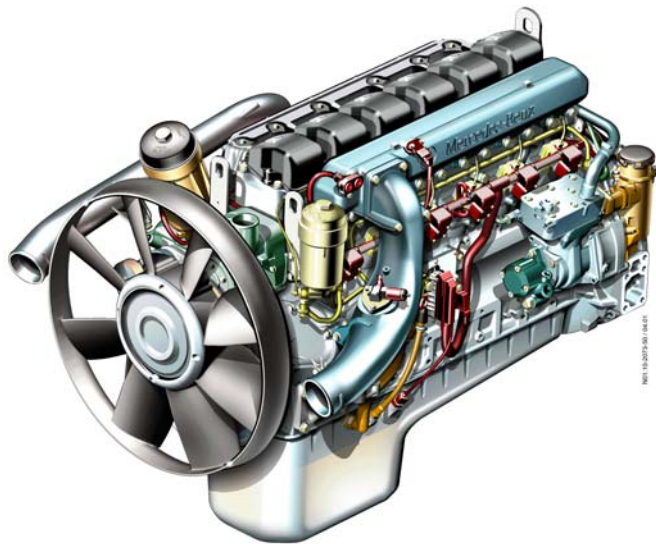


Series 500<>Engine models	62
Series 500<>Technical features	64
Series 500<>Cylinder head - port assignment	70
Series 500<>Cylinder head.....	71
Series 500<>Cylinder head mounting	73
Series 500<>Cylinder head gasket.....	74
Series 500<>EURO 2 and EURO 3 cylinder heads compared	75
Series 500<>Valve assembly	77
Series 500<>Pump-line-nozzle injection system (PLD)	83
Series 500<>Removing/installing the MR/PLD unit pump.....	91
Series 500<>EURO 2 and EURO 3 pistons	101

Series 500<>Connecting rod	102
Series 500<>Crankcase.....	103
Series 500<>Cylinder liners.....	104
Series 500<>EURO 2 and EURO 3 cylinder liners compared	107
Series 500<>Crankcase ventilation system	108
Series 500<>Fuel system	112
Series 500<>Oil cooler and oil filter housing – component locations.....	124
Series 500<>Oil circuit	128
Series 500<>Engine oil system.....	129
Series 500<>Oil spray nozzle.....	130
Series 500<>Water guide	134
Series 500<>Thermostat location.....	136
Series 500<>Supercharging system and charge air ducting.....	137
Series 500<>Engine oil and filter change	140
Series 500<>Cleaning the fuel prefilter / filter insert	144
Series 500<>-Fuel prefilter with water separator - replacing the filter element	146
Series 500<>Replacing the oil separator insert	148
Series 500<>Replacing the fuel filter - air cleaner - coolant	150
Engines OM 904 and 906	152
Engine series 900	153
Series 900<>Technical features	156
Series 900<>Port assignments in the cylinder head gasket	159

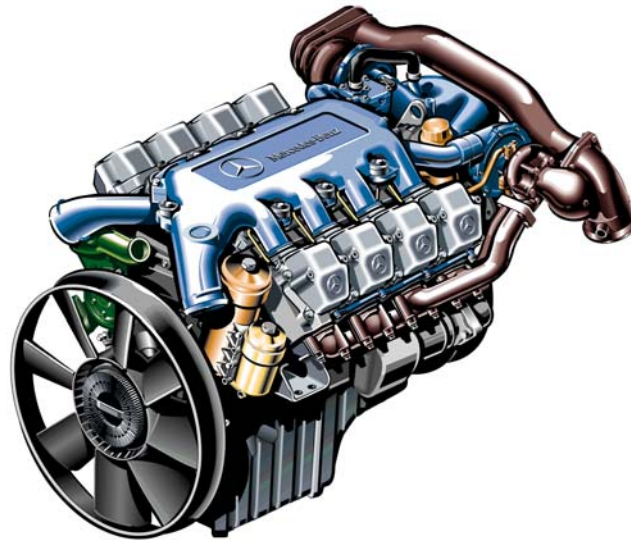
Series 900<>Tightening instructions for cylinder head bolts	160
Series 900<>Valve control.....	162
Series 900<>Setting valve play	164
Series 900<>Pump-line-nozzle injection system (PLD)	167
Series 900<>Crankcase.....	185
Series 900<>Ölspritzdüsen - Unterschiede	188
Series 900<>Pistons and piston rings	189
Series 900<>Connecting rod	190
Series 900<>Pistons and connecting rod - modifications	191
Series 900<>Engine oil circuit	192
Series 900<>Removing/installing the oil pan	196
Series 900<>Fuel system	200
Series 900<>Supercharging system and charge air ducting.....	212
Series 900<>Removing/installing the coolant thermostatic control	216
Series 900<>Engine oil and filter change	218
Series 900<>Cleaning the fuel prefilter - filter insert	221
Series 900<>Fuel prefilter with water separator - replacing the filter element	223
Series 900<>Replacing the fuel filter - air cleaner - coolant	226

OM 457 LA



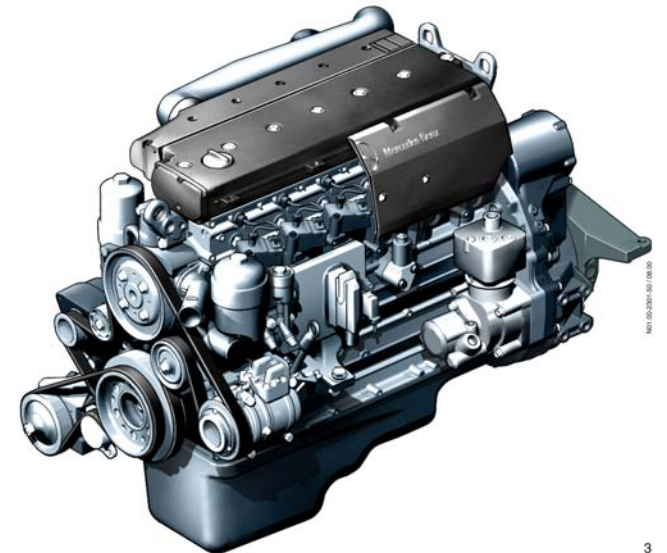
N01.10-2073-50

OM 502 LA



N01.10-0341-50

OM 906 LA



N01.00-2301-50

- ⇒ Outstanding **power output and torque characteristics** over the whole rpm range
- ⇒ Dynamic start-off characteristics and pulling power
- ⇒ Attractive power/weight ratio
- ⇒ Low **fuel consumption**
- ⇒ Enormous **potential**: the V6 engines meet the requirements of the highly popular 400 HP Class
- ⇒ High-pressure direct injection, **pump-line-nozzle system** with peak pressures up to 1,800 bar.
- ⇒ **Electronic engine control (MR)** with electronic system fixed to the engine, and extensive engine protection functions
- ⇒ Direct injection with centrally positioned **6-hole injection nozzle**.
- ⇒ **4-valve technology**
- ⇒ Useful engine brake rpm well over rated rpm, up to **2400 rpm**
- ⇒ Meets the emission legislation of **EURO 3 and EUROMOT/EPA Level 2**
- ⇒ Turbocharger with charge air cooling
- ⇒ V8 with 2 turbochargers
- ⇒ **Viscous fan clutch, electromagnetic fan clutch and high-speed fan drive** on the most powerful engines
- ⇒ Rated engine speed **1,800 rpm or 2000 rpm**
- ⇒ Low maintenance requirement
- ⇒ Long maintenance intervals
- ⇒ Engine oil and fuel filter located at the front, for easy maintenance
- ⇒ Maintenance-free belt drive
- ⇒ Can run on FAME / RME (rape methyl ester) or biodiesel, and engine oil changes are halved
- ⇒ High reliability and long runtime
- ⇒ Low number of component variants, as many parts are the same on both 6 and 8 cylinder engines
- ⇒ Rear engine power take-off ex works

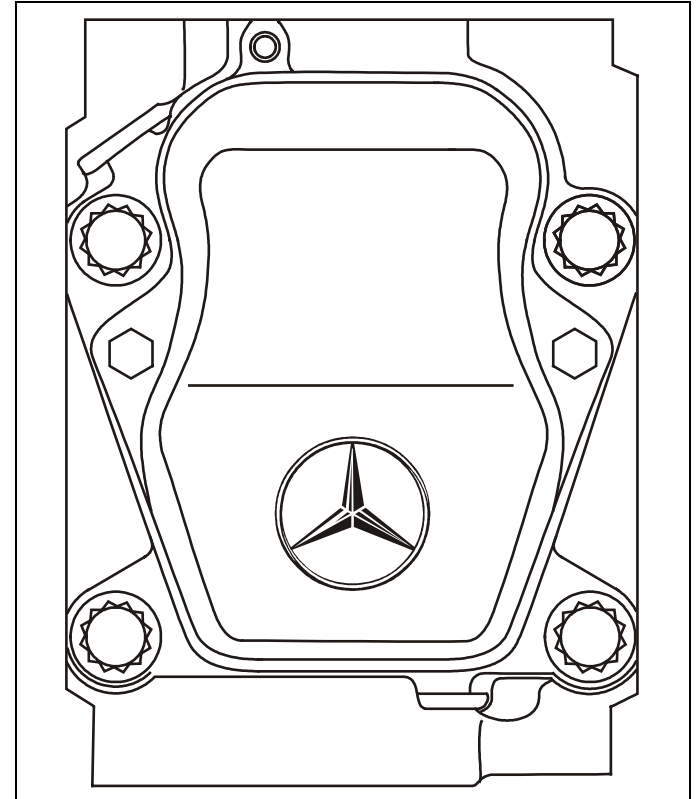
The individual cylinder heads are made of high-quality molybdenum/cast iron alloy. Each has four stretch-thread bolts (M18x2), with which it is bolted to the crankcase.

The optimal position for the injection nozzle is the vertical position at the center of the combustion chamber.

This ideal arrangement can only be achieved by using multi-valve technology.

This consists in arranging the valves in pairs (2 intake, 2 exhaust) around the injection nozzle.

A fifth valve is required for the constant throttle or the decompression valve/engine brake. In both cases, these are linked to the exhaust port through an exactly adjusted hole.



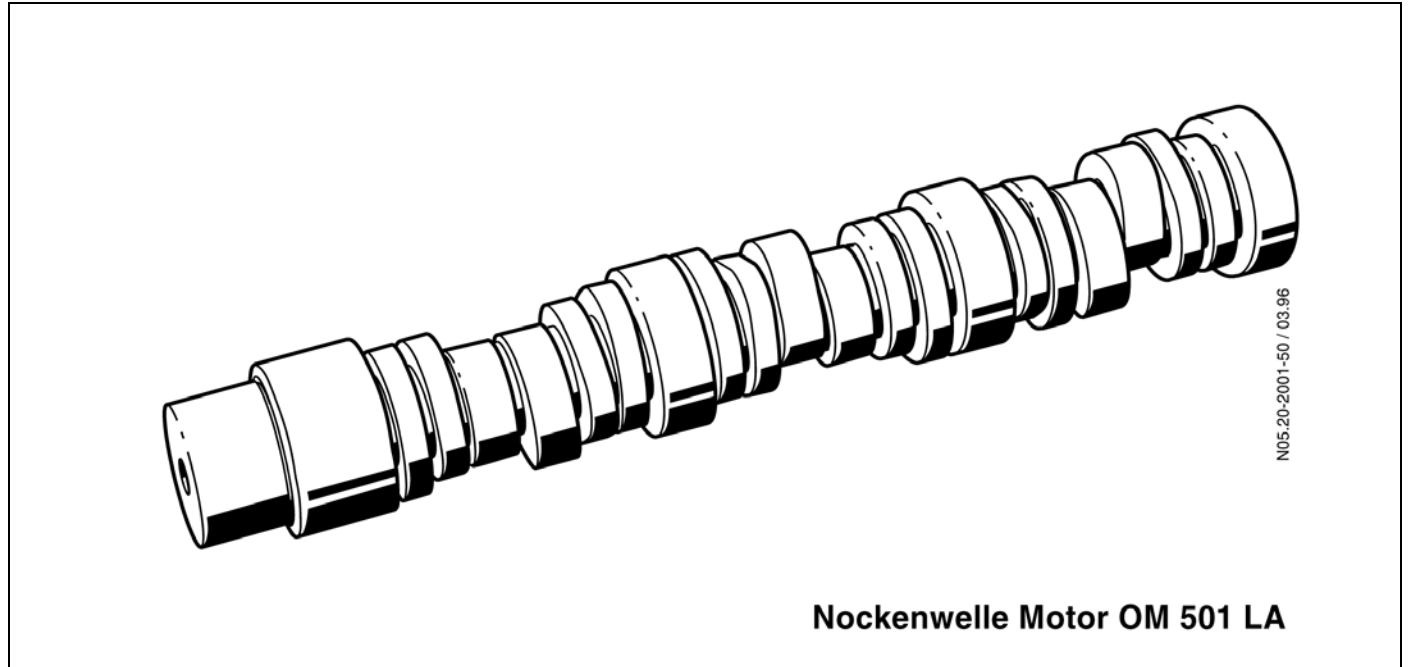
N01.30-2025-02

Camshaft

The camshaft is made of high-strength material, with induction-hardened running surfaces, and has 4 bearings in the OM 501 LA, 5 bearings in the OM 502 LA.

Between the bearings are 4 valve timing cams and 2 injection cams for each opposing cylinder pair.

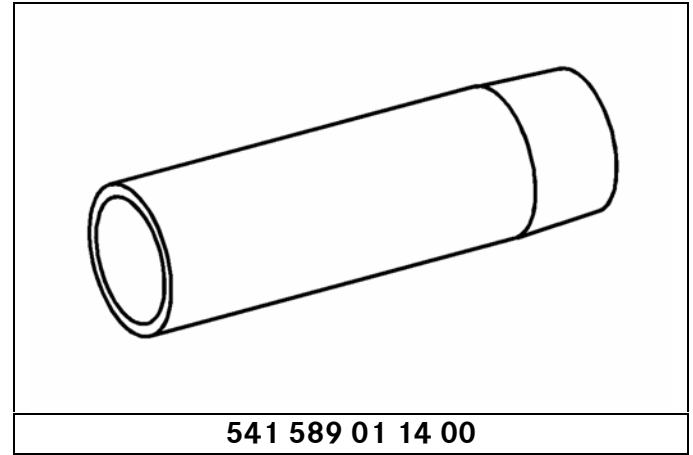
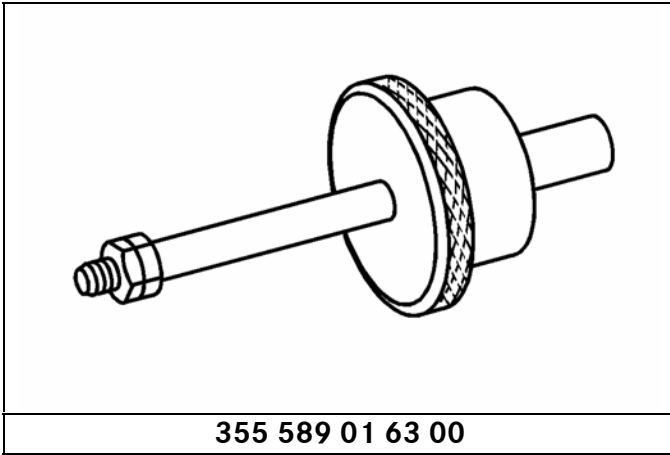
The slide ways of the timing cams for the valve and injection roller tappets are supplied with lube oil through additional oil holes in the piston jet pipe.



N05.20-2001-50

	To remove	
1.	Risk of explosion due to gas ignition, risk of poisoning by inhaling or absorbing fuel, or risk of injury to skin and eyes through contact with fuel.	Fire, sparks, naked flames, smoking are forbidden. Only store fuel in suitable and appropriately marked containers. Wear protective clothing if handling fuel.
2.	Remove the cylinder head cover	
3.	Remove leak fuel line (2) from cylinder head	
4.	Remove injection line (1)	
5.	Unscrew pressure screw (3) and remove pressure pipe connection (5).	
6.	Remove retaining clip (9)	
7.	Fit the adapter (12) and extractor (13) to the inside thread (M 8) of nozzle holder combination (6)	Adapter: 904 589 00 63 00 Extractor: 355 589 01 63 00
8.	Take out the nozzle holder combination (6)	The nozzle holder combination should not be disassembled. If worn or faulty, the nozzle holder combination must be replaced.
9.	Remove the adapter (12) and extractor (13) from nozzle holder combination (6)	
10.	Take out the sealing ring (10)	

	To install	
1.	Measure the shank length of screw (8).	i If the maximum shank length is exceeded, replace the screw. MB Standard 10105 screws are generally to be replaced by screws with an MB Part No. on the screw head.
2.	Insert a new O-ring (7) at nozzle holder combination (6)	i Grease the O-ring.
3.1	Place the new O-ring (10.1) at nozzle holder combination (6)	i Up to engine End Number 197928 Note the installation location and thickness of the sealing ring: the smaller ring surface should point towards the nozzle holder combination. Grease the sealing ring.





Euro 2 cylinder liner

N01.10-2070-11



Euro 3 cylinder liner

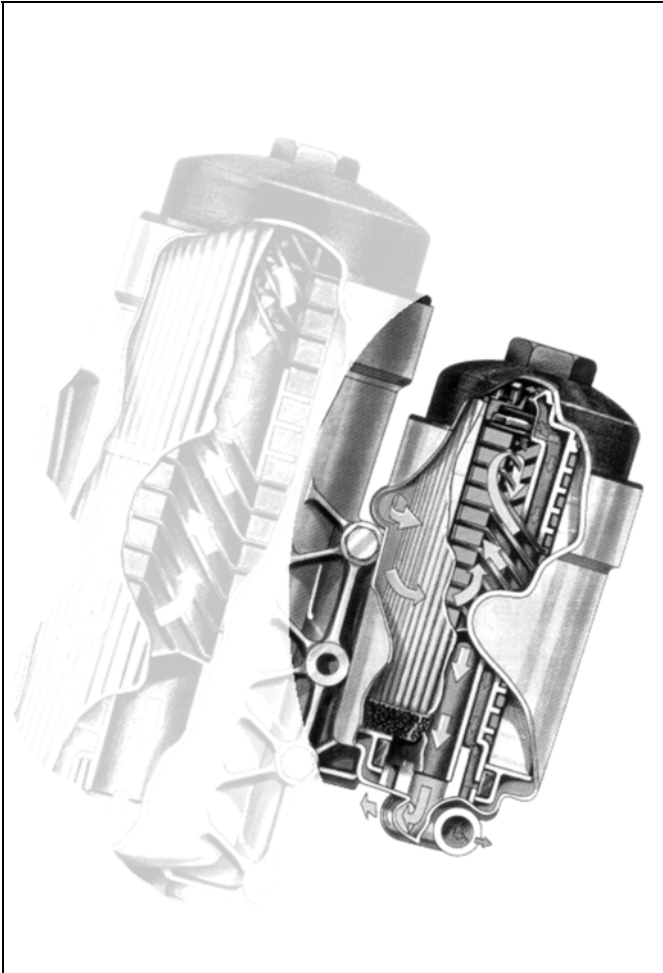
N01.30-2071-11

Modification to Euro 3 standard

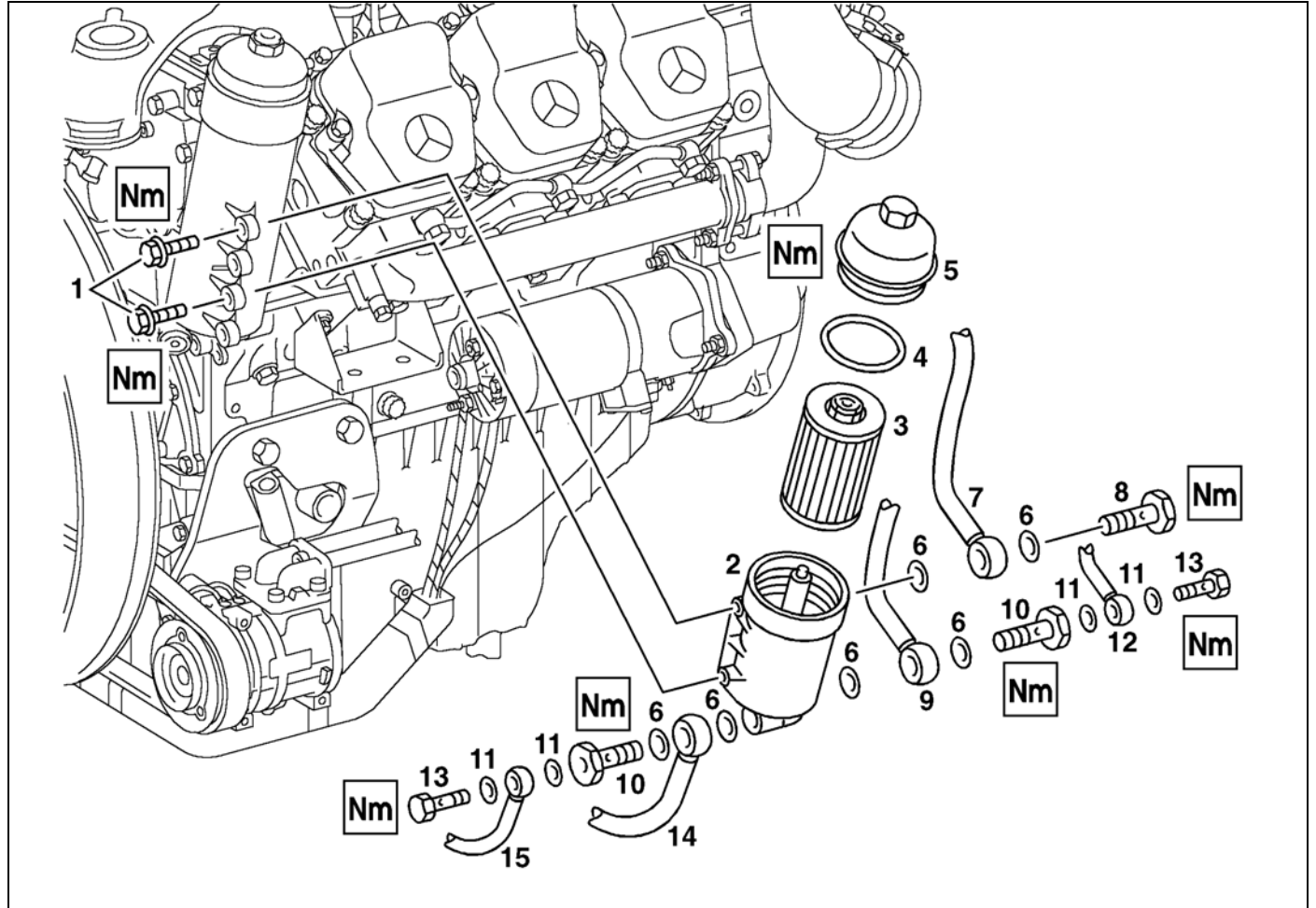
As part of "Quality offensive 2000", the crankcase in engine model series BR 500 has been modified starting from 07/00. Partially hardened raised bead liners are now used, as in Euro 3.

The overall length of the cylinder liner was also shortened in order to adapt the pre-worked dimensions to the finished part.

Location of the fuel filter bowl



N47.20-2033-02



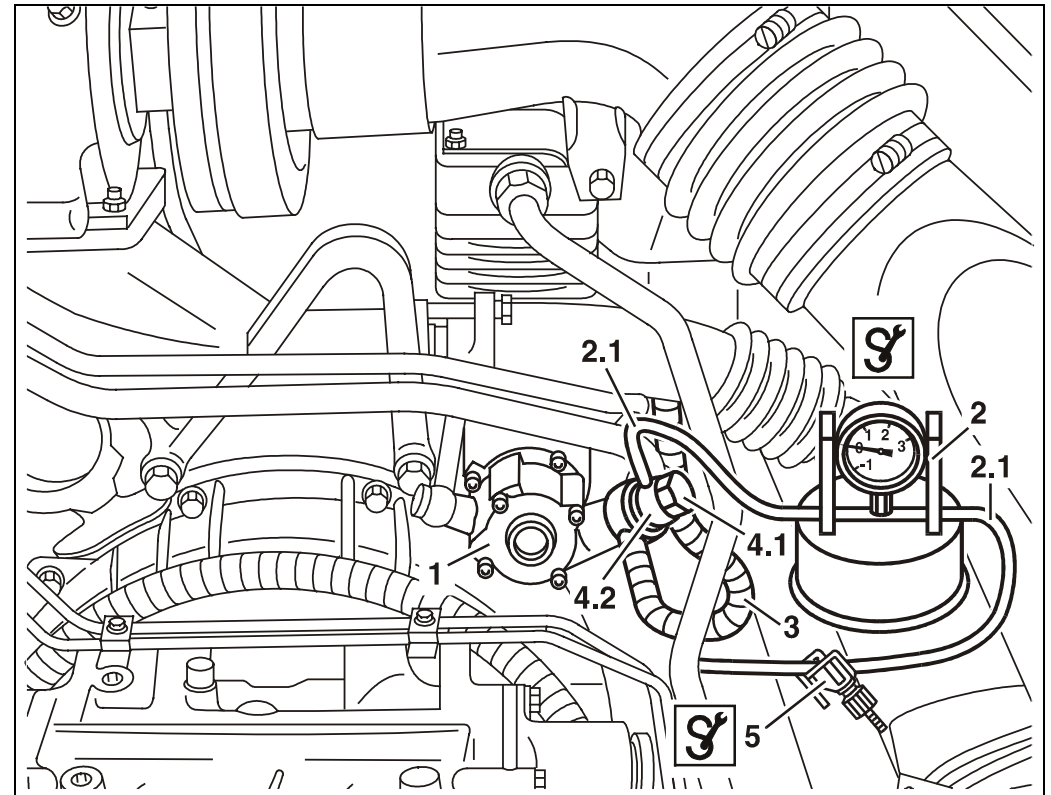
W07.57-0002-06

The fuel filter bowl is fixed to the oil filter oil filter housing, but has its own feed lines that can be removed separately.

Testing the fuel intake pressure at the fuel feed pump

- Attach the tester (2) with test line (2.1) and fuel feed line (3) to fuel feed pump (1).
- Unclip the free test line (2.1) with clamp (5). Put the tester (2) at the frame and fasten.

- 1 Fuel feed pump
- 2 Tester 617 589 04 21 00
- 2.1 Test lines
- 3 Fuel feed line
- 4.1 Double banjo bolt M16 x 1.5, 50 Nm
- 4.2 Banjo union
- 5 Clamp 000 589 40 37 00



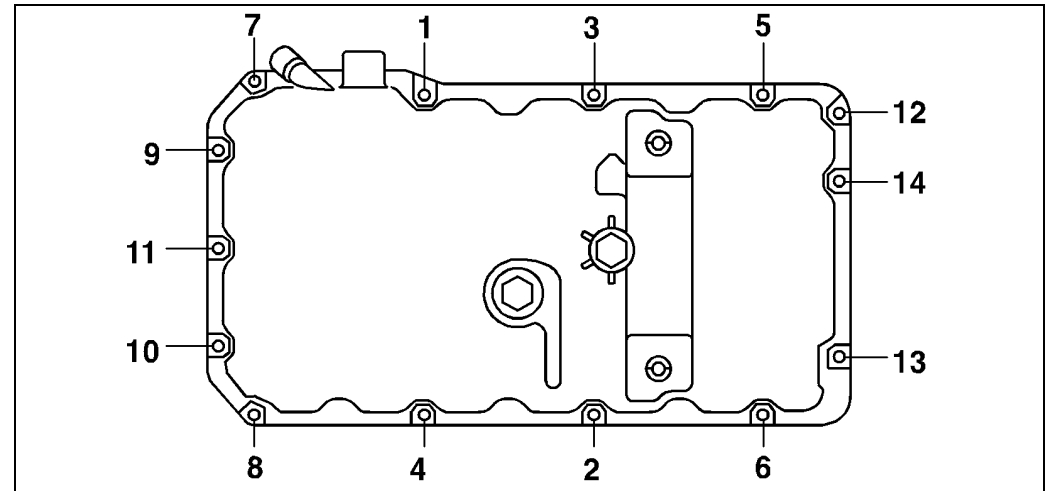
W07.15-0123-11

Testing		
4.	Connect the tester/gauge to the low pressure fuel system	Fuel intake pressure before the fuel feed pump

Tightening pattern for the oil pan bolts

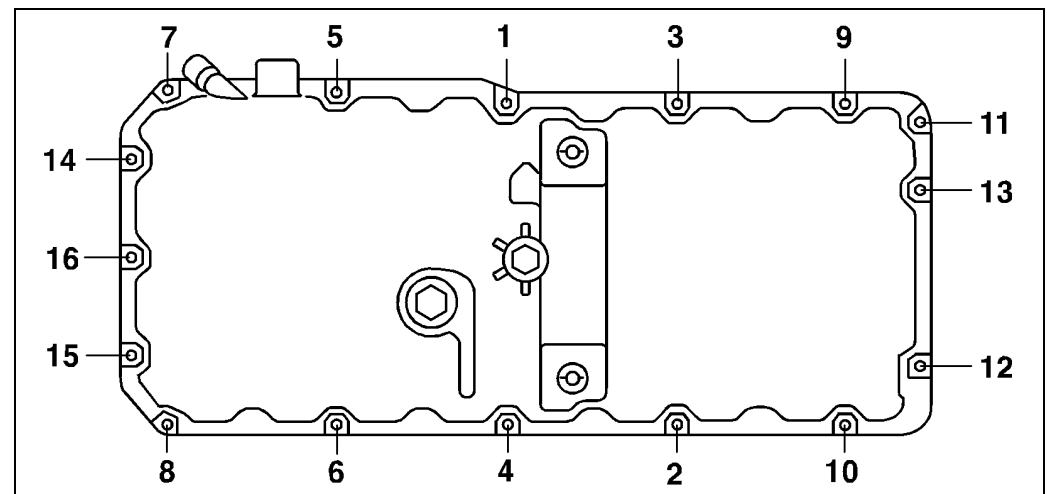
Observe the tightening torque and sequence for the oil pan bolts, always starting from position No. 1 (see tightening pattern).

⚠ To ensure even contact (no turning of the oil pan gasket), all tightening stages must be observed.




Engine 541 tightening pattern





W01.45-1008-10



Engine 542 tightening pattern

W01.45-1009-10

4.	Unscrew filter element (2)	 Dispose of the filter element in an environmentally acceptable manner.
5.	Unscrew the separator (3) from the filter element (2)	If damaged, replace the separator
6.	Clean the separator (3)	Ensure that the sealing ring groove is clean!

	To install	
7.	Moisten the new sealing rings (4 and 8) with engine oil.	
8.	Screw the separator (3) with new sealing ring (8) onto the filter element (2) and finger-tighten.	
9.	Screw the filter element (2) with new sealing ring (4) onto filter head (1) and finger-tighten.	 Do not use tools to tighten!
10.	Close drain valve (10).	
11.	Fill the prefilter with a manual fuel feed pump (7).	
12.	Close the bleed screw (6).	
 Danger!	Risk of accident due to vehicle starting off while engine is running. Risk of injury due to crushing or burns if components are touched during the start-up procedure or when the engine is running.	Wear closed and snug-fitting work clothes. Do not touch hot or rotating parts.
13.	Start the engine and bleed the fuel system.	 Let the engine run for about 1 minute. The fuel system is bled automatically.
14.	Check the prefilter for leaktightness.	