

HIAB 410K PRO

Operator's Manual GB

This operator's manual is an Original Instruction and applies to cranes with serial number from:
4100056.

2021-07

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.

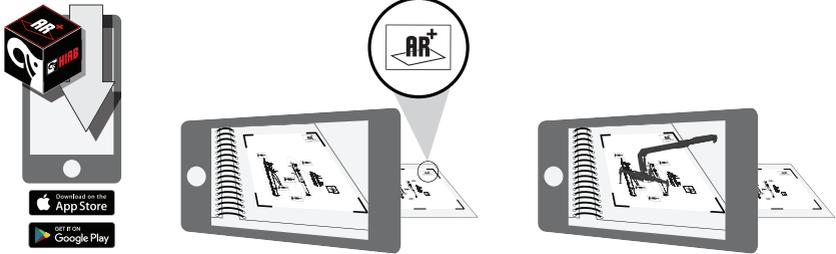
The aim of this manual is to help you handle your crane safely and with full satisfaction.

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

 This manual includes interactive contents.



Download the **'Hiab AR+ App'** for the interactive content in this manual. Look for the **AR+** symbol. Use your device to scan the image next to the symbol.

The interactive contents in the Hiab AR+ App will display suggestions to make the crane operation easier for you to understand. However, note that some of the content included in the 'Hiab AR+ App' may differ from the actual configuration of your crane and is subject to updates and changes from Hiab without prior notice.

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1. Introduction

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

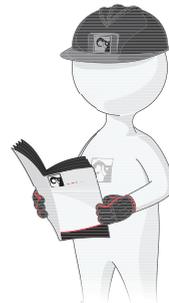


DANGER

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 remote diagnostics tools or similar sensor-based connectivity capabilities (“Connectivity”) in and from the Equipment; and
- access, send, receive, collect, store and use any and all information and data gathered through the Connectivity, including but not limited to, information concerning efficiency, availability, downtime, operation, operating environment, movement, condition, logon, location and similar information relating to the Equipment (the “Information”). Such Information may be used for optimizing the Equipment, or any related equipment or services as well as for Hiab’s internal business and/or operating purposes. Hiab shall be responsible for complying with applicable laws and regulations related to such Information.

The customer/user shall not in any way remove, disable, or interfere with the Connectivity or the Information. Any intellectual property rights or other right and title in and to the Connectivity features and the Information and all their further developments shall at all times be and remain the exclusive property of Hiab.

1.2. Cleanliness certificate

All Hiab equipment has been tested and certified at the factory according to the Hiab Standard C250.52 that defines the Cleanliness Requirements for Hydraulic Systems. This means that they fulfil the cleanliness class **20/18/14** measured by the ISO 4406 standard.

All hydraulic functions have been individually tested and fully comply with the defined requirements.



1.3. 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**

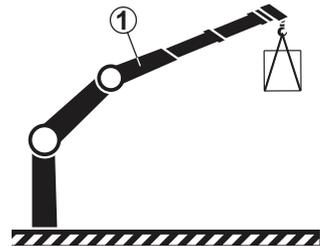
Tip to make the work easier to carry out.

The 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 optional. Not all options are available for your crane.

Illustrations used in this manual are for guidance only, and the illustrations are provided to help identify the general area of a crane/installation referenced in the text.

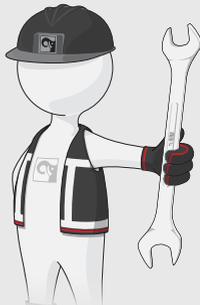
**DANGER**

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 authorised service workshop, or receive instruction from an experienced person from your own company before you start to operate your crane.
- Make sure that you comply with the regulations of the country in which you use the crane (for example, certificate, safety helmet, and other personal protection devices).

**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 authorised service workshop.
- Make sure 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 authorised 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 control 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 (hoist, rotator, etc.):

- 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 into or out of the transport position.

2. Structure and parts of the crane

2.1. Main groups

This HIAB crane consists of the following main groups:

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

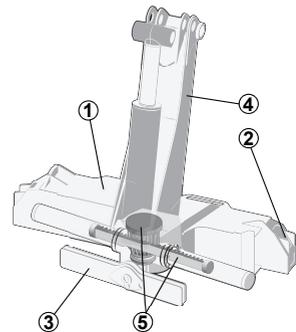
Some accessories can be fitted depending on your crane configuration:

- Add-on lifting accessories [option]
- Hooks [option]
- Separate lifting accessories [option]

2.2. Crane base with column and slewing system

The crane base, column and the slewing system consist of the following components:

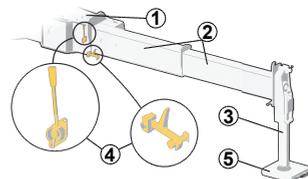
- (1) Crane base
- (2) Stabiliser beam
- (3) Three-point bridge
- (4) Column
- (5) Rack and pinion slewing system.



2.3. Stabiliser system

HIAB cranes (except stationary mounted) have two stabiliser extensions and two stabiliser legs. Auxiliary stabiliser systems may be needed for bigger cranes. The stabiliser system consists of:

- (1) Stabiliser beam
- (2) Stabiliser extensions
- (3) Stabiliser legs
- (4) Stabiliser locking devices [option]
- (5) Extra support plates



2.4. Boom system

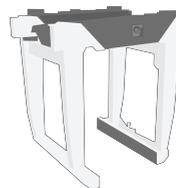
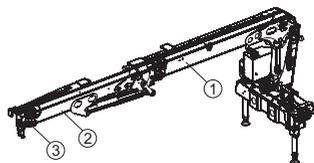
The boom system consists of the following components:

- 1st boom (1)
- 2nd boom (2)
- Hydraulic extensions (3)

The extensions are operated by hydraulic cylinders placed inside the extensions.

- **Add-on lifting accessories [option]**

Add-on lifting accessories are placed between the boom tip and the load (e.g. pallet fork, grapple, rotator).



Hooks [option]

Different hooks can be mounted depending on the crane model.



DANGER

Never exceed the maximum permissible loading of the hook.

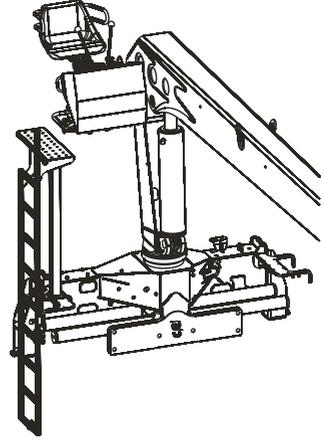
Separate lifting accessories [option]

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



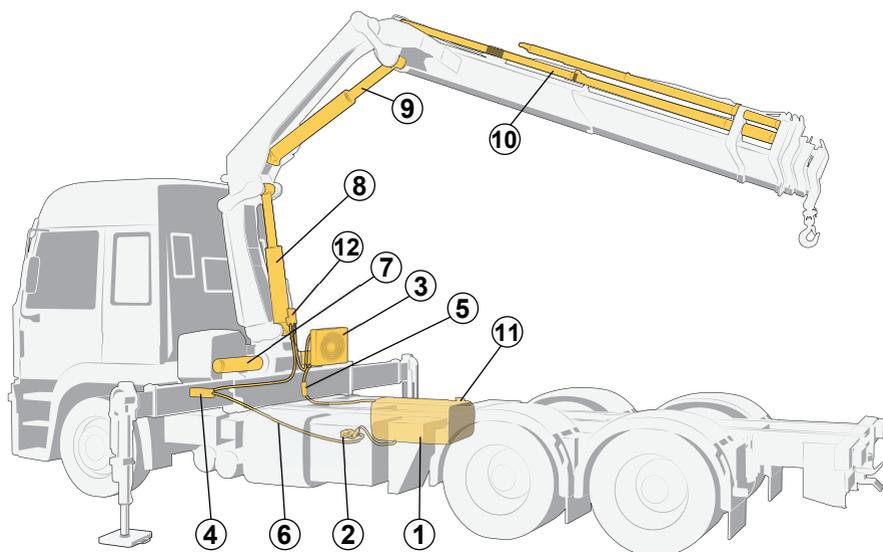
2.5. Ladder

The access to the high seat is through a ladder placed at one side of the base.



2.6. Operating system - hydraulic components

The operating system consists of the following hydraulic components:



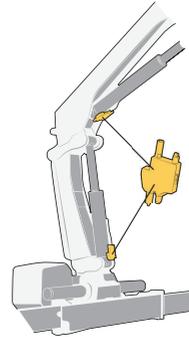
(1) Oil tank	(5) Stabiliser control valve [option]	(11) Return filter
(2) Hydraulic pump	(6) Hydraulic hoses and lines	(12) Load holding valve
(3) Oil cooler [option]	(7) Slewing cylinders / Slewing motors	Pressure filter [option]
(4) Main control valve	Actuators: (8) First boom cylinder (9) Second boom cylinder (10) Extension cylinder/s	

2.7. LHV Load holding valves

All cylinders are equipped with load-holding valves as a safety device. After a crane movement, they hold the crane in position, also in the unlikely event of a burst hose.

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

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



2.8. Description of HIAB 410K Pro

The HIAB 410K Pro are compact, fully hydraulically operated goods cranes.

Stress history class S1 according to EN 13001-1.

Lifting capacity:

- HIAB 410K = 29.7 tonne metres (214800 lbs.ft)

The cranes are supplied in a version:

- HIAB 410K-3 reach: 22.5 metres (73' 9" ft)

The main control valve V91 and the SPACE 3000 safety system are standard equipment on the HIAB 410K Pro.

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. Safety precautions and warnings

3.1. Operating conditions

You may use the crane **ONLY** if:

- You are outdoors or in a space with sufficient ventilation.
- With a mean wind velocity of less than 13.3 m/sec (approx. 29.7 mph). **See the wind speed table.**



DANGER

- **Do not use** the crane in a confined space because you could suffocate from the exhaust gases from the vehicle.
- **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 -30°C (-22°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.
- In cold weather, the wear on the hydraulic system is greater than at normal working temperatures.

In cold weather, start the crane as follows:

- Engage the power take-off at low rpm.
- Allow the system to idle for a few minutes.
- Operate stabiliser legs up and down for one minute, in order to warm up the oil.



3.2. 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	0.3 - 1.5	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.
2	1.6 - 3.3		
3	3.4 - 5.4	Moderate wind	Leaves and twigs in continuous movement, small branches begin to move. Dust and paper begin to move over the ground.
4	5.5 - 7.9		
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	

3.3. Definition of this 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:

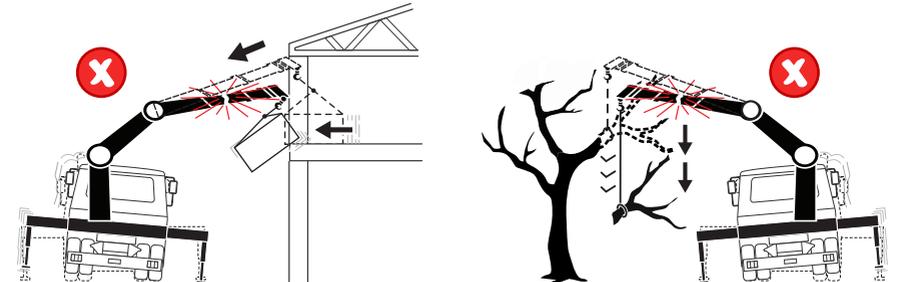
- Loading and unloading cargo from/to a vehicle
- Lifting of loads from the ground/vehicle to a higher place
- Installation work (beams, concrete plates, windows...) in building constructions
- Lifting construction material (wall boards, bricks, blocks...) on a pallet fork to a building, taking the material 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
- Moving filling material at a construction site with a bucket
- Handling large loads (containers, boats, machinery, vehicles...)
- Collection of waste and recycling material (glass, paper, cardboard, plastic...)
- Installation of informative posts, road signs, notice boards, traffic lights, street lights...

Forbidden duties:

- Crane mounted onboard ships or floating structures, only permitted in cases authorised by Hiab
- Continuous use as a production crane in assembly lines, foundries..., except for cranes prepared for that purpose
- Handle loads, work with submerge boom system or accessories, in strong currents such as rivers
- Pressure against the ground, unless the crane is specifically prepared for this
- Pushing/pulling with the boom system against any type of obstacle (wall, ground...)
- Putting loads on structures if you do not know their resistance
- Lifting loads with the wrong side of the boom system



- Lifting a mass that is partially loaded or attached to another equipment/structure/element



CAUTION

There is a risk of tipping the truck and/or damaging the crane, the load or other structures inside the working area.



DANGER

Lifting people with a crane is never allowed unless it is a MEWP crane.

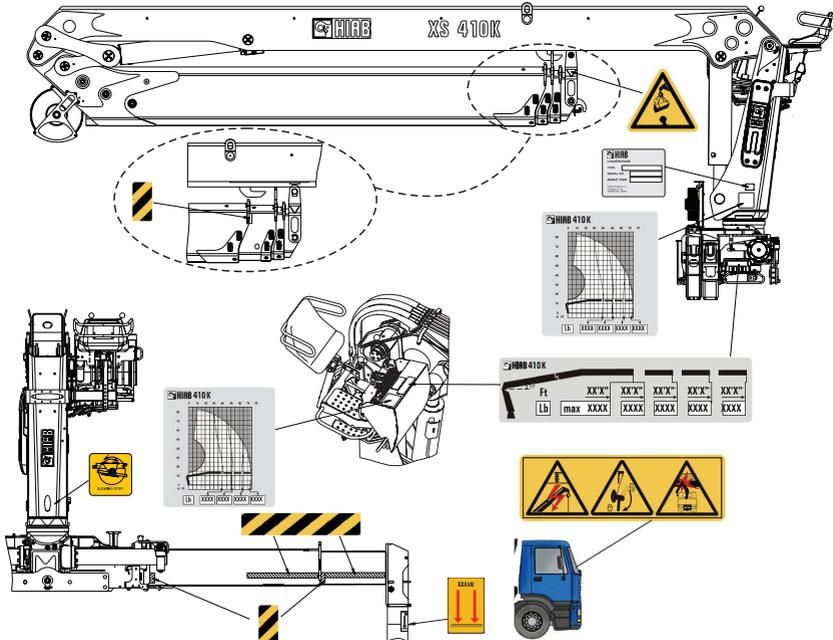
3.3.1. Noise declaration

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: LwA = 103 dB (Uncertainty: KwA = 2 dB).
- Emitted A-weighted sound power level for loader cranes with hoist in accordance with ISO 3744: LwA = 107 dB (Uncertainty: KwA = 2 dB).
- A-weighted sound pressure level at loader crane control stations in accordance with ISO 11201: LpA = 95 dB (Uncertainty: KpA = 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.

3.3.2. Signs on the crane



3.3.3. Maximum load [AR+]

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.
- Never use the crane with the OLP system switched off.

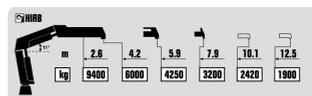


NOTE

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 next to the control valve. 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

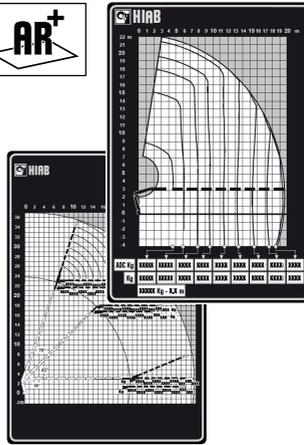
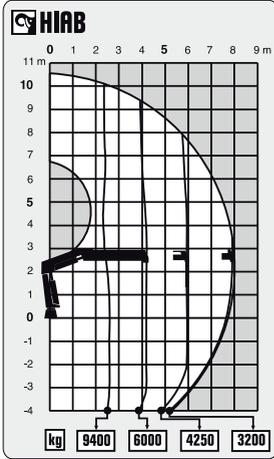
Never exceed the maximum weight on the load plate.

Load diagram

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

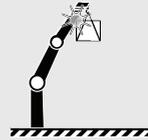
The white area is the working zone of the crane.

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.



WARNING

Never operate the hydraulic extensions against a solid object when the first boom is completely lifted. Do not try to push or compress loads when the first boom is fully lifted, as this could cause damage to the first boom cylinder.

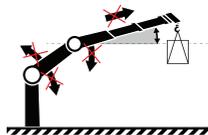


3.3.4. Maximum load moment

If 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.

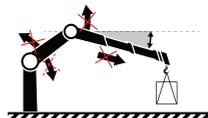
If the 2nd boom is raised, the following movements are locked:

- 1st boom down/up
- 2nd boom down
- extension boom out



If the 2nd boom is down, the following movements are locked:

- 1st boom up
- 2nd boom up
- extension boom out
- 1st boom down (certain crane types and cases)

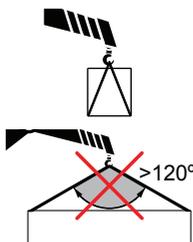


Lifting the load

Make sure 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°. The maximum working load, (usually known as the working load limit (WLL) in standards) of a multi-legged sling for general purposes, is calculated by multiplying the WLL of a single leg by a mode factor (refer to 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 is more than 90°, do not hang the slings directly on the hook. Use a ring hanging from the hook to attach the sling.

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.



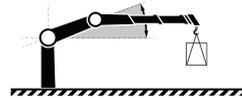
Working below ground level

If you have to load or unload below the level of the ground: keep the 1st boom angle to about 10 to 30° above the horizontal plane.



Heavy loads

Lift heavy loads with the 2nd boom in the optimum position in relation to the 1st boom. For this, see the load plate on your crane.



DANGER

Never exceed the maximum permissible loading of the hook.

Heavy loads cannot be handled with the boom straight.

Set the 2nd boom, so there is an angle in relation to the 1st boom.

Loads at the extreme limit of the working zone

Also in this case, angle down the 2nd boom somewhat. Only use the 1st boom .



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.

3.4. Signals when using a crane [AR+]



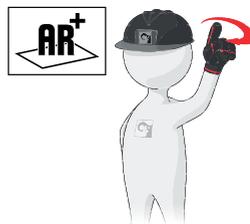
DANGER

- 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 qualified.
- The country-specific regulations for crane operator signals are to be used.

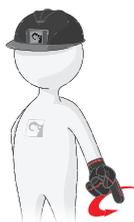
Signals in this manual give a number of standard signals that can be used.

Lift

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

**Lower**

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

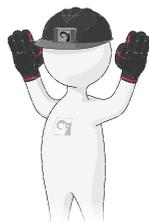
**Stop all crane movements / Hold the load in position**

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

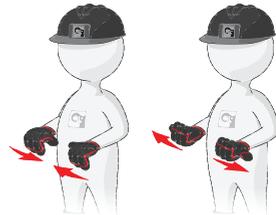
Place the hands a very short distance apart, with the palms facing each other. The hands may be held either horizontally or vertically. The next movement may be: Lift, lower, move the lifting gear, change the reach, or turn.



Change the reach

Signal with your hands.

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



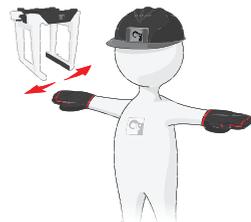
Turn in the direction indicated

Indicate the direction with the hands.



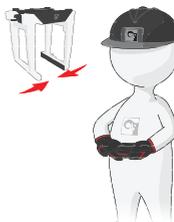
Open the tool

Extend the arms at shoulder height, with the palms facing downwards.



Close the tool

Move both hands close together.

**Lift the open tool a little**

Extend both arms at shoulder height, with the palms facing upwards. Make vertical movements with both arms outstretched.

**Keep the tool in position briefly**

Raise the hand drooping slightly, with the fist clenched.



3.5. Use of the crane

Starting crane operation



DANGER



- Make sure that you comply with the regulations of the country in which you use the crane (for example, certificate, safety helmet, and other personal protection devices).
- Check that the ground is sufficiently flat and firm.
- Verify that the ground is not uneven. Be careful with sewers, cellars, excavations etc.
- To make sure that the vehicle stays in its position, always engage the parking brake and place chocks under the wheels.
- Lower the stabiliser legs only on to a flat and firm surface.
- Do not lower the stabiliser legs on the edge of an embankment, soft shoulder, slope etc.
- Make sure that you can see the stabiliser legs and stabiliser extensions when you are operating them.
- The stabiliser legs must not sink in! Use support plates that are large and firm enough for your crane. The plates must not bend because of the load weight.
- Verify that the support plates do not sink as you gradually lift the load.



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, completely out if possible. Then lower the stabiliser legs for support.
- Never operate the stabiliser legs/ extensions if there is a load suspended from the crane.



**WARNING**

- Use low force when you put the stabiliser legs on the ground.
- Do not raise the vehicle with the stabiliser legs! If you do, you can cause damage to the stabiliser legs.
- Check that the add-on lifting accessories and separate lifting accessories are in good condition!

Add-on lifting accessories are sometimes attached to the crane (hoist, JIB) or on the boom tip (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 transport position.

**3.5.1. Preparations for use****DANGER**

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

To mark the working area correctly, think about the space that the crane will need to lift the load (direction of the lift, size of the load).

**CAUTION**

- Put on your vehicle's warning lights.
- Make sure that the parked truck does not block emergency exits, pedestrian roads or no-parking zones unless you have permission.
- Make sure that both the truck and the crane do not block the visibility of important signs for other users of the area (for example, road signs).



DANGER

- If a part of the crane comes in contact with an electricity line, you will be electrocuted!
- Always keep 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 uninsulated 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 40000 V:		power transmission



DANGER

When you go into the control station (high-seat, cabin, platform) remove all jewellery, loose clothing, or other hanging items from your body (for example, rings, scarfs, bracelets...). Jewellery, loose clothes, and other hanging items can be caught in some parts of the crane.



DANGER

When you go into or out from the control station, use only handles and supports on the crane that were specifically made to help the operator to go into or out from the control station.



WARNING

Make sure that you know the position of all the emergency stop buttons on your crane and on the controller.



3.5.2. Crane operation



DANGER

Your crane has a control system.

The control system will help you to work safely. Nevertheless, you remain responsible for safe use of the crane!

Therefore, always work according to the operating instructions!

In an emergency situation, push immediately any of the emergency stop buttons. This will stop all crane movements and prevent the free movement of the load.



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!

- Do not slew the crane, nor lift the first boom, nor lift the second boom into their ends positions at full speed. This can damage the crane.





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 an 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.

Precautions when slewing the crane

Your crane has a rack-and-pinion slewing system which provides more than 360° of rotation.

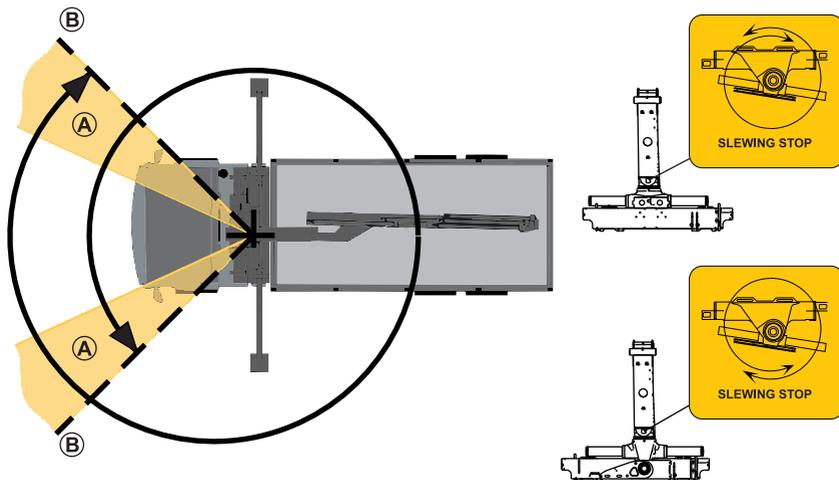
As part of the initial orientation and training:

1. Look at the plate(s) on the column to see the position of the 'slewing stop' (slewing stops).



NOTE

The exact positions for your crane can change from the image below.



2. Slew the crane slowly in each direction to the slewing stop (B).
3. Record the slewing stop positions.



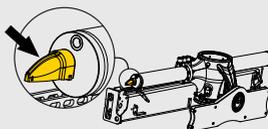
CAUTION

To prevent damage to your crane base, reduce the slewing speed in the area (A) before reaching the slewing stops (B).



NOTE

Remote controlled cranes with a slewing sensor will reduce the slewing speed automatically in the area (A), but they will not stop automatically before reaching the slewing stops (B).



CAUTION

Repeated rotation of the crane against the slewing stops during operation can cause major crane base damage. If this operation happens, it will be considered as a misuse of the crane.

3.5.3. Driving with the crane



DANGER

- Never move/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 main 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 must stay within the width of the truck.
- Make sure the stowed crane and its accessories cannot fall, hit bridges, tunnels, other vehicles etc.
- Pay attention to overhead power lines! Make sure that no part of the crane ever comes in contact with overhead power lines.



NOTE

- For further instructions, refer to the vehicle's manual(s).
- Make sure that you always obey local traffic rules when driving with a crane.

3.5.4. 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

3.5.5. Use of demountable cranes



DANGER

- Make sure that there are no unauthorised persons in the immediate vicinity of the crane. When mounting/demounting the crane on/from the vehicle, people can suffer fatal crushing injuries!
- After setting up, verify that the crane is properly locked!



WARNING

Be careful when mounting/demounting the crane on/from the vehicle as rough handling can seriously damage the crane or the vehicle.

3.5.6. 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, you can drive the vehicle away.

4. The Safety system

4.1. Safety System SPACE 3000

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 3000 is used on cranes with manual control. The control valve is type V91.

Crane version	Control Valve	Safety system
Pro	V91	SPACE 3000



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 authorised service workshop.

4.2. How the safety system works

The safety system works as follows:

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:
All movements are stopped, because when a spool is moved too much, power to the dump valve is cut.

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 authorised service workshop!

4.3. Components of SPACE 3000 Safety System

Control valve (1)

- The crane can be operated from the main control valve.

Selector valve (2)

- Select the oil flow towards either the crane or the stabiliser system.

User interface - Microprocessor (3)

- This is the user interface for SPACE 3000. On this user panel the operator turns on and off the system and activating stabiliser legs and OLP release. There is also a stop button on the user panel.



Filter (4)

- Pressure reduction filter. The filter feeds the positioners with filtered oil.

Dump valve 1 (5)

- 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 and the oil is returned directly to the hydraulic tank. As soon as the operator moves a lever the valve closes.

4.4. Operating components

- main control valve V91
- stabiliser control valve
- selector valve
- high seat
- remote control: CombiDrive2 (nonCE)
 - with radio
 - with cable connected

4.5. Standard symbols and functions of the crane and the stabiliser system

These symbols can be shown:

- On the plates.
- On the control valve levers.
- On the controller (if delivered).



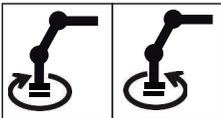
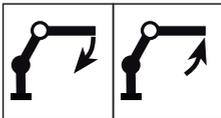
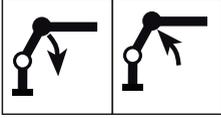
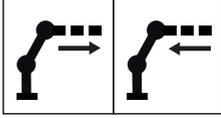
NOTE

If you use a controller to operate your crane, you can read about the symbols displayed on it in the dedicated section of this operator's manual.

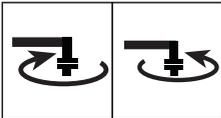
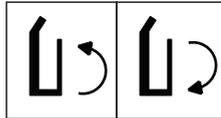
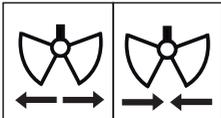
By default, the symbol on the controller corresponds to the positive movement of the levers. To operate the opposite movement of that symbol, move the lever on the opposite direction.

Always operate the lever according to the function on the symbol sign.

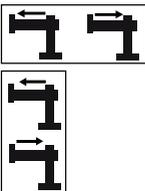
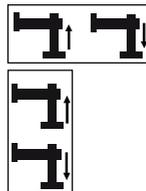
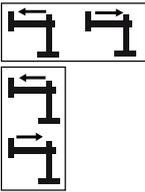
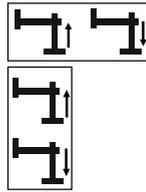
Basic crane symbols and functions

SYMBOLS		FUNCTIONS	SYMBOLS		FUNCTIONS
		Slewing			Second boom
		First boom			Hydraulic extensions

Accessories symbols and functions. (If delivered).

SYMBOLS		FUNCTIONS	SYMBOLS		FUNCTIONS
		Rotation tool			Tool
		Tool			

Stabiliser system symbols and functions (if delivered)

SYMBOLS	FUNCTIONS	SYMBOLS	FUNCTIONS
	Crane stabiliser extension		Crane stabiliser leg
	Auxiliary stabiliser extension		Auxiliary stabiliser leg

4.6. Main control valve

The speed of a function corresponds to the extent of the lever movement, regardless of the load and other functions, as long as the oil flow is sufficient. When the oil flow is insufficient, one or more functions might reduce their speed.

4.7. Different stabiliser control valves

Different stabiliser control valves that you can find on cranes:

- 2-function/4-function control valve included in the main control valve
- 2-function control valve
- 4-function control valve.

You can operate the stabiliser control valve manually or remotely. On remote-controlled cranes the stabiliser control valve levers are only to be used for emergency operation.

4.8. High seat

The high seat is equipped for using tools and operated by two joystick levers: (1) and (2); and two foot pedals: (3) and (4). The control valve is placed at the high seat.

The controls have the functions:

(1) Joystick

Second boom: upward/downward
Slew: clockwise/counterclockwise

(2) Joystick

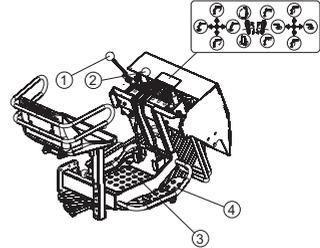
First boom: downward/upward
Add-on equipment

(3) Pedal

Add-on equipment

(4) Pedal

Extension boom: out/in



DANGER

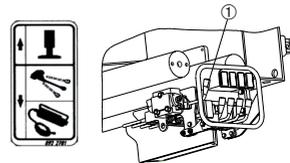
Take care not to put your foot on the pedals when taking place in the high seat. Unintentional crane movements can occur.

For safety reasons, it is necessary to sit down on the seat to operate the controls.

4.9. Selector valve

Use lever (1) to select:

- Crane functions
- Stabiliser system functions



4.10. OPS Operator Protection System [option]

- OPS is a system that protects the operator from the boom system's movements when operating the crane.
- The OPS system is integrated in the SPACE system, and it uses a sensor on the rack and tilt indicators on the boom system, to indicate the position of the crane. It creates a virtual cage around the area where the crane operator stands, while manually operating the crane.

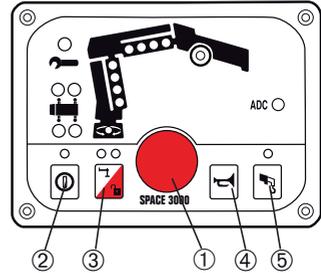


4.11. User panel SPACE 3000

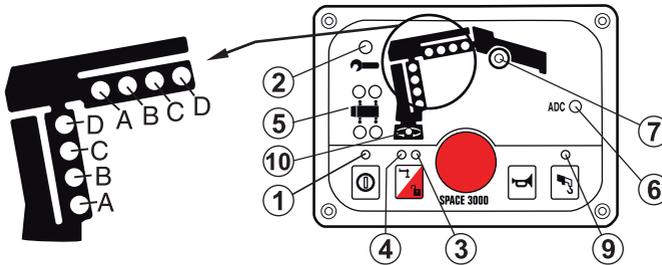
Manually controlled cranes are equipped with User Interface SPACE 3000

Functions:

- Stop button (1)
When you push the stop button, all crane movements are stopped immediately.
- ON/OFF button (2) to switch the safety system On/Off.
- Button (3)
Push the button to operate stabiliser extensions and legs.
The button is also an OLP release button with the functions:
Disconnecting the automatic dump function.
OLP release.
- Button (4), to sound the horn, if present.
- Button (5)
Push the button, to switch the manual extensions on/off.



4.11.1. Indicator lights on User Interface SPACE 3000



	<p>Power On</p>	<p>(1)</p>	<ul style="list-style-type: none"> ● Green light on: The system is on. ● Green light flashing: A stop button is depressed or remote control selected.
	<p>Service</p>	<p>(2)</p>	<ul style="list-style-type: none"> ● Green light on: Time to service the crane. ● Red light on: A non-critical error detected in the system. ● Red light flashing: Critical error is stopping the crane. Diagnostic required. ● Red light double flash: CAN Error, crane stops.

	OLP Release	(3)	<ul style="list-style-type: none"> ● Red light on: OLP crane ● Red light blinking: OLP Release crane ● Green light on: dump 2 active (if present)
	OLP Release	(4)	<ul style="list-style-type: none"> ● Green light on: Dump 1 active.
	OLP Release	(3) (4)	<ul style="list-style-type: none"> ● Green light on both ③ ④: Stabiliser functions are activated (dump 1 and 2 active).
	Stabiliser leg/extension	(5)	Not active.
ADC	Automatic duty control	(6)	<ul style="list-style-type: none"> ● Green light on: Increased capacity (ADC mode).
	Hoist LED	(7)	Not active.
	Cylinder pressure LED's	(8)	<ul style="list-style-type: none"> ● Green light A on: 50% of OLP pressure. ● Green light A - B on: 70% of OLP pressure. ● Red light A - C flashes: 90% of OLP pressure. ● Red light A - D on: 100% of OLP pressure. ● Red light blinking from A to D: OLP Release.
	Manual extension	(9)	Not active.
	Slewing sector	(10)	<ul style="list-style-type: none"> ● Green light on: Outside slewing sector, normal capacity. ○ Light off: Inside slewing sector, reduced capacity. ● Red light on: OLP. Vehicle has reached a stability limit. (Also all the 1st boom diodes will light red).

Lamp test for the User Interface SPACE 3000

See: Daily inspection.

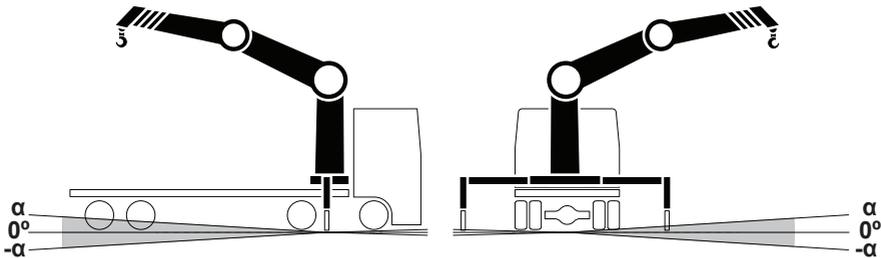
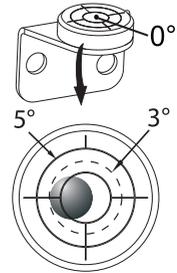
5. Starting crane operation

5.1. Starting operations [AR+]

- **General case:**

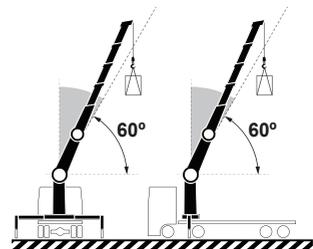
Place the vehicle on a flat, firm and stable surface. The vehicle inclination (α) during crane operation must **not be more than 3°**. If this value is exceeded, unintentional crane movements can occur.

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°.



- **Working with boom system beyond 60°**

To avoid side deflection and in order to guarantee the safest operation when working with e.g. Lifting Accessories and/or Hoist applications, the vehicle has to be completely levelled in any direction ($\alpha=0^\circ$).



NOTE

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

Engage the PTO

Engage the PTO (Power Take Off) and bring the vehicle 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 engine could stall.
- The maximum rpm may depend upon a governor on your PTO combination.



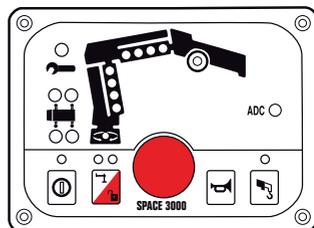
CAUTION

Close the driver's cab to prevent access to unauthorised persons.

Start the safety system

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

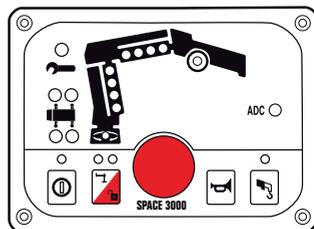
To start the safety system, press the On/Off button . The LED above the button lights up. The system will check itself. (2-4 seconds) .



Manual controlled stabiliser extensions and legs

When in manual operation:

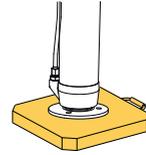
1. On the side where the stabiliser extension and leg will be operated, press the button  to activate.
2. Go to: **Extend stabiliser extensions and set stabiliser legs**



5.2. Stabiliser system and ground conditions

Always:

- Make sure that the ground can support the load that the stabiliser leg imposes on the ground. (*)
- Make sure that the ground is not undermined.
- Use the extra support plates that are large and firm enough for your crane model.



The maximum permitted ground inclination under the stabiliser leg plate is 5°.



(*) The maximum load (P) that the stabiliser leg can apply to the ground is (kN):

Crane Model	Stabiliser leg config.				
	Short	Medium	Long	Extra long	
265-285	200	200	-	-	
395-425-505-335K-410K-435K	230	230	-	-	
322-377-328-352-362-388	230	200	180	-	
422-477	Medium stab. exten.	220	220	-	-
	Long stab. exten.	240	240	-	-
	Extra long stab. exten.	220	220	-	-
358-398-408-418	230	200	180	-	
528-548-558-638-658	-	250	250	-	
858-1058	370	370	370	370	
HIAB Auxiliary stabilisers	180				



NOTE

Sign that shows the maximum force that the stabiliser legs can apply to the ground.





DANGER

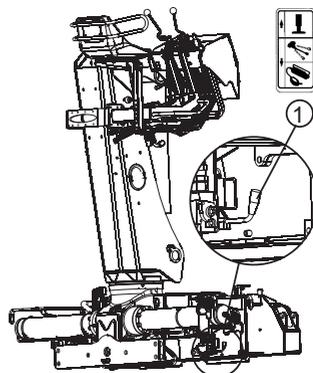


Check that the extra support plates do not bend or sink into the ground.

Do not lower the stabiliser legs on the edge of an embankment, soft ground, hollows, etc... Lower the stabiliser legs only on to a flat, firm and stable surface.

Selector valve

Move lever (1) to stabilizer position.

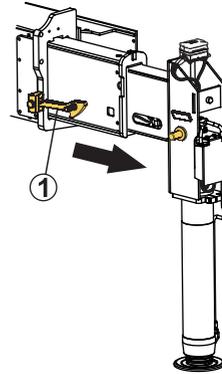


5.3. Extend the stabiliser extensions

The procedure of setting the stabiliser extensions differs depending on the type of stabiliser extensions. Repeat the instructions for the stabiliser extension on the other side of the vehicle. For auxiliary stabiliser system [option]: Repeat the process.

Hydraulically controlled stabiliser extensions

Unlock the stabiliser locking device (1) (if fitted) and extend the stabiliser extensions with the levers on the valve or the controller depending on your crane configuration.



WARNING

Do not stand in front of the hydraulically operated stabiliser legs when you are operating them.

5.4. Set the stabiliser legs [AR+]

The procedure of setting the stabiliser system differs depending on the type of stabiliser system. Repeat the instructions for the stabiliser extension and leg on the other side of the vehicle. For auxiliary stabiliser system [option]: Repeat the process.



WARNING

Take care not to lower the stabiliser leg onto your foot.



NOTE

For cranes with VSL the stabiliser leg downward movement is automatically stopped at a pre-given force level. To exceed this pre-given force level, operate the stabiliser leg down once again.

**DANGER**

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

Never operate up any stabiliser leg if you have load on the crane.

Put the extra support plates

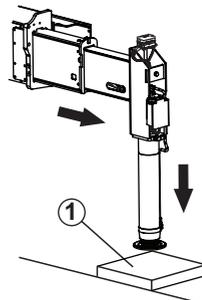
- Put the extra support plates under the stabiliser leg plates (if necessary).

**DANGER**

Do a check that the support plates do not bend or sink into the ground!

Non-tiltable stabiliser legs

1. Make sure that the stabiliser extensions are extended.
2. Put the extra support plate (1) onto the ground (if necessary).
3. Operate the stabiliser leg downwards until it is set to the ground.

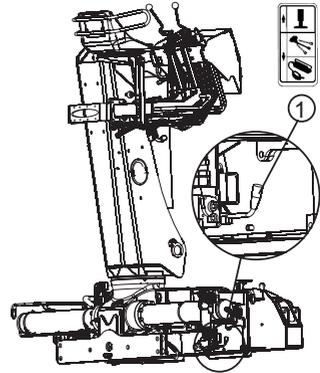
**5.5. Operate the boom system out of transport position****WARNING**

- A crane with add-on equipment can differ from the operations described in this section.
- For this reason study the operating instructions for add-on equipment carefully.

Once the stabiliser extensions and legs are ready you can start using the crane.

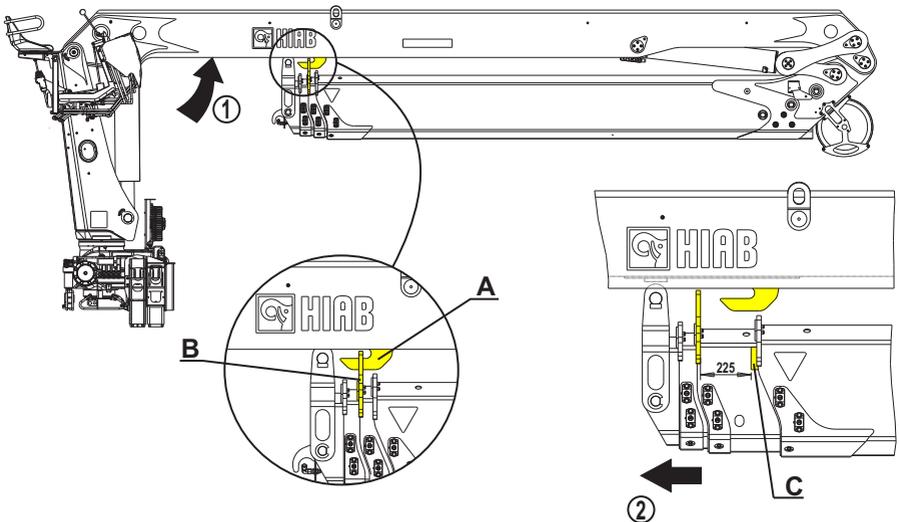
Selector valve

Move lever (1) to crane position.



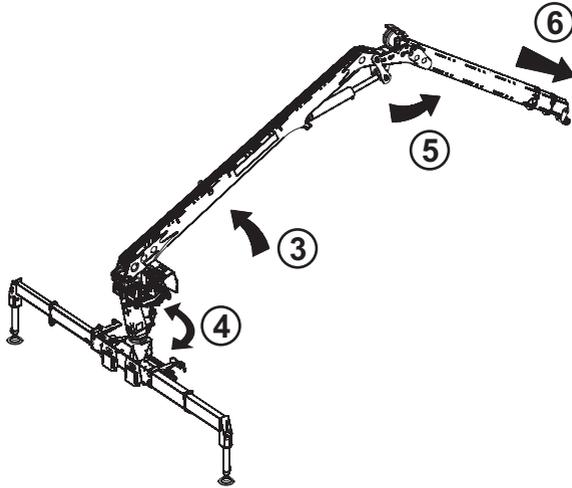
Operate the boom system

1. Raise the first boom (1).
2. Extend the boom extension about 230mm (2) until extension support "B" comes free of catcher "A". Sticker "C" will be visible. Do this operation carefully to avoid damaging parts "A" and "B".



3. Raise the first boom (3) again.
4. Slew the crane (4) and operate the boom system (5) to working position.

5. Extend the hydraulic extensions (6). The crane is now ready for use.



6. During operation

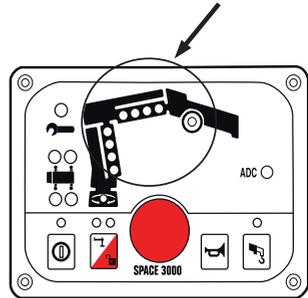
6.1. OLP (Overload protection)

OLP Crane

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 cylinder pressure LED's flash red.

When 100% of the maximum permitted pressure is reached, the OLP cuts in and stops all movements that increase the moment. The cylinder pressure LED's will light continuously.



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 "OLP release" 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 an appropriate crane function so as to correct the overload situation. Only one unallowed function at a time can be operated. Extension out cannot be operated.

The cylinder pressure LED's and the lamp above the OLP release 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 increasement 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.

**NOTE**

In case of a crane breakdown, the use of OLP release will be part of the investigation. If the use of OLP release is too excessive it might affect warranty.

7. Ending crane operation

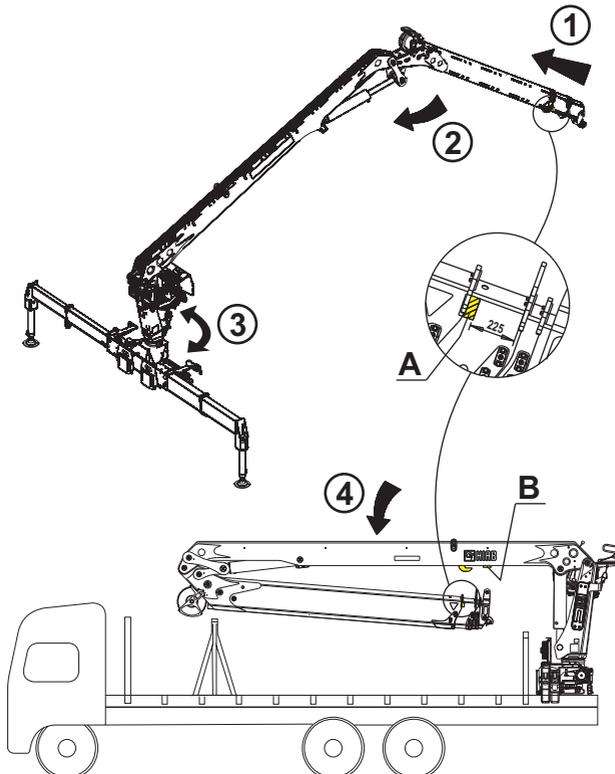
7.1. Operate the crane to parking position



WARNING

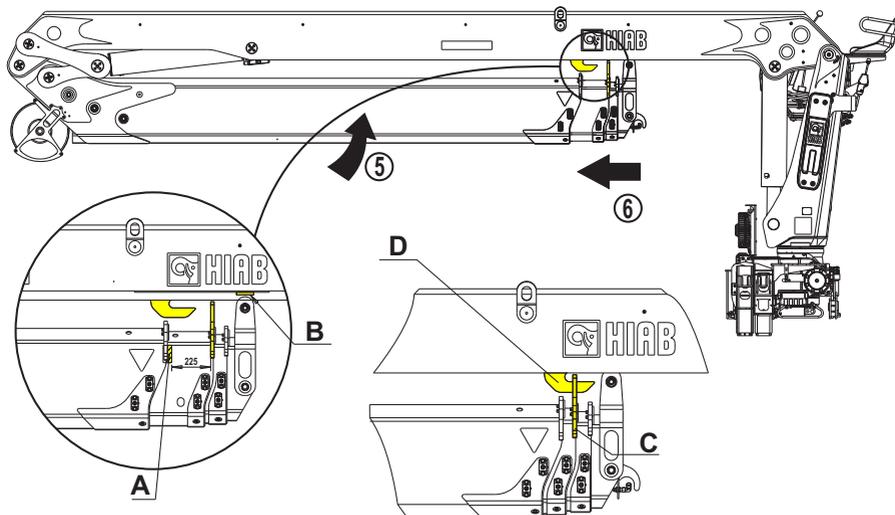
- A crane with add-on equipment can differ from the operations described in this section.
- For this reason, study the operating instructions for any add-on equipment carefully.

1. Retract the extensions (1) up to the sticker "A".
2. Operate the second boom against the underside of the first boom (2) without reaching the limit position.
3. Slew the crane (3) until the crane position is parallel to the vehicle.
4. Lower the boom system (4).



5. Operate the boom system against underside of the first boom (5). The crane tip matches with the stop plate "B".

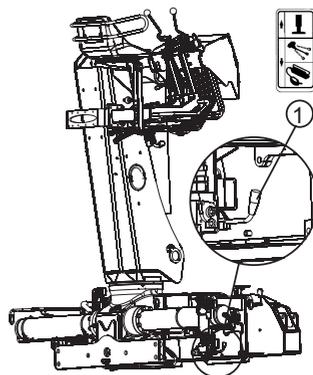
6. Retract first extension (6) until the catcher "D" is locked in support "C". Do this operation carefully to avoid damaging parts "D" and "C".



7. Lower the boom system against the vehicle. Check that the boom system is prevented from moving laterally and vertically.

Selector valve

Move lever (1) to stabilizer position.



7.2. Placing the stabiliser extensions and legs in transport position [AR+]

Activate operation of stabiliser extensions and legs.

**DANGER**

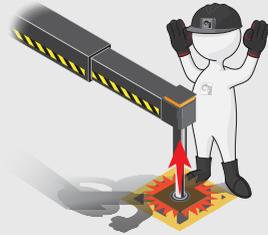
Do not stand in the stabiliser legs, tilting area.

**WARNING**

Do not put your foot on the support plate.

Risk of crushing injuries.

Always keep hands away from moving parts during operation.



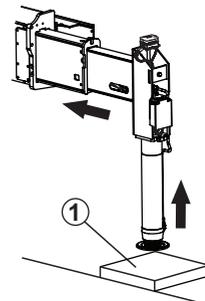
The procedure of operating the stabiliser legs differs depending on the type of stabiliser leg. Repeat the instructions for the stabiliser extension and leg on the other side of the vehicle. For auxiliary stabiliser system [option]: Repeat the process.

**DANGER**

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

Non-tiltable stabiliser legs

1. If there is an extra support plate (1) for the leg delivered, retract the stabiliser leg a little, if not, go to step 3.
2. Remove the extra support plate (1).
3. Retract the stabiliser leg completely.
4. Retract the stabiliser extension completely.

**WARNING**

Risk of crushing injuries.

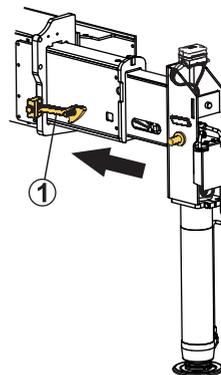
Always keep hands away from moving parts during operation.

Retract the stabiliser extensions

The procedure of retracting the stabiliser extensions differs depending on the type of stabiliser extensions. Repeat the instructions for the stabiliser extension on the other side of the vehicle. For auxiliary stabiliser system [option]: Repeat the process.

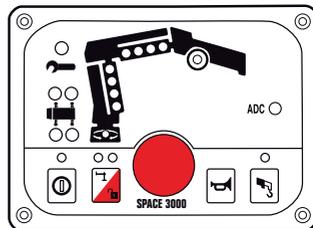
Hydraulically controlled stabiliser extensions

Retract the stabiliser extensions with the levers on the valve or the controller depending on your crane configuration. Make sure that the stabiliser locking device (1) (if fitted) is securely locked.



7.3. Switching off the safety system

- Switch off the safety system with the on/off button .
- Disengage the PTO.



7.4. Emergency operation Valve-V91

EMERGENCY operation to bring the crane to parking position

Do like this:

On the main control valve:

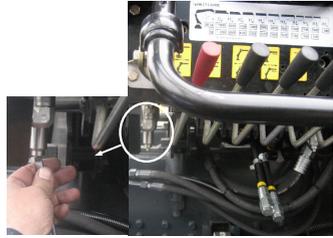


DANGER

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

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

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



7.5. Transport warning [option]



WARNING

If you switch off the safety system when stabiliser extensions/stabiliser legs are not locked in the transport position, and/or if the first boom angle exceeds a certain specified angle, the indicator LEDs on the UI 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 stabiliser extensions/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, put the crane into the 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.

8. Maintenance and Service

8.1. Service

No welding/drilling work on the crane



DANGER

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



Leakages



DANGER

- STAY AWAY from oil leaks in the hydraulic system! Oil in the hydraulic system is under high pressure, can spill, be very hot and cause you injury.
- Do not replace any hydraulic hoses or lines yourself.

You can disconnect a hydraulic line or a hose only for specific operator's tasks (for example, disconnecting the JIB or other accessories).

1. Make sure that the cylinders are not at the end of stroke and minimise as much as possible the forces acting on them.
2. Switch off the system.
3. Disengage the PTO.
4. Make sure that you wear the correct personal protective equipment.
5. Move all levers in both directions to the end of the stroke to release all the pressure in the line.
6. Slowly loosen all connectors.
7. If they do not come out easily, you have remaining pressure in the line. Stop and do step 5 again.

Deal with an oil leak as follows:

1. Rest the crane on the floor or on the truck platform.
2. Switch off the control system.
3. Disengage the PTO.

Leaking coupling:

- a. Tighten the coupling with a spanner.
- b. If tightening does not help, contact a Hiab authorised service workshop.

Small leak on a line or hose:

- a. Determine if you can still park the crane.
- b. If you can, park the crane and go to a Hiab authorised service workshop.
- c. If you cannot, contact a Hiab authorised service workshop.

8.2. Warranty

Hiab only provides a warranty if:

- The "Warranty – Terms and Conditions" specified in the "Service & Warranty Manual" are fulfilled.
- The crane is inspected and maintained, by a Hiab authorised service workshop as specified in the "Service & Warranty Manual".
- Original HIAB parts are used for every repair or maintenance work.
- All security seal wires on the valves are still intact.

Always use original HIAB parts.

8.3. Follow the maintenance instructions!

Take the crane to a Hiab authorised service workshop for inspection and maintenance. Maintain lifting accessories according to the supplier's instructions.

**WARNING**

- Make sure that faults in the crane are corrected immediately!
- Never correct faults yourself that may only be corrected by a Hiab authorised service workshop.
- Carry out yourself only the service and maintenance work you have the requisite knowledge and experience for. Maintenance must be performed by qualified personnel.
- Always use personal protection devices and other safety means during the maintenance work in compliance with the regulations of the country in which you use the crane.
- All personnel must understand and comply with all warning and instructional decals attached to the body, crane and truck controls.
- Mark out the working area and make sure that there are no unauthorised persons inside.
- NEVER walk or stand under a crane or a suspended part. People may suffer fatal crushing injuries!
- When working on any part of the crane, put the "Out of Service" tags displayed clearly and wherever possible on the vehicle, and remove the ignition keys to prevent accidental operation.

**NOTE**

- Make sure that you have read the complete manual before starting the preventive maintenance. It provides detailed information about the maintenance process.
- Make sure that the manual and other documentation are in good condition, near the machine and available for anyone who needs it.

Maintenance intervals:

- Carried out by the **operator: daily and monthly inspection.**
- Carried out by Hiab or a Hiab authorised service workshop:
 - **1st service:** to be made after 50 hours of use.
 - **Regular service:** to be made when one of these conditions are met:
 - 1,000 hours of use
 - 10,000 cycles
 - 365 days

**NOTE**

The service indicator on SPACE (if present) will light up for the 1st and regular service.

**NOTE**

Refer to the "Service and warranty manual" to know the actions performed by the Hiab authorised service workshop.

Long storage of the crane

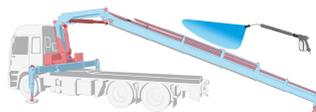
If you need to store your crane for a month or longer, do this first:

1. Clean it according to the instructions in the section "Cleaning" of this manual.
2. Lubricate it according to the lubrication schedule of this manual.
3. Put the crane into transport position and disconnect the power from the vehicle battery.
4. Put grease on the exposed piston rod(s) and the external seals of the hydraulic cylinders.
5. Put a plastic cover on the crane.
6. Protect it from rain, sun and dirt as much as possible.

Cleaning

Clean your crane and accessories regularly, but:

- Always set the power off before you start.
- Do not use aggressive cleaning agents.
- If you use a high pressure water jet, make sure that:
 - Maximum temperature of the cleaning water is 60°C.
 - Maximum working pressure is 150 bar.
 - Minimum distance between the nozzle and the surface to clean is 80 cm.



**CAUTION**

Never use a high pressure water jet 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.

**NOTE**

Always lubricate after cleaning the crane.

**WARNING**

Keep the devices to go into the control station (handles, supports, platforms...) clean from oil, grease and dirt to prevent slipping and falling.

8.3.1. Daily inspection

Refer to the daily inspection checklist at the end of this manual to photocopy.

Presence of signs and symbols

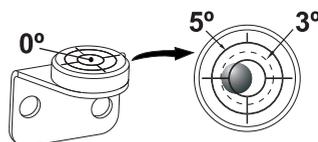
- See chapter "Safety precautions and warnings" under section "Signs on the crane". Make sure that all the signs shown in section "Signs on the crane" are in position and in good conditions .
- Make sure that all the symbols on your crane are in good conditions.

Locking devices

- Make sure that the locking devices are undamaged and working properly.
- Make sure that the locking devices are properly locked.

Spirit Level

- Make sure that the spirit level is clearly visible to the operator and works correctly.

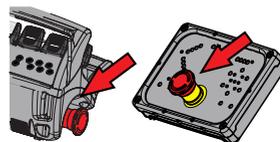


Shafts, shaft lockings, bearings and bushings

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

Stop buttons

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



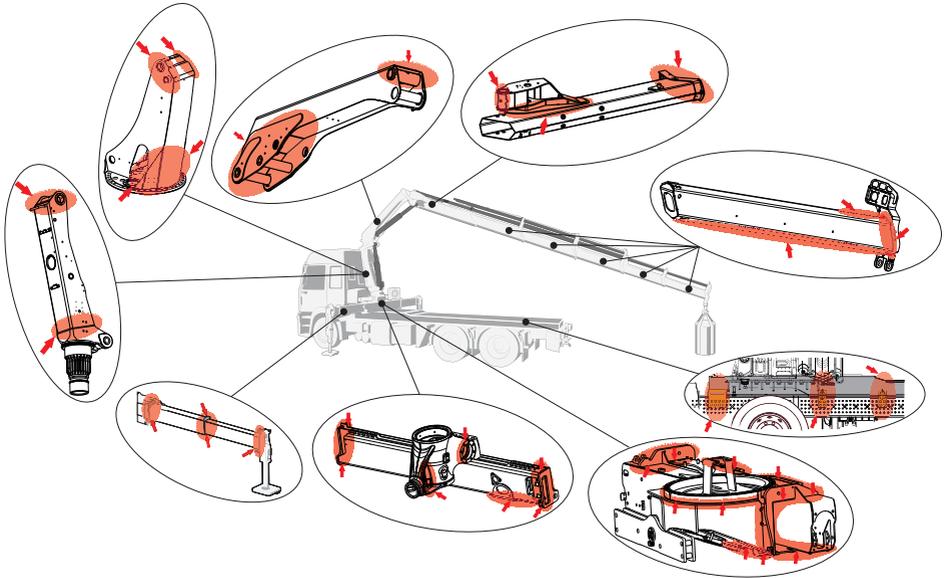
Levers

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

Controller

- Do a check of the controller functionality.

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:

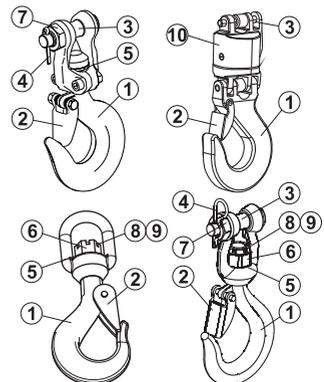
- Do not use the crane.
- Have the damage repaired immediately by a Hiab authorised service workshop.

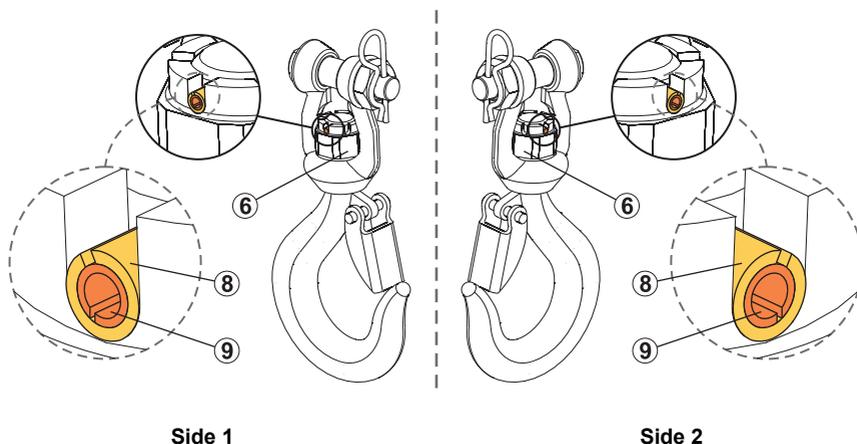
Hooks

Always keep the hook clean. Use a cloth to wipe away any dirt.

Before every working shift:

- Do an inspection of the general conditions of the Hook (1) for deformation (stretched, cracked, twisted, excessive wear...) and surface damages with significant depth (such as from chemicals or heat).
- Do an inspection of the Clevis/Link Shaft (3) for damage/ deformation.
- Do an inspection of the two Spring/Roll pins (8) and (9) that are in place and properly retaining the central hook nut (6).




Side 1
Side 2

The two Spring/Roll pins (8) and (9) should be in place and nearly flush with the outer edge of the hook nut (6) on both sides. (See the pictures **Side 1** and **Side 2**).

- Do an inspection of the spring-loaded safety Latch (2). The Latch must close the entire throat opening.
- Do an inspection of the Clevis/Link Shaft (3), Clevis/Links Shaft nut (7) and Cotter/Safety pin (4) are in place.
- Do an inspection of the Plane bearing/Washer (5) or the Swivel (10) that is in good conditions.
- Do a general inspection for deformation and operation of the remaining items: clevis, swivels, washers, nuts, pins...
- Lubricate the hook according to the chapter "Lubrication of the hooks".



DANGER

In the event of damage or worn to prevent a safety risk:

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

Add-on equipment and separate accessories (hoist, JIB, etc.)

- Check the cables, cable connections, the cable guides and the attachment points for the add-on equipment.
- Check the rope, rope connections, the rope guides and the attachment points for the add-on equipment.
- Maintain all add-on equipment, separate accessories, auxiliary equipment etc. according to the instructions supplied with it.
- Polyamid parts as well as all bolt components have to be checked and must be replaced in case of wear and tear.

Electronic components

- Check that these are in good condition.
- Make sure that the horn works correctly.

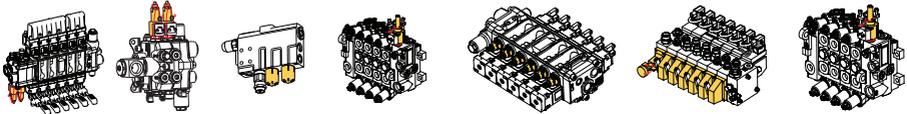
- Do a check of the LEDs on the User Interface.

LED Test on the UI box:

1. Push the ON/OFF button for at least 2 seconds. The test is activated and all the red LEDs are illuminated. If the system is equipped with warning lights / lamp poles, all the lights will come on.
2. Release the button. After 3 sec, all the green LEDs are illuminated. The test is finished when all LEDs are off.

Hydraulic system and oil level in the tank

- Check that there are no leaks from the hydraulic hoses, lines and connections.
- Make sure that all security seal wires (Ex. LHV, dump valves, etc...) are not broken. Always go to/contact a Hiab authorised service workshop when the seal wire has been broken.

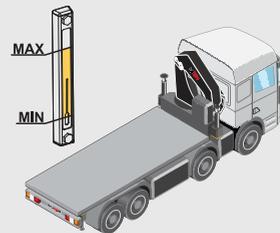


- Check oil level in the tank. If necessary, fill to correct level.



NOTE

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



Oil level on the slewing housing

- Do a check of the oil level in the slewing housing. If necessary, fill to correct level.

Filters

- Check the filter indicator. If red, a workshop must replace the cartridge.

8.3.2. Monthly inspection and maintenance



NOTE

Refer to the monthly inspection checklist at the end of this manual to photocopy.

In addition to the daily inspection, carry out the following tasks 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.

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 tight. If not, contact a Hiab authorised service workshop

Cables and sensors

- Check that cables and sensors are in good condition.

Lubrication schedule

- Carry out the lubrication according to the instructions.

Slewing bearing / upper column bearing

- Check that the slewing bearing / upper column bearing is lubricated sufficiently.

Hydraulic system

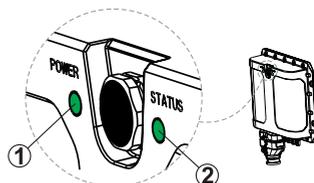
- Check that the hydraulic pump attachment screws are tightened.
- Check if the oil in the hydraulic system needs to be changed, or have it tested by a workshop or a specialist.

Add-on equipment etc.

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

Connectivity [option]

- Verify that you see both the POWER LED (1) and the STATUS LED (2) with the steady green light in the gateway box in order to confirm that there is a successful connection to the network. Refer to the section "Gateway connection box".



8.3.3. Annual maintenance

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

The workshop must carry out the following maintenance tasks at least once a year.

Hydraulic oil

- Change the hydraulic oil.



NOTE

If the workshop is equipped and the personnel prepared to do a test of the oil quality and think that the oil change is not needed, they can postpone it on their own responsibility.

Hydraulic system oil tank filler cap

- Change the filler cap.
- Replace filters.

Slewing housing

- Change oil in the slewing housing.

Hooks

- Replace missing or faulty parts on link assembly: shafts, safety pins and nuts.
- Replace the hook for a new one if the hook is damaged.
- Replace the latch assembly if it is damaged, missing or malfunctioning.
- **Hook 8 t and 10 t (without spring/roll pins):** replace the hook for a new one if the clevis/link or split clevis retaining nuts are missing or damaged.
- **Hook 10 t (with spring/roll pins):** replace the two spring/roll pins and the plane bearing for a new ones, at least once a year.

8.4. Lubrication

General greasing of the cranes

Incorrect or insufficient lubrication of a crane is the number one cause of premature failure.



WARNING

Before and after a long stop of the crane, lubrication is absolutely necessary. This is especially important after a winter shutdown.



WARNING

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

Procedure:

1. Shut down the crane.
2. Make sure that all the lubrication points are clean before lubricating. Dirt can damage the parts.
3. Lubricate all points in each section.
4. Operate the crane through the full cycle for each section. Moving the lubricated parts is really important to get the full and correct lubrication of all moving components.
5. Shut down the crane and repeat the lubrication.
6. Lubrication is finished when the grease spills out from the ends. Clean the excess grease.



WARNING

Personnel should never attempt to work on a crane that is moving. Serious injury or death will occur if you try to work on an activated/moving crane.



CAUTION

When you use pressure grease pumps, open the plastic safety guard of the nipple and close it at the end.

Greases

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



CAUTION

Do NOT grease with graphite or molybdenum-disulphide additives.

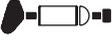
Recommended greases:

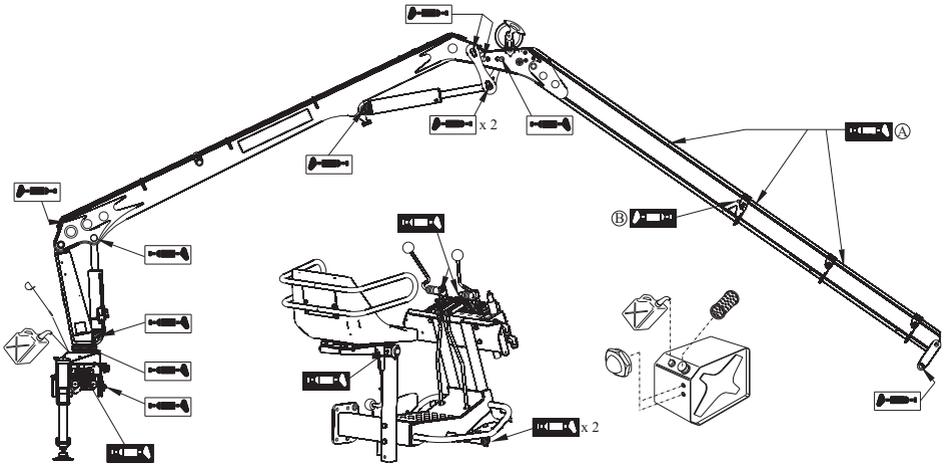
BP LS EP 2, ESSO UNIWAY EP2 N, AGIP GR MU/EP3, NYNÄS UNIFETT EP.

Alternative:

Use a Teflon grease spray to lubricate the extensions and mobile parts.

8.4.1. Lubrication schedule

	<p>Lubricate after every 16 hours of use.</p>
	<p>Lubricate after every 50 hours of use.</p> <p>A: Internal pads</p> <p>B: Internal guides</p>
	<p>See chapter of Slewing housing Lubrication</p>



8.4.2. Greasing the upper column bearing and three-point bridge



DANGER

The upper column bearing must be greased while the crane is slewed.



NOTE

The lubrication points can be fitted differently than showed in the image.

Grease through the nipples in the greasing manifold, located on the crane base, according to the greasing signs. If the manifold does not exist, grease directly through the nipples, located on the upper column bearing.

Nipples (1): For greasing upper column bearing

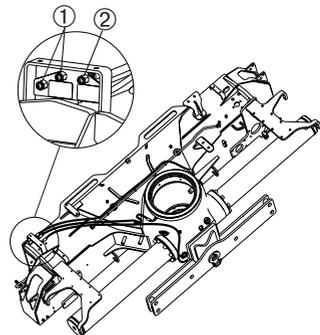
Nipple (2): For greasing three-point bridge

If you are greasing the upper column bearing without help:

1. Grease the upper bearing with a little grease.
2. Slew the crane a little.
3. Grease it again and repeat until the column has completed one turn.

If you are greasing the upper column bearing with help:

One person greases the upper column bearing, while another carefully slews the crane.



**DANGER**

Be very careful that the person greasing the bearing does not come into contact or get crushed by the crane!

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

Do not use grease with graphite or molybdenum-disulphide additives.

8.4.3. Lubrication of slide pads in boom system

Rear upper slide pads

- Extend the extensions until you can see the slide pad through the hole.
- Lubricate.
- Retract the extensions.

Front upper slide pads

- Extend extensions with load in order to create enough clearance.
- Lubricate.

Front lower slide pads

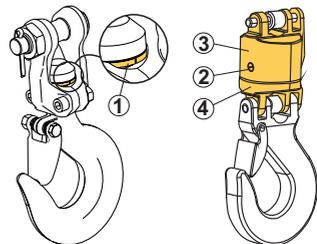
- Extend extensions without load and push slightly against the ground in order to create enough clearance.
- Lubricate.

8.4.4. Lubrication of the hooks

Hooks with plane bearing

If the hook cannot rotate easily without load:

- Put grease on the plane bearing surfaces (1).
- Use a heavy duty penetrating spray grease, type "ZEP 2000" or equivalent quality.



Hooks with swivel

Put grease if the swivel cannot rotate easily:

1. Remove the screw (2) and mount a grease nipple.
 2. Add grease until grease appears between house (3) and shank (4).
 3. Mount the screw (2).
- Use a bearing grease, type "Texaco Multifak EP 2" or equivalent quality.

8.5. Checking and topping up oil levels

8.5.1. Slewing housing: checking the oil level and topping up

Recommended oils for topping up oil in the slewing housing

Use a hypoid oil, type API GL-5, SAE J2360 (Formerly MIL-L-2105), viscosity SAE-80W-90, cleanliness NAS 1638:8. For example: "ENI ROTRA MP 80W-90", "SHELL SPIRAX S2 A 80W/90" or equivalent quality.



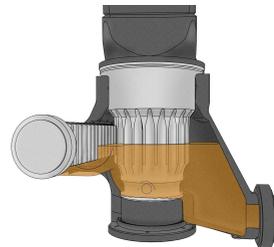
CAUTION

The oil used for filling must be clean. Do not mix different oils (a mixture will change the oil properties).

Oil level checking

Measuring stick or level glass

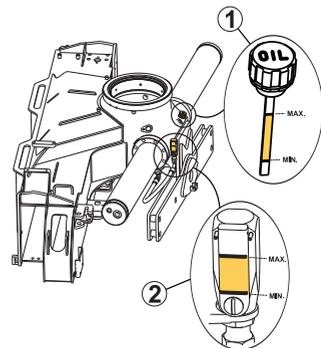
- Check if the oil level on the measuring stick (1) or on the level glass (2) is between the maximum and minimum levels.



Oil filling procedure (top up procedure)

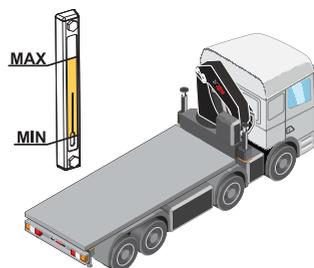
Measuring stick or level glass

1. If the oil level is below the minimum level, remove the measuring stick/plug (1).
2. Top up through the filling hole (1) with hypoid gear oil.
3. Make sure that the oil level is between the maximum and minimum levels on the measuring stick (1) or on the level glass (2).



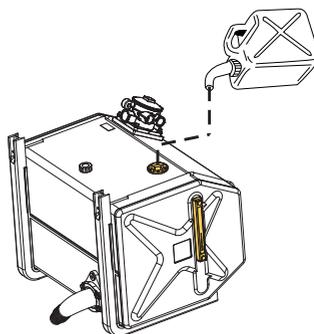
8.5.2. Checking of the oil level of the tank

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. If the oil level is too low, top up with hydraulic oil.



Oil filling / Top up

1. Make sure that the required equipment to fill the tank is fully clean.
2. Put the crane in the parked position.
3. Clean the area around the oil filler cap.
4. Fill with oil up to the max level indicator.



CAUTION

- Never fill the tank completely, because during operation, the volume of the oil could expand as the temperature increases.
- Never use recycled oil!

Filling the oil tank with hydraulic oil



CAUTION

The oil used for filling must be clean. Do not mix different oils (a mixture will change the oil properties).

Hydraulic oils must have been dealt with according to cleanliness requirements ISO 4406: -/16/13.

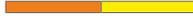
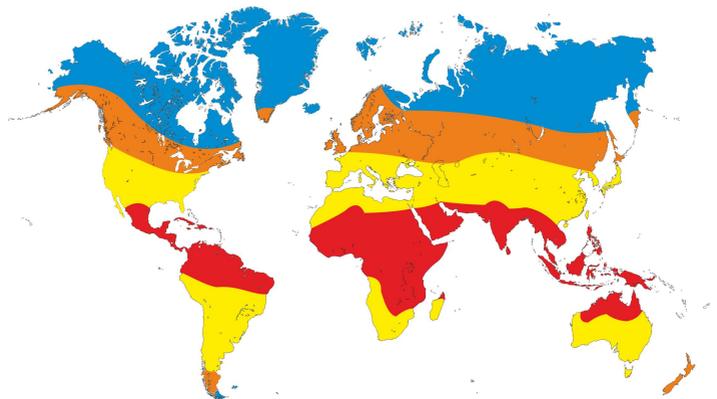
Hydraulic oil that is approved for HIAB products must comply with one of the following standards or equivalents:

- ISO 11158 HV
- DIN 51524 part 3 HVLP
- ISO 6743/4 L-HV

Verify with the supplier that the quality and performance of the hydraulic oil complies with the previous standards.

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

Recommended hydraulic oils

	ISO VG 32	ISO VG 46	ISO VG 68
Examples	Tellus S2 V32 Super 32 Hydrol L-HV 32	Shell TELLUS T 46 Texaco RANDO HDZ46 Agip ARNICA 46	Mobil SHC 526
Where to use them			
			

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 recommends an oil working temperature below 70°C. If necessary consider an oil cooler or heater.



NOTE

If you need to work at a temperature below -25, contact a Hiab authorised service workshop.

Environmentally friendly oil

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



CAUTION

Vegetable oils do not meet Hiab requirements and must not be used.

After filling the tank

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

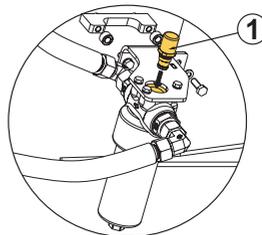
8.6. Replacement of filters

Filter cartridges must be replaced by a Hiab authorised service workshop:

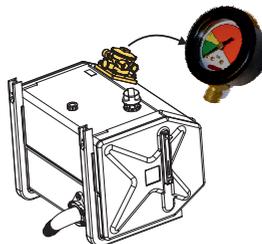
- After the first 50 hours operation
- Then after every 1000 hours operation
- Or at least once a year.

How do you verify if the filter needs a replacement?

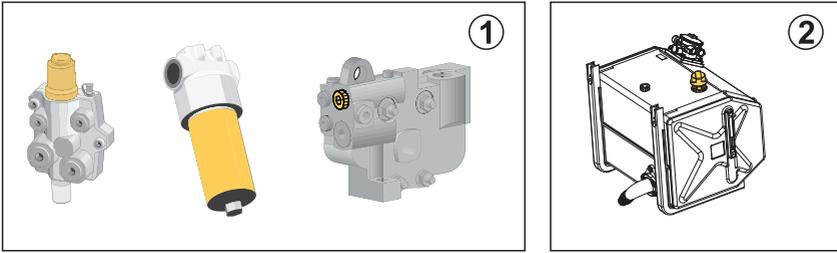
The high pressure filter is on the crane base, connected to the pressure line from the pump. It has an indicator (1) that turns red when the replacement is needed.



The return oil filter is on the oil tank, and can have a clogging indicator. This indicator turns red when needed. In all other cases (if the filter time is expired or without clogging indicator), you must follow the general recommendations for its replacement.



There are other filters on your crane (the pressure-reducer filter (1) on remote-controlled cranes, and the breathing filter (2) on the oil tank). These filters have no indicator and you must follow the general recommendations for their replacement.



8.7. 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 the air from the hydraulic system, proceed as follows:

1. Slowly extend and retract each stabiliser extension to its end position at least two times.
2. Slowly extend and retract each stabiliser leg to its end position at least two times.
3. Set stabiliser system in working position and operate the crane out of parked position.
4. Slew the crane slowly.
 - If your crane has a rack-and-pinion slewing system, slew the crane in each direction to the slewing stop at least twice.
 - If your crane has a continuous slewing system, slew at least two complete rotations.
5. Slowly raise and lower the 1st and the 2nd boom to its end position at least twice.
6. If the crane is equipped with JIB, slowly raise and lower the JIB at least twice with main boom system pointing downwards and upwards.
7. Slowly extend and retract the boom extensions to their end position at least twice.
 - a. If your crane is equipped with JIB, extend and retract the 2nd boom extensions with the JIB pointing almost vertically upwards and downwards.
 - b. Slowly extend and retract the JIB extensions to their end position at least twice.
8. Slowly operate each hydraulically operated add-on equipment such as hoist, grapple, pallet fork, etc. to their end position at least two times.



CAUTION

Do not keep the lever engaged at the end position of each movement.

9. Check the oil level in the tank and top up if necessary.

8.8. Troubleshooting

8.8.1. Main fuses

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

Fault	Probable cause	Action
The safety 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	1. Replace faulty fuses in the: <ul style="list-style-type: none"> - vehicle - standard box - relay box (See Description, Components, Fuse, Location) 2. Check all the cable connections

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, user panel, 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

8.8.2. 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 authorised service workshop!

Fault	Probable cause	Action
Crane does not react to the controls. Indicator lamps light up on the User Interface.	The crane is in an OLP situation	Perform movements to reduce the load moment. If necessary, release OLP.

Fault	Probable cause	Action
Crane does not work properly: One or more crane functions do not work, or not properly. Lifting capacity is much less than normal. Operating speed is significantly reduced. The service lamp is lit.	The system has detected a fault	Contact a Hiab authorised service workshop.
The hydraulic pump makes a noise. Three causes: Warning! Stop using the crane immediately!	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 authorised service workshop.
The stabiliser extensions do not slide out.	The extensions are still locked.	Unlock the extensions.
	Hydraulic fault.	Go to a Hiab authorised service workshop
The slewing movements are irregular or cause abnormal noises.	Insufficient oil in the hydraulic system.	Top up the oil tank
	Insufficient oil in the slewing housing.	Top up the oil in the slewing housing to the required level.
	The upper slewing bearing is not properly lubricated.	Lubricate the bearing
	The bearings in the slewing housing are damaged.	Go to a Hiab authorised 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 authorised service workshop
Leak on hydraulic system: leaking coupling, hose or line Danger! Keep well away from any oil leak.		<ol style="list-style-type: none"> 1. Press a Stop button 2. Disengage the PTO. 3. Contact a Hiab authorised service workshop

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:

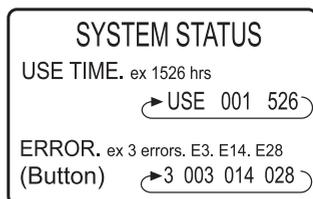
- The number of active errors and a dot.
- Each active error in turn (Blank display if no errors)
- (Start over)

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 CL is shown in the display.



9. Decommissioning

9.1. Decommissioning a crane



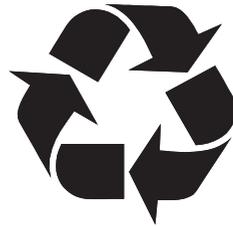
NOTE

Only qualified companies can remove the crane from the truck and dispose of it.

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 utilised and disposed of correctly. The crane must be decommissioned properly. Most of the crane's raw materials can be recycled.

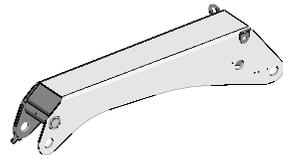
Follow the regulations of the local authorities!

- 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.



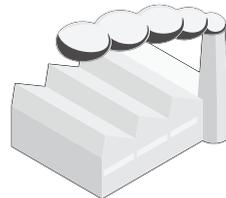
Sort the waste

- 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 utilised 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.



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.



European Union—Disposal Information

This symbol identifies the parts of your crane that need to be disposed of separately from household waste according to EU legislation. When one of these parts reaches the end of its life, take it to a collection site designated by local authorities. Responsible collection and recycling help protect natural resources, the environment, and human health.



10. Technical Data

10.1. Documentation

The Technical Data document shows diagrams and technical information about your specific crane

The enclosed Technical Data printed out by the installer should be stored together with this Operator's manual.

10.2. 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:

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

10.3. Daily inspection checklist

Operator			Document ID:	
Crane s/n:			Date:	
DAILY INSPECTION	✓	✗	⊘	Comments
Presence of signs and symbols				
Locking devices				
Spirit level				
Shafts, locking shafts, bearings and bushings				
Crane structure				
Hooks				
Add-on equipment and separate lifting accessories				
Electronic components				
Security seal wires				
Hydraulic system and oil level in the tank				
Oil level in the slewing housing and condition				
Oil level in the slewing motors and condition				
Filters				
FUNCTIONAL TESTS				
Emergency stop buttons				
Levers				
Controller				
Horn and LED test				
<p>If you find a fault that prevents you from operating the crane safely, contact a Hiab authorised service workshop. Do not try to repair the fault, it can cause you injury or you can damage the equipment.</p> <p>Permission to reproduce this checklist is granted; however please note that only the original document owned by Hiab will contain necessary amendments and updates. Hiab shall not be held liable if the copy in your possession does not contain the latest changes.</p>				

10.4. Monthly inspection checklist

Operator			Document ID:	
Crane s/n:			Date:	
MONTHLY INSPECTION	✓	✗	⊘	Comments
Piston rods				
Pivot pins and bushes				
Bolts and screw fixings				
Cables and sensors				
Lubrication schedule				
Slewing bearing / Upper column bearing				
Pump attachment screws				
Gateway connectivity				
<p>If you find a fault that prevents you from operating the crane safely, contact a Hiab authorised service workshop. Do not try to repair the fault, it can cause you injury or you can damage the equipment.</p> <p>Permission to reproduce this checklist is granted; however please note that only the original document owned by Hiab will contain necessary amendments and updates. Hiab shall not be held liable if the copy in your possession does not contain the latest changes.</p>				

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