

Removal and Installation of Propeller Shaft

Job No.

41-1

On Models 180 to 220 SE the removal and installation procedures for the propeller shaft are essentially the same as on Model 190. However, on Model 220 a and on older cars of Models 180, 180 D, and 190 SL the propeller shaft can only be removed toward the rear when the rear axle has been removed or it can be removed toward the front when the engine and the transmission have been removed, since on these cars the rear aperture in the propeller shaft housing at the point where the rib has been welded to the housing is smaller than on recent cars.

Disassembly and Reassembly of Propeller Shaft

Job No.

41-4

On Models 180 to 220 SE the disassembly and reassembly procedures for the propeller shaft are essentially the same as on Model 190.

The following points deserve attention:

a) Three-Way Flange on Front Propeller Shaft

The three-way flanges on the front propeller shaft have varying bolt-hole circles on the individual models (see table).

Model	Bolt-hole circle of three-way flange mm
180, 220 a	80
180 D up to Chassis End No. 65 01919	
190 SL up to Chassis End No. 65 00172	
219 up to Chassis End No. 65 00740	
180 a, 180 b, 180 Db, 190, 190 b, 190 D, 190 Db, 220 S, 220 SE	90
180 D as from Chassis End No. 65 01920	
190 SL as from Chassis End No. 65 00173	
219 as from Chassis End No. 65 00741	

When repairs are carried out on older cars of these models, a front propeller shaft with a three-way flange (90 mm bolt-hole circle) can be installed, provided that the three-way flange on the transmission is replaced at the same time.

b) Universal Joint Spider

The trunnions of the spiders on the front and rear propeller shafts have been reinforced. Furthermore both the arrangement and the design of the grease fitting have been modified in order to provide better access to the grease fitting when the universal joint is greased (see table).

Dimensions and Tolerances of Shaft Yoke, Needle Bearing Bushings, and Universal Joint Spider

		1st Version		2nd Version		3rd Version	
Installed in propeller shafts of Models		180, 180 D up to Chassis End No. 650 1919		180 D as from Chassis End No. 650 1920, 180 a, 190, 190 D, 190 SL, 220 a, 219, 220 S, 220 SE			
Type		I	II	I	II	I	II
Marking		1 white dot	2 white dots	1 white dot	2 white dots	1 white dot	2 white dots
Bore in shaft yoke		$\frac{22.000}{22.010}$	$\frac{22.011}{22.020}$	$\frac{26.000}{26.010}$	$\frac{26.011}{26.021}$	$\frac{28.000}{28.010}$	$\frac{28.011}{28.021}$
Needle bearing bushing	External diameter	$\frac{22.012}{22.002}$	$\frac{22.023}{22.013}$	$\frac{26.012}{26.002}$	$\frac{26.023}{26.013}$	$\frac{28.012}{28.002}$	$\frac{28.023}{28.013}$
	Internal diameter	$\frac{16.707}{16.720}$		$\frac{20.107}{20.120}$		$\frac{21.707}{21.720}$	
Trunnion ϕ of universal joint spider		$\frac{12.700}{12.689}$		$\frac{15.100}{15.089}$		$\frac{16.700}{16.689}$	
Part No. of complete universal joint spider		120 410 01 31		120 410 01 31		180 410 03 31	
Arrangement and design of grease fitting		Grease fitting at an angle of 90° and screwed into end face of universal joint spider (Fig. 41-4/1)				Longer straight grease fitting, screwed in between two trunnions at an angle of 45° (Fig. 41-4/1)	

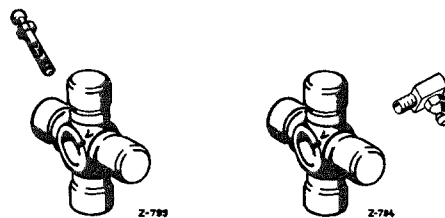


Fig. 41-4/1

Universal joint spider

3rd Version

1st and 2nd Versions

c) Self-Lubricating Universal Joints

A large number of cars of Models 180 a, 180 D, 190 D, 190 SL, 219, and 220 S and all cars of Models 180 b, 180 Db, 190 b, and 190 Db are fitted with propeller shafts with self-lubricating universal joints.

When these universal joints are installed, they are provided with a special lubricating compound sufficient to lubricate the spider trunnions for the whole of their service life. For this reason the joints require no maintenance. The grease fitting bore in the spider has been closed with a grub screw.

The fact that cars have no grease fittings on the universal joints of their propeller shaft proves that they have been provided with self-lubricating universal joints. Propeller shafts with standard universal joints cannot be subsequently converted to self-lubricating units by lubricating them with the special compound mentioned above since the ordinary spider seals are not suitable for permanent lubrication. The rubber sealing rings on self-lubricating universal joint have a higher sealing pressure which makes any lubricant leaks impossible.

d) Propeller Shafts as Replacement Parts

For reasons of standardization the reinforced universal joint spider Part No. 180 410 03 31 has also been installed in propeller shafts supplied as replacement parts. When front propeller shafts Part No. 180 410 16 01 (with 80 mm bolt-hole circle on the three-way flange) and with reinforced universal joint are installed on older cars of Models 190 SL and 220 a, it is no longer possible to lubricate the universal joint with a standard lubricator since the cut-out in the chassis base panel is too small. For this reason the universal joint on these cars must be lubricated by hand with Special Grease Gun 000 583 18 18 which has a curved mouth-piece.

e) Survey of Propeller Shafts / Date: December 31, 1959

Model	Total propeller shaft Part No.	Front propeller shaft Part No.	Rear propeller shaft Part No.	Three-way flange bolt-hole circle	Model
180 180 D	120 410 26 03	120 410 38 01	120 410 40 09	80	For cars with twin-jointed and single-jointed rear axle, on Model 180 D 1st version (up to Chassis End No. 65 019 19)
180 D	120 410 27 03	120 410 14 01	120 410 41 02	90	2nd Version (as from Chassis End No. 65 019 20)
180 a 190, 190 D 219	121 410 13 03	180 410 14 01	121 410 23 02	90	On Model 219 2nd Version (as from Chassis End No. 65 007 41)
190 SL	121 410 17 03	180 410 16 01	121 410 24 02	80	1st Version (up to Chassis End No. 65 001 72)
190 SL	121 410 14 03	180 410 14 01	121 410 24 02	90	2nd Version (as from Chassis End No. 65 001 73)
220 a	180 410 14 03	180 410 16 01	180 410 23 02	80	
219	105 410 02 03	180 410 16 01	121 410 23 02	80	1st Version (up to Chassis End No. 65 007 40)
220 S, 220 SE	180 410 11 03	180 410 14 01	180 410 23 02	90	
220 S, 220 SE Convertible and Coupé	180 410 12 03	180 410 14 01	180 410 24 02	90	
219	121 410 18 03	180 410 17 01	121 410 23 02	90	For cars with hydraulic-automatic clutch

Model	Total propeller shaft Part No.	Front propeller shaft Part No.	Rear propeller shaft Part No.	Three-way flange bolt-hole circle	Remarks
220 S, 220 SE	180 410 16 03	180 410 17 01	180 410 23 02	90	For cars with hydraulic-automatic clutch
220 S, 220 SE Convertible and Coupé	180 410 17 03	180 410 17 01	180 410 24 02	90	For cars with hydraulic-automatic clutch
180 Db	120 410 28 03	180 410 18 01	120 410 42 02	90	With self-lubricating universal joints
180 b, 190 b 190 Db	121 410 19 03	180 410 18 01	121 410 25 02	90	

f) Repair of Self-Lubricating Universal Joints

The procedures necessary to repair the self-lubricating universal joints are the same as for those with grease fittings, but the following details require attention:

In order to safeguard the service life of the self-lubricating universal joints, the lubricating canals in the universal joint spider must be completely filled with the prescribed special lubricant. On a self-lubricating universal joint the sealing between universal joint spider and needle bearing bushings is of particular importance since the lubricant cannot be replenished. For this reason the sealing rings between universal joint spider and needle bearing bushings are installed with a much greater bearing pressure than the sealing rings of universal joints with grease fittings. It goes without saying that self-lubricating universal joints should not be lubricated with ordinary grease or roller bearing grease, but only with the specified compound. The complete universal joint spiders are supplied fully lubricated and it is imperative that they should be fitted in such a way that no lubricant can be lost.

If the lubricant has to be replenished for some reason and if the prescribed special lubricant (EXD 1310 of Mobil OIL AG) is not available, a similar compound can be made to meet **emergencies**. This compound should consist of 75% by volume of roller bearing grease and 25% by volume of hypoid transmission oil SAE 90. The ingredients should be mixed thoroughly.