

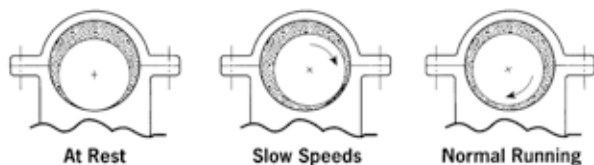


Bearing Lubrication No. 2

THE IMPORTANCE OF BEARING CLEARANCE

WHY THE OIL CLEARANCE IS CRITICAL

When at rest, a crankshaft squeezes out the oil and sits on the bottom of the bearing. It is then inevitable that the high spots on the opposing surfaces will penetrate the oil film and make contact in the same way as with dry surfaces. When the shaft starts to rotate, the friction force between the bearing and the shaft causes the shaft to ride up the bearing in the opposite direction to rotation. At the same time, the rotation of the shaft drags oil into the wedge formed between the two surfaces. As the oil is forced towards the thin end of the wedge the pressure generated in the oil starts to push the shaft away from the bearing surface. As the shaft speed increases, the pressure of the oil wedge increases until it becomes great enough to support the load on the shaft and forces the shaft towards the centre. This hydrodynamic pressure, up to several thousand psi, is far in excess of the pressure generated by the oil pump to deliver the oil to the bearing surfaces throughout the engine (60 psi approx.).



For long service and reliability, it is necessary to adhere strictly to the manufacturers recommended oil clearance. A crankshaft must be reground to the next undersize if wear has taken place and the journal diameter is below the minimum size stated in the catalogue.

The running clearance should not be reduced by inadvertently trapping dirt behind the steel back of the bearing shell. Cap bolts should be tightened in accordance with recommended torque figures.

The following can be used as a general guide for rebuilding purposes when the manufacturer's running clearance is not available.

Crankshaft Journal Clearances

Minimum Oil Clearance: = 0.0005" (1/2 thou") per inch of journal diameter.

Maximum Oil Clearance: = The minimum oil clearance worked out as above plus 0.002"

Crankshaft Endfloat Clearances

Crankshaft journal size endfloat

2" - 2.75" diameter 0.004" - 0.006"

2.75" - 3.5" diameter 0.006" - 0.008"

3.5" and over 0.008" - 0.010"

For engines with speeds in excess of 6000 revs/min, always refer to the manufacturer for crankshaft journal and crankshaft endfloat oil clearances.