

Bearing Wear Analysis

BEARING FAILURE ANALYSIS

MAIN MENU

- Home
- Oil Forums
- Viscosity Charts
- Conversion Factors
- What is Oil Analysis?
- Lubrication Design
- States of Lubrication
- Effects of Shearing
- Moly Basics
- Functions of Grease

Bearing Wear Analysis

- Air Filtration Test
- Glossary
- Sponsors
- Articles of the Month

RESOURCES

- Oil Forums



Normal wear exhibits "Smooth" finish. Accelerated wear may be caused by fine abrasives left in from extended oil change intervals not monitored by analysis.



Bearing surfaces which reveal scratches or "Trenches" are typical of particle wear. The oil filter element should reveal the culprit.



Particles, sandwiched between bearing and bore, can create distortion and a "Hot Spot". Particle may be embedded and visible. (see arrow)



"Oil Starvation" can be attributed to a number of causes. Wiping, Blue Discoloration and "Adhesion" wear to shaft or pin are common indicators.



Water and/or antifreeze in the engine oil create milky, grey edging and possible black corrosion on the lining. Pitting and Flaking are progressive damage.



Worn, Pitted surfaces with dark green coloration, indicate fuel dilution of lube oil. This corrosive action may also pit crankshaft.



"Shiny" indicators on the back of the bearing insert are signs of movement. Bore Geometry and surface dimension must be checked.



This is "Cavitation Erosion", on the unloaded half of insert. "Entrained" air bubbles in oil may cause additional lubrication problems.



Cavitation Erosion (round flaked portion) caused by entrained air bubbles, along with embedded hard debris, can require a close examination for failure analysis.



Lack of lubrication can be attributed to engine oil dilution, breakdown or elevated temperature. Causes must be investigated, too prevent further occurrences.



"Cold Start" can destroy bearing surfaces and lead to progressive failure. "Cold Start" failure is caused by lack of lubrication and running up to full RMP before the engine is warm.



"One Sided" wear is usually a misaligned or improperly adjusted assembly. Damage to adjacent bearings may occur.



Localized, symmetrical wear about a journal's axis is due to deviations in the journal's geometry.



Localized wear on opposite sides of a pair's shell halves is normally caused by a bent connecting rod.



Bearings improperly "Located" during installation can sometimes be hard to spot.



"Offside" wear is usually an indication of misaligned crankshaft or bore. This may not apply to "Offside" connecting rods.



Localized wear on main bearings showing a pattern along the shaft, for example, worst wear on the middle bearings, is evidence of a bent crankshaft.



This indicator may be evidence of "loose" or "tight" fit. This bearing experienced excessive "crush", causing deformation in this area.



Localized, polished areas are on steel back washers (fretting); caused by improper crush or movement of insert within its respective bore. This may cause damage to housing and/or shaft.



Excessive "End Play" can rapidly wear thrust washers. This can be caused by "abrupt" engagement or "riding the clutch".

