

AMSOIL SERVICE LINE

NEWS AND IDEAS FROM AMSOIL

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AMSOIL Severe Gear Protects Against Thermal Runaway

NOTES

Energy Surcharge Program Effective May 1

Although AMSOIL was forced to implement a price increase on March 1, the company has since received yet another round of large increases in the costs of raw materials and other materials necessary in the production of AMSOIL synthetic lubricants. Bottles, packaging, hard parts, etc. are all being affected by the trickle-down effect from the rising cost of oil. Freight surcharges that impact nearly everything are rising dramatically as well. Due to the volatile and unpredictable nature of the market at this time, AMSOIL is implementing a surcharge program as a temporary solution for recovering spiraling costs. Effective May 1, prices of all AMSOIL products will reflect an extra 3 to 7 percent surcharge across all programs in the U.S. and Puerto Rico. The exact percentage will be determined and announced at the end of April. Until the market stabilizes, the surcharge will remain in place and may be adjusted on a monthly basis. New price lists will be printed once the market reaches some level of stability.

Modern turbo-diesel pickup trucks, V-10 gasoline pickups and sport utility vehicles (SUVs) and high-horsepower V-8 trucks boast more towing and payload capacities than ever before. In fact, the market has seen a 34 percent increase in engine horsepower over the last decade. In the light truck segment, there has been a 93 percent horsepower increase since 1981. Differential stress has also increased in limousines, conversion vans, and trucks and cars with modified, high-performance engines.

The extreme loads, pressures and temperatures experienced by modern vehicles place increased stress on gear lubricants that can lead to a serious condition known as thermal runaway. As temperatures in the differential climb upward, gear lubricants tend to lose viscosity, while extreme loads and pressures can break the lubricant film, causing increased metal-to-metal contact and heat. The increased friction and heat, in turn, cause the lubricant to lose further viscosity, which further increases friction and heat. As friction and heat increase, lubricant viscosity decreases. As viscosity decreases, friction and heat continue to spiral upward. It is a vicious circle that eventually leads to greatly increased wear and irreparable equipment damage.

AMSOIL Severe Gear Synthetic Extreme Pressure (EP) Gear Lubes feature an exclusive blend of high viscosity, shear stable synthetic base oils and an extra treatment of high-performance additives that provide a highly protective iron sulfide barrier coating on gear surfaces. Severe Gear Synthetic Gear Lubes effectively protect equipment from thermal runaway through superior viscosity protection, viscosity index and shear stability.

Viscosity Protection

Viscosity is the most important property of a lubricant in its defense against friction and wear. Ideally, the lubricant's viscosity enables it to maintain a constant film strength to keep moving parts from contacting each other and creating friction, heat and wear. The higher the viscosity of a lubricant, the greater protection it provides. AMSOIL Severe Gear Synthetic Gear Lubes are available in 75W-90, 75W-110, 75W-140, SAE 190 and SAE 250 viscosities, each providing superior protection through superior film strength.

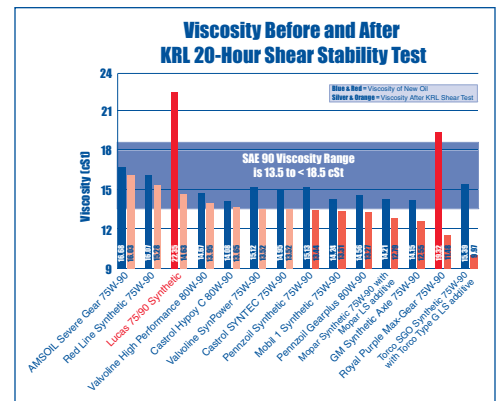
Viscosity Index

As temperatures rise, gear lubricant viscosity and load-carrying abilities tend to decrease. A lubricant's viscosity index (VI) indicates its ability to maintain its protective viscosity in high-temperature service. The higher a lubricant's VI, the less its viscosity changes in temperature extremes.

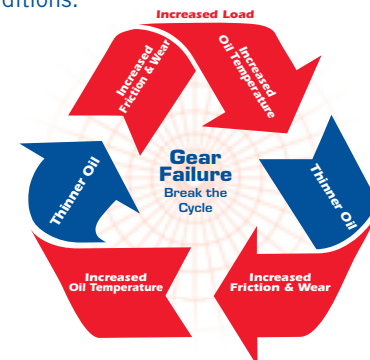
Shear Stability

Many gear lubes are formulated with viscosity index (VI) improvers in order to ensure multi-grade viscosity protection in both hot and cold temperatures. VI improver additives keep lubricants from becoming too thick to flow in cold temperatures and too thin to protect in high temperatures. However, shearing forces within equipment can cause these additives to break down and lose viscosity.

The SAE CEC L-45-A-99 (KRL) 20-Hour Shear Test is a requirement for all automotive gear lubes to ensure they do not shear down and fall below minimum viscosity requirements. The graph shows initial oil viscosity and viscosity following the test, while the shaded area indicates SAE J306 high-temperature viscosity requirements for SAE 90 gear lubes.



As seen in the graph, two gear oils failed SAE J306 requirements before the shear test began, exceeding the maximum 18.49 cSt initial viscosity requirements. Viscosity measurements following the test revealed that seven gear lubes sheared down below the minimum viscosity requirements for SAE J306. AMSOIL Severe Gear 75W-90 tested in the proper initial viscosity range and retained the highest viscosity of all tested oils after the shear test, indicating its superior ability to protect against thermal runaway by maintaining its protection qualities in severe, high-shear operating conditions.



AMSOIL Saves Money for Long-Distance Commuter

Matt Marshall was stationed at Warren Air Force Base in Cheyenne, Wyo. until August 2000 when he was transferred to Buckley Air Force Base in Denver, Colo. Rather than uprooting his family of four, Marshall decided to make the commute to Denver from his home in Cheyenne, a round-trip of 230 miles. Marshall was putting approximately 50,000 miles on his car per year. His first commuter car lasted about two years and 100,000 miles. Marshall was using conventional petroleum motor oil at the time, and the engine blew on one of his trips to Denver. In 2002, Marshall replaced the car with a 1999 Saturn that had 30,000 miles.

"I told him if he didn't want to be replacing cars every two or three years he needed to use AMSOIL," said Marshall's father-in-law, Greg Norman. Norman, an AMSOIL Dealer, set Marshall up with some AMSOIL Synthetic 10W-30 Motor Oil and an AMSOIL Ea Oil Filter.

"Five years later, the odometer shows over 280,000 miles and my son-in-law has retired from the Air Force," said Norman. "The car had no engine issues during the five years commuting to Denver and still runs very good."

Norman also spoke of an experience with his 1999 Ford Expedition. The Expedition's rear end has positraction, and when turning corners or when the positraction would disengage, Norman could hear a grinding noise.

"I found it rather disconcerting even though this is considered the norm with the factory-fill synthetic gear lube," said Norman. "I changed over to AMSOIL Severe Gear® 75W-140 Synthetic Gear Lube and the grinding noise is gone."

Marshall saved money through the superior protection provided by AMSOIL synthetic motor oil and AMSOIL Ea Oil Filters, and Norman's mind was set at ease by AMSOIL



Matt Marshall's 1999 Saturn racked up 50,000 miles per year for five years, problem-free with AMSOIL motor oil.

Severe Gear Synthetic Gear Lube. Reduced maintenance and equipment that lasts longer are two of the most evident and prevalent benefits of using AMSOIL products. For some, the savings are immediate; for others, the savings come over time. Either way, when people find a superior product that actually saves them money and provides peace of mind, they certainly like to spread the word.

"Over the past 30 years, I have used all of the various AMSOIL products," said Norman. "They have never failed to amaze me."

The AMSOIL Service Line sent courtesy of AMSOIL INC.



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