



Wacker Neuson Group

Service Manual

Wheel Loader

WL20e



Vehicle type

RL20e

Date

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Language

[en]

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24 Maintenance logs

24.1 Grounded conductor / insulation resistance measurement	24-1
24.2 Measurement at the battery cells	24-3

**Battery data (option)**

Manufacturer	Exide
Type	48 V 585 TCSM
Design	Lead acid battery with copper expanded metal 24 cells with 2 V/cell Water refill system Electrolyte circulation
Voltage	48 V
Nominal capacity	300 Ah
Dimensions	
Length mm (in)	830 (32.7)
Width mm (in)	414 (16.3)
Height mm (in)	500 (19.7)
Weight (± 5 %)	450 kg (992 lbs.)
Charging time	About 6 h
Operating time	About 2 – 5 h

Overview AGM battery**Information**

The service life of the batteries depends on the application conditions and the manner of driving.

Battery data (standard)

Manufacturer	HOPPECKE Batterie Systeme GmbH
Type	Trak Systemizer Dynamics
Design	Closed lead acid battery in AGM technology 24 cells with 2 V/cell
Voltage	48 V
Nominal capacity	225 Ah
Dimensions	
Length	901 mm (35.5 in)
Width	535 mm (21.1 in)
Height	561 mm (22.1 in)
Weight (± 5 %)	450 kg (992 lbs.)
Charging time	About 6 h
Operating time	About 1.5 – 3.5 h



Tightening torques for hydraulic screw struts SDS

Shape B with sealing edge (cutting edge) and shape E with soft O-ring seal

Dimension	Tightening torque (light-weight series) in Nm	Tightening torque (heavy-weight series) in Nm
M5	-	-
M6	-	-
M8 x 1	-	-
M10 x 1	18	-
M12 x 1.5	30	35
M14 x 1.5	45	55
M16 x 1.5	60	70
M18 x 1.5	70	110
M20 x 1.5	-	140
M22 x 1.5	140	170
M26 x 1.5	180	220
M27 x 2	190	250
M33 x 2	300	300
M42 x 2	500	550
M48 x 2	550	600
G 1/8 A	20	25
G 1/4 A	35	40
G 3/8 A	70	90
G 1/2 A	100	150
G 3/4 A	180	270
G 1 A	250	350
G 1-1/4 A	450	500
G 1-1/2 A	550	600
7/16 - 20 (11.1 mm)	-	-
1/2-20 (UNF)	-	-
9/16 - 18 (14.3 mm)	-	-
3/4 - 16 (19.1 mm)	-	-
7/8 - 14 (22.2 mm)	-	-
1-1/16 - 12 (27 mm)	-	-
1-5/16 - 12 (33.3 mm)	-	-
1-5/8-12 (UNF)	-	-
1-7/8 - 12 (UNF)	-	-
2 - 12 (UNF)	-	-



- Repair work may only be performed by a dealer authorized by the manufacturer.
- Drain all components before shipping the machine in order to avoid damage, for example due to temperatures below 0°C/32°F.
- It is prohibited to change the nominal pressure of pressure relief valves without explicit authorization by the manufacturer!

Before repair/maintenance

- Clean the entire machine, especially connections and threaded unions, of any traces of oil or preservatives before performing maintenance/repair work! Use lint-free cleaning rags and do not use aggressive cleaning agents!
- Before cleaning the loader with water, steam jet (high-pressure cleaner) or other cleaning agents, cover or tape up all openings which – for safety and functional reasons – must be protected against penetrating water, steam or cleaning agents.
Electrical elements are particularly at risk!
After cleaning, remove all covers and tapes applied for that purpose!
- Prior to adjustment, cleaning, and maintenance work as well as rectifying functional disorders:
 - Stop the engine.
 - Remove the battery connector from the machine connection.
- Before any adjustment, cleaning or maintenance work or before rectifying any functional faults in the hydraulic system, lower the attachment and/or infeed unit.
- Due to their function the machine drives are not automatically secured after stopping the engine.
- In addition, adjustment work can require that the drives are rotated. However, you must make sure that other persons cannot start the vehicle or turn the drives.

Removing components

- Burn hazard due to hot parts or liquids! Do not remove components as long as the machine is at operating temperature!
- Clean components thoroughly before removing them!
- Connections and open holes which are exposed when removing a component must be closed completely to prevent dirt from entering!

B Operation

B.1 Overview of control elements



1.2 Maintenance overview

Daily/weekly maintenance

Work to be performed by the operator	Daily	Every week
Clean the machine (do not clean the components in the rear section with water)	•	•
Check the machine for general damage	•	
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 seat belt	•	
Check the function of the instruments and indicator lights, as well as the warning and safety equipment according to the Operator's Manual	•	•
Check the electrical system and lights for correct function	•	
Check the brake pedal for correct function	•	
Check the steering system	•	
Check control levers and switches for correct function	•	
Check the battery and battery components		•
Check all power cable connections for tightness, check all cables for damage and tightness		•
Check the battery connector for damage and firm seating		•
Check the acid level. If necessary top off with demineralized water (only for Exide batteries)	•	
Check the attachments	•	
Perform grease lubrication according to the lubrication plan, including of the attachments		•
Check the protective ROPS/FOPS structure		•
Check the machine axles for leaks		•
Check the attachments for safety and correct function		•
Check the routing of the hoses, pipe lines and electric lines		•
Check the axle mounting		•
Carry out a general safety check		•

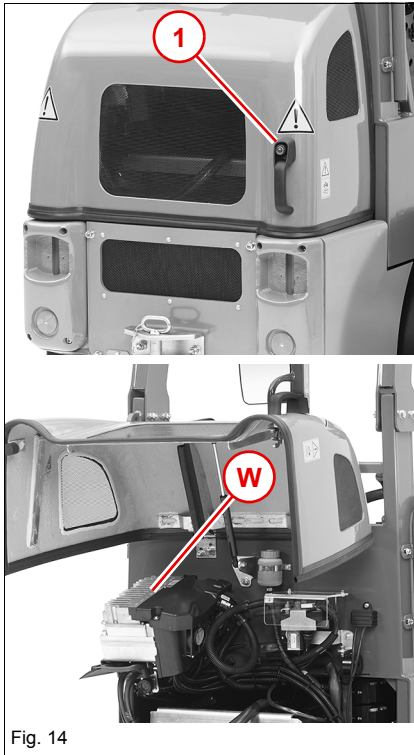


Fig. 14

Opening the engine cover

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

1. Open the engine cover lock by pressing button **1**.
➔ The engine cover is unlocked.
2. Raise the engine cover by pulling the handle.
➔ The engine cover is held open by a gas strut.

Closing the engine cover

1. Hold the engine cover on the handle and pull it downward against the spring action.
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.

Open the engine cover

If necessary, the tailgate of the machine can be opened for maintenance (for example for replacing the battery).

1. Open the engine cover.

Vehicles with Exide battery:

2. Remove screws **2**.
3. Unlock the spring locked connecting pin **1**.
➔ The tailgate is released.
4. Open the tailgate.

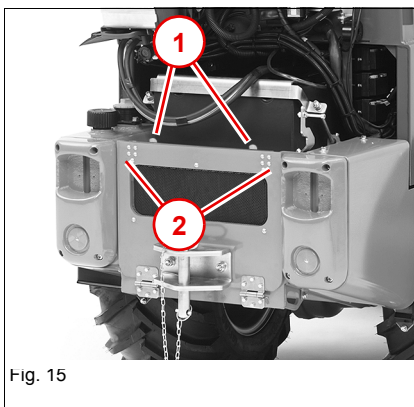


Fig. 15

Vehicles with AGM battery:

5. Remove screws **3**.
➔ The tailgate is released.
6. Open the tailgate.

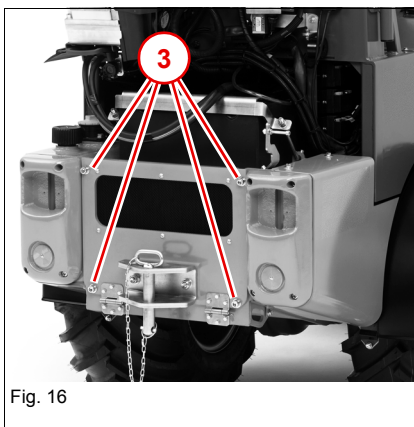


Fig. 16

Bleeding the hydraulic system



WARNING

Injury hazard due to uncontrolled movements of the loader unit!

Air inclusions in the hydraulic system can cause uncontrolled movements of the loader unit due to pressure loss.

- ▶ Bleed the hydraulic system after replacing the hydraulic oil, in the event of malfunctions in the hydraulic system, after repairs or after extended periods in which the machine and the hydraulic system are not used.
 - ▶ Perform bleeding only when seated on the operator seat.
 - ▶ Ensure that no one is in the danger zone of the machine.
-

1. Check the oil level in the hydraulic oil reservoir.
 - ➡ If necessary, add hydraulic oil until the oil level is between the "Min" and "Max" marks on the hydraulic oil dipstick.
2. Engage the starter.
3. Fully extend and retract the piston rods of all hydraulic cylinders several times.
4. Turn the steering wheel as far as it will go to either side until the steering system works correctly and without any sounds.
5. Check the oil level in the hydraulic oil reservoir.
 - ➡ If necessary, add hydraulic oil again until the oil level is between the "Min" and "Max" marks on the hydraulic oil dipstick.



Measure cell voltages



Information

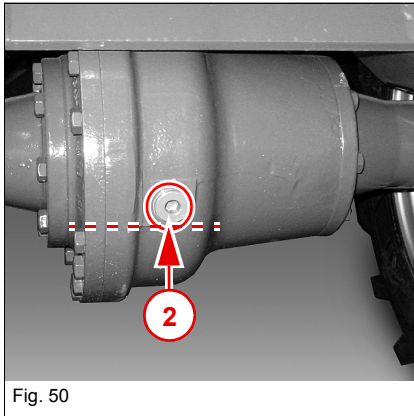
Each cell should have 2.13 V with a charged battery. The entire battery then has 51.12 V.

Only measuring devices should be chosen for measurement that ensure a precise measurement of the cell voltage. These are usually tools with 4-digit or 3.5-digit displays and with a DC voltage range of 0-3V.

Increased controls of individual voltages may be an indication of:

- ▶ Short circuits in individual cells
- ▶ Advanced aging of the battery

1. Battery fully charged.
2. Remove the battery.
3. Insert the measuring tip forcefully into the measurement openings of the pole screws with slight rubbing movements. In this way, the oxide layers at the measurement point are removed and the voltage is measured correctly. Maintenance logs – [see "Measurement at the battery cells" on page 24-3.](#)



5. Unscrew Allen screw **2**.
6. Add gearbox oil.
 - ➔ Gearbox oil type – see *"Fluids and lubricants" on page 1-13*.
 - ➔ The gearbox oil must be up to the bottom edge of the filler opening.
7. Screw in hexagon socket screw.

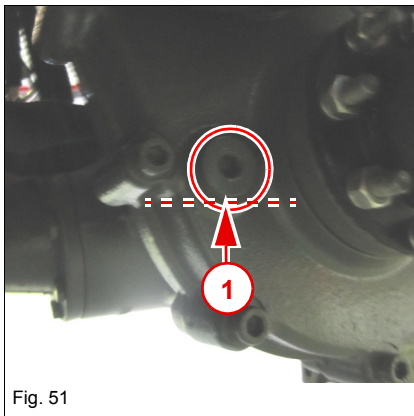


Information

Filling and drain plugs are located in the same positions on the front and rear axles.

Perform maintenance on the gearbox and axles according to the maintenance intervals specified in this manual.

Check the oil level in the distributor gearbox



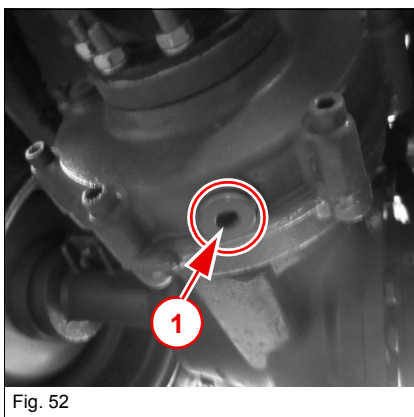
Preparations

1. Park the machine on firm, level and dry ground.
2. Apply the parking brake.
3. Lower the loader unit to the ground.
4. Disengage the starter.

Duct

1. Unscrew Allen screw **1**.
 - ➔ The gearbox oil must be up to the bottom edge of the filler opening.
2. Add gearbox oil if necessary.
 - ➔ Gearbox oil type – see *"Fluids and lubricants" on page 1-13*.
3. Screw in hexagon socket screw.

Change the gear oil in the distributor gearbox



Preparations

1. Park the machine on firm, level and dry ground.
2. Apply the parking brake.
3. Lower the loader unit to the ground.
4. Disengage the starter.

Duct



Environment

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

1. Position a suitable container with sufficient volume underneath the distributor gearbox – see *"Fluids and lubricants" on page 1-13*.
2. Unscrew the drain plug **1**.
3. Completely drain the gearbox oil.
4. Screw in drain plug.



1.15 Tires

Information on tires



WARNING

Risk of death due to incorrect assembly work!

Incorrect assembly work of tires and rims causes serious injury or death.

- ▶ Welding and cutting the rims is prohibited.
- ▶ Replace damaged rims by new ones.

NOTICE

Damage to differentials due to different-sized wheels and tires.

Only install wheels or tires on the machine from the same manufacturer, of the same size and that have the same wear condition.

Measurement at the main contactor

1. Disconnect the plug of the battery charger.
2. Remove battery connector.
3. Remove the cover of the main contactor.
4. Carry out a visual check. Replace damaged cables or components before measurement.
5. Connect the ground connection **1** to the vehicle frame.
6. Adjust the measuring instrument: test voltage 100 V, limit value 0.08 MOhm.

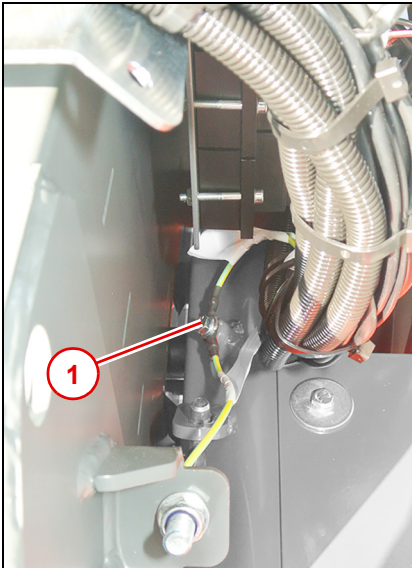


Fig. 77

CAUTION

Risk of an electric shock

Test voltage of 100 volts exists at the measuring tips.

- Do not touch the vehicle during the measurement.

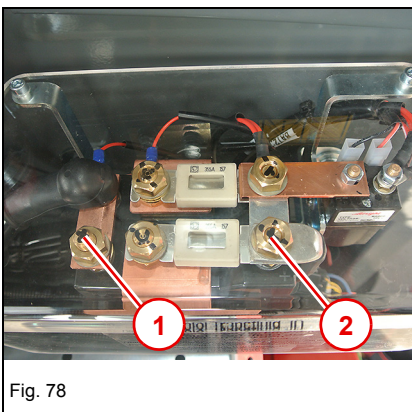


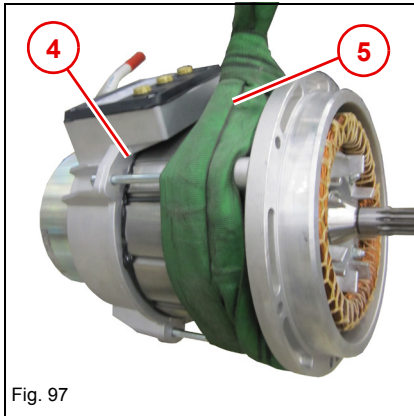
Fig. 78

7. Measure resistance value at the mains input side **2**.
8. Measure the resistance value at the output side **1**.

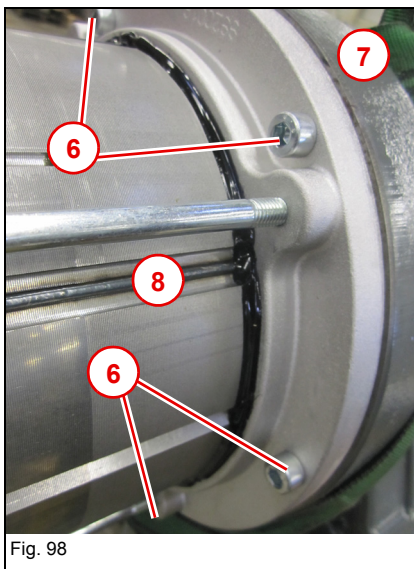
WARNING

Accident hazard due to electric current!

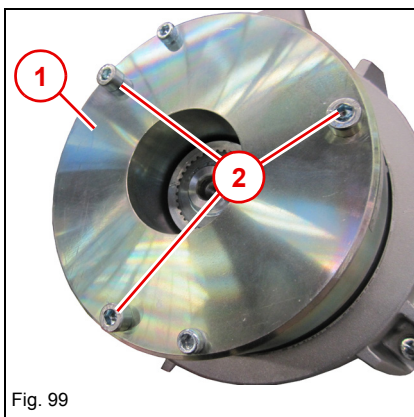
- With a measured value of < 80 kOhm, the machine is no longer ready for operation.
- No voltage from the battery charger or from the battery may be applied to the machine.
- Possible remedial measures – see *"Troubleshooting the insulation resistance measurement" on page 1-70*



3. Properly attach the hydraulic motor **4** with endless loop **5** and attach to the crane.



4. Carefully position the electric motor on the distributor gearbox.
5. Tighten the screws.



Disassemble

1. Remove screws **2**.
2. Remove the spring force brake **1** from the hydraulic motor.

4 Axles

4.1 Front axle

5 Brakes

5.1 Brake pedal

6 Steering system

6.1 Steering orbitrol S3

6.3 Steering column

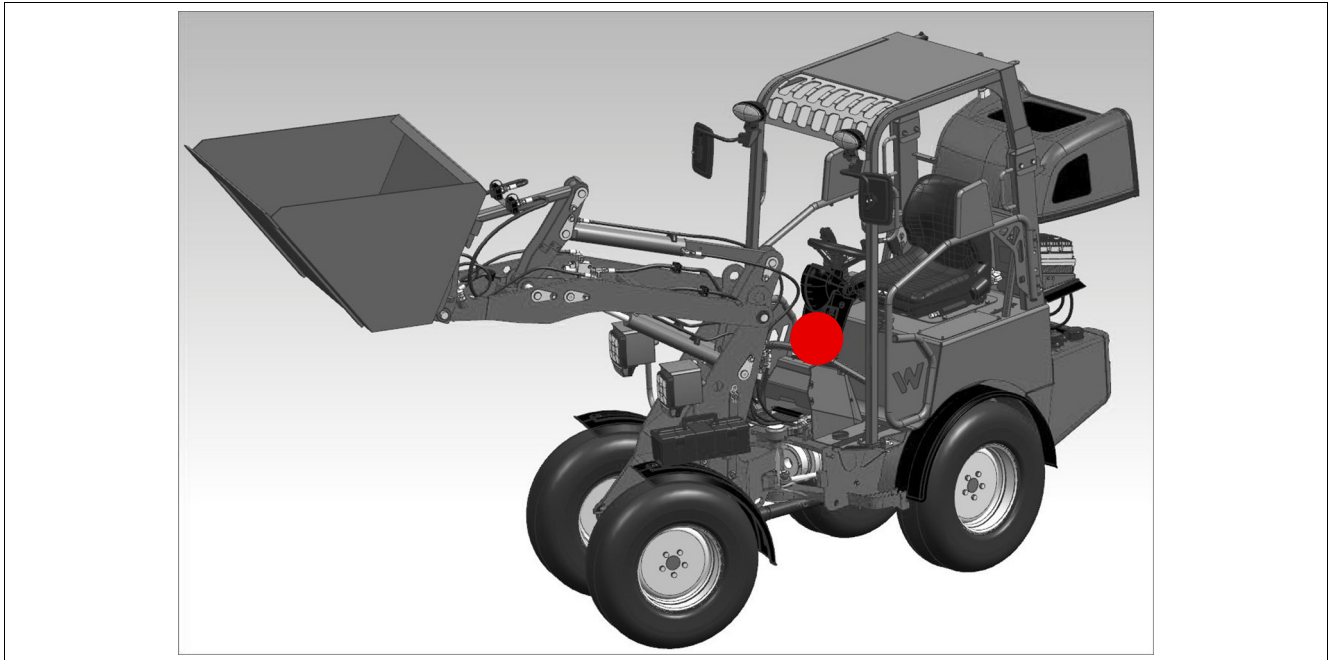
Removing/installing the steering column

Preparing work

Tools:

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

Technical data



Weight	Designation
7.5 kg	Steering column



Environment

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

Removing

1. Release the pressure in the hydraulic system – see [“Releasing residual pressure in the hydraulic system” on page E-32.](#)
2. Remove the cover plate of the steering column – see [“Disassemble” on page 12-14.](#)

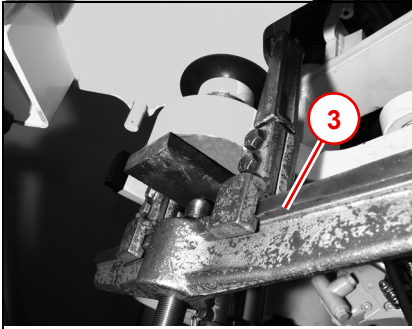


Fig. 190

5. Press the shaft into the bearings from above with an appropriate press-in tool **3**.

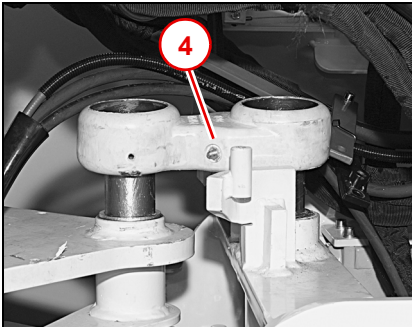


Fig. 191

6. Lightly grease the bolts and bearings.
7. If necessary, insert spacer rings on the bolt.
8. Place the pendulum bearings **4** onto the bolts from above.
9. Adjust the front and rear carriage if necessary.
10. Press the pendulum bearings onto the bolts from above with a suitable tool.

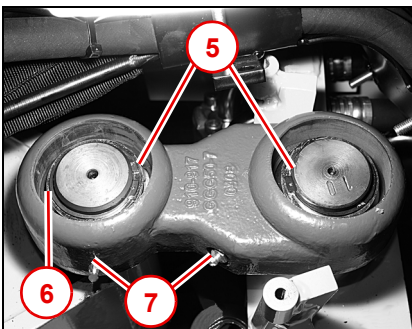


Fig. 192

11. If necessary, insert spacer rings **6** on the bolts.
12. Use 1 circlip **5** each.
13. Screw 2 zerk fittings **7** into the pendulum bearings.

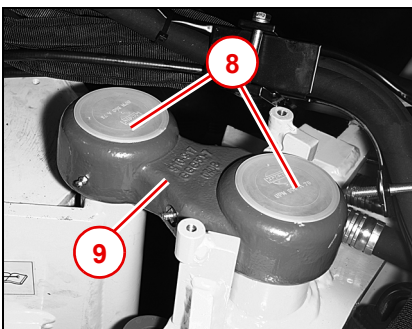


Fig. 193

14. Press protection caps **8** on the pendulum bearings **9** into the bores.
15. Check all circlips for a correct seat.



Item	Designation
A1	3rd control circuit left
B1	3rd control circuit right
A2	Roll in tipping cylinder
B2	Roll out tipping cylinder
A3	Raise boom
B3	Lower boom
P	from priority valve connection EF
T	To reservoir
B043	Position sensor spool I
B044	Position sensor spool II
B045	Position sensor spool III
1	Primary valve (225 bar)
2	Secondary valve (90 bar)

Torque settings

Item	Straight screw-in connection	Cap nut hydraulic hose
A1	40 Nm	For torque settings, see chapter: Introduction/Torque settings
B1		
A2		
B2		
A3		
B3		
P		
T		

The control valve **V108** is installed in the rear in vehicles **without** hydraulic connections

Function description

The control valve **V108** serves to supply the individual functions of the work hydraulics with oil.

The control valve **V108** is an open system. This means that the oil coming from the priority valve connection **EF** is guided directly via the connection **P** and connection **T** into the tank **Z67** when the work hydraulics are not actuated. The section 2 is provided with a secondary valve **2**. The system pressure is limited by the primary valve **1** to 225 bar. The position of gate **I**, **II** and **III** is monitored by the associated position sensors **B043**, **B044** and **B045**.

Removing/installing the gear pump motor

Preparing work

Tools:

- Suitable lifting tackle with a carrying capacity of at least 40 kg

Technical data



Weight		Designation
34 kg	M031	Gear pump motor (electric motor)
3.5 kg		Motor holder

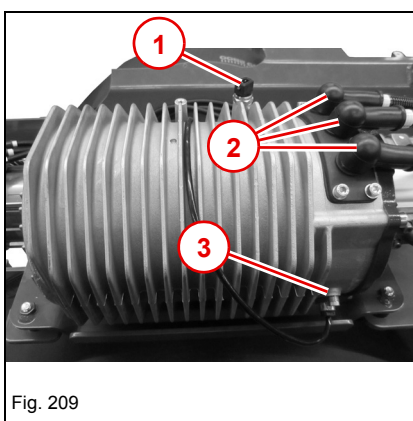


Fig. 209

Disassemble

1. Remove the base plate – see [“Removing” on page 14-2.](#)
2. Remove the gear pump – see [“Remove” on page 7-18.](#)
3. Label mounting positions of the cables.
4. Remove the cable 1 of the speed sensor.
5. Remove the three-phase current cable 2.
6. Remove the cable 3 of the temperature sensor.

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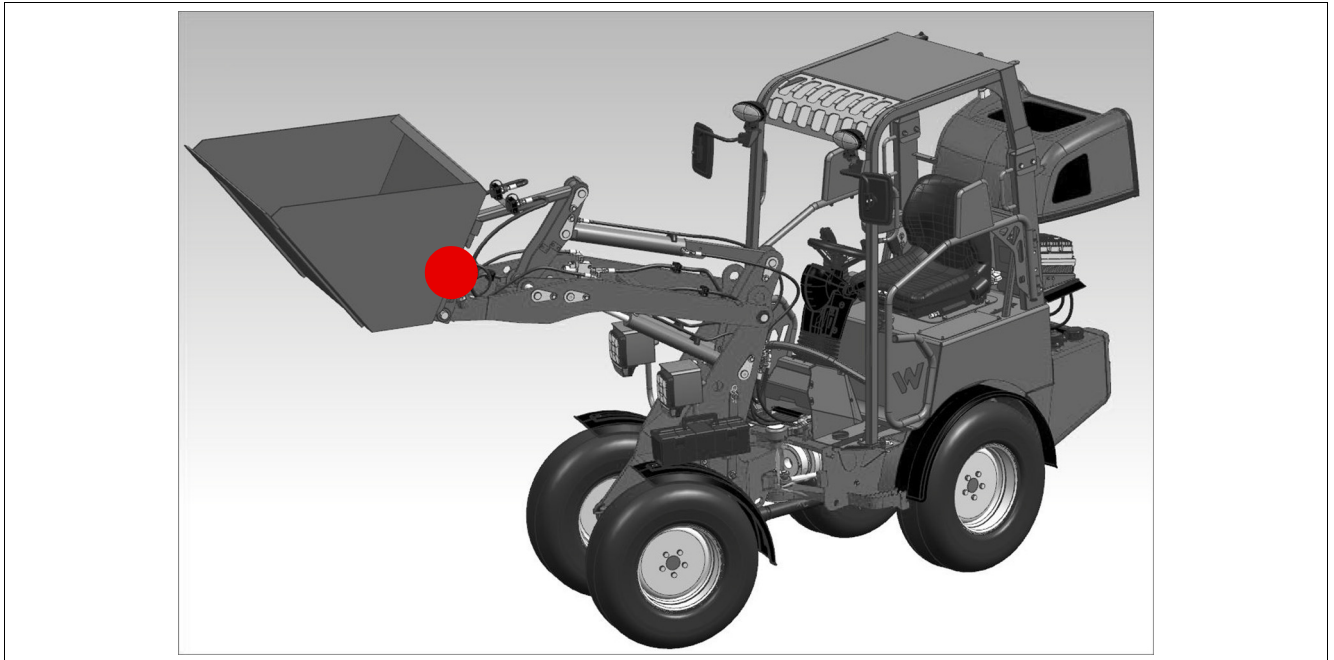
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7.5 Lock pins

Removing/installing lock pins

Technical data



Information

If the lock pin is corroded, check whether the guide is clean and grind it out if necessary.

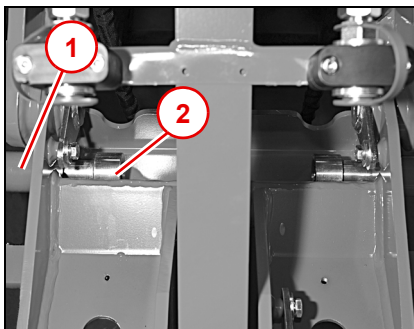


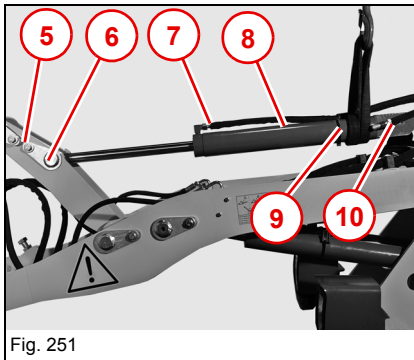
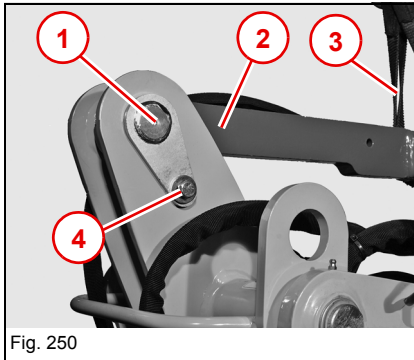
Fig. 230

Removing

1. Remove the lock cylinder – see [“Removing” on page 7-20](#)
2. Dislodge lock pin **2** from guide **1** in an inward direction.

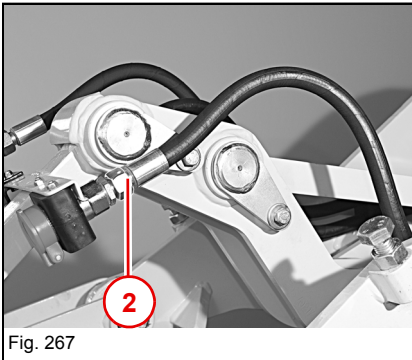
Installation

1. Slightly grease guide **1** and pin **2**.
2. Put new pin **2** into guide **1** from the inside.
3. Install the lock cylinder – see [“Installation” on page 7-21](#).
4. Grease the lock pin.

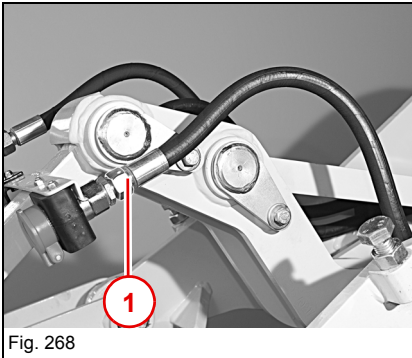


Install

1. Screw in and tighten any screwed connections.
2. Attach a tilt cylinder **2** with appropriate lifting gear **3** and insert so that the bottom-side bolt receptacles line up completely.
3. Slightly grease the bearing and bolt.
4. Drive in the bolt **1**.
5. Screw in the screw **4** with washer and tighten.
6. Screw hydraulic lines **7** and **10** on the connections of the tilt cylinder and tighten.
7. Tighten the bracket **9**.
8. Extend and lower the tilt cylinder **8** so that the rod-side bolt receptacles line up completely.
9. Insert any spacer rings if necessary.
10. Slightly grease the bearing and bolt.
11. Drive in the bolt **6**.
12. Coat the thread of the screw **5** with a locking agent.
13. Screw in and tighten the screw **5** with a spring washer and spacer ring.
14. Lubricate the lift cylinder bearing.

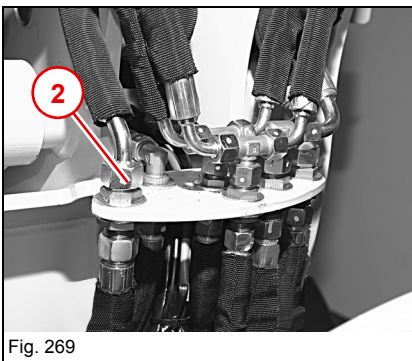


3. Unscrew and close the hydraulic line **2**.
4. Remove the hydraulic line.



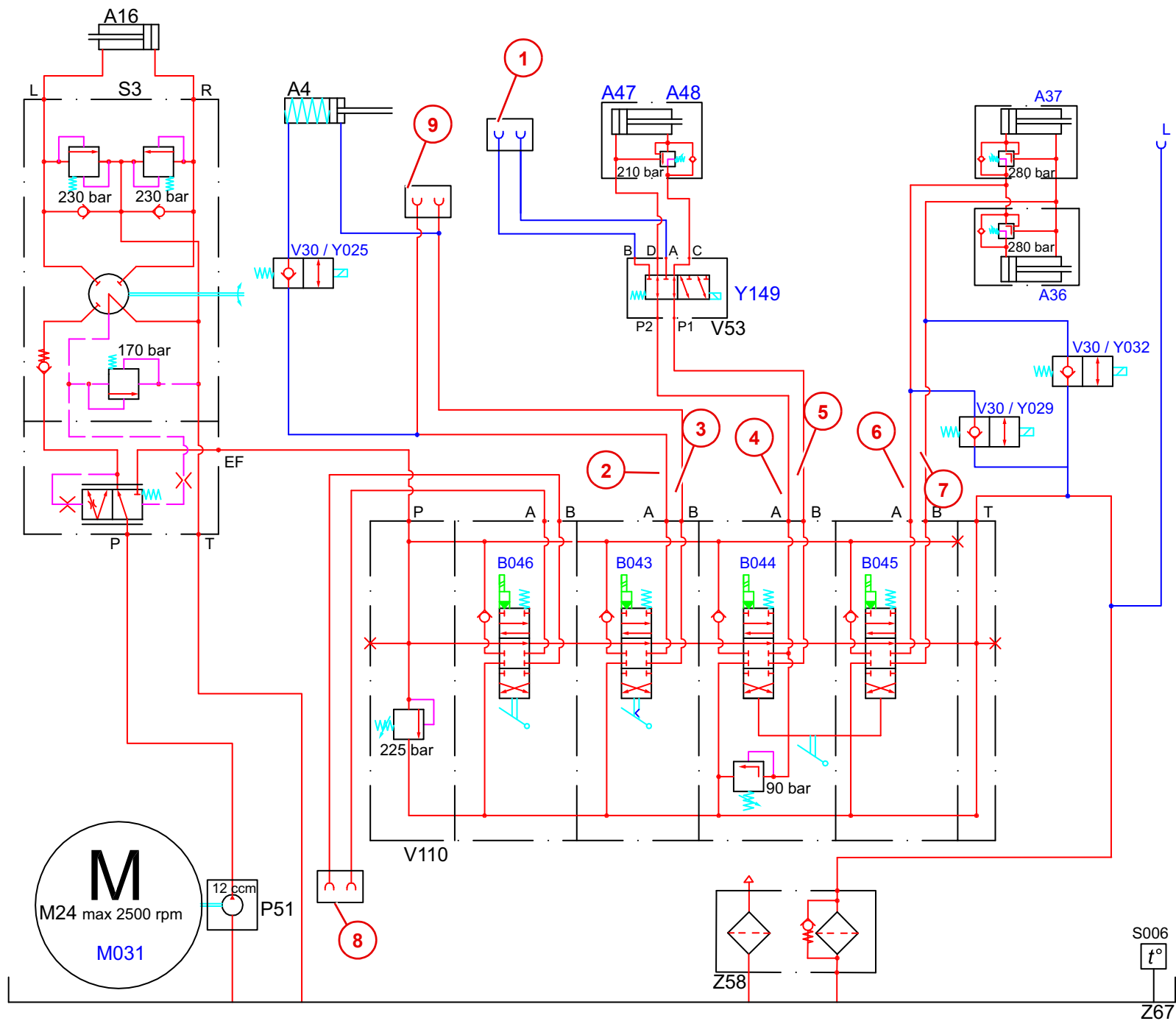
Installation

1. Select the required hydraulic line.
2. Screw the hydraulic line **1** onto the coupling and tighten.



3. Screw the hydraulic line **2** onto the screw connection and tighten.

7.23 Hydraulics Diagram – Vehicle with 4th control circuit and all options



Options:

Lock cylinder; 4th control circuit comfort; Return without pressure; Hydraulic ram with counterbalance valve

Hydraulic components

	Designation
A4	Lock cylinder
A11	Lift cylinder (standard)
A16	Steering cylinder
A47	Tilt cylinder with counterbalance valve high lift height
A48	Tilt cylinder with counterbalance valve
P51	Pump
S3	Steering orbitrol
V30	2/2 directional valve
V53	6/2 multiple way valve
V110	Control valve
Z58	Return filter
Z67	Hydraulic oil reservoir

Electrical components

	Designation
B043	Position sensor spool I
B044	Position sensor spool II
B045	Position sensor spool III
B046	Position sensor spool IV
M031	Electric motor hydraulic pump
S006	Temperature switch, hydraulic oil
Y029	Float position solenoid valve
Y032	Float position solenoid valve
Y149	Solenoid valve 4th control circuit comfort control

Legend

Item	Designation
1	Connection for working tools (3rd control circuit)
2	Right
3	Left
4	Unroll
5	Roll up
6	Raise
7	Lower
8	Hydraulic connection rear
9	4th control circuit comfort

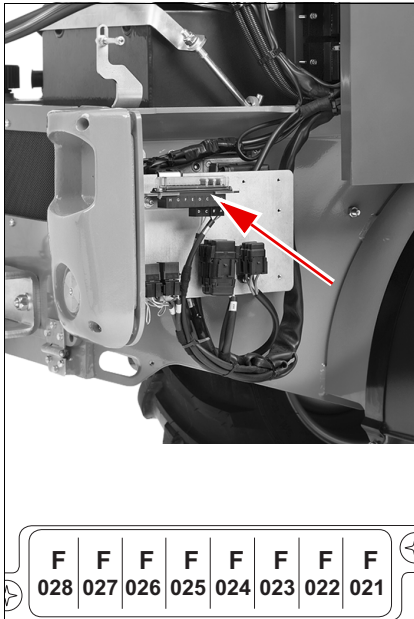


Fig. 271

Fuses under the cover on the rear carriage

Pos.	Protected function	A
F021	Charging connection	5
F022	Not assigned	
F023	Charging connection	5
F024	Not assigned	
F025	Charging connection	5
F026	Not assigned	
F027	Not assigned	
F028	Not assigned	

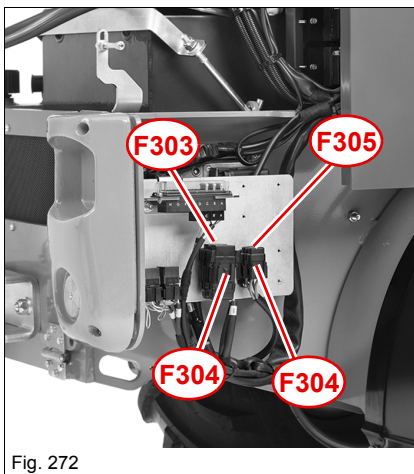


Fig. 272

Main fuses under the cover on the rear carriage

Pos.	Function	A
F303	Main fuse terminal 30	
F304	Main fuse terminal 15	
F305	Main fuse terminal 15	
F306	Main fuse terminal 15	

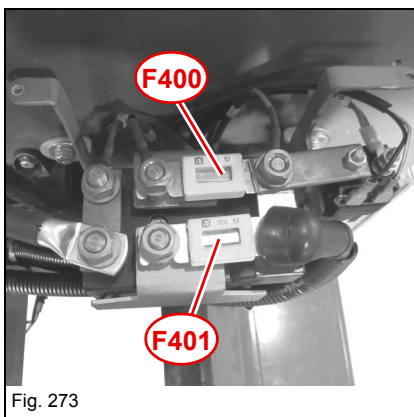


Fig. 273

Main fuses under the engine cover

Pos.	Function	A
F400	Main fuse 1 inverter (drive side)	
F401	Main fuse 2 inverter (drive side)	

8.4 Indicating instrument P011

Removing/installing the indicating instrument

Technical data



	Designation
P011	Display instrument

Removing

1. Remove the steering wheel – see *“Disassemble” on page 14-28.*
2. Unscrew screws **1** on both sides of the instrument panel **2**.
3. Raise the instrument panel.

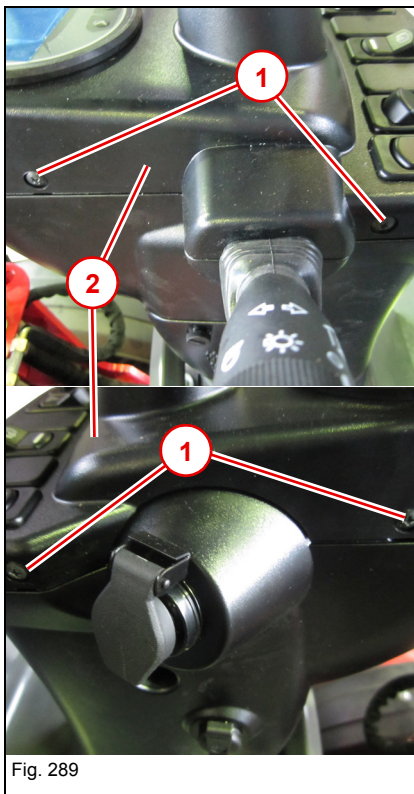


Fig. 289

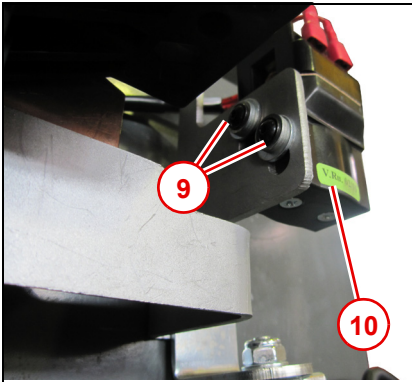


Fig. 309

10. Remove screws **9**.

11. Remove the secondary contactor **10 K131**.

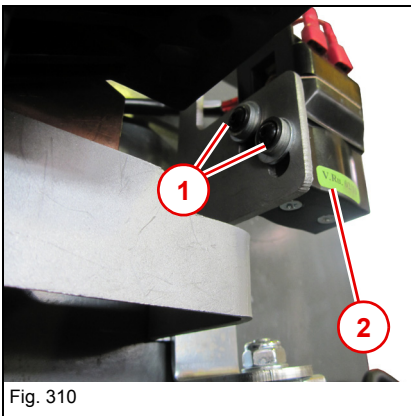


Fig. 310

Installation

1. Position the secondary contactor **2 K131**.

2. Screw in the screws **1**, but do not tighten.

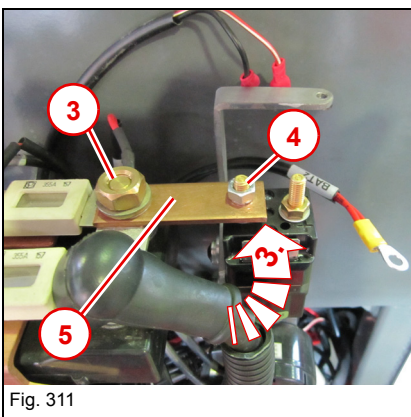


Fig. 311

3. Swivel the bridge **3** into position.

4. Align the secondary contactor **K131** and bridge **5** to each other.

5. Tighten the nut **4** with 3.6 to 3.9 Nm (SW 10).

6. Tighten the nut **4** with 14 Nm.

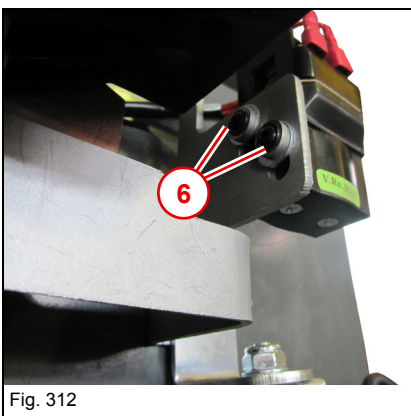
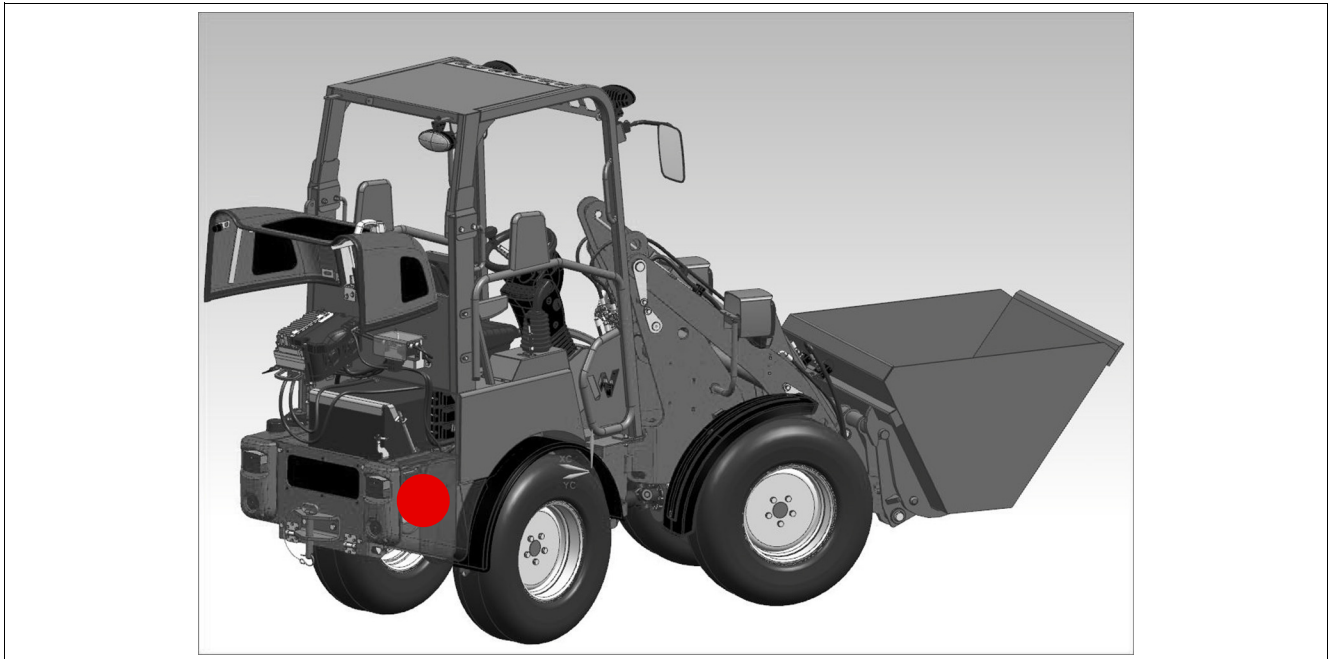


Fig. 312

7. Tighten screws **6**.

Removing/installing the ECU

Technical data



	Designation
N014	ECU control unit

Removing

1. Remove screws **1**.
2. Place the holder **2** of the fuse box facing down.

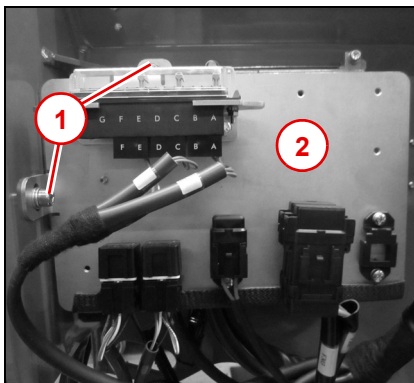


Fig. 325

3. Label the assembly positions of the plugs **3** and **4**.
4. Disconnect connector.

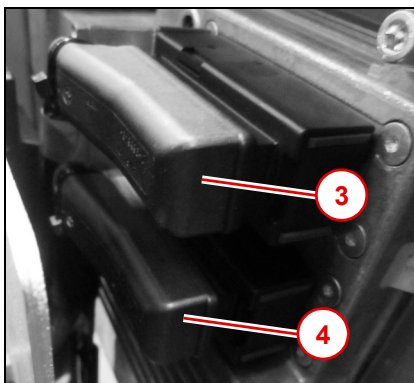
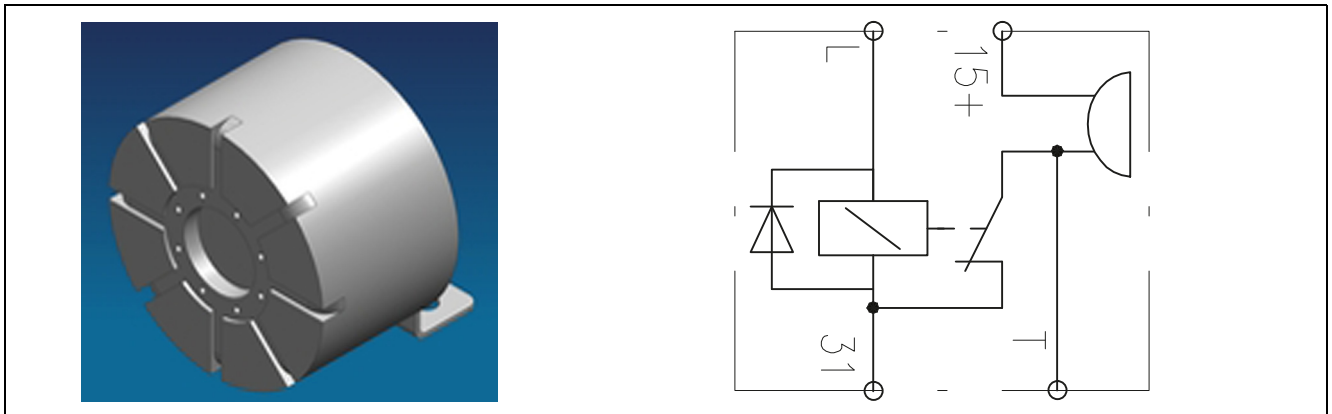


Fig. 326

8.14 Reverse warning system B018

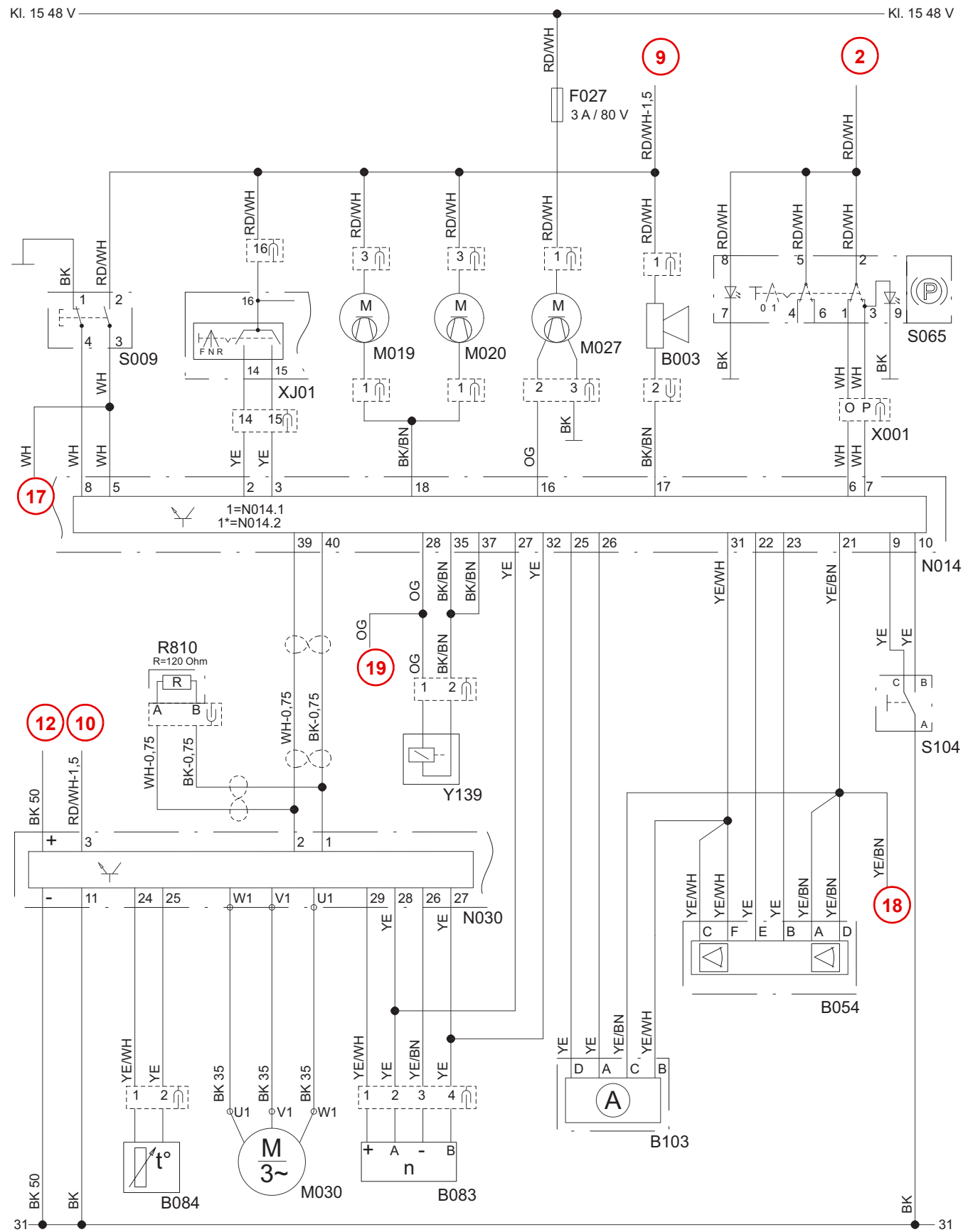
Overview



Function description

If the operator switches into reverse operation, the reverse warning system receives a signal. The reverse warning system generates between 70 and 90 tones per minute.

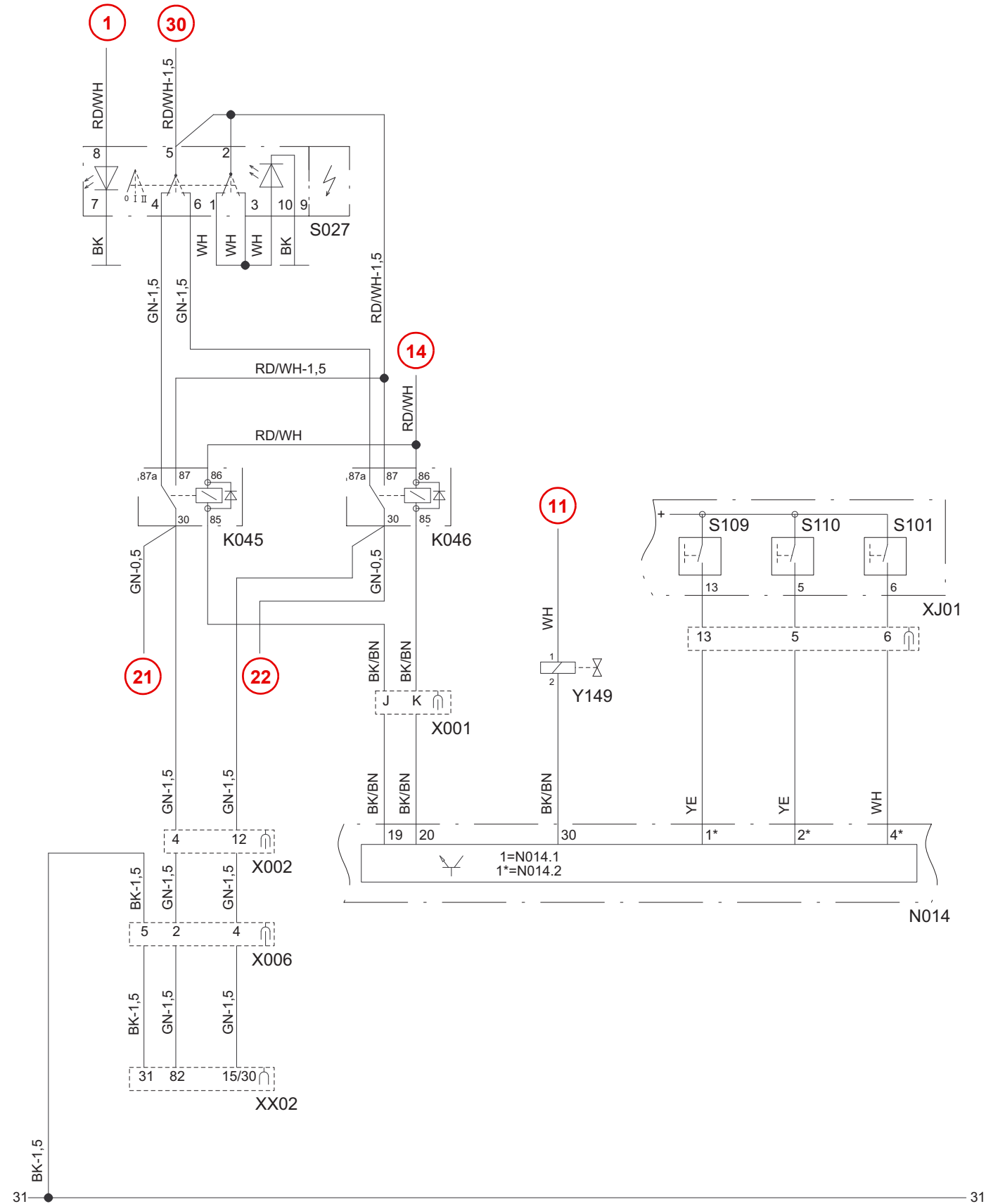
8.20 Electrical diagram – Driving function for vehicles with an AGM battery



Assignment	Designation
B003	Reversing warning system
B054	Accelerator pedal
B083	Engine driving speed sensor
B084	Engine driving temperature sensor
B103	Current sensor
F027	Hydraulic motor fan fuse
M019	Fan 1 inverter
M020	Fan 2 inverter
M027	Fan electric motor for driving
M030	Electric motor for driving
N014	ECU
N030	Twin inverter
R810	Terminating resistor CAN1
S009	Brake light switch
S065	Parking brake switch
S104	Operator presence switch
X001	Fitting connection
XJ01	Joystick
Y139	Spring force brake magnet

Item	Connection to
2	F001:0 (see page 8-53)
9	X001:B (see page 8-53)
10	X001:A (see page 8-53)
12	K117:24 (see page 8-53)
17	X001:L (see page 8-68)
18	B043:2 (see page 8-57)
19	X024:1 (see page 8-66)

8.30 Electrical diagram – Electric function, comfort 3rd control circuit – Version 2



Assignment	Designation
K045	Additional function switching relay
K046	Additional function switching relay
N014	ECU
S027	Front socket/changeover switch
X001	Fitting connection
X002	Fitting connection
X006	Front carriage connection
XJ01	Joystick
XX02	Triple-pole plug receptacle, front
Y149	3rd/4th control circuit comfort control solenoid valve

Item	Connection to
1	F001:0 (see page 8-53)
11	N014.1:15 (see page 8-53)
14	F001:0 (see page 8-53)
21	XA01:13 (see page 8-58)
22	XA01:14 (see page 8-58)
30	F003:0 (see page 8-63)

G005.1 - Voltage converter input 48 V

PIN	Cable color	Function	
		Abbreviation	Description
1	RD	BAT2:2	+48V
2	BK	GND1	GND 48V

G005.2 - Voltage converter output 12 V

PIN	Cable color	Function	
		Abbreviation	Description
1	RD/WH	F305:1	+12 V
2	BK	GND1	GND 12V

G006.1 - Voltage converter input 48 V

PIN	Cable color	Function	
		Abbreviation	Description
1	RD	BAT2:2	+48V
2	BK	GND1	GND 48V

G006.2 - Voltage converter output 12 V

PIN	Cable color	Function	
		Abbreviation	Description
1	RD/WH	F306:1	+12 V
2	BK	GND1	GND 12V

K117 - Power-break contactor plug

PIN	Cable color	Function	
		Abbreviation	Description
1	WH	SP7	ECU voltage supply
2	BK/BN	N014.1:13	0V ECU

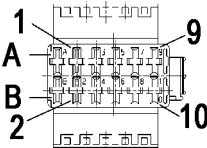
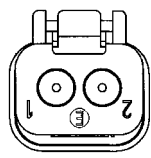
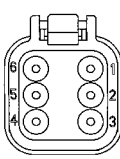
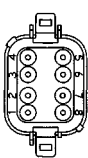
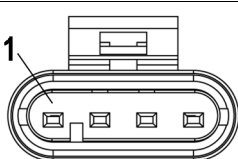


X001 - Interface fitting plug

Machine wiring harness

PIN	Cable color	Function	
		Abbreviation	Description
A	RD/WH	SP1	Fuse +12V
B	RD/WH	SP5	Fuse +12V
C	RD/WH	S092:5	Fuse
D	-	-	Fuse
E	RD/WH	S112:3	Loader unit stabilizer
F	RD/WH	S018:5	+12V rotating beacon
G	RD/WH	S120:10	Switch lights
H	RD/WH	S057:3	Rear hydraulic connection, double-acting
Y	BK/BN	N014.1:19	E-function 1 joystick (relay)
K	BK/BN	N014.1:20	E-function 2 joystick (relay)
L	-	-	-
M	-	-	-
N	VT	S018:1	Rotating beacon
O	WH	N014.1:6	FBA Auto
P	WH	N014.1:7	FBA Park
Q	-	-	-
R	-	-	-
S	-	-	-
T	-	-	-
V	-	-	-
V	-	-	-
W	BK	SP20	CANO-L
X	WH	SP18	CANO-H

8.36 Plug

Drawing	Details	
	Parts no.	1000103949
	Color	Gray
	Usage:	
	S018	Rotating beacon switch
	S057	Switch for option
	S092	Switch for option
	S112	Switch for loader unit stabilizer
	S120	Switch ECO/BOOST mode
	Parts no.	1000229795
	Color	Gray
	Usage:	
	X005	Working lights
	Y025	Tool lock
	Parts no.	1000229841
	Color	Gray
	Usage:	
	X000	Operator's canopy wiring harness
	Parts no.	1000229857
	Color	Green
	Usage:	
	Parts no.	1000255531
	Color	Black
	Usage:	
	B043	Position sensor, gate I 3rd control circuit
	B044	Position sensor, gate II, rolling in/rolling out
	B045	Position sensor, gate III, raise/lower
	B046	Position sensor spool IV
	B103	Current sensor
	S009	Brake pedal

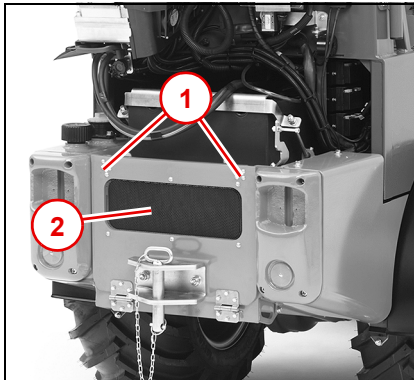


Fig. 356

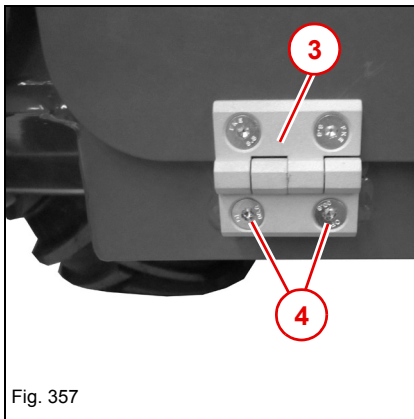


Fig. 357

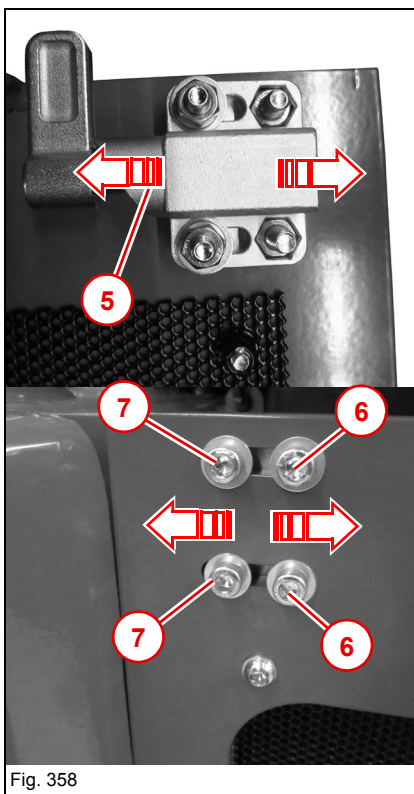
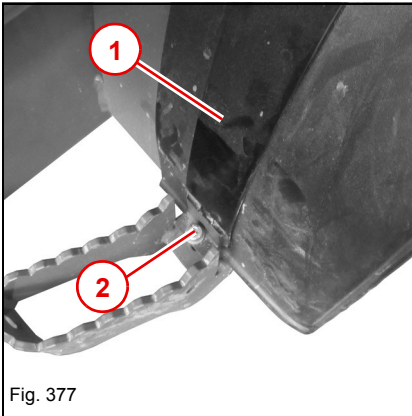


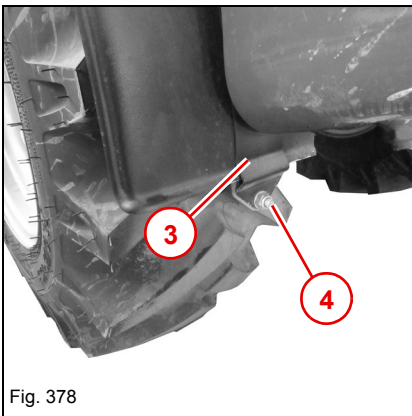
Fig. 358

Installation

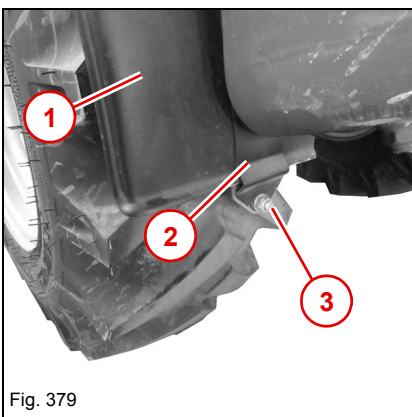
1. Position the tailgate **2**.
2. Lock the spring locked connecting pin **1**.
3. At both hinges **3** of the tailgate, screw on the screws **4** on the rear carriage.
4. Lock the spring locked connecting pin.
5. Adjust the spring locked connecting pin **5** by moving it.
6. Tighten the screws **6** on the tailgate.
7. Tighten the screws **7** and nuts.


Remove

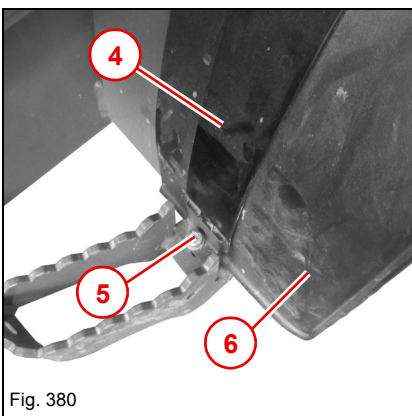
1. Unscrew the screw **2** and nuts.
2. Swivel the strap **1** to the side.



3. Remove the mudguard.
4. Unscrew the screw **4** and nuts.
5. Remove the strap **3**.


Installation

1. Apply the screw **3** and nut.
2. Fold the strap **2** upwards.
3. Insert the mudguard **1**.



4. Fold the strap **4** to the front
5. Apply the screw **5** and nut.
6. Align the mudguard **6**.
7. Tighten both screws and nuts.

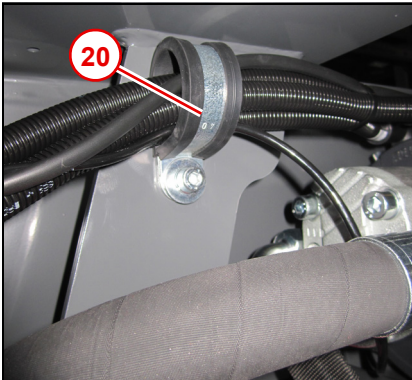


Fig. 405

19. Attach all pipe clamps **20** with hoses on the base plate.

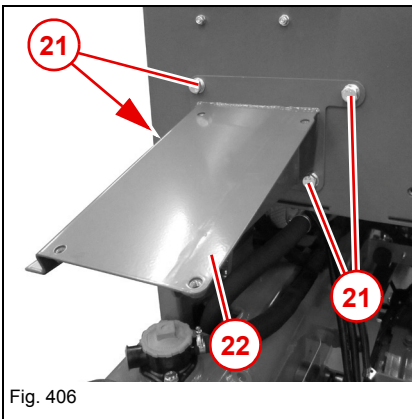


Fig. 406

20. Position the console **22** of the twin inverter **N030**.

21. Tighten screws **21**.

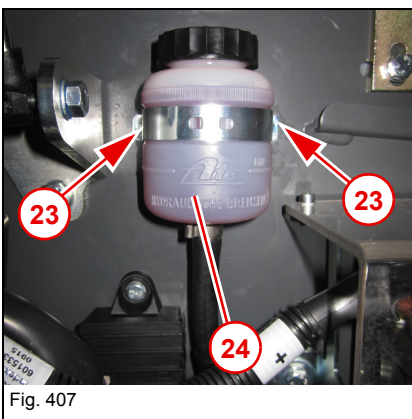


Fig. 407

22. Position the brake fluid container **24**.

23. Tighten screw **23**.

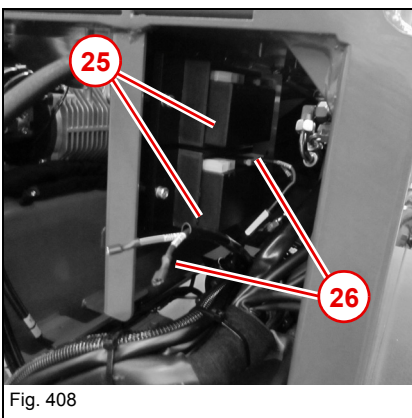


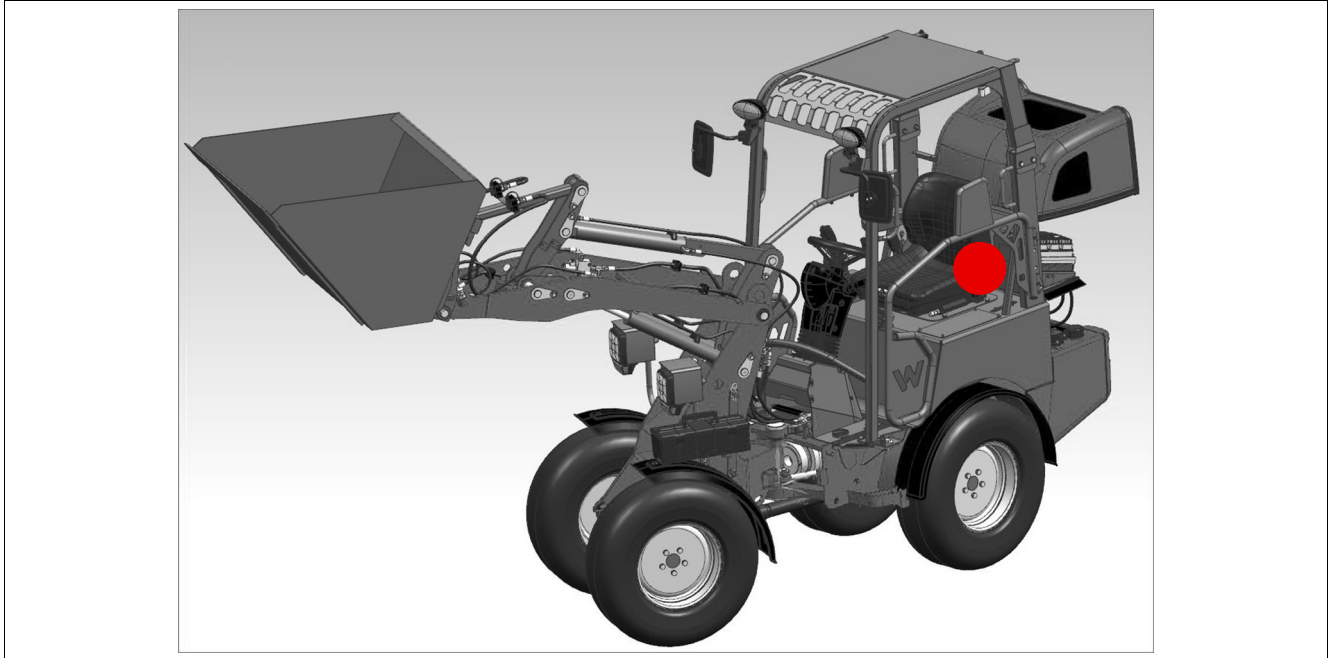
Fig. 408

24. Insert all cables **26** on the voltage converters **25 G004, G005** and, if necessary, **G006**.

14.5 Seat belt buckle

Removing/installing the seat belt buckle

Technical data



Designation

Seat belt buckle

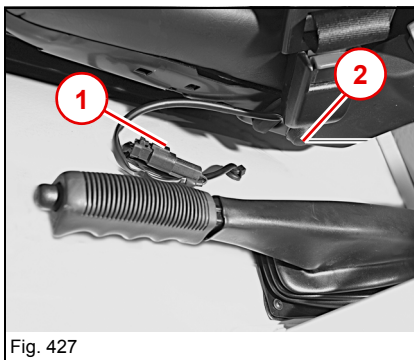


Fig. 427

Disassemble

1. Disconnect plug 1.
2. Remove the cap 2.

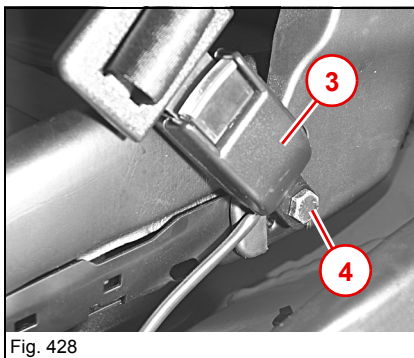


Fig. 428

3. Unscrew plug 4.
4. Remove the seat belt buckle 3.

Install in the reverse order.

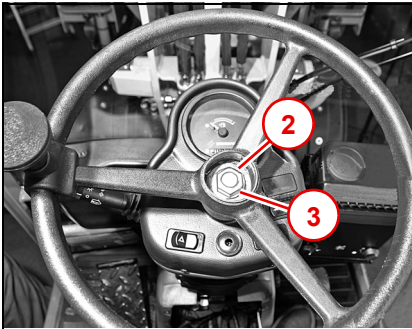


Fig. 445

2. Unscrew nut **2**.
3. Take out washer **3**.

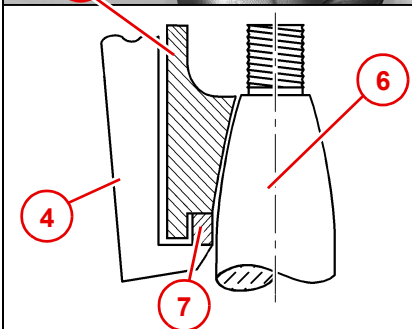
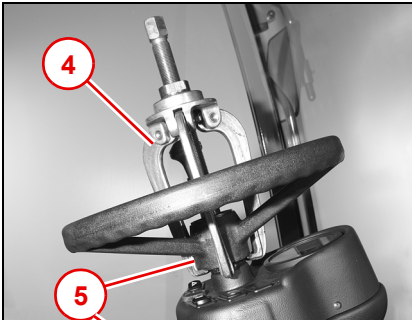


Fig. 446

4. Insert two half shells **7** from below and hold them in place.
5. Position three-legged extractor **4** on the steering wheel.
6. Carefully pull off steering wheel **5** from the steering column **6**.

Install

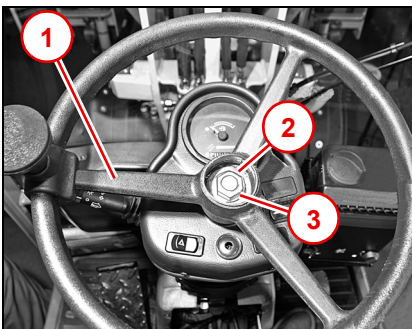


Fig. 447

1. Slide steering wheel **1** onto the steering column.
2. Screw nut **2** with washer **3** onto the steering column and tighten to a torque of 15 Nm.

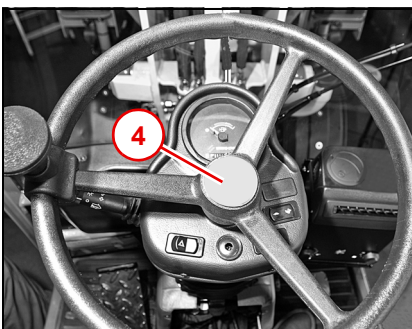
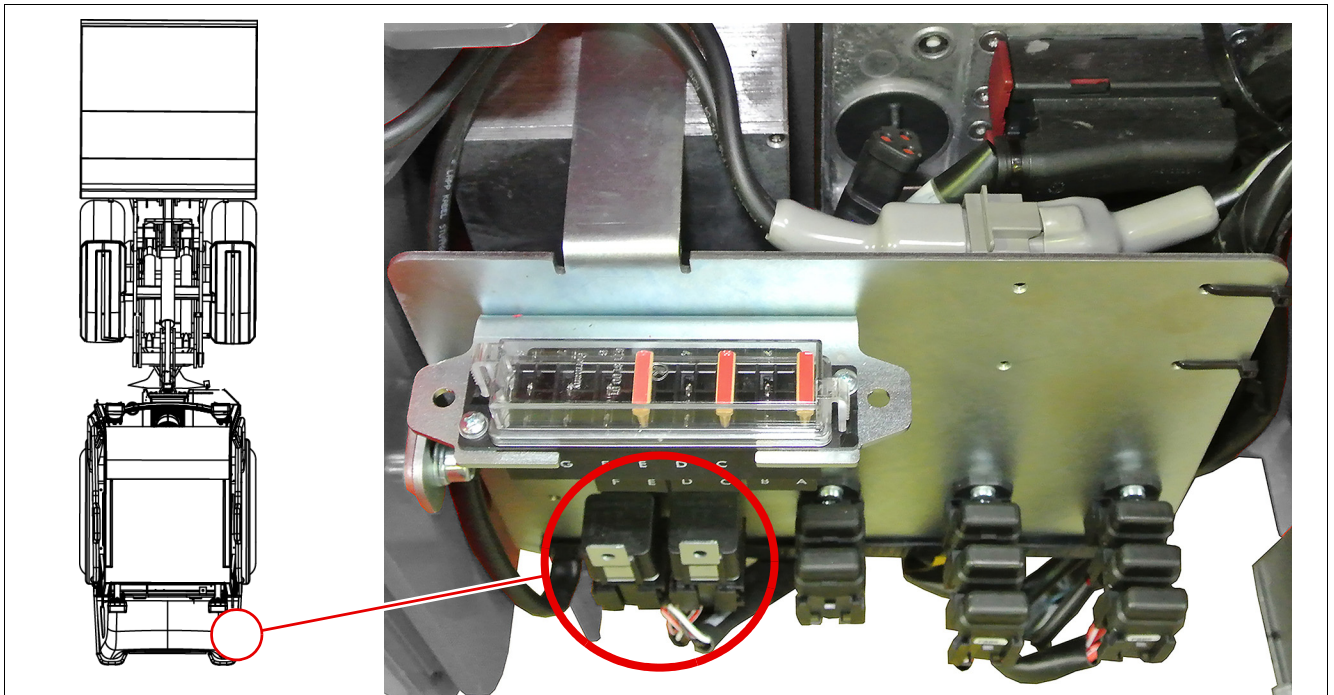
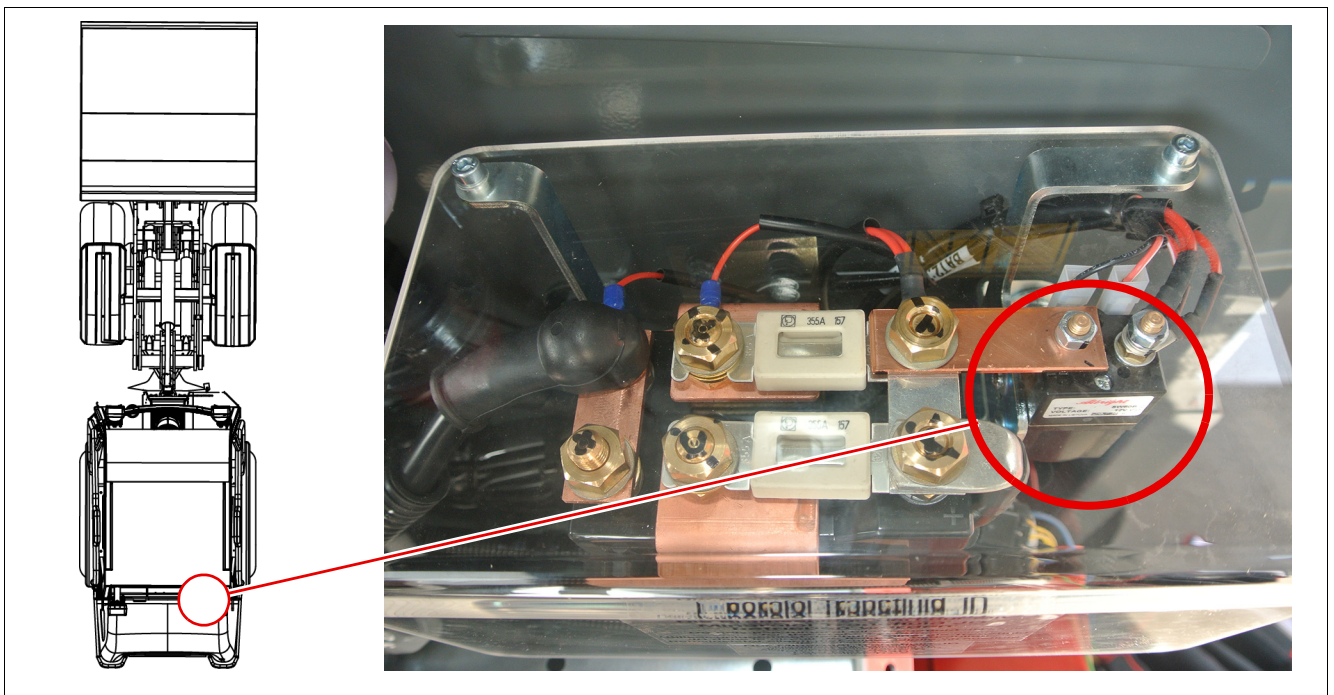


Fig. 448

3. Fit cap **4** onto the steering wheel.



	Designation
H	Control, signal and indicating devices
H020	Brake light (left)
H021	Brake light (right)
H024	Front right turn indicator
H025	Rear right turn indicator
H026	Front left turn indicator
H027	Rear left turn indicator
H028	Rotating beacon
K	Relays (electrical system)
K010	Turn indicator relay
K030	Brake light relay
K045	Additional function switching relay
K046	Additional function switching relay
K117	Main contactor
K120	Relay I charging circuit
K121	Relay II charging circuit
K131	Auxiliary contactor
M	Drives (electrical system)
M010	Air-suspension seat
M019	Fan 1 inverter
M020	Fan 2 inverter
M027	Fan electric motor for driving
M030	Electric motor for driving
M031	Electric motor hydraulic pump
N	Electronics (electrical system)
N014	ECU
N030	Twin inverter
P	Measuring- and indicating instruments
P011	Display for additional machine information
R	Resistors (electrical system)
R032	Heated seat
R810	Terminating resistor CAN1
R812	Terminating resistor CAN0
R813	Terminating resistor CAN0

K120, K121 – Charging circuit relay

K131 – Secondary contactor


SPN	SPN text	FMI	FMI text
518213	Pump converter, motor temperature	31	High/low temperature
518214	Pump converter, load current	16	Excess current
518215	Pump converter, CAN time out	9	Error bus communication (CAN bus time out)
518216	Pump converter, 12 V supply voltage	16	Peaks in the mains supply
		18	Drops in the mains supply
518220	Control unit error, function controller	12	Internal error
518221	Control unit error, function controller	12	Record
518222	Control unit error, function controller	12	Incorrect production data
518223	Control unit error, function controller	12	Safety controller watchdog communication error
518224	Control unit error, function controller	12	Hardware configuration (add on board) does not match specified value
518225	Control unit error, function controller	12	Boot loader missing
518226	Control unit error, function controller	12	Shutdown request from diagnosis/ODI
518227	Control unit error, function controller	12	Internal error (ID 6002)
518228	Control unit error, function controller	12	Internal error (ID 6007)
518229	Control unit error, function controller	12	Internal error (ID 6009)
518230	Control unit error, function controller	12	Internal error (ID 6010)
		12	Internal error (ID 7000)
518231	Control unit error, function controller	12	Incorrect production data
	Control unit error, safety controller, data set	12	Record error
518232	Control unit error, function controller	12	Faulty safety controller watchdog communication
	Control unit error, safety controller, production data	12	Production data invalid
518233	Control unit error, function controller	12	Internal error (ID 6037)
	Control unit error, safety controller, watchdog communication	12	Faulty safety controller watchdog communication
518234	Control unit error, function controller	12	Internal error (ID 6038)
518235	Control unit error, function controller	12	Internal error (ID 6040)
518236	Control unit error, function controller	12	Internal error (ID 6041)
	Control unit error, safety controller	31	Boot loader missing
518237	Control unit error, function controller	12	Internal error (ID 6042)
518238	Control unit error, function controller	12	Internal error (ID 6043)
518239	Control unit error, function controller	12	Internal error (ID 6044)
518240	CAN-0 nodes (diagnosis CAN)	12	Internal error (ID 6045)
		31	Communication error (node error)
518241	CAN-1 nodes (DC-AC converter CAN)	12	Internal error (ID 6098)
		31	Communication error (node error)
518242	CAN-2 nodes (DC-AC converter CAN)	12	Internal error (ID 6100)
		31	Communication error (node error)
518243	Control unit error, function controller	12	Internal error (ID 6101)
518244	Main contactor N014.1 / pin 15	26	Peaks in the mains supply
518245	Main contactor N014.1 / pin 15	26	Drops in the mains supply

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