EKS 210a

09.12

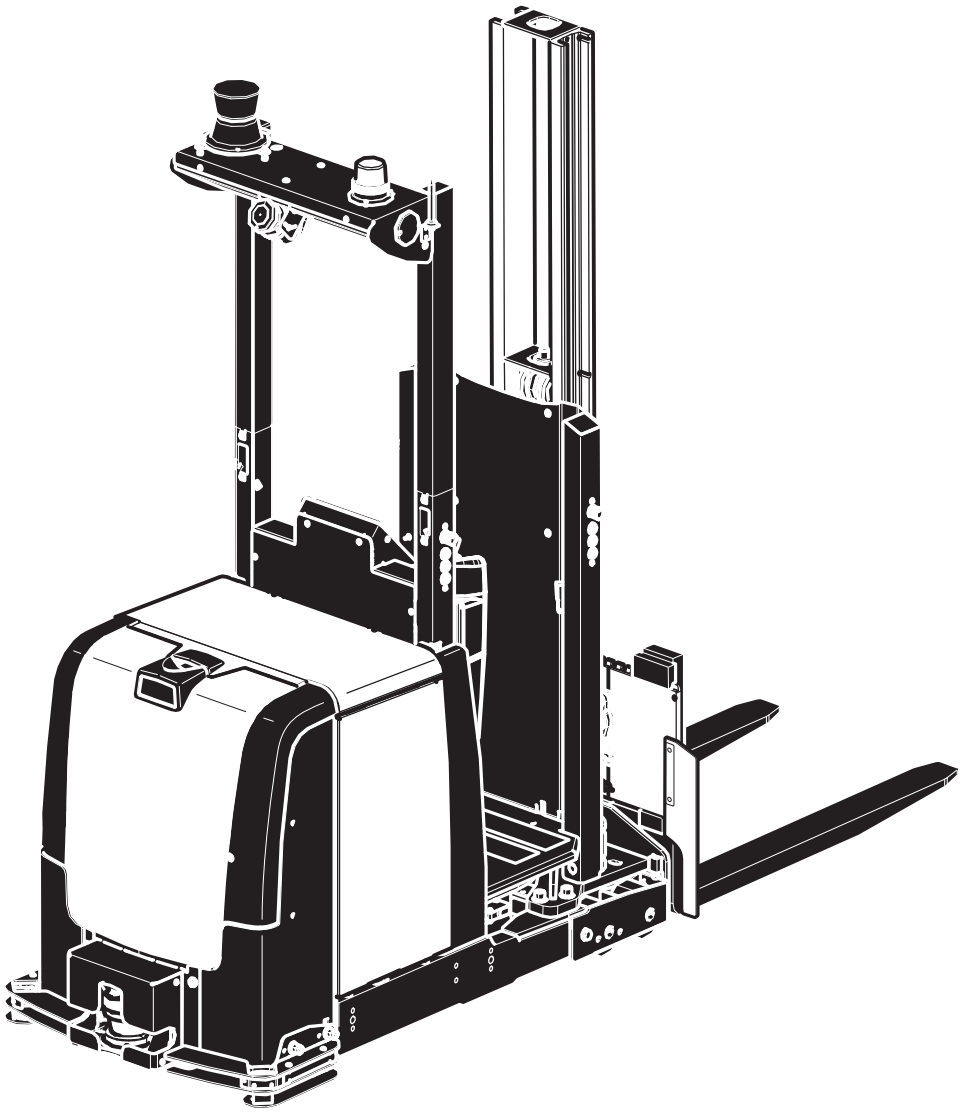
Operating instructions

GB

51269254

07.18

EKS 210a



JUNGHEINRICH

A Correct Use and Application

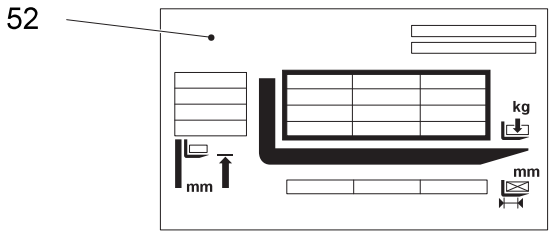
1 General

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

  - The transfer station must be specified and set up in the warehouse layout. This setting is undertaken by the manufacturer's customer service department.
- Full pallet stacking in automatic mode:
  - At specified transfer stations, the truck can stack pallets approved by the owner with their loads on top of each other.
  - The evaluation is performed via sensors fitted on the side of the forks.
  - This transfer station must be specified and set up in the warehouse layout. This setting is undertaken by the manufacturer's customer service department.

	Component	EKS 210a	
h_1	Truck height with load handler lowered	1615 - 3815	mm
h_2	Free lift	800 - 3000	mm
h_3	Lift	800 - 3000	mm
h_4	Truck height with load handler fully raised	1615 - 3815	mm
h_7	Height	335	mm

5.2 Truck capacity plate

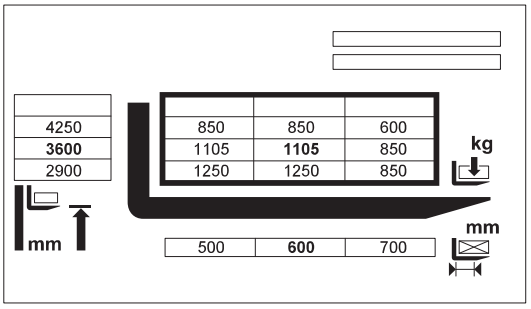


The capacity plate (52) gives the capacity Q (kg) of the truck for an upright mast. The maximum capacity is shown as a table with a given load centre of gravity D (mm) and the required lift height h_3 (mm).

The capacity plate (52) of the truck indicates the truck's capacity with the forks as originally supplied.

Example of how to calculate the maximum capacity

With a load centre distance (D) of 600 mm and a maximum lift height of (h_3) 3600 mm the max. capacity (Q) is 1105 kg.



Moving the truck manually on and off the transport vehicle

Requirements

– The incline on the ramp of the transport vehicle must not exceed 6 %.
– Manual truck operation is activated, see page 136.

Procedure

- Switch on the truck (see page 129).
- Raise the load handler (36) until it is clear of the ground (see page 153).
- Bring the truck onto the transport vehicle (see page 145).
- Fully lower the load handler (36) (see page 154)
- Switch off the truck (see page 130).
- Press one of the emergency disconnect switches (5) (see page 143).
- Remove the key from the "change mode" key switch (12).

The truck is now loaded.

1.1 General notes on handling batteries

⚠ WARNING!

Batteries can be hazardous

Batteries contain an acid solution which is poisonous and corrosive. Avoid contact with battery acid at all times.

- ▶ Dispose of used battery acid in accordance with regulations.
- ▶ Always wear protective clothing and goggles when working with batteries.
- ▶ Do not let battery acid come into contact with skin, clothing or eyes. If necessary, rinse with plenty of clean water.
- ▶ In the event of physical damage (e.g. skin or eye contact with battery acid) call for a doctor immediately.
- ▶ Spilled battery acid should be neutralised immediately with plenty of water.
- ▶ Only batteries with a sealed battery container may be used.
- ▶ Follow national guidelines and legislation.

⚠ WARNING!

Risk of short circuits or electric shock

Batteries without an insulated cover or without insulated live components can cause short circuits or electric shocks.

- ▶ Always use batteries whose covers or live components are insulated.

Park the truck securely before carrying out any work on the batteries (see page 159).

Preparing the battery for operation after charging

Requirements

– The battery (86) is fully charged.

Procedure

- Switch off the charger.
- Disconnect the charging cable from the battery connector (27).
- Check all cables and connectors for visible signs of damage.
- Connect the battery connector (27) to the truck.
- Close the battery cover (26), see page 64.

After the battery charge the truck is ready for operation.

➔ After a fully discharged battery has been completely re-charged and the truck switched on, it may take a few seconds before the truck is operational. During this time the battery symbol in the driver's display flashes.

Warning systems (signal lights, travel direction display (indicator), horn) on the truck

Visible warning devices such as indicators must be activated as soon as the trucks become operational or when they move. The exception to this rule are trucks whose speed does not exceed 0,3 m/s (1,08 km/h).

As soon as the truck approaches a place where it can continue in more than one direction, it must indicate the intended direction in a clearly visible manner. The same applies when cornering.

A clearly audible warning must sound if the truck moves in a direction that is not secured by the personal protection system.

Item	Symbol	Display element		Function
118		Battery discharge indicator	●	Shows the battery charge status (bar display).
			○	Displays the battery charge status (residual capacity as a percentage).
119	Function symbols (●). Description of function symbols, see page 96.			
120		Weighing function	○	Shows the weight of the raised load in kg, see page 231.

2.4 Hourmeter

Service hours are counted while the truck is operational and one of the following operations is performed:

– Lifting
– Lowering
– Travel

Item	Control/display		Function
22	"Request order" button	●	Pressing the "request order" button sends an order request to the central computer.
23	"Alignment" button	●	Pressing the "alignment" button aligns the truck with the travel path, see page 155.
24	"Cancel order" button	●	Pressing the "cancel order" button cancels the current order.
25	Sensors in the operator position	●	Sensors detect if there are any people in the operator position. If the sensor detects a person, the truck stops travelling. The truck must be re-aligned see page 155.
30	Broken pallet sensors	○	For details of how the broken pallet sensors operate and how to clean them, see page 227.

⚠ WARNING!

Loads or objects in the operator position leg compartment

Loads or objects in the operator position leg compartment can impede the operation of controls in this area. For example the objects can accidentally start or jam the controls.

Loads or objects protruding out of the perimeter of the operator position can collide with other components (e.g. racking systems) during operation. In the event of a collision, the operator in the operator position may be injured or the truck may be damaged.

Loads or objects also pose a trip hazard.

▶ Position loads or objects in the operator position such that there is no trip hazard and that the operation of controls in the leg compartment is not impeded.

▶ Ensure that loads or objects cannot protrude out of the operator position during operation.

▶ Secure loads or objects against slipping and falling.

⚠ WARNING!

Operating the truck manually with several people in the operator position can result in injury.

If there are other people in the operator position apart from the operator during manual operation, it cannot be guaranteed that the whole of their bodies will remain within the geometry of the truck. As a result, collisions and injuries may occur.

▶ Apart from the operator, no other persons are allowed in the operator position during manual operation.

Procedure

- To enter and exit, hold on to the following components:
  - Hold on to the chassis (138).
  - Hold on to the handle (8).
  - Hold on to the control lever (10).
- Enter or leave the operator position (37).

Pedestrian crossings

⚠ WARNING!

Pedestrian crossings can be hazardous

Danger of collision with trucks in automatic mode when crossing over pedestrian crossings Trucks in automatic mode always have priority.

- ▶ Persons and trucks in automatic mode must also give way to trucks in automatic mode at pedestrian crossings.
- ▶ You may only cross over travel routes if there are no trucks in automatic mode on the pedestrian crossing.
- ▶ You may only cross travel routes on the pedestrian crossings.
- ▶ Cross over the pedestrian crossing at the shortest route across the direction of travel.

Trucks in automatic mode reduce speed before pedestrian crossings. They do not stop before pedestrian crossings but continue travelling at reduced speed. After a pedestrian crossing the trucks continue again at maximum speed.

➔ Pedestrians always have priority over trucks in manual mode at pedestrian crossings.

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

⚠ WARNING!

Truck defects can result in accidents

Do not use the truck if the brake system, steering, hydraulic system and/or faulty personal protection system (PPS) are defective or faulty.

If damage or other defects are discovered on the truck, attachment (special equipment) or laser scanners and sensors, the truck must be taken out of service until it has been repaired.

▶ Report any defects immediately to your supervisor.

▶ Tag out and remove the defective truck from service.

▶ The truck may only be put back into service after the defect has been traced and rectified.

Requirements

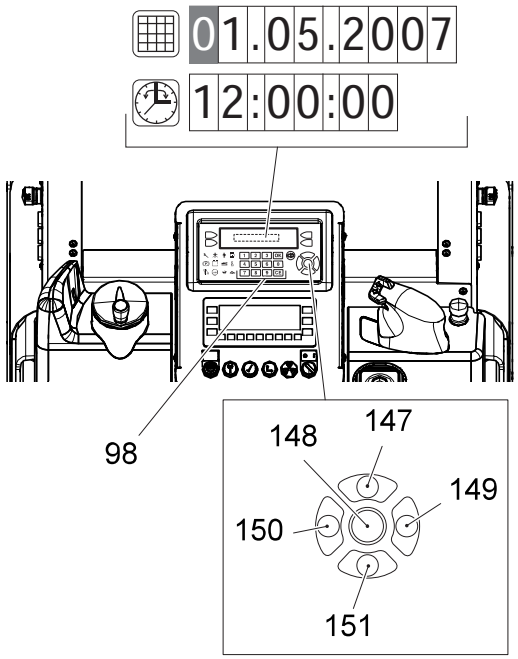
– Truck operational, see page 129.

Procedure

- Test warning indicators and safety equipment:
  - Test all emergency disconnect switches, see page 143.
  - Test the horn.
  - Test the dead man's switch.
  - Test the service and parking brake, see page 149.
  - Test the steering, see page 149. The maximum steer angle of ± 90 ° must be reached and shown on the driver's display.
  - Test the hydraulic system, see page 151.
  - Test the lift cut-offs (○), see page 189.
  - Test the travel functions, see page 145.
  - Test the travel cut-offs (○), see page 193.
  - Test the indicator lights.
  - Test the personal protection system, see page 215.
  - Check the front screens of the laser scanners of the personal protection system (○) for dirt and clean as required, see page 218.
- Test the controls and displays and check for damage, see page 82.
- Check the controls are automatically restored to their neutral position after being applied (e.g. the "hydraulic functions" control lever, dead man's switch).
- Carry out a reference run to adjust the height indicator, see page 133.

Date and time setting

Procedure



- Press the "Select" button (148) in the cursor field.

➔ The first digit of the date is displayed "dark".

- The operator can use the cursor keys (147,151) to choose the required setting in the selected field:
  - Cursor key (147): increase number.
  - Cursor key (151): decrease number.

➔ The required number can also be entered directly with the number field on the numerical keypad (98).

- Use the cursor keys (150,149) to select the next or previous field:
  - Cursor key (150): previous field.
  - Cursor key (149): one field forward.

➔ The selected field appears with a "dark" background.

- Press "OK" on the numerical keypad (98) to save the date and time settings.

4.13 Manual lifting and lowering of the load handler

⚠ WARNING!

Manual lifting and lowering can be hazardous

People can be injured in the hazardous area of the truck.
The hazardous area is defined as the area in which people are at risk from the truck movement, the load handler, attachments, etc. This also includes areas that can be reached by falling loads, operating equipment, etc.
Apart from the operator (in the normal operating position), no other people are permitted in the hazardous area of the truck.

- ▶ Instruct people to move out of the hazardous area of the truck. Stop using the truck immediately if people do not vacate the hazardous area.
- ▶ If people do not leave the hazardous area despite the warning, prevent the truck from being used by unauthorised people.
- ▶ Transport only loads that have been secured and positioned in accordance with regulations. Use suitable precautions to prevent parts of the load from tipping or falling down.
- ▶ Damaged loads must not be transported.
- ▶ Do not exceed the maximum loads specified on the capacity plate.
- ▶ Do not walk or stand underneath the raised load handler.
- ▶ Do not stand on the load handler.
- ▶ Do not pick up people.
- ▶ Do not reach or climb into moving truck parts.
- ▶ Do not climb onto parts of the building or other trucks.

5 Order picking and stacking

5.1 Adjusting the Forks (●)

⚠ 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.

⚠ WARNING!

Incorrect fork adjustments can cause accidents

To lift the load securely, the fork tines should be as far apart as possible and centrally positioned with respect to the fork carriage. The load centre of gravity must be centrally aligned between the forks.

⚠ WARNING!

Unsecured forks can cause accidents

The forks must be prevented from falling with the extension safety mechanisms (136). The truck must not be operated without an extension safety mechanism (136).

- ▶ Check the extension safety mechanisms (136) are present.
- ▶ Ensure the extension safety mechanisms (136) are secure.

5.2.8 Depositing a load in automatic mode

⚠ WARNING!

Deactivated sensors can cause accidents when travelling in the load direction

In order to pick up a load or enter a transfer station, the load-facing sensors or laser scanners must be deactivated in automatic mode. As the truck cannot detect obstacles during this time, the following conditions must be met:

- ▶ Do not stand in front of trucks in automatic mode if the trucks are transporting loads and travelling in the load direction.
- ▶ Hazardous areas must be clearly indicated.
- ▶ Only trained personnel are allowed to remain in hazardous areas for specific purposes (maintenance, troubleshooting).
- ▶ Block the hazardous areas during maintenance work and deactivate automatic mode.
- ▶ Do not reach through the mast.
- ▶ Notify all personnel working in the automatic mode area that the sensors have been deactivated.

NOTE

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

⚠ WARNING!

Trapping hazard when lowering the load

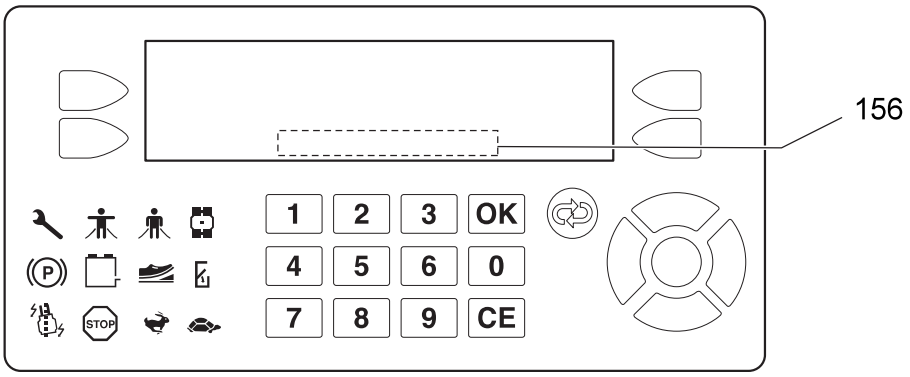
Despite the sensors in the load handler there remains a trapping hazard to third parties when the load is lowered

- ▶ Only trained personnel are allowed to remain in hazardous areas (e. g. transfer stations, pallet deposit areas) for specific purposes (maintenance, troubleshooting).

6.1.1 Troubleshooting (driver displays)

Event messages (E) and information messages (I)

Event messages and information messages are shown in the driver's display in the area (156).



6.5 Lower cutout override (○)

If local conditions require, an automatic lowering cut-off can be installed in the truck. The automatic lowering cut-off prevents the load handler from lowering after a certain lift height. The driver's display shows the "lowering cut-off override" symbol (160).

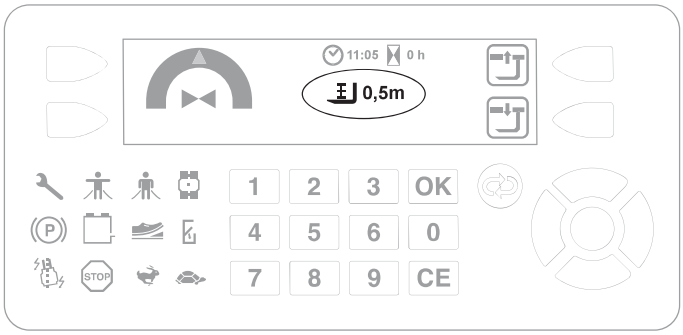
⚠ WARNING!

Placing the load handler can be hazardous

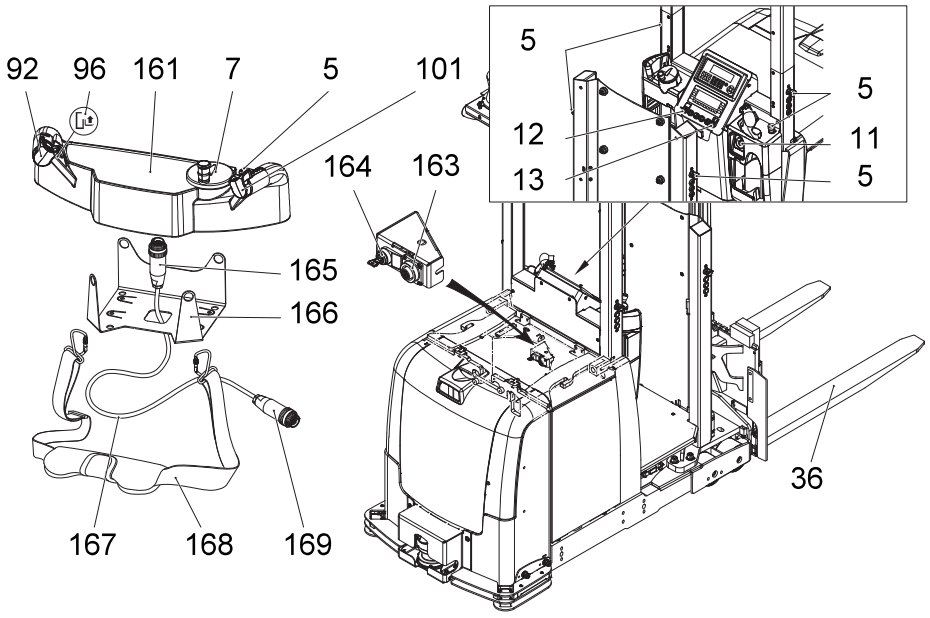
The lower cutout is an auxiliary function designed to support the operator which however does not release him from his responsibility to stop hydraulic operations e.g. when confronted with an obstacle.

- ▶ When the lower cutout has been de-activated the truck must be operated with extra care in order to detect obstacles when lowering the load handler.
- ▶ Stop lowering the load handler before you reach the obstacle.

Lower cutout only becomes effective after referencing has been carried out (see page 133). When referencing has been completed, the height actual value is shown in the driver's display.



6.7.5 Disconnect the external control panel from the truck after recovery



Requirements

– Load handler (36) fully lowered with the external control panel (161).

Procedure

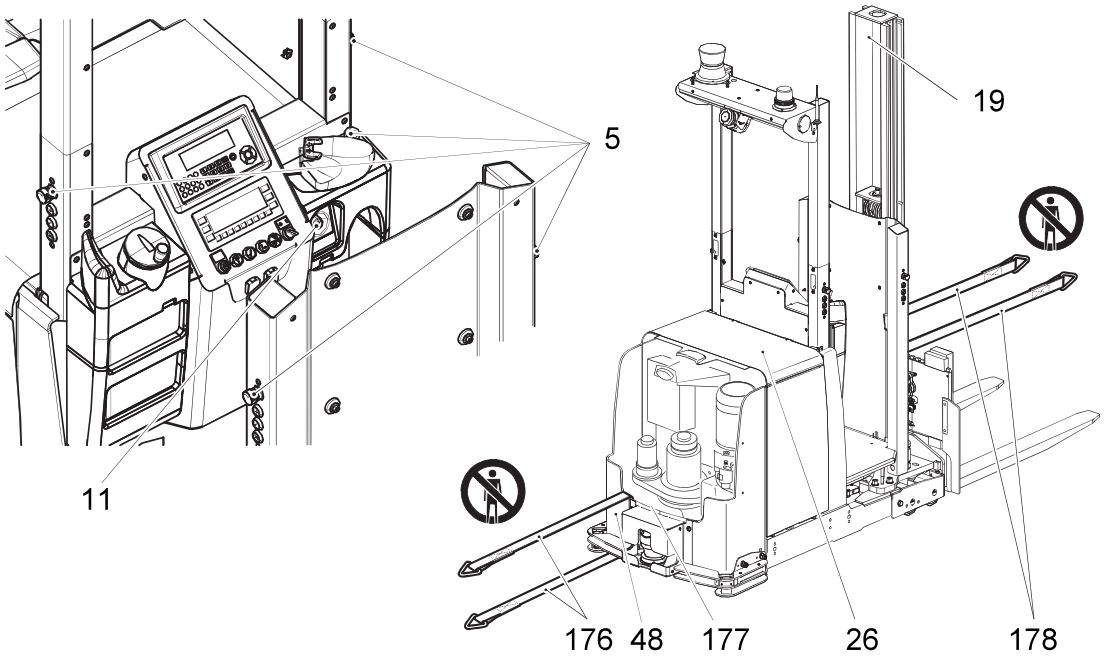
- To remove the electrical connection between the truck and the external control panel (161):
  - Remove the connector (169) from the terminal (163) above the battery compartment.
- To activate automatic mode:
  - Turn the key in the "Change mode" key switch (164) clockwise as far as it will go.
  - Remove the key from the "Change mode" key switch (164) above the battery compartment.

  The connection between the external control panel (161) and the truck is removed.

- Close the battery cover, see page 64.

Depending on the cause of the fault you can either carry on working with the truck or the fault will have to be removed:

- No information and / or event messages are shown in the display:
  - Re-align the truck, see page 155.
- No information and / or event messages are shown in the displays:
  - Park the truck securely, see page 159.
  - Rectify faults with the remedies outlined in the "Troubleshooting" section, see page 180.
  - If the fault cannot be rectified, inform your supervisor immediately and tag out and remove the truck from service.
  - The truck may only be started again once the fault has been localised and rectified.



Recovering the truck in the drive direction with or without a load

Requirements

– Load handler fully lowered, see page 151 or see page 185.
– Drive wheel brake released, see page 203.

Tools and Material Required

– Tow rope, tow force > 5 tonnes.

Procedure

- Switch off the truck, see page 130.
- Press one of the emergency disconnect switches (5).
- Open the battery panel (26).
- Disconnect the battery.
- Disassemble the drive compartment cover (28), see page 248.

NOTE

Risk of damage from the tow rope

Do not route the tow rope (176) around the tailgate (177) as the tailgate (177) is not designed for recovery operations.

Do not route the tow rope (176) over or around hydraulic hoses or electric cables.

- Route the tow rope (176) through the recess around the truck chassis (48) (see illustration).
- Recover the truck carefully and slowly in the drive direction.
- If the steer angle has to be changed during a recovery operation, brake until the truck comes to a halt:
  - Adjust the steer angle, see page 207.
- After recovery, secure the truck to prevent it from moving inadvertently, see page 203.

7.6 Daily checks before starting the Personal Protection System

– Check the front screens of the Personal Protection System laser scanner for contamination and clean as required (see page 218).

7.7 Personal safety system

7.7.1 No obstacles and / or persons detected

➔ Provided there are no persons and / or obstacles in the PPS warning or protection fields, the truck can travel at the maximum speed setting.

7.7.2 Obstacles and / or persons in the warning field

Requirements

– Automatic mode is activated on the truck, see page 136.
– Truck is aligned, see page 155.
– Truck has received the order from the central computer.

➔ A warning field infringement is not shown in the displays. Warning field infringements can be identified through a speed reduction to 2,5 km/h.

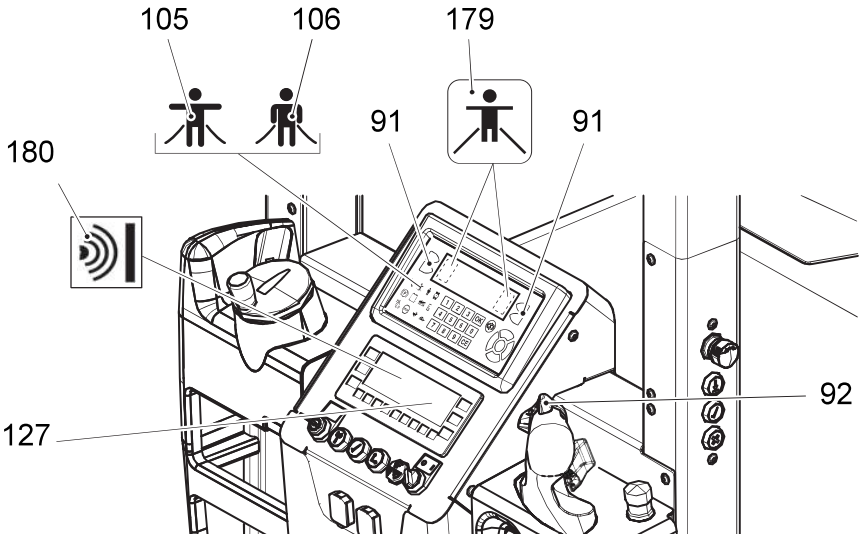
Obstacles and / or persons in the PPS warning field:

– The travel speed is restricted to 2,5 km/h.

The obstacle or person are no longer in the warning field:

– The truck can travel again at the maximum enabled speed.

7.7.3 Obstacles and / or persons in the protection field

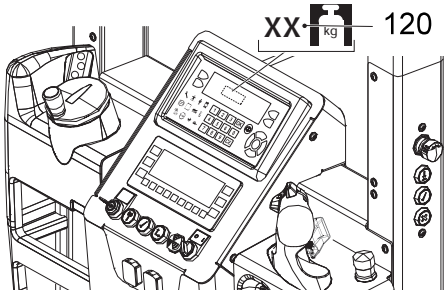


➔ Protection field infringements are displayed via the "protection field infringement" symbol (179) and the displays (105,106) flash alternately. For protection field infringements the truck also brakes to a halt.

➔ A protection field infringement is shown in the automatic component display by the "Sensor stop" symbol (180) and by an event message (127). For protection field infringements the truck also brakes to a halt.

8.7 Weighing system (○)

The truck can be fitted with a weighing system as an option. When the load has been raised slightly with the load handler, the weight is shown on the driver's display in kg (120), see page 153.



NOTE

The weigher is not a substitute for calibrated scales.

8.7.1 Tare function (○)

The weighing system can optionally be equipped with tare function. The tare function sets the weigher display to zero.

2.6 Attachment Repairs and Inspection

⚠ WARNING!

A faulty attachment can be hazardous

Check the attachment daily for external signs of damage or defects. Faulty attachments can cause the load to fall.

▶Report any defects immediately to your supervisor.

▶Tag out and decommission a faulty lift truck.

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

Procedure

- Check all fuses (184-190) in accordance with the "fuse rating" table below and replace as required.
  - Using the slotted screwdriver turn each fuse (184-190) anticlockwise out of the controller (191).
  - Pull the fuses (184-190) and their brackets out of the controller (191).
  - Check the fuses (184-190) in accordance with the following table and replace as required.
  - Insert the fuses (184-190) and their brackets into the controller (191).
  - Using the slotted screwdriver turn each fuse (184-190) clockwise into the controller (191).
- Assemble the drive compartment cover, see page 248.

Cleaning the truck

Requirements

– Prepare the truck for maintenance and repairs (see page 246).

Tools and Material Required

– Water-based solvents
– Sponge or cloth

Procedure

- Clean the surface of the truck with water-based solvents and water. Use a sponge or cloth to clean.
- In particular, clean the following areas:
  - Windows
  - All walk-on areas
  - Oil filler ports 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 267).

The truck is now clean.

7 Final de-commissioning, disposal

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

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

8 Human vibration measurement

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