Wacker Neuson Group

Service Manual

Wheel Loader

WL32



Vehicle type	**WL32**
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E.2 Technical data

Engine

Perkins engine 404D-22 (36.3 kW)	
Manufacturer	Perkins
Design	Four-cylinder diesel engine
Type	404D-22
Capacity cm³ (inch³)	2216 (135)
Cooling	Water
Rpm	2800
Output kW (hp)	36.3 (48.7)

Perkins engine 404F-22 (35.7 kW) (America only)	
Manufacturer	Perkins
Design	Four-cylinder diesel engine
Type	404F-22
Capacity cm³ (inch³)	2216 (135)
Cooling	Water
Rpm	2600
Output kW (hp)	35.7 (47.9)

Perkins engine 404F-22T (44.7 kW)	
Manufacturer	Perkins
Design	Four-cylinder diesel engine
Type	404F-22T
Capacity cm³ (inch³)	2216 (135)
Cooling	Water
Rpm	2800
Output kW (hp)	44.7 (59.9)

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E.3 Tightening torques

General tightening torques

Screw dimensions	Tightening torques in Nm[1]		
	8.8	10.9	12.9
M4	3	4	5
M5	5.5	8	10
M6	10	14	16
M8	23	34	40
M10	46	67	79
M12	79	115	135
M14	125	185	220
M16	195	290	340
M18	280	400	470
M20	395	560	660
M22	540	760	890
M24	680	970	1150
M27	1000	1450	1700
M30	1350	1950	2300

1. These values are valid for screws with untreated, non-lubricated surfaces.

Specific tightening torques

Designation	Screw dimensions	Tightening torque
Wheel nut	M14 x 1.5	150 Nm
	M18 x 1.5	285 Nm
	M20 x 1.5	400 Nm
High-pressure limiting valve	M8	22 Nm

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E.4 Safety instructions

Pay particular attention to the following

To eliminate risks, the instructions in this service manual must be read and observed by every person using, servicing, repairing, maintaining or inspecting this machine.

In particular, read this section on safety.

Safety symbols and signal words

Explanation

The following symbol identifies safety instructions. It is used for warning against potential personal risk or danger.

DANGER

DANGER identifies a situation causing death or serious injury if it is not avoided.

Consequences in case of non-observance.

► Avoidance of injury or death.

WARNING

WARNING identifies a situation that can cause death or serious injury if it is not avoided.

Consequences in case of non-observance.

► Avoidance of injury or death.

CAUTION

CAUTION identifies a situation that can cause injury if it is not avoided.

Consequences in case of non-observance.

► Avoidance of injury.

NOTICE

NOTICE identifies a situation that causes damage to the machine if it is not observed.

► Avoidance of damage to property.

The warning and safety signs attached to the machine provide important information for safe operation. Compliance is for your safety.

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Control and display elements

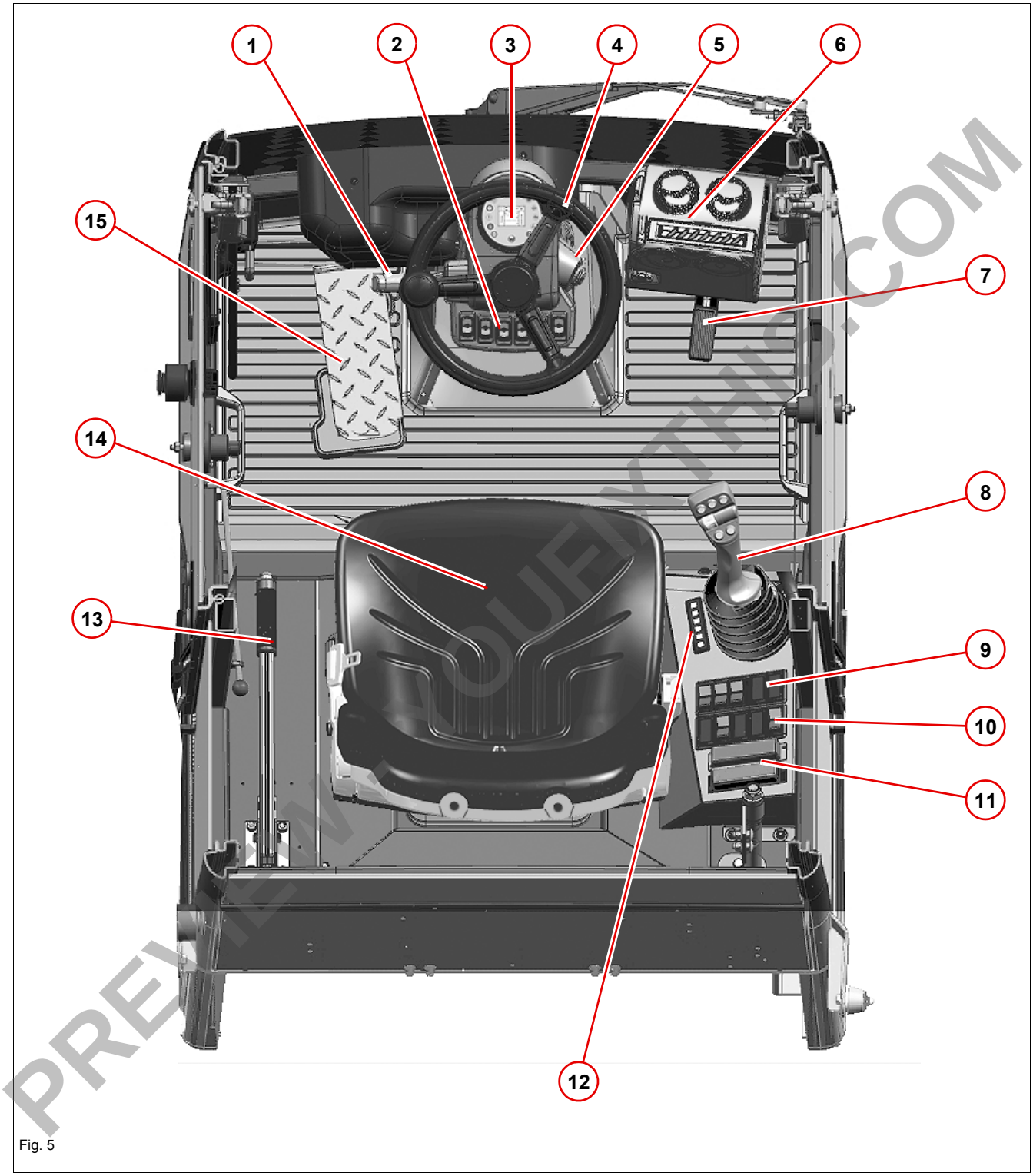


Fig. 5

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1.2 Maintenance overview

Daily/weekly maintenance

Work to be performed by the operator	Daily	Every week
Clean the machine	•	
Clean the air filter	•	
Check the machine for general damage	•	
Check the coolant level	•	
Check the engine-oil level	•	
Check the engine for leaks		•
Check the hydraulic oil level	•	
Check the tire condition and pressure		•
Check all bolts for tightness		•
Check the wheel bolts		•
Check the braking system for correct function	•	
Check the brake fluid		•
Check the washer system and wiper water level	•	
Check the seat belt	•	
Check the instruments and indicator lights, and the acoustic warning devices for correct function	•	
Check the electrical system and lights for correct function	•	
Check the brake/inching pedal for correct function	•	
Check the steering system	•	
Check control levers and switches for correct function	•	
Check the attachments	•	
Check the exhaust for malfunctions and excessive smoke		•
Perform grease lubrication according to the lubrication plan, including of the attachments		•
Check the protective ROPS/FOPS structure		•
Clean the preliminary separator of the fuel filter		•
Check the machine axles for leaks		•
Check the hydraulic oil and water radiator for leaks and dirt, clean it if necessary		•
Check the attachments for safety and correct function		•
Check the routing of the hoses, pipe lines and electric lines		•
Check the air filter and intake hose		•
Check the engine mounting and axle mounting		•
Perform a general safety check, – *see “General safety check” on page 1-21*		•

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1.5 Maintenance accesses

Maintenance openings

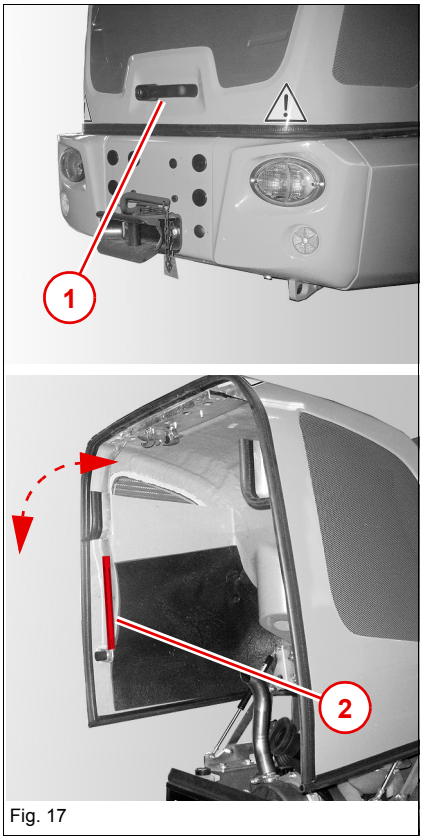


Fig. 17

Opening the engine cover

CAUTION

Injury hazard due to hot and moving engine parts!

Hot and moving engine parts can cause injury.

- ► Do not open the engine cover if the engine is running.
- ► Let the engine cool down.
- ► Wear protective equipment.

NOTICE

Engine damage due to loose objects in the engine compartment.

- ► Remove all tools and objects from the engine compartment before closing the engine cover.

Open the engine cover with handle 1. The handle is lockable.

1. Open the engine cover lock by pressing the button on handle 1.
   ➥ The engine cover is unlocked.
2. Raise the engine cover by pulling the handle.
   ➥ The engine cover is held open by gas struts.

Closing the engine cover

1. Hold the engine cover at bar 2 at the lower edge and pull it downward against the pressure of the gas struts.
2. Make the engine cover lock into place by pressing it downward.
3. Pull on the handle to check whether the engine cover is locked in place.

Raising the control stand sideways

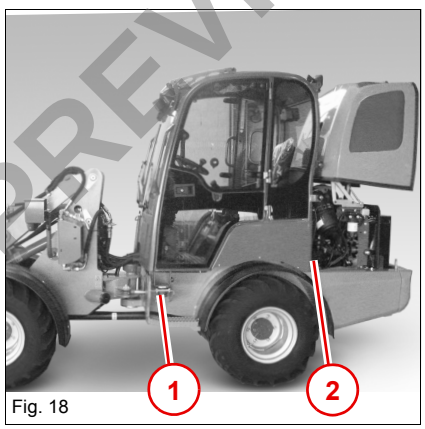


Fig. 18

WARNING

Risk of injury due to control stand being raised sideways!

If the fastening bolts are not fitted back on again correctly, the control stand can tilt sideways on its own.

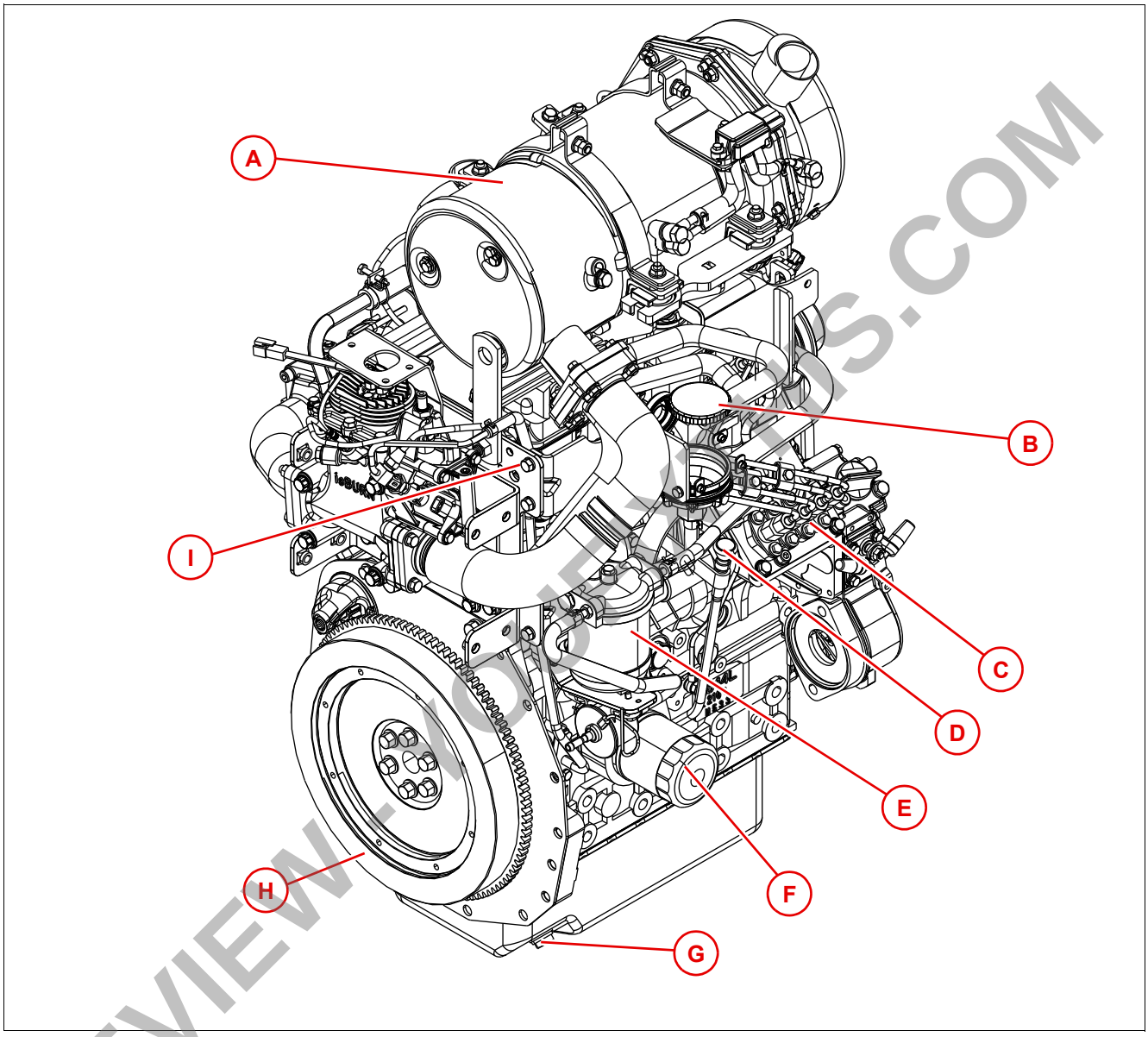
- ► Immediately install the fastening screws again after lowering the control stand.
- ► Do not use the machine if the fastening screws are not installed.

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2.2 Complete component (44.7 kW engine)

Overview



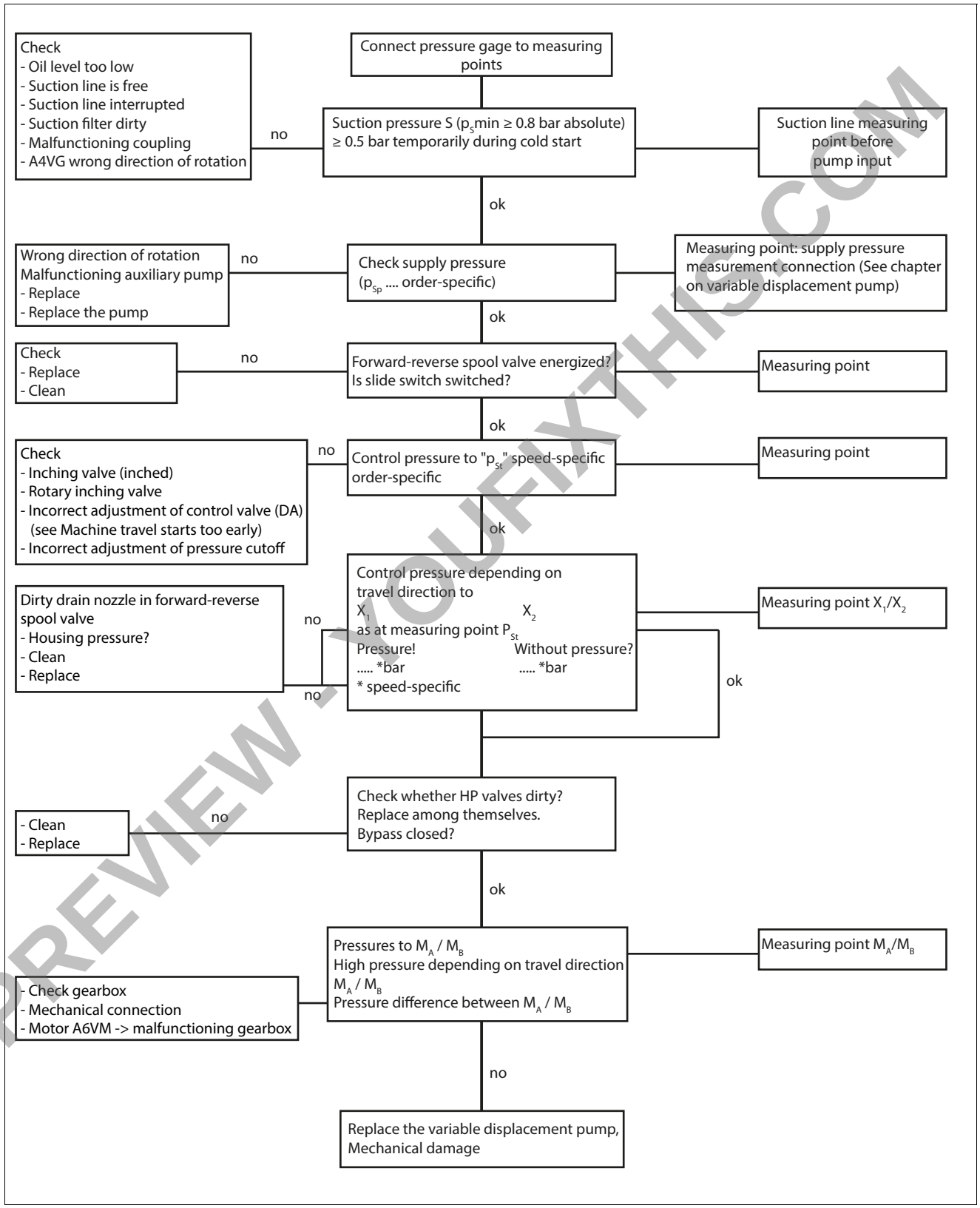
Pos.	Designation
A	Aftertreatment system
B	Breather
C	Fuel injection pump
D	Oil dipstick
E	Electric fuel pump
F	Oil filter
G	Oil-drain plug
H	Flywheel housing
I	Front lifting-eye bracket

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4.8 Troubleshooting

No forward or reverse travel



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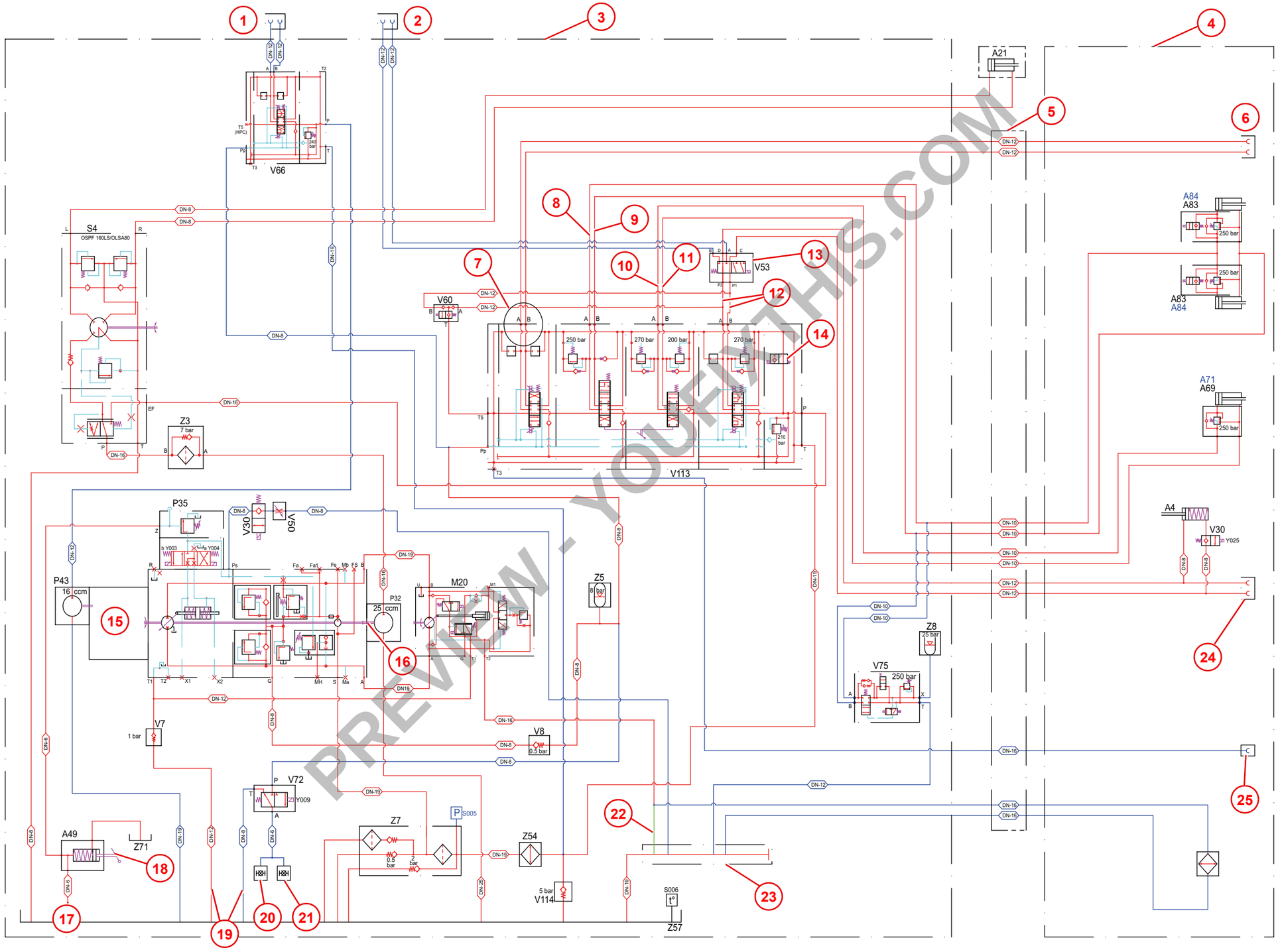
8.14 Designation of hydraulic components

BMK	Designation
A	**Actuators**
A4	Lock cylinder
A21	Steering cylinder
A49	Master brake cylinder
A69	Tilt cylinder with counterbalance valve
A71	Tilt cylinder
A83	Lift cylinder with counterbalance valve
A84	Lift cylinder
M	**Drive Motors**
M20	Variable displacement motor
P	**Pumps**
P32	Hydro gear pump 25 cm³
P35	Variable displacement pump
P43	Hydro gear pump 16 cm³
S	**Signal sensor**
S4	Steering orbitrol
V	**Valves**
V6	Non-return valve 5 bar
V7	Non-return valve 1 bar
V8	Non-return valve 0.5 bar
V30	2/2 directional valve, electric (lock)
V50	Rotary inching valve for manual inching
V53	Cpl 6/2 valve with solenoid (VLS)
V60	Pressure relief
V66	Control valve HDS21/1
V72	Hydraulically switchable lock (3/2 way)
V112	Control valve HDS21/3
V113	Control valve HDS21/4
V114	Non-return valve 5 bar
Z	**Other components**
Z3	High pressure filter 7 bar
Z5	Diaphragm-type accumulator 8 bar

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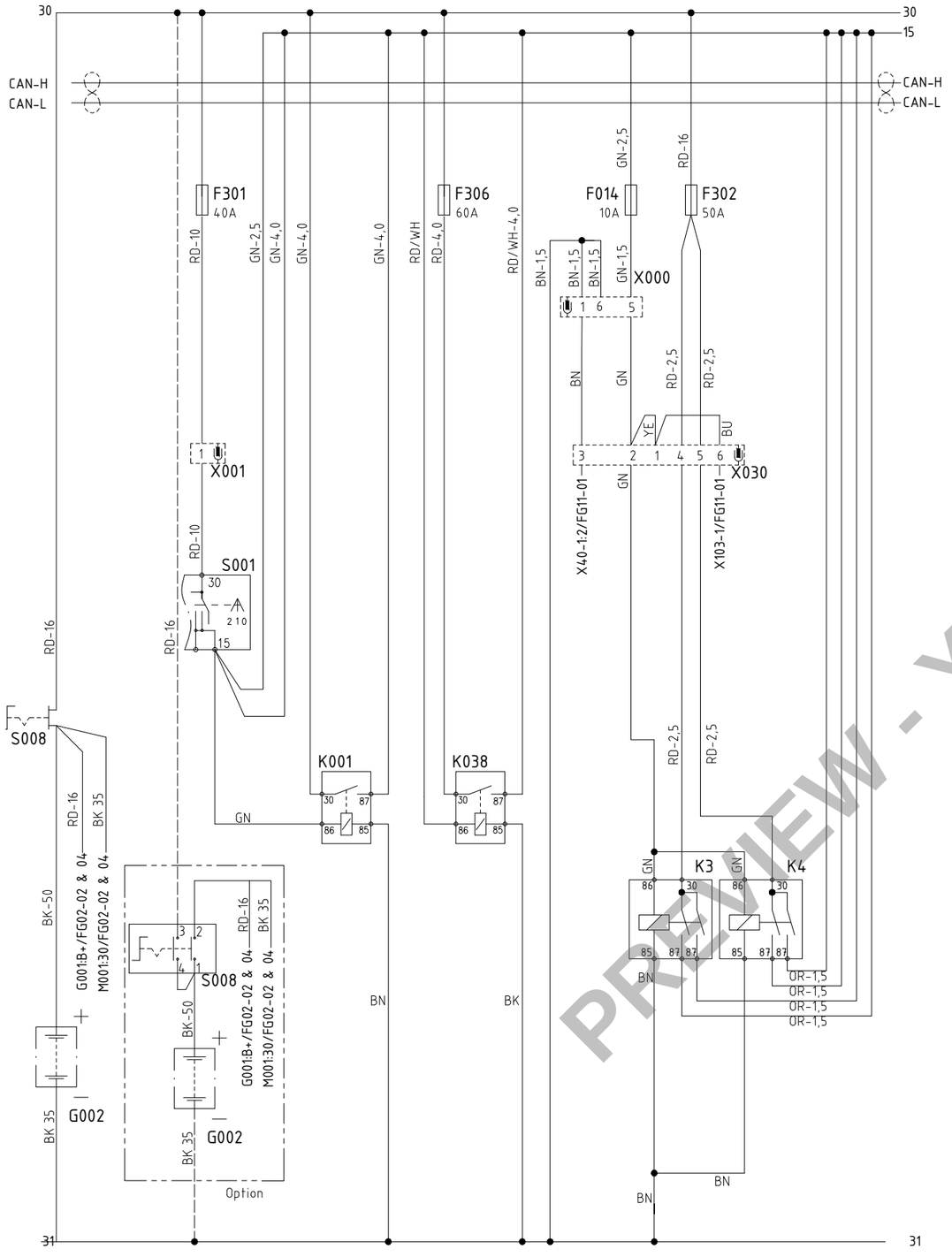
8.15 Hydraulics diagram – HDS21/4 with HDS21/1 or 6/2 directional valve



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9.6 Electrical diagram – power supply



Assignment	Designation
F014	Cabin
F301	Instrument panel
F302	Cabin
F306	Control electronics, options
G002	Battery
K001	High-current relay
K003	High-current relay
K004	High-current relay
K038	Options switching relay
S001	Preheating start switch
S008	Battery master switch
X...	General connector

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Error code				Error setting condition (detection threshold)
SPN (component)		FMI (error type)		
SPN	SPN text	FMI	FMI text	
723	Engine speed 1	3	Voltage too high	Sensor 1: correct Sensor 2: engine speed less than 100 rpm
723	Engine speed 2	4	Voltage too low	Sensor 1: correct Sensor 2: engine speed over 4000 rpm
723	Engine speed 2	8	Abnormal frequency	Sensor 1: engine speed less than 100 rpm Sensor 2: engine speed over 4000 rpm
723	Engine speed 1	10	Abnormal modification rate of engine speed	Engine speed sensor 2: difference is less than 20 rpm
733	Crankshaft sensor	3	Voltage too high	Over 4.5 V
733	Crankshaft sensor	4	Voltage too low	Under 0.5 V
1485	ECM main relay	7	Mechanism does not react	Relay only switches on at terminal 15
2840	Engine control unit	11	Internal error	-
2840	Engine control unit	12	Internal error	-
2840	Engine control unit	13	Internal error	-
2970	Accelerator pedal 2 idling switch	3	Voltage too high	Above setting
2970	Accelerator pedal 2 idling switch	4	Voltage too low	Below setting
3241	Exhaust-gas treatment temperature sensor 1	1	Valid data, but below the normal range	Below 50 °C and below the setting
3241	Exhaust-gas treatment temperature sensor 1	3	Voltage too high	Below setting and below 0.05 V
3241	Exhaust-gas treatment temperature sensor 1	4	Voltage too low	Over 999 °C and over 5 V
3241	Exhaust-gas treatment temperature sensor 1	15	Valid data, but above the normal range	Over 700 °C
3241	Exhaust-gas treatment temperature sensor 1	16	Valid data, but above the normal range	Over 800 °C and less than 5 V
3242	Exhaust-gas treatment 1 diesel particulate filter intake temperature sensor	1	Valid data, but below the normal range	Below 50 °C and below the setting
3242	Exhaust-gas treatment 1 diesel particulate filter intake temperature sensor	3	Voltage too high	Below setting and over 5 V
3242	Exhaust-gas treatment 1 diesel particulate filter intake temperature sensor	4	Voltage too low	Over 999 °C and below 0.05 V

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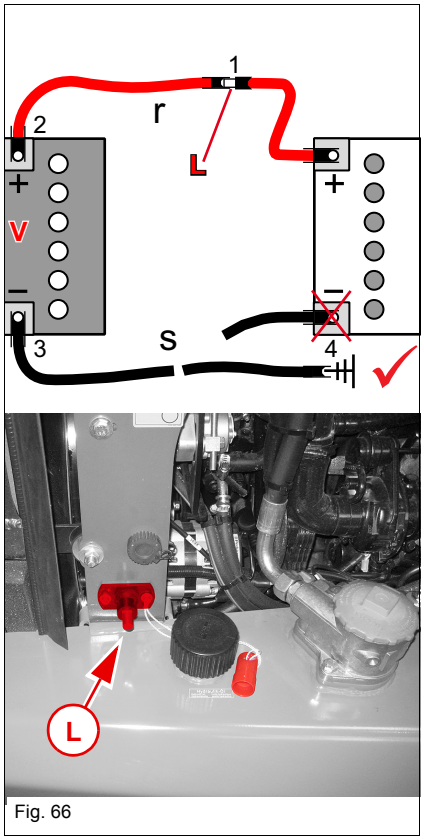


Fig. 66

Connecting the battery jumper cables

Follow the order of the activity!

1. Remove the cover of the positive terminal L of the machine.
2. First connect one end of the red battery jumper cable (+) to the positive terminal of the machine L, then connect the other end to the positive terminal of the starting battery V.
3. Connect one end of the black battery jumper cable (−) to the negative terminal of the starting battery V.
4. Connect the other end of the black battery jumper cable to a bare spot on the engine block.
   - Do not connect it to the negative terminal of the discharged battery, otherwise explosive vapors can ignite if sparks are formed.
   - Maintain a minimum distance of 30 cm from the battery.

Jump start: starting the engine

1. Do not start the engine of the vehicle giving a jump start, otherwise the on-board electronics can be damaged by voltage peaks.
2. Start the engine of the machine being given a jump start.
   ➥ If the engine of the machine does not start after 15 seconds, wait one minute and repeat the procedure.

Disconnecting the battery jumper cables

Follow the order of the activity.

1. First disconnect the black battery jumper cable from the engine block, then from the negative terminal of the vehicle giving a jump start.
2. First disconnect the red battery jumper cable from the positive terminal of the vehicle giving a jump start, then from the positive terminal of the machine.
3. Fit the cover of the positive terminal L of the machine back on again.

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8.4 Removing/installing lock cylinder A4

Preparing work

Tools:

- Suitable receptacle for collecting the hydraulic oil
- Plugs (different sizes) for closing the oil lines

Technical data



	Value	BMK	Remark/designation	
	3 kg	A4	Lock cylinder	
For non-specified tightening torques, see chapter “Introduction/tightening torques”				

Environment

Use a suitable container to collect the hydraulic oil as it drains and dispose of it in an environmentally friendly manner!

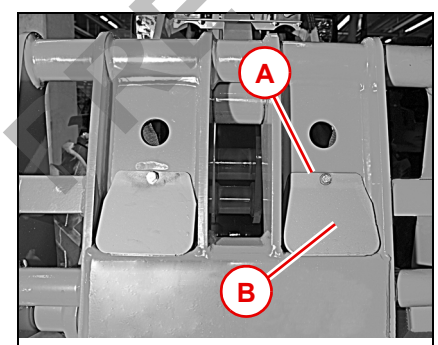


Fig. 235

Remove

1. Remove 1 screw **A** each.
2. Remove covers **B**.

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