Extending the Useful Life of Lubrication Systems

Extended warranties being offered by manufacturers of lubrication equipment has caused them focused attention on how to extend the useful life of the equipment and possible revisions to installation practices and materials used to provide greater scrutiny.

Leading lubrication equipment manufacturers have extended their warranties to replace defective parts and pay for the labor to make repairs from the customary one-year to two-, three- and even five years. These extended warranties have resulted in the manufacturers focusing attention on how to extend the useful life of the lubrication equipment to control warranty costs. Installation practices and materials used to install the equipment received close scrutiny since they can affect the performance and life of the equipment, as can the lack of safety devices designed to shut down systems operating abnormally. The following guidelines are suggested to ensure equipment longevity and promote safety.

Air System Design

The air system design for a service facility should be based on the typical cubic feet of air per minute (CFM) required for the air-operated equipment typically used in a fleet maintenance garage. The compressor capacity (in horsepower, pressure and storage tank capacity) and the size and configuration of the air piping is dependant on the volume of air required under normal operations with an allowance for operation at excess capacity. The following chart reflects the recommended pipe sizes after determining the CFM compressed air needed to be delivered.

The compressed air system must be free of moisture, pipe scale and other contaminates. Non-corrosive pipe such as galvanized pipe or copper tubing are best suited for compressed air systems to eliminate rust and scale. Regular routine maintenance should include checking the oil level in the compressor and draining the air compressor tank/reservoir of water to prevent rust and scale from entering the compressed air piping system. The installation of an automatic tank drain will assist with keeping the tank/reservoir free of collected moisture. This optional device will discharge any collected moisture when the compressor starts each cycle or it may discharge on a time delay interval. Either method will assure tank drainage on a regular basis. A refrigerant dryer may be used to eliminate excessive moisture, particularly where air will be used for spray painting.

Minimum Recommended Air Mainsizes

The main airline supply piping should slope approximately 4 degrees away from the pumps to facilitate water draining back to the compressor. All of the branch lines off of the main air supply header line should branch upward before dropping down and at each drop should have a drip leg of 12 to 18 inches below the outlet with a drain valve at the bottom to remove water.

Drops should be equipped with a properly sized airline filter with automatic drains at outlets where pneumatic tools will be used. These will further protect the equipment from contaminates and moisture. Use an air pressure regulators with gauges should be used on lubrication pumps to set the correct system operating pressures to control fluid flow rates. The installation of an airline lubricator will improve the performance and life to all pneumatic devices.

Lubrication Pumps

Lubrication pumps are designed to pump from either underground storage tanks (UST), above ground storage tanks and refinery drums. Underground storage tanks are typically pump may be wall mounted or directly connected to an underground tank suction standpipe. The same configurations may be used for above ground storage tanks. The installation of a check valve to maintain the prime on the suction line is important in all applications. The type of tanks used is usually restricted by local fire codes and may be of single- or double-wall construction and may be required to be 'fire protected' or 'fire resistant' if used aboveground.

Drum pumps are heavy and cumbersome to remove from a drum. Although there are several methods to do this, we recommend the use of either wall-mounting the pump and utilizing a suction wand assembly, or using an air operated hoist to raise the pump above the drum, making it easy to replace the drum with a full one. This prevents back injuries caused by lifting and increases product longevity and reduces the possibility of contamination entering the pump inlet.

Pump selection should be based on the application. Manufacturer's catalogs provide the pump performance specifications and indicate gallons per minute delivered and number of dispensing points that can be served simultaneously. Additionally, it may be helpful to determine the annual oil consumption of the fleet. Balcrank publishes a pump selection chart to assist with the selection of their pumps based on the annual oil consumption of each oil product.

Safety protection devices

Thermal expansion of petroleum lubricating oils due to increased temperatures can cause excessive in-line pressure that can cause premature equipment failures, as well present as a safety hazard. Seals, swivels, hose, hose couplings, meters and other equipment are susceptible to premature failure due to excessive pressure. Pressure relief valves that discharge when excessive pressure is sensed should be provided at the outlet of each pump to eliminate this potential problem.

If a storage tank is emptied and or a suction line is ruptured, the pneumatic pump will run

continuously, leading to premature pump failure and, in some cases, an environmental problem. Installing pump over-run control valves at the air inlet of the pump can eliminate this problem. These devises automatically shut off air to the pump if the fluid supply is empty or if the fluid line is broken and excessive air consumption by the pump is detected.

The growing trend is to use annealed steel hydraulic tubing for supply piping instead of threaded pipe. Radius bends with tubing reduce restrictions at 90-degree elbows and the resultant pressure loss. The tubing size and pressure rating are determined for each product being pumped and the associated pump pressure.

The heavy-duty end result

Heavy-duty hose reels, designed for heavy use typical of the fleet maintenance facilities, have heavy duty main springs, double arm construction for rigidity, multi-position heavy duty cast locking mechanisms, tangential outlet arms which reduces hose wear, and in some cases, lifetime lubricated bearings. Consideration should be given to using single wire braid hose on air reels since rayon braid hose may be too elastic for heavy-duty applications and wire braid hose will withstand the hard use.

The durability of oil dispensing meters is of prime importance. Whether electronic or mechanical meters, the selection of a high quality heavy duty meter is very important since these devices are the most used and abused component of the entire lubrication system. As a general rule, the parts of any system that is handled by individuals regularly will be the most trouble prone.

Maintenance

We have emphasized the importance of system design, use of safety devices and pressure controls, and the advantages of heavy-duty equipment. However, there is no substitute for a properly managed maintenance program. Although we've elaborated on many optional safety and automatic control devices, there is no substitute for hands-on physical attention that should be given to all systems. Attention must be given to compressor air filters changing them when needed, air line filters equipped with the automatic drain feature can clog with debris therefore the orifice may need to be cleared and a visual inspection of the entire piping system should be completed looking for air and/or fluid leaks. Any imperfections with these systems should be addressed and corrected immediately since they not only hinder the performance of the system but may also create certain safety hazards. All compressed air and fluid dispensing systems must be maintained on a regular routine maintenance schedule.

Following these precautions can ensure continued acceptable performance while extending the life of the lubrication equipment dispensing system and the compressed air system. An efficient and reliable system begins with proper design. Teamwork consisting of engineers and architects, management and maintenance personnel for whom the system is being created for and a representative from a qualified lubrication equipment manufacturer together will assure a properly designed system. Automatic control devices will keep these systems in a safe operating range however, there can be no substitute for physical hands-on attention.

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