
PROPELLER SHAFT

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E25AA--

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SPECIFICATIONS

GENERAL SPECIFICATIONS

E25CA--

Items			SPACE RUNNER	SPACE WAGON
Propeller shaft	Type		3-joint type	4-joint type
	Length x O.D. mm (in.)	Front	968.0 x 70 (38.11 x 2.76)	888.5 x 65 (34.98 x 2.56)
		Center	–	627.5 x 65 (24.70 x 2.56)
		Rear	969.0 x 75 (38.15 x 2.95)	631.0 x 65 (24.84 x 2.56)
Universal joint	Type	No. 1	Cross type	Cross type
		No. 2	Constant velocity type (Löbro joint, LJ87)	Constant velocity type (Löbro joint, LJ87)
		No. 3	Cross type	Cross type
		No. 4	–	Cross type
	Lubrication		Oilless type	Oilless type
	Size mm (in.)	Cross type joint journal O.D.	14.689 (0.5783)	14.689 (0.5783)
		Constant velocity joint O.D.	94 (3.7)	94 (3.7)

NOTE

Propeller shaft length indicates the length between center points of each joint.

SERVICE SPECIFICATIONS

E25CB--

Items	Specifications
Standard value	
Journal axial play	mm (in.) 0.02–0.06 (0.0008–0.0024)
Limit	
Propeller shaft runout (Dial indicator reading)	
Front	mm (in.) 0.6 (0.024) or less
Center <SPACE WAGON>	mm (in.) 0.6 (0.024) or less
Rear	mm (in.) 0.6 (0.024) or less

LUBRICANTS

E25CD--

Items	Specified lubricant	Quantity
Sleeve yoke surface	Hypoid gear oil SAE 75W-90 or 75W-85W conforming to API GL-4 or higher	As required
Löbro joint assembly		
Outer and inner races ball grooves	Repair kit grease	As required
Löbro joint assembly inner part	Repair kit grease	45–55 g (1.59–1.94 oz.)

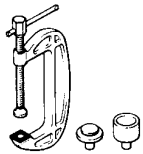
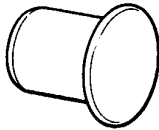
SEALANT AND ADHESIVES

E25CE-

Item	Specified sealants and adhesives	Characteristics
Löbro joint rubber packing	Quick fix adhesive 3M ATD Part No. 8121 or 3M ATD Part No. 8155, or equivalent	Quick-fix adhesive

SPECIAL TOOLS

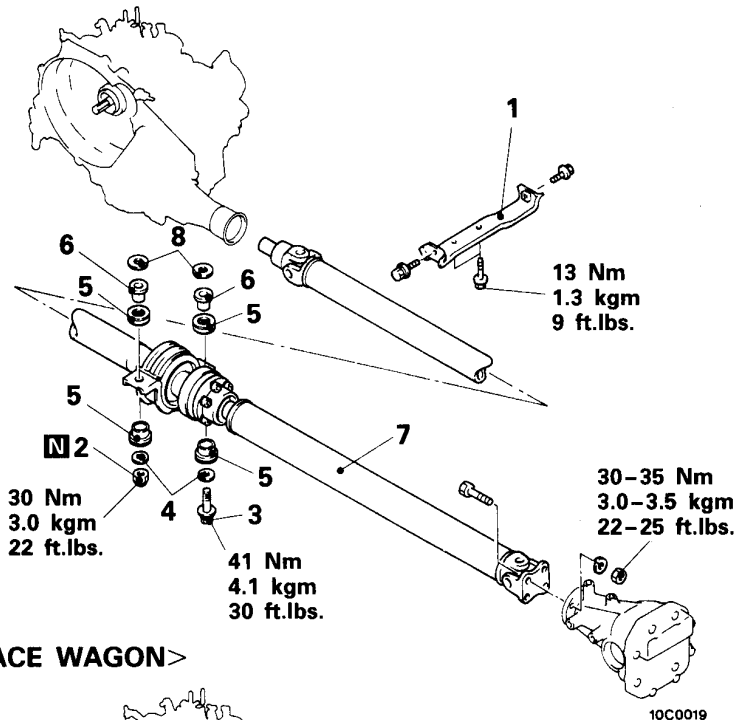
E25DA-

Tool	Number	Name	Use
	MB990840	Universal joint remover and installer	Disassembly/reassembly of the universal joint
	MB991193	Plug	Prevention of entry of foreign objects into the transfer

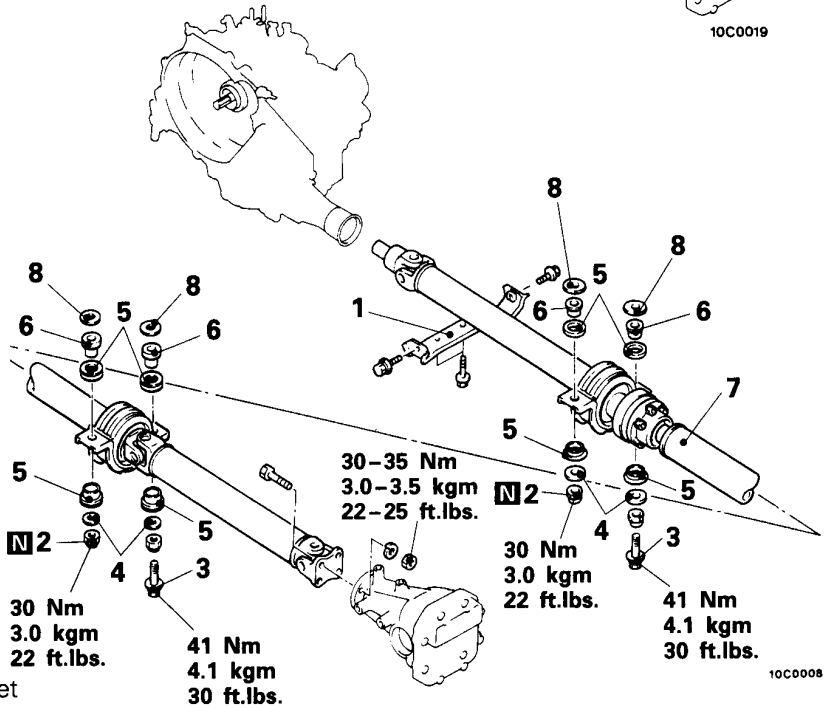
**PROPELLER SHAFT
REMOVAL AND INSTALLATION**

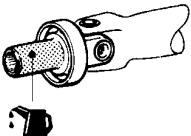
E25GA--

<SPACE RUNNER>



<SPACE WAGON>



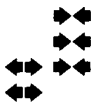


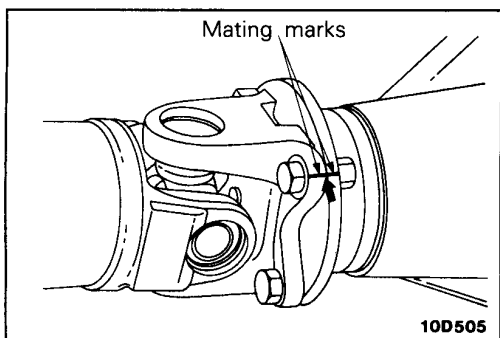
10G0001

Gear oil:
Hypoid gear oil SAE 75W-90 or 75W-85W conforming to API GL-4 or higher

Removal steps

1. Center exhaust pipe bracket
2. Self-locking nut
3. Bolt
4. Washer
5. Insulator
6. Spacer
7. Propeller shaft
8. Spacer



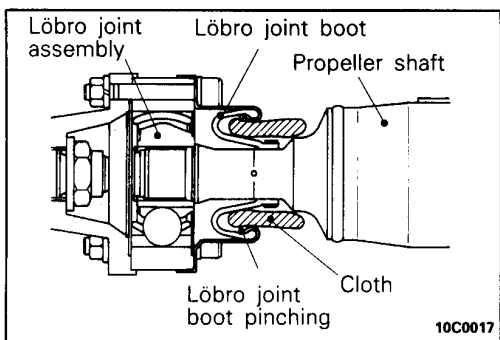


SERVICE POINTS OF REMOVAL

E25GBCD

7. REMOVAL OF PROPELLER SHAFT

- (1) Make mating marks on the differential companion flange and flange yoke.

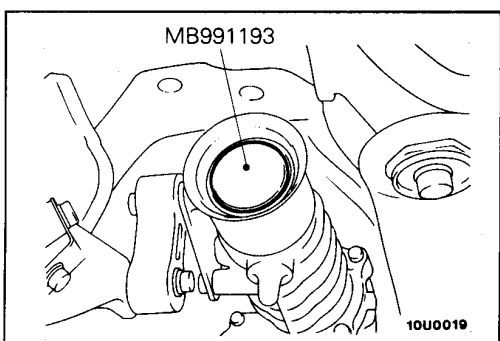


Caution

Remove the propeller shaft in a straight and level manner so as to ensure that the boot is not damaged through pinching.

NOTE

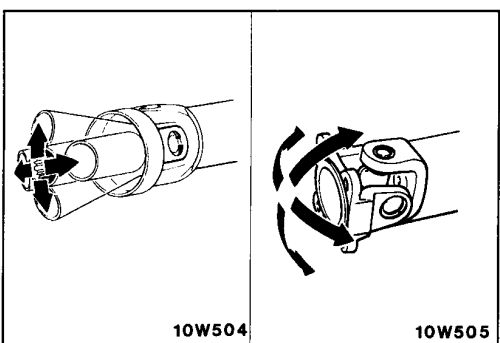
Damage to the boot can be avoided, and the work will be easier, if a piece of cloth or similar material is inserted in the boot.



- (2) Use the special tool provided as a cover to prevent the entry of foreign objects into the transfer case.

8. REMOVAL OF SPACER

The number of spacers used on each vehicle differs. Check the number of spacers used and write it down for reference during reassembly.



INSPECTION

E25GCAJ

- Check the sleeve yoke, center yoke and flange yoke for wear, damage or cracks.
- Check the propeller shaft yokes for wear, damage or cracks.
- Check the propeller shaft for bends, twisting or damage.
- Check the universal joints for smooth operation in all directions.
- Check the center bearing for smooth movement.
- Check the center bearing mounting rubber for damage or deterioration.

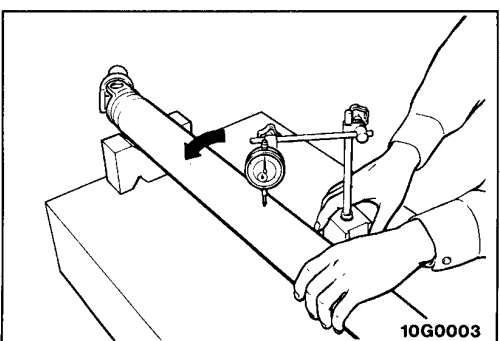
PROPELLER SHAFT RUNOUT

Limit:

Front propeller shaft	0.6 mm (0.024 in.) or less
Center propeller shaft*	0.6 mm (0.024 in.) or less
Rear propeller shaft	0.6 mm (0.024 in.) or less

NOTE

* indicates SPACE WAGON.

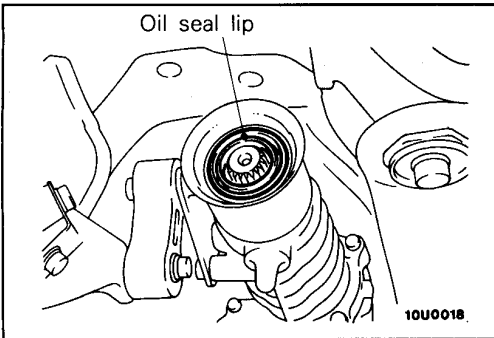


SERVICE POINTS OF INSTALLATION

7. INSTALLATION OF PROPELLER SHAFT

Caution

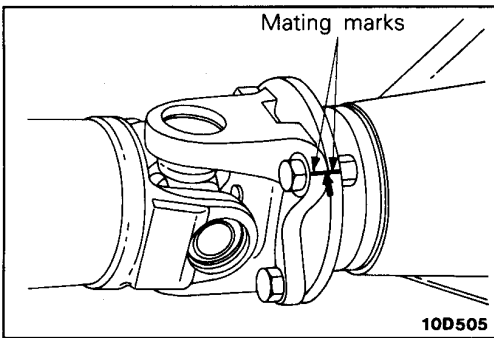
Be careful not to damage the lip section of the transfer case oil seal when installing the propeller shaft.



Install the propeller shaft to the companion flange with the mating marks properly aligned.

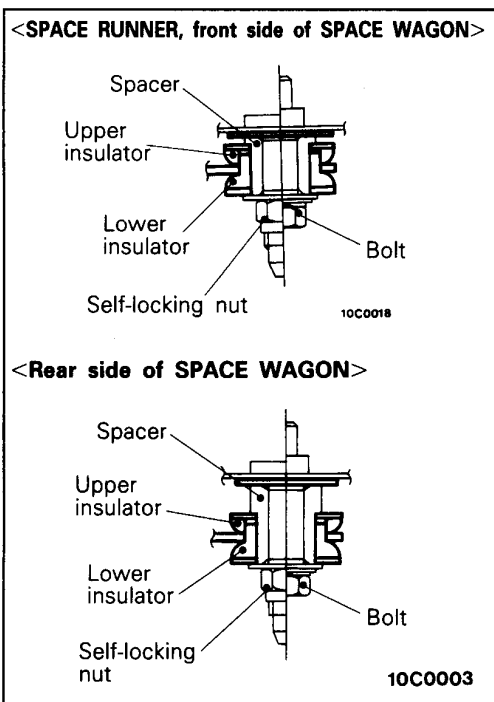
Caution

Tighten installation bolts after removing oil and grease from threads to prevent them from loosening due to lubrication.



6. INSTALLATION OF SPACER/5. INSULATOR

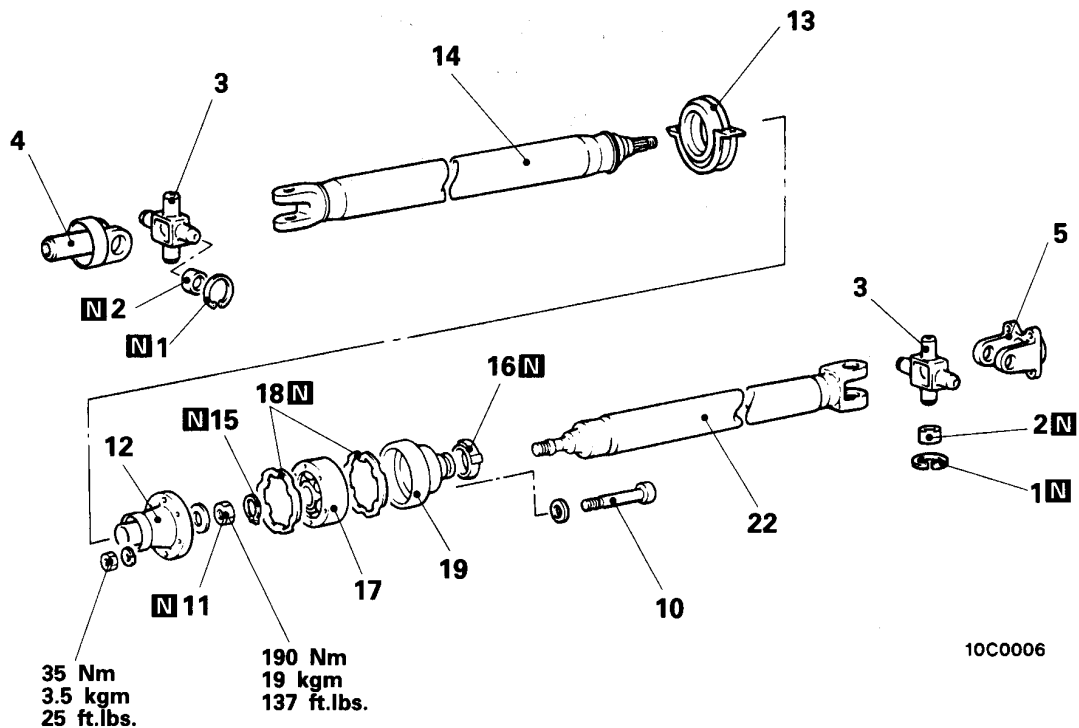
- (1) For the SPACE WAGON, the shape of the spacers at the front and rear are different, so install as shown in the illustration.
- (2) Install insulators as indicated in the illustration.



DISASSEMBLY AND REASSEMBLY

E25GE-

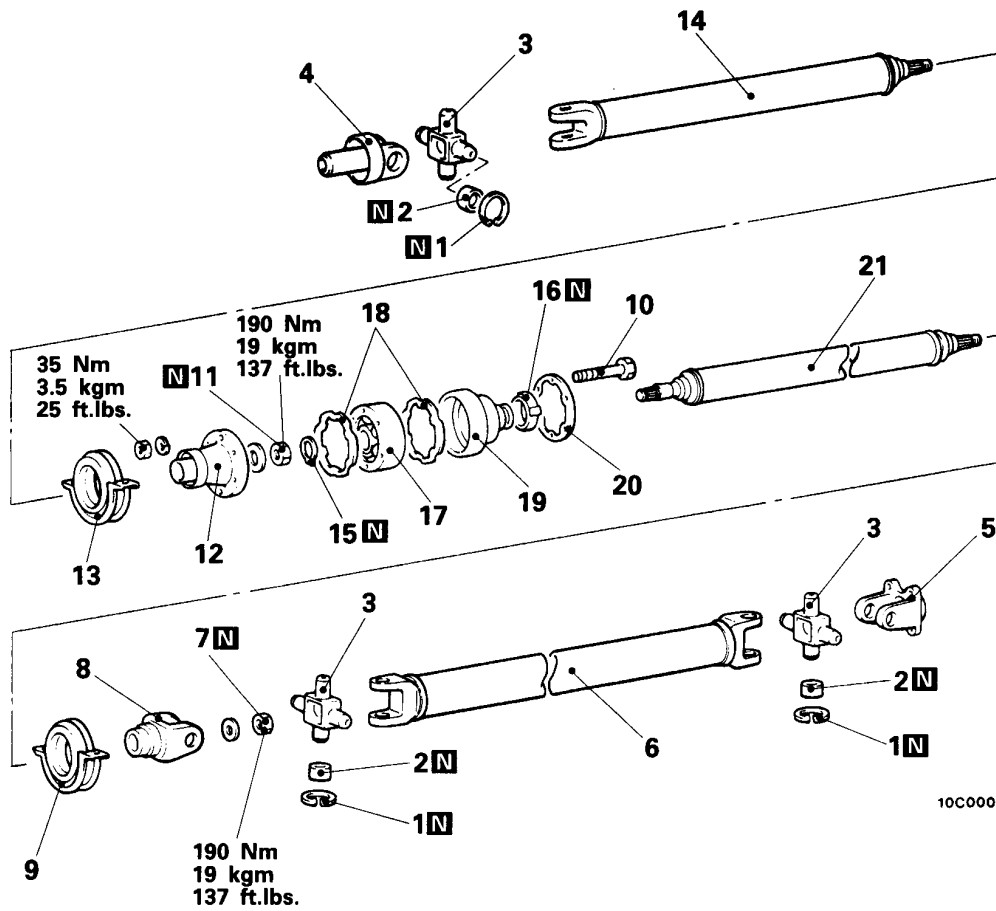
<SPACE RUNNER>



Disassembly steps

- ◄◄ ◄◄ 1. Snap rings
- ◄◄ ◄◄ 2. Journal bearings
- ◄◄ 3. Journals
- ◄◄ 4. Sleeve yoke
- ◄◄ 5. Flange yoke
- ◄◄ ◄◄ 10. Löbro joint assembly installation bolts
- ◄◄ ◄◄ 11. Self-locking nut
- ◄◄ ◄◄ 12. Companion flange
- ◄◄ ◄◄ 13. Center bearing assembly
- ◄◄ ◄◄ 14. Front propeller shaft
- ◄◄ ◄◄ 15. Snap ring
- ◄◄ 16. Boot band
- ◄◄ ◄◄ 17. Löbro joint assembly
- ◄◄ ◄◄ 18. Rubber packing
- ◄◄ ◄◄ 19. Löbro joint boot
- ◄◄ ◄◄ 22. Rear propeller shaft

<SPACE WAGON>

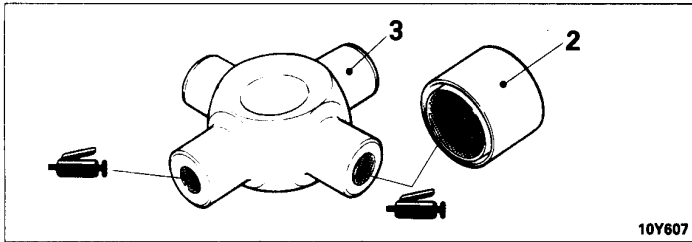


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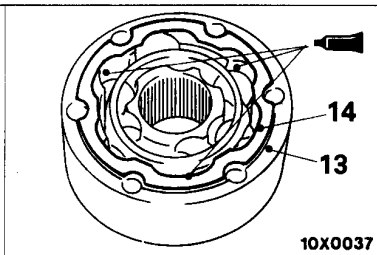
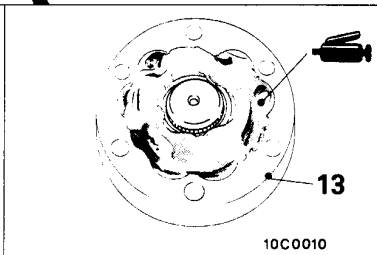
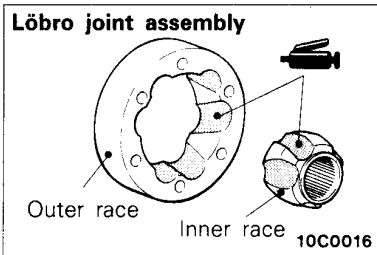
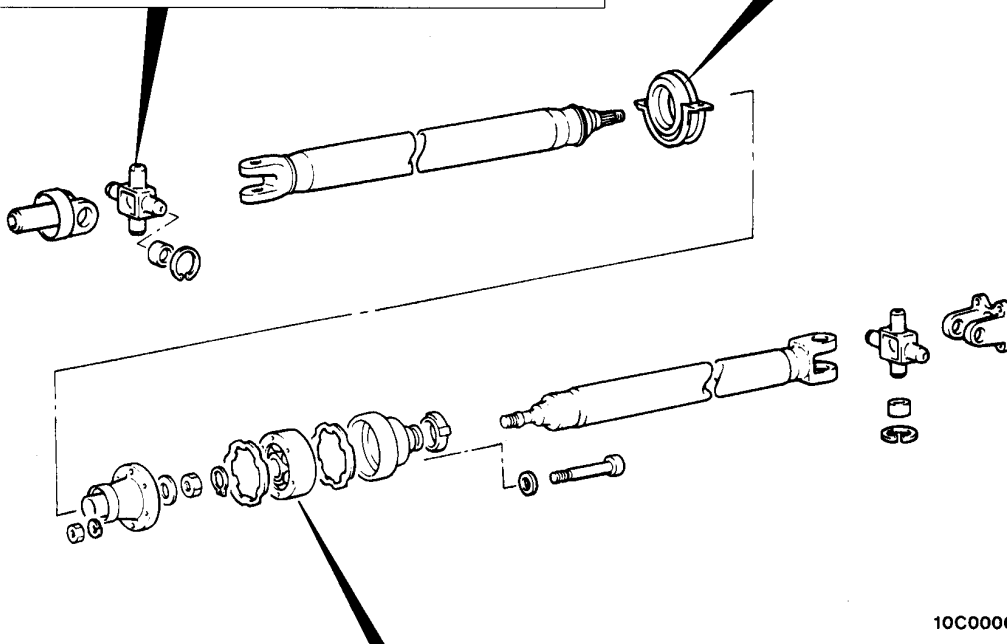
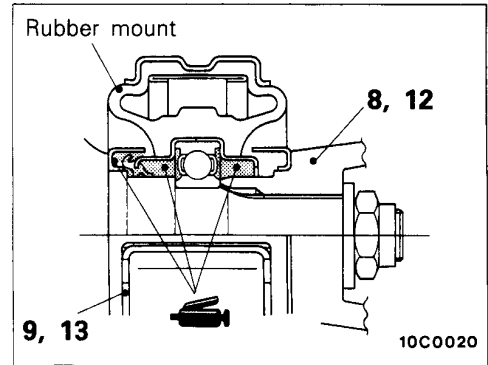
Disassembly steps

- ◄◄ ◄◄ 1. Snap rings
- ◄◄ ◄◄ 2. Journal bearings
- ◄◄ 3. Journals
- ◄◄ 4. Sleeve yoke
- ◄◄ 5. Flange yoke
- ◄◄ 6. Rear propeller shaft
- ◄◄ 7. Self-locking nut
- ◄◄ ◄◄ 8. Center yoke
- ◄◄ ◄◄ 9. Center bearing assembly
- ◄◄ ◄◄ 10. Löbro joint assembly installation bolts
- ◄◄ ◄◄ 11. Self-locking nut
- ◄◄ ◄◄ 12. Companion flange
- ◄◄ ◄◄ 13. Center bearing assembly
- ◄◄ ◄◄ 14. Front propeller shaft
- ◄◄ 15. Snap ring
- ◄◄ 16. Boot band
- ◄◄ ◄◄ 17. Löbro joint assembly
- ◄◄ ◄◄ 18. Rubber packing
- ◄◄ ◄◄ 19. Löbro joint boot
- ◄◄ ◄◄ 20. Washer
- ◄◄ ◄◄ 21. Center propeller shaft

LUBRICATION AND ADHESION POINTS

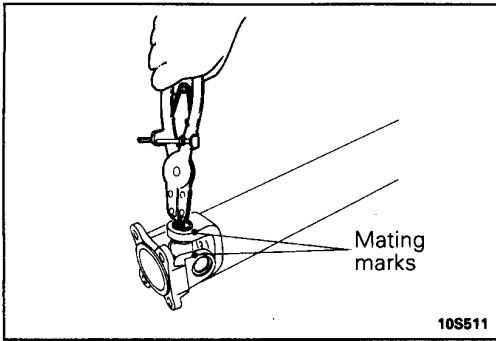


Caution
Do not apply excessive grease. Otherwise, faulty fitting of bearing caps and errors in the selection of snap rings may result.



Repair kit grease: 45–55 g (1.59–1.94 oz)

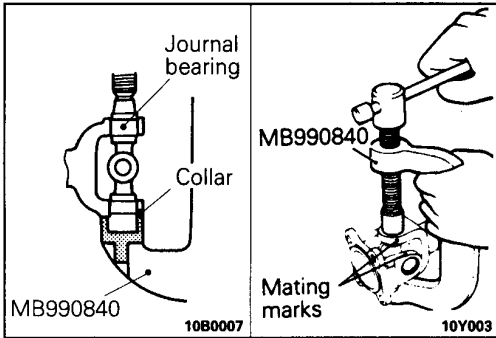
Adhesive:
Quick fix adhesive 3M ATD Part No. 8121 or 3M ATD Part No. 8155, or equivalent

**SERVICE POINTS OF DISASSEMBLY**

E25GFAN

1. REMOVAL OF SNAP RINGS

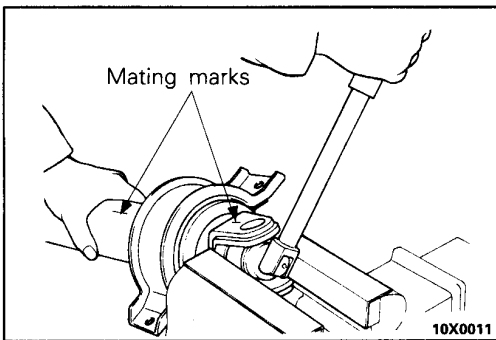
- (1) Make mating marks on the yoke and universal joint that is to be disassembled.
- (2) Remove the snap rings from the yoke with snap ring pliers.

**2. REMOVAL OF JOURNAL BEARINGS**

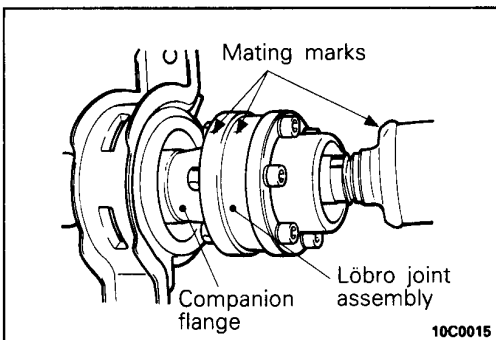
Force out the journal bearings from the yoke with a special tool.

Caution

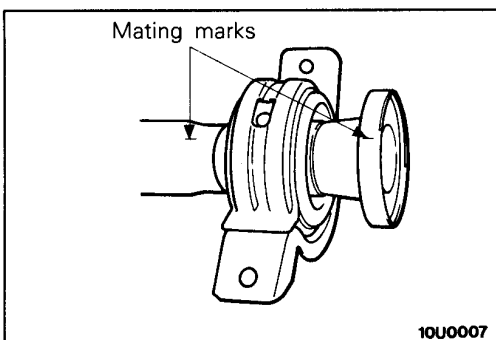
Do not tap the journal bearings to remove them, as this will upset the balance of the propeller shaft.

**8. REMOVAL OF CENTER YOKE <SPACE WAGON>**

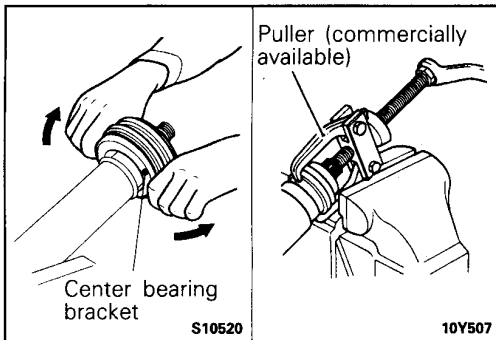
- (1) Place mating marks on the center yoke and center propeller shaft assembly.
- (2) Remove the center yoke from center propeller shaft.

**10. REMOVAL OF LÖBRO JOINT ASSEMBLY INSTALLATION BOLTS**

- (1) Place mating marks on the companion flange and Löbro joint assembly.
- (2) Remove the Löbro joint installation bolts and separate the Löbro joint from the companion flange.

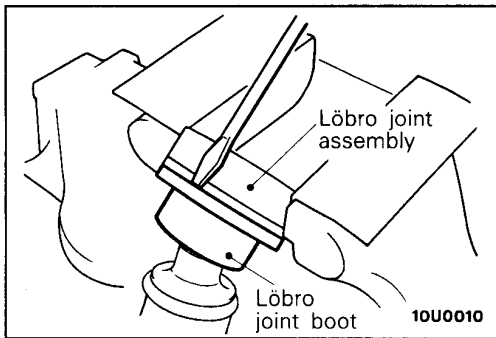
**11. REMOVAL OF SELF-LOCKING NUT/12. COMPANION FLANGE**

- (1) Place mating marks on the companion flange and front propeller shaft.
- (2) Remove the companion flange from front propeller shaft.



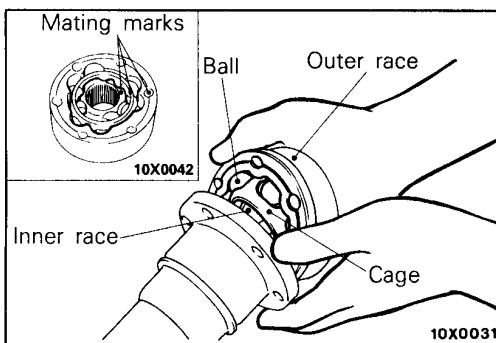
9./13. REMOVAL OF CENTER BEARING ASSEMBLY

- (1) Remove the center bearing bracket.
- (2) Pull out the center bearing with a commercially available puller.



17. REMOVAL OF LÖBRO JOINT ASSEMBLY

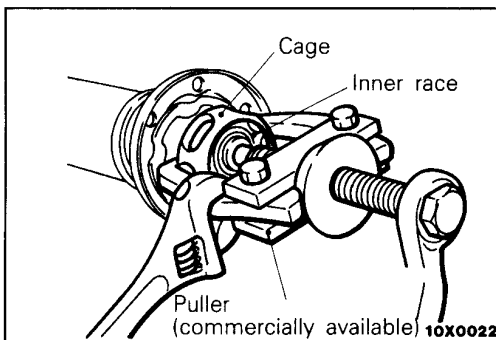
- (1) Remove the Löbro joint boot from the Löbro joint assembly.



- (2) Remove the Löbro joint assembly as follows:
 - ① Put mating marks on the outer race, cage and inner race with a scribe.
 - ② Remove the outer race and balls.

NOTE

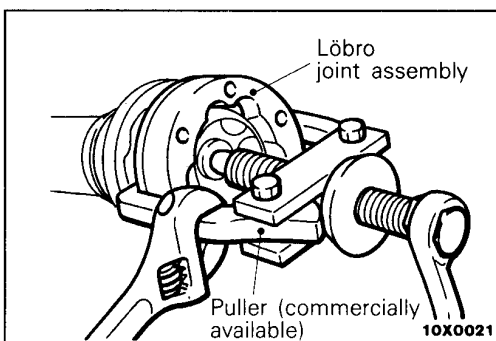
Note the positions of balls so that they can be reinstalled in their original positions.



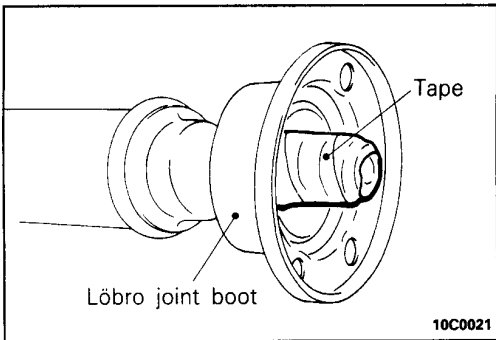
- ③ Remove the inner race with cage from the center propeller shaft by using a commercially available puller.

NOTE

When changing the grease on the Löbro joint assembly, wipe off the grease and clean the outer and inner races, cage and balls.

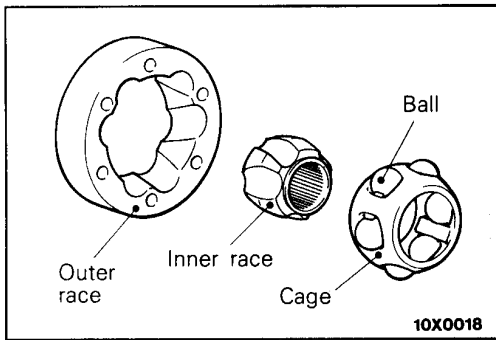


- ④ If the outer race cannot be removed, remove the complete Löbro joint assembly from the rear propeller shaft by using a commercially available puller.



19. REMOVAL OF LÖBRO JOINT BOOT

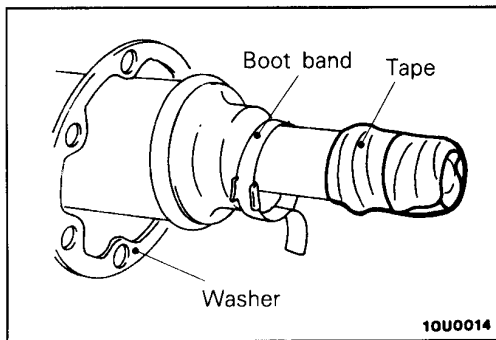
When reusing the Löbro joint boot, apply adhesive tape to the serration section of the propeller shaft before removing.



INSPECTION

E25GGAM

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

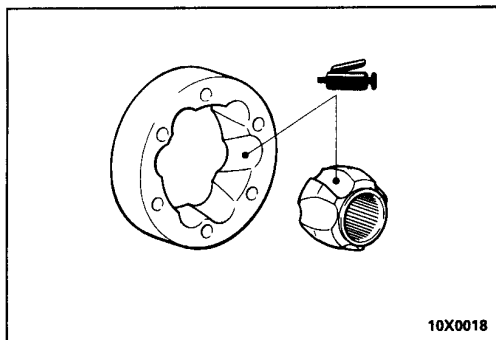


SERVICE POINTS OF REASSEMBLY

E25GHAM

19. INSTALLATION OF LÖBRO JOINT BOOT

Wrap the splined end of propeller shaft with adhesive tape.



17. INSTALLATION OF LÖBRO JOINT ASSEMBLY

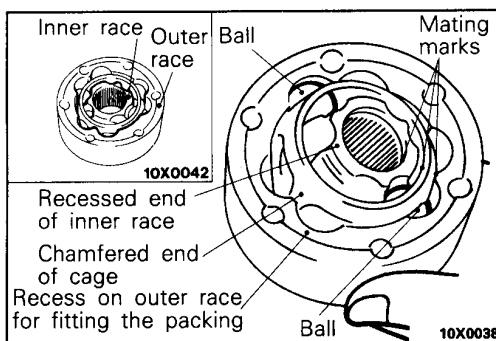
- (1) Apply a thin coat of the specified grease to the ball grooves of the inner and outer races.

Specified grease: Repair kit grease

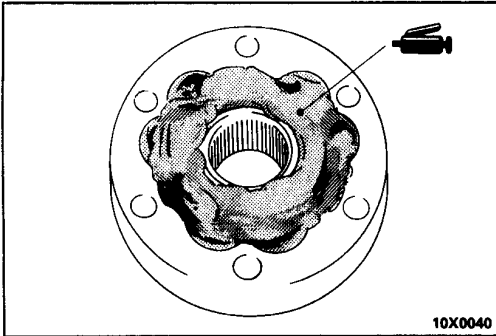
- (2) Put the cage on the inner race with the mating marks aligned and install two balls, one in a groove and the other in the groove opposite to that groove. Both balls should be placed in the grooves where they were before disassembly.
- (3) Assemble the inner race and cage in the outer race with their mating marks aligned.

NOTE

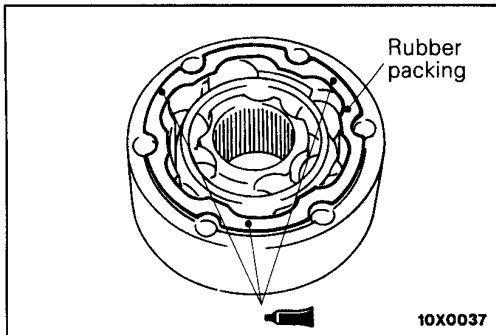
Make sure that the recessed end (where snap ring will be fitted) of the inner race, the recessed end (where packing will be fitted) of the outer race, and the chamfered end of the cage are all on the same side. Also ensure that the relative positions of the inner and outer races are as shown in the illustration.



- (4) Install the remaining balls in their original positions.
- (5) Check that the outer race rotates on the inner race smoothly.

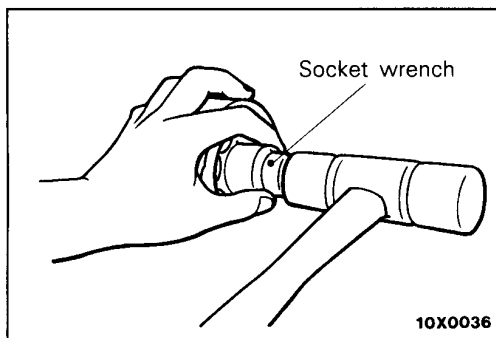


- (6) Apply specified grease to the Löbro joint assembly.
Specified grease: Repair kit grease
[45–55 g (1.59–1.94 oz.)]



- (7) Apply a small amount of specified adhesive in three equally divided places on the surface of the Löbro joint ball groove where there is a stepped section for the Löbro joint assembly packing, and then fit the rubber packing.

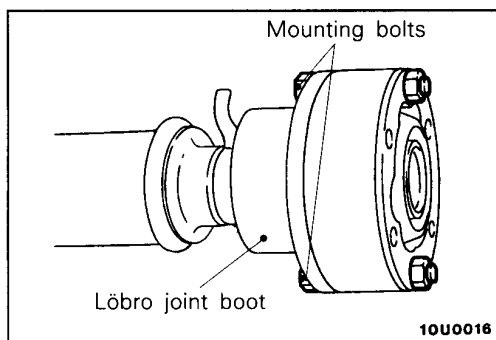
Specified adhesive: Quick fix adhesive 3M ATD Part No. 8121 or 3M ATD Part No. 8155 or equivalent



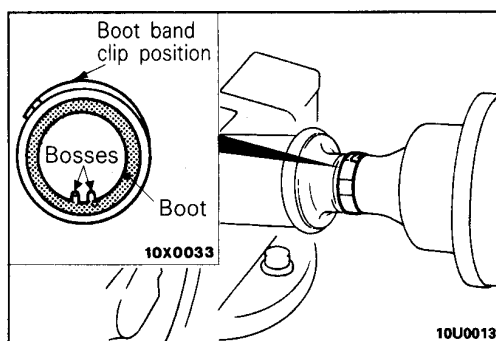
- (8) Install the Löbro joint assembly on the propeller shaft while aligning their bolt holes, and drive the joint assembly with a hammer using a socket wrench on the inner race for complete installation.

NOTE

Install so that the surface where there is a stepped section for the Löbro joint assembly packing is facing toward the Löbro joint boot.



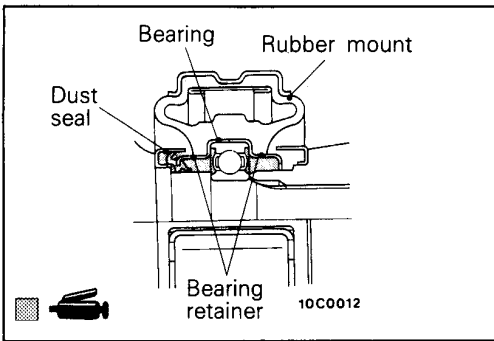
- (9) Realign the bolt holes in the boot and Löbro joint assembly utilizing the mounting bolts and fit the boot on the joint assembly.
 (10) Fit the rubber packing for the companion flange to the companion flange using the same procedure as in step (7).



16. INSTALLATION OF BOOT BAND

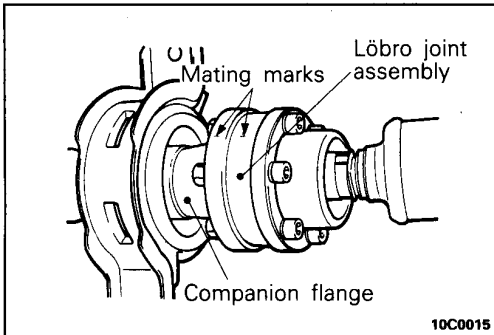
Caution

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. Grease obstructs the ventilation air passage.



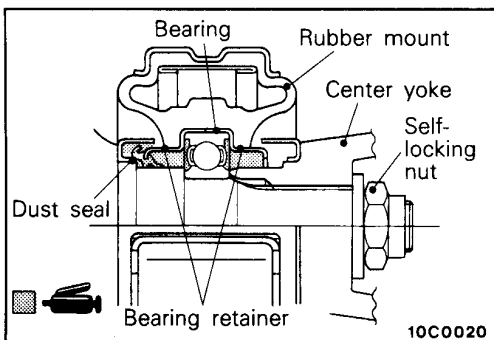
13. INSTALLATION OF CENTER BEARING ASSEMBLY/12. COMPANION FLANGE/11. SELF-LOCKING NUT

- (1) Install the bearing and retainer to the rubber mount groove of the center bearing bracket.
- (2) Install the dust seal of the center bearing assembly to the front propeller shaft so that it is facing the front propeller shaft.
- (3) Align the mating marks on the companion flange and front propeller shaft.
- (4) Press-fit the center bearing assembly with the companion flange while tightening the self-locking nut.



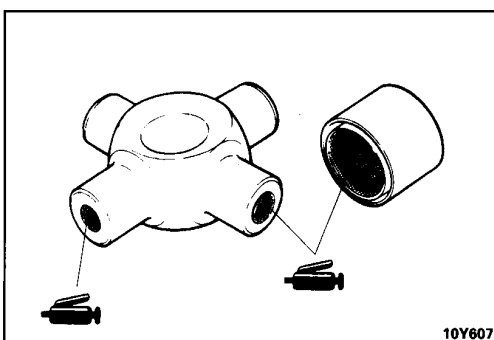
10. INSTALLATION OF LÖBRO JOINT ASSEMBLY INSTALLATION BOLTS

- (1) Align the mating marks on the companion flange and Löbro joint assembly.
- (2) Secure the companion flange and Löbro joint assembly with installation bolts.
- (3) Check for grease leakage from the Löbro joint boot and companion flange installation parts.



9. INSTALLATION OF CENTER BEARING ASSEMBLY/8. CENTER YOKE/7. SELF-LOCKING NUT <SPACE WAGON>

- (1) Install the bearing and retainer to the rubber mount groove of the center bearing bracket.
- (2) Install the dust seal of the center bearing assembly to the center propeller shaft so that it is facing the center propeller shaft.
- (3) Align the mating marks on the center yoke and center propeller shaft.
- (4) Press-fit the center bearing assembly with the center yoke while tightening the self-locking nut.

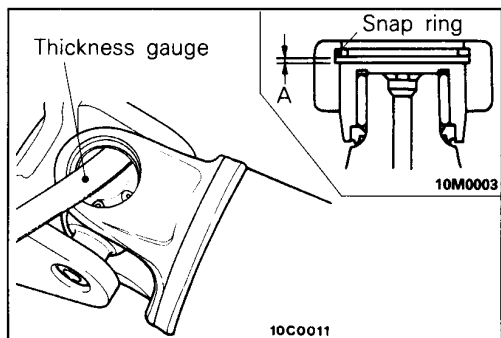
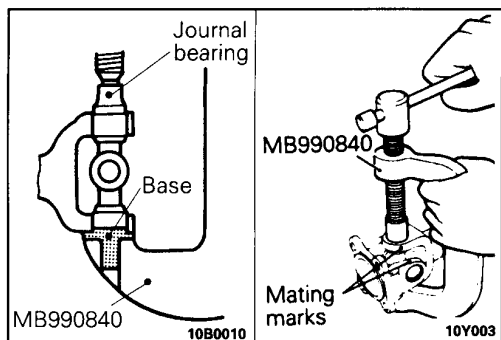


3. INSTALLATION OF JOURNALS/2. JOURNAL BEARINGS

- (1) Apply multipurpose grease to the following parts of the universal joint kit.
 - ① Shafts and grease sumps of journal
 - ② Dust seal lips
 - ③ Needle roller bearings

Caution

Do not apply excessive grease. Otherwise, faulty fitting of bearing caps and errors in the selection of snap rings may result.



- (2) Press fit the journal bearings to the yoke by using the special tool according to the following procedures.
- ① Install the base to the special tool proper.
 - ② Insert both bearings in the yoke, and hold and press fit them by using the special tool.

1. INSTALLATION OF SNAP RINGS

- (1) Install snap rings of the same thickness onto both sides of each yoke.
- (2) Press the bearing and journal into one side by using a brass bar.
- (3) Measure the clearance between the snap ring and the groove wall of the yoke with a thickness gauge. If the clearance exceeds the standard value, the snap rings should be replaced.

Standard value: 0.02–0.06 mm (0.0008–0.0024 in.)

Snap ring thickness mm (in.)	Identification colour
1.28 (0.0503)	–
1.31 (0.0516)	Yellow
1.34 (0.0528)	Blue
1.37 (0.0539)	Purple
1.40 (0.0551)	Brown