Engine Lubrication

The engine lubricating system is of the forced-feed type. The oil is drawn from the oil pan by the oil pump, whose suction basket is provided with a fine-mesh strainer, and is directed to the various bearing and lubricating points through passages in the cylinder crankcase.

As the oil flows through the two long passages, which run through the cylinder crankcase in longitudinal direction and whose ends are closed with screw plugs, the heat from the oil is transferred to the cooling water which is maintained at a definite temperature by means of a thermostat. In this way the water and oil temperatures are always held at the same level. After cold starts the cold oil is warmed by the cooling water which warms up quicker, so that the most favourable oil temperature will be reached sooner.

In the following the flow of oil through the engine is described:

The oil is pumped from the oil pump through the lower long oil passage to the full-flow oil filter, where it is cleaned. If the oil filter element is heavily contaminated, the oil filter is by-passed via an oil relief valve, so that proper lubrication of all bearing points will be warranted in any case.

The filtered oil flows through the upper passage and small ports to the crankshaft bearings. From the crankshaft bearings the connecting rod bearings are furnished with oil. The connecting rods are provided with longitudinal passages so the connecting rod bushing will be lubricated as well.

From the upper long oil passage the oil flows in a vertical bore through the cylinder crankcase, the cylinder head, the first camshaft bearing bracket and a port in the first camshaft bearing bracket into an oil passage in the camshaft, and from there it reaches the various bearing points. To improve distribution of the oil, an oil distributing pipe is provided in the camshaft oil passage.

To effect lubrication of the vertical distributor drive shaft, a port is provided in the wall of the vertical oil passage in the cylinder crankcase.

Because the vertical oil passage in the cylinder crankcase is interrupted by the port for the front bearing bushing of the intermediate gear shaft, the oil flows around the bushing. Through a port in the bushing the oil reaches the oil passage of the intermediate gear shaft, so that the rear bearing bushing is also lubricated (see Fig. M 3/43).

The oil relief valve in the filter case opens whenever the resistance offered by the oil filter element is too great, for instance during starting when the oil is too cold and hence too thick. The oil relief valve in the upper main passage of the cylinder crankcase takes care that the maximum permissible oil pressure will not be exceeded. When engine is warm, the minimum oil pressure should not be less than 0.3 atü (4.3 p.s.i.) during idling.

To rule out oil pressure trouble, give the following points your particular attention:

a) The end play of the crankshaft and connecting rod bearing journals must not be excessive.

b) The oil passages for the connecting rod journals must be provided with oil jets.

c) The chain lubricating oil jet at the front end of the cylinder crankcase is no longer used. In its place a blind plug is installed.

d) The four screw plugs for the oil pipes cast into the cooling water chamber of the cylinder crankcase must be tight. The pipes must by allmeans be free from porous spots.

e) The oil outlet at the mating surface between cylinder crankcase and cylinder head must not be obstructed by a bad gasket. On the other hand, the gasket must form a good seal against the sprocket housing and the cooling water chamber.

f) The contact surface between first camshaft bearing bracket and cylinder head must be tight.

g) The side play of the camshaft bearing journals must not be excessive.

h) The rear end of the camshaft oil passage must be sealed off with a cover plate.

i) The oil relief valve in the cylinder crankcase must open and close properly.

k) All oil passages must be free.

l) The oil pump must be in good working condition, and the oil pan must contain sufficient oil.