Issue 30: Bud's Take on Lubrication: Grease Fill Interval

Lubrication: Grease Fill Interval

Is this a familiar scenario? A large industrial plant subcontracted a gearbox maintenance crew and a motor maintenance crew to maintain their equipment. On one particular application the gearbox crew visited quarterly and the motor crew was scheduled annually. At the 9-month maintenance interval the gearbox technician noticed noisy motor bearings. A small amount of grease was added. Soon after the bearing suffered catastrophic failure. The motor shop, gearbox crew and motor crew were all pointing fingers as the industrial plant wanted answers.

Since I first wrote this in 2013, I continue to see failures that occurred due to lubrication issues. I felt it was a good time to re-visit the grease fill interval and how this can lead to premature bearing failure.

How to read a Grease Feeding Interval Chart

I will make use of the chart out of the Koyo catalog. Most bearing manufacturers have a version of this chart in their general catalogs. Let's assume we are using a 6211 deep groove ball bearing running at 1800 rpm in this example.

Using chart 1, a 6211 has a bore of 55 mm (5 x 11). Now locate the curved line that represents 55 mm. In this case it will be between 40 and 60, see blue arrow.

The bottom line or x-axis represents rotational speed, find 1800 rpm. The scale is logarithmic so the line should be closer to 2000 than 1000, see green arrow.

Find the intersection between the rotational speed line and the curved line representing the bore, see purple arrow.
Make a horizontal line over to column A for radial ball bearing. In this case the re-grease interval is approximately 9000 hours, see red arrow.

Relation to original scenario:

The result of our reading of the grease interval chart would easily confirm the 1-year maintenance schedule because 1 year is 8640 hours.

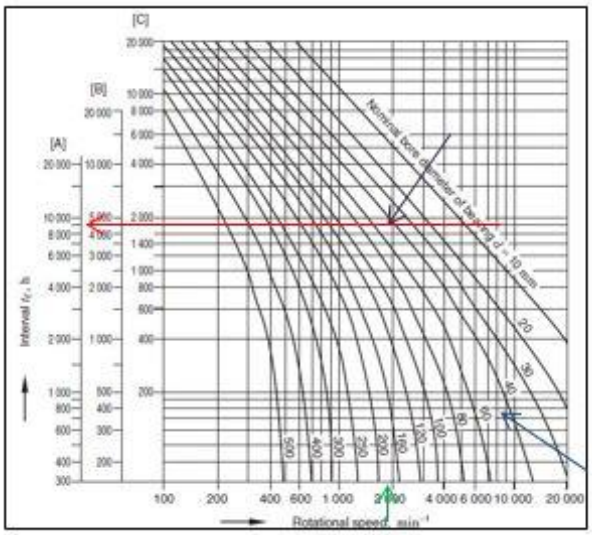

Chart 1: Grease feeding interval chart. Note: A-Radial ball bearings, B-Cylindrical & needle roller bearing, C-Tapered, spherical & thrust roller bearing.

What must also be considered?

In our interview we found that the housing temperature was around 155°F. We conservatively estimated the heat transfer through the housing would result in an outer ring temperature of 160°F, inner ring 170°F, and the rolling elements 175°F. Using the temperature coefficient chart, we would have to take our hours and multiple factor of 0.7, see chart 2 and the green arrow. 9000 X 0.7 = 6300 hours, which is about 8.75 months.

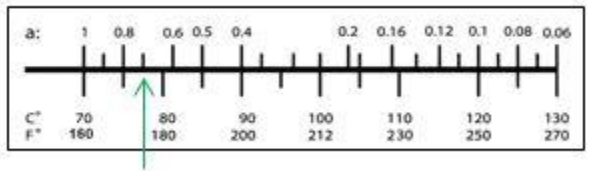

Chart 2: Temperature Coefficient

In our scenario, the bearing may have already been too far gone at the time the gearbox technician noted the problem.

Conclusion:

I recently worked on a similar failure. After collecting facts, it was determined that the root cause was no proper maintenance schedule existed. Re-lubrication intervals are critical to proper bearing functionality. If you have any questions please contact Midpoint Bearing or your bearing engineer.

If you have any questions, comments, ideas for future topics please feel free to contact me directly at bud@midpointbearing.com