

Enclosure 1 to SI 32 03 96 (148) En, edition Dec. 1, 1996

The ZF Gemmer steering gear is lubricated for life and therefore maintenance-free.

If repairs are carried out, the steering gear must be refilled with one of the following oils:

<i>Tradename</i>	<i>Manufacturer</i>
ARAL Getriebeöl Hyp. 90	ARAL
BP Mehrzweck-Getriebeöl 90	BP
ESSO Getriebeöl GX D 90	ESSO
FUCHS Renogear Hypoid 90	FUCHS
Castrol Hypoy B 90	Castrol
Shell Spirax MB 90	Shell
TEXACO Multigear EP 90	TEXACO
VALVOLINE X - 18 MD 90	VALVOLINE

Enclosure 2 to SI 32 03 96 (148), edition 02/2019

Note:

The oil reservoirs for hydraulic fluid are marked on the rim of the reservoir to show which type of oil grade can be used. ATF oil or Pentosin CHF oil

Only for topping up hydraulic steering

<i>Trade name</i>	<i>BMW part number</i>	<i>Container size</i>	<i>Oil colour</i>
BMW automatic transmission fluid D II	81 22 9 400 272	1-litre can	red

<i>Trade name</i>	<i>BMW part number</i>	<i>Container size</i>	<i>Oil colour</i>
Pentosin CHF 11S ¹⁾	83 29 0 429 576	1-litre can	green

¹⁾ Vehicles with AFS or with ARS are filled as standard with Pentosin CHF 11S.

The ZF rack-and-pinion steering has lifetime lubrication and is thus maintenance-free. In case of repair, the affected steering components must be lubricated with the following grease:

<i>Trade name</i>	<i>BMW part number</i>	<i>Container size</i>
Lubricating grease FB-1	83 23 2 208 093	100 g tube

RR1, RR2 and RR3 models are filled with Texaco Cold Climate.

<i>Trade name</i>	<i>BMW part number</i>	<i>Container size</i>
Texaco Cold Climate		

Enclosure 3 to SI 32 03 96 (148), edition 02/2019

Only the automatic transmission fluids listed in section 5 may be used to ensure trouble-free functioning of the hydraulic steering and the vane pump.

These automatic transmission fluids are clear homogeneous liquids without mineral oil insoluble substances, they contain only additives that do not fail even after longer immobility periods.

The additives are mineral oil soluble compounds that improve the pressure absorption capability, the viscosity/temperature dependence, the friction and wear resistance, the foam prevention and the compatibility with the sealants.

In the case of brief hydraulic noises after starting at low outside temperatures, we recommend replacing the red automatic transmission fluid with the green CHF oil in accordance with Section 4.0.

A filter change is not necessary. For vehicles of the model range (E23) which are still equipped with paper filters from the series launch, a filter change should only be carried out if necessary.

It is not necessary to do an oil change regularly. However, after repair work (assembly or line change) it is recommended to change the oil.

Enclosure 4 to SI 32 03 96 (148), edition 02/2005

The oils for BMW models with power steering and a brake-power-boosting H 31 unit are identical with the oils for power steering gears without H 31 unit.

The following exceptions apply:

- All models with recirculating self-levelling suspension, AHK (active rear-axle kinematics) or EH lock and common oil reservoir in the engine compartment (see Group 37)
- E32/M60 and E34/M60

Models for countries with low outside temperatures (Finland, Norway, Sweden and Canada).

These models are filled with Pentosin CHF 11S.

If repairs are carried out on these models or the oil level needs to be topped up, the hydraulic fluid Pentosin CHF 11S can be ordered from the BMW Parts Service:

Trade name	BMW part number	Container size
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Pentosin CHF 11S	81 22 9 407 758	1-litre can
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CHF and ATF oils must not be mixed. The oil types are indeed compatible, but if there is more of the one type in the steering gear than the other, this adversely affects the properties of the other oil. it is permissible to mix Pentosin CHF 4548 with CHF 7.1 - *except on the E32 with recirculating self-levelling suspension!*

Therefore, the hydraulic system for steering and brake-power assistance must be drained as completely as possible when changing from one type of oil to the other.

All oil reservoirs will in future be marked with the oil type used - ATF or CHF 11.

Enclosure 5 to SI 32 03 96 (148), edition 02/2019

Trade name BMW part number Container size

Copper paste 81 22 9 400 794 100 g tube

Enclosure 6 to SI 32 03 96 (148), edition 02/2019

See main group 31 enclosure 4.0 Lubricant for rubber mount installation