HIAB K-HiPro 285-425 X4

Operator's Manual GB

This operator’s manual is an Original Instruction and applies to cranes with serial numbers from: 2851001, 4250001.

2018-12

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.

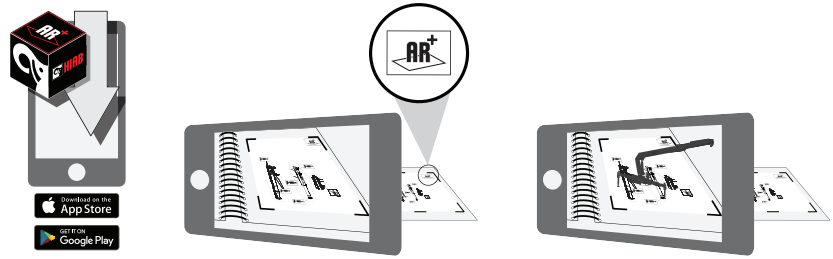
The aim of this manual is to help you handle your crane safely and with full satisfaction.

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.

Table of Contents

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1. Introduction

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

This manual describes:

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

Enclosed to this manual the Installer will provide:

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

Study these instructions carefully

DANGER

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

Therefore you should:

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

NOTE

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

NOTE

HIAB shall at all times have the right to:

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

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

1.2. 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!

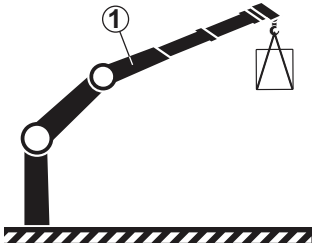
NOTE
Extra information that can prevent problems.

TIP
Tip to make the work easier to carry out.

Symbol for reference to a component in an illustration.

(1) Refers to a component in an illustration.

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

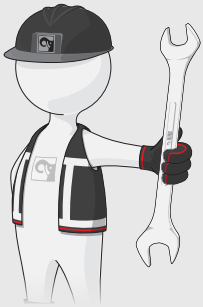


DANGER
Only persons with the requisite knowledge and experience with cranes may use the crane. Never operate the crane when you are sick, tired, under the influence of medicines, alcohol or other drugs.

- Take the delivery instructions from your HIAB Service workshop, or receive instruction from an experienced person from your own company. Only then should you operate your crane.
- Ensure that you comply with the statutory requirements of the country in which you use the crane (for example, certificate, obligatory safety-helmet).

DANGER

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



WARNING

- Never clean the electronic system, plastic components, signs or bearings with a high-pressure jet cleaner. It could cause damage.
- Never expose the electronic system to high electrical voltages. This could damage the 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 in to or out of transport position.

2. Structure and parts of the HIAB crane

2.1. Main groups

The HIAB crane consists of the following main groups:

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

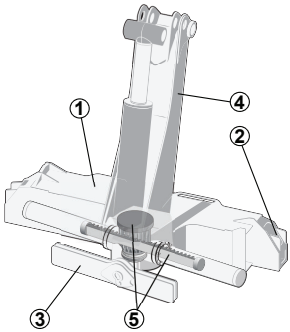
Some accessories can be fitted depending on your crane configuration:

- 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:

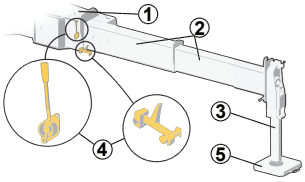
(1) Crane base
with stabiliser beams (2) and three-point bridge (3)
(4) Column
fitted to the crane base
(5) Rack and pinion slewing system



2.3. Stabiliser system

Every HIAB crane is equiped with two stabiliser extensions and two stabiliser legs. Auxiliary stabiliser systems may be needed for heavy cranes. The stabiliser system consists of:

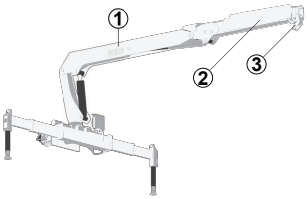
(1) Stabiliser beam
(2) Stabiliser extensions
(3) Stabiliser legs
(4) Stabiliser locking devices [option]
(5) Extra support plates



2.4. Boom system

The boom system consists of the following components:

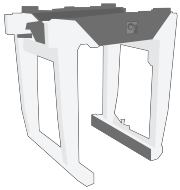
(1) 1st boom
(2) 2nd boom
(3) Hydraulic extensions
The extensions are operated by hydraulic cylinders placed inside the extensions.



2.5. Accessories on the boom system

Add-on lifting accessories [option]

Add-on lifting accessories are placed between the boom tip and the load (e.g. brick grapple, rotator) or on the crane (hoist).



Hooks [option]

Different hooks can be mounted depending on the crane model.

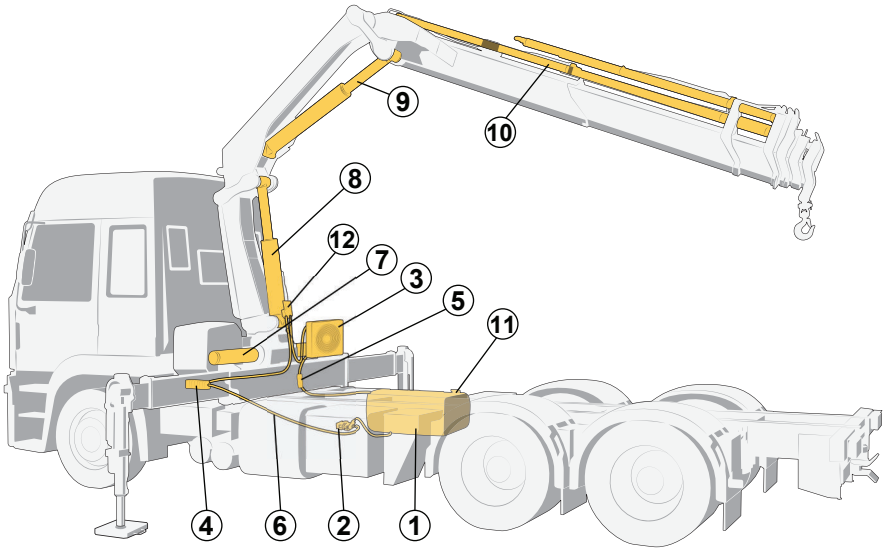
DANGER
Never exceed the maximum permissible loading of the hook.

Separate lifting accessories [option]

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

2.6. Operating system - hydraulic components

The operating system consists of the following hydraulic components:



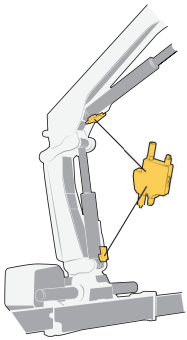
(1) Oil tank	(5) Stabiliser control valve [option]	(11) Return filter
(2) Hydraulic pump	(6) Hydraulic hoses and lines	(12) Load holding valve
(3) Oil cooler [option]	(7) Slewing cylinders / Motor reducers	Pressure filter [option]
(4) Main control valve	Actuators: (8) First boom cylinder (9) Second boom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

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



2.8. Description of HIAB K-HiPro 285-425

The HIAB K-HiPro 285-425 are compact, fully hydraulically operated goods cranes.

Lifting capacity:

- HIAB K-HiPro 285 = 25.5 tonne metres (184 400 ft-lbs)
- HIAB K-HiPro 425 = 34 tonne metres (245 900 ft-lbs)

The crane is supplied in many versions from:

- HIAB K-HiPro 285-2 reach: 13.6 metres (44' 5" ft)
- HIAB K-HiPro 285-3 reach: 16.1 metres (52' 10" ft)
- HIAB K-HiPro 425-4 reach: 19.1 metres (62' 8" ft)

The control valve V200, a controller (CombiDrive or XSDrive) and the SPACE X4 safety system are standard equipment on the HIAB K-HiPro 285/425.

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 only use the crane under the following conditions:

- In the open air, or in spaces with sufficient ventilation.
- With a mean wind velocity less than 13.3 m/sec (approx. 29.7 mph). **See the wind speed table.**

DANGER

- If you use the crane in a confined space 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 -40°C (-40°F), as the steel's properties deteriorate below this temperature.

WARNING

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

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

3.3. Definition of a HIAB loader crane

Usage of the crane

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

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

Permitted duties:

- Loading and unloading cargo from/to a vehicle
- Lifting of loads from the ground/vehicle to a higher place
- Installation work (beams, concrete plates, windows...) in building constructions
- Lifting construction material (wall boards, bricks, blocks…) on a pallet fork to a building, taking the material from the vehicle on which the crane is mounted, from another vehicle or from the ground
- Hoisting, e.g. beams, concrete plates and any other material and equipment used in building construction
- With a bucket, moving filling material at a construction site
- 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 authorized 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
- Loading cargo that is partially loaded or fastened by other means, without making sure the capacity of the crane is enough for the entire load
- Any duty which implies:
  - Pressure against the ground, unless the crane is specifically prepared for this
  - Push/pull with the boom system against any type of obstacle (wall, ground…)

DANGER

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

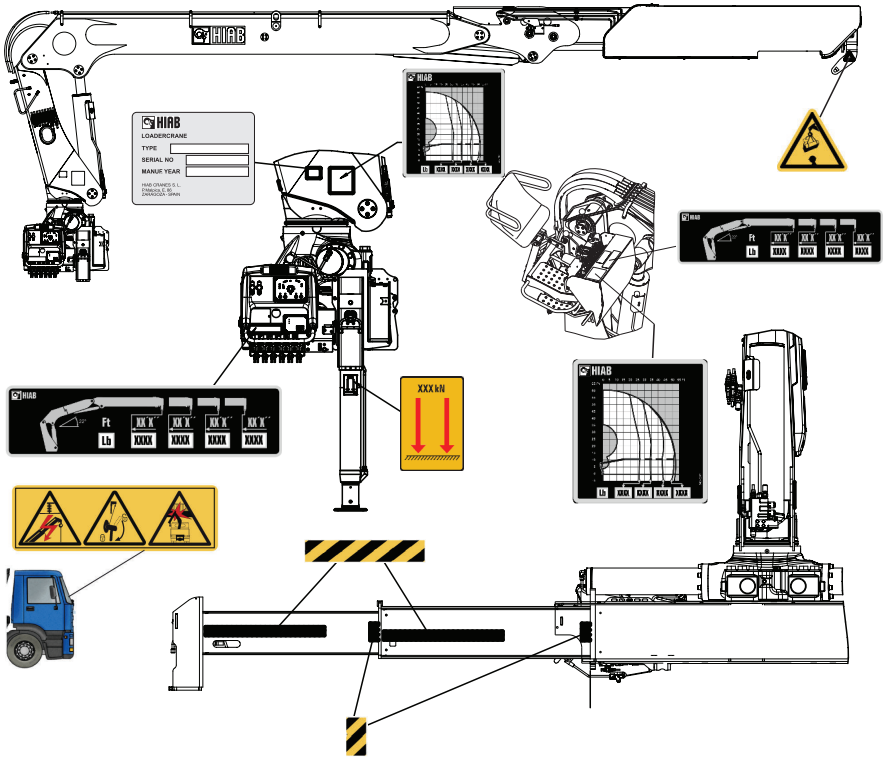
3.3.1. Noise declaration

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, tm or fts-lbs. 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

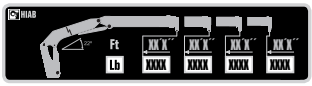
- Overloading could result in damage to the crane or in the worst case, personal injury or death.
- Never increase a hanging load, since that may cause a load holding valve to open and/or the vehicle to turn over.
- Never use the crane with the OLP system switched off.

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:

- Stabilty test of your crane on vehicle [if VSL as option]
- 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

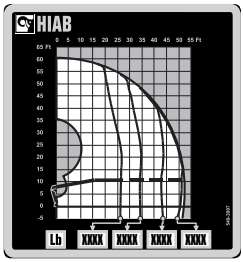
Never exceed the maximum weight on the load plate.

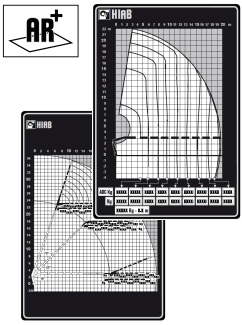
Load diagram

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.

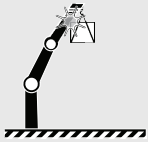
The load curves show the maximum load that may be lifted at a given reach and height. For a given maximum load, the possible working zone is to the left of the load curve. The lifting capacity for some cranes is limited in the high lifting area.





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

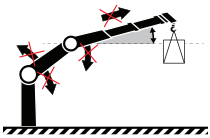
Never operate the hydraulic extensions against a solid objet when the first boom is completely lifted. Do not try to push or compress loads when the first boom is fully lifted, as this could cause damage to the first boom cylinder.

3.3.4. Maximum load moment

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

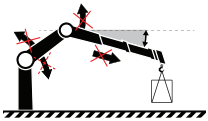
If the second boom is raised, then the following movements are locked:

- first boom down/up
- second boom down
- extension boom out



If the second boom is down, then the following movements are locked:

- first boom up
- second boom up
- extension boom out
- first boom down (certain crane types and cases)

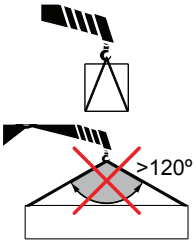


Lifting the load

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

Sling length

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



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

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

Working close to the load

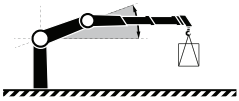
Always try to lift the load with the extension boom retracted, however not completely. The crane then has the greatest lifting capacity. Place the vehicle as close as possible to the load.

Working below ground level

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

Heavy loads

Lift heavy loads with the second boom in the optimum position in relation to the first boom. For this, see the load plate on your crane.

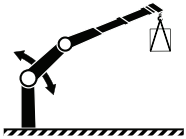


DANGER

Never exceed the maximum permissible loading of the hook.

Heavy loads cannot be handled with the boom straight.

Set the second boom, so there is an angle in relation to the first boom.



Loads at the extreme limit of the working zone

Also in this case, angle down the second boom somewhat. Only use the first 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+]

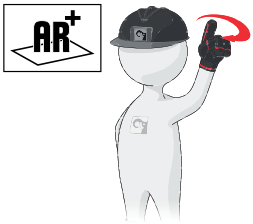
DANGER

- 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 hand.



Lower

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

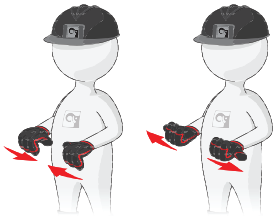
Very short movement

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

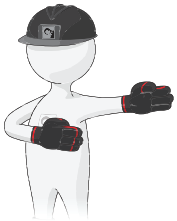
Signal with your hands.

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



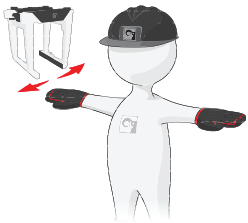
Turn in the direction indicated

Indicate the direction with the hands.



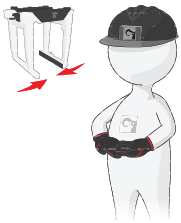
Open the grapple

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



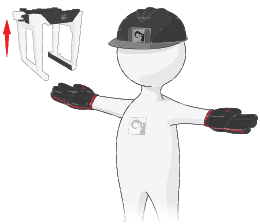
Close the grapple

Move both hands close together.



Lift the open grapple a little

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



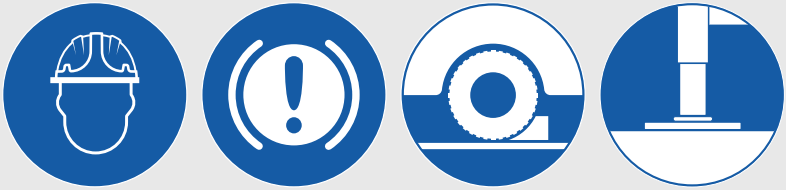
Keep the grapple in position briefly

Raise the hand drooping slightly, with the fist clenched.

3.5. Use of the crane

Starting crane operation

DANGER



- Wear a safety helmet (compulsory in some countries!).
- Check that the ground is sufficiently flat and firm.
- To ensure that the vehicle stays in its position, always engage the parking brake and place chocks under the wheels.
- Check that the ground is not undermined. Look out for sewers, cellars, excavations etc.
- The stabiliser legs must not be able to sink in! Use support plates that are large and firm enough for your crane. The plates must not bend under load.
  Check that the support plate as, it comes under load, is not pushed into the ground.
- Ensure you can see the stabiliser legs and stabiliser extensions when you are operating them.
- Do not lower the stabiliser legs on the edge of an embankment, soft shoulder, slope etc.
  Lower the stabiliser legs only on to a flat and firm surface.

DANGER

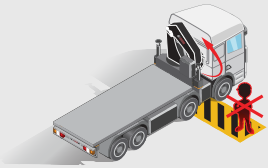
- Do not stand in front of the hydraulically operated stabiliser legs when you are operating them!
- Never use the stabiliser legs as a parking brake, since the vehicle could start to slide.
- Slide the stabiliser extension, on both sides of the vehicle, out completely if possible. Then lower the stabiliser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

WARNING

- Use low force when placing the stabiliser legs on the ground.
- Do not raise the vehicle with the stabiliser legs!
  If you raise the vehicle with the stabiliser legs, this may damage the stabiliser legs.
- Check that the add-on lifting accessories and separate lifting accessories are in good order!
  Add-on lifting accessories are sometimes fitted on the crane (hoist, JIB) or placed between the boom tip and the load (grapple, rotator).
  Separate lifting accessories are connected to the standard load hook (slings, chains, chackles etc).

DANGER

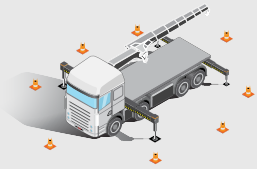
Do not stand in front of the boom system when operating the crane out of parking position.



3.5.1. Preparations for use

DANGER

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



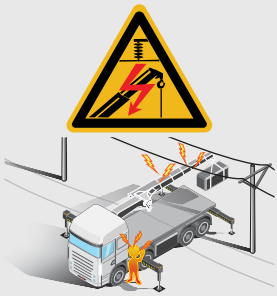
TIP

Mark out the working range, e.g. with cones.

Put on your vehicle's warning lights.

DANGER

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



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.

Minimum distance between crane and over head 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 40000V:		power transmisson

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 immediately switch off all crane movements!

- Push a **stop button**.

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

DANGER

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

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

  See the list of signals. Make certain that you and the person assisting you know these signals.
- Pay attention to the safety of the person giving the signals!
- Never move the vehicle, if you have a freely-suspended load on the crane!
- Never walk or stand under a suspended load!

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

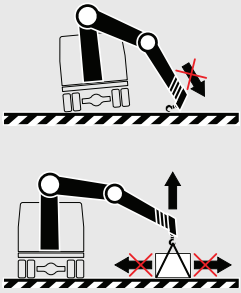
- Never push a load along the ground, or the vehicle's load space, with the extension boom. This can cause damage to the boom system. This will lead to expensive repairs.
- Never use the extension boom as a jack. This could damage the slewing bearings and the connection between the crane column and the 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

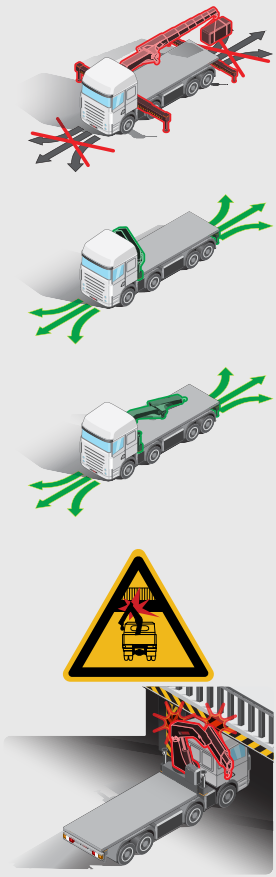
- Operate the crane using smooth and gentle lever movements.
- If a cylinder is at its end position, free the operating lever. Otherwise overheating can occur.

3.5.3. Driving with the crane

DANGER

- Never drive the vehicle if there is a load suspended from the crane.
- Before you move the vehicle:

  Check that there is no pump flow to the 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 has to stay within the width of the truck. Make sure the stowed crane can not hit bridges, tunnels etc.
- Pay attention to overhead power lines! Make sure that no part of the crane ever comes in contact with overhead power lines.

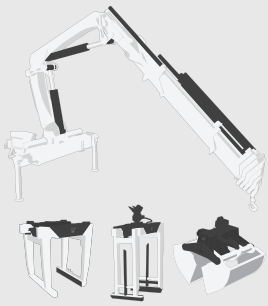


For further instructions see vehicle's manual(s).

3.5.4. Use of lifting equipment

DANGER

- Only use lifting accessories (hoist, grapple, rotator) 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

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

WARNING

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

Roughly handling can seriously damage the crane or the vehicle.

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, should you drive the vehicle away.

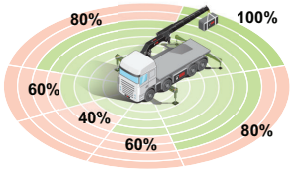
4. The HiPro system

4.1. Control System SPACE X4

SPACE X4 is a crane control system.

The control system:

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



Crane version	Control valve	Control System	Controller
HiPro	V200	SPACE X4	CombiDrive XSDrive: Levers / Joysticks

NOTE

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

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

Contact your HIAB service workshop.

4.2. How the safety system works

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

- When prohibited movements/speeds are approached, a warning is given.
- When prohibited movements/speeds are reached:
  On remote controlled cranes prohibited movements are stopped.
  On manually operated cranes, all movements are stopped, because when a spool is moved too much, power to the dump valve is cut, all movements are stopped.

Fault monitoring

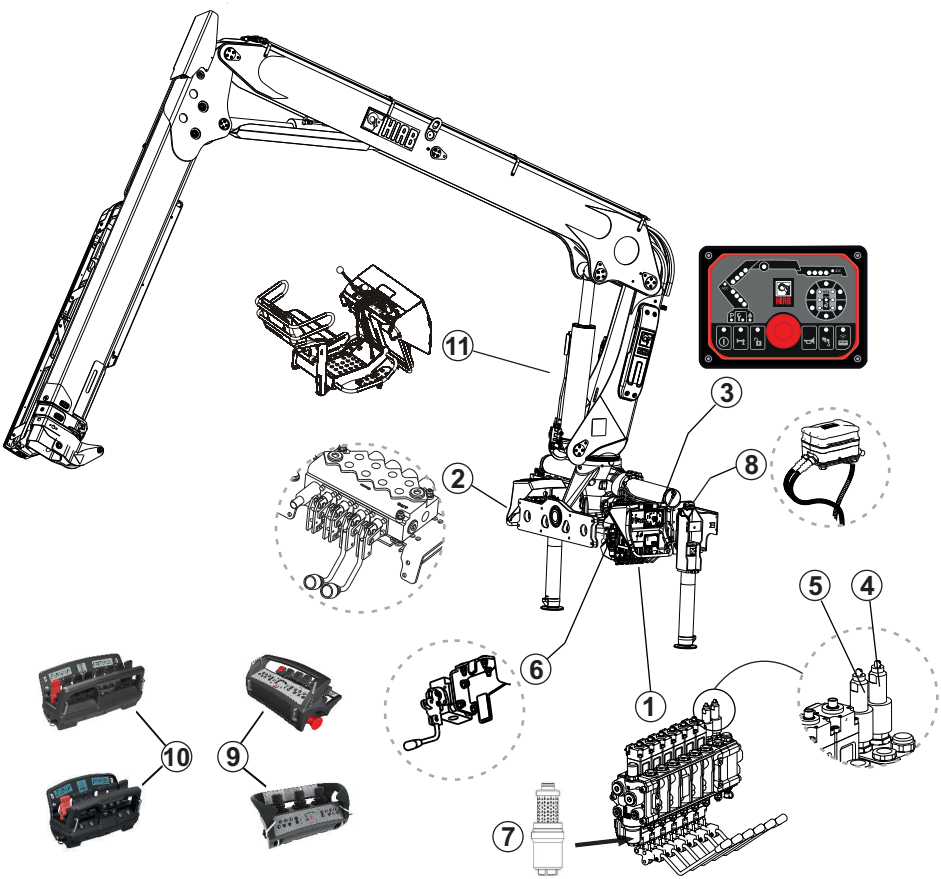
When there is a fault in the control system it will give an immediate warning.

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

DANGER

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

4.3. Components of the HiPro system



(1) **Main control valve**	(5) **Dump valve 2 [option]**	(9) **XSDrive controller [option]**
(2) **Stabiliser control valve**	(6) **Selector valve [option]**	(10) **CombiDrive controller [option]**
(3) **User panel SPACE X4-UI**	(7) **Pressure-reducer filter**	(11) **High seat [option]**
(4) **Dump valve 1**	(8) **Warning lamp [option]**	

4.4. 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).

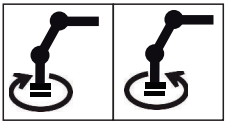
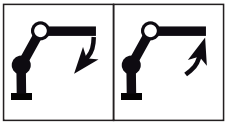
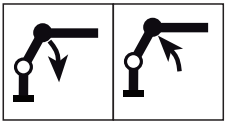
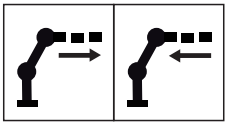
NOTE

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.

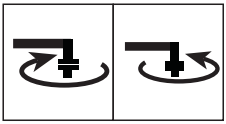
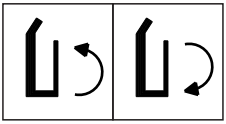
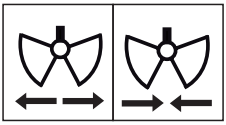
By default, the symbol on the controller corresponds to the positive movement of the levers. To operate the opposite movement of that symbol, move the lever on the opposite direction.

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

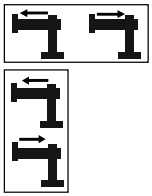
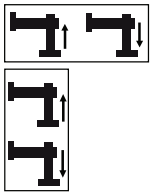
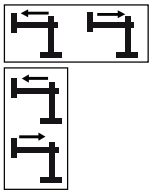
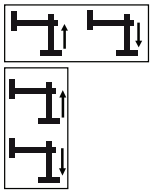
Basic crane symbols and functions

SYMBOLS	FUNCTIONS		SYMBOLS	FUNCTIONS
	Slewing			Second boom
	First boom			Hydraulic extensions

Accesories 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

4.5. Main control valve

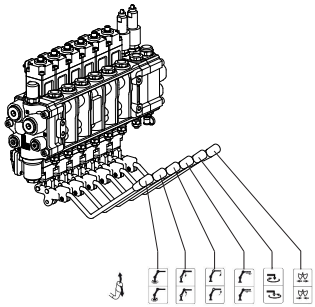
The crane can be operated from the main control valve, but as soon as you have selected remote control operation, it is impossible to operate the main control valve levers.

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.

When remote control is used, the oil flow is allocated by means of PFD.

Standard functions and symbols

The order of the functions is customized for each crane. The image on the right shows an example of a main control valve functions placed on the base.



4.6. Different stabiliser control valves

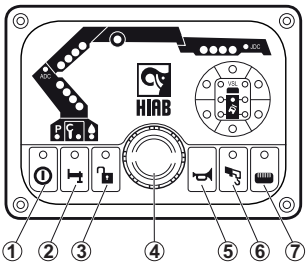
Different stabiliser control valves that you can find on cranes:

- 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.

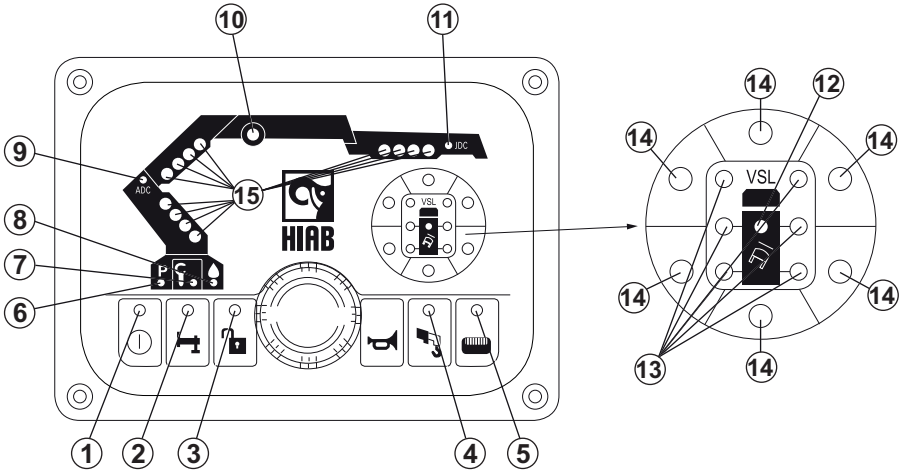
4.7. User panel

Buttons:



- On/off button (1)
  To switch the control system on and off.
- Button (2) is stabiliser operation activation to enable operation of stabiliser extensions. The driver must have full view when operating the stabiliser extensions outward.
- Button (3) is used for OLP release if the crane is in an OLP situation and for disconnecting the automatic dump function.
- Stop button (4) is pushed in an emergency.
- Button (5)
  Once the controller is activated, this button can be used to sound the crane horn.
- Button (6) activates OLP for manual extensions (if fitted).
- Button (7) activates the controller.

4.7.1. Indicator LEDs on user panel



	Power on/off **APO**	(1)	Green light on: The system is on. Green light blinking: System on and the stop button has been pressed. Green light flashing: APO emergency operation time running. Red light flashing: CAN communication has been lost/ APO override time running
	Stabiliser system activation	(2)	Green light on: Stabiliser system active. Green light flashing: Stabiliser extension is in locked position.
	OLP Release	(3)	Red light blinking: OLP Release active (crane, VSL or stabiliser leg) Green light flashing: Critical error.
	Manual extensions	(4)	Not active in this configuration.
	Remote control	(5)	Green light on: Remote control is active. Green light flashing: Button for remote control has been pressed, waiting for connection to hand unit. Red light on: Radio interference.
P	**Parking control**	(6)	Blue light on: Slew is in parking position.
	Service	(7)	Green light on: Service needed. Red light on: Error in the system. Red light blinking: Critical error.
	Dump valve	(8)	Blue light on: Dump activated.
ADC	**ADC**	(9)	Blue light on: Crane has enhanced capacity (ADC mode).
	Hoist	(10)	Not active in this configuration.
JDC	**JDC**	(11)	Not active in this configuration.
	VSL	(12)	VSL-OLP reached.

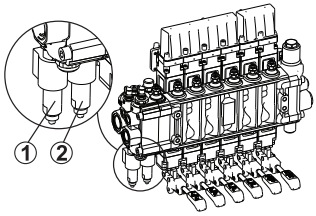
	Stabiliser legs	(13)	Green light on: Stabiliser leg set. Red light on: OLP stabiliser leg.
	Stability sector **(Cranes with VSL function)**	(14)	Red light on: 0-19% stability. LED off: 20-69% stability. Yellow light on: 70-89% stability. Green light on: 90-100% stability.
	Stability sector **(Cranes without VSL function)**	(14)	Green light on: regardless of the situation.
	Cylinder pressure	(15)	1 of 4 green light on: 50% pressure. 2 of 4 green light on: 70% pressure. 3 of 4 red blinking light: 90% pressure. 4 of 4 red light on: 100% pressure. 4 of 4 red running light: OLP release activated.

LED test, see Daily inspection.

4.8. Dump valves

Dump valve 1. (1)

Allows operation of the crane functions. 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 the dump valve is opened and the oil is returned directly to the hydraulic tank. As soon as the operator moves a lever the valve closes.



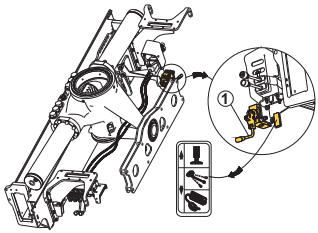
Dump valve 2. (2)

Allows operation of the stabiliser extensions and legs only when this valve is activated. The dump valve 2 will be placed between the main control valve and the stabiliser control valve. The dump valve 2 must be activated from the user panel before the stabiliser system can be controlled.

4.9. Selector valve [option]

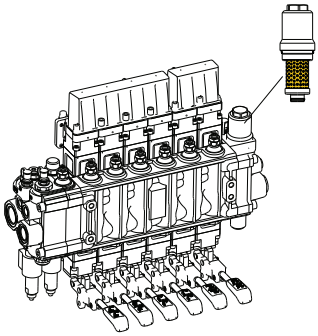
Use lever (1) to select:

- Crane functions: manual or remote
- Stabiliser system functions



4.10. Pressure-reducer filter

Pressure-reducer filter integrated in the main control valve. The oil goes through the filter and then to the positioner(s).



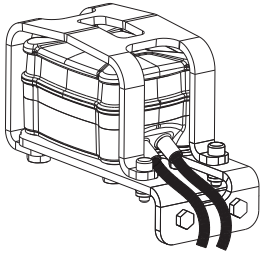
4.11. Warning lamps

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

System ON: the stabiliser leg lamps light up

Remote control ON: the stabiliser leg lamps blink

90% of maximum permitted load and OLP: the stabiliser leg lamps flash twice



4.12. XSDrive controller

Controller XSDrive has either four or six levers, or two or three joysticks for proportional functions programmed in the different menu selections. The controller normally communicates with the crane via radio but can also be operated via cable.

Radio communication is dependent on:

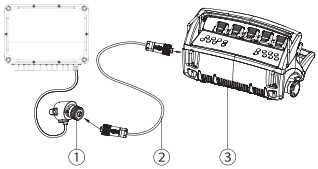
- Transmitter, fitted in the controller.
- Receiver box, fitted on the operating base.
  The Receiver box consists of a combined radio receiver and 12 outputs for servo valves. The status of the receiver is visible on the controller. In case of radio interference, it is possible to change the channel by pushing button . There is a maximum of 12 channels available.

WARNING

When the controller is in use (stop button released), keep a distance of minimum 1 meter between the controller and the crane or truck because of possible electromagnetic interference.

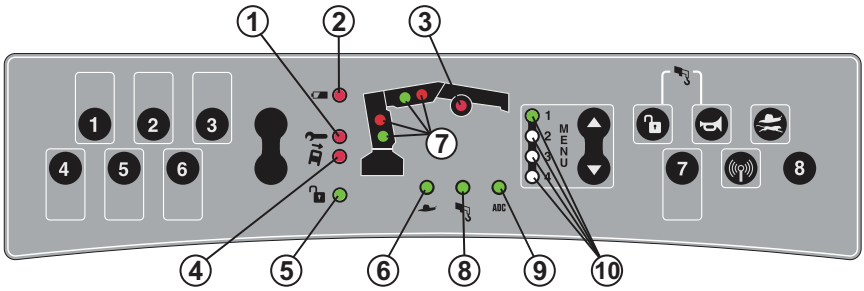
Cable connection [option]

The cable (2) is intended to be used for short-term operation and when pairing in conjunction with the replacement of controller or receiver. Connection is made between the controller (3) and the receiver box (1). Radio communication is automatically disabled when the cable is connected.



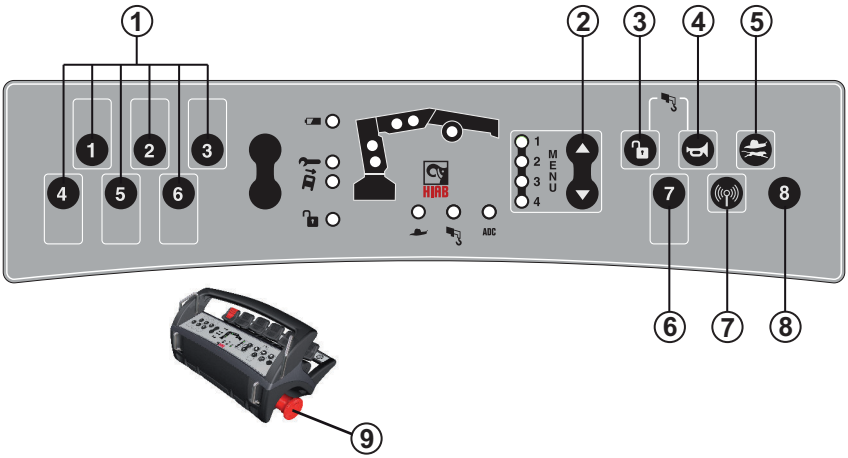
4.12.1. Indicator LEDs on XSDrive controller

The indicator LEDs on the controller indicates errors, stability, cylinder pressure etc. The appearance of the panel differs somewhat depending on if the controller has levers or joysticks.



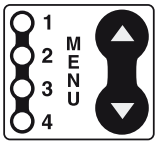
	Service	(1)	Red light on: Error detected in the system.
	Battery	(2)	Red light on: Low power
	Hoist LED	(3)	Not active in this configuration.
	VSL	(4)	Red light on: VSL-OLP. Vehicle has reached a stability limit. (Also all the 1st boom diodes will light red).
	OLP Release	(5)	Red light on: OLP Red light blinking: OLP Release.
	Low speed	(6)	Green light on: Reduced speed. For normal speed, see section “Buttons”
	Cylinder pressure LEDs	(7)	Lower LEDs green light on: 70% of maximum pressure Lower LEDs, red light flashing: 90% of maximum pressure Lower and upper LEDs red light: 100% of maximum pressure
	Manual extension	(8)	Not active in this configuration.
ADC	**ADC**	(9)	Green light on: Increased capacity (ADC mode)
	Menu LEDs	(10)	Light on: Indicates active menu

4.12.2. Buttons



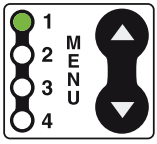
(1)	**ON/OFF buttons**	Buttons for 7 extra ON/OFF functions (engine on/off, engine speed, horn etc.)
(2)	**Menu selection**	Push to change between menus 1 to 4.
(3)	**OLP release**	Push and hold the button while you operate a pressure reducing function.
(4)	**Horn**	Push to operate the horn.
(3) & (4)	**Manual extensions**	Push at the same time to activate the manual extension.
(5)	**Speed selection**	At the start, you have maximum operational speed. Push the button to operate the crane with decreased speed. Push it again for maximum speed.
(6) & (8)	**LSS-V**	If the crane has LSS-V, button (6) activates this feature and button (8) deactivates it.
(7)	**Channel shift**	Push to change radio channel. There are 12 channels in total.
(9)	**Stop button**	When you push the button, you stop all crane functions. To release it, turn the button clockwise.

Locking the controller



1. Push the stop button.
2. Push and hold both arrows on the toggle button and release the stop button at the same time.
3. The 4 LEDs flash at the same time.
   Now you cannot operate the controller.
4. Push the stop button.

Unlocking the controller

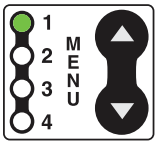
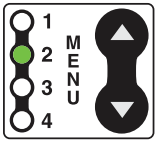
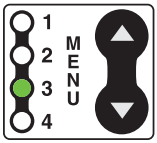


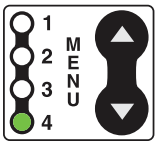
1. Make sure that you pushed the stop button.
2. Push and hold both arrows on the toggle button and release the stop button at the same time.
3. The 4 LEDs flash at the same time for 5 times.
4. LED 1 comes on. (Start menu)

4.12.3. Menus

The functions presented in each menu can be customized depending on crane configuration. It can be changed by a Hiab Authorized Workshop.

The table below shows an example:

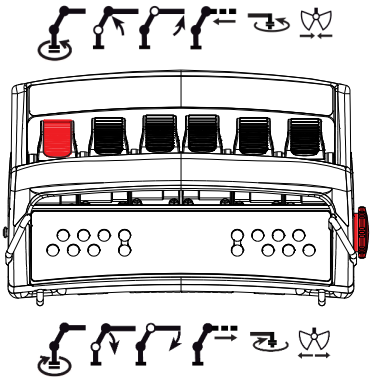
Menu 1 	Slewing, first boom, second boom, extension boom, tools JIB, hoist, etc.
Menu 2 	[option] (If crane is equipped with extra remote controlled stabiliser system)
Menu 3 	[option] Slewing, attachment. (If crane is equipped with remote controlled stabiliser): left and right stabiliser extension, left and right stabiliser leg.

Menu 4	
	[option] Similar to menu 3 but for extra stabiliser legs

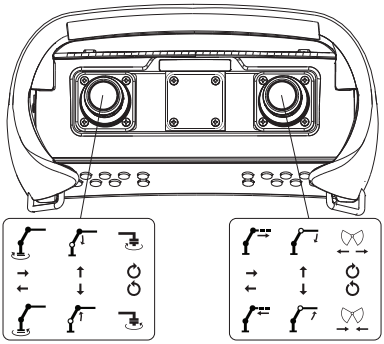
4.12.4. Standard functions and symbols

The function corresponding to each lever depends on the configuration of the specific crane. The table below shows examples:

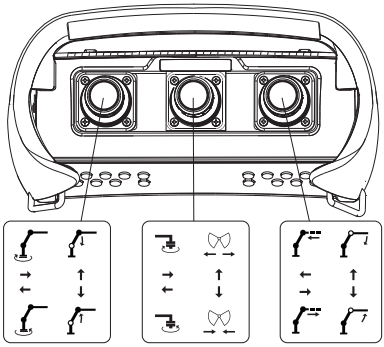
Controller XSDrive levers



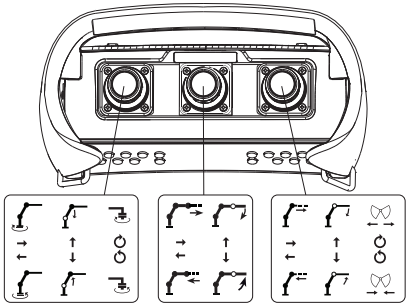
Controller XSDrive joystick 3-0-3



Controller XSDrive joystick 2-2-2



Controller XSDrive joystick 3-2-3



CTC symbols

The order of the levers is customized.

- CTC mode, crane tip up/down ①
- CTC mode, crane tip out/in ②
- Activate manual control of the 1st boom in CTC mode ③
- Operate 1st boom up/down manually in CTC mode ④

4.12.5. Battery and battery charger XSDrive

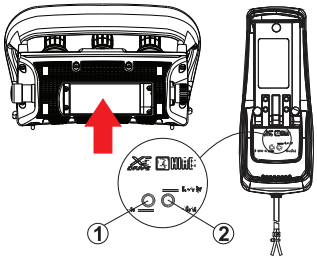
Battery

A fully charged battery provides approximately 5-8 hours use (at 25 °C, 77 °F) and the voltage level is approximately 8,4V. When the battery is about to wear out an indicator LED on the controller burns steady red and the horn will sound twice. Push the stop button before changing the battery. Note that the battery voltage remains between 7,6V and 7,5V for a long time. Therefore, the battery voltage cannot be used to estimate remaining hours of use.

Battery charger

The battery charger is to be fitted in a protected environment, preferably in the cab. Two batteries are delivered with each unit, one of which can always be placed in the charger.

LED (1) is lit continuously when the battery charger is ready for use. Place the battery in the charger. LED (2) flashes slowly during recharging and has a steady light when the battery is fully charged.



Charging time

The normal charging time for a flat battery, is approximately 3 hours. Operating ambient temp: Battery = 0° to + 45°C.

NOTE

A charged battery is a concentrated energy source. Never store a charged battery in a toolbox or similar, where there is a risk of a short due to contact with metal components. Used batteries should be taken care of according to the local regulations.

4.13. CombiDrive controller

The controller has either six or eight levers. Normally the controller operates wirelessly via radio but it can also be operated via cable. The controller is equipped with a menu selection system as standard. The displays continuously provide the operator with information.

Radio communication is dependent on:

- Radio for two-way communication fitted in the controller.
- Radio/decoder fitted at the crane base.

Information can be sent both from and to the controller. In the decoder/radio there is a corresponding unit which handles the traffic at the other end.

Cable connection:

A four-metre cable is supplied as standard with The controller. The cable is intended to be used for short-term operation and when pairing in conjunction with the replacement of controller or decoder. The cable connects to the vehicle at the connector (1) on the front of the decoder.

When the cable is connected to the controller (2), the centre display shows the symbol for cable operation.

4.13.1. Displays

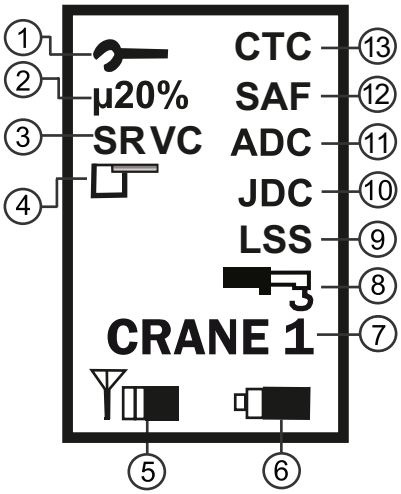
The displays are of LCD-type and will perform best in temperatures above +10 °C. At 0 °C there is a delay in shifting symbols of approximately 1 sec. At -20 °C the delay will increase to approximately 8 sec. Alternating symbols will not be updated at temperatures below freezing.

In order to prevent inaccurate menu shifts, in temperatures below -10 °C there will be a delay before any menu button will react to a second push. This can partly be avoided by storing the controller in a compartment where the temperature exceeds +10 °C whenever not in use.

Centre display

The center display provides information about which menu has been chosen, as well as indicating for example radio reception, battery status, fault information, ADC and VSL.

Indications on the centre display



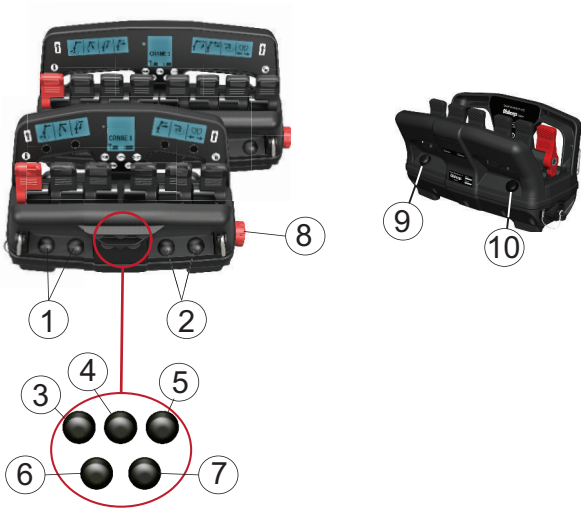
	(1) Error This symbol, a spanner, appears if the control system, has discovered a fault in the system. See section “Buttons” for error code display. **Non critical error:** Symbol appears enlarged in the center of the display and then returns to normal size in the upper part of the display. **Critical error:** Symbol remains enlarged in the center of the display. The crane stops. To continue, the fault must first be confirmed by pressing the release button, only then will the spanner go back to normal size.	**(7) Main menu** The text shows which main menu has been selected. The number shows which sub-menu is active. The main menus are CRANE, EXTRA and ON-OFF.	CRANE 1 EXTRA 2 ON-OFF 2
µ20%	**(2) Micro** Indicates that micro operation has been selected. Micro operation changes the sensitivity of the levers as follows: At full lever deflection, µ50% gives 50% and µ20% gives 20% of normal speed.	**(8) Manual extension** Manual extension is selected by pushing the horn and release buttons at the same time. The control system acknowledges by showing this symbol.	3

SRVC	**(3) SRVC** Indicates time for service. When remote control is first engaged, the symbol will be shown enlarged and then return to normal size.	**(9) LSS (Load Stabilizing System)** Indicates that the LSS-V function is active.	LSS
	**(4) MEWP (Mobile Elevating Work Platform)** Indicates that MEWP mode (if present) is active.	**(10) JDC** Indicates that the JDC function is active.	JDC
	**(5) Signal strength** The bars show the radio signal strength. Five bars indicate optimum reception. If the symbol flashes, the radio is connected but starting conditions are not met.	**(11) ADC (Automatic Duty Control)** Indicates that the ADC function is active.	ADC
	**(6) Battery capacity** The battery symbol shows remaining power in the battery. When the symbol begins to flash there is capacity for just a few more minutes. When this happens the horn on the crane will sound twice as an indication of low battery.	**(12) / (13) SAF/CTC** [option] SAF function or CTC function is active.	CTC SAF

Left and right displays

The side displays show the symbol for the function which each lever controls in the active menu. Function symbols change according to which menu has been activated. The direction shown in the function symbols applies to when the lever is moved forward.

4.13.2. Buttons



(1)-(2)	**ON/OFF buttons [option]** The controller has four configurable pushbuttons for controlling on/off functions e.g. start/stop engine, increase/ decrease rpm on the engine etc. The function of each button is depending on the configuration of the specific crane.	**Micro mode** Push to choose micro mode. Push again to choose normal mode.	(7)
(3)	**Menu CRANE** Push to choose menu CRANE.	**Stop button** Push to deactivate the controller. Release to activate.	(8)
(4)	**Menu EXTRA** Push to choose menu EXTRA.	**OLP release** Push and hold to activate OLP release. See section “OLP release”.	(9)
(5)	**Menu ON-OFF** Push to choose menu ON-OFF.	**Manual extensions** Push simultaneously to activate OLP for manual extensions.	(6)&(9)

(4)&(5)	**Locking of controller** See section “Locking and unlocking the controller”.	**Error code display** Push the button to display error codes in the system. If there are more than six error codes at the same time, the six most recent ones sent from the control system, are shown.	(10)
(6)	**Horn** Push to sound the horn.		

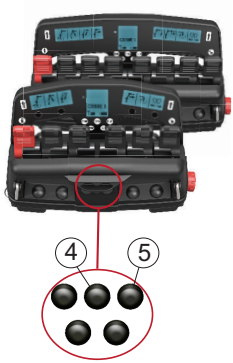
Locking the controller

1. Push and hold button (4) and (5) while the stop button is pushed.
2. Keep button (4) and (5) pushed while pulling out the stop button. The centre display then shows a large locked padlock symbol

Unlocking the controller

1. Push and hold button (4) and (5) while the stop button is pushed.
2. Keep button (4) and (5) pushed while pulling out the stop button.
3. Release button (4) and (5).

The controller is ready to use.

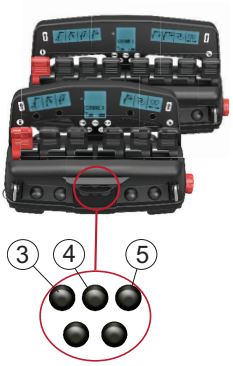


4.13.3. Menus, standard functions and symbols

The function of each lever may be the same or different in different menus. The left and right displays show which function is controlled by each lever. The function symbols show a direction (up, down, left, right) which applies to when the lever is moved forwards.

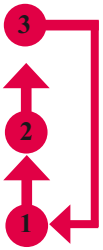
Main menus:

- CRANE menu, button (3)
- EXTRA menu, button (4)
- ON-OFF menu, button (5)



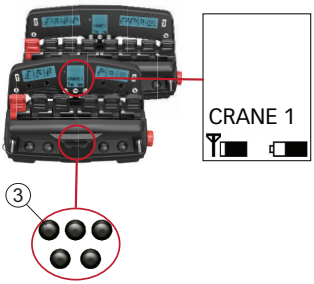
In each of the main menus the operator can step through submenus by pushing the menu button repeatedly.

Each function is operated using a specific lever. If a lever is faulty or moved at startup, the lever and the function is disabled. The other levers works as normal. With the 2 extra levers on the 8 lever controller, it is possible to use the seventh and eighth functions simultaneously with functions 1-6, without shifting CRANE menu.



CRANE menu, button (3)

When the operator pulls out the stop button on the controller, it always starts in CRANE 1 menu. The submenus in CRANE menu are configured in production but can be changed by HIAB service personnel.



Example of submenus for the 6 lever controller:

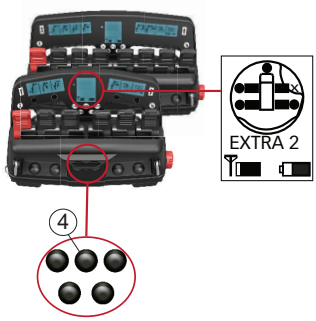
<table>
<tr><td rowspan="2">"CRANE MENU"
 
</td><td colspan="3">Left side display</td><td>Centre display</td><td colspan="3">Right side display</td></tr>
<tr><td></td><td></td><td></td><td>CRANE 3</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td>CRANE 2</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td>CRANE 1</td><td></td><td></td><td></td></tr>
</table>

Example of submenus for the 8 lever controller:

<table>
<tr><td rowspan="2">"CRANE MENU"
 
</td><td colspan="4">Left side display</td><td>Centre display</td><td colspan="4">Right side display</td></tr>
<tr><td></td><td></td><td></td><td></td><td>CRANE 2</td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>CRANE 1</td><td></td><td></td><td></td><td></td></tr>
</table>

EXTRA menu, button (4)

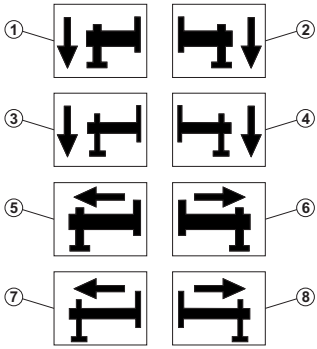
The EXTRA menu contains hydraulically proportional functions for example front and rear stabiliser extensions and legs, boat supports, bunk shifting, etc



Symbols shown on the displays

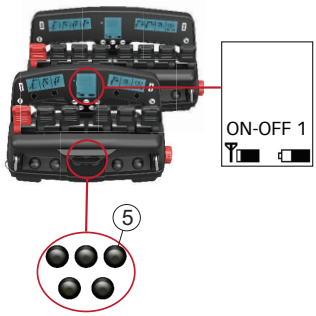
The order of the levers is customized.

- Crane stabiliser leg (1) down/up.
- Crane stabiliser leg (2) down/up.
- Auxiliary stabiliser leg (3) down/up.
- Auxiliary stabiliser leg (4) down/up.
- Crane stabiliser extension (5) out/in.
- Crane stabiliser extension (6) out/in.
- Auxiliary stabiliser extension (7) out/in.
- Auxiliary stabiliser extension (8) out/in.



ON-OFF menu, button (5)

The ON-OFF menu includes functions such as engine start, stop and throttle. The functions are shown as text instead of symbols in the displays. A lever may be moved in any direction in order to activate the corresponding function.

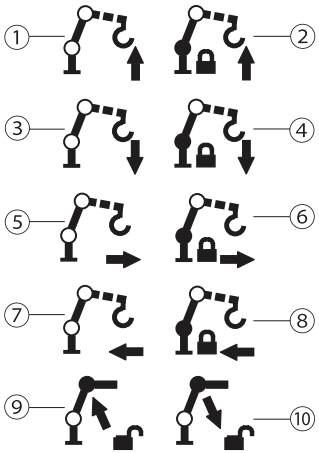


Examples of the left side display		Centre display	Examples of the right side display	
FRONT LIGHT	REAR LIGHT	ON-OFF 2	PUMP 1	PUMP 2
ENGINE START	ENGINE STOP	ON-OFF 1	ENGINE RPM UP	ENGINE RPM DOWN

CTC symbols shown on the displays

The order of the levers is customized.

- CTC mode, crane tip down/up (1).
- 1st boom locked when operating CTC mode, crane tip down/up (2).
- CTC mode crane tip up/down (3).
- 1st boom locked when operating CTC mode, crane tip up/down (4).
- CTC mode, crane tip in/out (5).
- 1st boom locked when operating CTC mode, crane tip in/out (6).
- CTC mode, crane tip out/in (7).
- 1st boom locked when operating CTC mode, crane tip out/in (8).
- Manually control the 1st boom up/down in CTC mode (9).
- Manually control the 1st boom down/up in CTC mode (10).



4.13.4. Battery and battery charger

Battery

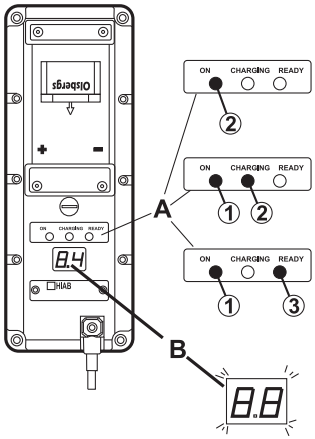
The voltage level of a fully charged battery is approximately 8,4V and it provides about 5-8 hours working time. Note that the battery voltage remains between 7,6V and 7,5V for a long time. Therefore, the battery voltage cannot be used to estimate remaining hours of use.

Install a fully-charged battery in the controller as shown on the right. It is important to fit the battery the right way round. If the battery is upside-down the controller will not start.

Battery charger

The battery charger is to be fitted in a protected environment, preferably in the cab. Two batteries are delivered with each unit, one of which can always be placed in the charger.

Normal charging time for a flat battery, is approximately 3 hours. Operating ambient temp: Battery = 0° to + 45°C.



Display A

(1) lights when the charger is activated.

(1) and (2) lights during charging.

(1) and (3) lights when the battery is fully charged.

Display B

Shows the battery voltage (8.4).

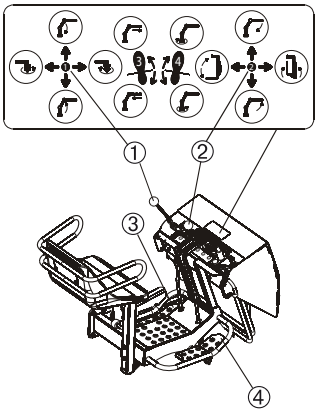
When the display blinks 0.0 there is error in the battery: Change battery.

NOTE

A charged battery is a concentrated energy source. Never store a charged battery in a toolbox or similar, where there is a risk of a short due to metal components. Used batteries should be taken care of according to the local regulations.

4.14. Cranes with high seat [option]

The high seat is equipped for using tools and operated by two joysticks: (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
First boom: downward/upward
Add-on equipment
(2) Joystick
Second boom: downward/upward
Add-on equipment
(3) Pedal
Extension: out/in
(4) Pedal
Slew: clockwise/counterclockwise

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

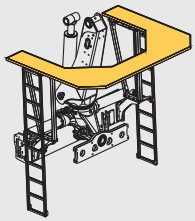
DANGER
Take care not to put your foot on the pedals when taking place in the high seat. Unintentional crane movements can occur.

Hydraulic stabiliser extensions and legs are controlled by an additional control valve fitted to the stabiliser beam.

Platform [option]

DANGER

Use the platform to access to the high seat, never operate the crane standing on the platform with the controller.



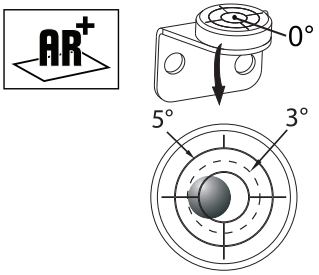
5. Starting crane operation

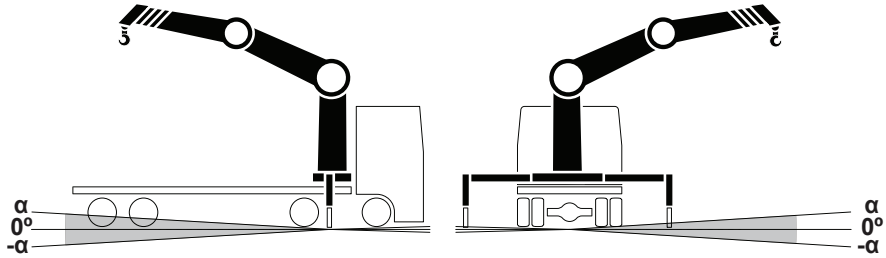
5.1. Starting operations [AR+]

- **General case:**

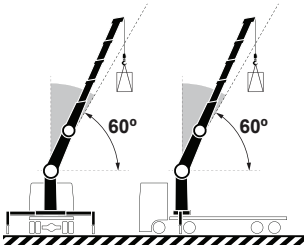
Place the vehicle on a flat, firm and stable surface. The vehicle inclination (α) during crane operation must **not be more than 3º**. If this value is exceed, unintentional crane movements can occur.

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 **(α=0º)**.
- **Particular case 1: Working with extra load on the vehicle platform to benefit from VSL+.**
  To avoid sudden movements of the vehicle and damages on the stabiliser system, the vehicle must be completely levelled in any direction **(α=0º)**.



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.

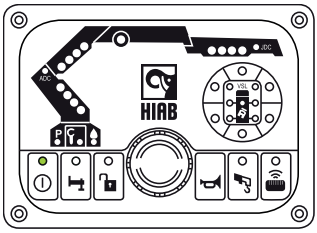
NOTE

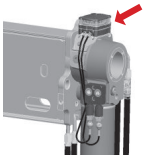
- Rpm too high: the oil in the hydraulic system might overheat. Rpm too low: during crane operation, the vehicle engine could stall.
- The maximum rpm may depend upon a governor on your PTO combination.

Start the control system

The operating levers must be in neutral position before start up. To start the control system, push the On/Off button on the user panel.

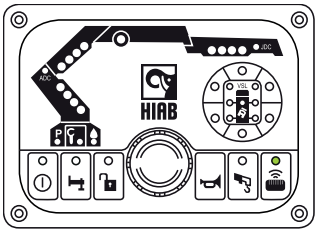
The LED above the button lights up. The system will check itself for a few seconds. The warning lamps on the stabiliser legs light up.

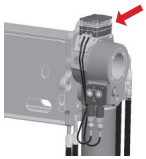




Start the controller

1. Fasten the controller to a waist belt, or shoulder-/neck strap, in the most comfortable operation position. The Stop button should be on the right hand side.
2. Push button  on the user panel. The LED above that button gives a steady light.
3. To activate the controller, pull out the stop button by turning it clockwise. The warning lamps on the stabiliser legs blinks.





Indications XSDrive

The menu LEDs on the controller starts blinking. When communication has been established, the LEDs will give a steady light = ready for use.

Indications CombiDrive

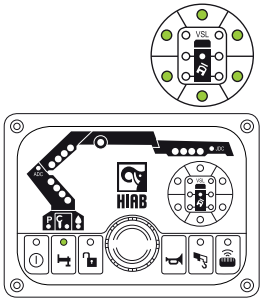
“Wait” is shown on the centre display while radio contact is being established. On the decoder LED (1) is lit. LED (2) starts to blink.

When contact has been established CRANE 1 menu and signal strength are displayed on the controller. On the decoder LED (2) on gives a steady light and LED (1) flickers.

5.2. Set the stabiliser system

To ensure the maximum stability of the vehicle, all the stabiliser extensions and legs must be fully extended and set to the ground without lifting the wheels from the ground.

- **Cranes with VSL:** when the stabiliser extensions are not fully extended, the lifting capacity is optimized by the VSL function to ensure the maximum stability of the vehicle.
- **Cranes without VSL:** crane must be operated with the stabiliser extensions fully extended and the stabiliser legs set to the ground without lifting the wheels from the ground, otherwise the stability of the vehicle will not be ensured.



DANGER

For cranes without VSL the operator is the responsible to make sure that the vehicle is stable while lifting a load and the maximum load is not exceeded.

Stability sector indication

The operator must have a full view of the stabiliser system when operating it. To confirm a full view of the stabiliser system, button is pushed on the user panel on the side where the stabiliser system is going to be operated. As soon as the button has been pushed, the LED for the active stabiliser leg will light green.

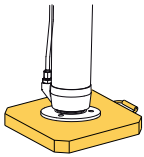
- **Cranes with VSL:** the stability sector LEDs will indicate the crane capacity in six different sectors due to stability. The stability sector indication will change according to the stabiliser system position.
- **Cranes without VSL:** the stability sector LEDs will light green regardless of the situation. The operator is the responsible to make sure that the vehicle is stable while lifting a load.

5.2.1. 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 5º.



(*) 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	-	-
395-425-335K-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.

5.2.2. Activate the stabiliser system

Manually controlled stabiliser system:

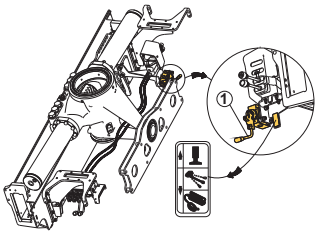
1. Make sure manual control is active. If not, push the button on the user panel
2. Push the button to activate stabiliser system operation.

Remote controlled stabiliser system:

1. Make sure remote control is active. If not, push the button on the user panel.
2. Select the menu for stabiliser system on the controller.
3. On the side where the stabiliser extensions are to be operated outwards, push the button to activate stabiliser system operation and confirm the view. The stabiliser legs can be driven up and down regardless of the side.

If selector valve [option]:

If the crane has selector valve move lever (1) to stabiliser system position.

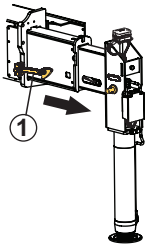


5.2.3. Extend the stabiliser extensions

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.

5.2.4. 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

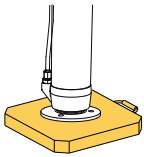
For cranes with VSL the stabiliser leg downward movement is automatically stopped at a pre-given force level. To exceed this pre-given force level, operate the stabiliser leg down once again.

DANGER

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

Place the extra support plates

- Place the extra support plates under the stabiliser leg plates.

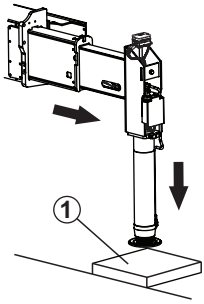


DANGER

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. Position the extra support plate (1) onto the ground (if delivered).
3. Operate the stabiliser leg downwards until it is set to the ground.



5.3. Operate the boom system out of transport position

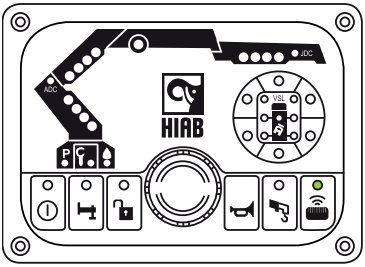
WARNING

- A crane with add-on equipment can differ from the operations described in this section. For this reason, study the operating instructions for any add-on equipment carefully.
- Always ensure that the stabiliser extensions and legs are in working position and securely locked before operating the boom system out of parking position.

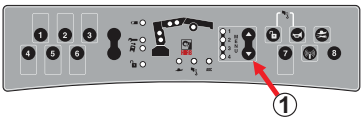
DANGER

Always operate a manually controlled crane from the position shown in the image!

1. If the stabiliser system is manually controlled, push button on the user panel to activate remote control.



2. If using remote control, push button (1) on the controller to change the menu into crane operation.

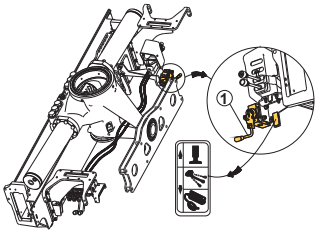


NOTE

As soon as you have selected remote control operation, it is no longer possible to operate the main control valve levers.

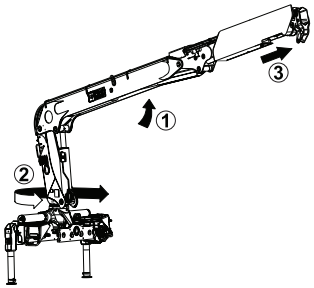
If selector valve [option]:

If the crane has selector valve move lever (1) to crane position.



Operate the boom system

1. Raise the first boom (1).
2. Slew the crane to the working position (2).
3. Extend the hydraulic extensions. The crane is now ready for use (3).



NOTE

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

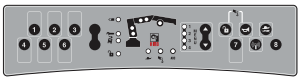
6. During operation

6.1. Features

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

6.1.1. Controlling the crane speed with the controller XSDrive

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



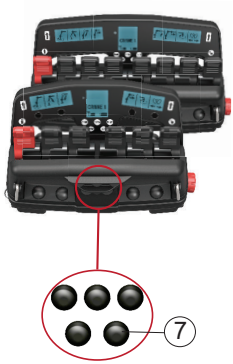
When pushing the speed selector button, all levers must be in neutral.

NOTE

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

6.1.2. Controlling the crane speed with the controller CombiDrive

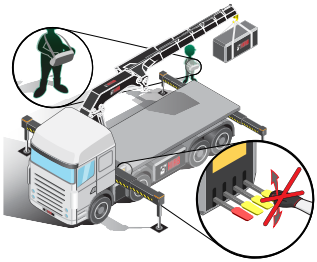
At startup the crane speed is set to 100%. It is possible to choose between three different speeds. Push button (7) to change. Current speed is shown as a percentage on the display.



6.1.3. Supervision of spools

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

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



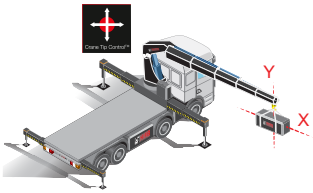
6.1.4. CTC Crane Tip Control [option]

CTC controls the direction of the tip instead of each crane function. One lever is used for horizontal movement and one for vertical. The crane will calculate and carry out the necessary operations to move the crane tip in and out or up and down.

CTC is operated in a separate menu on the controller.

How to operate the crane using CTC

1. Navigate to the menu for CTC.



NOTE
The crane tip will not move until the 1st boom reaches its optimum position.

2. Use levers:

XSD	CD	Function
		X, horizontal
		Y, vertical

The levers can be used simultaneously.

NOTE
CTC cannot be activated with the boom system folded.

Manually control the 1st boom in CTC mode

In CTC mode, SPACE calculates the optimum angle for the boom system to optimize the lifting capacity. If the optimum position cannot be used because of obstacle, the operator can manually position the first boom

1. Make sure CTC is selected in the menu.
2. Push button on the controller to disconnect the 1st boom from CTC mode.
3. Use levers to manually control the 1st boom. The crane tip will not move during this time.
   - XSDrive
   - CombiDrive

Now, when operating X and Y direction, only 2nd boom and extension are operated.

Push button again to deactivate.

NOTE
The crane tip will not move until the 1st boom reaches its optimum position.

6.1.5. APO Automatic power off

APO is a function which automatically switches off the power to the control system. It consists of:

1. Timeout controlled power off. (30 minutes by default).
2. Parking brake controlled power off.
   Through the vehicle's parking brake, APO offers a safety function which ensures that the control system is off when the vehicle is moving. When parking brake is released, the control system receives a signal and shuts OFF.
   For emergency operation
   During 5 seconds, it is possible to activate the control system by pushing the ON/OFF button on the user panel.

6.1.6. ADO Automatic dump function

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

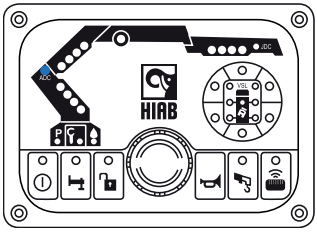
6.1.7. ASC Automatic Speed Control

The ASC function automatically provides the extra power by reducing the speed smoothly, when working close to the rated capacity. When the load decreases, normal speed is restored.

6.1.8. ADC Automatic Duty Control

The purpose of the ADC function is to increase the lifting capacity by 10%.

The first boom pressure sensors indicate if there is a positive or negative pressure on the first boom.

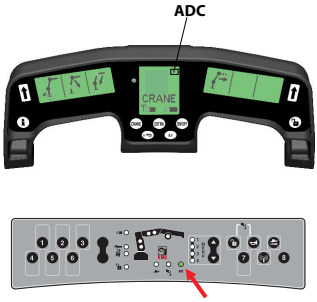


Normal capacity

- If the first boom is pressed down, the sensors indicate a negative pressure and the lifting capacity is normal during the complete lifting cycle.

Increased capacity (ADC mode)

- ADC lamps light up.
  If the sensors indicate a positive pressure, the lifting capacity is increased during the complete lifting cycle.

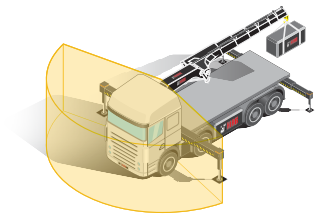


6.1.9. PFD Pump flow distribution

When operating several functions simultaneously the pump flow may not be sufficient. PFD will now take over, reducing the speed of all operated functions. Uncontrolled movements are thus avoided, smooth simultaneous operation is achieved.

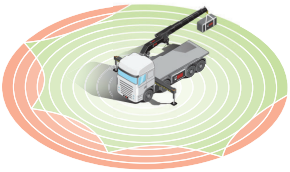
6.1.10. Slewing sector [option]

Within slewing sector, lifting capacity can be reduced due to stability. The overload warning will be given at a lower load in the limited sector than outside the sector. In case of an overload warning you may slew out of the sector but not further into it.



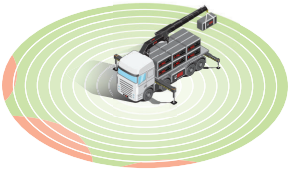
6.1.11. VSL Variable Stability Logic [option]

The VSL function detects the stabiliser extensions position and that the stabiliser legs are pressed to the ground. The benefit is that the crane lifting capacity is optimized in relation to vehicles stability.



6.1.12. VSL+ (Variable Stability Logic Plus) [option]

VSL+ is a patented function that automatically optimizes the crane's capacity in relation to the vehicles stability.



VSL+ works like VSL but has the capability to take advantage if the vehicle platform is loaded, the extra load acts as a counter weight.

This automatic function increases flexibility, especially on worksites where it is not possible to utilize the full stabiliser extension reach.

WARNING

In order to get the maximum benefit from the VSL+ system, some of the wheels of the vehicle shall be lifted from the ground but Hiab strongly recommends that at least one wheel is braked by the parking brake and has contact with the ground.

When using the crane in MEWP mode (Mobile Elevating Working Platform mode), VSL+ is automatically disabled.

The percentage on the main display shows the capacity gained due to the function VSL+.

6.1.13. LSS-V Load stabilising system-vertical [Option]

LSS-V reduces vertical oscillations in the boom system. This function makes it easier to handle loads at long outreach.

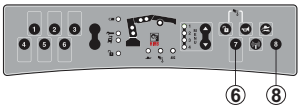
WARNING

Deactivate LSS-V when working in confined spaces. Compensating movement can cause the crane to collide with obstacles.

If the function LSS-V is active when SPACE is switched off, the function will be active when SPACE is started again.

Activate and deactivate LSS-V (By default) with the controller XSDrive

Push button (6) to activate and button (8) to deactivate.

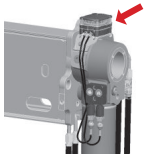


Activate and deactivate LSS-V (By default) with the controller CombiDrive

1. Push the ON-OFF button (5) on the remote control.
   - CombiDrive with 6 levers: Menu 2 ON-OFF
   - CombiDrive with 8 levers: Menu 1 ON-OFF
2. Move the levers according to the text in the display.
   - CombiDrive with 6 levers: lever 4 (activate) and lever 5 (deactivate).
   - CombiDrive with 8 levers: lever 7 (activate) and lever 8 (deactivate).

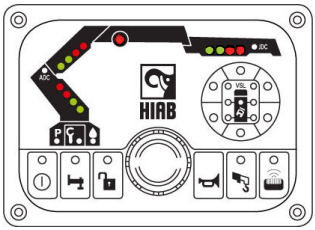
6.2. OLP (Overload protection)

OLP is a safety function that prevents overloading of the crane. With 90% of maximum permitted pressure the warning lamps on the stabiliser legs double blink. When 100% of maximum pressure is reached the warning lamps will blink.



OLP boom system

When 100% of the maximum permitted pressure is reached, OLP cuts in and stops all functions that increase the pressure.



The pressure level in the first and second boom is indicated by the LEDs on the user interface:

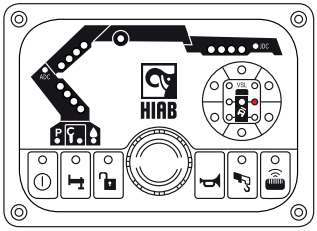
- 50% of maximum pressure – 1 of 4 LEDs light green
- 70% of maximum pressure – 2 of 4 LEDs light green
- 90% of maximum pressure – 3 of 4 LEDs flash red
- 100% of maximum pressure – 4 of 4 LEDs flash red

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.

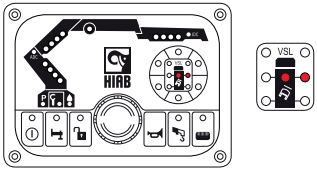
OLP stabiliser system [option]

If a stabiliser leg is overloaded, slewing is stopped in the direction towards the stabiliser leg where the OLP occurs. The crane stops. The warning lamps on the stabiliser legs will blink. On the user interface the LED for the overloaded stabiliser leg will light red. Move the levers to neutral and only operate permitted (pressure reducing) functions.



VSL - OLP [option]

VSL-OLP occurs when there is a risk of instability of the vehicle. Slewing is stopped towards the instability direction and the crane stops. On the user interface the LED for VSL-OLP and the LED for stabiliser leg will light red. Move the levers to neutral and only operate permitted (pressure reducing) functions.



OLP manual control

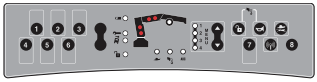
If one prohibited function is used, all functions will stop. The crane will be fully operational as long as only allowed functions are used.

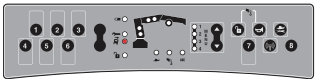
6.3. OLP - indications on the controller

XSDrive

OLP boom system: The cylinder LEDs indicate a percentage of maximum pressure:

- 70% of maximum pressure reached - lower LED on each cylinder light green
- 90% of maximum pressure reached - lower LED on each cylinder flash red
- 100% of maximum pressure reached - both LEDs on each cylinder light red





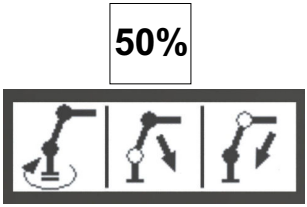
OLP stabiliser system [option]: No indication on the controller. See indications on the user panel.

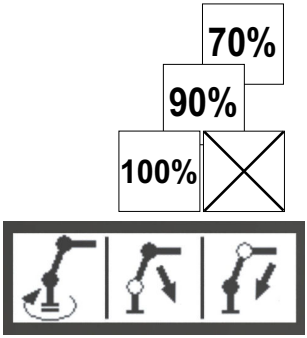
VSL-OLP [option]: The LED for VSL light red.

CombiDrive

OLP boom system shown on the left and right displays:

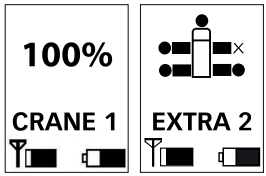
- A percentage of maximum permitted pressure in the cylinders is shown on the displays. When 50% or more of maximum pressure is reached, the percentage alternates with the function symbol once a second in the display corresponding to each lever. The display shows 50%, 70%, 90% and 100% as the pressure increase.
- When pressure reaches 100 %, all functions that would increase pressure are blocked. If the operator attempts to operate a blocked function, the function symbol is replaced by a cross while the lever is engaged. When the lever is returned to neutral position, the cross disappears and the function symbol returns. Operate permitted (pressure reducing) functions only. In an OLP situation, symbol "x" is shown in every menu in the centre display.





OLP stabiliser system [option]:

The centre display shows the symbol 100% and the symbol for which stabiliser leg has overload (marked with an X).



Symbols shown on the display:

(1) Stabiliser extension in or not completely out. Stabiliser leg set (the stabiliser leg reaches the minimum pressure to the ground).

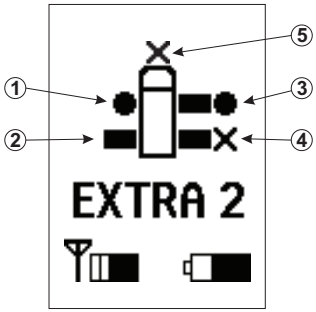
(2) Stabiliser extension out. Stabiliser leg not set.

(3) Stabiliser extension out. Stabiliser leg set.

(4) Stabiliser extension out. Stabiliser leg in OLP situation.

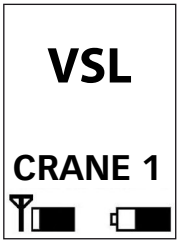
(5) Front left or right stabiliser leg in OLP situation.

In an OLP situation, symbol "x" is shown in every menu in the centre display.



VSL-OLP [option]:

The centre display shows the symbol VSL. The 100% symbol in the left display alternates with OLP for crane. Move the levers to neutral and only operate permitted (pressure reducing) functions.



6.4. To release OLP

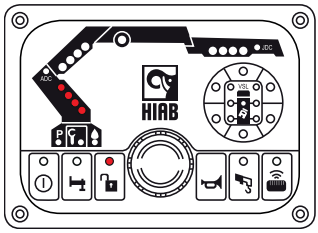
If all functions have been blocked due to OLP it is possible to temporarily release OLP and operate an appropriate crane function to correct the overload situation. OLP release is active in 5 second intervals. After each 5 second interval of OLP release there is a wait before the release operation can be activated again. The wait will increase in three steps: 30, 60 and maximum 90 seconds. During each 5 second interval only one function at a time can be operated. Extension out cannot be operated at all. The 5 second interval starts to count down as you move the lever.

DANGER

Only use the OLP release to get the crane out of a locked position. Never use the OLP release to overload the crane deliberately!

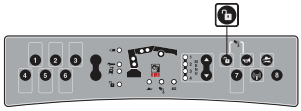
OLP release on user panel

Push and hold button on the user panel whilst operating load reducing functions. The cylinder pressure LEDs on the user panel perform a running light. The LED for padlock symbol will blink red.



OLP release on controller XSDrive

Push and hold the button on the controller whilst operating load reducing functions. On the user panel the cylinder pressure LEDs perform a running light. The LED for padlock symbol will blink red.



OLP release on controller CombiDrive

Push and hold the button (9) on the right hand side below the display handle. The unlocked padlock will appear in the centre display. On the user panel the cylinder pressure LEDs perform a running light. The LED for padlock symbol will blink red.

7. Ending crane operation

7.1. Operate the boom system into transport position

WARNING

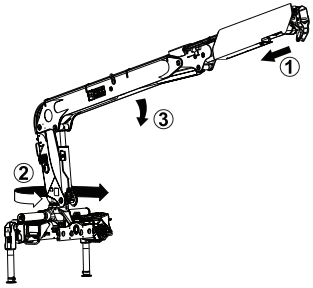
- A crane with add-on equipment can differ from the operations described in this section.
- For this reason, study the operating instructions for any add-on equipment carefully.

DANGER

- During folding of the boom system, always operate the crane manually from the position indicated in the figure.
- With remote controlled cranes, stay in a safety area while the boom system is moving.

Operate the boom system

1. Retract the extensions completely (1).
2. Slew the crane until the crane is parallel to the vehicle (2).
3. Lower the boom system against the vehicle (3). (Do not extend the second boom cylinder fully).



7.2. Placing the stabiliser system in the transport position [AR+]

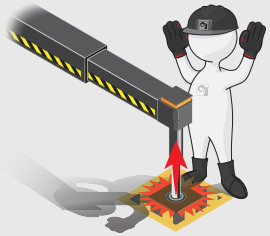
DANGER
Do not stand in the stabiliser legs, tilting area.

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.

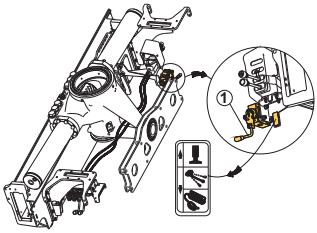
DANGER
Always ensure that the stabiliser legs and the stabiliser extensions are in transport position and securely locked before moving the vehicle.

- **Manually controlled crane:**

  Activate stabiliser system operation on the user panel by pressing button .
- **Remote controlled crane:**
  - Manually controlled stabiliser system: Press button on the user panel to deactivate the controller. Activate stabiliser system operation on the user panel by pressing button .
  - Remote controlled stabiliser system: Select on the controller the defined menu for the stabiliser system operation.

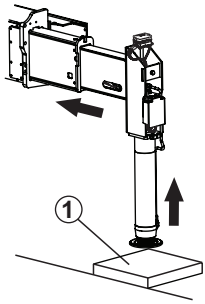
If selector valve [option]:

If the crane has selector valve move lever (1) to stabiliser system position.



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.
4. Retract the stabiliser extension completely.



WARNING

Risk of crushing injuries.

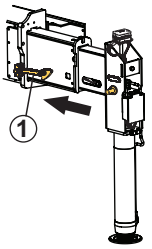
Always keep hands away from moving parts during operation.

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.

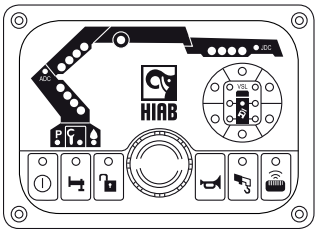


7.3. Switching off the control system

- Switch off the control system with the on/off button .

If you are using the remote controller:

- Push the stop button on the controller and switch off the control system.
- Disengage the PTO.



7.4. Emergency operation Valve-V200

EMERGENCY operation to bring the crane to transport position

Do like this:

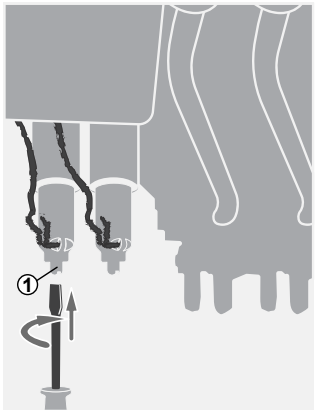
On the main control valve:

DANGER

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

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

1. Engage the pump.
2. Break the security sealing on dump valve 1 (1) on the main control valve.
3. Use a screw driver (or similar) and push the knob on dump valve 1 (1).
4. Check that no unintended movements starts. If you get unintended movements then release the knob and contact HIAB service.
5. Push the dump valve button and turn 90 degrees until it is blocked.
6. Operate the crane to transport position using the levers on the main control valve.



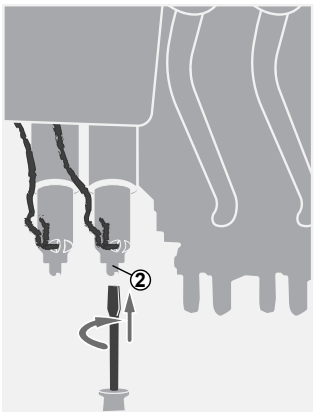
Separate stabiliser control valve: [option]

DANGER

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

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

1. Follow actions 1-5 in previous section *"EMERGENCY operation to bring the crane to transport position". The button on dump valve 1 on the main control valve is to remain depressed.*
2. Break the security sealing on dump valve 2 (2) on the main control valve.
3. Use a screw driver (or similar) and push the knob on dump valve 2 (2).
4. Check that no unintended movements starts. If you get unintended movements then release the knob and contact HIAB service.
5. Push the dump valve button and turn 90 degrees until it is blocked.
6. Operate the stabiliser extensions and stabiliser legs to transport position using the levers on the stabiliser control valve.



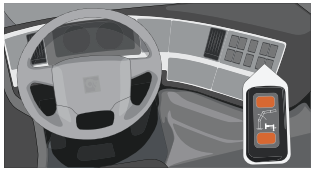
7.5. TWI Transport warning interface [option]

WARNING

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

The vehicle must not be moved.

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



The vehicle must not be moved

1. Switch the system on, 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

DANGER

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

Before carrying out any welding on the vehicle:

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

After welding on the vehicle:

- Connect the power between the vehicle and the crane.

Leakage

DANGER

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

Deal with an oil leak as follows:

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

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, at least once a year, by a Hiab service workshop as specified in the "Service & Warranty Manual".
- 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 and tools.

8.3. Follow the maintenance instructions!

Take the crane, at least once a year, to a HIAB service workshop for inspection and maintenance. Maintain lifting accessories according to the supplier's instructions.

WARNING

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

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

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

Filters

Replace the filter cartridge

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

Cleaning

Clean your crane and accessories regularly, but:

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

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.

Shafts, shaft lockings, bearings and bushings

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

Stop buttons

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

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:

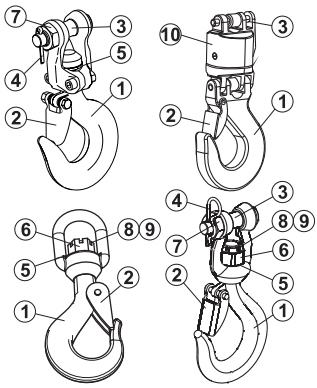
- Do not use the crane.
- Have the damage repaired immediately by a HIAB service workshop.

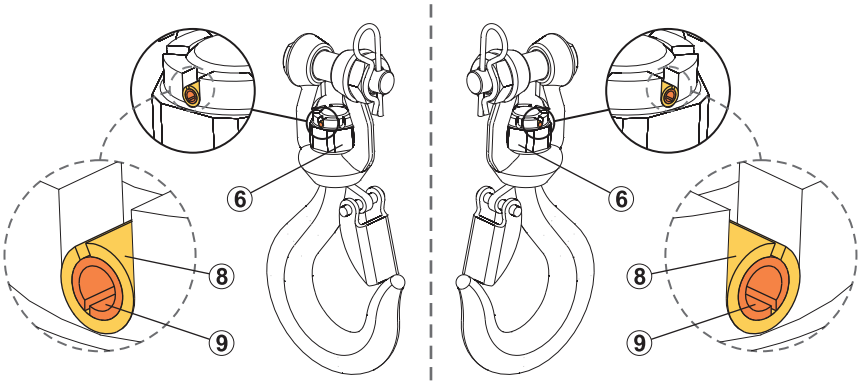
Hooks

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

Before every 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 that prevents a safety risk:

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

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

- Check the cables, cable connections, the cable 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.

Electronic components

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

To do the test:

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

Hydraulic system

- 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 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, replace the cartridge.

8.3.2. Monthly inspection and maintenance

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

Piston rods

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

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 not loose. If loose contact a HIAB service workshop

Cables and sensors

- Check that these 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 the oil tested by a workshop or specialist.

Add-on equipment etc.

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

8.3.3. Annual maintenance

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

Carry out the following maintenance at least once a year.

Hydraulic system

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

NOTE

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

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 8TN:** replace the hook for a new one if the Clevis/Link or Split clevis retaining nuts are missing or damaged.
- **Hook 10TN:** replace the two spring/roll pins and the plane bearing for a new ones, at least once a year.

8.4. Lubrication

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.

Type of grease

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

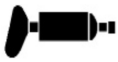
Recommended greases:

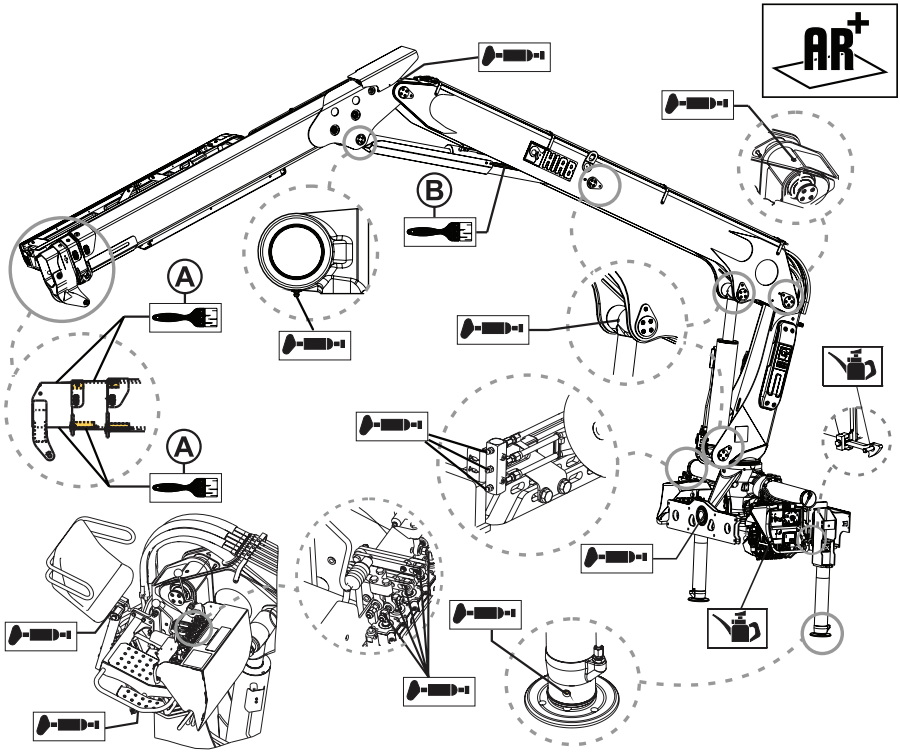
BP LS EP 2, ESSO UNIWAY EP2 N, AGIP GR MU/EP3, NYNÄS UNIFETT EP.

NOTE

Avoid grease with graphite or molybdenum-disulphide additives.

8.4.1. Lubrication schedule [AR+]

	Lubricate after every 16 hours of use.
	Lubricate after every 50 hours of use.
	Grease after every 50 hours of use. **A**: Internal pads **B**: Internal guides



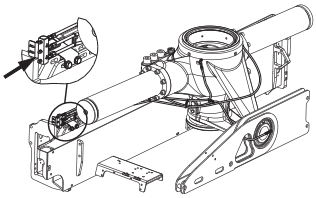
8.4.2. Lubrication of the upper column bearing

DANGER

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

If you are lubricating the upper column bearing without help:

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



8.4.3. Lubrication of slide pads in boom system

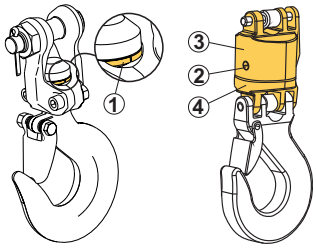
Front upper slide pads

- 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:
  1. Lubricate the plane bearing surfaces (1).
     Use a heavy duty penetrating spray grease, type "ZEP 2000" or equivalent quality.
- **Hooks with swivel.**
  Lubricate 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.

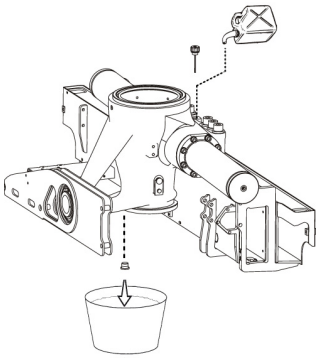
8.5. Hydraulics

8.5.1. Slewing housing: checking the oil level/oil change

Measuring stick [if fitted]

- **Checking the oil level in slewing housing**

  1. Check if the oil level on the measuring stick is between the maximum and minimum levels.
  2. If the oil level is below the minimum level: Top up through the hole for the measuring stick with transmission oil of type MIL-L-2105C or API-GL-5, viscosity SAE-80W-90, cleanliness NAS 1638:8.



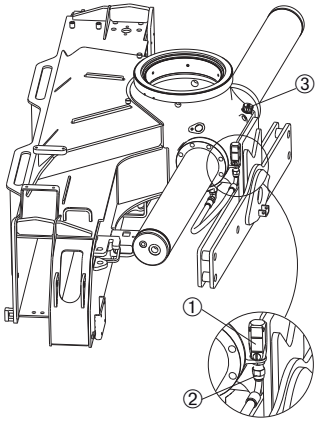
- **Changing oil in the slewing housing**
  Change the oil in the slewing house yearly!

  1. Use a container with sufficient capacity to receive the oil. Drain off the oil through the drain plug.
  2. Refill through the hole for the measuring stick, with transmission oil of type MIL-L-2105C or API-GL-5, viscosity SAE-80W-90, cleanliness NAS 1638:8.
  3. Slew the crane to the end positions three times.
  4. Check the oil level. If necessary top up again.

Measuring level glass [if fitted]

- **Checking the oil level in slewing housing**

  1. Check if the oil level in the level glass (1) is between the maximum and minimum levels.
  2. If the oil level is below the minimum level: Remove the plug (3).
  3. Top up through the filling hole (3) with transmission oil of type MIL-L-2105C or API-GL-5, viscosity SAE-80W-90, cleanliness NAS 1638:8.



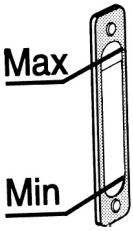
- **Changing oil in the slewing housing**
  Change the oil in the slewing house yearly!

  1. Remove the hose coupling (2) from the level glass.
  2. Remove the plug (3).
  3. Use a container with sufficient capacity to receive the oil. Drain off the oil through the filling hose (2).
  4. Attach the hose coupling (2) to the level glass.
  5. Refill through the filling hole (3), with transmission oil of type MIL-L-2105C or API-GL-5, viscosity SAE-80W-90, cleanliness NAS 1638:8.

6. Refit the plug (3).
7. Slew the crane to the end positions, three times.
8. Check the oil level. If necessary top up again.

8.5.2. Checking the oil tank level

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



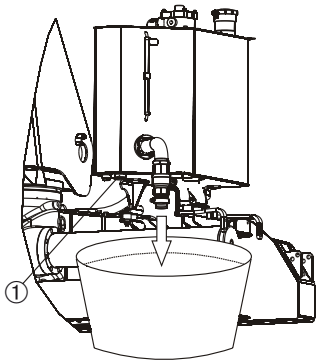
8.5.3. Changing the hydraulic oil

WARNING
The oil can be hot and cause injury.

1. Operate the crane for a while to warm the oil. Place the crane in the parked position. Take care that the temperature of the oil does not exceed the point where you can handle it safely. If this occurs allow the oil to cool before moving to the next step.

WARNING
- Suitable eye and hand protection must be worn while carrying out this operation, and if there is a risk for inhalation of oil mist, a mask as well.
- Inhalation of oil mist: Contact a doctor.
- Skin contact: Remove polluted clothing, wash with soap and water. In the event of high pressure injection of the product, see a doctor without delay.
- Eye contact: Rinse eyes with plenty of water, see a doctor if irritation persists.

2. Drain the oil tank through the drain plug (1). Make sure the system contains as little as possible.
   The capacity of the tank is 40-235 litres (10.6-62 gallon). Use a container with sufficient capacity.



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

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

Filling the oil tank with hydraulic oil

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

Hydraulic 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

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

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

Viscosity of oil

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

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

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

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

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

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

Environmentally Friendly Oil

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

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

After filling the tank

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

8.5.4. Bleeding air from the hydraulic system

Bleed the air from the hydraulic system:

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

WARNING
Air in the hydraulic system can lead to faults and damage

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

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

8.5.5. Replacement of filters

WARNING

High pressure / temperature hazard. Whenever work is carried out on the filters, be prepared for hot oil to escape which can cause injury.

NOTE

Only filter cartridges from Hiab must be used. If non-Hiab supplied cartridges are used, warranty claims will be void.

- The hydraulic system must be switched off before any work is carried out on the filter. The filter must be released of pressure.
- Keep tools, working area and equipment clean.
- After disassembling the filter, clean all parts, check for damage or wear and replace if necessary.
- When changing a filter cartridge, a high level of cleanliness must be observed.
- Never unpack a new filter until just prior to the installation of the filter.
- Replace the filter cartridges as recommended: After the first 50 operating hours. Then, after every 1000 operating hours or once a year during regular service.

Main control valve: V200

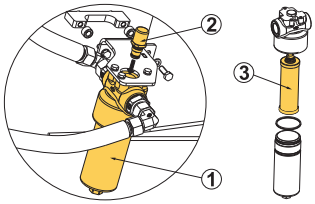
- **High pressure filter**
  Located at the crane base, connected to the pressure line from the pump.
- **Pressure-reducer filter (only remote-controlled cranes):**
  Located in the outlet section of the main control valve.
  It is usually located at the crane base. For continuous slewing cranes, it is located at the column.
  V98 stabiliser control valve - For continuous slewing cranes, an additional filter is located in the outlet section of the supply valve when stabiliser system is remote-controlled.
  V80R stabiliser control valve - An additional internal filter is located inside the outlet section of the stabiliser control valve when stabiliser system is remote-controlled, regardless of the slewing system.
- **Return filter**
  Located in the oil tank.

8.5.6. Replacing the cartridge in high pressure filter

(1) High pressure filter

(2) Optical indicator

(3) Cartridge



WARNING

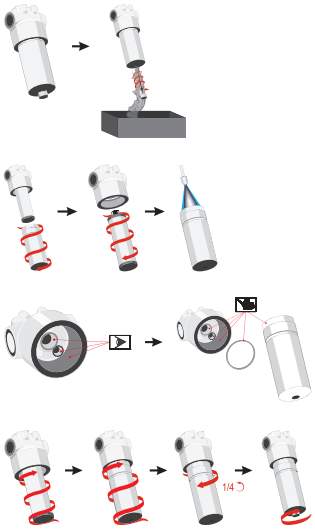
Dirt will damage the hydraulic system

NOTE

DO NOT clean the filter cartridge.

When clogging indicator turns red or filter time is reached (which ever is the sooner), the cartridge must be replaced. **If indicator is not fitted, replace the cartridge periodically as recommended by Hiab.**

1. Switch off hydraulic system. Release filter of pressure.
2. Clean the immediate surrounding area of the filter.
3. Remove the oil drain plug. Collect oil in a suitable container.
4. Unscrew the filter housing. Collect oil in a suitable container and clean or dispose of it in accordance with environmental regulations.
5. Remove the filter cartridge. Examine the surface of the cartridge for dirt residue and larger particles; these can indicate damage to the components.
6. Clean the filter housing.
7. Examine the filter housing and head segment, especially sealing surfaces and thread, for mechanical damage.
8. Always replace the O-ring of the filter housing.
9. Oil the threads and sealing surfaces on the filter housing and head segment, as well as the O-ring.
10. Replace the filter cartridge with the new one and screw carefully.
11. Fully tighten the filter housing. Then, unscrew it 1/4-turn back.
12. Screw the oil drain plug.
13. Switch on hydraulic system and check the filter for leakage.



8.5.7. Replacing the cartridge in pressure-reducer filter - V200

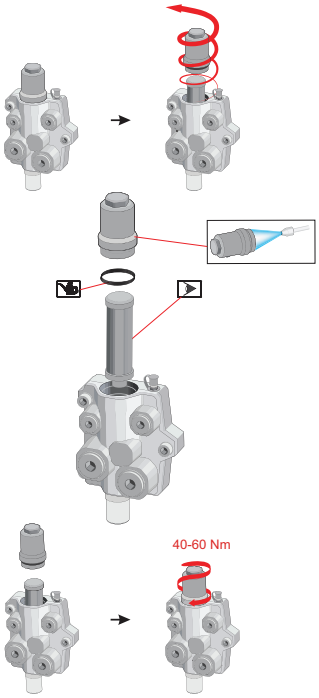
The pressure-reducer filter is located in the main control valve or in the supply unit [option]

WARNING

Dirt will damage the hydraulic system

It is not possible to clean the cartridge. It must always be replaced.

1. Switch off hydraulic system. Release filter from pressure.
2. Carefully clean the filter housing and the surrounding area on the housing.
3. Remove the filter housing using a 27 mm wrench.
4. Remove the old O-ring and replace it with the supplied one (oil it before assembling).
5. Remove the filter cartridge. Examine the surface of the filter cartridge for dirt residue and larger particles; these can indicate damage to the components.
6. Clean the filter housing.
7. Unpack the new filter cartridge. Make sure that it is clean and screw carefully.
8. Remount the filter housing and tighten it, torque 40-60 Nm.
9. Switch on hydraulic system and check the filter for leakage.



8.5.8. Replacing the cartridge in return oil filter

Return oil filter with clogging indicator

NOTE

Do not clean the filter.

Replace the breathing filter of the filler cap at the same time as the return filter cartridge.

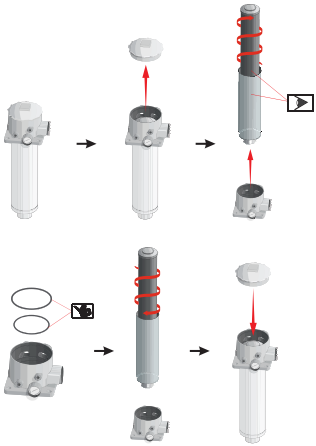
When clogging indicator turns red or filter time is reached (whichever is the sooner), the cartridge must be replaced. **If indicator is not fitted, replace the cartridge periodically as recommended by Hiab.**

WARNING

Dirt will damage the hydraulic system

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

1. Switch off the hydraulic system and release the filter of pressure.
2. Clean the immediate surrounding area of the filter.
3. Remove the cover.
4. Remove the filter cartridge with attached filter housing by using the handle.
5. Examine the surface of the filter cartridge for dirt residue and larger particles; these can indicate damage to the components.
6. Examine the filter housing for any possible mechanical damage.
7. Replace the filter cartridge with a new one.
8. Remove old O-rings and replace (oil before assembling).
9. Place the filter cartridge carefully into the filter housing and screw. Pay attention to the position of the handle.
10. Install the filter cartridge with attached filter housing.
11. Refit the cover.
12. Replace the breathing filter in the filler cap.
13. Switch on hydraulic system and check the filter for leakage.



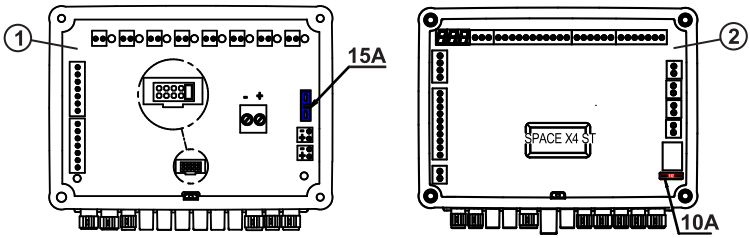
8.6. Troubleshooting

8.6.1. Main fuses

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

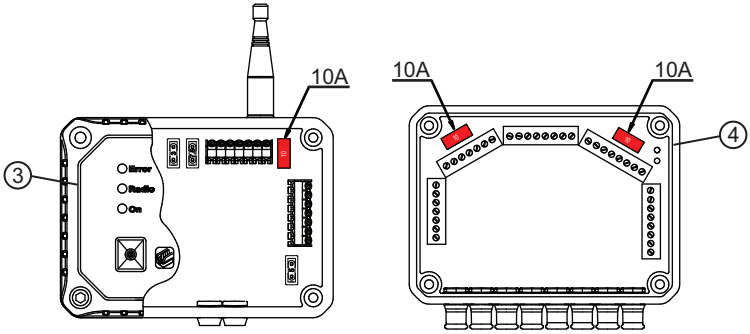
Fault	Probable cause	Action
The control system does not work at all. The indicator light next to On/Off button on the user panel is not lit, even if you push On/Off.	Defective fuses.	1. Replace faulty fuses in the: - vehicle - standard box - relay box (See Description, Components, Fuse, Location) 2. Check all the cable connections.

Description	Components	Fuse	Location
System main fuse	Relay Box, Standard Box, Oil Cooler	40 A	Located on the vehicle, were the crane is mounted.
Fuse for all components controlled by the relay box.	Hydraulic main control valve, stabiliser leg warning lamp, Remote control, user panel, MUX box. Truck warning interface, Work lights.	15 A	Located inside the relay box (1).
Fuse for all components connected to the standard box.	Hydraulic main control valve, stabiliser leg warning lamp, user panel, MUX box. Truck warning interface.	10 A	Located inside the standard box (2).



Main fuses CD

Description	Components	Fuse	Location
Fuse for all components controlled by the radio decoder	DA-26	10 A	Located inside the radio decoder (3).
Fuse for DA-26	Remote controlled valves	2x10A	Located inside the DA-26 (4).



8.6.2. Faults on the crane

Faults in the crane must be rectified immediately.

DANGER

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

Fault	Probable cause	Action
Electronic system will not start.	Parking brake on the truck is not engaged.	Engage parking brake on the truck.
The hydraulic pump makes a noise. **Warning! Stop using the crane immediately!**	Oil tank filler breather is clogged.	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.
	Hydraulic pump is faulty.	Go to a HIAB service workshop.

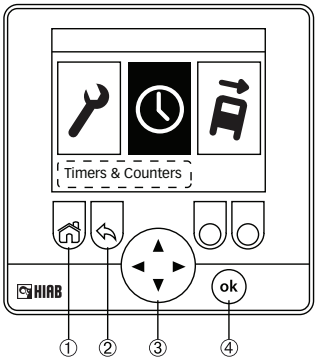
Fault	Probable cause	Action
Leak on hydraulic system: leaking coupling, hose or line. **Danger! Keep away from any oil leak.**		1. Push in the Stop button [If fitted].
		2. Disengage the PTO.
		3. Contact a HIAB service workshop.
Stabiliser extensions do not slide out.	Stabiliser extensions are still locked.	Unlock the stabiliser extensions.
	Hydraulic fault.	Go to a HIAB service workshop.
The stabiliser extensions do not slide out/in. (Chain-driven stabiliser system)	Incorrect chain tension.	Contact a HIAB service workshop.
The stabiliser leg cylinder cannot keep the truck load and it goes inwards.	Check valve damaged.	Go to a HIAB service workshop.
	Cylinder internal leakage.	Go to a HIAB service workshop.
	Soft ground surface.	Set again the stabiliser led onto the ground or add an extra support plate between the cylinder and ground.
Slewing support cylinders do not turn	Three-way valve failure.	Go to a HIAB service workshop.
Irregular slewing movements and unusual noises in cranes with rack and pinion slewing system.	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 service workshop.
Irregular slewing movements and unusual noises in cranes with continuous slewing system.	Insufficient oil in the hydraulic system.	Top up the oil tank.
	Insufficient oil in the gear box.	Top up the oil in the gear box to the required level.
	Bearing assemblies and pinion are not properly lubricated.	Lubricate the bearing while slewing.

Fault	Probable cause	Action
	Bearing assemblies or pinion are damaged.	Go to a HIAB service workshop.
One function of the controller does not work.	One lever of the controller was not in neutral at start up.	1. Push in the Stop button.
		2. Make sure that all levers are in neutral.
		3. Release the Stop button.
Crane does not react to controls. Indicator lamps light up on the user panel.	The crane is in an OLP situation.	Perform movements to reduce the load moment. If necessary, release OLP.
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 service workshop.
Cane performance when operating it with the controller is unsatisfactory.	The pressure reducer filter is clogged.	Replace the pressure reducer filter.
Boom system cannot keep the load height, and it goes down by itself.	Load holding valves on the first boom or second boom damaged.	Go to a HIAB service workshop.
	Cylinder internal leakage.	Go to a HIAB service workshop.
Boom extension cylinders do not follow the sequence.	Cylinder internal leakage.	Go to a HIAB service workshop.
Boom extensions shake during extending/retracting function.	Cylinder internal leakage.	Go to a HIAB service workshop.
	Sequence screw in cylinder head loose.	Tight the screw in the right position.
Boom extensions cannot keep the load height and they move out by themselves.	Extension load holding valve damaged.	Go to a HIAB service workshop.
	Cylinder internal leakage.	Go to a HIAB service workshop.

Fault	Probable cause	Action
Add-on equipment does not work properly (rotator, hoist, etc.)	Connectors not properly connected.	Reconnect the add-on equipment, according to the instructions.
	Other defect.	Go to a HIAB service workshop.
When using feature CTC: The feature is not behaving as usual, or the first boom seems to be locked in the same position during operation.	The button for manual control of the first boom has been pushed.	Push button again. This will give CTC control over the boom system.

8.6.3. Display [option]

The display has three menu items: *Error codes, Timers & Counters* and *VSL*. These items are shown on the screen when the display is first engaged. To be able to select an item push the menu toggle button or the OK button. In the bottom left of the screen the name of the item currently highlighted is shown.



Buttons

(1) Push to go back to main menu
(2) Push to go back one step
(3) Push to toggle between menu items
(4) Push to select item

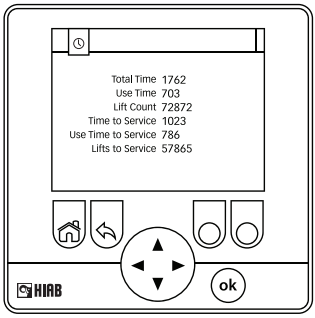
Menu items

Error codes

If item *Error codes* is selected and there are errors present in the system the screen will show a three digit number for each fault in the system.

Timers & Counters

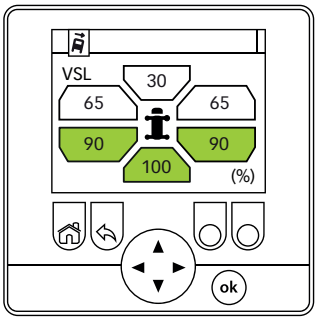
When item is selected information is shown about:



- Total time - Number of hours that the crane has been engaged
- Use time – Number of hours that dump valve has been active
- Lift count – Number of lifts made
- Time to service – Number of hours with the crane engaged until next service
- Use time to next service – Number of hours with dump valve active until next service
- Lifts to service – Number of lifts until next service

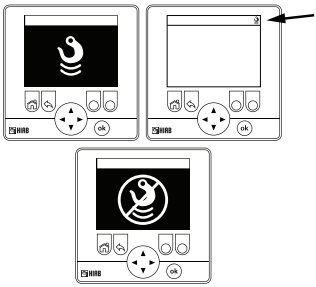
VSL

If this item is selected the truck VSL diagram is shown. The diagram shows six sectors surrounding the crane and in each sector a percentage is shown. A percentage of 90 indicates that the working pressure is reduced to 90% in this sector to guarantee full stability. The different sectors are marked in colors green, yellow, grey or red where green indicates the highest percentage of working pressure and red indicates the lowest percentage.



Function indication

If function LSS-V is activated the screen turns blue and a symbol of a hook is shown. This to notify the operator of the occurrence. When the screen goes back to normal the symbol of the hook is shown in the top right of the screen. When deactivating LSS-V the screen turns blue again and the hook symbol is shown, this time crossed in a red circle. The hook symbol in the top right of the screen disappears.



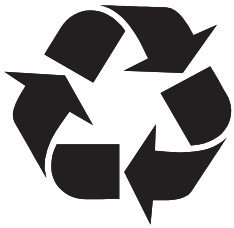
9. Decommissioning

9.1. Decommissioning a crane

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

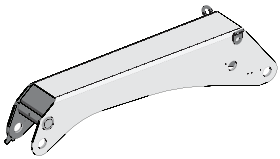
Follow the regulations of the local authorities!

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



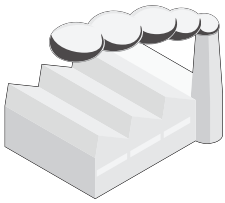
Sort the waste

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



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

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



Unsorted waste should be delivered to a landfill

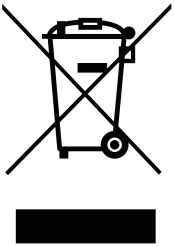
- drained hydraulic hoses, electrical wires, control cables, seat, hydraulic cylinder seals, lights, small plastic and rubber parts.

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

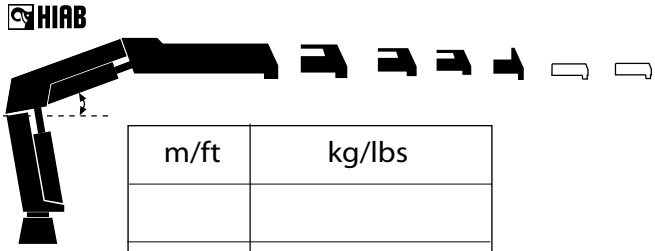
This symbol identifies the parts of your crane that need to be disposed of separately from household waste according to EU legislation. When one of this part reaches the end of its life, take it to a collection site designated by local authorities. Responsible collection and recycling helps protect natural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



10. Technical Data

10.1. Load plate table

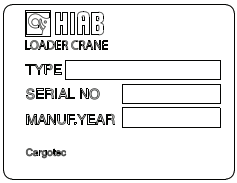
When the crane has VSL [option], the Installer should fill in the valid meters (**m**) or feet (**ft**) and kilos (**kg**) or pounds (**lb**) in this table, following instructions given in the Installation instructions.



m/ft	kg/lbs

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: .....

10.3. Abbreviations

- ADC - ('Automatic Duty Control') - Automatic Duty Control
- ADO - ('Automatic Dumping of Oil') - Automatic Dumping of Oil
- APO - ('Automatic Power Off') - Automatic Power Off
- ASC - ('Automatic Speed Control') - Automatic Speed Control
- BDA - ('Boom Deployment Assistant') - Boom Deployment Assistant
- CTC - ('Crane Tip Control') - Crane Tip Control
- DA modules - ('Digital Amplifier Modules') - Digital Amplifier Modules
- HDC - ('Hoist Dual Capacity') - Hoist Dual Capacity
- JDC - ('Jib Dual Capacity') - Jib Dual Capacity
- LSS-H - ('Load Stabilising System-Horizontal') - Load Stabilising System-Horizontal
- LSS-V - ('Load Stabilising System-Vertical') - Load Stabilising System-Vertical
- MEWP - ('Mobile Elevating Work Platform') - Mobile Elevating Work Platform
- MSC - ('Manual Speed Control') - Manual Speed Control
- MUX - ('Multiplexer Box') - Multiplexer Box
- OLP - ('Overload Protection') - Overload Protection
- OPS - ('Operator Protection System') - Operator Protection System
- PFD - ('Pump Flow Distribution') - Pump Flow Distribution
- PSB - ('Power Supply Box') - Power Supply Box
- SAF - ('Semi Automatic Folding') - Semi Automatic Folding
- SCB - ('Stabiliser Control Box') - Stabiliser Control Box
- SSL - ('Sector Stability Limit') - Sector Stability Limit
- TWI - ('Transport Warning Interface') - Transport Warning Interface
- UI - ('User Interface') - User Interface
- VSL - ('Variable Stability Logic') - Variable Stability Logic
- VSL+ - ('Variable Stability Logic Plus') - Variable Stability Logic Plus

10.4. Daily inspection checklist to photocopy

Operator:		**Document ID:**	
Crane s/n:		**Date:**	

	OK	No OK*	N/A	Comments
1. VISUAL INSPECTION				
1.1 Presence of signs and symbols				
1.2 Locking devices				
1.3 Shafts, shaft lockings, bearings and bushings				
1.4 Crane structure				
1.5 Hooks				
1.6 Add-on equipment and separate lifting accessories				
1.7 Electronic components				
1.8 Security seal wires				
1.9 Oil level in the slewing housing				
1.10 Oil level in the slewing motors				
1.11 Oil level in the tank				
1.12 Filters				
2. FUNCTIONAL TESTS				
2.1 Stop buttons				
2.2 Levers				
2.3 Controller				
2.4 LED test				
2.5 Hydraulic system				

*** If you find a fault that prevents you to operate the crane safely, contact to a Hiab authorized service workshop. Do not try to repair the fault, it can cause you injury or you can damage the equipment.**