

Lubrication system



Brief description

The lubrication system of the M57 corresponds to that of the M47. Geometric adaptations and optimisation measures have been implemented.

Requirements and Objectives

The lubrication system must meet the following requirements and objectives:

- Requirements
 - To lubricate sliding surfaces in the engine
 - To dissipate heat
 - To absorb combustion residue of the fuel
 - To seal off gap between cylinder and piston

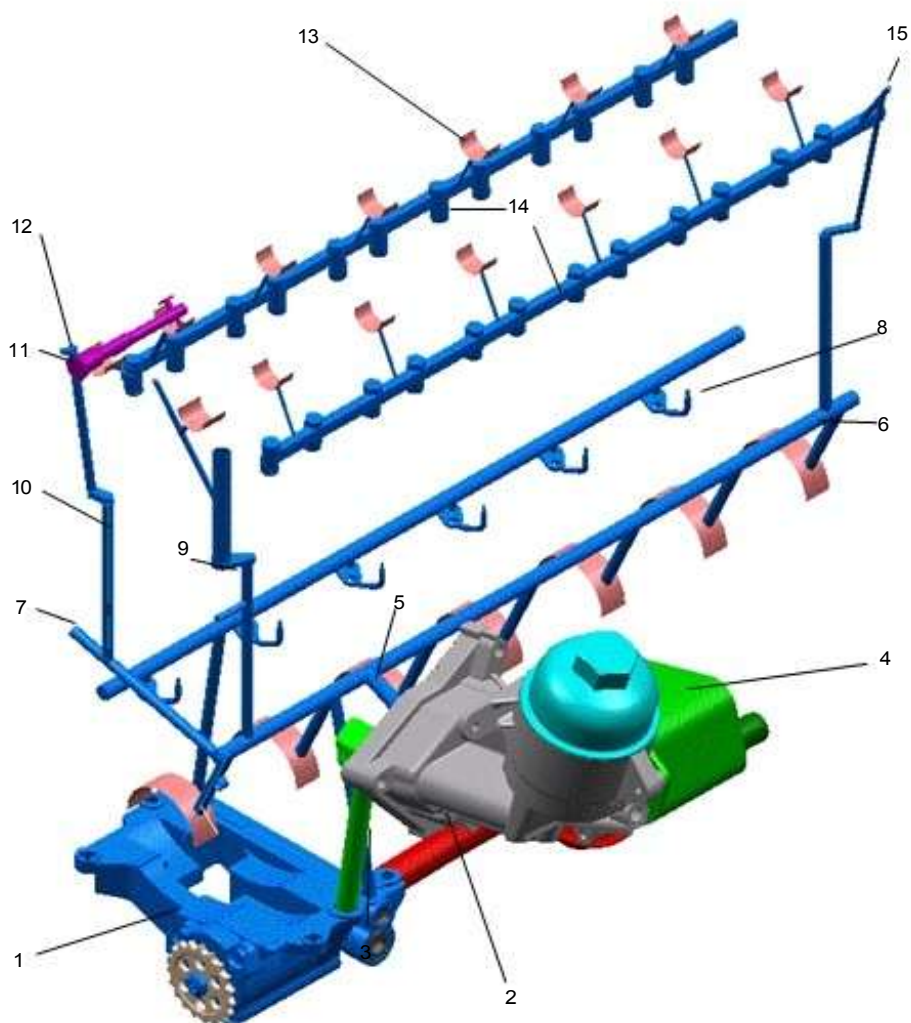
- Objectives
 - To lower oil consumption
 - To increase engine performance
 - To minimise engine wear

System structure



The lubrication system consists of following components:

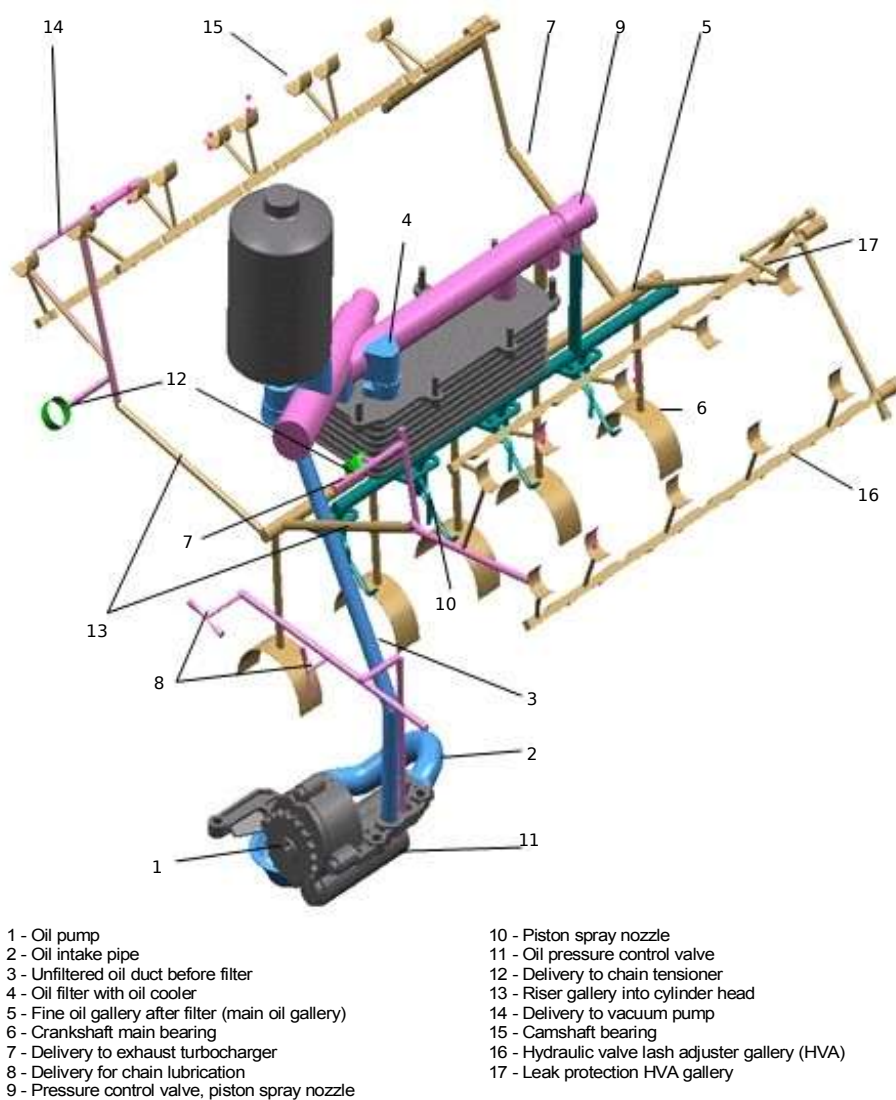
- Oil pan with dipstick (see engine components)
- Oil pump
- Oil filter with integrated oil-to-water heat exchanger
- Oil spray nozzles



- | | |
|---|--|
| 1 - Oil pump | 9 - Pressure supply to chain tensioner |
| 2 - Oil intake pipe | 10 - Riser to cylinder head |
| 3 - Unfiltered oil duct before filter | 11 - Pressure supply to vacuum pump |
| 4 - Oil filter with oil cooler | 12 - Pressure supply for upper chain lubrication |
| 5 - Precision oil gallery after filter (main oil gallery) | 13 - Camshaft bearing |
| 6 - Crankshaft main bearing | 14 - Hydraulic valve lash adjuster gallery (HVA) |
| 7 - Pressure supply to exhaust turbocharger | 15 - Runout stop, HVA gallery |
| 8 - Piston spray nozzle (hook-type nozzle) | |

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Fig. 36: Lubrication system overview M57 E38/E39



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Fig. 37: Lubrication system overview M67 E38

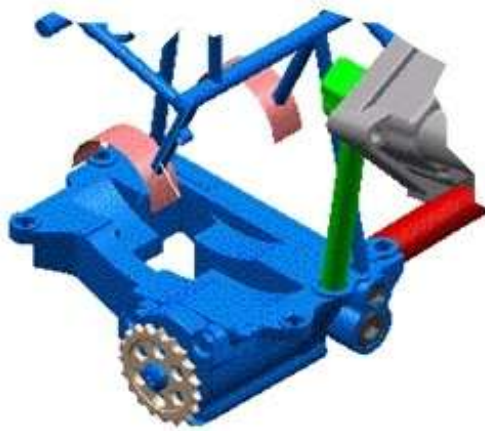
Component description

Oil pump



Oil pump M57 E38/E39

- Oil pump arranged in oil pan
- Chain drive



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Fig. 38: Oil pump M57

Oil pump M67 E38

- Duocentric pump
- Arranged at bottom of engine block
- Chain drive
- Intake snorkel in oil pan



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Fig. 39: Oil pump M67

Technical data

	M57	M67	
Delivery capacity		85	l/min
Opening pressure of cutout valve		4.2–0.2	bar

Oil filter with integrated oil-to-water heat exchanger

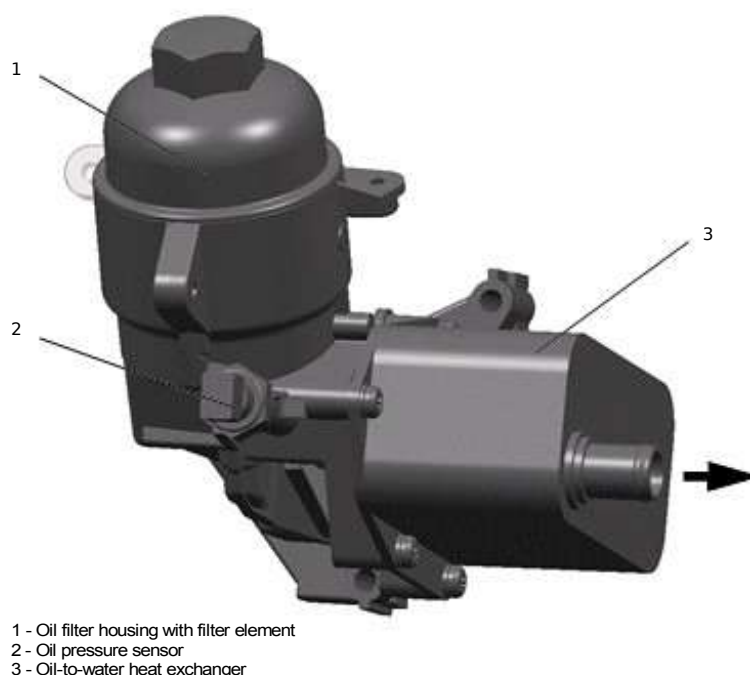


The oil-to-water heat exchanger is connected to both the oil circuit as well as the water circuit of the engine. This arrangement ensures the engine oil is heated faster by the coolant when the engine is cold and is effectively cooled by the coolant when the engine is at operating temperature.

Shortening the warm-up phase greatly contributes to reducing fuel consumption.

Oil filter with oil-to-water heat exchanger M57 E38/E39

- Mounted directly on the engine block
- The water for the oil-to-water heat exchanger is supplied directly from the engine block (crankcase)
- In the same way as on the M47, the water outlet is located on the oil-to-water heat exchanger



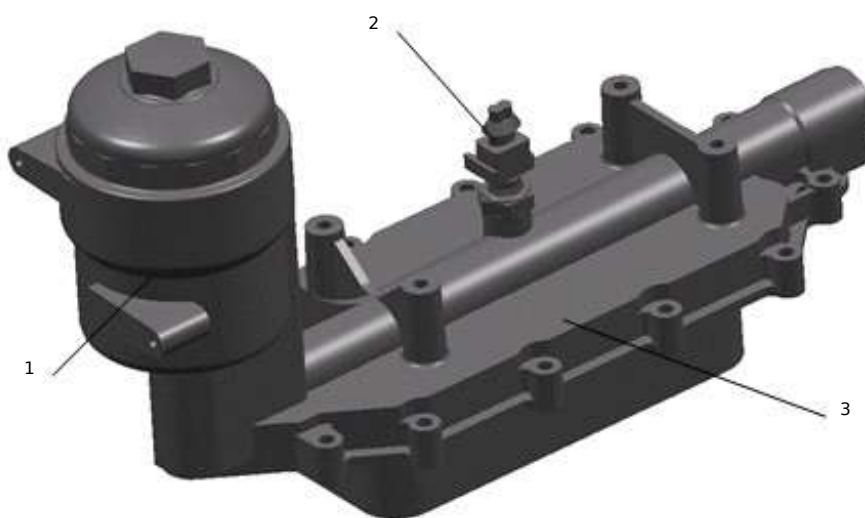
1 - Oil filter housing with filter element
2 - Oil pressure sensor
3 - Oil-to-water heat exchanger

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Fig. 40: Oil module M57 E38/E39 (with oil-to-water heat exchanger)

Oil filter with oil-to-water heat exchanger M67 E38

- Mounted directly in V-area of cylinder block
- Oil-to-water heat exchanger located in water bath of V-area



- 1 - Oil filter housing with filter element
2 - Oil pressure sensor
3 - Oil-to-water heat exchanger

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Fig. 41: Oil module M67 E38 (with oil-to-water heat exchanger)

Oil spray nozzles

The oil spray nozzles for cooling the piston crown are mounted in the engine block. They are designed as hook-type nozzles.



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Fig. 42: Oil spray nozzles