TB-2032

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BEARING APPEARANCE

We are occasionally asked about variations in the appearance of bearings especially after they have been in storage for a period of time. These questions generally pertain to plated trimetal bearings.

BACKGROUND

Composition of the final thin flash plating on a trimetal bearing can vary depending on the manufacturer and each type will have a slightly different color. Most trimetal bearings have an electroplated overlay on their running surface consisting of an alloy of lead, tin and copper. After the overlay is applied the bearings are "Flash Plated" all over with either an alloy of lead and tin or pure tin to improve corrosion resistance during storage. There is also another overlay system used for trimetal bearings, which employs an alloy of lead and indium. These lead-indium bearings are generally not flash plated and their steel back remains bare.

APPEARANCE

As mentioned above, the color of the bearing surface will vary depending on the plating system used. Except for some special high performance competition bearings, all Clevite 77 trimetal bearings use a lead-tin-copper overlay with a lead-tin flash plating. This plating system typically results in a darker color than either pure tin or lead-indium. As time passes additional darkening may occur due to reaction of lead in the bearing surface with oxygen and other elements present in the atmosphere.

Lead-tin was chosen for the flash plate layer on Clevite 77 bearings due to its compatibility with the underlying materials and its performance as a bearing material rather than for its cosmetic appearance. Over the years Clevite 77 brand bearings have become known for their characteristic darker color and are recognizable by this distinguishing quality.

STAINING

Under certain conditions isolated areas of some bearings may actually blacken in time. This condition is referred to as staining and is the result of oxidation of copper from the lead-tin-copper overlay. Since the flash plate layer is applied all over the bearing shell, it is purposely kept very thin to prevent excessive build up on the steel back which may cause interference with

bearing seating and retention. Although this thin flash plate layer initially provides a uniform appearance and inhibits the formation of copper oxide, prolonged storage may eventually lead to some blackening in isolated areas. These areas most frequently occur along edges and on the OD near the parting lines.

PERPORMANCE

Copper oxide identified by its dark, almost black, color is not detrimental to bearing performance. Bearings having this appearance may be used without concern for their ability to perform. It is preferred that bearings having this appearance not be polished in an effort to improve appearance as damage or removal of the critical bearing overlay may result.

Competitive bearings, which employ a pure tin flash plating for a lighter color and a more attractive appearance are susceptible to the formation of tin-oxides. Tin oxides, which result from exposure to moisture and air are light in color and therefore not readily detectable however, they are abrasive and consequently detrimental to wear resistance. In addition tin oxides have an affinity for moisture, which has a tendency to perpetuate their formation

Bearings, which display pitting or a build up of deposits on their surface which is detectable by feel have been subjected to corrosive attack from exposure to moisture and should not be confused with the conditions described above. Clevite 77 brand bearings are packaged in a plastic shrink-wrap to provide protection during shipping and storage. Parts displaying corrosion give evidence of exposure to conditions far in excess of normal and should not be installed.