EJC 010i/110i/112i/110zi/112zi

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Operating instructions

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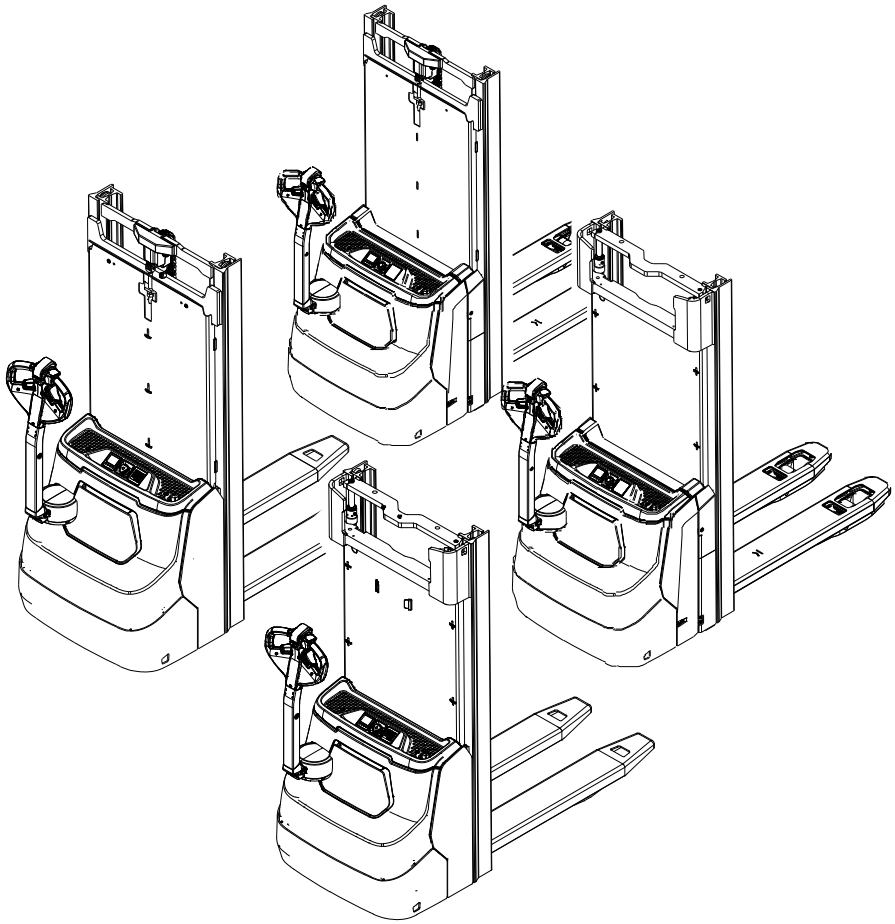
EJC 010i
EJC 110i
EJC 112i
EJC 110zi
EJC 112zi



JUNGHEINRICH

Declaration of Conformity

CE

Manufacturer

Jungheinrich AG, 22039 Hamburg, Germany

Description
Industrial truck

Type	Option	Serial no.	Year of manufacture
EJC 010i EJC 110i EJC 112i EJC 110zi EJC 112zi			

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.

UK CA

JUNGHEINRICH

Declaration of Conformity (○)

Product:	EJC 010i/110i/112i/110zi/112zi 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

07.24 en-GB

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

➔ Not all options are available for all types of industrial truck.

Jungheinrich Aktiengesellschaft

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07.24 en-GB

Contents

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 123.

Permissible activities

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

Prohibited activities

– Travelling with a raised load (> 500 mm)
  In double-deck operation, the load handler must not be raised higher than 1800 mm. The bottom load must be heavier than the top.
– 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 34.
  • Notes on travelling on slopes and inclines – see page 105.

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)** [1]				
Finished floors e.g. screed on its own, screed for accommodating floor coverings, floor coverings, tile coverings, smoothed and bonded surfaces	≤ 0.1 m	1 m	4 m	10 m	≥15 m
	2 mm	4 mm	10 mm	12 mm	15 mm
[1] *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 85.

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.

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

3.3 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 65.

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.

Version EJC 110zi/112zi:
The support arm lift increases the ground clearance when transporting on uneven ground.

1.1 Truck models and rated capacity

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

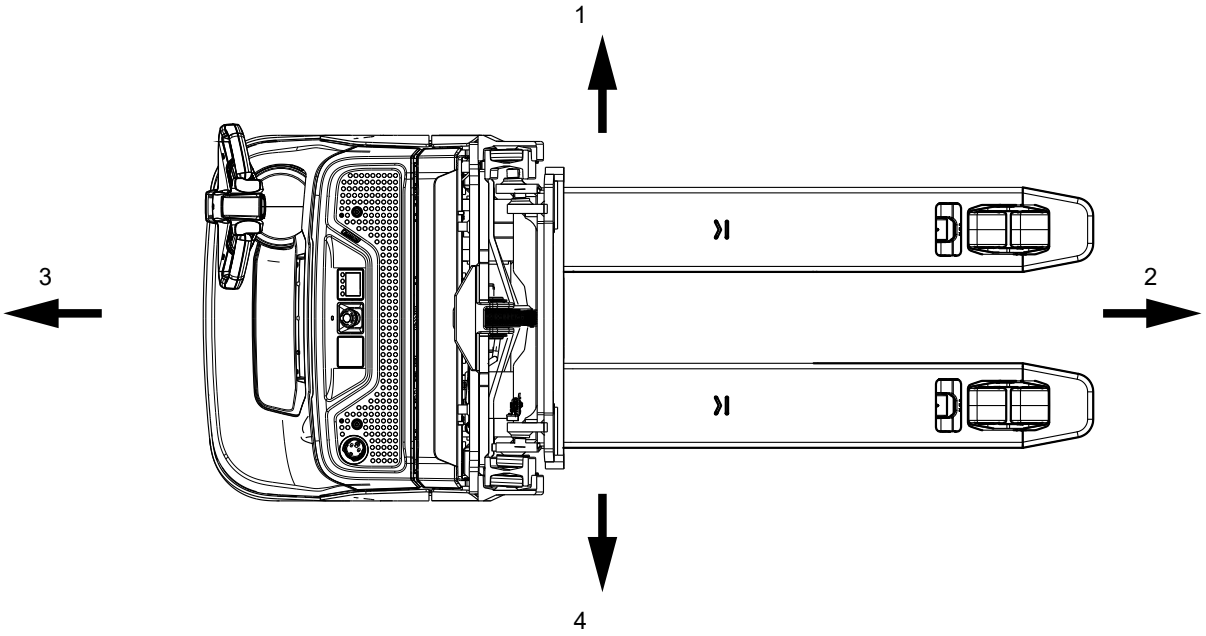
EJC 010i/110i/112i/110zi/112zi

EJC 112zi	Type designation
1	Series
12	Rated capacity x 100 kg
z	Support arm lift
i	Lithium-ion battery

The rated capacity is not generally the same as the permissible capacity. The permissible capacity can be found on the capacity plate attached to the truck – see page 52.

2 Travel direction definition

The following determinations have been made for travel direction specification:

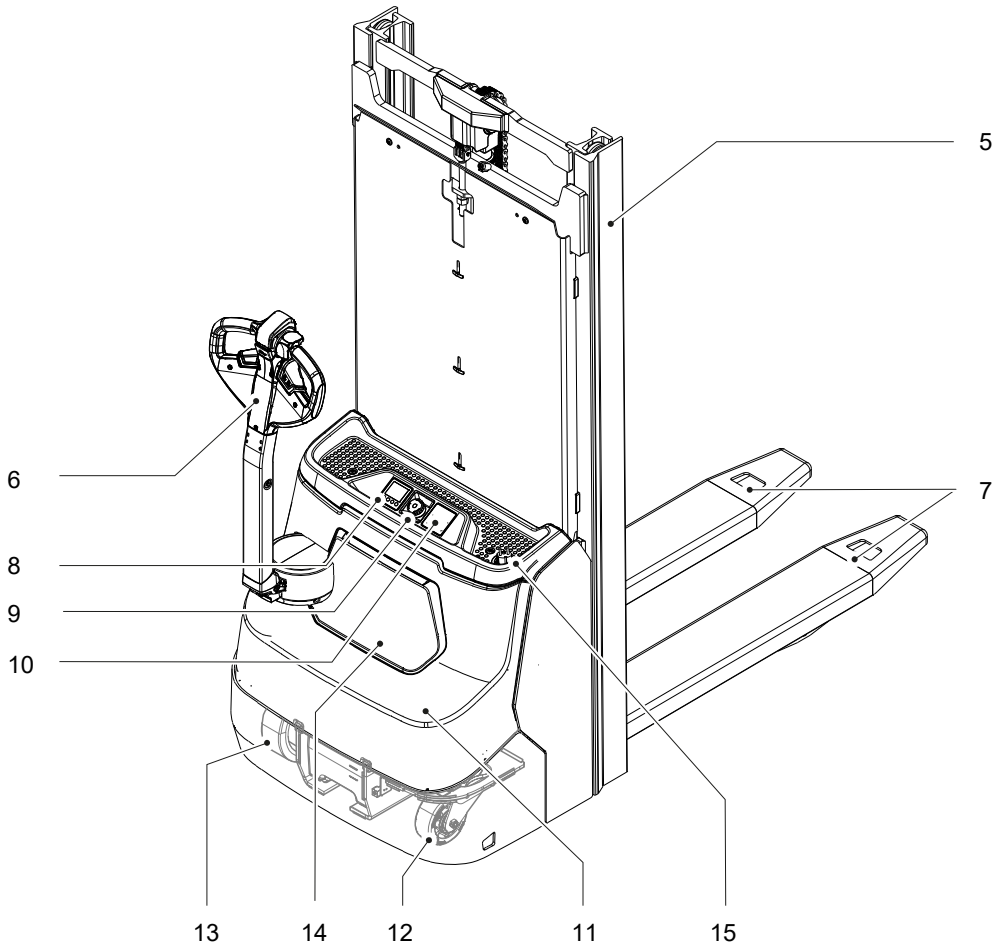


Item	Description
1	Left
2	Load direction
3	Drive direction
4	Right

3 Assembly description

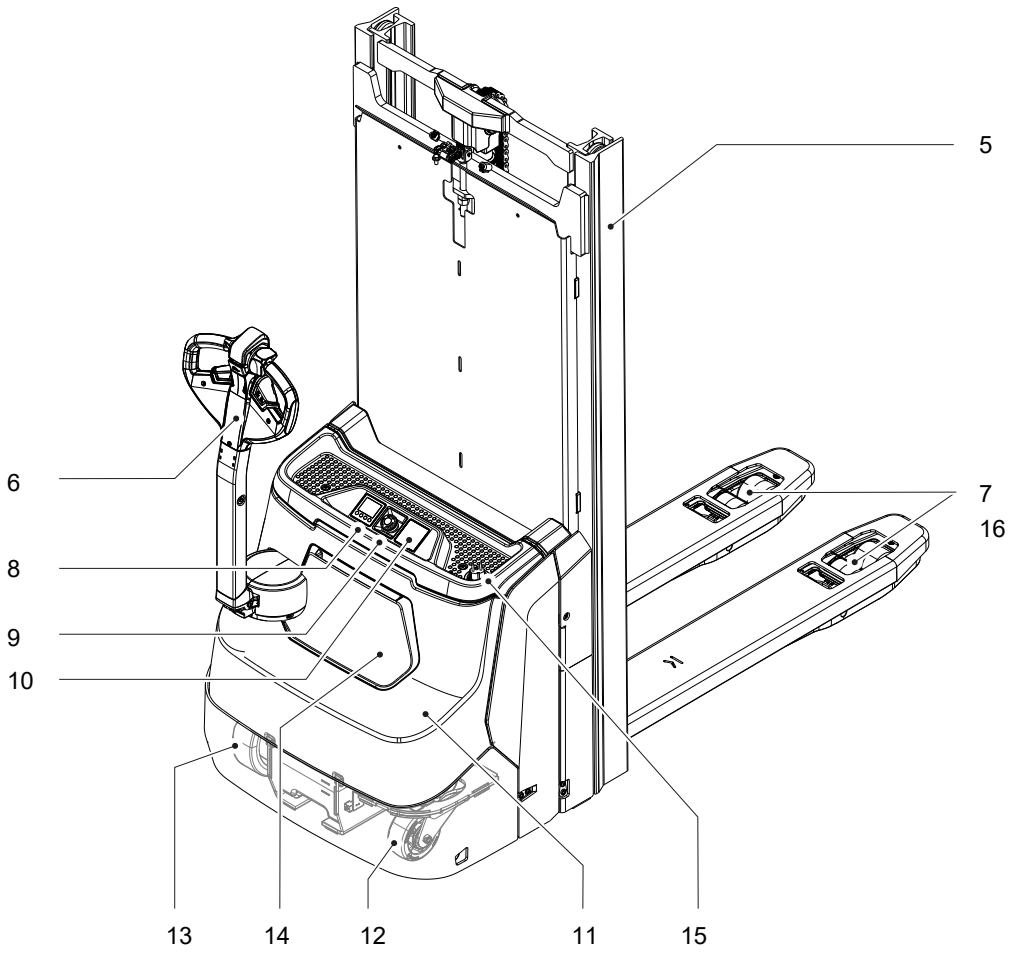
3.1 Assembly Overview

EJC 010i/110i/112i



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

EJC 110zi/112zi



Item		Designation
5	●	Mast
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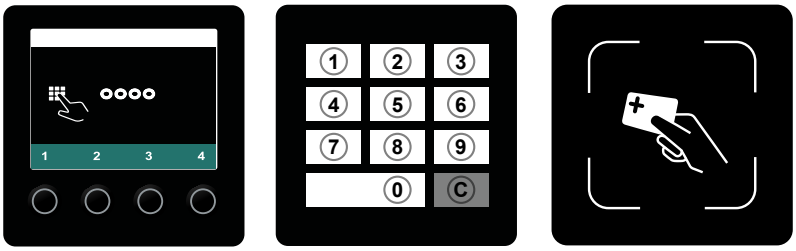
11	●	Front panel
12	●	Support wheel
13	●	Drive wheel
14	●	Document storage compartment
15	●	Mains plug (on-board charger)
16	●	Support arms

3.2 Keyless Access System

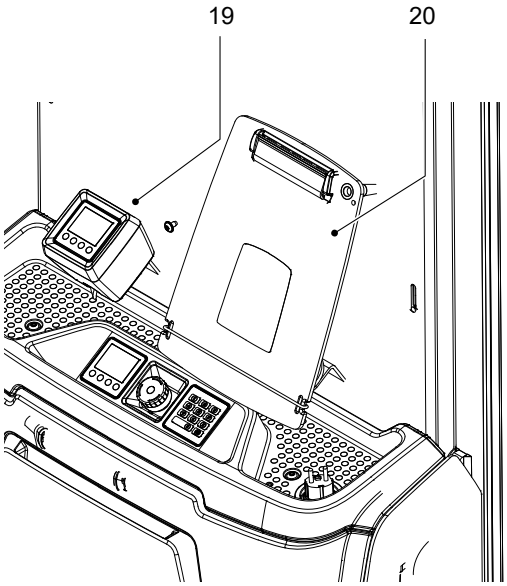


8 17 18

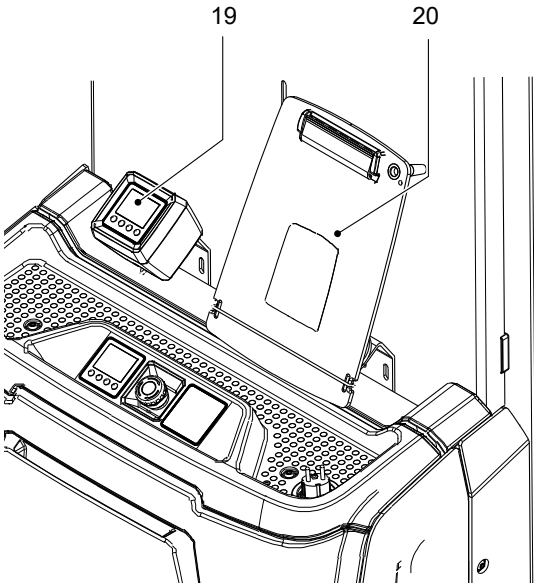
Item		Designation
8	●	Display unit with 2-inch display
17	○	Keypad
18	○	Transponder reader Plus

3.3 Optional Assemblies on the Dashboard Panel

EJC 010i/110i/112i



EJC 110zi/112zi

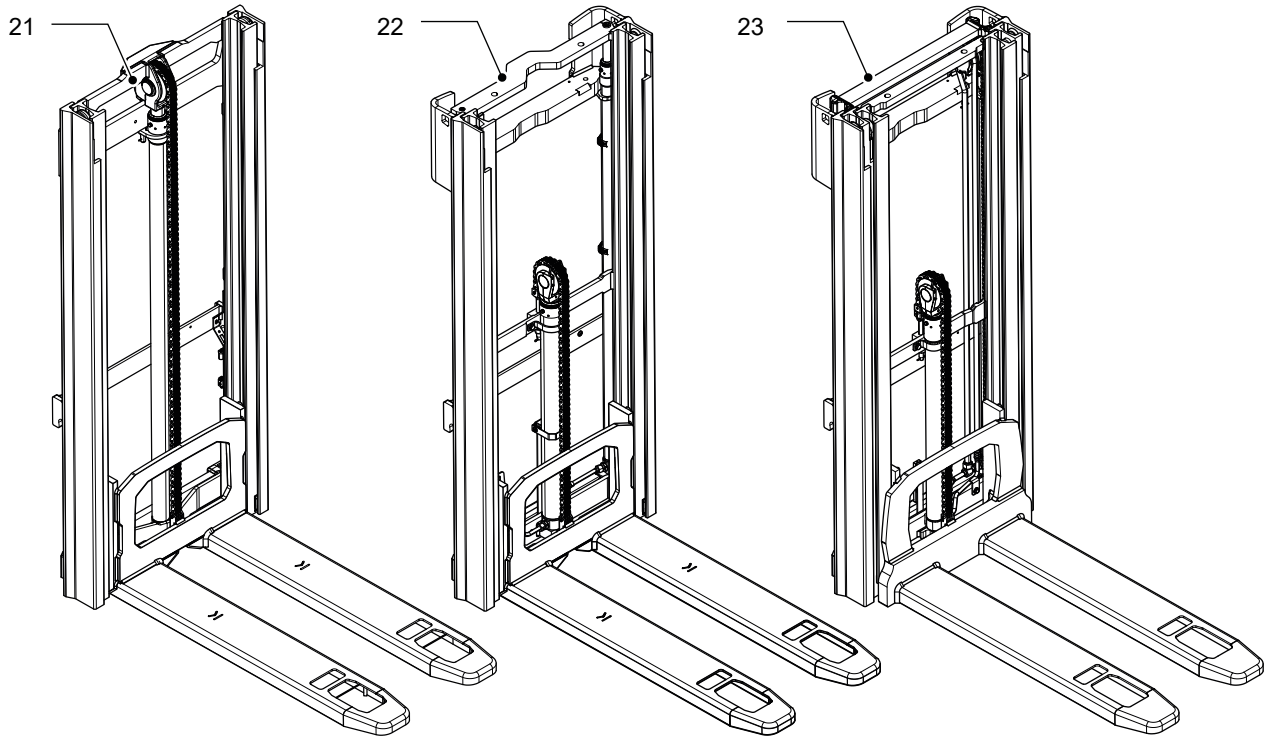


Item		Designation
19	○	Pre-Op Check display unit
20	○	DIN A4 writing board

The Pre-Op Check display unit is always located on the left. If the display unit is not present, the DIN A4 writing board can also be mounted on the left-hand side.

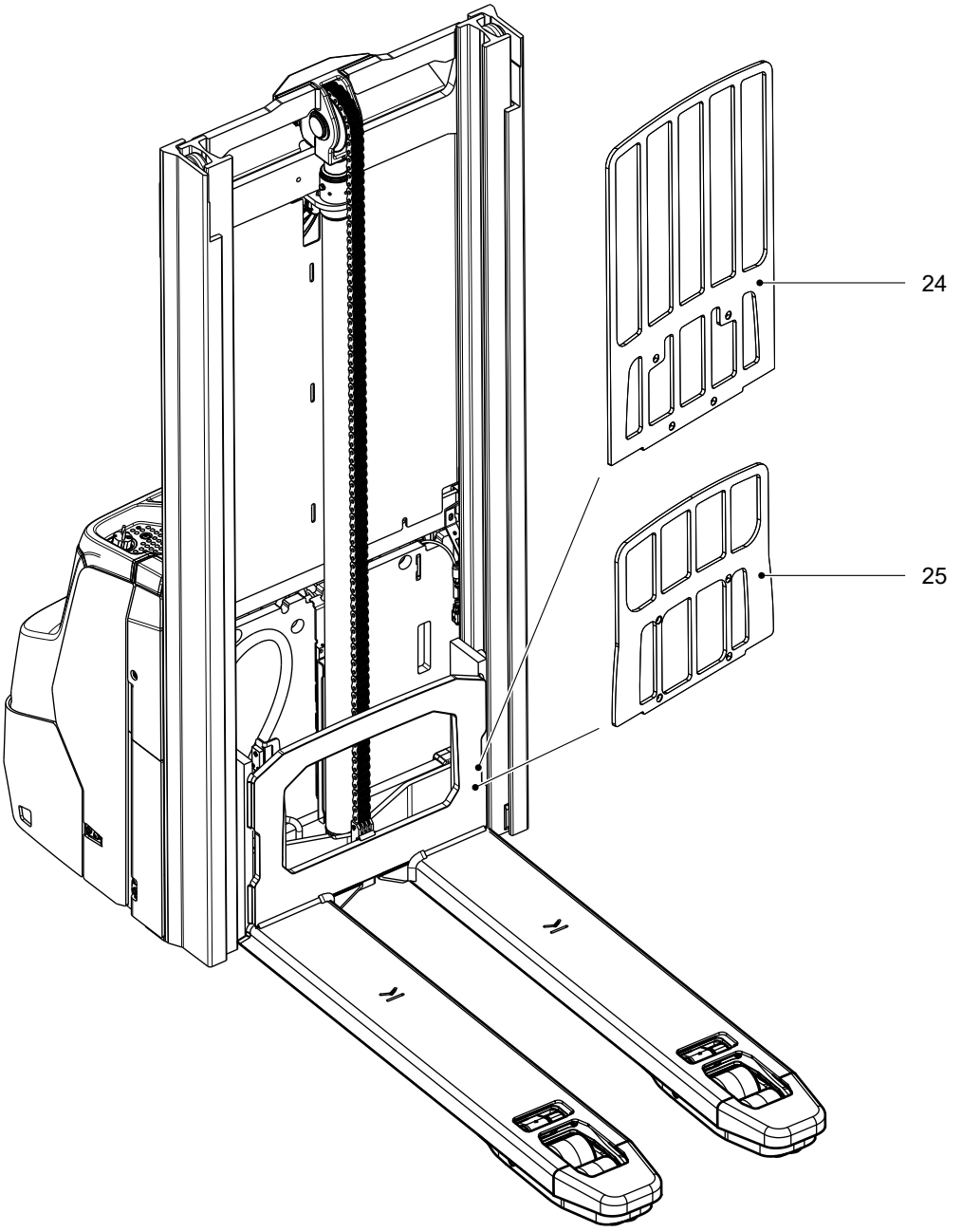
3.4 Mast

Overview



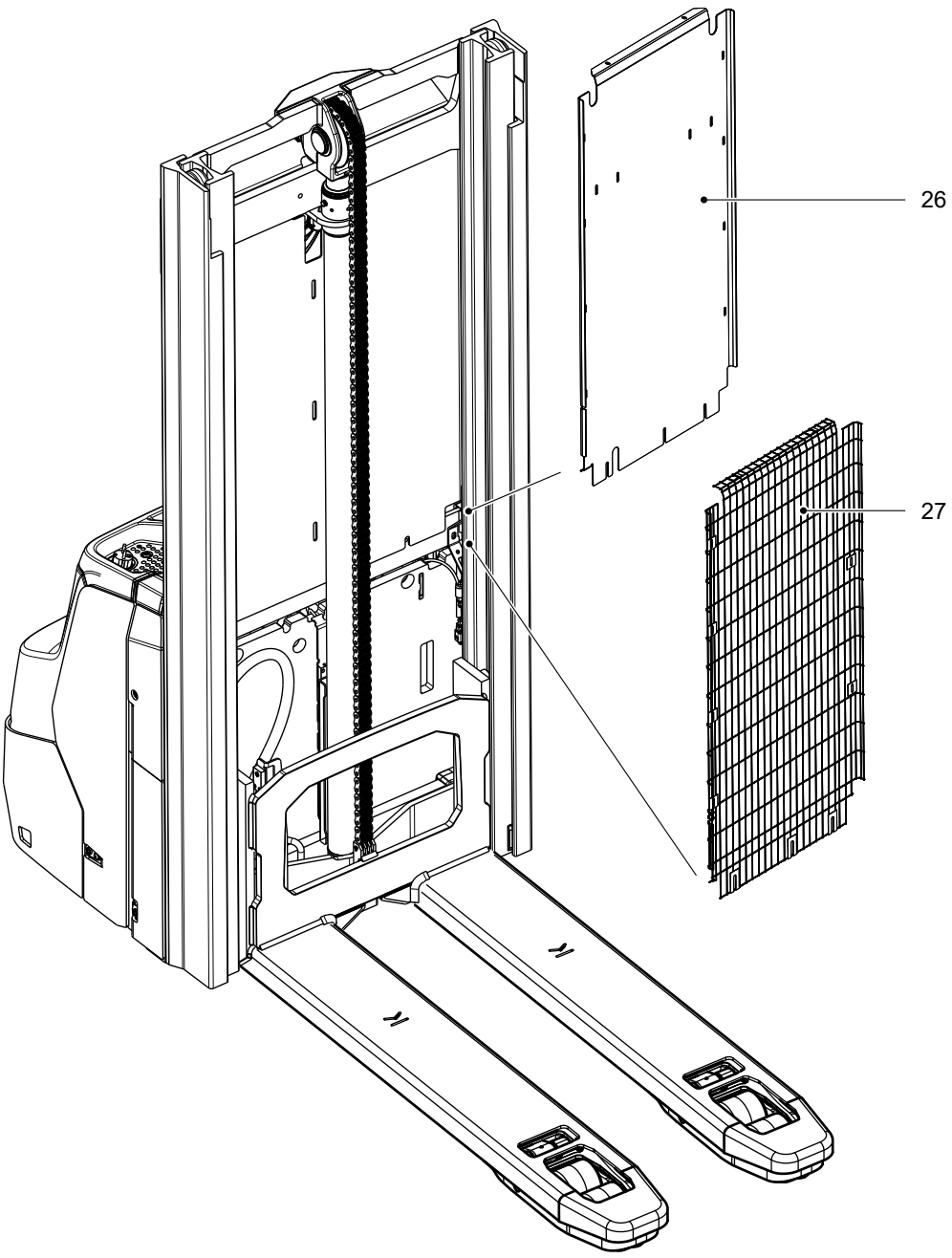
Item		Description
21	○	ZT mast (ZT = two-stage telescopic mast)
22	○	ZZ mast (ZZ = double mast with auxiliary lift)
23	○	DZ Mast (DZ = triple mast with auxiliary lift)

Load backrest



Item		Description
24	○	Load backrest, large
25	○	Load backrest, small

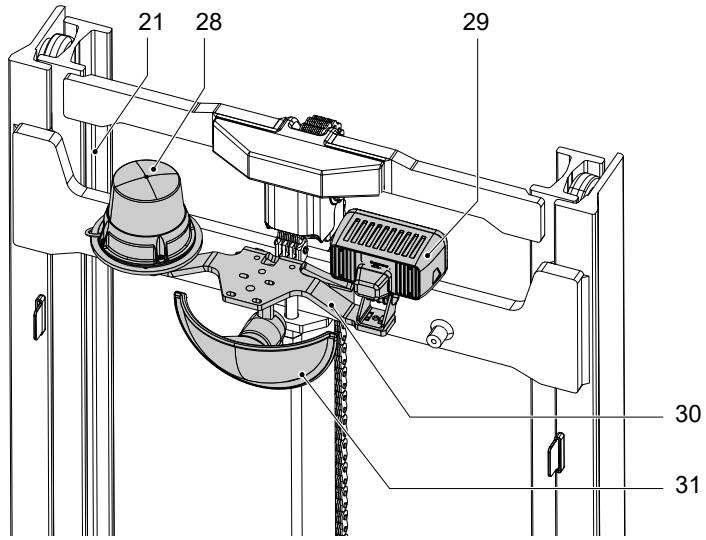
Mast cover

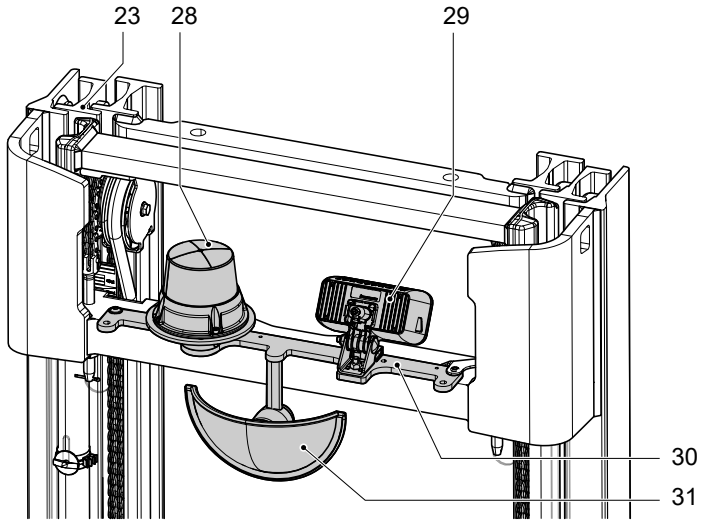


Item		Description
26	●	Protective screen panel (not suitable for cold store operation)
27	○	Protective grille

3.5 Optional Assemblies on the Mast

Overview





Item		Description
21	○	ZT mast (ZT = two-stage telescopic mast)
23	○	DZ Mast (DZ = triple mast with auxiliary lift)
28	○	Beacon
29	○	Red or blue LED light (Floor-Spot)
30	○	Options bracket
31	○	Panoramic mirror

➔ The panoramic mirror can be mounted on the options bracket in three positions.

4 Functional Description

➔ Some options are available depending on the truck equipment.

4.1 General description

Drive system

A fixed AC three-phase motor actuates the drive wheel via a gearbox. 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): 5,2 km/h, medium acceleration
– Travel program 3 (fast): 6 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 ± 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:

– ZT mast: The load weight is displayed over the entire lift height.
– ZZ/DZ mast: The load weight is displayed up to 350 mm (lift height h3) and again once the mast lift has been reached. No load weight is displayed in the area in between.

➔ No load determination takes place in the initial lift.

➔ 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 110.
– "Slow travel button", see page 114.
– Button for lifting or lowering the load handler, see page 118.

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.

Initial lift

The initial lift (also called: support arm lift) increases the ground clearance when transporting on uneven ground.

Free lift

With the ZZ mast and the DZ 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.

Double-deck function (○)

The double-deck function allows two pallets to be picked up and transported at the same time.

Automatic lower sequence of support arm lift (○)

⇨ EJC 110zi/112zi only

With the support arm lift raised, loads can be stacked and retrieved with the load fork up to a lift height of 1800 mm. For higher lift heights, the support arm lift must be lowered.

On trucks with the "automatic lower sequence of support arm lift" function (○), the support arms are automatically lowered as of a load fork lift height of 1800 mm when the "raise load fork" button remains depressed.

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.

Floor-Spot (○)

The activated Floor-Spot forewarns people of the truck travel path by projecting a coloured light dot onto the floor at the set distance.

The Floor-Spot is available in two versions:

– With blue light dot
– With red light dot

Beacon (○)

The beacon improves truck visibility and provides protection at risk points.

Panoramic mirror (○)

As an option, the industrial truck can be equipped with a panoramic mirror to support the operator's all-round view.

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 109.

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 107.

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 – see page 22.

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 144.

4.3 Assistance systems

curveCONTROL (○)

The curveCONTROL assistance system helps the operator to operate the truck safely. When cornering, the maximum travel speed is reduced according to the steer angle.

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.

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 110.

Slow travel with the forks lowered (○)

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

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

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

5 Technical Specifications

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

EJC 010i

	Designation	**EJC 010i**	
Q	Rated capacity	1000	kg
c	Load centre distance	600	mm
	Travel speed with / without load	5.3 / 5.3	km/h
	Lift speed with/without load (ZT HG)	0.15 / 0.27	m/s
	Lower speed w/ w.o. load (ZT mast)	0.34 / 0.34	m/s
	Drive motor, output S2 60 min.	1	kW
	Lift motor output S3	2.2 / 5	kW / %
	Energy consumption in accordance with EN 16796	0.43	kWh/h

EJC 110i/112i

	Designation	**EJC 110i**	**EJC 112i**	
Q	Rated capacity	1000	1200	kg
c	Load centre distance	600		mm
	Travel speed with / without load	6.0 / 6.0		km/h
	Lift speed with/without load (ZT HG)	0.15 / 0.27	0.17 / 0.33	m/s
	Lower speed w/ w.o. load (ZT mast)	0.34 / 0.34	0.45 / 0.37	m/s
	Drive motor, output S2 60 min.	0.9		kW
	Lift motor output S3	2.2 / 5	2.8 / 13	kW / %
	Energy consumption in accordance with EN 16796	0.66		kWh/h

EJC 110zi/112zi

	Designation	EJC 110zi	EJC 112zi	
Q	Rated capacity / load for mast lift	1000	1200	kg
	Rated capacity / load for initial lift	1400	1600	kg
c	Load centre distance	600		mm
	Travel speed with/without load	6.0 / 6.0		km/h
	Lift speed with/without load (ZT HG)	0.15 / 0.24	0.16 / 0.29	m/s
	Lower speed w/ w.o. load (ZT mast)	0.34 / 0.34	0.41 / 0.37	m/s
	Lift speed of initial lift with / without load	0.09 / 0.11		m/s
	Lowering speed of initial lift with / without load	0.07 / 0.03		m/s
	Drive motor, output S2 60 min.	0.9		kW
	Lift motor output S3	2.2 / 5	2.2 / 10	kW / %
	Energy consumption as per EN 16796	0.66		kWh/h

5.2 Gradeability

EJC 010i/110i/112i

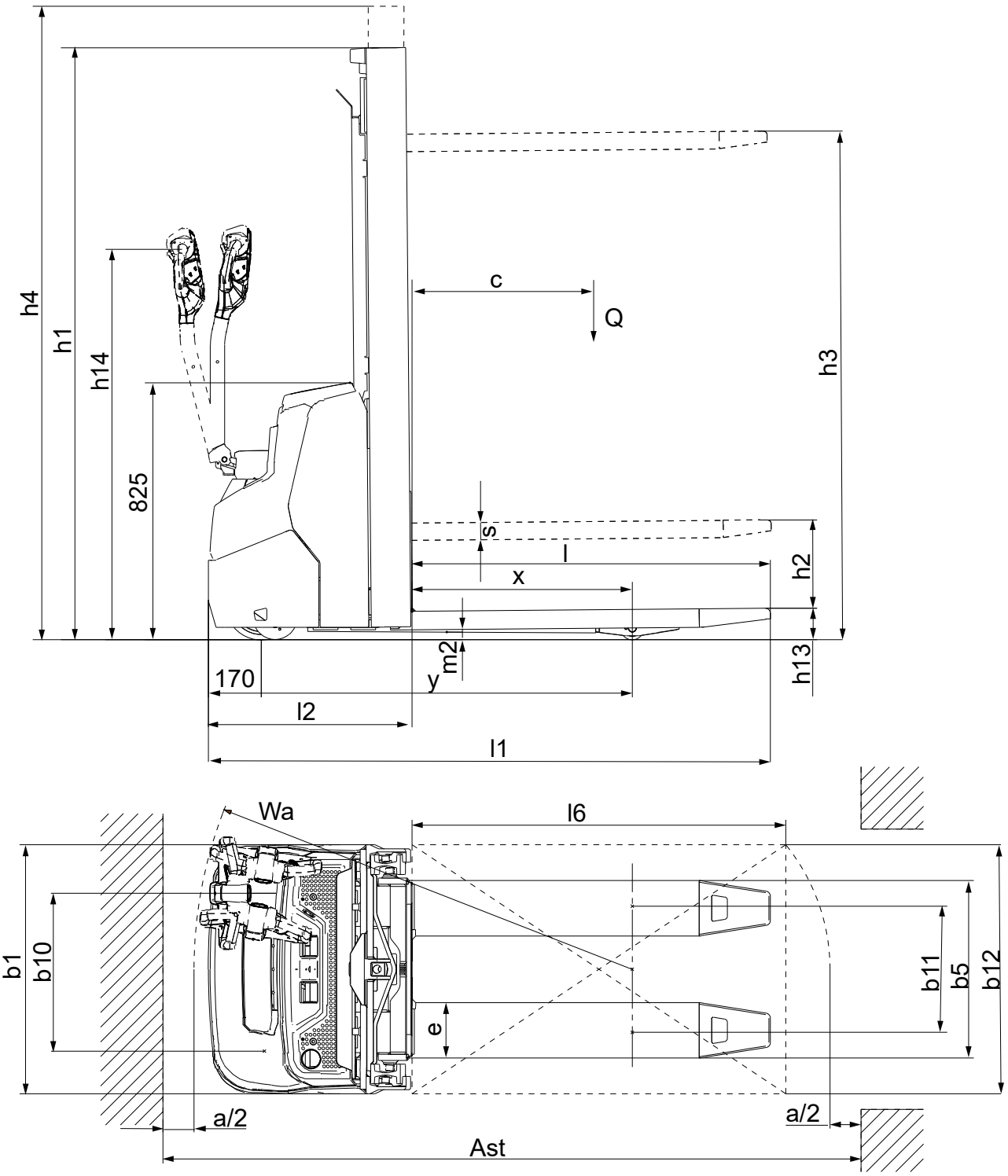
	Maximum gradeability	EJC 010i/110i/112i	
	With / without load – mast lift	6 / 14	%

EJC 110zi/112zi

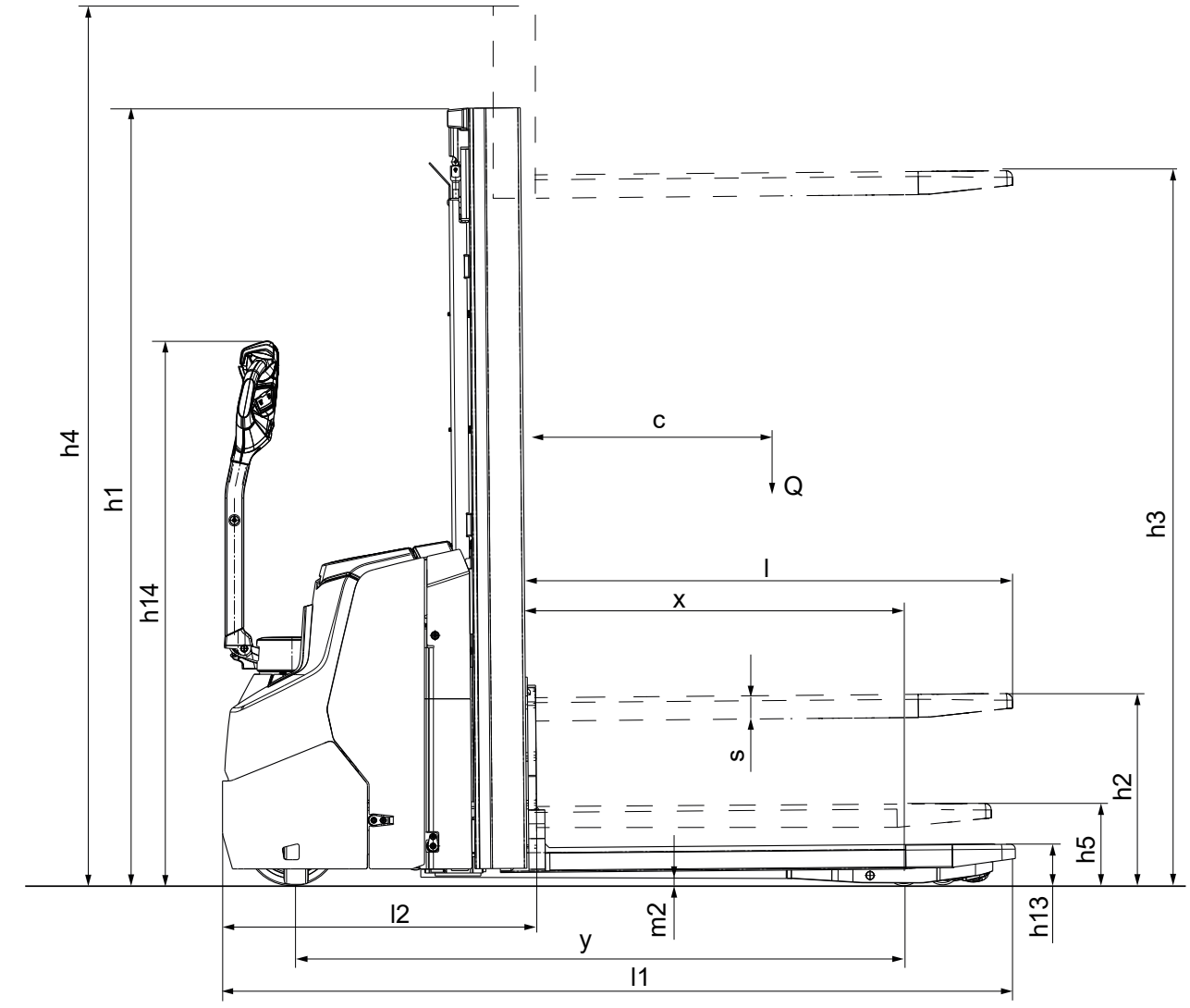
	Maximum gradeability	EJC 110zi/112zi	
	With / without load – mast lift	5 / 14	%
	With / without load – initial lift	4 / 14	%

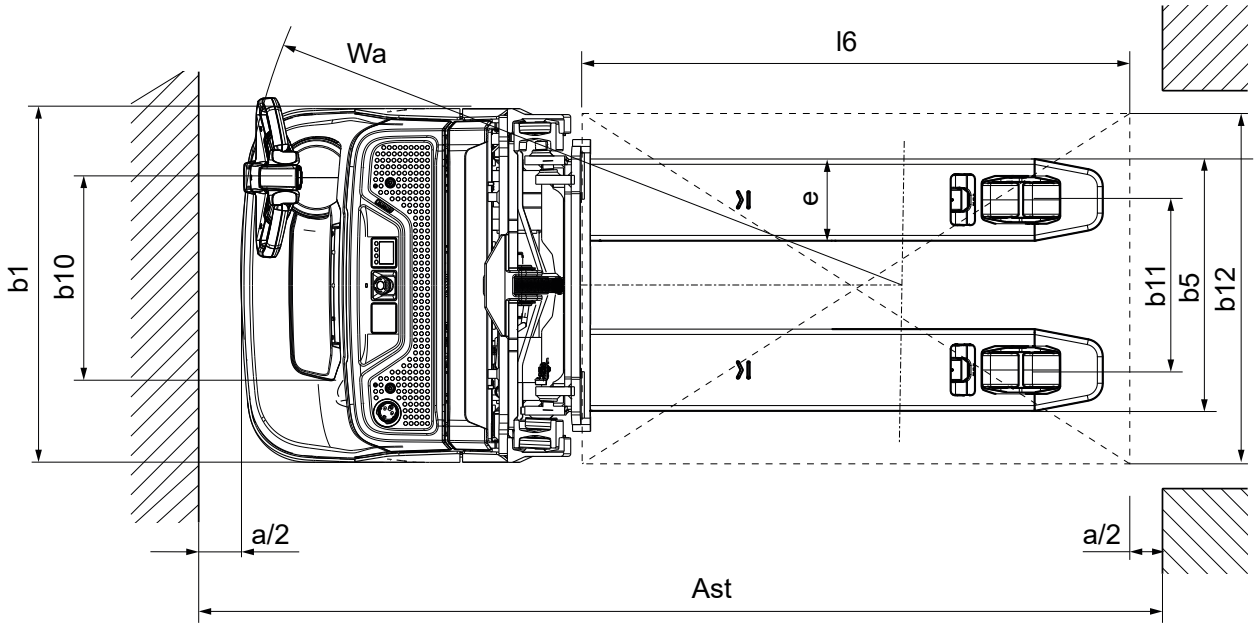
5.3 Dimensions

EJC 010i/110i/112i



EJC 110zi/112zi





EJC 010i

	Designation	EJC 010i [1]	
h1	Height	1950	mm
h2	Free lift	100	mm
h3	Lift	2900	mm
h4	Mast height extended	3375	mm
h13	Load forks lowered	90	mm
h14	Tiller height in travel position (min./max.)	750 / 1260	mm
x	Load distance [2]	707	mm
y	Wheelbase	1141	mm
l1	Overall length [2]	1754	mm
l2	Length including fork shank [2]	604	mm
b1	Overall width	800	mm
b5	Width across forks	570	mm
b10	Track width, front	507	mm
b11	Track width, rear	405	mm
m2	Ground clearance	24	mm
s	Fork arm dimensions	60	mm
e		178	mm
l		1150	mm
Ast	Aisle width for pallets 1000 x 1200 crossways: diagonal (in accordance with VDI) Reduced, with free swivel range	2227[3 4] 2002 [3 2]	mm
Ast	Aisle width for pallets 800 x 1200 lengthways: diagonal (in accordance with VDI) Reduced, with free swivel range	2194[3 5] 2052 [3 2]	mm
Wa	Turning radius[3]	1359	mm

[1)] *All values for 290 ZT mast*
[2)] *DZ: x - 40 mm; l1 + 40 mm; l2 + 40 mm; Ast + 40 mm*
[3)] *Tiller upright (slow travel)*
[4)] *DZ: Ast + 18 mm*
[5)] *DZ: Ast + 31 mm*

EJC 110i

	Designation	EJC 110i XS [1]	EJC 110i S [1]	
h1	Height	1950		mm
h2	Free lift	100		mm
h3	Lift	2900		mm
h4	Mast height extended	3375		mm
h13	Load forks lowered	90		mm
h14	Tiller height in travel position (min./max.)	750 / 1260		mm
x	Load distance [2]	707		mm
y	Wheelbase	1141	1191	mm
l1	Overall length [2]	1754	1804	mm
l2	Length including fork shank [2]	604	654	mm
b1	Overall width	800		mm
b5	Width across forks	570		mm
b10	Track width, front	507		mm
b11	Track width, rear	405		mm
m2	Ground clearance	24		mm
s	Fork arm dimensions	60		mm
e		178		mm
l		1150		mm
Ast	Aisle width for pallets 1000 x 1200 crossways: diagonal (in accordance with VDI) Reduced, with free swivel range	2227 [3 4] 2002 [3 2]	2275 [3 4] 2050 [3 2]	mm
Ast	Aisle width for pallets 800 x 1200 lengthways: diagonal (in accordance with VDI) Reduced, with free swivel range	2194 [3 5] 2052 [3 2]	2242 [3 5] 2100 [3 2]	mm
Wa	Turning radius [3]	1359	1407	mm

[1] *All values for 290 ZT mast*
[2] *DZ: x - 40 mm; l1 + 40 mm; l2 + 40 mm; Ast + 40 mm*
[3] *Tiller upright (slow travel)*
[4] *DZ: Ast + 18 mm*
[5] *DZ: Ast + 31 mm*

EJC 112i

	Designation	EJC 112i XS [1]	EJC 112i S [1]	
h1	Height	1950		mm
h2	Free lift	100		mm
h3	Lift	2900		mm
h4	Mast height extended	3375		mm
h13	Load forks lowered	90		mm
h14	Tiller height in travel position (min./max.)	750 / 1260		mm
x	Load distance [2]	707		mm
y	Wheelbase	1141	1191	mm
l1	Overall length [2]	1754	1804	mm
l2	Length including fork shank [2]	604	654	mm
b1	Overall width	800		mm
b5	Width across forks	570		mm
b10	Track width, front	507		mm
b11	Track width, rear	405		mm
m2	Ground clearance	24		mm
s	Fork arm dimensions	60		mm
e		178		mm
l		1150		mm
Ast	Aisle width for pallets 1000 x 1200 crossways: diagonal (in accordance with VDI) Reduced, with free swivel range	2227 [3 4] 2002 [3 2]	2275 [3 4] 2050 [3 2]	mm
Ast	Aisle width for pallets 800 x 1200 lengthways: diagonal (in accordance with VDI) Reduced, with free swivel range	2191 [3 5] 2052 [3 2]	2242 [3 5] 2100 [3 2]	mm
Wa	Turning radius[3]	1359	1407	mm

[1)] *All values for 290 ZT mast*
[2)] *DZ: x - 40 mm; l1 + 40 mm; l2 + 40 mm; Ast + 40 mm*
[3)] *Tiller upright (slow travel)*
[4)] *DZ: Ast + 18 mm*
[5)] *DZ: Ast + 31 mm*

EJC 110zi/112zi

	Description	EJC 110zi/112zi [1]	
h1	Mast height retracted	1950	mm
h2	Free lift	100	mm
h3	Lift	2900	mm
h4	Mast height extended	3375	mm
h5	Support arm lift	122	mm
h13	Lowered height	90	mm
h14	Tiller handle height in travel position (min. / max.)	750 / 1260	mm
x	Load distance	965 [2 3]	mm
y	Wheelbase	1544 [3]	mm
l1	Overall length	1899 [2]	mm
l2	Length including fork shank	749 [2]	mm
b1	Overall width	800	mm
b5	Width across forks	570	mm
b10	Track width, front	507	mm
b11	Track width, rear	385	mm
m2	Ground clearance	18	mm
s	Fork arm dimensions	56	mm
e		185	mm
l		1150	mm
Ast	Aisle width for pallets 1000 x 1200 crossways	2506 [4 5] 2136 [2 4 6]	mm
Ast	Aisle width for pallets 800 x 1200 lengthways:	2392 [4 7] 2186 [2 4 6]	mm
Wa	Turning radius	1751 [4 3]	mm

[1] *All values for 290 ZT mast*
[2] *DZ: x - 40 mm; l1 + 40 mm; l2 + 40 mm; Ast + 40 mm*
[3] *Raised: - 51 mm*
[4] *Tiller upright (slow travel)*
[5] *DZ: Ast + 7 mm*
[6] *Reduced, with free swivel range*
[7] *DZ: Ast + 24 mm*

5.4 Mast versions

EJC 010i

ZT mast

Lift (h3)	Mast height retracted (h1)	Free lift (h2)	Mast height extended (h4)
2300	1650	100	2775
2500	1750	100	2975
2900	1950	100	3375
3200	2100	100	3675
3600	2300	100	4075

EJC 110i/112i/110zi/112zi

ZT Mast

Lift (h3)	Mast height retracted (h1)	Free lift (h2)	Mast height extended (h4)
2300	1650	100	2775
2500	1750	100	2975
2700	1850	100	3175
2900	1950	100	3375
3200	2100	100	3675
3600	2300	100	4075
3900	2450	100	4375
4100 [1]	2550	100	4575
4300 [1]	2650	100	4775
[1)] *EJC 112i and EJC 112zi only*			

ZZ mast

Lift (h3)	Mast height retracted (h1)	Free lift (h2)	Mast height extended (h4)
2300	1600	1125	2775
2500	1700	1225	2975
2900	1900	1425	3375
3200	2050	1575	3675
3600	2250	1775	4075
3900	2400	1925	4375

DZ Mast

Lift (h3)	Mast height retracted (h1)	Free lift (h2)	Mast height extended (h4)
4090	1845	1338	4597
4300	1915	1408	4807
4700 [1]	2050	1564	5213
[1)] *EJC 112i and EJC 112zi only*			

5.5 Weights

EJC 010i

Designation	EJC 010i XS	
Net weight (incl. battery) [1]	630	kg
Axle load, with load (front/rear) [1]	530 / 1100	kg
Axle load, without load (front/rear) [1]	440 / 190	kg
Battery weight - 25.6 V / 50 Ah	23.8	kg
[1)] *Values for 290 ZT mast*		

EJC 110i

Designation	EJC 110i XS	EJC 110i S	
Net weight (incl. battery) [1]	665	680	kg
Axle load, with load (front/rear) [1]	556 / 1109	560 / 1120	kg
Axle load, without load (front/rear) [1]	465 / 200	480 / 200	kg
Battery weight - 25.6 V / 50 Ah	23.8	-	kg
Battery weight - 25.6 V / 100 Ah	35	-	kg
Battery weight - 25.6 V / 105 Ah	-	55.5	kg
Battery weight - 25.6 V / 150 Ah	-	47	kg
Battery weight - 25.6 V / 200 Ah	-	55.5	kg
[1)] *Values for 290 ZT mast*			

EJC 112i

Designation	EJC 112i XS	EJC 112i S	
Net weight (incl. battery) [1]	675	690	kg
Axle load, with load (front/rear) [1]	580 / 1295	590 / 1300	kg
Axle load, without load (front/rear) [1]	475 / 200	490 / 200	kg
Battery weight - 25.6 V / 100 Ah	35	47	kg
Battery weight - 25.6 V / 105 Ah	-	55.5	kg
Battery weight - 25.6 V / 150 Ah	-	47	kg
Battery weight - 25.6 V / 200 Ah	-	55.5	kg
[1)] *Values for 290 ZT mast*			

EJC 110zi/112zi

Description	EJC 110zi	EJC 112zi	
Net weight (incl. battery) [1]	860	870	kg
Axle load, with load (front/rear) [1]	840 / 1020	890 / 1180	kg
Axle load, without load (front/rear) [1]	610 / 250	620 / 250	kg
Battery weight - 25.6 V / 105 Ah	41		kg
Battery weight - 25.6 V / 150 Ah	47		kg
Battery weight - 25.6 V / 200 Ah	55.5		kg
[1)] *Values for 290 ZT mast*			

5.6 Tyre type

EJC 010i

Designation	EJC 010i	
Tyre size, drive system	Ø 210 x 70	mm
Tyre size, load section (single/ tandem)	Ø 75 x 105/Ø 75 x 80	mm
Support wheel	Ø 140 x 54	mm
Wheels, number front / rear (x = driven)	1 x + 1/2	

EJC 110i

Designation	EJC 110i XS	EJC 110i S	
Tyre size, drive system	Ø 230 x 70		mm
Tyre size, load section (single/ tandem)	Ø 75 x 105/Ø 75 x 80		mm
Support wheel	Ø 140 x 54		mm
Wheels, number front / rear (x = driven)	1 x + 1/2		

EJC 112i

Designation	EJC 112i XS	EJC 112i S	
Tyre size, drive system	Ø 230 x 70		mm
Tyre size, load section (single/ tandem)	Ø 75 x 105/Ø 75 x 80		mm
Support wheel	Ø 140 x 54		mm
Wheels, number front / rear (x = driven)	1 x + 1/2		

EJC 110zi/112zi

Designation	EJC 110zi/112zi	
Tyre size, front	Ø 230 x 70	mm
Tyre size, rear (single (●) / tandem (○))	Ø 85 x 95 / Ø 75 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 010i/110i/112i/110zi/112zi: 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

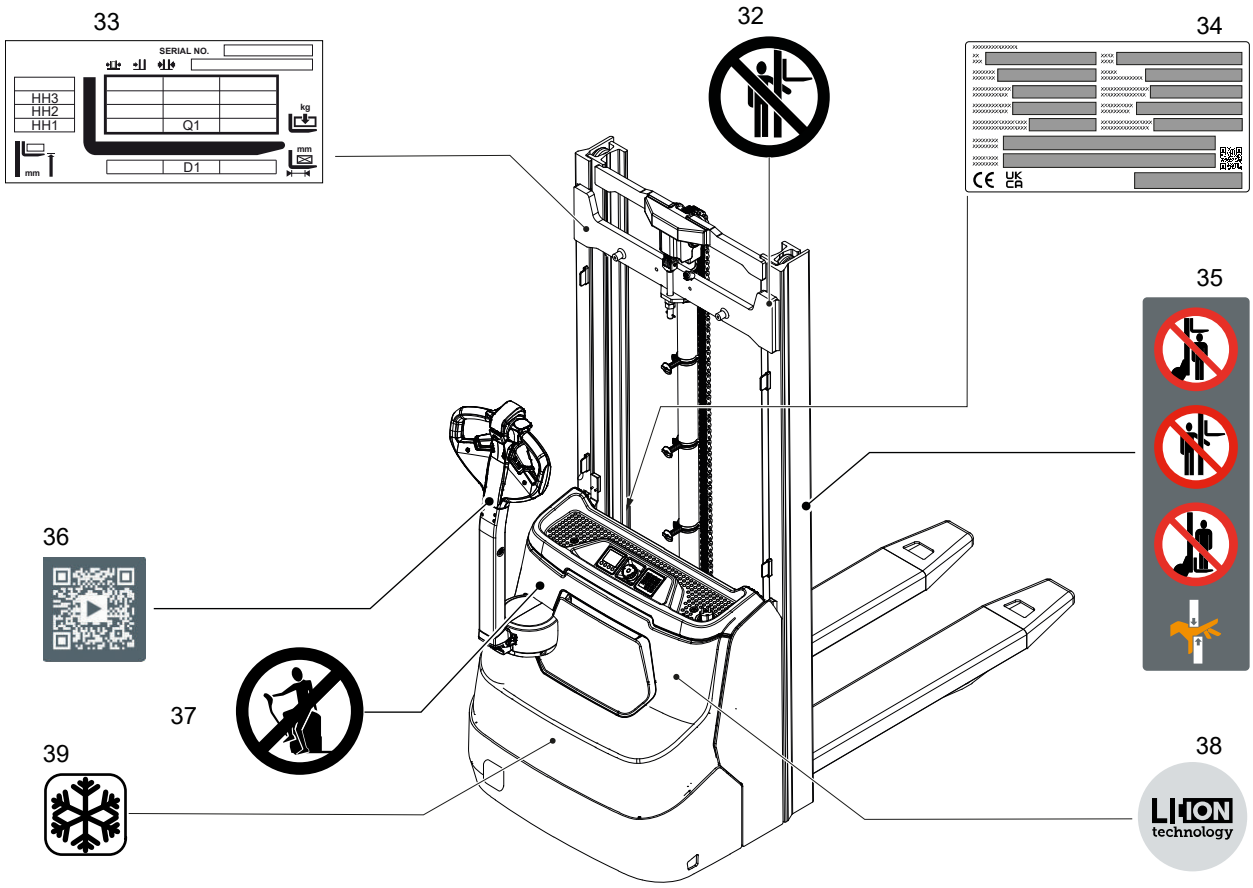
The manufacturer confirms adherence to the requirement for design and manufacture of the truck with regard to the safety requirements specific to intended use in accordance with EN ISO 3691-1.

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

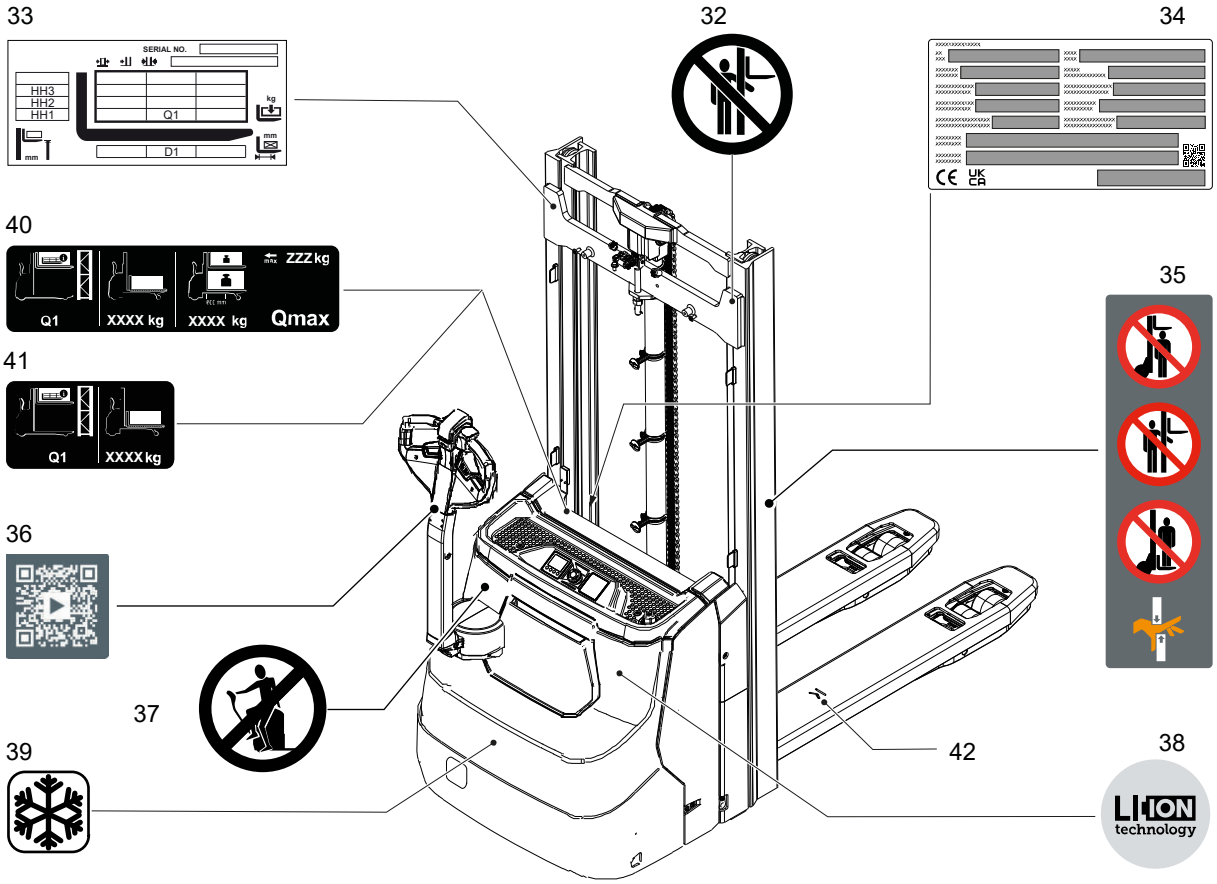
EJC 010i/110i/112i



Item		Designation
32	●	Prohibition plate: "Do not reach through the mast"
33	●	Truck capacity plate (varies depending on the truck equipment – see page 53)
34	●	Data plate
35	●	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
36	●	Information sign: "QR code" The QR code contains a short online video on the basic functions of the industrial truck.

Item		Designation
37	●	Prohibition plate: "No passengers"
38	●	"Lithium-ion battery" plate
39	○	"Cold-store equipment" plate
42	●	Marking for picking up a Euro pallet from the side (ZT and ZZ masts only)

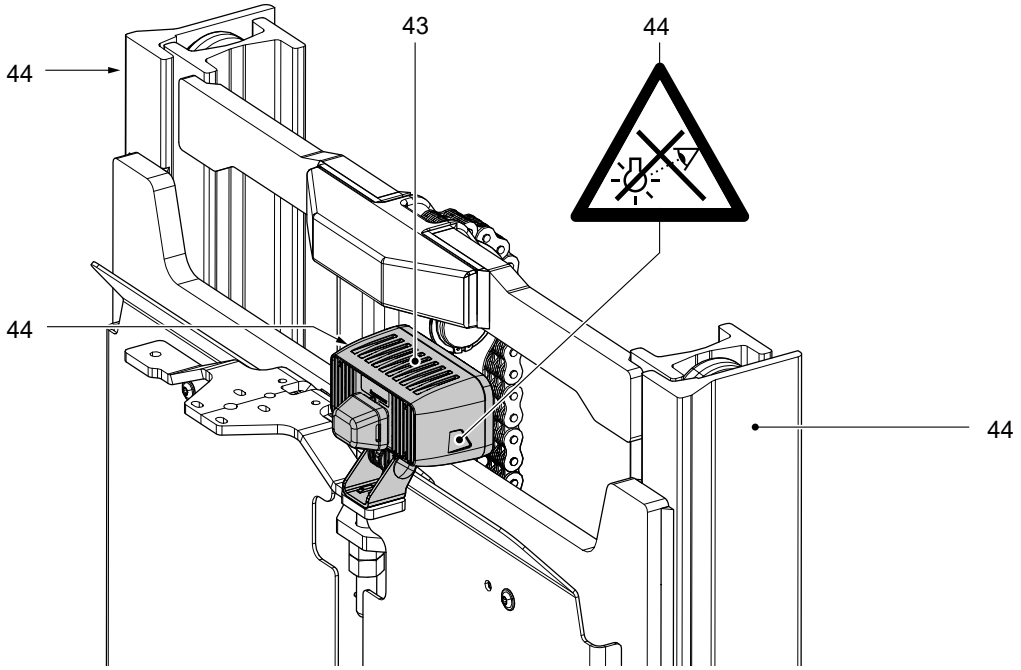
EJC 110zi/112zi



Item		Designation
32	●	Prohibition plate: "Do not reach through the mast"
33	●	Truck capacity plate (varies depending on the truck equipment – see page 53)
34	●	Data plate
35	●	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
36	●	Information sign: "QR code" ➔ The QR code contains a short online video on the basic functions of the industrial truck.
37	●	Prohibition plate: "No passengers"
38	●	"Lithium-ion battery" plate

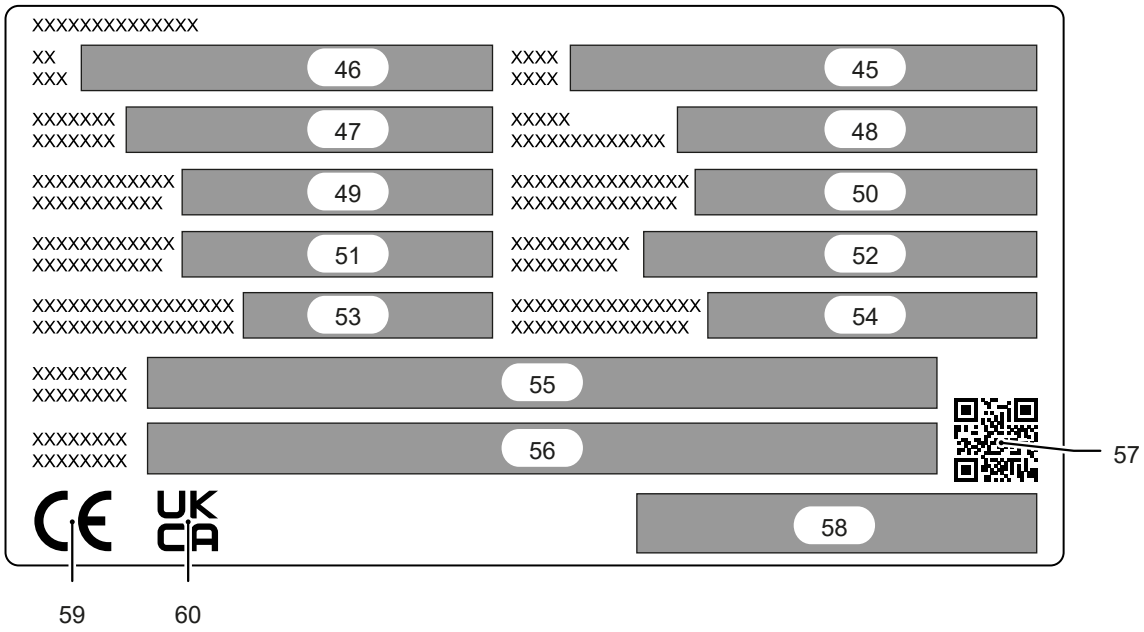
Item		Designation
39	○	"Cold-store equipment" plate
40	○	Capacity plate for stacking, transport and double-deck operations
41	●	Capacity plate for stacking and transport operations
42	●	Marking for picking up a Euro pallet from the side (ZT and ZZ masts only)

Marking points of blue Floor-Spot (○)



Item		Description
43	○	Floor-Spot (blue)
44	○	Warning notice: "Danger! Optical radiation" (on trucks with blue Floor-Spot)

6.2 Data plate



Item	Description	Item	Description
45	Year of manufacture	53	Net weight without battery [kg]
46	Type	54	Min./max. battery weight [kg]
47	Serial number	55	Manufacturer
48	Option	56	Importer - imported by (○)
49	Rated capacity [kg]	57	QR code
50	Load centre distance [mm]	58	Manufacturer's logo
51	Battery voltage [V]	59	CE marking[1)]
52	Drive output [kW]	60	UKCA marking (○)[2)]

➔ For queries regarding the truck or when ordering spare parts, always quote the truck serial number (47).

➔ The illustration shows the standard version for EU member states. The data plate may differ in other countries.

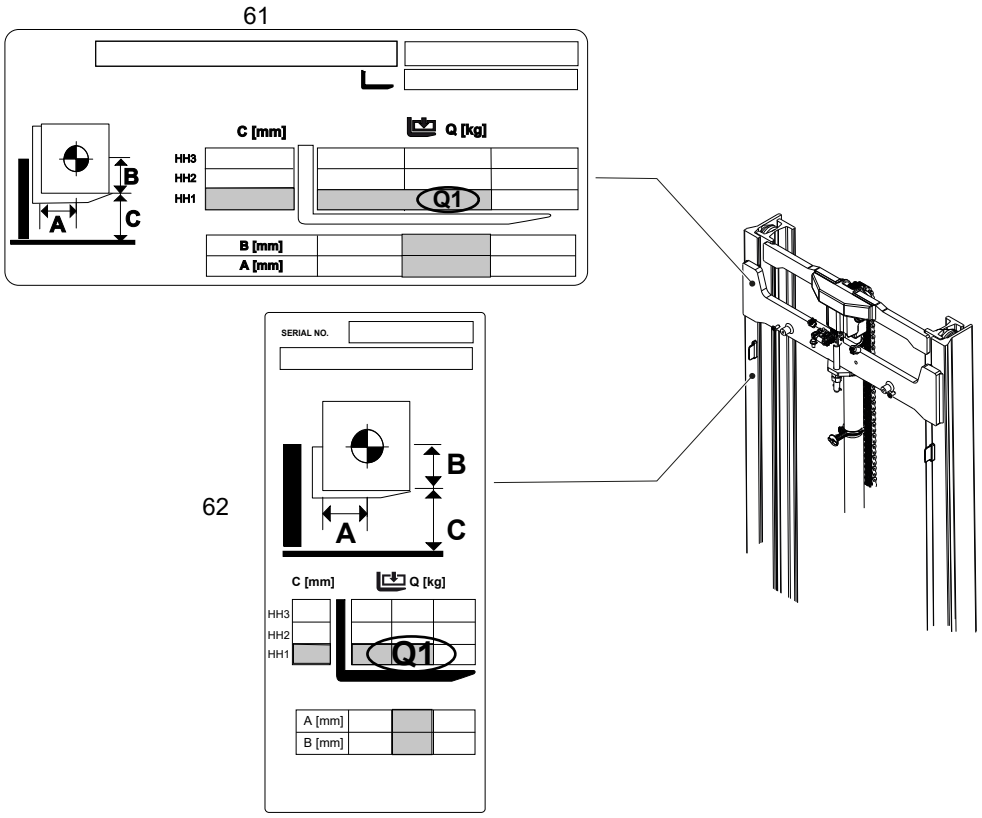
➔ The battery data plate is described in the relevant section – see page 65.

1) *Conformité Européenne*

2) *United Kingdom Conformity Assessed*

6.3 Capacity plate

6.3.1 Type A

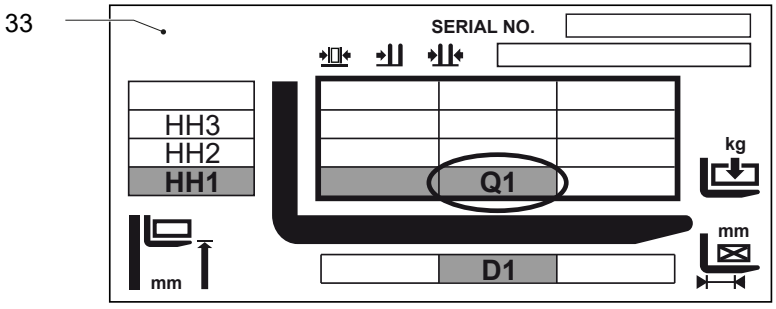


Item		Description
61	○	Horizontal truck capacity plate, height h1 < 2250 mm
62	○	Vertical truck capacity plate, height h1 ≥ 2250 mm

The capacity plate (61, 62) 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

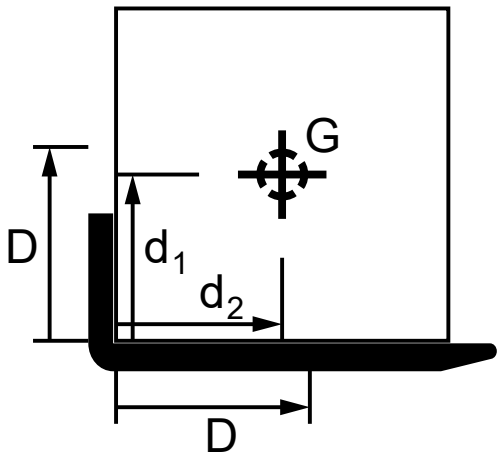


The capacity plate (33) indicates the maximum capacity Q (in kg) for a given load centre distance D (in mm) and corresponding lift height H (in mm) for the truck when raising a load.

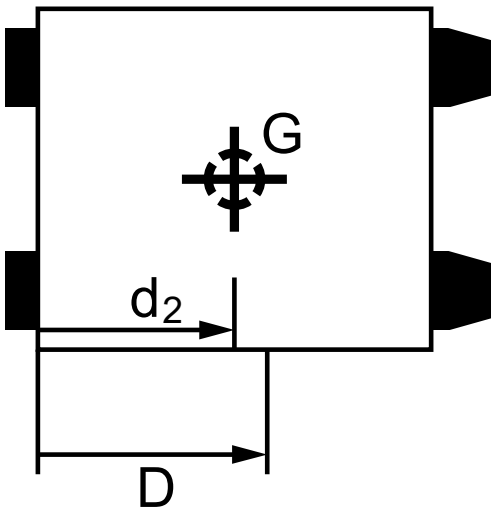
Example of how to calculate the maximum capacity: The maximum capacity is Q1 at a load centre G within the load centre distance D1 and a lift height up to HH1.

Load centre distance

Side view from the right



View from above



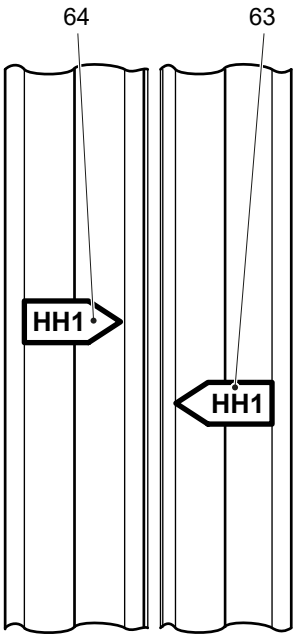
The load centre distance D of the load handler is specified as the horizontal distance from the front face and the vertical distance from the upper edge of the load handler.

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

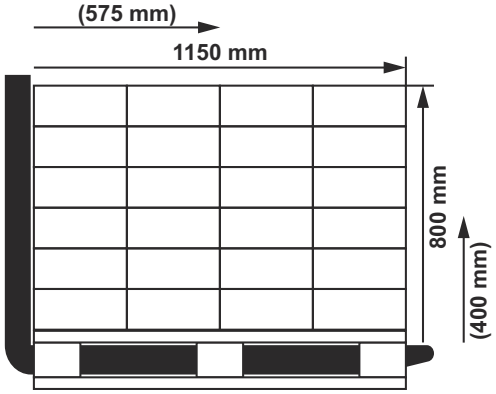
The distances d_1 and d_2 depicted in the illustration between the load handler and the actual centre of gravity G of the load must be smaller or equal to the load centre distance D ($d_1 \leq D$ and $d_2 \leq D$) to avoid the risk of overturning, see page 123.

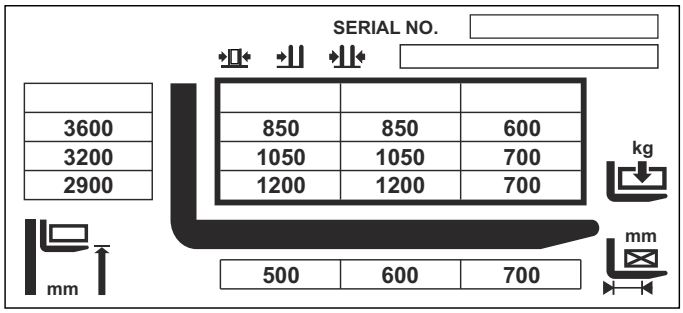
Lift height limits

The arrow shaped markings on the outer mast (64) and on the inner mast (63) indicate to the operator when the height limits specified on the capacity plate have been exceeded.



6.3.3 Example of Use of Capacity Plate





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.

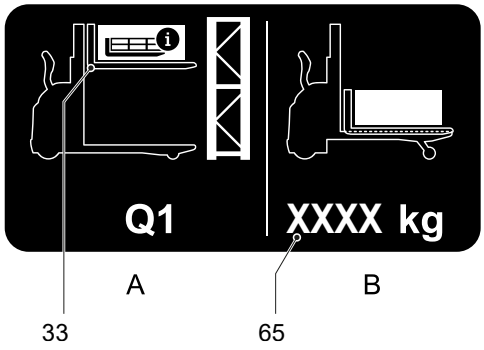
For rectangular loads with an even weight distribution over the entire volume the load centre distance is in the middle, i.e. half the length, half the height and half the width of the load.

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.

6.4 Capacity plate for stacking and transport operation

➔ Only EJC 110zi/112zi without double-deck function (○)



A	Stacking operations (stacking and retrieving loads) in mast lift – The capacity according to the lift height is specified on the capacity plate (33), see page 53
B	Transport operation in support arm lift – Maximum capacity in support arm lift (65)

The stacking and transport operation capacity plate indicates the capacity Q (in kg) of the truck during stacking and transport operation.

➔ Do not travel with a raised load (> 500 mm).

6.5 Capacity Plate for Stacking, Transport and Double-Deck Operation (○)

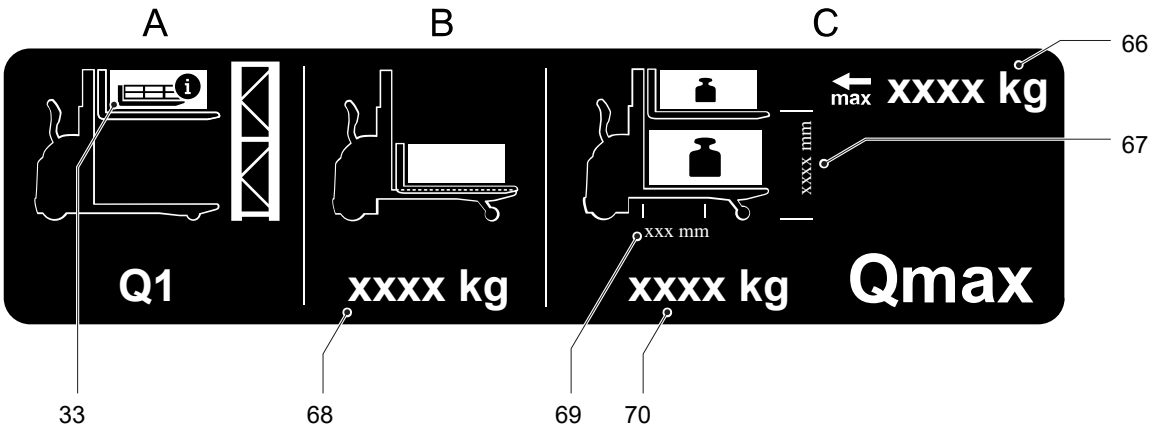
➔ Only with EJC 110zi/112zi double-deck function (○)

⚠ CAUTION!

Risk to operational stability

In order not to jeopardize the operational stability, pay attention to the weight when transporting two pallets so that the truck does not tip over.

▶ In order not to jeopardize the operational stability, the heavier pallet should always be transported underneath.



The capacity plate for stacking, transport and double-deck operations specifies the truck capacity during stacking, transport and double-deck operations.

A	Stacking operations (stacking and retrieving loads) in mast lift – The capacity according to the lift height is specified on the capacity plate (33), see page 53
B	Transport operation in support arm lift – Maximum capacity in support arm lift (68)
C	Double decker mode – Maximum capacity in mast lift (66) – Maximum lift height in mast lift (67) – Maximum combined capacity of mast lift and support arm lift (70) – Load centre distance (69)

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 52).
- ▶ 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.

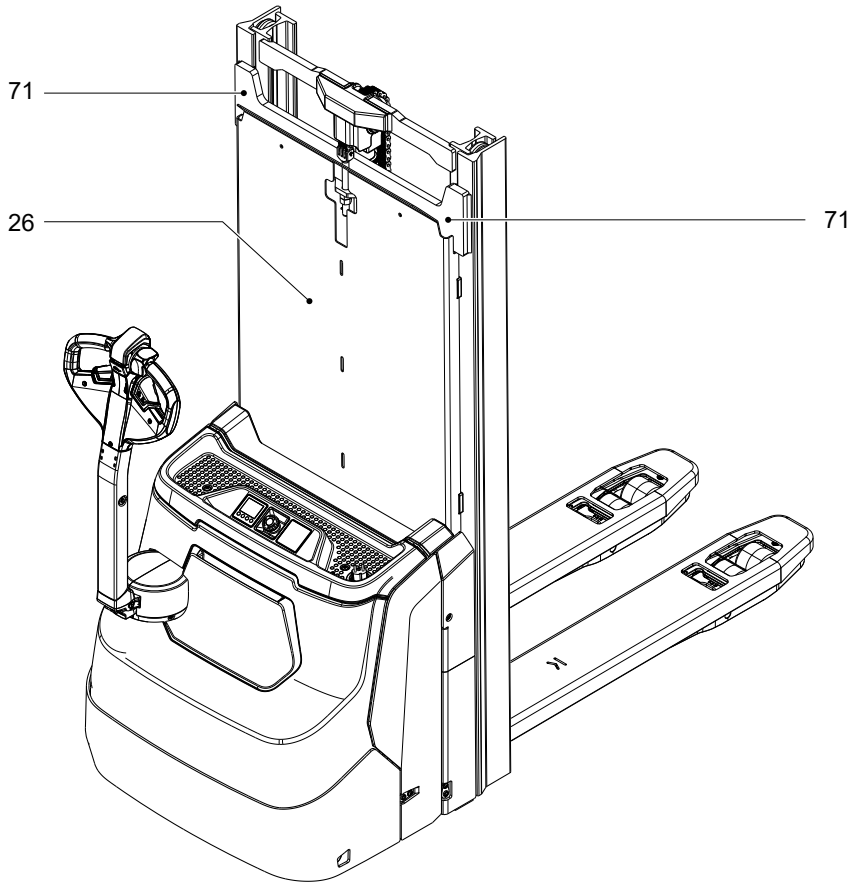
- ▶ Raise and set down the truck slowly and carefully.
- ▶ Keep the area around the truck clear.

⚠ 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.



ZT mast

Loading the truck by crane

Requirements

– Truck parked securely – see page 101.

Tools and Material Required

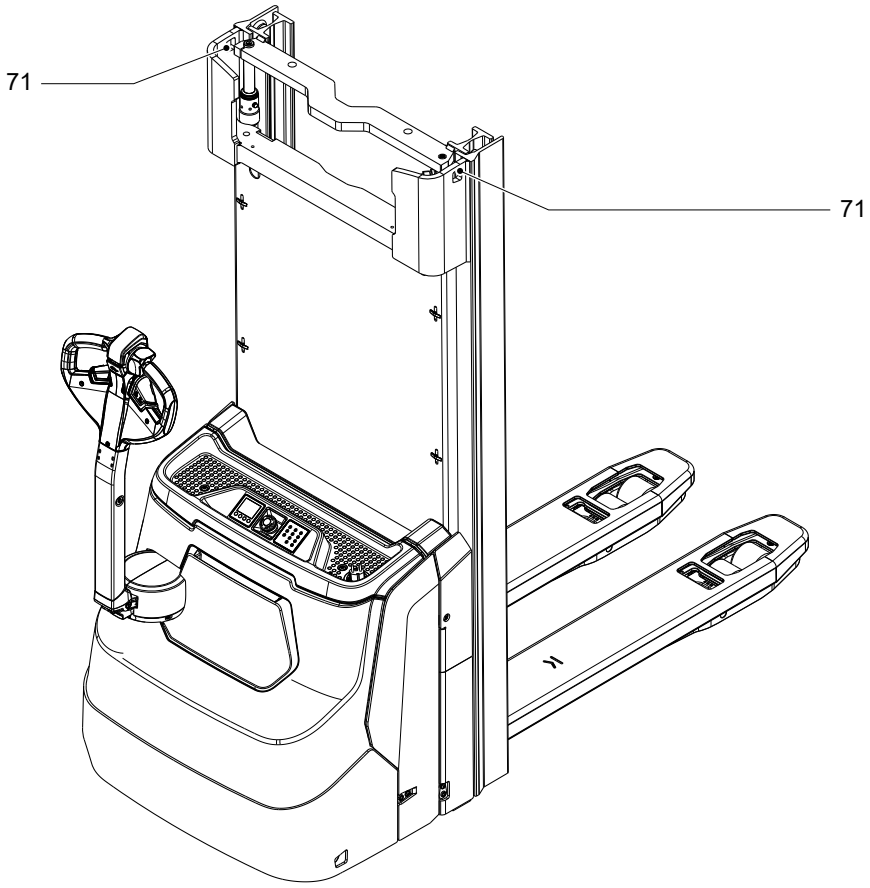
– Lifting gear
– Crane lifting gear

Procedure

- Remove the safety device (26) and put it to one side – see page 174.
- Secure the crane lifting gear to the attachment points (71).

The truck can be loaded.

Fit the safety device after loading the industrial truck.



ZZ and DZ mast

Loading the truck by crane

Requirements

– Truck parked securely – see page 101.

Tools and Material Required

– Lifting gear
– Crane lifting gear

Procedure

• Secure the crane lifting gear to the attachment points (71).

The truck can be loaded.

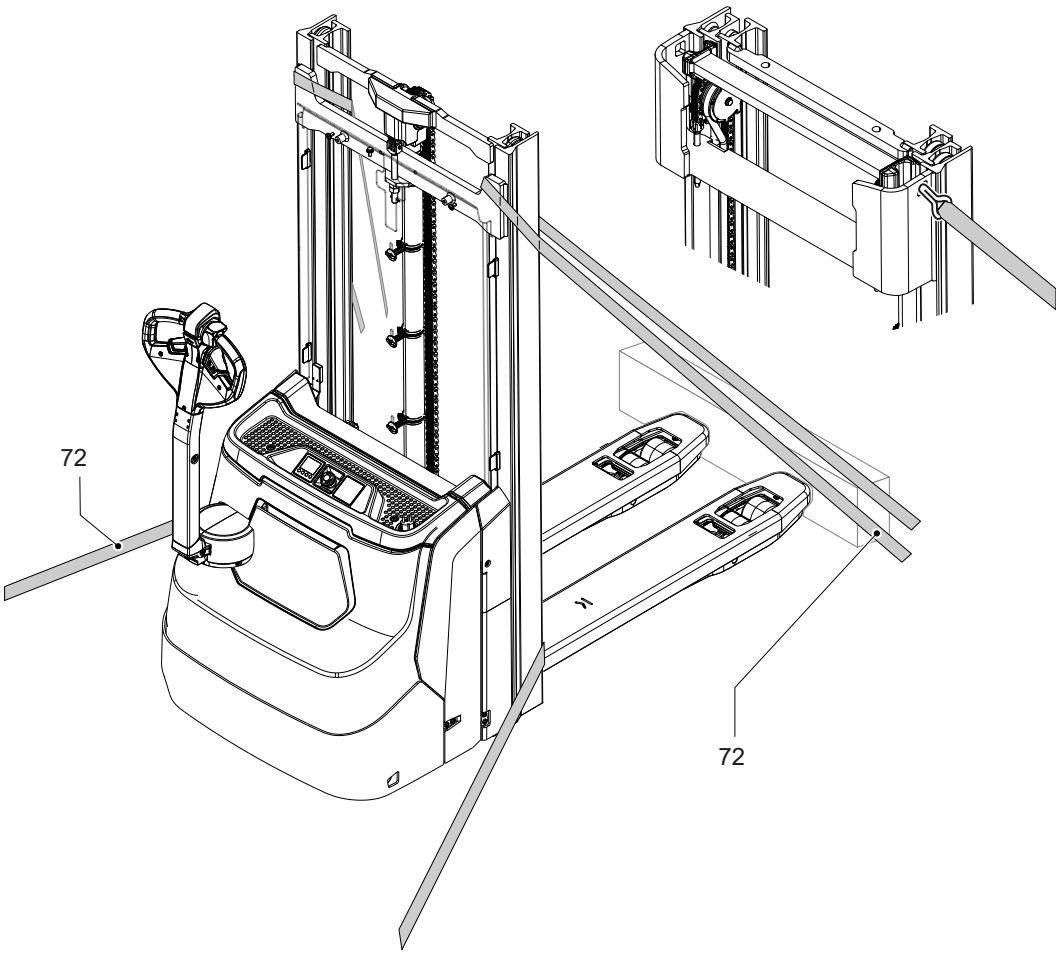
2 Transport

⚠ 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 101.

Tools and Material Required

– Lashing straps

Procedure

• Attach the lashing straps (72) to the truck, strap them to the transport vehicle and tension sufficiently.

The truck can be transported.

3 Using the Truck for the First Time

⚠ WARNING!

The use of unsuitable energy sources can be hazardous

Rectified AC current 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 73.
- Check the hydraulic oil level and correct if necessary – see page 180.
- Carry out initial commissioning of the optional equipment as soon as this is possible:
  - Activate the keypad or transponder reader – see page 145.

The truck can now be started – see page 98.

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:

- ▶ 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!

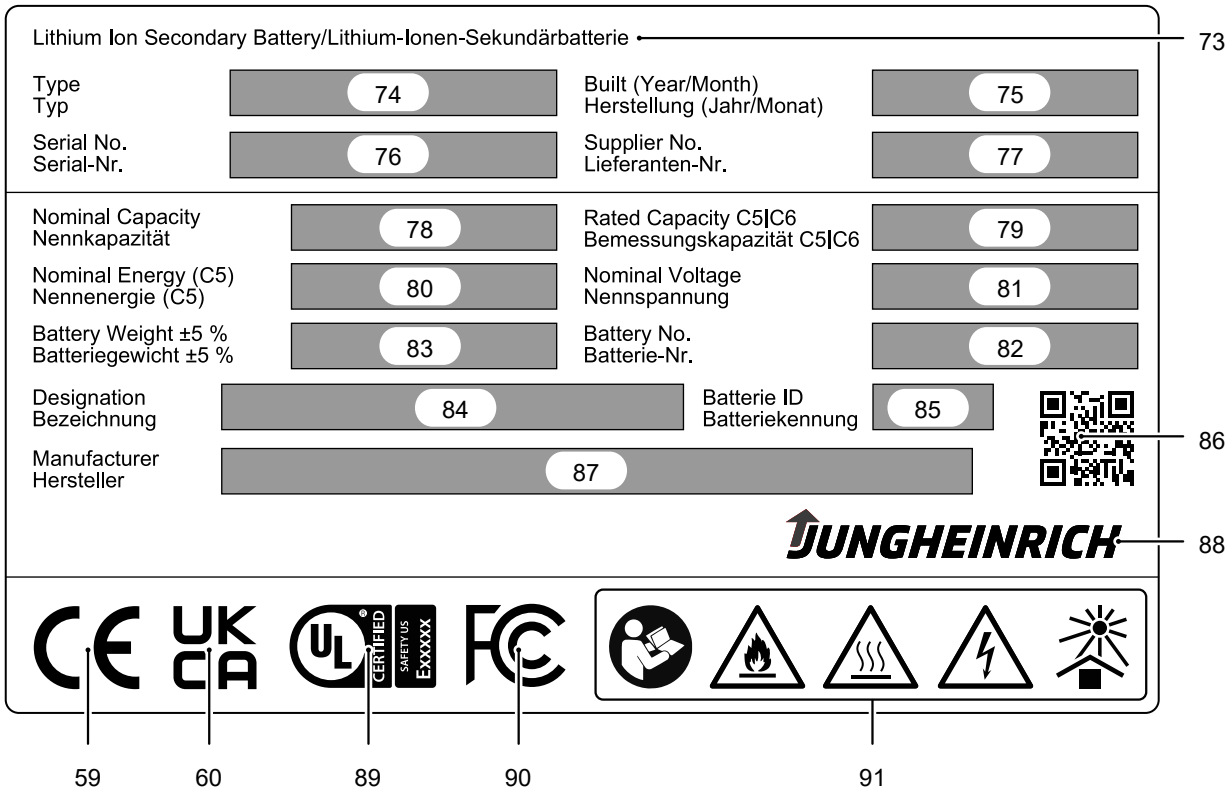
Touch voltage hazard

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 67.

2.2 Lithium-ion battery data plate

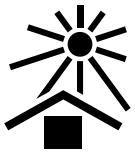


If you have any questions about the lithium-ion battery, supply the serial number (76) to either the manufacturer's customer service department or a customer service organisation authorised by the manufacturer.

Item	Description
59	CE mark (*Conformité Européenne*)
60	UKCA marking (*United Kingdom Conformity Assessed*)
73	Lithium-ion secondary battery
74	Battery type
75	Production (year/month)
76	Serial number
77	Supplier number
78	Rated capacity in ampere-hours [Ah]
79	Rated capacities C5 and C6 in ampere-hours [Ah]
80	Rated energy (C5) in watt-hours [Wh] – Calculation of the rated energy (C5): rated capacity C5 multiplied by the rated voltage
81	Rated voltage in volts [V]
82	Battery material number
83	Battery weight in kilogrammes [kg] – Tolerance range: 5 %
84	Designation

Item	Description
85	Battery identifier
86	QR code
87	Manufacturer
88	Manufacturer's logo
89	UL mark (*Underwriters Laboratories*)
90	FCC mark (*Federal Communications Commission*)
91	Safety and warning information – see page 71

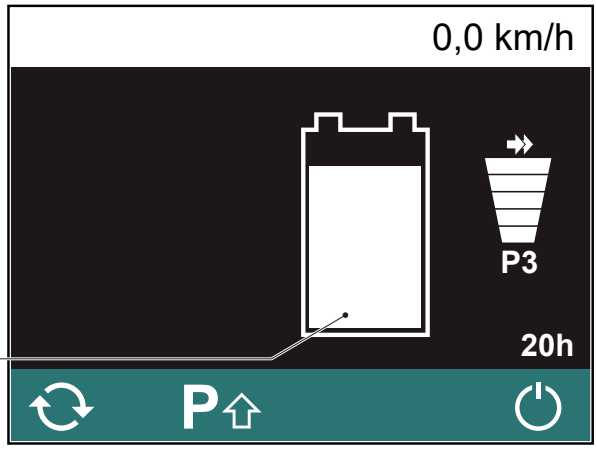
2.2.1 Safety Instructions, Warning Indications and other Notes

	Observe the operating instructions – The operating instructions must be clearly visible at the charging location. – 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. – Do not attempt to rectify faults independently. – Do not open the battery.
	Avoid fire and short-circuits due to overheating – Do not ignite or position open flames, glowing embers or sparks near the lithium-ion battery. – Keep batteries away from strong heat sources.
	Hot surfaces – Battery cells can generate very high short-circuit currents, causing them to become hot.
	Hazardous electrical voltage – The metal parts of the battery cells are permanently live. Therefore, do not place any foreign objects or tools on the battery. – Observe the accident prevention regulations and DIN EN 62485-3.
	Protect the battery against heat and solar radiation.

2.3 Battery types

Battery type	Nominal voltage	Capacity
Lithium-ion	25.6 V	50 Ah
		100 Ah
		105 Ah
		150 Ah
		200 Ah

2.4 Charge Status Indicator



The charge status of the lithium ion battery is shown on the display of the display unit (92). 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 85.

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 burning

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

- ▶ Always use mains cables with a maximum length of 30 m. Local regulations must be observed.
- ▶ Unwind the cable reel fully when using it.
- ▶ Always use original manufacturer's mains cables.
- ▶ Insulation safety, acid and caustic ratings must comply with the manufacturer's mains lead.
- ▶ The mains plug 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 [3], 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.

[3] 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 77. 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 recommend 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
50 Ah	3 hours 20 minutes
100 Ah	6 hours 40 minutes
105 Ah	7 hours
150 Ah	10 hours
200 Ah	13 hours 20 minutes

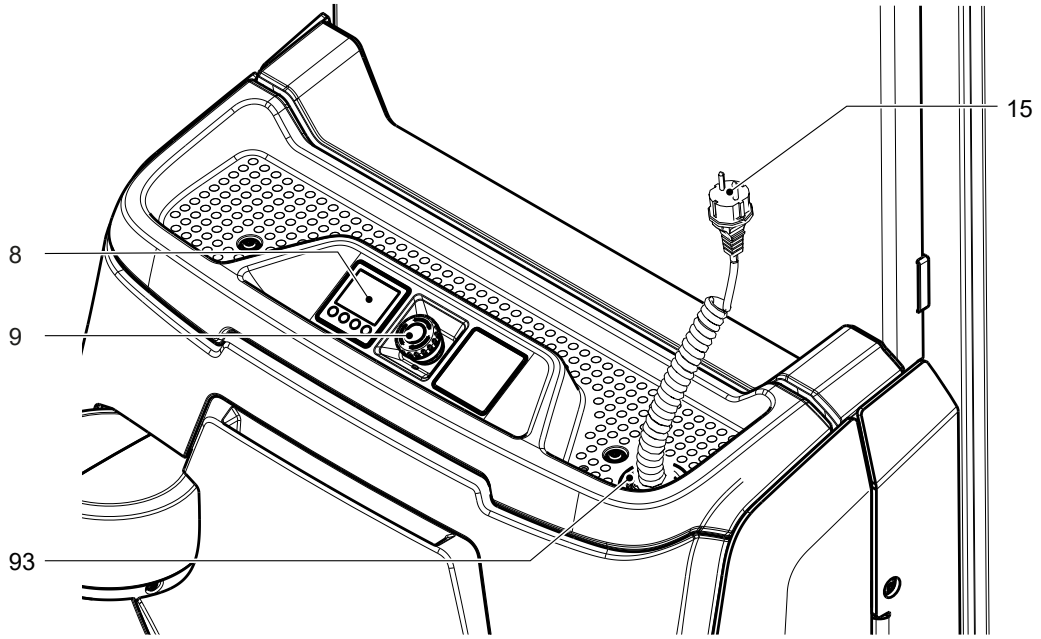
35 A on-board charger (○)

Battery capacity	Charging time for a discharged battery
50 Ah	1 hour 25 minutes
100 Ah	2 hours 50 minutes
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
50 Ah	1 hour
100 Ah	1 hour 25 minutes
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 101.

Procedure

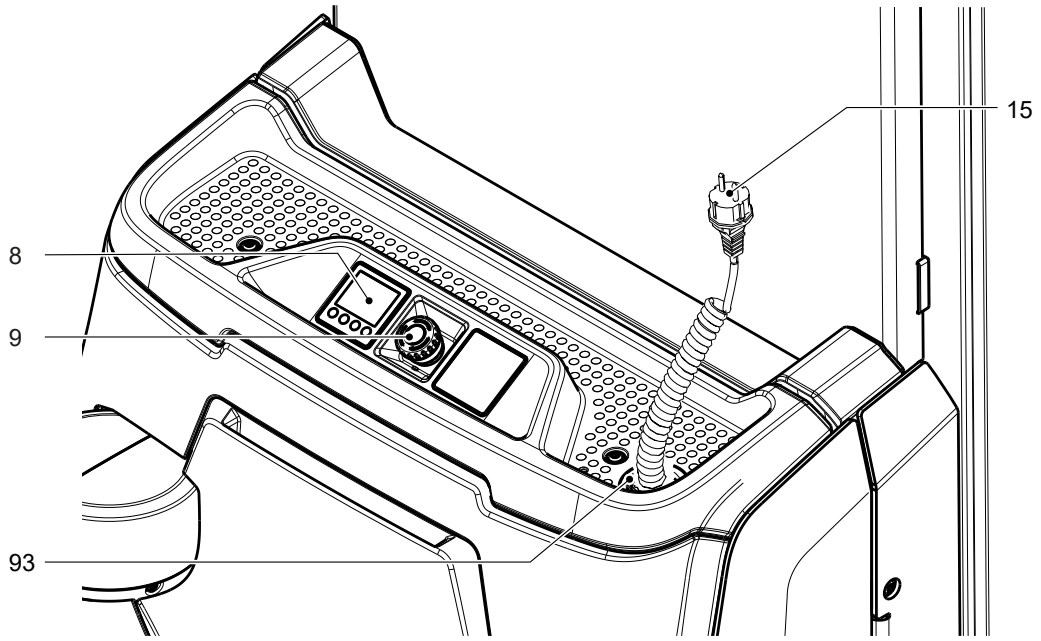
- Check the cable and mains plug (15) of the on-board charger for visible damage before charging.

➔ 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 (15) into a mains socket.
- If the charge status is to be displayed on the industrial truck, unlock the emergency disconnect switch (9) – see page 107.

➔ The display unit (8) shows the charge status, symbols in connection with the charging stop or a fault – see page 85.

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 87.

- Unplug the mains plug (15) by pulling the plug (not the cable) out of the mains socket.
- **Always** stow the **entire** charger cable in the storage compartment (93).

➔ Only if equipped with the "mains plug detection, immobiliser" function (○); otherwise, a display symbol will appear on the display unit – see page 87. With this equipment, the industrial 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 48) 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.

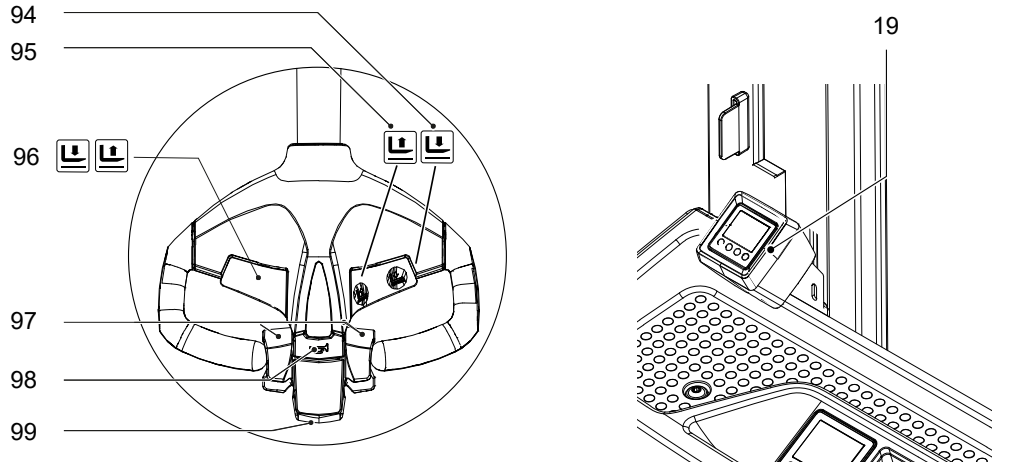
Repairs

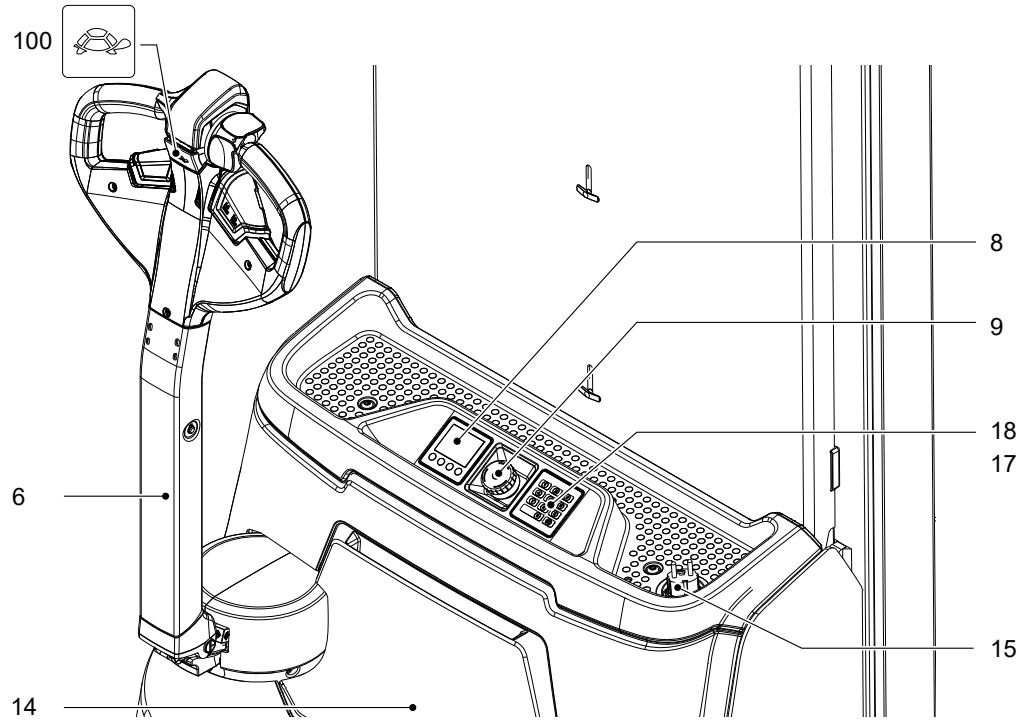
The operator must not carry out any repairs or alterations to the truck without authorisation and the necessary training to do so. The operator must never disable or adjust safety mechanisms or switches.

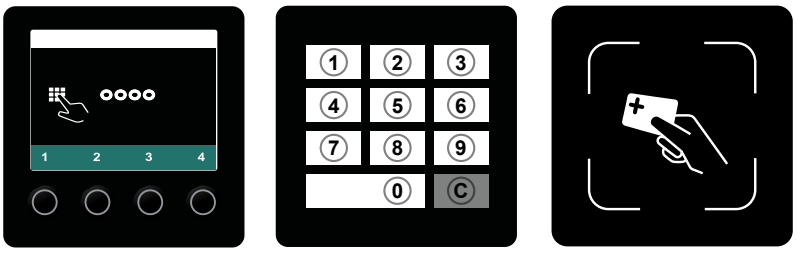
2 Displays and Controls

2.1 Overview

EJC 010i/110i/112i



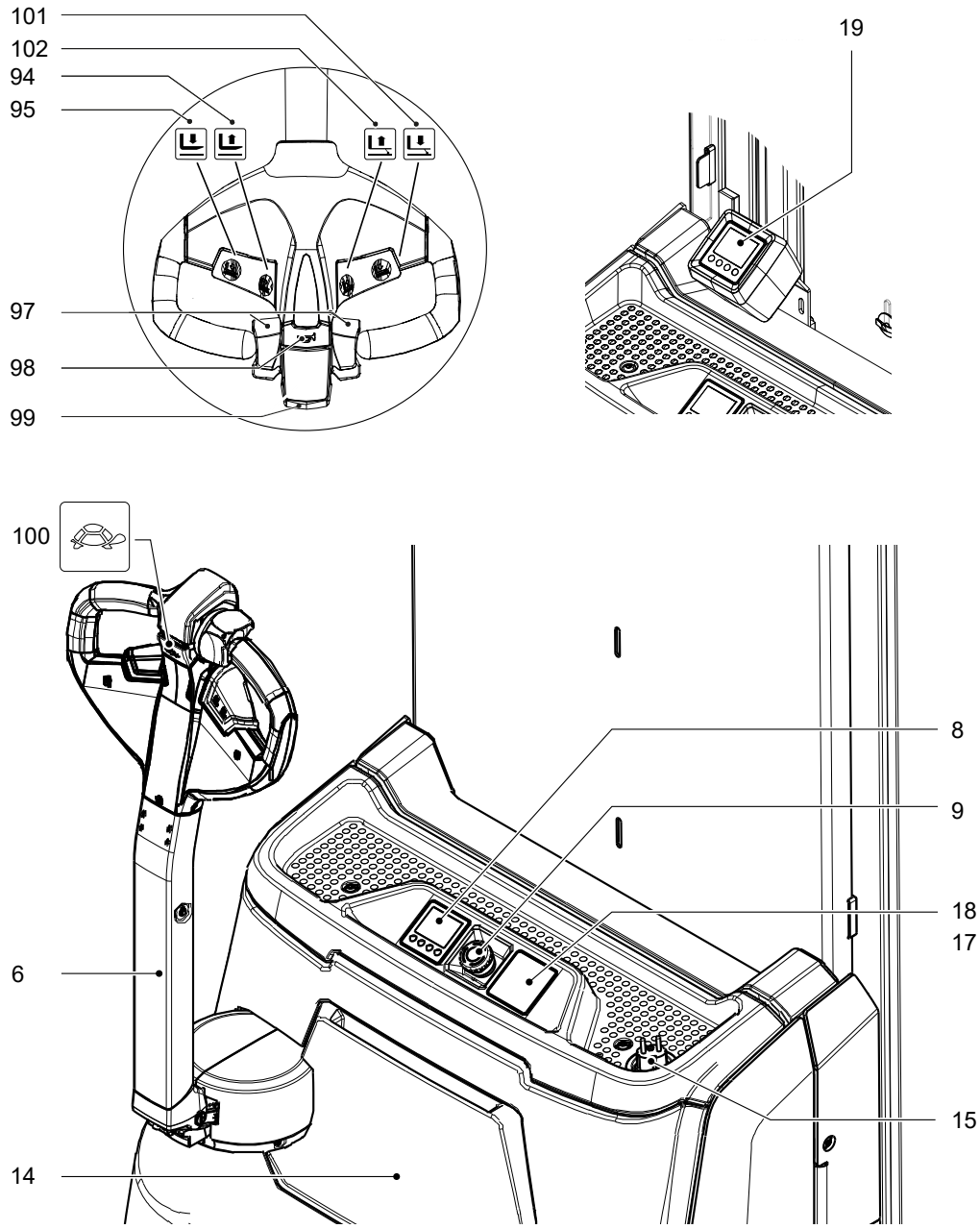


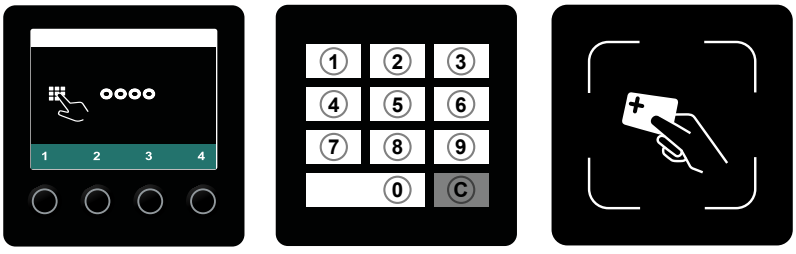


8 17 18

➔ The controls for raising and lowering the support arms and load fork can optionally be arranged laterally reversed.

EJC 110zi/112zi





8 17 18

The controls for raising and lowering the support arms and load fork can optionally be arranged laterally reversed.

Item	Control / display element		Function
6	Tiller	●	Controls lift and travel functions.
8	Display unit with 2-inch display	●	Display for: – Battery charge status – Battery capacity – Service hours – Travel program – Warning indicators – Event messages Selection of: – Travel program – Options – Releasing the truck by entering master and access codes with EasyAccess Softkey
9	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.
14	Document storage compartment	●	Used to store the operating instructions.
15	Mains plug for on-board charger	●	Used to charge the battery with the on-board charger – see page 73.
17	Keypad	○	Supplement to the display unit. – Releasing the truck by entering setup and access codes with EasyAccess PinCode access system
18	Transponder reader Plus	○	Supplement to the display unit. – Releasing the truck by card/transponder with EasyAccess Transponder access system – The transponder reader Plus supports additional transponder standards
19	Pre-Op Check display unit	○	Displaying the digital checklist for the Pre-Op Check – Performing and logging a digitally guided status check for the industrial truck – Only available in conjunction with the Jungheinrich Fleet Management System. – For further information on the Pre-Op Check, see the "Jungheinrich Fleet Management System" operating instructions.
94	“Raise load fork” button	●	Raises the load fork at a variable speed.
95	“Lower load fork” button	●	Lowers the load fork at a variable speed.
96	"Raise load fork" and "lower load fork" buttons	○	Raise and lower the load fork at a variable speed. – Optional for operation from both sides.
97	Travel switch	●	Controls travel direction and travel speed.

Item	Control / display element		Function
98	"Warning signal" button (horn)	●	Used to trigger the warning signal (horn).
99	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.
100	“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 114.
101	"Lower support arms" button	●	Applies only to EJC 110zi/112zi: Lowers the support arms at a constant speed.
102	"Support arm raise" button	●	Applies only to EJC 110zi/112zi: Raises the support arms at a constant speed.

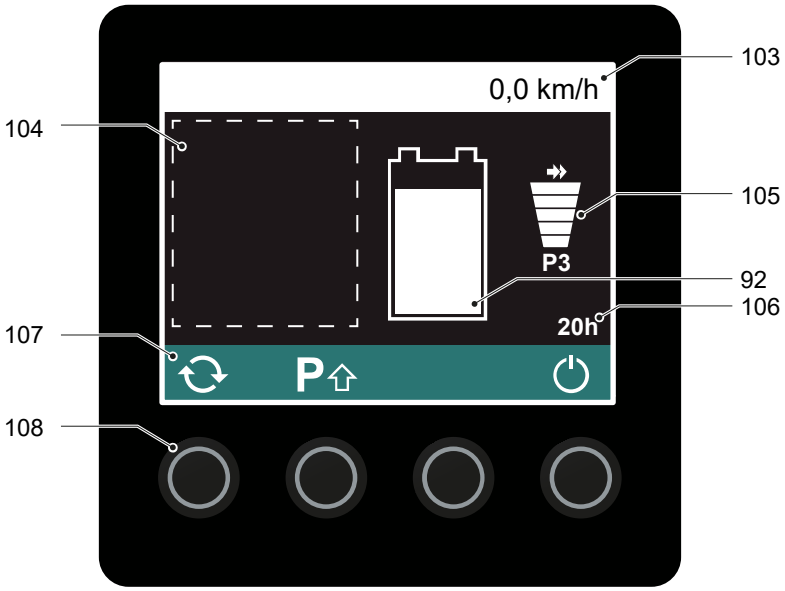
2.2 Battery discharge monitor

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
92	Battery charge status	The higher the fill level on the charge status indicator, the higher the residual capacity of the battery.
103	Information field	Displays event messages and optional information such as speed – see page 86.
104	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 87.
105	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.
106	Service-hours display	Displays the current number of service hours.
107	Function symbols	The functions shown as function symbols are operated using the function key located underneath, see page 91.
108	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 (103).

➔ Further information on the event messages shown: see page 136.

Speed display

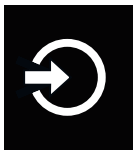
The right section of the information line shows the truck speed in km/h or mph.

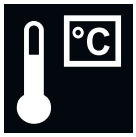
➔ The setting for the displayed units can be configured by the manufacturer's customer service department.

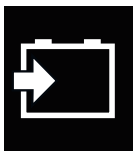
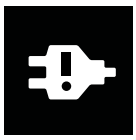
2.3.3 Display symbols

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 Green Yellow Red	Lights up when waiting for user authentication on additional equipment (○).
	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.

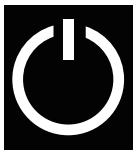
Symbol	Meaning	Colour	Function
	“Automatic support arm lift lowering” function active	Green	Lights up green when the function for automatic lowering of the support arm lift is active.
	The support arms are lowered.	Flashes yellow	Flashes yellow while the support arms are being lowered by the "automatic 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 ≤ 30% Charge the battery soon.
		Red	Lights up when residual capacity ≤ 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.

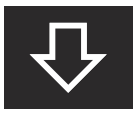
General

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.
	Floor-Spot	Activates or deactivates the Floor-Spot. ➔ The Floor-Spot must be actively switched on or off. The last switching position remains active.
	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.

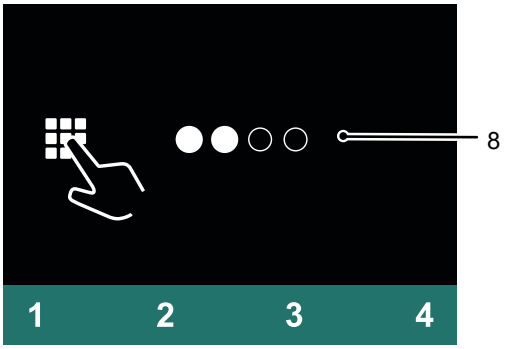
2.3.5 Using the Display:

2.3.5.1 Switching on the truck with an access code

Procedure

- Release the emergency disconnect switch, see page 107.
- Enter the access code with the buttons below the display (8).

The truck is switched on.

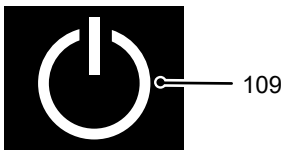


2.3.5.2 Switching off the truck

Procedure

- Press the key under the "Switch off" symbol (109) in the display unit.
- Press the Emergency Disconnect switch, see page 107.

The truck is switched off.



2.3.5.3 Changing the set-up code

Requirements

– The truck is switched on, see page 93.

Procedure

- Press the key below the "Settings" symbol (110).
- Press the key below the "Change set-up code" symbol (111).
- Enter the set-up code using the keys below the display unit (8).

  The set-up code entered is shown as filled-in circles.
- Press the key below the "Delete" symbol (112).

  The set-up code is deleted.
- Enter the new set-up code using the keys below the display unit (8).

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

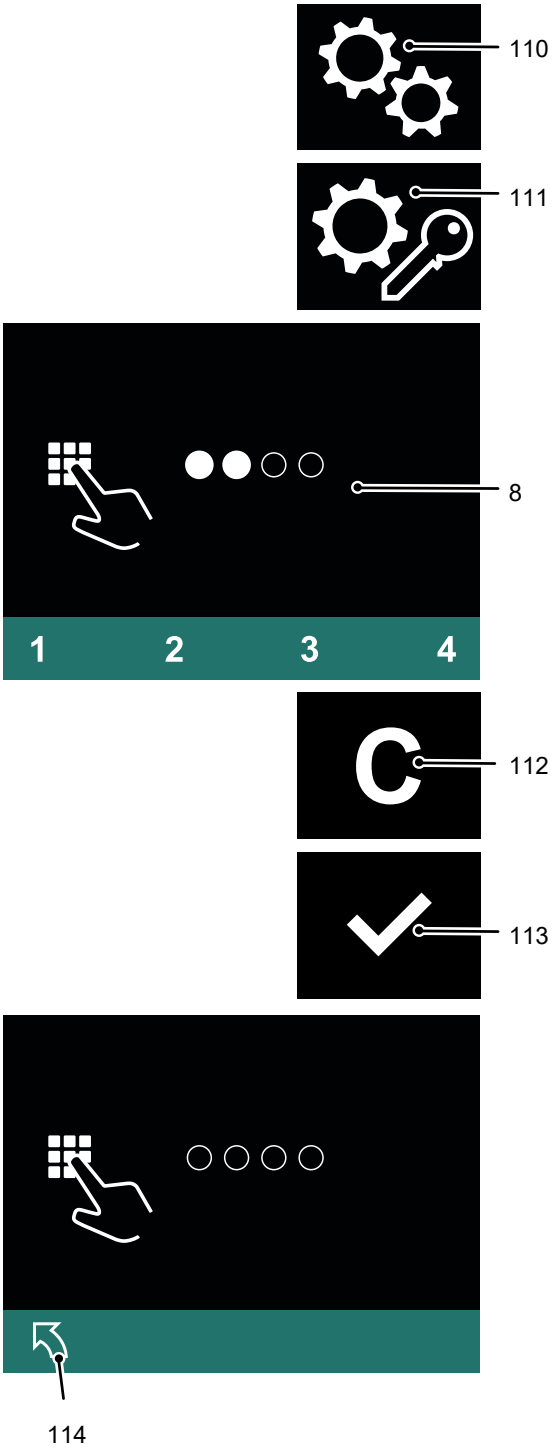
- Press the key below the "Confirm" symbol (113).

  The new set-up code is displayed.

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

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

The set-up code has been changed.



2.3.5.4 Adding a new access code

Requirements

– The truck is switched on, see page 93.

Procedure

- Press the key below the "Settings" symbol (110).
- Press the key below the "Edit access code" symbol (115).

  The set-up code is requested.
- Enter the set-up code using the keys below the display unit (8).

  All the access codes are displayed.
- Press the key below the "Add" symbol (116).
- Enter the new access code using the keys below the display unit (8).

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

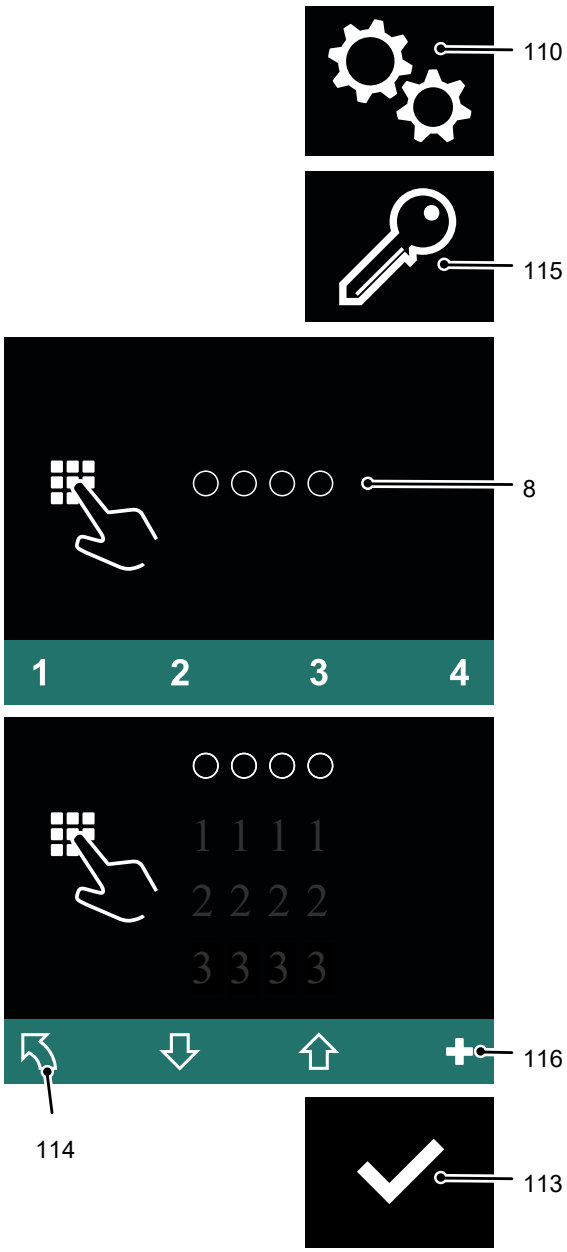
- Press the key below the "Confirm" symbol (113).

  The new access code is displayed.

➔ If the new access code has been entered incorrectly, delete it, see page 96, and add an access code again.

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

A new access code has been added.



2.3.5.5 Deleting an access code

Requirements

– The truck is switched on, see page 93.

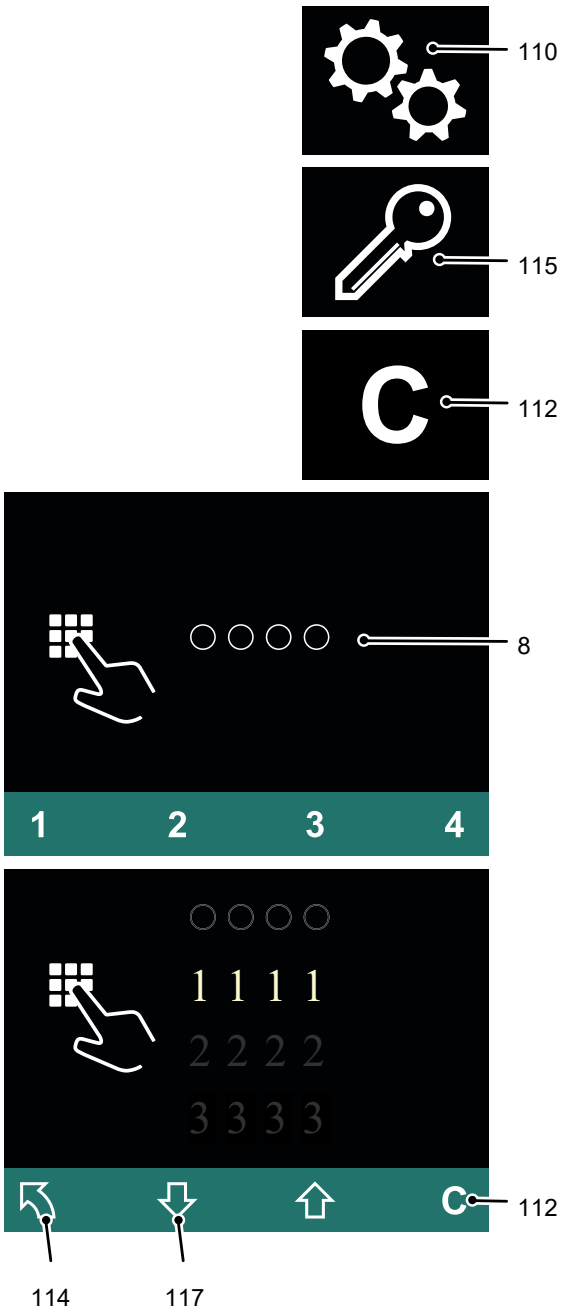
Procedure

- Press the key below the "Settings" symbol (110).
- Press the key below the "Edit access code" symbol (115).

  The set-up code is requested.
- Enter the set-up code using the keys below the display unit (8).

  All the access codes are displayed.
- Select the access code to be deleted using the key below the "Down selection" symbol (117).
- Press the key below the "Delete" symbol (112).

  The access code has been deleted.
- To return to the main menu, press the key below the "Back" symbol (114).



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.

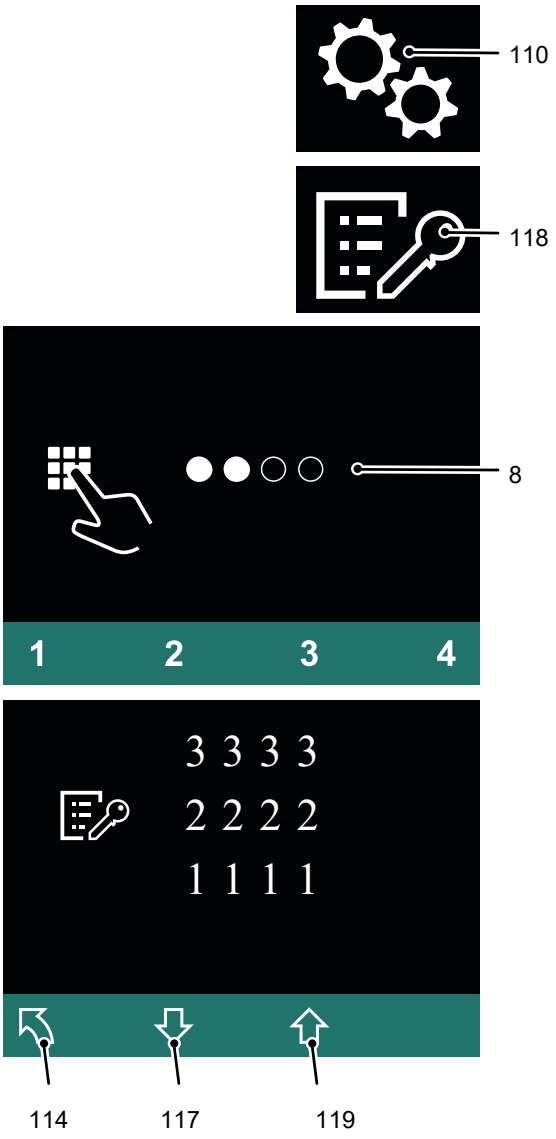
Requirements

– The truck is switched on, see page 93.

Procedure

- Press the key below the "Settings" symbol (110).
- Press the key below the "Log-in process" symbol (118).
- Enter the set-up code using the keys below the display unit (8).
  The set-up code entered is shown as filled-in circles.
- To scroll forward, press the button under the "Down selection" symbol (117) 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 (119) as many times as necessary.
  The display area moves: More recent log-ins are displayed.
- To return to the main menu, press the key below the "Back" symbol (114).

The log-in process is displayed.



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

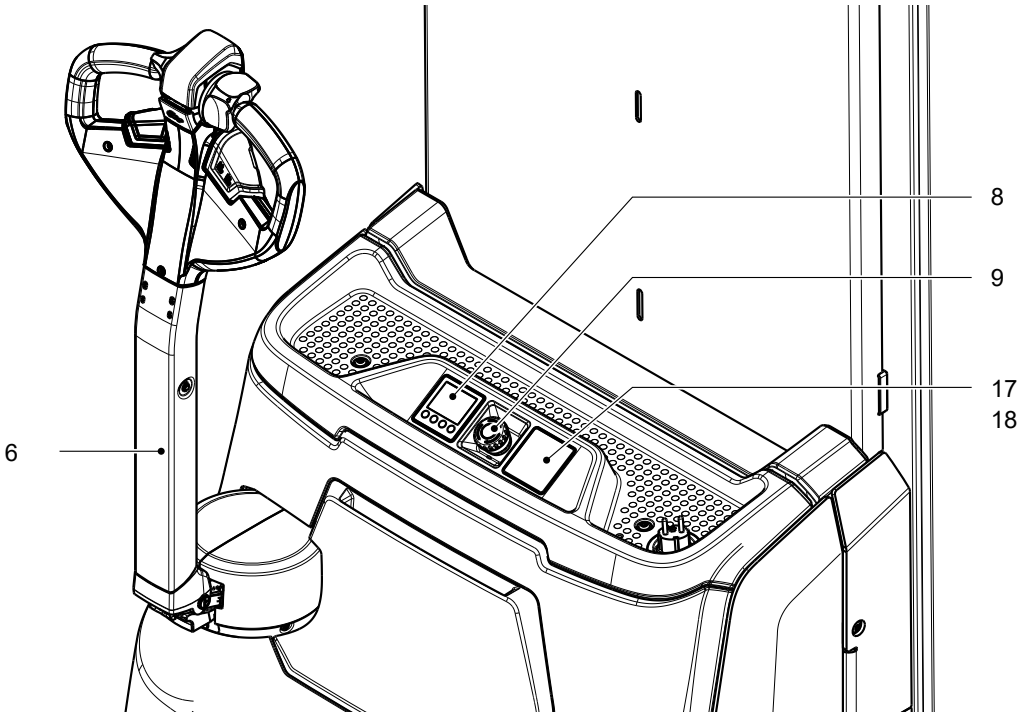
Requirements

– Truck parked securely – see page 101.

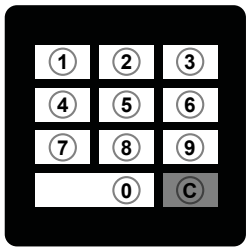
Procedure

- 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 180.
- Check the drive wheel and load wheels for damage and freedom of movement – see page 183.
- 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 48.
- Check that the controls return automatically to the neutral position after being used – see page 110.
- Check that the tiller automatically returns to the upright position – see page 109.

3.2 Preparing the truck for operation



8



17

18

Switching on the truck

Requirements

– Checks and operations before starting daily work completed, see page 98.
– Tiller (6) in the upper braking zone – see page 116.

Procedure

- Unlock the emergency disconnect switch (9) – see page 107.
- Switch on the industrial truck with the available keyless access system – see page 145.

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 (8) and use the "Troubleshooting" section to identify the cause – see page 136.

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 81.
  - Test the collision safety switch by pressing the switch while travelling in the drive direction.
  - Test the brakes, see page 116.
- Test the travel functions – see page 110.
- Test the steering – see page 115.
- Test the hydraulic functions, see page 118.
- Test the displays and controls and check for damage – see page 81.

3.4 Parking the truck securely

⚠ WARNING!

An unsecured truck can cause accidents

Do not leave an unsecured truck.

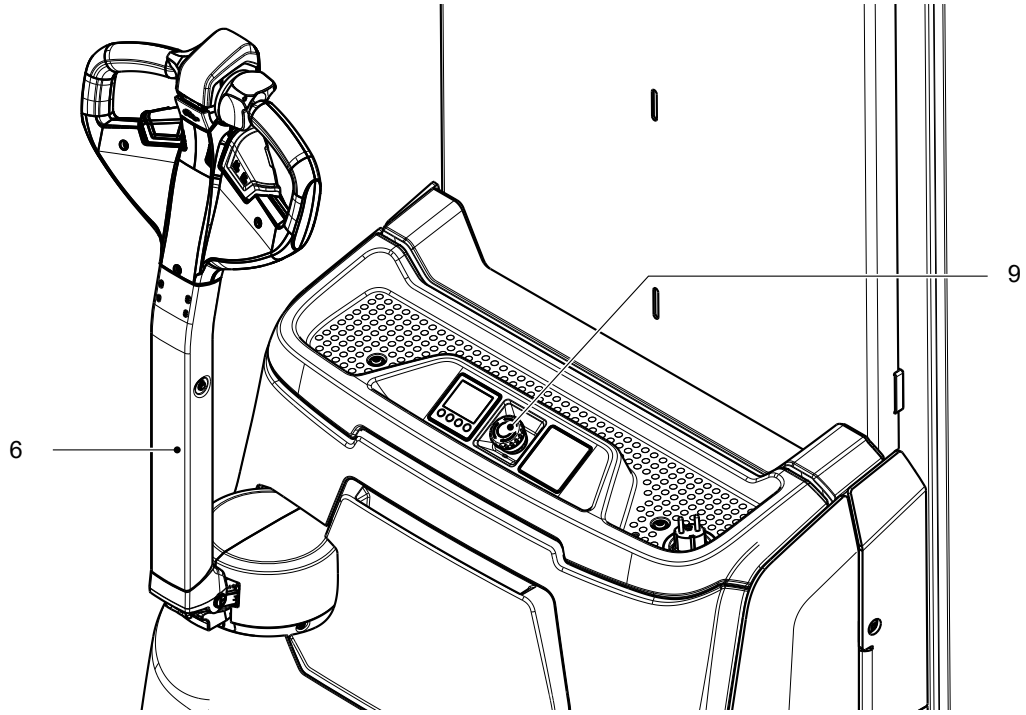
- ▶ Park the truck securely when leaving it.
- ▶ Exception: If the operator intends to remain in the immediate vicinity and is leaving the truck for only a short while, the applied parking brake is sufficient to hold the truck, see page 117. Immediate vicinity is when the operator is able respond to 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 118.
- Set the drive wheel to "straightahead travel" using the tiller (6).
- Switch off the truck – see page 93.
- Press the emergency disconnect switch (9).

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 34.
- The slopes and inclines must be clean and non-slip and it must be possible to negotiate them safely in accordance with the truck's technical specifications.
- The travel direction must be selected in accordance with the following overview.
- The industrial truck must not be turned, operated at an angle or parked on inclines or slopes.
- Inclines must only be negotiated at slow speed, with the driver ready to brake at any moment.

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

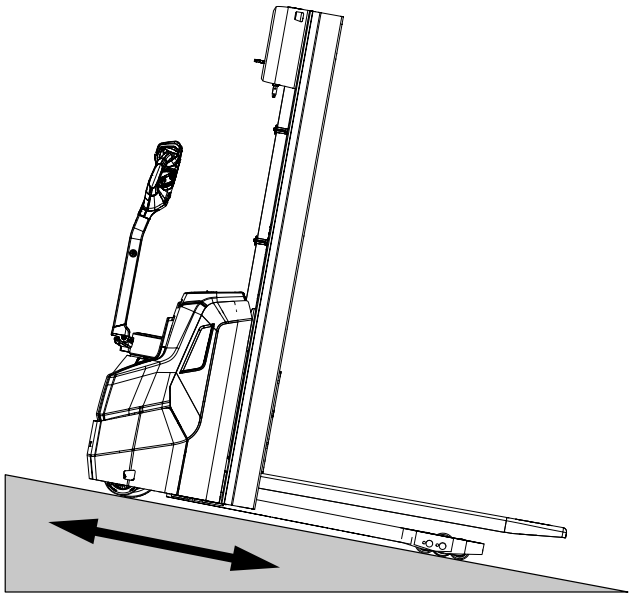
➔ When travelling on slopes and inclines unladen, the load handler must always be oriented towards the downslope.

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

4.1.1.1 Load status

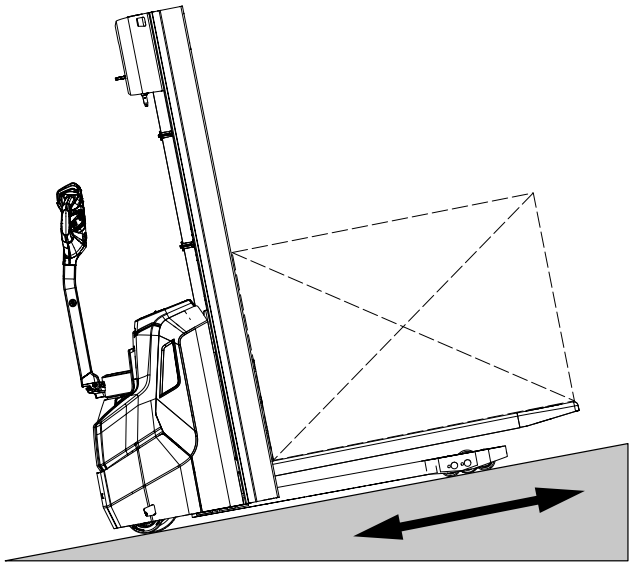
The travel direction that should be selected when driving on slopes and inclines depends on the current load status (transport travel or unladen travel).

4.1.1.2 Empty journey



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

4.1.1.3 Transport run



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

4.2 Emergency Disconnect

⚠ CAUTION!

Applying maximum braking can result in accidents

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

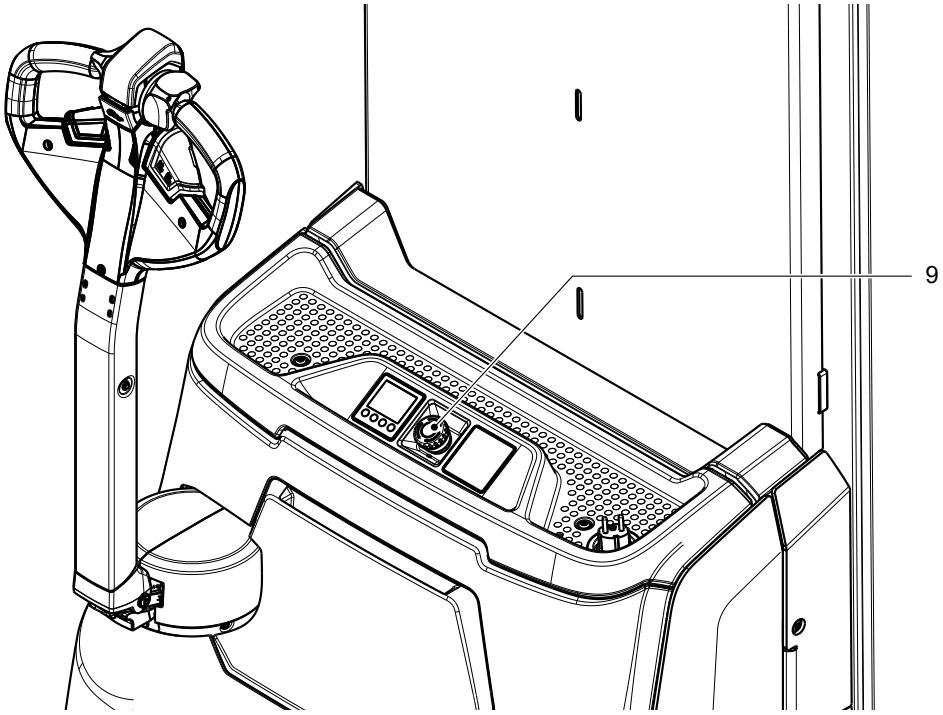
- ▶ Do not use the Emergency Disconnect switch as a service brake.
- ▶ Use the Emergency Disconnect switch during travel only in emergencies.

⚠ CAUTION!

Faulty or non-accessible Emergency Disconnect switches can cause accidents

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

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



Pressing the emergency disconnect switch

Procedure

- Press the emergency disconnect switch (9).

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

Unlocking the emergency disconnect switch

Procedure

- Turn the emergency disconnect switch (9) 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).

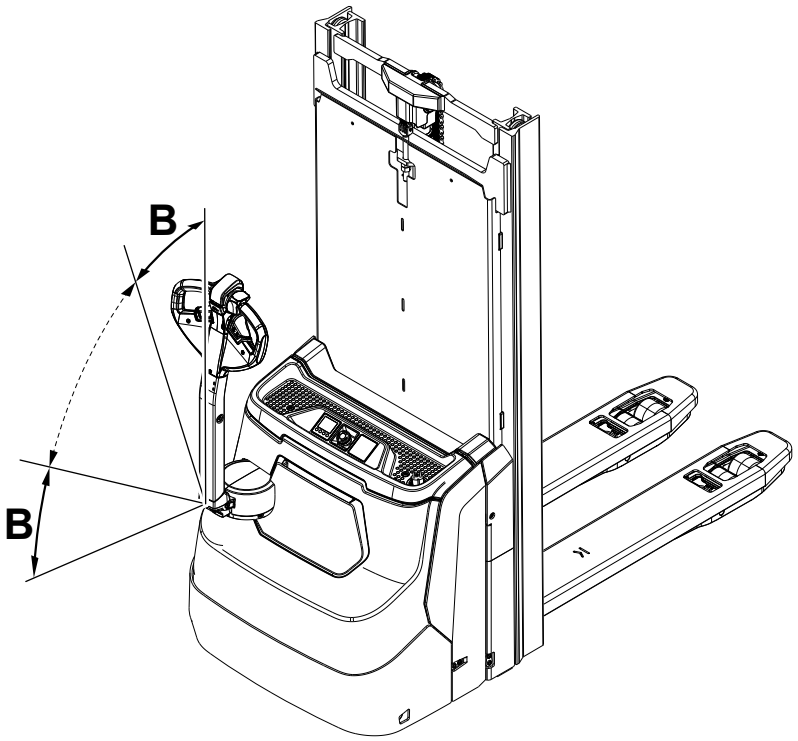
4.3 Automatic braking

⚠ 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.

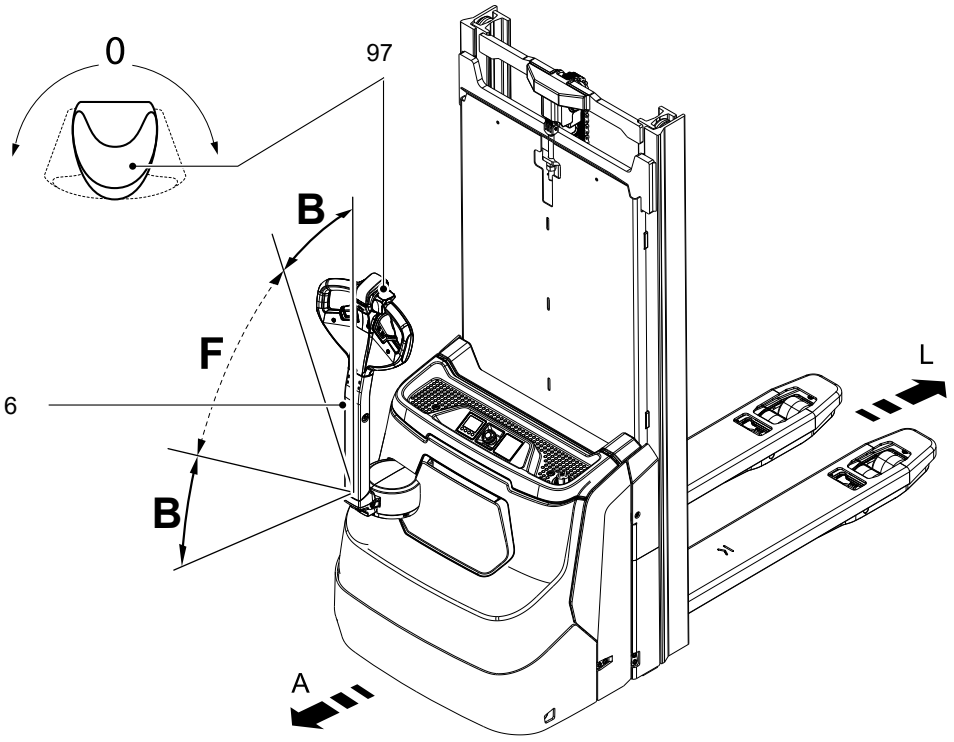
- ▶ Wear personal protective equipment (e.g. safety shoes).
- ▶ The truck must be operated with particular care and attention in pedestrian mode.
- ▶ Make sure there are no other people standing between the truck and obstacles when operating in pedestrian mode.

⚠ 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 98.

Procedure

- Set the tiller (6) to the travel zone (F).
- Control the travel direction with the travel switch (97):
  - 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 (97):
  - 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 109.

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.

Slow travel with the forks lowered (○)

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

On trucks with automatic speed reduction, travel with the load handler lowered is possible at reduced speed only. To be able to use the maximum speed, the operator must first raise the load handler slightly.

curveCONTROL (○)

The curveCONTROL assistance system helps the operator to operate the truck safely. When cornering, the maximum travel speed is reduced according to the steer angle.

➔ Not all options are available for all types of industrial truck.

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 (97) 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 (100).
- Rotate the travel switch (97) in the required travel direction.

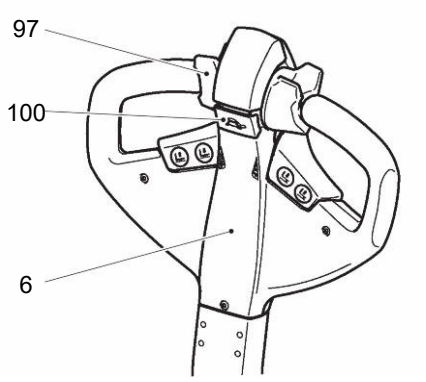
The brake is released. The truck travels at slow speed.

Switching off slow travel

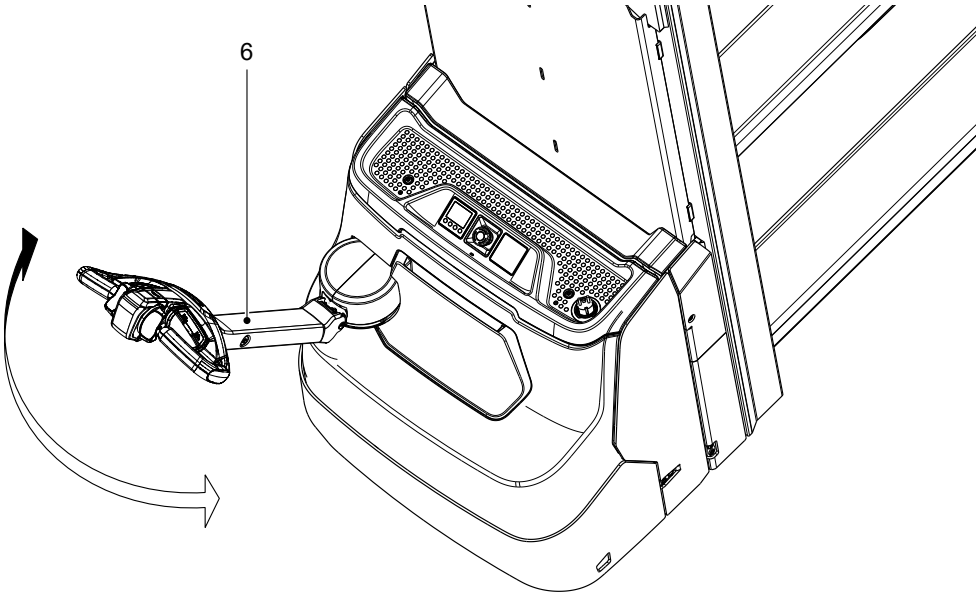
Procedure

- Release the "slow travel" button (100).
  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 (97).

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



4.5 Steering

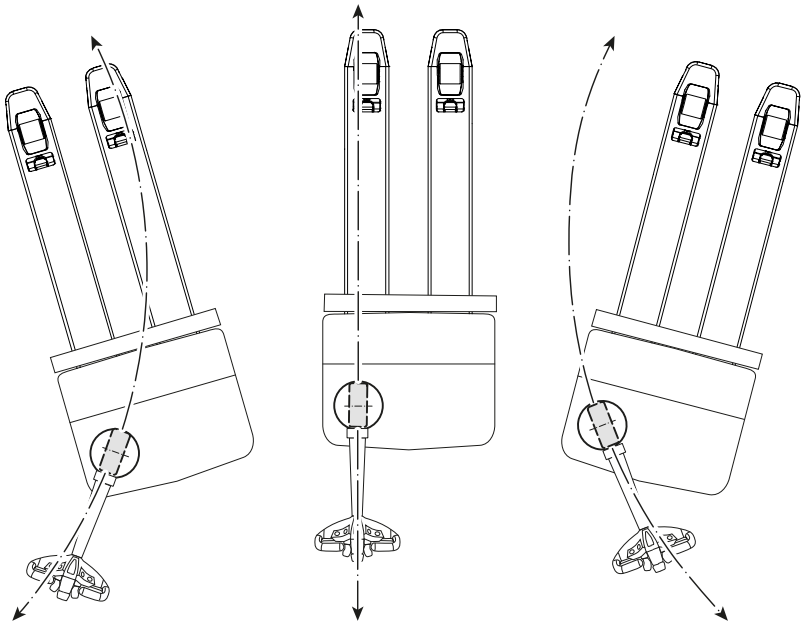


Procedure

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

The truck is steered in the required direction.

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

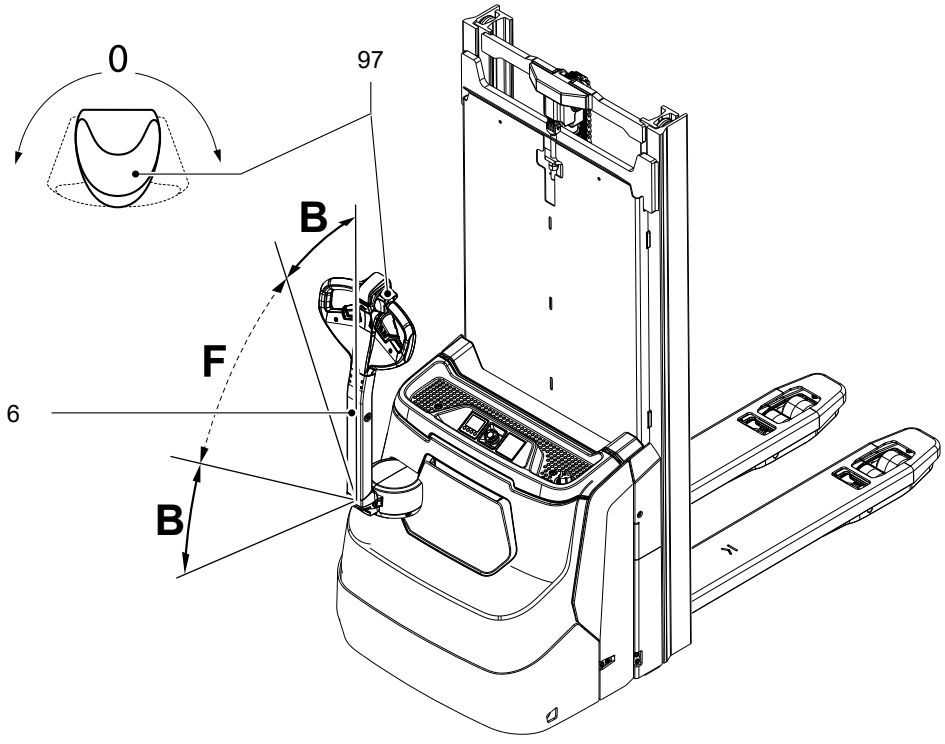
Applying the Emergency Disconnect switch during travel will cause the truck to decelerate to a halt at maximum force. This may cause the load to slide off the load handler. There is a higher risk of accidents and injury.

▶ 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 107.

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 (97) 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 (97) to the opposite travel direction during travel – see page 113.

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

Lift heights > 1800 mm are released only when the support arms are manually lowered. This ensures the operational stability of the truck. Above a lift height of 1800 mm, the support arms can no longer be raised.

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 158.

Automatic support-arm-lift lowering (○)

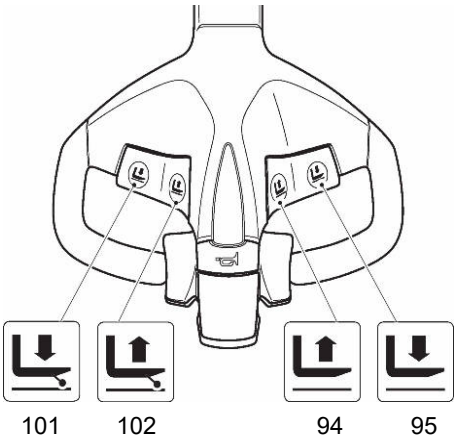
➔ EJC 110zi/112zi only

With the support arm lift raised, loads can be stacked and retrieved with the load fork up to a lift height of 1800 mm. For higher lift heights, the support arm lift must be lowered.

On trucks with the "automatic lower sequence of support arm lift" function (○), the support arms are automatically lowered as of a load fork lift height of 1800 mm when the "raise load fork" button remains depressed.

4.7.1 Raising or Lowering the Load Fork

Tiller from above



Requirements

– Truck ready for operation and switched on see page 99.

Procedure

- Actuate the "raise load fork" button (94) 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

- Actuate the "lower load fork" button (95) until the desired lift height is reached.

➔ EJC 110i, EJC 110zi (●): 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 112i, EJC 112zi (●); EJC 110i, EJC 110zi (○): 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.

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

Short button travel = slow lower

Long button travel = fast lower

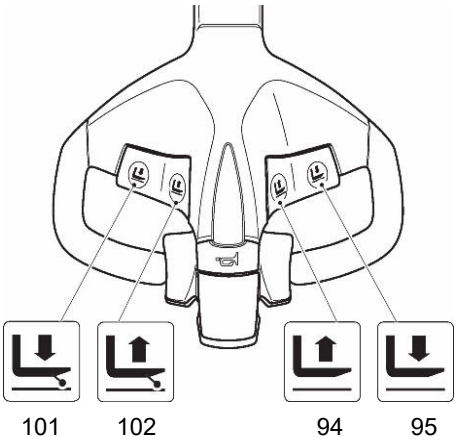
Use as an elevated work table

The raised load handler can be used as an elevated work table when the truck is switched off, see page 135.

4.7.2 Raising or Lowering the Support Arms

Only EJC 110zi/112zi

Tiller from above



Requirements

– Truck ready for operation and switched on see page 99.

Raising the support arms

- Actuate the "raise support arms" button (102) until the desired support arm lift is reached.

The support arms are raised.

Lowering the support arms

- Actuate the "lower support arms" button (101) until the desired support arm lift is reached.

The support arms are lowered.

4.7.3 Raising the Support Arms with the "Double-Click Lifting" function (○)

➔ Only with EJC 110zi/112zi double-deck function (○)

⚠ WARNING!

Risk of accidents while lifting with the automatic lifting function

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

▶ Be particularly careful when activating automatic lifting.

▶ Avoid activating automatic lifting accidentally. Do not press the operating buttons multiple times in quick succession if you do not wish automatic lifting to be activated.

▶ Press the emergency disconnect switch in an emergency.

The "double-click lift" function enables continuous lifting to the maximum lift height of the support arms.

Requirements

– Truck operational, see page 99.

Procedure

• Press the “Raise support arms” button (102) twice in quick succession.

The support arms are raised continuously up to the maximum lift height.

➔ When the emergency disconnect switch is actuated, the automatic lift function is interrupted.

➔ The status and usage of automatic lifting are shown in the display unit, see page 87.

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.

With the two-stage Duplex mast (ZZ) and three-stage Duplex mast (DZ) a short, centre-mounted free lift cylinder performs the initial lift of the load fork (free lift) without changing the overall height of the truck. From a truck-specific lift height, the travel speed is automatically reduced when lifting and increased again when lowering.

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. With the ZZ mast and the DZ mast, reduction takes place from the mast transition point.

Observe the information and instructions on lifting and lowering the load handler – see page 118.

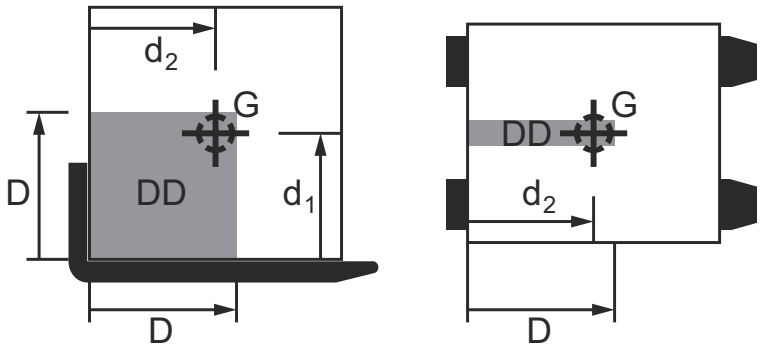
4.8.1 Load Centre

⚠ 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 53.
- ▶ 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.

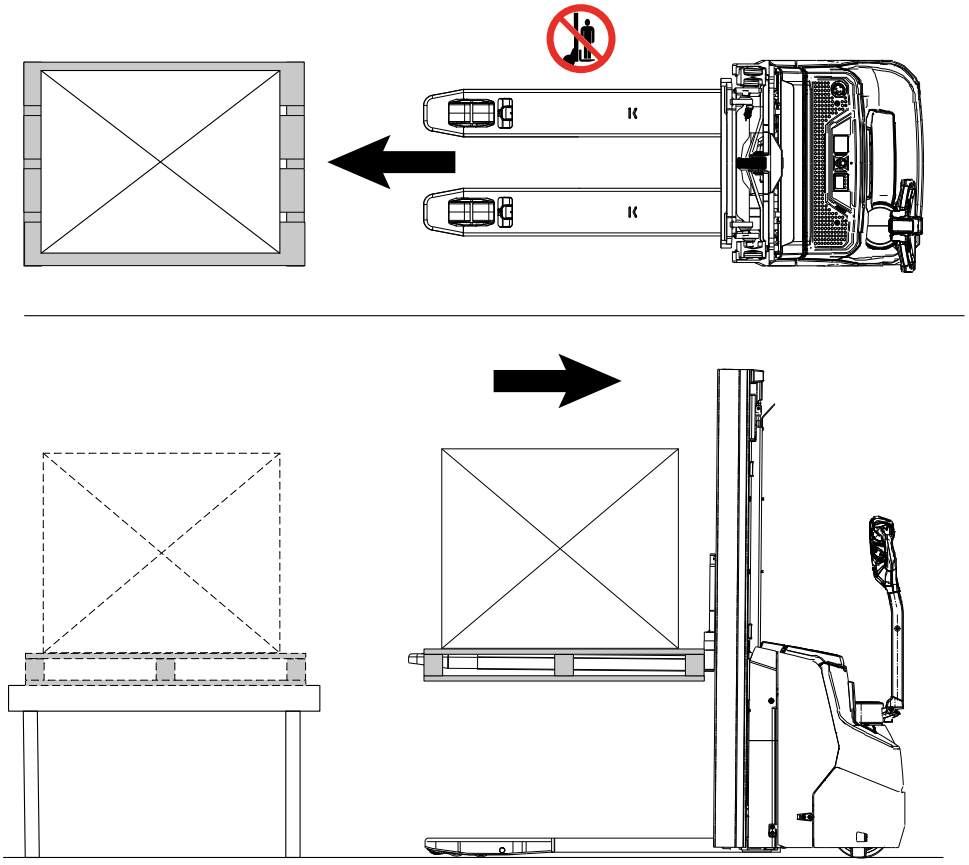
4.8.2 Picking up loads with the load fork

⚠ 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 53.
– 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 118.

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

Loads may be stored and retrieved with a raised support arm lift up to a lift height of 1800 mm. For lift heights above 1800 mm, the support arm lift must be lowered.

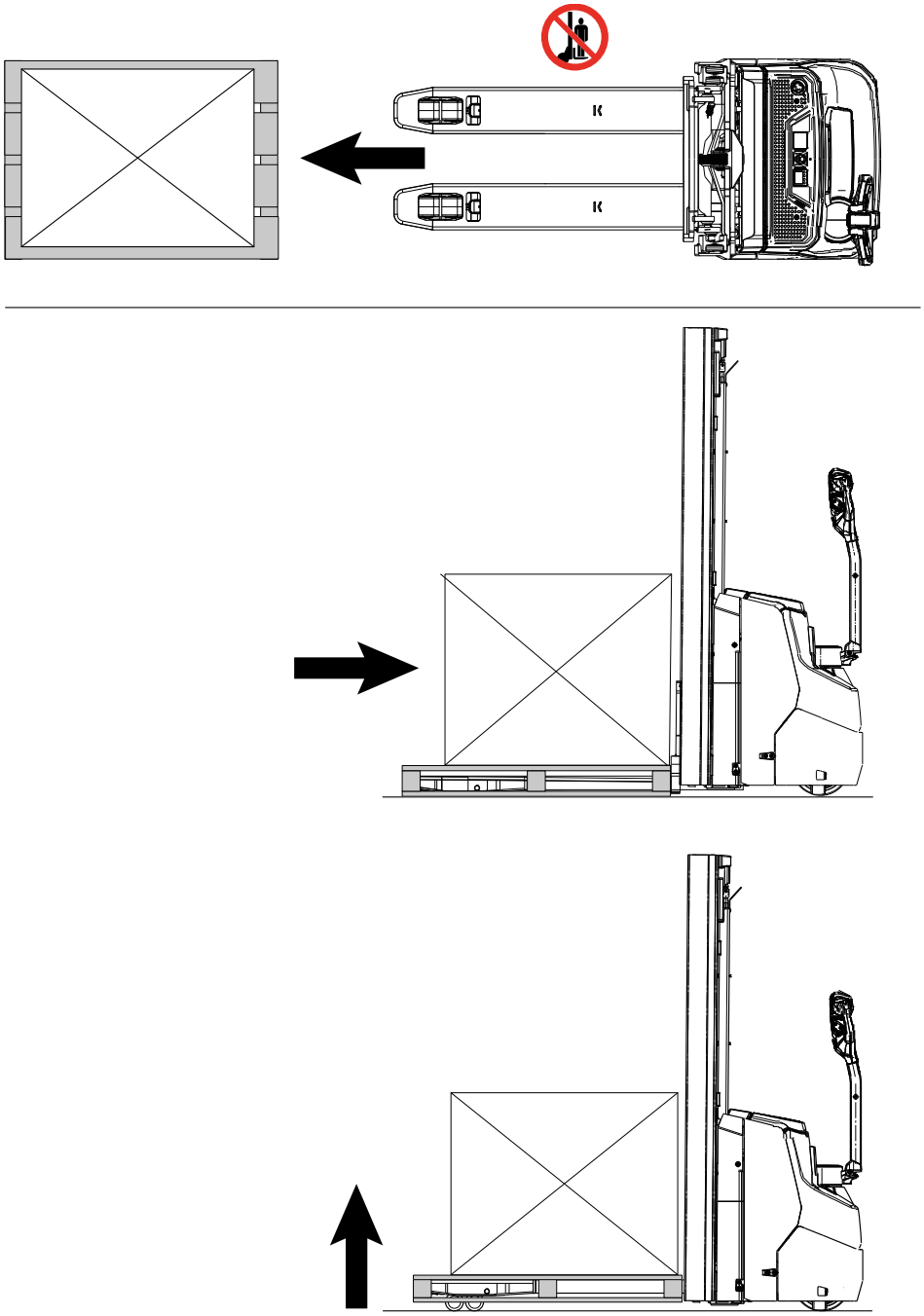
Overload warning at the lift limit

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 81. The load picked up is not too heavy.

➔ Two palletised loads one above the other can only be picked up by trucks with the double-deck function (○) – see page 129.

4.8.3 Lifting loads with support arms

Only EJC 110zi/112zi



Requirements

– Load correctly palletised.
– Capacity of the truck is sufficient for the load – see page 53.
– Load handler evenly loaded for heavy loads.

Procedure

- Drive the truck slowly up to the pallet.
- Insert the support arms slowly into the pallet until the pallet is resting against the back.
- Raise the support arms until you reach the desired lift height – see page 121.

Load picked up.

4.8.4 Picking up the load with the double-decker function (○)

➔ Only with EJC 110zi/112zi double-deck function (○)

⚠ 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.

⚠ CAUTION!

Risk to operational stability

In order not to jeopardize the operational stability, pay attention to the weight when transporting two pallets so that the truck does not tip over.

▶ In order not to jeopardize the operational stability, the heavier pallet should always be transported underneath.

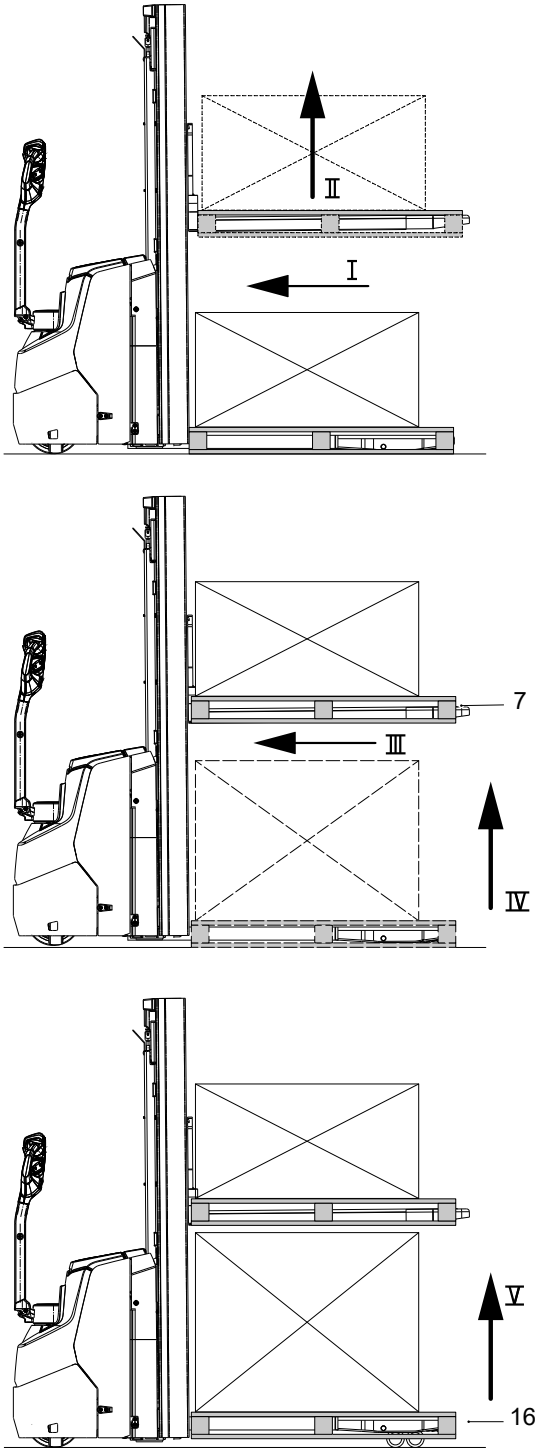
Requirements

– Load correctly palletised.
– The total weight of the load corresponds to the capacity of the industrial truck – see page 58.
– Load handler evenly loaded for heavy loads.

Procedure

- Drive the truck carefully up to the pallet.
- Insert the load fork (7) slowly into the pallet until the pallet is resting against the back (see figure).
- Raise the load fork until you reach the desired lift height – see page 120.
- Drive into the second pallet with the support arms (16).
- Raise the support arms – see page 121.
- Lower the load forks as far as possible without the load coming into contact with the support arms.

Both pallets are raised.



➔ In double-deck operation, the load fork must not be raised higher than 1800 mm.

➔ When transporting, the load fork with the upper load must be lowered as close as possible to the lower load without being deposited on the lower load.

4.8.5 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 105.
- Be prepared to brake at all times:
  - Brake gently in normal circumstances.
  - Only stop abruptly in hazardous situations.

Two palletised loads can only be transported on top of each other if the corresponding optional equipment is available, see page 132.

4.8.5.1 Transporting a load with the double-deck function (○)

➔ Only with EJC 110zi/112zi double-deck function (○)

⚠ CAUTION!

Risk to operational stability

In order not to jeopardize the operational stability, pay attention to the weight when transporting two pallets so that the truck does not tip over.

▶ In order not to jeopardize the operational stability, the heavier pallet should always be transported underneath.

Requirements

– Load raised correctly.
– Load forks lowered as far as possible without the load coming into contact with the support arms.
– Faultless ground conditions.

Procedure

- Accelerate and decelerate the truck carefully.
- Adapt your travel speed to the conditions of the route and the load you are transporting.
- Travel at a constant speed.
- Always be ready to brake:
  - Brake the truck gently in normal circumstances.
  - Only stop abruptly in hazardous situations.
- Watch out for other traffic at crossings and passageways.
- You must use a lookout at blind spots.
- Observe the information on travelling on slopes and inclines – see page 105.

4.8.6 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 118.
- 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.

4.8.7 Depositing a Load with the Double-Deck Function (○)

Only with EJC 110zi/112zi double-deck function (○)

⚠ 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.

Requirements

– Storage location suitable for storing the load.

Procedure

- Drive the truck carefully up to the first storage location.
- Lower the support arms until the load is set down.
- Carefully move the support arms out of the pallet.
- Lower the support arms.
- Lower the load fork to transport height (150 - 500 mm).
- Drive the truck carefully up to the second storage location.
- Lower the load fork so that it is clear of the load.
- Carefully withdraw the load fork from the pallet.
- Lower the load fork.

Both loads have been set down.

4.8.8 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 125.

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 101.

⚠ 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 spare 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.

➔ 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 107
-	Faulty fuse	– Check fuses, see page 185
-	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 145
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 110
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 101. – 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 81

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 87.

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 180
-	Battery discharge monitor has switched off	– Charge the battery, see page 84
-	Faulty fuse	– Check fuses, see page 185
-	Excessive load	– Note maximum capacity, see page 52
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	– Lowering and travelling possible up to 1.5 km/h. – Park the truck securely – see page 101. – 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 81

5.4 Lithium-ion battery is not functioning

Description / possible cause	Actions
Low voltage : – The lithium-ion battery switches off.	– Move the lithium-ion battery into the permissible temperature range, see page 12. – Connect the lithium-ion battery to the battery charger. – Charge the lithium-ion battery – see page 77. – If the malfunction persists, contact the manufacturer's customer service department.
Low temperature : – Cell temperature of at least one battery cell is too low. – The lithium-ion battery was operated outside the permissible application range. – The lithium-ion battery switches off.	– Move the lithium-ion battery into the permissible temperature range, see page 12. – Connect the lithium-ion battery to the battery charger. – 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. – If the malfunction persists, contact the manufacturer's customer service department.
Overtemperature: – Cell temperature of at least one battery cell is too high. – The lithium-ion battery was operated outside the permissible application range. – The lithium-ion battery switches off.	– Move the lithium-ion battery into the permissible temperature range, see page 12. – Do not operate the lithium-ion battery further. – Allow the lithium-ion battery to cool down. Do not operate the lithium-ion battery again until it has cooled down. – If the malfunction persists, contact the manufacturer's customer service department.

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.

➔ 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.

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.

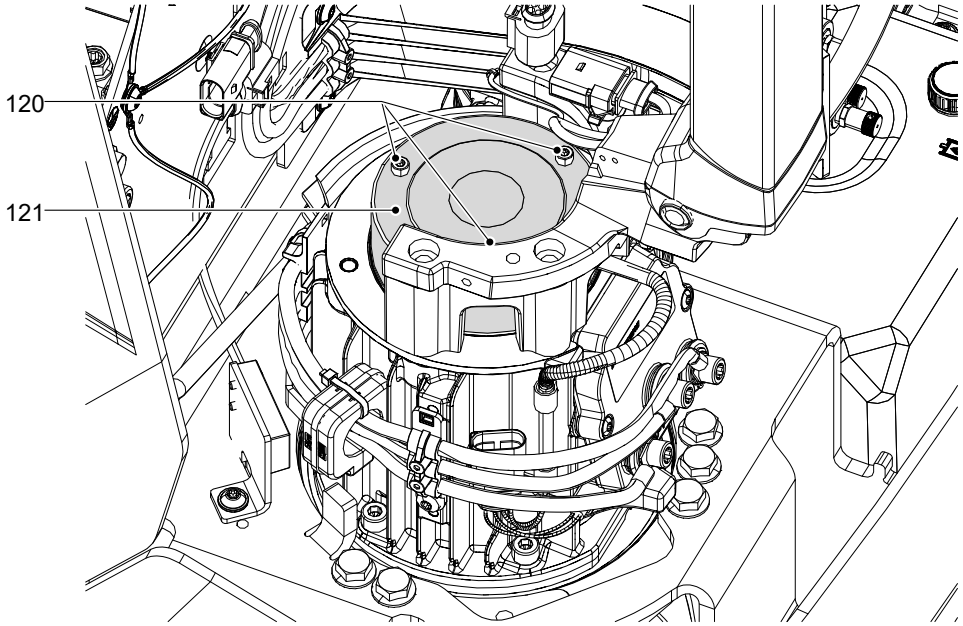
▶Do not release the parking brake on slopes or inclines.

▶Activate the parking brake again when you reach your destination.

▶Do not park the truck with the parking brake released.

➔ The following description applies to: EJC 110i/112i/110zi/112zi.

▶ It is not possible to release the brake on the EJC 010i. In an emergency, move the EJC 010i by crane.



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 171.
– The document compartment has been disassembled – see page 172.
– The drive panel has been disassembled – see page 173.

Tools and Material Required

– Torque wrench (5,5 Nm) and Torx insert T25

Procedure

• Unscrew three screws (120) until the brake (121) is resting loosely on the surface.

➔ The brake must not be released completely.

• Remove the chocks.

The truck can be moved.

Activating the brake

Requirements

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

Procedure

- Tighten three screws (120) with a torque of 5,5 Nm.
- Fit the drive panel – see page 173.
- Fit the document compartment – see page 172.
- Fit the front panel – see page 171.

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

⚠ WARNING!

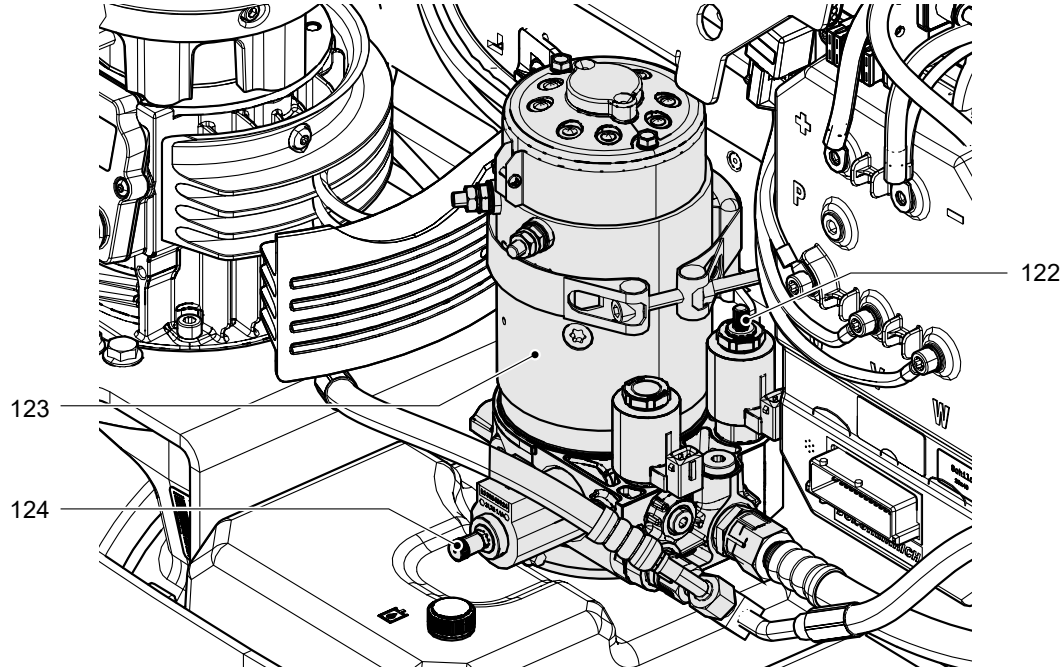
Only return the truck to service when you have identified and rectified the fault.

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 107.
- Remove the front panel – see page 171.
- Completely unscrew the knurled screw (122) on the mast lift valve.
- Slowly unscrew the knurled screw (124) on the lowering valve until the load handler lowers.

The load handler is lowered.

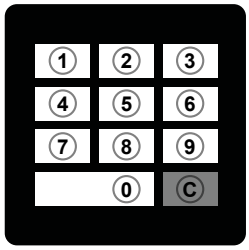
➔ *After carrying out emergency lowering, tightening both knurled screws as far as the stop.*

8 Optional Equipment

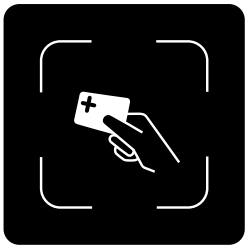
8.1 Keyless Access System

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

8



17



18

Item	Description
8	Display unit (EasyAccess Softkey): – Description see page 85 – Entry of 4-digit set-up and access codes – Up to 10 access codes can be stored – For set-up and access codes with the numbers 1 to 4
17	Keypad (EasyAccess PinCode): – Consists of keys 0 to 9 and C (clear) – Entry of 4-digit set-up and access codes – Up to 100 access codes can be stored
18	Transponder reader Plus (EasyAccess Transponder): – The transponder reader Plus supports additional transponder standards.

8.1.1 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.

8.1.2 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.

8.1.2.1 Activating the keypad

Procedure

- Release the emergency disconnect switch, see page 107.
- Enter the default code 1-2-3-4 using the keys below the display unit (8).
  The truck is switched on.
- Press the key below the "Settings" symbol (110).
- Press the key below the "Change set-up code" symbol (111).
- 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.

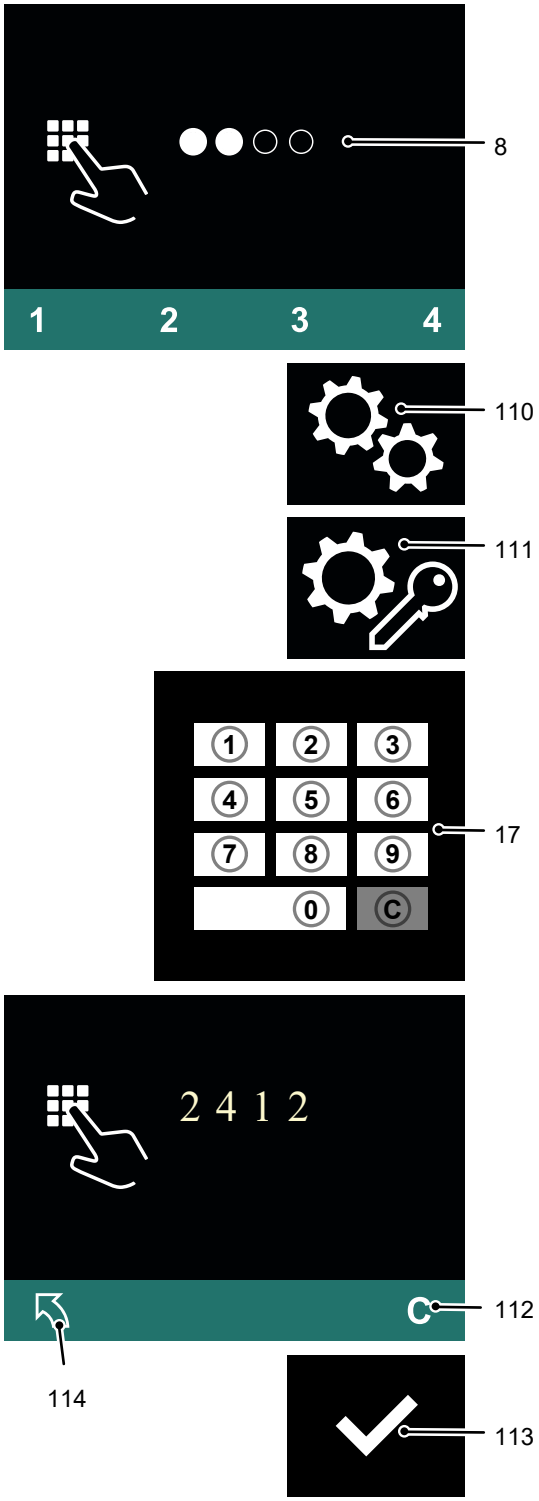
Press the key below the "Delete" symbol (112).
The set-up code is deleted.

- Enter the new set-up code using the keypad (17).
- Press the key below the "Confirm" symbol (113).
  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 (112).

- To return to the main menu, press the key below the "Back" symbol (114).
- Delete the default code, see page 152.
- Create access codes, see page 151.

The keypad is active.



8.1.2.2 Activating the transponder reader

Procedure

- Release the emergency disconnect switch, see page 107.
- Enter the default code 1-2-3-4 using the keys below the display unit (8).

  The truck is switched on.
- Press the key below the "Settings" symbol (110).
- Press the key below the "Change set-up code" symbol (111).
- Enter the set-up code 2-4-1-2 using the keys below the display unit (8).

  The set-up code entered is displayed.
- Press the key below the "Delete" symbol (112).

  The set-up code is deleted.
- Hold a transponder in front of the transponder reader (125).

  This transponder thus becomes the set-up transponder.
- Press the key below the "Confirm" symbol (113).

  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 (112).

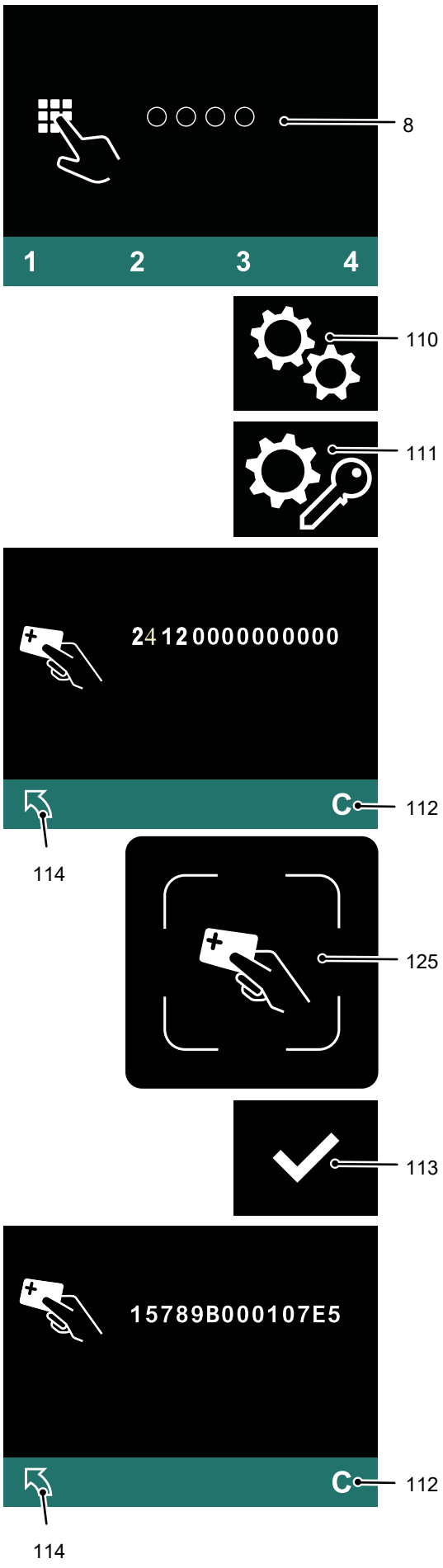
- To return to the main menu, press the key below the "Back" symbol (114).

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

Delete the default code, see page 157.

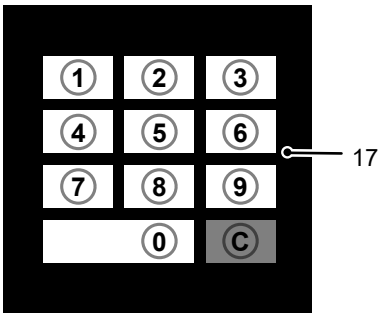
- Add new transponders, see page 156.

The transponder reader is now active.



8.1.3 Using the Keypad

8.1.3.1 Switching on the truck with an access code



Procedure

- Release the emergency disconnect switch, see page 107.
- Enter the access code with the keypad (17).

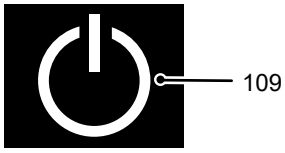
The truck is switched on.

Procedure

- Press the key under the "Switch off" symbol (109) in the display unit.
- Press the Emergency Disconnect switch, see page 107.

The truck is switched off.

8.1.3.2 Switching off the truck



Procedure

- Press the key under the "Switch off" symbol (109) in the display unit.
- Press the Emergency Disconnect switch, see page 107.

The truck is switched off.

8.1.3.3 Changing the set-up code

Requirements

– The truck is switched on, see page 149.

Procedure

- Press the key below the "Settings" symbol (110).
- Press the key below the "Change set-up code" symbol (111).
- Enter the set-up code using the keypad (17).

  The set-up code entered is shown in the display unit (8) as filled-in circles.
- Press the key below the "Delete" symbol (112).

  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.

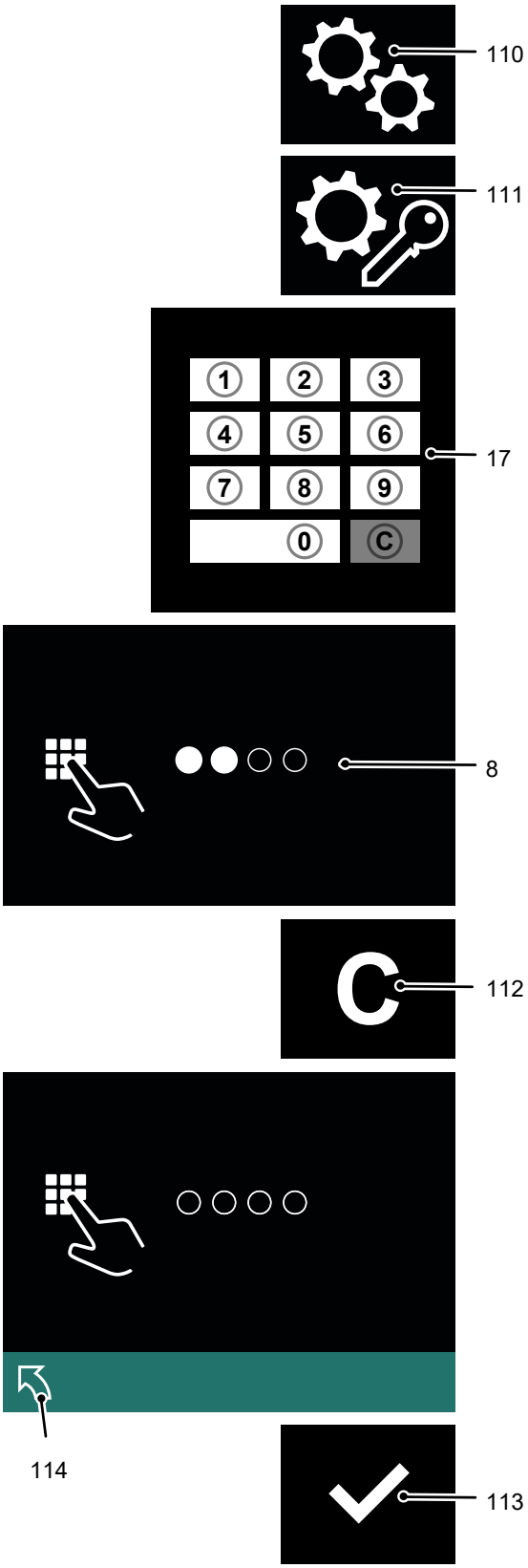
- Press the key below the "Confirm" symbol (113).

  The new set-up code is displayed.

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

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

The set-up code has been changed.



8.1.3.4 Adding a new access code

Requirements

– The truck is switched on, see page 149.

Procedure

- Press the key below the "Settings" symbol (110).
- Press the key below the "Edit access code" symbol (115).

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

  All access codes are shown on the display unit (8).
- Press the key below the "Add" symbol (116).
- Enter a new access code using the keypad (17).

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

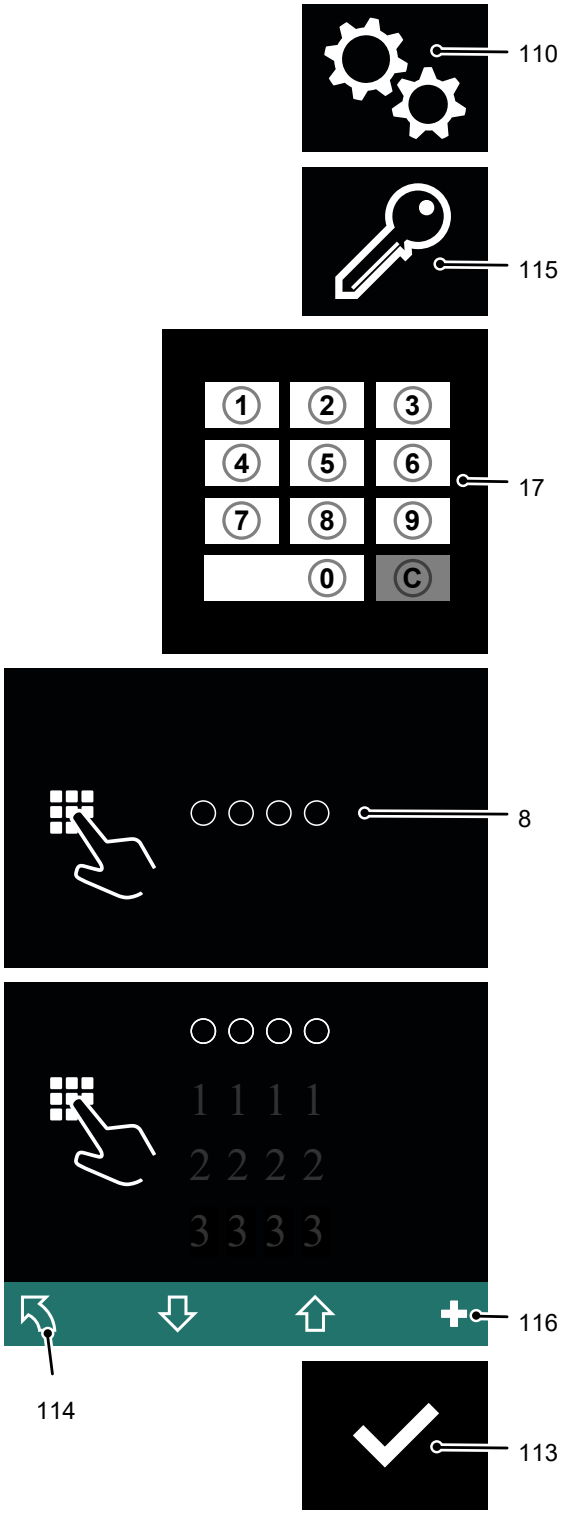
- Press the key below the "Confirm" symbol (113).

  The new access code is shown on the display unit (8).

➔ If the new access code has been entered incorrectly, delete it, see page 152, and enter the correct access code.

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

A new access code has been added.



8.1.3.5 Deleting an access code

Requirements

– The truck is switched on, see page 149.

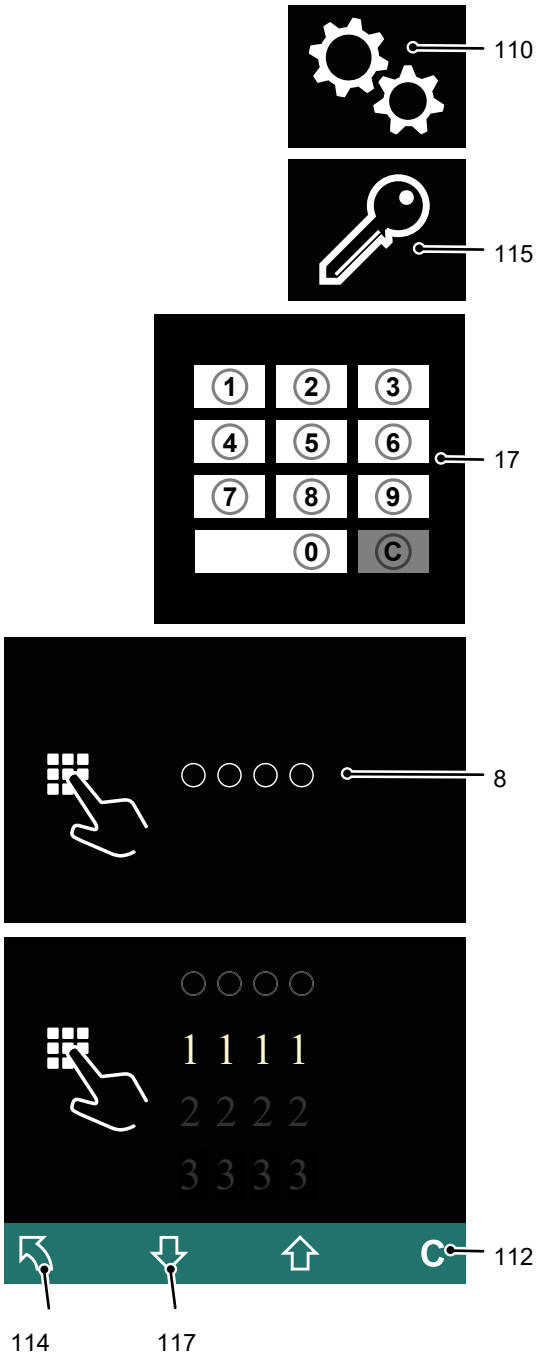
Procedure

- Press the key below the "Settings" symbol (110).
- Press the key below the "Edit access code" symbol (115).

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

  All access codes are shown on the display unit (8).
- Select the access code to be deleted using the key below the "Down selection" symbol (117).
- Press the key below the "Delete" symbol (112).

  The access code has been deleted.
- To return to the main menu, press the key below the "Back" symbol (114).



8.1.3.6 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 149.

Procedure

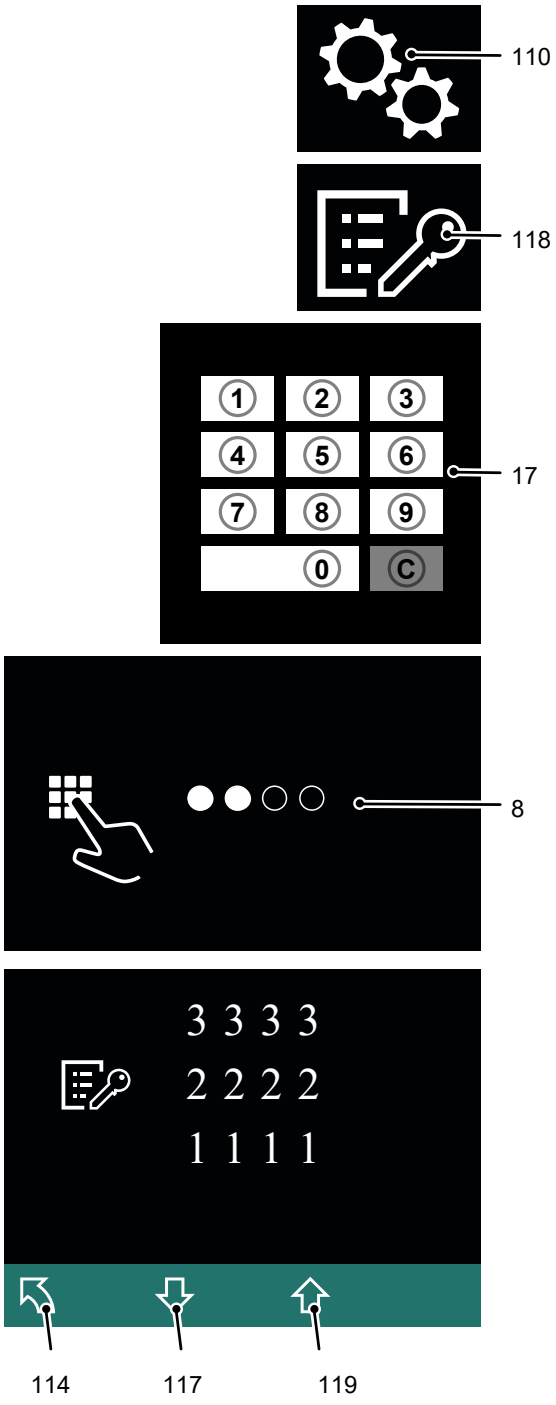
- Press the key below the "Settings" symbol (110).
- Press the key below the "Log-in process" symbol (118).
- Enter the set-up code using the keypad (17).

  The set-up code entered is shown in the display unit (8) as filled-in circles.
- To scroll forward, press the button under the "Down selection" symbol (117) 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 (119) as many times as necessary.

  The display area moves: More recent log-ins are displayed.
- To return to the main menu, press the key below the "Back" symbol (114).

The log-in process is displayed.



8.1.4 Operating the transponder reader

NOTICE

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

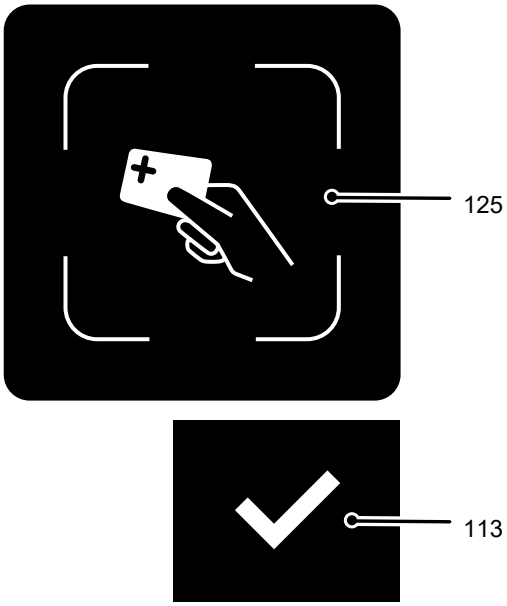
8.1.4.1 Switching on the truck with a transponder

Procedure

- Release the Emergency Disconnect switch, see page 107.
- Hold the transponder in front of the transponder reader (125).

  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 (113).

The truck is switched on.



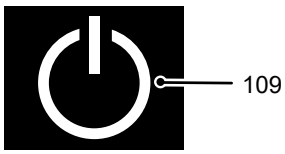
The truck can only be switched on when the display unit (8) is lit. If the display unit is in standby the code or transponder will not be recognised. Pressing any key cancels standby mode.

8.1.4.2 Switching off the truck

Procedure

- Press the key under the "Switch off" symbol (109) in the display unit.
- Press the Emergency Disconnect switch, see page 107.

The truck is switched off.



8.1.4.3 Changing the set-up transponder

Requirements

– The truck is switched on, see page 154.

Procedure

- Press the key below the "Settings" symbol (110).
- Press the key below the "Change set-up code" symbol (111).
- Place the set-up transponder on the transponder reader (125).

  The code of the set-up transponder is shown on the display unit (8).
- Press the key below the "Delete" symbol (112).

  A dashed line is shown.
- Place the new set-up transponder on the transponder reader (125).

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

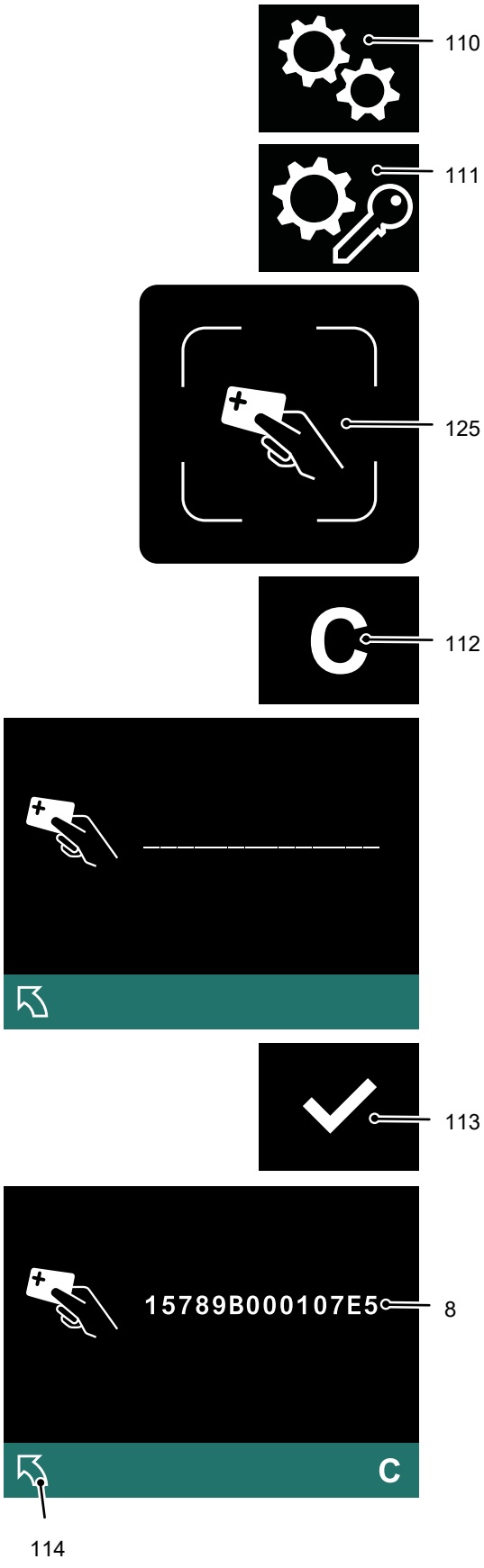
- Press the key below the "Confirm" symbol (113).

  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 (112).

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

The set-up transponder has been changed.



8.1.4.4 Adding a new transponder

Requirements

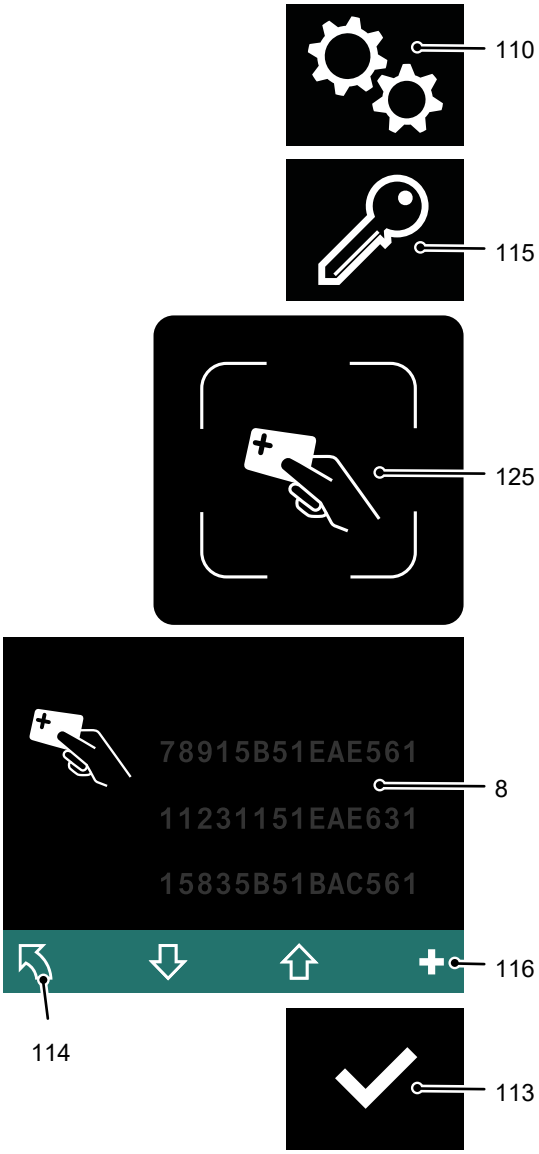
– The truck is switched on, see page 154.

Procedure

- Press the key below the "Settings" symbol (110).
- Press the key below the "Edit transponder" symbol (115).

  The set-up transponder is requested.
- Place the set-up transponder on the transponder reader (125).

  All transponder codes are shown on the display unit (8).
- Press the key below the "Add" symbol (116).
- Place the new transponder on the transponder reader (125).



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

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

  The new transponder code is displayed.

➔ If the wrong transponder has been used, delete it, see page 157, and add a correct transponder.

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

A new transponder has been added.

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

8.1.4.5 Deleting a transponder

Requirements

– The truck is switched on, see page 154.

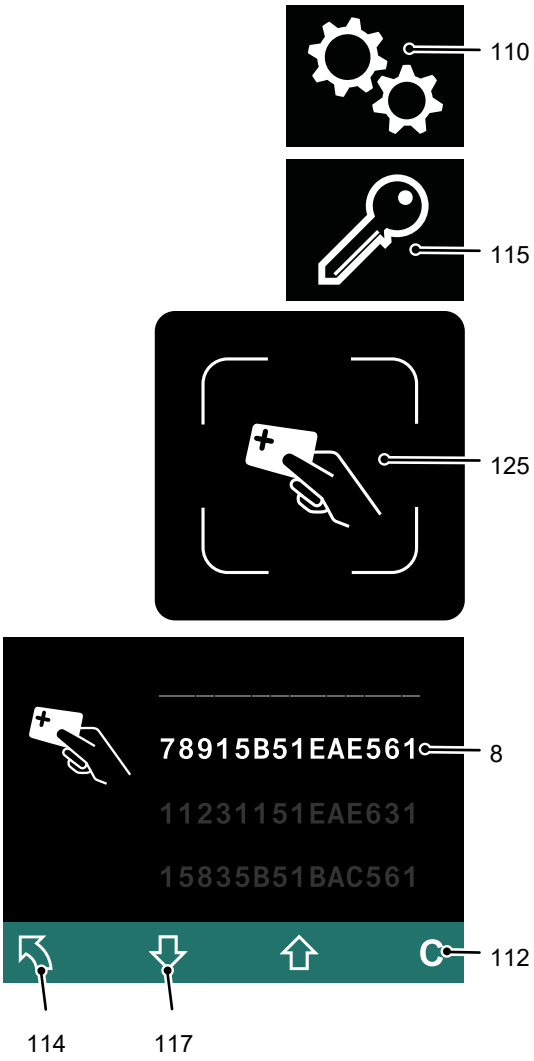
Procedure

- Press the key below the "Settings" symbol (110).
- Press the key below the "Edit transponder" symbol (115).

  The set-up transponder is requested.
- Place the set-up transponder on the transponder reader (125).

  All transponder codes are shown on the display unit (8).
- Select the transponder code to be deleted using the key below the "Down selection" symbol (117).
- Press the key below the "Delete" symbol (112).

  The transponder has been deleted.
- To return to the main menu, press the key below the "Back" symbol (114).



8.1.4.6 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.

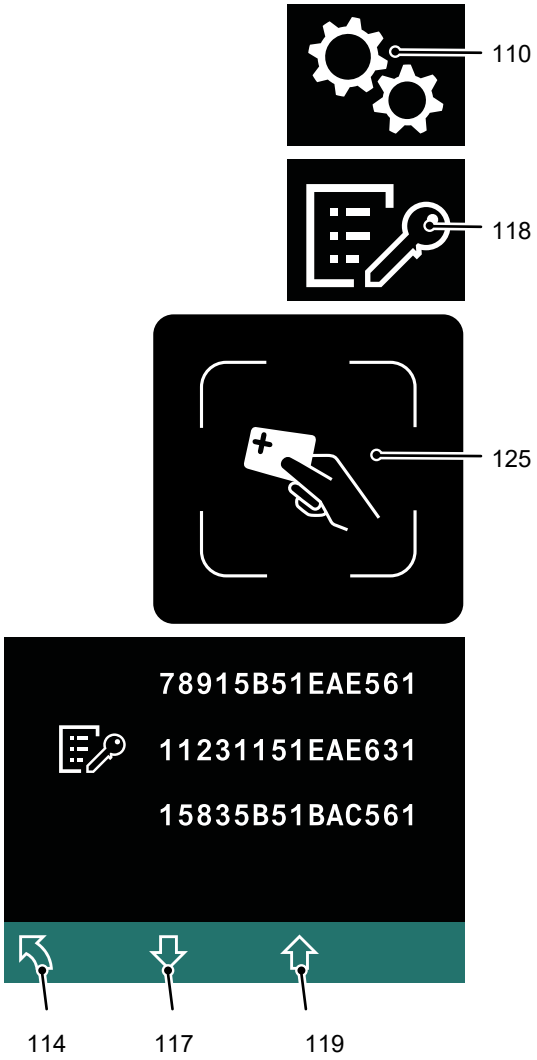
Requirements

– The truck is switched on, see page 149.

Procedure

- Press the key below the "Settings" symbol (110).
- Press the key below the "Log-in process" symbol (118).
- Place the set-up transponder on the transponder reader (125).
- To scroll forward, press the button under the "Down selection" symbol (117) 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 (119) as many times as necessary.
  The display area moves: More recent log-ins are displayed.
- To return to the main menu, press the key below the "Back" symbol (114).

The log-in process is displayed.



8.2 Parameters

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

8.3 Fleet Management System

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

8.4 Floor-Spot (○)

⚠ CAUTION!

Risk of retinal damage due to blue light from blue Floor-Spot

In accordance with IEC 62471, the blue floor spot is classified as risk group 2:

Medium risk. Blue light can potentially damage the retina within a range of 400 nm to 780 nm.

- ▶ Check that the warning notice: "Caution! Potentially dangerous optical radiation" is present and legible, and replace if necessary, see page 48.
- ▶ Do not look directly into the beam of the Floor-Spot.
- ▶ When performing maintenance and repair work, remove the Floor-Spot from service and secure it against unintentional recommissioning.

⚠ CAUTION!

Risk of accident due to restricted view

Looking directly at the LED light in the floor spot can dazzle and temporarily impair eyesight.

- ▶ Do not look directly at the LED light in the floor spot.
- ▶ Practise travelling and working with the floor spot carefully.
- ▶ Do not change the factory setting.

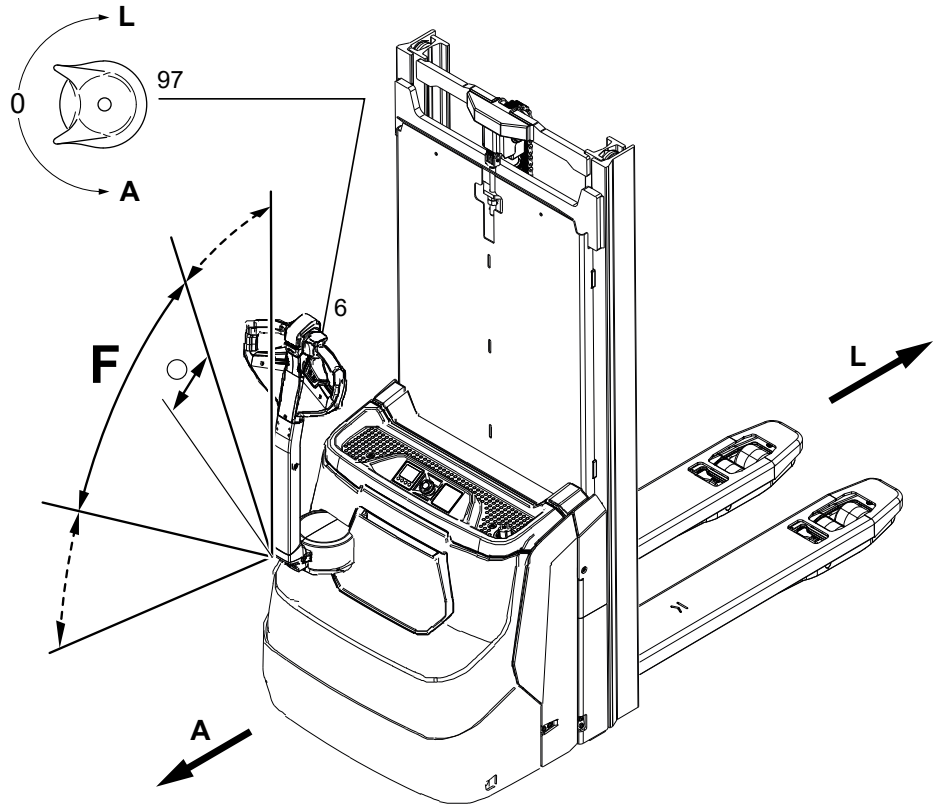
The activated Floor-Spot forewarns people of the truck travel path by projecting a coloured light dot onto the floor at the set distance.

The Floor-Spot is available in two versions:

- With blue light dot
- With red light dot

The position of the projected spot of light is factory pre-set.

8.5 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) by entering the serial number.

➔ The serial number can be found on the data plate, see page 52.

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 191.

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 191.

⚠ 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 186.

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 personal of the operating company has the technical expertise and experience to perform the activities in the maintenance check list for the operating company. The maintenance and repair work to be performed by the operating company are also written down, see page 170.

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 101).
- ▶ 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 161.

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.
- ▶ Lubricate a lift chain with particular care around the pulleys.

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!

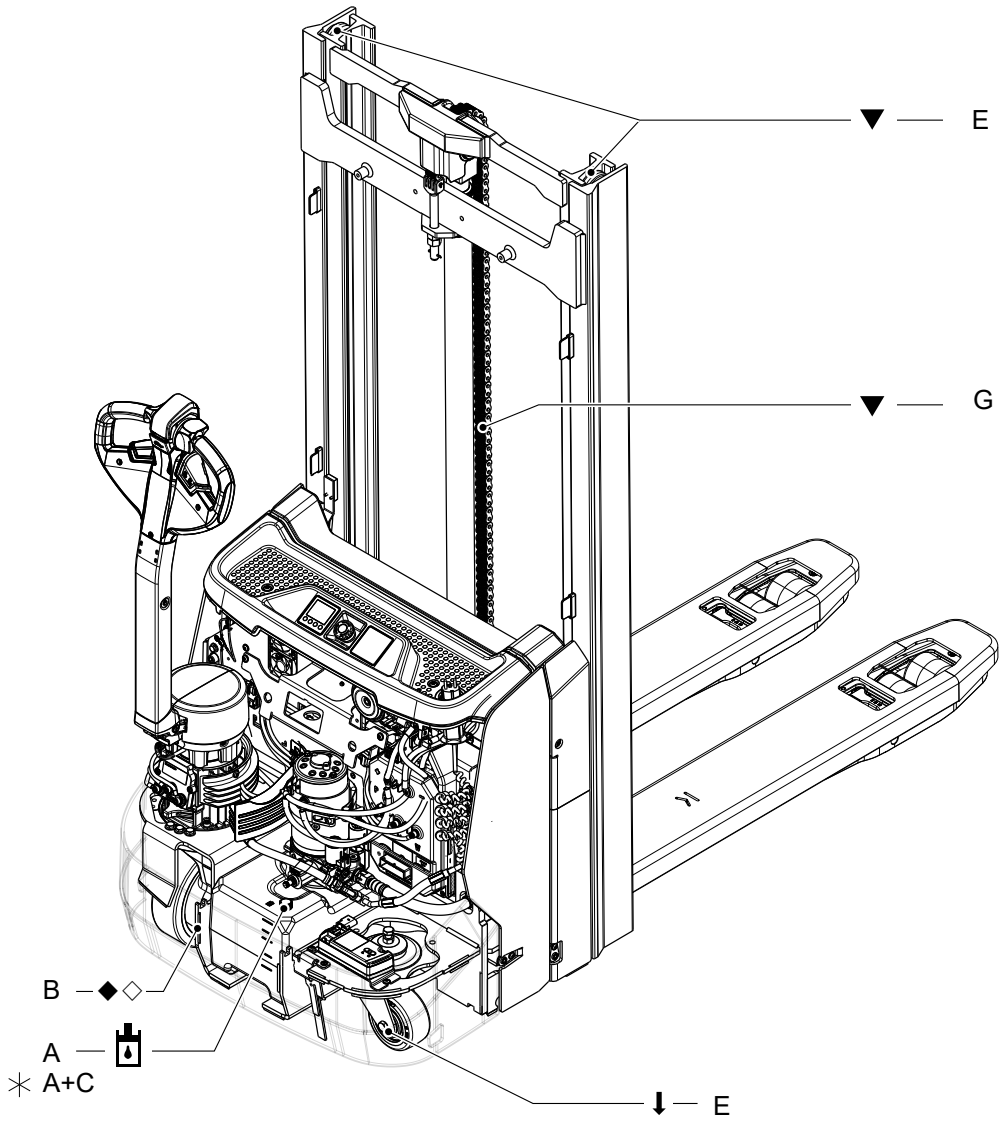
Improper handling of oils can be hazardous

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	✳	Cold store application [1]
⬇	Grease nipple	◆	Transmission-oil filler neck
	Hydraulic oil filler plug	◇	Transmission-oil drain plug
[1] *Mixing ratio for cold store application: 1:1*			

4.3 Consumables

Code	Order no.	Supplied quantity	Description	Used for
A	51132827*	5.0 l	Jungheinrich Hydraulic oil	Hydraulic system
	51132826*	1.0 l		
	51090781	1.0 l	Renolin MR 310	
B	50380904	5.0 l	Titan Gear HSY 75W-90	Transmission
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 59.

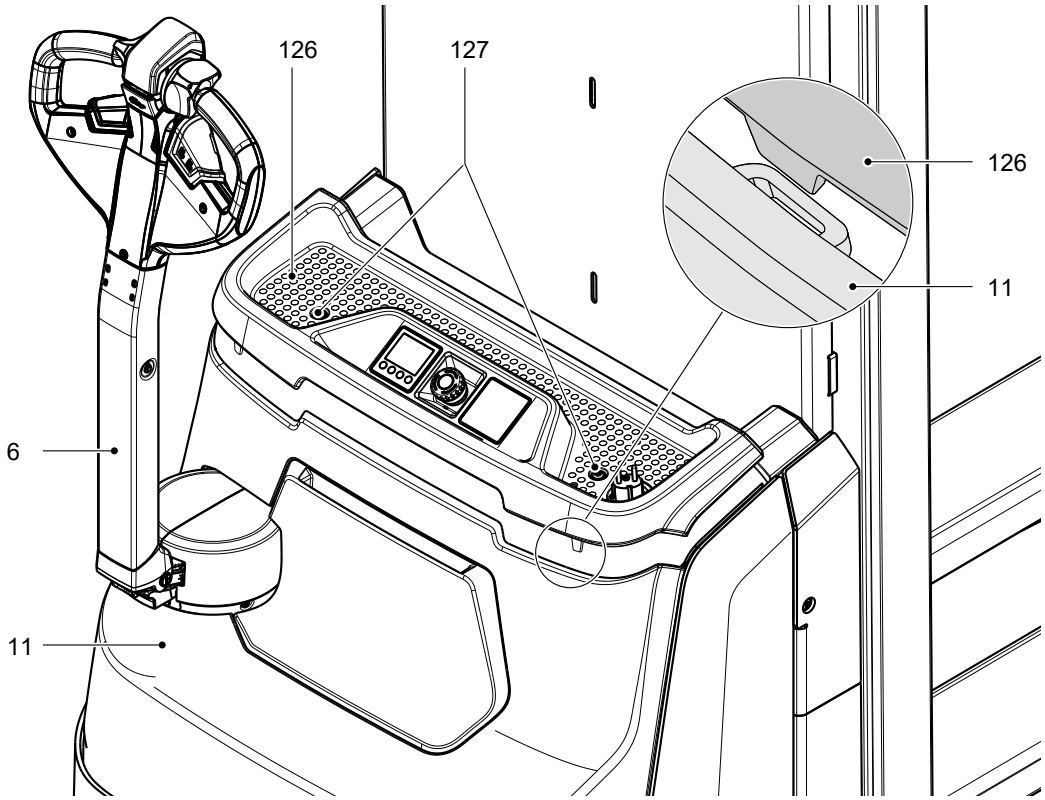
▶ When working on the parking brake, secure the truck to prevent it rolling away accidentally (e.g. using chocks).

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 101.
- 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 101.

Tools and Material Required

– Torx insert T45
– Torque wrench

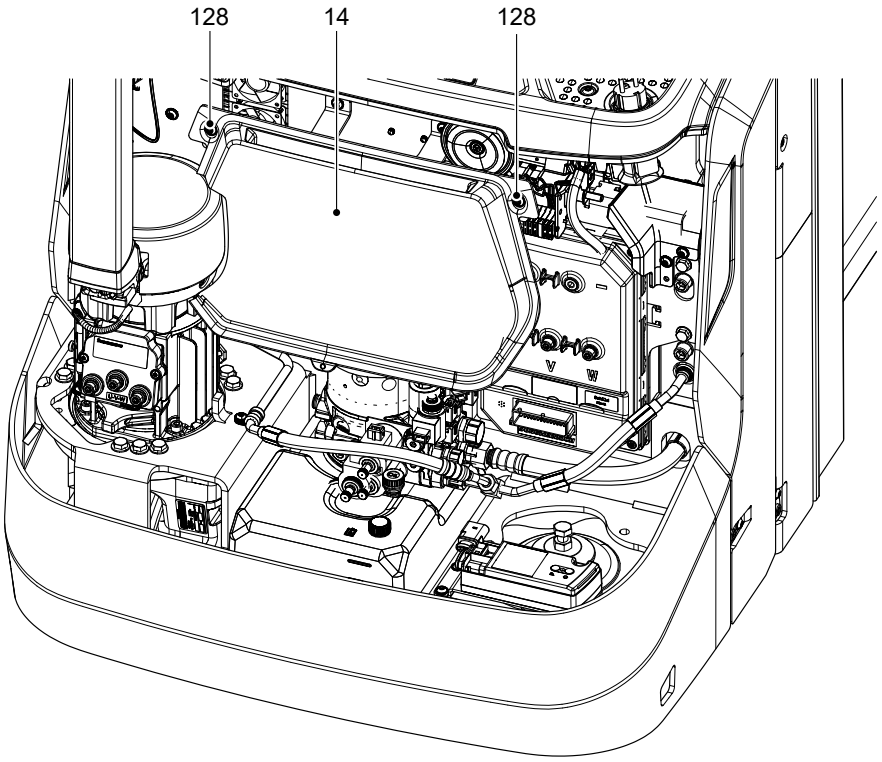
Procedure

- Remove the 2 flanged button head bolts M8 x 25 (127).
- Slightly lift the dashboard panel (126) and remove the front panel (11) from the guides (see detailed drawing).
- Lift the front panel (11) over the tiller (6) and set it down.

The front panel has been removed.

Proceed in reverse order to install the front panel (11). Tighten the flanged button head bolts (127) 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 101.
– The front panel has been disassembled – see page 171.

Tools and Material Required

– Torque wrench (3 Nm) and Torx insert T20

Procedure

- Remove two flanged button head bolts (128).
- Lift up the document compartment (14).

The drive compartment is exposed.

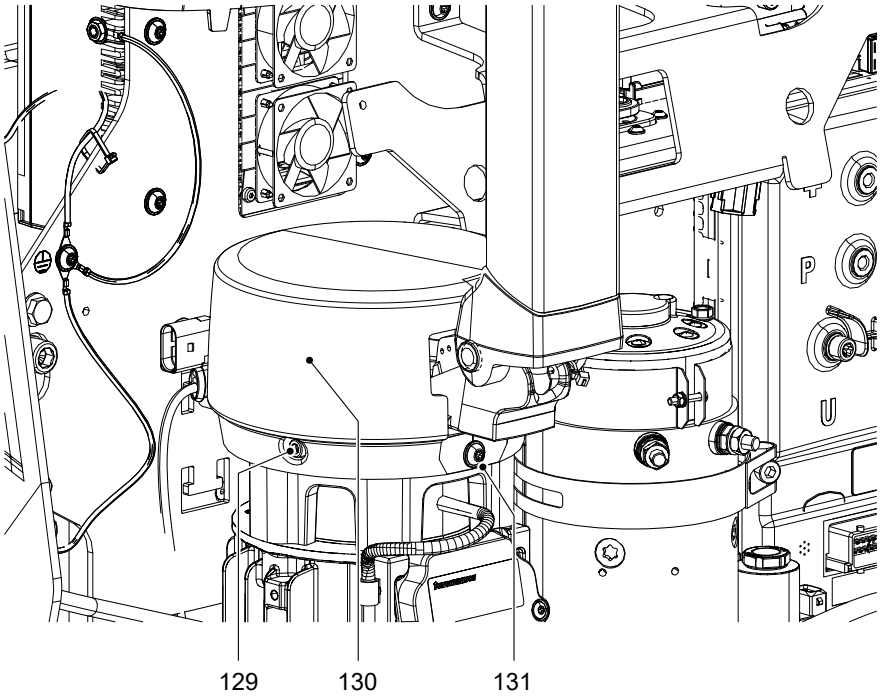
Fitting the document compartment

Procedure

- Position the document compartment (14).
- Tighten two flanged button head bolts (128) 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 101.
– The front panel has been disassembled – see page 171.
– The document compartment has been disassembled – see page 172.

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 (129).
- Remove one rounded head screw (131).
- Pull apart the two halves of the drive panel (130) and lift off.

The drive panel is now disassembled.

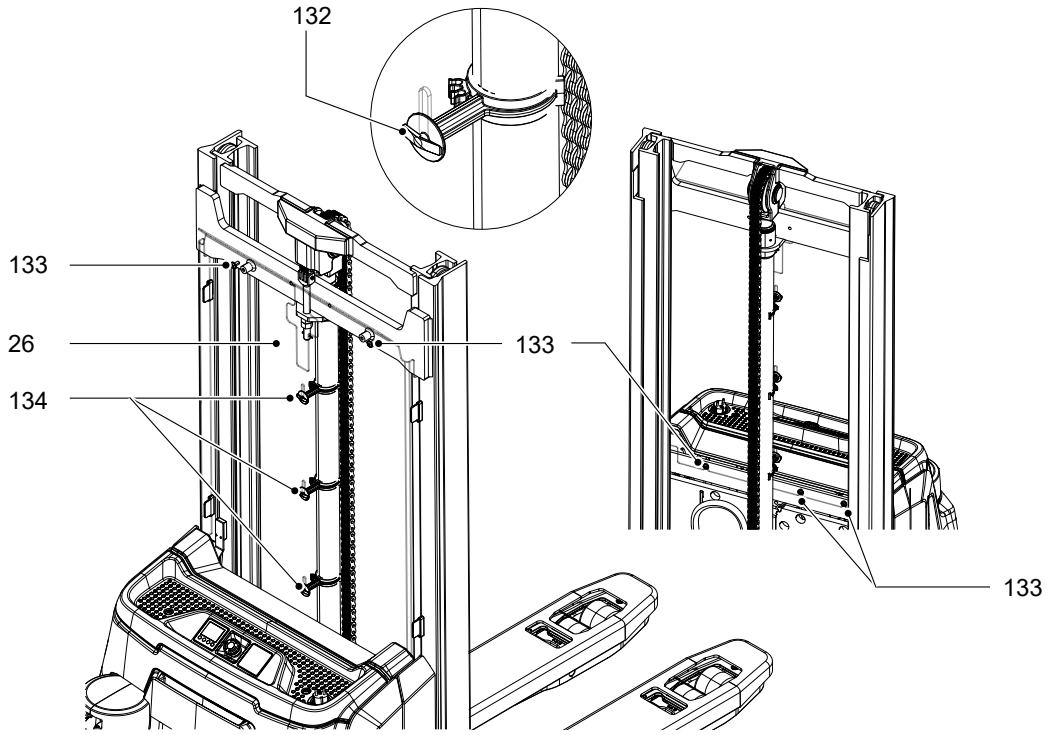
Drive panel assembly

Procedure

- Bring together the two halves of the drive panel (130) as shown.
- Tighten two cheese-head screws (129) with a torque of 3 Nm.
- Tighten one rounded head screw (131) 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 101

Procedure

- Remove the screw connections (133) from the safety device (26).
- Turn all latches (132) of the supports (134) by 90° to unlock them.
- Lift out the safety device (26) and store in a safe place.

The safety device is disassembled.

Safety device assembly

Requirements

– The truck is parked securely, see page 101

Tools and Material Required

– Torque wrench

Procedure

- Insert the safety device (26).
- Turn all latches (132) of the supports (134) by 90° to lock them.
- Fit the screw connections (133) of the safety device (26) with a torque of 8 Nm.

The safety device is assembled.

5.6 Lifting and jacking up the truck safely

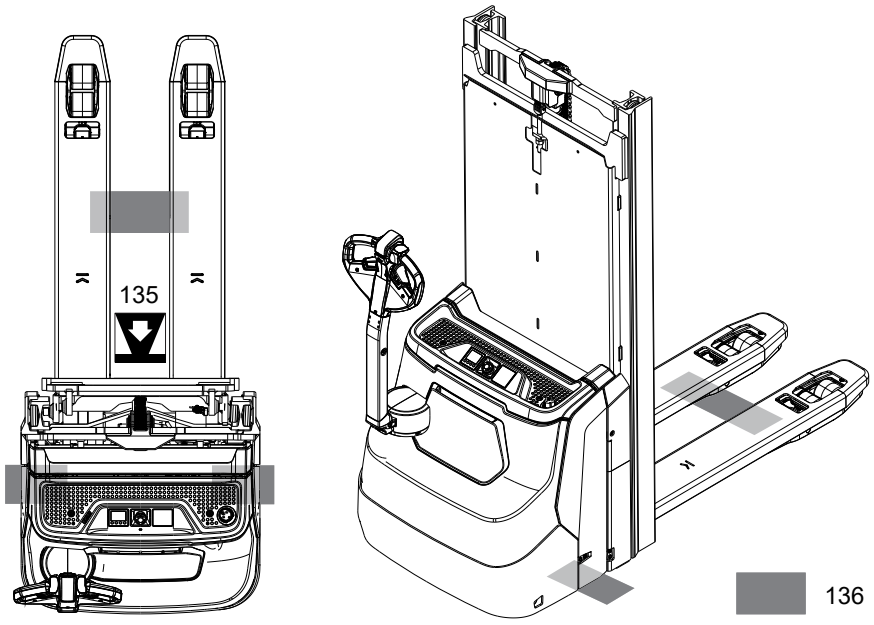
⚠ WARNING!

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 59.
- ▶ 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

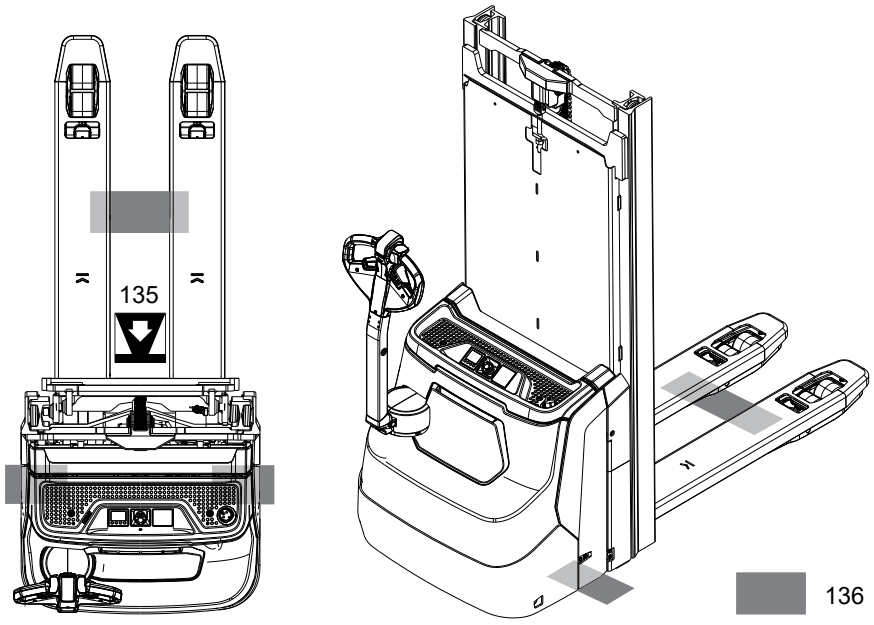
- Raise the load handler.
- Secure the load handler with wooden blocks (136).
- Lower the load handler.
- Switch off the truck.
- Place the jack against the jacking point (135).
- Raise the truck.
- Support the truck with wooden blocks at the marked positions (136).
- Remove the jack.

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 170.

Tools and Material Required

– Lifting equipment/crane lifting gear
– Wooden blocks

Procedure

- Apply the crane lifting gear to the attachment points (71) – see page 59.
- Raise the truck.
- Support the truck with wooden blocks at the marked positions (136).
- 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 48.

▶ 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 170.

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 186.

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 170.

Tools and Material Required

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

Procedure

- Expose the electrical system – see page 171.
- 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 171.
- Carry out all the tasks listed in the section "Recommissioning the truck after cleaning or maintenance work" – see page 186.

The electrical-system assemblies are now clean.

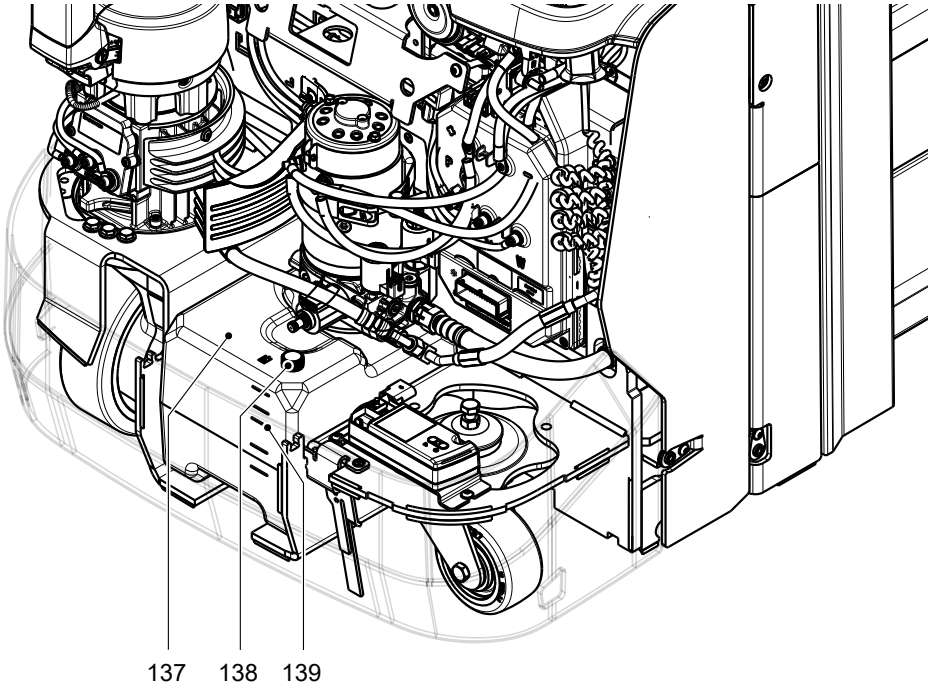
5.8 Checking the hydraulic oil level and refilling the hydraulic oil

⚠ 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 170.
– The front panel has been disassembled – see page 171.

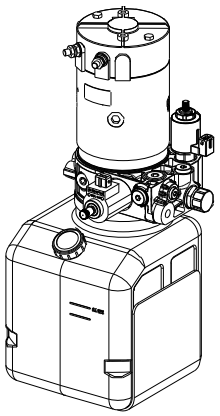
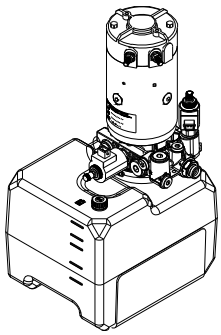
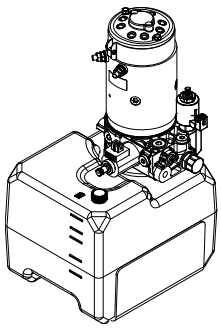
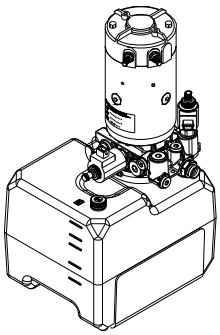
Procedure

- Check the oil level in the hydraulic reservoir (137).

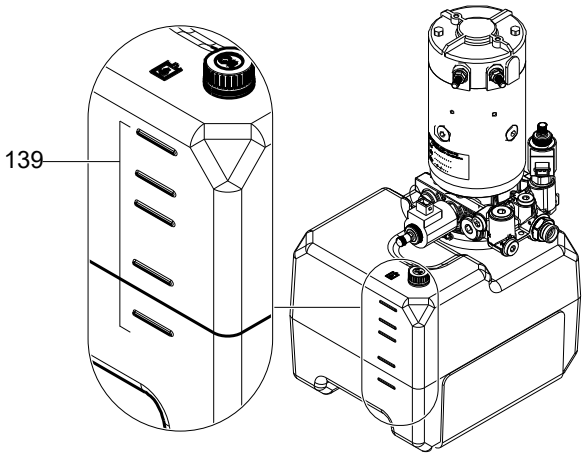
➔ Depending on the mast, the hydraulic oil level must be at a mark (139) according to the following table.

- If necessary, add hydraulic oil of the correct grade via the filler neck (138) – see page 169.

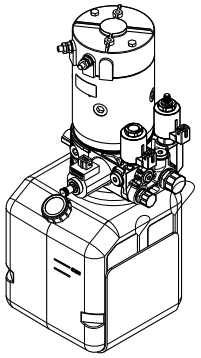
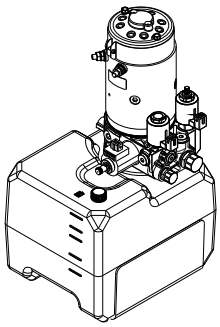
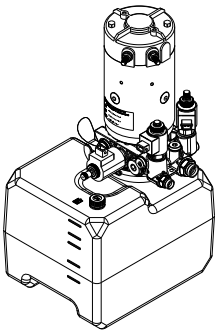
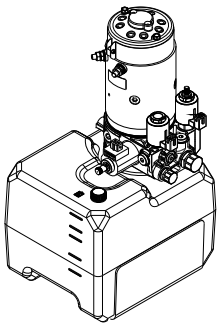
The hydraulic oil level is now checked.

Lift height [mm]	EJC 010i ZT EJC 110i ZT	EJC 112i ZT	EJC 010i ZZ EJC 110i ZZ EJC 112i ZZ	EJC 010i DZ EJC 110i DZ EJC 112i DZ
	Oil quantity [l]	Oil quantity [l]	Oil quantity [l]	Oil quantity [l]
2300	4	4.5	6.5	-
2500	4	4.5	6.5	-
2700	4.5	5	-	-
2900	4.5	5.5	7.5	-
3200	5	6	8	-
3600	5	6.5	8.5	-
3900	5.5	6.5	9	-
4090	-	-	-	6.5
4100	-	6.5	-	-
4300	-	6.5	-	6.5
4690	-	-	-	7 [1]
				

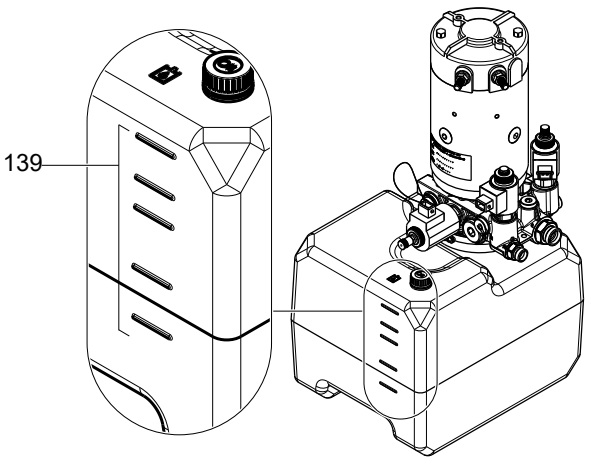
[1] *EJC 112i only*

Marking	Litres	Not EJC 010i ZT and EJC 110i ZT[1]
1 (top)	9.6	
2	9	
3	8	
4	6	
5 (bottom)	4	

[1] *On the EJC 010i and EJC 110i with ZT mast, the hydraulic reservoir has only two markings. The hydraulic oil level must be between the two markings.*

Lift height [mm]	EJC 110zi ZT	EJC 112zi ZT	EJC 110zi ZZ EJC 112zi ZZ	EJC 110zi DZ EJC 112zi DZ
	Oil quantity [l]	Oil quantity [l]	Oil quantity [l]	Oil quantity [l]
2300	4.5	5	7	-
2500	4.5	5	7	-
2700	4.5	5	-	-
2900	5	5.5	7.5	-
3200	5	5.5	8	-
3600	5	6	9	-
3900	5	6.5	9.5	-
4090	-	-	-	7
4100	-	6.5	-	-
4300	-	7	-	7
4690	-	-	-	7.5 [1]
				

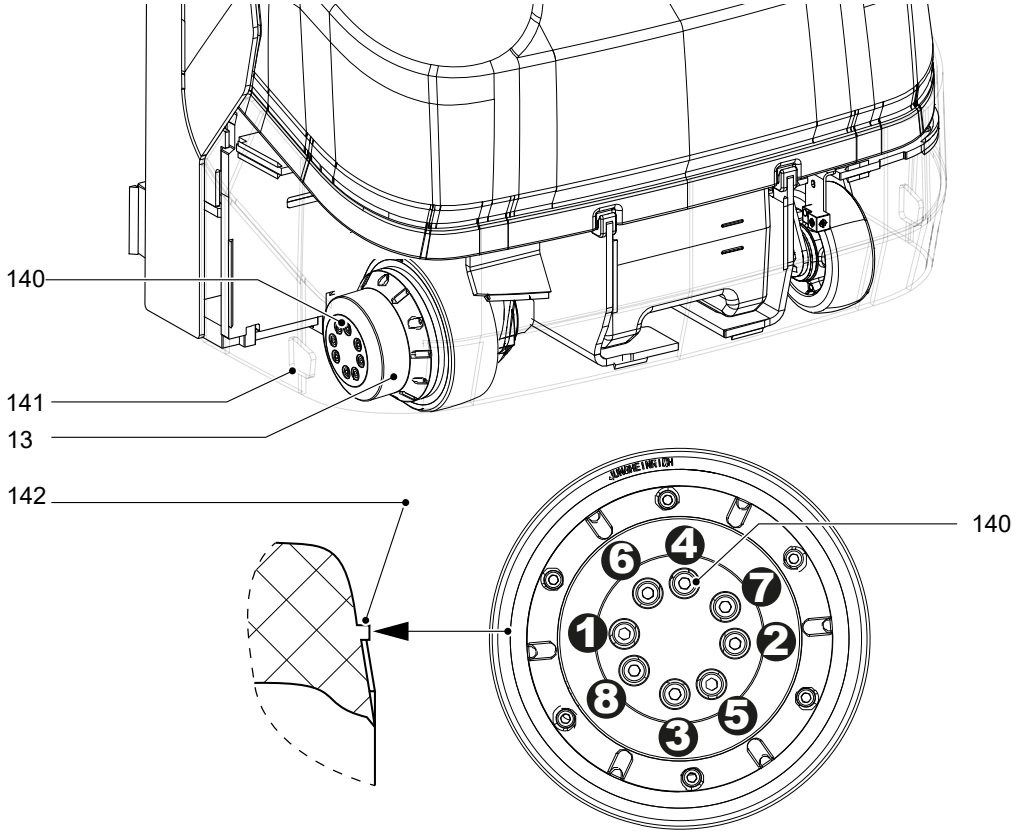
[1] *EJC 112zi only*

Marking	Litres	Not EJC 110zi ZT [1]
1 (top)	9.6	
2	9	
3	8	
4	6	
5 (bottom)	4	

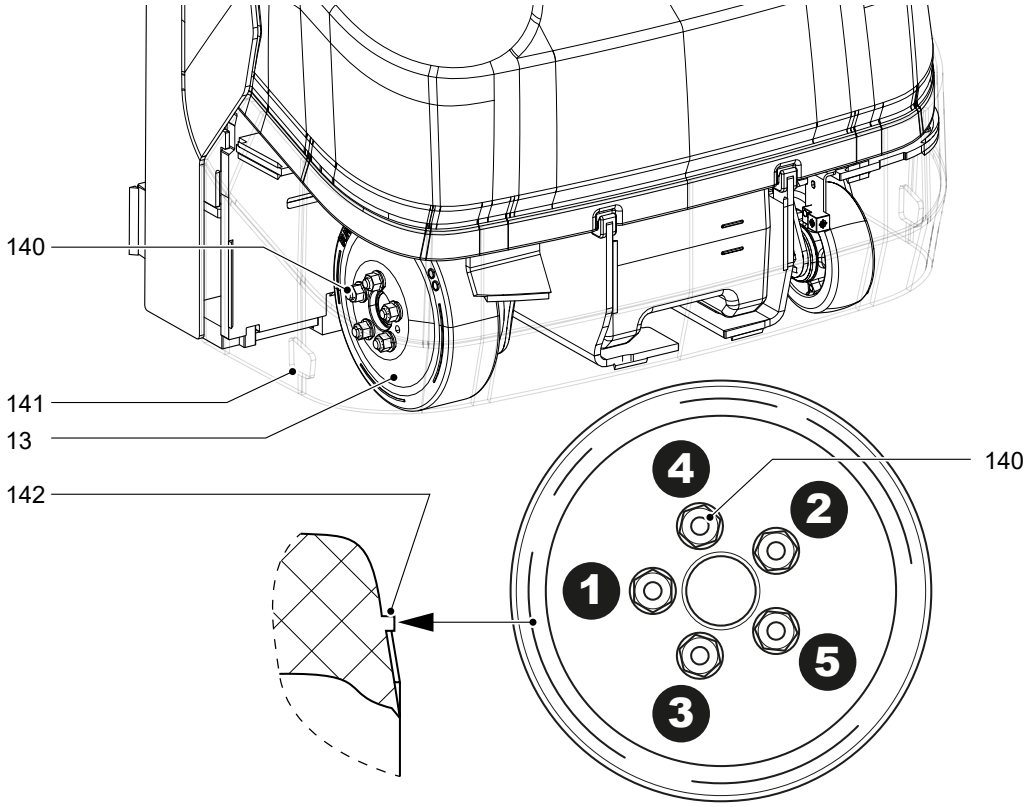
[1] *On the EJC 110zi with ZT mast, the hydraulic reservoir has only two markings. The hydraulic oil level must be between the two markings.*

5.9 Checking the attachment and wear of the wheels

EJC 010i



EJC 110i/112i/110zi/112zi



➔ Replace the wheels if the wear limit (142) 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 191.

Tightening the wheels nuts

Requirements

– Truck is prepared for maintenance and repair work, see page 170.

Tools and Material Required

– Torque wrench

Procedure

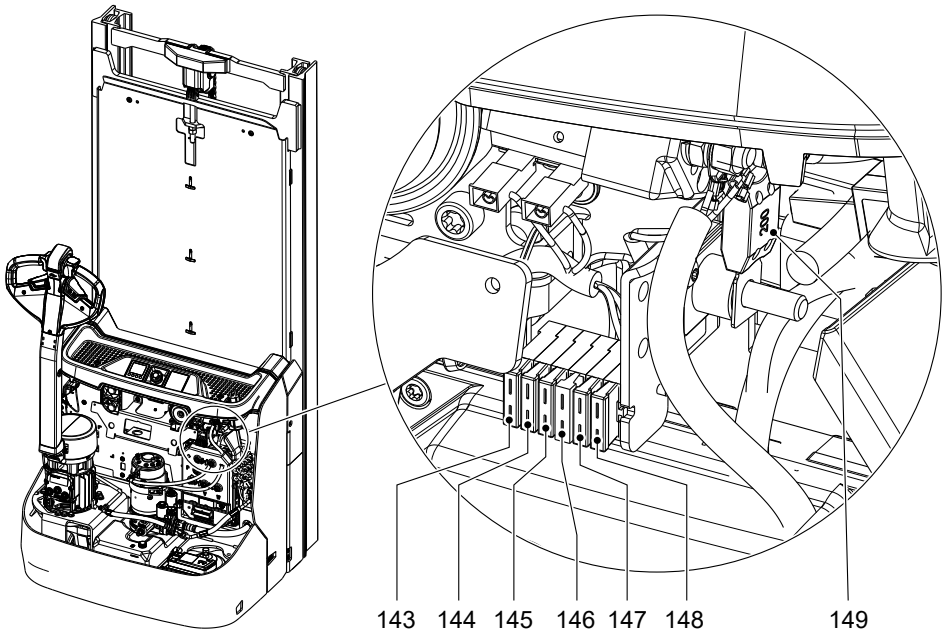
- Position the drive wheel (13) such that the wheel nuts (140) can be tightened through the assembly opening (141).
- Tighten all wheel nuts (140) using the torque wrench through the assembly opening (141) in the bumper.

  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.

5.10 Checking the electrical fuses



Item	Description	Protection	Rating (A)
143	9FC91	Activation of master, telematics box	4
144	9FC63 [1]	Main contactor control	4
145	9FC62 [1]	Battery voltage	2
146	9FC81 [1]	Electromechanical components	4
147	9FC82	Options	4
148	9FC61	Master controller, valves	4
149	FC1	Main fuse (travel/lift motor)	200
[1)] *Only available for industrial trucks with DZ mast*			

Checking fuses

Requirements

– Truck prepared for maintenance and repair work, see page 170.
– Front panel removed, see page 171.

Procedure

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

The fuses have been checked.

5.11 Restoring the truck to service after maintenance and repairs

Procedure

- Thoroughly clean the truck, see page 178.
- Lubricate the truck according to the lubrication diagram, see page 168.
- Charge the battery, see page 73.
- Start up the truck, see page 99.

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 175.

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:

▶ 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 178.
- Prevent the truck from rolling away accidentally.
- Check the hydraulic oil level and replenish if necessary, see page 180.
- Apply a thin layer of oil or grease to any non-painted mechanical components.
- Lubricate the truck according to the lubrication diagram, see page 168.
- Charge the battery, see page 65.

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:

▶ 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 65.

6.3 Restoring the truck to service after decommissioning

Procedure

- Thoroughly clean the truck – see page 178.
- Lubricate the forklift truck according to the lubrication schedule – see page 168.
- Charge the battery – see page 77.
- Start up the truck – see page 98.

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.

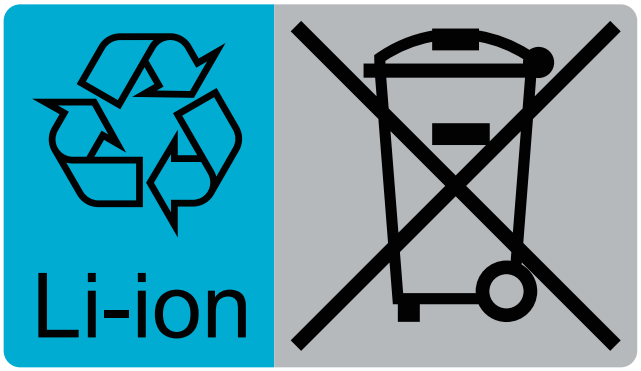
The operating company is responsible for ensuring that faults are rectified immediately.

8 Final de-commissioning, disposal

➔ Final de-commissioning or disposal of the truck in 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.

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.

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 010i / EJC 110i / EJC 112i

Issued on: 2024-04-22 12:30

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

Brakes
Test the brake.

Hydraulic operations
Lubricate the load chains.
Correct the hydraulic-oil level.

Steering
Test the tiller return function.

1.1.2 Inspection contents

1.1.2.1 Standard equipment

The following points must be checked:

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

Power supply
Check battery and battery components for damage

Travel
Collision safety switch for functionality and damage
Check wheels for wear and damage

Chassis/structure
Industrial truck for damage and leaks
Check labels for legibility, completeness and plausibility
Check doors or covers for damage
Mechanism to protect against trapping and shearing is present, secure, functions correctly and is free of dirt and damage

Hydraulic operations
Test hydraulic system
Check fork arms or load handler for wear and damage

Battery charger
Mains plug and mains cable for damage

1.1.2.2 Optional Equipment

The following points must be checked:

Strobe light/warning beacon

Electrical system
Test strobe light/warning beacon and check for damage

Warning zone lights, red/blue

Electrical system
Test lighting and check for damage

1.2 Customer Service

In accordance with the EJC 010i / EJC 110i / EJC 112i service interval, to be performed every 1000 service hours, but at least once a year.

1.2.1 Maintenance contents

1.2.1.1 Standard equipment

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

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

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

Hydraulic operations
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.
Clean the fan.
Carry out a potential measurement on the chassis while charging is in progress.

1.2.1.2 Optional Equipment

Radio data

System components
Clean the scanner and terminal.

1.2.2 Inspection contents

The following points must be checked:

1.2.2.1 Standard equipment

Electrical system
Cables and motor for secure fit and damage
Warning and safety equipment in accordance with the operating instructions
Functionality of display and controls
Test emergency disconnect switch and check for damage
Contactors and/or relays for wear and damage
Check electrical wiring for damage (insulation damage, connections) and check whether the fuse ratings are correct
Telematics box and its components for secure attachment, functionality and damage

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

Travel
Drive system bearings for wear and damage
Transmission for noise and leaks
Check wheels for wear, damage and secure mounting
Check wheel bearings and mounting of wheels for wear and damage

Chassis/structure
Industrial truck for damage and leaks
Check chassis connections and screw connections are securely attached and check for damage
Check labels for legibility, completeness and plausibility
Check mast is securely attached
Mechanism to protect against trapping and shearing is present, secure, functions correctly and is free of dirt and damage

Hydraulic operations
Test hydraulic controls and check their labels for legibility, completeness and plausibility
Check cylinders and piston rods are securely attached and check for damage
Check lateral play of the mast sections and fork carriage
Check slide pieces and stops for wear and damage
Load chains and chain guides for wear and 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 mast and fork carriage stops are present and secure
Check the hoses, pipes and connections are securely attached and check for wear, leaks, damage, blisters and kinks

Steering
Tiller for lateral play
Steering components for play and damage

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

1.2.2.2 Optional Equipment

Radio data

System components
Scanner and terminal for secure fit, functionality and damage
Fuses for correct ratings
Check cables are securely attached and check for damage

Access module

Electrical system
Check access module is securely attached, test and check for damage

Strobe light/warning beacon

Electrical system
Test strobe light/warning beacon and check for damage

Warning zone lights, red/blue

Electrical system
Test lighting and check for damage

Foot protection sensor

Travel
Sensors for secure attachment, function and damage

Warning signal, buzzer when lifting

Electrical system
Check buzzer/warning alarm is securely attached, test and check for damage

Pre-Op_Check

Electrical system
Check access module is securely attached, test and check for damage

1.2.3 Maintenance parts

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

1.2.3.1 Standard equipment

maintenance part	service hours	months
Gear oil	10000	
Hydraulic system breather filter	2000	12
Hydraulic oil	2000	12
Hydraulic oil filter	2000	12

1.2.3.2 Optional Equipment

Cold store application

maintenance part	service hours	months
Hydraulic oil	1000	12
Hydraulic oil additive	1000	12

2 Maintenance Contents EJC 110zi / EJC 112zi

Issued on: 2024-04-10 10:00

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

Brakes
Test the brake.

Hydraulic operations
Lubricate the load chains.
Correct the hydraulic-oil level.

Steering
Test the tiller return function.

2.1.2 Inspection contents

2.1.2.1 Standard equipment

The following points must be checked:

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

Power supply
Check battery and battery components for damage

Travel
Collision safety switch for functionality and damage
Check wheels for wear and damage

Chassis/structure
Industrial truck for damage and leaks
Check labels for legibility, completeness and plausibility
Check doors or covers for damage
Protective screen panel or protective grille for damage

Hydraulic operations
Test hydraulic system
Check fork arms or load handler for wear and damage

Battery charger
Mains plug and mains cable for damage

2.1.2.2 Optional Equipment

The following points must be checked:

Strobe light/warning beacon

Electrical system
Test strobe light/warning beacon and check for damage

Warning zone lights, red/blue

Electrical system
Test lighting and check for damage

2.2 Customer Service

In accordance with the EJC 110zi / EJC 112zi 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.
Measure the air gap of the magnetic brake.

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

Hydraulic operations
Test the function of the cut-out of the initial lift.
Test the lift sensors in the mast lift and initial lift.
Adjust the slide pieces.
Adjust the load chains.
Lubricate the load chains.
Test emergency lowering.
Correct the hydraulic-oil level.
Test and adjust the pressure relief valve.

Agreed services
Carry out a test run with the rated capacity or a customer-specific load.
Lubricate the truck according to the lubrication schedule.
Demonstration after maintenance.

Steering
Test the tiller return function.

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

2.2.1.2 Optional Equipment

Radio data

System components
Clean the scanner and terminal.

2.2.2 Inspection contents

The following points must be checked:

2.2.2.1 Standard equipment

Electrical system
Cables and motor for secure fit and damage
Warning and safety equipment in accordance with the operating instructions
Functionality of display and controls
Test emergency disconnect switch and check for damage
Contactors and/or relays for wear and damage
Check electrical wiring for damage (insulation damage, connections) and check whether the fuse ratings are correct
Telematics box and its components for secure attachment, functionality and damage

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

Travel
Drive system bearings for wear and damage
Transmission for noise and leaks
Check wheels for wear, damage and secure mounting
Check wheel bearings and mounting of wheels for wear and damage

Chassis/structure
Industrial truck for damage and leaks
Check chassis connections and screw connections are securely attached and check for damage
Check labels for legibility, completeness and plausibility
Check doors or covers for damage
Check mast is securely attached
Protective screen panel or protective grille for damage

Hydraulic operations
Test hydraulic controls and check their labels for legibility, completeness and plausibility
Lift sensors in the mast lift and initial lift for damage
Check cylinders and piston rods are securely attached and check for damage
Check lateral play of the mast sections and fork carriage
Check slide pieces and stops for wear and 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
Tie/plunger rods for uniform adjustment, wear and damage

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

2.2.2.2 Optional Equipment

Radio data

System components
Scanner and terminal for secure fit, functionality and damage
Fuses for correct ratings
Check cables are securely attached and check for damage

Access module

Electrical system
Check access module is securely attached, test and check for damage

Entry skids/rollers

Hydraulic operations
Check entry skids or entry rollers for damage and wear, and test their function

Strobe light/warning beacon

Electrical system
Test strobe light/warning beacon and check for damage

Warning zone lights, red/blue

Electrical system
Test lighting and check for damage

Foot protection sensor

Travel
Sensors for secure attachment, function and damage

Warning signal, buzzer when lifting

Electrical system
Check buzzer/warning alarm is securely attached, test and check for damage

Pre-Op_Check

Electrical system
Check access module is securely attached, test and check for damage

2.2.3 Maintenance parts

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

2.2.3.1 Standard equipment

maintenance part	service hours	months
Gear oil	10000	
Hydraulic system breather filter	2000	12
Hydraulic oil	2000	12
Hydraulic oil filter	2000	12

2.2.3.2 Optional Equipment

Cold store application

maintenance part	service hours	months
Hydraulic oil	1000	12
Hydraulic oil additive	1000	12