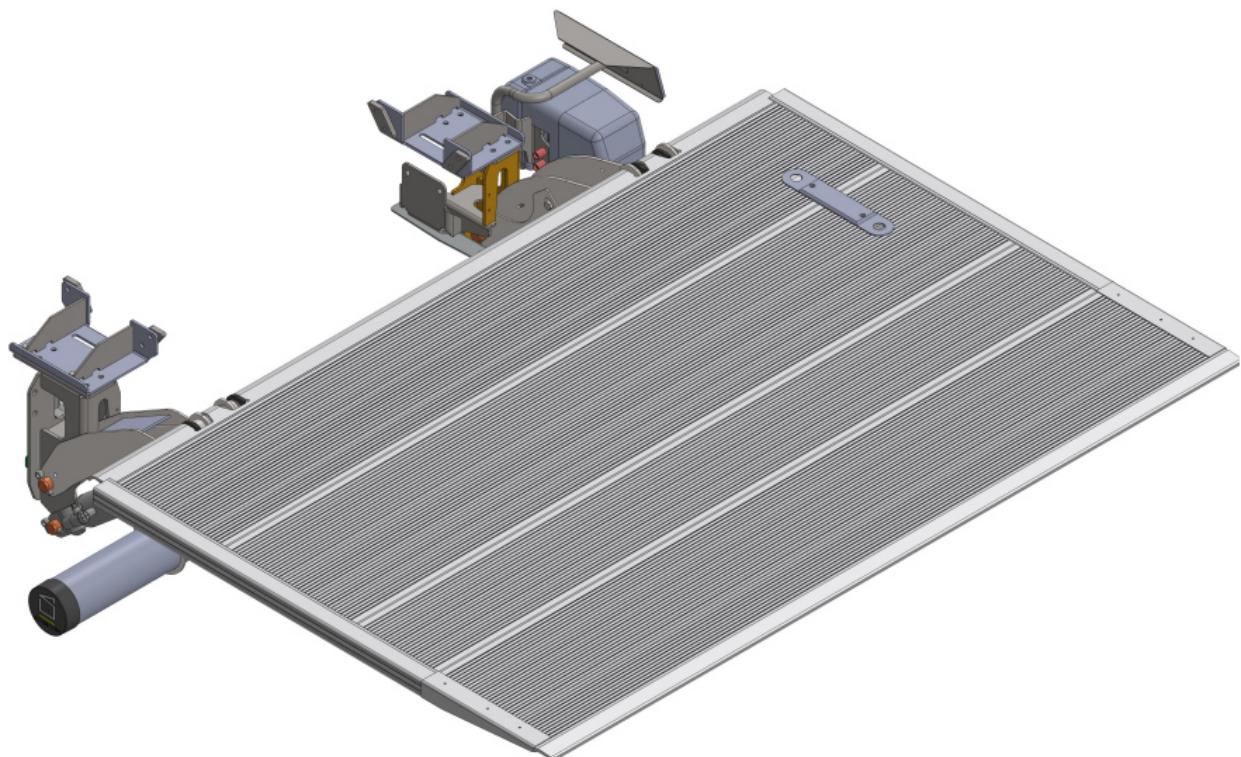




SÖRENSEN
Uplifting performance.

User manual

X1A 750 BS – Master XDD



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1 General

1.1 Intent and purpose of the operating and maintenance instructions

This user manual is intended for owners and operators of the tail lift. Please read this user and maintenance manual carefully before operating the Sörensen tail lift. The manual will help familiarize you with the tail lift's mode of operation and warn you against misuse. The purpose of these instructions is to promote safety and improve maintenance of the product.

These instructions cover the set-up, operation, cleaning, maintenance, repair, shutdown, dismantling, and disposal.

Read this manual before working on or operating the tail lift.

Do not deviate from the instructions contained in this manual. By doing so, you risk injury, damage to property, and voiding of the warranty.

Make sure that this manual always remains with the tail lift or vehicle.

NOTE

For information on maintenance and annual inspections, see the inspection record book.

NOTE

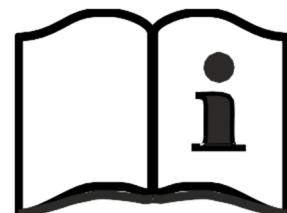
The declaration of conformity is supplied separately and is part of the user manual.

NOTE

This user manual must be kept as a reference in the driver's cabin.

1.2 Supplied documents

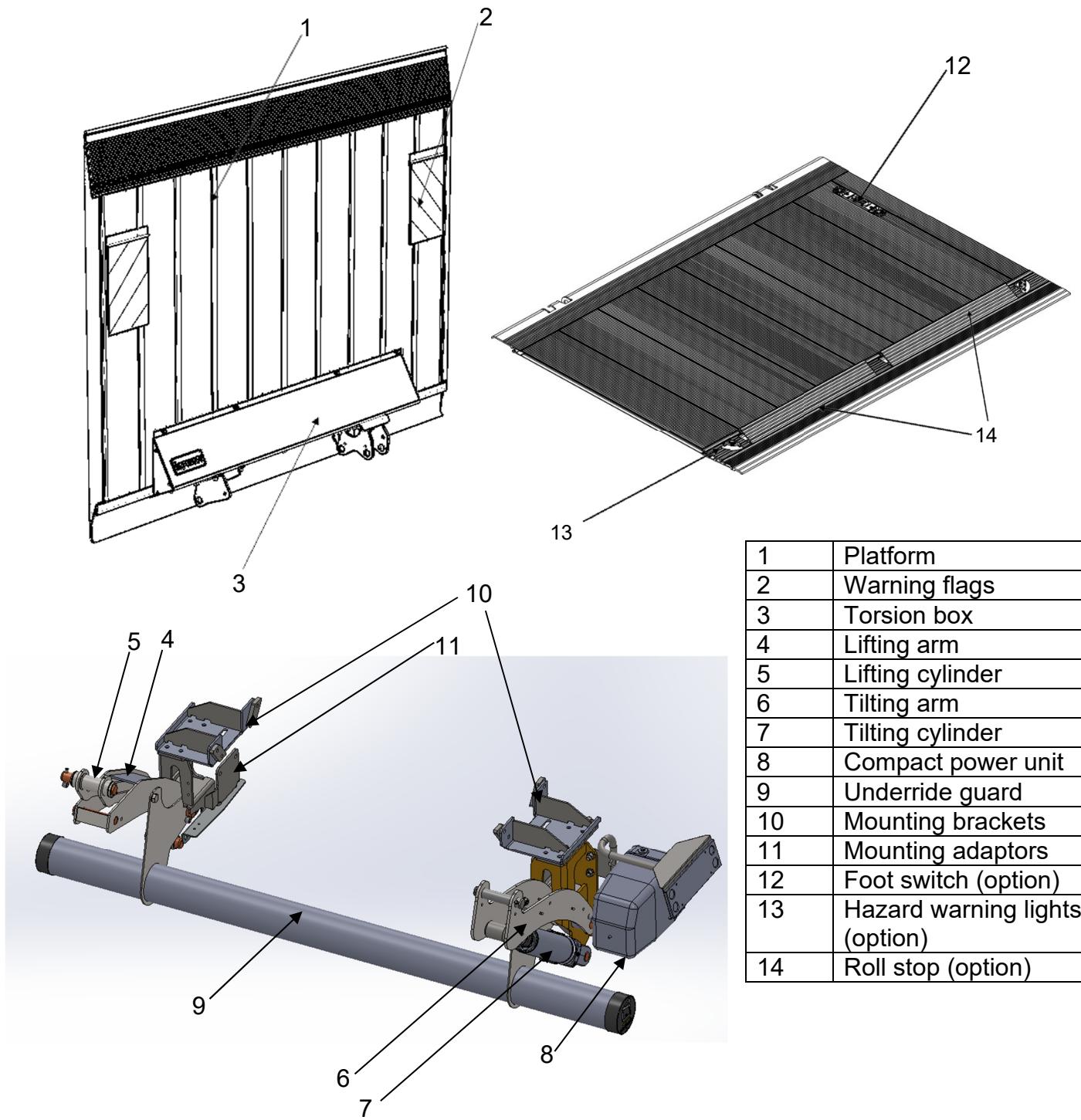
▪ Inspection logbook	Art.-Nr. 60 700 495
▪ Installation manual	Art.-Nr. 20 913 543
▪ Operating and maintenance instructions	Art.-Nr. 20 913 565
▪ Declaration of conformity	Art.-Nr. 20 910 159
▪ Electrical circuit diagram	Art.-Nr. 20 913 432
▪ Hydraulic circuit diagram	Art.-Nr. 20 907 672



1.3 Description der Sörensen Tail lifts

You have chosen a tail lift of the highest quality. Sörensen tail lifts comply with the EC Machinery Directive 2008/42/EC, as well as the DIN EN 1756 – 1 norm. The Sörensen – tail lifts are very undemanding and simple to use. It is equipped with maintenance-free bearings and requires little lubrication throughout its service life.

1.4 General components of the X1 tail lift with two cylinders



1.5 Description of the Sörensen tail lift components

Electrical system/operating unit

The individual functions are controlled by a very flat control panel with four membrane switches (refer to page 21) or via a handheld control (refer to page 23). The interface between the tail lift and the vehicle complies with ETMA guidelines.

Foot switch (option)

The foot switch on the platform (refer to page 22), are mounted inside a protective, die-cast aluminium housing. It can lower the tail lift to the ground and lift it to the height of the vehicle floor. The platform automatically tilts up and down to a position horizontal with the ground.

Priority control

The foot switch is a priority control. When the tail lift is operated via the foot switch, other control options (control panel, handheld control) are automatically locked out electrically.

Hydraulics

The tail lift is driven by a compact power pack mounted on the supporting structure/directly on the closing cylinder/integrated in the axle beam. This power pack is used to move the lifting or closing cylinder(s) to the desired position. The hydraulic cylinder's connecting rods are nitrated to a high-grade quality.

Lifting gear

The lifting gear (mounting brackets as well as the lifting and closing arms) has the final factory finish and is coated black (RAL 9005). Grease nipple bolts must be lubricated. All other bearing points are maintenance-free and do not need to be lubricated. The mounting brackets and their adapters are factory-matched to the frame of the corresponding vehicle type. The underride guard is TÜV-tested / EC-approved and approved in accordance with the ECE R58 directive. Interfaces comply with the ETMA standard. Each tail lift type is tested with 20,000 load cycles before release for production.

Platform

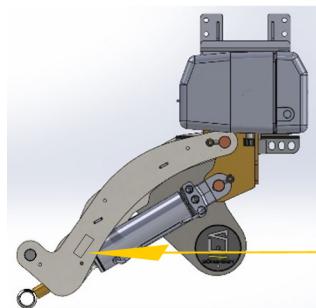
The platform comprises clipped-together aluminium hollow sections that are stabilized by means of welded tip and end sections. The platform has a smooth back to accommodate advertising labels optimally.

1.6 The tail lift number and label

The tail lift serial number is the tail lift's most important ID number. It is required for all technical support, spare parts orders, and warranty claims and is found on every device on a label located in three positions:

Position 1

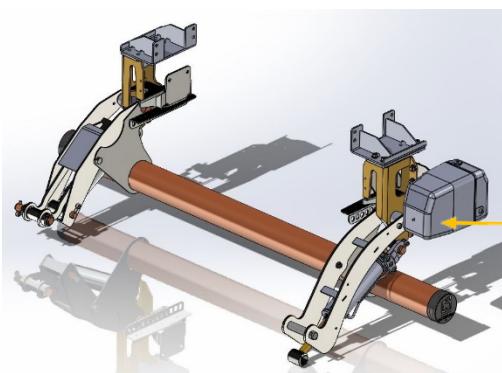
The label with the loading diagram and serial number is affixed to the closing arm on the right side of the vehicle as viewed in the forward direction of travel.



Label on tilting arm

Position 2

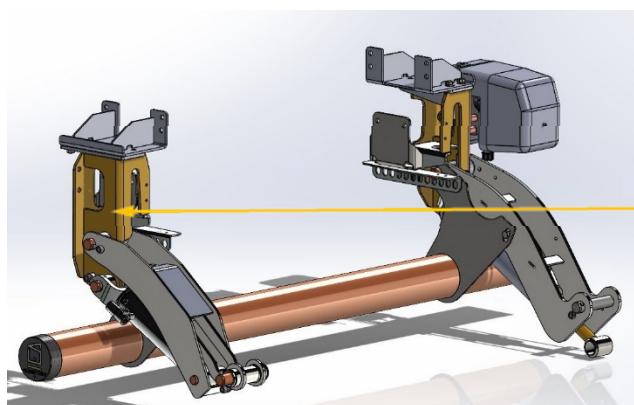
The same label is also affixed to the inside of the power pack cover:



Label within the power pack cover

Position 3

The serial number is also stamped on a part (Axe beam/Mounting flange/Lifting arm) on the left as viewed in the forward direction of travel. It is important that it is visible from the top view.



Factory-Nr. / Tail lift-Nr. imprinted

2 Safety

2.1 Outline of warning notices

The following types of notices are used in this manual to identify hazards and complications:

DANGER

- Failure to heed this notice will result in death or serious injury.

WARNING

- Failure to comply with such a warning may result in death or serious injury.

CAUTION

- Failure to comply with such a warning may result in moderate or light injury.

ATTENTION

- Failure to comply with such a warning may cause property damage or environmental harm.

As well as:

NOTE

Important information or a useful tip for correct usage.

2.2 Safety instructions

This section outlines the safe operation of the Sörensen tail lift. Proper operation protects the device from misuse and avoids accidents involving people or the environment.

WARNING

Do not deviate from the instructions contained in this manual for safely operating the tail lift. By doing so, you risk injury, damage to property, and voiding of the warranty.

2.3 Fundamental hazards (sources of hazard caused by the tail lift)

DANGER

Electrical system with on-board voltage:

The tail lift receives electrical power from the vehicle's on-board power supply (max. 48 V DC). The electrical system is designed using state-of-the-art technology.

- Do not damage or modify electrical components and wiring. Fire and explosion hazard.
- Excessive current may damage the battery or cable harness. To prevent this, visually inspect the electrical system (during maintenance schedule).

DANGER

High-pressure hydraulic system:

The tail lift's integrated hydraulic system operates at high pressure (max. 220 bar). The hydraulic system is designed using state-of-the-art technology.

- Do not damage or modify hydraulic components or hoses. Danger from pressurized liquids and gases.

Hydraulic components/pipes can burst and cause injury.

- Inspect hydraulic components/pipes at regular intervals (according to maintenance schedule).
- Only replace hydraulic components/pipes according to the state of the art.

DANGER

Moving parts with crushing points:

All parts that move in close proximity to one another can potentially crush fingers.

- Watch out for the unexpected movement of moving parts.

DANGER

Moving parts with locations where objects can be pulled in and/or trapped:

Parts of the body, long hair, and clothing are at risk of being caught and pulled in by moving parts. This can result in fatal injuries.

- Always secure long hair
- Do not wear loose-fitting clothing

2.4 Emergency procedure

If you or another person get into a dangerous situation while working on or with the tail lifts, stop the operation immediately and seek professional help.

2.5 Safety devices of the tail lift

Hose rupture valves

If a hose, pipe, or screw connection bursts, the tail lift lowers or tilts in a controlled manner at the permitted speed for as long as a function is being performed via one of the control units (control panel, handheld control, manual control box, or foot switch). Once the control unit is no longer being activated, the tail lift stops immediately.

Safety valve

The factory-set safety valve protects the tail lift against lifting loads that are heavier than the specified load-carrying capacity. This valve may only be adjusted by a qualified specialist using a test weight and a manometer.

Fuses

Defective fuses may only be replaced by fuses that correspond to the values specified in the circuit diagram and on the control unit. Larger fuses may not be triggered by malfunctions, which could result in cables catching fire.

2.6 Intended use

Depending on the type, the Sörensen tail lift was developed for vehicles ranging from trucks to trailers, including semitrailers. The tail lift is used for both loading and unloading the vehicle and for transferring loads. Do not use the tail lift to lift any person other than the operator. Any other use is prohibited.



WARNING

Incorrect or improper use or handling of the tail lift or, for example, errors caused by its being operated by unqualified personnel can create risks for operators and bystanders that may result in serious or fatal injuries.



NOTE

To ensure safe operation of the tail lift, read the safety instructions and warnings in the user manual provided.

2.7 Responsibilities of the operating company and requirements for the operator

The operator (the company, usually commercial use) is obliged to comply with the statutory provisions on occupational safety. The operator must provide personal protective equipment such as safety shoes and protective work clothing for the personnel in contact with the tail lifts. The applicable accident prevention and trade association regulations, in particular BGR 500, BGG 945 lifting platforms (VBG 14), as well as the applicable statutory and company guidelines, occupational health and safety regulations and environmental protection regulations must be complied with.

The operator is responsible for the annual inspections and the technically proper condition of the tail lifts. An annual inspection in accordance with the accident prevention regulations (BGR 500 / BGG 945) must be carried out by a specialist or expert, and the result of this inspection must be entered in the inspection logbook. The appliance must be marked as tested with a test sticker. Any defects must be rectified immediately and missing parts must be replaced without delay!

The operator is responsible for the timely repair of recognized defects!

NOTE

Additional regulations are printed in the inspection logbook. The inspection record book is part of this user manual.

NOTE

The inspection report dealing with the static and dynamic inspection performed before starting up the tail lift is kept in the inspection logbook.

The tail lift must be operated in accordance with the user manual. The tail lift may be operated, maintained, and serviced only by personnel who have received appropriate training and have been specifically instructed in the dangers associated with its operation.

Only persons aged 18 years or older who have been instructed in the operation and maintenance of the tail lift and have proven their capability to the company are allowed to independently operate and maintain the tail lift. They must be expressly assigned to its operation and maintenance. The assignment for operating and maintaining the tail lift must be issued in writing.

If more than one person is working on the tail lift, the operating company must appoint a supervisor. Tail lift maintenance may be performed by specially trained personnel only.

2.8 Startup procedure

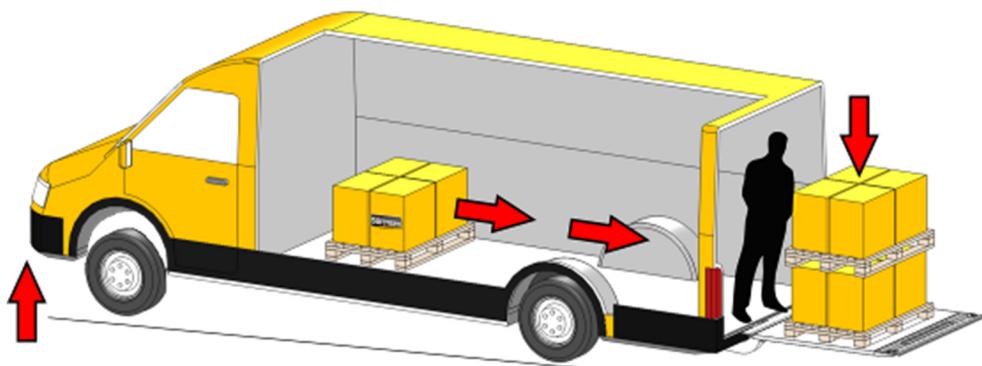
- (1) Do not use the tail lift before it is properly installed.
- (2) Never operate the tail lift with the vehicle in motion.
- (3) Operate the tail lift at your own risk.
- (4) When operating the tail lift, secure the vehicle against unexpected movement.
- (5) Portable lifting platforms such as tail lifts must be stable to avoid creating crushing and shearing points between the tail lift and objects around it. Pay particular attention to potential crushing and shearing points between the platform and the vehicle cargo area, and between the platform and the ground.

⚠️ WARNING

Risk of crushing or shearing caused by moving parts on the tail lift. Watch out for potential crushing points. Define and observe the danger zone, including for third parties.

⚠️ WARNING

Risk of the vehicle losing stability/tipping. The front end of the vehicle can potentially lift and create a risk of injury. If supports are available, they must be used.



⚠️ WARNING

Risk of the vehicle losing stability/tipping. The front end of the vehicle can potentially lift and create a risk of injury. Refer to the safety sticker for instructions on correct operation.

- (8) Keep people and objects way from all moving parts of the tail lift.

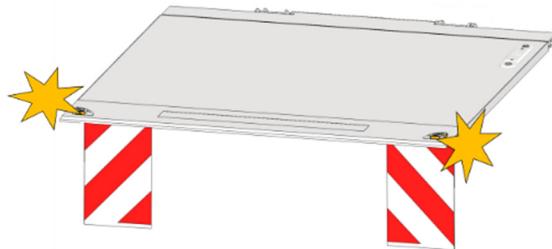
⚠️ WARNING

Slipping, tripping, or falling hazard (involving the tail lift). In the fully lowered position, the platform may cause people to trip, resulting in injury.

NOTE

Affix warning label: Watch out! Tripping hazard when platform is fully lowered.

- (9) Activities involving the lifting device or loads must be performed without obstructions and according to the equipment's intended purpose.
- (10) Tail lifts operated in areas of vehicle traffic or where the tail lift extends into these areas must be suitably protected against danger from vehicles.
- (11) During operation, the tail lift platform must be made clearly visible to vehicles approaching from behind by means of warning flags and flashing lights. The warning lights flash as soon as the tail lift is activated.



NOTE

Keep safety devices clean and in perfect working order.

⚠️ WARNING

When the platform is open and at loading height, it poses a danger for approaching street traffic. Use warning flags and flashing lights for safety and as a warning. Observe local requirements.

- (12) During operation, make sure that the loading area has sufficient lighting.

(13) Before starting to work on the lifting device, make sure that safety devices are in place to prevent people and objects from falling.

⚠️ WARNING

There is a risk of falling from the platform, especially in cold and wet conditions. Outside influences such as gravity, wind, snow, dirt, etc. increase the risk of slipping on the platform.

(14) Do not modify, cover, or remove product labels (warning labels, instructions, label plates). They must be free of damage and clearly visible.

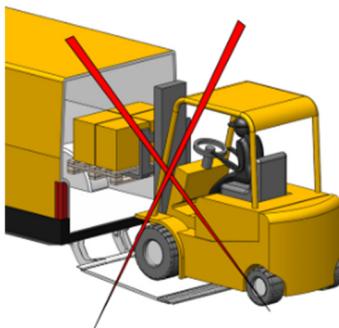
⚠️ WARNING

The absence of warning notice stickers on the vehicle or the absence of a load diagram (missing label plate) may make it more difficult to recognize hazards and result in injuries. Regularly check the condition of warning labels/stickers (maintenance schedule). Replace damaged or illegible product labels (warning labels, instructions, label plates) immediately.

(15) Before the vehicle is moved, the tail lift must be moved to the driving position. The tail lift is in the driving position when the platform is perpendicular to the vehicle.

2.9 Handling and behaviour during operation

- (1) Secure the vehicle against unexpected movement when performing any kind of loading or unloading operation (use handbrake or wheel chocks).
- (2) Do not place loads on the tail lift that exceed the rated capacity (comply with loading distance and load, see load diagram on page 19).
- (3) Never drive a forklift onto the tail lift platform! (Exception: the weight of the forklift plus the weight of the load being transported is less than the tail lift's maximum carrying capacity). The platform must be completely lowered (including platform tip).



- (4) Do not unnecessarily stand within the tail lift's range of movement.
- (5) Do not stand under the lifting device and load.
- (6) Do not stand on the lifting device (except for the operator).
- (7) No one other than the operator may ride on the lifting device.
- (8) Step onto or off the tail lift only at designated access points.
- (9) Control the tail lift only from the designated control positions (see page 24).
- (10) During all functions that are operated via a control, the tail lift must be constantly monitored.

WARNING

Since the device cannot be seen from the control panel, there is a risk that the operator or a third party could be shut inside. Make sure that no one is in the cargo area when the tail lift is closed.

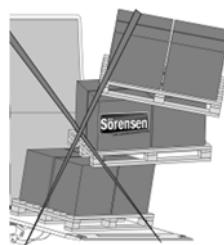
- (11) Operating personnel must ensure that neither they nor any other person is endangered by any movement of the tail lift.
- (12) When loading/unloading, make sure you leave enough space to operate safely. See the diagram of the safety distance required when using the wired remote control on page 24.
- (13) Do not allow the tailgate to swing.
- (14) Do not throw objects onto the platform or from the platform to the ground.
- (15) Loads must be placed on the platform in such a way that unintentional movement is impossible.



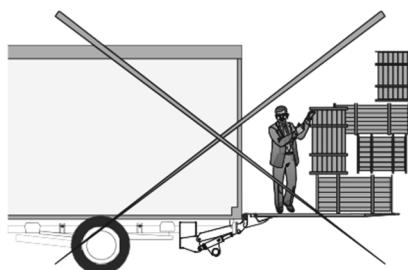
WARNING

Load the platform correctly and do not overload. Overloading the platform may cause components to fail and result in injury.

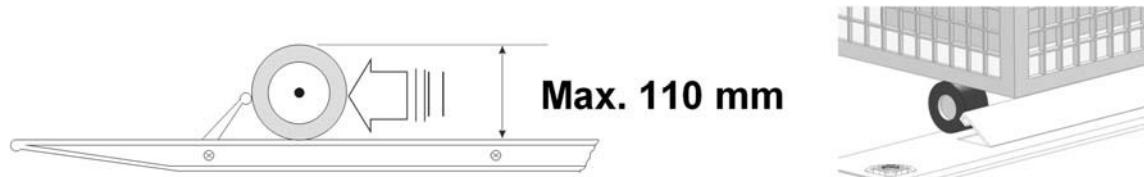
- (16) Loads may only be lowered or lifted in a horizontal position.
- (17) It is forbidden to tilt the platform when it is loaded and in the raised position.



- (18) Secure the load against toppling over or sliding.



(19) Slippery or rolling goods must be secured on the platform. Roll containers cannot be loaded or unloaded unless the platform is fitted with roll stops, available on request. The maximum diameter of the wheels must not exceed 110 mm.



⚠️ WARNING

Unsecured rolling loads can fall off the platform and cause serious injury. Before transporting rolling loads, raise the roll stops. Observe the danger zone.

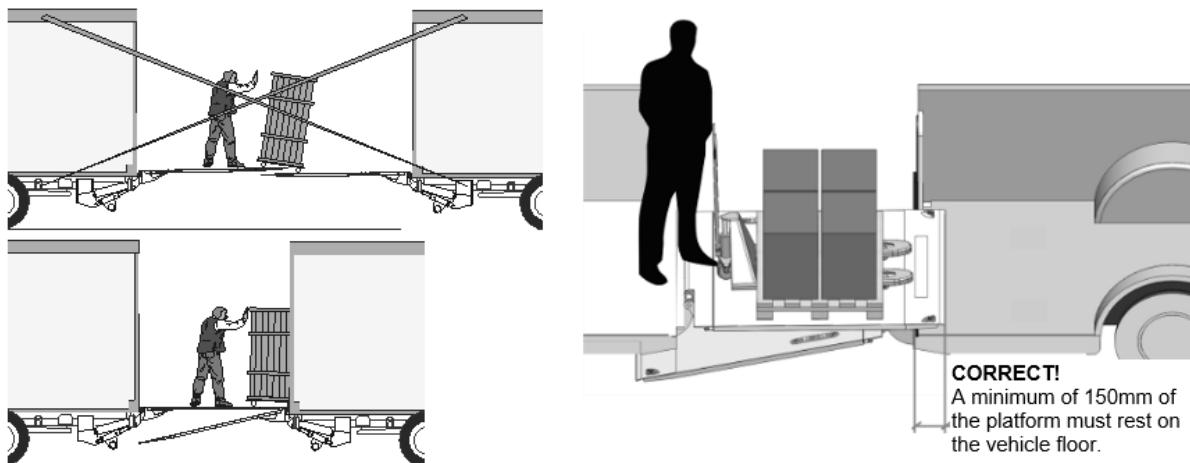
NOTE

If the tail lift does not have support struts, follow the notes on securing loads.

NOTE

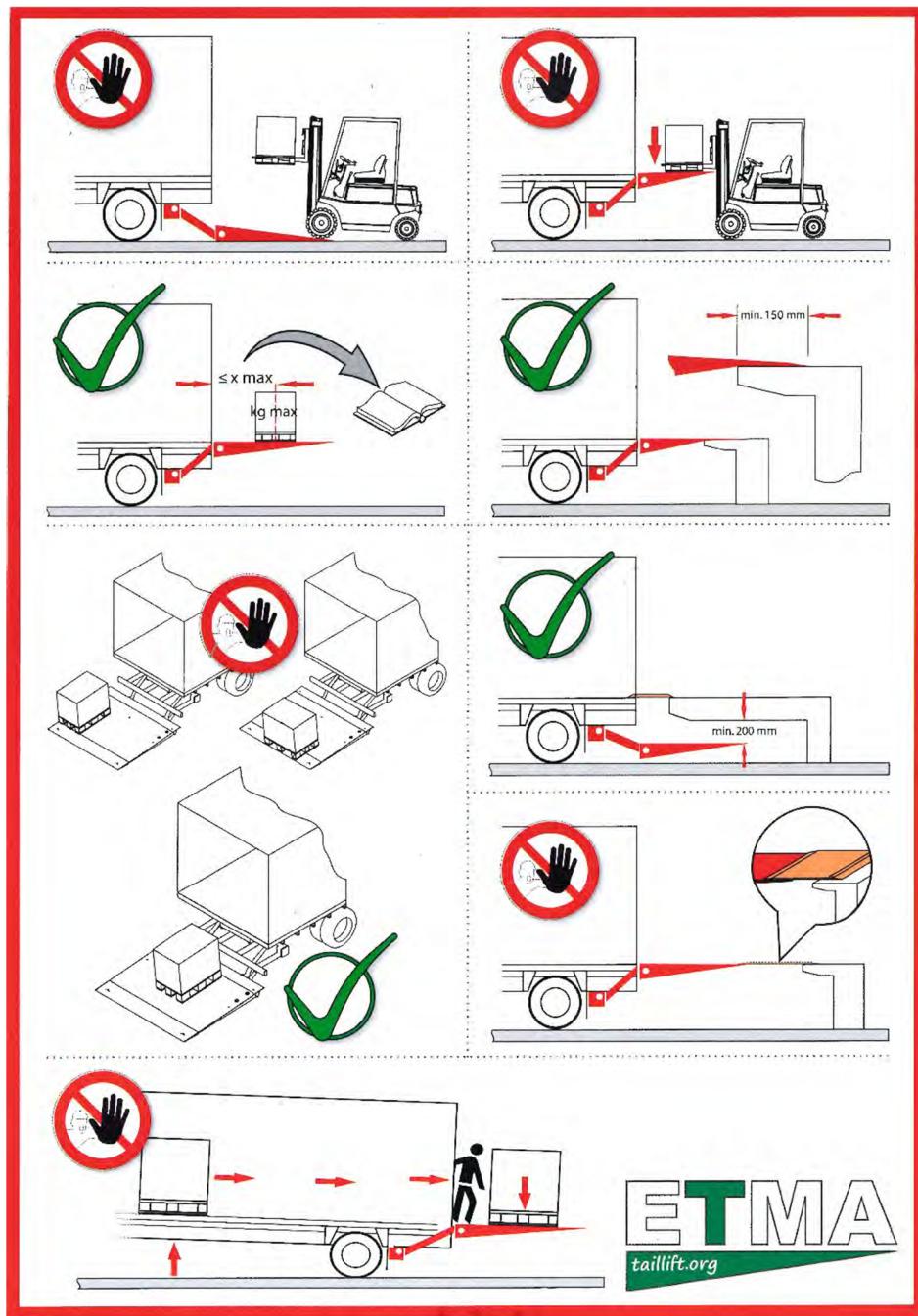
The effectiveness of the roll stops may be reduced or cancelled by dirt. It is imperative that they are kept clean.

(20) When transferring loads from vehicle to vehicle, only one of the two platforms should be used as a dock. A minimum of 150mm of the platform must rest on the floor of the opposite vehicle and may be traversed only with loads that do not exceed its maximum load-carrying capacity.



2.10 Danger notice sticker "Safe handling of the tail lift"

The danger notice sticker uses individual pictograms to indicate potential incorrect and correct usage of the tail lift. This sticker is supplied with all new tail lifts. The installing company must place it in a clearly visible location on the inside of the vehicle cargo area.



NOTE

If the sticker is missing or no longer readable, you must order a new sticker (Article no. 20 909 238).

2.11 Permissible loads

NOTE

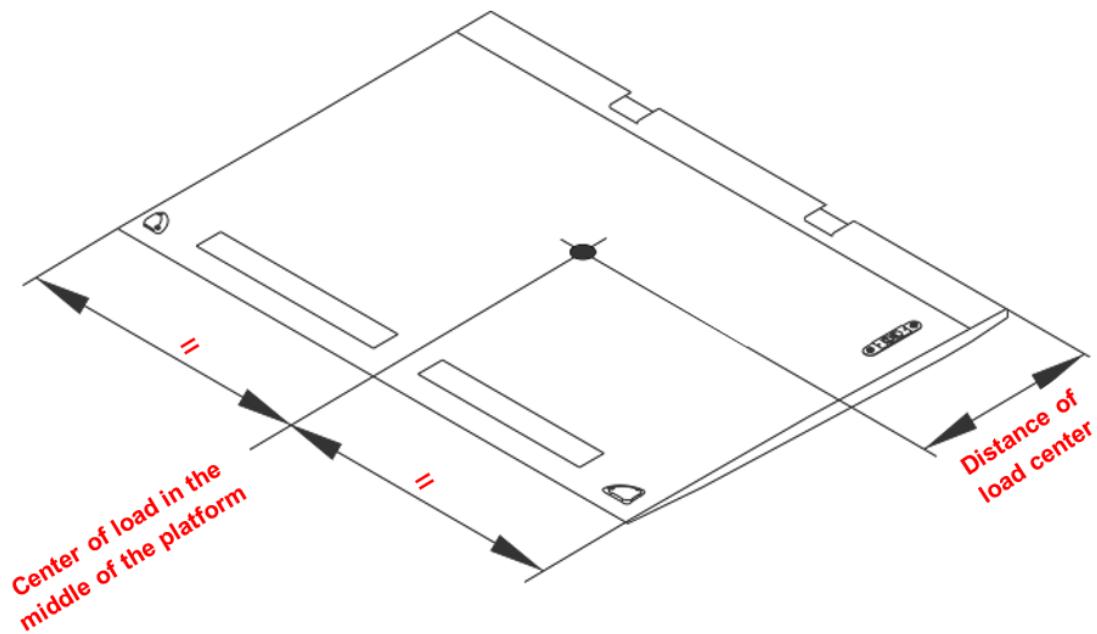
Do not allow any load to exceed the rated capacity for the tail lift. The load diagram on the rating plate must be observed. A one-sided load must not exceed 50% of the load-carrying capacity. The centre of the load should be as centered as possible between the lifting arms. The greater the distance of the load from the centre, the lower the rated loading capacity.

NOTE

There is no built-in protection against loads that exceed the rated capacity or that are not within the correct loading distance and are moved from the vehicle to the platform. Overloading of this type can, for example, cause the platform to break. The operator is responsible for ensuring that the platform is traversed/loaded only with loads that comply with the tail lift's load diagram.

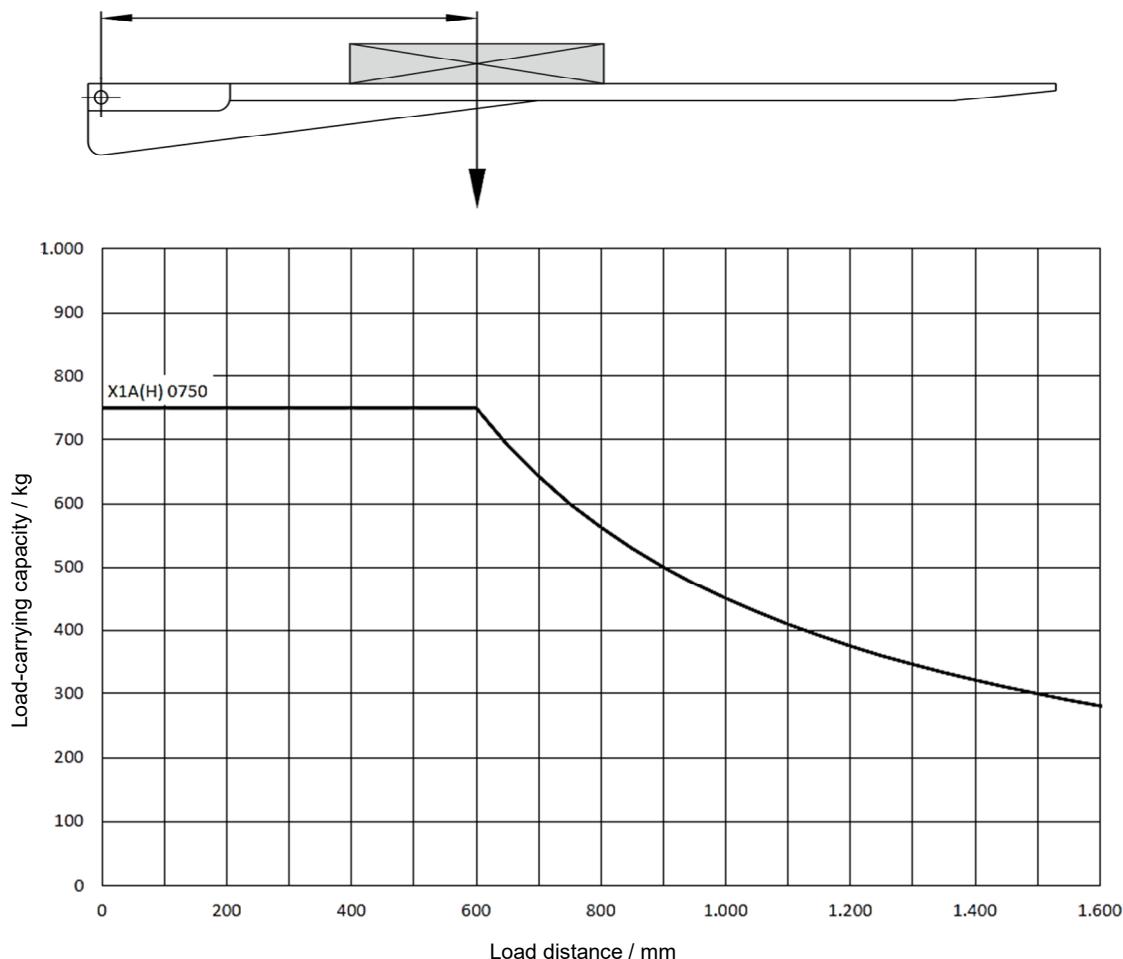
WARNING

Load the platform correctly and do not overload. Overloading the platform may cause components to fail due to a breakage of mechanical components during operation. This can result in serious or fatal injuries, serious damage to property, and voiding of the warranty.



2.12 Load diagram X1A 750 BS

Distance of load center



NOTE

Do not exceed the maximum load-carrying capacity specified in the load diagram. When the platform is completely lowered, it may be traversed/loaded only with loads that do not exceed its rated capacity.

Operate the lifting and lowering functions only with the platform in the horizontal position.

Do not tilt the platform down when it is loaded and in the raised position.

3 Operation of the tail lift

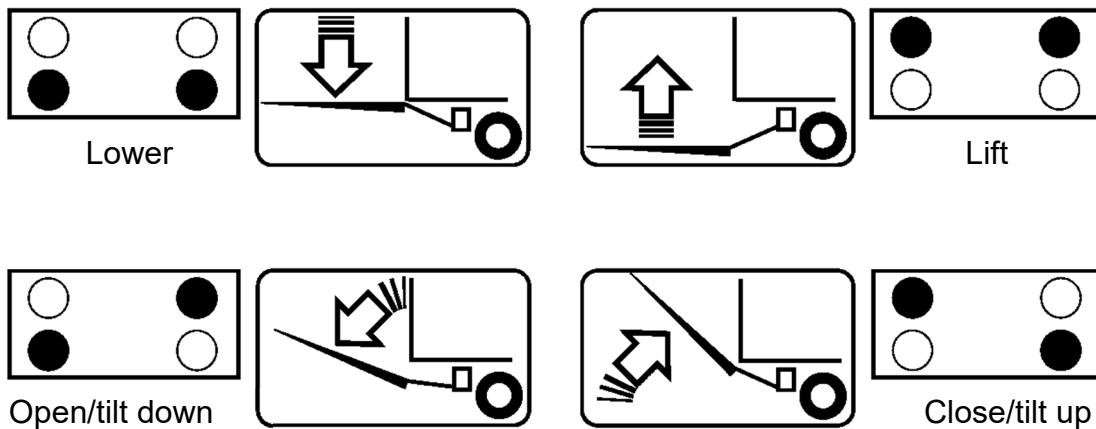
3.1 Activating the tail lift

Insert the key into the inverted C-shaped lock on the right-hand side of the control panel. DO NOT TURN. The tail lift is now switched on.



3.2 Operation using the control panel

From the control panel, all functions are initiated by pressing two different buttons simultaneously. The diagram shows which buttons are responsible for each individual function:

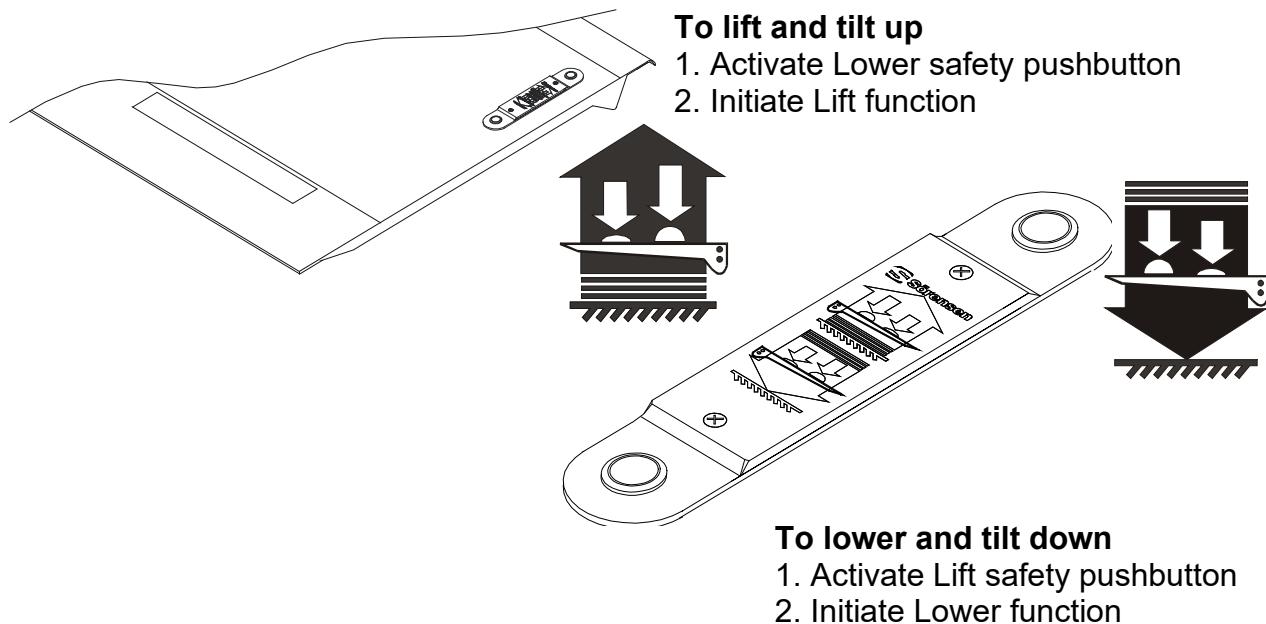


⚠️ WARNING

Be careful not confuse the control elements for tilt up/tilt down and lift/lower. Incorrect operation could injure third parties. Define and observe the danger zone, including for third parties.

3.3 Operation using the optional foot switch

The foot control is configured in such a way, that the two buttons must always be operated one after the other:

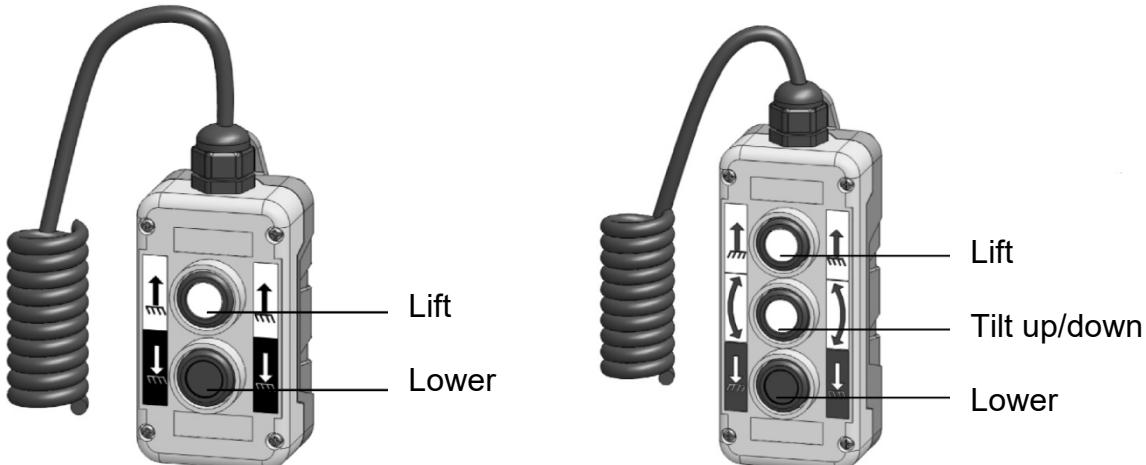


WARNING

Be careful not confuse the control elements for tilt up/tilt down and lift/lower. Incorrect operation could injure third parties. Define and observe the danger zone, including for third parties.

3.4 Operation using the optional handheld control with spiral cable

The two- or three-button wired remote control can be used to operate the following functions:



WARNING

Crushing or shearing hazard. Observe the specified operating position and comply with the safety distances from the operating position. All moving parts of the tail lift are crushing and shearing hazards. Define and observe the danger zone, including for third parties. Make sure that you have a good view of the entire loading area and that no one is near the platform.

3.5 Operating positions and safety distances when using the optional handheld control with spiral cable

NOTE

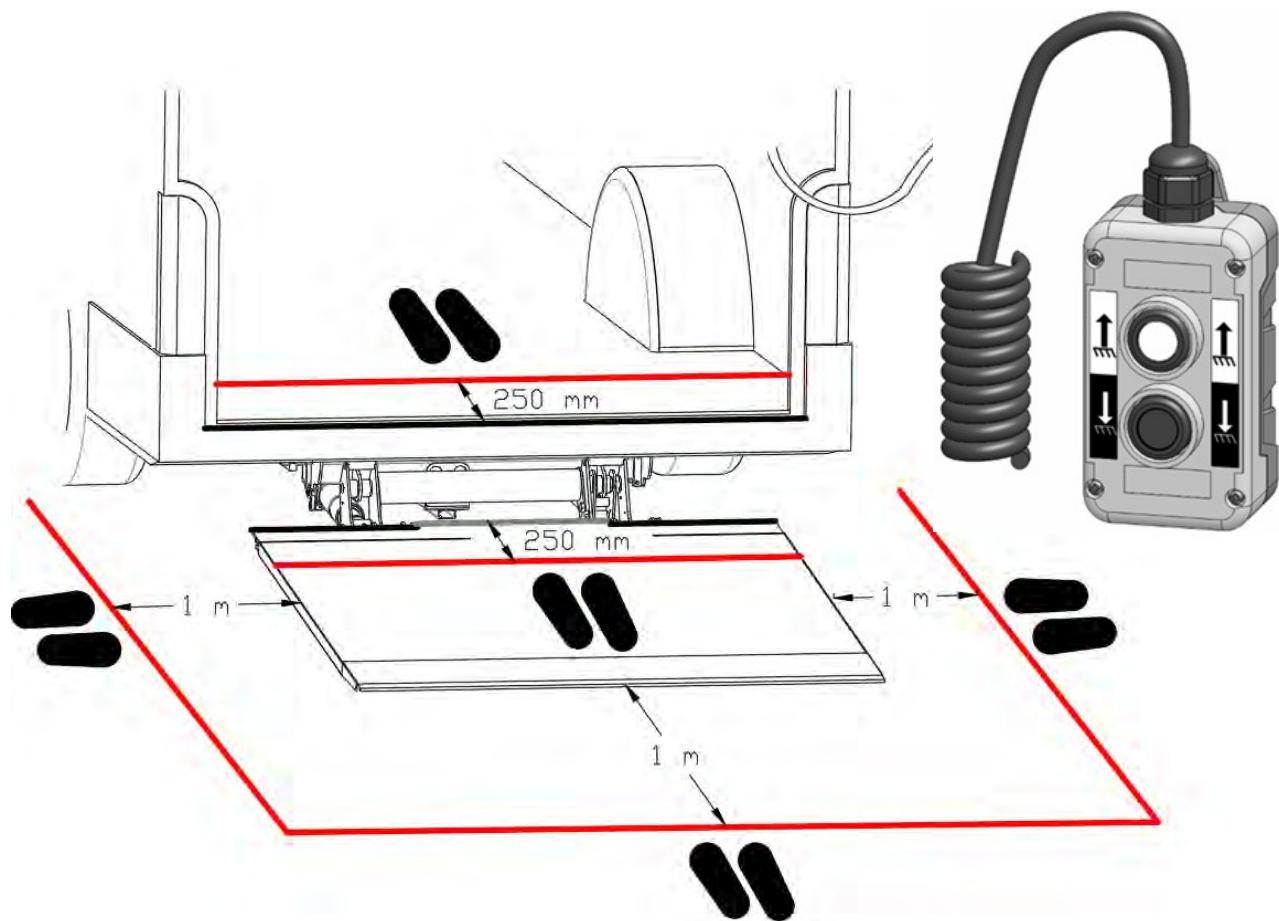
When using a handheld control with a spiral cable, the operator may initiate tail lift functions only while standing in the positions shown in the illustration.

Operating position on the platform or vehicle floor

The operator must stand a minimum of 250mm from the front edge of the platform or rear edge of the vehicle floor.

Operating position from the ground

When operating the platform from the ground, the operator must stand at least 1m from all edges of the platform and from the crushing edge between the platform and vehicle.



4 Maintenance

4.1 Daily visual inspections

- a. Check functioning and completeness of the operating and safety devices.
- b. Check that all warning and instruction labels are readable.
- c. Check for damage and completeness of pins and check that pins are securely tightened.
- d. Check cylinders for damage to/tightness of hoses, screw connections, and valves.
- e. Check warning lights for damage and functioning.
- f. Check functioning of battery master switch (optional equipment).

4.2 Annual inspection

After commissioning, the tail lift must be inspected at least once a year by trained personnel. The results of this inspection must be entered in the inspection record book.

4.3 Service, maintenance, testing and repair

- a. Before starting maintenance, secure the tail lift against unexpected movement.
- b. Check that all screw connections are tight.
- c. Check that cables and hoses are able to move freely. Correct shearing and chafing points on cables and hoses. Immediately replace damaged hydraulic hoses with new hoses of the same quality and note the replacement in the inspection record book.
- d. During cleaning, make sure that no moisture penetrates the power pack, control panel, or handheld control. Do not clean the bearing areas with high-pressure or steam jets because this may allow dirt and moisture to penetrate the bearing.
- e. Check the hydraulic unit for leaks. With the tail lift lowered, check the oil level in the unit reservoir (dipstick on the oil filler neck cover). If necessary, top up with hydraulic fluid of class HLPD 22 (temperature range -15°C to +50°C). when the dipstick is approximately 1cm immersed in the oil.
- f. Carry out an annual oil change and clean the suction filter. Carry out the oil change before any period of frost, in order to prevent the hydraulic unit from freezing.

Hydraulic oil recommendations

HLPD 22 (ISO-VG 22) "detergent" so that free water remains emulsified (e.g. to prevent ice formation in winter) and to improve oil film adhesion. In colder regions, use HLPD 10 grade hydraulic fluid.

Sörensen hydraulic oil HLPD 22	Art. Nr. 60 700 283
Sörensen hydraulic oil HLPD 10	Art. Nr. 20 841 181
Sörensen Bio-oil	Art. Nr. 20 858 811



WARNING

Risk of poisoning through contact with hydraulic fluid (e.g. when changing).

- Wear protective gloves when handling hydraulic fluid:
- Handle and dispose of hydraulic fluid in accordance with local regulations.

Maintenance and repair

NOTE

Repairs to load-bearing components are to be carried out only by an authorized repair shop. The components must be tested by a qualified specialist and the results entered in the inspection record book.

(1) After breakage of a load-carrying device, inspect the supporting structures and power pack, including safety devices, to prevent the lifting device from falling or lowering when a cable, chain, gear unit, or bearing nut breaks or when the hydraulic or pneumatic system leaks. Replace damaged components.

(2) Replace pressure hoses as needed but no later than 6 years.



WARNING

Be careful when restoring the power supply after an interruption. Maintenance personnel may be injured by an unintentional restart.

NOTE

Do not make changes to the tail lift without written permission from Sörensen engineering department. Use only original spare parts for repairs.

WARNING

Do not modify, bypass, or remove safety devices. Removing, modifying, or bypassing safety devices can result in injury.

WARNING

Careful ! Route the cable from the control panel to the power pack only from below. Penetration of moisture into the control panel connector can be caused by external influences (gravity, wind, water, snow, contaminants, etc.). This may cause unexpected movement that results in injury.

WARNING

Replace electrical system components only with approved original electrical components with EMC approval. External influences on electrical equipment may cause false signals/voltage in the power network and result in malfunction. Absence of EMC immunity can cause the control unit to malfunction, resulting in injury to people near the tail lift or driving behind the vehicle.

Battery capacity

The battery capacity necessary for operating tail lifts is normally specified by the vehicle manufacturer. Follow the vehicle manufacturer's installation guidelines.

WARNING

Electrical hazard for persons coming into contact with live parts. Risk of short-circuiting the battery when connecting the tail lift to the vehicle battery.

- Use only trained personnel.
- Follow the vehicle manufacturer's instructions when handling the battery.

Our recommendation for battery capacity

We strongly recommend installing a heavy-duty alternator and an additional battery. The operating company is responsible for the battery capacity and charge status.

Capacity	Battery	
750kg	12 Volt - 1 x 88 Ah	24 Volt - 2 x 6 Ah

NOTE

If you believe that the batteries are draining too quickly, have the batteries and the cables to the power pack inspected by a specialist. It may be necessary to repair or replace the cables, ground connection, or batteries.

NOTE

Make sure that the battery charging intervals between individual loading and unloading operations are sufficient.

Electric motor

The electric motor of the hydraulic power pack has a capacity of 0,8 to 3,0 KW, depending on the tail lift's load-carrying capacity.

At full operating voltage, the current is as follows:

- At 12V the current is up to 150A. If the operating voltage drops to 9V, the current doubles up to 300A.
- At 24V the current is up to 150A. If the operating voltage drops to 12V, the current doubles up to 300A.

WARNING

This high current accompanied by a low voltage causes the copper winding to overheat. As a result, the protective coating on the copper winding melts, possibly resulting in a short circuit or motor burnout.

How to prevent damage to the electric motor and power relay

You can prevent damage to the electric motor and power relay by ensuring that there is sufficient voltage to operate the tail lift at all times. If you notice that the electric motor has difficulty with a load that is usually easy to lift, stop the lifting operation immediately and charge the batteries.

DANGER

Electrical system with on-board voltage:

The tail lift receives electrical power from the vehicle's on-board power supply (max. 48 V DC). The electrical system is designed using state-of-the-art technology.

Do not damage or modify electrical components or wiring.

Fire and explosion hazard. Excessive current may damage the battery or cable harness. To prevent this, visually inspect the electrical system (maintenance schedule).

5 Fault diagnosis and elimination

5.1 Explanation of diagnostic LED in the control unit

The control unit is the central control unit for the tail lift's electrical system, and is found in the power pack. An LED (monitoring and diagnostic LED) integrated in the control unit serves as an operating state and fault diagnosis indicator.



Explanation of LED in series 13

LED-Diode Monitoring function	Switch in driver's cabin or key switch	LED off	LED on	LED flashes
Platform closed (90°)	off	X		
Platform opened (90° to 60°)	on		X	
Platform opened (60° to 0°)	on	X		
Platform tilted down (0° to -10°)	on		X	
Switch actuated *	on			X

Description of the positioning of the platform

90° = Platform closed

0° = Platform opened in horizontal position

-10° = Tip of platform tilted down

*If a control element on the handheld control, pushbutton (lever switch, switch of remote control, or foot controls) is actuated, the control LED diode flashes.

5.2 Checking the tilt sensor in the platform

Platform closed und tail lift activated: **LED on**

Power supply is functioning correctly.

Platform position 0 ° to approx. 60 °: **LED off**

Tilt sensor S1 in switching position is functioning correctly.

Corner lights are activated.

Platform position 0° to -10° (Tilted down): **LED on**

Tilt sensor in switching position is functioning correctly.

The switchover occurs in the horizontal position, making it possible to configure the automatic tilt-up function.

5.3 Checking the S4 pressure sensor

Simultaneously press the two buttons at the bottom of the control panel to lower the platform. As soon as the platform reaches the ground and the pressure switch is activated, the LED will change from normal flashing to very rapid flashing for about 4 seconds and the platform will tilt towards the ground. This means that the pressure switch has worked. If not, it is faulty or not powered.

5.4 Assistance with the LED

Error case	Status of the Platform/ Status of the diagnostic LED	Possible errors
No functions can be executed with control panel, handheld control or foot switch	Platform closed LED does not light up	- Check fuse - Control-Unit defective
Functions (except opening) can only be executed with control panel and not with handheld control or foot switch	LED flashes quickly	- Connection to sensor/platform set interrupted - Sensor/platform set defective
Control panel does not have any function	LED does not flash when a button is pressed	- Connection to control panel faulty - Control panel defective
Control panel does not have any function	LED flashes when each individual button is pressed	- Control-Unit defective
Handheld control does not have any function	LED does not flash when a button is pressed	- Connection to handheld control defective - Handheld control defective
Handheld control does not have any function (not even when opening)	LED flashes when each individual button is pressed	- Control-Unit defective
Foot control does not have any function	LED does not flash when a button is pressed	- Foot control defective
Foot control does not have any function	Platform is horizontal Corner lights flash LED flashes when a button is pressed	- Control-Unit defective
No automatic tilting available	LBW switched on, platform tilted below 0° LED does not light up	- Sensor/platform set defective
No automatic lowering available	Platform has touched the ground LED flashes every second when lowering is carried out	- Pressure switch S4 defective
Horizontal position is not assumed	Platform in horizontal position +/- 10° LED flashes quickly after pressing the buttons for programming the horizontal position	- Platform is tilted up or down too much - Sensor/platform set defective

5.5 Support for fault diagnosis and elimination

Problem	Possible cause
1. Power pack's electric motor does not work	Battery cable or ground cable is not connected or is defective Cable to driver's cabin is disconnected Main fuse is defective Fuse in power pack is defective Main battery switch is not switched on Switch in driver's cabin is not switched on Power relay is defective and does not operate Motor is defective
2. The motor does not work when the pushbuttons or lever switch are pressed	Power relay is defective Cable from control panel (control cabinet) to power pack is defective Control lines in power pack are defective Control panel (control cabinet) is defective
3. Tail lift does not open or opens slowly	Platform sticks at the vehicle cargo area Power pack motor does not start Cable feed to solenoid valve is defective Solenoid valve from closing cylinder is defective Valve YA does not operate Reactor in the closing cylinder is defective or blocked
4. Tail lift does not lower or lowers slowly	Solenoid valve Y3 is not triggered or is defective Valve YA does not operate Reactor in the lifting cylinder is defective or blocked
5. Tail lift tilts down instead of up when operated with the foot controls or handheld control	Pressure switch S4 does not operate Cable is defective Mechanical damage to lifting cylinder
6. Platform tilts down independently without the function being activated	Solenoid valve from closing cylinder is defective

7. Platform does not tilt down when touching the ground	Cable feed to pressure switch is defective Pressure switch is defective
8. Tail lift does not lift	Power pack does not work Too little fluid in reservoir Voltage is too low
9. Tail lift does not lift the rated weight	Load is not within the loading distance Load is too heavy Safety valve is incorrectly set Pump is defective Voltage is too low
10. Platform does not tilt up from ground when unloaded	Control panel is defective Microswitch does not operate
11. Platform does not tilt up from the ground when loaded	Load is not within the loading distance Load is too large Safety valve is incorrectly set
12. Platform tilts up from the ground to beyond the horizontal position	Position switch S2 is defective or incorrectly set Cable to switch S2 is defective
13. Tail lift does not close	Control panel is defective Hydraulic fluid is low

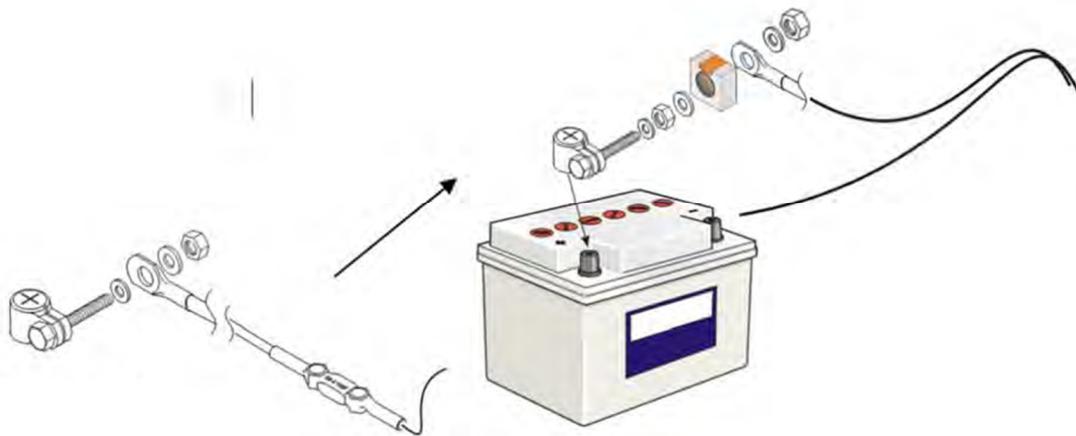
5.6 When electric motor is operated continuously - « Tail lift cannot be switched off”

Tip: Turn the nut around the battery's positive terminal to the left until contact is interrupted or disconnect using battery main switch to stop the motor from running. Then take the tail lift to the nearest authorized repair shop or call our customer service so that the defect can be corrected.

⚠ WARNING

Electrical hazard for persons coming into contact with live parts. Risk of short-circuiting the battery by connecting the tail lift to the vehicle battery.

- Use only trained personnel.
- Follow the vehicle manufacturer's instructions when handling the battery.



5.7 Emergency! Platform moved by mechanical means

In an emergency – for example, the tail lift breaks down while open – lifting and/or closing the tail lift by mechanical means instead of hydraulically causes the hydraulic cylinders to be filled with air. This means that the safety valves (solenoid valves) are out of order. Under these circumstances, the careless and/or incorrect opening and lowering of the tail lift could result in serious injury or death due to the tail lift free-falling to the ground. In this case, secure the tail lift using ropes, straps, or chains and affix a clear warning notice:



CAUTION ! Serious risk of death or injury!

The tail lift is unprotected and must only be operated by trained personnel.
All the safety devices are out of order.
The platform was closed by mechanical means, and opening it could result in death!

NOTE

If the tail lift breaks down in this way, contact customer service or an authorized repair shop for more information.

5.8 Malfunction

In the event of a malfunction, call our customer service or the nearest authorized repair shop. We will be happy to send you a current list of our customer service workshops on request.

6 Shutdown, disassembly and disposal

After shutting down, secure power-operated and power-assisted tail lifts against unauthorized use. Be particularly careful when removing the solenoid valves (safety valves). Before unscrewing the solenoid valves, make sure the platform is secured against sudden lowering and opening, e.g. using ropes, straps, or chains.

DANGER

Serious risk of death or injury!

When the tail lift is unsecured and the safety devices (e.g. solenoid valves) are out of order, the operator can lose control of it. Under these circumstances, the careless and/or incorrect opening and lowering of the tail lift could result in serious injury or death due to the tail lift free-falling to the ground.

- The platform must be secured against opening using ropes, straps, or chains.
- The platform may be opened only with the aid of a crane or forklift.

When disposing of the tail lift, the hydraulic system (lifting and closing cylinders, reservoir, hydraulic pump, solenoid valves, cables, high-pressure hoses, etc.) must be completely drained of fluid. Components lubricated with oil and grease must be cleaned using a pressure washer before disposal.

Dispose of hydraulic fluid in accordance with local regulations, especially those related to environmental protection, e.g. at a recycling centre or specialized dealer.

Remove and dispose of electrical components and cables in accordance with local regulations.

Remove plastic and elastomer components and dispose of separately in accordance with local regulations.

WARNING

Decommissioning may be hazardous if the tail lift could not be shut down under optimal conditions. Malfunctioning control elements can cause injury. Be sure to perform regular inspections (maintenance schedule) of the control elements.

WARNING

Decommissioning may be hazardous if the tail lift could not be shut down under optimal conditions. A missing or non-functional emergency stop button can result in injury.

⚠️ WARNING

Risk of unexpected startup. Incorrectly functioning control elements (handheld control, control panel, foot controls) can result in injury if the tail lift could not be shut down under optimal conditions. Be sure to perform regular inspections (maintenance schedule) of the control elements.

⚠️ WARNING

Risk of control system failure/malfunction, resulting in a restart after a malfunction or power failure.

Without shutdown signals, the tail lift can enter a critical state. People on or near the tail lift could be injured.

⚠️ WARNING

Risk of injury during disassembly caused by sudden release of pretensioned springs.
Use only trained and qualified maintenance personnel.

⚠️ WARNING

Risk of injury during disassembly/assembly (particularly of safety devices, e.g. removing solenoid valves) due to improper or incorrect assembly/disassembly.

Use only trained and qualified maintenance personnel.

⚠️ WARNING

Removing, modifying, or bypassing safety devices can result in injury. Do not modify, bypass, or remove safety devices.

⚠️ WARNING

Fingers are at risk of being crushed or sheared when the lifting gear is disassembled or assembled.

Be careful at the connecting points between the lifting gear and vehicle.

 **WARNING**

When transport locks are removed, parts may fall or the platform my tip over, resulting in injury. After disposing of packing materials, store all parts in a secured manner and carefully remove transport locks.

 **WARNING**

When transport locks are removed, parts may fall.

If parts fall, fluid can escape.

Carefully remove transport locks and secure loose parts before removal.

Always transport the lifting gear in an upright position using suitable lifting points.

7 Electrical circuit diagram

NOTE

The electrical circuit diagram is supplied with the tail lift as a separate document and is part of this user manual.

NOTE

The electrical circuit diagram must always remain with the tail lift.

You can also get the electrical circuit diagram anytime online at:

<http://home.soerensen.de/de/service/schaltplaene/>

For this you will need the tail lift serial number (Factory-Nr. / Tail lift-Nr.), refer to page 7 or the relevant circuit diagram.

For additional technical information, we are at your disposal online at www.soerensen.de, or through the contact information on page 1.

8 Hydraulic circuit diagram

NOTE

The hydraulic circuit diagram is supplied with the tail lift as a separate document and is part of this user manual.

NOTE

The hydraulic circuit diagram must always remain with the tail lift.

You can also get the hydraulic circuit diagram anytime online at:
<http://home.suerensen.de/de/service/schaltplaene/>

For this you will need the tail lift serial number (Factory-Nr. / Tail lift-Nr.), refer to page 7 or the relevant circuit diagram.

For additional technical information, we are at your disposal online at www.suerensen.de, or through the contact information on page 1.

9 Warranty, exclusion of liability, copyright protection

9.1 Copyright protection

This user and maintenance manual is intended for owners and operators of the Sörensen tail lifts. It may not be reproduced or made available to third parties without the express permission of Sörensen Hydraulik GmbH. Any violation is punishable by law.

9.2 Warranty

During the first 24 months from the date of delivery, we are liable for defects in the tail lifts that are attributable to material, design, and/or processing faults. Liability is limited in all cases to the replacement or repair of the defective part. Labor costs will only be reimbursed if the work is carried out by a workshop authorized by us and corresponds to the standard times. Subsequent costs incurred, e.g. for a replacement vehicle, will not be reimbursed.

9.3 Exclusion of liability

Our liability excludes: damages assigned to wrong installation or operation of the tail lift, as well as overloading, improper use, insufficient battery charge or capacity, accidents, or damages due to ground contact (e.g. rough terrain and/or building sites).

10 Notes