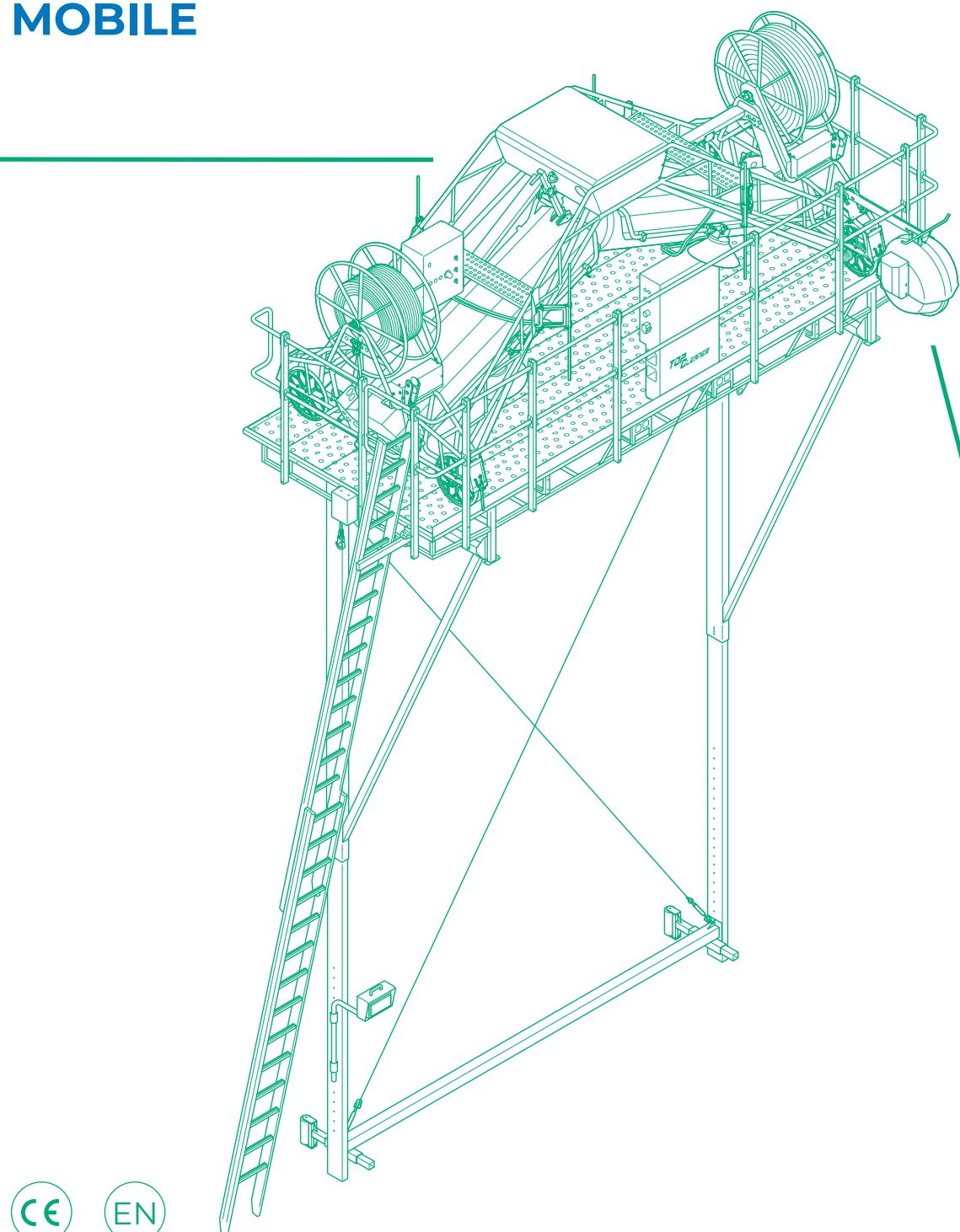


INSTALLATION AND USER INSTRUCTIONS

Top Cleaner MOBILE




Van der Waay

OCTOBER 2022 | VERSION 1.00 | THESE ARE THE ORIGINAL ENGLISH INSTRUCTIONS

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1.1 DESCRIPTION OF THE USER

These instructions are intended for the end-user of the Top Cleaner. The end-user can be described as each person who interacts directly with the machinery. The end-user typically includes, but is not limited to:

- Installer
- Maintenance personnel or technicians
- User
- Dismantling personnel

All use of the machinery shall only be carried out by an authorized and a properly qualified and skilled person of 18 years or older, who:

- Has read and understood this manual
- Is familiar with operating similar equipment
- Knows how to control this machinery
- Is aware of all possible dangers and acts accordingly
- Is trained and authorized to work at heights
- Has a spraying license, if applicable

The required maintenance and/or inspection work as stated in this user manual is allowed by the aforementioned persons, unless clearly indicated when this is not allowed. Exceptions to this are the supplied lifting and climbing materials and personal protective equipment. These shall always be inspected and certified by approved companies/ authorities.

1.2 PURPOSE OF THESE INSTRUCTIONS

Thank you for purchasing this machinery. The purpose of this document is to make you familiar with the installation and use of the Top Cleaner, so that you can safely operate it as an end-user. This documentation should therefore be regarded as an integral part of the machinery.

The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein.

This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither Van der Waay nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information that is contained herein. If you have any suggestions for improvements or amendments or have found errors in this publication, please notify us.

Furthermore, the manufacturer reserves the right to revise this publication at any time without incurring an obligation to notify any person of the revision. The content of these instructions is constantly monitored and, where necessary, modified. However, inconsistencies between these documents can not be excluded. No guarantee is therefore given with regard to the completeness of these instructions. All images in this document are for illustrative purposes only.

1.3 RETAINING INSTRUCTIONS



IMPORTANT

READ CAREFULLY BEFORE USE
KEEP FOR FUTURE REFERENCE

Read and understand this manual and its safety instructions before using this machinery. Failure to do so can result in serious injury or death.

Follow all the instructions. This will avoid fire, explosions, electric shocks or other hazards that may result in damage to property and/or severe or fatal injuries.

The machinery shall only be used by persons who have fully read and understand the contents of this user manual.

Ensure that each person who uses the machinery has read these warnings and instructions and follows them.

Keep all safety information and instructions for future reference and pass them on to subsequent users of the machinery.

The manufacturer is not liable for cases of material damage or personal injury caused by incorrect handling or non-compliance with the safety instructions. In such cases, the warranty will be voided.

1.4 CONVENTIONS USED IN THIS MANUAL

The following style conventions are used in this document:

Bold

Names of machinery elements, commands, options, programs, processes, services, and utilities

Names of interface elements (such as windows, dialog boxes, buttons, fields, and menus)
Interface elements the user selects, clicks, presses, or types

Italic

Publication titles referenced in text
Emphasis (for example a new term)
Variables

1.5 EXPLANATION OF SAFETY WARNINGS

DANGER

"DANGER" indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

WARNING

"WARNING" indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

CAUTION

"CAUTION" indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

NOTICE

"NOTICE" indicates information considered important, but not hazard-related.

1.6 OBTAINING DOCUMENTATION AND INFORMATION

This is the original English user manual. Manuals in other languages are available upon request. The latest version of the documentation as well as spare parts are available at the following address or can be ordered by email:

<https://portal.vdwaay.nl/en/shop> | salesteam@vdwaay.nl

For inquiries, information, technical assistance or any other questions or feedback, please contact us:

Van der Waay B.V.

Finlandlaan 2

2391 PV Hazerswoude

The Netherlands

Tel.: +31 (0) 172 210311

info@vdwaay.nl

1.7 OTHER DOCUMENTATION

Besides this documentation, the below documentation is supplied with the machinery and is available upon request. Always consult these documents as well, before using the machinery.

- *Ixon keepgo manual* - Installation manual for remote access and connection via app.
- *Manual Dosatron D3* - Dosatron dosing pump owner's manual.
- *Comet piston pump user manual* - Comet high pressure pump instructions.
- Installation and user instructions Top Cleaner Spray Boom.

1.8 WARRANTY

The limited warranty covers 24 months after the date of delivery. This warranty is limited to materials only. Any shipping costs are the responsibility of the owner of the machinery.

If requested, the defective part must be sent to the manufacturer within two weeks.

The warranty will be void in the following cases:

- Normal wear
- External force
- Improper maintenance
- Failure to comply with these installation and user instructions
- Unskilled and incorrect usage
- Damage caused by lightning
- Damage caused by freezing
- Damage caused by severe weather
- Modifications that have not been carried out or approved by the manufacturer

2.1 SAFETY INSTRUCTIONS

DANGER

Read and understand this manual and its safety instructions before using the machinery.
Failure to do so can result in serious injury or death.

2.1.1 Safety instructions related to the intended use and reasonably foreseeable misuse

- The machinery shall only be used for applications as described by the manufacturer. All other applications are unprofessional and considered dangerous. The manufacturer cannot be held liable for damage resulting from errors, unintended or unprofessional use of the machinery.
- The machinery is not intended for use by persons (including children) with restricted physical, sensory or intellectual capability or lack of experience and/or knowledge.
- Only use the machinery within the specified performance limits as described in these instructions.
- The width of the wheelbase of the machinery shall fit the width between two gutters of the greenhouse it is being used on.

2.1.2 Safety instructions related to personal protective equipment

- Always use appropriate personal protective equipment when working with the machinery, such as protective gloves, safety shoes (minimum class S3), safety goggles, safety harness, hard hat, lifeline and protective overalls.
- Wear sun protective clothing if necessary and use sunscreen to protect exposed body parts against the sun.
- Wear warm and water resistant clothing against the cold or when it is raining.

2.1.3 Safety instructions related to transporting and lifting

- Always make sure that the machinery and any of its parts are fixed during transportation, so there is no possibility of sudden movements or instability.
- Lifting works shall only be carried out by authorized persons.
- When lifting the machinery, use only approved lifting tools with sufficient lifting capacity.
- Always carry out lifting with more than one person, even when using lifting tools.
- Only use a certified four-way webbing lifting sling with a minimum length of 3 meters (10 feet) and a minimum capacity of 4 x 1000 kg (4 x 2200 lbs). Only lift the machinery by the designated lifting points.
- Always use the lifting points when lifting the machinery, to avoid the risk of tilting.
- Make sure that you carry out lifting works on a flat and hardened surface. Apply road plates if necessary.
- Make sure that there are no persons within the turning range of the crane during lifting works.
- Never stand directly underneath the machinery during lifting tasks and always be aware of possible falling objects. Failure to do so can result in serious injury or death.
- Check the lifting tools for damage before lifting. If there is any visible damage, do not lift the machinery.
- Do not lift the machinery with wind speeds above 17 m/s (38 mph).

2.1.4 Installation safety instructions

- Installation and commissioning shall be carried out by a properly qualified and skilled installer with due observance of the applicable rules and legislation. The installer is responsible for employing skilled and qualified personnel.
- Always fence off the work area for unauthorized persons prior to installation. Ensure public safety, depending on the situation. For example by securing the area with fences, barrier tape or traffic cones when working near a public road or other works.
- During installation be mindful of personal injuries.
- Check the machinery for damage before installation. If there is any visible damage, do not install the machinery. Contact the manufacturer.
- Inform yourself properly with respect to the prescribed safety devices on the basis of the EU directives and local regulations on working at heights. All local regulations must be followed.
- Consult available construction reports, certificates, etc. to make sure that the greenhouse rail, gutters and end-gutter protection are of sufficient strength to carry the weight of the machinery and everyone and everything on the machinery. Refer to the type identification plate for the weight of the machinery. Contact your greenhouse builder in case of any doubts.
- In the event that you have to do installation tasks for which you need to move yourself on the machinery, make sure that you have an evacuation plan drawn up by an official safety expert.

2.1.5 Electrical safety instructions

- Only a qualified electrician shall carry out the electrical installation and the initial activation.
- Only connect the machinery to a grounded socket with earth leakage protection that is connected in accordance with the legal guidelines.
- Check the machinery and the cables for damage before electrical installation. If there is any visible damage, a strong odor or excessive heating of components, disconnect the power supply immediately and do not use the machinery.
- Protect disconnected plugs against rain and keep them away from moisture.
- Only use extension cords of the same quality as the original ones and with a diameter of at least 4mm² (12 AWG).

2.1.6 Safety instructions prior to the use

- Make sure that the combined weight of the machinery standing in the greenhouse gutters, everyone and everything on the machinery does not exceed the maximum allowed gutter load.
- Make sure that all greenhouse gutters are provided with proper end-gutter protection. If these protections are not present and/or properly attached, the machinery moving in the greenhouse gutters can fall off the greenhouse.
- Make sure that the top rail has been equipped with a firm steel barrier with a minimum height of 80 mm (3 inch) on both ends.
- Make sure that the supplied foundation extensions are attached to both side gables of the greenhouse if the greenhouse does not have a bottom rail. If the lower wheels of the platform hit next to the foundation, the platform may fall off the greenhouse.
- Make sure that the bottom rail extends at least 50 cm (127 inch) beyond both side gables of the greenhouse. If the platform's lower wheels hit next to the foundation, the platform may fall off the greenhouse.
- Make sure that there is a minimum of 20 cm (8 inch) of free space between the ground and the bottom of the lower wheels at all times.

- Make sure that the bottom rail is immovably secured along the entire length of the greenhouse gable and is not bent.
- Make sure that the end of rail switches on the left and right side of the platform are adjusted and working correctly (automatic control only).
- Make sure that the machinery can move freely alongside the greenhouse gable. Remove any obstacles that are in its way.
- Make sure that the machinery can move freely inside the greenhouse gutters. Remove any obstacles that are in its way.
- Make sure that all steel beams, angle irons, straps and cable ties that are used as transport protection are removed.
- Make sure that the windows of the greenhouse are closed and remain closed when using the machinery.
- Make sure that there is no-one inside the greenhouse where the machinery is in use. Depending on the situation, create a NO GO zone to ensure public safety.
- Before use make sure that you have an evacuation plan drawn up by an official safety expert.
- Make sure that you know where the emergency stop buttons are located before operating the machinery.
- Make sure that a first aid kit is present on the machinery where people are working.

2.1.7 Safety instructions related to the use

- Do not exceed the maximum load of the machinery. Consult the type identification plate(s) for the maximum load.
- Do not exceed the maximum number of people allowed on the machinery.
- Be vigilant at all times and always be careful what you are doing. Do not use the machinery if you are lacking in concentration or awareness, or are under the influence of drugs, alcohol or medication. Even a moment of inattentiveness can lead to serious accidents and injuries when using the machinery.
- Beware of any moving or hinging parts of the machinery. Do not place any fingers or hands where they can get jammed.
- Never insert body parts between rotating parts of the machinery.

- The machinery is not intended to be used as a device to move persons.
- Do not use the machinery after an earthquake. Keep a safe distance from the greenhouse and machinery until they have been fully inspected by a qualified and trained person.
- Never use the machinery with wind speeds above 11 m/s (25 mph).
- Always anchor the van der Waay platform to the anchor plates when wind speeds above 17 m/s (38 mph) are expected. Remove the roof washer from the platform or securely strap it to the platform by fastening the four lifting points of the roof washer to the lifting points of the platform, with four ratchet straps. When possible remove the Top Cleaner from the greenhouse entirely.
- Never use the machinery at temperatures lower than 0.5 °C (31 °F).
- Do not use the machinery during thunderstorms and extreme weather conditions. Seek shelter in the event of an approaching thunderstorm or sudden weather deterioration.
- Always remove the machinery from the greenhouse when heavy snowfall is expected. The weight of the snow can damage the top rail causing the machinery to fall off the greenhouse.
- In case of an accident, stop using the machinery and consult a doctor if necessary.
- Use a bright headlamp when working in the dark.
- When storing the machinery in an area with risks of whirlwinds, make sure that you properly store and/or anchor the machinery.
- Make sure that the anti-climb protection is put and locked on the ladder when there is no authorized personnel nearby.

2.1.8 Safety instructions related to working at heights

- When performing works on top of the greenhouse or on a van der Waay platform, make sure to wear a certified safety harness and a certified double lifeline of 2 meters (6.5 feet) in length.
- When going up onto the roof of the greenhouse always make sure that you wear a certified safety harness that is leashed with a certified fall arrest device.
- Always use a gutter walker to safely walk via the greenhouse gutters to the machinery. Gutter walkers are available through your greenhouse builder, your supplier or the manufacturer.

- Make sure that you can sound an alarm when necessary. Always carry a mobile phone or other means of communication with you.
- Remove all loose materials and tools from the machinery. These can be moved by the wind and cause material damage to the machinery and the greenhouse.
- Never use a ladder to get onto the roof of a greenhouse, unless the ladder is a part of the van der Waay platform.

2.1.9 Maintenance, repair and modification safety instructions

- All repair and modification tasks shall only be carried out by qualified and skilled persons. Only open or repair parts of the machinery when you know what you are doing. If you have any doubts, contact the manufacturer.
- All cleaning and maintenance tasks shall only be carried out by qualified and skilled persons. To ensure the operational safety of the machinery, regular maintenance shall be carried out by qualified persons in accordance with the manufacturer's instructions.
- Always shut off the machinery according to the LOCK OUT-TAG OUT method before performing any maintenance or repair work.
- Maintenance and inspection should be done on a frequent basis. If there is any visible damage, a strong odor or excessive overheating of components, stop using the machinery. Non-frequent maintenance shortens the activity and life span of the machinery and voids the warranty.
- Use only original accessories and spare parts. You can always order spare parts from the webshop <https://portal.vdwaay.nl/en/shop> or by sending an email to salesteam@vdwaay.nl.
- Alterations to the machinery and technical modifications are not permitted without written permission of the manufacturer. Failure to do so may result in damage to property and/or severe or fatal injuries and it will invalidate the warranty.

2.2 STRENGTH OF THE GREENHOUSE STRUCTURE

DANGER

- Consult available construction reports, certificates, etc. to make sure that the greenhouse rail, gutters and end-gutter protection are of sufficient strength to carry the weight of the machinery and everyone and everything on the machinery. Refer to the type identification plate for the weight of the machinery. Contact your greenhouse builder in case of any doubts.

Van der Waay recommends to only use this machinery on greenhouses of which the transport rail, end-gutter protection and greenhouse gutters are in accordance with the following standards and documentation:

- NEN-EN 13031-1 2020
- TNO report RO2366 ppl AVAG rail
- TNO report 2014 R10342 gutter

Contact your greenhouse builder for more information on the structural integrity of your greenhouse.

2.3 ANCHOR POINTS AND FALL ARREST DEVICE

The platform has four anchor points and one fall arrest device. The roof washer has two anchor points.

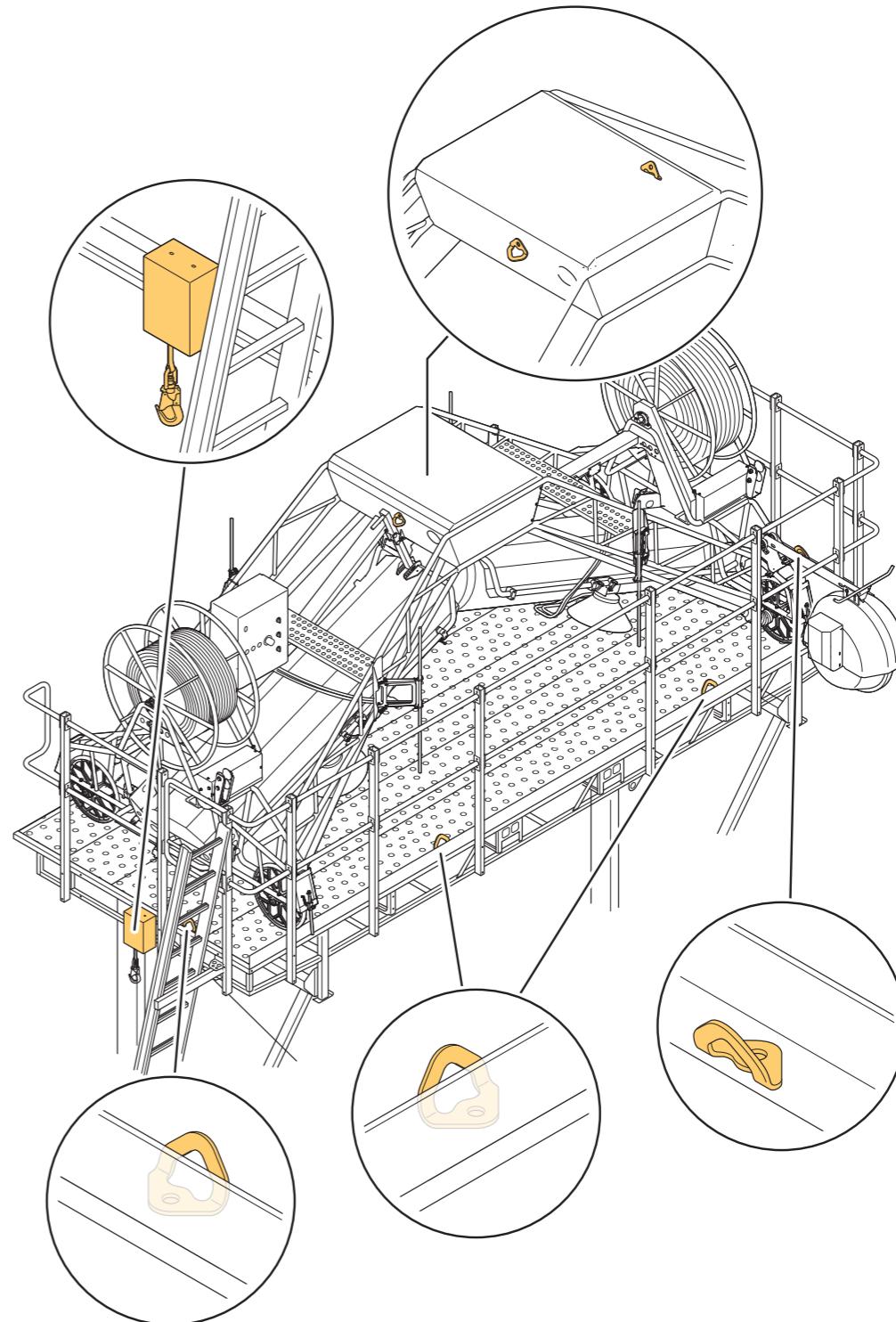


Fig. 1 Fall arrest device anchor points of the roof washer and platform

2.4 PLACING THE ANTI-CLIMB PROTECTION

The anti-climb protection must be installed on the ladder when the machine is not in use.

The anti-climb protection prevents unauthorized persons from entering the platform.

To place the anti-climb protection:

1. Put the **anti-climb protection** on the **ladder**.
2. Lock the **anti-climb protection** with the padlock.

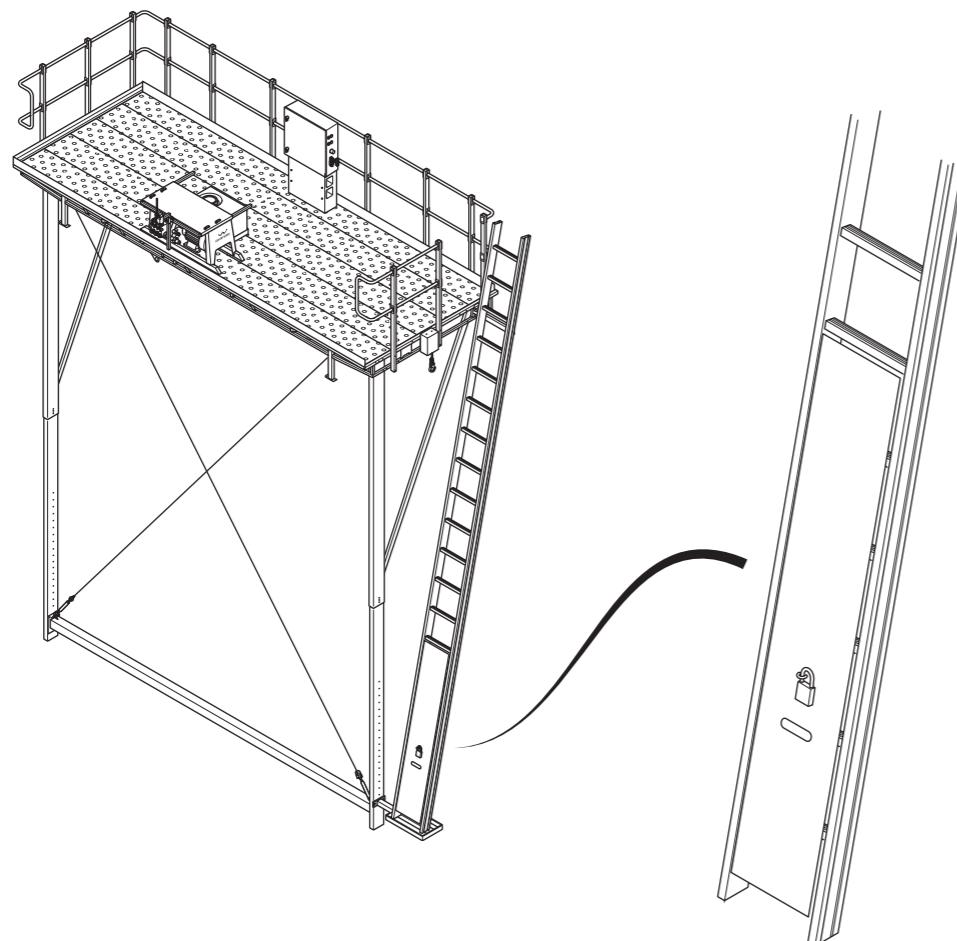


Fig. 2 Placing the anti-climb protection

2.5 STORM ANCHORING

⚠ WARNING

- **Always anchor the van der Waay platform to the anchor plates when wind speeds above 17 m/s (38 mph) are expected. Remove the roof washer from the platform or securely strap it to the platform by fastening the four lifting points of the roof washer to the lifting points of the platform, with four ratchet straps.**
When possible remove the Top Cleaner from the greenhouse entirely.

The platform can be anchored after installation of the platform and the greenhouse anchor plates, see 5 PREPARATION. When a wind speed above 17 m/s (38 mph) is expected the platform shall be anchored and remain anchored until the storm has passed.

To anchor the platform:

1. Move the **platform** to the location of the anchor plates. Align the **legs** of the platform with the two anchor plates.
2. Connect the ratchet strap with one end to an anchor plate and with the other end to the anchor point on one of the **legs** of the **platform**.
3. Use the ratchet to tighten the strap until the strap is no longer slack.

NOTICE Make sure to not over tighten the strap to avoid warping of the legs.

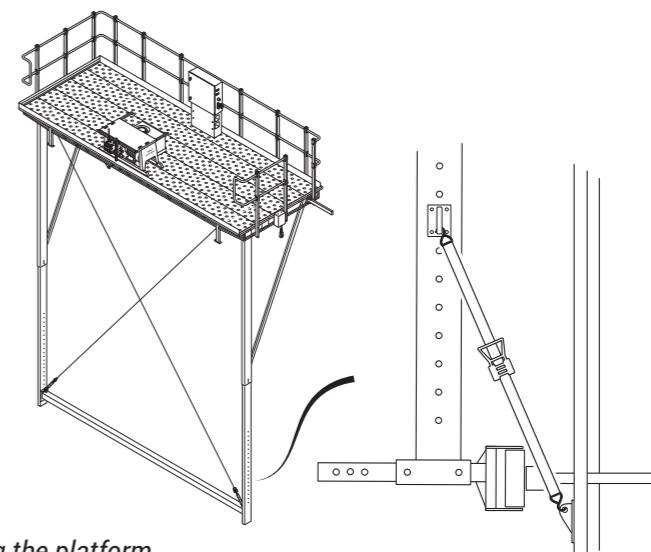


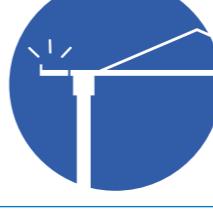
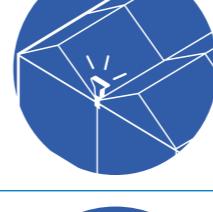
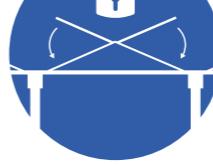
Fig. 3 Anchoring the platform

4. Do the same with the other anchor plate and **leg** of the **platform**.

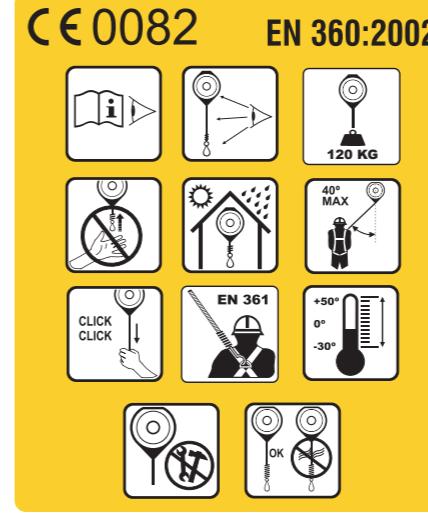
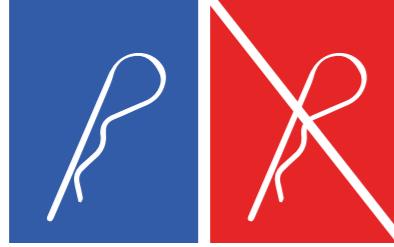
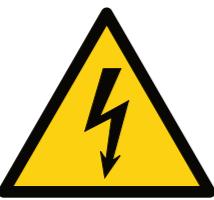
2.6 SYMBOLS AND SAFETY INFORMATION ON THE MACHINERY

Warning stickers are affixed to different parts of the machinery to warn the user about possible dangers when performing certain actions. The meaning of the warning stickers is explained in the table below. Depending on the version of the machinery, some of these stickers may not be present.

Sticker	Meaning
	Instructs to read the manual before use.
	Instructs to use safety footwear.
	Instructs to use a hard hat.
	Instructs to use an anchor point for one person when working at heights and indicates its location.
	Instructs to use a certified fall arrest device when working at heights.

	Instructs to use the lifting point(s) and indicates its location.
	Instructs to use the lifting point(s) and indicates its location.
	Instructs to use the forklift truck lifting points and indicates its location.
	Instructs to install properly mounted end-rail protection on both ends of the upper rail of the greenhouse before using the machinery.
	Instructs to install properly mounted end-gutter protection on all the gutters of the greenhouse before using the machinery.
	Instructs to close the windows before the roof washer enters the greenhouse roof.
	Instructs to lock the anti-climb protection with the padlock.

2 SAFETY

	<p>Instructs to use the LOCK OUT-TAG OUT procedure during maintenance and/or repair works.</p>		<p>Warns that the platform leg is extended to its maximum length.</p>
	<p>Instructs to position the lower beam correctly.</p>		<p>Warns on how the fall protection shall be used safely.</p>
	<p>Instructs to secure the lower beam with retaining clips properly.</p>		
	<p>Instructs to (re)fill the oil tank of the hydraulic pump with Energol SHF-HV 32 oil only.</p>		
	<p>Warns that all steel beams, angle irons, straps and cable ties that are used as transport protection must be removed.</p>		<p>Warns and instructs that at expected wind speeds above 17 m/s (38 mph), the platform shall be anchored to the greenhouse.</p>
	<p>Warns that the machinery can start automatically.</p>		<p>Forbids to ride on the roof washer.</p>
	<p>Warns for high voltage.</p>		<p>Forbids to step on the roller brush cover.</p>

	Forbids unauthorized persons to enter the platform.
	Forbids to use the machinery below 0.5 °C (31 °F). ↓ 0.5°C, 31°F
	Forbids to use the machinery during a thunderstorm.
	Forbids to use the machinery at wind speeds above 11 m/s (25 mph). ↑ 11 m/s, 25 mph

3.1 INTENDED USE

The Top Cleaner is intended to be used for:

- Mechanically brushing of the outer glass and gutters of greenhouse roofs
- Applying a temporary protective coating to the roof by means of optional Top Cleaner Spray Booms

The Top Cleaner is not intended to be used:

- As a device to move persons or objects
- To conduct reparations to the greenhouse roof
- As a snowplow
- At temperatures lower than 0.5°C (31°F)
- At wind speeds more than 11 m/s (25 mph)

Only use the machinery within the specified performance limits. The machinery must only be used according to the instructions as described in this manual. All use other than described in this manual is seen as unintended use. The machinery shall be used with original accessories and components only.

3.2 GENERAL DESCRIPTION OF THE MACHINERY

The machinery consists of a platform and roof washer with which the glass and the gutters of greenhouses can be cleaned. The roof washer runs through the greenhouse gutters on its four wheels. The roof washer is driven by a hydraulic pump, which is driven by an electric motor. The electric motor is powered by a cable that is mounted on a reel and automatically rolls up and unrolls.

The roof washer runs automatically to the end of the roof top, stops and returns to the platform.

The required water is supplied via a water hose, which is mounted on a second reel that automatically rolls up/unrolls.

The roof washer can optionally be equipped with an optional spray boom with which the greenhouse roof can be provided with a temporary protective coating.

The platform can be moved to other greenhouses and contains adjustable legs for different greenhouse heights.

3.3 MACHINERY ELEMENTS

3.3.1 Main elements

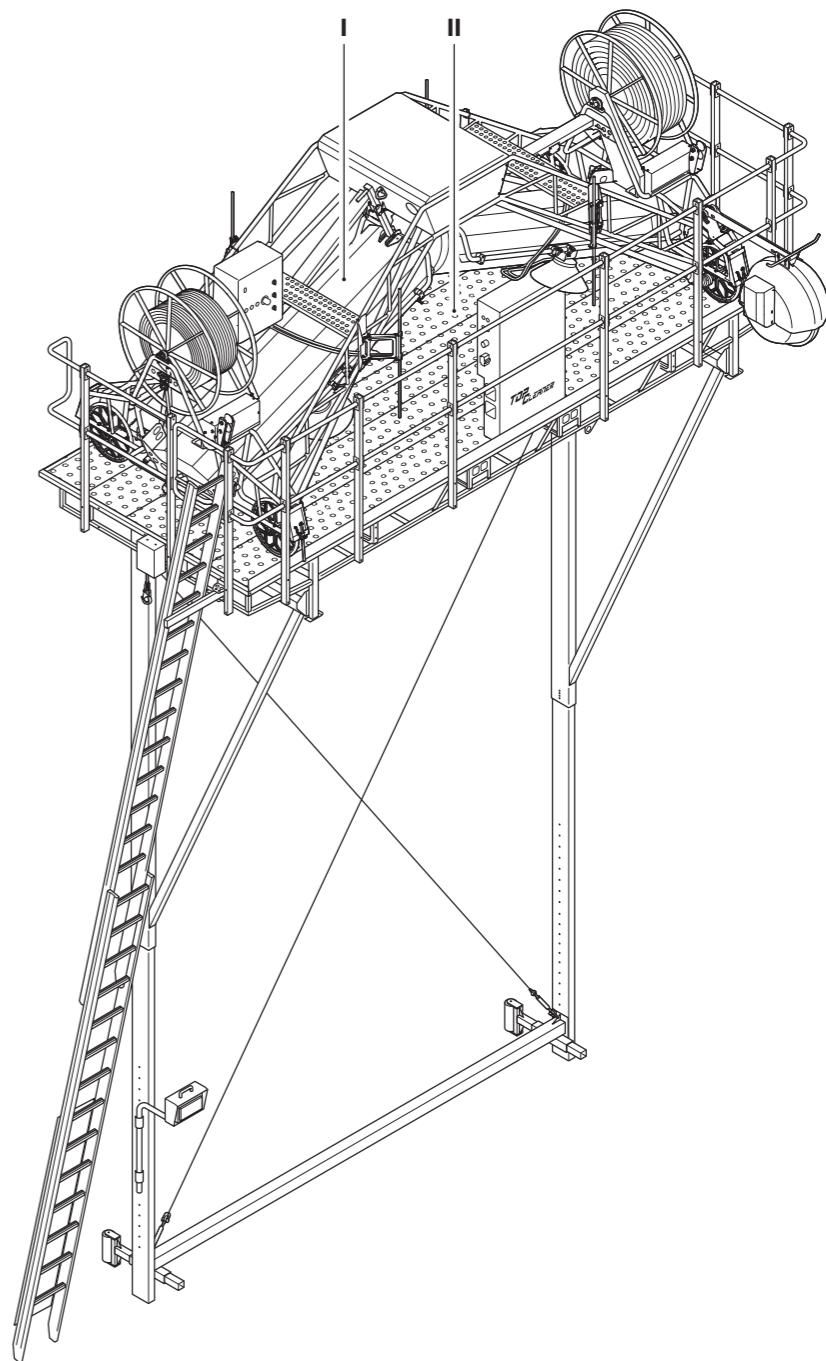


Fig. 4 Main elements Top Cleaner

I. Roof washer

II. Platform

3.3.2 Important parts of the roof washer (I)

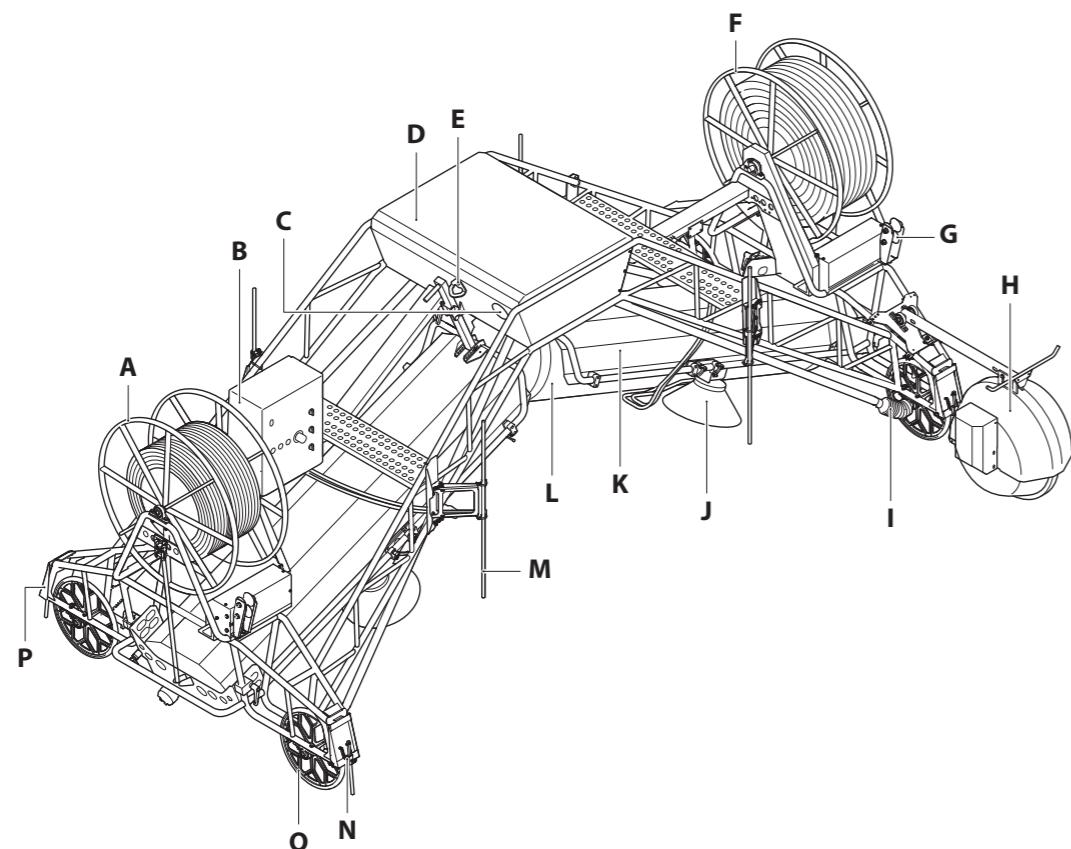


Fig. 5 Important parts roof washer

A. Cable reel	I. Drive shafts
B. Control cabinet roof washer	J. Disc brushes for window edge (optional)
C. LED lamps	K. Roller brush cover (optional)
D. Upper compartment with hydraulic unit	L. Roller brushes
E. Anchor points (yellow)	M. Air vent detection switches (optional)
F. Hose reel	N. Wheel switches rear
G. Reel guides (optional)	O. Aluminum wheels
H. Gutter brush (optional)	P. Wheel switches front

3.3.3 Important parts of the platform (II)

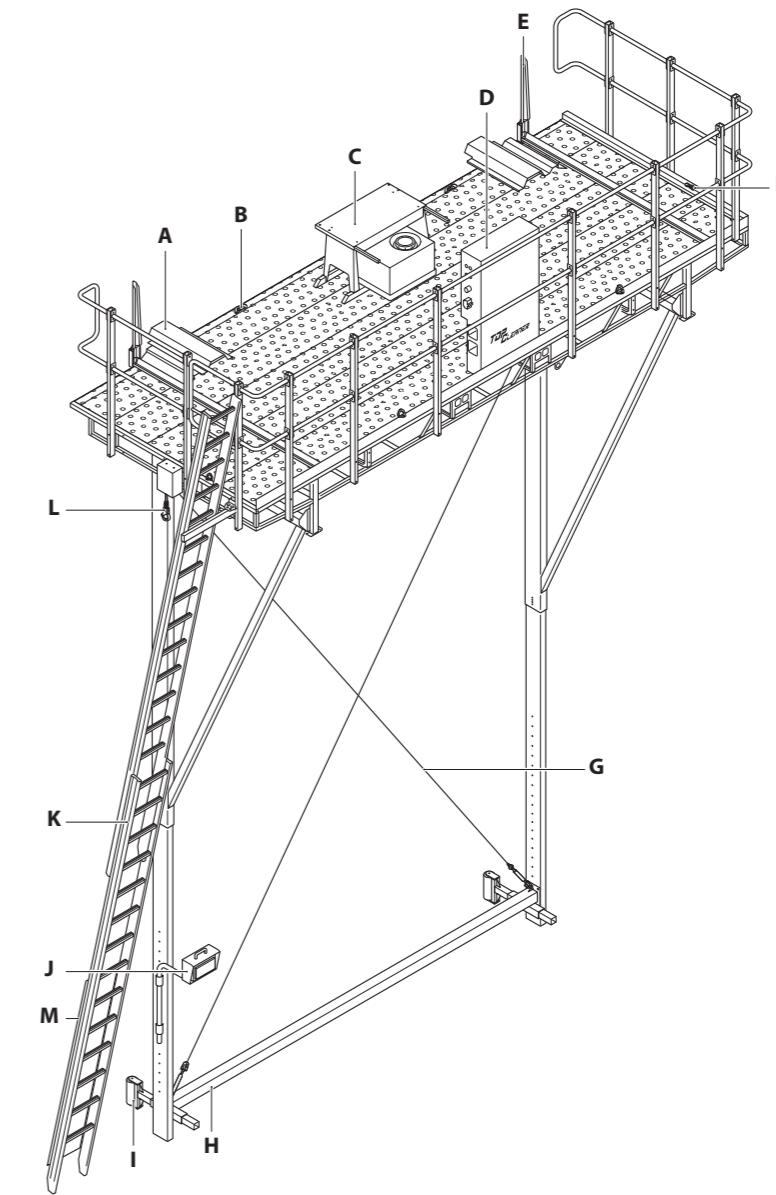


Fig. 6 Important Parts platform

A. Drive wheels	H. Lower beam
B. Lifting points (red)	I. Lower wheels
C. Water pump with float tank	J. Operation display
with rooftop position switch	(for automatic version only)
D. Control cabinet platform	K. Ladder
E. Platform ramps	L. Fall arrest device
F. Anchor points (yellow)	M. Ladder anti-climb protection
G. Cross braces	

3.4 UNDERSTANDING CONTROLS AND INDICATORS

3.4.1 Remote control undercarriage

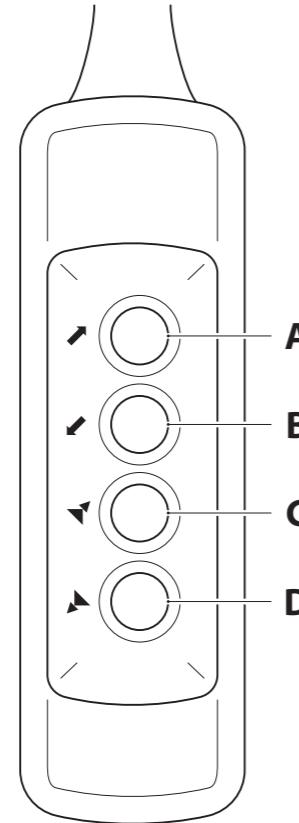


Fig. 7 Remote control undercarriage

- A. Upper platform leg up
- B. Upper platform leg down
- C. Lower platform leg up
- D. Lower platform leg down

3.4.2 Remote control roof washer and platform

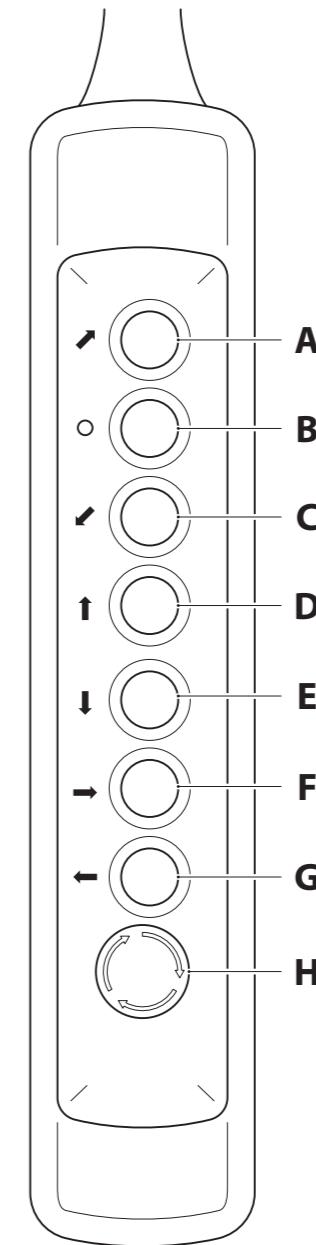


Fig. 8 Remote control roof washer and platform

- A. Roof washer forward
- B. Roof washer stop
- C. Roof washer backward
- D. Platform ramps up
- E. Platform ramps down
- F. Platform right
- G. Platform left
- H. Emergency stop button

3 DESCRIPTION OF THE MACHINERY

3.4.3 Control cabinet roof washer

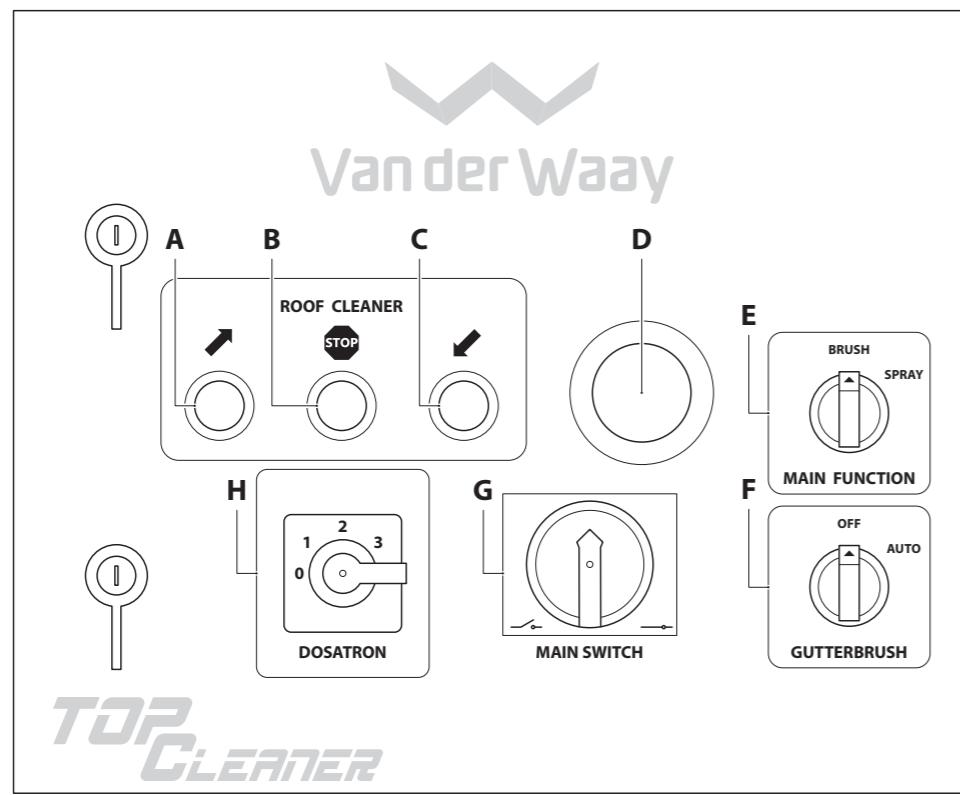


Fig. 9 Controls and indicators of the control cabinet roof washer

- A. Roof washer forward
- B. Roof washer stop
- C. Roof washer backward
- D. Emergency stop button
- E. Main function
- F. Gutter brush
- G. Main switch
- H. Dosatron settings

3.4.4 Control cabinet platform

Depending on the version of the machinery, one out of the following four platform control cabinets has been installed.

3.4.4.1 Control cabinet platform manual EU

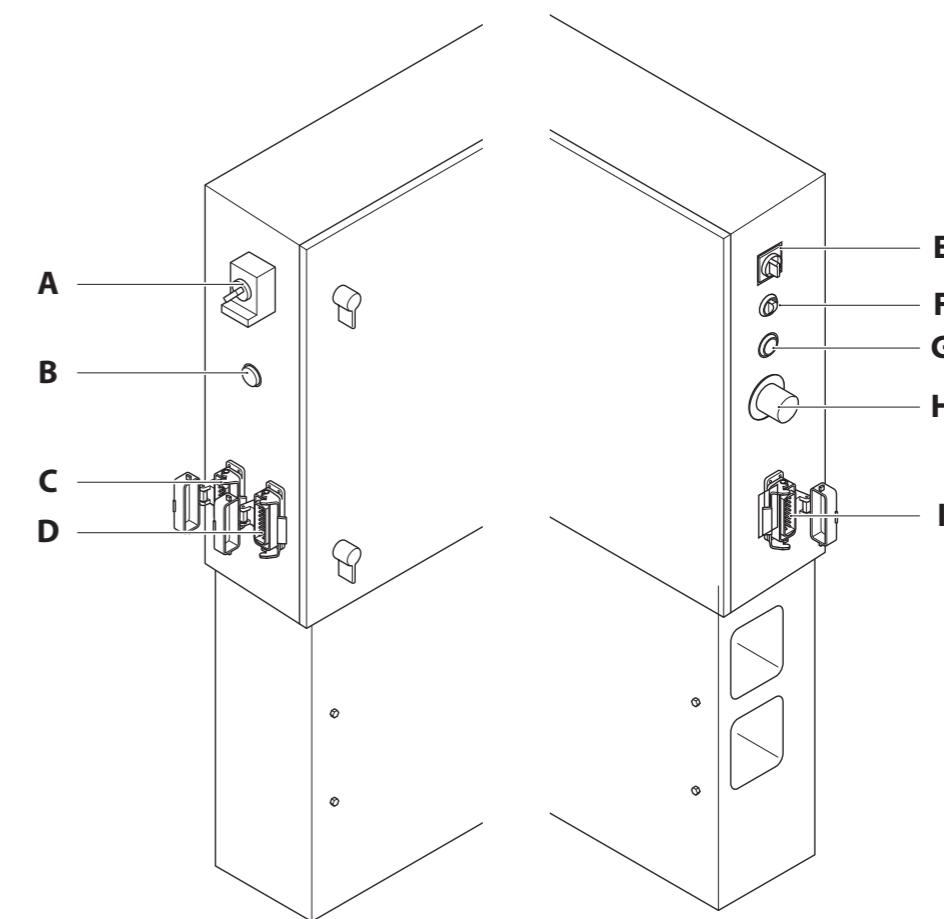


Fig. 10 Controls and indicators of the control cabinet platform manual EU

- A. Main switch 1S0
- B. Light 10H5
- C. Connector 1X0
- D. Connector 1X8
- E. Switch 8S1
- F. Switch 15S3
- G. Button / light 12S6/12H2
- H. Emergency button 11S2/1
- I. Connector X5

3 DESCRIPTION OF THE MACHINERY

3.4.4.2 Control cabinet platform manual UL/CSA

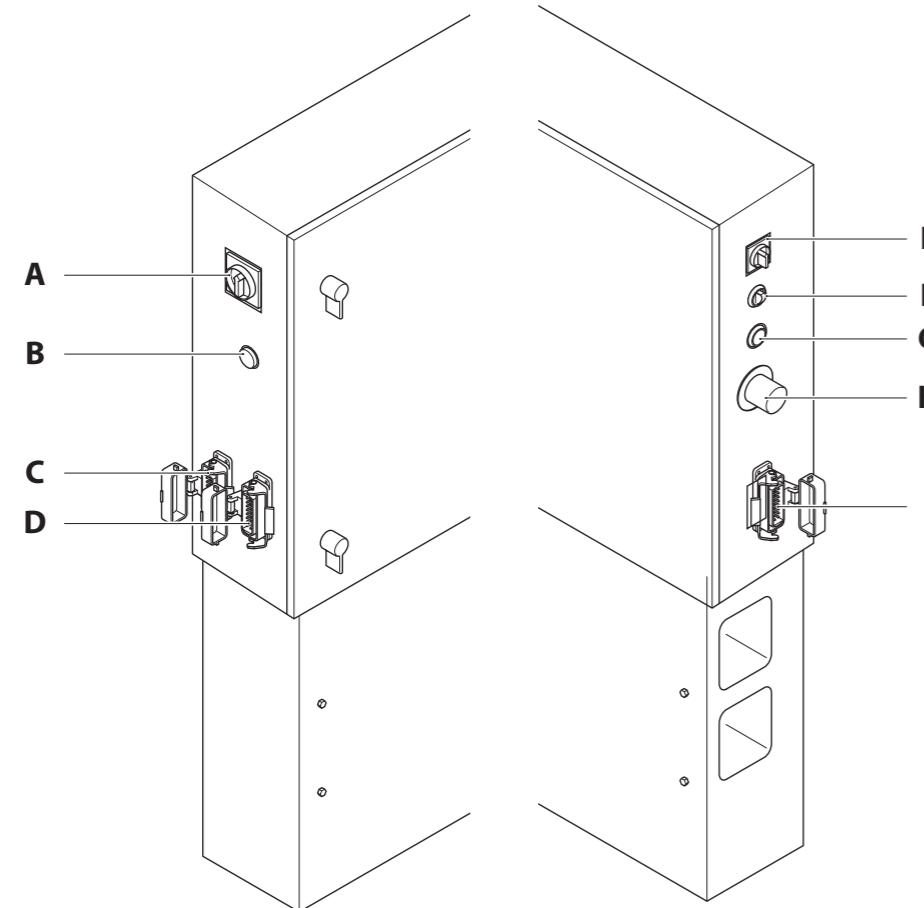


Fig. 11 Controls and indicators of the control cabinet platform manual UL/CSA

- A. Main switch 1S0
- B. Light 10H5
- C. Connector 1X0
- D. Connector 1X8
- E. Switch 8S1
- F. Switch 15S3
- G. Button / light 12S6/12H2
- H. Emergency button 11S2/1
- I. Connector X5

3.4.4.3 Control cabinet platform automatic EU

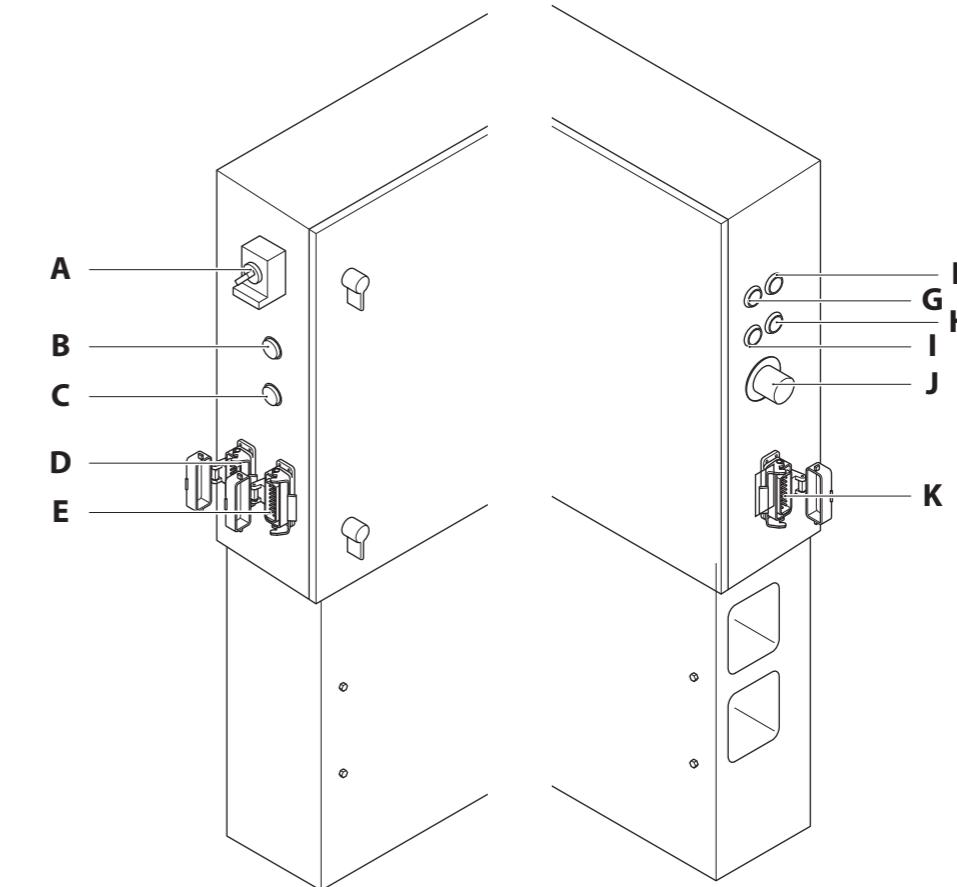


Fig. 12 Controls and indicators of the control cabinet platform automatic EU

- A. Main switch 1S0
- B. Light 17H9
- C. Buzzer 15H6
- D. Connector 1X0
- E. Connector 1X8
- F. Button / light 16S4/12H4
- G. Button / light 16S3/12H2
- H. Button / light 17S1/17H8
- I. Button / light 16S7/17H6
- J. Emergency button 11S2/1
- K. Connector X5

3 DESCRIPTION OF THE MACHINERY

3.4.4.4 Control cabinet platform automatic UL/CSA

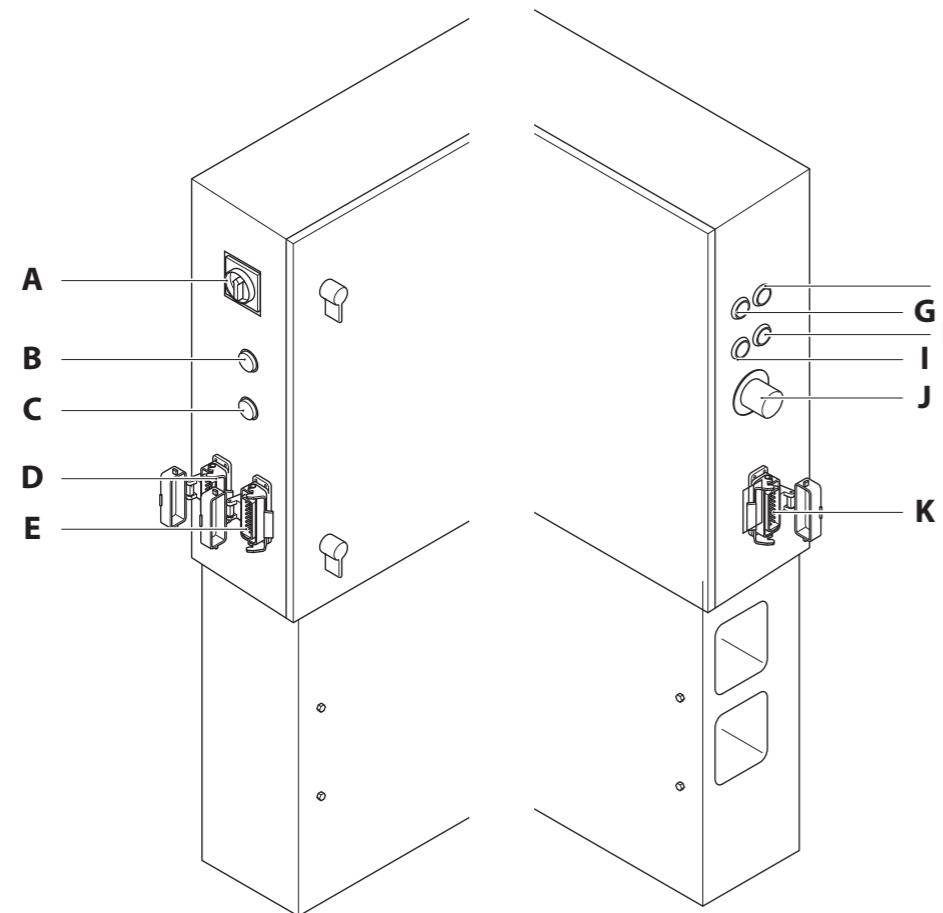


Fig. 13 Controls and indicators of the control cabinet platform automatic UL/CSA

A. Main switch 1S0	G. Button / light 16S3/12H2
B. Light 17H9	H. Button / light 17S1/17H8
C. Buzzer 15H6	I. Button / light 16S7/17H6
D. Connector 1X0	J. Emergency button 11S2/1
E. Connector 1X8	K. Connector X5
F. Button / light 16S4/12H4	

3.5 EXPLANATION OF VISUAL AND AUDITORY SIGNALS

Ref.	Signal	Meaning
A	Light flashes red	Moving between rooftops. Emergency stop. Machinery in interruption mode. Consult 9.2 Troubleshooting of the manual version or 9.4 Troubleshooting of the automatic version
A	Lights on green	Roof washer moves forward
A	Lights on blue	Roof washer moves backward
B	Light flashes red, between 1 and 12 times	Consult 9.2 Troubleshooting of the manual version or 9.4 Troubleshooting of the automatic version
C	Lights on red	Incorrect phase sequence
D	Beeps for 5 seconds	Platform is moving
D	Beeps for 30 seconds	Countdown for starting a washing cycle
E	Lights on green	Water pump on MANUAL mode
F	Lights on green	Waterpomp on AUTO mode
G	Lights on green	Main control on MANUAL mode
H	Lights on green	Main control on AUTO mode
I	Lights on red	Thermal fault platform
I	Light flashes red, between 1 and 12 times	9.2 Troubleshooting of the manual version

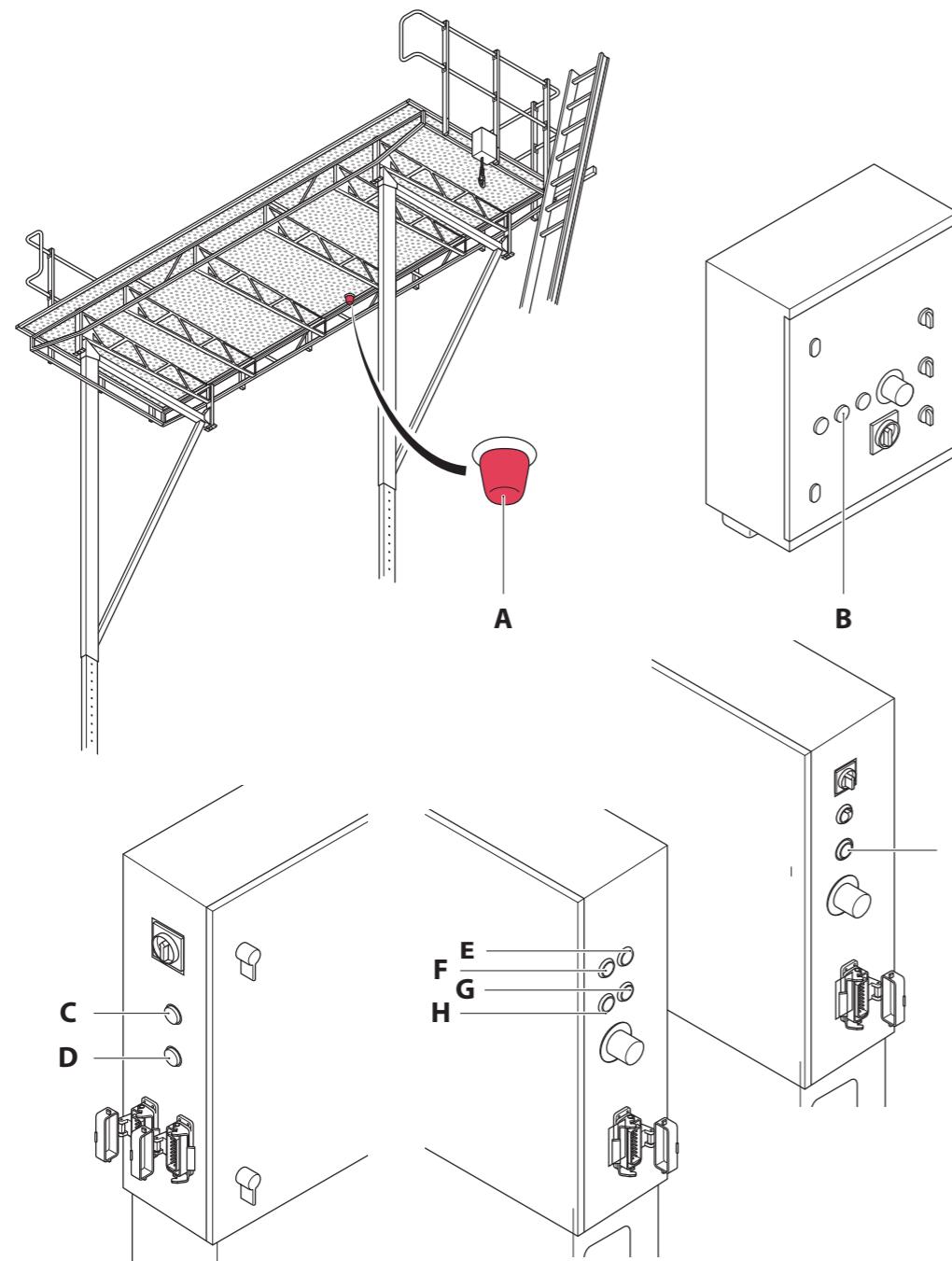


Fig. 14 Visual and auditory signals

3.6 TECHNICAL DATA

3.6.1 Position of the type identification plates

Position of the type identification plate on the roof washer:

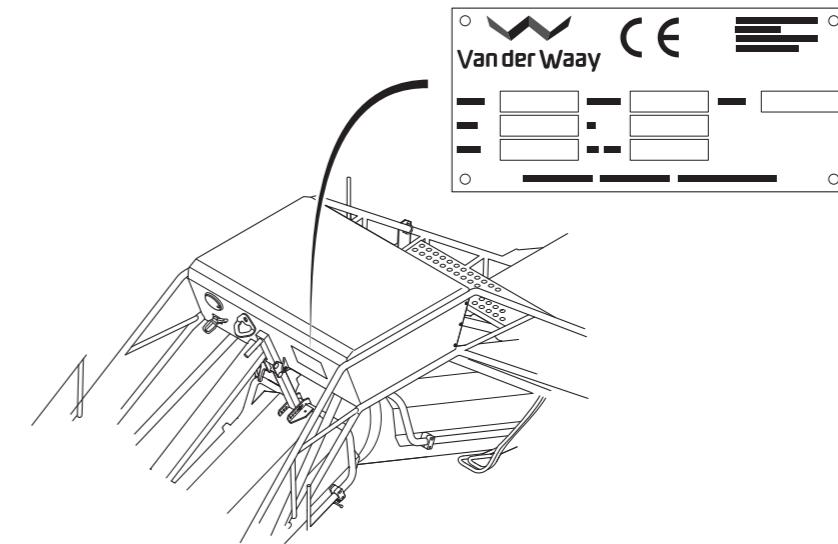


Fig. 15 Position of type identification plate roof washer

Position of the type identification plate on the platform:

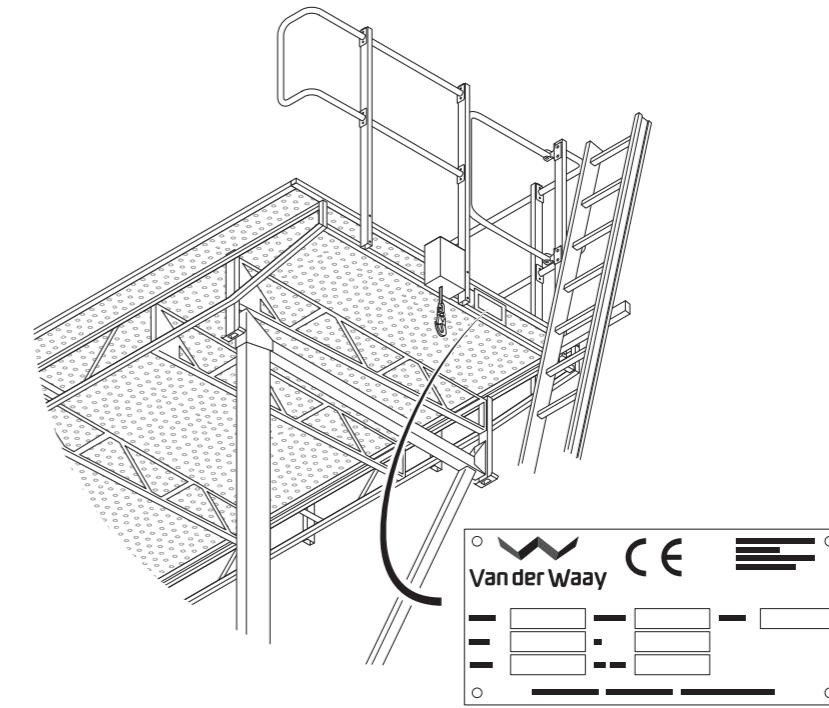


Fig. 16 Position of type identification plate platform

3 DESCRIPTION OF THE MACHINERY

3.6.2 General specifications

Top Cleaner	Unit	Value
Designation	-	Greenhouse Roof Washer
Model	-	Top Cleaner
Manufacturer	-	Van der Waay B.V. Finlandlaan 2, 2391 PV Hazerswoude The Netherlands
Year of construction	-	Refer to type identification plate
Country of manufacture	-	The Netherlands
Technical life span	-	10 years
Number of allowed persons on platform	-	2
Operating temperature	°C (°F)	0.5 ... +49 (33 ... +120)

3.6.3 Technical data of the roof washer

Roof Washer	Unit	Value
Propulsion	-	Electric/Hydraulic
Voltage	V	400/480
Frequency	Hz	50/60
Max. power	kW	4
Max. current	A	10
Velocity	m/min (ft/min)	0 ... +25 (0 ... +82)
Max. hose length	M (ft)	350 (1,150)
Hose diameter	mm (inch)	12.7 (0.5)
Max. cable length	m (ft)	350 (1,150)
Cable diameter	mm ² (AWG)	4 G1.5 (EUR) (4 G14)
Frequency band	MHz	868 (900)
Maximum radio-frequency Power transmitted in the Frequency band(s) in which the radio equipment operates	W	0.5
Oil pressure hydraulic system	bar (psi)	150 (2,175)
Hydraulic oil type	-	HV 32
Hydraulic oil volume	l (USgal)	8 (2.11)
Sound level	dB (A)	< 70
Pressure sound emission	dB	< 80
Weight	kg (lbs)	< 600 (1,322) (depending on options; consult type identification plate)

3 DESCRIPTION OF THE MACHINERY

3.6.4 Technical data of the platform

Platform	Unit	Value
Propulsion	-	Electric/Hydraulic
Voltage	V	400/480
Frequency	Hz	50/60
Max. power	kW	1.05
Max. current	A	3
Velocity	m/min (ft/min)	6 (20)
Max. hose length	M (ft)	125 (410)
Hose diameter	mm (inch)	25.4 (1)
Max. cable length	m (ft)	125 (410)
Cable diameter	mm ² (AWG)	4 G4,0 (EUR) (4 G12)
Frequency band	MHz	868 (900)
Maximum radio-frequency Power transmitted in the Frequency band(s) in which the radio equipment operates	W	0.5
Sound level	dB (A)	< 70
Pressure sound emission	dB	< 80
Weight	kg (lbs)	< 800 (1,800) (depending on options; consult type identification plate)

3.6.5 Technical data of the water pump

Water Pump	Unit	Value
Propulsion	-	Electric
Voltage	V	400/480
Frequency	Hz	50/60
Max. power	kW	4
Max. current	A	10
Water output	l/min (USg/min)	30 (8)
Max. pressure water pump	bar (psi)	70 (1,015)
Oil type	-	SEA10W-30
Oil volume	l (USgal)	1.1 (0.28)
Sound level	dB (A)	< 70

4.1 DIMENSIONS, MASS AND CENTER OF GRAVITY

4.1.1 Dimensions in mm (inches)

Model	A	B	C
320	4740 (186.6)	2399 (94.4)	2233 (87.9)
400	5540 (218.1)	2399 (94.4)	2233 (87.9)
427	5760 (226.8)	2400 (94.4)	2505 (98.6)
450	6040 (237.8)	2511 (98.9)	2233 (87.9)
480	6240 (245.7)	2599 (102.3)	2233 (87.9)

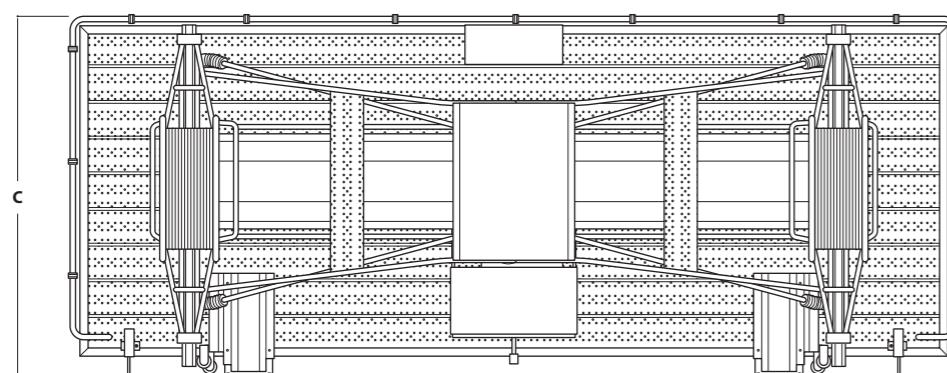
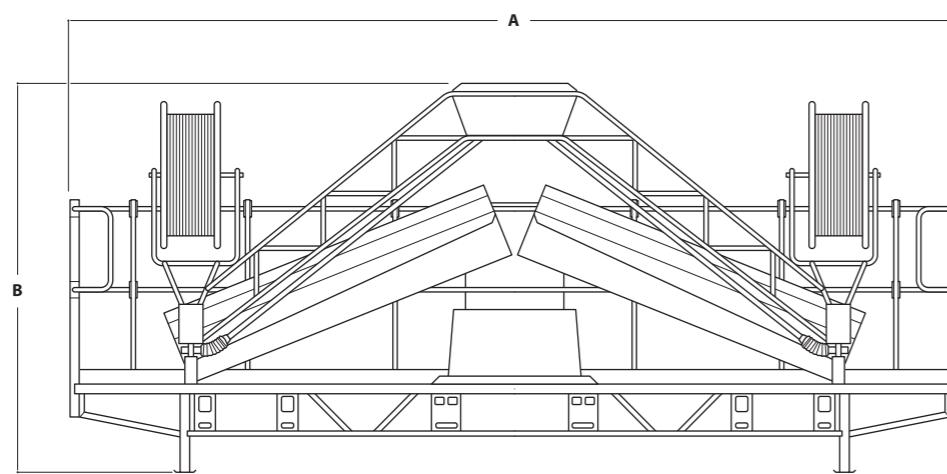


Fig. 17 Dimensions

4.1.2 Mass

Refer to the type identification plate for the weight of the roof washer and platform.

4.1.3 Center of gravity

⚠ WARNING

- Only lift the Glass Elevator by connecting a certified lifting sling and bow shackle to the pad eye. The machinery's center of gravity and the pad eye are shown in the image below.

The machinery's center of gravity is indicated with a downward pointing arrow in the image below. The lifting points which should be used to lift the machinery are indicated with A.

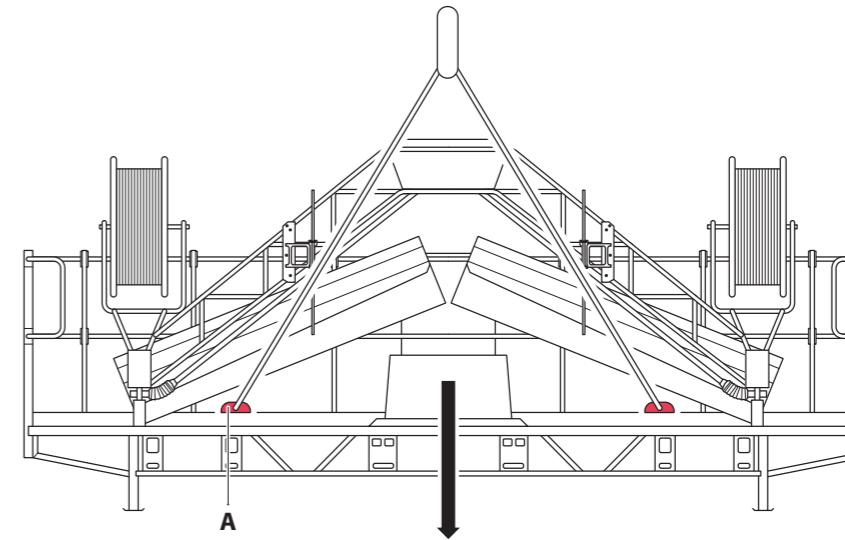
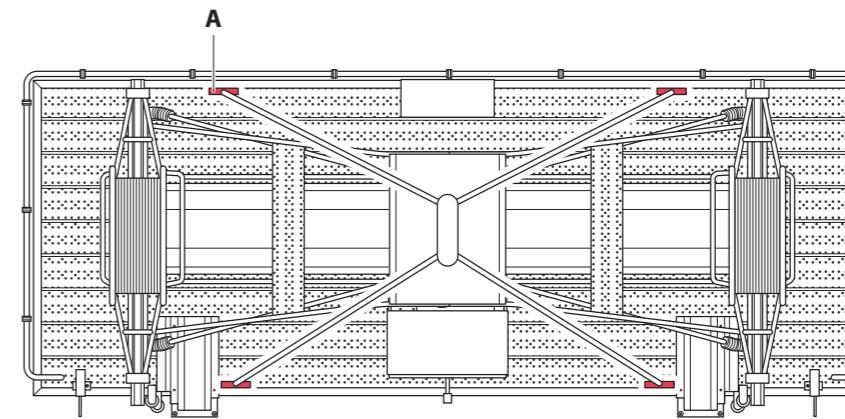


Fig. 18 Center of gravity and location of lifting points

4.2 HANDLING AND TRANSPORTING THE MACHINERY

⚠ WARNING

- Always make sure that the machinery and any of its parts are fixed during transportation, so there is no possibility of sudden movements or instability.

To handle and transport the Top Cleaner:

- Fasten the roof washer to the platform with four ratchet straps. Attach the ratchet straps to the four **lifting points of the roof washer A** and the four **lifting points of the platform** (see 4.1.3 *Center of gravity*).

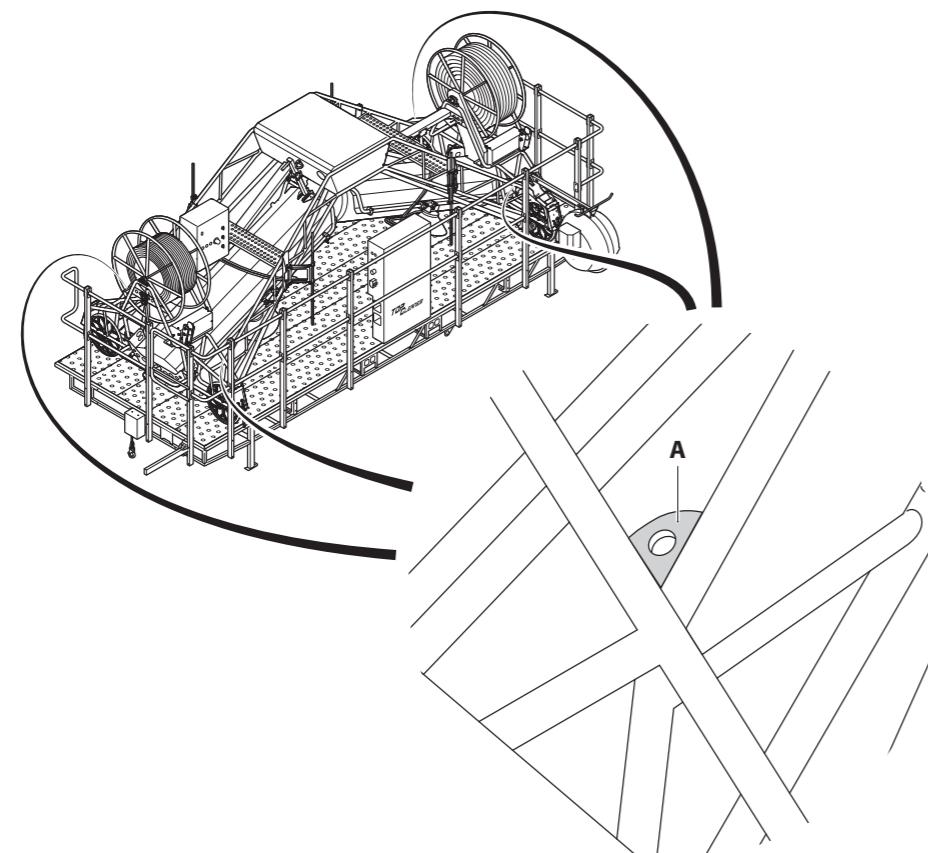


Fig. 19 Securing the machinery with ratchet straps

- Use a forklift truck to lift the machinery. Only use the forklift lifting points, indicated by the blue stickers on the platform. **WARNING!** Do not stand or walk under the lifted machinery.
- Place the machinery horizontally on a trailer with a flat surface and sufficient capacity.
- Secure the machinery against shocks by fixing the steel base of the platform with ratchet straps with sufficient strength to the trailer. **NOTICE** Make sure there is no possibility of sudden movements and or instability.

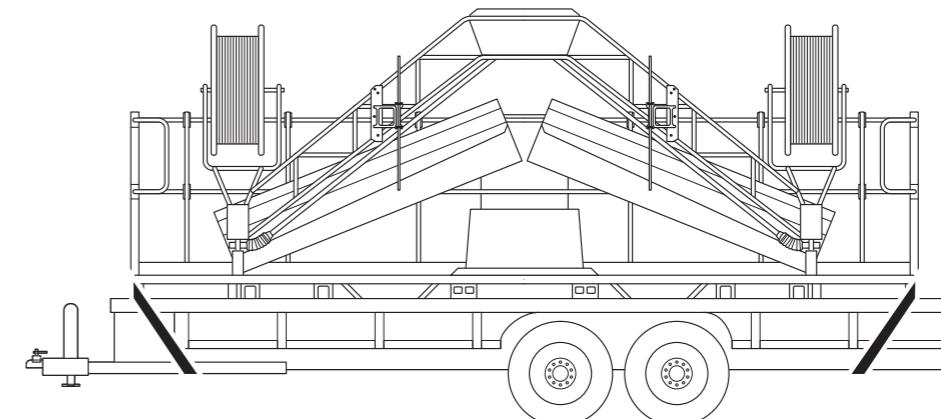


Fig. 20 Securing the machinery with ratchet straps

- Transport the trailer with the machinery carefully to the desired location.

DANGER

- Always use appropriate personal protective equipment when working with the machinery, such as protective gloves, safety shoes (minimum class S3), safety goggles, safety harness, hard hat, lifeline and protective overalls.
- Wear sun protective clothing if necessary and use sunscreen to protect exposed body parts against the sun.
- Wear warm and water resistant clothing against the cold or when it is raining.
- Installation and commissioning shall be carried out by a properly qualified and skilled installer with due observance of the applicable rules and legislation. The installer is responsible for employing skilled and qualified personnel.
- Always fence off the work area for unauthorized persons prior to installation. Ensure public safety, depending on the situation. For example by securing the area with fences, barrier tape or traffic cones when working near a public road or other works.
- During installation be mindful of personal injuries.
- Check the machinery for damage before installation. If there is any visible damage, do not install the machinery. Contact the manufacturer.
- Inform yourself properly with respect to the prescribed safety devices on the basis of the EU directives and local regulations on working at heights. All local regulations must be followed.
- Consult available construction reports, certificates, etc. to make sure that the greenhouse rail, gutters and end-gutter protection are of sufficient strength to carry the weight of the machinery and everyone and everything on the machinery. Refer to the type identification plate for the weight of the machinery. Contact your greenhouse builder in case of any doubts.
- In the event that you have to do installation tasks for which you need to move yourself on the machinery, make sure that you have an evacuation plan drawn up by an official safety expert.
- Make sure that all steel beams, angle irons, straps and cable ties that are used as transport protection are removed.

5.1 HOW TO CHECK THE CONTENTS OF THE DELIVERY

Make sure that your delivery contains the following (exact scope of delivery depends on what you ordered):

- Roof washer with platform
- Ladder
- Anti-climb protection including padlock
- Water supply hose
- Power supply cable
- Elastic cord for fall arrest device
- Remote control undercarriage
- Remote control roof washer and platform
- Operation display (for automatic version only)
- Gutter brush (optional)
- Dosing pump (optional)
- Certified 4-way webbing lifting sling
- Certified safety harness(es) (optional)
- Certified double lifeline(s) of 2 meters (6.5 ft) (optional)
- Toolbox
- Coating Controller Box (optional)
- Spray booms (optional)
- Spare parts (optional)
- Organizer with documentation
- Foundation extensions (optional)
- Storm anchor kit
- Additional storm anchor plates (optional)

5.2 HOW TO PREPARE THE GREENHOUSE

5.2.1 Install the storm anchor plates

1. Make sure the machinery is placed on the rail of the greenhouse, before attaching the anchor plates. See *5.5 How to place the machinery on the rail of the greenhouse*.
2. Determine two suitable spots on the greenhouse foundation to bolt the **anchor plates** to. Each anchor plate should be approximately 30 cm (11.8 inch) on the outside of each platform leg. **NOTICE** Never place it at the level of the first or last roof top. Make sure the anchor plates are not attached at the same height as the lower wheels, when the greenhouse does not have a bottom rail.
3. Mark off and drill four holes per **anchor plate** in the concrete foundation of the greenhouse and attach the **anchor plates** with the **wedge bolts**.

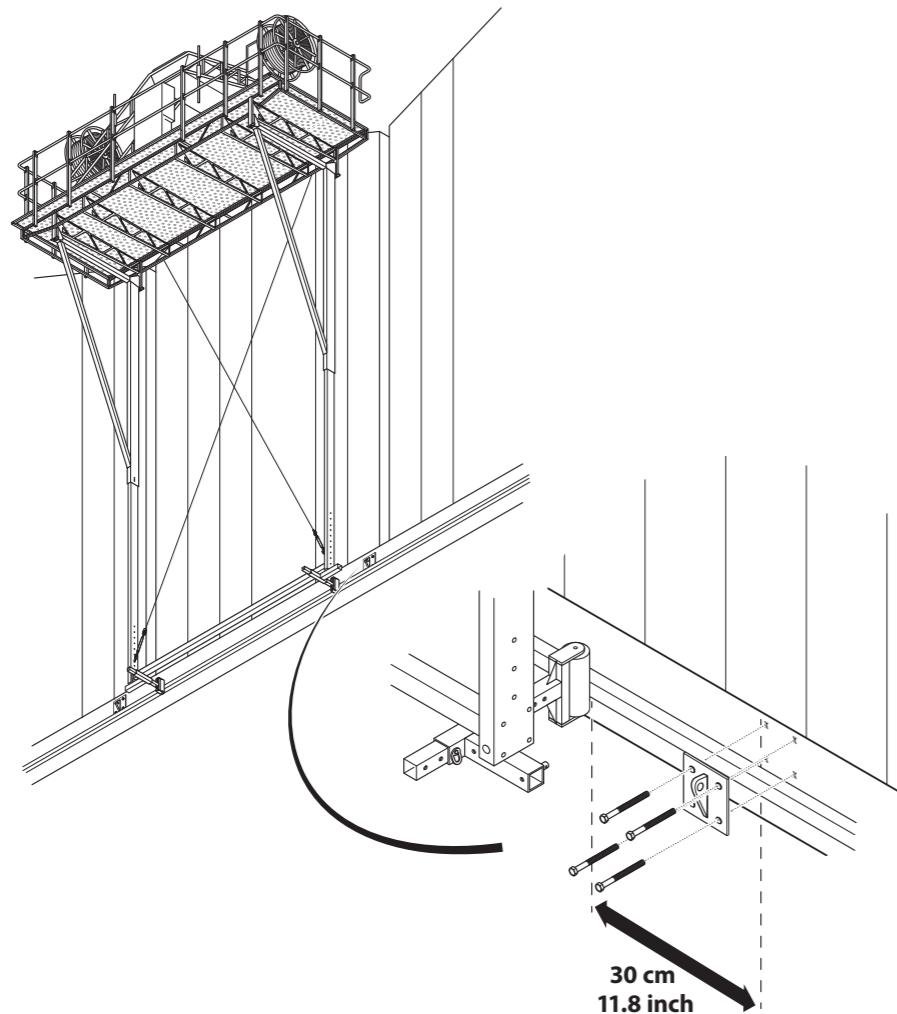


Fig. 21 Installing the anchor plates

5.2.2 Install the foundation extensions

DANGER

- Make sure that the supplied foundation extensions are attached to both side gables of the greenhouse if the greenhouse does not have a bottom rail. If the lower wheels of the platform hit next to the foundation, the platform may fall off the greenhouse.
- Make sure that the bottom rail extends at least 50 cm (127 inch) beyond both side gables of the greenhouse. If the platform's lower wheels hit next to the foundation, the platform may fall off the greenhouse.
- Make sure that the bottom rail is immovably secured along the entire length of the greenhouse gable and is not bent.

To install the foundation extensions:

1. Each **foundation extension** shall be installed on each corner of the greenhouse foundation.
2. Mark off and drill eight holes per **foundation extension** in the concrete foundation of the greenhouse and attach the **foundation extension** with the **wedge bolts**.

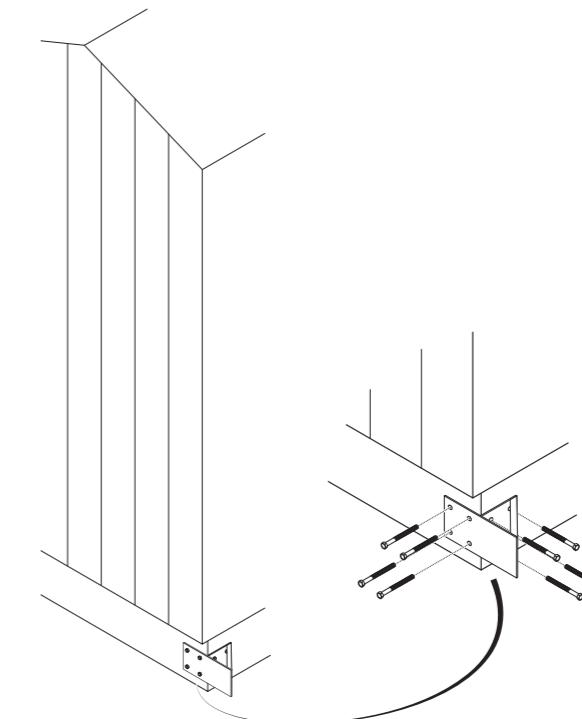


Fig. 22 Installing the foundation extensions

5.3 HOW TO PREPARE THE PLATFORM

The following subparagraphs describe how to prepare the platform. The subparagraphs, as well as their instructions, shall be followed in the order they are presented in. Do not skip a subparagraph or an instruction and continue until the last instruction of the last subparagraph to fully prepare the platform.

Required tools:

- Several tools that can be found in the supplied tool box.

Prerequisites:

- Make sure there is the following power supply along the greenhouse gable:
 - 400V; 50Hz; 32A (EU)
 - 480V; 60Hz; 30A (North America)
- Make sure there is the following water supply along the greenhouse gable:
 - 2,500 l/h; 3 bar (EU)
 - 660 USg/hr); 44 psi (North America)

5.3.1 Install the foundation extensions

⚠ WARNING

- Only a qualified electrician shall carry out the electrical installation and the initial activation.
- Only connect the machinery to a grounded socket with earth leakage protection that is connected in accordance with the legal guidelines.
- Check the machinery and the cables for damage before electrical installation.
If there is any visible damage, a strong odor or excessive heating of components, disconnect the power supply immediately and do not use the machinery.
- Protect disconnected plugs against rain and keep them away from moisture.
- Only use extension cords of the same quality as the original ones and with a diameter of at least 4mm² (12 AWG).

Connect the supplied power cable to 400V (EU) or 480V (UL/CSA) wall socket along the greenhouse gable. **WARNING!** It is only allowed to connect the machinery to a 5-pole wall socket that is secured by a circuit breaker of 32A (EU)/ 30A (UL/CSA) with an earth leakage protection in conformity with the legal requirements. Please have your electrician check this.

1. Connect the other end of the **power cable A** to the **connector 1X0 B** of the **control cabinet platform C**.

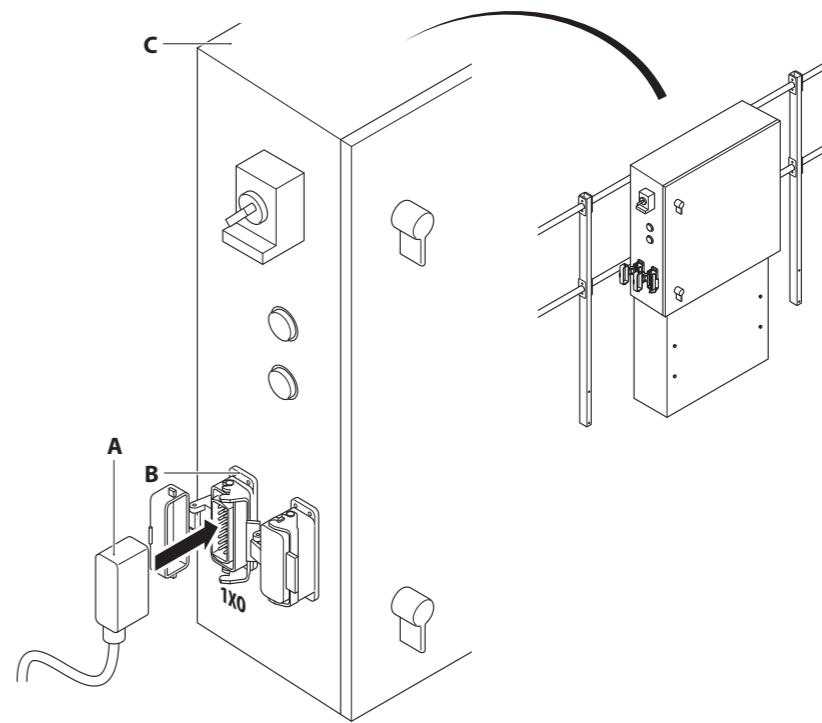


Fig. 23 Connect the power cable to the control cabinet platform

2. Attach the **cable pulling grip** **B** of the **power cable** **A** with the supplied **carabiner** **C** to the **eye** **D** on the platform

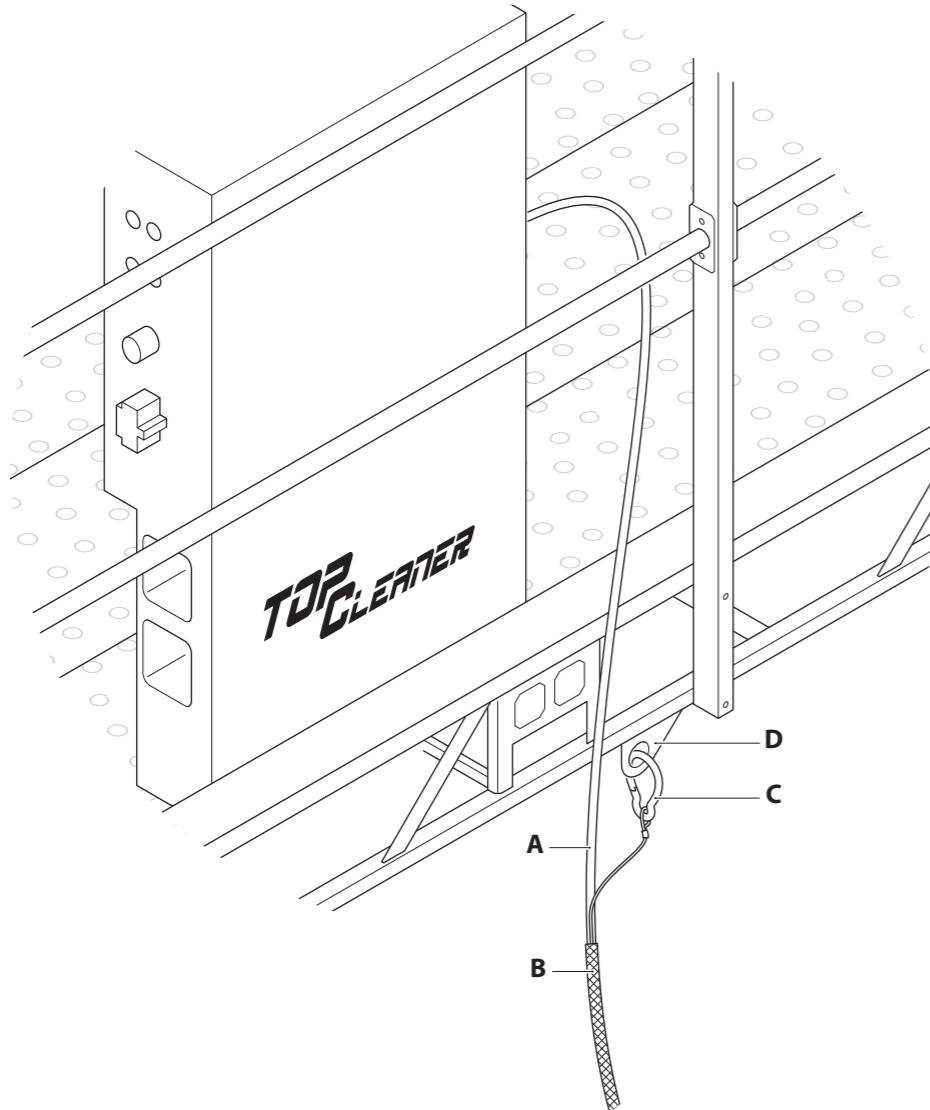


Fig.24 Attach the cable pulling grip

3. Choose one of the following:

a. For the *EU version*: Set the **main switch 1S0** **A** to **position 1**.

NOTICE When the **red light** **B** comes on, the phase sequence is incorrect.

Turn the **main switch 1S0** **A** to **position 2** until the **red light** **B** is off.

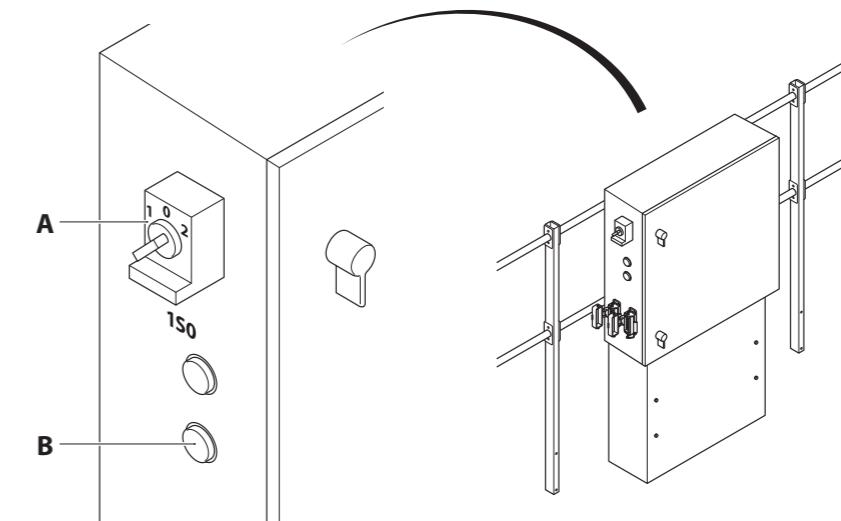


Fig. 25 Set the main switch - EU version

b. For the *North American (UL/CSA) version*: Set the **main switch 1S0** **A** to the **ON** position. **NOTICE** When the **red light** **B** comes on, the phase sequence is incorrect. Ask an electrician to interchange two phase wires in the **power plug**. Never interchange the electric wiring in the **control cabinet platform**.

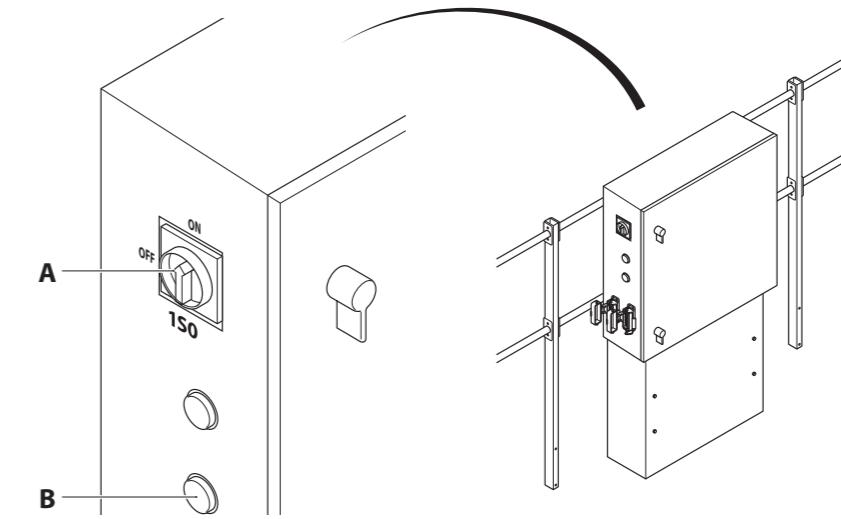


Fig. 26 Set the main switch - UL/CSA version

5.3.2 Connect the water supply

1. Unroll the first 50 meter (165 ft) **water hose A** (the one with the cable pulling grip).
2. Unroll the remaining hose roll(s) and connect it to the first 50 meter (165 ft), and to the water supply at the greenhouse.
3. Flush the hose to remove contamination.
4. Connect the **water hose A** to the **float tank B**.

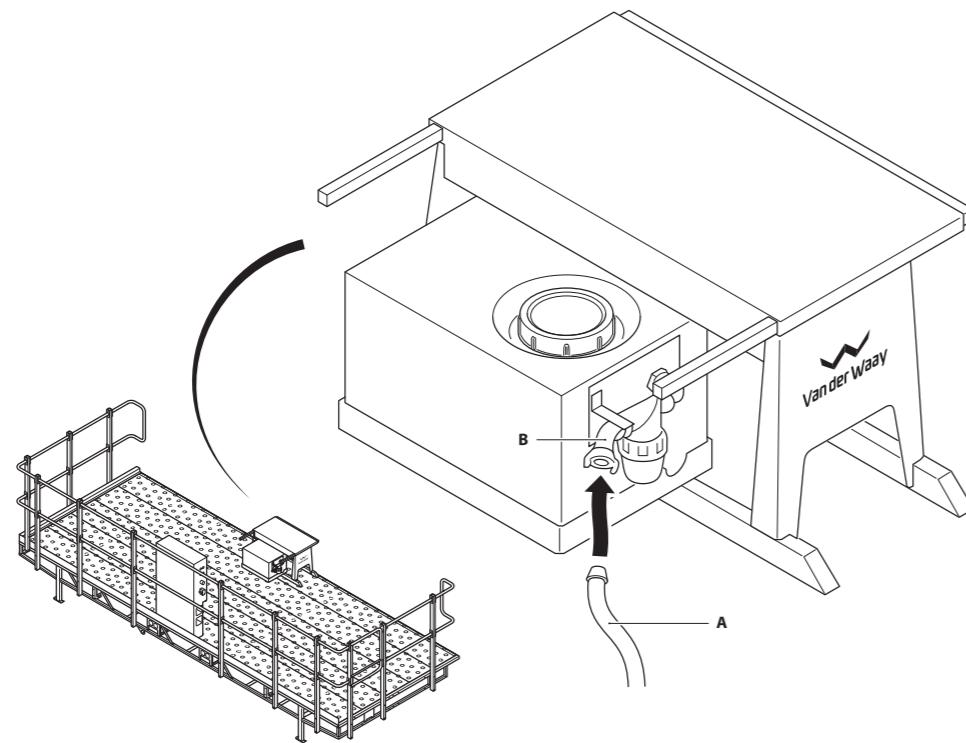


Fig. 27 Connect the water hose

5. Attach the **cable pulling grip B** of the water hose with the supplied **carabiner C** to the eye on the platform.

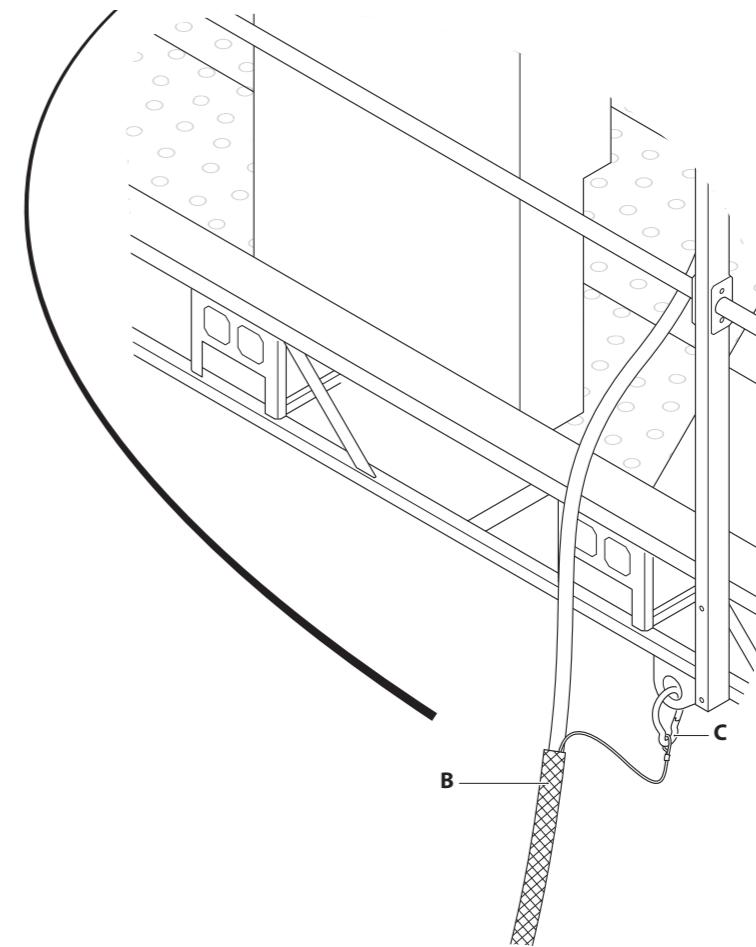


Fig. 28 Attach the cable pulling grip

5.3.3 Connect the remote control undercarriage

1. Disconnect the **dummy plug** **A** from **connector X5** **B** on the **control cabinet** **platform** **C**.

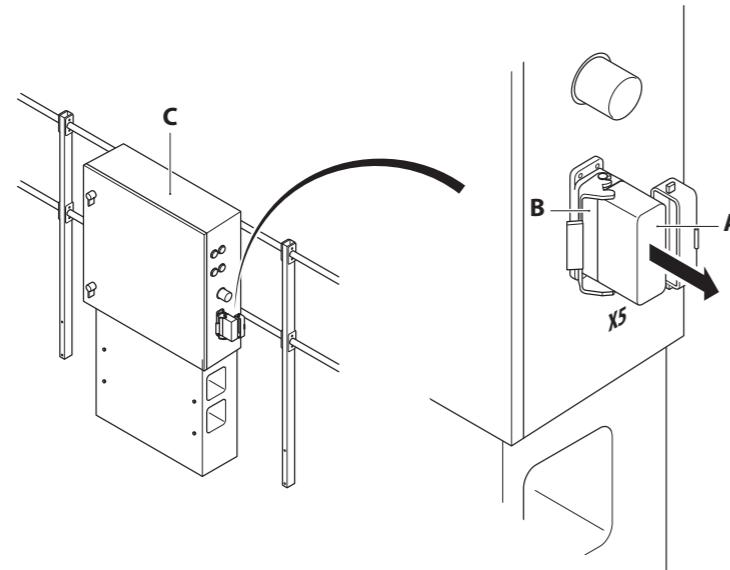


Fig. 29 Disconnect the dummy plug

2. Connect the **remote control undercarriage** **A** to **connector X5** **B**.

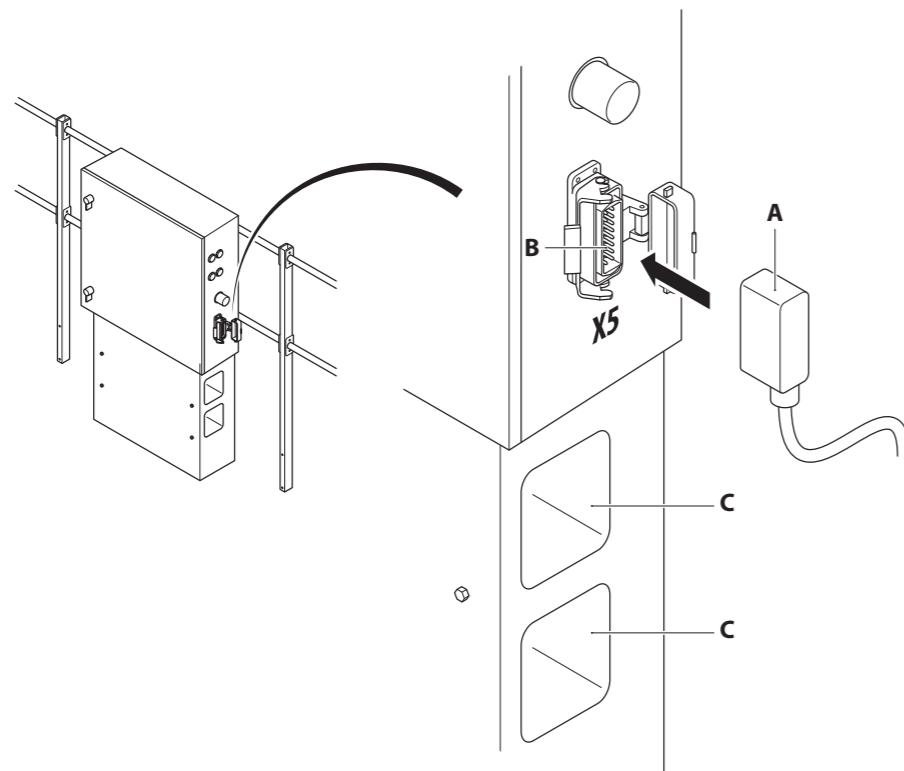


Fig. 30 Connect the remote control undercarriage

3. Unroll the **cable** of the **remote control undercarriage** and put the **remote control undercarriage** on the ground.

4. Attach the **cable pulling grip** **A** with the supplied **carabiner** **B** to the eye bolt on the **platform**.

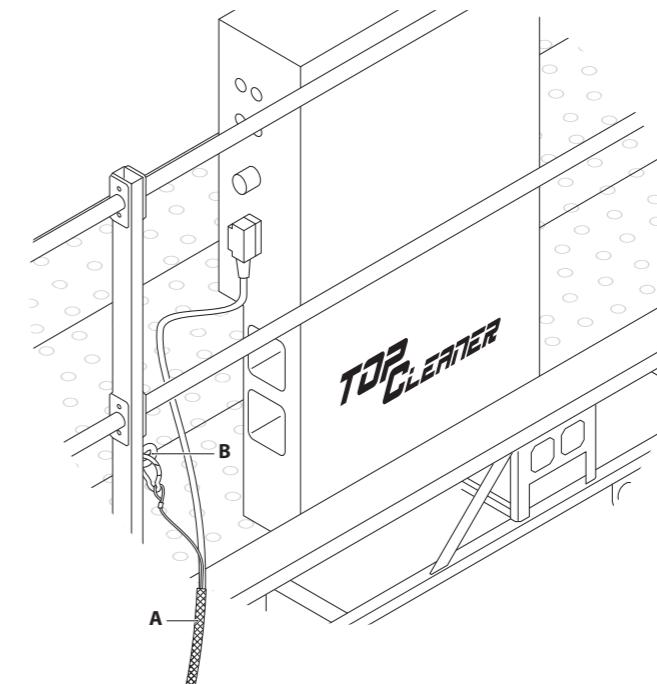


Fig. 31 Attach the carabiner of the cable pulling grip

5. Make sure that the **platform legs** respond correctly to the **remote control** by pushing the **lower platform leg down button** **B** and **upper platform leg down button** **A**.

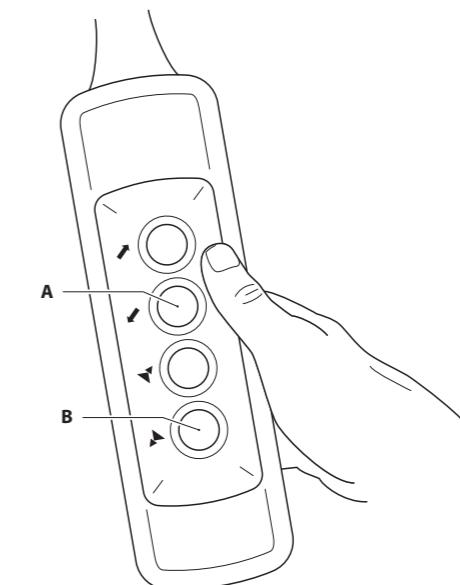


Fig. 32 Test the remote control

5.3.4 Prepare the remaining parts of the platform

1. Releasing the **index bolt** **B**, unfold the **upper ladder support** **A** fully and secure the **upper ladder support** with the **index bolt** **B** again.

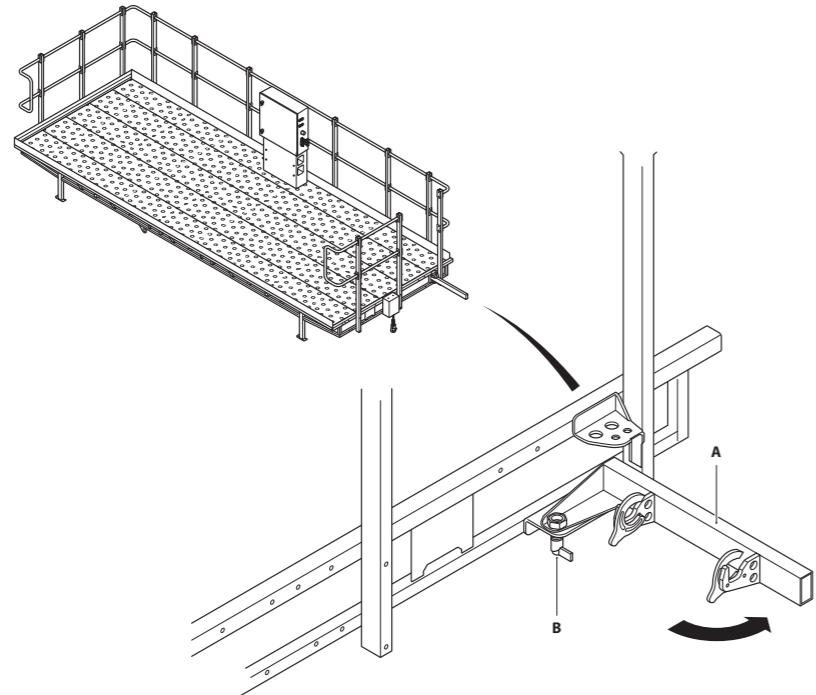


Fig. 33 Unfold the ladder support

2. Slide both **ladder lock hooks** **A** fully open.

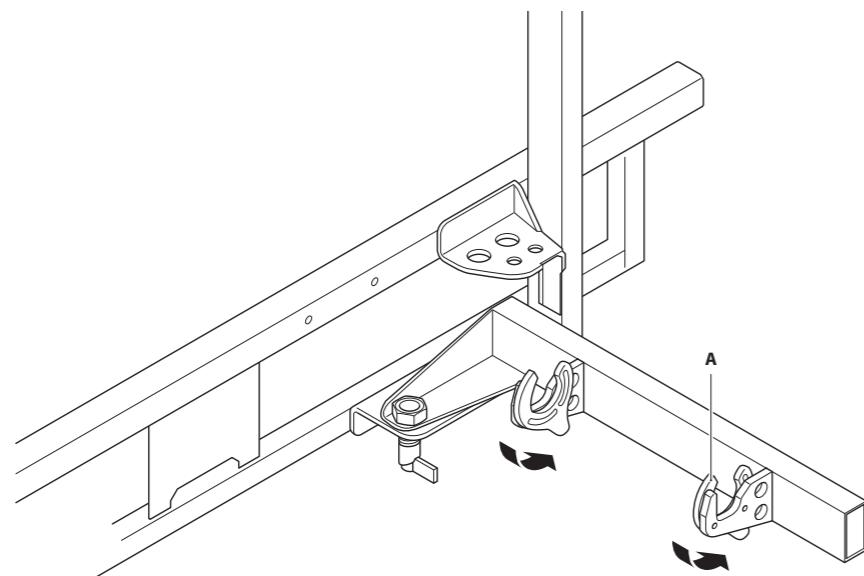


Fig. 34 Open ladder lock hooks

3. Attach the supplied **red elastic cord** **A** to the **fall arrest device** **B**.

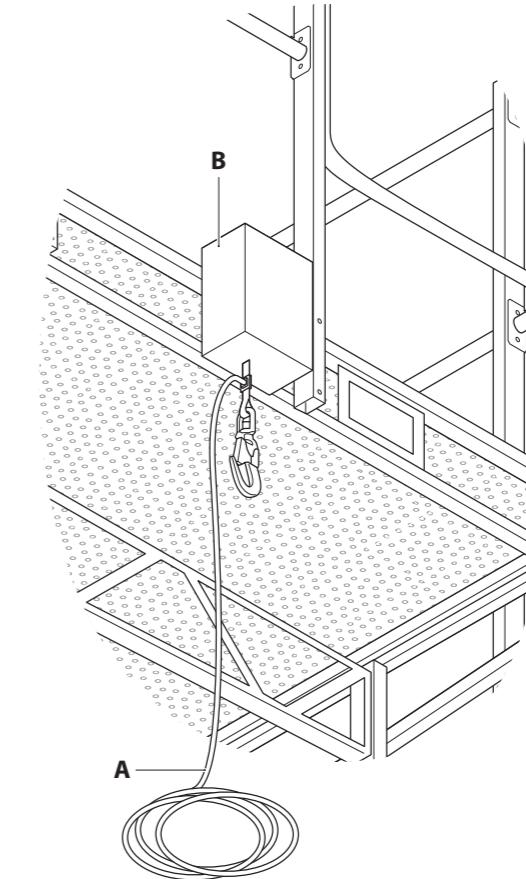


Fig. 35 Attach cord to fall arrest device

4. Take the **lower beam** and make sure that it has the correct **lower wheels**:
 - a. **White nylon wheels** **A** for greenhouses with bottom rail.
 - b. **Black single wheels** **B** for greenhouses with concrete foundation without bottom rail.
 - c. **Black double wheels** **C** for greenhouses with insulation plates without bottom rail.

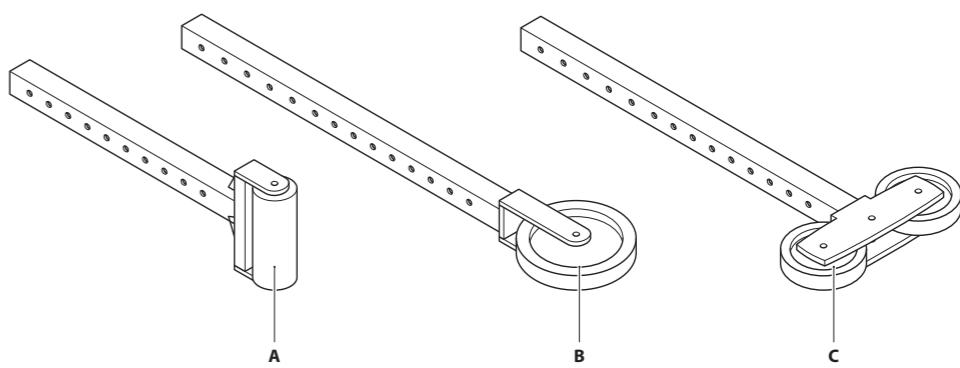


Fig. 36 Three different lower wheels

5 PREPARATION

- Move the **lower wheels** **A** into the **lower beam** **B**. **NOTICE** Make sure that the **THIS SIDE UP sticker** on the **lower beam** is facing upwards.
- Secure the **lower wheels** with the **locking pins** **C** and **retaining clips** **D**. **NOTICE** Make sure to place the white nylon wheels in the correct position (with the **nut** **E** facing upwards).

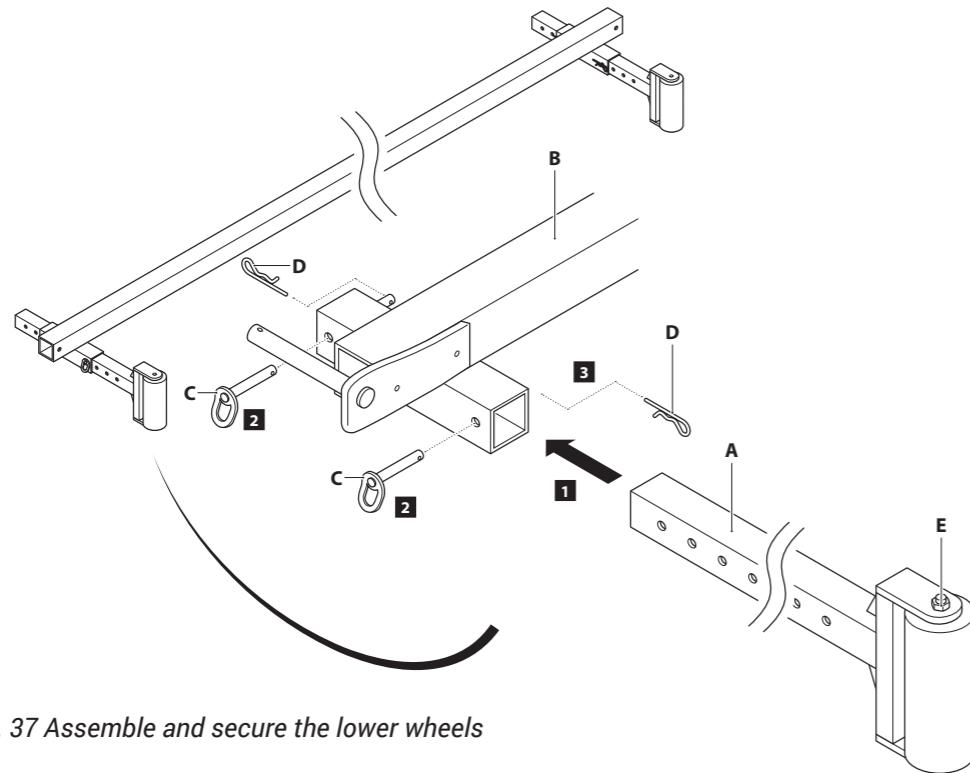


Fig. 37 Assemble and secure the lower wheels

- Disconnect the optional **display support** **A** and **Scaff clamps** **B** (for automatic platform only) from the **hand railing** **C**. And put this and the **operation display cable** on the ground.

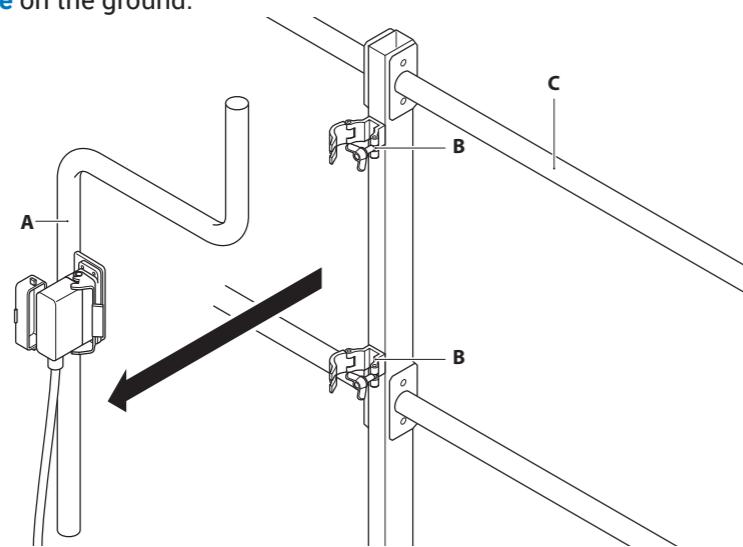


Fig. 38 Disconnect the optional display support

- Make sure that the **roof detection switch** **A** is facing backwards before lifting the machinery.

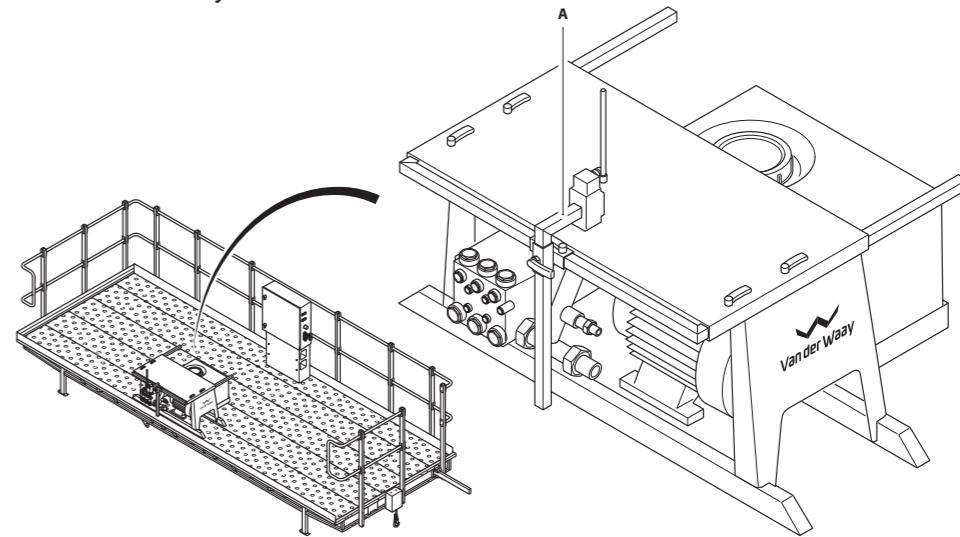


Fig. 39 Roof detection switch correct position

- Make sure the space between the **counter bearings** of the **drive wheels** **A** is 10 mm (0.4 inches) larger than the width of the **top rails** **B** of the greenhouse. If needed, loosen the counter bearing's bolt, move the counter bearing to the right position and tighten the bolt. Do the same for the second drive counter bearing.

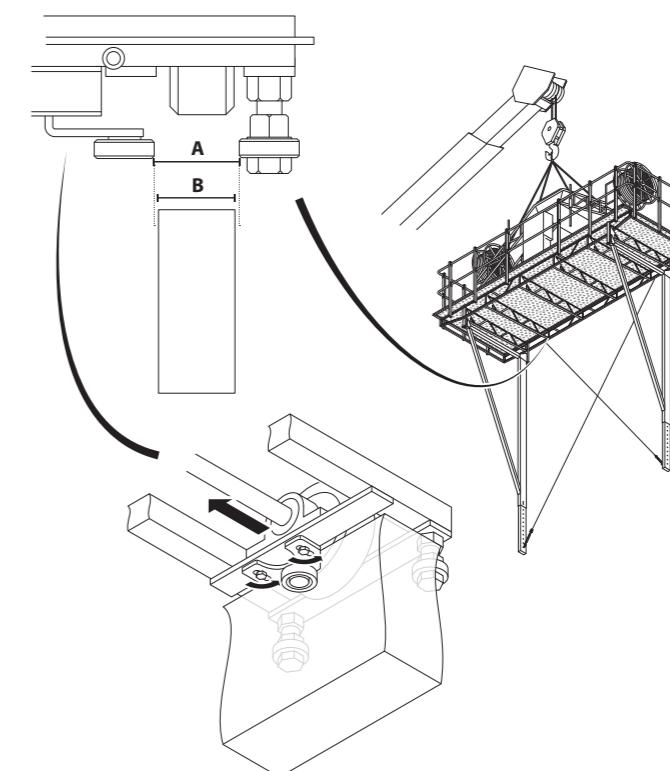


Fig. 40 Adjusting the counter bearing

5.4 HOW TO PREPARE THE ROOF WASHER

1. Optionally, attach the **gutter brush** **A**, with the four **scaff clamps** **B** to the **roof washer frame** **C**. **NOTICE** Remove the **railing** **D** at the back of the platform at the side where the gutter brush is attached.

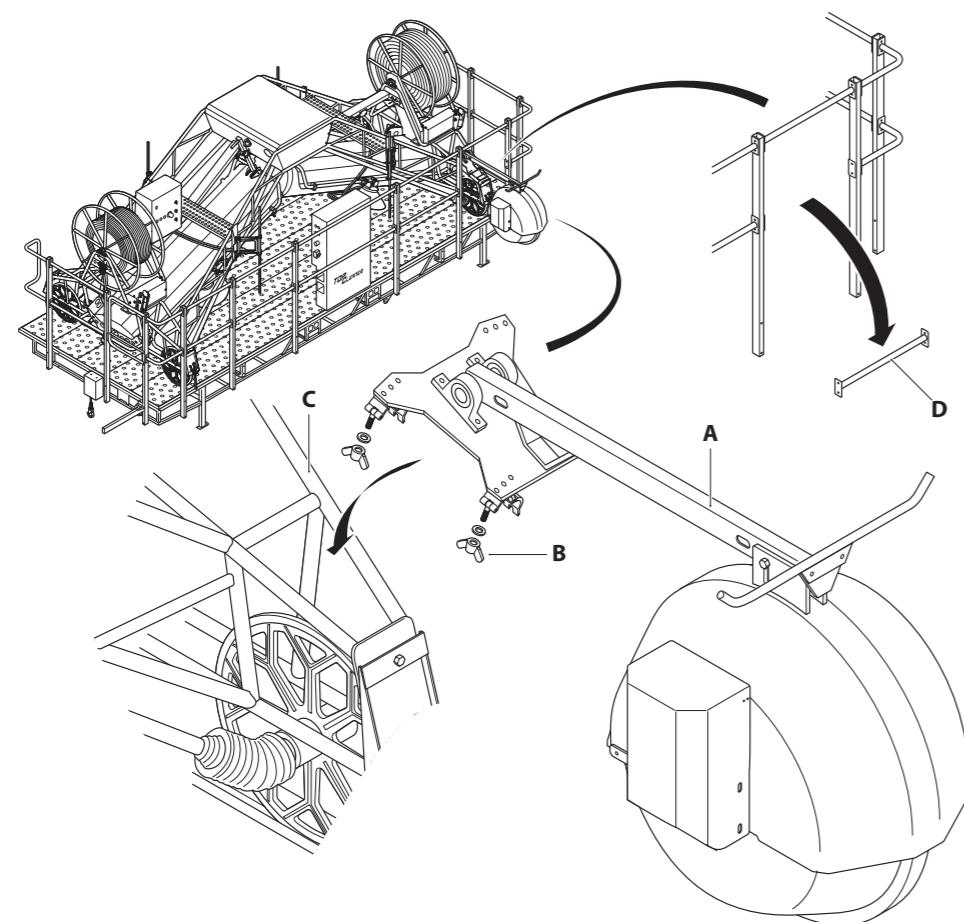


Fig. 41 Attach the gutter brush (optionally)

2. Choose one of the following:

- a. When the **gutter brush** is connected at the right side (hose reel side), connect the **power cable** **A** to the **gutter brush connector** **B**.

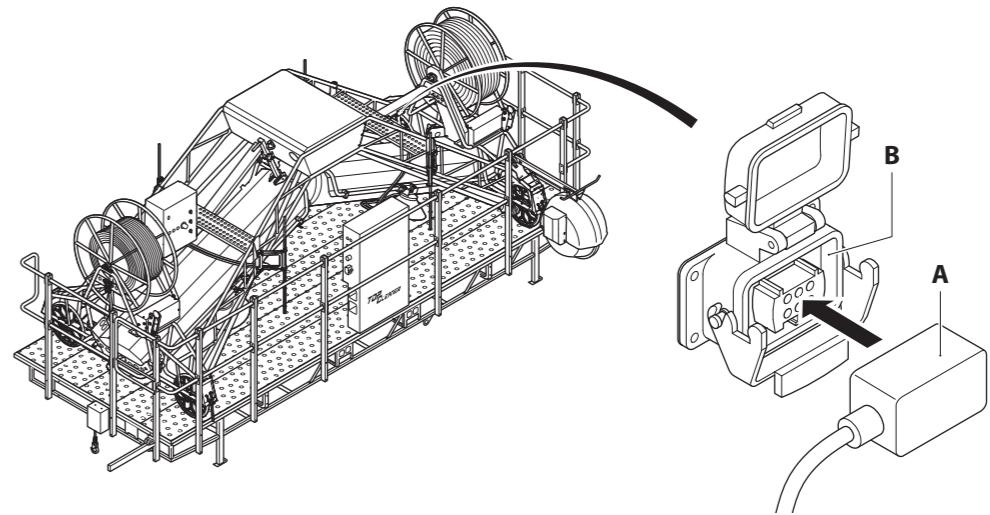


Fig. 42 Connect the power cable when gutter brush is on the right side

- b. When the **gutter brush** is connected at the left side (cable reel side), connect the **power cable** **A** to the **gutter brush connector** **B** at the bottom of the **control cabinet roof washer**.

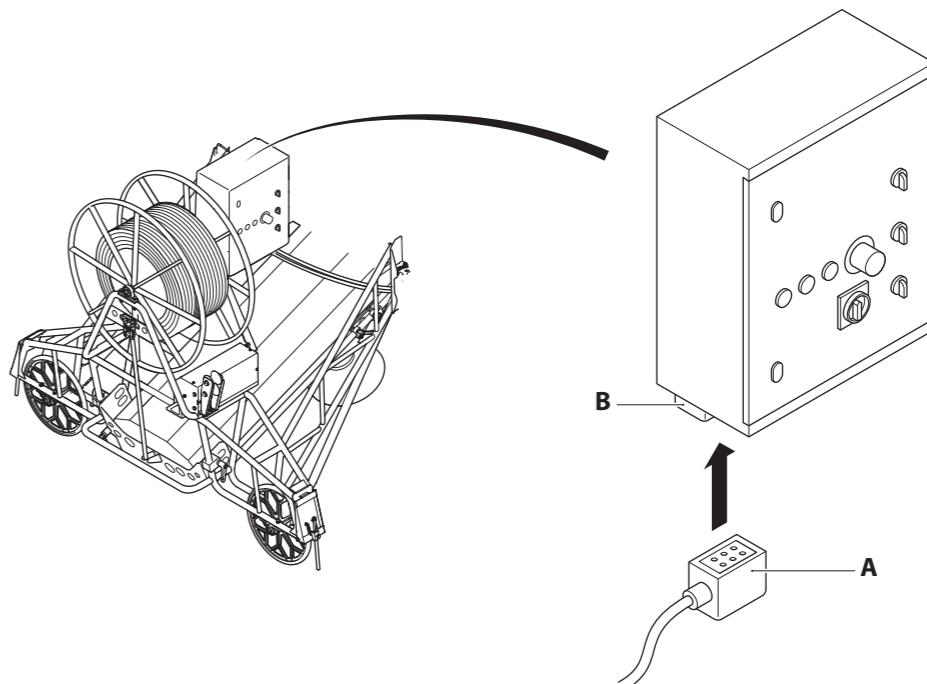


Fig. 43 Connect the power cable when gutter brush is on the left side

3. Optionally remove the four **carbon tubes A**, which are temporarily attached with cable ties, on the roof washer frame to prepare the window protection switches.

NOTICE If you have the spray option installed, remove the middle spray boom first. Consult the manual of the spray booms for instructions on how to remove these parts (see *1.7 Other documentation*).

4. Attach each of the **carbon tubes A** to a **window protection switch B**. By putting a **carbon tube A** in **holder C** and tighten the **holder C** carefully.

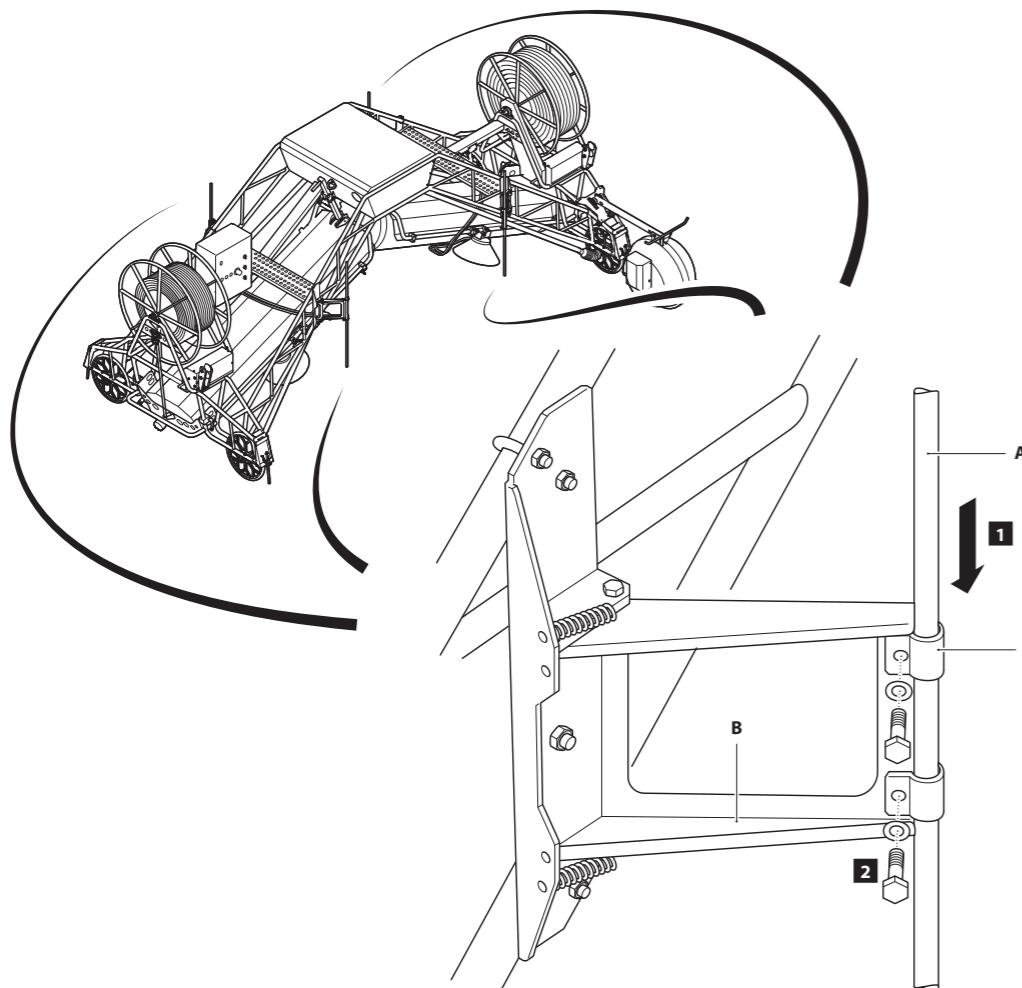


Fig. 44 Prepare the window protection switches

5.5 HOW TO PLACE THE MACHINERY ON THE RAIL OF THE GREENHOUSE

DANGER

- Lifting works shall only be carried out by authorized persons.
- When lifting the machinery, use only approved lifting tools with sufficient lifting capacity.
- Always carry out lifting with more than one person, even when using lifting tools.
- Only use a certified four-way webbing lifting sling with a minimum length of 3 meters (10 feet) and a minimum capacity of 4 x 1000 kg (4 x 2200 lbs). Only lift the machinery by the designated lifting points.
- Always use the lifting points when lifting the machinery, to avoid the risk of tilting.
- Make sure that you carry out lifting works on a flat and hardened surface. Apply road plates if necessary.
- Make sure that there are no persons within the turning range of the crane during lifting works.
- Never stand directly underneath the machinery during lifting tasks and always be aware of possible falling objects. Failure to do so can result in serious injury or death.
- Check the lifting tools for damage before lifting. If there is any visible damage, do not lift the machinery.
- Do not lift the machinery with wind speeds above 17 m/s (38 mph).
- Make sure that there is a minimum of 20 cm (8 inch) of free space between the ground and the bottom of the lower wheels at all times.

Required tools:

- Telehandler or crane
- Stepladder (optional)

5 PREPARATION

To place the machinery on the rail of the greenhouse:

1. Attach the four hooks of the **four-way webbing sling** **A** to the four red **lifting points** **B** on the **platform**. **CAUTION!** Make sure to put the legs of the four-way webbing sling **in front** of the **window protection switches** **C**.

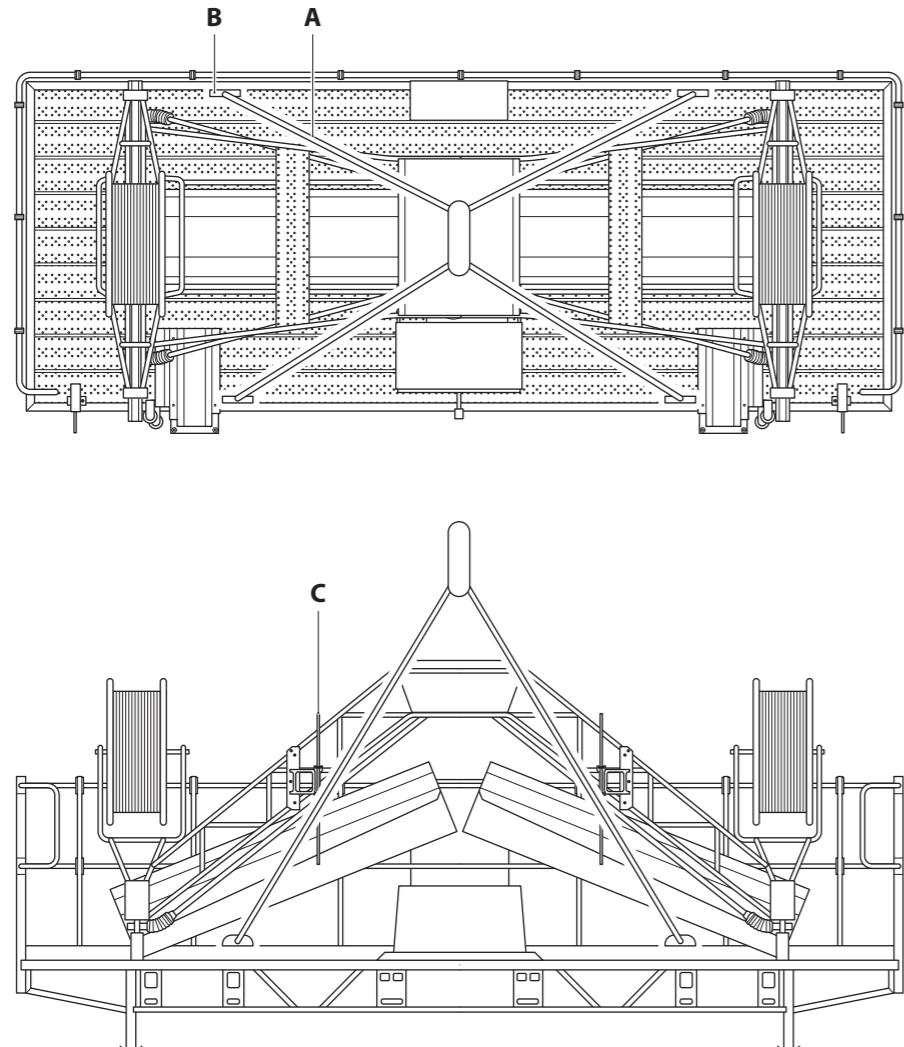


Fig. 45 Attach the four hooks of the four-way webbing sling

2. Attach a **guiding rope** to the hand railing of the **platform** so you can hold the **platform** in position if necessary. **WARNING!** Never loop the rope around your hand, arm or body when guiding the load, to avoid being dragged along with the load.
3. Use the **crane** to lift the **platform** with the **roof washer** 5 meters (16 feet) off the ground.

4. Push the **lower platform leg down button** to unfold the **lower platform leg** **B** vertically. Do the same with the **upper platform leg down button** **A**.

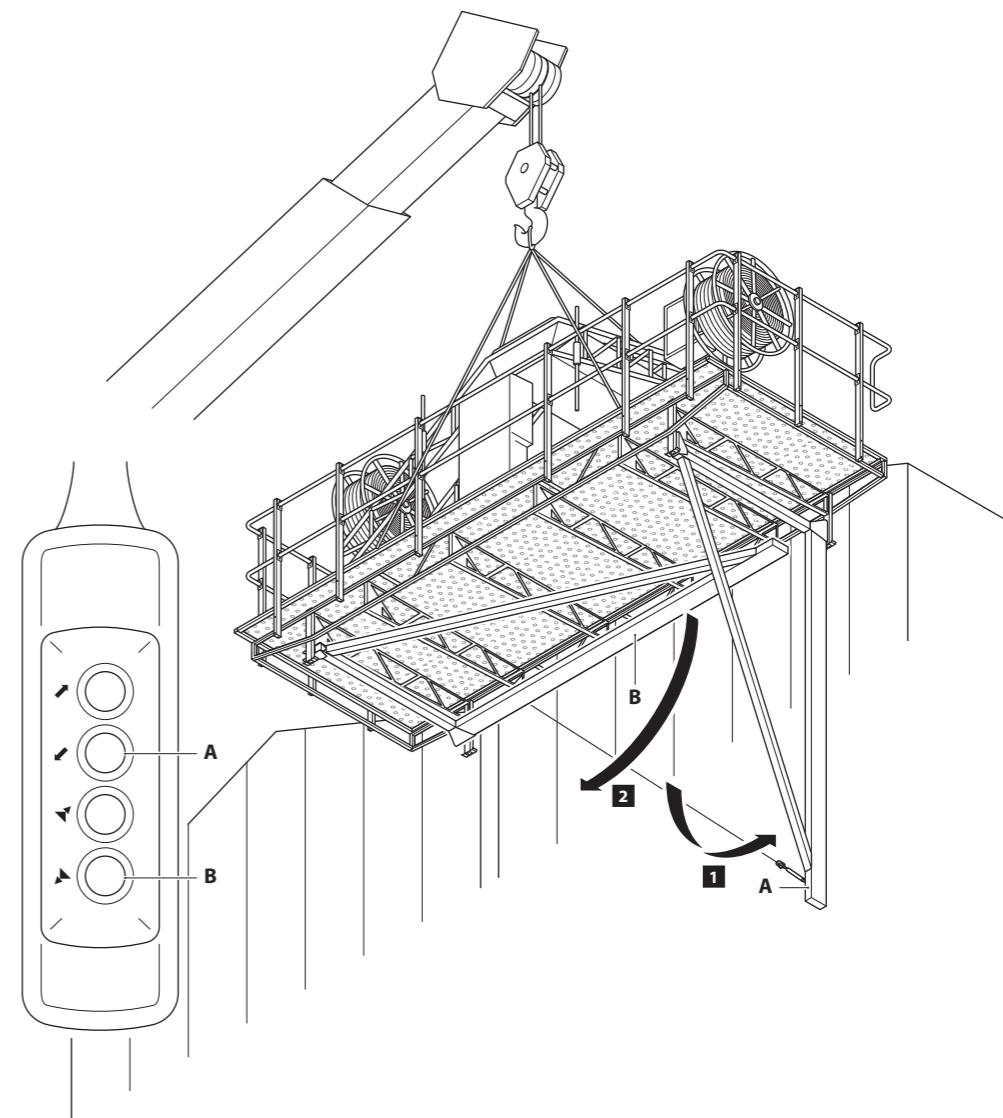


Fig. 46 Unfold the platform legs

5 PREPARATION

5. Put the **locking pins** **B** of the **lower beam** **A** through the **platform legs** **C** and secure them with **retaining clips** **D**. **NOTICE** Make sure that the **THIS SIDE UP** **sticker** on the lower beam is facing upwards. Always make sure the retaining clips are located on the side where the blue sticker is found.

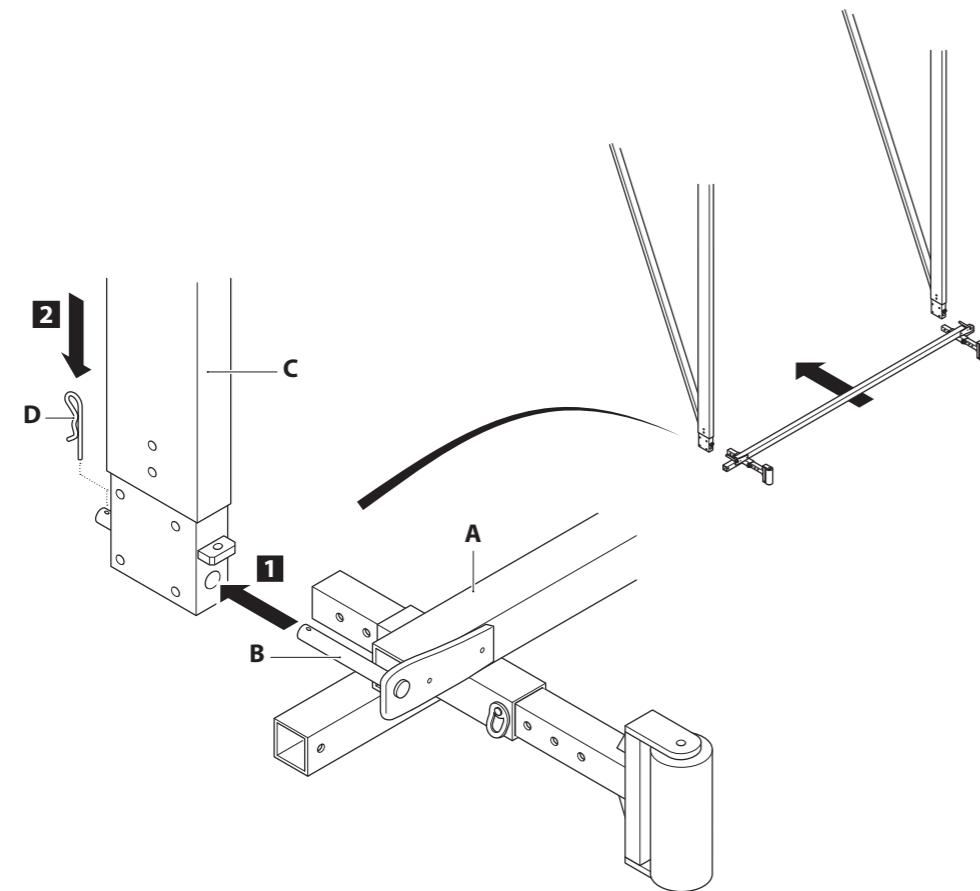


Fig. 47 Attach the lower beam

6. Remove the **retaining clips** **A** and pull out the **locking pins** **C** of the **platform legs** **B** and lower the **extension legs** **D**. **NOTICE** Do this carefully by hand until the cross braces hold the extension legs in place. Make sure to keep the locking pins of the first stage extension legs in place when your platform has two stage extension legs.

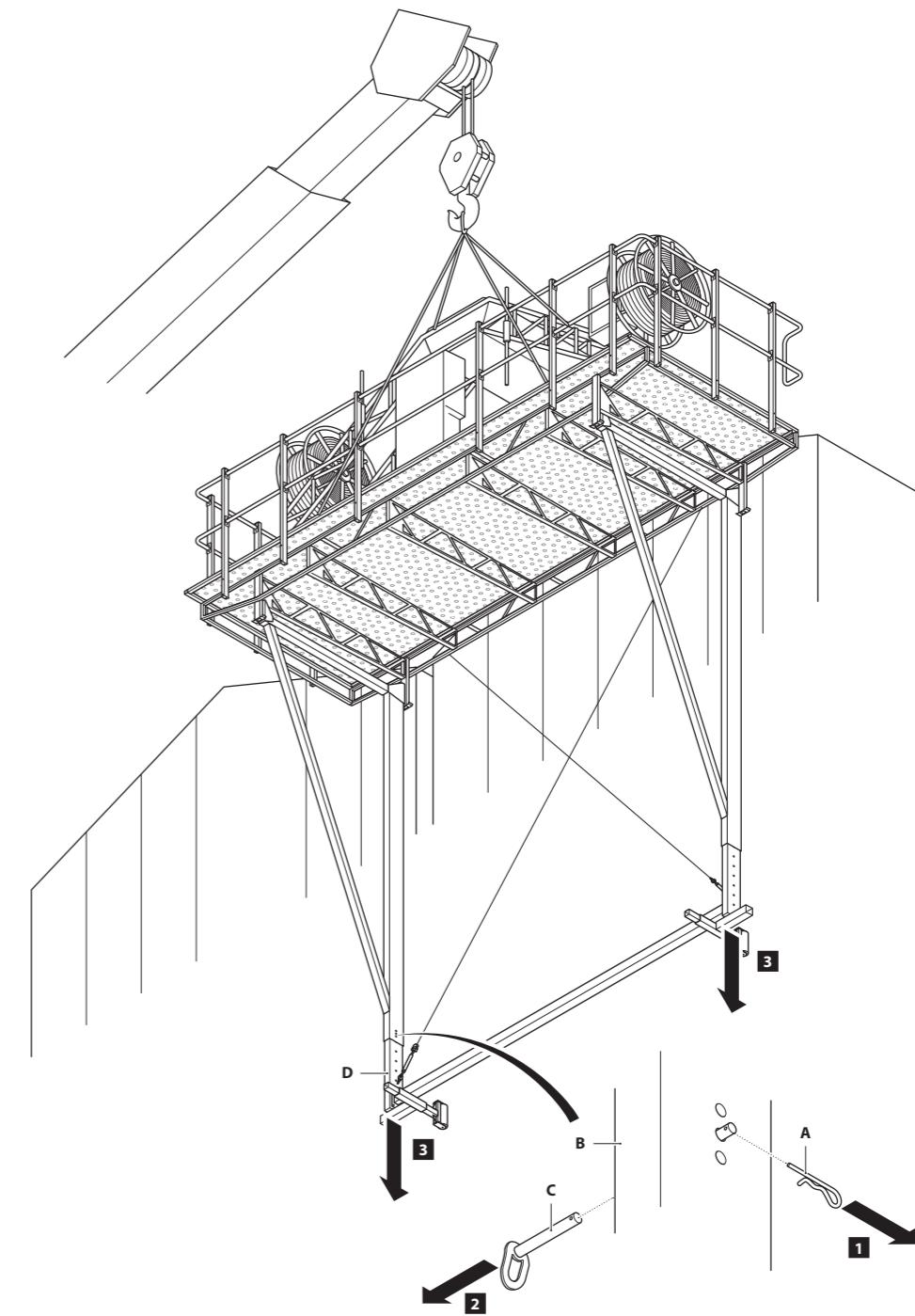


Fig. 48 Lower the extension legs

7. Lift and steer the platform **A** further with the **crane**, until the **drive wheels** **B** rest on the **top rails** **C**, while one person guides the platform with the guiding rope and holds it in position. **CAUTION!** Make sure there is enough spacing between the bearings, see *5.3.4 Prepare the remaining parts of the platform*.

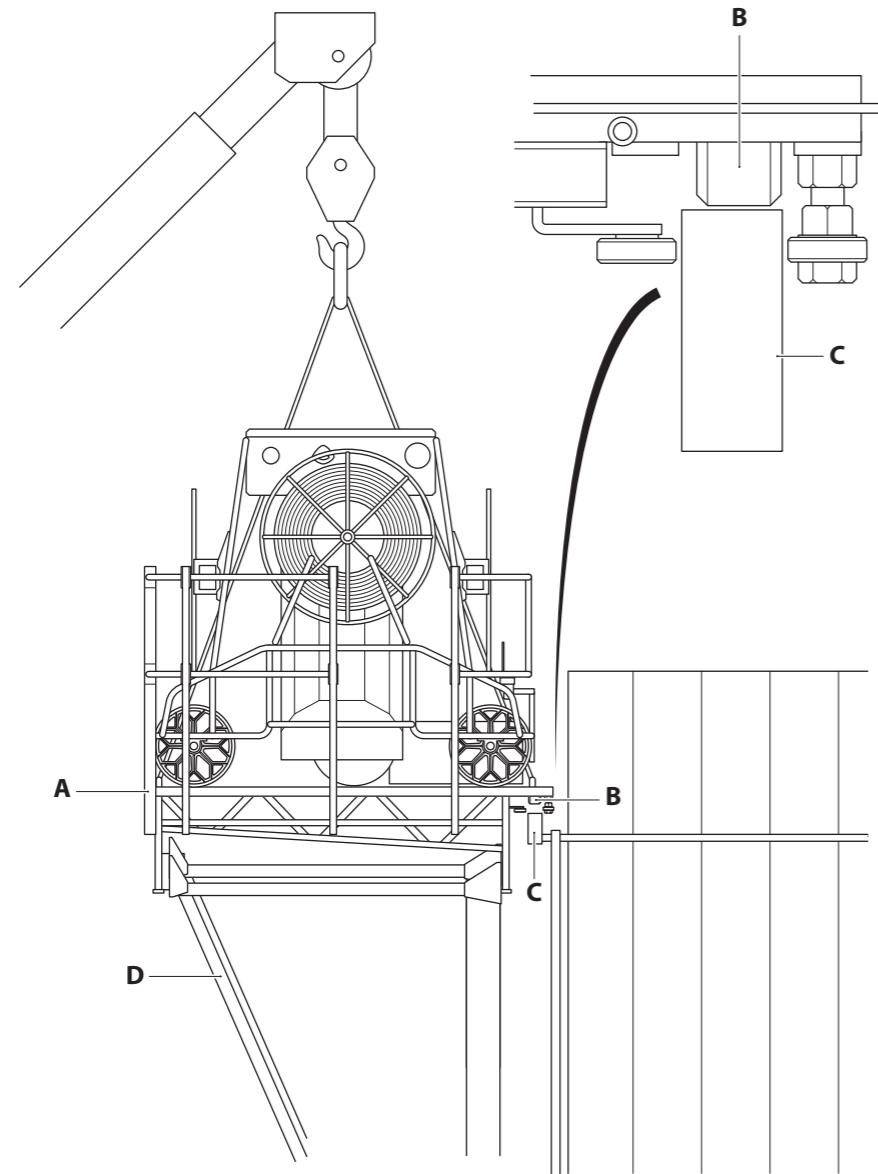


Fig. 49 Lift the platform on the top rail

8. Lower the **left and right extension leg** alternately with small steps by using the **remote control undercarriage**. **WARNING!** Never lower the extension legs further than the *MAXIMUM LENGTH* indication. Choose one of the following options:

- With one-stage extension legs: continue lowering until the **lower wheels** are centered on the **bottom rail** or foundation of the greenhouse with a minimum of 20cm (8 inch) of free space under the **lower wheels**. **CAUTION!** Make sure that both extension legs are extended at the same length, to prevent deformation or damage to the platform construction.

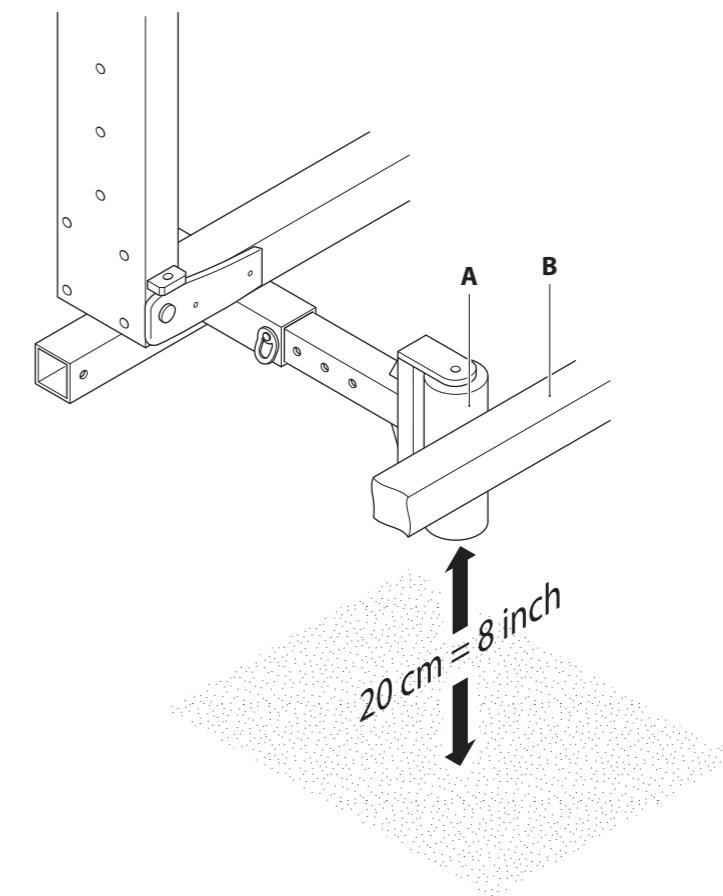


Fig. 50 Correct height of the lower wheels

- With two-stage extension legs: Continue lowering until the *MAXIMUM LENGTH* sticker appears on both extension legs.

5 PREPARATION

9. Put the the **locking pin** **C** back in both platform legs and add the **retaining clip** **A** to secure them. Use a **stepladder** if necessary. **NOTICE** Continue to step 13, when your platform has one-stage extension legs.
10. Remove the **retaining clips** **A** and pull out the **locking pins** **C** of the **extension legs** **B** and lower the **second-stage extension legs** **D**. Do this carefully by hand until the cross braces hold the second stage extension legs in place. **NOTICE** this step only applies to two-stage extension legs.

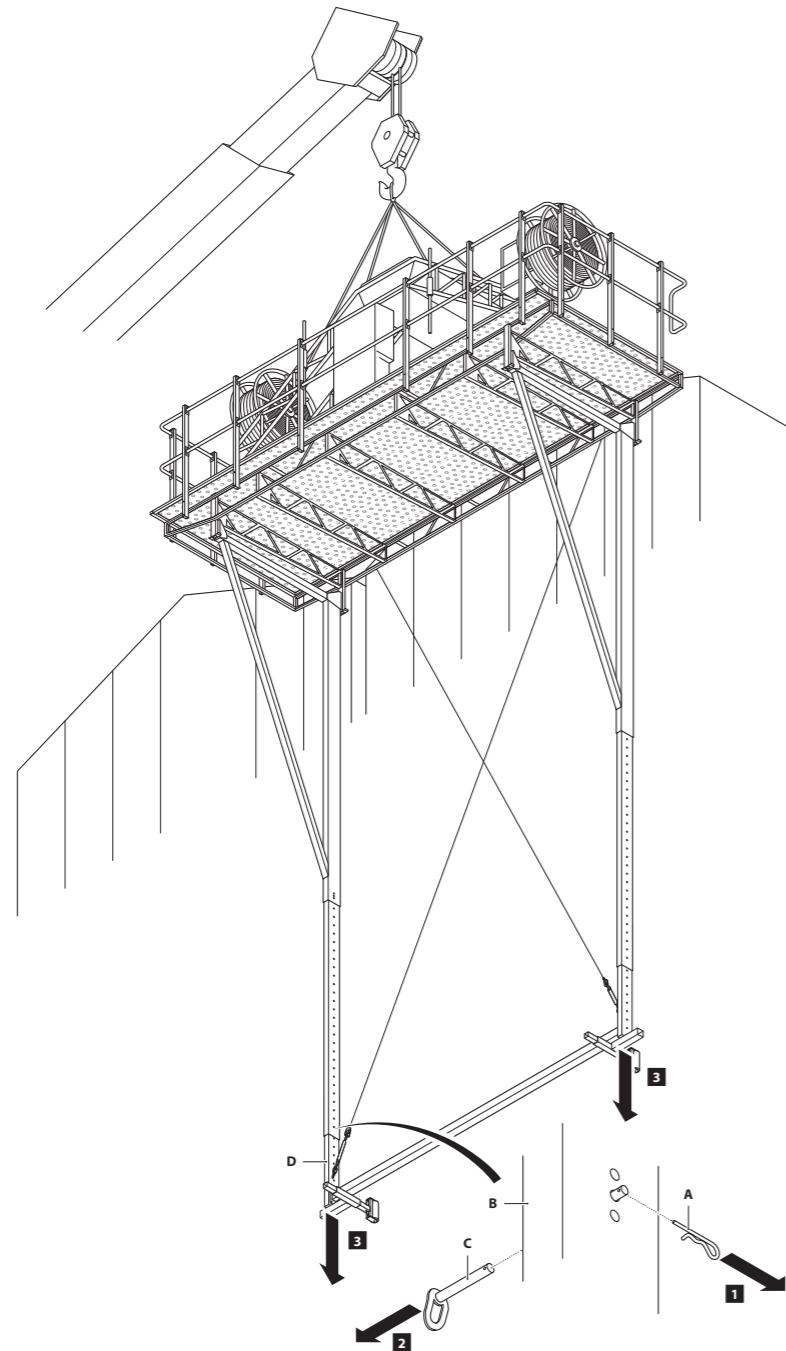


Fig. 51 Lower the second stage extension legs

11. Lower the **left and right second-stage extension leg** alternately with small steps by using the **remote control undercarriage**. Continue until the **lower wheels** are centered on the **bottom rail** or foundation of the greenhouse with a minimum of 20 cm (8 inch) of free space under the **lower wheels**. **CAUTION!** Make sure that both extension legs are extended at the same length, to prevent deformation or damage to the platform construction. **NOTICE** this step only applies to two-stage extension legs.

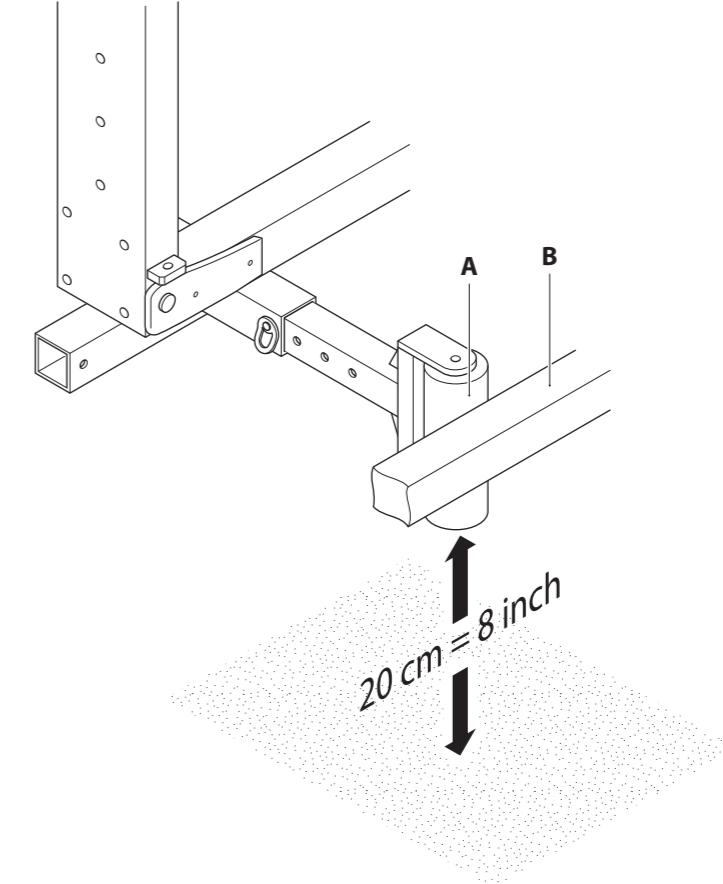


Fig. 52 Correct height of the lower wheels

12. Put the the **locking pin** **C** back in both **extension legs** and add the **retaining clip** **A** to secure them. Use a **stepladder** if necessary. **NOTICE** this step only applies to two-stage extension legs.

13. Lower the **crane** to release the tension in the **4-way sling**. Make sure that the angle between the **platform A** and **gable B** is 88-90 degrees. **NOTICE** Step 14 explains how to adjust the angle.

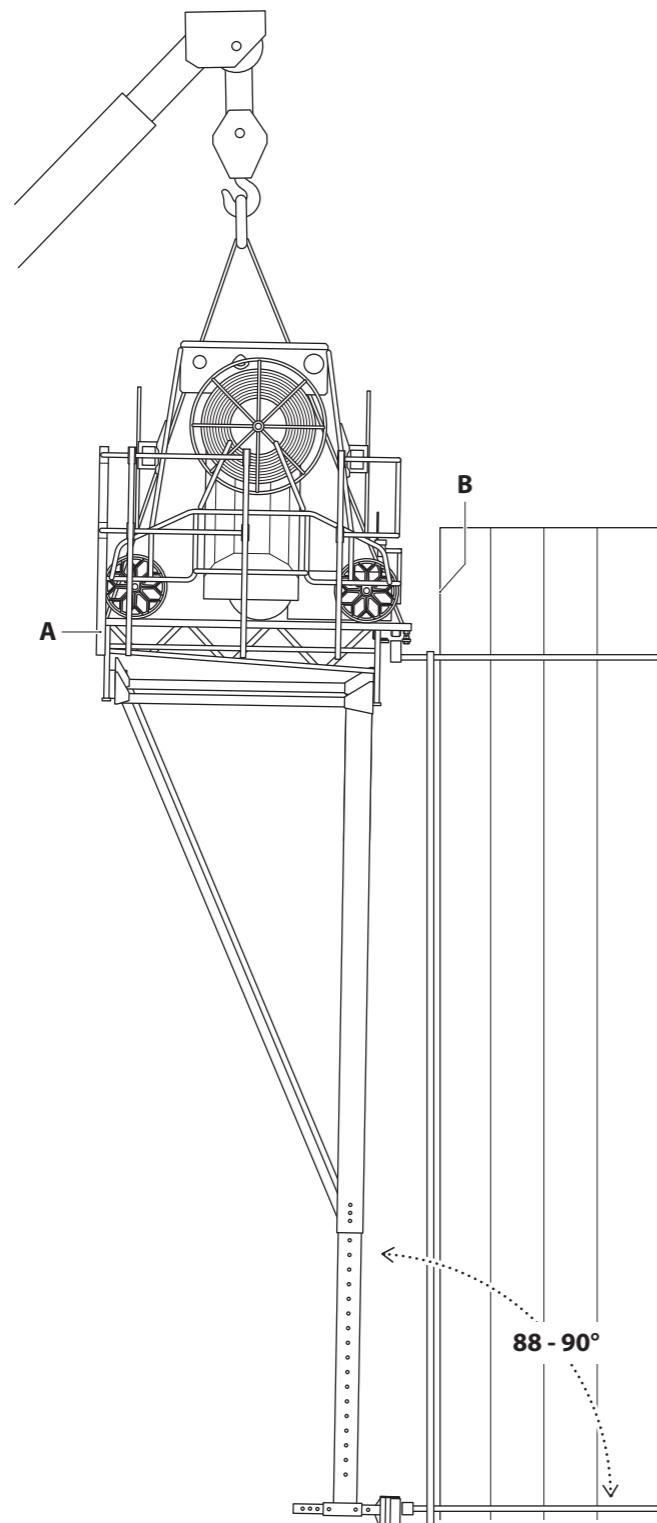


Fig. 53 Make sure the angle is correct

14. When necessary adjust the **lower wheels A** to the correct horizontal position to set the correct angle. Do this by lifting the **crane** until the **4-way sling** is under tension. Removing the **retaining clips B** and **locking pins C**, moving the **lower wheels** and securing them again. Make sure to lower the crane after the correct angle is set. **NOTICE** Shorten the **lower wheels A** to increase the angle and make the **lower wheels A** longer to decrease the angle.

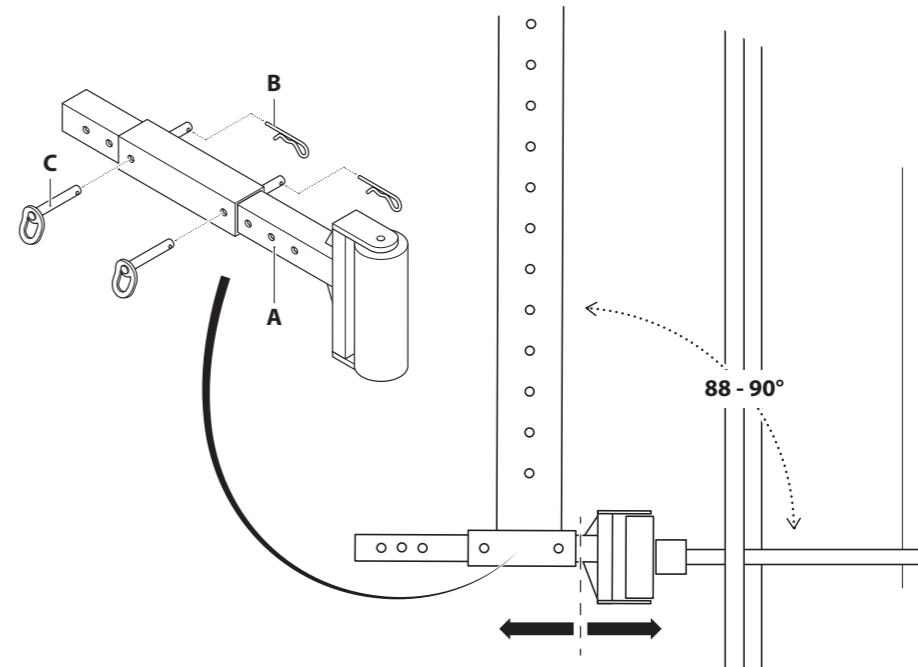


Fig. 54 Move the lower wheels in the correct position

15. Push both **platform leg up buttons** on the remote control to tighten the tension in the **cross braces** **A**. Make sure that both **platform legs** **B** are vertical and parallel to the greenhouse. **WARNING!** Risk of instability which may result in the platform **falling** from the rails! Always tighten the tension in the cross braces to the maximum.

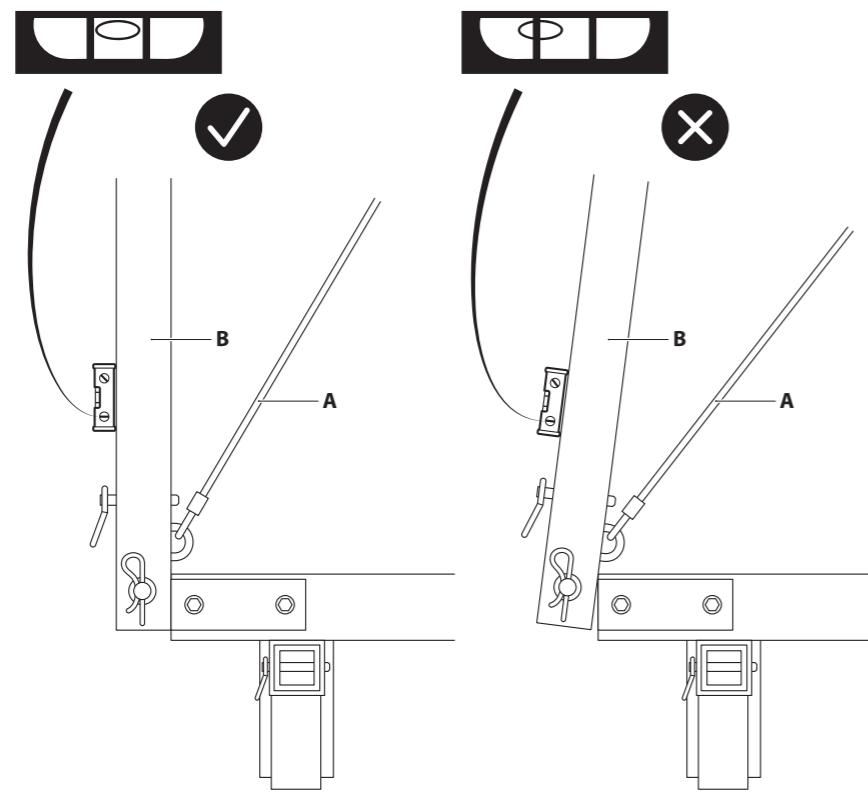


Fig. 55 Correct way of tightening the cross braces

5.6 HOW TO ATTACH THE REMAINING PLATFORM PARTS

1. Attach the **lower ladder support** **A** on the side of the **upper ladder support** **B**. Secure the **lower ladder support** **A** with the **M10 bolts** **C** and **wing nuts** **D** and the retaining clips with **locking pins** **E**.

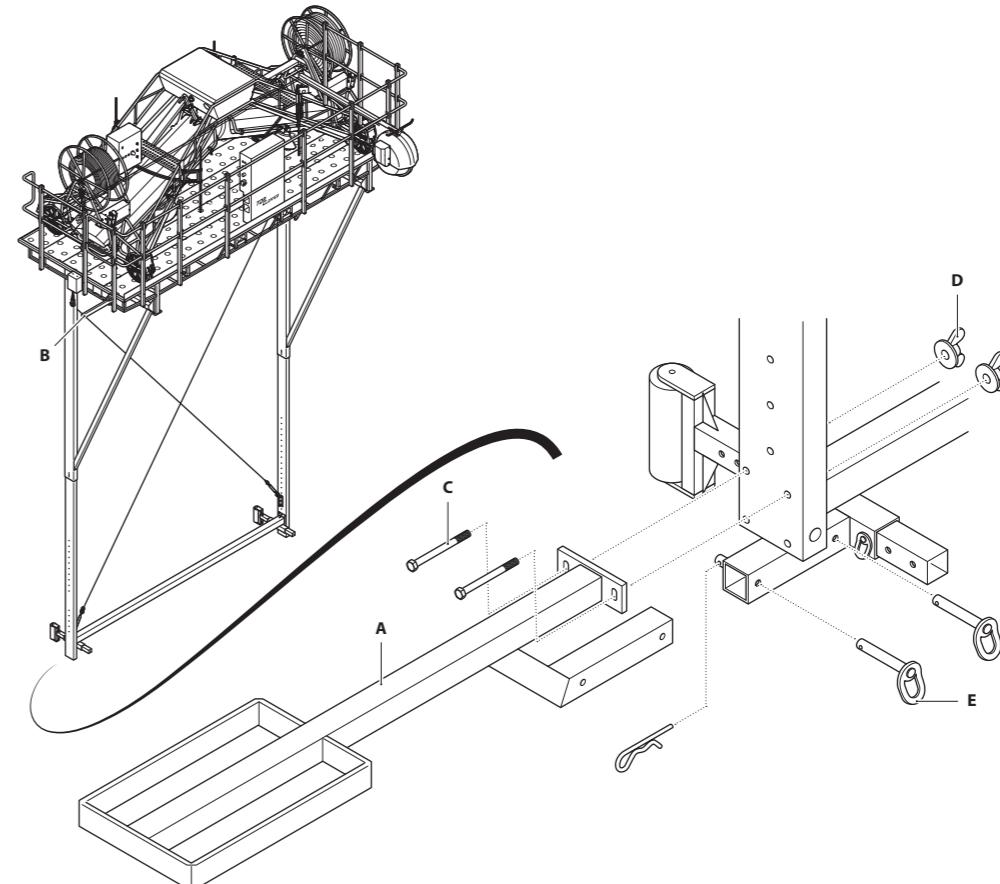


Fig. 56 Attach the lower ladder support

5 PREPARATION

- Put the **ladder** on the ground. Slide the **ladder** out to reach the correct height.

NOTICE Visually estimate if the ladder will reach the top of the hand railing of the platform.

- Attach the **ladder locking plate A** to an overlapping step of both parts of the ladder, by using the **M8 bolts** and **wingnuts**. **WARNING!** Failure to attach the ladder locking plate could result in death or serious injury.

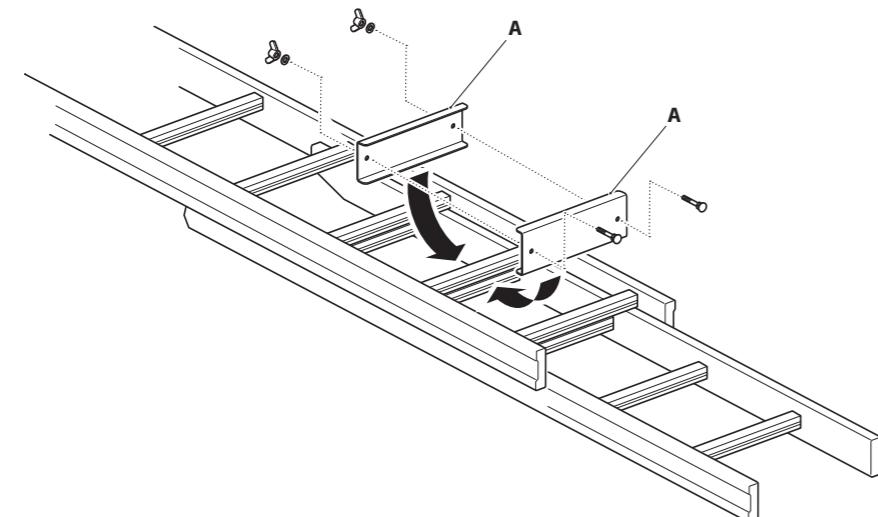


Fig. 57 Attach ladder locking plate

- Pick the **ladder A** up and put it in the **lower ladder support B**.

CAUTION! Always carry and place the ladder with a minimum of 2 people, to avoid the ladder from tipping over.

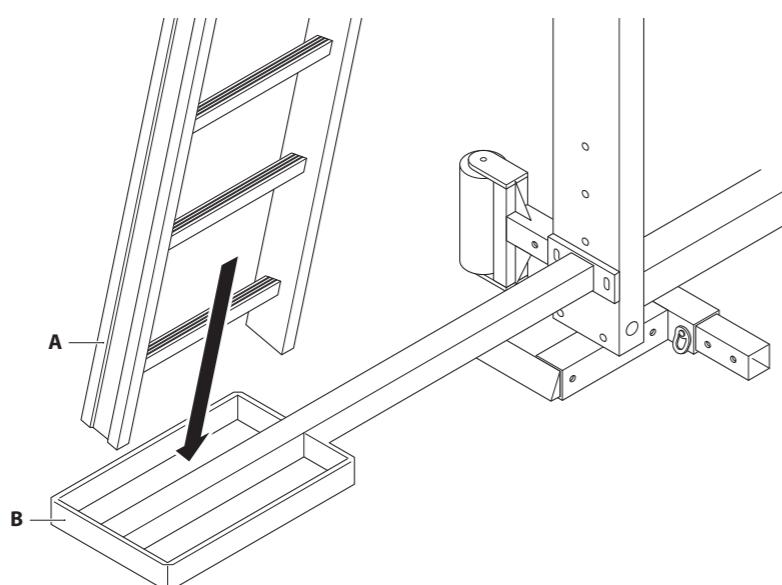


Fig. 58 Put the ladder in the lower support

- Attach the **ladder A** to the **upper ladder support B**. **NOTICE** The ladder shall be at the same height as the platform fencing.

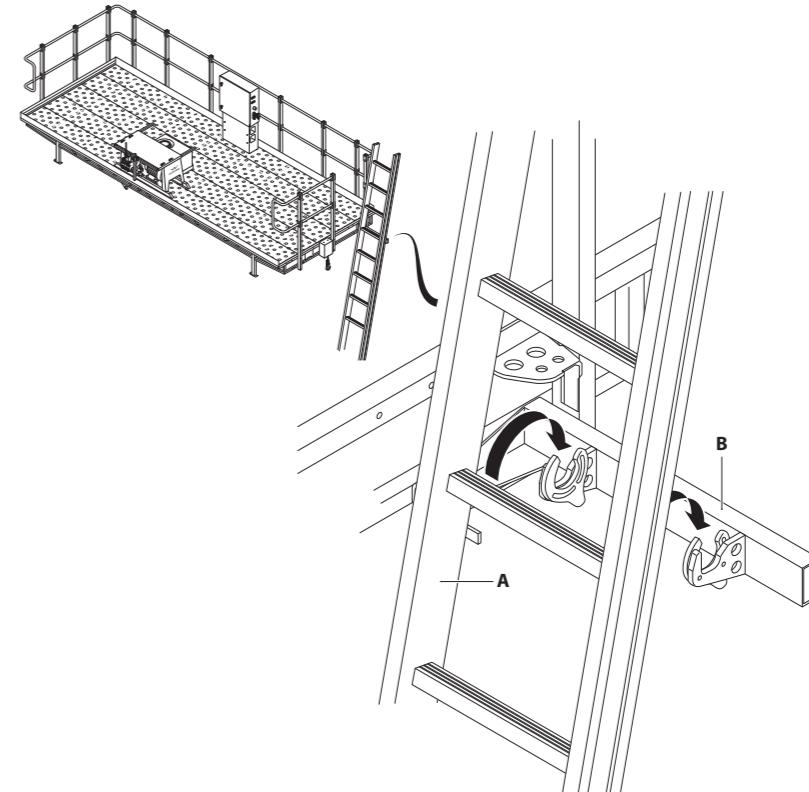


Fig. 59 Attach the ladder to the upper support

- Put on your **harness with a lifeline**. Pull the **red elastic cord**, and connect the **harness** to the **fall arrest device**. Climb up the **ladder**.

- Close the ladder lock hooks A**.

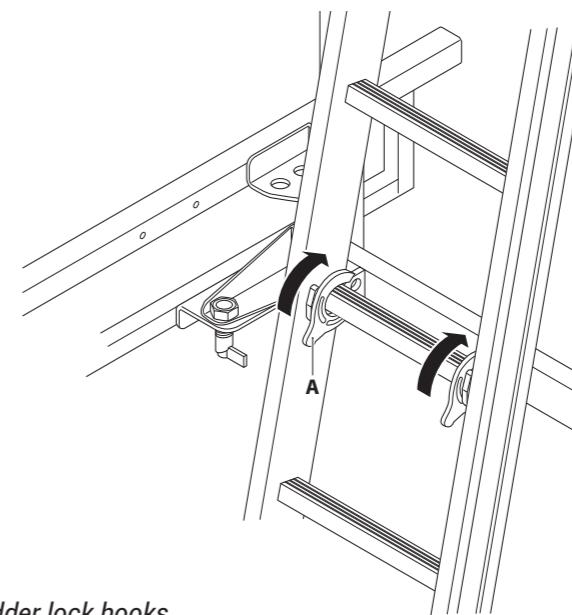


Fig. 60 Close the ladder lock hooks

5 PREPARATION

8. Climb on top of the **platform**. Connect the **lifeline** to a **yellow anchor point**.
Disconnect the **lifeline** from the **fall arrest device**.
9. Disconnect and remove the **four-way webbing sling** and detach the **guiding rope** from the hand railing of the **platform**.
10. At the bottom, attach the **operation display A** (for an automatic platform only) with the **Scaff clamps B** to the platform legs when completely installed.
NOTICE When attaching the operation display to the platform legs, the machinery can be safely operated from ground level without climbing the ladder.

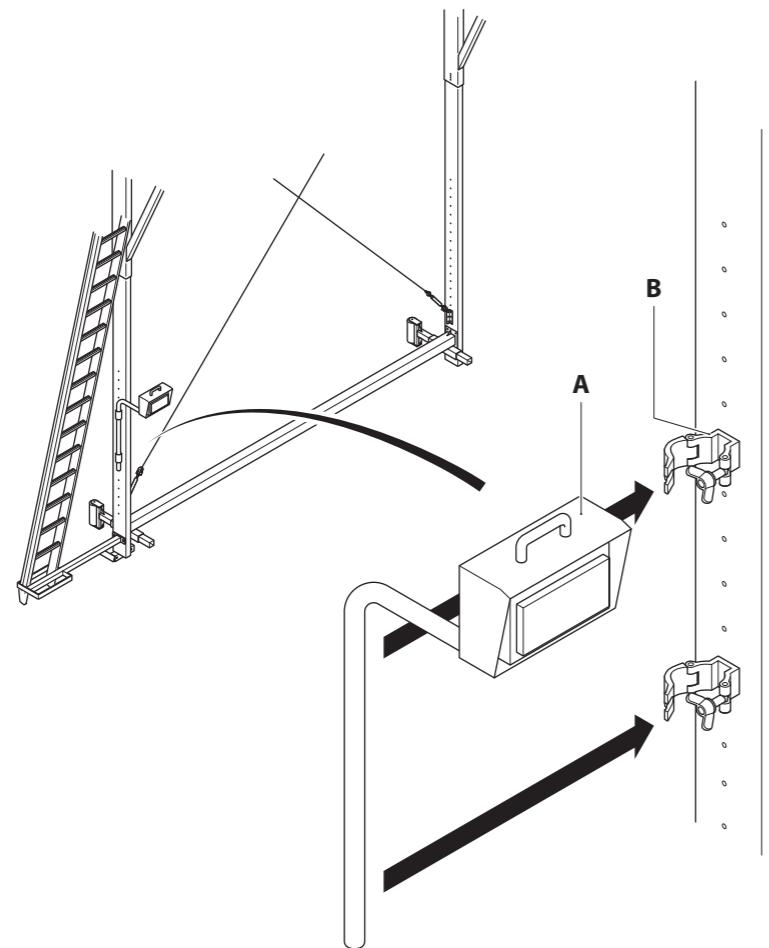


Fig. 61 Attach operation display

11. Connect the **multi-plug A** of the **operation display cable** to the **operation display B**. Lock the **multi-plug**.

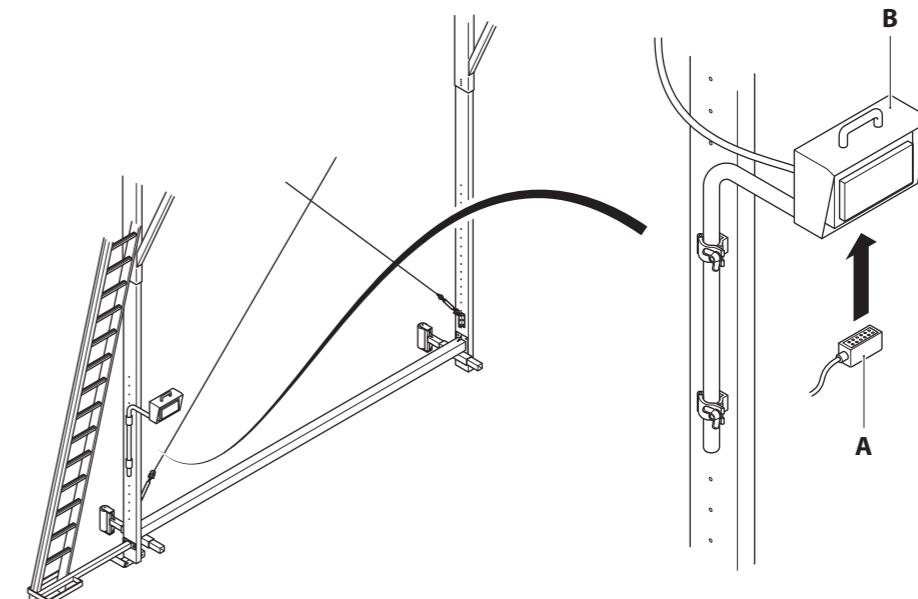


Fig. 62 Connect the multi-plug

5.7 HOW TO ADJUST THE PLATFORM

⚠ WARNING

- When performing works on top of the greenhouse or on a van der Waay platform, make sure to wear a certified safety harness and a certified double lifeline of 2 meters (6.5 feet) in length.
- When going up onto the roof of the greenhouse always make sure that you wear a certified safety harness that is leashed with a certified fall arrest device.
- Always use a gutter walker to safely walk via the greenhouse gutters to the machinery. Gutter walkers are available through your greenhouse builder, your supplier or the manufacturer.
- Make sure that you can sound an alarm when necessary. Always carry a mobile phone or other means of communication with you.
- Remove all loose materials and tools from the machinery. These can be moved by the wind and cause material damage to the machinery and the greenhouse.
- Never use a ladder to get onto the roof of a greenhouse, unless the ladder is a part of the van der Waay platform.

The following subparagraphs describe how to adjust the platform. The subparagraphs, as well as their instructions, shall be followed in the order they are presented in.

Do not skip a subparagraph or an instruction and continue until the last instruction of the last subparagraph to correctly adjust the machinery.

5.7.1 Change the remote control

For safety reasons it is not possible to control the platform when the remote control undercarriage is connected. After the platform is properly placed on the rail of the greenhouse, the remote control undercarriage needs to be changed with the dummy plug or the remote control roof washer and platform.

To change the remote control:

- Remove the remote control undercarriage from connector X5 **B**. Store the remote control undercarriage in the dedicated storage slots **C**, right underneath the control cabinet platform.
- Connect the remote control roof washer and platform **A** to connector X5 **B**.
NOTICE This remote control is used to operate the machinery manually.
- Attach the cable pulling grip of the remote control roof washer and platform to the carabiner on the platform. **NOTICE** Store the remote control roof washer and platform when you don't use it in the dedicated storage slots **C**, right underneath the control cabinet platform.

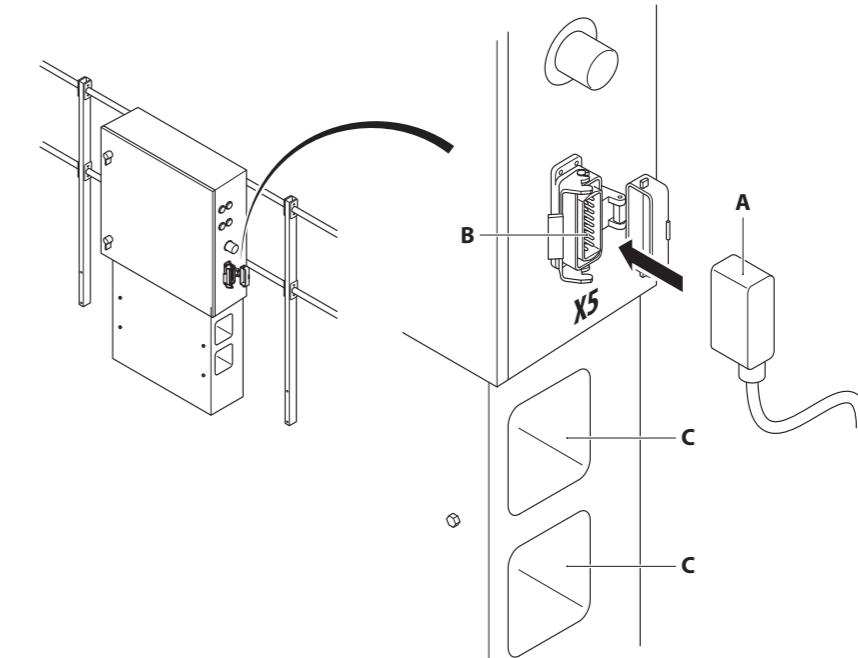


Fig. 63 Connect the remote control roof washer and platform

- Reset the machinery, see 6.5 How to reset the machinery

5.7.2 Adjust the ramps

1. Push the **platform left/right buttons** on the **remote control roof washer and platform** until the **platform** is in line with the **gutters**.
2. Push the **platform ramp down button** on the **remote control roof washer and platform** to move the **ramps** to the **gutter**.
3. When one of the two ramps is not fully in line with the gutter adjust this **ramp A** with your hands. **NOTICE** Make sure to adjust the ramp when it is in the upward position.

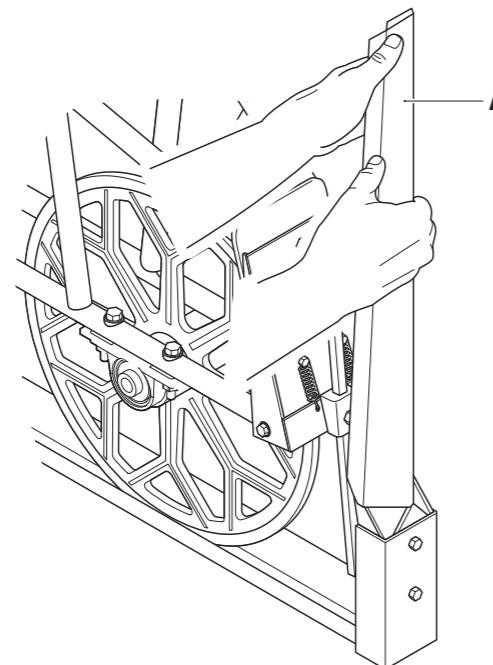


Fig. 64 Manual adjustment of the ramp

4. When the ramps are not low enough and do not touch the gutter, adjust the **lower proximity switch for ramp** by loosening the **nut A** of the **lower proximity switch for ramps B**. **NOTICE** when the ramps are low enough continue to 5.7.3 *Adjust the roof detection switch*
5. Move the **lower proximity switch for ramps B** down.
6. Tighten the **nut** of the **lower proximity switch for ramps B**.

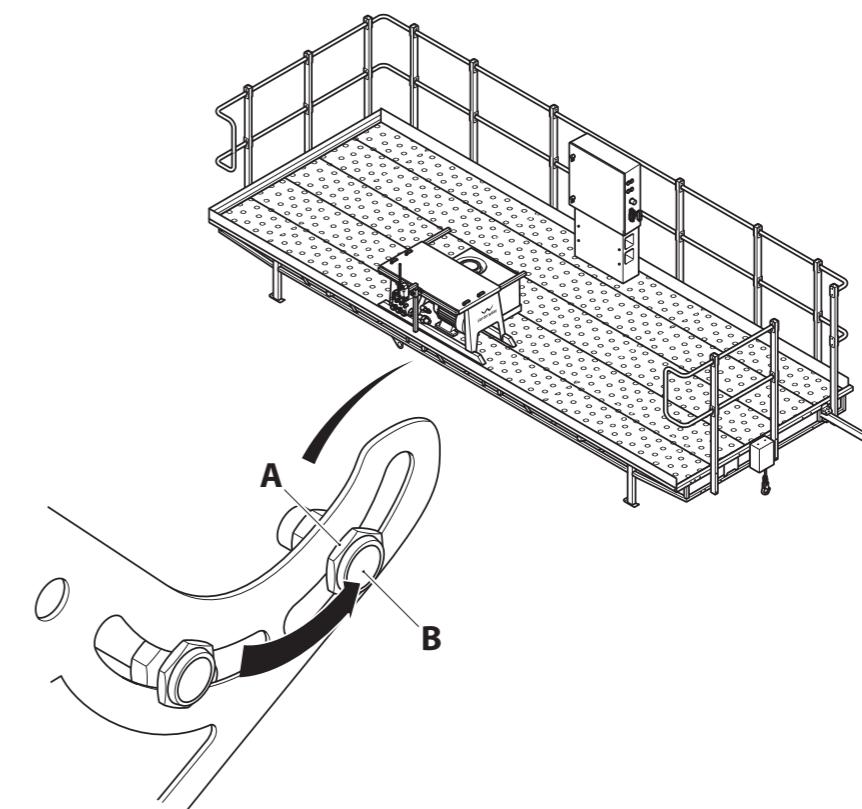


Fig. 65 Lower the proximity switch for ramp

7. Use the **remote control roof washer and platform** to make sure that the ramps touch the gutter.
8. Repeat step 5 to 7 until the **ramps** are in the correct position.

5.7.3 Adjust the roof detection switch

The **roof detection switch** makes sure that the **platform** is automatically positioned in front of the **gutters**. The **roof detection switch lever** operates the **roof detection switch** when it is activated by the **ridge**. Adjusting the **roof detection switch** is therefore a very accurate process. The standard factory settings move the **platform** from left to right.

1. Loosen the **height clamp A** of the **the roof detection switch B**. Put the **roof detection switch B** from transport position to normal position. Fasten the **height clamp A**.

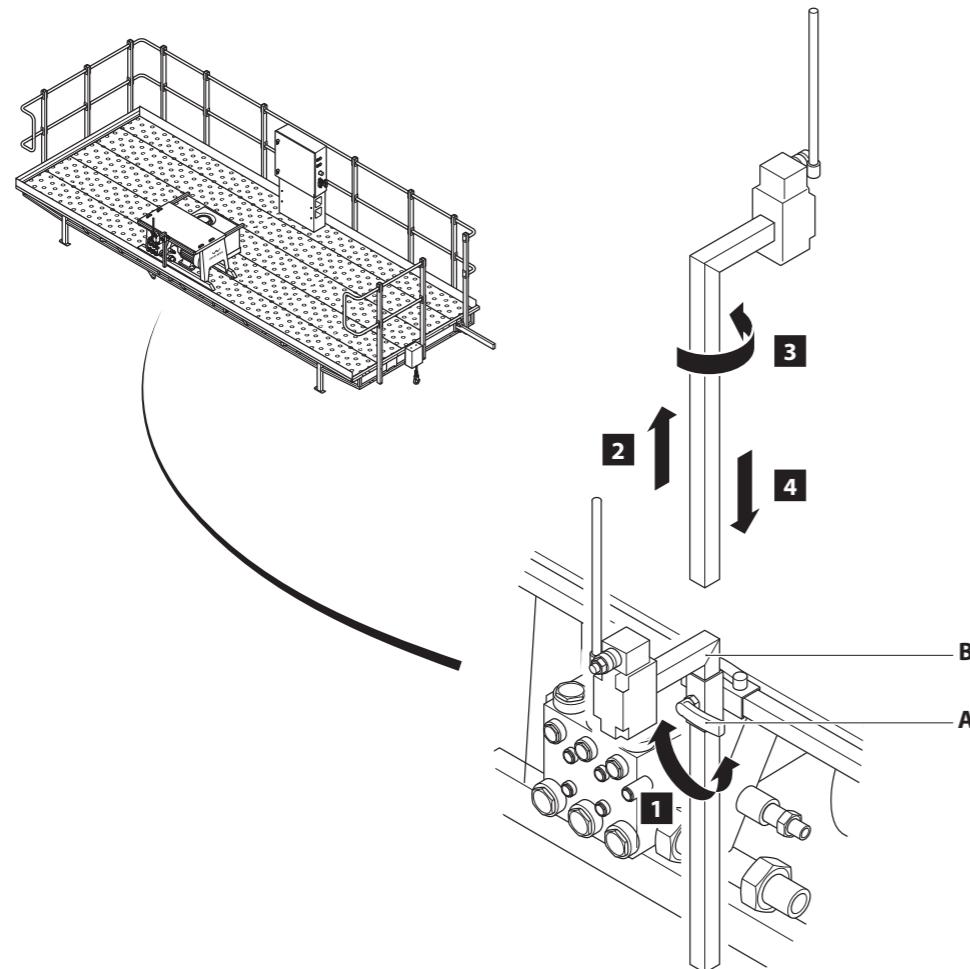


Fig. 66 Change the position of the roof detection switch

2. Loosen the **clamps A** of the **roof detection switch B**. Position the **roof detection switch** toward the **ridge C** such that:
 - The **roof detection switch** is to the left side of the **ridge C**.
 - The clearance between the **roof detection switch lever D** to the **gable E** is at least 20 mm (1 inch).
 - The **roof detection switch lever D** has a distance of 30 mm (1.2 inch) above the **ridge rod**.

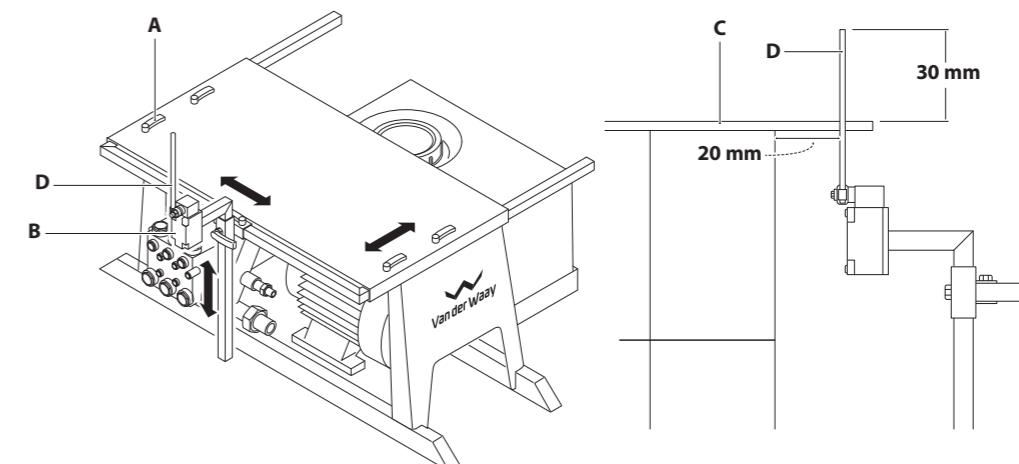


Fig. 67 Correct adjustment of the roof detection switch

3. Move the **roof detection switch A** to the right until you hear a "click".
4. Hold the **roof detection switch A** and tightly tighten the **clamp**.

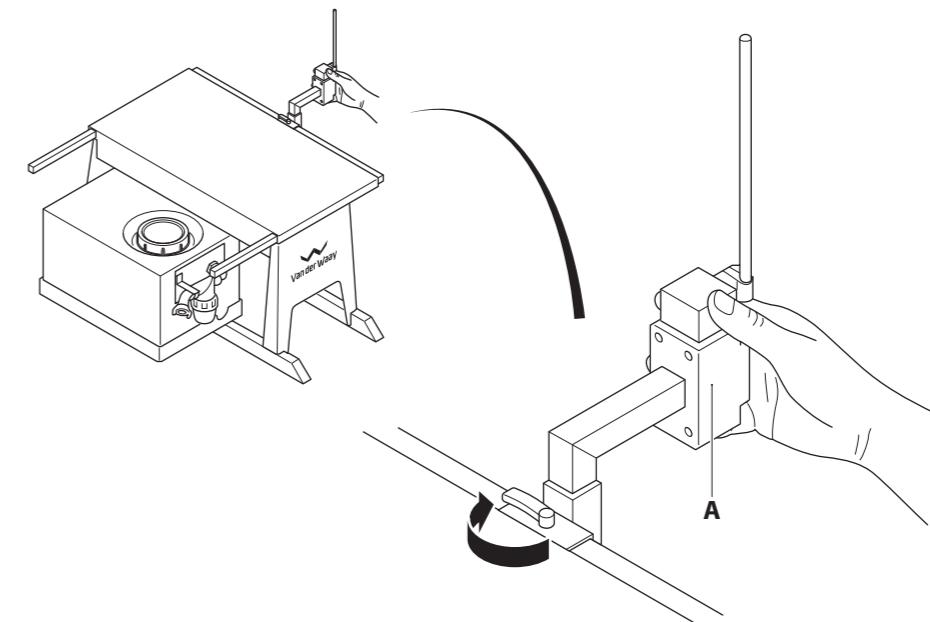


Fig. 68 Tighten the roof detection switch

5. Make sure that the adjustment is correct by pushing the **platform ramp up button**.
6. Push the **platform left button** until the **roof detection switch pin** does not touch the **ridge** anymore.
7. Push the **platform right button** until the **platform** automatically stops.
8. Push the **platform ramp down button**. The adjustment of the **roof detection switch** is correct when the **ramps** are correctly positioned in the **gutters**.
Adjust the **roof detection switch** if the **ramps** are outside the gutters.
9. Check the adjustment for two more rooftops. **NOTICE** Contact the manufacturer when the ramps are not correctly positioned in the gutters of the other rooftops.

5.7.4 Adjust the end of rail switches

⚠ DANGER

- These instructions only apply to the automatic version.
- Make sure that the top rail has been equipped with a firm steel barrier with a minimum height of 80 mm (3 inch) on both ends.
- Make sure that the supplied foundation extensions are attached to both side gables of the greenhouse if the greenhouse does not have a bottom rail. If the lower wheels of the platform hit next to the foundation, the platform may fall off the greenhouse.
- Make sure that the bottom rail extends at least 50 cm (127 inch) beyond both side gables of the greenhouse. If the platform's lower wheels hit next to the foundation, the platform may fall off the greenhouse.
- Make sure that the bottom rail is immovably secured along the entire length of the greenhouse gable and is not bent.

5.7.4.1 How to adjust the left end of rail switch

1. Move the **platform** **B** to the **very first rooftop on the left**. Align the **platform** with the **gutters**.
2. Move the **platform** to the right until the **roof detection switch** **A** is released on the right side of the **ridge** **C**.
3. Move the **platform** to the left until the **roof detection switch** is released on the left side of the **ridge** **C**.

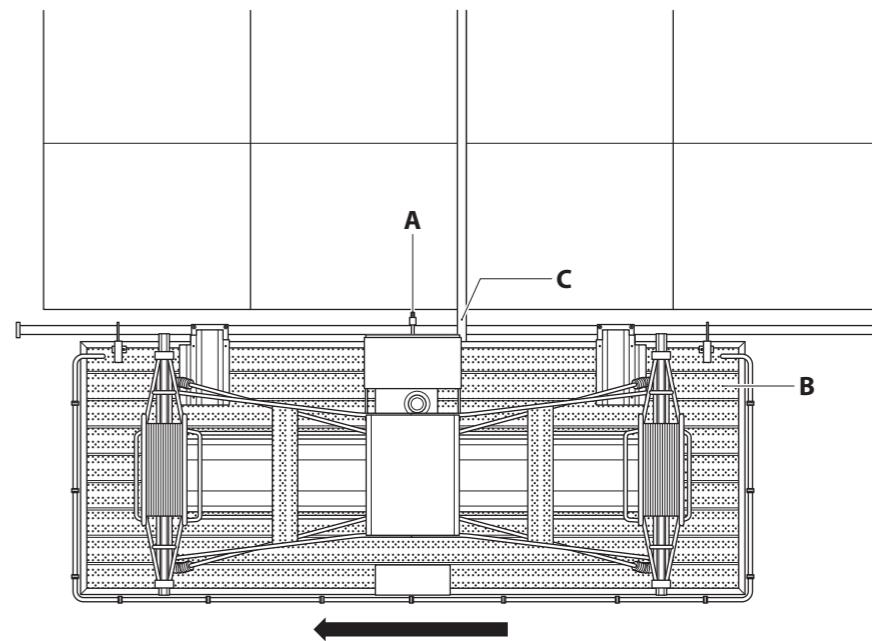


Fig. 69 Move the platform to the left

4. Loosen the two **nuts** **A** of the **end of rail switch** **B** and move the **end of rail switch** to the left until it switches on the **rail barrier** **C**. If necessary adjust the length of the **lever** **D** of the **end of rail switch** so it will be activated by the **rail barrier**.

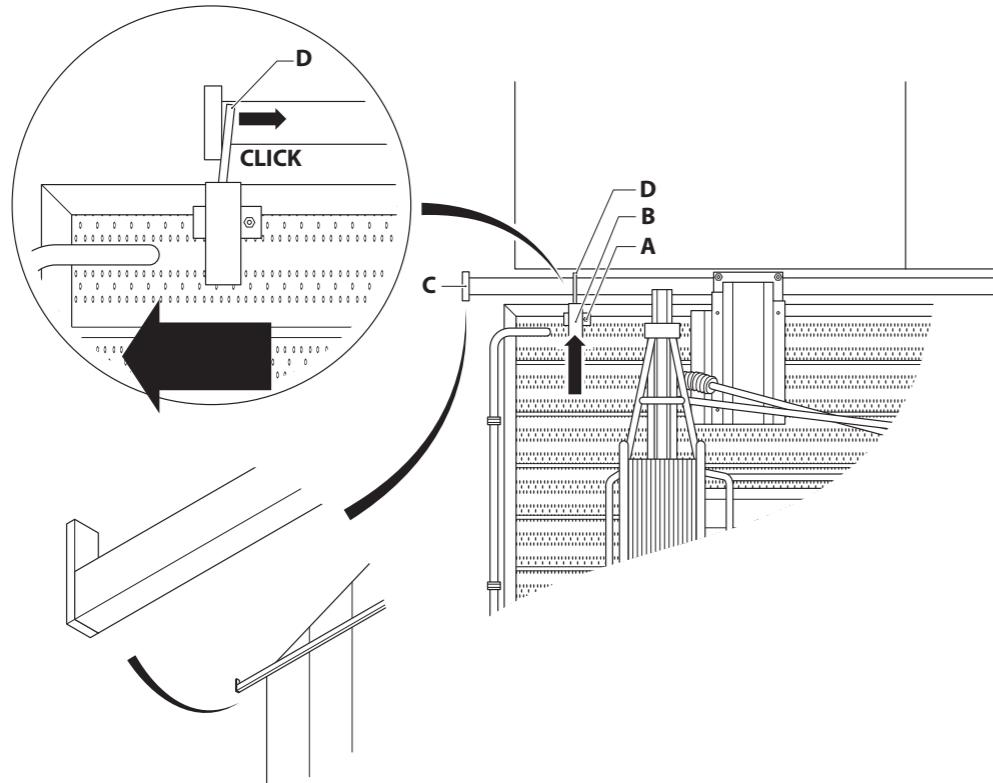


Fig. 70 Adjust end of rail switch

5. Fasten the **end of rail switch** and **lever**.
6. Move the **platform** to the right till the **roof detection switch** is released (stands up straight) on the right side of the **ridge**.
7. Move the **platform** to the left till the **roof detection switch** is released (stands up straight) on the left side of the **ridge**.
8. Make sure that the adjustment is correct by moving the **platform** to the left until the platform stops automatically. The **roof detection switch** must be completely released and at the left side from the **ridge**. **NOTICE** The platform may not stop until the roof detection switch is completely released (stands straight up).
9. When necessary repeat step 1 to 8 until the **roof detection switch** is adjusted correctly.

5.7.4.2 How to adjust the right end of rail switch

1. Move the **platform** to the **last rooftop on the right**. Align the **platform** with the **gutters**.
2. Move the **platform** to the left until the **roof detection switch** is released on the left side of the **ridge**.
3. Move the **platform** to the right until the **roof detection switch** is released on the right side of the **ridge**.
4. Loosen the two **nuts** of the **end of rail switch** and move the **end of rail switch** to the right until it switches on the **rail barrier**. If necessary adjust the length of the **lever** of the **end of rail switch** so it will be activated by the **rail barrier**.
5. Fasten the **end of rail switch** and **lever**.
6. Move the **platform** to the left till the **roof detection switch** is released (stands up straight) on the left side of the **ridge**.
7. Move the **platform** to the right till the **roof detection switch** is released (stands up straight) on the right side of the **ridge**.
8. Make sure that the adjustment is correct by moving the **platform** to the right until the platform stops automatically. The **roof detection switch** must be completely released and at the right side from the **ridge**. **NOTICE** The platform may not stop until the roof detection switch is completely released (stands straight up).
9. When necessary repeat step 1 to 8 until the **roof detection switch** is adjusted correctly.

5.8 HOW TO ADJUST THE ROOF WASHER

⚠ WARNING

- Make adjustments only when the roof washer is on the platform.
- Make sure that the top rail has been equipped with a firm steel barrier with a minimum height of 80 mm (3 inch) on both ends.
- When performing works on top of the greenhouse or on a van der Waay platform, make sure to wear a certified safety harness and a certified double lifeline of 2 meters (6.5 feet) in length.
- When going up onto the roof of the greenhouse always make sure that you wear a certified safety harness that is leashed with a certified fall arrest device.
- Always use a gutter walker to safely walk via the greenhouse gutters to the machinery. Gutter walkers are available through your greenhouse builder, your supplier or the manufacturer.
- Make sure that you can sound an alarm when necessary. Always carry a mobile phone or other means of communication with you.
- Remove all loose materials and tools from the machinery. These can be moved by the wind and cause material damage to the machinery and the greenhouse.
- Never use a ladder to get onto the roof of a greenhouse, unless the ladder is a part of the van der Waay platform.

5.8.1 Adjust the main brushes

1. When the machine contains the optional spray boom, put the **MAIN FUNCTION** switch on **BRUSH**.

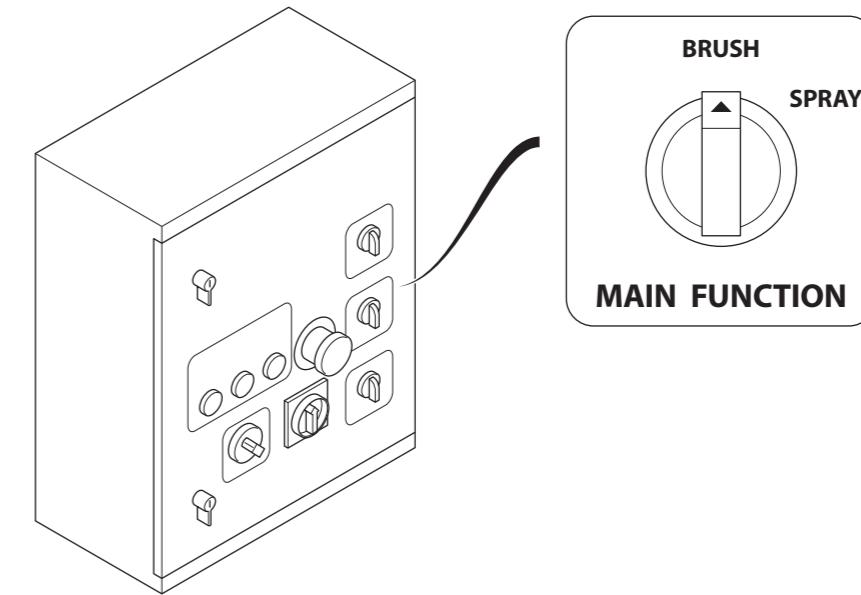


Fig. 71 Main function switch

2. Make sure the **roof washer** is on the greenhouse with all four wheels into the gutters.
3. Visually examine if:
 - a. The **main brush hair points A** touch the glass.
 - b. The **main brush** covers the roof from **gutter B** to **ridge**.

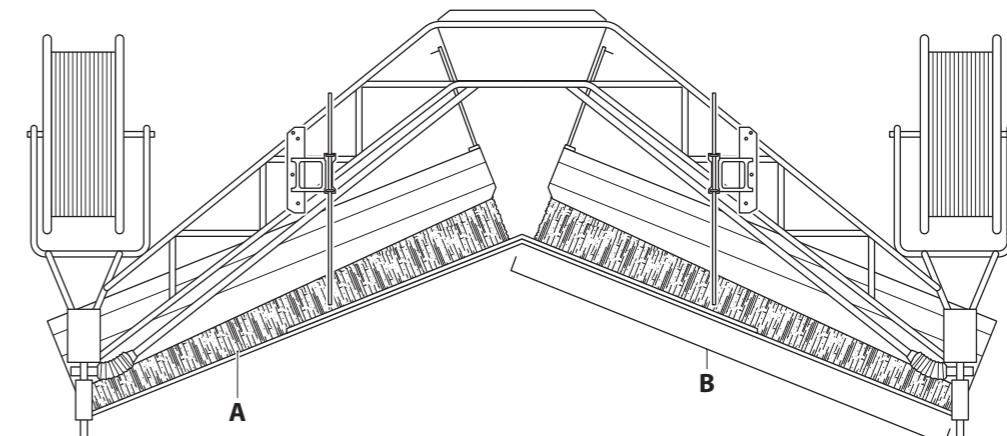


Fig. 72 Adjust main brush

5 PREPARATION

4. Move the **roof washer** back onto the platform. **NOTICE** when the lower side of the main brush is at the correct height continue to *step 8*.
5. Unlock the **ratchet C**, release the tension of the **security strap A** and lock the **ratchet C**.

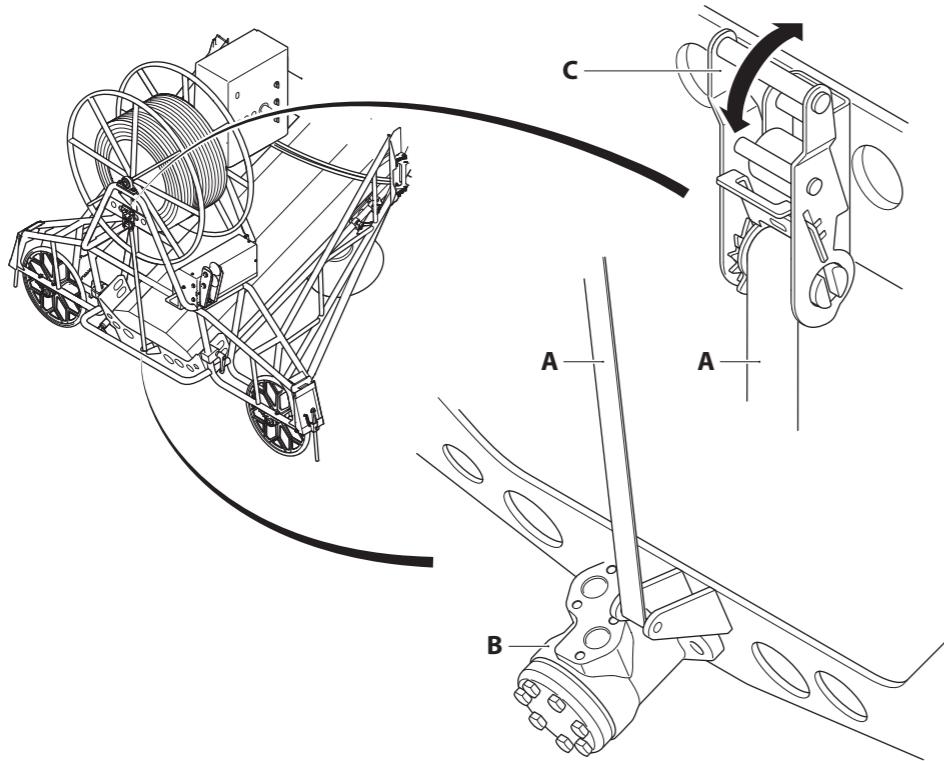


Fig. 73 Adjust the lower side of the main brush

8. Adjust the top side of the **main brush**, if necessary. When the top side of the main brush is at the correct height, continue to *step 10*.
9. Loosen the **upper main brush clamp A**. Adjust the **main brush** height and tighten the **upper main brush clamp A**.

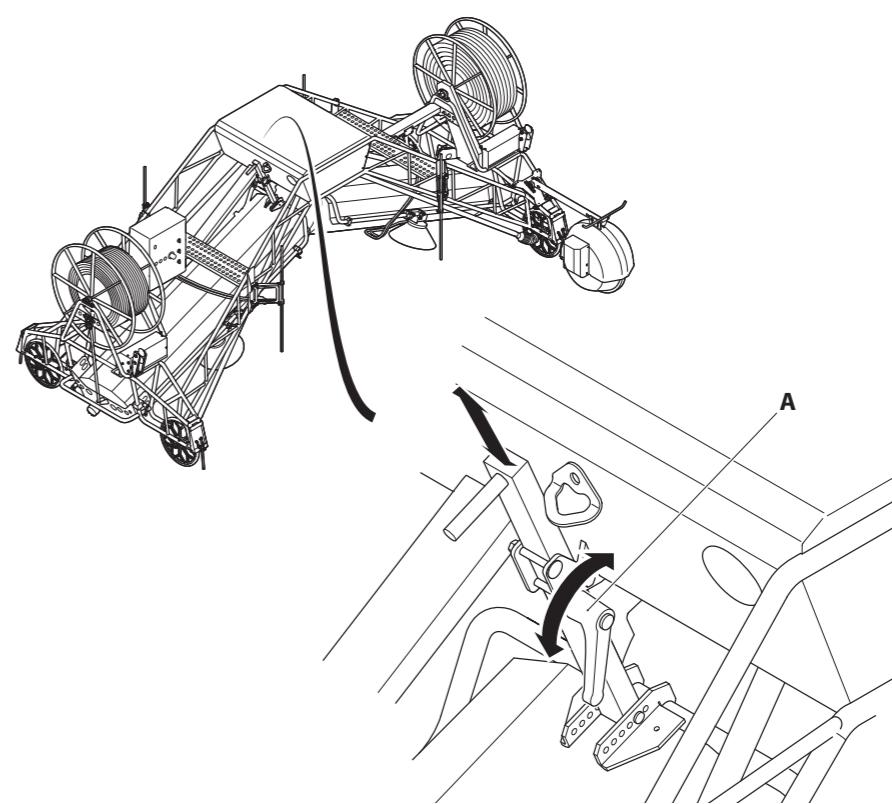


Fig. 75 Adjust height of the top of the main brush

6. Loosen the two **lower main brush clamps A**. Make sure that the **main brush B** moves down and backward until the strap is tensioned again.
7. Tighten the **lower main brush clamps A**.

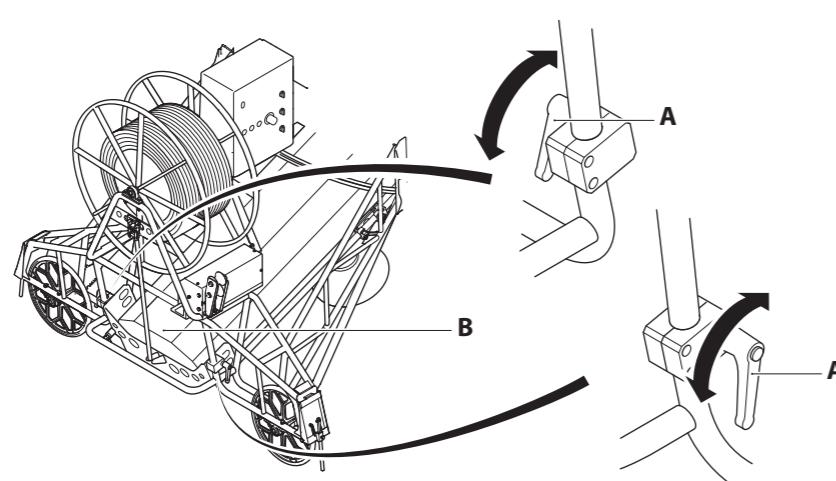


Fig. 74 Tighten the lower main brush clamps

10. Move the **main brush** backward or forward, if necessary. When the main brush is in the correct position, continue to *step 14*.
11. Loosen the two **lower main brush clamps A**.

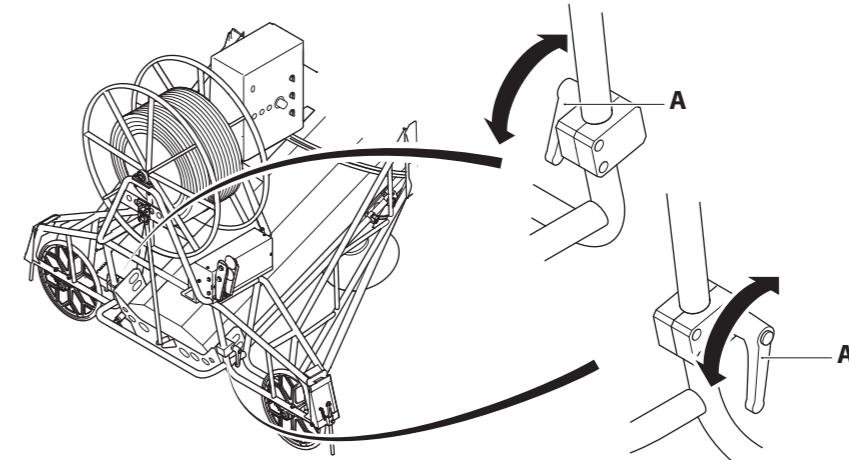


Fig. 76 Loosen the main brush clamps

12. Put the **main brush** **A** in the correct position so the **hairs of the main brush** **B** will cover the roof from **gutter** **C** to ridge.

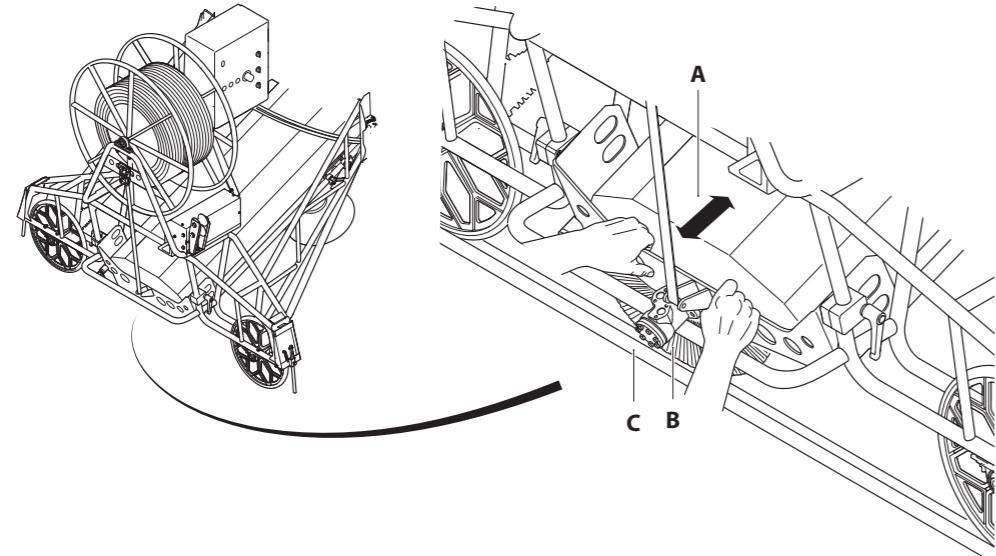


Fig. 77 Position the main brush

16. Measure the **vertical distance** **A** of the lower side of the **first main brush**.

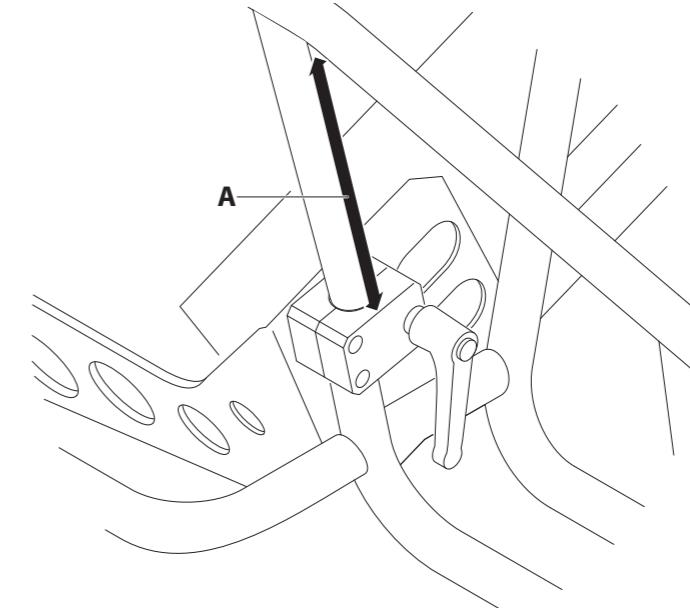


Fig. 79 Measure the lower side of the first main brush vertically

13. Tighten the **lower main brush clamps**.

14. Repeat steps 1-13 until the **main brush** is in the correct position.

15. The **second main brush** shall be adjusted identically to the **first main brush**.

To adjust the **second main brush**, measure the **horizontal distance** **A** of the lower side of the **first main brush**.

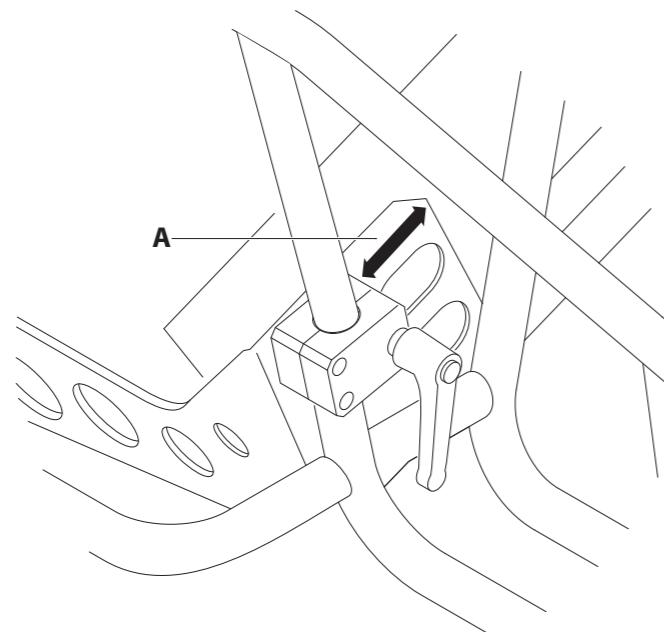


Fig. 78 Measure the lower side of the first main brush horizontally

17. Measure the **vertical distance** **A** of the upper side of the **first main brush**.

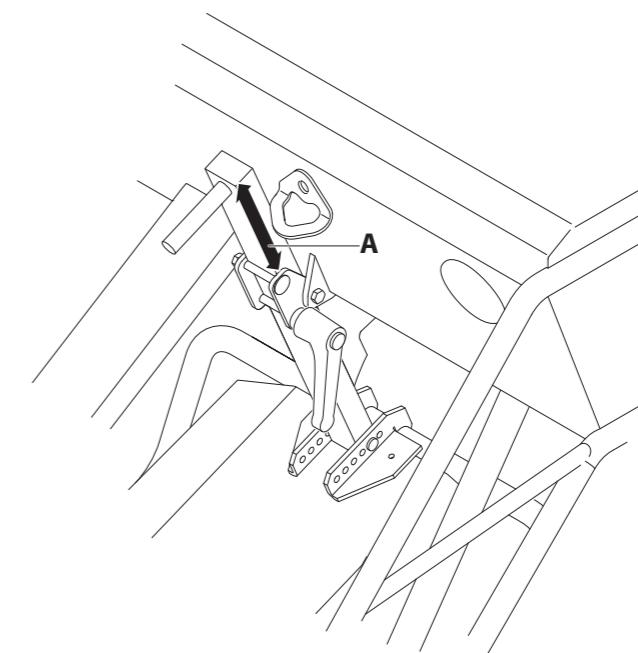


Fig. 80 Measure the upper side of the first main brush

18. Put the **second main brush** to the same position as the **first main brush**, by using the measurements.

5.8.2 Adjust the optional window disk brush

The optional **window disk brushes** are intended to clean the lower side of the windows.

NOTICE The window disk brushes can optionally also be used to clean the sides of the gutters.

To adjust the optional window disk brush:

1. To adjust the **first window disk brush**, make sure the **roof washer** is on the greenhouse, positioned above a window.
2. Visually examine if the hairs of the **window disk brush A** just touch the lower side of the **window B**.

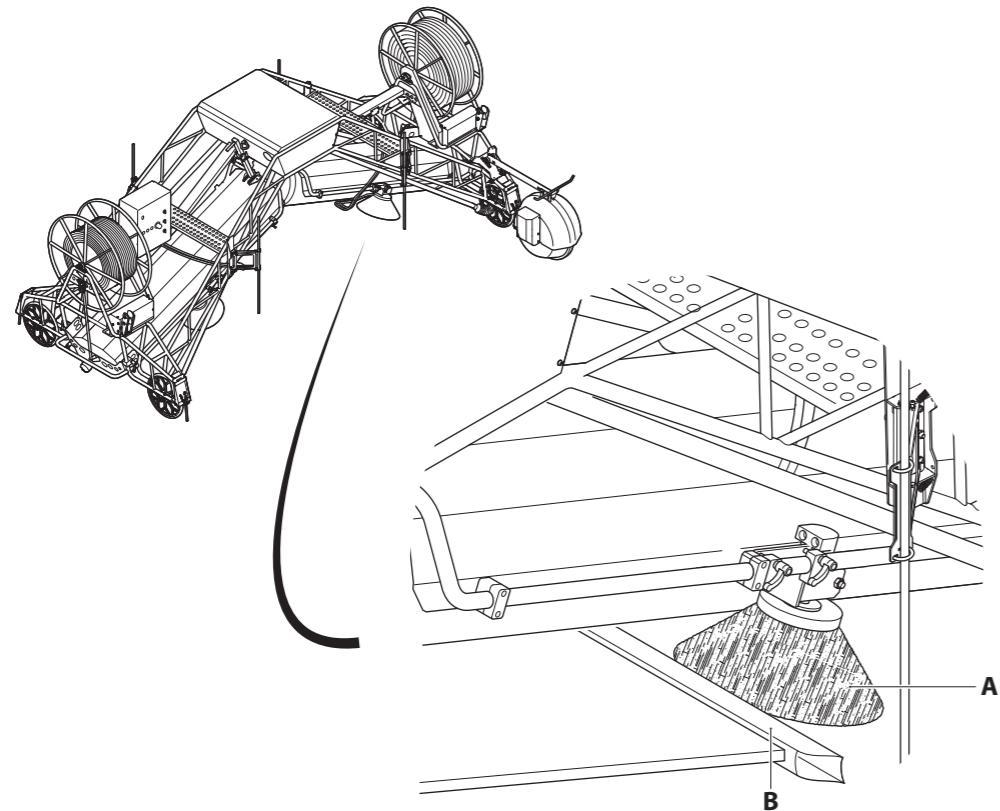


Fig. 81 Visually inspect if the window disk brushes are positioned correctly

3. Move the **roof washer** back onto the platform. **NOTICE** when the lower side of the main brush is at the correct height continue to step 8.

4. Loosen the two **clamps A** and/or the two **nuts B** of the **window disk brush C**.

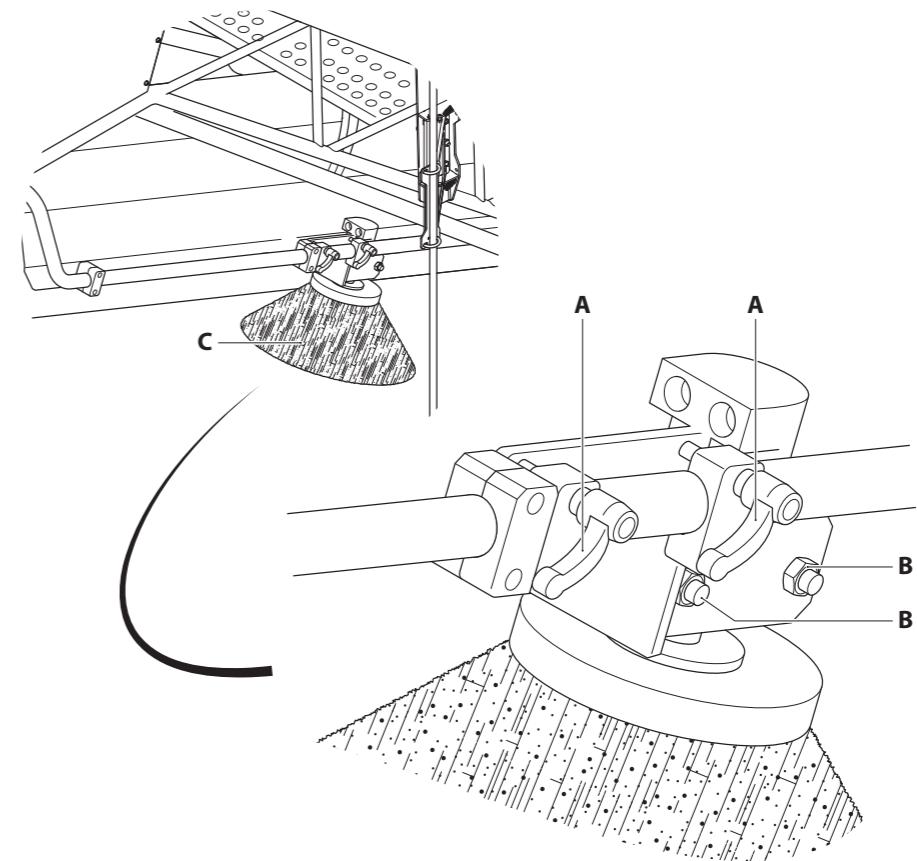


Fig. 82 Loosen the window disk brush clamps and nuts

5. Move the **window disk brush A** to the correct position.

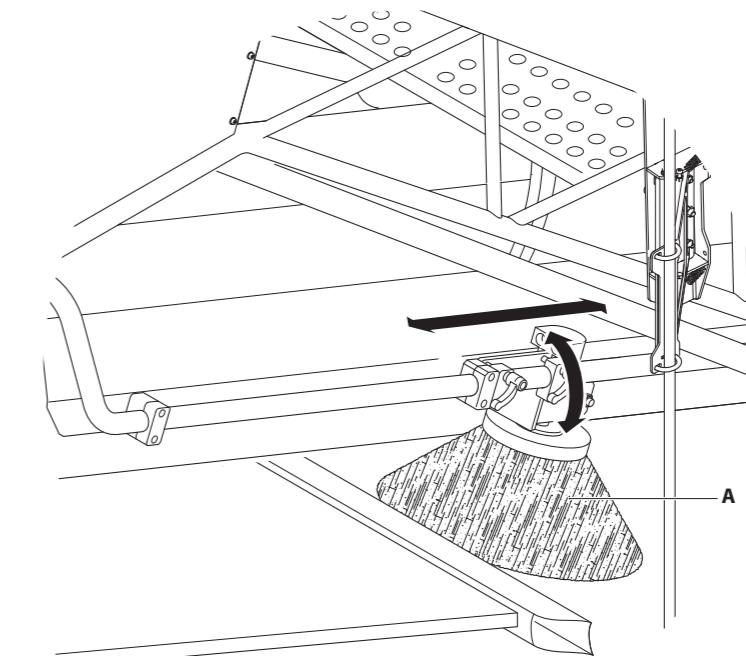


Fig. 83 Move the window disk brush

6. Tighten the two **clamps** and/or the two **nuts** of the **window disk brush**.
7. Repeat steps 1 to 6 until the **window disk brush** is in the correct position.
8. The **second window disk brush** shall be adjusted identically to the **first window disk brush**. To adjust the **second window disk brush**, measure the distances of the **first window disk brush**. Put the **second window disk brush** to the same position as the **first window disk brush**.

5.8.3 Adjust the optional window protection switch

1. Position the **roof washer** above a **window** and visually examine if the distance between the highest point of the **window A** and the **carbon tube B** is approximately 20 mm (0.8 inch).

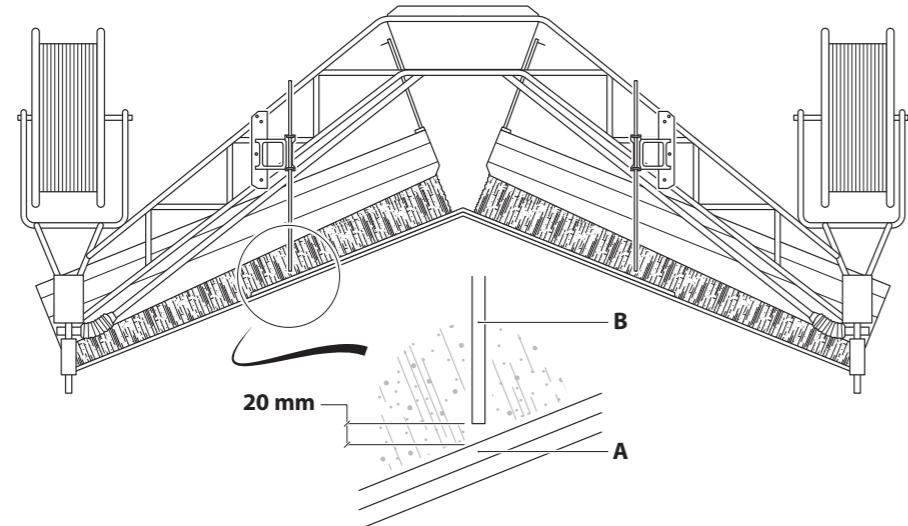


Fig. 84 Adjust the carbon tube

2. Move the **roof washer** back onto the platform.

3. If necessary loosen the **holders A** of the **carbon tube B**. Adjust the height of **carbon tube B** to get the distance between the highest point of the **window A** and the **carbon tube B** to be approximately 20 mm (0.8 inch). Tighten the **holders A**.

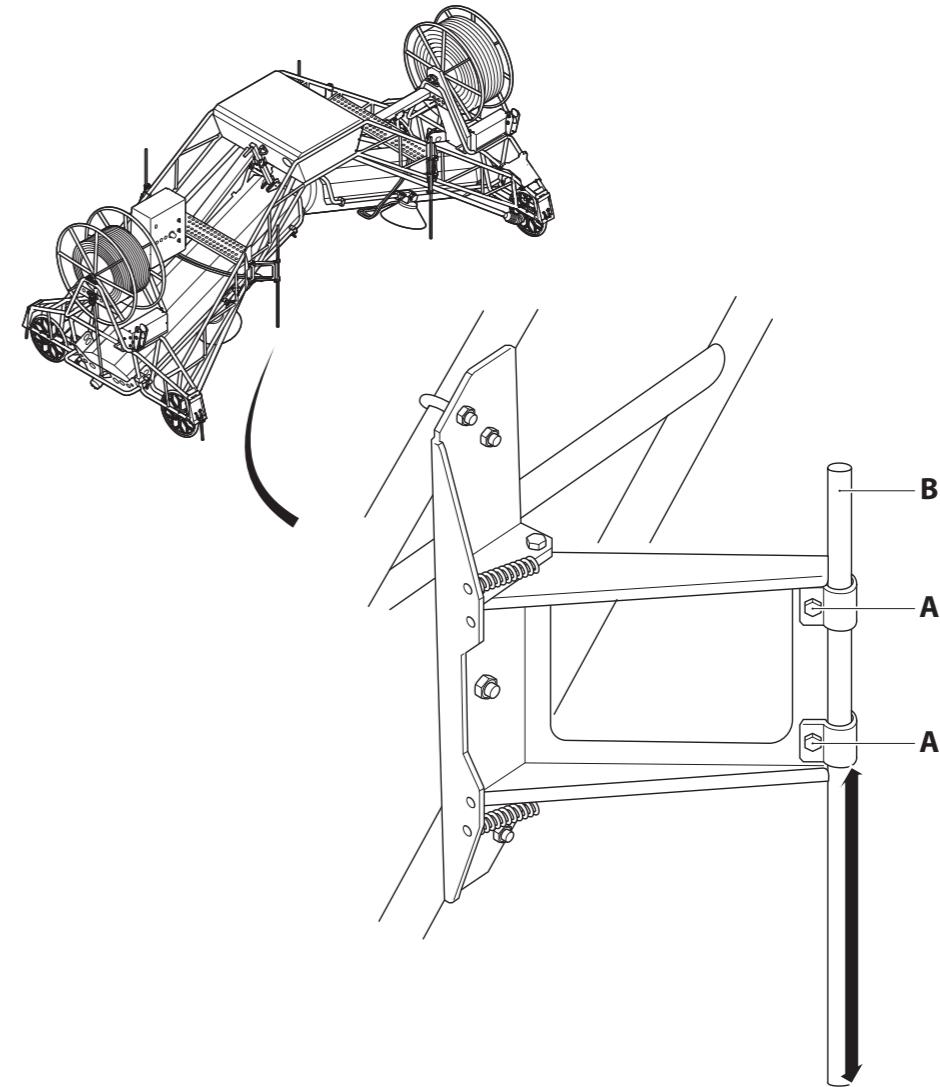


Fig. 85 Adjust the height of the carbon tube

4. Adjust the **other three carbon tubes** to the same height.

5.8.4 Adjust the optional gutter brush

1. Make sure that the **GUTTERBRUSH** switch is put on **AUTO**.

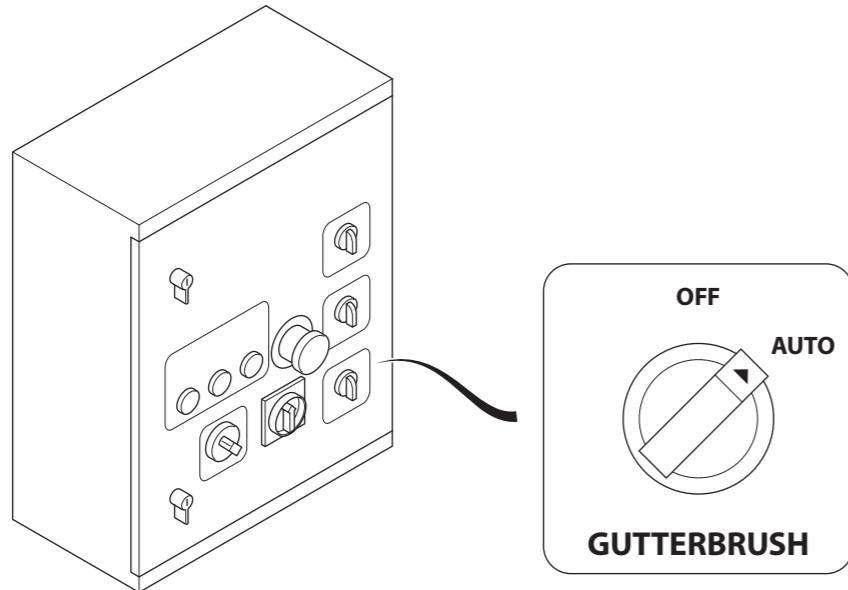


Fig. 86 Put the GUTTERBRUSH switch on AUTO

2. Turn the **adjustment bolt A** to adjust the **gutter brush B** upwards/downwards.

NOTICE When the brush is too low adjusted, it will hit the platform and the machinery may damage!

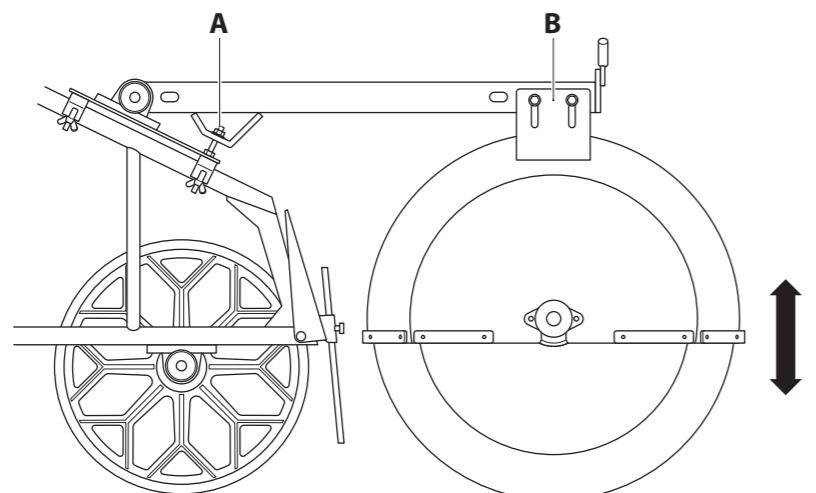


Fig. 87 Adjust the gutter brush height

5.8.5 Adjust the front wheel switch levers

1. Visually examine the height of the **gutter end stop**.
2. Adjust the height of the two **front wheel switch levers A** so the **gutter end stops** activates them. There shall be a distance of 10 mm (0.4 inch) between the **wheel switch levers A** and the **platform ramp B**. **NOTICE** Don't position the wheel switches too low otherwise they may hit the ramps and the machinery will stop and move back to the platform.

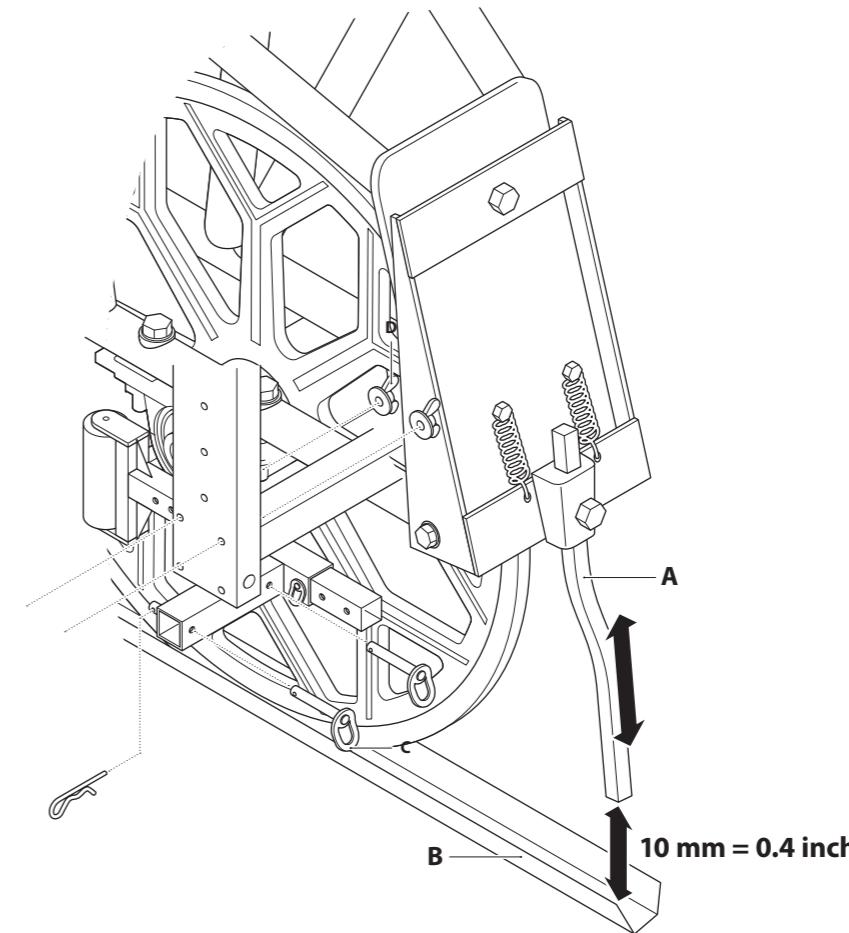


Fig. 88 Adjust the front wheel switch levers

5.9 HOW TO PROTECT THE MACHINERY FROM FROST

⚠ WARNING

- Never use the machinery at temperatures lower than 0.5 °C (31 °F).

If the temperature drops below 0.5 °C (31 °F), the machinery may not be used.

The machinery shall either be taken off of the greenhouse (see *5.10 How to take the machinery off of the greenhouse*) and be stored in a location free of frost. Alternatively all excess water which is left in the water system shall have to be removed to make sure no parts of the machinery will be damaged by frost.

To remove all excess water:

- Disconnect the **water hose** from the water supply at the greenhouse.
- Turn on the **water pump** and let it run until the **float tank** is empty. Turn off the **water pump** after the **float tank** is empty.
- Remove the **float tank filter** and the **inlet filter** by removing the **filter house lid** and the **filter element** and store it in a place safe from frost. See *step 1 and 2 of 8.10 How to clean the filters of the water pump*.
- Open all four **drain valves A** at the bottom of the **brush frames** and leave them open.

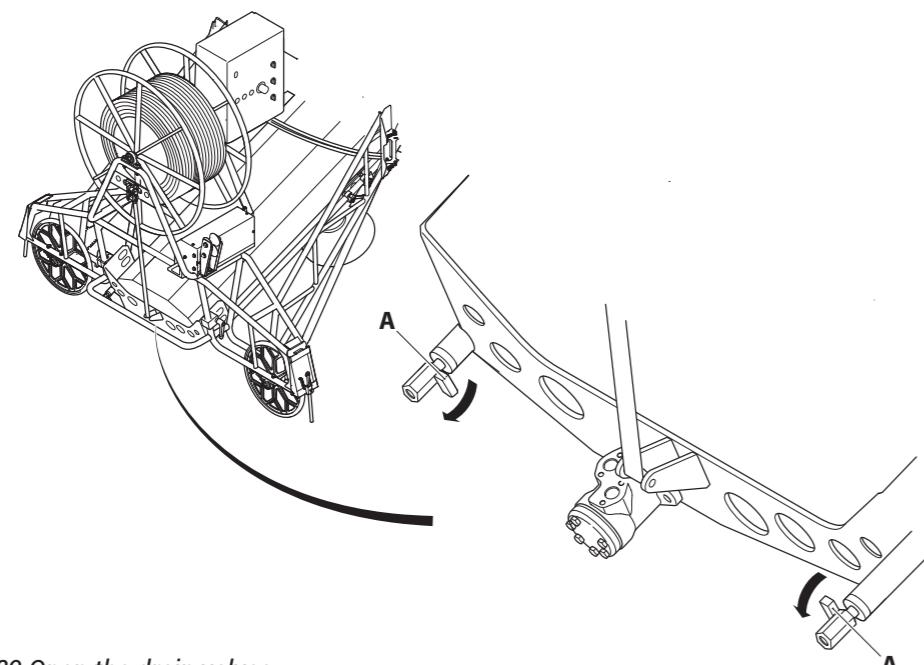


Fig. 89 Open the drain valves

- Choose one of the following options:

- there is no filter installed between the **water hose** of the roof washer and the **hand railing** of the platform: Disconnect the **water hose** from the connection on the platform.
- If there is a **filter A** installed between the **water hose** of the roof washer and the **hand railing** of the platform: Open the **drain valve B** at the bottom of the filter and leave it open.

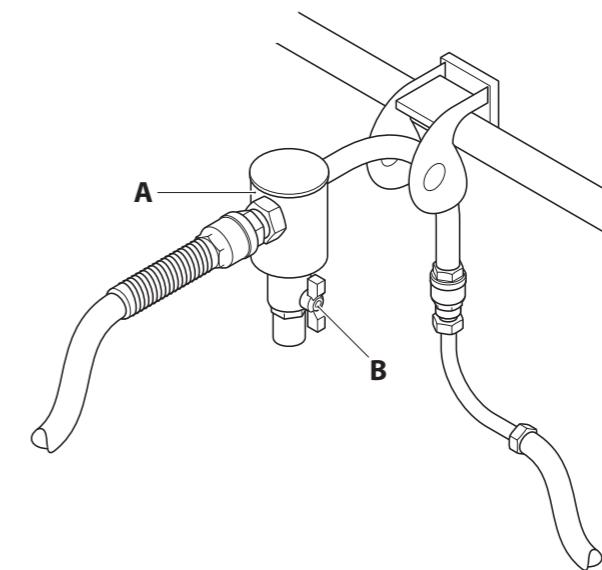


Fig. 90 Open the filter drain valve

- If applicable, remove all **spray booms**, the **CCB** (Coating Controller Box) and the **Dosing pump** and store them in a place safe from frost. Consult the manual of the spray booms for instructions on how to remove these parts (see *1.7 Other documentation*).

5.10 HOW TO TAKE THE MACHINERY OFF OF THE GREENHOUSE

When you want to disconnect the platform and roof washer in order to install the machinery on another greenhouse, you can do the steps as described in *5.5 How to place the machinery on the rail of the greenhouse* in reversed order.

When disconnecting the platform with roof washer, specifically make sure to:

1. Remove the **operation display with support** (automatic version only) first. See *5.3.4 Prepare the remaining parts of the platform*.
2. The roof detection switch is in the transport position. To put the roof detection switch in transport position, Follow the instructions in reverse order of *5.7.3 Adjust the roof detection switch*.
3. When you fold in the platform legs, first fold in the upper platform leg and then the lower platform leg. See *5.5 How to place the machinery on the rail of the greenhouse*.

DANGER

- Always use appropriate personal protective equipment when working with the machinery, such as protective gloves, safety shoes (minimum class S3), safety goggles, safety harness, hard hat, lifeline and protective overalls.
- Wear sun protective clothing if necessary and use sunscreen to protect exposed body parts against the sun.
- Wear warm and water resistant clothing against the cold or when it is raining.
- Make sure that the combined weight of the machinery standing in the greenhouse gutters, everyone and everything on the machinery does not exceed the maximum allowed gutter load.
- Make sure that all greenhouse gutters are provided with proper end-gutter protection. If these protections are not present and/or properly attached, the machinery moving in the greenhouse gutters can fall off the greenhouse.
- Make sure that the top rail has been equipped with a firm steel barrier with a minimum height of 80 mm (3 inch) on both ends.
- Make sure that there is a minimum of 20 cm (8 inch) of free space between the ground and the bottom of the lower wheels at all times.
- Make sure that the machinery can move freely alongside the greenhouse gable. Remove any obstacles that are in its way.
- Make sure that the machinery can move freely inside the greenhouse gutters. Remove any obstacles that are in its way.
- Make sure that the windows of the greenhouse are closed and remain closed when using the machinery.
- Make sure that there is no-one inside the greenhouse where the machinery is in use. Depending on the situation, create a NO GO zone to ensure public safety.
- Before use make sure that you have an evacuation plan drawn up by an official safety expert.
- Make sure that you know where the emergency stop buttons are located before operating the machinery.
- Make sure that a first aid kit is present on the machinery where people are working.

- Do not use the machinery after an earthquake. Keep a safe distance from the greenhouse and machinery until they have been fully inspected by a qualified and trained person.
- Never use the machinery with wind speeds above 11 m/s (25 mph).
- Always anchor the van der Waay platform to the anchor plates when wind speeds above 17 m/s (38 mph) are expected. Remove the roof washer from the platform or securely strap it to the platform by fastening the four lifting points of the roof washer to the lifting points of the platform, with four ratchet straps. When possible remove the Top Cleaner from the greenhouse entirely.
- Never use the machinery at temperatures lower than 0.5 °C (31 °F).
- Do not use the machinery during thunderstorms and extreme weather conditions. Seek shelter in the event of an approaching thunderstorm or sudden weather deterioration.
- Always remove the machinery from the greenhouse when heavy snowfall is expected. The weight of the snow can damage the top rail causing the machinery to fall off the greenhouse.
- In case of an accident, stop using the machinery and consult a doctor if necessary.
- Use a bright headlamp when working in the dark.
- Make sure that the anti-climb protection is put and locked on the ladder when there is no authorized personnel nearby.
- When performing works on top of the greenhouse or on a van der Waay platform, make sure to wear a certified safety harness and a certified double lifeline of 2 meters (6.5 feet) in length.
- When going up onto the roof of the greenhouse always make sure that you wear a certified safety harness that is leashed with a certified fall arrest device.
- Make sure that you can sound an alarm when necessary. Always carry a mobile phone or other means of communication with you.
- Remove all loose materials and tools from the machinery. These can be moved by the wind and cause material damage to the machinery and the greenhouse.
- Never use a ladder to get onto the roof of a greenhouse, unless the ladder is a part of the van der Waay platform.

6.1 HOW TO OPERATE THE MANUAL VERSION

1. Make sure that the **front wheel switches** operate correctly. In order to do so, move the roof washer on the platform and activate the wheel switches with your foot. The roof washer should stop and move backward.
2. Make sure that the **water supply hose** and **power supply cable** from greenhouse to platform can move freely and don't get stuck.
3. Push the **platform /left button** on the **remote control roof washer and platform** to move the **platform with the roof washer** in front of a rooftop and the **gutters** until the platform stops automatically and is aligned correctly with the gutters.
4. Push the **platform ramp down button** on the **remote control roof washer and platform** to put the **ramps** in the **gutter**.
5. Put the **WATER PUMP switch** in the ON position on the **control cabinet platform** to start the **water pump**.

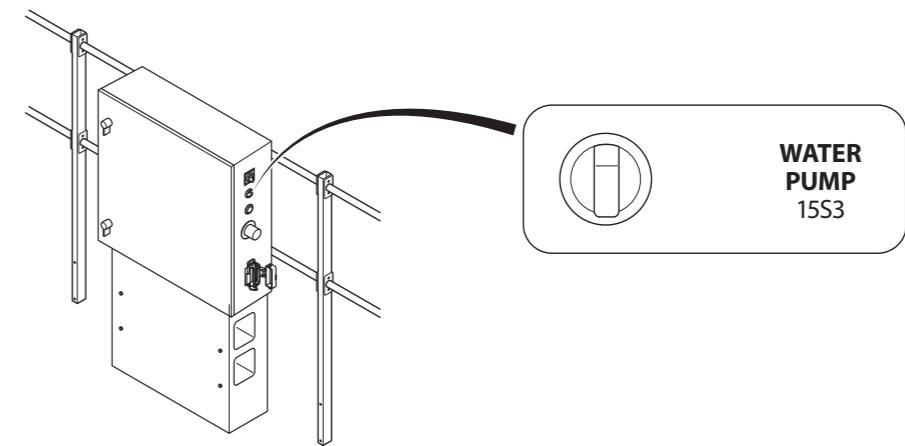


Fig. 91 Start the water pump

6. Push the **roof washer forward button** on the **remote control roof washer and platform**. The **roof washer** moves onto the greenhouse and brushes the roof. The **roof washer** automatically stops at the end of the **gutters**. The water hose and cable reels are activated and the roof washer moves back to the platform. The roof washer automatically stops at the platform.
7. Push the **platform ramp up button** to raise the **ramps**.
8. Move the **platform** and **roof washer** to the next rooftop. Repeat steps 11,12,14,15 until the **greenhouse roof** has been washed completely.

9. Store the **remote control roof washer and platform** and the **remote control undercarriage** when you don't use it in the dedicated **storage slots A**, right underneath the **control cabinet platform**.

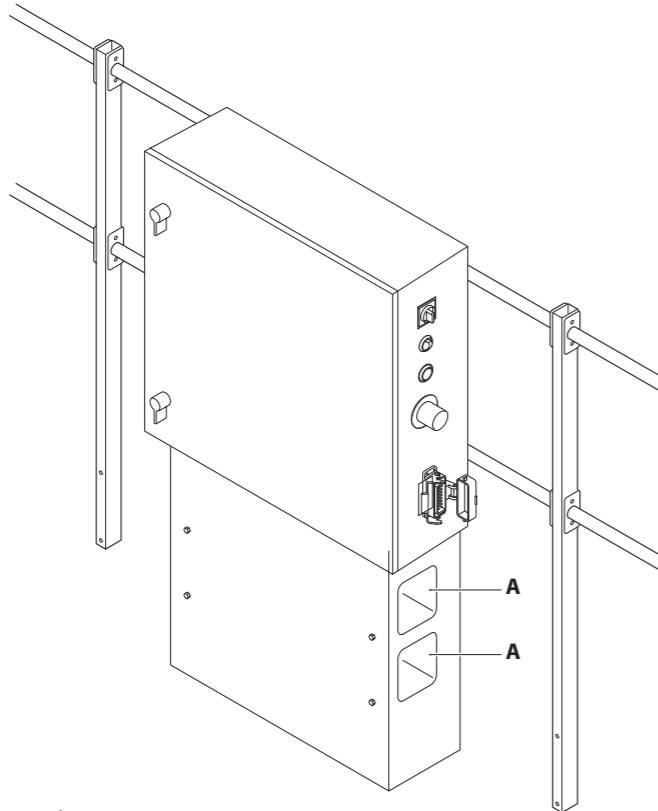


Fig. 92 Remote control storage

10. Make sure that the **WATER PUMP switch** is in the OFF position on the **control cabinet platform**.
11. Put the **main switch 1S0 A** of the **control cabinet platform** to the **0 position** (put to the **OFF** position for the North American version).

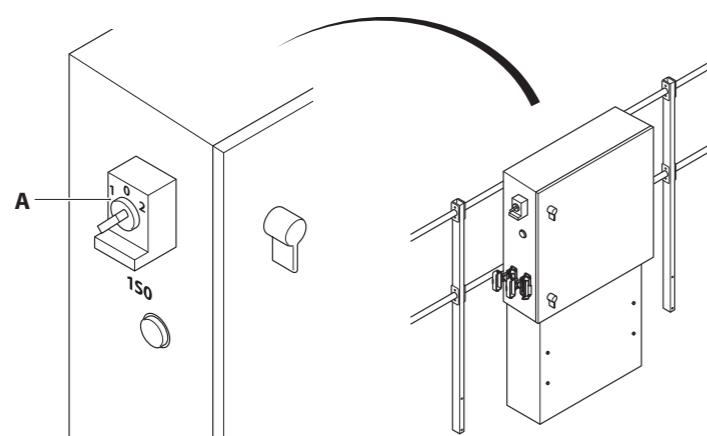


Fig. 93 Turn the control cabinet platform off

6.2 HOW TO CONNECT THE REMOTE CONTROL

The **operation display** is used to operate the roof washer and platform automatically. When the operation display has been connected to the platform legs, the machinery can be safely operated from ground level without climbing the ladder.

The machinery can be operated both manually and automatically via the operation display. The **remote control roof washer and platform** can also be used to operate the automatic version manually. Optionally the machinery can be controlled with an app on a mobile device. If this applies to your machine, consult the *Ixon keepgo manual*, see 1.7 Other documentation on how to install and use the app.

The automatic version will go in standby mode after its washing cycle is done and remains in standby mode until it receives new input.

6.2.1 Start an automatic washing cycle

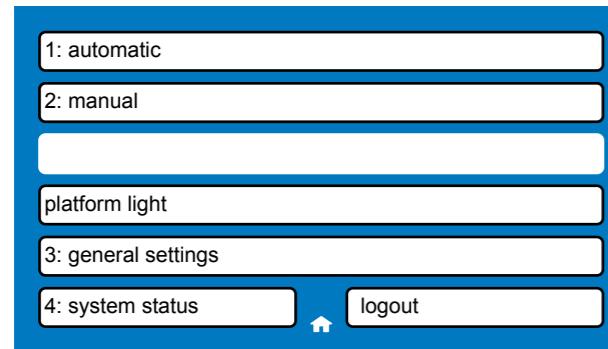
1. Make sure the machinery complies with the following start-conditions, before starting a washing cycle:
 - The ramps are in the upwards position.
 - The platform is positioned in front of a rooftop.
 - The roof washer is parked on the platform.
 - The **water supply hose** and **power supply cable** from greenhouse to platform are not stuck.
2. Login on the **operation display**. The default password for the **user login** is 2011. To change the password, see 6.2.5 *Adjust the general settings*. The **Home screen** opens.



Screen 0 Login

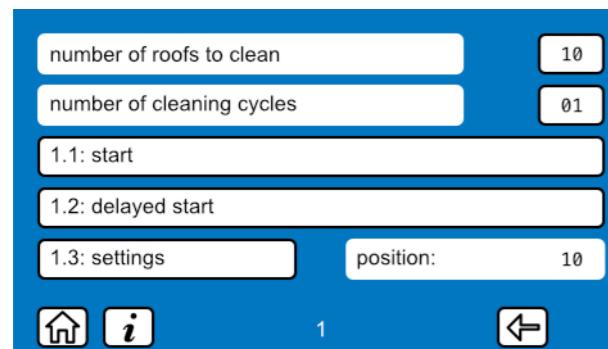
6 OPERATION

3. On the **HOME** screen tap **1: automatic** to enter the settings for an automatic cleaning cycle.



Screen *HOME automatic*

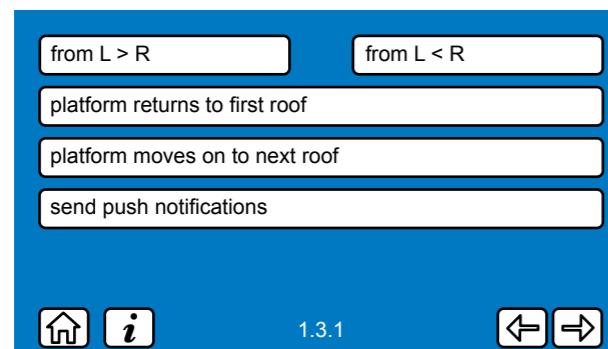
4. For first-time use tap **1.3: settings** to adjust the settings.



Screen *1 automatic cleaning*

5. Match the settings to your machine. The amount of settings which can be changed depends on the version of the machinery.

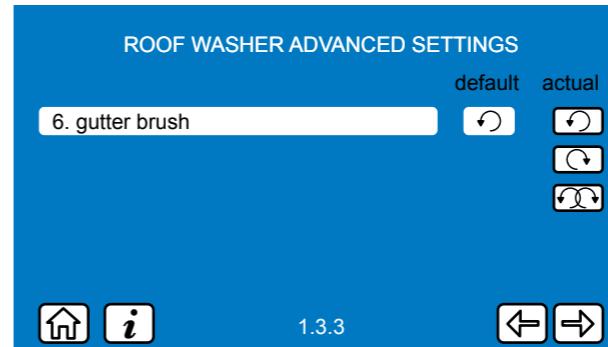
NOTICE Tap **i** for more information on the meaning of these settings.



Screen *1.3.1 Machine settings for automatic cleaning*

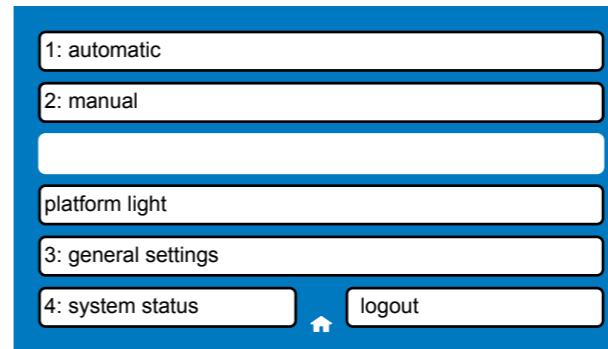
6. Tap to enter the **ADVANCED ROOF WASHER SETTINGS**. Continue tapping and completing all the settings and return to the **HOME** screen.

NOTICE Tap **i** for more information on the meaning of these settings.



Screen *1.3.1 Roof washer advanced settings*

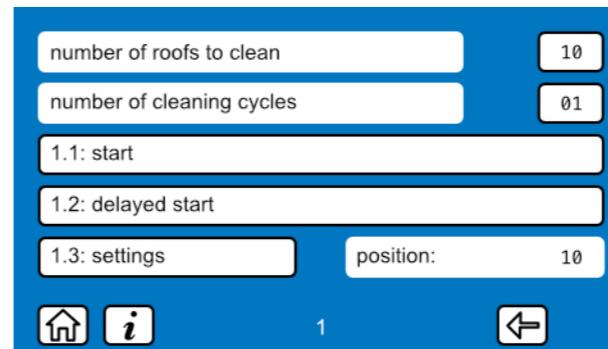
7. On the **HOME** screen tap **1: automatic**.



Screen *HOME automatic*

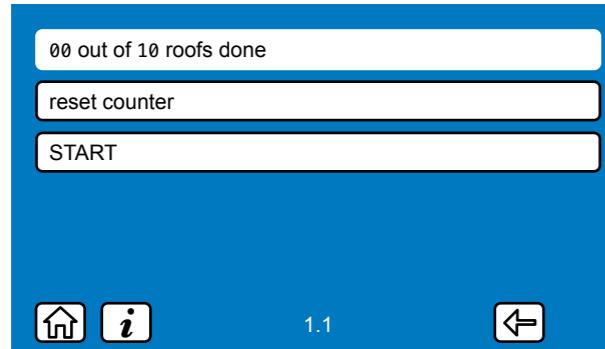
8. Enter the **number of rooftops** to be washed, and the **number of times** each rooftop needs to be washed.

NOTICE Tap **i** for more information on the meaning of these settings.



Screen *1 Automatic washing*

9. Tap **1.1:start**. Tab **reset counter** if you want to start counting again from rooftop 00. Tap **START**. After a countdown of 30 seconds the roof washer will start the washing cycle. **NOTICE** If a warning message appears, the machinery did not comply with the start-conditions of step one. The machinery changes to manual mode, see *6.2.3 Control the machinery with the operation display manually*. **NOTICE** Tap  for more information on the meaning of these settings.



Screen 1.1 Start settings

6.2.2 Start an automatic washing cycle with a delayed start

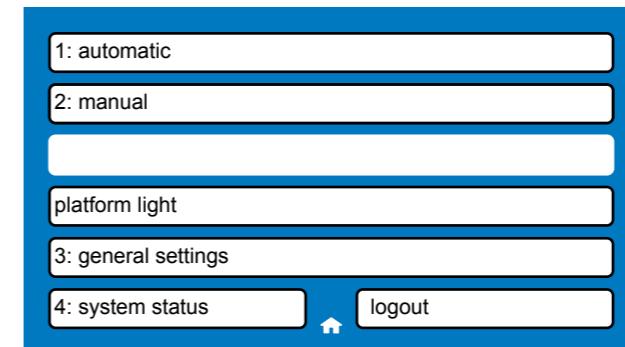
1. Make sure the machinery complies with the following start-conditions, before starting a washing cycle:
 - a. The ramps are in the upwards position.
 - b. The platform is positioned in front of a rooftop.
 - c. The roof washer is parked on the platform.
 - d. The **water supply hose** and **power supply cable** from greenhouse to platform are not stuck.

2. Login on the **operation display**. The default password for the **user login** is 2011. To change the password, see *6.2.5 Adjust the general settings*. The **Home screen** opens.



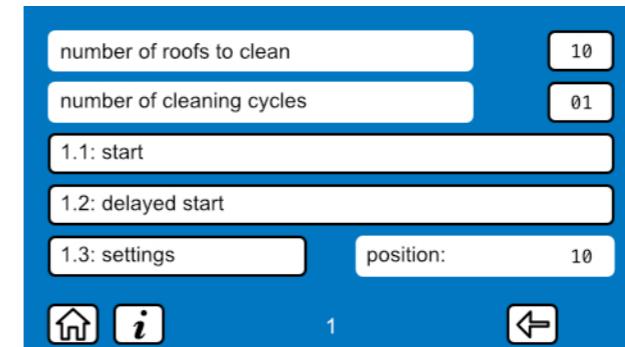
Screen 0 Login

3. On the **HOME** screen tap **1: automatic** to enter the settings for an automatic cleaning cycle.



Screen HOME automatic

4. For first-time use tap **1.3: settings**.

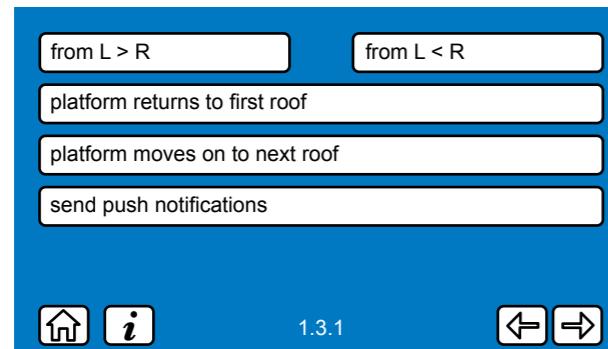


Screen 1 automatic cleaning

6 OPERATION

5. Match the settings to your machine. The amount of settings which can be changed depends on the version of the machinery.

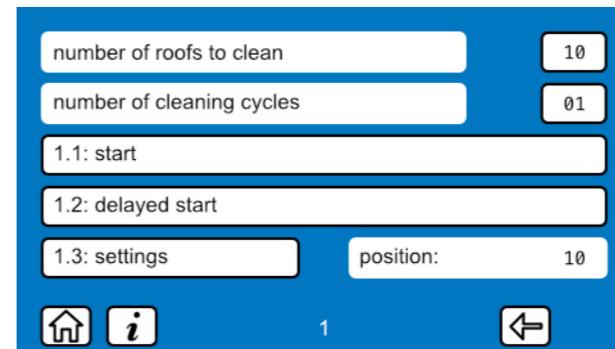
NOTICE Tap  for more information on the meaning of these settings.



Screen 1.3.1 Machine settings for automatic cleaning

8. Enter the **number of rooftops** to be washed, and the **number of times** each rooftop needs to be washed. Tap **1.2: delayed start**

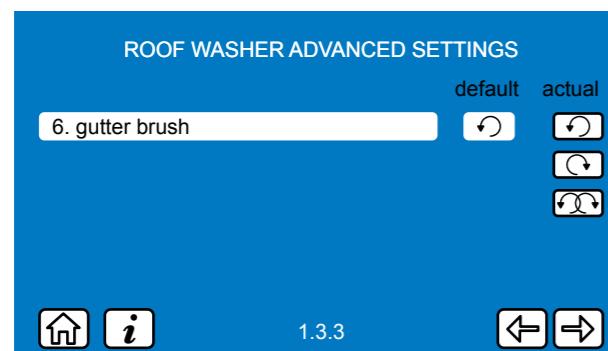
NOTICE Tap  for more information on the meaning of these settings



Screen 1 Automatic washing

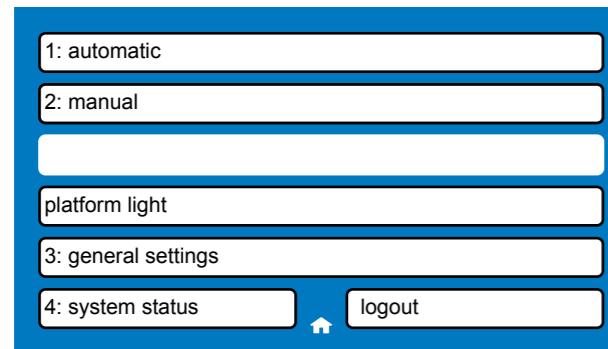
6. Tap  to enter the **ADVANCED ROOF WASHER SETTINGS**. Continue tapping  and completing all the settings and return to the **HOME screen**.

NOTICE Tap  for more information on the meaning of these settings.



Screen 1.3.1 Roof washer advanced settings

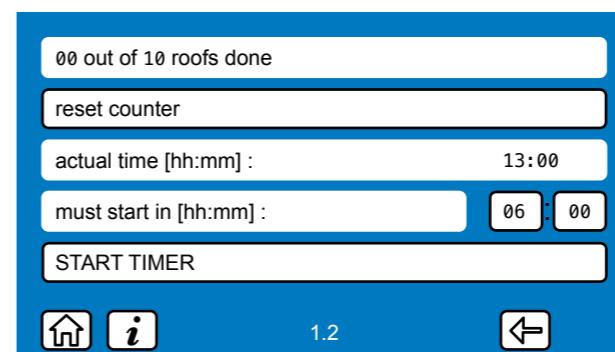
7. On the **HOME screen** tap **1: automatic**.



Screen 1 Automatic washing

9. Enter the amount of **hours** and **minutes** before the washing cycle should start.

NOTICE Tap  for more information on the meaning of these settings.



Screen 1.2 Delayed start settings

10. Tap the **START TIMER** button. A timer will be active up until the point the roof washer will start the washing cycle. **NOTICE** If a warning message appears, the machinery did not comply with the start-conditions of step one. The machinery changes to manual mode, see **6.2.3 Control the machinery with the operation display manually**.

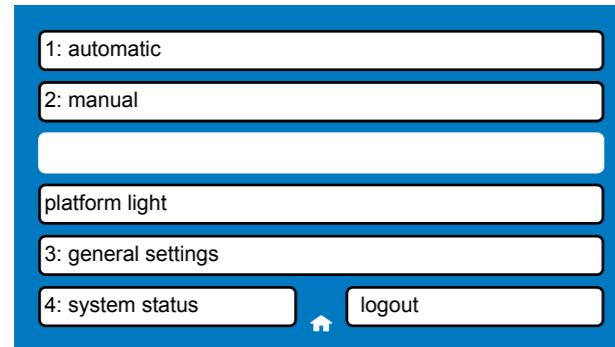
NOTICE Tap  for more information on the meaning of these settings

6.2.3 Control the machinery with the operation display manually

It is also possible to manually control an automatic version. This is generally done while testing and adjusting the machinery or when an error occurs during an automatic washing cycle.

To manually control the automatic version:

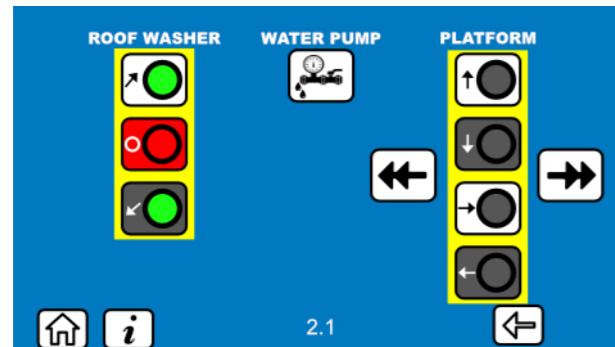
1. Go to the **Home screen** 
2. Tap **2: manual button**.



Screen *HOME manual*

3. Control the roof washer, the platform and the water pump manually to wash the greenhouse.

NOTICE tap  for more information on the use of the buttons.

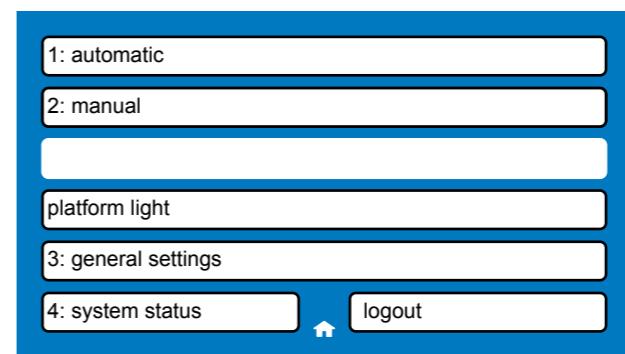


Screen *2.1 manual operation*

6.2.4 Turn the platform light on or off

1. Go to the **Home screen** 
2. Tap the **platform light** to turn the light on or off.

NOTICE When the Platform light button is white, the light is off. When the Platform light button is green, the light is on. After turning off the platform light, the light will switch off after three minutes.

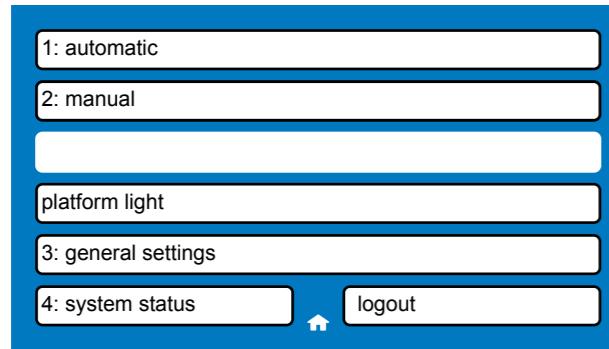


Screen *HOME platform light*

6.2.5 Adjust the general settings

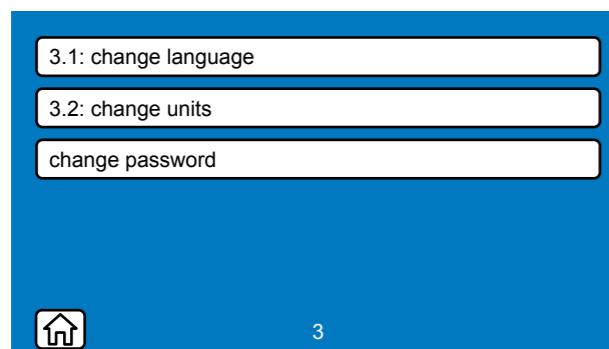
In the general settings the language, time, date and password can be changed.

1. Go to the **Home screen** .
2. Tap **3: general settings button**.



Screen HOME general settings

3. Change any of the language, time, date or password settings you wish to change by tapping on the button and entering the settings accordingly.



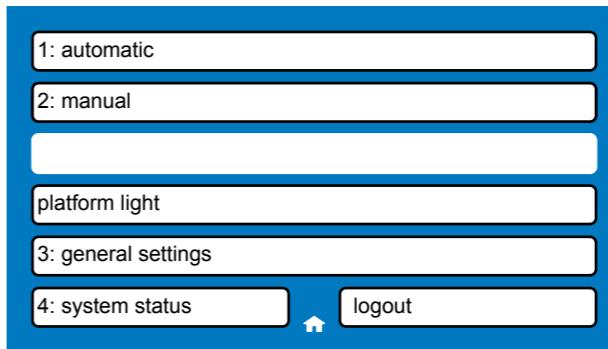
Screen 3 general settings

6.2.6 Check the status of the machinery

Whenever there is a warning or an error screen and the machine does not want to start or when it suddenly stops, the **system status** can provide information. The **system status** shows where the problem is occurring by showing which sensors are active and inactive.

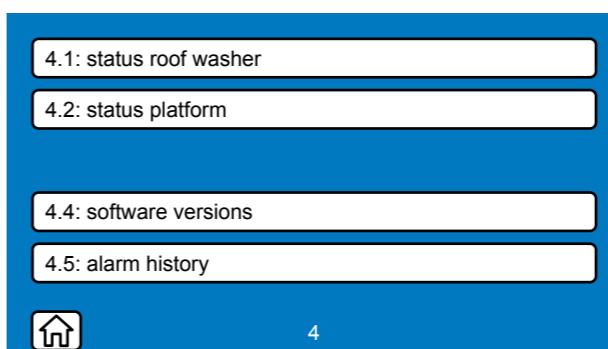
To view the status of the machinery:

1. Go to the **Home screen** .
2. Tap **4: system status**.



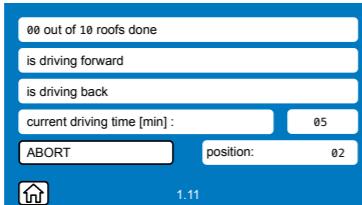
Screen HOME system status

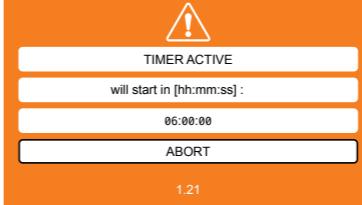
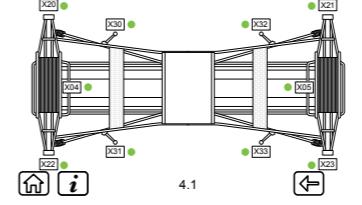
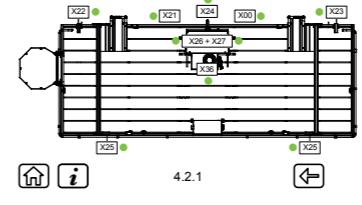
3. Tap the button of the roof washer, platform, software or alarm history to get the status of that part of the machinery.

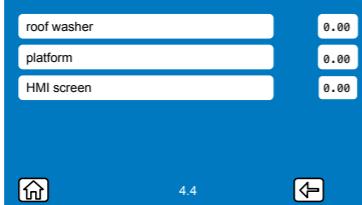
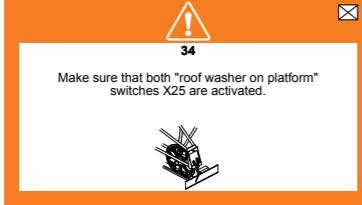
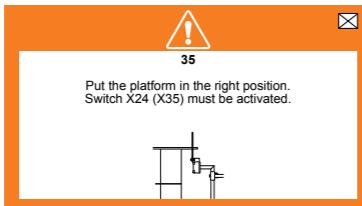
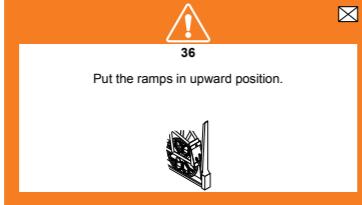


Screen 4 System status

6.2.7 Explanation of additional screens

Level	Screen	Meaning
		<ul style="list-style-type: none"> Instructions to work safely.
1.10		<ul style="list-style-type: none"> For safety reasons the machinery starts after a delay of 30 seconds. An acoustic warning sounds at the same time. Abort the automatic washing cycle. The machinery will not start and should be programmed again.
1.11		<ul style="list-style-type: none"> Indicates how many rooftops were already washed. Indicates if the roof washer is driving forward or backward. Indicates how many minutes the roof washer is driving on the current rooftop. Abort the automatic washing cycle. The roof washer will finish the rooftop and once back on the platform it stops and shuts down. Indicates the actual position (rooftop No.).
		<ul style="list-style-type: none"> Indicates that all set rooftops were washed without any interruptions.

1.21		<ul style="list-style-type: none"> Indicates there is a timer active. indicates that the machinery is waiting to start when the counter reaches zero. Indicates the actual time. Aborts the automatic washing cycle.
2.1		<ul style="list-style-type: none"> Roof washer control. Water pump on/off. Platform control.
1.51		<ul style="list-style-type: none"> Indicates that the platform is driving to the leftmost rooftop without stopping. Abort will stop the platform immediately.
1.52		<ul style="list-style-type: none"> Indicates that the platform is driving to the rightmost rooftop without stopping. Abort will stop the platform immediately.
4.1		<ul style="list-style-type: none"> Indicates the status of all roof washer switches/sensors. A green dot means that the switch/sensor is active. A gray dot means that the switch/sensor is not active.
4.2.1		<ul style="list-style-type: none"> Indicates the status of all platform switches/sensors. A green dot means that the switch/sensor is active. A gray dot means that the switch/sensor is not active.

4.4		<ul style="list-style-type: none"> Indicates the present software version for the roof washer control. Indicates the present software version for the platform control. Indicates the present software version for the operation display control.
4.5		<ul style="list-style-type: none"> Displays a summary of all previous alarms including the date/time that an alarm occurred, and was recovered.
34		<ul style="list-style-type: none"> Warning 34 instructs the operator to put the roof washer in the right position on the platform before an automatic washing cycle can be started. Both switches X25 must be active. After closing this screen, the display automatically jumps to the manual operation screen, No 2.
35		<ul style="list-style-type: none"> Warning 35 instructs the operator to put the platform in the right position before an automatic washing cycle can be started. Switch X35 must be active. After closing this screen, the display automatically jumps to the manual operation screen, No 2.
36		<ul style="list-style-type: none"> Warning 36 instructs the operator to put the ramps of the platform in vertical up position before an automatic washing cycle can be started. After closing this screen, the display automatically jumps to the manual operation screen, No 2.

6.3 HOW TO DECOMMISSION THE MACHINERY

- Put the **main switch 1S0 A** of the **control cabinet platform** to the **0 position** or put to the **OFF B** position for the North American version.

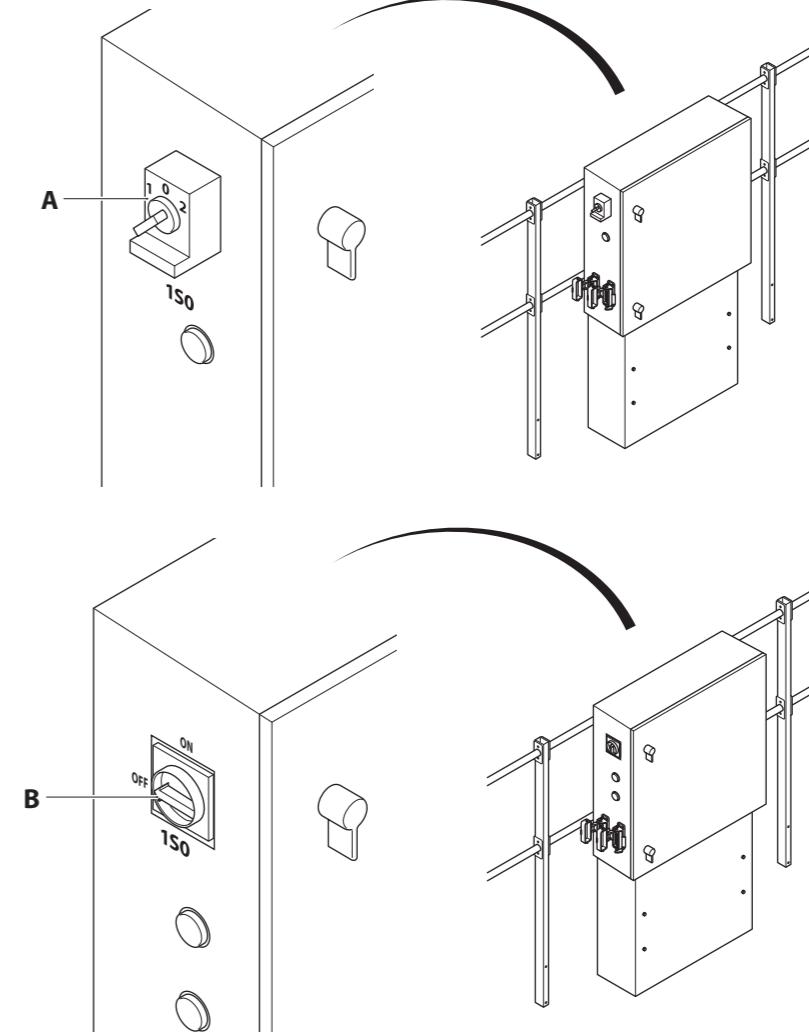


Fig. 94 Turn the control cabinet platform off

6.4 WHAT TO DO IN AN EMERGENCY AND EXCEPTIONAL SITUATION

The machinery is equipped with multiple emergency stop buttons that the user can activate by pushing the red button whenever there is an emergency situation. All activities of the machinery are then aborted. A reset must be done after pushing an emergency stop button. Before doing a reset, pull out an activated (pressed) emergency stop button. For doing a reset, see *6.5 How to reset the machinery*.

Location of the emergency stop buttons:

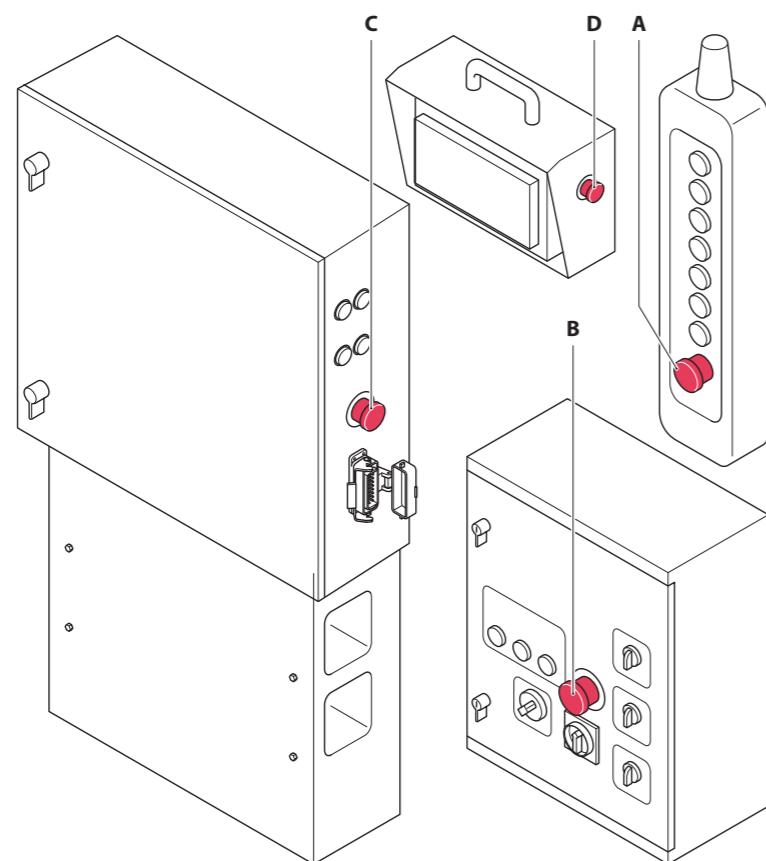


Fig. 95 Locations of emergency buttons.

- A. Emergency stop button on the remote control roof washer and platform
- B. Emergency stop button on the control cabinet roof washer
- C. Emergency stop button at the side of the control cabinet platform
- D. Emergency stop button at the side of the display of the operation display
(for automatic version only)

6.5 HOW TO RESET THE MACHINERY

6.5.1 Reset after an emergency stop or interruption with manual version

1. Do the troubleshooting procedure to find the cause of the malfunction. Find a solution for the malfunction. See *9.2 Troubleshooting of the manual version*.
2. Make sure that all activated (pressed) emergency stop buttons are pulled out.
3. Push the **failure/reset button 12S6** on the **control cabinet platform** until the red light turns off.

6.5.2 Reset after an emergency stop or interruption with automatic version

1. Look at the error message on the **operation display** to find the cause of the malfunction. Find a solution for the malfunction. See *9.4 Troubleshooting of the automatic version*.
2. Make sure that all activated (pressed) emergency stop buttons are pulled out.
3. Tap **RESET** on the **operation display** or close the error message to reset the machine. The **MANUAL OPERATION** screen will open automatically.
4. Put the machine back into position.
5. Go back to the **HOME** screen.

DANGER

- Always follow the instructions with regard to storing and transporting dangerous substances.
- Make sure that safety sheets of the relevant substances are available. Read and understand the safety sheets before using the substances.
- Ensure that each person who uses the machinery has read the safety sheets. Keep all safety sheets for future reference and pass them on to subsequent users of the machinery.
- Always conduct the instructions in this section by a minimum of two authorized persons: one person is near the chalking pump on the ground and one person is on the platform.
- Make sure to have eyewash available in the vicinity of the activities.
- Always use appropriate personal protective equipment when working with the machinery, such as protective gloves, safety shoes (minimum class S3), safety goggles, safety harness, hard hat, lifeline and protective overalls.
- Installation and commissioning shall be carried out by a properly qualified and skilled installer with due observance of the applicable rules and legislation. The installer is responsible for employing skilled and qualified personnel.
- In the event that you have to do installation tasks for which you need to move yourself on the machinery, make sure that you have an evacuation plan drawn up by an official safety expert.
- Make sure that the combined weight of the machinery standing in the greenhouse gutters, everyone and everything on the machinery does not exceed the maximum allowed gutter load.
- Make sure that all greenhouse gutters are provided with proper end-gutter protection. If these protections are not present and/or properly attached, the machinery moving in the greenhouse gutters can fall off the greenhouse.
- Make sure that the top rail has been equipped with a firm steel barrier with a minimum height of 80 mm (3 inch) on both ends.

- Make sure that the windows of the greenhouse are closed and remain closed when using the machinery.
- Make sure that there is no-one inside the greenhouse where the machinery is in use. Depending on the situation, create a NO GO zone to ensure public safety.
- Before use make sure that you have an evacuation plan drawn up by an official safety expert.
- Make sure that you know where the emergency stop buttons are located before operating the machinery.
- Do not exceed the maximum load of the machinery. Consult the type identification plate(s) for the maximum load.
- Do not exceed the maximum number of people allowed on the machinery.
- When performing works on top of the greenhouse or on a van der Waay platform, make sure to wear a certified safety harness and a certified double lifeline of 2 meters (6.5 feet) in length.
- When going up onto the roof of the greenhouse always make sure that you wear a certified safety harness that is leashed with a certified fall arrest device.
- Make sure that you can sound an alarm when necessary. Always carry a mobile phone or other means of communication with you.
- Remove all loose materials and tools from the machinery. These can be moved by the wind and cause material damage to the machinery and the greenhouse.
- Never use a ladder to get onto the roof of a greenhouse, unless the ladder is a part of the van der Waay platform.

Depending on your order the spray boom is connected to the roof washer or not. Consult the Top Cleaner Spray Boom manual on how to install and use the spray boom (see 1.7 *Other documentation*).

DANGER

- Always use appropriate personal protective equipment when working with the machinery, such as protective gloves, safety shoes (minimum class S3), safety goggles, safety harness, hard hat, lifeline and protective overalls.
- Wear sun protective clothing if necessary and use sunscreen to protect exposed body parts against the sun.
- Wear warm and water resistant clothing against the cold or when it is raining.
- Do not exceed the maximum load of the machinery. Consult the type identification plate(s) for the maximum load.
- Do not exceed the maximum number of people allowed on the machinery.
- Beware of any moving or hinging parts of the machinery. Do not place any fingers or hands where they can get jammed.
- Never insert body parts between rotating parts of the machinery.
- The machinery is not intended to be used as a device to move persons.
- Use a bright headlamp when working in the dark.
- When performing works on top of the greenhouse or on a van der Waay platform, make sure to wear a certified safety harness and a certified double lifeline of 2 meters (6.5 feet) in length.
- When going up onto the roof of the greenhouse always make sure that you wear a certified safety harness that is leashed with a certified fall arrest device.
- Make sure that you can sound an alarm when necessary. Always carry a mobile phone or other means of communication with you.
- Remove all loose materials and tools from the machinery. These can be moved by the wind and cause material damage to the machinery and the greenhouse.
- Never use a ladder to get onto the roof of a greenhouse, unless the ladder is a part of the van der Waay platform.
- All repair and modification tasks shall only be carried out by qualified and skilled persons. Only open or repair parts of the machinery when you know what you are doing. If you have any doubts, contact the manufacturer.
- All cleaning and maintenance tasks shall only be carried out by qualified and skilled persons. To ensure the operational safety of the machinery, regular maintenance shall be carried out by qualified persons in accordance with the manufacturer's instructions.

- Always shut off the machinery according to the LOCK OUT-TAG OUT method before performing any maintenance or repair work.
- Maintenance and inspection should be done on a frequent basis. If there is any visible damage, a strong odor or excessive overheating of components, stop using the machinery. Non-frequent maintenance shortens the activity and life span of the machinery and voids the warranty.
- Use only original accessories and spare parts. You can always order spare parts from the webshop <https://portal.vdwaay.nl/en/shop> or by sending an email to salesteam@vdwaay.nl.
- Alterations to the machinery and technical modifications are not permitted without written permission of the manufacturer. Failure to do so may result in damage to property and/or severe or fatal injuries and it will invalidate the warranty.

8.1 TECHNICAL ASSISTANCE

For technical assistance please contact:

Van der Waay B.V.
Finlandlaan 2
2391 PV Hazerswoude
The Netherlands
Tel.: +31 (0) 172 210311
info@vdwaay.nl

For ordering spare parts visit <https://portal.vdwaay.nl/en/shop>

8.2 MAINTENANCE AND INSPECTION SCHEDULE

Required tools and supplies:

- Several tools that can be found in the supplied tool box.
- Manual oil change sump pump [SKU number Van der Waay 9547]
- Grease gun with water resistant lubrication
- Chain spray
- Lubricating spray

8.2.1 Before every use

Task	Notice
Check running hours in the LOGIN screen (for automatic version only).	If the amount of running hours is >50 hours, perform the maintenance tasks as described in section <i>8.2.3 Inspection and maintenance every month or every 50 running hours</i>
Check running hours on the hour counter inside the control cabinet roof washer (for manual version only)	

8.2.2 After every use

Task	Notice
Clean the roof washer and platform.	See section <i>8.11 How to clean the machinery</i>
Make sure that the wheels of the roof washer do not have a damaged rubber surface.	<ol style="list-style-type: none"> 1. Carefully remove any glass, screws, etc. that protrude the rubber. 2. Replace the wheels if the rubber surface is severely damaged, loose or worn.

8.2.3 Inspection and maintenance every month or every 50 running hours

NOTICE

- An incorrect assembly of the drive shafts after replacing wheels, wheel bearings and/or universal joints, has a negative effect on the activity of the roof washer. Make sure that both the upper and lower universal joints are aligned with each other.

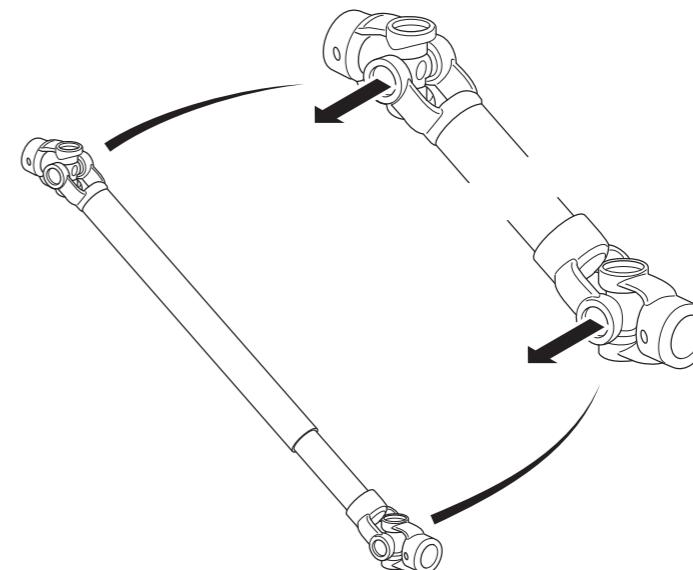


Fig. 96 Alignment of universal joints

Task	Notice
Make sure that the oil tank of the hydraulics pump of the roof washer is filled for 2/3l.	<p>Fill the oil tank if necessary up to 2/3.</p> <p>There may be a leak in the hydraulics system when you have to fill oil regularly. Consult the manufacturer if necessary. NOTICE Only use HV 32 oil!</p>
Make sure that the oil level of the water pump is between the min. and max. level	<p>See <i>8.8 How to check the water pump oil level and change the oil of the water pump</i></p>
Make the first oil change of the water pump (for the first 50 running hours only!)	<p>See <i>8.8 How to check the water pump oil level and change the oil of the water pump</i></p>

8 INSPECTION, MAINTENANCE AND CLEANING

Make sure that the wheel bearings of the roof washer have no wear and/or play.	<p>Make sure that the wheel bearings of the roof washer have no play by trying to move the wheels sideways by hand.</p> <p>The wheel bearings are worn if you can move the wheels sideways.</p>	Make sure that the brushes have no excessive wear.	Replace the brushes if the brushing result becomes less good and/or when they cannot be adjusted any more.
Make sure that the wheels of the roof washer do not have a damaged rubber surface.	<ol style="list-style-type: none"> 1. Carefully remove any glass, screws, etc. that protrude from the rubber. 2. Replace the wheels if the rubber surface is severely damaged, loose or worn. 	Lubricate the wheel set bearings on the platform.	See 8.6 How to lubricate the wheel set bearings of the platform
Make sure that the universal joints of the roof washer have no wear and/or play.	<p>Make sure that the universal joints of the roof washer have no play by trying to move the drive shafts by hand.</p> <p>The universal joints are worn if you can move the drive shafts. Replace the universal joints when they have play/are worn.</p>	Lubricate the hinges of the platform ramps on the platform.	See 8.7 How to lubricate the hinges of the platform ramps
Lubricate the universal joints and driveshafts of the roof washer.	See 8.3 How to lubricate the universal joints of the roof washer	Make sure that the platform undercarriage cross braces are not damaged or loose.	<ol style="list-style-type: none"> 1. Tighten the cross braces if necessary. 2. Replace the cross braces if damaged.
Lubricate the wheel bearings of the roof washer.	See 8.4 How to lubricate the wheel bearings of the roof washer	Make sure that the supply cable and water hose are not damaged.	Replace the supply cable and water hose if necessary.
Lubricate and possibly tighten the reel chains on the roof washer.	See 8.5 How to lubricate and tighten the reel chains	Clean the filters.	See 8.10 How to clean the filters of the water pump
Make sure that the chains of the hose and cable reel have no excessive wear.	Replace the chains of the cable and hose reel if necessary.	Make sure that the water pressure of the water pump is between 50 and 70 bar.	Adjust the water pressure if necessary.
Make sure that the adjustment of the brushes is correct.	<p>Adjust the brushes if necessary.</p> <p>See 5.8 How to adjust the roof washer</p>	Make sure that the following safety devices operate correctly and are not broken:	Replace the safety devices if necessary
		<ul style="list-style-type: none"> • Air vent switches • Wheel switches • End of rail switches on the platform 	

8.2.4 Inspection and maintenance every two years

Inspection task	Required action
Replace the wheel bearings of the roof washer.	Replace the wheel bearings only when the roof washer is on the ground.

8.2.5 Inspection and maintenance every 500 running hours

Inspection task	Required action
Change the oil of the water pump.	See 8.8 How to check the water pump oil level and change the oil of the water pump.
Change the hydraulic oil of the roof washer.	See 8.9 How to change the hydraulic oil of the roof washer. NOTICE Only use HV 32 oil!

8.3 HOW TO LUBRICATE THE UNIVERSAL JOINTS OF THE ROOF WASHER

The eight universal joints, and the four drive shafts are each equipped with a grease fitting. **NOTICE** Do not use too much lubrication and remove excess lubrication.

To lubricate the universal joints and drive shafts:

1. Remove the **lid of the top tray** **A** to reach the **upper universal joints** **B**. Lubricate the four **grease fittings** **C** on the **universal joints**.

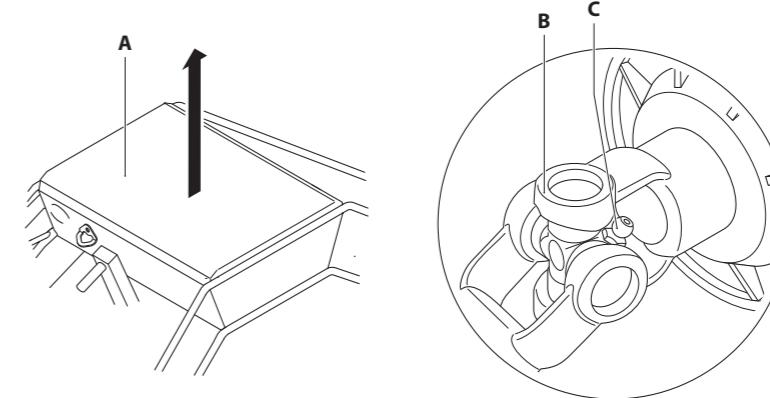


Fig. 97 Remove the lid of the top tray

2. Carefully remove the **covers** **A** at the side of the wheels to reach the **lower universal joints** **B**. Lubricate the four **grease fittings** on the **universal joints**. **NOTICE** There is another grease fitting on each **drive shaft**, above the cover.

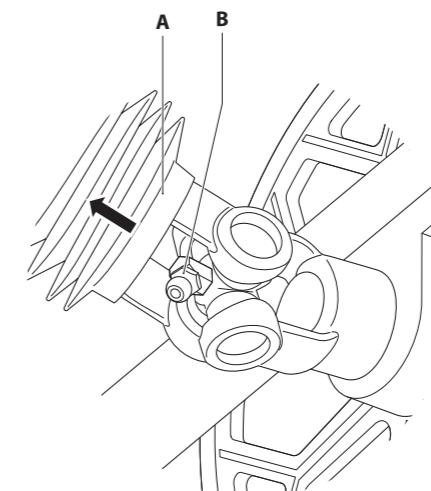


Fig. 98 Lubricate the grease fittings of the lower universal joints

8.4 HOW TO LUBRICATE THE WHEEL BEARINGS OF THE ROOF WASHER

This paragraph only applies to those roof washers which have grease fittings on the wheel bearings. Do not use too much lubrication and remove excess lubrication.

To lubricate the wheel bearings:

- Carefully lubricate the two **grease fittings A** on the **wheel bearings** of each wheel.

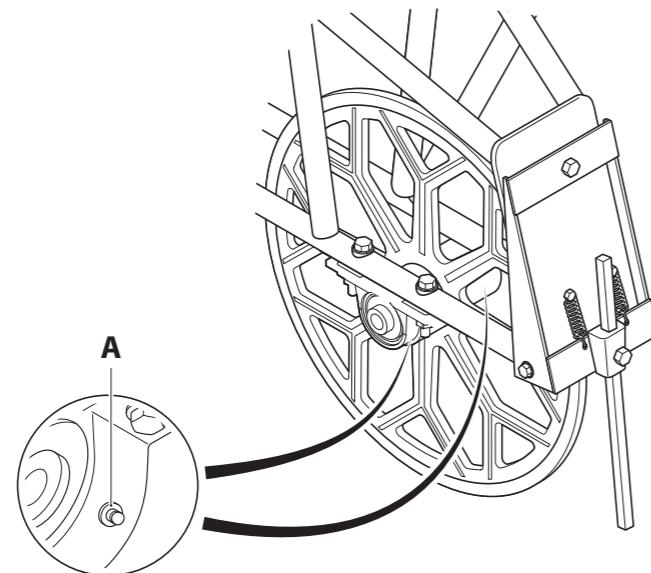


Fig. 99 Grease fittings of the wheel bearings.

8.5 HOW TO LUBRICATE AND TIGHTEN THE REEL CHAINS

- Use a marker to indicate the position of the **roll holder A**. Disassemble the **roll holder A**.

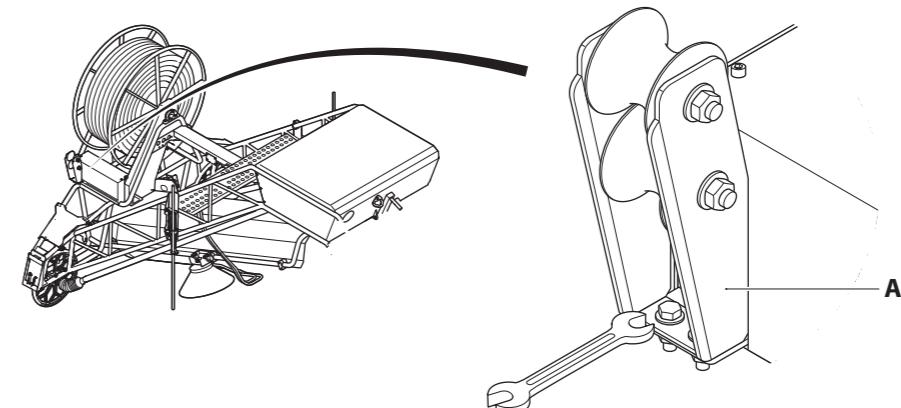


Fig. 100 Disassemble the roll holder

- Remove the **aluminum cover A** of the **guide B**. Remove the **reel chain guard C**.

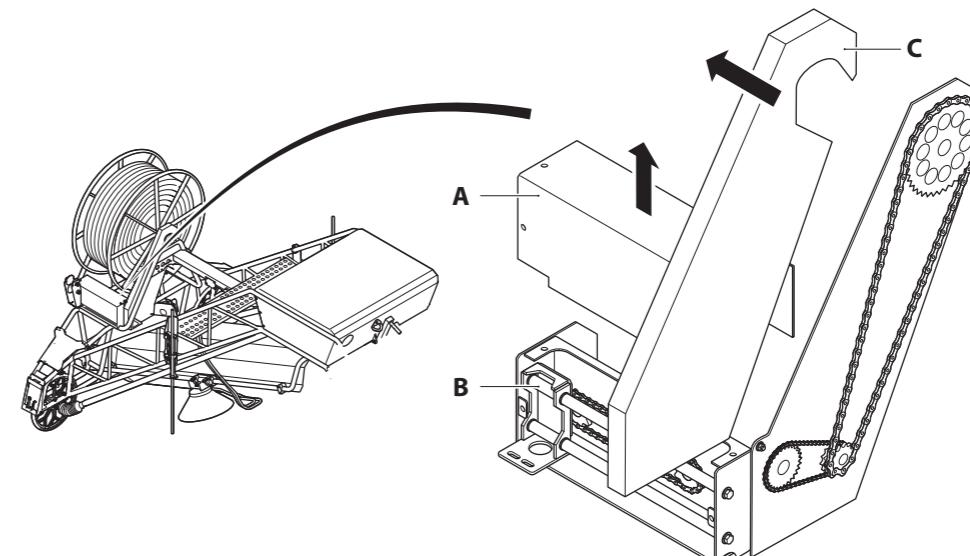


Fig. 101 Remove the reel chain guards

8 INSPECTION, MAINTENANCE AND CLEANING

3. Make sure that the tension of the **guide chain A** is sufficient by moving the **guide chain** between thumb and index finger. The play shall be approximately 10 mm (0.4 inch).

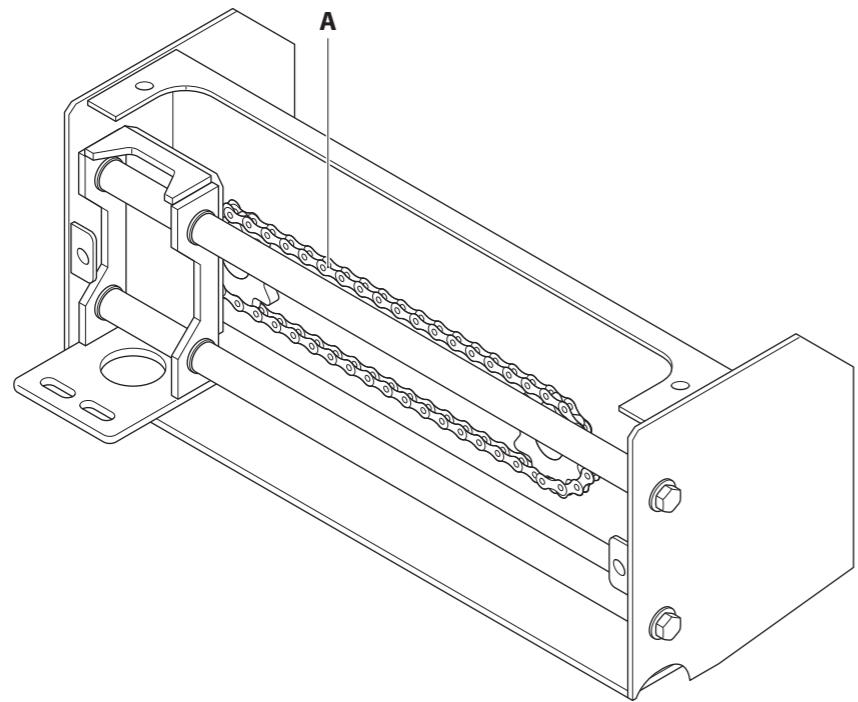


Fig. 102 Check the play of the guide chain

4. Tighten the **guide chain A** with the **adjusting bolt B** at the side of the **guard C**.

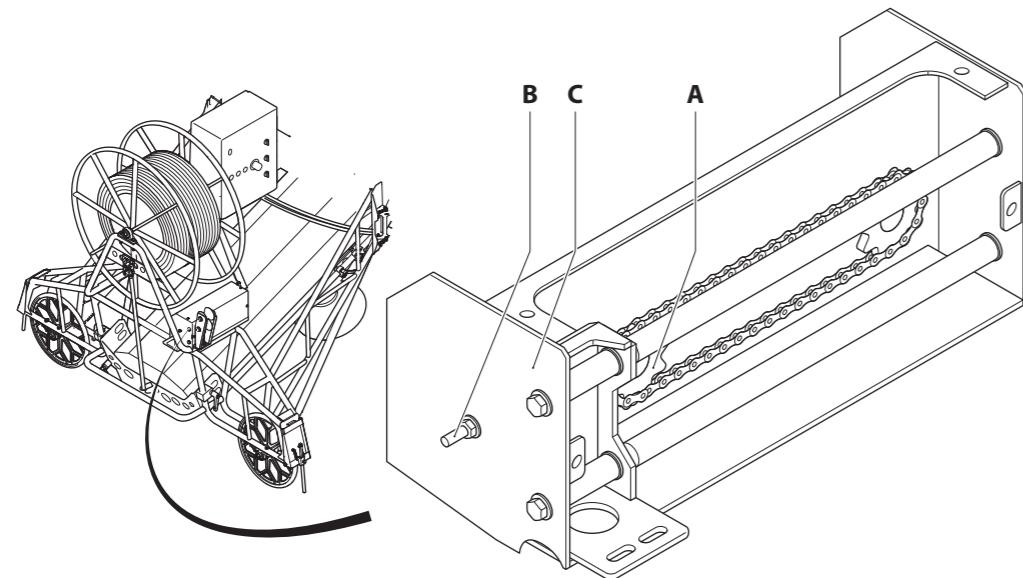


Fig. 103 Tighten the guide chain

5. Make sure that the tension of the **short drive chain A** is sufficient by moving the **short drive chain** between thumb and index finger. The play shall be approximately 10 mm (0.4 inch).
6. Make sure that the tension of the **long drive chain B** is sufficient by moving the **long drive chain** between thumb and index finger. The play shall be approximately 20 mm (0.8 inch). **NOTICE** Turn the reel by hand till the chain is tensioned the most before measuring the play.

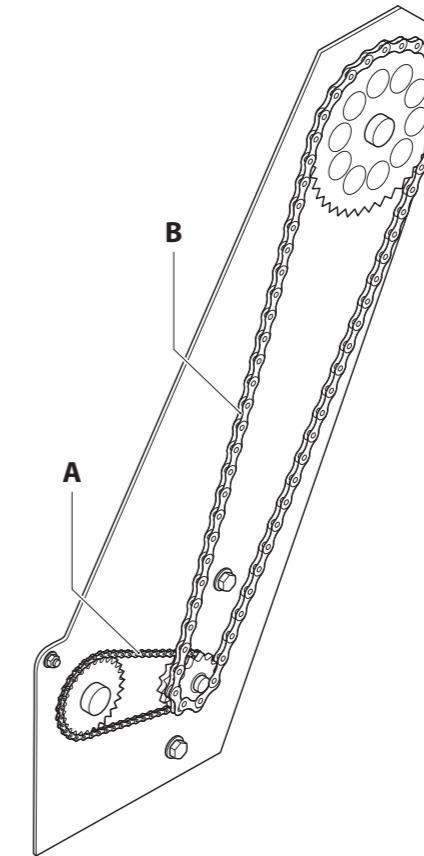


Fig. 104 Check the play on the long drive chain

8 INSPECTION, MAINTENANCE AND CLEANING

7. If necessary, tighten the two **drive chains** **C** by adjusting the **hydraulic motor** **B** downwards, by loosening the two **bolts** **A**. Moving the **hydraulic motor** **B** down by hand until both **drive chains** **A** have the right tension. Tightening the two **bolts** **A**.

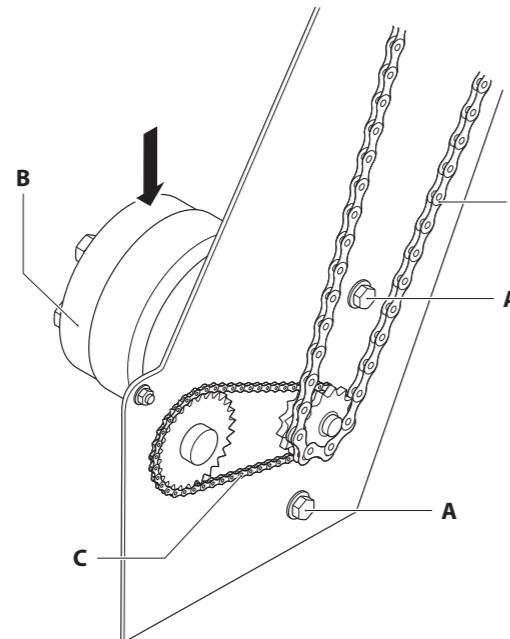


Fig. 105 Tighten the drive chains

9. Lubricate the two **drive chains** **A** **B**.

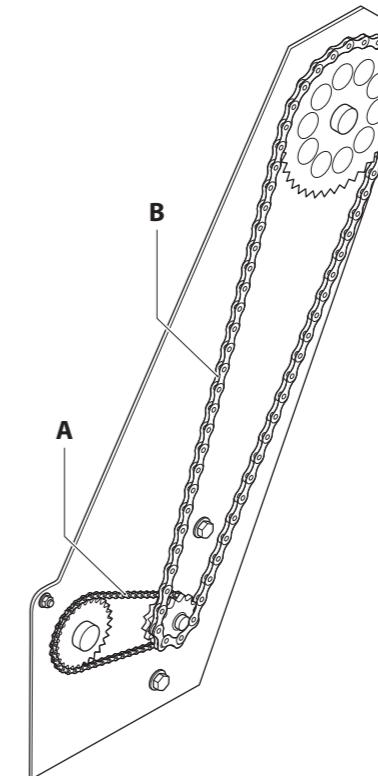


Fig. 107 Lubricate both drive chains

8. Carefully clean both **guide rods** **B** with a cloth. Spray the **guide chain** **A** with chain spray.

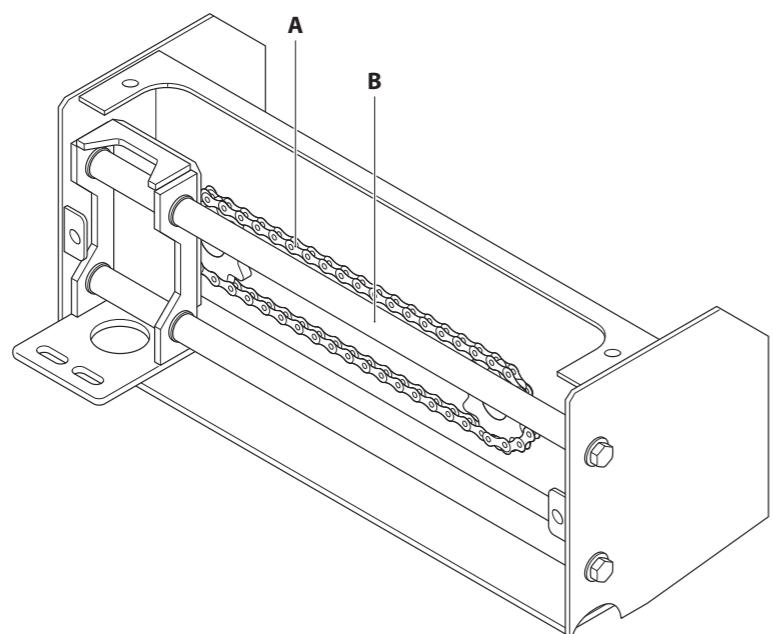


Fig. 106 Clean both guide rods

8.6 HOW TO LUBRICATE THE WHEEL SET BEARINGS OF THE PLATFORM

There are two bearings with grease fittings on each wheel set.

NOTICE Do not use too much lubrication and remove excess grease.

To lubricate the wheel set bearing:

- Lubricate the **wheel set bearings A** with water resistant lubrication.

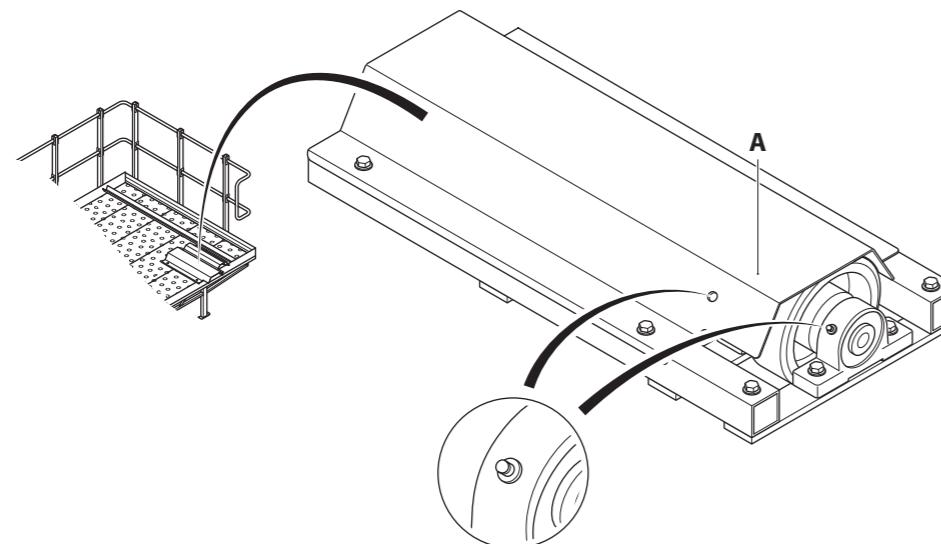


Fig. 108 Lubricate the wheel set bearings

8.7 HOW TO LUBRICATE THE HINGES OF THE PLATFORM RAMPS

There are three hinges for every platform ramp.

To lubricate the hinges of the platform ramps:

- Lubricate the **hinges A** with lubricating spray.

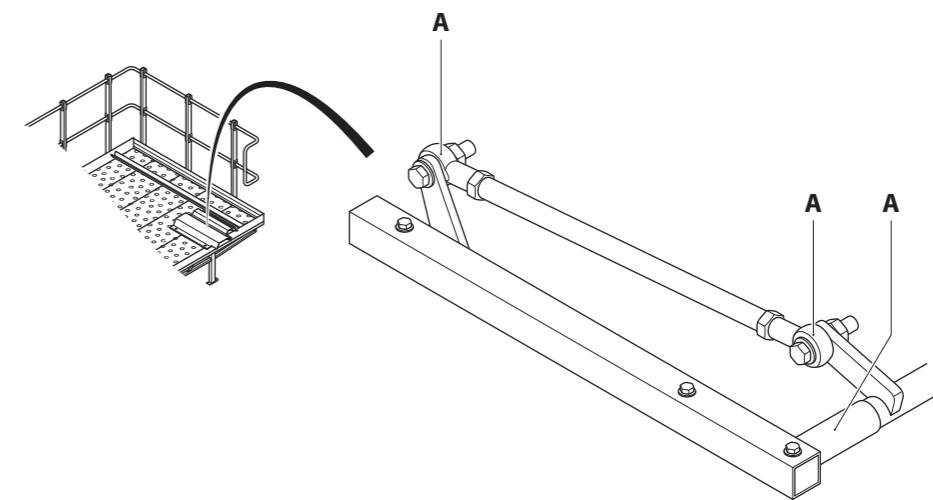


Fig. 109 Lubricate the hinges

8.8 HOW TO CHECK THE WATER PUMP OIL LEVEL AND CHANGE THE OIL OF THE WATER PUMP

⚠ WARNING

- Make sure that you have read and understood the documentation of the water pump before working with the product.

8.8.1 How to check the water pump oil level

- Loosen the **oil dipstick with indicator A** and make sure that the oil level is in between the min and max indicator.

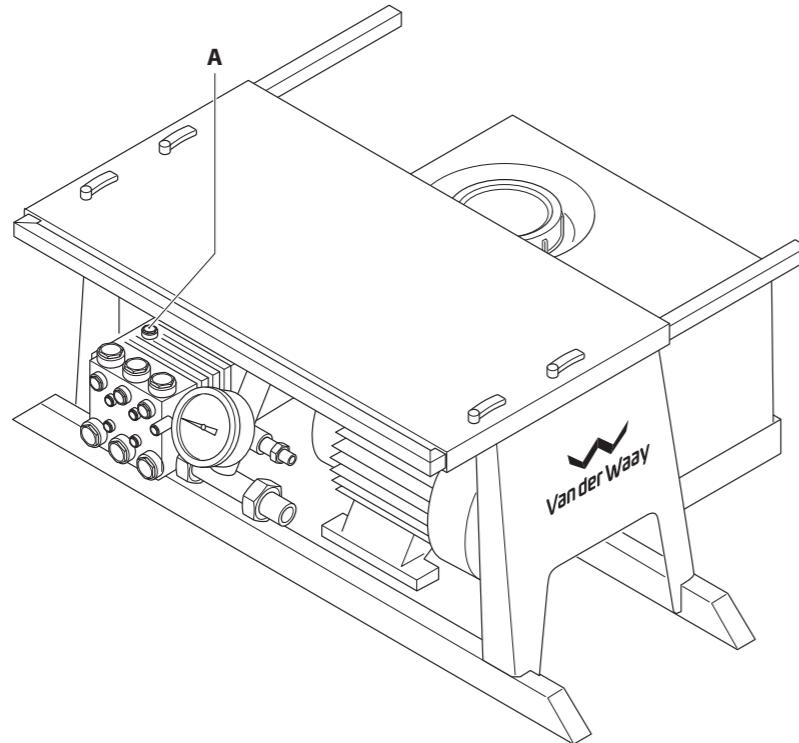


Fig. 110 The oil dipstick

8.8.2 How to change the water pump oil

- Remove the **oil dipstick with indicator**.
- Get the oil out of the pump housing using a **manual oil change sump pump**.
This pump is available in the webshop <https://portal.vdwaay.nl/shop>.
- Fill the pump housing with new oil until the oil level is between the min - max marks on the dipstick. **NOTICE** Use only SAE-10W30 oil.

8.9 HOW TO CHANGE THE HYDRAULIC OIL OF THE ROOF WASHER

- Remove the **lid of the top tray A** to reach the **hydraulics tank B** and remove the **screw cap C**.

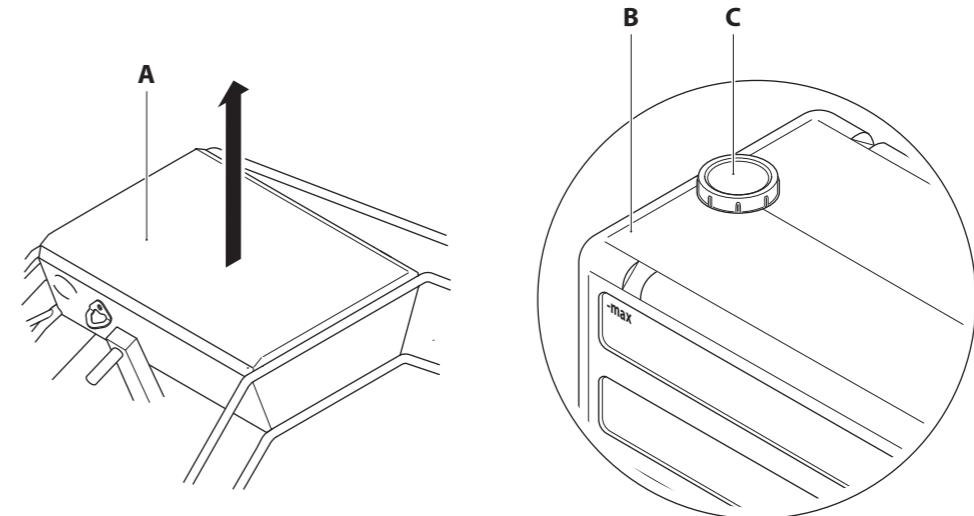


Fig. 111 Remove the screw cap of the hydraulics tank

- Get the oil out of the hydraulic tank using a **manual oil change sump pump**.
This pump is available in the webshop <https://portal.vdwaay.nl/shop>.
- Fill the hydraulic tank with new oil until the oil level is 1 cm (0.4 inch) **below** the **MAX mark A** on the tank. **NOTICE** Use Energol SHF-HV 32 oil only. Do not overfill the tank. This will cause oil leakage.

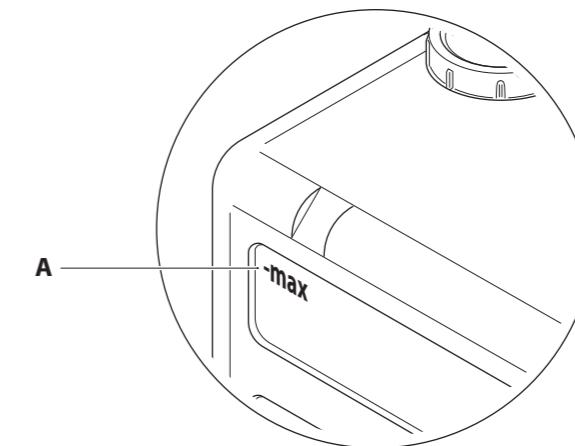


Fig. 112 The MAX mark on the hydraulics tank

8.10 HOW TO CLEAN THE FILTERS OF THE WATER PUMP

1. Remove both **filter house lids A**. **NOTICE** There are two filters on the water pump; at the pump inlet and on the float tank.
2. Remove both **filter elements B**.
3. Clean both **filter elements B** under running water.
4. Place both **filter elements B** back into the **filter house lids A**.

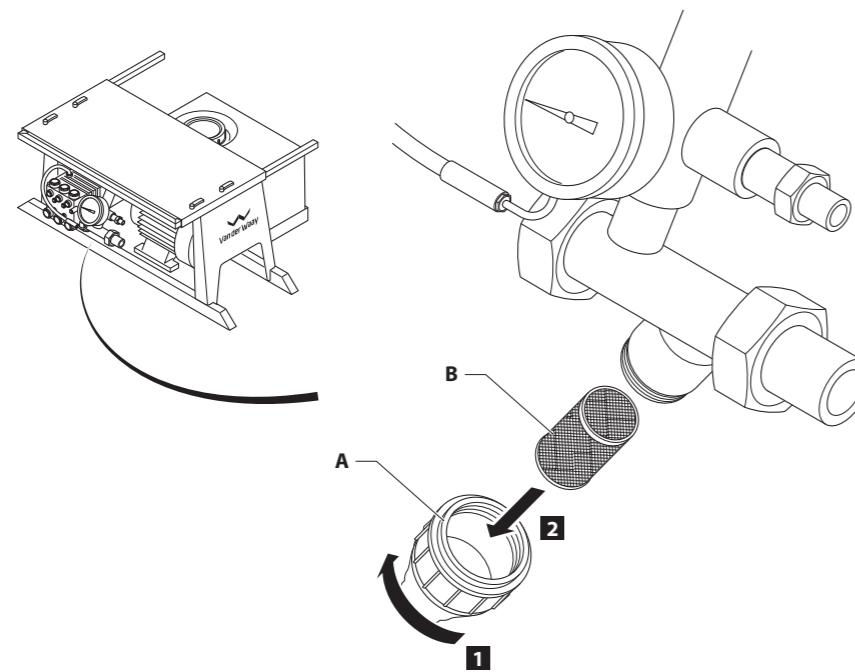


Fig. 113 Pump inlet filter

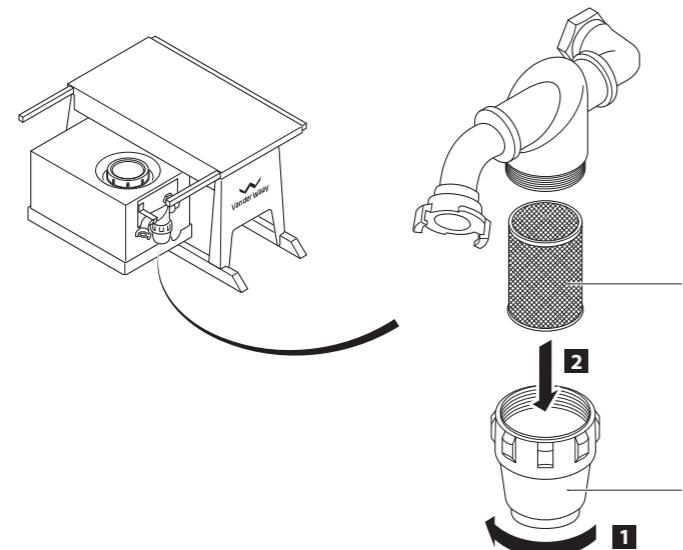


Fig. 114 Float tank filter

8.11 HOW TO CLEAN THE MACHINERY

For a longer life span of the machinery, the roof washer and platform shall be cleaned thoroughly frequently with a non-aggressive cleansing agent and water.

To clean the roof washer and platform:

1. Spray the roof washer and platform with cold tap water to remove coarse dirt. **NOTICE** No direct water beams should be directed towards control cabinets, control panels, switches and drive motors. The power of the water can remove oil and grease out of rotating or moving parts. There is also the risk that water enters the electrical system, which may lead to short-circuiting.
2. Apply a neutral non-aggressive cleaning agent (pH value of between 6 and 8).
3. Allow the cleaning agent to work sufficiently in accordance with the relevant product information.
4. Rinse the roof washer and platform thoroughly with tap water.

⚠ WARNING

- Always use appropriate personal protective equipment when working with the machinery, such as protective gloves, safety shoes (minimum class S3), safety goggles, safety harness, hard hat, lifeline and protective overalls.
- Wear sun protective clothing if necessary and use sunscreen to protect exposed body parts against the sun.
- Wear warm and water resistant clothing against the cold or when it is raining.
- When performing works on top of the greenhouse or on a van der Waay platform, make sure to wear a certified safety harness and a certified double lifeline of 2 meters (6.5 feet) in length.
- When going up onto the roof of the greenhouse always make sure that you wear a certified safety harness that is leashed with a certified fall arrest device.
- Always use a gutter walker to safely walk via the greenhouse gutters to the machinery. Gutter walkers are available through your greenhouse builder, your supplier or the manufacturer.
- Make sure that you can sound an alarm when necessary. Always carry a mobile phone or other means of communication with you.
- Remove all loose materials and tools from the machinery. These can be moved by the wind and cause material damage to the machinery and the greenhouse.
- Never use a ladder to get onto the roof of a greenhouse, unless the ladder is a part of the van der Waay platform.

9.1 HOW TO IDENTIFY AND SOLVE PROBLEMS OF THE MANUAL VERSION

Error messages and malfunctioning of the machinery are indicated by the following:

- **Button/illumination 12S6-12H2 A** on control cabinet roof washer (will blink in case of error).
- **Button/illumination 12S6-12H2 B** on control cabinet platform.(will blink in case of error).
- **Illumination 10H5 C** on control cabinet platform

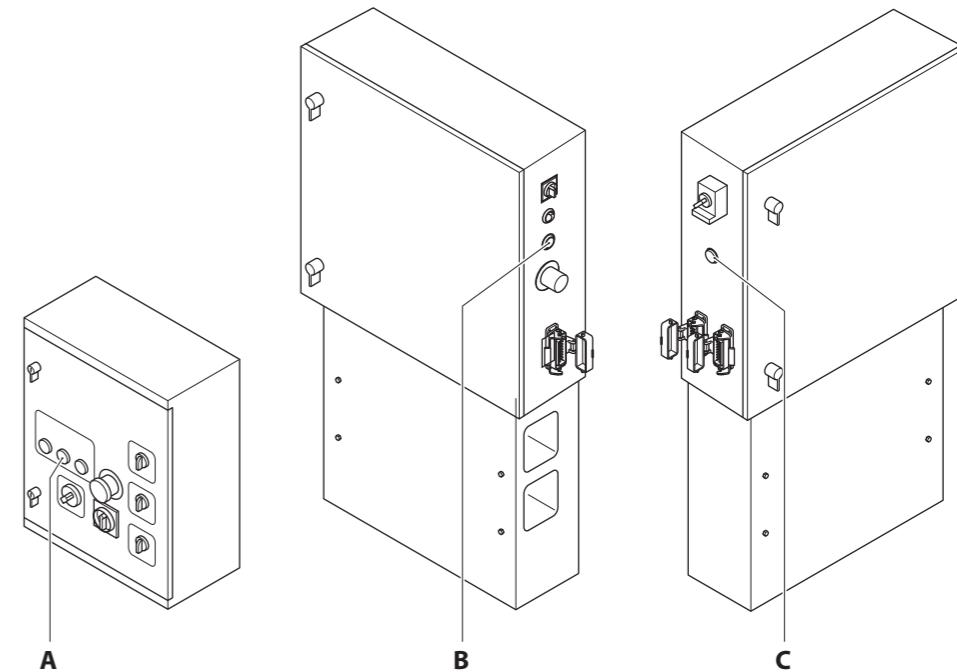


Fig. 115 Error messages and malfunctioning indicators manual version

9.2 TROUBLESHOOTING OF THE MANUAL VERSION

Error Message	Possible cause	Solution
12S6-12H2 on control cabinet roof washer and control cabinet platform blinks 1 x.	The air vent detection switch is stuck.	Inspect and/or adjust the air vent detection switches on the front.
	Roof washer has hit an open window while moving forwards.	Close and lock all windows. Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control.
12S6-12H2 on control cabinet roof washer and control cabinet platform blinks 2 x.	Roof washer has hit an open window while moving backwards.	
12S6-12H2 on control cabinet roof washer and control cabinet platform blinks 3 x.	The wheel switch lever on the left-front side was activated while the roof washer was moving backwards.	Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control.
12S6-12H2 on control cabinet roof washer and control cabinet platform blinks 4 x.	The wheel switch lever on the right-front side was activated while the roof washer was moving backwards.	Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control. When the error message recurs, check the wheel switch levers and gutter.
12S6-12H2 on control cabinet roof washer and control cabinet platform blinks 5 x.	The wheel switch lever on the left-rear side was activated while the roof washer was moving forwards.	

Error Message	Possible cause	Solution
12S6-12H2 on control cabinet roof washer and control cabinet platform blinks 6 x.	The wheel switch lever on the right-rear side was activated while the roof washer was moving forwards.	Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control. When the error message recurs, check the wheel switch levers and gutter.
12S6-12H2 on control cabinet roof washer and control cabinet platform blinks 7 x.	The cable is stuck on the reel, roller brushes or wheels.	Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control. When the error message recurs, check the cable reel.
12S6-12H2 on control cabinet roof washer and control cabinet platform blinks 7 x.	The reel drive chain is tightened too much.	Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control. Move the roof washer back to the platform. Check the chain tension.
12S6-12H2 on control cabinet roof washer and control cabinet platform blinks 7 x.	The hydraulic oil pressure is too high.	Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control. Move the roof washer back to the platform. Contact the manufacturer.

9 FAULT FINDING, TROUBLESHOOTING AND REPAIR

Error Message	Possible cause	Solution
12S6-12H2 on control cabinet roof washer and control cabinet platform blinks 8 x	The hose is stuck on the reel, roller brushes or wheels.	Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control. Check the reel when the error message recurs.
	The reel drive chain is tightened too much.	Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control. Move the roof washer back to the platform. Check the chain tension.
	The hydraulic oil pressure is too high.	Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control. Move the roof washer back to the platform. Contact the manufacturer.

Error Message	Possible cause	Solution
12S6-12H2 on control cabinet roof washer and control cabinet platform blinks 9 x	The roller brush pressure on the glass is too high.	The hydraulic pump motor relay automatically resets after 20 minutes. Do not turn off the power, and wait 20 minutes.
	on control cabinet roof washer and control cabinet platform blinks 9 x .	Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control. Move the roof washer back to the platform. Readjust the roller brushes.
	The gutter brush motor is overburdened.	Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control. Move the roof washer back to the platform. Check the adjustment of the gutter brush and reset relay 3A1 on the control cabinet roof washer.
	The gearbox of the gutter brush motor is broken.	Replace the gearbox of the gutterbrush motor.
12S6-12H2 on control cabinet roof washer and control cabinet platform blinks 10 x	The gutter brush motor is burned-out.	Replace the gutter brush motor.
	Defected relay of the gutter brush motor.	Replace relay 3A1 in the control cabinet roof washer.

9 FAULT FINDING, TROUBLESHOOTING AND REPAIR

Error Message	Possible cause	Solution	Error Message	Possible cause	Solution
12S6-12H2 on control cabinet roof washer and control cabinet platform blinks 11 x .	See fault indication on the display of the frequency controller.	Wait 3 minutes and turn the power back on using the main switch. The frequency controller resets automatically. Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control. Contact the manufacturer when the error message recurs.	12S6-12H2 on control cabinet platform lights up continuously.	The ramp motor is overburdened, because ramps are jammed in the gutter.	Reset relay 4A1 on the control cabinet platform. Make sure the ramps function correctly. Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control.
12S6-12H2 on control cabinet platform lights up continuously.	Left or right platform driving motor has too much resistance while moving along the rails due to, for example, uneven rail profiles.	Reset relay 2A1 or 3A1 on the control cabinet platform. Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control.		Defected relay of the ramps motor.	Replace relay 4A1 on the control cabinet platform.
	The gearbox of the platform driving motor is broken.	Replace the gearbox of the driving motor.		Left or right platform undercarriage motor turned off due to trapped cross braces.	Reset relay 20A1 or 21A1 on the control cabinet platform. Check the cross braces. Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control.
	The platform driving motor is burned-out.	Replace the driving motor.		The emergency stop buttons on the control cabinet of the platform, roof washer or remote control is activated.	Make sure the emergency stop buttons on the control cabinet of the platform, roof washer and remote control are pulled out. Push button 12S6-12H2 on the control cabinet platform for 5 seconds to reset the control.
	Defected relay of the driving motor.	Replace relay 2A1 or 3A1 on the control cabinet platform.			

Error Message	Possible cause	Solution
10H5 on control cabinet platform lights up continuously . ONLY EU VERSION.	Phase sequence error.	Set the main switch from position 1 to 2 or from 2 to 1 until red light 10H5 is off.
	One or more phases are missing.	Make sure all 3 phases are present.
10H5 on control cabinet platform lights up continuously . ONLY UL/CSA VERSION.	Phase sequence error.	Swap two phase wires in the plug of the power cable from greenhouse to platform until lamp 10H5 is off.
	One or more phases are missing.	Make sure all 3 phases are present.

9.3 HOW TO IDENTIFY AND SOLVE PROBLEMS OF THE AUTOMATIC VERSION

Error messages and malfunctioning of the machinery are indicated by the following:

- **Button/illumination 12S6-12H2 A** on control cabinet roof washer (will blink in case of error).
- **Illumination 17H9 B** on control cabinet platform.
- Text on **operation display C**.

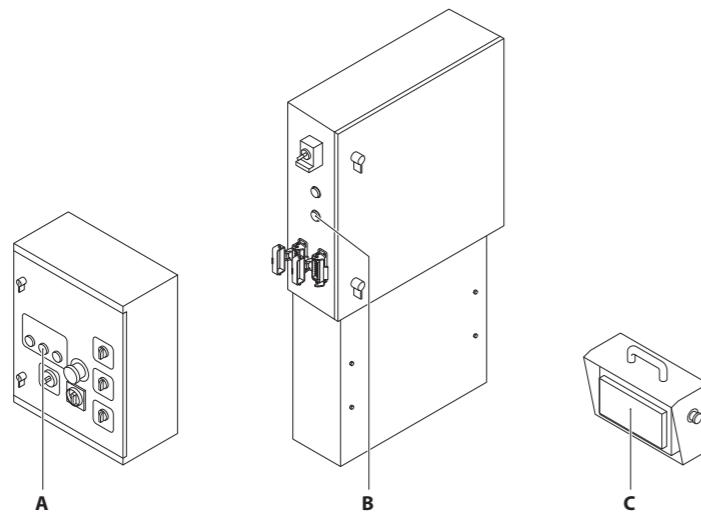
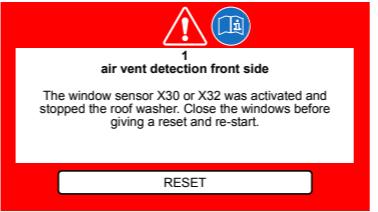
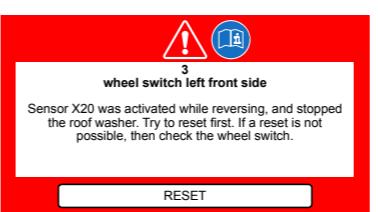
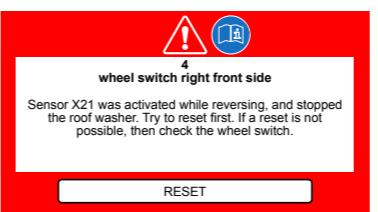
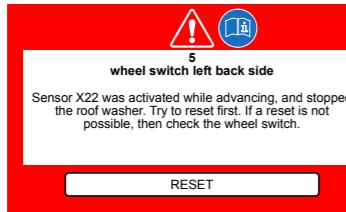
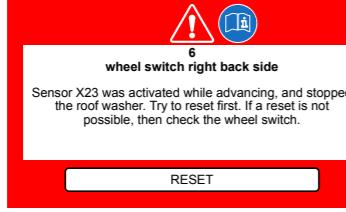
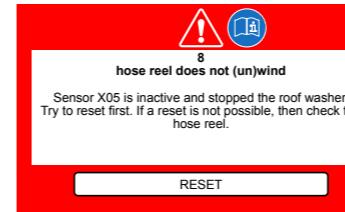
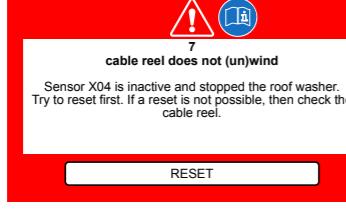
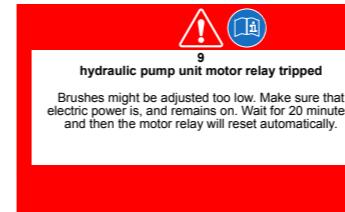


Fig. 116 Error messages and malfunctioning indicators

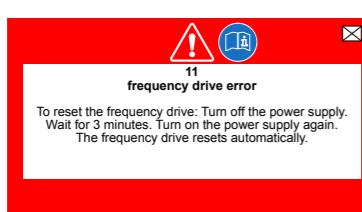
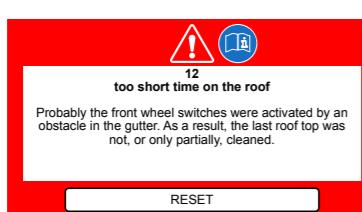
9.4 TROUBLESHOOTING OF THE AUTOMATIC VERSION

Error Message	Possible cause	Solution
 1 air vent detection front side The window sensor X30 or X32 was activated and stopped the roof washer. Close the windows before giving a reset and re-start. RESET	The air vent detection switch is stuck.	Inspect and/or adjust the air vent detection switches on the front.
 2 air vent detection rear side The window sensor X31 or X33 was activated and stopped the roof washer. Close the windows before giving a reset and re-start. RESET	Roof washer has hit an open window while moving forwards.	Close and lock all windows. Press RESET on the operation display to reset the control. Control the roof washer from the manual operation screen. Any automatic washing cycle is aborted.
 3 wheel switch left front side Sensor X20 was activated while reversing, and stopped the roof washer. Try to reset first. If a reset is not possible, then check the wheel switch. RESET	Roof washer has hit an open window while moving backwards.	Press RESET on the operation display to reset the control. Any automatic washing cycle is aborted. Control the roof washer from the manual operation screen.
 4 wheel switch right front side Sensor X21 was activated while reversing, and stopped the roof washer. Try to reset first. If a reset is not possible, then check the wheel switch. RESET	The wheel switch lever on the right-front side was activated while the roof washer was moving backwards.	When the error message recurs, check the wheel switch levers and gutter.

9 FAULT FINDING, TROUBLESHOOTING AND REPAIR

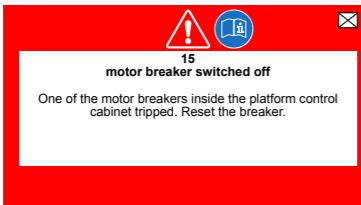
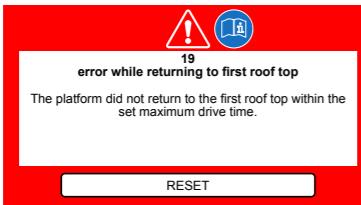
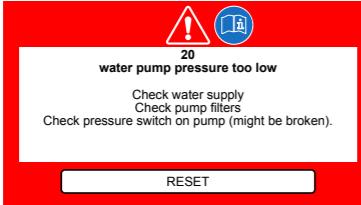
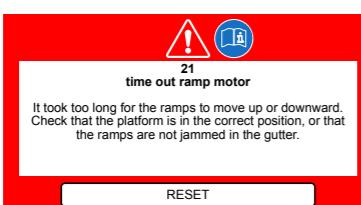
Error Message	Possible cause	Solution	Error Message	Possible cause	Solution
	The wheel switch lever on the left-rear side was activated while the roof washer was moving forwards.	Press RESET on the operation display to reset the control. Any automatic washing cycle is aborted. Control the roof washer from the manual operation screen. When the error message recurs, check the wheel switch levers and gutter.		The hose is stuck on the reel, roller brushes or wheels.	Press RESET on the operation display to reset the control. Any automatic washing cycle is aborted. Control the roof washer from the manual operation screen. When the error message recurs, check the cable reel.
	The wheel switch lever on the right-rear side was activated while the roof washer was moving forwards.			The reel drive chain is tightened too much.	Press RESET on the operation display to reset the control. Any automatic washing cycle is aborted. Move the roof washer back to the platform from the manual operation screen. Check the chain tension.
	The cable is stuck on the reel, roller brushes or wheels.	Press RESET on the operation display to reset the control. Any automatic washing cycle is aborted. Control the roof washer from the manual operation screen. When the error message recurs, check the cable reel.		The hydraulic oil pressure is too high.	Press RESET on the operation display to reset the control. Any automatic washing cycle is aborted. Move the roof washer back to the platform from the manual operation screen. Contact the manufacturer.
	The reel drive chain is tightened too much.	Press RESET on the operation display to reset the control. Any automatic washing cycle is aborted. Move the roof washer back to the platform from the manual operation screen. Check the chain tension.		The roller brush pressure on the glass is too high.	The hydraulic pump motor relay automatically resets after 20 minutes. Do not turn off the power, and wait 20 minutes. Tab on the operation display to close the error message. Any automatic washing cycle is aborted. Move the roof washer back to the platform from the manual operation screen. Readjust the roller brushes.
12S6-12H2 on control cabinet roof washer blinks 5 x.			12S6-12H2 on control cabinet roof washer blinks 8 x.		
12S6-12H2 on control cabinet roof washer blinks 6 x.			12S6-12H2 on control cabinet roof washer blinks 9 x.		
12S6-12H2 on control cabinet roof washer blinks 7 x.					

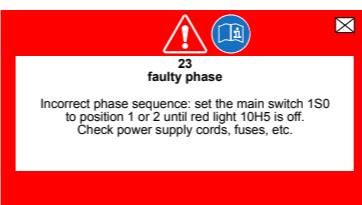
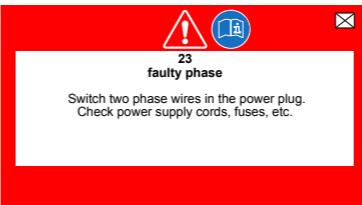
9 FAULT FINDING, TROUBLESHOOTING AND REPAIR

Error Message	Possible cause	Solution
 <p>12S6-12H2 on control cabinet roof washer blinks 10 x.</p>	The gutter brush motor is overburdened.	<p>Move the roof washer back to the platform from the manual operation screen.</p> <p>Check the adjustment of the gutter brush and reset relay 3A1 on the control cabinet roof washer.</p> <p>Tab <input checked="" type="checkbox"/> on the operation display to close the error message.</p> <p>Any automatic washing cycle is aborted.</p>
	The gearbox of the gutter brush motor is broken.	Replace the gearbox of the gutterbrush motor.
	The gutter brush motor is burned-out.	Replace the gutter brush motor.
	Defected relay of the gutter brush motor.	Replace relay 3A1 in the control cabinet roof washer.
 <p>12S6-12H2 on control cabinet roof washer blinks 11 x.</p>	See fault indication on the display of the frequency controller.	<p>Put the main switch 1S0 on the control cabinet platform on 0 (or on OFF for the UL/CSA version).</p> <p>Wait 3 minutes and turn the power back on using the main switch.</p> <p>The frequency controller resets automatically.</p> <p>Tab <input checked="" type="checkbox"/> on the operation display to close the error message.</p> <p>Any automatic washing cycle is aborted.</p> <p>Contact the manufacturer when the error message recurs.</p>
	Weeds or some other obstacle in the greenhouse gutters caused the roof washer to drive back to the platform from the manual operation screen.	<p>Press RESET on the operation display to reset the control.</p> <p>Any automatic washing cycle is aborted.</p> <p>Move the roof washer back to the platform from the manual operation screen.</p> <p>Try washing the roof top again.</p> <p>If the problem recurs then check the gutters.</p>

Error Message	Possible cause	Solution
	Roof detection switch X24 is not adjusted correctly.	<p>Press RESET on the operation display to reset the control.</p> <p>Any automatic washing cycle is aborted.</p> <p>Adjust the roof detection switch X24 again.</p>
	The roof ridge is too short, causing the sensor to fail.	<p>Press RESET on the operation display to reset the control.</p> <p>Any automatic washing cycle is aborted.</p> <p>Extend the ridge rod.</p>
	Left or right platform driving motor has too much resistance while moving along the rails due to, for example, uneven rail profiles.	<p>Reset relay 2A1 or 3A1 on the control cabinet platform.</p> <p>Tab <input checked="" type="checkbox"/> on the operation display to close the error message.</p> <p>Any automatic washing cycle is aborted.</p>
	The gearbox of the platform driving motor is broken.	Replace the gearbox of the driving motor.
	The platform driving motor is burned-out.	Replace the driving motor.
	Defected relay of the driving motor.	Replace relay 2A1 or 3A1 on the control cabinet platform.
	The ramp motor is overburdened, because ramps are jammed in the gutter.	<p>Reset relay 4A1 on the control cabinet platform.</p> <p>Make sure the ramps function correctly.</p> <p>Tab <input checked="" type="checkbox"/> on the operation display to close the error message.</p> <p>Any automatic washing cycle is aborted.</p>
	Defected relay of the ramps motor.	Replace relay 4A1 on the control cabinet platform.
	Left or right platform undercarriage motor turned off due to trapped cross braces.	<p>Reset relay 20A1 or 21A1 on the control cabinet platform.</p> <p>Check the cross braces.</p> <p>Tab <input checked="" type="checkbox"/> on the operation display to close the error message.</p>

9 FAULT FINDING, TROUBLESHOOTING AND REPAIR

Error Message	Possible cause	Solution
	The water pump motor has turned off.	Reset relay 6F1 on the control cabinet platform. Check that the water pressure does not exceed 70 bar. Tab <input checked="" type="checkbox"/> on the operation display to close the error message. Any automatic washing cycle is aborted.
	The platform has encountered an obstacle while driving back to the first roof top, or the feed hose or power cable has gotten caught behind something.	Press RESET on the operation display to reset the control. Check the greenhouse gable.
	There is not enough water supply from the greenhouse to the pump. Water pump filter is polluted. Defective water pump. Defective pressure sensor.	Press RESET on the operation display to reset the control. Any automatic washing cycle is aborted. Check that there is sufficient water supply, or that the supply hose is not kinked. Clean the filters. Repair or replace the water pump. Replace the pressure sensor.
	The ramp motor is overburdened, because ramps are jammed in the gutter.	Press RESET on the operation display to reset the control. Any automatic washing cycle is aborted. Make sure the ramps function correctly.

Error Message	Possible cause	Solution
	The emergency stop buttons on the control cabinet of the platform, roof washer or remote control is activated.	Make sure the emergency stop buttons on the control cabinet of the platform, roof washer and remote control are pulled out. Tab <input checked="" type="checkbox"/> on the operation display to close the error message. Any automatic washing cycle is aborted.
	Phase sequence error.	Set the main switch from position 1 to 2 or from 2 to 1 until red light 17H9 is off. Tab <input checked="" type="checkbox"/> on the operation display to close the error message. Any automatic washing cycle is aborted.
	ONLY EU VERSION. One or more phases are missing.	Make sure all 3 phases are present. Tab <input checked="" type="checkbox"/> on the operation display to close the error message. Any automatic washing cycle is aborted.
	Phase sequence error. ONLY UL/CSA VERSION. One or more phases are missing.	Swap two phase wires in the plug of the power cable from greenhouse to platform until lamp 10H5 is off. Tab <input checked="" type="checkbox"/> on the operation display to close the error message. Any automatic washing cycle is aborted. Make sure all 3 phases are present. Tab <input checked="" type="checkbox"/> on the operation display to close the error message. Any automatic washing cycle is aborted.

9.5 HOW TO REPAIR THE MACHINERY

⚠ WARNING

- All repair and modification tasks shall only be carried out by qualified and skilled persons. Only open or repair parts of the machinery when you know what you are doing. If you have any doubts, contact the manufacturer.
- Always shut off the machinery according to the LOCK OUT-TAG OUT method before performing any maintenance or repair work.
- Use only original accessories and spare parts. You can always order spare parts from the webshop <https://portal.vdwaay.nl/en/shop> or by sending an email to salesteam@vdwaay.nl.
- Alterations to the machinery and technical modifications are not permitted without written permission of the manufacturer. Failure to do so may result in damage to property and/or severe or fatal injuries and it will invalidate the warranty.

⚠ WARNING

- Always use appropriate personal protective equipment when working with the machinery, such as protective gloves, safety shoes (minimum class S3), safety goggles, safety harness, hard hat, lifeline and protective overalls.

10.1 DISABLING

1. Make sure that the roof washer is on the platform.
2. Make sure that the **main switch** is put in the **0 position** (or to the **OFF position** for the North American version).

10.2 DISMANTLING

1. Follow the instructions described in paragraph *5.10 How to take the machinery off of the greenhouse*.
2. Disconnect all **power cables**.
3. Disconnect **water supply**.
4. Disconnect and remove **hoses** and **cables**.
5. Disconnect and remove **remote controls**.
6. Disassemble large parts and options.
7. Dispose/Scrap the machinery according to the instructions in paragraph *10.3 Scrapping and disposal*.

10.3 SCRAPPING AND DISPOSAL

Old or worn parts have to be disposed of in the most environmentally friendly way, for example by bringing them to an acknowledged recycling center.

Familiarize yourself with the national and local regulations with respect to environmentally friendly disposal of harmful substances such as oil and lubrication agents, parts and materials.

It is not allowed to dispose of parts, options and components with unsorted municipal waste. Electric and electronic components and parts have to be recycled separately in an environmentally friendly way and with due respect of the applicable legislation.

If certain chemicals have been used for cleaning, you have to dispose of these in an environmentally friendly way. Also think of cloths and such that have become filthy with lubrication agents or oil. Consult the instructions for the chemicals for more information.

By disposing of the device in the proper manner, you help to avoid possible hazards for the environment and public health that could otherwise be caused by improper treatment of waste equipment. The recycling of materials contributes to the conservation of natural resources.

A – DECLARATION OF CONFORMITY (DOC) OF THE MACHINERY

Declaration according to Directive 2006/42/EC, as amended (hereafter called Machinery Directive).

This language version of the declaration is verified by the manufacturer (original declaration).

We (manufacturer):

Business name: Van der Waay B.V.
Address: Finlandlaan 2, 2391PV
Hazerswoude
Country: The Netherlands

Declare under our sole responsibility for the following machinery:

Generic denomination: Greenhouse roof washer
Function: Cleaning and/or spraying of greenhouse roof
Model: Top Cleaner
Type: 320/400/427/450/480
Serial number: KDR-XXX-YYY and VPD-XXX-YYY
(XXX = working width, YYY = reference number 100-999)
Commercial Name: Top Cleaner

that all the relevant provisions of the Machinery Directive are fulfilled;

that the machinery also complies with the provisions of the following European Directives:

- DIRECTIVE 2014/30/EU relating to electromagnetic compatibility
- DIRECTIVE 2011/65/EU on the restriction of the use of certain hazardous substances in electrical equipment.
- DIRECTIVE 2014/53/EU relating to radio equipment
- DIRECTIVE 2000/14/EC relating to the noise emission in the environment by equipment for use outdoors

that the machinery is in conformity with the following standards and/or other normative documents:

- EN ISO 12100:2010, Safety of machinery - General principles for design - Risk assessment and risk reduction
- EN 280:2013 Mobile elevating work platforms - Design calculations - Stability criteria - Construction - Safety - Examinations and tests, which supersedes EN 280:2001+A2:2009 on 31 January 2015
- EN 1953:2013 Atomising and spraying equipment for coating materials - Safety requirements, which supersedes EN 1953:1998+A1:2009 on 31 March 2014
- EN 349:1993+A1:2008 Safety of machinery - Minimum gaps to avoid crushing of parts of the human body
- EN 60947-5-5:1997 Low-voltage switchgear and control gear - Part 5-5: Control circuit devices and switching elements - Electrical emergency stop device with mechanical latching function.
- EN ISO 14982:2009 Agricultural and forestry machinery - Electromagnetic compatibility - Test methods and acceptance criteria
- EN 60034-1:2010 Rotating electrical machines - Part 1: Rating and performance
- EN 1990: Basis of structural design.
- EN 1991: Actions on structures
- EN 1993: Design of steel structures
- Loadings acc. ASCE/SEI -7-10
- International Building Code 2015
- Steel construction manual (Thirteenth edition)

that the following natural or legal person established in the Community is mandated in writing to perform all or part of the obligations and formalities connected with the **Machinery Directive**:

Business name: Van der Waay B.V.
Address: Finlandlaan 2, 2391PV, Hazerswoude
Country: Netherlands
Name: M. Koolmees
Position: Director

and that the following natural or legal person established in the Community is authorized to compile the technical file:

Business name: Van der Waay B.V.
Address: Finlandlaan 2, 2391PV, Hazerswoude
Country: Netherlands
Name: M. Koolmees
Position: Director

Place and date of issue (of this DoC):

1 July 2019

Signed by or for the manufacturer:



.....
Name: Marcel Koolmees
Title: Director



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Van der Waay
Finlandlaan 2
2391 PV Hazerswoude
Netherlands

+31 (0) 172 210 311 | info@vdwaay.nl

WWW.VDWAAY.NL