

TROUBLE TRACER BULLETIN

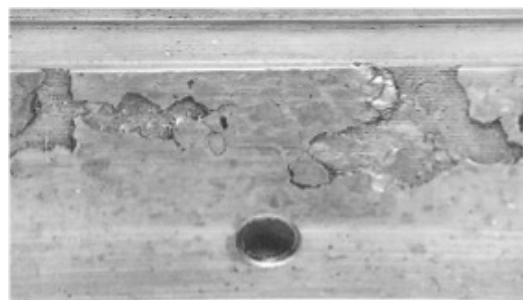
October 2024

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 corrected 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 many factors, below are examples of the main causes for the engine bearing fatigue and the remedies:

Engine bearing failures due to fatigue	
Cause	Remedy
Fuel detonation / advanced ignition	Retard ignition or use a fuel with higher octane number
Running engine at high torque and low RPM for a long time (climbing)	Change to bearing material with higher load capacity (e.g. tri-metal instead of bi-metal)
Poor conforming of the bearing back with the housing surface	Check the bearing crush height ; Properly re-size the housing
Lack of oil supply	Check oil passages and engine oil pump
Geometry misalignments causing localization of bearing loading	Fix/replace distorted parts
Corrosive action of contaminated oil enhancing fatigue	Eliminate/diminish oil dilution or use oil with corrosion inhibiting additives

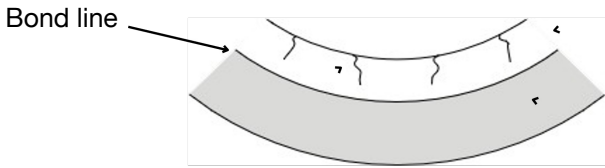
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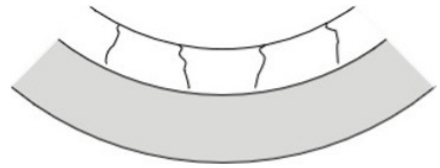
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Out of shape journals

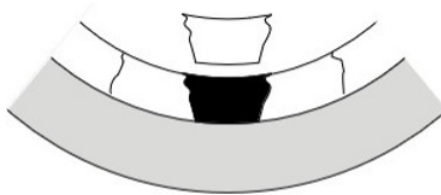


Vertical Cracks

Vertical fatigue cracks appear on the bearing surface first



As the cause of the fatigue continues to be applied towards the material bond line



Close to the bond line, the vertical cracks run. Running to the bearings, the vertical cracks become deeper 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 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.

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