General

The gear oils approved for MB vehicles are classified according to their application into:

Hypoid gear oils, sheet
235.0/.7/.9/.14/.15/.23/.33/.61/.62

Transmission oils, sheet
235.3/.10/.14/.17/.21/.74
236.24
239.31

Transmission fluids (ATF) sheet
235.73,
236.1/.2/.3/.7/.8/.10/.12/.13/.14/15/.17./.20/.21/.22/.24/.25/.26/.41/.81/.93,
239.21/.22

Automated manual transmission sheet
235.71/. 72

Axle gear oils, sheet
235.63/.64/.66/.74,
239.71/.72/.73

Transfer case gear oils, sheet
236.10/.12/.13/.15/.17
239.41

Electric drive, eAxle sheet
235.65
236.21/.24
237.11/12

Frequently the transmission oils fulfill multifunctional requirements, which is why they are used in a wide variety of transmission designs and hydraulic systems. However, where very specific technological properties of the transmission oil are required, special transmission oils had to be formulated for these major assemblies. These are listed on separate sheets of the MB Specifications for Operating Fluids and explain the large number of sheets for transmission oils.

The Mercedes-Benz standard for the corresponding lubricant quality and its area of application for major assemblies installed in MB vehicles is documented using the various sheets.

The overview on the sheet number 231.1 provide the allocation of the respective Specifications for Operating Fluids (lubricant quality) to their use in the respective major assemblies.

Requirements

Gear oils are, like all lubricants, design-specific materials which only fulfill their task best if they are perfectly matched to the materials in tribological contact with them.

These specific material requirements can be subdivided into structural, technological and material requirements and are the primary properties that vehicle gear oils have to fulfill.

The general requirements, which are no less important, are classified into shelf life, environmental compatibility, worldwide availability, profitability and the consistent quality of the guaranteed lubricant properties, which must meet the Mercedes-Benz standards worldwide.

P00.40-0208-11

If prior to starting the vehicle the gear oil temperature is below the critical temperature for the oil used, then either the gear oil should be prewarmed or the transmission should be warmed up while in neutral.

When downloading the file, please note that it is frequently updated.
Please ensure that you are always downloading the current version on the Operating Fluids website.

Disposal

All approved transmission oils, either fresh oil or used oil, are valuable substances which can be reused using the appropriate recycling method for the material. The detailed disposal methods can be found in the waste guidelines for the countries.

1. Hypoid gear oils, **Sheet 235.0/.7/.9/.15/.23/.33/.61/.62** (for use see sheet 231.1)

   Hypoid gear oils contain a high level of EP/AW additives (Extreme Pressure/Antiwear) and a highly viscous base oil to prevent seizure when the hypoid gears mesh (mixed and boundary friction conditions) and to ensure a high degree of protection against wear. The seal compatibility with radial shaft sealing rings is regarded as critical for such high additive concentrations, as the P/S additive systems become thermally unstable at temperature from 130 °C to 140 °C and can lead to a sludging of the hypoid oil. The resulting deposits on the radial shaft sealing rings then generally lead to thermal overload and this in turn leads to leakage at this component.

   The tooth engagement conditions of the hypoid gears result in a high proportion of sliding and a low hydrodynamic proportion of tooth engagement between the pinion and ring gear. Due to the high tribological load compared to adhesive wear (seizure) and pitting, the performance of hypoid gear oils must be particularly high with respect to these types of wear. The formula of the oils is therefore determined by a high concentration of EP/AW additives and a highly viscous base oil. Alternative oils, e.g. engine oils, cannot be used for these drives. Service confirmation that an oil fulfills the requirements of Mercedes-Benz AG is provided by internal tests. However, the hypoid gear oils must at least correspond to the US military specification MIL-L-2105 B/C/D and must be classed GL-5 in the quality grade according to API (American Institute of Petroleum).

   Viscosity requirements

   The cold flow behavior is only specified for SAE 75W-, 85W-... oils. Here, the limits according to SAE J 306 c apply, according to which the dynamic viscosity may be max. 150,000 mPa s at –40 °C for 75W oils and at –12 °C for 85W oils. As a result of the tendency to form deposits in the transmission, the polymer content is limited to max. 1 percent by weight for pour point reducers. Polymers as VI improvers for thickening low-viscosity base oils are not permitted.

   1. Hypoid gear oils, sheet 235.9

      Replacement for sheet 235.8 transferred to Daimler Truck AG

   2. Hypoid gear oils, sheet 235.23

      Replacement for sheet 235.20 transferred to Daimler Truck AG

   3. Hypoid gear oils, sheet 235.33

      Replacement for sheet 235.31 transferred to Daimler Truck AG

2. Transmission oils, **sheet 235.3/.10/.14/.17/.21/.71/.72, 236.24, 239.31** (for use see sheet 231.1)

   1. Transmission oils, **sheet 235.14**

      Replacement for sheet 235.1 transferred to Daimler Truck AG

      The additive and viscosity properties of the transmission oils are adjusted so that they meet all the requirements placed on manual transmissions with steel/molybdenum synchronization, spur gear axles, MB and ZF transfer cases and reversing gears. Among other things, this results in the fact that the oils ensure a defined friction coefficient of the synchronizer elements, even after a high number of shift operations, without crunching noises. With gears and roller-element bearings, the adhesive wear (seizure) and pitting in particular should be minimized as far as possible.

      1. **Viscosity requirements**

         The cold flow behavior is only specified for SAE 75W-, 80W, 85W-... oils. Here, the limits according to SAE J 306 c apply, according to which the dynamic viscosity may be max. 150,000 mPa s at –40 °C for 75W oils, at -26 °C for 80W oils and at –12 °C for 85W oils.

         Due to the formation of deposits in the transmission, the polymer content is limited to max. 1 percent by weight for pour point reducers. Polymers as VI improvers for thickening low-viscosity base oils are not permitted. The kinematic viscosity at 100 °C must be at least 9.5 mm²/s. In hot zones, gear oils of SAE grade 90 are also permitted.

2. Transmission oils, **sheet 235.3**

   NMT service kit for MBC (NSG270/NSG400) service kit = complaints about cold-shifting response

3. Transmission oils, **sheet 235.10**

   The partly synthetic transmission oils have favorable viscosity/temperature characteristics, a very good cold-shifting response and due to the composition of the transmission oil, a good thermal/oxidative stability of the oil at high oil temperatures can be expected.

   With the use in passenger car manual transmissions which are also installed in cross-country vehicles, the approved transmission oil is usually only used in the event of repairs or for refilling.

4. Transmission oils, **sheet 235.17**
   Mineral oil based transmission oil

5. Transmission oils, **sheet 235.21**

   Replacement for sheet 235.11 transferred to Daimler Truck AG (transmission oil transfer case)

6. Transmission oils, **sheet 235.71** use for Smart according to sheet 231.1

7. Transmission oils, **sheet 235.72** use for the Smart automated manual transmission and the electric drive according to sheet 231.1

8. Transmission oils, **sheet 236.24**

   The transmission oils are approved for the ZF transmission

9. Transmission oils, **sheet 239.31** approved for front manual trasmission as per sheet 231.1

3. Transmission fluids (ATF), **sheet 235.73, 236.1/.2/.3/.7/.8/.10/.12/.13/.14/15/.17./.20/.21/.22/.24/.25/.26/.41/.81/.93, 239.21/.22** (for use see sheet 231.1)

   ATF are comparatively low-viscosity gear oils which, due to their universal use potential as a gear oil or a hydraulic fluid, can cover a wide spectrum of applications. The ATFs in the individual sheets differ essentially due to their inherent friction coefficients in tribological contact. This property makes these oils ideally suited for use as functional liquids for automatic transmissions, the shifting comfort of which is heavily influenced by the behavior of the friction value of the ATF, among other things. Therefore, to achieve optimum performance of the vehicles, only the ATF quality (sheet no.) assigned to the major assembly is to be used. The individual ATF qualities will be described in greater detail below.

   1. Automatic transmission fluids (ATF), **sheet 235.73**
      use for Smart according to sheet 231.1

   2. Automatic transmission fluids (ATF), **sheet 236.1**

      The approved ATF correspond to the currently no longer valid GM specification Dexron II-D or the currently valid GM specification Dexron III.

      The field of application of these ATF includes MB automatic transmissions without controlled torque converter lockup clutch in passenger cars, ZF Ecomat transmissions.

   3. Transmission fluids (ATFs), **sheet 236.2**, for MB passenger car transmissions with non-ferrous heavy metal synchronization except front-wheel drive manual transmission of A-Class (s. section 2.5, sheet 235.10), hydrostat fan drive.

      The ATF must meet all the requirements of the transmissions with nonferrous metal synchronization. These include, in particular, wear protection against pitting and seizure as well as a defined friction coefficient of the synchronizer components that is as constant as possible over the entire service life. As a hydraulic fluid, the ATF is used for hydraulic power transmission and for protecting the hydraulic unit from wear.

      The seal compatibility must be ensured with all elastomer materials installed. The approved ATFs according to sheet 236.2 correspond to the currently no longer valid GM specification Type A Suffix A. The kinematic fresh oil viscosity at 100 °C must be at least 7.0 mm²/s, after shearing (as per CEC- TLPG 7) at least 6.0 mm²/s.

4. **Steering gear oils, sheet 236.3**, for power steering in passenger cars and VANs except Van T0 and T1N, S-Class W220, power pack of the A-Class and off-road vehicles, mechanical steering L 075 Z for passenger cars and mechanical steering in off-road vehicles..

   In the S-Class W220, in the power-pack of the A-Class as well as in the vans T0 and T1N, the hydraulic fluids according to sheet 345.0 must be used from/below outside temperatures of –25 ℃.

5. Transmission fluids (ATFs), **sheet 236.6**, the sheet has been deleted. See here overview sheets for MB Specifications for Operating Fluids 231.1.

6. Transmission fluids (ATFs), **sheet 236.7**, for MB automatic transmission without controlled torque converter lockup clutch in passenger cars.

   The approved ATF according to sheet 236.7 corresponds to the no longer valid GM specification Dexron II-D. The kinematic fresh oil viscosity at 100 ℃ must be at least 7.0 mm²/s, after shearing (as per CEC- TLPG 7) at least 6.0 mm²/s.

7. Automatic transmission fluids (ATF), **sheet 236.8**, for MB automatic transmissions without controlled torque converter lockup clutch in passenger cars (only in arctic climates).

   The approved ATF correspond to the no longer valid GM specification Dexron II-E, Allison C4, Voith lubricant lists G 607 and G 1363 as well as ZF lubricant specifications TE-ML 14.

8. Automatic transmission fluids (ATF), **sheet 236.10**

   0. For MB automatic transmission with and without regulated torque converter lockup clutch (GKÜB) in cars. These ATF are installed ex works as lifetime oil in all MB automatic transmissions 722.6 with controlled torque converter lockup clutch. In the event of repair work, only the ATF quality shown in sheet 236.10 can be used for refilling in this new generation of automatic transmissions.

   1. All MB automatic transmissions without regulated torque converter lockup clutch in passenger cars can either be filled with the ATF as per Sheet 236.10 or the ATF as per Sheets 236.1/.6/.7/.81/.93

   2. Transfer case (4MATIC) model 124, 163, 210

9. Automatic transmission fluids (ATF), **sheet 236.12,** for 7-speed automatic transmissions are also downwards-compatible for all 5-speed automatic transmissions.

10. Automatic transmission fluids (ATF), **sheet 236.13**

    0. Repair solution for MB automatic transmission without regulated torque converter lockup clutch in passenger cars in the event of the complaint "double shift joint after engaging in drive range D."

    1. Transfer case (for use see sheet 231.1)

11. Automatic transmission fluids (ATF), **sheet 236.14**

    For use as per sheet 231.1 can also be used for 5-speed automatic transmission with regulated torque converter lockup clutch (KÜB) for vehicles with rear wheel drive (722.6)

12. Transmission fluids (ATF), **sheet 236.20,** for CVT transmissions that are used in the Mercedes-Benz A- and B-Class with CVT transmission, model 169, 245 with transmission 722.8.

13. Transmission oils, **sheet 236.24**, ZF-gearbox 716.7 in model 172. 205. 213. 238. 253.

14. Automatic transmission fluids (ATF), **sheet 236.93**
    Replacement for sheet 236.9 transferred to Daimler Truck AG, for MB automatic transmissions without controlled torque converter lockup clutch in passenger cars.
    The ATF correspond to the valid GM specification Dexron III, Voith lubricant list G 607 and ZF lubricant specification TE-ML 14.

4. Axle gear oils, **235.63/.64/.66/.74, 239.71/.72.73** (for use see sheet 231.1)

   1. Axle gear oils, **sheet 235.63** for TWIN rear axle differential rear axle for gear set

2. Axle gear oils, **sheet 235.64** for TWIN rear axle differential rear axle for coupling

3. Axle gear oils, **sheet 235.66** for AAM rear axle China production

4. Axle gear oils, **sheet 235.74** for rear axle, model 163,

   Front axle 4MATIC (except models 166,167, 205, 207, 212, 213, 214, 217, 218, 222, 238, 253, 257, 292)

5. Axle gear oils **sheet 239.71** rear axle (normal differential) with light alloy housing

6. Axle gear oils **sheet 239.72** front axle differential (normal differential)

7. Axle gear oils, **sheet 239.73** for ZF rear axle with light alloy housing China production

5. Transfer case gear oils **Sheet 235.11/.14/.21, sheet 236.10/.12/.13/.15/.17, 239.41** (for use see sheet 231.1)

6. Oil for electric drive, sheet **235.17/.65, 236.21/.24, 237.11/.12** (for use see sheet 231.1)

   This oils are approved for the electrical drive systems of Mercdes Benz passenger cars and Vans