

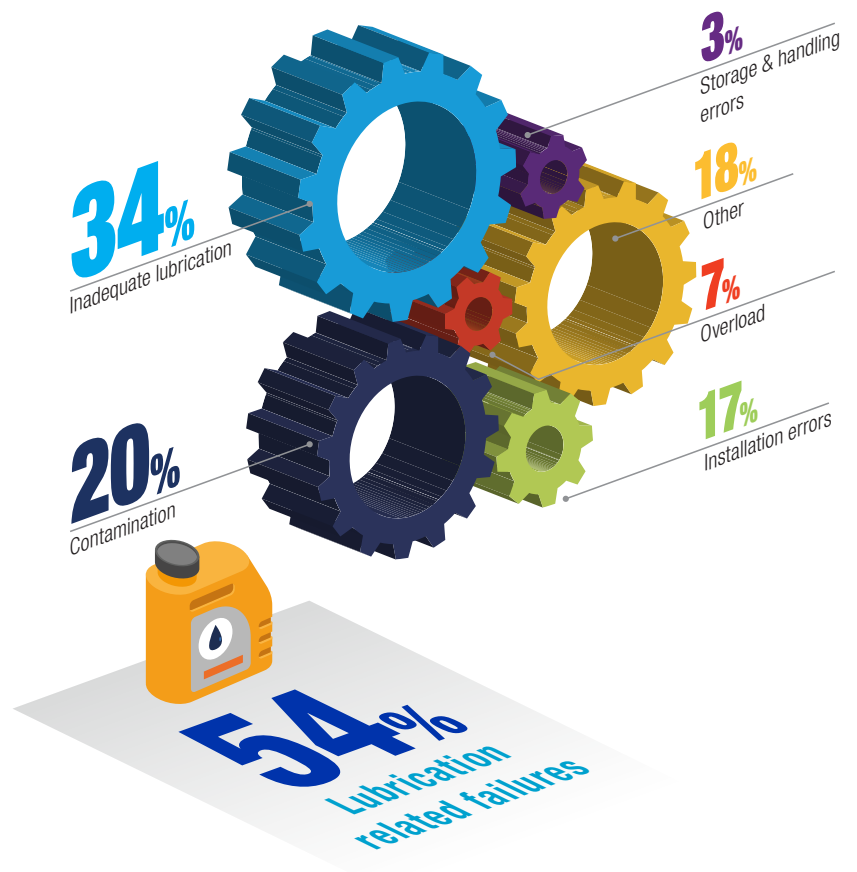
Discover how automatic lubrication leads to **Extended Equipment Lifetime**

Why bearings fail

There are several reasons bearings fail, but inadequate lubrication significantly increases the risk of failure. In fact, studies show that more than **50% of bearing failures are the result of improper lubrication**. It is crucial to avoid these failures, because the costs can add up to much more than the cost of replacing the bearing.

Take into account the following effects of a bearing failure:

- Costs of new bearings and related materials
- Loss of production due to downtime
- Labor costs for the repair of the bearings
- Increased safety risks when repairing the bearings
- Missed customer deliveries



The importance of adequate lubrication

Selecting the appropriate lubrication solution can help **reduce premature bearing failures**. Manual lubrication systems can't guarantee the right amount of lubricant at the right time and in the right place.

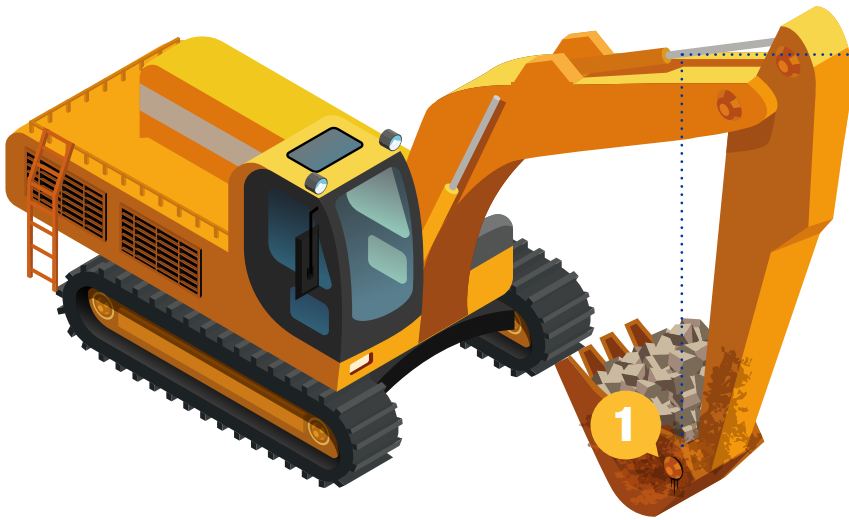
This leads to serious risks for equipment where optimal lubrication is necessary to ensure efficient processes and a minimum of downtime and maintenance costs.

Inadequate lubrication leads to:

- ➔ Increased component wear
- ➔ Premature equipment failure
- ➔ Higher energy usage
- ➔ Increased operating costs
- ➔ Increased maintenance costs

CAUSES OF WEAR

A closer look at two major causes of bushing wear



Contamination

Contamination is caused by **environmental conditions**. Grease is not only the lubricant, it is also the barrier to contamination. Open lube points that lack fresh grease **allow dirt to easily enter the system**. Additionally, bad storage conditions — lids that are not properly closed — can allow contaminants such as dust and rain to enter the grease.

Dirty grease zerks

If zerks are not cleaned before manually lubricating with a grease gun, the dirt will be **pushed into the lube point**, creating wear that will **significantly reduce the lifetime** of the bearing or bushing. This will further result in equipment downtime and high repair and maintenance costs.



Spot the differences

Most pin bushings today have **'grease grooves'** on the inner diameter. While providing a film thickness for the pin to rotate on, they help purge contamination from the bushing by **forcing out unwanted materials**.

Beware

If proper greasing intervals are not maintained, these grooves can also collect contamination. Wear can occur if the bushings are not cleaned frequently.

Good bushing



Texture and grooves still visible

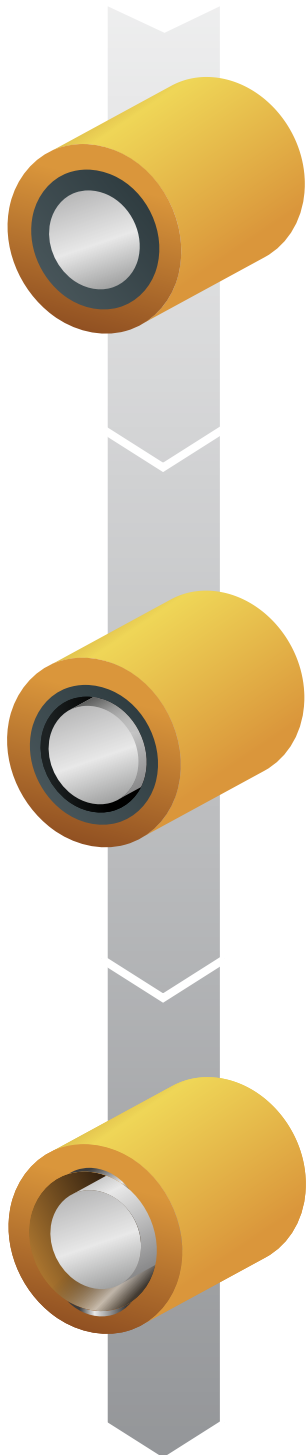
Worn bushing



Texture and grooves disappeared

Understanding pin & bushing wear

Today's construction and mining equipment uses the most sophisticated form of bronze pin bushings, and their ability to reduce wear is impressive. Nevertheless, there is a problem with the nature of the material itself. Bronze is extremely reliable and very durable when used as a 'wear' material, but it is not contamination-proof. Let's look at how wear comes about.



Good bushing

The purpose of the bushing is to **reduce damage to structural steel components** — a bronze bushing is much cheaper to replace than an excavator boom arm, for example. The effect of contamination on pin bushings is directly related to lubrication. Without proper lubrication, the pin runs harder and hotter, compromising the lifespan of the bushing and equipment.

Worn bushing

When excessive **contamination builds up** between a pin and bushing surface, the rotation of the pin and the pressure load force contamination into the bronze bushing. As contamination continues to build up, it restricts the pin's movement by increasing friction. The pin will eventually **gouge the bronze and start removing material from the bushing** to allow it to rotate.

Affecting frame

These material deposits lead to additional contamination between the pin and bushing, making the problem even worse. If this process continues, the space between the pin and bushing will increase, leading to additional contamination and wear. When all the bronze bushing material is worn away, the pin will **start digging into the steel structure** of the equipment.

Out of service



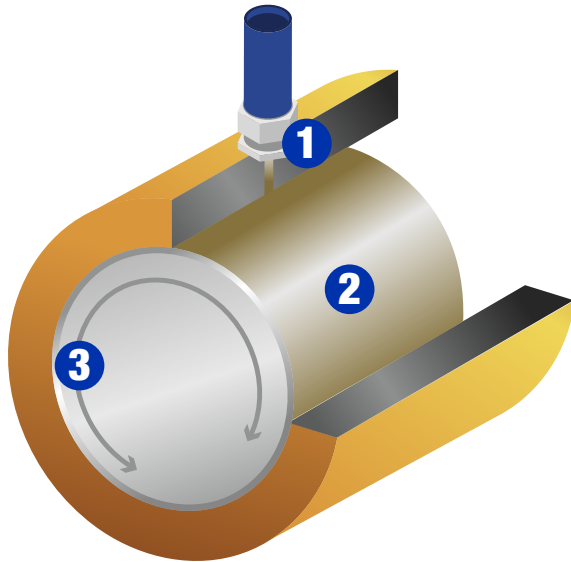
If the **bushings need to be replaced**, production machinery is generally put out of service.

- If only the bushing is damaged, only the **pin and bushing set** needs to be replaced.
- However, if the pin has damaged the structural steel of the equipment, a **line bore** will probably be required, increasing the cost of repairs exponentially.

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Without proper lubrication, equipment runs harder and hotter, compromising its lifespan.
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CONCLUSION

Automatic lubrication leads to extended equipment lifetime

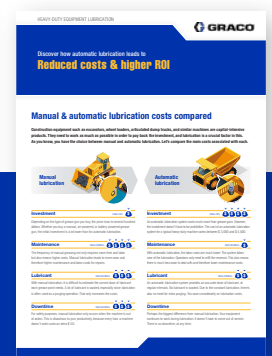


Proper lubrication will prevent the need for replacement or repair of pin bushings, except in case of bushing deformation due to impact loading. Manual lubrication typically produces inconsistent lubrication. This allows contaminants to enter the bearing, producing premature wear and impacting bearing life significantly.

- 1 An automatic lubrication system **consistently dispenses accurate doses of lubricant.**
- 2 It enables the **permanent purging of contamination** from the pin and bushing while the system is working.
- 3 By greasing during equipment operation, **the entire pin is coated**, and equal purging of the pin's circumference is obtained.

This increases equipment life and extends machine performance, reducing the maintenance and repair frequency and resulting in minimal downtime.

Discover our other journals on automatic lubrication



- 1 Less downtime & higher productivity
- 2 Better & safer working conditions
- 3 Reduced costs & higher ROI



**ALWAYS ON.
ALWAYS INNOVATING.**

Graco manufactures automatic lubrication systems specifically designed for yellow iron construction and mining equipment. Our systems provide certainty for today's modern equipment manufacturers, managers, and operators seeking continuous uptime and optimal productivity from the machines they rely on daily.

For more information on automatic lubrication for heavy equipment, go to www.graco.com/heavyequipment

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