Service Line
NEWS AND IDEAS FROM AMSOIL

AMSOIL Delivers Diverse Line of Products

AMSOIL Oils, Lubes, Filters Fit Needs of Multiple Markets

In 1972, AMSOIL INC. introduced the first synthetic motor oil in the world to meet American Petroleum Institute (API) service requirements. This oil set all new standards for motor oil quality. AMSOIL synthetic motor oil outperformed conventional petroleum motor oil on all counts. AMSOIL went on to develop a complete line of industry firsts, including synthetic diesel oils, racing oils, marine oils, two-cycle oils and gear lubes.

In the years since, AMSOIL INC. followed those industry firsts with continuing development of superior products. The year 2004 saw the introduction of a diverse group of products specifically engineered to meet the needs of virtually all markets. To learn about other AMSOIL products, contact your AMSOIL servicing Dealer, or visit the web at www.amsoil.com.

5W-40 Synthetic European Motor Oil

European vehicle manufacturers generally recommend premium quality oils of 5W-40 viscosity grade, ensuring protection over extended drain intervals and in all operating conditions. AMSOIL Synthetic 5W-40 European Motor Oil (AFL) is specially formulated for the lubrication needs of European gasoline and diesel cars and light trucks. Blended with advanced AMSOIL synthetic base stocks, premium additives and a broad 5W-40 viscosity rating, AMSOIL Synthetic European Motor Oil allows motorists to take advantage of the maximum extended drain intervals recommended by European automakers while providing second-to-none protection and performance.

AMSOIL Marine Gear Lube

AMSOIL Universal Marine Gear Lube (AGM) is an exclusive formulation of AMSOIL synthetic base oils and high performance additives engineered for the specific demands of marine applications. AMSOIL Marine Gear Lube is convenient and versatile. It replaces both 75W-90 and 80W-90 gear lubes and is recommended for all outboard lower units, stern drives, V-drives, bow and tunnel thrusters and marine transmissions meeting GL-4 and GL-5 specifications. AMSOIL Synthetic Marine Gear Lube is an extreme pressure lubricant that provides superior protection from shock loading caused by propellar cavitation. It is water resistant and non-foaming. It maintains full lube film, providing optimum lubrication, and retains extreme pressure protection, even when subjected to 10 percent water contamination.

Marine Dual Remote Filtration System

Specifically designed for the severe operating conditions of recreational and light commercial marine applications that use inboard or inboard/outboard stern drive engines, the Marine Dual Remote Filtration System (BMK-18) offers easily accessible remote mounting capability for a full flow and spin-on style by-pass oil filter. The Marine Dual Remote Filtration System provides highly efficient oil filtration, increased oil capacity, longer oil and filter life and the ability to remove moisture and condensation. Adapter kits of four different sizes allow the BMK-18 to be used with a wide variety of marine engines.

Severe Gear™ Synthetic EP Gear Lubes (75W-90 & 75W-140)

AMSOIL Severe Gear™ Synthetic EP Gear Lubes (SVG & SVO) are engineered for high demand applications, including trailer towing, heavy hauling, 4x4 off road driving, commercial use and racing. Superior lube "film strength" and extra additives effectively protect gears and bearings from scoring and wear, while resisting high heat and providing excellent cold flow properties. SEVERE GEAR™ Gear Lubes outperform all conventional gear oils, are compatible with most limited-slip differentials and are recommended for all types of vehicles such as turbo diesel pick-ups, SUVs, autos, trucks, heavy equipment and motor homes.

Price Adjustment Effective April 1

Increasing costs to AMSOIL for raw materials, packaging and shipping necessitate a price adjustment for customers in the U.S. and Puerto Rico effective as of April 1. Look for a complimentary price list that reflects those price adjustments in this issue of the *Service Line*.

What Are Synthetic Lubricants?

Engines, transmissions and other mechanical systems contain hundreds of moving parts. Though the metal surfaces of these parts look smooth, they are actually full of microscopic peaks and valleys. When the peak of one surface touches its mating surface, it causes damage. Damage may lead to component failure or wear. Failure prevention and wear reduction are the primary functions of lubrication.

REFINED OILS

Conventional oils – the oils most people are familiar with – are refined from crude oil. Refining is a process of physically separating light oil components from heavy ones.

Crude oil contains millions of different kinds of molecules. Many are similar in weight but not in structure. The refining process cannot distinguish such molecules, so a wide assortment of molecules is present in the finished lubricant made from crude oil stocks.

Some crude oil molecules are not beneficial to the lubrication process. For example, paraffin causes refined lubricants to thicken and flow poorly in cold temperatures. Molecules containing sulfur, nitrogen and other elements invite the formation of sludge and other products of lubricant breakdown, especially in high-temperature applications. Sludge and breakdown products significantly increase wear rates.

The assorted molecules of refined lubricants also have different shapes, making lubricant surfaces irregular at the molecular level. As lubricant layers flow

The main advantage of mineral oils is their low cost. The main limitation of mineral oils is that … the lubricant-sized molecules have a variety of structures ranging from the best to the worst (in terms of wear control).

– A. Jackson, *Mechanical Engineering Transactions*

across one another during the lubrication process, these irregularities create friction, which consumes power, reduces efficiency and increases heat and wear.

SYNTHETIC LUBRICANTS

Synthetic lubricants are chemically engineered from pure chemicals rather than refined from crude oil. That gives them significant advantages over refined oils.

Pure – The feedstocks from which synthetic lubricants are made do not contain sulfur, nitrogen or other elements that invite the formation of sludge and other products of lubricant breakdown. Synthetic lubricants can be used in higher temperatures than refined lubricants without breaking down. Their resistance to breakdown also allows them to be used longer than refined lubricants can be used. Lubricated systems stay cleaner and last longer with synthetic lubricants.

Synthetic lubricants differ from refined oils in three key ways: synthetics are pure, their molecular structure is uniform, and they may be designed to work in applications in which refined oils cannot.

Uniform – The feedstocks from which synthetic lubricants are made feature uniform and smooth molecular structures, which ensures low friction as lubricant layers slide across one another. Reduced friction increases energy through-put for greater fuel efficiency and power and reduces heat and wear for longer equipment life.

Molecular uniformity also helps synthetics resist thinning in heat and thickening in cold, which helps them protect better than refined oils over a system's operating temperature range and helps ensure secure sealing.

Field experience has shown that synthetics can give economic benefits when used in place of mineral oils which were working satisfactorily. The benefits fall in five general areas:

- **Improved energy efficiency**
- **Wider operating temperature range**
- **Increased design ratings**
- **Reduced maintenance**
- **Better reliability and safer operation**

– A. Jackson,
Mechanical Engineering Transactions

Designable – Many different kinds of feedstocks may be used to create synthetic lubricants, allowing a synthetic to be designed for virtually any application. Some feedstocks are ideal for use in extremely cold environments. Others are perfect for use in extreme heat. Some are extremely safe in applications in which refined lubricants pose a fire or explosion hazard. Refined oils simply do not offer the design flexibility synthetics offer.

The design flexibility of synthetics also allows them to be tailored very specifically to the needs of everyday applications, such as automotive engines, commercial equipment or much industrial machinery. That specificity helps ensure long life and peak power, performance and fuel economy from the lubricated system and long lubricant life.

Why Are AMSOIL Synthetic Lubricants Best?

Lieutenant Colonel Albert J. Amatuzio served as an award-winning jet fighter pilot for 25 years and had ample opportunity to witness synthetic lubricants in action. These oils are used exclusively in jet engines because of three extraordinary performance characteristics: an ability to reduce friction and wear, an ability to function dependably at temperature extremes and an ability to withstand rigorous and lengthy engine operation without chemical breakdown.

Recognizing that these same lubricant characteristics would benefit automotive and other reciprocating engines, Al Amatuzio formulated the world's first synthetic motor oil to meet American Petroleum Institute (API) service requirements for automobiles. The new lubricant performed like no other before it. When the first can of AMSOIL Synthetic 10W-40 Motor Oil appeared on the market in 1972, it signaled the birth of an industry. During the past 30 years, AMSOIL synthetic lubricants have expanded the boundaries of lubrication science and redefined the performance possibilities of engines, equipment and machinery in automotive, commercial and industrial use. Why are AMSOIL synthetic lubricants the best lubricants available? Take a look.

MOLECULAR ENGINEERING

AMSOIL lubricants are synthesized, not refined. Refining doesn't remove critical impurities, and the lubrication and performance qualities of refined petroleum lubricants are limited. AMSOIL lubricants are impurity-free and offer superior performance and greater versatility.

HIGH-TEMPERATURE PROTECTION AND PERFORMANCE

AMSOIL synthetic lubricants are much more stable in high temperatures than refined oils are. Their superior heat stability reduces the rates of oil consumption, lubricant breakdown and lubricant oxidation, which keeps oil consumption low; equipment clean, protected and running right; and extends lubricant life.

COLD-TEMPERATURE PROTECTION AND PERFORMANCE

AMSOIL synthetic lubricants remain fluid in temperatures far below zero, allowing dependable engine start-up, fast lubrication, dependable protection and maximum fuel economy in severe cold operations.

INCREASED EFFICIENCY

AMSOIL synthetic lubricants are superior to refined oils in reducing friction, helping lubricated systems use fuel energy for work, not for overcoming drag. Superior friction reduction, as well as lower volatility rates, also helps keep exhaust emissions low.

LONGER ENGINE AND EQUIPMENT LIFE

AMSOIL synthetic lubricants' heat stability and friction-reducing ability keep wear rates low, which helps increase the time to first teardown, increases the interval between teardowns and increases overall equipment life.

EXTENDED LUBRICANT DRAIN INTERVALS

AMSOIL synthetic lubricants offer eight times the service life offered by refined lubricants, and sometimes even more. The long life of AMSOIL synthetic lubricants reduces costs, downtime, waste and environmental damage.

PRODUCT LINE

AMSOIL manufactures synthetic lubricants, advanced filtration systems, fuel additives and coolants for virtually every commercial, industrial or automotive application.

QUALITY CONTROL

AMSOIL synthetic lubricants are manufactured from top-quality synthetic basestocks and performance additives according to a stringent quality control protocol in computer-controlled AMSOIL manufacturing facilities. AMSOIL synthetic lubricants may be counted on to deliver the same top quality performance and protection every time they are used, no matter where in the world they are purchased.

EXPERIENCE

AMSOIL formulated the first API synthetic motor oil in the world and has more experience formulating synthetic lubricants than any other manufacturer in the world. AMSOIL leads the industry in product quality and innovation.

AMSOIL Keeps Heavy Duty Trucks on the Roads

Heavy equipment owners and operators know the toll heavy loads take on their expensive equipment.

The only way to protect and improve the bottom line is to reduce maintenance costs and downtime.

Mike Tauber, of Linthicum Heights, Md., the owner of Tauber's, a towing and recovery truck company, has cut lost time and costs by using AMSOIL synthetic motor oils and lubricants for the past 10 years.

Tauber owns the largest towing and recovery truck "east of the Mississippi River," according to his friend Ed Bradt.

TOWING AND RECOVERY – ***This monster tow truck is one of Mike Tauber's towing and recovery trucks in Linthicum Heights, Md. He says AMSOIL products keep the truck "running and running" without any mechanical problems.***

The 2004 Kenworth C-500-B 4x4 is a monster 475 horsepower, 35 ton JERR-DAN wrecker with a C-15 ACERT Cat engine, an 18 speed Fuller transmission, two-speed FABCO transfer case, 30,000 pound Meritor rear axle, 22,000 pound Sisu front axle and driver controlled locking axles.

The business first started in 1947 when Julius Tauber opened shop. It has since passed to his son, Michael.

Tauber uses AMSOIL motor oils and lubricants bumper to bumper in the heavy-duty tow trucks. AMSOIL Synthetic 15W-40 Heavy Duty Diesel and Marine oil runs in the engine and AMSOIL Torque-Drive Synthetic Automatic Transmission Fluid is in the transmission and the transfer case.

"So, pretty much this truck is all AMSOIL," Tauber said. "I just like the product because I haven't had any engine, transmission or rear end problems since I started using it. All the trucks I've put it in so far, we just run them and run them."