



**Manual and automatic transmissions
for trucks, buses and light commercial vehicles
with "TE-ML 02" entry on the type plate**

List of lubricants TE-ML 02

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1. Approved lubricant classes

1.1 Trucks and special applications

Product groups trucks Note: Instead of the "0" as the last figure, there may also be a: 2;3;4;5. (Example: 12AS1935, 16S2223)	Lubricant classes	
	First fill (5)	Service fill (6)
Ecolite S5-42, S6-36, S6-36/2, S5-420	ZF-Ecofluid M 02B(1) / 02E	ZF-Ecofluid M 02B(1) / 02E / 02F / 02L
Ecolite / AS Tronic lite 6S850, 6AS850	ZF-Ecofluid M 02B(1) / 02E	ZF-Ecofluid M 02B(1) / 02E / 02H(1) / 02L
Ecolite 6S1200TO, 6S1200TD	ZF-Ecofluid M 02B(1) / 02E / 02H(1)	ZF-Ecofluid M 02B(1) / 02E / 02H(1) / 02L
Ecolite / AS Tronic lite 6S700TO, 6AS700TO, 6S800TO, 6AS800TO, 6S1000TO, 6AS1000TO	ZF-Ecofluid M 02E	ZF-Ecofluid M 02B(1) / 02E / 02L
AS Tronic lite Hydraulic actuators	02K	02K
Ecomid without Intarder 9S75, 8S109, 9S109, 16S109	ZF-Ecofluid M 02B / 02E / 02H	ZF-Ecofluid M 02B / 02E / 02H / 02L
Ecomid with Intarder 8S109IT, 9S109IT, 16S109IT	ZF-Ecofluid M 02E / 02H	ZF-Ecofluid M 02E / 02H / 02L
Ecomid without Intarder 8S1110, 9S1110, 9S1310	ZF-Ecofluid M 02B / 02E	ZF-Ecofluid M 02B / 02E / 02L

<p>The list of lubricants TE-ML 02, Edition 02.04.2012 replaces all previous editions. The current list can be requested from any ZF after-sales service center or accessed on the Internet under www.zf.com.</p>	<p>ZF Friedrichshafen AG D-88038 Friedrichshafen phone: + 49 7541 77 3505 fax: + 49 7541 77 7319</p>
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Product groups trucks (continuation) Note: Instead of the "0" as the last figure, there may also be a: 2;3;4;5. (Example: 12AS1935, 16S2223)	Lubricant classes	
	First fill (5)	Service fill (6)
Ecomid with Intarder 8S1111, 9S1111, 9S1311	ZF-Ecofluid M 02E	ZF-Ecofluid M 02E / 02L
AS Tronic mid 12AS1010, 12AS1210, 12AS1220, 12AS1420, 12AS1620	ZF-Ecofluid M 02E	ZF-Ecofluid M 02B / 02E / 02L
Ecosplit without Intarder 8S151, 16S151, 8S181, 16S181, 16S221, 16S251 8S1620, 16S1620, 8S1820, 16S1820, 8S1920, 16S1920, 16S2020, 8S2220, 16S2220, 16S2520, 16S2720 16S1580, 16S1680, 16S2180, 16S2280	ZF-Ecofluid M 02B / 02E / 02H	ZF-Ecofluid M 02B / 02E / 02H / 02L
Ecosplit with Intarder 8S151IT, 16S151IT, 8S181IT, 16S181IT, 16S221IT, 16S251IT 8S1621, 16S1621, 8S1821, 16S1821, 8S1921, 16S1921, 16S2021, 8S2221, 16S2221, 16S2521, 16S2721 16S1581, 16S1681, 16S2181, 16S2281	ZF-Ecofluid M 02E / 02H	ZF-Ecofluid M 02E / 02H / 02L
Ecosplit without Intarder 16S231, 16S2320, 16S2330	ZF-Ecofluid M 02E	ZF-Ecofluid M 02B / 02E / 02L
12S2130, 12S2330, 12S2830	ZF-Ecofluid M 02E	ZF-Ecofluid M 02B / 02E / 02L
8S1630, 16S1630, 8S1830, 16S1830, 8S1930, 16S1930, 16S2030, 8S2230, 16S2230, 16S2530, 16S2730	ZF-Ecofluid M 02E	ZF-Ecofluid M 02B / 02E / 02H / 02L
Ecosplit with Intarder 16S231IT, 16S2321, 16S2331	ZF-Ecofluid M 02E	ZF-Ecofluid M 02E / 02L
12S2131, 12S2331, 12S2831	ZF-Ecofluid M 02E	ZF-Ecofluid M 02E / 02L
16S1631, 8S1831, 16S1831, 8S1931, 16S1931, 16S2031, 8S2231, 16S2231, 16S2531, 16S2731	ZF-Ecofluid M 02E	ZF-Ecofluid M 02E / 02H / 02L
Classic Line 8S1350, 16S1455TD, 16S1650, 9S1820, 16S1650HD S6-1550, S6-820, S5-680, S6-680, S5-820	ZF-Ecofluid M 02B / 02E / 02H	ZF-Ecofluid M 02B / 02E / 02H / 02L
AS Tronic without Intarder 12AS1630, 12AS1930, 12AS2130, 12AS2140, 12AS2300, 12AS2301, 12AS2330, 12AS2340, 12AS2501, 12AS2530, 12AS2540, 12AS2740, 12AS2940, 12AS3001, 12AS3002, 12AS3140, 16AS2230, 16AS2600, 16AS2601, 16AS2630	ZF-Ecofluid M 02E	ZF-Ecofluid M 02B / 02E / 02L
AS Tronic with Intarder 12AS1631, 12AS1931, 12AS2131, 12AS2141, 12AS2300IT, 12AS2301IT, 12AS2331, 12AS2341, 12AS2501IT, 12AS2531, 12AS2541, 12AS2741, 12AS2941, 12AS3001IT, 12AS3002IT, 12AS3141, 16AS2231, 16AS2600IT, 16AS2601IT, 16AS2631	ZF-Ecofluid M 02E	ZF-Ecofluid M 02E / 02L
Transmatic (Joint oil circuit of basic transmission and converter lock-up clutches) 16S151WSK, 16S221WSK, 16S251WSK	02H(2)	02H(2)

Product groups trucks (continuation) Note: Instead of the "0" as the last figure, there may also be a: 2;3;4;5. (Example: 12AS1935, 16S2223)	Lubricant classes	
	First fill (5)	Service fill (6)
TC Tronic (Separate oil circuit of basic transmission and converter lock-up clutches) Basic transmission: 12TC2540, 12TC2740	ZF-Ecofluid M 02E	ZF-Ecofluid M 02B / 02E / 02L
Torque converter lock-up clutches: TC 2	02H(2) / ATF nach TE-ML 14(7)	02H(2) / ATF nach TE-ML 14(7)
TC Tronic HD (Heavy Duty) (Separate oil circuit of basic transmission and converter lock-up clutches) Basic transmission: 12AS3040TCIT	ZF-Ecofluid M 02E	ZF-Ecofluid M 02E / 02L
Torque converter lock-up clutches: TCHD	ZF-Ecofluid M 02E	ZF-Ecofluid M 02E

1.2 Buses

Product groups buses	Lubricant classes	
	First fill (5)	Service fill (6)
Ecolite S5-42, S6-36, S6-36/2, 5S600BO	ZF-Ecofluid M 02B(1) / 02E	ZF-Ecofluid M 02B(1) / 02E / 02F / 02L
Ecolite 6S890, 6S700BO	ZF-Ecofluid M 02B(1) / 02E	ZF-Ecofluid M 02B(1) / 02E / 02H / 02L
Ecolite without Intarder S6-85, 6S1000BO, 6S1000BD, 6S1200BO, 6S1200BD, 6S1350BO, 6S1600BD, 6S1650BO, 6S1700BO, 6S1900BO	ZF-Ecofluid M 02B(1) / 02E / 02H	ZF-Ecofluid M 02B(1) / 02E / 02H / 02L
Ecolite with Intarder 6S1351BO, 6S1601BD, 6S1651BO, 6S1901BO, 6S1701BO	ZF-Ecofluid M 02E / 02H	ZF-Ecofluid M 02E / 02H / 02L
Ecolite / AS Tronic lite 6S710BO, 6AS710BO, 6S1010BO, 6AS1010BO	ZF-Ecofluid M 02E	ZF-Ecofluid M 02B(1) / 02E / 02L
AS Tronic lite Hydraulic actuators	02K	02K
Ecomid without Intarder 8S180, 8S2100BO, 8S2100BD	ZF-Ecofluid M 02B / 02E / 02H	ZF-Ecofluid M 02B / 02E / 02H / 02L
Ecomid with Intarder 8S180IT, 8S2101BO, 8S2101BD	ZF-Ecofluid M 02E / 02H	ZF-Ecofluid M 02E / 02H / 02L
Classic Line S6-1550, S6-820, S5-680, S6-680, S5-820, 6S1380BD	ZF-Ecofluid M 02B / 02E / 02H	ZF-Ecofluid M 02B / 02E / 02H / 02L
AS Tronic without Intarder 10AS2300BO, 10AS2310B, 10AS2700BO, 12AS2000BO, 12AS2300BO, 12AS2301, 12AS2700BO	ZF-Ecofluid M 02E	ZF-Ecofluid M 02B / 02E / 02L
AS Tronic with Intarder 10AS2010BIT, 10AS2301IT, 10AS2310BIT, 12AS1601BO, 12AS2000BIT, 12AS2001BO, 12AS2300BIT, 12AS2301IT, 12AS2301BO, 12AS2701BO	ZF-Ecofluid M 02E	ZF-Ecofluid M 02E / 02L

1.3 Light commercial vehicles

Product groups	Lubricants / Lubricant classes	
	First fill (5)	Service fill (6)
Light commercial vehicles		
5S200VO, 5S270VO, 6S300VD, 6S320VD, 6S350VD, 6S380VO, 6S420VO	ZF-Ecofluid M 02E Petronas Gear Oil T.E. LD SAE 75W-80 Total Tranself LD SAE 75W80	ZF-Ecofluid M 02B / 02E / 02L
eTronic 6AS300VD, 6AS320VD, 6AS380VO, 6AS400VO , 6AS420VO	Petronas Gear Oil T.E. LD SAE 75W-80 Total Tranself LD SAE 75W80	ZF-Ecofluid M 02B / 02E / 02L
6S650, 6S720, 6S750	ZF-Ecofluid M 02E	ZF-Ecofluid M 02B / 02E / 02F / 02L
6S450 VW Amarok	ZF-Ecofluid M VW spare part no. G 055 538 A2	
6S450 Mercedes-Benz Sprinter	ZF-Ecofluid M 02E	ZF-Ecofluid M 02E Exxon Mobil Gear Oil MB 317 Mercedes-Benz MB 235.10 -- Manuel Transmission Oil A 001 989 26 03
5S400	Fuchs Titan EG MP 80 Petronas TUTELA OTZ (80W-90)	02B

1.4 Product groups/Models/Versions from the past, not individually listed

Product groups/Models/Versions	Lubricant classes
Torque converter lock-up clutches (WSK) with separate oil circuit	02H(2) / ATF in accordance with TE-ML 14(7)
Transmissions without ZF-Intarder AS Tronic 1 (12AS1800, 16AS2200) Constant-mesh and synchronised transmissions for commercial vehicles	ZF-Ecofluid M 02B / 02E / 02H / 02L
Transmissions with ZF-Intarder AS Tronic 1 (12AS1800IT, 16AS2200IT) Constant-mesh and synchronised transmissions for commercial vehicles	ZF-Ecofluid M 02E / 02H / 02L

2. Oil and filter change intervals (filter replacement affects only transmission with Intarder or WSK [torque converter clutch])

Caution: Please refer to the previous pages, Section 1, tables, for information on the lubricant classes released for the individual product groups.

ZF-Ecofluid M was specially designed for applications with manual transmissions and automatic transmissions in commercial vehicles. The combination of a hydrocrack base oil with a specially balanced additive package ensures excellent oxidation stability and is thus excellently suited for very long oil change intervals. It warrants high-quality transmission component protection, in particular of the synchronizers and the gearings. As a result of the flat viscosity characteristic curve, the oil is suited for applications in all climate zones, particularly in hot and cold regions. Moreover, in comparison with mineral transmission fluids, ZF-Ecofluid M helps to reduce fuel consumption by 0.5 up to 1.0%.






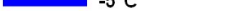
Truck, bus and special applications according to sections 1.1, 1.2, and 1.4

Lubricant class	02B, 02F, 02H, ATF	02L	ZF-Ecofluid M 02E	02K
Application	Oil and filter change intervals (3)			
- Off-road operation e.g. mining application - Average speed up to 20 km/h - Stationary drives	1.000 h 20.000 km 1 year	5.000 h 100.000 km 1 year	10.000 h 200.000 km 2 years (4)	---
- Outside temperatures > 40°C - Long-distance transport > 44 t - Short-distance transport - Tough operating conditions - Scheduled routes (buses) - Average speed from 20 to 60 km/h	120.000 km 1 year	240.000 km 2 years	360.000 km 3 years (4)	---
- Long-distance transport (trucks) - Long-distance coach journeys (buses) - Average speed as of 60 km/h	160.000 km 1 year	300.000 km 2 years	540.000 km 3 years (4)	---
- Hydraulic actuators	---	---	---	no oil change needed

Light commercial vehicles according to section 1.3

Lubricants / Lubricant classes	Oil change intervals
02B, 02F Fuchs Titan EG MP 80 Petronas TUTELA OTZ (80W-90)	60.000 km
02L Total Tranself LD 75W-80 Petronas Gear Oil T.E. LD SAE 75W-80	240.000 km
ZF-Ecofluid M / 02E Exxon Mobil Gear Oil MB 317 Mercedes-Benz MB 235.10 -- Manuel Transmission Oil A 001 989 26 03	no oil change needed

3. Low temperatures limits

Lubricant classes	Oil type / SAE viscosity grade	Initial vehicle start-up at oil sump temperatures
ZF-Ecofluid M 02B / 02E / 02F / 02K / 02L / ATF	75W / 75W-80 / 75W-85 / 75W-90 / ATF	- 40°C 
02B / 02H	80W / 80W-85 / 80W-90	- 20°C 
02B / 02H	40, 85W-90, 90	0°C 
	30	- 15°C 
	20W (Torque converter lock-up clutches TC 2 only)	- 40°C 
	20W (Transmatic only)	- 40°C  -5°C

4. Explanation of footnotes and comments

Footnotes

- (1) In moderate climate zones, shift quality of non-automated transmissions is impaired when using the lubrication classes 02B / 02H.
- (2) Lubricants marked (*) on the following pages must not be used.
- (3) Oil and filter change required, depending on what occurs first. Only use genuine ZF filter inserts.
- Intarder 2: 6085 298 026
- Intarder 3: 0501 215 163
- WSK: 0501 202 378
- (4) These intervals only apply to a hose breather in a dry area. If there is no hose breather in the dry area, the oil change intervals specified for lubricant class 02L apply. This restriction does not apply to bus applications.
In the case of transmissions filled ex-works with lubricant class 02E, no oil change must be effected during the first two years as of initial registration. In case of retrofitting or repair in this period, oil refills with lubricant class 02E or 02L are permitted.
Exception: The limits of application in accordance with the TE-ML 02 (operating hours, mileage [km]) are already met prior to the expiration of the first two years.
- (5) First filling: The lubricant classes listed are compulsory for initial fillings of transmissions as well as fillings during transmission break-in (under 7,500 km). **ZF factory oil fills must fulfill additional requirements according to ZF Oil Specification 02.**
- (6) Service filling: The lubricant classes listed are compulsory for service oil changes according to the oil-change intervals mentioned under Section 2. These lubricant classes may generally only be used in broken-in transmissions (7,500 km and more). In the case of transmissions filled ex-works with lubricant class 02E, due attention must always be paid to footer 4.
- (7) All lubricants of TE-ML 14 may be used. Oil change intervals and temperature limits of TE-ML 02 do apply.

Comments:

1. Instructions for transmission ventilation in accordance with Installation Guidelines 1203 765 110 and 1328 765 101 must be followed.
2. A lithium saponified multipurpose grease of NLGI class 2 which is mixable with mineral oil is to be used at greasing points (grease code KP2K-30 in acc. with DIN 51825 or ISO-L-XCCHB2 in accordance with ISO 6743-9).
3. Additives of any kind added later to the oil change the oil in a manner that is unpredictable, and they are therefore not permitted. No liability of any kind will be accepted by ZF for any damage resulting from the use of such additives.
4. ZF will not assume liability for damage caused by non-observance of our maintenance instructions.