

## Hydraulic/Transmission Fluid - The Full Story, by Llamas

---

*Ford N-Series Transmission/Hydraulic Fluid - the Full Story*  
by Llamas - N-Series Discussion Forum

The transmission fluid in an N-series tractor lubricates the transmission, differential, rear wheel bearings, PTO and hydraulic pump drive, and it also acts as the working fluid for the hydraulic lift. In 9N/2N models, it also lubricates the steering sector and shaft system.

The owner's manual for the 9N and 2N models specified the use of only two fluids. They were STRAIGHT MINERAL OIL SAE 90 (above freezing) and STRAIGHT MINERAL OIL SAE 80 (below freezing). Caps in original. By the time 1950 rolled around, and the 8N was the only Ford tractor, oil technology had advanced a bit, and Ford specified the use of "Mild EP GEAR OIL conforming to Ford specs M4864A (SAE 80) (below freezing) or B (SAE 90) (above freezing)". Caps in original.

Today, if asked, Ford-New Holland will specify the use of a combined hydraulic/transmission fluid which conforms to their specification M2C134D in all "N" series models.

The original specification for STRAIGHT MINERAL OIL would conform to the present-day API gear oil designation of GL1. Although less normal today, this can still be had – it is still used in non-synchronesh truck transmissions, for example.

Ford M4864 "mild EP GEAR OIL" would conform to the present-day API gear oil designation of GL3. It contains some Extreme Pressure additives (sulphur and phosphorus compounds) which make it a better lubricant for transmissions and for bevel-gear final drives where there is high-pressure sliding contact. It should be noted that the EP designation refers to contact pressure between moving parts – it has nothing to do with hydraulic pressure.

Combined hydraulic/transmission fluid is a compromise product. It contains many additives to make it work reasonably well as a hydraulic power transmission fluid, as a hydrostatic power transmission fluid and as a gear lubricant. It is not typically specified by SAE viscosity number (or "weight") although it may be.

The Ford M2C134D fluid, for example, is not specified by SAE "weight" although its viscosity is defined by maximum numbers on various scales at various temperatures. Its viscosity on the SAE scale, based on those numbers, would be between 40 and 50.

True hydraulic fluids – fluids intended only for hydraulic and/or hydrostatic power transmission - are also typically not specified by SAE viscosity number. The ATF familiar to every driver with an automatic transmission, for example, carries no SAE viscosity number – instead, it is specified by a whole range of performance requirements, of which its viscosity is just one part. True hydraulic or hydrostatic fluids are typically of the order of 10 to 20 on the SAE viscosity scale. So there is no such thing as "SAE 80 Mild EP hydraulic fluid", for example.

If we go shopping at TSC, for example, we will find two types of fluid for our N-series transmission/hydraulic application on sale. One is marked "Ford Tractor Transmission Fluid – High quality oil for use in older Ford tractors". This is the original stuff, almost. It has an SAE viscosity number of 80W90. It is not "straight mineral oil". The sniff test tells us that it has sulphur additives, so it is at least an API GL3 gear oil. Most likely, it is an API GL5 gear oil, because that's the universal automobile standard for gear oil these days. It is exactly the same type of oil that would be used in a conventional automobile or truck differential, although it may not be up to the latest standard.

Our other choice is "Universal Tractor Hydraulic Fluid". This is a pig of a different grunt. It is a 10W20 oil (much thinner, and multigrade) which is "recommended" for use in place of the Ford M2C134D, as well as a whole list of other manufacturers specifications. Note that it does NOT say "Meets Ford M2C134D specification" – it can't do that, just based on the stated viscosity alone. This oil does have an additive package which is intended to make it work reasonably well as both a gear lubricant and a hydraulic fluid.

We may also see "Hydraulic fluid" on sale. This is something else again. It is not intended for use in transmissions or final drive applications, and indeed it says so in big letters on the jug. This is for hydraulic systems ONLY. As it happens, it is marked with an "equivalent" SAE viscosity number of 20. It should be noted that there are no such designations as "EP" or "mild EP" for hydraulic fluid, and indeed, API and SAE don't really get into specifying hydraulic fluids at all – some of their tests and standards are sometimes used for hydraulic fluid, but the full specifications are typically originated by the makers of hydraulic equipment. To use this in an N transmission would be quick and sure death for the transmission and differential - it simply lacks both the viscosity and the additives required to do that work. The hydraulics would probably work quite well using this, though.

TSC is not the only game in town, but broadly the same choices are available at your local ag supply store. The "universal" transmission/hydraulic fluid is perhaps the least best choice. It attempts to meet fifty different manufacturers' specifications in one fluid. Some of those specifications are mutually exclusive – as will be seen in the example of viscosity noted above. It would, however, be a good hydraulic fluid for a hydraulic lift system in good working order. The originally-specified 80 or 90 weight gear oil is probably a better transmission and final-drive lubricant – the downside is that it is not so good as a hydraulic fluid, especially in cold weather. For those reasons, a combination transmission/hydraulic fluid which does conform to the Ford M2C134D spec is probably a better compromise between hydraulic system performance and gear lubrication.



*Best internet source  
of information and help  
for old Ford tractors.*

[www.ntractorclub.com](http://www.ntractorclub.com)