

User Manual

C1e Compact Crane



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VERSION HISTORY

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PREFACE

This user manual applies to the C1e Compact Crane. Throughout the rest of this document this type will simply be referred to as 'crane'. This manual constitutes the operating instructions for the crane.

Read this entire user manual carefully to familiarise yourself with the correct operation and maintenance of the crane. The figures in this document are for illustration purposes only and may differ slightly from the crane in your situation.

The crane is exclusively designed and intended for lifting loads as specified in this user manual. Any other use or application is contrary to the instructions. The use of the crane or parts thereof with a product that is not made or prescribed by Hoeflon International B.V. is done entirely at your own risk, and Hoeflon International B.V. makes no guarantees as to the suitability of such use, which is completely forbidden. This may lead to forfeiture of the right to service or warranty on the crane as described in this manual. Hoeflon International B.V. is never liable for such improper use.

All risk associated with failure to observe the instructions in this user manual and/or the provisions of the General Terms and Conditions is borne by the user and may result in bodily injury, damage to the machine and/or property damage. Hoeflon International B.V. recommends that the original copy of this user manual, including all the annexes, be kept in a safe, central place. It is also a good idea to keep a copy of this user manual near the machine at the workplace. For technical support, please contact the manufacturer (see details on the cover) or your dealer.

Hoeflon International B.V. is committed to keeping the information in this user manual complete, accurate and up to date. Hoeflon International B.V. accepts no liability for the consequences of errors, except in the case of wilful intent or deliberate recklessness on the part of Hoeflon International B.V. Hoeflon International B.V. cannot guarantee that changes made by unauthorised third parties to software and equipment, even if referred to in this user manual, will not affect the applicability of the information contained in this manual.

Although Hoeflon International B.V. has made every reasonable effort to ensure that this user manual is as accurate and helpful as possible, Hoeflon International B.V. does not provide any guarantees with regard to the accuracy or completeness of the information provided herein.

General terms & conditions

In all cases, Hoeflon International B.V. delivers the machine exclusively in accordance with the General Terms and Conditions applicable at the time of purchase. These General Terms and Conditions can be found on the website www.hoeflon.com.

This user manual supersedes all previous versions. No part of this user manual may be reproduced, or processed, modified, duplicated or distributed using electronic systems, in any form whatsoever, without prior written permission from Hoeflon International B.V.. We reserve the right to make technical and design modifications and all rights relating to the machine and this user manual.

The product as delivered may differ slightly from the product illustrations in this user manual.

Warranty and liability

The machine conforms to the applicable basic safety and health requirements of the EU directives and has been carefully tested for trouble-free operation at the factory. Should malfunctions nevertheless occur, please contact your dealer immediately.

Hoefflon International B.V. is not liable for any damage resulting from failure to observe the factory specifications in this user manual, non-adherence to the legal requirements or modifications to the equipment made by the user. Repairs you perform on the machine, modifications to the crane other than those described in the manual, improper use, lack of maintenance or unauthorised replacement of parts can have a considerable negative impact on the all aspects of safety and operation of the machine and will void the warranty.

No liability is accepted for damage or injury resulting from failure to use the machine in accordance with this user manual.

In connection with continuous further development and product improvement, we reserve the right to make changes to the technical design and execution at any time without prior notice. No liability is accepted for damage resulting from unintended use, and such use also voids the warranty.

Target audience

The crane may only be operated by personnel who have been sufficiently trained to work with the machine. Completion of the training at Hoefflon International B.V., concluded with a certificate, is recommended. Those who fail to comply with the instructions and regulations in this user manual do so entirely at their own risk, and bodily injury and damage to the equipment may result.

Notes for the reader

The instructions, recommendations and warnings in this user manual are accompanied by the following terms and pictograms. Read these instructions carefully.

**DANGER**

Failure to understand and comply with these instructions may directly result in personal injury or damage to the machine.

**WARNING**

Failure to understand and comply with these instructions can lead to dangerous situations that may result in personal injury or damage to the machine.

**REMARK**

Note or tip with additional information for the user.

1.

INTRODUCTION

1.1 Intended use



Figure 1.1 C1e Compact Crane

The C1e Compact Crane has a lifting capacity of 500 kg and is suitable for lifting loads such as heavy building materials and glass walls in a limited space. Its compact dimensions allow you to transport this crane on a trailer or in a van. The crane is powered by a battery and controlled via a radio remote control.

It is only permitted to use the crane for the intended uses, which are described in this manual.

Additionally, you are not permitted to change movement speeds yourself. It is also absolutely prohibited to exceed the maximum working load, and it is forbidden to bypass sensors.

This manual has been prepared with the greatest possible care and made as complete as possible. Nevertheless, continuous safety vigilance in both familiar and unfamiliar situations is always necessary.

1.2 EC Declaration

Hoeflon International B.V. declares that the crane is in conformance with applicable European Directives. The EC Declaration of Conformity is attached as an annex.

1.3 Technical data

1.3.1 Dimensions

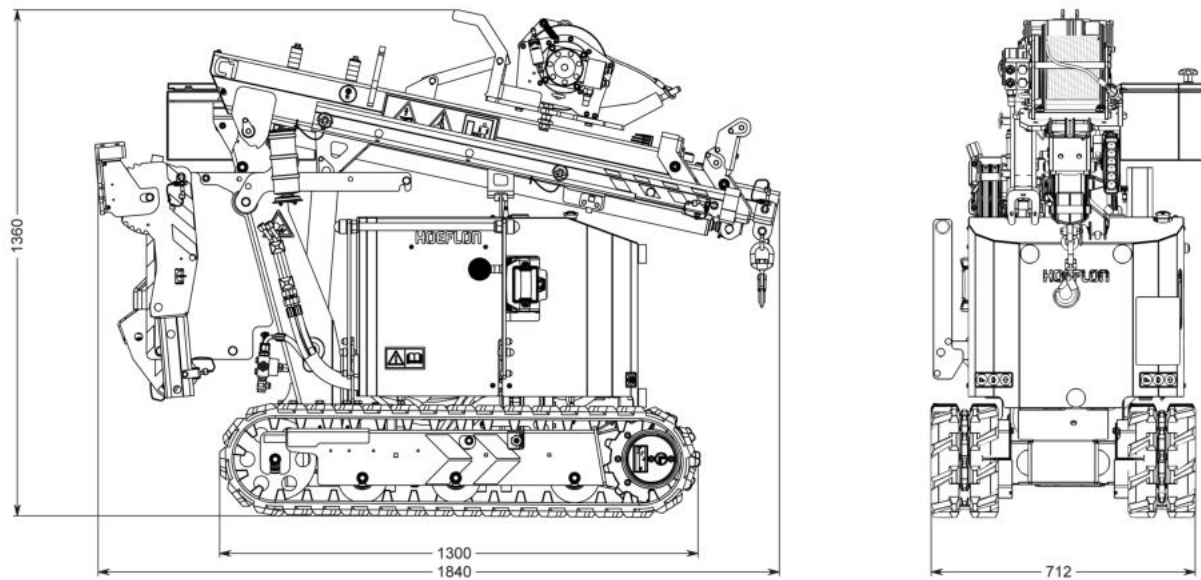


Figure 1.2 Front and side views

1.3.2 Technical specifications

General data	
Machine brand	Hoeflon
Maximum slope angle	15°
Clearance angle	20°
Maximum lean angle	2°
Ground clearance	65 mm
Ambient temperature	-10 to 40 °C
Slewing range	136°
Max. working load and lifting point of crane	See load table provided in the annexes
Maximum wind speed	10.8 m/s (6 Beaufort)

Technical data	
Transport length	1700 mm
Transport width	700 mm
Width with extended crawler tracks	1100 mm
Transport height	1400 mm
Total weight with counterweight, excl. winch	960 kg
Total weight, counterweight	250 kg
Weight of winch weight with hook	2.5 kg
Weight of winch head	13 kg
Weight of adjustable section	10 kg
Weight of manual jib extension	11 kg
Maximum ground pressure per surface area	0.76 kg/cm ²
Max. load horizontal retracted	500 kg
Max. load horizontal extended	190 kg
Max. winch load	420 kg

1.3.3 Sound pressure level

The noise measurements were conducted on a flat surface.

Sound pressure level dB(A)	8 metres	16 metres
Front, motor side	51.3	51.5
Rear, control side	54.5	51.5

1.3.4 Hydraulic system

The specifications for the hydraulic system are shown below.

Hydraulic system		
Volume of hydraulic tank	3.6 litres	
Pump 1	Type:	Gear pump
	Max. pressure:	170 bar
Pump 2	Type:	Gear pump
	Max. pressure:	170 bar

1.3.5 Electrical system

Electrical system	
Electric motor	24 VDC 2 kW
Maximum power required during charging	700 W
Power converter	3 kW



REMARK

For more technical specifications, see the corresponding crane logbook and the user manual for the motor.

1.4 Type plate

A type plate containing the machine data is mounted on the machine. This type plate may not be removed. The CE mark indicates that the machine conforms to the applicable standards for the European Economic Area.



Type	The type of machine
Model	The brand of the machine
Serial no.	The serial number of the machine
Year	The year the machine was built
Weight	The weight of the machine
Max. capacity	Maximum working load



REMARK

Please provide the type number and serial number when ordering parts.

2.

DESCRIPTION AND OPERATION

2.1 Main components

The crane is exclusively intended for lifting and raising loose objects by means of a hook. The objects to be transported must fall within the specifications stated in this user manual.

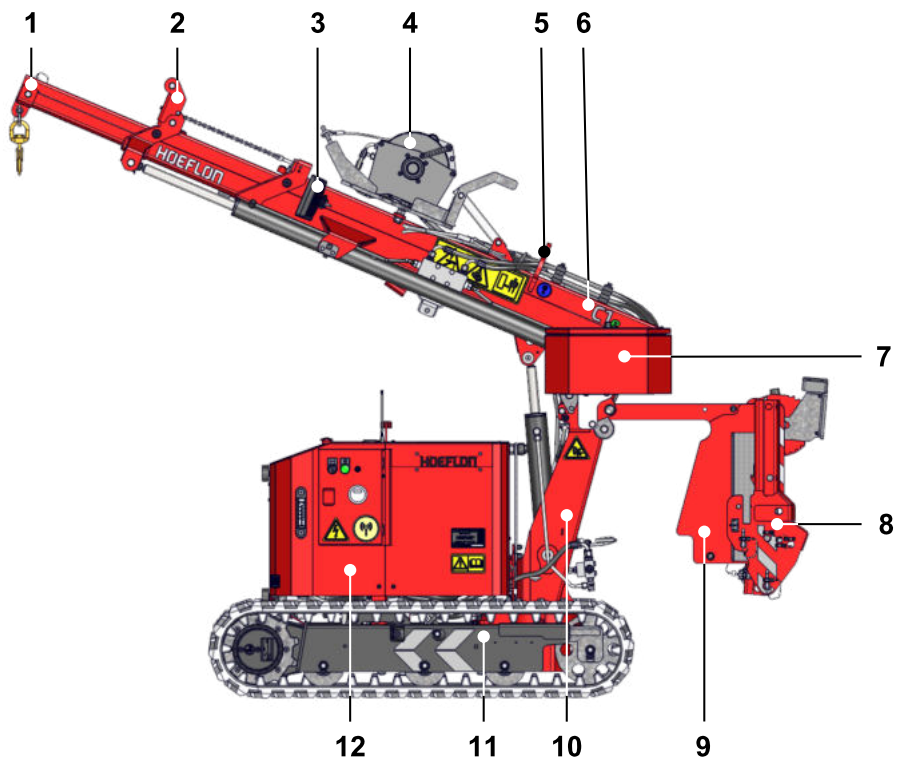


Figure 2.1 Front view

- | | | | |
|---|----------------|----|---|
| 1 | Boom section 3 | 7 | Storage box |
| 2 | Boom section 2 | 8 | Storage location for adjustable section |
| 3 | Work light | 9 | Counterweight |
| 4 | Winch | 10 | Crane column |
| 5 | Lifting point | 11 | Track undercarriage |
| 6 | Boom section 1 | 12 | Electrical cabinet |

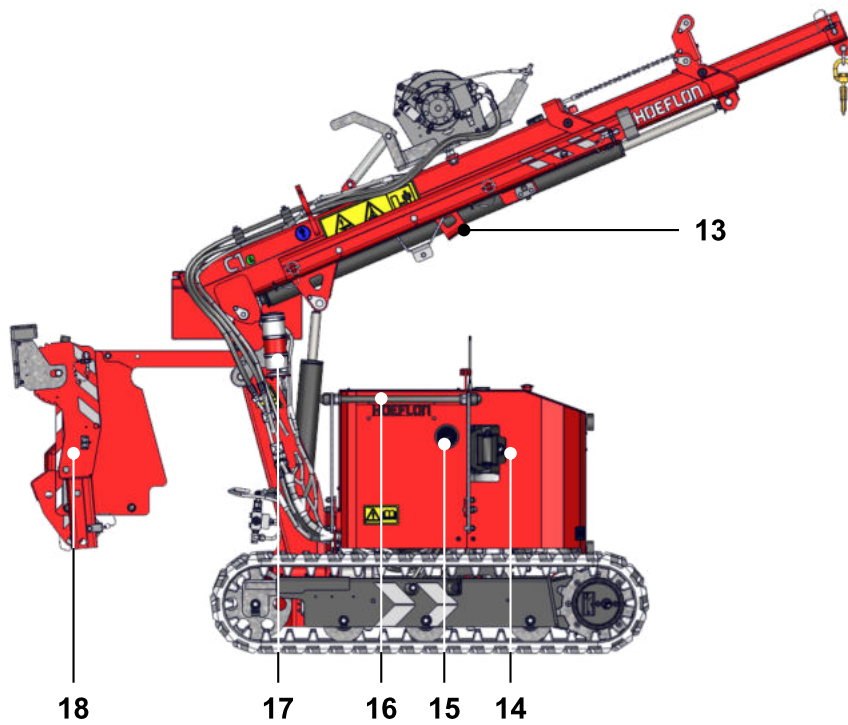


Figure 2.2 Rear view

- | | | | |
|----|------------------------------------|----|-------------------|
| 13 | Manual jib extension | 16 | Transport support |
| 14 | Battery charger for remote control | 17 | Stack light |
| 15 | Charging connector 230 V | 18 | Winch head |

2.2 Remote control

The crane is operated by remote control; the buttons and functions of the remote control are explained in this section.

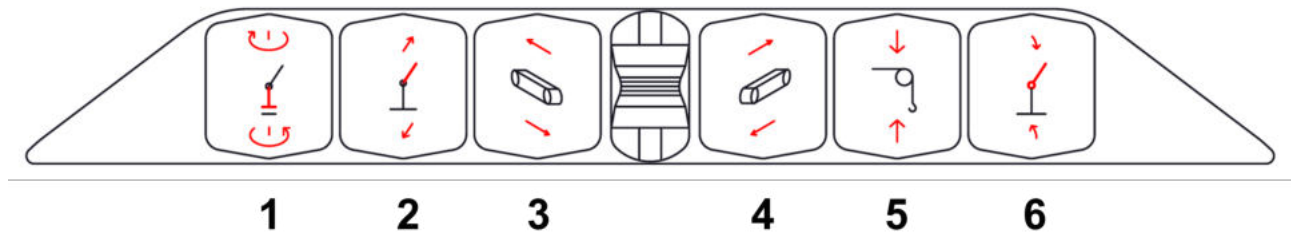
Also note the following points:

- The remote control is splash- and rain-proof.
- Never clean the remote control with a pressure washer and do not immerse it.
- Keep the remote control clean; make sure that pictograms, screen and labels remain legible.
- Wear the remote control using the hip belt or neck belt.
- Always have a second, fully charged battery in the battery charger.
- Switch off the remote control if it is not in range or makes poor contact. Then switch the remote control on again and it will search for another channel.







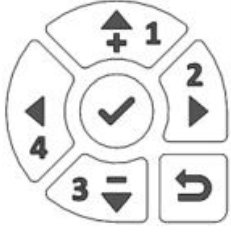










Figure 2.3 Remote control

2.2.1 Remote control levers



No.	Image	Function	Lever backwards	Lever forwards
1		Slew crane	Left	Right
2		Extend/retract main boom	Retract	Extend
3		Operate left crawler track	Backwards	Forwards
4		Operate right crawler track	Backwards	Forwards
5		Raise and lower winch	Raise	Lower
6		Boom up and down	Boom up	Boom down

2.2.2 Remote control buttons

Button	Function	Note
	Emergency stop button	The crane receives a signal to stop all communication. This stops all crane functions.
	On/off	Switch remote control on and off.
	Link remote control and crane	Activate connection between remote control and crane.
	Switching between driving and lifting	Green light on: lifting Green light off: driving, slewing and lifting Button only works if no lever or button has been operated for at least two seconds. After pressing the button, the crane's mode of operation changes and the information on the display changes.
	Navigation panel	
	 Confirm	 Down arrow
	 Up arrow	 Left arrow
	 Right arrow	 Back
	Second driving speed	Switch between slow and fast driving speed Green light on: fast driving Green light off: slow driving
	Crawler tracks out	Extend crawler tracks.
	Crawler tracks in	Retract crawler tracks.
	Work light	Switch work lights on and off.

2.2.3 Display on remote control

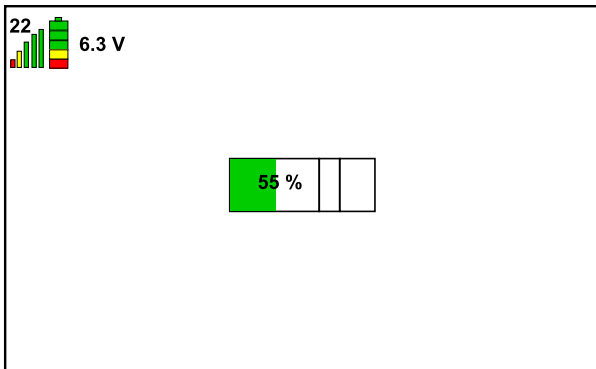


Figure 2.4 Example of display on remote control

2.3 Electrical cabinet



DANGER

Remove key from key switch when performing work on the electrical system and prevent unauthorised people from switching on the crane

There are a number of functions present on the electrical cabinet. The functions on the exterior are shown in *Electrical cabinet exterior*, with explanations below. The functions inside the cabinet are shown in *Electrical cabinet interior*, with explanations below.

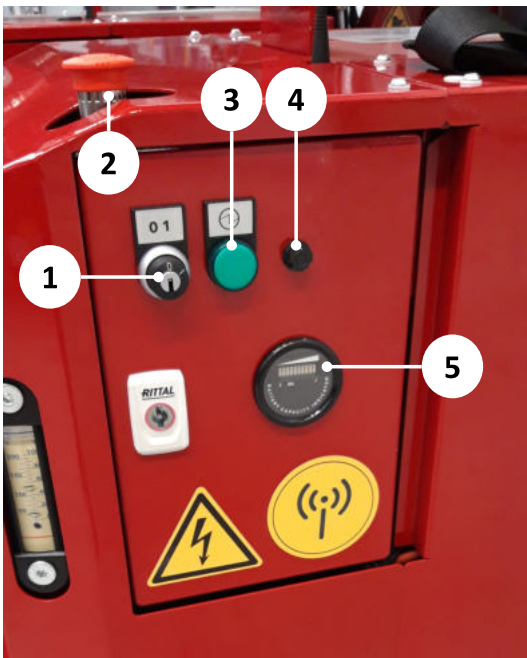


Figure 2.5 *Electrical cabinet exterior*

Number	Component	Function
1	Main switch, implemented as key switch	0: Crane switched off 1: Driving and lifting with crane
2	Emergency stop button	Switches off the crane as quickly as possible
3	Power on indicator	Lit when the main switch is on
4	Connection for emergency control cable	Not in use
5	Battery level bargraph	Indicates how much charge is left in the battery

See *Pictograms* for explanation of the decals.

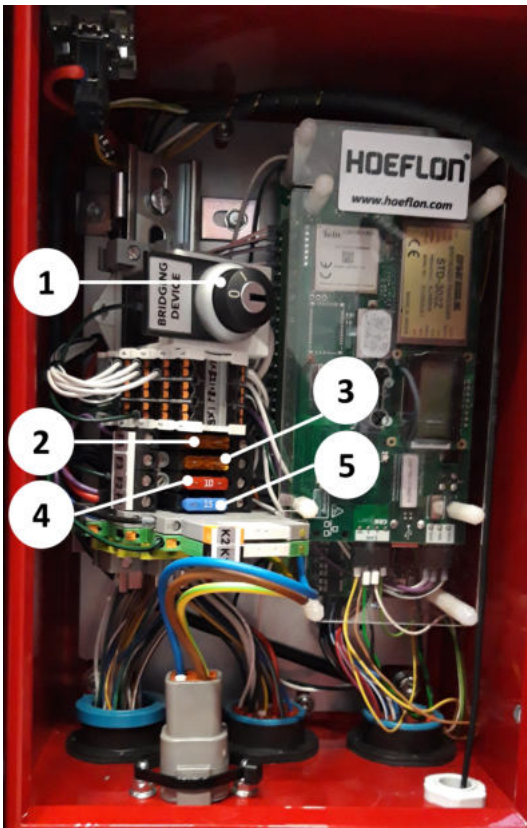


Figure 2.6 Electrical cabinet interior

Code	No.	Description	Function
	1	Key switch	0: neutral 1: complete override of safety functions
F1	5	Main fuse, blade-type 15 A (blue)	
F2	4	Fuse, blade-type 10 A (red)	Printed circuit boards and hydraulic controller
F3	3	Fuse, blade-type 5 A (orange)	Sensors
F4	2	Option	

2.4 Work light

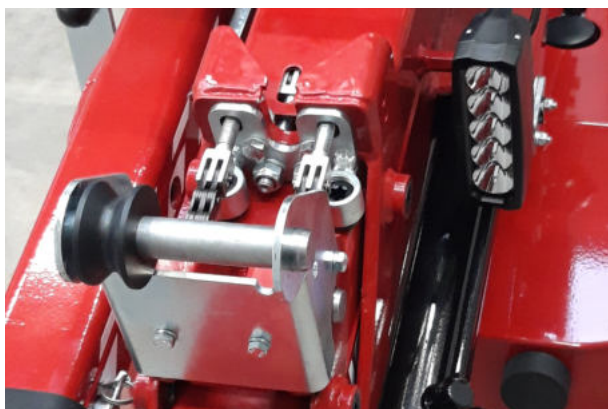


Figure 2.7 Work light

The work light on the crane can be operated as follows:

- Switch on by pressing the **Work light** button on the remote control.
- Switch off by pressing the **Work light** button again.

3.

SAFETY

3.1 Introduction

This chapter contains the general safety precautions to be observed during use of the crane. It is of paramount importance that the user closely observes these warnings and precautions to prevent injury to themselves and others and damage to the equipment.

Make sure you are familiar with all applicable legal requirements before you start operation, in particular the requirements for occupational safety and accident prevention.

Always be aware of the weight of components. Always use the correct tools and approved lifting equipment.

3.2 Operating personnel

Operating personnel may not be under the influence of narcotics or alcohol and must be at least 18 years of age. These people must be familiar with all the functions and tools associated with this crane. People who work with the crane must wear safety shoes, gloves and a safety helmet.

3.3 Warnings

Every employee must heed the following warnings and regulations.

3.3.1 Work environment



REMARK

Keep the crane clean and prevent dirt from accumulating.



REMARK

Use communication equipment if the operator does not have an overview of the entire operating radius.

3.3.2 Use

**DANGER**

Never climb on the crane when it is in motion or when it is being used.

**DANGER**

It is prohibited to change the pressure settings and the motor speed as this can lead to dangerous situations and damage to the crane. Any such changes will void the warranty immediately.

**DANGER**

It is prohibited to use the crane with a damaged or weakened hook, cable or other lifting equipment.

**DANGER**

It is prohibited to use the crane in the vicinity of high voltage cables.

**DANGER**

It is prohibited to use the crane in an explosive environment.

**DANGER**

It is prohibited to use the crane during lightning storms and/or wind speeds of Beaufort Force 6 or higher.

**DANGER**

It is prohibited to use the crane to drag loads, pull loads free (such as pulling out poles), cause loads to fall, push loads or winch loads at an angle. This can lead to dangerous situations and cause damage to the crane.

**DANGER**

Lifting with the boom below horizontal is prohibited, due to the extension and retraction chains. Lifting with the jib below the horizontal line is allowed.

**DANGER**

It is prohibited to use the crane to transport or lift people.

**DANGER**

HIGH VOLTAGE! (Danger of electrocution). Removing and opening the HV box is prohibited. Only technicians trained by Hoeflon are allowed to disconnect cables.

**DANGER**

Never leave the crane unattended with a load hanging from the crane.

**DANGER**

Do not let unauthorised people enter the crane's operating radius during operation.

**DANGER**

Never place materials or tools on the motor shroud of the machine or on the crane. These objects may end up in the motor compartment and cause a short circuit there.

**DANGER**

Remove key from key switch when performing work on the electrical system and prevent unauthorised people from switching on the crane

**DANGER**

Make sure the load bearing capacity of the ground is adequate and use access mats. Never place the crane on manholes or beside/in holes.

**DANGER**

Never lift heavier loads than the maximum permitted workload according to the load chart.

**DANGER**

Never transport the crane if the crane and counterweight are not completely collapsed, stowed, retracted and locked. Also, the crane must not be loaded. This can lead to dangerous situations and damage the crane!

**DANGER**

Avoid contact with rotating and moving parts.

**DANGER**

Only move loads that can move freely from the surface they are sitting on and that are located directly beneath the hook!

**WARNING**

Make sure that the crane's operating radius is cleared and fenced off so that unauthorised personnel cannot enter the area.

**WARNING**

Dangerous situations can arise in which there is intense interaction between the crane, operator, load, surroundings and ground. Thorough knowledge and preparation is a must.

**WARNING**

When the crane is connected to the mains, it is prohibited to use the crane in rain, snow, or high or wet grass or to drive through water.

**WARNING**

It is prohibited to use the crane on public roads; the crane does not have the necessary markings and lighting.

**WARNING**

Hot parts of the motor and components of the hydraulic system can cause burn injuries.

**WARNING**

Always collapse the crane after use in the open air if the crane is to be left outside (due to wind).

**WARNING**

Never transport a loaded crane.

**WARNING**

Only suitable, trained people who are familiar with the content of this user manual and have completed the user training provided by Hoeflon International B.V. may operate or work with the crane!

**WARNING**

Mind the height restriction in covered areas.

**WARNING**

When working in poorly lit areas, artificial light must be used to carry out the operations safely.

**WARNING**

The crane may only be moved by means of hold-to-run control. Levers must be actively continuously in order to drive. Always maintain a good view of the surrounding area, to avoid hitting people or objects.

**WARNING**

The boom is flexible and bends when lifting the load. Be aware that the boom will spring back when the load is put down.

**WARNING**

Take extra caution and safety measures in situations where the ground, surroundings or load strongly influences or restricts the use of the crane. When in doubt about the safe use of the crane, request advice from a specialist or contact your dealer or the manufacturer.

**WARNING**

Make sure that no loose objects are present on the load or boom during lifting operations.

**REMARK**

Never leave a crane unattended with the keys and remote control.

**REMARK**

Follow national regulations concerning working conditions and work safety when using the crane.

3.3.3 Maintenance



DANGER

It is prohibited to bypass a sensor; doing so can cause danger to life and damage to the crane. If a sensor fails, contact Hoeflon Service immediately.



WARNING

Take precautionary measures before disconnecting hydraulic lines and hoses to ensure that the line/hose is no longer under hydraulic pressure once the supply of energy to the system has been switched off.

3.4 Emergency stop

There is an emergency stop button on top the electrical cabinet and on the remote control. Emergency stop buttons all have the same function: when activated they stop all movements.

Only operate the emergency stop button in the event of an emergency or disaster.





WARNING

Never use the emergency stop button to switch off the crane during normal operation.

3.5 Stack light

A stack light is fitted on the crane. If the red light is on, the crane is at or above 100% load capacity. At 100% the stack light produces an audible signal.

Optional: When bypassed by means of the key switch, the stack light produces an audible signal to alert everyone in the vicinity.

Crane operation	
100% load (red lamp lights)	
 100% load (an audible signal sounds)	

3.6 Load moment limiter (LML)










When a load is hanging from the crane and the crane's outreach is increased, if the crane enters the range in which it is no longer allowed to lift the load, it will automatically stop increasing the outreach. The red lamp in the stack light will also light and an acoustic signal will sound.

Now the crane can only be operated in the direction in which the load comes back into the safe range. That is, the direction in which the outreach is reduced.

The following functions can be blocked by the LML: Extend boom/main boom, winch, lift and rotate.

3.7 Pictograms

The pictograms used are shown below. These may not be removed. Missing or damaged pictograms must be replaced immediately!

Pictogram	Meaning	Location
	Use of safety shoes, gloves and safety helmet is mandatory	On the electrical cabinet
	Lifting point for lifting the crane	On the boom
	Charge indicator for 80 V batteries	
	From left to right: Do not use in the vicinity of high-voltage cables / suspended loads / maintain sufficient distance	On the boom
	Read the manual before operating the crane	On the electrical cabinet
	Risk of crushing or cutting	On the crane column
	Electrical danger	On the electrical cabinet
	Warning for radio remote control	On the electrical cabinet
	Label that shows when annual inspection is due (Netherlands only)	On the electrical cabinet

4.

OPERATION

4.1 General precautions

4.1.1 Warnings

Every employee must observe the following warnings and regulations while working with the crane.

**DANGER**

Never enter the operating radius; this can have serious consequences.

**DANGER**

Do not let unauthorised people enter the crane's operating radius during operation.

**DANGER**

Never move a load over people.

**DANGER**

It is prohibited to use the crane in an explosive environment.

**WARNING**

Always operate the crane with extreme care. Avoid abrupt movements and maintain contact with any signal men.

**WARNING**

The bypass in the electrical cabinet bypasses sensors. It is prohibited to bypass the winch sensor. Use of the bypass is entirely at your own risk.

**WARNING**

Always perform the daily inspection first!

**WARNING**

Always check for unsafe situations!

**WARNING**

Make sure that the crane's operating radius is cleared and fenced off so that unauthorised personnel cannot enter the area.

**WARNING**

To charge the crane, use a cable with a minimum conductor cross-sectional area of 2.5 mm² and a maximum length of 25 m.

**WARNING**

At the end of each day that the crane is used, plug the charging cable into the mains socket so that the battery packs are charged and balanced. This keeps the battery packs in good condition.

**WARNING**

Switch off the control while performing other work to prevent unintentional movements.

**WARNING**

Never leave the crane unattended, unless the key has been removed.

**WARNING**

Make sure that no loose objects are present on the load or boom during lifting operations.

**REMARK**

The directions of movement on the remote control best match those of the crane when you are standing behind the crane.

**REMARK**

Use the toolbox (if present) only for crane parts and the tools necessary for working with the crane.

4.1.2 Assessing weather conditions

The weather can affect the use of the crane and disrupt the work schedule. Therefore, observe the following warnings and remarks.

**DANGER**

It is prohibited to use the crane during lightning storms and/or wind speeds of Beaufort Force 6 or higher.

**WARNING**

Check the weather forecast. This is important for scheduling the work.

**WARNING**

If lightning has struck the crane, a new certification inspection is required.

4.1.3 Inspecting lifting equipment

It is important that the lifting equipment is in order. Therefore, observe the following warnings and remarks.



DANGER

It is prohibited to use the crane with a damaged or weakened hook, cable or other lifting equipment.



DANGER

The user is responsible for safe operation of the crane, the selection of appropriate accessories (based on intended use, capacity, validity of inspection stickers and visual inspection) and the personal safety of the operator and people in the vicinity.



DANGER

It is forbidden to lift without counterweight on the crane. The crane can tip over.

4.2 Daily inspection prior to use



DANGER

HIGH VOLTAGE! (Danger of electrocution). Removing and opening the HV box is prohibited. Only technicians trained by Hoeflon are allowed to disconnect cables.

For your own safety and to obtain the maximum service life from your equipment, it is of great importance that you always inspect the condition of the crane before use. Resolve any problems you find, or have your dealer do so, before you use the crane again.

Perform the daily inspection as follows:

1. Before performing the daily inspection, first ensure that the crane is horizontal (to ensure oil level indication is correct).
2. Check that the emergency stop button stop on the remote control is pressed.
3. Perform a thorough general visual inspection of the crane. Look, in particular, for oil leakage, leaking cylinders, loose connections, dirt accumulation and any damage. Remove any dirt which has accumulated, and have necessary repairs performed if you observe a leak.
4. Check the oil level in the hydraulic tank (see *Figure 4.1*). The oil level must be between the upper and lower marks in the sight glass on the left side of the crane. If necessary, top up with Hydro 46.
5. Check that all protective caps and covers are in position and that all nuts and bolts are in place and secured firmly.
6. Make sure that the pins are present and secure. For example, at the jib and lifting equipment.
7. Visually check the tension and condition of the crawler tracks. If defects are found, contact the dealer.
8. Drive the front of the crawler tracks onto a wooden beam. The middle part of the crawler tracks is lifted off of the ground. They may not sag more than 2 cm at the bottom. If they sag more, they must be tensioned.
9. Tension the crawler tracks by fitting the grease gun to the grease nipple in the middle of the track beams (see *Figure 4.2*) and pumping until you feel resistance from the grease gun. The crawler tracks must not be too tight.
10. Check whether the crane operating levers automatically return to the centre position.
11. Make sure all loose parts are correctly stored and/or secured.
12. Check for correct operation of the emergency stop button; never perform lifting operations if the emergency stop button is not functioning properly. If defective, always have this repaired immediately!
13. Check for wear of the lifting cable, hook and other lifting accessories.

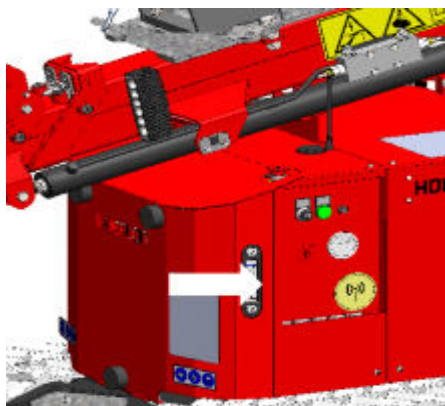


Figure 4.1 Checking oil level

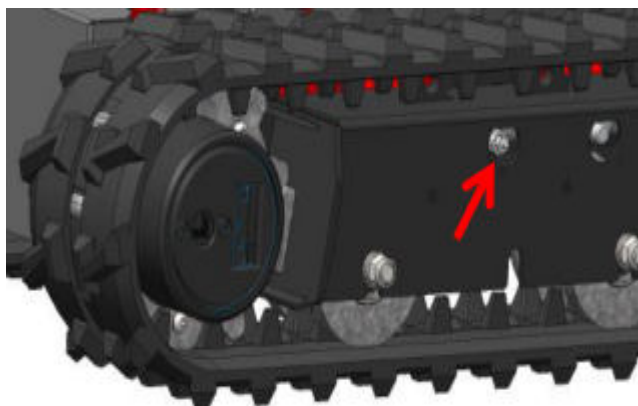


Figure 4.2 Tensioning crawler tracks

4.3 Using the remote control

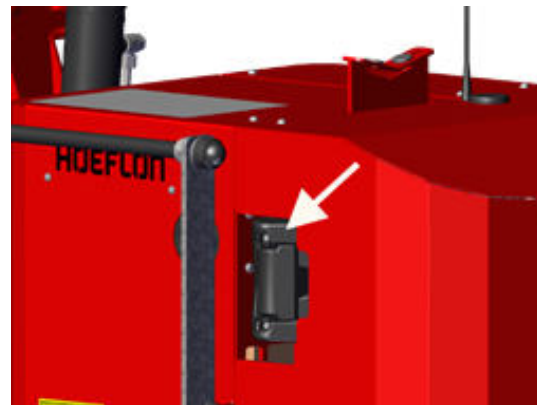
4.3.1 Changing and charging the remote control battery

To change the battery of the remote control:

1. Push in the two buttons next to the battery.
2. Remove the discharged battery from the remote control.
3. Take the charged battery from the battery charger and place it in the remote control.
4. Place the discharged battery in the battery charger. The battery is only charged when the main switch on the electrical cabinet is in position 1.
5. Switch on the remote control. and establish contact with the crane again.

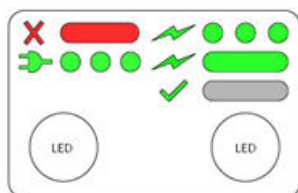


Step 2



Step 4

See the table below for the meaning of the LEDs.



Left LED (charger status, fault only)		Right LED (battery status, user)	
LED status	Meaning	LED status	Meaning
Short green flash every 5 s	12 V connected	LED off	Battery not connected
Continuous red	Fault	LED continuous green	Battery charging 1 A
		LED flashing green	Charging 0.3 A
		LED off	Battery fully charged

4.4 Calibrating levers

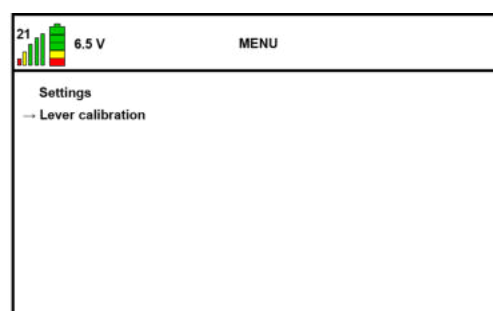
If the levers of the remote control do not respond over the entire range of movement, they must be calibrated. Calibrating the levers can also be the solution when there is no connection with the crane, i.e. the LED on the **Link remote control and crane** button is not flashing.

Start the calibration as follows:

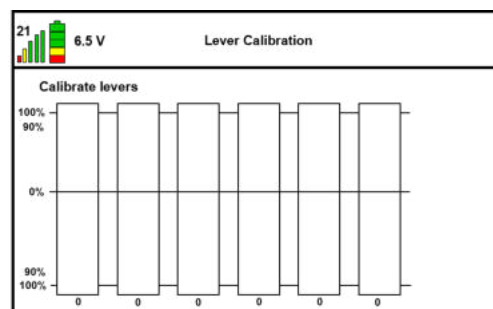
1. Switch on the remote control with the **On/Off** button, and activate the remote control menu by pressing the **Confirm** button.



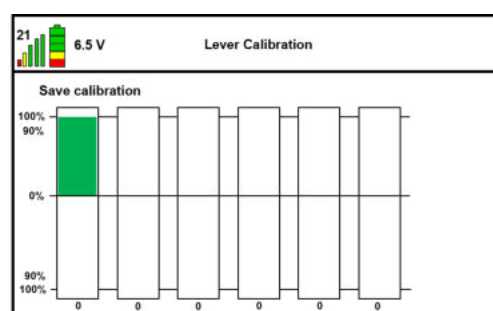
2. Press the **Down arrow** button to move the arrow in the display until it points to *Lever calibration*.



3. Press the **Confirm** button. The *Calibrate levers* screen appears with a bar for each lever.



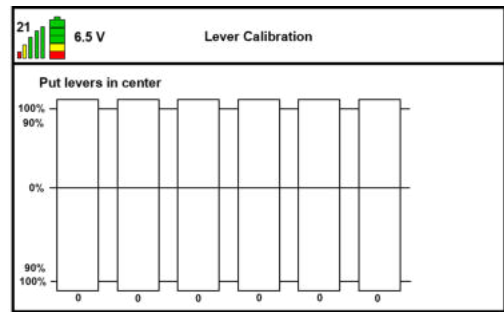
When you operate a lever the bar turns green. In the maximum position the bar should be 100% green. If not, the levers must be calibrated.



The screen shows six bars, with each bar representing a lever. When you operate a lever the bar turns green. When the lever is at its farthest position, the bar should be 100% green. If it does not reach 100%, the levers must be calibrated.

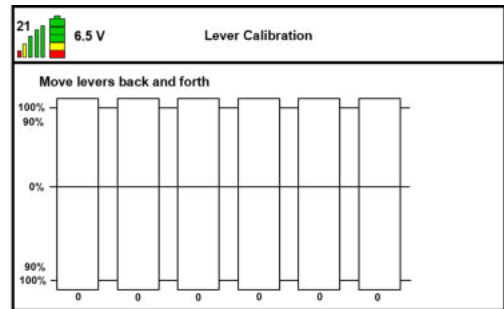
To calibrate the levers:

1. Press the **Confirm** button. The text *Put levers in center* is now displayed. ✓

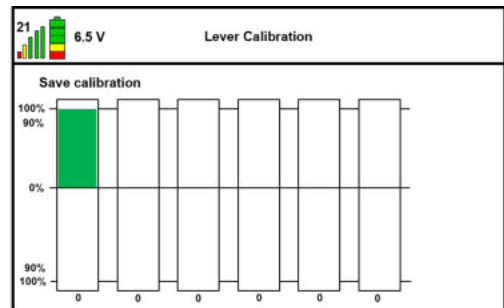


2. Set all levers to the centre position and press the **Confirm** button. ✓

3. The text *Move levers back and forth* is now displayed. Slowly move the levers one at a time, from all the way back to all the way forward. ✓



4. Press the **Confirm** button. The text *Save calibration* is now displayed.



5. Move the levers one by one to check that the bar turns 100% green. Move the levers all the way in both directions.

6. Press the **Confirm** button to confirm the calibration. The settings are saved. ✓





7. Press the **Back** button twice to return to the home screen. ↶

4.5 Starting and switching off the crane

For an explanation of the remote control, see 'Remote control' section.

Starting the crane

Start the crane as follows:

1. If you want to charge the battery while you work, plug the charging cable into the mains socket. This is not necessary if you do not want to charge the battery while you work.
2. Check that all levers of the remote control are in the centre position. If one or more levers are not in the centre position, no connection can be made with the crane.
3. Set the main switch on the electrical cabinet to position **1**.
4. Switch the remote control on with the **On/off** button. 
5. Activate communication between the remote control and the crane with the **Link remote control and crane** button. 
6. Set the remote control to the (crane operating) position with the **Switch between driving and lifting** button (green light on). 
7. Check that the crane is level.
8. Start extending the boom cylinder with the corresponding lever on the remote control.
9. Then extend the boom.
10. To drive the crane, press the **Switch between driving and lifting** button (green light off). 

Perform this procedure in reverse when the lifting operations are complete.


Switching off the crane



WARNING

Never use the emergency stop button to switch off the crane during normal operation.

Switch off the crane as follows:

1. Put the crane in the transport position or any other desired position.
2. Switch off the remote control with the **On/off** button. 
3. Set the main switch on the electrical cabinet to position **0**.
4. Plug the charging cable into the mains socket, if necessary.

4.5.1 Starting the crane via 230 V connection

If the crane's 24 V batteries are discharged, you can start the crane via the 230 V connection:

1. Press the emergency stop button.
2. Connect the plug of the charging cable to the mains socket.
3. Wait until the battery level bargraph shows that the batteries are being charged. For more information, see section 5.7.
4. Start the crane.

4.6 Moving the crane



DANGER

It is prohibited to drive the crane when the counterweight is extended, as this can cause the crane to tip over backwards.



DANGER

The crane can tip over if it is extremely tilted. See the permitted values.



DANGER

It is forbidden to be beside the crane while driving, due to instability.



WARNING

Always operate the crane with extreme care. Avoid abrupt movements and maintain contact with any signal men.



WARNING

It is forbidden to drive through water more than 10 cm deep.



WARNING

Always drive with the crawler tracks extended; this minimises the load on the ground and ensures maximum stability of the crane.



WARNING

If the situation necessitates that the crawler tracks be retracted, take extra care.



WARNING

It is forbidden to pull with boom and jib, both horizontally and vertically, such as pulling out poles or dragging loads. The crane is intended for vertical transport of loads subjected only to the pull of gravity. Towing loads with the drawbar eye is permitted while driving.

Maximum slope angles when driving the crane

Make sure that the crane is travelling on as flat a surface as possible. If you do have to drive on a slope, observe the following maximum values.

Direction of movement	Maximum slope angle
Forwards	15°
Backwards	23°
Sideways – crawler tracks retracted	15°
Sideways – crawler tracks extended	23°

4.6.1 Driving the crane

**WARNING**

Only drive the crane when it is in the transport position.

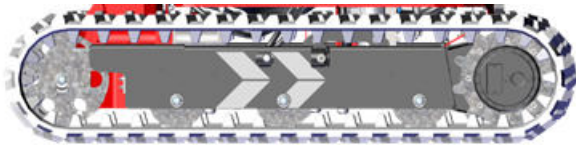


Figure 4.3 Driving direction

Inspection

If you want to charge the battery while you work, plug the charging cable into a mains socket.

**WARNING**

Make sure the charging cable is not too short if it is left in the mains socket while driving the crane.

Drive as follows:

1. Check that all levers of the remote control are in the centre position.
2. Make sure the crane is collapsed and unloaded.
3. Set the main switch on the electrical cabinet to position (1).
4. Switch the remote control on with the **On/off** button.
5. Activate the remote control by pressing the **Link remote control and crane** button.
6. Operate levers 3 and 4 on the remote control simultaneously forwards or backwards to drive. The direction of travel is indicated by the white arrows on the undercarriage. Operate one of the two levers to change direction.
7. Stop the crane by releasing the levers; they return to the centre position automatically.



4.6.2 Crawler track width adjustment

Adjust the crawler track width as follows:

1. While driving, press the **Extend tracks** button to extend the tracks.
2. While driving, press the **Retract tracks** button to retract the tracks.
3. Only set the crawler tracks to the maximum and minimum width.



4.7 Lifting



REMARK

In case of overload, retract the extendable sections of the crane until the load is once more within the safe operating radius of the crane.

4.7.1 Display during lifting and driving

While working with the crane, the remote control display shows all kinds of information.

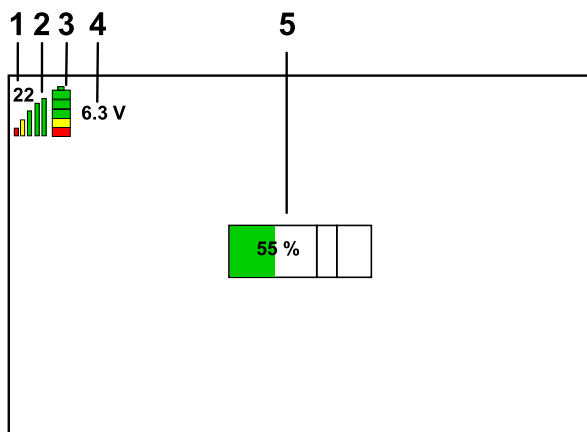


Figure 4.4 Remote control display

No.	Function	Explanation
1	Channel	The channel (22) via which the remote control communicates with the crane.
2	Signal strength	If the strength is good, five bars are shown. As the signal weakens, the green bars disappear first, then yellow and red.
3	State of charge of remote control battery	A fully charged battery is indicated by five blocks. As the battery discharges, the blocks go out, one at a time.
4	Voltage	The voltage of the remote control battery is shown in volts.
5	Load	Crane load in per cent of capacity.

4.7.2 Extending and retracting counterweight

**DANGER**

Stay away from the counterweight, particularly during retraction of the counterweight (risk of crushing).

**DANGER**

It is forbidden to lift without counterweight on the crane. The crane can tip over.

The crane counterweight must be extended manually, as follows:

1. Release the counterweight by twisting or pulling the lip of the locking pin (see *Figure 4.5*).
2. Use the black handle in the middle of the rear of the counterweight to pull the counterweight back as far as it can go.
3. Lock the counterweight by turning the lip on the locking pin again. The pin will fall back into the notch by spring force.
4. Perform the steps in reverse to slide the counterweight in again.

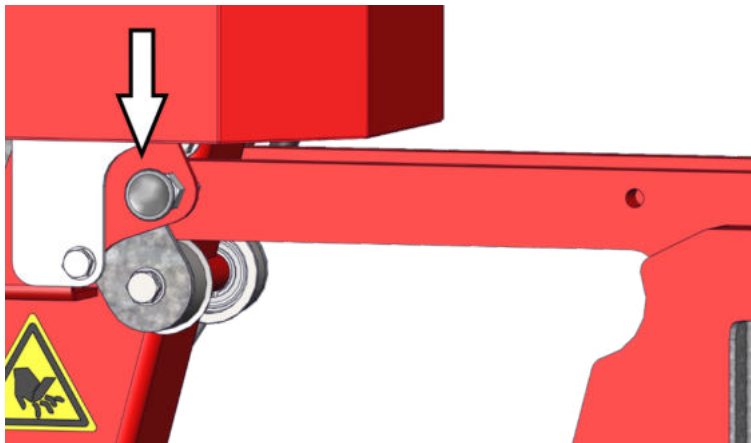


Figure 4.5 Extending counterweight

4.7.3 Guiding the load

**WARNING**

The mass of the load and the position of the centre of gravity must be known so that the lifting plan can be drawn up. This is necessary in order to determine the correct crane configuration and lifting accessories.

**WARNING**

Operate the crane with due care; to prevent jolts while driving, never release the levers of the remote control suddenly.

Adhere to the following regulations when guiding a load:

- Always operate the crane with the load very carefully and only at the slow speed.
- Make sure the load is properly secured and will continue to hang stably.
- Never place body parts under the load or between the load and surrounding obstacles.
- Stand behind the load when it moves horizontally.
- Use protective clothing and safety goggles when working near or with fragile materials where there is a risk of splinters, such as stone and glass.
- Maintain visual contact and open channels of communication between guides and operator.
- Whenever possible, use guide lines to maintain a safe distance.
- Always ensure that there is a clear escape route to get to safety.
- Never stand or hang on the load.
- Avoid abrupt movements of the crane and load.
- Make sure the area is clean and tidy to minimise the risk of tripping and the guide line getting caught and/or damaged.

4.8 Lifting with the winch

**DANGER**

The maximum load of the winch is 420 kg.

**DANGER**

Make sure the cable runs along the grooves in the sheaves and the slot in the winch head stop plate!

**DANGER**

Check the lifting cable for damage, wear, twists or kinks. If it does, replace the cable before use.

**WARNING**

Use the winch only for vertical lifting. There is a risk of overloading when lifting at an angle.

**WARNING**

Whenever possible, leave the winch weight attached to the lifting cable so the cable will be wound up more tightly.

**WARNING**

The winch will stop automatically when there are three turns of the lifting cable remaining on the winch drum.

Please note the following points:

- Make sure that both pins are attached and secured when using the winch head in the adjustable section.
- Any time tension on the lifting cable has been slack, check that the cable is still taught and neatly wound around the winch drum before operating the winch.
- When using the winch, keep in mind the limits of the various crane configurations.
- Remember: the complete winch weight with hook is 33 kg. Do not move or lift the weight manually.
- With the exception of the winch weight, lifting hook and counterweight removal support, never pull on parts of the crane.

4.8.1 Adjustable section limits

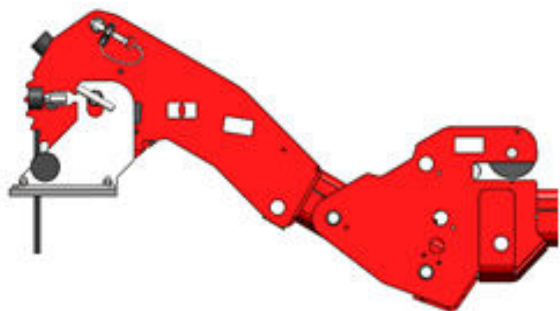


Figure 4.6 Adjustable section upper limit

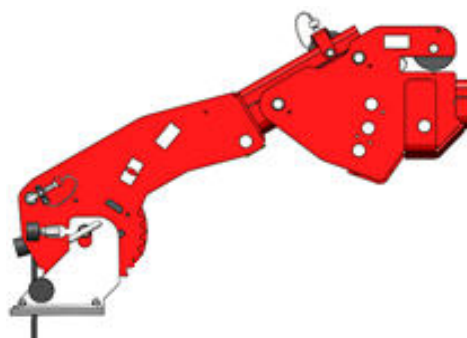


Figure 4.7 Adjustable section lower limit

Use of winch head and adjustable section

	Min. boom angle	Max. boom angle
Winch head without lifting weight	Not permitted	Not permitted
Winch head	0 degrees	70 degrees
Adjustable section with winch head lowered (see Figure 4.6). Attention! Fit the extra roller in the winch head (see arrow).	0 degrees	75 degrees
Adjustable section with winch head raised (see Figure 4.7).	0 degrees	60 degrees

4.8.2 Lifting without options

Inspection

1. Visually inspect the cable for external deficiencies, such as kinks and broken strands.
2. Check that cable is wound neatly and tightly on the drum; if not, unwind the cable and wind it tightly (see *Figure 4.8*).

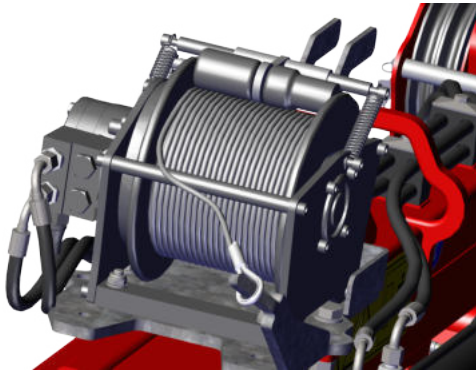


Figure 4.8 Check the cable

Preparation

1. Make sure the crawler tracks are fully extended.
2. Make sure the boom is horizontal and retracted.

Attaching winch head

1. Remove the winch head from the counterweight support (see *Figure 4.9*).
2. Secure the winch head in the boom with the locking pin (1) and secure the pin.

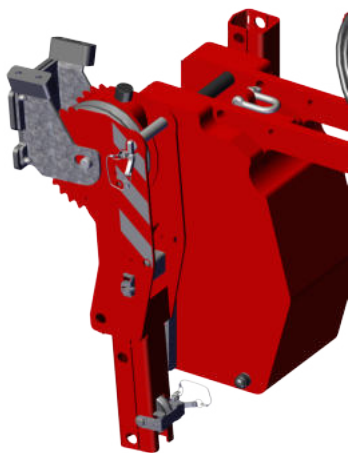


Figure 4.9 Winch head on counterweight

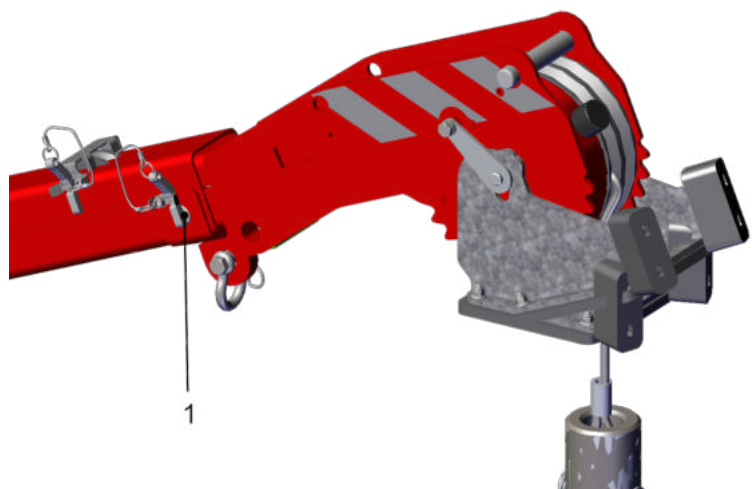


Figure 4.10 Locking pin

Activating winch control

1. Activate the winch control by pressing the **Confirm** button on the remote control. ✓
2. Now open settings by pressing the **Confirm** button. ✓
Then use the **Down arrow** button to select *Winch state* on the screen. Then use the **Right arrow** button to set *Winch state* to **ON**. ▼
3. After activating and setting the winch, return to the home screen by pressing the **Back** button. ↶

Execution

1. Start the drive system and activate the remote control.
2. Check that the crane is level.
3. Use the appropriate lever on the remote control to raise the boom until it is horizontal. Then extend the boom slightly. Wind out the cable as described below.
4. Carry out this procedure in reverse order after using the winch.
5. Make sure the cable does not touch the ground, as this may prevent the cable from winding up correctly.
6. When the cable is not in use, secure the loop on the cable to the designated hook on the winch (see *Figure 4.8*).

Running the cable



WARNING

The use of gloves is mandatory when running the lifting cable!

1. Use one hand to operate the winch control lever on the remote control and the other hand to hold the cable and keep it under tension.
2. Wind out the cable until the end is about one metre in front of the crane. Keep the cable under tension while winding it out.
3. Switch off the remote control.
4. Run the cable over the sheaves of the boom (1). Check that the cable has been run over the sheaves in the winch head correctly (see *Figure 4.11*).

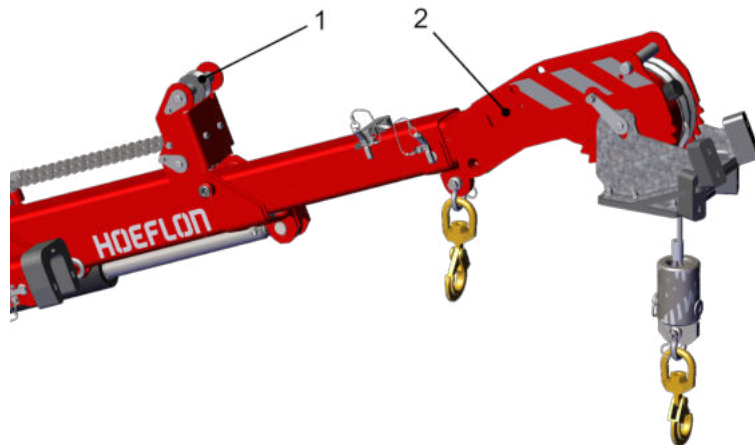


Figure 4.11 Routing the cable

5. Run the cable over the winch head. First remove the upper pin (1) from the winch head. Place the cable over the middle sheave and fit the upper pin again. Position the cable properly through the winch stop (see Figure 4.12).

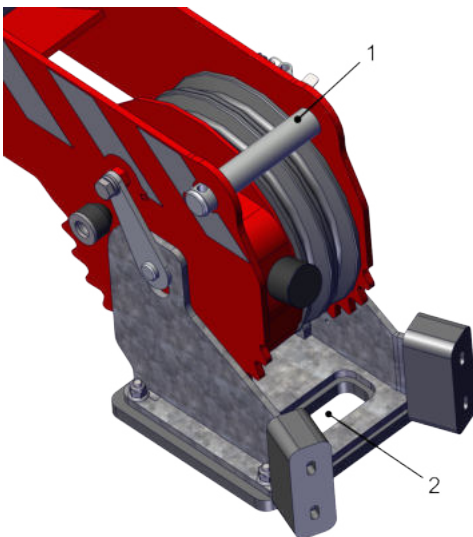


Figure 4.12 Positioning the cable

6. Attach the winch weight to the cable.

Winding in the cable

1. After you have used the winch, wind in the cable until the end is about one metre in front of the crane, run it through the sheaves and then pull the cable tight and wind it in (see Figure 4.8).
2. Hang the eye on the support and carefully wind in the cable and gently pull it tight.
3. Deactivate the winch by setting the *Winch state* to **OFF** in the remote control menu.

4.8.3 Lifting with adjustable section

Preparation

1. Make sure the attachments have been removed from the boom and stored and secured in place.
2. Make sure the boom is horizontal and retracted.

Attaching adjustable section

1. Remove the adjustable section from the counterweight support.
2. Place the adjustable section in the boom and secure it with the locking pin and locking clip (see *Figure 4.13*).
3. Now the winch head or manual jib extension can be attached with the two pins (see *Figure 4.14*).

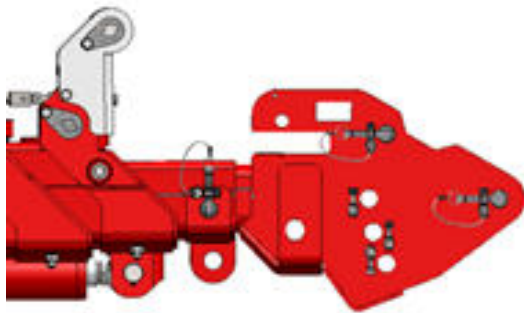


Figure 4.13 Attachment of adjustable section to boom

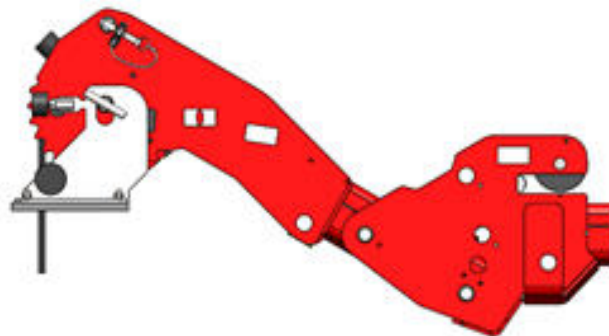


Figure 4.14 Attachment of winch head or manual jib extension to adjustable section

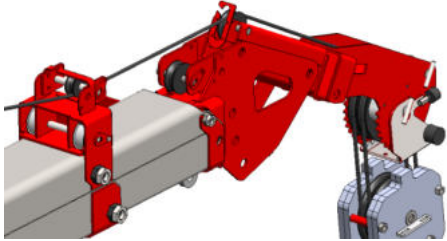
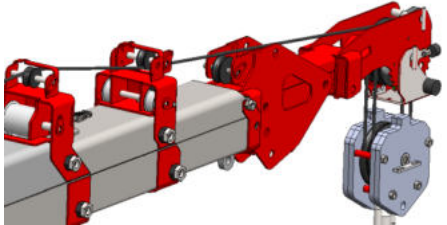
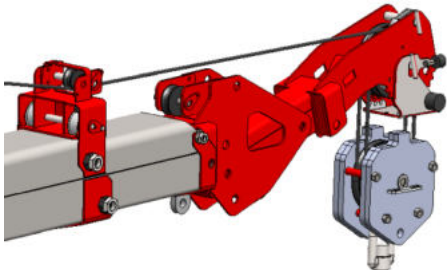
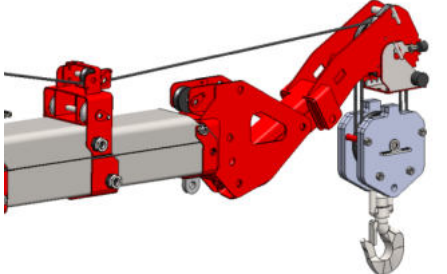
Attaching manual jib extension

1. Remove the manual jib extension from the support on the boom.
2. Place the manual jib extension in the boom and secure it with the locking pin and locking clip.

Attaching winch head

1. Remove the winch head from the support on the counterweight.
2. Place the winch head in the boom and secure it with the locking pin and locking clip.

4.8.4 Winch head positions in adjustable section – with main boom

Main boom	
<p>Winch head in top hole. Cable over auxiliary pulley to rear of winch head.</p>	
<p>Winch head in second hole. Cable without auxiliary pulley to large sheave in winch head.</p>	
<p>Winch head in third hole. Cable without auxiliary pulley to large sheave in winch head.</p>	
<p>Winch head in bottom hole. Cable without auxiliary pulley to large sheave in winch head.</p>	

4.8.5 Attaching winch weight

**DANGER**

The maximum load of the winch is 420 kg.

**DANGER**

Make sure the cable runs along the grooves in the sheaves and the slot in the winch head stop plate!

**WARNING**

The winch will stop automatically when there are three turns of the lifting cable remaining on the winch drum.

Preparation

1. Make sure the crane is level, with the crawler tracks extended.
2. Make sure the winch head is mounted.

Execution

1. Switch on the remote control and position the cable over the roller on the boom and through the winch head (see *Figure 4.15*).
2. If the eye of the cable is hanging below the winch head, the winch weight can be attached. The winch weight is stored in the toolbox.
3. Remove the pin from the bush on the winch weight.
4. Insert the eye of the cable in the bush of the winch weight and secure it with the pin and split pin.
5. The lifting hook hangs on the bottom of the winch weight.
6. The crane is now ready to lift with the winch.
7. Perform this procedure in reverse to remove the winch weight.

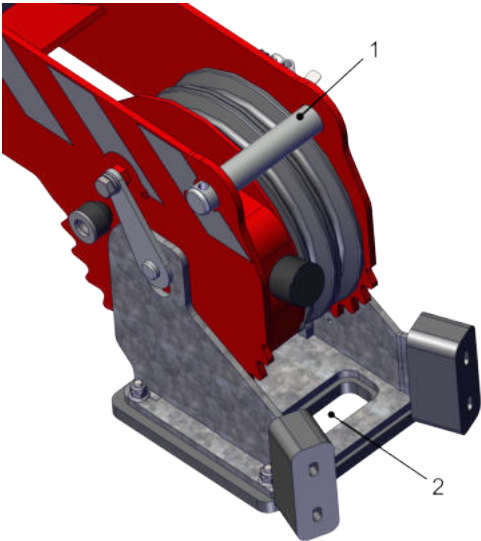


Figure 4.15 Positioning the winch cable



Figure 4.16 Attaching winch cable to lifting hook

5.

MAINTENANCE

5.1 Introduction

This chapter provides instructions for the maintenance that is necessary to ensure proper operation of the crane. It is very important that these instructions are followed, to ensure your safety and that of others who are present.

Unusual noises or vibrations can indicate a defect in the crane. It is then necessary to perform a repair or maintenance without delay. Consult your dealer or Hoeflon International B.V. about this.

Contact your dealer's technical department for additional information concerning aspects such as maintenance and repair of specific parts.

5.2 Warnings

**DANGER**

Remove key from key switch when performing work on the electrical system and prevent unauthorised people from switching on the crane

**DANGER**

Never use your hand to locate a leak in the hydraulic system; use a piece of paper or cardboard instead. Oil under high pressure can penetrate the skin and cause poisoning.

**DANGER**

Turn off the engine when topping up with oil.

**DANGER**

Always correctly reinstall any protection measures that have been removed!

**WARNING**

Only the dealer or Hoeflon International B.V. may perform work on the crane's electrical or hydraulic system.

**WARNING**

ATTENTION! Parts of the engine and hydraulic system components may still be hot;

allow them to cool first!

**WARNING**

If you are unable to correct a malfunction, contact your dealer or Hoeflon International B.V.

5.3 Maintenance work

The risk of accidents with cranes is generally greater during maintenance, cleaning and service. Have your dealer perform the maintenance work on the crane. In the Netherlands you can choose to enter a maintenance contract with Hoeflon International B.V.. The maintenance intervals and activities are shown in the lubrication schedule and maintenance schedule.

5.3.1 Weekly maintenance

1. See maintenance chart.
2. Grease the crane in accordance with the lubrication chart.
3. Clean the crane with water and a mild cleanser such as car wash shampoo. Never use solvents or other flammable liquids as a cleanser. When spray cleaning, never aim directly at the motor or electrical parts.
4. Clean the crane daily after use in or transport through a salty/briny environment. Be sure to remove all the salt/brine, to prevent corrosion of the crane.

5.3.2 Monthly maintenance

1. See maintenance chart.
2. Grease the crane in accordance with the lubrication chart.

5.3.3 Scheduled service

1. The first scheduled service must be performed after 2 weeks or 50 hours of operation.
2. Thereafter the crane requires scheduled service annually or every 250 hours of operation.
3. It must also be inspected annually. For the Netherlands, the following sticker is used to indicate when the next inspection is due.
4. It is recommended that you have the scheduled service and inspections performed by your dealer or Hoeflon International B.V..



Figure 5.1 Maintenance sticker

5.3.4 First use

1. Perform the daily inspection.
2. Test the following aspects of the crane:
 - a. Operation of emergency stop buttons.
 - b. Operation of all functions.
 - c. Operation of safeguards.

5.4 Maintenance schedule

The maintenance schedule indicates which maintenance must be carried out and at what interval. Instructions for the maintenance tasks can be found later in this chapter.

Description of maintenance	Action	Hours interval							
		Daily	First 50 hours	50	100	250	500	1000	4000
o = manufacturer/dealer, ● = owner									
Crawler track undercarriage									
Tension of crawler tracks	Check/adjust			●					
Oil level, crawler track motors	Check/top up					o			
	Replace						o		
General									
Crane	Clean			●					
Safety devices	Check	●							
Lifting accessories (cables, hooks etc.)	Check/replace	●							
Control levers	Check	●							
Condition and presence of pictograms	Check					o			
Mechanical components	Check	●							
Boom clearance	Check/adjust							o	
Turntable	Check/tighten		o				o		
	Lubricate			●					
Construction incl. pins, shafts etc.	Check					o			
Boom extension and retraction chains	Check				●				
	Lubricate				●				
Plastic slide plates on boom	Check					o			
	Lubricate			●					
Boom guide bolts	Check					o			
Pivot points and extendable sections	Lubricate			●					
Bolt connections	Tighten						o		
Boom wear parts (completely disassemble)	Replace								o
Hydraulic system									
Hydraulic oil	Check	●							
	Replace							o	
Leaks	Check	●							
Hydraulic hoses	Check					o			
	Replace								o
Pressure levels	Check							o	
Hydraulic return filter	Replace		o				o		
Hydraulic pressure filter	Replace						o		
Stop valves and pressure relief valve	Test							o	
Hydraulic system	Flush								o
Electrical system									
Wiring connectors	Check					o			
Emergency stop buttons and sensors	Check	●							
Voltage	Check					o			
Electrolyte level of battery pack	Check			o					

5.5 Lubrication chart

The lubrication chart indicates which parts need to be lubricated and at what interval. The instructions can be found further in this chapter.

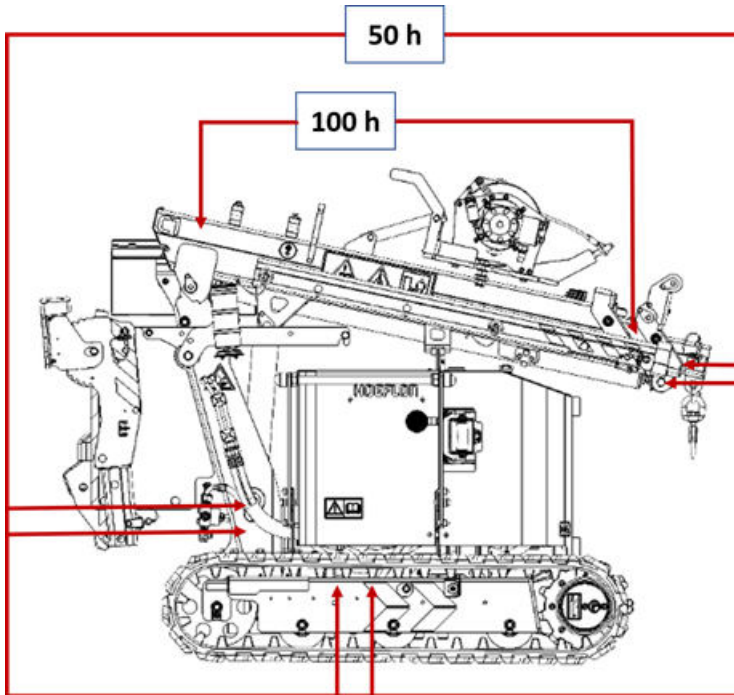


Figure 5.2 Lubrication chart

5.6 Lubricate

Lubricate the crane as shown in the lubrication chart below, paying particular attention to the following:

1. Clean the grease nipples thoroughly before lubrication.
2. Remove excess/old grease from the masts.
3. Use clean greases, stored in sealed packaging.
4. Lubricate the top side of the plastic guide on the boom by inserting a grease gun fitted with a nipple connector through the holes, when the boom is fully extended.
5. Use only prescribed greases; see lubricant specifications.

5.6.1 Lubricants

Manufacturer	Hydraulic oil		Final drives	Lubrication points	Chains	Sliding parts	
	Universal	Organic				Grease	Spray
Q8	Heller 32	Q8 Holbein HP SE Bio 46	T 55	EP 2	Industrial chain spray	EP2	PTFE
Total	Equavis AF 32 / ZS 46	BioHydran TMP 32	EP-B 80W90	EP 2	Industrial chain spray	EP2	PTFE
Shell	Shell Tellus S2/S3	Shell Naturelle HF-E 32	Spirax S3 AX 80W-90	EP 2	Industrial chain spray	EP2	PTFE
Kroon oil	Perlus ZF 46	Perlus Biosynth 46	Gearlube GL-5 80W-90	EP 2	Industrial chain spray	EP2	PTFE

5.7 Charging 80 V batteries

Read these instructions carefully to familiarise yourself with how to handle the batteries correctly.

It is of paramount importance that personnel closely observe these warnings and precautions to prevent injury to themselves and others and damage to the equipment.



DANGER

Do not open or disassemble the batteries or charger.



DANGER

Disconnect the battery when replacing electrical components.



WARNING

To charge the crane, use a cable with a minimum conductor cross-sectional area of 2.5 mm² and a maximum length of 25 m.

5.7.1 Battery level bargraph

The crane is fitted with a battery level bargraph (1) that shows the state of charge (SOC) and charging mode (M) of the battery packs. The location of the battery level bargraph on the crane is indicated by the pictogram (2) (see *Battery level bargraph and pictogram*).

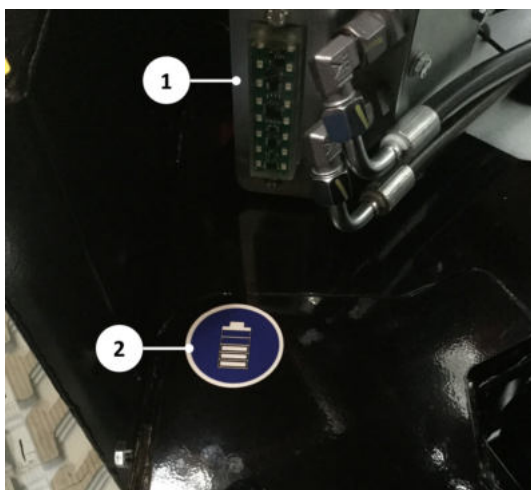


Figure 5.3 Battery level bargraph and pictogram

When the crane is connected to the mains and the charger is active, the upper LED bar flashes, so the current SOC value will be lit continuously. If the crane is not connected to the mains, the SOC is displayed when the main switch on the electrical cabinet is in position 1. When the main switch is in position 0, nothing is displayed but charging does take place. For cranes with older software, this works slightly differently.

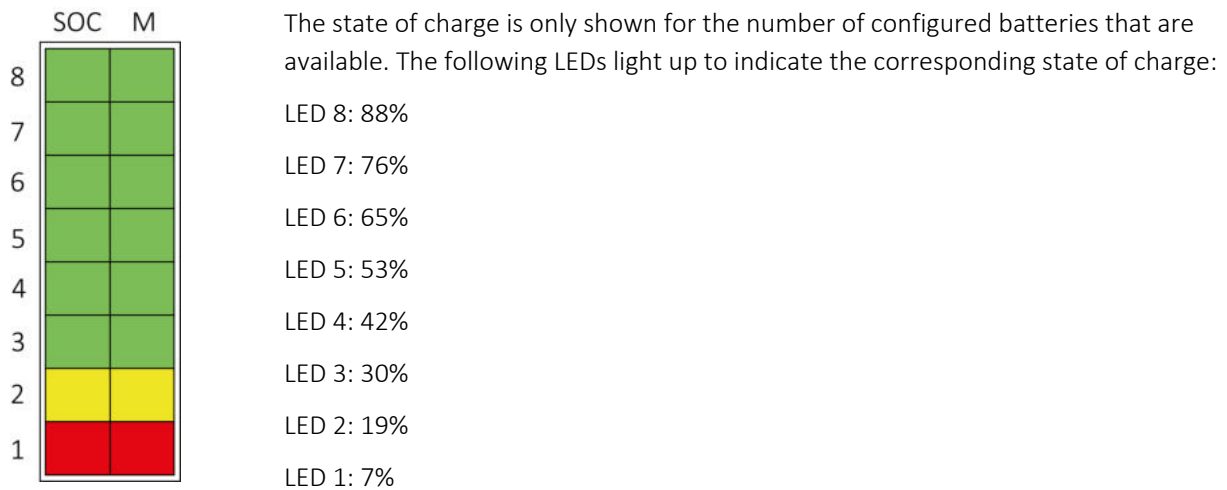


Figure 5.4 Battery level bargraph with SOC (state of charge, left) and M (charging mode, right)

The following table shows the different charging modes:

Mode	Battery level bargraph
Fast charging (>2A per battery)	The battery level bargraph fills every 4 seconds
Balance charging: All cells are equalised to ensure the battery is charged to maximum capacity.	The battery level bargraph fills every 16 seconds
If all the batteries have been fully charged since the charging plug was connected.	All the LED segments are on

When the crane is switched off, the battery level bargraph shows the status and mode as long as the charging plug is connected to the mains.

5.7.2 Charging the batteries



REMARK

Charge the batteries at the end of each day to keep them balanced and in good condition. Condition: The emergency stop buttons must not be pressed, and the main switch on the electrical cabinet must be in position 0.



REMARK

When the crane's key switch is off, the priority is on charging the batteries. When the key switch is on, charging continues while the crane is lifting. Then the priority is lifting. The batteries will still be charged, but less efficiently and less quickly. This can also cause a pack to not be charged at all, with the risk that it will become fully discharged.

To charge the batteries:

1. Set the main switch on the electrical cabinet to position 0.
2. Check that the charging cable plug is clean and dry.
3. Connect the plug to the mains socket. Charging starts automatically.

4. During charging, the battery level bargraph fills up. When the state of charge is above 88%, all LEDs in the SOC column are lit.
5. When the batteries are fully charged, all the SOC LEDs are lit.
6. Disconnect the charging cable from the mains supply and store it in the crane again.

5.8 Maintaining the boom chains

Please note the following when maintaining the chains:

- Do not repair chains or insert new links; if deficient, have them completely replaced by your dealer or Hoeflon Service.
- If there are two extension or retraction chains, replace both, along with the connections, at the same time.
- If the chains are soiled to the point that lubrication no longer helps, clean with petroleum ether or diesel. Do not clean with acidic agents or a pressure washer. These can damage the chains.
- Check the chain regularly for lubrication, rust, breaks in the pins/plates and wear.
- Lubricate the chain every 100 hours (see 'Maintenance schedule' section).

5.9 Battery charger maintenance

The crane is equipped with an AQ-TRON 24V/25A high frequency charger for flooded cell batteries (WET version).

The battery charger continuously monitors the battery voltage and determines whether the battery needs to be recharged. If the voltage is low, the battery charger will top up the battery. When the battery has reached the correct voltage again, the battery charger will automatically stop charging.

The battery charger is capable of charging lead-acid batteries within 12 hours. The exact charging time depends on the crane to which the battery charger is connected. Environmental factors also play a role.

The battery charger is waterproof (IP67) and can therefore be used without problems indoors and outdoors (even in the rain). Cleaning the battery charger with a pressure washer is prohibited.

A temperature sensor takes the ambient temperature into account during charging. The ambient temperature affects the battery's service life.

A charge indicator (LED) on the housing shows whether the charger is charging or has finished charging.



Figure 5.5 AQ-TRON battery charger

LED colours	Problem	Solution
Green / Red flash alternatingly	Battery is not connected	Check the wiring between the battery and the charger Check polarity (possibly reversed) Battery charge may be too low
Red flashing	Battery is 0-80% charged	
Yellow flashing	Battery is 80-100% charged	
Green flashing	Battery is 100% charged	
Red / Green / Red	Battery voltage is too high	If this problem occurs frequently, return the battery charger to the manufacturer for repair/inspection.
Red / Green / Red / Green	Ambient temperature too high or too low	Check whether the ambient temperature is too high and ensure good ventilation.
Green / Red	Battery charger is overheated	Send battery charger back to manufacturer for repair/inspection.
Red / Green	Voltage on output	Send battery charger back to manufacturer for repair/inspection.
Red / Green / Red / Green / Red	Mains voltage too high or too low.	Check the mains voltage (220 V ±15%, 50 Hz)

5.10 Removing and installing counterweight

Removing the counterweight is usually only done prior to transport of the crane. The crane is 250 kg lighter without the counterweight.

**WARNING**

Stow the removable support after mounting the counterweight. Otherwise, the support will contact the column during retraction.

**WARNING**

Never stand within the slewing range of the counterweight. During extension, never stand within sliding range of the counterweight (risk of crushing).

**WARNING**

Be careful not to damage the crane while removing the counterweight.

Preparation

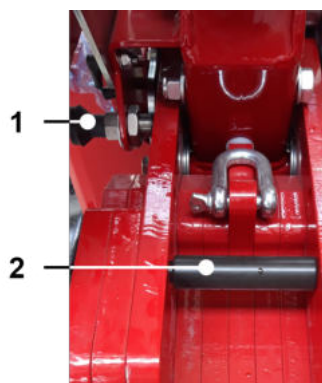
- Make sure there is nothing within a radius of approximately 2 m.
- Make sure the crawler tracks are retracted.
- Make sure the boom is horizontal.
- Make sure the counterweight is placed in a safe spot, not on walking or driving paths and not within the operating radius of the crane or the working area of other machines or employees.

Required tools

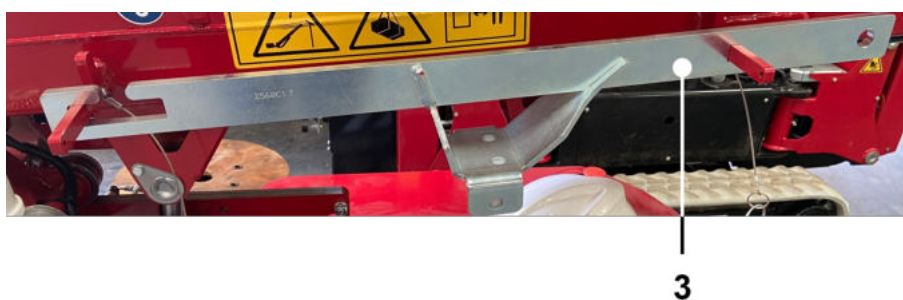
19 mm combination spanner

Execution

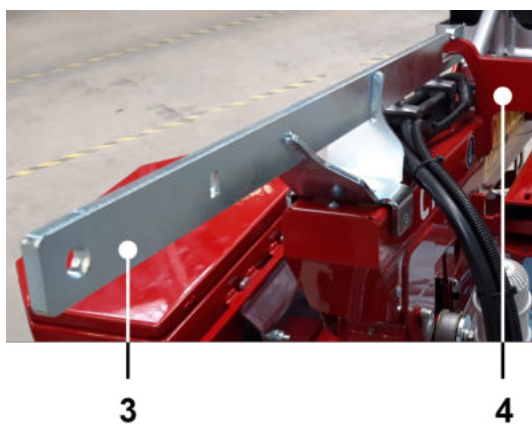
1. Remove the adjustable section and winch head from the counterweight.
2. Release the counterweight by twisting or pulling out the grip of the locking pin (1).
3. Use the black handle (2) to pull the counterweight back as far as it can go.



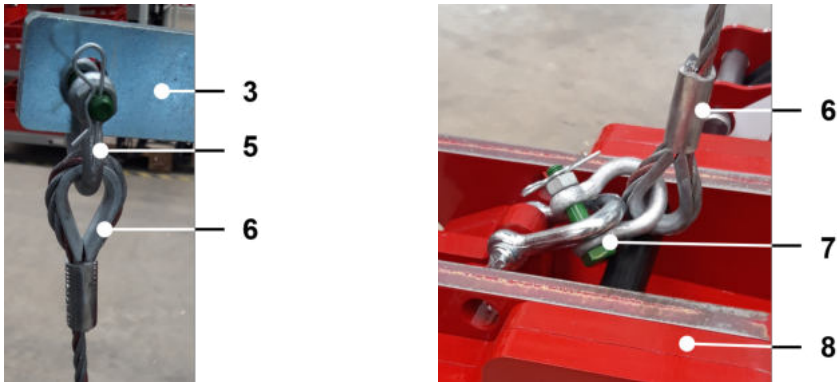
4. Set the boom horizontal.
5. Remove the long manual jib extension from the boom, and take the removal hook (3) off the bracket.



6. Slide the removal hook (3) through the opening of the lifting point (4) on the boom.



7. Attach the counterweight removal cable (6) to the back end of the removal hook (3) with a bow shackle (5).
8. Raise the boom to lower the removal hook and attached cable.
9. Attach the other end of the cable (6) to the counterweight (8) with a bow shackle (7).



10. Lower the boom just enough to put tension on the cable.

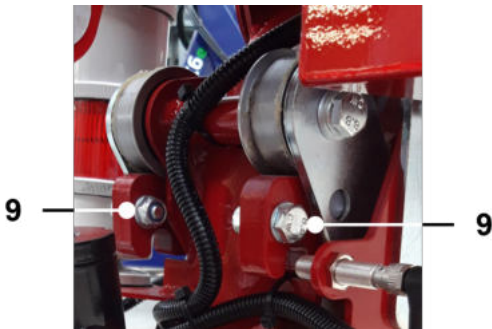


DANGER

It is forbidden to disconnect the counterweight before the cable on which it hangs has slight tension on it.

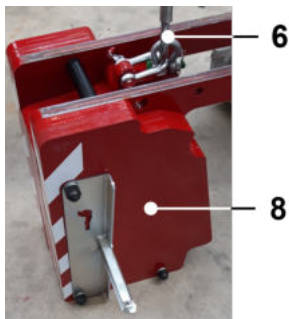
11. Remove the bolts (9).

12. Turn the locking pin (1) and pull out the pin.



13. Raise and lower the boom a little, and pull the counterweight back as far as it will go. The counterweight is now hanging freely.

14. Raise the boom to lower the counterweight and place it on the ground.



15. Disconnect the cable, and store the cable with bow shackles and the tool, in the crane's toolbox for example.

16. The crane can now be put in transport mode and driven away from the counterweight.

Inspection

17. Check whether the counterweight has disappeared from the display on the remote control.
18. Check whether the counterweight is in a safe position, move the counterweight if necessary and/or cordon off the area around the counterweight to prevent accidents.

Assembly

19. Install the counterweight by performing the steps in reverse order.

6.

TROUBLESHOOTING

6.1 Warnings pertaining to malfunctions

Correct operation and careful maintenance will extend the life of the crane and ensure many years of trouble-free operation.

The following warnings must be observed for all work performed in connection with a malfunction.

**DANGER**

Remove key from key switch when performing work on the electrical system and prevent unauthorised people from switching on the crane

**DANGER**

Never use your hand to locate a leak in the hydraulic system; use a piece of paper or cardboard instead. Oil under high pressure can penetrate the skin and cause poisoning.

**WARNING**

Hydraulic oil can be hot; wear gloves and safety glasses when troubleshooting the hydraulic system.

**WARNING**

Repair leaks in the hydraulic system immediately and top up the oil reservoir.

**WARNING**

Before disconnecting hydraulic lines and hoses, precautionary measures must be taken to ensure that the line/hose is no longer under pressure once the supply of energy to the system has been switched off. This can be achieved by moving the control levers back and forth.

**WARNING**

If you are unable to correct a malfunction, contact your dealer or Hoeflon International B.V.

6.2 Troubleshooting

A number of possible malfunctions are described hereafter. If a malfunction occurs that is not listed in this user manual, contact your dealer or Hoeflon International B.V.

Fault	Cause	Solution
The crane is not working properly; it jerks.	Too little oil in the hydraulic system	Check the hydraulic oil level.
	Hesitation when operating lever on remote control	
Vibrations in the crane	Oil temperature too low	Increase the oil temperature by raising and lowering the boom.
Telescopic section does not extend or retract fully or does not do so easily	Guides not sufficiently lubricated	Lubricate the guides
The crane does not slew well	Turntable not sufficiently lubricated	Lubricate the turntable
	Damaged or worn rotation mechanism	Overhaul rotation mechanism
A number of functions do not work	Problem in electrical system	Check sensors
		Check emergency stop button
		Reduce the load on the crane
Movements are slower than usual	Oil filter restricted	Clean oil filter
	Hydraulic pump defective	Replace hydraulic pump
Crunching sound during movements	Pivot points not sufficiently lubricated	Lubricate pivot points in accordance with the lubrication chart

7.

TRANSPORT, STORAGE AND DISPOSAL

7.1 Warnings for transport

**WARNING**

Only use suitable lifting accessories with the correct capacity for the lifting application. The lifting accessories must be accompanied by a certificate, have a periodic inspection, be visually inspected and have been found to be suitable for use.

**WARNING**

Drive the crane backwards onto a trailer (counterweight first) and forwards off a trailer.

**WARNING**

The clearance angle of the loading ramps must not exceed 15°.

**WARNING**

When transporting the crane, make sure the crane is in transport mode and unloaded: no load on the hook and the boom down.

7.1.1 Putting the crane in transport position

The crane must be placed in transport position before transport. To do this, follow these steps:

1. Secure attachments in the intended transport locations. Adjustable section and winch head to the left and right of the counterweight. The manual jib extension alongside or in the boom.
2. Make sure that in the transport position the winch is always wound up and the loop of the cable is attached to the appropriate hook.

The crane can also be driven if the boom is raised, but the boom angle may not exceed 55°. If raised further, it will no longer drive (due to the risk of tipping over backwards).



Figure 7.1 Crane in transport position

7.1.2 Securing crane for transport



WARNING

Overloaded lashing eyes can cause damage to the crane. Therefore always heed the following instructions.



WARNING

Folding a lashing strap double also doubles the applied tension.

Point	Load on attachment point
Lashing points	Max. 1000 kg per eye

- Towards the front and sides, lash down at least 0.5x the crane's weight; towards the rear lash down at least 1x the crane's weight.
 - It is recommended that the space between the headboard of the transport vehicle and the front of both tracks be filled, in connection with braking forces. Otherwise, use lashing provisions that can hold at least 1.5x the crane's weight at the rear.
 - Make sure the crawler tracks of the crane are resting directly on the deck of the transport vehicle, because ground protection plates or anything similar in between will reduce the sliding resistance of the crane relative to the transport vehicle.
1. Make sure the crane is in the transport position.
 2. There must not be any load on the crane.
 3. Use loading ramps of sufficient size and capacity. The loading ramps must be long enough so that the angle with the ground is less than 15°.
 4. Drive the crane forward, onto a suitable transport vehicle. When driving up the ramps the operator must be assisted by a person who provides instructions concerning the driving direction.
 5. Stop the motor.
 6. Set the main switch on the electrical cabinet to position (0).
 7. Secure the crane by attaching four lashing straps to the crane. Attach two lashing straps to the eye at the bottom of the inner mast and pull them towards the front (one to the left front and one to the right front). Attach the other two lashing straps to the lifting eye on top of the mast and pull them towards the rear (one to left rear and one to right rear).



Figure 7.2 Securing crane

7.1.3 Lifting crane for transport

1. Make sure the crane is in the transport position.
2. There must not be any load on the crane.
3. Lift the crane using lifting straps or chain slings with a capacity of at least 2000 kg. Fasten these to the lifting point on the boom.

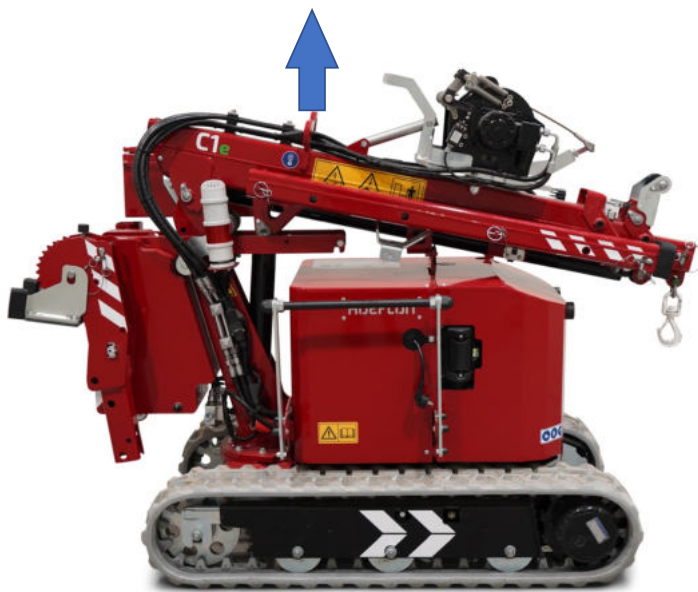


Figure 7.3 Lifting crane for transport

7.2 Storing the crane

Perform the following procedure before storing the crane for longer than three months:

- Remove any dirt and clean the crane with water and, for example, car wash shampoo. The track undercarriage can be cleaned with a pressure washer.
- Grease the crane in accordance with the lubrication chart.
- Touch up any damage to the paintwork.
- Grease parts that may rust easily, such as exposed sections of hydraulic piston rods.
- Place the crane in a dry location, protected from rain, heat and cold.
- Connect the plug of the EV charging station to the crane so it keeps the battery packs and the 24 V system in good condition.
- Do not press the crane's emergency stop button.
- Make sure the crane cannot be activated by unauthorised people.
- Cover the crane with tarpaulin; keep a section free from the ground to allow for ventilation.

Before using the crane again after more than three months of storage, carry out the daily inspection.

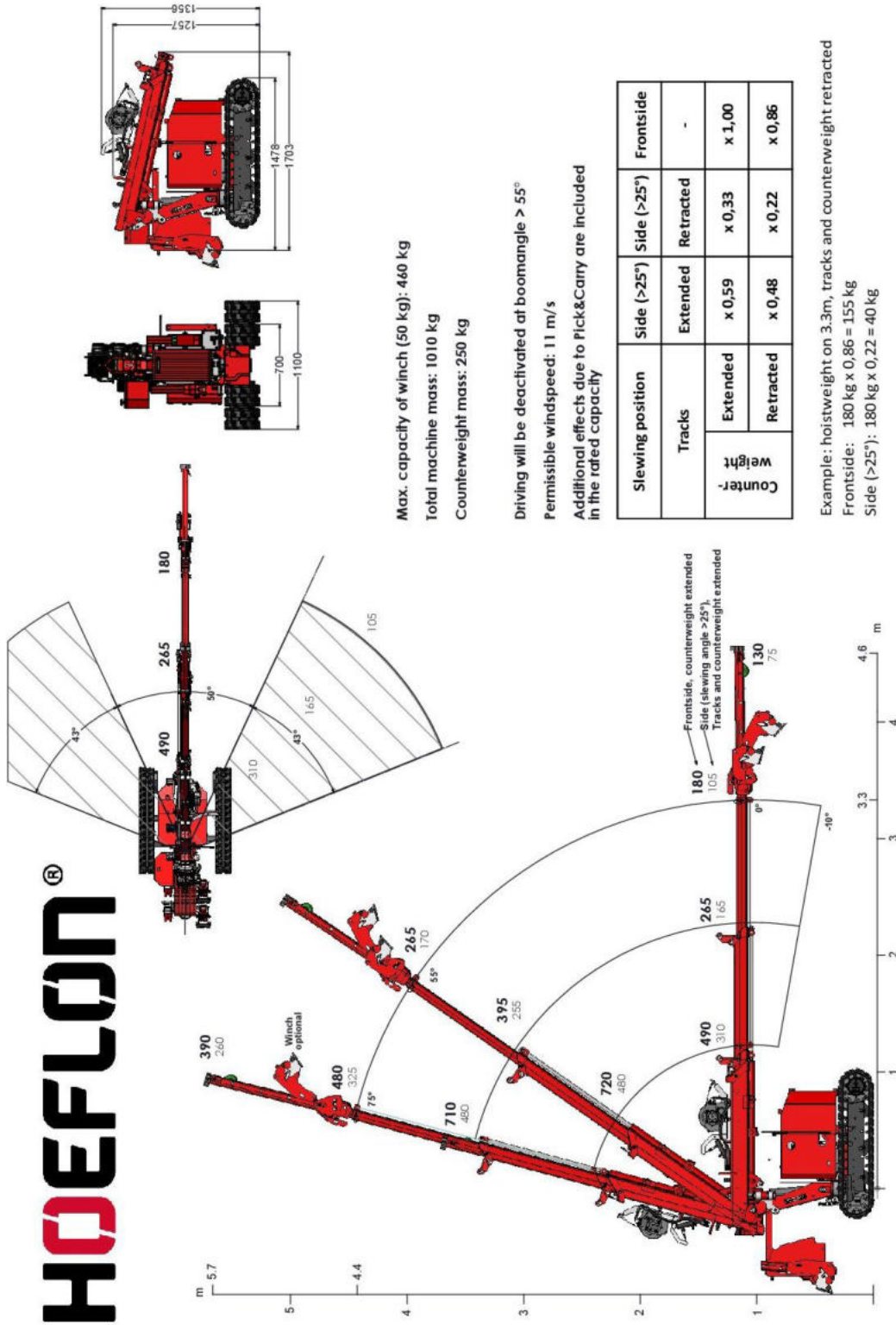
7.3 Waste disposal

Dispose of waste in accordance with the applicable local regulations. Incorrect disposal of waste can be harmful to the environment. Environmentally harmful waste includes: engine oil, diesel fuel, hydraulic oil, differential oil, coolant, filters, batteries and greases.

8.

ANNEXES

8.1 C1 load chart



C1 Load diagram v1.5_28-07-2021