

## SECTION 13

# MANUAL TRANSMISSION AND DIFFERENTIAL

### NOTICE:

Refer to the section "13. TRANSMISSION AND DIFFERENTIAL" of 99500-84000-01E SERVICE MANUAL (ALTO) for necessary information concerning the subject of this section.

## SECTION 14

# DRIVE SHAFT

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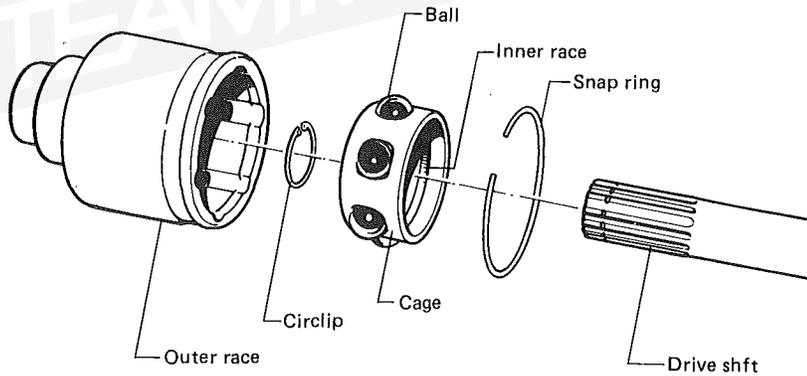
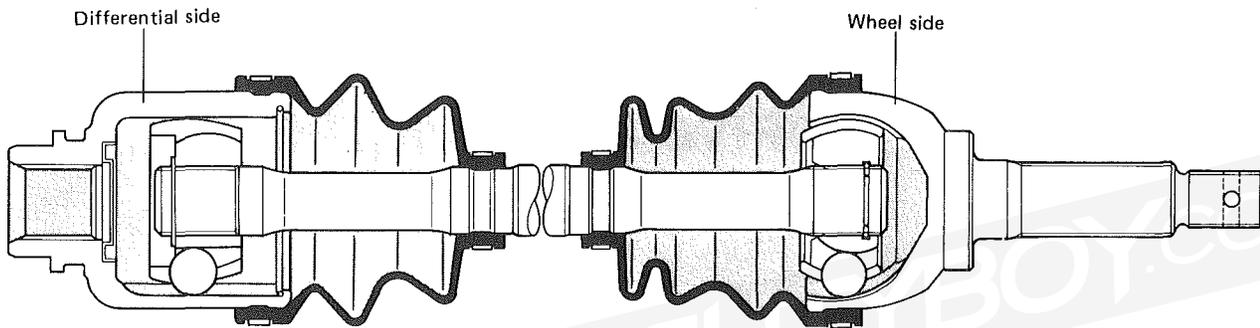
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## 14-1. DESCRIPTION

The drive shaft joint is a constant velocity joint (C.V. joint) which slides in the axial direction. The joint is composed of an outer race, cage, inner race and balls. In the turning direction, the joint rotates in the same way as a ball bearing. The 6 balls lock rotation completely and transmit drive. In addition, this vehicle is also characterized by a function that the shaft can slide through the balls in the grooves of the outer race in the extension/contraction direction of the drive shaft.

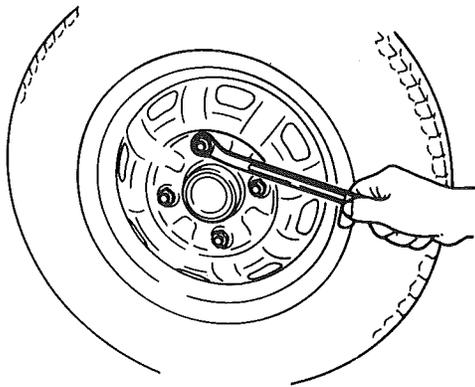
### Major characteristics

1. Being a complete constant velocity joint, the joint ensures smooth rotation of drive shaft.
2. Small drive shaft sliding resistance reduces the effect of engine vibration on the chassis.
3. Durability is excellent.

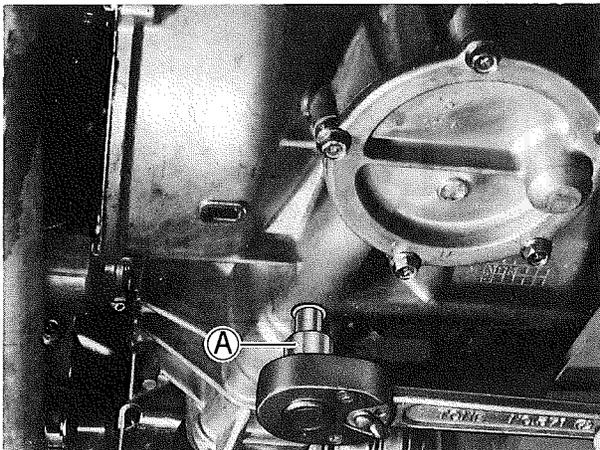


## 14-2. DISMOUNTING

- 1) Lift front end of vehicle by jacking after loosening hub nuts, and support it on safety stands.
- 2) Take off a wheel.



- 3) Drain out oil in transmission.

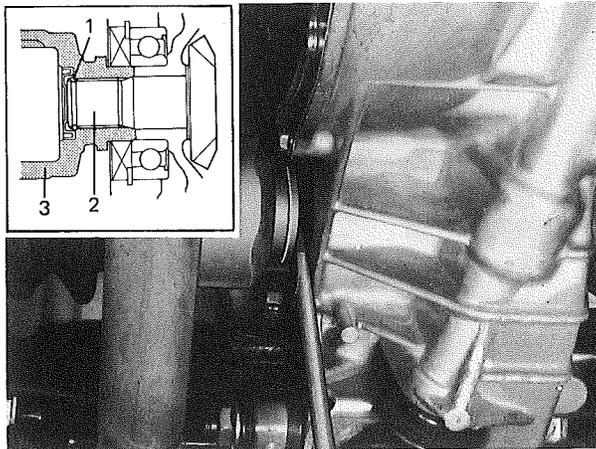


Special tool (A) (09915-27810)

- 4) Draw drive shaft out of snap ring fitted on spline of differential side gear.

### NOTICE:

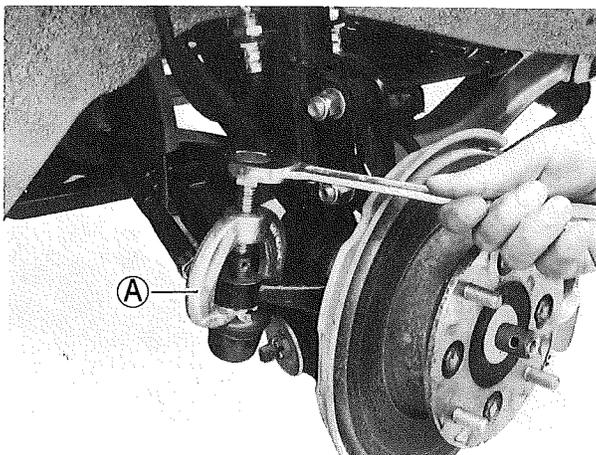
At this stage, drive shaft cannot be taken out from side gear.



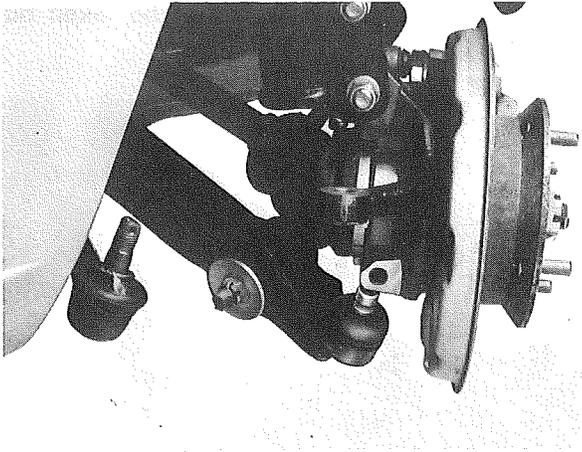
1. Snap ring    2. Side gear    3. Drive shaft

- 5) Remove drive shaft castle nut and tie rod end castle nut.

- 6) Detach tie rod end from steering knuckle by using special tool (A) (09913-65210).

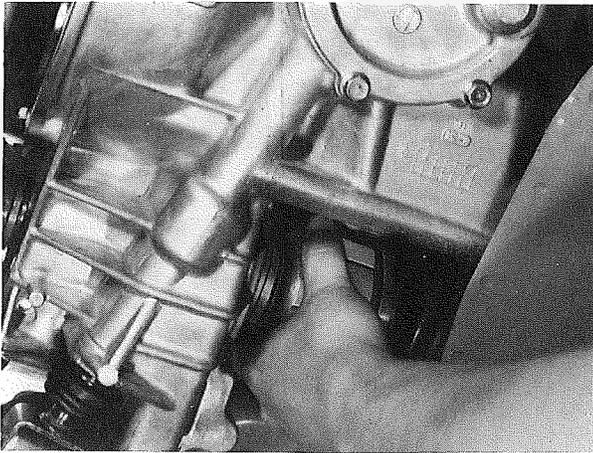


7) Detach front suspension arm ball joint stud from steering knuckle.



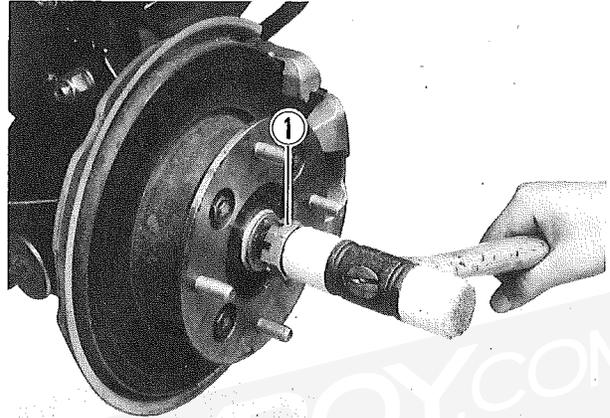
8) Draw drive shaft out of differential side gear spline.

**CAUTION:**  
At this time, be careful not to damage brake flexible hose.



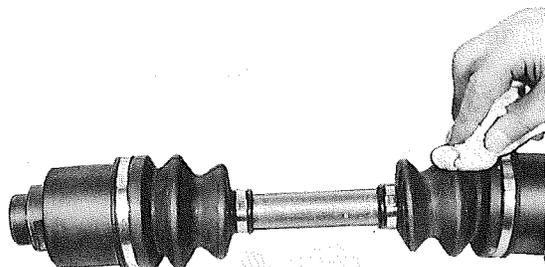
9) After inserting suspension arm ball joint stud to steering knuckle, fit nut ① on drive shaft and tap shaft from outside to inside with a plastic hammer.

**CAUTION:**  
To prevent breakage of boots (wheel side and differential side), be careful not to bring them into contact with other parts when removing drive shaft assembly.

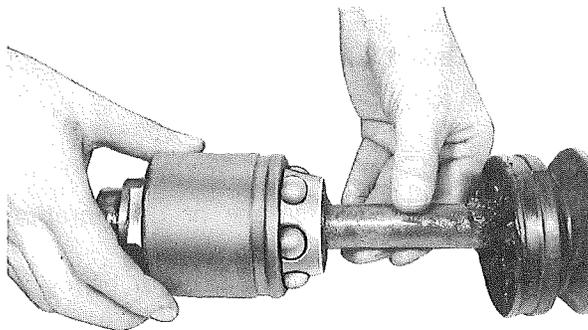


### 14.3. DISASSEMBLY

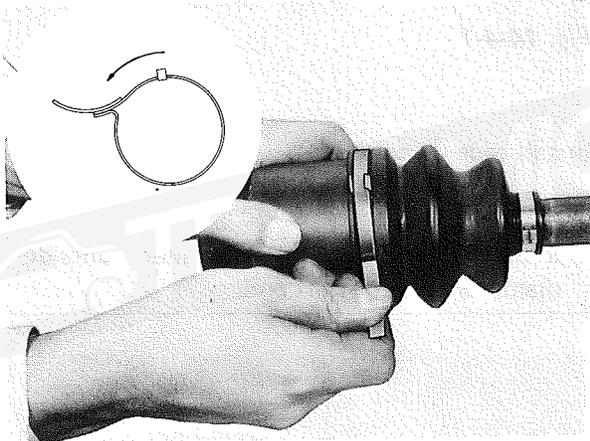
Wipe outer surface of drive shaft with a cloth and disassemble in the following manner.



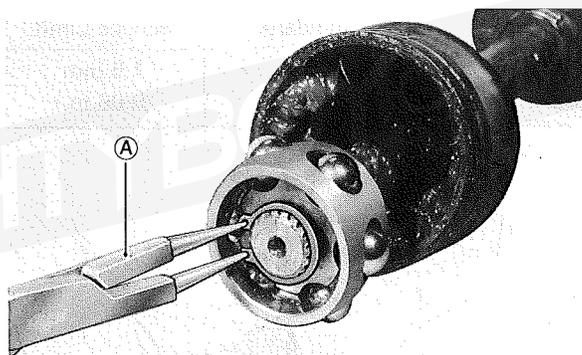
Take shaft out of outer race.



Remove boot band of differential side joint.



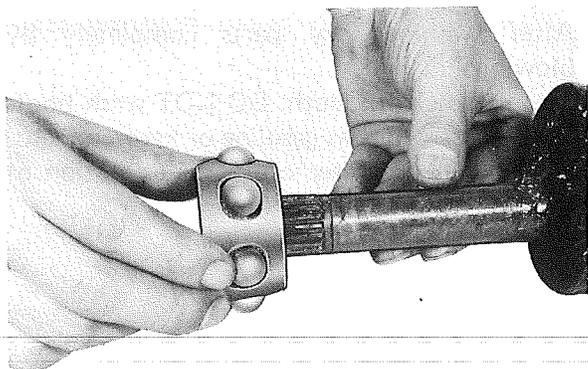
Wipe off grease and remove circlip used to fix cage by using circlip remover (A) (09900-06107).



Slide boot toward the center of shaft and remove snap ring from outer race.



Draw away cage and boot (inside or outside boot) from shaft.



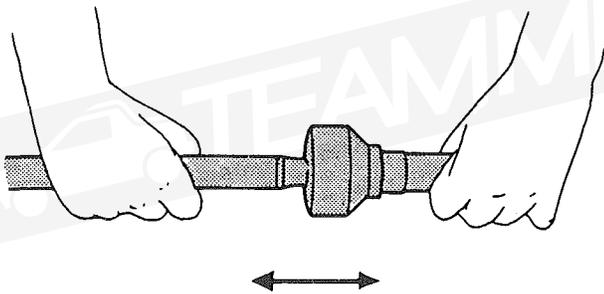
**NOTICE:**

- Do not disassemble wheel side joint (outboard joint). If any malcondition is found in any joint, replace it as assembly.

**INSPECTION**

- Check boots for breakage or deterioration. Replace them as necessary.
- Check circlip, snap ring and boot bands for breakage or deformation. Replace as necessary.
- To be checked on barfield joint is its axial play, which shows up when push-and-pull motion is given to live axle shaft and wheel spindle held in both hands, as shown in figure. There should be no play at all although play of up to 1.5 mm (0.06 in.) is permissible. If play exceeds limit, replace joint.

	Standard	Service Limit
Axial play in Barfield joint	0 mm (no play)	1.5 mm (0.06 in.)



**CLEANING**

- Wash disassembled parts (except boots). After washing, dry parts completely by blowing air.
- Clean boots with cloth. DO NOT wash boots in degreaser, such as gasoline or kerosene, etc. Washing in degreaser causes deterioration of boot.

**14-4. ASSEMBLY**

**CAUTION:**

Wash all parts before installation. Wipe boot with cloth.

Install boot onto drive shaft till its small diameter side fits to shaft groove and fix there with boot band.

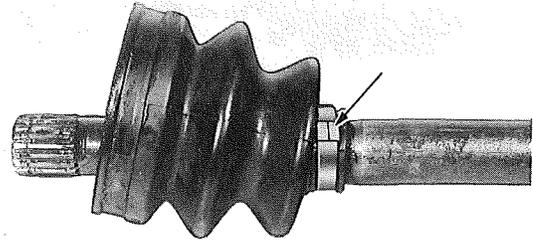


Fig. 14-4-1

Install cage ① to shaft.

**CAUTION:**

Install cage directing smaller outside diameter side to shaft end.

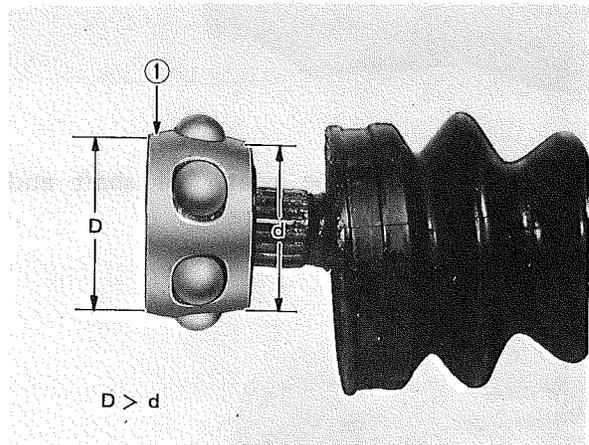


Fig. 14-4-2

Do not forget to fit circlip when fitting cage.

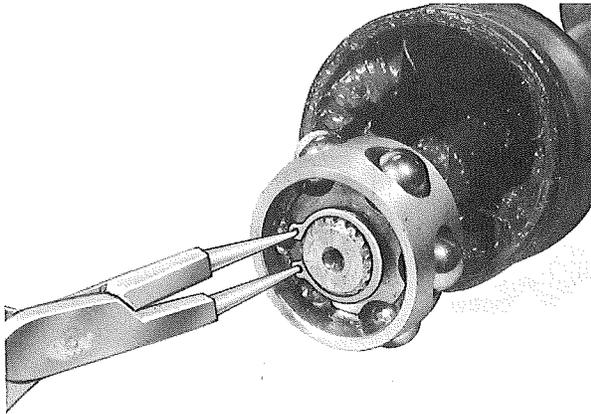


Fig. 14-4-3

Apply 30 – 50 g (1.06 – 1.76 oz) SUZUKI SUPER GREASE H (C.V. joint grease) to entire surface of cage.

SUZUKI SUPER GREASE H  
(C.V. joint grease) (99000 - 25120)

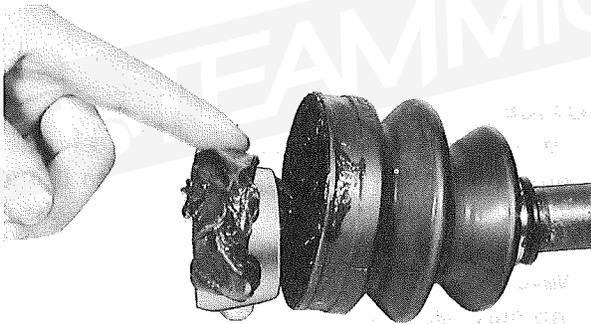


Fig. 14-4-4

Insert cage into outer race and fit snap ring into groove of the outer race.

**CAUTION:**  
Locate opening of snap ring ① so that its opening will not be lined up with a ball.

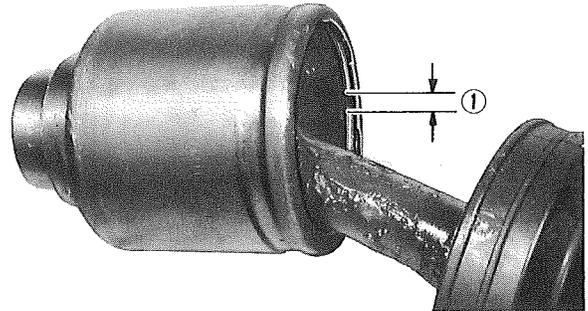


Fig. 14-4-5

Apply 30 – 40 g (1.06 – 1.41 oz) SUZUKI SUPER GREASE H (99000-25120) to inside of outer race, and fit boot to outer race.

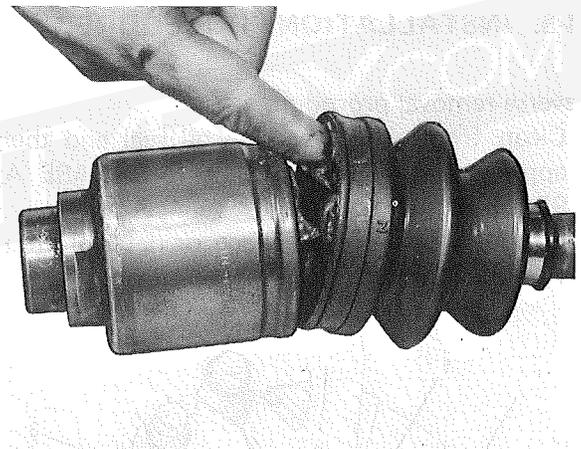


Fig. 14-4-6

After fitting boot, insert driver into boot on outer race side and allow air to enter boot so that air pressure in boot becomes the same as atmospheric pressure at positions indicated in Fig. 14-4-7.

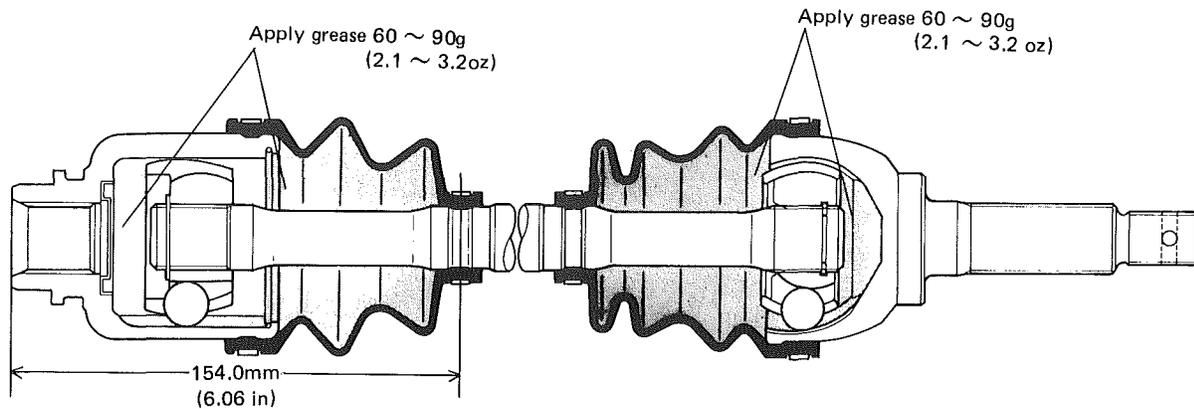


Fig. 14-4-7

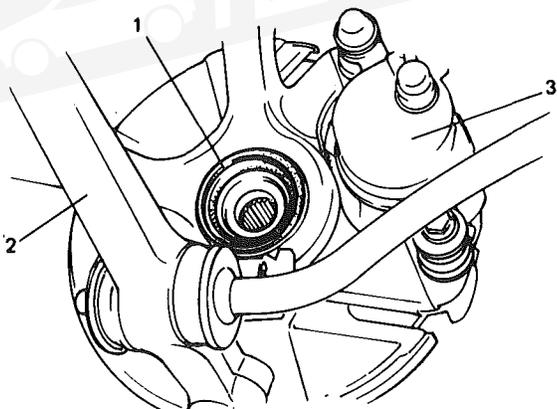
Fix boot to outer race with boot band, taking care not to distort boot.

## 14-5. INSTALLATION PROCEDURE

Reverse removal procedure.

- Clean front wheel bearing oil seal and then apply grease (SUZUKI SUPER GREASE A, 99000-25010) to oil seal. Check oil seal for breakage or deterioration. Replace it as necessary.

- Install wheel side joint to steering knuckle and then differential side joint to differential side gear. Push differential side joint by hand until it is positioned by snap ring fitted to side gear spline.



1. Front wheel bearing oil seal
2. Front suspension control arm
3. Disc brake caliper

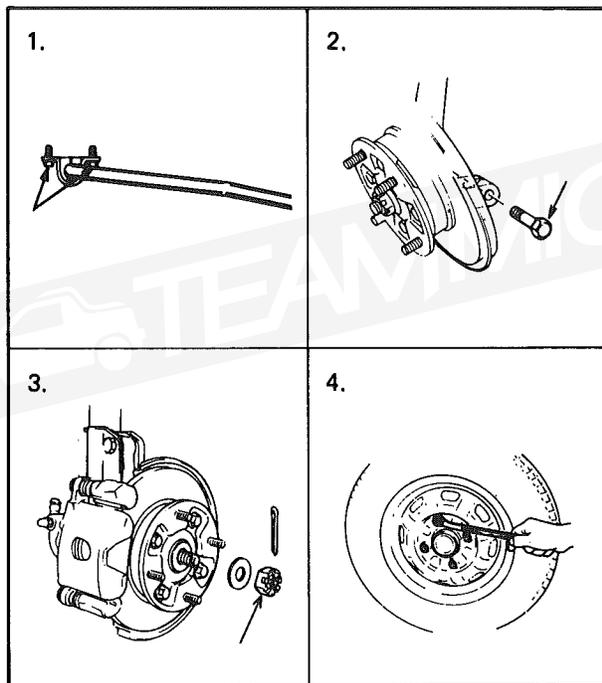
Fig. 14-5-1

### NOTICE:

- To prevent breakage of boots (wheel side and differential side), be careful not to bring them into contact with other parts when installing drive shaft assembly.
- Never tap boot when inserting drive shaft as this may damage boot.

- Tighten each bolt and nut to the specified torque.

Bolt or nut	Tightening torque
1. Stabilizer bar mount bracket bolts	30 – 55 N·m 3.0 – 5.5 kg·m 22.0 – 39.5 lb·ft
2. Ball joint stud bolt	50 – 65 N·m 5.0 – 6.5 kg·m 36.5 – 47.0 lb·ft
3. Drive shaft nut	150 – 270 N·m 15.0 – 27.0 kg·m 108.5 – 195.0 lb·ft
4. Wheel nuts	40 – 70 N·m 4.0 – 7.0 kg·m 29.0 – 50.5 lb·ft
5. Tie rod end castle nut	30 – 55 N·m 3.0 – 5.5 kg·m 22.0 – 39.5 lb·ft



- After tightening the drive shaft nut, install the split pin to the shaft.
- Install the split pin to the tie rod end castle nut.
- Refill the transmission case with specified oil.  
Refer to page 1-17 for transmission oil and level.

## 14-6. MAINTENANCE SERVICES

- 1) Check the boots for breakage.
- 2) Inspect for abnormal noise at start or while running.
- 3) Jack up the car body and confirm that the drive shaft is free from play in the rotational direction and rotates smoothly.

When any defect is found, check the following points.

- Inspect the boots for breakage and replace if broken (inspect following points before replacement).
- Inspect contact condition of parts (wear) and replace if worn remarkably or damaged.
- Check each part for chips and cracks.
- Check the circlip and snap ring for deformation or breakage and replace when defective.

