



**Technical Service Bulletin**

**Date:** 9/24/10

**Product Description:** AMSOIL Synthetic Multi-Vehicle Automatic Transmission Fluid (ATF) and Synthetic Fuel Efficient Automatic Transmission Fluid (ATL)

**Subject:** Automatic Transmission Fluid Supplements

**OBJECTIVE:**

Alert customers of the ineffectiveness and potential damaging effects caused by the additives in typical ATF supplements when used with a well-formulated automatic transmission fluid.

**ISSUES:**

ATF supplement additives can alter a well-formulated automatic transmission fluid's properties, causing degraded low temperature performance, premature wear, corrosion and shudder problems.

**TECHNICAL DISCUSSION:**

Original equipment manufacturers (OEMs) extensively test their transmissions to determine the fluid characteristics required for specific transmission designs and applications. Based on this testing, OEMs issue engineering specifications that outline the physical properties and minimum performance levels of the required fluids. A well-formulated automatic transmission fluid that meets these OEM specifications ensures the transmission will function as intended and will help it reach its maximum service life.

In the past, a few major OEM specifications covered the transmission fluid requirements for the entire industry. Today, numerous specifications that differ significantly have led to confusion and inconvenience for consumers. Owners of three vehicle brands generally don't want to keep three different transmission fluids on hand. Installers face similar issues; keeping an inventory of different fluids may be confusing, and the cost of well-formulated multi-vehicle transmission fluid may not be financially attractive. To simplify matters and reduce costs, many customers and installers rely on ATF supplements to fortify used fluid, transform less-costly outdated fluid into a currently-required fluid or add an extra level of protection. Claims by ATF supplement manufacturers lead consumers to believe transmissions receive everything they need to perform well and last longer.

Despite such claims, several vehicle and transmission OEMs have warned against use of ATF supplements. The benefits of these additives are usually short-lived and, more importantly, can degrade the performance of a well-

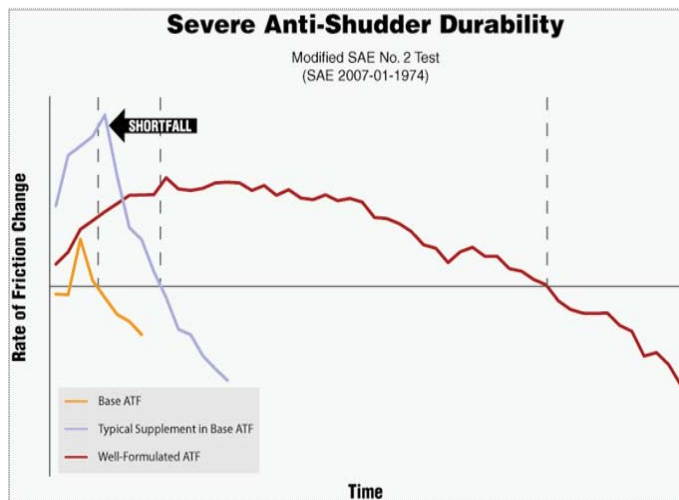
formulated transmission fluid.

The following test data demonstrates the shortfalls of a typical ATF supplement in three critical performance areas. The data also identifies a situation where the ATF supplement additives prevented the original fluid from meeting the specification it was designed for.

**Frictional Performance:**

To perform well, the friction surfaces in an automatic transmission and locking torque convertor must slip enough to engage smoothly and then firmly lock to transmit power without slippage. Well-formulated automatic transmission fluid contains carefully-designed friction modifier additives that effectively promote this process over the recommended fluid life. If the required frictional performance level is not met, the clutches and other friction surfaces slip and lock intermittently under load, causing shudder. If severe enough, the driver will hear and feel this shudder. If mild, it may go unnoticed by the driver, but will contribute to inefficiency and possible future transmission problems.

ATF supplement manufacturers attempt to address shudder by including highly friction-modified additives in their products. As the following modified SAE severe anti-shudder durability test shows, however, the supplement may initially boost the base's anti-shudder performance, but the benefit is short-lived.



**Submitted By:** MC

**Reviewed By:** DP

**Approved By:** AA

**Approval Date:** 9/24/10

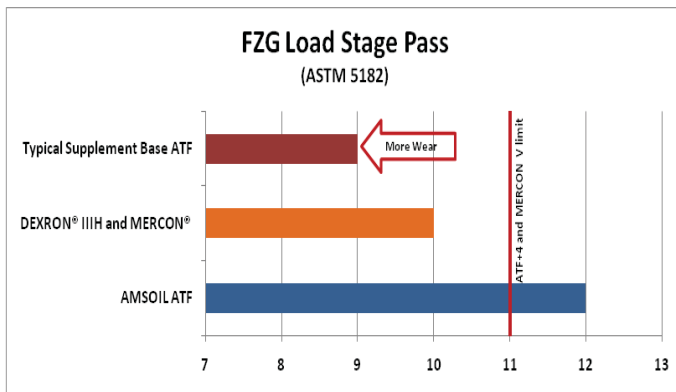
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In less than an hour, the anti-shudder performance level of the base ATF treated with a typical ATF supplement began to decline, and within 1.5 hours fell below the minimum performance reference line. In contrast, the well-formulated fluid maintained its ability to resist shudder for close to six hours. ATF supplement additives cannot take the place of carefully-designed additive packages built into well-formulated fluids.

**Wear:**

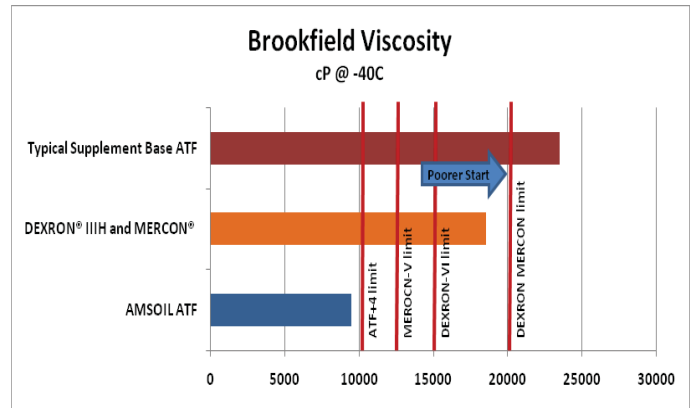
The FZG wear test (ASTM D-5182) is used to gauge resistance to scuffing loads common in automatic transmissions. At each stage a progressively heavier load is applied to a set of gears, and scuffing of the gears is evaluated. The fluid protecting the gears will either pass or fail the load stage based on this evaluation.



The negative effect ATF supplements can have on fully-formulated transmission fluid is clearly demonstrated by this result. The untreated DEXRON® IIIH/MERCON® transmission fluid produced an FZG pass rating of 10. When a typical ATF supplement was added, its additives interfered with the original fluid’s designed protective properties and lowered the rating to 9. In contrast, AMSOIL Synthetic Multi-Vehicle ATF produced an FZG pass rating of 12, surpassing virtually all OEM specification requirements.

**Cold Temperature Performance:**

Vehicle manufacturers specify maximum cold temperature transmission fluid viscosity limits to ensure proper lubrication at start-up and proper shift performance in cold weather. The Brookfield Viscosity Test (ASTM D-2983) is used by the lubricant industry to measure the viscosity of fluids at low temperatures. A measurement at -40°C is a common transmission fluid specification requirement, and the result of the test is expressed in centipoises (cP). The higher the cP, the more the fluid resists flow.



The maximum Brookfield viscosity limits at -40°C for four OEM transmission fluid specifications are shown in this graph. The untreated DEXRON IIIH/MERCON base alone met the DEXRON/MERCON Brookfield viscosity requirement. However, when a typical automatic transmission fluid supplement was added to the DEXRON IIIH/MERCON base, it failed to meet the requirement, demonstrating clear evidence of ATF supplement additives interfering with the properties of the base ATF. AMSOIL Synthetic Multi-Vehicle ATF meets the Brookfield viscosity requirements of all the specifications displayed in the graph, demonstrating that a well-designed multi-vehicle transmission fluid is the optimal choice when a single product must satisfy the requirements of multiple specifications.

**RECOMMENDATION:**

AMSOIL INC. recommends against the use of ATF supplements as they may cause a reduction in performance, protection and longevity of equipment and can ultimately cause permanent damage to a vehicle’s transmission. The use of any aftermarket ATF supplement will void the AMSOIL Limited Warranty.

AMSOIL Synthetic Multi-Vehicle Automatic Transmission Fluid (ATF) and Synthetic Fuel Efficient Automatic Transmission Fluid (ATL) are high quality transmission fluids engineered to the highest performance requirements of multiple transmission fluid specifications. AMSOIL transmission fluids are multi-vehicle products that accomplish the objective of additive supplements without degrading performance. They effectively reduce confusion, inventory, misapplication and cost, while providing superior protection to help extend transmission life. AMSOIL ATF and ATL are warranted by AMSOIL for use in a wide range of domestic and import vehicle transmissions as identified on the product labeling.

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