

What is going on with automatic transmission fluid?

In any automatic transmission fluid there are factors that determine the application and useful life of that particular fluid. OEM's often spend a great deal of time and money to specify an ATF that will allow their transmission to function properly for the life of the warranty and hopefully beyond. While it is important to heed the service fill advice of the OEM it is equally important to understand the functional requirements of the transmission so you, as an informed consumer, can make service fluid selections that meet the requirements and intentions of the OEM without the high cost and limited availability that often accompany these "OEM service fill recommendations". I will list a number of fluids and attempt to make sense of what has become a very confusing and expensive reality for car care centers.

Fluid for automatic transmissions has been improving and changing for the last twenty years. Following the mantra of "fluid engineering optimization" OEM transmission designers have unleashed a multitude of different fluids that must be exclusively used for their transmission or damage and failure will occur (according to them). Many of these fluids were called "fill for life" and led the consumer to believe they were not obligated to change the fluid.

They quickly learned this meant "fill for life of the warranty" as the factory warranty expired and so did the transmission, with the dealership happy to replace your transmission at your expense. The service provider that wants to provide the service these units actually require on a regular basis are often handicapped by limited availability and high cost for the transmission fluid specified.

Today passenger car ATF's generally fall into two categories that relate to viscosity and longevity (which determine the "useful life" of the fluid). These categories are determined by the "new fluid" viscosity that fall on the higher side (between 6.8-8.0 cSt @100° C.) and the new "low viscosity ATF's (they normally fall between 5.5-6.8 cSt @100° C.) The longevity or "useful life" properties result from the initial base oil quality and the additive package used by the ATF formulator. Understanding how these properties relate to the OEM fluids and the high quality ATF's available today in the aftermarket will allow the consumer purchasing service product to protect and extend the life of the automatic transmission without having to resort to expensive hard to find OEM fluids.

The ATF's that fall into the higher viscosity range (between 6.8-8.0 cSt @100° C.) are blends of Group I and Group II base oils that are often referred to as "semi-synthetic" ATF. These fluids were

much better than prior transmission fluids and lasted longer but were still prone to a loss of viscosity stability as they were passed through highly load gears and bearings in a process known as "shear-down". Shear-down is permanent viscosity loss and the viscosity is never gained back. Shear-down can eventually progress to the point there is no longer sufficient viscosity to safely lubricate planetary gears, bearings and other load bearing moving parts and wear and part failure follows. With an understanding of how fluids perform after they are sheared-down, it soon becomes apparent that a certain amount of viscosity reduction was advantageous as long as it could be controlled and stabilized for extended periods of time and service.

Having come to the conclusion that higher quality (synthetic) reduced viscosity automatic transmission fluids were capable of offering better cold starting with reduced cranking torque and provided sufficient viscosity for planetary gears and bearings at higher operating temperatures, transmission fluid formulators gradually developed the new category of higher quality reduced viscosity ATF's (they normally fall between 5.5-6.8 cSt @100° C.). The improved efficiency and extended life of these ATF's met the requirements for extended warranties and improved fuel economy so important in today's competitive automotive marketplace. Because the

only base oils that were capable of meeting these new requirements were Group II, Group III and Group IV (true synthetic) base oils, the main component required for extended life oxidatively stable transmission fluids was now required to meet the new standards for extended life with improved efficiency. With the advent of extended warranties (some for 100,000 miles!) it became necessary to formulate lower viscosity, extended life ATF's that OEM's now decided to tie to these extended warranties.

With all of this confusion came exclusive use requirements and the need for service options that fulfill the intent of the manufacturer and are usually only available from the OEM at high cost and limited availability.

What is required?

This is a list of conventional viscosity ATF's that use conventional and semi-synthetic base oils and additives commonly specified and required by OEM's.

- Esso Type LT 71141
- G 055 025 A2 (Also called T-IV, JWS 3309, ATF 3317)
- G 052 162 A2
- G 055 005 A2
- G 052 990 A2
- MERCON® V

One thing these fluids all have in common in actual daily use is a reduction in viscosity (shear-down) after a short period of service that causes a permanent viscosity drop that drops the operational viscosity down to the operating range of the “newer” reduced viscosity ATF’s that are often used to replace these fluids (DEXRON® VI can be used in place of DEXRON® III is one good example). It is not uncommon to see a specific transmission required to use a conventional viscosity ATF one year and the “reduced viscosity” ATF the next year model with no changes to the transmission (GM, Toyota and BMW are all know to have done this). The new “reduced viscosity ATF” is shear stable and is designed to function from the moment you put it in the vehicle at the same viscosity older transmission fluids would eventually shear down to. Efficiency by design for the life of the fluid is what allows the newer reduced viscosity ATF’s to function so well in older transmissions calling for “obsolete” OEM fluid specifications (like DEXRON®II or MERCON®). Knowing that this change in viscosity occurs when these fluids are used allows the choice of a “higher quality” ATF of more recent design and manufacture to be selected for service.

This is a list of “reduced viscosity” ATF’s that are currently in production. They are composed of Group II, Group III and Group IV base oils and additives. Some of the highest quality oils have “true

synthetic” base oil using Group IV base oil and are long life fluids with stable viscosity for the “life” of the fluid.

Toyota WS
G 060 162 A2
ZF Lifeguard 6
ZF Lifeguard 8
DEXRON® VI
FFL-3 (DSG)

These fluids are all “reduced viscosity” extended life OEM service fills that are designed for efficiency and extended service life. They have excellent cold temperature performance and are considered by many OEM’s to be “fill for life” with extended service intervals and an “exclusive use” claim that is often tied to an extended warranty. Unlike their older, thicker ATF predecessors these newer fluids are not reverse compatible. What that means is these transmissions require the use of a “reduced viscosity” extended life ATF and will not work as well or last as long if the older, thicker ATF is used.

There is always an exception to every rule and the G 052 182 A2 (FFL2) fluid for the DSG transmissions is one of these. It is full synthetic using Group IV base oil with a high quality additive package. The viscosity is 7.3 cSt @100° C. making it a conventional viscosity synthetic fluid. When using a replacement fluid for this application selecting the correct viscosity for the operating condi-

tions (speed, load, and temperature) ensures durability over long periods of time. Using a reduced viscosity ATF to replace these fluids is acceptable as long as the oil film thickness under operating conditions is greater than the combined surface finish of the gears in mesh (most newer DSG transmissions now use a reduced viscosity OEM fluid). This oil film in combination with the anti-wear agents and extreme pressure additives combine to carry the loaded meshing gears and bearings to operate without damage to the rotating elements.

Why LUBE1 is the universal service solution

With the introduction of the LUBE1 ATF the process for selecting service fill for all of the ATF's listed above became very simple. This is because the LUBE1 ATF is the best product available to the automotive service aftermarket for multiple applications. The LUBE1 is a fully formulated Synthetic ATF (COC 228° C. / 442° F.) using Group IV "true" synthetic base oil (not semi-synthetic mixtures of lesser quality base oils) with current cutting edge additive technology and the addition of a unique and proprietary additive technology designed for use in wet clutch automatic transmissions that allows frictional compatibility with all applications improving the torque carrying capacity of the fluid while assuring smooth clutch engagements (available

only in LUBE1). The fluid viscosity at operating temperatures is 6.25 cSt at 100° C. which is optimal for protection and improved efficiency at all operating temperatures. With cold flow properties equal to or better than the listed OEM required ATF's, LUBE1 (12,700 mPa s @-40° C.) has the cold flow properties of a true synthetic base oil, using high quality additives and VI improvers in addition to LUBE1's unique proprietary fluid technology to provide protection under the most severe conditions and service. For protection and value that exceeds the requirements of all major transmission manufacturers and OEM's there is no better service solution and value than LUBE1 Synthetic Automatic Transmission Fluid. LUBE1 - the one fluid service solution when only the best is good enough! Try it, you will like it!

Heat-induced residues (in mg)

