

KESTNER CHEMICAL PUMPS LIMITED

BEARING DAMAGE AND CORRECTIVE MEASURES

<u>DAMAGE</u>	<u>DESCRIPTION</u>	<u>CAUSES</u>	<u>CORRECTION</u>
Flaking	The surface of the guide way begins wearing away. Conspicuous hills and valleys form soon afterward.	Excessive loads or improper handling improper mounting. Improper precision in the shaft or housing. Insufficient clearance. Contamination. Rust. Drop in hardness due to abnormally high Temperatures.	Review application conditions. Select a different type of bearing. Re-evaluate the clearance. Improve the precision of the shaft and housing. Re-evaluate the layout (design) of the area around the housing. Review assembly procedures and review lubricant type and lubrication methods.
Seizure	The bearing heats up and becomes discoloured. Eventually the bearing will seize up.	Insufficient clearance (including clearances made smaller by local deformation). Insufficient lubrication or improper lubricant. Excessive loads. (excessive pressure). Skewed rollers.	Check for proper clearance (increase clearances). Review lubricant type and quantity. Review application conditions. Take steps to prevent mis-alignment. Re-evaluate the design of the area around bearing (including the fitting of the bearing). Improve assembly procedures.
Cracking & notching.	Localised flaking occurs. Little cracks Or notches appear.	Excessive shock loads. Excessive interference. Large flaking. Friction cracking. Inadequate abutment or chamfer. Improper handling (gouges from large to Foreign objects).	Review application conditions. Select proper interference and review materials. Improve assembly procedures & take care in handling. Take measures to prevent friction Cracking (review lubricant type). Re-evaluate the design of the area around the bearing.
Retainer damage	Rivets break or become loose Resulting in retainer damage.	Excessive moment loading. High speed or excessive speed fluctuations.	Review the application conditions. Review of application conditions.

		Inadequate lubrication. Impact with foreign objects. Excessive vibration. Improper mounting (misalignment). Abnormal temperature rise. (plastic retainers).	Re-evaluation of lubrication conditions. Review of retainer type selection. Take more care in handling.
Smearing & scuffing	The surface becomes rough & some Deposits form. Scuffing generally Refers to roughness on the race collar And the ends of the rollers.	Inadequate lubrication. Entrapped foreign particles. Roller skewing due to misaligned Bearing. Bare spots in the collar oil Film due to large axial loading. Surface roughness. Excessive slippage of rolling elements.	Re-evaluation of the lubricant type and lubrication method. Review of operating conditions. Setting of a suitable pre-load. Improve sealing performance. Take care to handle the bearing Properly.
Rust & corrosion	The surface becomes either partially or fully rusted, and occasionally rust even occurs along along the rolling element pitch lines.	Poor storage conditions. Poor packaging. insufficient rust inhibitor. Penetration by water, acid, etc Handling with bare hands.	Takes measures to prevent rusting while in storage. Improve sealing Performance. Periodically, inspect the lubricating oil. Take care when handling the bearing.
Fretting	There are two types of fretting:- In one, a rusty wear powder forms on The mating surfaces. In the other, brinelling indentations form on the raceway at the rolling element pitch.	Insufficient interference. Small bearing oscillation angle. Insufficient lubrication. Fluctuating loads. Vibration during transport.	Review the interference and apply a Coat of lubricant. Pack the inner & outer ring separately for transport. When the two cannot be separated Apply a pre-load. Select a different Type of lubricant. Select a different type of bearing.
Wear	The surfaces wear & dimensional deformation results. Wear is often accompanied by roughness and Scratches.	Entrapment of foreign particles in the lubricant. Inadequate lubrication. Skewed rollers.	Review lubricant type & lubrication Methods. Improve sealing performance. Take steps to prevent misalignment.
Electrolytic corrosion	Pits form in the raceway. The pits gradually grow into ripples.	Electric current flowing through the rollers.	Create a by-pass circuit for the current. Insulate the bearing so the current does not pass through.

Dents and scratches	Scoring during assembly, gouges due to Hard foreign objects and surface Denting due to mechanical shock.	Entrapment of foreign objects. Bite-in on the flaked off side. Dropping or other mechanical shocks Due to careless handling. Assembled misalignment.	Improve handling & assembly methods. Take measures to prevent the entrapment of foreign objects. Should the damage have been caused by little pieces of metal, thoroughly Check all other locations.
Slipping or creeping	Slipping is accomplished by Mirror-like or discoloured surfaces on The ID and OD. Scuffing may also occur.	Insufficient interference in the mating section. Sleeve not fastened down properly. Abnormal temperature rise. Excessive loads.	Re-evaluate the interference. Re-evaluate usage conditions. Review the precision of the shaft and housing.

NOTE While it is course impossible to directly observe bearings in operation, one can get a good idea of how they are operating by monitoring noise, vibration temperature and lubricant condition. Types of damage typically encountered are given in the above table.