrier front lip using the special tool.

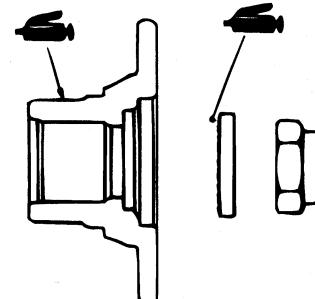
Apply multipurpose grease to the oil seal lip.

09517-21000



H7RA1080

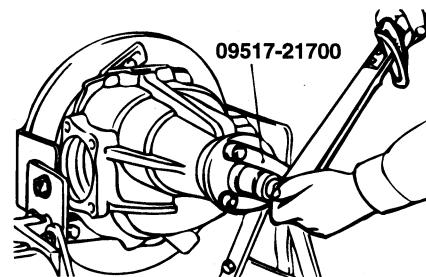
6. Apply a thin coat of multipurpose grease to the contacting surface of the oil seal in the companion flange and contacting surface of the washer of the flange before installing the drive pinion assembly.



EJJA007B

7. Install the drive pinion assembly, shim packs and companion flange with matchmarks properly aligned, and tighten the companion flange self-locking nut to the specified torque by using the special tool.

09517-21700



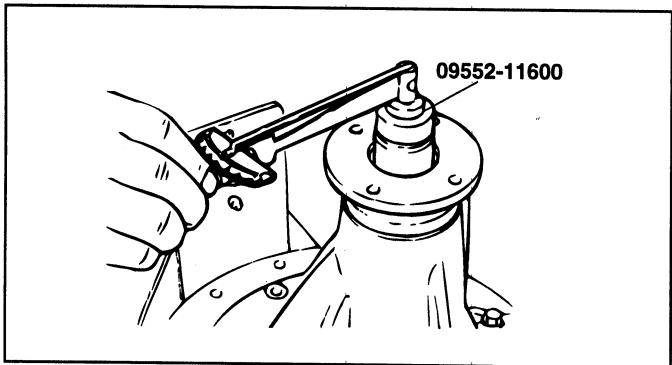
H7FA0970

8. Measure the drive pinion turning torque (with oil seal) by using the special tool to verify that the drive pinion turning torque is within the standard value.

**STANDARD VALUE :**

Bearing use	Bearing lubrication	Rotation torque Nm (kg•cm)
New	None (with anti-rust agent)	0.8-1.15 (8-11.5)
New or reused	Oil application	0.65-0.77 (6.5-7.5)

If it is beyond the standard value, verify the torque of the companion flange self-locking nut, or the fit of the oil seal.



H7FA0980

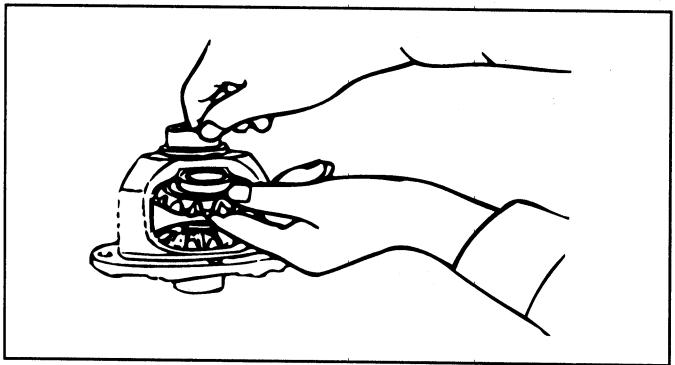
### ADJUSTMENT OF DIFFERENTIAL GEAR BACKLASH

Adjust the differential gear backlash according to the following procedures :

1. Assemble the side gears, side gear spacers, pinion gears, and pinion washers into the differential case.
2. Temporarily install the pinion shaft.

#### NOTE

Do not install the lock pin yet.



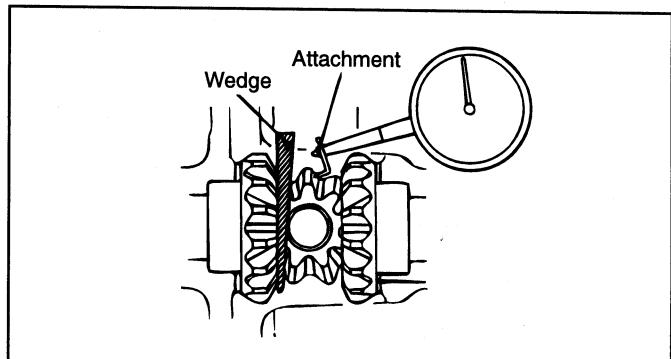
H7FA0990

3. Insert a wedge in the side gear and measure the differential gear backlash with a dial indicator on the pinion gear.

#### NOTE

Measure both pinion gears separately.

Standard value : 0-0.076 mm (0-0.0003 in.)  
Limit : 0.2 mm (0.008 in.)



A7FA1000

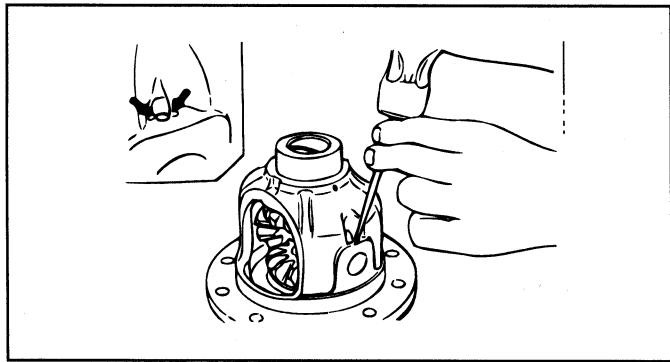
4. If the differential gear backlash exceeds the limit, adjust the backlash by installing thicker side gear thrust spacers.
5. Measure the differential gear backlash once again, and confirm that it is within the limit.

#### NOTE

- After adjustment, check that the backlash is within the limit and the differential gear rotates smoothly.
- When adjustment is impossible, replace the side gear and the pinion gear as a set.

## 6. Installation of the lock pin

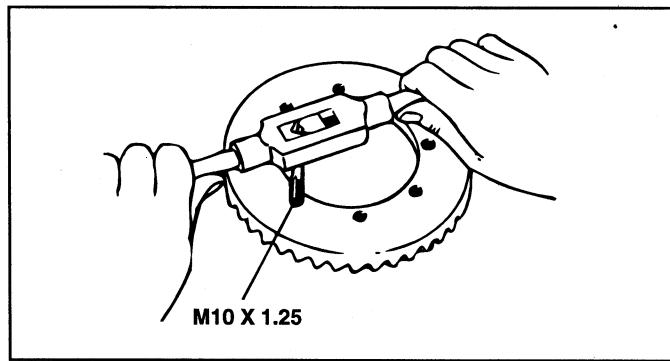
- Align the pinion shaft lock pin hole with the differential case lock pin hole, and drive in the lock pin.
- Fix the lock pin in place by staking two points around the lock pin hole with a punch.



H7FA1010

## 7. Installation of the drive gear

- Clean the drive gear attaching bolts.
- Remove the adhesive on the threaded holes of the drive gear use a tap (M10 1.25), and then clean the threaded holes with compressed air.

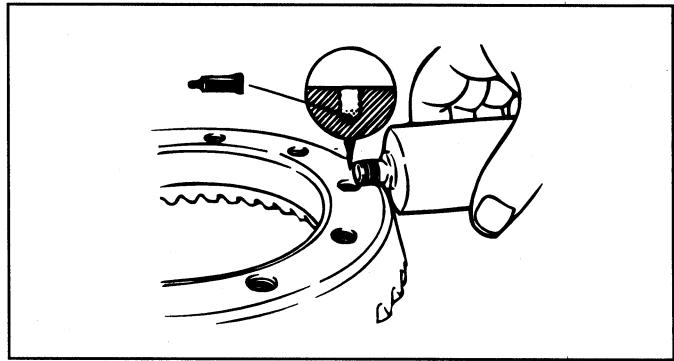


H7FA1020

- Apply the specified adhesive to the threaded holes of the drive gear.

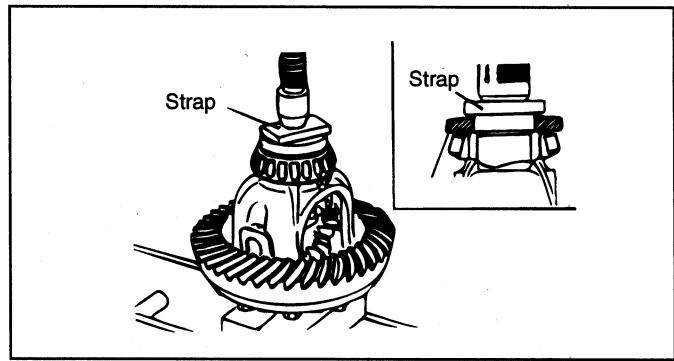
Specified adhesive : LOCTITE #262 or equivalent

- Install the drive gear in the differential case with the matchmarks properly aligned. Tighten the bolts to the specified torque (800-900 kg·cm) in a diagonal sequence.



H7FA1030

## 8. Press the side bearing inner race



A7FA1040

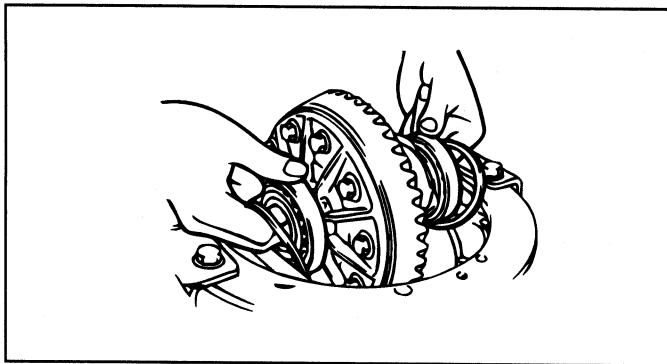
### ADJUSTMENT OF FINAL DRIVE GEAR BACKLASH

Adjust the final drive gear backlash according to the following procedures :

- Install side bearing spacers which are thinner than those removed, to the side bearing outer races, and then mount the differential case assembly into the gear carrier.

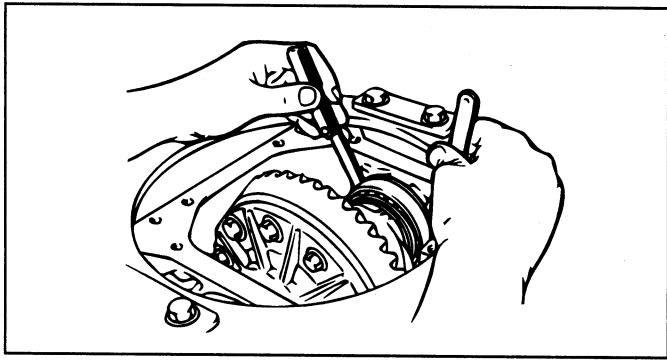
**NOTE**

Select side bearing spacers with the same thickness for both the drive pinion side and the drive gear side.



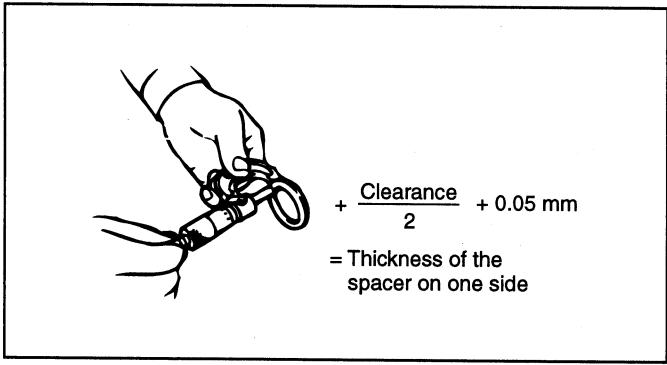
H7FA1050

2. Push the differential case to one side, and measure the clearance between the gear carrier and the side bearing with a feeler gauge.



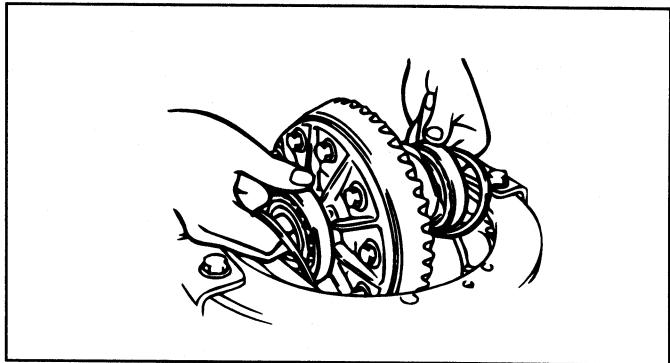
H7FA1060

3. Select two pairs of spacers which correspond to the value calculated according to the expression in the illustration. Install one pair each to the drive pinion side and the drive gear side.



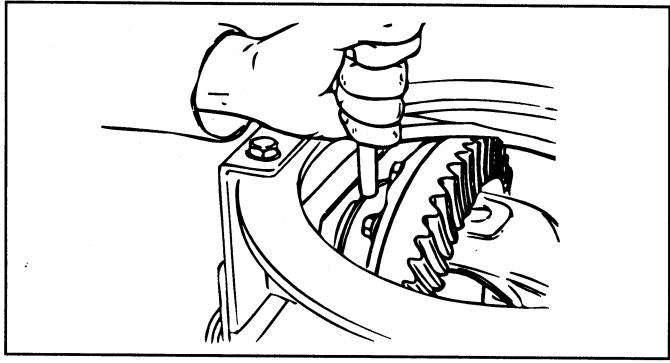
A7FA1070

4. Install the side bearing spacers and differential case assembly, as shown in the illustration, to the gear carrier.



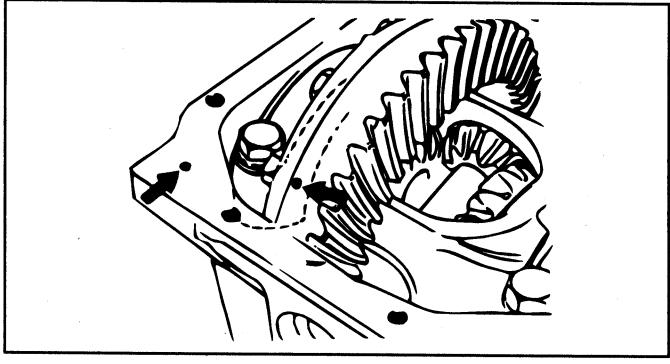
H7FA1080

5. Tap the side bearing spacers with a brass bar to fit them to the side bearing outer race.



H7FA1090

6. Align the matchmarks on the gear carrier and the bearing cap and tighten the bearing cap.



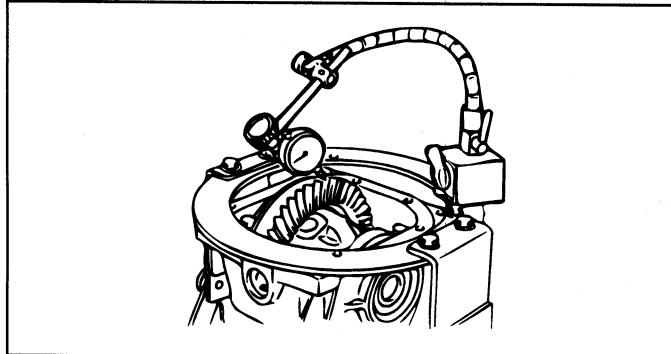
H7FA1100

7. With the drive pinion locked in place, measure the final drive gear backlash with a dial indicator on the drive gear.

**NOTE**

**Measure at four points or more on the circumference of the drive gear.**

Standard value : 0.08-0.13 mm (0.003-0.005 in.)

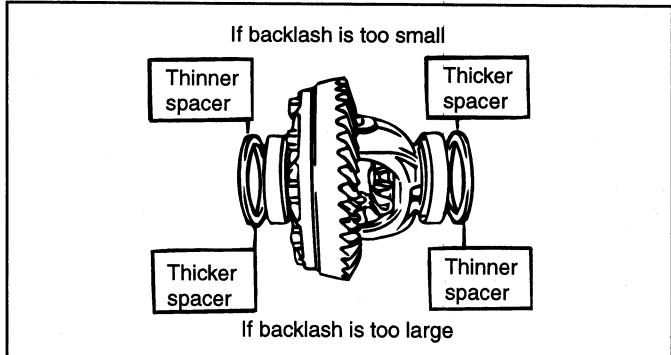


H7FA1110

8. Change the side bearing spacers as illustrated and then adjust the final drive gear backlash between the drive gear and the drive pinion.

**NOTE**

**When increasing the number of side bearing spacers, use the same number for each and as few as possible.**

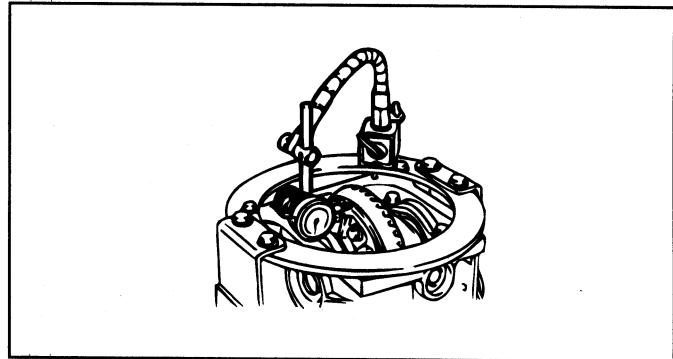


A7FA1120

9. Check the drive gear and drive pinion for tooth contact. If poor contact is evident, adjust again.

10. Measure the drive gear runout at the shoulder on the reverse side of the drive gear.

Limit : 0.05 mm (0.002 in.)



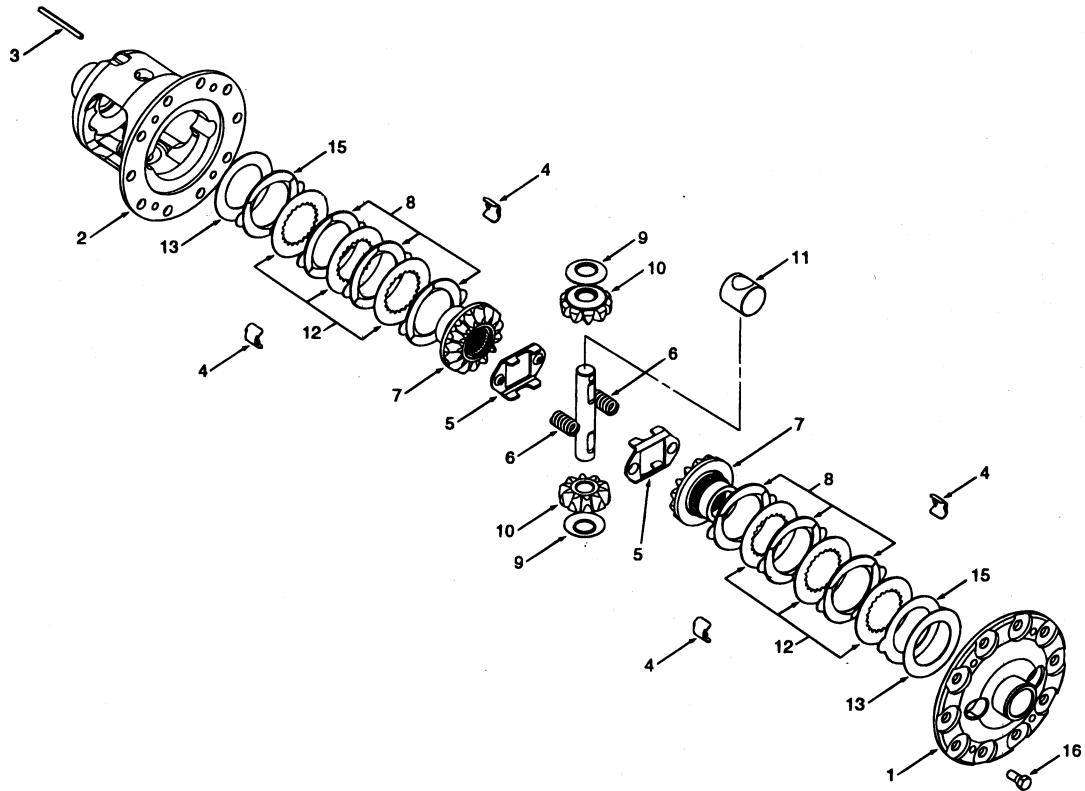
H7FA1130

11. If the drive gear runout exceeds the limit, reinstall by changing the position of the drive gear and differential case, and remeasure.

## LIMITED SLIP DIFFERENTIAL (LSD)

## COMPONENTS

EIJB0510



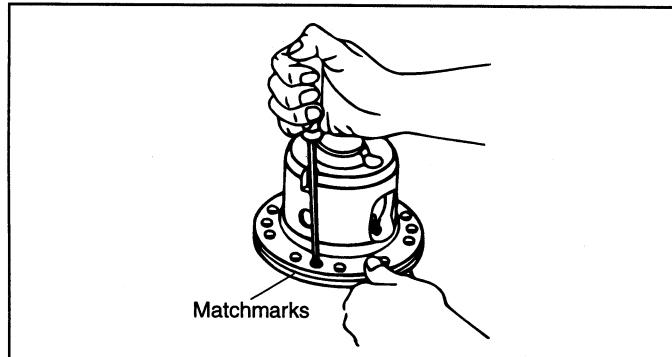
1. L.H.CASE
2. R.H.CASE
3. SPRING PIN
4. GUIDE - EAR
5. PLATE - PRELOAD
6. SPRING - PRELOAD
7. GEAR - SIDE
8. EARED DISC S/A (CARBON ON BOTH SIDES)
9. THRUST WASHER
10. PINION GEAR
11. CROSS SHAFT
12. DISC-SPLINED FRICTION
13. SHIM-SIDE GEAR
14. BLOCK - AXLE THRUST
15. EARED DISC S/A (CARBON ON ONE SIDE)
16. TORX SCREW - M6

**REMOVAL** EIJB0520

1. Using the torx screw driver #T27, remove the 4 torx screws on the flange.

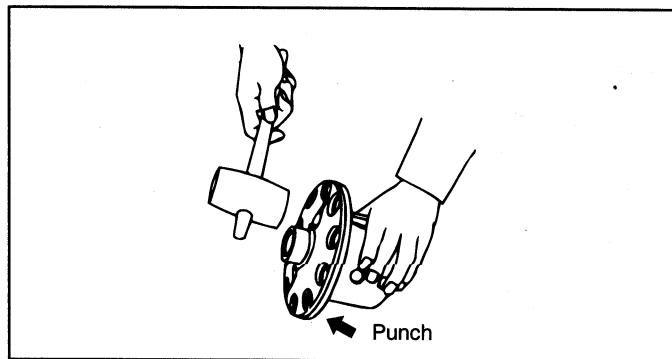
**NOTE**

- Before removal, make matchmarks.



AIJA0301

- If the case halves are not separated, tap the heads of the screws lightly with a punch and a hammer as shown in illustration.

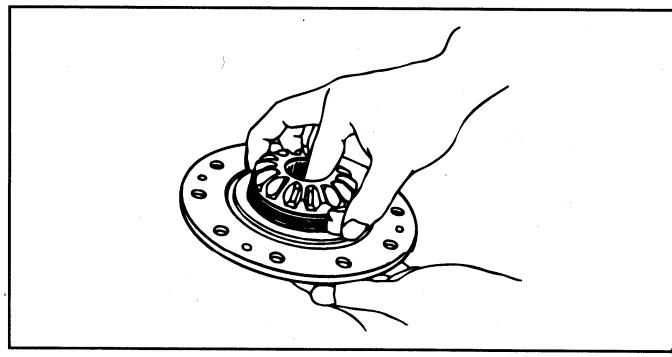


AIJA0302

2. Remove the screws, L.H. case, L.H. shim, L.H. gear sub-assembly (side gear, disc pack, and ear guides), preload plate and two preload springs from the R.H. case assembly.

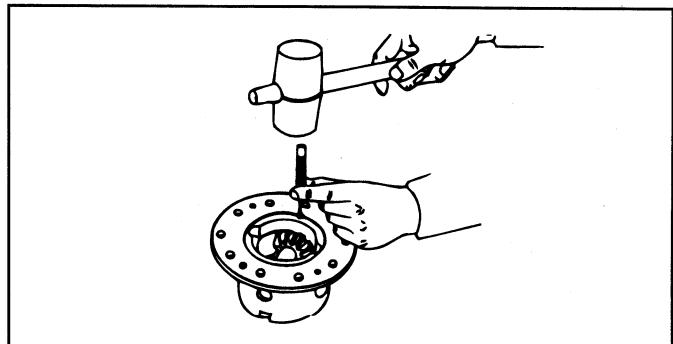
**NOTE**

Keep these parts separate so that they can be reassembled in the same location as they were originally.



AIJA0303

3. Drive out the cross shaft lock pin using a 4 mm diameter rod and a hammer.

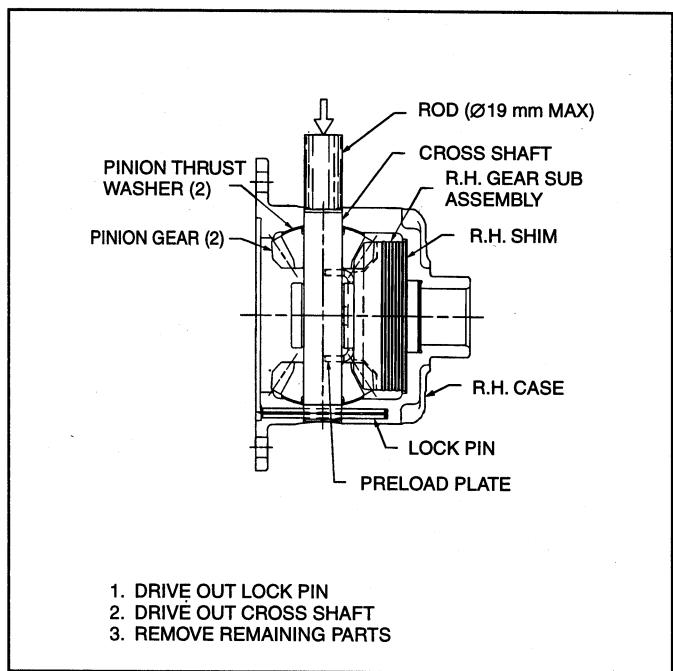


EIJA0304

4. Remove the cross shaft from the side gear.

**NOTE**

The cross shaft must be driven toward the side where the lock pin hole is located as shown in the illustration.

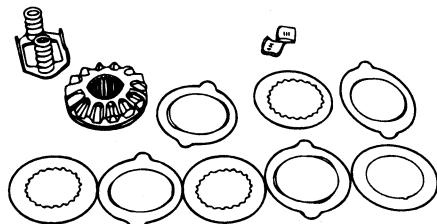


AIJA0305

5. Follow the same procedure for the opposite side case.

## NOTE

Do not mix R.H. and L.H. parts.



EJJA0306

## SHIM SELECTION FOR CLUTCH DISC

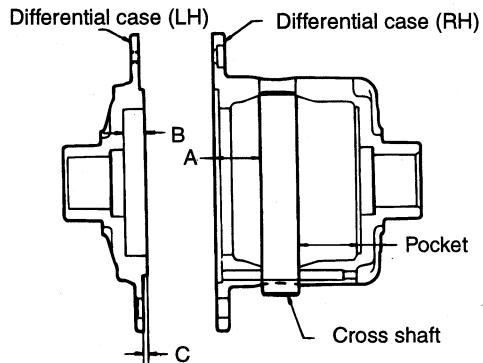
1. Measurement for R.H. pocket

Measure the R.H. pocket with the pinion shaft installed as shown in illustration.

2. Measurement for L.H. pocket

Measure the L.H. pocket with the pinion shaft installed according to the following formula as shown in illustration.

$$\text{L.H. POCKET} = A + B - C$$



Measurement for the pocket (LH/RH)

EJJA0307

## INSPECTION

EJJB0530

1. Check the side gears, pinions, pinion thrust washers, and cross shaft for wear or damage. If there is excessive wear, cracks, nicks, grooves or galling, replace the parts.
2. Inspect the carbon surfaces. After cleaning with a solvent, the carbon surface should appear a coarse weave fabric with flat spots on the peaks of the weave.

If the surface is smooth, either from wear or from the weave filled with debris, replace the entire disc pack.

3. Measure the thickness of the carbon friction discs.

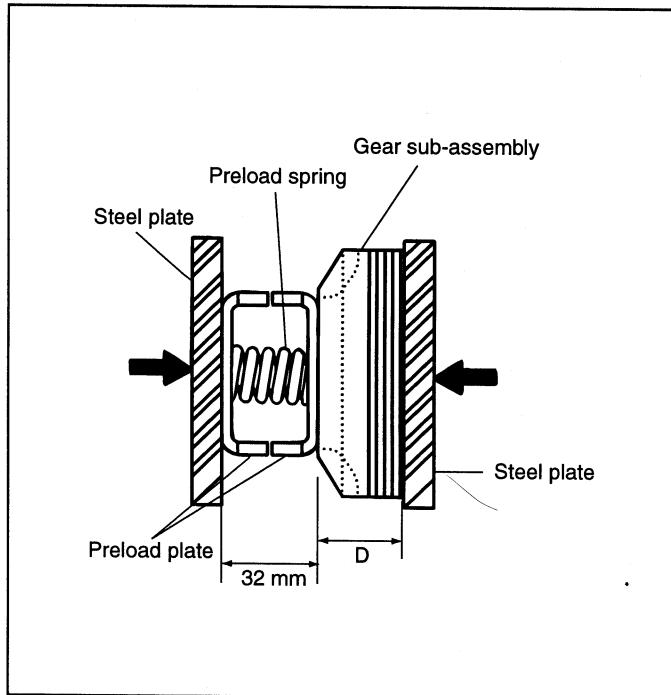
If the measurements is beyond the limit value, replace the disc.

Clutch discs	Limit value
Double sided discs	2.06 mm
Single sided disc	1.65 mm

4. Inspect the splined friction discs. If they have grooves or are polished, replace the entire disc pack. Small scratches on them are ok.

## 3. Measurement for the side gear sub height.

As shown in illustration, install the clutch disc, side gear, preload spring and spring plate, and then adjust the clearance of the preload spring by applying the pressure at both sides till it is 32mm as shown in illustration. At this time, measure the height of side gear sub at RH, LH sides by measuring the length of "D"



AIJA0308

## 4. Selecting shims by the side gear sub height

## a. Used disc

Shim thickness = RH(LH) pocket - RH(LH) side gear sub height - 6.45

## b. New disc

Shim thickness = RH(LH) pocket - RH(LH) side gear sub height - 6.20

## NOTE

- **Adjust the shim thickness within 0.08mm.**
- **When replacing one disc, replace all of the discs.**

## 5. The specifications of the clutch disc shim

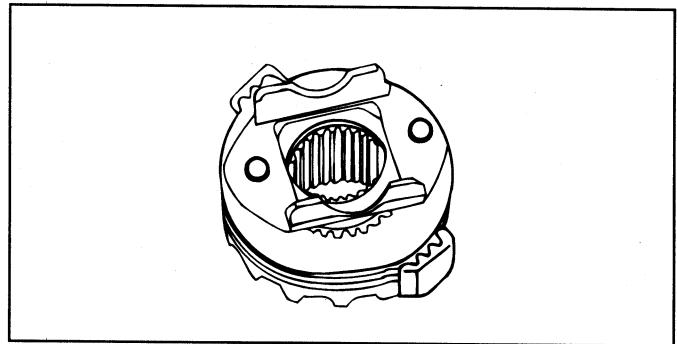
Part No. (EATON CO)	Shim thickness
EDS98754 - 10	0.010'
EDS98754 - 15	0.015'
EDS98754 - 20	0.020'
EDS98754 - 30	0.025'
EDS98754 - 35	0.030'
EDS98754 - 40	0.035'
EDS98754 - 45	0.040'

## REASSEMBLY EIJB0540

1. Install the clutch disc guide and clutch disc in order.

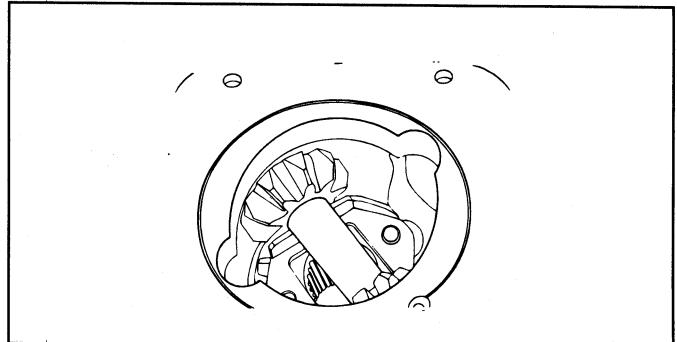
## NOTE

**Apply grease to the clutch disc guide and clutch disc before reassembly.**



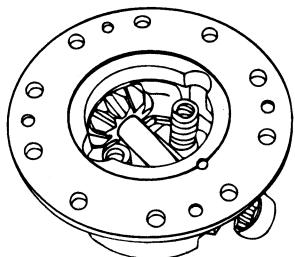
EIJA0309

2. Install the clutch preload plate and side gear.
3. After assembling the pinion shaft, pinion gear and washer, fix the pinion shaft lock pin with a hammer.



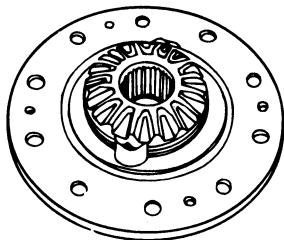
EIJA0310

4. Install the preload spring and spring plate in the opposite side .



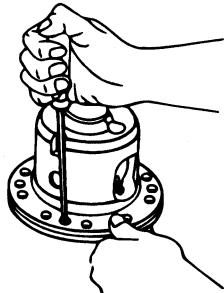
EJJA0311

5. After assembling the clutch disc and side gear in the opposite case, assemble the two cases.



EJJA0312

6. Assemble the case by tightening the torx screws.



EJJA0301