

TROUBLE TRACER CHART

INBUILT DEBRIS

Symptom: Localised surface disruption of bearing surface. The back of the bearing will be marked or indented behind the area of damage. The problem will commence during early bearing life. If not identified and corrected, the damage will spread.

Cause: Foreign material assembled between the back of a bearing and its housing. This causes bearing distortion, localised high pressures and breakdown of the lubricating oil film with consequent damage.

Remedy: Inspect the bearing housing and shaft for damage. Repair of replace as necessary. Ensure cleanliness when fitting new bearings. Ensure any piston under crown cooling jets are functioning correctly.





LOCAL OVERPLATE WEAR DUE TO TIN FLASH MIGRATION **ON STEELBACK**

Symptom: Heavy local overplate wear. Local **Remedy:** Check inner diameter of housing concentration of tin on steel back.

Cause: Micro-movement of bearing shell versus housing bore surface due to low pressfit.



bore. Check cleanliness of housing parting fa-

ces. Tighten bearing bolts correctly.

BEARING LINING CORROSION

Symptom: Corrosion of the bearing material. porous appearance.

Cause: Engine has been used with degraded or oil. contaminated oil that has become acidic. This firstly promotes wear of the bearing protective overlay plate, then corrosion of the bearing material.

OVERPLATE EROSION BY CAVITATION

Symptom: Overplate material is locally re-

solved from sliding surface. Faulty spots are located symmetric or centric in bearing sliding

Cause: Water or coolant in engine oil. Excessive

oil flow velocity. Knocking combustion. Incor-

Remedy: Check water content in engine oil

Safeguard correct bearing clearance and oil

flow. Check combustion and engine operation

rect bearing clearance. Engine overspeeding.

surface or behind end of an oilgroove.

Remedy: Thoroughly clean the engine, paying The surface will be worn and discoloured with a particular attention to all the lubricating system. Inspect all bearings and bushes and renew any which may be damaged. Use clean, new engine



SCORING BY HARMFUL PARTICLES

Symptom: Isolated deep scores in lining surface. No specific running surface in main load area of bearing shell visible.

Cause: Isolated debris particles from casting or grinding processes passed the bearing without being embedded.

Remedy: Effect comes up often after assembly- and repair working on the engine. Pristine cleanliness of components, tools and hands while working on an engine. Flushing the engine with clean oil by external oilpump after finishing assembly works and prior to starting the engine for break-in run.

EROSION BY DIRT

seen on the illustration.

sive material.

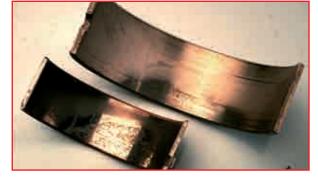


OVERPLATE FATIGUE

Symptom: Breakouts of lining material show-loading of bearing. Irregular combustion. of bearing.

Cause: Overloaded bearing material due to: Installation of non suitable bearings. Edge

alignment of housing bore. Check operation



ing "bark-beetle" pattern in main loaded zone Engine tuning.

conditions.

Remedy: Install correct bearing type. Check axial shape of journal. Check geometry and



FILLET OVERRIDE

Symptom: Inner surface of bearing contacts journal fillet on one or both ends of the shell. **Symptom:** Premature bearing wear. The interass as necessary. Ensure that the air and oil filtranal surfaces may appear scratched and/or have tion systems are functioning correctly and that Lining material is worn down at bearing edge(s) embedded debris. Erosion may also be visible all connections, pipes and trunking are in good along its circumference. adjacent to an oil groove or hole, as can be condition, and without leaks. Pay particular at-

> Cause: Bearing shell is too wide. Inner chamfer of shell is too small. Journal was incorrectly ground; fillet(s) are too wide. Clearance of thrust bearing is too wide. Incorrect alignment of thrust bearing.

Remedy: Check type of bearing shell, bearing width and size of chamfer. Inspect shape of journal fillets. Check axial clearance of crankshaft.



MISALIGNMENT

conditions.

Symptom: Overplate wear only in the crown area of bearing shell towards the edge zones. Worn zones are shifted against each other in circumferential direction.

Cause: Centerlines of bearing and journal are not parallel.

Remedy: Connecting rod: Check big end bore: centerline of housing bore must point exactly perpendicular to the thrustface levels of conrod. Make sure both thrustface levels are exactly parallel.

Main bearing: Check alignment of housing bores in main bearing line.



FRETTING CORROSION ON STEELBACK

Symptom: Fretting marks on steelback of bearing shell, often located close to the parting lines of the shell.

Cause: Lubricating oil contaminated with abra-

Remedy: Thoroughly clean the engine, including the lubrication system. This type of damage

may affect all moving engine components, which

should be inspected and repaired or renewed

Cause: Micro-movement of bearing shell versus housing bore surface due to loss of correct pressfit. Incorrectly tightened bearing bolts. Debris on parting faces of housing. Repeated or continuous engine overspeed. Use of bearing shells with incorrect spread.

Remedy: Tighten bearing bolts correctly. Check inner diameter of housing bore. Check cleanliness of housing parting faces. Use bearing shells with correct spread. Prevent engine overspeed.



tention to cleanliness when re-assembling the

engine. Use clean, new engine oil.

INSUFFICIENT LUBRICATION

surface which may progress to fatigue and de- Correct as necessary, fit new bearings. struction of the bearing material.

Cause: Disruption of the oil film between a bearing and its journal. This results in prolonged metal to metal contact with consequent friction and high temperatures which melt the bearing material. Intermittent or failure of the oil supply, misalignment between housing and journal. distorted or misshaped housing or journal can

Remedy: Ensure that the lubrication system is clean and functioning correctly, Inspect jour-

all cause oil film disruption.

