



LUBRICATION ENGINEERS®

OIL & GAS PRODUCTION FRAC TRUCKS



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Crack open the savings

Let LE help you lower your operational costs by decreasing downtime, increasing lube intervals and prolonging the life of your equipment.

When your business and profits depend on maximizing uptime and keeping your machinery running as efficiently as possible, the right lubricants can be just the solution you need. Instead of frequent top-offs of inferior oil, LE recommends you invest in long-lasting, high-performance lubricants that will significantly lower your fleet operating costs over time by simultaneously extending your oil drains and equipment life, while decreasing downtime.

We've identified three of the most common factors causing problems at hydraulic fracturing operations: heat, water and contamination. Together or separately, these three factors can slow production and cut into profits by causing wear and tear on the truck and deck components of your fracking rigs.

Following is information about each of these harmful factors, along with our recommended lubricant solutions for keeping your valuable equipment running and drastically reducing the need for repairs and rebuilds.

Heat

The ambient temperatures of the outdoor environment combined with high operating temperatures experienced by fracking equipment are hard on the lubricants. The heat can cause oxidation, which in turn affects lubricant viscosity and leads to lubricant degradation and shortened lubricant life.

LE Solution

• **High-Quality Lubricants** are the key to equipment performance. It is of vital importance that the right lubricant be used for each application. LE lubricants are formulated with highly refined or synthetic base oils and proprietary additives that combat heat and oxidation.



LE's enhanced lubricants deliver superior performance over conventional lubricants. They last longer – requiring fewer changes or top-offs – and provide better protection. We have documented results showing that LE lubricants help equipment run cooler, with component and lubricant life extended by up to two to three times.

Water

Frac equipment comes into frequent contact with water, whether from rain and other precipitation or from washing and the nature of the frac operation.

Condensation inside gearboxes and pumps is a



common problem that leads to costly downtime and repairs. This could be caused by direct impingement, by moisture in the air that is breathed into the equipment due to temperature changes, or by loss of integrity in the seal.

Some commercial quality lubricants are either removed or weakened by this frequent exposure to water.

LE Solution

• **Lubricants with demulsibility characteristics** keep water separate from oil so it can be removed. LE's Duolec® Vari-Purpose Gear Lubricant, for example, separates readily from water without emulsifying or foaming. It continues to provide effective lubrication and does not lose effectiveness after filtration.

• **Water-resistant lubricants** such as LE's will adhere better to metal because they are formulated with water-resistant polymers and/or thickeners. It is also important for lubricants in frequent contact with water to be able to shed or tolerate water without dramatically losing their original lubrication performance properties.

• **The right greases** should be chosen for applications where washout is a problem or where the grease needs to repel or seal out water. For example, LE's Almaplex® Industrial Lubricant has a robust aluminum complex formulation that seals out water and other contaminants and will not emulsify or wash out when moisture is present.

Contamination

Dust and dirt are other common sources of contamination for hydraulic fracturing operations. These contaminants and other particulates from the outdoor environment can create problems with your truck and other equipment. Even very small particles that contaminate the lubricant can cause significant wear and tear.



LE Solution

• **Lubricants** are the lifeblood of your equipment. The right lubricant should be chosen for each piece of equipment. LE experts can help recommend what you need for your equipment to ensure it receives the best protection possible.

• **LE's Monolec® engine oils** feature robust additive packages with heavy-duty detergents and dispersants to combat contaminant ingress and increase the efficiency of the equipment's in-line factory filtration.

• **High-quality greases** that stay in place under harsh conditions – resisting pound-out, wash-out and run-out – are better able to seal out harmful contaminants. LE has a range of greases to choose from – including its popular Almagard® Vari-Purpose Lubricant – to best match the needs of your equipment and environmental conditions.



Quality Matters

High-quality lubricants – chosen wisely and cared for properly for each piece of equipment – can prolong equipment life as well as reduce downtime and lubricant costs.

What challenges are you facing?

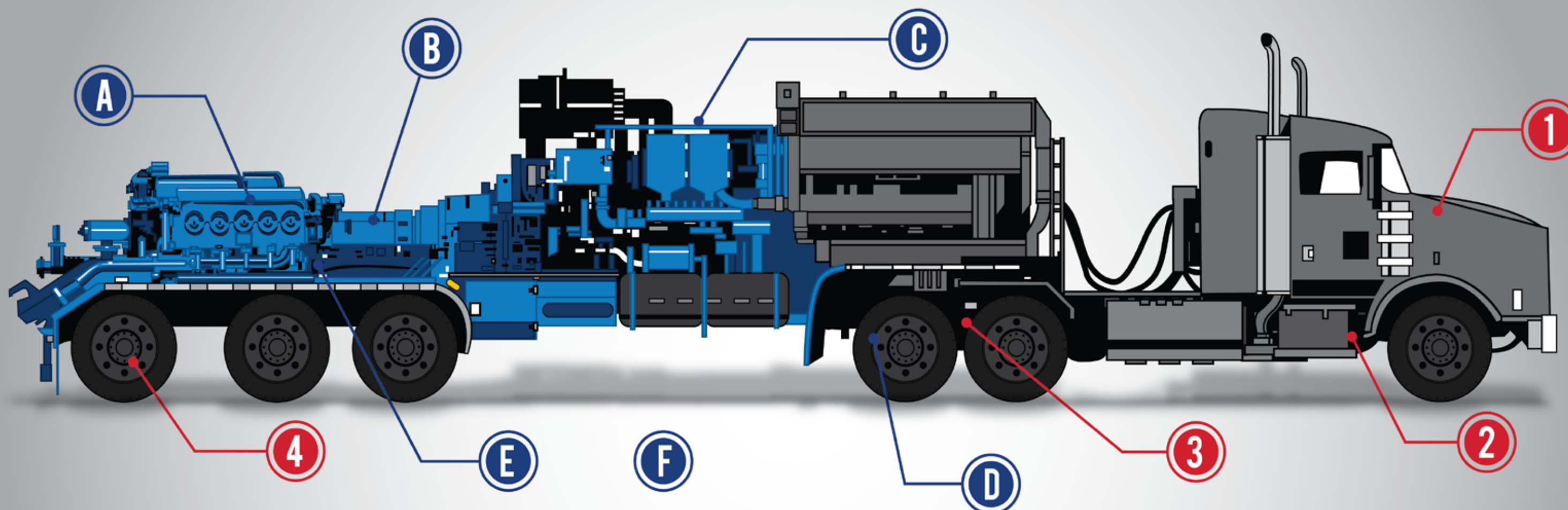
No matter what reliability challenges you are experiencing, LE has the expertise, products and services to create the best solutions for you. There's no need to go it alone when you can contact your local LE consultant for help today.

800-537-7683 • www.LElubricants.com



HYDRAULIC FRACTURING RIG

Recommended LE Products for Lowering Your Operating Costs



DECK

- A** **Triplex or Quintuplex Pump**
Duolec® Industrial Gear Oil (1604-1605, 1304)
Monolec® Gear Lubricant (703)
Monolec® Industrial Lubricant (4701-4702)
Almagard® Vari-Purpose Lubricant (3752)
- B** **Transmission**
Monolec® Engine Oil (8700)
Monolec Ultra® Syn Heavy Duty Engine Oil (8854-8855)
Monolec Ultra® Engine Oil (8800-8801)
Monolec® Drive Train Fluid (7531)
- C** **Deck Engine**
Monolec® Engine Oil (8700)
Monolec Ultra® Syn Heavy Duty Engine Oil (8854-8855)
Monolec Ultra® Engine Oil (8800-8801)
Full Torque™ Diesel Fuel Improvers (2411, 2421)
- D** **King Pin & Fifth Wheel**
Almagard® Vari-Purpose Lubricant (3752)
Monolec® Multiplex Lubricant (4622)
Almaplex® Industrial Lubricant (1275)
- E** **Centralized Lube System**
Monolec® Industrial Lubricant (4701-4702)
- F** **Hydraulics**
Equipower™ Hydraulic Oil (4932-4934)
Equipower™ Ultra Hydraulic Oil (6132, 6146, 6168)
Equipower™ Ultra HVI Hydraulic Oil (6522, 6532, 6546)
Low Tox® Hydraulic Oil (6603)

TRUCK

- 1** **Engine**
Monolec Ultra® Syn Heavy Duty Engine Oil (8854-8855)
Monolec Ultra® Engine Oil (8800-8801)
Full Torque™ Diesel Fuel Improvers (2411, 2421)
- 2** **Transmission**
Synolec® Transmission Fluid (640)
Monolec® Power Fluid (7500)
- 3** **Differential Axles**
Duolec® Industrial Gear Oil (1605)
Monolec® Gear Lubricant (703)
Monolec® Syn All-Climate Gear Lubricant (9919-9920)
- 4** **Wheel Bearings**
Monolec® Multiplex Lubricant (4622)
Almaplex® Industrial Lubricant (1275)

All Over Rig
Rods, Pins, Bearings, U-joints & Other Gear Points
Almagard® Vari-Purpose Lubricant (3752)
Monolec® Multiplex Lubricant (4622)
Almaplex® Industrial Lubricant (1275)

LE Provides Solutions for Frac Truck Operators

Ensuring Reliability Since 1951

Like other businesses that rely on efficient, long-lasting operation of their expensive equipment, frac truck operators can benefit from the standout mix of products, services, knowledge and experience offered by LE. With years of experience in the field, we understand the unique challenges presented by hydraulic fracturing and can help you take care of your valuable assets while lowering your costs.

LE's enhanced lubricants, made of highly refined base oils and proprietary additives, far exceed the performance of conventional lubricants. They extend lubrication intervals and equipment life and significantly reduce wear, energy use, downtime and maintenance.

We also offer a full line of lubrication reliability products and services, including solutions for oil analysis, storage, handling and transfer, contamination exclusion and removal, and education and training.

The LE Difference

Comprehensive Product Line & Full-Service Support

- Complete reliability program, including lubricants, reliability products and services
- Trained, local lubrication consultant to visit on a regular basis
- Corporate technical support to offer expert advice and troubleshooting

Research & Development

- Technology Center that continually develops and improves LE lubricants and additives
- Advanced technology to ensure that LE products remain the finest available

Proprietary Additives

LE has developed four high-performance additives for exclusive use in its lubricants.

- Almasol® solid wear-reducing additive
- Monolec® liquid wear-reducing additive
- Duolec® dual-acting (wear-reducing and extreme pressure) additive
- Quinplex® impact- and water-resistant additive



LE's state-of-the-art manufacturing facility, technology center and office are located in Wichita, KS. Our nationwide network of trained lubrication consultants ensures timely onsite assistance after the sale.



Nearly 60 percent of LE's lubricant orders are on the road the same day we receive them, while 95 percent go out in one day or less. Distribution comes out of Wichita as well as warehouses in Knoxville, TN, and Las Vegas, NV.



Greater ROI through Enhanced Lubricants

Investing in better performing lubricants can make your operation more reliable by protecting your equipment and keeping it running longer and more efficiently. By significantly reducing downtime and maintenance costs, LE lubricants are also cost-effective, returning the initial price of the lubricant many times over. From LE's broad offering of premium industrial lubricants, we are able to make recommendations based on your specific needs. Following is a list of LE lubricants that are recommended for hydraulic fracturing rigs.

Engine Oils

Increased fuel efficiency, dependable all-weather performance and outstanding wear protection

- Monolec® Engine Oil (8700)
- Monolec Ultra® Engine Oil (8800-8801)
- Monolec Ultra® Syn Heavy Duty Engine Oil (8854)

Fuel Improvers

Maximum fuel economy, longer equipment life, reduced emissions and lower cost per mile or hour of operation

- Full Torque™ Diesel Fuel Improvers (2411, 2421)

Gear Oils

Longer gear life with less maintenance expense, less downtime & extended drain intervals

- Duolec® Industrial Gear Oil (1604-1605)
- Monolec® Gear Lubricant (703)
- Monolec® Syn All-Climate Gear Lubricant (9919-9923)

Hydraulic Oils

Smoother ride and longer-lasting equipment, with protection from water, rust, corrosion & oxidation

- Equipower™ Hydraulic Oil (4932-4934)
- Equipower™ Ultra Hydraulic Oil (6132, 6146, 6168)
- Equipower™ Ultra HVI Hydraulic Oil (6522, 6532, 6546)
- Low Tox® Hydraulic Oil (6603)

Greases

Exceptional long-lasting wear protection

- Almagard® Vari-Purpose Lubricant (3752)
- Almaplex® Industrial Lubricant (1275)
- Monolec® Industrial Lubricant (4701-4702)
- Monolec® Multiplex Lubricant (4622)

Transmission Fluids

Reduced wear, longer transmission life & extended drain intervals

- Synolec® Transmission Fluid (640)
- Monolec® Power Fluid (7500)
- Monolec® Drive Train Fluid (7531)

For detailed descriptions and technical information for each of these lubricants, visit the product pages at www.LElubricants.com, refer to individual product flyers available online or in print, or contact your local LE consultant for assistance.

Proprietary Additives

Most of LE's recommended lubricants for fracv trucks contain our one or more of our following proprietary additives, each of which minimizes metal-to-metal contact and greatly reduces friction, heat and wear.

• **Duolec®** dual-acting additive imparts synergistic properties to lubricants, providing both wear-reducing and extreme pressure protection. The result of revolutionary technology designed specifically for use in LE gear lubricants, Duolec increases oil film strength and is temperature-activated to provide a protective layer that smooths metal surfaces and minimizes the effects of any contact.

• **Almasol®** solid wear-reducing additive withstands extremely heavy loads, chemical attack and temperatures up to 1,900°F (1,038°C). It is attracted to metal surfaces, forming a microscopic layer but not building on itself or affecting clearances.

• **Monolec®** wear-reducing additive creates a single molecular lubricating film on metal surfaces, vastly increasing oil film strength without affecting clearances. Monolec allows opposing surfaces to slide by one another.





Does your lubricant supplier do all of this?

If your lubricant supplier does not provide the products, services and results listed below as part of its lubrication reliability program, perhaps it is time to change suppliers.

- ✓ 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



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.

Equipower™, Asset Reliability Solutions™, Tetra-Syn™ and Full Torque™ are trademarks and Almasol®, Monolec®, Duolect®, Quinplex®, Monolec Ultra®, Synolec®, L-X®, Almagard®, Almaplex® and Greentastic® are registered trademarks; all of Lubrication Engineers, Inc.

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