02.65.31 Technical data

ENGINE Tier 4

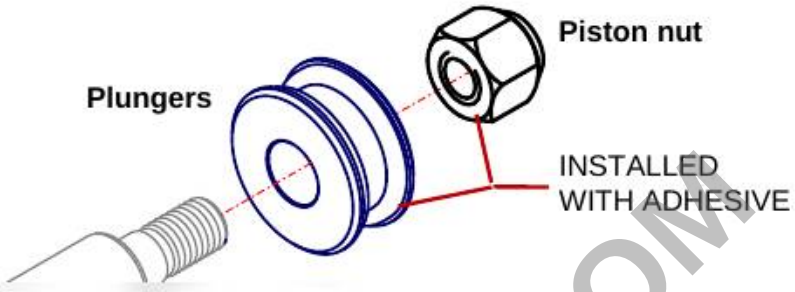
Engine type	Unit	Description
Manufacturer:		Deutz AG
Type:		TCD 2.9 L4
Operation		Four-stroke diesel engine
Displacement		Turbocharger with charge air cooling

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1.500.01 Tightening torques for pistons or piston nuts



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Assignment of the DEUTZ maintenance and service schedules to maintenance intervals

Standard maintenance schedule D/TD/TCD 2.9 L4			
Stage	Activity	To be carried out by	Maintenance interval every ..... operating hours (oh)
E10	Initial commissioning	Authorised specialists	When commissioning new or overhauled engines

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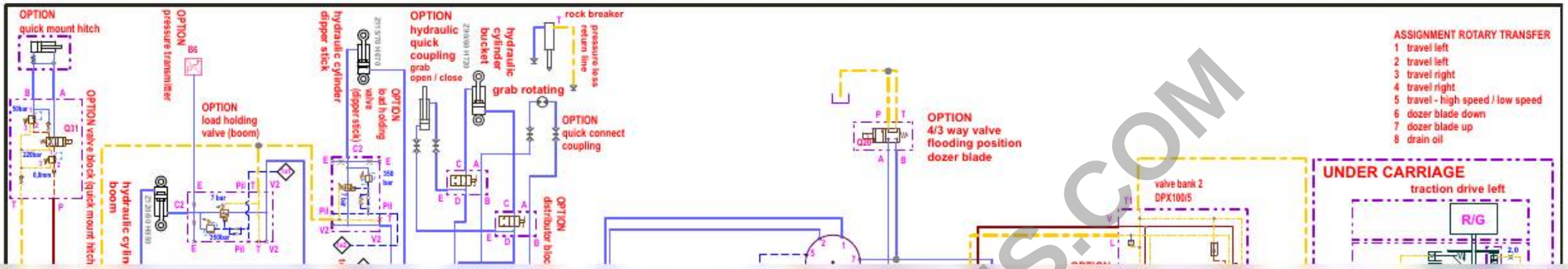
Power supply

Controller Diesel engine EDC 17 CV54

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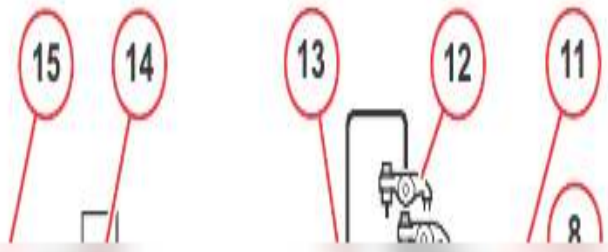
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Lubricating oil system

(example)

1 Lubricating oil sump
2 Lubricating oil pump
3 Overpressure valve
4 Lube oil cooler

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DTC Code (Hex)	DTC Type	SPN-Value	Failure type	Function/Module	Number	Description
622A01	C (communication)	207361	FMI=2--DATA ERRATIC, INTERMITTENT OR INCORRECT	HMI	1	No communication to the HMI (Display or dashboard)
732A01	C (communication)	207361	FMI=19--RECEIVED NETWORK DATA IN ERROR	HMI	1	I/O-failure on HMI (Display or dashboard)
623201	C (communication)	209409	FMI=2--DATA ERRATIC, INTERMITTENT OR INCORRECT	Keypad	1	No communication to the keypad
733201	C (communication)	209409	FMI=19--RECEIVED NETWORK DATA IN ERROR	Keypad	1	I/O-failure on keypad
621D01	C (communication)	204033	FMI=2--DATA ERRATIC, INTERMITTENT OR INCORRECT	ECU	1	No communication to the ECU (engine control unit)
731D01	C (communication)	204033	FMI=19--RECEIVED NETWORK DATA IN ERROR	ECU	1	I/O-failure on the ECU (engine control unit)
620201	C (communication)	197121	FMI=2--DATA ERRATIC, INTERMITTENT OR INCORRECT	ACU	1	No communication to the ACU (Air condition and climate control unit)
730201	C (communication)	197121	FMI=19--RECEIVED NETWORK DATA IN ERROR	ACU	1	I/O-failure on the ACU (Air condition and climate control unit)

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Subgroup directory Engine

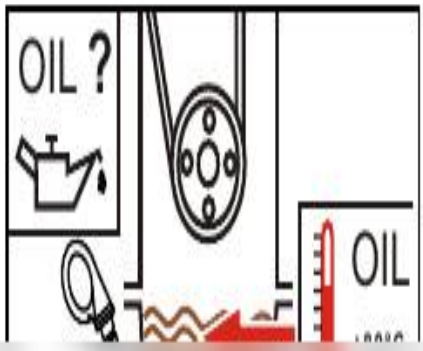
Device number	Subject	File number
0100 ► XXXX	**Operation Manual** **DEUTZ TCD 2.9 L4 (Tier4** final**)**	**03.65.01**
0100 ► XXXX	**Workshop Manual** **DEUTZ TCD 2.9 L4 (Tier4** final**)**	**03.65.11**
0100 ► XXXX	**Bleeding the fuel system** **DEUTZ TCD 2.9 L4 (Tier4** final**)**	**03.65.20**

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Regulations for working on the lubricating oil system

Do not work when the engine is running!
Smoking and naked lights prohibited!
Be careful of hot lubricating oil. Danger of scalding!



- The oil level must always be between the MIN and MAX marks! Top up to the MAX mark if necessary.

Changing the lubricating oil

- Warm up the engine (lubricating oil temperature > 80 °C).

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Grip Options - Joystick

Functional description: Grip option - Joystick on right hand side

Pin assignment –S23:X1#2

Deutsch DT04 8PA



Item	Description	Function
1	Red Cable Out1	Additional control circuit 1

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07.65.60 Diesel engine control unit structural diagram

HMI = **H**uman **M**achine **I**nterface
= Display (combo-tool)



Right armrest



Diagnostics interface
Diesel engine

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05.00.02 Hydromatik tightening values

Tightening torques for Hydromatik pumps/motors

Tightening torques for headless screws (standard metric ISO thread)

	Thread size	Strength categories		
		8.8	10.9	12.9
		Tightening torque (Nm)		
	M3	1.1	1.6	1.9

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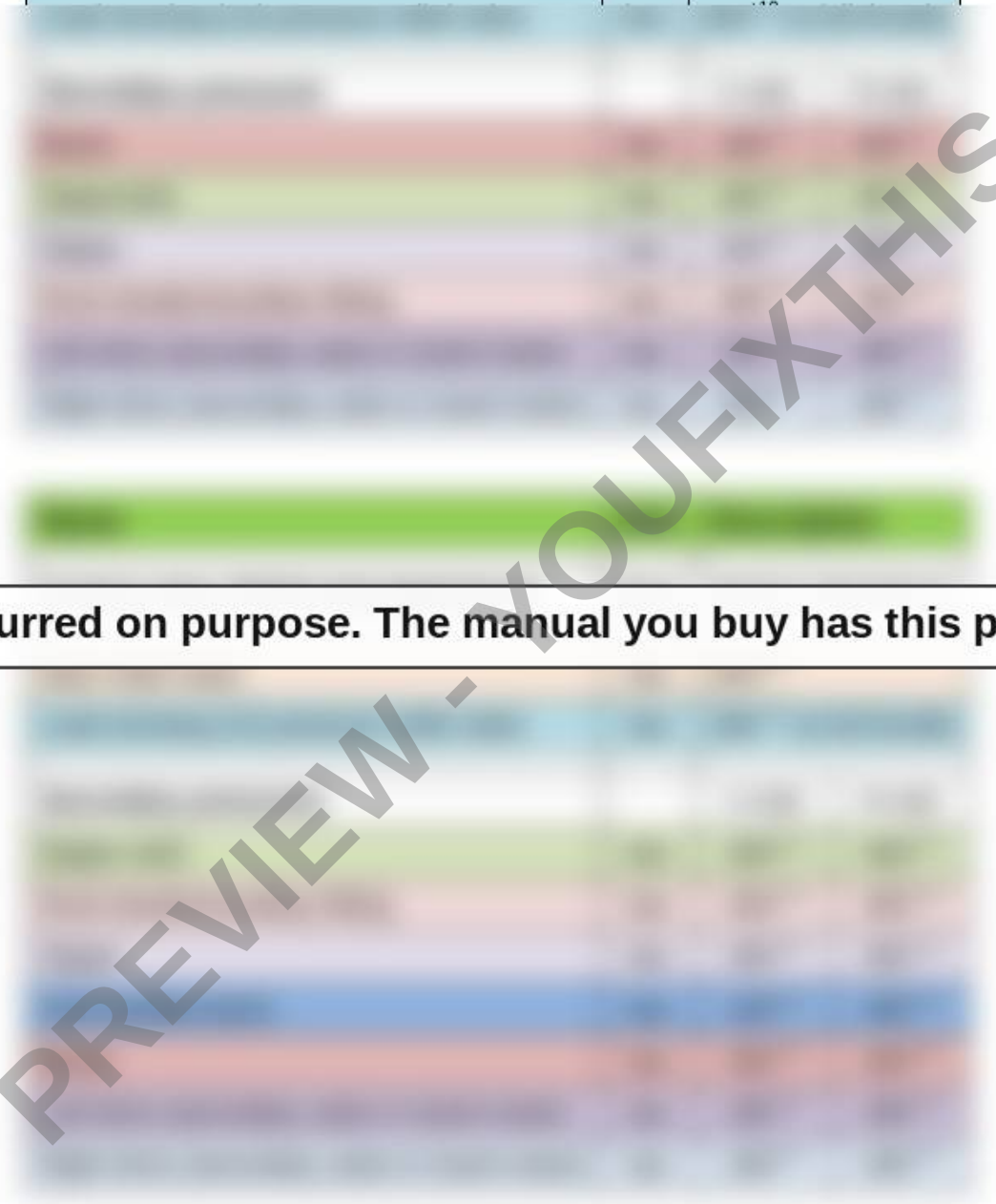
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Technical data

PRESSURE VALUES AND SETTINGS Working

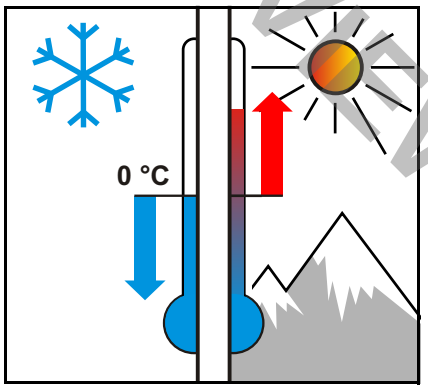
Name	Unit	Description
Control valve *6SX14 mono bloc boom*		
Main relief valve	bar	300^{+10}



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Low ambient temperatures

Lubricating oil

- Select the lubricating oil viscosity according to the ambient temperature.
- If cold starting occurs frequently cut the lube oil changing interval by half.

Fuel

- Use winter fuel below 0 °C (37).

Battery

- A good charging condition of the battery (56) is the prerequisite for starting the engine.
- Heating up the battery to approx. 20°C improves the starting behaviour of the engine. (Remove and store the battery in a warm room).

Cold start aid

- The engines in these operating instructions are equipped with glow plugs.(25)

Coolant

- Observe the mixing ratio anti-freeze/cooling water. (38)

High ambient temperatures, high altitude

This engine is equipped with an electric control unit.
Under the operating conditions listed below, the amount of fuel is reduced automatically, controlled by the electronic control unit.

- Application at high altitude
- Application at high ambient temperatures

Reason: Air density decreases as altitude or ambient temperature increase. This reduces the amount of oxygen in the engine intake air and the fuel-air mixture would be too rich if the injected amount of fuel were not reduced.

- The results would be:
  - black smoke in the exhaust
  - high engine temperature
  - reduction in engine performance
  - possible impairment of starting behaviour

Consult your equipment supplier or DEUTZ partner if you have any other questions.

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09.65.11 Keypad operation



1 Function button with symbol for function
2 LED (status indicator)
3 Number block (numeric input - *E.g. for immobilizer PIN code*)
4 ENTER (confirm - *save* program)
5 Dot 'period' (delete number entry - *delete entered numbers*)

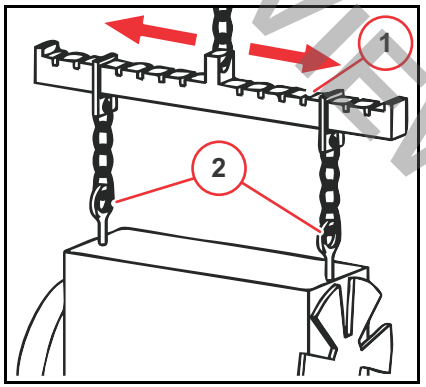
1	Working headlamps forwards	2	Working headlamps Rear (optional)	3	Flashing beacon (optional)
4	Windscreen wipe	5	Washer wiper	6	Automatic heating and air-conditioning *)
7	Heater fan *)	8	Increase inside cab temperature *)	9	Lower inside cab temperature *)
	Working hydraulics activation	0	Fast movement		Overload warning activation *)

The machine is operated primarily via the keypad.
Depending on the function, the corresponding button must be operated once or several times.

*) The corresponding screen is displayed when these functions are operated.

(Description: See also operating instructions).

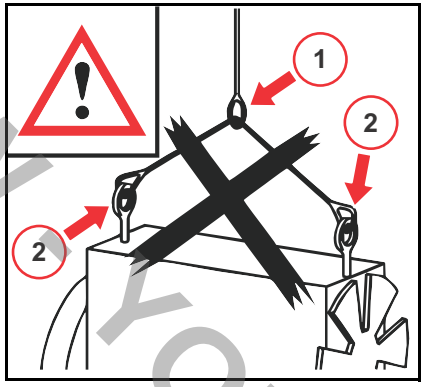
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Suspension equipment

The transport devices mounted on this engine are adapted to the engine weight. If the engine is transported with add-on components, the transport devices must be designed accordingly.

- Always use proper suspension equipment when transporting the engine.
- The suspension device (1) must be adjustable for the engine's centre of gravity.
- After transportation and before commissioning of engine: remove attachment eyes (2).



Danger to life!
The engine may tip over or fall down if suspended incorrectly!

- The fastening attachment cannot be fixed securely above the centre of gravity (1).
- The fastening attachment can slip, the engine swings backwards and forwards (1).
- Too short a fastening attachment causes bending torques in the transport device (2) and can damage it.

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List of Contents

1 General

2 Technical Data

3 Diesel Engine

4 Hydraulics

5 Setting Instructions

6 Function Description

7 Electrics

8 Maintenance

9 Operation

10 Options

11 Repair Instructions

12 Diagnosis / Tools

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Service Manual

SV85 2PB

SERIAL-NO.: from **TC08540103** to **TC0854XXXX**

Issue Date: 07/05/2018
Language: English (en)
Issue Number: 03
Original Instructions

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1.200.01. Safety and accident prevention

1 Introductory remarks

Read the operating instructions thoroughly and follow the notes on safe operation before starting up the earth-moving machine.

National safety regulations - e.g. the Accident Prevention Regulations, "Earth-Moving Machinery" (VBG 40) and "Vehicles" (VBG 12) in the Federal Republic of Germany - must also be complied with when operating the earth-moving machine.

In addition to the operating instructions, legal regulations governing road safety and accident prevention measures must also be observed. Such requirements could also apply with respect to the handling of hazardous goods or the wearing of personal safety gear, for example.

Furthermore, safety requirements governing work in particular locations (tunnels, adits, quarries, pontoons, contaminated areas, etc.) must likewise be observed.

2 Intended use

The earth-moving machine with standard bucket equipment is intended solely for work which is suitable for the function of the machine and its work attachments.

Such work involves loosening, taking up, transporting and dumping soil, rock, or other materials as well as loading these materials on trucks, conveyor belts, or other means of transport, when the transport of the material is normally done by positioning the earth-moving machine.

The assembly of special work attachments – such as multi-purpose bucket, side-dump bucket, broom, fork lift attachment, etc. – makes corresponding applications possible.
Any usage above and beyond that specified here – e.g. the transport of persons or the usage of the lift equipment as a work platform – is regarded as improper use. The supplier cannot be held responsible for any damage resulting from improper use. The risk is borne by the user alone.

Strict compliance with the operating and maintenance instructions and the performance of maintenance work, as well as adherence to the maintenance intervals is also part of intended use.

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1.100.01. Introduction / user notice

The individual assemblies of the manufacturer machine program and the functions of and adjustments to the installed units are described in this service manual.

The hydraulics and electrics diagrams and sectional representations combined with the operating instructions and spare parts list should make maintenance and repair work easier.

Descriptions of work procedures and assembly steps were consciously omitted, because big repairs are generally performed by qualified and experienced workshop personnel, who are masters at this routine work.

Safety and cleanliness at the workstation is the highest priority when performing repairs. Using tools in perfect condition and generally replacing sealing components during each repair should be a matter of course.

Provided no special values are specified, screw connections are to be fastened with the usual tightening torques.

This service manual has been issued by the customer service department with the aim of jointly improving the servicing of manufacturer machines. The service messages we send out for information can serve as a supplement.

We keep this manual up to date with continuous additions.

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The division of the main groups can be seen in the table of contents.

The accident prevention regulations of the responsible employer's liability insurance association are to be strictly observed.

Attentiveness when performing repairs is the best way of preventing accidents.
We therefore recommend studying the relevant instructions concerning the intended repair in detail.

Maintenance and repair work on machines in the field may only begin once the work equipment has been placed on the ground, the engine is turned off, the machine is secured against rolling away, and the hydraulic system has been relieved of pressure.

If repair work is performed by qualified personnel in the workshop, the relevant accident prevention regulations apply here too.

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DEUTZOperating Fluids





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Removing and installing the rail

Standard tools:
– Wrench insert size 14

Special tools:
– Long socket wrench insert 01899132
– Plugs/caps 01899144
– Special wrench 02992112
– Disassembly tool 02992127

– Marker pen, waterproof, permanent
– Assembly grease 01016496

– Safety information / User information

Danger!

Do not carry out work on the fuel system when the engine is running.
The fuel system is under high pressure - Danger of death.

The fuel pressure can continuously remain up to several 100 bar even after stopping the engine.
Here the fuel pressure is only reduced if the fuel system is opened and the fuel can escape outside.

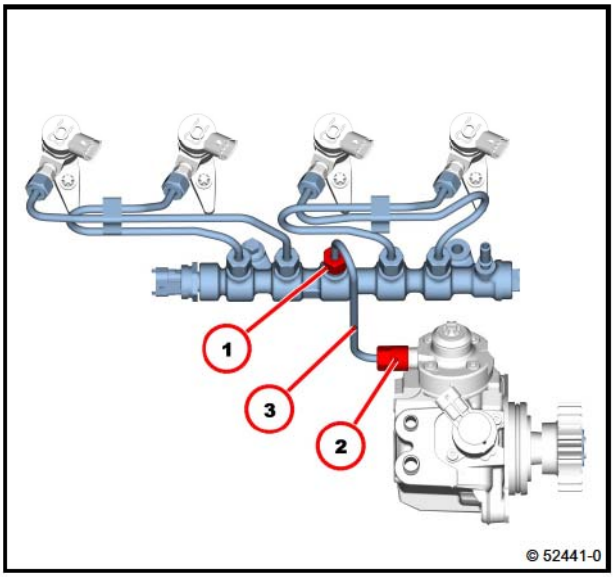
Attention!

Ensure utmost cleanliness for all work.
Remove any paint residue and dirt particles before disassembly.
Clean the area around the components concerned carefully. Blow wet parts dry with compressed air.
Observe the safety regulations and national specifications for handling fuels.
Close all connections immediately after opening with new, clean plugs/caps.
Do not remove plugs/caps until immediately before assembling.
Collect leaking operating substances in suitable vessels and dispose of according to regulations.

Removing high-pressure line

- Remove fuel return line.
- Unscrew union nut (1) with special wrench.
- Unscrew union nuts (2) with special wrench.
- Remove high-pressure line (3).

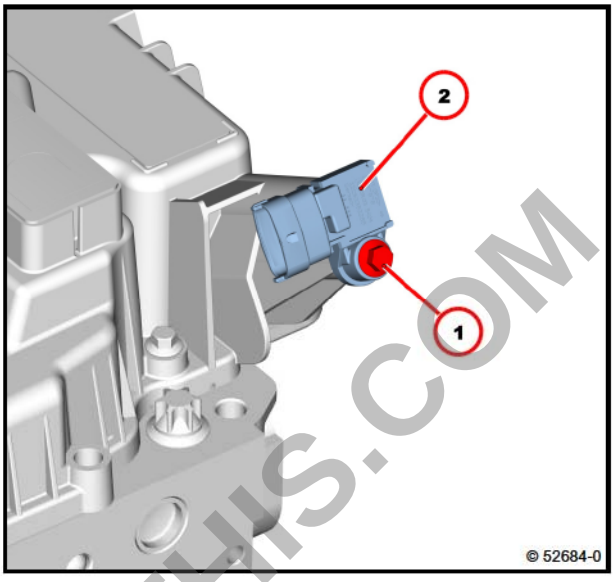
Collect draining fuel and dispose of according to regulations.



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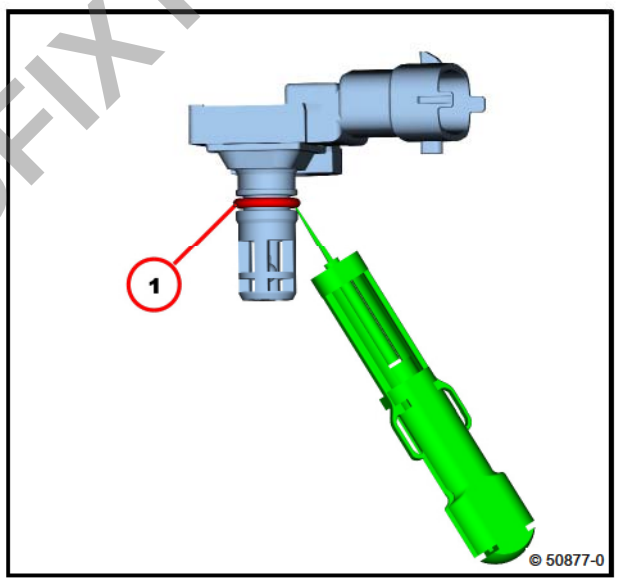
- Unlock cable plug.
- Pull out cable plug.
- Unscrew screw (1).
- Remove pressure/temperature sensor (2).



- Remove the O-ring (1) with the disassembly tool.

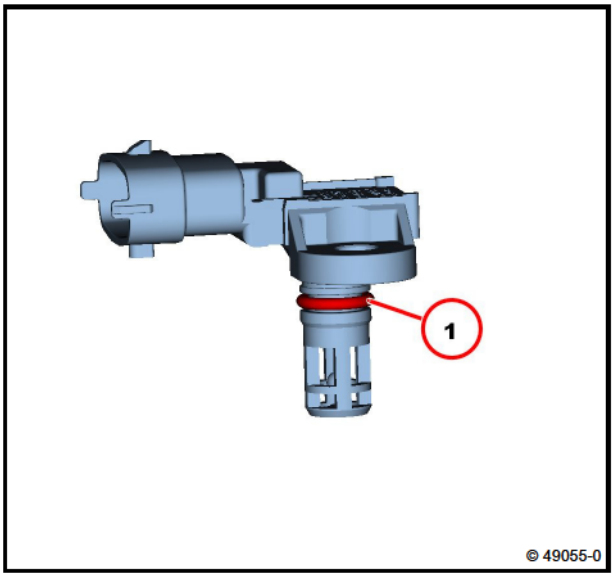
Attention!
Do not damage the component.

- Clean the component.
- Visually inspect the component.



Installing the pressure/temperature sensor

- Insert new O-ring (1).



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Control valve DPX100/5

Intake element

IN1 Intake element

7 Piston - initial deadweight tester

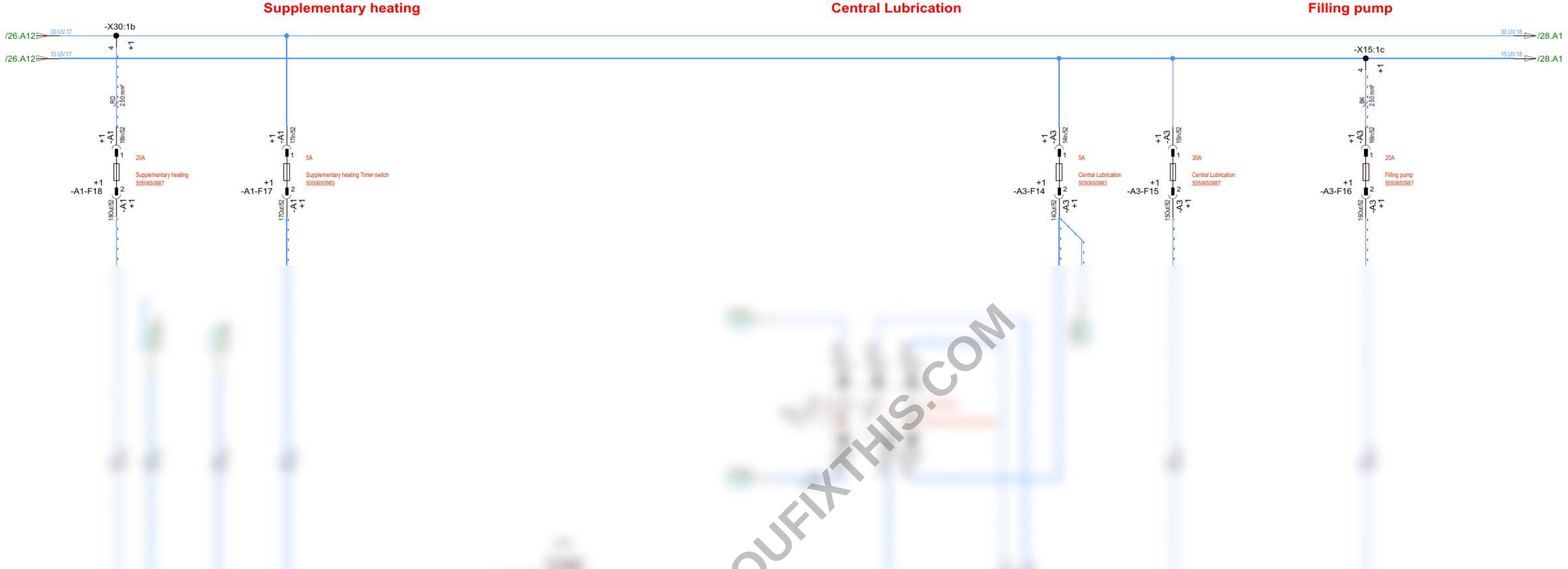
7a Plug - initial deadweight tester



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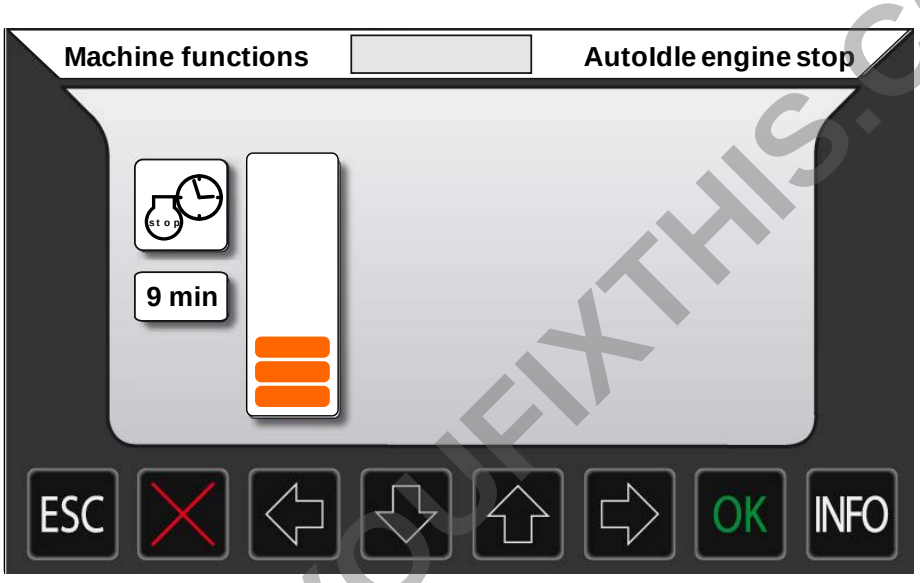
Instructions for using the combo-tool (display)

Description of the machine function icons



Auto-idle engine stop - time:

Once the engine has idled for the full “auto-idle stop time”,
due to the auto-idle function, the engine is shut off.
First, though, the ECO mode and the parking break / excavator brake need to be activated.



Press the OK button to get to the settings menu for the time to automatic engine shutdown in a range of 0 to 30 minutes.
A time of 0 minutes deactivates the engine shutdown.
The setting for the time to automatic engine shutdown is made through a bar chart.
Using the arrow keys ⇧ ⇩, the value can be changed in increments of 3 minutes.
The value is then saved permanently.

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