Plus-point product diversity

Operator`s Manual for Sörensen liftgates:
X1A 500E, X1A 500F, X1A 600E, X1A 600F

Sörensen
The tail lift experts

Operator`s Manual

X1 TECHNOLOGY

for Sörensen liftgates:

- X1A 500E
- X1A 500F
- X1A 600E
- X1A 600F

Verband der in Europa tätigen Hubladebühnen - Hersteller e.V.

TÜV NORD CERT GmbH DIN EN ISO 9001/KBA Freiwillige Zertifizierung

...lifts for life

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Contents

This operator`s manual is valid for the following liftgates:

X1A 500E, X1A 500F and X1A 600E, X1A 600F

General

Read this operator`s manual carefully, before using the liftgate. The hand book shall make you familiar with the way the liftgate is working, and warn for malpractice. The instructions contained therein are issued for security reasons, and for better conservation of the product. The Sörensen - liftgate may only be used for lifting and lowering loads, that must be placed according to the loading diagram. The lifting ability of the liftgate can be seen in the loading diagram on page 8.

The liftgate may only be used, maintained and repaired by personal that have an appropriate briefing about the mechanics of the device, and the dangers connected to the use of the device. All regulations for prevention of accidents must be complied to. The essential provisions are printed in the check book of this liftgate. The checkbook is a part of this operator`s manual.

Is the liftgate is operated by untrained personal, hazards for the operator as well as other persons can occur. All safety regulations must be complied to.

It is not allowed to make any changes on the liftgate without prior written approval from the constructing department of Sörensen. Only original spare parts are may be used for repair of the liftgate. Sörensen is not liable for damages which occur through not compliance with the prescribed directions in the operator`s manual

The operator`s manual shall therefore be kept in the cabin of the vehicle, so it is possible to look into it for instruction. The liftgate production number is necessary for ordering spare parts, to make warranty claims or obtain technical information. You will find the liftgate production number on the name plate located on the tilt arm. A second nameplate is located on the inside of the power pack cover. Further more the number is engraved in the left main mounting flange.

Description of the Sörensen liftgate

You have decided to purchase a liftgate of top quality. Sörensen liftgates comply with the EG Maschinenrichtlinie 2008/42/EG, as well as DIN EN 1756 – 1.
The Sörensen – liftgate is very undemanding. It has maintenance free bushings and must not be greased throughout its lifetime.

Electric system/operating unit

The controlling of the different functions are done with the very flat control panel page 15.

Foot controls
With the foot controls located on the platform, the liftgate can be lowered to the ground and can be lifted to the height of the vehicle floor. The tilt-down and tilt-up at the ground are automatic.

Priority controlling
The foot control is a priority controlling. Are the liftgate operated with the foot controls then (the control panel, and the cabled remote) is electrical blocked.

Hydraulic
The liftgate are driven with a power pack unit which are is mounted directly on the tilt cylinder or on the main frame of the liftgate. With this the liftgate can be driven in any wanted position over the lift and tilt cylinder. The cylinder rods are nitrated.

Main frame
The main frame as well as the other steel parts are painted black (RAL 9005).
The installation brackets are mounted in the right position for the type of vehicle present.
Every new type of liftgate is driven 80.000 cycles in a long-time test, before given free for sale.

Platform
The platform is made with aluminum extrusions which are clipped together and welded to a cross extrusion with the platform tip to obtain high stability.

Daily visual inspections
Function and completeness of the operation- and Safety devices
Readability of control and instruction signs
Damages and completeness of pins and pin locks.
Damages and tightness of hydraulic hoses, fittings valves
On the cylinders
Damages and function of event flashlights
Main switch (special equipment) must be tested for function

Any lack must instantly be fixed, and any missing parts must be replaced!
The operator is responsible for the timely maintenance and repair of detected errors!
The operator`s manual must always be available in the vehicle!
Repairs may only be made with original spare parts!

Annual inspection
After taking the liftgate in use, it must be inspected by an expert at least 1 time in a year.
The results must be notated in the check book of the liftgate.

Battery capacity
The battery capacity for the use of liftgates are normally prescribed by the vehicle producer, please always comply to the vehicle manufacturers installation guidelines.

Our recommendation for the battery capacity:
To build in a stronger generator and an extra battery is basically recommended. The user is responsible for the charging level of the battery.

Capacity 500 kg, 600 kg	12 Volt - 1 x 88 Ah	24 Volt – 2 x 66 Ah

The electro-motor
The Electro motor of the power pack has depending on capacity an input of 0,8 KW till 3KW. That gives by full voltage:
12 Volt a current of 150 A. Is the voltage lowered to 9 volt, the current will double to 300 A.
24 Volt a current of 150 A. Is the voltage lowered to 12 volt, the current will double to 300 A.

This high current at low voltage results in excessive-heating of the copper winding.
The result is that the protective lacquer melts, which can lead to a short-circuit and even a burned motor.

Like this you can prevent
You can avoid damages to the motor and the motor relay, if you always have sufficient voltage on the battery. If you experience that the motor has problems lifting a load that normally is no problem, then immediately stop the action and take care that the battery are charged.

If you realize that the batteries are running out of power too soon, then let an expert examine the batteries and the cables leading to the power pack. Possibly the cables + and ground must be changed.

Take care that the charging fazes for the batteries are sufficient between the single loadings or unloading.

Handling and behavior during the operation
(1) Liftgates may not be loaded with a higher load than its allowed max. load. (Always take care that the loading distance is correct)
(2) Loads shall be placed in a way, that unwanted position changes do not occur.
(3) Entering and leaving the platform must be done over the allowed ways.
(4) Liftgates may only be controlled from the control positions meant be used for controlling.
(5) The operator must by all movements of the liftgate take care that he/she or other persons are not at any risk.
(6) Unnecessary stay on or in the range of motion of the platform, are prohibited.

Un-allowed is further more:

1. Stay under the load handling attachments
2. To step on the load handling attachments
3. To be more persons than the operator on the platform by moving.
4. Use of the liftgate for purposes which it is not designed for.

(7) Moving liftgates are only to be driven with, when the platform is in the driving position.
(8) The platform may not be put in movements, which may lead to getting thrown off.

Closing down the liftgate
When power driven liftgates are taken out of use, they shall be secured against un-allowed use.

Maintenance
(1) Before doing maintenance on elevated parts of the liftgate, these parts must be secured against unwanted movements.
(2) To prevent a falling down or a sinking down of the platform all bearing elements, power pack and safety devices as well as the hydraulic connections are to be examined, and defect parts must be renewed. (3) Hydraulic hoses shall be renewed when necessary – though latest after 6 years.
The changes of the hydraulic hoses as well as other maintenance made, must be noted in the check book of the liftgate.

Use
The Sörensen liftgate are designed for lifting and lowering loads. It may only be operated by one person, and only one person are allowed to drive on the platform.

General instructions

Attention! When the liftgate are in use, it must be secured that the vehicle does not make any unwanted movements. The liftgate must be observed during all functions that can be driven from the control system.

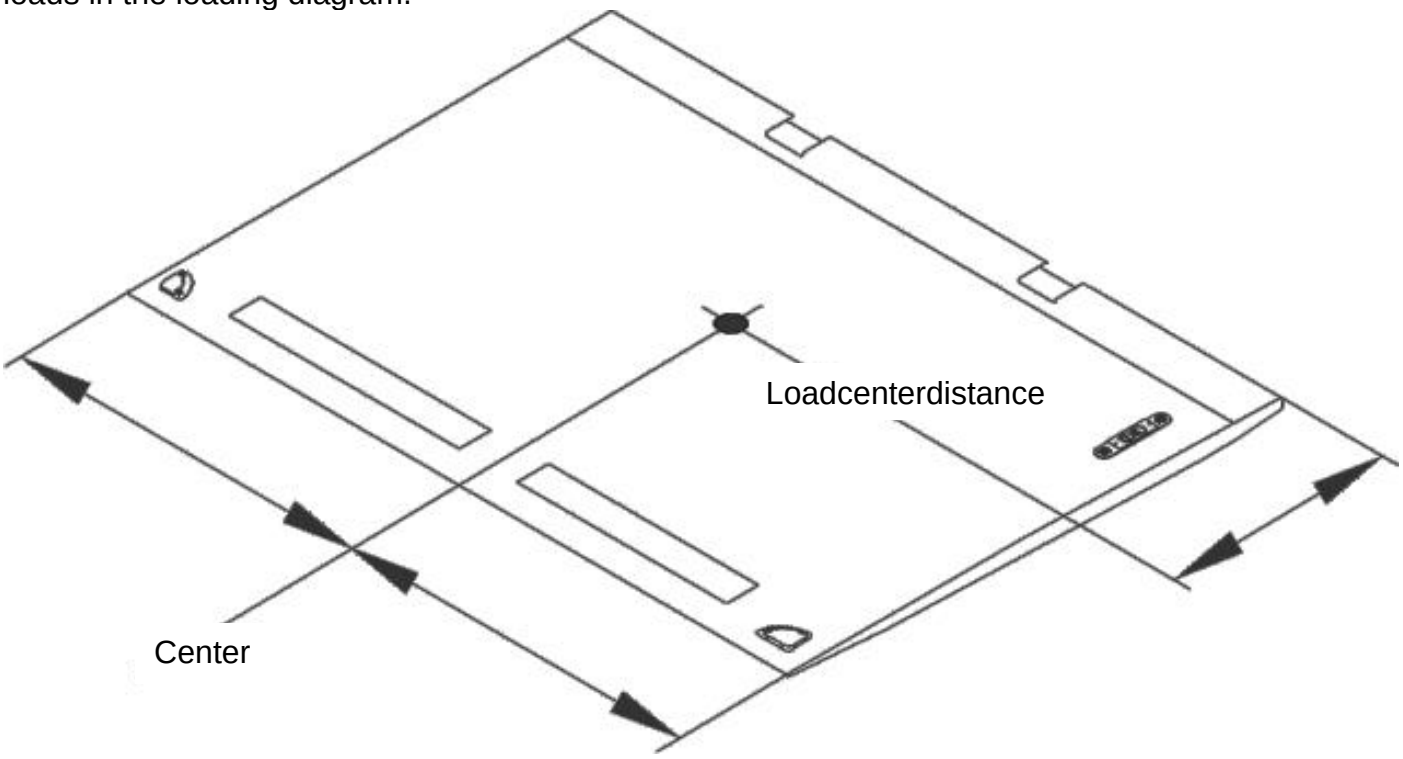
Attention! The complete working area of the liftgate must be kept free of persons or objects. Special attention shall be given to the squish and shear area between platform and body, as well the area between the platform and the ground.

Allowed load

Attention! The max. load of the liftgate may not be exceeded. Be aware of the loading diagram on the name plate. The one side load is 50 % of the max. load of the liftgate. The load center shall be kept as central as possible between the lifting arms. The bigger the loading distance is. The lower is the allowed load.

Driving loads on to the platform from the vehicle floor

Attention! Safeguarding against loads that are larger than the max. loads or loads which is not placed in the correct loading distance and loads driven from the vehicle to the platform, is impossible. An overload like this can lead to a break of the platform. It is the operator responsibility that the platform are not loaded with loads, that exceed the allowed loads in the loading diagram.

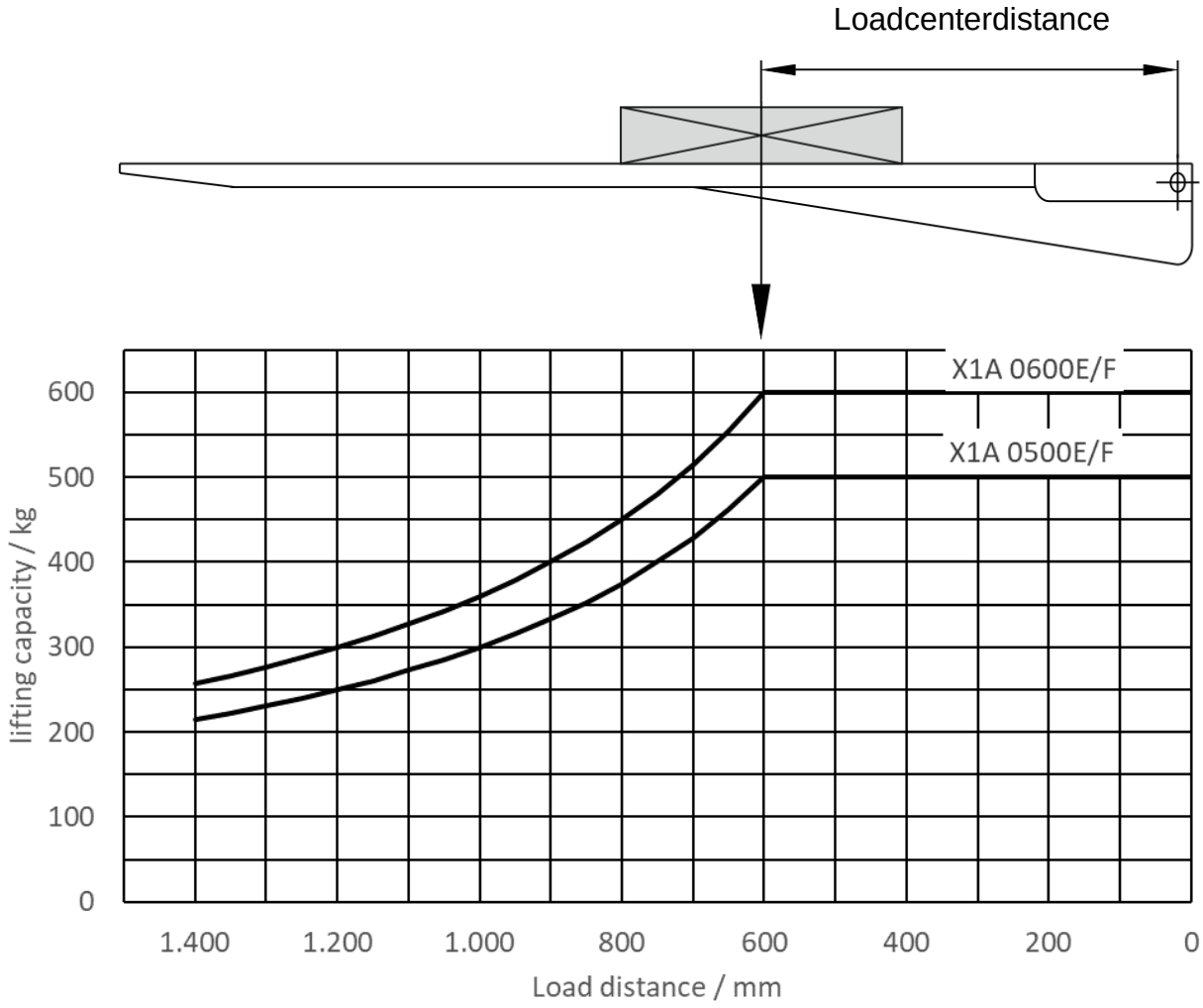


Loading diagram / capacity

In addition to the operating instructions, the liftgate loading diagram is also shown on its identification plate.

The load's centre of gravity should be in the middle between the lift arms.

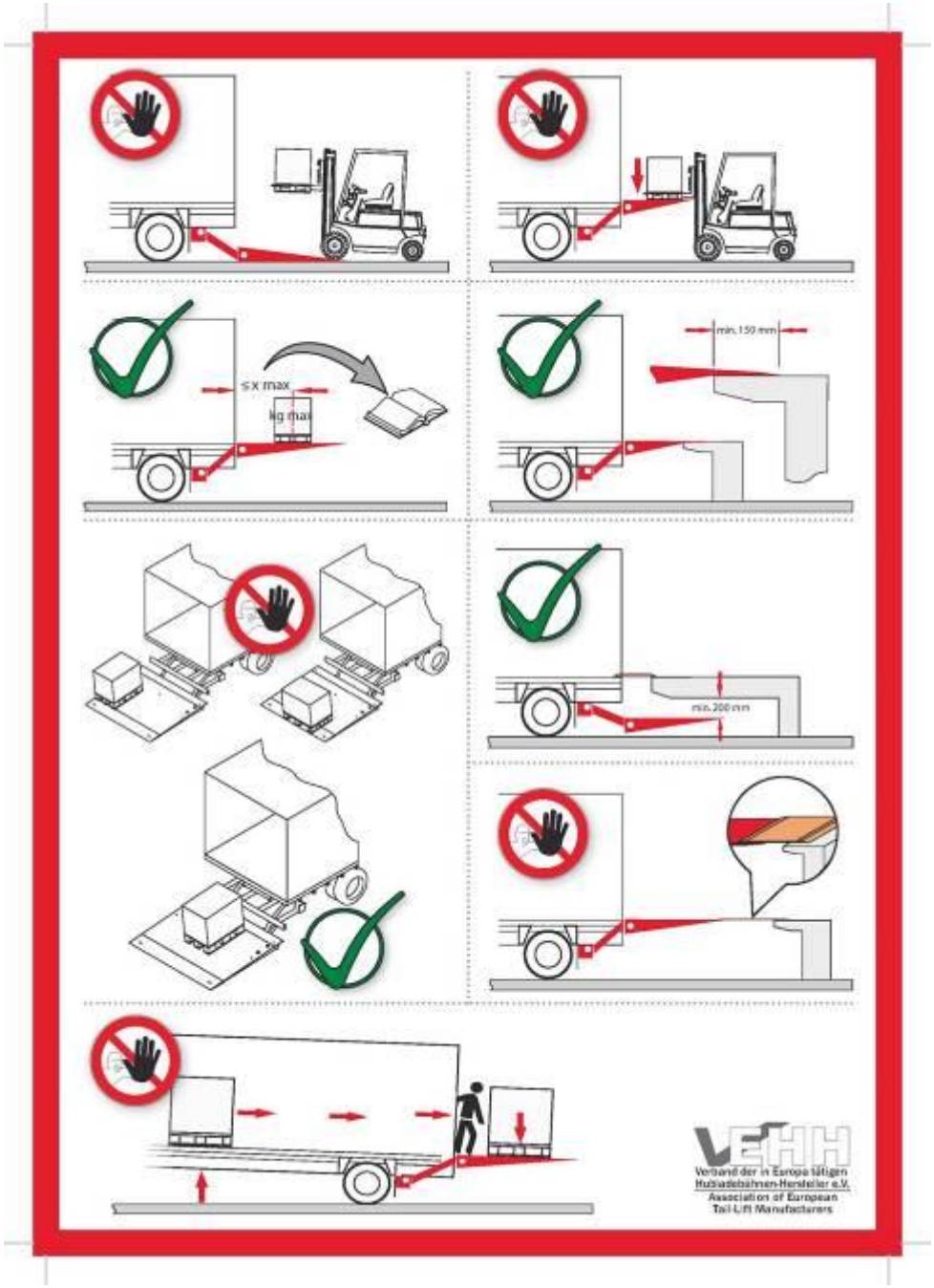
The greater the distance of the load from the end of the flatbed, the lower the loading capacity.



The maximum loading capacity specified in the loading diagram must not be exceeded. The platform may not be used as a bridge plate.

Drive only the functions lifting and lowering when the platform is horizontal. The platform may not be tilted down, when loaded and in elated condition.

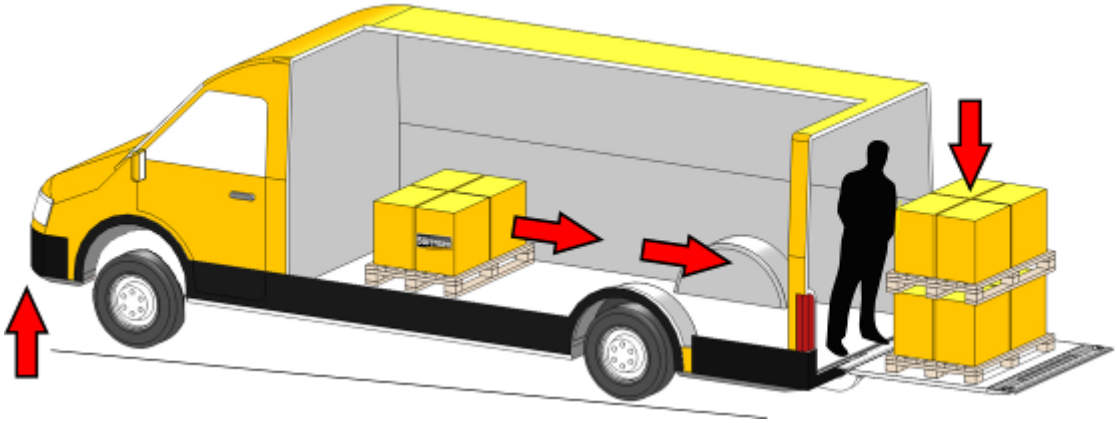
Danger clue – Sticker “safe handling of the liftgate”
The sticker is delivered with all new liftgates and must be placed on a visible place on the inside of the rear part of the vehicle. The danger clue – sticker shows possible falls actions and right actions in the single pictograms.



This sticker can be ordered under the part number 20 909 238.

Danger instruction about unsecured load

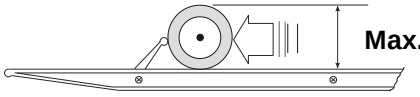
Attention! Under very unfavorable conditions there is by loading and unloading over a liftgates platform, a risk that the front aches are lifted. The sloping of the vehicle can lead to movements of not secured loads, which can lead to personal risks.



Rolling loads

Rolling or slippery goods must be secured on the platform. Without cart-stops it is not allowed to have rolling loads on the platform.
Sörensen liftgates can if wanted be equipped with cart-stops, (wheels with maximum diameter 110 mm) are safely secured.

Attention! Be aware of the safety instruction about unsecured load, by especially liftgates without support legs.



Description of the safety

Hose break valves

If a hose bursts, or a tube or a fitting breaks, the liftgate will, according to valid norm, lower the platform in a controlled way, with the allowed speed, as long as one of the functions on the controls are activated. Are no function then activated anymore the liftgate will stop immediately.

Safety valve

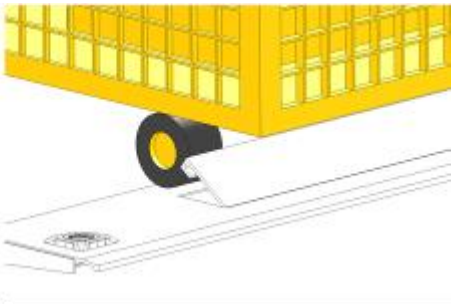
The liftgate is limited with a safety valve to lift only the max. permitted load. This valve is pre-adjusted from the factory, and adjustment of it is only permitted for experts by using a test weight and a manometer.

Electric fuses

Defect fuses are only to be renewed with fuses that have the values defined in the wiring diagram, and the on control unit. Larger fuses can lead to cable fire.

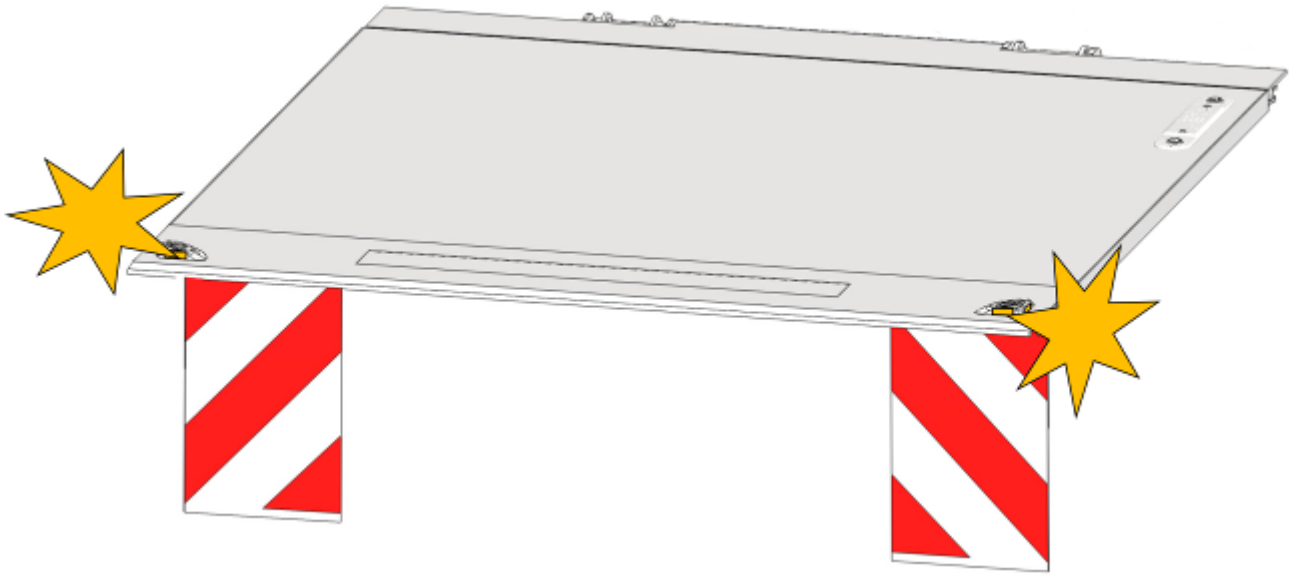
Cart stops

Attention! Are roll-container used, the liftgate must be equipped with cart stops. The function of the cart stops can be limited by dirt. The operator shall always keep these safety devices clean.



Warning markings and flashlights

The liftgates platform can be equipped with warning marks and/or with flashlights. These safety devices must always be functionally and be kept clean.



Safety instructions for the function Driving on the platform

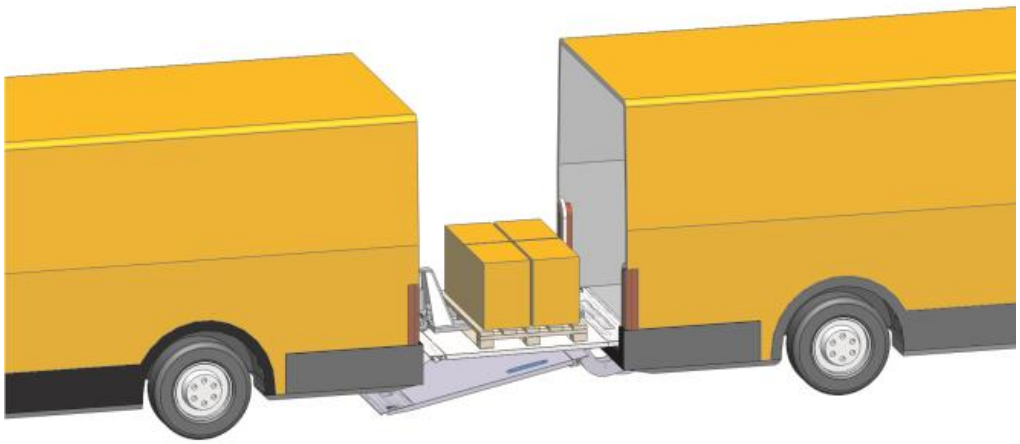
Attention! By loading the platform it must be secured that there are sufficient room left on the platform so that the operator can drive along on the platform and operate the liftgate.
Only the operator are permitted to drive on the platform.

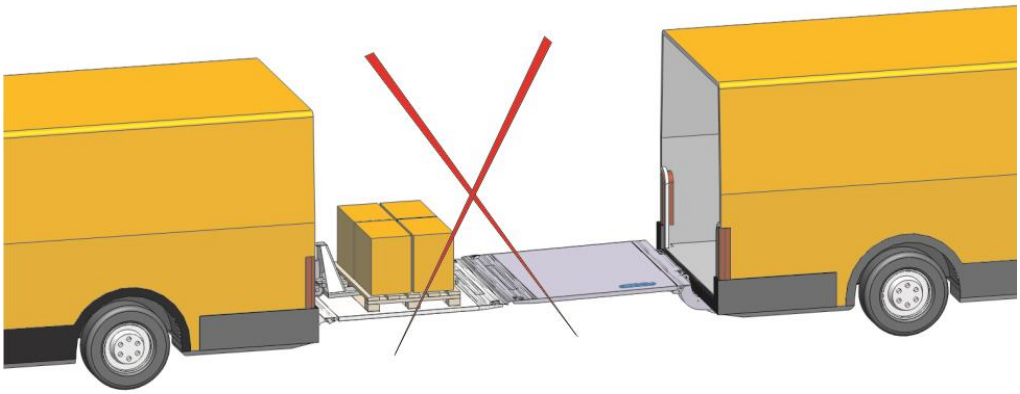
Securing load

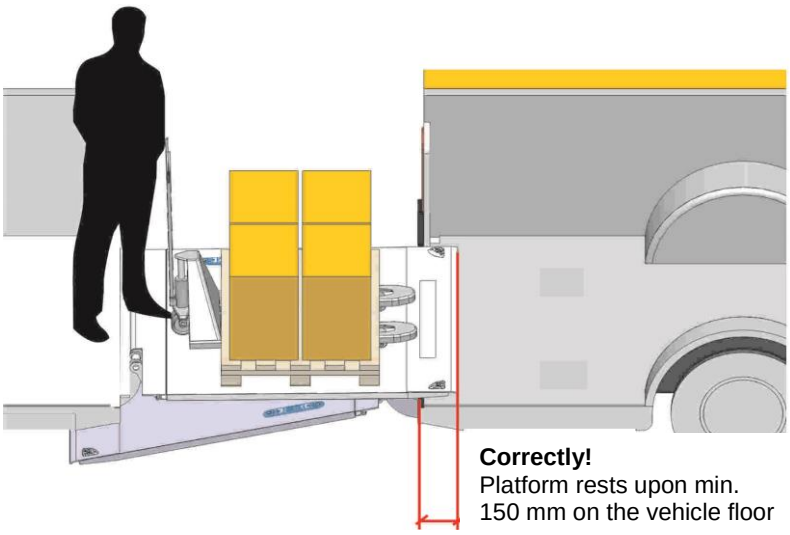
Attention! Make sure that the load are secured against slipping and kipping!
An elevated platform may not be tilted down.

Transshipping from one vehicle to another

Attention! By transshipping from one vehicle to another, only one of the two platforms can be used. The platform used must have the platform tip resting on the floor of the other vehicle overlapping **min. 150 mm** and can only be driven over with allowed max. load.



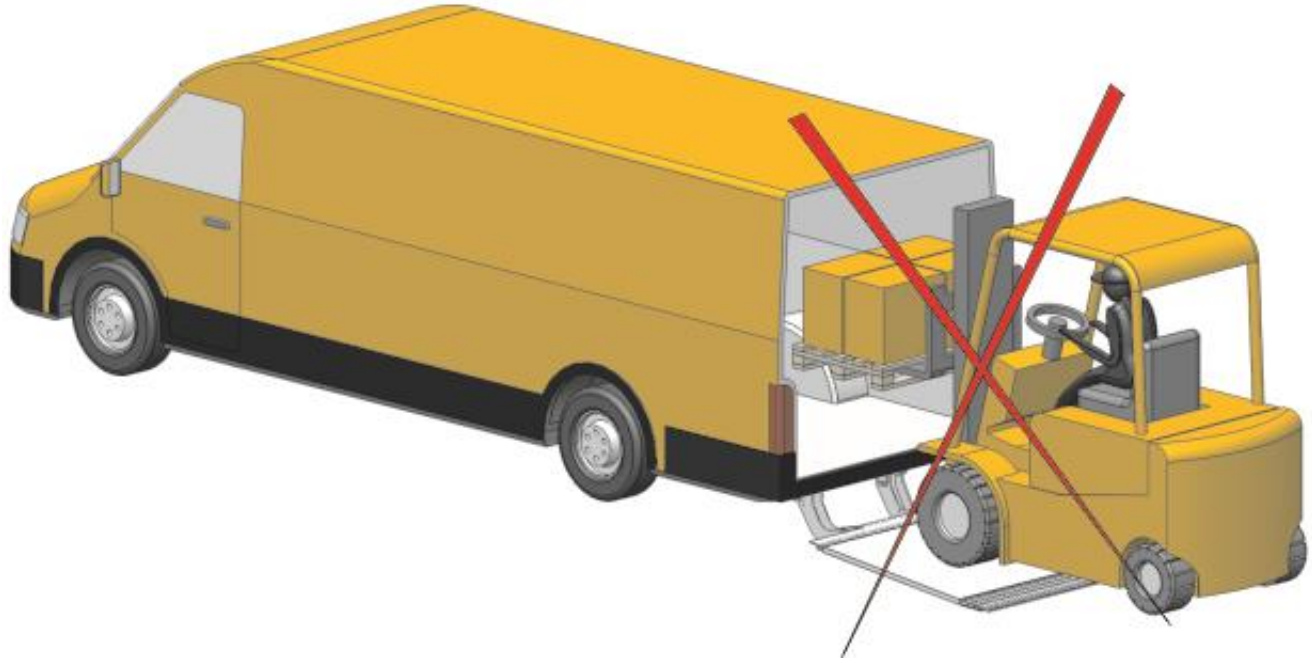




Correctly!
Platform rests upon min.
150 mm on the vehicle floor

Driving with a fork lift on the platform lying on the ground

Attention! It is not allowed to drive on the platform with a fork lift! (exception: The combined weight of the fork lift and the load are smaller than the allowed max. load of the liftgate). Doing this the platform must rest firmly on the ground – (also the platform tip).

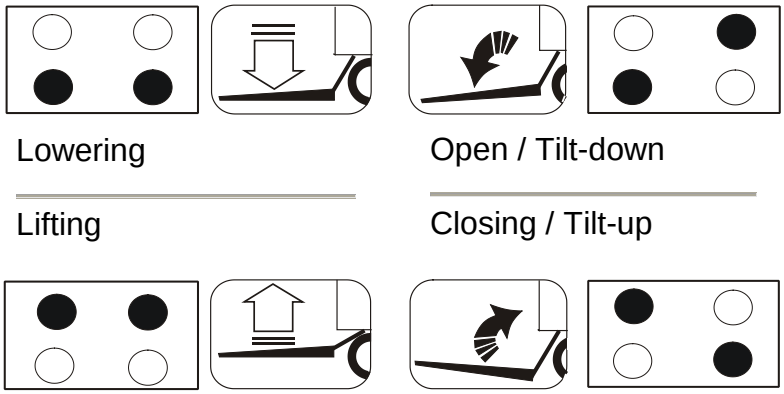


Attention!
By any loading or unloading the vehicle must be secured, so it does not roll away. (Activate parking brake).

Turning on the liftgate
With the switch in the cabin you switch on the control system of the liftgate. When the red control lamp is lights up, the liftgate is ready for operation.

Control panel

To drive the different functions on the control panel, you must always activate two different keys simultaneously. The key combination for every single function is shown in the graphics.

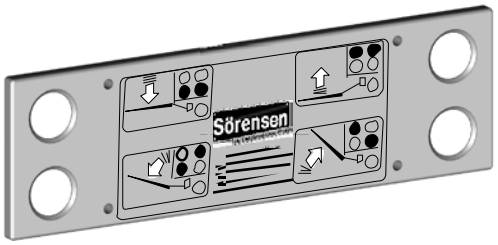


Lowering

Open / Tilt-down

Lifting

Closing / Tilt-up

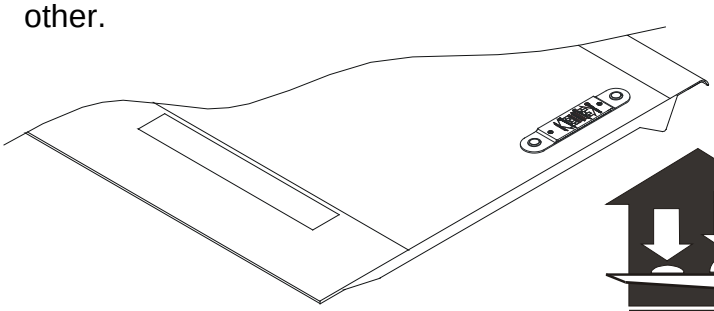


Controlling the liftgate from the platform

From the platform the operator may only drive the liftgate with the foot controls, or with a handheld remote, that are operated from a marked space on the platform.

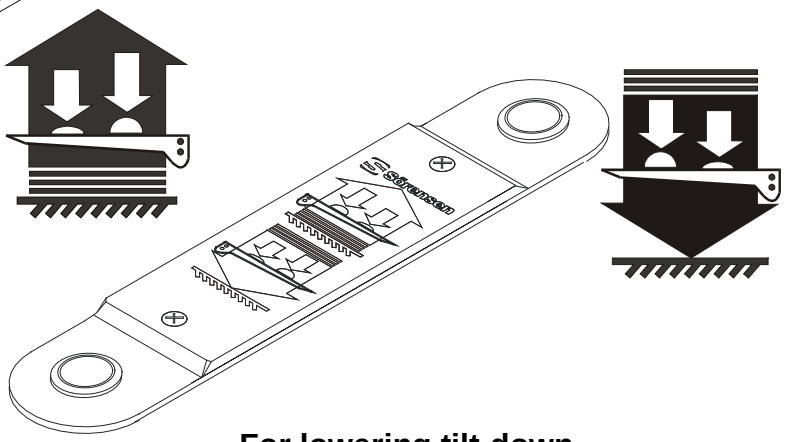
Foot controls

The foot controls is designed so that both has to be activated – one at the time after each other.



For tilt-up and lifting

1. Activate button (lower nearest body)
2. Begin lifting/tilt-up (button lift)

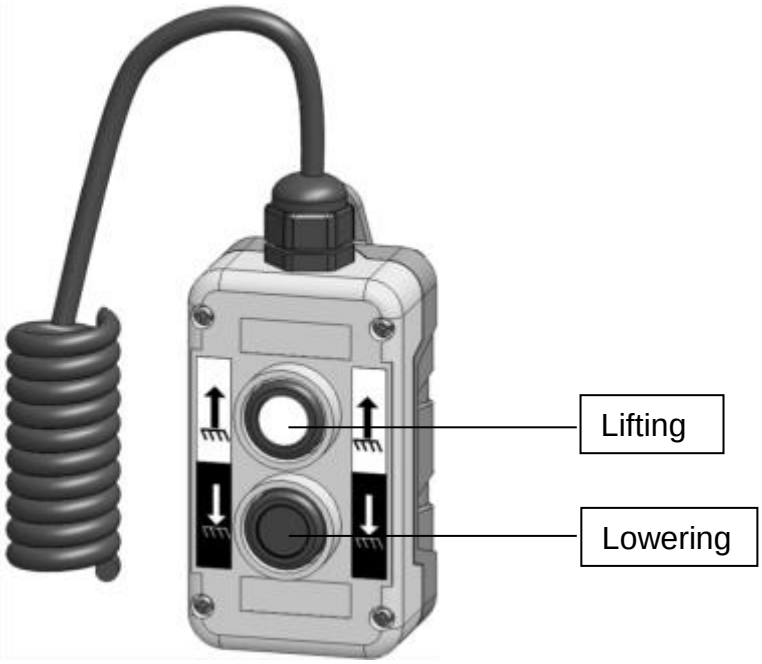


For lowering tilt-down

1. Activate button lift
2. Begin lowering/tilt-down (button lower)

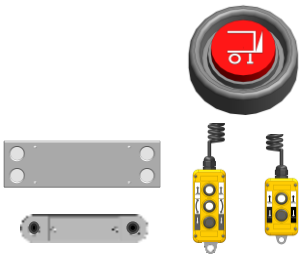
Option handheld remote with spiral cable

With the 2-button handheld remote the functions lifting and lowering can be operated, after the platform has been opened with the control panel.



With the 3-button handheld remote the functions lifting, lowering be driven. Additionally the tilt functions tilt-up and tilt-down be driven.

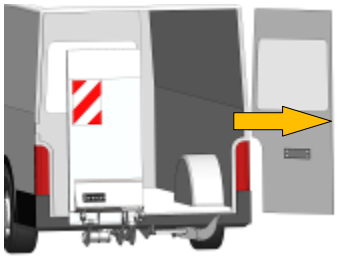
Users manual for the liftgate X1A 500F and X1A 600F



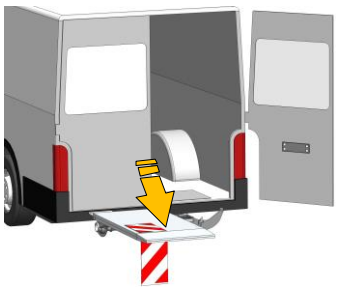
Open the platform

1. Turn on the liftgate.
(cabin switch page 14).

Manual for operating: operating panel, foot control and the option handheld cabled remote page 15, 16.

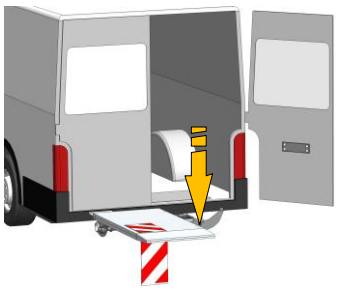


2. Open the right rear door to get access to the operating panel or to the option 3-button handheld cabled remote.

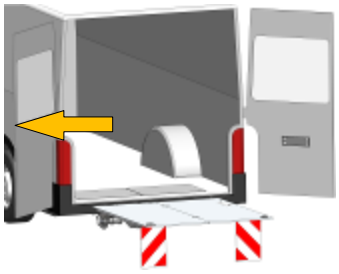


3. Open the platform with the operating panel (open/tilt-down) or on the option 3-button handheld (tilt) + (lowering).

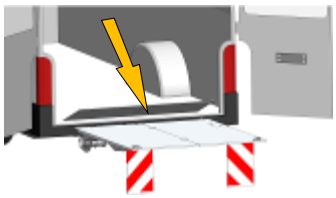
4. Flip open the right side of the platform.



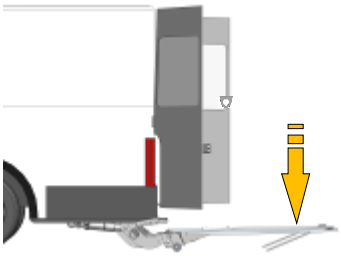
5. Lower the liftgates platform with the operating panel (lowering), or if you are on the platform - the foot control or the option handheld remote (lowering), so it gets possible to open the left door.



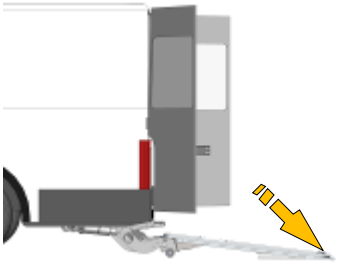
6. Open the left rear door.



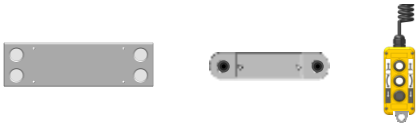
7. Flip over the bridge plate.



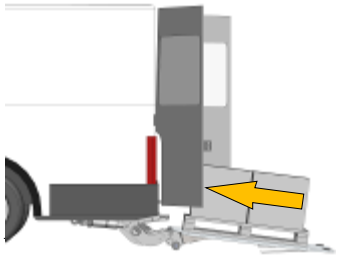
8. Lower the platform to the ground with the operating panel (lowering), or if you are on the platform with the foot controls or the option handheld remote (lowering).



9. Tilt-down the liftgates platform with the operating panel (open/tilt-down), or if you are on the platform the foot controls or the option 3-button handheld remote (tilt) + (lowering).

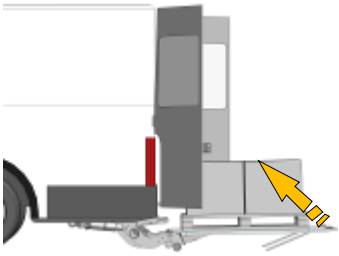


Loading and unloading the liftgate

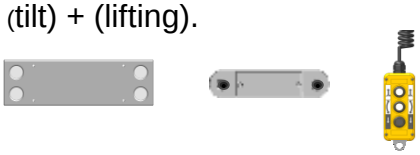


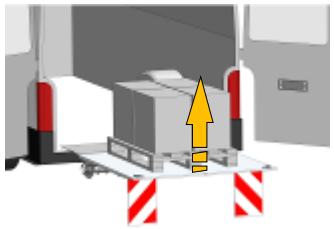
10. The liftgates platform is now ready for loading/unloading.

Loading the vehicle

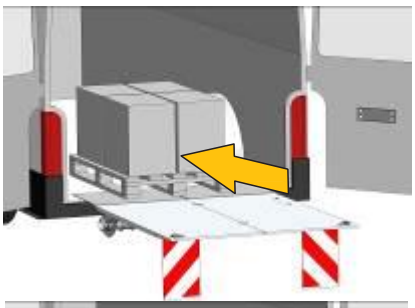


11. Tilt-up the liftgates platform with the operating panel (tilt-up), or when you are on the platform with the foot controls or with the option 3-button handheld remote (tilt) + (lifting).



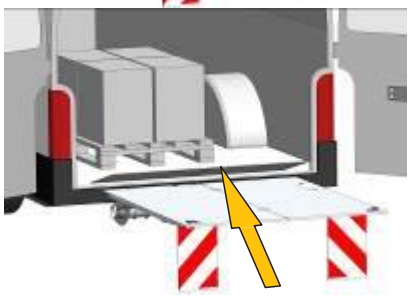


12. Lift the platform of the liftgate till it reaches the stop (up to marking of vehicle height) with the operating panel (lifting), or if you are on the platform with the foot controls or the option handheld remote (lifting).

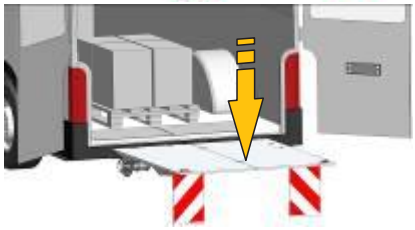


13. Load your vehicle.

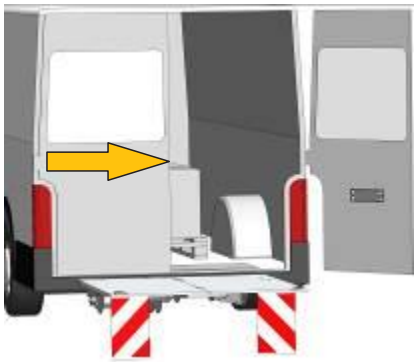
Closing the liftgate and getting it into driving position



14. Flip the bridge plate back.

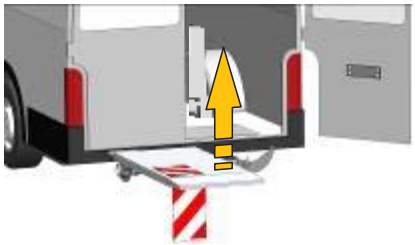


15. Lower the liftgates platform with the operator panel (lowering), or if you are on the platform with the foot controls or the option handheld remote (lowering), so much that it is possible to close the left door.

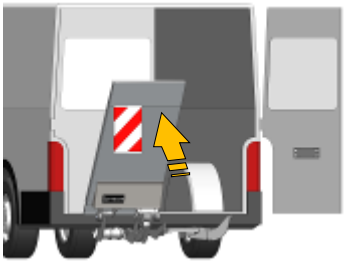


16. Close the left door.

17. Flip the right foldable platform part back by hand.



18. Lift the platform of the liftgate up till stop with the operators panel (lifting), or if you are on the platform with the foot controls or the option handheld remote (lifting).



19. Close the platform with the operating panel (tilt-up).

20. Close the right rear door of the vehicle.

21. Turn off the liftgate.
(cabin switch page 14).

Care, maintenance, inspection and repair

Before starting any maintenance work, the tail lift must be secured against unforeseen movement.

Check that all screw connections are tight. 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 ones of the same quality. Note down the replacement in the control book.

During cleaning it should be ensured that no moisture penetrates the power pack or the control box. The bearing areas should not be cleaned with high pressure or steam jets, as this may allow dirt and moisture to penetrate the bearing.

Check the hydraulic unit for leaks. With the tail lift lowered, check the oil level with the platform lowered to the ground in the unit's tank (dipstick on the oil filler neck cover).

The maximum oil level has been reached when the dipstick dips approx. one centimetre into the oil.

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 up.

Hydraulic oil - recommendations

HPLD 22 (ISO VG 22) deterging, so that free water stays in emulsion (ice forming in winter) and to improve the oil film.

In colder regions, the oil class HLPD 10 can be used

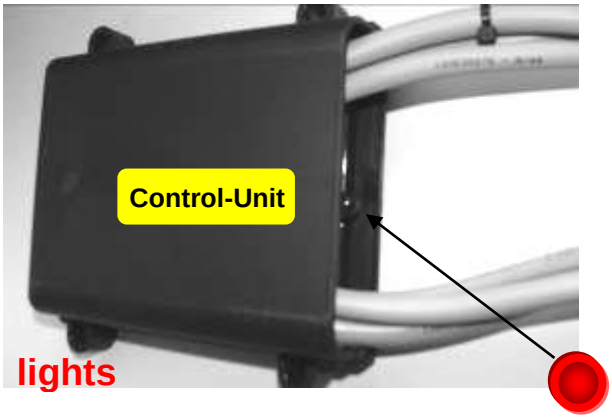
Sörensen Hydrauliköl HLPD 10	part no. 20 841 181
Sörensen Hydrauliköl HLPD 22	part no. 60 700 283
Sörensen bio oil	part no. 20 858 811

Aral (BP)	Castrol Hyspin HLPD 22	Panolin	HLP SYNTH (bio oil)
Aral (BP)	Castrol Hyspin DSP 22	Panolin	HLP Plus
DEA	Econa E 22 (bio-oil)	DEA	Actis HLPD22
Esso	Hydraulik Oil H-LPD 22	Mobil Oil	H-LPD 22
Shell	Tellus DO 22	Fuchs	Rhenolin MR 5

Diagnosis diode

Explanation of the diagnosis diode on the control unit

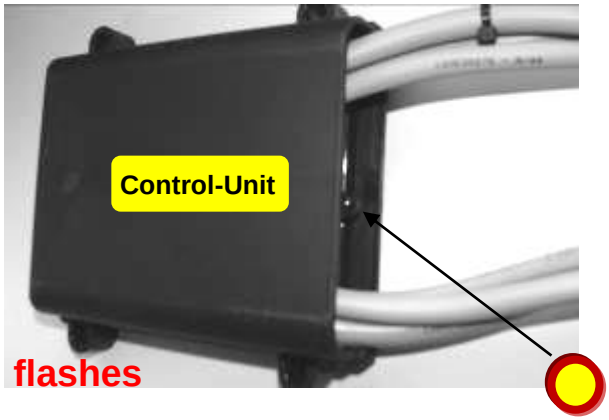
Control-Unit Series 10



diode lights constantly, if:

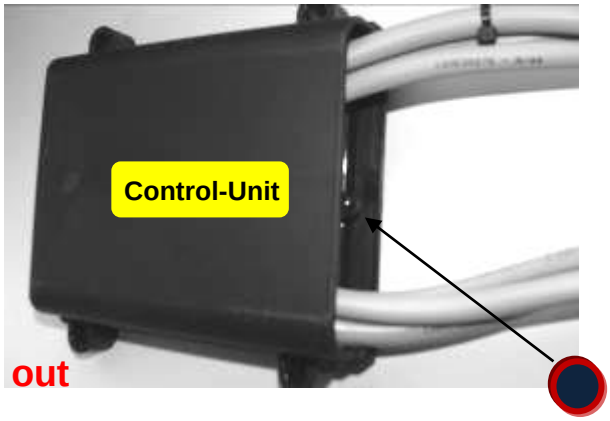
Cabin switch is on
or
platform position 60° till ca. 90 °
or
platform position 0° till -10°

Explanation: platform closed (vertical) 90°
platform open (horizontal) 0°
platform tip tilted down -10°



diode flash signal, if:

Control key operated
or
foot control operated
or
key on cabled operated

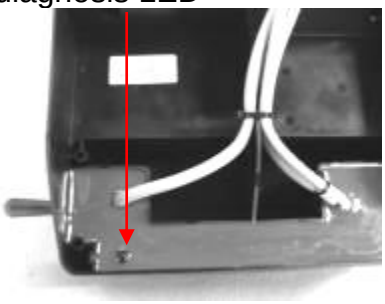


diode out, if:

Main switch off
or
platform position 0° till 60°

control panel

diagnosis LED



Option: control box series 9

Test of the sensor-switch in the platform:

platform closed and lift on:
LED lights.
Power supply Ok.

platform position 0 ° till ca. 60 °:
LED out
Sensor-switch S1 is Ok.
platform lights are activated.

platform position 0° till -10° (tilted down)
LED lights.
Sensor switch S2 is Ok.
The switch over occurs by horizontal position.
Making it possible to set the automatic tilt- function.

Test of the pressure switch S4:

With the foot control keys for lowering – >> begin lowering.
LED flashes.

As soon as the platform has reached the ground and the pressure switch switches, the flashing changes into
constant light - LED lights and the platform tilts down.

This indicates, that the pressure switch has switched. If not, the pressure switch is defect.

Troubleshooting

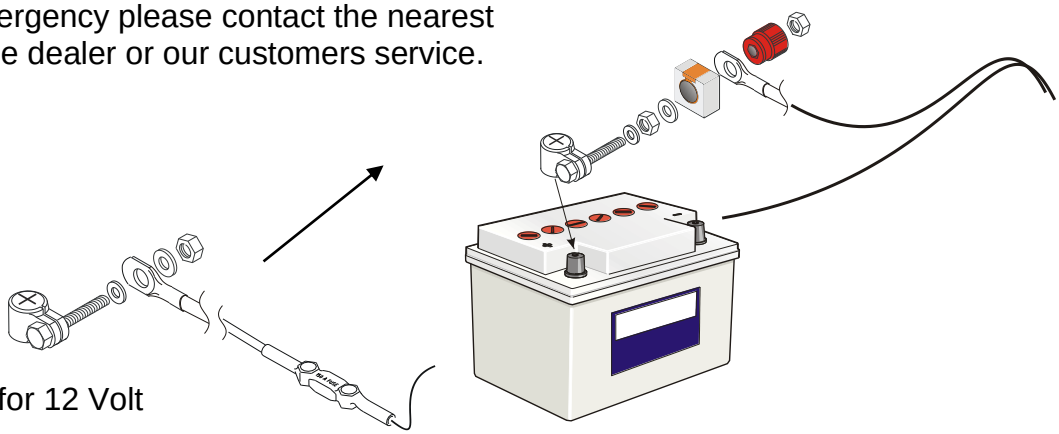
Attention! Repairs of parts

Repairs to parts may only be carried out by an authorized repair shop and must be checked by an Expert and entered in the inspection records.

Problem	Possible cause
1. Motor of power pack does not work	Battery cable or ground cable not connected or defective, or empty battery
	Cable to cabin switch disconnected
	Main fuse defect Fuse in power pack defect
	Battery main switch not on. Cabin switch not on.
	The motor relay is defective and doesn't switch
	Motor defect
2. Motor doesn't run when a key is operated	Motor relay defect
	Connection from control unit to power pack defect
	Control line in the power pack defect
	Control unit defect
3. The liftgate will not open or if – very slow	The platform is squishes on body Motor of power pack doesn't run
	Cable to solenoid defect
	Solenoid of tilt cylinder is defect Valve YA doesn't switch Throttle valve in tilt cylinder defect or clogged
4. Liftgate will not lower, or if, then slow	Solenoid Y3 are not powered or is defect Valve YA doesn't switch
	Throttle valve in the lift cylinder defect or clogged

5. Tilt down function doesn't work by operating foot control or handheld remote	Pressure switch S4 doesn't switch
	Cable defect
	Mechanical damage on lift cylinder
6. The platform tilts down without operating any functions	Solenoid on tilt cylinder defect
7. Platform doesn't tilt down by ground contact	Cable to pressure switch defect Pressure switch defect
8. Liftgate doesn't lift	Power pack doesn't run
	Too little oil in the tank
	Voltage too low
9. The liftgate doesn't lift the max. allowed weight	Load is out of loading distance
	Load too big
	Relief valve incorrect adjusted
	Pump defect
	Voltage too low
10. The platform doesn't tilt up from ground	Control unit defect
	Micro switch doesn't switch
11. The platform doesn't tilt up from ground with load	Load out of loading distance
	Load too big
	Relief valve incorrect adjusted
12. The platform tilts up higher than horizontal	Sensor switch S2 defect or incorrect adjusted
	Cable to sensor switch S2 defect
13. The liftgate will not tilt up/close	Control unit defect
	Not enough hydraulic oil

If the motor does not stop "tail lift can not be turned off at all"
Disconnect the positive cable from the battery by disconnecting the main switch or throwing the main fuse.
In case of an emergency please contact the nearest authorized service dealer or our customers service.



Version for 12 Volt

Failure on the tail lift in open position
If the tail lift in an emergency situation are lifted or closed by hand or mechanical means, the hydraulic cylinders will be filled with air. The safety valves will hereby be out of function. So by careless opening and lowering of the platform acute danger to life occurs, as the platform can fall uncontrolled to the ground. In a case like this be sure that the platform is secured by robes or chain, for example:

Attention! The tail lift is unsecured and may only be opened by trained technical personnel. By opening occurs danger to life!

Operation failure
In case of failure, please contact our customers service or the next authorized service dealer. We will provide an up-to-date list of service dealers on request
Contact Sörensen Technical Service at phone 040 – 739 60 6-42, fax 040 – 739 60 6-66 or www.soerensen.de.

Warranty
Our tail lifts have a warranty time of 24 month from delivery date. The warranty only concerns damages resulting in defect material, design or manufacturing. The warranty is limited in any case to the replacement or the repair of the defect component. Labour costs are only reimbursed if the work was performed in an authorised workshop, according to our time schedules. Collateral costs, for example for a rental truck or a vehicle transfer are not part of warranty claims and therefore not paid.

Liability exclusions
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 do to ground contact (e.g. rough terrain at building sites).