



1.0 ZF Gemmer Steering

The ZF Gemmer steering is permanently filled with oil. There is no drain plug.

2.0 ZF Rack and Pinion Steering Without Power Assist

The ZF rack and pinion steering is lubricated for its service life and therefore does not require servicing.

In case of repair, steering components on E21 vehicles are to be lubricated with a sodium-based grease, with a temperature range of -30°C to +75°C.

Calypsol D 4024 BMW Part No. 32 11 1 116 929

3.0 Ball and Nut or Rack and Pinion Power Steering

Only reputable brand Automatic Transmission Fluid (ATF) of Dexron® III formulation may be used for the power steering and power steering pump.

In case of brief hydraulic noise after starting at low outside temperatures, we recommend replacing the red ATF with green CHF or LHM oil (see below).

4.0 ZF Ball and Nut Power Steering with H31 System

The approved oils for BMW models with power steering and the H31 brake booster system are identical with those oils approved for power steering without the H31 system **except** for the following:

E32 models with self-leveling rear suspension and mutual oil supply tank in the engine compartment (see Group 37 Integrated Suspension Systems).

Countries with very low outside temperatures (e.g. Canada) had their power steering systems filled at the factory with Pentosin CHF 7.1 since 9/87 through 9/91. This is also to be used on vehicles built before 9/87.

Since 9/91, vehicles now use Pentosin CHF 11S instead of CHF 7.1.

Pentosin CHF 7.1 BMW Part No. 81 22 1 468 879
Pentosin CHF 11S BMW Part No. 82 11 1 468 041

These cars are marked with a pertinent label located close to the oil tank.

LHM oils (green color) of the following manufacturers may also be used instead of Pentosin (CHF 7.1):

Shell LHM
Castrol LHM
Exxon LHM

The mixing of CHF, LHM oils and ATF is not permitted.

Pentosin CHF 4548 was used on vehicles built before 9/87 but is no longer available. However, mixing of Pentosin CHF 7.1 with residual quantities of Pentosin CHF 4548 are permitted in these earlier vehicles. Mixing of these two oils is not permitted for E32 / E38 vehicles.

The hydraulic system for power steering and power-assisted brakes must be drained as completely as possible when changing from one type of oil to the other.

All oil supply reservoirs are marked with the type of oil being used — ATF or CHF.

5.0 Oil Change for Power Steering

Regular oil changing is not necessary. However, it is recommended to replace the oil after completion of repairs (unit or line replacement). Use ATF of Dexron® III formulation.

6.0 Horn Slip Rings

Approved grease is a copper paste (former BMW Part No. 81 22 9 400 794).

3M Part No. 8945
CRC Part No. 3046 010

See S.I. Bulletin B 61 04 90 (3082).