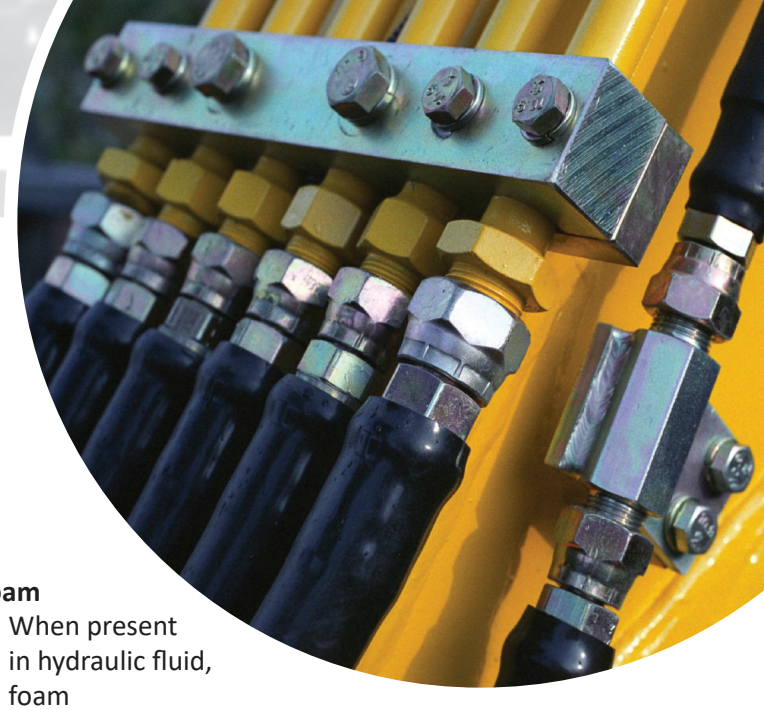

Best Practices Maximize Hydraulic Life

One of the best ways to ensure smooth-running hydraulic systems is to use the right hydraulic oil and keep it clean and dry. A lubrication reliability effort that includes selecting the right fluid and implementing the correct reliability best practices will protect metal surfaces from wear, leading to improved uptime, reduced maintenance costs, and longer lubricant and equipment life.

Hydraulic systems have become more sophisticated in recent years, as speed and pressure have increased tremendously. Because of these changes, wear rates have gone up dramatically and proper selection of hydraulic oil has become much more important.

Hydraulic Oil Selection Considerations

Viscosity

- The oil selected must have the right viscosity and be able to maintain its viscosity throughout its working life.
- Maintaining viscosity is influenced by the oil's ability to withstand oxidation, resist foam, separate from water, and withstand effects from temperature fluctuations.

Oxidation

- Oxidation rates increase with temperature and as the percentage of contaminants in the system increases.
- The right oxidation inhibitors can help extend oil life and prevent costly changeouts.

Foam

- When present in hydraulic fluid, foam is normally a symptom of another problem; however, it can also cause several issues, including oxidation, viscosity changes, cavitation and micro-dieseling, elevated temperatures, reduced film strength, increased oil compressibility, and varnish.
- Controlling foam is essential to hydraulic performance; select a fluid that will not foam in service.

Water

- Hydraulic oils – other than fire-resistant fluids – should shed water quickly so it can be removed. If not, emulsification will lead to equipment failure and performance loss.

Rust and corrosion

- With the right additive package, hydraulic oil will provide long-term protection from rust and corrosion.

Reliability Program

After selecting the right oil for the job, the next step is to put the rest of the lubrication reliability program in place. Add oil analysis to begin predictive trending of oil and asset condition; and use filtration, breathers and sight glasses to keep the oil clean and dry. With these solutions, you can start to safely extend the life of the asset and the oil – saving time and money.

Components of an Effective Hydraulic Lubrication Program

Hydraulic Fluid Selection

Oil Analysis

Contamination Exclusion & Removal

Identify the suffering points

Move forward with proven solutions for extending hydraulic components

Contamination: Oil cleanliness is imperative to the reliable operation of hydraulic components. Typical contaminants include dirt, process material, wear debris and water. Contaminated oil leads to problems such as wear, corrosion, accelerated degradation of oil, sluggish operation and component failures.

LE Solution: Routine filtration is a simple, effective way to extend oil and equipment life. Understanding, achieving and maintaining the right ISO cleanliness standard for hydraulic applications can extend the life of the oil by two to three times. LE offers a line of high-quality filtration equipment to help with this effort.

- Xtract® Portable Filter Cart
- Xtract® Portable Drum Topper
- Xtract® Dedicated Panel Unit
- Xtract® Hydraulic Adapter Kit

Time-Based Oil Changes: Changing oil on a time-based interval is wasteful and unnecessary. Instead, successful programs incorporate condition-based changes to minimize costs while ensuring efficient hydraulic performance.

LE Solution: A good oil analysis program is integral to any successful lubricant reliability program. With consistent, accurate monitoring of the condition of your oil, an oil analysis program can help you improve your bottom line with less lubricant to purchase, fewer parts to keep in inventory, less used lubricant requiring disposal, less labor and less downtime. LE's oil analysis program monitors oil samples for mechanical, operational and environmental factors that can affect equipment and oil life, and helps you make informed decisions. For hydraulic systems, LE recommends one of the following packages.

- Xamine® Basic Industrial with PQ
- Xamine® Advanced Industrial

Underperforming Hydraulic Fluid: OEMs typically recommend an ISO viscosity grade for hydraulic systems, while other characteristics are often ignored. Hydraulic fluids vary in many key properties, including their thermal and oxidative stability, friction reduction capability, detergency, anti-foam characteristics, demulsibility, hydrolytic stability, and ability to maintain viscosity across the temperature range. When any of these properties in a hydraulic fluid are not up to the challenges the equipment and environment pose, they can compound challenges in other areas. Further, some applications or environments have specific requirements, such as fire resistance, food grade, environmental, and dielectric strength.

LE Solution: With both system performance and equipment reliability affected by the lubricant, selecting the right fluid is of utmost importance. Working with a knowledgeable consultant who can help you select and maintain your hydraulic fluid can be the difference between trouble-free operation or continuous problems. LE provides a range of hydraulic fluids for various applications and environments – including those listed below – all of which are engineered to provide the best protection for your equipment.

- H1 Quinplex® Synthetic Food Grade Oil
- H1 Quinplex® White Oil
- Equipower™ Hydraulic Oil
- Equipower™ Ultra Hydraulic Oil
- Equipower™ Ultra HVI Hydraulic Oil
- Low Tox® Hydraulic Oil
- Monolec® Drive Train Fluid
- Multilec® Industrial Oil

Full Circle of Reliability

Armed with knowledge of best practices and all of the necessary tools to get the job done, your local LE lubrication consultant will help you plan and implement a world class lubrication reliability program to protect your assets.

LE Enhanced Lubricants

Xpert Services

Xpert Training

Xpert Equipment Reliability & Assessment

Xamine Oil Analysis

Xclude Contamination Exclusion

Xtract Contamination Removal

Xtract Filtration

Xtract Oil Sight Glasses

Xtract Hydraulic Adapter Kit

LE's state-of-the-art manufacturing facility, technology center, warehouse and primary office is located in Wichita, KS, with regional distribution out of Knoxville, TN, and Las Vegas, NV. Additional support functions are located in Fort Worth, TX. The company's international presence includes distributors in more than 60 countries.

LE Helps Protect Your Equipment & Grow Your Bottom Line

Leaders in Lubricants Since 1951

Lubrication Engineers, Inc. is the total solutions provider for lubrication reliability. We work closely with our customers to learn about their specific equipment and lubrication needs, and then help them create a world class lubrication reliability program that provides equipment protection and enhanced profits.

We start with an onsite equipment assessment. A trained, local lubrication consultant provides a detailed report recommending lubricants, application methods, usage amounts, and drain or lube intervals.

LE's line of high-performance lubricants – manufactured in the U.S. and made of highly refined base oils and proprietary additives – far exceed the performance of conventional lubricants in a wide variety of industrial and automotive applications. In addition, your LE consultant can offer you several other best practice products and services to ensure the effectiveness of your program, including solutions for oil analysis, storage, handling and transfer, contamination exclusion, contamination removal, education and training.

Does your lubricant supplier do all of this?

- ✔ Professional, onsite equipment reliability assessment
- ✔ Comprehensive lubricant line (industrial oils, engine oils and greases)
- ✔ Web-based oil analysis, with results reviewed by experts
- ✔ Storage systems, including stackable bulk units
- ✔ Visual identification, including tags, labels, color-coding and wall charts
- ✔ Handling and transfer equipment, including portable transfer containers, clear grease guns, grease pumps and lube reels
- ✔ Single- and multi-point automatic grease lubricators and lubricating systems
- ✔ Contamination exclusion and removal tools, including oil reservoir sight glasses, desiccant breathers and filtration equipment
- ✔ Local, factory-trained specialist available 24/7

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