Product Service Bulletin

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Ask the experts

Q: How often should a cylindrical roller bearing be re-lubricated?

A: Cylindrical roller bearings require more frequent lubrication due to the overhung load. Motor speed will determine the frequency of re-lubrication using the recommended quantity of grease. The lubrication interval for an 1800 RPM motor would be every 3 months. Motors running at 1200 RPM and slower would be every 6 months. Proper lubrication will help prevent bearing failure in a belting application.

Have a question for the experts? Contact us at jim.bryan@emotors.com

Belt Watch

Identifying Improper Belting Applications Early Can Save A Motor

Electric motor belting, while often considered a standard and cost-effective procedure, if not applied properly can quickly destroy a motor and the equipment it is driving. There are several warning signs that indicate an improper belting application. If identified early, these simple signals can help save a customer's motor and reduce costly downtime.

Belts are generally used to turn a piece of equipment (such as a fan or conveyor) at a desired speed. This speed is set at varying RPMs depending on the motor. This procedure is accomplished through a set of sheaves, one on the motor and the other on the driven piece of equipment that are connected by belts. The ratio between the sheaves will produce the desired speed. The motor will generally have a smaller sheave than the driven equipment, which causes the equipment to turn slower than the motor.

If you are called to a site to investigate a motor problem, using common sense will prevail in identifying the early stages of improper belting. A quick visual inspection can often tell you a lot. If you answer 'yes' to any of the questions below, further investigation is recommended:

- Do the sheaves look properly aligned?

Motor sheave mounted on end of shaft and beyond center point of sheave. Motor shaft eventually snapped.

- Are the sheaves in the approximate ratio or are they obviously mismatched?
- Is the motor sheave out on the end of the shaft or is it next the shaft shoulder?
- Do the sheaves have grooves cut into them?
- Are the belts drooping or are they tight as a guitar string?
- Is the belt guard full of belt dust?
- Are the belts cracked and stiff?
- Is the system vibrating excessively?

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- Are the bearings in the motor making noise?

More extensive damage will be indicated by squealing and whipping belts, broken shafts, frequent bearing failures, excessive belt dust in the belt guard, excessive vibration, V belt dimensions outside of NEMA standards, too many or not enough belts, sheave misalignment, sheave center point beyond the end of the shaft and sheaves mounted at the end of the shaft.

Besides an improper belt or sheave installation, other factors such as ball bearing and lubrication usage can also contribute to motor failure in a belting application. Incorrect bearings, such as using a ball bearing when you should be using a roller bearing and vice versa, can cause major problems. Ball bearings are not designed to withstand excessive radial loading. Roller bearings are designed for high radial loading and actually require a minimum amount of radial load. Without the radial load, the rolling elements will skid and cause premature bearing failure.

Correct lubrication of the bearings is an important, and often overlooked, element of a proper belting application. Roller bearings generally require more frequent re-greasing than do ball bearings. Using the manufacturer's recommended grease will help prevent problems. Mixing greases with different base material, such as lithium with polyurea, will cause the grease to lose its lubricating ability, resulting in bearing failure.

Improper belt tension is probably one of the biggest problems in a belting application. Overtensioning belts to reduce belt squeal can result in overloading the bearing. If the tension is excessive a broken shaft can result. Proper alignment of sheaves is very important in preventing failure. If not properly aligned, the belts will wear incorrectly, causing excessive vibration, broken belts, bearing failure, etc. Correct sheave diameter ratios are a must. Getting the incorrect ratio of drive sheave to driven sheave can result in not enough belt contact with the sheave allowing the belts to slip. Mounting a sheave at the end of the shaft will not only turn the shaft into a lever, dramatically increasing the chance of breaking the shaft, but it also increases the load on the bearing.

Motor failed due to mismatched and over-tightened sheaves causing excessive heat and melting motor shaft.

Should you identify a potential belting application error, please contact Emerson Motor Technologies' Product Service Department for suggested solutions. A Product Service engineer will provide you with a belting data form to collect the information they need to properly analyze the application. An engineer will review the form and determine if the motor is properly belted. After determining if the motor is belted properly, the engineer will work with you to determine whether the motor should be repaired or replaced.

You may call the Product Service Department at 314-553-1418, Monday through Friday, 7:30 a.m. to 4:15 p.m. Central Standard Time.

You've Got Questions? We've Got Answers.

Emerson Motor Technologies has established a Product Service Department hotline to more quickly field your questions about an Emerson motor or application. You may call 314-553-1418, 7:30 a.m. to 4:15 p.m. Central Standard Time, Monday through Friday, to speak directly to an Emerson Motor Technologies engineer. You will be patched through to the first available engineer. If you are currently working with an Emerson engineer and would like to speak directly to that engineer, you will have that option also.