Automatic Lubrication Systems - Don't Work!?!

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Companies seeking ways to gain operational efficiency and increase reliability often turn to technology. Increasing productivity with reducing operating costs has become a mandate for managers. Maintenance plays an important role in increasing equipment reliability through condition monitoring of critical assets, using tools such as oil analysis, vibration analysis, thermography, etc. Each concept or tool must often be sold to the management team, who is looking for a return on the investment.

Although the technology for automatic lubrication systems has been available for many years, there is a relatively large number of people who remain unconvinced, simply rejecting the use of these systems altogether for a variety of reasons, or perhaps waiting for more data to support their use and the impact they could have on their operations.

Skilled craftspeople, like their manager partners, are generally overwhelmed with tasks and responsibilities that continue to increase as companies reduce personnel and seek lean strategies. Yet, when labor-saving devices like centralized lubrication systems are proposed, objections and observations are often put forth that contradict the proven reliability and relatively simple technology automatic lubrication systems provide. A lack of awareness of the actual return on investment system installations provide is prevalent. Even more telling is that those that have systems don't understand why anyone would resist their use.

In my opinion, the resistance to the use of lubrication systems stems from a basic lack of understanding of how these systems work. In fact, the many comments we receive as marketers, designers, and installers of automatic lubrication systems, as well as premium lubricants, suggests there are a number of objections that have no merit. While there are those that have a catastrophic story to tell, there is invariably a sound reason or set of circumstances that contributed to the failure that in almost every case could have been avoided.

Why we don't want one!

Following is a litany of what we often hear from those that resist the concept of an automatic lubrication system.

- We used to have one on that machine, we took it off.
- Systems are not reliable.
- What happens when a line plugs?

Top: Leakage should not be tolerated. Tubing runs allowed to fly freely will not last

Bottom: Components are properly mounted: two pressure gauges, one at the pump discharge and one at the furthest run from the pump.

- Lube systems are for lazy people!
- They're too complicated; we like to keep things simple.
- If we put one on, no one will look at it!
- If a line breaks, the reservoir will empty.
- If a line breaks, all of the lube will go to the path of least resistance and nothing will get greased.
- They're too expensive; we would never even consider that.
- We've never needed it before, why do we need it now?

Although these comments represent only a sampling of our own experiences in the New England states we serve, it is safe to say that many equipment caretakers hold similar opinions or thoughts regarding the use of automatic systems. In fact, I offer here a few examples that stretch credibility:

1. A major corporation has spent $25,000 this year to date on replacing bearings in an application that is extremely wet, hot, and dirty. Several types of lubricants have been evaluated, as well as bearing types. A proposal was made for an automatic lubrication system that would serve 48 bearings, for a cost of $10,000 (not installed). The maintenance team states that management does not believe that the system will address the issue.
2. 12 lubrication systems were installed on new Kenworth trucks. The systems worked reliably for 6 years, at which time the company was sold. The new owners experienced a failure on a universal joint on the steering box input shaft. They declared that the presence of the systems caused the mechanics to ignore this lube point, resulting in all 12 systems being removed from the trucks and discarded.
3. A wheel loader system was proposed for a challenging environment. ROI was calculated at 17 weeks. This did not include the projected extended component life, reduced lubricant usage, or personnel safety enhancement. The cost of $6,500 was rejected by the company management, a waste hauler with over 120 trucks and several recycling facilities. Two years later the machine was line bored and rebushed at a cost of $10,000. A system was installed then. This company implemented a policy of installing systems on every piece of equipment they procure. After installing 18 systems, the company hired an outside consultant to review the maintenance of their equipment. The consultant declared that the purchase of lubrication systems should cease. His reasoning was that the systems cause the mechanics to believe that since everything is being greased automatically, they have no need to inspect the components they would typically see when being greased manually. A suggestion was made that if the mechanic was directed to inspect all of the components when the unit is in for service that this concern would be addressed, was rejected.

Education is critical

In order to install auto lube systems, they must first be sold, so many of the objections and observations listed must be overcome in order to do so. Our task becomes one of an educator. Our mission is sharing knowledge as to the actions one must take to minimize the notion that systems are not reliable or cannot be justified economically.

Owners and potential purchasers of any lubrication system, regardless of type, can benefit by being aware of the following list of areas of concern we often see as being ***causative factors in poor system reliability.***

Method of refilling - Some grease system designs expect the user to remove a reservoir cover and refill it with their hands or a paddle or board. System refilling should not be an afterthought but rather a part of the system itself. A manually operated pail pump with a hose and QD coupler or a Fluid Safe™ container or similar vessel should be provided.

Pressure gauges - These allow personnel to confirm the pump is creating pressure and are used as a convenient diagnostic tool. Yet, many systems, particularly on heavy equipment, lack this simple and valuable component. *Any system* moving grease or oil through progressive divider valves, injectors, or flow meters (Single Line Resistance) should have a pressure gauge on it.

Filters / strainers - Rarely seen on grease systems, filters and

Right: Allowing the reservoir to be refilled by removing a spin-off lid, is a sure recipe for system contamination.

Below: A grease and oil system serving a rotary dryer in a paper mill. It utilizes QD couplers to properly fill the reservoirs, pressure gauges, oil and grease filters, proximity switches on divider valves, and redundant controls, allowing the machine it serves to start up only after the system is energized and a lube cycle has been completed. It also provides visual confirmation of a failure to complete a lube cycle, as well as a signal to the mills' DSC.

Right: Lacking a pressure gauge, it is not possible to verify operation.

strainers provide basic protection of the components downstream from contaminants that may have entered the reservoir, ensuring longer, more reliable service from the system itself.

Lubricant selection - Ignorance of the appropriate type of lubricant suitable for a specific system is one factor leading to condemnation of systems in general. If system hardware mandates the use of an NLGI # 0 grade grease or softer, it will not perform properly when an NLGI # 2 grade lubricant is used. Systems using and/or calling for an NLGI # 2 grade grease, particularly parallel injector systems, have a vent valve that relies on the grease's venting characteristics to ensure proper re-priming of the injectors in a timely manner. Inability to vent in a timely manner results in injectors that do not cycle properly, causing the resultant failure of the bearing the injector feeds. Greases that may be susceptible to separation of the oil and thickener can cause piston seizure in progressive divider valves, leading to system failure.

Quality of lubricant - Some believe that since a lubrication system meters lubricant so frequently, the quality of lubricant used is insignificant, giving license to use a cheap lubricant. Some lubricants may not possess the load carrying properties, or have the resistance to oil/thickener separation, that a superior lubricant will have. Oil/thickener separation results in the oft-cited complaint of blocked lines. Especially prevalent in progressive divider systems where residual pressure exists, separation can stop the system cold. Hence, the system malfunctions and bearings may be lost, all because of an inappropriate lubricant, not a poorly designed system or hardware failure.

The lubricant must be capable of carrying the load and reducing or eliminating metal-to-metal contact. We have serviced systems that were using inferior lubricants that operated as designed yet experienced unacceptable component life simply because the lubricant was unable to maintain an adequate film while in the contact zone. It didn't matter if the lubricant was being replenished every minute; if it was incapable of carrying the load, wear occurred.

Lacking a fundamental understanding of how the system operates and what must be done to properly maintain it is at the root of many failures.

Lack of caretakers - In my opinion, this is the most unacceptable reason why a negative opinion is formed. The initial purchaser believed there was a return on the investment and that the system would be expected to work as desired. By caring for the system and ensuring it functions correctly, one can easily ensure years of trouble-free performance and the resultant benefits lubrication systems provide. For those that may not be familiar with these benefits, I list them here for your review:

- Enhanced personnel safety
- Reduced lubricant consumption
- Dramatically extended component life
- Increased machine productivity
- Reduced product spoilage
- Reduced man hours
- Improved operating efficiency

The caretakers' responsibility comes down to a few basics:

Pump operation - When the lubrication system controller initiates a lube cycle, the pump will create

pressure. A means to verify or confirm the pressure rise should be available, and doing so should be a routine task. When the system is energized, one can check for proper operation. ***Confirming the ability of the pump to build pressure and pump lubricant should be done on a routine basis,*** be it daily, weekly, or monthly, depending on the system and application.

Lubricant use - We have received calls from those who suddenly realized the pins were squeaking on their wheel loader, or that a bearing failed, yet no one can remember the last time the reservoir was refilled. ***Properly operating systems will use lubricant, so the reservoir will require periodic refilling.***

Visual inspection - The person charged with the responsibility for ensuring the system operates properly should have a checklist. On that checklist should be a general inspection of the tubing/hose runs, as well as the system distribution components, and of course the bearings or lube points. ***A "collar" of lubricant should be visible at the lubrication points; tubing, hoses, and components should be properly attached; and there should be no signs of leakage anywhere within the distribution system.*** In short, we like to say…

- the reservoir will go down
- lubricant will appear at the bearing points
- nothing should leak
- the pump should build pressure

System knowledge - ***Lacking a fundamental understanding of how the system operates and what must be done to properly maintain it is at the root of many failures.*** A progressive divider type system is not designed to allow elimination of a discharge port one no longer wants to use. Doing so results in a no lubricant condition; as this is one of the benefits of a progressive divider design, a blocked lube point will alert personnel to that condition. Yet the system will be non-operational because of personnel intervention, and of course a negative opinion will be formed.

Vendor support - Providing proper support to our clients to ensure reliable system operation is a mandate. ***The lubrication system vendor has the responsibility to the owner and purchaser to educate and share information freely to ensure that the system performs as expected for many years with minimal maintenance cost.***

Summary - A properly designed and installed system will provide years of reliable service. It cannot, however, do so without proper care. Like any other machine or asset, it requires care and understanding of system functionality and a partner vested in their success.

About the author:

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