

Pros and Cons of Different Bearing Lubrication Methods

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Lubrication plays a vital role in the performance and in the life of bearings. The functions of the lubricants are to reduce friction and wear, to dissipate heat, and for ferrous-based bearings, to prevent rusting.

There are bearings that are “lubricated for life” and bearings that need to be re-lubricated.

“Lubricated for life” bearing is a bearing that does not need re-lubrication over its normal service life.

For a maintenance crew, it is important to know which bearings need re-lubrication and make sure they are lubricating those bearings.

The bearings can be lubricated manually or by automatic lubrication systems. This article will review each method and discover its pros and cons.

Manual Lubrication

Pros

- Easy access. This method is good, when your bearings are easy to access and it is safe for the operator. These types of applications are not time consuming and will cost much less than automated systems.
- Inspection while greasing. Many maintenance managers prefer manual greasing to make sure their equipment is getting inspected. Having an automatic lubrication device doesn't mean that the system won't require any inspection, but a lot of places don't have proper inspection procedures, so lubrication is a reason to go and check the equipment as well.

Cons

The cons of manual lubrication are many. Since it is done by human beings, there are many things that can go wrong:

- The No. 1 reason that bearings fail prematurely is the improper amount of grease (overgreasing and undergreasing). Certain parts of equipment that are easy to access may get greased too many times and hard-to-reach areas may never get greased. The lubrication team must have proper training on how often and how much the equipment should be greased.
- Using the wrong lubrication can cause a premature failure because of grease incompatibility (not all greases are compatible with each other) or the incorrect grease for the application. Proper training and procedures are necessary for lubrication teams to know which grease goes where.
- Safety is an issue of concern, when doing a manual lubrication. In a lot of instances the lubrication points are in places where people can easily hurt themselves. For this reason, safety training is a must, when doing manual lubrication.
- Hard-to-reach lubrication points can be very time-consuming. Sometimes to reach certain lubrication points the technicians have to disassemble the equipment. This increases the cost of lubrication. For certain places lubrication tubes can be used, but not always.
- In many applications, grease fittings can be covered in contaminants, and you can never perfectly clean them up, which causes the contaminants to get injected into the bearing along with the grease. It is very easy



Fig. 1 Manual grease gun.

to damage or break the seals with grease guns (due to high pressure generated by grease gun). Also, contaminants can easily penetrate into damaged seals.

Automatic lubrication systems

Pros

- Protection from overgreasing and undergreasing. With automatic lubricators, the amount of grease is set over a period of time. The bearings are getting the grease and they are getting the right amount. This way no lubrication point is missed or forgotten.
- The chances of confusing the lubricants are less than with manual greasing.
- Increased safety. With automatic lubrication, the technicians don't have to get to unsafe places like in the case of manual greasing.
- Labor Savings. Automatic lubricators can save a lot of time, especially for hard-to-reach lubrication points.
- Less contamination is introduced, due to increased maintenance intervals. Most of the automatic lubricators don't have enough pressure to damage the bearing seals. This reduces the chance for contaminants to enter into the bearing due to damaged seals.
- Optimized lubricant delivery (Fig. 2).

Cons

- Investment cost. Of course, implementing an automatic lubrication system requires some level of investment. To maximize the return on that investment, the key is to choose the right solution based on the requirements and criticality of the application. Typical solutions range from inexpensive single-point automatic lubricators to very complex centralized systems with various options for online monitoring.

Let's take a look at the pros and cons of single-point lubricators and multi-point systems.

Single-Point Lubricators

Pros

- Single-point lubricators are suitable for remote locations.
- They don't require initial high investment cost as for centralized systems.
- They are easy to install and maintain.
- No long lubrication lines

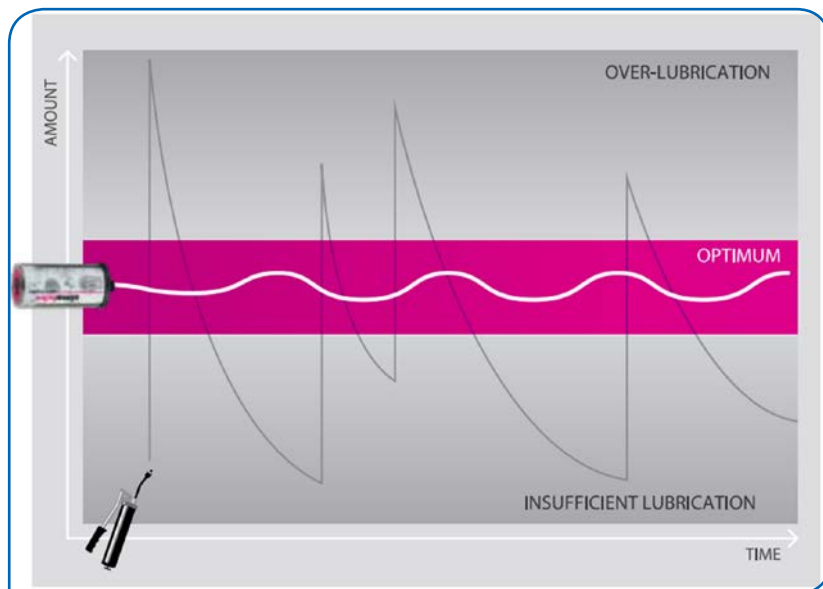


Fig. 2 Optimized lubricant delivery. The picture compares manual lubrication with automatic. The pink area is the optimal amount of lubrication inside the bearing. As you can see, the automatic lubrication is maintaining the right amount of lubrication over time. Image courtesy of Simatec Inc.



Fig. 3 A single-point lubricator. Image courtesy of Simatec Inc.

Cons

- Most of the single point lubricators are of single use, so after they dispense the grease you need to purchase again.

Multi-Point Lubricators**Pros**

- Some production plants have many lubrication points in one area. In such cases, it is more effective to have one centralized system to lubricate all the bearings in the area.
- Over time the cost may be less than single-point installation. After initial setup, technicians just have to fill the reservoir.
- Multi-point can generate much higher pressure than single-point, hence it can have longer tube lines to lubrication points. This is convenient in hard-to-reach areas.

Cons

- Much higher initial cost than with single-point lubricators.
- Proper inspections are needed. For hard-to-reach points, sometimes lines may break under high pressure. The bearing will not receive any lubrication and eventually will fail. The grease from a broken line may drip on the product or somewhere else where it not should be.

In summary, there is no perfect answer regarding which method is better. It all depends on application, maintenance crew, industry and other conditions. There are plants that use single-point lubricators, multi-points and still do manual greasing as well. **PTE**

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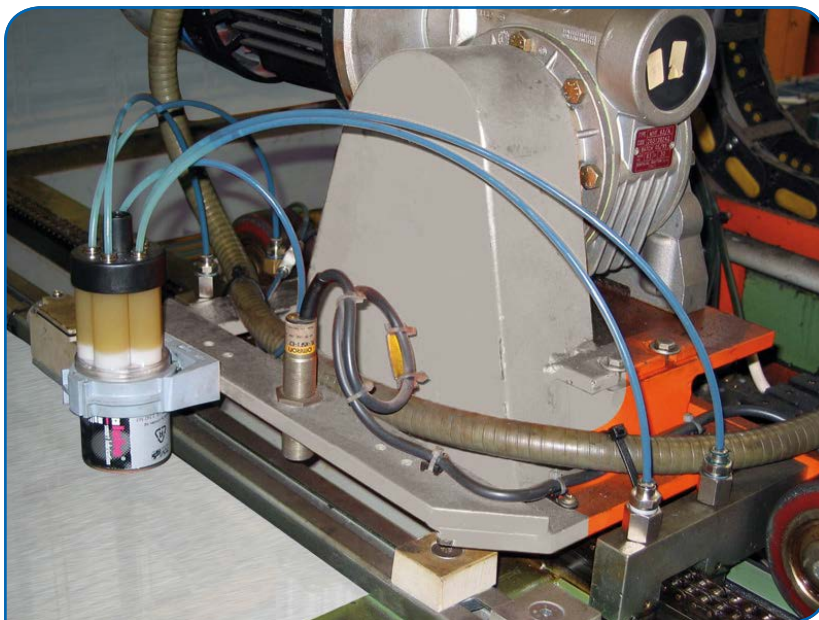


Fig. 4 A multi-point lubricator. Image courtesy of Simatec Inc.

Vladimir Harutyunyan is the president of HVH Industrial Solutions, a leading provider of power transmission parts.



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