



Operating Fluids

Group 33 Rear Axle

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Technical Service

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1.0 General Information On Final Drive Oil

Final Drive oil or hypoid gear lubricant must conform with the following requirements because of the high loads which occur on the profiles of the hypoid gear teeth:

- Load carrying capacity.
- Sufficient protection against seizure.
- Good wear protection.
- Optimal friction and temperature behavior.
- Seal compatibility.
- Aging resistance.

These and other properties are already contained in brand-name hypoid gear lubricants because of the high content of EP additives (EP = extreme pressure).

Oil Additives

The factory has **not approved** oil additives for hypoid gear lubricants.

All final drives are designed in such a manner that they do not require any type of oil additives. Any type of additives is fundamentally rejected by the factory. BMW NA cannot accept any liability for follow-up damage resulting from the use of additives.

2.0 Approved Final Drive Oils For Front And Rear Axle Final Drives With And Without Limited Slip Or Viscous Coupling

Mineral based final drive oils are no longer recommended due to the release of synthetic final drive oils for all vehicles with or without limited slip differentials.

Limited Slip Differentials

With the introduction of the Z3 roadster a new synthetic final drive oil for all vehicles with a multi-plate limited-slip differential has been released. The new BMW final drive oil SAF-XJ will replace the old final drive oil SAF-XLS.

The SAF-XLS final drive oil is not to be used in the final drive of the Z3 roadster.

Use only the SAF-XJ in the final drive of the Z3 roadster.

Note: If a non-limited slip differential oil is used in a limited slip differential a whining or chattering sound can be heard on very tight turns and will eventually result in a failure of the differential.

Description	Quantity	Part Number
BMW Synthetic Final Drive Oil (with multi-plate Limited Slip Differential)	55 liter drum (SAF-XJ)	83 22 1 470 080

E71 X6 xDrive35i and X6 xDrive50i:

Rear Differential with Superposing Gear Units (QMVH)

The rear differential assembly consists of three separate filler plugs, one in the center for the angle drive with differential gear and one additional filler plug on each of the left and right superposing gear units.

Angle drive with differential gear (center filler plug): PN 83 22 9 407 768 (SAF-XO)

Superposing gear units (two outer filler plugs): (SAF-CARBON) This fluid is not available at this time, please enter a PuMA case if fluid is needed.

For more information regarding filler plug locations and operation please refer to the TIS Website – Technical Training – ST710 E71 Complete Vehicle Workbook – E71 Chassis Dynamics Workbook.

Motorsport Vehicles:

All E46 M3, E60 M5, E63/E64 M6, E85 M roadster, E86 M coupe and E90/E91 and E92 M3 require SAF-XJ Fluid.

Non Limited Slip Differentials

Description	Quantity	Part Number
BMW Synthetic Final Drive Oil (without multi-plate limited slip differential, or with viscous differential lock (325iX/iXA)	55 liter drum (SAF-XO)	83 22 9 407 768

Note: See S.I. Bulletin B 33 01 92 for additional final drive oil info.

3.0 Final Drive Oil For BMW M1 Motorsport Coupe

The final drive of a BMW M1 is integrated into the manual transmission and the oil supply is accomplished with a mutual oil filling.

Use reputable brand SAE 80 manual transmission oil conforming with specifications MIL-L-2105 A or API-GL 4.

4.0 Oil Change Intervals

Maintenance requirements per the vehicle's Service Booklet or the respective Service Maintenance Checklist.

Replacement final drives: same as for new vehicles.

All models as of 9/97 production are factory-filled with synthetic rear axle oil having a long-life service rating. No oil changes are required for the life of the vehicle.

5.0 Cars Without Service Indicator (Including BMW M1)

First oil change at 600 miles
Further oil changes at 18,000 miles

Special rule for BMW 530i, 528i (E 12):

1st oil change at 600 miles after final drive replacement
2nd oil change at 4,500 miles after final drive replacement
Further oil changes at 9,000 miles intervals, beginning at 9,000 miles.

6.0 Cars With Service Indicator

Refer to Service Maintenance checklist for respective model year.

Break-In Procedures

Drive the car with changing engine speeds and road speeds during the first 1,200 miles/2,000 km, but never faster than 2/3rds of maximum speed in a selected gear. Avoid using full throttle and kick-down positions of the accelerator pedal during this period.

BMW M3/M5/M6 Up to 1,200 miles max. engine speed 5500 RPM
 Generally avoid full-throttle position of the accelerator.

These break-in procedures are, of course, also applicable to replacement final drives.

7.0 Output Shafts

The joints of output shafts have permanent grease lubrication and require no servicing. The amount of joint grease required after repairing is supplied in the "dust cover repair kit".

8.0 Wheel Bearings

Ball Bearings E24 (Since 5/82), E28, E30, E31, E32 And All Following

Bearing unit is lubricated for its service life, cannot be disassembled and does not require subsequent lubrication.

Grooved Ball Bearings E12, E21, E23, E24 Before 5/82

Grease type: Retinax A (former BMW Part No. 81 22 9 407 710)
CRC Part No. SL 3131

9.0 Differential Housing Final Drive Covers And Housing

On 735i/iL, 750iL, M6 and M5 (E28) models, the attaching bolts are to be installed with Hylogrip/Loctite 270 (green) thread sealant (former BMW Part No. 81 22 9 400 086).

Würth Part No. 8932700
Loctite Part No. 21438

See S.I. Bulletins B 33 01 89 (1869) and B 33 01 88 (1621).