



SERVICE LINE

NEWS AND IDEAS FROM AMSOIL

Preventive Maintenance Improves Fuel Economy

NOTES

Transportation Spending

According to the Bureau of Labor Statistics (BLS) of the U.S. Department of Labor, transportation is second only to housing when it comes to annual consumer spending. The most recent BLS Consumer Expenditure Survey indicates that average annual spending on transportation increased 7 percent from 2004 to 2005, and 2 percent from 2005 to 2006. Transportation spending includes vehicle purchases, finance charges, gasoline and motor oil, maintenance and repairs, insurance, public transportation and vehicle rental, leases, licenses and other charges. According to AAA, the cost of owning and operating a new vehicle is 54.1 cents per mile, an increase of 1.9 cents per mile over last year. "While the cost of some driving expenses declined since the start of 2007, higher gasoline prices have more than offset these savings and pushed the overall cost of vehicle ownership and operation higher this year," said AAA director of public affairs Gail Weinholzer.

High gasoline prices have negatively affected motorists across the nation, and although they are powerless to change the prices, they can employ a few vehicle preventive maintenance strategies to improve fuel economy and help ease the strain on their budgets.

"The key to reducing the financial strain of rising gas prices is the [sic] make sure your vehicle is running at an optimum level," says Bob Arlotta, 2008 NAPA Technician of the Year. "There are several common parts located throughout the vehicle that if not functioning properly can really limit a vehicle's gas mileage, costing owners more at the pump."

Motor Oil and Oil Filters

Clean oil reduces friction in the engine, increasing both fuel economy and engine reliability.

The synthetic construction of AMSOIL synthetic motor oils effectively reduces friction, decreasing overall fuel consumption, while the superior efficiency of Ea Oil Filters further controls friction and increases fuel economy by keeping oil clean.

Fuel Additives

A vehicle's fuel economy, power, performance and acceleration all suffer as deposits build up in the fuel system.

AMSOIL P.i. Performance Improver effectively cleans the entire fuel system in only one tank of gasoline, improving fuel economy and restoring power, performance and acceleration.

AMSOIL Diesel Concentrate is a total system cleaner and lubricity improver, effectively improving diesel engine performance, fuel efficiency and longevity, while reducing deposits, black smoke and emissions.

Fuel Filters

Once a fuel filter becomes plugged, sensors instruct the vehicle's computer to send more fuel to the engine, leading not only to increased fuel consumption, but also emissions testing failure and engine system wear. Replacing fuel filters at their proper intervals prevents them from plugging and maximizes fuel economy.

WIX Fuel Filters available from AMSOIL provide unmatched fuel cleansing performance, boosting fuel economy while preventing pump wear, injector clogging and premature engine wear.

Spark Plugs

Subjected to extreme conditions in the combustion chamber, spark plugs can eventually foul and contribute to engine misfires, reducing fuel economy. Replacing spark plugs at their proper intervals increases fuel economy, keeps the engine running smoothly and reduces emissions.

Premium NGK Spark Plugs available from AMSOIL provide superior service in automotive applications, providing reduced fouling, superior heat dissipation and conductivity and excellent performance and durability.

AMSOIL Diesel Concentrate Plus Cold Flow Improver

Two fuel additives in one bottle adds convenience for diesel owners

AMSOIL now offers a premium, year-round diesel fuel additive that provides improved efficiency and maximum cold-weather performance. AMSOIL Diesel Concentrate Plus Cold Flow Improver (DFC) combines the superior detergency of AMSOIL Diesel Concentrate (ADF) and the excellent anti-gelling properties of AMSOIL Cold Flow Improver (ACF) in one convenient package without sacrificing performance.

Improved Efficiency

AMSOIL Diesel Concentrate Plus Cold Flow Improver is formulated with excellent detergency properties to help keep injectors, rings, piston crowns and the fuel pump lubricated. By improving injector performance, combustion becomes more efficient and less soot is generated. Diesel Concentrate Plus Cold Flow Improver cleans dirty injectors, improving fuel economy by up to five percent and restoring horsepower to like new. Acceleration is improved and with regular use, Diesel Concentrate Plus Cold Flow Improver continues to enhance performance by keeping injectors clean. The net savings on fuel expense can result in no additional cost to vehicle operation.

Superior Cold-Weather Performance

As the temperature drops, the wax naturally found in diesel fuel begins to form crystals. The point at which wax crystals form is known as the cloud point. These wax crystals eventually clog the fuel filter and starve the engine of fuel, preventing it from starting. While low-quality fuels may form wax crystals in temperatures as warm as 40°F (4°C), most fuels have a cloud point near 32°F (0°C). The point at which the wax crystals clog the fuel filter is known as the cold filter-plugging point (CFPP). AMSOIL Diesel Concentrate Plus Cold Flow Improver lowers the CFPP by as much as 34°F (19°C) in ultra-low-sulfur diesel fuel (ULSD).

It also reduces the pour-point temperature of treated diesel fuel, providing better fuel delivery to the injectors during cold weather. It is formulated with a jet-fuel-type deicer that controls ice formation in all sections of the fuel system. Diesel Concentrate Plus Cold Flow Improver minimizes the need for the use of #1 diesel fuel, enabling better fuel economy, performance and lubricity. Product performance may vary depending on diesel grade and quality.

Pour Point Vs. CFPP

It is important to distinguish between CFPP and pour point. Many competitors make great claims regarding pour point, leading consumers to believe their products are superior when they actually have an inferior CFPP. Once fuel surpasses its cloud point, the wax crystals begin to clog the fuel filter. The CFPP temperature is a more important characteristic than pour point because the engine will not run if fuel cannot pass through the fuel filter.



Ultra-Low-Sulfur Diesel Fuel Challenges

The reduced sulfur levels in modern ULSD result in reduced lubricity, the property that controls wear in the fuel injectors and fuel pump. Improving lubricity in ULSD is difficult because it must be done without adding sulfur back into the fuel. Additionally, ULSD is subjected to extensive refining, making it even more difficult to treat. AMSOIL Diesel Concentrate Plus Cold Flow Improver is formulated specifically for modern ULSD fuel. It improves lubricity, helps maintain engine oil TBN and prevents soot loading.

Recommendations

One 16-oz. bottle of Diesel Concentrate Plus Cold Flow Improver treats 40 gallons of fuel. Diesel Concentrate Plus Cold Flow Improver will show no signs of solidifying in its concentrated state in the bottle until the temperature reaches -22°F (-30°C). It will only freeze in its concentrated state, and AMSOIL recommends storing it at temperatures above 0°F (-18°C). If Diesel Concentrate Plus Cold Flow Improver is allowed to freeze in the bottle it can be thawed and used. When mixed with diesel fuel, Diesel

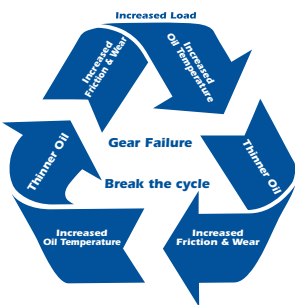
Concentrate Plus Cold Flow Improver effectively improves diesel fuel cold-temperature properties. Because Diesel Concentrate Plus Cold Flow Improver will not dissolve wax crystals which have already formed in the fuel, it is recommended that fuel already in the tank be treated at temperatures above 32°F (0°C). When filling the tank with fuel from an underground tank, it may be treated with Diesel Concentrate Plus Cold Flow Improver when temperature is below 32°F (0°C) because the fuel itself is warmer.

AMSOIL Diesel Concentrate Plus Cold Flow Improver meets federal regulations for ULSD fuel. It complies with federal low-sulfur content requirements for use in diesel motor vehicles and non-road engines. While Diesel Concentrate Plus Cold Flow Improver is formulated specifically for ULSD fuel, it is also effective with non-ULSD fuels, including biodiesel.

AMSOIL Diesel Concentrate Plus Cold Flow Improver is specifically formulated to improve the lubrication of fuel system components, improve fuel flow, help maintain fuel integrity and prevent the fuel filter and injectors from clogging. Diesel Concentrate Plus Cold Flow Improver is recommended for diesel-powered vehicles, home heating oil and kerosene heating systems.

Severe Gear® Synthetic Gear Lubes Demonstrate Superior Shear Stability

The extreme pressures and temperatures generated by modern vehicles increase stress on gear lubricants and can lead to a serious condition known as thermal runaway. As temperatures in the differential climb upward, gear lubricants lose viscosity and load carrying capacity. When extreme loads break the lubricant film, metal-to-metal contact occurs, increasing friction and heat. This increased friction and heat, in turn, results in further viscosity loss, which *further* increases friction and heat. As heat continues to spiral upward, viscosity continues to spiral downward. Thermal runaway is a vicious cycle that leads to irreparable equipment damage from extreme wear, and ultimately catastrophic gear and bearing failure.



In order to ensure continued viscosity protection in high-shear conditions, it is required that SAE 75W-140 automotive gear lubes stay in grade throughout the CEC L-45-A-99 (KRL) 20-Hour Shear Test. AMSOIL recently subjected Severe Gear 75W-140 Synthetic

Gear Lube (SVO) and four competing 75W-140 gear lubes to KRL shear stability testing.

SAE J306 standards dictate SAE 140 gear lubes maintain a minimum 24.0 cSt viscosity. Although each of the test oils met this standard before testing began, each competitor failed to stay in grade following the test. In fact, two experienced viscosity losses so dramatic that they dropped well below SAE 140 requirements and all the way down to an SAE 85 viscosity. AMSOIL Severe Gear, on the other hand, easily retained its viscosity within SAE J306 requirements, indicating its superior ability to protect against thermal runaway by maintaining its protection qualities in severe, high shear operating conditions.

Brand	cSt Before	cSt After	Viscosity Loss (%)
AMSOIL SVO 75W-140	24.90	24.56	1.37
Redline 75W-140	26.27	Failed	21.59
Royal Purple 75W-140	33.70	Failed	21.06
Lucas 75W-140	27.39	Failed	8.94
Torco 75W-140	29.33	Failed	8.75

AMSOIL also took the opportunity to subject Severe Gear 75W-110 Synthetic Gear Lube (SVT) to KRL testing. SAE J306 standards dictate SAE 110 gear lubes maintain a

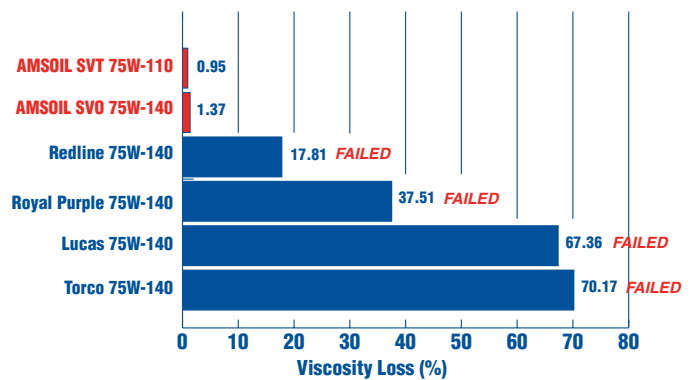
minimum 18.5 cSt viscosity. Like Severe Gear 75W-140, SVT demonstrated its superior protection qualities by easily retaining its viscosity and staying in grade.

Brand	cSt Before	cSt After	Viscosity Loss (%)
AMSOIL SVT 75W-110	19.92	19.73	0.95

The graph indicates the viscosity losses experienced by each of the tested gear lubes:

The superior viscosity protection, viscosity index and shear

KRL Shear Stability Test
CEC L-45-A-99 (20 Hours)



stability properties of AMSOIL Severe Gear Synthetic Gear Lubes effectively protect equipment from the devastating effects of thermal runaway. Severe Gear Synthetic 75W-90, 75W-110 and 75W-140 Gear Lubes are ideal for severe-duty applications, including towing, hauling, steep hill driving, commercial use, plowing, racing, off-road use, rapid acceleration, frequent stop-and-go operation and high ambient temperatures.

