

## A. OM 636

### I. General

Either a horizontally arranged oil filter (Figure 18-9/1) or a vertically arranged bowl-type oil filter (Figure 18-9/2) is fitted to the Model OM636. The two versions are designed as annular edge-type filters with metal filter element and operate on the same principle.

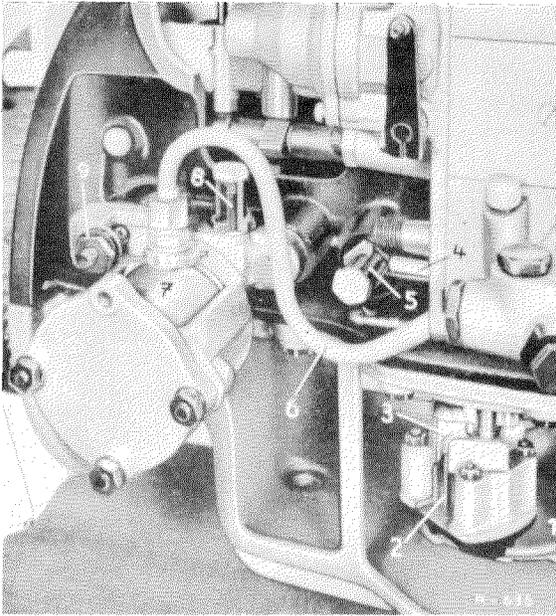


Figure 18-9/1

- 1 Suction strainer with suction pipe
- 2 Geared pump
- 3 Pressure passage in pump housing
- 4 Main oilway in crankcase
- 5 Relief valve (8 atm.) in main oilway
- 6 Line from the oil pump to the oil filter
- 7 Wire coil and/or metal filter element
- 8 Relief valve in filter housing (2 atm.)
- 9 Adapter for the flow of the filtered oil from the filter housing into the main oilway and connector for the oil pressure gauge line

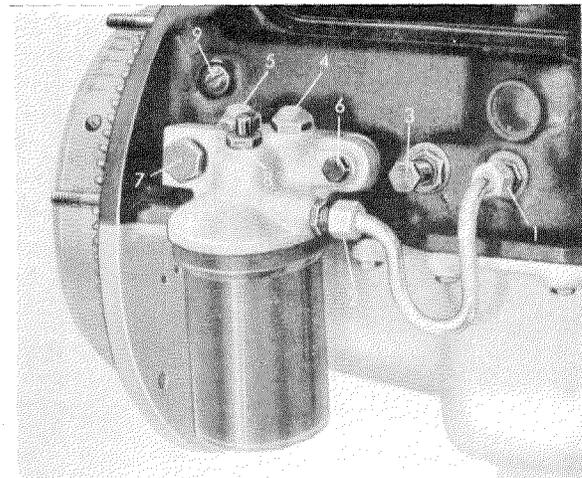


Figure 18-9/2

- 1 Oil outlet from the pump
- 2 Oil inlet to the oil filter
- 3 Oil relief valve in main oilway
- 4 Relief valve for metal filter element
- 5 Relief valve for a fine filter element (the Model OM 636 has no fine filter element)
- 6 Fixing screw
- 7 Adapter
- 8 Connector for the oil pressure gauge line and/or the oil pressure control
- 9 Locating screw for the 3rd camshaft bearing

The oil filter is installed between the oil pump and the main oilway. The metal filter element consists of a wire coil, the wires being placed close together. The oil from the oil pump is discharged into the filter housing and pressed through the wire coil from the outside inwards. During this process the impurities in the oil are retained by the wire coil. From the inside of the filter the oil flows through a passage and the adapter (9) to the main oilway (Figure 18-9/1).

The relief valve (8) adjusted at 2 atm. and installed in the filter housing diverts the oil stream directly to the main oilway and the individual points of lubrication if the oil is cold and viscous or

if the filter element is fouled and clogged (Figure 18-9/1). The relief valve opens as soon as the difference in oil pressure before the filter and the oil pressure behind the filter becomes greater than 2 atm. This guarantees an immediate and adequate oil supply to all points of lubrication during every operating condition of the engine.

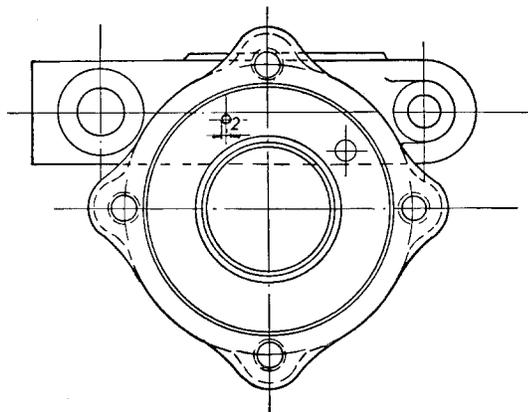


Figure 18-9/3

The housing of the horizontally arranged oil filter is in addition furnished with a 2 mm hole (see Figure 18-9/3). Oil flows through this hole into the main oilway, even at the lowest oil pressures, that is even before the opening of the relief valve (8) (see Figure 18-9/1).

In addition to the relief valve (4) another relief valve (5) is installed in the upper part of the bowl-type filter (see Figure 18-9/2). In other engine types having an additional fine filter element this relief valve (5) opens the oil passage to the main oilway if the fine filter element is clogged. The fixing screw (7) is designed as an adapter (see Figure 18-9/2). On the horizontally arranged oil filter the adapter (9) is provided with a connector for the oil pressure gauge line (see Figure 18-9/1). On the bowl-type filter this connector (8) is fixed to the upper part of the housing (see Figure 18-9/2).

The filter element must be cleaned each time the oil is changed. (Also see Job No. 0-9.)

## II. Disassembly:

### a) Horizontally arranged oil filter

**Note:** In order to clean the oil filter the filter housing (5) is not removed from the engine (see Figure 18-9/4).

1. Unscrew the 4 nuts at the housing cover and pull out this cover with the filter element (3) (see Figure 18-9/4).

**Caution!** Put a suitable oil tray underneath the filter housing before this operation, because the oil contained in the housing will flow out.

2. Remove the metal filter element (3) from the housing cover (4) (Figure 18-9/4). For this purpose loosen the fixing nut at the bottom ring and remove this ring and the metal filter element from the housing cover.

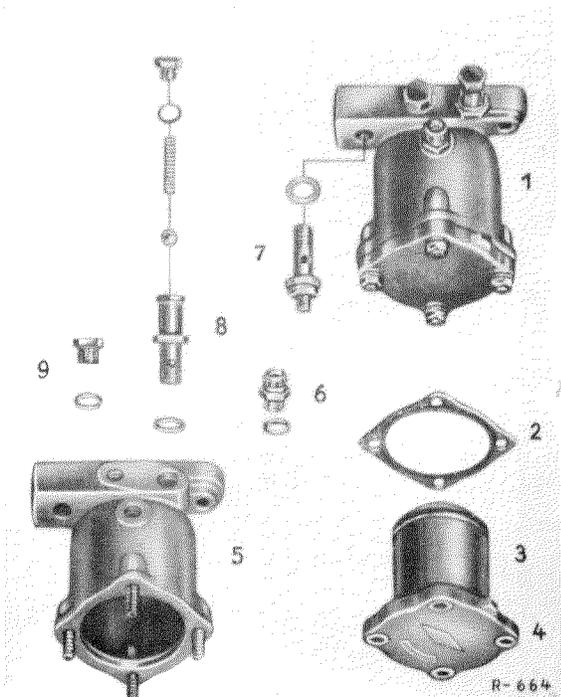


Figure 18-9/4

- 1 Oil filter assembled
- 2 Gasket
- 3 Metal filter element
- 4 Housing cover
- 5 Oil filter housing
- 6 Connector for the oil line
- 7 Adapter
- 8 Relief valve in oil filter
- 9 Screw plug

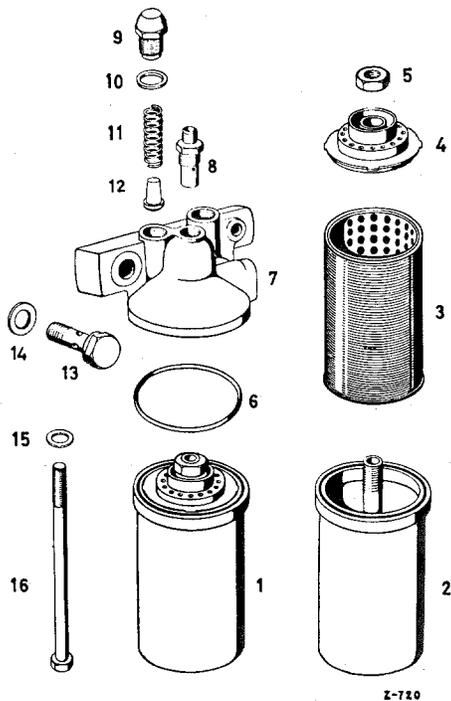


Figure 18-9/5

- 1 Filter bowl with metal filter element installed, outlet ring with hex nut
- 2 Filter bowl
- 3 Metal filter element (wire coil element)
- 4 Outlet ring
- 5 Hex nut
- 6 Sealing ring
- 7 Upper part of oil filter housing
- 8 Adapter and connector for the oil pressure gauge line or the oil pressure control
- 9 Screw plug
- 10 Sealing ring
- 11 Spring
- 12 Valve cone
- 13 Adapter
- 14 Sealing ring
- 15 Sealing ring
- 16 Hexagon screw M 10x1x160 mm DIN 960-8 G

### b) Bowl-type oil filter

**Note:** In order to clean the oil filter the upper part of the oil filter housing (7) is not removed from the engine (Figure 18-9/5).

1. Unscrew the hexagon screw (16) and remove the filter bowl (1) from the upper part of the oil filter housing (7). **Caution!** Hold the filter bowl upright, because the bowl is filled with oil (see Figure 18-9/5).
2. Unscrew the nut (5), then take out the outlet ring (4) and the metal filter element (3) (Figure 18-9/5).

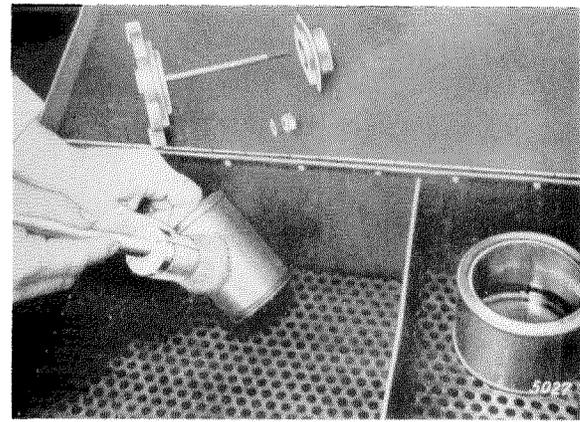


Figure 18-9/6

Housing cover, metal filter element and outlet ring

### III. Cleaning the Oil Filter Element:

1. Clean the metal filter element (wire coil element) in the parts cleaning equipment. If such an equipment is not available, the filter element must be cleaned in Tri lye. To do this, place the element into the Tri lye for some time to soften and then clean with a brush (see Figure 18-9/6).

**It is not sufficient to clean the wire coil or strainer element with washing gasoline.**

Then blow the filter element from inside to outside with compressed air. Damaged filter elements must be replaced.

2. Also clean thoroughly the filter bowl and the outlet ring of the bowl-type oil filter and/or the inside of the filter housing of the horizontally arranged oil filter. Furthermore, on the horizontally arranged oil filters check with wire whether the 2 mm hole in the filter housing is open (see Figure 18-9/3).

**Note:** If there are leaks at the contact surfaces of the oil filter mounting flange and the crankcase, determine whether the gasket is damaged or the mounting flange is distorted. For this purpose remove the oil filter housing and/or the upper part of the oil filter housing and check the contact surface on a surface plate, rework if necessary.

On the bowl-type filter the bottom of the filter bowl must not be bulged-in, if it is, the filter bowl must be replaced.

#### IV. Assembly:

##### a) Horizontally arranged oil filter

1. Put the metal filter element (3) on the housing cover (4) and mount the outlet ring on the filter element, so that the sealing collar of the outlet ring faces toward the filter (see Figure 18-9/4 and 18-9/6). Secure the two parts to the housing cover with the hex nut.

**Note:** If the oil filter housing was removed from the engine, install the housing with a new gasket. The contact surfaces must be absolutely level and clean.

Install the fixing screw M 8×35 with a washer and the adapter (7) with a new sealing ring (see Figure 18-9/4).

Screw in and tighten the relief valve (8), the connector (6) and the screw plug (9) with new sealing rings. Connect the oil line to the connector (6) (see Figure 18-9/4).

2. Then put a new gasket (2) on the contact surface of the oil filter housing (5) (see Figure 18-9/4). Install the filter element (3) in the housing (5) and tighten the hex nuts crosswise and uniformly. The hex nuts must be installed with washers.

##### b) Bowl-type Oil Filter

1. If the upper part (7) was removed from the engine, install it with a new gasket. The contact surfaces must be absolutely level and clean (see Figure 18-9/5).

Install the valve cones (12) and the valve springs (11) in the upper part, then secure the screw plugs (9) with a new sealing ring (10) (see Figure 18-9/5).

2. Put the metal filter element (3) into the filter bowl (2). Then mount the outlet ring (4) on the filter bowl and secure it with the nut (5) (see Figure 18-9/5).

**Note:** During the installation of the outlet ring make sure that the ring is centered in the bore of the filter bowl.

3. Insert the sealing ring (6) in the groove at the filter bowl (2). Only original sealing rings must be used. Then secure the filter bowl (1) to the upper part (7) with the hexagon screw (16). Do not forget the sealing ring (15) between the screw and the filter bowl (see Figure 18-9/5).

The screw must be adequately tightened, so that the filter bowl is well sealed. Under no circumstances should the screw be secured too tightly, because this could bulge in the bottom of the filter bowl.

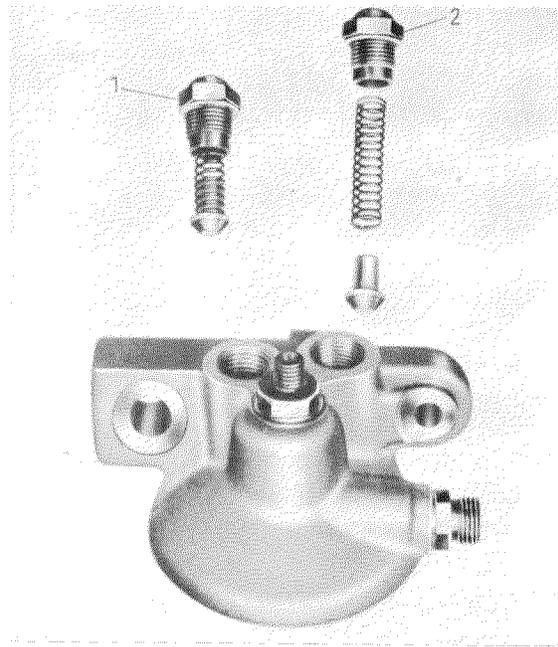


Figure 18-9/7

- 1 Relief valve for fine filter element (no fine filter element is installed in the Model OM 636 and OM 621)
- 2 Relief valve for metal filter element

**Note:** Only the hexagon screw (16) with a length of 160 mm and a new sealing ring (15) between the bottom and the fixing screw must be used (see Figure 18-9/5). The passage for the oil pressure gauge line in the adapter (8) can be obstructed if a longer screw is used. The oil pressure gauge will then indicate incorrectly or not at all.

2. Check the valve spring, the valve cones and/or the valve ball installed in the horizontally arranged oil filter, and the valve seats.
3. Identical springs and valve cones are installed in the two relief valves of the bowl-type filter.

#### V. Testing of Relief Valves:

The opening pressure of the relief valve (8) installed in the horizontally arranged oil filter (see Figure 18-9/4) and the relief valve (2) for the metal filter element of the bowl-type filter (see Figure 18-9/7) is  $2 \pm 0.2 \text{ kg/cm}^2$  for each of the two filter designs.

1. Unscrew, disassemble and clean the relief valves installed in the filter housing.

**Note:** The opening pressure of the relief valve (1), which has been provided for a fine filter element to be installed in the bowl-type filter, is  $1.2 \pm 0.2 \text{ kg/cm}^2$ .

The different opening pressures of the relief valves 1 and 2 (see Figure 18-9/7) are obtained in spite of identical parts by means of the different initial tension of the springs.

### B. OM 621

#### I. General

A vertical, upright main line bowl-type filter (see Figure 18-9/8) is installed in type 621.910 of model 190 D or 190 Db and 621.914 of model 180 Dc.

The OM 621 of type 621.912, model 190 Dc, and 621.913, model L and O 319 Dc is provided with a completely new combination main and by-pass oil filter. It is attached to the cylinder crankcase in an inclined position by means of four hexagon socket screws. The filter is higher and has a substantially larger diameter as compared to the former design (see Figure page 38 and Figure 18-9/10).

The engine oil delivered by the oil pump reaches the oil filter by way of the inlet hole; a large portion of the oil flows over the main filter element (disk plate element with perlon filter) and over the oil outlet hole in the main line in the cylinder crankcase to the engine lube points. A smaller portion of the pressure oil flows back to the oil pan over the by-pass filter element, or the return and throttle hole, respectively. In this way, the engine oil is filtered practically twice which in turn improves oil purification.

#### II. Main Line Bowl-Type Oil Filter

The disassembly, cleaning and assembly of the main line bowl-type oil filter, refer to Figure 18-9/8, is essentially the same as described for the OM 636 under Section A.

The oil filter of this engine is equipped ex works with a paper filter element part No. 000 184 42 25. With the first oil change, exchange this paper filter against the strainer element part No. 000 184 47 45. This strainer filter can also be subsequently installed into engines which had been in operation for a longer period.

However, also the paper filter element can be further used, which should then be replaced every 3 000 km; as a replacement, the filter element installed by the factory until the first oil change, part No. 000 184 42 25 should not be used then, but the paper filter element part No. 000 184 43 25.