

# **Operator's Manual GB HIAB T-HiDuo 013/018/023/029/038 CE**

This operator's manual is an Original Instruction  
and applies for cranes from serial number:  
BL013000001, BL018000001, BL023000001, BL029000001, BL038000001

2016-04

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## **Congratulations with your new crane!**

You are now the owner of a quality product from Cargotec, built to the highest standards of safety and quality.

The aim of this manual is to help you handle your crane safely and with full satisfaction.

Please read the complete manual. It provides detailed information about the crane, control system and the practical management and maintenance of the crane.

We advise you to read it carefully and familiarize yourself with your crane before you start to use it.



Help us to improve this manual. Please send your comments and suggestions to **[documentation@hiab.com](mailto:documentation@hiab.com)**

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## 1.1 This Operator's Manual is intended for operators of this HIAB crane.

This manual describes:

- Operation
- Safety precautions and warnings
- The crane control system
- Maintenance and troubleshooting

Enclosed to this manual the Installer will provide:

- Technical Data for your crane
- Technical Data and manuals for add on equipment if fitted

Study these instructions carefully



### DANGER

If you do not study the complete Operator's Manual for your crane carefully, it could lead to fatal accidents or serious damage.

Therefore you should:

- Study the entire Operator's Manual carefully.
- Study the operating manuals for other add-on equipment, if fitted.
- Use the crane only after having done so.
- Follow the directions for use, operation and maintenance of the crane and add on equipment exactly.
- Store the Technical Data and manuals from the Installer, together with this Operator's manual.



### ! NOTE

The manufacturer reserves the right to change specifications, equipment, operating instructions and maintenance instructions without prior notice.



**NOTE**

HIAB shall at all times have the right to:

- install, maintain and dismantle automated remote diagnostics system or similar sensor-based system (the “System”) in and from the Equipment; and
- access, send, receive, collect, store and use any and all information and data gathered or created by such System including but not limited to information concerning operation, operating environment, movement, condition, logon, location and similar information relating to the Equipment (the “Information”).

The Customer shall not in any way remove or alter the System, nor interfere with the use of the System or the Information. The System and the Information and all their further developments shall at all times be and remain the exclusive property of HIAB without granting any right or license to the customer.

## 1.2 Indications in the Operator’s Manual

### What must you do and not do?

The following indications are used in the Operator’s Manual:



**DANGER**

Danger to life for yourself or to bystanders.  
Follow the instructions carefully!



**WARNING**

Danger of injury to yourself or to bystanders, or danger of serious damage to the crane or other objects.  
Follow the instructions carefully.



**CAUTION**

Hazard for the crane or crane components.  
Follow the instructions carefully.

**Important:**

If actions are numbered

1. Do this
2. Do that
3. ....
4. ....
5. ....

you should carry them out in numerical order!

**! NOTE**

Extra information that can prevent problems.

**TIP**

Tip to make the work easier to carry out.

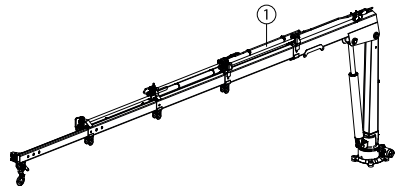
**Symbol for reference to a component in an illustration**

① Refers to a component in an illustration.

[option]: Indication for parts that are not-standard for the crane, but are an option.

**DANGER**

Only persons with the requisite knowledge and experience with cranes may use the crane.  
Never operate the crane when you are sick, tired, under the influence of medicines, alcohol or other drugs.



- Take the delivery instructions from your HIAB Service workshop, or receive instruction from an experienced person from your own company. Only then should you operate your crane.

- Ensure that you comply with the statutory requirements of the country in which you use the crane (for example, certificate, obligatory safety-helmet).



## DANGER

- Carry out yourself only the service and maintenance work you have the requisite knowledge and experience of.
- All other maintenance work may only be carried out by a HIAB service workshop.
- Ensure that every defect is rectified immediately, according to the instructions.
- Follow the instructions exactly!
- All other work to rectify faults must be performed by personnel in a HIAB service workshop!



## WARNING

- Never clean the electronic system, plastic components, signs or bearings with a high-pressure jet cleaner. It could cause damage.
- Never expose the electronic system to high electrical voltages. This could damage the safety system.
- Never immerse the controller in water or other liquid. This will make the controller unusable.

If your crane is equipped with add-on lifting equipment:

- The operation of the crane with add-on lifting equipment can differ from the operation as described in this manual.
- You should therefore study the Operating Manual for the add-on equipment carefully, before you use the crane.
- Take particular note when placing the crane in to or out of transport position.

### 1.3 The Machinery Directive 2006/42/EC

- The Declaration of Conformity, delivered with the crane contains ①:
- Business name and full address where the crane is manufactured ②:  
Factory addresses:  
Hiab Cranes S.L.U. Pol. Ind. Malpica, calle E, 86 50016 Zaragoza, Spain  
Cargotec Poland Sp. z o. o. Ul. Metalowa 2, 73-102 Stargard, Poland
- Description and identification of the loader crane ③:  
Mark  
Type: see chapter Identification of the crane.  
Serial number  
Manufact. year  
Declaration of which provisions the loader crane fulfils.
- Name and address of the person authorised to compile the technical file ④:  
Name  
Address
- Identity and signature of the person who drawn up the declaration ⑤:  
Name  
Position  
Date and Signature

**Declaration of conformity with the Machinery Directive 2006/42/EC**

We .....  
.....

hereby declares that the loader crane:

**Mark:** .....  
**Type:** .....  
**Serial number:** .....  
**Manufact. year:** .....

.....  
..... complies with the provisions of the machinery directive 2006/42/EC;  
..... also complies with the provisions of the directive on electromagnetic compatibility 2004/108/EC as amended.

Technical file in accordance with Directive 2006/42/EC, Annex VII A is compiled by:

**Name:** .....  
**Address:** .....

This declaration is drawn up by:

**Name** .....  
**Position** .....

XXXXXXXXXX                      XXXXXXXXXXXX



## 1.3.1 Identification of the loader crane



The information below is to be filled in by the installer. The same information will be found on the serial number plate on the crane:

Mark: HIAB

Type: .....

Serial number: .....

Manufact. year: .....

	<b>HIAB</b>	
<b>LOADER CRANE</b>		
TYPE	<input type="text"/>	
SERIAL NO	<input type="text"/>	
MANUF. YEAR	<input type="text"/>	
<small>Cargotec</small>		

## 2.1 Main groups

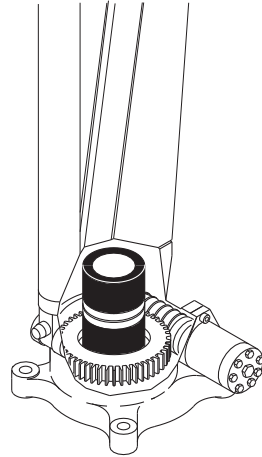
The HIAB crane consists of the following main groups:

- Crane base with column and slewing system
- Stabiliser system
- Boom system
- Operating system

## 2.2 Crane base with column and slewing system

Crane base, column and the slewing:

- Crane base  
worm wheel  
hydraulic motor
- Column  
bearings
- Cog wheel



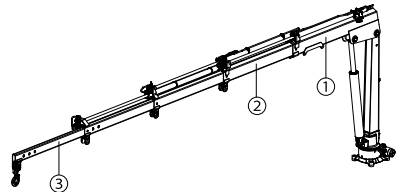
## 2.3 Boom system

The boom system consists of the following components:

- 1st boom ①
- Hydraulic extension ②
- Manual extension ③

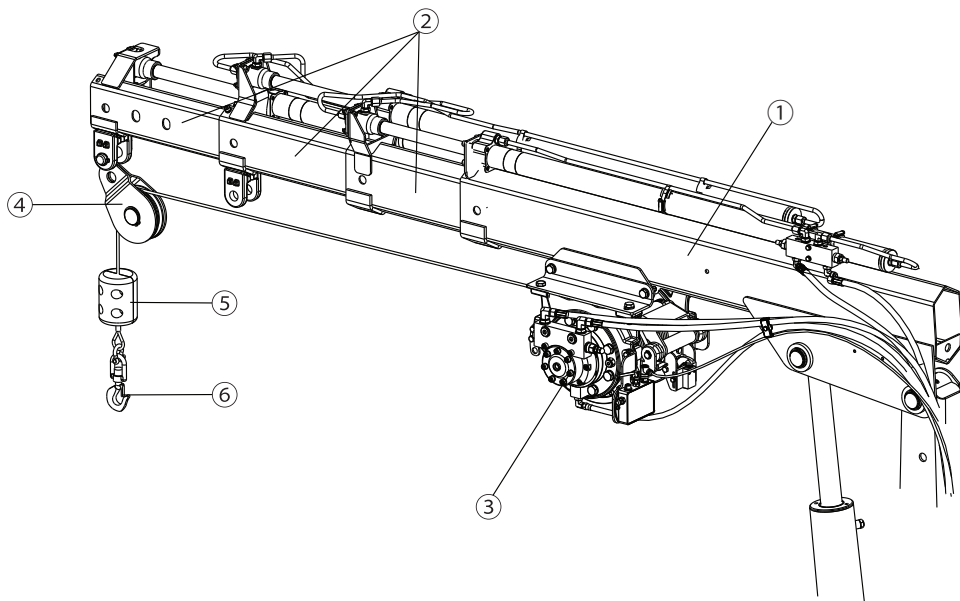
The length of the hydraulic extension depends on the type of crane.

Manual extension is slid by hand into the hydraulic extension.





## 2.4 Boom system with hoist



**The boom system consists of the following components:**

- ① 1st boom
- ② Hydraulic extensions

The length of the hydraulic extension depends on the type of crane.

- ③ Hoist [option]
- ④ Sheave block [option]

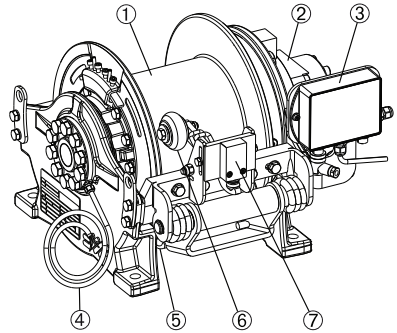
The sheave block must only be attached to a hydraulic extension. Never to a manual extension.

- ⑤ Counterweight [option]
- ⑥ Hook [option]

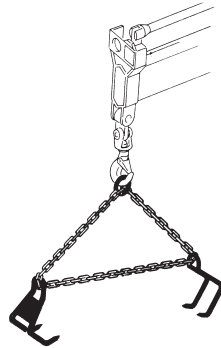
**Hoist [option]**

The hoist consists of the following components:

- ① Rope
- ② Motor
- ③ Electronic box
- ④ Electrical wire to load sensor
- ⑤ Pressure roller
- ⑥ Wear plate for rope end monitoring
- ⑦ Switch for 3-rolls left to rope end monitoring

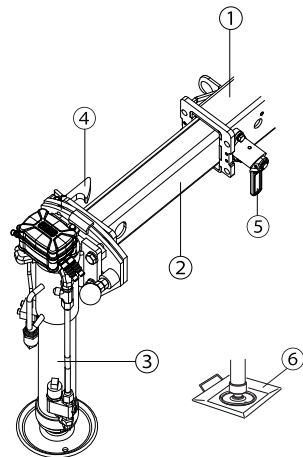
**Separate lifting accessories [option]**

Separate lifting accessories, help to make or use a slinging device: eye-hooks, shackles, eye-bolts etc.

**2.7 Stabiliser leg system**

Every truck mounted HIAB crane has a minimum of **one** stabiliser leg. Auxiliary stabilisers may be needed for heavy cranes.

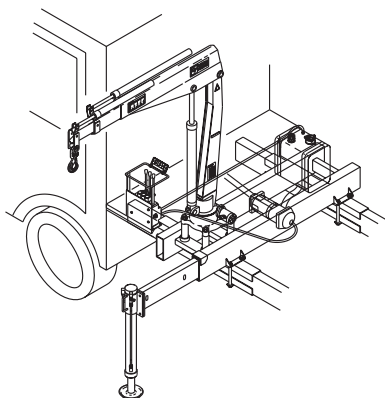
- Stabiliser beam ①
- Stabiliser extension ②.
- Stabiliser leg ③
- Stabiliser leg locking device ④
- Stabiliser extension locking device ⑤
- Support plate ⑥. The support plates are used under the stabiliser legs for additional support.



## 2.8 Operating system - hydraulic components

The operating system consists of the following hydraulic components:

- oil tank
- hydraulic pump  
PTO or a 12V/24V motor
- Main control valve
- hydraulic hoses and pipes
- actuators:  
first boom cylinder  
extension cylinder/s
- filter/s

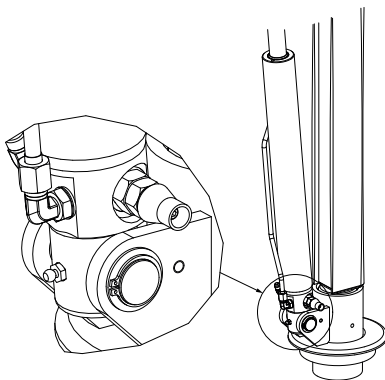


## 2.9 LHV Load holding valves

The cylinder is equipped with a load-holding valve. After a crane movement it holds the crane in position.

If there is a leak or a component fractures, such as a pipe, hose or a coupling, the load-holding valve will stop the boom from collapsing down, even when the hydraulic system is switched off, and you operate a particular crane function.

To operate a hydraulic cylinder equipped with a load holding valve, an opening pressure is required.



## 2.10 Description of HIAB T-HiDuo 013/018/023/029/038

The HIAB T-HiDuo 013/018/023/029/038 are compact, hydraulically operated goods cranes and fulfil the European Machinery Directive requirements specified in the standard EN12999. The cranes are stress class S0, according to EN13001.

Lifting capacity:

- HIAB T-HiDuo 013 = approx. 1,2 tonne metres
- HIAB T-HiDuo 018 = approx. 1,8 tonne metres
- HIAB T-HiDuo 023 = approx. 2,3 tonne metres
- HIAB T-HiDuo 029 = approx. 2,8 tonne metres
- HIAB T-HiDuo 038 = approx. 3,6 tonne metres

The cranes are supplied in versions from:

HIAB T-HiDuo 013-1 (reach 2 metres) to HIAB T-HiDuo 013-3 (reach 4,2 metres)

**Note!** VSL is not available on Hiab T-HiDuo 013

HIAB T-HiDuo 018-1 (reach 2 metres) to HIAB T-HiDuo 018-3 (reach 4,2 metres)

HIAB T-HiDuo 023-2 (reach 3,4 metres) to HIAB T-HiDuo 023-3 (reach 4,4 metres)

HIAB T-HiDuo 029-2 (reach 3,4 metres) to HIAB T-HiDuo 029-4 (reach 5,5 metres)

HIAB T-HiDuo 038-2 (reach 3,6 metres) to HIAB T-HiDuo 038-4 (reach 6 metres)

The crane type and the manufacturer are marked on the serial number plate.



### **! NOTE**

The exact technical information for your crane is shown in the Technical Data.

### 3.1 Operating conditions

You may only use the crane under the following conditions:

- In the open air, or in spaces with sufficient ventilation.



#### DANGER

- If you use the crane in a confined space you could suffocate from the exhaust gases from the vehicle.
- With a mean wind velocity less than 13.3 m/sec (approx. 29.7 mph). **See the wind speed table.**
- Never use the crane in a high wind or storm. When the mean wind velocity exceeds 13.3 m/sec (approx. 29.7 mph) the crane will behave unpredictably. **Never** use the crane during a thunderstorm.
- **Never** use the crane at temperatures below -40° C (-40 °F), as the steel's properties deteriorate below this temperature.



#### WARNING

- At temperatures below 0 °C (32 °F):  
Do **not** touch the operating levers during the first few minutes.
- When starting in cold weather, the wear on the hydraulic system is greater than at normal working temperatures.

To minimise wear, the crane should be started as follows:

- Engage the power take-off at low rpm.
- Allow the system to idle for a few minutes.
- Operate the stabiliser leg up for one minute in order to warm up the oil.
- Working with hoist in temperatures below -10 °C (14 °F) operate the hoist in both directions without load for a few minutes to warm up the oil.



## 3.2 Definition of a HIAB loader crane

### Usage of the crane

The HIAB loader crane is used to lift and move loads in the working area permitted by the load plate and the load diagram. The cranes are normally mounted on a vehicle but they can also be mounted on a fixed base plate. The crane can be equipped with a number of accessories.

Loader cranes are designed for loading and unloading the vehicle, as well as for other duties as specified:

#### Permitted duties:

- Loading and unloading cargo from/to a vehicle
- Lifting of loads from the ground/vehicle to a higher place
- Installation work (beams, concrete plates, windows...) in building constructions
- Lifting construction material (wall boards, bricks, blocks...) on a pallet fork to a building, taking the material from the vehicle on which the crane is mounted, from another vehicle or from the ground
- Hoisting, e.g. beams, concrete plates and any other material and equipment used in building construction
- Collection of waste and recycling material (glass, paper, cardboard, plastic...)
- Installation of informative posts, road signs, notice boards, traffic lights, street lights...
- Handling submerged pumps in wells, using a hoist

#### Forbidden duties:

- Crane mounted onboard ships or floating structures, only permitted in cases authorized by HIAB

- 
- Continuous use as a production crane in assembly lines, foundries..., except for cranes prepared for that purpose
  - Loading cargo that is partially loaded or fastened by other means, without making sure the capacity of the crane is enough for the entire load
  - Any duty which implies:
    - Pressure against the ground, unless the crane is specifically prepared for this
    - Push/pull with the boom system against any type of obstacle (wall, ground...)

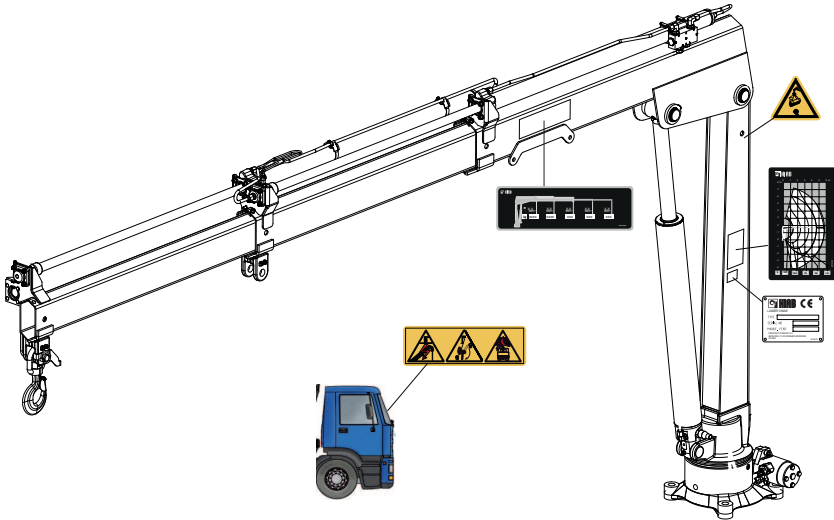
### 3.2.1 Noise declaration

The following values for emitted noise may be taken as general and conservative values for ordinary installations of loader cranes on normal diesel engine powered trucks. Declared dual-number noise emission values in accordance with ISO 4871:

- Emitted A-weighted sound power level for basic loader cranes in accordance with ISO 3744:  $L_{wA} = 103$  dB (Uncertainty:  $K_{wA} = 2$  dB).
- Emitted A-weighted sound power level for loader cranes with hoist in accordance with ISO 3744:  $L_{wA} = 107$  dB (Uncertainty:  $K_{wA} = 2$  dB).
- A-weighted sound pressure level at loader crane control stations in accordance with ISO 11201:  $L_{pA} = 95$  dB (Uncertainty:  $K_{pA} = 4$  dB).

Particular installations can be quieter, in which case a post installation noise measurement in accordance with clause 6.3 of EN 12999:2011 may be used to prove this.

### 3.2.2 Warning signs



### 3.2.3 Maximum load

#### Lifting capacity

Your crane has a certain lifting capacity, expressed in kNm or tm. This lifting capacity is also known as the load moment. The lifting capacity is: the payload at hook multiplied by the outreach in metres that the crane can operate at different positions. The lifting capacity of your crane determines the maximum load your crane may lift within its working zone. However take careful note; the greater the operating radius of the crane, the lower the lifting capacity will be because of the weight of the boom system itself. The load plate and the load diagram on your crane show the maximum loads you may lift in the operating reach of your crane.



**DANGER**

- Overloading could result in damage to the crane or in the worst case, personal injury or death
- Never increase a hanging load, since that may cause a load holding valve to open and/or the vehicle to turn over.

**! NOTE**

The extra weight of the lifting accessories has to be added to the load. Thus, with lifting accessories the load you can lift is less heavy.

**Load plate**

You will find the load plate on the boom system. On the plate is the maximum weight that you may lift at a given reach, with the 1st boom in the optimum position. In chapter Technical Data in this manual you will find these values for your crane.

**Optimum position**

The weight that your crane can lift will be determined by:

- Stabiliser extensions positioned and legs pressed to ground.
- The reach at which you are working and the optimum position of the boom.
- The optimal position for your crane is on the load plate.

**DANGER**

**Never** exceed the maximum weight on the load plate.

### 3.2.3

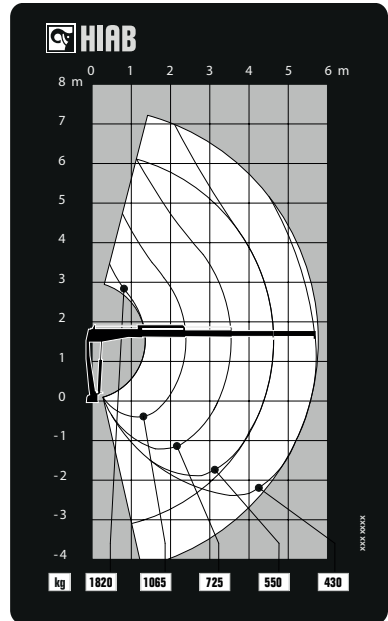
## Safety precautions and warnings

### Load diagram

The load diagrams are placed on the column and show the maximum loads your crane may lift in the entire working zone (manual extensions excluded). The load diagram drawing will also be found in the enclosed Technical Data.

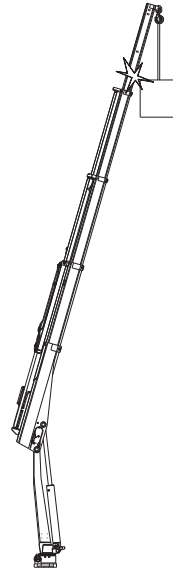
**The white area is the working zone of the crane.**

The load curves show the maximum load that may be lifted at a given reach and height. For a given maximum load, the possible working zone is to the left of the load curve. The lifting capacity for some cranes is limited in the high lifting area.



### WARNING

Care must be taken when handling loads in the high lifting area, so the load/tool does not come into contact with the boom system.

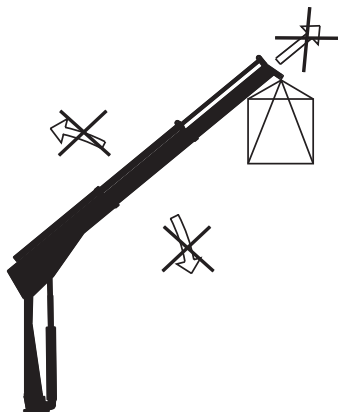


### 3.2.4 Maximum load moment

If your crane has reached the maximum load moment (lifting capacity), the OLP gives a warning and locks any crane movement that will increase the load moment. This is known as an OLP situation.

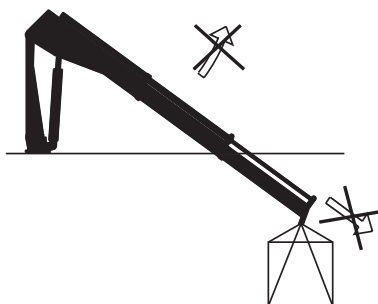
**If the first boom is raised, then the following movements are locked:**

- first boom down/up
- extension boom out



**If the first boom is downward, then the following movements are locked:**

- first boom up
- extension boom out



### Lifting the load

You obtain the best from your crane in this way: Ensure that you always have the work in clear view. If you cannot see the load properly, you could cause a fatal accident or serious damage.

### Sling length

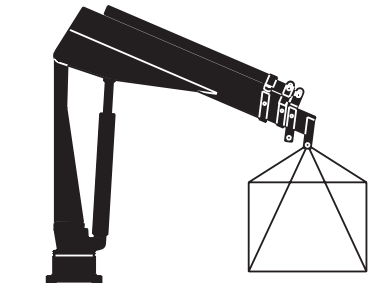
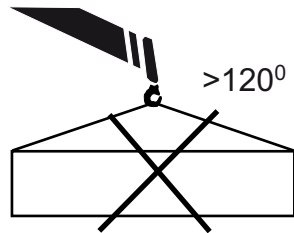
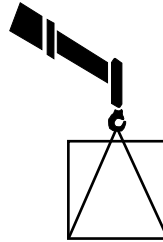
Always attach the load using the shortest possible sling. The angle between the legs of the sling must not exceed  $120^\circ$ . The maximum working load (usually known as the working load limit (WLL) in standards) of a multilegged sling for general purposes is calculated by multiplying the WLL of a single leg by a mode factor, in accordance with the table.

Max angle to the vertical of any sling leg (degrees)	Mode factor two legged sling	Mode factor three and four legged sling
0-45	1,4	2,1
45-60	1,0	1,5

If the angle between the legs of the sling exceeds  $90^\circ$ , the slings should not be hung directly on the hook, but rather be slung from a ring that is hung on the hook.

### Working close to the load

Always try to lift the load with the extension boom retracted, however not completely. The crane then has the greatest lifting capacity. Place the vehicle as close as possible to the load.

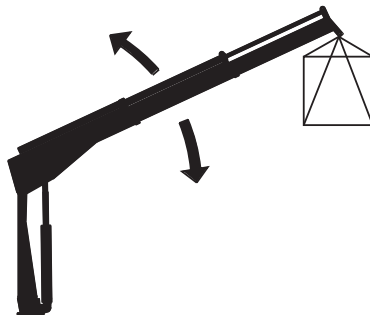


**TIP**

Make smooth crane movements: operate the crane with various functions simultaneously. In this way you will also prevent the hydraulic system heating up quickly.

**DANGER**

Never exceed the maximum permissible loading of the hook.



### 3.2.6 Determination - Hoist

The TC hoists belong to the group of hoisting winches. The use as determined is hoisting and lowering of loads as specified for each hoist type and under the attention of the given installation regulations as well as of the safety notes.

Passenger transport with a.m. hoists is forbidden!

The use as determined also includes the related equipment manufacturer's recommendations regarding installation, operation and maintenance.

Machine safety is guaranteed only if it is used for its intended purpose and according to instructions in this manual.

### 3.3 Signals when using a crane

**DANGER**

- If it is not possible to see the load and the entire working area clearly the crane operator is obliged to follow the instructions and signals given by a qualified person.
- The country-specific regulations for crane operator signals are to be used.

Signals in this manual give a number of standard signals that can be used.

**Lift**

Raised arm and index finger raised. Circular motion with hand.

**Lower**

Arm pointing downwards and index finger down. Circular motion with hand.

**Stop all crane movements**

Also: **Hold the load in position.**

Raise the open hand, with the palm clearly visible, and arm at shoulder height.

Keep the hand still.

**Emergency stop for all movements by the crane.**

Raise the hands and the arms to an oblique angle.



## Very short movement

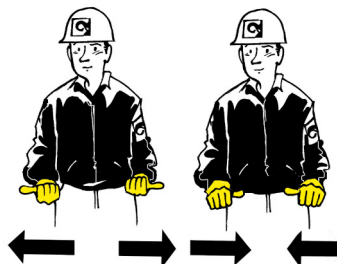
Place the hands a very short distance apart, with the palms facing each other. The hands may be held either horizontally or vertically. The next movement may be: Lift, lower, move the lifting gear, change the reach, or turn.



## Change the reach

Signal with your hands.

- Sideways movement outwards with both hands. Thumbs outwards.
- Sideways movement inwards with both hands. Thumbs inwards.



## Turn in the direction indicated

Indicate the direction with the hands.



### 3.4 Wind speeds

Wind speed averaged over 10 minutes at a height of 10 m

Wind Force	Above flat ground		Characteristics
	m/s	Wind type	
0	0.0 - 0.2	Calm	Calm, smoke rises vertically or nearly vertically
1 2	0.3 - 1.5 1.6 - 3.3	Slight breeze	Wind direction recognisable from smoke plumes, the wind begins to be noticeable on the face; leaves begin to rustle and weather vanes can start to move.
3 4	3.4 - 5.4 5.5 - 7.9	Moderate wind	Leaves and twigs in continuous movement, small branches begin to move. Dust and paper begin to move over the ground.
5	8.0 - 10.7	Fairly strong wind	Small leaved branches make swaying movements; crested waves form on lakes and canals.
6	10.8 - 13.8	Strong wind	Large branches move; you can hear the wind whistling in telephone wires; umbrellas can only be held with difficulty.
7	13.9 - 17.1	Severe wind	Entire trees move; the wind causes difficulty when you walk into it.
8	17.2 - 20.7	Stormy wind	Twigs break off, walking is difficult.
9	20.8 - 24.4	Storm	Causes superficial damage to buildings (chimney pots, roof-tiles, and TV antennae are blown off).
10	24.5 - 28.4	Severe storm	Uprooted trees; considerable damage to buildings etc. (occurs infrequently on land).
11	28.5 - 32.6	Very severe storm	Causes extensive damage (occurs very infrequently on land).
12	> 32.6	Hurricane	



## 3.5 Use of the crane

### Starting crane operation



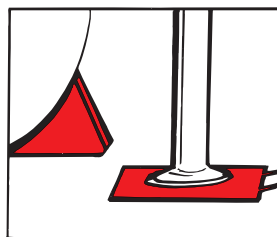
#### DANGER

- Wear a safety helmet (compulsory in some countries!).
- Check that the ground is sufficiently flat and firm.
- To ensure that the vehicle stays in its position, always engage the parking brake and place chocks under the wheels.
- Check that the ground is not undermined. Look out for sewers, cellars, excavations etc.
- The stabiliser legs must not be able to sink in! Use support plates that are large and firm enough for your crane. The plates must not bend under load.

Check that the support plate as, it comes under load, is not pushed into the ground.

- Ensure you can see the stabiliser legs and stabiliser extensions when you are operating them.
- Do not lower the stabiliser legs on the edge of an embankment, soft shoulder, slope etc.

Lower the stabiliser legs only on to a flat and firm surface.



**DANGER**

- Do not stand in front of the hydraulically operated stabiliser legs when you are operating them!
- Never use the stabiliser legs as a parking brake, since the vehicle could start to slide.
- Slide the stabiliser extension, on both sides of the vehicle, out completely if possible. Then lower the stabiliser legs for support.
- Never operate the stabiliser legs, while the crane has a load!

**WARNING**

- Use low force when placing the stabiliser legs on the ground.
- Do not raise the vehicle with the stabiliser legs, if the crane is equipped with only two stabiliser legs!

If you raise the vehicle with the stabiliser legs, this may damage the stabiliser legs.

- Check that the add-on lifting accessories and separate lifting accessories are in good order!

Add-on lifting accessories are sometimes fitted on the crane (hoist, JIB) or placed between the boom tip and the load (grapple, rotator).

Separate lifting accessories are connected to the standard load hook (slings, chains, shackles etc).





**DANGER**

Do not stand in front of the boom system when operating the crane out of parking position.



**3.5.1 Preparations for use**



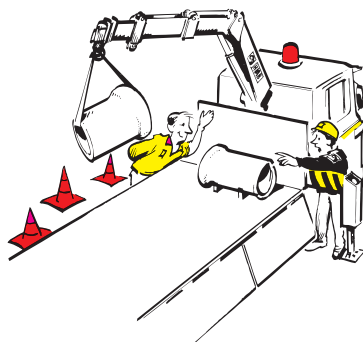
**DANGER**

Ensure that there are no unauthorised persons within the operating range of your crane!



**TIP**

Mark out the working range, e.g. with cones.  
Put on your vehicle's warning lights.



## 3.5.1

## Safety precautions and warnings



### DANGER

- If a part of the crane comes in contact with an electricity line, you will be electrocuted!
- Maintain the following minimum distances between the crane and overhead electricity lines, unless otherwise prescribed by national rules.

### Minimum distance between crane and overhead electricity lines

Voltage (V)	Minimum distance to an insulated conductor	Minimum distance to an un-insulated conductor
<500 V	0.5 m	2 m
500-40000 V	1.5 m	4 m
>40000 V	2.0 m	6 m

### Voltages are found:

up to 500 V:	to buildings
500-40000 V:	trams, trains
over 40000V:	power transmission

### Crane operation



### DANGER

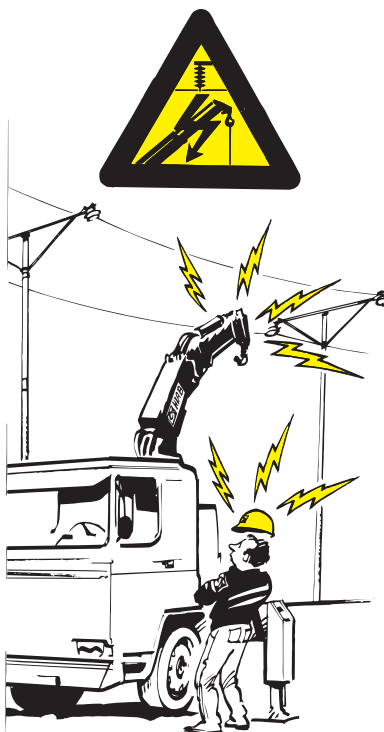
You remain responsible for safe use of the crane!

Therefore, always work according to the operating instructions!

### In an emergency immediately switch off all crane movements!

- Press a **stop button**.

To avoid unexpected load movements and at every interruption in crane operation.



**DANGER**

- Keep checking that there are no unauthorised persons within the operating reach of the crane!
- Make certain that you can always see the load!

If your view of the load is not adequate, have someone else give you signals.

See the list of signals. Make certain that you and the person assisting you know these signals.

- Pay attention to the safety of the person giving the signals!
- Never move the vehicle, if you have a freely-suspended load on the crane!
- Never walk or stand under a suspended load!

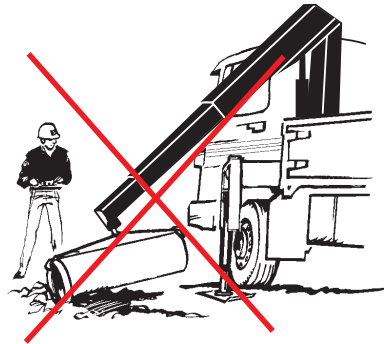
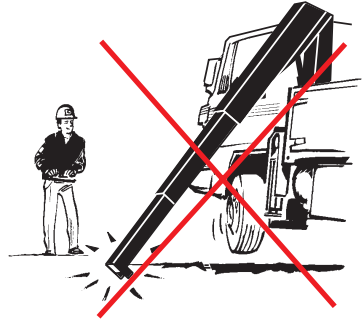
During operation, never stand below the boom system or load!

- Never slew at full speed to the final position. This will damage the slewing system.



**WARNING**

- Never push a load along the ground, or the vehicle's load space, with the extension boom. This can cause damage to the boom system. This will lead to expensive repairs.
- Never use the extension boom as a jack. This could damage the slewing bearings and the connection between the crane column and the crane base.
- Always lift the load from the ground before you start to slew. Do not tow the load over the ground. This can damage the boom system.
- If you are working with loads in restricted spaces (for example, windows):  
Check that the boom system can move up and down freely.  
The boom system will bend somewhat, when loading and unloading the crane.
- If the boom system is in a high position (first boom above 70°), do not allow the boom to lower at full speed. The crane could go into uncontrolled movement.  
Be careful if, in particular, the OLP gives an early warning!
- When loading the vehicle:  
Take the load off the stabiliser legs by withdrawing them slightly. The stabiliser legs must remain in light contact with the ground.

**CAUTION**

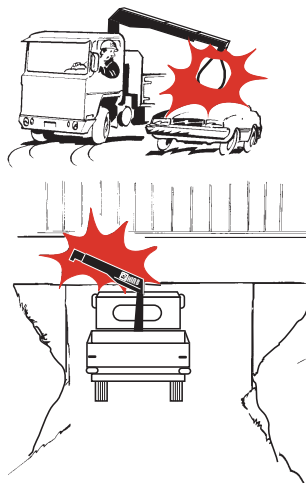
- Operate the crane using smooth and gentle lever movements.
- If a cylinder is at its end position, free the operating lever. Otherwise overheating can occur.

### Driving with the crane



#### DANGER

- Never drive the vehicle if there is a load suspended from the crane.
- Before you move the vehicle:  
Check that there is no pump flow to the crane control valve. The PTO or power supply must be disengaged. The operating system must be switched off!
- Pay attention to the width and height of the crane in the transport position. The crane has to stay within the width of the truck. Make sure the stowed crane can not hit bridges, tunnels etc.
- Pay attention to overhead power lines! Make sure that no part of the crane ever comes in contact with overhead power lines.



### 3.5.4 Ending crane operation



#### DANGER

Always end crane operation as follows:

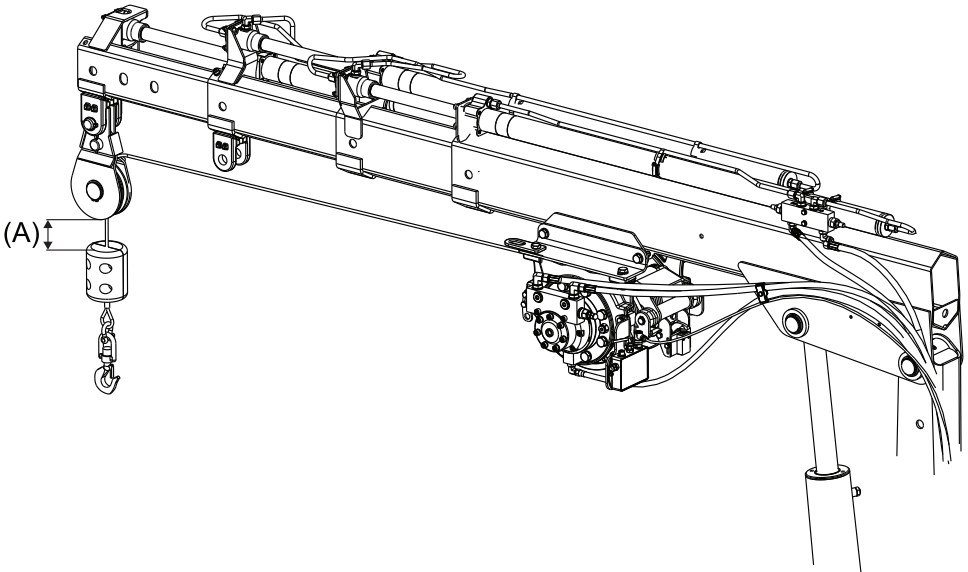
- After use, always place the crane in the transport position!
- Withdraw the stabiliser legs and stabiliser extensions.
- Check that the locking mechanisms are properly locked.
- Switch off the operating system.
- Disengage the PTO or power supply after work.
- If you drive with the PTO or power supply engaged, this will cause serious damage to the PTO/gearbox combination.
- Only after doing the above, should you drive the vehicle away.

### 3.6 Use of the Hoist

The hoist is a crane accessory which permits load handling without any or only limited boom movement.

Lifting and lowering is achieved by winding/unwinding the drum rope.

During hoist operation, the rope must not be pulled off the hoist drum completely. The hoist safety system is fitted with an automatic system to prevent that. Three safety windings will always remain on the drum.



#### WARNING

The counterweight should not touch the sheave block. As a safety measure, distance (A) between them should preferably not be less than a visible gap, to allow getting out of an overload situation and avoid unnecessary stresses in the boom system.



**WARNING**

**Make sure that ropes do not touch or slide over corners, cutting edges or other obstacles, for example sharp edges on surfaces close to the wire rope.**

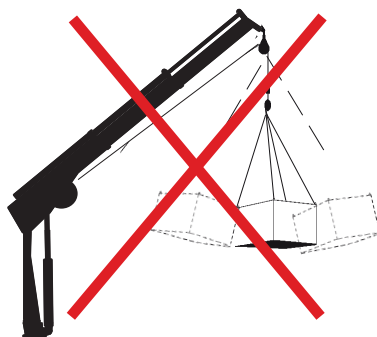
The swing is mainly caused by the wind and can occur with or without load.

**WARNING**

The load should not swing excessively. Max permissible swing angle (pendulum angle) e.g. 20°. If the load starts to swing, it shall be stabilized and return to a calm state especially in the last 1,5-2 meter towards the sheave block. The swing amplitude increase extensively while the counterweight approach the sheave block.

**DANGER**

- When using the hoist, follow the instructions carefully!
- Watch out for hazards!
- Always stay clear of the hoist, hoist cable, sheave block and counterweight when operating the hoist.



### 3.7 Use of lifting equipment

**DANGER**

- Only use lifting accessories that are suitable for your crane. Contact a HIAB service workshop.
- Never attempt to install add-on lifting accessories yourself!
- Add-on lifting accessories may only be installed by an authorised HIAB service workshop.
- When using lifting accessories, follow the instructions supplied with the equipment!
- Watch out for hazards!
- Never try to adjust lifting accessories when you are working on the crane!

After the lifting accessories have been fitted:

1. Check that the lifting accessories are securely fixed.
2. Only after this should you use your crane.

**WARNING**

- Clean the couplings, when connecting and disconnecting lifting accessories. Dirt can damage the hydraulic system.
- Take care that your fingers are not trapped

### 3.8 Use of demountable cranes

**DANGER**

- Ensure that there are no unauthorized persons in the immediate vicinity of the crane. When mount/demount the crane to the vehicle people can suffer fatal crushing injuries!
- After setting up:  
Check that the crane is properly locked!



### **WARNING**

Take care when mounting/demounting the crane on/off the vehicle.

Roughly handling can seriously damage the crane or the vehicle.

## 4.1 Safety System SPACE 4000 and Remote Control

With the XSDrive Lite you can control the crane remotely.

### The safety system:

- Monitors the crane's operation and prevents unsafe actions.
- Increases the precision with which you can work.
- Makes operation easier.
- Makes troubleshooting easier.

SPACE 4000 is used on cranes with Main control valve type: Open center and remote control XSDrive Lite



### **! NOTE**

The safety system provides a large number of functions. Certain functions are standard, others are options.

If you do not use the system for 30 minutes, it will switch itself off, in order to prevent draining the truck battery. This feature can be cancelled.

Contact your HIAB service workshop.

## 4.2 How the safety system works

On the crane there are various sensors and indicators which send signals about the crane's load, position and movements to a central microprocessor. The microprocessor then decides how the crane can be operated and stops/reduces prohibited movements/speeds according to the following:

- When prohibited movements/speeds are approached, a warning is given.
- When prohibited movements/speeds are reached:

On remote controlled cranes prohibited movements are stopped.

On manually operated cranes, all movements are stopped, because when a spool is moved too much, power to the dump valve is cut, all movements are stopped.

### Fault monitoring

When there is a fault in the control system it will give an immediate warning.

Depending upon the fault the crane speed and/or the load capacity will be reduced. When the fault is serious, use of the crane is blocked completely.



### DANGER

Never try to repair the control system yourself. Repairs may only be made by a HIAB service workshop!

## 4.3 Components of the SPACE 4000 Safety System

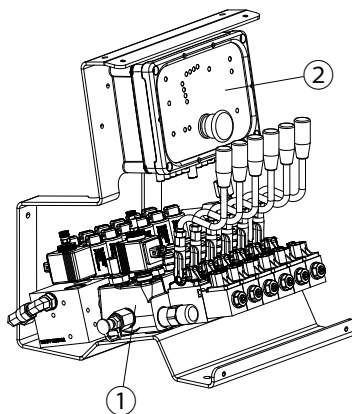
### Control valve ①

- The crane can be operated from the main control valve, but as soon as you have selected remote control operation, it is impossible to operate the main control valve levers.

### User Interface - Microprocessor ②

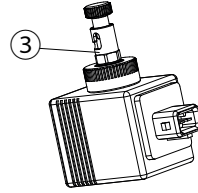
- This is the user interface for SPACE 4000. On this user panel the operator turns on and off the system and activating stabiliser legs and OLP release.

Activating the remote control and the signal horn. There is also a stop button on the user panel.

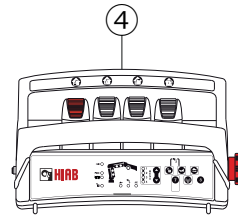


**Dump valve 1 ③**

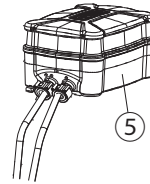
- To prevent high pressure and thereby unnecessary heating of the oil there is an automatic dumping function. When no lever movement has been made for 3 seconds SPACE system opens the dump valve 1 and the oil is returned directly to the hydraulic tank. As soon as the operator moves a lever the valve closes.

**Remote control ④**

- The controller is the device that the operator use to control the crane. There is also an emergency stop button on the controller.

**Warning lamp ⑤**

- A warning lamp on each stabiliser leg is used to warn the surrounding about ongoing activity, by amber light indication. A warning lamp also gives information to the operator about the different statuses of the crane.



System ON: the warning lamps light up

Remote control ON: the warning lamps blink

90% of maximum permitted load and OLP:

the warning lamps flash twice

**! NOTE**

No warning light on manual stabiliser legs.

**4.4 Operating components**

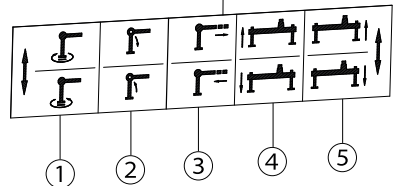
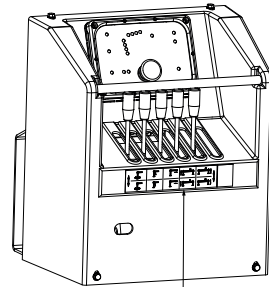
- Main control valve and user panel SPACE 4000 with remote control XSDrive Lite
  - with radio
  - with cable connection

### 4.5 Main control valve

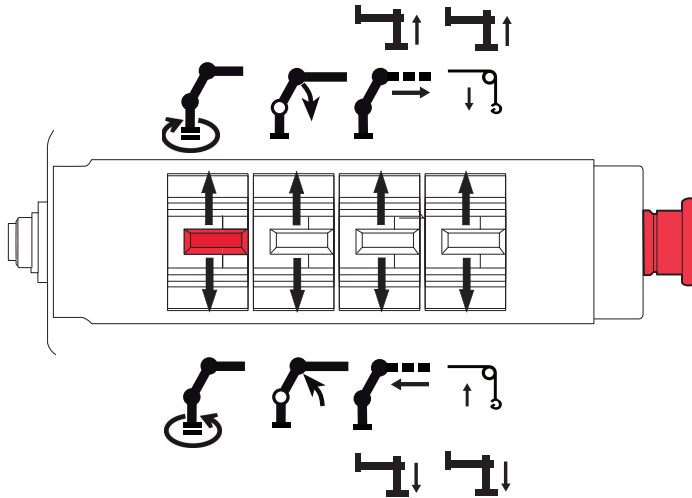
The speed of a function corresponds to the extent of the lever movement, as long as the oil flow is sufficient. When the oil flow is insufficient, one or more functions will stop.

#### Control valve lever function

- Slewing ①
- First boom ②
- Extension boom ③
- Stabiliser leg ④
- Stabiliser leg ⑤



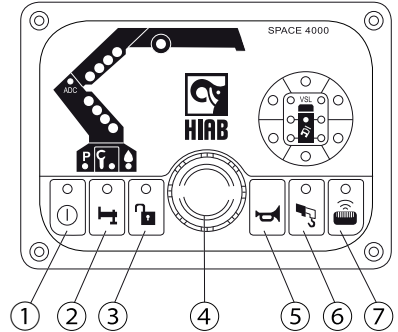
#### Remote control lever function



## 4.6 User panel SPACE 4000

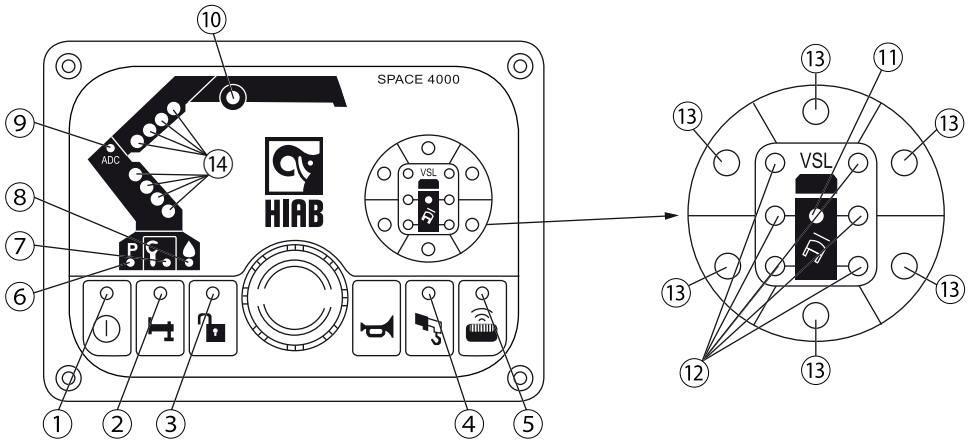
### Functions: Buttons 1-7







- Button ①.  
To switch the safety system on and off.
- Button ②  
Not active in this configuration.
- Button ③.  
For OLP release if the crane is in an OLP situation and for disconnecting the automatic dump function.
- Stop button ④  
When the button is pressed, all crane functions are stopped.  
To release, turn the button clockwise.
- Button ⑤  
Sounds the horn.
- Button ⑥  
Activates OLP for manual extensions.
- Button ⑦  
Activates the remote controller.






4.7 Indicator LEDs on user panel, SPACE 4000



	<p><b>Power on/off</b></p>	<p>①</p>	<ul style="list-style-type: none"> <li>● Green light on: The system is on.</li> <li>● Green light flashing: System on and the stop button has been pressed.</li> <li>● Red light flashing: CAN communication has been lost.</li> </ul>
	<p><b>Stabiliser extension activation</b></p>	<p>②</p>	<p>Not active in this configuration.</p>
	<p><b>OLP Release</b></p>	<p>③</p>	<ul style="list-style-type: none"> <li>● Red light blinking: OLP Release active (crane, VSL or stabiliser leg)</li> <li>● Green light flashing: Critical error.</li> </ul>
	<p><b>Manual extensions</b></p>	<p>④</p>	<ul style="list-style-type: none"> <li>● Green light on: Manual extension mode is active.</li> </ul>
	<p><b>Remote control</b></p>	<p>⑤</p>	<ul style="list-style-type: none"> <li>● Green light on: Remote control is active.</li> <li>● Green light flashing: Button for remote control has been pressed, waiting for connection to hand unit.</li> <li>● Red light on: Radio interference.</li> </ul>
<p><b>P</b></p>	<p><b>Parking control</b></p>	<p>⑥</p>	<ul style="list-style-type: none"> <li>● Blue light on: Slew is in parking position.</li> </ul>
	<p><b>Service</b></p>	<p>⑦</p>	<ul style="list-style-type: none"> <li>● Green light on: Service needed.</li> <li>● Red light on: Error in the system.</li> <li>● Red light flashing: Critical error.</li> </ul>

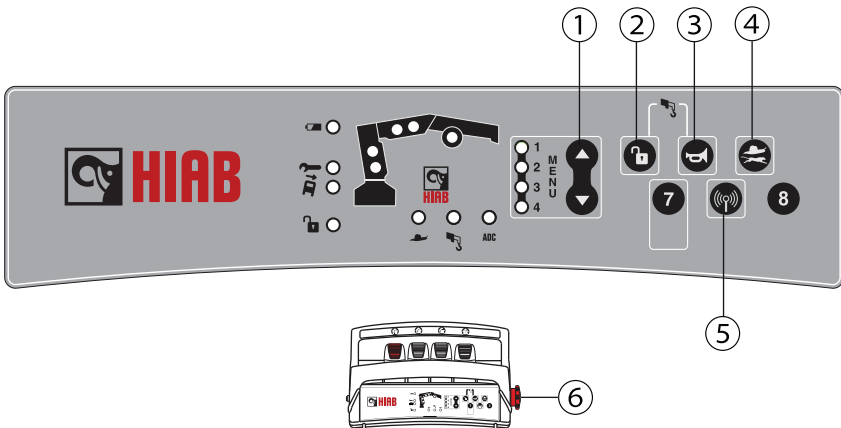
## 4.8

## The Safety system

	<b>Dump valve</b>	⑧	● Blue light on: Dump activated.
<b>ADC</b>	<b>ADC</b>	⑨	● Blue light on: Crane has enhanced capacity (ADC mode).
	<b>Hoist</b>	⑩	● Green light on: Hoist mode. ● Red light flashing: 90% of OLP pressure. ● Red light on: 100% of OLP pressure.
	<b>VSL</b>	⑪	● VSL-OLP reached.
	<b>Stabiliser legs</b>	⑫	● Green light on: Stabiliser leg set. ● Red light on: OLP stabiliser leg.
	<b>Stability sector</b>	⑬	● Red light on: 0-19% stability. ○ LED off: 20-69% stability. ● Yellow light on: 70-89% stability. ● Green light on: 90-100% stability.
	<b>Cylinder pressure</b>	⑭	● 1 of 4 green light on: 50% pressure. ● 2 of 4 green light on: 70% pressure. ● 3 of 4 red flashing light: 90% pressure. ● 4 of 4 red light on: 100% pressure. ● 4 of 4 red flashing light: OLP release activated.

LED test for the user panel, see Daily inspection.

## 4.8 XSDrive Lite controller

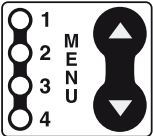


## The controller has:

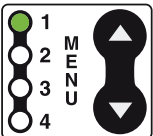
4 Levers for proportional functions programmed according to the item Menu selection.

①	<b>Menu selection</b>	Press to toggle between menus 1 to 4.
②	<b>OLP release</b>	Press and hold the button whilst operating a pressure reducing function.
③	<b>Horn</b>	Press to sound the horn.
② & ③	<b>Manual extensions</b>	Press simultaneously to activate manual extension.
④	<b>Speed selection</b>	At start up, the system is set to full speed by default. Press the button for reduced speed operation. Repeat for full speed.
⑤	<b>Channel shift</b>	Press to change radio channel. There are 12 channels in total.
⑥	<b>Stop button</b>	When the button is pressed, all crane functions are stopped. To release, turn the button clockwise.

## Locking the controller

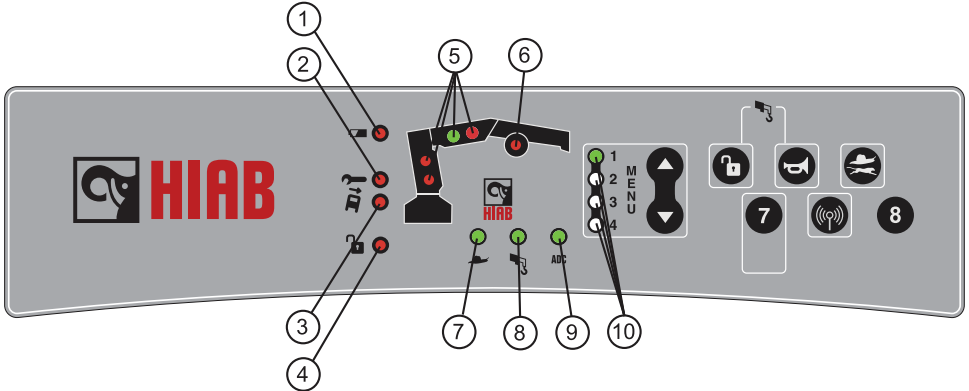
	<ol style="list-style-type: none"> <li>1. Ensure that the stop button is pressed.</li> <li>2. Press both arrows on the toggle button at the same time, while releasing the stop button.</li> <li>3. The four LEDs flash simultaneously about 5 seconds. The controller can not be operated.</li> <li>4. Press the stop button.</li> </ol>
--	---







## Unlocking the controller

	<ol style="list-style-type: none"> <li>1. Ensure that the stop button is pressed.</li> <li>2. Press both arrows on the toggle button at the same time, while releasing the stop button.</li> <li>3. The four LEDs flash simultaneously 5 times.</li> <li>4. LED 1 lights up. (Start menu)</li> </ol>
---	--

## 4.9 Indicator LED's on XSDrive Lite controller

The indicator LEDs on the controller indicates button positions, errors, stability, cylinder pressure, hoist etc.




	<b>Battery</b>	①	● Red light on: Low power
	<b>Service</b>	②	● Red light on: Error detected in the system
	<b>VSL</b>	③	● Red light on: VSL-OLP. Vehicle has reached a stability limit. (Also all the 1st boom diodes will light red).
	<b>OLP Release</b>	④	● Red light on: OLP ● Red light blinking: OLP Release.
	<b>Cylinder pressure LEDs</b>	⑤	● Lower LEDs green light on: 70% of maximum pressure ● Lower LEDs, red light flashing: 90% of maximum pressure ● Lower and upper LEDs red light: 100% of maximum pressure
	<b>Hoist LED</b>	⑥	● Red light flashing: 90% of maximum pressure ● Red light on: 100% of maximum pressure
	<b>Low speed</b>	⑦	● Green light on: Low speed
	<b>Manual extension</b>	⑧	● Green light on: Manual extension activated
<b>ADC</b>	<b>ADC</b>	⑨	● Green light on: Increased capacity (ADC mode)
	<b>Menu LEDs</b>	⑩	● Light on: indicates the menu you are in

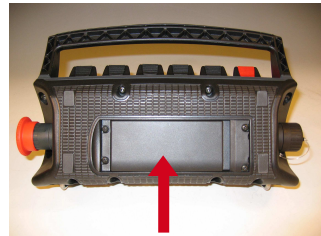
## 4.10 Remote control XSDrive Lite with radio

### The radio consists of:

- Transmitter, fitted in the controller
  - Receiver, fitted on the operating base.
- Each transmitter is programmed to only function with its own receiver. When there is interference with the transmission, it is possible to change the channel. There are a maximum of 12 channels available.

### Transmitter

- A fully charged battery provides approx. 5-8 hours use (at 25 °C, 77 °F).
- Indicator light on the controller burns steady red, when the battery becomes weak and the horn will also sound twice.
- Push the stop button, before changing the battery.
- Button 
- Pushing the button once changes to the next channel.



### WARNING

When the stop button on the controller is pulled out, the controller is not to be used closer to the crane (truck) than 1,0 metre.  
Reason: possible electromagnetic interference.

### Receiver

- The receiver consists of a combined radio receiver and 6 (XSDrive Lite) or 12 (XSDrive) outputs for servo valves. The status of the receiver is visible on the controller.



### 4.11 Battery charger XSDrive Lite

The battery charger is to be fitted in a protected environment.

Lamp ① is lit continuously when the battery charger is ready for use.

Place the battery in the charger.

Lamp ② flashes slowly during precharging.  
When lamp ② has a steady light, the charging process is finished.

#### Charging time

The normal charging time for a flat battery, is approximately 3 hours. The battery charger is designed not to damage the battery, even during long continuous charging.

Operating ambient temp:

Battery = 0° to + 45°C.

#### A charged battery

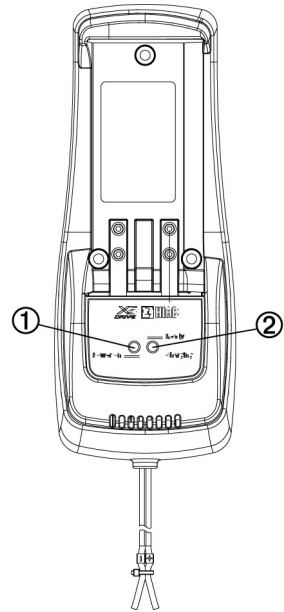
The voltage level of a fully charged battery is approximately 8,4V and it provides about 5-8 hours working time. Note that the battery voltage remains between 7,6V and 7,5V for a long time. Therefore, the battery voltage cannot be used to estimate the working time.



#### ! NOTE

A charged battery is a concentrated energy source. Never store a charged battery in a toolbox or similar, where there is a risk of a short due to metal components.





Used batteries should be taken care of according to the local regulations.



### 4.12 Menu selection XSDrive Lite

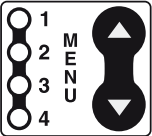
These menus can only be programmed in the factory or at an authorized workshop.

Examples of menus:

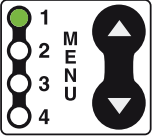
<p><b>Menu 1</b></p> 	<p>Slewing, first boom, extension boom, (hoist)</p>
<p><b>Menu 2</b></p> 	<p>Stabiliser legs</p>
<p><b>Menu 3</b></p> 	<p>[option] Slewing, attachment. (If crane is equipped with remote controlled stabiliser): left and right stabiliser extension, left and right stabiliser leg.</p>
<p><b>Menu 4</b></p> 	<p>[option] Similar to menu 3 but for extra stabiliser legs</p>

## 4.13 Locking and unlocking the controller

### Locking the controller

	<ol style="list-style-type: none"> <li>1. Ensure that the stop button is pressed.</li> <li>2. Press both arrows on the toggle button at the same time, while releasing the stop button.</li> <li>3. The four LEDs flash simultaneously about 5 seconds. The controller can not be operated.</li> <li>4. Press the stop button.</li> </ol>
--	---


### Unlocking the controller

	<ol style="list-style-type: none"> <li>1. Ensure that the stop button is pressed.</li> <li>2. Press both arrows on the toggle button at the same time, while releasing the stop button.</li> <li>3. The four LEDs flash simultaneously 5 times.</li> <li>4. LED 1 lights up. (Start menu)</li> </ol>
---	--

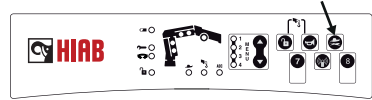
## 4.14 Functions in XSDrive Lite

The system provides a large number of functions. Certain functions are standard, others are options.

### Controlling the crane speed

At start up, the system by default is set to full speed. To reduce the speed, push button  once. The low speed LED will light continuously. By pushing the button again, the crane returns to full speed and the LED goes out.

When pushing the speed selector button, all levers must be in neutral.



### ! NOTE

The crane speed will depend upon the crane functions you are using and how many crane functions you operate at the same time.

### Supervision of spools

If a valve spool movement is greater than the equivalent lever movement on the controller, a safety function is tripped, and all crane movements stops.

This occurs if a control lever on the valve is moved while the remote control is engaged.

### ADO Automatic dump function

If a lever is not moved for 3 seconds, this function diverts the oil to the tank, thereby preventing the oil from overheating. The next lever movement stops the dumping and it functions as normal.



## VSL Variable Stability Limit

The VSL function detects the position of the stabiliser extensions and that the stabiliser legs are pressed to the ground. This optimizes the crane lifting capacity in relation to the vehicle's stability.



### ! NOTE

VSL function is not available on cranes with manual stabiliser legs.



## 5.1 Starting operations

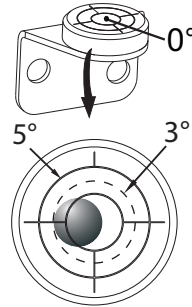
### Placing the vehicle

- **General case:**

Place the vehicle on a flat and firm surface. The vehicle inclination during crane operation must **not be more than allowed in the Technical Data for your crane.**

To determine the inclination of the truck, check the spirit level on the crane. When the bubble is in the middle of the gauge, the crane is in horizontal position. When the bubble is between the two circles, the crane inclination is between 0° and 5°.

If the slope exceeds the permitted inclination, unintentional crane movements can occur.



- **Particular case: Working with boom system beyond 60°**

To avoid side deflection and in order to guarantee the safest operation when working with e.g. hoist applications, the vehicle has to be completely levelled in any direction.



### ! NOTE

- Operating the crane in to and out of parking position must also be done with the vehicle completely levelled.
- Activate the parking brake and place chocks under the wheels to prevent vehicle movement.

### PTO

- Engage the PTO (Power Take Off).
- Bring the vehicle's engine to the correct rpm.



### ! NOTE

- Rpm too high: the oil in the hydraulic system might overheat. Rpm too low: during crane operation, the vehicle's engine could stall.
- The maximum rpm may depend upon a governor on your PTO combination.

## Power Pack [option]


The power for the Power Pack comes from the truck battery.

When the crane is operated for a longer period the battery could run flat.

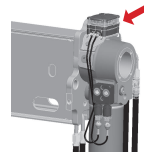
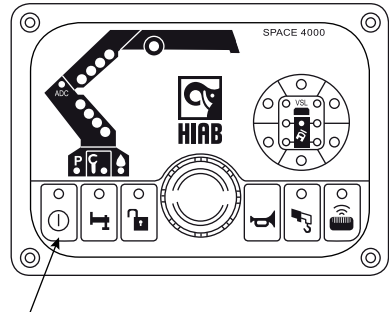
To prevent this keep the truck engine running.

## Start the safety system

The operating levers must be in the neutral position before start up.


To start the safety system, press the On/Off button . The LED above the button lights up. The system will check itself. (2-4 seconds)

The warning lamps on the stabiliser legs light up.



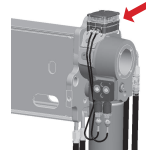
## XSDrive-Start the remote control

Fasten the controller

1. Fasten the controller to a waist belt, or shoulder-/neck strap, in the most comfortable operating position.
2. Press the remote control button 
3. Release the stop button on the controller. The menu LED starts blinking. When communication is established, the LED lights constant = ready for use.



The warning lamps on the stabiliser legs blink swell light.



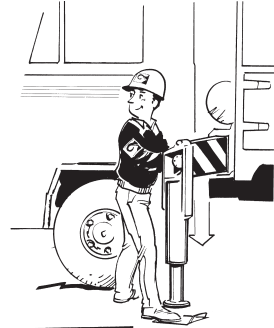
## 5.2 Extend stabiliser extensions and set stabiliser legs

To ensure the full crane capacity and stability, all the stabiliser extensions and legs must be fully extended and set to the ground without lifting the wheels off the ground.



### ! NOTE

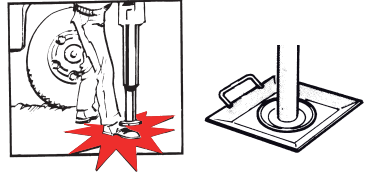
For cranes with VSL the stabiliser leg downward movement is automatically stopped when pressure to the ground is sufficient. To operate the stabiliser legs further downward, move the lever once again.



**! WARNING**  
Take care not to lower the stabiliser leg to your foot.

**! DANGER**  
Check that the support plates do not bend or sink into the ground!

**! WARNING**  
Always ensure that the stabiliser legs and stabiliser extensions are in working position and securely locked.



**Manual controlled stabiliser extension and leg**

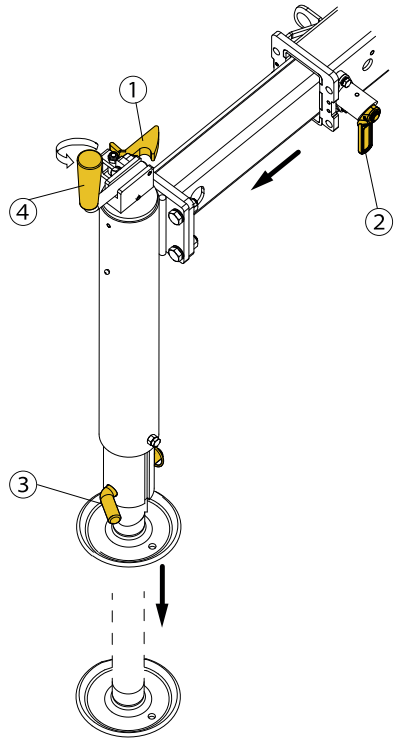
Unlock the catcher ① and the handle ②.

Extend the stabiliser extension and lock with the handle ②

**Place the leg on the ground:**

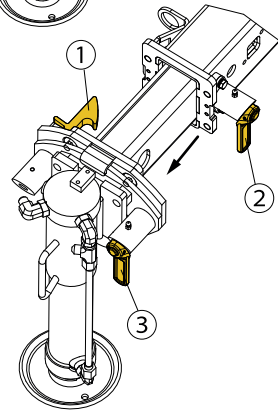
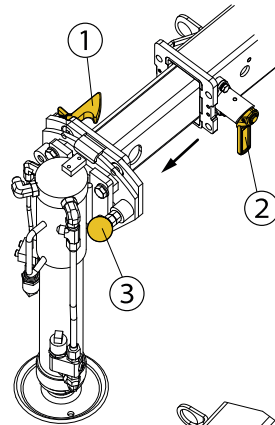
1. Remove the locking pin ③ and place it in one of the holes to get a suitable height.
2. Turn the handle ④ upwards to make small adjustment of the height. Lock this position by turning the handle down.

Repeat for the the stabiliser extension and leg on the other side of the vehicle.




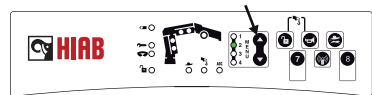
### Manual controlled stabiliser extension and tilt-able stabiliser leg

1. Unlock the catcher ① and the handle ②.  
Extend the stabiliser extension a little, until the stabiliser leg can be rotated free of the vehicle.
  2. Be careful when tilting the stabiliser leg from transport position: Unlock the stabiliser leg with the handle ③ and make sure that you have full control of the movement to avoid risk of crushing.
  3. Lock the stabiliser leg with handle ③.
  4. Extend the stabiliser extension (**minimum 300 mm on crane side**) and lock with the handle ②.
  5. Place the stabiliser leg on the ground.
- Repeat for the the stabiliser extension and leg on the other side of the vehicle.



#### ! NOTE

If remote controlled leg: Select menu 2 with button  on the controller, before placing the leg on the ground.



---

### 5.3 Operate the crane out of parked position

1. Raise the first boom.
2. Slew the crane to working position. The crane is ready for use.

**! NOTE**

As soon as you have selected remote control operation, it is impossible to operate the main control valve levers.

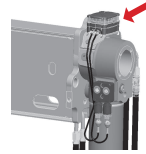
## 6.1 OLP (Overload protection)

### OLP (Overload protection)

The OLP function is a safety function in SPACE that prevents overloading of the crane.

On the boom system: With 90% of maximum permitted load, a prewarning is given. The warning lamp on the stabiliser leg double blinks and the cylinder pressure LEDs flash red.

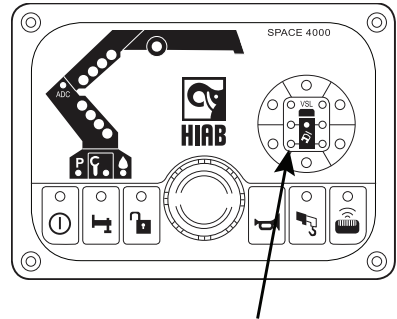
When 100% of the maximum permitted pressure is reached, the OLP cuts in and stops all movements that increase the moment. The warning lamp on the stabiliser leg will flash twice and the cylinder pressure LEDs will light continuously.



### OLP stabiliser system:

If a stabiliser leg is overloaded, slewing is stopped in the direction towards the stabiliser leg where the OLP occurs. The crane stops. The LED on the user panel for the overloaded stabiliser leg light red.

Move the levers to neutral and only operate permitted (load reducing) functions.



### VSL - OLP

VSL-OLP occurs when there is a risk of instability of the vehicle.

The slewing is stopped towards the instability direction and the crane stops.

The indicator lamp for VSL on the user panel light red.


Move the levers to neutral and only operate permitted (load reducing) functions.



## OLP Release


In certain OLP situations, the first and second booms can be locked. It is then possible to release the OLP for approximately 5 seconds.

### To release the OLP

Press the button , while moving one lever.

There is a waiting time before the release operation can be activated again. The time increase in three steps: 30, 60 and maximum 90 seconds (the time starts to count down as you move the lever)

During this period it is possible to operate a load reducing function to correct the overload situation. Only one unallowed function at a time can be operated. Extension out cannot be operated.

The cylinder pressure LEDs and the lamp above the button  flash red.

## OLP End of stroke operation

(automatic OLP disconnect)

If a boom cylinder reaches its end position while lifting, the cylinder may reach the OLP limit and SPACE will interpret this as an overload.

In this case, SPACE will calculate the pressure increment over time and automatically release OLP.



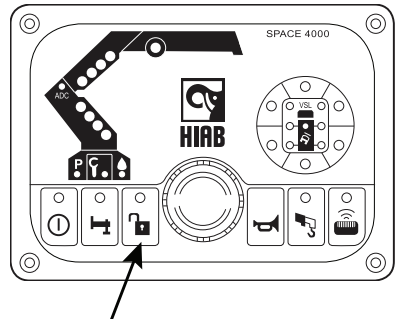
### ! NOTE

Do not operate heavy loads with the extensions fully retracted. In an OLP situation, it is an advantage to be able to retract the extensions.



### DANGER

Never use the OLP override to overload the crane deliberately! Never exceed the values given on the load plate.



## 6.2 Manual extensions [option]

### Operation with manual extensions

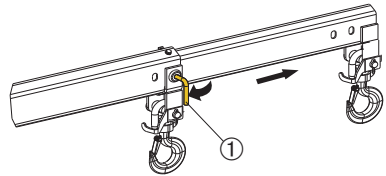
- Always extend the hydraulic extensions first, then the manual extensions.
- The use of manual extensions should be restricted to the longest outreach needed. When this reach is not needed, the manual extension should be retracted.

**DANGER**

Do not stand in front of moving parts. They may eventually move and cause injuries.

**To extend the manual extensions**

1. Locate the booms as close as possible to the horizontal position, but low enough to reach the extension by hand.
2. Stop the crane, by pressing the stop button.
3. Turn the locking device ① 90 degrees clockwise and pull it out.
4. Extend the manual extension fully by hand and secure it by turning the locking device back.

**DANGER**

- Make sure that the locking device is properly locked.
- Each manual extension has a sign for the maximum load that can be handled. Do not lift loads heavier than the values stated on the hook attachment.

To lift heavier loads than specified on the sign, the hook position must be moved to the nearest hydraulic extension, in accordance with the load plate on the crane.

**To retract the manual extensions**

1. Locate the booms as close as possible to the horizontal position, but low enough to reach the extension by hand.
2. Stop the crane, by pressing the stop button.

3. Turn the locking device 90 degrees clockwise and pull it out.
4. Retract the manual extension fully by hand and secure it by turning the locking device back.



### DANGER

- Make sure that the locking device is properly locked.




### Activate and de-activate OLP for manual extensions




### WARNING


You must switch the OLP on and off manually for additional manual extensions!

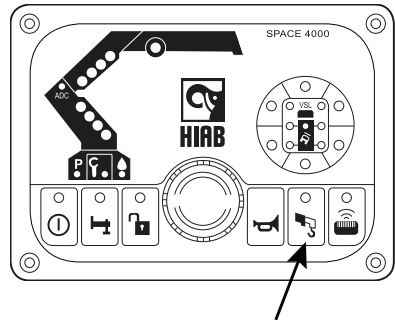
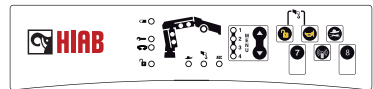
#### Activate:

Push buttons  and  on the controller or  on the user panel.

The manual extensions are now included in the OLP protection. The lifting capacity will be reduced automatically. The lamp for  lights up on the user panel.

#### De-activate:

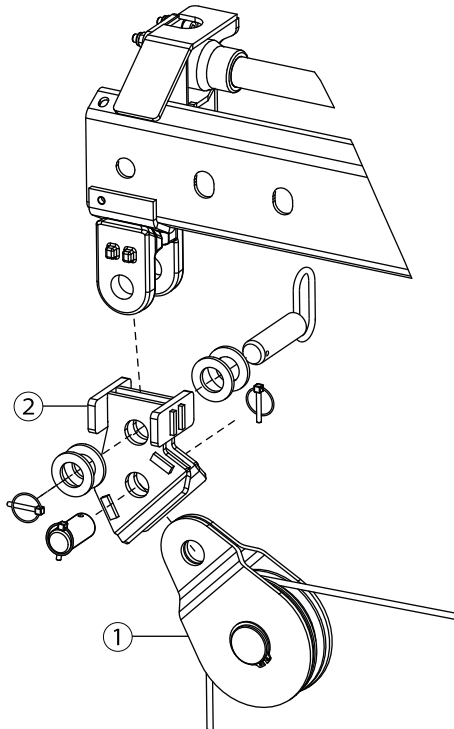
Push the buttons again. The lamp for  goes out.



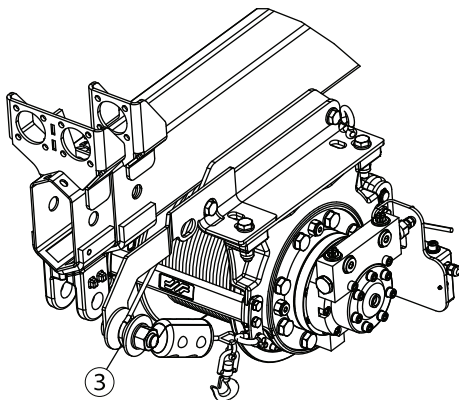
### 7.1 Change from hoist to hook operation

The hoist should be in horizontal position.

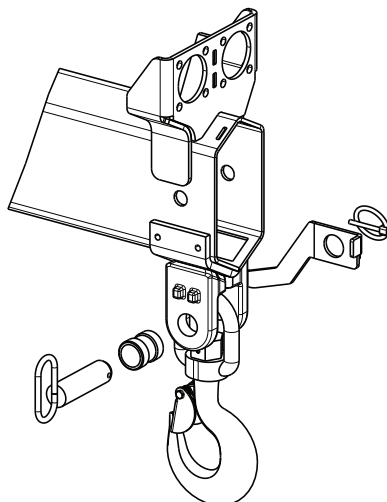
1. Unwind the rope until the counterweight touch the ground and rope is without tension.
2. Detach the sheave block ① from its bracket and the block bracket ② from the hook attachment.
3. Open the sheave block ① and remove the rope.



4. Store small parts secure in a safe place (pins, washers etc.).
5. Set up the rope using the roll ③.



6. Wind the rope until the counterweight is about 30 cm from the role ③.
7. Attach the shekel to the loop at the edge of the hoist.
8. Wind the rope until it settles on the roll with slight tension.
9. Install hook on last extension.



## 8.1 Operate the crane to parking position



### DANGER

When parking the crane, slew the boom away from driving position to avoid injury.

1. Retract the extensions completely.
2. Fold in the hook.
3. Lower the first boom to parking position.

## 8.2 Placing the stabiliser legs in the transport position

Activate stabiliser leg operation.



### DANGER

Do not stand in the stabiliser legs, tilting area.



### WARNING

Do not put your foot on the support plate.



### DANGER

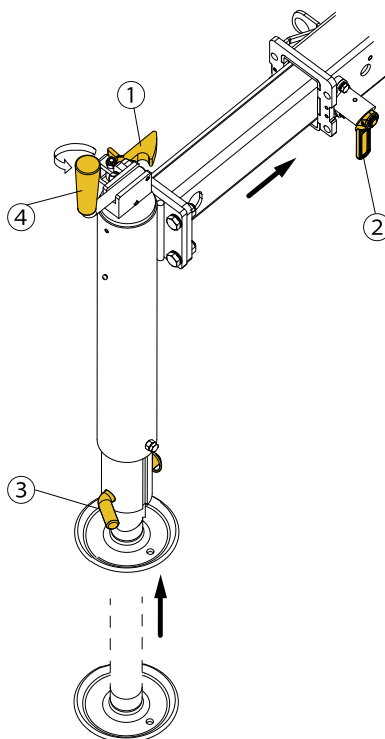
Always ensure that the stabiliser legs and the stabiliser extensions are in transport position and securely locked.



**Manual controlled stabiliser extension and leg**

1. Turn the handle ④ upwards and remove the locking pin ③.
2. Rise the leg and lock it with the locking pin ③.
3. Unlock the handle ② and retract the stabiliser extension.
4. Lock the handle ② and check that the catcher ① is secured.

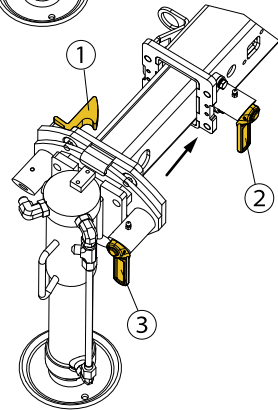
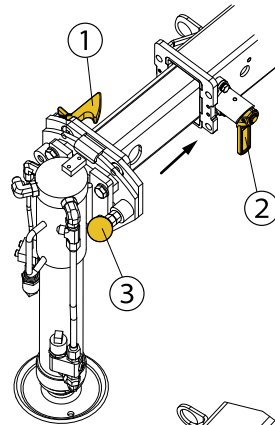
Repeat for the stabiliser extension and leg on the other side of the vehicle.




### Manual controlled stabiliser extension and tilt-able stabiliser leg

1. Raise the stabiliser leg completely.
2. Unlock the stabiliser leg with the handle ③ and rotate the leg manually.
3. Lock the stabiliser leg with the handle ③.
4. Unlock the handle ②. Retract the extension and lock with the handle ②. Check that the catcher ① is secured.

Repeat for the stabiliser extension and leg on the other side of the vehicle.

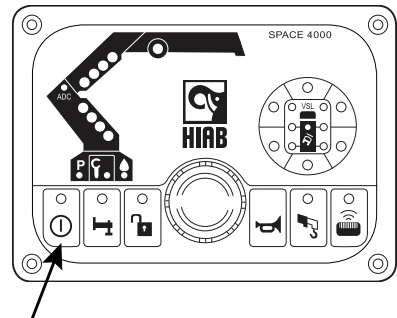


### 8.3 Switching off the safety system

- Switch off the safety system with the button .

#### If you are using the remote controller:

- Press the stop button on the controller and switch off the safety system.
- Disengage the PTO.



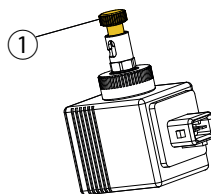


## 8.4 Emergency operation main control valve

**EMERGENCY** operation to bring the crane to parking position

Do like this:

On the main control valve:



### DANGER

To operate the crane like this is **HIGHLY DANGEROUS** because during emergency operation all crane security is disconnected.

**Always go to/contact a HIAB service workshop when the seal wire has been broken.**

1. Break the security sealing on the dump valve.
2. Press button ① and turn 90 degrees until it is blocked.
3. Operate the crane to parking position using the levers on the main control valve.

## 8.5 TWI Transport warning interface



### WARNING

If you switch off the control system when manual operated stabiliser extensions/tiltable stabiliser legs are not locked in the transport position, and/or if the first boom angle exceeds a certain specified angle, the indicator lamps for both the cylinders and the hoist will flash red for a while.

**The vehicle must not be moved.**



- A warning, visible and audible from the driving position for transport, indicates when the crane height exceeds a predetermined maximum and when the manual operated stabiliser extensions/tiltable stabiliser legs are not locked in the transport position.
- The audible warning can be silenced by an acknowledgement button [option] or by a signal indicating that the parking brake of the vehicle is engaged.

**The vehicle must not be moved**

1. Switch the system on and operate the crane into transport position.
2. Switch off the system. The vehicle may be moved.

**DANGER**

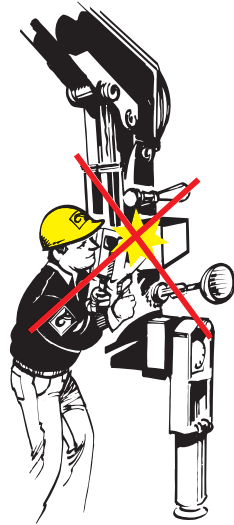
After use always put the crane into the transport position! When you have to park the boom on the load space, or over the load, secure the boom and the lifting accessories to prevent any unintentional movement of the crane and the lifting accessories.

## 9.1 Service



### DANGER

- Do not do any welding work on the crane yourself! Welding work on the crane may only be carried out by, or in close consultation with, a HIAB service workshop.
- Do not drill into the crane yourself. Drilling work on the crane may only be carried out by, or in close consultation with, a HIAB service workshop.
- Never try to reinstall the crane. Only a HIAB Dealer may reinstall the crane.



### Before carrying out any welding on the vehicle:

- Disconnect the power between the vehicle and the crane.
- Contact the vehicle manufacturer.

### After welding on the vehicle:

- Connect the power between the vehicle and the crane.

## Leakage

**DANGER**

- Keep well away from an oil leak on the hydraulic system! The oil spraying out can cause serious injury. The oil in the hydraulic system is under high pressure.
- Do not replace any hydraulic hoses or lines yourself: Precautions shall be taken when disconnecting hydraulic lines and hoses to ensure that no hydraulic pressure is retained in the line when the power supply to the system is switched off. Pressure may be retained in the hydraulic lines when the power supply has been switched off.
- Always contact a HIAB service workshop.

**Deal with an oil leak as follows:**

1. Rest the crane on the floor or on the truck platform.
2. Switch off the operating system.
3. Disengage the PTO.
4. Leaking coupling:
  - Tighten the coupling with a spanner.
  - If tightening does not help: contact a HIAB service workshop.
5. Small leak on a line or hose:
  - Determine if you can still park the crane.
  - If you can: park the crane and go to a HIAB service workshop. If you cannot: contact a HIAB service workshop.
6. In all other cases, contact a HIAB service workshop.

**9.2 Warranty****HIAB only provides a warranty if:**

- The instructions for maintenance and service have been followed, and original HIAB parts have been used.

- 
- All security seal wires on the valves are still intact.

**Always use original HIAB parts and tools.**

### 9.3 Follow the maintenance instructions!

**Take the crane, at least once a year, to a HIAB service workshop for inspection and maintenance.**

Maintain lifting accessories according to the supplier's instructions.



#### **WARNING**

- Ensure that faults in the crane are corrected immediately!
- Never correct faults yourself that may only be corrected by a HIAB service workshop.
- Carry out yourself only the service and maintenance work you have the requisite knowledge and experience of.

**If the crane is not be used for 1 month or longer:**

- Lubricate the crane thoroughly, according to the lubrication schedule.
- Park the crane in the transport position.

#### **Filters**

Replace the filter cartridge

- after the first 50 hours operation
- then after every 1000 hours operation
- or at least once a year.

### Cleaning

Clean your crane and accessories regularly, but:

- Do not use aggressive cleaning agents.
- Never use a high pressure jet cleaner on electronic parts, plastic components, signs, bearings, control valves, cylinders or the oil tank. Only the cranes surface may be cleaned with a high-pressure jet cleaner.

### Checking the worm gear

To ensure an efficient worm drive, the shaft must be axially secured.

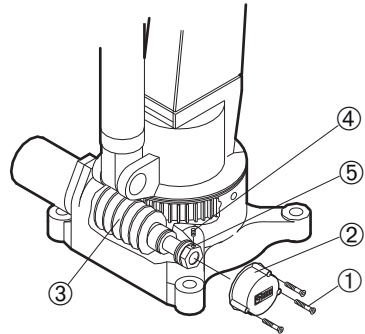
Place the first boom in horizontal position and move the boom manually from side to side while watching the shaft:

- Demount the screws ① and the cover ② to check the play. The worm shaft ③ must not show any sign of axial movement.
- If the worm shaft ③ must be tightened, the safety screw ④ must be loosened before the nut ⑤ can be tightened.
- Tighten the nut to extinguish the play.

Check the worm drive at regular intervals.

### Hoist

- At the regular inspection of the crane a test load has to be lifted near to the ground and the energy supply of the hoisting hoist has to be switched off (switch off drive motor). Checking time approx. 5 minutes. The load must not sink in this condition. If the load sinks, stop the operation and have the fault rectified by a HIAB service workshop.
- Inspect the braking system.



## 9.3.1 Daily inspection

### Stabiliser locking devices

- Check that the stabiliser locking devices are undamaged and working properly.

### Shafts, shaft lockings, bearings and bushings

- Check that the shafts, shaft lockings, bearings and bushings are undamaged and working properly.

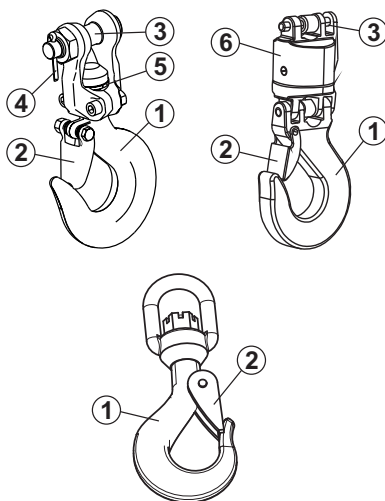
### Stop buttons

- Check that the Stop buttons are undamaged and working properly.

### Hooks

Before every lift:

- Check general condition of the hook, and parts of the hook ① for deformation and surface damages with significant depth.
- Check for damage to the hook structure (e.g. any formation of cracks).
- Check that the latch ② closes entirely.
- Check that the shaft ③ and the locking pin ④ are in place.
- Check that the plane bearing ⑤ or the swivel ⑥ are in good conditions.



### DANGER

In the event of damage or worn that prevents a safety risk:

- Do not use the hook.
- Have the damage repaired immediately by a HIAB service workshop.

**Hoist**

- Visual check of the rope. In the event of damage to the rope, see the rules how to handle this in section: Check rope.
- Check cables, cable connections, rope guides and the attachment points.
- Polyamid parts as well as all bolt components have to be checked and must be replaced in case of wear and tear.

**Levers**

- Check that the levers operate smoothly.
- Check that the levers return to neutral position.

**Electronic components**

- Check that these are in good condition.
- LED test

To do the test:

1. Press the ON/OFF button for at least 2 sec. The test is activated and all the red LEDs are illuminated.
2. Release the button. After 3 sec, all the green the LEDs are illuminated. The test is finished when all LEDs is extinguished.

**Crane structure**

- Check for damage to the crane structure (e.g. any formation of cracks).

**DANGER**

In the event of damage that presents a safety risk:

- Do not use the crane.
- Have the damage repaired immediately by a HIAB service workshop.



---

### Hydraulic system

- Check that there are no leaks from the hydraulic hoses, lines and connections.
- Check oil level in the tank. If necessary, fill to correct level.



#### **! NOTE**

Always place the vehicle on level ground with the crane in transport position while checking the oil.

### Filters

- Check the filter indicator. If red, replace the cartridge.

### Add-on equipment

- Check cables, cable connections and the attachment points.
- Maintain all add-on equipment, auxiliary equipment etc. according to the instructions supplied with it.

## 9.3.2 Monthly inspection and maintenance

In addition to the daily inspection, carry out the following each month:

### Piston rods

- In cases where the cylinder piston rod is exposed to pollution due to the parking location, the chromed surfaces must be cleaned and oiled to prevent corrosion. This needs to be done regularly.

### Presence of decals

- Check that all the decals shown in section “Warning signs” are in position.

### Pivot pins and bushes

- Inspect all the pivot pins and bushings for the crane boom and cylinders for damage, play, etc.

**Bolts and screw fixings**

- Check that bolt and screw fixings are tightened.

**Cables and sensors**

- Check that these are in good condition.

**Lubrication schedule**

- Carry out the lubrication according to the instructions.

**Hydraulic system**

- Check that the hydraulic pump attachment screws are tightened.
- Check if the oil in the hydraulic system needs to be changed.

**Add-on equipment etc.**

- Maintain all add-on equipment, auxiliary equipment etc. according to the instructions supplied with it.

**Hoist**

- Visual control of pressure roller.

---

### 9.3.3 Annual maintenance

Take the crane, at least once a year, to a HIAB service workshop for inspection and maintenance.

Carry out the following maintenance at least once a year.

#### Hydraulic oil

- Change the hydraulic oil.  
Or have it tested by a workshop or specialist.

#### Hydraulic system oil tank filler cap

- Change the oil tank filler cap.
- Replace filters.



#### ! NOTE

If the crane is being used in hot climates the oil might need to be changed more often.

#### Hoist

- Change the gear oil in the drum.
- Inspect the braking system.

### 9.3.4 Check rope

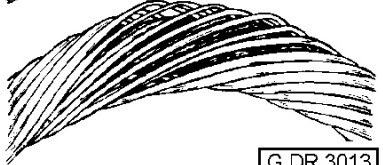
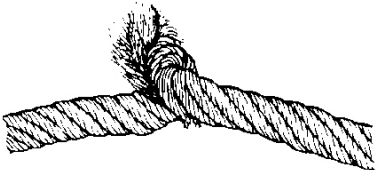
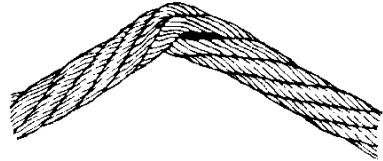


#### WARNING

As ropes undergo very heavy strain and are not of permanent durability, it is important for the safety of the hoist system and like this for their operating personnel, to carry out a thorough check-up and to renew the rope in time.

After every use the rope has to be checked for damage according to the national regulations of the country of application.

Various types of damage are illustrated on the right that indicate when the rope needs to be replaced: Reduction of rope nominal diameter by more than 10%, corkscrew-type deformation, kinked rope, contracted rope, flattening rope, loop formation of wires on the rope, knots on the rope, splicing on the rope, basket formation on the rope, loose wires in the rope, individual wire breakages.



#### WARNING

A rope has to be discarded, when there are (number of ruptures in the outer layers according to DIN 15020; ISO 4309):

- 2 ruptures on a length of  $6 \times d$ ,  
- resp. for rope diam.  $\varnothing d = 7, 8, 10$
- 4 ruptures on a length of  $30 \times d$ ,  
- resp. for rope diam.  $\varnothing d = 12, 14, 16$ .
- 5 ruptures on a length of  $30 \times d$ .

### 9.3.5 Cleaning the rope

In case the rope is extremely dirty the rope has to be cleaned with clear water and a brush before it is spooled again onto the drum.

After each wet cleaning use spray oil on the rope.

G DR 3013

**! NOTE**

Do not clean the rope with steam jet blower or high pressure cleaner.

### 9.3.6 Requirements of the rope

#### Rope requirements

For the hoists we recommend a rotating resistant rope, cross lay to the right. Always use HIAB original rope.

hoist type	rope Ø (mm)	possible hoisting force (kN)		
		1st layer	2nd layer	4th layer
TC1	8	11,5	-	9.5
TC2/TC2L	10	24	-	18
TC3	14 (12)	39 (39)	-	30 (xx)
TC5	14 (16)	54 (54)	-	43 (xx)
BR05	6	5,7	4,9	-

**! NOTE**

When choosing a rope under all circumstances the standards of the country of the user have to be noted.

This applies especially for the permitted loading of the rope.

### 9.3.7 Change of rope

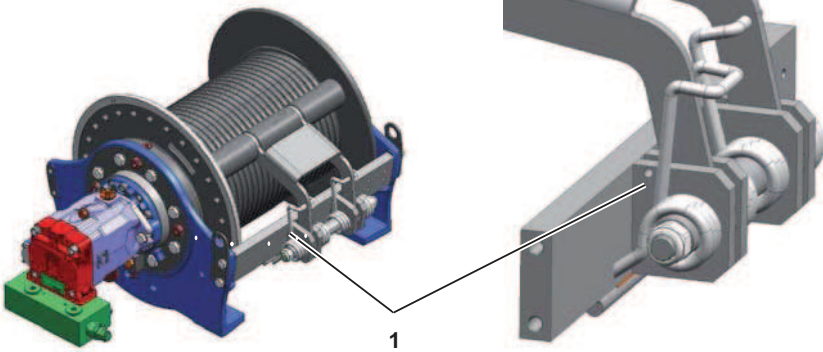


#### WARNING

- Incorrect installation of the rope may allow the load to drop down, causing material damage, severe injury or even death.
- Always wear protective gloves when handling a hoist rope.
- Carry out the procedure with two persons.
- During hoist movements, keep at least 2m distance from the hoist drum.
- Make sure to keep your fingers and clothing out of the way of the moving hoist parts.

#### Removal

a. Remove the load hook, counterweight and damper from the hoist rope.



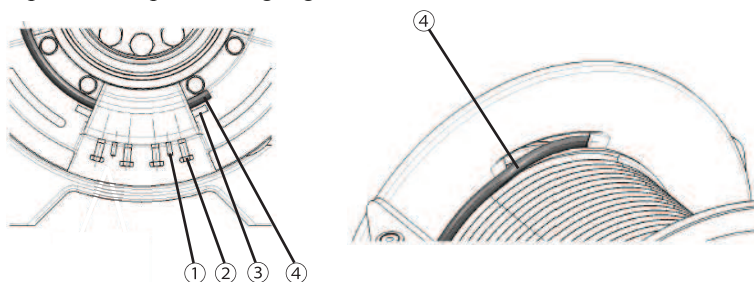
Pressure roller spring arm lock

c. Lock the spring arms of the pressure roller by pushing a pin into the two openings indicated.

d. Spool of the old rope, until the last 4 safety windings are reached:

- Keep the hoist rope tensioned to prevent loops and tangled rope.
- Wind the old rope around an empty drum or spool.

- or place it on the floor in an eight-shaped figure (a left turn followed by a right turn, etc.) to prevent loops and tangling.



Hoist rope end mounting.

1. Locating pins (2x)
  2. Mounting screws (4x)
  3. Rope clamp (2x)
  4. Hoist rope
- e. Turn the hoist drum until you have access to the rope end screws.
- f. Loosen the four screws and pull the hoist rope ④ from underneath the rope clamps ③.
- g. Pull the old rope completely away from the drum.
- h. Bundle it and discard.

### Mounting

- a. Lock the spring arms of the pressure roller by pushing a pin into the two openings indicated.
- b. Pass the end of the hoist rope ④ outward through the slot on the drum plate.
- c. Pass the rope under the two clamps ③ located by the two pins ①.
- d. Fix the rope with the two clamps ③ by tightening the four screws ② (M6, toll size 10mm, tightening torque 10.4 Nm).

It is possible that some winches use cap head screws (M6, Allen key 5mm, tightening torque 10.4 Nm).

e. Remove the two pins that held the spring arms of the pressure roller (placed during removal of the rope).

f. Spool the rope onto the drum. Keep the hoist rope tensioned and check that the rope does not tangle and loop.

It is important that the rope is spooled evenly on the drum.

g. Mount the counter weight and hook.

## 9.4 Lubrication



### WARNING

Follow the lubrication schedule exactly. If you not do so, there may be serious damage to the crane and to add-on equipment.

### Type of grease

Use lithium based grease containing EP additives (consistencies 2 and 3 are recommended, depending on the climate).

### Recommended greases:

BP LS EP 2, ESSO UNIWAY EP2 N, AGIP GR MU/EP3, NYNÄS UNIFETT EP.

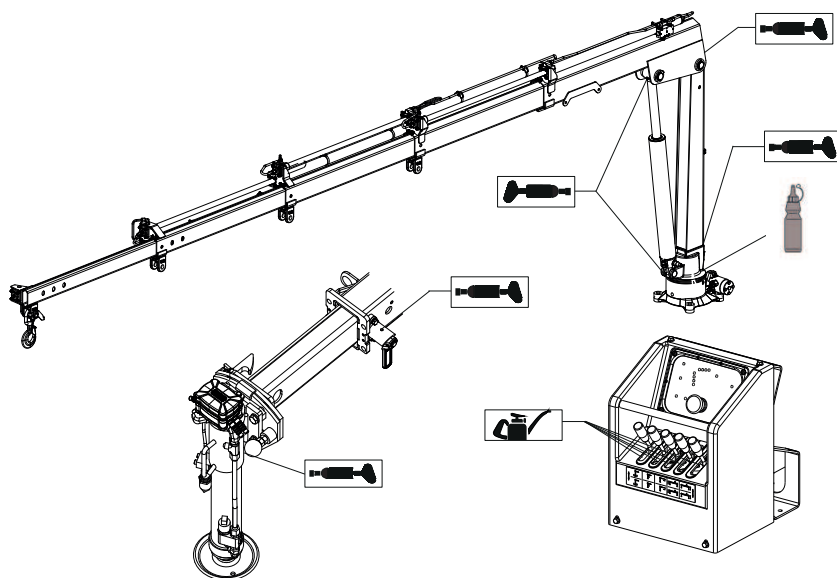





### ! NOTE

Avoid grease with graphite or molybdenum-disulphide additives.



9.4.1 Lubrication schedule



	<p>Lubricate after every 16 hours of use.</p>
	<p>SG 02.94 p/n 55135. Lubricate after every 50 hours of use.</p>
	<p>Lubricate after every 50 hours of use.</p>

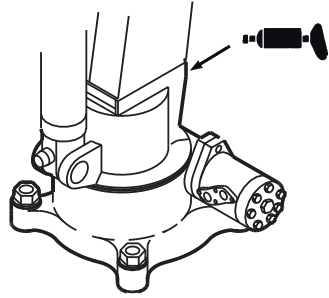
If the loader is not to be used for some time all points should be lubricated.

## 9.4.2 Lubrication of the column bearings



### DANGER

The column bearings must be lubricated while the crane is slewed. If one person lubricates the column bearings, while another is slewing the crane: Take care that the person lubricating the bearings does not come into contact or get crushed by the crane!



### If you are lubricating the column bearings without help:

- Lubricate the bearings with a little grease.
- Slew the crane a little.
- Again lubricate with a little grease. Repeat, until the column has been slewed round completely.

## 9.5 Hydraulics

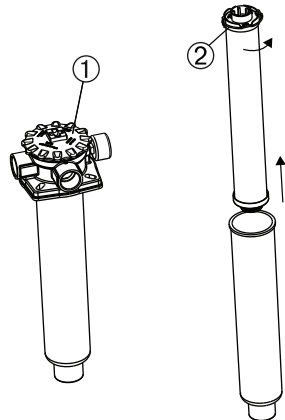
### 9.5.1 Replacing the cartridge in return oil filter

#### Return oil filter with fouling indicator



### WARNING

Dirt will damage the hydraulic system



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Make sure that the area around the filter is clean to prevent contamination of the hydraulic oil.

1. Switch off the hydraulic system and release the filter of pressure.
2. Clean the immediate surrounding area of the filter.
3. Unscrew and remove the cover. ①
4. Pull out the filter cartridge and filter housing, still attached to each other.
5. Unscrew the filter cartridge from the housing using the handle. ②
6. Clean the filter housing and the cover.
7. Replace the filter cartridge.
8. Check the condition of the o-rings and gaskets. Replace if necessary.
9. Put the filter housing and filter cartridge back in place.
10. Attach the cover.

**! NOTE**

Check that the cover is properly fitted.

### 9.5.2 Checking the oil tank level

1. Place the crane and stabiliser legs in the transport position.
2. Place the vehicle on level ground.
3. Check the oil level in the tank.
4. Oil level too low:  
Top up with hydraulic oil.

### 9.5.3 Changing the hydraulic oil

**WARNING**

The oil can be hot and cause injury.

1. Operate the crane for a while to warm the oil. Place the crane in the parked position. Take care that the temperature of the oil does not exceed the point where you can handle it safely. If this occurs allow the oil to cool before moving to the next step.
2. Suitable eye and hand protection must be worn while carrying out this operation, and if there is a risk for inhalation of oil mist, a mask as well.

**WARNING**

- Inhalation of oil mist: Contact a doctor.
- Skin contact: Remove polluted clothing, wash with soap and water. In the event of high pressure injection of the product, see a doctor without delay.
- Eye contact: Rinse eyes with plenty of water, see a doctor if irritation persists.

3. Drain the oil tank through the drain plug. Make sure the system contains as little as possible.  
Use a container with sufficient capacity.

**! NOTE**

Ensure the waste oil is disposed of safely and in accordance with local environmental regulations.

4. Change at the same time:
  - all filters
5. Refit the drain plug.

**Filling the oil tank with hydraulic oil**

The oil used for filling must be clean. Do not mix different oils.

Hydraulic oil that is approved for HIAB products must comply with one of the following standards or equivalents:

- DIN 51524 part 3
- SS 15 54 34

-ISO 11158 HV

Suppliers of hydraulic oil must verify that the quality and performance of the oil complies with the above standards.

When changing from mineral oil to a non-polluting synthetic oil, or when changing to biodegradable oil, contact a HIAB service workshop.

### Viscosity of oil

The viscosity of the oil is of great importance to achieve high efficiency of the hydraulic system.

The naming of the oil in the table below: 32, 46 or 68 tells the viscosity of that oil at 40°C (reference temperature).

Viscosity of oil at 40°C	Temperature range
32	-25°C to 75°C
46	-15°C to 90°C
68	-5°C to 90°C

The recommended viscosity during normal working conditions is between 16 and 40cSt.

HIAB strongly recommend an oil working temperature below 70°C. If necessary consider an oil cooler or heater.



### ! NOTE

When working in arctic condition consider an oil with lower viscosity than the 32 oil in the table above.

### Environmentally Friendly Oil

The environmentally friendly oils recommended for HIAB products are ester based synthetic hydraulic fluids (synthetic ester).

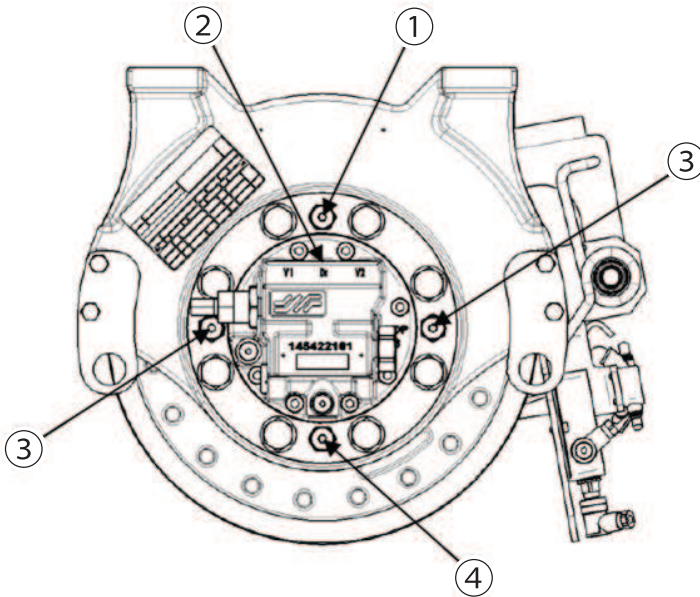


### ! NOTE

**Vegetable oils do not meet HIAB's requirements and must not be used.**

**After filling the tank**

1. Operate each crane function to its end positions.
2. Operate the crane to parking position.
3. Check and top up the oil tank to max level on the tank gauge.
4. Bleed the system.

**9.5.4 Hoist gear, top up or exchange oil**

**NOTE:** To remove any oil inside the reduction gear, it must be stored in appropriate containers ready to be handed over to authorized waste disposal centres, in accordance to the laws in force.

---

Lubricant must be changed the first time within and not later than 50/60 hours from running in. In normal environmental conditions, lubricant can be renewed every 500 hours of work. For recommended lubricants see 1.3 Specifications of consumables.

For topping up and renewing, use the special plugs provided. Replace seals under the plug every time you unscrew them for inspections.

It is recommended to replace the lubricant when it is warm to prevent sludge forming.

#### **Drain oil**

- a. Make sure the gear oil is warm. If necessary, heat up by reeling in and out a number of times.
- b. Stop the crane with the boom system in horizontal position, and switch off.
- c. Place an oil container under the hoist and remove plug ④.
- d. Drain all oil. Discard according to local procedures.
- e. Mount plug ④ again.

#### **Fill / top up**

- a. Get access to the fill-opening on top and remove the plug ①. Remove the filling/level plugs ③.
- b. If the winch contains a small amount of protective oil, place an oil container under the drum and remove plug ④. Then close the drain plug ④.
- c. Fill the drum with oil by a pump through one of the two plugs ③ until it starts leaking out of the opening plug ③ at the opposite side. (content approx. 0,8 liters).
- d. Remove the pump and mount all the plugs again.

### **9.5.5 Bleeding air from the hydraulic system**

#### **Bleed the air from the hydraulic system:**

- after changing the hydraulic oil

- after working on the hydraulic system
- if your crane works slowly or jerkily
- if your crane has not been used for a long time

**WARNING**

Air in the hydraulic system can lead to faults and damage

**To bleed air from the hydraulic system, proceed as follows:**

Move each crane cylinder and each hydraulically operated piece of add-on equipment at least twice to its end positions (slowly).



## 9.6 Troubleshooting

### 9.6.1 Main fuses

If the microprocessor detects a fault, this must be rectified immediately.

Fault	Probable cause	Action
The control system does not work at all The indicator light next to On/Off button on the user panel is not lit, even if you press On/Off	Defective fuses	<ol style="list-style-type: none"> <li>1. Replace faulty fuses in the: <ul style="list-style-type: none"> <li>- vehicle</li> <li>- standard box</li> <li>- relay box</li> </ul> (See Description, Components, Fuse, Location) </li> <li>2. Check all the cable connections</li> </ol>
The remote control gradually works less well	Blocked filter insert	Replace the filter insert.
One remote control function does not work	The remote control lever was not in neutral at start up	<ol style="list-style-type: none"> <li>1. Push in the <b>Stop button</b></li> <li>2. Make sure that all levers are in neutral</li> <li>3. Pull out the <b>Stop button</b></li> </ol>

Description	Components	Fuse	Location
System main fuse	Relay Box, Standard Box, Oil Cooler	40 A	Located on the vehicle, where the crane is mounted
Fuse for all components connected to the standard box	Hydraulic control valve, stabiliser leg warning lamp, XSDrive, user panel, MUX box, extended box. Truck warning interface	10 A	Located inside the standard box
Fuse for all components controlled by the relay box	Work lights, solenoid valves	15 A	Located inside the relay box

## 9.6.2 Faults on the crane

Faults in the crane must be rectified immediately.



### DANGER

- Only correct yourself the faults that according to the table you may rectify.
- Follow the instructions exactly!
- All other faults must be corrected by personnel in a HIAB service workshop!

Fault	Probable cause	Action
The hydraulic pump makes a noise. Three causes: <b>Warning! Stop using the crane immediately!</b>	Oil tank filler cap air filter is blocked.	Clear the blockage or replace the entire filler cap.
	Oil level in the tank is too low.	Top up the oil tank and bleed the hydraulic system.
	The pump is faulty	Go to a HIAB service workshop.
The stabiliser extensions do not slide out.	The extensions are still locked.	Unlock the extensions.
The slewing movements are irregular or cause abnormal noises.	Insufficient oil in the hydraulic system.	Top up the oil tank
	The column bearings are not properly lubricated.	Lubricate the bearings
	The column bearings are damaged.	Go to a HIAB service workshop
Add-on equipment does not work properly (rotator, hoist, etc.)	Connectors not properly connected.	Reconnect the add-on equipment, according to the instructions.
	Other defect.	Go to a HIAB service workshop
Leak on hydraulic system: leaking coupling, hose or line <b>Danger! Keep well away from any oil leak.</b>		<ol style="list-style-type: none"> <li>1. Press a stop button.</li> <li>2. Disengage the PTO.</li> <li>3. Contact a HIAB service workshop</li> </ol>

## External Display [option]

### Placing

The unit shall be placed under the plastic cover together with the SPACE-box where it is protected from direct water splash.

### Start up

The External display automatically starts when the SPACE system is started.



### Operating modes

The display has three basic operating modes:

1. Use time mode (default)
2. Error display mode
3. Config mode

#### Use time mode (default)

By default the display shows how many hours the crane has been used. (Levers not centred and oil not dumped). Use time is shown on the display as:

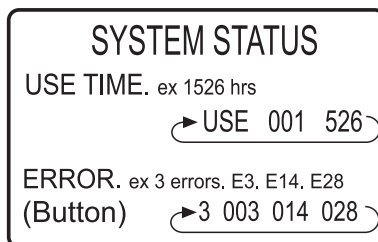
- USE
- Number of thousands of hours
- Number of hours and a dot
- (Start over)

example use time=1526 hours

#### Error display mode

Press the button to switch to Error display mode. Display shows Err a short time, and then start showing errors as:


- The number of active errors and a dot.
- Each active error in turn (Blank display if no errors)
- (Start over)



Press the button again to return to Use time mode.

Example: 3 active errors, 003, 014 and 028

#### Clear errors

In Error display mode, errors can be cleared (as in SPACE terminal) by pressing the button for 2 seconds until the clear errors symbol  is shown in the display.

### 9.6.3 Faults in the hoist

Faults in the hoist must be rectified immediately.



#### DANGER

- Only correct yourself the faults that according to the table you may rectify.
- Follow the instructions exactly!
- All other faults may be dealt with only by personnel in a HIAB service workshop!

Symptom	Probable cause	Action
Hoist will not hoist/pull rated load.	Inadequate hydraulic system supply pressure.	Verify hydraulic system supply pressure and correct as required.
	Damaged hoist motor.	Go to a HIAB service workshop to have the motor replaced.
	Hoist center line is distorted due to uneven mounting surface.	Contact a HIAB service workshop.
	Binding load carrying sheaves.	Inspect and repair or lubricate sheaves as required.

Symptom	Probable cause	Action
Hoist will not turn at rated speed.	Inadequate hydraulic system supply volume.	Verify hydraulic system supply volume and correct as required.
	Damaged hoist motor.	Go to a HIAB service workshop to have the motor replaced.
	Hoist center line is distorted due to uneven mounting surface.	Contact a HIAB service workshop.
	Binding load carrying sheaves.	Inspect and repair or lubricate sheaves as required.
Hoist will not hold the load.	The rope is wound onto the drum in the wrong direction.	Spool rope according to section in this manual: Course and requirements of the rope.
	Clutch assembly is damaged.	Verify and replace as required.
	Brake Friction or Separator Plates are worn or damaged.	Verify and replace as required.

## 10.1 Decommissioning a crane

Cranes are designed and manufactured taking the environment into consideration. Environmental requirements and soundness have been considered when selecting the raw materials. The metal parts are designed to achieve a light and durable construction, this includes the selection of higher-quality grades of steel. When the crane is decommissioned at the end of its service life, years from now, waste will be created, which must be utilized and disposed of correctly. The crane must be decommissioned properly. Most of the crane's raw materials can be recycled.

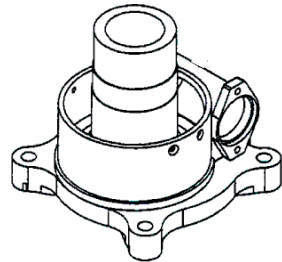
### Follow the regulations of the local authorities!

- Oil and grease must not be spilled on to the ground or released into the environment!
- Drain the oil from hydraulic cylinders, valves and hoses.



### Sort the waste

- Deliver the metal parts for recycling, for reuse as raw material. These are load-bearing, structures manufactured from steel or cast iron, hydraulic cylinders and lines drained of oil, directional control valves, shafts, bearing bushes, control levers, small parts.



**Energy waste** can be utilized by incinerating it at a proper waste incineration plant

- spiral wraps, manufactured from polyethene, plastic, bearings (cleaned of lubricants) used in the column, beam system etc, manufactured from polyamide plastic.



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**Unsorted waste** should be delivered to a landfill

- drained hydraulic hoses, electrical wires, control cables, seat, hydraulic cylinder seals, lights, small plastic and rubber parts.



**Hazardous waste** is delivered to a collection point for hazardous waste

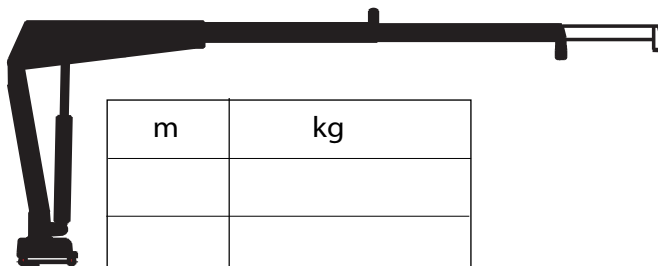
- oils: hydraulic oil, transmission oil from the slewing system
- solid lubricants: greases from the joints and journal bearings
- other waste containing oils and greases: hydraulic oil filters.



Content

### 11.1 Load plate table

The Installer must fill in the valid meters (m) and kilos (kg) in this table, following instructions given in the Installation instructions.



m	kg

The enclosed Technical Data must be stored together with this Operator's manual.