

Figure 18-1/4

The lubricating system of the OM 621 is shown in the above figure which represents the engine Model 190

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|--------------------------------------|--|
| 1 Oil duct to the camshaft | 9 Oil gallery to the oil filter |
| 2 Oil return flow | 10 Oil filter |
| 3 Oil duct to the crankshaft bearing | 11 Oil gallery to the lubricating points |
| 4 Oil pump | 12 Oil duct in the camshaft |
| 5 Oil pan | 13 Screw-type cap for oil filler |
| 6 Screw plug | 14 Oil pocket for chain tightener |
| 7 Suction strainer | 15 Oil dip stick |
| 8 Oil bores in the crankshaft | 16 Oil pressure gauge line |

The lubrication of the engine features a forced-feed lubrication. The oil pump (4) sucks the oil from the oil pan (5) via the suction strainer (7) through the oil gallery (9) to the oil filter (10); from there the cleaned oil passes into the oil gallery (11) (see Figure 18-1/4).

From the oil gallery (11) the oil flows through the bores (3) to the crankshaft bearings and from there through the bores (8) in the crankshaft to the big end bearings. For lubricating the small end bushings, the connecting rods feature a longitudinal bore.

When the oil flows through the gallery (9) and (11), the heat of the oil is transferred to the cooling water which is kept at a definite temperature through a thermostat. Consequently the water temperature and the oil temperature will at any time have the same level. Vice versa, when starting the cold engine, the cold oil is warmed up through the cooling water and the favourable oil temperature is reached earlier.

For lubricating the two bearing bushings of the intermediate gear shaft, the vertical bore (1) in the cylinder crankcase is connected through a side bore. The oil flows through this bore, coming from the vertical bore (1) and from the oil gallery (11), into the bearing bore of the front bearing bushing; from there it flows via the bearing bushing into the bores of the intermediate gear shaft to the rear bearing bushing (see Figure 18-1/4 and 07-25/4).

Oil for the vertical oil pump drive shaft and/or the helical gear (39) is supplied through a bore from the oil gallery (11) via the bearing body (38) into the oil pump drive shaft and from there to the upper bearing bushing (37) and to the helical gear itself (see Figure 18-1/4 and 07-25/4).

The oil flows via the vertical bore (1) from the oil gallery (11) through the cylinder crankcase upwards and further on through the cylinder head into the first camshaft bearing bracket. Through two radial bores in the front bearing pin of the hollow camshaft, the oil passes into the camshaft and from there to the bearing seats of the camshaft and the camshaft sliding surfaces. Part of the oil which flows out there is sprayed on the rocker arm seats and lubricates the pressure surfaces of the rocker arms and/or the cap nuts on the valves.

If the oil filter element is very dirty, the oil pressure relief valve (by-pass valve) opens and the oil filter is bypassed. The oil pressure relief valve in the oil filter housing opens too if the resistance of the oil filter element is too high, e. g., during starting when the oil is still cold and thick.

The oil pressure relief valve for the metal filter element opens at 2.2–2.5 atm. The oil pressure relief valve in the upper gallery (11) in the cylinder crankcase causes that a definite maximum oil pressure (6 atm.) is not exceeded (see Figure 18-1/4).

With hot and idling engine, the oil pressure must not drop below 0.3 atm.

Irregularities of the oil pressure may have different causes which may be:

- a) The oil pressure relief valve in the gallery (11) must close properly.
- b) The three plugs and the oil pressure relief valve in the oil galleries (9) and (11) must seal properly.
- c) All oil ducts and galleries must be free.
- d) The oil pump should function properly and a sufficient quantity of oil should be in the oil pan.
- e) The suction pipe of the oil pump must not be broken.
- f) The radial clearance of the crankshaft journals and big end bearing pins should not be too large.
- g) The radial clearance of the camshaft bearing pins should not be too large.
- h) The oilway in the camshaft should be closed on the rear side by a cap.
- i) The first camshaft bearing bracket should be leak-proof with respect to the cylinder head seating surface.
- k) The oil outlet at the separating surface in the cylinder crankcase and in the cylinder head must not be clogged by the cylinder head gasket.
- l) The cylinder head gasket must not be broken at the oil slot (connecting duct from oil outlet in cylinder crankcase to oil duct in cylinder head).
- m) The mounting screw for the oil filter housing lower part must not be too long (see Job No. 18-9).

OM 621 with Combination Oil Filter

The OM 621 engine of type designation 621.912 (model 190 Dc) and 621.913 (model L and O 319 Dc) is equipped with an entirely newly developed combination main and bypass oil filter. It is attached by means of four hexagon socket screws at an angle on the cylinder crankcase. The filter is higher and in its diameter substantially larger than the present version (refer to Fig. 18-7/4).

The oil filters for both models 190 Dc and L and O 319 Dc differ only by the location of the oil pressure gauge connection.

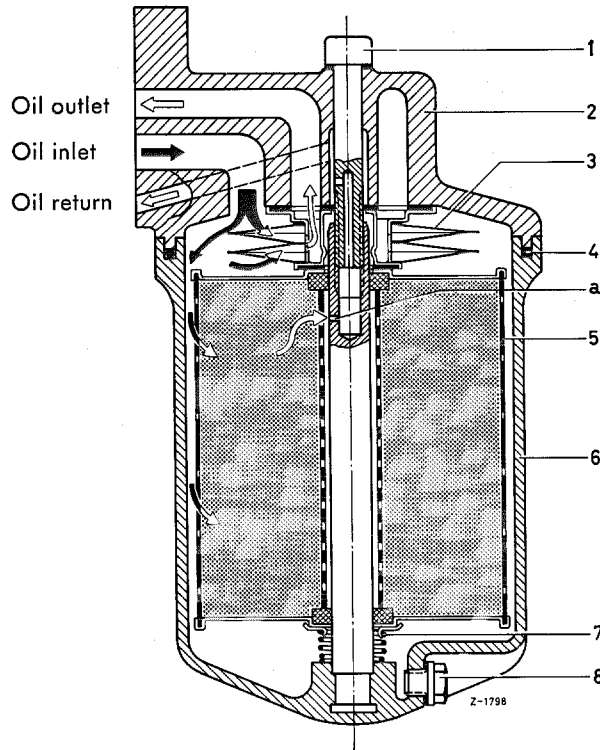


Fig. 18-1/5

Combination Main and Bypass Oil Filter
with old oil drain plug. As of late the drain plug has been set approx. 20 mm higher at the outer jacket of the filter base (refer to Figure 18-9/11).

- 1 Cylinder head screw for attaching oil filter base
- 2 Oil filter top
- 3 Main flow filter element
- 4 Rubber seal
- 5 Bypass filter element
- 6 Oil filter base
- 7 Compression spring with spring retainer
- 8 Oil drain plug
- a Throttle hole

Attention please! If the oil pressure is too low check whether the nozzle with throttle hole (a) is in place.

The oil coming from the oil pump flows through the inlet hole into the oil filter and for the largest part across the main flow filter insert (plate-type element with perlon cloth) and through the outlet hole into the main oil duct in the cylinder crankcase to the engine lubricating points. A small portion of the pressure oil flows through the bypass filter insert or through the return and throttle bore back into the oil sump. In this manner the engine oil is practically filtered twice and the purity of the filtered oil considerably improved.

The combination oil filter is provided with **one** large paper filter insert for the first 500 km at the factory. This paper insert is replaced at the first customer service acc. to voucher A (500 km) by the main flow filter insert (plate element with perlon cloth), part No. 000 184 57 25 **and** by the bypass filter element, part No. 000 184 58 25.

After the "first 3000 km" (voucher B) and then after each 6000 km driving the main flow filter insert should be **cleaned**, while the bypass filter insert must be **replaced**.