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## GROUP 25

# PROPELLER SHAFT

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## GENERAL INFORMATION

M1251000100216

For 4WD vehicles, a 3 way split 4-joint type propeller shaft with centre bearing is used.

## SERVICE SPECIFICATIONS

M1251000300179

Item	Standard value	Limit
Propeller shaft run-out mm	—	0.6
Clearance between snap ring and snap ring groove mm	0.02 – 0.06	—

## LUBRICANTS

M1251000400295

Item	Specified lubricant	Quantity
Front propeller shaft sleeve yoke	Hypoid gear oil API classification GL-5 SAE 90	As required
DOJ assembly	Repair kit grease	95 ± 5 g


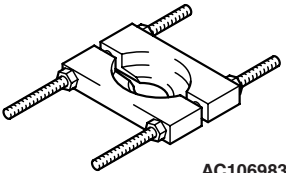
## SEALANT

M1251000500098

Item	Specified sealant
Rubber packings for DOJ assembly	3M Stud Locking 4170 or equivalent

## SPECIAL TOOLS

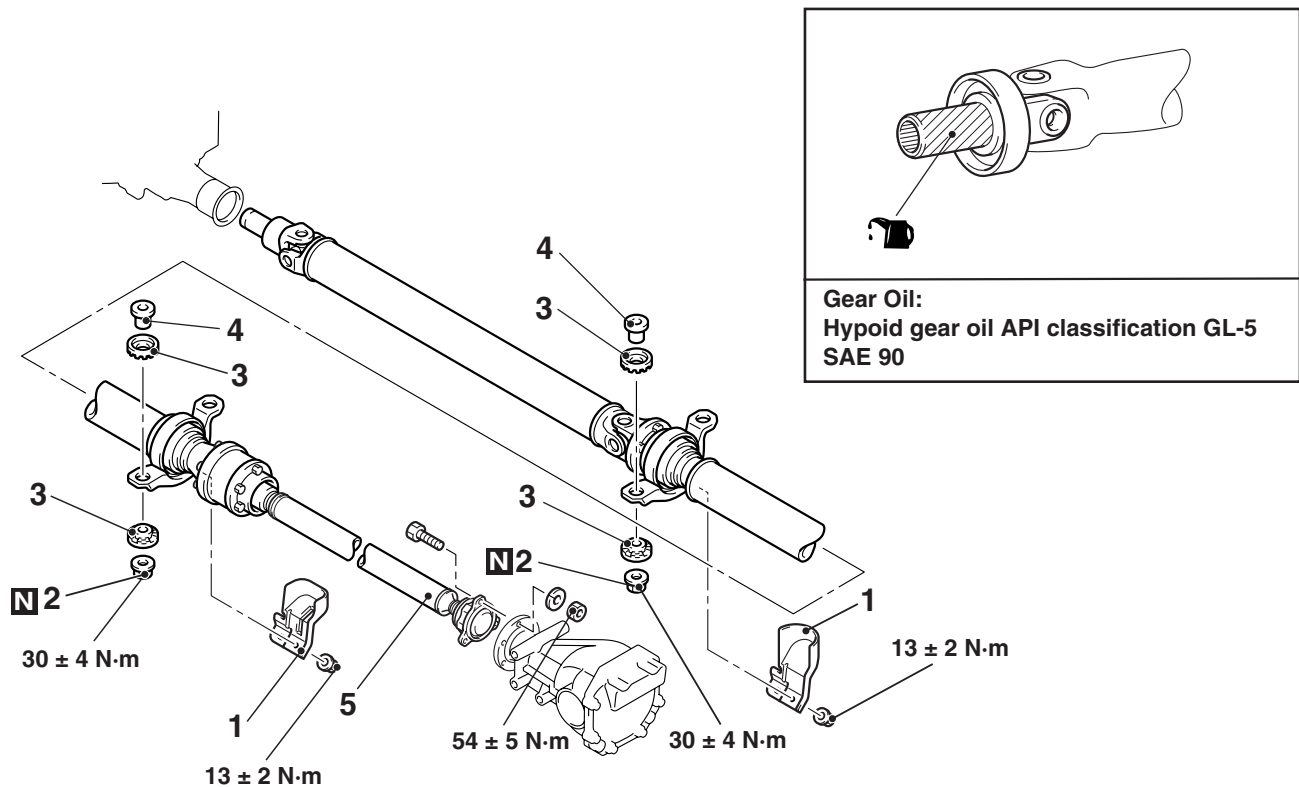
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Tool	Number	Name	Use
	MB990840	Universal joint remover and installer	Disassembly and reassembly of universal joint
	MD998801	Bearing remover	Removal of center bearing assembly

# PROPELLER SHAFT

## REMOVAL AND INSTALLATION

M1251001000353



AC203945 AE

### Removal steps

1. Heat protector
  2. Self-locking nut
  3. Insulator
  4. Spacer
  5. Propeller shaft assembly
- <<A>> >>A<<

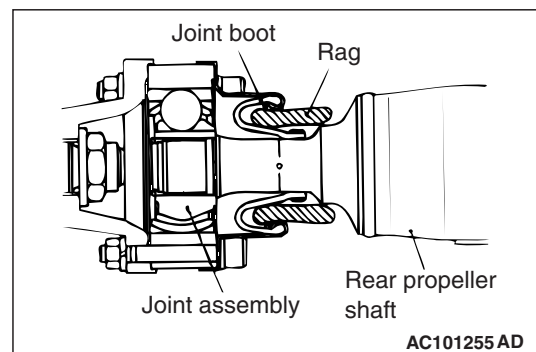
### REMOVAL SERVICE POINT

#### <<A>> PROPELLER SHAFT ASSEMBLY REMOVAL

1. Make mating marks on the differential companion flange and the propeller shaft assembly.

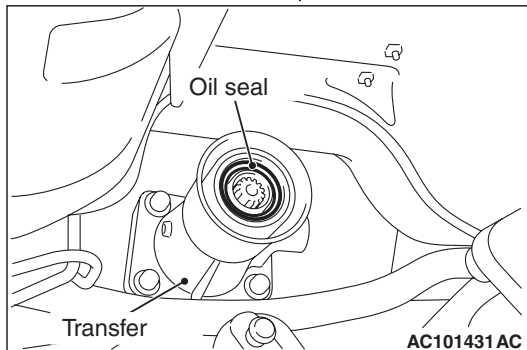
### CAUTION

Be careful not to bend the joint portion when removing the propeller shaft because this will damage to the joint boot.



2. Insert a rag so as to avoid boot damage, and remove the propeller shaft assembly in a straight and level manner.

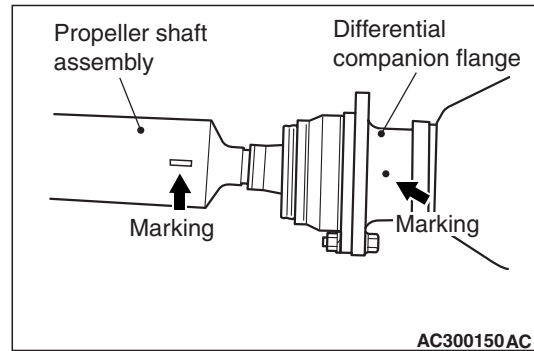
## INSTALLATION SERVICE POINT

>>A<< PROPELLER SHAFT ASSEMBLY  
INSTALLATION**⚠ CAUTION**

**Do not damage the oil seal lips on the transfer case.**

- Remove oil and grease from the threads of the mounting bolts and nuts before tightening, or they will loosen.
- Be careful not to bend the joint portion when removing the propeller shaft, because this will damage the joint boot.

1. If reusing the propeller shaft, align the mating marks of differential companion flange and propeller shaft assembly to install.

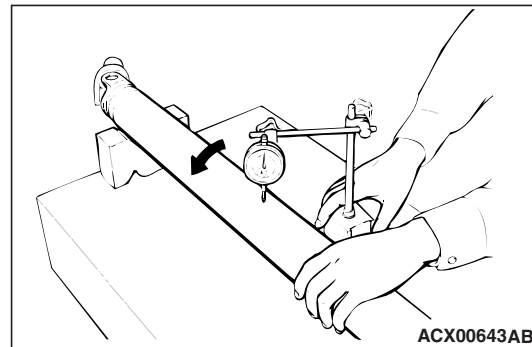


2. When installing a new rear propeller shaft assembly, align the mark on the propeller shaft tube with the mark at the side of the differential companion flange.

**INSPECTION**

M1251001100156

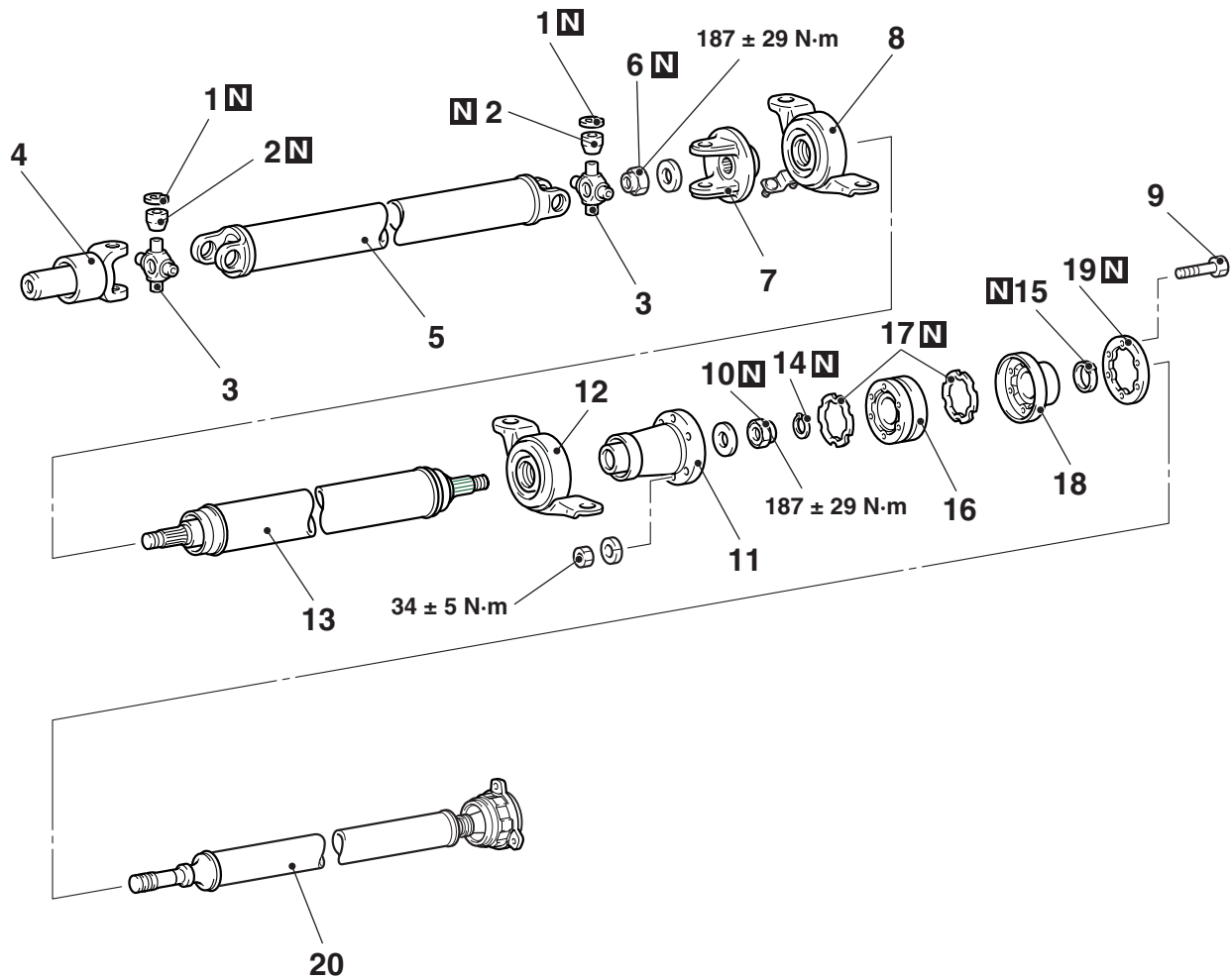
- Check the sleeve yoke and centre yoke for wear, damage or cracks.
- Check the propeller shaft for bends, twisting or damage.
- Check the universal joint for smooth operation in all directions.
- Check the centre bearing for smooth movement.

**PROPELLER SHAFT RUNOUT**

**Limit: 0.6 mm**

# DISASSEMBLY AND REASSEMBLY

M1251001200313



DOJ kit	DOJ boot kit	Universal joint kit

AC203968 AD

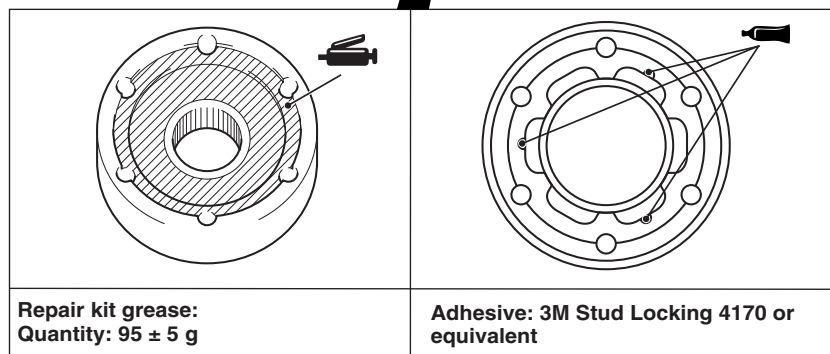
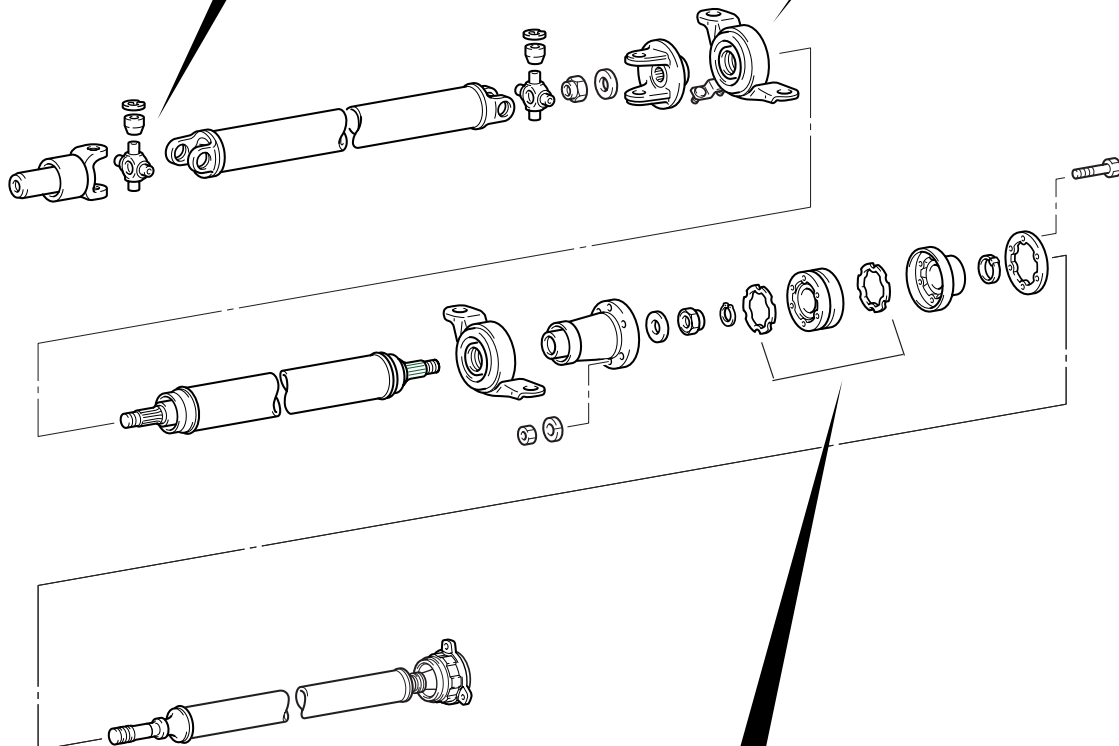
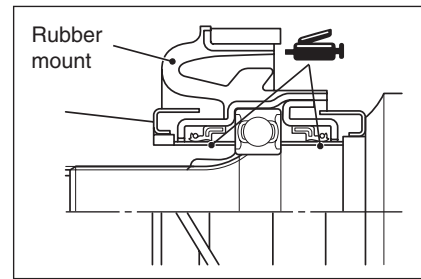
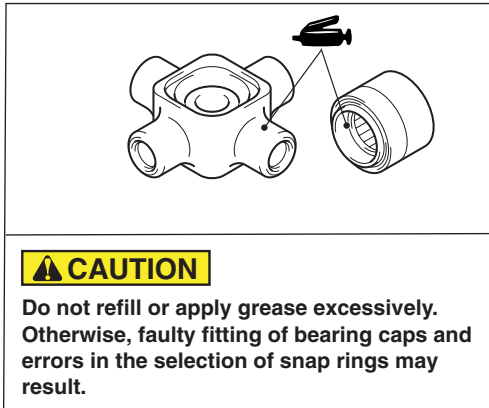
- Disassembly steps**
- <<A>> >>G<< 1. Snap ring  
<<B>> >>F<< 2. Journal bearing  
>>F<< 3. Journal  
4. Sleeve yoke  
5. Front propeller shaft  
>>E<< 6. Self-locking nut

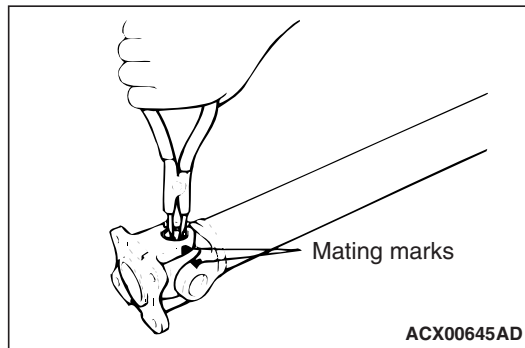
- Disassembly steps (Continued)**
- <<C>> >>E<< 7. Centre yoke  
<<D>> >>E<< 8. Centre bearing assembly  
<<D>> 9. Bolt  
>>D<< 10. Self-locking nut  
>>D<< 11. Companion flange  
<<D>> >>D<< 12. Centre bearing assembly

**Disassembly steps (Continued)**

- 13. Centre propeller shaft
- 14. Snap ring
- >>C<< 15. Boot band
- <<E>> >>B<< 16. DOJ assembly
- 17. Rubber packing
- <<F>> >>A<< 18. DOJ boot
- 19. Washer
- 20. Rear propeller shaft

## Lubrication and Adhesive Points

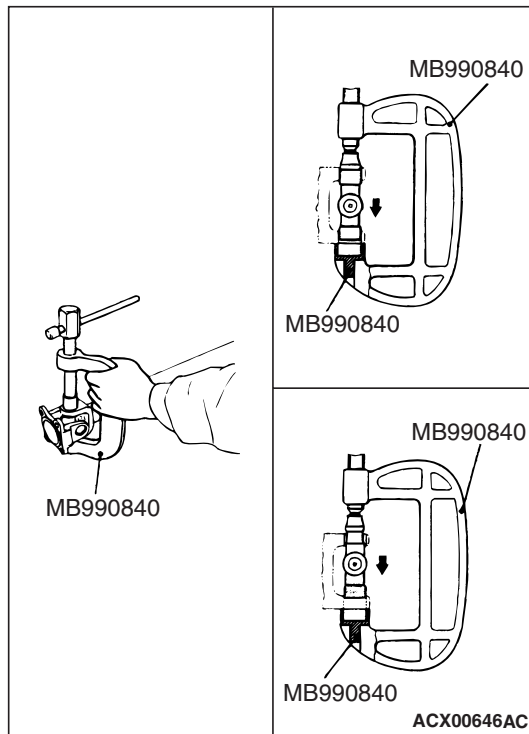


**DISASSEMBLY SERVICE POINTS****<<A>> SNAP RING REMOVAL**

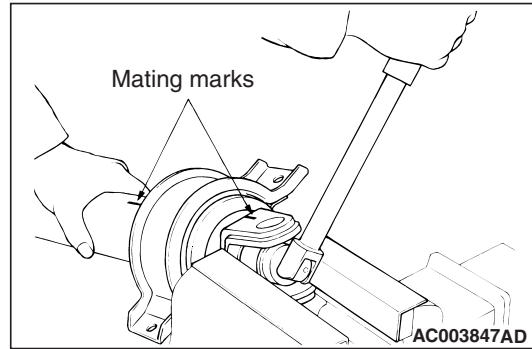
Make mating marks on the flange yoke and propeller shaft. Then, remove the snap rings.

**<<B>> JOURNAL BEARING REMOVAL****⚠ CAUTION**

Do not tap the journal bearings to remove them, as this will upset the balance of the propeller shaft.



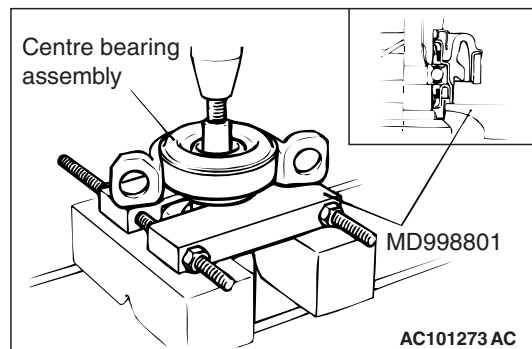
1. Use special tool universal joint remover and installer (MB990840) to press in the journal bearing on one side, and take out the journal bearing on the opposite side.
2. Insert special tool into the other side and press the journal to remove the first journal bearing that was pushed.

**<<C>> CENTRE YOKE REMOVAL**

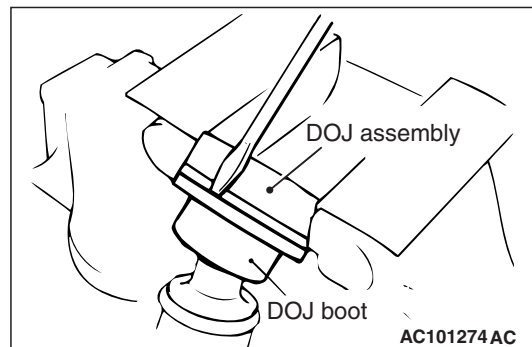
Make mating marks on the centre yoke and centre propeller shaft, and then remove the centre yoke.

**<<D>>CENTRE BEARING ASSEMBLY/BOLT REMOVAL**

1. Make mating marks on the centre propeller shaft, DOJ assembly and companion flange, and then remove the bolt.

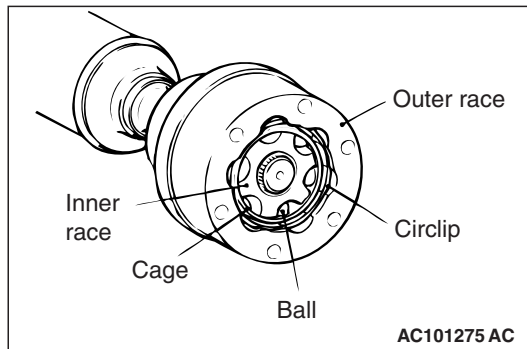


2. Use special tool bearing remover (MD998801) to remove the centre bearing assembly from the centre propeller shaft.

**<<E>>DOJ ASSEMBLY REMOVAL**

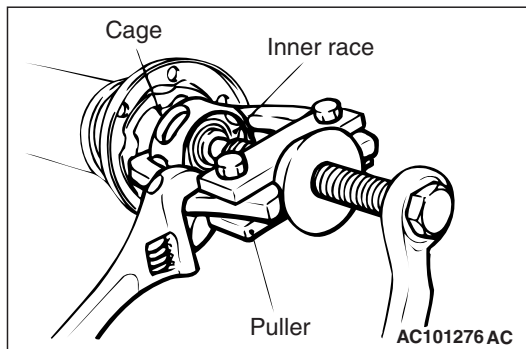
1. Remove the DOJ boot from the DOJ assembly.





2. Make mating marks on the outer race, cage and inner race, and then remove the circlip, outer race and ball.

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



3. Remove the inner race with cage from the centre propeller shaft assembly by using a puller (commercially available).
4. Wipe off the grease and clean the outer race, inner race, cage and balls.

## <<F>> DOJ BOOT REMOVAL

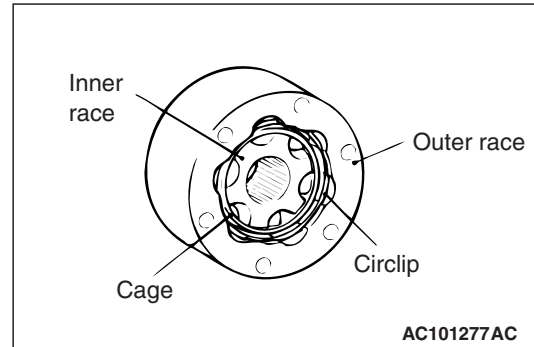
When the DOJ boot is reused, tape the spline part on the rear propeller shaft and then remove the DOJ boot.

## REASSEMBLY SERVICE POINTS

### >>A<< DOJ BOOT INSTALLATION

1. Install the boot band.
2. Wrap a plastic tape around the spline part on the centre propeller shaft and then install the DOJ boot.

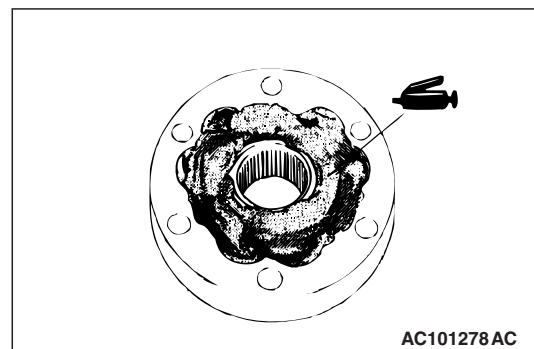
### >>B<< DOJ ASSEMBLY INSTALLATION



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

**Specified grease: Repair kit grease**

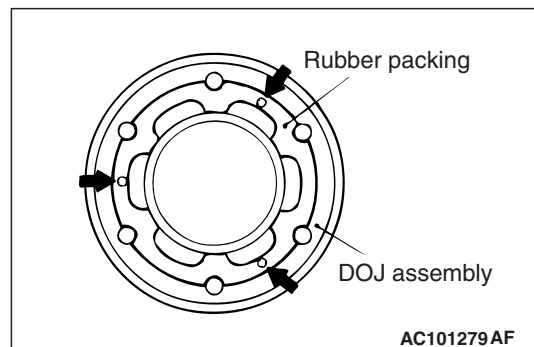
2. Assemble the DOJ assembly as follows:
  - (1) Assemble the outer race, cage, balls, and inner race with their mating marks aligned.
  - (2) Install the circlip.



3. Apply specified grease to the DOJ assembly.

**Specified grease: Repair kit grease**

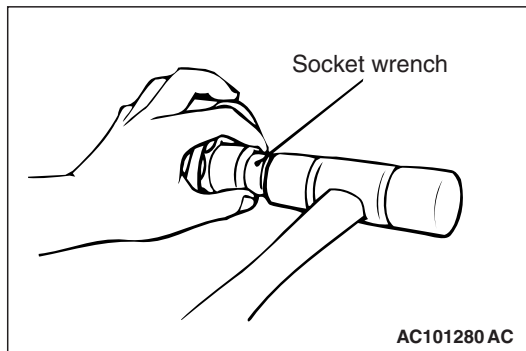
**Amount to use: 95 ± 5 g**



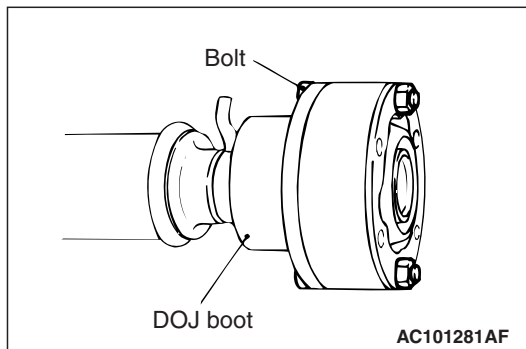
4. Apply a thin coat of specified adhesive to the groove side of DOJ assembly (shown by arrows in the figure) and install the rubber packing.

**Specified adhesive: 3M Stud Locking 4170 or equivalent**

5. Set the groove side of DOJ assembly (for packing) toward the DOJ boot side and install them.



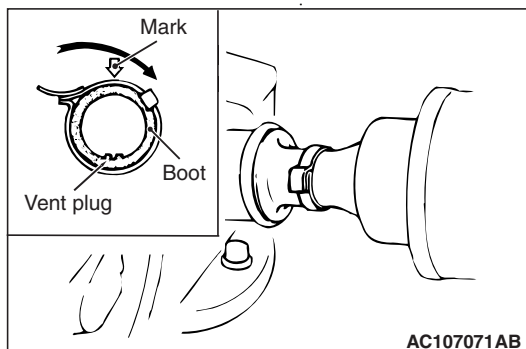
6. Lining up the mating marks on the DOJ assembly and the centre propeller shaft and using the socket wrench, install the DOJ assembly to the centre propeller shaft.



7. Using the bolt, align the bolt holes of the DOJ boot and the DOJ assembly and install DOJ boot to the DOJ assembly.
8. Install the rubber packing of the companion flange side in the same manner as described in (4) above.

### >>C<< BOOT BAND INSTALLATION

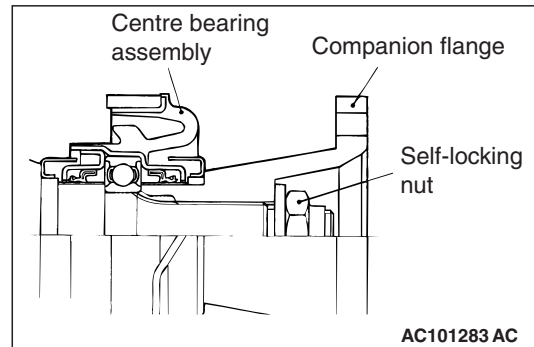
#### ⚠ CAUTION



Clamp the boot by holding down the lever at a position nearly opposite to the vent groove provided in the DOJ boot (at arrow marked position on boot).

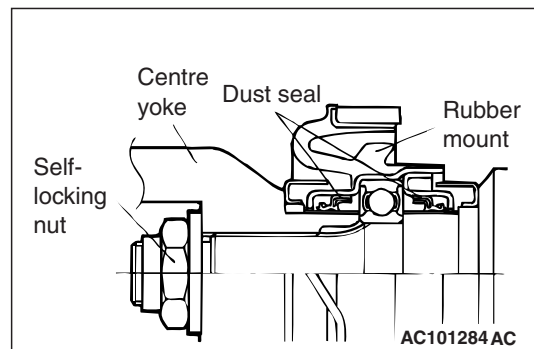
- Be sure to remove grease, if present, from around the vent groove. Grease obstructs the ventilation air passage.

### >>D<< CENTRE BEARING ASSEMBLY/COMPANION FLANGE/SELF-LOCKING NUT INSTALLATION



1. Set the centre bearing assembly in the direction shown in the figure and install it to the centre propeller shaft.
2. Install, lining up the mating marks on the companion flange and the centre propeller shaft.
3. While tightening the self-locking nut, install the centre bearing assembly with the companion flange.

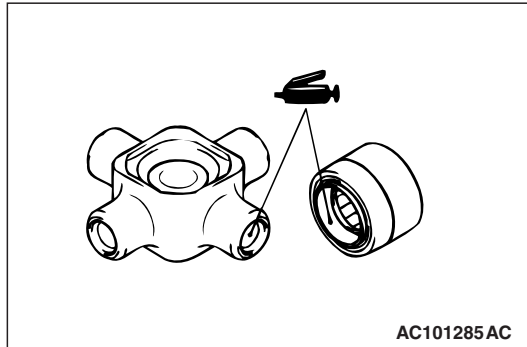
### >>E<<CENTRE BEARING ASSEMBLY/CENTRE YOKE/SELF-LOCKING NUT INSTALLATION



1. Set the centre bearing assembly in the direction shown in the figure and install it to the centre propeller shaft.
2. Install, lining up the mating marks on the centre yoke and the centre propeller shaft.
3. While tightening the self-locking nut, install the centre bearing assembly with the centre yoke.

## >>F<< JOURNAL/JOURNAL BEARING INSTALLATION

### ⚠ CAUTION

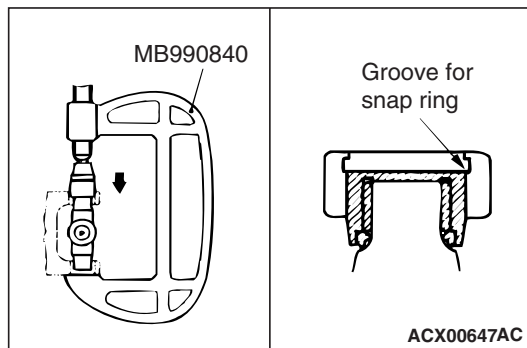


**Do not apply grease excessively. Too much grease can result in errors in the selection of snap rings.**

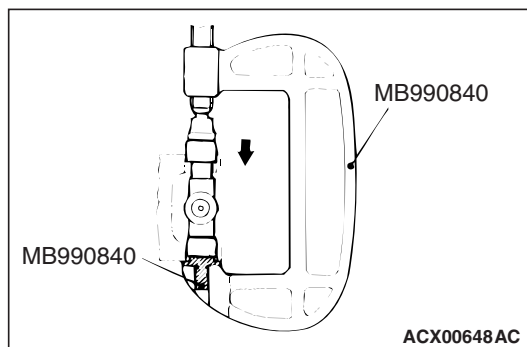
1. Apply multi-purpose grease to the following universal joint kit.
  - Shaft and journal grease cup
  - Dust seal lip
  - Needle roller bearing

### ⚠ CAUTION

**Be careful when pressing the journal bearings. If they are pressed at an angle, the inside of the journal bearings will be damaged.**



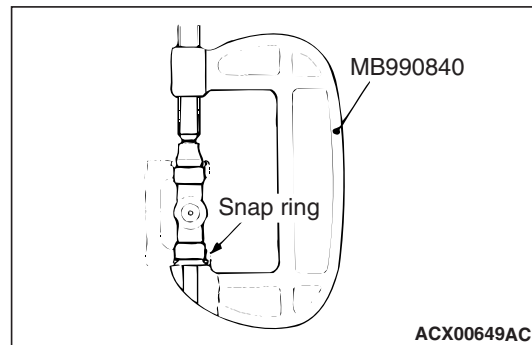
2. Use special tool universal joint remover and installer (MB990840) to press the journal bearing into the centre yoke, sleeve yoke or flange yoke until the snap ring groove is fully visible.



3. Use special tool to press the opposite side journal bearing into the yoke.
4. Align the mating marks on the centre yoke and rear propeller shaft, and install the propeller shaft journal bearings in the same manner as described in (1) and (2) above.

## >>G<< SNAP RING INSTALLATION

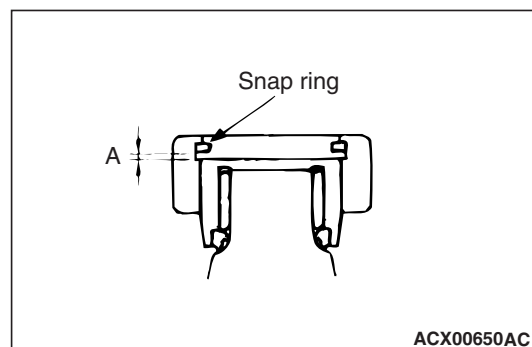
1. Install a snap ring to one side of the journal.



2. Use special tool universal joint remover and installer (MB990840) at the opposite side of the installed snap ring to press in the journal bearing toward the snap ring.

### ⚠ CAUTION

**Always use snap rings of equal thickness on both sides.**



3. Install the snap ring on the opposite side, and measure the clearance of the snap ring groove with a feeler gauge.

**Standard value (A): 0.02 – 0.06 mm**

4. If the clearance exceeds the standard value, adjust by changing the thickness of the snap ring.

Thickness mm	Identification colour
1.28	—
1.31	Yellow
1.34	Blue
1.37	Purple
1.40	Brown

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## NOTES