

# How To Minimize The Major Bearing Maintenance Costs

The improper fit of a bearing inner race on a shaft, or a bearing outer race in a housing, can ruin the bearing and its surroundings and also endanger life.

Heat is the worst enemy of a bearing. Good lubrication in the right amount should insure proper operation of a bearing. However, this assumption is too often not true. Excessive heat damages and causes failure of the bearing, with serious damage to the machinery. People may be hurt as well.

Some mechanical failures in housed bearings occur when the bearing races spin on the unattached holding surfaces because:

1. Improper bore dimensional tolerance matched with too much bearing size clearance.
2. Spinning of outer race in the bore.
3. Excessive shaft dimensional tolerances and too much bearing clearance.
4. Spinning of inner race on the shaft.

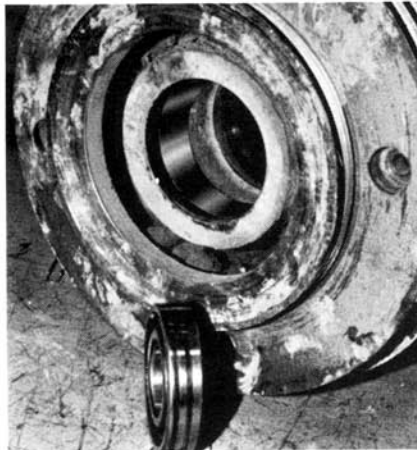
In these cases the bearing will either rotate in the bore or on the shaft. This causes spalling on the outer surface of the outer race or on the inner surface of the inner race. Continued operation generates excessive heat which may cause bearing or even shaft or housing failure.

Many of these conditions can be quickly rectified without damage to the machinery or replacement of the bearing. Some bearings' irregularities are observed readily such as bearings on roller conveyors. Others may not be so apparent. Usually, excessive power demands or a stalled shaft may indicate bearing trouble in addition to excessive heat.

These problems can lead to a major repair shutdown which may last days or weeks. Rocklinizing, a controlled dimensional build-up of material, can restore the requisite tolerance for a press-fit to exist with the outer bearing race surfaces. This system may similarly be applied to the inside housing dimension, or the outside shaft dimension, quickly restoring the unit to service.

Welding or metallizing, with its unregulated heat generation during application, cannot be successfully applied to bearings as it surely affects the mechanical properties of the metal in the bearing, and possibly the housing and shaft. They cannot be used with housings or shafts without losing the close tolerances. Further, with welding or metallizing, expensive pre-machining and post-machining are essential to resize the work piece.

## MAINTENANCE



Process is applied to the exterior of the bearing race so that its exterior dimension is increased.

Rocklinizing, a patented electronic and metallurgical process, fuses the electrode material in finite quantities such that the dimensional addition to the work surface can be controlled in dimensional tolerances of .0001 in. The amount of build-up depends upon the material to which it is applied, the dial setting of the electronic charge generator and the type of Rocklinizer electrode used. The electrodes are specialized forms of tungsten carbide, titanium carbide, and Rockhard for metal applications.

The deposit capabilities range from .0001 to approximately .004 in. in a single application, all controllable within .0001 in. The process will not harm the bearing operation or the metal surface of the race or shaft. In most cases, sufficient build-up can be placed on the outside housing race, or inside shaft race of the bearing, to provide adequate tolerance to reset the bearing with a press-fit to properly anchor it in the housing, or on the shaft. All of this is accomplished without machining and sometimes without disassembling the machinery.

The process, with its finite spark emission and quick air quenching, does not result in much residual heat. It can be applied to the anchoring surfaces of the bearing housings and shaft races without damaging the bearings. It can also be

added to the bearing housing bore for dimensional decrease, or to the shaft for dimensional increase. In this manner, a racing unanchored bearing race can be quickly corrected allowing the machinery to be placed back in operation without a major shutdown.

A California mechanic discovered the advantages of the system when a bulldozer stopped working because of a slipping bearing in the fan-belt pulley. A diameter check of the bearing housing bore indicated a tapered bore in addition to the polished bore surface.

A Model 314 Rocklinizer applied



Surface treatment is applied to bearing housing by means of a "gun" holding the electrode material.

tungsten carbide to the inside diameter of the bearing housing. The larger diameter zone of the tapered bore was built back to press-fit tolerance so that the press-fit surface of the bearing housing was again effectively parallel to the axis of the pulley. Time was 45 min.

A new bearing with a standard OD was press fit into the pulley, and the pulley re-installed on the engine. Fan belts were adjusted and the dozer placed back in operation.

Normal shop procedure called for making the set-up, boring the bearing housing, machining a sleeve, press-fitting the sleeve, boring the sleeve for a bearing fit, then press-fitting the bearing into the sleeve. Estimated shop time is six hours, at \$20 per hour. The dozer downtime reduction is 5.25 hours.

Total cost reduction: 5.25 hours machine shop at \$20 is \$105; 5.25 hours dozer downtime at \$65 is \$341.25, for a total net cost reduction of \$446.25. The mechanic who brought the housing bore back to a parallel press-fit gage had never seen a Rocklinizer until five min. before he started to work with the unit. □

**Rocklin** MANUFACTURING CO.  
110 SOUTH JENNINGS STREET  
P.O. BOX 1259  
SIOUX CITY, IOWA 51102-1259 USA  
PHONE (800) 831-0890  
(712) 255-7957