

EKM 202 - 300 T

10.18

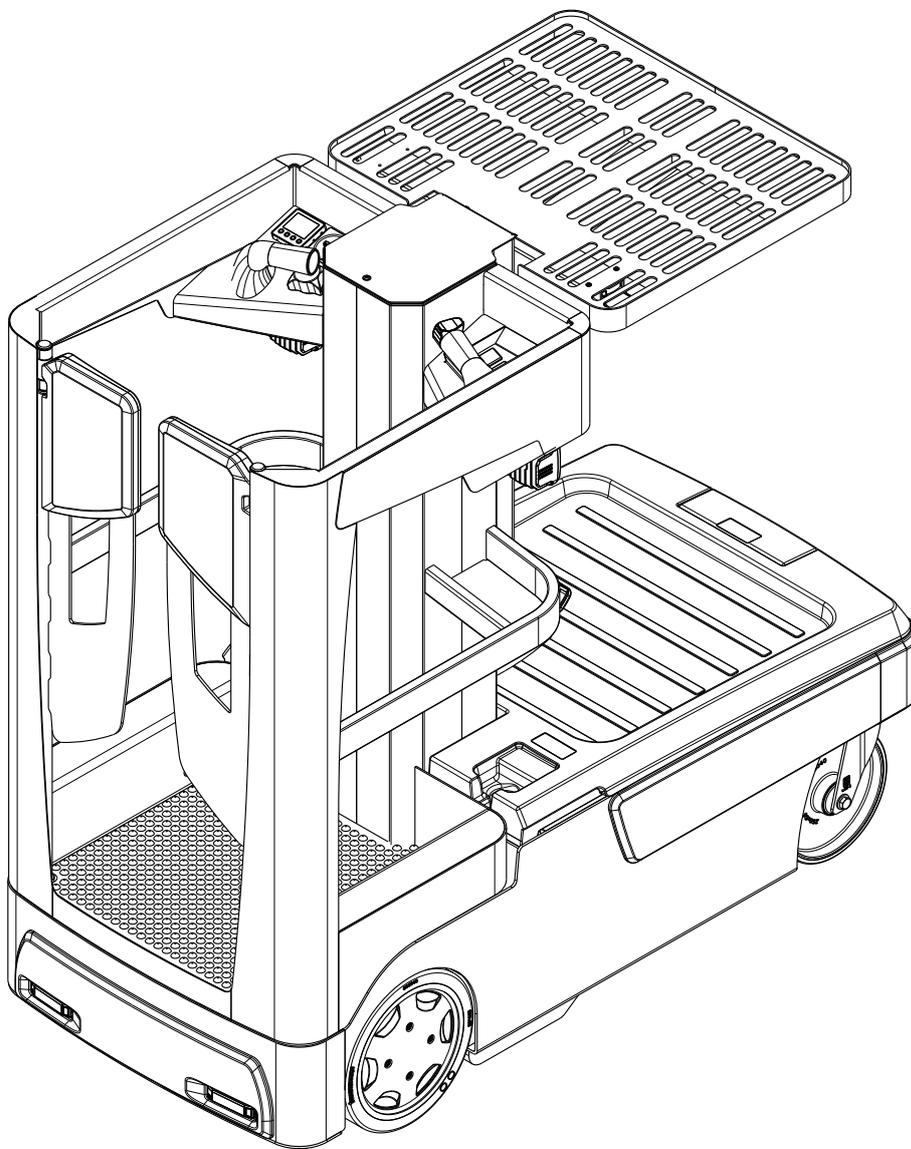
Operating instructions

en-GB

51663473

01.21

EKM
202 - 300 T



**JUNGHEINRICH**

Declaration of Conformity



Jungheinrich AG, Friedrich-Ebert-Damm 129, D-22047 Hamburg
Manufacturer or agent operating in the European Union

Type	Option	Serial No.	Year of manufacture
EKM 202			

Additional information

On behalf of

Date

en-GB EC Declaration of Conformity

The undersigned hereby declare that the Mobile Elevating Work Platform (MEWP) described below in detail complies with the European Directives 2006/42/EG (Machinery Directive) and 2014/30/EU (Electromagnetic Compatibility - EMC) including amendments as well as the legislative decree to incorporate the Directives into national law. The signatories are in each case individually authorised to compile the technical documents.

Foreword

Notes on the operating instructions

The present ORIGINAL OPERATING INSTRUCTIONS are designed to provide the knowledge necessary for the safe operation of the mobile elevating work platform (MEWP). The information is presented in a precise and clear manner. The chapters are arranged by letter and the pages are numbered continuously.

The operating instructions describe different truck versions. When operating and carrying out maintenance on the truck, make sure that the related description applies to your truck type.

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

Safety notices and text mark-ups

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

DANGER!

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

WARNING!

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

CAUTION!

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

NOTICE

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

 Used before notices and explanations.

	Indicates standard equipment
	Indicates optional equipment

Copyright

Copyright of these operating instructions remains with JUNGHEINRICH AG.

Jungheinrich Aktiengesellschaft

Friedrich-Ebert-Damm 129
22047 Hamburg - Germany

Tel: +49 (0) 40/6948-0

www.jungheinrich.com

Contents

A	Correct Use and Application	11
1	General	11
2	Correct application	11
3	Approved application conditions	13
4	Proprietor responsibilities	14
5	Adding attachments and/or optional equipment	14
B	Truck Description	15
1	Application	15
2	Travel direction definition	16
3	Assemblies and Functional Description	17
3.1	Assembly Overview	17
3.2	Functional Description	20
4	Technical Specifications	23
4.1	Performance data	23
4.2	Dimensions	24
4.3	Weights	25
4.4	Tyre type	25
4.5	EN norms	26
4.6	Specifications according to RED guideline (Radio Equipment Directive) for radio units	27
4.7	Conditions of use	27
5	Identification Points and Data Plates	28
5.1	Indication Points	28
5.2	Brief instructions	30
5.3	Data plate	31
5.4	Wind loads	31
6	Stability	32
C	Transport and Commissioning	33
1	Transport	33
2	Using the Truck for the First Time	35
2.1	Moving the MEWP without a Battery	35
D	Battery - Servicing, Recharging, Replacement	37
1	Safety instructions for handling lead-acid batteries	37
1.1	General notes on handling batteries	39
2	Battery types	40
3	Lithium-ion battery	41
3.1	General	41
3.2	Approved application conditions	41
3.3	Identification points and data plates	41
3.4	Technical Specifications	44
3.5	Safety regulations for handling lithium-ion batteries	45
3.6	Battery lifetime and maintenance	46
3.7	Operation	46
3.8	Troubleshooting	49

3.9	Storage, Disposal and Transport.....	54
4	Charging the battery.....	58
5	Battery removal and installation.....	61
E	Operation	65
1	Safety regulations for the operation of mobile elevating work platforms.....	65
2	Displays and Controls.....	67
2.1	Display unit (2 inch display).....	68
3	Preparing the MEWP for Operation.....	77
3.1	Checks and Operations to Be Performed Before Starting Daily Work.....	77
3.2	Entry and exit.....	77
3.3	Preparing the truck for operation.....	80
3.4	Checks and operations to be carried out when the truck is operational..	81
3.5	Parking the MEWP securely.....	82
4	Working with the MEWP.....	84
4.1	Safety regulations for truck operation.....	84
4.2	Emergency Disconnect.....	89
4.3	Emergency control and 2nd operator platform.....	91
4.4	Emergency lowering.....	94
4.5	Travel.....	96
4.6	Steering.....	99
4.7	Brakes.....	100
4.8	Raising or lowering the MEWP.....	102
4.9	Raising or lowering the storage table.....	105
5	Troubleshooting.....	108
5.1	The MEWP does not move.....	109
5.2	Cannot raise the work platform.....	110
5.3	Storage table cannot be raised.....	110
6	Moving the MEWP without its own drive.....	111
7	Optional equipment.....	113
7.1	Keyless Access System.....	113
7.2	General Information about the Use of Keyless Access Systems.....	114
7.3	Commissioning the Keypad and the Transponder Reader.....	114
7.4	Using the Display:	117
7.5	Operating the transponder reader.....	122
7.6	ISM access module (○).....	126
7.7	Warning Zone Light.....	126
7.8	Narrow Aisle Operation.....	129
F	Maintenance of the MEWP	131
1	Spare Parts.....	131
2	Operational Safety and Environmental Protection.....	131
3	Maintenance Safety Regulations.....	133
3.1	Working on the electrical system.....	134
3.2	Consumables and used parts.....	134
3.3	Wheels.....	134
3.4	Hydraulic system.....	135
4	Lubricants and Lubrication Schedule.....	136
4.1	Handling consumables safely.....	136
4.2	Lubrication Schedule.....	138
4.3	Consumables.....	139
5	Maintenance and repairs.....	140

5.1	Preparing the MEWP for maintenance and repairs	140
5.2	Removing and installing the battery panel.....	140
5.3	Preventing the Operator Platform from Accidentally Lowering.....	141
5.4	Check lowering cut-off.....	142
5.5	Cleaning.....	143
5.6	Check wheel attachment and wear.....	147
5.7	Checking the hydraulic oil level.....	148
5.8	Checking electrical fuses	150
5.9	Putting back into service after maintenance and repair work.....	152
6	Decommissioning the MEWP.....	153
6.1	Prior to decommissioning.....	153
6.2	Action to be taken during decommissioning.....	153
6.3	Putting the MEWP back into service after decommissioning.....	153
7	Safety tests to be performed at intervals and after unusual incidents.....	154
8	Final de-commissioning, disposal.....	154
9	Human vibration measurement.....	154
G	Maintenance, Inspection and Changing of Maintenance Parts Requiring Replacement.....	155
1	Maintenance Contents EKM 202.....	155
1.1	Owner.....	155
1.2	Customer Service.....	158

A Correct Use and Application

1 General

The mobile elevating work platform must be used, operated and serviced in accordance with the present operating instructions. Any other type of application is considered improper use and may result in injuries to personnel and damage to the MEWP or other property.

2 Correct application

NOTICE

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

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

- Raising and lowering by the operator on the operator platform.
- Transporting small items on the storage table.
- Travel with the platform raised or lowered.
- Travel in indoor areas.
- Travel on even ground.
- Order picking of goods.
- Maintenance work.

The following operations / reasonably foreseeable incorrect applications are prohibited:

- Lifting and carrying people, with the exception of the driver on the operator platform.
- Pushing or pulling loads.
- Travel on uneven ground.
- Travel in outdoor areas.
- Several changes of direction in quick succession.
- Towing a trailer.
- Transporting suspended loads
- Transporting swaying loads

⚠ CAUTION!

Risk of tipover due to wind forces

Wind forces affect the operational stability of the MEWP.

- ▶ The MEWP is intended only for indoor applications.
 - ▶ If wind forces occur during an indoor application (e.g. if warehouse gates are opened), operation is to be suspended until the wind forces have subsided.
-

Operation in areas open to the public

⚠ WARNING!

Risk of injury to third parties if the truck is operated in areas open to the public.

- ▶ If operated in areas open to the public, the MEWP must be driven and operated only by trained operators or drivers.
 - ▶ If the situation becomes too confusing due to the presence of the public, the owner must instruct the public to allow space in order to avoid potential accidents. If necessary, the operator must work in co-operation with a marshaller who directs people away from the hazardous area and warns the operator if anyone is still present in the hazardous area.
 - ▶ People must be warned not to work under, stand under or walk through a raised operator platform.
-

➔ For shearing and crushing points see page 28

3 Approved application conditions

- Operation in industrial and commercial environments.
- Operation only on secure, level surfaces with sufficient capacity.
- Do not exceed the permissible surface and point loading limits on the travel paths.
- Operation only on travel paths that are visible and approved by the operating company.
- Negotiating slopes up to a maximum of 3° with a lowered working platform.
- Do not travel across or at an angle on slopes. Travel with the load facing uphill.

⚠ WARNING!

Operation under extreme conditions

Operating the truck under extreme conditions can result in malfunctions and accidents.

- ▶ Special equipment and authorisation are required if the MEWP is to be used in extreme conditions, especially in dust-laden or corrosive environments.
- ▶ Operation in explosive atmospheres is not permitted.

The MEWP must be used exclusively in industrial and commercial environments. The truck must be parked and secured only in indoor areas.

- Permissible temperature range +5 °C to +25 °C.
- Secure parking is only permissible at +5 °C to +25 °C.
- Maximum air humidity 95% non-condensing.
- Do not charge the battery below +5 °C.

4 Proprietor responsibilities

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

The operating company must ensure that the MEWP is used only for the purpose it is intended for and that danger to life and limb of the operator 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 operators have read and understood these operating instructions.

NOTICE

Failure to comply with the operating instructions shall invalidate 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 extends the functionality of the MEWP requires prior permission in writing from the manufacturer. Local-authority approval may also need to be obtained.

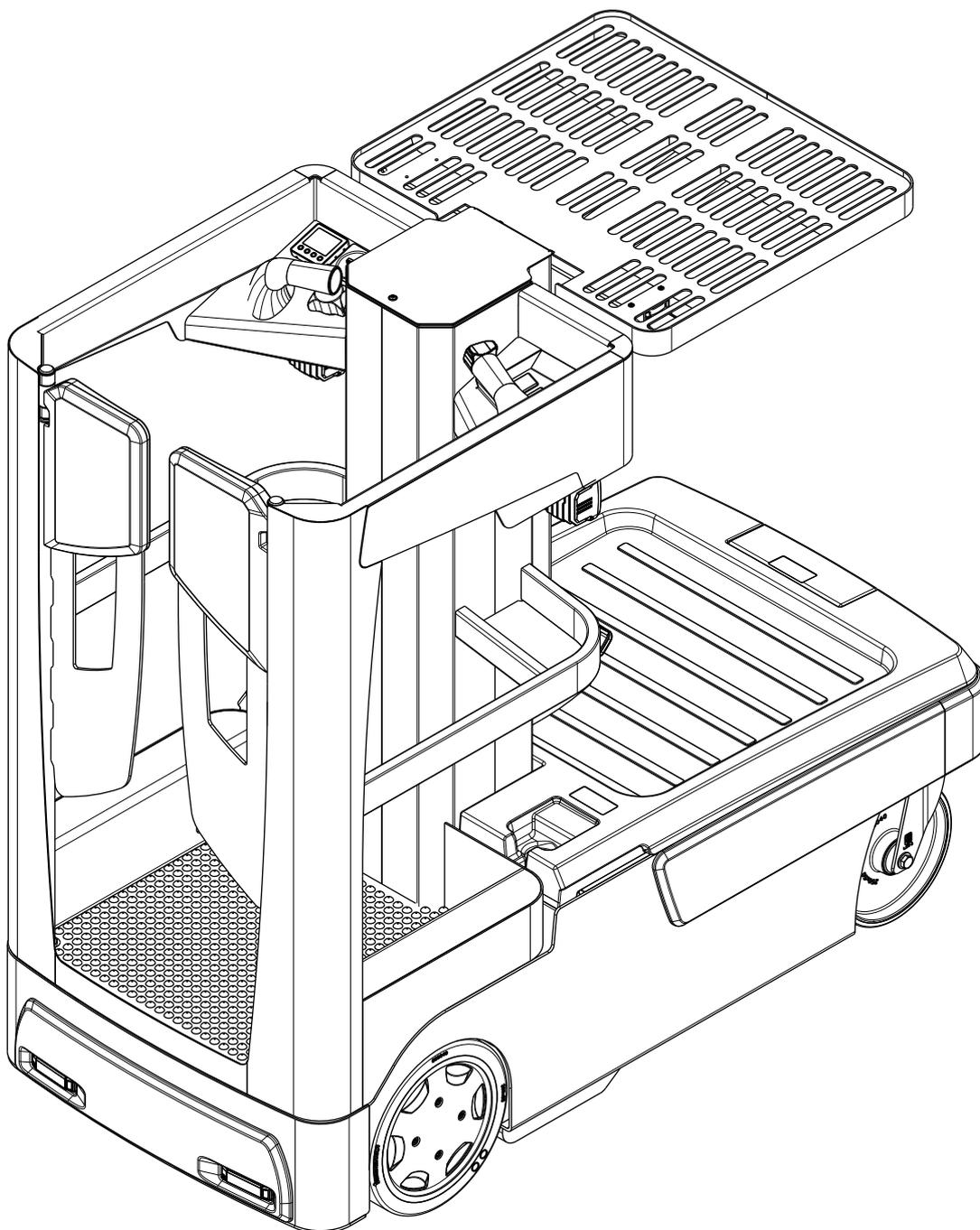
Local authority approval, however, cannot take the place of the manufacturer's approval.

B Truck Description

1 Application

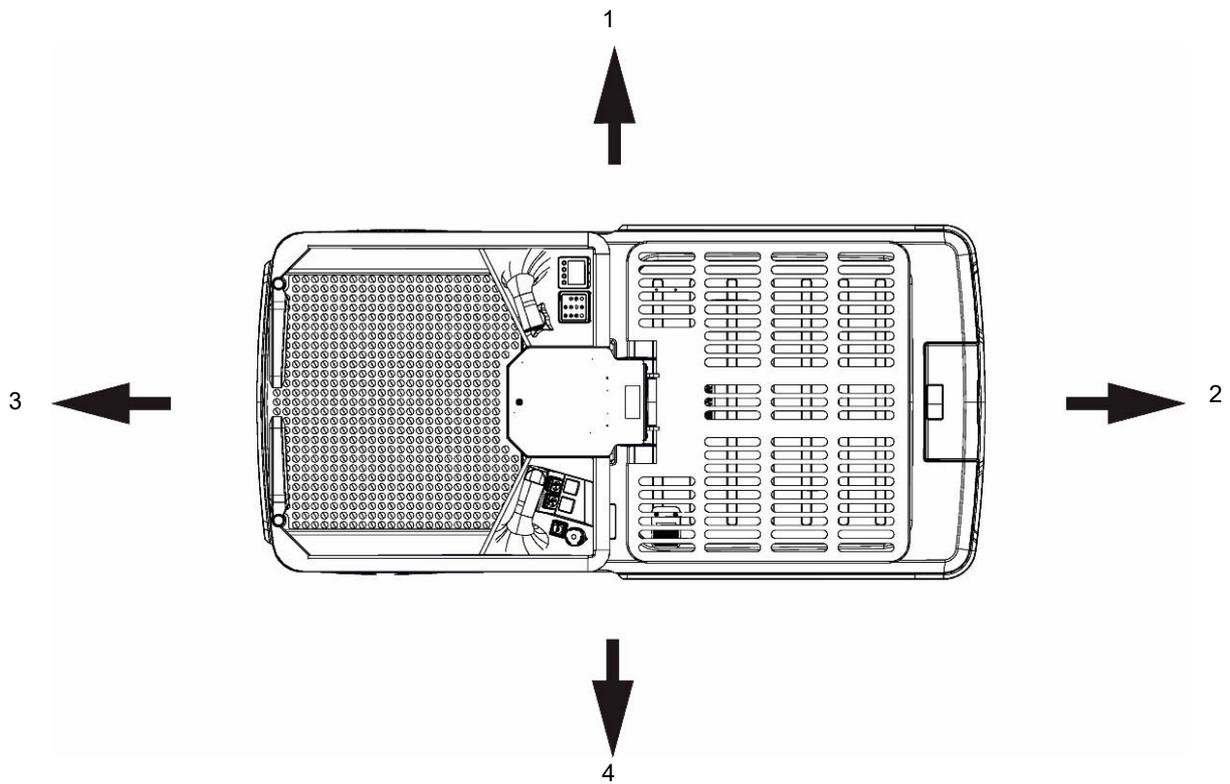
The MEWP is a small items orderpicker and is intended for operation on level ground. Small items can be placed and carried on the storage table. The low overall height and platform height allow it to be driven through doorways. The low net weight means that it can travel on lifts.

The rated capacity is indicated on the data plate or the Qmax capacity plate.



2 Travel direction definition

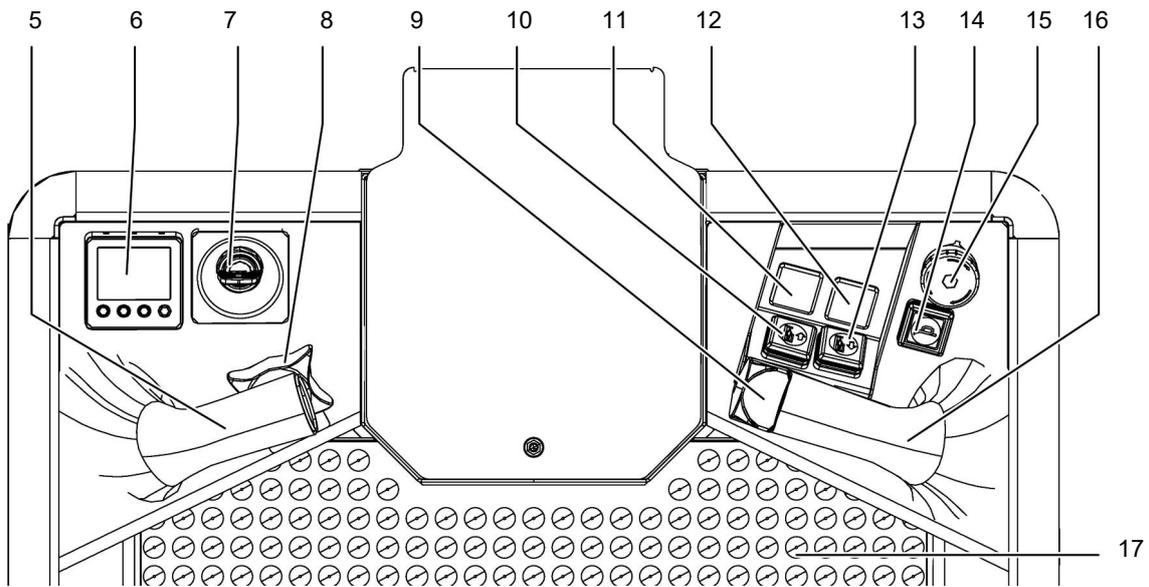
The following determinations have been made for travel direction specification:



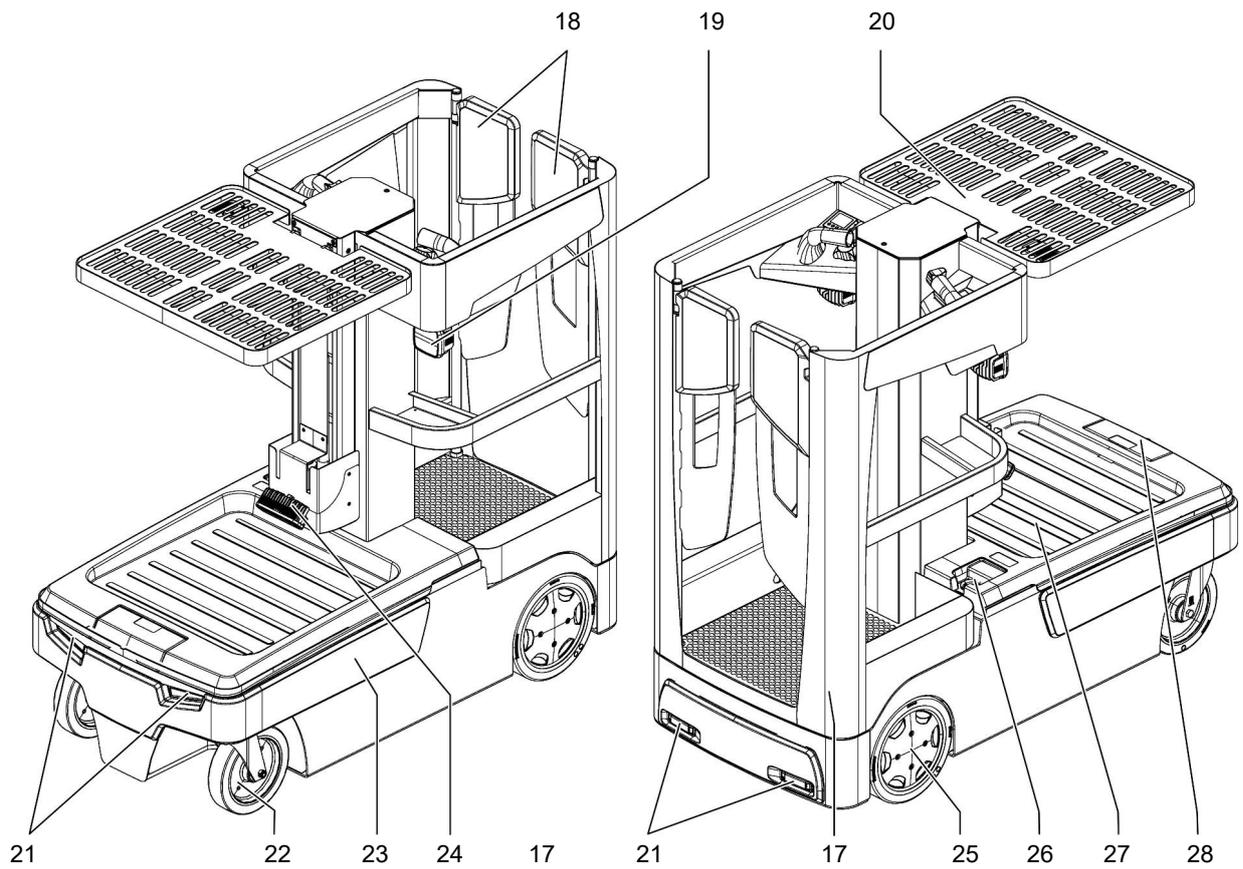
Item	Travel direction
1	Left
3	Reversing/drive direction
2	Forward/load direction
4	Right

3 Assemblies and Functional Description

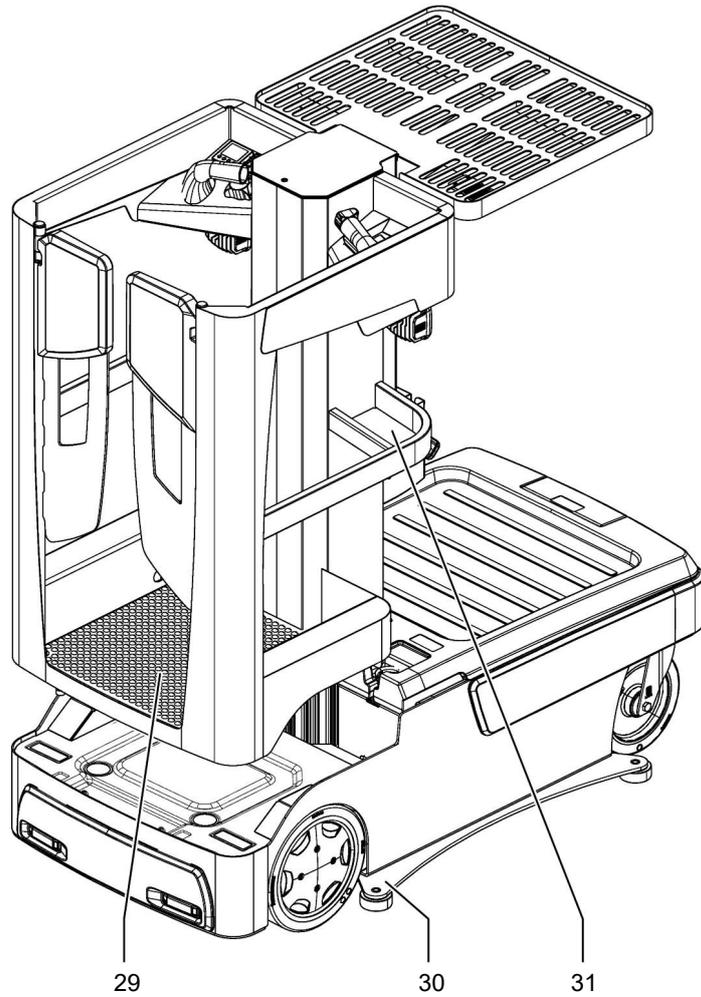
3.1 Assembly Overview



Item	Description	Item	Description
5	● Handle (left, capacitive)	9	● Travel direction rocker/service brake
6	● Control/display unit	10	● "Raise operator platform" button
7	● Key switch	11	○ "Raise storage table" button
	○ Transponder	13	● "Lower operator platform" button
	○ Keypad	12	○ "Lower storage table" button
	○ Easy Access storage compartment	14	● "Warning signal (horn)" button
	○ ISM access module	15	● Emergency disconnect switch
8	● Steering rotary switch	16	● Handle (right)



Item	Description	Item	Description
18	● Operator platform doors	24	○ Warning protection light
19	○ Work lights	17	● Operator platform/working platform
20	● Storage table (with manual height adjustment)	25	● Drive wheel
	○ Storage table (with electric height adjustment)		
21	● Reflectors	26	● Mains plug
	○ Lighting "Flasher" warning system	27	● Battery panel/lower storage facility
22	● Support wheel	28	● Emergency mode control
23	● Skirt		



Item		Description	Item		Description
29	●	Pressure-sensitive mat (deadman switch)	31	●	Storage compartment
30	○	Rail guidance			

3.2 Functional Description

Safety equipment

The enclosed and smooth geometry with rounded edges ensures safe handling of the MEWP. The operator on the operator platform is surrounded by a handrail.

Doors must always be kept closed when the work platform is raised. It is also possible to install a door lock (○) that can only be opened when the operator platform has been lowered fully.

An optional acoustic signal sounds during travel, when the MEWP is being raised and lowered or when the doors are opened.

In the raised position, a pressure-sensitive switch monitors the area between the drive system and the operator platform. If the area is occupied (e.g. by an object or person), lowering is stopped.

Activating the emergency disconnect switch rapidly cuts out all electrical functions in hazardous situations.

Emergency Stop safety feature

The emergency stop is activated by the traction controller. Each time the MEWP is switched on, the system performs a self-diagnosis. The steering controller sends a system status signal, which is monitored by the traction controller. If the signal fails to appear or a fault is identified, the MEWP automatically brakes to a halt. Event messages on the display unit indicate the emergency stop.

CAUTION!

The MEWP brakes automatically

If the system detects that the required signals have not been received, or detects an error, the system responds with an emergency stop and brakes the MEWP until it stops or until a valid signal status has been reached.

Hydraulic system

Pressing the lifting button starts the pump unit, supplying hydraulic oil from the oil reservoir to the lift cylinder. Pressing the lift button raises the operator platform at a constant speed; pressing the lower button lowers the operator platform.

Operator platform

The MEWP is equipped with an operator platform. The travel functions are enabled only if the operator is standing on the operator platform, both hands are on the handles, and the doors are closed.

Drive system

Two maintenance-free AC three-phase motors power the drive wheels through the transmission. The electronic traction controller ensures stepless speed regulation of the drive motors and hence smooth starting, powerful acceleration, and electronically controlled braking with energy recovery.

Braking system

The operator can brake gently and wear-free by pulling back the travel control knob. This feeds energy into the battery (service brake).

The electromagnetic spring pressure brake acting on the drive motor serves as both parking and handbrake. The parking brake is electrically released and actuated through spring pressure.

Steering

The electric steering is operated through a rotary switch near the left handle. Steering movements are performed by varying the rotational speeds of the two drive motors.

Electric steering

The electric steering system is self-monitoring. The steering controller checks the steering system continuously. If an error is detected, the traction controller interrupts travel mode (emergency stop) and brakes until the truck comes to a halt. The parking brake then engages.

When the Emergency Stop or Emergency Disconnect are activated steering functions are disabled until the system is reset.

Electrical System

The MEWP is equipped with electronic drive and lift control. The electrical system of the MEWP has an operating voltage of 24 Volt.

Controls and displays

Ergonomic controls ensure fatigue-free operation for sensitive application of travel operations. The display unit (2-inch display) shows the operator key information such as the travel program, service hours, battery capacity and event messages.

One-hand operation

The MEWP is equipped with one-hand operation, which can be activated via a button on the control and display unit, see page 70. If this button is pressed, only one hand needs to be on the handles for operation.

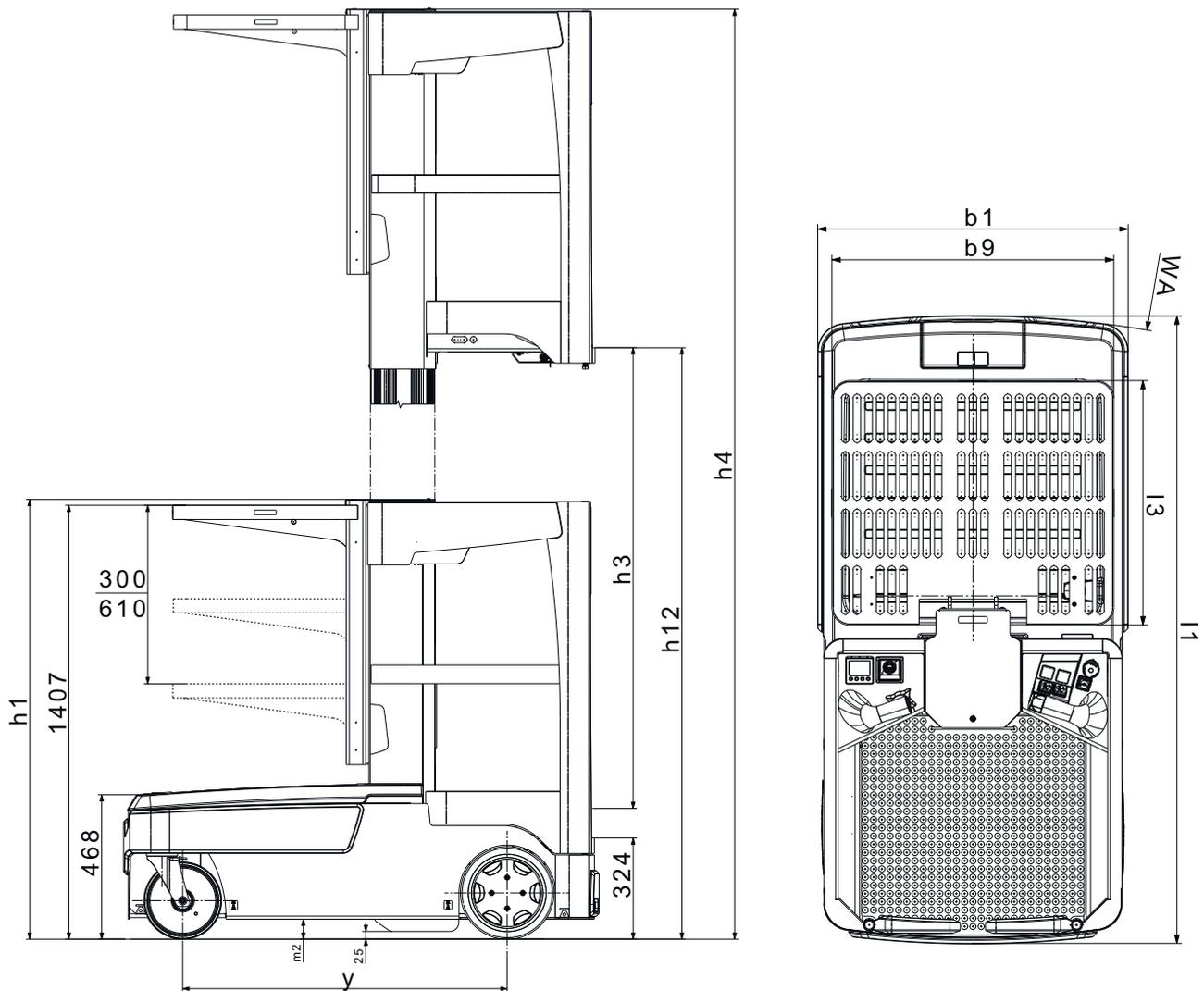
- ➔ When one-hand operation is activated, the MEWP travels at a speed of 1,6 km/h.

4 Technical Specifications

4.1 Performance data

	Description	EKM 202 - 300 T	
Q	Rated capacity (max. 1 person (max. 135 kg))	215	kg
	Storage table capacity	100	kg
	Capacity of battery-cover storage facility	115	kg
	Maximum permitted manual force	200	N
	Maximum permitted wind speed ¹	0	m/s
	Permissible tilt when operator platform is raised	2	°
	Travel speed Load direction/drive direction	8 / 4	km/h
	Operator platform lift speed	0.25	m/s
	Operator platform lowering speed	0.21	m/s
	Lift speed, work table with/without rated load	80	mm/s
	Lowering speed, work table with/without rated load	80	mm/s
	Max. gradeability (5 min.) with/without load with lowered operator platform	15 / 15	%
	Drive motor	2 x 0.5	kW
	Lift motor Output S3 10 %	2.2	kW
	Service brake	Inversion/regenerative	
	Parking brake	Magnetic brake	
	Traction controller type	AC traction controller	
	Drive system	Electric	
	Steering	Electric	
¹⁾ Only permitted for use in enclosed areas.			

4.2 Dimensions



Description		EKM 202 - 300 T	
l_1	Overall length	1528	mm
l_3	Platform length	595	mm
b_1/ b_2	Overall width	750	mm
b_9	Platform width	681	mm
h_1	Mast height retracted	1433	mm
h_3	Lift	3000	mm
h_4	Mast height extended	4433	mm
h_7	Platform height	324	mm
h_{12}	Platform height, raised	3324	mm
W_a	Turning radius	1250	mm
	Storage table lift, manual/electric height adjustment	290/610	mm
	Battery panel top edge to floor	468	mm
	Picking height	5331	mm

4.3 Weights

Description	EKM 202 - 300 T	
Net weight incl. battery (standard)	660	kg
Front axle load with load incl. battery	410	kg
Rear axle load with load incl. battery	600	kg
Front axle load without load incl. battery	250	kg
Rear axle load without load incl. battery	410	kg

4.4 Tyre type

⚠ WARNING!

Accident risk from incorrect wheel disassembly/assembly

- ▶ The load wheels/drive wheel may only be disassembled or assembled by the manufacturer's customer service department, which has been specially trained to do this. In exceptional cases, this task may be performed by a customer service department authorised by the manufacturer.

⚠ CAUTION!

Risk of accident due to uneven wear of the wheels

The quality of the wheels affects the operational stability and driving behaviour of the MEWP. Uneven wear affects the stability of the MEWP and lengthens the stopping distance.

- ▶ When replacing wheels, make sure the MEWP is not skewed.
- ▶ Always replace wheels in pairs (left and right).

Description		EKM 202 - 300 T	
Tyre size, drive system	●	300 x 65	mm
Tyre size, support wheels	●	250 x 50	mm
Tyre size, support wheels → With rail guidance option	○	200 x 50	mm
Wheels, number front/rear (x = driven)	●	2/2x	

4.5 EN norms

Continuous sound pressure level

- Mobile elevating work platform: 60 dB(A)

in accordance with EN 12053 as harmonised with ISO 4871.

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

Vibration

- Mobile elevating work platform: 1,81 m/s²

in accordance with EN 13059

- In accordance with standard procedures, the vibration acceleration acting on the body in the operating position is the linearly integrated, weighted acceleration in the vertical direction. It is calculated when travelling over thresholds at constant speed. These measurements were taken on a single occasion and must not be confused with the human vibrations of the "2002/44/EC/Vibrations" operator directive. The manufacturer offers a special service to measure these human vibrations, see page 154.

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!

Medical equipment can be damaged by non-ionised radiation

Electrical equipment on the MEWP emitting non-ionising radiation (e.g. wireless data transmission) can affect medical equipment (pacemakers, hearing aids etc.) carried by the operator, and result in malfunctions. Consult a doctor or the manufacturer of the medical equipment to determine whether it can be used near the MEWP.

4.6 Specifications according to RED guideline (Radio Equipment Directive) for radio units

- The table contains any components installed according to the European Directive 2014/53/EU. The table shows the affected frequency range and the emitted transmission power for each component.

Component	Frequency range	Transmission power
Radio module (ISM Online)	433,05 - 434,79 MHz	< 10 mW
Gateway (ISM Online)	433,05 - 434,79 MHz	< 10 mW
Gateway (ISM Online)	GSM 850/900 MHz	2 W
Gateway (ISM Online)	GSM 1800/1900 MHz	1 W
Access module (ISM Online)	13,56 MHz	< 100 mW
Gateway (ISM Online)	LTE 850/900 MHz	3,2 W (35 dBm)
Gateway (ISM Online)	LTE 1800/1900 MHz	1,6 W (32 dBm)

4.7 Conditions of use

Ambient temperature

- operating at +5 °C to +25 °C

- Special equipment and authorisation are required if the MEWP is to be used continually in conditions where there are extreme temperature fluctuations and condensing air humidity.
- Use in a cold store is prohibited.

⚠ WARNING!

Risk of accident due to use in extreme conditions

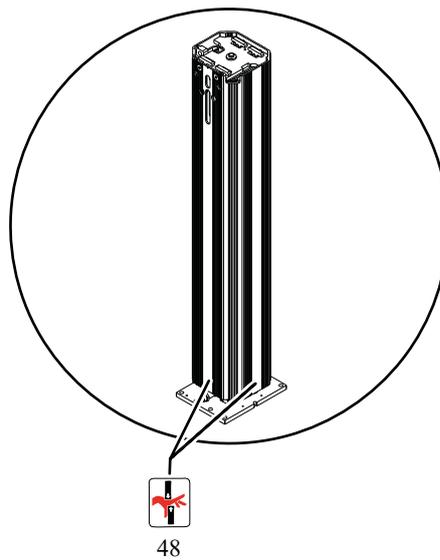
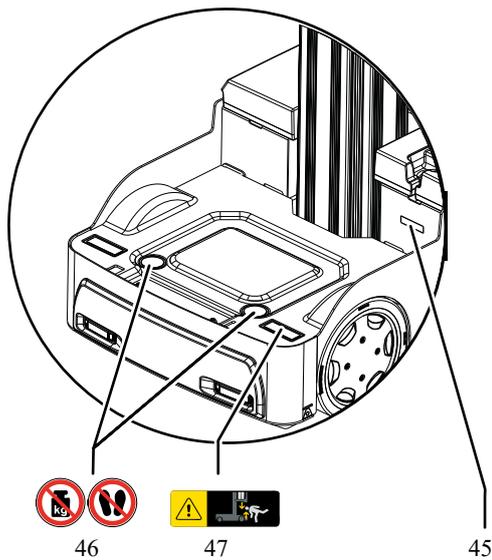
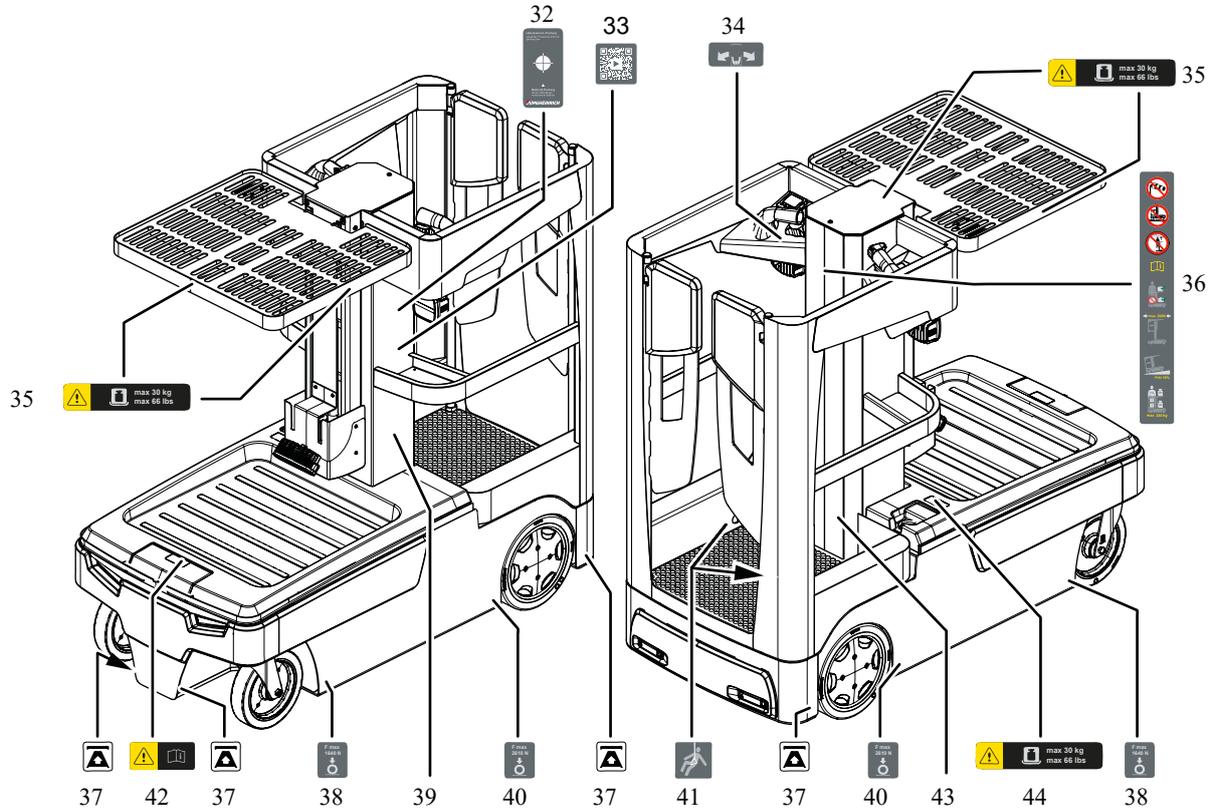
Operating the MEWP under extreme conditions can result in malfunctions and accidents.

- ▶ The MEWP requires special equipment and authorisation for applications under extreme conditions, such as dust-laden or corrosive environments.
- ▶ Use in areas where there is a risk of explosion is prohibited.
- ▶ Use near unprotected active components of electrical equipment is prohibited.

5 Identification Points and Data Plates

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

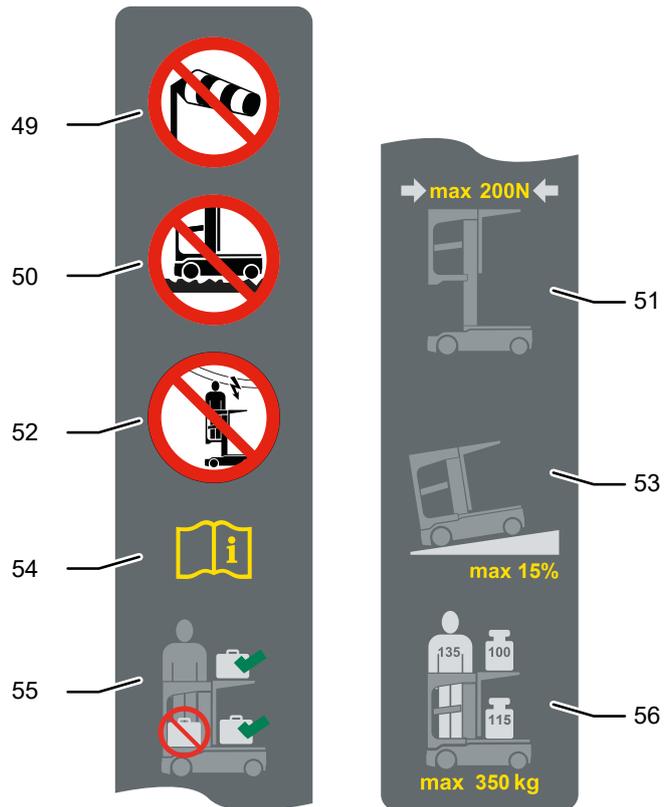
5.1 Indication Points



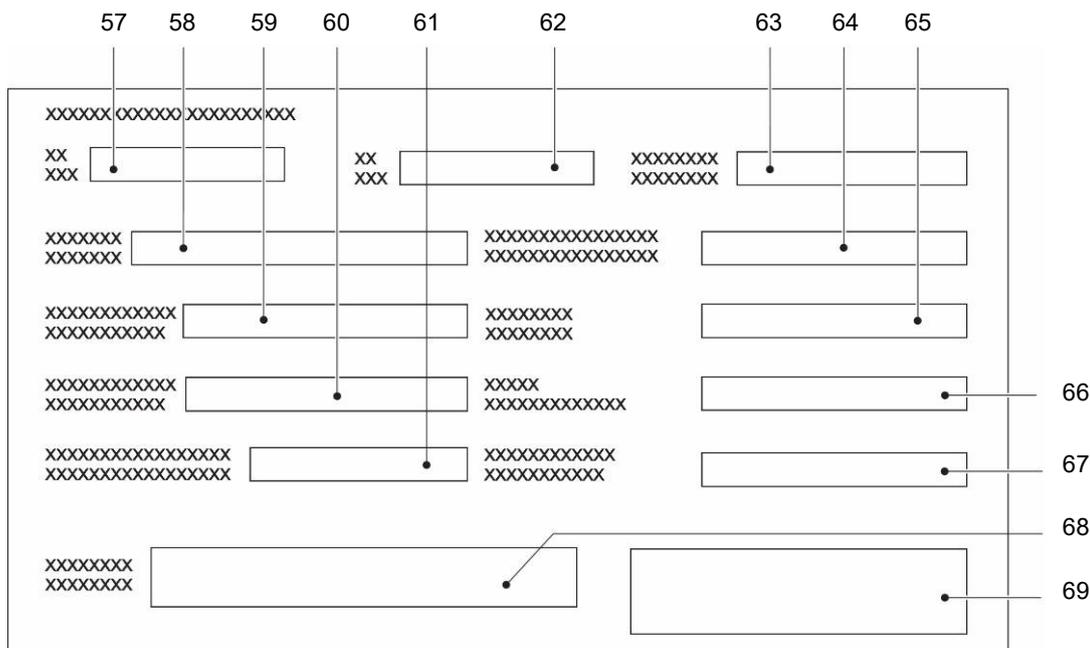
Item	Designation
32	Inspection plaque
33	Information sign: "QR code"  The QR code contains a short online video on the basic functions of the MEWP.
34	Information sign: "Steering"
35	Warning: "Maximum load" 100 kg / 220 lbs
36	Information sign: "Mast"
37	Jacking points
38	Information sign: "Steering wheel support force"
39	Truck designation
40	Information sign: "Drive wheel support force"
41	Attachment point for personal restraint systems
42	Warning: "Observe the operating instructions"
43	Data plate see page 31
44	Warning: "Maximum load" 115 kg / 253 lbs
45	Serial number of the MEWP
46	Information signs: "Do not stand on this area!" and "No loads on this area!"
47	Warning notice: "Danger of crushing by platform"
48	Warning notice: "Trapping hazard"  4 times each mast stage

5.2 Brief instructions

Item	Description
49	No operation permitted in wind.
50	No operation permitted on uneven ground.
52	Maintain clearance to the ceiling. – No operation permitted under power lines.
54	Observe the operating instructions.
55	Carrying loose objects: – no loose objects may be carried on the operator platform. – Secure objects against falling.
51	Maximum manual force
53	Maximum slope with lowered operator platform
56	Maximum load. – Maximum operator weight – Maximum load on the storage table



5.3 Data plate



Item	Description	Item	Description
57	Type	64	Year of manufacture
58	Chassis inclination angle	65	Manual force in N
59	Rated capacity (1 person) in kg	66	Rated capacity (lower storage facility) in kg
60	Rated capacity (storage table) in kg	67	Wind speed
61	Net weight without load in kg	68	Manufacturer
62	Option	69	Manufacturer's logo
63	Serial number		

→ For queries regarding the MEWP or ordering spare parts, always quote the serial number (63).

5.4 Wind loads

Wind forces affect the operational stability of the MEWP.

→ The MEWP is intended only for indoor applications. If wind forces occur during an indoor application (e.g. if warehouse gates are opened), operation should be suspended until the wind forces have subsided.

6 Stability

The operational stability of the MEWP has been tested according to latest technical standards. These take into account the dynamic and static tilting forces that can occur when the MEWP is used for its intended purpose. Among other things, the operational stability of the MEWP can be affected by the following components:

- Battery size and battery weight
- Wheels
- Mast
- Transported load (size, weight and load centre)
- Ground clearance (e.g. modification of the tilt safety device)
- Additional weights (e.g. in the battery compartment)
- Attachment (e.g. rail guidance)

WARNING!

Risk of accident due to reduction or loss of operational stability

Changes to the components that affect the operational stability of the MEWP can impair the operational stability.

- ▶ Changes to components may only be made following consultation with the manufacturer's customer service department.
-

C Transport and Commissioning

1 Transport

⚠ WARNING!

Accidental movement during transport

Improper fastening of the MEWP during transport can result in serious accidents.

- ▶ 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.
- ▶ The MEWP must be correctly lashed down when transported on a lorry or trailer.
- ▶ The lorry or trailer must be equipped with tie-down rings.
- ▶ Secure the MEWP with chocks to prevent accidental movements.
- ▶ Use only lashing straps with sufficient rated strength.
- ▶ Use non-slip materials to secure the transport aids (pallet, wedges, ...) e.g. non-slip mats.

⚠ WARNING!

Torn lashing straps

Lashing straps can tear when routed over sharp edges.

- ▶ Do not route lashing straps over sharp edges, use suitable cut protection, if necessary.
- ▶ Lashing straps that are routed over lift chains must be protected with a suitable oil-resistant base.

⚠ CAUTION!

Damage to the battery panel and operator platform

The battery panel is not designed to withstand the forces in lashing straps and other fastening materials.

- ▶ Remove the battery panel if one of the securing materials is required nearby. Store the battery panel safely.

Securing the MEWP for transport

Requirements

- Operator platform fully lowered.
- Work platform is laden.
- Elevating working platform is parked securely, see page 82.

Tools and Material Required

- Lashing straps
- Edge protectors
- Wooden beam or pallet

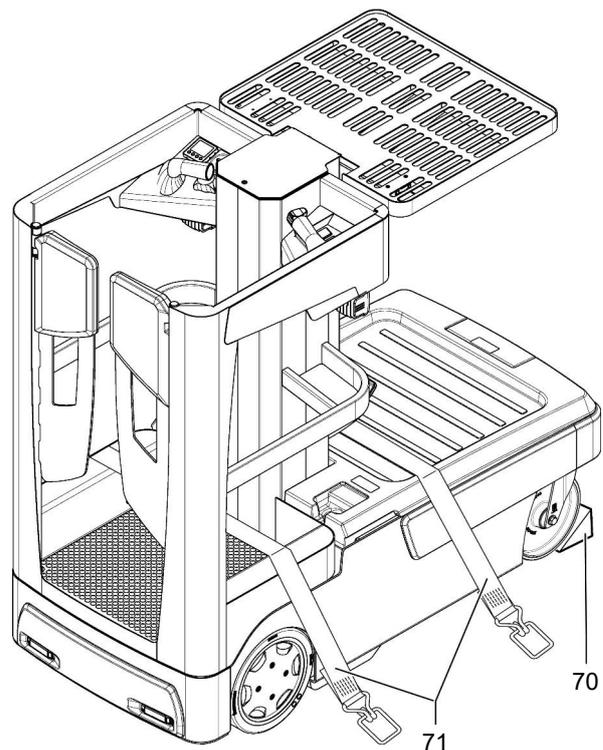
Procedure

- Position the wooden beam or pallet between the front of the transport vehicle and the elevating working platform to ensure a positive fit.
- Lay the lashing strap (71) over the elevating working platform, attach to the transport vehicle and tension sufficiently.

→ Use edge protectors to protect the MEWP and the lashing straps.

- Secure the steering wheels with chocks (70) to prevent slipping.

The MEWP can now be transported.



2 Using the Truck for the First Time

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

WARNING!

The use of unsuitable energy sources can be hazardous

Rectified AC current damages the assemblies (control devices, sensors, motors etc.) of the electronic system.

Unsuitable cable connections (trailing cables) to the battery (too long, wire cross-section too small) can overheat and set fire to the battery and MEWP.

- ▶ Operate the MEWP with battery current only.
 - ▶ Cable connections to the battery (trailing cables) must be less than 6 m long and have a minimum cross-section of 50 mm².
-

Procedure

- Check that the equipment is complete.
- Charge the battery, see page 58.

The MEWP can now be put into operation, see page 77.

2.1 Moving the MEWP without a Battery

This operation must only be carried out by a specialist maintenance engineer who has been instructed in operation.

WARNING!

It must not be performed on slopes or inclines (no brakes).

-  Moving the MEWP without a battery see page 111.

D Battery - Servicing, Recharging, Replacement

1 Safety instructions for handling lead-acid batteries

Maintenance personnel

Batteries may only be charged, serviced or replaced by trained personnel. These operating instructions and the manufacturer's instructions concerning batteries and charging stations must be observed when carrying out the work.

- Work on the battery, installation and removal must be performed only by customer service.

Fire protection

Do not smoke and avoid naked flames when handling batteries. When the MEWP is parked for charging there must be no inflammable material or operating equipment that causes sparks within a distance of at least 2,5 m in the surrounding area. The room must be ventilated. Fire protection equipment must be available.

⚠ CAUTION!

The use of unsuitable fire-protection equipment can result in acid burns

In the event of fire, a reaction with the battery acid can occur if water is used to extinguish the fire. This can lead to acid burns.

- ▶ Use powder extinguishers.
- ▶ Never extinguish burning batteries with water.

⚠ CAUTION!

Short circuits can result in fire

Damaged battery connections can cause short circuits which can then set fire to the MEWP and the battery.

- ▶ Before closing the battery cover, make sure that the battery connections are not damaged.
- ▶ Report any defects immediately to your supervisor.
- ▶ Identify a faulty MEWP and take out of service.
- ▶ Put the MEWP back into service only after the fault is identified and rectified.

Battery disposal

Batteries may only be disposed of in accordance with national environmental protection regulations or disposal laws. The manufacturer's disposal instructions must be observed.

	<p>Used batteries must be treated as hazardous waste. These batteries are marked with the recycling symbol and the sign showing a crossed-out rubbish bin, and should not be disposed of with ordinary household waste. Buy-back terms and type of recycling are to be agreed with the manufacturer as described in § 8 of the battery legislation.</p>
	<p>Do not smoke! No naked flames, glowing embers or sparks near the battery - fire and explosion hazard!</p>
	<p>Avoid fire and explosion hazards and short circuits due to overheating! Keep away from naked flames and strong heat sources.</p>
	<p>Always wear protective clothing (e.g. safety goggles and safety gloves) when working on cells and batteries. Always wash your hands after completing the work. Use only insulated tools. Do not mechanically machine the battery, strike, crush, compress, notch, dent or modify it in any way.</p>
	<p>Hazardous electric voltage! The metal parts of the battery cells are permanently live. Therefore do not place any foreign objects or tools on the battery. Observe national health and safety regulations.</p>
	<p>If the materials leak, do not inhale the fumes. Wear safety gloves.</p>
	<p>Follow the user instructions and keep them in a visible position in the charging area. Work on the batteries should be performed only as instructed by specialist personnel.</p>

1.1 General notes on handling batteries

⚠ WARNING!

Risk of accidents and injuries when handling batteries

Batteries contain dissolved acid which is toxic and caustic. Avoid physical contact with battery acid.

- ▶ 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 injury (e.g. skin or eye contact with battery acid) call a doctor immediately.
 - ▶ Spilled battery acid should be neutralised immediately with plenty of water.
 - ▶ Follow national guidelines and legislation.
-

⚠ WARNING!

The use of unsuitable batteries not approved by Jungheinrich for the MEWP can be hazardous

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

- ▶ Use only batteries approved by Jungheinrich for the MEWP.
 - ▶ 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 MEWP.
 - ▶ Do not use batteries that have not been approved by the manufacturer.
-

Before carrying out any work on the batteries, park the elevating working platform securely (see page 82).

2 Battery types

NOTICE

The MEWP is equipped with maintenance-free batteries. Battery equipment should be replaced only by customer service.

- ▶ No distilled water can be added to this battery type.
- ▶ The cell covers are fixed tight and must not be opened. Opening the covers will damage the battery.

NOTICE

Reduction of the service life of the batteries

Compensation charging of the standard batteries will reduce the service life of the batteries.

- ▶ Only charge batteries with a low residual capacity. The "battery indicator, low residual capacity" symbol lights up in yellow, see page 73.

- The battery weights can be taken from the battery data plate.

The following table shows the battery types to be used, with reference to their capacity:

Battery type		Capacity	Min. weight	Max. dimensions	Number
6V battery	●	190 Ah	30 kg	262x180x254 mm	4
24V - Li-Ion	○	120 Ah	45 kg	422x204x320 mm	1

3 Lithium-ion battery

3.1 General

The 130 Ah lithium-ion battery is a maintenance-free battery with rechargeable high-performance energy cells. The battery's daily operating time can be extended through intermediate charges.

3.2 Approved application conditions

Note the permissible application temperature of the lithium-ion battery – see page 44.

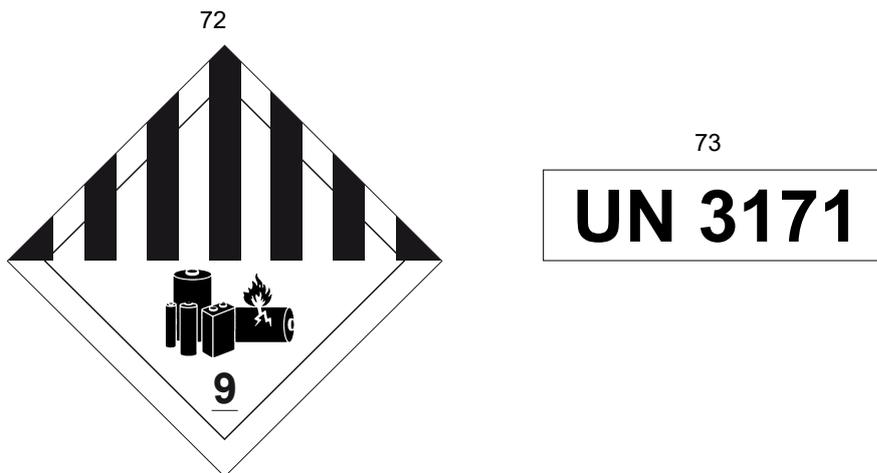
The permissible range of the battery application temperature does not increase the permissible range of the MEWP's application temperature.

3.3 Identification points and data plates

3.3.1 Marking of packages with lithium-ion batteries

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.



Item	Description
72	Danger label class 9A for lithium-ion batteries
73	Marking of packages with lithium-ion batteries in accordance with the dangerous goods regulations GGVS/ADR appendix 9 for the transport of hazardous goods

3.3.2 Lithium-ion battery data plate

Lithium Ion Secondary Battery / Lithium Ionen Sekundärbatterie			
Type Typ	75	Year of Manufacture Baujahr	76
Serial-No. Serien-Nr.	77	Supplier-No. Lieferanten-Nr.	78
Capacity Kapazität	79	Nominal voltage Nennspannung	80
Nominal energy Nennenergie	81	Battery-No. Batterie-Nr.	82
Battery weight +/- 5% Batteriegewicht +/- 5%	83	Battery ID Batteriekennung	84
Designation Bezeichnung	85		QR code
Manufacturer Hersteller	87		
CE marking	88		Safety and warning information

90

Item	Designation	Item	Designation
74	Lithium-ion secondary battery	83	Battery weight ($\pm 5\%$) in kg
75	Battery type	84	Battery identifier
76	Year of manufacture	85	Designation
77	Serial number	86	QR code
78	Supplier number	87	Manufacturer
79	Rated capacity in Amp hours (Ah)	88	Manufacturer's logo
80	Rated voltage in Volts (V)	89	Safety and warning information, see page 43
81	Rated energy in Watt hours (Wh)	90	CE marking
82	Battery number		

3.3.3 Safety Instructions, Warning Indications and other Notes

	<p>Used 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. Buy-back terms and type of recycling are to be agreed with the manufacturer in example to accordance with the Battery Directive 2006/66/EG, for example.</p>
	<p>Avoid fire and short circuits due to overheating. Do not ignite or position an open flame, glowing embers, or sparks near the lithium-ion battery. Keep lithium-ion batteries away from strong heat sources.</p>
	<p>Hot surfaces. Battery cells can generate very high short-circuit currents, causing them to become hot.</p>
	<p>Dangerous electrical voltage! Battery cells can generate very high short-circuit currents, causing them to become hot. Caution! The metal parts of the battery cells are constantly under voltage, so do not place any foreign objects or tools on the lithium-ion battery. Observe the accident prevention regulations and DIN EN 62485-3.</p>
	<p>Wear personal protective equipment (e.g. safety goggles and safety gloves) when handling damaged battery cells and lithium-ion batteries. Use only insulated tools. If the contents leak out, do not inhale the fumes. Always wash your hands after completing the work. Do not mechanically machine the lithium-ion battery, strike, crush, compress, notch, dent or modify it in any way. Do not open, damage, penetrate, bend, heat the lithium-ion battery or allow it to become hot, do not throw it into a fire, short circuit it or immerse it in water. Do not store it or operate it in pressurised containers.</p>
	<p>Follow the operating instructions and keep them in a visible position in the charging area. If any faults are found on the lithium-ion battery, contact the manufacturer's customer service department immediately. Do not carry out any actions on your own. Do not open the lithium-ion battery.</p>
	<p>Protect the lithium-ion battery from solar radiation or other forms of heat radiation. Do not expose the lithium-ion battery to heat sources.</p>

3.4 Technical Specifications

3.4.1 Technical data of battery

1.	Product	Lithium-ion battery 130 Ah
2.	Nominal voltage	25,6 V (3,2 V x 8 cells)
3.	Rated capacity	130 Ah
5.	Application temperature during operation ^{1,2}	-20°C to 55°C , corresponds to ambient temperature -20°C to 40°C
6.	Operating temperature for charging	0°C to 55°C, corresponds to ambient temperature 0°C to 40°C
7.	Storage temperature (at 5% to 90% relative humidity) ¹	-20°C to 45°C Recommended: 20° to 30°C (max. 3 months)
8.	Electro-chemical system	Lithium-ion, LiFePO4 cathode

¹⁾ Higher and lower temperatures reduce the service life, lower temperatures reduce the available capacity.

²⁾ The permissible range of the battery's application temperature does not increase the permissible range of the EWP's application temperature.

3.4.2 EN norms

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 DIN EN 61000-6-4, DIN EN 61000-6-2 and DIN EN 61000-4-2 as well as the normative references contained therein.

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

⚠ WARNING!

Medical equipment can be damaged by non-ionised radiation

Electrical equipment on the MEWP emitting non-ionising radiation (e.g. wireless data transmission) can affect medical equipment (pacemakers, hearing aids etc.) carried by the operator, and result in malfunctions. Consult a doctor or the manufacturer of the medical equipment to determine whether it can be used near the MEWP.

3.5 Safety regulations for handling lithium-ion batteries



Do not carry out any repairs on the lithium-ion battery.

Replace defective lithium-ion battery by customer service.

⚠ WARNING!

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 charging connector must be dry and clean when used.
-

⚠ WARNING!

Unsuitable batteries without manufacturer approval for the MEWP can be dangerous.

The design, weight and dimensions of the battery have a considerable effect on the operational safety of the MEWP, and especially its stability and capacity. The use of unsuitable batteries that are not approved by the manufacturer for the EWP can lead to a deterioration of the braking characteristics of the EWP during energy recovery. This can lead to considerable damage to the electrical control unit and result in serious danger to the health and safety of individuals.

- ▶ Only batteries approved by the manufacturer may be used in the EWP.
 - ▶ The battery equipment must only be replaced with the manufacturer's authorisation.
 - ▶ When replacing/installing the battery, make sure the battery is securely located in the battery compartment of the EWP.
 - ▶ Do not use any batteries without approval from the manufacturer.
-

⚠ WARNING!

Any damage and other defects to the charger can result in accidents.

If any safety-related modifications, damage or other defects are discovered on the charger or during operation, the charger must be taken out of service until it has been repaired.

- ▶ Report any defects immediately to your supervisor.
 - ▶ Tag out and decommission a faulty charger.
 - ▶ Only return the charger to service when you have identified and rectified the fault.
-

NOTICE

Intermediate charging of the lithium-ion battery

Intermediate charging of the lithium-ion battery is possible, i.e. a battery that is not fully discharged can be charged or partially charged at any time.

- ▶ The lithium-ion battery should be fully charged before use.
 - ▶ To ensure reliable operation of the lithium-ion battery, it must be fully charged at least every 4 weeks with frequent intermediate charging.
 - ▶ Turn off the battery charger before disconnecting the lithium-ion battery from the charger.
-

3.6 Battery lifetime and maintenance

The lithium-ion battery is wear-free.

The components are designed to be 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 discharge

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

- ▶ Disconnect the interface connector from the lithium-ion battery if it is to remain unused for longer than a week.
 - ▶ Fully charge the battery before extended downtimes.
 - ▶ To ensure a long service life of the lithium-ion battery, it must be fully charged every 4 weeks when not in use.
-

NOTICE

Intermediate charging of the lithium-ion battery

Intermediate charging of the lithium-ion battery is possible, i.e. a battery that is not fully discharged can be charged or partially charged at any time.

- ▶ The lithium-ion battery should be fully charged before use.
 - ▶ To ensure reliable operation of the lithium-ion battery, it must be fully charged at least every 4 weeks with frequent intermediate charging.
 - ▶ Turn off the battery charger before disconnecting the lithium-ion battery from the charger.
-

3.7 Operation

3.7.1 Activating the lithium-ion battery

The lithium-ion battery can be switched from energy-saving mode to normal operation (battery activation) as outlined in the following chapter:

- Connection to the mains socket – see page 58.

3.7.2 Discharging the battery

NOTICE

Damage to the lithium-ion battery due to discharge

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

- ▶ Disconnect the interface connector from the lithium-ion battery if it is to remain unused for longer than a week.
- ▶ Fully charge the battery before extended downtimes.
- ▶ To ensure a long service life of the lithium-ion battery, it must be fully charged every 4 weeks when not in use.

The specified rated capacity is 90% available.

No particular action needs to be taken.

3.7.2.1 Transmitter

The lithium-ion battery has an integrated transmitter. This transmitter uses an acoustic signal to warn the operator when the charge status of the lithium-ion battery is low.

Charge status	Operating condition of the EWP	Transmitter	Meaning
≥ 25%	Switched on	Off	– Es sind keine besonderen Maßnahmen zu beachten.
	Switched off	Off	
25% > ... > 13%	Switched on	Off	– Anzeige in der Anzeigeeinheit oder dem Fahrerdisplay der Hubarbeitsbühne beachten. – Das Laden der Lithium-Ionen Batterie wird empfohlen ¹⁾ . – Batterie laden, see page 58.
	Switched off	Off	

Charge status	Operating condition of the EWP	Transmitter	Meaning
13% > ... > 0%	Switched on	Off	<ul style="list-style-type: none"> – Anzeige in der Anzeigeeinheit oder dem Fahrerdisplay der Hubarbeitsbühne beachten. – Das Laden der Lithium-Ionen Batterie wird empfohlen¹⁾. – Batterie laden, see page 58.
	Switched off and not plugged into a mains socket	An acoustic signal sounds at 10 second intervals	
0%	Switched on	An acoustic signal sounds at 10 second intervals	<ul style="list-style-type: none"> – Anzeige(n) in der Anzeigeeinheit oder dem Fahrerdisplay der Hubarbeitsbühne beachten. – Lithium-Ionen Batterie umgehend laden, um Schäden an der Batterie zu vermeiden¹⁾. – Batterie laden, see page 58.
	Switched off		

- 1) Depending on the charge status of the lithium-ion battery, the EWP may initiate lift cut-off or travel cut-off:
- Lift cut-off:
The lift cut-off prevents the load handler from lifting.
Lowering of the load handler is still available.
 - Travel cut-off:
The travel cut-off locks the travel functions or reduces the EWP travel speed.

→ If there is no charge current even when the MEWP is connected to a mains socket, an acoustic signal sounds at 10 second intervals.

3.8 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 remedial action table.

→ If the following remedial actions are carried out and the MEWP cannot be restored to operational condition, or if a fault or defect in the electronics system is displayed with a corresponding error message, please contact the manufacturer's service department.

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

In order for customer service departments to respond quickly and specifically to the fault, the following information is essential:

- Serial number of the MEWP
- Event message on the display unit (if present)
- Error description
- Current location of the MEWP.

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.

3.8.1 Potential hazards

If unusual events occur due to external influences such as use of force, fire, flooding, etc., the following instructions must be observed:

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

3.8.1.1 Measures for fire fighting

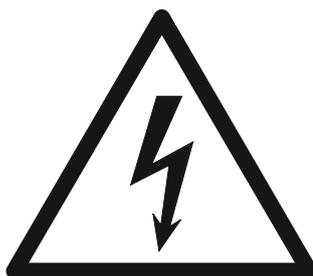
Fire-fighting measures may only be carried out on a burning lithium-ion battery by trained and specially equipped fire-fighting personnel (e.g. by a member of the fire brigade).

3.8.1.2 Touch voltage hazard

⚠ WARNING!

Hazardous contact voltages only arise in the event of a technical or physical defect. The batteries are normally charged. There is still some residual voltage in a discharged battery. This must be considered as a hazardous contact voltage.

With this kind of defect the battery must not be touched and must not come into contact with metal objects see page 50.



3.8.2 Restricted Use (Slow Travel, Lift Cut-Off, No Travel) of the EWP

Possible cause	Actions
<ul style="list-style-type: none">– Fehler in einem Strang (Ereignismeldung 5195.x) Die Lithium-Ionen Batterie ist weiterhin einsatzfähig, jedoch mit verringerter Kapazität.	<ul style="list-style-type: none">– Lithium-Ionen Batterie mit dem Ladegerät verbinden.– Wenn die Störung dadurch nicht behoben wird, Kundendienst des Herstellers verständigen.

→ For other malfunctions – see "Troubleshooting" on page 108.

3.8.3 EWP can no longer be switched on

Possible cause	Actions
<ul style="list-style-type: none"> – Lithium-Ionen Batterie hat zum Schutz vor Tiefentladung in den Energiesparbetrieb geschaltet. 	<ul style="list-style-type: none"> – Lithium-Ionen Batterie vom Energiesparbetrieb in den Normalbetrieb schalten, see page 46. – Batterie mit dem Ladegerät verbinden. – Wenn die Störung dadurch nicht behoben wird, Kundendienst des Herstellers verständigen.
<ul style="list-style-type: none"> – Lithium-Ionen Batterie wurde außerhalb des Einsatzbereichs betrieben oder hat einen Defekt. Folgende Fehlermeldungen zeigen an, dass die Lithium-Ionen Batterie außerhalb des Einsatzbereichs betrieben wird und führen zur Abschaltung der Batterie: <ul style="list-style-type: none"> – Übertemperatur: E5409.1 – Untertemperatur: E5413.2 – Unterspannung: E5344.1 / E5342.1 Before the lithium-ion battery is shut down, corresponding warnings appear on the EWP. 	<ul style="list-style-type: none"> – Lithium-Ionen Batterie in den zulässigen Einsatzbereich bringen, see page 44. – Batterie mit dem Ladegerät verbinden. – Wenn die Störung dadurch nicht behoben wird, Kundendienst des Herstellers verständigen.

➔ For other malfunctions – see "Troubleshooting" on page 108.

3.9 Storage, Disposal and Transport

3.9.1 Storing the battery

NOTICE

In new condition, the lithium-ion battery is transported and stored with a charge level of 50%.

NOTICE

Damage to the lithium-ion battery due to discharge

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

- ▶ Disconnect the interface connector from the lithium-ion battery if it is to remain unused for longer than a week.
 - ▶ Fully charge the battery before extended downtimes.
 - ▶ To ensure a long service life of the lithium-ion battery, it must be fully charged every 4 weeks when not in use.
-

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

3.9.2 Instructions for safe handling

NOTICE

In new condition, the lithium-ion battery is transported and stored with a charge level of 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 comply with these safety instructions can result in fire and explosion or the leakage of harmful materials.

3.9.3 Disposal and transport of a lithium-ion battery

3.9.3.1 Instructions for disposal

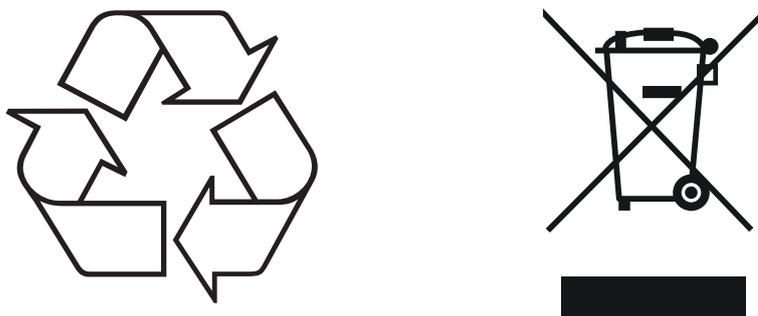
NOTICE

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

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

Used lithium-ion batteries are recyclable commodities and 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 in accordance with the Battery Directive 2006/66/EG. Buy-back terms and type of recycling are to be agreed with the manufacturer.

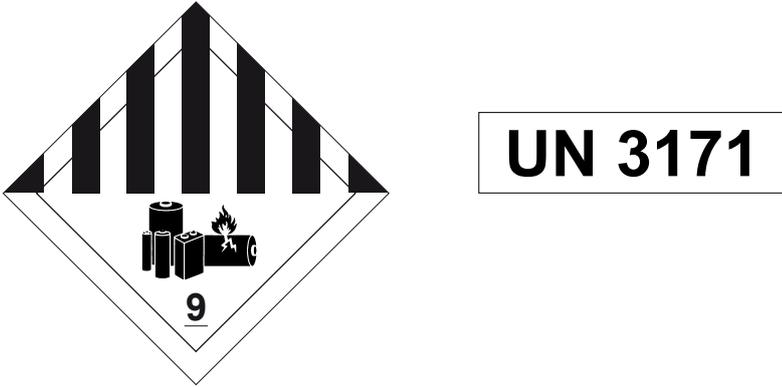
3.9.3.2 Shipping information

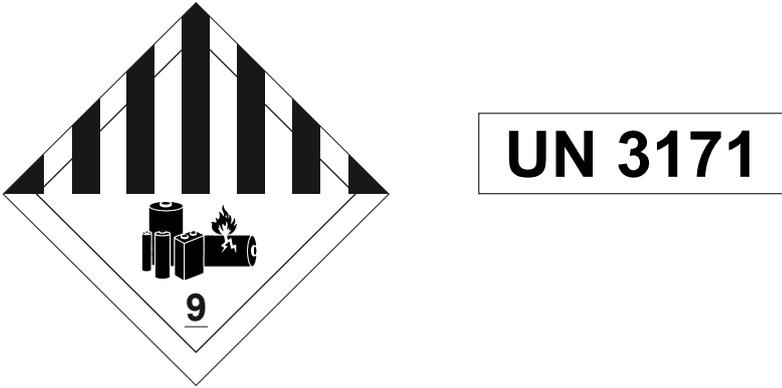
The lithium-ion battery is a hazardous material. The applicable ADR regulations must be observed during transport.

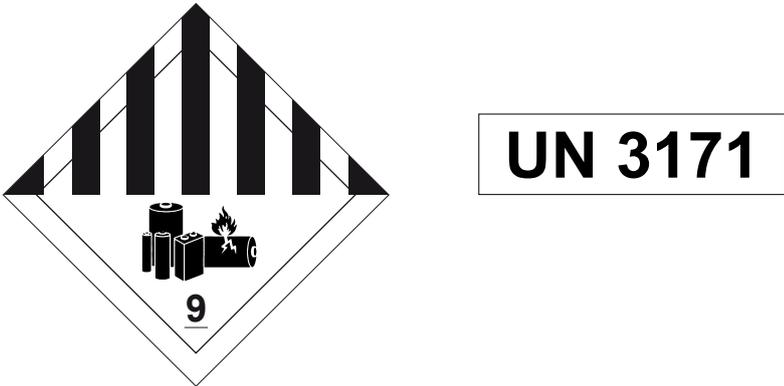
→ ADR = Accord européen relatif au transport international des marchandises Dangereuses par Route

Shipping functional batteries

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

Classification according to ADR (road transport)	UN 3171 lithium-ion battery class 9
- Classification code	M4 lithium battery
- Danger label	
- ADR limited quantity	LQ:0

IMDG classification (sea transport)	UN 3171 lithium-ion battery class 9
- EMS	F-A, S-I
- Danger label	
- IMDG limited quantity	LQ: -

IATA classification (air transport)	UN 3171 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

In new condition, the lithium-ion battery is transported with a charge level of 50%.

Shipping faulty batteries

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

4 Charging the battery

⚠ DANGER!

Risk of electric shock and fire

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

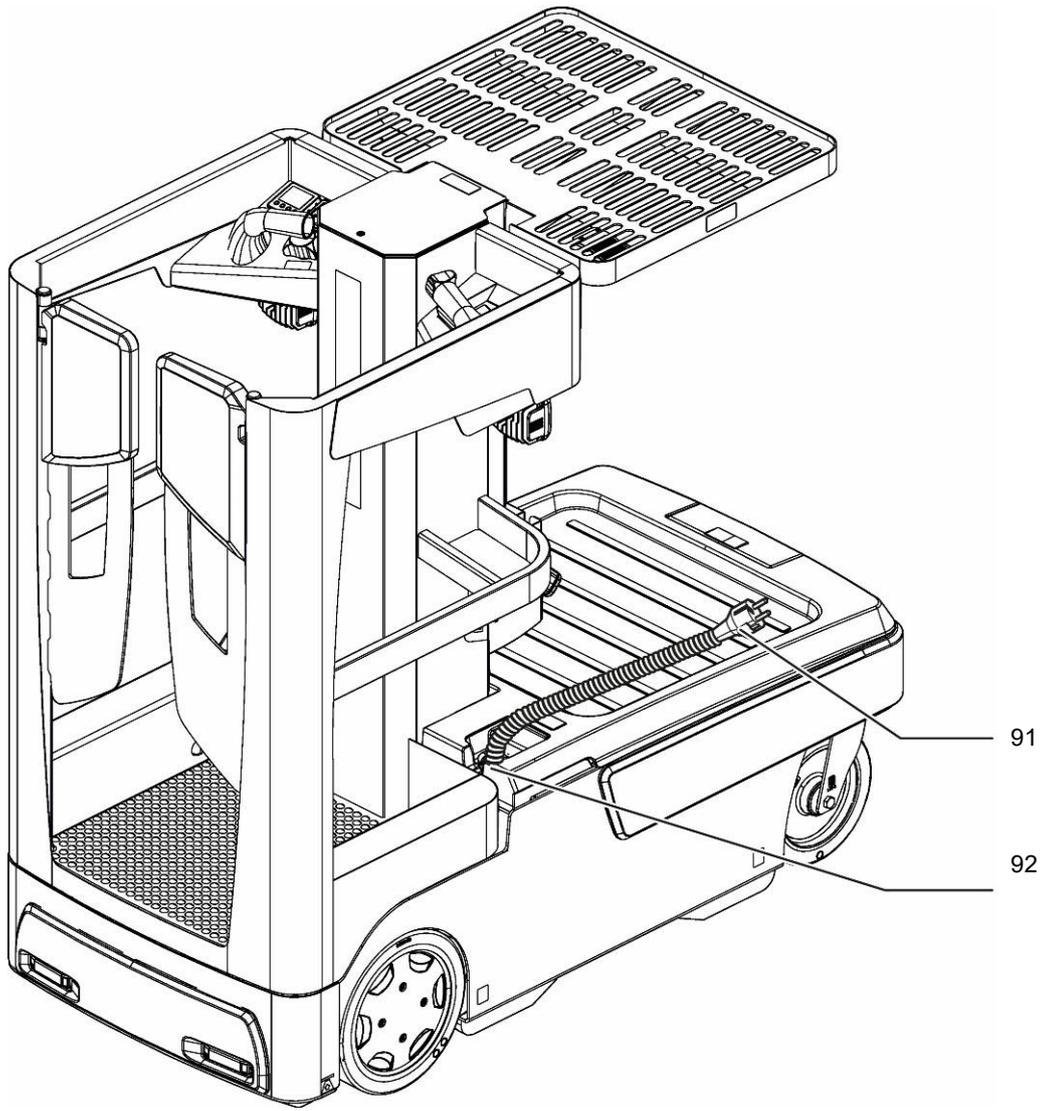
- ▶ Always use mains cables with a maximum length of 30 m.
Local regulations must be observed.
 - ▶ Unwind the cable reel fully when using it.
 - ▶ Always use original manufacturer's mains cables.
 - ▶ Insulation safety, acid and caustic ratings must comply with the manufacturer's mains lead.
 - ▶ The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

⚠ WARNING!

Risk of explosion due to gases produced while charging

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

- ▶ Switch the charging station and MEWP off first before connecting/disconnecting the charger cable of the battery-charging station to/from the battery connector.
 - ▶ The battery charger must be adapted to the battery in terms of voltage and charge capacity.
 - ▶ Before charging, check all cables and plug connections for visible signs of damage.
 - ▶ Sufficiently ventilate the room in which the MEWP is to be charged.
 - ▶ The battery panel must be open and the battery cell surfaces must be exposed during charging to ensure adequate ventilation.
 - ▶ Do not smoke and avoid naked flames when handling batteries.
 - ▶ Wherever the MEWP is parked for charging, there must be no inflammable material or consumables capable of creating sparks within a 2,5 m area of the MEWP.
 - ▶ Fire protection equipment must be on hand.
 - ▶ Do not place any metallic objects on the battery.
 - ▶ Always follow the safety regulations of the battery manufacturer and the charging station manufacturer.
-



To start battery charging

Requirements

- Park the MEWP securely, see page 82.
- The "battery indicator, low residual capacity" symbol lights up in yellow on the display unit, see page 73.

Procedure

- Pull the mains connector (91) out of the storage compartment (92) and plug into the mains socket.

Battery charging begins. The "charging" symbol flashes in green on the display unit, see page 73.

- Check on the MEWP display unit that charging has begun.

Completing battery charging; restoring the truck to operation

NOTICE

If charging has been interrupted, the full battery capacity will not be available.

Requirements

- The battery is fully charged.

Procedure

- Remove the mains connector (91) from the mains socket and store it along with the cable in the storage compartment (92).

The truck is now ready to operate again.

Charging times

The duration of charge depends on the battery capacity.



Charging continues automatically after a mains failure. Charging can be interrupted by removing the mains connector and continued as partial charging.

5 Battery removal and installation

- Work on the battery, installation and removal must be performed only by customer service.

⚠ WARNING!

Accident risk during battery removal and installation

Due to the battery weight and acid there is a risk of trapping or scalding when the battery is removed and installed.

- ▶ Note the "Safety regulations governing the handling of lead-acid batteries" section in this chapter.
 - ▶ Wear personal protective equipment (safety shoes, helmet, hi-vis vest, protective gloves etc.) when removing and installing the battery.
 - ▶ Use only batteries with insulated cells and insulated terminal connectors.
 - ▶ When replacing a battery always install the same battery type in the battery compartment. Compensating weights must not be removed and must remain in the same position.
 - ▶ Park the MEWP on a level surface to prevent the battery from sliding out.
 - ▶ Only use crane lifting gear with sufficient capacity when replacing the battery.
 - ▶ Use only approved battery replacement devices (battery roller stand, replacement trolley etc.).
 - ▶ Make sure the battery is located securely in the MEWP's battery compartment.
-

⚠ CAUTION!

Battery installation and removal can cause short circuits

The battery cable or connector can get trapped between the truck chassis and battery when the battery is installed and removed.

Damaged cables can cause short circuits, setting the MEWP and battery on fire.

- ▶ Place the battery cable and connector on the battery.
 - ▶ Do not pinch or trap the battery cable and connector.
-

Removing the battery

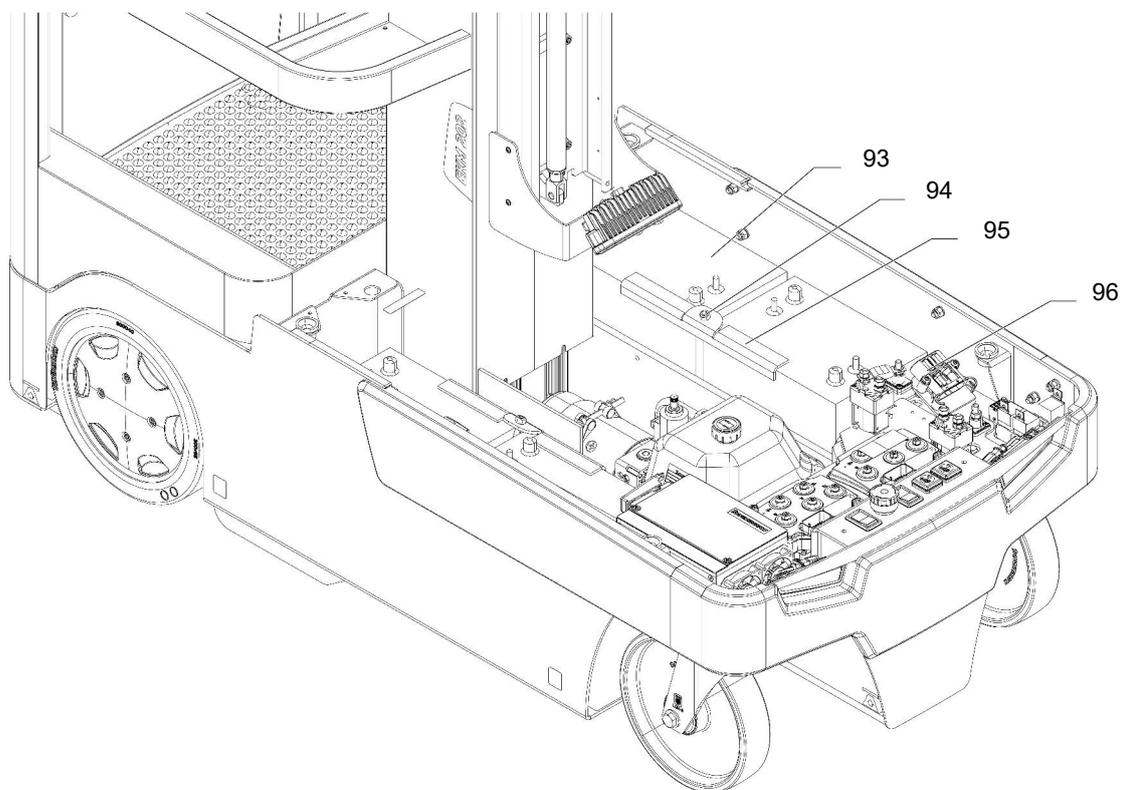
Requirements

- Elevating working platform is parked securely, see page 82.
- Battery exposed, see page 140.
- Battery voltage measured and faulty battery located.

Procedure

- Disconnect the battery connector (96).
 - Disassemble the battery retainer (95):
 - Remove the M8 hex nut (94).
- The battery retainer has been disassembled.*
- Undo the battery terminals and insulate with a suitable material.
 - Lift out the battery (93).

The faulty battery (93) has been removed.



Installing the battery

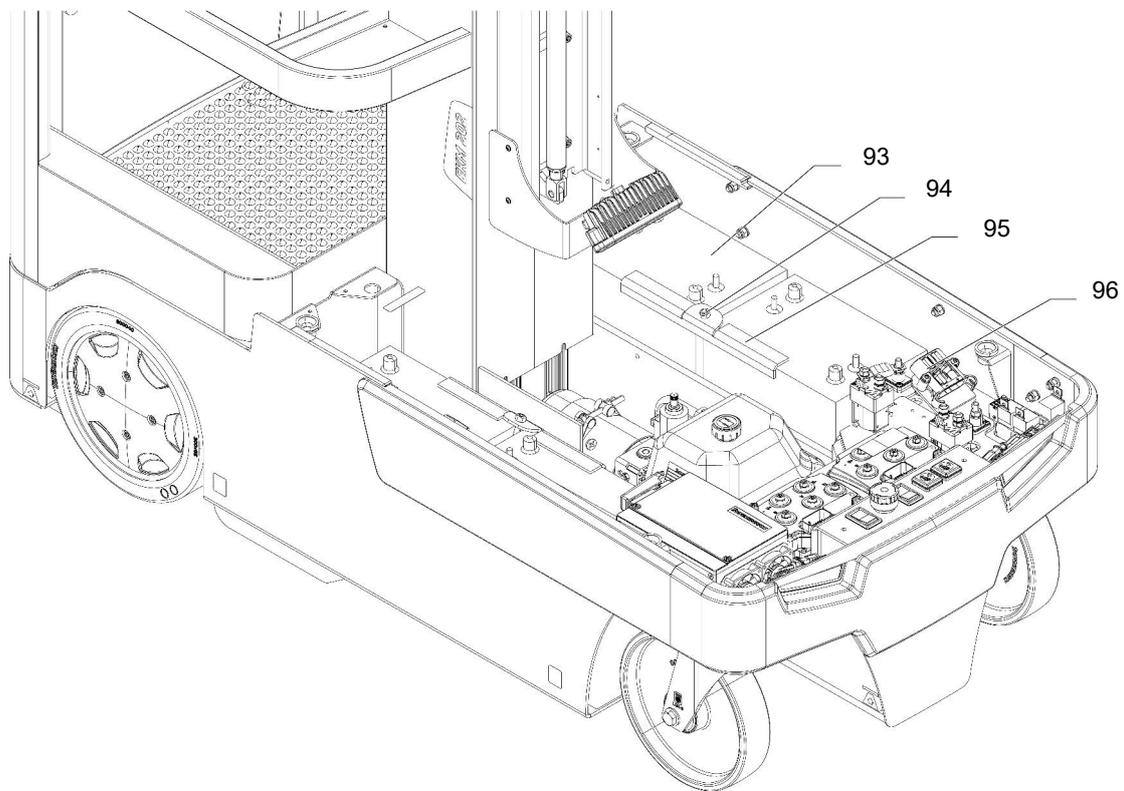
Requirements

- Elevating working platform is parked securely, see page 82.
- Faulty battery removed

Procedure

- Insert the new battery (93).
- Install the battery retainer (95).
- Connect the batteries.
- Check all cables and connectors for visible damage.
- Insert the battery connector (94).
- Insert the battery panel.

The battery (93) has been installed.



E Operation

1 Safety regulations for the operation of mobile elevating work platforms

Driver authorisation

The MEWP must be used only by suitably trained personnel, who have demonstrated to the operating company or its representative that they can drive and handle loads and have been expressly authorised to operate the MEWP by the operating company or its representative; national regulations must also be followed where applicable. A driver's licence is not required.

Wind forces affect the operational stability of the MEWP.

- The MEWP is intended only for indoor applications. If wind forces occur during an indoor application (e.g. if warehouse gates are opened), operation should be suspended until the wind forces have subsided.

Operator's rights, obligations and responsibilities

The operator must be informed of his duties and responsibilities and be instructed in the operation of the MEWP, and must be familiar with the content of these operating instructions.

Unauthorised use

The operator is responsible for the MEWP while it is in use. The operator must prevent unauthorised persons from driving or operating the MEWP. No one (except the operator) must be lifted or carried on the MEWP.

Damage and faults

The supervisor must be informed immediately of any damage or faults in the MEWP. An MEWP which is unsafe for operation (e. g. due to worn wheels or fault brakes) must not be used until it has been correctly repaired.

Repairs

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

Hazardous area

⚠ WARNING!

Danger of accident/injury in the hazardous area around the MEWP

The hazardous area is the area in which people can be endangered by the travelling or lifting movements of the MEWP. This also includes the area within range 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 personnel are still within the hazardous area despite being requested to leave, stop the MEWP immediately.
-

Safety devices, warning signs and warning instructions

Safety devices, warning signs (see page 28) and warning instructions in the present operating instructions must be strictly observed.

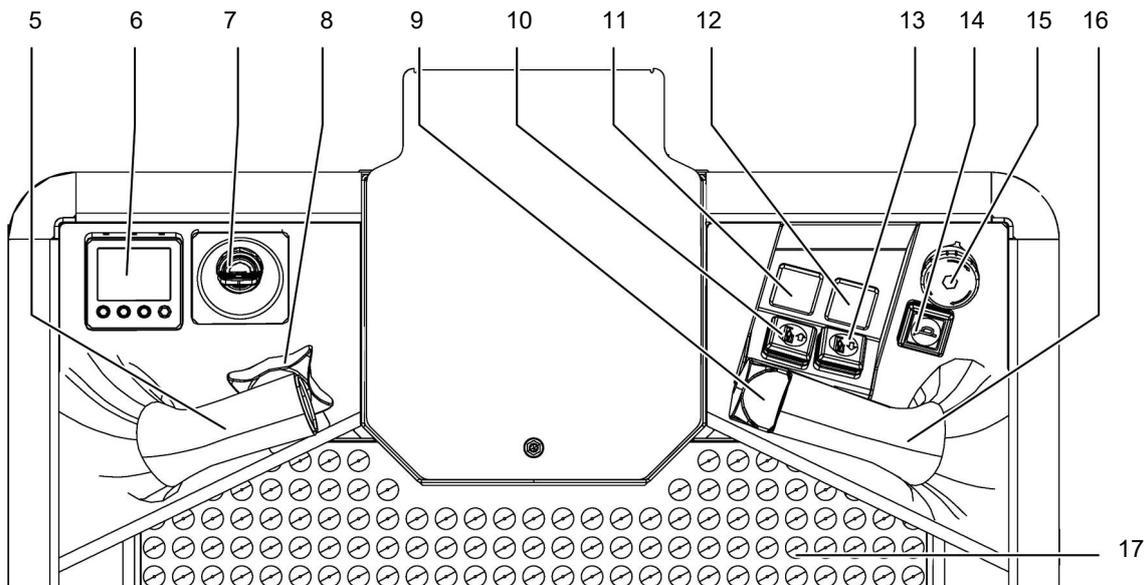
⚠ WARNING!

Removing or disabling safety devices can cause accidents

Removing or disabling safety devices such as the emergency disconnect switch, key switch, buttons, horn, flashing lights, sensors, panels, etc. can result in accidents and injuries.

- ▶ Report any defects immediately to your supervisor.
 - ▶ Identify the faulty MEWP and take out of service.
 - ▶ Do not return the MEWP to service until you have identified and rectified the fault.
-

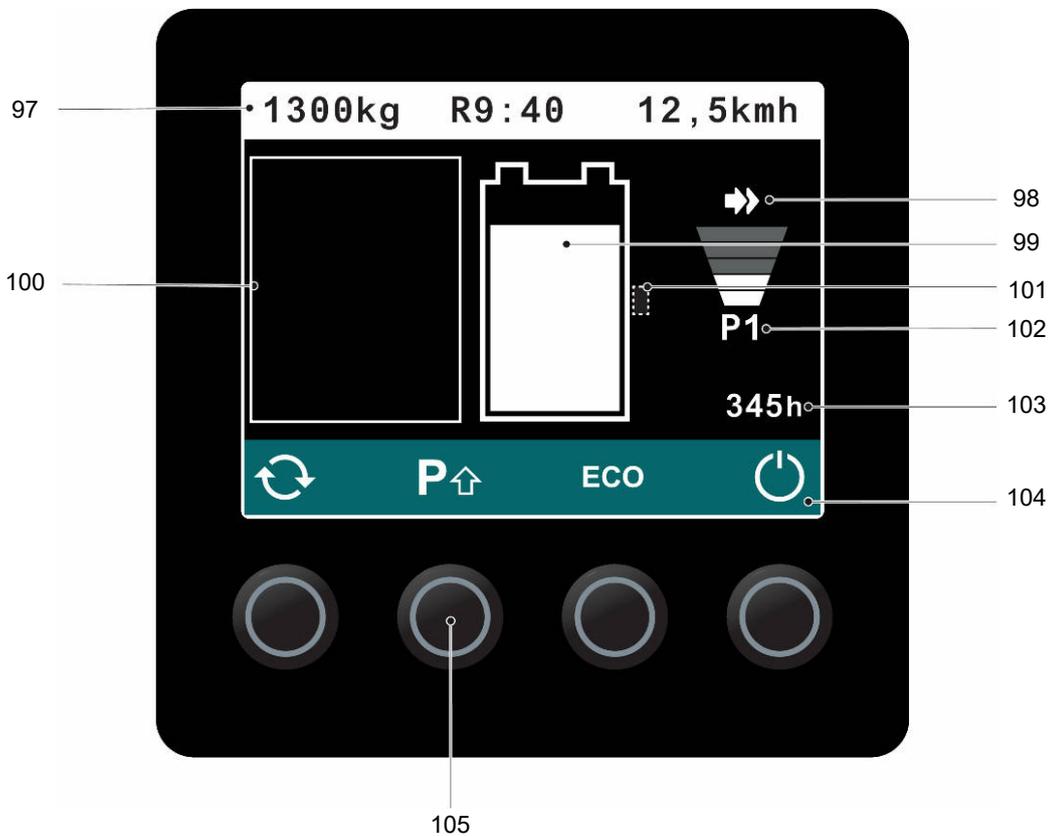
2 Displays and Controls



Item	Control /display		Function
5	Left handle	●	<ul style="list-style-type: none"> Both handles must be held to operate the MEWP. If the left handle is released, the MEWP remains at a standstill (capacitive hand sensor). One-hand operation: <ul style="list-style-type: none"> After changing over to crawl speed, operation with one hand becomes possible, see page 70.
16	Right handle	●	
6	Control and display unit	●	Displays steering modes, warning indicators, incorrect operation notes and service displays
		○	Switches on the MEWP using Easy Access with PIN code
7	Key switch	●	Switches control current on and off. Removing the key prevents the MEWP from being switched on by unauthorised persons.
	ISM access module	○	Switches on the MEWP
	Keypad	○	
	Transponder	○	
	Easy Access	○	
8	Steering rotary switch	●	Steering <ul style="list-style-type: none"> Turn the switch to the right: Travel direction changes to the right. Turn the switch to the left: Travel direction changes to the left.
9	Travel direction rocker	●	Forward travel and reversing; acceleration and braking: <ul style="list-style-type: none"> Move rocker forward: Acceleration and forward travel. Move rocker back: Braking and reversing.

Item	Control /display		Function
10	Button for "Raise working platform"	●	– Working platform is raised.
11	Button for "Raise work table"	○	– Work table is raised.
12	Button for "Lower work table"	○	– Work table is lowered.
13	Button for "Lower working platform"	●	– Working platform is lowered.
14	Warning signal (horn) button	●	– Warning signal button (horn)
15	Emergency disconnect switch	●	Disconnects the main current circuit from the battery – All main electrical functions are shut down and the MEWP is braked. – Electric steering is shut down and the MEWP cannot be steered.
17	Operator platform (all functions are unlocked when occupied)	●	The operator platform acts as a deadman's switch: – Operator platform occupied: Travel and all functions enabled. – Operator platform unoccupied: Brake is applied.

2.1 Display unit (2 inch display)



Item	Control or display	Function
99	Battery capacity display	Battery discharge status
97	Information line	Displays event messages and optional information such as speed or residual run time.
98	Power display	Shows the available power in the travel program selected.
100	Symbol field	Displays the symbols, see page 73.
101	Battery type (characteristics)	Displays the set battery type or set battery characteristic curve ¹ 1 = Maintenance-free gel/dry-cell battery 2 = Special battery (lithium-ion battery)
102	Travel program	Shows the travel program selected.
103	Service hours	Shows the MEWP operating hours, see page 76.
104	Button allocation	see page 70
105	Buttons	Selection buttons for the functions shown above them.

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

2.1.1 Information field

Any event messages are shown in the left section of the information line (97).

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

- The manufacturer's customer service department can change the information line from kg and km/h units to lbs and mph units and vice versa.

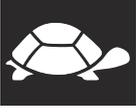
2.1.2 Button allocation of the display

Functions and operator menus that can be operated via the symbols and buttons of the display unit depend on the operating situation as well as the scope and settings of the MEWP.

Button allocation within the main menu

Symbol	Meaning
	Menu change: Changes to the next operator menu
	Travel program up (●): Changes the travel program in rider mode
	(No symbol) (○): Uses the pre-set travel program in rider mode The default setting can be changed by the manufacturer's customer service department.
	Shutdown (○): Allows the MEWP to be switched off Shutdown is only on the display if the MEWP is switched on with an access code.

Button allocation in options menu (○)

Symbol	Meaning
	Menu change: Changes to the next operator menu
	Slow travel: Switches slow travel on and off.
	Settings (○): To change to the menu to administer the codes or transponders

- Depending on the number of options that can be activated an additional operator menu may appear.

Button allocation in menu for managing codes or transponders (○)

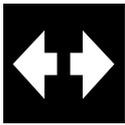
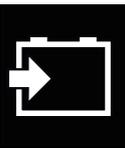
Symbol	Meaning
	Back: Cancels the current procedure and returns to the previous menu.
	Log-in history: Displays the chronological log-in history
	Change set-up code: To change the set-up code and to activate the keypad or the transponder reader.
	Edit access code / transponder: To add or delete access codes or transponders

Button allocation in the submenus

Symbol	Meaning
	Selection up: To select access codes or transponders, to scroll back during the log-in process
	Selection down: To select access codes or transponders, to scroll forward during the log-in process
	Delete: To delete access codes selected
	Add: To add a new access code
	Confirm: To confirm an entry or a transponder code

2.1.3 Symbols in the display

Any number of pictograms can be displayed in the pictogram field (100). Which pictograms are shown in the pictogram field depends on the operating and truck status.

Symbol	Meaning	Colour	Function
	Emergency stop	Red	Fault detected – Lifting, lowering and travel functions stopped. Lowering at reduced speed is still possible.
	Service note	Yellow	Lights up when maintenance is due.
	Emergency control	Red	Operation has switched to emergency control – see page 93.
	Indicator	Green	Indicator active
	Deadman switch on operator platform	Yellow	Illuminates if the operator platform is not under load when the travel switch is actuated.
	Parking brake	Red	Parking brake activated
	Charging process	Green	Battery charge display (with on-board charger only): – Flashing: Charging in progress – Illuminates continuously: Charging complete
		Red	Charging interrupted
	High temperature	Yellow	High temperature detected – Funktionen Heben, Senken und Fahren der Hubarbeitsbühne werden reduziert
		Red	High temperature detected – Funktionen Heben, Senken und Fahren der Hubarbeitsbühne werden abgestellt

Symbol	Meaning	Colour	Function
	Low temperature of lithium-ion battery (○)	Yellow	Lithium-ion battery low temperature detected – Entladeströme und Energierückspeisung werden bei tiefen Temperaturen reduziert.
			Lithium-ion battery below permissible temperature range – Die Hubarbeitsbühne wird über das Batterieschutz abgeschaltet. – Die Anzeigeeinheit wird abgeschaltet.
	Impact display (equipment with fleet management system)	Yellow	Lights up when a moderate shock event has occurred. – Schleichfahrt wird ausgelöst.
		Red	Lights up when a serious shock event has occurred. – Funktionen Heben, Senken und Fahren der Hubarbeitsbühne werden abgestellt.
	Slow travel	Green	Lights up when the "slow travel" button is pressed (travel speed reduction).
	Slow travel	Yellow	Reduced speed and lift height
	Safety doors	Yellow	Lights up when the safety doors are not closed and the lift or lower button has been pressed.
	Lift deactivated	Yellow	Lights up if the lift functions are deactivated due to insufficient battery capacity or if the lift function has not been released.
	Lifting of lift limit blocked	Yellow	Illuminates if the "lift" button is pressed when the lift limit has been reached.
	Lowering limit, mast lift	Red	Lights up when the mast lift lower limit is reached.
	Two-hand operation	Yellow	Left hand not on handle when travel switch actuated

Symbol	Meaning	Colour	Function
	Tilt angle	Red	Tilt angle > 2°
	Work lights	Green	Work lights switched on
	MEWP guided	Green	The MEWP is in narrow aisle operation – see page 129.
	Battery fault	Yellow	Fault detected. – Dieses Symbol wird angezeigt, wenn die Batterie nur noch einen stark reduzierten Lade- / Entladestrom zulässt.
	Warning	Yellow	Operating error
		Red	Fault detected. – Funktionen Heben, Senken und Fahren der Hebebühne werden abgestellt.

2.1.4 Battery discharge indicator

The battery charge status is shown on the MEWP display via a battery symbol (99). When a battery is discharged to the permissible discharge level, the message "Charge Battery" appears in the left section of the information line (97), (see page 68).

- The standard setting for the battery discharge indicator (99) is based on MEWPs delivered with standard batteries.

2.1.5 Battery discharge monitor

If the residual capacity falls below the required level, lifting is inhibited. A corresponding display (100) appears. Lifting is not enabled until the connected battery is at least 70% charged.

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 58.

2.1.6 Hourmeter

- Prepare the MEWP for operation, see page 80 or see page 113.

The service hours are counted when the MEWP is ready for operation.

3 Preparing the MEWP for Operation

3.1 Checks and Operations to Be Performed Before Starting Daily Work

⚠ WARNING!

Risk of accident in the hazardous area around the MEWP

Before the MEWP can be started, operated or a load lifted, transported or lowered, the operator must ensure that there is nobody within the hazardous area.

- ▶ Instruct all persons to leave the hazardous area around the MEWP. If people do not leave the hazardous area, cease working with the MEWP immediately.
 - ▶ If people do not leave the hazardous area despite being warned, the MEWP must be secured against use by unauthorised persons.
-

⚠ WARNING!

Damage or other defects in the MEWP can result in accidents.

If damage or other defects are discovered in the MEWP during the following checks, it must be taken out of service until it has been properly repaired.

- ▶ Report any defects immediately to your supervisor.
 - ▶ Identify the faulty MEWP and take out of service.
 - ▶ Put back into service only after the fault has been identified and repaired.
-

Inspection before daily operation

Procedure

- Check the entire MEWP from the outside for damage and leaks.
- Check the drive wheel and load wheels for damage.
- Check the markings and labels for completeness and legibility, see page 28.
- Make sure panels are secure and check them for damage.
- Check the safety functions.

3.2 Entry and exit

⚠ WARNING!

Loads or objects in the operator position leg compartment

Loads or objects in the operator platform 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 platform can collide with other components during operation. In the event of a collision, the operator on the operator platform may be injured or the MEWP may be damaged.

Loads or objects also pose a trip hazard.

- ▶ Keep the operator platform leg compartment clear of objects.
-

⚠ WARNING!

Risk of falling from a raised operator platform

The operator could fall out if the doors are open and the operator platform is raised.

- ▶ Do not open the doors when the operator platform is raised.
-

⚠ CAUTION!

Crushing by the operator platform doors

There is a risk of hands or feet being crushed when the gates are opened and closed.

- ▶ Do not place any part of your body between the doors and the frame of the operator platform when opening the doors.
-

⚠ CAUTION!

It is forbidden to operate the MEWP with more than one person on the operator platform.

Requirements

- Operator platform is fully lowered.
- MEWP braked to a halt, see page 100.

Procedure

- Open the operator platform doors (18) inwards.



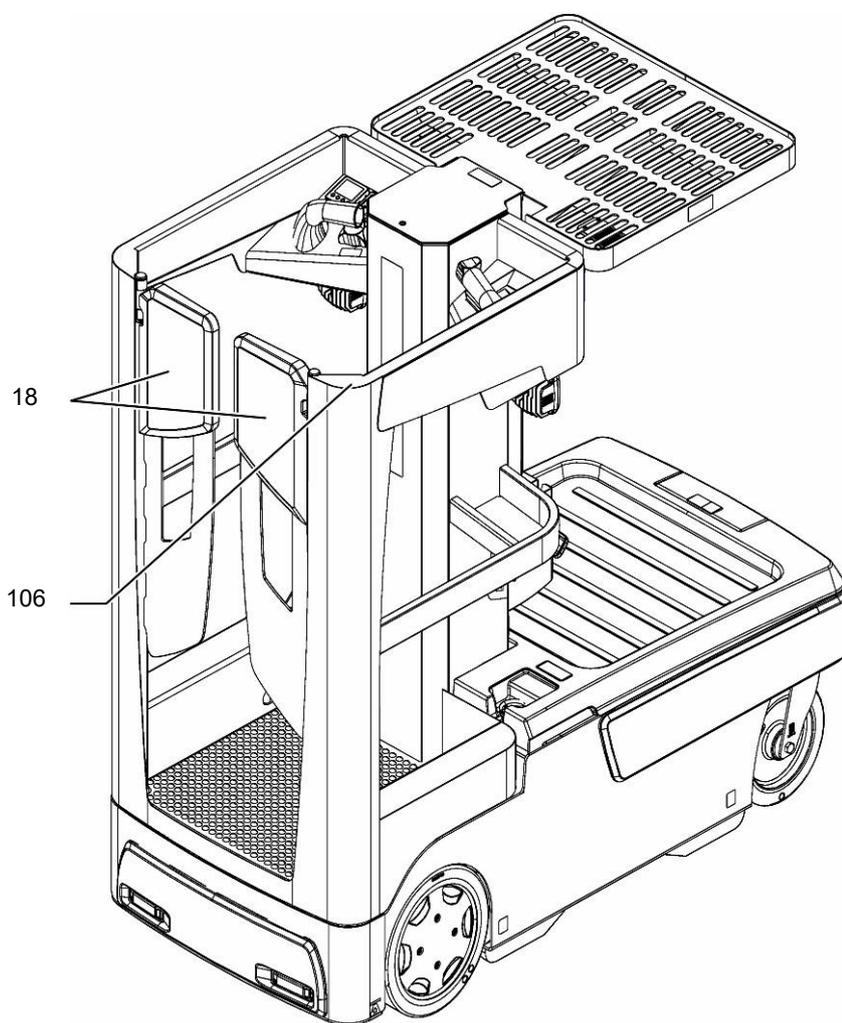
You must face the MEWP upon entry and exit.

- To enter and exit, hold onto the frame (106) of the MEWP.
- The doors (18) close automatically behind the driver.

The operator platform has been occupied. Travel is enabled only when the pressure-sensitive mat is under load.



If the mechanical door lock option is fitted (○), the MEWP doors (18) will not open when the operator platform is raised.



3.3 Preparing the truck for operation

- For a correct start, do not place hands on the operating handles when switching on. The operating handles may only be used when started fully.

Switching on the MEWP

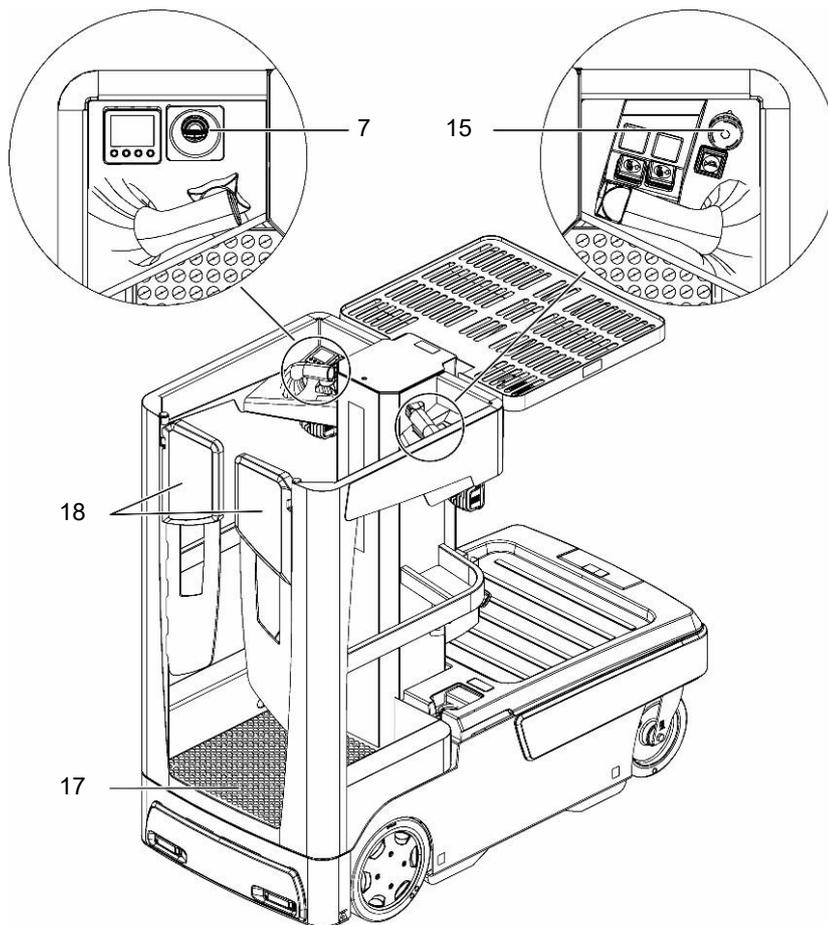
Requirements

- Checks and operations before starting daily work performed, see page 77.

Procedure

- Open the doors (18).
- Step onto the operator platform (17).
- Close the doors (18).
- Turn the emergency disconnect switch (15) to unlock it.
- Switch on the MEWP; to do this:
 - Insert the key in the key switch (7) and turn it as far to the right as it will go.
 - Use the keyless access system (○), see page 113.
 - Hold the card or transponder in front of the ISM access module and, depending on the setting, press the green button on the ISM access module (○).

The MEWP is ready to operate.



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

⚠ WARNING!

Damage and other defects to the MEWP and optional equipment can result in accidents

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

- ▶ Report any defects immediately to your supervisor.
 - ▶ Tag out the faulty MEWP and take out of service.
 - ▶ Do not return the MEWP to service until you have identified and rectified the fault.
-

Requirements

- Prepare for operation, see page 80.

Procedure

- Test warning devices and safety equipment:
 - Test the emergency disconnect switch, see page 89.
 - Test the horn by pressing the "warning signal" button.
 - Test the doors.
 - Test the service and parking brake, see page 100.
 - Test the steering, see page 99.
 - Test the hydraulic system, see page 102 and see page 105.
 - Test the travel functions, see page 96.
 - Test the lighting (work lights, etc.) (○).
- Test the controls and displays and check for damage, see page 67.

3.5 Parking the MEWP securely

⚠ WARNING!

Risk of accident due to unsecured MEWP

It is forbidden to leave the MEWP when unsecured.

- ▶ Park the MEWP securely when leaving it.
 - ▶ Exception: If the operator is staying in the immediate vicinity of the MEWP and is leaving it only for a brief time, it is sufficient simply to apply the parking brake, see page 101. The operator stands in the immediate vicinity of the MEWP only if he can immediately resolve a problem or prevent an attempt at unauthorised use.
-

⚠ WARNING!

Risk of accident due to MEWP not being securely parked

It is forbidden to park the MEWP on a slope or incline. It is forbidden to park the MEWP without engaging the brakes.

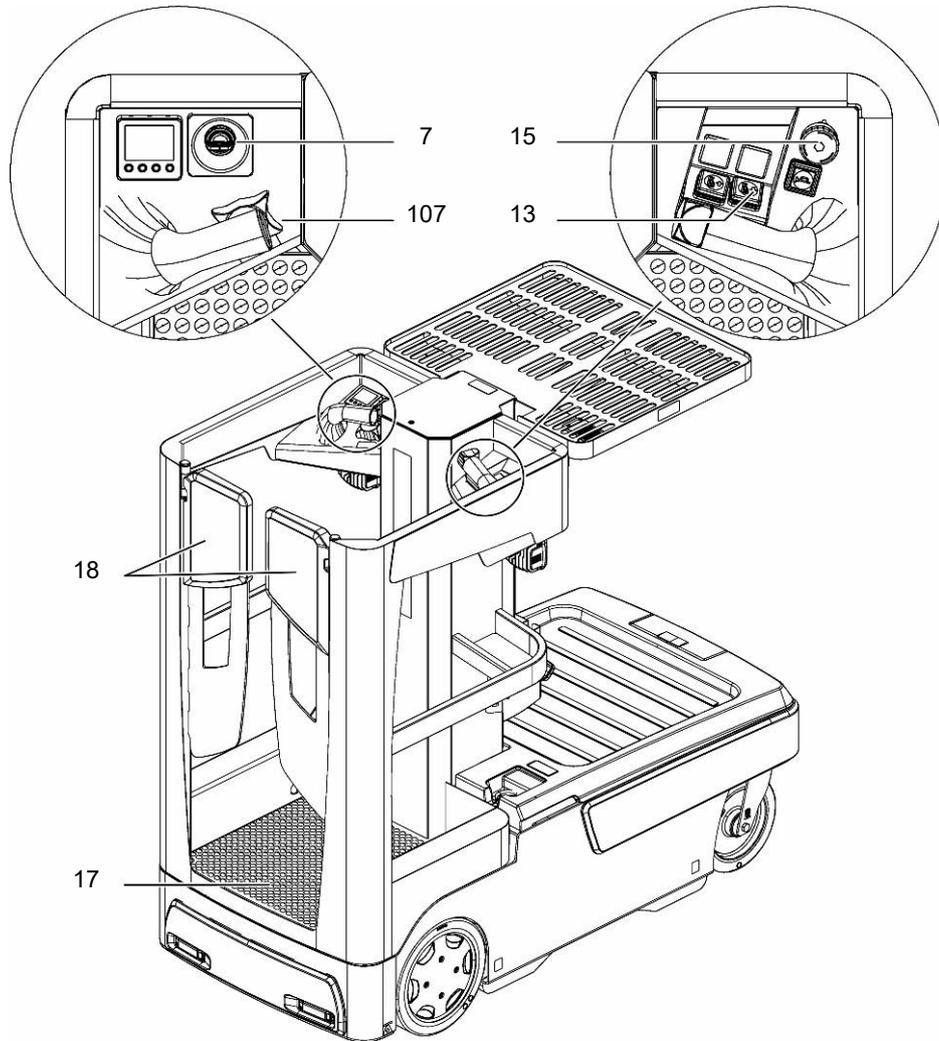
- ▶ Park the MEWP on level ground. In special cases, the MEWP may need to be secured with chocks.
 - ▶ If the brake is not working, place wedges underneath the wheels of the MEWP to prevent it from moving inadvertently.
-

Parking the MEWP securely

Procedure

- Park the MEWP on a level surface.
- Fully lower the operator platform:
 - Press the "lower operator platform" button (13).
- With the steering rotary switch (107) , turn the steering wheel to "straight-ahead travel".
- Switch off the MEWP; to do this:
 - Turn the key in the key switch (7) anti-clockwise as far as it will go. Remove the key from the key switch (7).
 - Use the keyless access system (○), see page 113.
 - Press the red key on the ISM access module (○).
- Press the Emergency Disconnect switch (15).
- Open the doors (18).
- Leave the operator platform (17).
- Close the doors (18).

The MEWP is parked securely.



4 Working with the MEWP

4.1 Safety regulations for truck operation

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 MEWP must be operated only in work areas where there is sufficient lighting, in order to avoid danger to personnel and materials. Additional optional equipment is necessary if the MEWP is operated in areas with insufficient lighting.

→ Operation is permitted only in enclosed areas.

⚠ 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 surface

The travel surface on which the MEWP is to be used must be appropriately maintained to ensure the traction to be expected for travel, steering and braking under the prevailing environmental conditions.

The specifications on the MEWP data plate are based on a dry, level travel surface. Other ground conditions may have a negative effect on the operational stability of the MEWP. They require an adjustment to the rated performance (reduction of speed, etc.) of the MEWP.

⚠ WARNING!

Action to take in the event of MEWP tipover

If the MEWP is in danger of tipping over, the operator should not jump out of the MEWP. He must keep his whole body within the operator platform.

The operator must:

- ▶ Crouch down,
 - ▶ Hold onto the operator platform with both hands,
 - ▶ Lean against the direction of fall.
-

Conduct while travelling

The operator must adapt the travel speed to local conditions. The operator must drive slowly when negotiating bends or narrow passageways, when passing through swing doors, and at blind spots. The operator must always keep a safe braking distance from any vehicle in front, and must be in control of the working platform at all times. Abrupt stopping (except in emergencies), rapid U turns and overtaking at dangerous or blind spots are not permitted. It is forbidden to lean out or reach out while travelling out of the working and operating area.

Tilt sensors

Tilt sensors are active over a platform height of 500 mm. These prevent the MEWP from tipping over when travelling on sloping surfaces. At inclination angles over 2°, travel and lifting are shut off. The operator platform must then be lowered. The MEWP can then be shunted out of the hazard area.

Travel visibility

The operator must look in the travel direction and must always have a clear view of the route ahead. If carrying loads that affect visibility, the MEWP must travel against the load direction. If this is not possible, a second person must walk alongside the MEWP as a marshaller to observe the travel path while maintaining eye contact with the operator. Travel only at crawl speed and with particular caution. Stop the MEWP immediately if eye contact is lost.

WARNING!

Risk of accident when operating with a raised operator platform

Working with a raised operator platform can affect the operator's visibility. Persons within the hazardous area of the MEWP could be injured. The hazardous area is the area in which people can be endangered by the movements of the MEWP. 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 MEWP.

- ▶ When carrying out hydraulic or travel operations, make sure that nobody is present in the hazardous area.
 - ▶ Instruct other people to move out of the hazardous area of the MEWP.
 - ▶ Stop working with the MEWP immediately if people do not leave the hazardous area.
-

Fall protection

The operator must not leave the operator platform when it is raised. Do not leave the operator platform to climb onto parts of the building or onto other trucks. Climbing over and onto the safety gates, control panel, operator platform guard etc. can result in the operator falling out of the raised operator platform.

Negotiating slopes and inclines

Do not negotiate slopes and inclines up to 3° unless they are marked as traffic lanes. The slopes or inclines must be clean and non-slip. It should be possible to travel along them according to the technical specifications of the truck. The truck must always be driven with the load facing uphill. It is forbidden to turn, drive at an oblique angle, or park the MEWP on inclines or slopes. Inclines up to 3° must only be negotiated with the load handler lowered, at slow speed and with the driver ready to brake at any moment.

Negotiating lifts, loading ramps and docks

Lifts may only be negotiated if they have sufficient capacity, are suitable for driving on and authorised for truck traffic by the operating company. The driver must satisfy himself of the above before entering these areas. When entering lifts, the MEWP must have 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 along with the MEWP must only enter the lift after the MEWP has safely stopped, and must leave the lift before the MEWP. The driver must ensure that the loading ramp / dock cannot move or come loose during loading / unloading.

Type of loads to be carried

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

⚠ WARNING!

Risk of accident and tipover when transporting suspended and swinging loads

Transporting suspended and swinging loads can reduce the operational stability of the MEWP. In addition, swaying loads can injure or damage people or components in the vicinity of the MEWP.

- ▶ Do not transport suspended loads.
 - ▶ Do not transport swinging loads.
-

⚠ WARNING!

Risk of accident when transporting liquid loads

The following hazards can arise when transporting liquid loads:

Liquids sloshing out.

Change to the load centre through jerky lifting and travel movements and the associated falling of the load.

Impairment of MEWP operational stability due to slipped or unstable loads.

- ▶ Accelerate the MEWP gradually.
 - ▶ Travel at a constant speed.
 - ▶ Adapt your travel speed to the conditions of the route and the load you are transporting.
 - ▶ Be prepared to brake at all times.
 - ▶ Reduce travel speed accordingly on narrow bends.
 - ▶ Watch out for other traffic at crossings and passageways.
 - ▶ Always travel with a lookout at blind spots.
-

⚠ WARNING!

Electromagnetic interference can result in accidents

Strong magnets can cause electronic components such as Hall-effect sensors to be damaged, resulting in accidents.

- ▶ Do not bring magnets into the operating area of the MEWP. Exceptions to this rule are commercial, weak clamping magnets for attaching notices.
-

⚠ CAUTION!

Risk of tripping and falling when working with the MEWP

The operator may fall from the work platform when carrying out work unsecured or improperly.

- ▶ A personal restraint system comprising a safety belt with safety rope is recommended.
 - ▶ Before using the work platform, ensure that all railings and doors are closed and properly locked.
 - ▶ Always stand securely with both feet on the platform. Never place ladders, crates, planks or similar objects on the platform in order to create additional range.
-

⚠ CAUTION!

Risk of injury from falling parts

Objects may fall if carried on the storage table.

- ▶ Carefully stow loads and objects on the storage table.
 - ▶ Secure objects on the storage table against falling by using a container and/or sufficient means of load securing.
 - ▶ Do not exceed the permissible load of the storage table.
 - ▶ Loose objects may not be carried on the operator platform.
-

NOTICE

Unintentional travel movement in single-hand operation

If single-hand operation is switched on, goods, tools, body parts, etc. may come into contact with the right-hand travel switch. Contact will trigger unintentional travel movement.

- ▶ Keep sufficient clearance from the travel switch.
-

Towing trailers and other vehicles

⚠ CAUTION!

The MEWP must not be used to tow a trailer or to tow other trucks!

4.2 Emergency Disconnect

⚠ CAUTION!

Maximum braking can cause accidents

Operating the emergency disconnect switch during travel will bring the MEWP to a halt with maximum braking force. This can cause the load to slide. There is a higher risk of accidents and injury.

- ▶ Do not use the emergency disconnect switch as a service brake.
 - ▶ When travelling, only use the emergency disconnect switch in the event of danger.
-

⚠ CAUTION!

Faulty or non-accessible emergency disconnect switches can cause accidents

A faulty or non-accessible emergency disconnect switch can cause accidents. In dangerous situations, the operator cannot bring the MEWP to a halt in time by applying the emergency disconnect switch.

- ▶ Operation of the emergency disconnect switch must not be obstructed by objects placed in its way.
 - ▶ Report any defects on the emergency disconnect switch immediately to your supervisor.
 - ▶ Identify the faulty MEWP and take out of service.
 - ▶ Put into service only after the fault has been identified and repaired.
-

Pressing the emergency disconnect switch

Procedure

- Press the emergency disconnect switch (15).

All main electrical functions are deactivated.

The MEWP is braked to a halt.

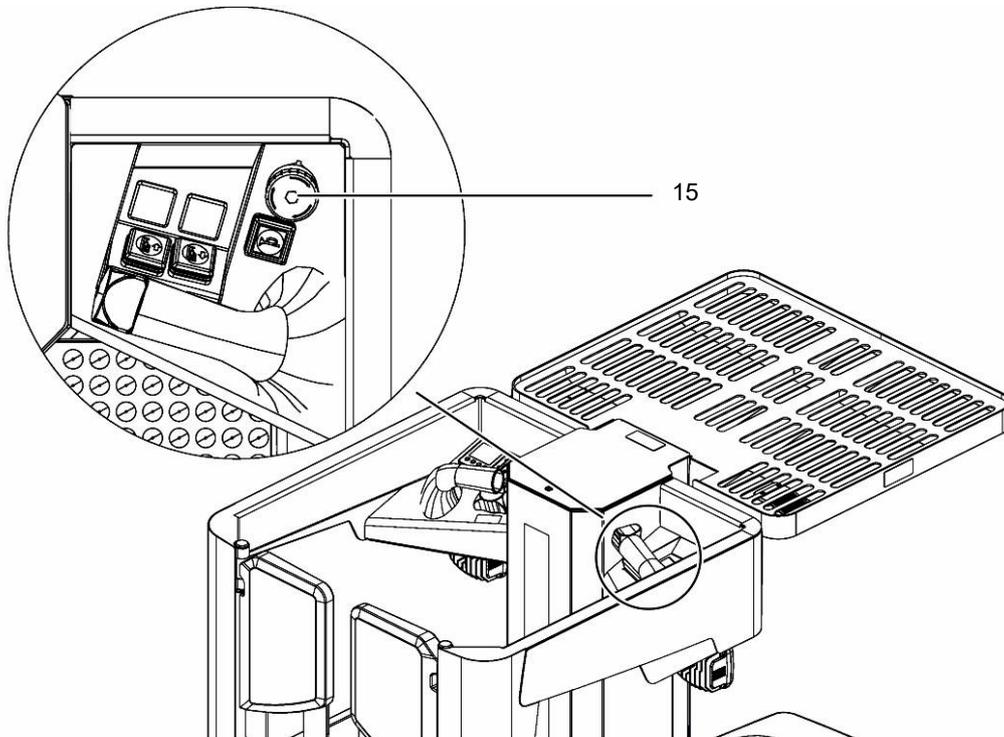
- *When you press the emergency disconnect switch, electric steering is shut off. Steering functions are disabled until the system is reset.*
- Press the Emergency Disconnect switch on in emergencies.

Releasing the emergency disconnect switch

Procedure

- Turn the emergency disconnect switch (15) to unlock it.

All electrical functions are switched on and the MEWP is operational again (provided the MEWP was operational before the emergency disconnect switch was pressed).



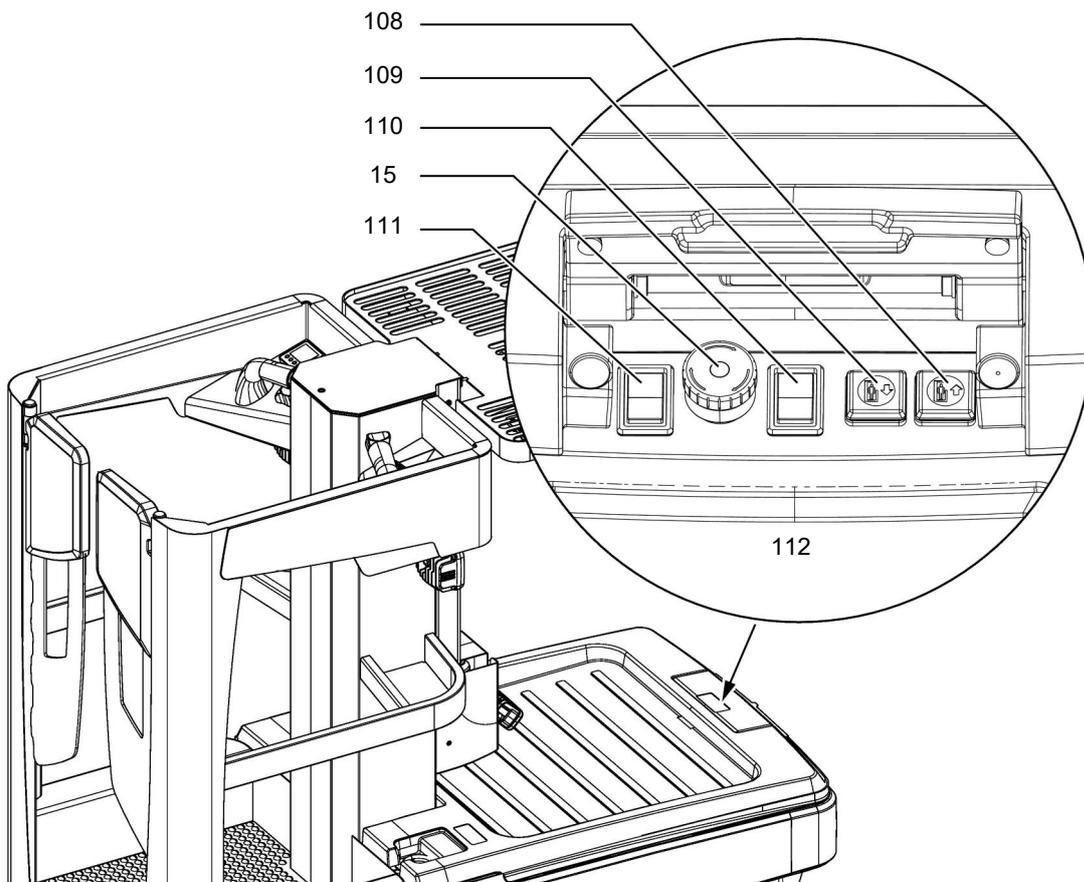
4.3 Emergency control and 2nd operator platform

⚠ CAUTION!

Emergency lowering must only be performed by trained personnel.

- ▶ Maintain sufficient clearance between the working platform and battery panel during the procedure.
- ▶ Note the shearing and crushing points under the operator platform before fully lowering.

The emergency control (112) – second operator platform – is used for operation in an emergency and for the daily function test/safety test. In order to access the emergency control, the flap in the cover must be opened.



Item	Description	Item	Description
15	Emergency disconnect switch	110	"Changeover" switch
108	"Raise elevating work platform" button	111	"Brake release" switch
109	"Lower elevating work platform" button		

4.3.1 Emergency control - releasing the brake

⚠ CAUTION!

A released brake can result in accidents

When the "brake release" button is actuated, the MEWP is not secured against rolling away.

- ▶ Do not release the brake on a gradient.
- ▶ After moving the MEWP, the "brake release" button must be pressed again.

Release the brake

Requirements

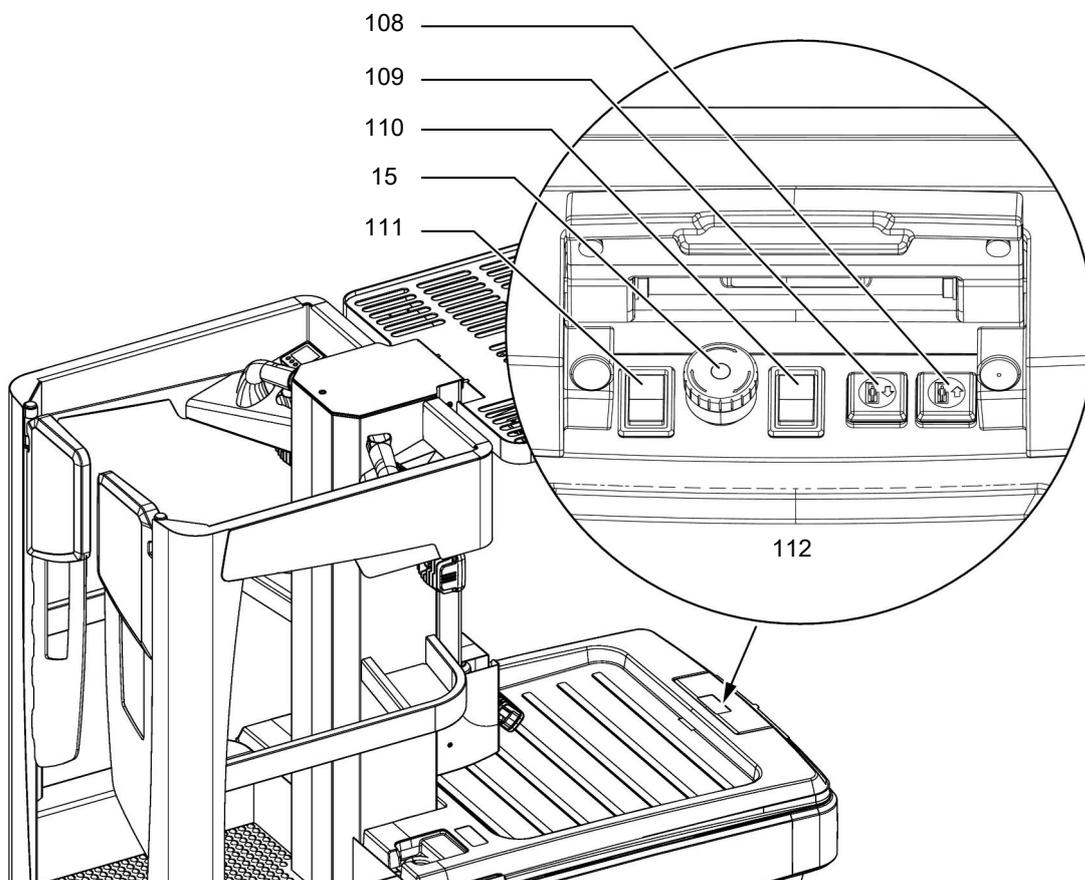
- There is an emergency situation.
- The MEWP is standing on level ground.
- The MEWP is secured to prevent rolling.
- The MEWP is lowered.
- No one is on the MEWP or in the hazardous area.

Procedure

- Open the flap on the emergency control.
- Press the "Brake release" button (111).

The brake is released.

- ➔ After moving the MEWP, the "Brake release" button" (111) must be pressed again.



4.3.2 Emergency control - switchover

In emergency situations, the MEWP can be switched to emergency control using the switchover button. The Raise and Lower buttons on the MEWP are then enabled.

Control switchover

Requirements

- There is an emergency situation.

Procedure

- Open the flap on the emergency control.
- Press the "Switchover" button (110).

Control is switched over.

Raising the MEWP

Requirements

- There is an emergency situation.
- Switchover to emergency control has been completed.
- The MEWP is switched on.
- The doors are closed.

Procedure

- Press the "Raise work platform" button (108).

The work platform is raised.

Lowering the MEWP

Requirements

- There is an emergency situation.
- Switchover to emergency control has been completed.
- The MEWP is switched on.
- The doors are closed.

Procedure

- Press the "Lower work platform" button (109).

The work platform is lowered.

4.4 Emergency lowering

⚠ WARNING!

Lowering the load handler and operator position can result in injuries

The hazardous area is the area in which people can be endangered by the mast, the operator position or the storage table or the load. This also includes the area within reach of falling loads or lowering/falling operating equipment.

- ▶ Instruct other people to move out of the hazardous area of the MEWP during emergency lowering.
- ▶ Do not stand underneath a raised storage table or raised operator position.
- ▶ If a second person is used to lower the operator position via the emergency lowering device below, this person and the operator must communicate with each other. Both people must be in a safe area to avoid danger.
- ▶ Do not perform emergency lowering of the operator position when the parts of the elevating work platform are in the rack.
- ▶ Report any defects immediately to your supervisor.
- ▶ Tag out the faulty MEWP and take out of service.
- ▶ Do not return the MEWP to service until you have identified and rectified the fault.

⚠ WARNING!

Risk of crushing during emergency lowering

During emergency lowering, there is a risk of the operator on the operator platform getting crushed between the operator platform and the rack or other objects.

- ▶ Keep the whole of your body inside the operator platform.

⚠ CAUTION!

Emergency lowering must only be performed by trained personnel.

- ▶ Maintain sufficient clearance between the working platform and battery panel during the procedure.
- ▶ Note the shearing and crushing points under the operator platform before fully lowering.

The operator platform can be lowered using the emergency lowering function even if the electronics have failed.

Opening the lowering valve

Requirements

- There is an emergency situation.
- The MEWP is parked securely, see page 82.
- The platform cannot be lowered with the emergency control, see page 91.

Procedure

- Remove the battery panel, see page 140.
- Open the lowering valve (114):
 - Carefully turn the adjusting screw (113) anticlockwise by hand.

➔ The lowering speed increases the further the lowering valve is opened.

The lowering valve has been opened. The operator platform is lowering.

Closing the lowering valve

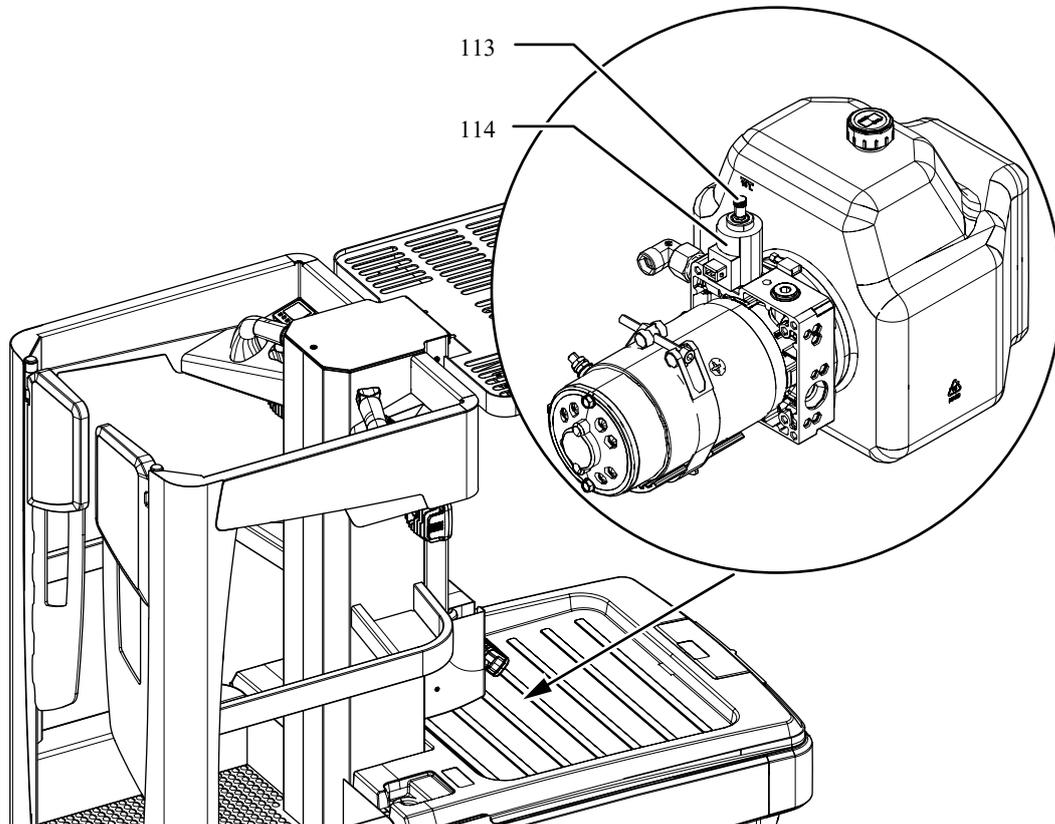
Requirements

- Lowering valve (114) open.

Procedure

- Carefully turn the adjusting screw (113) clockwise by hand as far as it will go.

The lowering valve is closed.



4.5 Travel

WARNING!

Incorrect travel can cause accidents and injury

Incorrect travel can cause accidents and therefore injury to the operator and / or third parties.

- ▶ Always transport a load outside the narrow aisle as low as possible, allowing for ground clearance.
 - ▶ Do not lean out of the truck while travelling.
 - ▶ Make sure the travel routes are clear.
 - ▶ Adapt your travel speed to the route conditions, the work area and the load.
 - ▶ Make sure you have sufficient visibility when reversing.
 - ▶ Ensure that there is nobody in the hazardous area when carrying out travel and hydraulic operations.
 - ▶ Instruct other people to move out of the hazardous area of the MEWP.
 - ▶ Stop working with the MEWP immediately if people do not leave the hazardous area.
-

WARNING!

Risk of collision when operating the MEWP

Operating the MEWP with open panels and covers can lead to collisions with persons or objects.

- ▶ Do not operate the MEWP unless the panels and covers are closed and properly locked.
-

Anti-roll back device for slow travel on inclines

If the MEWP does not have sufficient speed to travel up an incline, it may roll back. Roll-back is detected by the MEWP control and the MEWP is braked to a halt.

Requirements

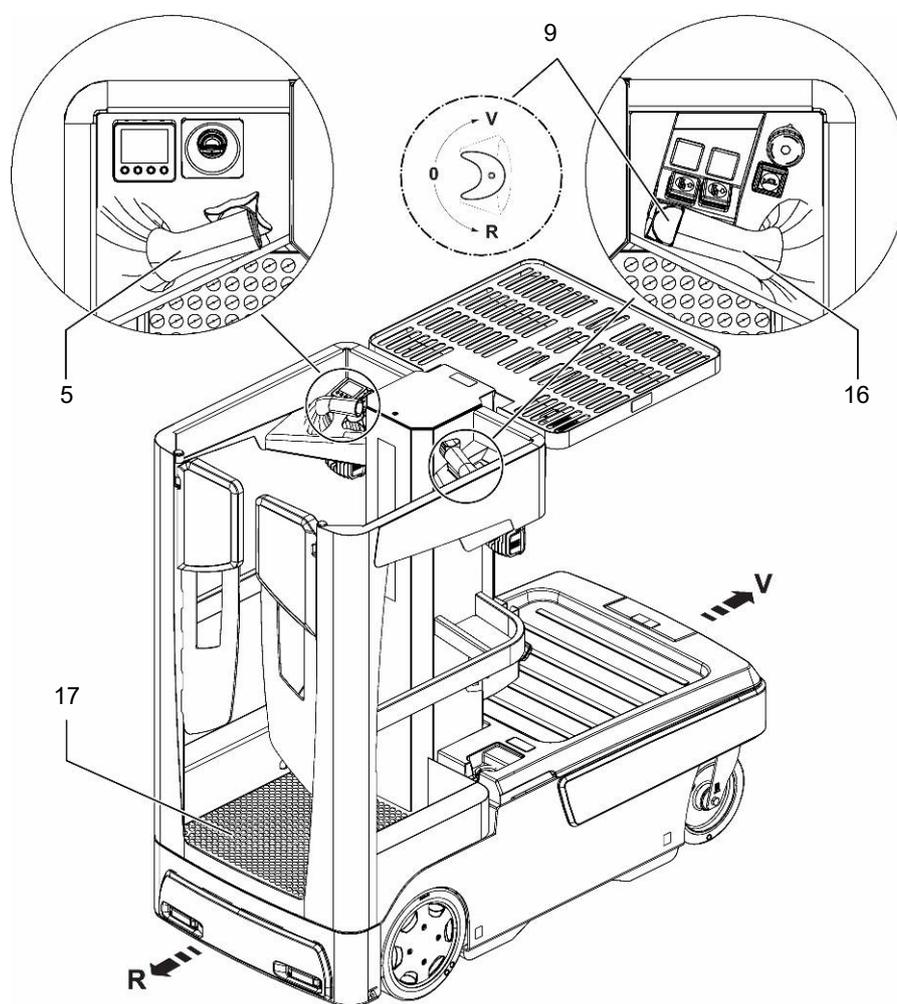
- Put the MEWP in operation, see page 80.
- Step onto the operator platform (17), see page 77.

Procedure

- Grip the left handle (5) with the left hand and the right handle (16) with the right hand.
 - Move the travel switch (9) in the desired travel direction: forward (V) or reverse (R).
- ➔ When the travel switch is released, it automatically returns to the neutral position and the MEWP brakes.
- Control the travel speed with the travel switch (9).

The brake is released and the MEWP moves in the selected direction.

- ➔ For details of the brake functions, see page 100.



4.5.1 Changing direction during travel

⚠ CAUTION!

Danger when changing travel direction during travel

Changing the travel direction causes the MEWP to decelerate sharply. When the travel direction is changed, this can result in a high speed in the opposite travel 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 the direction of travel.
 - ▶ Maintain an adequate overview of the route you are travelling.
-

⚠ CAUTION!

Risk of tipover when changing direction repeatedly

Changes in direction of travel carried out in quick succession can cause the MEWP to rock and impair operational stability.

- ▶ If there is a risk of rocking, release the travel direction rocker until the EWP has stabilised.
-

Changing direction during travel

Requirements

- The MEWP is ready to operate, see page 80.
- The operator platform is occupied, see page 77.

Procedure

- Grip the left handle (5) with the left hand and the right handle (16) with the right hand.
- Drive the MEWP in the load or drive direction:
 - Actuate the travel direction rocker (9).
- While travelling in the opposite direction, turn the travel direction rocker (9).
The MEWP brakes regeneratively via the traction controller until it starts to move in the opposite direction.

☞ *The travel direction change reduces the MEWP energy consumption. Energy is recovered, which is controlled by the traction controller.*

- After setting off in the opposite direction, only actuate the travel direction rocker (9) lightly or not at all.

4.6 Steering

Procedure

- Turn the steering rotary switch (8) to the left or right.

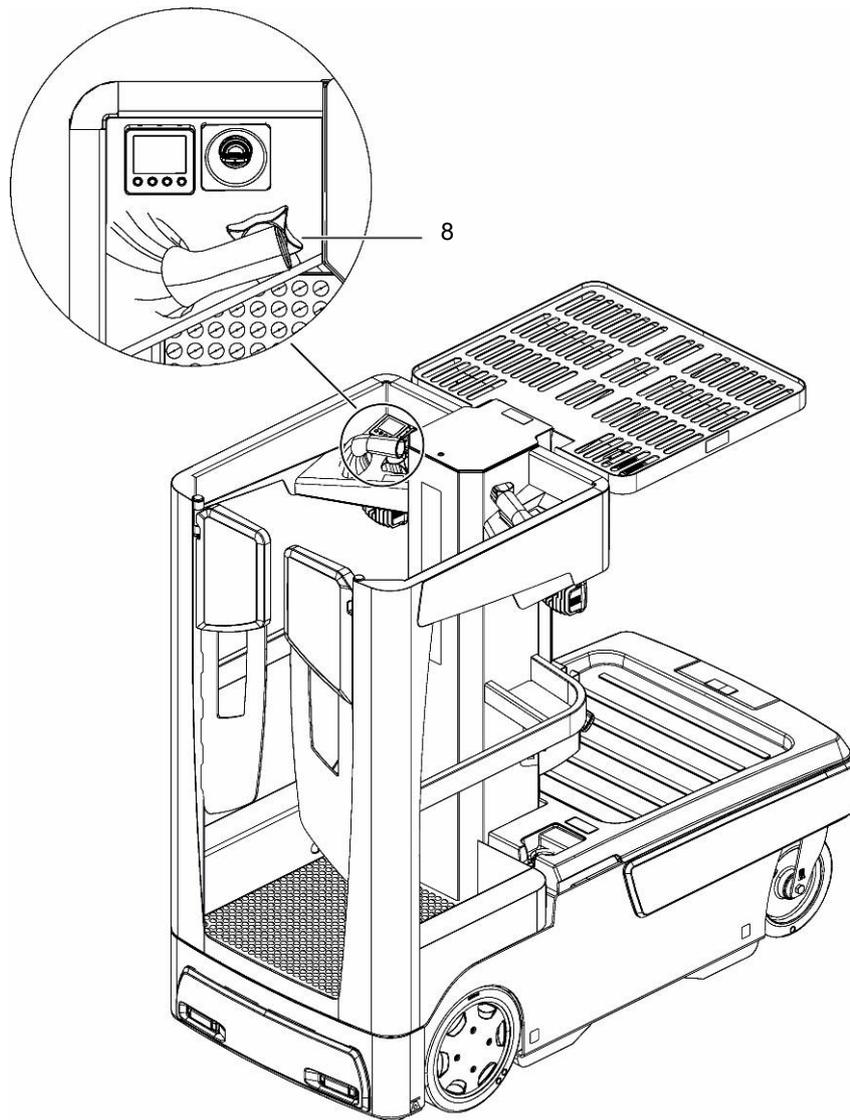
The MEWP is steered in the desired direction.

- If steering while at a standstill, the work platform rotates around itself.

NOTICE

Steering within narrow aisles

The MEWP is guided within narrow aisles. Steering is not possible.



4.7 Brakes

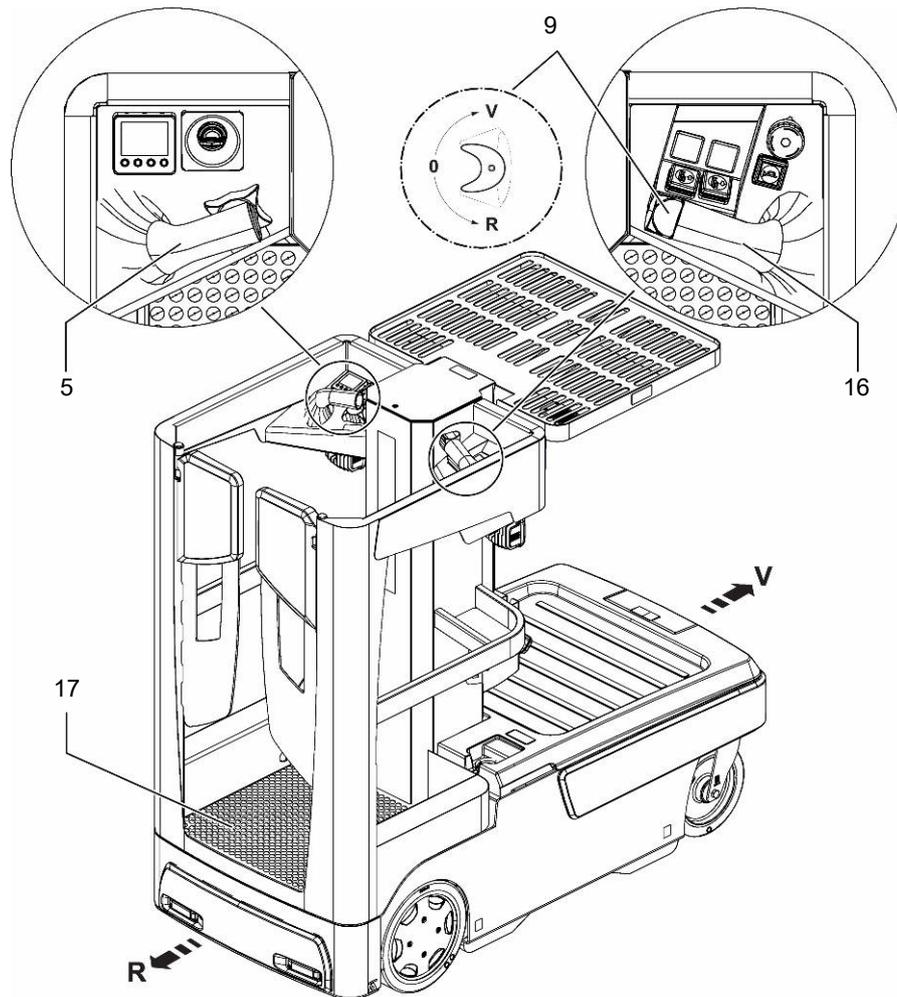
⚠ WARNING!

Accident risk

The brake pattern of the MEWP depends largely on the conditions on the travel lane.

- ▶ The operator must take into account the travel lane conditions when braking.
- ▶ Brake the MEWP carefully to prevent the load from slipping.
- ▶ In normal operation, brake the MEWP only with the service brake.

➔ Press the Emergency Disconnect switch on in emergencies.



4.7.1 Braking with the Service Brake

Procedure

- When the travel switch (9) is set to the zero position (0), the MEWP is braked regeneratively.

The MEWP is braked to a halt regeneratively.

4.7.2 Inversion braking

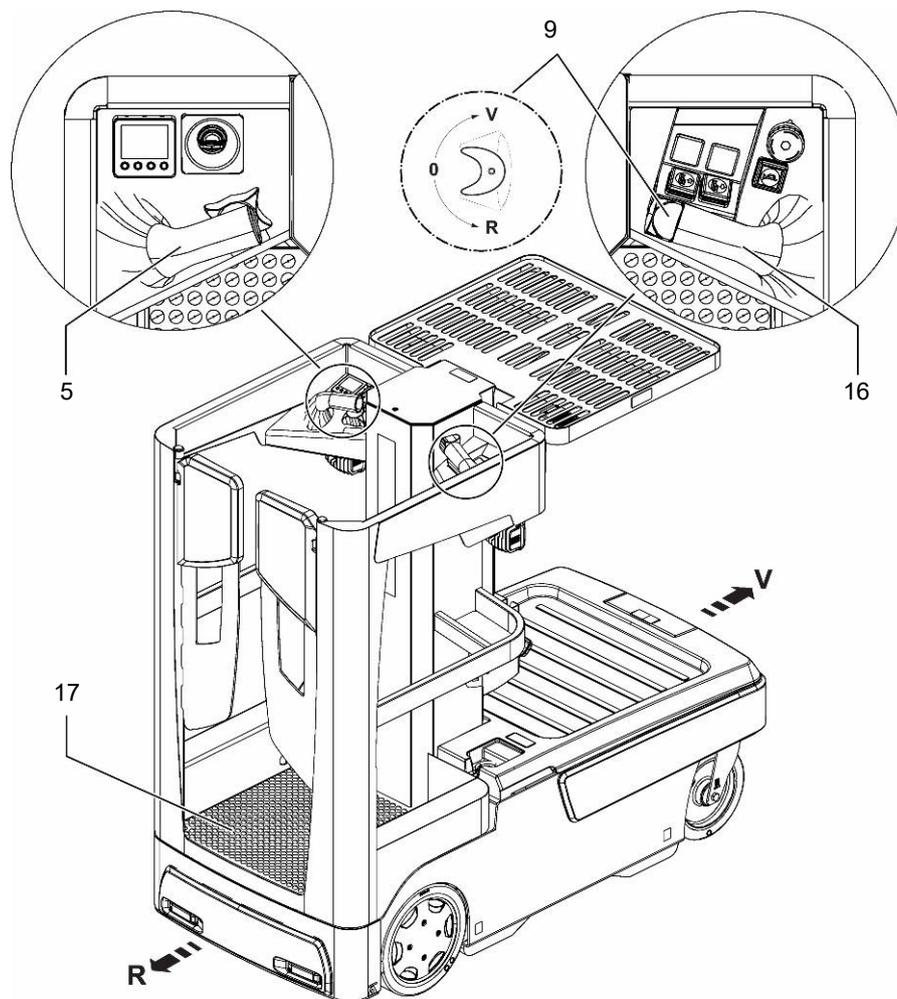
Procedure

- While travelling, set the travel switch (9) in the opposite travel direction, see page 98.

The MEWP is braked by countercurrent until it starts to move in the opposite direction.

4.7.3 Parking brake

- The mechanical brake automatically applies when the MEWP comes to rest.



4.8 Raising or lowering the MEWP

⚠ WARNING!

Risk of accidents during lifting and lowering

Other people can be injured in the MEWP's hazardous area.

The hazardous area is defined as the area in which people are at risk from the MEWP movement, including the load handler, attachments etc. This also includes areas that can be reached by falling loads etc.

Apart from the operator (in the normal operating position), there should be no other people in the MEWP's hazardous area.

- ▶ Instruct other people to move out of the hazardous area of the MEWP. Stop working with the MEWP immediately if people do not leave the hazardous area.
 - ▶ If people do not leave the hazardous area despite the warning, prevent the MEWP from being used by unauthorised people.
 - ▶ Only transport loads that have been correctly secured and positioned. Use suitable precautions to prevent parts of the load from tipping or falling down.
 - ▶ Damaged loads must not be transported.
 - ▶ Do not exceed the maximum loads specified on the capacity plate.
 - ▶ Do not walk or stand underneath the raised operator position.
 - ▶ Do not stand on the storage table.
 - ▶ Do not lift any persons other than the operator.
 - ▶ Do not reach or climb into moving MEWP parts.
 - ▶ The operator must not leave the operator position when it is raised. Do not climb onto parts of the building or other trucks.
-

⚠ WARNING!

Risk of falling from a raised operator platform

The operator could fall out if the doors are open and the operator platform is raised.

- ▶ Do not open the doors when the operator platform is raised.
-

⚠ WARNING!

Unauthorised lowering speeds can cause accidents

The line break safety valve in the Main Lift hydraulic cylinders stops the operator's position from lowering if the lowering speed is out of range ($> 0,4$ m/s). If the safety valve applies for an unauthorised lowering speed, determine the cause.

- ▶ If there no leakage in the hydraulic system, raise the Main Lift slightly and then lower it again slowly.
 - ▶ Report any defects immediately to your supervisor.
 - ▶ Tag out the faulty MEWP and take out of service.
 - ▶ Do not return the MEWP to service until you have identified and rectified the fault.
 - ▶ Spilled, leaking hydraulic oil must be removed immediately with an appropriate bonding agent.
 - ▶ The mixture of bonding agents and consumables must be disposed of in accordance with relevant regulations.
-

⚠ CAUTION!

Risk of injury from falling parts

Objects may fall if carried on the storage table.

- ▶ Carefully stow loads and objects on the storage table.
 - ▶ Secure objects on the storage table against falling by using a container and/or sufficient means of load securing.
 - ▶ Do not exceed the permissible load of the storage table.
 - ▶ Loose objects may not be carried on the operator platform.
-

Raising the MEWP

Requirements

- The MEWP is ready to operate, see page 80.
- Both hands are on the handles or crawl speed is switched on.
- Make sure that there is sufficient upward room.

Procedure

- Press the "Raise work platform" button (10).

The work platform is raised.

Lowering the MEWP

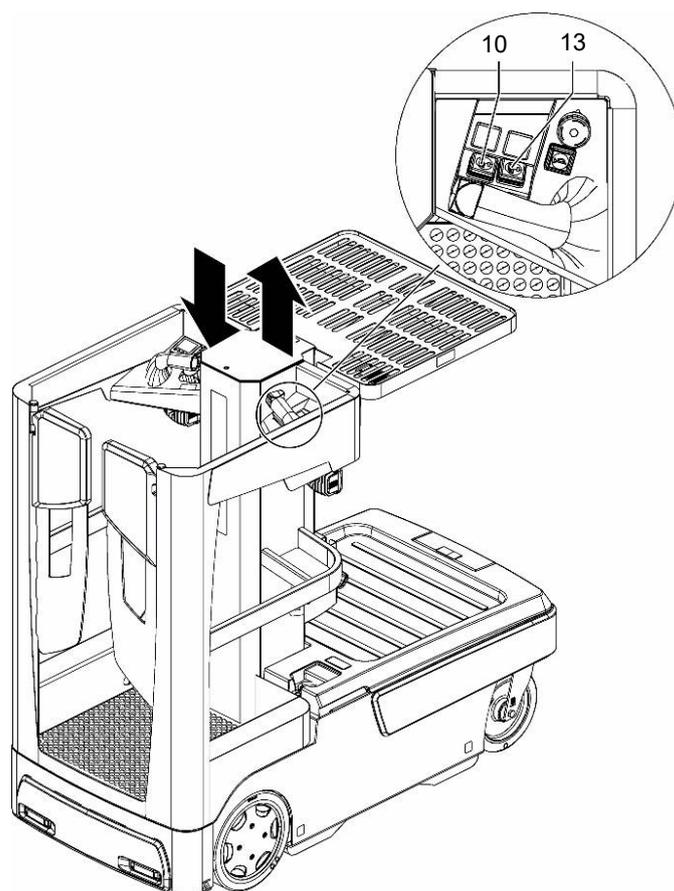
Requirements

- The MEWP is ready to operate, see page 80.
- Both hands are on the handles or crawl speed is switched on.
- Constant checking to ensure that no one is located under the platform.

Procedure

- Press the "Lower work platform" button (13).

The work platform is lowered.



4.8.1 Lift Limit (○)

The lift height and travel below a defined lift height can be set for a specific customer by the customer service department of the manufacturer.

The operator can manually override the setting by pressing and holding the softkey below the symbol.



4.9 Raising or lowering the storage table

⚠ CAUTION!

Risk of injury from falling parts

Objects may fall if carried on the storage table.

- ▶ Carefully stow loads and objects on the storage table.
 - ▶ Secure objects on the storage table against falling by using a container and/or sufficient means of load securing.
 - ▶ Do not exceed the permissible load of the storage table.
 - ▶ Loose objects may not be carried on the operator platform.
-

NOTICE

When lowering the storage table, make sure that it does not collide with the loads on the lower storage facility.

4.9.1 Mechanical Storage Table (●)

⚠ CAUTION!

Risk of injury due to uncontrolled lowering of the mechanical storage table

The weight of the load pushes the mechanical storage table down jerkily when the actuation lever is pushed.

- ▶ Only adjust the mechanical storage table in an unladen condition.
-

Lowering the storage table

Procedure

- Grab the side of the storage table with both hands.
- Press and hold the actuation lever (115).
- Push the storage table down.

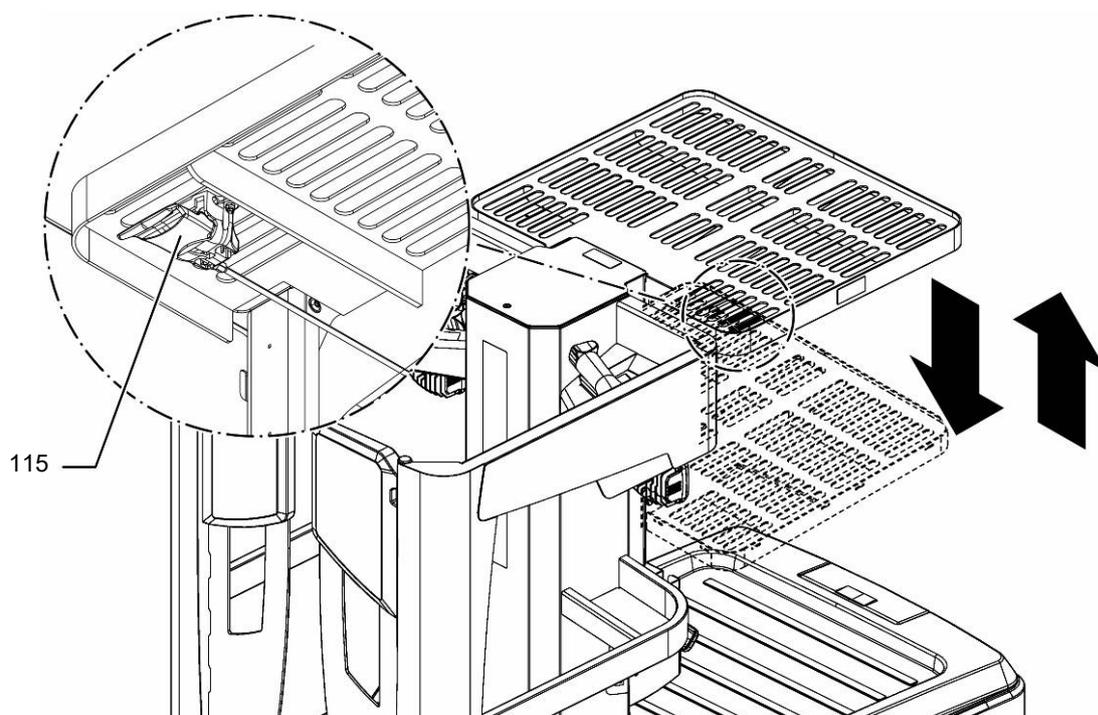
The height of the storage table has been adjusted.

Raising the storage table

Procedure

- Grab the side of the storage table with both hands.
- Press and hold the actuation lever (115).
- Adjust the storage table upwards.

The height of the storage table has been set.



4.9.2 Electrical storage table (○)

Lowering the storage table

Requirements

- Both hands are on the handles or crawl speed is switched on.

Procedure

- Press the "Lower storage table" button (12).

The storage table is lowered.

Raising the storage table

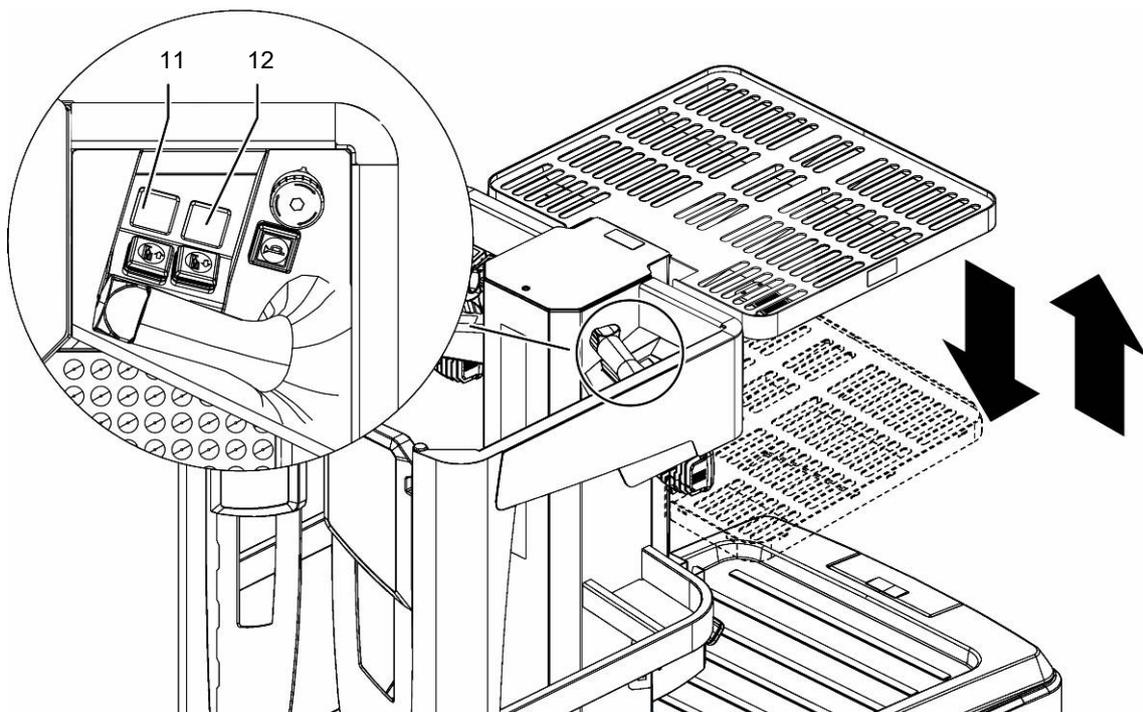
Requirements

- Both hands are on the handles or crawl speed is switched on.

Procedure

- Press the "Raise storage table" button (11).

The storage table is raised.



5 Troubleshooting

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

- If the following remedial actions are carried out and the MEWP cannot be restored to operational condition, or if a fault or defect in the electronics system is displayed with a corresponding error message, please contact the manufacturer's service department.

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

In order for customer service departments to respond quickly and specifically to the fault, the following information is essential:

- Serial number of the MEWP
- Event message on the display unit (if present)
- Error description
- Current location of the MEWP.

- For other malfunctions – see "Troubleshooting" on page 49.

Event messages (E) and information messages (I)

- Event messages (E) and information messages (I) are displayed in the information line (97) of the display unit, see page 68.

5.1 The MEWP does not move

Possible cause	Action
Battery connector not inserted	Check the battery connector and insert if necessary.
Emergency Disconnect pressed	Unlock the Emergency Disconnect
Key switch set to "O"	Set the key switch to I
Battery charge too low	Check the battery charge and charge battery if necessary
Faulty fuse	Checking fuses
Incorrect code entered in display unit (○)	Enter correct code, see page 117
Incorrect code entered on keypad (○)	Enter correct code, see page 114
Incorrect transponder used on transponder reader (○)	Use correct transponder, see page 122
Incorrect transponder used on ISM access module (○)	Use correct transponder, see page 126
Two-hand operation: Both hands not on the handles.	Both hands on the handles or change to one-hand operation.
Operator platform not occupied.	Occupy the operator platform.
Switched to 2nd operator platform. Operation only from below.	Switch to operation at 2nd operator platform.
Brake released?	Bleed the brake.
Doors are open	Close the doors.

5.2 Cannot raise the work platform

Possible cause	Action
MEWP is not ready to operate.	Carry out all actions listed under "The MEWP does not move".
Hydraulic oil level too low.	Check hydraulic oil level.
Battery discharge monitor has switched itself off.	Charges the battery.
Faulty fuse.	Check the fuses.
Excessive load.	Note maximum capacity (see data plate).
"Raise elevating working platform" button/"Lower elevating working platform" button not in neutral position when the elevating working platform was switched on.	Do not press the buttons.
Buttons on 1st operator platform not working.	Change over to 2nd operator platform.
MEWP is standing on sloping ground.	Move to level ground.
Brake released.	Bleed the brake.
Doors are open.	Close the doors.
Deadman switch not pressed.	Press the deadman's switch.
Both hands not on the handles in two-hand operation.	Place both hands on the handles or change to slow travel.

5.3 Storage table cannot be raised

Possible cause	Action
MEWP is not ready to operate.	Carry out all actions listed under "The MEWP does not move".
Battery discharge monitor has switched off.	Charge the battery.
Faulty fuse.	Check the fuses.
Excessive load.	Note maximum capacity (see data plate).
"Raise storage table" button/"Lower storage table" button not in neutral position when the elevating working platform was switched on.	Do not press the buttons.
Two-hand operation - Second hand not on the handle.	Place the second hand on the handle.

6 Moving the MEWP without its own drive

⚠ WARNING!

Put the MEWP back into service only after the fault has been identified and rectified.

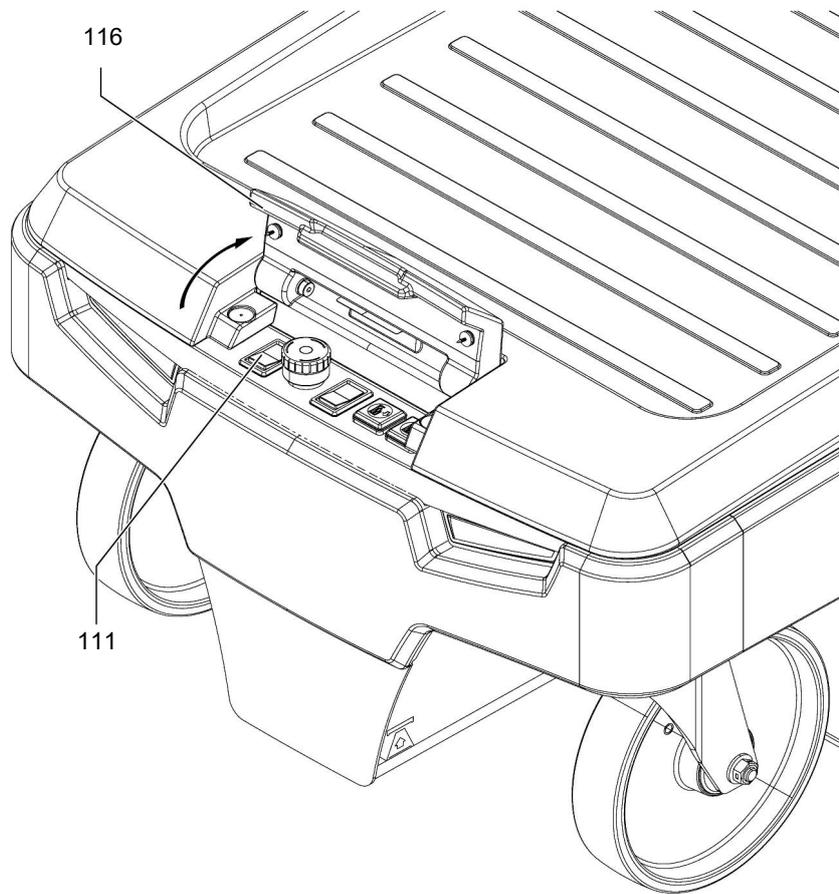
⚠ WARNING!

Risk of crushing and material damage

Uncontrolled movements can occur if the MEWP is on a sloping surface and the brake is released. This can result in personal injuries or material damage.

► Secure the MEWP to prevent it rolling.

The emergency control – second operator platform – is used for operation in an emergency and for the daily function test/safety test. In order to access the emergency control, the flap (116) in the cover must be opened.



Release the brake

Requirements

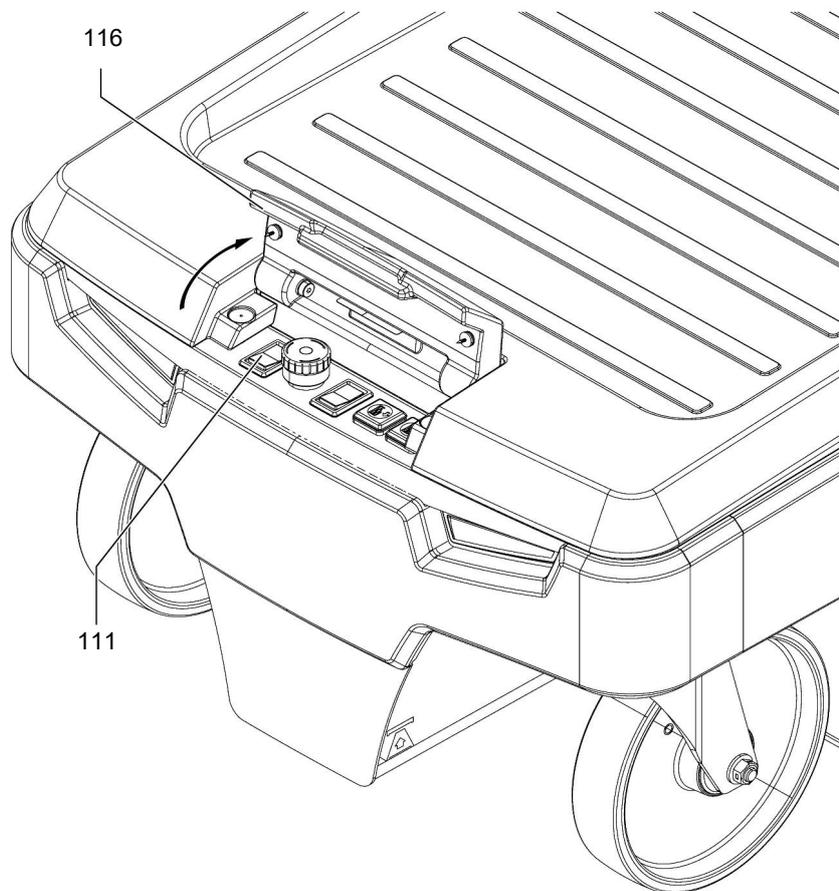
- There is an emergency situation.
- The MEWP is standing on level ground.
- The MEWP is secured to prevent rolling.
- The MEWP is lowered.
- No one is on the MEWP or in the hazardous area.

Procedure

- Open the flap on the emergency control.
- Press the "Brake release" button (111).

The brake is released.

- ➔ After moving the MEWP, the "Brake release" button" (111) must be pressed again.

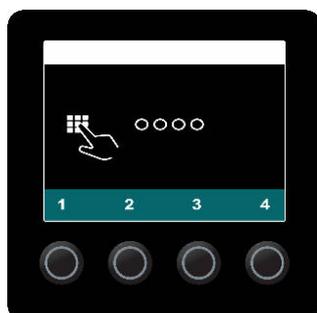


7 Optional equipment

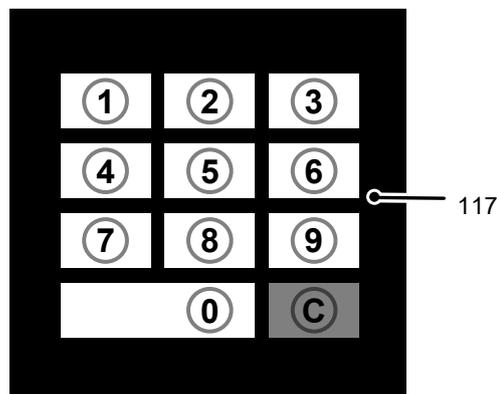
7.1 Keyless Access System

The keyless access systems serve as a replacement for the key switch to release the MEWP.

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



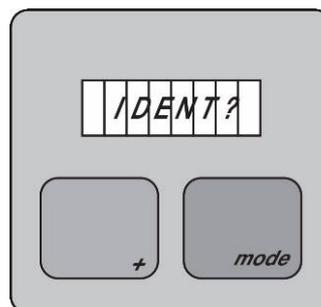
6



117



118



119

Item	Description
6	Display unit (EasyAccess Softkey): <ul style="list-style-type: none"> – Description see page 68 – Entry of 4-digit set-up and access codes – For set-up and access codes with the numbers 1 to 4 – Up to 10 access codes can be stored
117	Keypad (EasyAccess PINCode): <ul style="list-style-type: none"> – Only in combination with the display unit (6) – Entry of 4-digit set-up and access codes and C (clear) – For set-up and access codes with the numbers 0 to 9 – Up to 100 access codes can be stored
118	Transponder reader (EasyAccess Transponder): <ul style="list-style-type: none"> – Only in combination with the display unit (6) – Up to 100 transponders can be stored
119	ISM online access module: <ul style="list-style-type: none"> – If the truck is equipped with an ISM Online access module, see "ISM Online Access Module" operating instructions.

7.2 General Information about the Use of Keyless Access Systems

The default code is to be found on a sticker. When using for the first time, change the set-up code and remove the sticker!

- Default code: 2-5-8-0
- Factory set-up code: 2-4-1-2

- When a valid code is entered or a valid transponder used, a green tick appears on the display unit.
When an invalid code has been entered or an invalid transponder used, a red cross is displayed, and the entry must be repeated.
- If the MEWP is not used for a certain length of time, the display unit switches to standby mode. Pressing any key cancels standby mode.

The following additional settings can be performed by the manufacturer's customer service department.

7.3 Commissioning the Keypad and the Transponder Reader

If the MEWP is equipped with a keypad or a transponder reader, it can only be operated using the keys on the display unit. The keypad and the transponder reader have to be activated by the operating company.

7.3.1 Activating the keypad

Procedure

- Release the emergency disconnect switch, see page 89.
- Enter the default code 2-5-8-0 with the keys below the display unit (6).

The MEWP is switched on.

- Press the key below the "Settings" symbol (120).
- Press the key below the "Change set-up code" symbol (121).
- Enter set-up code 2-4-1-2 with the keypad (117).

The set-up code entered is displayed.

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

Press the key below the "Delete" symbol (122).

The set-up code is deleted.

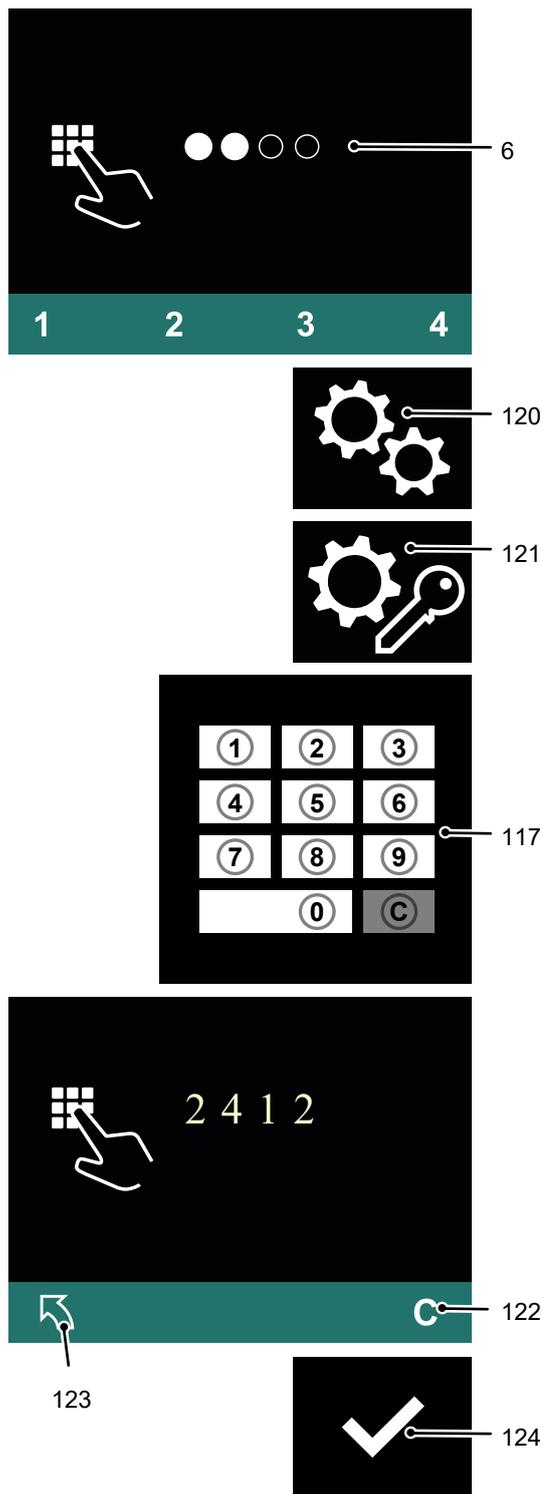
- Enter a new set-up code with the keypad (117).
- Press the key below the "Confirm" symbol (124).

The new set-up code is displayed.

- If the new set-up code was entered incorrectly, the procedure can be repeated using the key below the "Delete" symbol (122).

- To return to the main menu, press the key below the "Back" symbol (123).
- Delete the default code, see page 120.
- Create access codes, see page 119.

The keypad is active.



7.3.2 Activating the transponder reader

Procedure

- Release the emergency disconnect switch, see page 89.
- Enter the default code 2-5-8-0 with the keys below the display unit (6).
The MEWP is switched on.
- Press the key below the "Settings" symbol (120).
- Press the key below the "Change set-up code" symbol (121).
- Enter the set-up code 2-4-1-2 with the keys below the display unit (6).
The set-up code entered is displayed.
- Press the key below the "Delete" symbol (122).
The set-up code is deleted.
- Hold a transponder in front of the transponder reader (118).
This transponder thus becomes the set-up transponder.
- Press the key below the "Confirm" symbol (124).
The code for the set-up transponder is displayed.

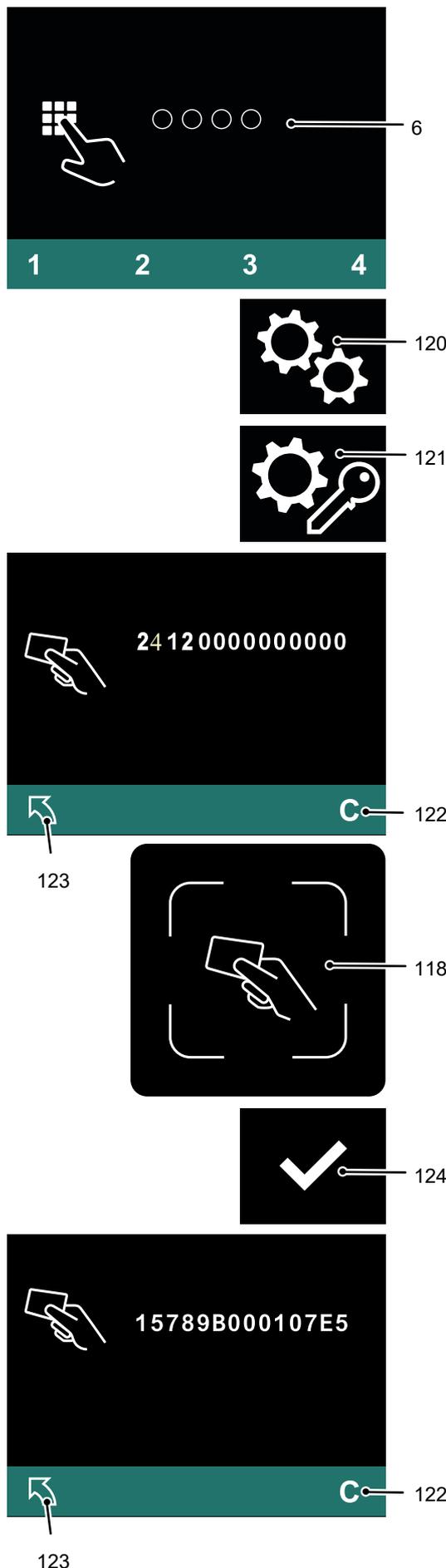
→ *If the wrong transponder has been used, the procedure can be repeated using the key below the "Delete" symbol (122).*

- To return to the main menu, press the key below the "Back" symbol (123).

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

- Delete the default code, see page 125.
- Add new transponders, see page 124.

The transponder reader is now active.



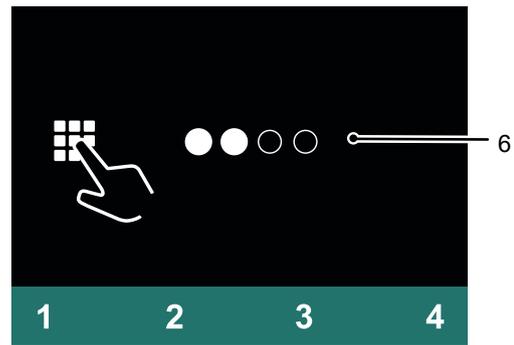
7.4 Using the Display:

7.4.1 Switching on the MEWP with an Access Code

Procedure

- Release the emergency disconnect switch, see page 89.
- Enter the access code with the buttons below the display (6).

The MEWP is switched on.

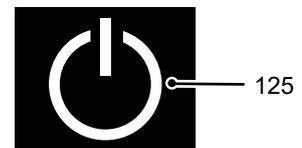


7.4.2 Switching off the MEWP

Procedure

- Press the key under the "Switch off" symbol (125) in the display unit.
- Press the emergency disconnect switch, see page 89.

The MEWP is switched off.



7.4.3 Changing the Set-up Code

Requirements

- The MEWP is switched on, see page 117.

Procedure

- Press the key below the "Settings" symbol (120).
- Press the key below the "Change set-up code" symbol (121).
- Enter the set-up code with the keys below the display unit (6).

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

- Press the key below the "Delete" symbol (122).

The set-up code is deleted.

- Enter the new set-up code with the keys below the display unit (6).

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

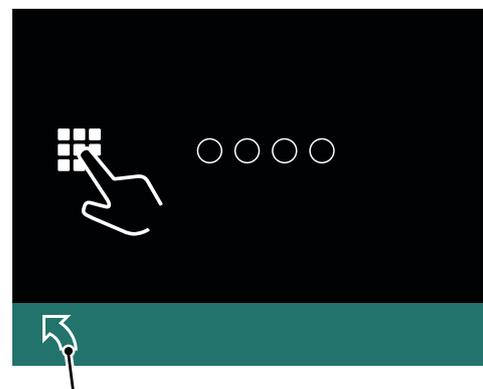
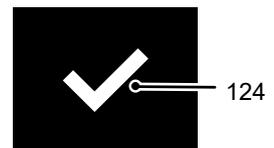
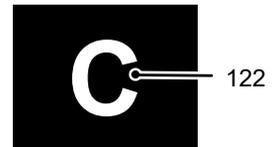
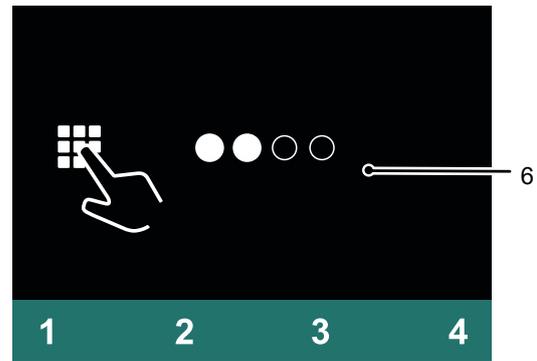
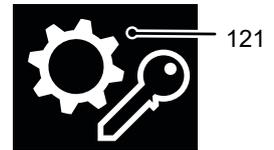
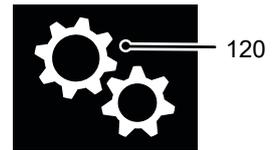
- Press the key below the "Confirm" symbol (124).

The new set-up code is displayed.

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

To return to the main menu, press the key below the "Back" symbol (123).

The set-up code has been changed.



123

7.4.4 Adding a new access code

Requirements

- The MEWP is switched on, see page 117.

Procedure

- Press the key below the "Settings" symbol (120).
- Press the key below the "Edit access code" symbol (126).

The set-up code is requested.

- Enter the set-up code with the keys below the display unit (6).

All the access codes are displayed.

- Press the keys below the "Add" symbol (127).
- Enter the new access code with the keys below the display unit (6).

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

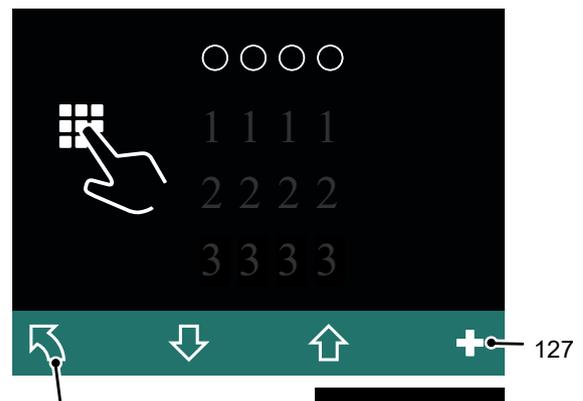
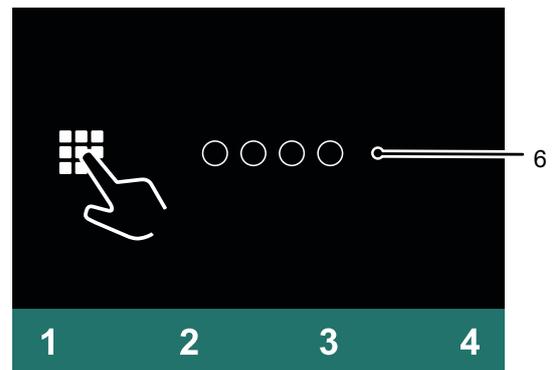
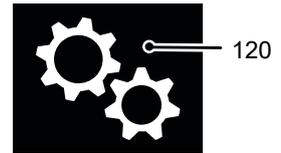
- Press the key below the "Confirm" symbol (124).

The new access code is displayed.

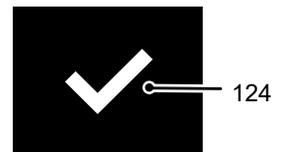
→ If the new access code has been entered incorrectly, delete it, see page 120, and add an access code again.

To return to the main menu, press the key below the "Back" symbol (123).

A new access code has been added.



123



7.4.5 Deleting an access code

Requirements

- The MEWP is switched on, see page 117.

Procedure

- Press the key below the "Settings" symbol (120).
- Press the key below the "Edit access code" symbol (126).

The set-up code is requested.

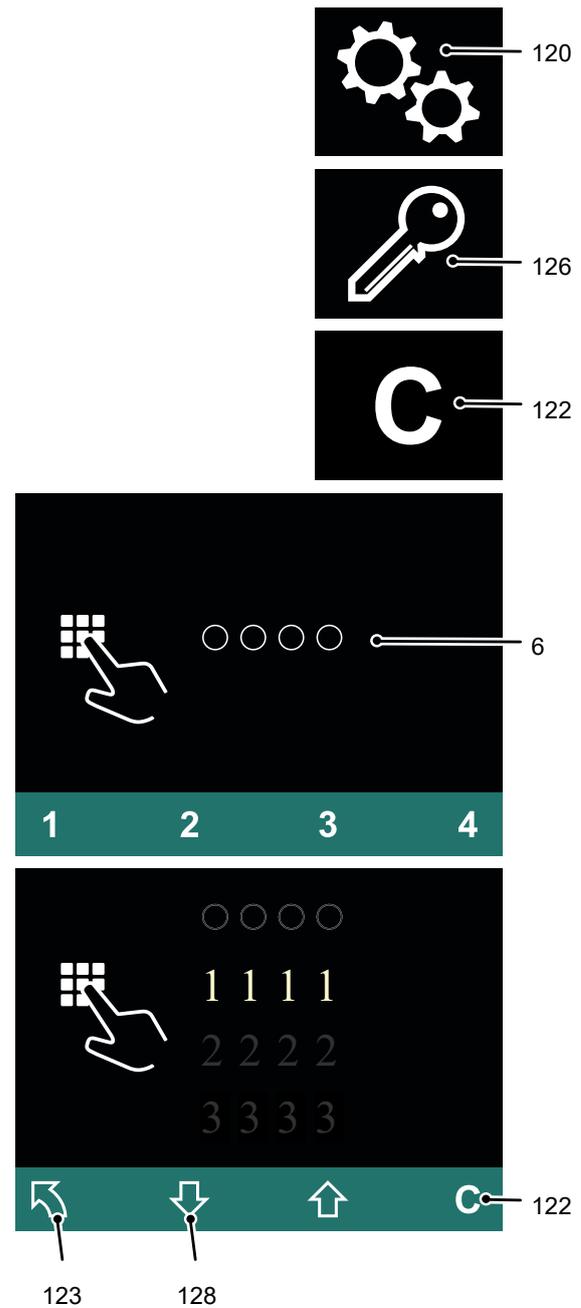
- Enter the set-up code with the keys below the display unit (6).

All the access codes are displayed.

- Select the access code to be deleted with the key below the "Selection down" symbol (128).
- Press the key below the "Delete" symbol (122).

The access code has been deleted.

- To return to the main menu, press the key below the "Back" symbol (123).



7.4.6 Displaying the Log-in Process

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

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

Requirements

- The MEWP is switched on, see page 117.

Procedure

- Press the key below the "Settings" symbol (120).
- Press the key below the "Log-in process" symbol (129).
- Enter the set-up code with the keys below the display unit (6).

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

- To scroll forward, press the button under the "Down selection" symbol (128) as many times as necessary.

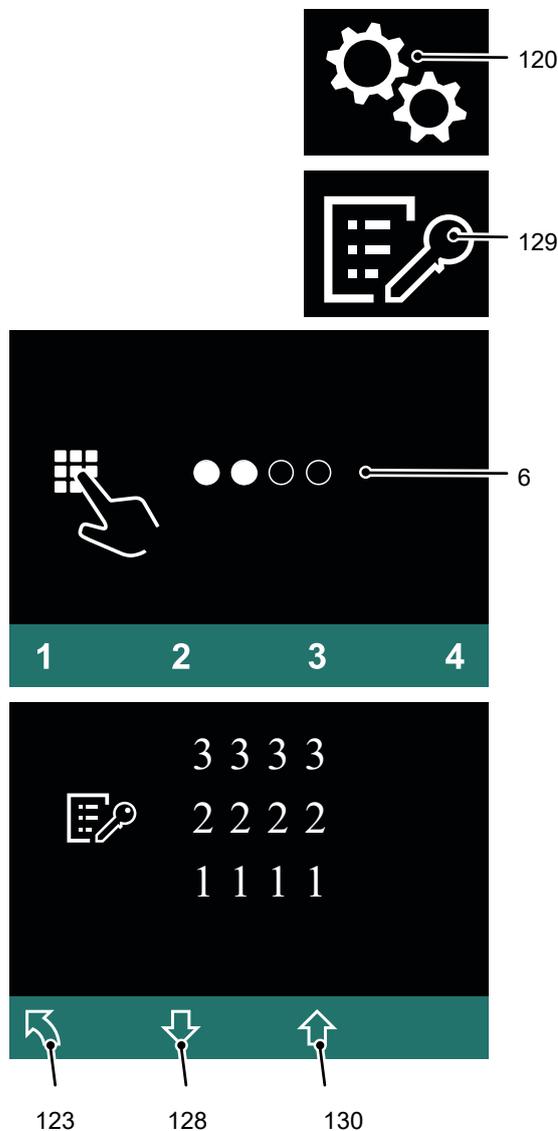
The display area moves: Additional earlier log-ins are displayed.

- To scroll back, press the button under the "Up selection" symbol (130) as many times as necessary.

The display area moves: More recent log-ins are displayed.

- To return to the main menu, press the key below the "Back" symbol (123).

The log-in process is displayed.



7.5 Operating the transponder reader

NOTICE

Do not damage the transponders. The MEWP cannot be switched on with damaged transponders.

7.5.1 Switching on the MEWP with a Transponder

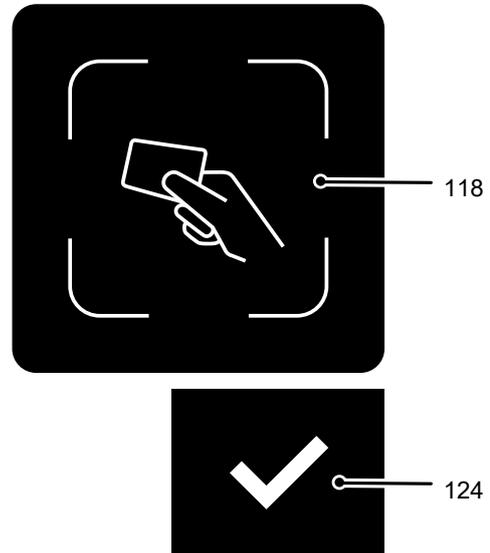
Procedure

- Release the emergency disconnect switch, see page 89.
- Hold the transponder in front of the transponder reader (118).

A green tick appears and remains until the transponder has been confirmed. If there is no confirmation within 20 seconds, the access prompt appears.

- Press the button below the "Confirm" symbol (124).

The MEWP is switched on.



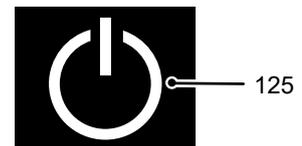
- The MEWP can only be switched on when the display unit (6) is lit. If the display unit is in standby mode, the code or transponder will not be recognised. Pressing any key cancels standby mode.

7.5.2 Switching off the MEWP (Transponder Reader)

Procedure

- Press the key under the "Switch off" symbol (125) on the display unit.
- Press the emergency disconnect switch, see page 89.

The MEWP is switched off.



7.5.3 Changing the Set-up Transponder

Requirements

- The MEWP is switched on, see page 122.

Procedure

- Press the key below the "Settings" symbol (120).
- Press the key below the "Change set-up code" symbol (121).
- Place the set-up transponder on the transponder reader (118).

The code of the set-up transponder is shown on the display unit (6).

- Press the key below the "Delete" symbol (122).

A dashed line is shown.

- Place a new set-up transponder on the transponder reader (118).

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

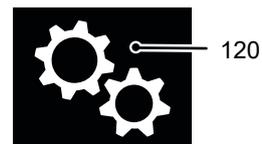
- Press the key below the "Confirm" symbol (124).

The new code for the set-up transponder is displayed.

→ If the wrong transponder has been used, the procedure can be repeated using the key below the "Delete" symbol (122).

To return to the main menu, press the key below the "Back" symbol (123).

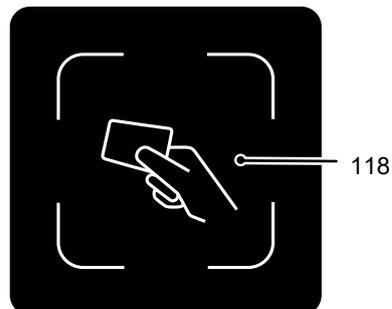
The set-up transponder has been changed.



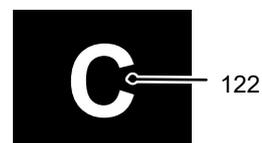
120



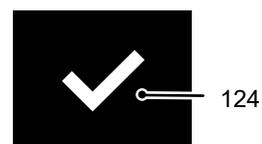
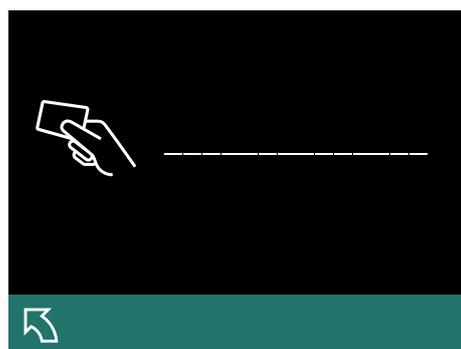
121



118



122



124



6

123

→ With components software from V1.04 onwards, up to 4 set-up transponders can be used.

7.5.4 Adding a new transponder

Requirements

- The MEWP is switched on, see page 122.

Procedure

- Press the key below the "Settings" symbol (120).
- Press the key below the "Edit transponder" symbol (126).

The set-up transponder is requested.

- Place the set-up transponder on the transponder reader (118).

All transponder codes are shown on the display unit (6).

- Press the key below the "Add" symbol (127).
- Place a new transponder on the transponder reader (118).

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

- Press the key below the "Confirm" symbol (124).

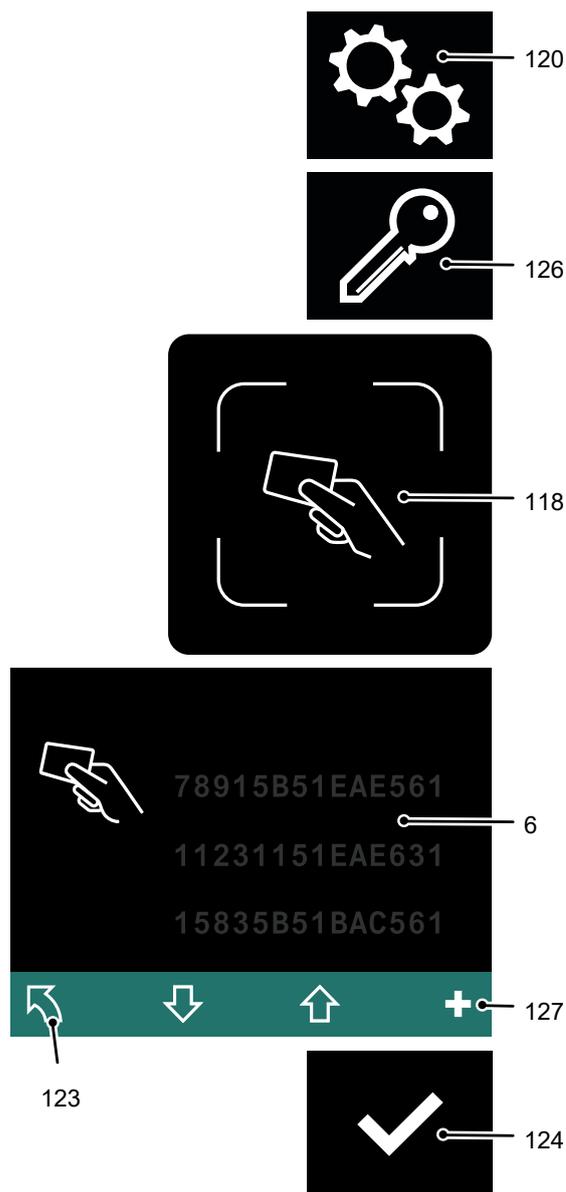
The new code is displayed.

→ If the wrong transponder has been used, delete it, see page 125, and add a correct transponder.

To return to the main menu, press the key below the "Back" symbol (123).

A new transponder has been added.

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



7.5.5 Deleting transponders

Requirements

- The MEWP is switched on, see page 122.

Procedure

- Press the key below the "Settings" symbol (120).
- Press the key below the "Edit transponder" symbol (126).

The set-up transponder is requested.

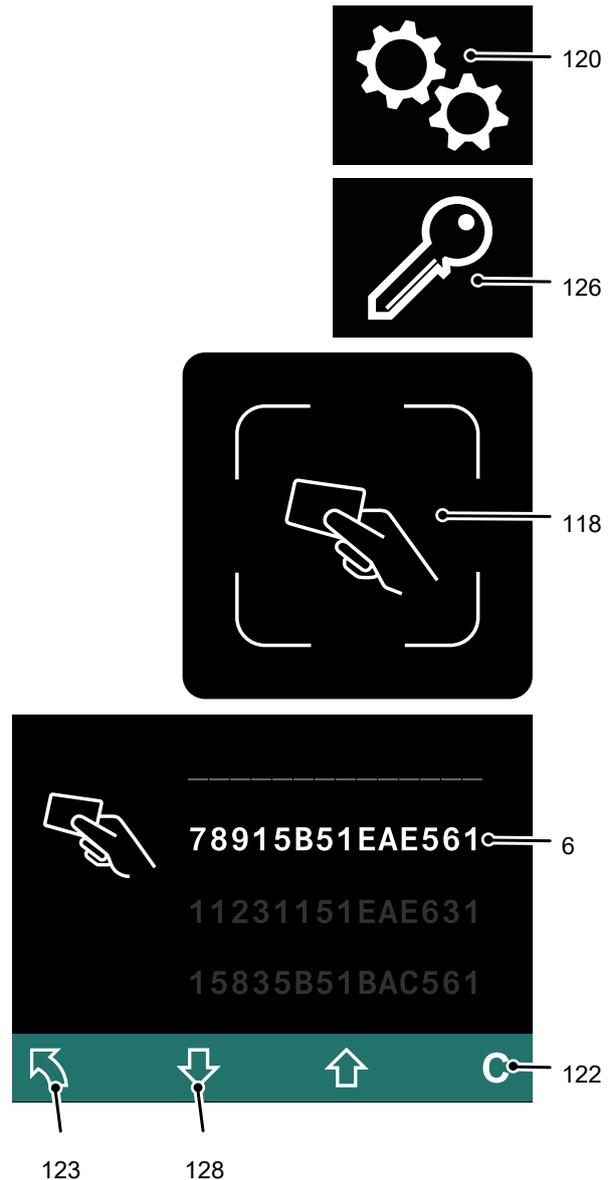
- Place the set-up transponder on the transponder reader (118).

All transponder codes are shown on the display unit (6).

- Select the transponder code to be deleted with key below the "Selection down" symbol (128).
- Press the key below the "Delete" symbol (122).

The transponder has been deleted.

- To return to the main menu, press the key below the "Back" symbol (123).



7.5.6 Displaying the Log-in Process

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

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

Requirements

- The MEWP is switched on, see page 117.

Procedure

- Press the key below the "Settings" symbol (120).
- Press the key below the "Log-in process" symbol (129).
- Place the set-up transponder on the transponder reader (118).
- To scroll forward, press the button under the "Down selection" symbol (128) as many times as necessary.

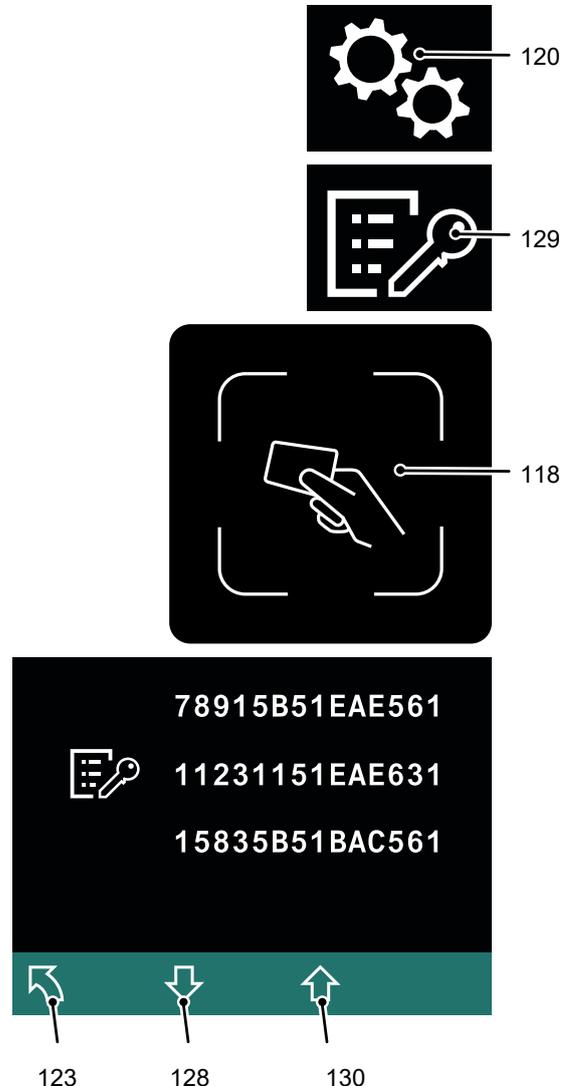
The display area moves: Additional earlier log-ins are displayed.

- To scroll back, press the button under the "Up selection" symbol (130) as many times as necessary.

The display area moves: More recent log-ins are displayed.

- To return to the main menu, press the key below the "Back" symbol (123).

The log-in process is displayed.



7.6 ISM access module (○)

- If the truck is equipped with an ISM access module or Can Code refer to the "ISM Access Module" operator manual.

7.7 Warning Zone Light

⚠ CAUTION!

Risk of accident due to restricted view

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

- ▶ Do not look directly at the LED light.
- ▶ Do not change the factory setting.

⚠ CAUTION!

Reduced intensity of dot projected on the ground when operator platform is raised

When travelling with a raised operator position in the load direction, the area projected on the ground weakens as the lift height increases. At the same time, the distance of the area around the MEWP grows as the lift height increases.

NOTICE

Concealed warning zone light

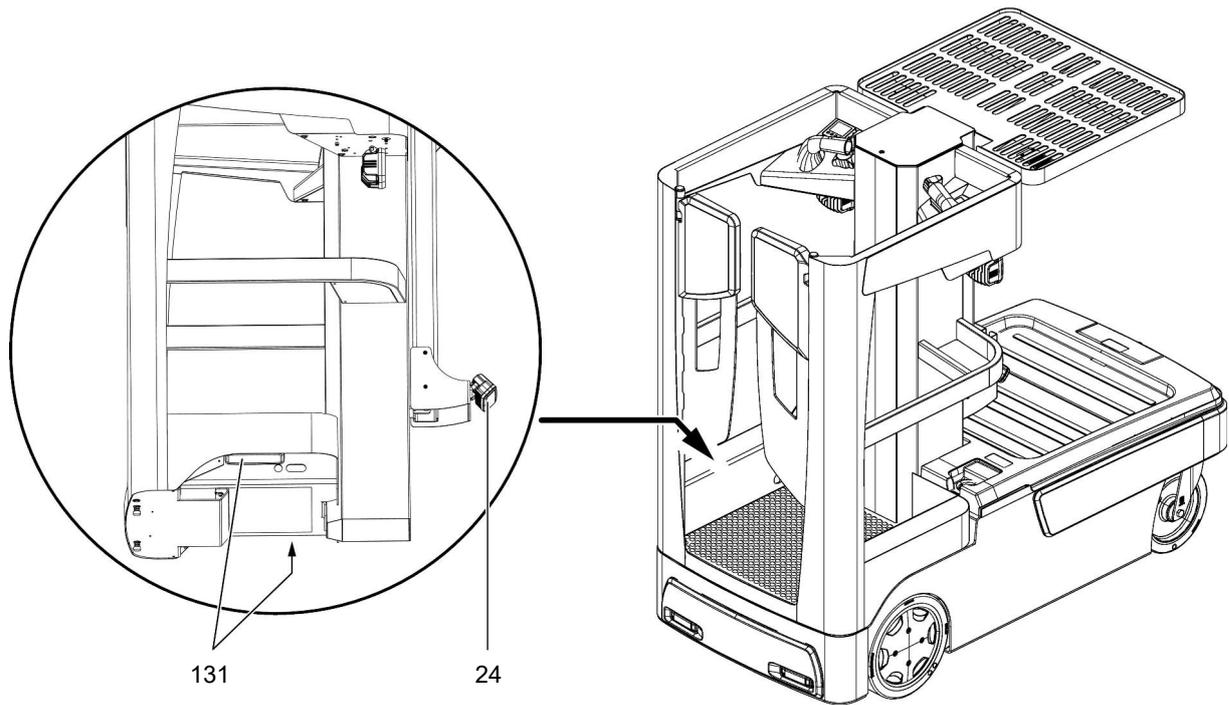
The warning zone light function activates automatically from a platform height of 500 mm.

Warning zone lights serve as a visual aid and provide greater safety in the warehouse. When the operator platform is raised, the 3 warning zone lights project a red area onto the ground to the side and in front of the MEWP.

The position of the projected area is factory pre-set.

The operating MEWP can thus be detected at an early stage. When working with a raised operator platform, people in the area surrounding the MEWP are given warning and accidents are avoided

7.7.1 Components Overview – Warning Zone Light



Item	Description
24	Warning protection light in the load direction
131	Side warning protection lights

7.8 Narrow Aisle Operation

There are several types of rail guidance for use in narrow aisles. These variants each have different properties.

Varianten:

- Einsatz in einer Personenschutzanlage
- Einsatz mit zusätzlichen Sensoren
- Permanenter Schmalgangbetrieb

- Bei allen Varianten ist eine doppelte Trittschaltmatte und die Option Blinker verbaut.
- The speed in narrow aisle operation may be limited due to the regulations of the country of use.

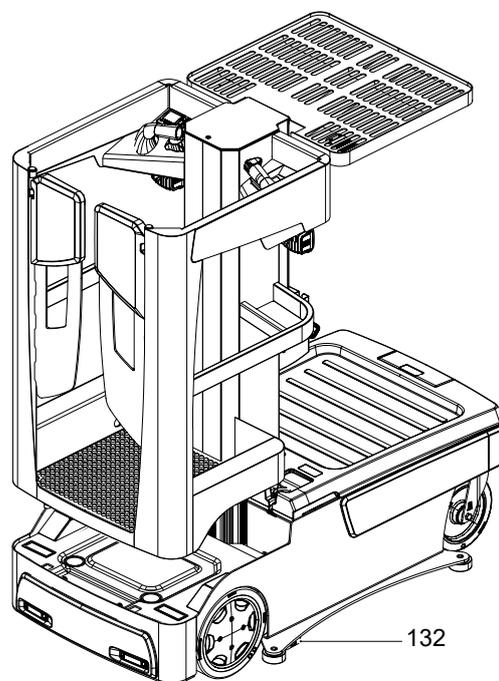
Einsatz in einer Personenschutzanlage

When used in a personal protection component, there are no restrictions on the EWP functions.

Einsatz mit zusätzlichen Sensoren

The MEWP is also equipped with sensors (132), which automatically detect entry into narrow aisles. The following restrictions apply when using the MEWP in narrow aisles:

- Reduzierung der Geschwindigkeit auf 4 km/h.
- Fahren mit angehobener Arbeitsbühne über 1,2 m ist nicht möglich.



During use in narrow aisles, the narrow aisle symbol appears in the display unit.



Permanenter Schmalgangbetrieb

With permanent narrow aisle operation, the following restrictions apply both inside and outside the narrow aisle:

- Reduzierung der Geschwindigkeit auf 4 km/h.
- Fahren mit angehobener Arbeitsbühne über 1,20 m ist nicht möglich.

F Maintenance of the MEWP

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 31.



2 Operational Safety and Environmental Protection

The inspections and maintenance tasks listed in chapter "Maintenance, Inspection and Changing of Maintenance Parts Requiring Replacement" must be performed according to the defined service intervals (see page 155).

The manufacturer recommends the replacement of the maintenance parts also listed in chapter "Maintenance, Inspection and Changing of Maintenance Parts Requiring Replacement" according to the specified replacement intervals (see page 155).

⚠ WARNING!

Risk of accidents and component damage

Any modifications to the MEWP, especially the safety devices, is prohibited.

Exception: Operating companies should only make changes or have changes made to the MEWP if the manufacturer has withdrawn from this line of business and there is not a business successor; however, the operating company must:

- Ensure that the changes to be made are planned, tested and performed by a engineer specialised in mobile elevating work platforms and their safety
- 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 operating instructions and workshop manuals
- Attach a permanent and clearly visible marking to the MEWP indicating the type of changes made, the date of the changes, and the name and address of the organisation in charge of 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 MEWP may be installed near the computer, control devices and wire guidance sensors (antennae). These components (computers, control devices, wire guidance sensors (antenna)) must therefore not be replaced by similar components from other MEWPs of the same series.

- After inspection and maintenance, carry out the operations listed in the section "Putting back into service after cleaning or maintenance work" (see page 152).

3 Maintenance Safety Regulations

Maintenance and repair personnel

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

Repair and maintenance of the MEWP, and parts replacements must only be carried out by specialised personnel. The activities to be carried out are divided into target groups.

Customer service department

Customer service has been specifically trained to work on the MEWP and are able to carry out maintenance and repairs independently. The customer service personnel are aware of the relevant standards, guidelines and safety regulations necessary to carry out this work.

Operating Company

Due to their expert knowledge and experience, the operating company's maintenance personnel are able to carry out the activities described in the maintenance checklist for the operating company. The maintenance and repair work to be carried out by the operating company are also described, see page 155.

3.1 Working on the electrical system

⚠ WARNING!

Electrical current can cause accidents

Make sure the electrical system is voltage-free before starting work. The capacitors in the control must be completely discharged. The capacitors are completely discharged after approximately 10 minutes. Before starting maintenance on the electrical system:

- ▶ Only suitably trained electricians may operate on the truck's electrical system.
 - ▶ Before working on the electrical system, take all precautionary measures to avoid electric shocks.
 - ▶ Park the MEWP securely (see page 82).
 - ▶ Disconnect the battery.
 - ▶ Remove any rings, metal wrist bands etc.
-

3.2 Consumables and used parts

⚠ CAUTION!

Consumables and used parts are an environmental hazard

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

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

3.3 Wheels

⚠ WARNING!

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

The quality of the wheels affects the operational stability and driving behaviour of the MEWP.

Uneven wear affects the stability of the MEWP and lengthens the stopping distance.

- ▶ When replacing wheels, make sure the MEWP 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.

3.4 Hydraulic system

⚠ WARNING!

Leaky hydraulic systems can result in accidents

Hydraulic oil can escape from leaky and faulty hydraulic systems.

- ▶ Report any defects immediately to your supervisor.
 - ▶ Tag out the faulty MEWP and take out of service.
 - ▶ Do not return the MEWP to service until you have identified and rectified the fault.
 - ▶ Remove any spilled hydraulic oil immediately with an appropriate bonding agent.
 - ▶ The mixture of bonding agents and consumables must be disposed of in accordance with relevant 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 MEWP can be injured by the escaping 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.
 - ▶ Tag out the faulty MEWP and take out of service.
 - ▶ Do not return the MEWP 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 operating conditions of the MEWP have a considerable impact on the ageing of hydraulic hoses.

- ▶ Hydraulic hoses must be checked at least 1x per year and replaced if necessary.
 - ▶ If the operating conditions become more arduous, the inspection intervals must be reduced accordingly.
 - ▶ In normal operating conditions a precautionary replacement of the hydraulic hoses is recommended after 6 years. The owner must carry out a risk assessment to ensure safe, prolonged use. The resulting protection measures must be observed and the inspection interval reduced accordingly.
-

4 Lubricants and Lubrication Schedule

4.1 Handling consumables safely

Handling consumables

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

⚠ WARNING!

Improper handling is hazardous to health, life and the environment

Consumables can be flammable.

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

⚠ CAUTION!

Spilled consumables can cause slipping and endanger the environment

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

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

⚠ WARNING!

Improper handling of oils can be hazardous

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

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

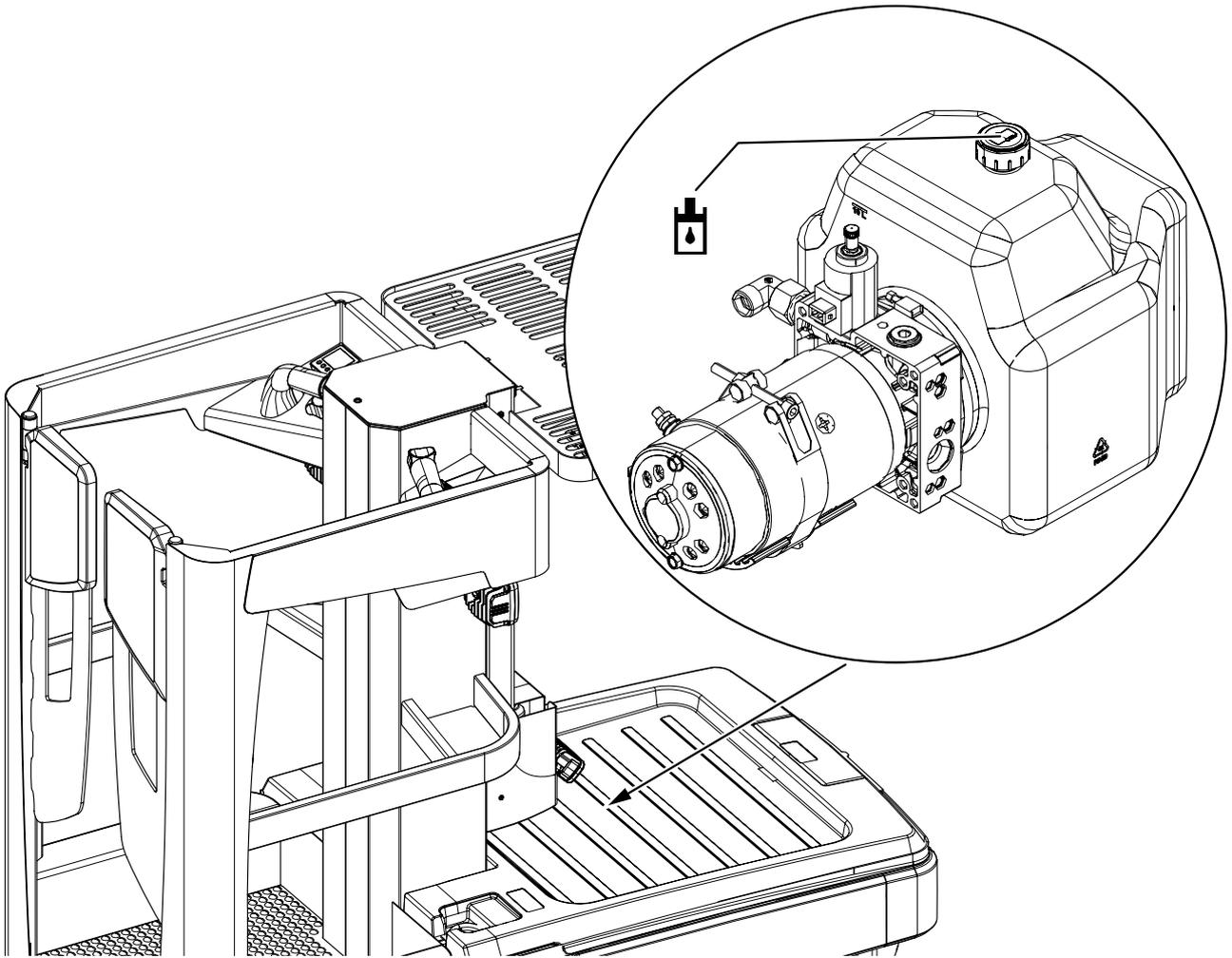
⚠ CAUTION!

Consumables and used parts are an environmental hazard

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

▶ Note the safety regulations when handling these materials.

4.2 Lubrication Schedule



	Hydraulic oil filler plug		
---	---------------------------	--	--

4.3 Consumables

Cod e	Order no.	Package quantity	Component	Used for
A	51132827	5.0 l	Jungheinrich hydraulic oil*	Hydraulic System
	51132826	1.0 l	HVLP 32, DIN 51524	
E	29202050	1.0 kg	Grease, Polylub GA 352P	

*The MEWPS are delivered ex-works with a special hydraulic oil (Jungheinrich hydraulic oil which has a blue colouration) and the cold-store hydraulic oil (red colouration). The Jungheinrich hydraulic oil is available only from the Jungheinrich service department. The use of named alternative hydraulic oils is allowed, but may lead to a decline in functionality. The Jungheinrich hydraulic oil may be mixed with one of the named alternative hydraulic oils.

Grease guidelines

Code	E
Saponification	Lithium
Dew point	>220 °C
Worked penetration at 25 °C	280–310
NLG1 class	2
Operating temperature	-35 °C / +120 °C

- In the standard version of the MEWP, the lifting kinematics and load wheels have lubrication-free and maintenance-free bushes.

5 Maintenance and repairs

5.1 Preparing the MEWP for maintenance and repairs

⚠ WARNING!

Risk of accident due to MEWP not being securely parked

It is forbidden to park the MEWP on a slope or incline. It is forbidden to park the MEWP without engaging the brakes.

- ▶ Park the MEWP on level ground. In special cases, the MEWP may need to be secured with chocks.
- ▶ Fully lower the working platform or secure the mast against inadvertent lowering with the mast retainer present, see page 141.
- ▶ Move the upper storage table to the upper end stop.
- ▶ If the brake is not working, place wedges underneath the wheels of the MEWP to prevent it from moving.

NOTICE

The MEWP must not be parked on traffic lanes or escape routes, in front of safety equipment, or in front of operating equipment that must be accessible at all times.

Procedure

- Fully lower the operator platform.
- For work where it is necessary to raise the operator platform, secure the operator platform in the raised position, see page 141.
- Park the MEWP securely, see page 82.
- Disconnect the battery to prevent the MEWP from being switched on accidentally.

5.2 Removing and installing the battery panel

Removing the battery panel

Requirements

- Prepare the elevating working platform for maintenance and repair work (see page 140).
- Move the upper storage table to the upper end stop, see page 105.

Procedure

- Put your hands into the recessed grips.
- Pull the battery panel upward and away from the mast.
- Set the battery panel down.

The battery panel is now removed.

➔ Assembly is carried out in the reverse order.

5.3 Preventing the Operator Platform from Accidentally Lowering

⚠ CAUTION!

Working under an unsecured working platform can result in accidents and crushing.

When carrying out maintenance and repair work under the working platform, the working platform must be protected against accidental lowering with a retaining block when in the raised position. Do not perform any work underneath the working platform without the retaining block in place.

► Secure the working platform when carrying out maintenance and repairs underneath the operator position.

► Never secure the working platform with a load on the storage table.

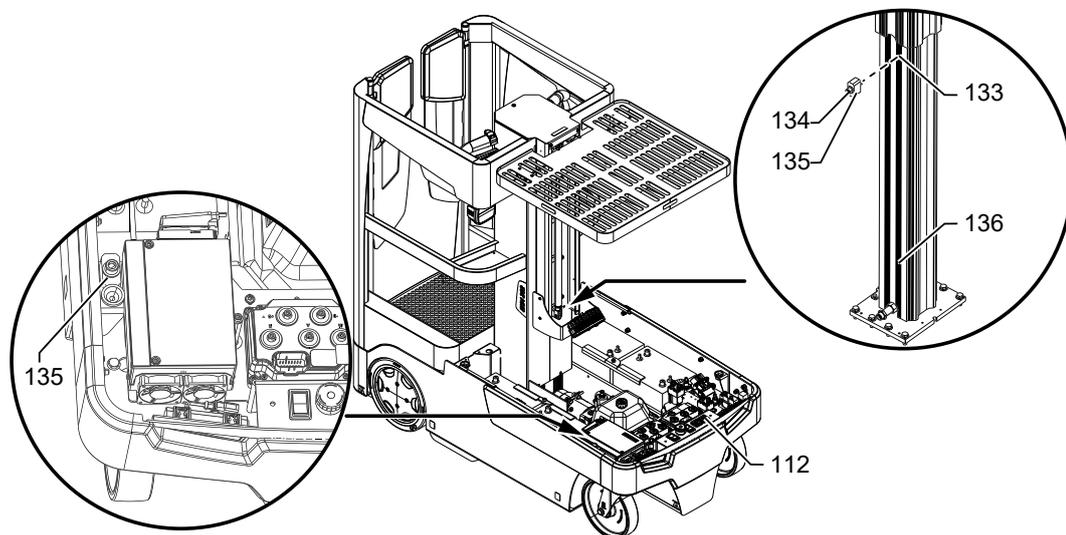
Requirements

– Battery panel removed, see page 140.

Procedure

- Raise the operator platform using the 2nd operator platform (112) until the first (136) or second hole (133) is visible in the inner mast profile.
- Remove the mast retainer (135) from the MEWP.
- Using the supplied screw (134), vertically screw the mast retainer (135) to the first (136) or second (133) position in the inner mast profile
- Lower the operator platform via the second operator platform (112) until the second mast profile is resting on the mast retainer (135)

The operator platform is protected against accidental lowering. Maintenance and repair work underneath the operator platform can now be started.

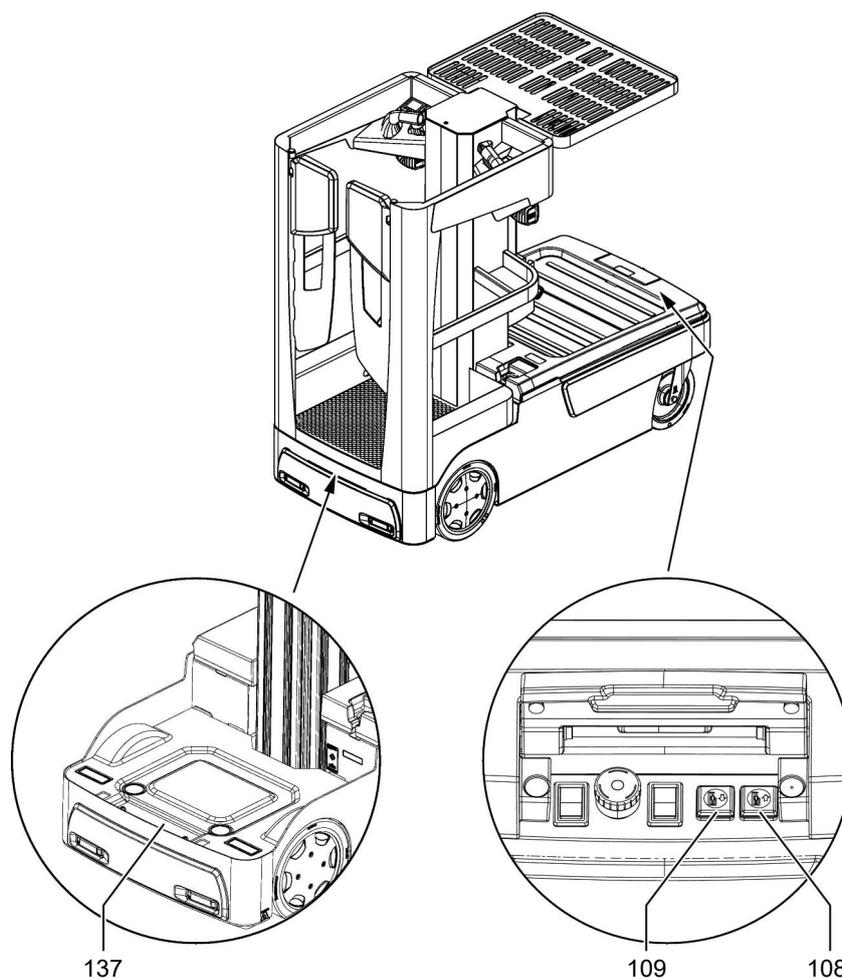


5.4 Check lowering cut-off

Procedure

- Raise the operator platform via the second operator platform.
 - Press the "raise MEWP" button (108).
- Place an object on the lower cut-off (137).
- Try to lower the operator platform via the second operator platform.
 - Press the "lower MEWP" button (109).

The operator platform should not lower due to the loaded lower cut-off (137). If the lower cut-off is defective, decommission the MEWP and inform the supervisor immediately.



5.5 Cleaning

5.5.1 Cleaning the Elevating Work Platform

- The MEWP may only be cleaned in the designated locations, which adhere to the stipulations of the country of use.

⚠ CAUTION!

Fire hazard

Do not use flammable liquids to clean the MEWP.

- ▶ Before cleaning, carry out all necessary safety measures to prevent sparking (e.g. by short-circuiting).

⚠ CAUTION!

Risk of component damage when cleaning

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

- ▶ Before cleaning the MEWP with a high-pressure cleaner, carefully cover all assemblies of the electronic system (control devices, sensors, motors etc.).
- ▶ Do not hold the jet of the high-pressure cleaner at marking points to avoid damaging them (see page 28).
- ▶ Do not clean the work platform with a steam jet.

Cleaning the MEWP

Requirements

- Prepare the elevating working platform for maintenance and repair work (see page 140).

Tools and Material Required

- Water-based solvents
- Sponge or cloth

Procedure

- Clean the outside surface of the elevating work platform with water-based solvents and water. Use a sponge or cloth to clean.
- In particular, clean the following areas:
 - Oil filler ports and their surroundings
 - Grease nipples (before lubrication)
- After cleaning, dry the elevating work platform, e.g. with compressed air or a dry cloth.
- Carry out all the tasks in the section "Putting back into service after maintenance and repair work". (see page 152).

Cleaning of the MEWP is complete.

5.5.2 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

- Prepare the elevating working platform for maintenance and repair work (see page 140).

Tools and Material Required

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

Procedure

- Expose the electrical system, see page 140.
- Clean the electrical system assemblies with weak suction or compressed air (use a compressor with a water separator) and a non-conductive, anti-static brush.
- Mount the cover on the electrical system, see page 140.
- Carry out all the tasks in the section "Putting back into service after maintenance and repair work" (see page 153).

The electrical system assemblies are now clean.

5.5.3 Cleaning the Front Screen of the Optical Sensors

Requirements

- Prepare the elevating working platform for maintenance and repair work (see page 140).
- Raise the operator platform from the emergency operator platform, see page 91.
- Prevent the operator platform from accidentally lowering, see page 141.

Tools and Material Required

- Cotton, microfibre or new soft disposable paper towel
- Plastics cleaner, see page 139

Procedure

- Damp-clean the front screen (138).

- Dry cleaning carries the risk of static charge. More dust will be attracted to the front screen. Moreover, there is also the risk of scratching the front screen.

Wipe the screen dry with a clean, soft cotton cloth, microfibre cloth or a new soft disposable paper towel.

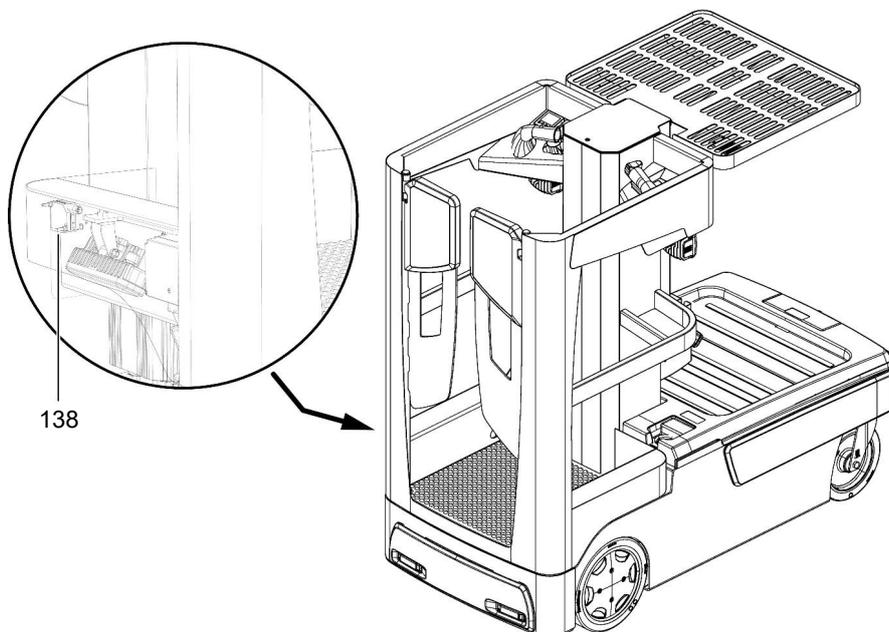
NOTICE

Risk of damage when cleaning the front screen

Do not use dirty or large-fibre cleaning cloths as these can scratch the front screen. A scratched front screen will lead to faults so that the sensor will have to be replaced.

- After cleaning, hold a light or torch against the front screen. Check for any contamination or scratches on the front screen and clean again if necessary.

The front screen is now clean.



5.6 Check wheel attachment and wear

- Replace the wheels if the wear limit is reached.
- The drive wheel must only be replaced by authorised service personnel.
- The wheel nuts on the drive wheel must be re-tightened in accordance with the maintenance intervals indicated in the maintenance checklist, see page 155.

Tightening the wheel nuts

Requirements

- Prepare the work platform for maintenance and repair work, see page 140.

Tools and Material Required

- Torque wrench

Procedure

- Tighten all wheel nuts with the torque wrench.

To do this, tighten the wheel nuts in the indicated order

- initially to 10 Nm
- then to 25 Nm.

The wheel nuts have now been tightened.

5.7 Checking the hydraulic oil level

⚠ CAUTION!

The hydraulic oil is pressurised during operation and is a hazard to health and to the environment.

- ▶ Do not touch pressurised hydraulic lines.
 - ▶ Dispose of used oil in accordance with regulations. Store used oil safely until it can be disposed of in accordance with regulations.
 - ▶ Do not spill hydraulic oil.
 - ▶ Remove any spilled hydraulic immediately with an appropriate bonding agent.
 - ▶ The bonding agent / consumable mixture must be disposed of in accordance with regulations.
 - ▶ Observe national regulations when handling hydraulic oil.
 - ▶ Wear safety gloves when handling hydraulic oil.
 - ▶ Prevent hydraulic oil from coming into contact with hot motor parts.
 - ▶ Do not smoke when handling hydraulic 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.
-

⚠ 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.
 - ▶ Tag out the faulty MEWP and take out of service.
 - ▶ Do not return the MEWP to service until you have identified and rectified the fault.
 - ▶ Remove any spilled hydraulic oil immediately with an appropriate bonding agent.
 - ▶ The mixture of bonding agents and consumables must be disposed of in accordance with relevant regulations.
-

⚠ 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.
-

Checking the oil level

Requirements

- Lower the load handler.
- Prepare the elevating working platform for maintenance and repair work, see page 140.

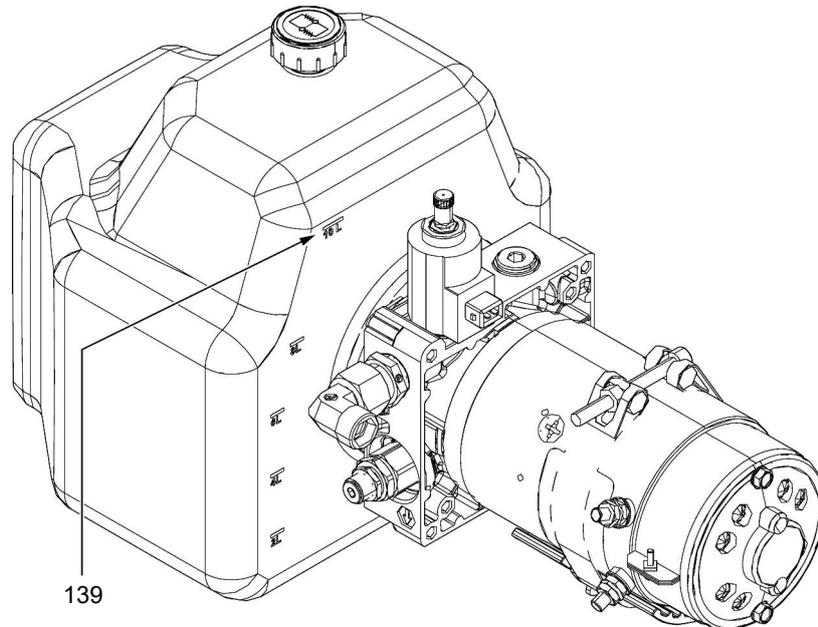
Procedure

- Remove the battery panel, see page 140.
- Check the oil level in the hydraulic reservoir (139).

→ With the work platform lowered, the oil level in the hydraulic reservoir should be between the 8 l [min.] and 10 l [max.] marks.

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

The oil level has now been checked.



⚠ WARNING!

You cannot change from BIO hydraulic oil "Plantohyd 22 S" to hydraulic oil "HLP D22". The same applies to changing from hydraulic oil "HLP D22" to bio hydraulic oil "Plantohyd 22 S".

Mixed operation with hydraulic oil "HLP D22" and BIO hydraulic oil "Plantohyd 22 S" is not permitted.

5.8 Checking electrical fuses

⚠ WARNING!

Electrical current can cause accidents

Make sure the electrical system is voltage-free before starting work on it. The capacitors in the controller must be completely discharged. The capacitors are completely discharged after approximately 10 minutes. Before starting maintenance on the electrical system:

- ▶ Only suitably trained electricians may operate on the truck's electrical system.
 - ▶ Before working on the electrical system, take all precautionary measures to avoid electric shocks.
 - ▶ Park the elevating working platform securely (see page 82).
 - ▶ Disconnect the battery.
 - ▶ Remove any rings, metal wristbands etc.
-

⚠ CAUTION!

The use of incorrect fuses can cause fire and damage components

The use of incorrect fuses can damage the electrical system and result in fire. The safety and functionality of the MEWP cannot be ensured when incorrect fuses are used.

- ▶ Use only fuses with the prescribed rated current, see page 150.
-

Check fuses

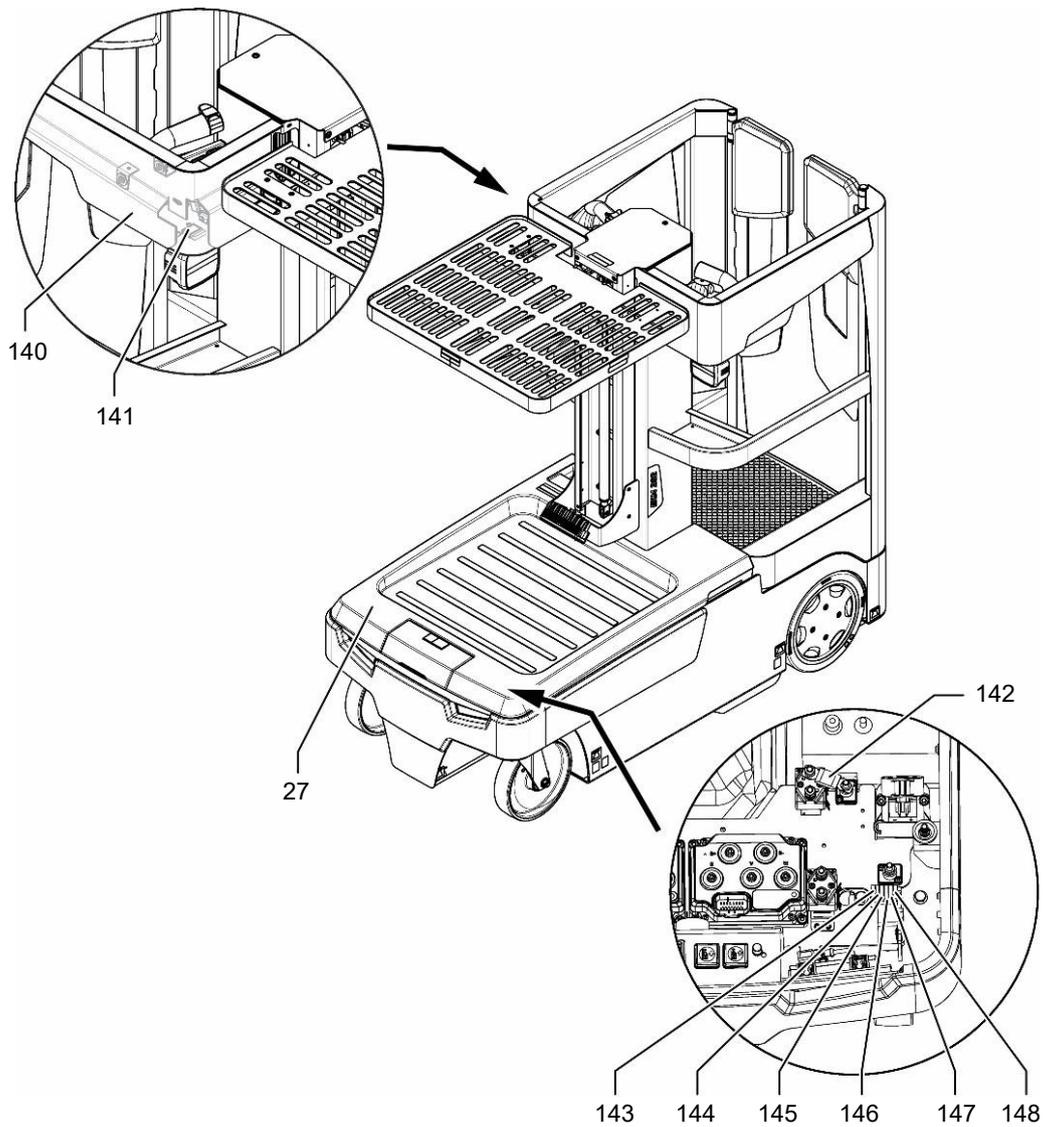
Requirements

- Work platform prepared for maintenance and repair work, see page 140.
- Battery panel removed, see page 140 .

Procedure

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

The fuses are now checked.



Item	Description	To protect	Rating (A)
141	F25	Auxiliary fuse for electric storage table (○)	2
142	2F1	Main fuse	200
143	2F.20	Electrical storage table (○)	20
144	F3.3	Warning indicator	4
145	F3.2	Warning zone light	4
146	F3.1	Tilt sensor and emergency control	4
147	F4	Switch-on routine	2
148	1F9	Control unit power supply	10

5.9 Putting back into service after maintenance and repair work

It is not permitted to put the MEWP back into service after maintenance and repair work until the following tasks have been performed:

Procedure

- Connect the battery connector (96) to the MEWP.
- Prepare the MEWP for operation, see page 77.
- Make the MEWP ready for operation, see page 80.
- Test the safety equipment, see page 81.

6 Decommissioning the MEWP

If the MEWP is to be taken out of service for more than a month, it must be stored in a frost-free dry room. All necessary measures must be taken before, during and after decommissioning as described below.

While the MEWP 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, see page 28.

If the MEWP is to be out of service for more than 6 months, agree further measures with the manufacturer's customer service department.

6.1 Prior to decommissioning

Procedure

- Thoroughly clean the work platform, see page 143.
- Secure the MEWP to prevent it rolling away accidentally.
- Check the hydraulic oil level and top up if necessary, see page 148.
- Apply a thin layer of oil or grease to any non-painted mechanical components.
- Lubricate the work platform according to the lubrication schedule, see page 138.
- Charge the battery, see page 58.
- Disconnect the battery, clean it and grease the battery terminal screws with terminal grease.

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

6.2 Action to be taken during decommissioning

NOTICE

Full discharge can damage the battery

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

▶ Charge the battery at least every 2 months.

→ Charge the battery, see page 58.

6.3 Putting the MEWP back into service after decommissioning

Procedure

- Thoroughly clean the work platform, see page 143.
- Lubricate the work platform according to the lubrication schedule, see page 138.
- Clean the battery, grease the terminals and connect the battery.
- Charge the battery, see page 58.
- Put the work platform into operation, see page 77.

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

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

A full inspection of the technical condition of the MEWP must be carried out regarding accident safety. The MEWP must also be examined thoroughly for damage.

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

8 Final de-commissioning, disposal

- The final proper decommissioning or disposal of the MEWP must be performed in accordance with the regulations of the country of application. In particular, regulations governing the disposal of batteries, consumables and electronic and electrical systems must be observed.

The MEWP must only be disassembled by trained personnel in accordance with the procedure specified by the manufacturer.

9 Human vibration measurement

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

G Maintenance, Inspection and Changing of Maintenance Parts Requiring Replacement

⚠ WARNING!

Lack of maintenance can result in accidents

Failure to perform regular maintenance and inspections can lead to failure of the MEWP and also creates a potential hazard to personnel and plant.

► Thorough and correct maintenance and inspections are among the most important requirements for safe operation of the MEWP.

NOTICE

The operating conditions of the MEWP have a considerable impact on component wear. The following service, inspection and replacement intervals are based on single-shift operation under normal operating conditions. They must be reduced accordingly if the equipment is to be used in very dusty conditions, sharp 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 EKM 202

Issued on: 2020-07-01 09:00

1.1 Owner

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

1.1.1 Maintenance contents

1.1.1.1 Standard equipment

Brakes

Test the brake.

Hydraulic operations

Clean the sensors.

Correct the hydraulic-oil level.

1.1.1.2 Optional equipment

Rail guidance

Electrical system

Clean the optical sensors.

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 lighting and check for damage
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
Check wheels for wear and damage

Chassis/structure
EWP for damage and leaks
Check labels for legibility, completeness and plausibility
Check doors or covers for damage
Test optional equipment such as mirrors, storage compartments, handles, windscreen wipers and windscreen washing systems, etc. and check for damage

Hydraulic operations
Test hydraulic system

Battery charger
Mains plug and mains cable for damage

1.1.2.2 Optional equipment

The following points must be checked:

Rail guidance

Travel
Rail guidance rollers for wear and damage

Work lights

Electrical system
Test lighting and check for damage

Warning zone lights, red/blue

Electrical system
Test lighting and check for damage

1.2 Customer Service

In accordance with the EKM 202 service interval, to be performed every 500 service hours, but at least once a year.

1.2.1 Maintenance contents

1.2.1.1 Standard equipment

Brakes
Test the brake.
Measure the air gap of the magnetic brake.

Electrical system
Test the contactors and/or relays.
Clean the motor with compressed air.
Carry out a frame leakage test.

Chassis/structure
Test the lifting operator platform.

Hydraulic operations
Test the lift-limit cut-off/lift cut-off.
Test the sensors.
Clean the sensors.
Test emergency lowering.
Correct the hydraulic-oil level.
Test and adjust the pressure relief valve.
Lowering cut-off for functionality.

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

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

1.2.1.2 Optional equipment

Rail guidance

Electrical system
Clean the optical sensors.

1.2.2 Inspection contents

The following points must be checked:

1.2.2.1 Standard equipment

Electrical system
Cables and motor for secure fit and damage
Warning and safety equipment in accordance with the operating instructions
Functionality of display and controls
Test pressure-sensitive floor mat and check for damage
Test lighting and check for damage
Test emergency disconnect switch and check for damage
Contactors and/or relays for wear and damage
Check electrical wiring for damage (insulation damage, connections) and check whether the fuse ratings are correct
Check carbon brushes for wear
Power supply
Battery latch and battery attachment for correct function and damage
Battery connector for secure fit, functionality and damage
Travel
Attachment of the drive systems
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
EWP for damage and leaks
Check chassis connections and screw connections are securely attached and check for damage
Check labels for legibility, completeness and plausibility
Lifting operator platform for damage
Check doors or covers for damage
Test optional equipment such as mirrors, storage compartments, handles, windscreen wipers and windscreen washing systems, etc. and check for damage
Check mast is securely attached
Check chassis and screw connections to ensure that they are present and for damage
Check operator mat and steps are non-slip and free of 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
Check slide pieces and stops for wear and damage
Test hydraulic system
Check hydraulic connections, hoses and pipes are securely attached and check for leaks and damage

Battery charger
Mains plug and mains cable for damage

1.2.2.2 Optional equipment

Rail guidance

Travel
Sensors for secure attachment, function and damage
Attachment of the rail guidance rollers
Rail guidance rollers and their bearings for wear and damage

Work lights

Electrical system
Test lighting and check for damage

Warning zone lights, red/blue

Electrical system
Test lighting and check for damage

1.2.3 Maintenance parts

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

1.2.3.1 Standard equipment

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