

# EJE 114 / 116 / 118 / 120

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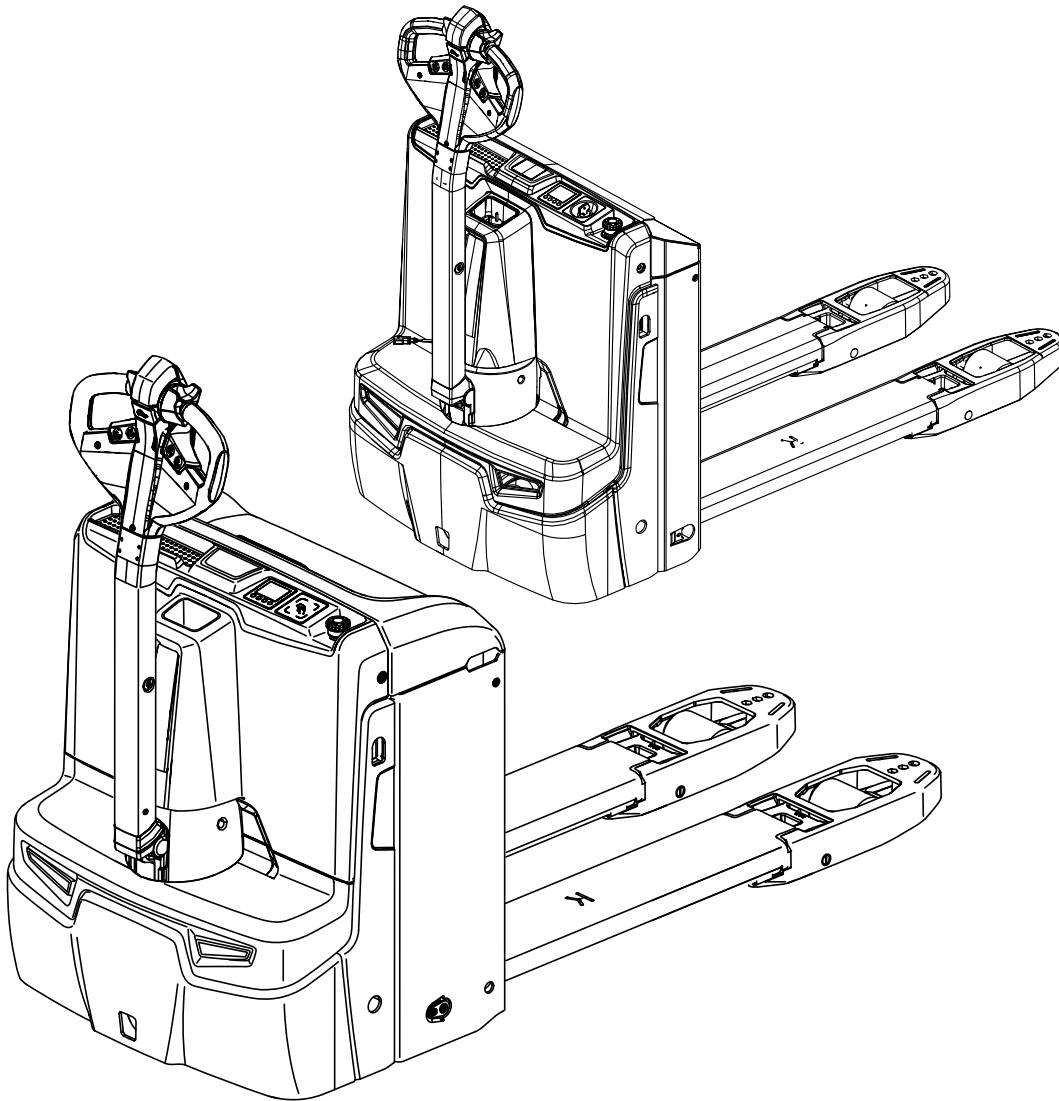
Operating instructions

en-GB

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EJE 114  
EJE 116  
EJE 118  
EJE 120





# Declaration of Conformity



## Manufacturer

Jungheinrich AG, 22039 Hamburg, Germany

<b>Description</b>
<b>Industrial truck</b>

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

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.





# 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**

Copyright of these operating instructions remains with JUNGHEINRICH AG.

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# A Correct Use and Application

## 1 General

The truck must be used, operated and serviced in accordance with the present instructions. All other types of use are beyond its scope of application and may result in damage to personnel, the industrial truck or property.

## 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 95.

---

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.
- 

- 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 25.
  - Notes on travelling on slopes and inclines – see page 86.

##### **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.



## 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 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 104.

### 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

Usage 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

Usage and ambient conditions	
Permissible temperature range	-10 °C to +40 °C
Temperature range for secure parking	+5 °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

Usage and ambient conditions	
Permissible temperature range	-10 °C to +55 °C
Temperature range for secure parking	+5 °C to +40 °C
Minimum temperature for charging	+5 °C
Maximum relative air humidity	95% non-condensing

### 3.3.4 Replaceable Lithium-Ion Battery

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

### 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 and a protective frame instead of a mast guard on the mast.
- ▶ 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 51.

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 **permanently** and should not be parked securely for more than 15 minutes.

#### 3.4.1 Truck in General

Usage 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

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

## 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.

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## 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.

## 7 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.

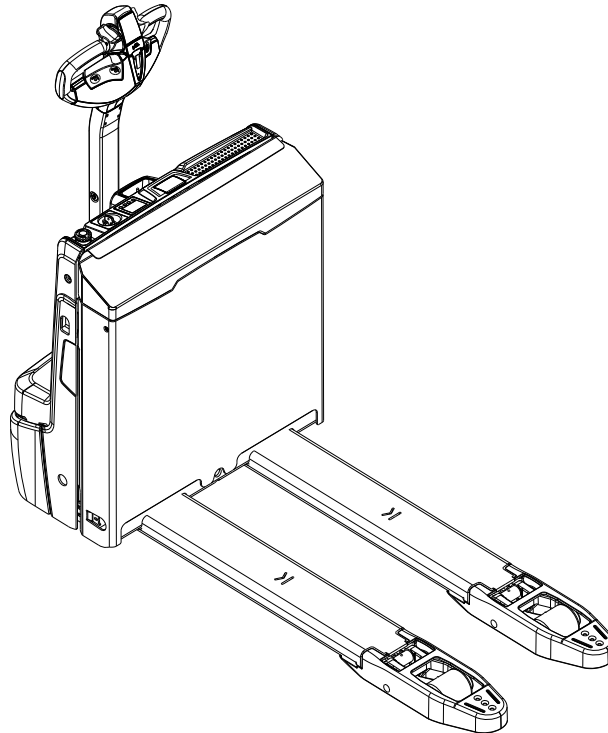


# B Truck Description

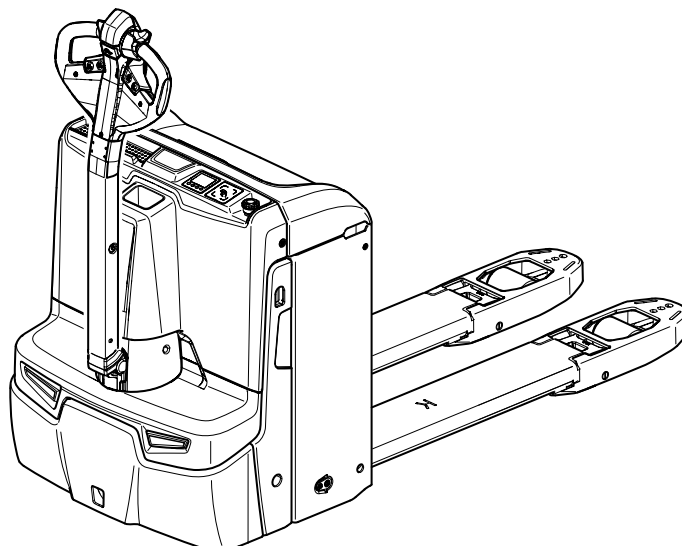
## 1 Application

The EJE 114 / 116 / 118 / 120 is designed to transport goods on level surfaces. It can lift open-bottom pallets or pallets with transverse boards outside area the load-wheel area, as well as roll cages. The capacity is shown on the capacity plate, Qmax.

### Battery compartment XS

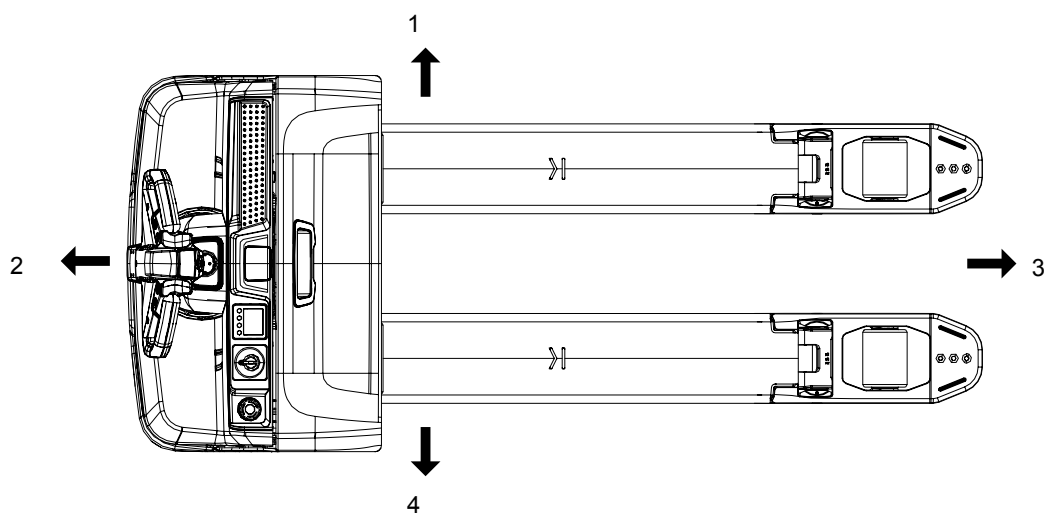


### Battery compartment S, M, L



## 2 Travel direction definition

The following determinations have been made for travel direction specification:



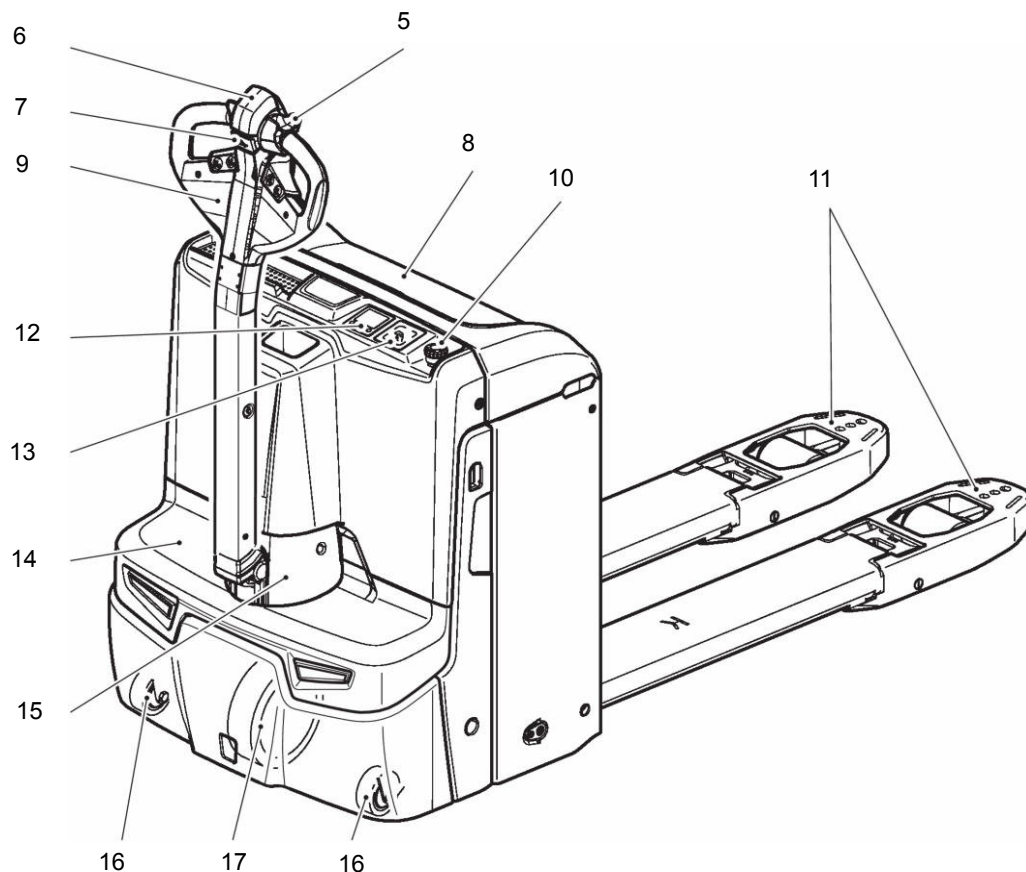
Item	Travel Direction
1	Left
2	Drive direction
3	Load direction
4	Right



## 3 Assemblies and Functional Description

### 3.1 Assembly Overview

→ The graphic shows the EJE 114 as an example.



Item		Designation	Item		Designation
5	●	Travel switch	12	○	Display unit
6	●	Collision safety switch	13	●	Key switch
7	●	"Slow travel" button		○	Keypad
8	●	Battery panel		○	Transponder reader/ transponder reader Plus
9	●	Tiller		○	2-stage key switch
10	●	Emergency disconnect switch	14	●	Front panel
11	●	Load handler	15	●	Tiller hood
12	●	Discharge indicator	16	●	Support wheels
			17	●	Drive wheel

## 3.2 Protective and safety equipment

### 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 controls

When released, a gas strut pushes the swivelling tiller up and activates braking, see page 90.

The travel switch must be held in the travel position to move the truck. When released, the travel switch moves to the neutral position and the truck brakes, see page 94.

### Emergency disconnect switch

Activating the emergency disconnect switch rapidly cuts out all electrical functions in hazardous situations, see page 89.

### 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 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.

### 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 91.

### **3.3 Functional Description**

#### **Electrical system**

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

#### **Drive system**

An AC three-phase motor powers the drive wheel via a gearbox.

The electronic traction controller ensures smooth speed control of the drive motor and hence smooth starting, powerful acceleration and electrically controlled braking with energy recovery.

The operator can choose from 3 travel programs depending on the load and the environment: from high-performance to energy-saving (2-inch display).

#### **Hydraulische Anlage**

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.

#### **Steering**

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

#### **Operator position**

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

## **positionCONTROL (○)**

The "positionCONTROL" option enables comfortable approach of predefined entry and lifted heights and free lift heights for up to three definable pallet types with simple actuation of the raise/lower function. "positionCONTROL" can be activated and deactivated with the display unit menu (○).

- ➔ Before angled entry into a pallet, positionCONTROL must be deactivated as pallets can become damaged in the event of accidental lifting with the automatic function.
- ➔ positionCONTROL is not available for battery compartment XS.

## **3.4 Hourmeter**

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

- Tiller in travel zone "F", see page 91.
- "Slow travel button", see page 93.
- "Lift" button, see page 95.
- "Lower" button, see page 95.

## **3.5 Explanation of travel programs**

All trucks in the EJE series are supplied with a pre-set travel program ex works. The information in the section "Performance data" (see page 25) relates to travel program 2.

Travel program 1: reduced top speed, reduced acceleration.

Travel program 2: standard travel program.

Travel program 3: increased acceleration, maximum braking.

## 4 Technical Specifications

→ Technical data specified in accordance with VDI 2198.  
Technical modifications and additions reserved.

### 4.1 Performance data

Designation	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 <sup>1)</sup> \ 0.03/0.04	0.04/0.04		0.03/0.04	m/s
Lowering speed with\without rated load	0.05/0.04 <sup>1)</sup> \ 0.04/0.04	0.05/0.04			m/s

<sup>1)</sup> Battery compartment XS

### 4.2 Gradeability

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

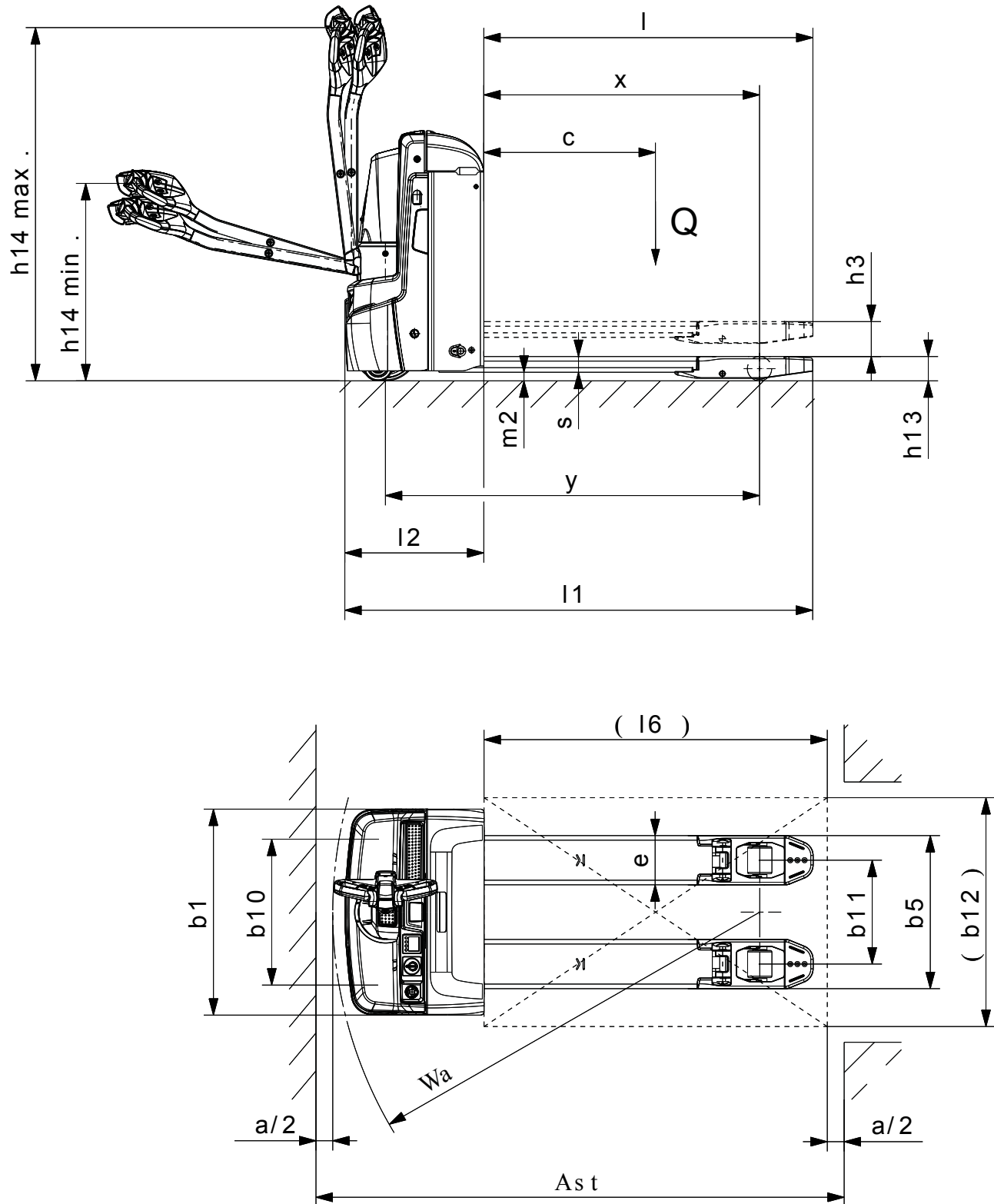
<sup>1)</sup> Battery compartment XS

### 4.3 Engine Data

Designation	EJE 114	EJE 116/118/120
Drive motor	0.9 kW	1.1 kW
Lift motor -	1.2 kW	

## 4.4 Dimensions

- Technical data specified in accordance with VDI 2198.  
Technical modifications and additions reserved.
- The graphic shows the EJE 114 as an example.



	Designation	EJE 114	EJE 116	EJE 118	EJE 120	
h3	Lift	122				mm
c	Load centre-distance for standard forklift length <sup>1)</sup>	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) <sup>2)</sup>	1182 / 1252 / - / -	1182 / 1252 / 1321 <sup>3)</sup> / 1393 <sup>3)</sup>		- / 1252 / 1321 <sup>3)</sup> / 1393 <sup>3)</sup>	mm
l1	Overall length (XS / S / M / L) <sup>3)</sup>	1566 / 1636 / - / -	1566 / 1636 / 1705 <sup>3)</sup> / 1777 <sup>3)</sup>		- / 1636 / 1705 <sup>3)</sup> / 1777 <sup>3)</sup>	mm
l2	Length including fork shank (XS / S / M / L)	416 / 486 / - / -	416 / 486 / 555 <sup>3)</sup> / 627 <sup>3)</sup>		- / 486 / 555 <sup>3)</sup> / 627 <sup>3)</sup>	mm
l	Standard forklift length	1150				mm
b1	Fork width	720				mm
b5	Width across forks	513	513 <sup>6)</sup> / 535		535	mm
b10	Track width, front	500 <sup>7)</sup> / 510	510			mm
b11	Track width, rear	363				mm
e	Fork width	150	150 <sup>6)</sup> / 172		172	mm
s	Fork-arm thickness	55				mm
m2	Ground clearance, centre of wheelbase	30				mm
x	Load distance <sup>2)</sup>	908				mm
Wa	Turning radius (XS / S / M / L) <sup>2)</sup>	1363 / 1433 / - / -	1363 / 1433 / 1502 <sup>3)</sup> / 1574 <sup>3)</sup>		- / 1433 / 1502 <sup>3)</sup> / 1574 <sup>3)</sup>	mm
Ast	Working aisle width, pallets 800x1200 length (XS / S / M / L) <sup>5)</sup>	2058 / 2128 / - / -	2058 / 2128 / 2197 <sup>3)</sup> / 2269 <sup>3)</sup>		- / 2128 / 2197 <sup>3)</sup> / 2269 <sup>3)</sup>	mm
Ast	Aisle width with pallet 1000x1200 transversely (XS / S / M / L) <sup>4)</sup>	2170 / 2240 / - / -	2170 / 2240 / 2309 / 2381 <sup>3)</sup>		- / 2240 / 2309 <sup>3)</sup> / 2381 <sup>3)</sup>	mm

<sup>1)</sup> For longer fork lengths, the load centre is in the centre of the forks.

<sup>2)</sup> 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



## 4.5 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

## 4.6 Tyre type

Designation	EJE 114	EJE 116	EJE 118	EJE 120	
Tyre size, front	ø 230 x 70				mm
Tyre size, rear – Single – Tandem – Triple	ø 85 x 95 ø 82 x 70 ø 82 x 35	ø 85 x 95 <sup>1)</sup> / ø 85 x 110 ø 82 x 70 <sup>1)</sup> / ø 85 x 85 ø 82 x 35 <sup>1)</sup> / 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				

<sup>1)</sup> Battery compartment XS

## 4.7 EN norms

### Continuous sound pressure level

– EJE 114 / 116 / 118 / 120: 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.

### **WARNING!**

#### **Damage to medical equipment due to non-ionising radiation**

Electrical equipment on the truck carrier 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 it can be used near the industrial truck.

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## 4.8 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.

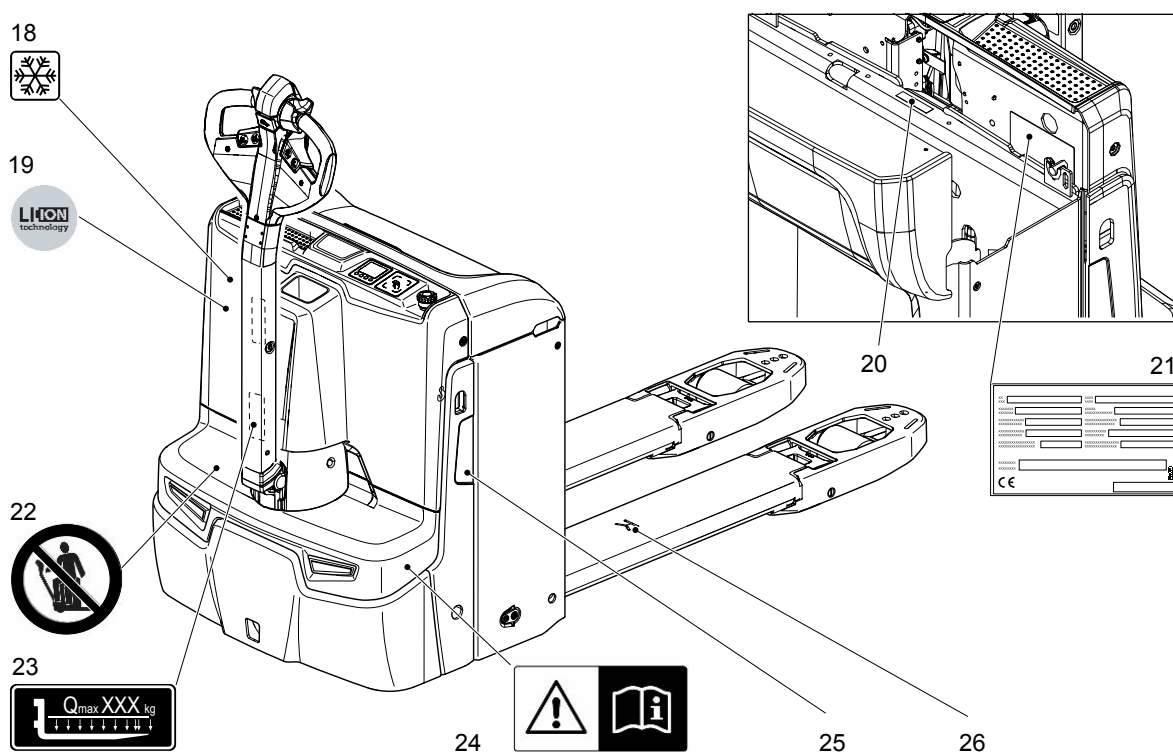
Component	Frequency range	Transmission power
WMT 110	13.56 MHz	< 100 mW
WMT 110	2.4 GHz	10 mW
Transponder reader	13.56 MHz	< 100 mW
Transponder reader Plus	13.56 MHz	< 500 mW
Battery module	2.4 GHz	< 10 mW
Telematics Box Basic	2.4 GHz	< 20 mW
Telematics Box Basic	2G 850 /900 MHz	< 2 W
Telematics Box Basic	2G 1800/1900 MHz	< 1 W
Telematics Box Basic	3G 800 - 2100 MHz	< 250 mW
Telematics Box Plus	4G 700-2100 MHz	< 200 mW
Telematics Box Plus	2.4 GHz	< 100 mW
Telematics Box Plus	2.4 GHz	< 10 mW
Telematics Box Plus	5 GHz	< 100 mW
Telematics Box Plus	2G 850/900 MHz	< 2 W
Telematics Box Plus	2G 1800/1900 MHz	< 1 W
Telematics Box Plus	3G 800-2100 MHz	< 250 mW
Telematics Box Plus	4G 700-2100 MHz	< 200 mW

## 5 Identification points and data plates

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

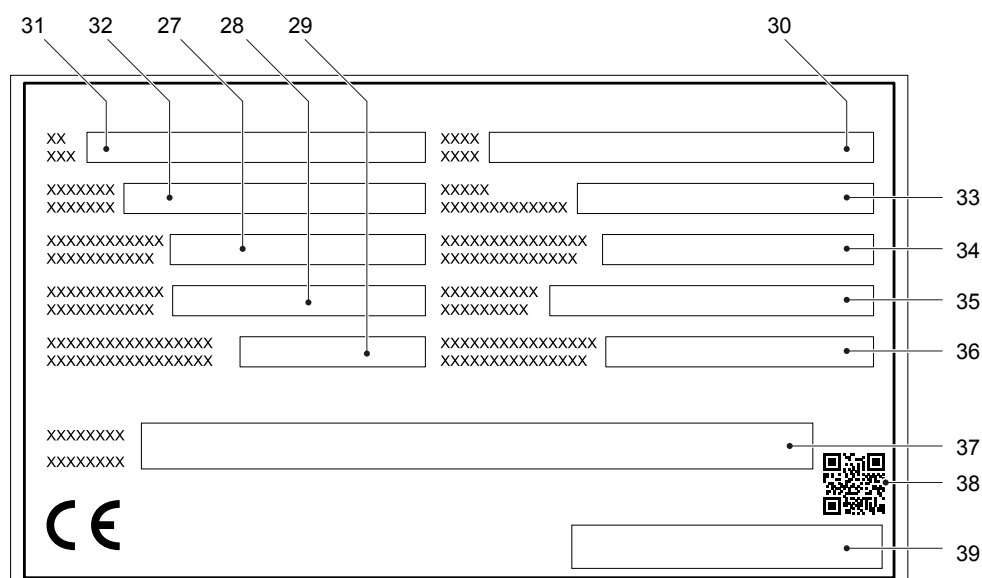
### 5.1 Indication Points

- The graphic shows the EJE 114 as an example.



Item	Designation
18	"Cold store" plate (○)
19	Note on lithium-ion battery (○)
20	Serial number
21	Data plate
22	Prohibition plate: "No passengers"
23	Capacity plate $Q_{\max}$
24	"Observe the operating instructions" decal
25	Model description
26	Marking point for pallet angled entry

## 5.2 Data plate



Item	Model	Item	Model
27	Rated capacity (kg)	34	Load centre distance (mm)
28	Battery voltage (V)	35	Drive output
29	Net weight w.o. battery (kg)	36	Min./max. battery weight (kg)
30	Option	37	Manufacturer
31	Model	38	QR code
32	Serial number	39	Manufacturer's logo
33	Year of manufacture		



For queries regarding the truck or when ordering spare parts, always quote the truck serial number (32).

### 5.3 Truck capacity plate

The capacity plate (23) gives the maximum load-bearing capacity (Q) of the truck in kg assuming the load on the load handler is evenly distributed.





# 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 crash 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.

- ▶ The truck may be loaded only by people who are trained in using lifting accessories and lifting gear.
- ▶ Wear personal protective equipment (e.g. safety shoes, safety helmet, hi-vis jacket, protective gloves) when loading by crane.
- ▶ Do not stand under suspended loads.
- ▶ Do not walk into or stand in a hazardous area.
- ▶ Always use lifting gear with sufficient capacity (for truck weight, see truck data plate).
- ▶ Always attach the crane lifting gear to the prescribed attachment points and prevent them from slipping.
- ▶ Use the lifting accessories only in the prescribed load direction.
- ▶ Crane lifting gear must be fastened in such a way that it does not come into contact with any attachments when lifting.

### **CAUTION!**

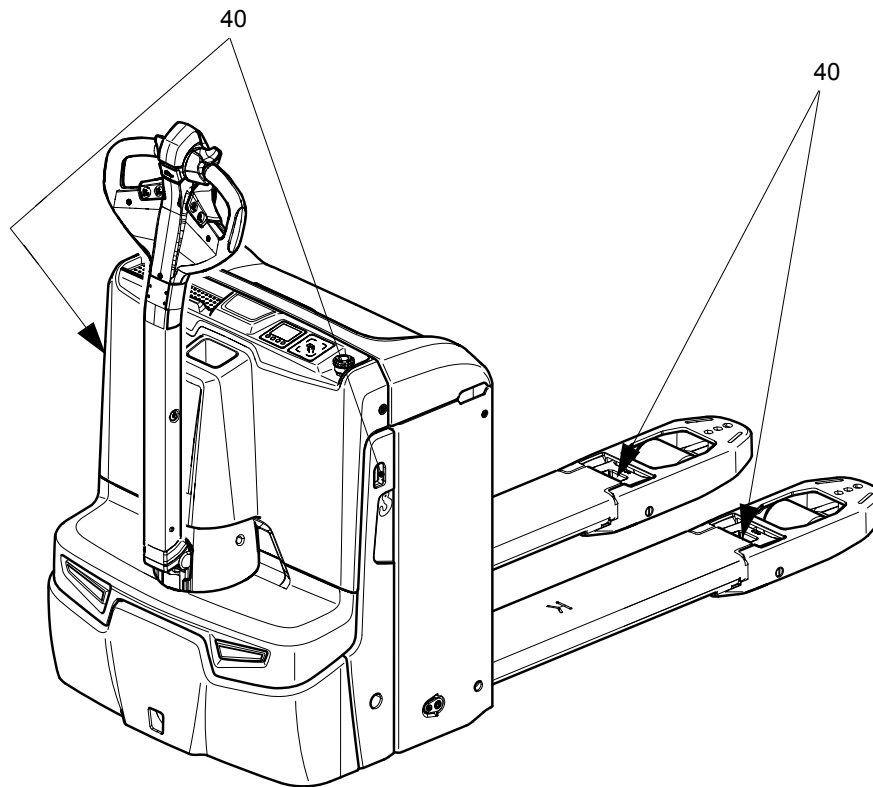
#### **Danger of injury from swinging truck**

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 (40) 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 84.

#### ***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 (40).

*The truck can now be lifted by crane.*



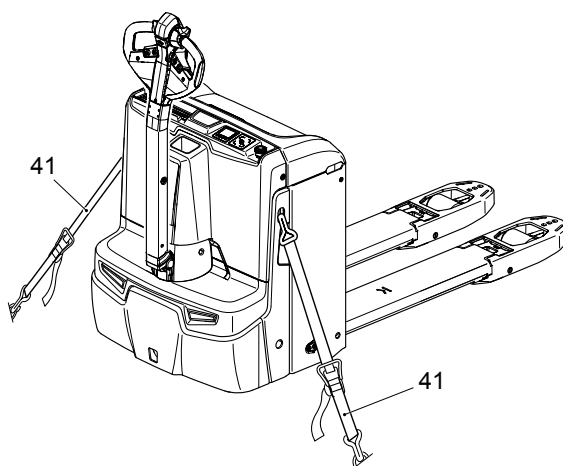
## 2 Transport

### **⚠ WARNING!**

#### **Uncontrolled movement during transport**

Improper fastening of the truck and mast during transport can result in serious accidents.

- ▶ Loading is only to be carried out by specially trained staff. The specialist personnel must be instructed in the securing of loads on road vehicles and in the use of load-securing equipment. When securing the truck, the appropriate measures must be determined and applied for each individual case.
- ▶ The truck must be securely fastened when transported on a lorry or a trailer.
- ▶ The lorry or trailer must have lashing rings.
- ▶ Use wedges to prevent the truck from moving.
- ▶ Use only lashing straps with sufficient load rating.
- ▶ Use anti-slip material to secure loading aids (pallets, wedges,...), e. g. anti-slip mats.



#### **Securing the truck for transport**

##### *Requirements*

- The truck is loaded.
- The truck is parked securely, see page 84.

##### *Tools and Material Required*

- Lashing straps

##### *Procedure*

- Attach the lashing straps (41) to the industrial truck and the transport vehicle and tension sufficiently.

*The truck can now be transported.*

### 3 Using the Truck for the First Time

#### **WARNING!**

##### **The use of unsuitable energy sources can be hazardous**

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

Unsuitable cable connections (too long, insufficient wire cross-section) to the battery (tow cables) can overheat, setting the truck and battery on fire.

- ▶ The truck must only be operated with battery current.
  - ▶ Cable connections to the battery (tow leads) must be less than 6 m long and have a minimum cross-section of 50 mm<sup>2</sup>.
- 

##### *Procedure*

- Check the equipment is complete.
- If necessary, install the battery, see page 45. Do not damage the battery cable.
- Charge the battery, see page 51.

- ➔ The truck settings must match the battery model (if the customer is charging the battery).
  - Check the hydraulic oil level and top up if necessary (see page 80).
  - Start up the truck (see page 81).

##### *Truck is operational.*

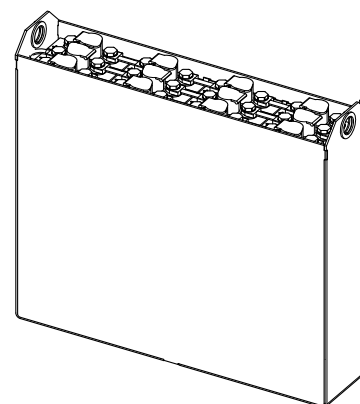
- ➔ If the truck is equipped with a display unit the delivery code is marked on a sticker, see page 111.
- ➔ If the truck is equipped with a keypad or a transponder reader, it can only be operated at first by the keys in the display unit, see page 112.

# D Battery - Servicing, Recharging, Replacement

## 1 Notes on Battery Technologies

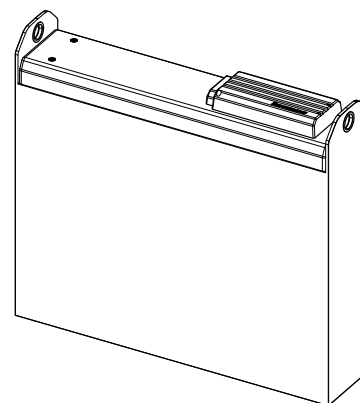
### Lead-acid batteries (●)

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 40.



### Replaceable lithium-ion batteries (○)

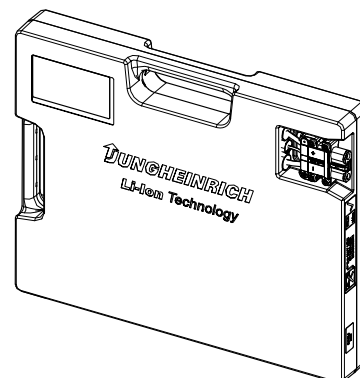
The truck is optionally fitted with a replaceable lithium-ion battery. The associated descriptions are in the separate "Li-ion battery 24 V - 110 Ah / 240 Ah / 360 Ah" operating instructions and in the chapter titled "Replaceable lead-acid and lithium-ion batteries" – see page 40.



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

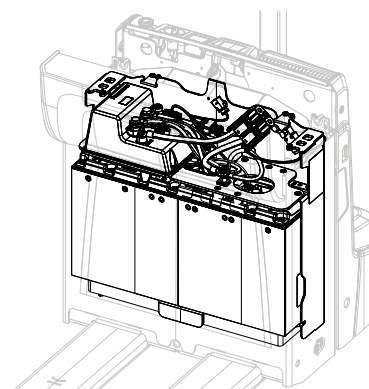
The truck is optionally fitted with a lithium-ion battery in the version as case battery (battery compartment XS only). The associated descriptions are in the following chapters:

- Safety for handling lithium-ion batteries – see page 62,
- General information on lithium-ion batteries – see page 61,
- Descriptions of the battery types, for installing, removing and charging this battery – see page 42.



### 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 61.



## 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.

Park the truck securely before carrying out any work on the batteries (see page 84).

#### 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.
  - ▶ Always wear protective clothing and eye protection when working with 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 injury (e.g. skin or eye contact with battery acid) call a doctor immediately.
  - ▶ Spilled battery acid should be neutralised immediately with plenty of water.
  - ▶ Only batteries with a sealed battery container may be used.
  - ▶ 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)

Voltage	Battery type	Weight (kg)	Battery dimensions (mm)
25.7 V	Li-ion 40 Ah	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)

Voltage	Battery type	Weight (kg)	Battery dimensions (mm)
24 V	2PzB 130 Ah	133	650 x 145 x 560
	2PzVB 134 Ah	144	662 x 148 x 592
	2PzB 150 Ah		
	NXS 166 Ah		
25.6 V	Li-ion 110 Ah	139	660 x 145 x 590

### Battery tray M (top battery removal)

Voltage	Battery type	Weight (kg)	Battery dimensions (mm)
24 V	2PzV 160 Ah	171	624 x 212 x 537
	2PzS 180 Ah		
	2PzV 174 Ah		
	2PzM 180 Ah		
	2PzV 200 Ah	204	624 x 212 x 628
	2PzS 250 Ah		
	2PzV 220 Ah		
	2PzM 250 Ah		
	XFC 158 Ah		
	NXS 166 Ah		
	NXS 166 Ah	204	
	2NXS 164 Ah		
25.6 V	Li-ion 110 Ah	210	624 x 207 x 627

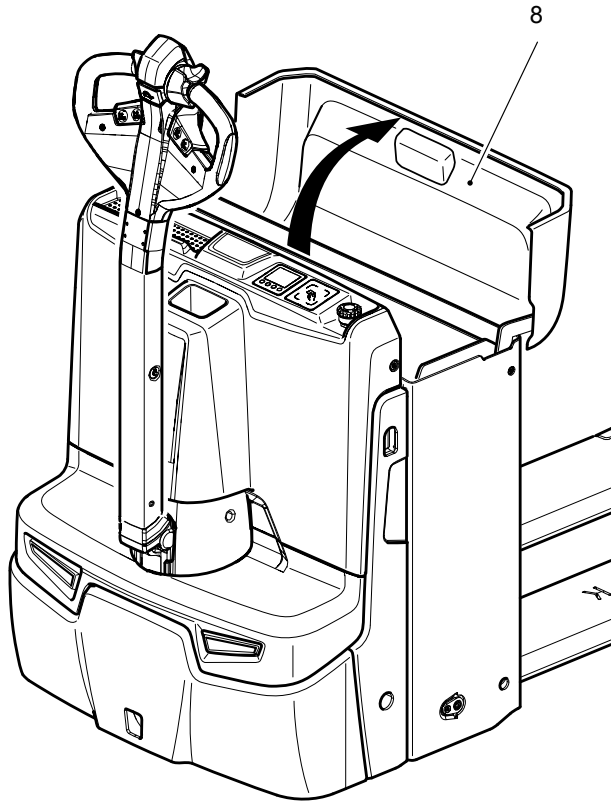
### Battery tray M (side battery removal)

Voltage	Battery type	Weight (kg)	Battery dimensions (mm)
24 V	2PzV 160 Ah	171	624 x 212 x 537
	2PzS 180 Ah		
	2PZV 174 Ah		
	2PzM 180 Ah		
	2PzV 200 Ah	204	624 x 212 x 628
	2PzS 250 Ah		
	2PZV 220 Ah		
	2PzM 250 Ah		
	XFC 158 Ah		
	NXS 166 Ah	180	
	NXS 166 Ah	204	
	2NXS 164 Ah		

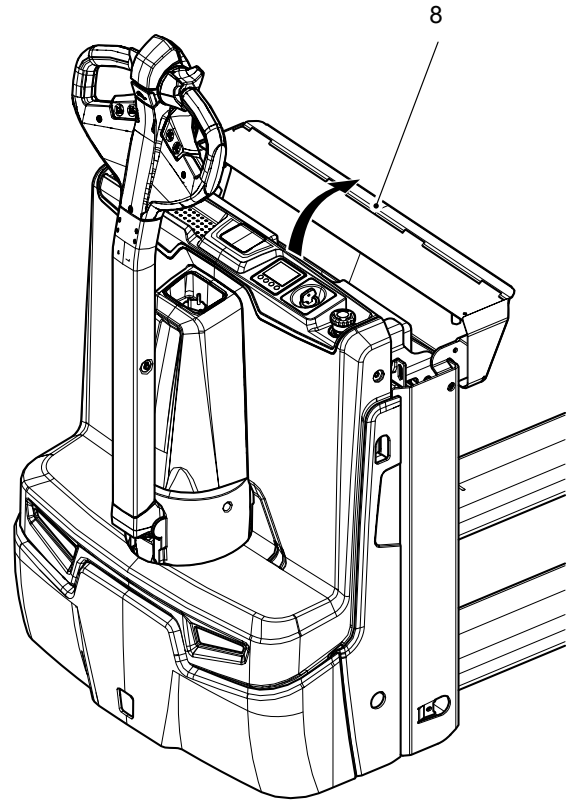
### Battery tray L (top/side battery removal)

Voltage	Battery type	Weight (kg)	Battery dimensions (mm)
24 V	3PzV300	273	624 x 284 x 628
	3PzS375		
	3PzV330		
	3PzM375		
	XFC316		
	NXS332		
25.6 V	Li-Ion 240/260 Ah		
	Li-Ion 360/390 Ah		

## 2.3 Exposing the battery



Battery compartment S, M, L



Battery compartment XS

### *Requirements*

- Truck parked securely on a horizontal surface, see page 84.

### *Procedure*

- Open the battery panel (8).

*The battery is now exposed.*



## 2.4 Battery removal and installation

### **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 for handling acid batteries" section in this chapter.
  - ▶ 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 slings have sufficient capacity to replace the battery.
  - ▶ Use only approved battery replacement devices (battery roller stand, replacement trolley etc.).
  - ▶ Make sure the battery is securely located in the truck's battery compartment.
- 

### **CAUTION!**

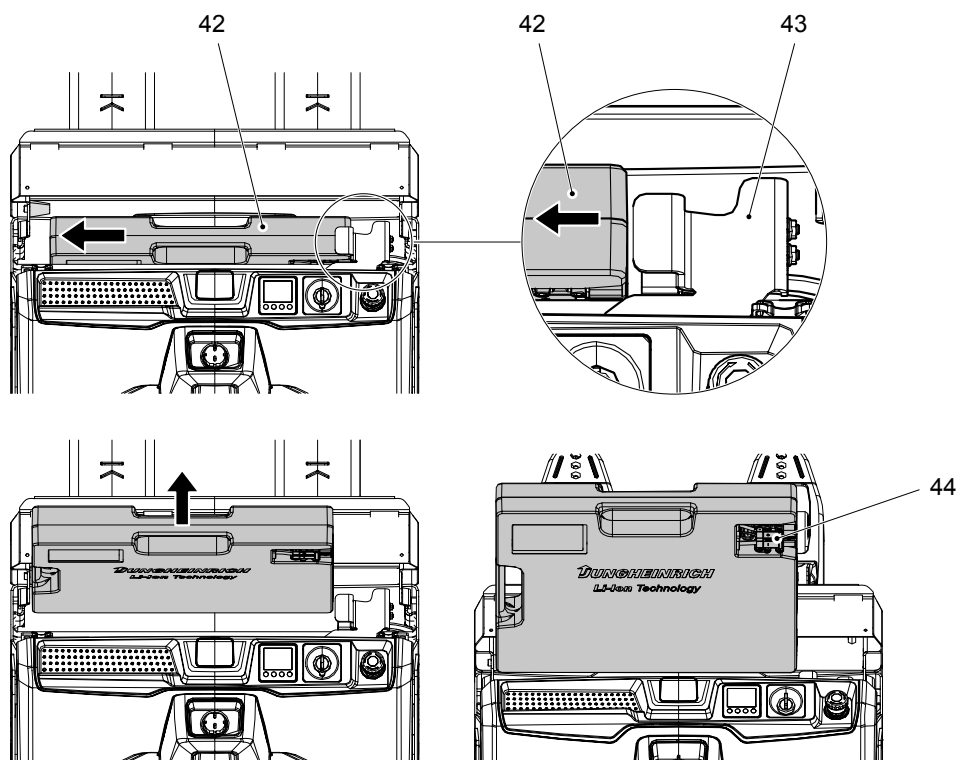
#### **Trapping hazard**

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.
-

## 2.4.1 Removing the battery from the top

### Battery compartment XS



### Removing the case battery

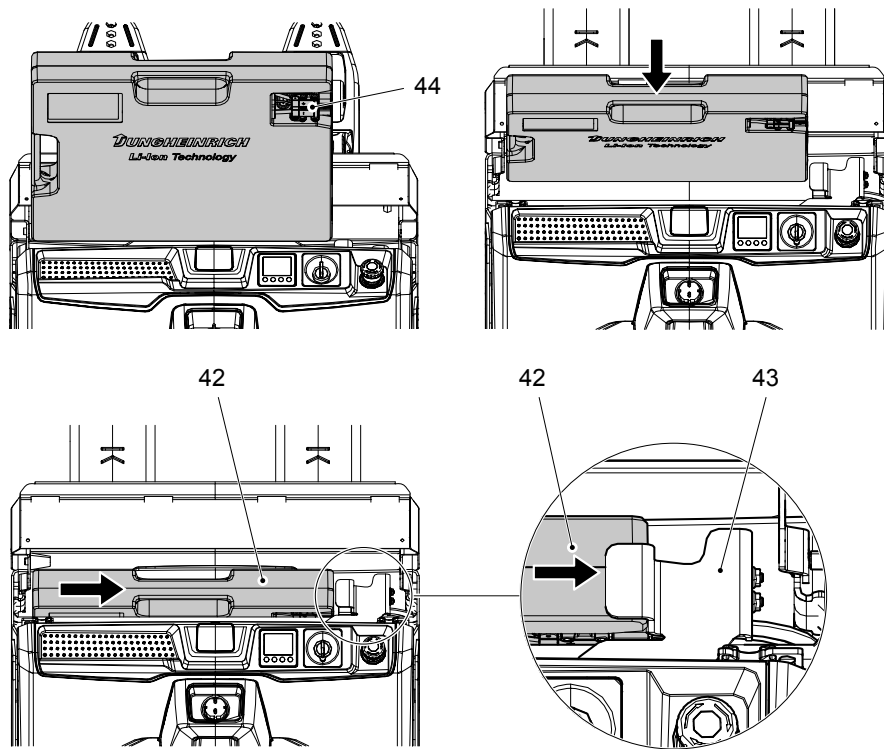
#### Requirements

- The truck is parked securely – see page 84.
- The battery lid is opened – see page 44.

#### Procedure

- Pull the case battery (42) to the left without tilting the battery.
- ➔ This disconnects the battery connector (44) from the truck connector. The truck connector is fitted to the support (43).
- Lift the case battery upwards out of the battery compartment.

*The case battery has been removed.*



### ***Installing the case battery***

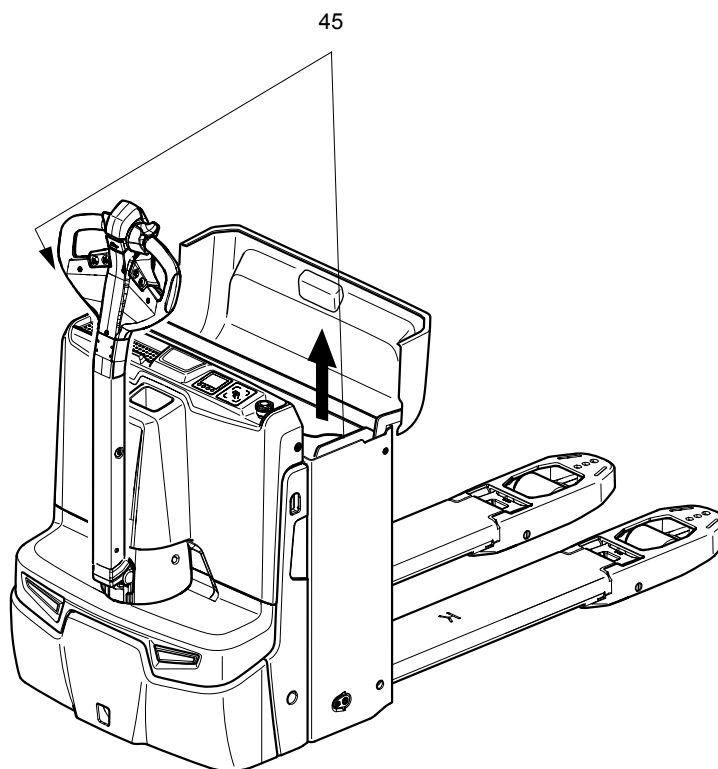
#### ***Procedure***

- Insert the case battery (42) 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 (44) is firmly connected to the truck connector. The truck connector is fitted to the support (43).

*The case battery has been installed.*

## Battery compartment S, M, L



### **Removing the battery**

#### *Requirements*

- Truck parked securely – see page 84.
- Battery exposed – see page 44.

#### *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 (45).
- ➔ 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.

## 2.4.2 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 84.
- Battery is exposed, see page 44.

##### *Tools and Material Required*

- Battery replacement station/trolley

##### *Procedure*

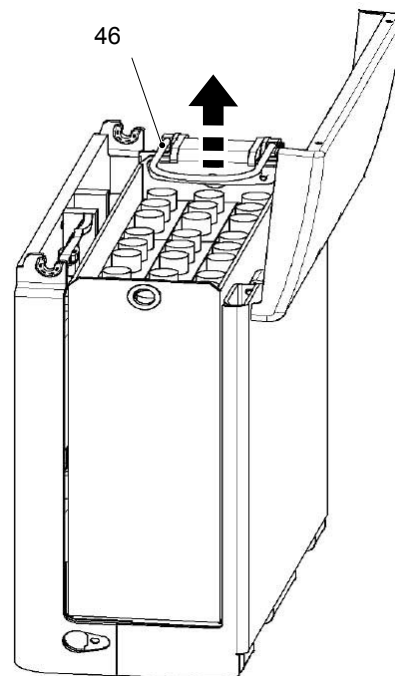
- Disconnect the battery connector (48) from the truck connector.
- Undo the battery latch (46).
- Move the battery replacement station/trolley up to the side of the truck.
- Turn the battery latch as far as the stop.



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.*



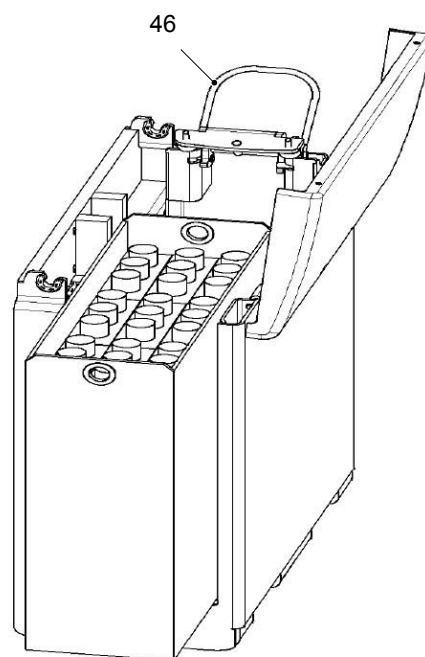
#### **Installing the battery**

##### *Requirements*

- The truck is parked securely, see page 84.
- 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.

## 2.5 Charging the battery

### 2.5.1 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 69.

#### **⚠ WARNING!**

##### **Risk of electric shock and fire due to lacking 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, charger (charge characteristics) and battery parameters must match each other, otherwise damage may result.

---

## 2.5.2 Charging the battery with a stationary 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.

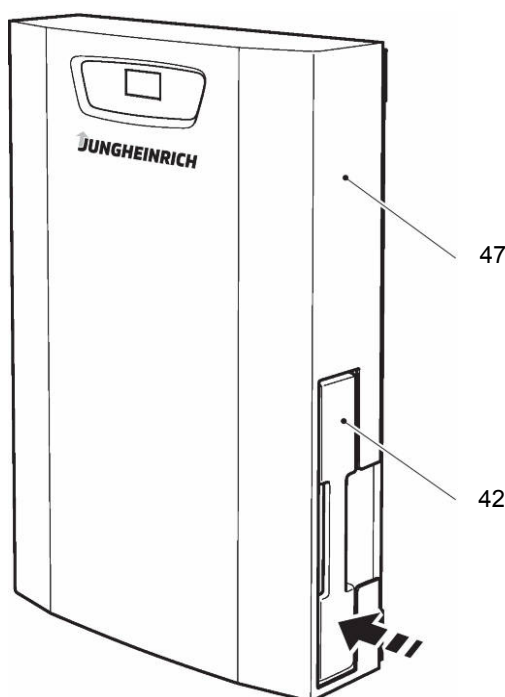
### **NOTICE**

#### **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 84.

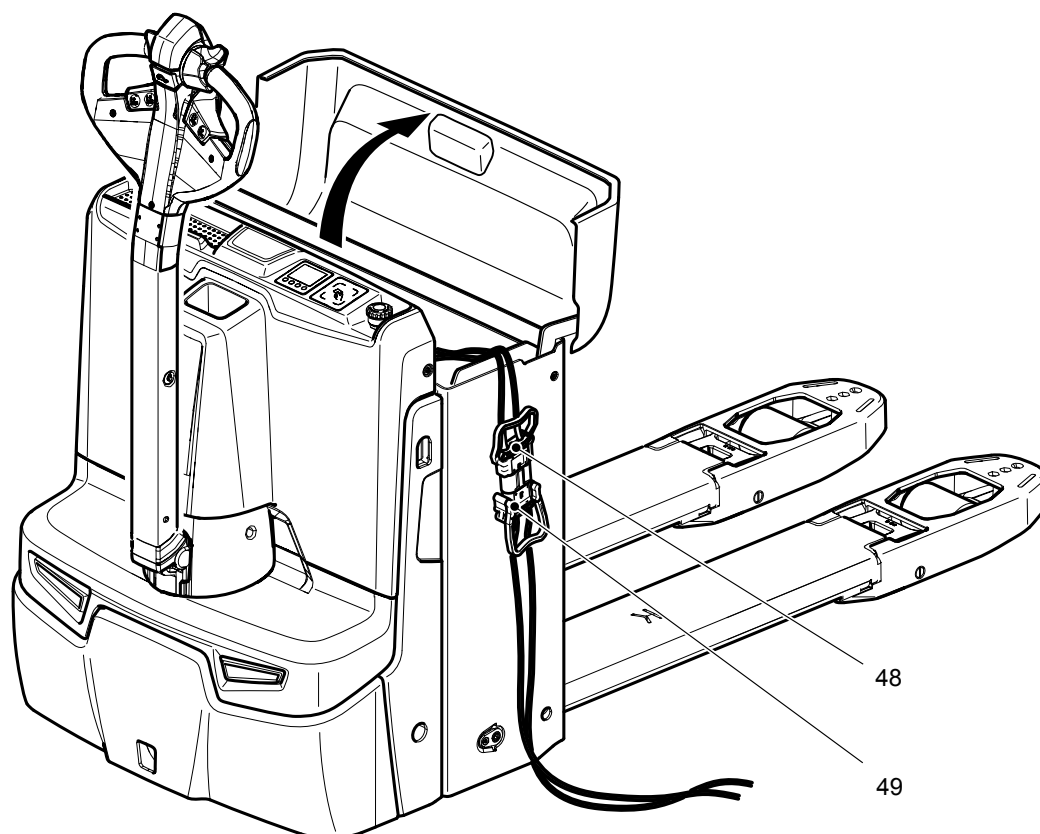
#### ***Procedure***

- Connect the mains connector of the charger to a mains supply outlet.
- Remove the battery, see page 46.
- Insert the battery (42) with the connector side facing first into the charger (47).

*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 84.
- Battery exposed, see page 44.
- The charging program that matches the battery type is set on the battery charger.

### Procedure

- Remove the insulating mat from the battery, if present.
- Disconnect the battery connector (48) from the truck connector.
- Connect the battery connector (48) to the charger cable (49) of the stationary battery charger.
- Commence 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 56).

## ***Complete battery charging and restore the truck to operation***

### ***Requirements***

- Battery charging is complete.

### ***Procedure***

- Switch off the charger.
- Remove the battery connector (48) from the charging cable (49).
- Connect the battery connector (48) 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.*

## 2.5.3 Charging the battery with the on-board charger

### 2.5.3.1 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.
- 

#### **NOTICE**

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

The on-board charger, which comprises the battery charger and battery controller, must not be opened. In the case of faults, contact the manufacturer's customer service department.

- ▶ The battery charger may only be used for batteries supplied by the manufacturer or other approved battery types provided they have been adapted by the manufacturer's customer service department.
- 

### 2.5.3.2 Setting the charging characteristics (ELH 2415 / 2425 / 2435)

The charging characteristic is set via parameters from the truck software.

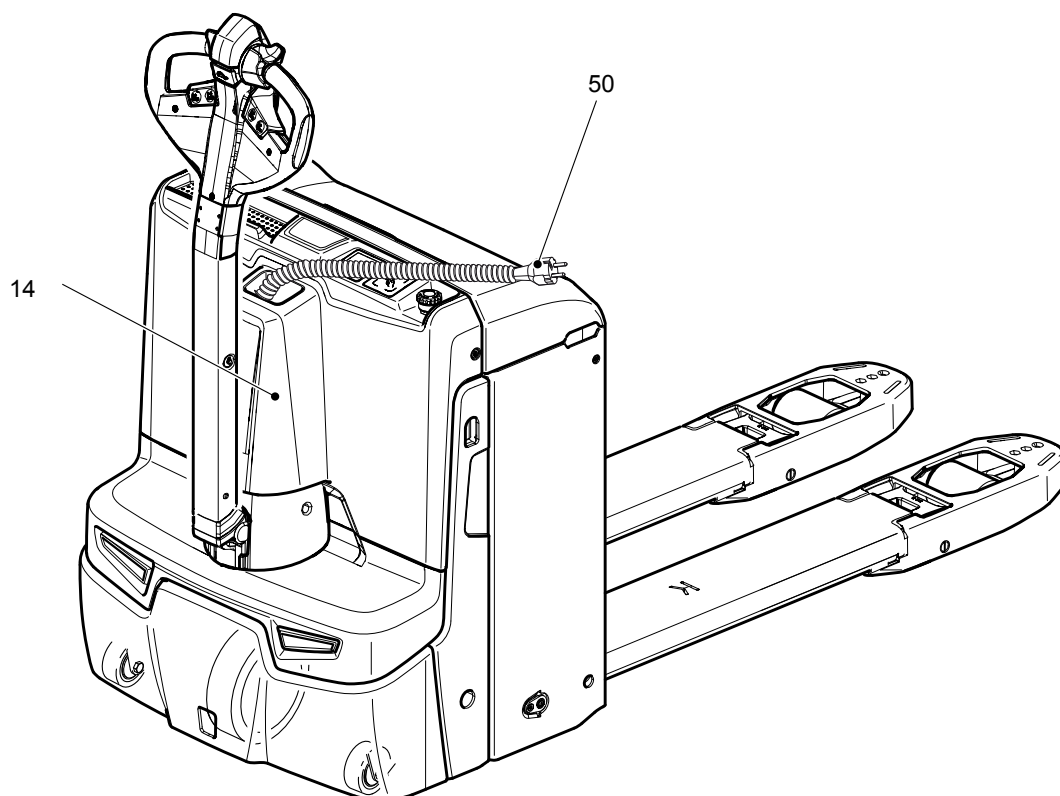
The setting is made at the factory or by the manufacturer's customer service department.

### 2.5.3.3 Starting Charging

#### Mains connection of the on-board charger

Component	Mains voltage	Mains frequency
ELH on-board charger (○)	230 V (+15 %, -10 %)	50 - 60 Hz (+15 %, -10 %)

The mains cable and mains connector (50) of the on-board charger are stowed in a storage compartment in the front panel (14).



#### Charge battery

##### Requirements

- The truck is parked securely, see page 84.
- Battery is exposed, see page 44.
- The charging program that matches the battery type is set on the battery charger.

##### Procedure

- Remove the insulating mat from the battery, if present.
- The battery connector (48) must remain plugged in.
- Plug the mains connector (50) into a mains socket.
- The flashing LED indicates the charge status or a fault (for flashing codes, see the "LED display" table).

*The battery is now charged.*

- ➔ 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.

## ***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**

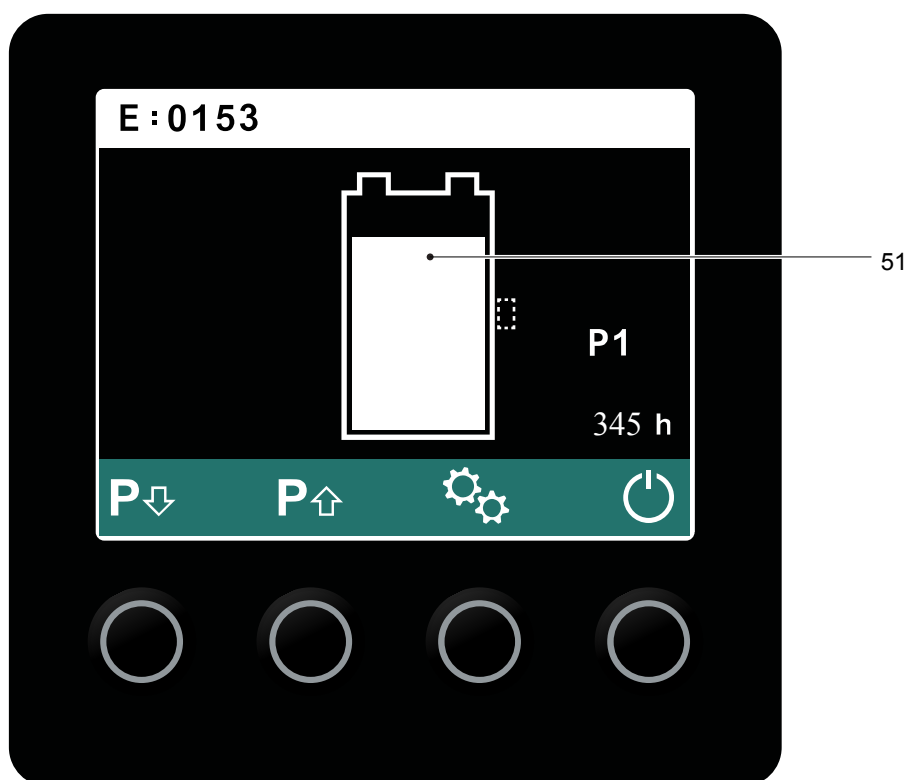
The duration of the charge depends on the battery capacity and charge status.

#### **Mains failure**

Charging continues automatically after a mains failure.

## Charge status

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

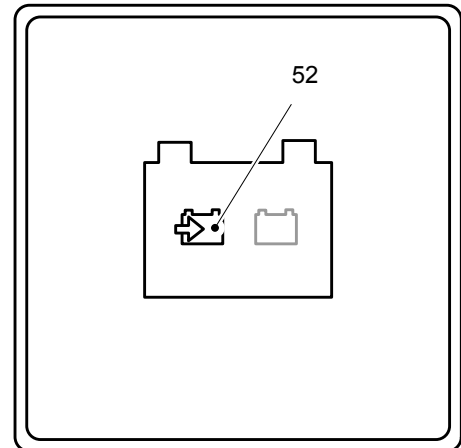


Item	Control or display element	Function
51	Battery capacity display	Battery discharge status

➔ Further information on the 2-inch display under optional equipment – see page 104.

## LED display (52)

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.



## **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**

- The information in these operating instructions regarding the operating conditions and handling instructions, in particular the use of the battery charger provided by Jungheinrich, must be strictly complied with without exception. If the lithium-ion battery is used as intended, no special measures are required, see page 11.

The following activities are prohibited; there is a risk of fire if these safety instructions are not observed:

- Do not mechanically machine, modify or short-circuit the lithium-ion battery.
- Do not open, damage, penetrate or bend the lithium-ion battery.
- Do not throw the lithium-ion battery into the fire.
- Protect the lithium-ion battery from high temperatures and overheating.
- Specified charging, operating and storage temperature ranges must be observed (see page 12).
- The safety devices of the lithium-ion battery must never be replaced or rendered ineffective.

### **3.2.2 Potential hazards**

If unusual events occur due to external influences such as use of force, fire, flooding, etc., 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.
- However, the amount of these substances is so small that caution is only required in the immediate vicinity of the battery.

### 3.2.3 Touch voltage hazard

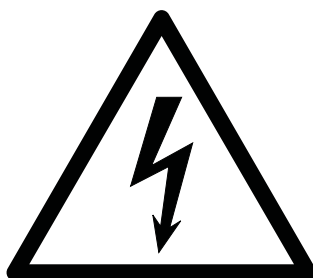
#### **⚠ WARNING!**

##### **Risk of accident due to contact voltage**

Hazardous contact voltages may occur in the event of a technical or mechanical defect on the battery. This may also be the case on an apparently discharged battery.

- ▶ Tag out the faulty battery and take out of service.
  - ▶ 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 62.



### 3.2.4 Measures for fire fighting

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 Battery lifetime and maintenance

#### **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 is wear-free.

The components are maintenance-free, and therefore no maintenance intervals are defined for this battery.

The battery is continually monitored by the battery management system.

### 3.2.6 Shipping information


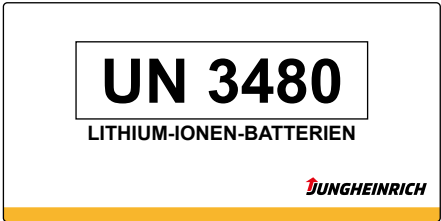
The Jungheinrich lithium-ion battery is a hazardous material. The applicable ADR regulations must be observed during transport.


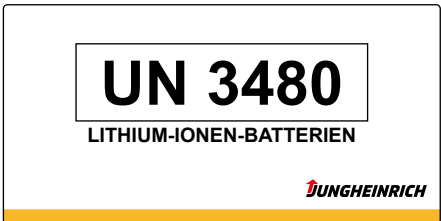
→ ADR = Accord européen relatif au transport international des marchandises Dangereuses par Route.


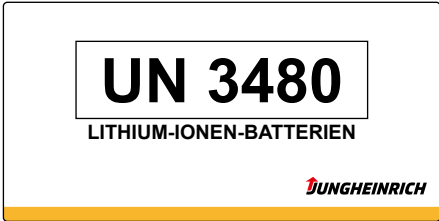
→ If in doubt, contact the manufacturer's customer service department.

#### 3.2.6.1 Shipping functional batteries

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

Classification according to ADR (road transport)	UN 3480 lithium-ion battery class 9
- Classification code	M4 lithium battery
- Danger label	 
- ADR limited quantity	LQ:0

IMDG classification (sea transport)	UN 3480 lithium-ion battery class 9
- EMS	F-A, S-I
- Danger label	 
- IMDG limited quantity	LQ: -

IATA classification (air transport)	UN 3480 lithium-ion battery class 9
- Danger label	 

Exposure scenario	Not specified.
Substance safety rating	Not specified.
Marking	Product does not require marking under EC Directive / HazMatR.

### 3.2.6.2 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.

### 3.2.7 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.



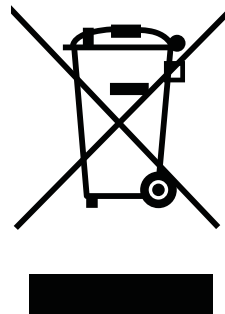
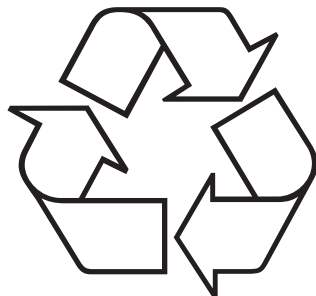
The lithium-ion battery may be damaged by a nearby fire. There must be no flammable material or consumables capable of creating sparks within 2,5 m of the stored lithium-ion battery.

### 3.2.8 Instructions for disposal

#### NOTICE

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.



Used lithium-ion batteries are recyclable commodities. These 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.

### 3.3 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	130 Ah
Lithium ion	25.6 V		260 Ah

### 3.4 Battery data plate

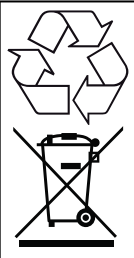






The integrated modular lithium-ion battery is an inherent component of the truck and must not be changed by the operator or owner. For this reason, the data plate of the battery is not directly visible.

The diagram shows a rectangular data plate for a Lithium Ion Secondary Battery. It contains the following fields and callouts:

- 53:** Title "Lithium Ion Secondary Battery / Lithium Ionen Sekundärbatterie"
- 54:** Type / Typ
- 55:** Year of Manufacture / Baujahr
- 56:** Serial-No. / Serien-Nr.
- 57:** Supplier-No. / Lieferanten-Nr.
- 58:** Capacity / Kapazität
- 59:** Nominal voltage / Nennspannung
- 60:** Nominal energy / Nennenergie
- 61:** Battery-No. / Batterie-Nr.
- 62:** Battery weight +/- 5% / Batteriegewicht +/- 5%
- 63:** Battery ID / Batterieerkennung
- 64:** Designation / Bezeichnung
- 65:** QR code
- 66:** Manufacturer / Hersteller
- 67:** Manufacturer's logo
- 68:** Safety and warning icons (recycling, no fire, flame, hot surface, high voltage, warning, person with book, sun)
- 69:** CE marking

Item	Designation	Item	Designation
53	Lithium-ion secondary battery	62	Battery weight ( $\pm 5\%$ ) in kg
54	Battery type	63	Battery identifier
55	Year of manufacture	64	Designation
56	Serial number	65	QR code
57	Supplier number	66	Manufacturer
58	Rated capacity in Amp hours (Ah)	67	Manufacturer's logo
59	Rated voltage in Volts (V)	68	Safety and warning information, see page 68
60	Rated energy in Watt hours (Wh)	69	CE marking
61	Battery number		

### 3.4.1 Safety and warning information

	<p>Used lithium-ion batteries must be treated as hazardous waste.</p> <p>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 example to accordance with the Battery Directive 2006/66/EG, for example.</p>
	<p>Avoid fire and short circuits due to overheating.</p> <p>Do not ignite or position an open flame, glowing embers, or sparks near the lithium-ion battery.</p> <p>Keep lithium-ion batteries away from strong heat sources.</p>
	<p>Hot surfaces.</p> <p>Battery cells can generate very high short-circuit currents, causing them to become hot.</p>
	<p>Dangerous electrical voltage!</p> <p>Battery cells can generate very high short-circuit currents, causing them to become hot.</p> <p>Caution!</p> <p>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.</p> <p>Observe the accident prevention regulations and EN 50272-3.</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.</p> <p>If the contents leak out, do not inhale the fumes.</p> <p>Always wash your hands after completing the work.</p> <p>Do not mechanically machine the lithium-ion battery, strike, crush, compress, notch, dent or modify it in any way.</p> <p>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.</p> <p>If any faults are found on the lithium-ion battery, contact the manufacturer's customer service department immediately.</p> <p>Do not carry out any actions on your own.</p> <p>Do not open the lithium-ion battery.</p>
	<p>Protect the lithium-ion battery from solar radiation or other forms of heat radiation.</p> <p>Do not expose the lithium-ion battery to heat sources.</p>



### 3.5 Usability as a Function of the Battery Temperature

Lithium-ion battery temperature	Usability
-10 °C to +55 °C <sup>1), 2)</sup>	Travel and hydraulic functions: – The usable battery capacity and power are reduced at low temperatures.
0 °C to +55 °C <sup>3)</sup>	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.  $-10^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$ .
- 3) Corresponds to an ambient temperature of approx.  $0^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$ .

Cold-store application (below  $-10^{\circ}\text{C}$ ) 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 44.

### 3.7 Charging the battery

#### 3.7.1 Safety Instructions for Charging Lithium-Ion Batteries

##### **WARNING!**

##### **Risk of electric shock and fire due to lacking 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, charger (charge characteristics) and battery parameters must match each other, otherwise damage may result.



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**

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 73.

### **3.7.3 Compensation charging**

## **NOTICE**

### **Intermediate charging**

A lithium-ion battery that is not fully discharged can be recharged at any time either in part or in full. In order to ensure the reliable operation of the lithium-ion battery, the following must be borne in mind:

- ▶ In the event of frequent intermediate charging, charge the lithium-ion battery fully every 4 weeks. If the battery charger has a “balancing” function, ensure that the balancing phase is completed at the end of charging. Further information on “balancing” can be found in the operating instructions for the battery charger.
- ▶ Turn off the battery charger before disconnecting the lithium-ion battery from the battery charger.

The lithium-ion battery can be partially charged (compensation 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 compensation charging of the lithium-ion battery.

### **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.

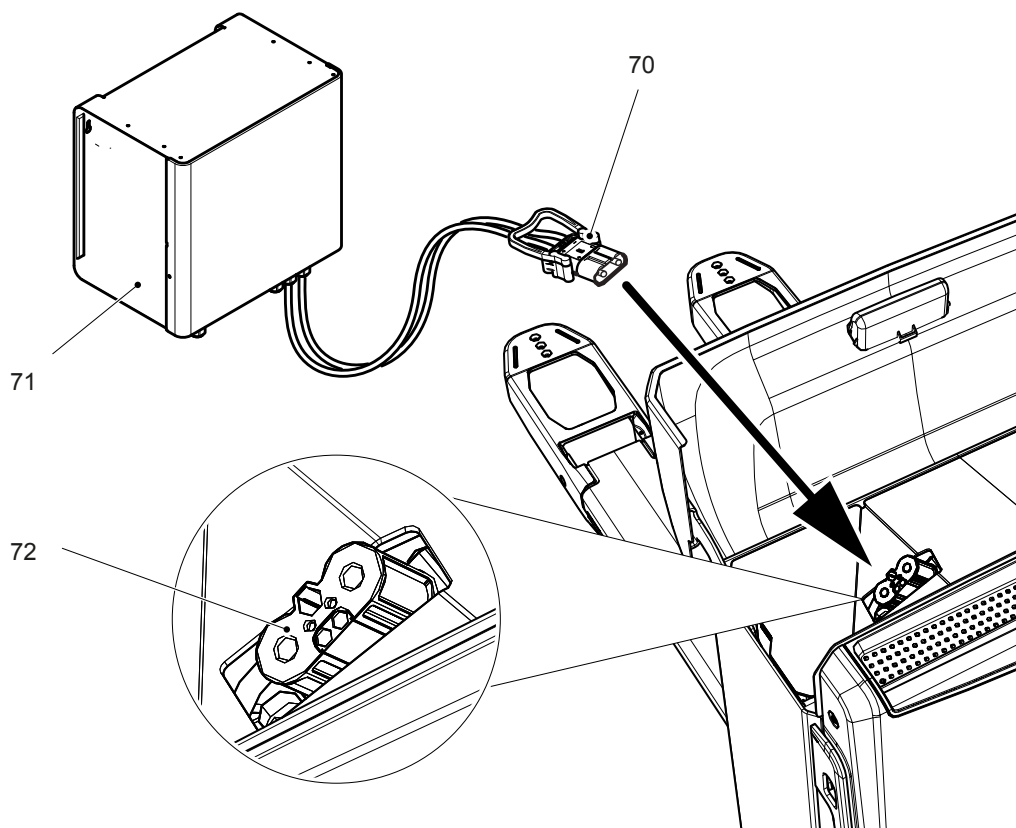
### **3.7.5 Trickle charging the lithium-ion battery**

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 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 84.
- The battery charger has been tested and is free of defects, see the operating instructions for the battery charger SLH 300i.
- The battery charger is connected to the power supply, but not yet turned on.
- Battery is exposed, see page 44.

##### ***Procedure***

- Connect the charge connector (70) of the battery charger (71) to the charge connector (72) of the battery.
- Commence 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 powered up again, see page 89.
  - In this case, the truck should not be switched on.

*The battery is now charged.*

## **⚠ 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 (70) from the charge connector (72) 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 56.

# E Operation

## 1 Safety Regulations for the Operation of Forklift Trucks

### **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.

### **Unauthorised use of 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.

### **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.

### **Safety devices, warning signs and warning instructions**

Safety devices, warning signs (see page 32) and warning instructions in the present operating instructions must be strictly observed.

### **Hazardous area**

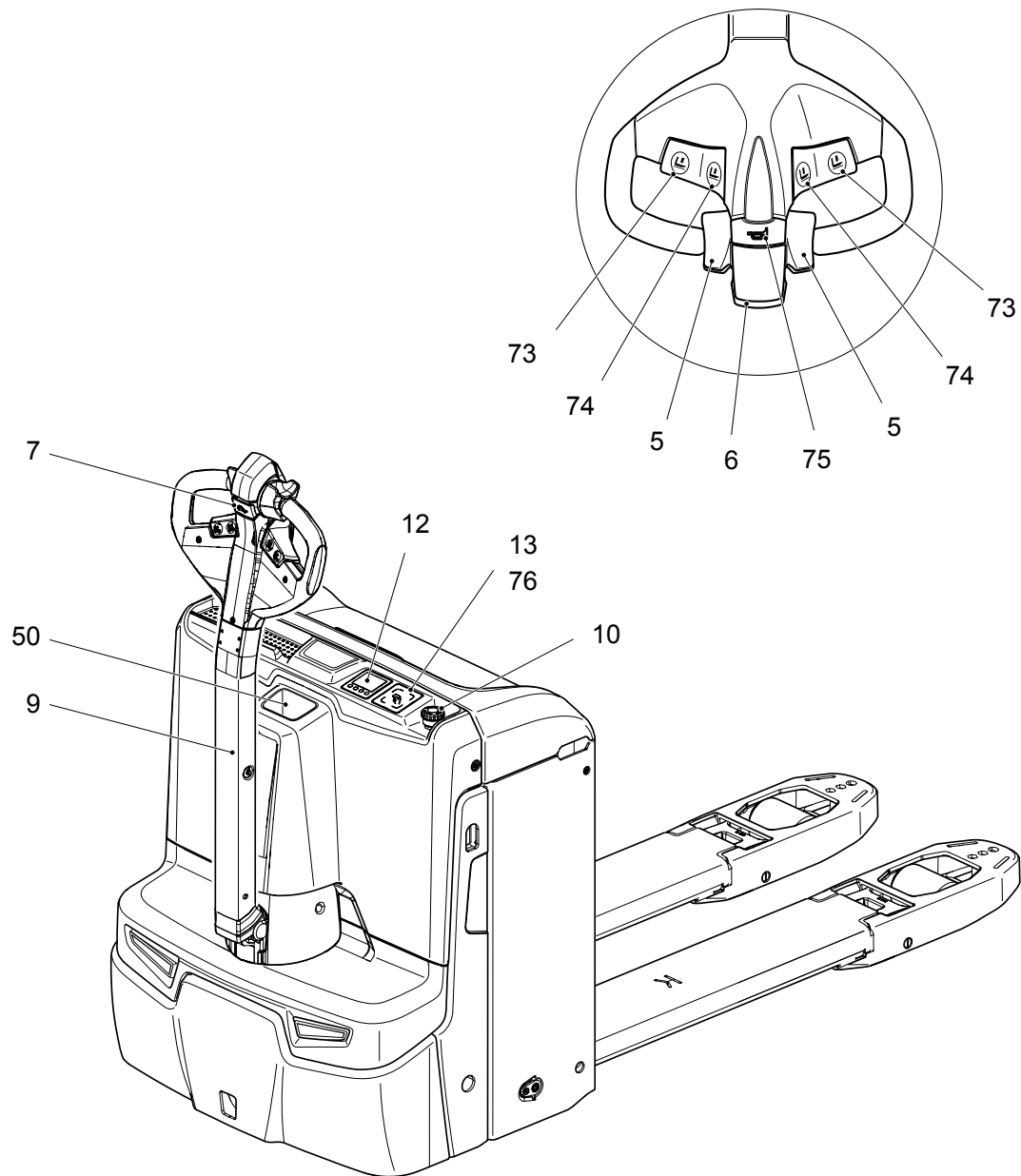
#### **WARNING!**

#### **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.
-

## 2 Displays and Controls





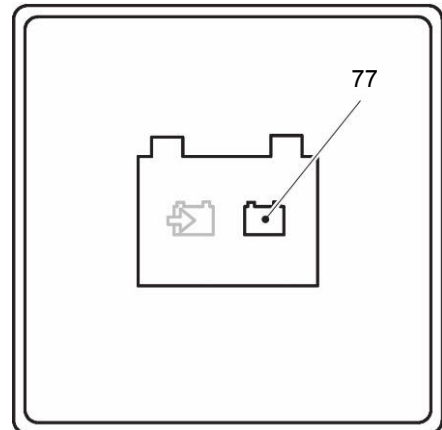
Item	Controls and displays		Function
5	Travel switch	●	Controls travel direction and speed.
6	Collision safety switch	●	Safety feature When the collision safety switch is actuated, the truck travels for approx. 3 seconds in the fork direction. The parking brake then applies. The truck remains switched off until the travel switch is set to neutral.
7	"Slow travel" button	●	If the tiller is in the brake zone, pressing this button overrides the braking function and the truck can be operated at slow speed.
9	Tiller	●	Used for steering and braking
10	Emergency disconnect switch	●	All hazardous electrical functions are cut out and the truck is braked.
12	Charge status indicator	●	Shows the charge/discharge status of the battery.
	Display unit (Battery compartment XS ●)	○	Display for: – Battery charge status – Battery capacity – Service hours – Remaining running time – Travel program – Warning indicators – Event messages
	Soft keys under the display unit (Battery compartment XS ●)		Selection of – travel program – Options  Replaces the key switch – Truck release by entering master and access codes
13	Key switch	●	– Truck release by switching on the control voltage – Removing the key prevents the truck from being switched on by unauthorised personnel
50	Mains connector for on-board charger (with safety circuit)	○	Charges the battery by inserting the mains connector into a mains socket.
73	"Lower" button	●	Lowers the load handler.
74	"Lift" button	●	Raises the load handler.

Item	Controls and displays		Function
75	"Warning signal" button	●	Activates an audible signal.
76	Transponder reader Transponder reader Plus	○	Replaces the key switch <ul style="list-style-type: none"> <li>– Solely to expand the display unit</li> <li>– Releases the truck via a card/transponder</li> </ul>
	Keypad	○	Replaces the key switch <ul style="list-style-type: none"> <li>– Solely to expand the display unit</li> <li>– Truck release by entering master and access codes</li> </ul>
	2-stage key switch	○	Replaces the key switch <ul style="list-style-type: none"> <li>– Solely to expand the display unit</li> <li>– Truck release by turning the GF30 or GF60 key to position 1</li> <li>– Release of the spring-loaded brake exclusively by turning the GF60 key to position 2</li> <li>– Truck shutdown by turning the key to position 0</li> </ul>

## 2.1 Charge Status Indicator

After the truck has been started, the charge status of the battery is shown. The LED (77) 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.

## 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 51.

If the residual capacity falls below the required level, lifting is inhibited. A corresponding display (77) appears.

## 3 Starting up the truck

### 3.1 Checks and operations to be performed before starting daily operation

#### **WARNING!**

**Any damage and other defects to the truck 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 industrial truck to service until you have identified and rectified the fault.

---

#### ***Inspection before daily operation***

##### *Procedure*

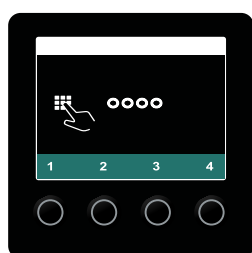
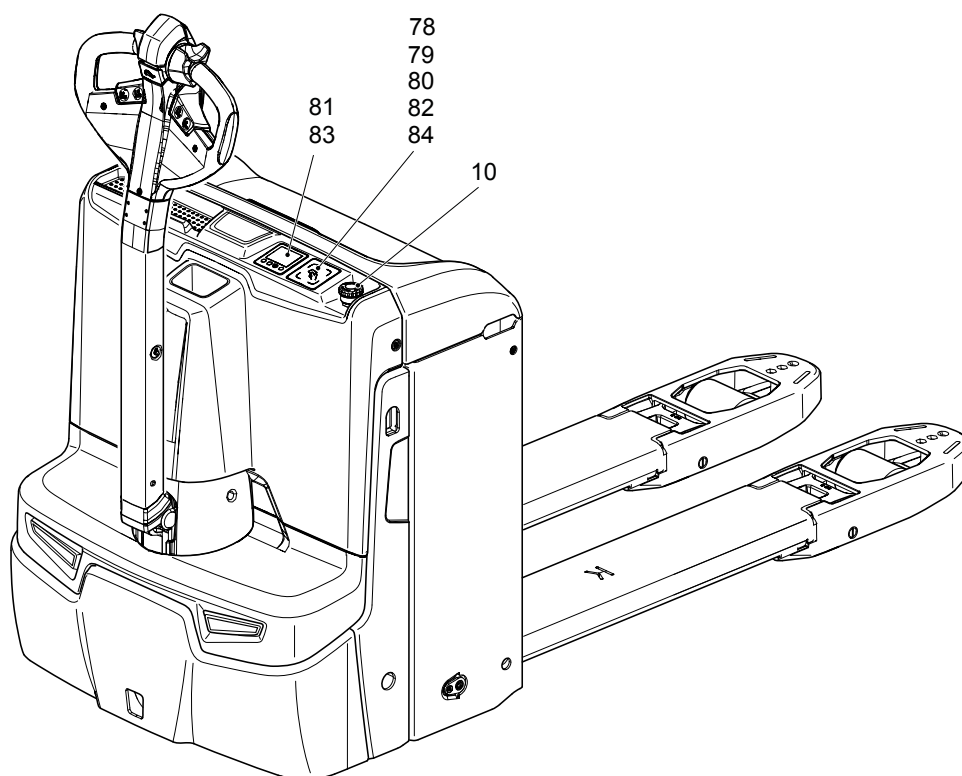
- Check the industrial truck externally for signs of damage and leakage.  
Damaged hoses must be replaced immediately.
- Check that the battery is securely mounted and that the cable connections are free of damage and firmly secured.
- Check the battery connectors are secure.
- Check the load handler for visible signs of damage such as cracks, bent or severe wear.
- Check the drive wheel and load wheels for damage.
- Check the markings and labels for completeness and legibility, see page 32.
- Make sure the drive panels and covers are secure and check for damage.
- Make sure the load restrainer or options bar is secure and check for damage.
- Check tiller return.

##### *Equipment-specific checks*

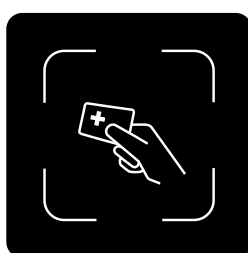
- Trucks with on-board charger (○): Check the mains cable of the on-board charger for damage.

*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.*

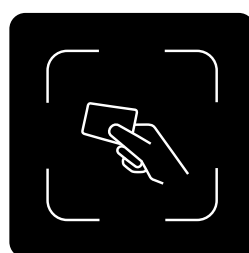
## 3.2 Preparing the truck for operation



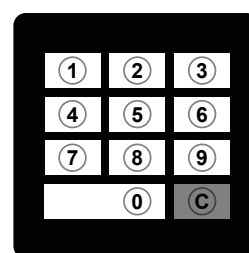
81



78



79



80

Item	Description
78	Transponder reader Plus (EasyAccess Transponder): <ul style="list-style-type: none"> <li>– Only in combination with the display unit (81)</li> <li>– Up to 100 transponders can be stored</li> </ul>
79	Transponder reader (EasyAccess Transponder): <ul style="list-style-type: none"> <li>– Only in combination with the display unit (81)</li> <li>– Up to 100 transponders can be stored</li> </ul>
80	Keypad (EasyAccess PinCode): <ul style="list-style-type: none"> <li>– Only in combination with the display unit (81)</li> <li>– Entry of 4-digit set-up and access codes and C (clear)</li> <li>– For set-up and access codes with the numbers 0 to 9</li> <li>– Up to 100 access codes can be stored</li> </ul>
81	Display unit (EasyAccess Softkey): <ul style="list-style-type: none"> <li>– Description see page 104</li> <li>– Entry of 4-digit set-up and access codes</li> <li>– For set-up and access codes with the numbers 1 to 4</li> <li>– Up to 10 access codes can be stored</li> </ul>

## ***Switching on the truck***

### ***Requirements***

- Checks and operations before starting daily work completed, see page 80.

### ***Procedure***

- Make sure that the emergency disconnect switch (10) is unlocked.
- Switch on the truck; to do this
  - Insert the key into the key switch (82) and turn it as far to the right as it will go.
  - Insert the key in the 2-stage key switch (84) and turn to position 1.
  - Activate the keyless access system – see page 111.
- Complete the checks and operations to be carried out when the truck is operational – see page 83.

### ***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 (83) shows the current battery charge status.
- The display unit (81) indicates the current battery charge status and the operating hours.

### 3.3 Checks and operations to be carried out when the truck is operational

#### **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 80.
- Truck is switched on, see page 81.

#### *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 89.
  - Test the horn by pressing the "warning signal" button, see page 76.
  - Check the braking efficiency, see page 94.
  - Test the steering, see page 93.
  - Test the travel functions, see page 91.
  - Test the collision safety switch by pressing it while travelling in the drive direction, see page 76.
- Test the controls and displays and check for damage, see page 76.
  - Check tiller return function.
  - Check the controls automatically return to the neutral position after use.

### 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 94. Immediate vicinity is when the operator is able respond to malfunctions or attempts to use the truck by unauthorised persons immediately.
- 

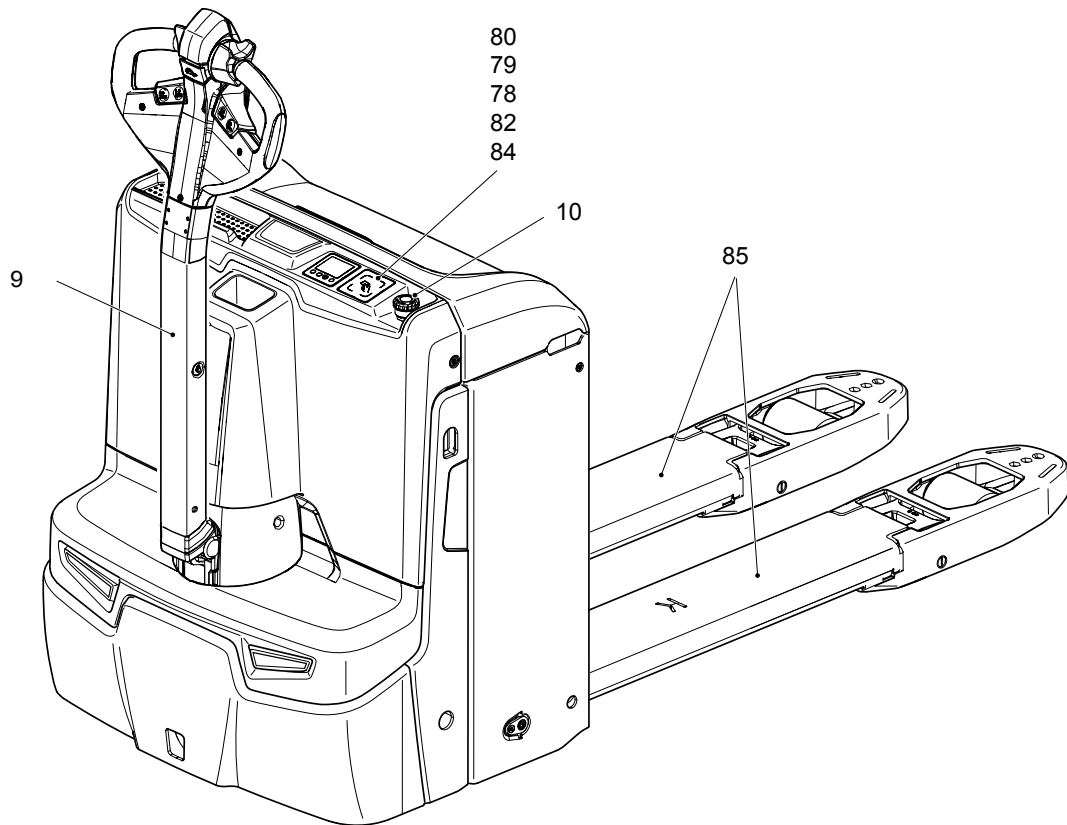
#### **WARNING!**

##### **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 (85) – see page 95.
- Set the drive wheel to "straight-ahead travel" using the tiller (9).
- Switch off the truck; to do this:
  - Turn the key in the key switch (82) anti-clockwise as far as it will go. Remove the key.
  - Turn the key in the 2-stage key switch (84) (○) to position 0. Remove the key.
  - Deactivate the keyless access system – see page 120.
- In hazardous or unclear situations, also press the emergency disconnect switch (10).

*Truck is parked securely.*

## 4 Industrial Truck Operation

### 4.1 Safety regulations for truck operation

#### Travel routes and work areas

Only use lanes and routes specifically designated for traffic. Unauthorised third parties must stay away from work areas. The load may only be stored in the designated locations.

The truck must only be operated in work areas with sufficient lighting to avoid danger to personnel and materials.

#### **DANGER!**

Do not exceed the permissible surface and point loading on the travel lanes.

At blind spots get a second person to assist.

The driver must ensure that the loading dock /dock leveller cannot be removed or come loose during loading/unloading.

---

#### Conduct while travelling

The operator must adapt the travel speed to local conditions. The operator must drive slowly e.g. on corners and in narrow spaces, when driving through swinging doors, in 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.

#### Travel visibility

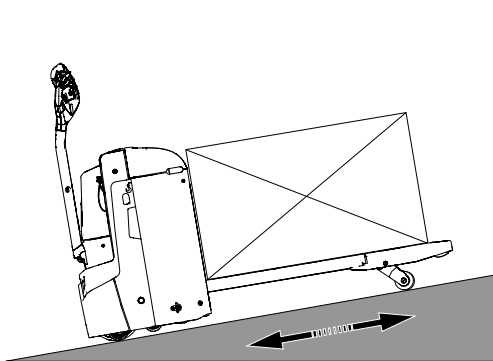
The operator must look in the direction of travel and must always have a clear view of the route ahead. If the truck is carrying loads that affect visibility, the truck must travel against the load direction. If this is not possible, a second person must walk alongside the truck as a lookout to observe 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 slopes and inclines

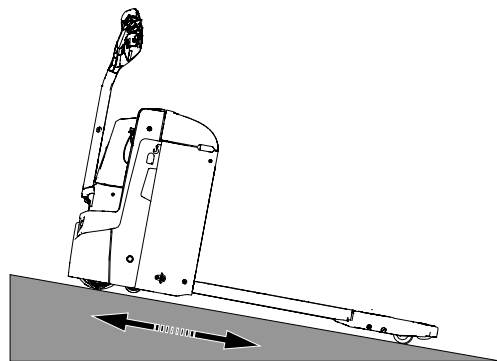
When negotiating slopes and inclines, observe the following:

- 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 25.
- 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.

### Travel direction for transport runs and empty runs



Transport runs: The load must be transported on the upslope.



Travelling unladen: The load handler can be oriented towards the downslope.

## 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.

### Type of loads to be carried

The operator must make sure that the load is in a satisfactory condition. Loads must always be positioned safely and carefully. Use suitable precautions to prevent parts of the load from tipping or falling down. Prevent liquid loads from sloshing out.

## 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.
-

## 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.

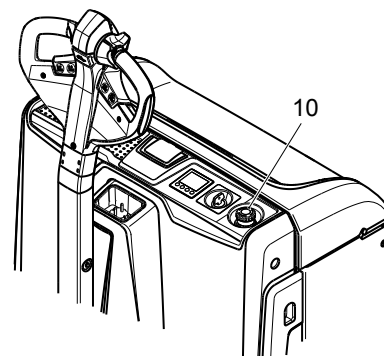
- ▶ The operation of the Emergency Disconnect switch must not be affected by any objects placed in its way.
- ▶ Report any defects on the Emergency Disconnect switch immediately to your supervisor.
- ▶ Mark defective truck and take out of service.
- ▶ Do not return the industrial truck to service until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

#### ***Pressing the emergency disconnect switch***

##### *Procedure*

- Press the emergency disconnect switch (10).

*All electrical functions are deactivated. The truck brakes to a halt.*



- ➔ 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.

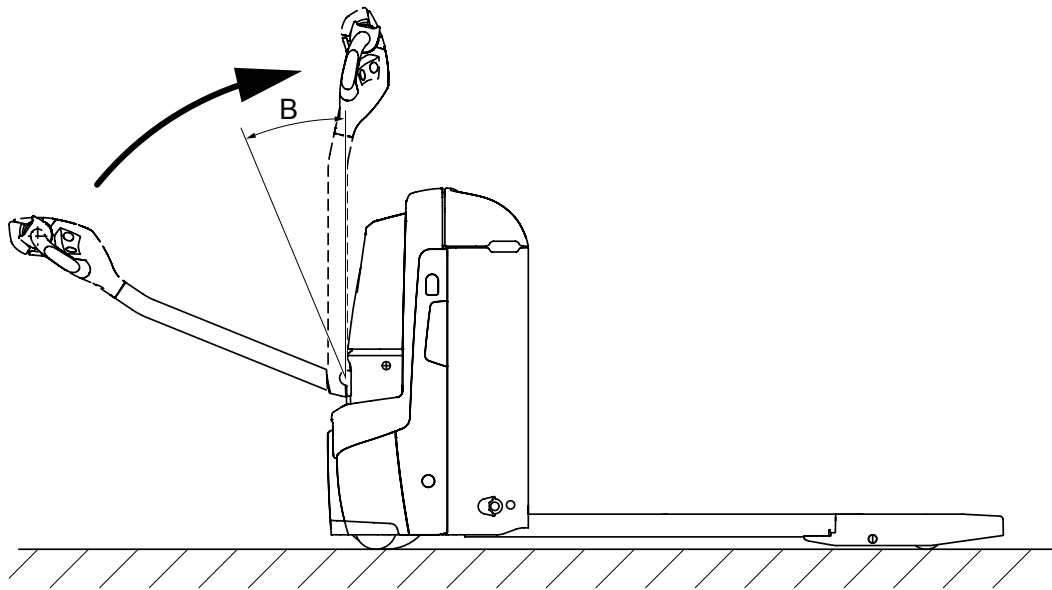
#### ***Unlocking the emergency disconnect switch***

##### *Procedure*

- Turn the emergency disconnect switch (10) 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

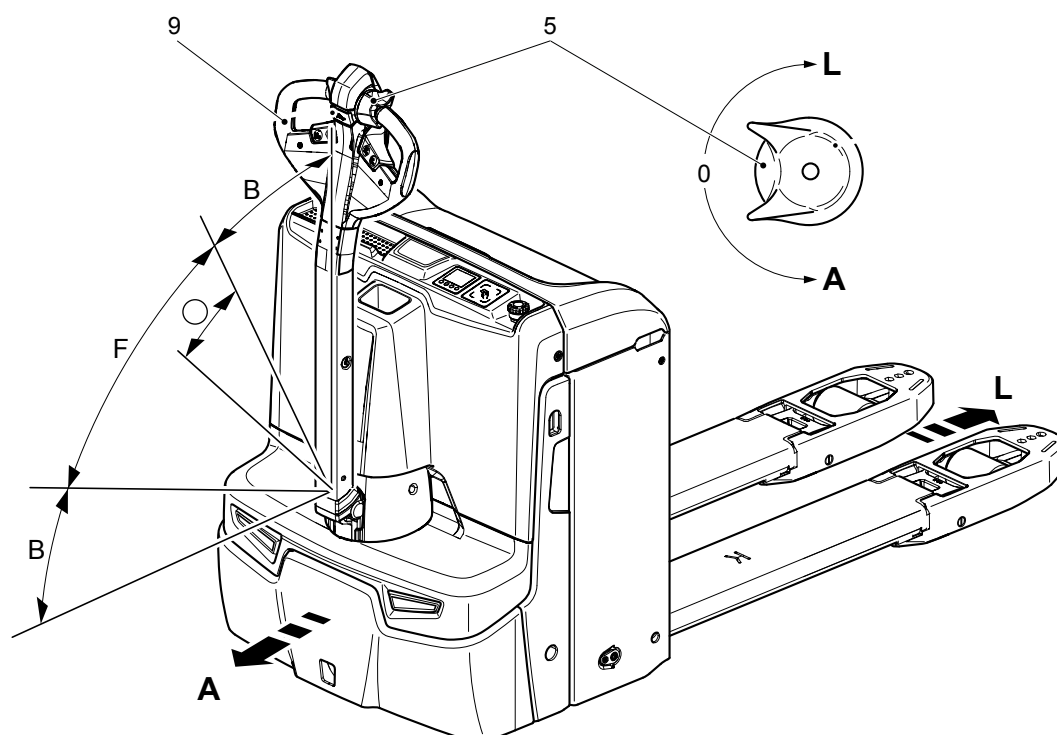
### **⚠ WARNING!**

#### **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.

- ➔ 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 23.



#### *Requirements*

- Truck prepared for operation, see page 80

#### *Procedure*

- Set the tiller (9) 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 direction during 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.

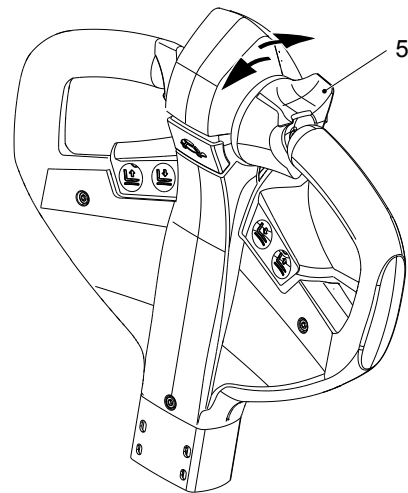
- ▶ After setting off in the opposite direction, apply the travel switch gently or not at all.
  - ▶ Do not perform any sudden steering operations.
  - ▶ Always face in the direction of travel.
  - ▶ Maintain an adequate overview of the route you are travelling.
- 

#### ***Changing direction during travel***

##### *Procedure*

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

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





## 4.6 Slow travel

### ⚠ CAUTION!

The driver must be particularly careful when applying the "slow travel" button (7). The brake is only activated when the "slow travel" button is released.

- In hazardous situations, brake by immediately releasing the slow travel button (7) or the travel switch (5).

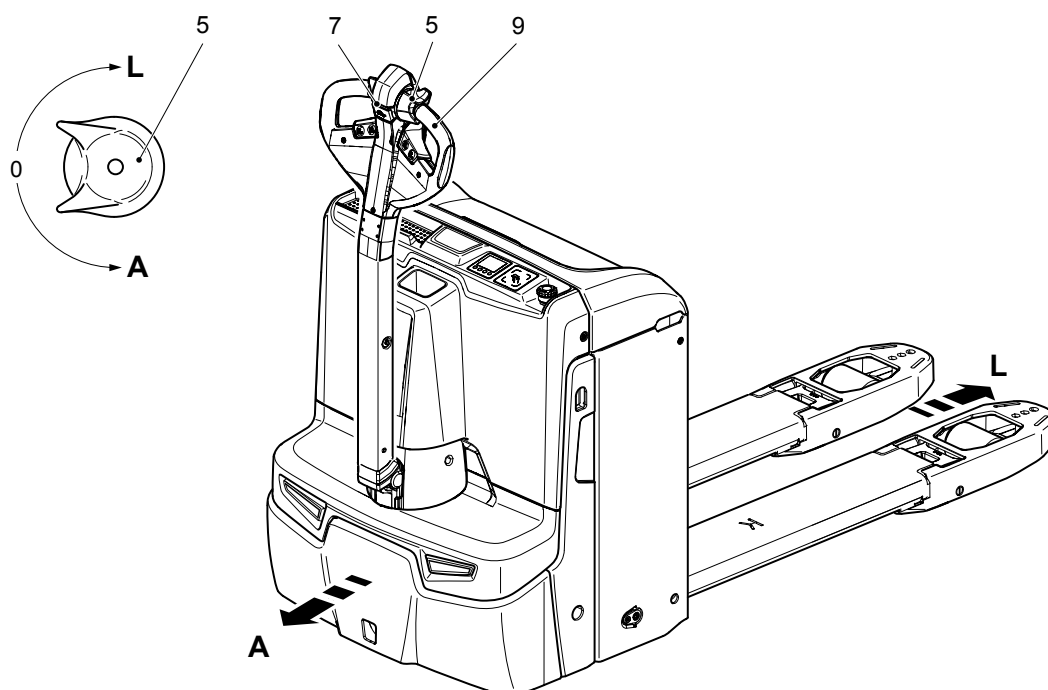
The truck can be operated with an upright tiller (9) (e.g. in congested areas / elevator).

### **Activating slow travel**

#### *Procedure*

- Press the slow travel switch (7).
- 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 switch (7).  
*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 is cancelled and the brake is applied. The truck can then be driven again at normal speed.*

## 4.7 Steering

#### *Procedure*

- Move the tiller (9) to the left or right.

*The truck is steered in the required direction.*

## 4.8 Brakes

### ⚠ CAUTION!

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

### 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 brake in the following ways:

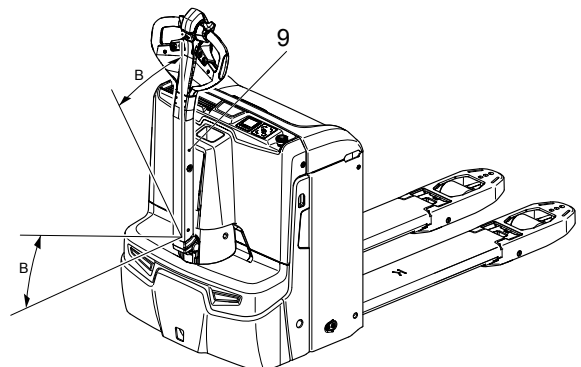
- Braking with the service brake, (tiller in braking zone "B")
- Braking by inversion braking (travel switch)
- Braking by regenerative braking (coasting brake)
- Actuating the emergency disconnect switch, see page 89  
Actuate only in an emergency, as damage to the drive wheel may occur.

### Braking with the service brake

#### Procedure

- Move the tiller (9) up or down to one of the brake zones (B).

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

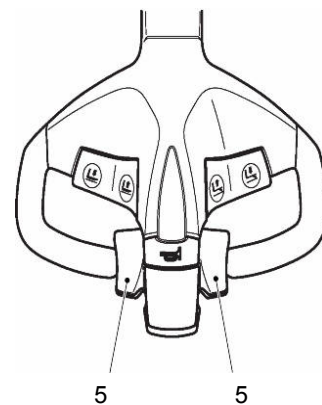


### Inversion braking

#### Procedure

- While travelling, 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 customer service department on request.

## **Regenerative braking**

### **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.

## **4.9 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**

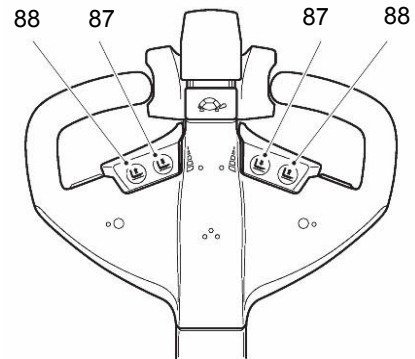
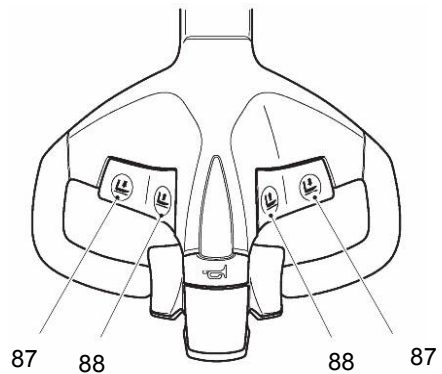
### **Requirements**

- Load is correctly palletised.
- Load weight matches the truck's capacity.
- Forks 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 (88) until you reach the maximum lift height.

*The load is raised.*



## **Last transportieren**

### **Requirements**

- Last ordnungsgemäß aufgenommen.
- Einwandfreie Bodenbeschaffenheit.

### **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.

## Lift cut-out



The EJE 114 / 116 / 118 / 120 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 (88) 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.

### ***Deposit the load***

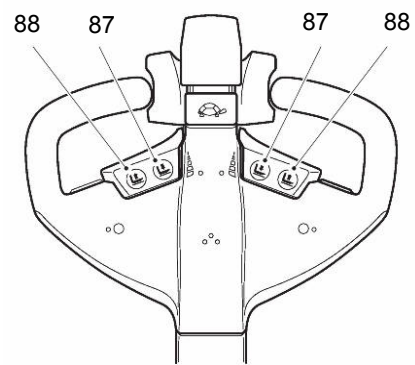
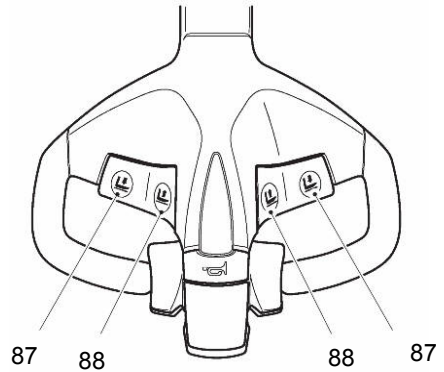
#### ***Requirements***

- Lagerstelle für Lagerung der Last geeignet.

#### ***Procedure***

- Drive carefully up to the storage location.
- Press the "Lower" button (87).
- Carefully lower the load handler so that the fork arms are clear of the load.
- Carefully remove the fork arms from the pallet.

*The load is deposited.*



#### 4.9.1 Lifting or lowering the load handler with the automatic lifting/lowering function - positionCONTROL (o)

##### **WARNING!**

##### **Risk of accidents while lifting with the automatic lifting function**



Damage can occur from the use of the automatic lifting function in the hazardous area of the truck, since this function cannot be cancelled by releasing a control.

- ▶ Be particularly careful when activating automatic lifting.
  - ▶ Avoid activating automatic lifting accidentally.
- 

After activation by the operator, automatic lifting enables the truck to lift continuously up to a set free lift height or above the intermediate height up to the lift limit.

After activation by the operator, automatic lowering enables the truck to lower continuously down to a set lifted height or below the lifted height down to the lowering limit.

The automatic lifting/lowering function can be activated and deactivated using the options menu on the display unit, see page 105.

-  The status and usage of the automatic lifting/lowering function are shown on the display unit, see page 107.
-  The free lift height, lifted height and time interval until activation of the automatic lifting/lowering function can be set by the manufacturer's customer service department.

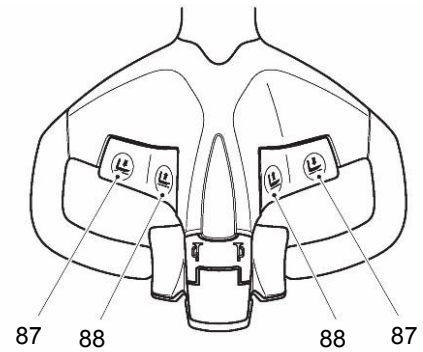
### Requirements

- Truck operational, see page 81.

### Procedure

- Briefly actuate the "lift" button (88).

*The load handler is raised continuously up to the free lift height.*



### Procedure

- Briefly actuate the "lower" button (87).

*The load handler is lowered continuously down to the lifted height or the lowering limit.*

- Actuating the emergency disconnect switch or vacating the platform will interrupt automatic lifting/lowering.
- Pressing the respective button for longer allows the height of the load handler to be adjusted manually, including whilst using the automatic raise/lower function.

## 5 Troubleshooting

This chapter enables the operator to localize and rectify basic faults or the results of incorrect operation himself. When trying to locate a fault, proceed in the order shown in the remedy table.



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

Troubleshooting must only be performed by the manufacturer's customer service department. The manufacturer has a 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 from the display unit (if applicable)
- 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

### 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.



## 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.

 Safety regulations for handling lithium-ion batteries – see page 62.

### 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"><li>– Charge the lithium-ion battery, see page 69</li><li>– If the problem persists, contact the manufacturer's customer service department</li></ul>

### 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"> <li>– Charge the battery, see page 69</li> <li>– If the problem persists, contact the manufacturer's customer service department</li> </ul>
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"> <li>– Move the lithium-ion battery to the permissible application range – see page 12.</li> <li>– Charge the battery – see page 69.</li> <li>– If the problem persists, contact the manufacturer's customer service department.</li> </ul>
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"> <li>– Bring the lithium-ion battery within the permissible application range, see page 12</li> <li>– Charge the battery, see page 69</li> <li>– If the problem persists, contact the manufacturer's customer service department</li> </ul>
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"> <li>– Charge the battery, see page 69</li> <li>– If the problem persists, contact the manufacturer's customer service department</li> </ul>

## 6 Operating the truck without its own drive system

### **WARNING!**

#### **Accidental truck movement**

When the brakes are deactivated, the truck must be parked on a level surface, as the brakes are no longer effective.

- ▶ Do not install or remove the brake on slopes or inclines.
  - ▶ The brake may only be installed or removed by the manufacturer's customer service department.
  - ▶ Do not park the truck with the brake removed.
- 

#### **Equipment without 2-stage key switch**

The truck can be moved without its own drive system only when the drive wheel brake is disassembled.

The brake may be disassembled and assembled only by authorised service personnel.

#### **Equipment with 2-stage key switch (○)**

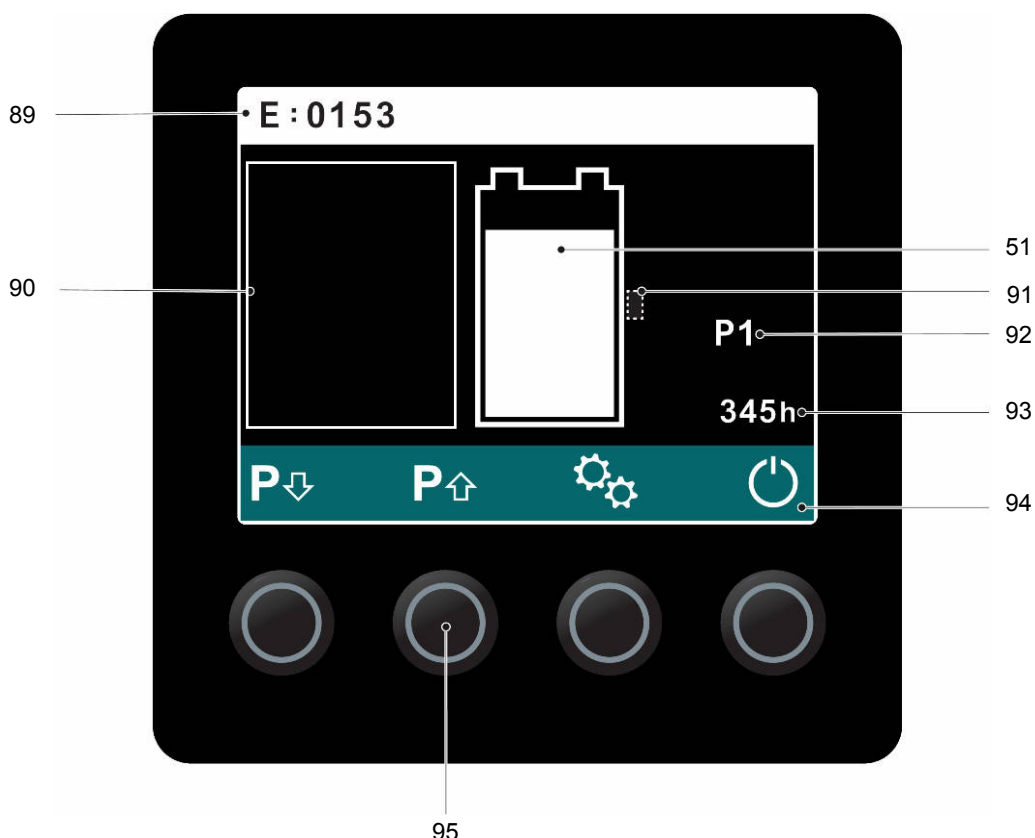
The truck spring-loaded brake (parking brake) can be released to enable truck recovery using the special GF60 key by turning and locking the 2-stage key switch in position 2.



More information on the 2-stage key switch, see page 109.

## 7 Optional equipment

### 7.1 Display unit (2 inch display)



Item	Control or display	Function
89	Information line	Display of event messages, speed and remaining run time
51	Battery capacity display	Battery discharge status
90	Symbol field	Displays the symbols, see page 107.
91	Battery type (characteristics)	Displays the set battery type or set battery characteristic curve <sup>1</sup> 1 = Maintenance-free gel/dry-cell battery 2 = Special battery, for example XFC
92	Travel program	Shows the active travel program.
93	Service hours	see page 24
94	Button allocation	see page 105
95	Buttons	Selection buttons for the functions shown above them.

<sup>1)</sup> If the setting is for normal or high-performance wet-cell batteries or batteries for special options, no battery type is shown.

### 7.1.1 Information field




Any event messages are shown in the left section of the information line (89).

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









### 7.1.2 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



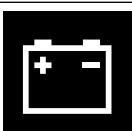
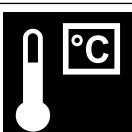



Symbol	Meaning
	Travel program: To change the travel program
	Settings (○): To change to the menu to administer the codes or transponders
	Shutdown (○): Allows the truck to be switched off Shutdown is only on the display if the truck is switched on with an access code.



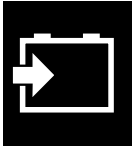





## Key allocation in menu for managing codes or transponders (○)

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 and transponders.
	Up selection: To select access codes or transponders.
	Down selection: To select access codes or transponders.
	Clear: To delete selected access codes.
	Add: To add new access codes.
	Back: Cancels the current procedure and returns to the previous menu.
	Confirm: To confirm an entry or a transponder code.

### 7.1.3 Symbols in the display

Any number of pictograms can be displayed in the pictogram field (90). Which pictograms are shown in the pictogram field depends on the operating and truck status.

Symbol	Meaning	Colour	Function
	Emergency stop	Red	Lights up in the case of automatic function deactivation due to truck malfunctions.
	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.
	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.
	Overtemperature detected	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.
	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.
	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.
	Tiller position	Yellow	Lights up on power-up with tiller in travel zone. Illuminates with travel switch operated and tiller in braking zone.

Symbol	Meaning	Colour	Function
	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.
	Charging process	Green	Shows information on battery charging (trucks with on-board charger). – Flashing: Charging – Lit: Charging complete
		Red	Shows information on battery charging (trucks with on-board charger). – Charging interrupted
	Slow travel (○)	Yellow	Illuminates when a reduction in travel speed is required, e.g. optional when the load handler is fully lowered.
	Impact display (equipment with fleet management system)	Yellow	Lights up when a moderate shock event has occurred. – Crawl speed is triggered.
		Red	Lights up when a serious shock event has occurred. – Lifting, lowering and travel functions are deactivated.
	Active rack height select (positionCONTROL)	Green	Shows the currently active rack height select. On the symbol shown, lift height 3 is active.
	Crawl speed	Yellow	Lights up when the speed of the truck is restricted to crawl speed by the fleet management system.
	Service note	Yellow	Lights up when maintenance is due.



## 7.2 Emergency Operation with 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.

### **⚠ 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.

#### ***Operating the truck without its own drive system***

##### *Requirements*

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

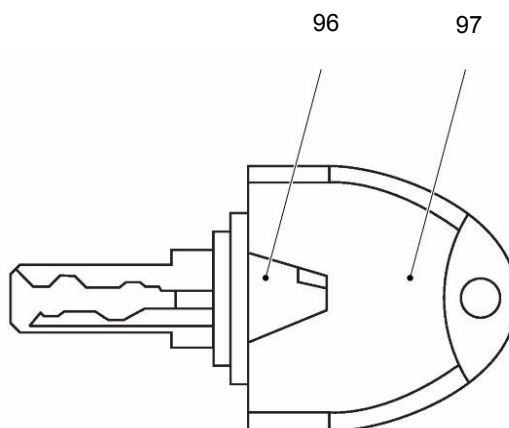
##### *Tools and Material Required*

- GF60 service key (97) with lock bar (96)

##### *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.

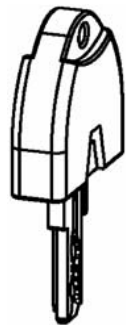
*The brake is now activated again.*

### **⚠ WARNING!**

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

GF 30

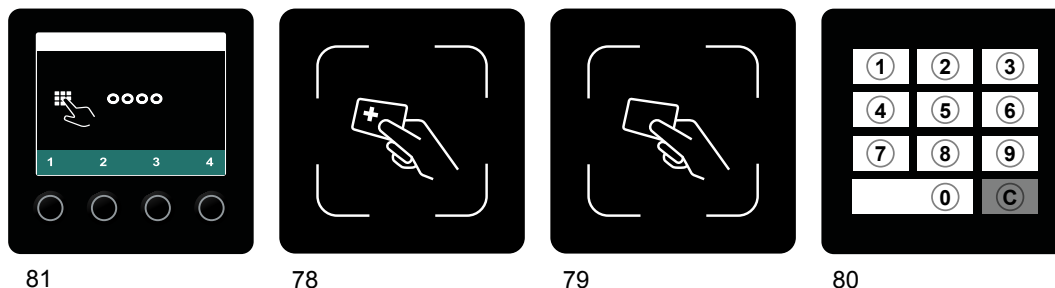
- The GF30 key (without lock bar) is for normal operation.  
The key can be inserted in both directions and can only be turned to position 1 in the key switch.



## 7.3 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
78	Transponder reader Plus (EasyAccess Transponder): <ul style="list-style-type: none"> <li>– Only in combination with the display unit (81)</li> <li>– Up to 100 transponders can be stored</li> </ul>
79	Transponder reader (EasyAccess Transponder): <ul style="list-style-type: none"> <li>– Only in combination with the display unit (81)</li> <li>– Up to 100 transponders can be stored</li> </ul>
80	Keypad (EasyAccess PinCode): <ul style="list-style-type: none"> <li>– Only in combination with the display unit (81)</li> <li>– Entry of 4-digit set-up and access codes and C (clear)</li> <li>– For set-up and access codes with the numbers 0 to 9</li> <li>– Up to 100 access codes can be stored</li> </ul>
81	Display unit (EasyAccess Softkey): <ul style="list-style-type: none"> <li>– Description see page 104</li> <li>– Entry of 4-digit set-up and access codes</li> <li>– For set-up and access codes with the numbers 1 to 4</li> <li>– Up to 10 access codes can be stored</li> </ul>

## 7.4 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.

## 7.5 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.

## 7.5.1 Activating the keypad

### Procedure

- Release the emergency disconnect switch, see page 89.
- Enter the default code 1-2-3-4 using the keys below the display unit (81).

*The truck is switched on.*

- Press the key below the "Settings" symbol (98).
- Press the key below the "Change set-up code" symbol (99).
- Enter the set-up code 2-4-1-2 using the keypad (80).

*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 (100).

*The set-up code is deleted.*

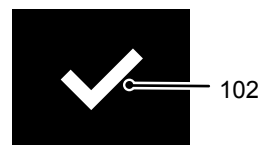
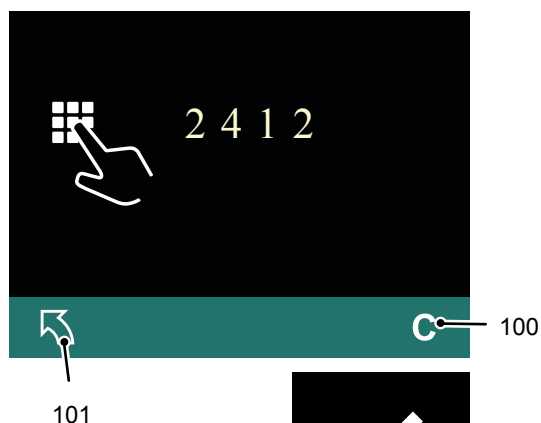
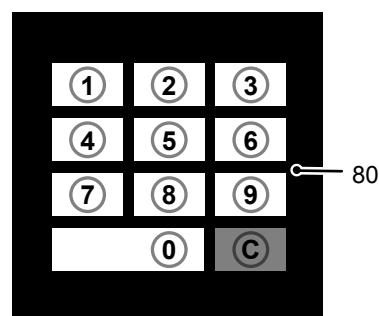
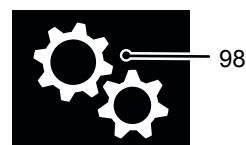
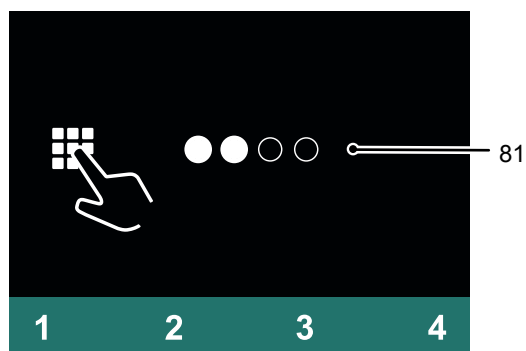
- Enter the new set-up code using the keypad (80).
- Press the key below the "Confirm" symbol (102).

*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 (100).

- To return to the main menu, press the key below the "Back" symbol (101).
- Delete the default code, see page 123.
- Create access codes, see page 122.

*The keypad is active.*



## 7.5.2 Activating the transponder reader

### Procedure

- Release the emergency disconnect switch, see page 89.
- Enter the default code 1-2-3-4 using the keys below the display unit (81).

*The truck is switched on.*

- Press the key below the "Settings" symbol (98).
- Press the key below the "Change set-up code" symbol (99).
- Enter the set-up code 2-4-1-2 using the keys below the display unit (81).

*The set-up code entered is displayed.*

- Press the key below the "Delete" symbol (100).

*The set-up code is deleted.*

- Hold a transponder in front of the transponder reader (79).

*This transponder thus becomes the set-up transponder.*

- Press the key below the "Confirm" symbol (102).

*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 (100).

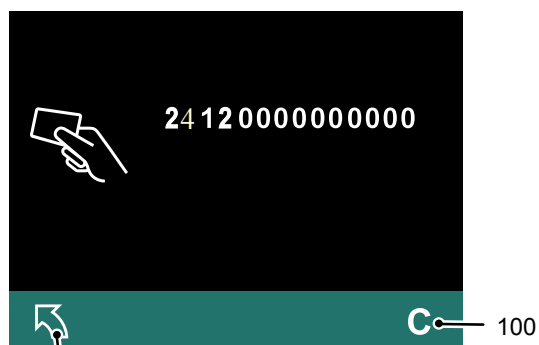
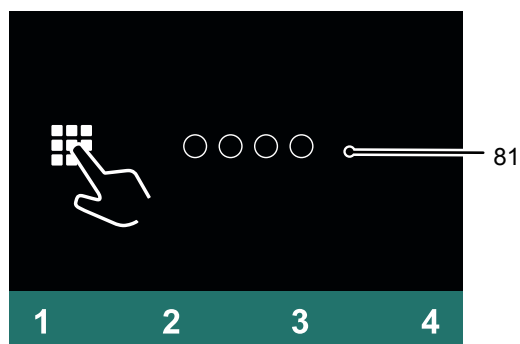
- To return to the main menu, press the key below the "Back" symbol (101).

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

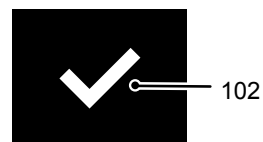
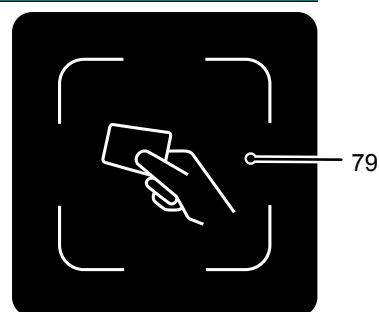
Delete the default code, see page 128.

- Add new transponders, see page 127.

*The transponder reader is now active.*



101



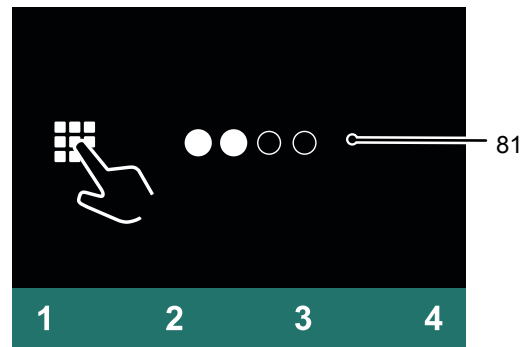
## 7.6 Using the Display:

### 7.6.1 Switch on the truck with the access code.

#### *Procedure*

- Release the emergency disconnect switch, see page 89.
- Enter the access code with the buttons below the display (81).

*The truck is switched on.*

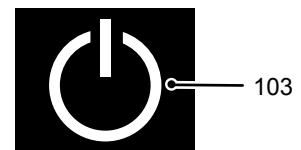


### 7.6.2 Switching off the truck

#### *Procedure*

- Press the key under the "Switch off" symbol (103) in the display unit.
- Press the Emergency Disconnect switch, see page 89.

*The truck is switched off.*



### 7.6.3 Changing the Set-up Code

#### Requirements

- The truck is switched on, see page 120.

#### Procedure

- Press the key below the "Settings" symbol (98).
- Press the key below the "Change set-up code" symbol (99).
- Enter the set-up code using the keys below the display unit (81).

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

- Press the key below the "Delete" symbol (100).

*The set-up code is deleted.*

- Enter the new set-up code using the keys below the display unit (81).

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

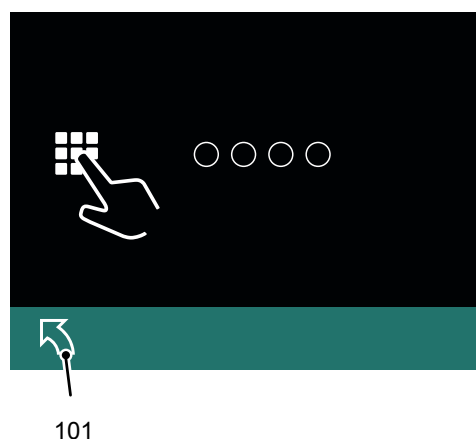
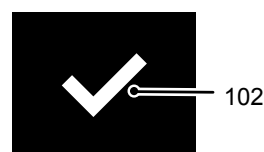
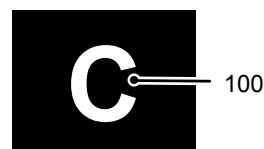
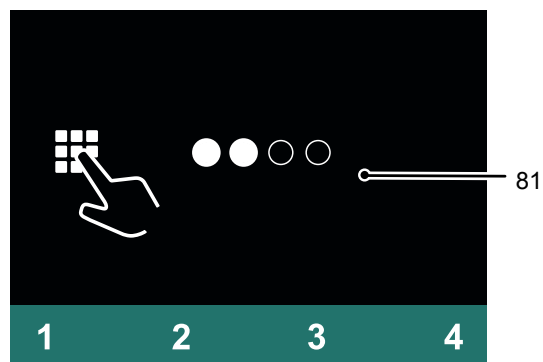
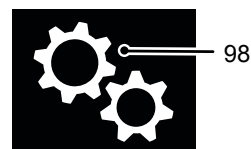
- Press the key below the "Confirm" symbol (102).

*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 (101).

*The set-up code has been changed.*





## 7.6.4 Adding a new access code

### Requirements

- The truck is switched on, see page 120.

### Procedure

- Press the key below the "Settings" symbol (98).
- Press the key below the "Edit access code" symbol (104).

*The set-up code is requested.*

- Enter the set-up code using the keys below the display unit (81).

*All the access codes are displayed.*

- Press the key below the "Add" symbol (105).
- Enter the new access code using the keys below the display unit (81).

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

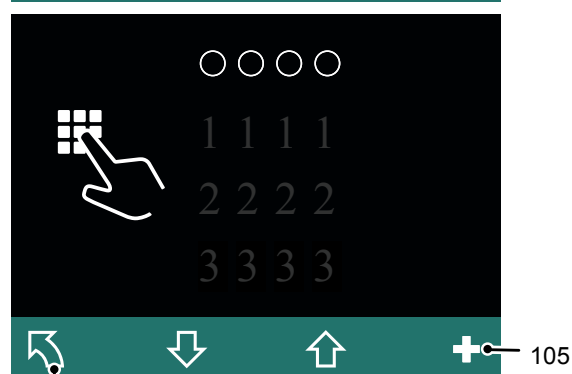
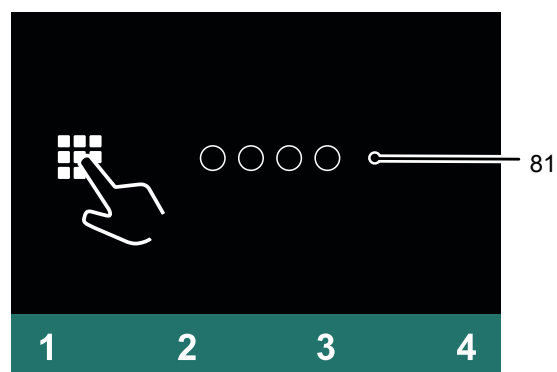
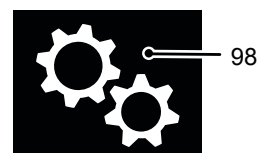
- Press the key below the "Confirm" symbol (102).

*The new access code is displayed.*

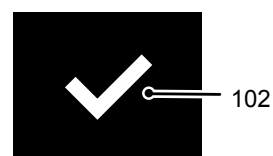
→ If the new access code has been entered incorrectly, delete it, see page 123, and add an access code again.

To return to the main menu, press the key below the "Back" symbol (101).

*A new access code has been added.*



101



## 7.6.5 Deleting an access code

### Requirements

- The truck is switched on, see page 120.

### Procedure

- Press the key below the "Settings" symbol (98).
- Press the key below the "Edit access code" symbol (104).

*The set-up code is requested.*

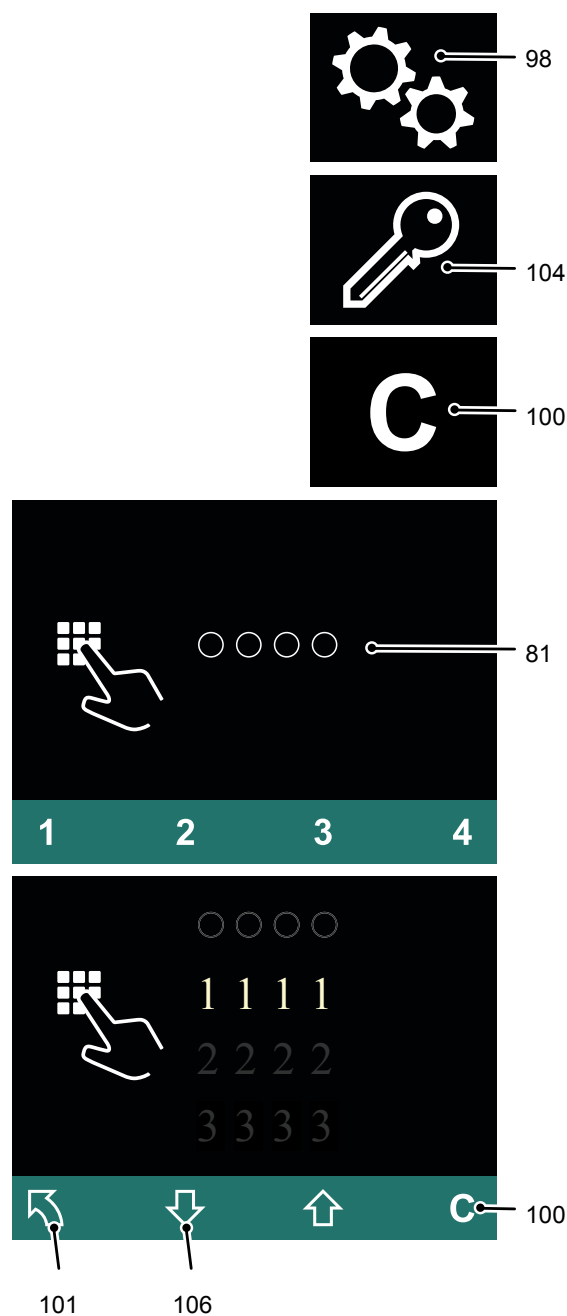
- Enter the set-up code using the keys below the display unit (81).

*All the access codes are displayed.*

- Select the access code to be deleted using the key below the "Down selection" symbol (106).
- Press the key below the "Delete" symbol (100).

*The access code has been deleted.*

- To return to the main menu, press the key below the "Back" symbol (101).



## 7.6.6 Displaying the Log-in Process

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 115.

### Procedure

- Press the key below the "Settings" symbol (98).
- Press the key below the "Log-in process" symbol (107).
- Enter the set-up code using the keys below the display unit (81).

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

- To scroll forward, press the button under the "Down selection" symbol (106) as many times as necessary.

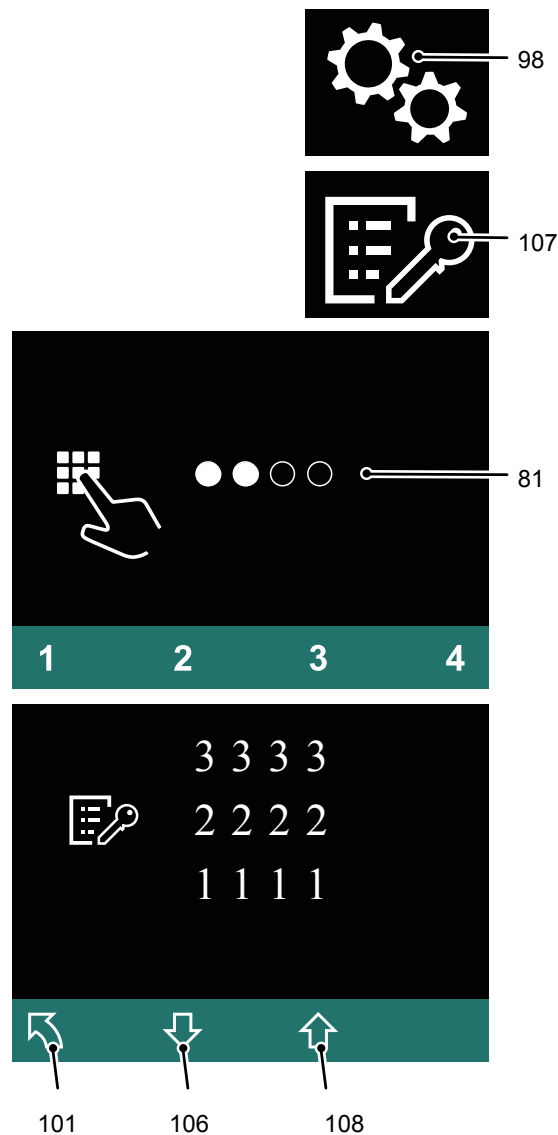
*The display area moves: Additional earlier log-ins are displayed.*

- To scroll back, press the button under the "Up selection" symbol (108) 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 (101).

*The log-in process is displayed.*



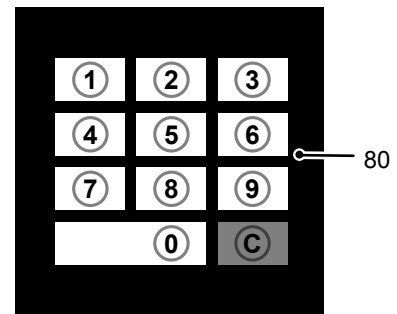
## 7.7 Using the Keypad

### 7.7.1 Switch on the truck with the access code.

#### Procedure

- Release the emergency disconnect switch, see page 89.
- Enter the access code with the keypad (80).

*The truck is switched on.*



#### Procedure

- Press the key under the "Switch off" symbol (103) in the display unit.
- Press the Emergency Disconnect switch, see page 89.

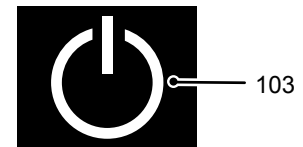
*The truck is switched off.*

### 7.7.2 Switching off the truck

#### Procedure

- Press the key under the "Switch off" symbol (103) in the display unit.
- Press the Emergency Disconnect switch, see page 89.

*The truck is switched off.*



### 7.7.3 Changing the Set-up Code

#### Requirements

- The truck is switched on, see page 120.

#### Procedure

- Press the key below the "Settings" symbol (98).
- Press the key below the "Change set-up code" symbol (99).
- Enter the set-up code using the keypad (80).

*The set-up code entered is shown in the display unit (81) as filled-in circles.*

- Press the key below the "Delete" symbol (100).

*The set-up code is deleted.*

- Enter the new set-up code using the keypad (80).

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

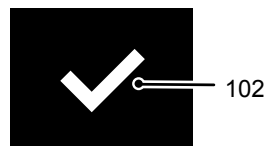
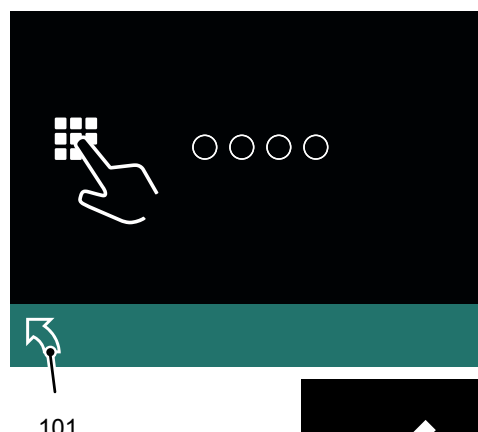
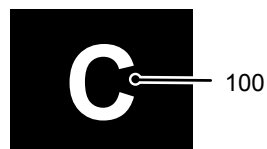
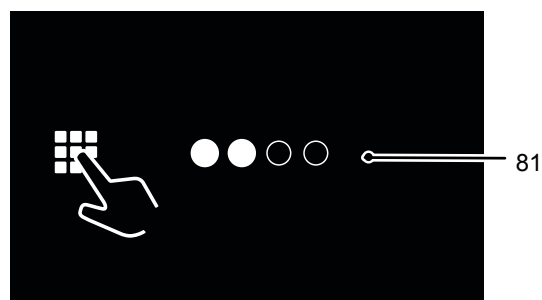
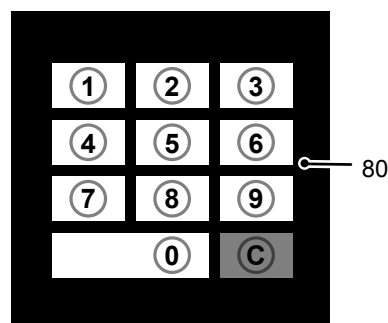
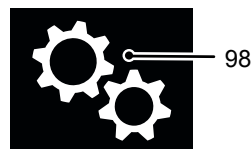
- Press the key below the "Confirm" symbol (102).

*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 (101).

*The set-up code has been changed.*



## 7.7.4 Adding a new access code

### Requirements

- The truck is switched on, see page 120.

### Procedure

- Press the key below the "Settings" symbol (98).
- Press the key below the "Edit access code" symbol (104).

*The set-up code is requested.*

- Enter the set-up code using the keypad (80).

*All access codes are shown on the display unit (81).*

- Press the key below the "Add" symbol (105).
- Enter a new access code using the keypad (80).

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

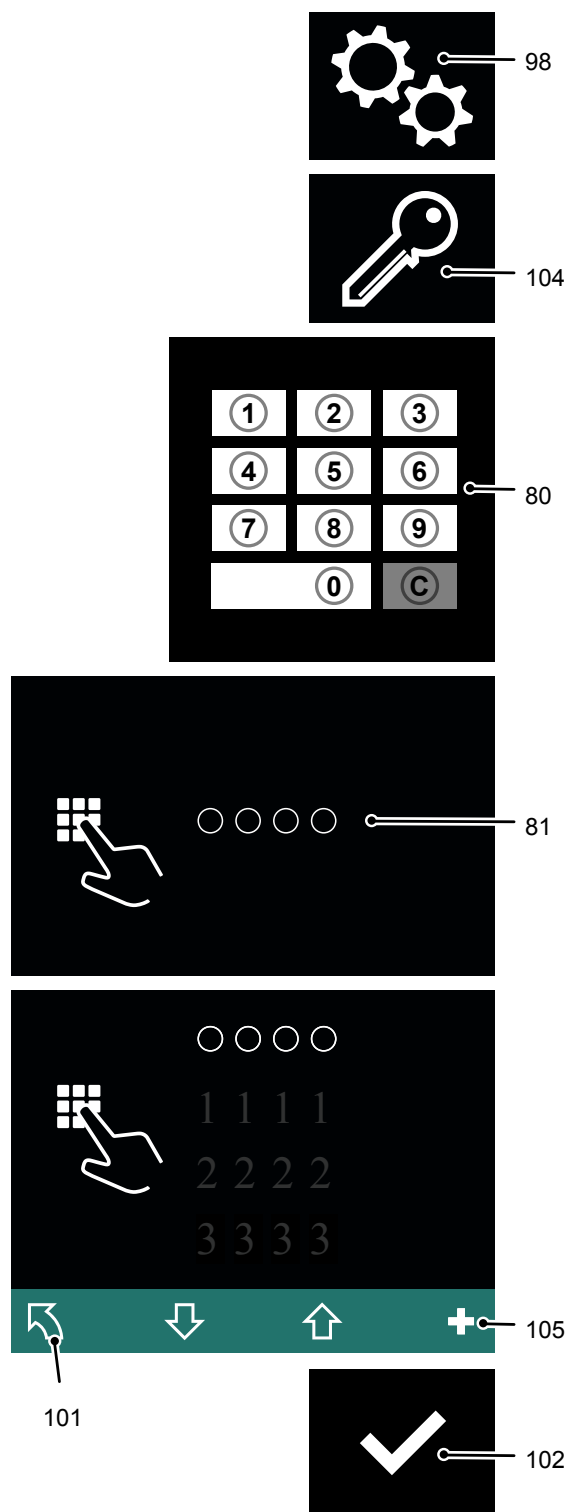
- Press the key below the "Confirm" symbol (102).

*The new access code is shown on the display unit (81).*

→ If the new access code has been entered incorrectly, delete it, see page 123, and enter the correct access code.

To return to the main menu, press the key below the "Back" symbol (101).

*A new access code has been added.*



## 7.7.5 Deleting an access code

### Requirements

- The truck is switched on, see page 120.

### Procedure

- Press the key below the "Settings" symbol (98).
- Press the key below the "Edit access code" symbol (104).

*The set-up code is requested.*

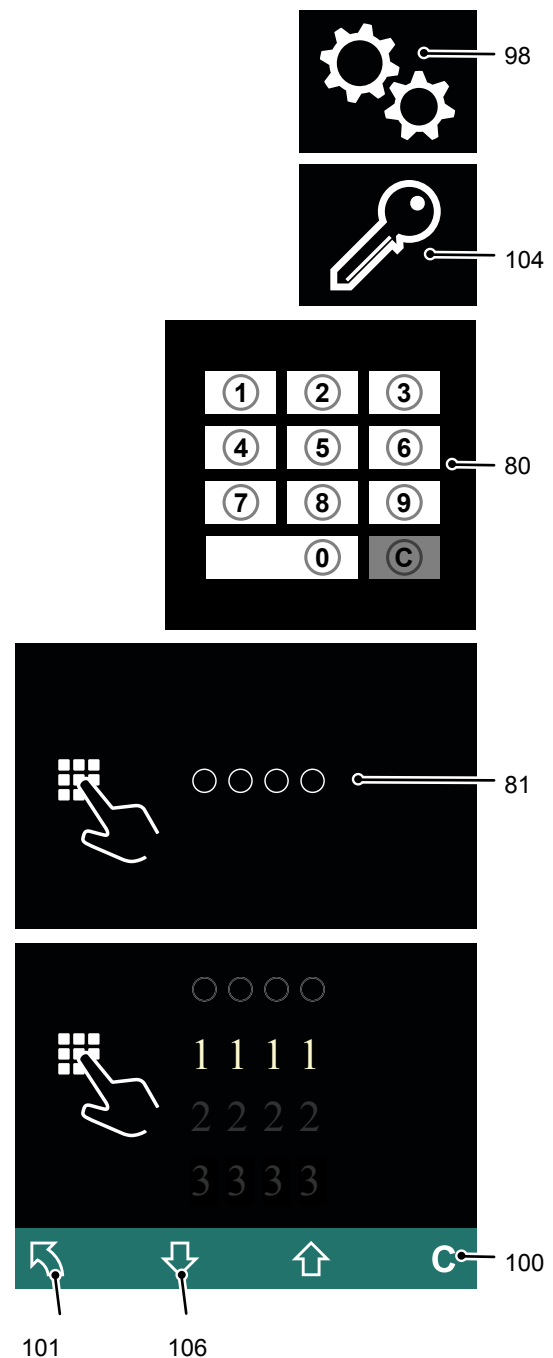
- Enter the set-up code using the keypad (80).

*All access codes are shown on the display unit (81).*

- Select the access code to be deleted using the key below the "Down selection" symbol (106).
- Press the key below the "Delete" symbol (100).

*The access code has been deleted.*

- To return to the main menu, press the key below the "Back" symbol (101).



## 7.7.6 Displaying the Log-in Process

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 115.

### Procedure

- Press the key below the "Settings" symbol (98).
- Press the key below the "Log-in process" symbol (107).
- Enter the set-up code using the keypad (80).

*The set-up code entered is shown in the display unit (81) as filled-in circles.*

- To scroll forward, press the button under the "Down selection" symbol (106) as many times as necessary.

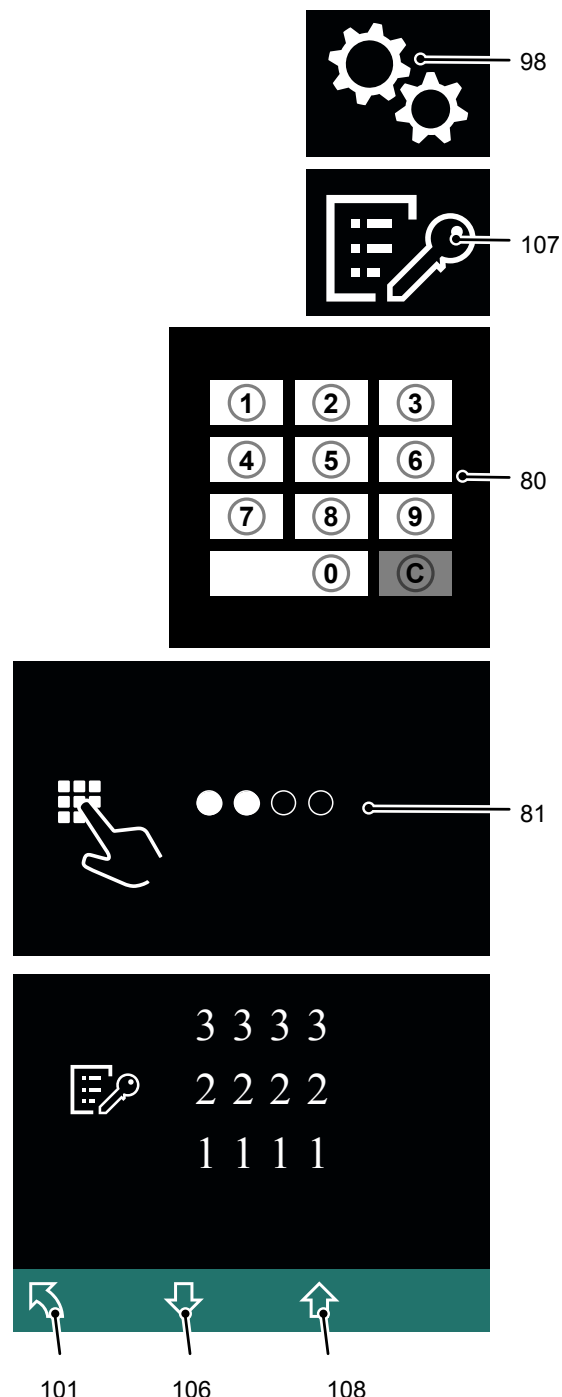
*The display area moves: Additional earlier log-ins are displayed.*

- To scroll back, press the button under the "Up selection" symbol (108) 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 (101).

*The log-in process is displayed.*





## 7.8 Operating the transponder reader

### NOTICE

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

### 7.8.1 Switching on the truck with the transponder

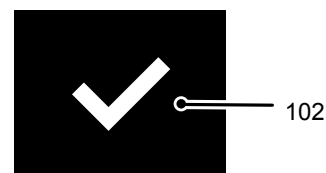
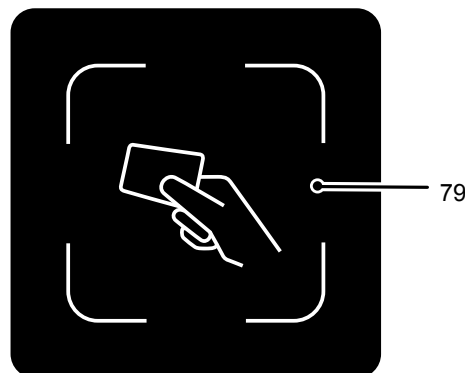
#### Procedure

- Release the Emergency Disconnect switch, see page 89.
- Hold the transponder in front of the transponder reader (79).

*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 (102).

*The truck is switched on.*



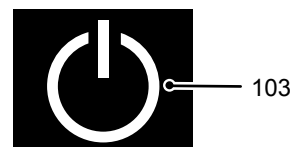
- The truck can only be switched on when the display unit (81) is lit. If the display unit is in standby the code or transponder will not be recognised. Pressing any key cancels standby mode.

### 7.8.2 Switching the truck off (transponder reader)

#### Procedure

- Press the key under the "Switch off" symbol (103) in the display unit.
- Press the Emergency Disconnect switch, see page 89.

*The truck is switched off.*



### 7.8.3 Changing the Set-up Transponder

#### Requirements

- The truck is switched on, see page 125.

#### Procedure

- Press the key below the "Settings" symbol (98).
- Press the key below the "Change set-up code" symbol (99).
- Place the set-up transponder on the transponder reader (79).

*The code of the set-up transponder is shown on the display unit (81).*

- Press the key below the "Delete" symbol (100).

*A dashed line is shown.*

- Place the new set-up transponder on the transponder reader (79).

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

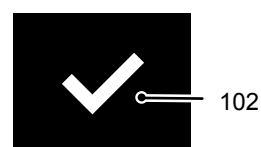
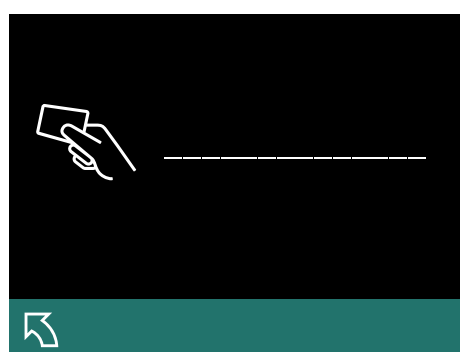
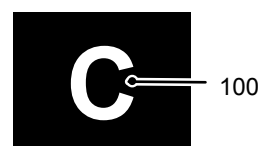
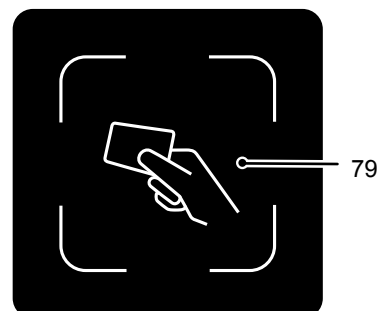
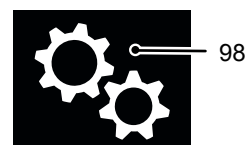
- Press the key below the "Confirm" symbol (102).

*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 (100).

To return to the main menu, press the key below the "Back" symbol (101).

*The set-up transponder has been changed.*



101

## 7.8.4 Adding a new transponder

### Requirements

- The truck is switched on, see page 125.

### Procedure

- Press the key below the "Settings" symbol (98).
- Press the key below the "Edit transponder" symbol (104).

*The set-up transponder is requested.*

- Place the set-up transponder on the transponder reader (79).

*All transponder codes are shown on the display unit (81).*

- Press the key below the "Add" symbol (105).
- Place the new transponder on the transponder reader (79).

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

- Press the key below the "Confirm" symbol (102).

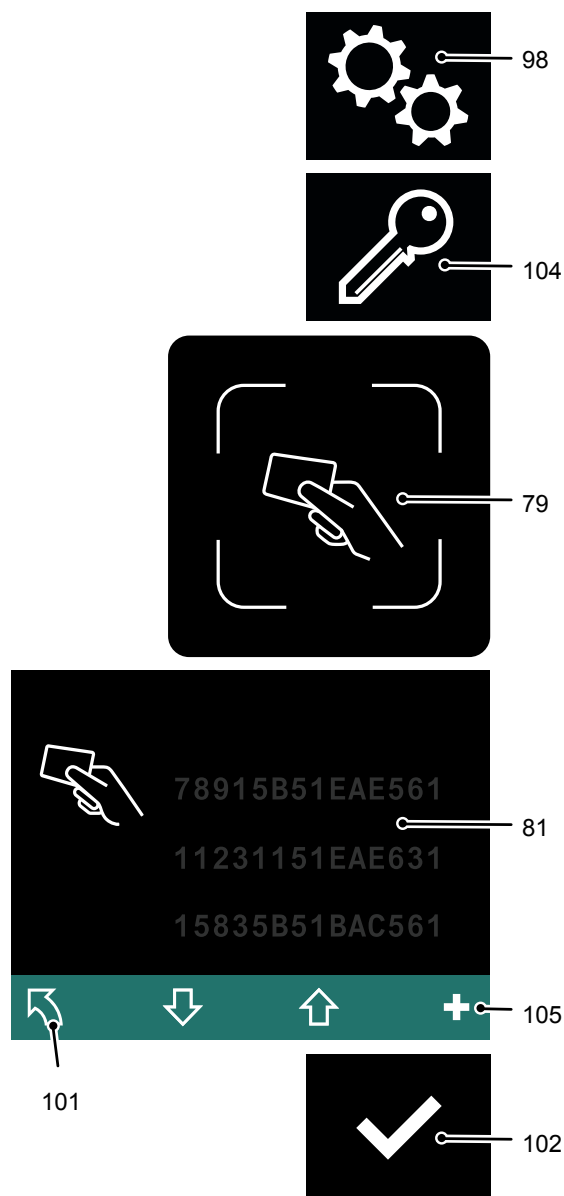
*The new transponder code is displayed.*

→ If the wrong transponder has been used, delete it, see page 128, and add a correct transponder.

To return to the main menu, press the key below the "Back" symbol (101).

*A new transponder has been added.*

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



## 7.8.5 Deleting transponders

### Requirements

- The truck is switched on, see page 125.

### Procedure

- Press the key below the "Settings" symbol (98).
- Press the key below the "Edit transponder" symbol (104).

*The set-up transponder is requested.*

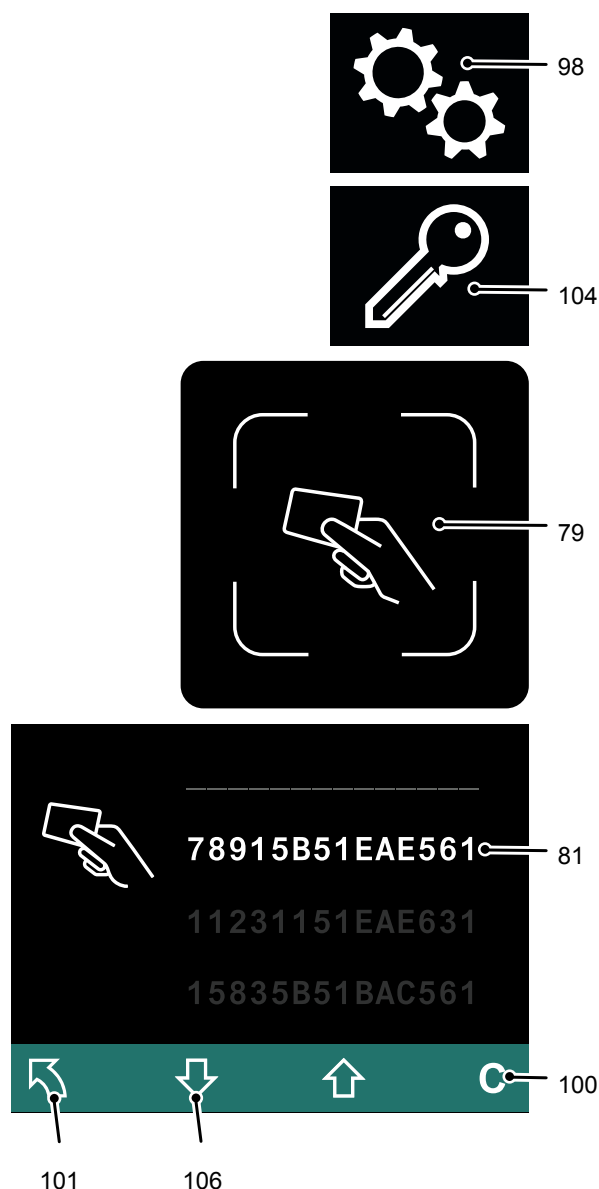
- Place the set-up transponder on the transponder reader (79).

*All transponder codes are shown on the display unit (81).*

- Select the transponder code to be deleted using the key below the "Down selection" symbol (106).
- Press the key below the "Delete" symbol (100).

*The transponder has been deleted.*

- To return to the main menu, press the key below the "Back" symbol (101).



## 7.8.6 Displaying the Log-in Process

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 115.

### Procedure

- Press the key below the "Settings" symbol (98).
- Press the key below the "Log-in process" symbol (107).
- Place the set-up transponder on the transponder reader (79).
- To scroll forward, press the button under the "Down selection" symbol (106) as many times as necessary.

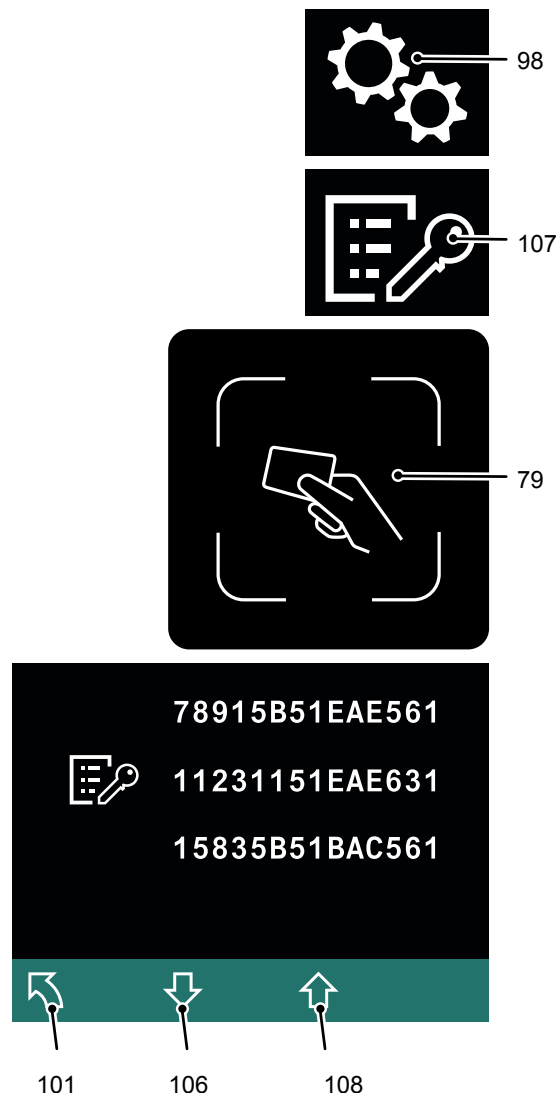
*The display area moves: Additional earlier log-ins are displayed.*

- To scroll back, press the button under the "Up selection" symbol (108) 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 (101).

*The log-in process is displayed.*



## 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](http://www.jungheinrich.de/spare-parts-search)) by entering the serial number.



The serial number can be found on the data plate, see page 33.



## 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 151).

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 151).

### **WARNING!**

#### **Risk of accidents and component damage**

Any modification to the truck, in particular the safety mechanisms, is prohibited.

---

**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 150).



## 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 131.

### Settings

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

## 3.1 Working on the electrical system

### WARNING!

#### Electrical current can cause accidents

Ensure the electrical system is de-energised before starting work. The capacitors in the control 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 work 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 84).
- ▶ Disconnect the battery.
- ▶ 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).

## 3.2 Consumables and used parts

### CAUTION!

#### **Consumables and used parts are an environmental hazard**

Used parts and consumables must be disposed of in accordance with the applicable environmental-protection regulations. Oil changes should be carried out by the manufacturer's customer service department, whose staff are specially trained for this task.

► Note the safety regulations when handling these materials.

---

## 3.3 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 131.

## 3.4 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.
-

## 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 are an environmental hazard**

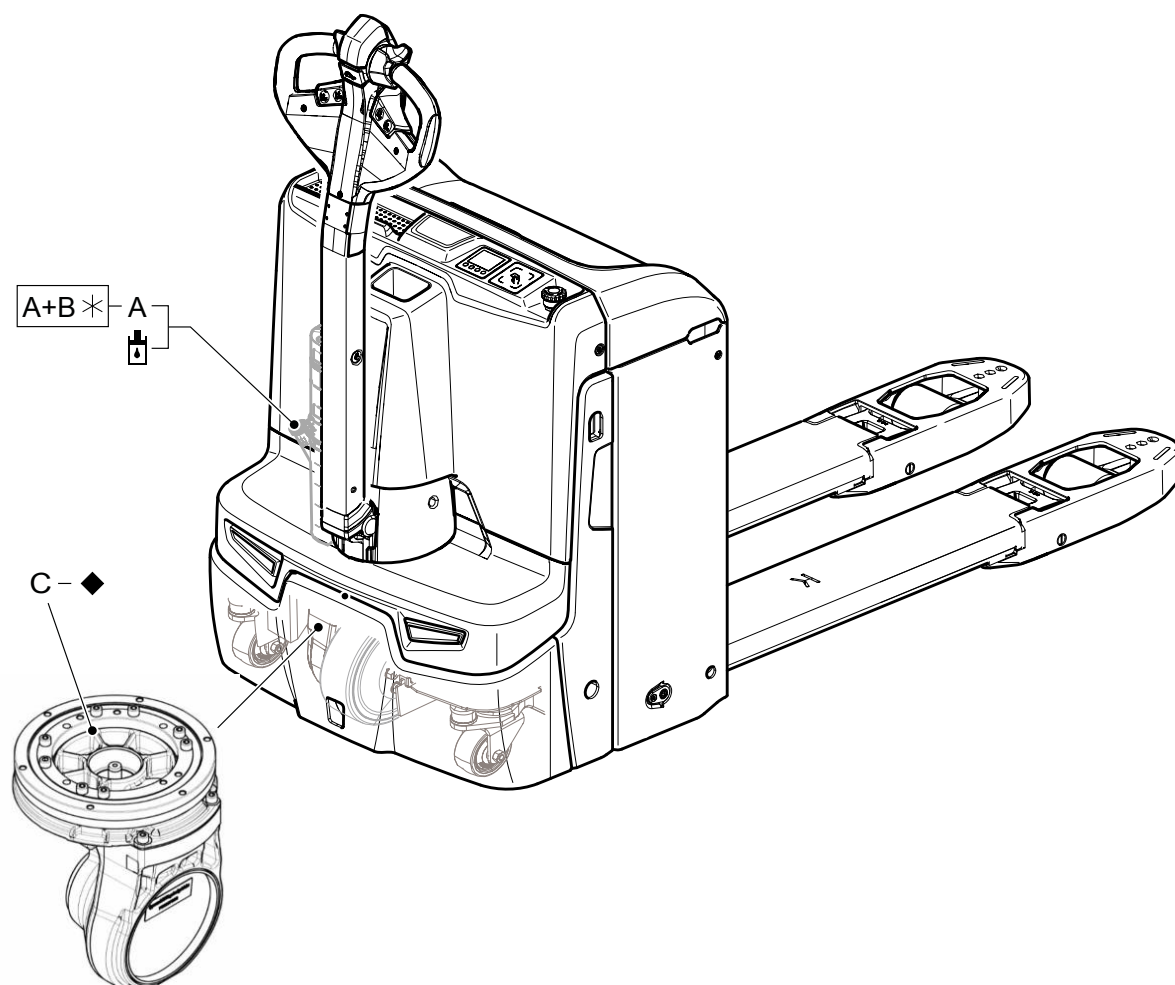
Used parts and consumables must be disposed of in accordance with the applicable environmental-protection regulations. Oil changes should be carried out by the manufacturer's customer service department, whose staff are specially trained for this task.

► Note the safety regulations when handling these materials.

---

## 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 repairs

#### *Procedure*

- Park the truck securely, see page 84.
- Disconnect the battery to prevent the truck from being switched on accidentally.

### 5.2 Lifting and jacking up the truck safely

#### **⚠ WARNING!**

#### **Lifting and jacking up the truck safely**

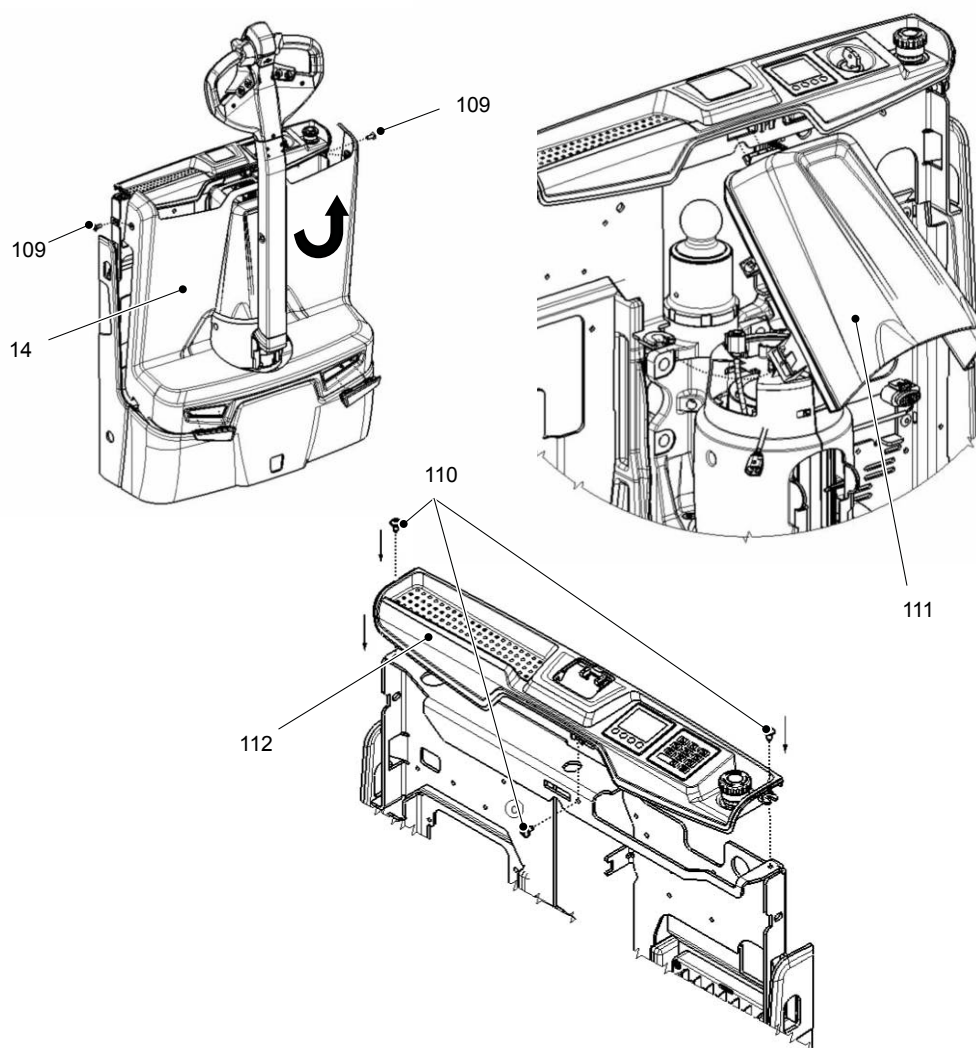
In order to raise the truck, the lifting gear must only be secured to the points specially provided for this purpose.

In order to raise and jack up the truck safely, proceed as follows:

- ▶ Jack up the truck only on a level surface and prevent it from moving accidentally.
  - ▶ Always use a jack with sufficient capacity. When jacking up the burden carrier, take appropriate measures to prevent it from slipping or tipping over (e.g. wedges, wooden blocks).
  - ▶ In order to raise the truck, the lifting accessories must only be secured to the points specially provided for this purpose, see page 35.
-



## 5.3 Front panel disassembly and assembly



### **Removing the covers**

#### *Requirements*

- Truck prepared for maintenance and repair work, see page 140.

#### *Tools and Material Required*

- Allen key, size 13 (7 Nm)

#### *Procedure*

- Remove the M8 hex. bolt with width across flats 13 (7 Nm) (109) from the front panel (14).
- Lift and remove the front panel (14).
- Turn the drive panel (111) approx. 90°, loosen on the tiller and remove.
- Remove the screws (110) from the dashboard panel (5 Nm) (112).
- Remove the dashboard panel (112).

*The covers have been removed.*

## 5.4 Cleaning

### 5.4.1 Cleaning the truck

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

#### **⚠ 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 (controllers, sensors, motors etc.) before cleaning the truck with a high-pressure cleaner.
- ▶ Do not hold the jet of the pressure washer by the marked points to avoid damaging them (see page 32).
- ▶ Do not clean the truck with a steam jet.

#### ***Cleaning the truck***

##### ***Requirements***

- Truck prepared for maintenance and repair work, see page 140.

##### ***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 148).

*The truck is now clean.*

## 5.4.2 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 140).

##### *Tools and Material Required*

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

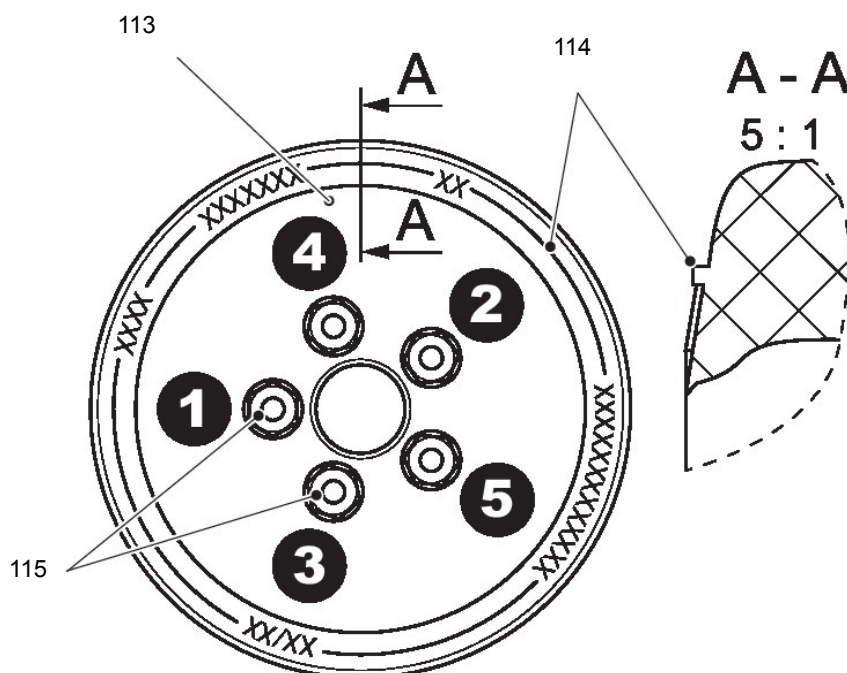
##### *Procedure*

- Expose the electrical system, see page 44.
- 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 panel, see page 44.
- Carry out all the tasks in the section "Recommissioning the truck after cleaning or maintenance work" (see page 148).

*The electrical system assemblies are now clean.*

## 5.5 Check wheel attachment and wear

- Replace the wheels if the wear limit (114) has been reached.
- The drive wheel must only be replaced by authorised service personnel.



- The wheel nuts on the drive wheel must be re-tightened in accordance with the maintenance intervals indicated in the maintenance checklist, see page 151.

### ***Tightening the wheel nuts***

#### ***Requirements***

- Prepare the truck for maintenance and repair work, see page 151.

#### ***Tools and Material Required***

- Torque wrench

#### ***Procedure***

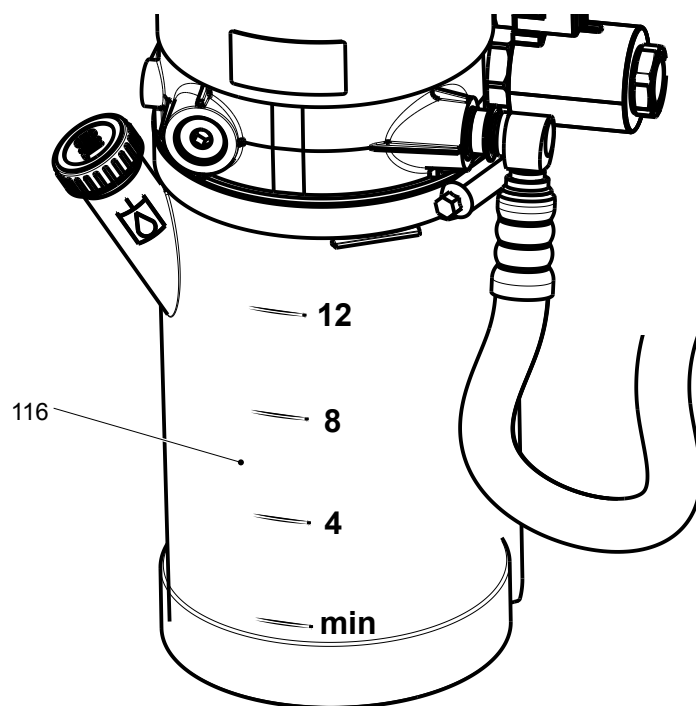
- Position the drive wheel (113) perpendicular to the longitudinal axis of the truck.
- Tighten all wheel nuts (115) using the torque wrench through the opening in the chassis.

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.*

## 5.6 Checking the hydraulic oil level



### ***Checking the oil level***

#### ***Requirements***

- Lower the load handler.
- Prepare the truck for maintenance and repairs, see page 140.

#### ***Procedure***

- Disassemble the front panel, see page 141.
- Check the oil level in the hydraulic reservoir (116).

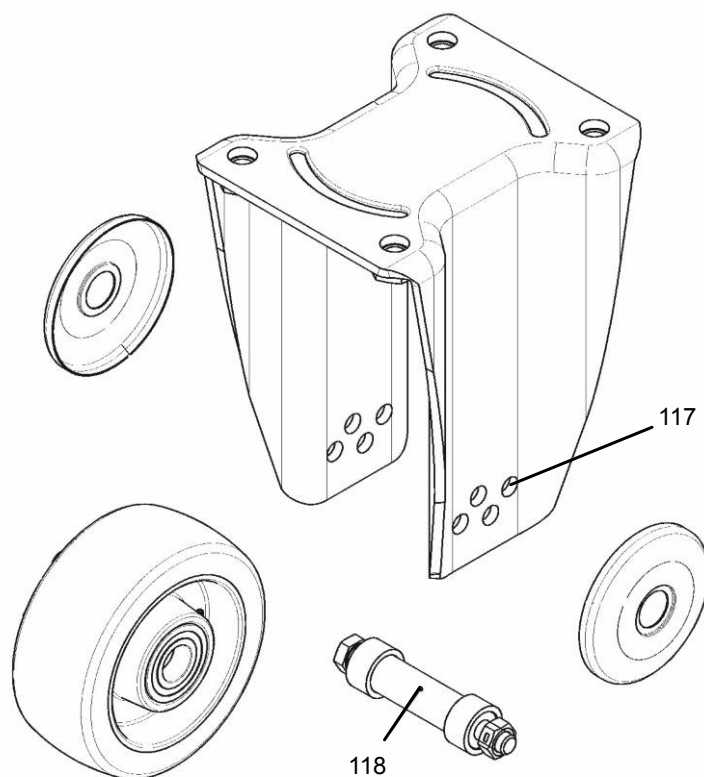
➔ With the load handler lowered, the hydraulic oil level in the hydraulic reservoir must be at roughly the " 8" marking.

- If necessary, add hydraulic oil of the correct grade, see page 139.

*The oil level has now been checked.*

## 5.7 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 140.

#### ***Tools and Material Required***

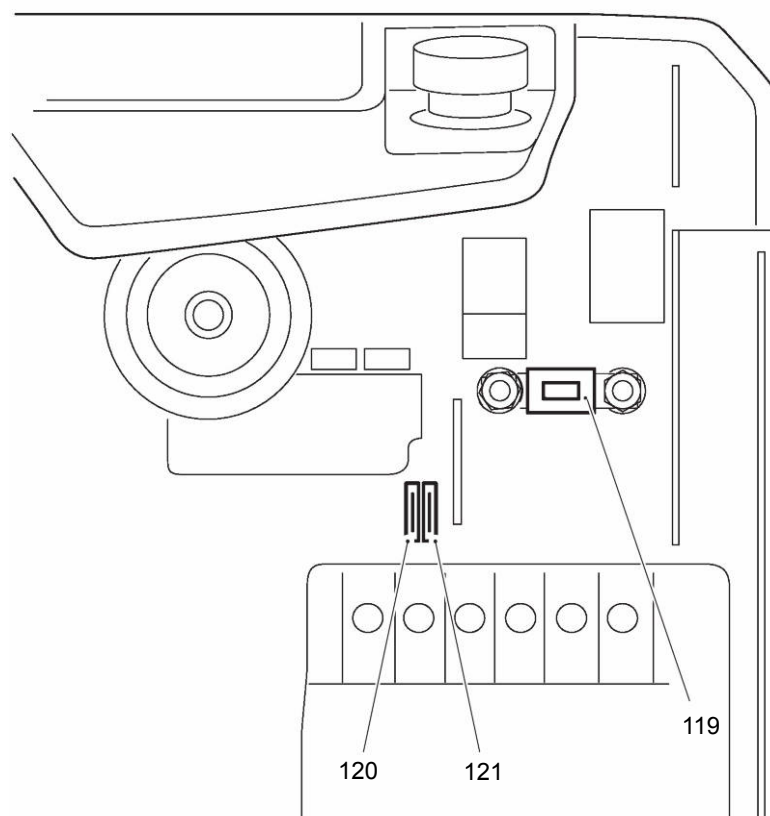
- Torque wrench

#### ***Procedure***

- Jack up the truck, see page 133.
- Insert the bolt (118) through one of the insertion positions (117). Select the insertion position so that the distance between the ground and the fixed support wheels is at least 2 mm.
- Tighten the bolt (118) with 15 Nm.

*The distance is set.*

## 5.8 Checking electrical fuses



### Checking fuses

#### Requirements

- Truck prepared for maintenance and repair work, see page 140.
- Front panel removed, see page 141.

#### Procedure

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

*The fuses have been checked.*

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

## 5.9 Restoring the truck to service after maintenance and repairs

### *Procedure*

- Thoroughly clean the truck – see page 142.
- Lubricate the forklift truck according to the lubrication schedule – see page 138.
- Equipped with lead-acid battery (●): Clean the battery, grease the battery terminal screws with terminal grease and connect the battery.
- Charge the battery – see page 51.
- Commission the forklift truck – see page 80.



## 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 140.

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 142.
- Prevent the truck from rolling away accidentally.
- Check the hydraulic oil level and replenish if necessary, see page 145.
- Apply a thin layer of oil or grease to any non-painted mechanical components.
- Lubricate the truck according to the lubrication diagram, see page 138.
- Charge the battery, see page 51.
- 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 142.
- Prevent the truck from rolling away accidentally.
- Check the hydraulic oil level and replenish if necessary, see page 145.
- Apply a thin layer of oil or grease to any non-painted mechanical components.
- Lubricate the truck according to the lubrication diagram, see page 138.
- Charge the battery, see page 51.

### 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 51.

## 6.3 Restoring the truck to service after decommissioning

### *Procedure*

- Thoroughly clean the truck – see page 142.
- Lubricate the forklift truck according to the lubrication schedule – see page 138.
- Equipped with lead-acid battery (●): Clean the battery, grease the battery terminal screws with terminal grease and connect the battery.
- Charge the battery – see page 69.
- Commission the forklift truck – see page 80.

## 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.

# 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

Issued on: 2021-06-14 08:00

## 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

<b>Hydraulic operations</b>
Correct the hydraulic-oil level.

<b>Steering</b>
Test the tiller return function.

#### 1.1.1.2 Optional equipment

##### Lead-acid battery, international

<b>Power supply</b>
Correct the battery-acid level using demineralised water.

##### Lead-acid battery

<b>Power supply</b>
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:

<b>Electrical system</b>
Warning and safety equipment in accordance with the operating instructions
Functionality of display and controls
Test emergency disconnect switch and check for damage

<b>Power supply</b>
Check battery and battery components for damage
Battery connector for secure fit, functionality and damage

<b>Travel</b>
Collision safety switch for functionality and damage
Check wheels for wear and damage

<b>Chassis/structure</b>
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

<b>Hydraulic operations</b>
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

<b>Battery charger</b>
Mains plug and mains cable for damage

#### On-board charger 35A

<b>Battery charger</b>
Mains plug and mains cable for damage

#### Lead-acid battery, international

<b>Power supply</b>
Check the battery cable connections for secure attachment
Check battery and battery components for damage

#### Lead-acid battery

<b>Power supply</b>
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

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

<b>Electrical system</b>
Test the contactors and/or relays.
Carry out a frame leakage test.

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

<b>Hydraulic operations</b>
Correct the hydraulic-oil level.
Test the pressure relief valve.

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

<b>Steering</b>
Test the tiller return function.

### 1.2.1.2 Optional equipment

#### Standard on-board charger

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

#### Radio data

<b>System components</b>
Clean the scanner and terminal.

#### Other tests

<b>Agreed services</b>
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

<b>Battery charger</b>
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.

## Lead-acid battery, international

<b>Electrical system</b>
Carry out a frame leakage test.

<b>Power supply</b>
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

<b>Electrical system</b>
Carry out a frame leakage test.

<b>Power supply</b>
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

<b>Electrical system</b>
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

<b>Power supply</b>
Battery latch and battery attachment for correct function and damage
Battery connector for secure fit, functionality and damage

<b>Travel</b>
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

<b>Chassis/structure</b>
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

<b>Hydraulic operations</b>
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

<b>Steering</b>
Tiller for lateral play
Steering components for play and damage

### 1.2.2.2 Optional equipment

#### Standard on-board charger

<b>Battery charger</b>
Mains plug and mains cable for damage
Cables and electrical connections for secure fit and damage

#### Electrolyte recirculation

<b>Power supply</b>
Hose connections and pump for correct function

#### Aquamatic

<b>Power supply</b>
Aquamatic plug, hose connections and float for functionality and sealing
Flow indicator for functionality and sealing

#### Lateral battery removal

<b>Power supply</b>
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

## 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

<b>maintenance part</b>	<b>service hours</b>	<b>months</b>
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

<b>maintenance part</b>	<b>service hours</b>	<b>months</b>
Transmission oil in cold store application		
Hydraulic oil		
Hydraulic oil additive		

## 2 Maintenance Contents EJE 114 Li-Ion EJE 116 Lilon EJE 118 Li-Ion

Issued on: 2021-06-29 11:00

### 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

<b>Brakes</b>
Test the brake.
<b>Hydraulic operations</b>
Correct the hydraulic-oil level.
<b>Steering</b>
Test the tiller return function.

#### 2.1.2 Inspection contents

##### 2.1.2.1 Standard equipment

The following points must be checked:

<b>Electrical system</b>
Warning and safety equipment in accordance with the operating instructions
Functionality of display and controls
Test emergency disconnect switch and check for damage
<b>Power supply</b>
Battery connector for secure fit, functionality and damage
<b>Travel</b>
Collision safety switch for functionality and damage
Check wheels for wear and damage
<b>Chassis/structure</b>
Industrial truck for damage and leaks
Check labels for legibility, completeness and plausibility
Check doors or covers for damage
<b>Hydraulic operations</b>
Test hydraulic system
Check fork arms or load handler for wear and damage

<b>Battery charger</b>
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 service hours, but at least once a year.

### 2.2.1 Maintenance contents

#### 2.2.1.1 Standard equipment

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

<b>Electrical system</b>
Carry out a frame leakage test.

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

<b>Hydraulic operations</b>
Correct the hydraulic-oil level.
Test the pressure relief valve.

<b>Agreed services</b>
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.

<b>Steering</b>
Test the tiller return function.

<b>Battery charger</b>
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

<b>System components</b>
Clean the scanner and terminal.

### 2.2.2 Inspection contents

The following points must be checked:

#### 2.2.2.1 Standard equipment

<b>Electrical system</b>
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

<b>Power supply</b>
Battery latch and battery attachment for correct function and damage
Battery cable for damage
Battery connector for secure fit, functionality and damage

<b>Travel</b>
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

<b>Chassis/structure</b>
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

<b>Hydraulic operations</b>
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

<b>Steering</b>
Tiller for lateral play
Steering components for play and damage

<b>Battery charger</b>
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

<b>Electrical system</b>
Check shock sensor/data recorder is securely attached and check for damage

### Radio data

<b>System components</b>
Scanner and terminal for secure fit, functionality and damage

### Access module

<b>Electrical system</b>
Check access module is securely attached, test and check for damage

### Entry skids/rollers

<b>Hydraulic operations</b>
Check entry skids or entry rollers for damage and wear, and test their function

## 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

<b>maintenance part</b>	<b>service hours</b>	<b>months</b>
Gear oil	10000	
Hydraulic system breather filter	2000	12
Hydraulic oil	2000	12
Hydraulic system – venting plug	2000	12