

EJE M13/M15/BA 115/BA 120

04.23

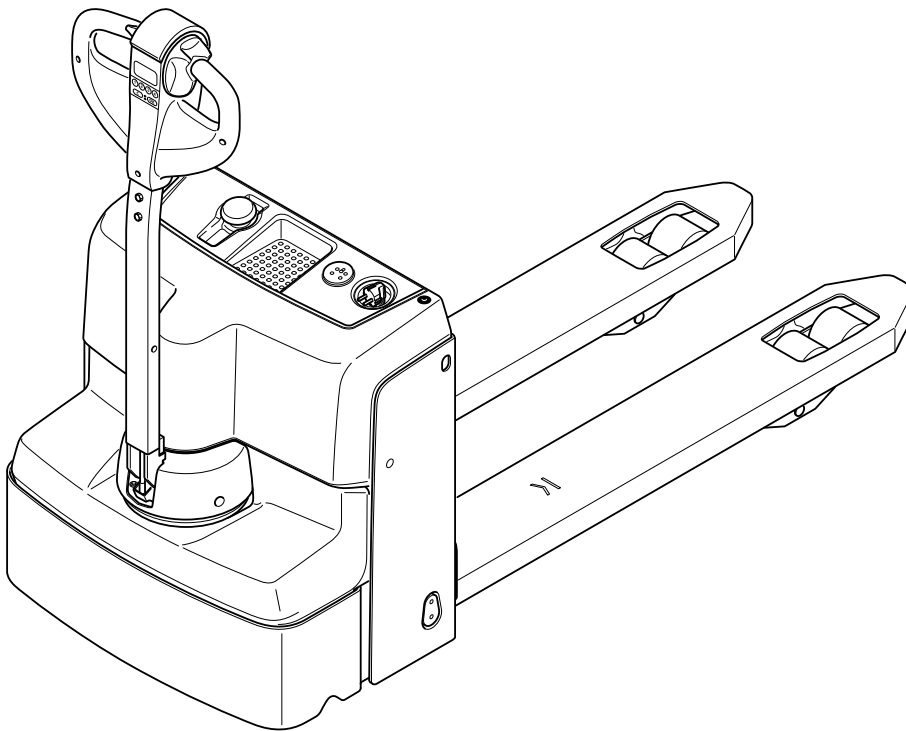
Operating instructions

en-GB

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EJE M13
EJE M15
EJE BA 115
EJE BA 120



Declaration of Conformity



Manufacturer

Jungheinrich AG, 22039 Hamburg, Germany

Description
Industrial truck

Type	Option	Serial no.	Year of manufacture
EJE M13 EJE M15 EJE BA 115 EJE BA 120			

On behalf of

Date

EU DECLARATION OF CONFORMITY

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

Declaration of Conformity (○)

Product: EJE M13/M15/BA 115/BA 120
Serial number/type number

Manufacturer: Jungheinrich Aktiengesellschaft
22039 Hamburg, Germany

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

Authorised to compile documentation:

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

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

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

Supply of Machinery (Safety) Regulations 2008 No. 1597

and

Electromagnetic Compatibility Regulations 2016 No. 1091

Signed for and on behalf of:

Jungheinrich Aktiengesellschaft

Foreword

Notes on the operating instructions

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

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

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

Safety notices and text mark-ups

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

DANGER!

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

WARNING!

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

CAUTION!

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

NOTICE

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



Used in front of notices and explanations.

●	Indicates standard equipment
○	Indicates optional equipment

Copyright

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A Correct Use and Application

1 General

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

2 Correct application

NOTICE

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

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

The load must be fully raised, see page 76.

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

- Lifting and lowering loads.
- Transporting lowered loads.

The following operations are prohibited:

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

3 Approved application conditions

- Operation in industrial and commercial environments.
- Permissible temperature range 0 °C to 40 °C.
- Operation only on secure, level surfaces with sufficient capacity.
- Do not exceed the permissible surface and spot load limits on the travel routes.
- Operation only on routes that are visible and approved by the operating company.
- Negotiating inclines up to a maximum of 6 % / 16 % (with/without load).
- Do not travel across or at an angle on inclines. Travel with the load facing uphill.
- Operation in partially public traffic.

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.
-

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.

B Truck Description

1 Application

The industrial truck is an electric, tiller operated 3-wheel truck with a steered drive wheel. Support wheels in the drive compartment ensure stability when steering. It is designed for use on level surfaces to lift and transport palletised goods. Open bottom pallets or roll cages can be lifted. The rated capacity of the truck is shown on the data plate or capacity plate Qmax.

→ The EJE M13/M15/BA 115/BA 120 is designed for light-duty operations; the maximum continuous operation time is 2 hours.

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

EJE	Model name
M	Series
13	Rated capacity x 100 kg
15	Rated capacity x 100 kg

EJE	Model name
BA 1	Series
15	Rated capacity x 100 kg
20	Rated capacity x 100 kg

M series and BA series refer to the same truck for different markets:

- M series: EMEA
- BA series: APAC

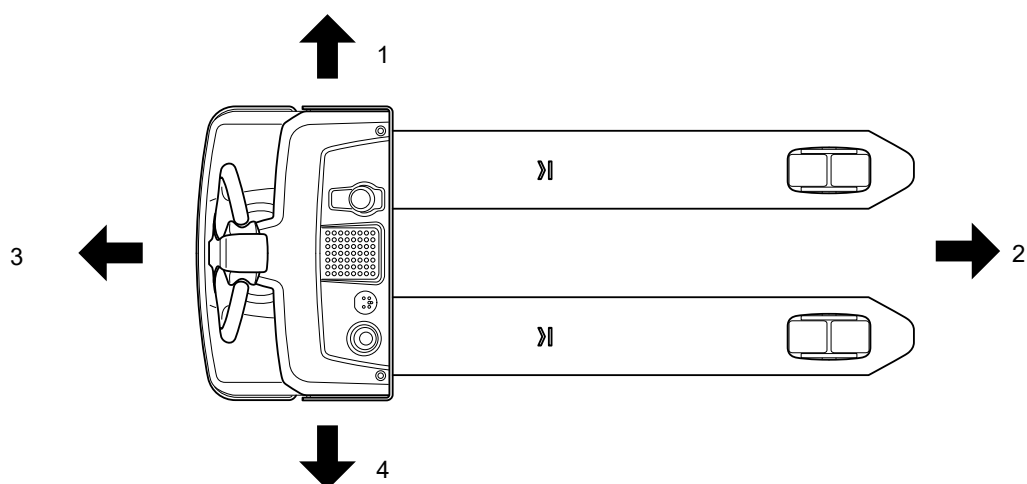
The industrial truck is available in four different options (Manufacturers type designation).

Option (Manufacturers type designation)	Model name
EJE - Standard	EJE M13 EJE M15
EJE - Scale option	EJE BA 115 EJE BA 120
EJE - Silent option	EJE M13 EJE M15 EJE BA 115
EJE - City pack	EJE M13 EJE M15 EJE BA 115 EJE BA 120

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

2 Travel direction definition

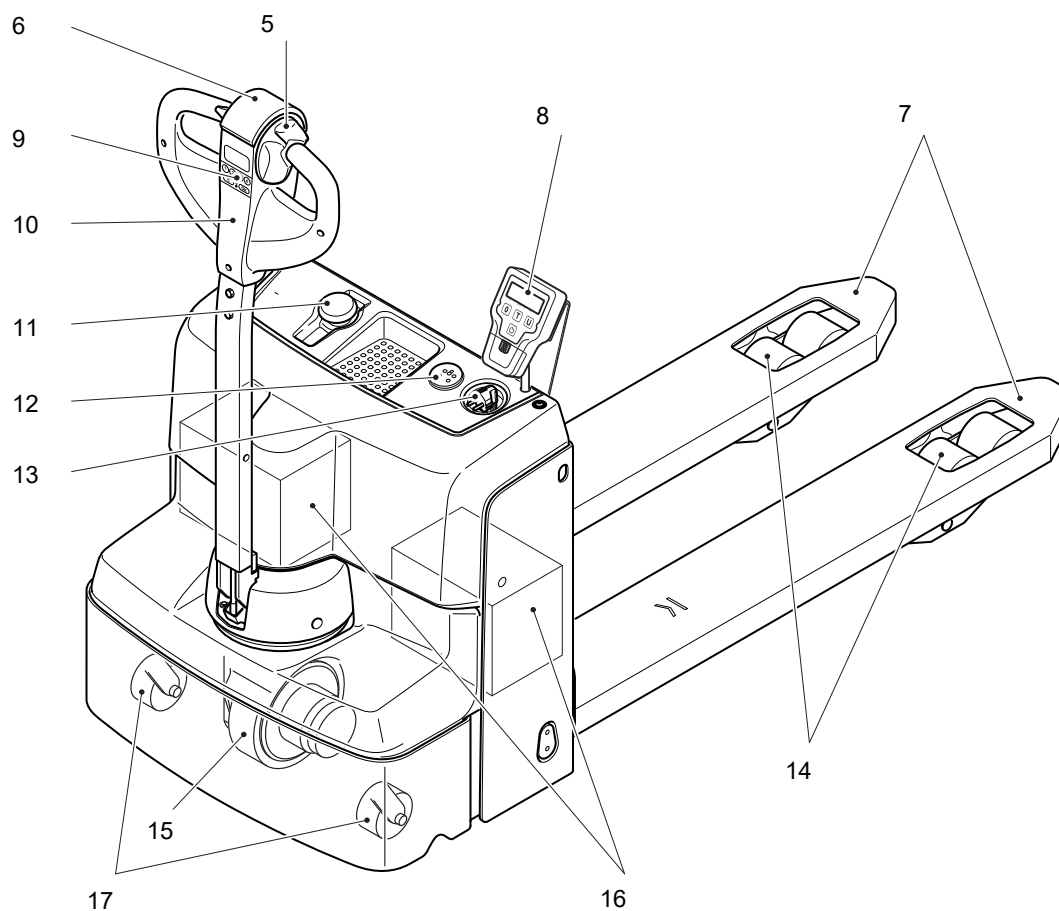
The following determinations have been made for travel direction specification:



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

3 Assemblies and Functional Description

3.1 Assembly Overview



Item		Component	Item		Component
5	●	Travel switch	12	●	Safety socket
6	●	Collision safety switch	13	●	Mains plug
7	●	Load handler	14	●	Load wheels
8	○	Weighing device	15	●	Drive wheel
9	●	Key pad	16	●	Battery
10	●	Tiller and tiller head	17	●	Support wheels
11	●	Emergency disconnect switch			

3.2 Functional Description

Safety Mechanisms

- An enclosed, smooth truck geometry with rounded edges ensures safe handling of the truck.
- The wheels are surrounded by a solid skirt.
- Pressing the Emergency Disconnect switch rapidly cuts out all electrical functions in hazardous situations.

Hydraulic system

- Lifting and lowering are activated via the lift and lower buttons.
- When lifting is activated, the pump unit starts to operate, supplying hydraulic oil from the oil reservoir to the lift cylinder.

Drive system

- An electric motor actuates the drive wheel via a multi-stage transmission. The electronic traction controller ensures smooth drive motor speed control and hence smooth travel, powerful acceleration and electrically controlled braking.

Tiller

The user steers with an ergonomic tiller. All travel and lift operations can be performed sensitively without taking a hand from the tiller.

Controls and displays

Ergonomic controls ensure fatigue-free operation for sensitive application of the travel and hydraulic operations. The battery discharge indicator displays the service hours and the available battery capacity.

Electrical systems

The truck has an electronic traction controller. The operating voltage of the truck's electrical system is 24 volts.

4 Technical Specifications

- The technical specifications comply with the German "Industrial Truck Data Sheet" Guidelines.
Technical modifications and additions reserved.

4.1 Performance data

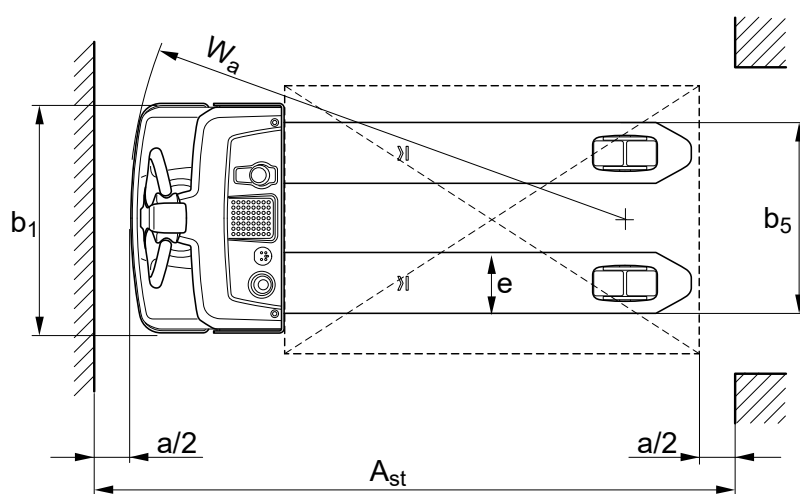
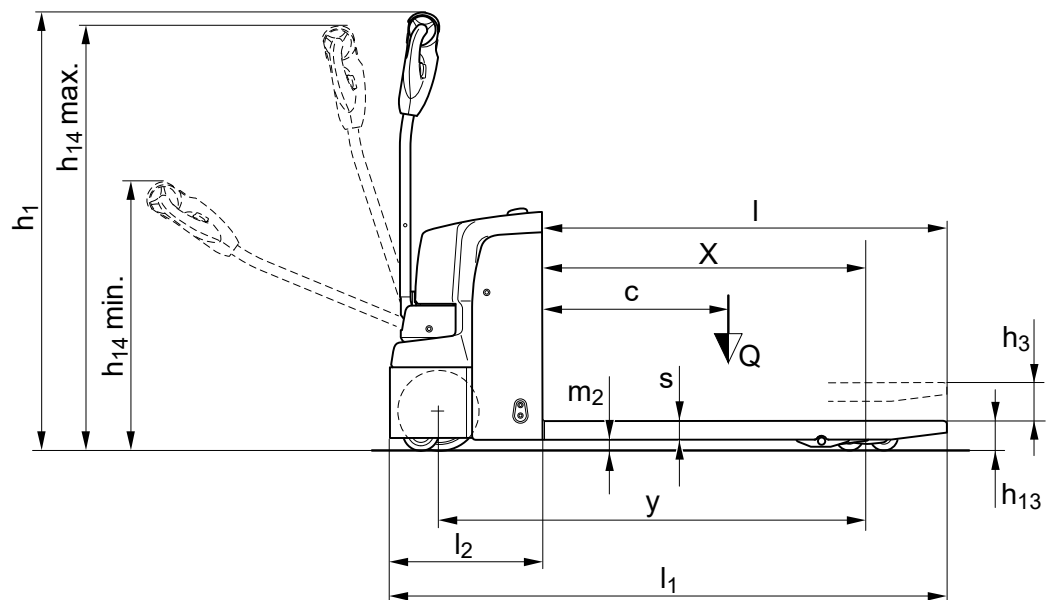
	Options (Manufacturers type designation)	EJE - Standard	EJE - Scale option	
	Valid for Model name	EJE M13 EJE M15 EJE BA 115 EJE BA 120		
Q	Rated capacity	1300/1500/2000	1300/1500/2000	kg
c	Load centre distance with standard fork length	600	600	mm
	Travel speed with / without load	5.0/5.0	5.0/5.0	km/h
	Lift speed with / without load	50/60	50/60	mm/s
	Lowering speed with / without load	40/20	40/20	mm/s
S2	Gradient performance with / without load	6/16	6/16	%

	Options (Manufacturers type designation)	EJE - Silent option	EJE - City pack	
	Valid for Model name	EJE M13 EJE M15 EJE BA 115	EJE M13 EJE M15 EJE BA 115 EJE BA 120	
Q	Rated capacity	1300/1500	1300/1500	kg
c	Load centre distance with standard fork length	600	600	mm
	Travel speed with / without load	5.0/5.0	5.0/5.0	km/h
	Lift speed with / without load	50/60	50/60	mm/s
	Lowering speed with / without load	40/20	40/20	mm/s
S2	Gradient performance with / without load	6/16	6/16	%

4.2 Dimensions

	Option (Options (Manufacturers type designation)	EJE - Standard	EJE - Scale option	
	Valid for model name	EJE M13 EJE M15 EJE BA 115 EJE BA 120		
h3	Lift	120	120	mm
h13	Forks lowered	85	90	mm
h14	Tiller height in min./max. travel position.	740 / 1190	740 / 1190	mm
h1	Overall height	1247	1247	mm
y	Wheelbase	1212	1212	mm
l1	Overall length	1585	1605	mm
l2	Head length	435	455	mm
x	Load distance lowered / raised	914	894	mm
b1	Truck width	650	650	mm
b5	Width across forks	540	550	mm
b10	Track width, front	460	460	mm
b11	Track width, rear	368	368	mm
s	Fork height	55	60	mm
e	Fork width	172	182	mm
l	Fork length	1150	1150	mm
m2	Ground clearance	35	35	mm
Ast	Working aisle width 1000x1200 transversal	1643	1663	mm
Ast	Aisle width 800x1200 longitudinal	1843	1863	mm
Wa	Turning radius	1357	1357	mm
	Truck weight	see truck data plate	see truck data plate	

	Option (Options (Manufacturers type designation)	EJE - Silent option	EJE - City pack	
	Valid for model name	EJE M13 EJE M15 EJE BA 115		
h3	Lift	120	120	mm
h13	Forks lowered	85	90	mm
h14	Tiller height in min./max. travel position.	740 / 1190	740 / 1190	mm
h1	Overall height	1247	1247	mm
y	Wheelbase	1212	1212	mm
l1	Overall length	1585	1605	mm
l2	Head length	435	455	mm
x	Load distance lowered / raised	914	894	mm
b1	Truck width	650	650	mm
b5	Width across forks	520	540	mm
b10	Track width, front	460	460	
b11	Track width, rear	368	368	
s	Fork height	55	55	mm
e	Fork width	172	172	mm
l	Fork length	1150	1150	mm
m2	Ground clearance	35	35	mm
Ast	Working aisle width 1000x1200 transversal	1643	1643	mm
Ast	Aisle width 800x1200 longitudinal	1843	1843	mm
Wa	Turning radius	1357	1357	mm
	Truck weight	see truck data plate	see truck data plate	



4.3 Weights

- Weights and axle loads vary depending on truck features. For Truck weight see page 27.

4.4 Battery Weights

- Battery weights depending on truck features. For Battery weight see page 27.

4.5 Tyre type

	EJE - Standard EJE - Scale option EJE - City pack	EJE - Silent option	
Tyre size, front	210 x 70	210 x 70	mm
Tyre size, rear (tandem)	80 x 70	85 x 32	mm
Additional wheels (dimensions)	80 x 40	80 x 40	mm
Wheels, number front / rear (x = driven)	1x +2/4	1x +2/6	

4.6 EN standards

Continuous sound pressure level

EJE - Standard, EJE - Scale option and EJE - City Pack: 64 dB (A) in accordance with EN 12053 as harmonised with ISO 4871.

EJE - Silent option: 60 dB (A) is in accordance with Piek

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

Electromagnetic compatibility (EMC)

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

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

WARNING!

Damage to medical equipment due to non-ionising radiation

Electrical equipment on the truck 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.
-

4.7 Conditions of use

Ambient temperature

- operating at 0 °C to 40 °C
- relative humidity in the range of 30 % to 95 %



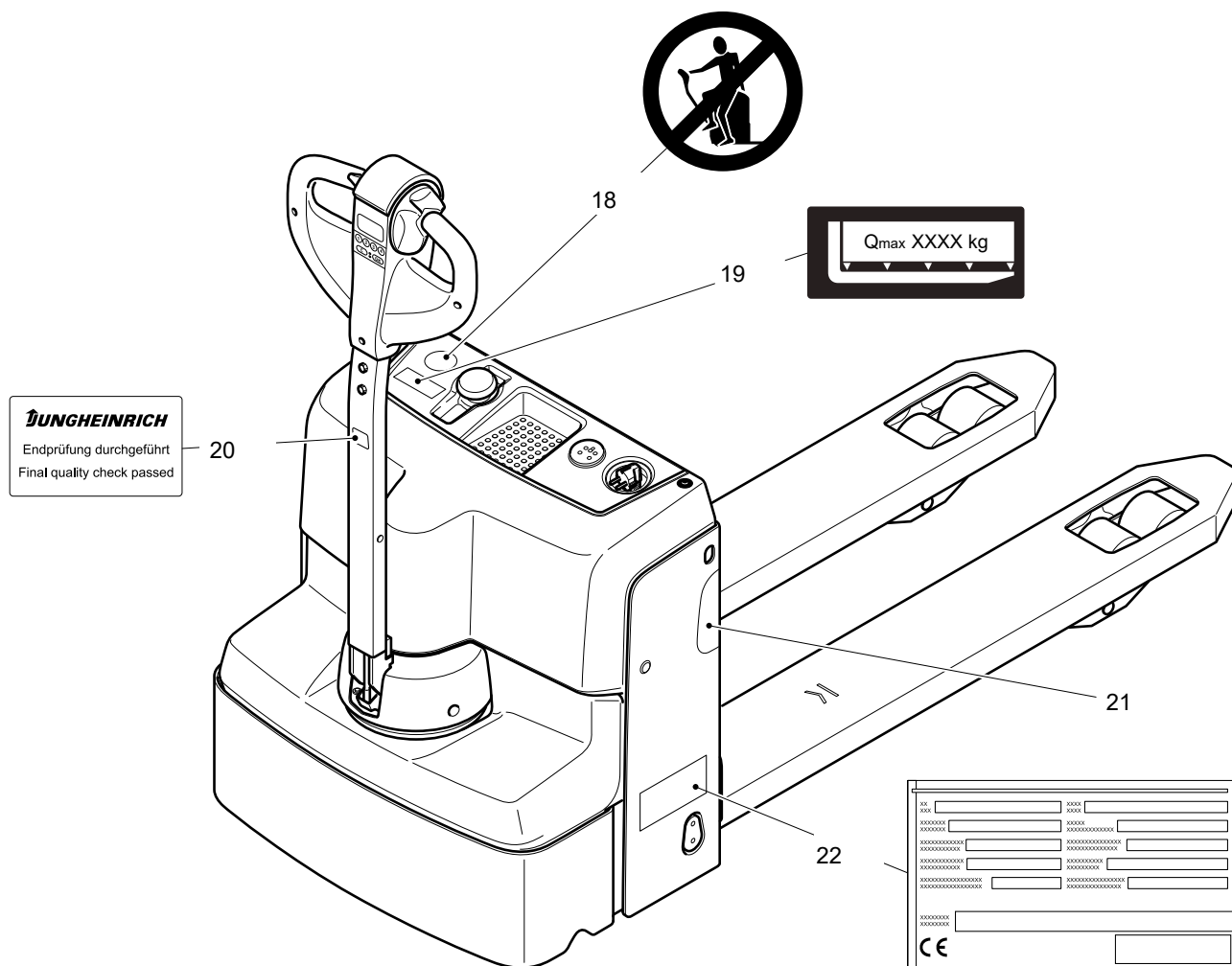
Special equipment and authorisation are required if the truck is to be used continually in conditions of extreme temperature or condensing air humidity fluctuations.

4.8 Electrical Requirements

The manufacturer confirms 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.

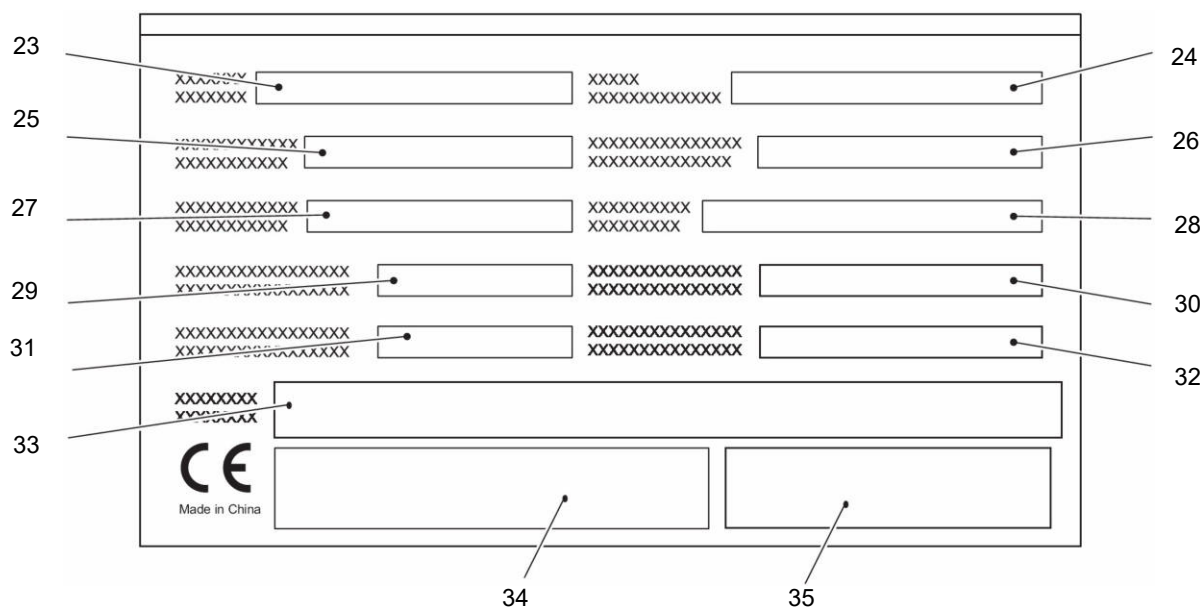
4.9 Identification Points and Data Plates

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



Item	Description
18	Prohibition plate: "No passengers"
19	Capacity plate Qmax
20	Inspection plaque
21	Truck description
22	Data plate

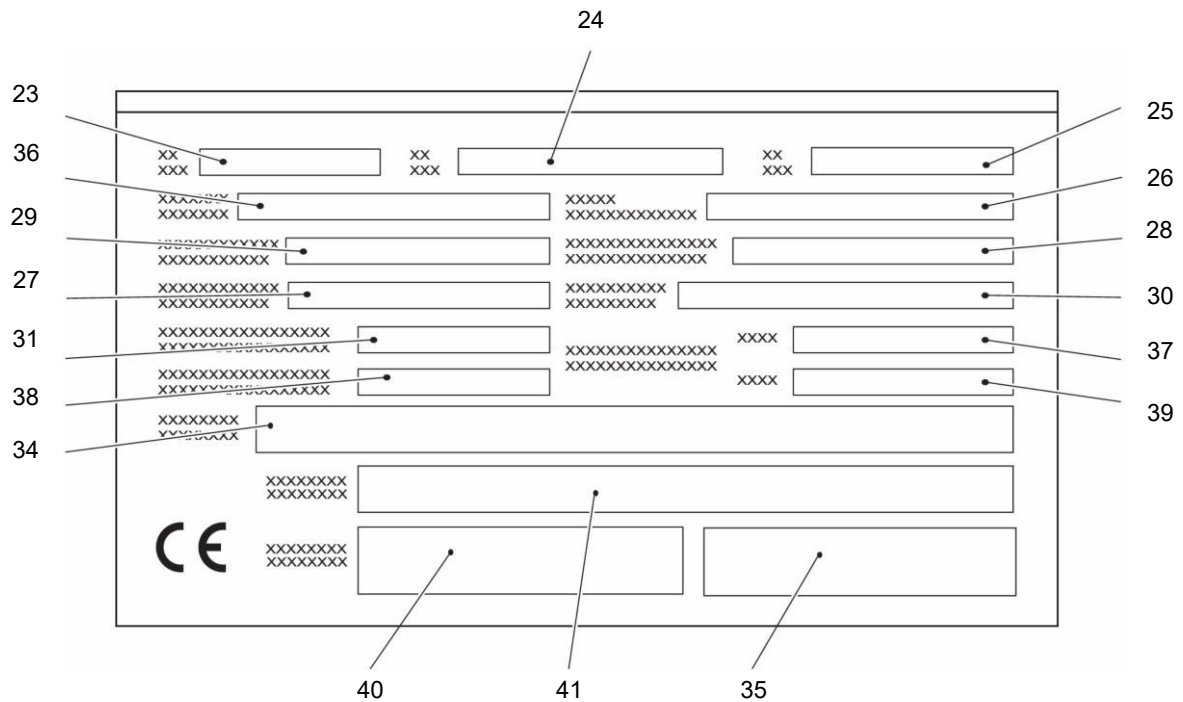
4.9.1 Data plate



Item	Description	Item	Description
23	Type	24	Option
25	Serial Number	26	Date of manufacture
27	Rated capacity (kg)	28	Load centre (mm)
29	Battery voltage (V)	30	Output
31	Net weight w.o. battery (kg)	32	Battery weight min/max (kg)
33	Production address	34	Manufacturer
35	Manufacturer's logo		



For queries regarding the truck or ordering spare parts always quote the truck serial number (25).



Item	Description	Item	Description
23	Type	24	Option
25	Serial Number	26	Date of manufacture
27	Rated capacity (kg)	28	Load centre (mm)
29	Battery voltage (V)	30	Output
31	Net weight w.o. battery (kg)	34	Manufacturer
35	Manufacturer's logo	36	Name
37	Min. battery weight (kg)	38	Net weight with battery (kg)
39	Max. battery weight (kg)	40	Production license
41	Production address		

➔ For queries regarding the truck or ordering spare parts always quote the truck serial number (25).

4.9.2 Truck load chart



The capacity plate (19) indicates the maximum capacity Q (in kg) for a given load centre C (in mm).

C Transport and Commissioning

1 Lifting by crane

DANGER!

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.

DANGER!

Incorrect lifting by crane can result in accidents

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

Prevent the truck from hitting other objects during lifting, and avoid uncontrolled movements. If necessary, secure the truck with guide ropes.

- ▶ The truck should only be loaded by personnel trained in the use of lifting slings and tools.
- ▶ Wear personal protective equipment (e. g. safety shoes, safety helmet, hi-vis jacket, protective gloves, etc.) when loading by crane.
- ▶ Do not stand under suspended loads.
- ▶ Do not enter or stand in a hazardous area.
- ▶ Always use lifting gear with sufficient capacity (for truck weight see truck rating plate).
- ▶ Always attach the crane lifting gear to the prescribed strap points (see page 29) and prevent them from slipping.
- ▶ Use the lifting slings only in the prescribed loading direction.
- ▶ Crane slings should be fastened in such a way that they do not come into contact with any attachments when lifting.



The strap points (42) under the chassis and at the fork tips are intended for lifting the truck with crane lifting gear.

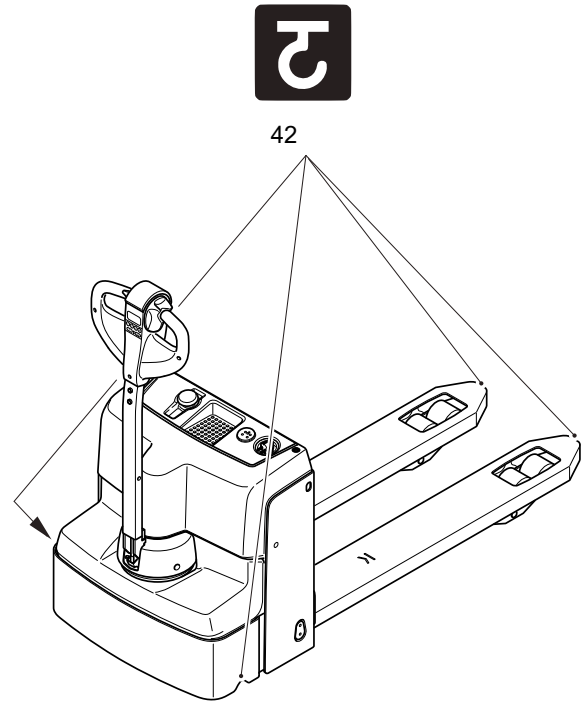
Lifting the truck by crane

Tools and Material Required

- Lifting gear
- Crane lifting gear
-

Procedure

- Park the truck securely, see page 65.
- Attach the crane lifting gear to the strap point (42).



The truck can now be lifted by crane.

2 Transport

WARNING!

Uncontrolled movement during transport

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

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

Securing the truck for transport

Requirements

- Truck loaded on the transporting vehicle.
- Truck parked securely, see page 65.

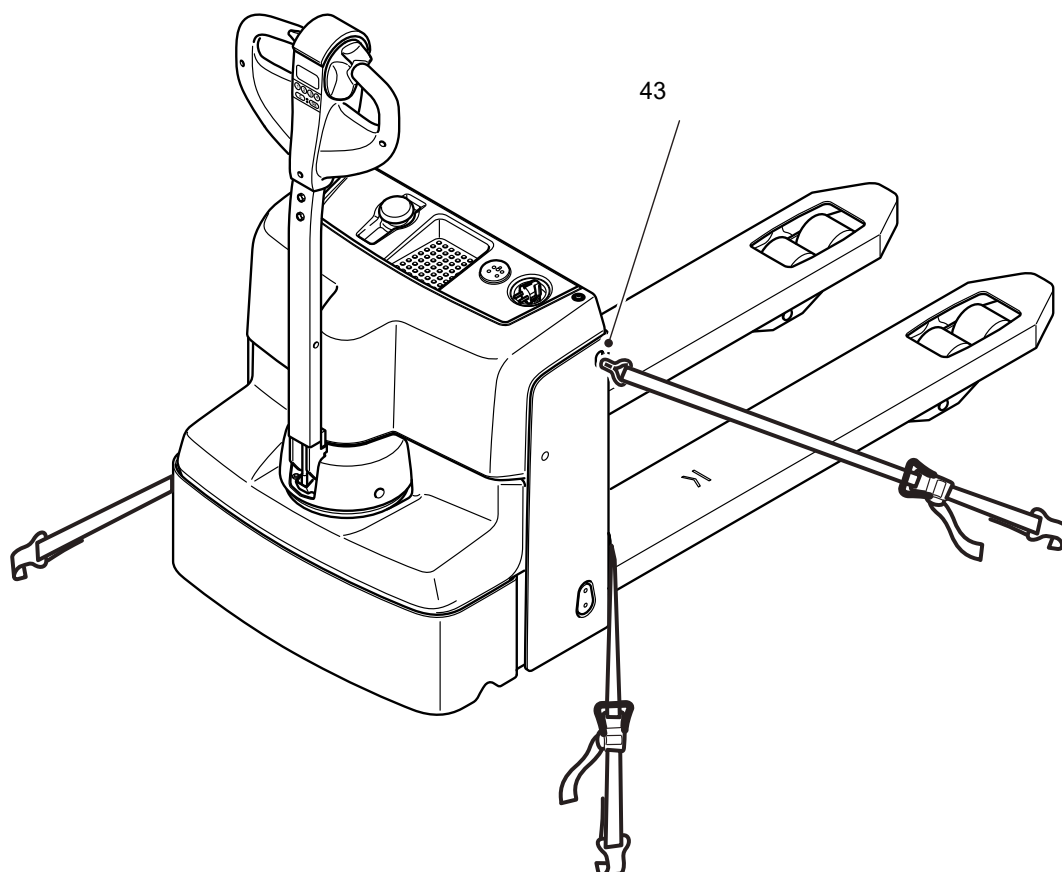
Tools and Material Required

- Tensioning belts / tie down straps

Procedure

- Sling the tensioning belt (43) around the truck and attach it to the fastening rings of the transporting vehicle.
- Tighten the tensioning belt with the tensioner.

The truck can now be transported.



3 Using the Truck for the First Time

WARNING!

The use of unsuitable energy sources can be hazardous

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

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

► The truck must only be operated with battery current.

Procedure

- Check if the equipment is complete.
- Charge the battery, see page 47.

The truck can now be started, see page 63.

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.

D Battery - Servicing, Recharging, Replacement

WARNING!

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

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

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

1 Battery lifetime and maintenance

The lithium-ion battery is wear-free.

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

The battery is continually monitored by the battery management system.

NOTICE

Damage to the lithium-ion battery due to deep discharge

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

- ▶ Disconnect the connection between the lithium-ion battery and the truck if it is to remain unused for longer than a week (e.g. detach the battery connector/interface connector).
- ▶ Fully charge the lithium-ion battery before extended downtimes.
- ▶ Fully charge the lithium-ion battery every 4 weeks to protect against deep discharge.
- ▶ If the battery charger has the "balancing" function, make sure that the balancing phase at the end of charging is completed. For further information on the "balancing" function, refer to the operating instructions for the battery charger.

NOTICE

Intermediate charging

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

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

⚠ WARNING!

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

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

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

2 Battery types

The EJE M13/EJE M15/EJE BA 115 is equipped with 24 volt / 50 Ah maintenance-free batteries.

The EJE BA 120 is equipped with 24 volt / 100 Ah maintenance-free batteries.

- Optimum battery service life is achieved at battery temperatures of 25 °C to 30 °C. Low temperatures reduce the available battery capacity, high temperatures reduce the battery service life.

NOTICE

40°C is the maximum temperature for batteries at which point the truck cannot be operated.

- When the industrial truck is parked securely the battery can be electrically separated from the industrial truck by pushing the emergency switch (connector). The industrial truck should not be stored without a battery compensation charge for more than 3 months at 20 °C or 2 months at 30 °C.

Battery type	Capacity (Ah)	Weight (kg)	Dimensions (mm) LxBxH
Lithium-ion battery EJE M13 EJE M15 EJE BA 115	50 Ah	15	260/171/212
Lithium-ion battery EJE BA 120	100 Ah	2 x 15	2 x 260/171/212

3 Operation

3.1 Usability as a Function of the Battery Temperature

NOTICE

Damage to the lithium-ion battery due to deep discharge

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

- ▶ Disconnect the connection between the lithium-ion battery and the truck if it is to remain unused for longer than a week (e.g. detach the battery connector/interface connector).
 - ▶ Fully charge the lithium-ion battery before extended downtimes.
 - ▶ Fully charge the lithium-ion battery every 4 weeks to protect against deep discharge.
 - ▶ If the battery charger has the "balancing" function, make sure that the balancing phase at the end of charging is completed. For further information on the "balancing" function, refer to the operating instructions for the battery charger.
-

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

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

3.2 Discharging the battery

NOTICE

Damage to the lithium-ion battery due to deep discharge

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

- ▶ Disconnect the connection between the lithium-ion battery and the truck if it is to remain unused for longer than a week (e.g. detach the battery connector/interface connector).
 - ▶ Fully charge the lithium-ion battery before extended downtimes.
 - ▶ Fully charge the lithium-ion battery every 4 weeks to protect against deep discharge.
 - ▶ If the battery charger has the "balancing" function, make sure that the balancing phase at the end of charging is completed. For further information on the "balancing" function, refer to the operating instructions for the battery charger.
-

3.3 Charging the battery

WARNING!

Risk of use of unsuitable battery charger on trucks with comfort charging socket

Voltage peaks may occur when using a battery charger with an incompatible voltage, charging capacity and battery technology. Voltage peaks can permanently damage the battery charger, truck and battery. Spark formation and uncontrolled movement of electronically controlled components may cause personal injury and material damage.

- ▶ The battery must only be charged with the Jungheinrich battery charger designed for this battery.
 - ▶ Use only battery chargers approved by the manufacturer.
-

WARNING!

Danger when charging with an unsuitable battery charger

The use of an unsuitable charger can cause the battery to overheat. Using unsuitable chargers can result in serious personal injury and material damage.

- ▶ Charge the lithium-ion battery with a stationary charger approved by the manufacturer.
 - ▶ Charge the lithium-ion battery with an on-board charger approved by the manufacturer.
-

WARNING!

Risk of accidents and injuries when handling lithium-ion batteries

Improper use can result in overheating, fire or explosion.

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

WARNING!

Warning: hazardous electrical voltage!

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

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

NOTICE

Intermediate charging

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

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



If the battery is deeply discharged or if the battery temperature is below the permissible level (6 %), the battery will not charge. Deeply discharged batteries cannot be charged by the operator (faulty). Contact the manufacturer's customer service department.

3.3.1 Partial charging, interrupting and re-starting charging

Partial charging

Charging can be interrupted on the battery charger and continued as partial charging. The charging pattern is automatically adjusted to the charge status of the battery.

Charging continues automatically after a mains failure.

Interrupt charging and re-start as required

Requirements

- The battery charger is connected to the mains.
- Battery is connected to the battery charger.

Procedure

- To interrupt charging , press the STOP/RESTART button on the battery charger.
Charging is interrupted and the battery charger switches to standby mode.
- To restart charging, press the STOP/RESTART button on the battery charger.
Charging is restarted.

3.3.2 Trickle charging the lithium-ion battery

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.

3.4 Charging the battery with an on-board charger

DANGER!

Risk of electric shock and fire

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

- ▶ Only use plug connections in accordance with IEC 60309.
 - ▶ Always use original manufacturer's mains cables.
 - ▶ Insulation classes and resistance to acids and alkalis must correspond to those of the manufacturer's mains lead.
 - ▶ The charger connector must be dry and clean when used.
 - ▶ Perform annual test in accordance with DIN VDE 0701/0702.
-

NOTICE

Improper use of the on-board charger can cause material damage

The on-board charger consisting of a battery charger and battery controller must not be opened. If faulty, contact the manufacturer's customer service department.

- ▶ The charger must only be used for batteries supplied by Jungheinrich or other approved batteries provided it has been adapted by the manufacturer's customer service department.
 - ▶ Batteries must never be swapped from truck to truck.
 - ▶ Do not connect the battery to two chargers simultaneously.
-

3.4.1 Charging the battery


Charging the battery

Requirements


- Truck parked securely, see page 65.
- Emergency disconnect switch released.

Procedure

- Attach the mains connector (13) to a mains socket.

 The battery symbol on the display unit shows the charge status or a fault.

The battery is now charged. All electrical functions of the truck are disconnected (electrical immobiliser). The truck cannot be operated.

 The BMS (battery management system) checks the battery temperature. If the battery temperature is below the permissible level the battery will not start to charge. The battery only starts to charge automatically once the temperature has returned to the permissible range.

4 Exposing the battery

CAUTION!

Trapping hazard

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

WARNING!

An unsecured truck can cause accidents

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

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

Requirements

- Truck parked on level surface.
- Truck parked securely, see page 65.

Procedure

- Remove the 4 screws (44).
- Lift the panel up.

The battery is now exposed.

WARNING!

An unsecured truck can cause accidents

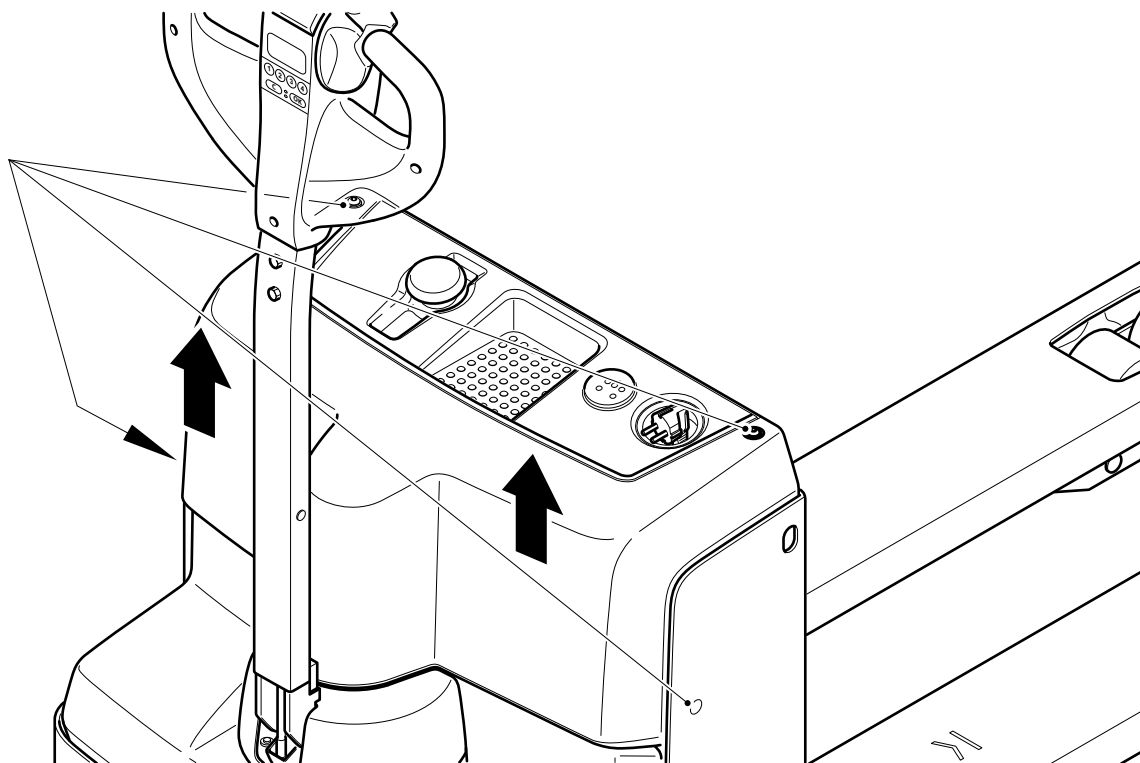
Parking the truck on an incline or with a raised load handler is dangerous and is strictly prohibited.

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



The lithium-ion battery may only be removed and installed by authorised service personnel.

44



5 Charging the battery

WARNING!

The gases produced during charging can cause explosions

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

- ▶ Before charging, check all cables and plug connections for visible signs of damage.
 - ▶ Ventilate the room in which the truck is being charged.
 - ▶ Do not smoke and avoid naked flames when handling batteries.
 - ▶ Wherever an industrial truck is parked for charging there shall be no inflammable material or lubricants within 2 m around the truck.
 - ▶ Fire protection equipment must be on hand.
 - ▶ Do not lay any metallic objects on battery.
 - ▶ It is essential to follow the safety regulations of the battery and charger.
-

5.1 Charging the battery with the integrated on-board charger

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.

CAUTION!

Improper use of the on-board charger can cause material damage

The on-board charger consisting of a battery charger and battery controller must not be opened. If faulty, contact the manufacturer's service department.

- ▶ The charger must only be used for batteries supplied by Jungheinrich or other approved batteries provided it has been adapted by the manufacturer's service department.
- ▶ Batteries must never be swapped from truck to truck.
- ▶ Do not connect the battery to two chargers simultaneously.

Starting charging with the on-board charger

Mains connection

Mains supply: 230 V/110 V ($\pm 10\%$) Mains frequency: 50 Hz/60 Hz ($\pm 4\%$) is equipped with an on-board charger as standard. The battery charger detects and automatically adapts the mains voltage. The cable to the battery charger is located under the front cover and can be accessed from outside.

CAUTION!

The on-board charger must not be opened.

NOTICE

During charging, the temperature of the battery is approx. 10 °C. Battery charging may only be started at a battery temperature below 35 °C. The battery temperature before charging must be at least 15 °C, otherwise charging may be impaired.

NOTICE

Shorter service life of the battery

Battery opportunity charging is partial charging that extends the daily application time. Higher average temperatures occur during opportunity charging which can reduce the service life of the battery.

- ▶ Fully discharge the battery before charging.

6 Charging lithium-ion batteries

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

NOTICE

Intermediate charging of the lithium-ion battery

Lithium-ion battery intermediate charging is possible. A battery that is not fully discharged can be partially or fully charged at any time.

- ▶ The lithium-ion battery must be fully charged before first use.
 - ▶ To ensure reliable operation, a lithium-ion battery that undergoes frequent intermediate charging must be fully charged at least once a week.
 - ▶ Turn off the battery charger before disconnecting the lithium-ion battery from the battery charger.
-

7 Removing or installing the battery

Removing the battery may only be performed by manufacturer's customer service department. The manufacturer has a service department specially trained for these tasks.

8 Storage, Disposal and Transport

8.1 Storing the battery

NOTICE

Damage to the lithium-ion battery due to deep discharge

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

- ▶ Disconnect the connection between the lithium-ion battery and the truck if it is to remain unused for longer than a week (e.g. detach the battery connector/interface connector).
 - ▶ Fully charge the lithium-ion battery before extended downtimes.
 - ▶ Fully charge the lithium-ion battery every 4 weeks to protect against deep discharge.
 - ▶ If the battery charger has the "balancing" function, make sure that the balancing phase at the end of charging is completed. For further information on the "balancing" function, refer to the operating instructions for the battery charger.
-

8.2 Instructions for safe handling

NOTICE

Charge status of the lithium-ion battery on leaving the manufacturer's plant

New lithium-ion batteries are transported and stored with a charge status of at least 50 %.

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

Failure to observe these safety instructions can result in fire.

8.3 Disposal and transport of a lithium-ion battery

8.3.1 Instructions for disposal

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

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

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



Instructions for disposal

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

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

8.3.2 Shipping information

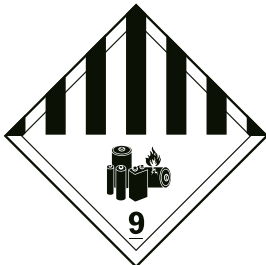
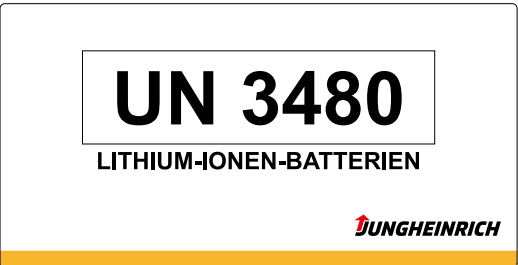
The Jungheinrich lithium-ion battery is a hazardous material. The applicable ADR regulations must be observed during transport.

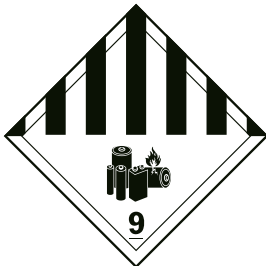
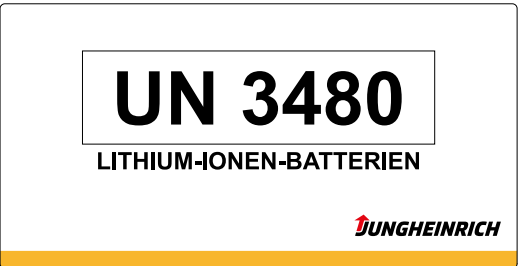


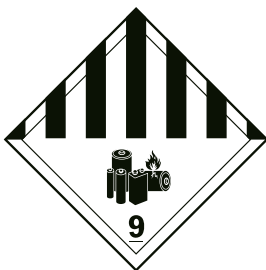
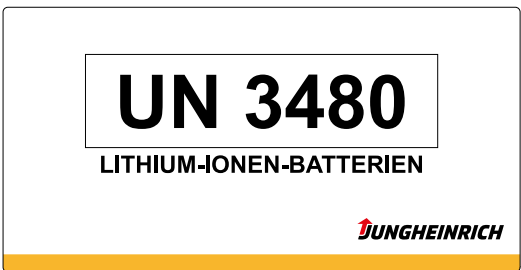
ADR = Accord européen relatif au transport international des marchandises Dangereuses par Route.

8.3.2.1 Shipping functional batteries

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

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

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

IATA classification (air transport)	UN 3480 lithium-ion battery class 9
- Danger label	 
Exposure scenario	Not specified.
Substance safety rating	Not specified.
Marking	Product does not require marking under EC Directive / HazMatR.

NOTICE

New lithium-ion batteries are transported with a charge status of at least 50 %.

8.3.2.2 Shipping faulty batteries

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

9 Dangers and safety notes

Hazard and safety instruction phrases are codified hazard and safety instruction phrases for hazardous materials used as part of the globally harmonised system for the grading and identification of chemicals.

The following H phrases describe the hazards arising from the battery cells and their contents.

The P phrases describe the safety measures to be applied.

E Operation

1 Safety Regulations for the Operation of Forklift Trucks

Driver authorisation

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

Operator's rights, responsibilities and rules of conduct

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

Unauthorised use of truck

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

Damage and defects

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

Repairs

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

Hazardous area

⚠ WARNING!

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

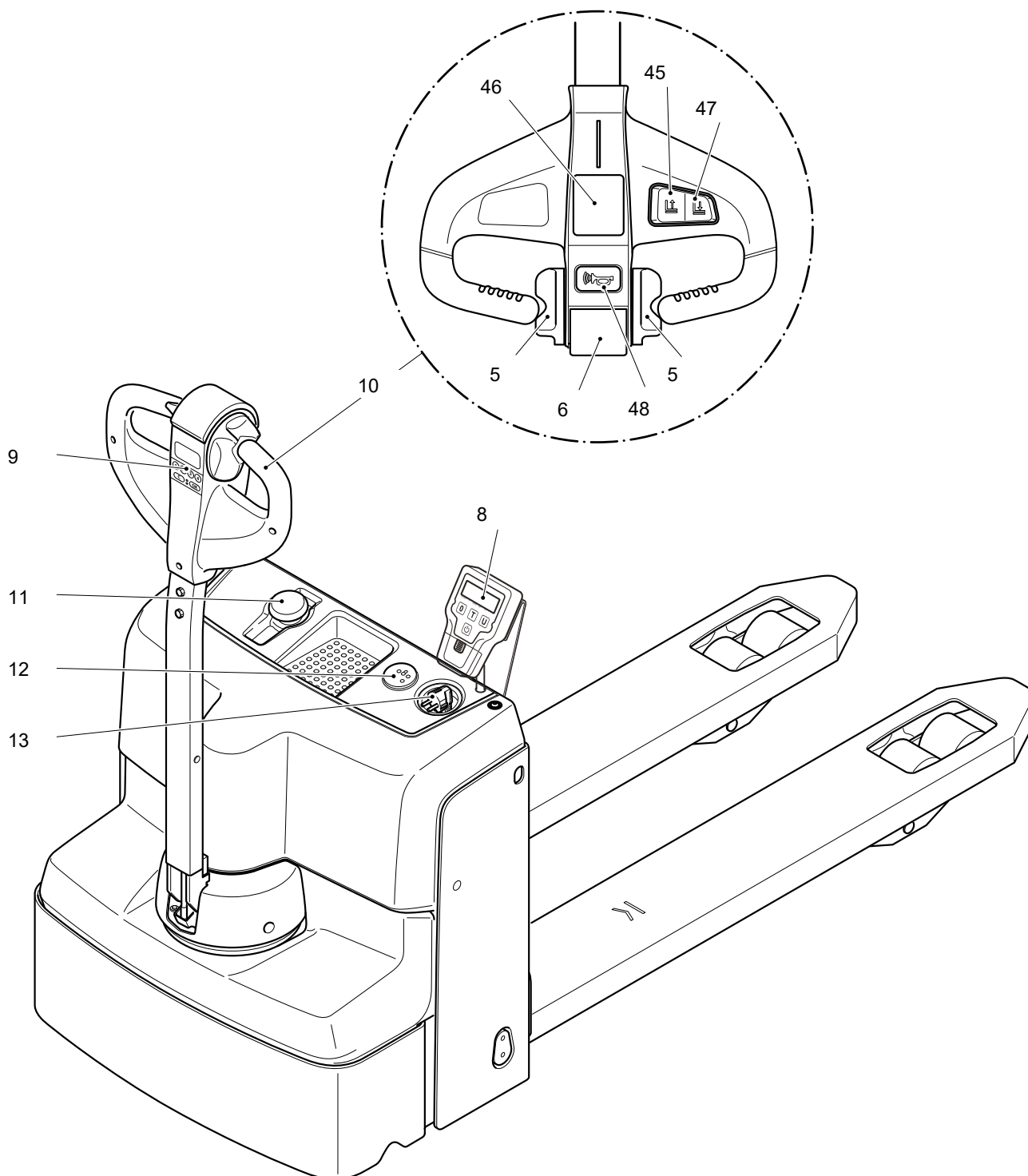
A hazardous area is defined as the area in which people are at risk due to travel or lifting operations of the truck, its load handler or the load. This also includes the area within reach of falling loads or lowering/falling operating equipment.

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

Safety devices, warning signs and warning instructions

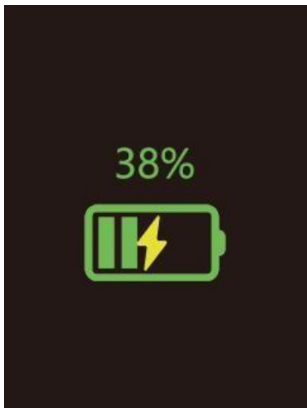



Safety devices, warning signs (see page 26) and warning instructions in the present operating instructions must be strictly observed.


1.1 Displays and Controls



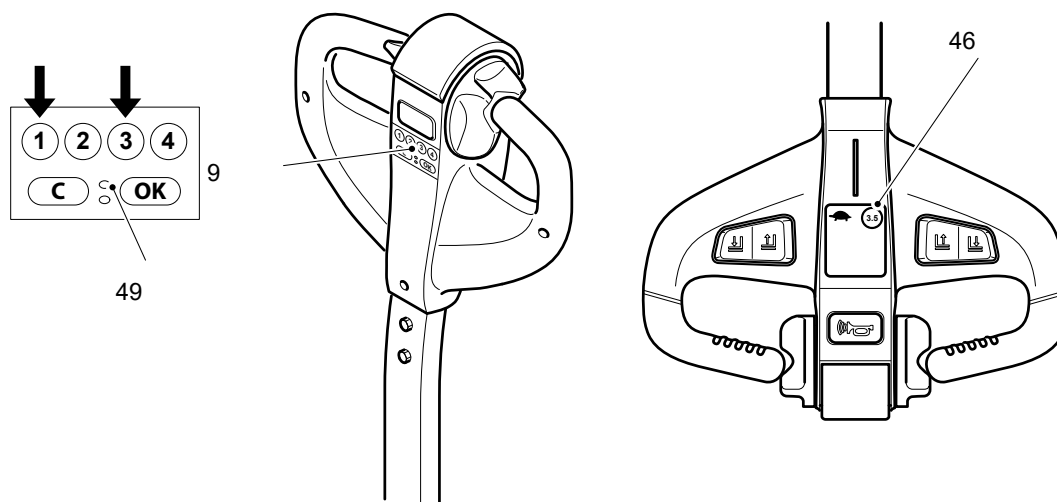
Item	Control /Display	EJE M13/M15/BA 115/BA 120	Function
5	Travel switch	●	Controls travel direction and speed.
6	Collision safety switch	●	Safety feature. When pressed the truck travels for approx 3 seconds in the fork direction. The parking brake then applies. The truck remains switched off until the controller is briefly restored to neutral.
8	Weighing device	○	Weighs the load, see page 29.
9	Key pad	●	Password authentication.
10	Tiller	●	Used for steering and braking.
11	Emergency disconnect switch	●	Disconnects the battery supply. All electric functions are deactivated and the truck decelerates.
12	Safety socket	●	Insert mains plug into the safety socket to make the truck can work at operating condition.
13	Mains plug	●	Charges batteries of the truck.
45	Load handler raise button	●	Raises the load handler.
46	Display	●	Shows essential information about the truck.
47	Load handler lower button	●	Lowers the load handler.
48	Warning signal button (horn)	●	Used to trigger the warning signal (horn).

1.1.1 Display function

Function	Symbol	Declaration
Battery power display		<ul style="list-style-type: none"> – Displays symbol and percentage of battery power. – Charging mode: in charging mode, switch to the charging interface, the indicator light is the indicator lights up red, and the indicator light is always green when fully charged
Power shortage prompt		<ul style="list-style-type: none"> – When there is 10 % remaining power, the power alarm icon flashes once every second.
Battery power percentage vehicle speed		<ul style="list-style-type: none"> – Digital display of the current accumulated working time of the vehicle, with a maximum of 6 digits, unit:h. – Battery SOC in percentage. – Real time display of vehicle speed
Fault code display		<ul style="list-style-type: none"> – Fault code display in case of fault.

Turtle mode		<ul style="list-style-type: none"> – The turtle icon in the upper left corner is lit, indicating that it is currently in turtle speed mode.
Speed limit mode		<ul style="list-style-type: none"> – Press the buttons 1 and 3 at the same time, the green light will turn on, and the speed limit icon will appear in the upper right corner.

1.1.2 Function password authentication



1, 2, 3 and 4 are the password setting keys. They can be set repeatedly and can be set to 16 different 4-digit user passwords.

The interactive display of red and green LED indicators represents the setting and use process.

When the password is not entered after the tiller is started, the red light (49) remains on.

When the forklift encounters a fault code or charges, the red light flashes.

When entering the correct password or charging is completed, the green light will remain on.

1.1.3 Function code of password authentication

Function code	Function declaration
1	Create / modify the user password
2	Delete a user
3	Delete all users

Create/Modify the user password

- In vehicle power off, enter the administrator password (default: 22222), press "OK". If the administrator password is correct, keep the red indicator (49) flashing. If the administrator password is wrong, the red indicator flashes (49) 3 times.
- Enter function code 1, the green indicator flashes, and remains on, waiting for the administrator to enter the user ID, the range is 11, 12, 13, 14, 21, 22, 23, 23, 24, 31, 32, 3, 33, 34, 41, 42, 43, 44 in 16 groups.
- After entering the user ID, press OK, and the green indicator flashes continuously.
- Enter the 4-bit user password (any digit in 1-4, the same number is repeatable) and press "OK". If the password is created, the green indicator flashes twice and then lights constantly. If the password is currently present, the red indicator will flash 3 times.
- After the password matches, it will return to step 3 (the green indicator is always on before operation), and the administrator can continue to add the user ID and password.
- If you need to exit the current functional operation, press the Cancel key and the red indicator flashes twice.

Delete a user



The user password cannot be repeated.

- If you need to exit the current functional operation, press the Cancel key and the red indicator (49) flashes twice.
- Enter function code 2, the green light flashes twice and then lights constantly.
- Enter the user ID that needs to be deleted on the user list, press "OK", and the green indicator flashes, indicating that the ID has been deleted.
- After the password is deleted, return to step 3 (the green indicator is always on before operation), and the administrator can then enter the user ID to be deleted.
- To exit the current function operation, press the Cancel key, and the red indicator light (49) flashes twice.

Delete all users

- Enter the administrator password, press "OK", and the red indicator (49) remains flashing.
- Enter function code 3, the green indicator flashes and then lights constantly.
- Press "OK", all users flash the green indicator twice after deletion, all users have been deleted.
- Need to exit the current function operation, press the cancel key, the red indicator flashes twice.

How to control password authentication

- Press "C" for 3 seconds, the red indicator (49) flashes 3 times. The input power was disconnected and the vehicle was locked successfully.

1.1.4 Vehicle status light indication

The controller is equipped with a vehicle status indicator belt, which is displayed in green when the vehicle works normally. When the vehicle battery is missing or faulty, the indicator belt flashes red, frequency once per second.

2 Starting up the truck

2.1 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.

Pre-start inspections

Procedure

- Check the whole of the outside of the truck for signs of damage and leaks. Damaged hoses must be replaced immediately.
- Test hydraulic system.
- Check the battery attachment and wire connections for damage and make sure they are secure.
- Check the load handler for visible signs of damage such as cracks, bent or severely worn forks.
- Check the drive wheel and load wheels for damage.
- Check that the markings and labels are present, clean and legible, see page 26.
- Check the control handle (damper) is restored to its normal position.
- Check the controls are automatically restored to zero after being applied.
- Test the warning signal.
- Test the brakes.
- Test the collision safety switch and Emergency Disconnect switch.
- Check doors and/or covers.
- Make sure the drive panels and covers are secure and check for damage.

2.2 Preparing the truck for operation

Starting up the truck

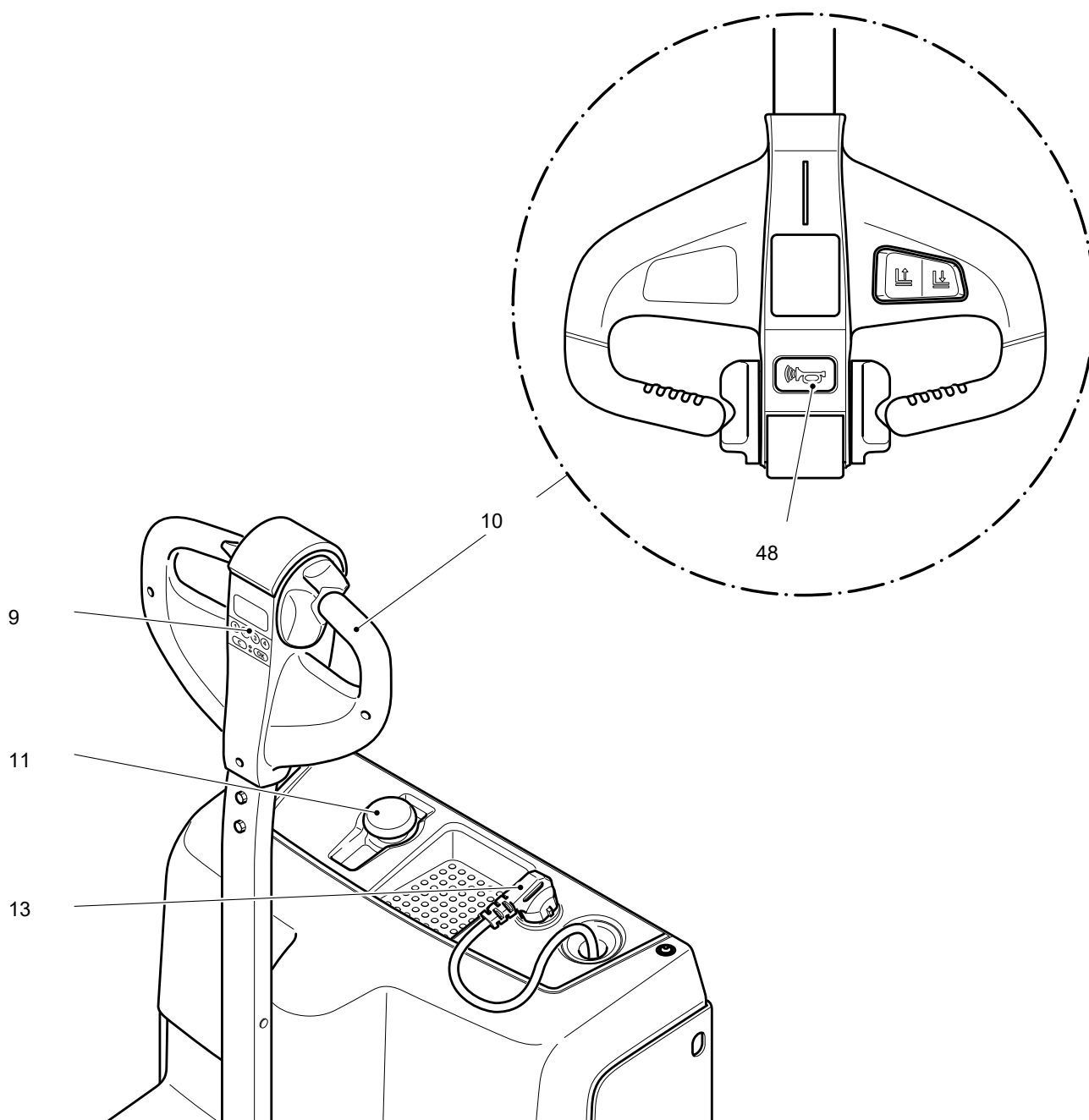
Requirements

- For checks and operations to be performed before starting daily operation, see page 63.

Procedure

- Pull the emergency disconnect (11).
- To switch on the truck, insert the mains plug (13) into the safety socket (12).
- Test the warning signal button (48).
- Test the lifting operations.
- Test the steering.
- Test the brake function of the tiller (10).

Truck is operational.



2.3 Parking the truck securely

DANGER!

An unsecured truck can cause accidents

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

- ▶ Park the truck on a level surface. In special cases the truck may need to be secured with wedges, see page 31.
- ▶ Fully lower the load handler.
- ▶ Select a place to park where no other people are at risk of injury from the lowered load handler.
- ▶ If the brakes are not working, place wedges underneath the wheels of the truck to prevent it from moving.

Parking the truck securely

Procedure

- Fully lower the load handler.
- Pull the mains plug (13) from the safety socket (12).
- Press down the emergency disconnect (11).

Truck is parked.

3 Working with the truck

3.1 Safety regulations for travel mode

Travel routes and work areas

Only use lanes and routes specifically designated for truck 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.

DANGER!

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

At blind spots get a second person to assist.

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

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 slopes and inclines

Negotiating slopes and inclines up to 6 % / 16 % is only permitted when they are recognised lanes. The slopes and inclines must be clean, have a non-slip surface, and negotiating them safely must be within the technical specifications of the truck. The truck must always be driven with the load facing uphill. 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.

Negotiating lifts 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 dock cannot move or come loose during loading / unloading.

⚠ 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.
-

3.2 Emergency Disconnect

DANGER!

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.
-

DANGER!

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.
-

Unlocking the emergency disconnect switch

Procedure

- Turn the emergency disconnect switch (11) 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).

3.3 Automatic braking

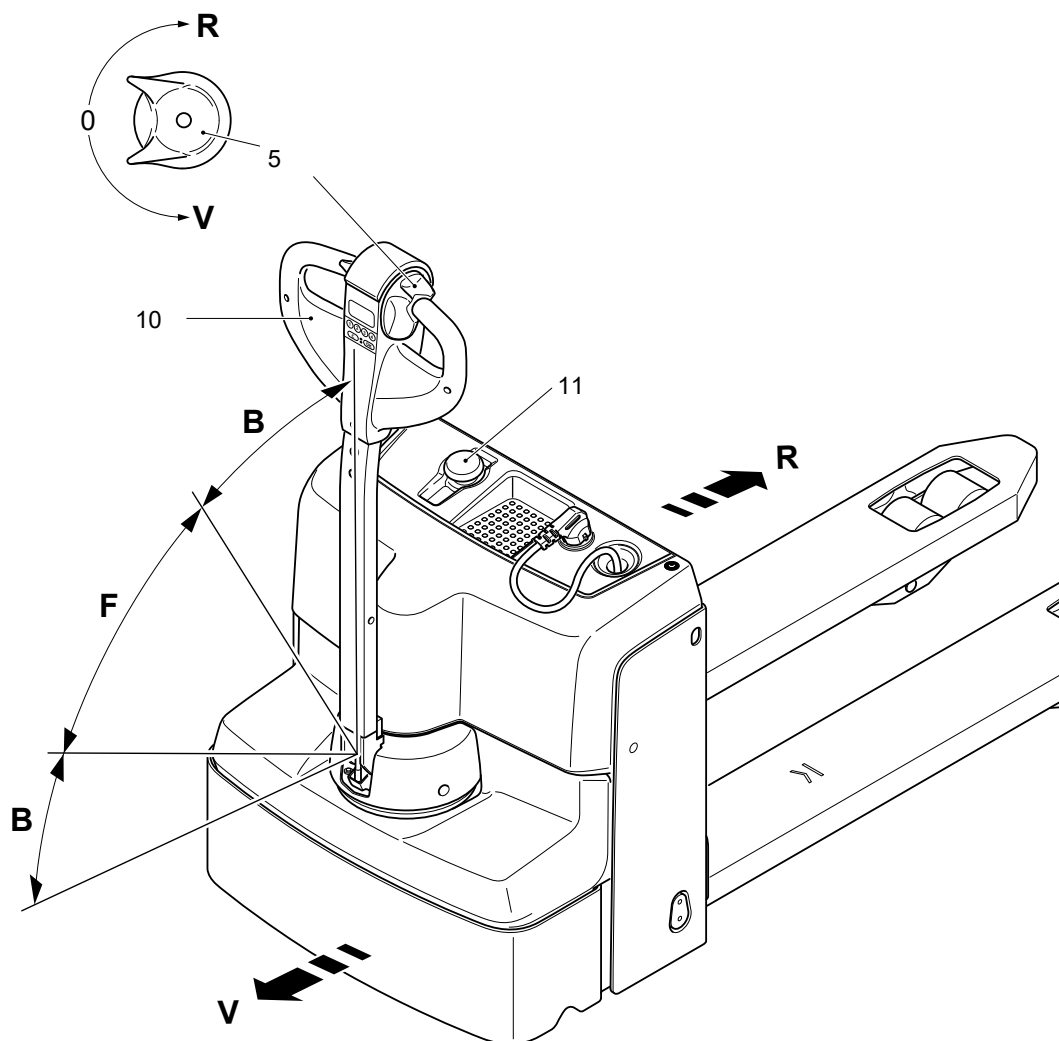
- When the tiller is released, it returns automatically to the upper brake zone (B) and the brakes are applied automatically.

⚠ WARNING!

Risk of collision due to a defective tiller

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

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



3.4 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.

Requirements


- Start up the truck, see page 63

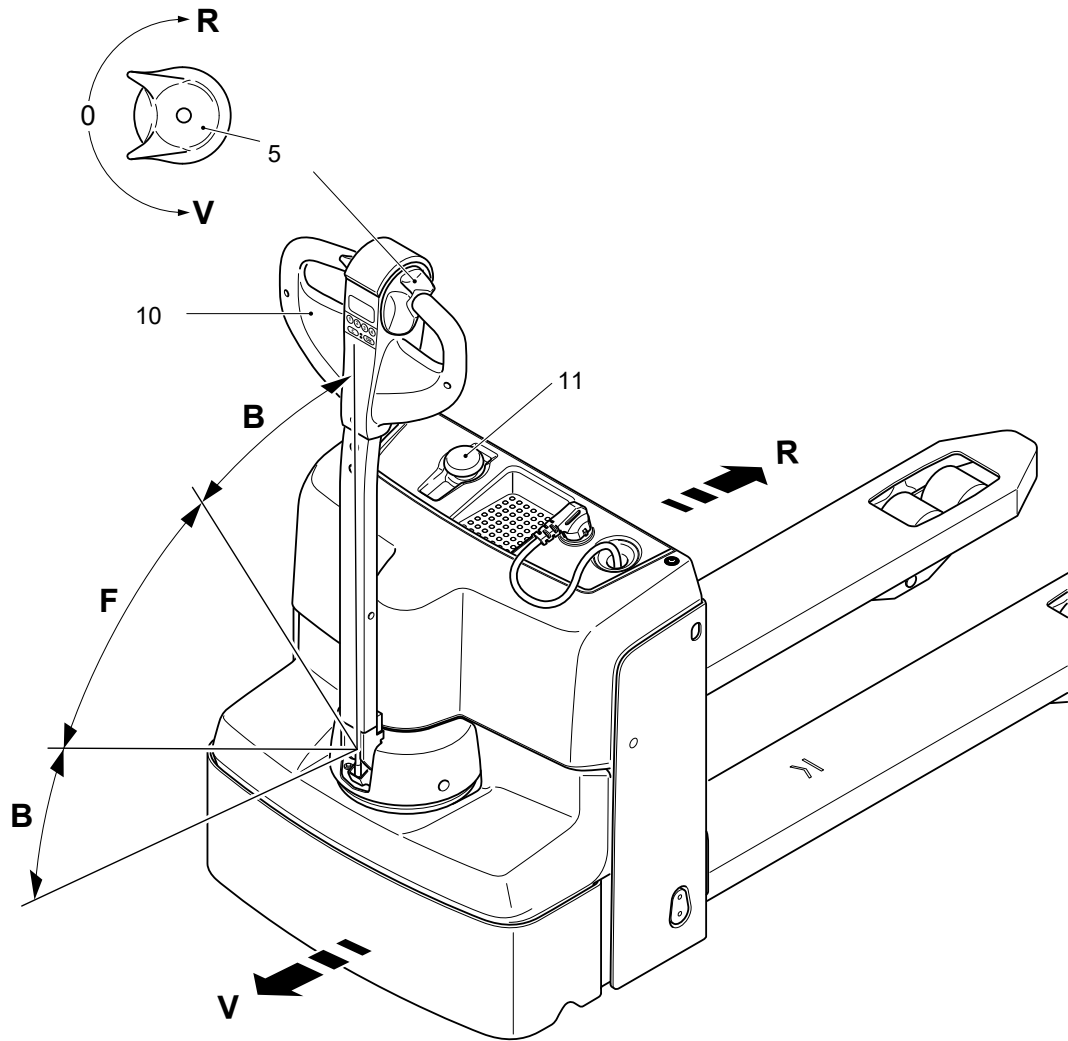
Procedure

- Set the tiller (10) to the travel range (F) and press the travel switch (5) in the desired direction (fwd. or rev.).
- Control the travel speed with the travel switch (5).

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

The brakes are released and the truck moves in the selected direction.

-  Preventing the truck from “rolling downhill”:
If the truck rolls backwards on an incline the controller detects the situation and the brake applies automatically after a short movement.



3.4.1 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 (5) to the opposite direction while travelling.

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

3.5 Slow travel

⚠ CAUTION!

The driver must be particularly careful when using the "slow travel" button (50). The brake is only activated when the "slow travel" button is released.

- ▶ In hazardous situations brake by immediately releasing the slow travel button (50) and the travel switch (5).
- ▶ During "slow travel" you can only brake by inversion braking (travel switch (5)).

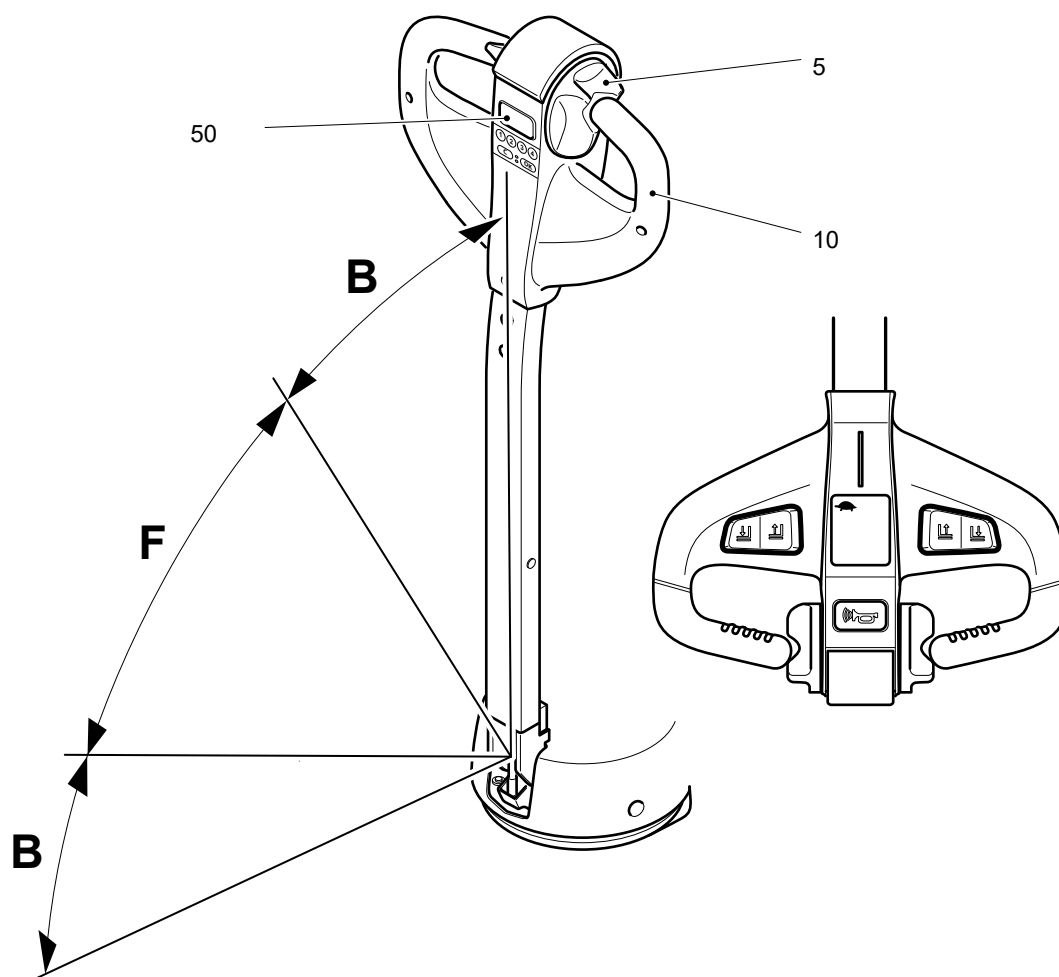
The truck can be operated with an upright tiller (10) (e.g. in enclosed spaces/lift):

Switching on slow travel

Procedure

- Press the slow travel switch (50).
- Set the travel switch (5) to the required travel direction (fwd. or rev.).

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



Switching off slow travel

Procedure

- Release the slow travel button (50).
In zone "B", the brake applies and the truck stops.
In zone "F", the truck continues at slow travel speed.
- Release the travel switch (5).

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

3.6 Steering

Procedure

- Move the tiller (10) to the left or right.

The truck is steered in the required direction.

3.7 Brakes

⚠ WARNING!

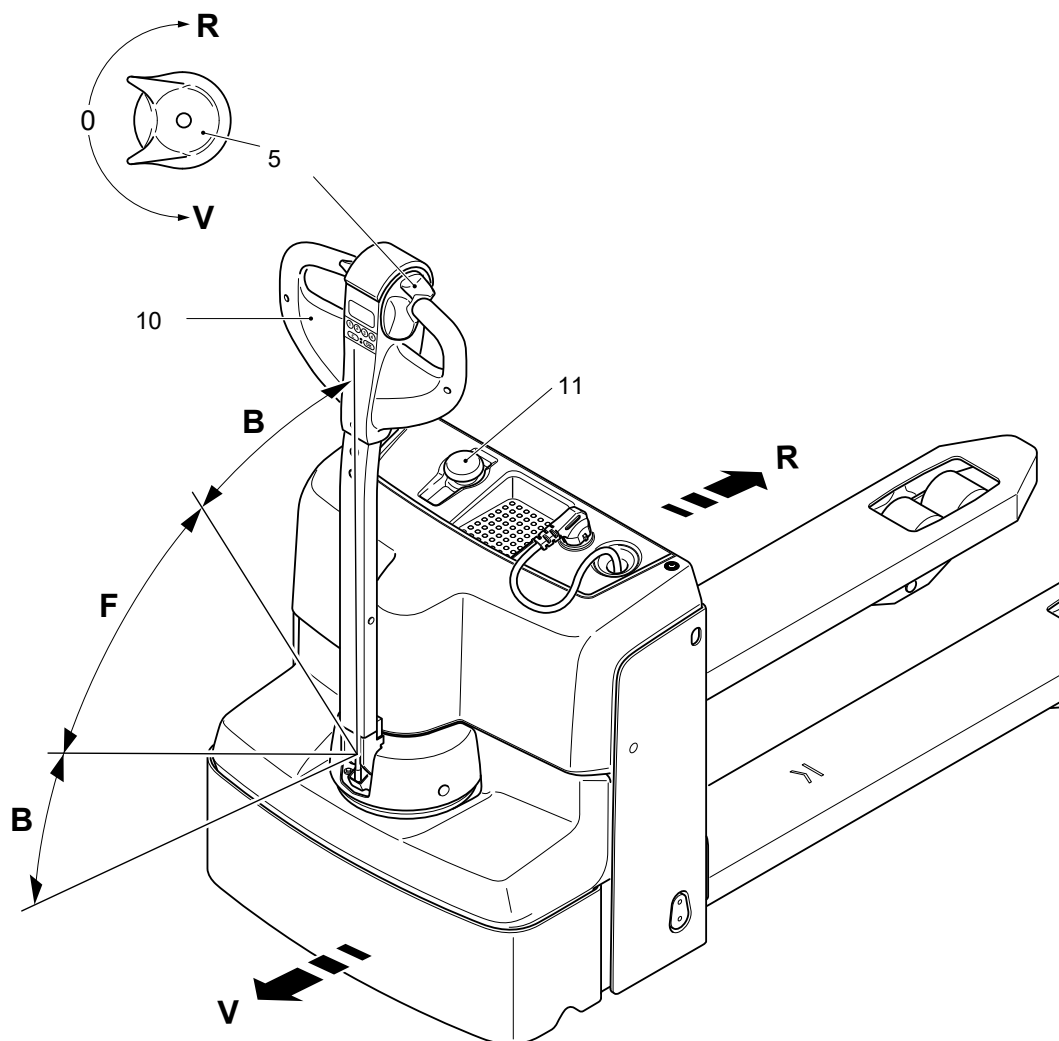
Accident risk

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.
- ▶ Allow for increased braking distance when travelling with load.

⚠ CAUTION!

- ▶ In hazardous situations set the tiller to the brake position or press the Emergency Disconnect switch.



Braking with the service brake

Procedure

- Move the tiller (10) up or down to one of the brake zones (B).

- Initially the truck brakes regeneratively. The mechanical brake is only applied when this brake fails to achieve the necessary braking force.

The truck will decelerate at the maximum rate and the service brake will apply.

Inversion braking

Procedure

- You can set the travel switch (5) to the opposite direction when travelling.

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

Regenerative braking

Procedure

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

The truck brakes to a halt regeneratively via the regenerative brake. The service brake then applies.

- With regenerative braking energy is recuperated to the battery, ensuring a longer service time.

Parking brake

- The mechanical brake (parking brake) applies when the truck comes to rest.

3.8 Lifting, transporting and depositing loads

⚠ WARNING!

Unsecured and incorrectly positioned loads can cause accidents.

Before lifting a load unit, the driver 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.
- ▶ Take care that the centre of the load have to be between the forks to prevent tilting.

NOTICE

Adapt a slower speed when stacking and retrieving.

3.8.1 Raising a load

Requirements

- Load unit correctly palletised.
- Load unit weight matches the truck's capacity.
- Forks evenly loaded for heavy loads.

Procedure

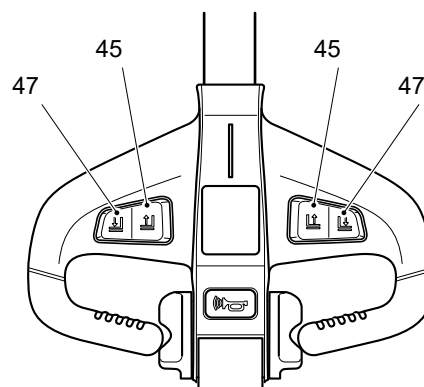
- Drive the truck carefully up to the pallet.
- Slowly insert the forks into the pallet until the fork shank touches the pallet.



The load unit must not extend by more than 50 mm beyond the fork tips.

- Press the "Lift" button (45) until you reach the desired lift height.

The load unit is raised.



⚠ CAUTION!

- ▶ Release the "Lift" button as soon as you reach the load handler limit position.

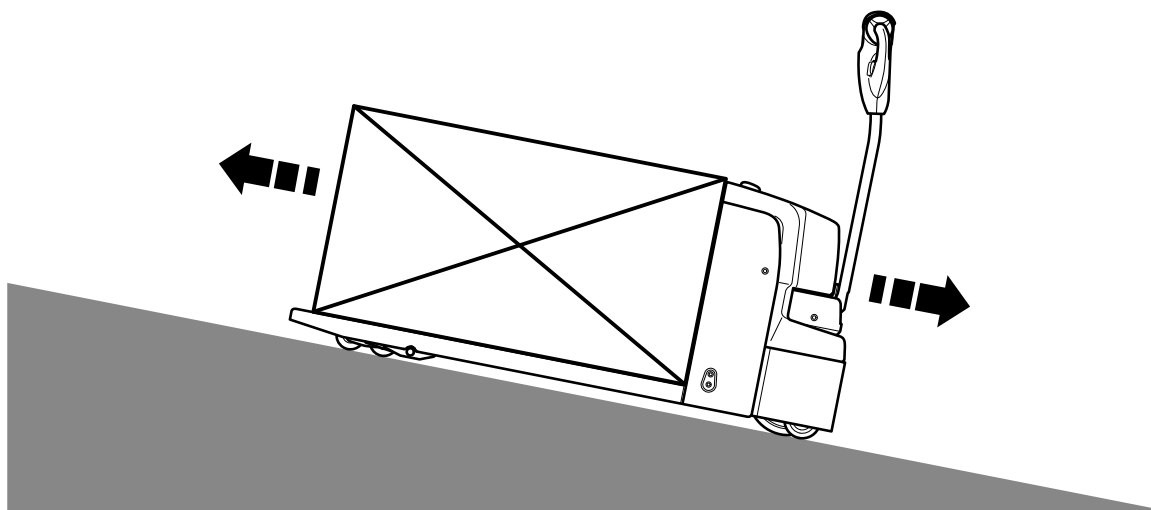
3.8.2 Transporting a load

Requirements

- Load raised correctly.
- Load is not on the ground.
- 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.
- Be prepared to brake at all times.
 - Brake gently in normal circumstances.
 - Only stop suddenly in dangerous situations.
- Watch out for other traffic at crossings and passageways.
- Always travel with a lookout at blind spots.
- Do not travel across or at an angle on inclines. Do not turn on slopes and inclines, and always drive with the load facing uphill (see graphic).



Depositing load units

NOTICE

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

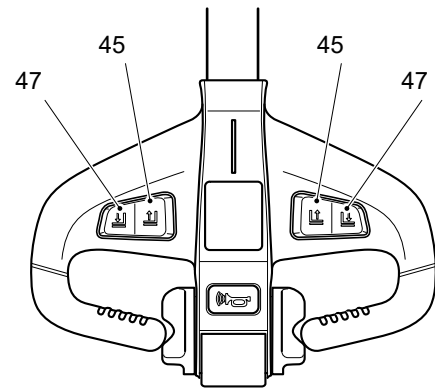
- Drive carefully up to the storage location.
- Press the lower load handler button (47).



Avoid depositing the load roughly to prevent damage to the load and the load handler.

- Carefully lower the load handler so that the forks are clear of the load.
- Carefully remove the forks from the pallet.

Load unit is lowered.



3.8.3 Wind loads

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

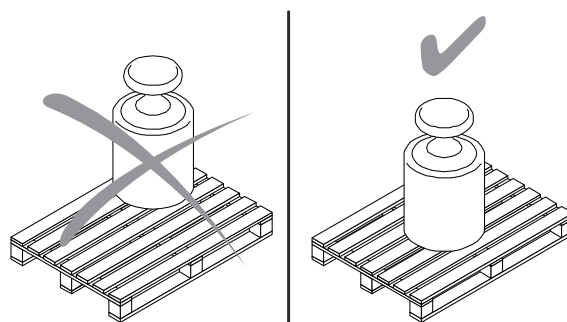
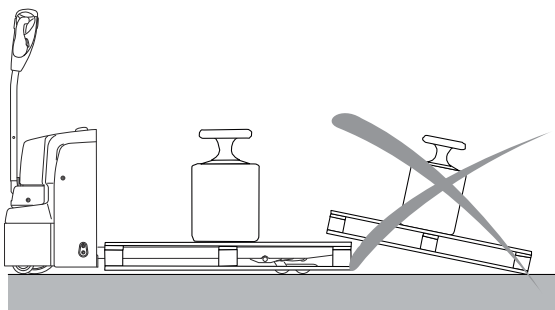
Light loads must be especially secured when they are subjected to wind forces. This will prevent the load from sliding or falling.

Stop the truck in both cases.

3.9 Weighing device

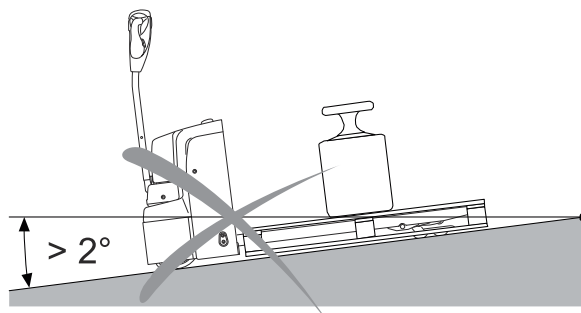
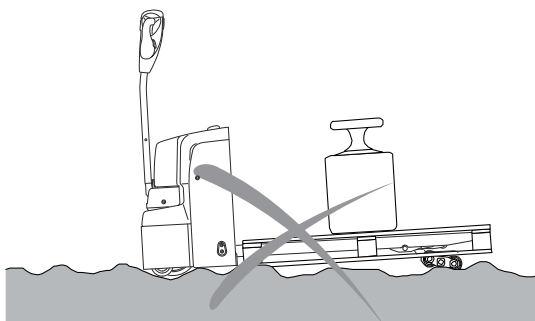
3.9.1 Avoiding malfunctions

- Arrange the load centrally on the pallet.



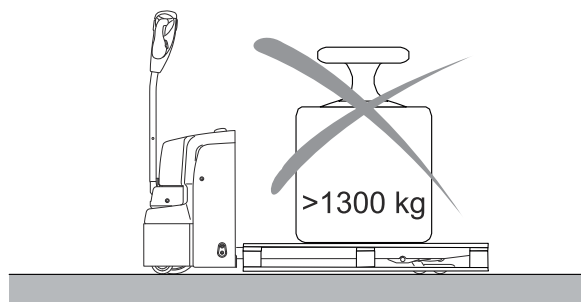
- Weighing must not be affected by other objects.

- The maximum truck incline when weighing is 2° .



- Always weigh on secure, level surface.

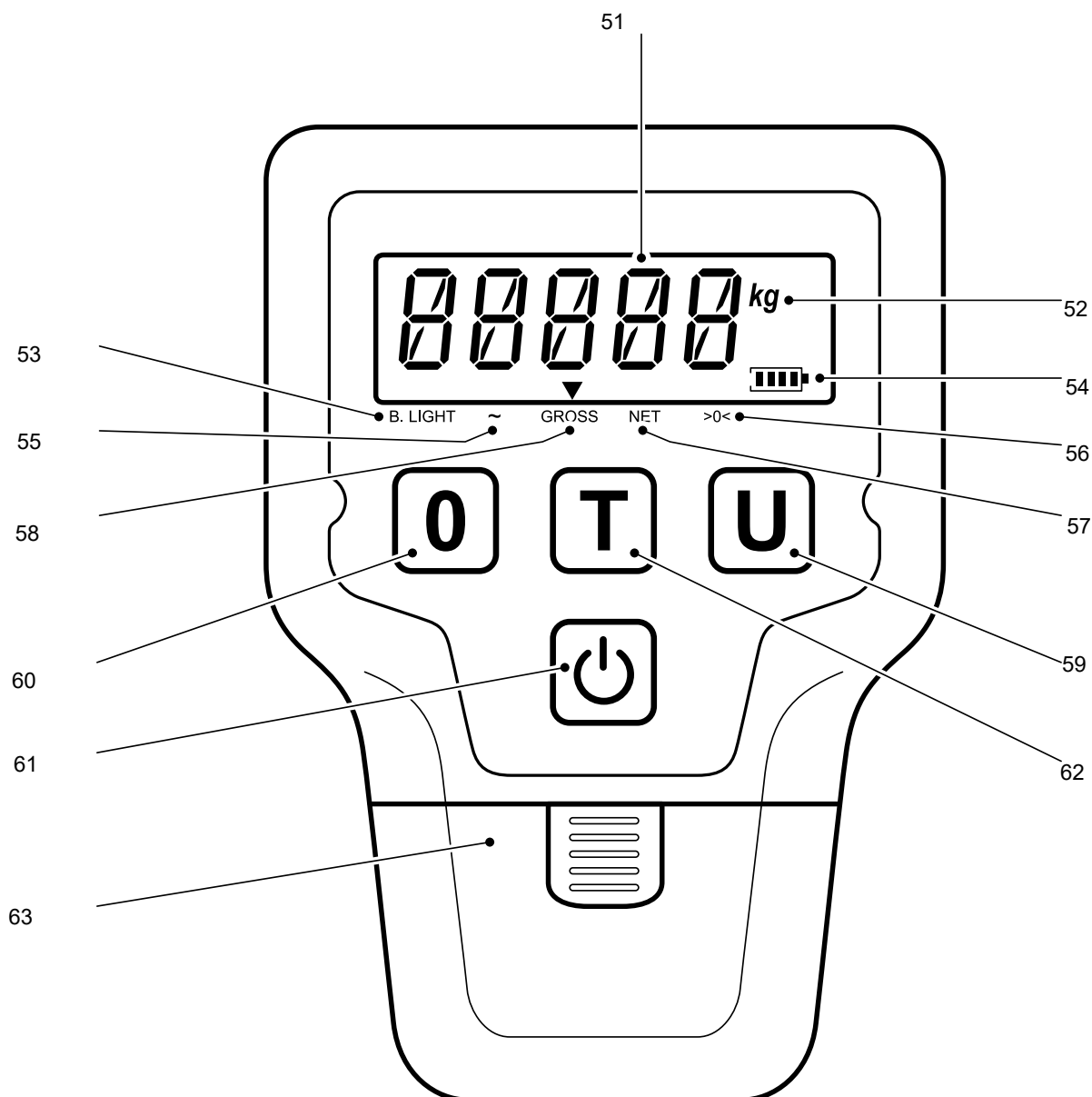
- Do not exceed the maximum capacity of the truck. The load must not be raised suddenly (too quickly) or too slowly.



3.9.2 Control and display unit









Major Functions

Basic functions: Zeroing, tare removal as well as switchover and calibration of measurement unit. Back light function: Mode setup and auto off of back light Other functions: Auto power-off (time setup available) and default setup of measurement unit.



Item	Components	Key Function
51	Weight Display	If any cargo is placed on the frame, its weight is to be displayed after 1 second; once “dynamic cursor” disappears, value as displayed on the screen will be the weight of cargo.
52	MeasurementUnit	
53	Back Light Cursor	
54	Battery Level	
55	Dynamic Cursor	
56	Zero Cursor	
57	Net Weight Cursor	
58	Tare Weight Cursor	
59	Unit Switching	It is for circulated switching of measurement unit among KG, T, OZ and LB, representing “kilogram”, “ton”, “ounce” and “pound” respectively.
60	Zeroing	Reset instrument readings within the permissible range.
61	On/Off / Back Light	Once this key is pressed shortly at ON status, “-----” is to be displayed on the screen before power-off; press the key for a while to turn on the back light in the back light mode. Press the key shortly for start-up.
62	Tare removal key	Current weight is taken as the tare weight for tare removal based on the gross weight; whereas the instrument is to be switched over to the net weight for display. Recover the tare weight as deducted at the net weight, and switch the instrument to the gross weight for display.
63	Battery Cover	

Parameter Setup Mode

Key		Function
&		Factory reset
		
&		Press simultaneously in normal display mode to enter the parameter setup mode when “ SETUP ” is displayed on the screen, keys function referred to as:
		
		Option selection
		Option confirmation
		Option cancellation
		Digit switching in calibration mode.

Description of Items on Screen

Items	Description
BLMOD	Back Light Mode Setup
CALBN	Calibration
CALOK	Calibration OK
FAIL	Plant Calibration Failed
OUTRG	Out of Range
PMODE	Plant Calibration Mode
POWTME	Auto Power-off Time Setup
RESET	Factory Reset
SS CK	Sensor Check
SS OK	Sensor OK
SSERR	Sensor Error
SETUP	Parameter Setup
TARE	Tare Removal
TR ER	Tare Removal Error
UNTARE	Untare
UNIT	Unit Setup
ZERO	Zeroing
ZR ER	Zeroing Error

Display

If any cargo is placed on the frame, its weight is to be displayed after 1 second; once “dynamic cursor” disappears, value as displayed on the screen will be the weight of cargo.

Default Unit Setup

Default unit of the system is kilogram (KG). The first option in parameter setup mode is default unit setup; when “UNIT” is displayed on the screen, press (**T**) to confirm entry into unit setup mode; press (**U**) for cancellation to proceed with next setup. Once default unit set up is confirmed, press (**U**) repeatedly for circulation switching among the units as displayed on the right side of screen: (KG), (T), (OZ) and (LB), representing “kilogram”, “ton”, “ounce” and “pound” respectively; press (**T**) to confirm the setup, and proceed with next setup.

Back Light Mode Setup

Default back light mode of the system is OFF; long press (**T**) to turn on the back light when back light cursor is displayed on the screen in back light mode. Once default unit setup is completed, proceed with setup of back light; when “BLMOD” is displayed on the screen, press (**T**) to confirm back light mode setup; press (**U**) for cancellation to proceed with next setup. Once back Light mode setup is confirmed,

press (0) for circulation switching of items displayed on the screen; “BL ON” and “BL OFF” refer to Back Light On and Off respectively; press (T) to confirm the setup, and proceed with next setup.

Auto Power-off Time Setup

Default auto power-off time of the system is 5 minutes when cargoes remain unchanged. Proceed with auto power-off time setup once back light mode setup is completed; when "POWTM" is displayed on the screen, press **(T)** to confirm entry into auto power-off time setup; press **(U)** for cancellation to proceed with next setup. Once auto power-off time setup is confirmed, press **(0)** for circulated switching among 1-9, representing auto power-off time (minute); press **(T)** to confirm the setup, and proceed with next setup.

Weighing Calibration

In case of inaccurate weighing, use the calibration function to calibrate the meter (calibration unit: kg). If there is no standard weight, use the confirmed weight as replacement (weight range 200-2000 kg). In order to calibrate the weighing device, proceed as follows:

Confirm that there are no goods on the truck. Switch on the weighing device.

Press **(U)** and **(T)** simultaneously to enter the parameter setting mode. The screen will display "SETUP".

Press **(T)** to confirm. The screen displays "UNIT" (default unit setting).

Triple press **(U)** to skip until "CAL BN" (calibration setting) is displayed.

Press **(T)** to enter the setting. Wait for "---" cursor to flash over, and the screen displays "00000". Place the calibration weight on the load handler. Fully lift the load handler and ensure that the weight is in a stable state during calibration.

Continuously press **(0)** to switch the numbers from 0 to 9.

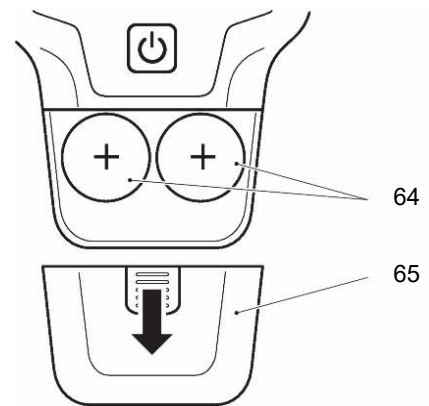
Long press **(T)** to change the cursor position.

Enter the weight of the calibration weight.

Press **(T)** to confirm the weight. Wait for the end of "---" cursor flashing. The screen will display "CALOK" to complete the calibration setting.

Battery Replacement

The instrument is provided with 2 CR2447 button cells (64).As shown, it is necessary to slide down instrument battery cover (65) to remove the used battery for replacement; put the new battery into the battery holder, and then close the battery cover.



Troubleshooting

Failure	Possible Cause	Remedy
System Halt		Please remove the battery, and refit it again to recover its normal operation in case of system halt.
Start-up Failure	Power run-out	Disassemble the gauge outfit, and use avometer to measure battery voltage; if the voltage is below 3.5 V, it means that battery voltage is extremely low, which may result in start-up failure; replace the old battery with new one in this case.
	Battery connecting line disconnected	Disassemble the gauge outfit, and use avometer to measure battery voltage; if the voltage is over 3.5 V, just check if the red-black connecting line between battery module and instrument panel is disconnected.
	Other problems	Please contact professionals for testing of panel if power supply is normal.
Abnormal Display	Unit switch	If the sensor is proved to be normal through test, just press “unit switching” key for unit switching to check if the data displayed is normal.
	Sensor connection	If display of instrument reading is abnormal, just turn off the machine and turn on it again to check screen display; if “SSERR” is displayed on the screen following display of “SS CK”, it means that connection of sensor is abnormal; in this case, it is necessary to check if connection between the sensor and instrument panel is normal before contacting professionals to check if sensor output is normal.
	Calibration	If abnormal data is still displayed by the instrument following unit switching, just use “unit switching” and “tare removal” in combination to enter the parameter setup mode, and recalibrate at the final setup option (for details, please refer to 3.2.5 of Operation Instructions).

Routine Maintenance

Be sure to replace the battery if power monitoring icon as displayed is blank, and data displayed is indistinct. It is better not to put the instrument into prolonged operation in case of rain and snow; prolonged exposure of instrument to the sunshine is strictly prohibited. It is applicable to clean the instrument shell with soft and clean rag in combination with routine washing solvent; never use industrial solvent for cleaning or directly spray it on the instrument surface. Users are recommended to check the instrument and sensor regularly to ensure its accuracy during use.

4 Troubleshooting

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



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

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

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

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

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

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

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

WARNING!

Do not open the battery.

4.1 Truck does not start

Possible Cause	Remedy
Emergency disconnect switch pressed	Unlock the emergency disconnect switch.
Mains plug not inserted into safety socket	Insert mains plug into safety socket.
Battery charge too low	Check battery charge and charge the battery as required.
Faulty fuse	Check fuses.

4.2 Load cannot be lifted

Safe places for storing batteries until the manufacturer's customer service department arrives on site must satisfy the following criteria:

- Do not store in places often frequented by personnel.
- Do not store in places where valuable objects (e.g. cars) are stored.
- A carbon dioxide extinguisher (CO₂) must be provided on site.
- There should be no fire or smoke detectors in the vicinity in order to ensure that an automatic fire detection system is activated only in the event of actual danger (e.g. naked flames).

- Small amounts of discharge from a single lithium-ion battery are not critical to the environment. Above-average natural ventilation is required in this case.
- No ventilation intake pipes should be in the vicinity, as discharged content could spread within a building.

Examples of where to store a non-functional lithium-ion battery:

- Roofed outdoor position
- Ventilated container
- Covered box with pressure and smoke discharge option

Possible Cause	Remedy
Truck not operational	Carry out all measures listed under "Truck does not start"
Hydraulic oil level too low	Check the hydraulic oil level
Battery discharge monitor has switched off	Charging the battery
Faulty fuse	Check fuses
Excessive load	Note maximum capacity, see data plate

Suitable extinguishing agents

- Carbon dioxide extinguisher (CO₂)
- Water (not on mechanically opened or damaged batteries!)

Unsuitable extinguishing agents

- Foam
- Grease fire extinguishing agents
- Powder extinguishers
- Metal fire extinguishers (PM12i extinguishers)
- Metal fire powder PL-9/78 (DIN EN 3SP-44/95)
- Dry sand

5 Touch voltage hazard

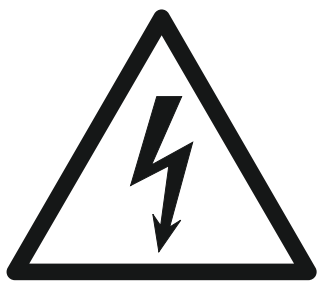
WARNING!

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 54.



6 Moving a truck without its own drive system

The brake may only be released by the manufacturer's customer service department. The manufacturer has a dedicated service department for such eventualities.

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 27.



2 Operational Safety and Environmental Protection

The checks and servicing operations contained in this chapter must be performed in accordance with the maintenance checklist service intervals.

⚠ WARNING!

Risk of accidents and component damage

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

Exception: Operating companies should only make changes or have changes made to powered industrial trucks if the truck 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 plans, 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 operator and service manuals.
- Attach 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.

3 Maintenance Safety Regulations

Lifting and jacking-up

WARNING!

Lifting and jacking up the truck safely

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

You may only work under a raised load handler if it has been secured with a sufficiently strong chain or the fastening bolt.

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

- ▶ Jack up the truck only on a level surface and prevent it from moving accidentally.
- ▶ Always use a jack with sufficient capacity. When jacking up the truck, take appropriate measures to prevent it from slipping or tipping over (e.g. wedges, wooden blocks).
- ▶ In order to lift the truck, the lifting gear must only be secured to the points specially provided for this purpose, see page 29.
- ▶ When jacking up the truck, take appropriate measures to prevent it from slipping or tipping over (e.g. wedges, wooden blocks).
- ▶ For jacking the truck, make sure to use structural parts of the truck as contact point for the jack (e.g. truck chassis).

CAUTION!

Risk of fire due to use of flammable cleaning agents

Using flammable cleaning agents increases the risk of fire.

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

Maintenance personnel

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

Maintenance personnel

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

Electrical system

WARNING!

Accident risk

- ▶ 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.
 - ▶ Always disconnect the battery before starting cleaning operations.
-

WARNING!

Electric currents can cause accidents

Make sure the electrical system is voltage-free before starting work on it. Before starting maintenance on the electrical system:

- ▶ Park the truck securely (see page 65).
 - ▶ Press the Emergency Disconnect.
 - ▶ Disconnect the battery.
 - ▶ Remove any rings or metal bracelets etc. before working on electrical components.
-

CAUTION!

Consumables and used parts are an environmental hazard

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

- ▶ Note the safety regulations when handling these materials.
-

Welding

Remove electrical and electronic components from the truck before performing welding operations, to avoid damage.

Settings

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

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 93.

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

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

4 Lubricants and Lubrication Schedule

4.1 Handling consumables safely

Handling consumables

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

WARNING!

Improper handling is hazardous to health, life and the environment

Consumables can be flammable.

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

CAUTION!

Spilled consumables can cause slipping and endanger the environment

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

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

WARNING!

Improper handling of oils can be hazardous

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

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

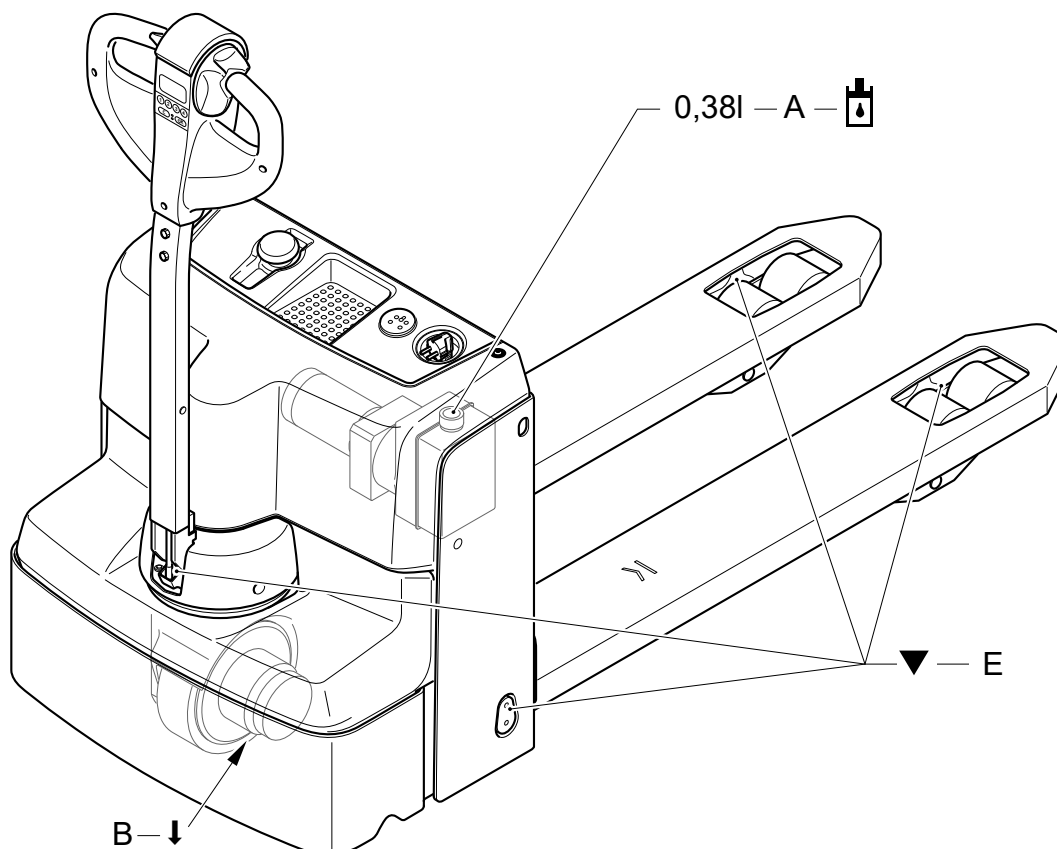
CAUTION!

Consumables and used parts are an environmental hazard

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

► Note the safety regulations when handling these materials.

4.2 Lubrication Schedule



▼	Contact surfaces
🛢️	Hydraulic oil filler neck
↓	Transmission grease nipples

4.3 Consumables

Code	Order no.	Package quantity	Description	Used for
A	51 374 718	5.0 L	Tellus S3 M 46	Hydraulic System
B	50 157 382	1.0 kg	Alvania Grease RL3	Gear unit
E	29 202 050	1.0 kg	Polyube GA 352P	Lubrication

Grease guidelines

Code	Saponification	Dew point °C	Worked penetration at 25 °C	NLG1 class
B	Lithium	>180	220 - 250	3
E	Lithium	>220	280 - 310	2

5 Maintenance and repairs

5.1 Preparing the truck for maintenance and repair work

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

Procedure

- Fully lower the load handler.
- Park the truck securely, see page 65.
- Push the emergency switch to prevent the truck from being switched on accidentally.
- When working under a raised lift truck, secure it to prevent it from lowering, tipping or sliding away.

⚠ WARNING!

Risk of accidents when working under the load handler and lift truck

- ▶ When working under a raised load handler or a raised truck, secure them to prevent the truck from lowering, tipping or sliding away.
 - ▶ When raising the truck, follow the instructions, see page 29. When working on the parking brake, prevent the truck from accidentally rolling away (e.g. with wedges).
-

5.2 Lifting and jacking up the truck safely

DANGER!

A truck tipover can cause accidents

In order to raise the truck, use only suitable lifting gear at the points specially provided for this purpose.

- ▶ Note the weight of the truck on the data plate.
 - ▶ Always use a jack with sufficient capacity.
 - ▶ Raise the unladen truck on a level surface.
 - ▶ When raising the truck, take appropriate measures to prevent it from slipping or tipping over (e.g. wedges, wooden blocks).
-

Raising and jacking up the truck securely


Requirements

- Prepare the truck for maintenance and repairs (see page 101).

Tools and Material Required

- Jack
- Hard wooden blocks

Procedure

- Place the jack against the contact point.
-  For jacking the truck, make sure to use the structural parts of the truck as contact point for the jack (e.g. truck chassis).
- Raise the truck.
- Support the truck with hard wooden blocks.
- Remove the jack.

The truck is now securely raised and jacked up.

5.3 Cleaning

5.3.1 Cleaning the truck

CAUTION!

Fire hazard

Do not use flammable liquids to clean the industrial truck.

- ▶ Disconnect the battery before starting cleaning work.
 - ▶ Carry out all necessary safety measures to prevent sparking before cleaning (e.g. by short-circuiting).
-

CAUTION!

Risk of component damage when cleaning the truck

Cleaning with a pressure washer can result in malfunctions due to humidity.

- ▶ Cover all electronic system assemblies (controllers, sensors, motors etc.) before cleaning the truck with a pressure washer.
 - ▶ Do not hold the jet of the pressure washer by the marked points to avoid damaging them (see page 26).
 - ▶ Do not clean the truck with a steam cleaner.
-

Requirements

- Truck prepared for maintenance and repair work – see page 101.

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 111.

The truck is now clean.

5.3.2 Cleaning the electrical system assemblies

CAUTION!

Risk of electrical system damage

Cleaning the assemblies (controllers, sensors, motors etc.) of the electronic system 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 not a conductive, anti-static brush.
-

Cleaning the electrical system assemblies

Requirements

- Truck prepared for maintenance and repair work – see page 101.

Tools and Material Required

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

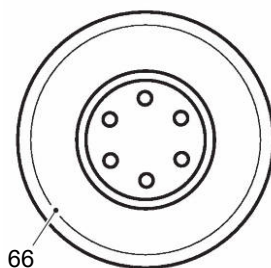
Procedure

- Expose the electrical system, see page 107.
- Clean the electrical system assemblies with weak suction or compressed air (use a compressor with a water trap) and not a conductive, anti-static brush.
- Cover the electrical system, see page 107.
- Carry out all the tasks in the section "Recommissioning the truck after cleaning or maintenance work" (see page 111).

The electrical system assemblies are now clean.

5.4 Checking the attachment and wear of the wheels

- Replace the wheels if the wear limit (66) has been reached.



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

5.5 Checking the hydraulic oil level

Check oil level

Requirements

- Lower the load handler.
- Prepare the truck for maintenance and repairs, see page 101.
- Remove the panel, see page 107.

Procedure

- Check oil level on hydraulic reservoir. The oil level should be visible between the MIN and MAX marking.

- Add hydraulic oil with the load handler lowered.
- Add the correct grade of hydraulic oil, see page 100.

Oil level is checked.

5.6 Disassembling or assembling the front panel

Disassembling the panel and cover

Requirements

- Prepare the truck for maintenance and repairs, see page 101.

Tools and Material Required

- Allen key

Procedure

- Turn or slightly tilt tiller towards the edge of the truck.
- Remove the screws (44) with the Allen key.
- Carefully lift off the front panel (70) and put it to one side.
- Unscrew the emergency disconnect switch (68).
- Remove the screws (67) with the Allen key.
- Slightly lift off the cover (69).

The front panel is now disassembled.

Disassembling the panel and cover

Requirements

- Truck prepared for maintenance and repairs, see page 101.

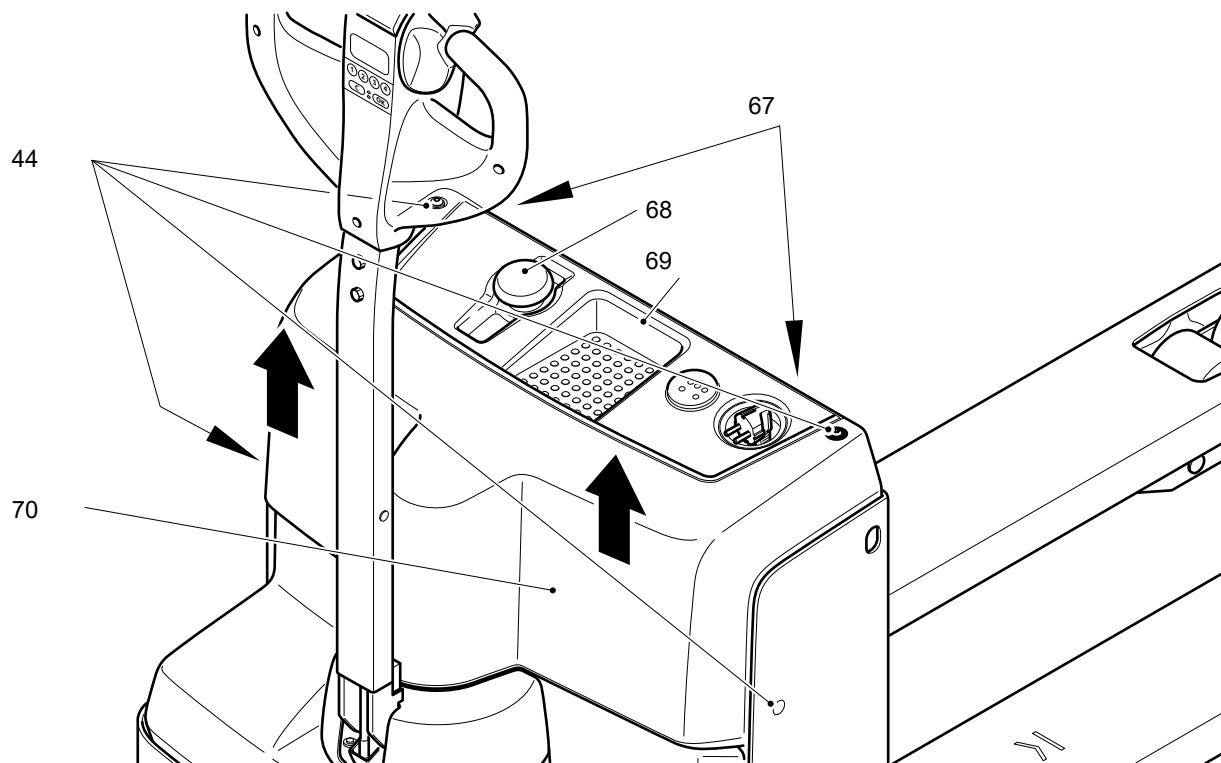
Tools and Material Required

- Allen key

Procedure

- Turn or slightly tilt tiller towards the edge of the truck.
- Remove the screws (44) with the Allen key.
- Carefully lift off the front panel (70) and put it to one side.
- Unscrew the emergency disconnect switch (68).
- Remove the screws (67) with the Allen key.
- Slightly lift off the cover (69).

The front panel is now disassembled.



5.7 Checking the electrical fuses

Check fuses

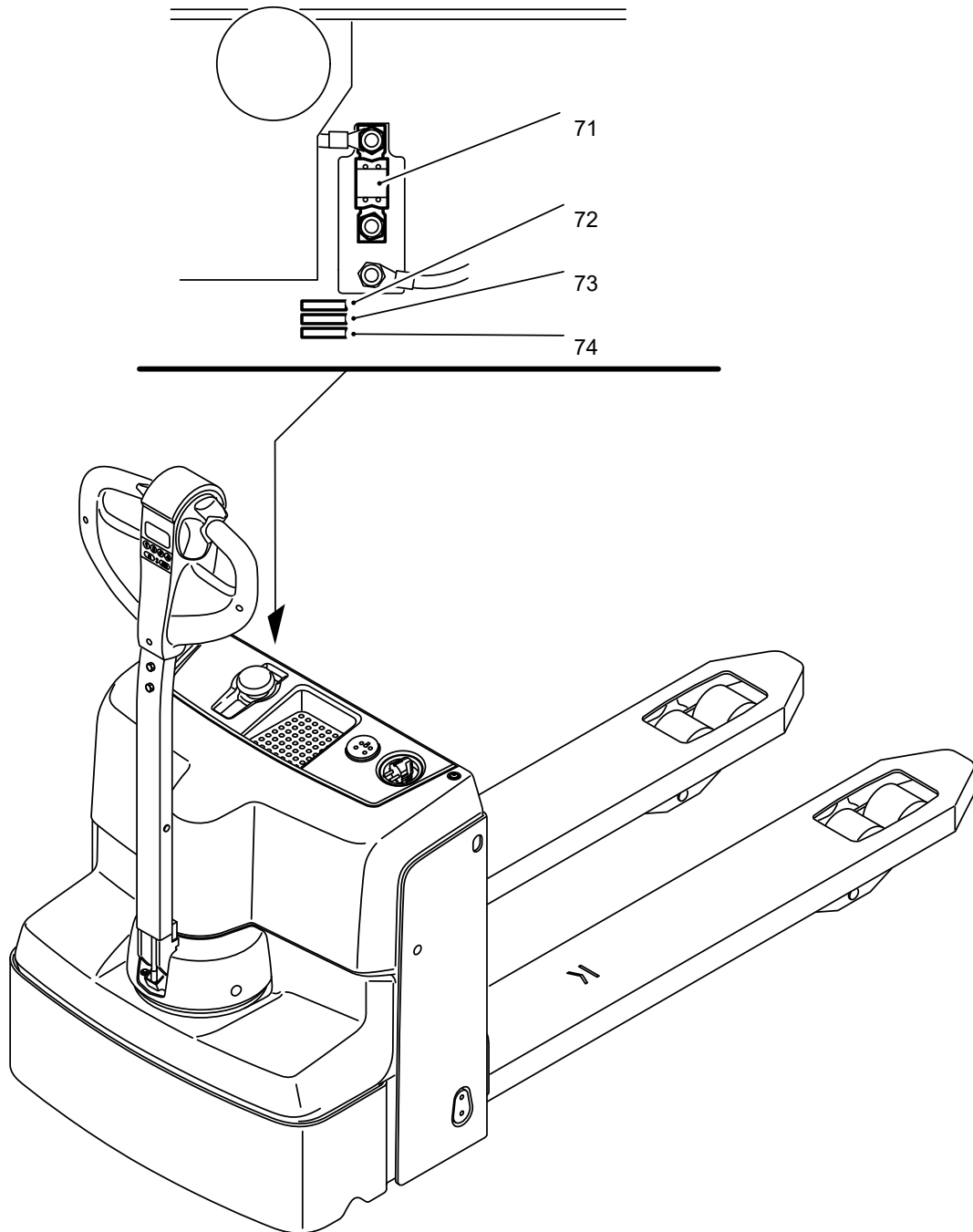
Requirements

- Truck prepared for maintenance and repairs, see page 101.
- Disassemble the panel and the cover, see page 107.

Procedure

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

The fuses are now checked.



Item	To protect	Rating
71	Drive motor / pump motor	150 A
72	Electronic system; control circuit	10 A
73	Electronic system; Tiller head	3 A
74	Electronic system; Lithium-ion battery wakeup	3 A

5.8 Restoring the truck to service after maintenance and repairs

Procedure

- Thoroughly clean the truck – ,see page 103.
- Lubricate the truck according to the lubrication schedule – ,see page 100.
- Insert the truck-side control line into the connection on the battery trough.
- Pull the battery forward.
- Insert the control line into the battery connection at the top of the battery or the inside of the trough.
- Slide the battery back in.
- Connect the battery to the truck.
- Close the battery connector lock: Tighten the bolted bar.
- Insert the truck control line into the interface converter on the battery.
- Charge the battery – ,see page 40.
- Commission the truck –, see page 63.

6 Decommissioning the Industrial Truck



If the truck is to be out of service for more than a month, e.g. for commercial reasons, 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.

WARNING!

Lifting and jacking up the truck safely

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

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

- ▶ Jack up the truck only on a level surface and prevent it from moving accidentally.
- ▶ Always use a jack with sufficient capacity. When jacking up the truck, take appropriate measures to prevent it from slipping or tipping over (e.g. wedges, wooden blocks).
- ▶ In order to raise the truck, the lifting gear must only be secured to the points specially provided for this purpose, see page 29.
- ▶ When jacking up the truck, take appropriate measures to prevent it from slipping or tipping over (e.g. wedges, wooden blocks).

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.

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 Before Taking the Truck out of Service

Procedure

- Thoroughly clean the truck, see page 103.
- Prevent the truck from rolling away accidentally.
- Check the hydraulic oil level and replenish if necessary, see page 106.
- Apply a thin layer of oil or grease to any non-painted mechanical components.
- Lubricate the truck according to the lubrication schedule, see page 100.
- Charge the battery, see page 47.

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

6.2 During decommissioning

NOTICE

Full discharge can damage the battery

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

► Charge the battery at least every 2 months.

→ Charge the battery, see page 47.

6.3 Restoring the truck to service after decommissioning

Procedure

- Thoroughly clean the truck – ,see page 103.
- Lubricate the truck according to the lubrication schedule – ,see page 100.
- Insert the truck-side control line into the connection on the battery trough.
- Pull the battery forward.
- Insert the control line into the battery connection at the top of the battery or the inside of the trough.
- Slide the battery back in.
- Connect the battery to the truck.
- Close the battery connector lock: Tighten the bolted bar.
- Insert the truck control line into the interface converter on the battery.
- Charge the battery – ,see page 40.
- Commission the truck –, see page 63.

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

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

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

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

8 Final de-commissioning, disposal

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

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

G Maintenance and Inspection

⚠ WARNING!

Lack of maintenance can result in accidents

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

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

NOTICE

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

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

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

1 Maintenance Contents EJE M13 / M15 BA 115 / BA 120

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1.1 Owner

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

1.1.1 Maintenance contents

1.1.1.1 Standard equipment

Brakes
Test the brake.
Hydraulic operations
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
Battery connector for secure fit, functionality and damage
Travel
Collision safety switch for functionality and damage
Check wheels for wear and damage
Chassis/structure
Check labels for legibility, completeness and plausibility
Check doors or covers for damage
Hydraulic operations
Test hydraulic system
Check fork arms or load handler for wear and damage
Battery charger
Mains plug and mains cable for damage

1.1.2.2 Optional Equipment

The following points must be checked:

1.2 Customer Service

In accordance with the EJE M13 / M15 BA 115 / BA 120 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.
Electrical system
Test the contactors and/or relays.
Perform insulation inspection.
Power supply
Measure the battery voltage.

Hydraulic operations
Adjust the lift mechanism.
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.
Carry out a potential measurement on the chassis while charging is in progress.

1.2.1.2 Optional Equipment

Weigher sensors/switches

Electrical system
Test the weigher.

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
Function of LED status display on tiller head
Test emergency disconnect switch and check for damage
Contactors and/or relays for wear and damage

Power supply
Battery and battery cables for damage, contamination and secure mounting
Battery latch and battery attachment for correct function and damage
Battery connector for secure fit, functionality and damage

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

Chassis/structure
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

Hydraulic operations
Test hydraulic controls and check their labels for legibility, completeness and plausibility
Lift mechanism for wear, functionality and damage
Check cylinders and piston rods are securely attached and check for damage
Test hydraulic system
Check fork arms or load handler for wear and damage
Tie/plunger rods for uniform adjustment, wear and damage

Battery charger
Mains plug and mains cable for damage

1.2.2.2 Optional Equipment

Weigher sensors/switches

Electrical system
Weigher 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
Hydraulic oil	1000	12