



Technical Training Tip of the Month

Automatic Transmission Maintenance

By Grant Wolter

For many years automatic transmission service and maintenance was a scheduled routine of dropping the pan, changing the filter and pan gasket, then refilling the transmission with a generic auto trans fluid and “letting it roll”. Recommended service intervals were usually in the range of 20K to 36K miles. Automatic transmission technology had been at a relative standstill, until recently, when automotive manufacturers decided to turn their attention to improving the efficiency of other parts of the powertrain besides the engine system. Powertrain engineers now look at the engine and transmission as an integrated package, tuned to new levels of performance and economy. You may be familiar with some of the more obvious changes, such as the availability of a mainstream CVT (Continuously Variable Transmission), and some interesting Hybrid Vehicle applications. Less obvious are the release of five and six speed automatic transmissions and transaxles that, besides an increase in the number of forward gears available, use new technologies in friction disc materials and employ significant changes in the way the clutches and bands are controlled.

Automatic transmission fluid has always been an integral part of the control of the amount of friction occurring in a clutch or band during shifting. In the past, however, manufacturers stuck with only a couple of types of friction materials on the clutches and bands, which meant that the same fluid could be used on a wide range of automatic transmissions from a variety of manufacturers. Friction materials are not the only consideration in a manufacturer’s choice of fluid, and today’s automatic transmissions may have a specific fluid designed for a specific transmission, and only that transmission. Look before you leap, and don’t just refill with whatever is in the 55 gallon drum in your service bay.

How often should you change the fluid? Most of the new automatic transmissions for use in light and medium duty applications have a 100K mile service interval listed in the owners guide. Careful though, if you read the fine print, you’ll find that the interval for your fleet qualifies as “severe service” and the recommended change interval is back down in that 30K to 50K mile range.

Why change the fluid more often under the definition of “severe service? If you look at the type of driving listed under “severe service” you’ll see that the trans would probably be operating under more load, which translates to higher peak operational temperatures. You might also note that the trans would be operating under more hot-cold cycles for a given mileage. High temperatures and hot-cold temp cycling are the major causes of automatic transmission oil breakdown. Normal operating temperature for an automatic transmission is about the same as the engine temperature, i.e., about 195°F. The temperature inside the torque converter, while pulling a big load from a standing start, could easily rise above 350°F. Fluid breakdown often results in harsh shifting and slip-bump concerns. broken down fluid often exhibits a different coefficient of friction, and foams up easily causing aeration.

What is an automatic transmission service?

- Visually inspect the transmission for external leaks
 - Transmission oil leaks are a leading cause of vehicle fires
 - Leakage is the number one cause of low fluid level, and low fluid level is the number one cause of auto trans concerns

- Inspect for proper placement of heat shields
 - Exhaust heat can cause damage to the seals in the transmission from the outside-in.
- Check the fluid condition (this is down the list because some transmissions do not have a dipstick to check the fluid from under the hood)
 - Brown, or even dark brown fluid is normal
 - Do not judge the age of the fluid by it's color
 - Wipe the fluid onto a clean piece of white paper and check for particulates suspended in the fluid
 - A fluid change cannot cure any of the problems associated with fluid contamination!
 - A small amount of fine gray powder, that almost looks like silt, is normal
 - If there are metal slivers or metal granules in the fluid, it's time for an overhaul
 - If there are chunks of brown flakes (friction material) in the fluid, it's time for an overhaul
 - If the fluid is whitish pink, there is water contamination and it's time for an overhaul
 - Smell the fluid
 - If it stinks so bad (burned smell) that you can't take a big whiff, then it's time for an overhaul
- Check the fluid level
 - Checks done under incorrect conditions can be as much as a quart off
 - Incorrect fluid level is the number one cause of Automatic Transmission concerns
 - Too much is as bad as too little
 - Fluid level, as checked with a dipstick, is normally checked with the engine running, in PARK, and at normal operating temperature.
 - For those transmissions without a dipstick for checking level, there will be a very specific check procedure specific to a make model year.
 - Look it up! Don't assume that it's like checking a manual transmission
 - Usually involving a specific operating temperature as checked with a scan tool
 - Usually checked at the trans fill port
- Drop the pan and inspect the contents (this might be considered optional)
 - The amount of fluid changed by just removing the pan is less than a third of the trans fluid capacity. This is not a step to change the fluid, but merely an inspection process
 - A thin coating of fine gray powder is normal
 - If there are little piles of debris in the pan, it's time for an overhaul
 - Check the filter for debris
 - If the filter is clogged, its time for an overhaul
 - The filter is not a normal service item for most automatic transmissions. It is there to clean the fluid of the normally small amount of debris that builds up during normal operation. The filter is typically designed to last the life of the transmission.
 - If the filter looks like it needs to be cleaned, then the transmission probably needs more service than just a new filter!
 - Change the fluid using a fluid displacement/exchange and flushing machine at a cooler line
 - There are other possible methods for changing the fluid, but the service industry, and most manufacturers, have agreed on the machines being the best method for removing the majority of the old fluid, and replacing it with new.
 - A typical rear wheel drive automatic transmission holds over 15 quarts of fluid
 - Manufacturers typically do not recommend any "additives" for their transmissions.
 - Some manufacturers specifically recommend not adding any "additives"

Remember that automatic transmission service is preventative maintenance. Other than changing fluid with one of correct or updated specification, changing the fluid won't cure any transmission concerns. Take a Look at what you are currently doing for automatic transmission and transaxle maintenance. Are you up to date? Are your technicians familiar with the fluid level check and fill procedures for the newer transmissions that do not have a dipstick under the hood? Are you using the correct fluid for each application? Are you performing service often enough for your fleets usage? Are you maybe performing service too often, and replacing very expensive fluid more often that you need to?

As with the rest of the technologies on current motor vehicles, times have changed. Have you kept your service procedures up to date?