

The four hexagon socket screws M 8 at the front of the cylinder head should be tightened by hand.

**After tightening the cylinder head screws check whether the camshaft can be turned easily by hand.**

**For the final tightening of the cylinder head screws on the warm engine proceed as follows:**

Warm up the engine under slight load until the cooling water temperature reaches 80° C. Run the engine for another 5 minutes at this cooling water temperature and then tighten the cylinder head screws to **9 mkg** in the sequence indicated above.

After a road test or after a mileage of no more than 20 km check the tightening torque of the cylinder head screws (9 mkg.) Do not force the engine during the road test.

After the road test also check all unions for leakage and all screws for tightness and, if necessary, retighten.

Finally check the tappet clearance once more with the **engine cold**.

After the car has run a further 500 km carry out a third check on the tightening torque of the cylinder head screws with the engine at normal running temperature; the tightening torque must be **9 mkg**.

## **D. Removal and Installation of Generator and Starter**

a) **Removal and Installation of Generator, see Job No. 15-11.**

b) **Removal and Installation of Starter, see Job No. 15-0.**

## **E. Removal and Installation of Water Pump with Fan**

Repair procedures see Job No. 20-5.

On Models 180 a, 180 b, 190 SL, 220 a, 219, 220 S, and 220 SE, with the exception of the pump on Model 190 SL, the removal and installation procedures are the same as for Model 190.

The usual by-pass line (8) (Fig. 01-4/40) is not installed in Model 190 SL, since the line heating the intake pipe also serves as a by-pass line. The threaded union (10) in the water pump housing has been replaced by a screw plug (Fig. 01-4/41). Furthermore, the hub pressed onto the water pump shaft and to which the pulley and the fan are fixed has four threaded bores, whereas on all other models pulley and fan are fastened with only three screws.

The water pumps of Models 180 a, 180 b, 190, 220 a, 219, 220 S, and 220 SE with the same capacity are interchangeable, whereas the pulleys vary in size (see table).

### **Pulley for Water Pumps**

Model	180 a, 180 b, 190, 190 b, 220 S	190 SL	220 a, 219, 220 SE
External diameter of pulley	138	125	149

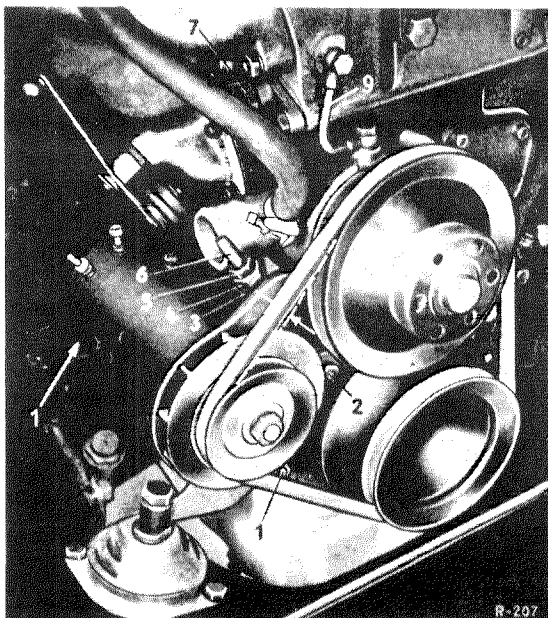


Fig. 01-4/40

- |                                 |                    |
|---------------------------------|--------------------|
| 1 Generator mounting            | 5 Hexagon nut      |
| 2 Tensioning screw (6) mounting | 6 Tensioning screw |
| 3 Clamping piece                | 7 Chain tensioner  |
| 4 Tensioning nut                | 8 By-pass line     |
|                                 | 9 Air vent line    |

On Models 220 a, 219, 220 S, and 220 SE the fixing screw (3) is a hexagon socket screw (Fig. 01-4/41). This screw can only be removed and installed through the vibration damper. To do this turn the crankshaft until one of the six bores in the vibration damper is accurately aligned with the screw.

### Water Pump with Higher Capacity

In recent cars of Models 180 a, 190 SL, 219, and 220 S water pumps with a capacity of 4 kg/sec are installed (previous capacity 3.25 kg/sec). Models 180 b and 220 SE have all been provided with this high capacity water pump. The new water pump has a larger impeller and as a consequence also a larger water pump housing; see also Job No. 20-5. The high capacity water pump can be installed subsequently in older engines of the above-mentioned models and also in Model 220 a. In future, only high capacity pumps will be supplied as replacement parts.

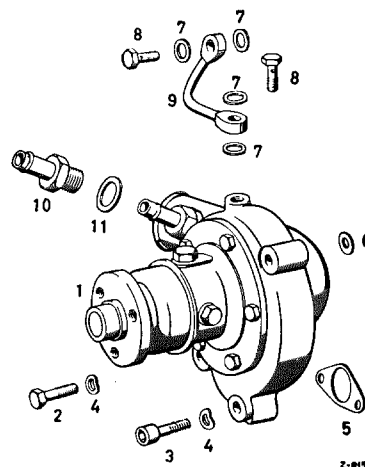


Fig. 01-4/41

- |                        |                     |
|------------------------|---------------------|
| 1 Waterpump            | 7 Sealing ring      |
| 2 Hexagon screw        | 8 Hollow screw      |
| 3 Hexagon socket screw | 9 Compensating line |
| 4 Spring washer        | 10 Threaded union   |
| 5 Gasket               | 11 Sealing ring     |
| 6 Sealing ring         |                     |

When installing the water pump do not forget the sealing ring (6) under the top fixing lug. On no account should a standard washer be used, since when the water pump fixing screws are tightened the sealing ring (6) must be compressed to the same degree as the gasket (5) in order to achieve a proper tight seal between the water pump and the crank-case.

In the case of the high capacity water pump a distinction must be made between the intermediate version and the final version. The intermediate version water pump has no connecting branch for the by-pass line on the inlet branch for the cooling water, whereas the final version water pumps are fitted with such a connecting branch.

The installation of an intermediate version water pump therefore requires a distributor pipe for cooling water return flow, heating, and by-pass line, whereas for the installation of the final version and the lower capacity water pump only a distributor pipe for cooling water return flow and heating is required.

When subsequently installing the water pump in Model 220 a up to engine end no. 55 09040 use a pulley Part No. 180 205 07 10 with 3 hexagon screws M 8×18 DIN 933-8 G and 3 spring washers B 8 DIN 137, since up to this engine number the pulley is cast integral with the hub. When installing the high capacity water pump subsequently, make sure that there is sufficient space between the recess on the crankcase and the modified water pump housing (Fig. 01-4/42). If necessary, increase the recess (b) by milling down the crankcase.

In addition, on Models 220 a, 219, and 220 S the eye (a) for the front stud bolt on the cylinder head must be milled down to ensure that the water pump does not touch the cylinder head (Fig 01-4/42).

The previous air vent line from the water pump to the cylinder head can no longer be used for the new water pump. Models 180 a and 190 SL require an air vent line Part No.

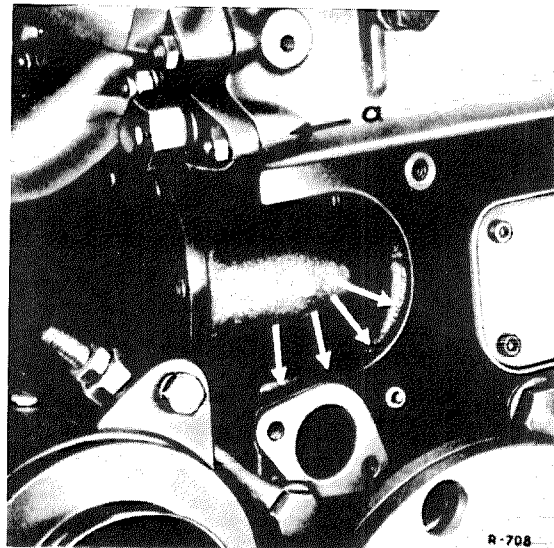


Fig. 01-4/42

121 200 02 58 and Models 220 a, 219, and 220 S require an air vent line Part No. 180 200 02 58.

## F. Removal and Installation of Distributor with Bearing

Repair procedures see Job No. 15-23.

### a) Distributor

The removal and installation procedures for the distributor on Models 180 a, 180 b, 190 SL, 220 a, 219, 220 S, and 220 SE are the same as described for Model 190.

In addition to the details given in the Workshop Manual for Model 190 the following points are of importance:

Before installing the distributor check whether the piston of the 1<sup>st</sup> cylinder is at ignition dead center and whether the distributor rotor arm points to the timing mark for the 1<sup>st</sup> cylinder on the distributor housing (Fig. 01-4/44).

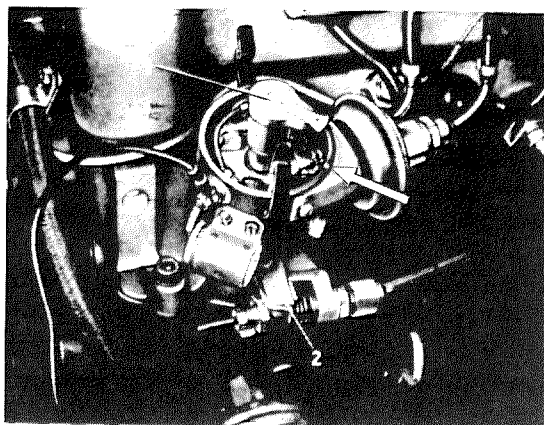


Fig. 01-4/44

1 Distributor rotor arm  
2 Timing lever