

Lubrication Checkup: Gearbox Failures?

Written by Dr. Lube, aka Ken Bannister
Friday, 23 March 2012 14:23



Symptom:

"Dr. Lube, for many years we have successfully run 85-140 gear oil in our lumber-mill gearboxes, with the exception of our worm gearboxes that fail twice a year. I believe this rate of failure is unacceptable." [Edited for space.]

Diagnosis:

A six-month failure rate on a worm gearbox would definitely fall under the premature-failure category. There are numerous ambient-condition factors such as heat, moisture, dirt contamination, wood chips, etc., present in a lumber-mill environment. Any combination of these coupled with over-loading, poor lubricant choice or poor lube practices could contribute to the early demise of equipment. The following regimen is designed to eliminate common root-failure causes of your problem.

Prescription:

1. Determine if the gearbox is operating within its design load limits (this is the first cardinal rule of reliability). If it's constantly overloaded, change to a higher-rated one or accept premature failure.
2. Make sure the gear oil has no EP (Extreme Pressure) additives. These additives are harmful to yellow metals like brass, and can literally "eat" away the worm wheel. (This is major root cause of failure.)
3. Verify that the gearbox reservoir is sludge-free. Sludge buildup can harbor fine cutting materials that rapidly wear the worm's soft brass.
4. If the gearbox is designed with a breather, see that it's in place to check moisture and dirt contamination.

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5. Check to see if the the reservoir cap is installed correctly.
6. Confirm that the reservoir has oil in it. An old sight gauge could have old lubricant etched on its surface, indicating a false level when no oil is present.
7. Make sure the gearbox is clean and that no dirt is near the fill port. This will also ensure that oil in the reservoir oil doesn't heat up and "cook."
8. Ensure that the lubricant transfer process and equipment are contamination-free (yellow metals are NOT dirt-tolerant).
9. Have a lab perform a failure analysis based on cuttings found in the oil to determine the nature of metallurgical failure.
10. Employ the assistance of your lube supplier(s), who should know the suitability of their products for your operations. (There should be no charge for this).

After going through these 10 steps, if your worm gearboxes are no healthier, bring in a third-party, independent lubrication specialist to assess the problem and make recommendations. **MT**

Lube questions? Ask Dr. Lube, aka Ken Bannister, author of the book Lubrication for Industry and the Lubrication section of the 28th edition

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