



## Gearbox Lubricants

Many folks ask what lube to run in the OD and others advise motor oil, ATF, synthetic oil, snake oil, etc. Laycock and Triumph specified the use of SAE 20/30 (winter/summer) motor oil for OD gearbox lubricant in the TR2 - TR3 era. Later, Triumph changed to recommend Hypoid 80/90 (GL4) in their gearboxes both with and without Overdrives. I recently saw a quote from some publication; don't remember which, stating that Triumph mistakenly recommended GL4 for use in the overdrives. I don't believe that; I think Triumph made the change intentionally to improve some aspect of the performance (I'm sure someone will provide me the correct reason so I can include it here). As to a mistake --- I don't believe it because they had more than ten years to correct it if they wanted. When one stands back and looks at it, it sort of makes sense to use engine oil in the engine, gearbox oil in the gearbox, coolant in the radiator, etc.

The most common current gear lube is 75W90 GL5. This upgrade from the GL4 has an increased amount of a sulfur based additive that may damage the brass bushings in the gearbox and OD, especially at elevated temperatures, so most folks advise against using it.

Ronnie Babbitt solicited input from the Triumph email list on what lube folks were using in their OD gearboxes. He got responses covering 25 autos as follows:

- ~50% use motor oil
- ~30% use GL4
- ~20% use synthetic

The motor oil folks were over half TR3s and roughly equally split between SAE 30, SAE 50 and 20W50.

So --- what is best? Damned if I know. I've used GL5 in the past with no recognizable bad side effects, but realizing that I keep these cars for decades, I decided against using GL5 in the future. Besides, the GL5 really stinks due to the additional sulfur based additives and the spouse complains if I use that stuff in the basement workshop.

My earlier thoughts were that all three (GL4, motor oil & synthetic gear lube) will not damage the gearbox and will give satisfactory performance. Since then several people have reported to the email lists that they have experienced unsatisfactory performance with the synthetic lubes --- apparently the synthetic lubes are so slick that the synchros can't get a bite on the hubs when shifting.

Ed Hackett in a note on the VTR website <http://www.vtr.org/maintain/oil-overview.html> shows a viscosity comparison between gear oil and engine oil. The 80W90 gear oil spans about the same viscosity as 20W50 engine oil. Given this, my choice in order of preference is:

1. GL4 - because it's what Triumph specified.
2. 20W50 - because it's readily available.

Just prior to an earlier revision of this note James (Jay) Holekamp posted the following information on the Triumph list:

*During the recent "stop the oil leaks" saga with my TR4 GBX/OD I needed to acquire a new stock of gear oil since my old (twenty years or so) supply of API GL-4 gear oil (some Esso, some Shell) was consumed between topping up the leaks and the several tries to solve the leaks.*

*I first made inquiry of the various oil companies (in USA only) easily found on the web and asked if they had a GL-4 gear oil and what happens if API GL-5 gear oil is used in an API GL-4 gear oil application. The consistent and typical answer was, "...if an API GL-5 gear oil is used in an application where API GL-4 gear oil is called for, chemical corrosion of "yellow metal" components may occur, such as bronze synchronizers, brass bushings, etc. This may lead to shifting difficulties or shortened life. "[Pennzoil web site] "Typically, GL-5 gear oil will have about 2 times the active additive level of a GL-4 Product. This additional additive can cause problems with yellow metals such as brass or bronze. "[Castrol tech email]*

*The only oil companies I contacted which said they had a GL-4 product were Pennzoil, Castrol & Valvoline. Details follow:*

- Pennzoil Gear Plus GL-4 SAE 80W-90 stock # 21176 32 oz bottle
- Castrol Hypoy Gear Oil GL-4 SAE 80W-90 35 lb pail(5 gal)
- Valvoline Hydro-Lube Gear Oil GL-3 & 4 SAE 80W-90 part # 538 5 gal por-pail

*I also found the following product in one of the local chain auto parts stores (Trak Auto):*

- Sta-Lube Hypoid Gear Oil GL-4 SAE 85W-90 part #SL24229 32 oz bottle (div of CRC Industries, Inc)

*At this time these are the product possibilities I know of in the US if one wants to use API GL-4 in their GBX/OD. I bought 3 quarts of the Sta-Lube brand for about \$ 3.00 ea. (all that was on hand). TRF sells Castrol Hypoy (cat #TRFGL4) repackaged in quart (32 oz) bottles for \$ 5.50 ea + shipping. Since I really didn't need 5 gals of gear oil, and per Castrol their nearest stocking distributor was in Lebanon, IN with none of their Illinois (where I'm located) distributors handling Castrol Hypoy, I special ordered a case (12 quarts) of Pennzoil Gear Plus GL-4 SAE 80W-90 through my local auto parts store. In two days the oil arrived, cost was \$2.80 per quart + sales tax. I gave 1/2 the oil to my younger brother who owns a '72 TR6 and we were both happy and back in GL-4 for the foreseeable future.*

When I asked Jay for permission to use the above information he added the following: *Brian Sanborn just reminded me that StaLub (div of CRC Industries, Inc. [tech svc 800 521 3168, cust svc 800 272 8963, tel nos not verified]) supplies a fine and inexpensive dispensing pump (product*

#SL4344) which makes adding gear oil via the GBX side fill plug from under the car on later GBXs reasonably easy. I have one of these pumps and like it a lot - although I hope to seldom make use of it in future.

It's now six months later, I had just finished overhauling a gearbox with J type OD, and then opened a failed Gearbox/ A Type OD combination. The OD batting average is still 100% ---- the OD failed because the gearbox failed -- usually the rear countershaft bearings. The resulting debris then got into the OD and interfered with the hydraulics. My limited experience has shown the ODs much less failure prone than the gearbox. So, if you want to keep everything running, you might ask, "what is the best lubricant for the gearbox"? I've now decided to go with the GL4 as specified by Triumph. Also, I think I'll make it a practice to change it every ten to twenty years.

With that in mind, I tried to find a local source of GL4. None of the auto stores ( Auto zone, NAPA, etc) were interested in ordering a case for me. I finally called the Castrol Distributor in neighboring Columbus, Ohio and found they had a 35 pound (~ 5 gallon) pail of the Castrol Hypo Gear Oil GL-4 SAE 80W-90 for \$40. (He asked if I had a BMW --- I wonder why?) At a little less than 2 quarts per gearbox, that'll probably do a dozen.

The photo shows the pail with the little pump (the StaLub brand mentioned earlier) I use to squirt the stuff into the side of the gearbox and differential. The pail was completely full, so much so that some came out onto the lid when the plastic cap was opened. I used the pump in the pail to fill a couple plastic quart oil bottles and to refill the antifreeze bottle. The pump won't reach the last 30% or so in the pail so I'll have to pour it out at that point ---- should be no problem.

That is the workshop counter, not the kitchen counter. However, I have a clean shop at the moment so it could be the kitchen. And yes, the workshop cat had to get in the picture. Sure wish she were as motivated to get the mouse that eats her cat food.



Update 8/2003 --- John Krause passed on the following suggestion:

"I have found one additional possibility, that was recommended to me by a longtime British Car mechanic, that you do not mention ... Redline Synthetic MT-90 which is different from most other synthetic oil. Redline MT-90 is a 75W90 API GL-4 Gear Oil that "satisfies the gear oil viscosity requirements of 75W, 80W, and 90 and motor oil viscosities SAE 40 and 10W40". Redline says that their oil is not too slippery like most gear oils. You can read what they have to say about MT-90 on their website ... <http://www.redlineoil.com/products.htm>

Redline also makes an MTL Manual Transmission - Manual Transaxle Lubricant that is an SAE 75W/80W API GL-4 Hypoid Gear Oil.

I have been using the MT-90 in my TR3A OD for four years now with very good results. I had my TR250 OD rebuilt last year and the shop that rebuilt it filled it with the factory recommendation. The 250s shifting is not as smooth as the TR3s, but that may be because it is not broken in yet. I may change to the Redline MT-90 in the future."

Thanks John