Product Service Bulletin
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Ask the experts

Q: *Our greaser did not remove the drain plug when regreasing one of our larger motors and he says he used two tubes of grease before he decided the bearing was sufficiently greased. The motor instruction manual says the bearing only requires .75 ounces of grease. Will this hurt the motor?*

A: The lubrication instructions for the equipment being serviced should be reviewed prior to starting the procedure. This will ensure the correct lubrication, quantity of lubricant and procedure is followed. The drain plug should always be removed when injecting grease into the bearing cavity. Failure to do so will prevent the old grease from being purged and will prevent any excess grease from escaping. Your greaser has not only over filled the bearing cavity, which can result in the bearing overheating, he may very well have forced grease into the motor winding. This motor will need to be disassembled, all excess grease removed, the winding cleaned before putting it back into service.

Proper Motor Lubrication

According to EASA, the motor component with the highest failure rate is the bearing. Of all the different types of motor failures, 51% of these failures are bearing failures. If bearings are cared for properly, this 51% number could be significantly reduced.

Bearing lubrication is one of the many aspects of motor care and one of major importance to the life of a motor. Getting it correct isn't as easy as it might seem. It will take some investigating, documentation and a lot of hard work.

Setting up a preventative maintenance system, a predictive maintenance system or whatever is in vogue today can severely affect the life of a motor. Arbitrarily re-lubricating motor bearings will result in one of two things. The bearings will be either over lubricated or under lubricated. Either one will reduce the expected life of the bearing. What needs to happen is to find that happy medium where the bearing is getting the correct amount of lubrication.

Bearings come in all shapes and sizes. They can be sealed (RS, 2RS), shielded (Z, 2Z) or open. These identifying characters are found in the bearing numbers on the nameplate of the motor. Sealed and shielded bearings are basically lubricated for life. There are those who will argue about lubricating shielded bearings, but by the time the oil gets past the shield, through the thickener and to the rolling element, the bearing will probably have lived its useful life. In addition, when re-lubricating a shielded bearing, there is always the possibility of creating so much pressure in the bearing housing, the shield could be forced into the rolling elements.

When determining the frequency of re-lubricating a motor, there are many criteria that need to be addressed. Some of these are type of grease, motor operating temperature, motor speed, bearing size, environmental conditions, duty cycle, the application and vibration analysis to name just a few.

Lubricant compatibility is of major importance. If two incompatible greases/oils are mixed together, they will loose their lubricating abilities very quickly. If in doubt, contact your lubricant provider or the motor manufacturer. Make sure the lubricant used is one recommended by the manufacturer

continued on back >

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< continued from page one

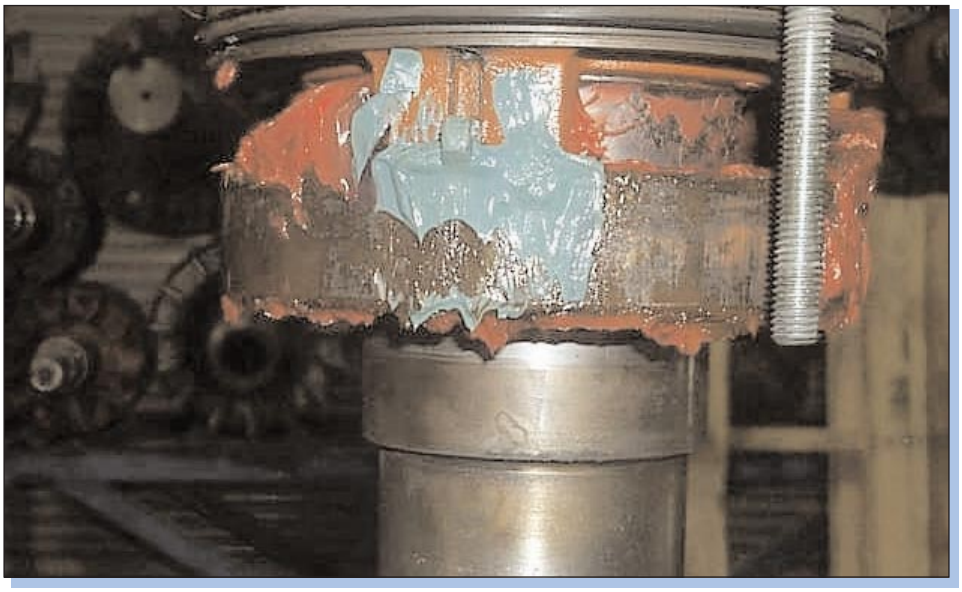
or an equivalent.

The bearing type and size, in conjunction with the motor's speed, need to be considered. Large or small bearings turning at 3600 rpm are working much harder than if they were turning a 900 rpm. Roller bearings require more frequent lubrication than ball bearings because of their heavy radial load.

Motors operating 24/7 located in a clean room may not require as frequent re-lubrication as a motor operating for 8 hours per day in a cement plant. The lubricant not only provides the bearing with oil, it also, to a slight degree, provides the bearing with protection from contaminates.

Eliminating contaminates from the lubrication will definitely have an effect on bearing life. Pumping clean grease into a fitting covered in dirt is defeating the purpose. Adding fresh oil to an oil sump does not remove contaminates from the existing oil. New grease and oil can be contaminated before they leave the storage location. Keeping lids on oil drums, grease containers sealed and the storage locker clean and free of debris, will lower the risks of adding contaminates when re-lubricating bearings.

If the motor is part of a critical system to the operation of the plant and the loss of this system would stop production, then the motor needs to be closely monitored to make sure it is maintained properly. However, if the loss of a motor would only be a minor inconvenience, then it may not be necessary to spend excessive amounts of time maintaining this motor. All motors should be properly maintained, but there are times when economics must also be considered. You don't spend a $100 a month maintaining a $300 motor.



This bearing is not only over greased but two different types of grease were used resulting in early failure

Vibration is playing an ever more important role in motor maintenance. Vibration analysis can be a very beneficial tool, though it is just that, a tool. When new motors are installed, a base line vibration needs to be taken. This base line should be taken after the motor bearings have been "broken in" by running the motor for 10-15 minutes. This allows the bearing to fully seat and for the lubrication to be fully distributed throughout the rolling elements. Subsequent readings need to be taken at set intervals and the history trended. A onetime vibration spectrum, without any historical data, does not tell the whole story. Is this spike a real problem or is it just a characteristic of the motor?

Bearing size will determine the amount of lubricant the bearing needs. Most motor manufacturers provide maintenance manuals detailing the correct procedure and the amount of lubricant required to re-lubricate a bearing. These manuals may also recommend time intervals between re-lubricating. These are only guidelines and may not work for each individual situation. Remember, over lubricating bearings is just as bad as under lubricating them.

A petrochemical plant in Canada started using vibration analysis to determine when a bearing should be re-lubricated. When the spectrum indicated the bearing required greasing, the technician added grease while monitoring the spectrum. When the spectrum took a plunge, the technician stopped adding grease. Over the course of a year, the company saved over $65,000 in grease costs, saw a sharp decline in motor failures, due to over greasing, and an increase in plant productivity in conjunction with reduced maintenance costs.

Proper care and maintenance of the motor and its bearings, can significantly increase the life of the motor, increase productivity, reduce costs and improve profits.

By Fred Spaid