

How do bearings get damaged

[Bearings](#) are mechanical components that are used for various purposes. These include reducing friction and vibration, as well as increasing accuracy and precision of motion. Bearings are designed to withstand high loads and speeds, but they can get damaged if they are not maintained properly. There are several ways in which bearings can get damaged. The following are some of the common reasons that cause damage to bearings:

Insufficient or improper lubrication

When bearings don't get enough lubrication, they can suffer from wear or damage. This can happen when there is insufficient lubricant to keep the parts moving smoothly, or when there is too much lubricant that reduces the friction between parts.

If the bearings are pushed beyond their limits, they will suffer from heat and oxidation. This can lead to permanent damage. Over time, heat causes the bearing material to become porous and brittle, which can cause it to break apart.

Insufficient lubrication can happen if you don't use the right kind of oil for your equipment or if you don't change it often enough. It also happens if you don't take care of your equipment properly by cleaning it regularly and performing routine maintenance checks on all its moving parts.

Pollution

All bearings are designed to operate in a relatively clean environment. However, bearings may be exposed to a variety of contaminants that can cause damage.

The most common type of pollution is contamination from water, dirt and dust particles. These contaminants can enter the bearing through seals or the lubricant reservoir. When contaminated oil is fed into the bearing, it can cause excessive wear and premature failure. Oil will also absorb water from the environment, which will cause corrosion in the bearing and lead to premature failure.

The second most common type of pollution encountered by bearings is caused by chemicals such as acids, alkalis and solvents. These chemicals can enter a bearing system when it comes into contact with materials that contain these chemicals (e.g., paper pulp). They can also be introduced into a system through an improper cleaning process (e.g., using hydrochloric acid to clean aluminum parts).

Another source of pollution that can affect bearings is heat generated from friction during operation. This friction causes some of the lubricating oil to become oxidized, which creates a film between surfaces that reduces their ability to slide smoothly against each other. As this oxidation builds up over time, it can lead to failure of the bearing system.

Improper handling and installation

A bearing can be damaged by improper handling and installation. It is important to know how to handle bearings properly so that they will not be damaged in the process.

Improper handling and installation of bearings can cause premature failure and even permanent damage. Bearings should be handled with care at all times, particularly when removing them from their packaging and installing them into a machine.

Bearings are delicate parts that require careful handling and installation. Improper handling or installation can cause premature failure and even permanent damage.

Overload

Overload is the most common cause of bearing failure. It can occur from excessive speed, load and/or vibration, but it's more often caused by insufficient lubrication.

Even if a bearing is otherwise in good condition, excessive vibration can lead to fatigue and cracking. The resulting micro-cracks will gradually grow and eventually cause the bearing to fail.

When a bearing is subjected to excessive load or speed, friction increases as well as heat generation within the lubricating film. This causes the oil to break down faster than usual and wear rates increase dramatically.

All of this leads to premature failure of bearings, which means that they will have to be replaced sooner than expected. Overheating can also cause creep damage on both sides of the raceway surface of plain bearings and wear in rolling contacts for rolling element bearings (ROE).

Misalignment

The most common type of damage done to bearings is misalignment. This can happen due to improper installation, or from the bearing being damaged during shipping or storage.

The result of misalignment is premature failure. The ball or roller that makes up the rolling element will not be able to rotate freely, and will come into contact with the inner race or cage. This causes wear on both surfaces and will eventually destroy the bearing if it goes unchecked long enough.

Another common reason for premature failure is lack of lubrication. In this case, the lubricant has either evaporated or become contaminated with dirt or other contaminants that prevent it from doing its job properly.

Insufficient internal clearance

Insufficient internal clearance can cause metal to metal contact between the bearing races and balls or rollers. This type of damage is usually caused by overloading or misalignment.

The bearing race is the part of a ball or roller bearing that supports the inner ring and allows it to rotate freely inside the outer ring. The races are designed to withstand high pressures without deforming or failing.

If there isn't enough space for the inner ring to move, it will rub against the outer ring causing damage. This can happen if you over-tighten a bolt that holds the wheel on your car, for example, or if you don't align your car's wheels correctly when you change a tire (and don't align them afterwards).

Fatigue

The most common cause of bearing failure is fatigue. Fatigue is the result of repeated stress cycles (loads) on a component. It usually occurs when a good quality part is used in an application with excessive load, speed or temperature. The effects of fatigue can be seen as small cracks that develop in the surface of a bearing, which then grow until they reach the roller shaft and eventually cause total failure.

The best way to prevent premature bearing failure due to fatigue is to keep the operating conditions within the normal limits for the type of bearing being used. This means ensuring that there are no excessive loads or speeds, and that the operating temperature does not exceed the maximum temperature rating specified by the manufacturer.

In this article we have covered the most common causes of

bearing failure. Bearings that are not used in their working environment or incorrectly installed can degrade quickly if these factors are not accounted for.