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1.0 General Information on Gear Lubricants

Gear lubricants for manual transmissions must conform to the following requirements due to the different transmission designs with considerable variation in loads, temperature and speeds.

The qualities of a recommended gear lubricant are:

- A. Load carrying capacity, i.e. high-pressure resistance.
- B. Noise reduction.
- C. Non-corrosive to various metals.
- D. Non-foaming.
- E. Non-separation of additives at operating temperatures.
- F. Non-sludge forming.
- G. Prevention of swelling, hardening and shrinking of seals.

These properties are already provided in manual transmission oil by:

- High-pressure additives.
- Corrosion inhibitors.
- Oxidation inhibitors (inhibitors which limit or prevent chemical reactions).
- Anti-foaming agents.

2.0 Oil Additives

BMW manual transmissions are designed so that they do not require aftermarket oil additives.

BMW disapproves the use of any oil additives and cannot accept the liability for any consequential damage that results from using oil additives.

3.0 Manual Transmission Oil Requirements and Specifications

A. All reputable brand mineral-based transmission oils of viscosity class SAE 80 according to specifications MIL-L-2105 or API GL-4 (**no label** on transmission bell housing).

B. Synthetic transmission fluid, Mobil SHC 630 (325e/528e without dual mass flywheel, produced before mid-1986). Manual transmissions which are filled with Mobil SHC 630 synthetic gear lube have a **green label** with the words "Special Oil" located next to the oil filter plug.



Note: Mobil SHC 630 is available in 5-gallon pails or 55-gallon drums from:

Mobil Oil Corporation - Contact your local Mobil oil distributor (see Yellow Pages) or call 1-800-582-3645.

Filling BMW transmissions with unapproved synthetic gear lubes could cause the following damage:

- Premature synchromesh ring wear
- Reduced service life of bearings
- Tooth profile damage
- Faster wear of selector forks
- Damage to radial shaft oil seals

Transmission gear clashing will eventually result.

Note: Do not use synthetic fluid Mobil SHC 630 in other vehicles. The transmission synchronizers of cars other than listed above are not compatible with synthetic fluid and premature wear will result.

Note: To reduce the physical effort required to change gear at low ambient temperatures, the following oils can be used in the transmission during the winter:

- Single-grade HD mineral engine oils SAE40, SAE30, SAE20
- In countries where the ambient temperatures are particularly low, ATF oils can also be used.

This has the disadvantage that the transmission tends to rattle or knock while in neutral at higher temperatures.

CAUTION! These transmissions must never be filled with synthetic engine oils or multigrade engine oils, since these oils contain coefficient of friction-reducing agents that can adversely affect operation of the synchromesh mechanism.

C. Automatic Transmission Fluid (ATF) of Dexron® II or Dexron® III formulation on any of the following:

- Dual mass flywheel
- Direct drive fifth gear as of 9/90
- Six-speeds

Manual transmissions which are filled with ATF have 17mm external hex plugs in the filler and drain openings as well as an **orange label** on the transmission bell housing next to the filler plug.



D. From model year 1998 (9/97 production) all manual transmissions are filled with Esso/Exxon "MTF-LT-1" long-term fluid.

A **yellow label** with the letters "MTF-LT-1" is located next to the oil filler plug.

No oil change is required for the entire service life of these transmissions.

In the event of a repair, the transmission must only be filled with the long-term oil.

Esso/Exxon MTF-LT-1

BMW P/N 83 22 9 408 942.

E. From model year 2004 some manual transmissions are filled with Castrol "MTF-LT-2" long-term fluid. This fluid has the same properties as the "MTF-LT-1" fluid indicated above in section D. The "MTF-LT-1" fluid may be mixed and/or substituted for the "MTF-LT-2" manual transmission fluid.

2006 MY and later E60 M5 and E63/64 M6 equipped with and without SMG utilizes only MTF-LT-2 fluid.

2006 MY and later E85 M Roadster and Coupe require MTF-LT-2 fluid.

2008 MY and later E90, E92 and E93 M3 require MTF-LT-2 fluid for conventional manual transmissions. This fluid is not to be used in the Dual-Clutch Manual Transmission (M DCT Drive logic). Refer to Operating Fluids, Group 28 for the Dual-Clutch Manual Transmission ((M DCT Drive logic) recommended lubricant.

MTF-LT-2 Fluid

BMW P/N 83 22 0 309 031

F. From Model Year 2006 all vehicles equipped with a manual transmission and the N52, N54 engines require the MTF-LT-3 long-term fluid. Refer to label on transmission, if label is missing enter vin number into EPC to acquire a new label with fluid description.

MTF-LT-3

BMW P/N 83 22 0 409 878

No oil change is required for the entire service life of these transmissions.

Manual Transmission Cold Shift Effort

Note: The following information does not apply to transmissions filled with long-term fluid.

Transmission cold shift effort is reduced by replacing the original oil (SAE 80 or Mobil SHC 630) with a reputable brand single-grade HD engine mineral oil of API-SE standards (SAE 20, SAE 30, or SAE 40). Thinner oils will run the risk of increased gear noise.

A further reduction in shift effort can be obtained by using ATF, but gear noise will be more noticeable compared to single-grade engine mineral oils.

For summer operation it is recommended that ATF or engine oil be drained and replaced by the original lubricant, either SAE 80 or Mobil SHC 630 (as specified) transmission fluid.

CAUTION: Never fill a manual transmission with synthetic engine oils or multigrade mineral-based engine oils, since they have friction-reducing components that could impair the function of the synchronizers.

4.0 Transmission Oil Change Interval

Refer to Service Maintenance checklists for the respective model year.

Starting with 1998 models all manual transmissions are filled with long-term fluid and require no fluid changes for the life of the vehicle.

5.0 SMG: Sequential Manual Gear Box

All models SMG Hydraulic Unit require the use of Pentosin CHF 11S fluid.