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Maintaining Automated Systems

This final article in a long-running series discusses some tips to help ensure your delivery systems perform their jobs for many years to come.

Previous articles in this series have focused on helping your operations implement the correct engineered approaches for specific applications. Once those systems are in place, it's up to the Maintenance Department to protect your investment. In this final installment of our series, we'll discuss the minimum maintenance requirements for ensuring that your delivery systems continue to perform their intended functions for many years to come.

Controlling Contamination

"Cleanliness is next to godliness" is a mantra to live by when dealing with lubricants and lubrication systems. Induced system contamination is a major factor in premature bearing and lubrication-system wear. When transferring lubricants into a lube-system reservoir, great care must be taken so peripheral dirt is not introduced and passed through to the bearing points.

By their design and nature, lube-system components are not dirt-tolerant: Many of these systems employ fine-tolerance pistons and spool valves in their pumps' delivery blocks and injectors—*similar to the fine tolerances found in the bearings they are called on to lubricate*. Heeding the following maintenance and setup tips can help you prevent most contamination

problems:

Fig. 1. RAG (Red/Amber/Green) systems colorfully indicate when a lubricant reservoir needs to be filled. (Courtesy EngTech Industries)New Installations…

- To avoid cross-lubricant contamination, make sure the lubricant reservoir tag that identifies the correct lubricant matches the lubricant that's about to be dispensed into the reservoir.
- Clean the reservoir-fill area and fill with clean lubricant. When filling with oil, use a filter cart with a clean dispensing nozzle and clean dedicated transfer funnel. When filling with grease, use a fully cleaned positive-coupled air-powered grease barrel pump.
- Start the pump and purge lubricant through it before connecting the main delivery lines.
- Clean all lube lines of swarf and debris before connecting them. Use an air-powered "wad" cleaning system to shoot wadding through the lines to ensure no dirt is present prior to startup.

- Connect lines to cleaned dispensing blocks and purge with lubricant before connecting and purging the secondary lines prior to connecting to the bearing points.
- Check for system leaks and repair them immediately, cleaning up all traces of leaked lubricant.
- After system runs for a number of *hours*, perform a second leak check.
- After system runs for a number of *days*, perform a lubrication check at each bearing point to ensure no lubricant has purged through the bearing. If lubricant is evident, the system will require further calibration.

Existing Installations…

- Set up a PM task to regularly clean the lubrication pump and reservoir.
- To avoid cross-lubricant contamination, make sure the lubricant reservoir tag that identifies the correct lubricant matches the lubricant that's about to be dispensed into the reservoir.
- Clean the reservoir-fill area and fill with clean lubricant. When filling with oil, use a filter cart with a clean dispensing nozzle and clean dedicated transfer funnel. When filling with grease, use a fully cleaned positive-coupled air-powered grease barrel pump.
- Perform a system leak check.

Regular PM/Operator Maintenance

Daily checks are essential for ensuring that a lubrication system is operating as designed (and that lubricant is, in fact, in the system). This is often best performed by the equipment operator who visually checks the entire system in a quick system-walk-around each day and only notifies the Maintenance Department when an exception is found. Check functions can include:

- Checking reservoir fill levels: Is the level between the Lo and HI mark on the reservoir? Some systems use RAG— *Red/Amber/Green*—indicator systems (like the one shown in Fig. 1) that show when to fill the reservoir. Green denotes the high fill-line. Amber means that the reservoir needs filling, but still has a lubricant reserve that's sufficient for a user-determined number of days. Red indicates that the reserve is only good for a user-determined number of hours before the lubricant runs dry.
- Checking for/immediately reporting any system leaks.
- Checking for apparent system damage, including line crush and any overpressure indicator signal denoting back pressure in the system caused by a damaged or blocked bearing or line.
- Checking for/immediately reporting controller warning signals/lights.
- Checking that pressure filters (in recirculating oil and hydraulic systems) aren't showing red-flag signals, which would indicate a filter is full and in bypass mode.

Of course, the type of lubrication system—*as well as the lubricant used in it*—will dictate the level of checking required. For example, recirculating oil systems are prime candidates for oil analysis, allowing the lubricant to be changed only when needed (based on its condition).

Coming Up

In 2013, *LMT* will carry a new series based on the ICML (International Council of Machinery Lubrication) Body of Knowledge that's used to certify Lubrication Technologists and Analysts. The focus will be on the basic elements for understanding and implementing a best-practice GLP (Good Lubrication Practices) program in any industrial plant or facility. **LMT**

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