Operation No.
M 45

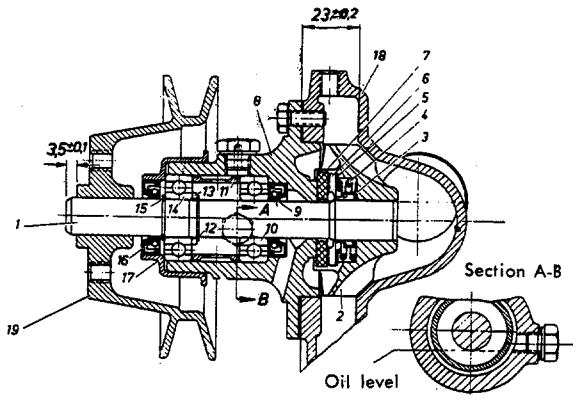
Reconditioning of Water Pump

Types 220 and 220 a

The water pump used in Type 220 and the pump of Type 220 a differ in their components only. When assembling the pump be careful not to interchange the parts.

The assembling and disassembling operations are very much the same. Where applicable, the deviations are stated.

Fig. M 45/00 shows the water pump for Type 220, and Fig. M 45/01 shows the water pump for Type 220 a.

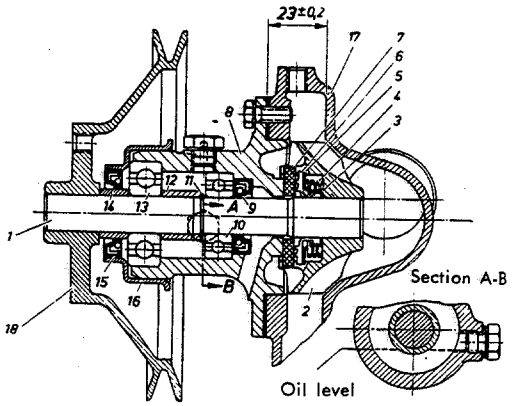


23 ± 0.2 mm (0.9 ± 0.008") 3.5 ± 0.1 mm (0.14 ± 0.004")

Fig. M 45/00

Water pump for Type 220

1 Water pump shaft
2 Impeller
3 Cover
4 Pressure spring
5 Sealing ring retainer
6 Sealing ring
7 Slip ring
8 Bearing housing
9 Grease retainer
10 Ball bearing
11 Spacer sleeve
12 Lock ring
13 Ring
14 Ball bearing
15 Lock ring
16 Grease retainer
17 Sealing ring retainer
18 Water pump housing
19 Pulley



23 ± 0.2 mm (0.9 ± 0.008")

Fig. M 45/01

Water pump for Type 220a

1 Water pump shaft
2 Impeller.
3 Cover
4 Pressure spring
5 Sealing ring retainer
6 Sealing ring
7 Slip ring
8 Bearing housing
9 Grease retainer
10 Ball bearing
11 Lock ring
12 Spacer sleeve
13 Ball bearing
14 Intermediate ring
15 Grease retainer
16 Sealing ring retainer
17 Water pump housing
18 Pulley

Special Tools:

Puller for pulley	120 589 00 33
Puller for sealing ring retainer	186 589 05 33
Pressing-out sleeve with arbor for impeller	187 589 01 35
Mounting sleeve for grease retainer	187 589 07 39
Mounting sleeve for ball bearing	187 589 04 39
Mounting sleeve for lock ring	187 589 08 39
Mounting sleeve for sealing ring retainer (Type 220)	187 589 05 39
Mounting sleeve for pulley	187 589 06 39

Procedure:

1. Unscrew water pump housing from bearing housing.
2. Remove pulley from shaft by means of puller 120 589 00 33 (Fig. M 45/2), clamping shaft with impeller in a vise.

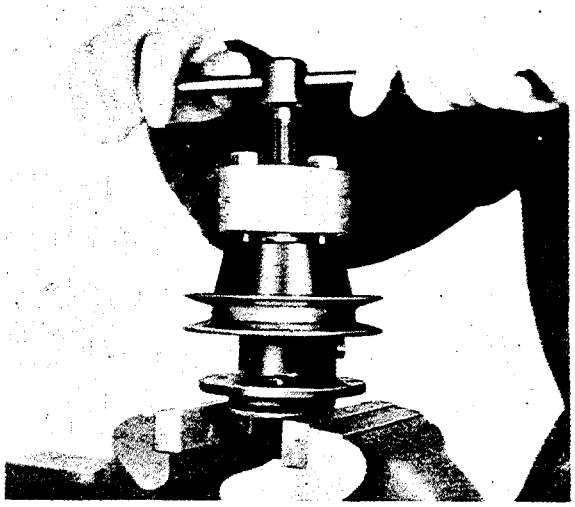


Fig. M 45/2

3. Clamp bearing housing in a vise and pull sealing ring retainer with sealing ring by means of puller 186 589 05 33 (Fig. M 45/3), then press sealing ring out of retainer.

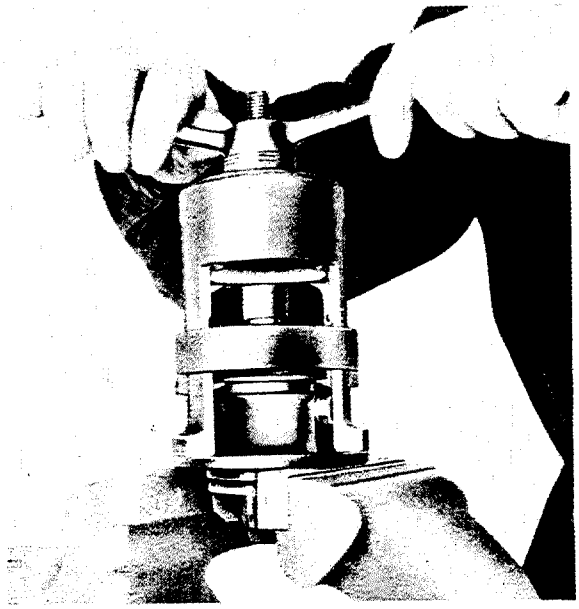


Fig. M 45/3

4. Drive water pump shaft out with a plastic hammer.

Note: Before attempting to drive out the water pump shaft of Type 220, remove lock ring in front of ball bearing. Drive shaft about 15 to 20 mm (0.6 to 0.8") into bearing housing, then drive back again so the front ball bearing can be pulled.

Proceed as follows: Place a U-shaped piece between ball bearing and housing and drive shaft back (Fig. M 45/4).

Take off ring and rear lock ring and drive shaft out.

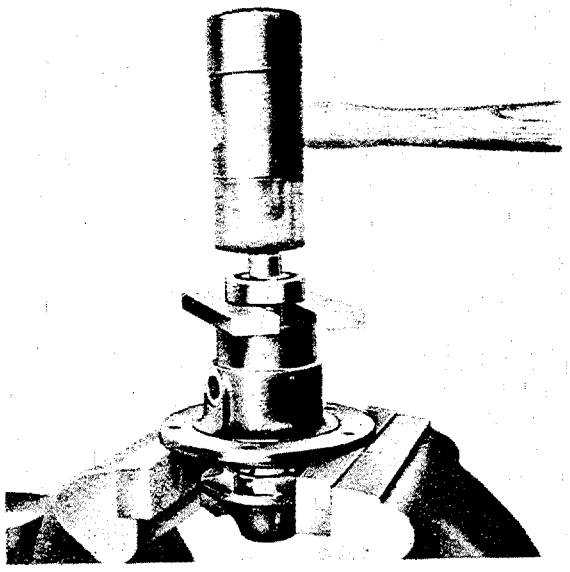


Fig. M 45/4

5. Drive rear ball bearing and rear grease retainer out of bearing housing by means of a suitable punch.

6. Press water pump shaft out of impeller, using tool 187 589 01 35 (Fig. M 45/6).

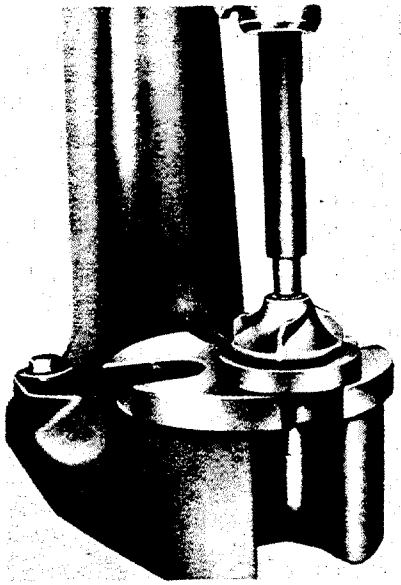


Fig. M 45/6

7. Clean and check all parts. It is particularly important to check the shaft and ball bearings for wear.

8. To install the water pump, proceed as follows:

Note: Always replace grease retainers, lock rings and sealing ring with slip ring.
To ensure that the grease retainers will glide smoothly when they are pressed in, apply a little oil to the outside of the retainers and the inside of the respective bore.

9. Press water pump shaft so into impeller that end of shaft is flush with impeller.

Note: In the case of Type 220 the water pump impeller is provided with four blades, in Type 220 a it has eight blades.

10. Push pressure spring, cover, sealing ring retainer, sealing ring and slip ring on shaft.

11. Place bearing housing on shaft and press grease retainer into housing by means of mounting sleeve 187 589 07 39.

12. Push ball bearing on shaft and press into the housing with tool 187 589 04 39 (Fig. M 45/12).

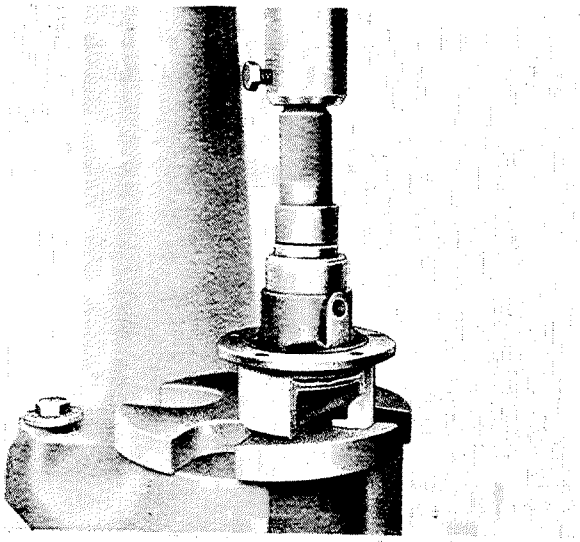


Fig. M 45/12

13. After the rear ball bearing has been pressed in, check distance between bearing housing flange and taper of impeller; it should be 23 ± 0.2 mm (0.905 ± 0.008″). See Figs. M 45/00 and 01.

14. Install lock ring, put on washer, place spacer sleeve on rear ball bearing and press front bearing in place. Install front lock ring.

Note: Typ 220a: Install a lock ring in front of the rear ball bearing. Put on spacer sleeve and press front ball bearing in place.

To push on the lock ring, use mounting sleeve 187 589 08 39.

15. Fill 10 ccm (0.61 cu.in.) of oil into the bearing housing, before the front ball bearing is pressed on. Before this is done, turn vent screw and oil level plug with sealing ring into the housing.

Note: It is recommended to use a screw without vent hole in the place of the vent screw during assembly of the water pump. This is to ensure that no oil will espace. After the assembly has been completed, exchange blind screw again for vent screw.

16. Press front grease retainer into sealing ring retainer and press sealing ring retainer on bearing housing by means of mounting sleeve 187 589 05 39.

17. Type 220a: Push on front intermediate ring.

18. Press pulley on shaft.

Note: In the case of a water pump for Type 220 the pulley must be installed about 3.5 + 0.1 mm (0.14 + 0.004″) from the end of the shaft.
In Type 220a the pulley is flush with the end of the shaft.

19. Screw water pump housing to bearing housing. Use new gasket.

Note: In mounted condition the vent screw must point upward.

20. Test water pump at the bench or on the engine. Neither water nor oil must escape from the pump.