

EJE 114/116/118/120/114i/116i/118i

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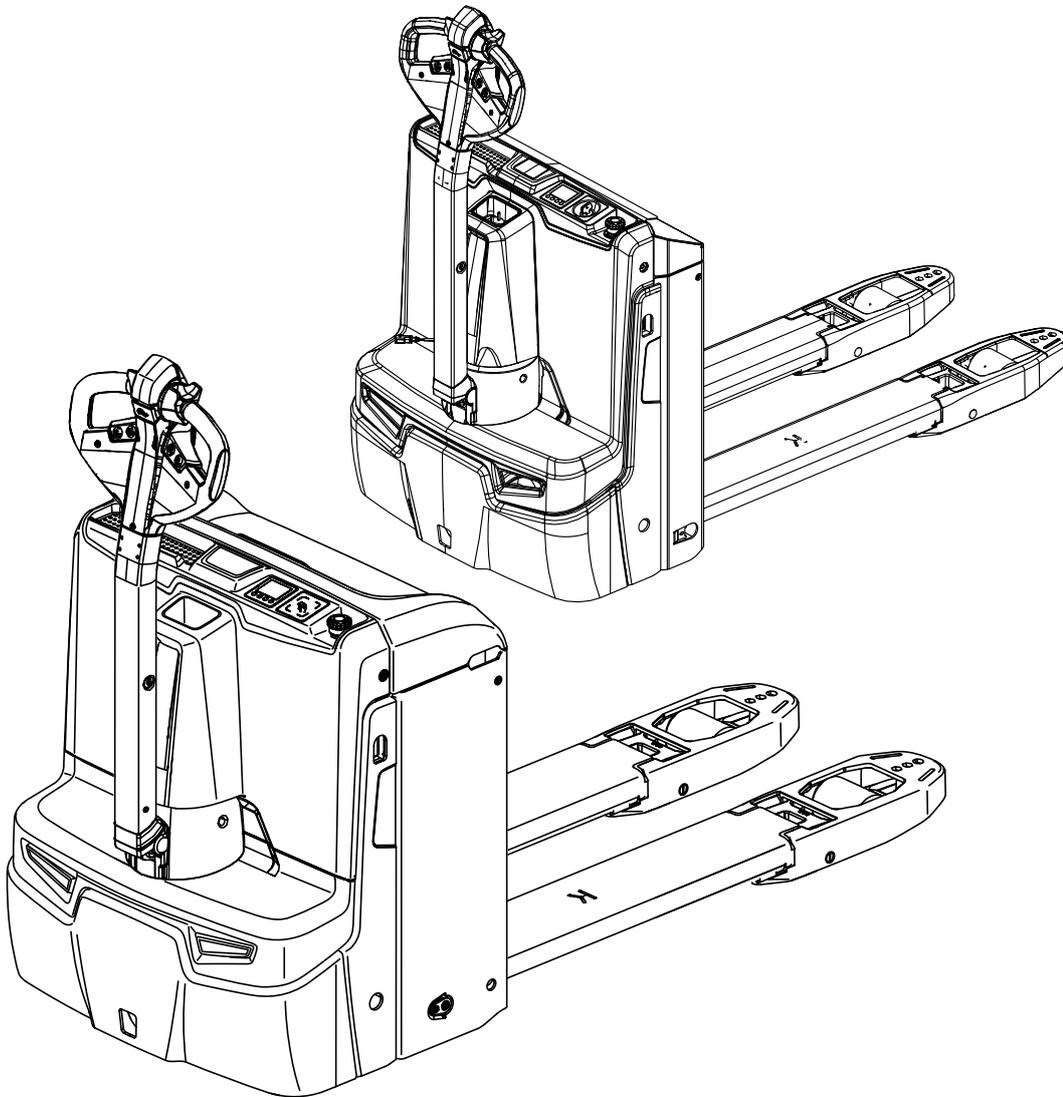
Operating instructions

en-GB

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EJE 114
EJE 116
EJE 118
EJE 120
EJE 114i
EJE 116i
EJE 118i



**JUNGHEINRICH**

Declaration of Conformity



Manufacturer

Jungheinrich AG, 22039 Hamburg, Germany

Description Industrial truck

Type	Option	Serial no.	Year of manufacture
EJE 114 EJE 116 EJE 118 EJE 120 EJE 114i EJE 116i EJE 118i			

On behalf of

Date

EU DECLARATION OF CONFORMITY

The undersigned hereby declare that the powered truck described in detail complies with the current versions of European Directives 2006/42/EG (Machinery Directive) and 2014/30/EU (Electromagnetic Compatibility - EMC). The manufacturer is authorised to compile the technical file.

Declaration of Conformity (○)

Product: EJE 114/116/118/120/114i/116i/118i
Serial number/type number

Manufacturer: Jungheinrich Aktiengesellschaft
22039 Hamburg, Germany

UK representative: Jungheinrich UK Ltd
Sherbourne House
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Authorised to compile documentation:

The manufacturer is authorised to compile the technical documentation and its representative is authorised to make documentation available upon reasoned request for a period of at least 10 years from the date of first placement of the product on the UK market.

The manufacturer bears sole responsibility for issuance of this Declaration of Conformity.

The subject of the Declaration as outlined above satisfies the applicable UK legislation:

Supply of Machinery (Safety) Regulations 2008 No. 1597

and

Electromagnetic Compatibility Regulations 2016 No. 1091

Signed for and on behalf of:

Jungheinrich Aktiengesellschaft

Foreword

Notes on the operating instructions

The present ORIGINAL OPERATING INSTRUCTIONS are designed to provide sufficient instruction for the safe operation of the industrial truck. The information is provided clearly and concisely. The chapters are arranged by letter and the pages are numbered continuously.

The operator manual details different industrial truck models. When operating and servicing the industrial truck, make sure that the particular section applies to your truck model.

Our trucks are subject to ongoing development. We reserve the right to alter the design, equipment and technical features of the system. No guarantee of particular features of the truck should therefore be assumed from the present operating instructions.

Safety notices and text mark-ups

Safety instructions and important explanations are indicated by the following graphics:

⚠ DANGER!

Indicates an extremely hazardous situation. Failure to comply with this instruction will result in severe irreparable injury and even death.

⚠ WARNING!

Indicates an extremely hazardous situation. Failure to comply with this instruction may result in severe irreparable injury and even death.

⚠ CAUTION!

Indicates a hazardous situation. Failure to comply with this instruction may result in slight to medium injury.

NOTICE

Indicates a material hazard. Failure to comply with this instruction may result in material damage.

 Used before notices and explanations.

	Indicates standard equipment
	Indicates optional equipment

Copyright

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Contents

A	Correct Use and Application	11
1	General	11
2	Correct application	11
3	Approved application conditions	12
3.1	Application area	12
3.2	Instructions for trucks with lithium-ion batteries	13
3.3	Internal Operation Combined with Brief External or Cold Store Operation (●)	14
3.4	Internal Operation in Cold Stores with Cold Store Equipment (○)	15
3.5	Wind loads	16
4	Proprietor responsibilities	17
5	Adding attachments and/or accessories	17
6	Removal of components	17
B	Truck Description	19
1	Application	19
1.1	Truck models and rated capacity	19
2	Travel direction definition	20
3	Assembly description	21
3.1	Assembly Overview	21
3.2	Keyless Access System	22
3.3	Overview of optional components	23
4	Functional Description	25
4.1	General description	25
4.2	Protective and safety equipment	26
4.3	Assistance systems	27
5	Technical Specifications	29
5.1	Performance data	29
5.2	Gradeability	29
5.3	Dimensions	30
5.4	Weights	33
5.5	Tyre type	33
5.6	On-Board Charger	33
5.7	Laws, standards and guidelines	34
5.8	Specifications according to RED guideline (Radio Equipment Directive) for radio units	35
5.9	Electrical Requirements	36
5.10	Safety of trucks	36
6	Identification Points and Data Plates	37
6.1	Indication Points	37
6.2	Data plate	38
6.3	Truck capacity plate	39
C	Transport and Commissioning	41
1	Lifting by crane	41
2	Transport	43
3	Using the Truck for the First Time	44

D	Battery - Servicing, Recharging, Replacement.....	45
1	Notes on Battery Technologies.....	45
2	Replaceable lead-acid and lithium-ion batteries.....	46
2.1	Safety instructions for handling lead-acid batteries.....	46
2.2	Battery types.....	48
2.3	Exposing the battery.....	51
2.4	Charging the battery.....	53
2.5	Removing or installing the battery.....	64
3	Integrated Modular Lithium-Ion Battery.....	70
3.1	Notes on Lithium-Ion Batteries.....	70
3.2	Safety regulations for handling lithium-ion batteries.....	71
3.3	Battery data plate.....	77
3.4	Battery types.....	80
3.5	Usability depending on the battery cell temperature.....	80
3.6	Exposing the battery.....	80
3.7	Charging the battery.....	81
E	Operation.....	87
1	Safety Regulations for the Operation of Forklift Trucks.....	87
2	Displays and Controls.....	89
2.1	Charge Status Indicator.....	93
2.2	Battery discharge monitor.....	93
3	Starting up the truck.....	95
3.1	Checks and operations to be performed before starting daily operation.....	95
3.2	Preparing the truck for operation.....	96
3.3	Visual inspections and activities to be performed after establishing operational readiness.....	98
3.4	Parking the truck securely.....	99
4	Working with the truck.....	101
4.1	Safety regulations for travel mode.....	101
4.2	Emergency Disconnect.....	105
4.3	Automatic braking.....	106
4.4	Travel.....	107
4.5	Changing the direction of travel.....	109
4.6	Slow travel.....	110
4.7	Steering.....	111
4.8	Brakes.....	112
4.9	Lifting, transporting and depositing loads.....	114
5	Troubleshooting.....	119
5.1	Truck does not start.....	119
5.2	Load cannot be lifted.....	121
5.3	Lithium-ion battery fault.....	122
6	Emergency recovery of the truck.....	125
6.1	Releasing the Drive-Wheel Brake without a GF60 Service Key.....	126
6.2	Releasing the drive wheel brake with a service key GF60.....	127
7	Optional Equipment.....	129
7.1	Display unit (2 inch display).....	129
7.2	Keyless Access System.....	135
7.3	General Information about the Use of Keyless Access Systems.....	136
7.4	Commissioning the keypad and the transponder reader.....	136
7.5	Using the Display:.....	139

7.6	Using the Keypad.....	144
7.7	Operating the transponder reader.....	149
7.8	Foot Protection Tiller.....	154
7.9	Fleet Management System.....	155
7.10	Parameters.....	155
F	Truck maintenance.....	157
1	Spare Parts.....	157
2	Operational Safety and Environmental Protection.....	157
3	Maintenance Safety Regulations.....	159
3.1	Welding.....	159
3.2	Working on the electrical system.....	159
3.3	Consumables and used parts.....	160
3.4	Wheels.....	161
3.5	Hydraulic system.....	161
3.6	Energy saving components.....	162
4	Lubricants and Lubrication Schedule.....	163
4.1	Handling consumables safely.....	163
4.2	Lubrication Schedule.....	165
4.3	Consumables.....	166
5	Maintenance and repairs.....	167
5.1	Preparing the truck for maintenance and repair work.....	167
5.2	Disassembling or assembling the front panel.....	168
5.3	Disassembling or assembling the drive panel.....	169
5.4	Lifting and jacking up the truck safely.....	170
5.5	Cleaning.....	173
5.6	Checking the hydraulic oil level.....	174
5.7	Checking the attachment and wear of the wheels.....	176
5.8	Check the distance of the fixed support wheels.....	177
5.9	Checking the electrical fuses.....	178
5.10	Restoring the truck to service after maintenance and repairs.....	179
6	Decommissioning the industrial truck.....	180
6.1	Prior to decommissioning.....	180
6.2	Action to be taken during decommissioning.....	180
6.3	Restoring the truck to service after decommissioning.....	181
7	Safety tests to be performed at intervals and after unusual incidents.....	181
8	Final de-commissioning, disposal.....	181
9	Human vibration measurement.....	181
G	Maintenance, Inspection and Changing of Maintenance Parts Requiring Replacement.....	183
1	Maintenance Contents EJE 114/ 116/118/ 120/ 120US.....	183
1.1	Owner.....	183
1.2	Customer Service.....	185
2	Maintenance Contents EJE 114 Li-Ion EJE 116 Lilon EJE 118 Li-Ion.....	190
2.1	Owner.....	190
2.2	Customer Service.....	191

A Correct Use and Application

1 General

The truck must be used, operated and serviced in accordance with these operating instructions. All other types of use are beyond its scope of application and may result in damage to persons, material assets and/or the truck.

2 Correct application

NOTICE

The maximum load and load distance are indicated on the capacity plate and must not be exceeded.

The load must rest on the load handler.

The load must be fully raised, see page 114.

The following operations are in accordance with regulations and are permitted:

- Lifting and lowering loads.
- Storing and retrieving loads.
- Transporting raised loads.

The following operations are prohibited:

- Carrying and lifting passengers.
- Pushing or pulling loads.

3 Approved application conditions

3.1 Application area

WARNING!

Use under extreme conditions

Using the truck under extreme conditions can result in malfunctions and accidents.

- ▶ Special equipment and authorisation are required if the truck is to be constantly used in extreme conditions, especially in dusty or corrosive atmospheres.
 - ▶ The truck cannot be used in areas at risk of explosion.
 - ▶ In adverse weather conditions (thunder, lightning) the industrial truck must not be operated outside or in endangered areas.
-

Changing the application areas and thawing

- The application areas can be changed, but in general this should be minimised due to thawing and possible corrosion.
- Thawing is permissible only if the truck can be subsequently dried thoroughly.

 Special equipment and authorisation are required if the truck is to be used continually in conditions of extreme temperature fluctuations or condensing air humidity.

- Operation in industrial and commercial environments.
- Operation only on secure, level surfaces with sufficient capacity.
- Do not exceed the permissible surface and point load limits on the travel routes.
- Operation only on routes that are visible and approved by the operating company.
- Read the instructions in these operating instructions before travelling on slopes and inclines:
 - Truck gradeability – see page 29.
 - Notes on travelling on slopes and inclines – see page 101.

Ground conditions

The condition of the ground on which the truck is used must satisfy the following requirements:

- The ground must be level, secure and have sufficient capacity.
- The ground must be free from oil and grease.
- In accordance with EN 1081, the earthing resistance of the ground must not exceed 1 MΩ.

3.2 Instructions for trucks with lithium-ion batteries

WARNING!

Danger of accidents due to regenerative braking fault

Regenerative braking faults can result in extended stopping distances and accidents, particularly when travelling on inclines. Other persons can be injured in the truck's hazardous area.

- ▶ Keep all persons out of the hazardous area during travel operations.
 - ▶ Instruct other people to move out of the hazardous area of the truck. Stop working with the truck if people do not leave the hazardous area.
 - ▶ In emergencies, use the service brake for braking.
-

Equipping the truck with a lithium-ion battery can affect the permissible operating conditions. The operating conditions of the truck and the various battery types are listed in this section.

- Travel and hydraulic functions: The usable battery capacity and power are reduced at low temperatures. If the lithium-ion battery is in the low-temperature range, the lift function may be impaired and regenerative braking with the coasting brake may not function correctly.
- High and low ambient temperatures increase the charging time of the lithium-ion battery.
- The permissible application range of the lithium-ion battery does not increase the permissible application range of the truck.

 A notification symbol appears on the display unit when the temperature of the lithium-ion battery is outside the permissible range – see page 129.

3.3 Internal Operation Combined with Brief External or Cold Store Operation (●)

In addition to the permissible operating conditions in industrial and commercial environments, the truck can also be used in outdoor environments, cool stores and fresh food areas. Secure parking is only permissible indoors or in a cold store environment.

- Use in a cold store (below -10 °C) is prohibited.

3.3.1 Truck in General

Operating and ambient conditions	
Permissible temperature range	-10 °C to +40 °C
Temperature range for secure parking	+5 °C to +40 °C
Maximum relative air humidity	95% non-condensing

3.3.2 Lead-acid battery

Operating and ambient conditions	
Permissible temperature range	-10 °C to +40 °C
Minimum temperature for charging	+5 °C
Maximum relative air humidity	95% non-condensing

3.3.3 Integrated Modular Lithium-Ion Battery

Operating and ambient conditions	
Permissible temperature range	-10 °C to +40 °C
Minimum temperature for charging	+5 °C
Maximum relative air humidity	95% non-condensing

3.3.4 Case battery (25,7 V / 40 Ah)

Operating and ambient conditions	
Permissible temperature range	-10 °C to +40 °C
Minimum temperature for charging	+5 °C
Maximum relative air humidity	95% non-condensing

3.3.5 Replaceable Lithium-Ion Battery

- See the separate operating instructions for the lithium-ion battery.

3.4 Internal Operation in Cold Stores with Cold Store Equipment (○)

NOTICE

Cold store trucks

- ▶ Trucks designed for use in cold stores have a cold store hydraulic oil.
- ▶ If a truck with cold store oil is used outside the cold store, the lowering speeds may increase.

NOTICE

Battery damage at low state of charge and at low temperatures

A low state of charge and increasing cooling can damage the battery. To avoid damage, observe the following:

- ▶ If the battery charge is low, do **not** use the truck in temperatures from -28 °C to -5 °C.
- ▶ If the battery charge is low, avoid using the truck in temperatures from -5 °C to +5 °C **where possible**.
- ▶ Charge the battery – see page 53.

In addition to the permissible operating conditions in industrial and commercial environments, the truck remains primarily in cold stores. The truck should only leave the cold store briefly to hand over a load.

- In cold store areas below -10 °C, the truck must be operated **continuously** and must not be parked securely for more than 15 minutes.

3.4.1 Truck in General

Operating and ambient conditions	
Permissible temperature range	-28 °C to +25 °C
Temperature range for secure parking	+5 °C to +40 °C
Maximum relative air humidity	95% non-condensing

3.4.2 Lead-acid battery

Operating and ambient conditions	
Permissible temperature range	-28 °C to +25 °C
Minimum temperature for charging	+5 °C
Maximum relative air humidity	95% non-condensing

3.4.3 Integrated Modular Lithium-Ion Battery

Operating and ambient conditions	
Permissible temperature range	-28 °C to +25 °C
Minimum temperature for charging	+5 °C
Maximum relative air humidity	95% non-condensing

3.4.4 Case battery (25,7 V / 40 Ah)

The battery is not authorised for use in cold stores.

3.4.5 Replaceable Lithium-Ion Battery

→ See the separate operating instructions for the lithium-ion battery.

3.5 Wind loads

Wind forces can affect the stability of a truck when lifting, lowering and transporting loads with large surface areas.

Light loads must be especially secured when they are subjected to wind forces. This will prevent the load from sliding or falling.

Stop the truck in both cases.

4 Proprietor responsibilities

For the purposes of the present operating instructions the “operating company” is defined as any natural or legal person who either uses the industrial truck himself, or on whose behalf it is used. In special cases (e.g. leasing or renting) the proprietor is considered the person who, in accordance with existing contractual agreements between the owner and user of the industrial truck, is charged with operational duties.

The proprietor must ensure that the industrial truck is used only for the purpose it is intended for and that danger to life and limb of the user and third parties are excluded. Furthermore, accident prevention regulations, safety regulations and operating, servicing and repair guidelines must be followed. The operating company must ensure that all users have read and understood these operating instructions.

NOTICE

Failure to comply with the operating instructions invalidates the warranty. The same applies if improper work is carried out on the truck by the customer or third parties without the permission of the manufacturer.

5 Adding attachments and/or accessories

The mounting or installation of additional equipment which affects or enhances the performance of the industrial truck requires the written permission of the manufacturer. Local authority approval may also need to be obtained.

Local authority approval however does not constitute the manufacturer’s approval.

6 Removal of components

It is forbidden to modify or remove truck components, particularly protective and safety equipment.

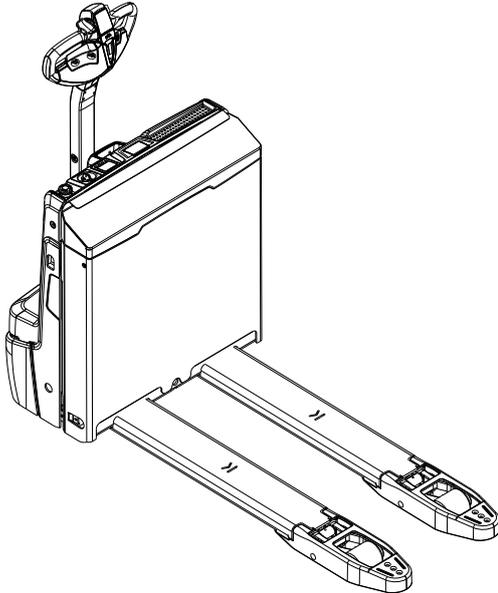
→ If in doubt, contact the manufacturer's customer service department.

B Truck Description

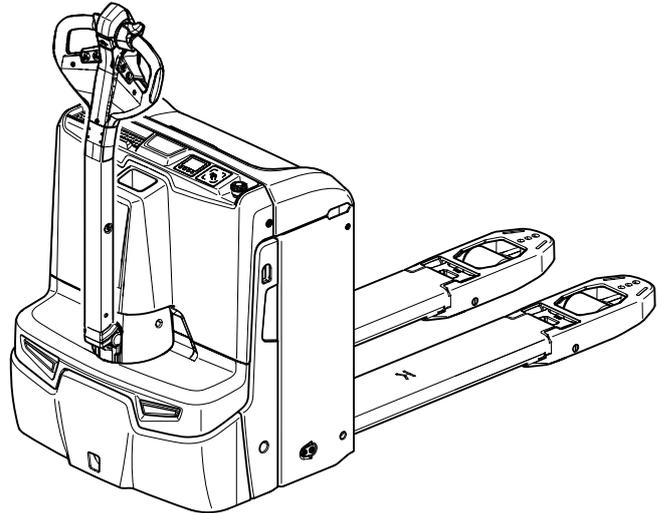
1 Application

The EJE/EJEi is designed to transport goods on level surfaces. It can lift open-bottom or stringer-board pallets beyond the area above the load wheels, as well as roll cages. The capacity is shown on the capacity plate, Qmax.

Battery compartment XS



Battery compartment S, M, L



1.1 Truck models and rated capacity

The rated capacity depends on the model. The rated capacity can be derived from the model name.

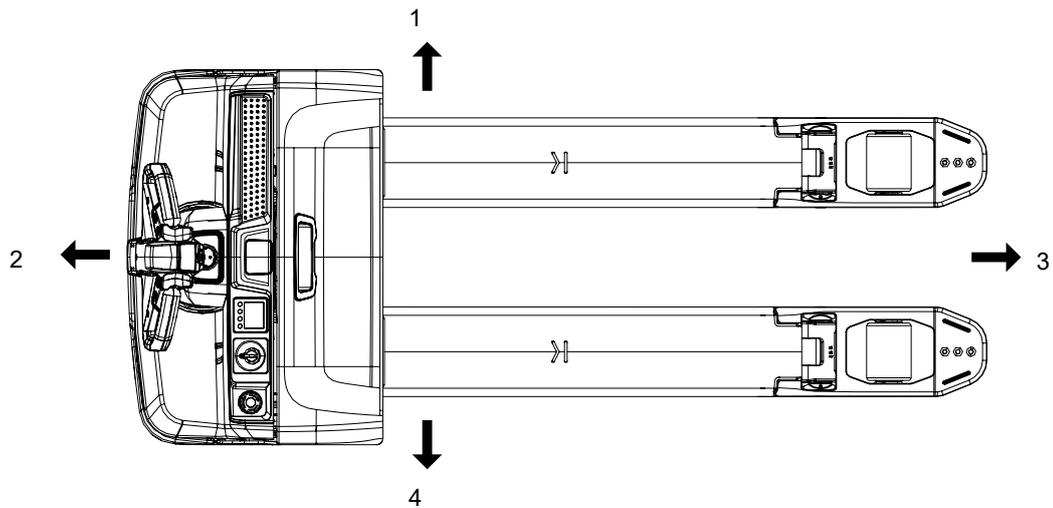
EJE 114i

EJE	Type designation
1	Series
14	Rated capacity x 100
i	Lithium-ion battery

The rated capacity is not generally the same as the permissible capacity. The capacity can be found on the capacity plate attached to the truck.

2 Travel direction definition

The following determinations have been made for travel direction specification:

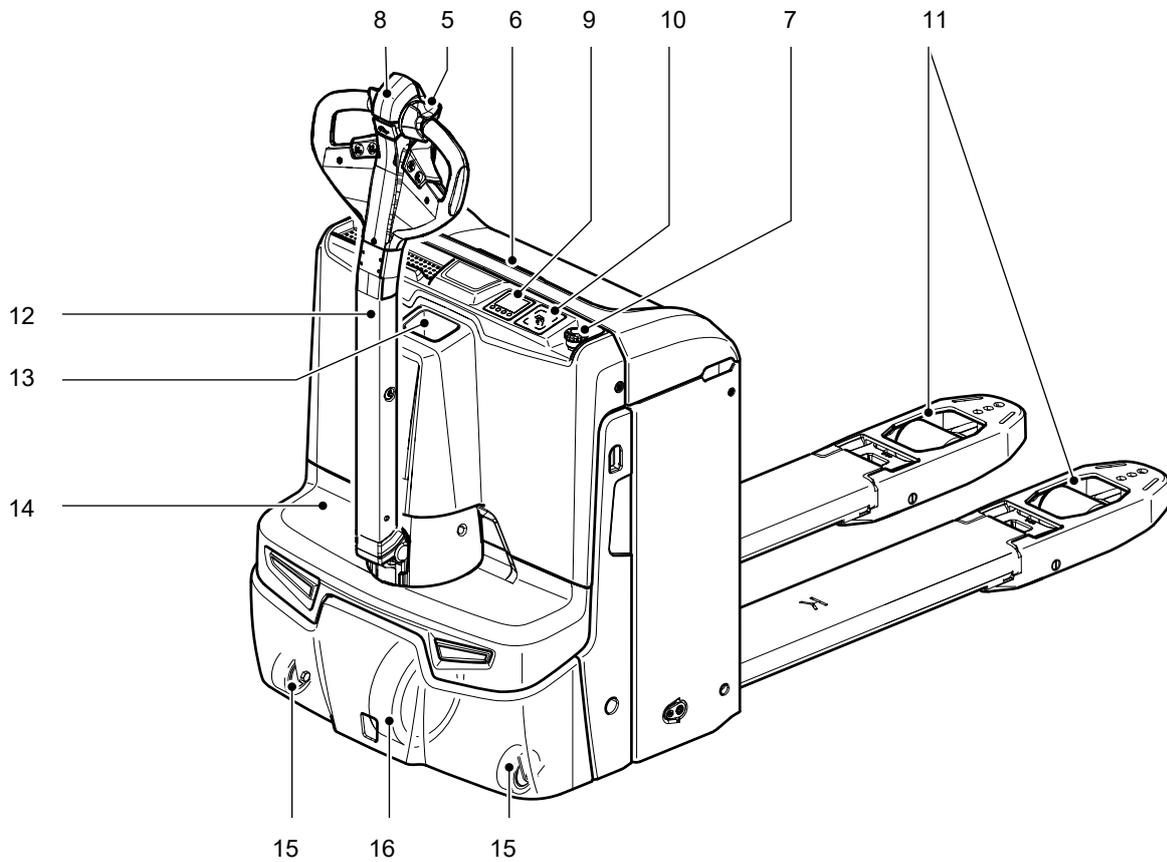


Item	Description
1	Left
2	Drive direction
3	Load direction
4	Right

3 Assembly description

3.1 Assembly Overview

→ The graphic shows the EJE 120 as an example.



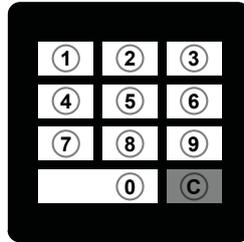
Item		Description
5	●	Travel switch
6	●	Battery panel
7	●	Emergency disconnect switch
8	●	Collision safety switch
9	●	Charge status indicator Alternatively at this position: – Display unit with 2-inch display (○)
10	●	Key switch Alternatively at this position: – Keypad (○) – Transponder reader (○) – Transponder reader Plus (○)
11	●	Load handler
12	●	Tiller

Item		Description
13	<input type="radio"/>	Mains plug for the on-board charger
14	<input checked="" type="radio"/>	Front panel
15	<input checked="" type="radio"/>	Support wheel
16	<input checked="" type="radio"/>	Drive wheel

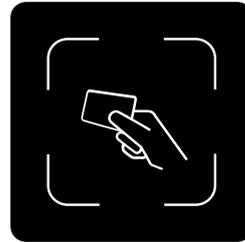
3.2 Keyless Access System



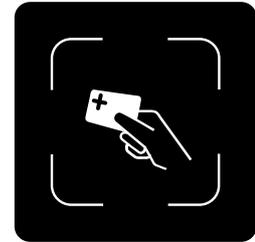
20



17



18

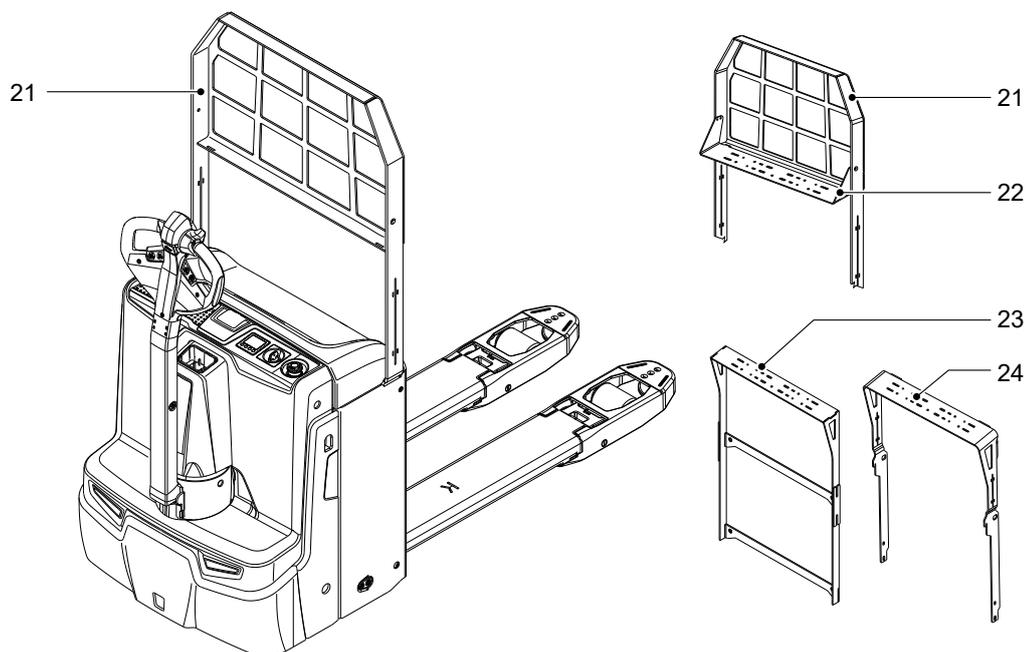


19

Item		Description
17	<input type="radio"/>	Keypad
18	<input type="radio"/>	Transponder reader
19	<input type="radio"/>	Transponder reader Plus
20	<input type="radio"/>	Display unit with 2-inch display

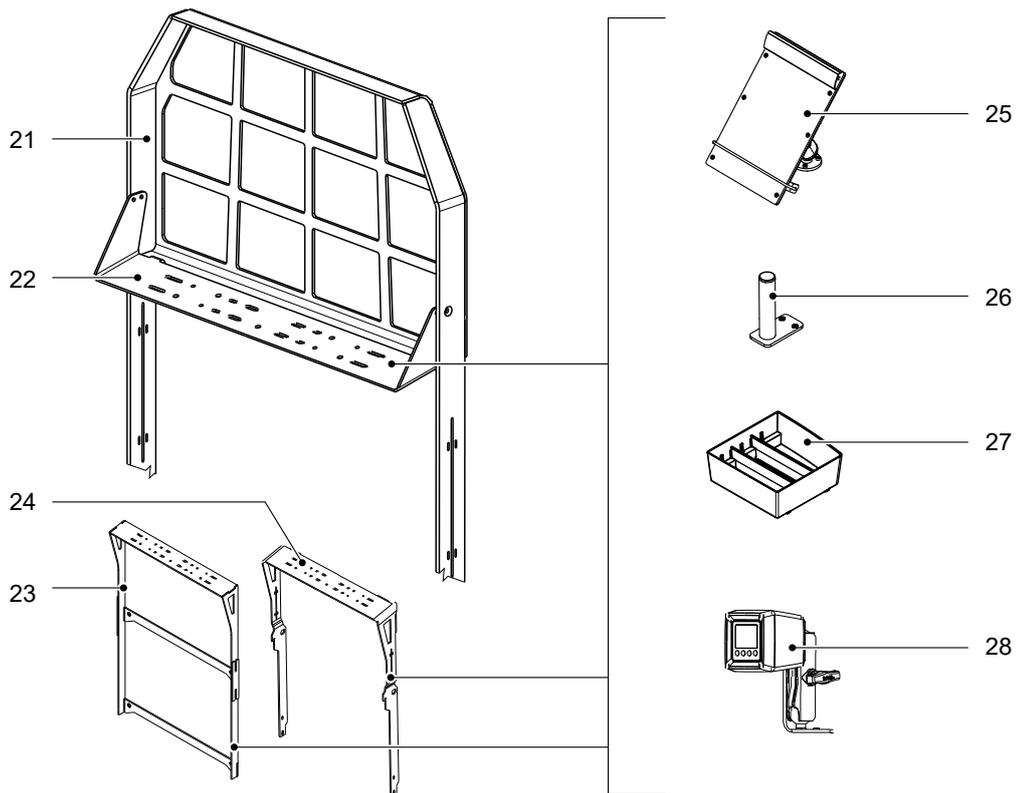
3.3 Overview of optional components

Load backrest and options bracket



Item		Description
21	<input type="radio"/>	Load backrest
22	<input type="radio"/>	Options bracket on the load backrest
23	<input type="radio"/>	Options bracket for lateral battery removal
24	<input type="radio"/>	Options bracket for battery removal upwards

Options bracket



Item		Designation
21	○	Load backrest
22	○	Options bracket on the load backrest
23	○	Options bracket for lateral battery removal
24	○	Options bracket for battery removal upwards
25	○	Writing board (right and left position)
26	○	Shrink wrap holder (right and left position)
27	○	Storage box with magnets (right and left position)
28	○	Pre-Op Check display unit

4 Functional Description

4.1 General description

Drive system

A fixed AC three-phase motor actuates the drive wheel via a transmission. The electronic traction controller ensures stepless speed regulation of the drive motor and hence smooth starting, powerful acceleration, and electronically controlled braking with energy recovery.

All trucks in the EJE series are supplied with a preset travel program ex works. The information in the "Performance data" section (see page 29) relates to travel program 2.

Travel programs

There are three travel programs with preset accelerations and travel speeds:

- Travel program 1 (slow), medium acceleration
- Travel program 2 (medium), medium acceleration
- Travel program 3 (fast), high acceleration

The following options are available when selecting the travel program:

- The industrial truck always starts with the last travel program set. The operator can switch between the travel programs on the display unit (●).
- The industrial truck always starts with the set travel program 1, 2 or 3. The operator can switch between the travel programs on the display unit (○).
- The industrial truck always starts with a preset travel program. The option to change the travel program is disabled. (○).

ECO mode

In ECO mode, the speed and acceleration of travel program 1 are reduced.

- The default setting can be changed by the manufacturer's customer service department.

Electrical system

The truck has an electronic traction controller. The truck electrical system operates with a rated operating voltage of 24 V.

Steering

The driver steers with an ergonomic tiller. The drive system can be pivoted +/- 90°.

Hydraulic system

Pressing the "Lift" button starts the pump unit, supplying hydraulic oil from the oil reservoir to the lift cylinder. The load handler is raised at even speed. Pressing the "Lower" button lowers the load handler.

Controls and displays

The charge status indicator shows the available battery capacity. The optional display unit shows the operator key information such as the travel program, service hours, remaining run time, battery capacity and event messages.

Hour meter

Service hours are counted while the truck is operational and one of the following controls is actuated:

- Tiller in travel zone "F", see page 107.
- "Slow travel button", see page 110.
- Button for lifting or lowering the load handler, see page 114.

Energy-saving function (○)

The energy-saving function includes automatic cut-out of the industrial truck after 5 minutes of inactivity. This value can be changed by the manufacturer's customer service department within a range of 1 to 30 minutes.

Load backrest (○)

The truck is equipped with a load backrest as an additional safety device when moving low or small item loads. The load backrest is mounted on the load frame and protects the operator and truck against falling loads.

- The load backrest forms part of the protective and safety equipment. A fitted load backrest must not be removed. Trucks designed for use with a load backrest must not be operated without the load backrest in place.

Operator position

All travel and lift operations can be performed without having to reach.

Pre-Op Check (○)

Pre-Op Check allows the operator to perform and log a digitally guided status check for the industrial truck.

Pre-Op Check is an option of the Jungheinrich Fleet Management System (JH FMS) and can be used only in combination with this system.

- For further information on the Pre-Op Check, see the "Jungheinrich Fleet Management System" operating instructions.

4.2 Protective and safety equipment

⚠ CAUTION!

Automatic braking can cause accidents

If the truck detects that signals which are required have not been received, or if it detects an error, the system reacts by triggering an emergency stop, either by braking the truck to a halt or until a valid signal status has been reached.

- ▶ Remain at a suitable distance from the truck during operation.

Truck contour

An enclosed, smooth truck perimeter with rounded edges ensures safe handling of the truck. The wheels are surrounded by a solid skirt offering collision protection.

- The truck contour must not be changed. Contact the manufacturer's customer service department, if necessary.

Automatic reset of the travel switch

After releasing the travel switch, it automatically returns to the neutral position (0) and the truck brakes.

Automatic reset of the tiller

When released, a gas pressure spring pushes the tiller up and activates braking see page 106.

Automatic reset of the lift/lower button

After releasing the button for lifting or lowering, it automatically returns to the neutral position (0) and the load-section movement is stopped.

Collision safety switch

The collision safety switch changes the travel direction if the truck comes into contact with a person. The truck brakes, travels away from the operator and stops. This prevents the truck driving into the operator.

Emergency disconnect switch

Activating the emergency disconnect switch disables all electrical functions in hazardous situations.

- Further information: see page 105.

Emergency stop safety concept

The emergency stop is activated by the traction controller. Each time the truck is switched on, the system carries out a self-diagnosis. If an error is detected, the truck automatically brakes to a halt. Event messages on the display unit indicate the emergency stop.

4.3 Assistance systems

Foot protection tiller (○)

The assistance system offers enhanced foot protection as the maximum travel speed is only enabled when the operator has moved the tiller by a sufficient amount. If the tiller is moved only a little, the travel speed is reduced – see page 107.

Slow travel with the forks lowered (○)

When the load handler is fully lowered, the travel speed is reduced to reduce the amount of wear on the load handler.

Roll-back protection on inclines (speedCONTROL)

If the truck does not have sufficient speed to travel up an incline, it may roll back. Rolling back is detected by the truck's controller and the truck brakes to a halt.

5 Technical Specifications

- Technical data specified in accordance with VDI 2198.
Technical modifications and additions reserved.
- The technical data of the battery is summarised in the battery section – see page 45.

5.1 Performance data

Description	EJE 114	EJE 116	EJE 118	EJE 120	
Rated capacity Q	1400	1600	1800	2000	kg
Travel speed with / without rated load	5.0 / 5.0	6.0 / 6.0			km/h
Lift speed with\without rated load	0.04/0.04 ¹⁾ \ 0.03/0.04	0.04 / 0.04		0.03 / 0.04	m/s
Lowering speed with\without rated load	0.05/0.04 ¹⁾ \ 0.04/0.04	0.05 / 0.04			m/s
Drive motor	0.9	1.1			kW
Lift motor	1.2				kW
Energy consumption in accordance with EN 16796	0.49	0.66	0.59 ¹⁾ / 0.62	0.7	kWh/h

¹⁾ Battery compartment XS

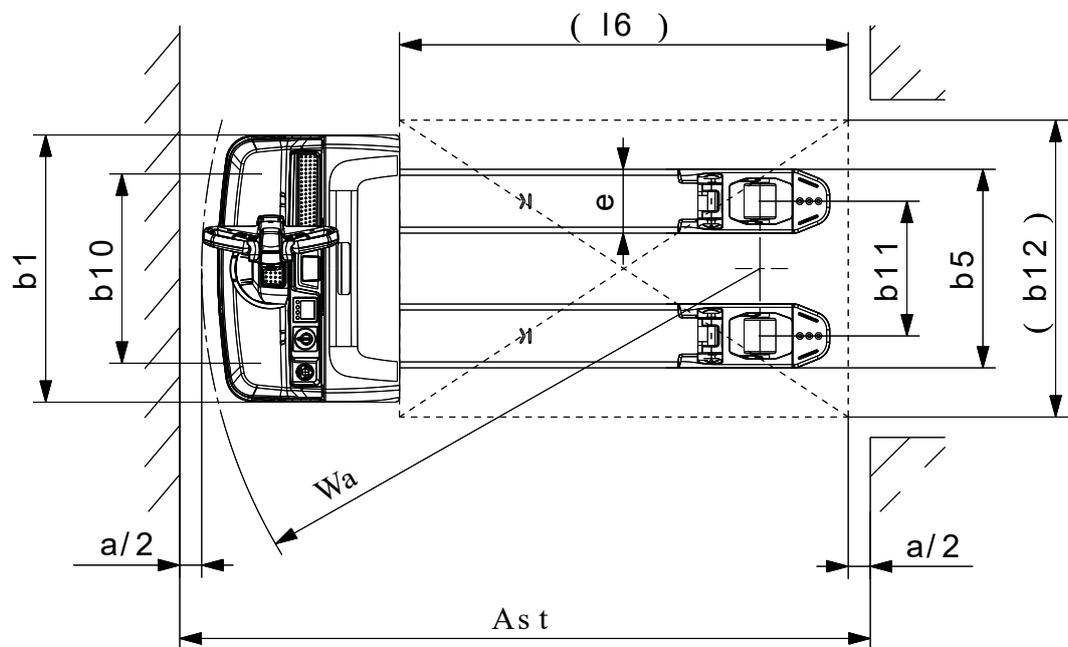
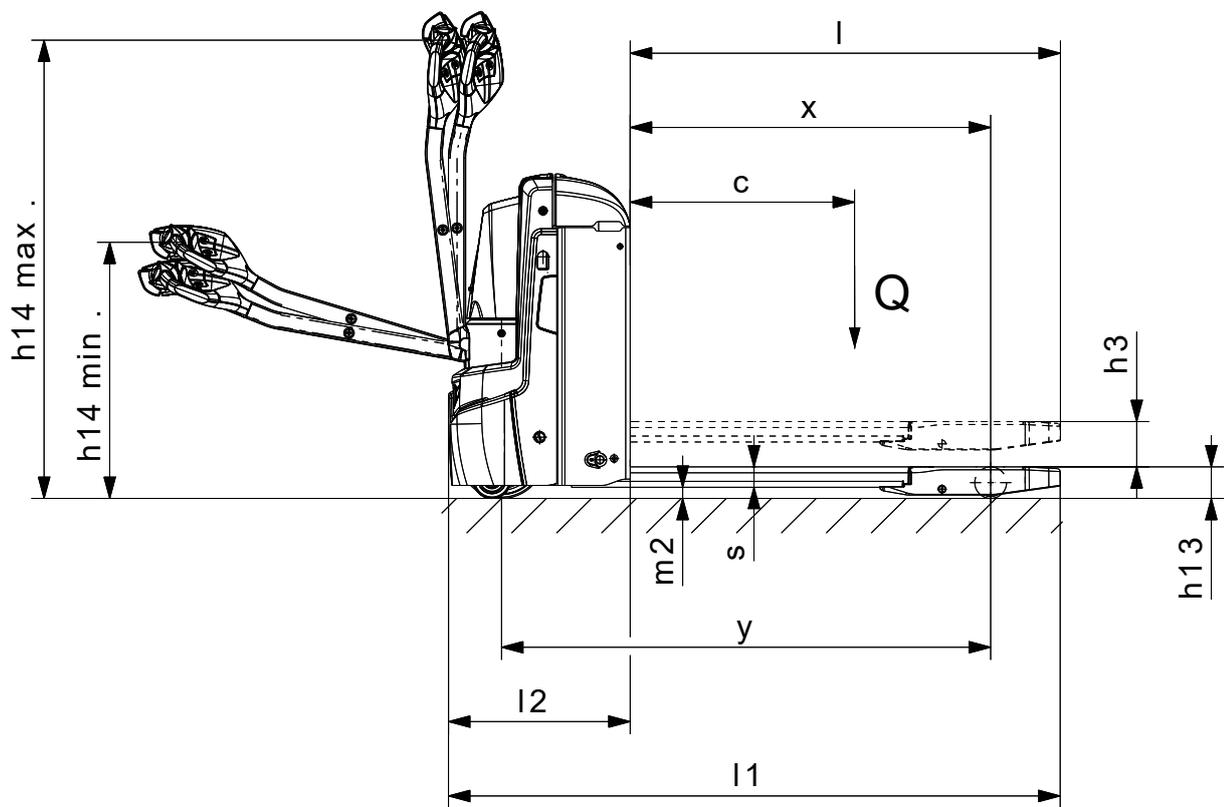
5.2 Gradeability

Load	EJE 114	EJE 116	EJE 118	EJE 120	
Empty journey	20				%
Transport run	8	8 ¹⁾ / 10	6 ¹⁾ / 9	8	%

¹⁾ Battery compartment XS

5.3 Dimensions

→ The graphic shows the EJE 120 as an example.



	Designation	EJE 114	EJE 116	EJE 118	EJE 120	
h3	Lift	122				mm
c	Load centre-distance for standard forklift length ¹⁾	600				mm
h13	Load handler lowered	85				mm
h14	Tiller height in the travel position min./max.	750/1237				mm
Y	Wheelbase (XS / S / M / L) ²⁾	1182 / 1252 / - / -	1182 / 1252 / 1321 ³⁾ / 1393 ³⁾		- / 1252 / 1321 ³⁾ / 1393 ³⁾	mm
I1	Overall length (XS / S / M / L) ³⁾	1566 / 1636 / - / -	1566 / 1636 / 1705 ³⁾ / 1777 ³⁾		- / 1636 / 1705 ³⁾ / 1777 ³⁾	mm
I2	Length including fork shank (XS / S / M / L)	416 / 486 / - / -	416 / 486 / 555 ³⁾ / 627 ³⁾		- / 486 / 555 ³⁾ / 627 ³⁾	mm
I	Standard forklift length	1150				mm
b1	Fork width	720				mm
b5	Width across forks	513	513 ⁶⁾ / 535		535	mm
b10	Track width, front	500 ⁷⁾ / 510	510			mm
b11	Track width, rear	363				mm
e	Fork width	150	150 ⁶⁾ / 172		172	mm
s	Fork-arm thickness	55				mm
m2	Ground clearance, centre of wheelbase	30				mm
x	Load distance ²⁾	908				mm
Wa	Turning radius (XS / S / M / L) ²⁾	1363 / 1433 / - / -	1363 / 1433 / 1502 ³⁾ / 1574 ³⁾		- / 1433 / 1502 ³⁾ / 1574 ³⁾	mm
Ast	Working aisle width, pallets 800x1200 length (XS / S / M / L) ⁵⁾	2058 / 2128 / - / -	2058 / 2128 / 2197 ³⁾ / 2269 ³⁾		- / 2128 / 2197 ³⁾ / 2269 ³⁾	mm
Ast	Aisle width with pallet 1000x1200 transversely (XS / S / M / L) ⁴⁾	2170 / 2240 / - / -	2170 / 2240 / 2309 / 2381 ³⁾		- / 2240 / 2309 ³⁾ / 2381 ³⁾	mm

¹⁾ For longer fork lengths, the load centre is in the centre of the forks.

²⁾ Load section lowered +56 mm

- 3) Side battery removal (SBE): M SBE = L; L SBE = L +53 mm
- 4) Load section lowered +50 mm
- 5) Load section lowered +25 mm
- 6) Battery compartment XS
- 7) Fixed support wheels

5.4 Weights

Designation	EJE 114	EJE 116	EJE 118	EJE 120	
Net weight (XS / S / M / L)	280 / 405 / - / -	280 / 420 / 498 / 576		- / 420 / 498 / 576	kg
Axle load, laden front/rear (XS \ S)	560/1120 \ 655/1150	600/1280 \ 695/1325	660/1420 \ 760/1460	- \ 785/1635	kg
Axle load without load front/rear (XS \ S)	220/60 \ 322/83	220/60 \ 331/89		- \ 331/89	kg

5.5 Tyre type

Description	EJE 114	EJE 116	EJE 118	EJE 120	
Tyre size, front	ø 230 x 70 ¹⁾				mm
Tyre size, rear – Single – Tandem – Triple	ø 85 x 95 ø 82 x 70 ø 82 x 35	ø 85 x 95 ²⁾ / ø 85 x 110 ø 82 x 70 ²⁾ / ø 85 x 85 ø 82 x 35 ²⁾ / ø 85 x 44		ø 85 x 110 ø 85 x 85 ø 85 x 44	mm
Additional wheels (dimensions)	ø 100 x 40				mm
Wheels number front/rear (x = driven)	1x + 2 / 2				

¹⁾ Bonded drive wheels (ø 230 x 65) (○) are subject to greater wear than drive wheels made of conventional tyre materials. Shorter replacement intervals may therefore be necessary.

²⁾ Battery compartment XS

5.6 On-Board Charger

Technical data	Value
Mains voltage	230 V (+15 %, -10 %)
Mains frequency	50 Hz - 60 Hz (+15 %, -10 %)

5.7 Laws, standards and guidelines

⚠ WARNING!

Damage to medical equipment due to non-ionising radiation

Electrical equipment on the truck emitting non-ionising radiation (e.g. wireless data transmission) can affect operators' medical equipment (pacemakers, hearing aids etc.) and result in malfunctions.

▶ Consult a doctor or the manufacturer of the medical equipment to clarify whether the medical equipment can be used near the industrial truck.

Continuous sound pressure level

– EJE 114/116/118/120/114i/116i/118i: 61 dB(A)

in accordance with EN 12053 as harmonised with ISO 4871.

- The continuous sound pressure level is calculated according to standard procedures and takes into account the sound pressure level when travelling, lifting and idling. The sound pressure level is measured at the operator's ear.
- Noise levels can fluctuate depending on the floor composition and wheel lining.

Electromagnetic compatibility (EMC)

The manufacturer confirms that the truck adheres to the limits for electromagnetic emissions and resistance as well as the static electricity discharge test in accordance with EN 12895 as well as the standardised instructions contained therein.

- No changes to electric or electronic components or their arrangement may be made without the written agreement of the manufacturer.

5.8 Specifications according to RED guideline (Radio Equipment Directive) for radio units

→ The table contains any components installed according to the European Directive 2014/53/EU. The table shows the affected frequency range and the emitted transmission power for each component.

Component	Frequency range	Transmission power
WMT 110	13.56 MHz	< 100 mW
WMT 110	2.4 GHz	10 mW
WMT 110	2.4 GHz (Bluetooth)	≤10 mW
WMT 110	2.4 GHz (WLAN)	≤100 mW
WMT 110	5 GHz	≤100 mW
WMT 115	2.4 GHz (Bluetooth)	≤10 mW
WMT 115	2.4 GHz (WLAN)	≤100 mW
WMT 115	5 GHz (WLAN)	≤100 mW
Transponder reader	13.56 MHz	< 100 mW
Transponder reader Plus	13.56 MHz	< 500 mW
Transponder reader Plus	125 kHz	< 500 mW
Transponder reader (EasyKey)	2.4 GHz	≤ 67,6 mW
Transponder reader (EasyKey)	5.8 GHz	≤ 66,1 mW
Battery module	2.4 GHz	< 10 mW
Telematics box basic 2G EU	2.4 GHz (Bluetooth)	< 20 mW
	900 MHz (2G)	< 2 W
	1800 MHz (2G)	< 1 W
Telematics box basic 3G/2G INT	2.4 GHz (Bluetooth)	< 20 mW
	850/ 900 MHz (2G)	< 2 W
	1800/ 1900 MHz (2G)	< 1 W
	800/ 850/ 900/ 1900/ 2100 MHz (3G)	< 250 mW
Telematics box basic 4G/2G EU	2.4 GHz (Bluetooth)	< 20 mW
	850/ 900 MHz (2G)	< 2 W
	1800/ 1900 MHz (2G)	< 1 W
	800/ 850/ 900/ 1900/ 2100 MHz (3G)	< 200 mW
Telematics box Plus 3G/2G INT	2.4 GHz (Bluetooth)	< 10 mW
	2.4 GHz (WLAN)	< 100 mW
	5 GHz (WLAN)	< 100 mW
	850/ 900 MHz (2G)	< 2 W
	1800/ 1900 MHz (2G)	< 1 W
	800/ 850/ 900/ 1900/ 2100 MHz (3G)	< 250 mW

Component	Frequency range	Transmission power
Telematics box plus 4G/2G EU	2.4 GHz (Bluetooth)	< 10 mW
	2.4 GHz (WLAN)	< 100 mW
	5 GHz (WLAN)	< 100 mW
	850/ 900 MHz (2G)	< 2 W
	1800/ 1900 MHz (2G)	< 1 W
	800/ 900/ 1800/ 2100 MHz (4G)	< 200 mW

5.9 Electrical Requirements

The manufacturer certifies compliance with the requirements for the design and manufacture of electrical equipment, according to EN 1175 "Industrial Truck Safety - Electrical Requirements", provided the truck is used according to its purpose.

5.10 Safety of trucks

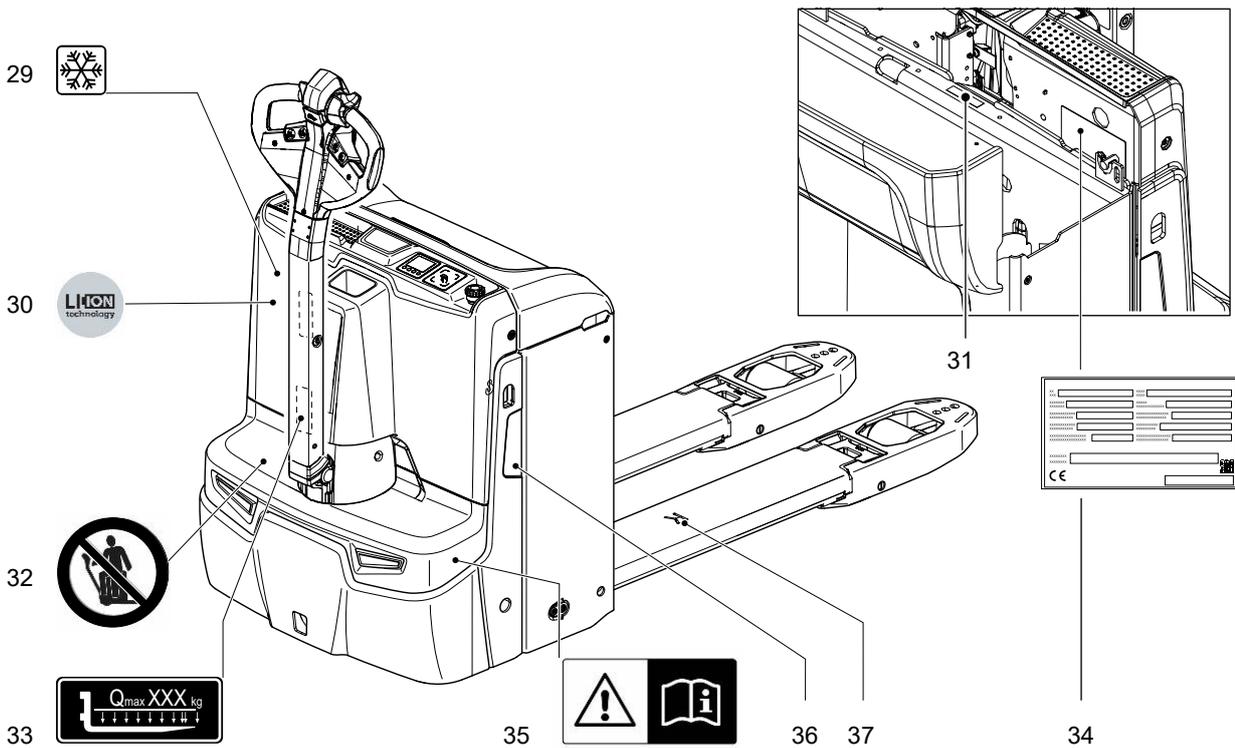
The manufacturer confirms adherence to the requirement for design and manufacture of the truck with regard to the safety requirements specific to intended use in accordance with EN ISO 3691-1.

6 Identification Points and Data Plates

- Warnings and notices such as capacity plates, attachment points and data plates must be legible at all times. Replace if necessary.

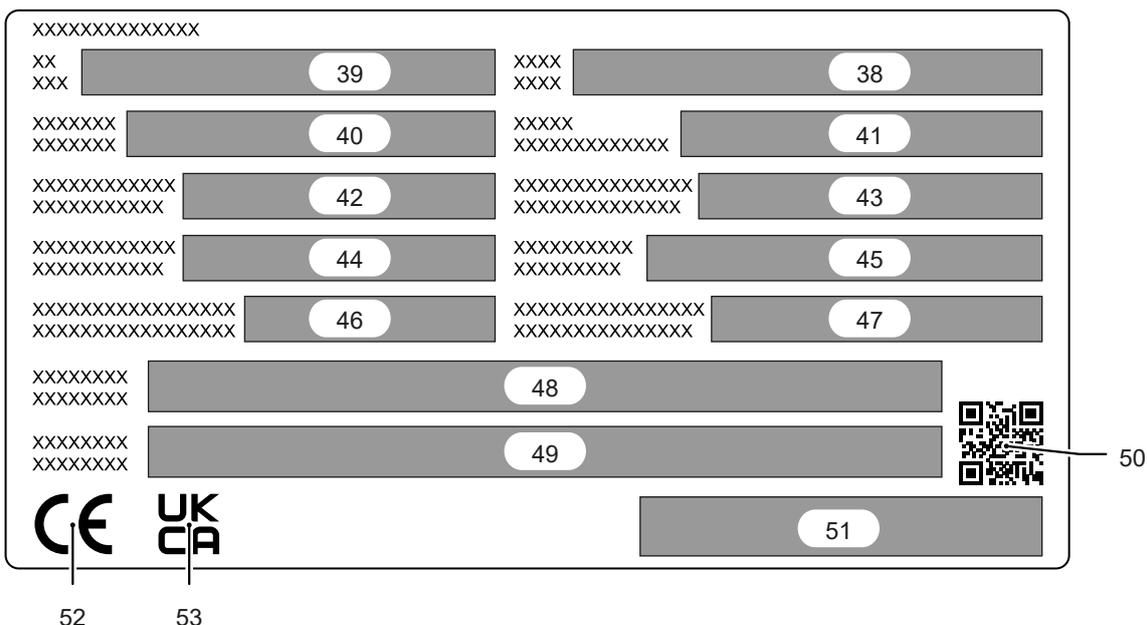
6.1 Indication Points

- The graphic shows the EJE 120 as an example.



Item	Description
29	"Cold store" plate (○)
30	Note on lithium-ion battery (○)
31	Serial number
32	Prohibition plate: "No passengers"
33	Capacity plate Q_{\max}
34	Data plate
35	"Observe the operating instructions" decal
36	Model description
37	Marking point for pallet angled entry

6.2 Data plate



Item	Description	Item	Description
38	Year of manufacture	46	Net weight without battery [kg]
39	Type	47	Min./max. battery weight [kg]
40	Serial number	48	Manufacturer
41	Option	49	Importer - imported by (○)
42	Rated capacity [kg]	50	QR code
43	Load centre distance [mm]	51	Manufacturer's logo
44	Battery voltage [V]	52	CE marking ¹⁾
45	Drive output [kW]	53	UKCA marking (○) ²⁾

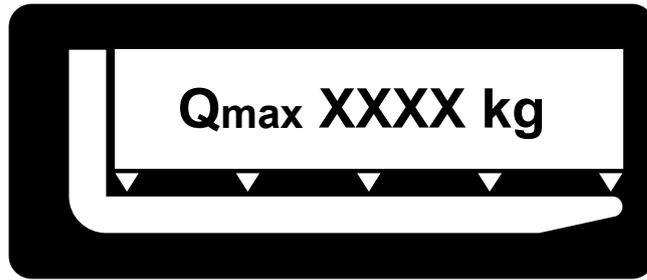
- For queries regarding the truck or when ordering spare parts, always quote the truck serial number (40).
- The illustration shows the standard version for EU member states. The data plate may differ in other countries.
- The battery data plate is described in the relevant section – see page 77.

¹⁾ *Conformité Européenne*

²⁾ *United Kingdom Conformity Assessed*

6.3 Truck capacity plate

The capacity plate (33) gives the maximum load-bearing capacity (Q) of the truck in kg assuming the load on the load handler is evenly distributed.



33

C Transport and Commissioning

1 Lifting by crane

⚠ WARNING!

All persons involved in loading by crane must be trained

Incorrect crane loading procedures due to untrained personnel can cause the truck to fall. There is a risk of injury to personnel and a risk of material damage to the truck.

- ▶ Loading must only be performed by specialist personnel trained for this purpose. The specialist personnel must be instructed in securing loads on road vehicles and handling load securing devices. In each case correct measurements must be taken and appropriate safety measures applied.

⚠ WARNING!

Improper loading by crane can result in accidents

Improper use or use of unsuitable lifting gear can cause the truck to fall when being loaded by crane.

- ▶ Prevent the truck from hitting other objects during lifting, and avoid uncontrolled movements. If necessary, secure the truck with guide ropes.
- ▶ Loading by crane may only be performed by persons who have been trained in the use of the lifting accessories.
- ▶ Wear personal protective equipment (e.g. safety shoes, hard hat, hi-vis jacket, protective gloves) when loading by crane.
- ▶ Do not stand under suspended loads.
- ▶ Do not enter or stand in the hazardous area.
- ▶ Always use lifting gear with sufficient capacity (observed truck weight in accordance with truck data plate – see page 38).
- ▶ Always secure crane lifting gear to the prescribed attachment points and prevent it from slipping.
- ▶ Use the lifting accessories only in the prescribed load direction.
- ▶ Lifting slings should be fastened in such a way that they do not come into contact with any attachments when lifting.

⚠ CAUTION!

Lowering of the drive frame when lifting the truck

When lifting the truck, the drive frame can lower in the area of the support arm lift. This can cause the truck to move inadvertently.

- ▶ Raise and set down the truck slowly and carefully.
- ▶ Keep the area around the truck clear.

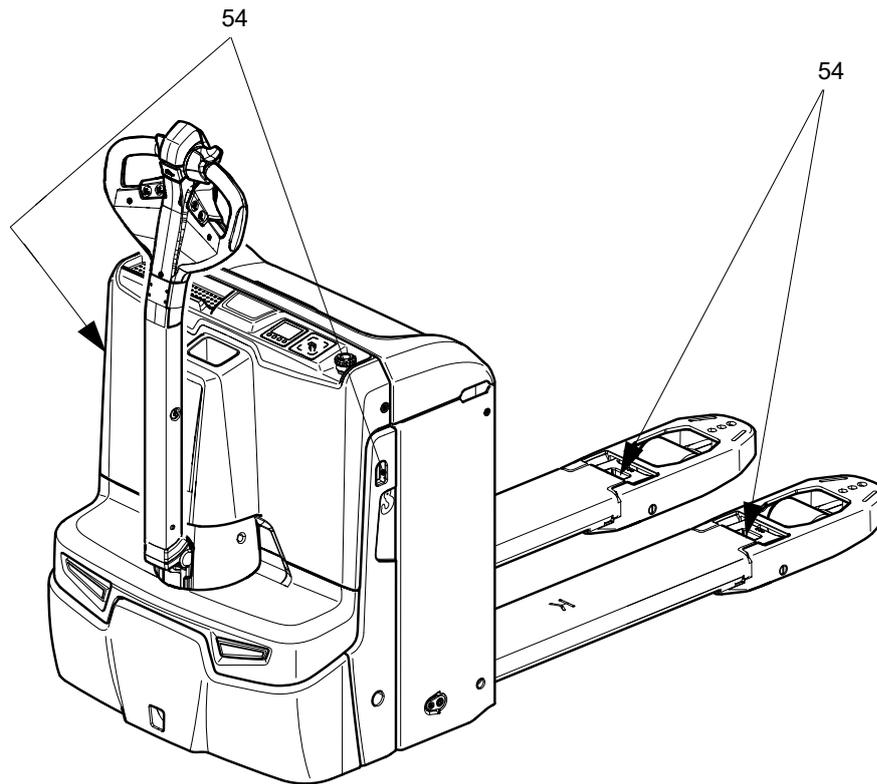
⚠ CAUTION!

Danger of injury from swinging truck

Different battery versions and battery weights can lead to the truck oscillating in a suspended position after being raised.

- ▶ Raise the truck carefully and allow to swing.
- ▶ Keep the hazardous area around the truck clear.

- Strap points (54) on the chassis are provided for transporting the truck with crane lifting gear.



Lifting the truck by crane

Requirements

- Park the truck securely, see page 99.

Tools and Material Required

- Lifting gear
- Crane lifting gear

Procedure

- Open the battery cover and remove the battery if necessary.
- Secure the lifting slings to the strap points (54).

The truck can now be lifted by crane.

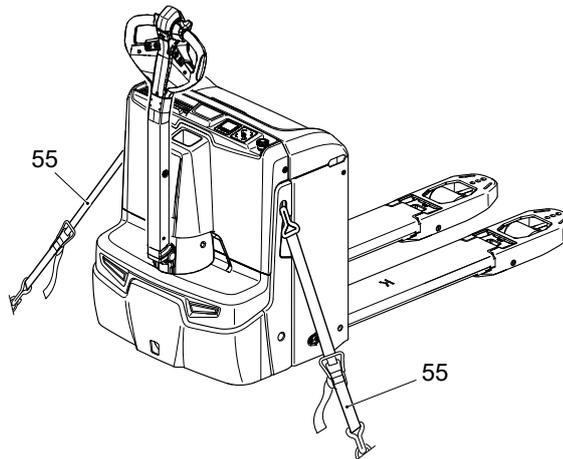
2 Transport

⚠ WARNING!

Uncontrolled movements during transport

Improper fastening of the truck during transport can result in serious accidents. Slipping lashing straps can lead to uncontrolled movements of the truck and even a fall during transport. Accidents caused by this can result in property damage and fatal injuries.

- ▶ Loading must only be performed by specialist personnel trained for this purpose. The specialist personnel must be instructed in securing loads on road vehicles and working with load securing equipment. Correct dimensioning and implementation of load securing measures must be ensured in each individual case.
- ▶ The truck must be securely fastened when transported on a lorry or a trailer.
- ▶ The lorry or trailer must be equipped with lashing rings.
- ▶ Use wedges to prevent the truck from accidentally moving.
- ▶ Use only lashing straps with sufficient tensile strength.
- ▶ Use non-slip materials to secure the transport aids (pallet, wedges, etc.), e.g. non-slip mats.



Securing the truck for transport

Requirements

- The truck is now loaded.
- Truck parked securely – see page 99.

Tools and Material Required

- Lashing straps

Procedure

- Attach the lashing straps (55) to the truck, strap them to the transport vehicle and tension sufficiently.

The truck can be transported.

3 Using the Truck for the First Time

⚠ WARNING!

The use of unsuitable energy sources can be hazardous

Rectified AC current damages the assemblies (controllers, sensors, motors etc.) of the electronic system.

Unsuitable cable connections (too long, wire cross-section too small) with the battery (jump leads) can overheat, setting the battery on fire.

▶ Operate the truck with battery current only.

NOTICE

Cold-store trucks

▶ Trucks intended for use in cold stores are equipped with hydraulic oil suitable for cold-store applications and a protective grille instead of a protective screen panel on the mast.

▶ If a truck with cold-store oil is used outside the cold store, the lowering speeds may increase.

▶ Note the permissible operating conditions, see page 12.

NOTICE

Do not lift loads if the truck is operated via a tow lead with an external battery.

→ If the truck is equipped with a display unit (EasyAccess Softkey), the delivery code is marked on a sticker – see page 135.

→ If the truck is equipped with a keypad (EasyAccess PinCode) or a transponder reader (EasyAccess Transponder), it can only be operated at first by the keys on the display unit – see page 136.

Delivery in several parts

If the truck is delivered in multiple parts, setup and commissioning must only be performed by trained, authorised personnel.

Carrying out initial commissioning

Procedure

- Check that the equipment is complete.
- Install the battery (if required), see page 64.
- Charge the battery, see page 53.
- Check the hydraulic oil level and correct if necessary, see page 174.
- Carry out initial commissioning of the optional equipment as soon as this is possible:
 - Activate the keypad or transponder reader, see page 136.

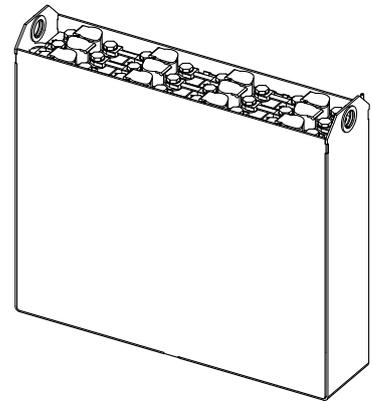
The truck can now be started, see page 95.

D Battery - Servicing, Recharging, Replacement

1 Notes on Battery Technologies

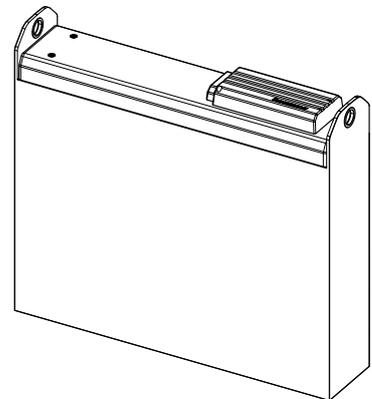
Lead-acid batteries (●)

The truck is fitted with a lead-acid battery as standard. The associated descriptions are in the chapter titled "Replaceable lead-acid and lithium-ion batteries" – see page 46.



Replaceable lithium-ion batteries (○)

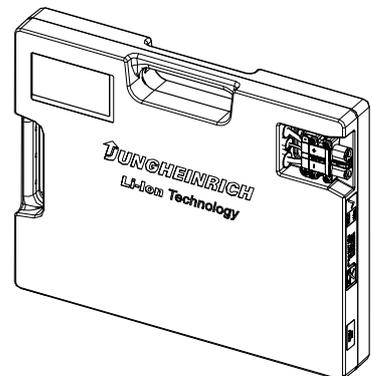
The truck is optionally fitted with a replaceable lithium-ion battery. The associated descriptions are in the operating instructions for the battery.



Lithium-ion battery in the version as case battery (○)

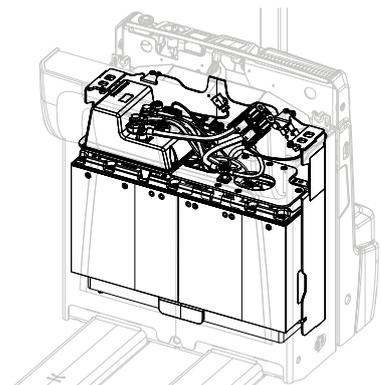
The truck is optionally fitted with a lithium-ion battery in the version as case battery (battery compartment XS only). The associated descriptions are in the following chapters:

- Safety for handling lithium-ion batteries – see page 71,
- General information on lithium-ion batteries – see page 70,
- Descriptions of the battery types, for installing, removing and charging this battery – see page 48.



Integrated modular lithium-ion battery (○)

The truck is optionally fitted with an integrated modular lithium-ion battery. The associated descriptions are in the chapter titled "Integrated modular lithium-ion battery" – see page 70.



2 Replaceable lead-acid and lithium-ion batteries

2.1 Safety instructions for handling lead-acid batteries

Safety information

- Do not physically machine or modify the battery.
- Do not open, damage, penetrate or bend the battery.
- Do not throw the battery into a fire.
- Protect the battery from high temperatures and overheating.
- Protect the battery from solar irradiation.
- Keep the battery away from radiant sources and strong heat sources.
- The specified charging, operating and storage temperature ranges must be observed.

Failure to observe these safety instructions can result in fire.

Maintenance personnel

Batteries may only be charged, serviced or replaced by trained personnel. These operating instructions and the manufacturer's instructions concerning batteries and charging stations must be observed when carrying out the work.

The truck must be parked securely before all work on the batteries, see page 99.

General condition of the battery

The battery cell covers must be kept dry and clean. The terminals and cable lugs must be clean, secure and have a light coating of dielectric grease.

Using the battery

WARNING!

Unsuitable batteries that have not been approved by Jungheinrich for the truck can be hazardous

The design, weight and dimensions of the battery have a considerable effect on the operational safety of the truck, in particular its stability and capacity. The use of unsuitable batteries that have not been approved for the truck by Jungheinrich, can lead to a deterioration of the braking characteristics of the truck during energy recovery, causing considerable damage to the electric controller and resulting in serious danger to the health and safety of individuals.

- ▶ Only Jungheinrich-approved batteries may be used on the truck.
- ▶ Battery equipment may only be replaced with the agreement of Jungheinrich.
- ▶ When replacing/installing the battery make sure the battery is securely located in the battery compartment of the truck.
- ▶ Do not use batteries that have not been approved by the manufacturer.

Battery disposal

Batteries may only be disposed of in accordance with national environmental protection regulations or disposal laws. The manufacturer's disposal instructions must be observed.

⚠ WARNING!

Risk of accidents and injuries when handling acid batteries

Batteries contain dissolved acid, which is toxic and caustic. Above all, avoid any contact with battery acid.

- ▶ Dispose of used battery acid in accordance with regulations.
 - ▶ Wear protective clothing and eye protection when working with acid batteries.
 - ▶ Do not let battery acid come into contact with skin, clothing or eyes. If necessary, rinse with plenty of clean water.
 - ▶ In the event of physical injuries (e.g. skin or eye contact with battery acid), call a doctor immediately.
 - ▶ Neutralise spilled battery acid immediately with plenty of water.
 - ▶ Use only batteries with a closed battery tray.
 - ▶ Follow national guidelines and legislation.
-

Fire protection measures

⚠ WARNING!

Short circuits can result in fire

Damaged cables can cause short circuits, setting the forklift truck and battery on fire.

- ▶ Before closing the battery cover make sure that the battery cables are not damaged.
-

⚠ CAUTION!

The use of unsuitable fire-protection equipment can result in acid burns

In the event of fire, a reaction with the battery acid can occur if water is used to extinguish the fire. This can lead to acid burns.

- ▶ Use powder extinguishers.
 - ▶ Never extinguish burning batteries with water.
-

Do not smoke and avoid naked flames when handling lead-acid batteries. Wherever an industrial truck is parked for charging, there must be no inflammable material or consumables capable of creating sparks within a minimum distance of 2,5 m from the truck. The room must be ventilated. Fire protection equipment must be on hand.

2.2 Battery types

Depending on the version, the truck is equipped with different battery types. The following table shows which combinations are intended as standard.

The use of battery types not listed here must be agreed with the manufacturer.

The battery weights can be taken from the battery data plate. Batteries with non insulated terminals must be covered with a non slip insulating mat.

Battery tray XS (top battery removal)

Battery type	Capacity (Ah)	Min. weight [kg]	Max. dimensions [mm] LxWxH
25.7 V - lithium-ion	40	17.5	531 x 72 x 421

→ EJE 114 / 116 / 118 with 40 Ah battery switch off automatically after 5 minutes to save energy.

Battery tray S (top battery removal)

Battery type	Capacity (Ah)	Min. weight [kg]	Max. dimensions [mm] LxWxH
24 V - 2PzB	130	133	652 x 148.5 x 560
24 V - 2PZV-BS	142	133	
24 V - 2PzVB	134	144	662 x 148.5 x 592
24 V -2PZMB	140		
24 V - 2PzB	150		
24 V - 2PZVB Lib. Silver	150		
24 V - NXS	166		
25.6 V - lithium-ion	105	53	
	110	139	

Battery tray M (top battery removal)

Battery type	Capacity (Ah)	Min. weight [kg]	Max. dimensions [mm] LxWxH	
24 V - 2PzV	160	171	624 x 212 x 537	
24 V - 2PzS	180			
24 V - 2PzV	174			
24 V - 2PzM	180			
24 V - 2PzV	200	204	624 x 212 x 628	
24 V - 2PzS	250			
24 V - 2PzV	220			
24 V - 2PzM	250			
24 V - XFC	158			
24 V - NXS	166			
24 V - NXS	166			
24 V - 2NXS	164			
24 V - 2NXS	190			
24 V - 2 NXS	220			
25.6 V - lithium-ion	110			624 x 207 x 627

Battery tray M (side battery removal)

Battery type	Capacity (Ah)	Min. weight [kg]	Max. dimensions [mm] LxWxH
24 V - 2PzV	160	171	624 x 212 x 537
24 V - 2PzS	180		
24 V - 2PzV	174		
24 V - 2PzM	180		
24 V - 2PzV	200	204	624 x 212 x 628
24 V - 2PzS	250		
24 V - 2PzV	220		
24 V - 2PzM	250		
24 V - XFC	158		
24 V - NXS	166		
24 V - NXS	166		
24 V - 2NXS	164		
24 V - 2NXS	190		
24 V - 2 NXS	220		

Battery tray L (top/side battery removal)

Battery type	Capacity (Ah)	Min. weight [kg]	Max. dimensions [mm] LxWxH
24 V - 3PzV	300	273	624 x 284 x 628
24 V - 3PzS	375		
24 V - 3PzV	330		
24 V - 3PzM	375		
24 V - XFC	316		
24 V - NXS	332		
25.6 V - lithium-ion	240/260 Ah		
	360/390 Ah		

2.3 Exposing the battery

⚠ WARNING!

An unsecured truck can cause accidents

Parking the truck on an incline or with a raised load handler is dangerous and is strictly prohibited.

- ▶ Park the truck on a level surface. In special cases the truck may need to be secured with wedges.
 - ▶ Fully lower the load handler.
 - ▶ Select a place to park where no other people are at risk of injury from the lowered load handler.
 - ▶ If the brakes are not working, place wedges underneath the wheels of the truck to prevent it from moving.
-

⚠ CAUTION!

A closing battery panel can pose a trapping hazard

If the battery cover is not opened fully, it can suddenly close on its own and cause bruising. The battery cover is only properly opened at an angle greater than 90°. It is then held by gravity.

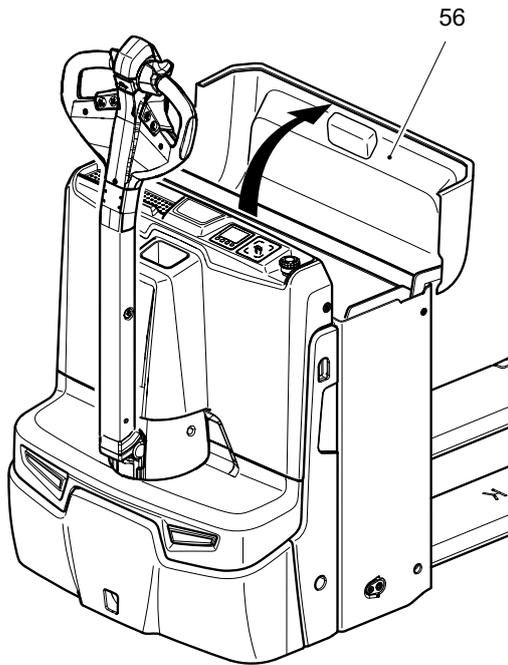
- ▶ Open the battery cover as far as the stop.
-

⚠ CAUTION!

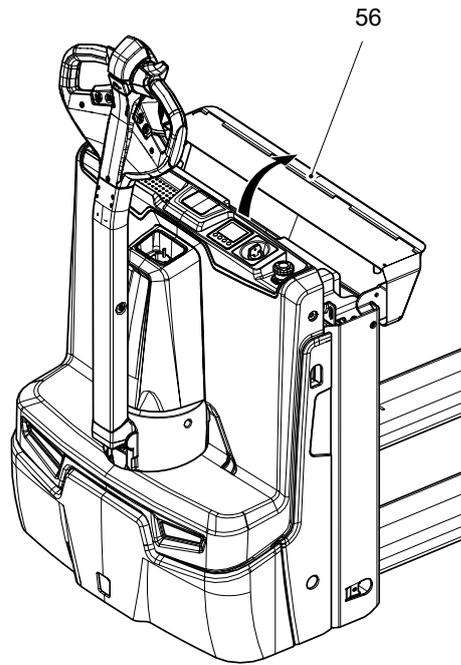
Risk of trapping

When closing the hood/cover, there is a risk of objects becoming trapped between the hood/cover and the truck.

- ▶ Make sure that the hood/cover can move freely.
-



Battery compartment S, M, L



Battery compartment XS

Requirements

- Truck parked securely on a horizontal surface, see page 99.

Procedure

- Open the battery panel (56).

The battery is now exposed.

2.4 Charging the battery

2.4.1 Safety Information

- There is information on charging the replaceable lithium-ion batteries in the separate operating instructions.
- Information on charging integrated modular lithium-ion batteries – see page 81.

⚠ WARNING!

Risk of electric shock and fire due to insufficient or inappropriate residual current devices

A lack of residual current devices or the use of inappropriate residual current devices can result in fatal injury due to electric shocks or electrical fires in the event of a fault.

- ▶ The owner must conduct an operational risk assessment of the usage location.
- ▶ An RCD switch (residual current device, circuit breaker) of type B or B+ must be used where necessary.

The following applies for lead-acid batteries:

⚠ WARNING!

The gases produced during charging can cause explosions

The battery produces a mixture of nitrogen and hydrogen (electrolytic gas) during charging. Gassing is a chemical process. This gas mixture is highly explosive and must not be ignited.

- ▶ Switch the charging station and truck off first before connecting/disconnecting the charging cable of the battery charging station to/from the battery connector.
- ▶ The charger must be adapted to the battery in terms of voltage and charge capacity.
- ▶ Before charging, check all cables and plug connections for visible signs of damage.
- ▶ Ventilate the room in which the truck is being charged.
- ▶ The battery cover must be open and the battery cell surfaces must be exposed during charging to ensure adequate ventilation.
- ▶ Do not smoke and avoid naked flames when handling batteries.
- ▶ Wherever an industrial truck is parked for charging there shall be no inflammable material or lubricants capable of creating sparks within 2,5 m around the truck.
- ▶ Fire protection equipment must be on hand.
- ▶ Do not lay any metallic objects on battery.
- ▶ It is essential to follow the safety regulations of the battery and charger station manufacturers.

NOTICE

Battery damage

The battery, battery charger (charging characteristic) and battery parameters must match; otherwise, the battery may be damaged during charging.

Trickle charge

The trickle charge starts automatically when charging is complete.

Mains failure

Charging continues automatically after a mains failure.

Partial charging

Charging can be interrupted on the battery charger and continued as partial charging. The charging process is automatically adapted to the charge status of the battery; see the operating instructions for the battery charger. This keeps battery wear to a minimum.

Simultaneous charging with two battery chargers

Simultaneous charging with two battery chargers (the stationary battery charger and the on-board charger) is not permitted.

2.4.2 Charging the battery with a stationary battery charger

⚠ DANGER!

Explosion risk when charging unsuitable battery types

Charging a battery that is not suitable for this charger can result in damage to the charger and battery. The battery could expand or burst.

- ▶ The lithium ion battery must only be charged with the Jungheinrich charger designed for this battery.
-

⚠ WARNING!

Warning: hazardous electrical voltage!

The charger is an electric component conducting voltages and currents that are hazardous to people.

- ▶ The charger must only be operated by trained technicians.
 - ▶ Disconnect the mains supply and the battery connector before carrying out any work on the charger.
 - ▶ The charger should only be opened and serviced by trained electricians.
-

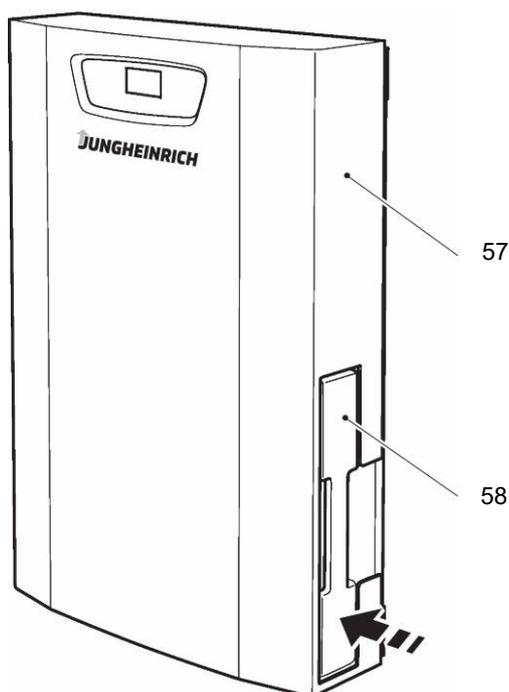
NOTICE

Discharge can damage the battery

If the battery is not used for a long period of time, it can become damaged through discharge.

- ▶ Before a long period of inactivity, the battery must be fully charged.
 - ▶ To ensure a long battery life, we recommend charging the battery every 14 days when it is not being used.
-

Battery compartment XS



-
- If the battery is deeply discharged or if the battery temperature is below the permissible level (+5 °C), the battery will not charge. Deeply discharged batteries cannot be charged by the operator (faulty). Contact the manufacturer's customer service department.
-

Charging the battery

Requirements

- Park the truck securely, see page 99.

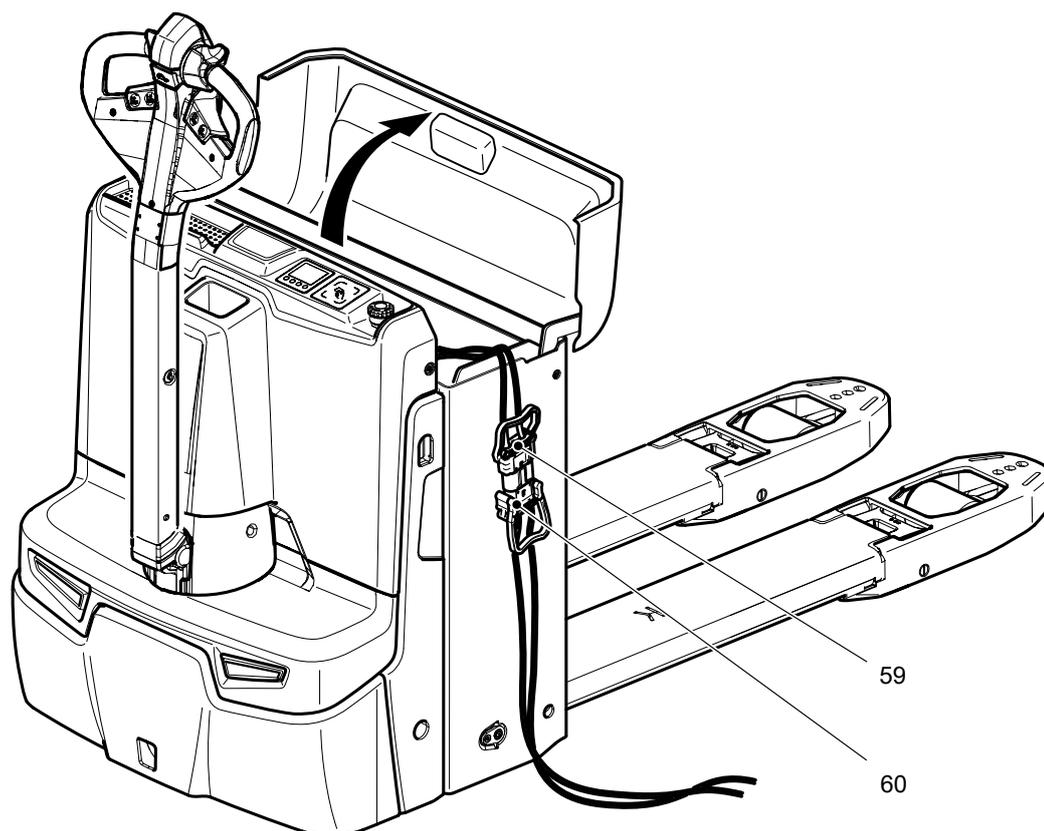
Procedure

- Connect the mains connector of the charger to a mains supply outlet.
- Remove the battery, see page 65.
- Insert the battery (58) with the connector side facing first into the charger (57).

Charging begins automatically.

- The battery is monitored during charging by the BMS (Battery Management System).
- The battery voltage is displayed on the battery charger.
- If a battery is charged in sleep mode, the initial charge is just 2 A (pre-charge current). This process can take up to 2 hours before the full 39 A charge current is applied.

Battery compartment S, M, L



Requirements

- The truck is parked securely – see page 99.
- Battery exposed – see page 51.
- The charging program that matches the battery type is set on the battery charger.

Procedure

- Remove any insulating mats from the battery.
- Check the battery cable and battery connector (59) on the truck as well as the connector and cable of the stationary battery charger (60) for visible signs of damage before charging.

If damage is identified, mark the affected truck or affected battery charger accordingly and take out of service. Have the truck or battery charger repaired by the manufacturer or by a specialist authorised by the manufacturer.

- Disconnect the battery connector (59) from the truck connector.
- Connect the battery connector (59) to the charger cable (60) of the stationary battery charger.
- Start charging in accordance with the battery charger operating instructions.

The battery is charging.



Optional NexSys batteries may only be charged with special NexSys battery chargers or the on-board charger (see page 58).

Ending battery charging and restoring readiness for operation

Procedure

- Complete charging in accordance with the battery charger operating instructions.
- Remove the battery connector (59) from the charger cable (60).
- Connect the battery connector (59) to the truck.
- If applicable, place the removed insulating mat back over the battery.
- Securely close the battery panel.

The truck is now ready for operation.

2.4.3 Charging the battery with an on-board charger

2.4.3.1 Safety Information

DANGER!

Risk of electric shock and fire

Damaged and unsuitable cables can cause electric shocks and can overheat, resulting in fires.

- ▶ Always use mains cables with a maximum length of 30 m.
Local regulations must be observed.
 - ▶ Unwind the cable reel fully when using it.
 - ▶ Always use original manufacturer's mains cables.
 - ▶ Insulation safety, acid and caustic ratings must comply with the manufacturer's mains lead.
 - ▶ The charging connector must be dry and clean when used.
-

WARNING!

Moving of a connected industrial truck with the mains socket switched off

If an industrial truck is being charged at an external mains socket, the automatic immobiliser detects this process and deactivates the truck travel functions. When charging an industrial truck at a mains socket that can be switched off, the industrial truck can start moving when the socket is switched off because the immobiliser detects only live mains sockets. This can cause damage to the electrical building installation as well as electric shocks and electrically induced fires.

- ▶ Before commissioning the truck, disconnect the mains cable from the mains socket and stow away in the designated position on the truck.
 - ▶ If no additional protection measures are taken, the truck must not be charged via the on-board charger using a mains socket that can be switched off.
 - ▶ This warning must be taken into account during the risk analysis performed by the operating company.
-

WARNING!

Danger due to damage to the on-board charger or live attachments

Damage to the on-board battery charger or live attachments (mains cable, plug) can cause a short circuit or electric shock.

- ▶ Do not trap the mains cable when closing the battery panel.
 - ▶ Report any defects immediately to your supervisor.
 - ▶ Notify the customer service department.
 - ▶ Mark the defective truck accordingly and take it out of service.
 - ▶ Do not return the truck to service until the fault has been identified and rectified.
-

NOTICE

Material damage due to incorrect use of the on-board charger

- ▶ The on-board charger must not be opened. In the event of faults, contact the manufacturer's customer service department.
- ▶ The battery charger must only be used for the batteries supplied or other approved batteries provided they have been adapted by the manufacturer's customer service department.
- ▶ Batteries must never be swapped from truck to truck.
- ▶ Do not connect the battery to two chargers simultaneously.

⚠ WARNING!

Danger of overheating when charging with an unsuitable battery charger

The use of an unsuitable charger can cause the battery to overheat.

- ▶ Only charge the lithium-ion battery with a battery charger specially designed for this battery. Observe the operating instructions and operating conditions for the battery charger.

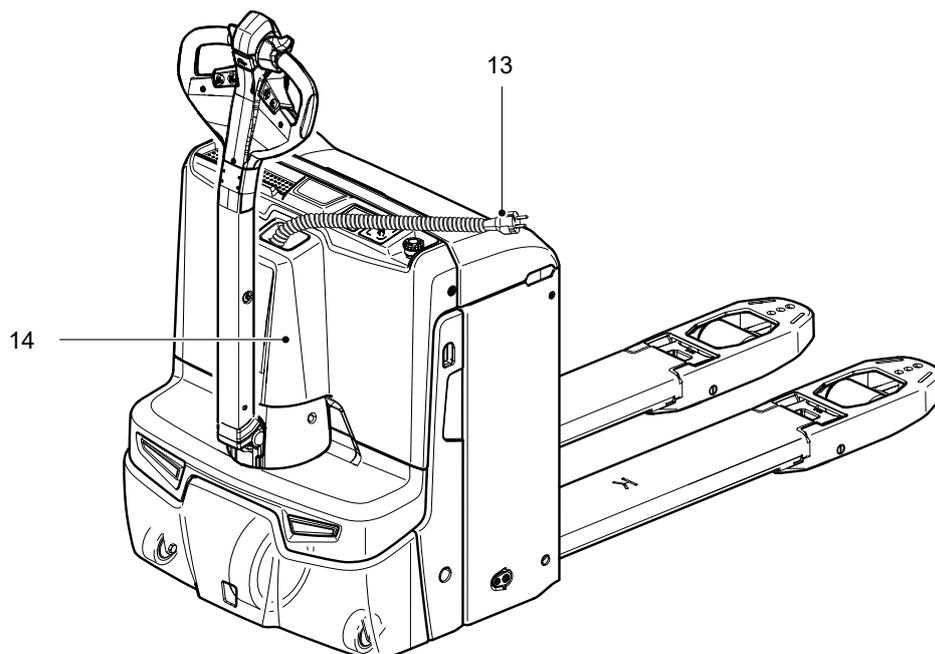
2.4.3.2 Setting the Charging Characteristic

Lead-acid batteries are charged using charging characteristics. The charging characteristic is set via parameters in the truck software either ex works or by the manufacturer's customer service department.

With lithium-ion batteries, the battery management system (BMS) of the battery regulates the current requirement.

2.4.3.3 Starting Charging

The mains cable and mains connector (13) of the on-board charger are stowed in a storage compartment in the front panel (14).



Charging the battery

Requirements

- The truck is parked securely – see page 99.
- The battery is exposed – see page 51.
- The charging characteristic that matches the battery type is set on the on-board charger – see page 59.

Procedure

- Remove any insulating mats from the battery.
- Check the cable and mains plug (13) of the on-board charger for visible damage before charging.

If damage is identified, mark the truck accordingly and take it out of service. Have the truck repaired by the manufacturer or by a specialist authorised by the manufacturer.

- The battery connector (59) must remain plugged in.
- Plug the mains plug (13) into a mains socket.
- The charge status indicator (9) or the optional display unit with 2-inch display (20) indicates the charge status or a fault (see "LED display" table for flashing codes).

Charging starts and ends automatically. The battery is charging.

- If the mains connector is connected to the mains, all the truck's electrical functions will be disconnected (electrical start-up protection). The truck cannot be operated.
- When the mains connector is attached to the mains the battery connector cannot be disconnected.
- On trucks with a display unit, the charge status of the battery is shown on the display unit – see page 129. For this purpose, the emergency disconnect switch (7) must be released so that the display unit is supplied with voltage – see page 105.

Completing battery charging; restoring the truck to operation

Requirements

- Battery is charged.

Procedure

NOTICE

Cable damage due to pulling

If the mains connector is pulled out of the socket from the cable, the cable may be damaged.

- ▶ Do not pull from the cable.
- ▶ Take hold of the mains connector and pull out of the mains socket.

-
- Fully stow the mains connector and cable in the storage compartment.
 - If applicable, place the insulating mat back over the battery.
 - Securely close the battery panel.

The truck is now ready for operation.

Charging time

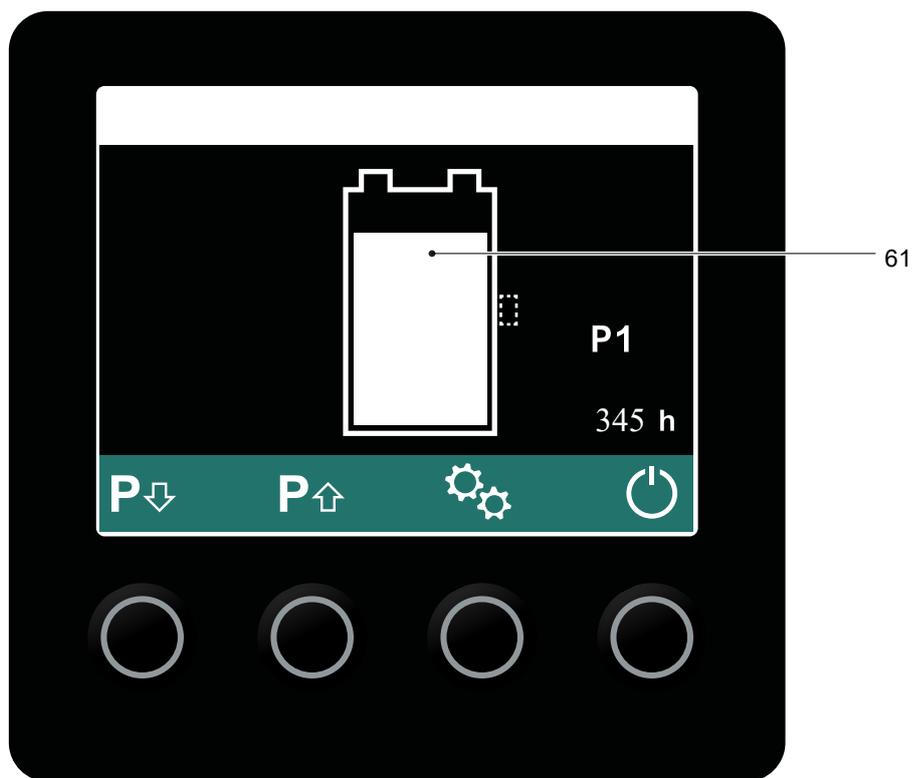
The duration of the charge depends on the battery capacity and charge status.

Mains failure

Charging continues automatically after a mains failure.

Charge status

Battery compartment XS with display unit (2-inch display)

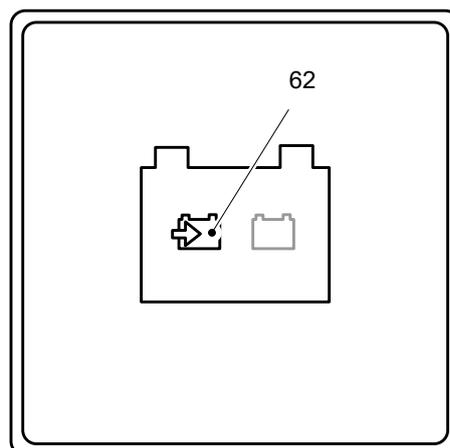


Item	Control or display element	Function
61	Battery capacity display	Battery discharge status

→ Further information on the 2-inch display under optional equipment – see page 129.

LED display (62)

Green LED (charge status)	
Lit	Charging complete, battery full. (Pause in charging, trickle charge or compensation charging).
Slow flash	Charging.
Rapid flash	Displayed when a charge begins or after setting a new characteristic curve. Number of flash pulses corresponds to the characteristic curve set.



Red LED (fault)	
Lit	Charging characteristic or battery parameters invalid
Slow flash	1x flash with noticeable interval: Overvoltage detected before charging starts
	2x flash with noticeable interval: Max. charge time exceeded
	3x flash with noticeable interval: Max. charge capacity exceeded
	4x flash with noticeable interval: Control deviation I_{max}
	5x flash with noticeable interval: Overvoltage cut-out
	6x flash with noticeable interval: Low voltage cut-out
	7x flash with noticeable interval: Battery is faulty, battery error
	8x flash with noticeable interval: Fan error
	9x flash with noticeable interval: Battery disconnected from battery charger during charging.
	10x flash with noticeable interval: Equipment overtemperature

Trickle charge

The trickle charge starts automatically when charging is complete.

Partial charging

Partial charging is possible, but should be the exception rather than the rule.

2.5 Removing or installing the battery

⚠ WARNING!

Accident risk during battery removal and installation

Due to the battery weight and acid there is a risk of trapping or scalding when the battery is removed and installed.

- ▶ Note the safety regulations governing the handling of lead-acid batteries, see page 46.
 - ▶ Wear safety shoes when removing and installing the battery.
 - ▶ Use only batteries with insulated cells and terminal connectors.
 - ▶ Park the truck on a level surface to prevent the battery from sliding out.
 - ▶ Make sure the crane lifting gear has sufficient capacity to replace the battery.
 - ▶ Use only approved battery replacement devices (battery roller stand, replacement trolley etc.).
 - ▶ Make sure the battery is located securely in the truck's battery compartment.
-

⚠ CAUTION!

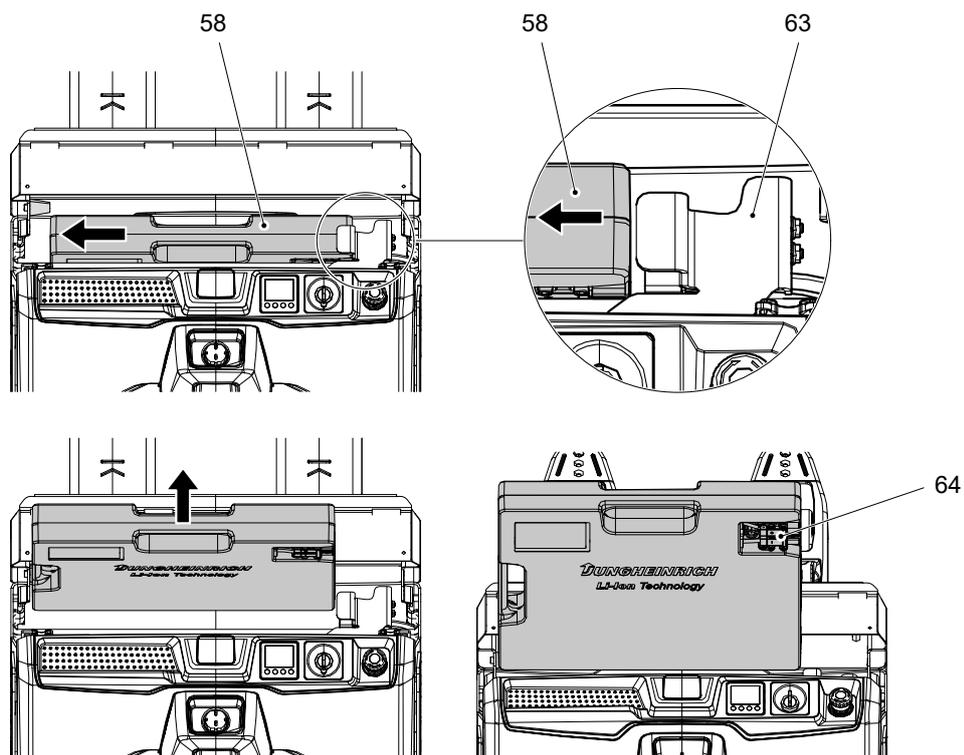
Trapping hazard

There is a risk of trapping when you close the battery cover.

- ▶ Make sure there is nothing between the battery cover and the truck when you close the battery cover.
-

2.5.1 Removing the battery from the top

Battery compartment XS



Removing the case battery

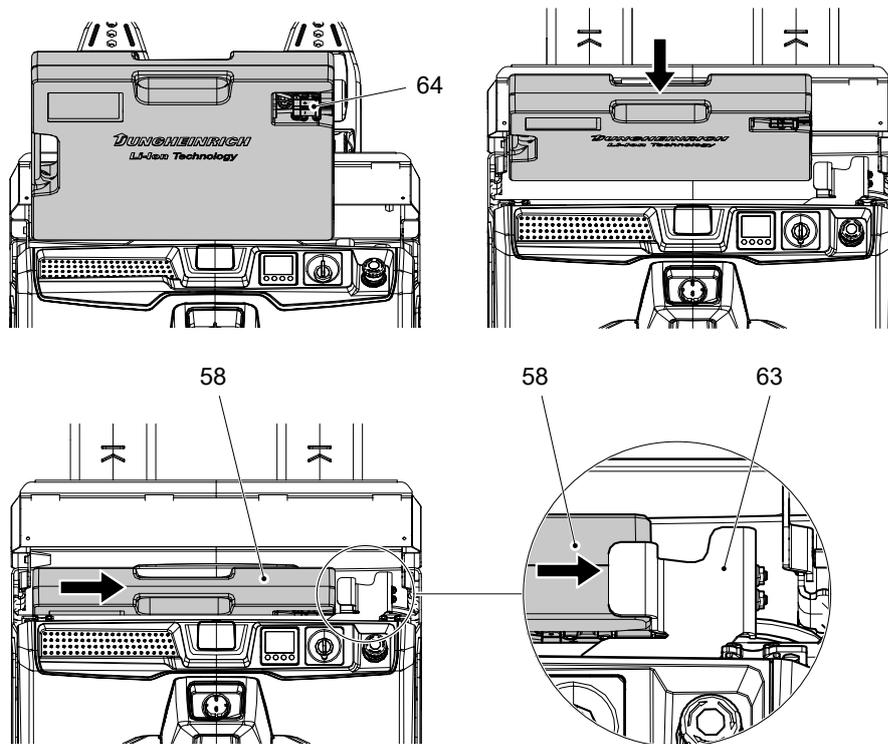
Requirements

- The truck is parked securely – see page 99.
- The battery lid is opened – see page 51.

Procedure

- Pull the case battery (58) to the left without tilting the battery.
- ➔ This disconnects the battery connector (64) from the truck connector. The truck connector is fitted to the support (63).
- Lift the case battery upwards out of the battery compartment.

The case battery has been removed.



Installing the case battery

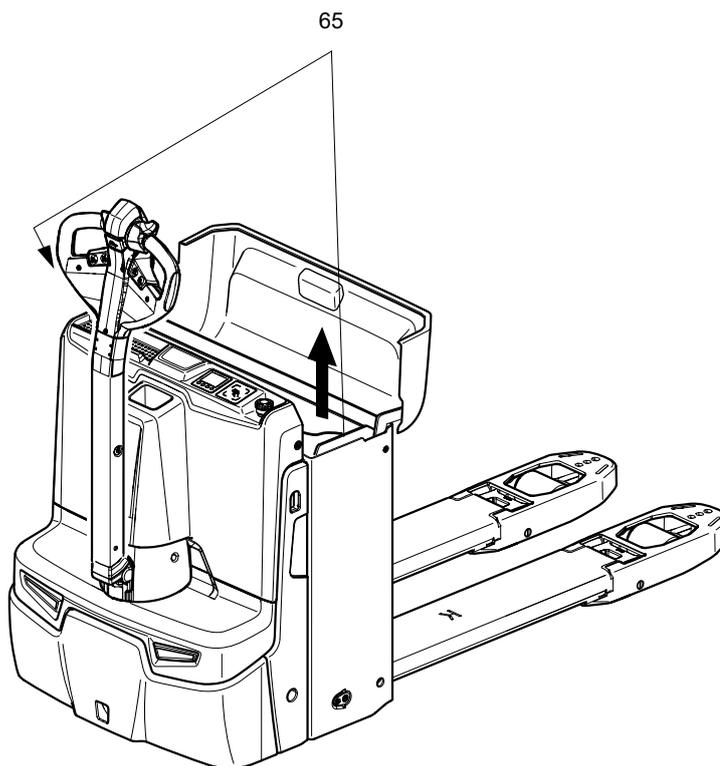
Procedure

- Insert the case battery (58) into the battery compartment from above.
- Push the case battery to the right as far as the stop.
- Close the battery lid.

- ➔ Closing the battery panel interlocks the case battery and the battery connector (64) is firmly connected to the truck connector. The truck connector is fitted to the support (63).

The case battery has been installed.

Battery compartment S, M, L



Removing the battery

Requirements

- Truck parked securely – see page 99.
- Battery exposed – see page 51.

Tools and Material Required

- Crane lifting gear

Procedure

- Disconnect the battery connector from the truck connector.
- Place the battery cable on the battery tray so that it cannot be severed when the battery is extracted.
- Attach the crane lifting gear to the eyelets (65).
- The hooks must be fitted in such a way that they do not fall onto the battery cells when the crane lifting gear is slackened. The crane lifting gear must exert a vertical pull so that the battery tray is not compressed.
- Slowly pull the battery up out of the battery tray with the crane lifting gear.

The battery is now removed.

- Assembly is in the reverse order. Note the correct mounting position and make sure the battery is connected correctly. Place the battery cable on the tray so that it cannot be severed when the battery is inserted.

After installing the battery, check all cables and plug connections for visible signs of damage.

2.5.2 Removing the battery from the side

⚠ CAUTION!

Trapping hazard

Trapping hazard when removing and installing the battery.

- ▶ When removing and installing the battery do not put your hands between the battery and the chassis.

Removing the battery

Requirements

- The truck is parked securely, see page 99.
- Battery is exposed, see page 51.

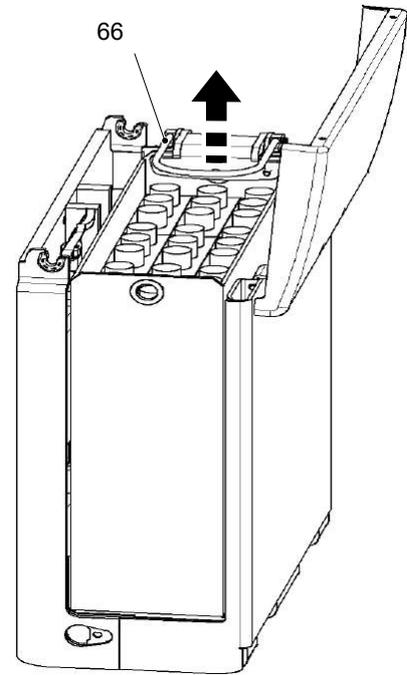
Tools and Material Required

- Battery replacement station/trolley

Procedure

- Disconnect the battery connector (59) from the truck connector.
 - Undo the battery latch (66).
 - Move the battery replacement station/trolley up to the side of the truck.
 - Turn the battery latch as far as the stop.
- ➔ Fully turning the bar moves the battery by approx. 30 mm.
- Carefully push the battery off the truck onto the battery replacement station/trolley.

The battery has now been removed.



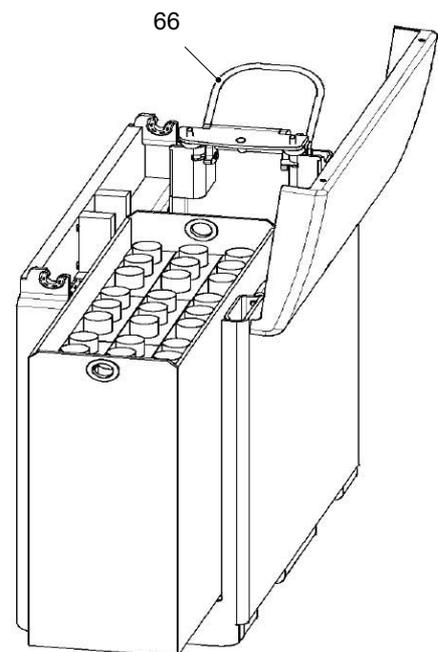
Installing the battery

Requirements

- The truck is parked securely, see page 99.
- Battery compartment is freely accessible.

Procedure

- Place the battery cable on the tray so that it cannot be severed when the battery is inserted.
- Ensure that the battery is installed and connected correctly
- Move the battery replacement station/trolley up to the side of the truck.
- Insert the battery.
- Press to return the battery latch to its original position and ensure the battery is locked securely.
- Attach the battery connector and the truck connector.
- Close the battery panel.



The battery is now installed.

- After each replacement, check that the battery is properly secured by the battery lock.

3 Integrated Modular Lithium-Ion Battery

3.1 Notes on Lithium-Ion Batteries

General information

The truck is optionally fitted with an integrated modular lithium-ion battery. All notes and information concerning lithium-ion batteries can be found in these operating instructions.

The Jungheinrich lithium-ion batteries are maintenance-free batteries with rechargeable high-performance energy cells. The batteries' daily operating time can be extended through intermediate charges.

Battery management system

The lithium-ion battery is continually monitored by the battery management system. The battery management system checks such things as the cell temperature, the voltage and the charge status of the cells, as well as enabling charge and discharge processes.

Faults or messages warning of approaching critical values are displayed, and the truck is switched off if necessary.

The battery management system is attached to the truck via an interface connector.

- The battery management system data can be checked by the manufacturer's customer service department.

Maintenance personnel

Batteries may only be charged, serviced or replaced by trained personnel. These operating instructions and the manufacturer's instructions concerning batteries and charging stations must be observed when carrying out the work.

3.2 Safety regulations for handling lithium-ion batteries

3.2.1 Correct application

⚠ WARNING!

Risk of overtemperature, fire or explosion due to incorrect handling

Incorrect handling of the lithium-ion battery can result in over temperature, fire or a battery explosion. Lithium-ion batteries with mechanical damage can cause a short circuit inside the lithium-ion battery. A short-circuited lithium-ion battery can overheat or release gas.

- ▶ Do not open the lithium-ion battery.
- ▶ Do not mechanically machine the lithium-ion battery.
- ▶ Do not mechanically modify the lithium-ion battery (conversion).
- ▶ Do not damage, penetrate, bend, strike, crush, compress the lithium-ion battery or similar.
- ▶ Do not immerse a lithium-ion battery in water.
- ▶ Do not store or operate the lithium-ion battery in pressurised containers.
- ▶ The safety devices (e.g. safety valves) of the lithium-ion battery must never be modified or rendered ineffective.

⚠ WARNING!

Do not open the battery!

If external influences (e.g. force, fire, flooding) cause unusual conditions or situations, the following instructions must be observed:

- The battery cells inside the lithium-ion battery contain substances that can be flammable if they come into contact with oxygen or water.
- The substances can escape if the battery cells are exposed to high pressure, an external fire or are mechanically damaged by force.
- The amount of these substances is so small that caution is only required in the immediate vicinity of the battery.

⚠ WARNING!

Hazard from liquid or gaseous contents from the battery

In the event of a technical defect or mechanical damage to the lithium-ion battery, as well as an overheated lithium-ion battery, electrolyte fluid can escape in liquid or gaseous form. Electrolyte fluid is hazardous to health. If the electrolyte fluid comes into contact with the skin or eyes, this can result in chemical burns and visual impairment. Inhaling the contents of electrolyte fluid can lead to respiratory illness.

- ▶ Wear personal protective equipment (e.g. safety gloves, safety shoes, respirator mask).
 - ▶ In the case of contact with the skin or eyes, rinse the affected areas with plenty of water and seek medical assistance immediately.
 - ▶ If the contents leak out, do not inhale the fumes.
 - ▶ If contents have been inhaled, seek medical assistance immediately. The affected person should also be taken to the fresh air.
 - ▶ Cordon off the affected area.
 - ▶ Ensure there is adequate ventilation.
 - ▶ Remain upwind of the area.
 - ▶ Keep persons away.
-

NOTICE

Environmental hazard due to electrolyte fluid escaping from the battery cell

If the stack or battery cell suffers mechanical damage, electrolyte fluid can escape from the damaged battery cell. If the escaped electrolyte fluid flows into the ground or groundwater, this can cause damage to the environment.

- ▶ Escaped electrolyte fluid must be removed professionally by the operating company on the basis of a corresponding risk assessment and disposed of in the correct manner. The fire brigade or similar institutions must be used where necessary.
 - ▶ Do not allow electrolyte fluid to enter the sewage system (surface water) or groundwater.
 - ▶ Absorb electrolyte fluid with liquid-binding material (e.g. vermiculite, sand, sawdust, universal binders, diatomaceous earth).
-

3.2.2 Shipping information

The Jungheinrich lithium-ion battery is a hazardous material. The applicable ADR regulations must be observed during transport.

→ ADR = Accord européen relatif au transport international des marchandises Dangereuses par Route.

→ If in doubt, contact the manufacturer's customer service department.

3.2.2.1 Shipping functional batteries

Functioning lithium-ion batteries can be shipped in accordance with the following regulations:

Land transport – classification according to ADR (road/rail)	
Classification code	M4 lithium battery
Danger label	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; text-align: center;"> UN 3480 LITHIUM-ION-BATTERY </div> <div style="text-align: center;">  </div> </div>
	UN 3480 lithium-ion battery class 9
ADR limited quantity	LQ:0

Sea transport – classification according to IMDG	
EmS	F-A, S-I
Danger label	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; text-align: center;"> UN 3480 LITHIUM-ION-BATTERY </div> <div style="text-align: center;">  </div> </div>
	UN 3480 lithium-ion battery class 9
IMDG limited quantity	LQ: -

Air transport – classification according to IATA	
Danger label	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; text-align: center;"> UN 3480 LITHIUM-ION-BATTERY </div> <div style="text-align: center;">  </div> </div> <p style="text-align: center;">UN 3480 lithium-ion battery class 9</p>
Exposure scenario	Not specified.
Substance safety rating	Not specified.
Marking	Product does not require marking under EC Directive / HazMatR.

3.2.2.2 Shipping faulty batteries

To transport these faulty lithium-ion batteries, contact the manufacturer's customer service department. Faulty lithium-ion batteries must not be transported independently.

3.2.3 Battery lifetime and maintenance

NOTICE

Damage to the lithium-ion battery due to discharge

If the lithium-ion battery undergoes a long period of non-use or storage, damage may occur due to deep discharge of the battery cells. Take the following actions to avoid damage due to deep discharge:

- ▶ Truck parked securely – see page 99.
- ▶ Fully charge the lithium-ion battery before extended periods of non-use or storage.
- ▶ Fully charge the lithium-ion battery every 3 months to protect against deep discharge.

Maintenance

The lithium-ion battery is a wear-free, maintenance-free and gassing-free (emission-free) sealed system.

- No maintenance intervals are planned for this lithium-ion battery. For example, no refilling of liquids or other substances is necessary.

The lithium-ion battery is continually monitored by the battery management system.

3.2.4 Dangers and information relating to fire in the vicinity of the lithium-ion battery

- Fire-fighting measures may only be carried out on a burning lithium-ion battery by trained and specially equipped fire-fighting personnel (e.g. by a member of the fire brigade).

3.2.5 Touch voltage hazard

⚠ WARNING!

Touch voltage hazard

Hazardous touch voltages may occur in the event of a technical or mechanical defect on the battery. Touch voltages also occur on seemingly discharged batteries. Touching the battery terminals or live attachments (battery cable, battery connector etc.) can result in dangerous current flows through the body. There is a risk of serious, irreversible or fatal injuries.

- ▶ Tag out the faulty battery and take out of service.
 - ▶ Do not touch faulty batteries.
 - ▶ Do not place any objects or tools on the lithium-ion battery to avoid short-circuiting the battery.
 - ▶ Do not short-circuit the lithium-ion battery.
 - ▶ Notify the customer service department.
-

With this kind of defect, the battery must not be touched and must not come into contact with metal objects – see page 71.

3.2.6 Storing the battery

NOTICE

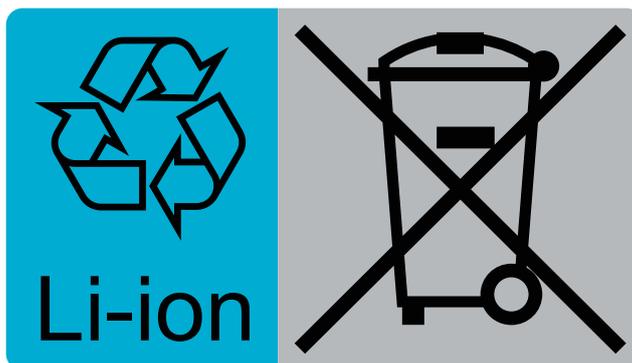
Damage to the lithium-ion battery due to discharge

If the lithium-ion battery is not used for a long period of time, it can become damaged through discharge.

- ▶ Fully charge the battery before extended downtimes.
 - ▶ To ensure a long service life of the lithium-ion battery, it must be fully charged every 4 weeks when not in use.
-

- ☞ The lithium-ion battery may be damaged by a nearby fire. There must be no flammable material or consumables capable of creating sparks within 2,5 m of the stored lithium-ion battery.
-

3.2.7 Instructions for disposal



Used lithium-ion batteries are recyclable commodities. These lithium-ion batteries must be treated as hazardous waste.

Lithium-ion batteries marked with the recycling symbol and the sign showing a crossed-out waste bin must not be disposed of with ordinary household waste.

Return or recycling of batteries must be ensured, for example, in accordance with the Battery Directive 2006/66/EG. Buy-back terms and the manner of recycling must be agreed with the manufacturer.



Instructions for disposal

Lithium-ion batteries must be disposed of in accordance with the relevant national environmental protection regulations.

► For lithium-ion battery disposal, contact the manufacturer's customer service department.

3.3 Battery data plate

The integrated modular lithium-ion battery is an inherent component of the truck and must not be changed by the operator or owner. For this reason, the data plate of the battery is not directly visible.

Item	Description
52	CE mark (<i>Conformité Européenne</i>)
53	UKCA marking (<i>United Kingdom Conformity Assessed</i>)
67	Lithium-ion secondary battery
68	Battery type
69	Production (year/month)
70	Serial number
71	Supplier number
72	Rated capacity in ampere-hours [Ah]
73	Rated capacities C5 and C6 in ampere-hours [Ah]
74	Rated energy (C5) in watt-hours [Wh] – Calculation of the rated energy (C5): rated capacity C5 multiplied by the rated voltage
75	Rated voltage in volts [V]
76	Battery material number
77	Battery weight in kilogrammes [kg] – Tolerance range: 5 %
78	Designation

Item	Description
79	Battery identifier
80	QR code
81	Manufacturer
82	Manufacturer's logo
83	UL mark (<i>Underwriters Laboratories</i>)
84	FCC mark (<i>Federal Communications Commission</i>)
85	Safety and warning information – see page 79

3.3.1 Safety and warning information

	<p>Used lithium-ion batteries must be treated as hazardous waste. Lithium-ion batteries marked with the recycling symbol and the sign showing a crossed-out waste bin must not be disposed of with ordinary household waste. Buy-back terms and type of recycling are to be agreed with the manufacturer in accordance with the Battery Directive 2006/66/EG, for example.</p>
	<p>Avoid fire and short circuits due to overheating. Do not ignite or position open flames, glowing embers or sparks near the lithium-ion battery. Keep lithium-ion batteries away from strong heat sources.</p>
	<p>Hot surfaces. Battery cells can generate very high short-circuit currents, causing them to become hot.</p>
	<p>Dangerous electrical voltage! Battery cells can generate very high short-circuit currents, causing them to become hot. Caution! The metal parts of the battery cells are constantly under voltage, so do not place any foreign objects or tools on the lithium-ion battery. Observe the accident prevention regulations and DIN EN 62485-3.</p>
	<p>Wear personal protective equipment (e.g. safety goggles and safety gloves) when handling damaged battery cells and lithium-ion batteries. Use only insulated tools. If the contents leak out, do not inhale the fumes. Always wash your hands after completing the work. Do not mechanically machine the lithium-ion battery, strike, crush, compress, notch, dent or modify it in any way. Do not open, damage, penetrate, bend, heat the lithium-ion battery or allow it to become hot, do not throw it into a fire, short circuit it or immerse it in water. Do not store it or operate it in pressurised containers.</p>
	<p>Follow the operating instructions and keep them in a visible position in the charging area. If any faults are found on the lithium-ion battery, contact the manufacturer's customer service department immediately. Do not attempt to rectify faults independently. Do not open the lithium-ion battery.</p>
	<p>Protect the lithium-ion battery from solar radiation or other forms of heat radiation. Do not expose the lithium-ion battery to heat sources.</p>

3.4 Battery types

Depending on the version, the truck is equipped with different battery types. The following table shows the different battery types.

Battery type	Rated voltage	Number of cells	Capacity
Lithium-ion	25.6 V	3.2 V x 8 cells	40 Ah
			130 Ah
			260 Ah

3.5 Usability depending on the battery cell temperature

Lithium-ion battery temperature	Usability
-10 °C to +55 °C ^{1), 2)}	Travel and hydraulic functions: – The usable battery capacity and power are reduced at low temperatures.
0 °C to +55 °C ³⁾	Charging of the lithium-ion battery: – In the event of high temperatures ($\geq 50^{\circ}\text{C}$), the charging time of the lithium-ion battery is extended due to a reduction in the charge current.

- 1) The permissible range of the lithium-ion battery application temperature does not increase the permissible range of the truck's application temperature. Observe the permissible temperature range for the use of the truck.
- 2) Corresponds to an ambient temperature of approx. -10°C to +40°C.
- 3) Corresponds to an ambient temperature of approx. 0°C to +40°C.

Cold-store application (below -10 °C) is prohibited.

If the temperature is too high or too low, the battery management system shuts down the lithium-ion battery.

Extended exposure to low temperatures causes the lithium-ion battery to cool down, thereby reducing the usable battery capacity.

If the lithium-ion battery is in the low-temperature range, the lift function may be impaired and regenerative braking with the coasting brake may not function correctly.

The usable battery capacity and power are reduced at low temperatures.

→ A notification symbol appears on the display unit when the lithium-ion battery is in the low-temperature range.

3.6 Exposing the battery

Exposing the fixed lithium-ion battery is analogous to exposing the replaceable batteries, see page 51.

3.7 Charging the battery

3.7.1 Safety Instructions for Charging Lithium-Ion Batteries

WARNING!

Risk of electric shock and fire due to insufficient or inappropriate residual current devices

A lack of residual current devices or the use of inappropriate residual current devices can result in fatal injury due to electric shocks or electrical fires in the event of a fault.

- ▶ The owner must conduct an operational risk assessment of the usage location.
 - ▶ An RCD switch (residual current device, circuit breaker) of type B or B+ must be used where necessary.
-

-  Only charge the lithium-ion battery with the manufacturer's stationary battery charger SLH 300i. Observe the battery charger operating instructions.

WARNING!

Warning: hazardous electrical voltage!

The charger is an electric component conducting voltages and currents that are hazardous to people.

- ▶ The charger must only be operated by trained technicians.
 - ▶ Disconnect the mains supply and the battery connector before carrying out any work on the charger.
 - ▶ The charger should only be opened and serviced by trained electricians.
-

WARNING!

Risk of accidents and injuries when handling lithium-ion batteries

Improper use can result in overheating, fire or explosion.

- ▶ Do not expose the lithium-ion battery during charging.
 - ▶ Do not use the lithium ion battery cable connected to the truck for charging.
 - ▶ Do not place any metallic objects on the lithium-ion battery.
-

⚠ WARNING!

Danger of overheating when charging with an unsuitable battery charger

The use of an unsuitable charger can cause the battery to overheat.

- ▶ Only charge the lithium-ion battery with a battery charger specially designed for this battery. Observe the operating instructions and operating conditions for the battery charger.

NOTICE

Battery damage

The battery, battery charger (charging characteristic) and battery parameters must match; otherwise, the battery may be damaged during charging.

- If the battery is deeply discharged or if the battery temperature is below the permissible level (+5 °C), the battery will not charge. Deeply discharged batteries cannot be charged by the operator (faulty). Contact the manufacturer's customer service department.

3.7.2 Activating the lithium-ion battery (reset)

If the lithium-ion battery is not used for several hours, it switches to energy-saving mode to protect against deep discharge.

The lithium-ion battery can be reactivated by connecting it to the stationary battery charger, see page 84.

3.7.3 Intermediate charging

The lithium-ion battery can be partially charged (intermediate charging) each time there is a break in use, without limiting its service life. The following information must be borne in mind when carrying out intermediate charging of the lithium-ion battery.

→ Intermediate charging of the lithium-ion battery

A lithium-ion battery that is not fully discharged can be partially or fully recharged at any time. Note the following information to ensure reliable function of the lithium-ion battery:

- ▶ In the event of frequent intermediate charging, charge the lithium-ion battery fully every 4 weeks. If the battery charger features the "balancing" function, make sure that the balancing phase at the end of charging is completed. For further information on the "balancing" function, refer to the operating instructions for the battery charger.
- ▶ Turn off the battery charger before disconnecting the lithium-ion battery from the battery charger. Manual interruption of the charging process: see page 83. When the lithium-ion battery is fully charged, charging ends automatically.

3.7.4 Partial charging, interrupting and re-starting charging

The charging process can be interrupted on the battery charger and continued as a partial charge. The charging process is automatically adapted to the charge status of the battery, see the operating instructions for the battery charger SLH 300i.

→ Charging continues automatically after a mains failure.

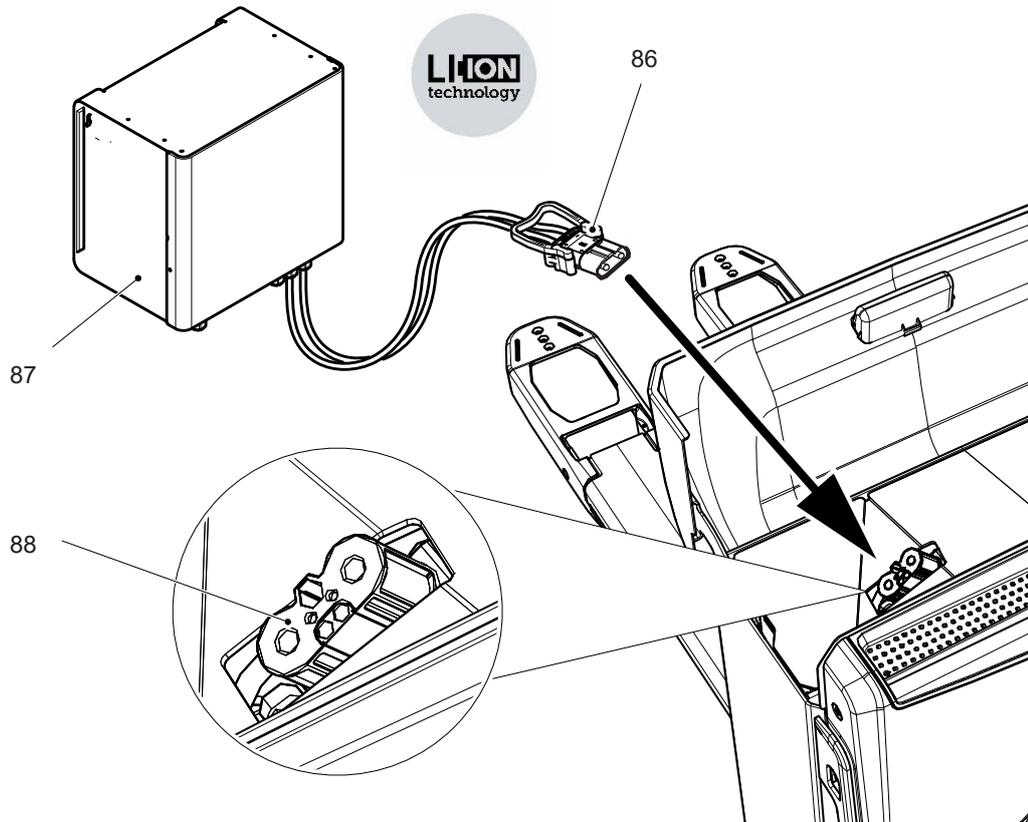
3.7.5 Trickle charging the lithium-ion battery

A fully charged lithium-ion battery can be connected to the battery charger for automatic trickle charging.

In the event of an extended period out of use, it is recommend that the trickle charge function of the battery charger be used in order to maintain the available capacity of the battery.

3.7.6 Charging the battery with a stationary battery charger

- Only charge the lithium-ion battery with the manufacturer's stationary battery charger SLH 300i. Observe the battery charger operating instructions.



Charging the battery

Requirements

- The truck is parked securely – see page 99.
- The battery charger has been tested and is free of defects; see the operating instructions for the SLH 300i battery charger.
- Check the cable and charge connector (86) of the battery charger (87) for visible damage before charging.

If damage is identified, mark the affected battery charger accordingly and take out of service. Have the battery charger repaired by the manufacturer or by a specialist authorised by the manufacturer.

- The battery charger is connected to the power supply, but not yet switched on.
- The battery is exposed – see page 51.

Procedure

- Connect the charge connector (86) of the battery charger (87) to the charge connector (88) of the battery.
- Start charging in accordance with the battery charger operating instructions.
- If the charge status is to be displayed:
 - Reset the emergency disconnect switch so that the control unit is supplied with voltage – see page 105.
 - In this case, the truck should not be switched on.

The battery is charging.

⚠ WARNING!

There is a danger of sparks if charging is improperly interrupted

Owing to the high charge currents, there is a risk of spark discharge if the charge connector is removed while charging is active. There is a risk of injury and of damage to the electrical contacts.

- ▶ Stop charging on the battery charger before removing the charge connector.
- ▶ Do not disconnect the mains cable or charge connector of the battery charger while charging (under load).

NOTICE

If charging has been interrupted, the full battery capacity will not be available.

Completing battery charging; restoring the truck to operation

Requirements

- The battery is partially or complete charged.
- Complete charging in accordance with the battery charger operating instructions.
- Disconnect the charge connector of the battery charger (86) from the charge connector (88) of the battery.
- Close the battery lid.

The truck is now ready for operation.

3.7.7 Charging the battery with an on-board charger

The process for charging the integrated modular lithium-ion battery with an on-board charger is analogous to the process for charging the replaceable batteries, see page 58.

E Operation

1 Safety Regulations for the Operation of Forklift Trucks

WARNING!

Risk of injury due to removal or disabling of safety equipment

Removing or disabling safety equipment such as the emergency disconnect switch, covers etc. can result in accidents and injury.

- ▶ Report any defects immediately to your supervisor.
 - ▶ Tag out the defective truck and take it out of service.
 - ▶ Do not return the truck to service until the fault has been identified and rectified.
-

Hazardous area

WARNING!

Risk of accidents/injury in the hazardous area of the truck

A hazardous area is defined as the area in which people are at risk due to travel or lifting operations of the truck, its load handler or the load. This also includes the area within reach of falling loads or lowering/falling operating equipment.

- ▶ Instruct unauthorised persons to leave the hazardous area.
 - ▶ In case of danger to third parties, give a warning signal in good time.
 - ▶ If unauthorised persons are still within the hazardous area, stop the truck immediately.
-

Safety devices, warning signs and warning instructions

Safety devices, warning signs (see page 37) and warning instructions in the present operating instructions must be strictly observed.

Driver authorisation

The truck may only be used by suitably trained personnel, who have demonstrated to the proprietor or his representative that they can drive and handle loads and have been authorised to operate the truck by the proprietor or his representative.

Operator's rights, responsibilities and rules of conduct

The driver must be informed of his duties and responsibilities and be instructed in the operation of the truck and shall be familiar with the operating instructions. Safety shoes must be worn on pedestrian-operated trucks.

Do not allow unauthorised persons to use the truck

The operator is responsible for the truck during the time it is in use. The operator must prevent unauthorised persons from driving or operating the truck. Do not carry passengers or lift other people.

When leaving the industrial truck, the operator must ensure that the industrial truck is secured against unauthorised use, e.g. remove the key or keep the access code secret.

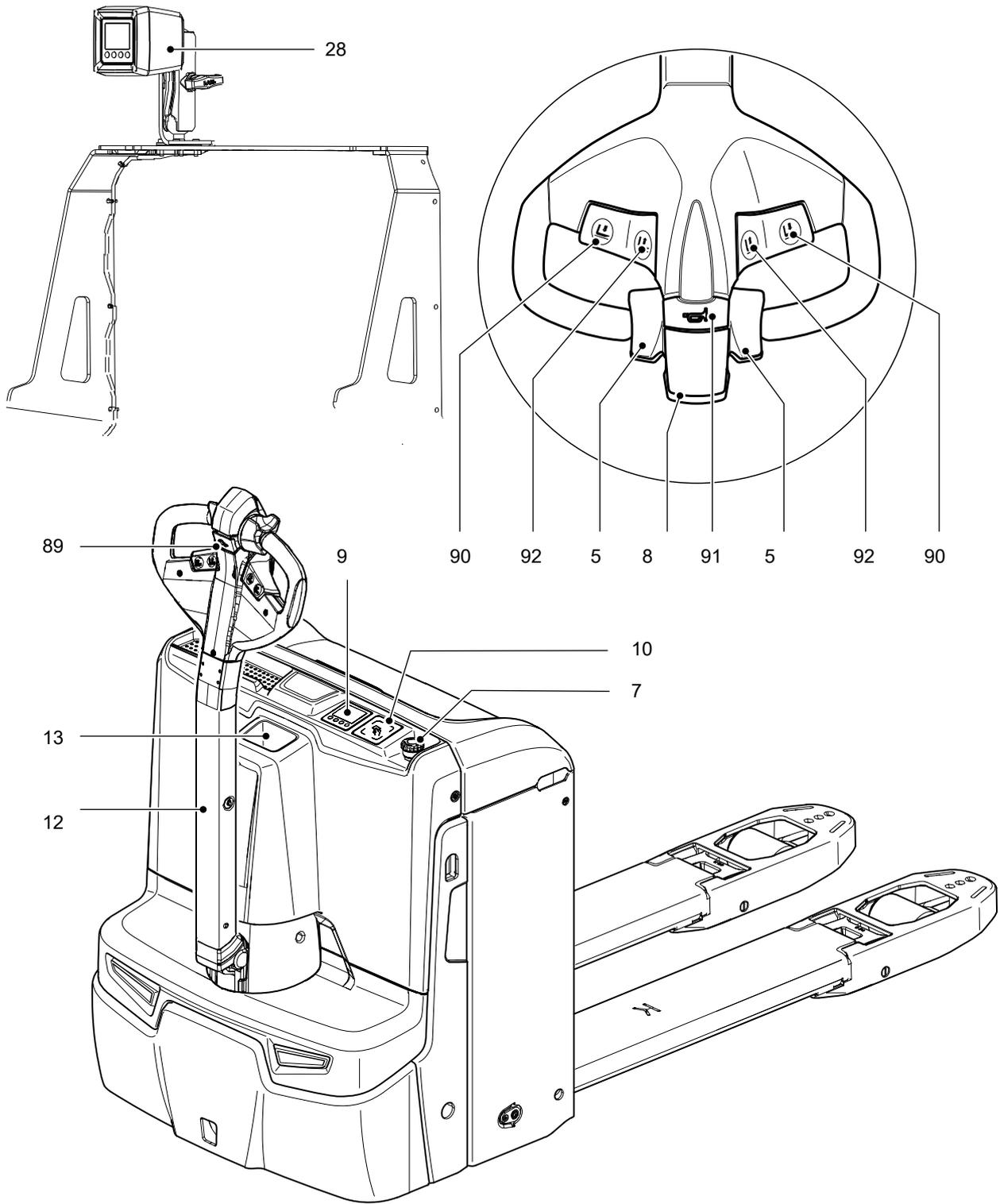
Damage and defects

The supervisor must be informed immediately of any damage or faults to the truck or attachment. Trucks which are unsafe for operation (e.g. wheel or brake problems) must not be used until they have been rectified.

Repairs

The operator must not carry out any repairs or alterations to the truck without authorisation and the necessary training to do so. The operator must never disable or adjust safety mechanisms or switches.

2 Displays and Controls



Item	Controls and displays		Function
5	Travel switch	●	Controls travel direction and travel speed.
7	Emergency disconnect switch	●	Used to brake the truck with maximum force and to interrupt the truck functions in an emergency. Activating the emergency disconnect switch disables all electrical functions in hazardous situations.
9	Charge status indicator	●	Shows the battery charge status.
	Display unit (Battery compartment XS ●)	○	Display for: <ul style="list-style-type: none"> – Battery charge status – Battery capacity – Service hours – Remaining run time – Travel program – Warning indicators – Event messages
	Soft keys under the display unit (Battery compartment XS ●)	○	Selection of: <ul style="list-style-type: none"> – Travel program – Options Replaces the key switch <ul style="list-style-type: none"> – Truck release by entering master and access codes

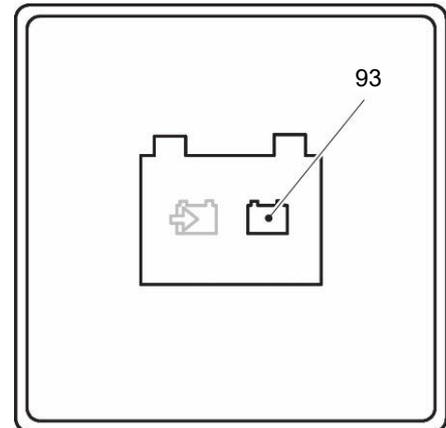
Item	Controls and displays		Function
10	Key switch and key	●	Truck release by switching on the control voltage. Prevents the truck from being switched on by unauthorised personnel.
	Keypad	○	Replaces the key switch – Solely to expand the display unit – Activates the truck by entering setup and access codes
	Transponder reader Transponder reader Plus	○	Replaces the key switch – Solely to expand the display unit – Activates the truck via a card / transponder – The transponder reader Plus supports additional transponder standards.
	2-stage key switch	○	Replaces the key switch – Solely to expand the display unit – Truck release by turning the GF30 or GF60 key to position 1 – Release of the spring-loaded brake exclusively by turning the GF60 key to position 2 – Truck shutdown by turning the key to position 0
8	Collision safety switch	●	Safety feature, drive direction travel only: When applied the truck travels for approx. 3 seconds in the load direction. The parking brake is then applied. The truck remains switched off until the travel switch is returned to neutral.
12	Tiller	●	Used for steering and braking
13	Mains connector for on-board charger (with safety circuit)	○	Used to charge the battery with the on-board charger – see page 58.
28	Pre-Op Check display unit	○	Displaying the digital checklist for the Pre-op Check – Performing and logging a digitally guided status check for the industrial truck – Only available in conjunction with the Jungheinrich Fleet Management System. – For further information on the Pre-op Check, see the "Jungheinrich Fleet Management System" operating instructions.

Item	Controls and displays		Function
89	"Slow travel" button	●	If the tiller is in the upper braking zone, braking can be overridden by pressing the button, and the truck can move at reduced speed (slow travel) – see page 110.
90	"Lower" button	●	Lowers the load handler.
91	"Warning signal" button	●	Used to trigger the warning signal (horn).
92	"Lift" button	●	Raises the load handler.

2.1 Charge Status Indicator

After the truck has been started, the charge status of the battery is shown. The LED (93) colours represent the following conditions:

LED colour	Charge status
Green	40 - 100%
Orange	30 - 40 %
Green/orange flashes 1 Hz	20 - 30 %
Red	0 - 20 %



→ If the LED is lit red, load can no longer be lifted. Lifting is only enabled when the battery connected is at least 70% charged.

If the LED flashes red and the truck is not ready for operation, inform the manufacturer's customer service department. Red flashing is a truck controller code. The flashing sequence indicates the type of fault.

Display during charging

Green LED (charge status)	
Lit	Charging complete, battery fully charged. (Pause in charging, trickle charge or compensation charging).
Slow flash	Charging.
Rapid flash	Displayed when a charge begins or after setting a new characteristic curve. Number of flash pulses corresponds to the characteristic curve set.

Red LED (fault)	
Lit	Overtemperature. Charging is interrupted.
Slow flash	Safety charging time exceeded. Charging is cancelled. Mains interruption required to begin charging again.
Rapid flash	Characteristic-curve setting is invalid.

2.2 Battery discharge monitor

→ The standard setting for the battery discharge indicator / discharge monitor is based on standard batteries. When using maintenance-free batteries or special batteries, the display and cut-off points of the battery discharge monitor must be set by the manufacturer's customer service department. If this setting is not configured, the battery may be damaged due to deep discharge.

NOTICE

Full discharge can damage the battery

Self-discharge can cause the battery to fully discharge. Full discharge shortens the useful life of the battery.

▶ Charge the battery at least every 2 months.

→ Charge the battery see page 53.

If the residual capacity falls below the required level, lifting is inhibited. A corresponding display appears. Lifting is not re-enabled until the battery connected is at least 70% charged.

3 Starting up the truck

3.1 Checks and operations to be performed before starting daily operation

WARNING!

Truck damage or defects can result in accidents

If damage or other truck defects are discovered during the following checks, the truck must be taken out of service until it has been repaired.

- ▶ Report any defects immediately to your supervisor.
 - ▶ Tag out the defective truck and take it out of service.
 - ▶ Do not return the truck to service until you have identified and rectified the fault.
-

Inspection before daily operation

Requirements

- Truck parked securely – see page 99.

Procedure

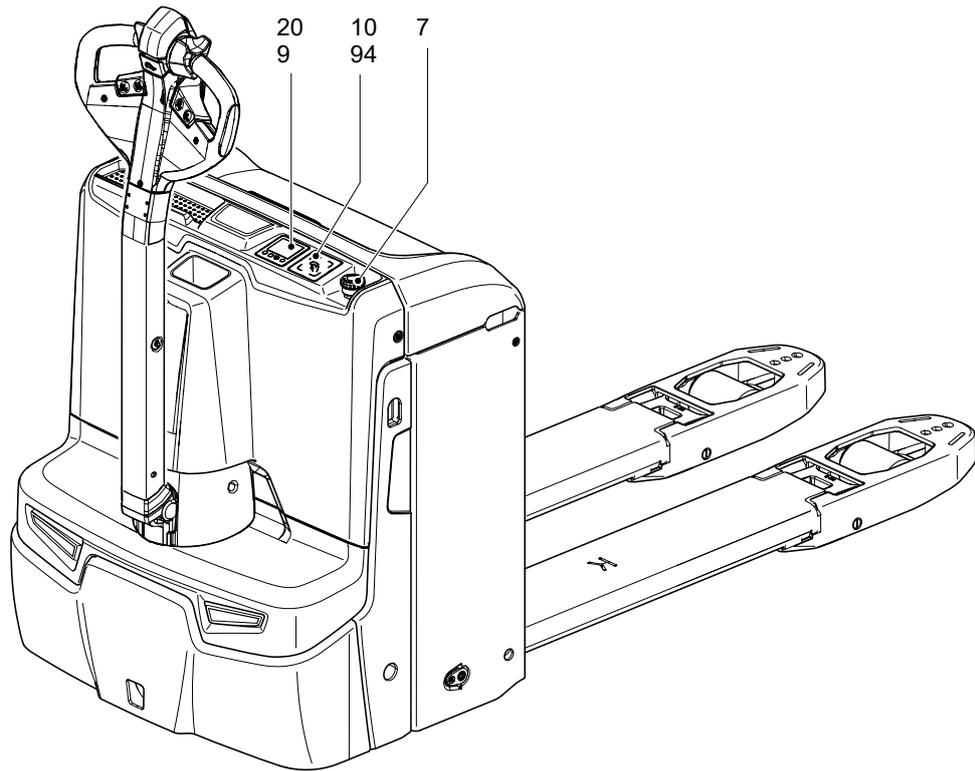
- Check the whole of the outside of the truck for signs of damage and leaks. Damaged hoses must be replaced immediately.
- Check the load handler for visible signs of damage such as cracks, bending or severe wear.
- Check the hydraulic system for leaks – see page 174.
- Check the battery attachment and cable connections for damage and make sure that they are secure – see page 45.
- Check the drive wheel and load wheels for damage and freedom of movement – see page 176.
- Check that the drive panels and covers are securely attached and check for damage – see page 21.
- Check the markings and labels for completeness and legibility – see page 37.
- Make sure the load backrest or options bar is secure and check for damage.
- Check that the controls return automatically to the neutral position after being used – see page 107.
- Check that the tiller automatically returns to the upright position – see page 106.

Equipment-specific checks

- Trucks with on-board charger (○): Check the mains cable of the on-board charger for damage.

If damage is identified, mark the truck accordingly and take it out of service. Have the truck repaired by the manufacturer or by a specialist authorised by the manufacturer.

3.2 Preparing the truck for operation



Switching on the truck

Requirements

– Checks and operations before starting daily work completed – see page 95.

Procedure

- Make sure that the emergency disconnect switch (7) is unlocked.
- Switch on the truck; to do this
 - Insert the key into the key switch (10) and turn it as far to the right as it will go.
 - Insert the key in the 2-stage key switch (94) and turn to position 1.
 - Activate the keyless access system – see page 135.
- Complete the checks and operations to be carried out when the truck is operational – see page 98.

Truck is operational.



After switching on, the travel program that was active when the truck was switched off is always active. Check the travel program.

- The charge status indicator (9) shows the current battery charge status.
- The display unit (20) indicates the current battery charge status and the operating hours.



If the truck cannot be switched on: Read any event messages on the display unit (20) and use the "Troubleshooting" section to identify the cause – see page 119.

- If the industrial truck is equipped with the Pre-Op Check function (○), the associated checklist must first be processed before the truck is fully ready for operation. For further information on the Pre-Op Check, see the "Jungheinrich Fleet Management System" operating instructions.

3.3 Visual inspections and activities to be performed after establishing operational readiness

⚠ WARNING!

Risk of accident due to damage to or other defects in the truck and optional features

If damage or other truck or attachment (optional equipment) defects are discovered during the following checks, the truck must be taken out of service until it has been repaired.

- ▶ Report any defects immediately to your supervisor.
- ▶ Mark defective truck and take out of service.
- ▶ Do not return the industrial truck to service until you have identified and rectified the fault.

Requirements

- Checks and operations before starting daily work performed – see page 95.
- Truck is switched on, see page 96.

Procedure

- Test warning devices and safety equipment:
 - Test the emergency disconnect function by pressing the emergency disconnect switch. The main circuit is disconnected and no truck operations can be performed. Now pull the emergency disconnect switch to unlock it, see page 105.
 - Test the horn by pressing the "warning signal" button – see page 89.
 - Check the braking efficiency – see page 112.
 - Test the steering – see page 111.
 - Test the travel functions – see page 107.
 - Test the lifting and lowering functions – see page 114.
 - Test the collision safety switch by pressing it while travelling in the drive direction – see page 89.
- Test the controls and displays and check for damage – see page 89.

3.4 Parking the truck securely

⚠ WARNING!

An unsecured truck can cause accidents

Do not leave an unsecured truck.

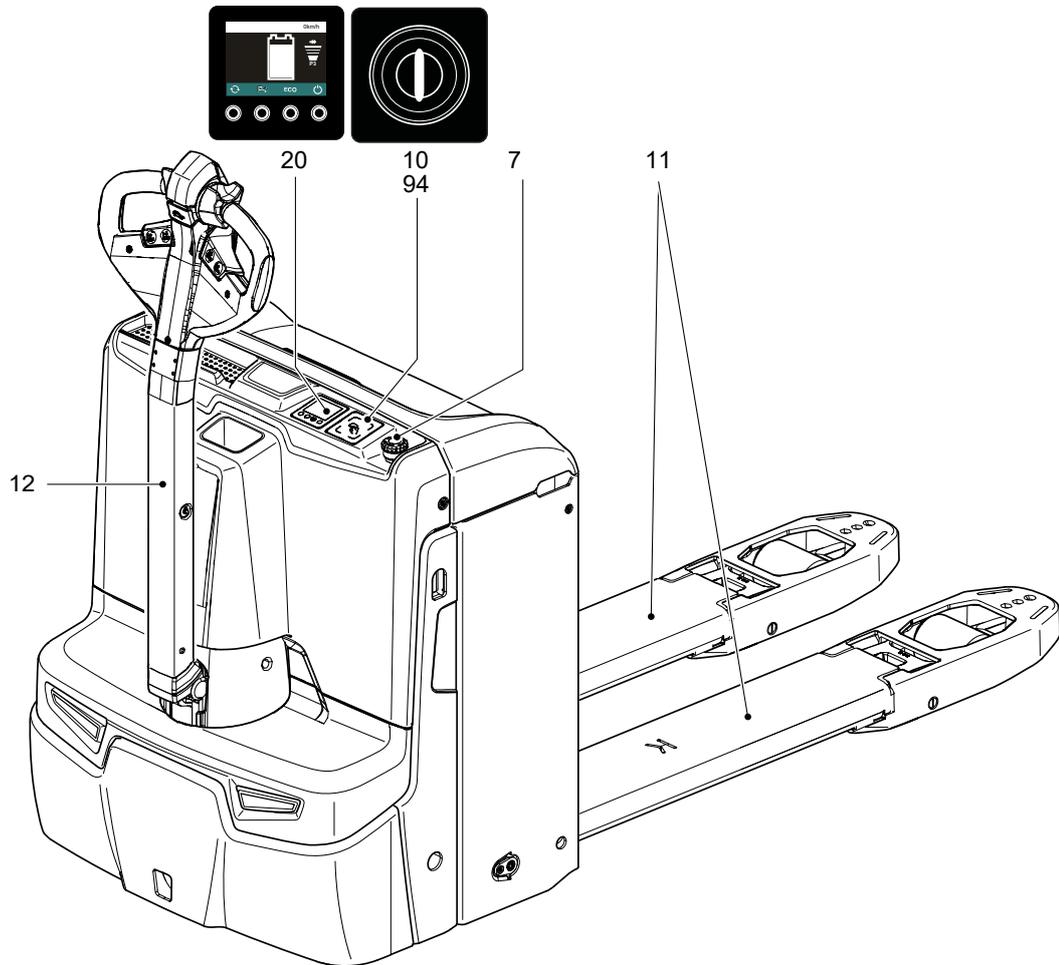
- ▶ Park the truck securely when leaving it.
 - ▶ Exception: If the operator intends to remain in the immediate vicinity and is leaving the truck for only a short while, the applied parking brake is sufficient to hold the truck, see page 112. Immediate vicinity is when the operator is able respond to malfunctions or attempts to use the truck by unauthorised persons immediately.
-

⚠ WARNING!

An unsecured truck can cause accidents

Do not park the truck on an incline. Do not park the truck without the brakes engaged. Do not park and leave the truck with the load handler raised.

- ▶ Park the truck on a level surface. In special cases the truck may need to be secured with wedges.
 - ▶ Fully lower the load handler when leaving the truck.
 - ▶ Select a place to park where no other people are at risk of injury from the lowered load handler.
 - ▶ If the brakes are not working, place wedges underneath the wheels of the truck to prevent it from moving.
-



Parking the truck securely

Procedure

- Park the truck on a level surface.
- Fully lower the load handler (11), see page 114.
- Set the drive wheel to "straight-ahead travel" using the tiller (12).
- Switch off the truck; to do this:
 - Turn the key in the key switch (10) anti-clockwise as far as it will go. Remove the key.
 - Turn the key in the 2-stage key switch (94) (○) to position 0. Remove the key.
 - Switch off the keyless access system (○) using the function button under the "switch on/off" symbol (20) on the display unit (○) – see page 144.
- In hazardous or unclear situations, also press the emergency disconnect switch (7).

Truck is parked securely.

4 Working with the truck

4.1 Safety regulations for travel mode

Travel paths and work areas

DANGER!

Do not exceed the permissible surface and spot load limits on the travel routes.

At blind spots get a second person to assist.

The driver must ensure that the loading ramp / dock cannot move or come loose during loading / unloading.

Only use lanes and routes specifically designated for traffic. Unauthorised third parties must stay away from work areas. Loads must only be stored in places specially designated for this purpose.

The truck must only be operated in work areas with sufficient lighting to avoid danger to personnel and materials. Additional equipment is necessary to operate the truck in areas of insufficient lighting.

Travel surface

The travel surface on which the truck is to be used on must be suitably maintained in order to provide the required traction for travel, steering and braking under the prevailing ambient conditions.

The details on the truck data plate assume a level and dry travel surface. Other ground surfaces may have a negative affect on the stability of the truck. They will result in a modification of the rated performance (e.g. speed reduction etc.) of the truck.

Faults due to strong magnets

WARNING!

Electromagnetic influence can result in accidents

Strong magnets can cause electronic components such as Hall sensors to become damaged, resulting in accidents.

► Do not use magnets in the operating area of the truck. Exceptions to this rule are commercial, weak clamping magnets for attaching notices.

Travel conduct

The operator must adapt the travel speed to local conditions. The truck must be driven at slow speed when negotiating bends or narrow passageways, when passing through swing doors and at blind spots. The operator must always observe an adequate braking distance between the forklift truck and the vehicle in front and must be in control of the truck at all times. Abrupt stopping (except in emergencies), rapid U turns and overtaking at dangerous or blind spots are not permitted. Do not lean out or reach beyond the working and operating area.

Travel visibility

The operator must look in the direction of travel and must always have a clear view of the route ahead. If the truck is carrying loads that affect visibility, the truck must

travel against the load direction. If this is not possible, a second person must walk alongside the truck as a lookout to observe the travel route while maintaining eye contact with the operator. Proceed only at walking pace and with particular care. Stop the truck as soon as you lose eye contact.

Negotiating lifts, loading ramps and docks

Lifts may only be negotiated if they have sufficient capacity, are suitable for driving on and authorised for truck traffic by the owner. The driver must satisfy himself of the above before entering these areas. The truck must enter lifts with the load in front and must take up a position which does not allow it to come into contact with the walls of the lift shaft. Persons riding in the lift with the forklift truck must only enter the lift after the truck has come to a rest and must leave the lift before the truck. The driver must ensure that the loading ramp / dock cannot move or come loose during loading / unloading.

Types of load to be carried

The operator must make sure that the loads are in a satisfactory condition. Loads must always be positioned safely and carefully. Take appropriate countermeasures if there is a risk of the load or parts of the load tipping or falling down.

Prevent liquid loads from sloshing out. Drive slowly and take special care when transporting liquid loads. Avoid abrupt braking or acceleration.

4.1.1 Negotiating slopes and inclines

When negotiating slopes and inclines, observe the following:

- Negotiating slopes and inclines in accordance with the technical specifications is permissible only if they are marked as traffic lanes.
- Before negotiating slopes, ensure that the truck has sufficient gradeability – see page 29.
- The slopes and inclines must be clean and non-slip and it must be possible to negotiate them safely in accordance with the truck's technical specifications.
- The travel direction must be selected in accordance with the following overview.
- The industrial truck must not be turned, operated at an angle or parked on inclines or slopes.
- Inclines must only be negotiated at slow speed, with the driver ready to brake at any moment.

→ In accordance with the German accident prevention regulations DGUV regulation 68 (as at August 2013), the load must be transported on the upslope when travelling on slopes and inclines.

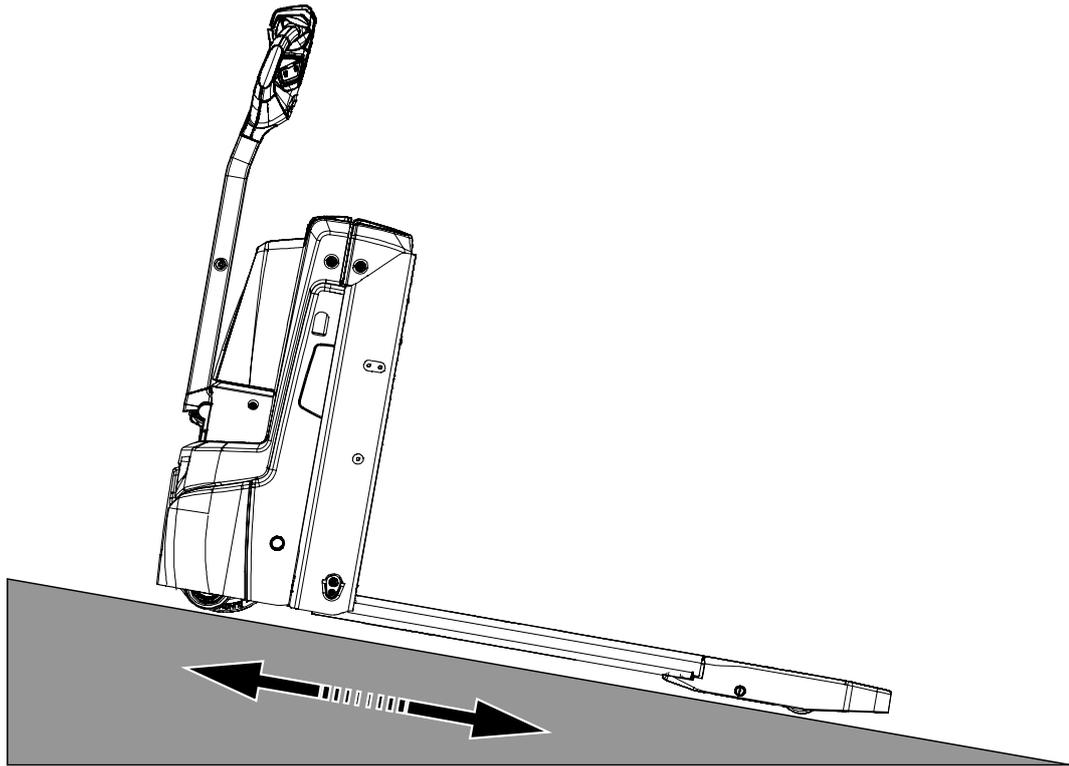
→ When travelling on slopes and inclines unladen, the load handler must always be oriented towards the downslope.

→ National regulations that deviate from this rule must be treated with priority.

4.1.1.1 Load status

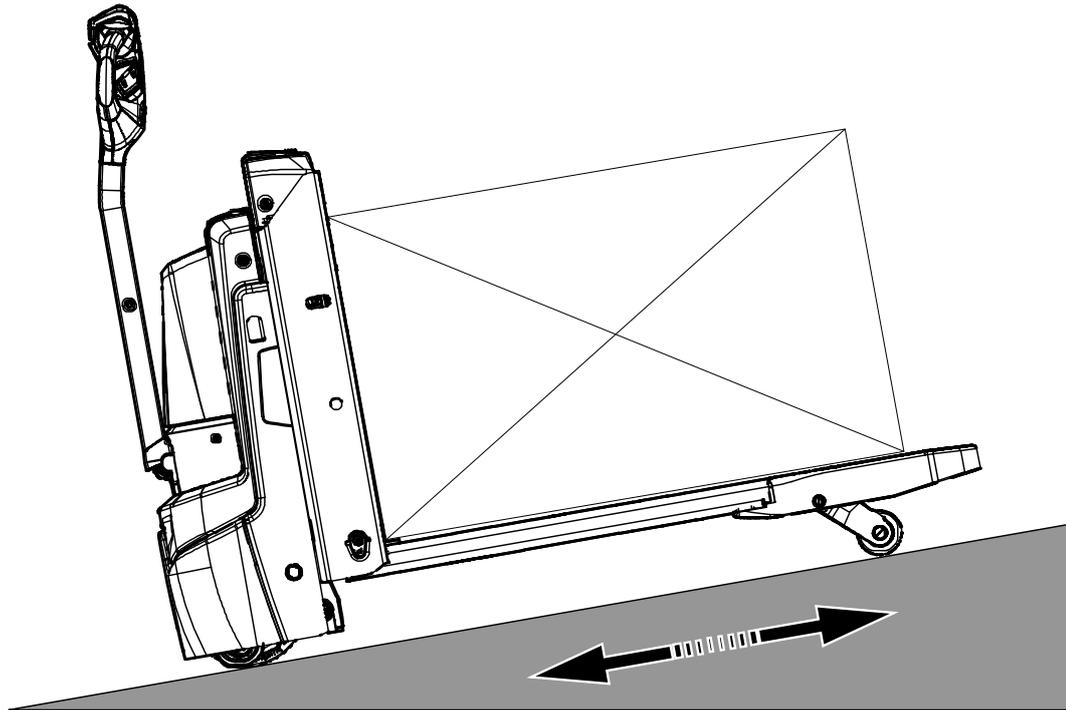
The travel direction that should be selected when driving on slopes and inclines depends on the current load status (transport travel or unladen travel).

4.1.1.2 Empty journey



- When travelling unladen in pedestrian mode, the load handler must be oriented towards the downslope, irrespective of the travel direction.

4.1.1.3 Transport run



- When travelling laden in pedestrian mode, the load handler must be oriented towards the upslope, irrespective of the travel direction.

4.2 Emergency Disconnect

⚠ CAUTION!

Applying maximum braking can result in accidents

Applying the Emergency Disconnect switch during travel will cause the truck to decelerate to a halt at maximum force. This may cause the load to slide off the load handler. There is a higher risk of accidents and injury.

- ▶ Do not use the Emergency Disconnect switch as a service brake.
- ▶ Use the Emergency Disconnect switch during travel only in emergencies.

⚠ CAUTION!

Faulty or non-accessible Emergency Disconnect switches can cause accidents

A faulty or non-accessible Emergency Disconnect switch can cause accidents. In dangerous situations the operator cannot bring the truck to a halt in time by applying the Emergency Disconnect switch.

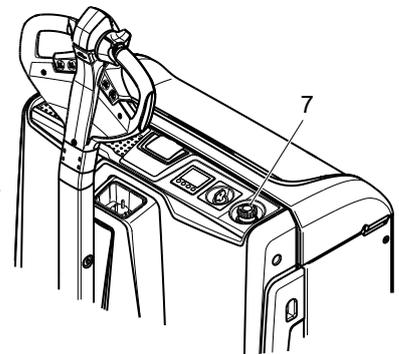
- ▶ The operation of the Emergency Disconnect switch must not be affected by any objects placed in its way.
- ▶ Report any defects on the Emergency Disconnect switch immediately to your supervisor.
- ▶ Mark defective truck and take out of service.
- ▶ Do not return the industrial truck to service until you have identified and rectified the fault.

Pressing the emergency disconnect switch

Procedure

- Press the emergency disconnect switch (7).

The industrial truck brakes to a halt and all electrical functions are deactivated.



- Press the Emergency Disconnect switch on in emergencies.
- Do not use the emergency disconnect switch as a service brake; otherwise, wear of the drive wheel will increase significantly.

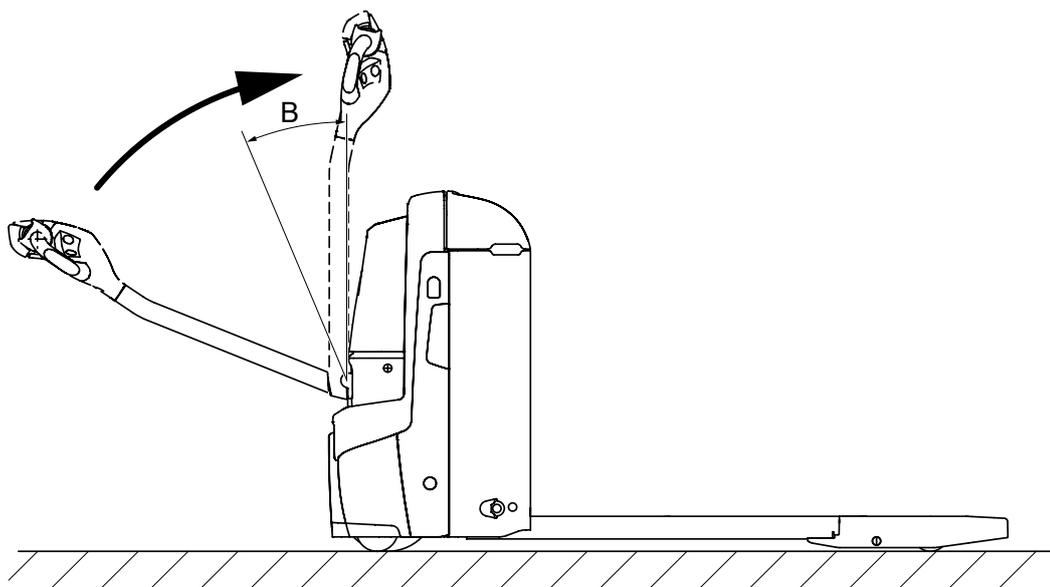
Unlocking the emergency disconnect switch

Procedure

- Turn the emergency disconnect switch (7) to unlock it.

All electrical functions are enabled and the truck is operational again (provided the truck was operational before the emergency disconnect switch was pressed).

4.3 Automatic braking



- When the tiller is released, it returns automatically to the upper brake zone (B) and the brakes are applied automatically.

⚠ WARNING!

Risk of collision due to a defective tiller

Operating the truck with a defective tiller can lead to collisions with persons or objects.

- ▶ If the tiller returns to the brake position slowly or not at all, the truck must be taken out of service until the cause of this fault is rectified.
 - ▶ Contact the manufacturer's customer service department.
-

4.4 Travel

⚠ WARNING!

Collision hazard when operating the truck

Collisions with personnel and equipment can result if the truck is operated with open panels.

- ▶ Do not operate the truck unless the panels and covers are closed and properly locked.
- ▶ When travelling through swing doors etc. make sure that the doors do not activate the collision safety button.

⚠ WARNING!

Risk of collision due to faulty travel switch

Operating the truck with a faulty travel switch can result in collisions with other people and objects.

- ▶ If the travel switch returns to the neutral position too slowly or not at all when released, the truck must be taken out of service until the cause of this fault is identified and rectified.

⚠ CAUTION!

Trapping hazard from the truck during pedestrian mode

In pedestrian mode, the truck can pose a trapping hazard for the operator and other people.

- ▶ Wear personal protective equipment (e.g. safety shoes).
- ▶ The truck must be operated with particular care and attention in pedestrian mode.
- ▶ Make sure there are no other people standing between the truck and obstacles when operating in pedestrian mode.

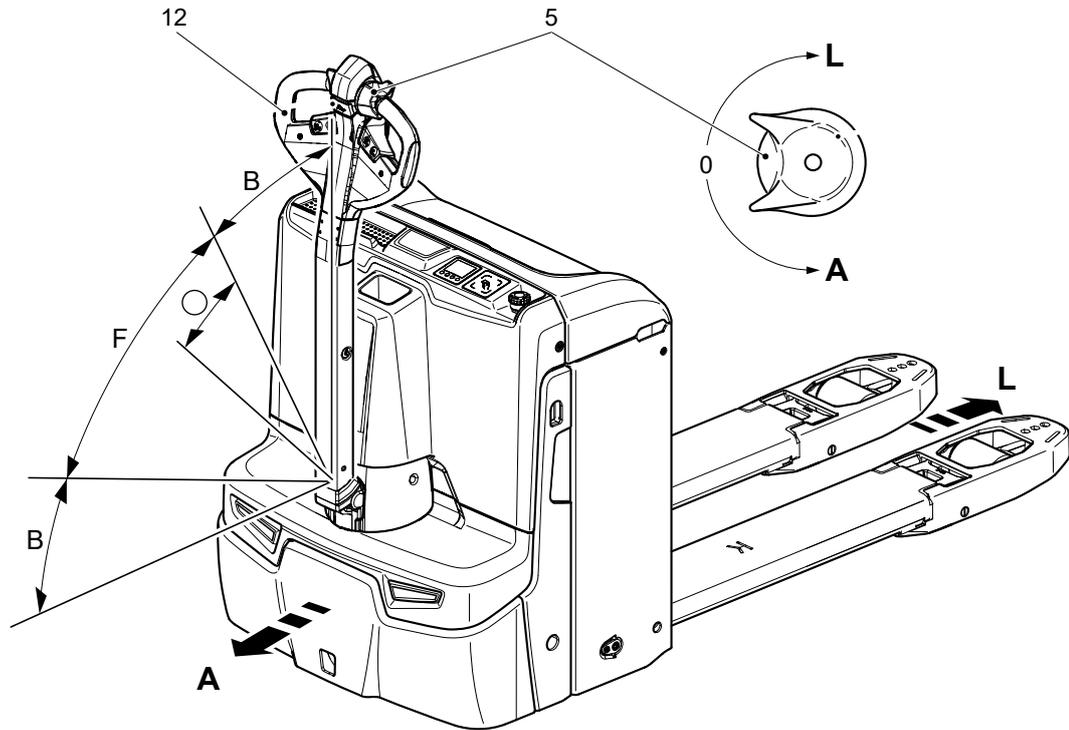
⚠ CAUTION!

Automatic braking can cause accidents

If the truck detects that signals which are required have not been received, or if it detects an error, the system reacts by triggering an emergency stop, either by braking the truck to a halt or until a valid signal status has been reached.

- ▶ Remain at a suitable distance from the truck during operation.

- ➔ Trucks can be equipped with an optional foot protection tiller. In this case, the travel speed is reduced in the upper range (○) of the travel zone F, see page 25.



Requirements

- Truck prepared for operation – see page 95

Procedure

- Set the tiller (12) to the travel zone (F) and actuate the travel switch (5) in the load direction (L) or the drive direction (A).
- Control the travel speed with the travel switch (5).

→ When the travel switch is released it automatically returns to its original position.

The brake is released and the truck moves in the selected direction.

→ Preventing the truck from "rolling downhill":
If the truck rolls backwards on an incline, the controller detects this and the brake is applied automatically after a short jolt.

4.5 Changing the direction of travel

⚠ CAUTION!

Danger when changing direction during travel

Changing direction during travel causes the truck to decelerate sharply. When the truck changes direction, it can start travelling at high speed in the opposite direction unless the travel switch is released in time.

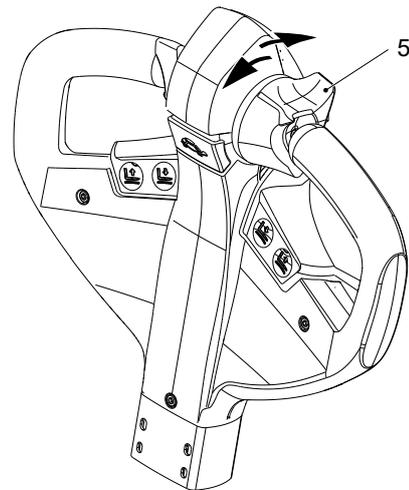
- ▶ After setting off in the opposite direction, apply the travel switch gently or not at all.
 - ▶ Do not perform any sudden steering operations.
 - ▶ Always face in the direction of travel.
 - ▶ Maintain an adequate overview of the route you are travelling.
-

Changing direction during travel

Procedure

- Set the travel switch (5) to the opposite travel direction while travelling.

The truck decelerates until it starts to travel in the opposite travel direction.



4.6 Slow travel

⚠ CAUTION!

Risk of accident if the service brake is deactivated

Particular care and attention is required by the operator during slow travel. The service brake is deactivated during slow travel and is only reactivated after the "slow travel" button is released.

- ▶ In hazardous situations brake by immediately releasing the "slow travel" button and the travel switch.
- ▶ During slow travel you can only brake by coating braking.

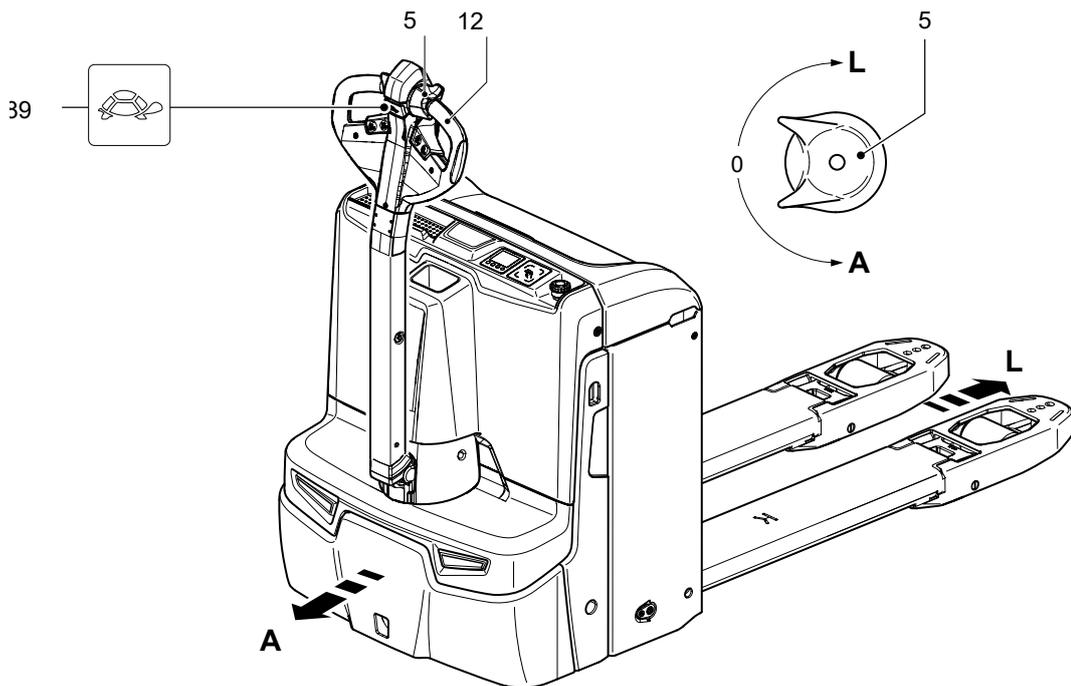
The truck can be operated with an upright tiller (12) (e.g. in congested areas / elevator).

Activating slow travel

Procedure

- Press the slow travel button (89).
- Actuate the travel switch (5) in the load direction (L) or drive direction (A).

The brake is released. The truck travels at slow speed.



Switching off slow travel

Procedure

- Release the slow travel button (89).
In zone "B", the brake applies and the truck stops.
In zone "F", the truck continues at slow travel speed.
- Release the travel switch (5).

Slow travel ends and the truck can now travel again at normal speed.

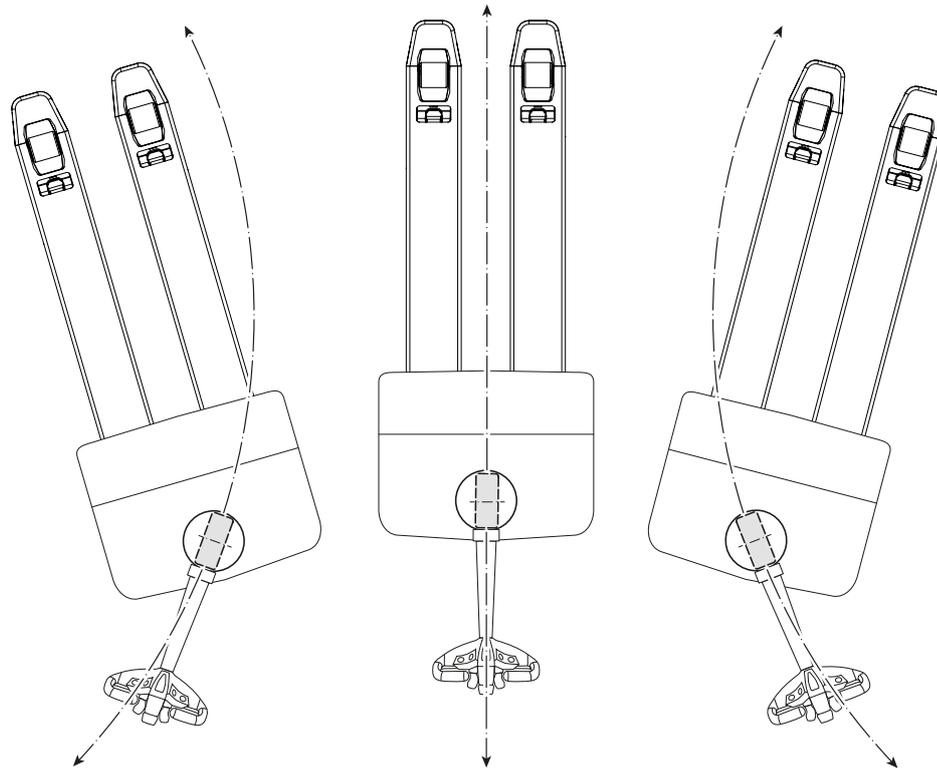
4.7 Steering

Procedure

- Swivel the tiller (12) to the left or right.

The truck is steered in the required direction.

- The steering direction of the truck corresponds to the swivel direction of the tiller, as shown by the figure.
The curve radius is determined by the swivel angle of the tiller.



4.8 Brakes

⚠ WARNING!

Accident risk

The brake pattern of the truck depends largely on the ground conditions.

- ▶ The operator must take into account the travel route conditions when braking.
- ▶ Brake with care to prevent the load from slipping.
- ▶ During normal operation the truck is to be braked only with the service brake.

⚠ CAUTION!

- ▶ In hazardous situations, swing the tiller to the brake position or press the emergency disconnect switch.

⚠ CAUTION!

Applying maximum braking can result in accidents

Applying the Emergency Disconnect switch during travel will cause the truck to decelerate to a halt at maximum force. This may cause the load to slide off the load handler. There is a higher risk of accidents and injury.

- ▶ Do not use the Emergency Disconnect switch as a service brake.
- ▶ Use the Emergency Disconnect switch during travel only in emergencies.

Braking types

The brake pattern of the truck depends largely on the travel-lane conditions. The driver must take this into account when driving the truck.

The truck can be braked in the following ways:

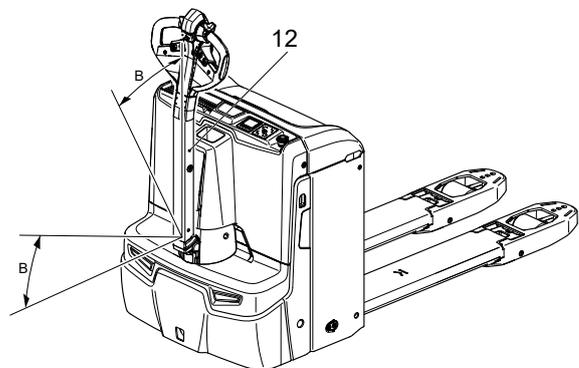
- Braking with the service brake, (tiller in braking zone "B")
- Braking by inversion braking (travel switch)
- Braking with the coasting brake
- Actuating the emergency disconnect switch – see page 105
Actuate only in an emergency, as damage to the drive wheel may occur.

Braking with the service brake

Procedure

- Move the tiller (12) up or down to one of the brake zones (B).

The truck decelerates at the maximum rate until it comes to a halt.

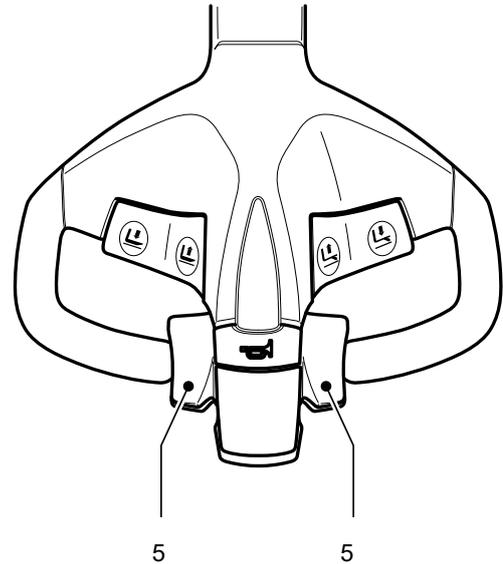


Inversion braking

Procedure

- During travel, set the travel switch (5) to the opposite direction.

The truck brakes regeneratively until it starts to move in the opposite direction.



→ The brake force can be set by the manufacturer's service department.

⚠ CAUTION!

Danger when changing direction during travel

Changing direction during travel causes the truck to decelerate sharply. When the truck changes direction, it can start travelling at high speed in the opposite direction unless the travel switch is released in time.

- ▶ After setting off in the opposite direction, apply the travel switch gently or not at all.
 - ▶ Do not perform any sudden steering operations.
 - ▶ Always face in the direction of travel.
 - ▶ Maintain an adequate overview of the route you are travelling.
-

Braking with the coasting brake

Procedure

- If the travel switch is set to 0, the truck automatically brakes regeneratively.

The truck brakes to a halt regeneratively via the coasting brake. The brake is then applied.

- When braking regeneratively, energy is returned to the battery, ensuring a longer service time.
- The brake force can be set by the customer service department on request.

⚠ WARNING!

Danger of accidents due to regenerative braking fault

Regenerative braking faults can result in extended stopping distances and accidents, particularly when travelling on inclines. Other persons can be injured in the truck's hazardous area.

- ▶ Keep all persons out of the hazardous area during travel operations.
- ▶ Instruct other people to move out of the hazardous area of the truck. Stop working with the truck if people do not leave the hazardous area.
- ▶ In emergencies, use the service brake for braking.

4.8.1 Parking brake

When the truck has come to a halt the parking brake applies automatically. The parking brake is electrically released and actuated through spring pressure. The parking brake prevents the truck from accidentally rolling away.

4.9 Lifting, transporting and depositing loads

⚠ WARNING!

Risk of accident due to unsecured and incorrectly positioned loads

Before lifting a load, the operator must ensure that it has been correctly palletised and does not exceed the truck's rated capacity.

- ▶ Instruct other people to move out of the hazardous area of the truck. Stop using the truck immediately if people do not vacate the hazardous area.
- ▶ Only transport loads that have been correctly secured and positioned. Use suitable precautions to prevent parts of the load from tipping or falling down.
- ▶ Damaged loads must not be transported.
- ▶ Never exceed the maximum loads specified on the capacity plate.
- ▶ Do not stand on the load handler.
- ▶ Do not pick up people.
- ▶ Insert the load handler as far as possible underneath the load.

⚠ CAUTION!

- ▶ Picking up longitudinal goods (e.g. pipes, rods, etc.) from the side is not permitted.

Picking up the load

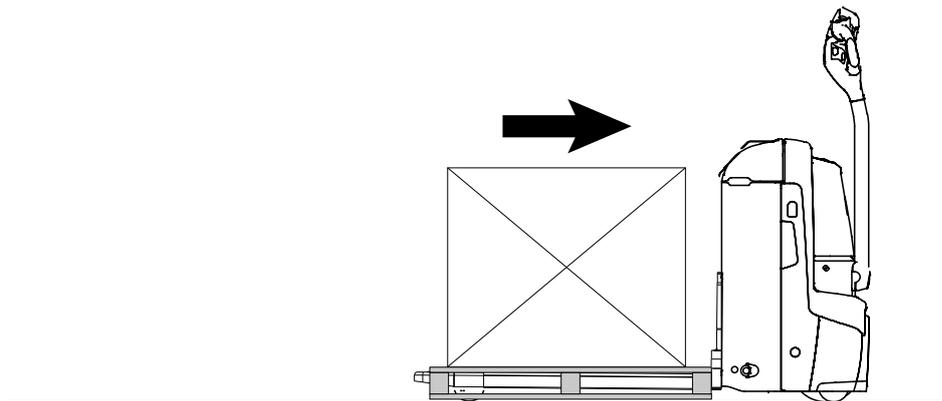
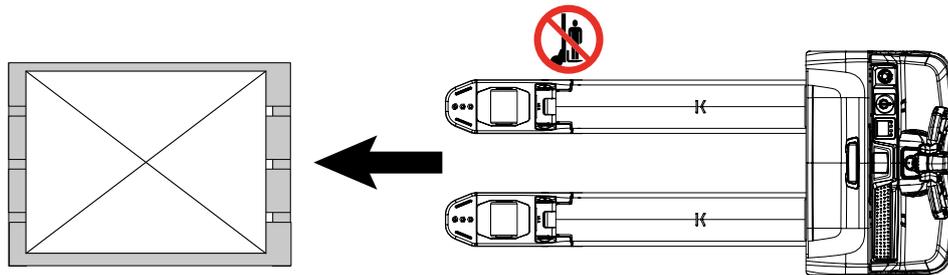
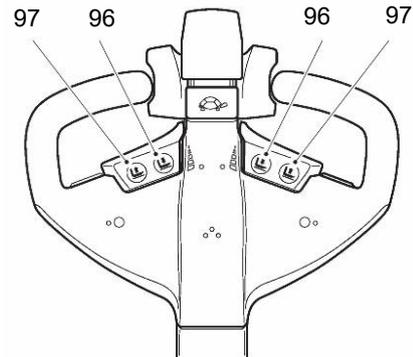
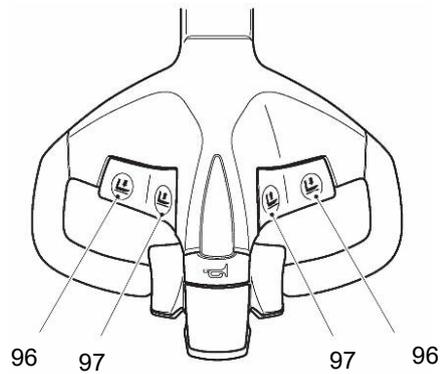
Requirements

- Load is correctly palletised.
- The weight of the load corresponds to the capacity of the industrial truck.
- Fork arms evenly loaded for heavy loads.

Procedure

- Drive the truck carefully up to the pallet.
- Carefully insert the fork arms into the pallet.
- Press the "lift" button (97) until you reach the maximum lift height.

The load is raised.



Hydraulic function lock: The default setting of the control enables lifting only when the tiller is in the travel range (F) or when the "slow travel" button is pressed. This does not affect lowering. This default setting can be changed by the manufacturer's customer service department via a parameter.

Transporting Load Units

Requirements

- Load raised correctly.
- Good ground conditions.

Procedure

- Accelerate and decelerate with care.
- Adapt your travel speed to the conditions of the route and the load you are transporting.
- Travel at a constant speed.
- Be prepared to brake at all times.
 - Brake gently in normal circumstances.
 - Only stop abruptly in hazardous situations.
- Watch out for other traffic at crossings and passageways.
- You must use a lookout at blind spots.
- Do not travel across or at an angle on inclines. Do not turn on slopes and inclines, and always drive with the load facing uphill.

Maximum load length

The load to be picked up must not extend more than 50 mm beyond the load handler tips.

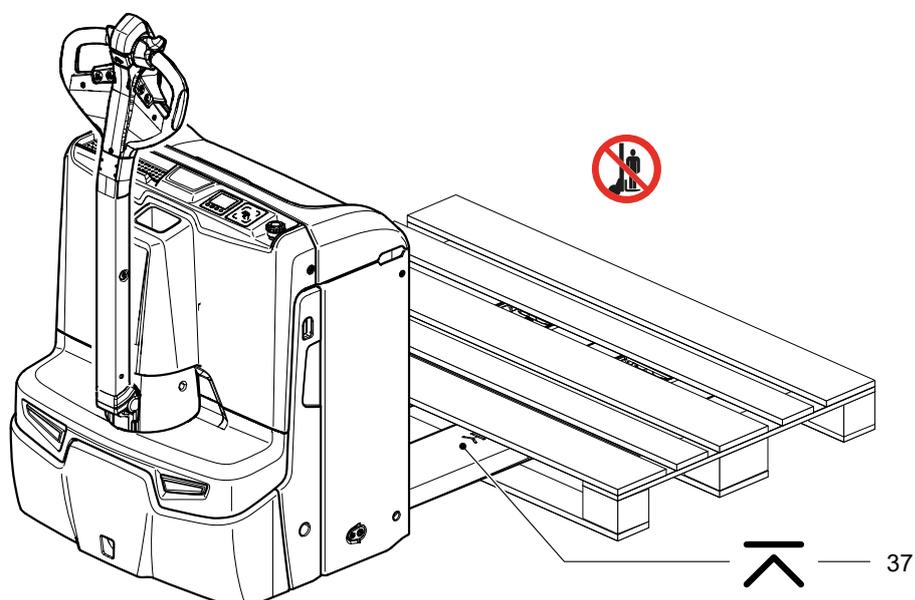
Picking up a Euro pallet from the side

NOTICE

Damage to incorrectly positioned pallets during lifting

When picking up a pallet from the side, if the truck is driven either not far enough or too far into the pallet the load rollers may end up resting on one of the transverse boards. The pallet may then be damaged when the initial lift is raised.

- ▶ When picking up Euro pallets from the side, observe the marking points on the support arms.
- ▶ When picking up other pallet types from the side, make sure before lifting that the load rollers are on the ground.



The truck support arms have special markings (37) that help the operator when picking up pallets from the side. When the pallet is correctly positioned, the truck load rollers are located between the pallet base boards.

Procedure

- Drive the truck up to the crossways pallet.
- Slowly insert the support arms into the Euro pallet until the transverse side of the pallet is touching the marking (37).
- Raise the support arms.

Load picked up.

Lift cut-out

- The EJE 114/116/118/120/114i/116i/118i is optionally equipped with automatic lift cut-off. This function can be set by the operator when needed. For this, the truck must be secured and parked without load. The "Lift" button (97) is then pressed for approx. 5 seconds until automatic cut-off. Additional lifting is then terminated automatically by the system in order to save energy.

⚠ CAUTION!

Loads must not be deposited on traffic lanes or escape routes, in front of safety equipment or in front of operating equipment that must be accessible at all times.

Depositing the load

Requirements

- Storage location suitable for storing the load.

Procedure

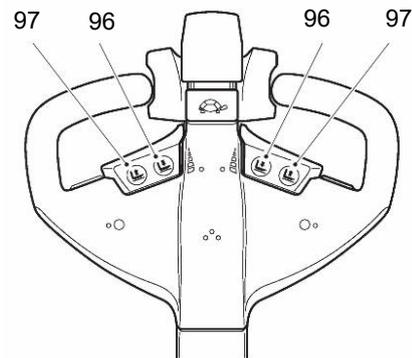
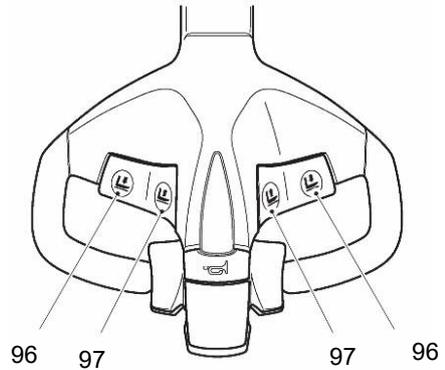
- Drive carefully up to the storage location.
- Press the "Lower" button (96).
- Lower the load handler until it is clear of the load.
- Carefully remove the load handler from the pallet.

The load is set down.

- Avoid depositing the load suddenly to avoid damaging the load, load handler and the rack support bar.

NOTICE

Avoid depositing the load suddenly to avoid damaging the load, load handler and the rack.



5 Troubleshooting

This chapter allows operators to identify and rectify simple faults or the results of incorrect operation themselves. When trying to locate a fault, proceed in the order shown in the remedy table.



If, after carrying out the following remedial action, the industrial truck cannot be restored to operation or if a fault in the electronics system is displayed with a corresponding error message, contact the manufacturer's customer service department.

Subsequent troubleshooting must only be performed by the manufacturer's customer service department. The manufacturer has a customer service department specially trained for these tasks.

In order for customer services to react quickly and specifically to the fault, the following information is essential:

- Truck serial number
- Event message on the display unit (if present)
- Error description
- Current location of truck.

5.1 Truck does not start

Possible Cause	Action
Battery connector not plugged in	Check the battery connector and plug it in if necessary.
Emergency Disconnect pressed.	Unlock the Emergency Disconnect
Key switch set to O.	Set the key switch to "I"
Battery charge too low	Check the battery charge and charge battery if necessary.
Faulty fuse	Check fuses

Event message	Possible cause	Actions
E-0914.2	Tiller not in the upper or lower braking zone when the industrial truck is switched on	– Set the tiller to the top or the bottom braking zone – see page 107
E-1914.1	Collision safety switch pressed when truck switched on	– Do not press collision safety switch
E-1925.1	Slow travel button pressed when truck switched on	– Do not press the button
E-1953.1	Travel switch not in home position when truck switched on	– Do not actuate the travel switch
E-1953.1	Travel switch actuated for more than 0.5 seconds with the tiller folded up, without release via the tiller switch or the "slow travel" button. The operating sequence has not been observed.	Follow the operating sequence: 1. Move the tiller into the travel zone (F) or press the "slow travel" button. 2. Actuate the travel switch.
E-2953.1	Button for lifting or lowering a load handler not in the home position when switching on the truck	– Do not press the button – see page 89

5.2 Load cannot be lifted

Possible cause	Action
Truck not operational	Carry out all actions listed under "Truck does not start"
Hydraulic oil level too low	Check the hydraulic oil level
Battery discharge monitor has switched off	Charge battery
Excessive load	Note maximum capacity, see data plate.

Event message	Possible cause	Actions
E-1914.1	Collision safety switch pressed when truck switched on	– Do not press collision safety switch
E-1953.1	Travel switch not in home position when truck switched on	– Do not actuate the travel switch
E-2953.1	Button for lifting or lowering a load handler not in the home position when switching on the truck	– Do not press the button – see page 89

5.3 Lithium-ion battery fault

If any faults are found in the battery or the Jungheinrich charger, contact the manufacturer's customer service department immediately.

The operating company must not carry out any remedial work on its own.

Independent attempts to tamper with or repair the battery may invalidate the warranty. A service agreement with Jungheinrich will help identify faults.

WARNING!

Do not open the battery.

5.3.1 Restricted use (slow travel, lift cut-off, no travel) of the truck

Event message	Possible cause	Actions
E-5195.x	Error in a strand The lithium-ion battery can still be used, but with reduced capacity	<ul style="list-style-type: none">– Charge the lithium-ion battery, see page 81– If the problem persists, contact the manufacturer's customer service department

5.3.2 Truck can no longer be switched on

Event message	Possible cause	Actions
-	The lithium-ion battery has switched to energy-saving mode to protect against deep discharge	<ul style="list-style-type: none"> – Charge the battery, see page 81 – If the problem persists, contact the manufacturer's customer service department
E-5409.1	Overtemperature or fault of the lithium-ion battery Before the lithium-ion battery is shut down, corresponding warnings appear on the truck	<ul style="list-style-type: none"> – Bring the lithium-ion battery within the permissible application range, see page 12 – Charge the battery, see page 81 – If the problem persists, contact the manufacturer's customer service department
E-5413.2	Low temperature or fault of the lithium-ion battery Before the lithium-ion battery is shut down, corresponding warnings appear on the truck	<ul style="list-style-type: none"> – Bring the lithium-ion battery within the permissible application range, see page 12 – Charge the battery, see page 81 – If the problem persists, contact the manufacturer's customer service department
E-5344.1 E-5342.1	Low voltage or fault of the lithium-ion battery Before the lithium-ion battery is shut down, corresponding warnings appear on the truck	<ul style="list-style-type: none"> – Charge the battery, see page 81 – If the problem persists, contact the manufacturer's customer service department

5.3.3 Deeply discharged batteries

Discharging below a certain capacity limit (deep discharge) considerably reduces the service life of the battery.

To protect the battery, the charge status indicator shows only the battery capacity range that can be used for operation, i.e. when the capacity limit is reached, the charge status is shown as 0 %. On some trucks, the lift function is also disabled, the travel speed is restricted to slow travel or a warning notice is shown on the control unit. This reduces the risk of damage to the battery through further discharge.

-
- Fully or partially discharged batteries must be re-charged immediately and not left. To achieve an optimum service life, avoid discharges below the displayed capacity range.
-

Deeply discharged batteries

No charging takes place if the battery is deeply discharged. Deeply discharged batteries cannot be charged by the operator (faulty).

- Contact the manufacturer's customer service department.

6 Emergency recovery of the truck

⚠ WARNING!

Accidental truck movement

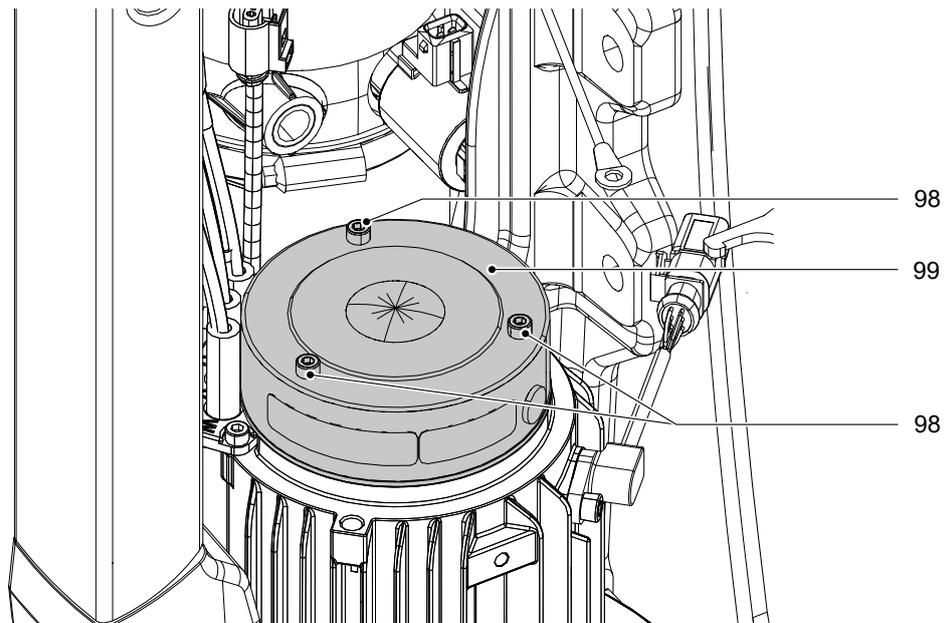
When the brakes are released, the truck must be parked securely on a level surface, since the brakes are no longer effective.

- ▶ Do not release the parking brake on slopes or inclines.
 - ▶ Activate the parking brake again when you reach your destination.
 - ▶ Do not park the truck with the parking brake released.
-

⚠ WARNING!

Only return the truck to service when you have identified and rectified the fault.

6.1 Releasing the Drive-Wheel Brake without a GF60 Service Key



Releasing the brake

Requirements

- Industrial truck can no longer be moved under its own power.
- Secure the truck to prevent accidental movement, e.g. using wheel chocks.
- The front panel has been disassembled – see page 168.
- The drive panel has been disassembled – see page 169.

Tools and Material Required

- Torque wrench (6 Nm)
- Hexagon socket insert 4 mm

Procedure

- Unscrew three screws (98) until the brake (99) is resting loosely on the surface.

➔ The brake must not be released completely.

- Remove the chocks.

The truck can be moved.

Activating the brake

Requirements

- Secure the truck to prevent accidental movement, e.g. using wheel chocks.

Procedure

- Tighten three screws (98) with a torque of 6 Nm.
- Fit the drive panel – see page 168.
- Fit the front panel – see page 169.

Braking is now restored. The brake can now be applied without current.

6.2 Releasing the drive wheel brake with a service key GF60

- The GF60 service key must not remain on the truck during normal operation. The service key may only be used by an authorised person.

Operating the truck without its own drive system

Requirements

- Truck prevented from rolling away.
- Battery in the truck is charged.

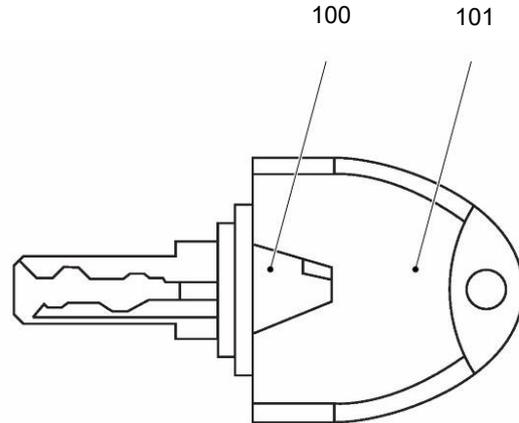
Tools and Material Required

- GF60 service key (101) with lock bar (100)

Procedure

- Insert the service key GF60 in the key switch.

- The service key GF60 and lock bar can only be inserted and turned on one side. If inserted in the wrong direction the key will not turn.
- Turn service key to position 1.
 - Press down the lock bar on the key head.
 - Turn the service key to position 2.



The truck can be operated without its own drive system.

⚠ CAUTION!

A released brake can result in accidents

The operator must apply particular care when operating the truck with a released brake. The truck can only brake in the following ways:

- ▶ By turning the service key to position 1.
- ▶ By applying the Emergency Disconnect switch.

Parking the truck

Procedure

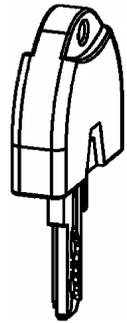
- Turn the service key to the 0 position and remove the key.

→ After switching back from level 2 to level 1, the lock bar returns to its original position.

The brake is now activated again.

→ The GF30 key (without lock bar) is for normal operation. The key can be inserted in both directions and can only be turned to position 1 in the key switch.

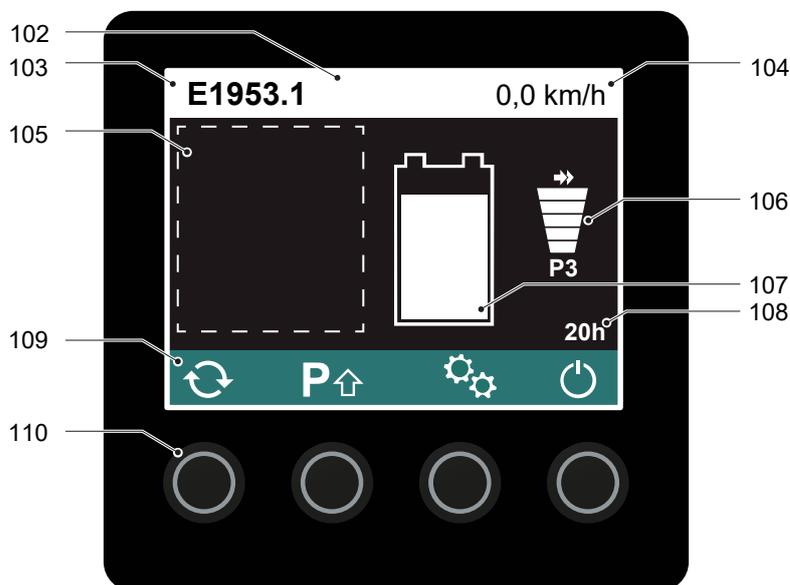
GF 30



7 Optional Equipment

7.1 Display unit (2 inch display)

7.1.1 Display unit with 2-inch display



Item	Display or control element	Function
102	Information field	Displays event messages and optional information such as speed – see page 129.
103	Information line	Event message – see page 119
104	Information line	Speed display – see page 129
105	Area for display symbols	Area for information concerning operation of the truck. The symbols shown depend on the operating situation and the truck status – see page 132.
106	Travel-program display	Displays the current travel program. The selected travel program is also shown in text form (P1, P2, P3) under the bar display.
107	Battery charge status	The higher the fill level on the charge status indicator, the higher the residual capacity of the battery.
108	Service-hours display	Displays the current number of service hours.
109	Function symbols	The functions shown as function symbols are operated using the function key located underneath, see page 130.
110	Function keys	Selection buttons for the corresponding functions.

The indicator lamps that appear on the display unit are dependent on the truck equipment.

7.1.2 Information field

Any event messages are shown in the left section of the information line (102).

The right section of the information line shows the truck speed in km/h or mph.

7.1.3 Button Allocation of the Display Unit (○)

Functions and operator menus that can be operated via the icons and keys of the display unit depend on the operating situation as well as the scope and settings of the truck.

Button allocation within the main menu

Symbol	Meaning
	Travel program: To change the travel program
	Settings (○): To change to the menu to administer the codes or transponders
	Shutdown (○): Allows the truck to be switched off Shutdown is only on the display if the truck is switched on with an access code.

Button allocation in options menu (○)

Symbol	Meaning
	Menu change: Changes to the next operator menu
	Settings (○): To change to the menu to administer the codes or transponders

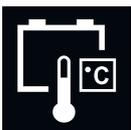
Button allocation in menu for managing codes or transponders (○)

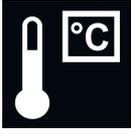
Symbol	Meaning
	Change set-up code: To change the set-up code and to activate the keypad or the transponder reader.
	Edit access code / transponder: To add or delete access codes or transponders
	Chronological log-in process: <ul style="list-style-type: none"> – In the log-in process, the last differing access codes or transponders with which the truck was switched on are displayed. – The last successful log-in is displayed first.
	Selection up: To select access codes or transponders
	Selection down: To select access codes or transponders
	Delete: To delete access codes selected
	Add: To add new access codes
	Back: Cancels the current operation and returns to the previous menu.
	Confirm: To confirm an entry or a transponder code

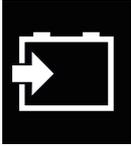
7.1.4 Symbols in the display

Any number of symbols can be shown in the display area. The symbols shown during operation depend on the operating and truck status.

Pictograms that appear in connection with the Pre-Op Check are explained in the "Jungheinrich Fleet Management System" operating instructions.

Symbol	Meaning	Colour	Function
	Emergency stop	Red	Lights up in the case of automatic function deactivation due to truck malfunctions.
	Login with additional equipment	White	Lights up when waiting for user authentication on additional equipment (○).
		Green	
		Yellow	
		Red	
	Warning	Yellow	Lights up in the case of an operating error.
		Red	Lights up in the case of a truck fault. Travel is restricted to slow travel or lift, lower and travel functions are reduced.
	Truck disabled	Yellow	Lights up when the truck has been disabled due to a serious event. Possible causes: – Error in the drive system – Error in the hydraulic system – Shock event (truck with fleet management system)
	Tiller position	Yellow	Lights up on power-up with tiller in travel zone. Illuminates with travel switch operated and tiller in braking zone.
	Service note	Yellow	Lights up when maintenance is due.
	Assistance system not ready	Yellow	Lights up when an assistance system of the truck is not ready.
	Lithium-ion battery overtemperature	Red	Lights up to indicate an overtemperature of the lithium-ion battery

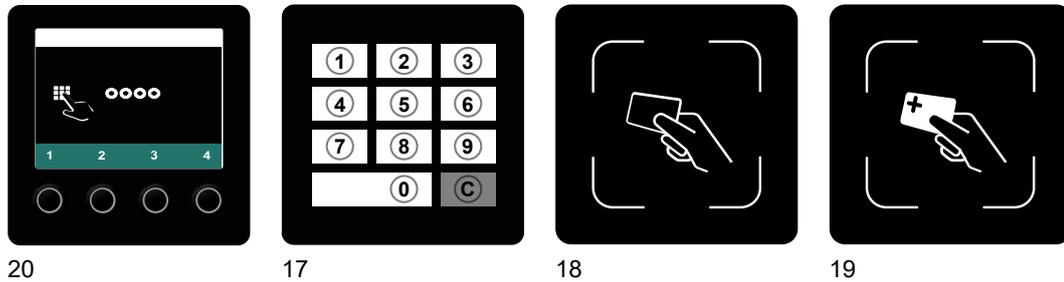
Symbol	Meaning	Colour	Function
	Lithium-ion battery low temperature	Yellow	Lights up to indicate a low temperature of the lithium-ion battery – Discharge currents and energy recovery are reduced.
		Red	Lights up to indicate a low temperature of the lithium-ion battery – The truck is switched off via the battery contactor. – The display unit switches off.
	Truck overtemperature	Yellow	Lights up when the temperature of the truck exceeds the permissible range. – Lifting, lowering and travel functions are reduced.
		Red	Lights up when the temperature of the truck exceeds the permissible range. – Lifting, lowering and travel functions are deactivated.
	Lift deactivated	Yellow	Lights up if the lift functions are deactivated due to insufficient battery capacity or if the lift function has not been released.
	Lift limit, support arm lift	Yellow	Illuminates if the “Raise support arm lift” button is pressed when the lift limit in the support arm lift has been reached.
	Lowering limit, support arm lift	Yellow	Illuminates if the “Lower support arm lift” button is pressed when the lowering limit in the support arm lift has been reached.
	Impact display (equipment with fleet management system)	Yellow	Lights up when a moderate shock event has occurred. – Slow travel is triggered.
		Red	Lights up when a serious shock event has occurred. – Lifting and travel functions are deactivated.
	Battery indicator, low residual capacity	Yellow	Lights up when residual capacity \leq 30% Charge the battery soon.
		Red	Lights up when residual capacity \leq 20 % Charge the battery immediately.

Symbol	Meaning	Colour	Function
	Charging process	Green	Shows information on battery charging (trucks with on-board charger). – Flashing: Charging process, readiness for charging – Lit: Charging complete
		Red	Shows information on battery charging (trucks with on-board charger). – Charging interrupted
	Slow travel	Yellow	Lights up when the travel speed is reduced by the control unit of the industrial truck (e.g. optional when the load handler is completely lowered) Lights up when the operator reduces the travel speed ("slow travel" button pressed).
		Green Yellow White	Lights up when slow travel is activated via an external interface (e.g. by the fleet management system).
	Slow travel (foot protection tiller)	Yellow	Illuminates when speed reduction has been activated by the "foot protection tiller" assistance system.

7.2 Keyless Access System

The keyless access systems serve as a replacement for the key switch to release the truck.

The keyless access system allows an individual code to be allocated to each operator or group of operators.



Item	Description
17	Keypad (EasyAccess PinCode): <ul style="list-style-type: none"> – Consists of keys 0 to 9 and C (clear) – Entry of 4-digit set-up and access codes – Up to 100 access codes can be stored
18	Transponder reader (EasyAccess Transponder): <ul style="list-style-type: none"> – Up to 100 transponders can be stored
19	Transponder reader Plus (EasyAccess Transponder): <ul style="list-style-type: none"> – The transponder reader Plus supports additional transponder standards.
20	Display unit (EasyAccess Softkey): <ul style="list-style-type: none"> – Description see page 129 – Entry of 4-digit set-up and access codes – Up to 10 access codes can be stored – For set-up and access codes with the numbers 1 to 4

→ Operation of transponder reader Plus (19) corresponds to the operation of the standard transponder reader (18).

7.3 General Information about the Use of Keyless Access Systems

The default code is to be found on a sticker. When using for the first time, change the set-up code and remove the sticker!

- Default code: 1-2-3-4
- Factory set-up code: 2-4-1-2

- When allocating the codes, ensure the rider trucks are given a different code than pedestrian trucks.
- When a valid code is entered or a valid transponder used, a green tick appears in the display unit.
When an invalid code has been entered or a invalid transponder used, a red cross is displayed, and the entry must be repeated.
- If the truck is not used for a certain length of time, the display unit switches to standby mode. Pressing any key cancels the standby mode.

The following additional settings can be performed by the manufacturer's customer service department.

7.4 Commissioning the keypad and the transponder reader

If the truck is equipped with a keypad or a transponder reader, it can only be operated using the keys in the display unit. The keypad and the transponder reader have to be activated by the operating company.

7.4.1 Activating the keypad

Procedure

- Release the emergency disconnect switch, see page 105.
- Enter the default code 1-2-3-4 using the keys below the display unit (20).

The truck is switched on.

- Press the key below the "Settings" symbol (111).
- Press the key below the "Change set-up code" symbol (112).
- Enter the set-up code 2-4-1-2 using the keypad (17).

The set-up code entered is displayed.

- When starting the truck for the first time, change the set-up code. The new set-up code must not be the same as the default set-up code or an access code.

Press the key below the "Delete" symbol (113).

The set-up code is deleted.

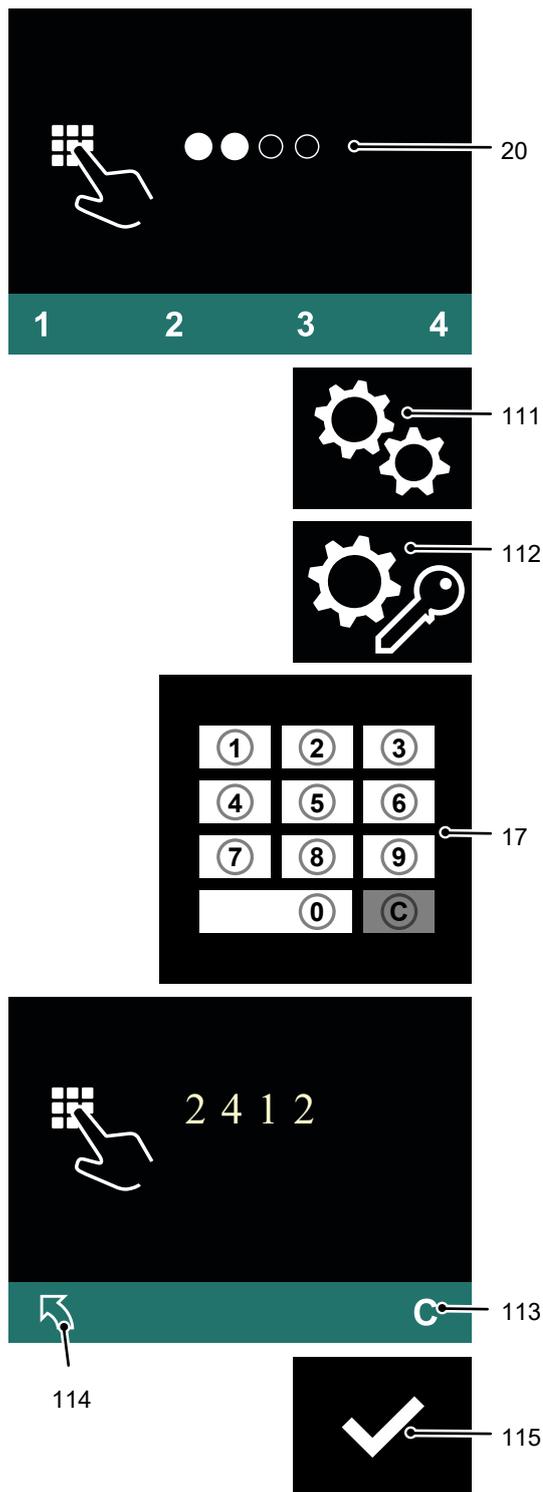
- Enter the new set-up code using the keypad (17).
- Press the key below the "Confirm" symbol (115).

The new set-up code is displayed.

- If the new set-up code was entered incorrectly, the procedure can be repeated using the key below the "Delete" symbol (113).

- To return to the main menu, press the key below the "Back" symbol (114).
- Delete the default code, see page 147.
- Create access codes, see page 146.

The keypad is active.



7.4.2 Activating the transponder reader

Procedure

- Release the emergency disconnect switch, see page 105.
- Enter the default code 1-2-3-4 using the keys below the display unit (20).

The truck is switched on.

- Press the key below the "Settings" symbol (111).
- Press the key below the "Change set-up code" symbol (112).
- Enter the set-up code 2-4-1-2 using the keys below the display unit (20).

The set-up code entered is displayed.

- Press the key below the "Delete" symbol (113).

The set-up code is deleted.

- Hold a transponder in front of the transponder reader (18).

This transponder thus becomes the set-up transponder.

- Press the key below the "Confirm" symbol (115).

The code for the set-up transponder is displayed.

→ *If the wrong transponder has been used, the procedure can be repeated using the key below the "Delete" symbol (113).*

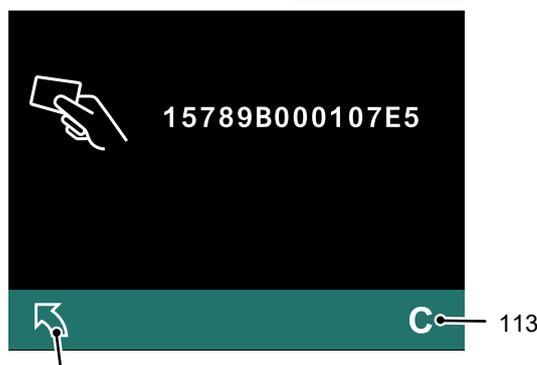
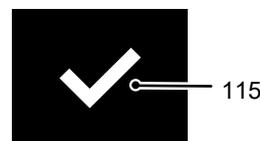
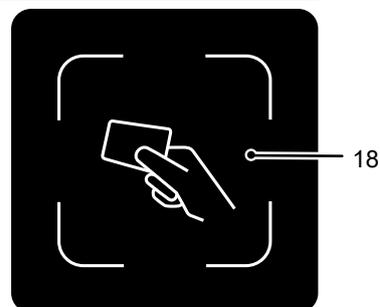
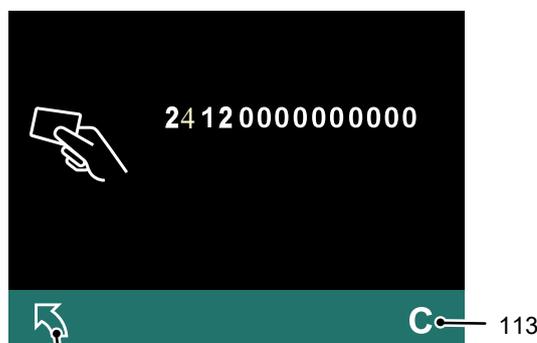
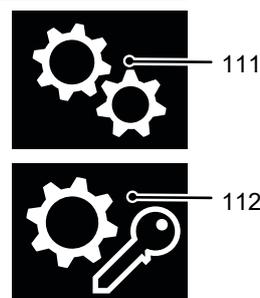
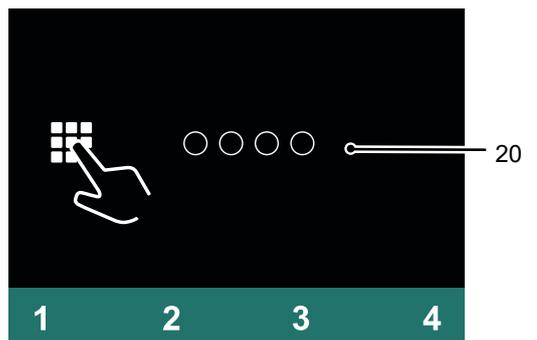
- To return to the main menu, press the key below the "Back" symbol (114).

→ The default code can no longer be used and must be deleted.

Delete the default code, see page 152.

- Add new transponders, see page 151.

The transponder reader is now active.



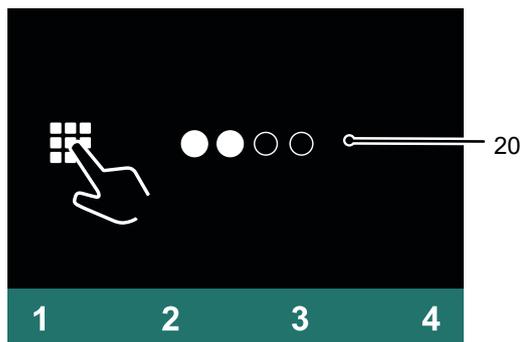
7.5 Using the Display:

7.5.1 Switching on the truck with an access code

Procedure

- Release the emergency disconnect switch, see page 105.
- Enter the access code with the buttons below the display (20).

The truck is switched on.

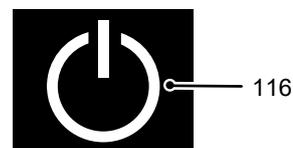


7.5.2 Switching off the truck

Procedure

- Press the key under the "Switch off" symbol (116) in the display unit.
- Press the Emergency Disconnect switch, see page 105.

The truck is switched off.



7.5.3 Changing the set-up code

Requirements

- The truck is switched on, see page 144.

Procedure

- Press the key below the "Settings" symbol (111).
- Press the key below the "Change set-up code" symbol (112).
- Enter the set-up code using the keys below the display unit (20).

The set-up code entered is shown as filled-in circles.

- Press the key below the "Delete" symbol (113).

The set-up code is deleted.

- Enter the new set-up code using the keys below the display unit (20).

→ The new set-up code must be different from existing access codes.

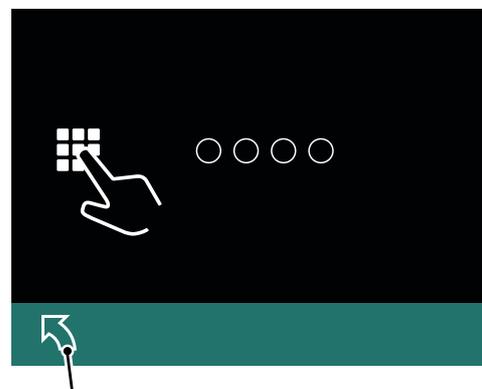
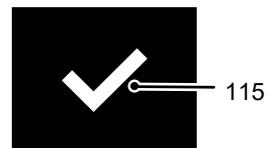
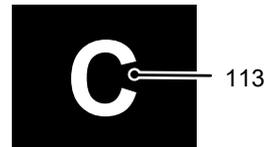
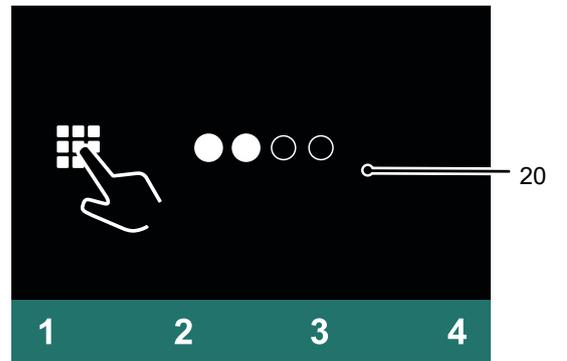
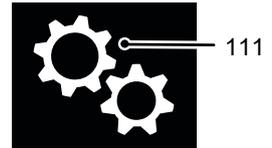
- Press the key below the "Confirm" symbol (115).

The new set-up code is displayed.

→ If the new set-up code has been entered incorrectly, delete it and add a set-up code again.

To return to the main menu, press the key below the "Back" symbol (114).

The set-up code has been changed.



114

7.5.4 Adding a new access code

Requirements

- The truck is switched on, see page 144.

Procedure

- Press the key below the "Settings" symbol (111).
- Press the key below the "Edit access code" symbol (117).

The set-up code is requested.

- Enter the set-up code using the keys below the display unit (20).

All the access codes are displayed.

- Press the key below the "Add" symbol (118).
- Enter the new access code using the keys below the display unit (20).

→ The new access code must be different from existing access codes.

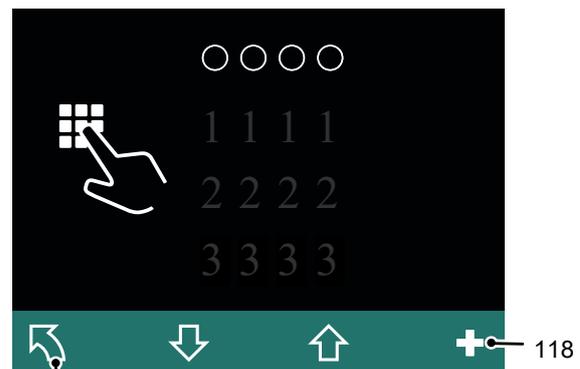
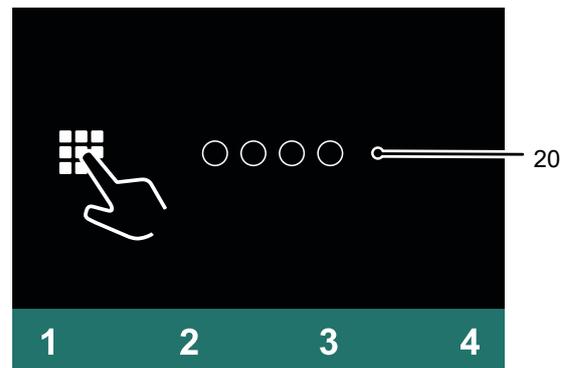
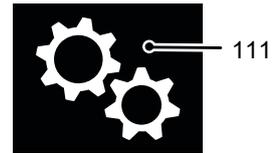
- Press the key below the "Confirm" symbol (115).

The new access code is displayed.

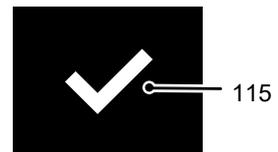
→ If the new access code has been entered incorrectly, delete it, see page 147, and add an access code again.

To return to the main menu, press the key below the "Back" symbol (114).

A new access code has been added.



114



7.5.5 Deleting an access code

Requirements

- The truck is switched on, see page 144.

Procedure

- Press the key below the "Settings" symbol (111).
- Press the key below the "Edit access code" symbol (117).

The set-up code is requested.

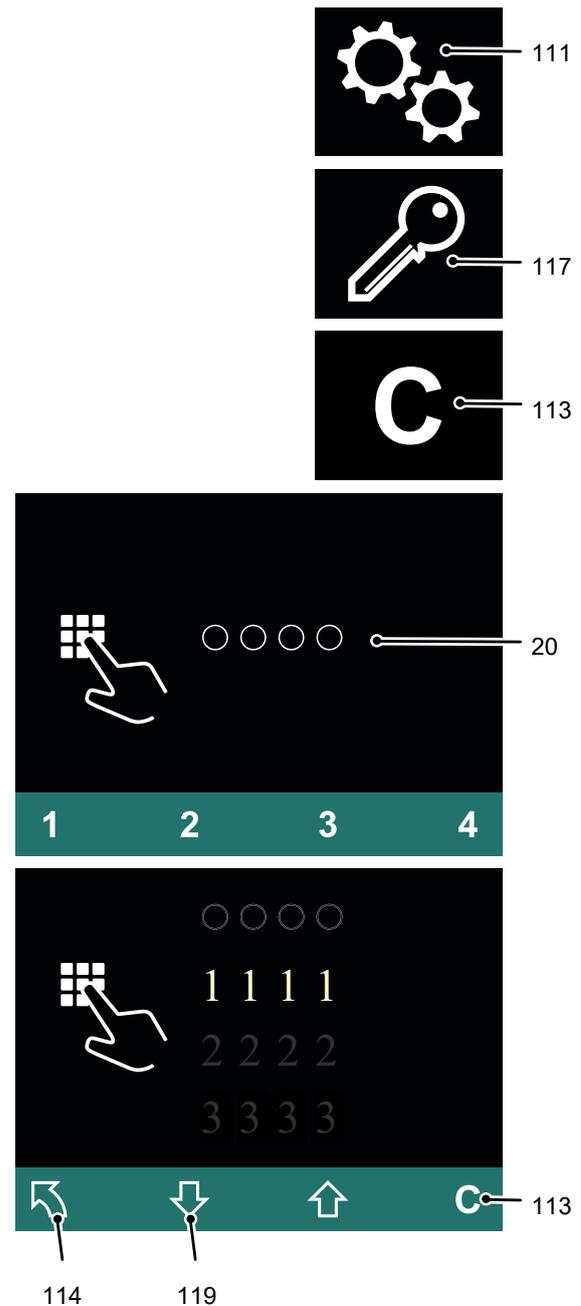
- Enter the set-up code using the keys below the display unit (20).

All the access codes are displayed.

- Select the access code to be deleted using the key below the "Down selection" symbol (119).
- Press the key below the "Delete" symbol (113).

The access code has been deleted.

- To return to the main menu, press the key below the "Back" symbol (114).



7.5.6 Displaying the log-in history

The use of the last different access codes is displayed during the log-in process. The last log-in is displayed first.

- If multiple access codes are logged as being displayable simultaneously, the display area can be moved by scrolling forward or back.

Requirements

- The truck is switched on, see page 139.

Procedure

- Press the key below the "Settings" symbol (111).
- Press the key below the "Log-in process" symbol (120).
- Enter the set-up code using the keys below the display unit (20).

The set-up code entered is shown as filled-in circles.

- To scroll forward, press the button under the "Down selection" symbol (119) as many times as necessary.

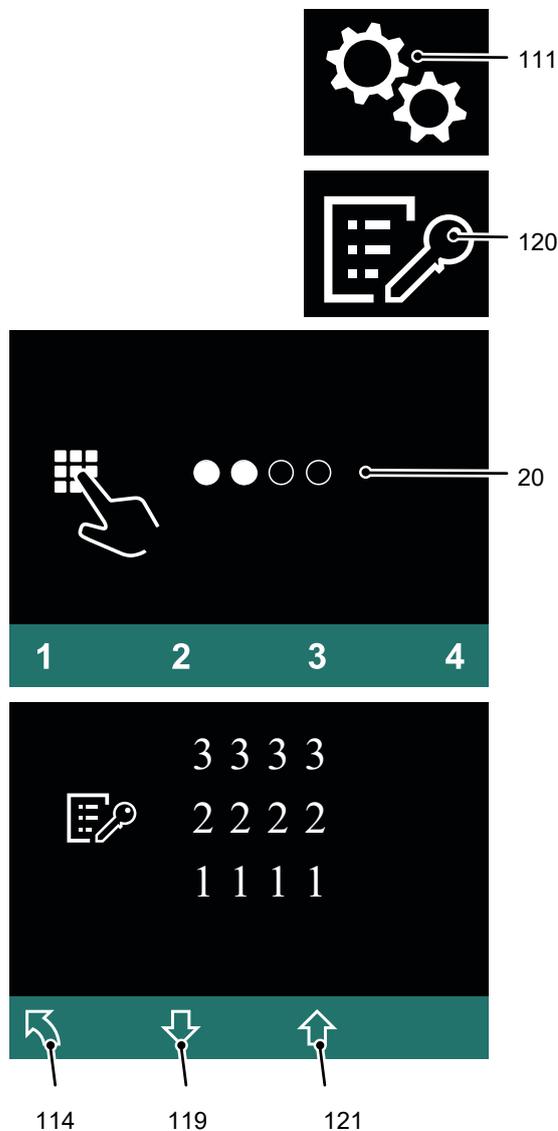
The display area moves: Additional earlier log-ins are displayed.

- To scroll back, press the button under the "Up selection" symbol (121) as many times as necessary.

The display area moves: More recent log-ins are displayed.

- To return to the main menu, press the key below the "Back" symbol (114).

The log-in process is displayed.



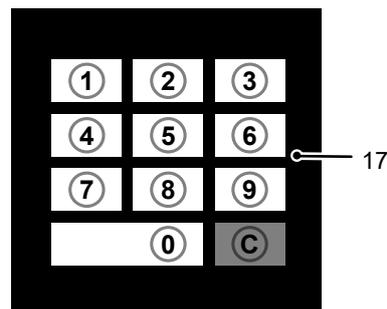
7.6 Using the Keypad

7.6.1 Switching on the truck with an access code

Procedure

- Release the emergency disconnect switch, see page 105.
- Enter the access code with the keypad (17).

The truck is switched on.



Procedure

- Press the key under the "Switch off" symbol (116) in the display unit.
- Press the Emergency Disconnect switch, see page 105.

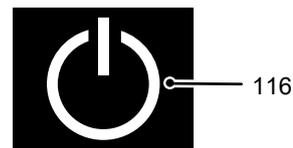
The truck is switched off.

7.6.2 Switching off the truck

Procedure

- Press the key under the "Switch off" symbol (116) in the display unit.
- Press the Emergency Disconnect switch, see page 105.

The truck is switched off.



7.6.3 Changing the set-up code

Requirements

- The truck is switched on, see page 144.

Procedure

- Press the key below the "Settings" symbol (111).
- Press the key below the "Change set-up code" symbol (112).
- Enter the set-up code using the keypad (17).

The set-up code entered is shown in the display unit (20) as filled-in circles.

- Press the key below the "Delete" symbol (113).

The set-up code is deleted.

- Enter the new set-up code using the keypad (17).

→ The new set-up code must be different from existing access codes.

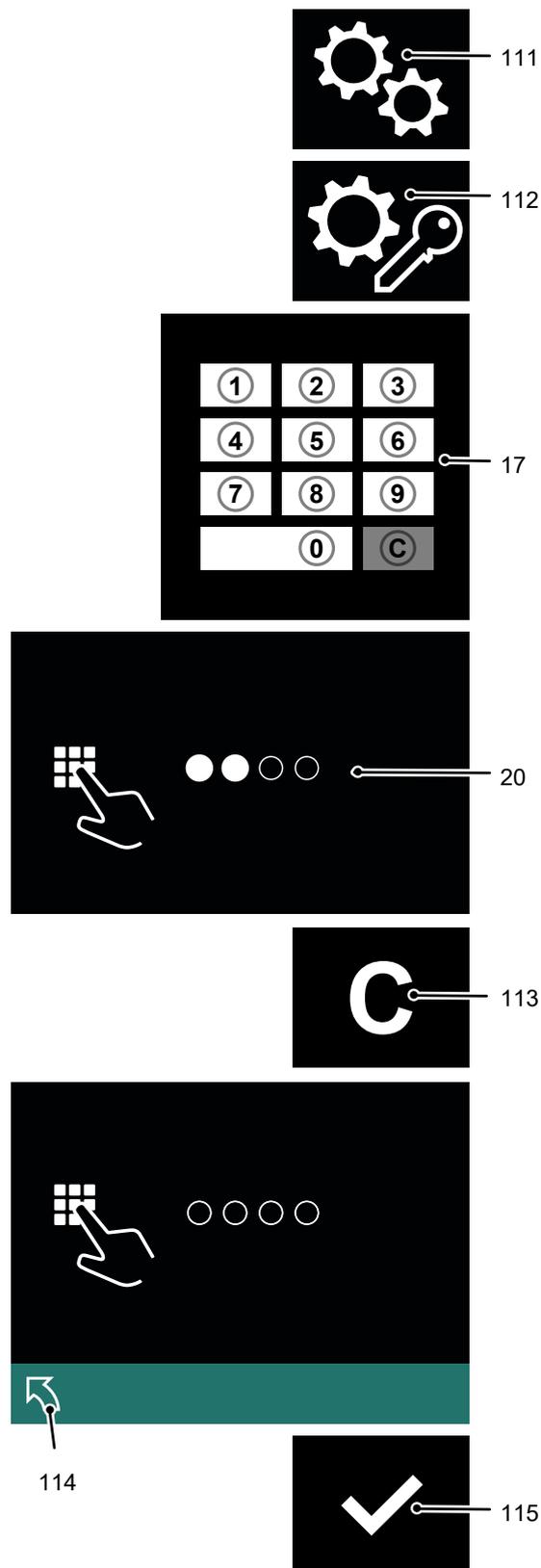
- Press the key below the "Confirm" symbol (115).

The new set-up code is displayed.

→ If the new set-up code has been entered incorrectly, delete it and enter the correct set-up code.

To return to the main menu, press the key below the "Back" symbol (114).

The set-up code has been changed.



7.6.4 Adding a new access code

Requirements

- The truck is switched on, see page 144.

Procedure

- Press the key below the "Settings" symbol (111).
- Press the key below the "Edit access code" symbol (117).

The set-up code is requested.

- Enter the set-up code using the keypad (17).

All access codes are shown on the display unit (20).

- Press the key below the "Add" symbol (118).
- Enter a new access code using the keypad (17).

→ The new access code must be different from existing access codes.

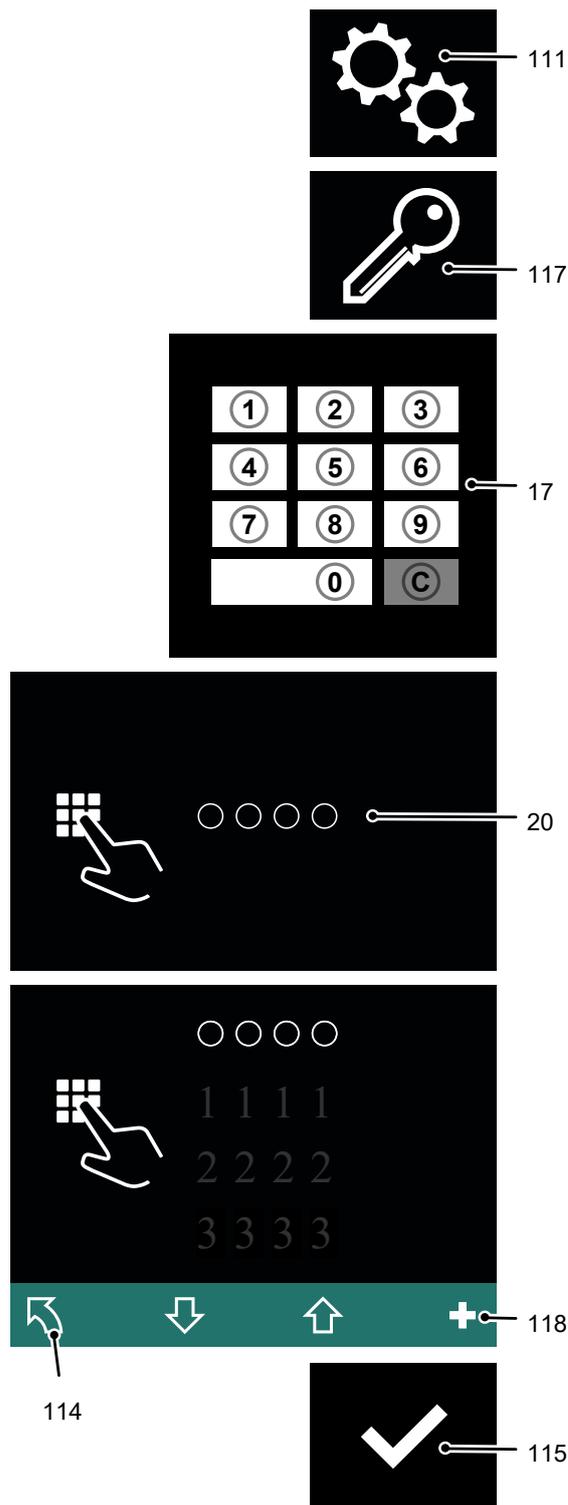
- Press the key below the "Confirm" symbol (115).

The new access code is shown on the display unit (20).

→ If the new access code has been entered incorrectly, delete it, see page 147, and enter the correct access code.

To return to the main menu, press the key below the "Back" symbol (114).

A new access code has been added.



7.6.5 Deleting an access code

Requirements

- The truck is switched on, see page 144.

Procedure

- Press the key below the "Settings" symbol (111).
- Press the key below the "Edit access code" symbol (117).

The set-up code is requested.

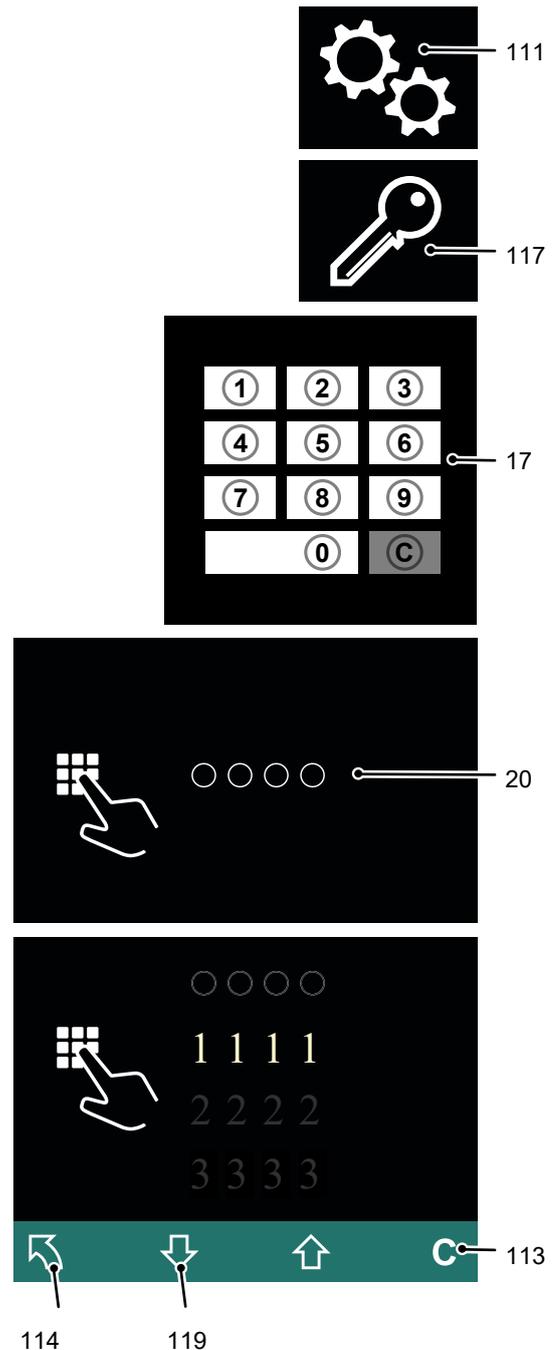
- Enter the set-up code using the keypad (17).

All access codes are shown on the display unit (20).

- Select the access code to be deleted using the key below the "Down selection" symbol (119).
- Press the key below the "Delete" symbol (113).

The access code has been deleted.

- To return to the main menu, press the key below the "Back" symbol (114).



7.6.6 Displaying the log-in history

The use of the last different access codes is displayed during the log-in process. The last log-in is displayed first.

- If multiple access codes are logged as being displayable simultaneously, the display area can be moved by scrolling forward or back.

Requirements

- The truck is switched on, see page 139.

Procedure

- Press the key below the "Settings" symbol (111).
- Press the key below the "Log-in process" symbol (120).
- Enter the set-up code using the keypad (17).

The set-up code entered is shown in the display unit (20) as filled-in circles.

- To scroll forward, press the button under the "Down selection" symbol (119) as many times as necessary.

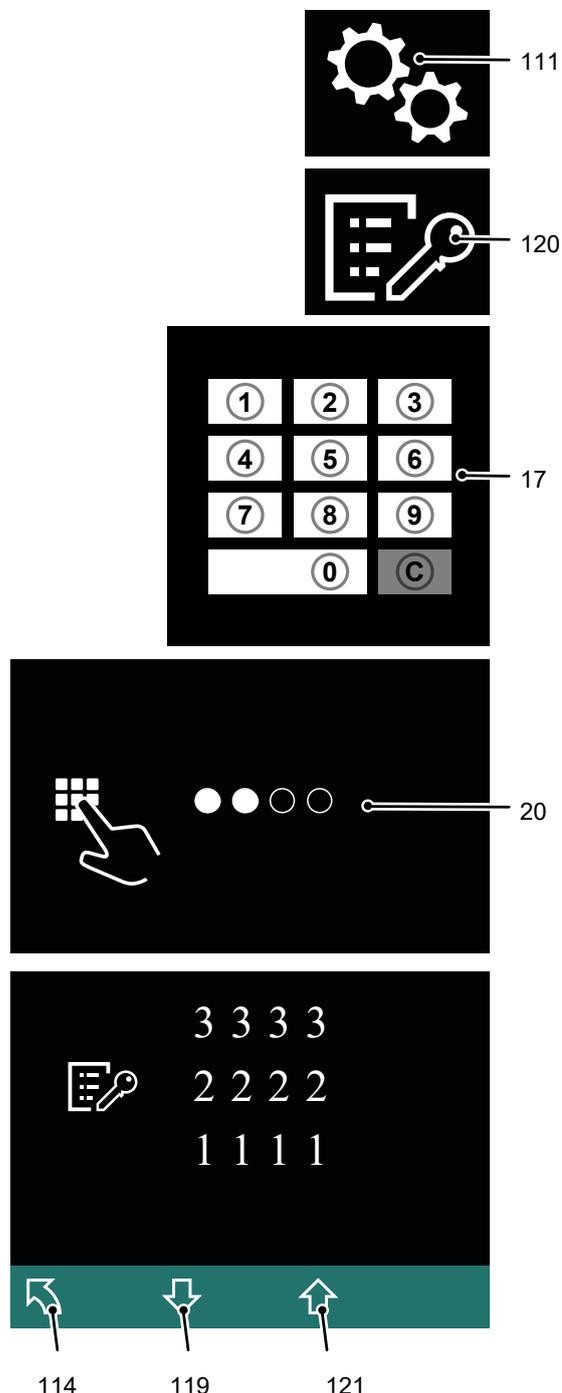
The display area moves: Additional earlier log-ins are displayed.

- To scroll back, press the button under the "Up selection" symbol (121) as many times as necessary.

The display area moves: More recent log-ins are displayed.

- To return to the main menu, press the key below the "Back" symbol (114).

The log-in process is displayed.



7.7 Operating the transponder reader

NOTICE

Take care not to damage the transponder. If the transponder is damaged, the truck cannot be switched on.

7.7.1 Switching on the truck with a transponder

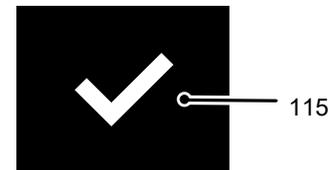
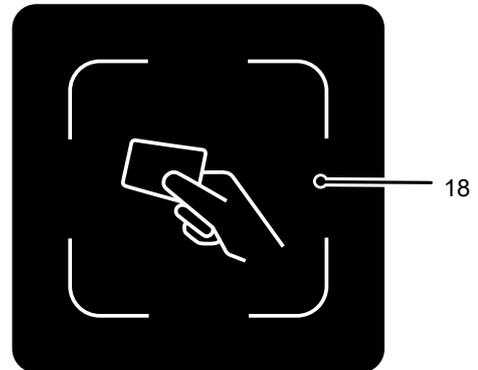
Procedure

- Release the Emergency Disconnect switch, see page 105.
- Hold the transponder in front of the transponder reader (18).

A green tick appears and remains until the transponder has been confirmed. If there is no confirmation within 20 seconds the access prompt appears.

- Press the button below the "Confirm" symbol (115).

The truck is switched on.



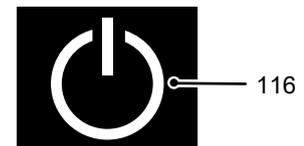
- The truck can only be switched on when the display unit (20) is lit. If the display unit is in standby the code or transponder will not be recognised. Pressing any key cancels standby mode.

7.7.2 Switching off the truck

Procedure

- Press the key under the "Switch off" symbol (116) in the display unit.
- Press the Emergency Disconnect switch, see page 105.

The truck is switched off.



7.7.3 Changing the set-up transponder

Requirements

- The truck is switched on, see page 149.

Procedure

- Press the key below the "Settings" symbol (111).
- Press the key below the "Change set-up code" symbol (112).
- Place the set-up transponder on the transponder reader (18).

The code of the set-up transponder is shown on the display unit (20).

- Press the key below the "Delete" symbol (113).
- Place the new set-up transponder on the transponder reader (18).

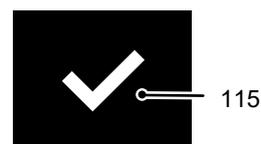
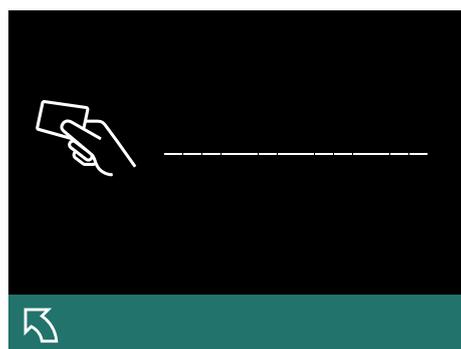
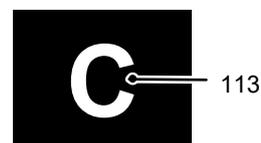
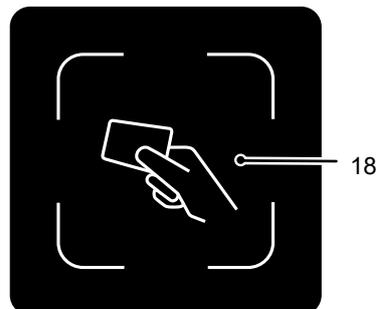
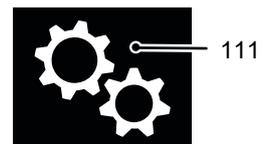
→ The new set-up transponder code must be different from existing transponder codes.

- Press the key below the "Confirm" symbol (115).
- The new code for the set-up transponder is displayed.*

→ If the wrong transponder has been used, the procedure can be repeated using the key below the "Delete" symbol (113).

To return to the main menu, press the key below the "Back" symbol (114).

The set-up transponder has been changed.



114

7.7.4 Adding a new transponder

Requirements

- The truck is switched on, see page 149.

Procedure

- Press the key below the "Settings" symbol (111).
- Press the key below the "Edit transponder" symbol (117).

The set-up transponder is requested.

- Place the set-up transponder on the transponder reader (18).

All transponder codes are shown on the display unit (20).

- Press the key below the "Add" symbol (118).
- Place the new transponder on the transponder reader (18).

→ The new transponder code must be different from existing transponder codes.

- Press the key below the "Confirm" symbol (115).

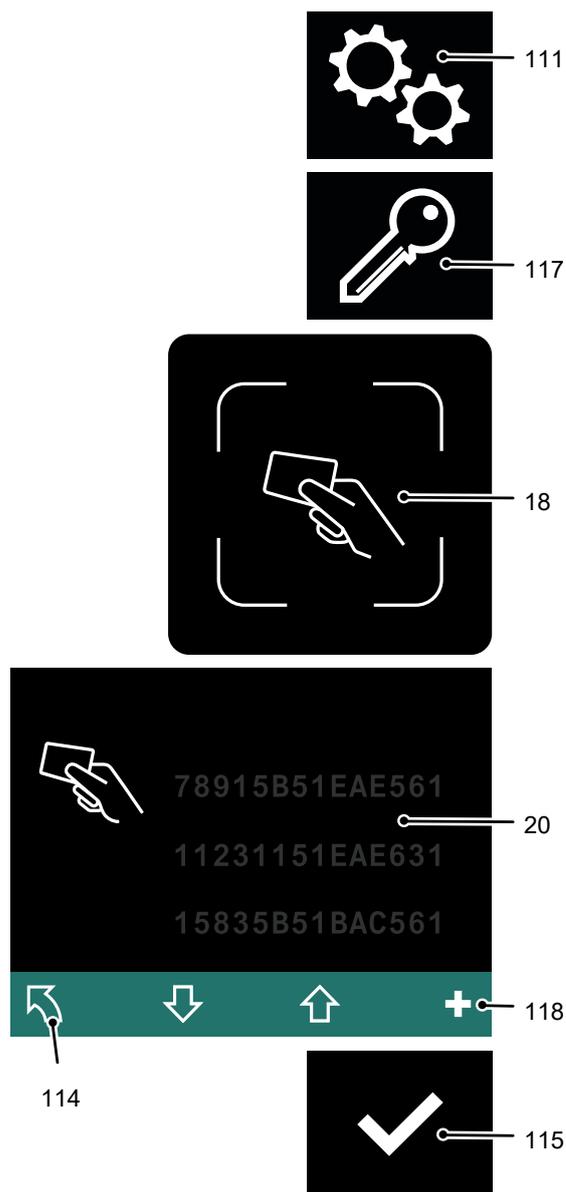
The new transponder code is displayed.

→ If the wrong transponder has been used, delete it, see page 152, and add a correct transponder.

To return to the main menu, press the key below the "Back" symbol (114).

A new transponder has been added.

→ The transponder codes saved are sorted first of all numerically and then alphabetically.



7.7.5 Deleting a transponder

Requirements

- The truck is switched on, see page 149.

Procedure

- Press the key below the "Settings" symbol (111).
- Press the key below the "Edit transponder" symbol (117).

The set-up transponder is requested.

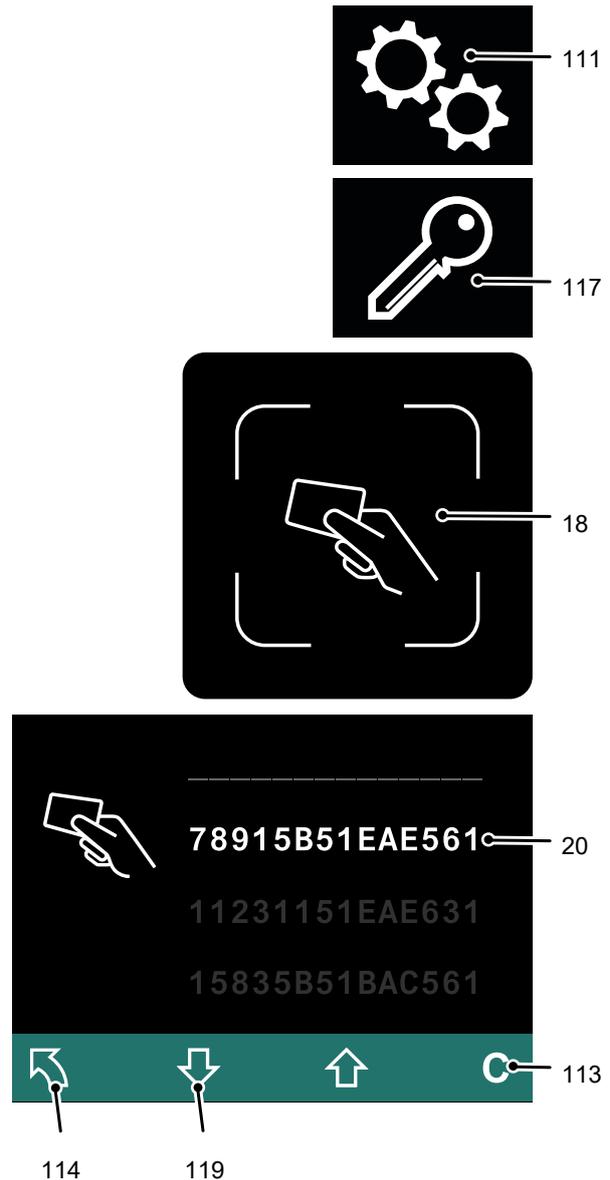
- Place the set-up transponder on the transponder reader (18).

All transponder codes are shown on the display unit (20).

- Select the transponder code to be deleted using the key below the "Down selection" symbol (119).
- Press the key below the "Delete" symbol (113).

The transponder has been deleted.

- To return to the main menu, press the key below the "Back" symbol (114).



7.7.6 Displaying the log-in history

The use of the last different transponders is displayed during the log-in process. The last log-in is displayed first.

- If multiple transponders are logged as being displayable simultaneously, the display area can be moved by scrolling forward or back.

Requirements

- The truck is switched on, see page 139.

Procedure

- Press the key below the "Settings" symbol (111).
- Press the key below the "Log-in process" symbol (120).
- Place the set-up transponder on the transponder reader (18).
- To scroll forward, press the button under the "Down selection" symbol (119) as many times as necessary.

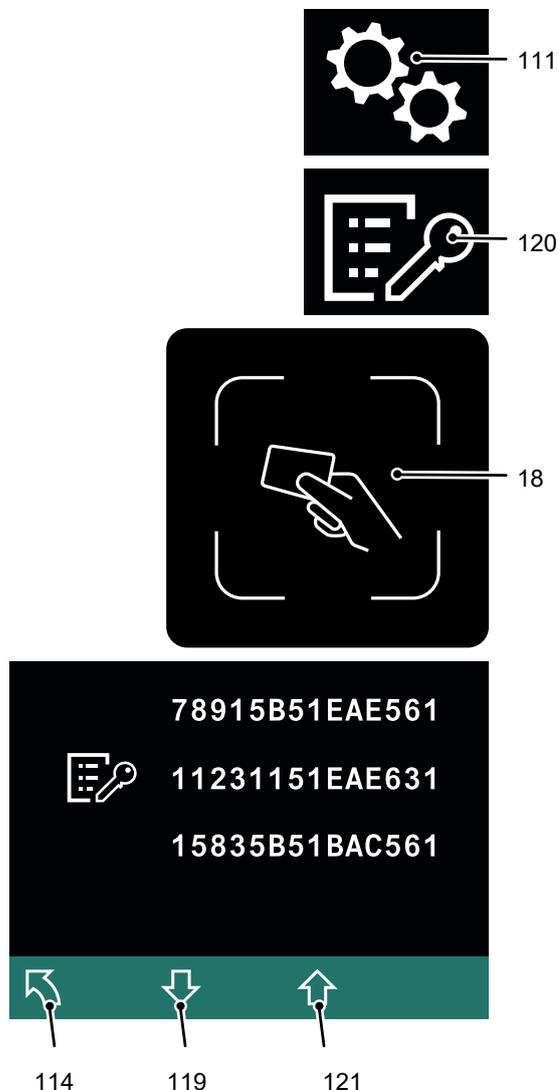
The display area moves: Additional earlier log-ins are displayed.

- To scroll back, press the button under the "Up selection" symbol (121) as many times as necessary.

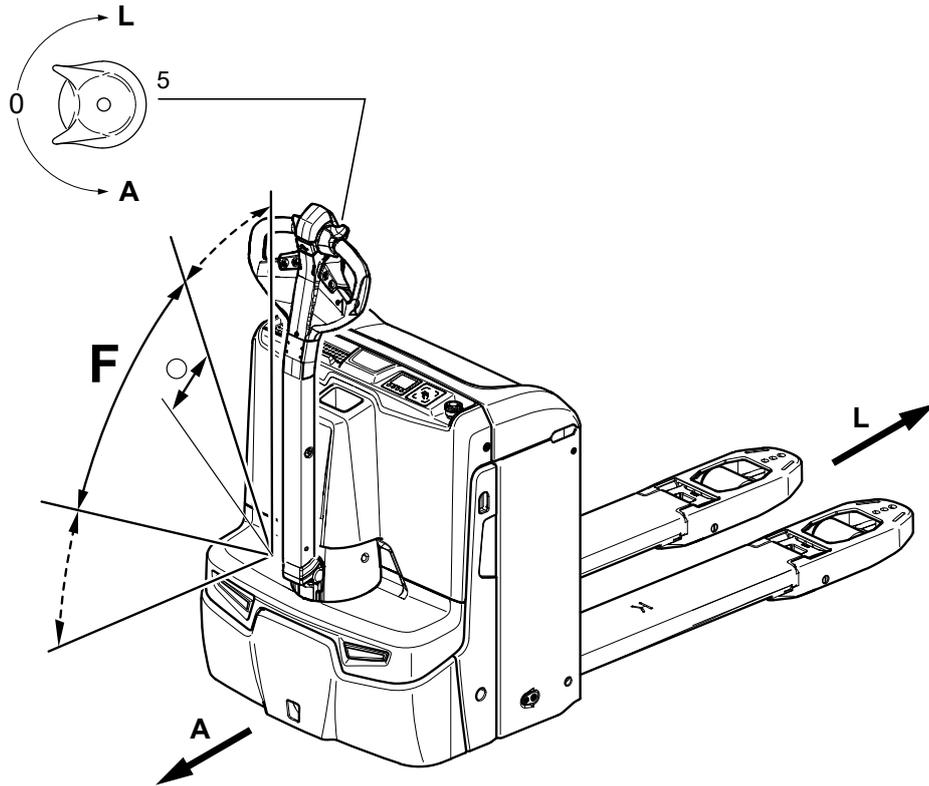
The display area moves: More recent log-ins are displayed.

- To return to the main menu, press the key below the "Back" symbol (114).

The log-in process is displayed.



7.8 Foot Protection Tiller



When the tiller is slightly deflected (range ○), the operator is very close to the truck. In this case the speed of the industrial truck is reduced, thus increasing safety for the operator.

The display unit shows the "slow travel" symbol in yellow.

As soon as the tiller is deflected more, normal travel speed is enabled and the symbol goes out.

Display symbols

Symbol	Meaning	Colour	Function
	Slow travel (foot protection tiller)	Yellow	Illuminates when speed reduction has been activated by the "foot protection tiller" assistance system.

7.9 Fleet Management System

- If equipped with a Jungheinrich fleet management component, see the "Jungheinrich fleet management system" operating instructions.

7.10 Parameters

- The default settings can be changed by the manufacturer's customer service department.

For supplied batteries, the correct battery parameter is set ex works.

F Truck maintenance

1 Spare Parts

To ensure safe and reliable operation, use only the manufacturer's original spare parts.

The manufacturer's original spare parts are consistent with the manufacturer's specifications and guarantee the highest possible quality of safety, size accuracy and material.

The installation or use of non-original spare parts can negatively affect the specified properties of the product and impair safety. The manufacturer cannot be held liable for damage caused by the use of non-original spare parts.

The product-related electronic spare parts catalogue can be found at (www.jungheinrich.de/spare-parts-search) by entering the serial number.

→ The serial number can be found on the data plate, see page 38.



2 Operational Safety and Environmental Protection

The inspections and maintenance tasks listed in chapter "Maintenance, Inspection and Changing of Maintenance Parts Requiring Replacement" must be performed according to the defined service intervals – see page 183.

The manufacturer recommends the replacement of the maintenance parts also listed in chapter "Maintenance, Inspection and Changing of Maintenance Parts Requiring Replacement" according to the specified replacement intervals – see page 183.

⚠ WARNING!

Risk of accidents and component damage

Any modification to the truck is prohibited.

▶ Safety equipment must not be modified.

Exception: Operating companies should only make changes or have changes made to powered industrial trucks if the manufacturer is no longer operating in the field and there is no successor to the business; operating companies must however:

- Ensure that the changes to be made are planned, tested and performed by a specialist engineer in industrial trucks taking safety into account.
- Keep permanent records of the construction, tests and completion of changes
- Carry out and have authorised the respective changes to the capacity data plates, decals and stickers as well as the operating instructions and workshop manuals
- Attach a permanent and clearly visible marking to the truck indicating the types of changes made, the date of the changes and the name and address of the organisation responsible for the work.

NOTICE

Only original spare parts are subject to the manufacturer's quality control. To ensure safe and reliable operation, use only the manufacturer's spare parts.

For safety reasons, only components which have been specially agreed by the manufacturer for this truck may be installed near the computer, controllers and wire guidance sensors (antennae). These components (computers, controllers, wire guidance sensors (antennae)) must therefore not be replaced by similar components from other trucks of the same series.

- On completion of inspection and service work, carry out the operations listed in the "Recommissioning the truck after cleaning or maintenance work section, see page 181.

3 Maintenance Safety Regulations

Maintenance personnel

The truck should only be serviced and repaired by the manufacturer's specialist customer service personnel who have been trained to do this. We therefore recommend that you enter into a maintenance contract with the manufacturer's local sales office.

Customer Services

Customer Services are specially trained in the use of the truck and are able to carry out maintenance and repairs independently. Customer Services are aware of the relevant standards, guidelines and safety regulations as well as potential risks.

Operating company

The maintenance personal of the operating company has the technical expertise and experience to perform the activities in the maintenance check list for the operating company. The maintenance and repair work to be performed by the operating company are also written down, see page 157.

Settings

When repairing or replacing hydraulic, electric or electronic components or assemblies, always note the truck-specific settings.

3.1 Welding

WARNING!

Fire hazard

Welding operations on the truck can damage or ignite components.

▶ Do not performing welding operations on the truck.

3.2 Working on the electrical system

WARNING!

Risk of accidents due to electrical current

Make sure the electrical system is voltage-free before starting work on it. The capacitors in the control unit must be completely discharged. The capacitors are fully discharged approx. 10 minutes after disconnecting the electrical system from the battery.

Before starting maintenance on the electrical system:

- ▶ Only suitably trained electricians may operate on the truck's electrical system.
 - ▶ Before working on the electrical system, take all precautionary measures to avoid electric shocks.
 - ▶ Park the truck securely – see page 99.
 - ▶ Disconnect the battery connector.
 - ▶ Remove any rings, metal wristbands etc.
-

⚠ CAUTION!

Risk of fire due to use of flammable cleaning agents

Using flammable cleaning agents increases the risk of fire.

- ▶ Do not use any flammable cleaning agents when cleaning.
 - ▶ Disconnect the battery before starting cleaning work.
 - ▶ Before cleaning, take necessary safety measures to prevent spark formation (e.g. due to short circuits).
-

3.3 Consumables and used parts

⚠ CAUTION!

Consumables and used parts represent an environmental hazard

- ▶ Dispose of used operating materials and used parts in accordance with the applicable environmental protection regulations.
 - ▶ Oil changes may only be performed by the manufacturer's customer service department.
 - ▶ Note the safety regulations when handling these substances.
-

3.4 Wheels

⚠ WARNING!

The use of wheels that do not match the manufacturer's specifications can result in accidents

The quality of wheels affects the stability and performance of the truck.

Uneven wear reduces truck stability and increases the stopping distance.

- ▶ After replacing wheels, make sure the truck is not skewed.
 - ▶ Always replace wheels in pairs, i.e. left and right at the same time.
-

- ☞ When replacing wheels fitted at the factory, only use the manufacturer's original spare parts. Otherwise the truck's rated performance cannot be ensured, see page 157.

3.5 Hydraulic system

⚠ WARNING!

Leaky hydraulic systems can result in accidents

Hydraulic oil can escape from leaky and faulty hydraulic systems.

- ▶ Report any defects immediately to your supervisor.
 - ▶ Mark the defective truck and take it out of service.
 - ▶ Do not return the truck to service until the fault has been identified and rectified.
 - ▶ Remove any spilled hydraulic oil immediately with an appropriate bonding agent.
 - ▶ The bonding agent/consumable mixture must be disposed of in accordance with regulations.
-

⚠ WARNING!

Faulty hydraulic hoses can result in injury and infection

Pressurised hydraulic oil can escape from fine holes or hairline cracks in the hydraulic hoses. Brittle hydraulic hoses can burst during operation. People standing near the truck can be injured by the hydraulic oil.

- ▶ Call for a doctor immediately if you are injured.
 - ▶ Do not touch pressurised hydraulic hoses.
 - ▶ Report any defects immediately to your supervisor.
 - ▶ Mark the defective truck and take it out of service.
 - ▶ Only restore the truck to service when the fault has been rectified.
-

NOTICE

Testing and replacing hydraulic hoses

Hydraulic hoses can become brittle through age and must be checked at regular intervals. The operating conditions of the truck have a considerable impact on the ageing of the hydraulic hoses.

- ▶ Hydraulic hoses must be checked at least 1x per year and replaced if necessary.
 - ▶ If the operating conditions become more arduous, the inspection intervals must be reduced accordingly.
 - ▶ In normal operating conditions, a precautionary replacement of the hydraulic hoses is recommended after 6 years. The owner must carry out a risk assessment to ensure safe, prolonged use. The resulting protection measures must be observed and the inspection interval reduced accordingly.
-

3.6 Energy saving components

⚠ CAUTION!

Risk of accident due to high pre-tension

The tiller tube contains a gas strut with high pre-tension. Incorrect opening may result in accidents.

- ▶ The gas strut must only be installed and removed by authorised service personnel.
-

4 Lubricants and Lubrication Schedule

4.1 Handling consumables safely

Handling consumables

Consumables must always be handled correctly. Follow the manufacturer's instructions.

⚠ WARNING!

Improper handling is hazardous to health, life and the environment

Consumables can be flammable.

- ▶ Keep consumables away from hot components and naked flames.
 - ▶ Always keep consumables in prescribed marked containers.
 - ▶ Always fill consumables in clean containers.
 - ▶ Do not mix up different grades of consumable. The only exception to this is when mixing is expressly stipulated in the Operating Instructions.
-

⚠ CAUTION!

Spilled consumables can cause slipping and endanger the environment

Risk of slipping from spilled consumables. The risk is greater when combined with water.

- ▶ Do not spill consumables.
 - ▶ Spilled consumables must be removed immediately with an appropriate bonding agent.
 - ▶ The bonding agent / consumable mixture must be disposed of in accordance with regulations.
-

⚠ WARNING!

Improper handling of oils can be hazardous

Oils (chain spray / hydraulic oil) are flammable and poisonous.

- ▶ Dispose of used oils in accordance with regulations. Store used oil safely until it can be disposed of in accordance with regulations.
 - ▶ Do not spill oil.
 - ▶ Spilled oils must be removed immediately with an appropriate bonding agent.
 - ▶ The mixture consisting of the bonding agent and oil must be disposed of in accordance with regulations.
 - ▶ Observe national regulations when handling oils.
 - ▶ Wear safety gloves when handling oils.
 - ▶ Prevent oil from coming into contact with hot motor parts.
 - ▶ Do not smoke when handling oil.
 - ▶ Avoid contact and digestion. If you swallow oil do not induce vomiting but seek medical assistance immediately.
 - ▶ Seek fresh air after breathing in oil fumes or vapours.
 - ▶ If oil has come into contact with your skin, rinse your skin with water.
 - ▶ If oil has come into contact with your eyes, rinse them with water and seek medical assistance immediately.
 - ▶ Replace oil-soaked clothing and shoes immediately.
-

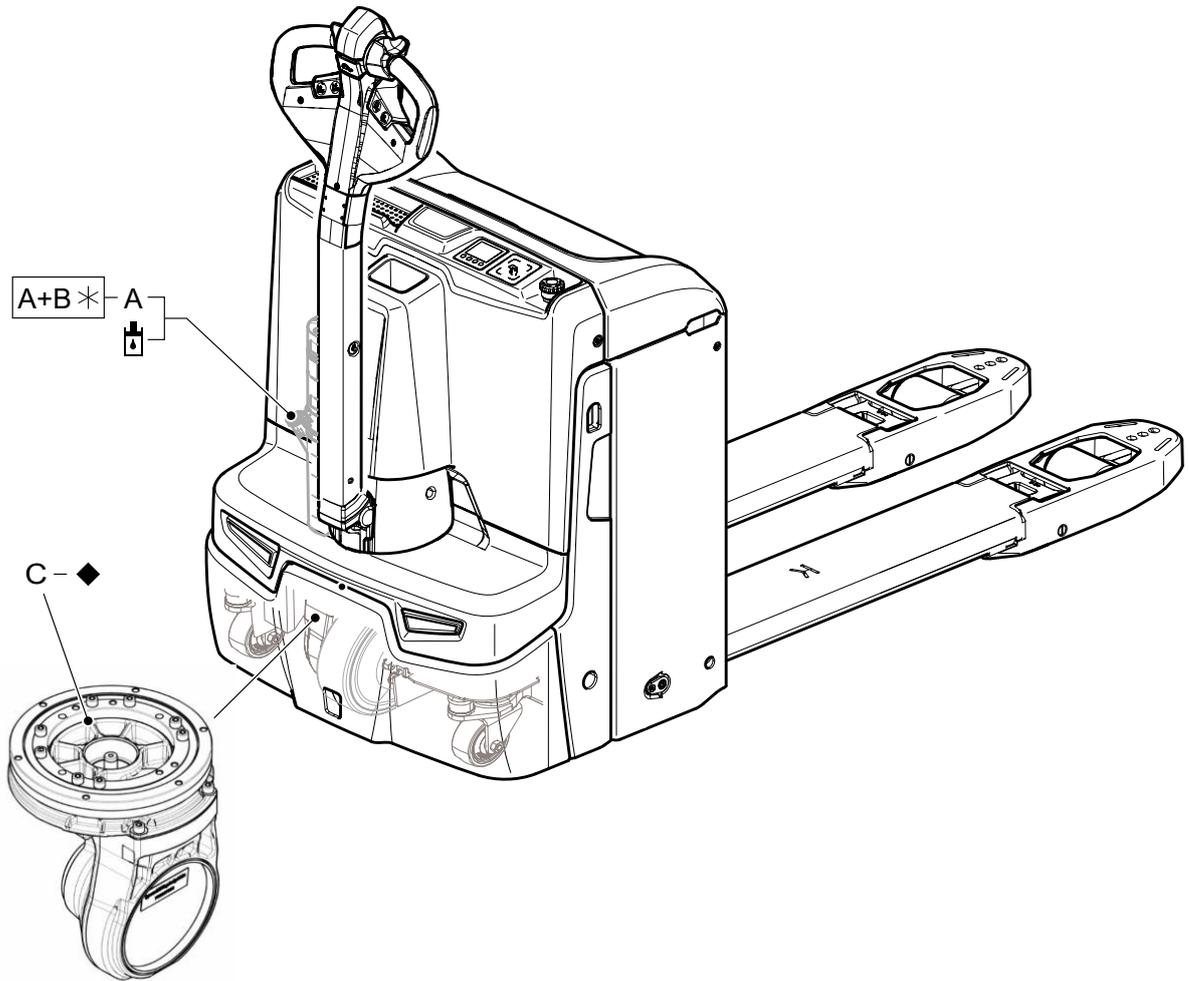
⚠ CAUTION!

Consumables and used parts represent an environmental hazard

- ▶ Dispose of used operating materials and used parts in accordance with the applicable environmental protection regulations.
 - ▶ Oil changes may only be performed by the manufacturer's customer service department.
 - ▶ Note the safety regulations when handling these substances.
-

4.2 Lubrication Schedule

- The truck is equipped with lubrication-free bushes. As such, no lubrication is required as part of maintenance.



⊞	Hydraulic-oil filler plug	*	Cold store application
◆	Transmission oil filling		

4.3 Consumables

Code	Order no.	Quantity	Description	Used for	Volume
A	51132826 *	1.0 l	Jungheinrich hydraulic oil	Hydraulic system	0.9 l
	51132827 *	5.0 l			
B	51037497	5.0 l	Renolin Lift 22	Cold store hydraulic system	See note
	51081875	5.0 l	Cold store hydraulic oil ISO15		
C	52030273	5.0 l	Titan Supergear 80W-90	Transmission	1.1 l



For cold-store applications, the hydraulic oil and the cold-store hydraulic oil must be mixed in a 1:1 ratio.

*The trucks are factory-equipped with a special hydraulic oil (the Jungheinrich hydraulic oil with a blue colouration) and the cold store hydraulic oil (red colouration). The Jungheinrich hydraulic oil is available only from the Jungheinrich service department. The Jungheinrich hydraulic oil may be mixed with one of the named alternative hydraulic oils.

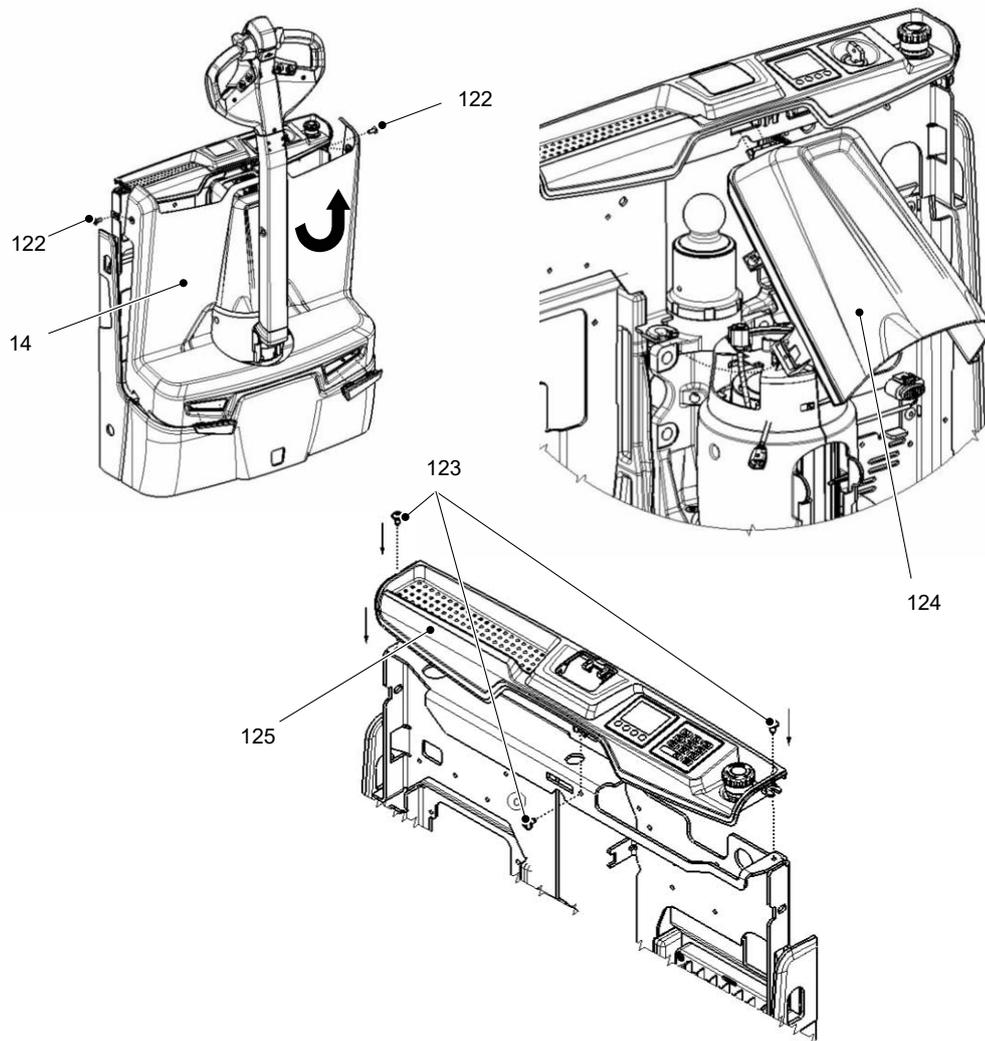
5 Maintenance and repairs

5.1 Preparing the truck for maintenance and repair work

Procedure

- Park the truck securely, see page 99.
- Disconnect the battery to prevent the truck from being switched on accidentally.

5.2 Disassembling or assembling the front panel



Removing the covers

Requirements

- Truck prepared for maintenance and repair work – see page 167.

Tools and Material Required

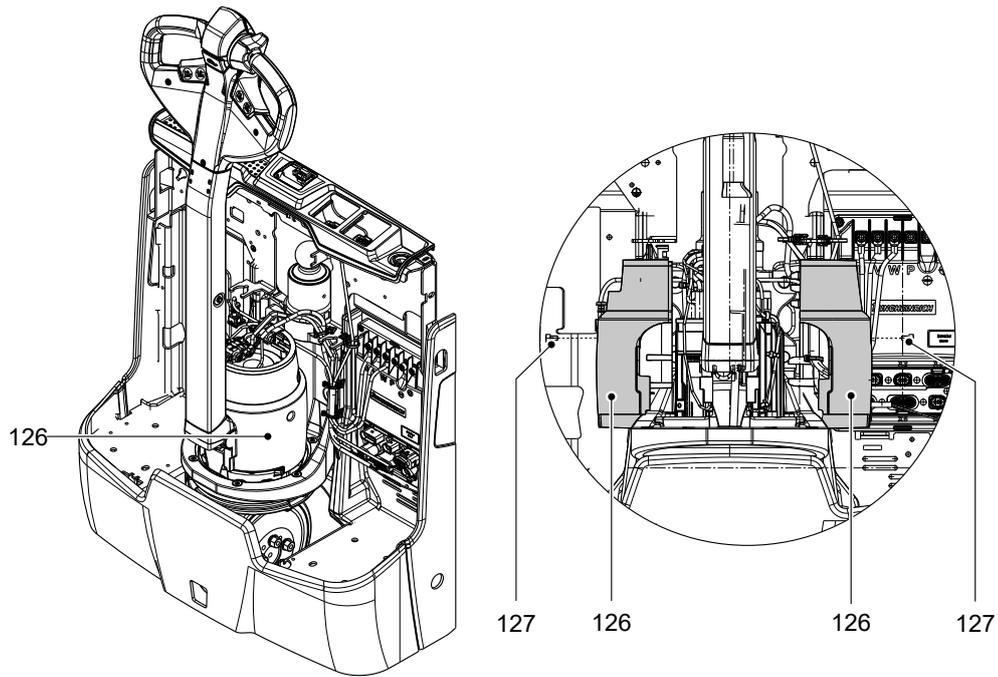
- Allen key (5 Nm)

Procedure

- Remove the flanged button head bolt M8 x 20 - 10.9 (122) (5 Nm) from the front panel (14).
- Lift and remove the front panel (14).
- Turn the drive panel (124) approx. 90°, loosen on the tiller and remove.
- Remove the screws (123) from the dashboard panel (5 Nm) (125).
- Remove the dashboard panel (125).

The covers have been removed.

5.3 Disassembling or assembling the drive panel



→ The drive panel consists of two parts.

Removing the drive panel

Requirements

- The truck is parked securely – see page 99.
- The front panel has been disassembled – see page 168.

Tools and Material Required

- Torque wrench (7 Nm)
- Hexagon socket insert, width across flats 4 mm

Procedure

- Remove two flat-head screws (127).
- Pull apart the two halves of the drive panel (126) and lift off.

The drive panel is now disassembled.

Drive panel assembly

Procedure

- Bring together the two halves of the drive panel (126) as shown.
- Tighten two flat-head screws (127) with a torque of 7 Nm.

The drive panel is now assembled.

5.4 Lifting and jacking up the truck safely

⚠ WARNING!

Risk of accident when working under the load handler or truck when not correctly secured

Failure to secure the raised load handler or truck correctly can result in uncontrolled lowering of the load handler or can cause the truck to tip or slip, which in turn can lead to fatal injuries.

- ▶ Secure the raised load handler or truck such that no lowering, tipping or slipping is possible.
 - ▶ The prescribed instructions must be followed when raising the truck – see page 41.
 - ▶ When working on the parking brake, secure the truck to prevent it rolling away accidentally (e.g. using chocks).
-

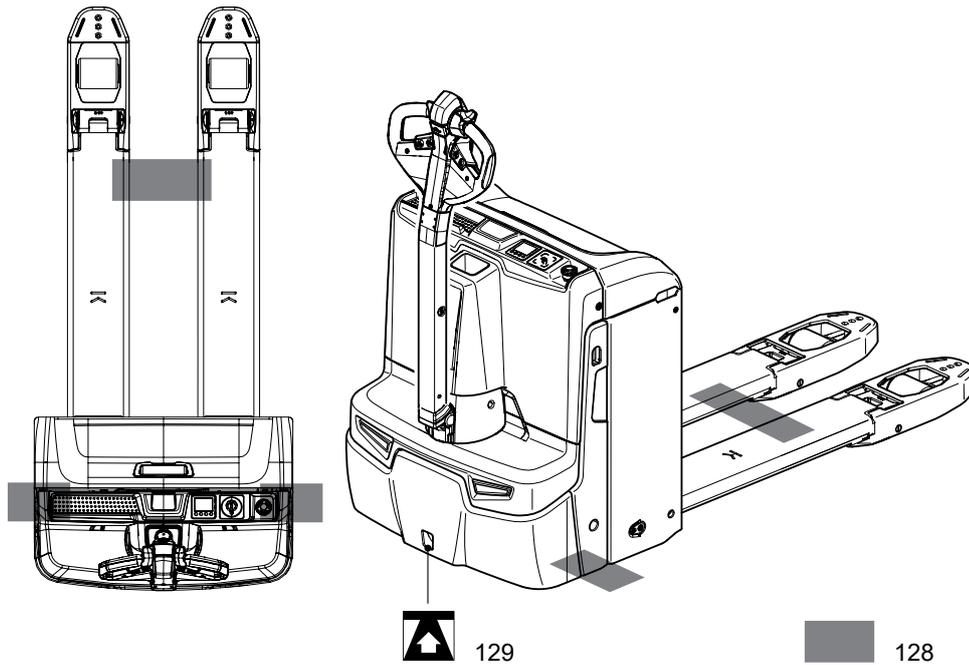
⚠ WARNING!

Risk of injury when lifting and jacking up the truck

When lifting and jacking up the truck, there is a risk of the truck unexpectedly tipping or slipping.

- ▶ Jack up the truck on level ground.
 - ▶ Secure the truck against unintentional movement.
 - ▶ Use a jack with sufficient capacity.
 - ▶ When lifting the truck, secure the lifting accessories to the attachment points specially provided for this purpose – see page 41.
 - ▶ When jacking up, use suitable means (chocks, wooden blocks) to prevent the truck from slipping or tipping.
-

5.4.1 Lifting and Jacking up with a Jack



The symbol (129) indicates the point at which the jack must be applied.

Lifting and jacking up the truck by jack

Requirements

- Truck parked on a level surface.

Tools and Material Required

- Jack
- Hard wooden blocks

Procedure

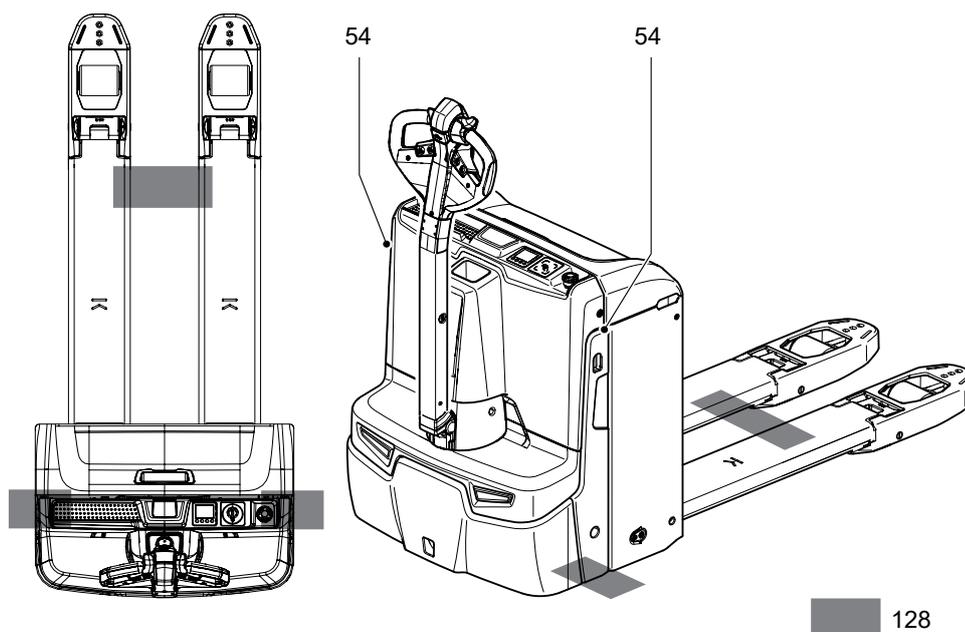
- Raise the load handler.
- Secure the load handler with wooden blocks (128).
- Lower the load handler.
- Switch off the truck.
- Disconnect the battery connector.
- Place the jack against the jacking point (129).
- Raise the truck.
- Support the truck with wooden blocks at the marked positions (128).
- Remove the jack.

The truck is now securely raised and jacked up.

Lowering the truck

- To lower the truck, proceed in reverse order.

5.4.2 Lifting and Jacking up with a Crane



Lifting and jacking up the truck by crane

Requirements

- Truck prepared for maintenance and repair work – see page 167.

Tools and Material Required

- Lifting equipment/crane lifting gear
- Wooden blocks

Procedure

- Apply the crane lifting gear to the attachment points (54) – see page 41.
- Raise the truck.
- Support the truck with wooden blocks at the marked positions (128).
- Lower the truck.
- Remove the crane lifting gear.

The truck is jacked up.

Lowering the truck

- To lower the truck, proceed in reverse order.

5.5 Cleaning

5.5.1 Cleaning the truck

⚠ CAUTION!

Risk of fire due to use of flammable cleaning agents

Using flammable cleaning agents increases the risk of fire.

- ▶ Do not use any flammable cleaning agents when cleaning.
- ▶ Disconnect the battery before starting cleaning work.
- ▶ Before cleaning, take necessary safety measures to prevent spark formation (e.g. due to short circuits).

NOTICE

Risk of component damage when cleaning the truck

Cleaning with a high-pressure cleaner can result in malfunctions due to humidity.

- ▶ Cover all electronic system assemblies (controls, sensors, motors etc.) before cleaning the truck with a high-pressure cleaner.
- ▶ Do not hold the jet of the high-pressure cleaner at marking points to avoid damaging them – see page 37.
- ▶ Do not clean the truck with a steam jet.



Cleaning tasks may only take place in the designated locations, which adhere to the stipulations of the country of use.

Cleaning the truck

Requirements

- Truck prepared for maintenance and repair work, see page 167.

Tools and Material Required

- Water-based solvents
- Sponge or cloth

Procedure

- Clean the surface of the truck with water-based solvents and water. Use a sponge or cloth to clean.
- Dry the truck after cleaning, e.g. with compressed air or a dry cloth.
- Carry out all the tasks in the section "Recommissioning the truck after cleaning or maintenance work" (see page 179).

The truck is now clean.

5.5.2 Cleaning the electrical system assemblies

NOTICE

Risk of electrical-system damage

Cleaning the electronic system assemblies (controllers, sensors, motors etc.) with water can damage the electrical system.

- ▶ Do not clean the electrical system with water.
- ▶ Clean the electrical system with weak suction or compressed air (use a compressor with a water trap) and a non-conductive, anti-static brush.

Cleaning the electrical system assemblies

Requirements

- Truck prepared for maintenance and repair work – see page 167.

Tools and Material Required

- Compressor with water separator
- Non-conductive, antistatic brush

Procedure

- Expose the electrical system – see page 51.
- Clean the electrical system assemblies with weak suction or compressed air (use a compressor with a water separator) and a non-conductive, anti-static brush.
- Fit the electrical system cover – see page 51.
- Carry out all the tasks listed in the section "Recommissioning the truck after cleaning or maintenance work" – see page 179.

The electrical-system assemblies are now clean.

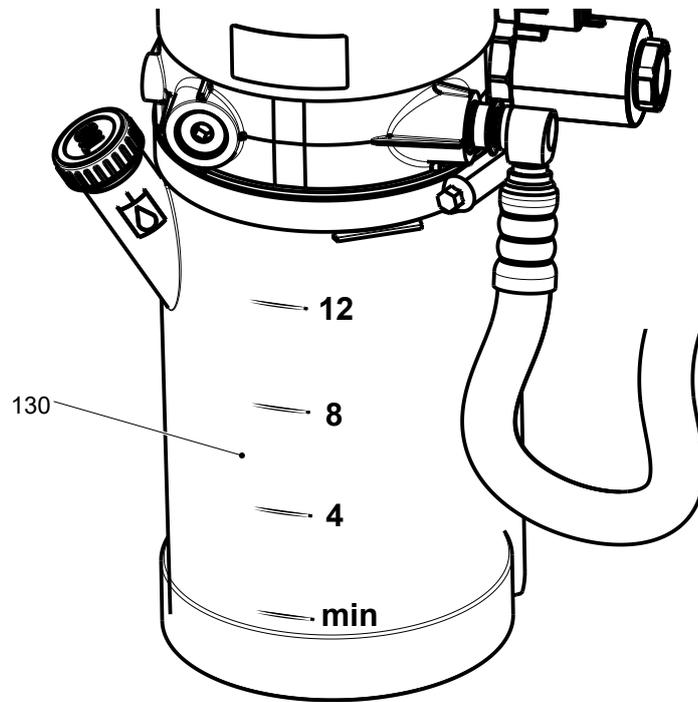
5.6 Checking the hydraulic oil level

⚠ WARNING!

Leaky hydraulic systems can result in accidents

Hydraulic oil can escape from leaky and faulty hydraulic systems.

- ▶ Report any defects immediately to your supervisor.
 - ▶ Mark defective truck and take out of service.
 - ▶ Do not return the industrial truck to service until you have identified and rectified the fault.
 - ▶ Remove any spilled hydraulic immediately with an appropriate bonding agent.
 - ▶ The bonding agent / consumable mixture must be disposed of in accordance with regulations.
-



Checking the oil level

Requirements

- Load handler lowered.
- Truck prepared for maintenance and repair work – see page 167.

Procedure

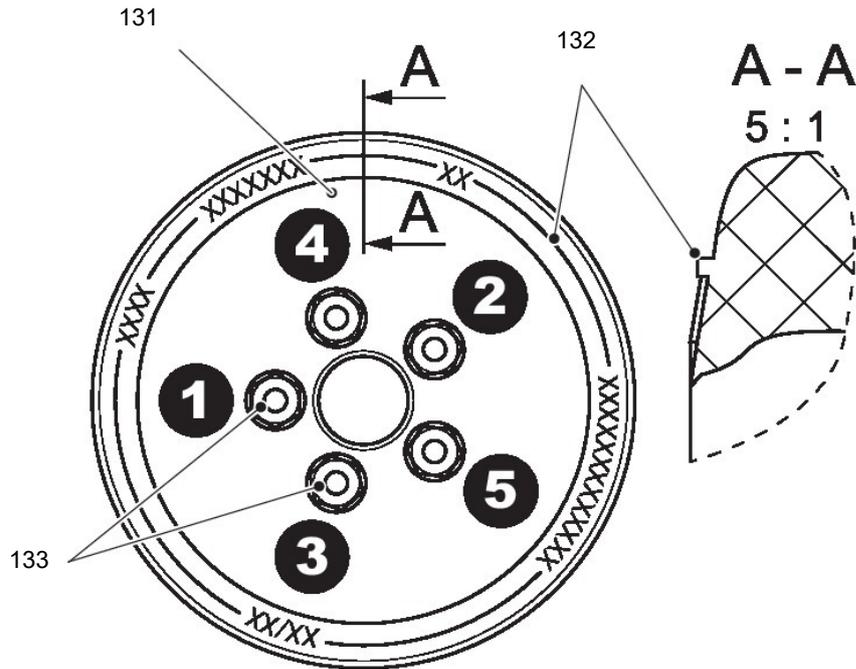
- Remove the front panel – see page 168.
- Check the oil level in the hydraulic reservoir (130).

→ With the load handler lowered, the hydraulic oil level in the hydraulic reservoir must be at roughly the " 8" marking.

- If necessary, add hydraulic oil of the correct grade – see page 166.

The oil level has now been checked.

5.7 Checking the attachment and wear of the wheels



- ➔ Replace the wheels if the wear limit (132) has been reached.
- ➔ The wheel nuts on the drive wheel must be re-tightened in accordance with the maintenance intervals indicated in the maintenance checklist, see page 183.

Tightening the wheel nuts

Requirements

- Prepare the truck for maintenance and repair work, see page 183.

Tools and Material Required

- Torque wrench

Procedure

- Position the drive wheel (131) perpendicular to the longitudinal axis of the truck.
- Tighten all wheel nuts (133) using the torque wrench through the opening in the chassis.

To do this, tighten the wheel nuts in the indicated order

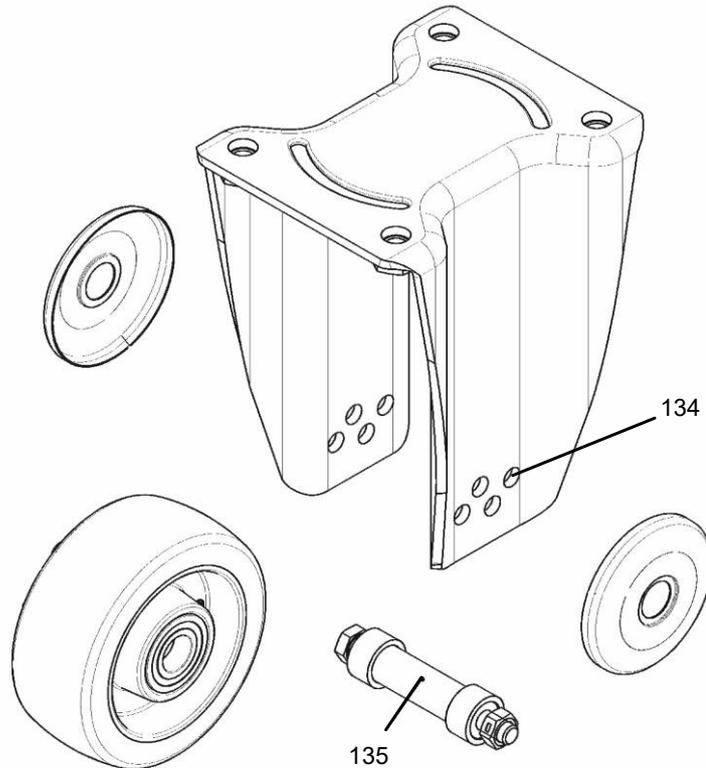
- initially to 10 Nm
- then to 150 Nm.

The wheel nuts have now been tightened.

- ➔ The drive wheel must only be replaced by authorised service personnel.

5.8 Check the distance of the fixed support wheels

- On trucks with fixed support wheels, the distance between level ground and fixed support wheels must always be more than 2 mm. If necessary, the height of the support wheels must be adjusted. Four different insertion positions are provided for this purpose.



Setting the distance

Requirements

- Truck is prepared for maintenance and repair work, see page 167.

Tools and Material Required

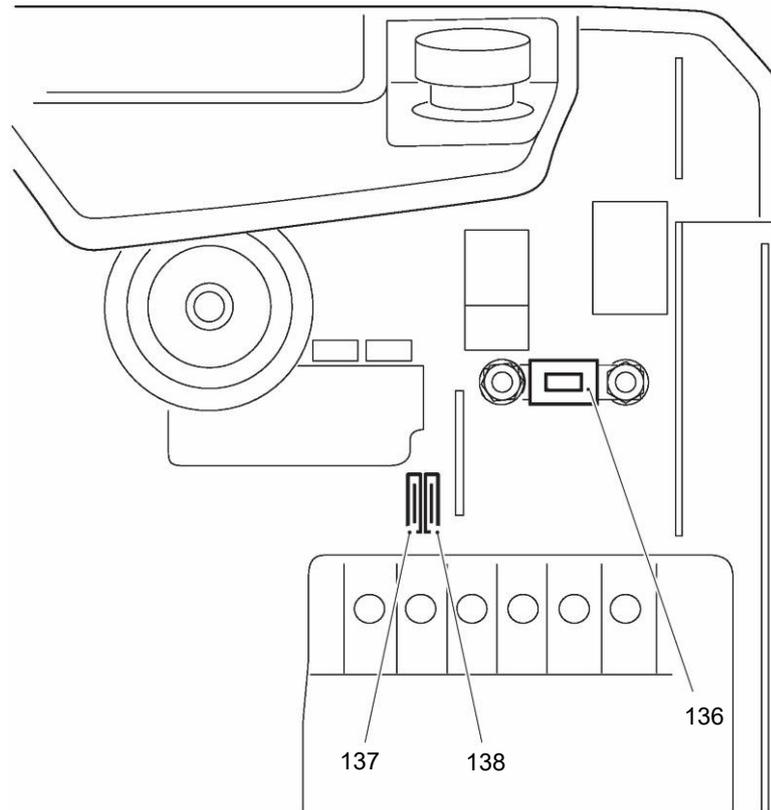
- Torque wrench

Procedure

- Jack up the truck, see page 159.
- Insert the bolt (135) through one of the insertion positions (134). Select the insertion position so that the distance between the ground and the fixed support wheels is at least 2 mm.
- Tighten the bolt (135) with 15 Nm.

The distance is set.

5.9 Checking the electrical fuses



Checking fuses

Requirements

- Truck prepared for maintenance and repair work, see page 167.
- Front panel removed, see page 168.

Procedure

- Check the fuse ratings against the table and their condition, and replace if necessary.

The fuses have been checked.

Item	Protection	Rating
136	Drive motor / pump motor	150 A
137	Magnetic brake main contactor control fuse	4 A
138	Horn/tiller head/key/access systems (fleet management system, transponder, display unit, keypad) control fuse	4 A

5.10 Restoring the truck to service after maintenance and repairs

Procedure

- Thoroughly clean the truck – see page 173.
- Lubricate the forklift truck according to the lubrication schedule – see page 165.
- Equipment with lead-acid battery (●): Clean the battery, grease the battery terminal screws with terminal grease and connect the battery.
- Charge the battery – see page 53.
- Commission the truck – see page 95.

6 Decommissioning the industrial truck

If the truck is to be out of service for more than a month, it must be stored in a frost-free and dry room. All necessary measures must be taken before, during and after decommissioning as described hereafter.

When the truck is out of service it must be jacked up so that all the wheels are clear of the ground. This is the only way of ensuring that the wheels and wheel bearings are not damaged.

→ Jack up the truck, see page 170.

If the truck is to be out of service for more than 6 months, agree further measures with the manufacturer's customer service department.

6.1 Prior to decommissioning

6.1.1 Trucks with lead-acid battery

Procedure

- Thoroughly clean the truck – see page 173.
- Prevent the truck from rolling away accidentally.
- Check the hydraulic oil level and replenish if necessary, see page 174.
- Apply a thin layer of oil or grease to any non-painted mechanical components.
- Lubricate the truck according to the lubrication diagram, see page 165.
- Charge the battery, see page 53.
- Disconnect and clean the battery.
- Clean the terminal screws, grease them with terminal grease and screw them into the connection thread to prevent short circuits.

→ In addition, follow the battery manufacturer's instructions.

6.1.2 Trucks with Lithium-Ion Battery

Procedure

- Thoroughly clean the truck, see page 173.
- Prevent the truck from rolling away accidentally.
- Check the hydraulic oil level and replenish if necessary, see page 174.
- Apply a thin layer of oil or grease to any non-painted mechanical components.
- Lubricate the truck according to the lubrication diagram, see page 165.
- Charge the battery, see page 53.

6.2 Action to be taken during decommissioning

NOTICE

Full discharge can damage the battery

Self-discharge can cause the battery to fully discharge. Full discharge shortens the useful life of the battery.

▶ Charge the battery at least every 2 months.

→ Charge the battery see page 53.

6.3 Restoring the truck to service after decommissioning

Procedure

- Thoroughly clean the truck – see page 173.
- Lubricate the forklift truck according to the lubrication schedule – see page 165.
- Equipment with lead-acid battery (●): Clean the battery, grease the battery terminal screws with terminal grease and connect the battery.
- Charge the battery – see page 53.
- Commission the truck – see page 95.

7 Safety tests to be performed at intervals and after unusual incidents

The truck must be inspected at least annually (refer to national regulations) or after any unusual event by a qualified inspector. The manufacturer offers a safety inspection service which is performed by personnel specifically trained for this purpose.

A complete test must be carried out on the technical condition of the truck with regard to safety. The truck must also be examined thoroughly for damage.

The operating company is responsible for ensuring that faults are rectified immediately.

8 Final de-commissioning, disposal

- Final de-commissioning or disposal of the truck must be performed in accordance with the regulations of the country of use. In particular, regulations governing the disposal of batteries, consumables and electronic and electrical systems must be observed.

The truck must only be disassembled by trained personnel in accordance with the procedures as specified by the manufacturer.

9 Human vibration measurement

- Vibrations that affect the operator over the course of the day are known as human vibrations. Excessive human vibrations will cause the operator long term health problems. The European "2002/44/EC/Vibration" operator directive has therefore been established to protect operators. To help operators to assess the application situation, the manufacturer offers a service of measuring these human vibrations.

G Maintenance, Inspection and Changing of Maintenance Parts Requiring Replacement

⚠ WARNING!

Lack of maintenance can result in accidents

Failure to perform regular maintenance and inspections can lead to truck failure and poses a potential hazard to personnel and equipment.

- ▶ Thorough and expert maintenance and inspections are among the most important requirements for the safe operation of the industrial truck.

NOTICE

The application conditions of an industrial truck have a considerable impact on component wear. The following service, inspection and replacement intervals are based on single-shift operation under normal operating conditions. The intervals must be reduced accordingly if more stringent requirements are placed on the equipment, e.g., use in conditions of extreme dust, temperature fluctuations or multiple shifts.

- ▶ To prevent damage due to wear, the manufacturer recommends an on-site application analysis to agree on appropriate intervals.

The following chapter defines the tasks to be performed, the respective intervals to be observed and the maintenance parts for which replacement is recommended.

1 Maintenance Contents EJE 114/ 116/118/ 120/ 120US

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1.1 Owner

To be performed every 50 service hours, but at least once a week.

1.1.1 Maintenance contents

1.1.1.1 Standard equipment

Hydraulic operations

Correct the hydraulic-oil level.

Steering

Test the tiller return function.

1.1.1.2 Optional Equipment

Lead-acid battery, international

Power supply

Correct the battery-acid level using demineralised water.

Lead-acid battery

Power supply

Correct the battery-acid level using demineralised water.

1.1.2 Inspection contents

1.1.2.1 Standard equipment

The following points must be checked:

Electrical system

Warning and safety equipment in accordance with the operating instructions

Functionality of display and controls

Test emergency disconnect switch and check for damage

Power supply

Check battery and battery components for damage

Battery connector for secure fit, functionality and damage

Travel

Collision safety switch for functionality and damage

Check wheels for wear and damage

Chassis/structure

Industrial truck for damage and leaks

Check labels for legibility, completeness and plausibility

Check doors or covers for damage

Mechanism to protect against trapping and shearing is present, secure, functions correctly and is free of dirt and damage

Hydraulic operations

Test hydraulic system

Check fork arms or load handler for wear and damage

1.1.2.2 Optional Equipment

The following points must be checked:

Standard on-board charger

Battery charger

Mains plug and mains cable for damage

On-board charger 35A

Battery charger

Mains plug and mains cable for damage

Lead-acid battery, international

Power supply
Check the battery cable connections for secure attachment
Check battery and battery components for damage

Lead-acid battery

Power supply
Check the battery cable connections for secure attachment

1.2 Customer Service

In accordance with the EJE 114/ 116/118/ 120/ 120US service interval, to be performed every 1000 service hours, but at least once a year.

1.2.1 Maintenance contents

1.2.1.1 Standard equipment

Brakes
Test the brake with the tiller in the maximum vertical and horizontal positions.
Measure the air gap of the magnetic brake.

Electrical system
Test the contactors and/or relays.
Perform insulation inspection.

Chassis/structure
Check that the panels and covers as well as mounting brackets are secure. Ensure they function correctly and are safe.

Hydraulic operations
Correct the hydraulic-oil level.
Test the pressure relief valve.

Agreed services
Carry out a test run with the rated capacity or a customer-specific load.
Demonstration after maintenance.

Steering
Test the tiller return function.

1.2.1.2 Optional Equipment

Standard on-board charger

Battery charger

Test the immobiliser on trucks with an on-board charger.
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Carry out a potential measurement on the chassis while charging is in progress.

Radio data

System components

Clean the scanner and terminal.

Other tests

Agreed services

Note: Tests on other options and special parts such as radio data and access modules (ISM) must be recorded in the test report.

On-board charger 35A

Battery charger

Test the immobiliser on trucks with an on-board charger.
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Clean the fan.

Carry out a potential measurement on the chassis while charging is in progress.

Lead-acid battery, international

Electrical system

Perform insulation inspection.

Power supply

Clean the battery.

Clean and grease the battery terminals.

Measure acid density and battery voltage.

Correct the battery-acid level using demineralised water.

Lead-acid battery

Electrical system

Perform insulation inspection.

Power supply

Clean the battery.

Clean and grease the battery terminals.

Measure acid density and battery voltage.

Correct the battery-acid level using demineralised water.

1.2.2 Inspection contents

The following points must be checked:

1.2.2.1 Standard equipment

Electrical system
Cables and motor for secure fit and damage
Warning and safety equipment in accordance with the operating instructions
Functionality of display and controls
Test emergency disconnect switch and check for damage
Contactors and/or relays for wear and damage
Check electrical wiring for damage (insulation damage, connections) and check whether the fuse ratings are correct
Power supply
Battery latch and battery attachment for correct function and damage
Battery connector for secure fit, functionality and damage
Travel
Drive system bearings for wear and damage
Transmission for noise and leaks
Check wheels for wear, damage and secure mounting
Check wheel bearings and mounting of wheels for wear and damage
Chassis/structure
Industrial truck for damage and leaks
Check chassis connections and screw connections are securely attached and check for damage
Check labels for legibility, completeness and plausibility
Mechanism to protect against trapping and shearing is present, secure, functions correctly and is free of dirt and damage
Hydraulic operations
Test hydraulic controls and check their labels for legibility, completeness and plausibility
Lift mechanism for wear, functionality and damage
Check cylinders and piston rods are securely attached and check for damage
Test hydraulic system
Check fork arms or load handler for wear and damage
Tie/plunger rods for uniform adjustment, wear and damage
Check the hoses, pipes and connections are securely attached and check for wear, leaks, damage, blisters and kinks

Steering
Tiller for lateral play
Steering components for play and damage

1.2.2.2 Optional Equipment

Standard on-board charger

Battery charger
Mains plug and mains cable for damage
Cables and electrical connections for secure fit and damage

Electrolyte recirculation

Power supply
Hose connections and pump for correct function

Aquamatic

Power supply
Aquamatic plug, hose connections and float for functionality and sealing
Flow indicator for functionality and sealing

Lateral battery removal

Power supply
Battery latch and battery attachment for correct function and damage

Shock sensor/data recorder

Electrical system
Check shock sensor/data recorder is securely attached and check for damage

Radio data

System components
Scanner and terminal for secure fit, functionality and damage
Fuses for correct ratings
Check cables are securely attached and check for damage

Access module

Electrical system
Check access module is securely attached, test and check for damage

Entry skids/rollers

Hydraulic operations
Check entry skids or entry rollers for damage and wear, and test their function

On-board charger 35A

Battery charger

Mains plug and mains cable for damage

Fan for correct functionality and damage

Cables and electrical connections for secure fit and damage

Folding frame

Chassis/structure

Folding frame and its stop for correct function and check for attachment and damage

Lead-acid battery, international

Power supply

Check battery, battery cables and cell connectors are securely attached and check for damage

Ensure safety labels are present and check for damage

Lead-acid battery

Power supply

Check battery, battery cables and cell connectors are securely attached and check for damage

Pre-Op_Check

Electrical system

Check access module is securely attached, test and check for damage

1.2.3 Maintenance parts

The manufacturer recommends the replacement of the following maintenance parts at the specified intervals.

1.2.3.1 Standard equipment

maintenance part	service hours	months
Gear oil	10000	
Hydraulic system breather filter	2000	12
Hydraulic oil	2000	12
Hydraulic oil filter	2000	12

1.2.3.2 Optional Equipment

Cold store application

maintenance part	service hours	months
Transmission oil in cold store application	10000	12
Hydraulic oil	1000	12
Hydraulic oil additive	1000	12

2 Maintenance Contents EJE 114 Li-Ion EJE 116 Lilon EJE 118 Li-Ion

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2.1 Owner

To be performed every 50 service hours, but at least once a week.

2.1.1 Maintenance contents

2.1.1.1 Standard equipment

Brakes

Test the brake.

Hydraulic operations

Correct the hydraulic-oil level.

Steering

Test the tiller return function.

2.1.2 Inspection contents

2.1.2.1 Standard equipment

The following points must be checked:

Electrical system

Warning and safety equipment in accordance with the operating instructions

Functionality of display and controls

Test emergency disconnect switch and check for damage

Power supply

Battery connector for secure fit, functionality and damage

Travel

Collision safety switch for functionality and damage

Check wheels for wear and damage

Chassis/structure
Industrial truck for damage and leaks
Check labels for legibility, completeness and plausibility
Check doors or covers for damage

Hydraulic operations
Test hydraulic system
Check fork arms or load handler for wear and damage

Battery charger
Mains plug and mains cable for damage

2.1.2.2 Optional Equipment

The following points must be checked:

2.2 Customer Service

In accordance with the EJE 114 Li-Ion EJE 116 Lilon EJE 118 Li-Ion service interval, to be performed every 1000 service hours, but at least once a year.

2.2.1 Maintenance contents

2.2.1.1 Standard equipment

Brakes
Test the brake with the tiller in the maximum vertical and horizontal positions.
Measure the air gap of the magnetic brake.

Electrical system
Perform insulation inspection.

Chassis/structure
Check that the panels and covers as well as mounting brackets are secure. Ensure they function correctly and are safe.

Hydraulic operations
Correct the hydraulic-oil level.
Test the pressure relief valve.

Agreed services
Carry out a test run with the rated capacity or a customer-specific load.
Lubricate the truck according to the lubrication schedule.
Demonstration after maintenance.

Steering
Test the tiller return function.

Battery charger
Test the immobiliser on trucks with an on-board charger.
Clean the fan.
Carry out a potential measurement on the chassis while charging is in progress.

2.2.1.2 Optional Equipment

Radio data

System components
Clean the scanner and terminal.

2.2.2 Inspection contents

The following points must be checked:

2.2.2.1 Standard equipment

Electrical system
Cables and motor for secure fit and damage
Warning and safety equipment in accordance with the operating instructions
Functionality of display and controls
Test emergency disconnect switch and check for damage
Check electrical wiring for damage (insulation damage, connections) and check whether the fuse ratings are correct

Power supply
Battery latch and battery attachment for correct function and damage
Battery cable for damage
Battery connector for secure fit, functionality and damage

Travel
Drive system bearings for wear and damage
Transmission for noise and leaks
Check wheels for wear, damage and secure mounting
Check wheel bearings and mounting of wheels for wear and damage

Chassis/structure
Industrial truck for damage and leaks
Check chassis connections and screw connections are securely attached and check for damage
Check labels for legibility, completeness and plausibility

Hydraulic operations
Test hydraulic controls and check their labels for legibility, completeness and plausibility
Lift mechanism for wear, functionality and damage
Check cylinders and piston rods are securely attached and check for damage
Test hydraulic system
Check fork arms or load handler for wear and damage
Tie/plunger rods for uniform adjustment, wear and damage
Check the hoses, pipes and connections are securely attached and check for wear, leaks, damage, blisters and kinks

Steering
Tiller for lateral play
Steering components for play and damage

Battery charger
Mains plug and mains cable for damage
Fan for correct functionality and damage
Cables and electrical connections for secure fit and damage

2.2.2.2 Optional Equipment

Shock sensor/data recorder

Electrical system
Check shock sensor/data recorder is securely attached and check for damage

Radio data

System components
Scanner and terminal for secure fit, functionality and damage

Access module

Electrical system
Check access module is securely attached, test and check for damage

Entry skids/rollers

Hydraulic operations
Check entry skids or entry rollers for damage and wear, and test their function

Pre-Op_Check

Electrical system
Check access module is securely attached, test and check for damage

2.2.3 Maintenance parts

The manufacturer recommends the replacement of the following maintenance parts at the specified intervals.

2.2.3.1 Standard equipment

maintenance part	service hours	months
Gear oil	10000	
Hydraulic system breather filter	2000	12
Hydraulic oil	2000	12
Hydraulic oil filter	2000	12