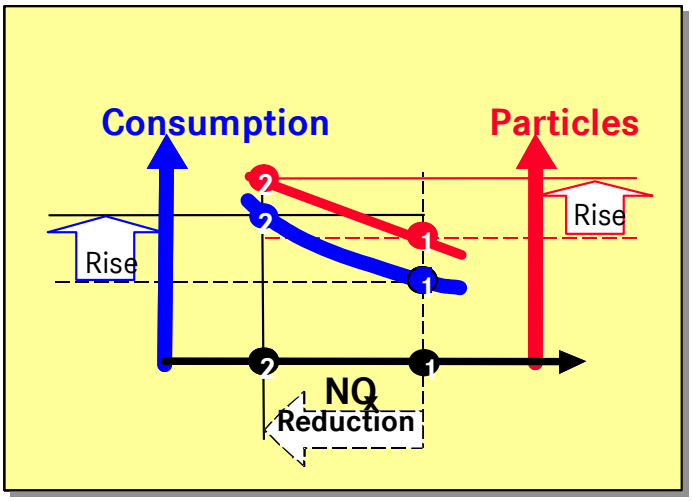
3 BlueTec Diesel Technology

3.1 General information

In order to reduce pollutant emissions in the exhaust gas of diesel engines and in order to be able to fulfil the exhaust standards euro 4 and future, DaimlerChrysler has developed exhaust after treatment with BlueTec diesel technology.
This is based on a procedure referred to as “Selective Catalytic Reduction“ (SCR), in which an after treatment of the exhaust gas enables a reduction of the nitrogen oxides (NO_X) which they contain to harmless nitrogen (N_2) and water vapor (H_2O).
Vehicles with this new BlueTec diesel technology have special system components and a more advanced engine whose combustion is designed for maximum efficiency and low emission of soot particles.

In the case of in-engine measures, which are designed for an optimum rate of effectiveness and hence maximum efficiency - namely: the greatest possible performance at low consumption, increased levels of nitrogen oxides (NO_X) arise. If the combustion were designed for a lower emission of nitrogen oxides (NO_X), an increased fuel consumption as well as an accompanying higher emission of soot particles, which are nothing more than non-combusted fuel, would have to be accepted.

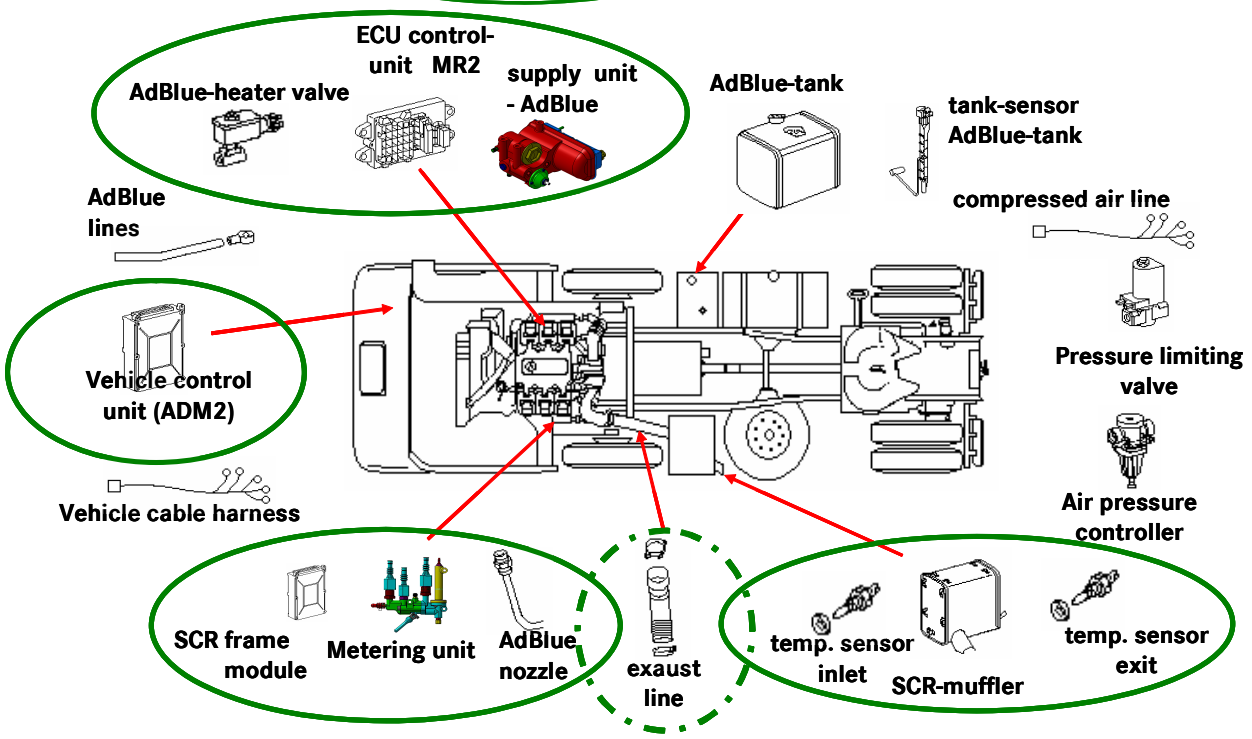
Target conflict in the development of diesel engines



An inner-engine optimization with the aim of a simultaneous reduction in the NO_x and particle emission, to the emission limits Euro4 and future ones is not possible owing to the technical target conflict (see upper diagram). The exhaust gas must be after-treated.
Vehicles which are equipped with BlueTec diesel technology therefore have, in addition to a more advanced engine, components which serve for the later reduction of nitrogen oxides resulting during combustion.
BlueTec requires the additional service product AdBlue, which has to be kept in a separate tank in the vehicle. AdBlue is a non-toxic, water-clear, synthetically-produced solution, (urea water solution as per DIN 70070) which is required for the after treatment process.
The following diagram shows the complete scope of supply or the minimum scope of supply which has to be supplied by DaimlerChrysler AG.

3.2 System Components

SCR-system components – minimum scope of supply



3.3 System function

After starting the engine, the operational readiness of the BlueTec system is first of all checked by the engine control unit (ECU) in an automatic test routine. After successful release of the system, the solenoid valve for the compressed air limitation SCR is switched and compressed air branched off from the ancillary consumer circuit. The compressed air flows into the compressed air input at the AdBlue metering unit as well as through the AdBlue injection line and Adblue injection nozzle.

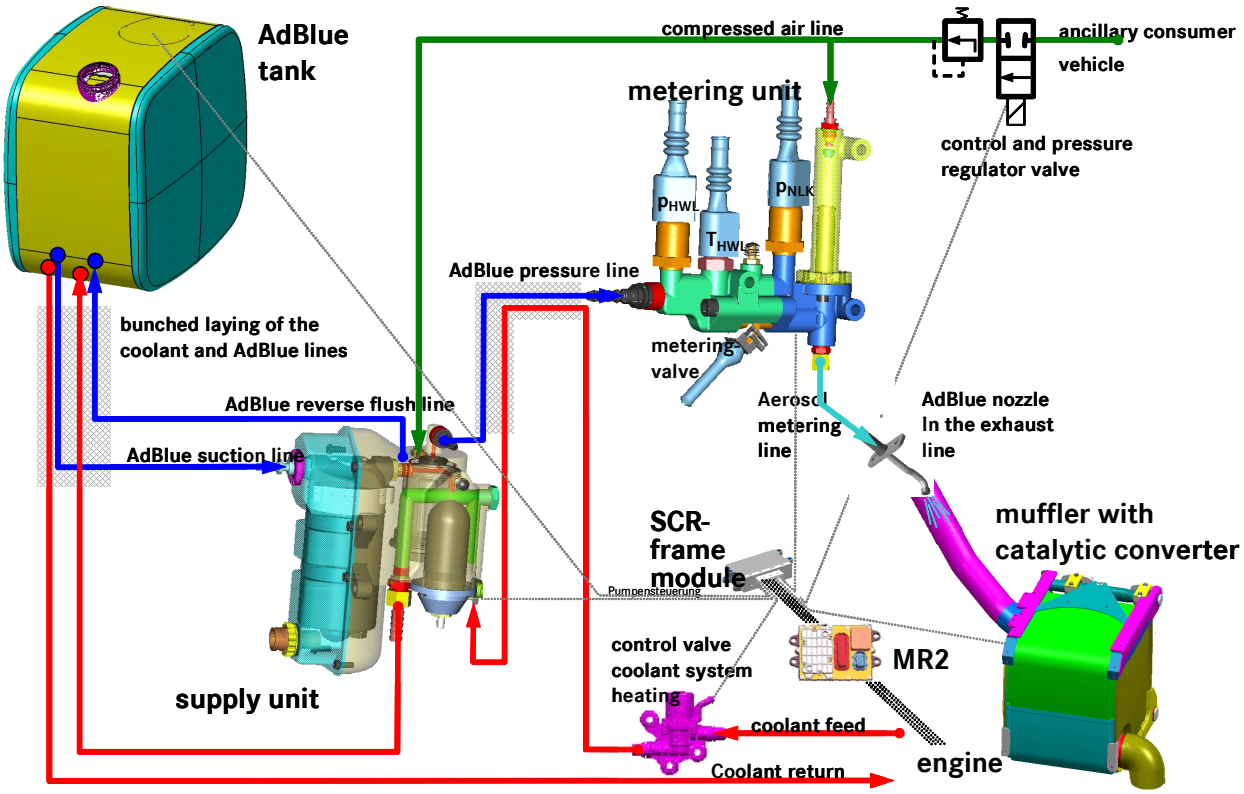
In the same way, the compressed air is directed to the compressed air input of the pump module/supply unit. Here the compressed air ensures that the pneumatic pressure relief valve closes the return line of the AdBlue from the pump module/supply unit into the AdBlue tank and that the AdBlue pressure build-up occurs. This occurs independently of whether AdBlue is injected or not. The continuous flow through the metering unit, as well as the subsequent injection line and injection nozzle ensures that the metered AdBlue is completely supplied without delay to the injection nozzle mounted on the exhaust gas outlet connection or in the exhaust gas line at all times. This also ensures that no AdBlue deposits remain in the metering unit, the injection nozzle and the injection line located between them.
If the engine control unit (ECU) issues the release on the basis of certain sensor values, the AdBlue contained in the AdBlue tank is sucked into the pump module of the AdBlue supply unit, filtered and then pumped further in the direction of the metering unit.
In the metering unit, the AdBlue is initially present with operating pressure at the closed metering valve. If this opens in the intervals calculated by the engine control unit (ECU), the AdBlue can flow through and is finally transported along by the air flow in the direction of the injection nozzle and AdBlue nozzle owing to the prevalent pressure and flow conditions. The AdBlue is directly injected into the hot exhaust flow in this way. The AdBlue air mixture thus resulting initially decomposes into ammonia (NH_3) in the hot exhaust gas flow in a first process stage. Together with the nitrogen oxide molecules produced during combustion, the resultant ammonia moves further in the direction of the muffler with the reduction catalytic converter. A honeycomb made from ceramic is located inside the reduction catalytic converter. The second stage of the reduction process occurs here.
The nitrogen oxide molecules (NO_X) encounter the ammonia molecules (NH_3), releasing energy in the form of heat, while only nitrogen (N_2) and water vapor (H_2O), which are not harmful to the environment, remain as a product of the chemical reaction.

To ensure that the correct amount of AdBlue is injected at the right time during each work cycle, a continuous data exchange is necessary between the BlueTec sensor system and the engine control unit (ECU).
The sensors in the metering unit continuously supply information on the AdBlue pressure and temperature as well as the pressure of the compressed air. Further sensors provide information on the exhaust gas temperature at the input and output of the catalytic converter.
In order to take into consideration the influence of humidity, temperature and charge air on the nitrogen oxide emissions, these charge air values are recorded by the combination sensor for humidity and charge air temperature, as well as the charge air pressure sensor on the charge air housing.

This installation guideline describes the requirements to be observed when installing the Blue Tec technology, in order to ensure perfect functioning of the system.

For the perfect functioning of the vehicles or devices with BlueTec diesel technology, the proper installation and correct interplay of components provided by DaimlerChrysler, only parts/components approved by DaimlerChrysler may be used. Divergent parts/components must be clarified with the responsible department in advance or tested via test bench runs.
The Blue Tec technology is a certification-relevant component of the engine homologation. If the vehicle / equipment are operated without AdBlue or another medium not approved by DaimlerChrysler, the operation approval / certification of the vehicle/device shall be rendered invalid.

Basic Diagram of the SCR System



3.3.1 Metering unit

The AdBlue metering unit functions analogously to a 2/2-way valve. Compressed air and AdBlue are mixed to form an aerosol in the metering unit, and blown into the exhaust gas flow via the metering line. The metering unit is predominantly installed engine-mounted and is mounted at different points for the series 500 / 900 and the 450 engines.

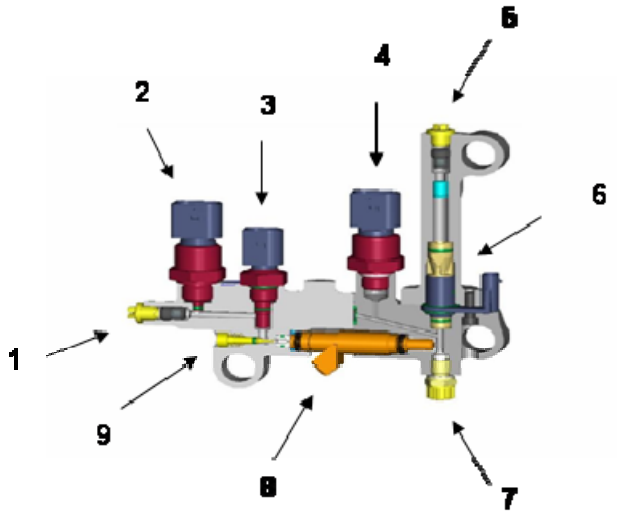
BR 500	> on the rear cylinder head of the left cylinder bank
OM 457 LA	> on the rear cylinder head beside the engine suspension eye
OM 457 hLA	> on the rear cylinder head beside the engine suspension eye, as well as design causes at the vehicle frame
BR 900	> on the right engine side above the turbocharger
OM 906 hLA	> as design causes at the vehicle frame

Specifications for the metering unit

Installation position:	Compressed air connection, upper Mounting on the engine: +/- 25°vertical axis, max.+ 25°/ - 5° horizontal axis Maximum inclined position from mounted position: 45° also in vehicle operation
Temperature range:	- 40°C to + 125°C
Protection class:	IP 67 / IP 69K (electrical connections)
Electrical parameters:	Line voltage 24 V DC Over voltage = 35 V DC for 10 s und 58 V DC for 500 ms
Operating pressures:	AdBlue pressure sensor abs. p_{in} = 4600 mbar, p_{out} = 5000 mbar
Dimensions:	L = 185 mm, W = 46 mm, H = 155 mm (without adapter and connections)

Test connection:
A test connection must be provided on the compressed air connection (item 5). The test connection must have the option of water and compressed air supply (water for potential crystal dissolution / compressed air for pressure test).
DaimlerChrysler recommendation: Test connection Schaefer MB Parts No. A 001 431 28 31
Test connection Voss MB Parts No. A 001 431 27 31

AdBlue metering unit



1 AdBlue inlet
2 AdBlue pressure sensor
3 AdBlue temperature sensor
4 Compressed air sensor
5 Compressed air inlet
6 Heated diffuser
7 Aerosol outlet
8 El. mech. metering valve
9 Calibrating screw

Connections	Connection type
Compressed air line	Screw connection Schaefer SDF NG 6
AdBlue inlet	Screw-in fitting M10X1 as per DIN 3852-1
Electrical connections	Plug connection Mini Timer 2-pole

3.3.2 AdBlue injection nozzle

A nozzle is integrated in the exhaust gas outlet connection or in the exhaust pipe of the engine for injecting the AdBlue into the exhaust pipe. This nozzle may not be changed in respect to its position.
The supply line from the metering unit to the AdBlue injection nozzle is made from stainless steel (OM 906 hLA a flexible line with stainless steel braid).

3.3.3 Solenoid valve coolant for AdBlue system heating

The solenoid valve serves for controlling the preheating of the AdBlue system (AdBlue tank, AdBlue lines and AdBlue supply unit). Coolant is removed from the engine coolant circuit for this. The extraction point is the pressure side after the coolant pump on the crankcase. The coolant is returned into the suction side of the coolant pump.
The feed and return heating lines are bundled with the AdBlue lines in order to realize a heating for these lines.
The solenoid valve is installed engine-mounted.

Installation and ambient conditions:

Temperature range :	- 40°C to + 125° C
Differential pressure:	2.0 bar with closed valve

3.3.4 Exhaust pipe of interface engine – to entrance muffler/catalyst

The exhaust pipe must be made from stainless steel (material: steel DIN 17455-1.4301+d2) and impervious to fluids, so that the escape of liquid AdBlue (as a result of wall deposits) is avoided.

The length and course of the exhaust pipe (non-insulated) from the engine separation point to the inlet into the catalytic converter relates to the relevant certificate of the engine. In order to prevent excessive cooling down through external influences, the exhaust pipe should be laid splash waterproof.
If a pipe extension is necessary, insulated pipe material must be used to avoid inlet temperature falling below the permissible catalytic converter inlet temperature.
These insulated pipes can be obtained in 1 or 2 meter lengths as well as an insulated 90° pipe bend as spare parts from DaimlerChrysler in Germersheim. They are available with 90 mm ID x 130 mm OD (BR 900) and 120 mm ID x 140 mm OD (BR 500 and engines OM 457) and are each provided with certification numbers. The extended exhaust pipe must not exceed a maximum length of 3 meters and must be insulated at least 80 %. At least one certification number must remain on each welded-on pipe piece. When laying the exhaust pipe it must be ensured that the max. permissible angle sum of the pipe of 270° is not exceeded. A pipe holder must be positioned in the area of a weld seam, maximum distance of the pipe holder: 1100mm.

When extending the exhaust system (extension of the exhaust pipes), the exhaust back pressure must be measured at full load. The values must be communicated to DaimlerChrysler for checking.

The following work and assembly instructions must be followed when separating and welding together the insulated exhaust pipes.

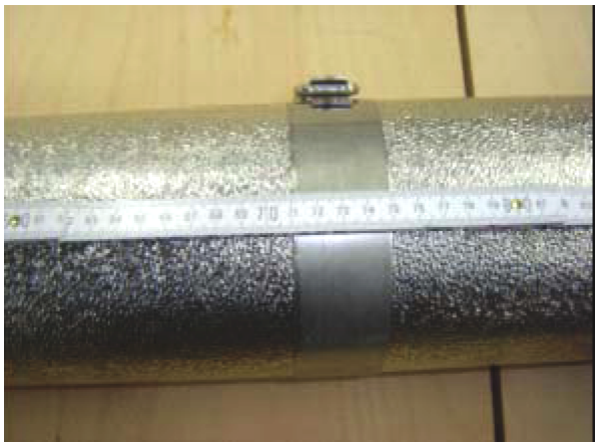
The following figure outlines the essential features of an exhaust pipe extension taking a 250 mm pipe shortening as an example

Engine BR 900: Pipe diameter with insulation 130 mm

Engines BR 500 / Engines 450: Pipe diameter with insulation 140 mm

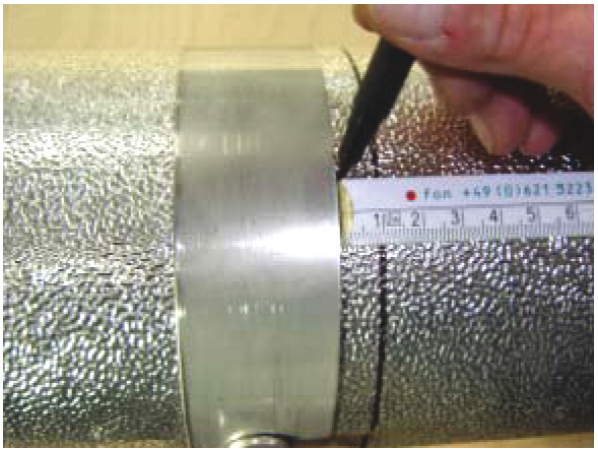
Work and Assembly Instructions for Exhaust Line, insulated
(Exhaust pipes: t=2 mm; diameter 120 mm – insulation strength : 10 mm

Initial situation



In the example a 1 m standard pipe is shortened to an end size of 750 mm.

Mark end size of 750 mm e.g. using a clamp. Alternatively, a flexible piece of cardboard or similar can be placed around the pipe so as to make the marking easier.



From the end size 750 mm mark a second marking offset by 10 mm (740 mm).

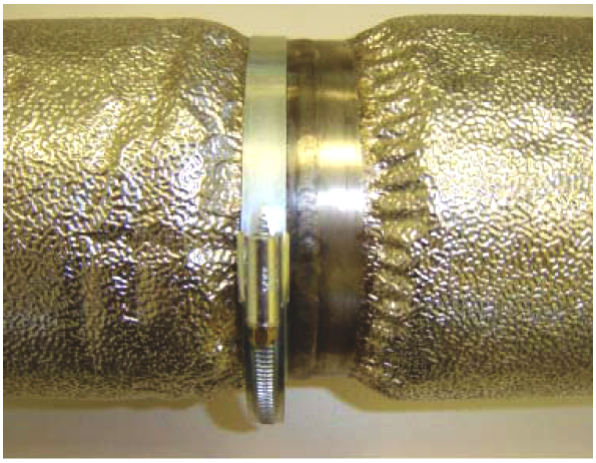
Separate exhaust pipe at the 750 mm marking with a cutting disk.

Remove the stainless steel film at the 2nd marking using plate shears.

Cut back the insulating material with a cutter knife as far as the edge of the stainless steel film.

Compress the insulating material by 10 to max. 20 mm below the stainless steel film.

Use a hammer and flat-nose pliers to press the stainless steel film down onto the diameter of the pipe.



Lock the stainless steel film pulled down using a stainless steel tensioning clamp on the exhaust pipe.

Separated stainless steel pipes are to be welded using the WIG/ or MAG method:

WIG method:

14 Diameter of Wolfram needle: 2.4 mm
15 Amperage: 30 amps
16 Welding filler material: Diameter 1.6 mm- W 18.8 Mn=1.4370
17 Nozzle: Diameter 11 mm / 11 liters/min
18 Welding gas: Argon – 4.8
19 Backing gas: Argon – 4.8
20 Seam preparation: Cleaned with stainless steel rotating brush

MAG method:

21 Inert gas M 12 (97.5 Ar / 2.5 Co2)
22 No. B 1878102520
23 Welding filler Ø 1 mm/ 15 kg
24 Coil / SG-X(15Cr Ni Mn 18 8)

3.3.5 Muffler with catalytic converter

The toxic nitrogen oxides (NO_X) resulting during fuel combustion is reduced to nontoxic nitrogen (N_2) and water (H_2O) in the muffler with reduction catalytic converter:
The exhaust gas muffler with reduction catalytic converter has a stainless steel housing. The reduction catalytic converter is located inside the muffler and is hence a part of the latter.
In vehicles coming into operation from 01.10.2007, a NOx sensor is installed in the exhaust silencer with a reducing catalyst. One temperature sensor each is located at the inlet chamber and outlet chamber of the muffler for measuring the exhaust gas inlet and outlet temperature.
The size and shape of the muffler with catalytic converter depend on certification and are a component of the engine scope of supply.

3.3.6 Control Unit SCR frame module

The control unit SCR frame module reads the analog signals of the connected sensors, converts these into digital CAN (Control Area Network) signals and routes these to the engine control unit (ECU).

- Temperature sensor before catalytic converter SCR
- Temperature sensor after catalytic converter SCR
- Combination sensor fill level and temperature AdBlue
- Combination sensor air humidity and intake air temperature

The following components are actuated with the signals processed in the control unit by CAN-bus via the SCR frame module.

- AdBlue pump module/supply unit
- Solenoid valve (3/2-way valve) for the compressed air limitation

Installation and ambient conditions:

- Temperature range: -40°C to + 80°C
- Weight: 0.32 kg
- Dimensions: L = 202 mm, W = 47 mm, H = 86.5 mm
- Vibration suspension: max. 6 g at 10 Hz – 1000 Hz
- Installation position: Plug downwards
- Installation location: on-board, step protection, stone chipping and spray water protection, protection against sludging of the pressure compensating element must be ensured on the vehicle side.
- Fastening on 3 screw-on elements with metal bushing (tightening torque max. 13 Nm)

Electrical connection: Pin socket housing 62-pole

Paintwork: Temperature stress through painting process: max. 30 minutes at + 100°C
It is essential to mask the pressure compensating element and the rating plate for paintwork.

3.3.7 AdBlue pump module/supply unit

The AdBlue pump module/supply unit consists of a spray-water protected plastic housing and a screwed-on aluminum block. The electrical diaphragm pump is located in the plastic housing. The bubble storage with filling valve, the AdBlue-filter, a coolant duct and a pneumatically-activated switching valve in the return are integrated in the aluminum block.
The pump module/supply unit sucks AdBlue out of the AdBlue tank, filters it and pumps it to the metering unit.

The pressure build-up / pressure reduction times are monitored in the system by the diagnostics. If these times are exceeded there is an entry in the fault memory.

Installation and ambient conditions:

- Temperature range: -40°C to + 80°C
- Installation location: on-board, observe step protection, protection against stone chippings
- Installation position: vertical, cooling water connection, below (note removal of filter)
- Fastening on 3 points (M 10x1.5 tightening torque max**. 60 Nm**)

Specifications:

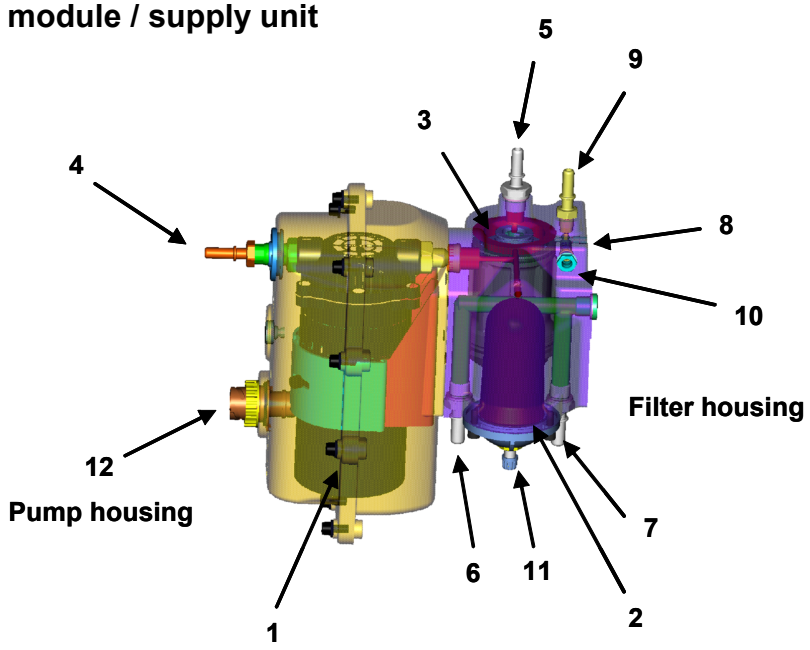
Motor type:	Permanent magnet – brush motor
Rated voltage:	24 V DC
Operating voltage:	22 to 30 V DC
Over voltage:	35 V for 10 s and 58 V DC for 500 ms
Protection class:	(electrical connections) IP67/IP69K as per DIN 40050 T9
Vibration suspension:	max. 5 g
Mass:	approx. 10.3 Kg
Dimensions:	approx. L = 260 mm, W = 154 mm, H = 259 mm

Hydraulic parameters:

Max. Suction lift:	500 mm
AdBlue volumetric flow:	18 l/h at Delta p 0.45 Mpa
Max. Operating pressure:	0.6 Mpa
Burst pressure:	0.9 Mpa
Pressure loss:	Pressure side max. 400 mbar
Filter mesh size:	30 / 100 µm
Filter area:	700 cm³
Storage volume:	0.125 l gas volume at 0.3 Mpa Preload, nitrogen initial filling, Refilling grease/oil-free air
Preload pressure:	Bubble storage 0.3 Mpa

Connections	**Connection type**
AdBlue suction connection	Norma Quick S NW 5/16
AdBlue pressure connection	Norma Quick S NW 5/16 screw-in fitting In the pump module
AdBlue return line	Norma Quick S NW 5/16
Coolant inlet	Norma Quick plug connector PS 3
Coolant outlet	Norma Quick plug connector PS 3
Electrical connection	Plug connection (DIN 72585) bayonet 2-pole
Compressed air connection	Schaefer SDF NG 6

AdBlue pump module / supply unit



1 Pump with electric motor	7 cooling water outlet
2 Bubble storage	8 Pneumatic switching valve
3 Pressure filter	9 Return line connection AdBlue to the tank
4 AdBlue suction connection	10 Compressed air connection
5 AdBlue pressure connection	11 Filling valve bubble storage including filling connection
6 Cooling water inlet	12 Electrical connections

3.3.8 AdBlue Tank

The AdBlue tank is made of either plastic or stainless steel and has the following connections:
2 connections each (feed and return) for coolant for tank content heating and AdBlue supply, as well as 1 electrical connection.
A prefilter with 100 µm mesh size is to be provided for the AdBlue removal**.** The tank also contains the support for the combination sensor (fill level and temperature AdBlue).

	Connections	**Connection type**
25	AdBlue removal	Plug connection Norma Quick S NW 5/16
26	AdBlue return	Plug connection Norma Quick S NW 5/16
27	Coolant warm feed	Plug connection Norma Quick pipe fitting PS 3
28	Coolant return	Plug connection Norma Quick pipe fitting PS 3
29	Electrical connection: Temperature and fill level sensor	Plug connection (DIN 72585) bayonet 4-pole

The filler neck (Elifax filler neck) has a smaller diameter at 19 mm than the filler neck of the diesel fuel tank and also has an integrated magnetic adapter in the form of a ring magnet and thus prevents an incorrect filling with diesel fuel with its special diameter and the magnetic adapter integrated in it.

Tank and tank volume design criteria:

Material: All parts used must be corrosion-resistant against AdBlue (urea-water solution) (plastic or stainless steel). No non-ferrous metals may be used.
The temperature resistance must correspond to the requirements of the vehicle.
Ambient temperature of minus 44° C to plus 70° C.

Tank material

Plastic: LDPE (Low Density Poly Ethylene)
Stainless steel: Steel DIN 17455-1.4301 (this quality is not resistant to salt water and must be painted from outside with clear coat),
or steel DIN 17455-1.4302 / 03 (this quality is resistant to salt water).

Max. perm. pressure / test pressure : 0.03 MPa
Non-removable residual volume: 5 %
Expansion volume of AdBlue: 12 % observe
Max. pressure of heating medium: 0.6 MPa
Design of filler and vent valve:

- Flow quantity air:	at under pressure 0.001 – 0.002 MPa		175 l / h
- Flow quantity AdBlue:	at overpressure to 0.02 MPa	≤	1.75 l / h

One AdBlue tank filling should be sufficient for minimum two diesel tank fillings.
A residual filling quantity in the Adblue tank must be ensured, the tank must not be fully emptied.

3.3.9 AdBlue heating

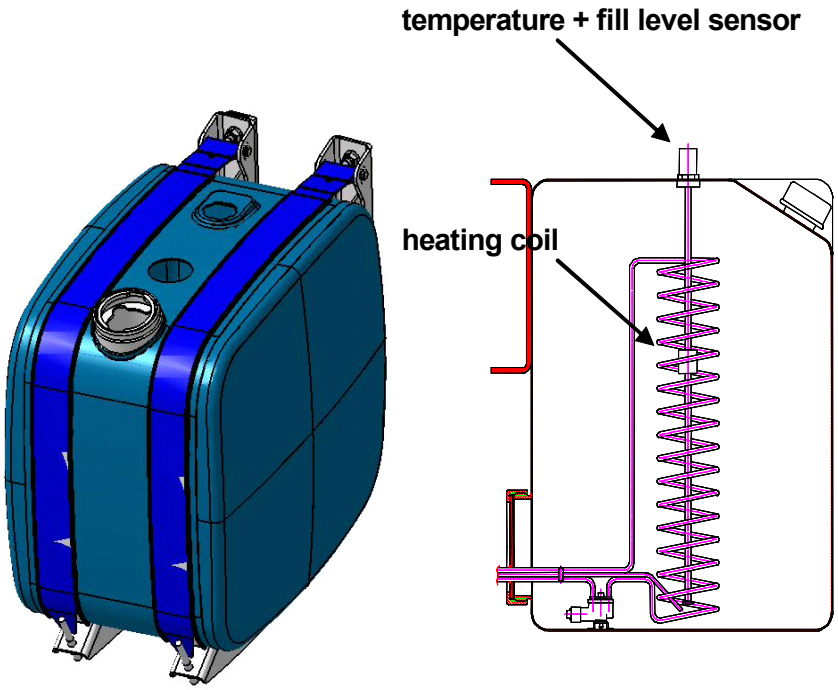
In winter operation, temperatures below -11° C may cause the AdBlue to freeze. If this is detected via the combination sensor (fill level and temperature) integrated in the AdBlue tank, (defined limit value of approx. 8° C) the coolant solenoid valve for the AdBlue tank heating is actuated by the engine control unit (ECU). The solenoid valve is opened upwards of a coolant temperature of ≥ 10°C.
The outside/ambient air temperature is required as an additional measuring signal for control of the solenoid valve. For recording the outside/ambient air, an additional signal is necessary which is connected to the ADM via the CAN J 1939 interface. The signal can be picked off by the outside/ambient air sensor of the vehicle, which has to be positioned in such a way that direct solar radiation and/or spray water cannot lead to impermissible measuring errors.
If an outside/ambient air sensor is not available, we recommend using the following components (not included in the scope of delivery).

- Outside/Ambient air sensor Type: PT100 Class B
  Supplier: e.g. Geratherm Medical AG, Fahrenheitstrasse 1, D- 98716 Geschwenda

- CAN module sensor Article No. : Ehb5003-1
  Supplier: ehb-electronics GmbH, Dreihornstrasse 18, D- 30659 Hannover

The AdBlue heating consists of the solenoid valve for the tank heating and a coolant line system from the engine to the AdBlue tank and back to the engine. The pump module / supply unit is integrated in the heating system.
The heat supply to the AdBlue lines is realized through a bunched installation of lines with the heating lines and insulating hoses.

Concept Design of AdBlue Tank



3.3.10 Adblue Supply lines

Line from the Adblue tank to the supply unit and interchange point metering unit.
Material: EPDM hose,
Dimensions: Line diameter 7.5 x 3.75 MB Parts No. A 930 476 00 01
Supplier: e.g. Conti Tech Fluid, Schlauch GmbH

Supply lines for compressed air

Compressed air lines from the compressed air valve to the supply and metering unit.
Material: PA12-PHLY / DIN 74324 see TB plastic pipe A 000 987 25 27
Dimensions: 8x1 mm

Supply lines for tank heating

Line from the solenoid valve to the Adblue tank
Material: EPDM hose with cord insert MB Parts No. A 930 501 00 82
Supplier: e.g. Conti Tech Fluid Schlauch GmbH

3.3.11 Sensors

AdBlue pressure sensor

The sensor is screwed into the metering unit from outside (see metering unit diagram).
The sensor records the pressure at which the AdBlue is present inside the metering unit, and communicates this information as an electrical voltage signal to the engine control unit (ECU).
The pressure sensor is an “active“ sensor, i.e. it is supplied with voltage via the vehicle cable harness.

AdBlue temperature sensor

The sensor is screwed into the metering unit from outside (see metering unit diagram).
The sensor records the temperature at which the AdBlue is present inside the metering unit, and communicates this information as an electrical voltage signal to the engine control unit (ECU).
The temperature sensor is a “passive“ sensor, i.e. it is not supplied with voltage.

Compressed air pressure sensor
The sensor is screwed into the metering unit from outside (see metering unit diagram).
The sensor records the pressure at which the compressed air is present inside the metering unit, and communicates this information as an electrical voltage signal to the engine control unit (ECU).
The pressure sensor is an “active“ sensor, i.e. it is supplied with voltage.

Temperature sensor before / after catalytic converter SCR

The temperature sensors before and after the catalytic converter are each screwed into the inlet and outlet chamber of the exhaust muffler with reduction catalytic converter.
The temperature sensors before and after the catalytic converter record the temperature of the exhaust flow in the inlet chamber and the outlet chamber of the exhaust muffler respectively and communicate this information as an electrical voltage signal to the control unit SCR frame module.
The temperature sensors before and after the catalytic converter SCR are “passive“ sensors, i.e. they are not supplied with voltage.

Installation conditions:

Connection:	Plug connection (DIN 72585) bayonet-2 pole

Combination sensor air humidity and air temperature

The combination sensor for air humidity and air temperature is screwed into the clean air pipe between the air filter and turbocharger from outside.
The combination sensor measures the relative air humidity and temperature of the intake air and ascertains the water content in the air.

Installation conditions:	The installation in the clean air pipe should occur min. 400 mm before the crankcase ventilation system
Cable connection plug connector:	Plug connection Tyco Electronics (similar to DIN 72585 / ISO 15170) bayonet 4-pole
Operating range temperature:	-40° C to 105° C
Operating range humidity:	0% RH to 100% RH

Combination sensors for AdBlue fill level and temperature

The combination sensor for fill level and temperature AdBlue is screwed into the AdBlue tank from outside (see AdBlue Tank section).
The combination sensor records the fill level and temperature of the AdBlue supply in the tank.
The combination sensor has an immersion tube with an integrated resistance measuring chain and a float for ascertaining the fill level.
An NTC resistor (Negative Temperature Coefficient) is located at the lower end of the measuring element for temperature measurement. This means that the electrical resistance reduces at increasing temperature.
To ensure problem-free parameterisation of the fluid level and temperature sensors, we recommend the use of a standard DC sensor (of which various variants are available)

Installation conditions:

Tightening torque:	max. 25 Nm
Plug connector – cable connection:	Plug connection (DIN 72585) bayonet 4-pole
Operating temperature:	-44° C to 85° C
Permissible ohmic range level sensor:	244 – 19 800 Ω
Permissible ohmic range temperature sensor:	137 – 23 340 Ω

3.3.12 Compressed air supply

Basic components

The compressed air supply, which is necessary for the functioning of the Blue Tec System, is realized by the compressed-air controller unit, which comprises the components – solenoid valve compressed air limitation, overflow valve (without return flow) and pressure limiting valve (with ventilation). The compressed-air controller unit should be installed so that it is protected against stepping damage and stone chippings (e.g. inside the vehicle frame).
The compressed air enables transportation of the AdBlue from the metering unit to the injection nozzle and return of the AdBlue from the pump module/supply unit to the tank. When stopping the engine, the metering line and nozzle of AdBlue are cleaned of residues through secondary injection in the system.
After starting the engine, the engine control unit (ECU) switches the solenoid valve for the compressed air limitation via the control unit frame module.
Compressed air is branched off out of the auxiliary consumer circuit of the compressed air system by opening. The compressed air flows through the solenoid valve for the compressed air limitation, and then flows through the overflow valve and the pressure limiting valve. The pressure limiting valve reduces the actuated compressed air to the set valve of approx. 5.5 bar.
The compressed air then flows via a compressed air line through the metering unit and through the subsequent injection nozzle. In the same way, compressed air is directed to the compressed air connection of the pump module. Here the compressed air ensures that a pneumatic shift valve closes the AdBlue return from the pump module into the AdBlue tank.
This safety valve is closed if it is pressurized with compressed air.
It must be ensured that a total air requirement of max. 25 liters/ min. is available for the Blue Tec System.

Solenoid valve for compressed air limitation

The solenoid valve for the compressed air limitation is part of the compressed-air controller unit. The solenoid connection to the compressed-air auxiliary consumer circuit.

Cable connection: Plug connector (DIN 72585) bayonet 2-pole

Overflow valve

Valve is a 3/2–way valve with ventilation actuated via the electronics, and opens or closes the
The overflow valve (part of the compressed-air controller unit) releases the passage of the compressed-air auxiliary consumer circuit after reaching a specified pressure.

Pressure limiting valve

The pressure limiting valve (part of the compressed-air controller unit) reduces the actuated compressed air to the set value of approx. 5.5 bar.

3.4 On-Board Diagnosis (OBD)

DaimlerChrysler, as a manufacturer, provides evidence of the proper functioning or non-functioning of exhaust aftertreatment, whilst driving, in accordance with legal requirements. This involves monitoring of all significant components by function sensors. Any malfunction is signalled in the cab on an indicator display. If, for example, there is no AdBlue in the tank, or if the pumps or metering units are not working, the fault display in the cab lights up and a corresponding entry is made in the fault memory.
The requirements for On-Board Diagnosis are being tightened as of the 1st October 2007.The legal requirement for all vehicles is registered from this date onwards to have permanent monitoring of the nitrogen content (NO_x value) in the exhaust. All vehicles must then be fitted with a NO_x sensor to monitor the NO_x emission. Slight excess in nitrogen content in the exhaust is signalled by the yellow warning lamp in the indicator display, **and is stored in the fault memory for at least one year and can be accessed by the official monitoring authorities.**
If the NO_x value rises to 7g/kWh and higher, this will lead to a reduction in engine torque after the next standstill (0 km/h).

Vehicles ≤ 16 tons:	Reduction in engine torque of 25%
Vehicles > 16 tons:	Reduction in engine torque of 40%

From 10 / 2007 vehicles without OBD 1 with NO_x control can no longer be registered.