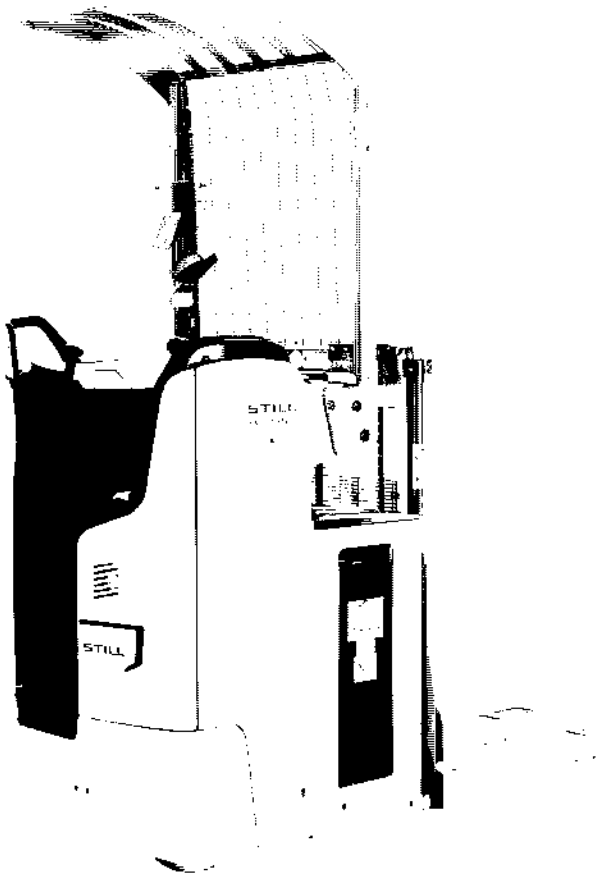
STILL

Workshop literature

Double pallet stacker with driver seated

FXD 20N



CE

1540

first in intralogistics

11648012111 EN - 09/2017

Foreword

Double pallet stacker with driver seated FXD 20N

Features		FXD 20N
Nominal capacity		**Double pallet stacker**: 1000 kg max. on the forks + 1000 kg max. on the load arms
		Pallet stacker: 1200 kg on the forks
		Pallet truck: 2000 kg max. on the load arms
Speed when laden/unladen		10 km/h / 10 km/h
Traction/lift controller		LAC 04
Traction motor		3 kW (asynchronous)
Electric steering unit ES30-24 (maintenance free)		0.185-kW asynchronous steering motor (S1)
Brake type		Electromagnetic
Control unit	as standard	Control module (traction/lift) and steering wheel (steering)
	as options	Joystick (traction/lift) and steering knob (steering)
Platform		Fixed
Driving		Seated with adjustable floor
Pump-motor unit (maintenance free)		2.2 kW (S3: 10%)
Battery		Side access (3 PzS and 4 PzS)

Emergency lowering of the mast

The emergency control (1) allows the mast to be lowered manually in the event of a problem.

This operation is to be performed as follows:

– Open the technical compartment door.

– Loosen the screw (1) using an 8 mm open-ended spanner.

⚠ DANGER

Danger of death!

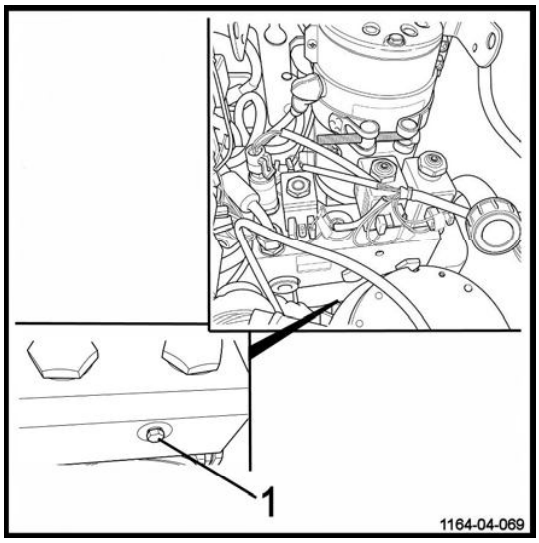
Do not walk underneath raised loads!

Check that no one is in the danger area before manually lowering the mast.

When the forks are fully lowered:

– Loosen the screw (1) using an 8 mm open-ended spanner.

– Close the technical compartment door.



Connecting a laptop to the USB CAN Box

1	Diagnostic connector, 7-pin
2	Adaptor cable for diagnostic connector, 7-pin
3	USB CAN Box
5	Laptop

The laptop (5) is connected directly to the CAN Box via the connecting line.

The CAN Box (3) is connected to the truck's diagnostic connector (1) via the adaptor cable (2).

Connecting a laptop to the serial CAN Box

1	Diagnostic connector, 7-pin
2	Adaptor cable for diagnostic connector, 7-pin
3	Serial CAN Box
4a	Connecting line, serial→serial
4b	Connecting line, serial→serial and serial converter
5	Laptop

NOTE

The serial CAN Box has been replaced with a USB CAN Box, and can no longer be ordered.

The CAN Box (3) is connected to the truck's diagnostic connector (1) via the adaptor cable (2).

The laptop (5) is connected to the CAN Box via the connecting line. The type of connection will depend on the type of ports available on the laptop. Laptops equipped with Sub-D plugs are connected using a "serial→serial" connecting line (4a). Laptops that are not equipped with Sub-D plugs are connected using a "serial→serial" connecting line and a serial converter (4b).

Error code 107 (Warning)

Description: Invalid state of charge (SOC)

Step	INSTRUCTIONS	YES	NO	NOTE
1	Switch the battery off and on again			Go to step 2
2	Error code 217 appears	Go to step 6	Go to step 3	
3	Error code 107 still appears	Go to step 4	Go to step 5	
4	Replace the BMS (see chapter 6: Lithium-ion battery, BMS)			
5	Error resolved (or corrected)	END	END	
6	Follow the procedure for error code 217			

Error code 110 (Warning)

Description: Difference in charging current (1st level)

Step	INSTRUCTIONS	YES	NO	NOTE
1	Error code 211 appears	Go to step 3	Go to step 2	
2	Charge or regeneration problem They do not meet the IMR thresholds After restarting, the battery should be functional	END	END	
3	Follow the procedure for error code 211			

Error code 111 (Warning)

Description: Difference in charging current (2nd level)

Step	INSTRUCTIONS	YES	NO	NOTE
1	Error code 211 appears	Go to step 3	Go to step 2	
2	Charge or regeneration problem They do not meet the IMR thresholds After restarting, the battery should be functional	END	END	
3	Follow the procedure for error code 211			

Error code 113 (Warning)

Description: Low state of charge (1st level)

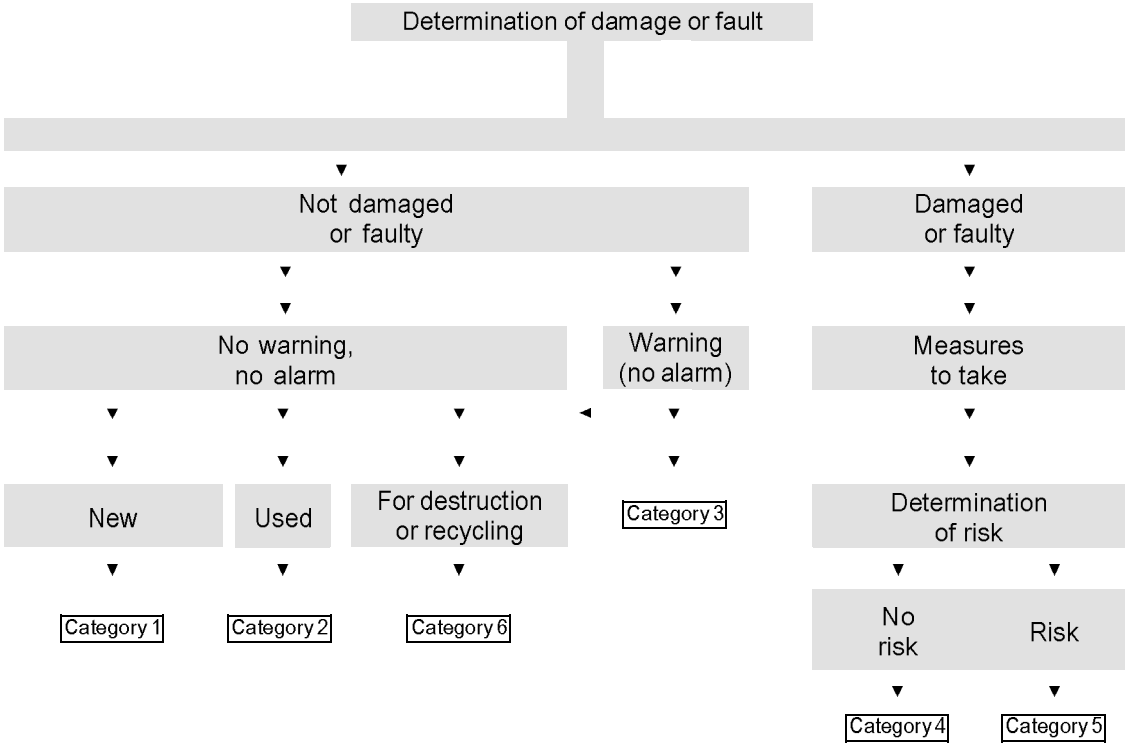
Step	INSTRUCTIONS	YES	NO	NOTE
1	Error code 103 appears	Go to step 4	Go to step 2	
2	Error code 205 appears	Go to step 5	Go to step 3	
3	The battery charge level is low: charge the battery	END	END	
4	Follow the procedure for error code 103			
5	Follow the procedure for error code 205			

Analysing the battery condition

⚠ CAUTION

The battery or the module must be stored for a minimum of four hours prior to completing the checklist.

Diagnostic help:



There are six categories:

Category	Function	Associated error codes
1	New battery or new module	No error codes activated
2	Used battery or module	No error codes activated
3	Battery with warning	100, 101, 102, 103, 110, 111, 113, 115, 214, 215, 216
4	Damaged or faulty battery or module without risk	No error codes activated
5	Damaged or faulty battery or module with risk	200, 202, 204, 205+100, 210, 218, 224
6	Battery or module for destruction or recycling	No error codes activated

Cleaning the motor

To ensure adequate cooling of the electric motors, the drive axle must be cleaned at the specified inspection and maintenance intervals.

The outside of the drive axle can be cleaned thoroughly. The best cleaning agent is **oil-free** compressed air. If the outside of the axle housing is very heavily soiled, a high-pressure cleaner can be used. However, depending on the level of contamination, it is recommended that the air ducts and power modules are removed. Special care should be taken to ensure that the spaces between the cooling fins on the motor are free from contamination, so as to ensure correct cooling of the motor. Only water may be used for this. Under no circumstances should chemical cleaning agents be added when using a high-pressure cleaner. Chemical cleaning additives may attack the plastic parts of the motor. Sufficient distance must be maintained between the jet lance and the motor.

NOTE

After disassembly of the motor connections, the electrical contact surfaces should be cleaned thoroughly before reassembly to avoid damage and error messages due to excessive contact resistance.

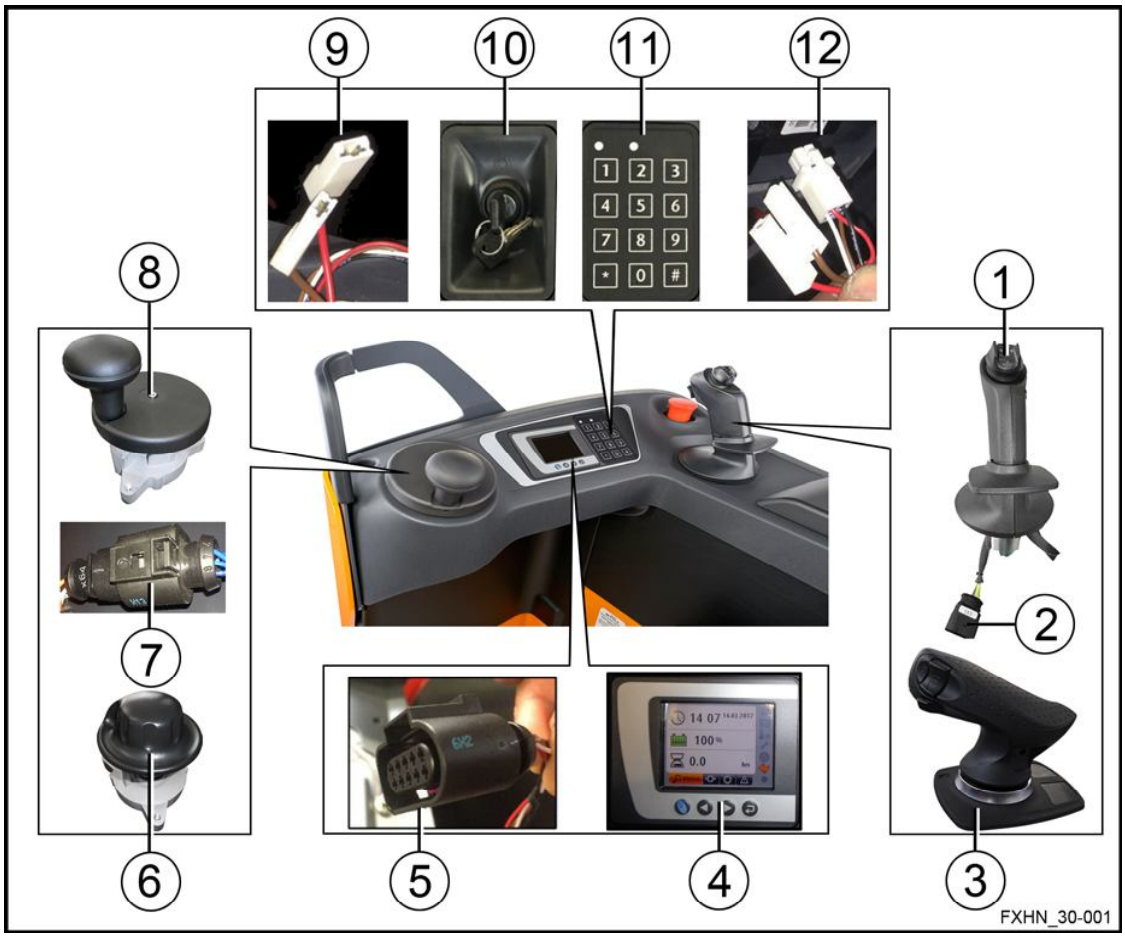
Intensive cleaning with a high-pressure cleaner should be avoided around the motor connections. No moisture should be allowed to enter the motor. If despite all precautions, moisture does penetrate the motor, the truck must be driven for an extended period to avoid corrosion damage (drying through heat generated by truck), or the motors must be dried using a heat source (hot-air blower or heating system).

A motor that has been dismantled must **not** be cleaned with a high-pressure cleaner in the area around the stator. Do **not** use compressed air for cleaning, as compressed air may contain oil or moisture. Firstly, any large particles of electrically conductive foreign matter should be removed by suction. Dust and grease should then be removed from the stator using a cloth and a solvent that will remove oxides and sulphides as well as gummed oils and greases. A final cleaning of the stator should be carried out with an electric cleaning material (e.g. S.L.X. electric cleaner – www.rivolta.de) . These electric cleaning materials have a dielectric strength of up to 100,000 V/cm and are free from hydrocarbons such as CHCs, CFCs, aromatics, PCB/PCTs and other pollutants. This allows all dirt to be rinsed thoroughly from the windings. After rinsing, the stator must be dried with a hot-air blower. Here it must be ensured that the blower temperature does not exceed 150 °C or the finish on the windings may be irreparably damaged.

The rotor can be cleaned with conventional cleaning methods .

- PCB – polychlorinated biphenyls
- PCT – polychlorinated terphenyls
- CHCs – chlorinated hydrocarbons
- CFCs – chlorofluorocarbons

Accessing the dashboard components



1	Control module	7	Braking module connector X13
2	Control module connector 1X3	8	Steering wheel and braking module
3	Joystick (option)	9	Switch key connection
4	Display	10	Switch key
5	Display connector 6X2	11	Electronic key
6	Steering knob (option) and braking module	12	Electronic key connection

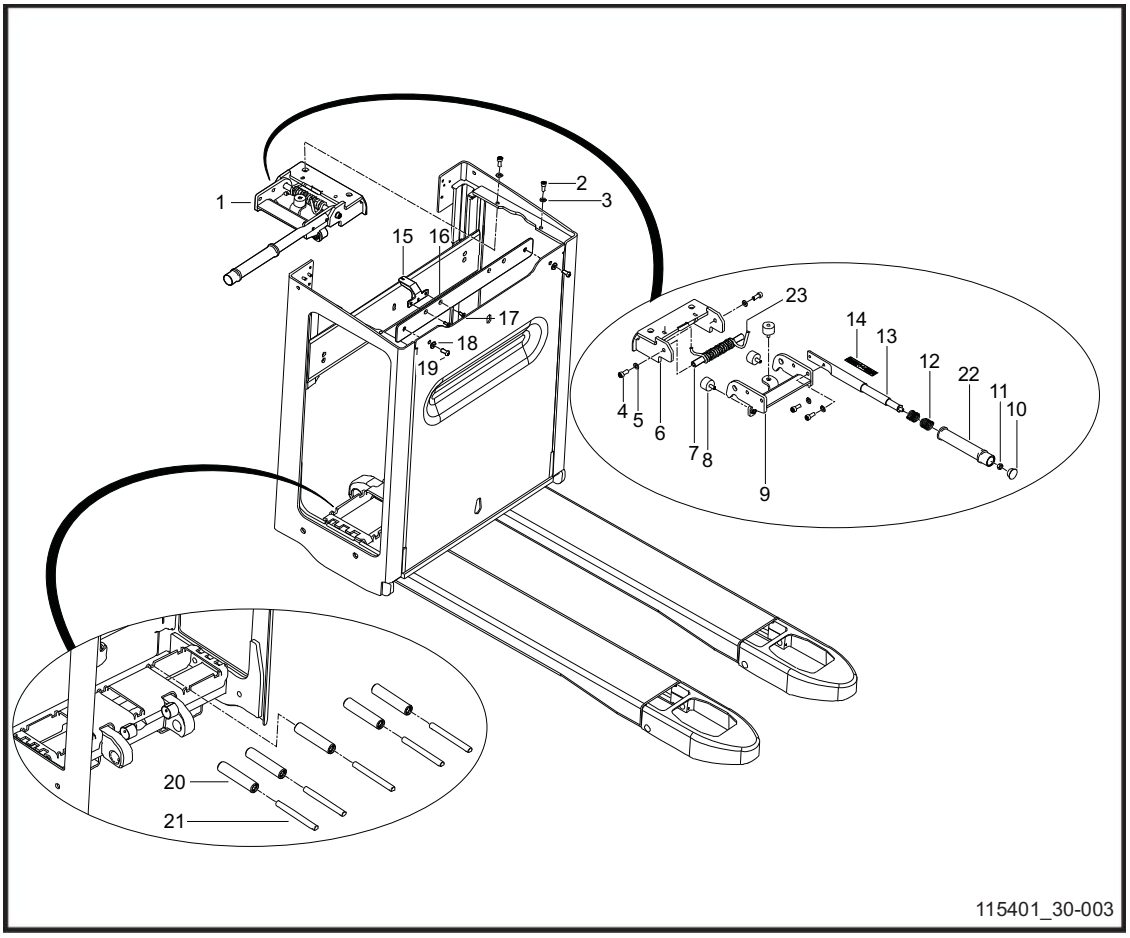
⚠ CAUTION

Risk of accident

Before commencing work:

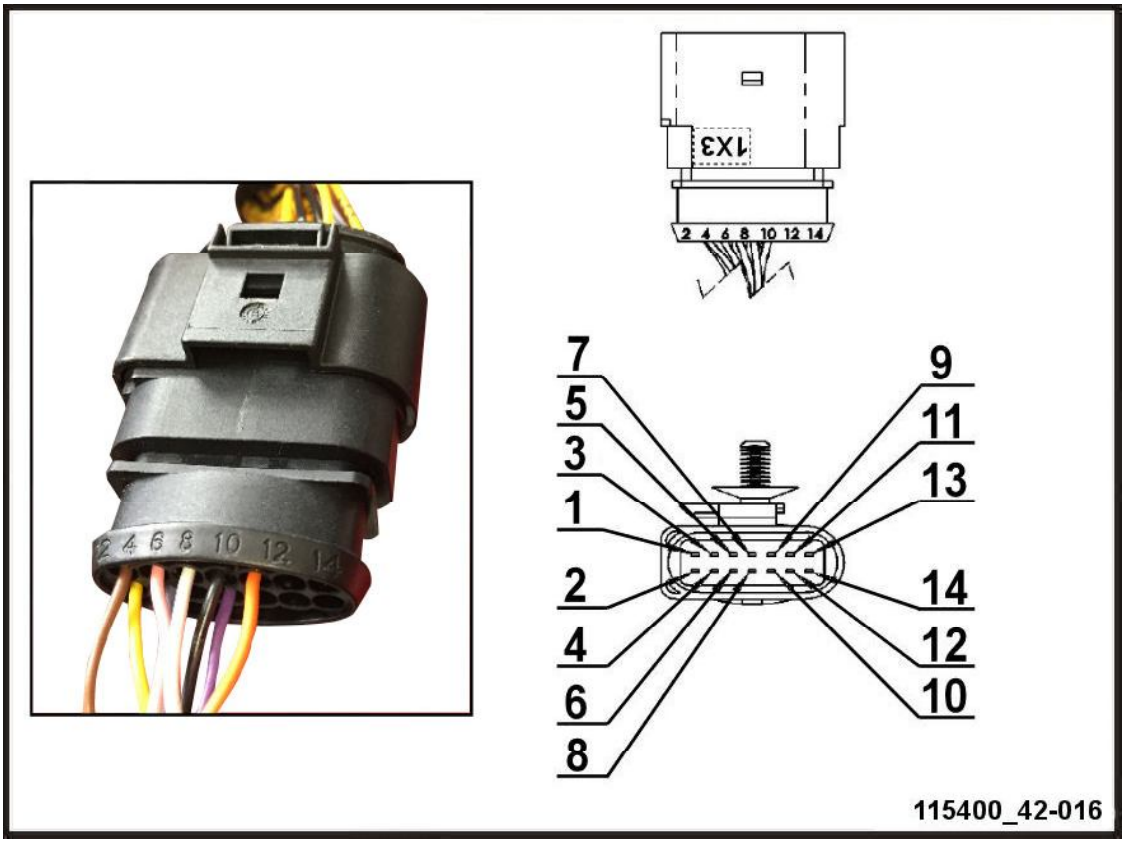
- Lower the load lift system.
- Switch off the truck (key or electronic key)
- Press the emergency off switch
- Disconnect the battery connector

Battery lock



1	Lock assembly	13	Compression part
2	Socket head screw	14	Label
3	Washer	15	Stop
4	Socket head screw	16	Flat
5	Washer	17	Countersunk screw
6	Battery lock	18	Washer
7	Tap axle	19	Button head screw
8	Spring	20	Roller assembly
9	Clamping piece	21	Pin
10	Plug	22	Handle
11	Washer nut	23	Torsion spring
12	Compression spring		

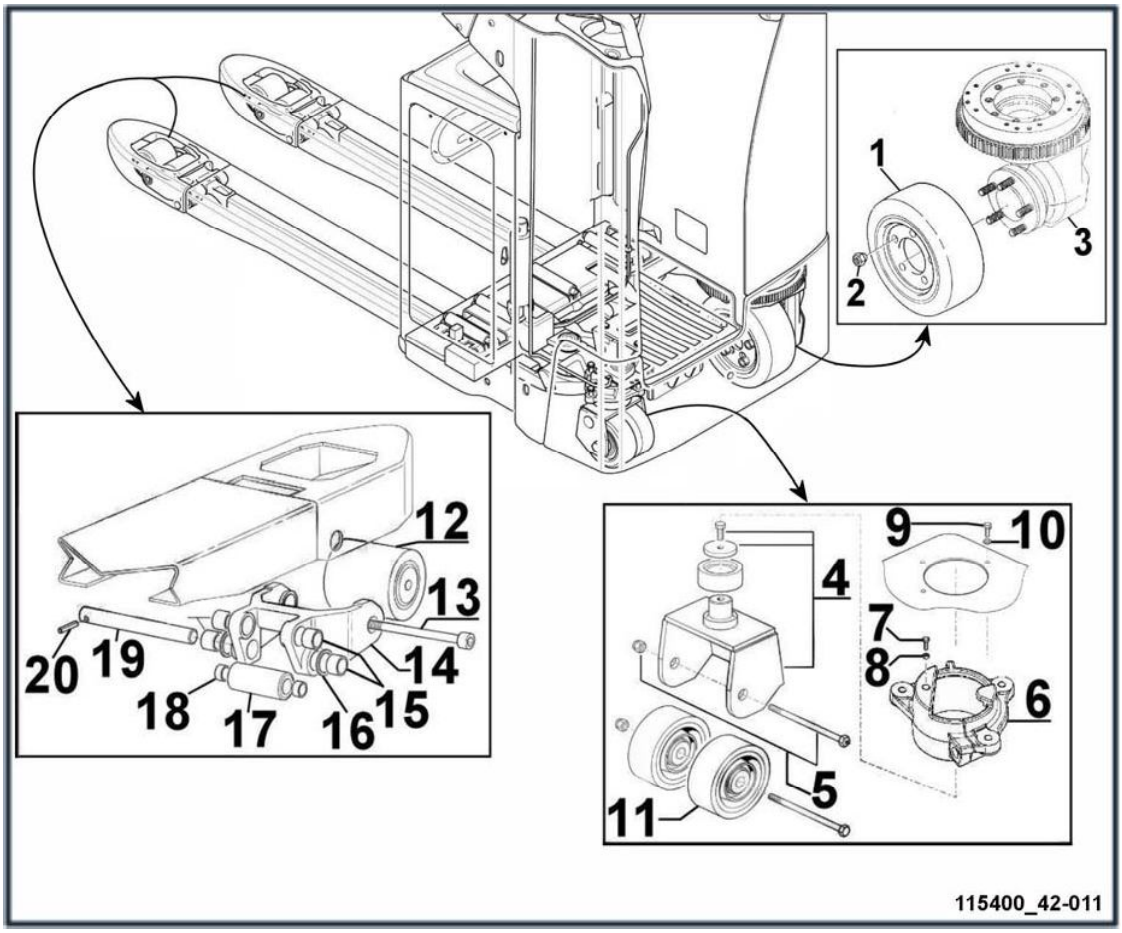
Pin assignment for connector 1X3



Pin	Colour	Signal
1X3: 1	Yellow	+5 V supply
1X3: 2	Orange	Traction setting track 1
1X3: 3	Grey	0 V
1X3: 4	Red	Horn
1X3: 5	-	-
1X3: 6	White	Initial lift
1X3: 7	Violet	Initial lowering
1X3: 8	Pink	0 V Horn
1X3: 9	-	-
1X3: 10	Brown	Traction setting track 2
1X3: 11	-	-
1X3: 12	White/Brown	Mast lift track 1
1X3: 13	-	-
1X3: 14	White/Violet	Mast lift track 2

Wheels

Description of the wheels



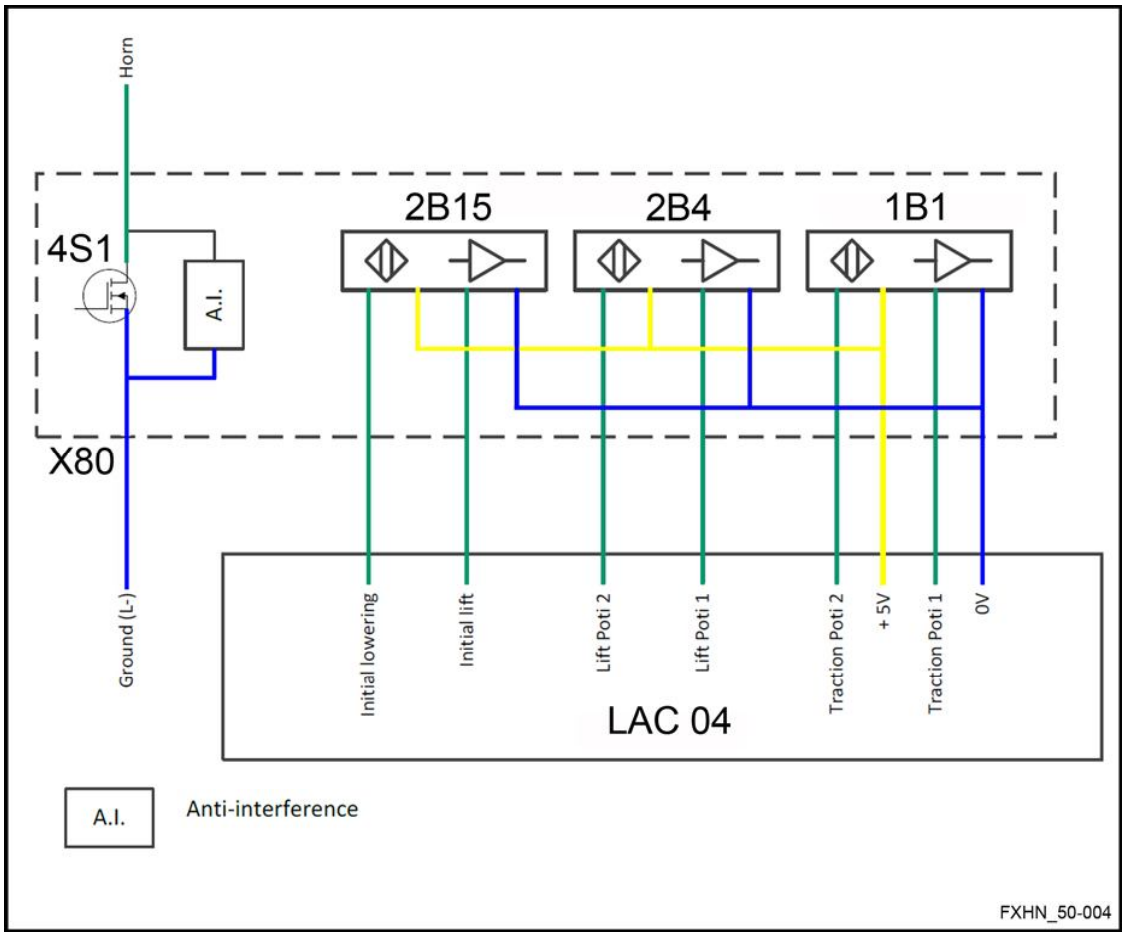
1	Drive wheel	11	Stabiliser wheels
2	Nut (tightening torque: **140 Nm**)	12	Load wheels (bogies)
3	Transmission gear	13	Socket head screw
4	Fork part	14	Load castor
5	Bolt	15	Bearing bush
6	Bearing	16	Washer
7	Hexagon head screw	17	Wheel
8	Hexagon nut	18	Bush
9	Hexagon head screw	19	Bolt
10	Washer	20	Pin

Contact with the ground is provided by

- One drive wheel (1)
- One fixed stabiliser (4)
- Two load wheels (12)

Joystick (option)

Functions of the joystick



1B1 Traction setpoint sensor
2B4 Main lift setpoint sensor (depending on the version)
2B15 Initial lift setpoint sensor (depending on the version)
4S1 Horn

Assignments

Pin for connector 1X1	Purpose	Analogue	Digital	Input	Output
1X1:9	Lowering the load arms		X	X	
1X1:12	Lift Poti 1	X		X	
1X1:25	Traction Poti 1	X		X	
1X1:26	Lift Poti 2	X		X	
1X1:27	+5V				X
1X1:36	Lifting the load arms		X	X	
1X1:39	Traction Poti 2	X		X	
1X1:42	0V				X

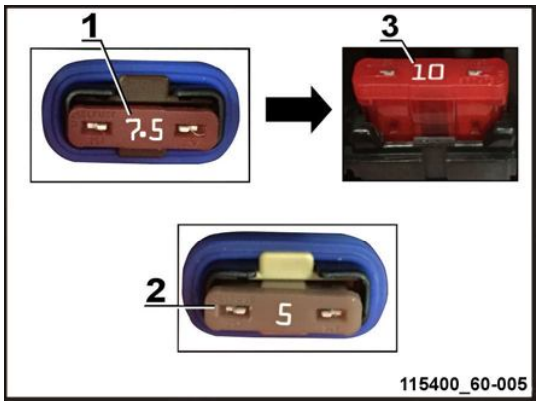
Function

– The 7.5-A fuse **1F3**(1) protects the control circuit.

– The 5-A fuse **1F4**(2) protects the control circuit.

NOTE

For the cold store truck version, the 7.5-A fuse is replaced with a 10-A fuse (3).

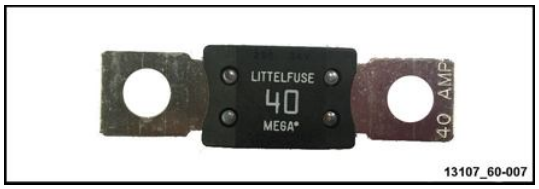


– The 300-A fuse **1F1** protects the traction and lift power circuit.

NOTE

The tightening torque for the power circuit fuse terminals is 9 Nm.

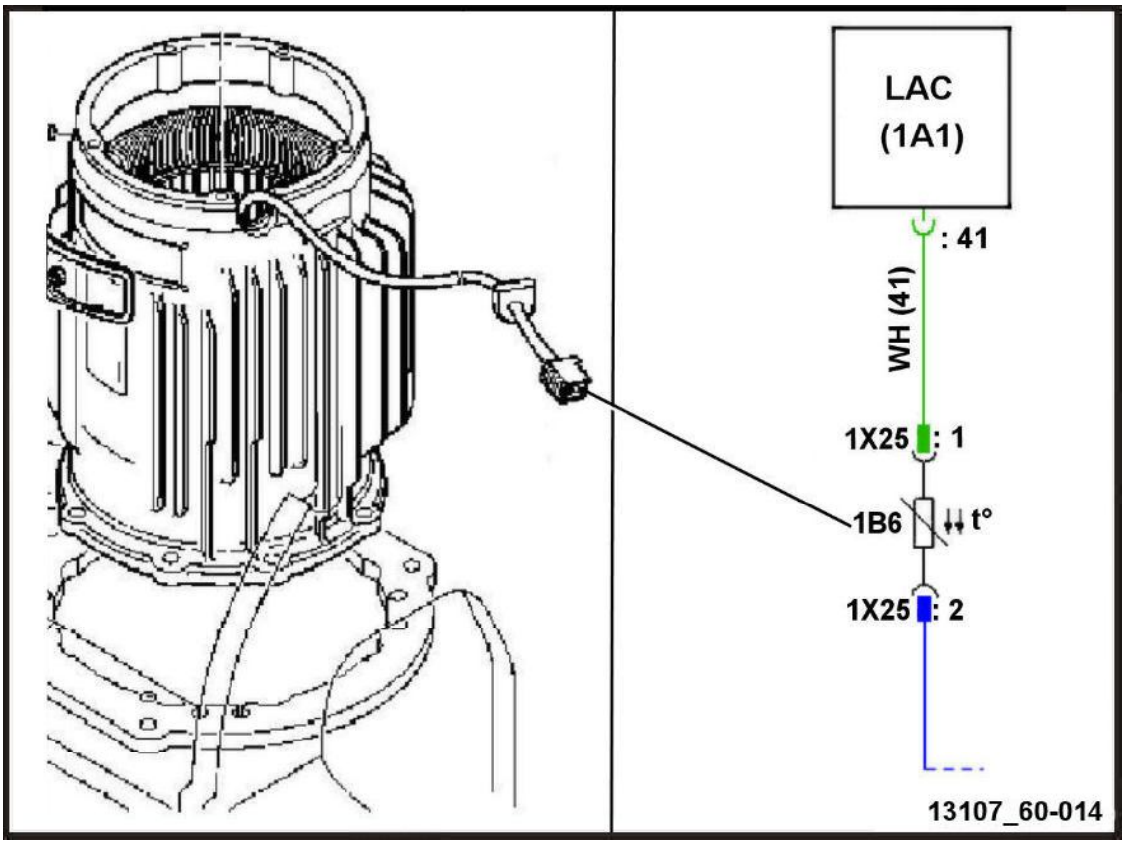
– The 40-A fuse **3F1** protects the steering power circuit on the ES30-24 unit.



NOTE

The sequence for attaching the cables from bottom to top is defined such that the current of the cable goes from the lowest to the highest.

Checking the operation of the temperature sensor (1B6)



1X25 Connector of the heat sensor
1X25:1 Temperature signal
1X25:2 Negative

A resistance sensor (1B6) is integrated into the stator windings. This sensor monitors the temperature and reduces performance when the temperature is too high:

- If the temperature of the motor exceeds 160°C, the truck speed is reduced to 2 km/h.
- If the temperature sensor is faulty or if the wiring harness is disconnected, the LAC controller will reduce the speed to 4 km/h.

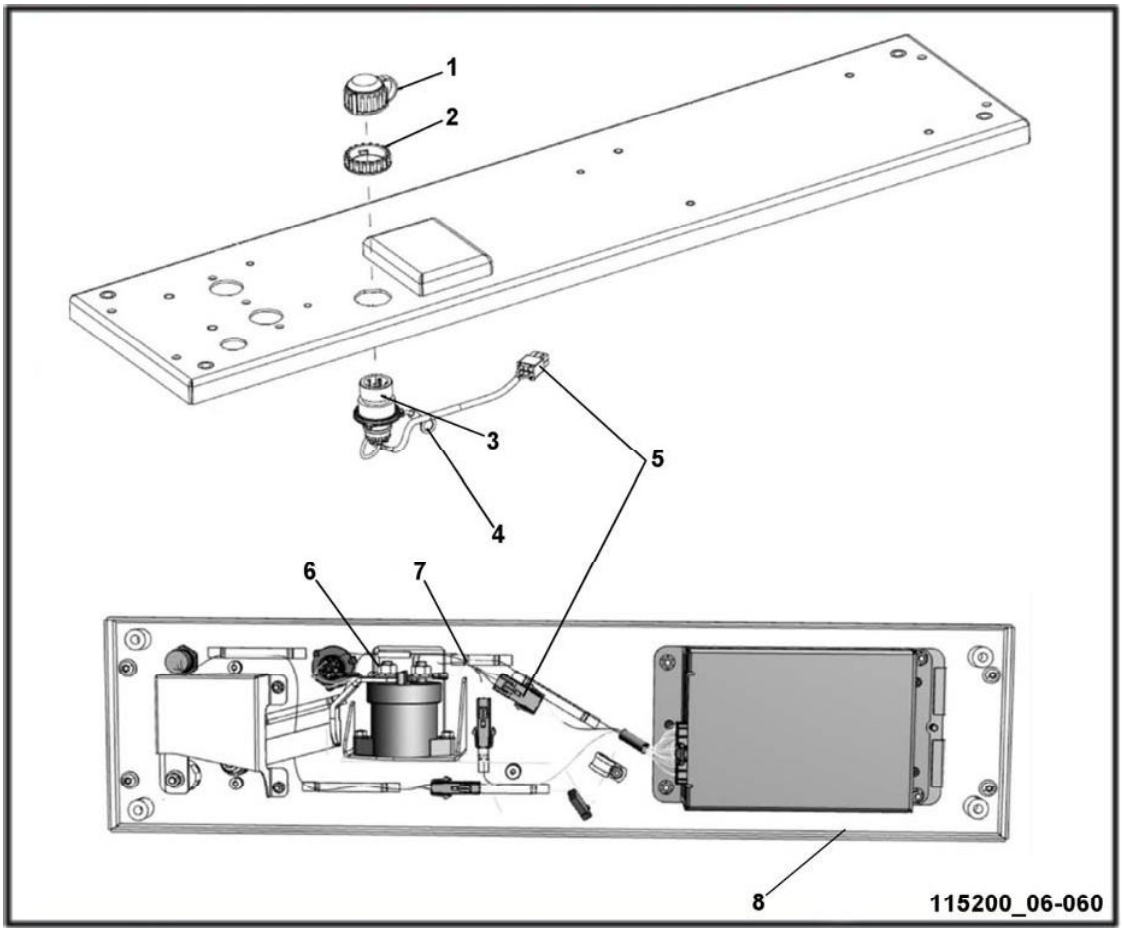
Parameterising the sensor

The KTY 84 sensor does not need to be parameterised because it is set by default in the LAC controller.

Checking the temperature sensor (1B6)

– Connect the CAN box to the **6X7** diagnostic connector
– Connect the CAN box to the laptop connector
– Start and connect the diagnostic tool

Replacing the diagnostic harness



Removing

- Unscrew the nut from the contact switch (6) and then remove the nut, the washers and the O-ring from the diagnostic harness (4).
- Remove the nylon rope clamp (7).
- Disconnect the diagnostic harness connector (5).
- Unscrew the protective cap (1) and its retaining tab.
- Unscrew the protective ring (2) from the diagnostic connector.
- Remove the head of the diagnostic harness (3) from the cover provided (8).

Replacing

- Install the head of the diagnostic harness (3) on the cover provided (8) through the hole provided for this purpose.
- Screw the mounting ring (2) on the diagnostic connector.
- Screw on the cap (1) using its retaining tab.
- Connect the diagnostic harness connector (5).
- Fit the nylon rope clamp (7).
- Fit the O-ring on the diagnostic harness (4). Fit the washers and the nut (6) and then screw on the nut of the contact switch (tightening torque: 10 Nm).

Reassembling the B1 and B2 battery module

1) Checking and cleaning the box:

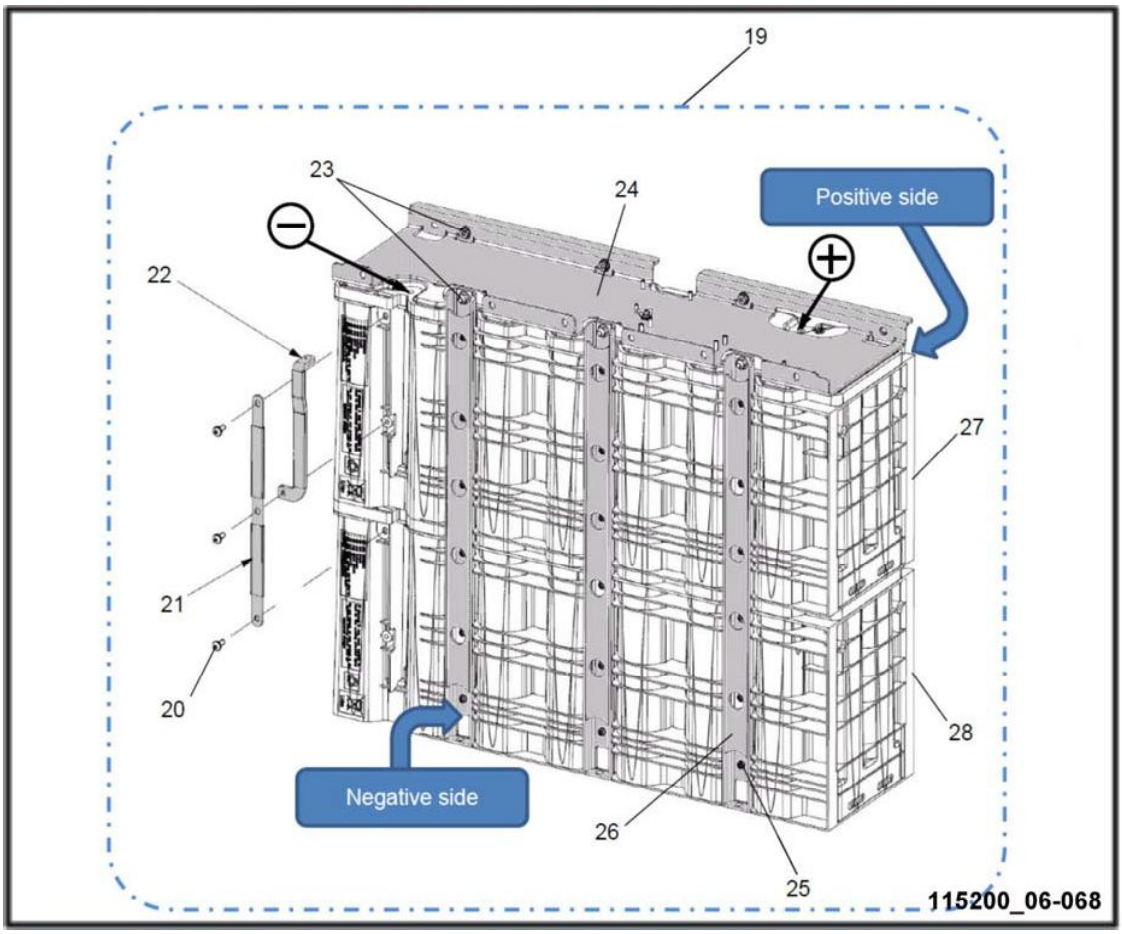
- Check that the box is not damaged.
- On the opening of the power pack, check that the holes intended for rivets are all cylindrical.

NOTE

If the box is damaged or if the holes (rivets) are not cylindrical, the box should not be used, so use another box.

- Clean the box with a suction system (no dust on the metal parts).
- Also clean around the opening of the power pack (around the seal of the side cover).

1) Reassembling the power pack:



- Place the upper module (27) on the lower module (28).
- On the two sides (positive and negative), position the seven reinforcements (26) and then screw in the reinforcement screws (25) (tightening torque: **3.5 Nm**).
- Place the reinforced plate (24) on the modules and then screw in the seven nuts of the reinforced plate (23) (tightening torque: **10 Nm**).
- On the two sides (positive and negative), position the rigid power connections (21 & 22) and then screw in the rigid connection screws (20) (tightening torque: **4 Nm**).

Status of lights:

Status	Meaning
OFF	Charger OFF Charger initialising Starting sequence
GREEN	Battery charged
ORANGE	Battery charging
RED	Battery warning (failure)
RED FLASHING	Battery alarm Charger alarm

If the light is flashing red, refer to the alarm codes described below:

Message	Meaning	Solution
MAX. TIME OVERRANGE ERROR CHARGER	Maximum charging time exceeded	Check the status of the battery (maximum charging time 780 minutes)
HIGH VOLTAGE ERROR CHARGER	High battery voltage	Check the battery status
INTERNAL TEMPERAT. ERROR CHARGER	Internal temperature of the charger is too high	Provide adequate air circulation Check that the internal FANS are operating correctly
ERROR BATTERY	Battery error The battery has encountered an unrecoverable error	Consult battery documentation
BATTERY ALARM	Battery alarm An alarm has occurred on the battery	Consult battery documentation
BATT. UNEXPECTED ERROR BATTERY	Incompatible battery man-ufacturer	Battery type and charger type are from different brands
MEASURE ERROR	Voltage (and/or) amperage readings incorrect	Contact the After-Sales Service Centre (maximum voltage tolerance 2 V, maximum current tolerance 5 A)

Electrical interface:

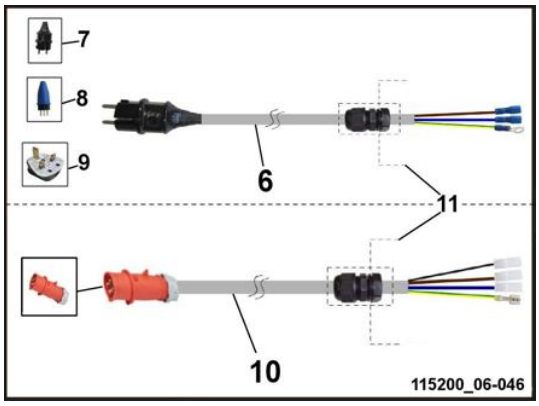
In single phase (6), the cable has three wires (phase, neutral, earth).

Three types of plug are compatible:

- EUR (Europe): 16 A (7)
- SUI (Switzerland): 16 A (8)
- UK (United Kingdom): 13 A (9)

In three phase (10), the cable has four or five wires (phase L1, phase L2, phase L3, neutral* and earth).

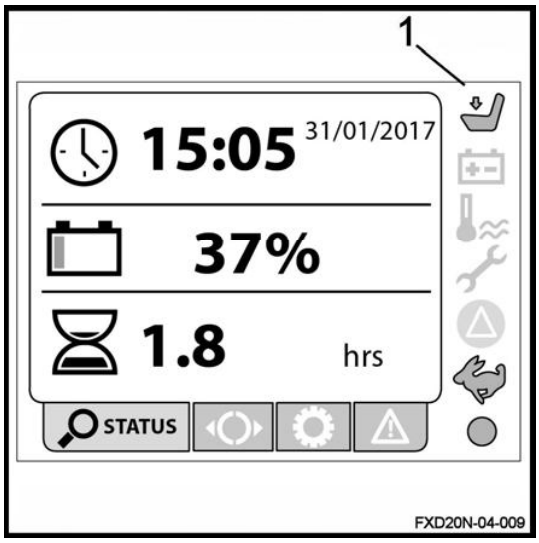
*: Not used and not connected



11 Inside the charger

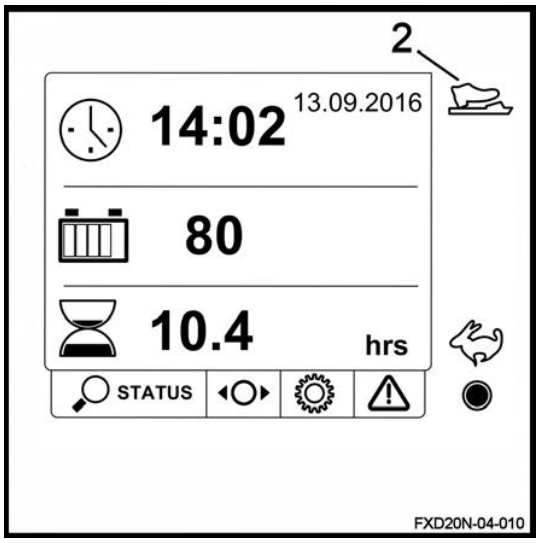
– Sit on the seat

The light indicating the **operator's presence on the seat** (1) is replaced by the light indicating the **operator's presence on the pedal** (2), which flashes.



– Press the operator presence pedal with your left foot

The light indicating the **operator's presence on the pedal** (2) remains continuously illuminated for two seconds and then goes out.



Managing battery charging

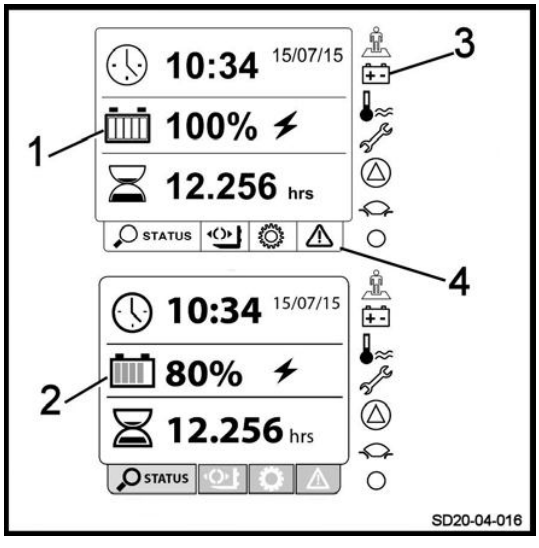
The operating unit shows the battery charge level.

The operator can refer to the battery icon (1) or (2).

The number of bars shown indicates the battery charge level.

- From 0 to 20%: 1 bar
- From 21 to 40%: 2 bars
- From 41 to 60%: 3 bars
- From 61 to 80%: 4 bars
- From 81 to 100%: 5 bars

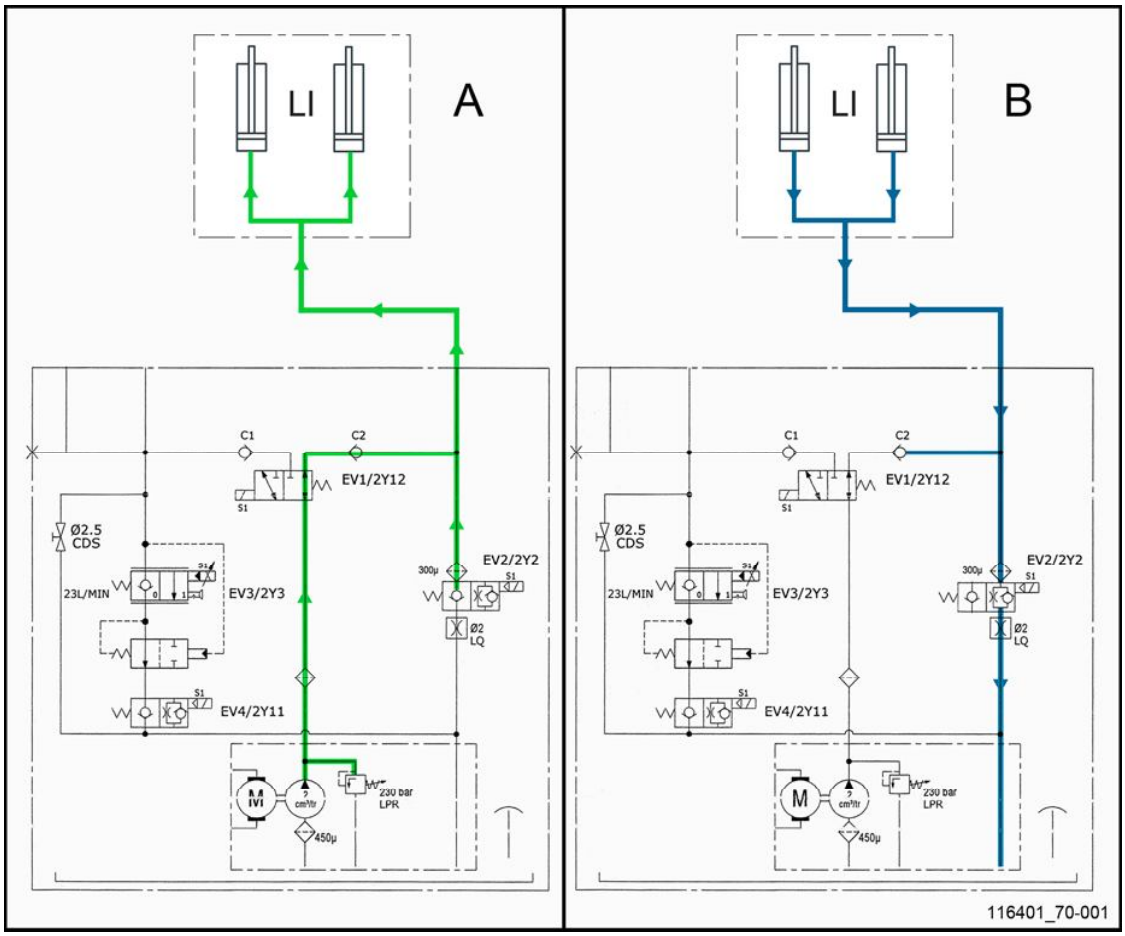
The **battery** light (3) comes on in the event of a deep discharge of the battery or in the event of a fault.



Hydraulic system

Initial Lift operation flow chart

Initial lift lifting and lowering phases



A	Lifting the load arms	2Y2	Initial lift lowering solenoid valve
B	Lowering the load arms	2Y3	Proportional solenoid valve
LI	Initial lift (LI) cylinders	2Y11	Load retaining solenoid valve
2M1	Lifting motor + pump	2Y12	Needle solenoid valve (main lift/initial lift)

Summary table

Condition	2M1	2Y2	2Y12
Lifting the load arms	1	0	0
Lowering the load arms	0	1	0