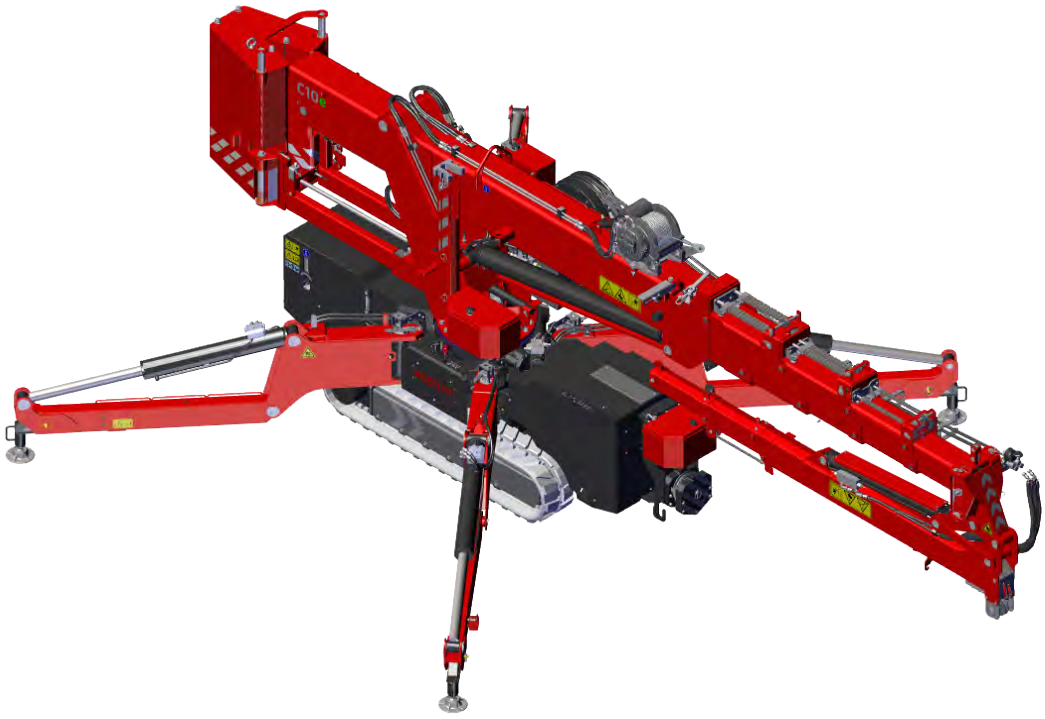
HOEFLON®

User Manual

C10e Compact Crane



Serial number:

Delivery date:

Reference: U.C10e.02.00.EN

Version: 1.0

Translation of the original manual

TABLE OF CONTENTS

VERSION HISTORY 6
INTELLECTUAL PROPERTY RIGHTS 6
PREFACE 7
General terms & conditions 7
Warranty and liability 8
Target audience 8
Notes for the reader 8
Structure of the user manual 9
1. INTRODUCTION 11
1.1 Intended use 11
1.2 EC Declaration 12
1.3 Technical data 12
1.3.1 Dimensions 12
1.3.2 Technical specifications 13
1.4 Type plate 15
2. DESCRIPTION AND OPERATION 17
2.1 Main components 17
2.1.1 Outriggers 20
2.2 Accessories 22
2.2.1 Fly jib 22
2.2.2 Adjustable section with manual jib extension 22
2.2.3 Winch 22
2.3 Storage compartments 23
2.4 Remote control 24
2.4.1 Remote control levers 25
2.4.2 Remote control buttons 27
2.4.3 Display on remote control 28
2.5 Electrical cabinet 29
2.6 Work lights 32
3. SAFETY 33
3.1 Introduction 33
3.2 Operating personnel 33
3.3 Personal protective equipment (PPE) 34
3.4 Warnings 35
3.4.1 Warnings for the work environment 35
3.4.2 Warnings for use 35
3.4.3 Warnings for maintenance 39
3.5 Emergency stop 39

3.6 Emergency operation 40
3.7 Stack lights 41
3.8 Load moment limiter (LML) 41
3.9 Pictograms 42
4. OPERATION 43
4.1 General precautions 43
4.1.1 Warnings 43
4.1.2 Assessing weather conditions 44
4.1.3 Inspecting lifting equipment 45
4.2 Daily inspection prior to use 46
4.3 Using the remote control 48
4.3.1 Changing and charging the remote control battery 48
4.3.2 Calibrating levers 50
4.4 Starting and switching off the crane 52
4.5 Moving the crane 53
4.5.1 Driving the crane 54
4.5.2 Crawler track width adjustment 55
4.6 Setting the outriggers 56
4.6.1 Display while setting the outriggers 57
4.6.2 Setting outriggers 58
4.7 Lifting 61
4.7.1 Display during lifting 61
4.7.2 Extending/retracting counterweight 63
4.7.3 Guiding the load 64
4.7.4 Lifting the load 65
4.8 Lifting with the winch 66
4.8.1 Adjustable section limits 68
4.8.2 Maximum angle of main boom and fly jib 69
4.8.3 Lifting without options 70
4.8.4 Lifting with fly jib 74
4.8.5 Lifting with adjustable section 76
4.8.6 Winch head positions in adjustable section – with main boom 77
4.8.7 Winch head positions in adjustable section – with fly jib 78
4.8.8 Attaching winch weight 79
4.8.9 Checking the winch stop 82
5. MAINTENANCE 83
5.1 Introduction 83
5.2 Warnings 83
5.3 Maintenance work 85
5.3.1 Weekly maintenance 85
5.3.2 Monthly maintenance 85

5.3.3 Scheduled service 85
5.3.4 First use 86
5.4 Maintenance schedule 87
5.5 Lubrication chart 88
5.6 Lubricating the turntable 89
5.7 Lubricate 90
5.7.1 Lubricants 90
5.8 Function mapping 91
5.9 Charging 80 V battery 93
5.9.1 Battery indicator 93
5.9.2 Battery charging 94
5.10 Using emergency charging points 95
5.11 Maintaining the boom chains 97
5.12 Removing and installing fly jib 98
5.13 Removing and installing counterweight 100
5.13.1 Removing counterweight 100
5.13.2 Installing counterweight 104
6. TROUBLESHOOTING 105
6.1 Warnings pertaining to malfunctions 105
6.2 Fault codes 106
7. TRANSPORT, STORAGE AND DISPOSAL 109
7.1 Transport 109
7.1.1 Lifting, securing and transport equipment 111
7.1.2 Putting the crane in transport position 112
7.1.3 Securing crane for transport 113
7.1.4 Lifting crane for transport 115
7.2 Storing the crane 116
7.3 Waste disposal 117
8. ANNEXES 119
8.1 C10e load chart 120
8.2 C10e Load chart without counterweight 121
8.3 Maximum outrigger pressure 122

VERSION HISTORY

Version	Date of issue	Remarks	From serial number
1.0	01-05-2023	First edition	2120 3126

Manufacturer

Hoeflon International B.V.
Zwolleweg 2
3771 NR Barneveld
The Netherlands

T: +31(0)342 400 288
I: www.hoeflon.com
E: info@hoeflon.com

For technical support:
T: +31(0)342 219 050
E: service@hoeflon.com

INTELLECTUAL PROPERTY RIGHTS

PREFACE

This user manual applies to the C10e 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 machine 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 machine 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 machine 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 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 crane 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.

Hoeflon 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 crane made by the user. Repairs you perform on the crane, 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 crane and will void the warranty.

No liability is accepted for damage or injury resulting from failure to use the crane 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 crane. Completion of the training at Hoeflon International B.V., concluded with a certificate, is mandatory.

It is of paramount importance that the user closely observes the instructions and regulations in this user manual to prevent injury to themselves and others and damage to the crane.

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 crane.

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

REMARK
Note or tip with additional information for the user.

Structure of the user manual

The user manual is structured as follows:

Preface describes the purpose of the manual, general terms and conditions, warranty and liability, target audience and notes for the reader.

Introduction includes an introduction to the crane.

Description and operation describes the main components of the crane and the operation of its various components.

Safety lists all the points the user needs to know to work safely with the crane.

Operation provides points of attention for commissioning and operating instructions for the intended use of the crane.

Maintenance provides information on the maintenance required, specifying the frequency.

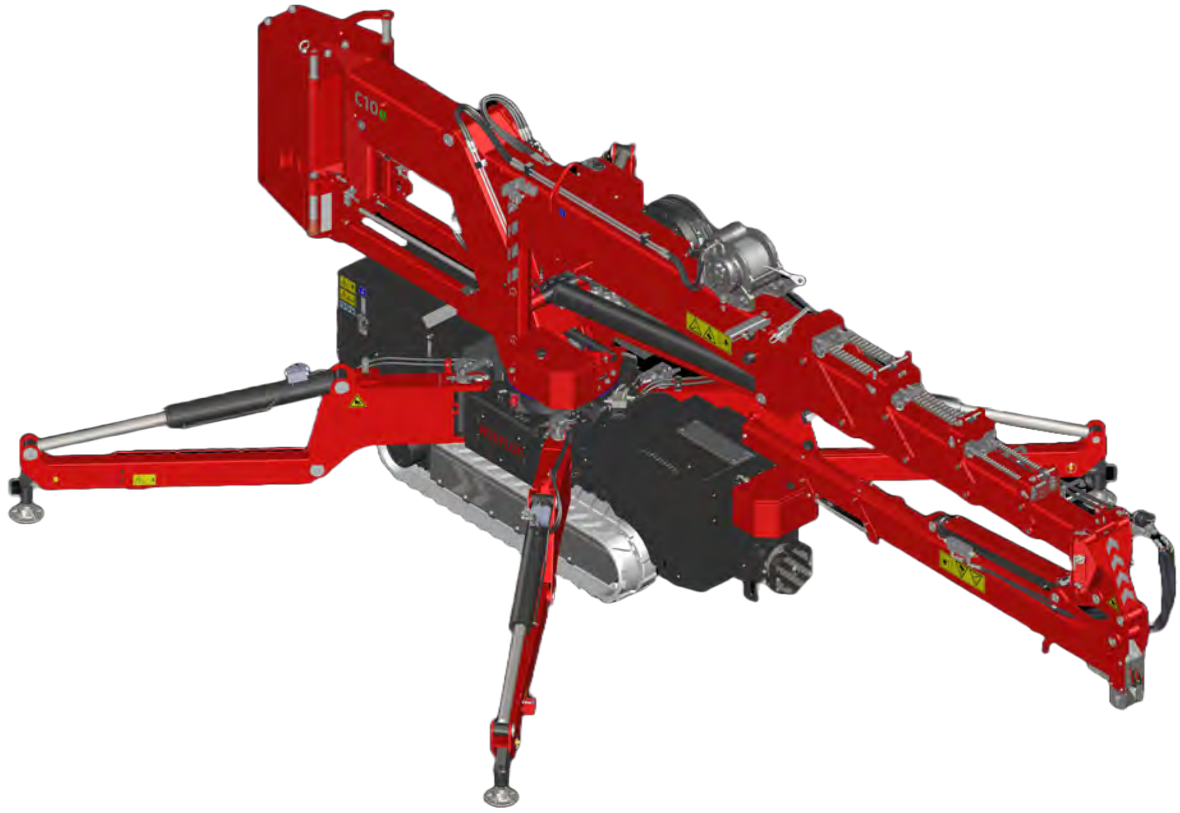
Troubleshooting lists possible faults and how to solve them.

Transport, storage and disposal provides points of attention for transporting the crane, temporary or permanent decommissioning and instructions for disposal of the crane.

1.

INTRODUCTION

1.1 Intended use



Figuur 1.1 C10e Compact Crane

The C10e Compact Crane is suitable for lifting loads such as heavy building materials and glass walls in a limited space. The crane is powered by a battery and controlled via a radio remote control. The electric drive makes the crane suitable for working in indoor areas.

The crane is designed so that charging and working can be done at the same time by connecting the crane to mains power at the workplace.

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. Also it is absolutely prohibited to exceed the maximum working load and bypass sensors.

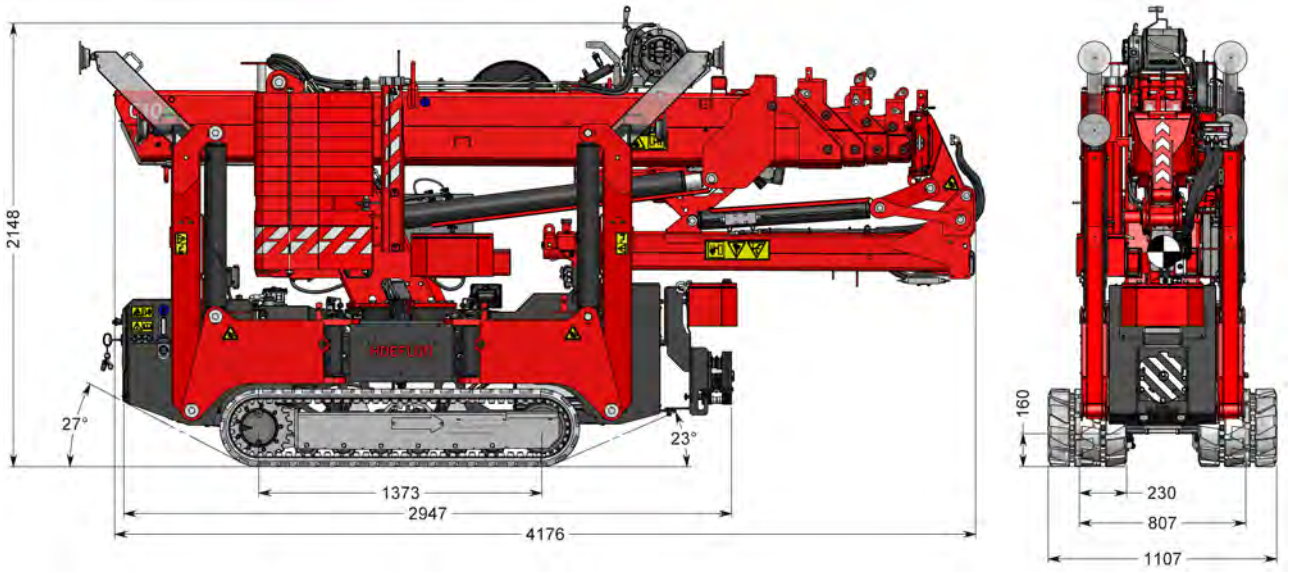
This manual has been prepared with the greatest possible care and made as complete as possible. Nevertheless, continuous safety vigilance in both familiar and unfamiliar situations is always necessary.

1.2 EC Declaration

Hoeflon International B.V. declares that the crane is in conformance with applicable European Directives. The EC Declaration of Conformity forms part of the crane logbook supplied with the crane.

1.3 Technical data

1.3.1 Dimensions



Figuur 1.2 Front and side views with centre of gravity indication

1.3.2 Technical specifications

BASIC DATA	
Machine brand	Hoeflon
Ambient temperature	-10 to 40 °C
Crane capacity	4000 kg
Max. working load and lifting point of crane	See load chart provided in the annexes
Maximum wind speed	10.8 m/s (6 Beaufort)
Hoisting height	16.3 m, and 22 m with options
Dimensions in transport position (l x w x h)	3.93 x 0.8 x 1.97 m
Dimensions including winch and fly jib	4.15 x 0.8 x 2.07 m
Boom outreach	13.7 m, and 19.8 m with options
Slewing range	360° (infinite rotation)
Total weight	4400 kg, or 4700 kg with options
Ballast weight	1320 kg

UNDERCARRIAGE	
Driving speed	1st gear: 1.1 km/h 2nd gear: 1.6 km/h
Tracks	Non marking
Crawler adjustment (hydraulic)	Retracted: 0.807 m, extended: 1.107 m wide
Pulling force (weight the crane can pull)	500 kg
Inclination angle, forwards and reverse	20°
Clearance angle	24°
Transport position ground pressure	0.76 kg/cm²
Ground clearance	160 mm

JACKS	
Outriggers	Folding legs
Maximum lean angle with outriggers extended	5°
Outrigger pressure per outrigger	5200 kg

ELECTRICAL SYSTEM	
Drive system voltage	80Vdc
Electric motor power	10.5 kW
Battery pack data	Voltage: 80 V Capacity: 163 Ah Type LiFePO4

ELECTRICAL SYSTEM	
System voltage (battery)	24 V (2x 12 V, 18 Ah)
Charging	Charging voltage: 230 Vac Maximum charging capacity: 2.3 kW Fully charging the battery pack takes 13.04 kWh. A fully charged battery pack is sufficient for approximately 8.5 hours of work (highly dependent on type of work)

OPERATION	
Remote control	434 MHz
Range	250 m
Display	3-inch TFT LCD
Battery	Exchangeable
Portability	Hip or shoulder strap
Control	Accurate proportional control

HYDRAULIC SYSTEM	
Volume of hydraulic tank	40 litres
Pump type	Gear pump
Maximum pump pressure	250 bar

1.4 Type plate

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

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

REMARK

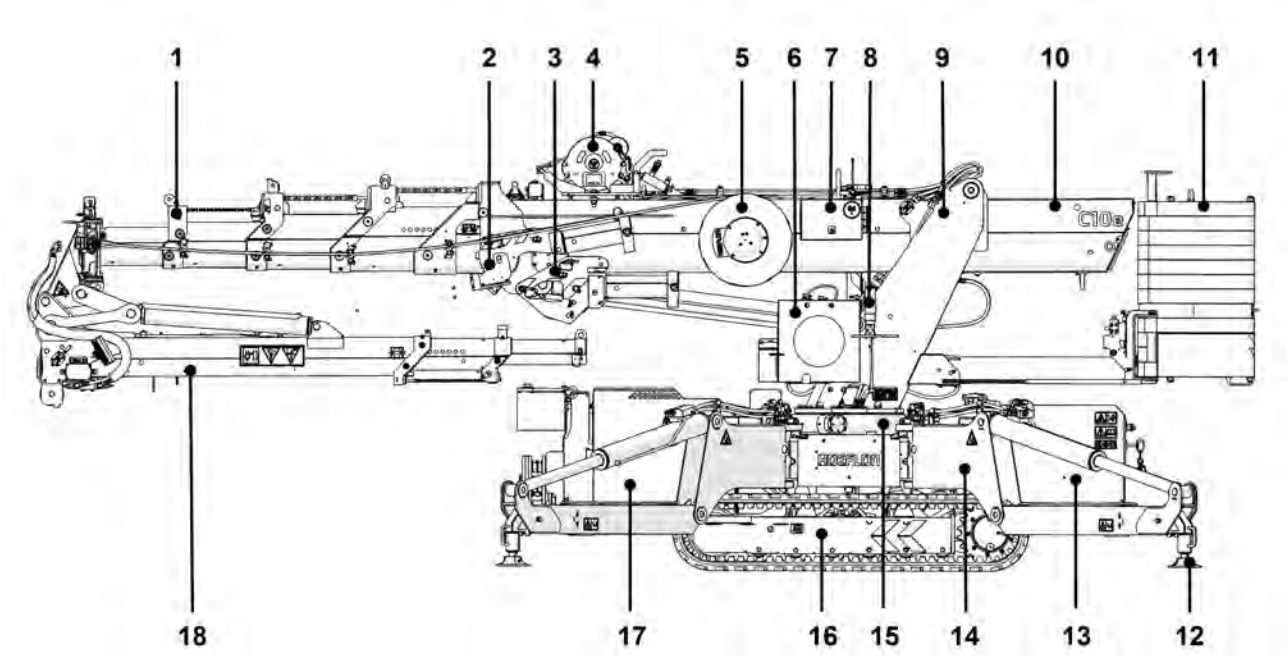
Please provide the type number and serial number when ordering parts.

2.

DESCRIPTION AND OPERATION

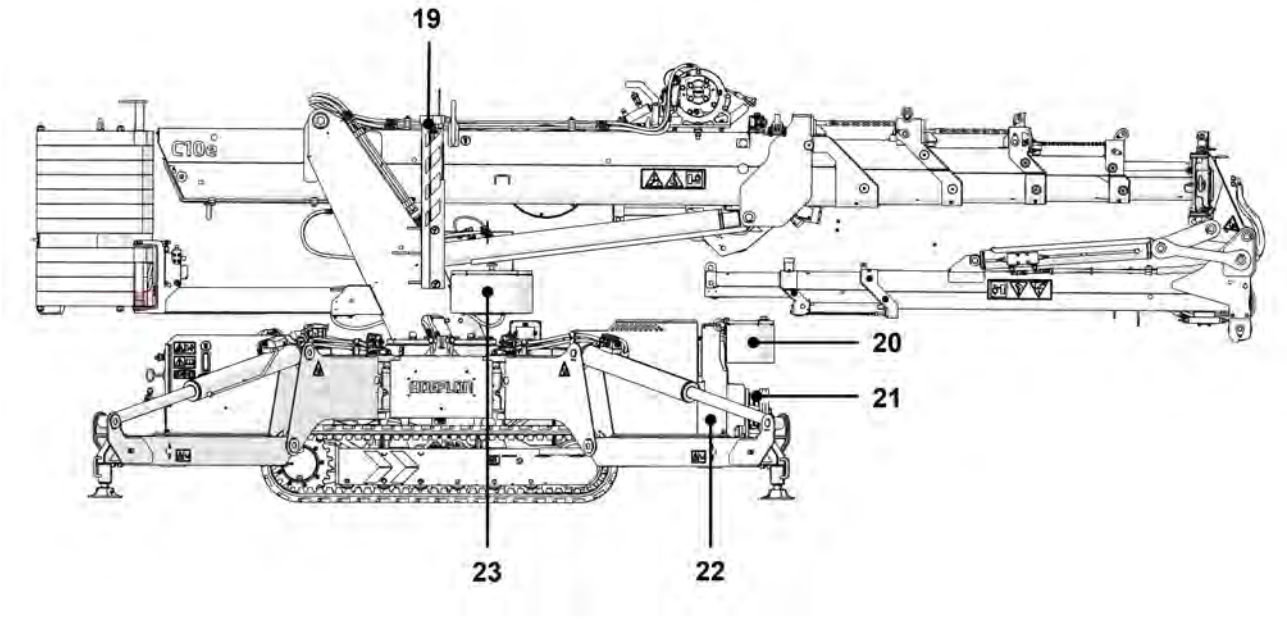
2.1 Main components

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



Figuur 2.1 Left side

1	Boom sections 1 to 5	10	Boom
2	Winch head	11	Counterweight
3	Adjustable section	12	Extendable outrigger
4	Winch	13	Electrical cabinet
5	Cable reel	14	Outrigger leg
6	Outrigger pads	15	Turntable
7	Lifting point	16	Track undercarriage
8	Stack light	17	Battery pack
9	Crane column	18	Fly jib



Figuur 2.2 Right side

19	Manual jib extension	22	Counterweight support
20	Storage space	23	Storage space
21	Winch weight		

Boom

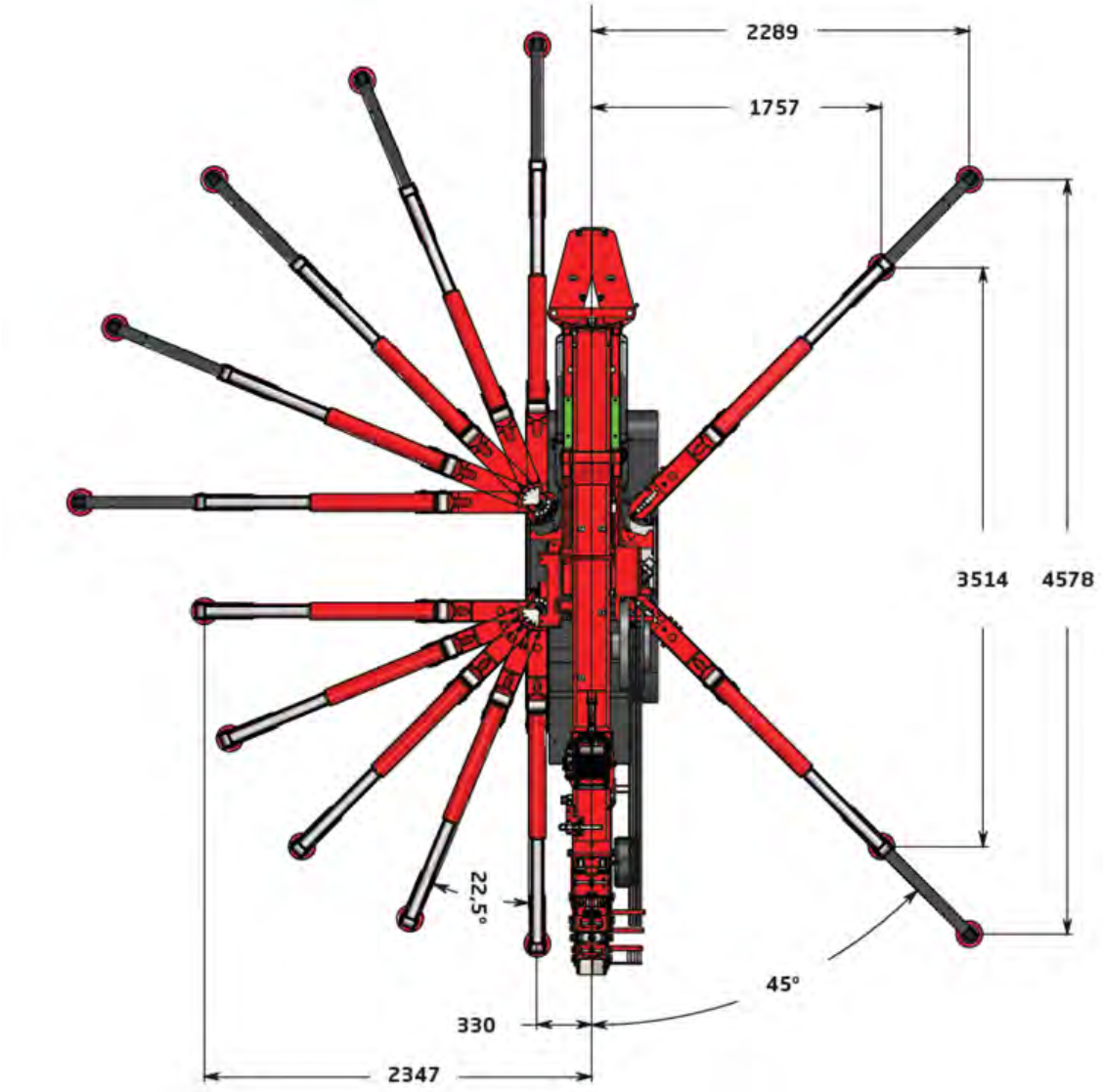
The boom consists of five hydraulically extendable sections. A fly jib is available for the crane (optional).

Counterweight

The counterweight is used to keep the crane in balance during lifting. The counterweight is hydraulically extendable. As it extends, it moves farther from the pivot point of the crane, resulting in greater opposing moment to counterbalance the load. This maintains better balance of the crane during lifting.

2.1.1 Outriggers

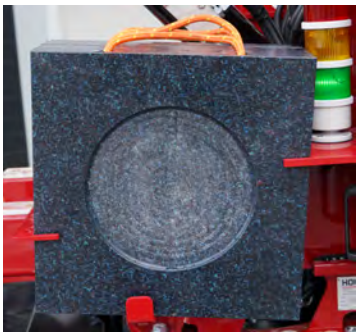
You can manually extend and retract the outriggers and swing them to five positions.



Figuur 2.3 Manually swingable outriggers

Figuur 2.4 Manually extendable outriggers

You can manually adjust the length of the outriggers by extending part of the outrigger.



Figuur 2.5 Outrigger pads

The crane has four outrigger pads as standard (400 mm x 400 mm).

2.2 Accessories

2.2.1 Fly jib

The fly jib is intended to give the crane more functionality. The fly jib consists of three parts in total, two of which are hydraulically extendable. The fly jib extends the maximum lifting range to a total of 21 metres. The fly jib can lift at angles of up to 15° in the negative direction. The crane can be used with and without the fly jib.

The fly jib can be rotated next to the main boom and secured there or can be detached completely.

Specifications	
Weight	200 kg
Maximum capacity	1200 kg

2.2.2 Adjustable section with manual jib extension

The adjustable section with manual jib extension is intended as a strong jib on the main boom or as an extension of the fly jib. Thanks to the rubber on the head of the manual jib extension, it is suitable for glass placement.

There is room on the side of the main boom to hang the adjustable section. On the crane column there is room to store the manual jib extension.

Specifications	
Weight	26 kg
Maximum capacity	4000 kg

2.2.3 Winch

The winch on the main boom makes it possible to lift loads without moving the boom.

The winch head is used to lift loads with the winch (usually in combination with the winch weight and hook). It is possible to reeve the winch cable up to 4 times, increasing the lifting capacity proportionally.

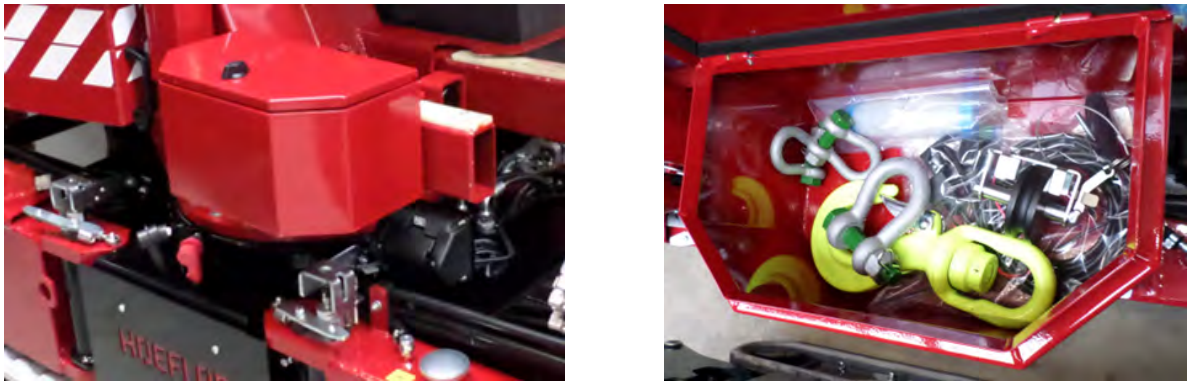
The winch weight hangs at the front of the crane. There is room on the side of the main boom to hang the winch head.

Specifications	
Weight of winch weight with hook	37.5 kg
Weight of winch head	16 kg
Maximum winch load option 1 (standard)	1000 kg with 40 m cable
Maximum winch load option 2	800 kg with 80 m cable
Maximum load with reeving option 1	1 x reeving: 2000 kg 2 x reeving: 4000 kg
Maximum load with reeving option 2	1 x reeving: 1600 kg 2 x reeving: 3200 kg

2.3 Storage compartments

Figuur 2.6 Front storage compartment

Contents of front storage compartment: safety helmet and safety vest



Figuur 2.7 Side storage compartment

Contents of side storage compartment:

- Lifting hook
- 2 x bow shackle 2000 kg with locking pin
- 1 x bow shackle 4750 kg with locking pin
- Paint set
- Emergency control cable
- Winch roller (for use with winch head)
- Tube adapter (for use with manual jib extension)

2.4 Remote control

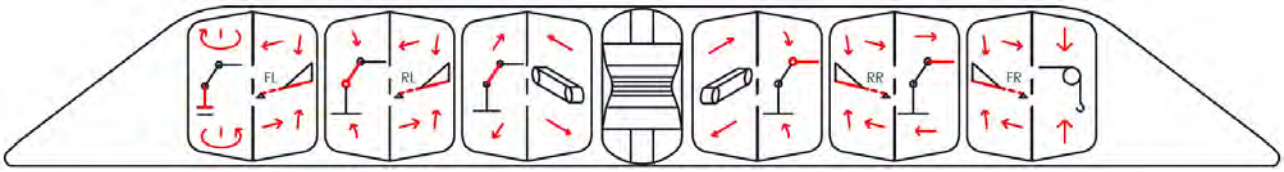
The crane is operated with the remote control. This section includes some instructions for use and explanation of the remote control levers and push buttons.

Instructions for use

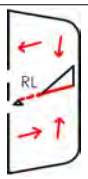
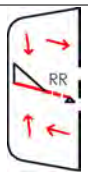
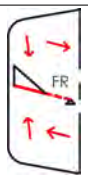
- The remote control is sealed against splashed water and rain.
- Never clean the remote control and receiver with high pressure and do not immerse them.
- Keep the remote control clean; make sure that pictograms, display and labels remain legible.
- Wear the remote control using the hip belt or neck belt.
- Always have a second battery in the 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.

Figuur 2.8 Remote control

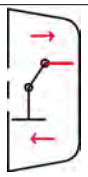
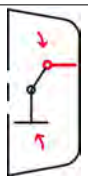
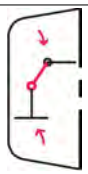
2.4.1 Remote control levers



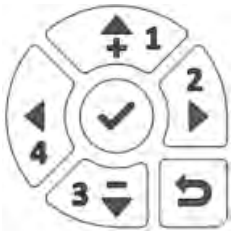
The standard functions of the levers with the main switch on the electrical cabinet in position **1** are as follows:

No.	Image	Function	Lever backwards	Lever forwards
1		Operate outrigger (LF – left front)	Up	Down
2		Operate outrigger (LR – left rear)	Up	Down
3		Operate crawler track (L – left)	Backwards	Forwards
4		Operate crawler track (R – right)	Backwards	Forwards
5		Operate outrigger (RR – right rear)	Up	Down
6		Operate outrigger (RF – right front)	Up	Down
7		Display		

The standard functions of the levers with the main switch on the electrical cabinet in position **2** are as follows:

No.	Image	Function	Lever backwards	Lever forwards
1		Slew main boom	Left	Right
2		Extend/retract main boom	Retract	Extend
3		Extend/retract fly jib	Retract	Extend
4		Raise and lower winch	Raise	Lower
5		Fly jib up and down	Up	Down
6		Boom up and down	Up	Down
7		Display		

2.4.2 Remote control buttons

Button	Function	Explanation
	**Emergency stop**	The crane receives a signal to stop all communication. Pressing it stops all crane functions.
	**On/off**	Switch remote control on and off.
	**Link remote control and crane / sound horn**	Pressing once: activate connection between remote control and crane. Pressing again after the connection is active: sound horn.
	**Temporarily increase LML**	See explanation below this table.
	**Switch between undercarriage and upper part**	LED on: superstructure (lifting) LED off: undercarriage (driving) 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**
	**Extend crawler tracks/counterweight**	Extend crawler tracks in undercarriage mode.
		Extend counterweight in upper part mode.
	**Retract crawler tracks/counterweight**	Retract crawler tracks in undercarriage mode.
		Retract counterweight in upper part mode.
	**Work light**	Switch work lights on and off.
	**Electric motor**	Switch electric motor on and off.
	**Driving speed**	Engage second driving speed.

If LED is lit, the function is active. Buttons that are not explained are not used on this crane.

110% button

You may only use this button if the crane is in an unsafe situation. By pressing this button, you can bring the crane back to a safe situation. As long as you hold the button, the load moment limiter (LML) is increased to 110%. Never use this button to increase the outreach of the crane or to continue winching.

2.4.3 Display on remote control

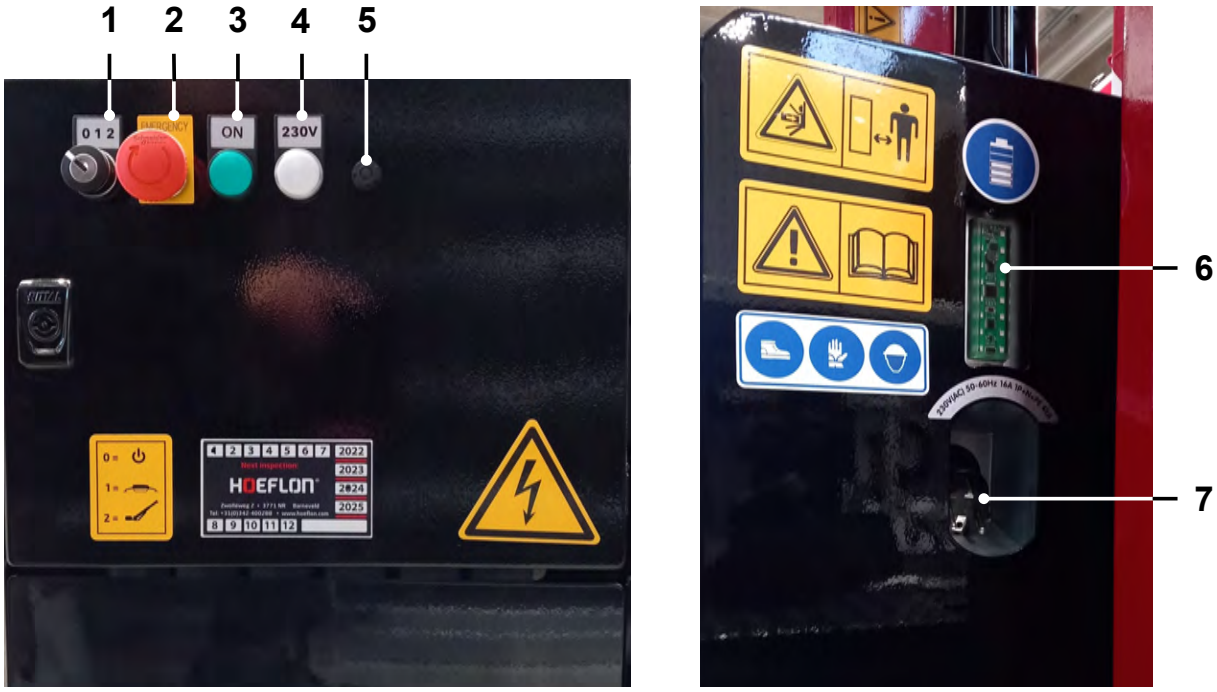
Figuur 2.9 Example of display on remote control

2.5 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. In *Figuur 2.10* the functions on the exterior are shown, with explanations below. In *Figuur 2.11* the functions inside the cabinet are shown, with explanations below.

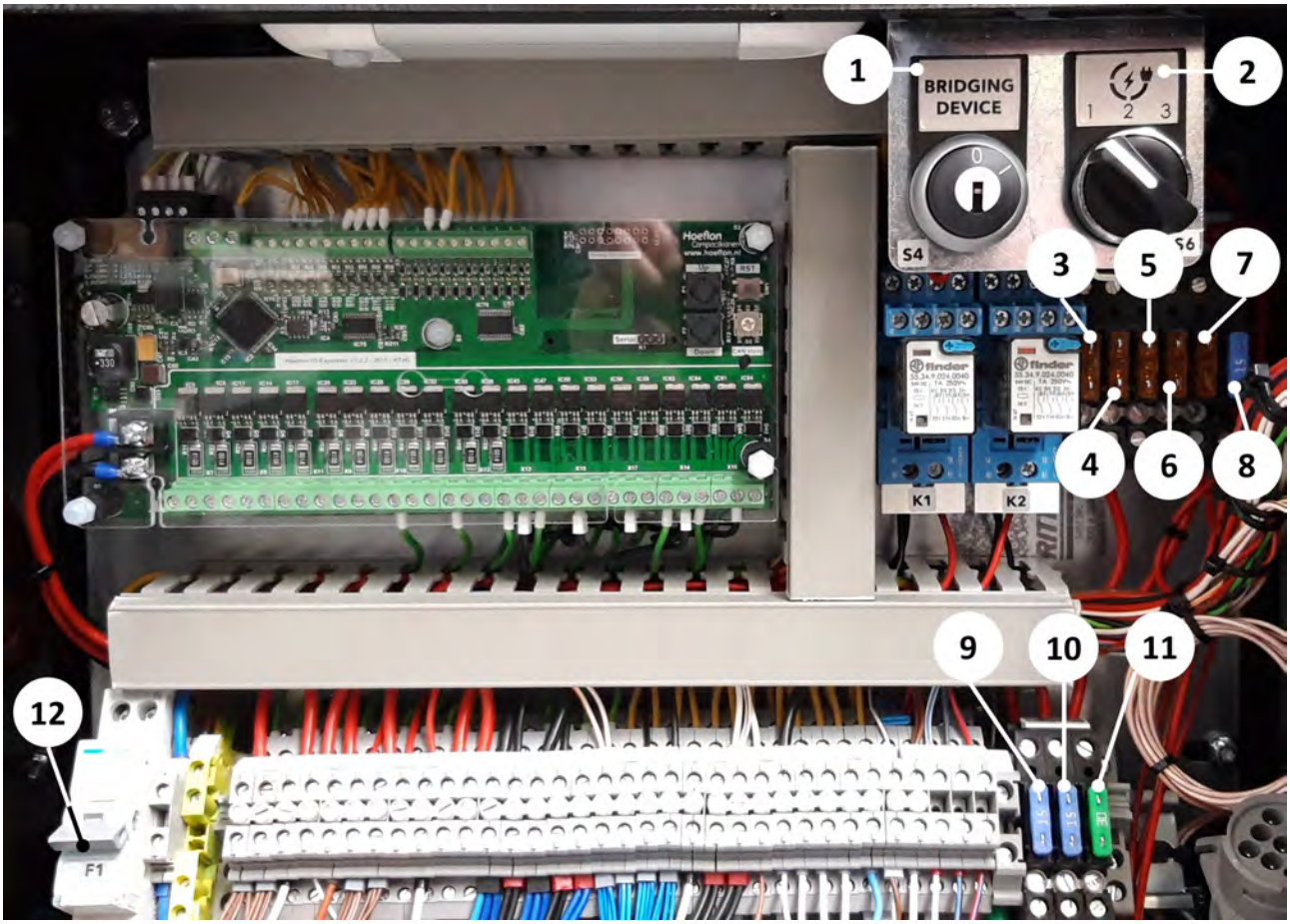


Figuur 2.10 Electrical cabinet exterior

	Button	Description	Function
1		**012** Main switch, implemented as key switch	0: Crane switched off 1: Undercarriage (driving crane or setting outriggers) 2: Upper part (lifting with crane)
2		**EMERGENCY STOP** Emergency stop button	Switches drive off
3		**ON** Power on indicator	Lit when the main switch is on
4		**230 V** Mains power indicator	Lit when the crane is connected to the mains

	Button	Description	Function
5		Connection for emergency control	If the remote control has no connection or the battery is dead, the emergency control can still be used to operate the crane.
6		Battery indicator	Battery state of charge and charging mode display
7		Plug for charging cable	

See section *3.8 Pictograms* for explanation of the stickers.



Figuur 2.11 Electrical cabinet interior

Code	No.	Description	Function
	1	Override switch	0: neutral 1: complete override of safety functions
	2	Maximum charging current switch	Switch for setting the maximum charging current to avoid overloading the 230 V circuit. The crane has the following charging rates: Position 1: charging at 550 W (2.5 A at 230 V) Position 2: charging at 1100 W (5 A at 230 V) Position 3: charging at 2300 W (10 A at 230 V)
F1	12	Circuit breaker 230 V 16 A	
F2	9	Blade-type fuse 15 A (blue)	Circuit board 1, controller, upper part
F3	10	Blade-type fuse 15 A (blue)	Circuit board 1, battery charger and sensors

Code	No.	Description	Function
F4	11	Blade-type fuse 30 A (green)	Constant power
F5	3	Blade-type fuse 5 A (red)	Gateway
F6	4	Blade-type fuse 5 A (red)	Battery pack 1
F7	5	Blade-type fuse 5 A (red)	Maximum charging current switch
F8	6	Blade-type fuse 5 A (red)	Cooling fan
F9	7	Blade-type fuse 5 A (red)	CAN power supply
F10	8	Blade-type fuse 15 A (blue)	Valve block

2.6 Work lights

Figuur 2.12 Two work lights on the crane

The two work lights on the crane are located on fly jib and boom and 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.

3.3 Personal protective equipment (PPE)

Use personal protective equipment appropriate to the situation.

WARNING

Ensure correct storage and keep the personal protective equipment clean!

Foot protection

Feet are at risk in two ways. Falling objects pose a hazard from above, and sharp protrusions such as nails can cause injuries from below. Therefore, while working, always wear type S3 safety shoes. Safety clogs are not suitable for operating mobile equipment. These can easily slip, resulting in the risk of a sprain injury or a foot getting caught between control pedals.
Preferably, use shoes that also provide ankle support (no loafers).

Hand protection

Hands must be protected from sharp parts, extreme temperatures, dirt and liquids. Gloves are therefore always required when attaching the load. Consult the customer about possible toxic or aggressive substances! Take appropriate measures for protection.

Head protection

Where there is a risk of falling objects, wearing a helmet is mandatory. This can be indicated by signs or agreements, for example. Within the range of the crane, everyone must wear a safety helmet. The operator is partly responsible for ensuring that third parties wear helmets within the range of the crane.

3.4 Warnings

Every employee must heed the following warnings and regulations.

3.4.1 Warnings for the 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.

3.4.2 Warnings for use

DANGER

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

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 with a damaged or weakened hook, cable or other lifting equipment.

DANGER

Avoid contact with rotating and moving parts.

DANGER

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

DANGER

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

DANGER

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

DANGER

Never transport the crane if the crane, outriggers 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

Make sure the ground is stable and has sufficient load bearing capacity, and use access mats or outrigger pads. Never place the crane on manholes or beside/in holes.

DANGER

Outriggers may only be used on a stable surface with sufficient bearing capacity.

DANGER

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

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

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

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

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

DANGER

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

DANGER

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

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 the 110% button to increase the crane’s outreach or to continue lifting.

DANGER

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

DANGER

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

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

Do not open or disassemble the battery/batteries or charger.

DANGER

Use an earthed mains socket for charging.

DANGER

Disconnect the battery when replacing electrical components.

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

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 drive the crane on public roads. The crane is not equipped with the markings and lights required to do so.

WARNING

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

WARNING

Make sure the outriggers are not extended too far, to prevent contact between the counterweight and outriggers during slewing.

WARNING

ATTENTION: During booming up, the maximum angle per attachment is limited. If this angle is

exceeded, the cable may scrape along the boom or fly jib, for example. Please refer to the user manual for information on limits.

WARNING

Avoid contact with the outriggers when setting or retracting the outriggers (crushing danger).

WARNING

Never transport a loaded crane.

WARNING

After outdoor use, do not leave the crane erected and unattended.

WARNING

Mind the height restriction in covered areas.

WARNING

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

WARNING

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

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

The lifting point on top of the fly jib is only intended for lifting the detached fly jib. It is forbidden to use this lifting point for lifting a load or for securing the crane.

WARNING

Take extra caution and safety measures in situations where the ground, surroundings or load strongly influences or restricts the use of the crane. If in doubt about the safe applicability of the crane, seek advice from your dealer.

WARNING

Maintain a close watch on the active outrigger during extension to prevent foot entrapment.

WARNING

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

WARNING

Make sure the crane and track undercarriage are parallel to one another before collapsing the crane.

WARNING

Use a suitable connection to the mains supply. An unsuitable mains connection may trip the

overcurrent protection.

WARNING

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

REMARK

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

REMARK

When driving the crane on soft or sloping ground, keep the outriggers 10 cm above the ground to mitigate the risk of tipping over.

REMARK

If the outriggers are parallel to . the crane on the counterweight side, booming up will stop automatically at 60°.

REMARK

*Charge the battery/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

It is not possible to fold in the fly jib when the boom is raised above 45°.

3.4.3 Warnings for 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 your dealer immediately.

3.5 Emergency stop

There is an emergency stop button on the back of the crane and on the remote control. These emergency stop buttons have the same function: when pressed, all crane functions are stopped.

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.

REMARK

*After operating the emergency stop button, the crane must be reactivated. To do so, set the main switch on the electrical cabinet to position **0** and then to position **1**.*

3.6 Emergency operation

DANGER

Take extra care when using the emergency control because the remote control's display is not functional.

WARNING

Only use the emergency control if the remote control cannot make radio contact, the display screen is defective or there is no replacement battery available.

WARNING

When the emergency control cable is connected, the display screen no longer works!

Use the emergency control as follows:

1. Plug one end of the emergency control cable into the socket on the bottom of the remote control.
2. Plug the other end of the cable into the socket on the electrical cabinet of the crane.
3. Operate the remote control in the usual way.

Step 1

Step 2

3.7 Stack lights

A stack light is fitted on the crane. The meaning of the colours is shown below. When bypassed by means of the key switch, the stack light produces an audible signal to alert everyone in the vicinity.

Light	Sound	Explanation	
		Crane controls active	
		Driving	
		90% to 100% load	
		100% load	
		Override 100% to 110%	
		Override without protection	

Figuur 3.1 Stack lights

3.8 Load moment limiter (LML)

The following describes how the crane is protected against overload by the LML (Load Moment Limiter).

When the crane is raised on the outriggers and the main switch is set back to position **2**, the crane knows exactly how it is standing on the outriggers. Based on this, the crane knows what it can lift where.

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. Winding out lifting cable, lowering and retracting fly jib are allowed.

The following functions can be blocked by the LML: Extending boom and fly jib, winding in lifting cable, raising boom and fly jib, slewing the superstructure, retracting the counterweight.

3.9 Pictograms

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

Pictogram	Meaning	Location
	- Foot protection mandatory - Hand protection mandatory - Head protection mandatory	On both sides of the electrical cabinet
	Lifting point for lifting crane and fly jib	On the boom and fly jib
	Charge indicator for 80 V battery	On the electrical cabinet
	From left to right: - Stay away from high-voltage cables - Warning for suspended loads - Keep sufficient distance	On the main mast and on jib section 1
	Risk of entrapment when operating the counterweight and maintain sufficient distance	On both sides of the electrical cabinet
	Read the manual before operating the crane	On both sides of the electrical cabinet
	Label that shows when annual inspection is due (Netherlands only)	On the door of the electrical cabinet
	Position of the main switch: 0 = Crane switched off 1 = Undercarriage (driving crane or setting outriggers) 2 = Superstructure (lifting with crane)	On the door of the electrical cabinet
	Risk of entrapment when setting the outriggers	On the outriggers
	Warning of entrapment hazard for hands	On the crane at pivot points and on the outriggers at the cylinders
	Warning for electrical voltage	On the door of the electrical cabinet
	Warning for non-ionising radiation	Near receiver on upper part 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.

DANGER

Make sure the ground is stable and has sufficient load bearing capacity, and use access mats or outrigger pads. Never place the crane on manholes or beside/in holes.

DANGER

Outriggers may only be used on a stable surface with sufficient bearing capacity.

DANGER

Never use the 110% button to increase the crane’s outreach or to continue lifting.

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 socket so that the battery is charged and equalised. This keeps the battery in good condition.

WARNING

Do not use the crane until precautions have been considered and taken to safeguard the user, crane, load, surroundings and ground.

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

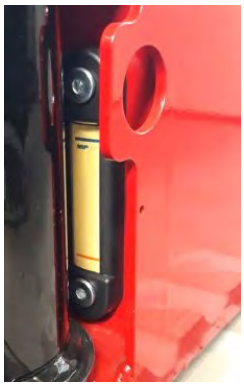
DANGER

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

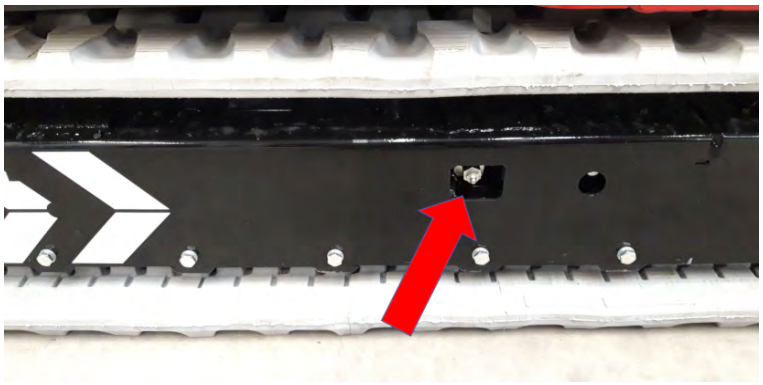
For your own safety and to obtain the maximum service life from your equipment, it is of great importance that you always inspect the condition of the crane before use. Resolve any problems you find, or have your dealer do so, before you use the crane again.

Perform the daily inspection as follows:

1. Before performing the daily inspection, first make sure 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 *Figuur 4.1*) with the crane collapsed. If necessary, top up the tank 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 outrigger, fly jib and lifting equipment.
7. Visually inspect the tension and condition of the crawler tracks. If defects are found, contact your dealer.
8. Tension the crawler tracks by fitting the grease gun to the grease nipple in the middle of the track beams and pumping to 60 bar (see *Figuur 4.2*). The crane should preferably be positioned so the crawler tracks do not touch the ground. The crawler tracks must not be too tight.
9. Check if the lights on the sensors for the boom and fly jib pulse on/off when the extend function is operated. This is how the boom length is measured.
10. Check that the crane control levers return to the centre position automatically and that the manual outrigger controls are automatically locked.
11. Make sure that all loose parts are correctly stored and/or secured.
12. Check for correct operation of the emergency stop button; never lift if the emergency stop button is not functioning properly. If defective, always have it repaired immediately.
13. Check all rotating and moving parts for wear and damage.
14. Check the chains for wear and damage.
15. Check for wear of the lifting cable, hook and other lifting accessories.



Figuur 4.1 Checking oil level



Figuur 4.2 Tensioning crawler tracks

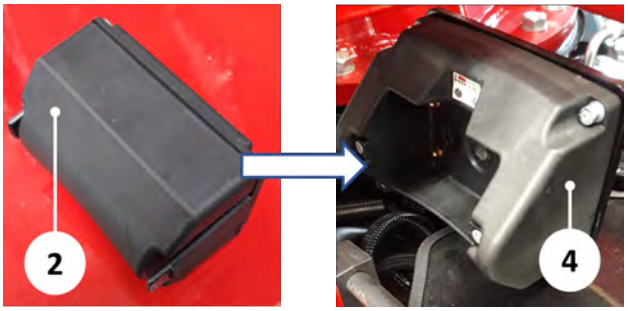
4.3 Using the remote control

4.3.1 Changing and charging the remote control battery

To change the battery of the remote control:

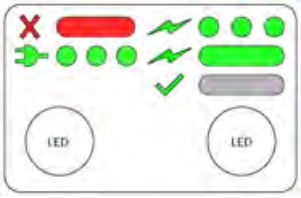
1. Push in the two buttons (1) on the remote control next to the battery (2).
2. Remove the discharged battery (2) from the remote control.

3. Take the charged battery (3) from the battery charger (4) and place it in the remote control.



4. Place the discharged battery (2) in the battery charger (4). The battery is only charged when the main switch on the electrical cabinet is in position **1** or **2**.
5. Switch on the remote control. and establish contact with the crane again.

There is a display on the battery charger (4) with information about the battery charger and the battery. 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	12V 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

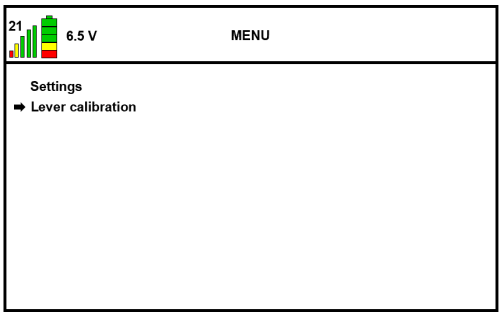
4.3.2 Calibrating levers

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 **Connect remote control and crane** button is not flashing.

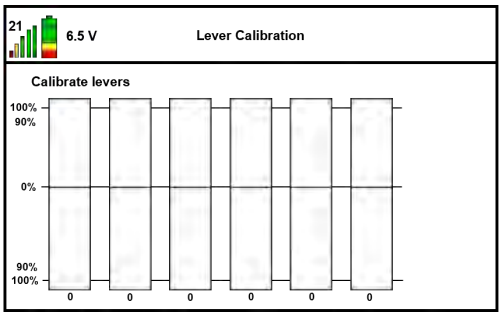
Start the calibration as follows:

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

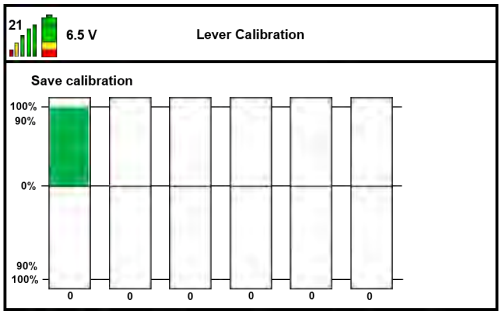
2. Press the **Down arrow** button to move the arrow in the display until it points to *Lever calibration*.



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



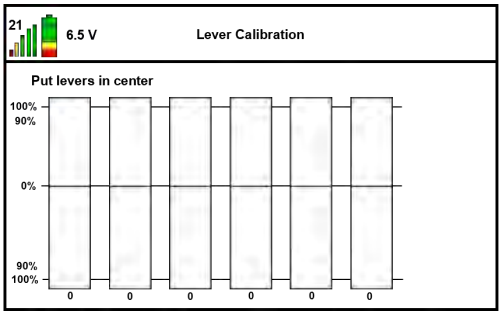
When you operate a lever the bar turns green. In the maximum position the bar should be 100% green. If not, the levers must be calibrated.



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.

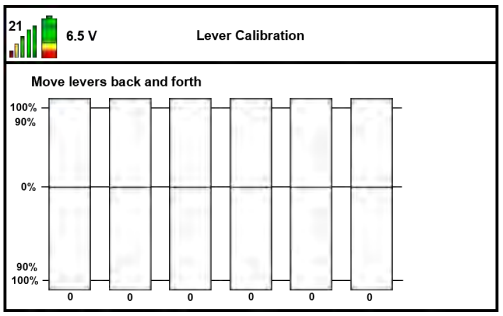
To calibrate the levers:

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

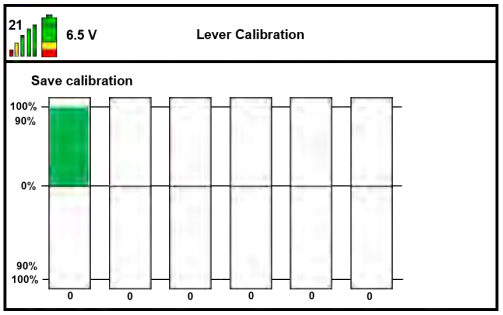


2. Set all levers to the centre position and press the **Confirm**button.

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.

4.4 Starting and switching off the crane

For an explanation of the remote control, see section *2.4 Remote control*.

Starting the crane

DANGER

Use an earthed mains socket for charging.

Start the crane as follows:

1. Check that all emergency stop buttons are pulled out.
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** or **2**.
4. Switch the remote control on with the **On/off** button.

5. Activate the remote control with the **Link remote control and crane** button.

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. Switch off the remote control.

2. Set the main switch on the electrical cabinet to position **0**.
3. If necessary, connect the crane to the mains.

Moving the crane

Move the crane at the job site with the fly jib stowed under the boom or hung beside the boom when the fly jib is not in use. For more information, see section *7.1.2 Putting the crane in transport position*.

4.5 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 fly 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.

REMARK

When driving the crane on soft or sloping ground, keep the outriggers 10 cm above the ground to mitigate the risk of tipping over.

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°

4.5.1 Driving the crane

WARNING

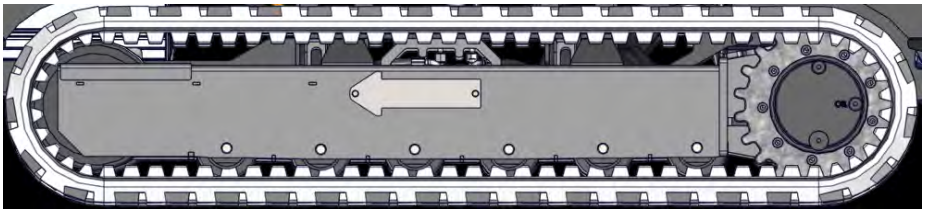
Only drive the crane when it is in the transport position.

WARNING

It is forbidden to drive through water more than 20 cm deep.

REMARK

When driving on a slope (e.g. up loading ramps onto a transport vehicle), ensure that the outriggers are extended on the lowest side to prevent the crane from tilting backwards. The same applies when driving the crane downhill.



Figuur 4.3 Forward direction of travel is indicated by white arrows

Inspection

DANGER

Use an earthed mains socket for charging.

WARNING

Make sure the charging cable is not too short if it is left in the 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 that 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 with 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.

4.5.2 Crawler track width adjustment

WARNING

Make sure the crane is raised on the outriggers so the crawler tracks are able to move freely.

WARNING

Avoid contact with the outriggers when setting or retracting the outriggers (crushing danger).

Adjust the crawler track width as follows:

1. Raise the crane on the outriggers.
2. Press the **Extend tracks/counterweight** button on the remote control to extend the tracks. 
3. Press the **Retract tracks/counterweight** button on the remote control to retract the tracks. 
4. Use only the maximum and minimum settings when configuring the crawler track width.

4.6 Setting the outriggers

WARNING

Make sure the outriggers are not extended too far, to prevent contact between the counterweight and outriggers during slewing.

WARNING

Make sure the chassis is horizontal, with a maximum tilt of 5°, to prevent instability.

WARNING

Do not raise the crane higher on the outriggers than necessary; once the crawler tracks have been lifted off the ground it is high enough.

WARNING

Assess the ground condition and use outrigger pads to reduce the ground pressure.

WARNING

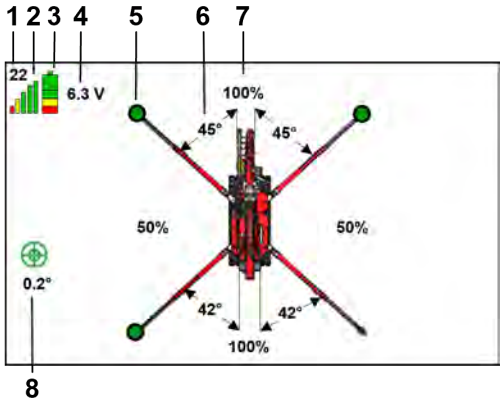
Make sure the outrigger foot sits in the recessed circle on the outrigger pad when setting the outriggers. This is particularly important when raising high on the outriggers, in connection with the folding legs.

WARNING

Check that the crane is collapsed.

4.6.1 Display while setting the outriggers

While setting the outriggers, the remote control display shows how much can be lifted and the position of the crane.



Figuur 4.4 Display while setting the outriggers

No.	Function	Explanation	Example
1	Channel	The channel on which the remote control communicates with the crane.	22
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. If the signal is too weak, you can select a different frequency by switching the remote control off and on.	Correct
3	State of charge of remote control battery	A fully charged battery is indicated by five blocks. When the battery is no longer fully charged, blocks disappear.	Full
4	Voltage	The battery voltage of the remote control.	6.3 V
5	Green mark	A green mark will appear at the end of the outrigger once the outrigger is placed correctly.	
6	Outrigger angle	The angle of the outrigger in relation to the crane is shown separately for each outrigger.	Front right: 45°, Left rear: 42°, Right rear: 42°
7	Lifting capacity	The permitted lifting capacity in per cent. This value is determined, in part, by the angles of the outriggers. The permitted lifting capacity is shown on each side of the crane.	Front and rear: 100% Right and left: 50%
8	Levelling	The green circles indicate how level the crane is. The number of degrees indicates how much the crane is tilted. Use the spirit level on the crane to determine which direction the crane is leaning.	0.2°

4.6.2 Setting outriggers

DANGER

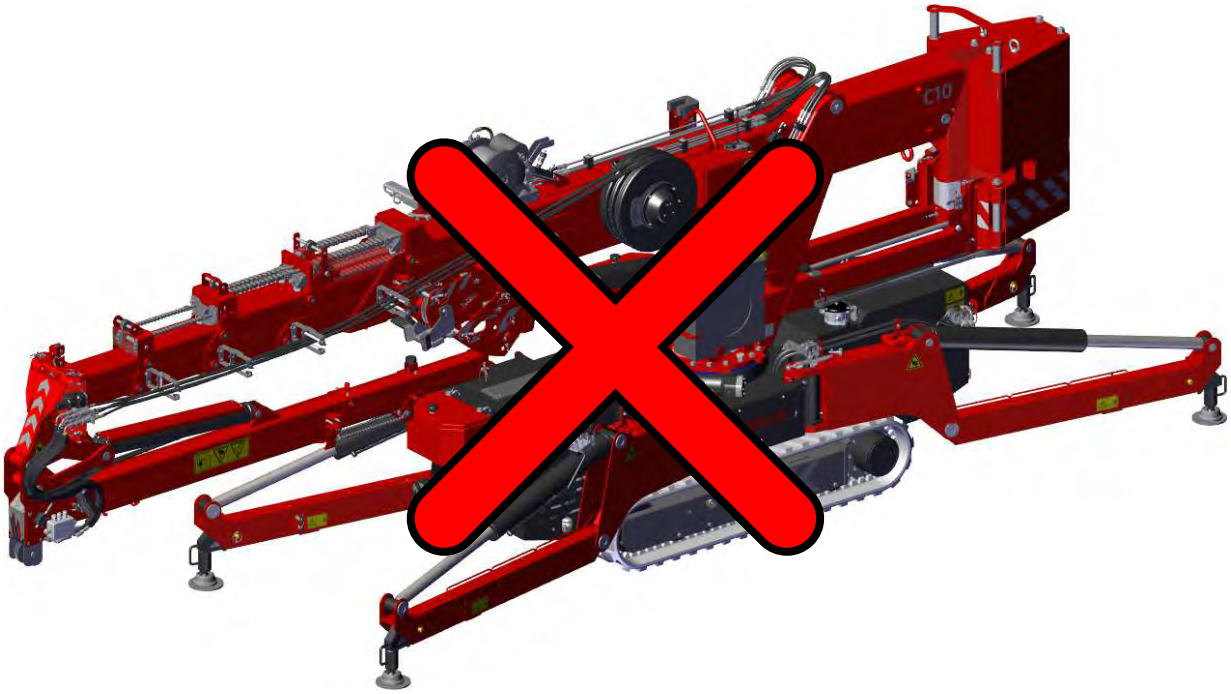
Outriggers may only be used on a stable surface with sufficient bearing capacity.

WARNING

Maintain a close watch on the active outrigger during extension to prevent foot entrapment.

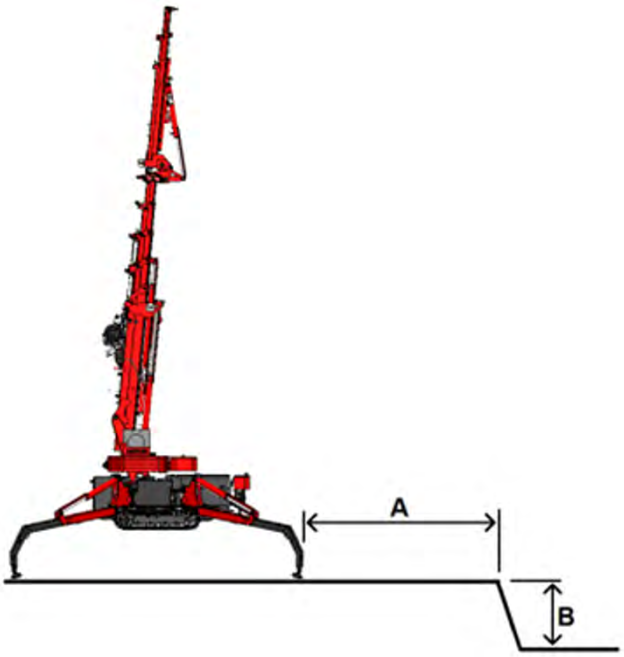
WARNING

Hydraulic extension is only possible if all the outriggers are raised off the ground. Otherwise, the extension system will be damaged.



Danger

Do not put all of the outriggers in line with the crane (< 5°). The crane will topple very easily.



Figuur 4.5 Position near a slope

Preparation

1. Ensure that the surface is stable, with sufficient bearing capacity.
2. When the crane is near a ditch or slope, make sure that the distance from the outrigger to the edge (A) is at least twice the depth of the ditch (B), (see *Figuur 4.5*).
3. Set the crane in the ideal position. Consider safety, obstacles in the operating radius, outreach of the load, capacity and the limits of the crane.
4. Make sure that people who need to be present in the crane's operating radius – to give instructions and guide the load, for example – can work there safely.
5. To operate the outriggers, the boom angle must be less than 40° and the counterweight must be retracted.

Execution

1. Set the main switch on the electrical cabinet to position **1**.
2. Switch on and activate the remote control.
3. Release the outriggers by operating the lever so that the outriggers can be rotated by hand.
4. Manually swing the outriggers to the desired position, preferably 45° for 100% outrigger range. Release the lever to lock the outriggers.
5. Check the outrigger angles on the display of the remote control.
6. Lower the outriggers with the levers of the remote control until they are horizontal.
7. Release and pull out the extendable section until you reach the end of the mark, i.e. the white stripe, and then lock it. Outriggers may only be used fully retracted or fully extended.
8. Lower the outriggers one by one until they hang just above the ground. Maintain a clear view of the

operated outrigger.

9. Place the outrigger pads under the outrigger feet so the outrigger foot falls in the recess of the outrigger pad. Also check the ground in the immediate vicinity for unevenness, loose material, slope and other issues that can affect the stability.
10. Fully lower the outriggers onto the outrigger pads.
11. Now operate the outriggers at the front simultaneously so the crane is just lifted off the ground. Do the same with the rear outriggers.
12. Check whether the crane is level and correct as necessary. The bubble in the level must be in the middle of the circle. The spirit level is on either side of the crane column.
13. Check whether all the outriggers are in contact with the ground after they have been set.
14. When the crane is supported properly by the outriggers, set the main switch on the electrical cabinet to position **2**. This saves the outrigger configuration.

Step 3

Step 7

Step 12

4.7 Lifting

DANGER

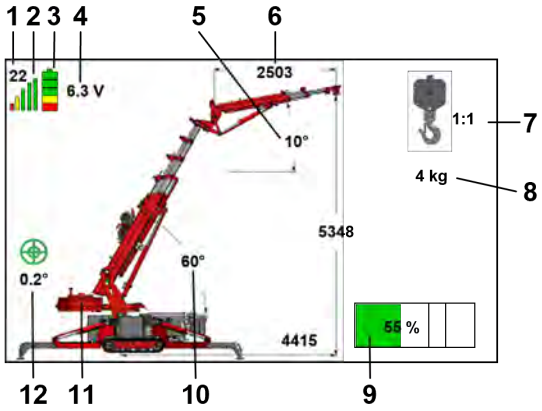
Only have a defective lifting cable replaced by a competent person.

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

During lifting, the remote control display shows how much can be lifted and the position of the crane.



Figuur 4.6 Display during lifting

No.	Function	Explanation	Example
1	Channel	The channel on which the remote control communicates with the crane.	22
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. If the signal is too weak, you can select a different frequency by switching the remote control off and on.	Correct
3	State of charge of remote control battery	A fully charged battery is indicated by five blocks. When the battery is no longer fully charged, blocks disappear.	Full
4	Voltage	The battery voltage of the remote control.	6.3 V
5	Position of fly jib	The angle of the fly jib in relation to the horizontal axis.	10°
	Position of boom	The angle of the boom in relation to the horizontal axis.	60°
	Outreach radius		4415 mm
	Hoisting height		5348 mm
	Length of fly jib		2503 mm
7	Reeving	Number of times the cable is reeved. 1:1 means the cable is reeved 1x.	1:1

No.	Function	Explanation	Example
8	Load weight	The weight hanging from the lifting hook.	4 kg
9	Load	Crane load in per cent of capacity.	55%
11	Counterweight position	The position of the counterweight shows whether the counterweight is retracted, extended or removed.	
12	Levelling	The green circles indicate how level the crane is. The number of degrees indicates how much the crane is tilted. Use the spirit level on the crane to determine which direction the crane is leaning.	0.2°

4.7.2 Extending/retracting counterweight

DANGER

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

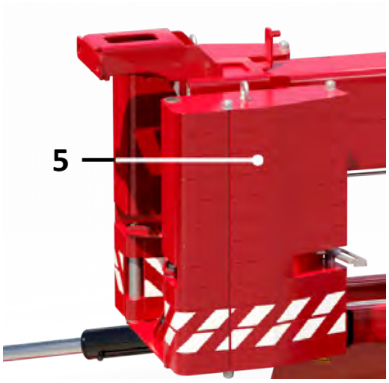
The counterweight can be retracted and extended when the crane is supported on the outriggers.

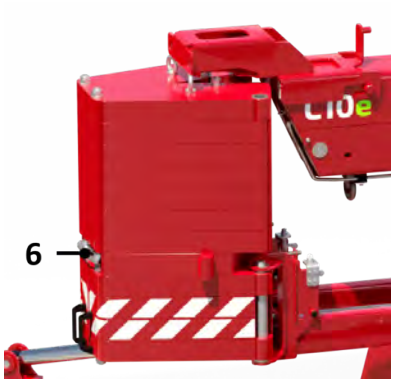
The counterweight can only be extended and retracted when the counterweight elements are tilted forward.

Extending counterweight

1. Set the main switch on the electrical cabinet to position **2**.
2. Before extending the counterweight, check that the counterweight is not going to come into contact with the boom.
3. Press the **Extend tracks/counterweight** button on the remote control to extend the counterweight.

4. Always extend the counterweight fully.
   Attention! A dangerous situation can arise if the counterweight is not completely extended, because the outriggers will be hit during slewing.
5. Swing both counterweight elements (5) backward.
6. Connect the two counterweight elements together with the bracket (6).





Retracting counterweight

1. Retract the counterweight by performing this procedure in reverse order.

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

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

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.

Adhere to the following regulations when guiding a load:

- Always operate the crane with the load very carefully and only at the slow driving speed (the LED on the **Driving speed** button may not be lit).
- 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 the signal men 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.
- Make sure that the area is clean and tidy to minimise the risk of tripping and that the guide line will get caught and/or damaged.

4.7.4 Lifting the load

To lift a load, the levers of the remote control are used. Note the following:

- Move the levers slowly forwards or backwards.
- In the highest position, the crane's LML may be triggered and indicate an overload. To get out of this situation, the override must be switched on and then load-reducing movements can be made. Once you have boomed down slightly, switch off the override.

DANGER

Only have a defective lifting cable replaced by a competent person.

REMARK

If the outriggers are parallel to . the crane on the counterweight side, booming up will stop automatically at 60°.

4.8 Lifting with the winch

DANGER

Observe the maximum load of the winch. When the cable is not reeved: 1000 kg, 1 x reeved: 2000 kg and 2 x reeved: 4000 kg. Where a reeved cable is used, it is prohibited to lift if the cables are twisted. Otherwise, the cable may break.

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 winch cable remaining on the winch drum.

Important points

For the correct selection of attachments and swivel hooks, see the information sections:

- *Winch head positions in adjustable section – with main boom*
- *Winch head positions in adjustable section – with fly jib*
- *Adjustable section limits*

No other use is permitted.

Procedure

1. Reeve the lifting cable if the mass of the load exceeds the capacity of the winch. Use one sheave in the winch weight for 1 x reeving (two cables) and both sheaves in the winch weight for 2 x reeving (four cables). For reeving, see section *4.8.8 Attaching winch weight*.
2. The lifting cable may get stuck under the counterweight tube with the boom at 85°; this risk can be eliminated by extending the counterweight.
3. Make sure that both pins are attached and secured when using the winch head in the adjustable section.

4. Push the winch weight backwards when lifting the winch weight from the engine shroud bracket. Be careful that the winch weight does not get caught on the support.
5. When removing the winch weight be careful that the elastic strap that holds the lifting hook has been removed.
6. When configuring the winch weight for reeving, be careful to remove the centring bush for the lifting hook while switching from two sheaves to one or no sheave. It should only be used when two sheaves are used in the winch weight.
7. 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.
8. When using the winch, keep in mind the limits of the various crane configurations.
9. Remember: the complete winch weight with hook is 33 kg. Do not move or lift the weight manually.
10. With the exception of the winch weight, lifting hook and counterweight removal support, never pull on parts of the crane.
11. Check the gauge for the winch cylinder. The indicator point on the plate must be between the points on the boom, as shown in the yellow circle (see *Figuur 4.7*). Contact your dealer if the gauge falls outside the level, in connection with incorrect lifting capacity.

Figuur 4.7 Winch cylinder indicator point

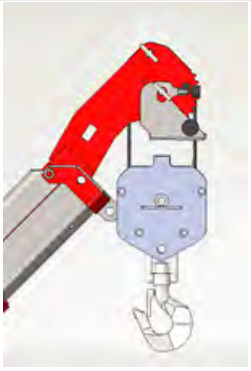
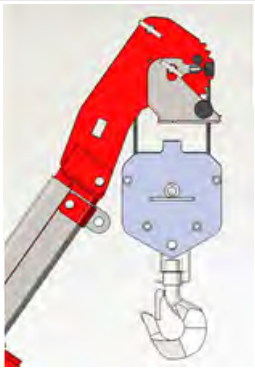
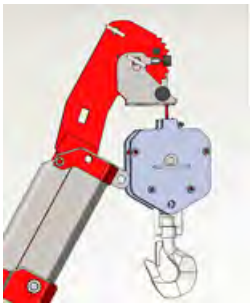
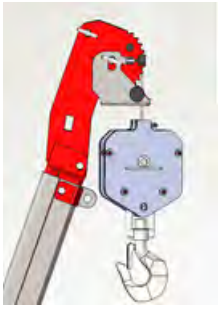
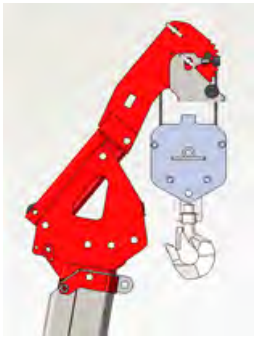
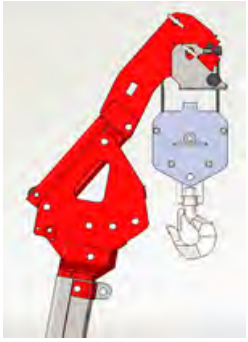
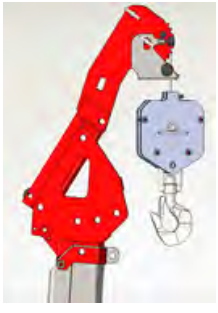
4.8.1 Adjustable section limits

Figuur 4.8 Adjustable section upper limit

Figuur 4.9 Adjustable section lower limit

		USE WITHOUT FLY JIB		USE WITH FLY JIB	
	Number of reevings	**Min. boom angle**	**Max. boom angle**	**Min. fly jib angle**	**Max. fly jib angle**
Winch head without winch weight		Not permitted	Not permitted	Not permitted	Not permitted
Winch head	0	0°	70°	-70°	70°
	1 or 2	0°	45°	-70°	45°
Adjustable section with winch head lowered (see *Figuur 4.9*)	0	0°	85°	-40°	70°
	1 or 2	0°	85° or 85° with boom retracted	-70°	60°
Adjustable section with winch head raised (see *Figuur 4.8*)	0	0°	60°	-70°	60°
	1 or 2	0°	35°	-70°	35°

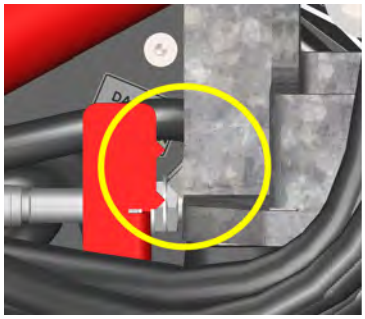
4.8.2 Maximum angle of main boom and fly jib

Winch head positions	Maximum angle of main boom		Maximum angle of fly jib	
Winch head with winch weight reeved	≤ 45°		≤ 55°	
Winch head with lifting weight and single cable	≤ 60°		≤ 70°	
Winch head with adjustable section in upper hole with lifting weight reeved	≤ 80°		≤ 80°	
Winch head with adjustable section in upper hole with lifting weight and single cable	≤ 85°		≤ 85°	

4.8.3 Lifting without options

Inspection

1. Check that the winch plate is within the indicator range. The winch plate must not be crooked. When under tension, the winch plate must be between the indicator points.
2. Check the cylinder behind the winch for leakage.
3. Inspect the lifting cable for external deficiencies, such as kinks and broken strands.
4. Check that the lifting cable is wound neatly and tightly on the drum. If not, wind out the cable and then wind it in again tightly. Always use a weight when winding in.



Step 1

Step 4

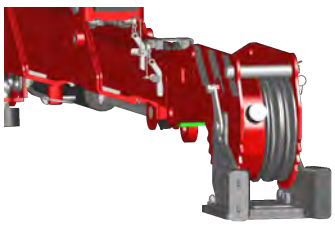
Preparation

1. Make sure the crane is supported on the outriggers, with the crawler tracks just above the ground.
2. Make sure the fly jib, jib adapter and/or other attachments have been removed from the boom and stored and secured in place.
3. Make sure the boom is horizontal and retracted.

Attaching winch head

1. Remove the winch head from the boom support.
2. Secure the boom adapter to the rear of the winch head with the lynch pin. Secure the pin.
3. Attach the winch head with the boom adapter to the boom with the lynch pin. Secure the pin.

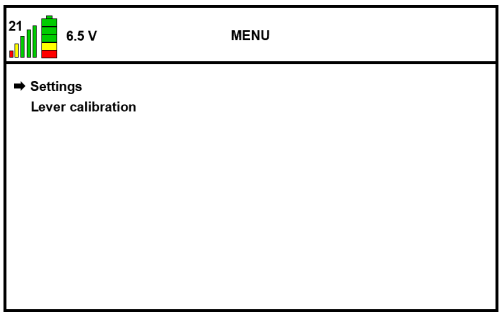
Step 1



Steps 2 and 3

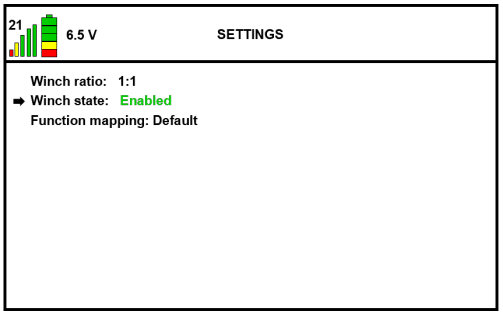
Activating winch control

1. Activate the winch control by pressing the **Confirm** button on the remote control.

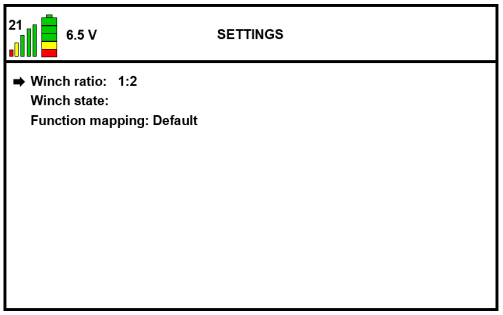


2. Now open settings by pressing the **Confirm** button.

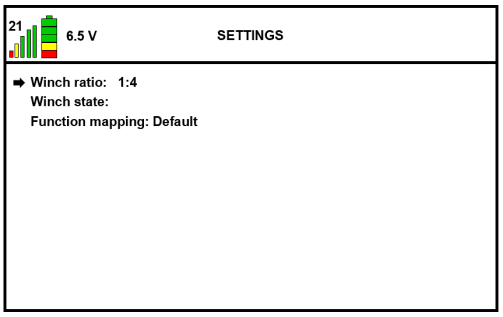
   Then use the **Down arrow** button to select *Winch state* on the screen. Then use the **Right arrow** button to set *Winch state* to **Enabled**.



3. If the display shows winch ratio, it must be set (see below). If no winch ratio is displayed, it does not need to be set.



4. Setting winch ratio: For the correct current load indication on the display while using the winch, the winch state must be set properly. For standard lifting with a single cable this should be set to 1:1. With a single reeving it should be set to 1:2 and for double reeving to 1:4



5. After activating and setting the winch, return to the home screen by pressing the **Back** button.

Execution

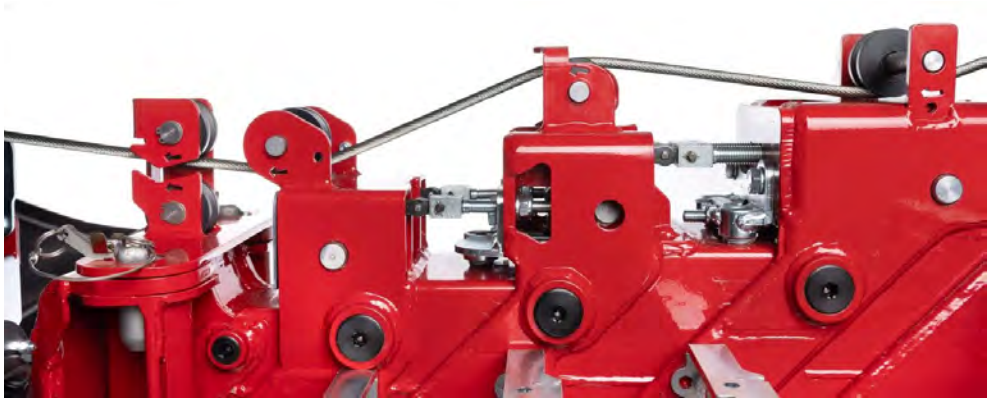
1. Start the drive system and activate the remote control.
2. Make sure the crane is supported on the outriggers and level.
3. Check whether the winch plate is between the indicator points. If not, contact your dealer.
4. Set the main switch on the electrical cabinet to position **2**.
5. Erect the crane and then extend the boom.

Running the cable

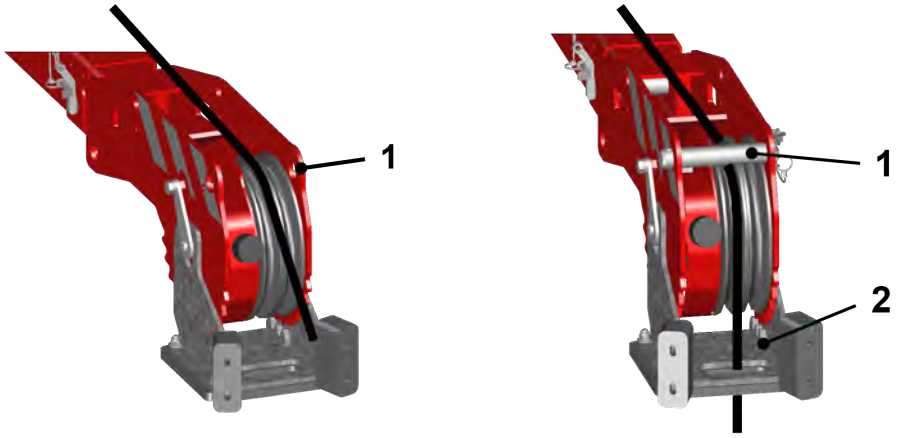
WARNING

The use of gloves is mandatory when attaching the winch cable!

1. Use one hand to operate the lever for the winch on the remote control and the other hand to hold the lifting cable and keep it under tension.
2. Wind out the lifting 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 lifting cable over the sheaves of the boom as shown in the figure. Check that the cable has been run over the sheaves correctly. There is an arrow engraved in the side of each sheave. These indicate how the cable is to be routed.
5. Run the cable over the winch head. First remove the upper pin (1) from the winch head. If you intend to lift with one cable, place the cable over the centre sheave and fit and secure the upper pin (1) in place again. Position the cable properly through the winch stop (2).



Step 4

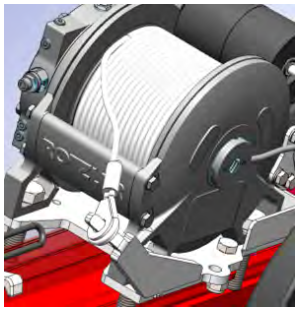


Step 5

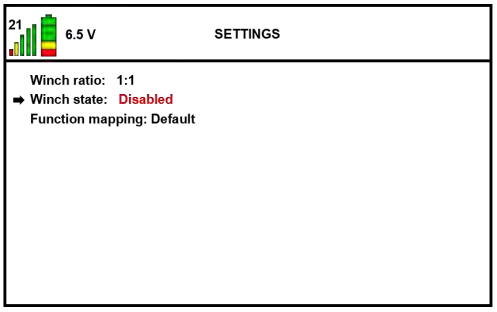
Winding in the cable

1. After you have used the winch, wind the cable until the end is about one metre in front of the crane, pass it through the sheaves and then pull the cable tight and wind it up.

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 **Disabled** in the remote control menu.



Step 1



Step 3

4.8.4 Lifting with fly jib

Preparation

1. Make sure the crane is supported on the outriggers, with the crawler tracks just above the ground.
2. Make sure the fly jib is correctly attached to the boom. For more information, see section *Removing and installing fly jib*.
3. Make sure the boom and fly jib are horizontal and retracted.

Attaching the winch head and running the cable

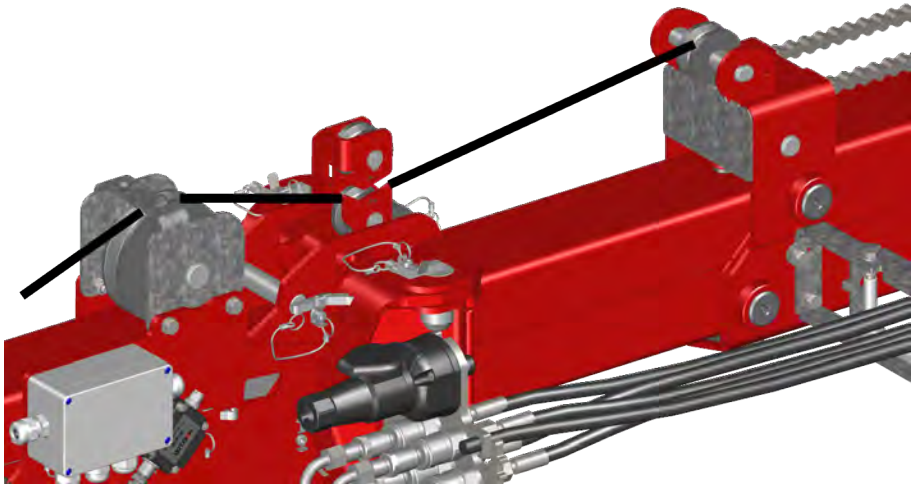
1. Remove the winch head from the support on the boom, and mount the winch head to the fly jib with the locking pin. Secure the pin.
2. Use one hand to operate the lever for the winch on the remote control and the other hand to hold the cable and keep it under tension. Wind out the cable until the end is about one metre in front of the crane. Keep the cable under tension while winding it out.
3. Run the cable over the sheaves of the fly jib as shown in the figures. Check that the cable is running over the sheaves correctly. Refit the retainers.
4. Guide the cable over the winch head and mount the winch weight.

Inspection

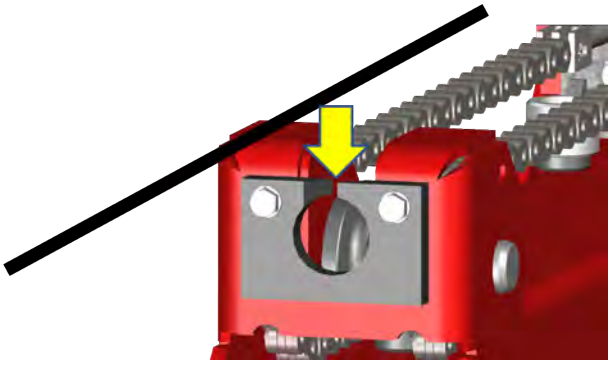
1. Make sure all the pins and loose parts are properly attached and secured.
2. Make sure the cable does not get caught on the boom and fly jib structure.

With fly jib installed

1. Slide the cable through the opening between the two sheaves so the cable runs between the two sheaves. Insert the eye through the recessed support. Place the cable in the sheave by holding the cable in the upper notch and sliding the roller under it. Now the cable can drop into the roller, and the roller with cable can be slid back into the middle.
2. Pass the cable through the plastic slot so it runs through the hole.

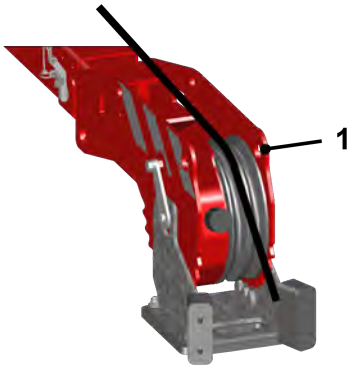


Step 1



Step 2

3. Pull the cable over the winch head and follow the steps described above.
4. To remove the cable, perform the steps in the reverse order. Make sure the cable is wound up tightly by holding it while winding it up.
5. After removing the winch, fit a hook to a D-shackle if necessary. Fit the pin and secure it.



Step 3

Step 5

4.8.5 Lifting with adjustable section

Preparation

1. Make sure the crane is supported on the outriggers, with the crawler tracks just above the ground.
2. Make sure the fly jib is correctly attached to the boom, as described for use fly of the jib.
3. Make sure the attachments have been removed from the boom or fly jib and stored and secured in place.
4. Make sure the boom and/or fly jib are horizontal and retracted.

Attaching adjustable section

1. Remove the adjustable section from the boom support; fit the retainer. If it will be used in the boom, mount the boom adapter.
2. Mount the adjustable section to the boom or fly jib and secure it with the locking pin. Secure the pin.

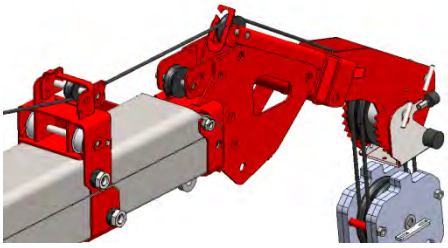
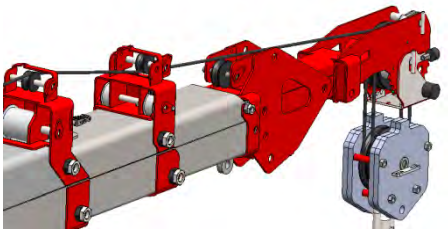
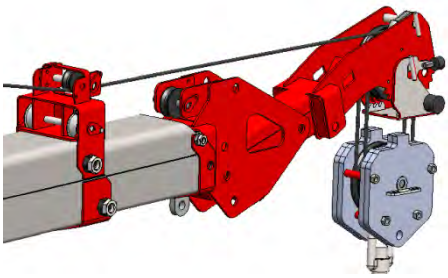
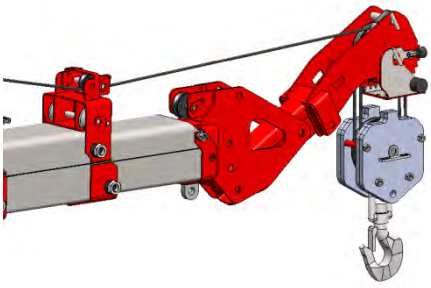
Attaching manual jib extension

1. Remove the manual jib extension from the counterweight weight.
2. Place the manual jib extension in the fly jib tube and lock it with the pin.
3. Or place the boom adapter so the manual jib extension can be placed directly in the boom and secure it with the lynch pin.

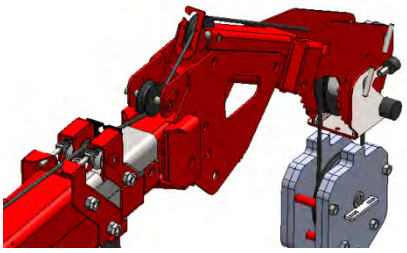
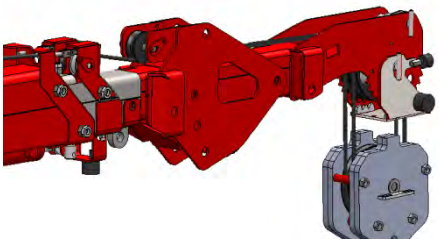
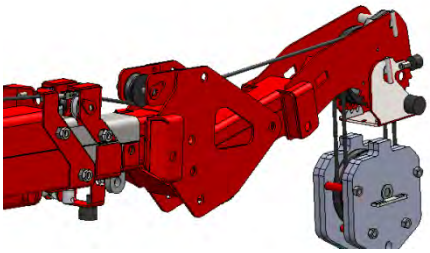
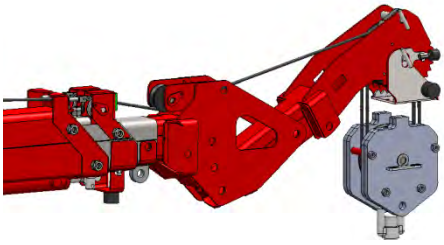
Attaching manual jib extension in combination with adjustable section

1. Attach the manual jib extension to the adjustable section with the two pins and secure them.

4.8.6 Winch head positions in adjustable section – with main boom

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

4.8.7 Winch head positions in adjustable section – with fly jib

Jib	
Winch head in top hole. Cable under auxiliary pulley of the adjustable section and over auxiliary pulley at rear of winch head, to large sheave in winch head.	
Winch head in second hole. Cable under auxiliary pulley of the adjustable section through to large sheave in winch head.	
Winch head in third hole. Cable under auxiliary pulley of the adjustable section through to large sheave in winch head.	
Winch head in bottom hole. Cable under auxiliary pulley of the adjustable section through to large sheave in winch head.	

4.8.8 Attaching winch weight

DANGER

Observe the maximum load of the winch. When the cable is not reeved: 1000 kg, 1 x reeved: 2000 kg and 2 x reeved: 4000 kg. Where a reeved cable is used, it is prohibited to lift if the cables are twisted. Otherwise, the cable may break.

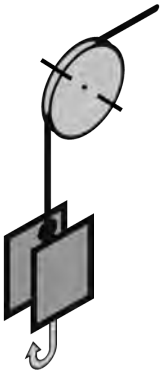
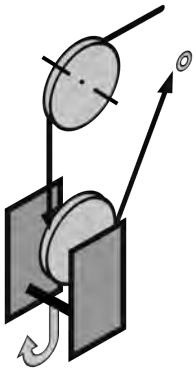
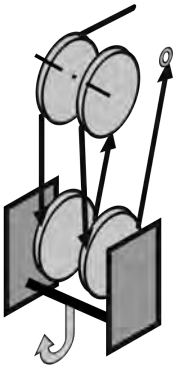
DANGER

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 winch cable remaining on the winch drum.

Principle of cable reeving

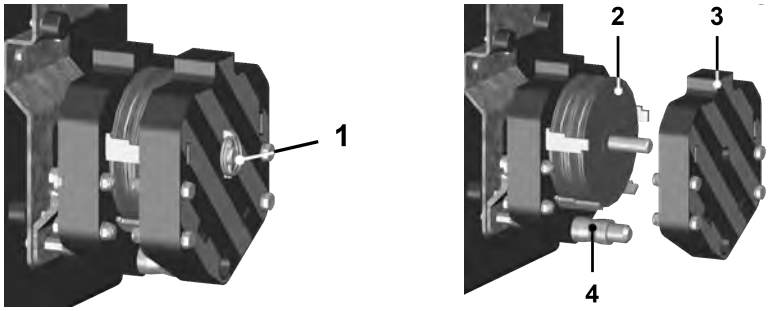
		
Not reeved (winch weight hangs directly on cable)	**1 x reeved** (two cables, one winch weight sheave)	**2 x reeved** (four cables, two winch weight sheaves)

Figuur 4.10 Principle of cable reeving

Preparation

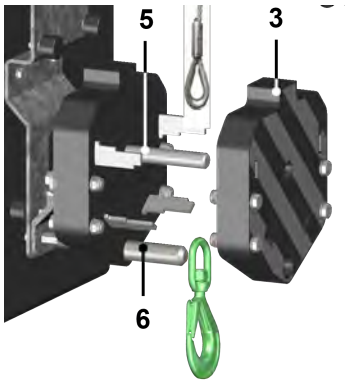
1. Make sure the crane is supported on the outriggers, with the crawler tracks just above the ground.
2. Make sure the winch head is mounted.
3. Switch on the remote control and position the lifting cable above the winch weight by raising the boom, slewing it if necessary and winding out the cable. Use one hand to operate the lever for the winch on the remote control and the other hand to hold the cable and keep it under tension.

Attaching winch weight without reeving



Figuur 4.11 Removing winch weight

1. Remove the lynch pin (1) from the winch weight.
2. Remove the front half (3) of the winch weight.
3. Remove the two sheaves (2).
4. Remove the centring bush (4).



Figuur 4.12 Attaching lifting cable and lifting hook to winch weight

5. Slide the lifting hook without the centring bush onto the pin (6).
6. Slide the eye of the lifting cable over the shaft (5) on which the sheaves were fitted.
7. Fit the front half (3) of the winch weight back in position.

   Attention: The front half must be placed the other way round. This half will now slide the rest of the way over the strips, and the eye of the lifting cable will be clamped between the two halves.
8. Fit the lynch pin (1) in the second hole in front of the front section of the winch weight to secure it in place.

Attaching winch weight with 1 x reeving

1. Remove the lynch pin (1) from the winch weight.
2. Remove the front half (3) of the winch weight.
3. Remove a sheave.

4. Remove the lifting hook from the centring bush (4).
5. Slide the lifting hook without the centring bush onto the pin (6).
6. Attach the lifting cable to the sheave.
7. Fit the front half (3) of the winch weight back in position.

   Attention: The front half may be placed the other way round. This half will slide the rest of the way over the strips and almost contact the sheave.
8. Fit the lynch pin (1) in the second hole in front of the front section of the winch weight to secure it in place.
9. Pull the eye of the lifting cable along the inside of the winch head and place it over the black plastic ring with the recess. Remove the pin at the top of the winch head and fit it again with the pin through the cable eye.

Attaching winch weight with 2 x reeving

1. Remove the lynch pin (1) from the winch weight.
2. Remove the front half (3) of the winch weight.
3. Run the lifting cable around the first sheave and then around the outermost sheave of the winch head. Then around the second sheave of the winch weight.
4. Make sure the lifting hook is around the centring bush.
5. Fit the front half (3) of the winch weight back in position.

   Attention: The front half must be positioned so the sheaves can rotate freely. If the front half is positioned incorrectly, the sheaves contact the steel winch weight.
6. Fit the lynch pin (1) in the first hole in front of the front section of the winch weight to secure it in place.
7. Pull the eye of the lifting cable along the inside of the winch head and place it over the black plastic ring with the recess. Remove the pin at the top of the winch head and fit it again with the pin through the cable eye.

Inspection

1. Make sure all the pins and loose parts are properly attached and secured.
2. Make sure the lifting cable does not get caught on the boom and fly jib structure.

Execution

1. Use one hand to operate the lever for the winch and the other hand to hold the cable and keep it under tension. Pull the cable until it is under tension.
2. Use one hand to push the winch weight backwards so it is no longer secured and use the other hand to operate the lever for the winch. See whether the winch weight can be lifted free of the support, and lift the winch weight off of the support.

4.8.9 Checking the winch stop

The winch is protected by the winch stop. Provided the winch weight is properly mounted on the lifting cable and the lifting cable is properly mounted in the winch head, the crane will stop winching if the winch weight touches the winch stop on the winch head. The figures below show how the lifting cable must be run in the winch head and the winch weight.

	Correct	Incorrect
1 cable		
1 x reeved		
2 x reeved		

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. Contact your dealer.

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

The engine must be stopped when topping off oil, coolant or fuel; DO NOT smoke while performing these tasks.

DANGER

Always correctly reinstall any protection measures that have been removed!

WARNING

Only your dealer 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.

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 1000 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. The sticker is located on the electrical cabinet.
4. Scheduled service and inspections must be carried out by your dealer or Hoeflon International B.V..

Figuur 5.1 Maintenance sticker

5.3.4 First use

1. Perform the daily inspection before use.
2. Perform the daily inspection as laid down in the maintenance schedule.

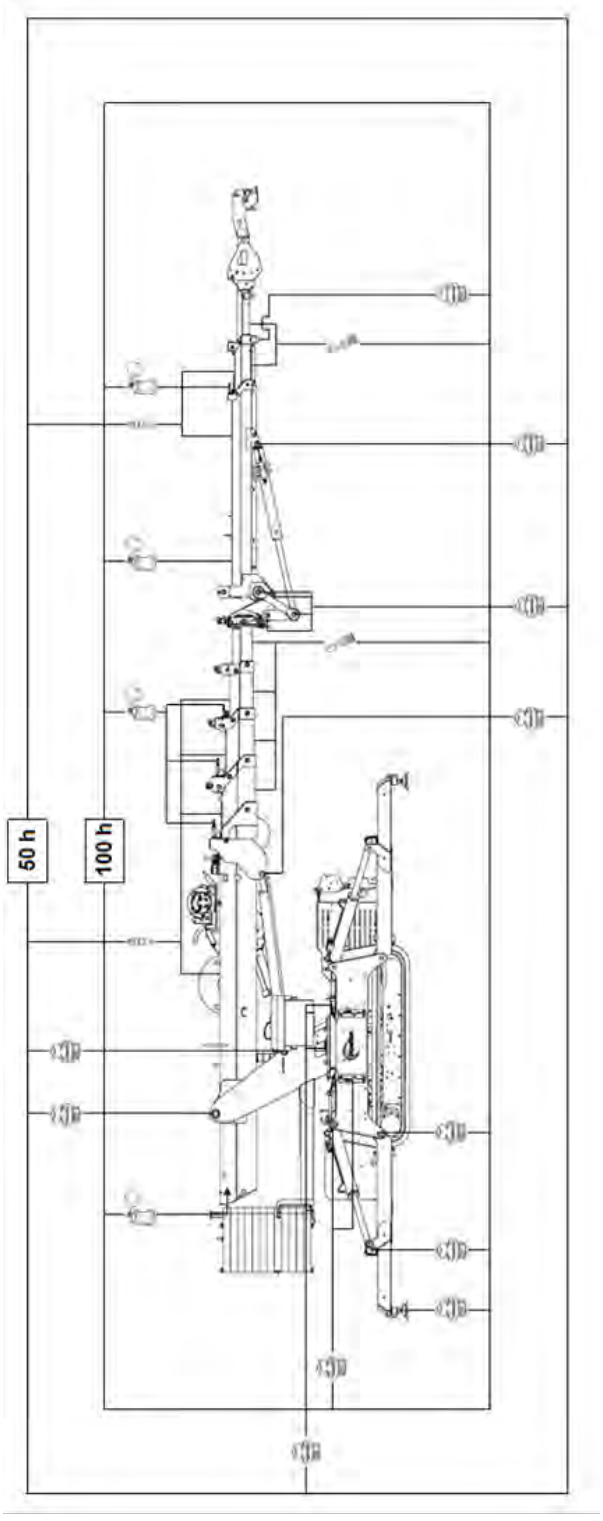
5.4 Maintenance schedule

The maintenance schedule indicates which maintenance must be carried out and at what interval.

Description of maintenance	Action	Hours interval							
o = manufacturer/dealer, ● = owner		Daily	First 50 hours	50	100	250	500	1000	4000
Track undercarriage									
Tension of crawler tracks	Check/adjust			●					
Oil level, crawler track motors	Check/top up					o			
	Replace						o		
General									
Crane	Clean			●					
Safety provisions + sensors	Check	●							
Lifting equipment (cables, hooks etc.)	Check/replace	●							
Control levers + emergency stop buttons	Check	●							
Condition and presence of pictograms	Check					o			
Mechanical components	Check	●							
Boom clearance	Check/adjust							o	
Turntable	Check/tighten		o				o		
	Lubricate			●					
Construction including 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			

5.5 Lubrication chart

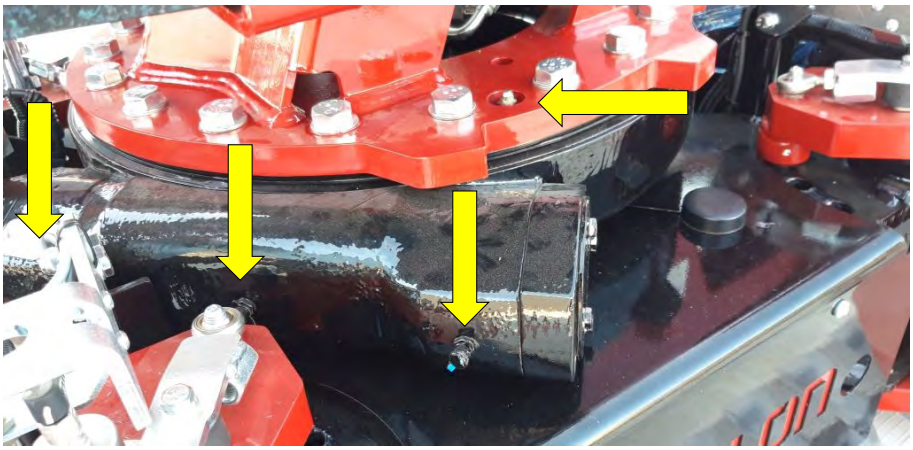
The lubrication chart indicates which parts need to be lubricated and at what interval. The instructions can be found further in this chapter.



Figuur 5.2 Lubrication chart

5.6 Lubricating the turntable

Lubricate the turntable every 50 hours at the points indicated.



Figuur 5.3 Turntable lubrication points (every 50 hours)

Lubricating the turntable may only be done while slowly rotating the turntable and in small amounts. Otherwise, the pressure of the grease may become too high in some area and the seal may be forced out.

The turntable will push out excess or excessive grease. If this causes the seal to be pushed upwards, you may gently push it back into the seal bore.

Figuur 5.4 Leave excess grease in place

REMARK

Leave excess grease in place. This serves as a kind of fine dust filter.

5.7 Lubricate

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

- Clean the grease nipples thoroughly before lubrication.
- Remove excess/old grease from the boom sections.
- Use clean greases, stored in sealed packaging.
- 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.
- Use only prescribed greases; see lubricant specifications.

5.7.1 Lubricants

Manufacturer	Hydraulic oil		Final drives
	Universal	**Organic**	
Q8	Heller 46	Q8 Holbein HP SE Bio 46	T55
Total	Equavis ZS 46	BioHydran TMP 46	EP-B 80W90
Shell	Shell Tellus S2/S3	Shell Naturelle HF-E 46	Spirax S3 AX 80W-90
Kroon oil	Perlus ZF 46	Perlus Biosynth 46	Gearlube GL-5 80W-90
Matrix		Hydromax HT ECO 46	

Also use the following lubricants:

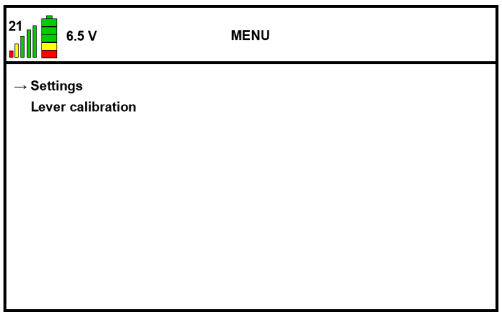
- For lubrication points: EP2
- For chains: industrial chain spray
- For sliding parts: Interflon OG

5.8 Function mapping

This function allows you to assign different functions to the levers. As standard, it is set to *Default*. If you set the function to *Custom*, the levers work the same way as for many truck-mounted cranes. This position can be selected if preferred. Contact your dealer.

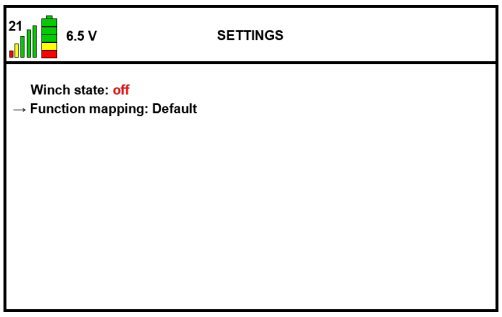
Do the following:

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 **Confirm** button to open the settings.

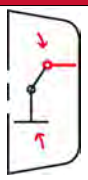
3. Press the **Down arrow** button to move the arrow in the display until it points to *Function mapping*.



4. Press the **Right Arrow** button and select *Custom*.

The alternate functions of the levers with the main switch in position **2** are as follows:

No.	Image	Function	Lever backwards	Lever forwards
1		Slew main boom	Left	Right
2		Boom up and down	Boom up	Boom down
3		Extend/retract main boom	Retract	Extend

No.	Image	Function	Lever backwards	Lever forwards
4		Fly jib up and down	Up	Down
5		Extend/retract fly jib	Retract	Extend
6		Raise and lower winch	Raise	Lower

5.9 Charging 80 V battery

Read these instructions carefully to familiarise yourself with how to handle the battery 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 battery/batteries or charger.

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

Only your dealer may perform work on the crane's electrical or hydraulic system.

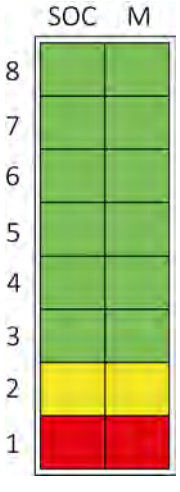
REMARK

Fully charge the battery once a week. This maximises the battery's performance.

5.9.1 Battery indicator

The crane is fitted with an indicator that shows the state of charge (SOC) and charging mode (M) of the battery pack.

The state of charge is displayed on the left LED bar. The charging status is shown when the charger is connected or when the main switch is switched on (position 1 or 2). The charging mode is shown on the right LED bar (see the table below).



The following LEDs light up to indicate the corresponding state of charge (SOC):

LED 8: 88%

LED 7: 76%

LED 6: 65%

LED 5: 53%

LED 4: 42%

LED 3: 30%

LED 2: 19%

LED 1: 7%

Figuur 5.5 Battery indicator with the state of charge (SOC, left) and the charging mode (M, right).

The following table shows the different charging modes:

Mode	Battery indicator
Rapid charging (>2 A)	The battery indicator fills every 4 seconds
Balance charging: The voltages of the cells in the battery pack are equalised. This is beneficial to battery pack life and capacity.	The battery indicator fills every 16 seconds
The charging process is complete.	All the LED segments are on

When the crane is switched off, the battery indicator shows the status and mode as long as the charging cable is connected to the mains.

5.9.2 Battery charging

REMARK

*Charge the battery/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

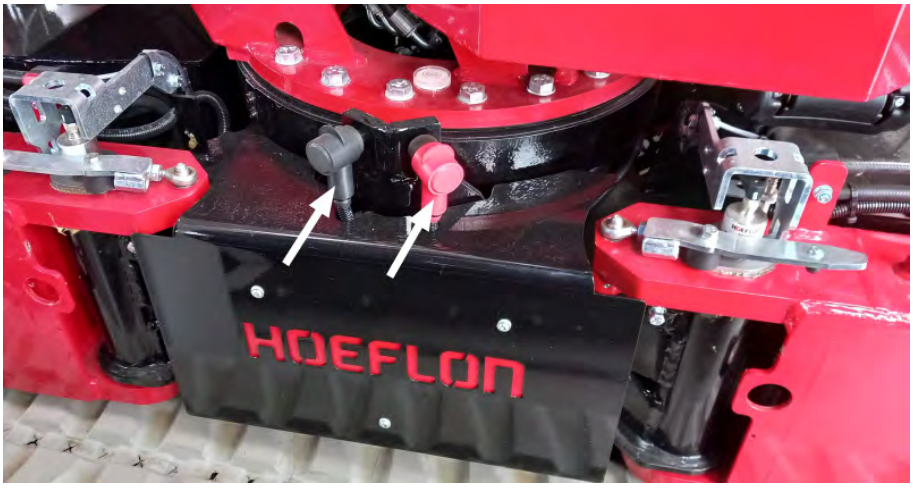
When the crane's key switch is off, the priority is on charging the battery/batteries. When the key switch is on, charging continues while the crane is lifting. Then the priority is lifting. The battery will still be charged, but less efficiently and less quickly.

To charge the battery:

1. Set the main switch on the electrical cabinet to position **0**.
2. Check that the charging cable plug (on the side of the electrical cabinet) is clean and dry.
3. Connect the plug to the mains socket. Charging starts automatically.
4. During charging, the battery indicator fills up. When the state of charge is above 88%, all LEDs in the SOC column are lit.
5. When the battery is fully charged, all the battery indicator LEDs are lit.
6. Disconnect the charging cable from the mains supply and store it in the crane again.

Read chapter TRANSPORT, STORAGE AND DISPOSAL for instructions on battery maintenance when the crane is placed in storage for a longer period.

5.10 Using emergency charging points



Figuur 5.6 Emergency charging points

The emergency charging points charge the 24 V system. The emergency charging points are located on the side of the turntable.

Preparation

Make the following preparations:

- Obtain a start assistance source with the correct voltage and sufficient capacity that is fit for purpose and place it as close as possible to the crane, yet at a safe distance.
- Obtain suitable start assistance cables with sufficient length and thickness and intact insulation, fitted with good, preferably insulated clamps.
- Make sure the area is safe, without any water or conductive materials. Make sure there are no loose parts on the crane or that may fall on the machine.
- Place insulating material to prevent direct and indirect contact with the + terminal (behind red protective cap) and chassis.
- Remove the remote control battery from the charger on the crane to prevent damage.

Procedure

Use the emergency charging points as follows:

1. Make sure the crane is switched off.
2. It is a 24 V system, so use a 24 V charger or vehicle.
3. Place insulating material between the chassis and + emergency charging point, if necessary.
4. Make sure the start assistance cables are connected to the emergency charging points correctly.
5. Always hold the + start assistance cable clamp in your hand, prevent contact and do not place it near the

– start assistance cable clamp.

6. Prevent the start assistance cables from becoming twisted together; separate them from each other.
7. First connect the + start assistance cable by clamping it firmly to the + charging terminal (with the red protective cap). Make sure the clamp cannot contact the chassis or the – charging terminal.
8. Connect the start assistance cable.
9. Verify that the clamps are correctly attached and making good contact.
10. Switch on the key switch of the crane.
11. Allow the crane to recharge for a few minutes.
12. Switch on the crane so it is in operation.
13. Switch off the start assistance source and remove the start assistance cables in the reverse order.
14. Place the protective caps back on the emergency charging points. Replace them if they are damaged.

5.11 Maintaining the boom chains

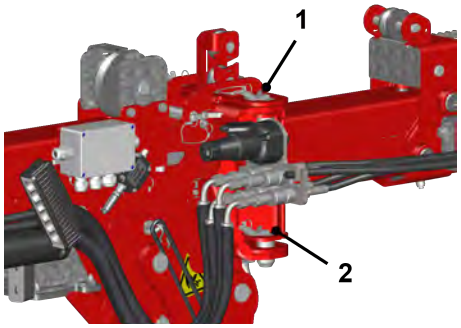
Please note the following when maintaining the chains:

- Do not repair chains or insert new links; if deficient, have them completely replaced by your dealer.
- Have double extension or retraction chains replaced at the same time, including the connections.
- 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 section *5.4 Maintenance schedule*).

5.12 Removing and installing fly jib

Removing

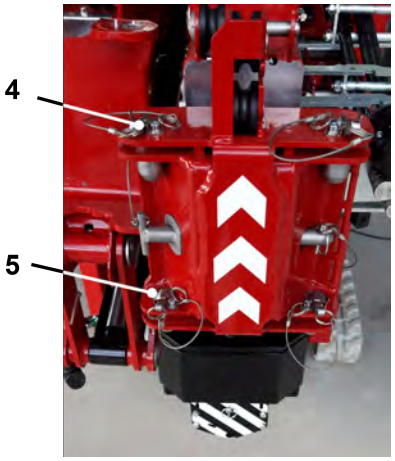
1. Retract the boom and fly jib fully and position them horizontally. Make sure the boom is positioned slightly above horizontal. This makes it easier to swing the fly jib.

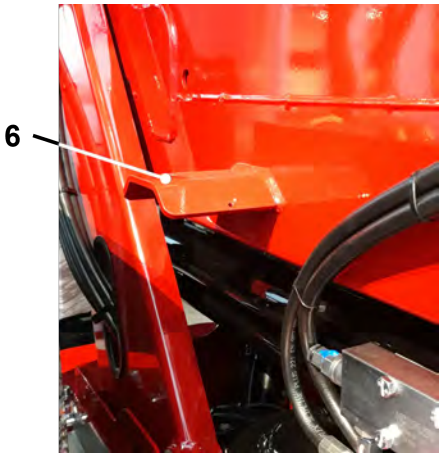


2. Remove the two pins (1 and 2) from the left side of the hinged section of the fly jib.
3. Swing the fly jib 180° so it hangs parallel to the boom.

4. Fit the D-shackle (3) on the main boom to the eye on the fly jib. To do this, raise the fly jib until it can be attached to the D-shackle. Secure the D-shackle.

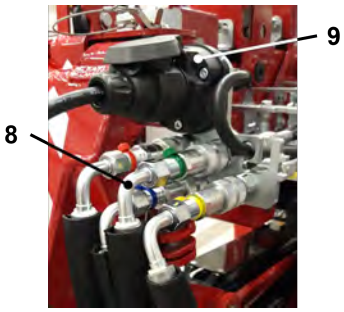
   The fly jib is now hanging from the D-shackle and can be moved easily.



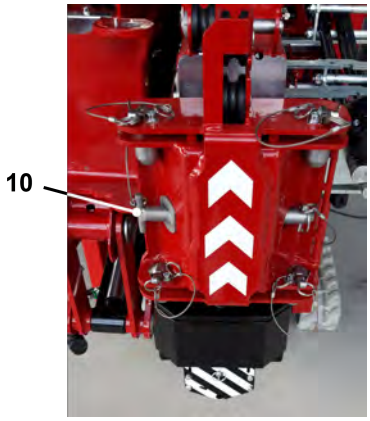


5. Remove the two pins (4 and 5) from the right side of the hinged section of the fly jib. Lower the fly jib when you do this so it is easier to remove the pins.

6. Guide the fly jib with the shaft on the underside of the boom into the corresponding section (6) of the main boom and lock it in place.



7. Place the eye of the draw latch (7) over the hook on the fly jib and latch it.
8. Disconnect the hydraulic hoses (8) and power plug (9). Secure the loose hoses to the fly jib.



9. The fixed section of the fly jib can be removed from the main boom, if necessary, by removing the pin (10) and manually pulling the section out of the main boom. It is also possible to work with the crane if the fixed section of the fly jib is still in the boom.
10. To install the fly jib, perform the steps in reverse order. Set the boom slightly lower than horizontal.
11. Do not forget to secure the pins!

5.13 Removing and installing counterweight

DANGER

Risk of entrapment; switch off the crane when you or anyone else is in range of the crane.

WARNING

The removal support is only intended for removal of the counterweight, not for horizontal transport of the counterweight.

WARNING

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

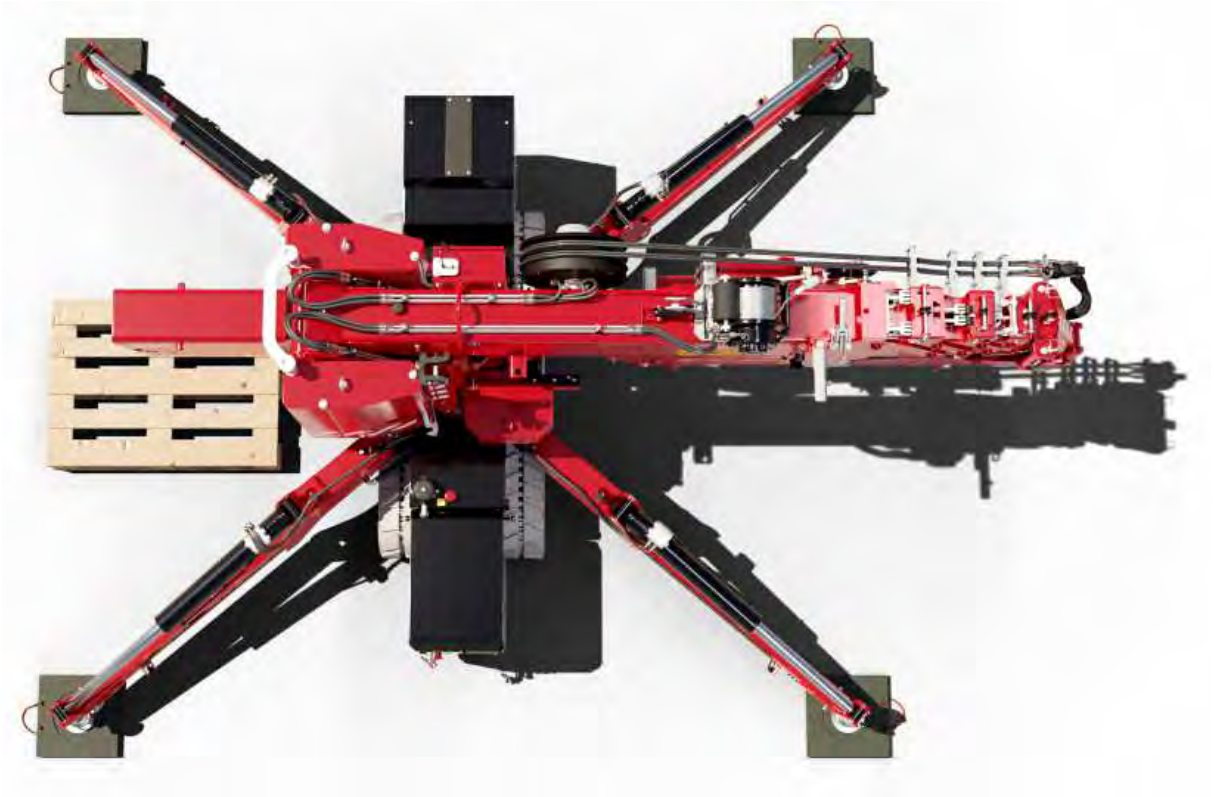
5.13.1 Removing counterweight

Preparation

1. Make sure the crane is supported on the outriggers in a square configuration on a flat and stable surface, with the crawler tracks just above the ground and no load on the hook.
2. Make sure there is enough space for the boom to be extended to one side (preferably the right side) so the counterweight can removed on the left side (because the sensors are on the right side).
3. Make sure the crawler tracks are retracted.
4. Make sure the boom is horizontal.
5. Use a ladder when removing and installing the counterweight.
6. Make sure the counterweight is placed in a safe spot and on a stable surface, not on walking or driving paths and not within the operating range of the crane or the working area of other machines or employees.

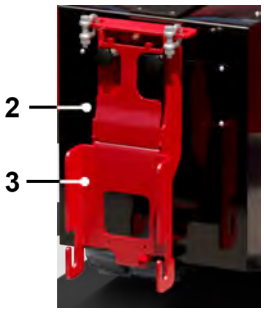
Execution

1. First perform the daily inspection.
2. Ensure that no hazardous situations can develop.
3. Start the crane and activate the remote control.
4. Place a pallet next to the crane.
5. Place the boom perpendicular to the crane with counterweight to left of the crane and above the pallet.

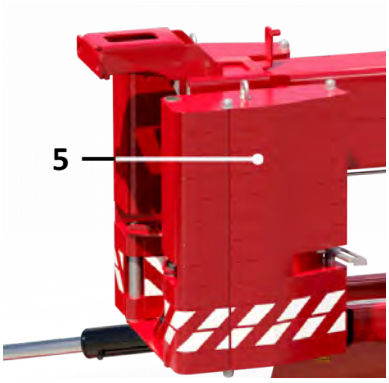


6. Remove mounting bracket (1) from the counterweight elements.

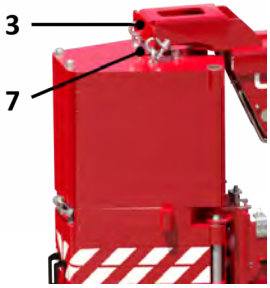
7. Remove the counterweight support (3) from the motor shroud (2).
8. Mount counterweight support (3) on boom (4).



9. Hydraulically extend the counterweight with the **Extend tracks/counterweight** button on the remote control.
10. Disconnect one counterweight element (5) and rotate it backwards. Do the same with the other counterweight element.
11. Connect the two counterweight elements together with the bracket (6).



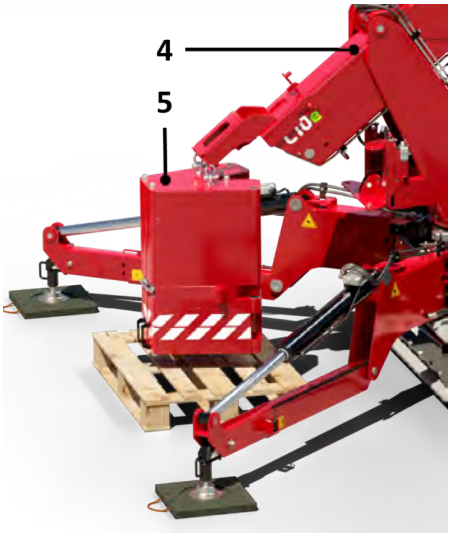
12. Get the D-shackles from the toolbox.
13. Attach the counterweight support (3) to the lifting eyes on the counterweight elements with the D-shackles (7).
14. Operate the boom to raise the counterweight support slightly.
15. Loosen the nut of locking pin (8) and push the locking pin down. Do the same with the locking pin of the other counterweight element.



16. Hydraulically retract the counterweight support (9). The counterweight is now hanging freely, from

the boom.

17. Raise the boom (4).
18. Lower the counterweight onto the pallet.



19. Detach the D-shackles from the counterweight and remove the counterweight support from the boom.
20. Mount the counterweight support on the motor shroud again.
21. The crane can now be put in transport position and driven away from the counterweight.

Verification

22. Check whether the counterweight has disappeared from the display on the remote control.
23. 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.

5.13.2 Installing counterweight

1. Attach the ballast to the crane in the 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

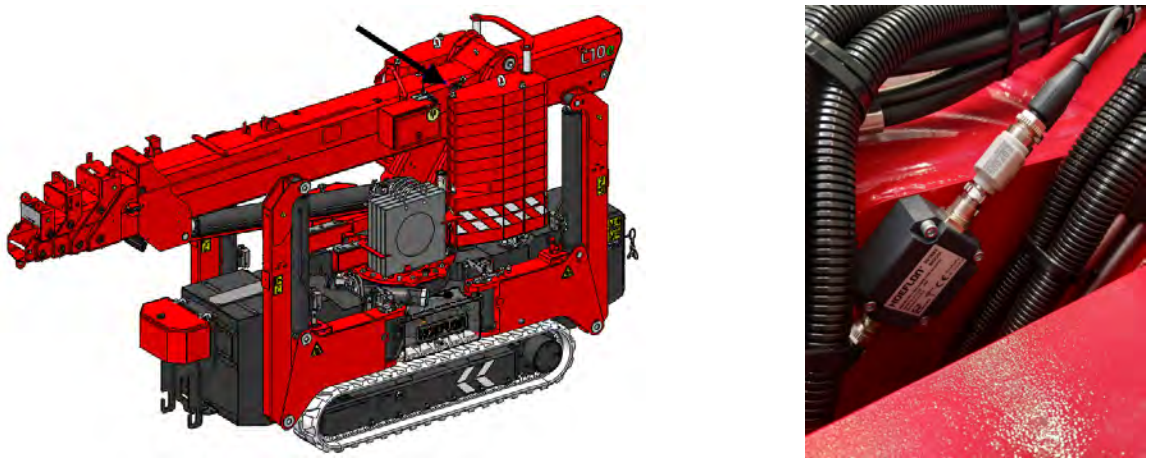
If you are unable to correct a malfunction, contact your dealer.

6.2 Fault codes

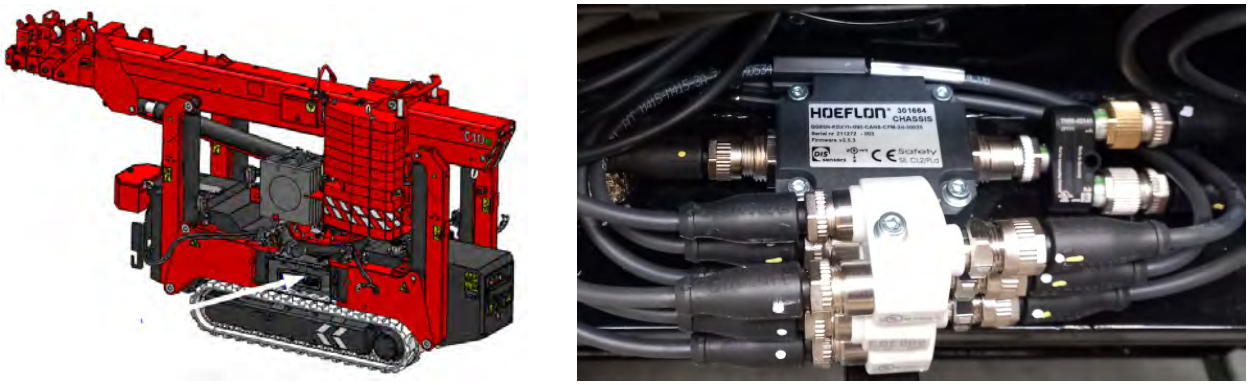
The following table contains the fault codes that may appear on the display. If the suggested action does not work, contact your dealer.

Code	Description	Action
E003	External RAM fault.	Contact your dealer.
E006	SD card fault.	Contact your dealer.
E007	CAN bus fault.	Contact your dealer.
E008	Real-time clock fault.	Contact your dealer.
E066	IO-EXP1, data missing.	Contact your dealer.
E070	IO-EXP2, data missing.	Contact your dealer.
E074	IO-EXP3, data missing.	Contact your dealer.
E078	Angle sensor for left-front outrigger, data missing.	Check cabling to sensor.
E079	Angle sensor for left-front outrigger, data invalid.	Check that sensor shaft is properly secured.
E083	Position sensor for left-front outrigger, data invalid.	Check that the LEDs on the two sensors are both on or off.
E085	Angle sensor for right-front outrigger, data missing.	Check cabling to sensor.
E086	Angle sensor for right-front outrigger, data invalid.	Check that sensor shaft is properly secured.
E090	Position sensor for right-front outrigger, data invalid.	Check that the LEDs on the two sensors are both on or off.
E092	Angle sensor for right-rear outrigger, data missing.	Check cabling to sensor.
E093	Angle sensor for right-rear outrigger, data invalid.	Check that sensor shaft is properly secured.
E097	Position sensor for right-rear outrigger, data invalid.	Check that the LEDs on the two sensors are both on or off.
E099	Angle sensor for left-rear outrigger, data missing.	Check cabling to sensor.
E100	Angle sensor for left-rear outrigger, data invalid.	Check that sensor shaft is properly secured.
E104	Position sensor for left-rear outrigger, data invalid.	Check that the LEDs on the two sensors are both on or off.
E108	Sensor for fly jib extension length, data invalid.	Check that LEDs on the two sensors blink alternately during extension and retraction. If not, check the cabling.
E110	Angle sensor for main boom, data missing.	Reset sensor by removing connector at bottom of sensor and then reconnecting (see figure *Angle sensor for main boom*).
E112	Sensor for main boom extension length, data invalid.	Check that LEDs on the two sensors blink alternately during extension and retraction. If not, check the cabling.

Code	Description	Action
E113	Pressure sensor for fly jib lift cylinder bottom end, data missing.	Check cabling.
E114	Pressure sensor for fly jib lift cylinder rod end, data missing.	Check cabling.
E120	Angle sensor for turntable, data missing.	Check cabling.
E131	Detection sensor counterweight extended, data difference left-right.	Check that both counterweight elements are properly extended (LEDs on both sensors on).
E132	Detection sensor 'counterweight present', data invalid.	Check that both counterweight elements are properly retracted (LEDs on both sensors on).
E133	Slide sensor for counterweight, data invalid.	Activate the bypass, extend counterweight all the way out and back again.
E135	Detection sensor for winch plate, data missing.	Check winch cylinder for leakage.
E136	Pressure sensor for winch, data missing.	Check cabling.
E138	Pressure sensor for winch, maximum value reached.	Reduce load on the winch.
E139	Limit switch/winch stop active.	Wind out winch cable.
E140	Three-winding protection active.	Wind in winch cable.
E148	Angle sensor for chassis, data missing.	Reset sensor by removing connector at bottom of sensor and then reconnecting (see figure *Angle sensor, chassis*).
E166	Theft protection active.	Theft protection has been activated by Hoeflon International B.V.. Contact your dealer.
E171	Main pressure sensor for hydraulic system, data missing.	Check cabling.
E172	Motor controller fault.	Contact your dealer.
E173	Battery pack fault.	Contact your dealer.
E174	Battery pack charge is below 8%.	The fault code disappears when the charge percentage rises above 8%. When the bypass is activated, the crane can be used until the charge percentage reaches 0%.



Figuur 6.1 Angle sensor for main boom



Figuur 6.2 Angle sensor, chassis

7.

TRANSPORT, STORAGE AND DISPOSAL

7.1 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

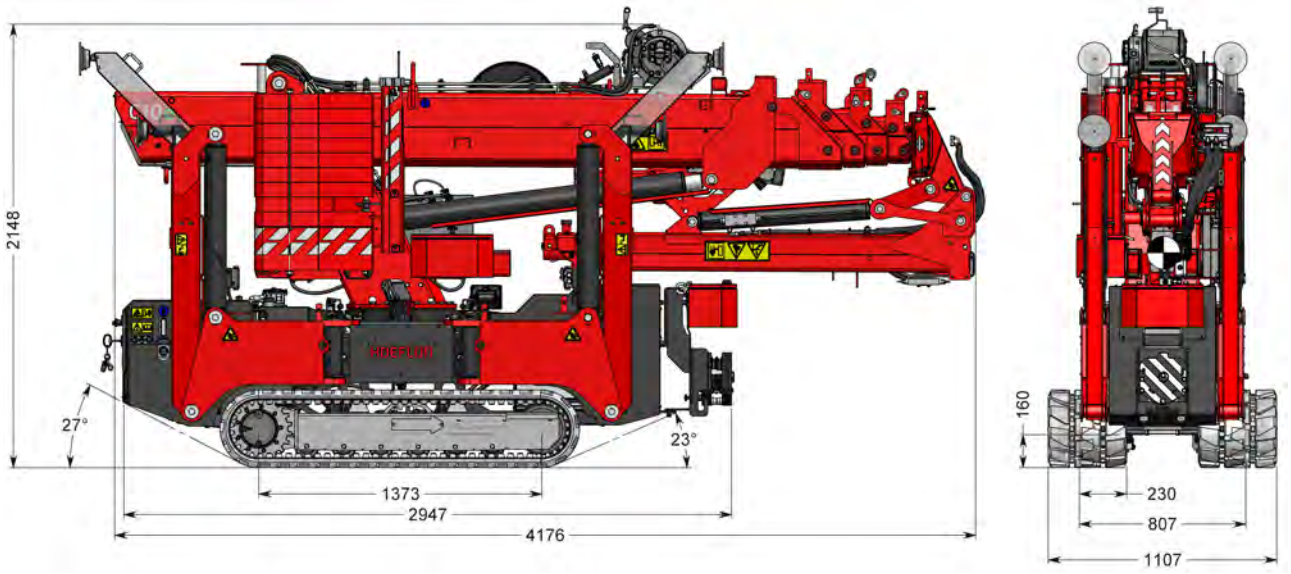
The clearance angle of the loading ramps must not exceed 15°.

WARNING

When transporting the crane, make sure the crane is in transport mode and unloaded. No load on the hook, outriggers stowed in transport position and boom retracted.

REMARK

When driving on a slope (e.g. up loading ramps onto a transport vehicle), ensure that the outriggers are extended on the lowest side to prevent the crane from tilting backwards. The same applies when driving the crane downhill.



TRANSPORT DATA	
Dimensions in transport position (l x w x h)	3.93 x 0.8 x 1.97 m
Dimensions including winch and fly jib	4.15 x 0.8 x 2.07 m
Total weight	4400 kg, or 4700 kg with options
Ambient temperature	-10 to 40 °C

Please note the following points:

- Make sure the outriggers are fully retracted and locked in position and that the crane is fully collapsed.
- There must not be any load on the crane.
- 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°.
- Drive the crane forward, onto a suitable transport vehicle. This could be a pick-up or a heavier commercial van. When driving up the ramps the operator must be assisted by a person who provides instructions concerning the driving direction.
- Stop the crane as described in section *4.4 Starting and switching off the crane*.
- Set the main switch on the electrical cabinet to position **0**.
- Remove any loose parts from the crane.

7.1.1 Lifting, securing and transport equipment

Required equipment:

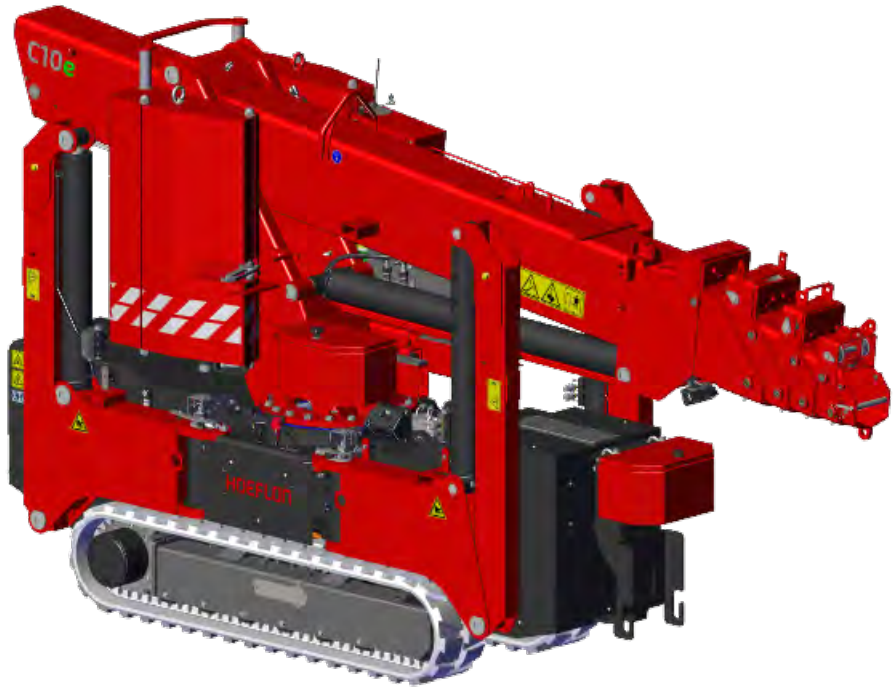
- Lifting equipment
- Securing equipment
- Transport equipment

- 2 chains (capacity: at least 2500 kg per chain)
- 3 lashing straps (capacity: at least 2500 kg per strap)
- Vehicle capable of transporting at least 4700 kg

7.1.2 Putting the crane in transport position

The most compact position of the crane is the transport position. That is without the fly jib, or with the fly jib folded, and with the boom in the lowest position. The outriggers are stowed and the counterweight is retracted. Use this position, with minimum height, for transport and storage of the crane.

With the fly jib mounted under the boom, the boom is at approximately 1° and the winch will be the highest point of the crane. This is the position that is usually used when moving the crane around the job site.



Figuur 7.1 Crane in transport position

Put the crane in the transport position as follows:

1. When the boom is fully boomed down, slew the crane column back to its original position.
2. The jib adapter can be attached to the jib if the fly jib is hanging beside the boom and other attachments are needed.
3. Attachments must be removed from the crane during transport and secured and locked in the appropriate positions. Some of these attachments and their positions are: adjustable section and winch head alongside the boom, manual jib extension on the counterweight, jib adapter in the boom.
4. The lifting cable must always be wound up.

7.1.3 Securing crane for transport

WARNING

Overloaded lashing eyes can cause damage to the crane. Therefore, always follow the instructions for securing the crane.

WARNING

Using a lashing strap to lash down two points also doubles the applied tension.

Figuur 7.2 Securing crane

Please note the following points:

Point	Load on attachment point
Lashing points on undercarriage	Max 2500 kg per eye

- Towards the front and sides lash down at least 0.5 x the crane's weight; towards the rear lash down at least 1 x the crane's weight.
- It is recommended that the space between the headboard of the transport vehicle and the front of both crawler tracks be filled, in connection with braking forces. Otherwise, use lashing provisions that can hold at least 1.5 x the crane's weight at the rear.
- If the lashing eyes on the undercarriage are used to secure the crane, the upper part must be secured to prevent rotation in both directions. Otherwise the turntable may be damaged by movement that occurs during transport.
- 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.

- Secure the crane by attaching four lashing straps to the holes in the outrigger hinge plates. The crane can likewise be secured in the crane column (see *Figuur 7.2*).

7.1.4 Lifting crane for transport

The crane has one lifting point for lifting the crane in the transport position.

Please note the following points:

1. Make sure the crane is in the transport position.
2. Lift the crane using two lashing straps or chains with a capacity of at least 2500 kg per strap/chain. Fasten these to the lifting point on the boom (see *Figuur 7.3*).

Figuur 7.3 Lifting point on boom

7.2 Storing the crane

WARNING

If the crane will be placed in storage for more than six months, contact your dealer for the procedure to be followed.

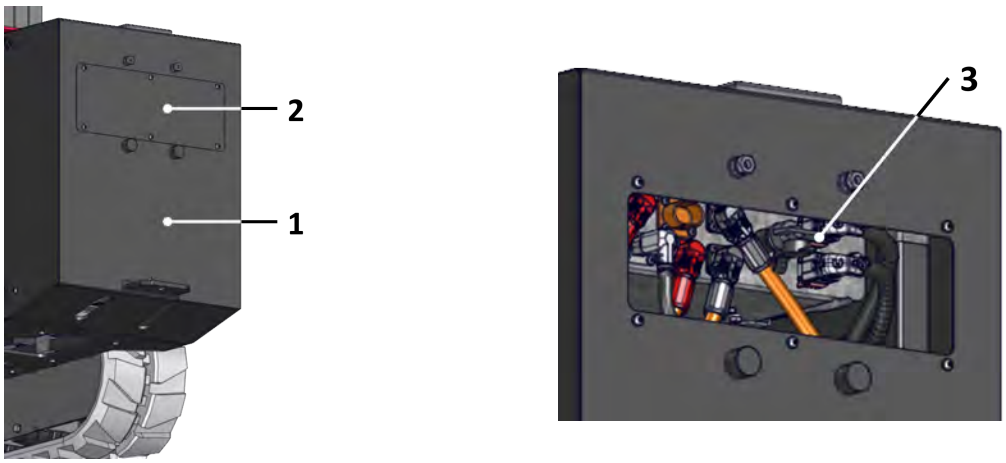
Perform the following procedure before storing the crane for longer than three months:

1. Remove any dirt and clean the crane with water and, for example, car wash shampoo. You may clean the track undercarriage with a pressure washer. Do not point the pressure washer at electrical components.
2. Grease the crane in accordance with the lubrication chart.
3. Repair damage to the paintwork.
4. Grease the parts that may rust.
5. Place the crane in a dry location, protected from rain, heat and cold.
6. Make sure the crane cannot be activated by unauthorised people.
7. Cover the crane with tarpaulin; keep a section free from the ground to allow for ventilation.

Battery

Instructions for the battery during storage of the crane:

- less than one week: no actions required.
- one week to one month: connect the charger of the crane.
- longer than one month: ensure that the SOC of the battery is between 40% and 70%, then turn off the earth switch. The earth switch (3) can be reached by removing the cover (2) of the motor shroud (1).



Figuur 7.4 Earth switch

After a month or more of disuse, it is important to fully charge the crane before it is used again.

7.3 Waste disposal

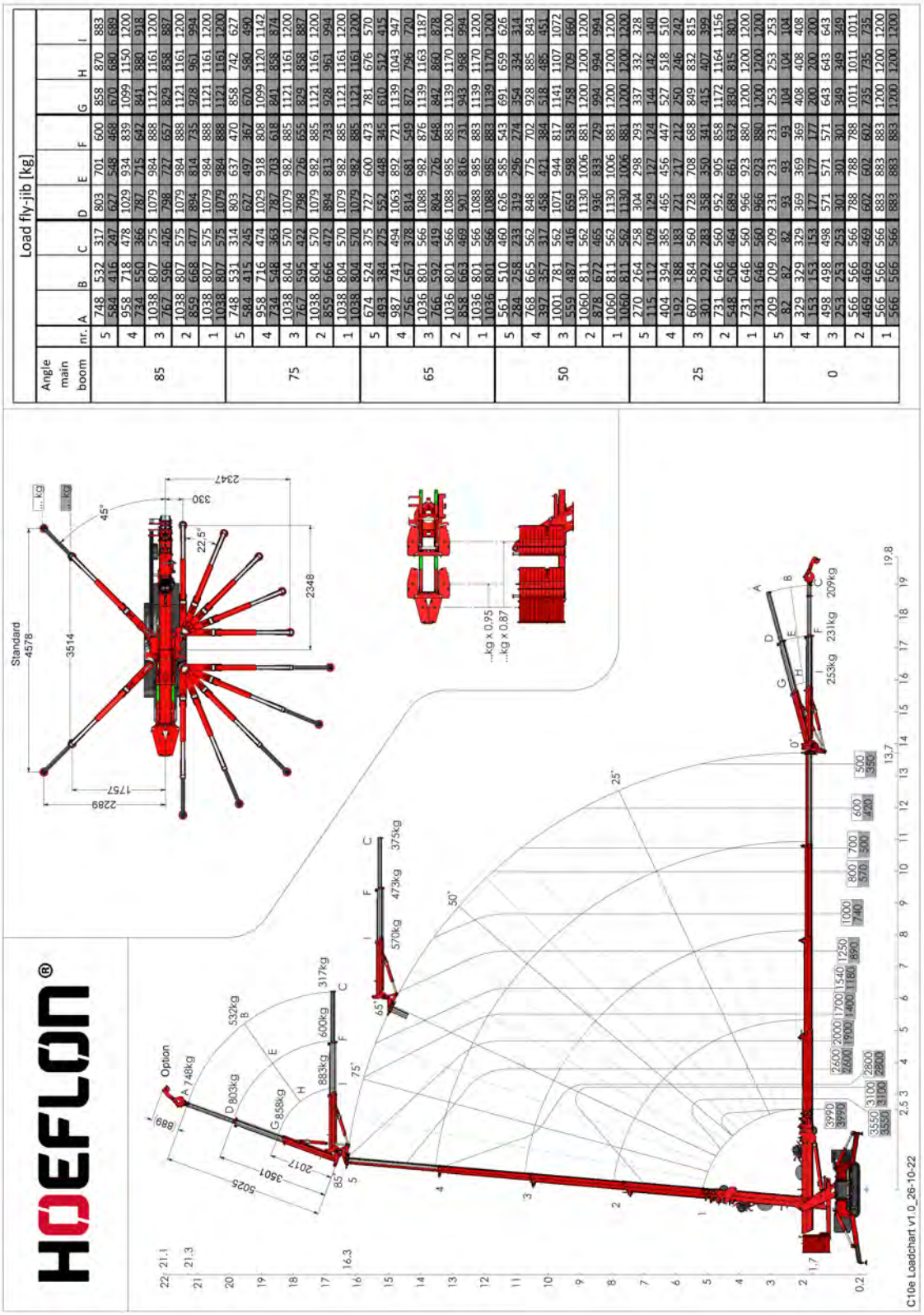
Dispose of waste in accordance with the applicable local regulations. Incorrect disposal of waste can be harmful to the environment. Environmentally harmful waste includes: engine oil, diesel fuel, hydraulic oil, differential oil, coolant, filters, batteries and greases.

8.

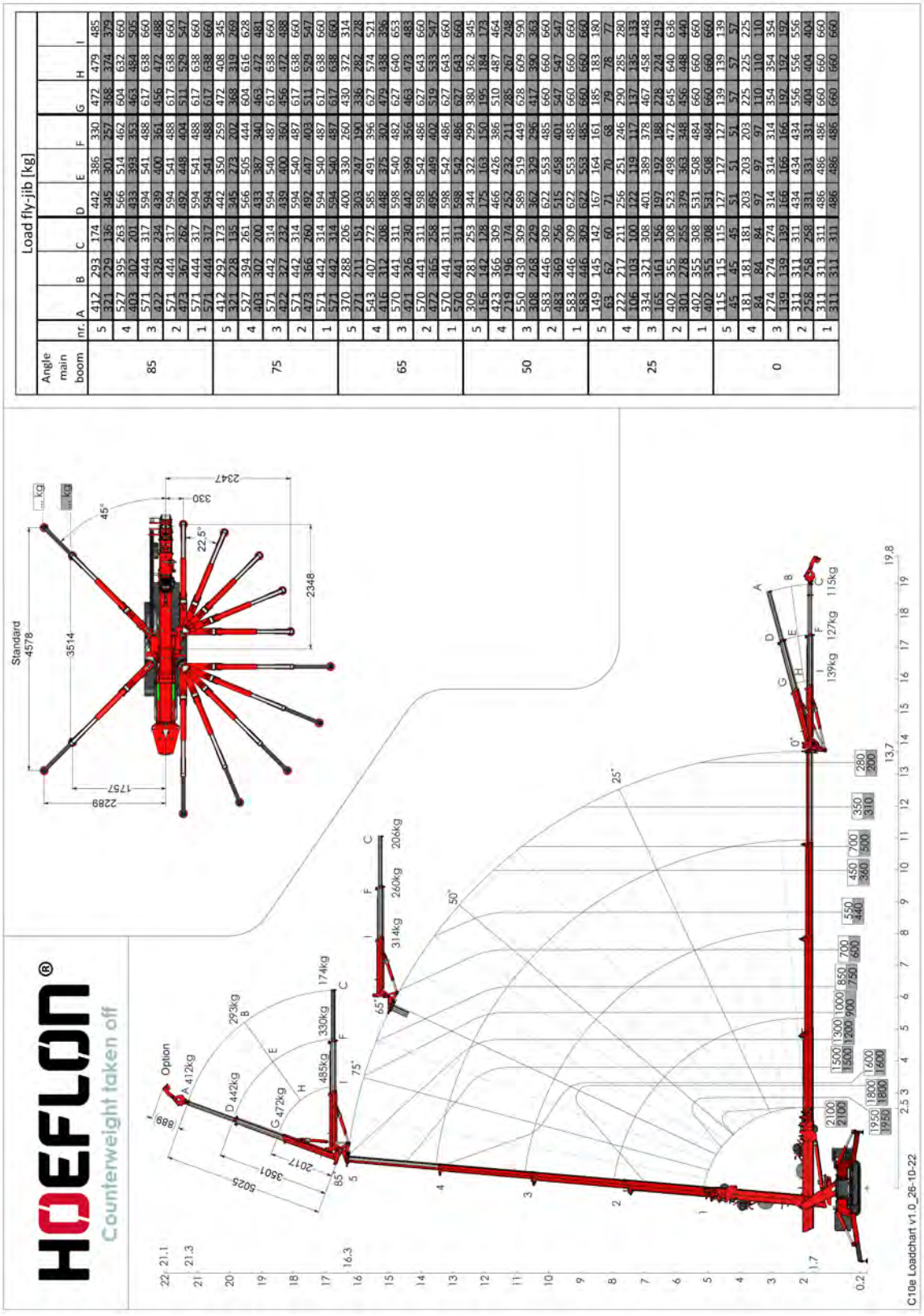
ANNEXES

8.1 C10e load chart

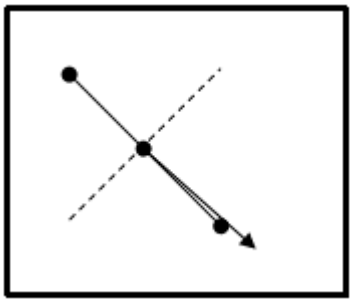
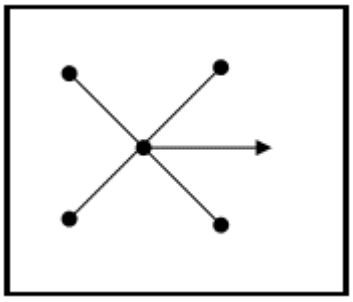
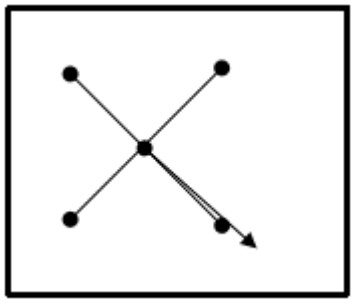
Angle main boom	nr.	Load fly-jib [kg] A	B	C	D	E	F	G	H	I
85	5	748	532	317	803	701	600	858	870	883
		584	416	247	627	548	468	670	680	689
	4	958	718	478	1029	934	839	1099	1150	1200
		734	550	366	787	715	642	841	880	918
	3	1038	807	575	1079	984	888	1121	1161	1200
		767	596	426	798	727	657	829	858	887
	2	1038	807	575	1079	984	888	1121	1161	1200
		859	668	477	894	814	735	978	961	994
	1	1038	807	575	1079	984	888	1121	1161	1200
		1038	807	575	1079	984	888	1121	1161	1200
75	5	748	531	314	803	637	470	858	742	627
		584	415	245	627	497	367	670	580	490
	4	958	716	474	1029	918	808	1099	1120	1142
		734	548	363	787	703	618	841	858	874
	3	1038	804	570	1079	982	885	1121	1161	1200
		767	595	422	798	726	655	829	858	887
	2	1038	804	570	1079	982	885	1121	1161	1200
		859	666	472	894	813	733	928	961	994
	1	1038	804	570	1079	982	885	1121	1161	1200
		1038	804	570	1079	982	885	1121	1161	1200
65	5	674	524	375	727	600	473	781	676	570
		493	384	275	552	448	345	610	512	415
	4	987	741	494	1063	892	721	1139	1043	947
		756	567	378	814	681	549	872	796	720
	3	1036	801	566	1088	982	876	1139	1163	1187
		766	592	419	804	726	648	847	860	878
	2	1036	801	566	1088	985	883	1139	1170	1200
		858	663	469	901	816	731	943	968	994
	1	1036	801	566	1088	985	883	1139	1170	1200
		1036	801	566	1088	985	883	1139	1170	1200
50	5	561	510	460	626	585	543	691	659	626
		284	258	233	319	296	274	354	334	314
	4	768	665	562	848	775	702	928	885	843
		397	357	317	458	421	384	518	485	451
	3	1001	781	562	1071	944	817	1141	1107	1072
		559	487	416	659	598	538	758	709	660
	2	1060	811	562	1130	1006	881	1200	1200	1200
		878	677	465	936	833	729	994	994	994
	1	1060	811	562	1130	1006	881	1200	1200	1200
		1060	811	562	1130	1006	881	1200	1200	1200
25	5	270	264	258	304	298	293	337	332	328
		115	112	109	129	127	124	144	142	140
	4	404	394	385	465	456	447	527	518	510
		192	188	183	221	217	212	250	246	242
	3	607	584	560	728	708	688	849	832	815
		301	297	283	358	350	341	415	407	399
	2	731	646	560	952	905	858	1172	1164	1156
		548	506	464	689	661	632	830	815	801
	1	731	646	560	966	923	880	1200	1200	1200
		731	646	560	966	923	880	1200	1200	1200
0	5	209	209	209	231	231	231	253	253	253
		82	82	82	93	93	93	104	104	104
	4	329	329	329	369	369	369	408	408	408
		153	153	153	177	177	177	200	200	200
	3	498	498	498	571	571	571	643	643	643
		253	253	253	301	301	301	349	349	349
	2	566	566	566	788	788	788	1011	1011	1011
		469	469	469	602	602	602	735	735	735
	1	566	566	566	883	883	883	1200	1200	1200
		566	566	566	883	883	883	1200	1200	1200



8.2 C10e Load chart without counterweight



8.3 Maximum outrigger pressure

Outrigger radius	2300 mm
Outrigger angle	4 x 45°
Outrigger leg	Extended
Counterweight	Extended
Maximum lifting capacity	4000 kg
Net weight	4400 kg
Maximum outrigger pressure in the most unfavourable position 	4850 kg
Minimum outrigger pressure 	3150 kg
Maximum outrigger pressure with outriggers in square configuration 	4250 kg

You can determine the outrigger pressures at the specific configuration positions.