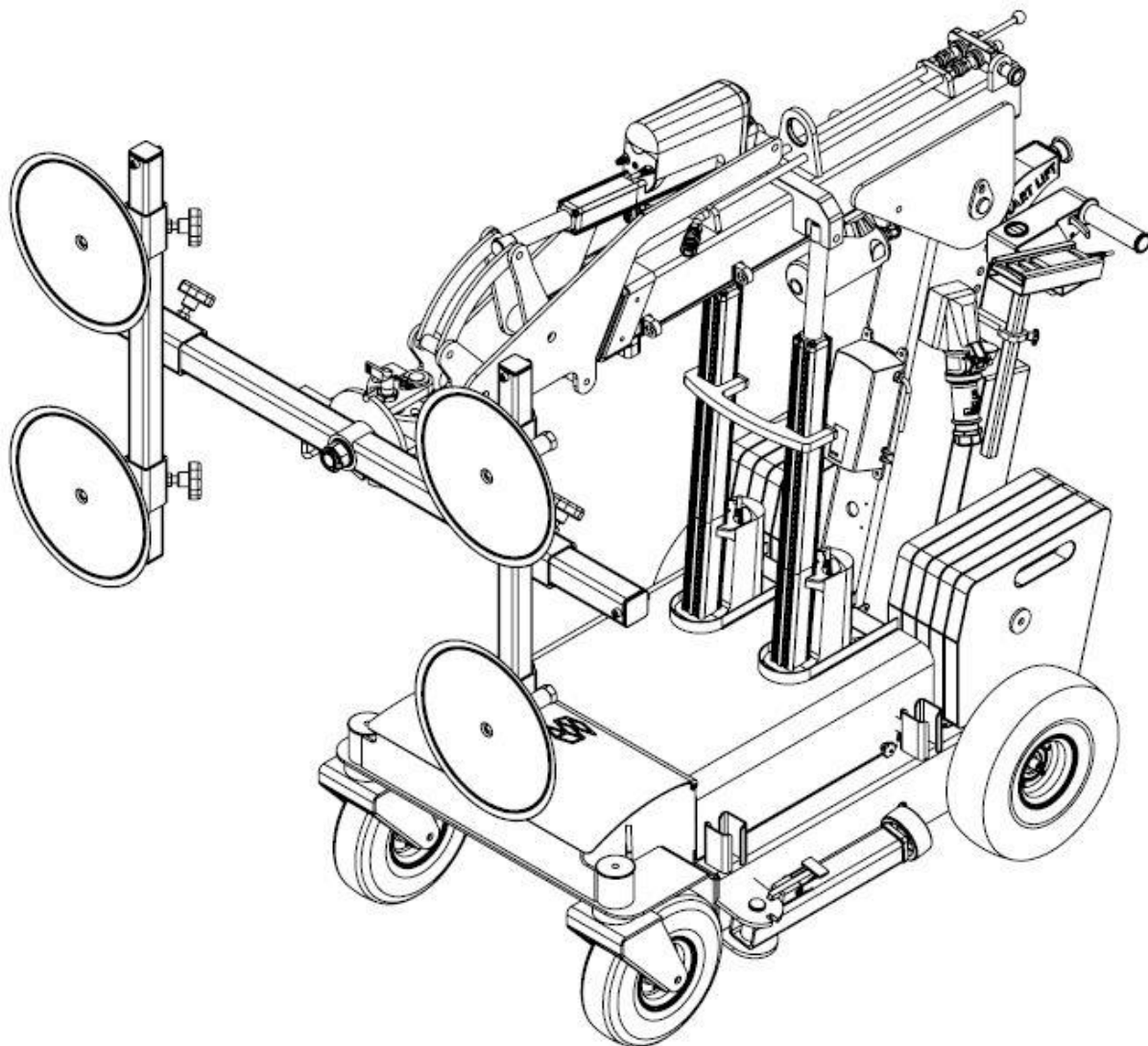


SMARTLIFT



SL 208

User Manual English

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1 Introduction

Smartlift A/S is an innovative company which develops and manufactures smart lifts, which are marketed worldwide. A Smartlift is characterised by the highest levels of precision, reliability and quality.

The machines are designed to transport and install heavy window sections on construction sites and in industry so that the user does not have to perform heavy and straining manual lifting. The machines are developed with user-friendliness and flexibility in mind, so they are suitable for most tasks.

1.1 Smartlift customer service

Smartlift customer service

Tel. +45 97 72 29 11

E-mail: Customerservice@smartlift.com.

1.2 Reading guide

These instructions have been prepared in accordance with DS/EN ISO 20607:2019 Safety of machinery – Operating instructions – General principles for design, and they are the manufacturer's original operating instructions for the machines.

The operating manual provides the user with the information necessary to operate the machine effectively and safely throughout the machine's service life. General safety instructions and conditions are described in a separate section, after which the machine and its intended use are described.

The operating manual is aimed at all users of the machine, and is structured according to the user's functions and interactions with the machine. Security-related information and instructions appear either as sections or as general information for all users.

When reviewing the operating manual, the following approach is recommended:

- Identify yourself as belonging to one or more user groups before using the machine.
- Read and understand the contents of the operating manual, including information and instructions. If applicable, you only need to read those which are aimed at your particular user type.

In case of uncertainty regarding the above, contact your immediate supervisor.

1.3 About the operating manual

The operating manual has been divided into a user manual and a service manual.

 User Manual Includes:	 Service manual Includes:
Machine overview	Parts lists
Safety instructions	Advanced troubleshooting
Operation of the machine	
Service forms	

The user manual must be stored in a place which is known and accessible to the user and to maintenance personnel.

The service manual must be stored in a place which is known and easily accessible to maintenance personnel.

It is the obligation of the employer (machine owner) to ensure that everyone who services, cleans, operates, maintains or repairs the machine has read the user manual and service manual, or at least the parts of them which are relevant to their work.

Additionally, anyone who operates, services, maintains or repairs the machine is under an obligation to seek information in both the user manual and service manual.

1.3.1 The user

"User" refers to an everyday user who is not a skilled worker in the particular field. The user is assumed to have been instructed in the safety and operation of the machine, and to be able to perform tasks within its field of work. For example, for operation, it is expected that the person is able to start and stop, check the proper centring of the vacuum yoke and remove items during normal operation.

It must be ensured that the person in question has been adequately instructed about the operating instructions and trained so that the work can be performed safely.

1.3.2 Maintenance personnel

Maintenance personnel must be qualified, either through having trained as e.g. blacksmiths, electricians or mechanics, or by being trained in a way that makes them equal to these professional groups. In addition, they must be familiar with the machine's operation and safety, and know the location of the emergency stop.

Maintenance personnel must have read and understood the user manual, service manual, instructions, workplace instructions, etc.

Before commencing work, repairmen and maintenance personnel must be instructed about the machine's safety situation.

New maintenance personnel must be trained by an experienced colleague.

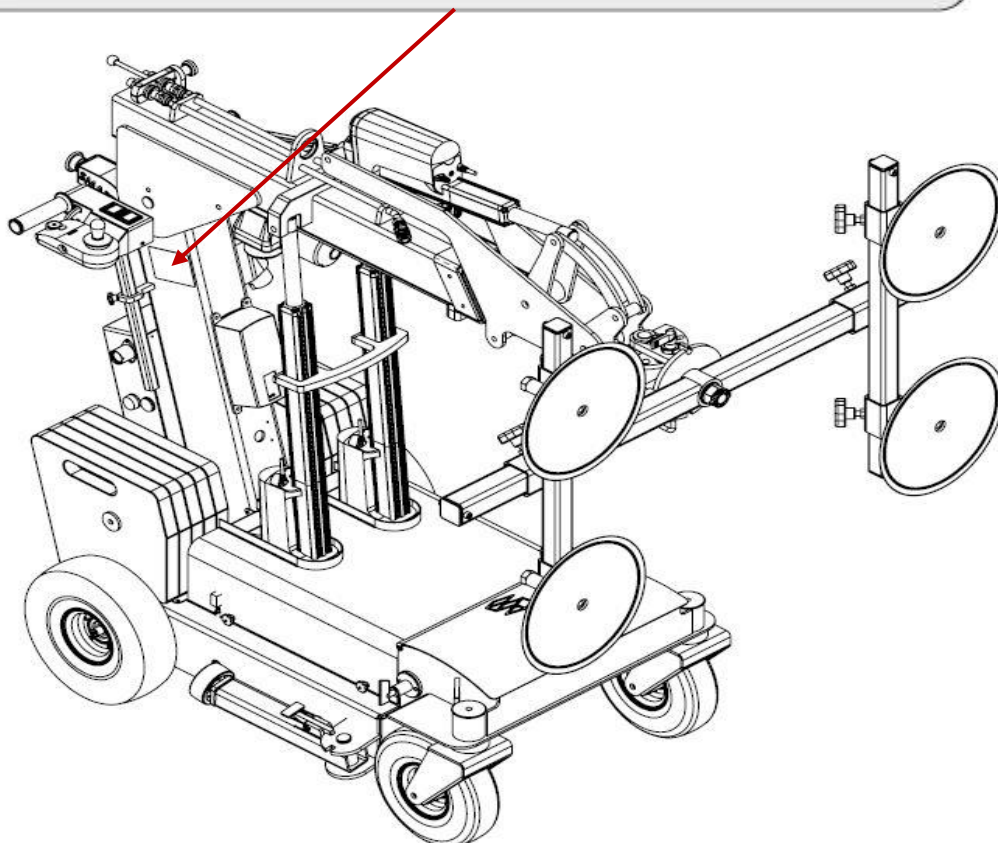
1.4 Machine types covered

The user manual covers the machine SL 208 which is part of Smartlift's Indoor series which has been designed for performing indoor work on construction sites. The machine is equipped with the following equipment:

Model	Description	Equipment			
		1. Extension - Electric	2. Extension - Manually	2. Extension - Electric	Electric Rotation
SL 208	Base machine	X			

1.5 Nameplate

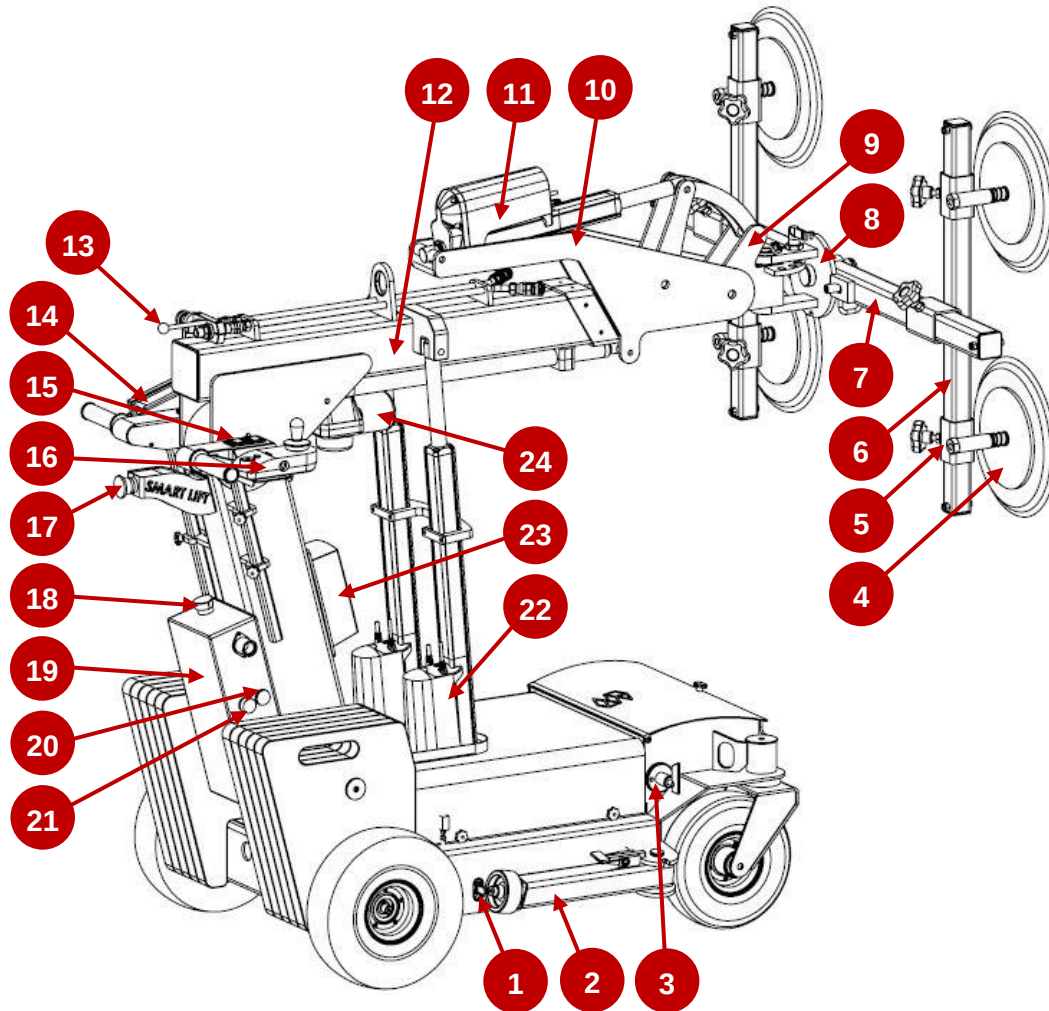
 SMARTLIFT			
Smartlift A/S N.A. Christensensvej 39, DK-7900 Nykøbing Mors Tel.: +45 97 72 29 11, www.smartlift.dk			
Model:			
Serial no.:		Type:	
SWL:		Year:	
Self-weight:		Battery:	
Power:			



2 Overview and use

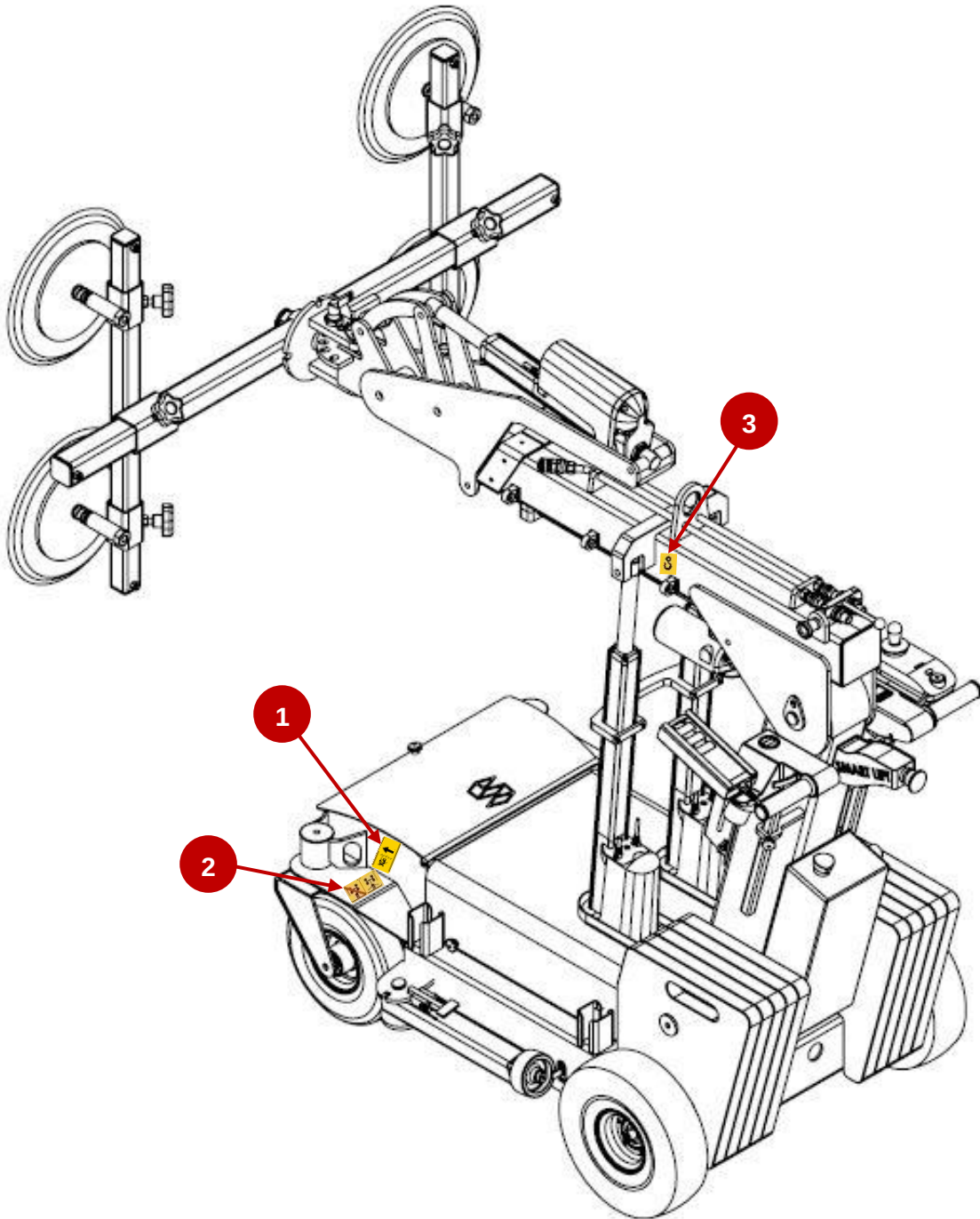
2.1 Machine overview

Below is an overview of the components that are mentioned in several places in this manual and which are often referred to in everyday situations.



No.	Description	No.	Description	No.	Description
1	Freewheel switch	9	Tilt head	17	Belly button
2	Main switch	10	Extension boom	18	Emergency stop
3	Support legs	11	Tilt actuator	19	Electrical cabinet
4	Suction cup	12	Main boom	20	Vacuum alarm - acoustic
5	Suction cup holder	13	Vacuum handle	21	Vacuum alarm - light
6	Crossbar	14	Remote control	22	Lifting actuator
7	Yoke	15	Digital vacuum meter	23	Charger
8	Swivel joint	16	Joystick	24	Extension actuator

2.2 Label overview



No.	Description
1	Use lashing eye to secure the machine during transport
2	Fold out support legs when hoisting and transporting loads
3	Use hoisting eye to hoist the machine



ATTENTION! In case of illegible or unclear information and warnings on labels, load charts, etc., these must be replaced by new ones.

New labels can be ordered from Smartlift's customer service department on tel. +45 97 72 29 11 or via email: Customerservice@smartlift.com.

How to replace labels:

- Remove the old label carefully using a plastic scraper.
- Adhesive residues can be removed using alcohol.
- When the alcohol has evaporated, the new label can be applied.
- Increase durability by removing air bubbles under the label. Air bubbles can be removed by gently pushing them to the edges of the label.

2.3 Technical specifications

Machine model	SL 208
SWL	200kg 440lb
Self-weight	480kg 1060lb
Total length	1,70m 6,60ft
Transport length	1,60m 5,30ft
Height	1,30m 4,26ft
Width	0,72m 2,36ft
Driving speed, up to	6km/t 3,7mph
Operating time, up to	10 hours
Suction cups (4 with diameters of)	200mm 7.9in
Vacuum level	-0,63 bar / -0,72 bar
Batteries (2 pcs.)	12V
Charger, standard	230V
Charger, option	110V
Charging time, minimum	8 hours
Sound level	84 dB (A) 86 dB (C)
Expected service life	10 years

2.4 Operating limits

It is the user's responsibility to be alert and vigilant in the environment in which the machine is used. The user must be aware of everything that could impact safety of both machine and people.

2.4.1 Materials

By default, the machine is equipped with SGF-type suction cups, which are intended for handling flat and smooth objects such as glass, plastic sheets and so on.

WARNING! Never use the machine to lift wet or greasy items.

WARNING! Never use the machine to lift items that are not airtight.

2.4.2 Lifting capacity

See the machine's lifting capacity (SWL) in conjunction with its reach in section **9.3 Load chart**.

2.4.3 Wind impact

Wind greatly impacts the stability of the machine, particularly when lifting large items. Therefore, it is important to assess the wind conditions before starting work. The table below can be used as an indicator of the percentage by which the safe working load (SWL) is reduced under certain wind conditions.

	Wind impact index											
	Areal		m²	1	2	3	4	5	6	7	8	9
	m/s	mph										
Slight wind	1	2,2		100	100	100	100	100	100	99	99	99
	2	4,5		100	99	99	99	98	98	98	98	97
	3	6,7		99	99	98	97	97	96	95	94	94
Light wind	4	8,9		99	98	96	95	94	93	91	90	89
	5	11,2		98	96	94	92	90	88	86	85	83
	6	13,4		97	94	92	89	86	83	81	78	75
Brisk wind	7	15,7		96	92	89	85	81	77	74	70	66
	8	17,9		95	90	85	80	75	70	65	60	56
	9	20,1		94	88	81	75	69	63	56	50	44
Strong wind	10	22,4		92	85	77	69	61	54	46	38	31
	11	24,6		91	81	72	63	53	44	35	25	16
	12	26,8		89	78	67	56	44	33	22	11	0

An example using an SL 208:

At a distance of $0,85m$ ($2,8ft$) from the front wheel, an SL 208 can lift up to 150 kg ($330lb$) (See section **9.3 Load chart**. At a wind speed of $8m/s$ ($17,9mph$) lifting an item with a surface area of $4m^2$ ($43sqft$), the wind load index reads as 80%.

This means that the maximum load is reduced to $150kg$ ($330lb$) $\times 0,8 = \underline{120kg}$ ($265lb$).

As mentioned, the above table provides an indication of how to take wind impact into account, but it is the user's responsibility to assess the stability of the machine, as turbulence, wind direction, humidity, etc. also influence this.

2.4.4 Temperature and humidity

Permissible temperature range	Fra -20 C° til 40 C°
Permissible relative humidity (non-condensing)	Fra 20 % til 80 %

2.4.5 Lighting

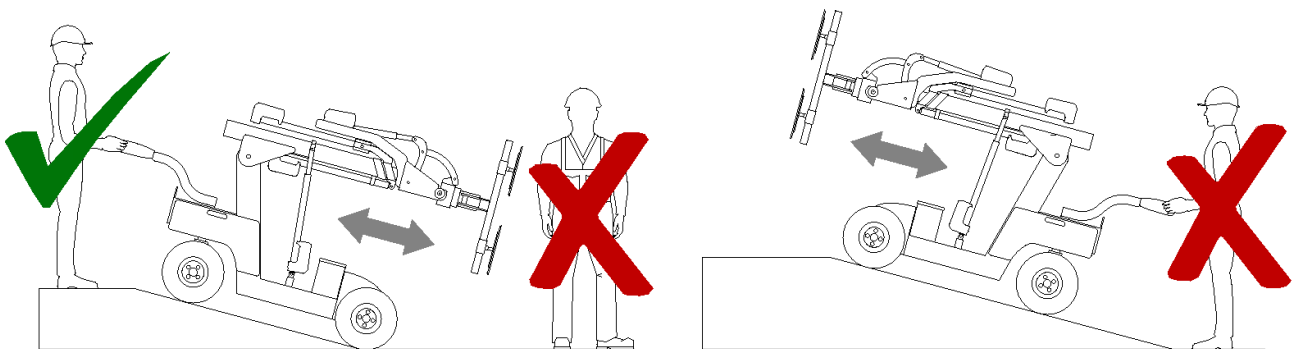
Workspace	Min 200 lux
Repair and maintenance work	Min 500 lux

2.4.6 Surface

When using the machine, a solid surface is important. This applies during both the driving and handling of objects. If the surface is soft, it is a great advantage to use ground protection mats.

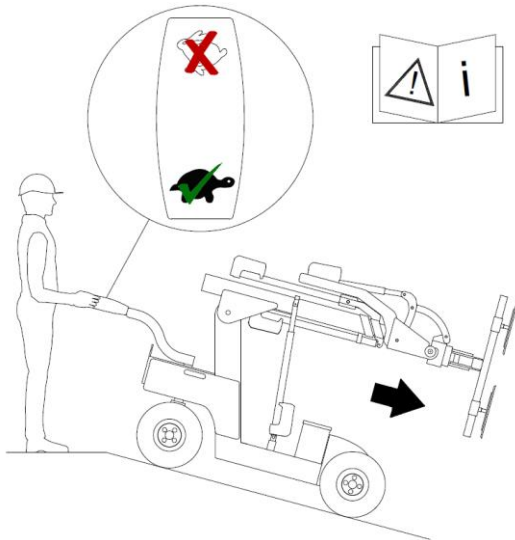
2.4.7 Slope – Location of user and person

When driving on a slope, the user must be aware of their own and others' positions in relation to the machine.



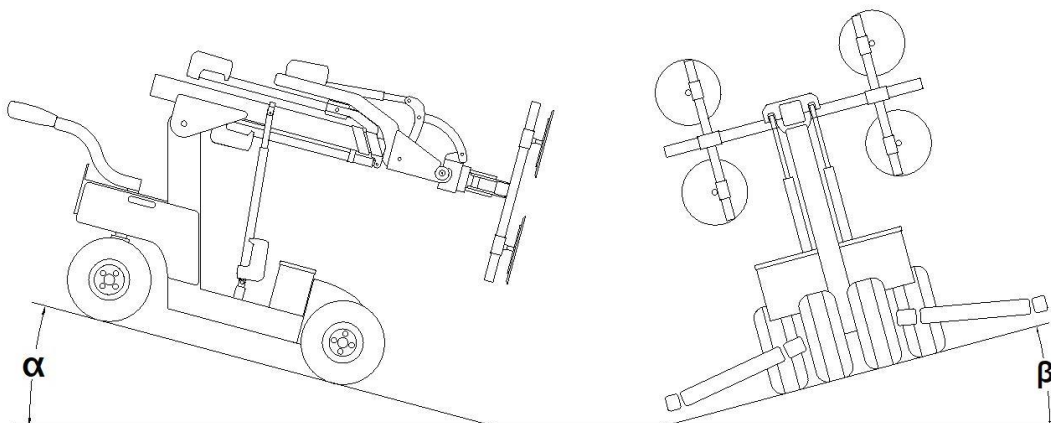
WARNING!

- **Never stand below the machine when it is moving up or down a slope!**
- **Always drive at low speed and exercise caution when going down a slope!**



2.4.8 Slope – without load

When driving on slopes without a load, the below values cannot be exceeded, as this may increase the risk of losing control of the machine and overturning:

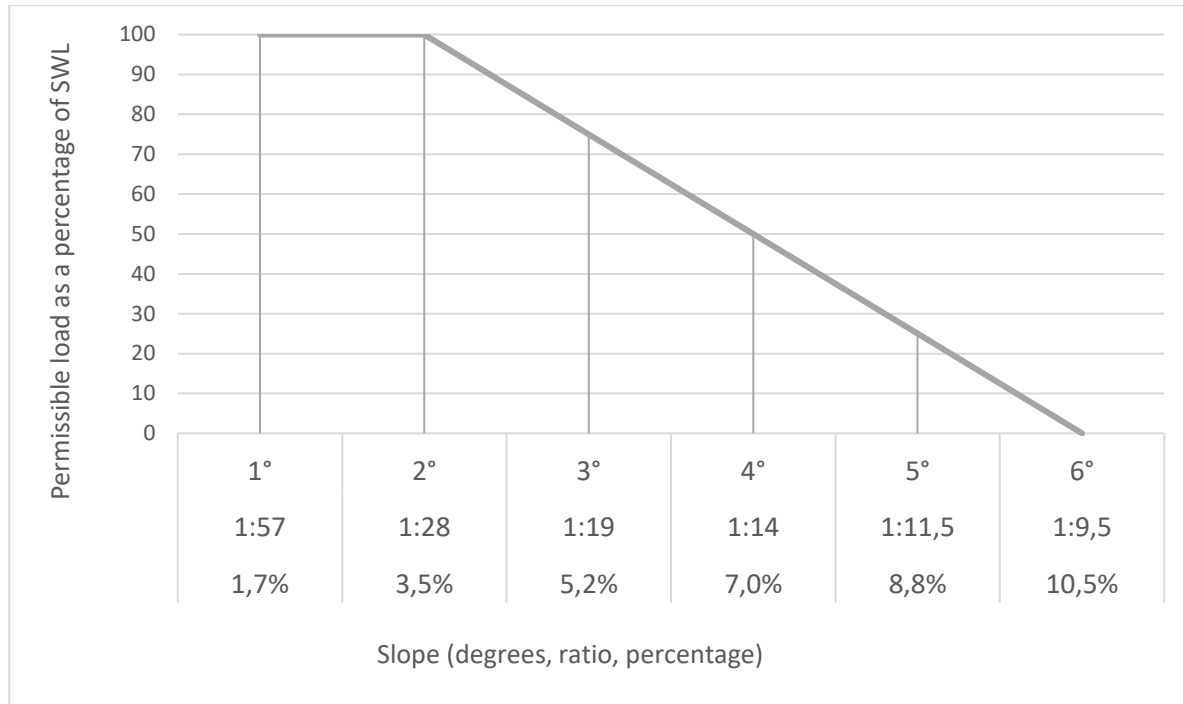


Machine type	SL 208
Max slope α	6°
	1:9,5
	10,5%
Max slope β	6°
	1:9,5
	10,5%

2.4.9 Slope – with load

When driving a loaded machine on slopes, the below chart can be used as a guide.

WARNING! The shape and weight of the load, the speed of the machine, and weather conditions all affect the stability of the machine when driving on a slope. Therefore, always assess whether moving it is sensible!



Example of a load situation:

- Machine: SL 208 with SWL 200kg (440lb)
- Surface sloping in the direction of travel: 3° / 1:19 / 5,2%
- Permissible load as a percentage of SWL: 75%

$$SWL_{slope} = SWL_{machine} * \text{Permissible load as percentage}$$

$$SWL_{slope} = 200kg (440lb) * 0,75 = 150kg (330lb)$$

3 Safety and residual risks

3.1 Safety instructions

The machine may only be used by persons who have received competent training in the use of the machine's functions and who understand the risks involved in using the machine. The user must have read and understood this user manual before using the machine. The user is always responsible for ensuring that the machine is used correctly and safely.

When using special equipment (forks, lifting hooks, etc.), the user must have read and understood the user manual for this equipment, and must hold the relevant certificates required by law.



It is forbidden to

- modify the machine.
- lift or transport people.
- be under or in front of the machine when it is loaded.
- be under the machine if it is hoisted.
- exceed the SWL of the machine or any accessories.
- exceed the load chart of the machine.
- use and charge the machine at the same time.
- lift underneath the machine using a forklift or the like.
- use the machine without wearing safety shoes.
- drive at high speed down slopes.
- use fewer than 4 suction cups when using the vacuum yoke.



WARNING! Risk of danger!

- Never use the machine without having read this manual.
- Never use the machine without having read and understood all labels on the machine.
- Never use the machine in case of visible damage or defects.
- Never use the machine without first considering the surroundings, the surface and the weather.
- Never use the machine to lift wet or greasy items.
- Never use the machine to lift items that are not airtight.
- Never use the machine without exercising great caution.
- Using the machine involves a risk of overturning.
- Always drive down slopes at low speed and with great caution.
- Never leave the machine loaded or on a slope.
- Always stay a sound distance away from the machine and load.



WARNING! Risk of explosion!

- It is forbidden to use the machine in areas where there is a risk of explosion (ATEX zones).

3.2 Emergencies

3.2.1 The machine loses vacuum

WARNING! If the machine suddenly loses vacuum, the load must be immediately lowered and placed on a solid surface!

3.2.2 The machine overturns

If the machine has overturned, it must be raised by hoisting from the designated hoisting eyes. See section **5.3 Handling and lifting**.

- Turn off the main switch.
- Strap the machine in place using the hoisting and lashing eyes.
- Protect the machine from rain, moisture and dust.

WARNING!

- The machine's batteries contain acid!
- If the machine tips over, there is a risk that battery acid will leak out!
- If skin or eyes come into contact with battery acid, rinse them with plenty of clean water and consult a doctor!

WARNING! In case of a crash, the machine must undergo complete servicing!

3.3 Personal protection equipment

This section describes what personal protective equipment may be required when using the machine.

WARNING! It is forbidden to use the machine without wearing safety footwear!



In addition, the following protective equipment is recommended: Safety helmet, gloves and earmuffs.



4 Operation

This section describes which basic elements it is important to understand in order to maintain a high level of safety when using the machine. This section describes the steps it is necessary to know before, during and after use of the machine.

ATTENTION! The user is always responsible for avoiding irresponsible operation of the machine!

4.1 Before operation

WARNING!

- **Do not use a knife to remove the packaging materials!**
- **Never use the machine if visible damage or defects have been identified!**

Before operating the machine, it must be inspected for visible damage to the i.e. vacuum hoses, wires, suction cups and the vital parts of the steel structure. In addition, the machine must be inspected for any defects. If any damage or defects are identified, these must be repaired before using the machine.

Before operating the machine, the user must always conduct a thorough assessment of the machine's task, including, as a minimum:

- Operation limits (See section **2.4 Operating limits**).
- Lifting capacity (See section **9.3 Load chart**).
- Battery level.

4.2 Operation in general

The following describes a typical procedure for using the machine. For a more detailed description of functions, buttons, etc., see section **4.5 Functional overview**.

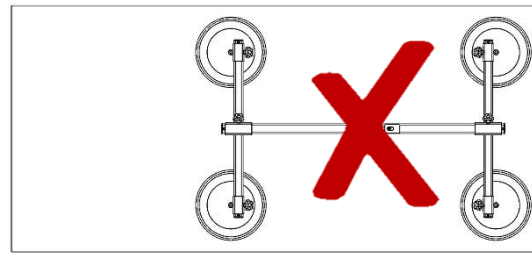
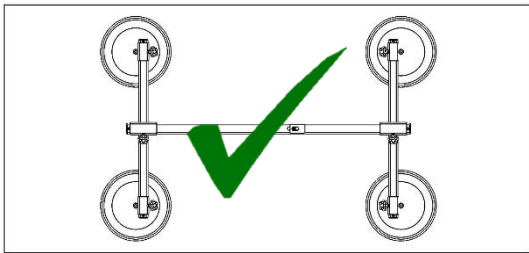
1. Turn on the machine using the main switch.
2. Check the battery level on the joystick or battery indicator.
3. Activate propulsion on the joystick on/off button.
4. Drive the machine to the object.
ATTENTION! When driving on terrain, the support legs must be deployed and locked!
5. Centre the machine in front of the object. If necessary, fine-tune the position using the side shift function.
6. Deploy the support legs.
7. Adjust the suction cups to fit the object.
ATTENTION! The distance between the suction cups must be as great as possible!
8. Push the suction cups against the object using the extension function.
WARNING! Never lift damp or greasy objects!
9. Activate vacuum.
ATTENTION! An alarm signal sounds until sufficient vacuum has been achieved!
10. Lift and transport the object.
ATTENTION! Transport the object as close to the surface and the machine as possible!
11. Place the item in the desired position and fasten.
12. Disable vacuum.
ATTENTION! Wait for the machine's suction cups to release the object!
13. When handling several objects, repeat steps 2 through 12.
14. Turn the machine off at the main switch.
15. Put it to charge at the end of the working day.

4.3 Operating functions

This section visualises where hazardous situations may occur when using the machines.

4.3.1 General:

- **ATTENTION! Before activating the actuators for lifting, extension or tilting, please note the following:**
 - The vacuum yoke or load can hit the machine or the surface.
- **ATTENTION! Before suction is applied to the load:**
 - The support legs must be deployed and locked.
 - The star knobs on suction cup holders and crossbars must be tightened.
 - The vacuum yoke must be centred relative to the load's centre of gravity.



WARNING! If the yoke is not centred relative to the load's centre of gravity, there is a risk that the load will be pulled off the suction cups and the machine will tip over!

- **ATTENTION! Before the load is lifted:**
 - The machine must be level.
 - Both freewheel switches must be deactivated.
 - The positioning bolt on the swivel joint must be engaged.
 - The positioning bolt for the vacuum must be engaged.
 - The vacuum pumps must stop, signifying sufficient vacuum.
- **ATTENTION! Before the vacuum yoke is rotated (manually):**
 - The positioning bolt on the swivel joint must be engaged.
 - The vacuum yoke and load can hit the machine or the surface.
 - Vacuum hoses can get pinched or stretched.
- **ATTENTION! Before the load is rotated to the side of the machine:**
 - The tilt head must be level in both directions.
 - The vacuum yoke may only be placed on the side of the machine during the transport of objects. The load must be kept as close to the surface as possible!
 - The positioning bolt must be engaged.
 - The vacuum yoke and load can hit the machine or the surface.
 - Vacuum hoses can get pinched or stretched.
 - **WARNING! When the load is rotated onto the side, it creates a risk that the machine will tilt, as the safety switch only detects an absence of load on the rear wheels!**

4.4 After operation

In order to ensure optimum preservation of battery capacity, use the following charging pattern:

- Connect the charger for at least 8 consecutive hours before using the machine.
- Connect the charger permanently when storing the machine. This maintains the batteries at a constant rate.

WARNING! Using and charging the machine at the same time is forbidden. This will damage the charger and batteries!

ATTENTION!

- **Charging must take place somewhere with good ventilation!**
- **Charging can never take place in a location where there are sparks, flames or smoking!**
- **The machine must be switched off at the main switch before charging!**
- **If the charger is connected for a period of time which is shorter than recommended, over time, the battery capacity will be reduced permanently!**
- **If the machine is stored for a long period of time without the charger being connected to a power supply, the battery capacity will be reduced permanently!**
- **The machine must be charged before the voltage on the batteries falls below 22V, otherwise the batteries will be permanently damaged**

4.4.1 Charger – LED indications

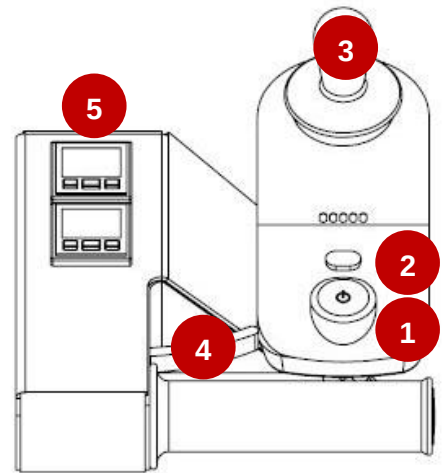
Battery charger 230V		Battery charger 110V	
LED	Description	LED	Description
 	Connected supply/storage mode	 	Fast charging
 	Quick flashing – fast charging	 	Reduced charging
 	Slow flashing – reduced charging	 	Fully charged – Maintenance
 	Fully charged		

For further information about charging and maintenance of batteries, refer to the manufacturer's website: www.victronenergy.com

4.5 Functional overview

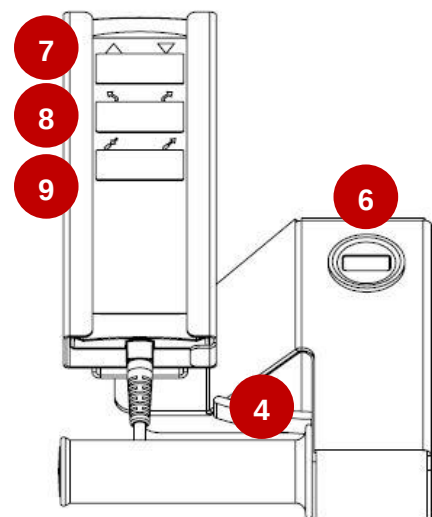
Joystick

No.	Description
1	On/off switch and speed regulator
2	Horn
3	Joystick



Control handle

No.	Description
4	Dead man's switch
5	Digital vacuum meter
6	Battery indicator

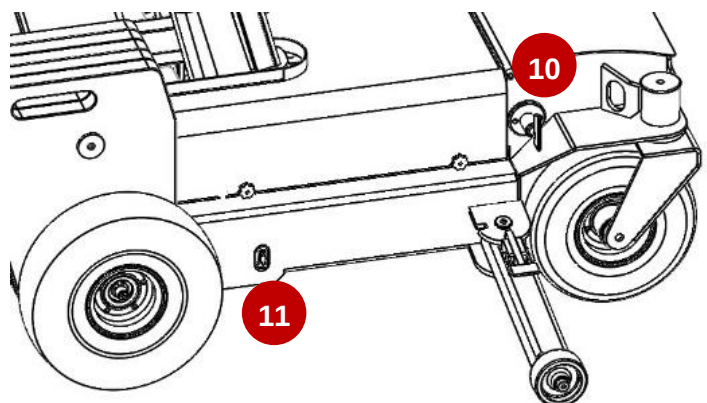


Remote control

No.	Description
7	Raise/lower boom
8	Tilt forward/backward
9	Extend boom in/out

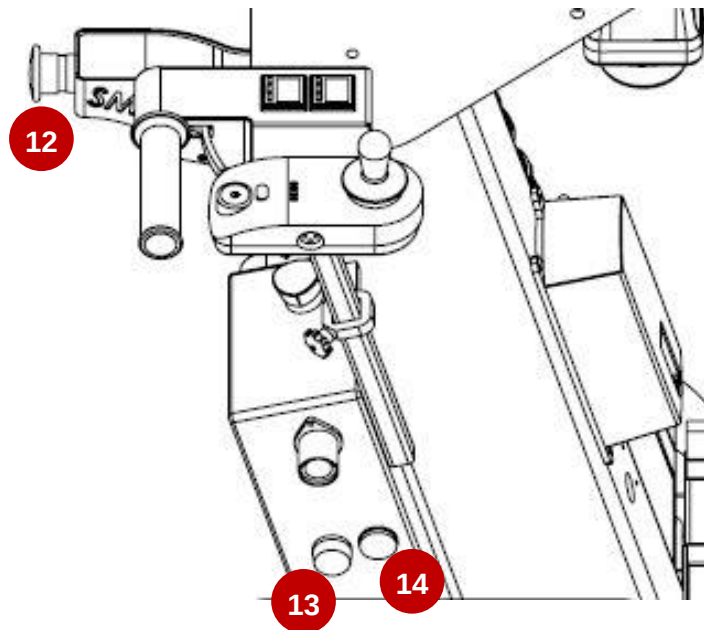
Main switch and freewheel switch

No.	Description
10	Main switch
11	Freewheel switch



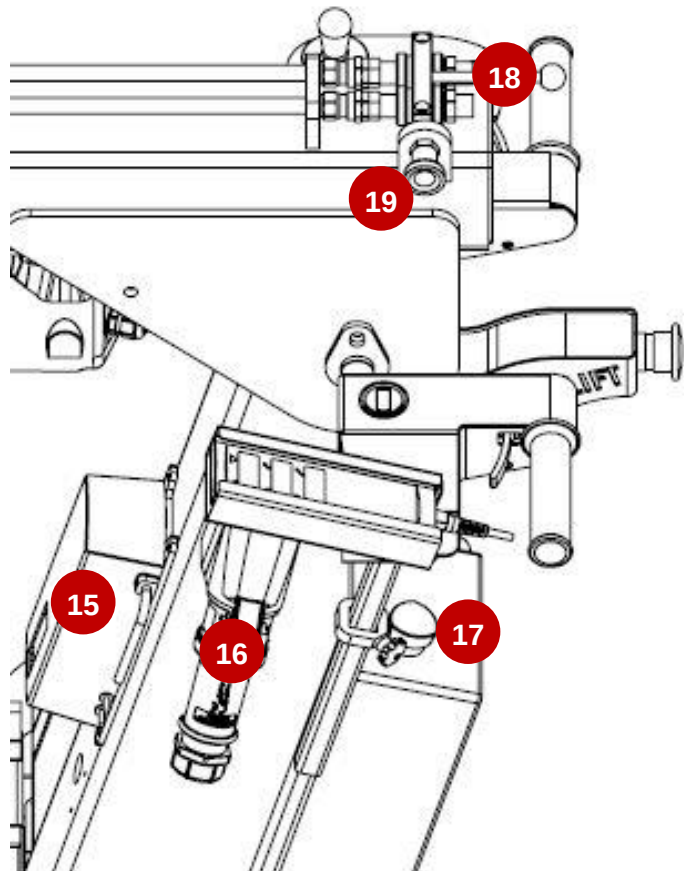
Belly button and vacuum alarmer

No.	Description
12	Belly button
13	Vacuum alarm - light
14	Vacuum alarm - acoustic



Power and vacuum

No.	Description
15	Charger
16	Charging plug
17	Emergency stop
18	On/off handle for vacuum
19	Safety lock for vacuum



4.6 Functional description

No.	Description	Function
1	On/off switch and speed regulator	Interrupts signal power to the motor. Can be used if accidental activation of propulsion must be eliminated. The speed can be adjusted.
2	Horn	Warning of people near the machine.
3	Joystick	Determines the direction of travel.
4	Dead man's grip	Ensures two-hand operation during propulsion.
5	Digital vacuum meter	Vacuum level monitoring.
6	Battery indicator	Indicates the battery level.
7	Raise/lower boom	Raises or lowers the boom.
8	Tilt forward/backward	Tilts the yoke forward or backward.
9	Extend boom in/out	Pushes out or retracts boom.
10	Main switch	Cuts power to all functions.
11	Free wheel switch	Manual deactivating of parking brake.
12	Safety switch	"Belly button" minimises the risk of pinching between machine and object .
13	Vacuum alarm - light	Warns when vacuum level is not sufficient.
14	Vacuum alarm - acoustic	Warns when vacuum level is not sufficient.
15	Battery charger	24 V charger for 230 V or 110 V.
16	Charging plug	Connect to mains socket for charging.
17	Emergency stop	Stops all the machine's moving parts.
18	On/Off handle for vacuum	Handle for activating and deactivating the vacuum.
19	Safety lock for vacuum	Safety lock is pulled out before deactivation of the vacuum.



5 Storage, transport, handling and lifting

5.1 Storage

If the machine needs to be stored, storage must be done under the following conditions in order to preserve the machine's condition and functional capacity:

- Indoor
- Dry
- With good ventilation

ATTENTION!

- **Water, moisture and dust can affect the machine's functionality and reduce the service life of suction cups!**
- **Drought, sunlight and temperatures below 0°C (32°F) or above 25°C (77°F) may reduce the service life of the suction cups!**

How to store:

- Turn off the main switch.
- Connect the charger so that the batteries are constantly charged and maintained. See section 0

- After operation.

5.2 Transport

When transporting the machine, it is recommended that a van, machine trailer, flatbed truck or similar with sufficient load capacity is used. Find the weight of the machine in section **2.3 Technical specifications**.

Technical specifications.

A method for secure fastening of the machine: See section **2.2 Label overview**.

- Turn off the main switch.
- Strap the machine in place using the lashing eye at the rear of the machine.
- Strap the machine in place using the lashing eyes by the support legs.
- Protect the machine's suction cups from rain, moisture and dust. Protective caps can be purchased in addition.

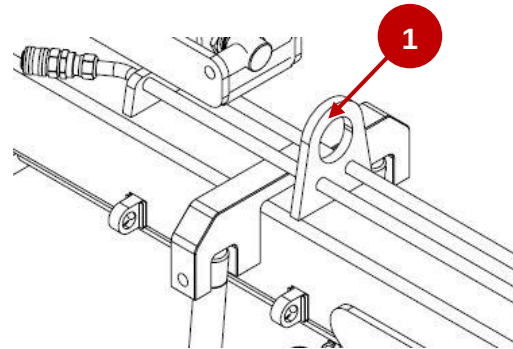
5.3 Handling and lifting

When handling and lifting the machine, use approved lifting equipment in the form of a crane or hoist with sufficient load capacity. In addition, approved lifting equipment must be used in the form of round slings, chains etc. with sufficient load capacity.

Method for handling and lifting the machine: See section **2.2 Label overview**.

- Turn off the main switch.
- Machines should be lifted by the designated hoisting eyes.

No.	Description
1	Hoisting eye



6 Maintenance and troubleshooting

6.1 Overview of service, maintenance and lubrication intervals

No.	Annually			In addition to the dates listed, some components are subjected to ongoing wear and must therefore be replaced if necessary.	
	↓	Monthly interval	Daily		
1.0				Machine log and labelling	
1.1	X	12	X	The user manual is accessible and easy to understand.	Receipt of new user manual. State machine type and serial number when ordering.
1.2	X	12		Labels on the machine. Check that all labels are visible and intact.	Defective labels must be replaced if necessary. Load chart, SWL, attention/warning stickers.
2.0				Battery and charger	
2.1	X	12	X	Battery	Check the capacity of the batteries (minimum 24V on fully charged batteries).
	X	12		Battery	Battery indicator. Replace the batteries if the voltmeter reads less than 22 volts when the batteries are fully charged. The terminals must be lubricated (A).



2.2	X	12		Charger	Check the charging function: output must be 28 volts when charging.
3.0				Vacuum system	
3.1	X	12	X	The alarm function must be checked for each lift.	The yellow light and acoustic alarm must be active when one or both vacuum pumps are active. See vacuum level in section 2.3 Technical specifications .
3.2	X	12		Vacuum control	Check red/green LEDs (does not apply to SL 208/1008) Display and protective glass are intact. Replace defective parts (only applies to SL 208/1008)
3.3	X	12	X	Vacuum pumps	See vacuum level in section 2.3 Technical specifications . If the pressure drops, check and remedy. Replace defective pumps.
3.4	X	12	X	Vacuum valves	Check the opening and closing function for the slider valves.
3.5	X	12		Vacuum filters	Remove and clean. Replace if necessary.
3.6	X	3		Vacuum system test	Check vacuum on a *test plate. Switch off the main switch and controller if the test plate remains stuck for a minimum of 10 min. If the test plate falls off, find the problem and remedy it.
3.7	X	12		Test vacuum sequences	The pumps start. See vacuum level in section 2.3 Technical specifications . The pumps stop. See vacuum level in section 2.3 Technical specifications . The acoustic alarm and yellow light are active when the vacuum pumps start. The acoustic alarm and yellow light stop when the vacuum limit is reached.
3.8	X	12		Vacuum hoses	Check and replace if damaged.
3.9	X	12	X	Suction cups	Check for damage and replace if necessary.
3.10	X	12		Couplings	Clean and lubricate (A). Check for leaks. Tighten if necessary and replace if damaged.
4.0				Actuator	
4.1	X	12		Check for suspicious sounds and full movement in all directions; lifting, extension, side shift, tilt and rotation.	Defective actuators must be replaced.
4.2	X	1		Reset lifting actuator	Move the lifting actuators all the way down. Press up and down simultaneously for 10 to 15 seconds. Restart
4.3	X	12		Cables, cable routes, connectors and connections.	Check all cables for breakage and fastening. Check all connectors and connections for poor connection and proper attachment.
5.0				Mechanical equipment	
5.1	X	12		Base machine	Visual inspection. Welds, damage or excessive wear on parts must be repaired or replaced.



5.2	X	12		Side shift	Visual inspection. Welds, damage or excessive wear on parts must be repaired or replaced.
5.3	X	12		Arm	Visual inspection. Welds, damage or excessive wear on parts must be repaired or replaced. Adjust the liner for the extension arm.
5.4	X	12		Yoke	Visual inspection. Welds, damage or excessive wear on parts must be repaired or replaced. Lubricate moving parts. (B)
5.5	X	12		Bearings and shafts	All moving parts must be checked for wear and clearance. Defective bearings must be replaced. Lubricate all shafts and grease nipples. (B)
5.6	X	6		After approx. 50 hours of use, follow the guide on the left. Tighten all bolts according to the manual.	Make sure the bolts and screws are secured with Loctite. Bolts on the actuators cannot be retightened.
5.7	X	12	5	Main yoke	Visual inspection. Check the hand screw function. Checks: M24 nut, washer and ring pin. It must be possible to remove and reinstall the yoke easily. Attach the yoke – rotatable. Add end sections and a stop screw if necessary. Damaged parts must be replaced. Lubricate all moving parts (B)
5.8	X	12	5	Crossbars/crossbeams	Visual inspection. Check the hand screw function. Add end sections and a stop screw if necessary. Damaged parts must be replaced. Lubricate moving parts (B)
5.9	X	12	5	Holder for suction cups	Visual inspection. Check the hand screw function. Damaged parts must be replaced. Lubricate moving parts. (B)
6.0				Electronics and safety equipment	
6.1	X	1		Main switch	Check the on/off function.
6.2	X	1		Emergency stop contact	Check the functionality. Repair or replace if necessary.
6.3	X	12		Remote control • ON/OFF switch • Emergency stop switch • Function switches	Check all functions. Remedy if this does not work or is damaged, and repair or replace if necessary.
6.4	X	3		Function check of overload	Use a load to trigger an overload by moving the extension out. When the overload is triggered, all lifting except extension must be deactivated. Retract the load until the overload switch disconnects, and all functions should be functional again. Repair or replace if necessary.
7.0				Propulsion system	
7.1	X	12		Function test of the propulsion system	Test the throttle in both directions. Test on/off function on the steering gear Test slow/turtle and fast/hare Function test of belly button.



7.2	X	12	X	Check the brake system.	With the machine moving at full speed, release the throttle. The machine must stop completely within 2 metres. This must be done in both directions and at both speeds (turtle/hare).
7.3	X	12	X	Check the parking brake	When the machine is stationary, the parking brake must be applied. Test this by pushing and pulling on the machine. It should not be possible to move the machine manually.
	X	12		Check the mechanical brake	The brake disc is located on the propulsion engine. Check the distance between the electromagnet and the pressure plate. The distance should be 0.2 to 0.3 mm. The minimum thickness of the brake disc is 6.5 mm.
8.0				Hydraulics (only applies to SL 1008)	
8.1	X	12		Check the oil level	The correct oil level is 4 cm below the filling opening, with all cylinders fully retracted.
8.2	X	12		Replace pressure filter	Replace pressure filter.
8.3	X	12		Check all hoses and connection for cracks and leaks.	Check all hoses and replace if necessary.
8.4	X			Check the pressure	The system should deliver 185 bar (2700 PSI) and then bypass to the tank.
8.5	X	12	X	Function test of all hydraulic functions.	Test all hydraulic functions in full motion and look for leaks and unusual movements.
9.0				External and additional equipment for the machine.	
9.1		12		Battery charger for remote control	Visual inspection. Make sure the device is present and intact.
9.2		12		Extra main battery and charger.	Visual inspection. Make sure the device is present and intact.
9.3		12		Communication cable for remote control	Visual inspection. Make sure the device is present and intact.
9.4		12		Shoulder strap for remote control	Visual inspection. Make sure the device is present and intact.
10.0				Static test load	
10.1	X	12		Test with load Follow the load diagram according to the label/manual.	

The test plate is a plate which is big enough to allow all suction cups to be on the plate at the same time (approx. 1,5x1,5m). The plate must be airtight and can be made of plastic, steel, etc.

Lubrication schedule:

A = Silicone grease, Kema SC4 or equivalent

B = Calcium sulfonate grease

Bearings are made with Teflon surfaces or oil-rubbed bronze. Lubrication is intended for smaller moving parts.

6.2 Functional inspection

6.2.1 Vacuum system

A method for inspecting the vacuum system for leakages, referred to as a leakage inspection in this document.

ATTENTION!

- **Suction cups should be inspected daily!**
- **Vacuum hoses should be inspected monthly or quarterly, as needed!**
- **Leakage inspection of the vacuum system must be done according to section 6.1 Overview of service, maintenance and lubrication intervals!**

1. Turn on the machine using the main switch.
2. Check the battery level.
3. Adjust the suction cups to fit the test object.

WARNING! Never use a wet or greasy object!

WARNING! Never use an object that is not airtight!

WARNING! There is a risk that the machine will release the object in connection with the leakage inspection!

ATTENTION! The object must be an airtight sheet, e.g. one of plastic, steel, glass or the like!

4. Push the suction cups against the object using the extension function.
5. Activate vacuum.

ATTENTION! An alarm signal sounds until sufficient vacuum has been achieved!

6. Monitor the machine's vacuum pumps for at least 10 minutes.

WARNING! If the vacuum pump starts before 10 minutes have passed, the machine cannot be used! See section 6.1 Overview of service, maintenance and lubrication intervals.

7. Disable vacuum.

ATTENTION! Wait for the machine's suction cups to release the object!

8. Turn the machine off at the main switch.

6.2.2 Safety functions

Method for inspecting security features.

ATTENTION!

- **Security features must be inspected according to section 6.1 Overview of service, maintenance and lubrication intervals!**
- **Security features must always be available and functional!**
- **If an inspection of the security features cannot be completed and approved, the machine cannot be used until repairs have been completed and a new inspection has been carried out!**
- **Always inspect security features in an open space where there are no obstacles!**
- **Reset the lifting actuators**
 - Press and hold the "DOWN" button until the actuators have lowered fully. Alternatively, it may be necessary to do this by repeatedly pressing "DOWN"
 - Then hold "UP" and "DOWN" for approx. 5 seconds to reset.
 - Repeat 3-5 times until the actuators stop correcting.
- **Main switch**



- Turn off the main switch.
 - Checks: All moving functions should now be inoperational.
 - Activate the main switch.
 - Checks: All moving functions should be operational again.
- **Emergency stop**
 - Activate the emergency stop by pushing the mushroom emergency stop button manually.
 - Checks: All moving functions should now be inoperational. Vacuum functions are not affected by emergency stop.
 - Deactivate the emergency stop by rotating the mushroom.
 - Checks: All moving functions should be operational again.
- **Safety switch – Belly button**
 - Activate low driving speed
 - Activate joystick to put the machine in reverse.
 - Activate the belly button by pushing it manually.
 - Check: The machine must not be able to drive backwards.
 - Deactivate belly button and repeat at high speed.
- **Parking brake**
 - Turn off the main switch.
 - Checks: It must not be possible to push or roll the machine.
 - Turn on the main switch.
 - Checks: It must not be possible to push or roll the machine.
- **The support legs**
 - Checks: It must be possible to put the support leg in either position.
 - Checks: Locks for the support leg must be functional in both positions.
- **Load limit system**
 - Read the load chart on the machine to see what the lifting capacity is at fully extended position. See section **9.3 Load chart**. For example, at fully extended position, the lifting capacity of a SL 208 will be 150 kg / 330 lb.
 - Then lift a load which exceeds this, and extend this forward until the load limit system interrupted.
 - Checks: The following features must now be inoperational:
 - Lowering/raising
 - Tilt back and forth
 - Extension of boom
 - Retract the load and set it down.
 - Checks: All functions must be operational again.

6.3 Cleaning the machine

- Clean the machine with a cloth with water and soap.
ATTENTION! Do not use a pressure washer to clean the machine.
 - **ATTENTION! Never direct the jet of water at the machine!**
 - Clean the suction cups with ethanol.
 - Alternatively, the suction cups can be cleaned with hot water, soap and a soft brush.
 - Always rinse with clean water.
 - Let the suction cups dry at room temperature.
- ATTENTION!**
- **Never direct the jet of water at the suction cups!**
 - **Always make sure that water does not enter the vacuum system.**



ATTENTION! Never use the following products to clean the suction cups:

- Pure glycerine.
- The solvents trichlorethylene, carbon tetrachloride or hydrocarbons.
- Vinegar-based cleaners.
- Sharp objects, metal brushes, sand paper, similar etc.

6.4 Troubleshooting

ATTENTION! In case of unexpected failure or malfunctioning of the machine, the machine must be stopped immediately, and the fault must be reported to Smartlift customer service immediately via tel. +45 97 72 29 11 or via email customerservice@smartlift.com.

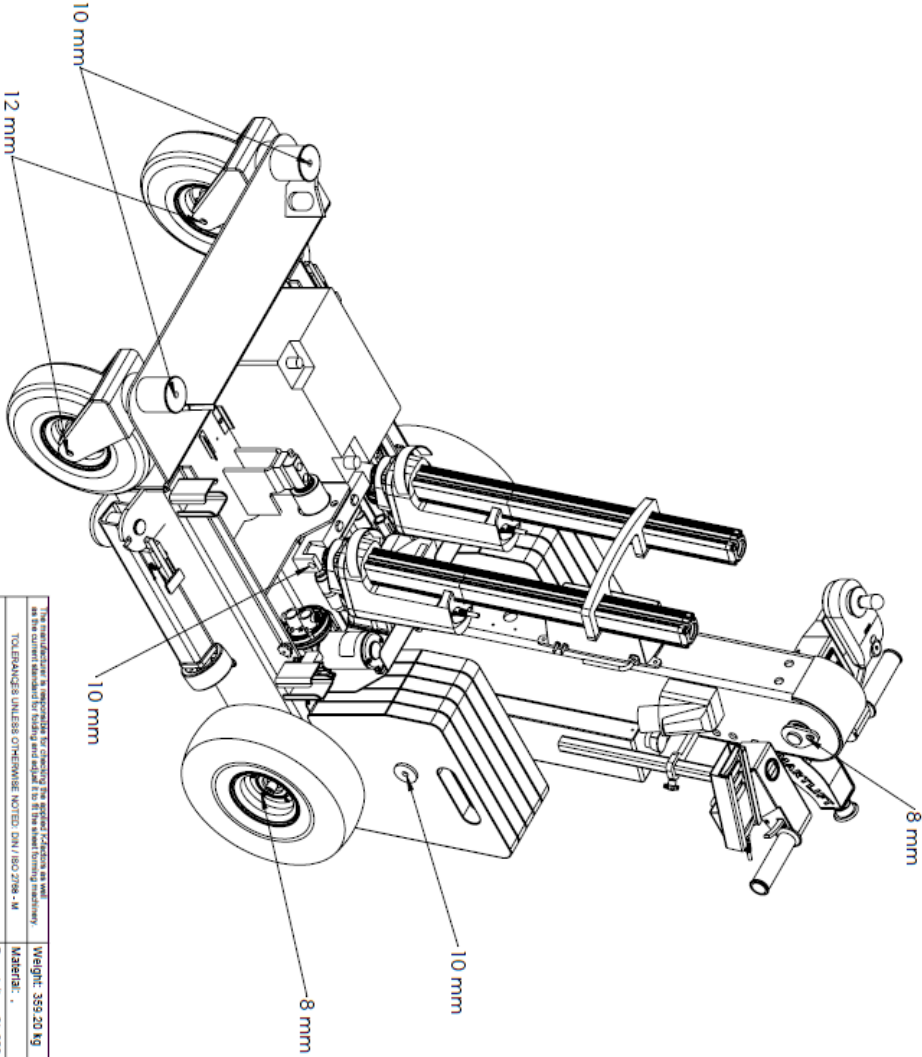
No.	 Problem	 Cause	 Solution
1.	No response to: - Lowering/raising - Tilt - Extension - Propulsion	- The power has been interrupted - The batteries have been discharged - The emergency stop has been pushed	- Turn the main switch - Check the battery level - Release the emergency stop - Check fuses
2.	No response to: - Lowering/raising - Tilt - Extension	The load limit system has interrupted these functions due to overload	Retract extension boom
3.	No response to: Lowering/raising	- Encoder error - The actuators are not running in parallel - The tilting joint is out of alignment	- Reset the actuators: - Press and hold the buttons "UP" and "DOWN" until the actuators have been lowered fully. Alternatively, it may be necessary to do this by repeatedly pressing "DOWN" - Then hold "UP" and "DOWN" for approx. 5 seconds to reset. - Repeat 3–5 times until the actuators stop correcting.
5.	No response to: Propulsion	- On/off switch is set to "off" - None of the dead man's grips are activated - One or both freewheel switches are activated - The engine has no electricity - The brake does not release	- Press the "on" button - Activate dead man's grip - Deactivate freewheel switches - Check point 1. - Check fuse for motor control
6.	Vacuum pump runs frequently or continuously	- Leak in the vacuum system. - ATTENTION! The vacuum level must be maintained for at least 10 minutes without the pumps running!	- Unload the machine immediately - Check that the suction cups seal tightly against the object - Check the vacuum hoses and suction cups for damage - Check that the slide valve has been closed - ATTENTION! The vacuum pumps must start and stop again!

6.5 Fuses

Size	Function	Position
100A	Propulsion	In front of batteries
30A	Supply to the control box	In front of batteries
15A	Charger	By charger

6.6 Tightening torques

Size	Tightening torque
6 mm	11,3 Nm
8 mm	27,3 Nm
10 mm	54,0 Nm
12 mm	93,0 Nm
16 mm	230,0 Nm



The manufacturer is responsible for checking the correct application as well as the correct selection for lifting and equal to fit the wheel forming machinery.

TOLERANCES UNLESS OTHERWISE NOTED: DIN / ISO 2768 - M

Weight: 359,20 kg

PROJECTION OF VIEWS:  Sheet 1 of 1

Material: -

Description: SL 208 Base machine

Refer to drawing: 

Coating: -

Material handling: - - -

NOTES:

DATE: 16/10/2021

TIME: 15:52:18

REV: 1.7

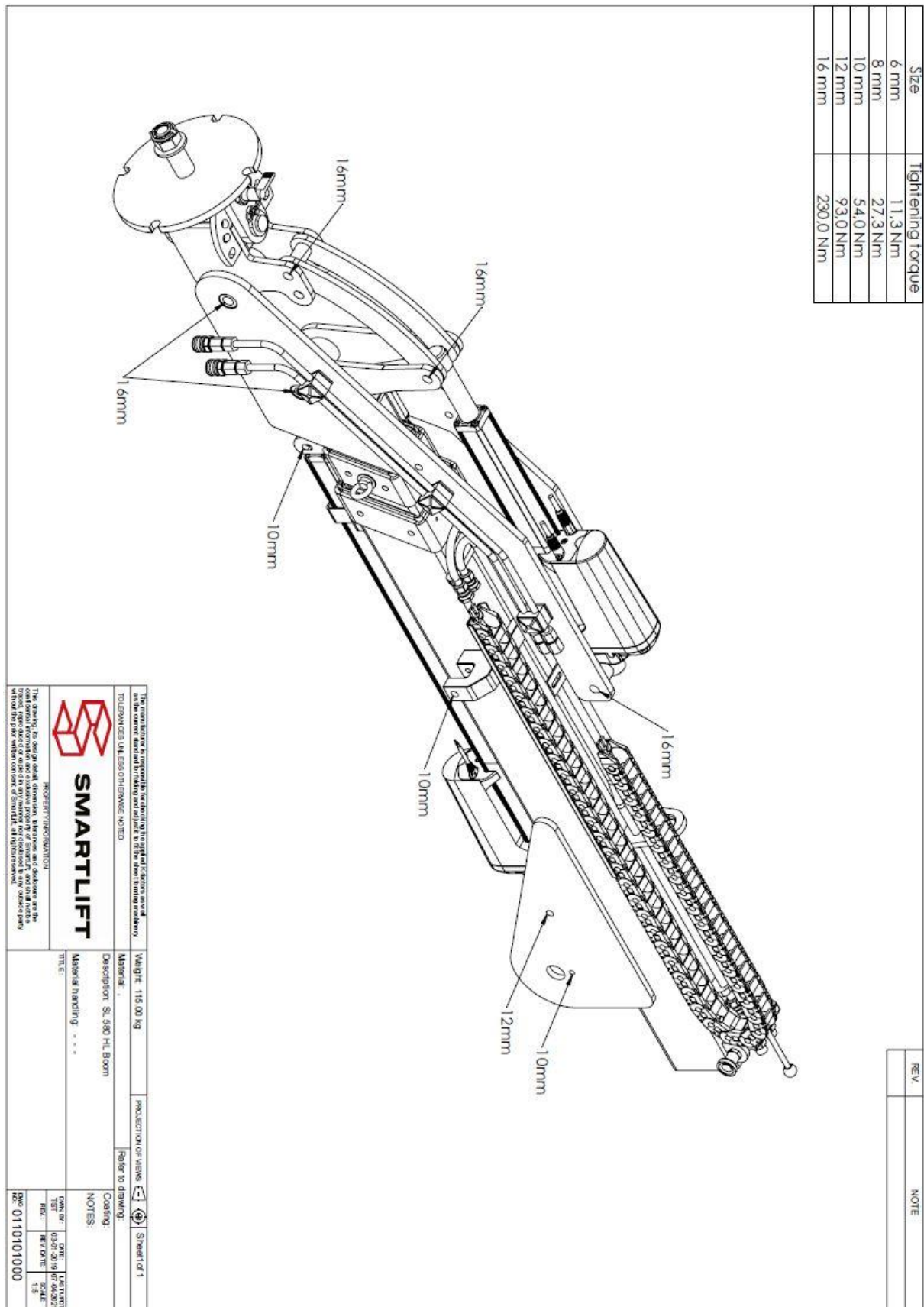
DWG NO: 1610100001

PROPERTY INFORMATION

SMARTLIFT

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REV.	NOTE



6.7 Spare parts

If spare parts are needed, these can be ordered by contacting your nearest dealer or Smartlift Customer Service at tel. +45 97 72 29 11 or email: customerservice@smartlift.com.

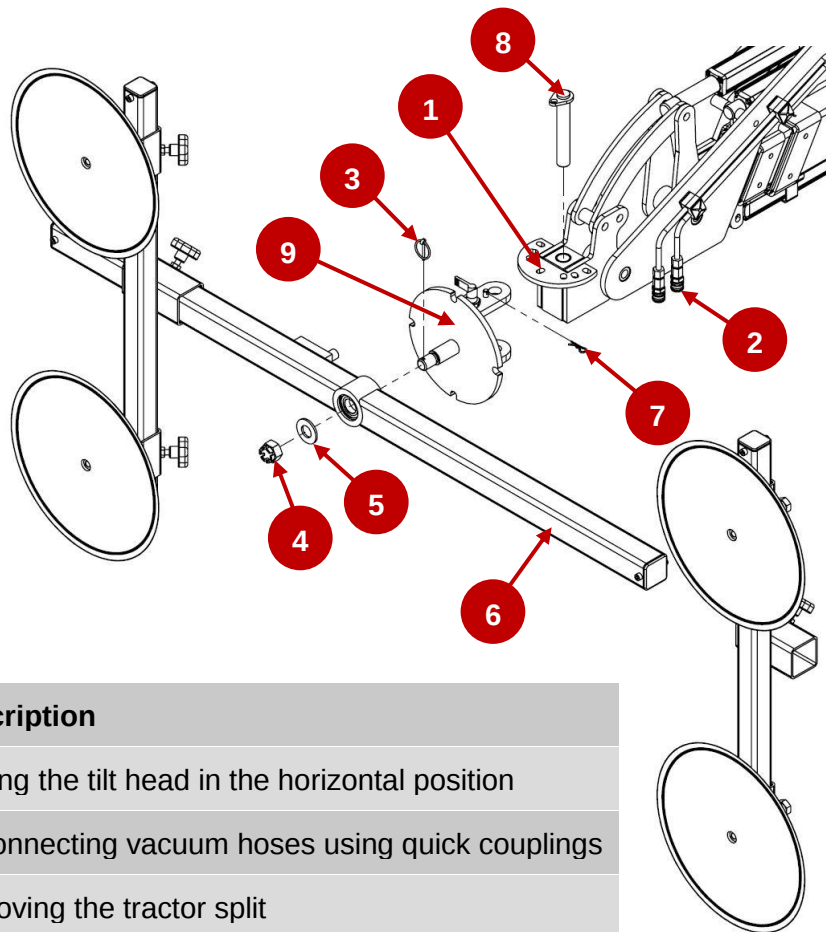
7 Scrapping and disposal

The machine must be scrapped and disposed of in accordance with local regulations.

8 Dismantling of vacuum yoke and swivel joint

This describes how the vacuum yoke is removed.

In order to remove the vacuum yoke and swivel joints, the following steps must be completed in the indicated order.



No.	Description
1	Placing the tilt head in the horizontal position
2	Disconnecting vacuum hoses using quick couplings
3	Removing the tractor split
4	Removing the castellated nut
5	Removing the washer
6	Removing the vacuum yoke
7	Removing the hairpin cotter
8	Removing the lock for the swivel joint
9	Removing swivel joints

9 Annexes

9.1 Terms and abbreviations

Term	Text
Warning!	Things that can cause bodily injury or death
Attention!	Things that can cause bodily injury or property damage
The user	The person who operates the machine and is responsible for security
The machine	The entire basic machine unit and any equipment model
Vacuum yoke	A collective term for yoke, crossbars and suction cups
The load	The object to be lifted
Wind load	Effect of wind on the load and machine

Abbreviation	Significance
SL	Smartlift
SWL	Safe Working Load / Safe load capacity

9.2 Declaration of conformity

Manufacturer and bearer of responsibility for the compilation of technical files:

Smartlift A/S
N.A. Christensensvej 39
DK - 7900 Nykøbing Mors

Hereby declares that:

Model:

☐ SL 208



Serie no.: _____

Date: _____ - _____ - 20____

has been manufactured in accordance with the following EC directives:

The Machinery Directive 2006/42EC

The EMC Directive 2014/30/EU

Date: _____

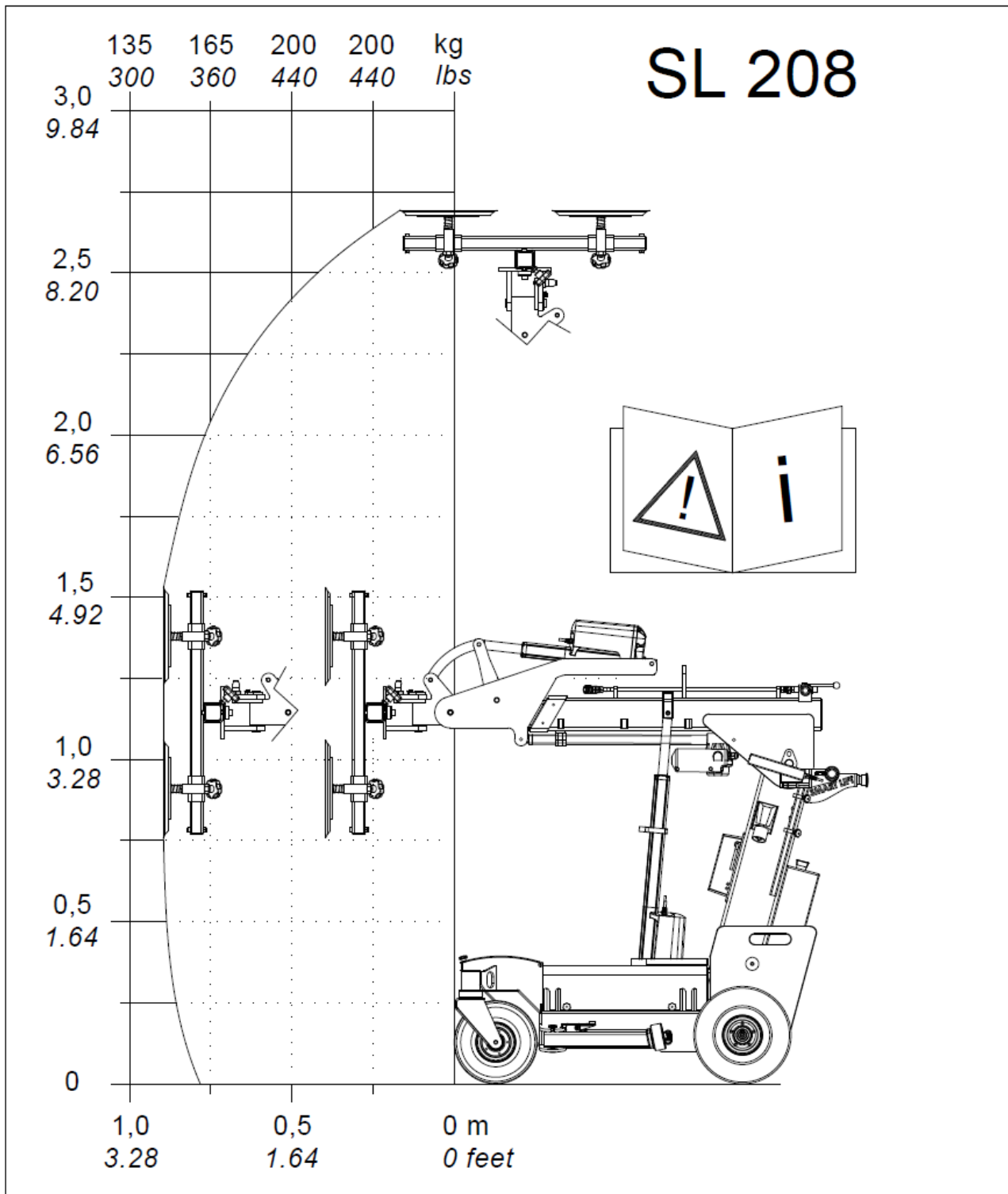
Signature: _____

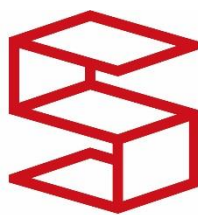
 **SMARTLIFT**
N. A. Christensensvej 39, DK-7900 Nykøbing Mors
Tel. +45 9772 2911 E-mail: smart@smartlift.com

Jacob Libach Nielsen, CEO

9.3 Load chart

The load chart only applies to machines with standard configurations.



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