PROPELLER SHAFT

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OPERATION

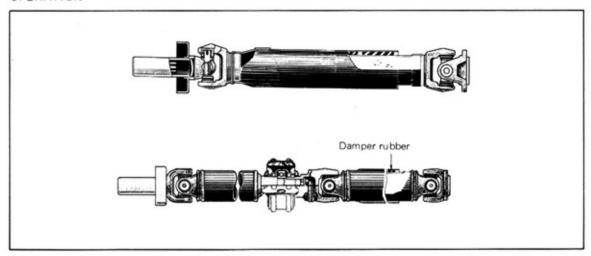


Fig. 3-1 Propeller Shaft Construction

There are two types of propeller shafts, the two-joint design and the three-joint design (for vehicles equipped with 2T-B or 8R-C engine). The propeller shaft joint yoke splines are of the involute type for minimizing vibration and wear. The sleeve yoke fits into the transmission extension-housing. The front and rear universal joints are both of the spider type equipped with needle rollers. Spider bearing seals are used to seal the cups to the spiders for the purpose of preventing the grease inside the bearings from leaking out as

well as preventing entry of water or foreign matter. This design ensures higher bearing durability and eliminates necessity for greasing except when disassembled. The three-joint design is comprised of the intermediate shaft at the front side and the propeller shaft at the rear side, with the center bearing at the middle separating these two shafts. The center bearing is provided with rubber mounts for taking up the propeller shaft longitudinal changes accompanying the vertical movement of the tires.

TROUBLE SHOOTING

Symptoms and Possible Causes	Remedies
Propeller shaft vibrates excessively or noisy	
When running (at medium or high speed), propeller develops vibration that	
is transmitted to body.	
 Universal joint spider bearing damage or worn excessively. 	Replace bearing
Propeller shaft bent	Replace propeller shaft
Propeller shaft unbalanced	Correct balance or replace propeller shaft
Propeller shaft installation loose	Retighten
Center bearing damaged or worn excessively or cushion rubber damaged.	Replace center bearing assembly
Propeller shaft knocks when starting or noisy when coasting.	
Universal joint worn or damaged	Replace
Splines worn	Replace sleeve yoke
Propeller shaft installation loose	Retighten
Joint flange yoke installation loose	Retighten

SPECIFICATIONS

Table 3-1 Propeller Shaft Specifications

	1194 x 75 x 71.5 mm (46.01 x 2.95 x 2.81 in)	
Length x Outside Dia. x Inside Dia.	501.5 x 65 x 61.8 mm (19.88 x 2.56 x 2.43 in) (Intermediate Shaft) 694.5 x 65 x 61.8 mm (27.34 x 2.56 x 2.43 in) (Propeller Shaft)	(for vehicles equipped with 2T-B or 8R-C engine.)

COMPONENT PARTS

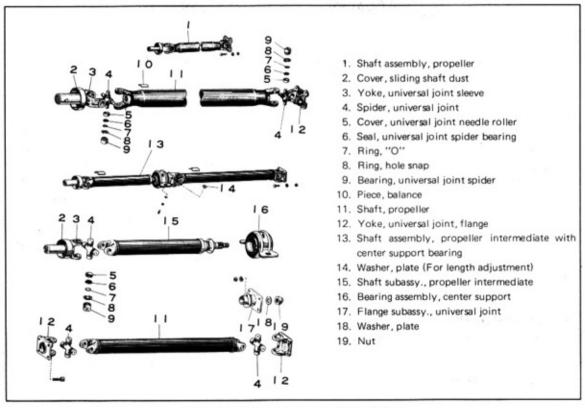


Fig. 3-2 Propeller Shaft Component Parts

REMOVAL

- Remove the four bolts mounting the propeller shaft universal joint flange yoke to the differential drive pinion companion flange,
- Remove the propeller shaft and insert Transmission Oil Plug [09325–12010] into the rear end of extension housing.

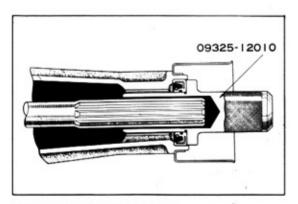
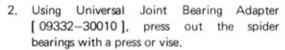


Fig. 3-3 Transmission Oil Plug

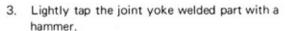
UNIVERSAL JOINT DISASSEMBLY

 Punch matching marks on the sleeve yoke (flange yoke) and propeller shaft, and remove the snap rings.

Note: Since balance weights are welded on the flange yoke and propeller shaft body, these matching marks are used to allow reassembling the parts with their balance weights in the same position they were before disassembly.



Caution: Sleeve yoke and spider will be deformed if pressed excessively.



The rebounding force will allow removing the spider bearings at the pressed-out side from out of the joint yoke.

 Remove the bearings from the opposite side and the other two ends by following procedures (1)—(3).

CENTER BEARING REMOVAL (Vehicles equipped with 2T-B and 8R-C engine.)

- Remove the parts (1) and separate the intermediate shaft from the propeller shaft.
- Remove the part (2) and take off the joint flange (3).
- Remove the parts (4) and take off the center bearing assembly (5).

Note: Do not disassemble the center bearing assembly. If defective, replace the entire assembly.

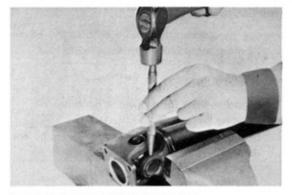


Fig. 3-4 Punching Matching Marks

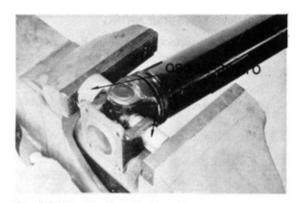


Fig. 3-5 Pressing Out Bearing Cup

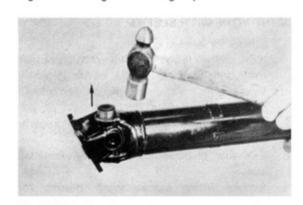


Fig. 3-6 Bearing Removal

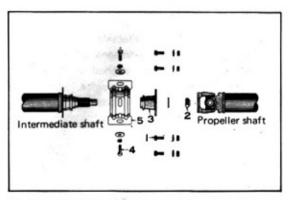


Fig. 3-7 Center Bearing Removal

INSPECTION

Inspect all disassembled parts as directed below and repair or replace any part found defective.

PROPELLER SHAFT

- Propeller shaft for damage or bending Bending limit 0,25 mm (0,010")
- Surfaces fitting against spider bearings for damage.

Bend limit 0.25mm (0.01")



Fig. 3-8 Propeller Shaft Deflection Inspection

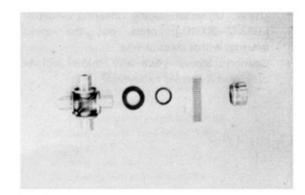


Fig. 3-9 Spider and Bearing Inspection

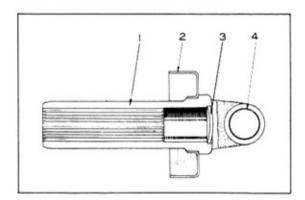


Fig. 3-10 Yoke with Sleeve Inspection

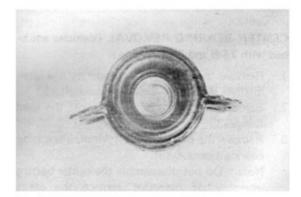


Fig. 3-11 Center Bearing Inspection

SPIDER AND SPIDER BEARING

- Spider shaft surfaces for damage or wear.
- 2. Snap rings for deformation or wear.
- 3. "O" rings for damage or wear.
- 4. Seals for deterioration.
- Cups for damage or wear.

JOINT YOKE WITH SLEEVE

Splines for damage or wear.

Note: When fitted over transmission output shaft splines, there should be no excessive looseness in rotational direction but should slide smoothly in axial direction.

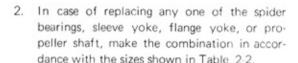
- Sliding shaft dust cover should be in properly installed state.
- Extension plug should be in properly installed state.
- Surface fitting against spider bearing for damage.

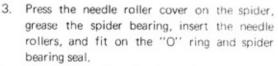
CENTER BEARING

 Center bearing for defective rotation, faulty seal, deteriorated or damaged cushion rubber.
 Caution: The three peened parts on the circumferences of the cushion rubber and housing must never be loosened. Loosening these parts will cause noise to develop.

UNIVERSAL JOINT REASSEMBLY

 In Fig. 3-12 and Fig. 3-13, the presence of "A" mark at position A indicates bore size of hole at punch marked side. Presence of "A" mark at position B indicates bore size of hole at side opposite to that with the punch mark.





- Place the spider in the yoke, and using Universal Joint Adapter [09332–30010], press on the spider bearing at one side with a vise or press. In the same manner, press on the spider bearing at the opposite side.
- Adjust the play in spider axial direction.
 Select and install snap rings that will provide less than 0.05 mm (0.002") axial play in spider and will be of the same thickness at both sides.

Caution: If the snap ring thicknesses should differ at both sides, the center of propeller shaft yoke will be disturbed and will cause vibration and noise.

- Install the other ends of the spider by following the procedures 1-5.
- After reassembling, turn the sleeve and flange yokes in vertical and horizontal directions to see that they turn smoothly.

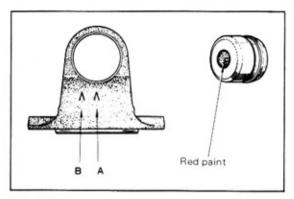


Fig. 3-12 Take In Marks

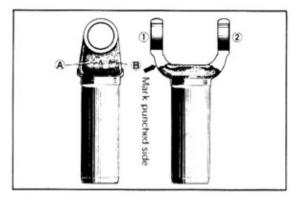


Fig. 3-13 ∧ Shape Punched Marks

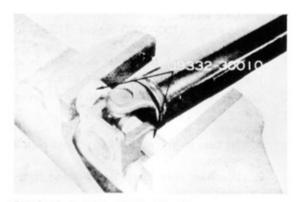


Fig. 3-14 Installing Spider Bearing



Fig. 3-15 Selecting Snap Ring