TSB: MO-2006-05-03

Date: 05/05/2006

Technical Service Bulletin

Product Description: ALL AMSOIL Motor Oils

Subject: Use of AMSOIL Synthetic Oils for High Mileage Vehicles

OBJECTIVE:

To inform AMSOIL Dealers that AMSOIL Synthetic Motor Oils provide more than adequate protection for high mileage vehicles.

ISSUES:

Americans are keeping their vehicles longer and driving farther than ever before. The average age of vehicles on the road is greater than 10 years and more vehicles have more than 100,000 miles.

As a vehicle's engine ages, its performance decreases and it requires more protection from lubricants. High mileage oils are a relatively new category of motor oils specifically marketed for high mileage vehicles. These products typically claim they are capable of restoring the performance of engines and eliminating further engine deterioration.

TECHNICAL DISCUSSION:

Definition of High Mileage Vehicle

Many motor oil marketers use 75,000 miles to classify high mileage vehicle. This statement does not reflect current engine performance. Most modern engines with proper maintenance should go to 150,000 miles with no problem. Judging vehicle engine condition solely on mileage can be very misleading. The engine of a vehicle driven on major highways in moderate climates will be almost like new at 75,000 miles. On the other hand, a short trip, stop and go driver that never gets the engine to normal operating conditions and drives in dusty conditions or cold winter can wear out the engine at 100,000 miles without proper maintenance.

Another way to estimate the life of a vehicle is by the hours it has operated. A high mileage vehicle is actually a "high hours" vehicle. For example, to travel a distance of 70 miles, a vehicle driving at 70 miles per hour will take one hour to complete the trip. On the other hand, a vehicle traveling at 35 miles per hour will require 2 hours. Therefore, for a 140,000 mile vehicle, the engine may have been operated for 2000 engine hours at an average of 70 miles per hour or 4000 engine hours at an average of 35 miles per hour. The engine protection requirements for these two different scenarios are clearly different.

Lubricant Performance Requirements for High Mileage Vehicles

Basically, there is no difference in motor oil performance demands between a high mileage vehicle and a new vehicle. A high mileage vehicle simply depends on a superior motor oil to replenish the diminished engine performance. These requirements are the following:

- Low volatility to fight off excess oil consumption (burn off)
- Superior engine wear protection
- Superior detergent package to clean engine parts to maximize engine output
- Resist thermal and oxidation breakdown
- Reduce deposit formation
- Provide easier cold starts

AMSOIL Synthetic Motor Oils outperform other commercial high mileage oils in all of these categories. One of the commonly applied viscosity grades of high mileage oil is 10W-30. The following Table I compares AMSOIL ATM with the published data of some commercial high mileage oils.

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Table I. Comparison of Physical Properties of AMSOIL ATM with Other High Mileage Motor Oils (Published Data)

Viscosity 10W-30	AMSOIL ATM	Castrol GTX High Mileage	Valvoline MaxLife	Quaker State Higher Mileage Engine	Havoline High Mileage Protection
Pour point , °C (°F)	-50 (-58)	Not available	-33 (-27)	-30 (-22)	-33 (-27)
Cold Crank (-25°C)	4020 (-25°C)	7000 cP (-25°C)	5700 cP (-25°C)	<3500cP At –20°C*	6500 cP (-25°C)
NOACK Volatility	5.4%	Not available	<15%	<15%	Not available
TBN	12.2	Not available	8.0	Not available	8.0

* reported data, 10W oil should be tested at (-25°C) according to SAE J300 publication

Help Engines Start Easier

As the vehicle ages, it gets more and more difficult to start, particularly during cold weather. The Cold Crank Simulator Test determines how easy the engine can start with the lubricant at low temperature conditions. AMSOIL ATM allows engines to achieve critical cranking speed in frigid temperatures much easier than other high mileage oils. AMSOIL ATM remains fluid down to –58° F. It helps engines turn over easier and flows quickly to engine parts for critical start up protection. Engines start faster and wear is greatly reduced. AMSOIL ATM has much lower pour point than other high mileage oils. It provides better protection in low temperature service.

Control Acid and Reduce Deposit Formation

Total Base Number (TBN) is the measurement of a lubricant's ability to control acid formation which leads to varnish and deposits. High mileage vehicles with worn out seals tend to generate more blow-by gases than new vehicles. High blow-by gas generation leads to higher acid formation and increased varnish and deposits. Because AMSOIL ATM has a higher TBN, it is more effective than other high mileage oils in suspending wear-causing contaminants and reducing the corrosive effects.

Reduce Oil Consumption

The NOACK Volatility Test determines the evaporation loss of motor oils in service. The more motor oils vaporize, the thicker and heavier they become, contributing to poor circulation, reduced fuel economy and increased oil consumption.

High mileage vehicles require oil with better volatilization protection. AMSOIL ATM performs better than other high mileage oils.

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RECOMMENDATIONS:

The best practice for protecting vehicle investments is to start them with AMSOIL Synthetic Motor Oils of the proper viscosity grade.

In the case of protecting a high mileage vehicle and switching over to AMSOIL for the first time, follow the procedure of engine flushing using AMSOIL AEF. This will remove engine deposits before installing AMSOIL Motor Oils. Although this flushing process is not required, it is beneficial.

AMSOIL 10W-30 ATM and XLT are recommended for most high mileage vehicles. Where heavier weight viscosity oil is required, AMSOIL 10W-40 AMO and XLO are recommended. AMSOIL 20W-50 ARO is recommended for high mileage vehicles with special requirements.

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Submitted By: DW/DY **Reviewed By: DY** **Approved By: Alan Amatuzio** **Approval Date: 5/05/06**

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