Introduction

The size of a bearing has no affect on its resistance to improper operating conditions, poor handling, or environmental influences. Bearings are precision components. Their manufacturing tolerances are often not found in other components that are part of the same assembly. Modern machining techniques and processes have managed to keep the cost of bearings low, masking their value as highly precise machine elements.

It is a known statistical fact that greater than 90% of all bearing failures are due to external influences. These include lubrication conditions, assembly installation techniques, contamination of the operating environment, and improper bearing size selection for the application.

Under proper operating conditions, a bearing should only fail from fatigue which is predictable based on the bearing size and it's application parameters.

Many other types of bearing damage can be prevented with the knowledge of how external influences affect the life of a rolling bearing.

For that reason, we present this guide as a reference towards understanding the causes and effects of bearing damage.

Prior to Installation

- Bearings should be stored in a clean and dry location without exposure to vibration.
- Keep bearings in their original packaging until they are installed.
- Hands should be clean and dry. Gloves are recommended.
- The work area should be clean with minimal exposure to contaminant generating equipment.
- Handle bearings with care. A drop from even a low height or a low shock load can cause rolling surface brinelling, a starting point for surface damage.
- Avoid cleaning or degreasing a new bearing as it will remove the preventative rust coating.
- Never spin a bearing with compressed air.

Correct Bearing Installation Techniques

- Use the appropriate sized tools for the bearing. Check for tool wear often.
- Assure that both the shaft and housing seating areas are clean and free from contaminants. The dimensions of the shaft and housing as well as any radii contacting the bearing should be confirmed as correct for the bearing size chosen.
- Do not apply shock loads to the bearing during assembly either through mishandling or direct use of a hammer.
- Use only the lubricant chosen for the application during installation. Do not mix lubricants.
- Avoid touching bearing surfaces with bare hands as this can lead to surface oxidation.
- Prior to press fitting, assure the bearing is aligned. Only apply force to the bearing race being pressed. For example: Do not cross load the bearing by pressing on the inner race when the outer race is being fitted.