



Bearing Fatigue

Fatigue failure of a bearing occurs usually as a result of the bearing exceeding its normally expected life span, i.e. a very high mileage engine. However, if a fatigue failure occurs in a newly built or low mileage engine the cause must be identified and rectified to prevent a recurrence.

Appearance

The bearing surface has small irregular areas where material appears to have been broken away leaving the bearing lining exposed (**Fig. 1**).

Cause

Bearing fatigue is caused by four main factors or a multiplication of any two or more factors, these are:-

1. Overloading
2. Incorrect bearing material for the application
3. Bent or misaligned Con Rod
4. Out of shape journals

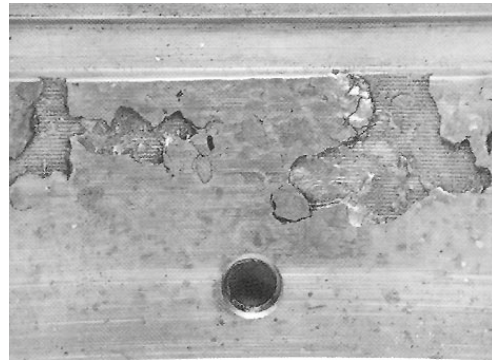
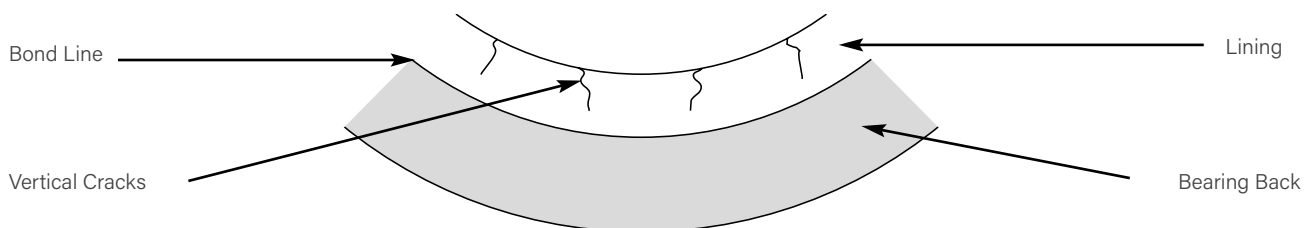
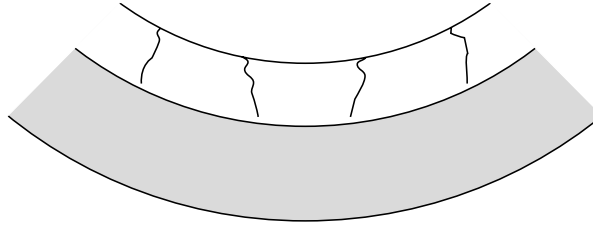


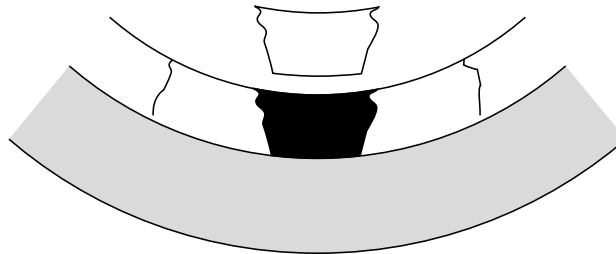
Fig. 1



Vertical fatigue cracks appear on the bearing surface first.



As the cause of the fatigue continues to be applied to the bearings the vertical cracks become deeper towards the material bond line



Close to the bond line the vertical cracks run. Running parallel until they meet another vertical crack. At this point the material bond is weakened

Failure Mechanism

The fatigue life of a bearing is determined by the amount of pulsating load coupled to the number of times the load is applied. Fatigue cracks appear on the surface of the bearing and gradually become wider and deeper until they reach the bond line, between bearing material and bearing backing. Here the crack turns and runs parallel to the bond line. Where two vertical cracks join, the material is weakened. The material bond is then broken, resulting in bearing material being carried away by the oil flow and crankshaft rotation.

Recommendation

1. Ensure the correct bearings are chosen for the application from the AE catalogue.
2. Ensure Con Rods are straight and journals are machined to the correct diameter.
3. Advise the end user of the correct running in procedures