What is the most common cause of bearing failure?

The most common cause of bearing failure is overloading. This can be caused by excessive speed, load, or both.

Another common cause of bearing failure is lack of lubrication. This can be caused by a lack of oil feed to the bearing or inadequate oil flow through the bearing.

The third most common cause of bearing failure is contamination. Contamination can occur if there are foreign objects present in the lubricant, such as sand or metal particles, which will wear away at the surfaces of the rolling elements and cause premature failure.

Lubrication and Contamination

The most common cause of bearing failure is lubrication and contamination. The main reason for this is that bearings are made from materials which are not compatible with the application environment. In addition, when a bearing is assembled, there may be some surface damage or defects in the balls or races which can lead to early failure.

In order to ensure long life, bearings must be properly lubricated and maintained. There are two types of lubricants: oil and grease. Oil-based lubricants include vegetable oils and mineral oils. Grease-based lubricants include lithium and silicone based products.

All types of lubricants leave some residue on their surfaces when they dry out or degrade over time. This residue can become a source of contamination if it comes into contact with other parts of your equipment or machinery causing premature wear and failure.

Improper Installation

Improper installation is the most common cause of bearing failure.

Improper installation can damage a bearing and make it fail prematurely. Bearings are precision parts that must be installed properly to ensure proper operation. Improper installation can result in damage to the races, rollers and other internal components.

Improper installation can also cause excessive heat or noise levels, both of which can affect bearing life and performance.

Inappropriate mounting procedures can lead to:

Heat damage from over tightening or overtightening. This damage can occur either during assembly or when installed in service. Over tightening may distort the inner ring raceways or inner bore, causing damage to the raceways or inner bore; over-tightening may also cause a significant increase in friction between the rollers and raceways which leads to increased heat

generation and premature failure of the bearing.

Corrosion

Corrosion is the most common cause of bearing failure. All bearings contain some amount of lubricant, which acts as a barrier against corrosion. However, this protection is only effective if it is constantly replenished by the flow of clean oil. When the oil becomes contaminated with water (hydrostatic pressure) or dirt, it loses its ability to repel contaminants. As the contaminants accumulate inside the bearing, they are subjected to constant shearing forces that cause them to wear away at surfaces and initiate corrosion.

The two most common types of corrosion are pitting and crevice corrosion. Pitting occurs when small holes form in the metal surface due to an electrochemical reaction between the steel and surrounding materials like water and oxygen in air. Crevice corrosion occurs when gases from other parts of a machine leak into an enclosed space like a bearing housing and react with the metal walls to form corrosive compounds that can eat away at them over time.

Overload

Overload is the most common cause of bearing failure.

The load on a bearing is the force that acts on it. The load can be generated by two factors: static (stationary) and dynamic (vibratory). Static loads are caused by gravity, weight or pressure. Dynamic loads are caused by motion, such as vibration or shock.

Bearings are designed to withstand only a certain amount of load before they fail. If you exceed the maximum allowable load rating, you risk damaging your bearings and causing machine failure.

There are several ways to determine whether your bearings are being subjected to excessive loads:

Inspect the surface of the shaft for scratches or burrs, which indicate excessive wear or damage. These signs may mean that the shaft has been subjected to excessive torque or runout.

Fatigue

Fatigue is the most common cause of bearing failure. Fatigue occurs when a material is subjected to repeated stress, causing it to crack and break. The stress can be applied in any direction and at any frequency, but if the material is subjected to cyclic loading, fatigue cracks are more likely to form.

Fatigue failures are usually catastrophic, often resulting in the complete disintegration of a

component. The failure may occur suddenly and without warning, which makes fatigue one of the most dangerous types of failure in engineering.

Fatigued components can often be detected by visual inspection or by performing a special test known as an oscilloscope test. During this test, an oscilloscope monitors the signal from a rotating shaft as it undergoes cyclic loading (i.e., spinning up and down). Any anomalies that occur during this process may indicate that fatigue damage has occurred in the bearing or housing assembly.

Overheating

The life expectancy of a bearing is determined by the operating temperature. For example, if the bearing operates at 300°C (572°F), it can withstand 100,000 hours of operation. However, if the same bearing operates at 400°C (752°F), it will only last for 20,000 hours – one-fifth as long.

Bearings have a maximum temperature limit beyond which they will fail prematurely or even melt. This limit is called “the thermal rating” or “maximum allowable operating temperature” (MAOT). If bearings are operated above this rating, they will fail much sooner than expected.

The most common cause of bearing failure is lack of lubrication and cleanliness. Be sure to check your bearings before use and make sure that there is enough free flow of grease in the right places. Lubrication can be applied with a grease gun or some other lubrication device. It should also be mentioned that if your bearings are starting to make noise, they may already be failing from either lack of lubrication or general wear and tear, so it is important to check them regularly and replace them as soon as is necessary.