C. Replacing Universal Joint Spider in Front or Rear Propeller Shaft

Disassembly:

32. Press out the four crescent-shaped snap rings (1) from the four needle bearing bushings (2) of the spider (Fig. 41 — 4/5).

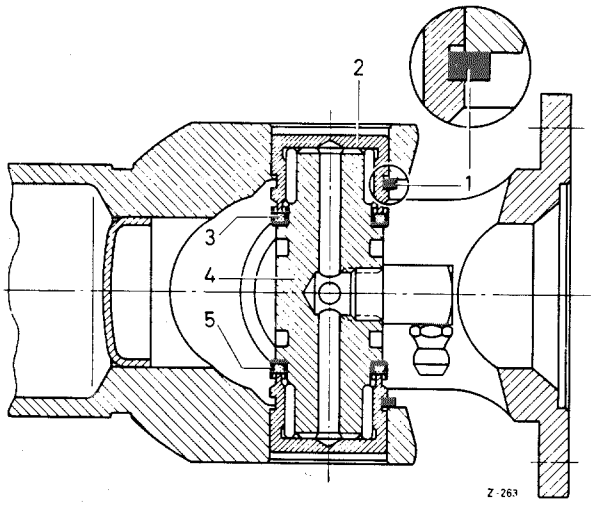

Fig. 41 — 4/5

1 Crescent-shaped snap ring
2 Needle bearing bushing
3 Sealing ring
4 Spider
5 Sealing ring retainer

33. Using a suitable support (2), place the yoke of the joint flange (3) under an arbor press (Fig. 41 — 4/6).

34. Use a suitable sleeve (4) to press the yoke (1) down as far as possible (see Fig. 41 — 4/6), thus pressing out the needle bearing bushing.

35. Turn the yoke over and press the opposite needle bearing bushing out in the same way.

36. Then press the needle bearing bushings out of the other yokes.

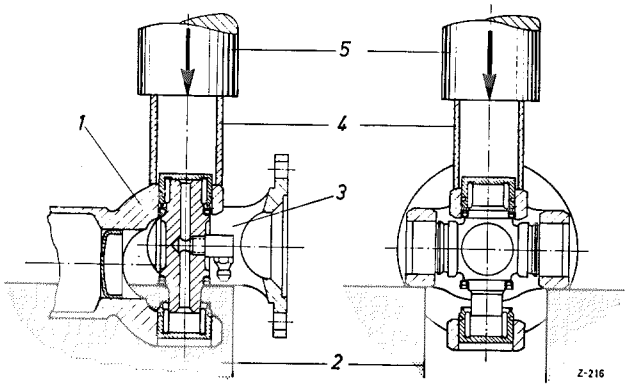

Fig. 41 — 4/6

1 Yoke
2 Support
3 Joint flange
4 Sleeve
5 Arbor

Checking:

37. Check the bores in the yokes. For measurements see Table below. If the bores are worn, the yokes must not be repaired; the front or rear propeller shaft assembly must be replaced.

38. The needle bearing bushings are available in two sizes (see Table below).

    Select the needle bearing bushings to comply with the specified oversize fit.

Note: As replacement parts the spiders are supplied complete with needle bearing bushings and needles. When ordering replacements, please indicate whether size I or II is required. It is not permissible to replace individual needles or to replace the needle bearing bushings without a new spider.

Dimensions and Tolerances of Needle Bearing Bushing and Shaft Yoke in mm

Type	Marking	External diameter of needle bearing bushing	Bore in shaft yoke	Force-fit dimension	Internal diameter of needle bearing bushing	Trunnion diameter	Clearance
I	1 white dot	$\frac{26.015}{26.022}$	$\frac{26.000}{26.010}$	+ 0.005 to + 0.022	$\frac{20.120}{20.107}$	$\frac{15.089}{15.100}$	0.02 to 0.05
II	2 white dots	$\frac{26.023}{26.028}$	$\frac{26.011}{26.021}$	+ 0,002 to + 0.017			

Reassembly:

39. Put the yoke on a suitable support and press a needle bearing bushing with needles in slightly more than half its length (Fig. 41 — 4/7).

Note: Make sure that the correct size needle bearing bushing is fitted.

Use as little grease as possible to hold the needles in the needle bearing bushings; the trunnions of the spider should only be given a very light coating of grease.

The 22 needles of a needle bearing bushing must not be installed in another needle bearing bushing.

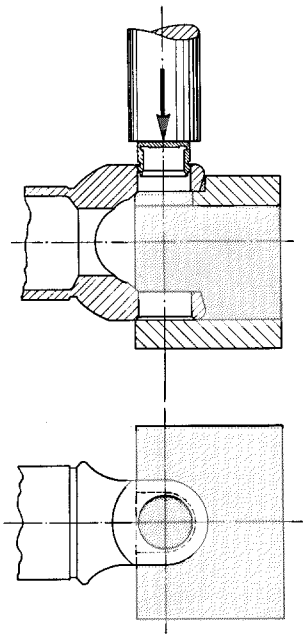

Fig. 41 — 4/7

40. Install the spider, with pinion rim grease fitting screwed in and with new pressed-cork seals (3), into the needle bearing bushing which is pressed in halfway (see Fig. 41 — 4/9).

Note: When installing the slip coupling and the corresponding joint flange, make sure that the pinion rim grease fittings point in the same direction (Fig. 41 — 4/8).

The pinion rim grease fittings of the front propeller shaft and of the universal joint must also point in the same direction.

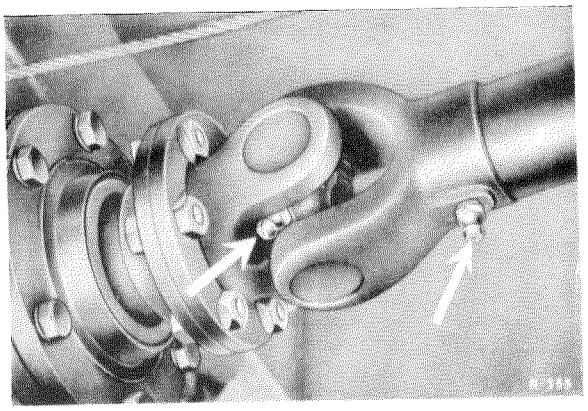

Fig. 41 — 4/8

41. Press the needle bearing bushing home and install the crescent-shaped snap ring (1) (Fig. 41 — 4/9).

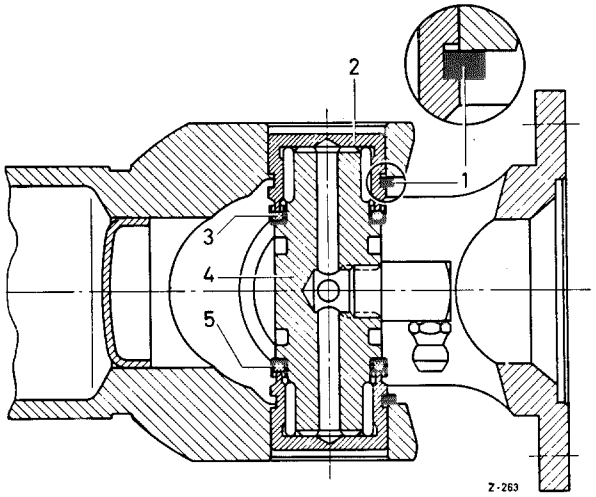

Fig. 41 — 4/9

1 Crescent-shaped snap ring
2 Needle bearing bushing
3 Sealing ring
4 Spider
5 Sealing ring retainer

42. Put in the opposite needle bearing bushing and press it in.

43. Install a crescent-shaped snap ring (1) in the second needle bearing bushing (see Fig. 41 — 4/9).

44. Then put the yokes on a support and relieve the stresses by a tap with a plastic hammer.

Note: The yoke must slowly drop by its own weight.

If the universal joints are difficult to move, install thinner crescent-shaped snap rings. If the joints move too freely, install thicker crescent-shaped snap rings. The crescent-shaped snap rings are available in the following thicknesses:

1.6 mm	Part No. 180 994 09 34
1.65 mm	Part No. 180 994 08 34
1.7 mm	Part No. 180 994 10 34

This check must be made with the utmost care since the universal joints become noisy on a change-over from pushing to pulling if they have too much axial play. If the joints do not move easily, the needle bearings tend to become scored.
For the same reason it is necessary to ensure that on reassembly a minimum of grease is used, since otherwise it becomes impossible to rely on experience when determining the axial play.

45. The other needle bearing bushings are installed in the same way.