

Workshop Service Manual

MF 6600



MF 6600

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1 Engine

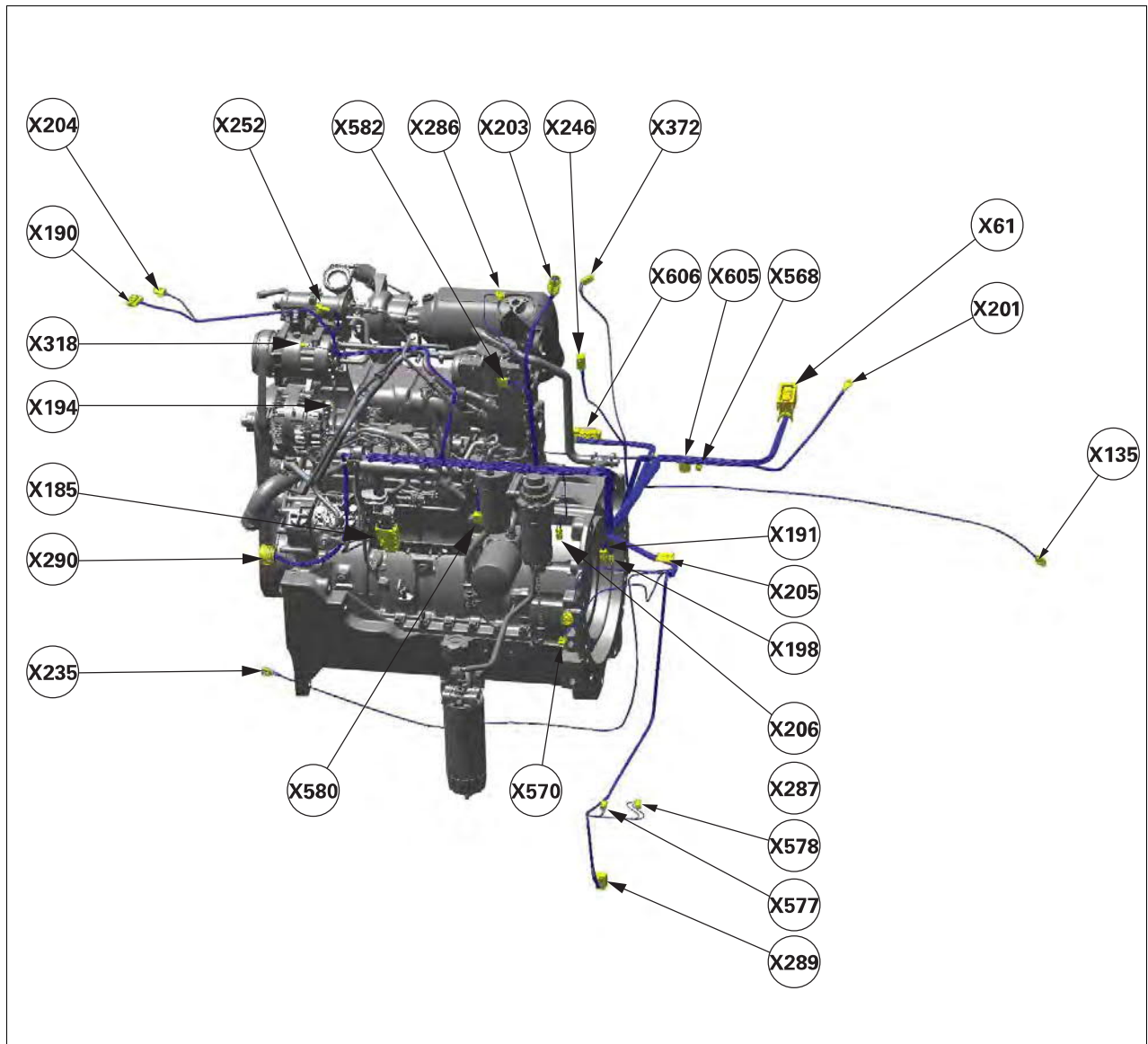


Fig. 1.

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X61	Cab transmission harness/engine harness junction	X252	Automatic air conditioning condenser
X135	Braking pressure sensor	X286	AdBlue™ or DEF (urea) injection valve
X185	AGCO Power EEM unit	X287	AdBlue™ or DEF (urea) reservoir pre-heating valve
X190	Vistronic fan	X289	Management module for e3 SCR Technology engine
X191	Diesel fuel preheater	X290	Front accessory connection socket harness/front function harness junction
X194	D + alternator 1	X318	Automatic air conditioning compressor
X198	Pneumatic trailer brake sensor	X372	Orbitrol safety solenoid valve
X201	Engine harness earth	X568	Turbocharger outlet temperature sensor
X203	Engine harness/front headlights harness junction	X570	AdBlue™ or DEF reservoir gauge
X204	Cooling unit harness/engine harness junction	X575	Main heater relay
X205	Front axle harness/engine harness junction	X577	AdBlue™ or DEF pressure lines heater
X206	Sensor detecting water in the diesel fuel	X580	Connecting connector
X235	Front axle steering sensor (WAS sensor)	X582	Turbocharger outlet "NOx" sensor
X246	Auto-Guide™ external harness/engine harness junction	X605	Engine harness/exhaust harness connection
		X606	Secondary fuse box connector 1

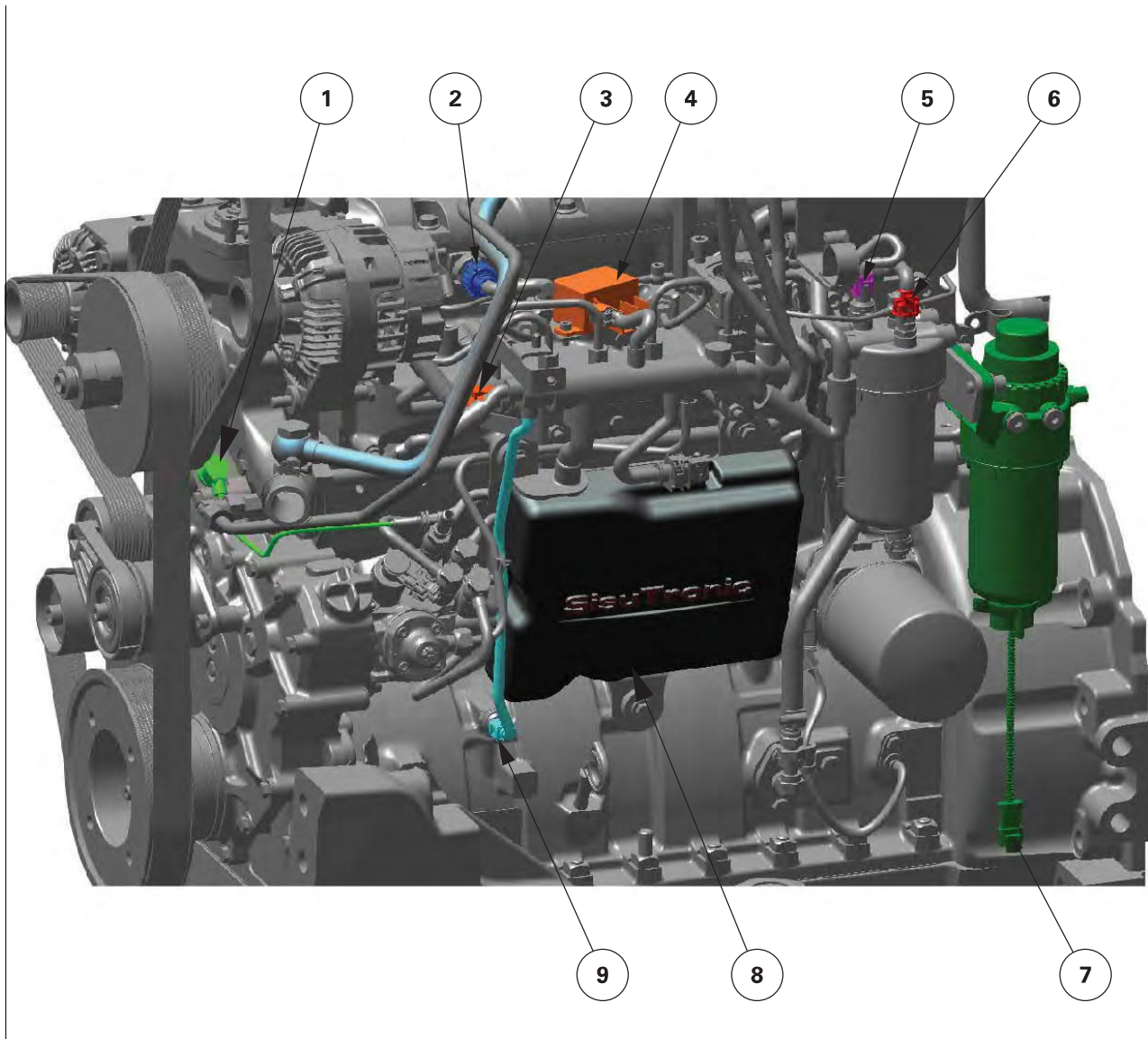


Fig. 2.

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- | | |
|--|--------------------------------|
| (1) Secondary speed sensor | (6) Fuel temperature sensor |
| (2) Injector wiring | (7) Water sensor (fuel) |
| (3) Rail pressure sensor | (8) Engine controller EEM4 |
| (4) Inlet air preheater solenoid valve | (9) Engine oil pressure sensor |
| (5) Fuel pressure sensor | |

1 Measuring the engine oil pressure

1. Remove the oil pressure sensor (7) and replace it with a pressure gauge of 0 bar (0 psi) to 10 bar (145 psi).
2. Measure the lubrication pressure between minimum and maximum speed. This should be between 2,5 bar (36 psi) and 5 bar (73 psi).
3. If the engine lubrication oil pressure is low or varies, check the oil level, check the regulating valve and then check the lubrication pump.

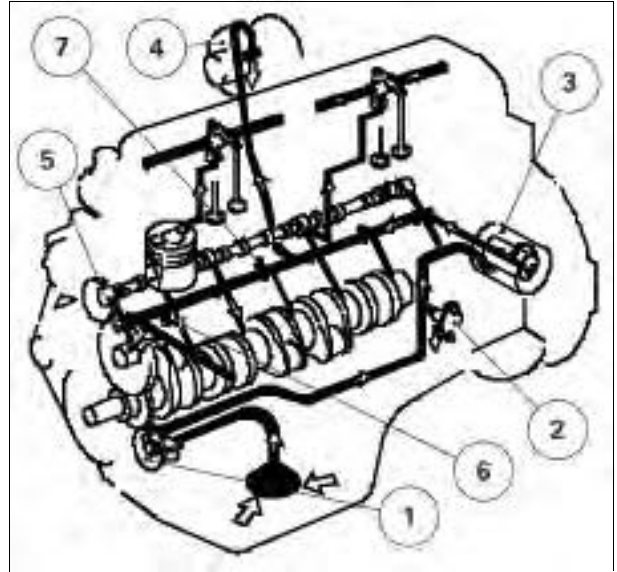


Fig. 1.

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1 General

1.1 Notice to the technician

Selective Catalytic Reduction, also known as SCR, is a process applied to the emissions from diesel engines, designed to meet the emissions standards. In the SCR process, a diesel emissions reducing agent in the form of an aqueous urea solution is injected into the flow of exhaust fumes in order to convert nitrous oxide (NOx) into a harmless mixture of nitrogen and water vapour.

SCR is a simple nitrous oxide (NOx) post-treatment system which offers the following advantages:

- fuel savings
- a simple solution that requires no modification to current engine cooling systems. In fact, because it is possible to reduce the recirculation rate of exhaust fumes, engine performance can be increased and the operating temperature lowered.
- very little maintenance is required
- a proven and reliable method

The SCR system comprises a urea tank, an injector, a metering module, some sensors and a catalyser.

The system is automated; the operator has only to monitor the gauge and to fill the urea tank as required. There are warnings of low urea level similar to the warnings for other fluids, such as the low fuel level warning.

The AdBlue™ or DEF is comprised of 67.5% water and 32.5% urea. Urea is a non-hazardous nitrogen product which is also used in fertilisers.



Fig. 1.

I043049

1.2 Safety instructions related to urea (AdBlue™ or DEF)

Identification of dangers

According to Directive 1999/45/EC and its amendments, the product is not classified as hazardous.

Classification	Not classified
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Information about the components

Substance/preparation	Preparation
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Component name	CAS Number	%	EC Number	Classification
water	7732-18-5	67.5	231-791-2	Not classified
urea	57-13-6	32.5	200-315-5	Not classified

First aid	
Ingestion	If large quantities of this product are swallowed, seek medical advice immediately. Do not induce vomiting unless advised to do so by medical staff. Do not administer liquid to a person who is unconscious.
Contact with the skin	Avoid prolonged or repeated contact with the skin. After handling, always wash your hands thoroughly with soap and water. In the event of irritation, seek medical advice.
Contact with the eyes	In case of contact with the eyes, rinse immediately under running water. In the event of irritation, seek medical advice.
Protection of rescuers	No action must be taken which puts an individual at risk or in the absence of appropriate training.

Fire protection measures and prevention of explosions and fires	
Extinguishing methods	In the event of fire, spray with water (spray mist), foam, dry chemical powder or carbon dioxide gas (CO ₂)
Items that can be used	Use a suitable extinguishing agent to put out a neighbouring fire.
Risks related to thermal decomposition products	These products can be: oxides of carbon (CO, CO ₂), oxides of nitrogen (NO, NO ₂ etc.), ammonia (NH ₃).
Special protective equipment for personnel pre-equipped to fight a fire	Fire brigade officers must wear suitable protective equipment as well as self-contained breathing apparatus with an integral mask operating in positive pressure mode.

Measures to be taken in the event of accidental spillage	
Individual precautionary measures	Follow all of the procedures relating to fighting a fire.
Measures to protect the environment and clean-up methods	Prevent the spilled substance from coming into contact with the ground and surface water courses. Absorb using sand or an alternative dry non-combustible material. Collect up solid material and the absorbed product using a shovel and place it all inside a suitable and labelled waste container. Avoid forming a cloud of dust and prevent it from being spread by the wind. Keep a safe distance away from aquatic environments.

Handling and storage	
Handling	Avoid all contact with the eyes, skin and clothing. Ensure that automatic eye rinsing systems and safety douches are located in close proximity to the location of the work stations.
Fuel storage	Keep the container firmly closed. Store the container in a cool and well-ventilated area. Keep away from heat and direct sunlight.
Recommended packaging materials	Use the original container.

Physical and chemical properties

General information	
Physical state	Liquid (clear)
Colour	Colourless
Odour	Ammoniacal (weak)

Information relating to health, safety and the environment	
pH	9.8 to 10 (Conc. (% weight/weight): 10%)
Boiling point	Decomposition temperature: 100°C (212°F)
Melting/freezing point	-11.5°C (11°F)
Vapour pressure	6.4 kPa (48 mm (1.9 in) Hg) (at 40°C (104°F))
Volume mass	1.09 g/cm ³ (20°C (68°F))
Can be mixed with water	Yes

Stability and reactivity	
Stability	Stable under storage and recommended handling conditions.
Conditions to avoid	Urea reacts with sodium hypochlorite or calcium to form very explosive nitrogen trichloride.
Materials to avoid	Extremely reactive or incompatible with the following materials: oxidant materials, acids and alkalines.
Hazardous decomposition products	These products can be: oxides of carbon (CO, CO ₂), oxides of nitrogen (NO, NO ₂ etc.), ammonia (NH ₃).

Toxicological information

Potential acute effects on health.

Effects on health are considered as fairly unlikely if the product is used in accordance with the recommendations.

Potential chronic effects on health	
Chronic effects	No major effects or critical dangers are known.
Carcinogenicity	No major effects or critical dangers are known.
Mutagenesis	No major effects or critical dangers are known.
Congenital abnormalities	No major effects or critical dangers are known.
Effects on development	No major effects or critical dangers are known.
Effects on fertility	No major effects or critical dangers are known.

Signs/symptoms of over-exposure	
Inhalation	No specific data.
Ingestion	No specific data.
Skin	No specific data.
Eyes	No specific data.

Information relating to waste disposal options	
Waste processing methods	Empty containers or inner packaging may retain traces of product. Do not discard residue down the drain and do not dispose of this product and its container without taking all the necessary precautions relating to its use. Discard in accordance with all applicable local and national regulations.

1.3 Abbreviations or terms used

CAN	Controller Area Network
CAT	Catalyser
Denox Catalyst	Catalyser capable of reducing nitrous oxides as an oxidising mixture
Denoxtronic	Technical name of the metering module (BOSCH)
H ₂ O	Chemical symbol for water
N ₂	Chemical symbol for nitrogen
NO _x	Chemical symbol for nitrous oxide
SCR	Selective Catalytic Reduction

2 Principles of operation

2.1 e3 SCR Technology engine layout

e3 SCR Technology engine

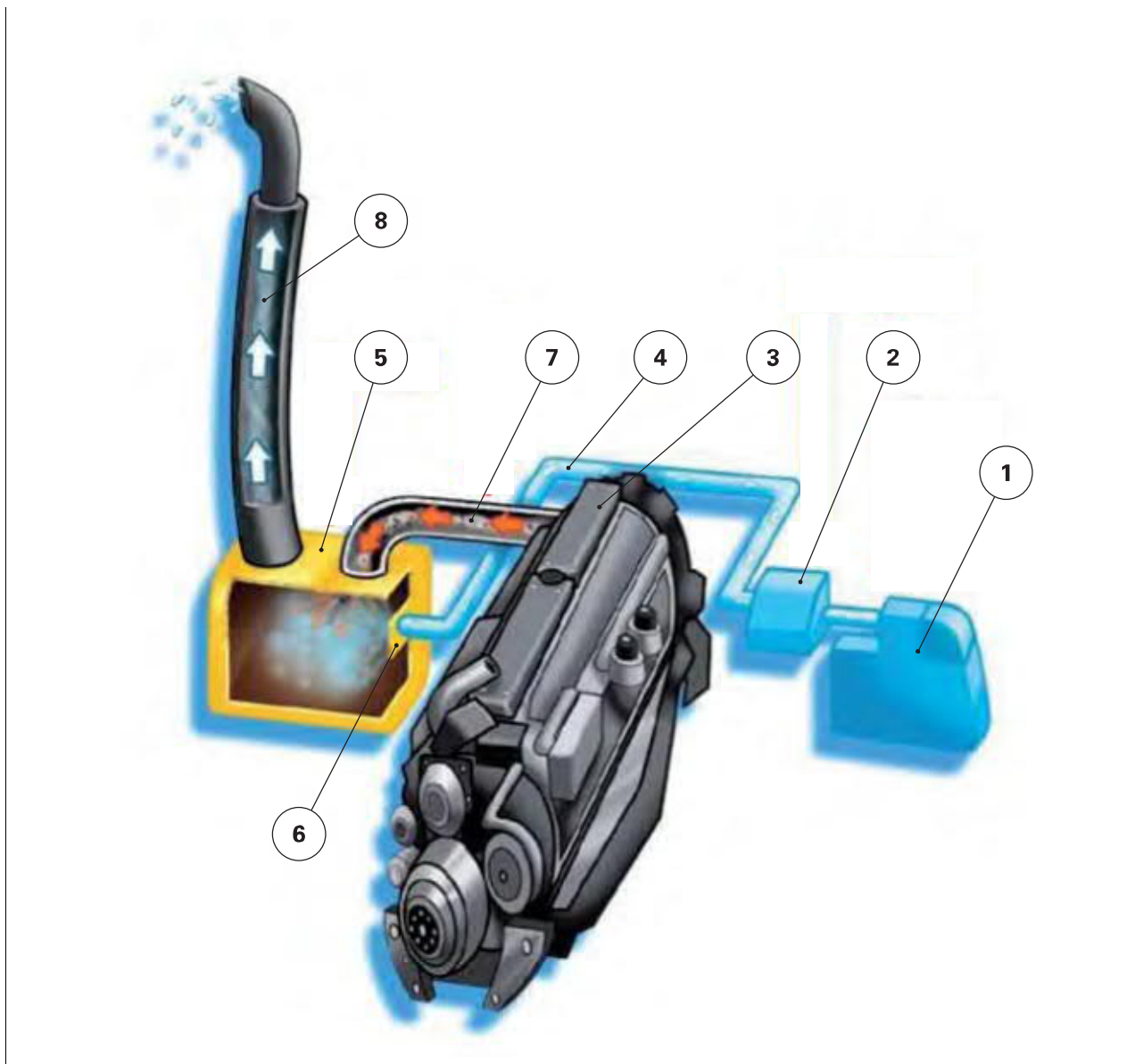


Fig. 2.

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- | | |
|--------------------------------|-----------------------------|
| (1) AdBlue™ or DEF tank | (5) Catalyser |
| (2) Metering module | (6) AdBlue™ or DEF injector |
| (3) Engine | (7) Exhaust line |
| (4) AdBlue™ or DEF supply pipe | (8) Silencer |

The e3 SCR Technology engine comprises various components that are located close to the engine. The e3 SCR Technology engine is a self-managed system. It is electronically connected to the engine information in order to ensure the best measurement of urea into the exhaust line.

e3 SCR Technology engine components

Urea tank

The AdBlue™ or DEF tank is located on the left-hand side of the tractor. It has a capacity of 30 l (7.9 gal (US)) and is used to store the AdBlue™ or DEF.

The AdBlue™ or DEF filler plug is coloured blue to comply with the standard, so that the operator does not make a mistake when filling.



Fig. 3.

I040033

Engine controller

The metering module, also called the Denoxtronic module, has been developed by BOSCH.

It is a vital component of the e3 SCR Technology engine. It is equipped with the main systems used to self-manage the SCR technology.

It comprises a diaphragm pump system, filters and a sensor. It is controlled directly by the engine controller.

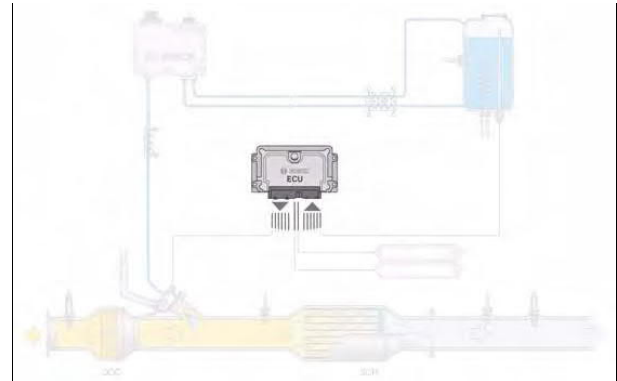


Fig. 4.

I026902

The module is connected via a harness that provides the electrical power supply and also exchanges information with the engine controller to control the metering based on engine load.



Fig. 5.

I026904



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Injector

The injector is located on the exhaust line and controls the dose of urea.

The injector is electrically controlled by the module controller.

The injector has the special feature of being cooled by the engine coolant as its operating temperature must not exceed 600 °C (1112 °F). The injector is activated when the temperature inside the exhaust line exceeds 230 °C (446 °F). It is deactivated after switching off the ignition when the exhaust temperature drops below 230 °C (446 °F). After switching off the engine, it is possible to hear the module pump, which continues to run in order to bleed the injector.



Fig. 6.

I026905

- (1) Supply line
- (3) Electrical connector
- (4) Injector nozzle
- (5) Protection against high temperatures
- (6) Metal heat shield

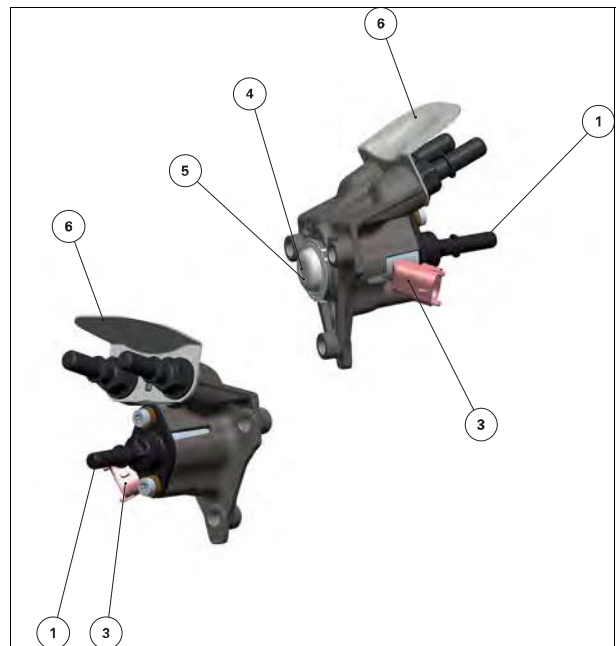


Fig. 7.

I026963

Gauge

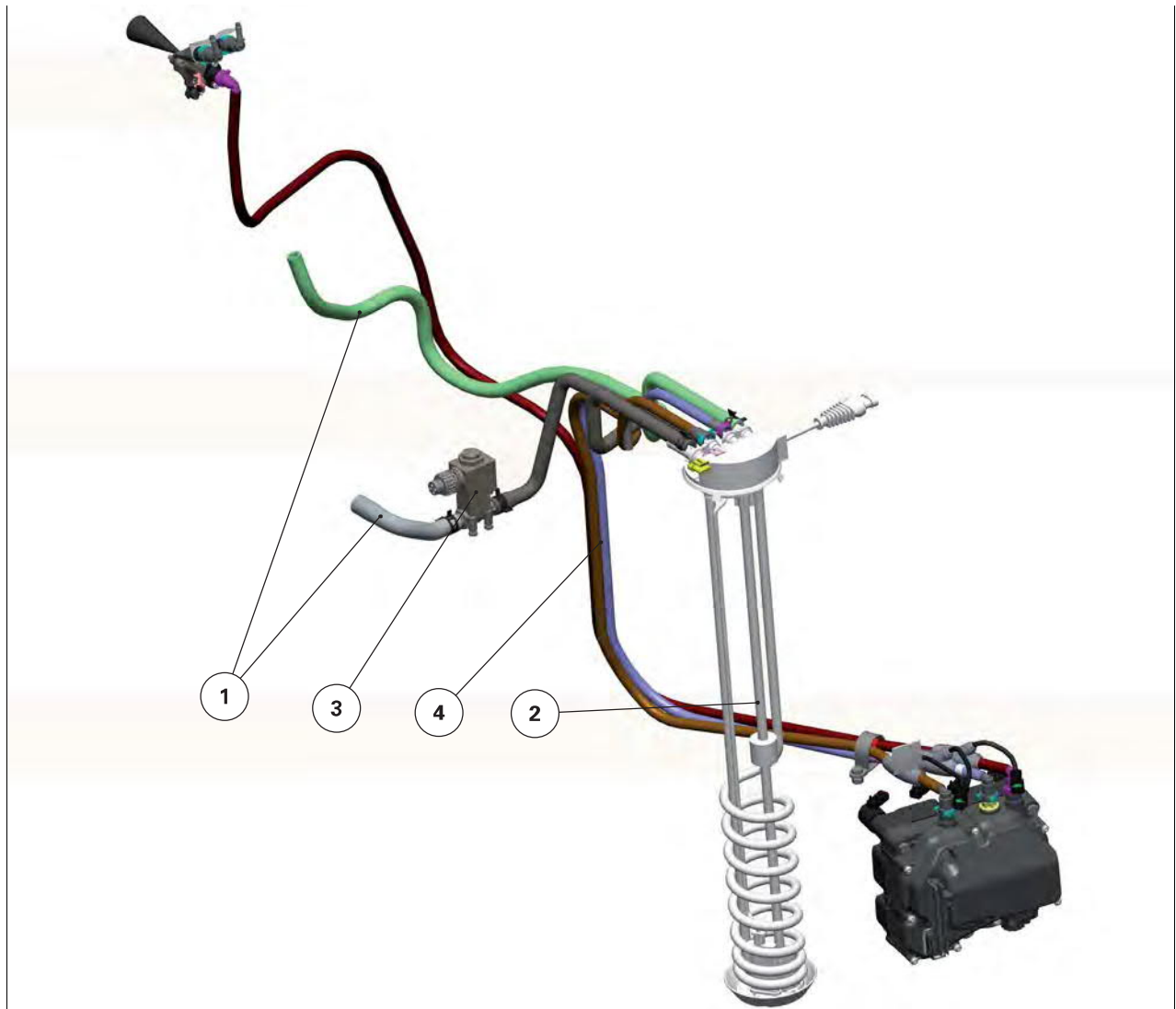


Fig. 8.

1027000

- | | |
|---------------------------------|---|
| (1) Coolant line | (3) Coolant solenoid valve |
| (2) AdBlue™ or DEF pumping line | (4) AdBlue™ or DEF/coolant parallel lines |

The gauge monitors the fluid level and fluid pumping.

This gauge is fitted with a coil through which the coolant from the engine passes. When temperatures are low, it is used to heat the AdBlue™ or DEF, which freezes at temperatures below -11,5 °C (11 °F).

Coolant circulation is controlled by a solenoid valve managed by the engine controller according to the outside temperature information.

During operation, the coolant cools the line via a pipe fitted parallel to the AdBlue™ or DEF line.

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