High-tech safety for gearboxes

Gear oils for passenger cars and commercial vehicles
02/2014
Gear oils for passenger cars.

For problem-free operation over the entire life of the vehicle, passenger car gearboxes today need high-performance lubricants which protect against wear and significantly increase shifting comfort. In addition, extending oil change intervals up to the life of the vehicle make considerable demands on the quality of the oils.

As the long-term development partner of the world’s leading gearbox manufacturers, we operate at the leading edge of technology.

Go for quality and reliability. Go for FUCHS.
**TITAN**

**SINTOFUID FE**

**SAE 75W**

Premium Performance Manual Transmission Fluid offering increased gearbox efficiency in passenger cars due to low viscosity level. Reduces fuel consumption and offers best properties at low temperature. Suitable as fill for life fluid according to manufacturer.

**Specifications:**
API GL-4

**Approvals:**

**FUCHS Recommendations:**
- VW TL 521 71 (G 052 171 A1/A2)
- VW TL 521 78 (G 052 178 A2)
- VW TL 525 12 (G 052 512 A2)
- VW TL 726 (G 052 726 A2/G 055 726 A2/G 060 726 A2/G 070 726 A2)

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**TITAN**

**SINTOPOID FE**

**SAE 75W-85**

Premium Performance Gear Oil offering increased gearbox efficiency in passenger cars due to low viscosity level, formulated with fully-synthetic base oils. Reduces fuel consumption and offers best properties at low temperature. Suitable as fill for life fluid according to manufacturer.

**Specifications:**
API GL-5

**Approvals:**

**FUCHS Recommendations:**
- MB-APPROVAL 235.7
- ZF TE-ML 18

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**TITAN**

**SINTOFUID**

**SAE 75W-80**


**Specifications:**
API GL-5

**Approvals:**

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**TITAN**

**SINTOPOID**

**SAE 75W-90**

Premium Performance Axle Gear Oil for passenger cars, also for high-offset hypoid drives offering good gearbox efficiency. Suitable as fill for life fluid according to manufacturer.

**Specifications:**
API GL-5

**Approvals:**

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**TITAN**

**SINTOPOID LS**

**SAE 75W-90/75W-140**

Premium gear oil for axle and transfer gearboxes, formulated with fully-synthetic base oils. Offers best cold start behaviour. Suitable for axle and transfer gearboxes with and without limited slip differential. SINTOPOID LS 75W-90 is suitable as trouble shooter for conventional manual transmissions.

**Specifications:**

**SAE 75W-90 LS:**
- API GL-4/-5/-5 incl. LS
- SAE 75W-140 LS:
  - API GL-5

**Approvals:**

**FUCHS Recommendations:**
- SAE 75W-90 LS:
  - VW G50 / G51
  - SAE 75W-140 LS:
    - BMW 83 22 2 282 583
    - BMW 83 22 2 407 870
    - CHRYSLER MS-8985
    - FORD M2C192-A, GM 12346140
    - JOHN DEERE JDM J 11 G
    - SCANIA STO 1:0

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Reduce your operating costs: By using mixed fleet products in your vehicle park.

FUCHS has developed special gear oils for the wide variety of gearboxes in cars and trucks.
To reduce the chances of incorrect filling.
To reduce stock-keeping.
And ultimately, to reduce operating costs.
Choose FUCHS rationalisation products.
**TITAN SUPERGEAR MC SAE 80W-90**

*Super High Performance Gear Oil based on MC-Synthesis for extended oil change intervals.*

**Specifications:**
- API GL-4/GL-5
- SCANIA STO 1:0

**Approvals:**
- MAN 341 TYPE E2
- MAN 341 TYPE Z2
- MAN 342 TYPE M2
- MB-APPROVAL 235.0
- ZF TE-ML 02B, 05A, 12L, 12M, 16B, 17B, 19B, 21A

**FUCHS Recommendations:**
- CASE MS 1316
- FORD M2C197-A
- JOHN DEERE JDM J 11 E
- MAN M 3343 TYPE M
- NH 520 A
- SDFG OP 1705
- STEYR B-101
- ZF TE-ML 07, 08

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**TITAN SUPERGEAR MC SAE 80W-140**

*Super High Performance Gear Oil based on MC-Synthesis for extended oil change intervals.*

**Specifications:**
- API GL-4/GL-5
- SCANIA STO 1:0

**Approvals:**
- MAN M 342 TYPE M2
- ZF TE-ML 05A, 12E, 12B, 19B, 21A

**FUCHS Recommendations:**
- JOHN DEERE JDM J 11 E
- OPEL 19 42 386
- RENAULT VI
- ZF TE-ML 08

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**TITAN SUPERGEAR SAE 80W-90**

*High Performance Gear Oil for extended oil change intervals.*

**Specifications:**
- API GL-4/GL-5
- SCANIA STO 1:0

**Approvals:**
- MAN M 342 TYPE M2
- ZF TE-ML 05A, 12E, 17B, 19B, 21A

**FUCHS Recommendations:**
- JOHN DEERE JDM J 11 E
- OPEL 19 42 386
- RENAULT VI
- ZF TE-ML 17A

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**TITAN SUPERGEAR SAE 85W-140**

*High Performance Gear Oil for extended oil change intervals.*

**Specifications:**
- API GL-4/GL-5

**Approvals:**
- MAN M 342 TYPE M1
- MB-APPROVAL 235.0
- ZF TE-ML 16C, 17B, 19B, 21A

**FUCHS Recommendations:**
- FORD M2C104-A
- JOHN DEERE JDM J 11 F
- LIEBHERR
- NH 520 B

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**TITAN GEAR LS SAE 90**

*High Performance LS (Limited Slip) hypoid gear oil for axles with or without limited slip differentials.*

**Specifications:**
- API GL-5

**Approvals:**
- ZF TE-ML 05C, 12E, 16E, 21C

**FUCHS Recommendations:**
- MIL-L-2105 D
- FORD M2C9008-A
- LIEBHERR
- NH 520 B

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**TITAN GEAR MP SAE 80**

*High Performance Gear Oil for synchronized and non-synchronized manual gearboxes as well as auxiliary drives, axles and differentials in commercial vehicles and passenger cars.*

**Specifications:**
- API GL-4

**Approvals:**
- MAN 341 TYPE E1
- MAN 341 TYPE Z2
- MB-APPROVAL 235.1
- ZF TE-ML 17A

**FUCHS Recommendations:**
- BMW 81 22 9 407 052
- BMW 81 22 9 407 053
- EATON
- FORD M2C9102-A
- VW TL 726
- ZF TE-ML 08

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**TITAN GEAR MP SAE 90**

*High Performance Gear Oil for synchronized and non-synchronized manual gearboxes as well as auxiliary drives, axles and differentials in commercial vehicles and passenger cars.*

**Specifications:**
- API GL-4

**Approvals:**
- MAN 341 TYPE Z1

**FUCHS Recommendations:**
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**TITAN GEAR HYP SAE 90**

*High Performance Gear Oil for highly-stressed differentials in commercial vehicles and passenger cars.*

**Specifications:**
- API GL-5

**Approvals:**
- MAN 342 TYPE M1
- MB-APPROVAL 235.0
- ZF TE-ML 16C, 17B, 19B, 21A

**FUCHS Recommendations:**
- FORD M2C9102-A
- JOHN DEERE JDM J 11 E
- OPEL 19 42 387
- VW TL 727
- ZF TE-ML 07, 08

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Commercial vehicle gearboxes are subject to all sorts of loads. Urban driving puts different demands on the gearbox and its oil than long-distance haulage. As perfect and reliable function is a must – down-time can be ruinously expensive – the gear oil used must be perfectly matched to the gearbox and all of its application parameters. Make no compromises.

Rely on the leading OEM supplier.

**TITAN**

**CYTRAC RR – SAE 75W-90**

Fully synthetic Premium Performance Hypoid Gear Oil for axle drives in railcars and heavy duty vehicles.

**Specifications:**
- API GL-5
- API MT-1
- SCANIA STO 1:0

**Approvals:**
- SAE J2360
- SIEMENS FLENDER Gear Units for Railway Vehicles

**FUCHS Recommendations:**
- VOITH TURBO 132.00374401 (3.325-340)
- ZF TE-ML 05B, 12L, 12N, 16F, 17B, 19C, 21B

**CYTRAC ULTRA SYNTH – SAE 75W-80**

Premium Performance Gear Oil for extended drain intervals in commercial vehicles, especially developed for ZF heavy duty transmissions with and without Intarder. Reduces fuel consumption by improving gearbox efficiency. Suitable for the longest oil change intervals.

**Specifications:**
- API GL-4
- ZF TE-ML 01E, 02E, 16P

**Approvals:**
- MAN 341 TYPE Z5
- VOLVO 97307

**FUCHS Recommendations:**
- DAF
- IVECO
- MAN
- Renault Trucks

**CYTRAC MB SYNT – SAE 75W-90**

Premium Performance Gear Oil for extended drain intervals in commercial vehicles, specially developed for Mercedes-Benz Actros vehicles, formulated with fully-synthetic base oils. Reduces fuel consumption by improving gearbox efficiency. Suitable for the longest oil change intervals.

**Specifications:**
- API GL-4

**Approvals:**
- MAN 341 TYPE MB
- MB-APPROVAL 235.11

**FUCHS Recommendations:**
- ZF TE-ML 08

**CYTRAC MAN SYNTH – SAE 75W-80**

Premium Performance Gear Oil for extended drain intervals in commercial vehicles, specially developed for manual and automatic ZF-gearboxes, formulated with fully-synthetic base oils. Reduces fuel consumption by improving gearbox efficiency. Suitable for the longest oil change intervals and compatible with Carbon-Syncronizers.

**Specifications:**
- API GL-4

**Approvals:**
- MAN 341 TYPE Z4
- ZF TE-ML 01L, 02L, 16K

**FUCHS Recommendations:**
- DAF
- EATON
- IVECO
- RENAULT
- VOLVO 97307
**CYTRAC SL – SAE 75W-90**

*Premium Performance Gear Oil for highly-stressed hypoid axles in commercial vehicles formulated with fully-synthetic base oils. Developed for the longest oil change intervals in commercial vehicle axle drives.*

**Specifications:**
- API GL-5
- SCANIA STO 1:0

**Approvals:**
- MAN 342 TYPE S1

**FUCHS Recommendations:**
- JOHN DEERE JDM J 11 E/G
- MB 235.8
- VOLVO 97312
- ZF TE-ML 05B, 07, 08, 12B, 16F, 17B

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**CYTRAC LD – SAE 75W-80**

*Ultra High Performance Gear Oil for extended oil change intervals in commercial vehicles fitted with integral retarders or supplementary retarders.*

**Specifications:**
- API GL-4

**Approvals:**
- EATON
- MAN 341 TYPE E3

**FUCHS Recommendations:**
- DAF
- MAN 341 TYPE Z3
- VOLVO 97305
- ZF TE-ML 02D, 08

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**CYTRAC HSY – SAE 75W-90**

*Ultra High Performance Gear Oil for commercial vehicle manual transmissions and axle drives formulated with fully-synthetic base oils.*

**Specifications:**
- API GL-4/GL-5

**Approvals**: *
- ZF TE-ML 05B, 12L, 12N, 16F, 17B, 19C, 21B

**FUCHS Recommendations:**
- DAF
- MAN 341 TYPE Z2/E3
- MAN 342 TYPE M3
- MAN M 3343 TYPE S
- JOHN DEERE JDM J 11 E/G
- SCANIA STO 1:0
- ZF TE-ML 07

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**GEAR HYP LD – SAE 80W-90**

*Super High Performance Gear Oil specially developed for Mercedes-Benz commercial vehicles. Offering enhanced thermal stability and fuel-economy potential.*

**Specifications:**
- API GL-5
- API MT-1

**Approvals:**
- MAN 342 TYPE M3
- MB-APPROVAL 235.20
- ZF TE-ML 05A, 12L, 12M, 16B, 17B, 19B, 21A

**FUCHS Recommendations:**
- MIL-PRF-2105 E
- ARVIN MERITOR AXLES
- MACK GO-J
- JOHN DEERE JDM J 11 E
- SCANIA STO 1:0
- ZF TE-ML 07A

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**How to find the right gear oil.**

**API Classifications**
The American Petroleum Institute (API) created a classification system for gear oils based on application conditions and the type of gears most commonly used. The presence of frictional systems such as clutches or synchromesh rings in gearboxes as well as sealing material compatibility or component wear are not considered. API gear oil classifications are now internationally recognized and used.

API classification:
- GL – Gear Lubricant: For hypoid axle drives and differentials.

**Specifications & Approvals**

<table>
<thead>
<tr>
<th>API</th>
<th>Application conditions</th>
<th>Gearbox type</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>GL-1</td>
<td>Low flank loading and sliding speeds.</td>
<td>Axle drives with bevel gears, worm drives, manual gearboxes.</td>
<td>Old!</td>
</tr>
<tr>
<td>GL-2</td>
<td>Higher loading than described under GL-1.</td>
<td>Worm drives which are not adequately lubricated by API GL-1 oils.</td>
<td>Old!</td>
</tr>
<tr>
<td>GL-3</td>
<td>Moderately difficult operating conditions regarding rotational speed and torque.</td>
<td>Axle drives with bevel gears, manual gearboxes.</td>
<td>Old!</td>
</tr>
<tr>
<td>GL-4</td>
<td>High rotational speed / low torque or low rotational speed / high torque.</td>
<td>Manual gearboxes, hypoid axle drives, moderate axle off-sets.</td>
<td>Old!</td>
</tr>
<tr>
<td>GL-5</td>
<td>High rotational speed and shock loading, high rotational speed / low torque or low rotational speed / high torque; sliding motion.</td>
<td>Hypoid axle drives, manual gearboxes, large axle off-sets.</td>
<td>GL-5</td>
</tr>
<tr>
<td>MT-1</td>
<td>Spur gear, dog-engaged gearboxes.</td>
<td>Non-synchromesh manual gearboxes.</td>
<td>MT-1</td>
</tr>
</tbody>
</table>

**US Military Specifications**
The US Military authorities have created their own gear oil specifications which are sometimes also used for civilian application.

<table>
<thead>
<tr>
<th>MIL Specification</th>
<th>Status</th>
<th>API Performance</th>
<th>SAE Grades</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIL-L-2105</td>
<td>Introduced in 1950. Superseded by MIL-L-2105 B.</td>
<td>API GL-4</td>
<td>SAE 75 / 80 / 90</td>
</tr>
<tr>
<td>MIL-L-2105 B</td>
<td>Introduced in 1962. Superseded by MIL-L-2105 C.</td>
<td>API GL-5</td>
<td>SAE 80 / 90 / 140</td>
</tr>
<tr>
<td>MIL-L-2105 D</td>
<td>Introduced in the 2nd half 1987.</td>
<td>API GL-5</td>
<td>SAE 75W / 80W-90 / 85W-140</td>
</tr>
<tr>
<td>MIL-PRF-2105 E</td>
<td>Introduced in 1997: As MIL-L-2105 D, with additional suitability for non-synchromesh, manual gearboxes.</td>
<td>API GL-5</td>
<td>SAE 75W / 80W-90 / 85W-140</td>
</tr>
<tr>
<td>SAE J2360</td>
<td>Civil version of MIL-L-2105 E.</td>
<td>see above</td>
<td>see above</td>
</tr>
</tbody>
</table>

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**Approvals by manufacturers**

**MACK**  
**Application area**

- **GO-H** Axle oils, e.g. SAE 90, SAE 140, SAE 80W-90 and SAE 85W-140
- **GO-J** Gear oil, axle oil, normal drain interval (up to 250,000 miles/3 years on highway operation)  
  Also fulfills SAE J2360 specification.
- **GO-J Plus** Gear oil, axle oil, extended drain interval (up to 500,000 miles/3 years on highway operation)  
  e.g. SAE 40/ SAE 50.
- **TO-A Plus** Manual transmission fluid (MTF), e.g. SAE 50, extended drain interval (up to 500,000 miles/3 years on highway operation).

**MAN**  
**Application area**

- M 3343 Multifunctional oils for use in ZF manual gearboxes and axle gearboxes.
  - M Multifunctional oil, mineral-based, extended drain intervals.
  - S Multifunctional oil, synthetic, extended drain intervals.
- MAN 339 ATF  
  - Type A ATF Type A Suffix A, obsolete.
  - Type Z1-Z4 ATF for ZF automatic gearboxes.
- Z... High pressure gear oil/MTF for ZF transmissions.
  - Z1 MTF, mineral oil-based, normal change intervals.
  - Z2 MTF, mineral oil-based, extended change intervals.
  - Z3 MTF, semi-synthetic, extended change intervals.
  - Z4 MTF, semi-synthetic, extended change intervals.
  - Z5 MTF, synthetic, maximum change intervals.
- MAN 341 High pressure gear oil/MTF for EATON transmissions.
  - E... MTF, mineral oil-based, normal change intervals.
  - E2 MTF, mineral oil-based, extended change intervals.
  - E3 MTF, semi-synthetic, extended change intervals.
  - E4 MTF, synthetic, maximum change intervals.
- MAN 341 ZE MTF, ZF gearboxes without Astronic.
- MAN 341 VR MTF, VOITH Retarder.
- MAN 341 MB MTF, Mercedes-Benz manual gearboxes in buses.
- MAN 342 Extreme pressure gear oils/hypoid axle drives and differentials.
  - M1 Axle oil, mineral oil or semi-synthetic, normal change intervals.
  - M2 Axle oil, mineral oil or semi-synthetic, extended change intervals.
  - M3 Axle oil, mineral oil or semi-synthetic, extended change intervals.
  - S1 Axle oil, synthetic, maximum change intervals.

**MB-sheet Application area**

- MB 235.0 Hypoid gear oils SAE 85W-90, SAE 90.
- MB 235.1 Gear oils SAE 80, 80W / 85W.
- MB 235.3 FE Gear oils.
- MB 235.4 Synthetic gear oils SAE 75W / 85W.
- MB 235.5 Gear oils SAE 80, 80W / 85W.
- MB 235.6 Hypoid gear oils SAE 85W-90, SAE 90.
- MB 235.7 Fuel Economy hypoid gear oils SAE 85W-90.
- MB 235.8 Hypoid gear oils SAE 75W-90.
- MB 235.11 Fuel Economy manual gearbox oils for extended change intervals.
- MB 235.13 Fully-synthetic manual gearbox oils for NFZ.
- MB 235.15 Hypoid gear oils SAE 75W-85.
- MB 235.27 Retarder oils for trucks, category Voith A.
- MB 235.28 Retarder oils for trucks, category Voith B.
- MB 235.29 Retarder oils for trucks, category Voith C.
- MB 235.31 Commercial vehicle hypoid gear oil.
- MB 235.41 Gear Oil for commercial vehicles.
- MB 235.61 Hypoid gear oils, AMG.
- MB 235.62 Differential gear oils.
- MB 235.71 Smart automatic gearbox oils.
- MB 235.72 Automatic gearbox oils, Type 451 for Smart Fortwo and Type 454 for Smart Roadster.
- MB 235.74 Front axle gear oil.

**SCANIA**  
**Application area**

- STO 1:0 GL-5 axle oil for use in SCANIA manual gearboxes, power distributors and rear axles.
- STO 2:0A SAE J 2360 axle oil for use in SCANIA manual gearboxes, power distributors and rear axles. Improved shearing and oxidation stability and fuel savings. Additionally, extended oil change intervals to 540,000 km (tested in field trials).
- STO 2:0G SAE J 2360 axle oil for use in Scania manual gearboxes, power distributors and rear axles. Improved shearing and oxidation stability and fuel savings. Additionally, extended oil change intervals to 540,000 km (tested in field trials).

**VOLVO**  
**Application area**

- WB 101, UTTO  
  - 97303 Multifunctional oil for wet brake systems API GL-4, SAE 80W-90
  - 97305 Manual transmission oil, transfer case oil API GL-4
  - 97307 Manual transmission oil, extended drain intervals API GL-4
  - 97308 Special synthetic manual transmission oil API GL-4
  - 97309 Gear oil for MMT6, MTX75 and IB5 manual transmissions API GL-4
  - 97310 Gear oil for heavy rear axles API GL-4
  - 97312 Gear oil for heavy rear axles, extended drain intervals API GL-5
  - 97315 Fully-synthetic manual transmission oil, more extended drain intervals (400,000 km) API GL-4
  - 97331 Special synthetic ATF -
  - 97335 ATF DEXRON IID, IIE und IIL
  - 97342 Volvo AT102 -

**ZF**  
**Application area**

- TE-ML 01 Manual gearboxes in trucks and buses.
- TE-ML 02 Manual and automatic transmissions for commercial vehicles.
- TE-ML 03 Converter transmissions for off-road equipment.
- TE-ML 04 Marine gearboxes.
- TE-ML 05 Axles for off-road vehicles.
- TE-ML 06 Tractor transmissions and hydraulic lifts.
- TE-ML 07 Hydrostatic-mechanical and electric drive systems.
- TE-ML 08 Mechanical steering systems in cars, commercial vehicles and machinery.
- TE-ML 09 Steering systems and oil pumps in cars, commercial vehicles and machinery.
- TE-ML 12 Axles for commercial vehicles and buses.
- TE-ML 13 ZF assemblies in special purpose vehicles.
- TE-ML 14 Powershift gearboxes in commercial vehicles and buses.
- TE-ML 15 Braking systems in special vehicles.
- TE-ML 16 Transmissions for rail vehicles.
- TE-ML 17 Transmissions and axles for lift-trucks.
- TE-ML 18 Axles for cars.
- TE-ML 19 Transfer and offset transmissions for commercial vehicles.
- TE-ML 20 Powershift gearboxes in buses.
- TE-ML 21 Front axles in tractors, harvester gearboxes and power take-offs.

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Gear oils for passenger cars and commercial vehicles
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