

# EJC 110i (E)/110bi (E)

06.24

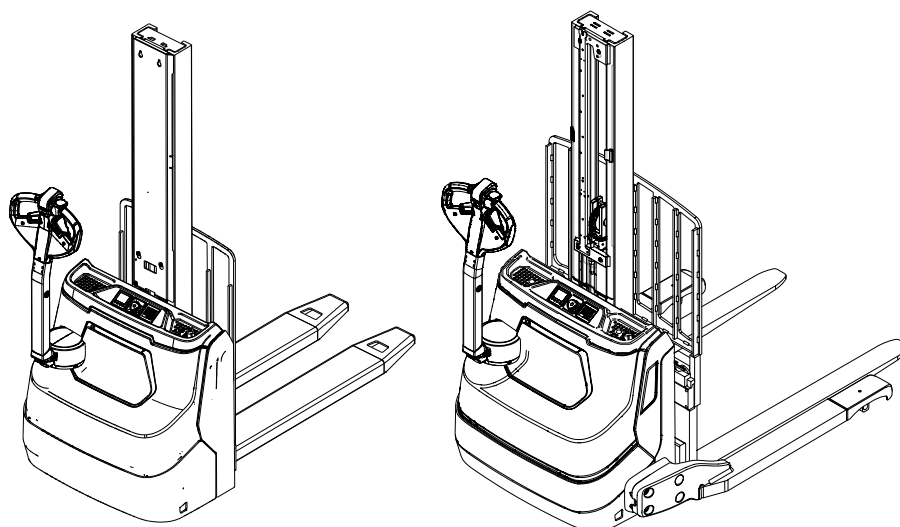
Operating instructions

en-GB

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EJC 110i (E)  
EJC 110bi (E)





# Declaration of Conformity



## Manufacturer

Jungheinrich AG, 22039 Hamburg, Germany

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

Type	Option	Serial no.	Year of manufacture
EJC 110i (E) EJC 110bi (E)			

**On behalf of**

**Date**

## EU DECLARATION OF CONFORMITY

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

**Declaration of Conformity (○)**

**Product:** EJC 110i (E)/110bi (E)  
Serial number/type number

**Manufacturer:** Jungheinrich Aktiengesellschaft  
22039 Hamburg, Germany

**UK representative:** Jungheinrich UK Ltd  
Sherbourne House  
Sherbourne Drive  
Tilbrook  
Milton Keynes  
MK7 8HX

**Authorised to compile documentation:**

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

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

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

**Supply of Machinery (Safety) Regulations 2008 No. 1597**

and

**Electromagnetic Compatibility Regulations 2016 No. 1091**

Signed for and on behalf of:

**Jungheinrich Aktiengesellschaft**



# Foreword

## Notes on the operating instructions

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

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

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

## Safety notices and text mark-ups

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

### **DANGER!**

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

### **WARNING!**

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

### **CAUTION!**

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

### **NOTICE**

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



Used before notices and explanations.

●	Indicates standard equipment
○	Indicates optional equipment

## **Copyright**

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 these operating instructions. All other types of use are beyond its scope of application and may result in damage to persons, material assets and/or the truck.

## 2 Correct application

### **NOTICE**

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

The load must rest on the load handler or be lifted by an attachment approved by the manufacturer.

The load must be fully raised, see page 103.

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### **Permissible activities**

- Lifting and lowering loads
- Stacking and retrieving loads
- Transporting lowered loads

### **Prohibited activities**

- Travelling with a raised load (> 500 mm)
- Carrying and lifting passengers
- Pushing or pulling loads

### 3 Approved application conditions

#### **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 27.
    - Notes on travelling on slopes and inclines – see page 88.

##### **Ground conditions**

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

- The ground must be level, secure and have sufficient capacity.
- The ground must be free from oil and grease.
- In accordance with EN 1081, the earthing resistance of the ground must not exceed 1 MΩ.
- The following also applies for stacking:
  - The capacity data specified on the truck applies to horizontal ground that meets the specifications in the table below.

##### **Limit values for deviations from level**

Reference	Limit values (mm) for measuring point distances (m) <sup>1</sup>				
	≤ 0.1 m	1 m	4 m	10 m	≥15 m
Finished floors e.g. screed on its own, screed for accommodating floor coverings, floor coverings, tile coverings, smoothed and bonded surfaces	2 mm	4 mm	10 mm	12 mm	15 mm
<sup>1)</sup> Specifications in accordance with DIN 18202:2019-07 - Table 3 - row 3 - limit values for deviations from level					

##### **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.

### 3.1 Instructions for trucks with lithium-ion batteries

#### **WARNING!**


##### **Danger of accidents due to regenerative braking fault**

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

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

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

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

 A notification symbol appears on the display unit when the temperature of the lithium-ion battery is outside the permissible range – see page 68.

### 3.2 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.

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

### 3.3 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 49.

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

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

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

### 3.4 Wind loads

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

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

Stop the truck in both cases.

## 4 Proprietor responsibilities

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

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

### NOTICE

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

---

## 5 Adding attachments and/or optional equipment

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

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

## 6 Removal of components

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



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

# B Truck Description

## 1 Application

The EJC is a four-wheel, electric pallet truck with a steered drive wheel. The EJC is designed to lift and transport goods on level surfaces. Open-bottom pallets or roll cages can be lifted.

The rated capacity is shown on the data plate. The capacity with respect to lift height and load centre distance is indicated on the capacity plate.

### 1.1 Truck models and rated capacity

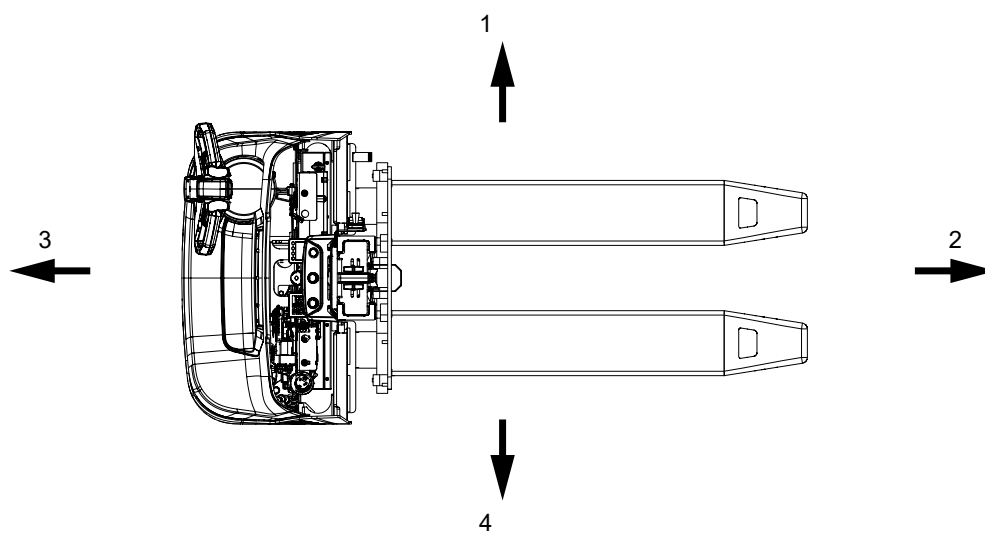
The rated capacity depends on the model. The rated capacity can be derived from the model name.

EJC 110i (E) EJC 110bi (E)	Type designation
1	Series
10	Rated capacity x 100 kg
b	Straddle truck
i	Lithium-ion battery
E	Single mast

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

## 2 Travel direction definition

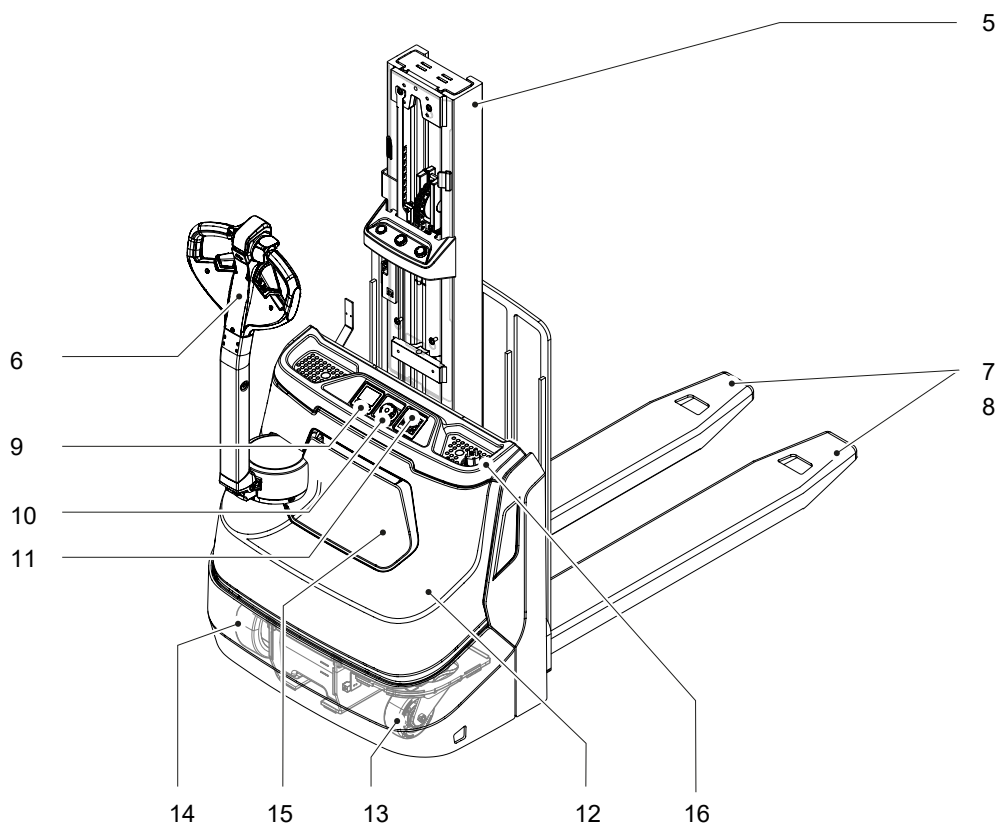
The following determinations have been made for travel direction specification:



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

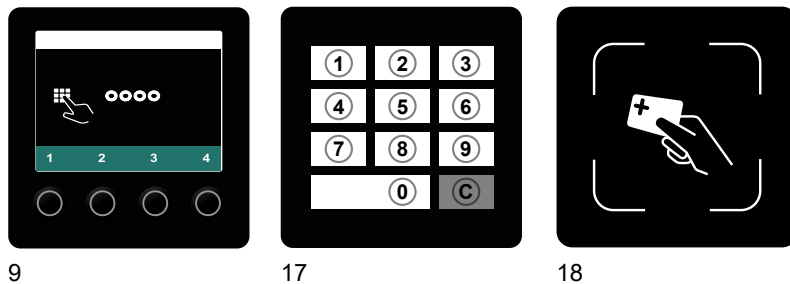
## 3 Assembly description

### 3.1 Assembly Overview



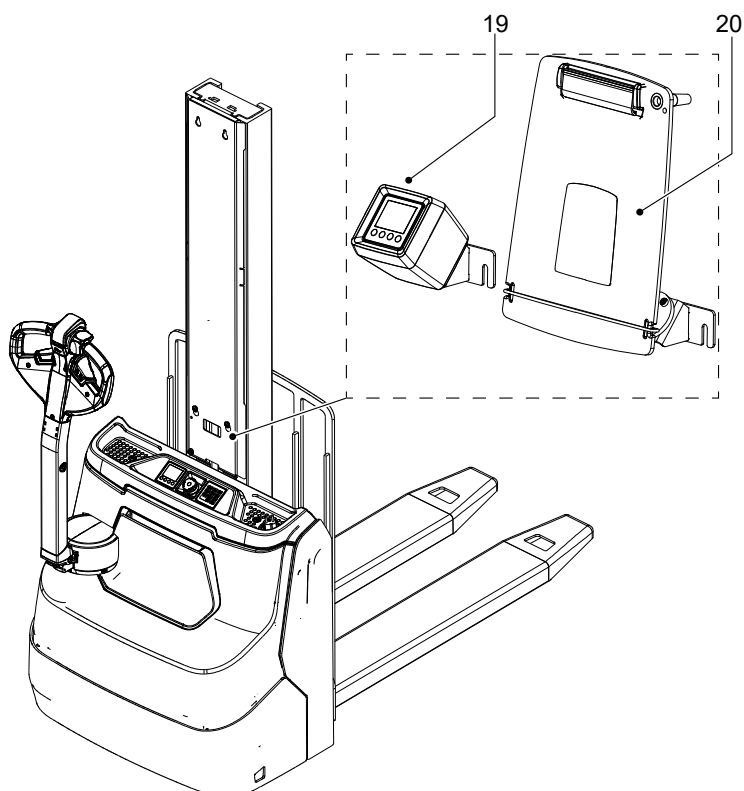
Item		Designation
5	●	Mast
6	●	Tiller
7	●	Load fork
8	●	Support arms
9	●	Display unit with 2-inch display
10	●	Emergency disconnect switch
11	●	Cap (placeholder for the Transponder reader Plus and keypad keyless access systems (○))
12	●	Front panel
13	●	Support wheel
14	●	Drive wheel
15	●	Document storage compartment
16	●	Mains plug (on-board charger)

## 3.2 Keyless Access System



Item		Designation
9	●	Display unit with 2-inch display
17	○	Keypad
18	○	Transponder reader Plus

## 3.3 Optional Assemblies on the Dashboard Panel



Item		Designation
19	○	Pre-Op Check display unit
20	○	DIN A4 writing board



## 4 Functional Description

### 4.1 General description

#### Drive system

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

#### Travel programs

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

- Travel program 1 (slow): 4 km/h, medium acceleration
- Travel program 2 (medium): 4,8 km/h, medium acceleration
- Travel program 3 (fast): 5,3 km/h, high acceleration

The following options are available when selecting the travel program:

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

#### ECO mode

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



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

#### Electrical system

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

#### Tiller

The driver steers with an ergonomic tiller. All travel and lift operations can be performed sensitively without having to reach. The tiller has a steer angle of 180°.

#### Hydraulic system

"Lifting" and "lowering" are activated via the "lift" and "lower" buttons. Pressing the "lift" button starts the pump unit, supplying hydraulic oil from the hydraulic reservoir to the lift cylinder.

## Control and display elements

Ergonomic controls ensure fatigue-free operation for sensitive application of the travel and hydraulic operations. The display unit shows key information such as travel program, service hours, battery capacity and event messages.

### Load indicator (○)

The load weight is shown with an accuracy of  $\pm 50$  kg on the display of the display unit. The measuring range depends on the type of mast, as the weight is determined indirectly via a pressure sensor in the hydraulic system:



The load display cannot replace load weighing with a calibrated weigher.

### Hour meter

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

- Tiller in travel zone "F", see page 93.
- "Slow travel button", see page 97.
- Button for lifting or lowering the load handler, see page 101.

### Mast

The high-strength steel sections are narrow, enabling excellent visibility of the load handler. The lift rails and the load handler run on permanently lubricated and thus maintenance-free inclined rollers.

### Free lift

With this mast, the load handler is initially raised (free lift) by a short, centre-mounted free lift cylinder without changing the overall height of the truck.

### Forks

The truck is equipped with 2A forks.

## Automatic lift positioning

The automatic lift positioning is used to adjust the load carriage to a freely selectable ergonomic reach height. Automatic lift positioning distinguishes between two states:

- **Laden:** If a load unit is placed on the load carrier, e.g. a pallet, the load carriage is lowered until the top edge of the load unit corresponds to the preset work height.
- **Unladen:** If a load unit is removed from the load carrier, e.g. e.g. pallet, the load carriage is raised until the top edge of the load unit corresponds to the preset work height.

## Energy-saving function (○)

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

## Immobiliser, mains plug detection (○)

The mains plug of the on-board charger must be fully inserted into the storage compartment before the industrial truck can be operated. Otherwise, the travel and lift functions are deactivated.

The immobiliser function prevents operation if the industrial truck is connected to a switched-off socket, for example.

## Load backrest (○)

A load backrest is recommended as an additional protective mechanism to move low or small item loads above the mast protection frame or grille (○). The load backrest is mounted on the load handler and protects the operator and truck against falling loads.



The extended mast height (h4) increases according to the load backrest mounted on the load handler.

### **Buzzer when lifting the load handler (○)**

When the load handler is being lifted, a regular beep sounds to warn people in the hazardous area of a potentially dangerous situation.

### **Pre-Op Check (○)**

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

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



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

## 4.2 Protective and safety equipment

### Truck contour

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

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

### Automatic reset of the travel switch

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

### Automatic reset of the tiller

When released, a gas pressure spring pushes the tiller up and activates braking see page 92.

### Automatic reset of the lift/lower button

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

### Collision safety switch

When travelling in the drive direction, the red collision safety switch changes the travel direction if the truck comes into contact with a person. The truck brakes, travels away from the operator for 3 s and stops. This prevents the truck driving into the operator.

### Emergency disconnect switch

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

- Further information: see page 90.

### Emergency stop safety concept

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

### Charging stop

The charging stop function enables charging to be safely interrupted via the display unit. The function must be activated before unplugging the mains plug.

### Mast cover

The protective screen panel or backrest protect the operator from moving mast parts and sliding loads.

## **Emergency lowering of the load handler**

The hydraulic unit is equipped with emergency lowering that allows manual lowering of the load handler in the event that the electrical system fails, see page 118.

### **4.3 Assistance systems**

#### **Foot protection tiller (○)**

The assistance system offers enhanced foot protection as the maximum travel speed is only enabled when the operator has moved the tiller by a sufficient amount. If the tiller is moved only a little, the travel speed is reduced – see page 93.

## 5 Technical Specifications

→ The technical specifications comply with the German "Industrial Truck Data Sheet" Guidelines.

Technical modifications and additions reserved.

→ In accordance with VDI 2198, the load centre is indicated by the letter "c" in this section. In the other sections and on the capacity plate, the letter "D" is used in accordance with EN ISO 3691-1.

### 5.1 Performance data

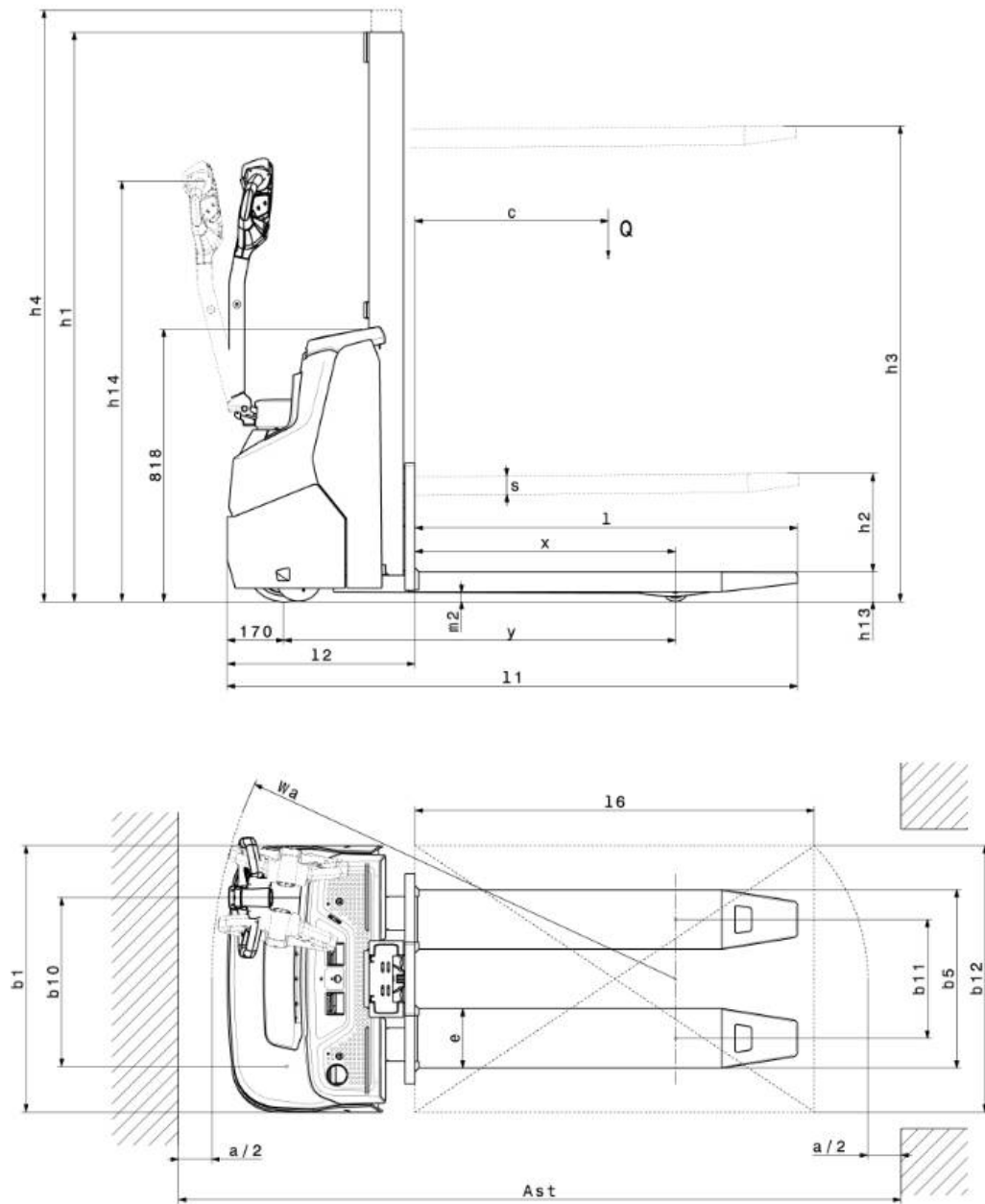
	Description	EJC 110i (E)	EJC 110bi (E)	
Q	Rated capacity / load - mast lift	1000		kg
c	Load centre distance	600		mm
	Travel speed With / without load	5.3/5.3		km/h
	Lift speed With / without load	0.15/0.25		m/s
	Lowering speed With / without load	0.15/0.15		m/s
	Drive motor, output S2 60 min.	1.0		kW
	Lift motor output S3	1.2/5		kW / %
	Energy consumption as per EN 16796	0.35 <sup>1</sup>		kWh/h
<sup>1)</sup> <i>Provisional value</i>				

### 5.2 Gradeability

	Maximum gradeability	EJC 110i (E)	EJC 110bi (E)	
	With / without load – mast lift	6/10		%

## 5.3 Dimensions

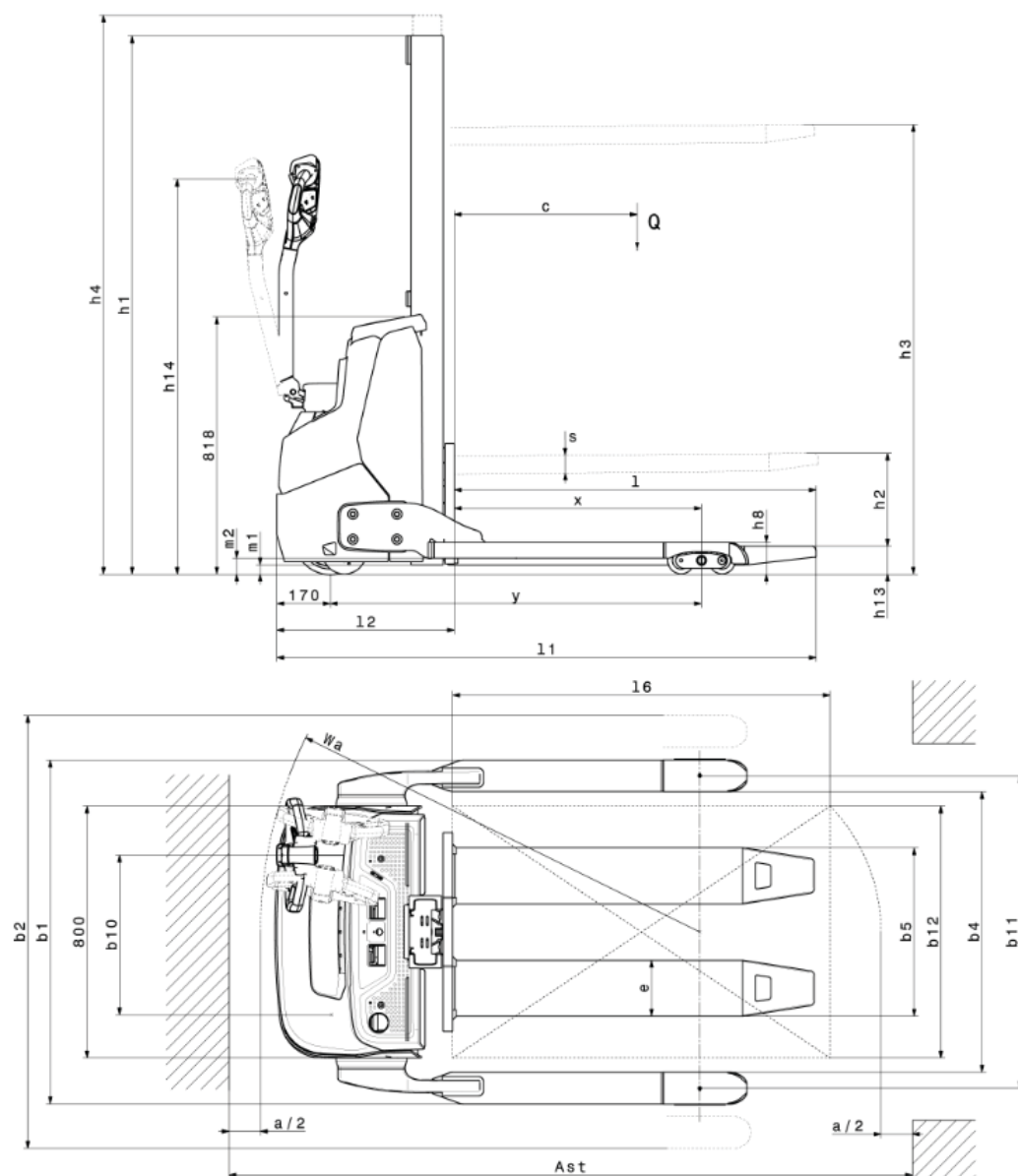
### EJC 110i (E)





	Description	EJC 110i (E)	
h1	Mast height retracted	1710/1970/2430	mm
h2	Free lift	1200/1540/2000	mm
h3	Lift	1200/1540/2000	mm
h4	Mast height extended	1710/1970/2430	mm
h13	Lowered height	90	mm
h14	Tiller handle height in travel position (min. / max.)	750/1260	mm
x	Load distance	783	mm
y	Wheelbase	1177	mm
l1	Overall length	1714	mm
l2	Length including fork shank	564	mm
b1	Overall width	800	mm
b5	Width across forks	535	mm
b10	Track width, front	507	mm
b11	Track width, rear	394	mm
m2	Ground clearance	27	mm
s	Fork dimensions	60	mm
e		178	mm
l		1150	mm
Ast	Aisle width for pallets 1000 x 1200 crossways: – diagonal VDI – Reduced, with free swivel range	2232 <sup>1</sup> 1961 <sup>1</sup>	mm
Ast	Aisle width for pallets 800 x 1200 lengthways: – diagonal VDI – Reduced, with free swivel range	2172 <sup>1</sup> 2011 <sup>1</sup>	mm
Wa	Turning radius	1394 <sup>1</sup>	mm
<sup>1)</sup> Tiller upright (slow travel)			

**EJC 110bi (E)**



	Description	EJC 110bi (E)	
h1	Mast height retracted	1710/1970/2430	mm
h2	Free lift	1170/1510/1970	mm
h3	Lift	1170/1510/1970	mm
h4	Mast height extended	1710/1970/2430	mm
h8	Support arm height	101	mm
h13	Lowered height	-	mm
h14	Tiller handle height in travel position (min. / max.)	750/1260	mm
x	Load distance	810 <sup>1</sup>	mm
y	Wheelbase	1204	mm
l1	Overall length	1714 <sup>1</sup>	mm
l2	Length including fork shank	564 <sup>1</sup>	mm
b1	Overall width	1098/1268/1468	mm
	Fork carriage width (ISO 2A)	800	mm
b5	Width across forks	Max. 706	mm
b10	Track width, front	507	mm
b11	Track width, rear	992/1162/1362	mm
m2	Ground clearance	51	mm
s	Fork arm dimensions	40	mm
e		100	mm
l		950/1000/1050/1100/1150	mm
Ast	Aisle width for pallets 1000 x 1200 crossways: – diagonal VDI – Reduced, with free swivel range	-/-/2358 <sup>2 3</sup> -/-/1960 <sup>4 2 3</sup>	mm
Ast	Aisle width for pallets 800 x 1200 lengthways: diagonal VDI – diagonal VDI – Reduced, with free swivel range	2179/2259/2358 <sup>2 5</sup> 2010/2010/2010 <sup>4 2</sup>	mm
Wa	Turning radius	1420 <sup>2</sup>	mm
<sup>1)</sup> With fork carriage: x - 42 mm; l1 + 42 mm; l2 + 42 mm; Ast + 42 mm <sup>2)</sup> Tiller upright (slow travel) <sup>3)</sup> only available for version with b1 = 1468 mm <sup>4)</sup> With fork carriage: x -42 mm; l1 +42 mm; l2 +42 mm; Ast +42 mm <sup>5)</sup> With fork carriage +31 mm			

## 5.4 Mast versions

### EJC 110i (E)

<b>Lift (h3)</b>	<b>Mast height retracted (h1)</b>	<b>Free lift (h2)</b>	<b>Mast height extended (h4)</b>
<b>1200</b>	1710	1200	1710
<b>1540</b>	1970	1540	1970
<b>2000</b>	2430	2000	2430

### EJC 110bi (E)

<b>Lift (h3)</b>	<b>Mast height retracted (h1)</b>	<b>Free lift (h2)</b>	<b>Mast height extended (h4)</b>
<b>1170</b>	1710	1170	1710
<b>1510</b>	1970	1510	1970
<b>1970</b>	2430	1970	2430

## 5.5 Weights

Description	EJC 110i (E)	EJC 110bi (E)	
Net weight (incl. battery)	480	515	kg
Axle load with load (front/rear)	500/980	545/970	kg
Axle load without load (front/rear)	350/130	370/145	kg
Battery weight - 25.6 V / 50 Ah	23.8		kg
Battery weight - 25.6 V / 100 Ah	35		kg

## 5.6 Tyre type

Description	EJC 110i (E)	EJC 110bi (E)	
Tyre size, front	Ø 210 x 70		mm
Tyre size, rear (Single (●) / Tandem (○))	Ø 75 x 70/Ø 75 x 45	- / Ø 85 x 75	mm
Additional wheels	Ø 140 x 54		mm
Wheels, number front / rear (x = driven)	1 x + 1/2		

## 5.7 On-Board Charger

Technical data	Value
Mains voltage	230 V (+15 %, -10 %)
Mains frequency	50 Hz - 60 Hz (±3 Hz)
Current of ELH 2415	15 A
Current of ELH 2435	35 A
Current of ELH 2470	70 A

## 5.8 EN norms

### **WARNING!**

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

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

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

---

#### **Continuous sound pressure level**

– EJC 110i (E)/110bi (E): 65 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.

#### **Electromagnetic compatibility (EMC)**

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

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

## 5.9 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
Transponder reader Plus	13.56 MHz	< 500 mW
Transponder reader Plus	125 kHz	< 500 mW
Battery module	2.4 GHz	< 10 mW
Telematics box Plus 4G/2G noWLAN EU	850/900 MHz (2G)	< 2 W
	1800/1900 MHz (2G)	< 1 W
	800/900/1800/2100 MHz (4G)	< 200 mW

## 5.10 Electrical Requirements

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

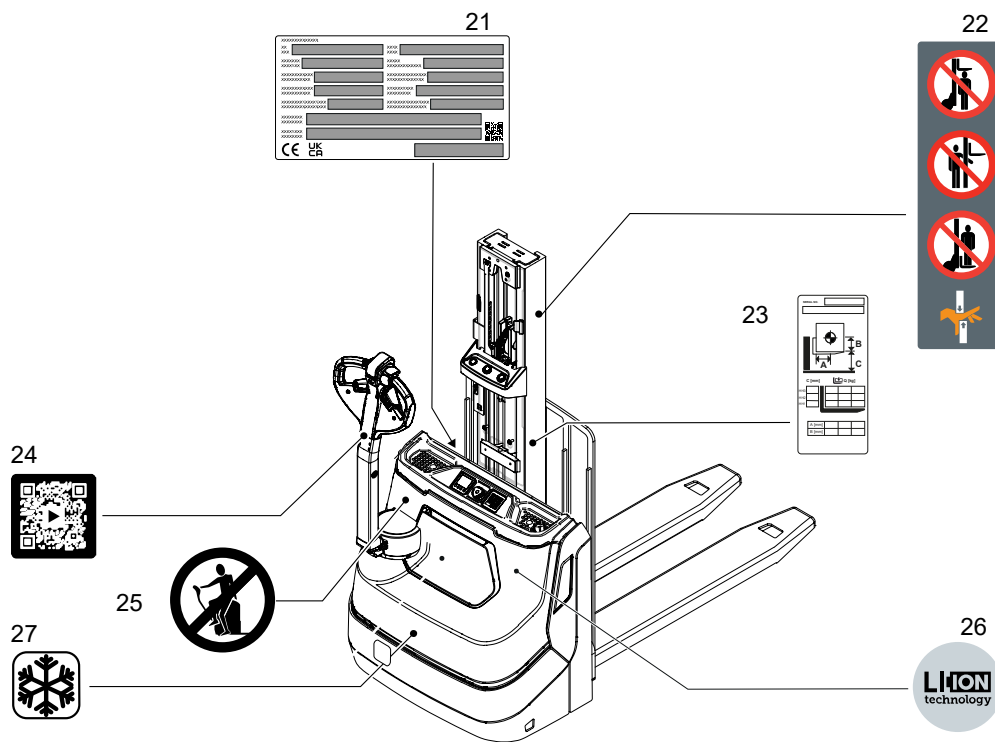
## 5.11 Safety of trucks

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

## 6 Identification Points and Data Plates

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

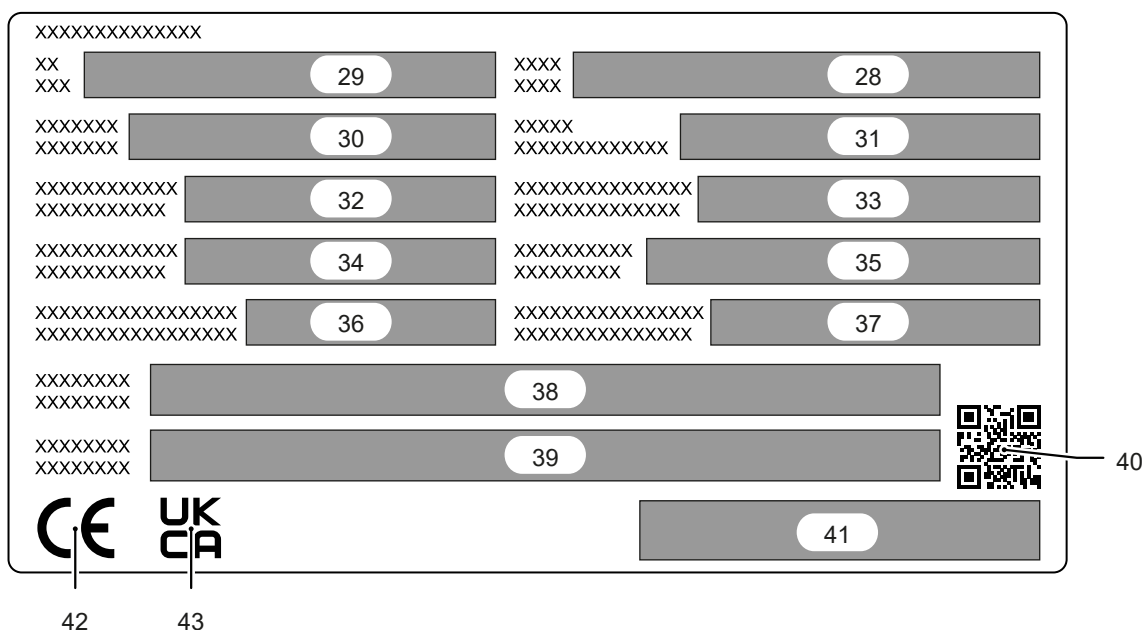
### 6.1 Indication Points



Item		Designation
21	●	Data plate
22	●	Combined plate: - Prohibition plate: "Do not step under the load handler" - Prohibition plate: "Do not reach through the mast" - Prohibition plate: "Lifting persons prohibited" - Risk of trapping
23	●	Truck capacity plate (varies depending on the truck equipment – see page 38)
24	●	Information sign: "QR code" → The QR code contains a short online video on the basic functions of the industrial truck.
25	●	Prohibition plate: "No passengers"
26	●	"Lithium-ion battery" plate
27	○	"Cold-store equipment" plate



## 6.2 Data plate



Item	Description	Item	Description
28	Year of manufacture	36	Net weight without battery [kg]
29	Type	37	Min./max. battery weight [kg]
30	Serial number	38	Manufacturer
31	Option	39	Importer - imported by (○)
32	Rated capacity [kg]	40	QR code
33	Load centre distance [mm]	41	Manufacturer's logo
34	Battery voltage [V]	42	CE marking <sup>1)</sup>
35	Drive output [kW]	43	UKCA marking (○) <sup>2)</sup>

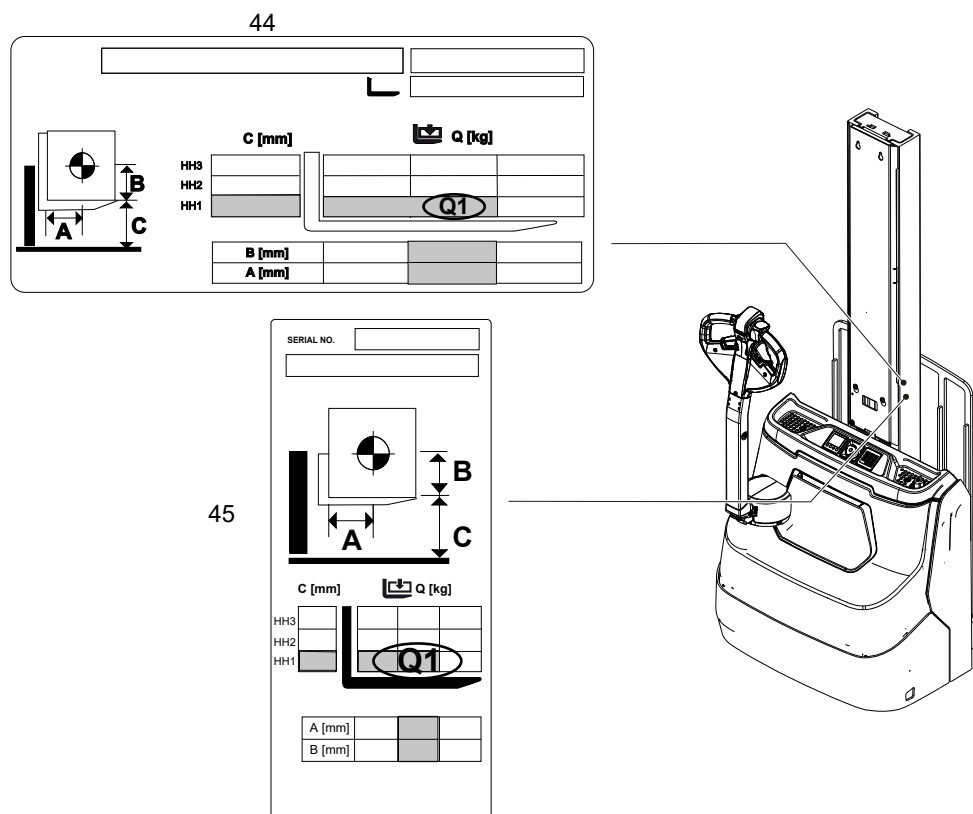
- For queries regarding the truck or when ordering spare parts, always quote the truck serial number (30).
- The illustration shows the standard version for EU member states. The data plate may differ in other countries.
- The battery data plate is described in the relevant section – see page 49.

<sup>1)</sup> Conformité Européenne

<sup>2)</sup> United Kingdom Conformity Assessed

## 6.3 Capacity plate

### 6.3.1 Type A

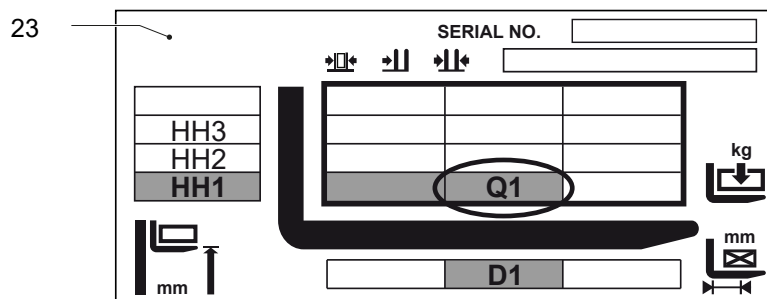


Item		Description
44	○	Horizontal truck capacity plate
45	○	Vertical truck capacity plate

The capacity plate (44, 45) indicates the maximum capacity Q (in kg) for a given load centre distance A (in mm) and corresponding lift height C (in mm) for the truck when picking up a load.

Example of how to calculate the maximum capacity: With a vertical load centre B, a horizontal load centre A and a lift height up to HH1, the maximum capacity is Q1.

### 6.3.2 Type B

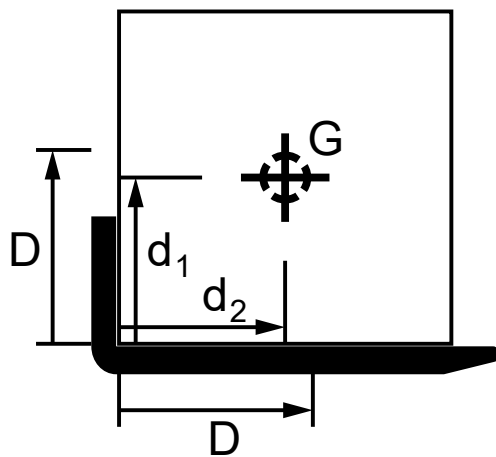


The capacity plate (23) indicates the maximum capacity Q (in kg) for a given load centre distance D (in mm) and corresponding lift height H (in mm) for the truck when raising a load.

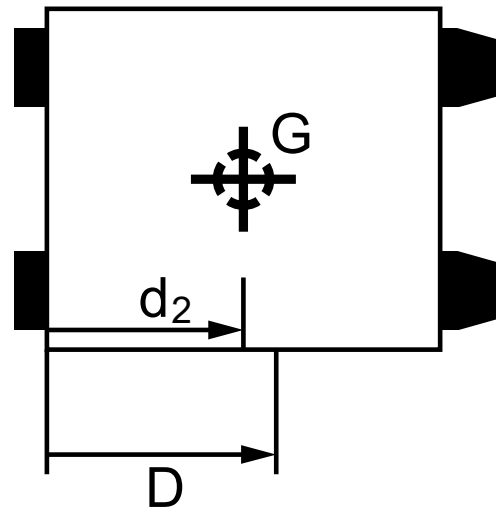
Example of how to calculate the maximum capacity: The maximum capacity is  $Q_1$  at a load centre  $G$  within the load centre distance  $D_1$  and a lift height up to  $HH_1$ .

## Load centre distance

Side view from the right



View from above



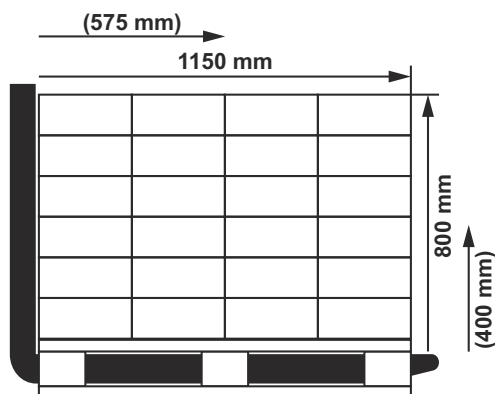
The load centre distance  $D$  of the load handler is specified as the horizontal distance from the front face and the vertical distance from the upper edge of the load handler.



The capacity plate for standard load handlers specifies valid load centre distances of 500 mm, 600 mm and 700 mm.

The distances  $d_1$  and  $d_2$  depicted in the illustration between the load handler and the actual centre of gravity  $G$  of the load must be smaller or equal to the load centre distance  $D$  ( $d_1 \leq D$  and  $d_2 \leq D$ ) to avoid the risk of overturning, see page 103.

### 6.3.3 Example of Use of Capacity Plate



SERIAL NO. <input type="text"/>		
<div> <div> <div></div> <div></div> <div></div> </div> <div> <div></div> <div></div> <div></div> </div> <div> <div></div> <div></div> <div></div> </div> </div>		
3600	850	850
3200	1050	1050
2900	1200	1200
<div> <div>mm</div> <div>mm</div> <div>mm</div> </div>		
500	600	700
<div> <div>kg</div> <div>mm</div> </div>		

Example load (palletised):

- several cardboard boxes of the same size and same weight
- Load height: 800 mm
- Load length: 1150 mm
- Distances between the load centre distance and the load handler:  
400 mm vertical, 575 mm horizontal

For loads with an even weight distribution, the load centre distance lies in the geometric centre of the volume.

For rectangular loads with an even weight distribution over the entire volume the load centre distance is in the middle, i.e. half the length, half the height and half the width of the load.

Load centre distance of the load handler:

- The capacity plate specifies valid load centre distances for the load handler of 500 mm, 600 mm and 700 mm.
- The second load centre distance suits the example load: At 600 mm it is greater than the distances of 400 mm and 575 mm between the load centre of gravity and the load handler .

Capacities as specified in the capacity plate depending on the lift heights at a load centre distance of 600 mm:

- At a lift height of 2900 mm the maximum capacity is 1200 kg.
- At a lift height of 3200 mm the maximum capacity is 1050 kg.
- At a lift height of 3600 mm the maximum capacity is 850 kg.



# C Transport and Commissioning

## 1 Lifting by crane

### **WARNING!**

#### **All persons involved in loading by crane must be trained**

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

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

### **WARNING!**

#### **Improper loading by crane can result in accidents**

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

- ▶ Prevent the truck from hitting other objects during lifting, and avoid uncontrolled movements. If necessary, secure the truck with guide ropes.
- ▶ Loading by crane may only be performed by persons who have been trained in the use of the lifting accessories.
- ▶ Wear personal protective equipment (e.g. safety shoes, hard hat, hi-vis jacket, protective gloves) when loading by crane.
- ▶ Do not stand under suspended loads.
- ▶ Do not enter or stand in the hazardous area.
- ▶ Always use lifting gear with sufficient capacity (observed truck weight in accordance with truck data plate – see page 37).
- ▶ Always secure crane lifting gear to the prescribed attachment points and prevent it from slipping.
- ▶ Use the lifting accessories only in the prescribed load direction.
- ▶ Lifting slings should be fastened in such a way that they do not come into contact with any attachments when lifting.

### **CAUTION!**

#### **Lowering of the drive frame when lifting the truck**

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

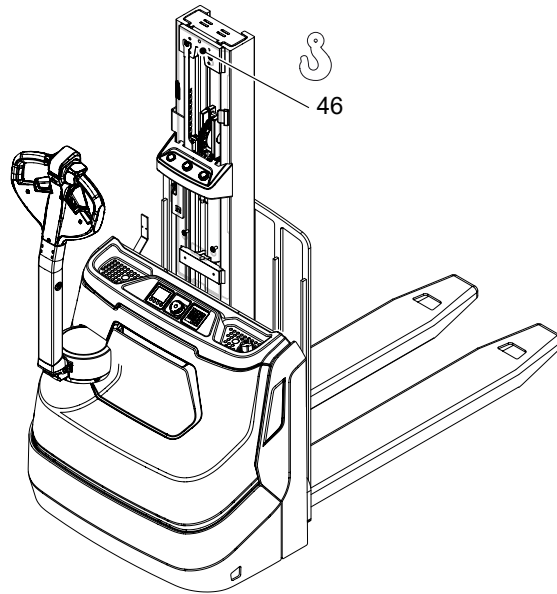
- ▶ Raise and set down the truck slowly and carefully.
- ▶ Keep the area around the truck clear.

### **CAUTION!**

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

The truck may swing when suspended.

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



### ***Loading the truck by crane***

#### ***Requirements***

- Truck parked securely, see page 84.

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

- Lifting gear
- Crane lifting gear

#### ***Procedure***

- Secure the crane lifting gear to the attachment points (46).

*The truck can be loaded.*



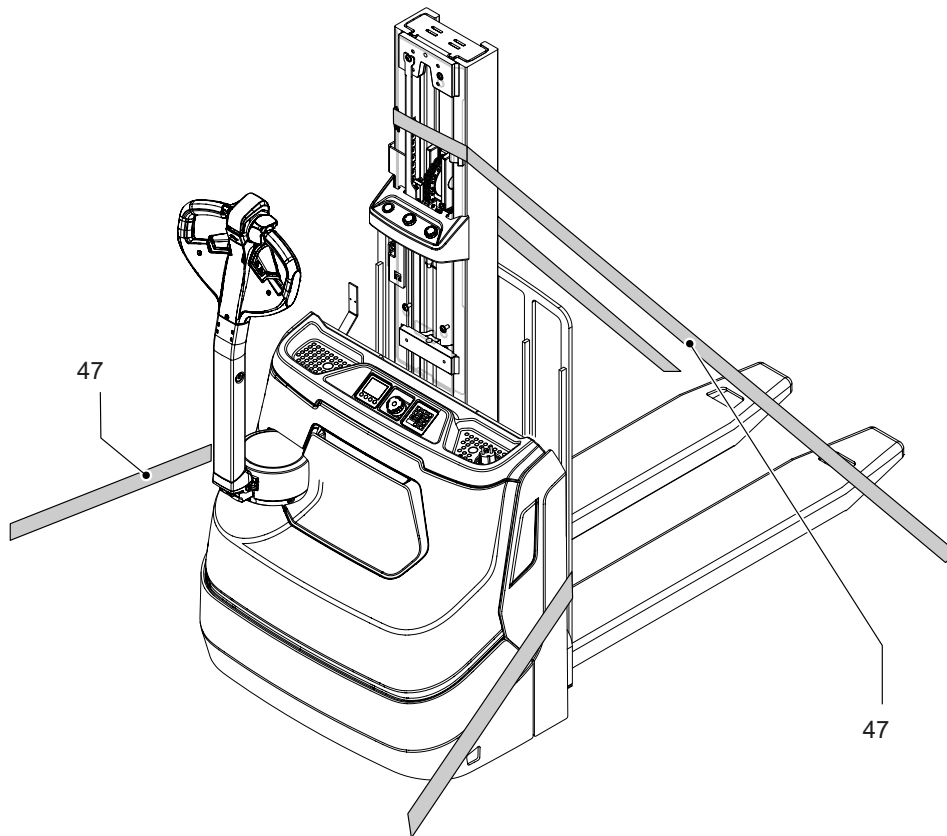
## 2 Transport

### **WARNING!**

#### **Danger due to uncontrolled movement of the truck or the mast during transport**

If the truck and mast are not properly secured during transport, serious accidents can occur. Slipping lashing straps can lead to uncontrolled movements of the truck or mast and even a fall during transport. Accidents caused by this can result in property damage and fatal injuries.

- ▶ Loading must only be performed by specialist personnel trained for this purpose. The specialist personnel must be instructed in securing loads on road vehicles and working with load securing equipment. Correct dimensioning and implementation of load securing measures must be ensured in each individual case.
  - ▶ The truck or mast must be professionally and securely fastened when transported on a lorry or trailer.
  - ▶ The lorry or trailer must be equipped with lashing rings.
  - ▶ Use wedges to prevent the truck from accidentally moving.
  - ▶ Use only lashing straps with sufficient tensile strength. Attach the lashing straps so that they cannot slip.
  - ▶ Use non-slip materials to secure the transport aids (pallet, wedges, etc.), e.g. non-slip mats.
-



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

#### ***Requirements***

- The truck is now loaded.
- Truck parked securely – see page 84.

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

- Lashing straps

#### ***Procedure***

- Attach the lashing straps (47) to the truck, strap them to the transport vehicle and tension sufficiently.

*The truck can be transported.*



Optionally, other fastening options (e.g. e.g. transport hooks for container shipping) can be used.

### 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.

---

#### **CAUTION!**

##### **Poor visibility through the protector**

The mast protection pane protector can impair the operator's visibility.

► Remove the protector (transport retainer) from both sides of the mast protection pane.

---

#### **NOTICE**

##### **Cold-store trucks**

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

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

► Note the permissible operating conditions, see page 12.

---

##### **Delivery in several parts**

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

##### **Wheel flattening**

If the truck has been parked for a long period, the wheel surfaces may tend to flatten. This flattening has a negative effect on the safety and stability of the truck. Once the truck has covered a certain distance, the flattening will disappear.

##### **Carrying out initial commissioning**

###### *Procedure*

- Check that the equipment is complete.
- Charge the battery – see page 57.
- Check the hydraulic oil level and correct if necessary – see page 161.
- Carry out initial commissioning of the optional equipment as soon as this is possible:
  - Activate the keypad or transponder reader – see page 125.

*The truck can now be started – see page 81.*



# D Battery

## 1 General safety regulations for batteries

### **WARNING!**

#### **Risk of overtemperature, fire or explosion due to incorrect handling**

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

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

#### **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.

## 2 Lithium-Ion Battery

### General information

The truck is equipped with an integrated 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 monitors the cell temperature, voltage and charge status of the cells, for example. The charge and discharge processes of the lithium-ion battery are also enabled and monitored by the lithium-ion battery.

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

If critical values are reached or malfunctions occur, messages may be displayed or cut-offs triggered on the truck.



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

## 2.1 Safety regulations for handling lithium-ion batteries

### 2.1.1 Correct application

#### **WARNING!**

Do not open the battery!

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

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

#### **WARNING!**

##### **Hazard from liquid or gaseous contents from the battery**

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

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

#### **NOTICE**

##### **Environmental hazard due to electrolyte fluid escaping from the battery cell**

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

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

### 2.1.2 Shipping information

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

- ADR = Accord européen relatif au transport international des marchandises Dangereuses par Route.
- If in doubt, contact the manufacturer's customer service department.
- A truck with a fixed lithium-ion battery can be transported without special precautions.

### 2.1.3 Battery lifetime and maintenance

#### **NOTICE**

##### **Damage to the lithium-ion battery due to discharge**

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

- ▶ Truck parked securely – see page 84.
- ▶ Fully charge the lithium-ion battery before extended periods of non-use or storage.
- ▶ Fully charge the lithium-ion battery every 3 months to protect against deep discharge.



## Maintenance

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

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

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

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

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

### 2.1.5 Touch voltage hazard

#### **WARNING!**

##### **Touch voltage hazard**

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

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

With this kind of defect, the battery must not be touched and must not come into contact with metal objects – see page 51.

## 2.2 Lithium-ion battery data plate

Lithium Ion Secondary Battery/Lithium-Ionen-Sekundärbatterie 48

Type Typ	49	Built (Year/Month) Herstellung (Jahr/Monat)	50
Serial No. Serial-Nr.	51	Supplier No. Lieferanten-Nr.	52

Nominal Capacity Nennkapazität	53	Rated Capacity C5 C6 Bemessungskapazität C5 C6	54
Nominal Energy (C5) Nennenergie (C5)	55	Nominal Voltage Nennspannung	56
Battery Weight ±5 % Batteriegewicht ±5 %	58	Battery No. Batterie-Nr.	57

Designation  
Bezeichnung 59

Manufacturer  
Hersteller 62

Batterie ID  
Batteriekennung 60

61

63

42

43

64

65






66

→ If you have any questions about the lithium-ion battery, supply the serial number (51) to either the manufacturer's customer service department or a customer service organisation authorised by the manufacturer.

Item	Description
42	CE mark ( <i>Conformité Européenne</i> )
43	UKCA marking ( <i>United Kingdom Conformity Assessed</i> )
48	Lithium-ion secondary battery
49	Battery type
50	Production (year/month)
51	Serial number
52	Supplier number
53	Rated capacity in ampere-hours [Ah]
54	Rated capacities C5 and C6 in ampere-hours [Ah]
55	Rated energy (C5) in watt-hours [Wh] – Calculation of the rated energy (C5): rated capacity C5 multiplied by the rated voltage
56	Rated voltage in volts [V]
57	Battery material number
58	Battery weight in kilogrammes [kg] – Tolerance range: 5 %
59	Designation

Item	Description
60	Battery identifier
61	QR code
62	Manufacturer
63	Manufacturer's logo
64	UL mark ( <i>Underwriters Laboratories</i> )
65	FCC mark ( <i>Federal Communications Commission</i> )
66	Safety and warning information – see page 55

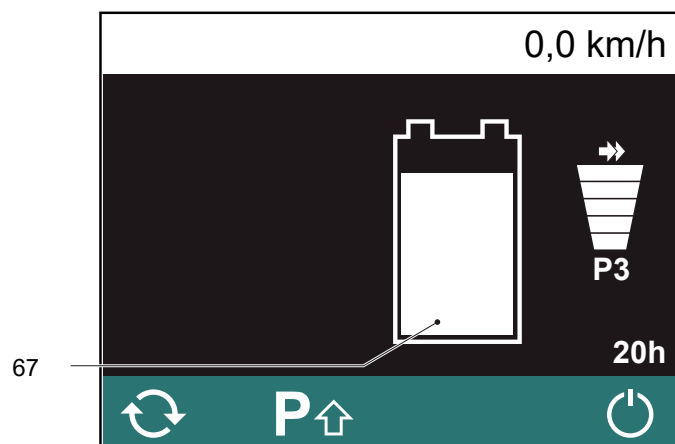
### 2.2.1 Safety Instructions, Warning Indications and other Notes

	<p>Observe the operating instructions</p> <ul style="list-style-type: none"> <li>– The operating instructions must be clearly visible at the charging location.</li> <li>– If any faults are identified on the battery, the battery must no longer be used. Immediately tag out the faulty battery and take it out of service. Contact the manufacturer's customer service department.</li> <li>– Do not attempt to rectify faults independently.</li> <li>– Do not open the battery.</li> </ul>
	<p>Avoid fire and short-circuits due to overheating</p> <ul style="list-style-type: none"> <li>– Do not ignite or position open flames, glowing embers or sparks near the lithium-ion battery.</li> <li>– Keep batteries away from strong heat sources.</li> </ul>
	<p>Hot surfaces</p> <ul style="list-style-type: none"> <li>– Battery cells can generate very high short-circuit currents, causing them to become hot.</li> </ul>
	<p>Hazardous electrical voltage</p> <ul style="list-style-type: none"> <li>– The metal parts of the battery cells are permanently live. Therefore, do not place any foreign objects or tools on the battery.</li> <li>– Observe the accident prevention regulations and DIN EN 62485-3.</li> </ul>
	<p>Protect the battery against heat and solar radiation.</p>

## 2.3 Battery types

Battery type	Rated voltage	Capacity
Lithium-ion	25.6 V	50 Ah
		100 Ah

## 2.4 Charge Status Indicator



The charge status of the lithium ion battery is shown on the display of the display unit (67). The display of the display unit also indicates important information on the operating condition of the lithium-ion battery as required (e.g. low charge status, excessively high or low temperature) – see page 68.

### Cut-out depending on the charge status

Depending on the charge status of the lithium-ion battery, the truck may initiate lift cut-off or travel cut-off:

- Lift cut-off:  
The lift cut-off prevents the load handler from lifting.  
Lowering of the load handler is still available.
- Travel cut-off:  
The travel cut-off locks the travel functions or reduces the truck travel speed.

### Deeply discharged batteries

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

- Contact the manufacturer's customer service department.

## 2.5 Removing or installing the battery

- The lithium-ion battery is permanently installed. Removal and installation are not foreseen in normal operation.

## 2.6 Charging the battery with an on-board charger

### 2.6.1 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 classes and resistance to acids and alkalis must correspond to those of the manufacturer's mains lead.
  - ▶ The mains connector must be dry and clean when used.
- 

#### **WARNING!**

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

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

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

#### **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!**

##### **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.
-

## **⚠ WARNING!**

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

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

- ▶ Before commissioning the truck, disconnect the mains cable from the mains socket and stow away in the designated position on the truck.
- ▶ If no additional protective measures have been taken <sup>3</sup>, do not charge the industrial truck at a mains socket that can be switched off.
- ▶ This warning must be taken into account by the operating company when analysing the risk.

## **⚠ WARNING!**

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

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

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

## **NOTICE**

### **Improper use of the on-board charger**

Material damage to the industrial truck

- ▶ Do not open the on-board charger.
- ▶ Only use the on-board charger to charge the battery installed in the industrial truck.
- ▶ Only use other batteries after installation and approval by the manufacturer's customer service department.
- ▶ Do not install the on-board charger in other industrial trucks.

<sup>3)</sup> One possible protective measure is the "mains plug detection, immobiliser" function.

## 2.6.2 Charge statuses and compensation charging

### Intermediate charging of the lithium-ion battery

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

- In the event of frequent intermediate charging, charge the lithium-ion battery fully at least once per week.
- Interrupt the charging process with the charging stop function before disconnecting the battery charger from the mains – see page 61. If the battery charger is not disconnected from the mains, charging continues automatically after a waiting time.
- When the battery is fully charged, charging ends automatically.

### Trickle charge

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 recommended that the trickle charge function of the battery charger be used in order to maintain the available capacity of the battery.

### Charging time

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

### Mains failure

Charging continues automatically after a mains failure.

## 2.6.3 Setting the Charging Characteristic

### **NOTICE**

#### **Battery damage**

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

---

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.

## 2.6.4 Charging Times

- The charging times apply to discharged lithium-ion batteries. Partial charging can be carried out at any time to bring forward the use of the industrial truck.

In the event of **high** or **low** battery temperature, the charging time of the lithium-ion battery is extended due to a reduction in the charge current.

### 15 A on-board charger (●)

Battery capacity	Charging time for a discharged battery
105 Ah	7 hours
150 Ah	10 hours
200 Ah	13 hours 20 minutes

### 35 A on-board charger (○)

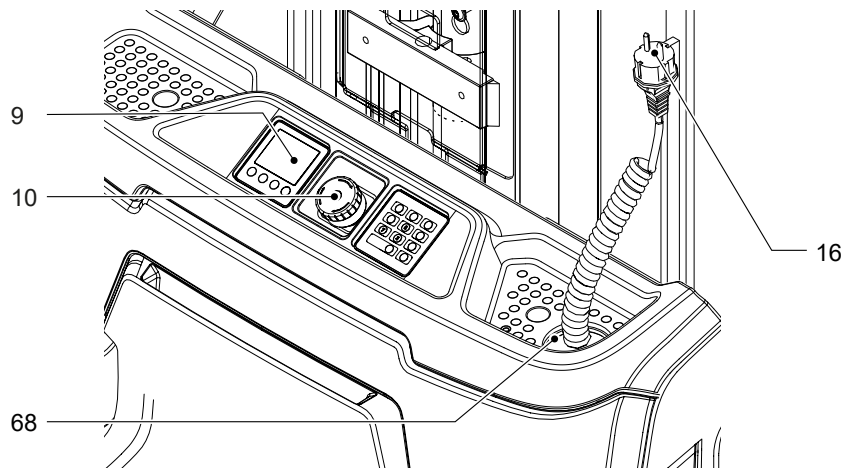
Battery capacity	Charging time for a discharged battery
105 Ah	3 hours
150 Ah	2 hours 20 minutes
200 Ah	5 hours 40 minutes

### 70 A on-board charger (○)

Battery capacity	Charging time for a discharged battery
105 Ah	1 hour 30 minutes
150 Ah	2 hours 10 minutes
200 Ah	2 hours 50 minutes



## 2.6.5 Charging the battery



### Charging the battery

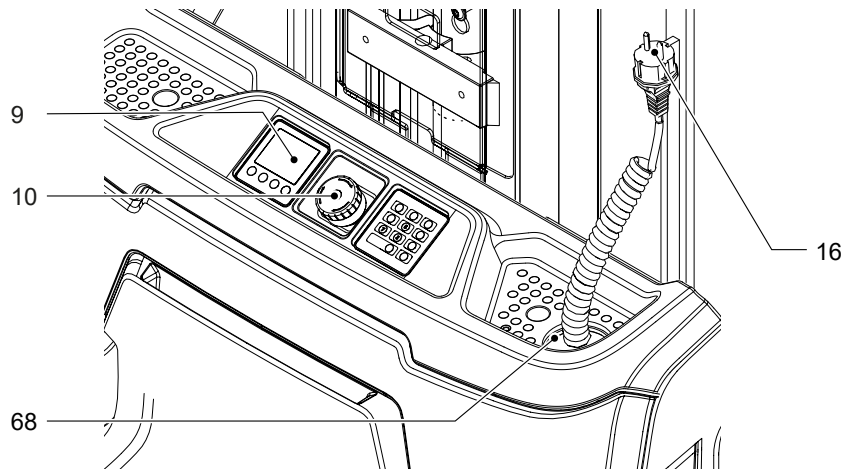
#### Requirements

- Truck parked securely – see page 84.

#### Procedure

- Check the cable and mains plug (16) of the on-board charger for visible damage before charging.
- ➔ If damage is identified, mark the truck accordingly and take it out of service. Have the truck repaired by the manufacturer or by a specialist authorised by the manufacturer.
- Plug the mains plug (16) into a mains socket.
- If the charge status is to be displayed on the industrial truck, unlock the emergency disconnect switch (10) – see page 90.
- ➔ The display unit (9) shows the charge status, symbols in connection with the charging stop or a fault – see page 68.

*Charging starts and ends automatically. The battery is charging.*



## **Completing the battery charge**

### *Requirements*

- The battery is partially or fully charged.

### *Procedure*

- Press the "charging stop" function button on the display unit to stop charging safely.
- ➔ The display unit shows the "unplugging main plug allowed" display symbol – see page 70.
- Unplug the mains plug (16) by pulling the plug (not the cable) out of the mains socket.
- **Always** stow the entire charger cable in the storage compartment (68).
- ➔ Only if equipped with the "mains plug detection, immobiliser" function (○); otherwise, a display symbol will appear on the display unit, see page 70. With this equipment, the truck can be started only when the mains plug is fully stowed in the storage compartment.
- Establish operational readiness.

*The truck is operational.*

# E Operation

## 1 Safety Regulations for the Operation of Forklift Trucks

### **WARNING!**

#### **Removing or disabling safety devices can cause accidents**

Removing or disabling safety devices such as the Emergency Disconnect switch, key switch, buttons, horn, strobe lights, mast protection pane, mast grille, sensors, panels etc. can result in accidents and injury.

- ▶ 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.

---

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

Safety devices, warning signs (see page 36) 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.

---

#### **Driver authorisation**

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

## **Operator's rights, responsibilities and rules of conduct**

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

### **Do not allow unauthorised persons to use the truck**

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

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

### **Damage and defects**

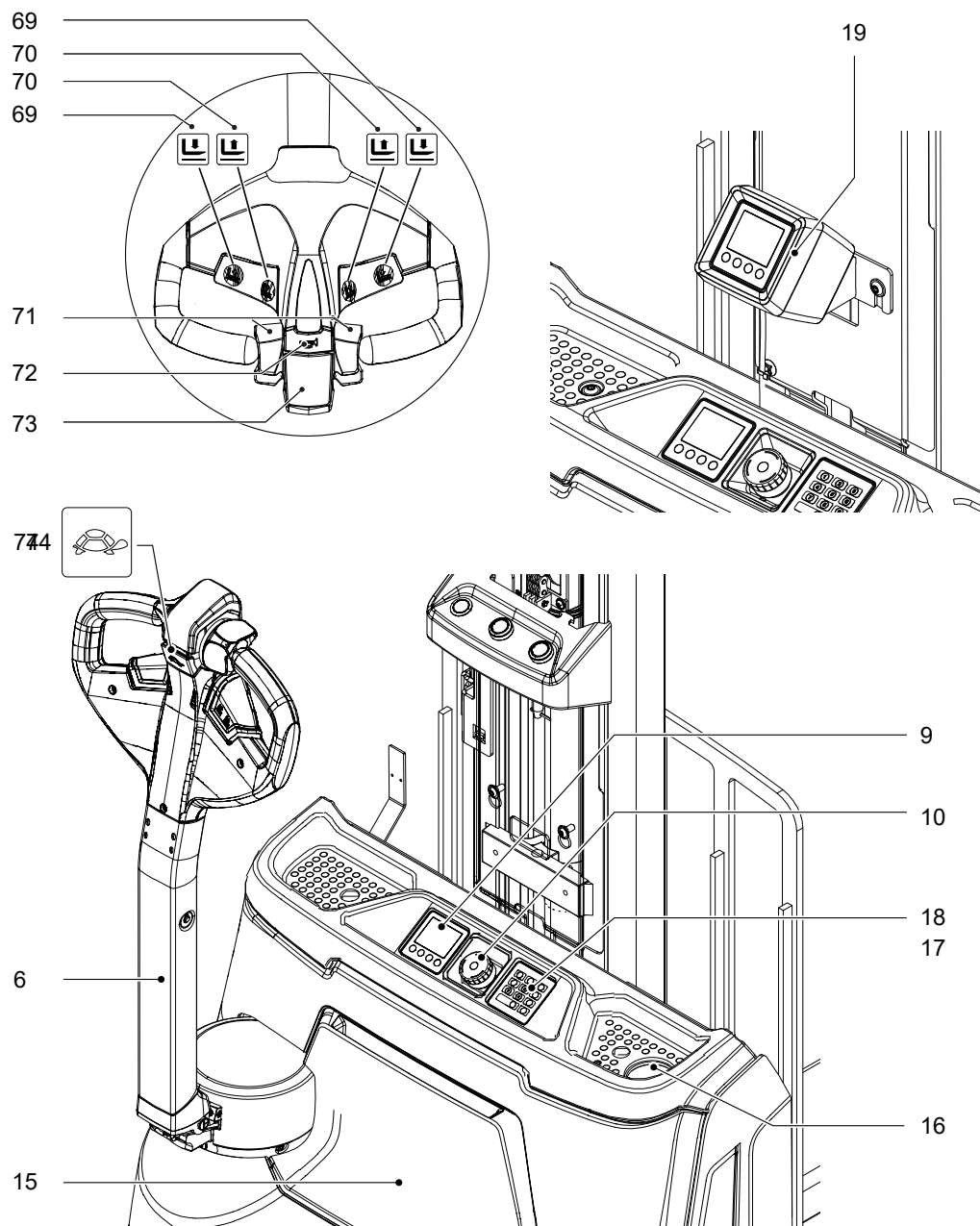
The supervisor must be informed immediately of any damage or faults to the truck or attachment. Trucks which are unsafe for operation (e.g. wheel or brake problems) must not be used until they have been rectified.

### **Repairs**

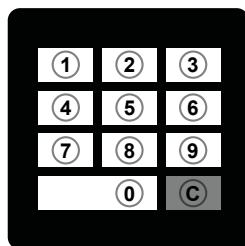
The operator must not carry out any repairs or alterations to the truck without authorisation and the necessary training to do so. The operator must never disable or adjust safety mechanisms or switches.

## 2 Displays and Controls

### 2.1 Overview



9



17



18

Item	Control/display		Function
6	Tiller	●	Controls lift and travel functions.
9	Display unit with 2-inch display	●	Display for: <ul style="list-style-type: none"> <li>– Battery charge status</li> <li>– Battery capacity</li> <li>– Service hours</li> <li>– Travel program</li> <li>– Warning indicators</li> <li>– Event messages</li> </ul> Selection of: <ul style="list-style-type: none"> <li>– Travel program</li> <li>– Options</li> <li>– Releasing the truck by entering master and access codes with EasyAccess Softkey</li> </ul>
10	Emergency disconnect switch	●	Used to brake the truck with maximum force and to interrupt the truck functions in an emergency. Activating the emergency disconnect switch disables all electrical functions in hazardous situations.
15	Document storage compartment	●	Used to store the operating instructions.
16	Mains plug for on-board charger	●	Used to charge the battery with the on-board charger – see page 57.
17	Keypad	○	Supplement to the display unit. <ul style="list-style-type: none"> <li>– Releasing the truck by entering setup and access codes with EasyAccess PinCode access system</li> </ul>
18	Transponder reader Plus	○	Supplement to the display unit. <ul style="list-style-type: none"> <li>– Releasing the truck by card/transponder with EasyAccess Transponder access system</li> <li>– The transponder reader Plus supports additional transponder standards</li> </ul>
19	Pre-Op Check display unit	○	Displaying the digital checklist for the Pre-Op Check <ul style="list-style-type: none"> <li>– Performing and logging a digitally guided status check for the industrial truck</li> <li>– Only available in conjunction with the Jungheinrich Fleet Management System.</li> <li>– For further information on the Pre-Op Check, see the "Jungheinrich Fleet Management System" operating instructions.</li> </ul>
72	"Warning signal" button (horn)	●	Used to trigger the warning signal (horn).
73	Collision safety switch	●	Safety feature, drive direction travel only: When applied, the truck travels for approx. 3 Seconds in the load direction. The parking brake is then applied. The truck remains switched off until the travel switch is returned to neutral.

Item	Control/display		Function
94	Travel switch	●	Controls travel direction and travel speed.
95	“Slow travel” button	●	If the tiller is in the upper braking zone, braking can be overridden by pressing the switch, and the truck can move at reduced speed (slow travel), see page 97.
96	“Lower load fork” button	●	Lowers the load fork at a variable speed.
97	“Raise load fork” button	●	Raises the load fork at a variable speed.

## 2.2 Battery discharge monitor

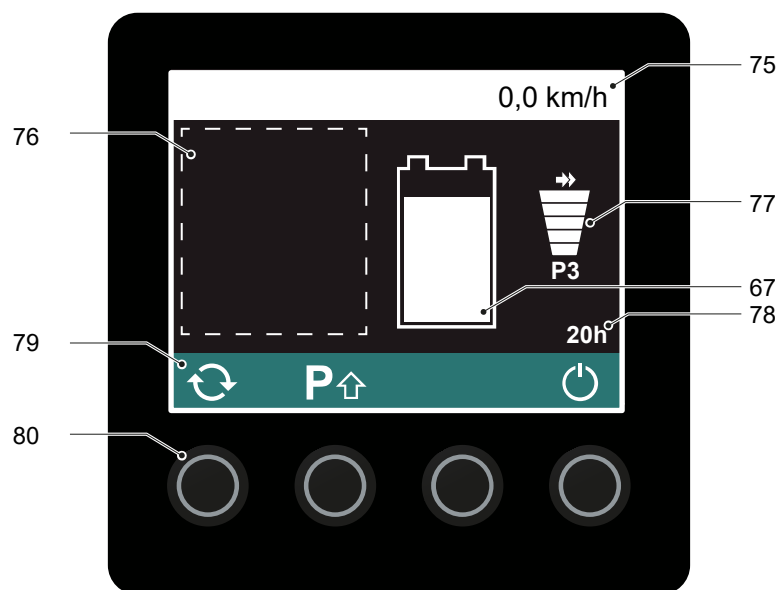


The default setting for the battery discharge monitor is made on lithium-ion batteries and cannot be changed.

If the residual capacity falls below the required level (< 12%), lifting is inhibited. A corresponding display appears. Lifting is not re-enabled until the lithium-ion battery is at least 13% charged.

## 2.3 Display unit

### 2.3.1 Display unit with 2-inch display



Item	Display or control element	Function
67	Battery charge status	The higher the fill level on the charge status indicator, the higher the residual capacity of the battery.
75	Information field	Displays event messages and optional information such as speed – see page 69.
76	Area for display symbols	Area for information concerning operation of the truck. The symbols shown depend on the operating situation and the truck status – see page 70.
77	Travel-program display	Displays the current travel program. The selected travel program is also shown in text form (P1, P2, P3) under the bar display.
78	Service-hours display	Displays the current number of service hours.
79	Function symbols	The functions shown as function symbols are operated using the function key located underneath, see page 74.
80	Function keys	Selection buttons for the corresponding functions.

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



### 2.3.2 Information field

#### Display of event messages

Current event messages are shown in the left section of the information line (75).

- Further information on the event messages shown: see page 110.

#### Speed display









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


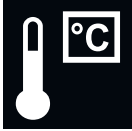




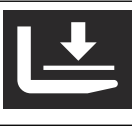

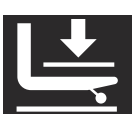
- The setting for the displayed units can be configured by the manufacturer's customer service department.




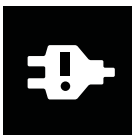
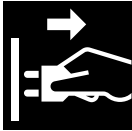

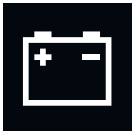


### 2.3.3 Display symbols






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

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

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

Symbol	Meaning	Colour	Function
	Lithium-ion battery low temperature	Yellow	Lights up to indicate a low temperature of the lithium-ion battery – Discharge currents and energy recovery are reduced.
		Red	Lights up to indicate a low temperature of the lithium-ion battery – The truck is switched off via the battery contactor. – The display unit switches off.
	Truck overtemperature	Yellow	Lights up when the temperature of the truck exceeds the permissible range. – Lifting, lowering and travel functions are reduced.
		Red	Lights up when the temperature of the truck exceeds the permissible range. – Lifting, lowering and travel functions are deactivated.
	Double-click lifting: Continuous lifting up to intermediate height or lift limit	Green	Lights up to indicate operational readiness of the automatic lift function.
		Yellow	Flashes when the load handler is raised via the automatic lift function.
	Indicator lamp	Green	Illuminated when at least one indicator lamp is switched on.
	Beacon / strobe light	Green	Beacon / strobe light is switched on.
	Lift end, load fork	yellow	Illuminates if the “Raise load fork” button is pressed when the lift limit in the mast lift has been reached.
		green	
	Lowering end, load fork	yellow	Illuminates if the “Lower load fork” button is pressed when the lowering limit in the mast lift has been reached.
	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.

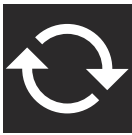


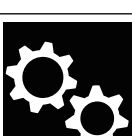


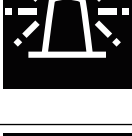

Symbol	Meaning	Colour	Function
	"Automatic support arm lift lowering" function active	Green	Lights up green when the function for automatic lowering of the support arm lift is active.
	The support arms are lowered.	Flashes yellow	Flashes yellow while the support arms are being lowered by the "automatic support arm lift lowering" function.
	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.
	Charging process	Green	Battery charge display (with on-board charger only): – Flashing: Charging in progress – Illuminates continuously: Charging complete
		Red	Charging interrupted
	Mains plug detection	Yellow	Lights up if the mains cable of the on-board charger is not fully stowed in the storage compartment.
	Unplugging mains plug allowed	White	Lights up when unplugging the mains plug of the on-board charger is allowed.
	Unplugging mains plug not allowed	White	Lights up when unplugging the mains plug of the on-board charger is not allowed. If charging is to be interrupted, the "charging stop" function button must be actuated.
	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.
	Impact display (equipment with fleet management system)	Yellow	Lights up when a moderate shock event has occurred. – Slow travel is triggered.
		Red	Lights up when a serious shock event has occurred. – Lifting and travel functions are deactivated.
	Eco mode	Green	Lights up when the energy-saving travel program is active.

Symbol	Meaning	Colour	Function
	Slow travel	Yellow	Lights up when the travel speed is reduced by the control unit of the industrial truck (e.g. optional when the load handler is completely lowered)
			Lights up when the operator reduces the travel speed ("slow travel" button pressed).
	Slow travel	Green	Lights up when slow travel is activated via an external interface (e.g. by the fleet management system).
		Yellow	
		White	
	Slow travel (foot protection tiller)	Yellow	Illuminates when speed reduction has been activated by the "foot protection tiller" assistance system.
	Buzzer	Green	Lights up when the transmitter is active during lifting.
	Overload at pressure sensor	Yellow	Lights up when the picked-up load slightly exceeds the permissible weight.
		Red	Lights up when the lift function of the truck is deactivated due to an excessive overload.





### 2.3.4 Function Symbols

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.






#### General

Symbol	Meaning	Function
	Function selection	Switches through the various functions and displays of the display unit.
	ON/OFF	Switches the truck on and off.
	Travel program	Switches through the various travel programs of the truck.
	Settings	Opens the Settings menu.
	Buzzer	Activates or deactivates the buzzer when the load handler is lifted.  → The buzzer is always activated when the industrial truck is restarted and must be switched off if necessary.
	Beacon	Activates or deactivates the beacon.  → The beacon must be actively switched on or off. The last switching position remains active.
	Charging stop	Used to safely interrupt charging before the mains plug of the on-board charger can be unplugged.
	ECO mode	Activates or deactivates ECO mode.

## Settings menu

Symbol	Meaning	Function
	Back	Cancels the current operation and returns to the previous menu.
	Edit access code/ transponder	To add or delete access codes or transponders.
	Changing the Set-up Code	To change the set-up code and to activate the keypad or the transponder reader.
	Log-in History	Shows the log-in history in chronological order.

## Submenus

Symbol	Meaning	Function
	Confirm	To confirm an entry or a transponder code.
	Adding	To add new access codes.
	Delete	To delete selected access codes.
	Selection up	For selecting the access codes or transponders and to scroll back during the log-in process.
	Selection down	For selecting the access codes or transponders and to scroll forward during the log-in process.

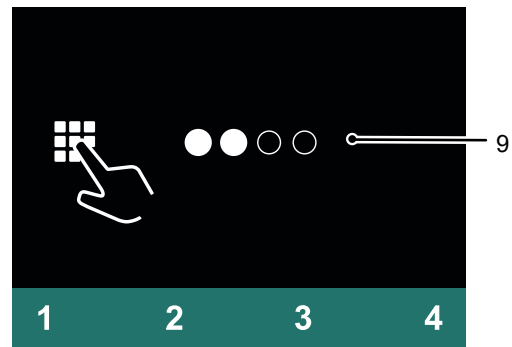
## 2.3.5 Using the Display:

### 2.3.5.1 Switching on the truck with an access code

#### *Procedure*

- Release the emergency disconnect switch, see page 90.
- Enter the access code with the buttons below the display (9).

*The truck is switched on.*

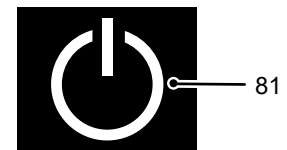


### 2.3.5.2 Switching off the truck

#### *Procedure*

- Press the key under the "Switch off" symbol (81) in the display unit.
- Press the Emergency Disconnect switch, see page 90.

*The truck is switched off.*





### 2.3.5.3 Changing the set-up code

#### Requirements

- The truck is switched on, see page 76.

#### Procedure

- Press the key below the "Settings" symbol (82).
- Press the key below the "Change set-up code" symbol (83).
- Enter the set-up code using the keys below the display unit (9).

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

- Press the key below the "Delete" symbol (84).

*The set-up code is deleted.*

- Enter the new set-up code using the keys below the display unit (9).

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

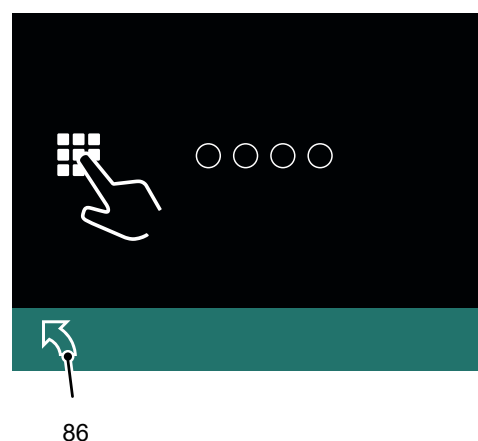
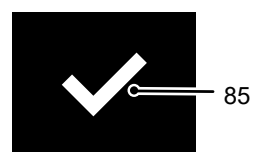
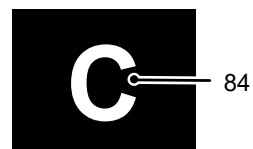
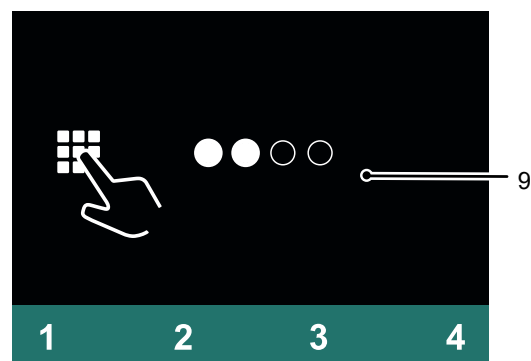
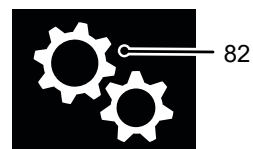
- Press the key below the "Confirm" symbol (85).

*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 (86).

*The set-up code has been changed.*



#### 2.3.5.4 Adding a new access code

## Requirements

- The truck is switched on, see page 76.

### Procedure

- Press the key below the "Settings" symbol (82).
- Press the key below the "Edit access code" symbol (87).

*The set-up code is requested.*

- Enter the set-up code using the keys below the display unit (9).

*All the access codes are displayed.*

- Press the key below the "Add" symbol (88).
- Enter the new access code using the keys below the display unit (9).

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

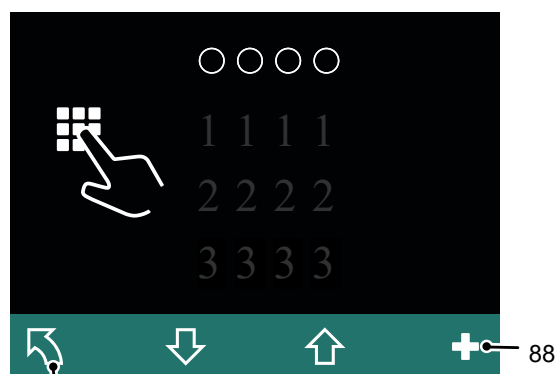
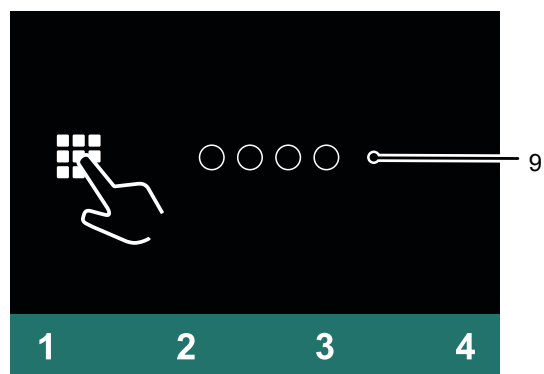
- Press the key below the "Confirm" symbol (85).

*The new access code is displayed.*

- ➔ If the new access code has been entered incorrectly, delete it, see page 79, and add an access code again.

To return to the main menu, press the key below the "Back" symbol (86).

*A new access code has been added.*



### 2.3.5.5 Deleting an access code

#### Requirements

- The truck is switched on, see page 76.

#### Procedure

- Press the key below the "Settings" symbol (82).
- Press the key below the "Edit access code" symbol (87).

*The set-up code is requested.*

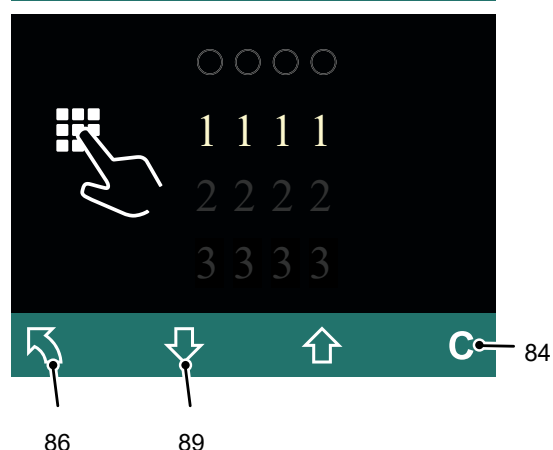
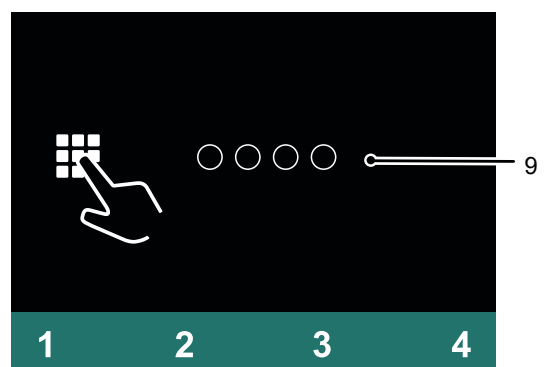
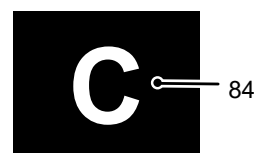
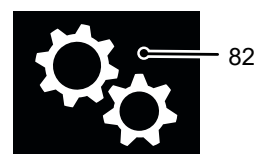
- Enter the set-up code using the keys below the display unit (9).

*All the access codes are displayed.*

- Select the access code to be deleted using the key below the "Down selection" symbol (89).
- Press the key below the "Delete" symbol (84).

*The access code has been deleted.*

- To return to the main menu, press the key below the "Back" symbol (86).



### 2.3.5.6 Displaying the log-in history

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

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

#### Requirements

- The truck is switched on, see page 76.

#### Procedure

- Press the key below the "Settings" symbol (82).
- Press the key below the "Log-in process" symbol (90).
- Enter the set-up code using the keys below the display unit (9).

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

- To scroll forward, press the button under the "Down selection" symbol (89) as many times as necessary.

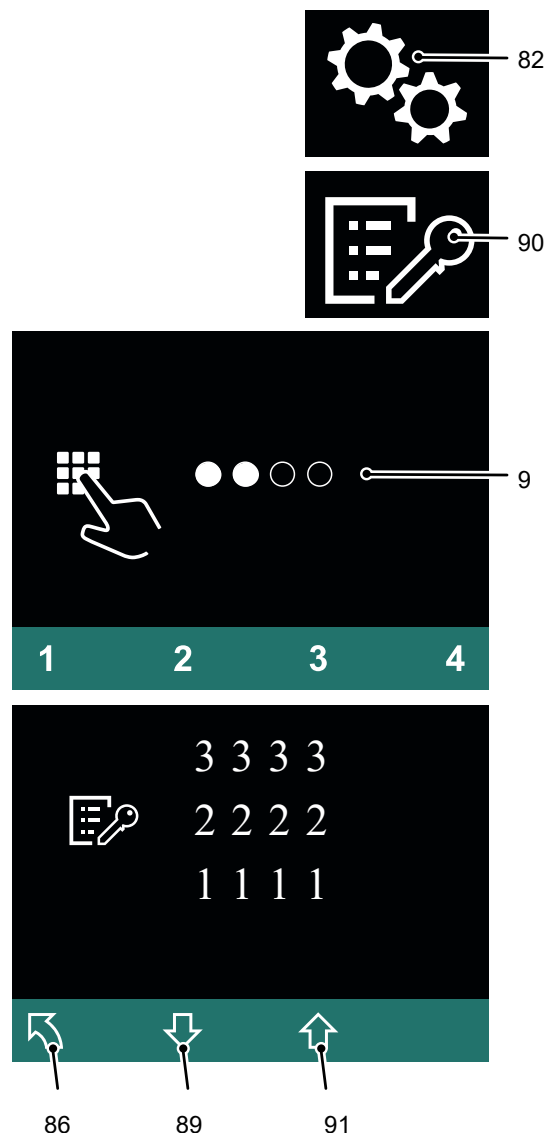
*The display area moves: Additional earlier log-ins are displayed.*

- To scroll back, press the button under the "Up selection" symbol (91) 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 (86).

*The log-in process is displayed.*



## 3 Preparing the Truck for Operation

### 3.1 Checks and Operations to Be Performed Before Starting Daily Work

#### **WARNING!**

**Damage and other truck or attachment (optional equipment) defects can result in accidents.**

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.

---

#### ***Performing checks before daily operation***

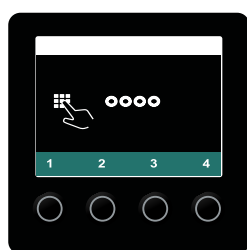
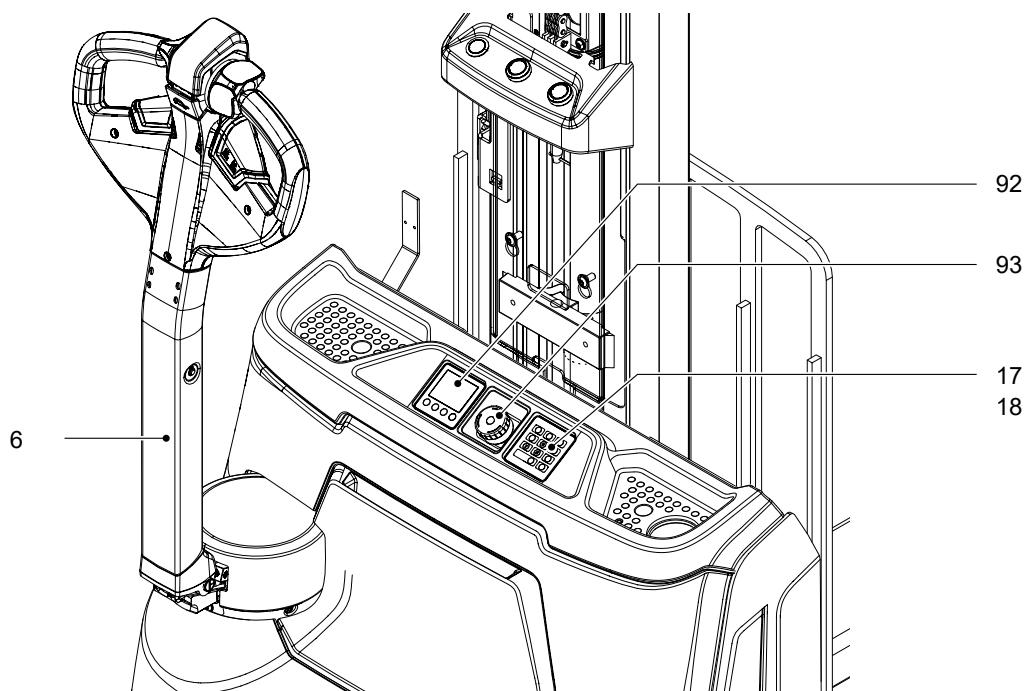
##### *Requirements*

- Truck parked securely – see page 84.

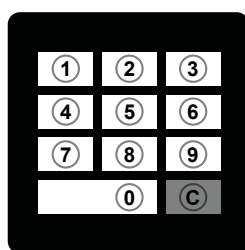
##### *Procedure*

- Check the whole of the outside of the truck for signs of damage and leaks. Damaged hoses must be replaced immediately.
- Check the load handler for visible signs of damage such as cracks, bent or severely worn forks.
- Check the hydraulic system for leaks – see page 161.
- Check the drive wheel and load wheels for damage and freedom of movement – see page 165.
- Check the protective screen panel/protective grille and the mounting for correct seating and damage.
- Check that the drive panels and covers are securely attached and check for damage – see page 19.
- With the load handler lowered, check the mast chains are tensioned and secured correctly.
- Check the markings and labels for completeness and legibility – see page 36.
- Check that the controls return automatically to the neutral position after being used – see page 93.
- Check that the tiller automatically returns to the upright position – see page 92.

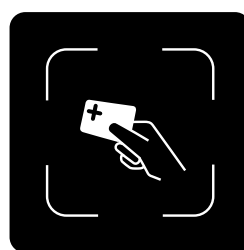
## 3.2 Preparing the truck for operation



9



17



18

### Switching on the truck

#### Requirements

- Checks and operations before starting daily work completed, see page 81.
- Tiller (6) in the upper braking zone – see page 99.

#### Procedure

- Unlock the emergency disconnect switch (10) – see page 90.
- Switch on the industrial truck with the available keyless access system – see page 125.

*The truck is ready for use.*

- ➔ If the industrial truck is equipped with the Pre-Op Check function (○), the associated checklist must first be processed before the truck is fully ready for operation. For further information on the Pre-Op Check, see the "Jungheinrich Fleet Management System" operating instructions.
- ➔ If the truck cannot be switched on: Read any event messages on the display unit (9) and use the "Troubleshooting" section to identify the cause – see page 110.

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

#### **WARNING!**

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

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

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

---

#### *Procedure*

- Test warning indicators 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 unlock the emergency disconnect switch.
  - Test the horn by pressing the "warning signal" button – see page 65.
  - Test the collision safety switch by pressing the switch while travelling in the drive direction.
  - Test the brakes, see page 99.
- Test the travel functions – see page 93.
- Test the steering – see page 98.
- Test the hydraulic functions, see page 101.
- Test the displays and controls and check for damage – see page 65.

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

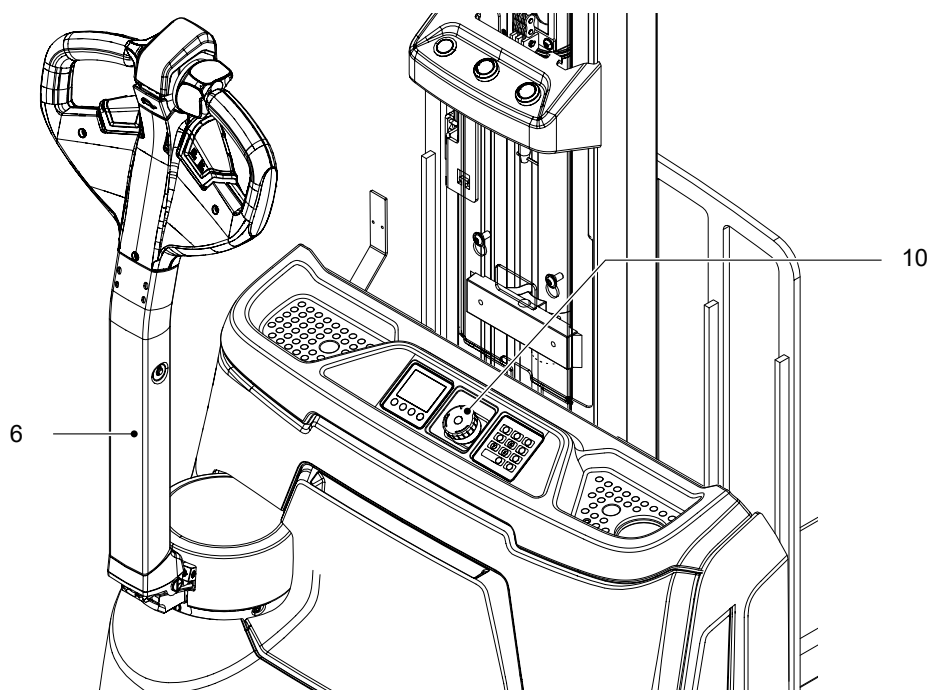
#### **WARNING!**

##### **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, see page 101.
- Set the drive wheel to "straightahead travel" using the tiller (6).
- Switch off the truck – see page 76.
- Press the emergency disconnect switch (10).

*The truck is parked.*

## 4 Working with the truck

### 4.1 Safety regulations for travel mode

#### Travel paths and work areas

##### **DANGER!**

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

At blind spots get a second person to assist.

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

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

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

#### Travel conduct

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

#### Travel visibility

The operator must look in the direction of travel and must always have a clear view of the route ahead. If the truck is carrying loads that affect visibility, the truck must travel against the load direction. If this is not possible, a second person must walk alongside the truck as a lookout to observe the travel route while maintaining eye contact with the operator. Proceed only at walking pace and with particular care. Stop the truck as soon as you lose eye contact.

## Negotiating lifts, loading ramps and docks

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

### Type of loads to be carried

#### **WARNING!**

##### **Risk of injury from falling loads**

Low or small item loads moved above the mast protection pane or grille (○) and protruding over the load backrest can fall, endangering the operator and truck.

- Secure low or small item loads protruding over the load backrest, e.g. by wrapping them in film.

---

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.

#### 4.1.1 Negotiate 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 27.
- The uphill and downhill slopes 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 truck must not be turned, operated at an angle or parked on uphill and downhill slopes.
- Downhill slopes must only be negotiated at slow speed, with the driver ready to brake at any moment.
- In accordance with the German accident prevention regulations DGUV regulation 68 (as at August 2013), when travelling on slopes and inclines, the load must be guided uphill.
- When travelling on slopes and inclines unladen, the load handler must be guided downhill.
- Deviating national regulations must be given priority by the operating company.

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

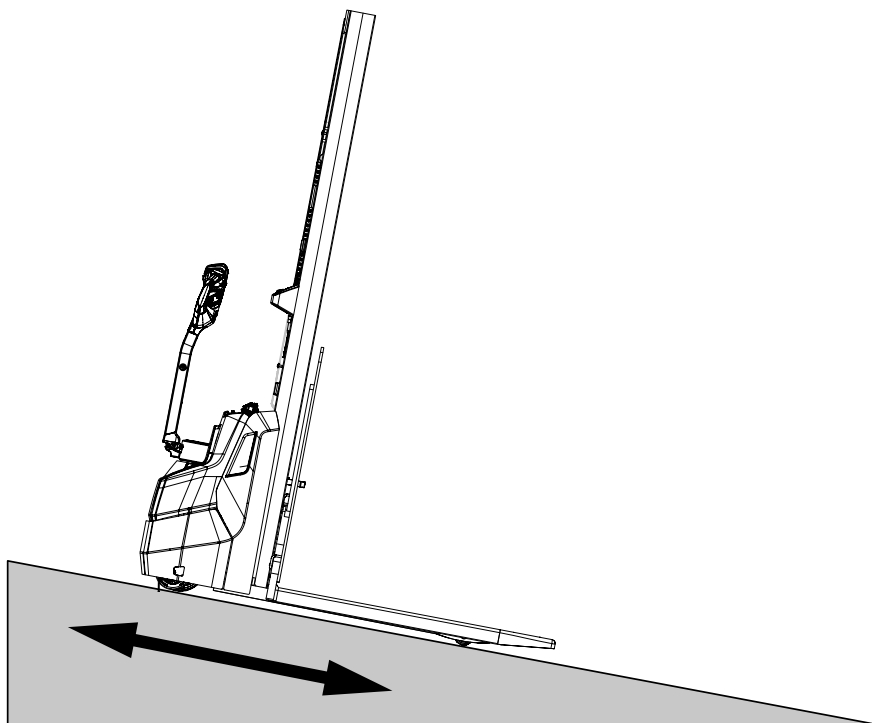
→ When travelling on slopes and inclines unladen, the load handler must always be oriented towards the downslope.

→ Deviating national regulations must be given priority by the operating company.

##### 4.1.1.1 Load status

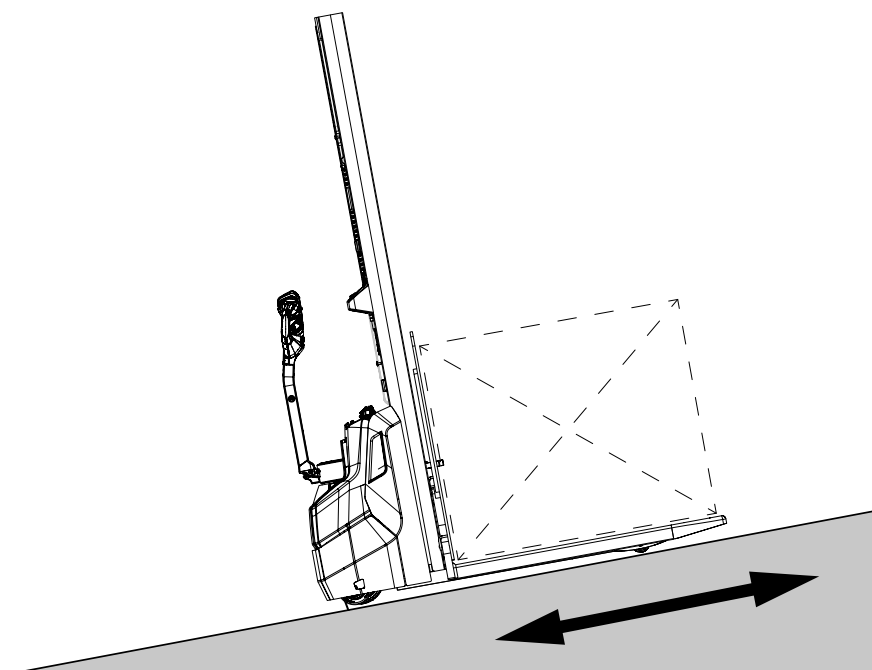
The travel direction that should be selected when driving on slopes and inclines depends on the current load status (transport travel or unladen travel).

#### 4.1.1.2 Empty journey



- When travelling unladen in pedestrian mode, the load handler must be guided downhill, irrespective of the travel direction.

#### 4.1.1.3 Transport run



- When travelling laden in pedestrian mode, the load handler must be guided uphill, irrespective of the travel direction.

## 4.2 Emergency Disconnect

### CAUTION!

#### **Applying maximum braking can result in accidents**

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

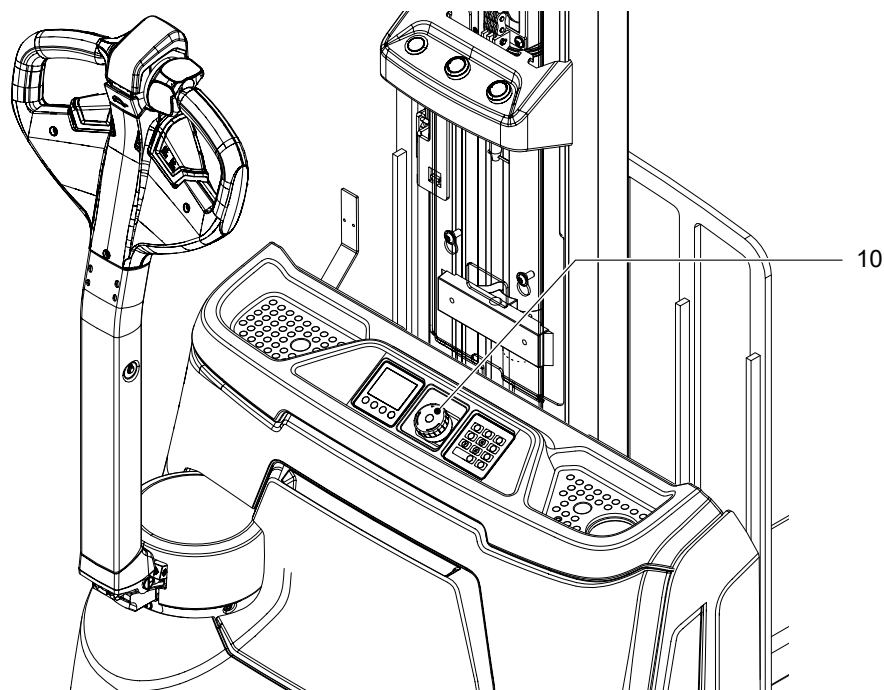
- ▶ Do not use the Emergency Disconnect switch as a service brake.
  - ▶ Use the Emergency Disconnect switch during travel only in emergencies.
- 

### CAUTION!

#### **Faulty or non-accessible Emergency Disconnect switches can cause accidents**

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

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



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

#### ***Procedure***

- Press the emergency disconnect switch (10).

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

### ***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).*

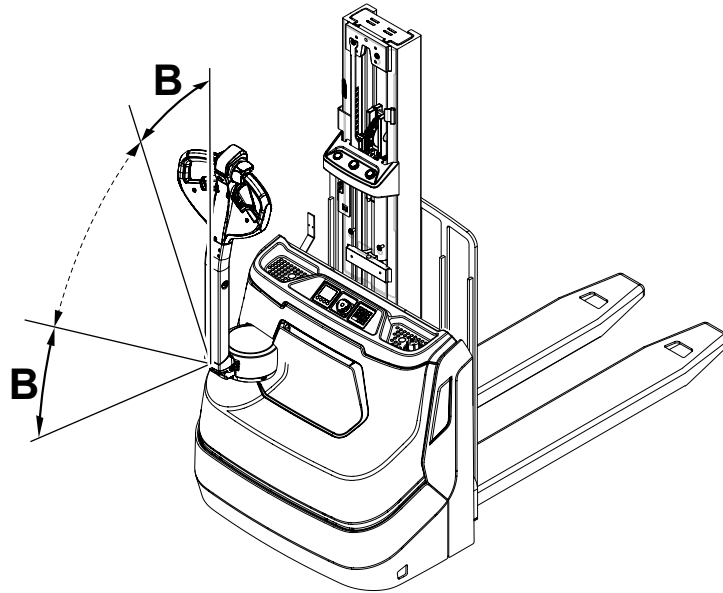
## 4.3 Automatic braking

### **⚠ WARNING!**

#### **Faulty tillers can result in collisions**

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

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



#### **Automatic reset of the tiller**

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



## 4.4 Travel

### ⚠ WARNING!

#### Collision hazard when operating the truck

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

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

### ⚠ CAUTION!

#### Trapping hazard from the truck during pedestrian mode

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

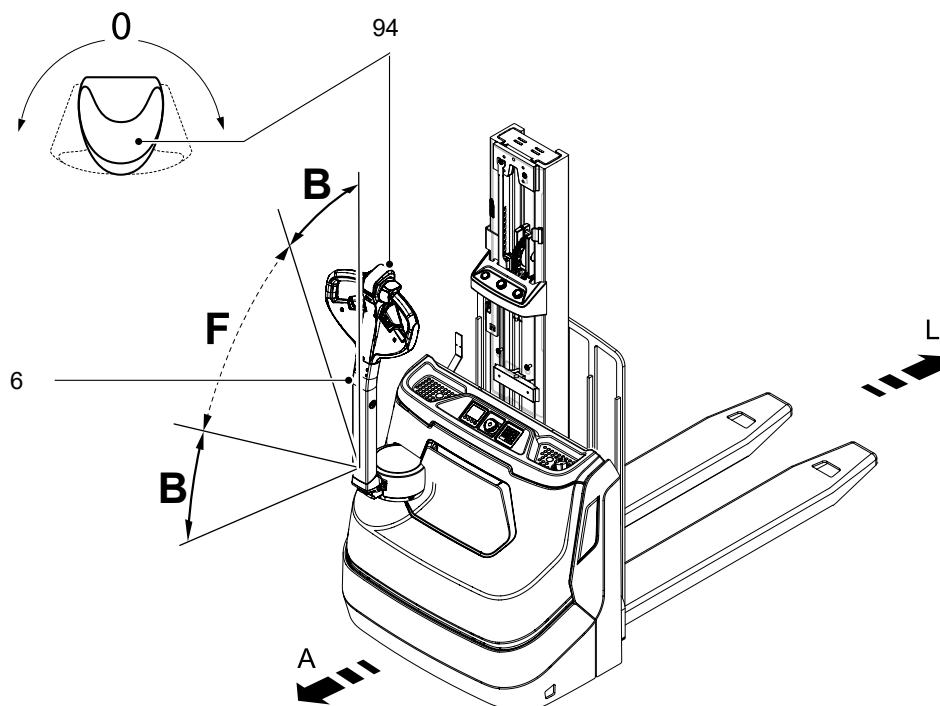
- ▶ Wear personal protective equipment (e.g. safety shoes).
- ▶ The truck must be operated with particular care and attention in pedestrian mode.
- ▶ Make sure there are no other people standing between the truck and obstacles when operating in pedestrian mode.

### ⚠ CAUTION!

#### Automatic braking can cause accidents

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

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



#### Requirements

- Truck has been prepared for operation – see page 81.

### *Procedure*

- Set the tiller (6) to the travel zone (F).
- Control the travel direction with the travel switch (94):
  - Slowly turn the travel switch in the load direction (L):  
Travel in load direction.
  - Slowly turn the travel switch in the drive direction (A):  
Travel in drive direction.
- Control the travel speed with the travel switch (94):
  - The further the travel switch is turned, the higher the speed.

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

### **Automatic reset of the travel switch**

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

### **Automatic reset of the tiller**

When released, a gas pressure spring pushes the tiller up and activates braking see page 92.

### **Roll-back protection on inclines (speedCONTROL) (○)**

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

#### 4.4.1 Changing the direction of travel

##### **CAUTION!**

##### **Danger when changing direction during travel**

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

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

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

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

- Set the travel switch (94) to the opposite direction while travelling.

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

#### 4.4.2 Slow travel

##### **⚠ CAUTION!**

##### **Risk of accident if the service brake is deactivated**

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

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



The truck can be operated with an upright tiller (6) (e. g. in confined spaces / elevators).

##### **Switch on the slow travel function**

###### *Procedure*

- Press and hold down the "slow travel" button (95).
- Rotate the travel switch (94) in the required travel direction.

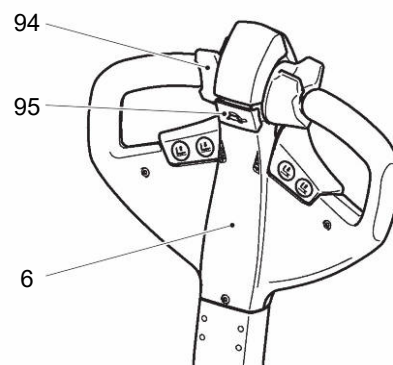
*The brake is released. The truck travels at slow speed.*

##### **Switching off slow travel**

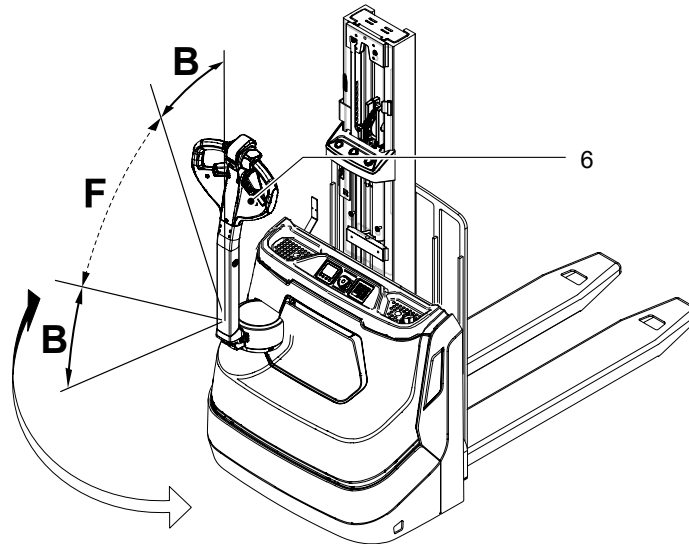
###### *Procedure*

- Release the "slow travel" button (95).  
*If the tiller is in brake zone "B", the brake applies and the truck stops.*  
*If the tiller is in brake zone "F" the truck continues at slow travel speed.*
- Release the travel switch (94).

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



## 4.5 Steering



### Procedure

- Swivel the tiller (6) to the left or right.

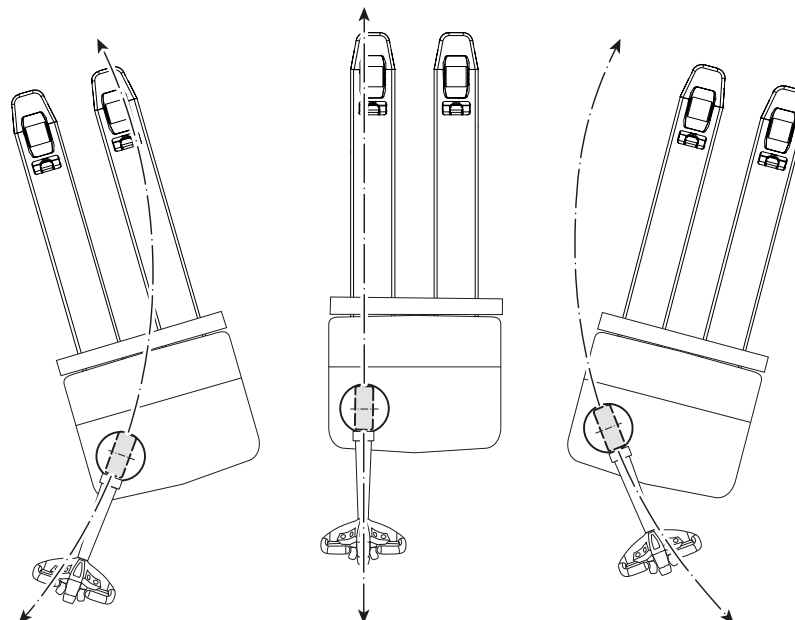
*The truck is steered in the required direction.*



The steering direction of the truck corresponds to the swivel direction of the tiller, as shown by the figure.

The curve radius is determined by the swivel angle of the tiller.

### Steering direction



The steering direction of the truck corresponds to the swivel direction of the tiller, as shown by the figure.

The curve radius is determined by the swivel angle of the tiller.

## 4.6 Brakes

### ⚠ WARNING!

#### Accident risk

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

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

### ⚠ CAUTION!

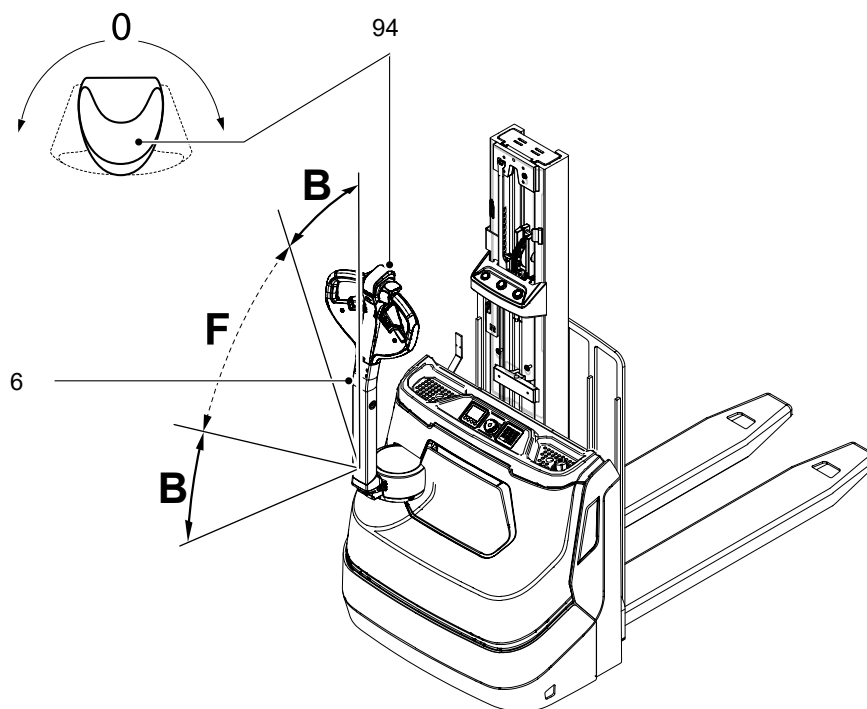
#### Applying maximum braking can result in accidents

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!

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



The truck can be braked in the following ways:

- Regeneratively with the service brake (tiller in braking zone B)
- Regeneratively with the coasting brake
- With the inversion brake (by reversing the travel direction via the travel switch)
- In emergencies: with the emergency stop switch – see page 90.

### 4.6.1 Braking with the service brake

#### Procedure

- Move the tiller (6) up or down to one of the brake zones (B).

*The truck brakes to a halt regeneratively via the service brake.*

#### **4.6.2 Braking with the coasting brake**

##### *Procedure*

- If the travel switch (94) is set to (0), the truck automatically brakes regeneratively.

*The truck brakes to a halt regeneratively via the coasting brake.*



*When braking regeneratively, energy is returned to the battery, ensuring a longer service time.*

#### **4.6.3 Inversion braking**

##### **⚠ 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.

---

##### *Procedure*

- Set the travel switch (94) to the opposite travel direction during travel – see page 96.

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

#### **4.6.4 Parking brake**

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



## 4.7 Raising or Lowering the Load Handler

### **WARNING!**

#### **Risk of accidents during lifting and lowering**

People can be injured in the hazardous area of the truck.

The hazardous area is defined as the area in which people are at risk from movements of the truck including the load handler etc. This also includes areas which can be reached by falling loads, operating equipment etc.

Apart from the operator (in the normal operating position), no other people are permitted in the hazardous area of the truck.

- ▶ 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.
- ▶ If people do not leave the hazardous area despite the warning, prevent the truck from being used by unauthorised people.
- ▶ Only carry loads that have been secured and positioned in accordance with regulations. Use suitable precautions to prevent parts of the load from tipping or falling off.
- ▶ Never exceed the maximum loads specified on the capacity chart.
- ▶ Never walk or stand underneath a raised load handler.
- ▶ Do not stand on the load handler.
- ▶ Do not lift other people on the load handler.
- ▶ Never reach or climb into moving truck parts.
- ▶ Do not climb onto parts of the building or other trucks.

### **NOTICE**

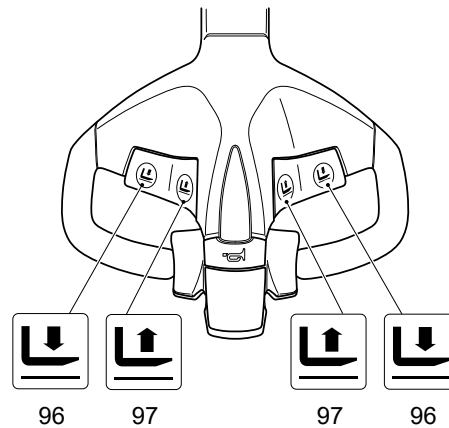
#### **Risk of material damage to the hydraulic unit**

Once you have reached the mechanical limit position, release the button for raising the load handler. Otherwise, the hydraulic unit may suffer material damage.



Hydraulic function lock: The default setting of the control enables lifting and lowering only when the tiller is in the travel range (F) or when the "slow travel" button is pressed. The default setting can be changed via a parameter – see page 138.

### 4.7.1 Raising or Lowering the Load Fork



#### *Requirements*

- Truck ready for operation and switched on see page 82.

#### *Procedure*

- Actuate the "raise load fork" button (97) until the desired lift height is reached.

- ➔ The lift speed can be infinitely controlled via the stroke of the button (approx. 8 mm).
  - ▶ Short button stroke = slow lift
  - ▶ Long button stroke = fast lift

*Load fork is raised.*

#### *Procedure*

- Press the "lower load fork" button (96) until the desired lift height is reached.

- ➔ EJC 110i (E), EJC 110bi (E) (●): The lowering speed can be controlled at two levels via the stroke of the button (approx. 8 mm).
  - ▶ Short button stroke = slow lower
  - ▶ Long button stroke = fast lower
- ➔ EJC 110i (E), EJC 110bi (E) (○): The lowering speed can be infinitely controlled via the button travel (approx. 8 mm).
  - ▶ Short button stroke = slow lower
  - ▶ Long button stroke = fast lower

*Load fork is lowered.*

#### **Use as an elevated work table**

The raised load handler can be used as an elevated work table when the truck is switched off, see page 109.

## 4.8 Lifting, transporting and depositing loads

### **WARNING!**

#### **Unsecured and incorrectly positioned loads can cause accidents**

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

- ▶ 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.
- ▶ Only carry loads that have been correctly secured and positioned. Use suitable precautions to prevent parts of the load from tipping over or falling off the truck.
- ▶ Damaged loads must not be transported.
- ▶ Never exceed the maximum loads specified on the load diagram.
- ▶ Never stand underneath a raised load handler.
- ▶ Do not stand on the load handler.
- ▶ Do not lift other people on the load handler.
- ▶ Insert the load handler as far as possible underneath the load.
- ▶ Cornering should be avoided when stacking and retrieving due to the risk of tipover.

### **WARNING!**

#### **Risk of injury from falling loads**

Low or small item loads moved above the mast protection pane or grille (○) and protruding over the load backrest can fall, endangering the operator and truck.

- ▶ Secure low or small item loads protruding over the load backrest, e.g. by wrapping them in film.

### **CAUTION!**

- ▶ Do not lift long loads at an angle.

### **NOTICE**

#### **Risk of material damage to the hydraulic unit**

Once you have reached the mechanical limit position, release the button for raising the load handler. Otherwise, the hydraulic unit may suffer material damage.

- At lift heights > 1800 mm, truck speed is reduced to 2,5 km/h. Truck acceleration is reduced from a lift height of 1800 mm.
- Observe the information and instructions on lifting and lowering the load handler – see page 101.

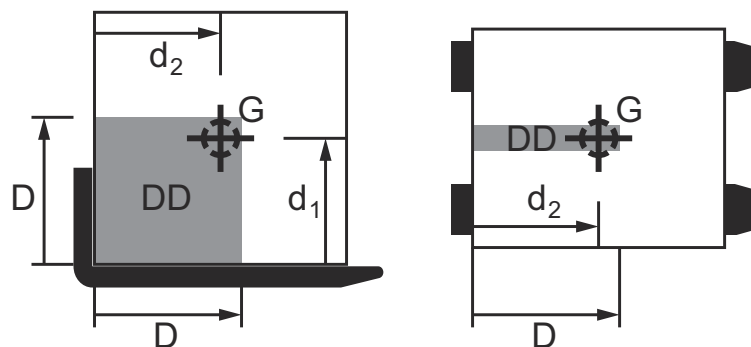
#### 4.8.1 Load Centre

##### **⚠ WARNING!**

##### **Risk of accident when the centre of gravity of the load is outside of the load centre distance**

If the centre of gravity  $G$  of a raised load lies outside the load centre distance  $D$  specified for the load handler in the horizontal or vertical planes, under unfavourable conditions the raised load and also the truck can tip over while working.

- ▶ Observe load centre distances and capacities of the load handler, see page 38.
- ▶ Pick up the load so that its centre of gravity lies between the load arms of the load handler.
- ▶ Preferably, the load should be configured and picked up so that its centre distance lies within the load centre distance of the load handler ( $d_1 \leq D$  and  $d_2 \leq D$ , see area DD in the illustration).
- ▶ A load with a centre of gravity outside of the load centre distance of the load handler ( $d_1 > D$  and/or  $d_2 > D$ ) should only be moved very carefully, as this load case has not been checked on a truck tested according to the test guideline.



For loads with an even weight distribution, the load centre distance lies in the geometric centre of the volume.

For rectangular loads with an even weight distribution over the entire volume the load centre distance is in the middle, i.e. half the length, half the height and half the width of the load.

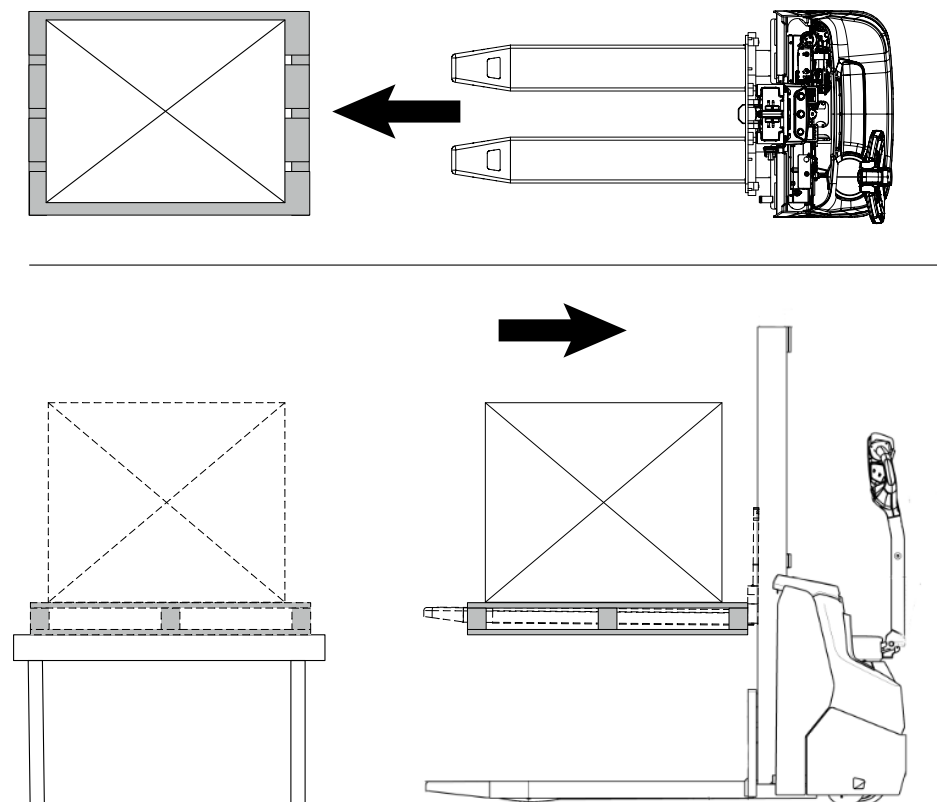
## 4.8.2 Raising a load

### **⚠ CAUTION!**

#### **Danger when travelling with a raised load**

Travelling with a raised load on the load fork – and no load on the support arms – impairs the driving characteristics of the truck and can cause it to tip over.

► Travelling with a raised load on the load fork is permitted only when picking up and putting down a second load in double-deck mode.



#### **Maximum load length**

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

##### *Requirements*

- Load correctly palletised.
- Capacity of the truck is sufficient for the load – see page 38.
- Load handler evenly loaded for heavy loads.

##### *Procedure*

- Drive the truck carefully up to the pallet.
- Insert the load fork slowly into the pallet until the pallet is resting against the back.
- Raise the load fork until you reach the desired lift height – see page 101.

*Load picked up.*



The lowering speed can be infinitely controlled via the button travel (approx. 8 mm).

Short button travel = slow lower

Long button travel = fast lower

### **Overload warning at the lift limit**

If the operator reaches the lift end stop, an overload warning is displayed as the hydraulic pressure is very high. The error message can be cancelled by briefly pressing the "lower load fork" button – see page 65. The load picked up is not too heavy.

### 4.8.3 Transporting a load

#### *Requirements*

- Load raised correctly.
- Load fork lowered for correct transport (approx. 150 - 500 mm above the ground).  
Do not travel with a raised load (>500 mm).
- Perfect ground conditions.

#### *Procedure*

- Accelerate and decelerate with care.
- Adapt your travel speed to the conditions of the route and the load you are transporting.
- Travel at a constant speed.
- 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.
- Observe the information on travelling on slopes and inclines – see page 88.
- Be prepared to brake at all times:
  - Brake gently in normal circumstances.
  - Only stop abruptly in hazardous situations.

#### 4.8.4 Depositing a load

##### **CAUTION!**

Loads must not be deposited on travel or escape routes, in front of safety mechanisms or plant equipment that must be accessible at all times.

##### **NOTICE**

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

##### *Requirements*

- Storage location suitable for storing the load.

##### *Procedure*

- Drive carefully up to the storage location.
- Lower the load handler so that the load handler is clear of the load, see page 101.
- Carefully remove the load handler from the pallet.

*The load is deposited.*

#### **Lowering speed reduction, depositing on the ground (○)**

The "lowering speed reduction" assistance system reduces the lowering speed of the load to be lowered shortly before it reaches the ground (approx. 400 mm) and thus facilitates the gentle depositing of the load.

#### 4.8.5 Stacking or unstacking the load

##### **WARNING!**

##### **Increased risk of accidents during stacking and retrieving**

When stacking and retrieving, the truck is moved with the load raised, which increases the risk of tipover. There is also a risk that parts could fall off.

- ▶ Adopt an appropriate, slow speed when stacking and retrieving.
- ▶ Avoid cornering when stacking and retrieving.
- ▶ Keep a sufficient distance between the load handler, load and storage equipment.
- ▶ Before driving away, ensure that the load is securely in the rack.

##### *Requirements*

- Load picked up correctly – see page 105.

##### *Procedure*

- Raise the load to the required height.
- Store the load.



## 4.9 Use as a Lift Work Table

### **WARNING!**

#### **A raised load handler can cause accidents**

A stationary truck with a raised load handler is potentially hazardous in work areas.

- ▶ Prevent any risk to personnel and materials.
- ▶ Never load or discharge loads manually with a raised load handler in areas that are hazardous, with limited visibility or insufficient lighting.
- ▶ Park the truck securely when leaving it, see page 84.

### **WARNING!**

#### **Risk of injury from falling loads**

Falling loads can cause injuries.

- ▶ Never stand underneath a raised load handler.
- ▶ Never manually load or unload loads that could fall on the operator without additional safety devices at heights greater than 1800 mm.
- ▶ Always load loads so that they cannot fall off or accidentally shift.
- ▶ Secure low or small-item loads e.g. by wrapping them in film.
- ▶ Do not manually load or unload loads that are not correctly packed or have shifted as well as loads with damaged pallets or damaged stacking containers.

### **CAUTION!**

#### **Risk of accident when the raised load handler slowly lowers of its own accord**

The raised load handler can lower independently due to internal leakage. According to EN ISO 3691-1 the load handler may lower by up to 100 mm during the first 10 minutes at the rated capacity with the hydraulic oil at normal operating temperature.

- ▶ Never stand underneath a raised load handler.

#### **Presence of the operator**

The load handler can remain in a raised position to be used as a lift work table when the truck is switched off, provided the operator is close to the truck.



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

Observe national regulations and local operating conditions.

#### ***Use as an elevated work table***

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

- Storage space suitable for manual loading or discharging of loads.

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

- Drive the truck carefully up to the storage location.
- Raise the load handler to the desired lift height.
- Switch off the truck.

*Loads can be loaded or discharged manually with the load handler raised.*

## 5 Troubleshooting

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



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

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

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

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

## 5.1 Truck does not start

Event message	Possible cause	Actions
-	Emergency disconnect switch pressed	– Unlock the emergency disconnect switch – see page 90
-	Faulty fuse	– Check fuses, see page 163
-	Incorrect transponder used on transponder reader (○)(EasyAccess Transponder)	– Use correct transponder
-	Incorrect code entered using the soft keys under the display unit (2-inch display) (○)	– Enter correct code, see page 125
E-0914.1	Tiller not in brake position when the truck is switched on	– Set the tiller to the top or the bottom brake zone – see page 93
E-1914.1	Collision safety switch pressed when truck switched on	– Do not press collision safety switch
E-1925.1	Slow travel button pressed when truck switched on	– Do not press the button
E-1953.1	Travel switch not in home position when truck switched on	– Do not actuate the travel switch

Event message	Possible cause	Actions
E-1953.1	Travel switch actuated for more than 0.5 seconds with the tiller folded up, without release via the tiller switch or the "slow travel" button. The operating sequence has not been observed.	Follow the operating sequence: 1. Move the tiller into the travel zone (F) or press the "slow travel" button. 2. Actuate the travel switch.
E-1953.1	Charger cable of the on-board charger not fully stowed in the storage compartment.	– Stow the entire charger cable in the storage compartment.
E-2124.2	Switch in mast implausible	– Lowering and travelling possible up to 1.5 km/h. – Park the truck securely – see page 84. – Contact the manufacturer's customer service department.
E-2953.1	Button for lifting or lowering a load handler not in the home position when switching on the truck	– Do not press the button – see page 65

## 5.2 Truck Operates Only in Slow Travel Mode

Event message	Possible cause	Actions
E-2124.21 or E-2124.22	During the set time, the control unit has not received any valid signals from the KoStaS sensor in the mast (default 5 hours).	With the industrial truck stationary, raise the mast to a load-fork lift height of more than 1800 mm. The yellow flashing "lift limit reached" icon goes out – see page 70.

### 5.3 Load cannot be lifted

Event message	Possible cause	Action
-	Truck not operational	– Carry out all measures listed under “Truck does not start”
-	Hydraulic oil level too low	– Check the hydraulic oil level, see page 161
-	Battery discharge monitor has switched off	– Charge the battery, see page 67
-	Faulty fuse	– Check fuses, see page 163
-	Excessive load	– Note maximum capacity, see page 37
E-1914.1	Collision safety switch pressed when truck switched on	– Do not press collision safety switch
E-1953.1	Travel switch not in home position when truck switched on	– Do not actuate the travel switch
E-2124.2	Switch in mast implausible	<ul style="list-style-type: none"> <li>– Lowering and travelling possible up to 1.5 km/h.</li> <li>– Park the truck securely – see page 84.</li> <li>– Contact the manufacturer's customer service department.</li> </ul>
E-2953.1	Button for lifting or lowering a load handler not in the home position when switching on the truck	– Do not press the button – see page 65

## 5.4 Lithium-ion battery is not functioning

Description / possible cause	Actions
<p>Low voltage :</p> <ul style="list-style-type: none"> <li>– The lithium-ion battery switches off.</li> </ul>	<ul style="list-style-type: none"> <li>– Move the lithium-ion battery into the permissible temperature range, see page 12.</li> <li>– Connect the lithium-ion battery to the battery charger.</li> <li>– Charge the lithium-ion battery – see page 61.</li> <li>– If the malfunction persists, contact the manufacturer's customer service department.</li> </ul>
<p>Low temperature :</p> <ul style="list-style-type: none"> <li>– Cell temperature of at least one battery cell is too low.</li> <li>– The lithium-ion battery was operated outside the permissible application range.</li> <li>– The lithium-ion battery switches off.</li> </ul>	<ul style="list-style-type: none"> <li>– Move the lithium-ion battery into the permissible temperature range, see page 12.</li> <li>– Connect the lithium-ion battery to the battery charger.</li> <li>– Warm up the lithium-ion battery to ambient temperature. Do not operate the lithium-ion battery again until the lithium-ion battery has warmed up.</li> <li>– If the malfunction persists, contact the manufacturer's customer service department.</li> </ul>
<p>Overtemperature:</p> <ul style="list-style-type: none"> <li>– Cell temperature of at least one battery cell is too high.</li> <li>– The lithium-ion battery was operated outside the permissible application range.</li> <li>– The lithium-ion battery switches off.</li> </ul>	<ul style="list-style-type: none"> <li>– Move the lithium-ion battery into the permissible temperature range, see page 12.</li> <li>– Do not operate the lithium-ion battery further.</li> <li>– Allow the lithium-ion battery to cool down. Do not operate the lithium-ion battery again until it has cooled down.</li> <li>– If the malfunction persists, contact the manufacturer's customer service department.</li> </ul>

## 5.5 Deeply discharged batteries

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

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



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

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### Charging deeply discharged batteries

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



Contact the manufacturer's customer service department.

## 6 Moving a truck without its own drive system

### **⚠ 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.

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#### **Releasing the brake**

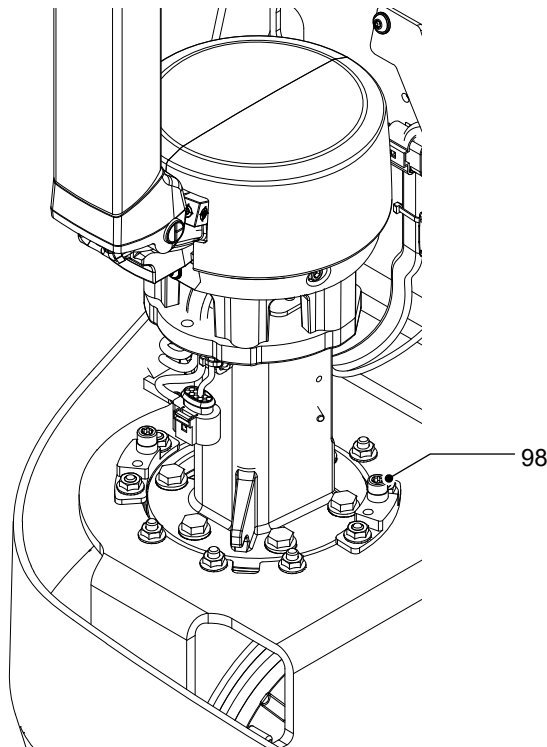
##### *Requirements*

- Industrial truck can no longer be moved under its own power.
- Secure the truck to prevent accidental movement, e.g. using wheel chocks.
- The front panel has been disassembled – see page 151.

##### *Tools and Material Required*

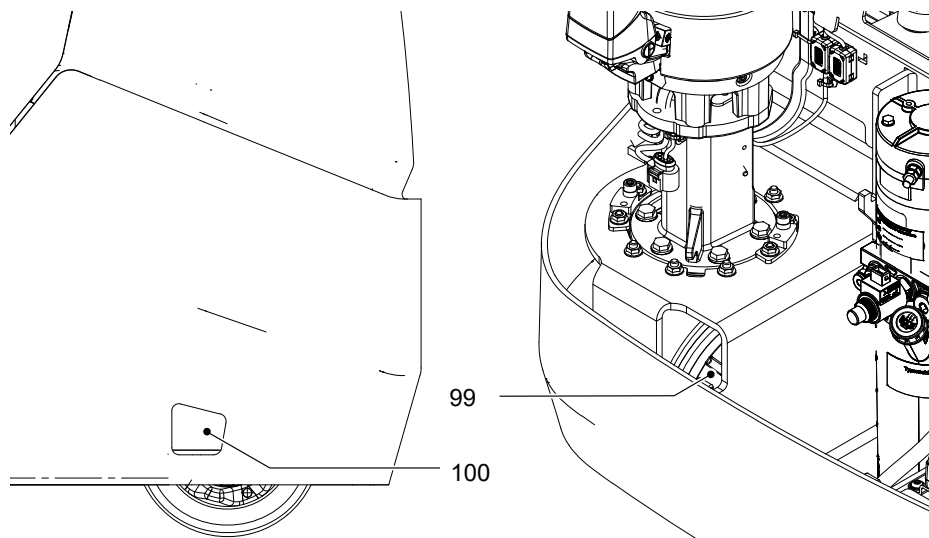
- Torque spanner (3 Nm and 2 Nm), hexagon socket screw

##### *Procedure*



- Remove the drive stop screw (98).
- Remove the tiller.
- Disconnect the cable connections from the tiller.
- Turn the drive approx. 100° anti-clockwise.





- Remove the 4 screws in the brake cover.
  - Remove the 2 screws via the mounting hole in the drive support (99).
  - Remove the 2 screws via the mounting hole in the panel (100).
- Remove the brake cover.
- Unscrew the 3 brake screws just so far that the brake rests loosely on the ground.

➔ The brake must not be released completely.

- Remove the chocks.  
*The truck can be moved.*

### **Activating the brake**

#### *Requirements*

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

#### *Procedure*

- Tighten the three brake screws with a tightening torque of 3 Nm (hexagon socket).
- Tighten the four screws of the brake cover with a tightening torque of 2 Nm (hexagon socket screw).
- Fit the front panel – see page 151.

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

### **⚠ WARNING!**

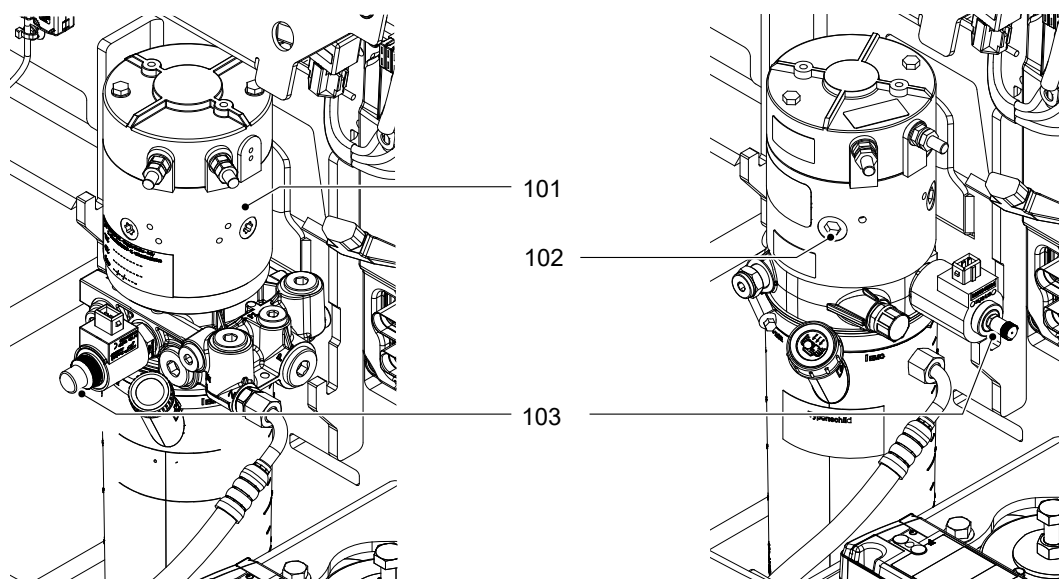
Only return the truck to service when you have identified and rectified the fault.

## 7 Load handler emergency lowering

### **⚠ WARNING!**

#### **Load handler emergency lowering**

- ▶ Instruct other people to move out of the hazardous area of the truck during emergency lowering.
- ▶ Never step or stand underneath a raised load handler.
- ▶ Only operate the emergency lowering valve when standing next to the truck.
- ▶ When the load handler is in the racking, emergency lowering is not permitted.
- ▶ 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.



#### ***Emergency lowering of the load handler***

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

- Load handler is not in the rack.

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

- Switch off the truck.
- Press the emergency disconnect switch – see page 90.
- Remove the front panel – see page 151.

*The hydraulic unit (101 (●) or 102 (○)) is exposed.*

- Slowly unscrew the knurled screw (103) on the lowering valve until the load handler lowers.

*The load handler is lowered.*

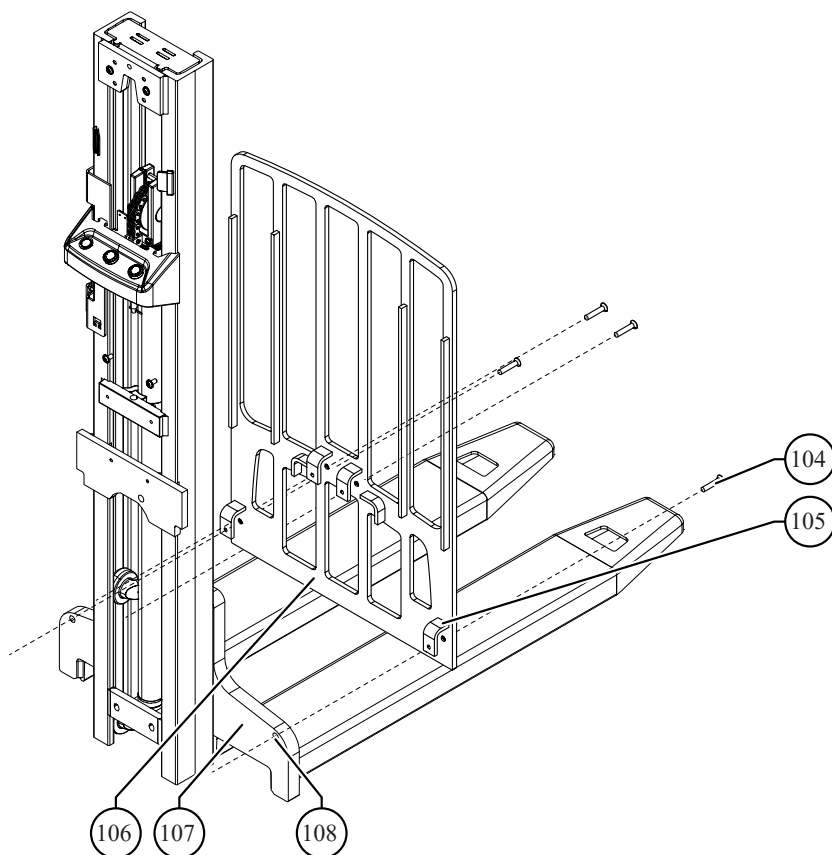


*After carrying out emergency lowering, tightening both knurled screws as far as the stop.*

## 8 Optional Equipment

### 8.1 Removable load backrest

#### 8.1.1 EJC 110 i (E)



Item	Description
104	Countersunk screw
105	Load backrest bracket
106	Load backrest
107	Load carriage
108	Holes on the load carriage

#### ***Dismantling the load backrest***

- Loosen the countersunk screw (104).
- Hold the load backrest (106) with one hand.
- Remove the countersunk screw (104).
- Remove the load backrest (106) upwards and store safely.

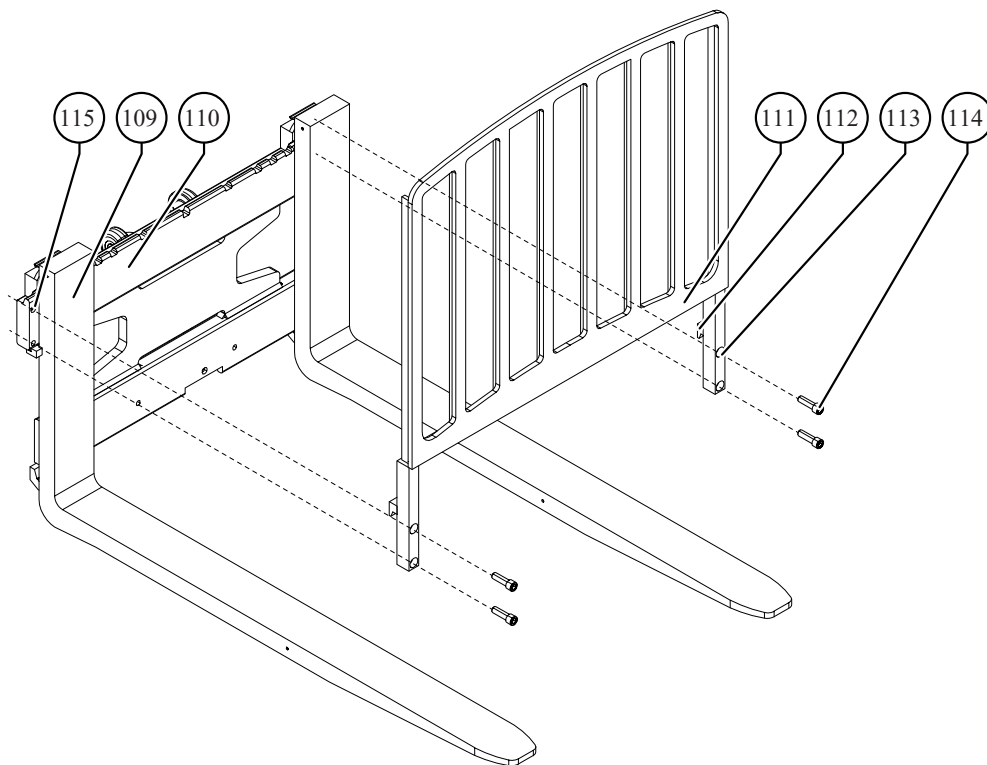
*Load backrest is dismantled.*

### ***Installing the load backrest***

- Place the load backrest (106) from above onto the load carriage (107).
  - The bracket (105) on the backrest (111) helps with positioning.
  - Hold the load backrest (106) with one hand.
- Manually insert the countersunk screw (104) through the holes (108) on the load carriage and hand-tighten in the brackets (105).
- Tighten the countersunk screw (104) evenly.

*Load backrest is fitted.*

## 8.1.2 EJC 110 bi (E)



Item	Designation
109	Fork arms
110	Fork carriage
111	Load backrest, wide
112	Load backrest hook
113	Load backrest hole
114	Cheese head screw
115	Thread

### ***Dismantling the load backrest***

- Undo the cheese head screws (114)
- Hold the load backrest (111) with one hand.
- Remove the cheese head screws (114).
- Remove the load backrest (111) upwards and store safely.

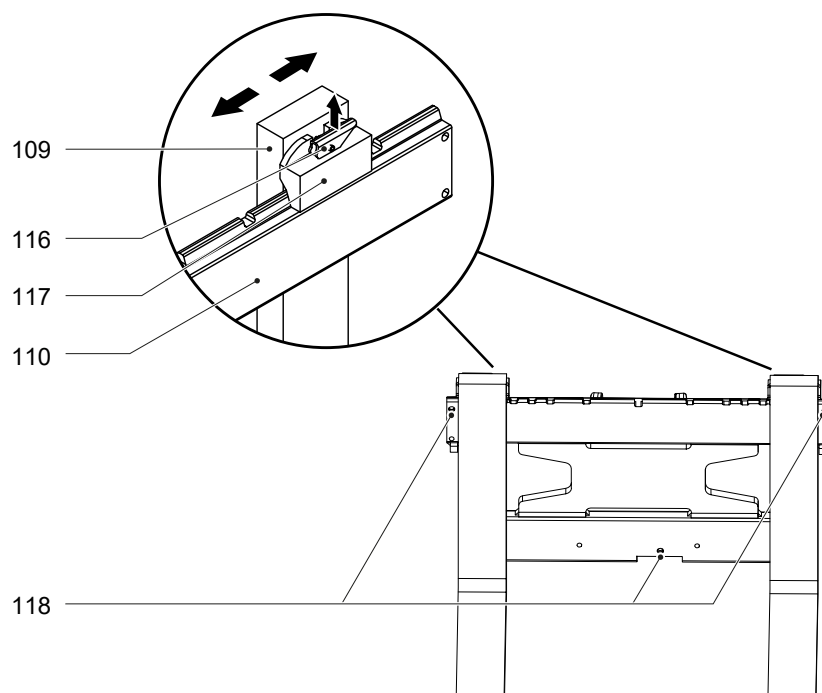
*Load backrest is dismantled.*

### ***Installing the load backrest***

- Place the load backrest (111) onto the fork carriage (111) from above.
  - The hook (112) on the load backrest (111) helps with positioning.
  - Hold the load backrest (111) with one hand.
- Manually insert the cheese head screws (114) through the hole (113) and hand-tighten in the thread.
- Tighten the cheese head screws (114) evenly.

*Load backrest is fitted.*

## 8.2 Forks



Item	Description
109	Fork arms
110	Fork carriage
116	Locking lever
117	Fork stop
118	Retaining bolts

## 8.2.1 Adjusting the forks

### **WARNING!**

#### **Unsecured and incorrectly adjusted forks can cause accidents**


Before adjusting the forks make sure the retaining bolts (118) are fitted.

- ▶ Adjust the forks so that both forks are equidistant from the outside edge of the fork carriage.
  - ▶ Engage the locking pin in a groove to prevent the forks from moving accidentally.
  - ▶ The load centre of gravity must be located centrally between the forks.
- 

#### *Requirements*

- Park the truck securely – see page 84.

#### *Procedure*

- Swing up the locking lever (116).
  - Push the fork arms (109) on the fork carriage (110) into the correct position.
-  To pick up the load securely, the fork arms (109) must be spread as far apart as possible and positioned centrally with respect to the fork carriage. The load centre must lie centrally between the fork arms (109).
- Swing the locking lever (116) down and move the fork arms until the locking pin engages in a slot.

*Fork arms adjusted.*

## 8.2.2 Replacing the forks

### **WARNING!**

#### **Unsecured forks can cause injury**

You can injure your legs when replacing the forks.

- ▶ Never pull the forks towards your body.
- ▶ Always push the forks away from your body.
- ▶ Secure heavy forks with lifting slings and a crane before pushing them down from the fork carriage.
- ▶ After replacing the forks fit the retaining bolts (118) and make sure the bolts are seated correctly. Retaining bolt torque: 84 Nm.

### **CAUTION!**

#### **Risk of accident and injury due to the use of impermissible fork arms**

The fork arm design approved for a truck type is specified by the manufacturer. The configuration of the mast and control components of the truck is based on the approved design. If fork arms with a different design are used, accidents may occur (e.g. if the fork arms touch the ground or in the event of a collision due to the altered dimensions).

- ▶ Only use fork arms in the design approved for the relevant truck type.

Truck type	Approved fork arm design
EJC 110bi (E)	2 A

#### *Requirements*

- Truck prepared for maintenance and repair work (see page 150).
- Load handler lowered, fork arms not touching the ground.

#### *Procedure*

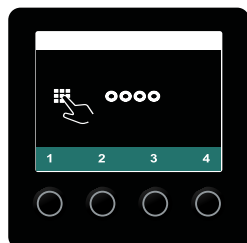
- Remove the retaining bolt (118).
- Release the fork stop (117).
- Carefully push the forks up to the middle of the fork carriage and lift them out over the recess.

*The forks are now dismantled from the load carriage and can be replaced.*

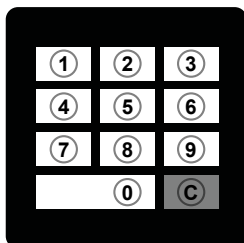


## 8.3 Keyless Access System

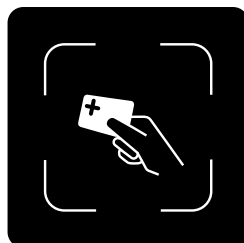
The keyless access system allows an individual code to be allocated to each operator or group of operators.



9



17



18

Item	Description
9	Display unit (EasyAccess Softkey): <ul style="list-style-type: none"><li>– Description see page 68</li><li>– Entry of 4-digit set-up and access codes</li><li>– Up to 10 access codes can be stored</li><li>– For set-up and access codes with the numbers 1 to 4</li></ul>
17	Keypad (EasyAccess PinCode): <ul style="list-style-type: none"><li>– Consists of keys 0 to 9 and C (clear)</li><li>– Entry of 4-digit set-up and access codes</li><li>– Up to 100 access codes can be stored</li></ul>
18	Transponder reader Plus ( EasyAccess Transponder): <ul style="list-style-type: none"><li>– The transponder reader Plus supports additional transponder standards.</li></ul>

### 8.3.1 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.

### 8.3.2 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.

### 8.3.2.1 Activating the keypad

#### Procedure

- Release the emergency disconnect switch, see page 90.
- Enter the default code 1-2-3-4 using the keys below the display unit (9).

*The truck is switched on.*

- Press the key below the "Settings" symbol (82).
- Press the key below the "Change set-up code" symbol (83).
- Enter the set-up code 2-4-1-2 using the keypad (17).

*The set-up code entered is displayed.*

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

Press the key below the "Delete" symbol (84).

*The set-up code is deleted.*

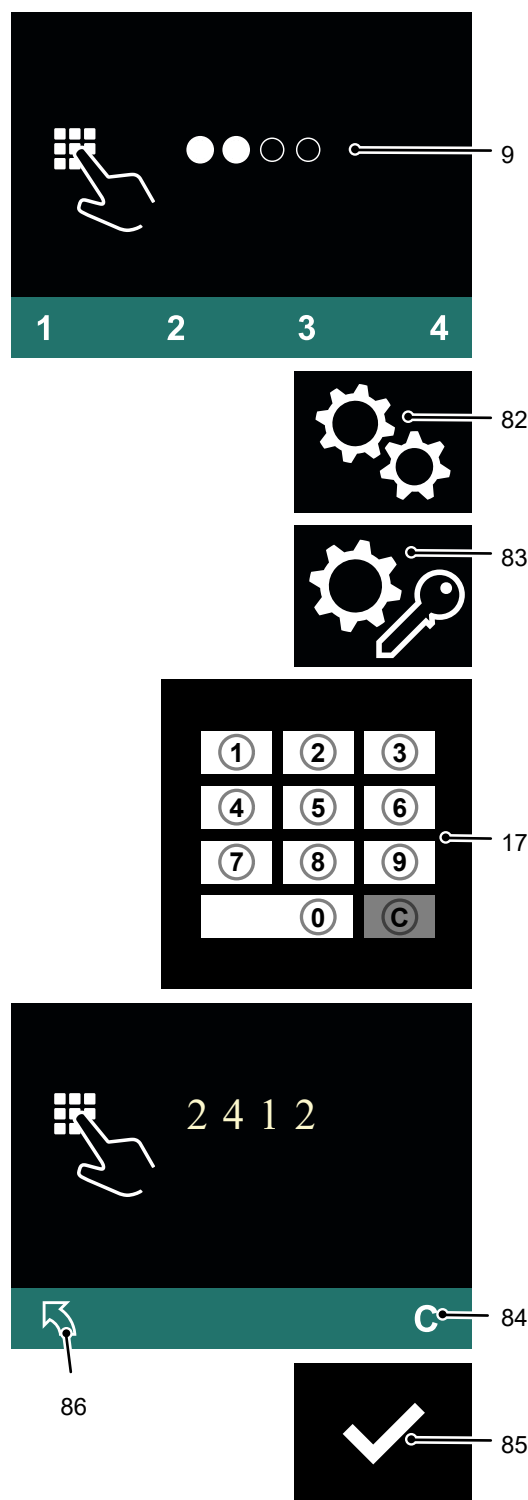
- Enter the new set-up code using the keypad (17).
- Press the key below the "Confirm" symbol (85).

*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 (84).

- To return to the main menu, press the key below the "Back" symbol (86).
- Delete the default code, see page 132.
- Create access codes, see page 131.

*The keypad is active.*



### 8.3.2.2 Activating the transponder reader

#### Procedure

- Release the emergency disconnect switch, see page 90.
- Enter the default code 1-2-3-4 using the keys below the display unit (9).

*The truck is switched on.*

- Press the key below the "Settings" symbol (82).
- Press the key below the "Change set-up code" symbol (83).
- Enter the set-up code 2-4-1-2 using the keys below the display unit (9).

*The set-up code entered is displayed.*

- Press the key below the "Delete" symbol (84).

*The set-up code is deleted.*

- Hold a transponder in front of the transponder reader (119).

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

- Press the key below the "Confirm" symbol (85).

*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 (84).*

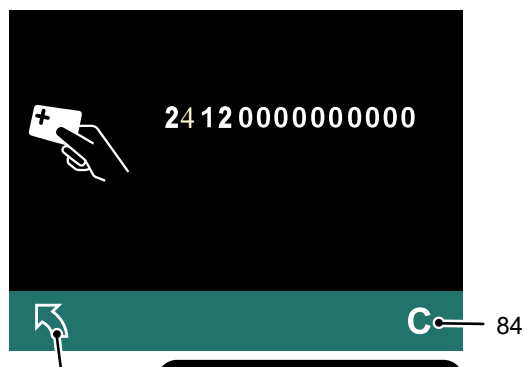
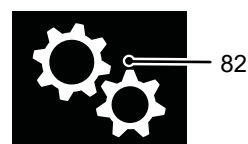
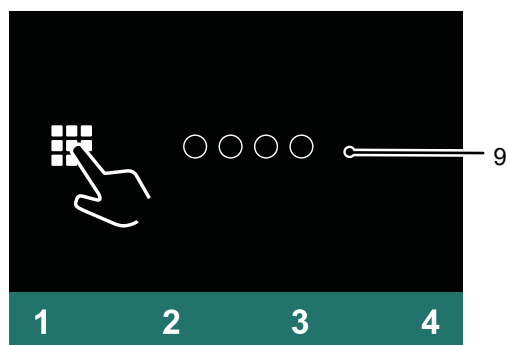
- To return to the main menu, press the key below the "Back" symbol (86).

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

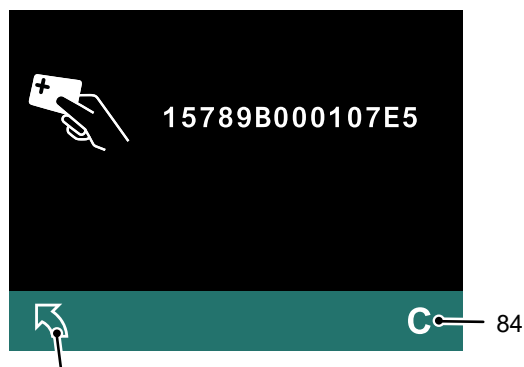
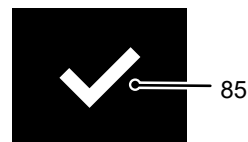
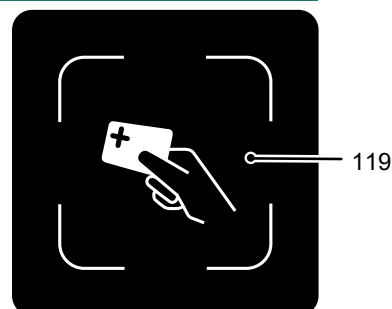
Delete the default code, see page 137.

- Add new transponders, see page 136.

*The transponder reader is now active.*



86



86

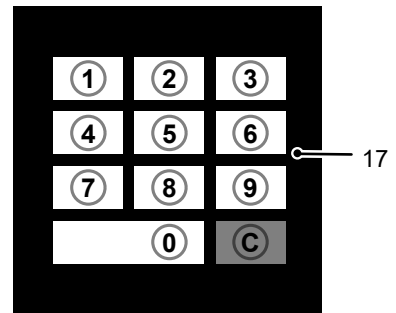
### 8.3.3 Using the Keypad

#### 8.3.3.1 Switching on the truck with an access code

##### *Procedure*

- Release the emergency disconnect switch, see page 90.
- Enter the access code with the keypad (17).

*The truck is switched on.*



##### *Procedure*

- Press the key under the "Switch off" symbol (81) in the display unit.
- Press the Emergency Disconnect switch, see page 90.

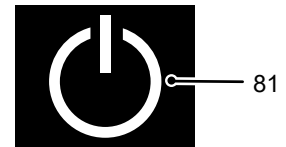
*The truck is switched off.*

#### 8.3.3.2 Switching off the truck

##### *Procedure*

- Press the key under the "Switch off" symbol (81) in the display unit.
- Press the Emergency Disconnect switch, see page 90.

*The truck is switched off.*



### 8.3.3.3 Changing the set-up code

#### Requirements

- The truck is switched on, see page 129.

#### Procedure

- Press the key below the "Settings" symbol (82).
- Press the key below the "Change set-up code" symbol (83).
- Enter the set-up code using the keypad (17).

*The set-up code entered is shown in the display unit (9) as filled-in circles.*

- Press the key below the "Delete" symbol (84).

*The set-up code is deleted.*

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

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

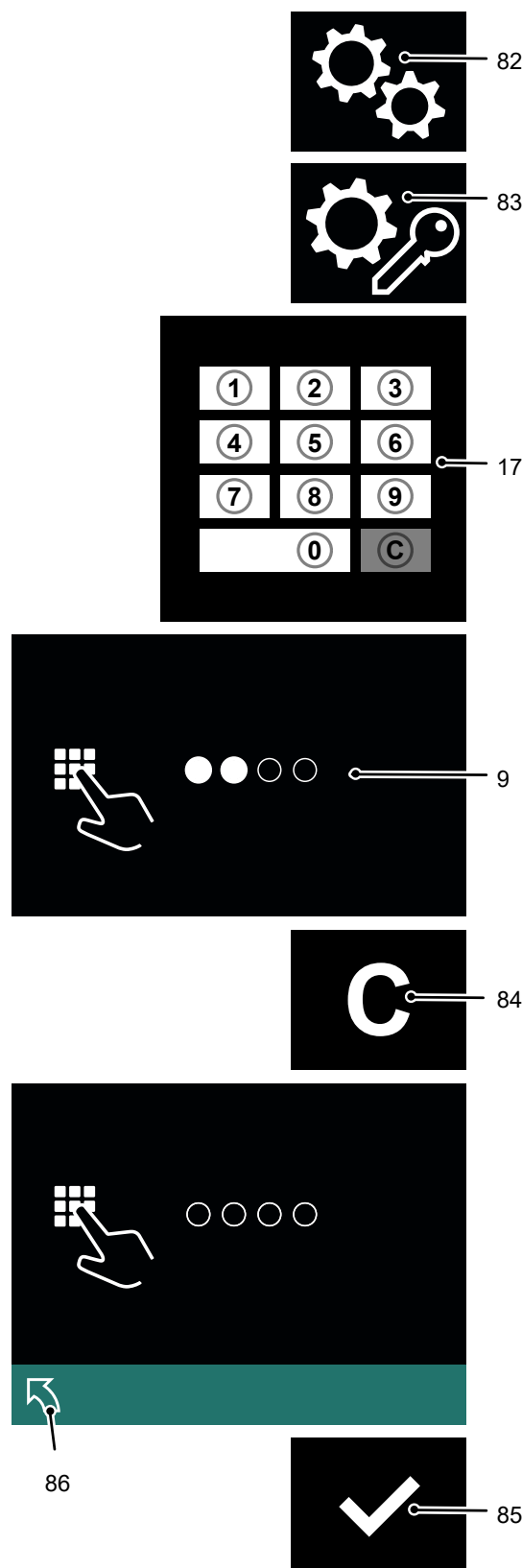
- Press the key below the "Confirm" symbol (85).

*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 (86).

*The set-up code has been changed.*



### 8.3.3.4 Adding a new access code

#### Requirements

- The truck is switched on, see page 129.

#### Procedure

- Press the key below the "Settings" symbol (82).
- Press the key below the "Edit access code" symbol (87).

*The set-up code is requested.*

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

*All access codes are shown on the display unit (9).*

- Press the key below the "Add" symbol (88).
- Enter a new access code using the keypad (17).

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

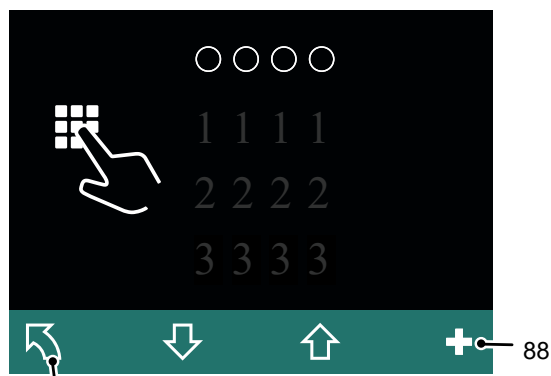
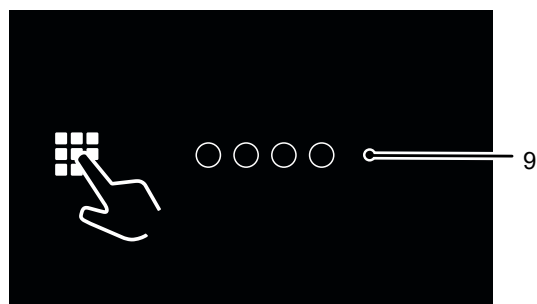
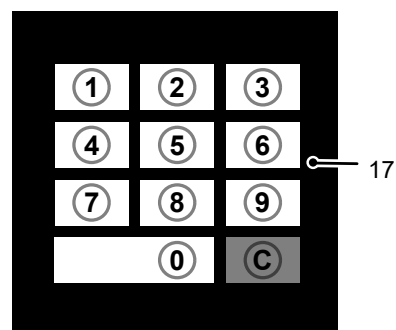
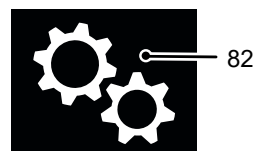
- Press the key below the "Confirm" symbol (85).

*The new access code is shown on the display unit (9).*

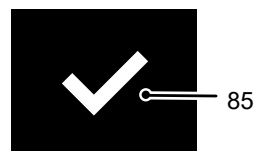
→ If the new access code has been entered incorrectly, delete it, see page 132, and enter the correct access code.

To return to the main menu, press the key below the "Back" symbol (86).

*A new access code has been added.*



86



### 8.3.3.5 Deleting an access code

#### Requirements

- The truck is switched on, see page 129.

#### Procedure

- Press the key below the "Settings" symbol (82).
- Press the key below the "Edit access code" symbol (87).

*The set-up code is requested.*

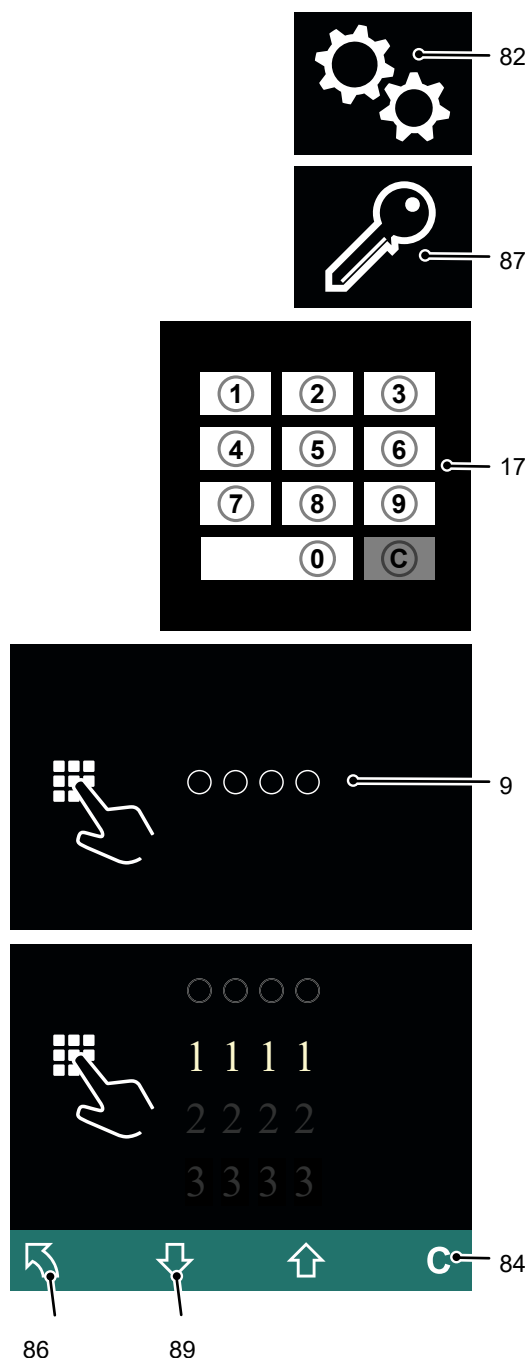
- Enter the set-up code using the keypad (17).

*All access codes are shown on the display unit (9).*

- Select the access code to be deleted using the key below the "Down selection" symbol (89).
- Press the key below the "Delete" symbol (84).

*The access code has been deleted.*

- To return to the main menu, press the key below the "Back" symbol (86).





### 8.3.3.6 Displaying the log-in history

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

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

#### Requirements

- The truck is switched on, see page 129.

#### Procedure

- Press the key below the "Settings" symbol (82).
- Press the key below the "Log-in process" symbol (90).
- Enter the set-up code using the keypad (17).

*The set-up code entered is shown in the display unit (9) as filled-in circles.*

- To scroll forward, press the button under the "Down selection" symbol (89) as many times as necessary.

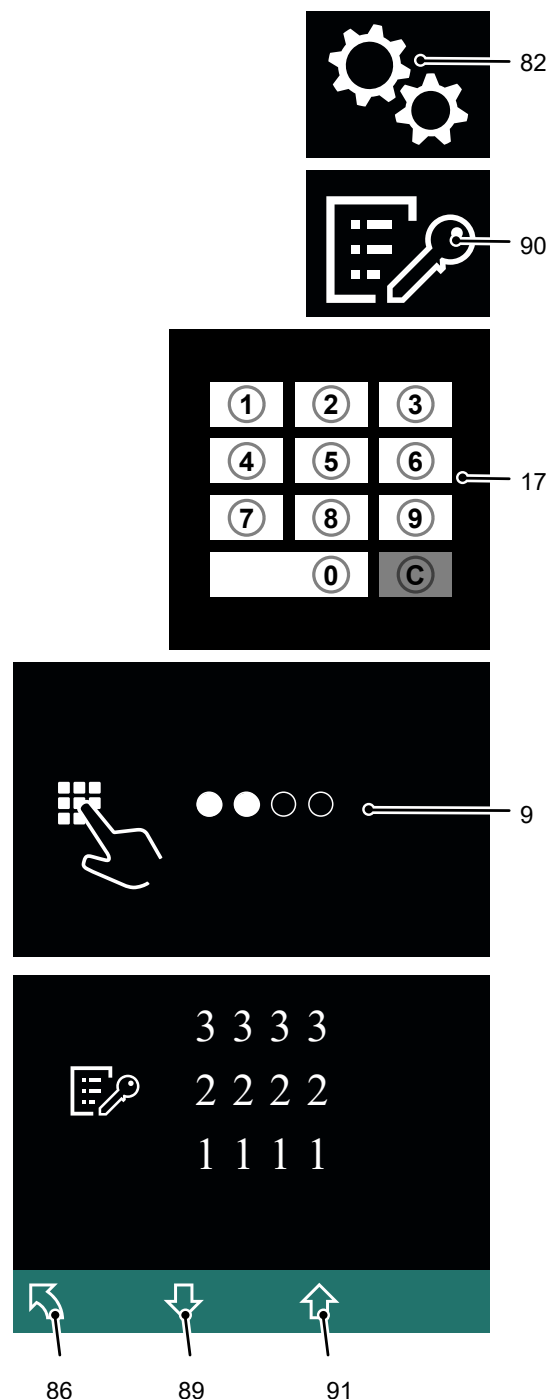
*The display area moves: Additional earlier log-ins are displayed.*

- To scroll back, press the button under the "Up selection" symbol (91) 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 (86).

*The log-in process is displayed.*



### 8.3.4 Operating the transponder reader

#### NOTICE

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

#### 8.3.4.1 Switching on the truck with a transponder

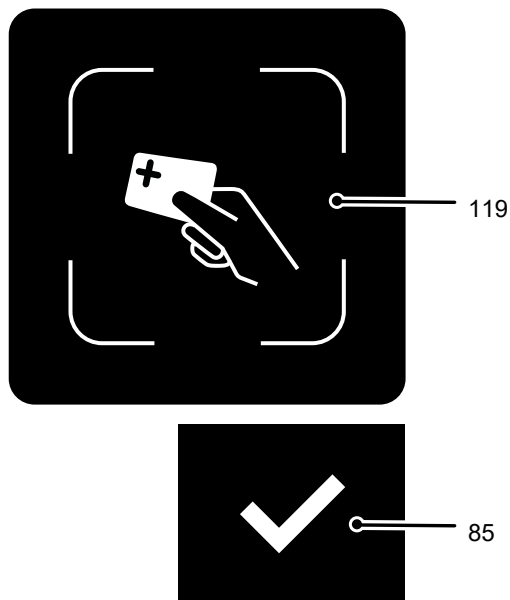
##### Procedure

- Release the Emergency Disconnect switch, see page 90.
- Hold the transponder in front of the transponder reader (119).

*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 (85).

*The truck is switched on.*



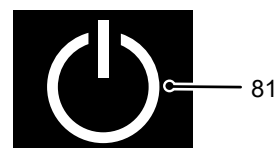
- The truck can only be switched on when the display unit (9) is lit. If the display unit is in standby the code or transponder will not be recognised. Pressing any key cancels standby mode.

#### 8.3.4.2 Switching off the truck

##### Procedure

- Press the key under the "Switch off" symbol (81) in the display unit.
- Press the Emergency Disconnect switch, see page 90.

*The truck is switched off.*



### 8.3.4.3 Changing the set-up transponder

#### Requirements

- The truck is switched on, see page 134.

#### Procedure

- Press the key below the "Settings" symbol (82).
- Press the key below the "Change set-up code" symbol (83).
- Place the set-up transponder on the transponder reader (119).

*The code of the set-up transponder is shown on the display unit (9).*

- Press the key below the "Delete" symbol (84).

*A dashed line is shown.*

- Place the new set-up transponder on the transponder reader (119).

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

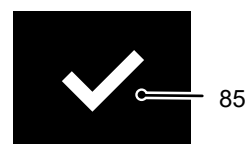
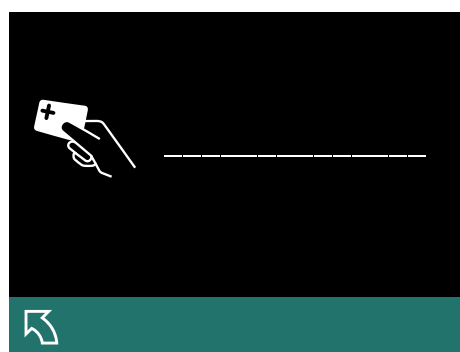
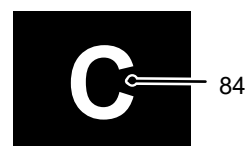
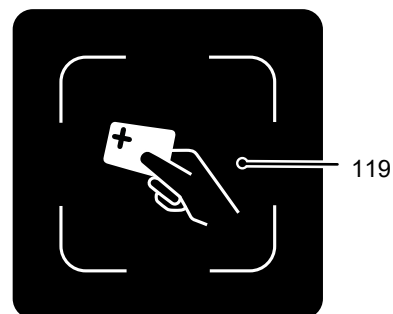
- Press the key below the "Confirm" symbol (85).

*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 (84).

To return to the main menu, press the key below the "Back" symbol (86).

*The set-up transponder has been changed.*



86

### 8.3.4.4 Adding a new transponder

#### Requirements

- The truck is switched on, see page 134.

#### Procedure

- Press the key below the "Settings" symbol (82).
- Press the key below the "Edit transponder" symbol (87).

*The set-up transponder is requested.*

- Place the set-up transponder on the transponder reader (119).

*All transponder codes are shown on the display unit (9).*

- Press the key below the "Add" symbol (88).
- Place the new transponder on the transponder reader (119).

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

- Press the key below the "Confirm" symbol (85).

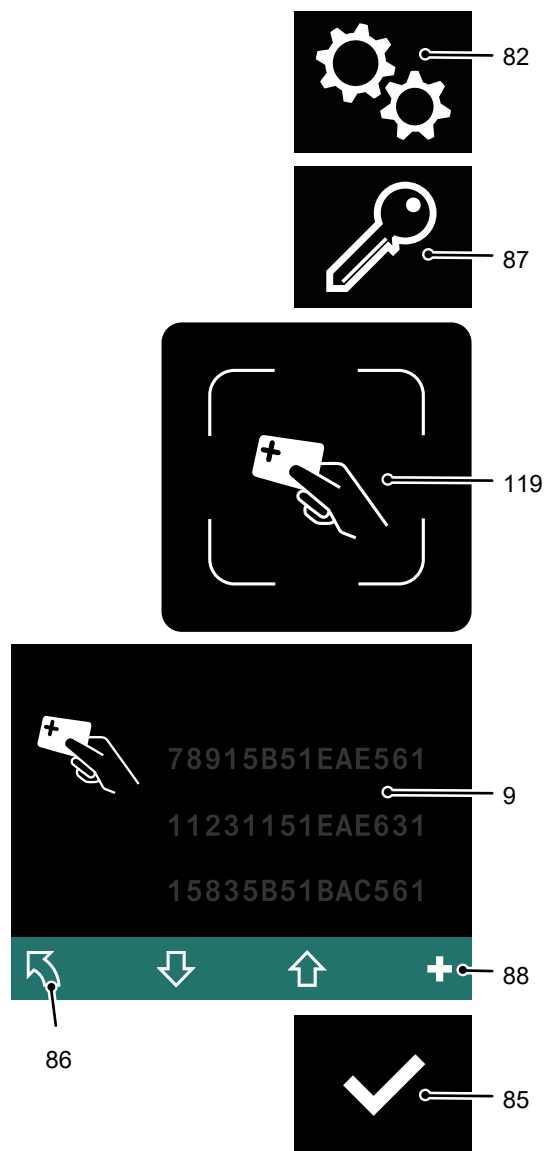
*The new transponder code is displayed.*

- If the wrong transponder has been used, delete it, see page 137, and add a correct transponder.

To return to the main menu, press the key below the "Back" symbol (86).

*A new transponder has been added.*

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



### 8.3.4.5 Deleting a transponder

#### Requirements

- The truck is switched on, see page 134.

#### Procedure

- Press the key below the "Settings" symbol (82).
- Press the key below the "Edit transponder" symbol (87).

*The set-up transponder is requested.*

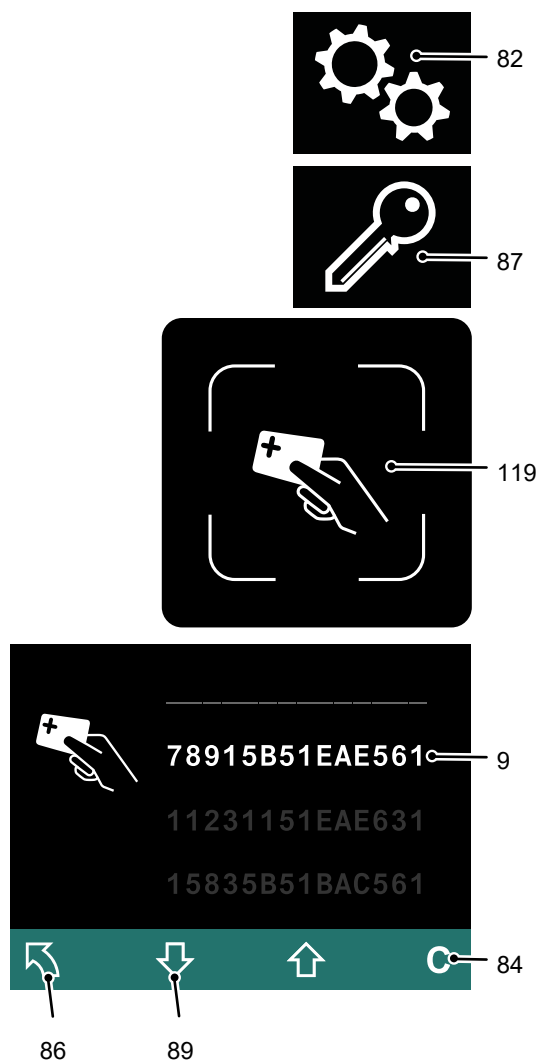
- Place the set-up transponder on the transponder reader (119).

*All transponder codes are shown on the display unit (9).*

- Select the transponder code to be deleted using the key below the "Down selection" symbol (89).
- Press the key below the "Delete" symbol (84).

*The transponder has been deleted.*

- To return to the main menu, press the key below the "Back" symbol (86).



### 8.3.4.6 Displaying the log-in history

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

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

#### Requirements

- The truck is switched on, see page 129.

#### Procedure

- Press the key below the "Settings" symbol (82).
- Press the key below the "Log-in process" symbol (90).
- Place the set-up transponder on the transponder reader (119).
- To scroll forward, press the button under the "Down selection" symbol (89) as many times as necessary.

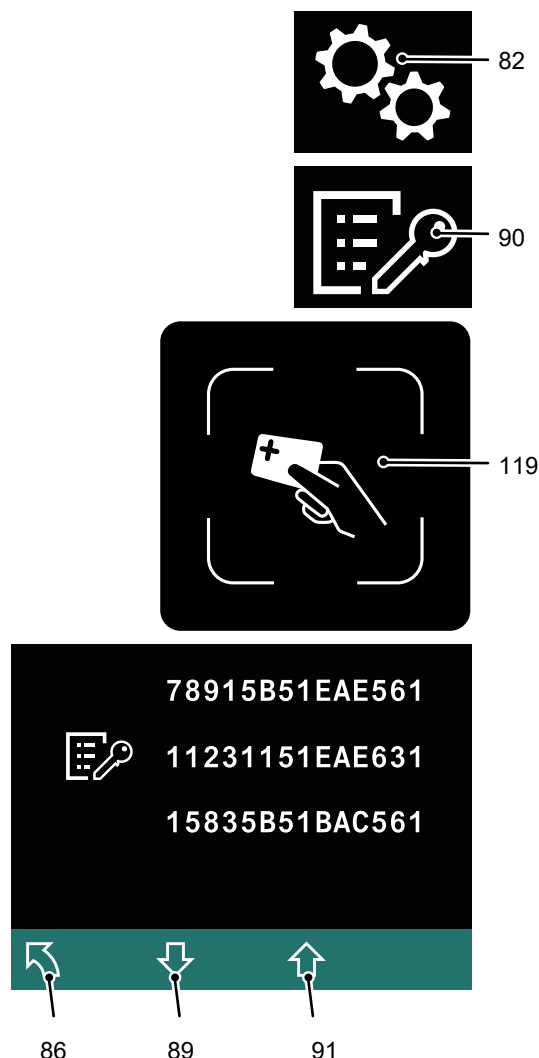
*The display area moves: Additional earlier log-ins are displayed.*

- To scroll back, press the button under the "Up selection" symbol (91) 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 (86).

*The log-in process is displayed.*



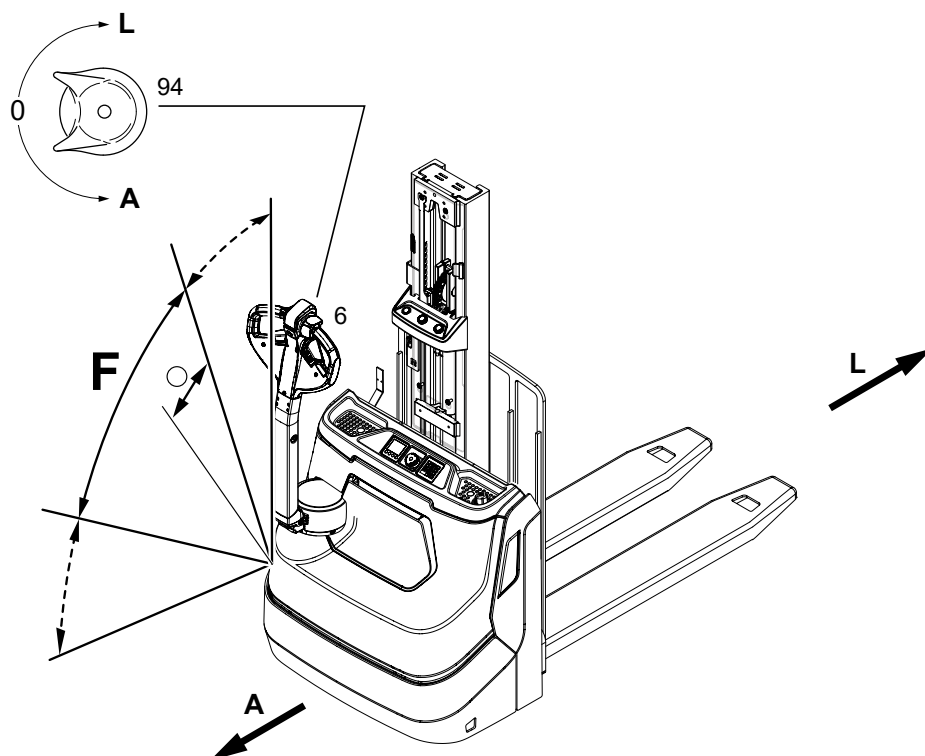
## 8.4 Parameters

- These parameters can be adjusted by the manufacturer's customer service department.

## 8.5 Fleet Management System

- 
- Description of the Jungheinrich Fleet Management System optional equipment – see the "Jungheinrich Fleet Management System" operating instructions.
-

## 8.6 Foot Protection Tiller (○)




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

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

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

### Display symbols

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



# 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 37.



## 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 171.

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 171.

### **WARNING!**

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

Any modification to the truck is prohibited.

- ▶ Safety equipment must not be modified.
- ▶ The operating speeds of the truck must not be changed.
- ▶ Laminating over the front window 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 164.

## 3 Maintenance Safety Regulations

### Maintenance and repair personnel

- The manufacturer has a customer service department specially trained for these tasks. A maintenance contract with the manufacturer will support trouble-free operation.

Truck maintenance, repair work and changing of parts requiring replacement must only be carried out by specialist personnel. The activities to be carried out are divided into the following target groups.

#### 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 personnel 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 150.

#### Settings

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

### 3.1 Welding

#### **WARNING!**

##### Fire hazard

Welding operations on the truck can damage or ignite components.

► Do not performing welding operations on the truck.

---

## 3.2 Working on the electrical system

### **WARNING!**

#### **Risk of accidents due to electrical current**

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

Before starting maintenance on the electrical system:

- ▶ Only suitably trained electricians may operate on the truck's electrical system.
  - ▶ Before working on the electrical system, take all precautionary measures to avoid electric shocks.
  - ▶ Park the truck securely (see page 84).
  - ▶ Remove any rings, metal wristbands etc.
- 

## 3.3 Consumables and used parts

### **CAUTION!**

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

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

## 3.4 Wheels


### **WARNING!**

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

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

Uneven wear reduces truck stability and increases the stopping distance.

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

-  When replacing wheels fitted at the factory, only use the manufacturer's original spare parts. Otherwise the truck's rated performance cannot be ensured, see page 141.

### 3.5 Hydraulic system

#### **WARNING!**

##### **Leaky hydraulic systems can result in accidents**

Hydraulic oil can escape from leaky and faulty hydraulic systems.

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

#### **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 in the event of an injury.
  - ▶ Do not touch pressurised hydraulic hoses.
  - ▶ Report any defects immediately to your supervisor.
  - ▶ Mark defective truck and take it out of service.
  - ▶ Do not return the industrial truck to service until you have identified and rectified the fault.
- 

#### **NOTICE**

##### **Checking and replacing hydraulic hoses**

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

- ▶ Check the hydraulic hoses at least once per year and replace if necessary.
  - ▶ In the case of heavy-duty operation, the inspection intervals must be reduced accordingly.
  - ▶ Under normal operating conditions, preventive replacement of the hydraulic hoses is recommended after 6 years. The owner must carry out a risk assessment to ensure safe, prolonged use. The resulting protection measures must be observed and the inspection interval reduced accordingly.
-

### 3.6 Lift Chains

#### **WARNING!**

##### **Risk of accident from non-lubricated and incorrectly cleaned lift chains**

Lift chains are safety-critical parts. Lift chains must not show signs of serious contamination. Lift chains and pivot pins must always be clean and sufficiently lubricated.

- ▶ The lift chains are cleaned by wiping or brushing. Significant contamination can be softened by a paraffin derivative such as petroleum.
  - ▶ Do not clean lift chains with high-pressure steam jets or chemical cleaning agents.
  - ▶ Immediately after cleaning, dry the lift chain with compressed air and apply a chain spray.
  - ▶ Lift chains must be unloaded when lubricated; to do this, fully lower the load handler.
- 

### 3.7 Energy saving components

#### **CAUTION!**

##### **Risk of accident due to high pre-tension**

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

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

## 4 Lubricants and Lubrication Schedule

### 4.1 Handling consumables safely

#### Handling consumables

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

#### **⚠ WARNING!**

##### **Improper handling is hazardous to health, life and the environment**

Consumables can be flammable.

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

#### **⚠ CAUTION!**

##### **Spilled consumables can cause slipping and endanger the environment**

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

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

#### **⚠ WARNING!**

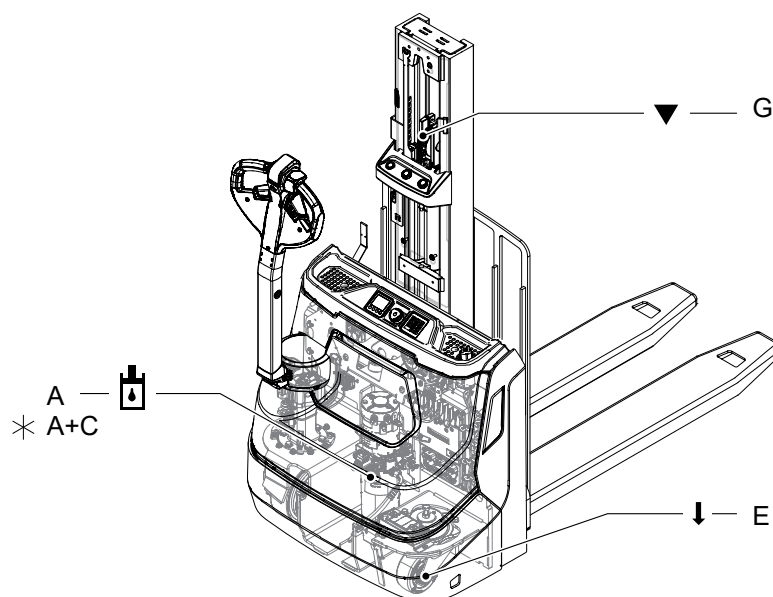
##### **Improper handling of oils can be hazardous**


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

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

## 4.2 Lubrication Schedule

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



▼	Contact surfaces
↓	Grease nipple
	Hydraulic oil filler plug
*	Cold store application <sup>1</sup>
<sup>1)</sup> <i>Mixing ratio for cold store application: 1:1</i>	



### 4.3 Consumables

Code	Order no.	Supplied quantity	Description	Used for
A	51132827*	5.0 l	Jungheinrich	Hydraulic system
	51132826*	1.0 l	Hydraulic oil	
	51090781	1.0 l	Renolin MR 310	
C	51081875*	5.0 l	ISO 15 LOW cold store hydraulic oil	Hydraulic system Additive for use in cold stores
E	29202050	1.0 kg	Polylub GA 352P	Lubrication
G	29201280	0.4 l	Chain spray	Chains

\* \*The trucks are delivered ex-works 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 use of named alternative hydraulic oils is not prohibited but may lead to a loss in functionality. The Jungheinrich hydraulic oil may be mixed with the named alternative hydraulic oil.



For applications in cold stores and fresh food areas, the manufacturer hydraulic oil (A) and the cold-store hydraulic oil (B) must be mixed in a 1:1 ratio.

## 5 Maintenance and repairs

### 5.1 Preparing the truck for maintenance and repair work

#### **WARNING!**

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

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

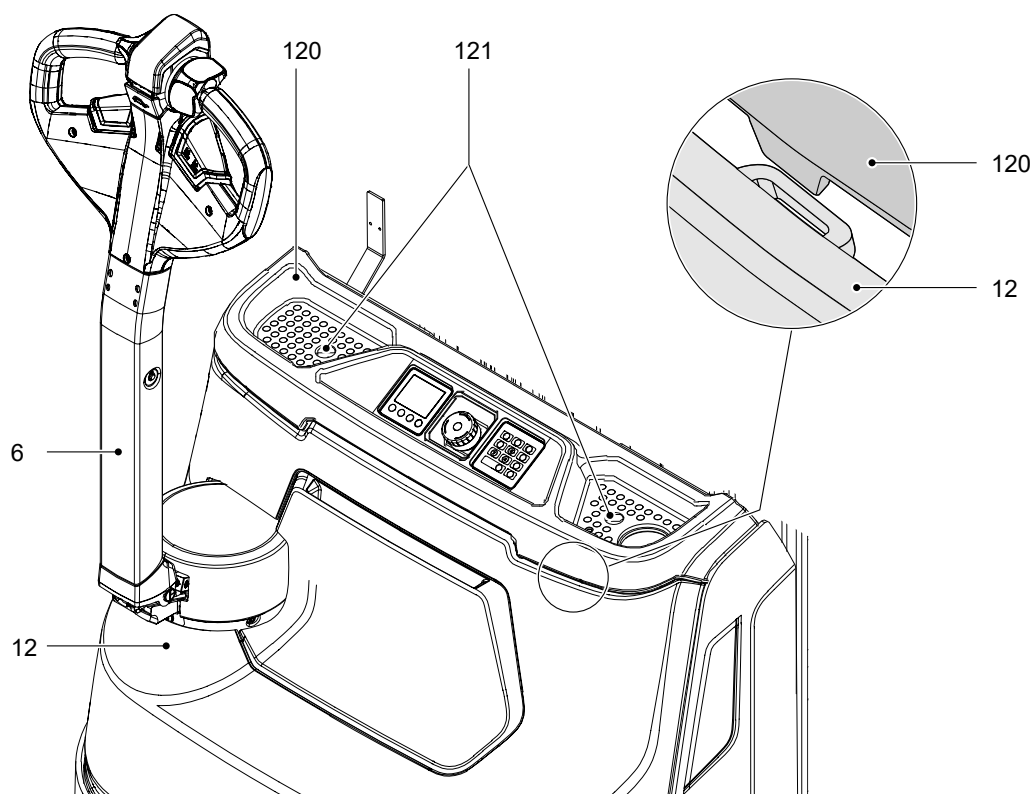
- ▶ Secure the raised load handler or truck such that no lowering, tipping or slipping is possible.
  - ▶ The prescribed instructions must be followed when raising the truck – see page 43.
  - ▶ When working on the parking brake, secure the truck to prevent it rolling away accidentally (e.g. using chocks).
- 

All necessary safety measures must be taken to avoid accidents when carrying out maintenance and repairs. The following preparations must be made:

##### *Procedure*

- Park the forklift truck securely – see page 84.
- A truck that is undergoing maintenance or repairs must be clearly marked as such.
- Secure the truck against unintentional activation.

## 5.2 Disassembling or assembling the front panel



### ***Removing the Front Panel***

#### ***Requirements***

- Truck parked securely – see page 84.

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

- Torx insert T45
- Torque wrench

#### ***Procedure***

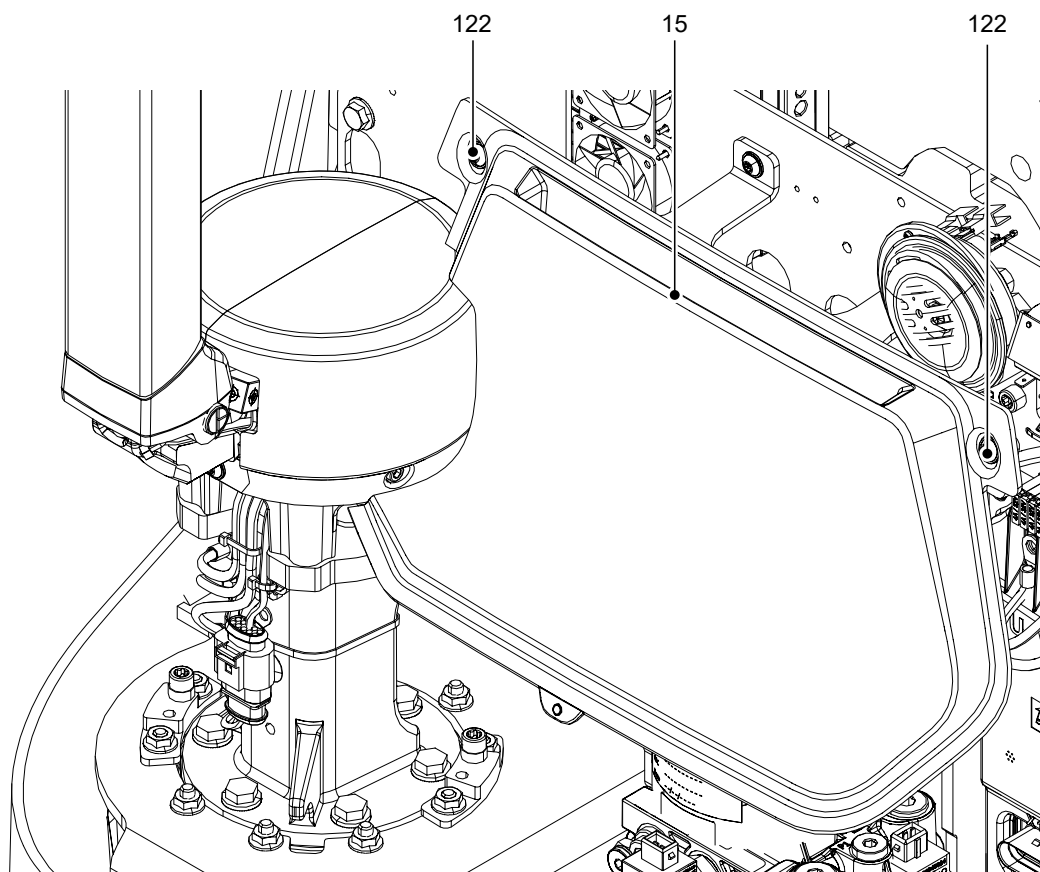
- Remove the 2 flanged button head bolts M8 x 25 (121).
- Slightly lift the dashboard panel (120) and remove the front panel (12) from the guides (see detailed drawing).
- Lift the front panel (12) over the tiller (6) and set it down.

*The front panel has been removed.*



Proceed in reverse order to install the front panel (12). Tighten the flanged button head bolts (121) with a torque of 3 Nm.

## 5.3 Removing or Fitting the Document Compartment



### ***Removing the document compartment***

#### ***Requirements***

- The truck is parked securely – see page 84.
- The front panel has been disassembled – see page 151.

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

- Torque wrench (3 Nm) and Torx insert T20

#### ***Procedure***

- Remove two flanged button head bolts (122).
- Lift up the document compartment (15).

*The drive compartment is exposed.*

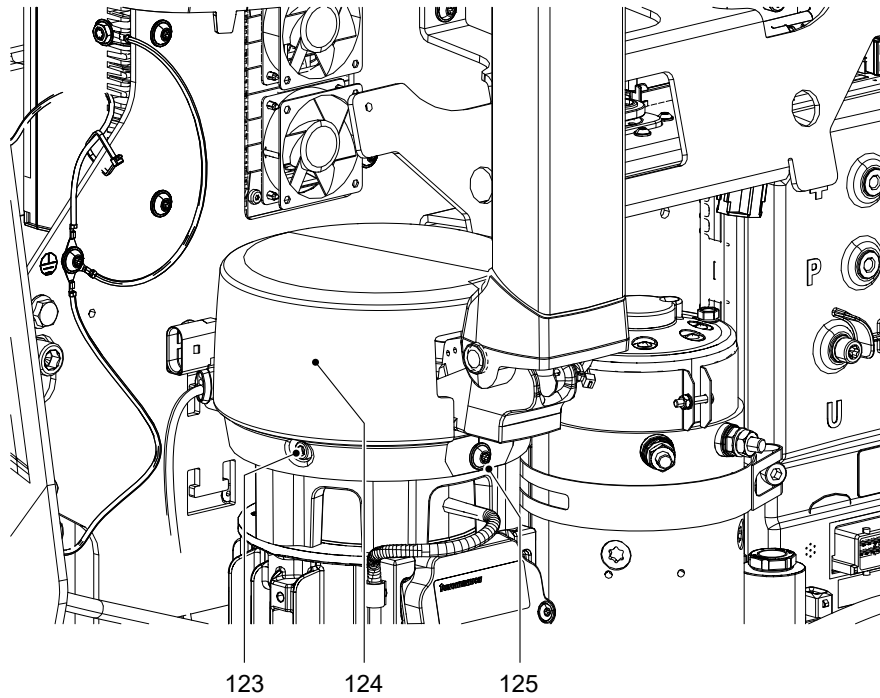
### ***Fitting the document compartment***

#### ***Procedure***

- Position the document compartment (15).
- Tighten two flanged button head bolts (122) with a torque of 3 Nm.

*The document compartment is fitted.*

## 5.4 Disassembling or assembling the drive panel



→ The drive panel consists of two parts.

### **Removing the drive panel**

#### *Requirements*

- The truck is parked securely – see page 84.
- The front panel has been disassembled – see page 151.
- The document compartment has been disassembled – see page 152.

#### *Tools and Material Required*

- Torque wrench (T20) and Torx insert T20
- Hexagon socket insert, width across flats 5 mm

#### *Procedure*

- Remove two cheese-head screws (123).
- Remove one rounded head screw (125).
- Pull apart the two halves of the drive panel (124) and lift off.

*The drive panel is now disassembled.*

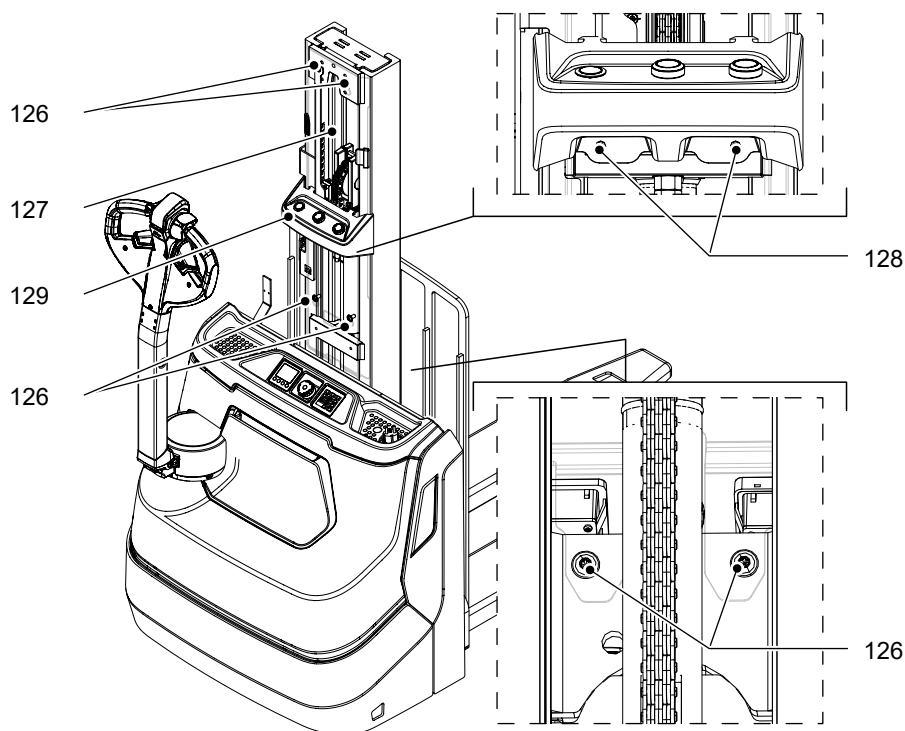
### **Drive panel assembly**

#### *Procedure*

- Bring together the two halves of the drive panel (124) as shown.
- Tighten two cheese-head screws (123) with a torque of 3 Nm.
- Tighten one rounded head screw (125) with a torque of 3 Nm.

*The drive panel is now assembled.*

## 5.5 Disassembling or assembling the safety devices



### ***Removing the safety device***

#### *Requirements*

- The truck is parked securely, see page 84

#### *Procedure*

- Remove the screw connections (126) from the safety device (127).
- If necessary, remove the housing of the automatic lift positioning (129).
  - To do this, remove the screws (128).
  - Lever out the housing.
  - Loosen the cable connections.
- Lift out the safety device (127) and store in a safe place.

*The safety device is disassembled.*

## ***Safety device assembly***

### ***Requirements***

- The truck is parked securely, see page 84

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

- Torque wrench

### ***Procedure***

- Insert the safety device (127).
- Fit the screw connections (126) of the safety device (127) with a torque of 8 Nm.
- If necessary, fit the housing of the automatic lift positioning (129).
  - Plug in the cable connections correctly.
  - Lever the housing into the holder.
  - Assemble the screws (128) with a torque of 8 Nm.

*The safety device is assembled.*

## 5.6 Lifting and jacking up the truck safely

### **WARNING!**

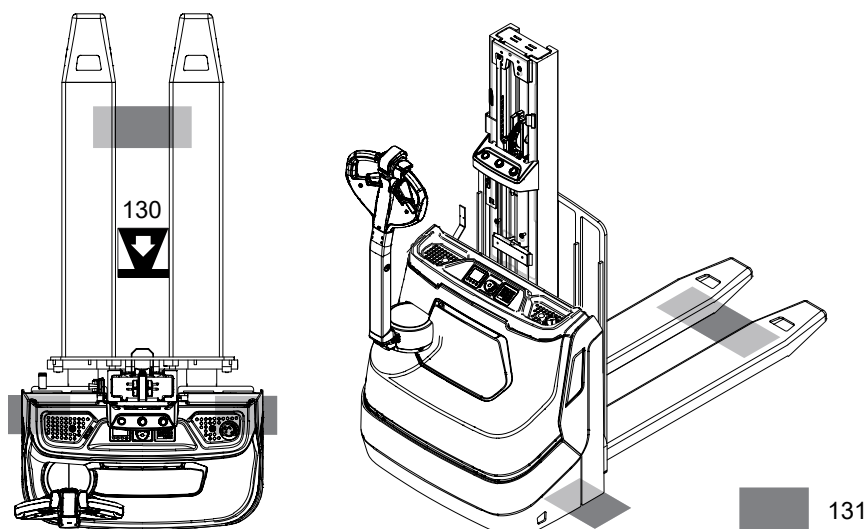
#### **Risk of injury when lifting and jacking up the truck**

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

- ▶ Jack up the truck on level ground.
  - ▶ Secure the truck against unintentional movement.
  - ▶ Use a jack with sufficient capacity.
  - ▶ When lifting the truck, secure the lifting accessories to the attachment points specially provided for this purpose – see page 43.
  - ▶ When jacking up, use suitable means (chocks, wooden blocks) to prevent the truck from slipping or tipping.
-



## 5.6.1 Lifting and Jacking up with a Jack



### ***Lifting and jacking up the truck by jack***

#### ***Requirements***

- Truck parked on a level surface.

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

- Jack
- Hard wooden blocks

#### ***Procedure***

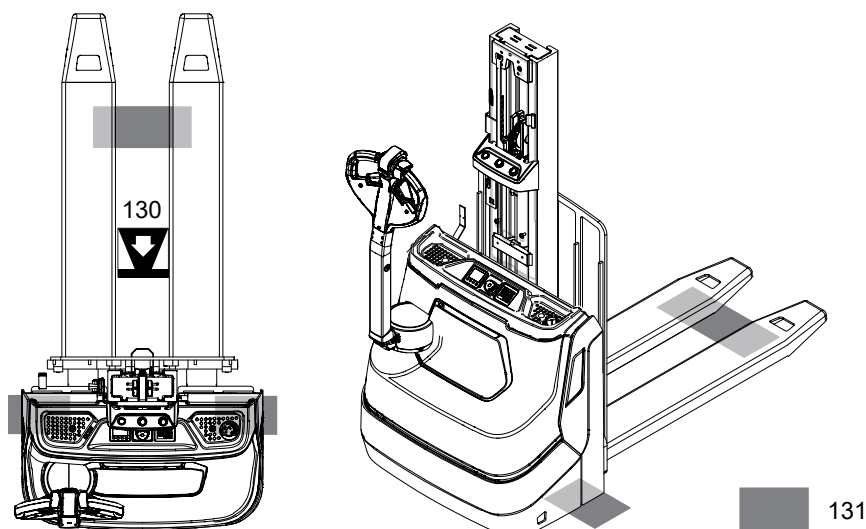
- Raise the load handler.
- Secure the load handler with wooden blocks (131).
- Lower the load handler.
- Switch off the truck.
- Place the jack against the jacking point (130).
- Raise the truck.
- Support the truck with wooden blocks at the marked positions (131).
- Remove the jack.

*The truck is now securely raised and jacked up.*

### ***Lowering the truck***

- To lower the truck, proceed in reverse order.

## 5.6.2 Lifting and Jacking up with a Crane



### ***Lifting and jacking up the truck by crane***

#### ***Requirements***

- Truck prepared for maintenance and repair work – see page 150.

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

- Lifting equipment/crane lifting gear
- Wooden blocks

#### ***Procedure***

- Apply the crane lifting gear to the attachment points (46) – see page 43.
- Raise the truck.
- Support the truck with wooden blocks at the marked positions (131).
- Lower the truck.
- Remove the crane lifting gear.

*The truck is jacked up.*

### ***Lowering the truck***

- To lower the truck, proceed in reverse order.

## 5.7 Cleaning

### 5.7.1 Cleaning the truck

#### **CAUTION!**

##### **Risk of fire due to use of flammable cleaning agents**

Using flammable cleaning agents increases the risk of fire.

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

#### **NOTICE**

##### **Risk of component damage when cleaning the truck**

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

- ▶ Cover all electronic system assemblies (controls, sensors, motors etc.) before cleaning the truck with a high-pressure cleaner.
- ▶ Do not hold the jet of the high-pressure cleaner at marking points to avoid damaging them – see page 36.
- ▶ Do not clean the truck with a steam jet.



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

##### *Requirements*

- Truck prepared for maintenance and repair work – see page 150.

##### *Tools and Material Required*

- Water-based cleaning agents
- Sponge or cloth

##### *Procedure*

- Clean the surface of the truck with water-based solvents and water. Use a sponge or cloth to clean.
- In particular, clean the following areas:
  - Window(s)
  - Oil filler caps and their surroundings
  - Grease nipples (before lubrication)
- 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 164.

*The truck is now clean.*

## 5.7.2 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 150.

##### *Tools and Material Required*

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

##### *Procedure*

- Expose the electrical system – see page 151.
- Clean the electrical system assemblies with weak suction or compressed air (use a compressor with a water separator) and a non-conductive, anti-static brush.
- Fit the electrical system cover – see page 151.
- Carry out all the tasks listed in the section "Recommissioning the truck after cleaning or maintenance work" – see page 164.

*The electrical-system assemblies are now clean.*

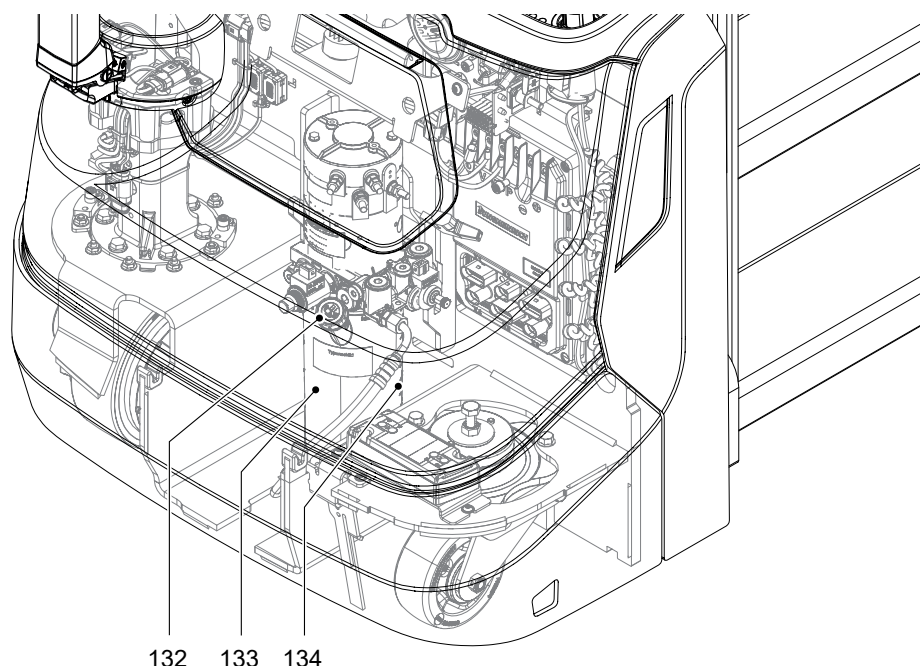
## 5.8 Checking the hydraulic oil level and refilling the hydraulic oil

### **⚠ WARNING!**

#### **Leaky hydraulic systems can result in accidents**

Hydraulic oil can escape from leaky and faulty hydraulic systems.

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



### **Checking the oil level**

#### *Requirements*

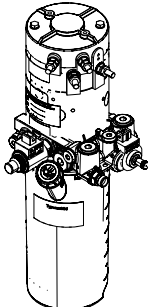
- Load handler lowered.
- Truck prepared for maintenance and repair work – see page 150.
- The front panel has been disassembled – see page 151.

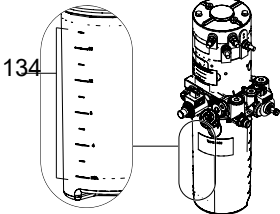
#### *Procedure*

- Check the oil level in the hydraulic reservoir (133).

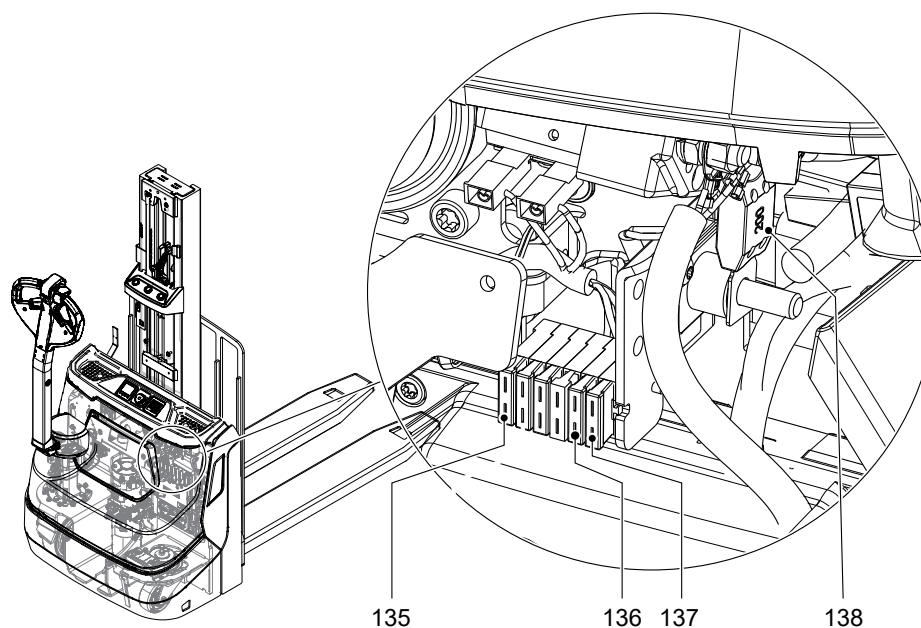
- ➔ Depending on the mast, the hydraulic oil level must be at a mark (134) according to the following table.
- If necessary, add hydraulic oil of the correct grade via the filler neck (132) – see page 149.

*The hydraulic oil level is now checked.*

Lift height [mm]	EJC 110i (E)/EJC 110bi (E)
	Oil quantity [l]
1200	1.6
1540	1.6
2000	2.0
	

Marking	Litres	
max (top)		
16		
12		
8		
4		
min (bottom)		

## 5.9 Checking the electrical fuses



Item	Description	Protection	Rating (A)
135	9FC91	Activation of master, telematics box	4
136	9FC82	Options	4
137	9FC61	Master controller, valves	4
138	FC1	Main fuse (travel/lift motor)	200

### Checking fuses

#### Requirements

- Truck prepared for maintenance and repair work, see page 150.
- Front panel removed, see page 151.

#### Procedure

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

*The fuses have been checked.*

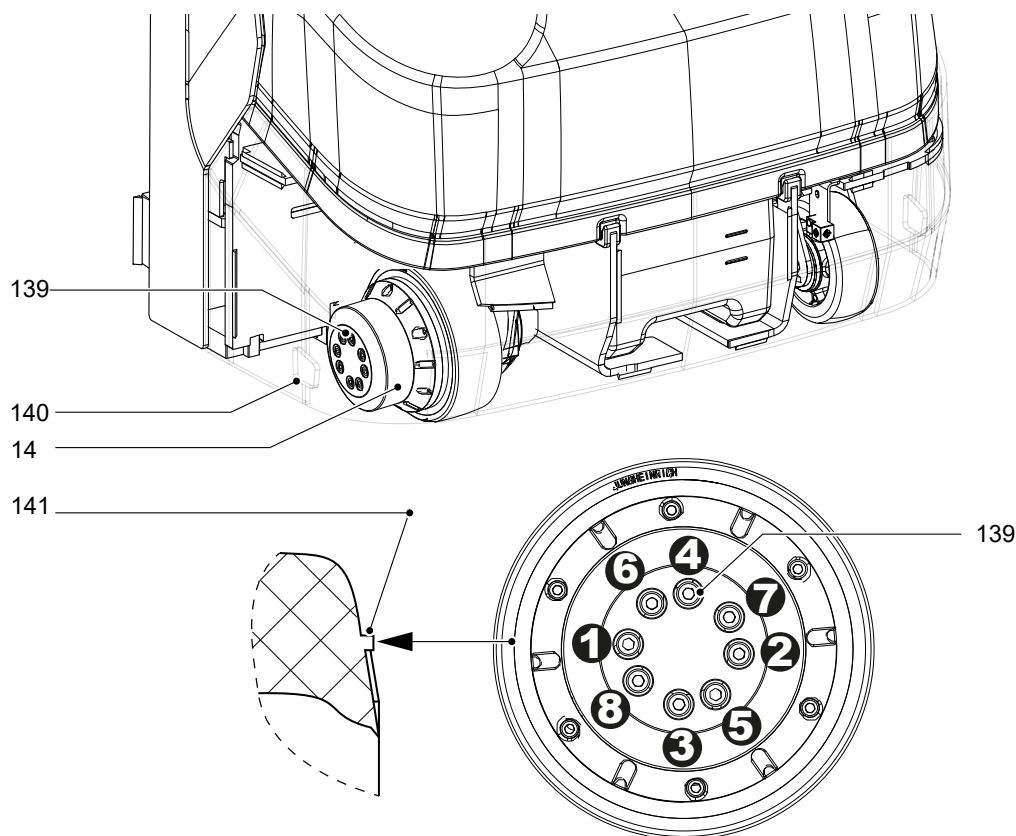
## **5.10 Restoring the truck to service after maintenance and repairs**

### *Procedure*

- Thoroughly clean the truck, see page 159.
- Lubricate the truck according to the lubrication diagram, see page 148.
- Charge the battery, see page 57.
- Start up the truck, see page 82.



## 5.11 Checking the attachment and wear of the wheels



- ➔ Replace the wheels if the wear limit (141) has been reached.
- ➔ The wheel nuts on the drive wheel must be retightened in accordance with the maintenance intervals indicated in the maintenance checklist, see page 171.

### ***Tightening the wheels nuts***

#### ***Requirements***

- Truck is prepared for maintenance and repair work, see page 150.

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

- Torque wrench

#### ***Procedure***

- Position the drive wheel (14) such that the wheel nuts (139) can be tightened through the assembly opening (140).
- Tighten all wheel nuts (139) using the torque wrench through the assembly opening (140) in the bumper.

To do this, tighten the wheel nuts in the prescribed order.

- First tighten with 10 Nm.
- Then tighten with 150 Nm.

*The wheel nuts have now been tightened.*

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

## 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 156.

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

#### **NOTICE**

##### **Damage to the lithium-ion battery due to discharge**

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

- ▶ Truck parked securely – see page 84.
- ▶ Fully charge the lithium-ion battery before extended periods of non-use or storage.
- ▶ Fully charge the lithium-ion battery every 3 months to protect against deep discharge.

---

##### *Procedure*

- Thoroughly clean the truck, see page 159.
- Prevent the truck from rolling away accidentally.
- Check the hydraulic oil level and replenish if necessary, see page 161.
- Apply a thin layer of oil or grease to any non-painted mechanical components.
- Lubricate the truck according to the lubrication diagram, see page 148.
- Charge the battery, see page 49.

## 6.2 Action to be taken during decommissioning

### NOTICE

#### Damage to the lithium-ion battery due to discharge

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

- ▶ Truck parked securely – see page 84.
  - ▶ Fully charge the lithium-ion battery before extended periods of non-use or storage.
  - ▶ Fully charge the lithium-ion battery every 3 months to protect against deep discharge.
- 

- Charge the battery – see page 49.

## 6.3 Restoring the truck to service after decommissioning

#### *Procedure*

- Thoroughly clean the truck – see page 159.
- Lubricate the forklift truck according to the lubrication schedule – see page 148.
- Charge the battery – see page 61.
- Start up the truck – see page 81.

## **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.

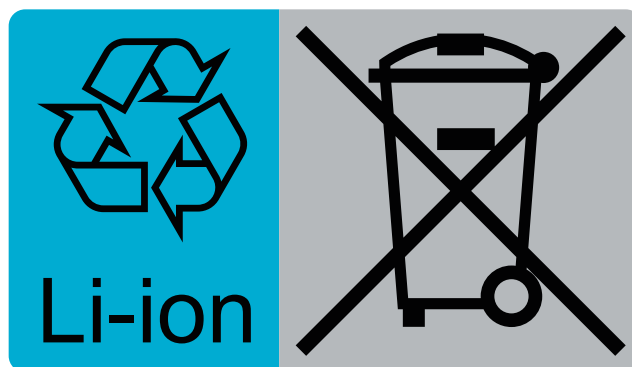
The operating company is responsible for ensuring that faults are rectified immediately.

## **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.

## 8.1 Disposal of a Lithium-Ion Battery



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

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

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



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### Instructions for disposal

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

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

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## 9 Human vibration measurement



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



# G Maintenance, Inspection and Changing of Maintenance Parts Requiring Replacement

## ⚠ WARNING!

### Lack of maintenance can result in accidents

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

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

## NOTICE

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

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

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

## 1 Maintenance Contents EJC 110bi (E)

Issued on: 2024-07-18 14:00

### 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>
Lubricate the load chains.
Correct the hydraulic-oil level.
<b>Steering</b>
Test the tiller return function.

#### 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

<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

### 1.1.2.2 Optional Equipment

The following points must be checked:

#### Optional equipment

<b>Chassis/structure</b>
Test optional equipment such as mirrors, storage compartments, handles, windscreen wipers and windscreen washing systems, etc. and check for damage

## 1.2 Customer Service

In accordance with the EJC 110bi (E) 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.



<b>Electrical system</b>
Test the contactors and/or relays.
Perform insulation inspection.
<b>Power supply</b>
Measure the battery voltage.
<b>Travel</b>
Correct the transmission oil level or grease filling of the transmission.
<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>
Adjust the load chains.
Lubricate the load chains.
Test emergency lowering.
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.
Carry out a potential measurement on the chassis while charging is in progress.

## 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

<b>Electrical system</b>
Contactors and/or relays for wear and damage
Check electrical wiring for damage (insulation damage, connections) and check whether the fuse ratings are correct
Check connections and cables are securely attached and check for insulation damage and other signs of damage
Check access module is securely attached, test and check for damage
<b>Power supply</b>
Battery latch and battery attachment for correct function and damage
<b>Travel</b>
Sensors/switches for secure fit, functionality and damage
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
Check mast is securely attached
<b>Hydraulic operations</b>
Test hydraulic controls and check their labels for legibility, completeness and plausibility
Check cylinders and piston rods are securely attached and check for damage
Check load chain mounting elements and chain pins for wear and damage
Check mast rollers and their running surfaces for wear and damage
Test hydraulic system
Check fork arms or load handler for 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
Cables and electrical connections for secure fit and damage

### 1.2.2.2 Optional Equipment

#### Optional equipment

<b>Chassis/structure</b>
Test optional equipment such as mirrors, storage compartments, handles, windscreen wipers and windscreen washing systems, etc. and check for damage

#### Discharge strap

<b>Electrical system</b>
Check presence of electrostatic discharge strap or chain and check for damage

#### Pre-Op\_Check

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

#### automatic ergonomic lift

<b>Electrical system</b>
Sensors for secure attachment, function and 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>
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>
Hydraulic oil	1000	12
Hydraulic oil additive	1000	12

## 2 Maintenance Contents EJC 110i (E)

Issued on: 2024-07-18 14:00

### 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>
Lubricate the load chains.
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>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:

## Optional equipment

### Chassis/structure

Test optional equipment such as mirrors, storage compartments, handles, windscreen wipers and windscreen washing systems, etc. and check for damage

## 2.2 Customer Service

In accordance with the EJC 110i (E) service interval, to be performed every 1000 service hours, but at least once a year.

### 2.2.1 Maintenance contents

#### 2.2.1.1 Standard equipment

### Brakes

Test the brake with the tiller in the maximum vertical and horizontal positions.

### Electrical system

Test the contactors and/or relays.

Perform insulation inspection.

### Power supply

Measure the battery voltage.

### Chassis/structure

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

### Hydraulic operations

Adjust the load chains.

Lubricate the load chains.

Test emergency lowering.

Correct the hydraulic-oil level.

Test the pressure relief valve.

### Agreed services

Carry out a test run with the rated capacity or a customer-specific load.

Lubricate the truck according to the lubrication schedule.

Demonstration after maintenance.

### Steering

Test the tiller return function.

### Battery charger

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

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

## 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
Contactors and/or relays for wear and damage
Check electrical wiring for damage (insulation damage, connections) and check whether the fuse ratings are correct
Check connections and cables are securely attached and check for insulation damage and other signs of damage
Check access module is securely attached, test and check for damage
<b>Power supply</b>
Battery latch and battery attachment for correct function and damage
<b>Travel</b>
Sensors/switches for secure fit, functionality and damage
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
Check mast is securely attached
<b>Hydraulic operations</b>
Test hydraulic controls and check their labels for legibility, completeness and plausibility
Check cylinders and piston rods are securely attached and check for damage
Check load chain mounting elements and chain pins for wear and damage
Check mast rollers and their running surfaces for wear and damage
Test hydraulic system
Check fork arms or load handler for 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
Cables and electrical connections for secure fit and damage

#### 2.2.2.2 Optional Equipment

##### Optional equipment

<b>Chassis/structure</b>
Test optional equipment such as mirrors, storage compartments, handles, windscreen wipers and windscreen washing systems, etc. and check for damage

##### Discharge strap

<b>Electrical system</b>
Check presence of electrostatic discharge strap or chain and check for damage

##### Pre-Op\_Check

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

##### automatic ergonomic lift

<b>Electrical system</b>
Sensors for secure attachment, function and damage

#### 2.2.3 Maintenance parts

The manufacturer recommends the replacement of the following maintenance parts at the specified intervals.

##### 2.2.3.1 Standard equipment

<b>maintenance part</b>	<b>service hours</b>	<b>months</b>
Hydraulic system breather filter	2000	12
Hydraulic oil	2000	12
Hydraulic oil filter	2000	12

### 2.2.3.2 Optional Equipment

#### Cold store application

<b>maintenance part</b>	<b>service hours</b>	<b>months</b>
Hydraulic oil	1000	12
Hydraulic oil additive	1000	12