



Bearing Failures CAUSES & CURES

Seizure: Bearing seized from excessive heat. Discoloration, softening and fusion of raceway and rolling elements.

Causes: Poor lubrication, excessive load, clearance too small, entrance of contaminants, poor precision of the shaft or housing.

Cures: Reconfirm bearing selection, review lubricant selection type & quantity, check shaft & housing, improve sealing mechanism.



Flaking: Repetitive heavy stress cycle between the bearing raceways and rolling elements resulting in surface fatigue cracks and spalls.

Causes: Excessive load, poor mounting, excessive moment load, entry of contamination, improper bearing clearance, improper shaft & housing precision.

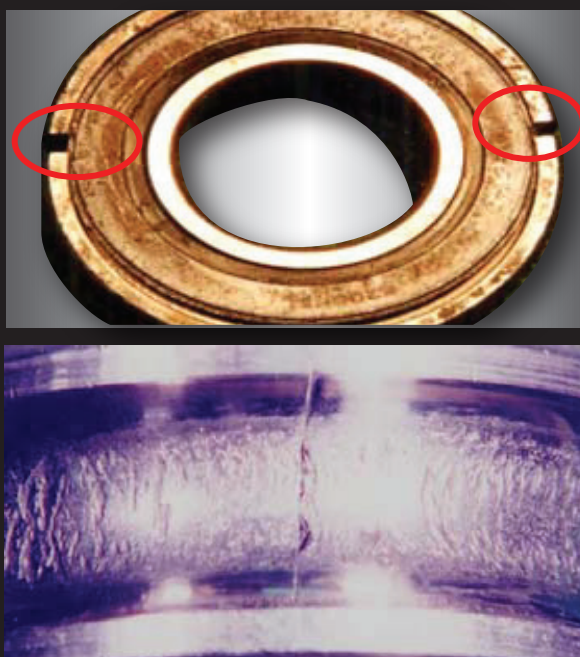
Cures: Reconfirm the bearing application & load conditions, improve mounting method, improve sealing mechanism, use proper lubricant, check shaft & housing accuracy.



Cracks: Splits and cracks in the inner ring, outer ring or rolling element.

Causes: Excessive interference fit, impact load, progression of flaking, shaft corner larger than bearing, heat generation & fretting problem.

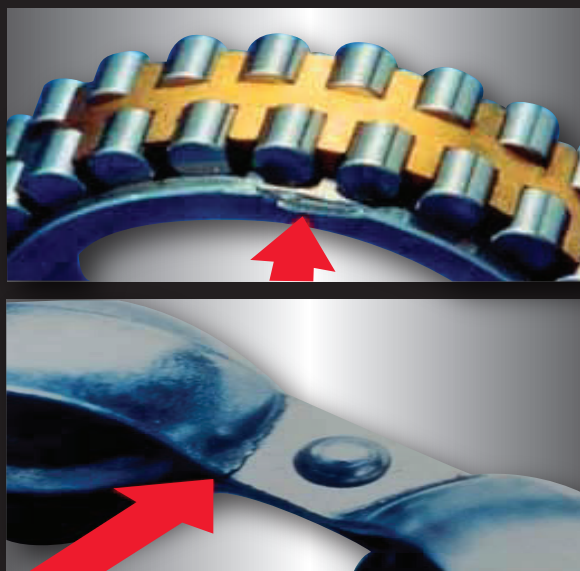
Cures: Check shaft & housing fits and inspect for damage, review the load conditions, make shaft corner smaller than that of the bearing.



Fracture: Cracked inner ring rib. Broken retainer.

Causes: Excessive impact load during handling or mounting, heavy shock load or vibration.

Cures: Review handling, check mounting practice, recheck load conditions & bearing selection.



True Brinelling: The occurrence of dents on the raceways that are the result of exceeding the elastic limit of the steel.

Causes: Any static overload, severe impact.

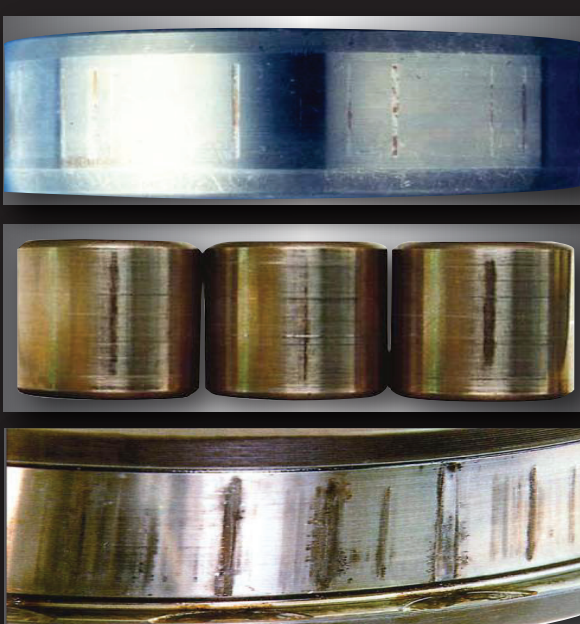
Cures: Install bearings by applying force only to the ring being press fitted, recheck that static load conditions do not exceed bearing capacity.



False Brinelling: The occurrence of elliptical wear at ball or roller spacing due to an excessive external vibration.

Causes: Small relative motion between the rolling elements & raceways in a non-rotating bearing, stand by equipment or shipping damage.

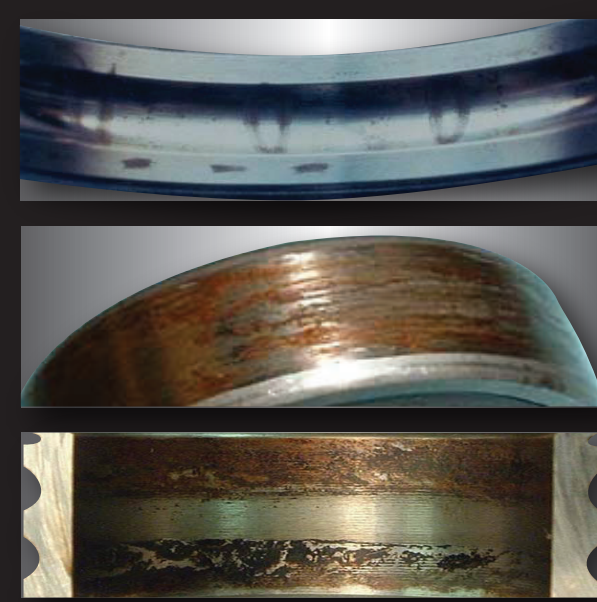
Cures: Isolate bearing from external vibration, secure shaft & housing during shipping, reduce vibration by preloading bearings.



Fretting: Wear and oxidation due to repetitive sliding between two steel surfaces of non-rotating components. This can occur between mating components or between rolling elements & raceways. This can develop into false brinelling.

Causes: Improper shaft & housing fits, vibration with a small amplitude.

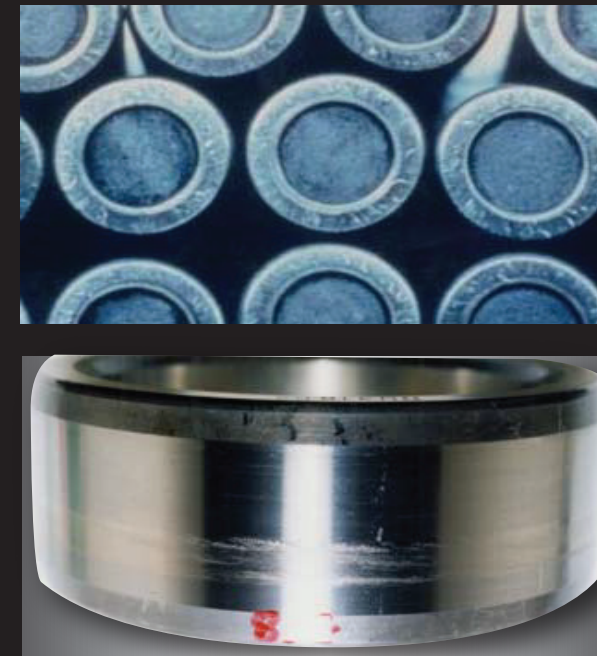
Cures: Check shaft & housing dimensions to ensure they are within recommended tolerances, preload or load bearing, use an oil or grease in bearings when exposed to vibration.



Smearing: Metal to metal contact due to the destruction of oil film. Sliding between outer ring, inner ring and rolling elements.

Causes: Improper lubricant selection, rapid acceleration or deceleration, water intrusion.

Cures: Use a proper lubricant, review preload/clearance conditions, improve sealing mechanism.



Excessive Wear: Surface deterioration due to heavy sliding friction between the contact areas of the bearing components.

Causes: Poor lubrication, entry of contamination particles, progression from corrosion.

Cures: Use proper type and amount of lubricant, improve sealing mechanism, clean shaft & housing before mounting.



Rusting & Corrosion: Rusting and corrosion is oxidation of the steel. Can cause pits on the surface of the rings & rolling elements.

Causes: Ingress of water, corrosive fluid or gas, condensation of moisture in the air, poor packing/storage conditions, handling with bare hands.

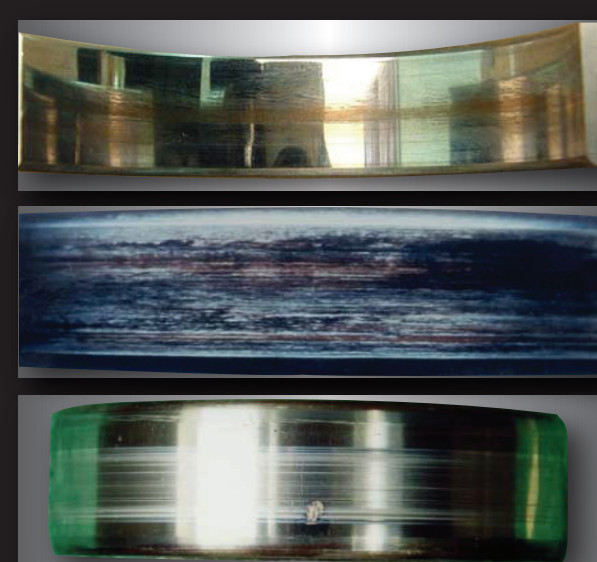
Cures: Proper sealing mechanism, improve storage & handling, implement measures for preventing rust during long periods of non-operation.



Creep: Galling, wear, sliding and discoloration of fit face.

Causes: Improper shaft & housing fits, thermal expansion of the shaft & housing material.

Cures: Rework shaft or housings back to recommended tolerances, improve accuracy of shaft & housing.



Electric Arcing: Pitted or corrugated surface caused by electric current passing through the bearing.

Causes: Electric current passes through the bearing, current melts patterns in the raceway surface.

Cures: Eliminate the flow of electric current through the bearing by grounding brush, insulating bearing or using ceramic balls.

