

## Technical Service Bulletin

Date: 11/3/2004

Product Description: **AMSOIL Synthetic Universal Automatic Transmission Fluid (ATF)**

Subject: **How Cold Temperatures Affect Automatic Transmission Efficiencies**

### OBJECTIVE:

To demonstrate that AMSOIL Synthetic Universal ATF has excellent low temperature properties such as a low Brookfield Viscosity and pour point, which provides higher automatic transmission efficiencies at low temperatures than conventional automatic transmission fluid.

### ISSUES:

The use of conventional automatic transmission fluid at low temperatures has always meant slow transmission shifting, sluggish operation, and frustration. This brings to our attention the benefits of AMSOIL Synthetic Universal ATF at low temperatures.

### TECHNICAL DISCUSSION:

Transmission fluid viscosity has a tremendous effect on the mechanical efficiency of an automatic transmission. During the transfer of power in the transmission, over 40% of the total energy losses are due to the transmission pumping automatic transmission fluid to the working components of the transmission. Tests (reference 1) relating to torque losses associated with pumping automatic transmission fluid at different temperatures have shown that a temperature rise of 150°F can increase the mechanical efficiency in an automatic transmission by as much as 37.5%. This data means that increases in mechanical efficiencies are directly caused by thinner oil (lower viscosity). When ambient temperatures drop; the fluid gets thicker, and transmission efficiencies decrease which greatly reduces effective useful power and efficiency of the transmission.

Automatic transmission fluid is an important component in an automatic transmission. Fiber plates contact metal plates, bearings contact bearing races, gears contact gears, and automatic transmission fluid comes in contact and lubricates all of them. Cold temperatures can cause conventional automatic transmission fluids to increase in viscosity, causing a decrease in automatic transmission efficiency. This efficiency decrease is often referred to as sluggish operation; which demands more energy from the engine to actuate all the parts that come into contact with the automatic transmission fluid. Synthetic oils that are not affected by temperature reductions as much as conventional oils will have better low temperature pumpability and therefore better mechanical efficiency. Better efficiency can provide better fuel economy.

AMSOIL Synthetic Universal Automatic Transmission Fluid has a lower pour point, (Graph I) and is pumpable at much lower temperatures than conventional automatic transmission fluids as demonstrated by the Brookfield Viscosity Test (Graph II). It is capable of providing greater transmission efficiencies and better fuel economy at low temperatures than conventional automatic transmission fluids.

Submitted By: KD

Reviewed By: DY

Approved By: Alan

Approval Date: 11/10/04

Distribution:  Internal  All

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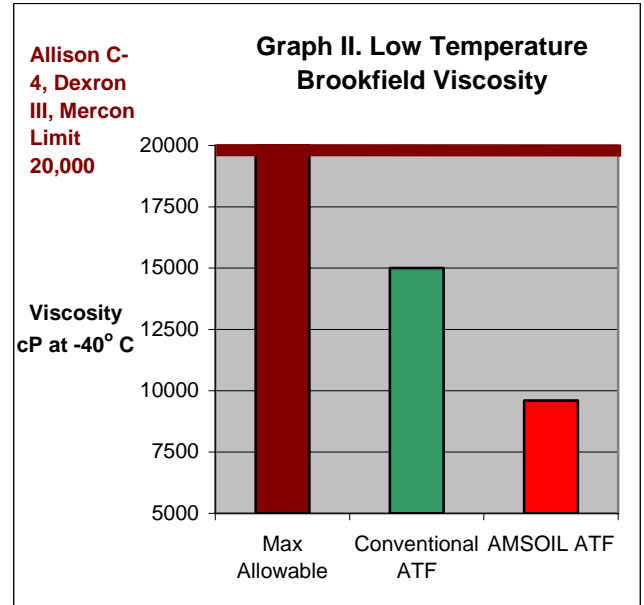
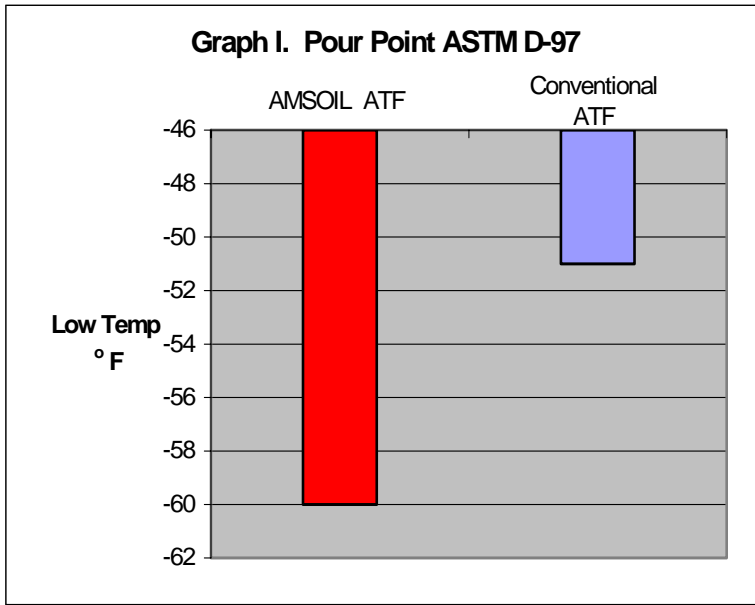


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## RECOMMENDATION:

In order to obtain maximum cold temperature benefits, thoroughly drain and flush conventional automatic transmission fluid from the transmission and replace with AMSOIL Synthetic Universal Automatic Transmission Fluid (ATF).

- Mitsubishi Diamond SP II & III
- Toyota Type T, T-IV
- Hyundai SP-II, SP-III
- Vickers I286S & M2950S

AMSOIL Synthetic Universal ATF is recommended for applications requiring the following specifications:

- GM Dexron II, Dexron III
- Ford Mercon, Mercon V
- Chrysler ATF+ through ATF+4
- Allison C-3 & C-4
- Caterpillar TO-2 & To-3
- Voith Commercial
- ZF TE-ML14C
- Honda Z-1

## REFERENCE:

1. Torque Losses Associated with Pumping ATF at Different Temperatures.  
SwRI Automatic Transmission Technology Section Project Briefs.  
Project: 03-6138

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