

en

Operator's manual

Pipe layer

Document ID

	ORIGINAL OPERATOR'S MANUAL
Order number:	93517379
Issued:	01.08.2018
Version:	01
Author:	LWT / Technical Documentation Department

Product ID

Manufacturer:	Liebherr-Werk Telfs GmbH
Type:	RL 56 3A
Type no.:	1632
From Serial no.:	15619

Contact

Liebherr-Werk Telfs GmbH
Hans Liebherr-Straße 35
A – 6410 Telfs

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

- Thank you very much for reading the preview of the manual.
- You can download the complete manual from: www.heydownloads.com by clicking the link below



- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

5.5.3	Turn the electrical system off	270
5.6	Overall machine	271
5.6.1	Lubricating the working attachment	271
5.6.2	Checking the window wiper	271
5.7	Diesel engine	273
5.7.1	Check the engine oil level	273
5.7.2	Diesel engine: Check the arrangement and belly pans for contamination and clean	274
5.8	Cooling system	275
5.8.1	Check the coolant level	275
5.8.2	Cleaning the cooling system	277
5.9	Fuel system	279
5.9.1	Notes for work on the fuel system	279
5.9.2	Fuel preliminary filter: Drain the condensation	279
5.9.3	Fuel tank: draining condensation and sediments	280
5.9.4	Emptying and cleaning the fuel tank	281
5.10	Air filter system	285
5.10.1	Replacing the air filter	285
5.10.2	Clean the dust discharge valve	287
5.11	Hydraulic system	289
5.11.1	Checking oil level in the hydraulic tank and topping up oil	289
5.12	Splitterbox	293
5.12.1	Splitterbox: Check the oil level	293
5.13	Electrical system	294
5.13.1	Check the display unit and lighting	294
5.14	Heater, ventilation, air conditioning system	295
5.14.1	Check the air conditioning system	295
5.14.2	Checking condenser for contamination and clean it, if necessary	295
5.15	Drive gear	296
5.15.1	Check condition of travel gear	296
5.15.2	Checking the oil level in the duo cone (slip ring) area	296
5.16	Track components	298
5.16.1	Checking the nuts and bolts of the travel gear components are firmly seated	298
5.16.2	Checking track tension and adjusting, if necessary	299
5.17	Working attachment	304

Undercarriage

Design	Track frame, rigid
Mounting	Elastic components at a separate pivot
Track chains	Lubricated, single-grouser shoes, tensioning via steel spring and grease tensioner
Links, each side	45
Track rollers, each side	9
Carrier rollers, each side	2
Sprocket segments, each side	5
Track shoes	914 mm/36"

Sound Levels

Operator sound exposure ISO 6396	
L _{PA} (in the cab)	78 dB(A)
Exterior sound pressure 2000/14/EC	
L _{WA} (to the environment)	108 dB(A)

Refill Capacities

Fuel tank	505 l/ 133.3 gal
Cooling system	60 l/ 15.08 gal
Engine oil with filter	43 l/ 11.4 gal
Splitter box	8.5 l/ 2.2 gal
Hydraulic tank	112 l/ 29.6 gal
Final drive, each side	19.5 l/ 5.1 gal

Hydraulic Winch

Hoist winch	Variable flow hydraulic pump
Safety brake	Spring-loaded disk brake holds the load safely in any position
Drum diameter	254 mm/10"
Drum length	274 mm/10.79"
Flange diameter	610 mm/24.02"
Cable diameter	20 mm/0.8"
Cable length	80 m/87.49 yd
Hook block	3 sheaves
Hook speed (up, down)	0 – 20.0 m/min/0 – 66 ft/min
Security	Free fall device

Dawbar Pull

Max.	387 kN
at 1.5 km/h/0.9 mph	387 kN
at 3.0 km/h/1.9 mph	216 kN
at 6.0 km/h/3.7 mph	108 kN
at 9.0 km/h/5.6 mph	72 kN

Metric standard thread and fine thread				Metric standard thread and fine thread			
At least one element of the screwed connection (screws, washers, nuts, ...) with following surface: flZn = zinc coating (LH standard 10021432, LH standard 10215295 flZnnc-480h-L valid ≥M6)				All elements of the screwed connection (screws, washers, nuts, ...) with following surface: black oxide or phosphated zinc plated (LH standard 10215295 Fe//ZnNi(12)5//Cn//T2)			
Minimum total coefficient of friction $\mu_G = 0.09$				Minimum total coefficient of friction $\mu_G = 0.11$			
Thread	Grade	Assembly prestressing forces F_M in kN	Tightening torques M_A in Nm	Thread	Grade	Assembly prestressing forces F_M in kN	Tightening torques M_A in Nm
				M 4	8.8	4.5	2.9
					10.9	6.6	4.3
					12.9	7.7	5.0
				M 5	8.8	7.3	5.7
					10.9	10.7	8.4
					12.9	12.5	9.8
M 6	8.8	10.6	8.6*	M 6	8.8	10.3	9.9
	10.9	15.5	12.6*		10.9	15.2	14.5
	12.9	18.2	14.7*		12.9	17.7	16.9
M 7	8.8	15.3	13.9*	M 7	8.8	15.0	16.1
	10.9	22.5	20.4*		10.9	22.0	23.6
	12.9	26	23.9*		12.9	26	28
M 8	8.8	19.3	20.6*	M 8	8.8	18.9	23.8
	10.9	28	30*		10.9	28	35
	12.9	33	35*		12.9	32	41
M 8 x 1	8.8	21.0	21.7*	M 8 x 1	8.8	20.5	25
	10.9	31	32*		10.9	30	37
	12.9	36	37*		12.9	35	43
M 9 x 1	8.8	27	31*	M 9 x 1	8.8	27	36
	10.9	40	46*		10.9	39	53
	12.9	47	53*		12.9	46	62
M 10	8.8	31	40	M 10	8.8	30	47
	10.9	45	59		10.9	44	68
	12.9	53	69		12.9	52	80
M 10 x 1	8.8	35	44	M 10 x 1	8.8	34	51
	10.9	51	64		10.9	50	75
	12.9	60	75		12.9	59	88
M 10 x 1.25	8.8	33	42	M 10 x 1.25	8.8	32	49
	10.9	48	62		10.9	47	72
	12.9	56	72		12.9	55	84

LWT093517379/01/01_08.2018/en

Engine standstill sign

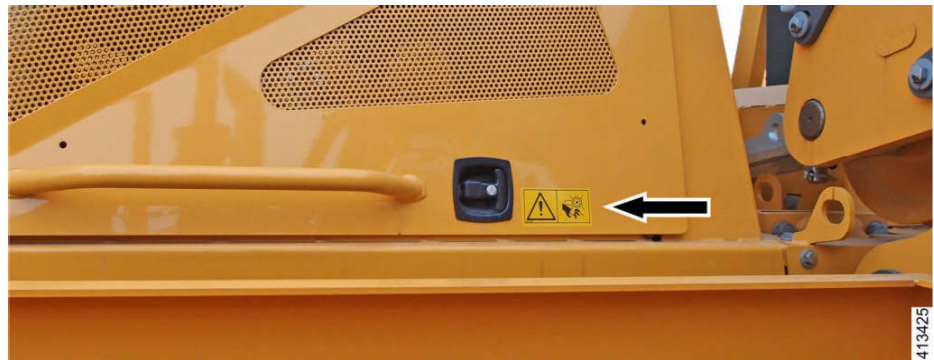


Fig. 13: Engine standstill sign

The sign is located on left and right-hand side on the engine compartment doors and at front and back on the fan.

Warns of risk of accidents potentially resulting in very severe injuries.

Meaning: **Open only if the diesel engine is not running!**

Operator's platform tilt device sign



Fig. 14: Operator's platform tilt device sign

The sign is located inside in the oil reservoir duo cone / slipping area.

Warns of risk of accidents potentially resulting in death or very severe injuries.

Meaning: **Do not stand under the tilted operator's platform unless the safety support bar is in place. When operator's platform is tilted, the machine must not be started or driven. Put parking switch in park position beforehand.**

Lubrication chart

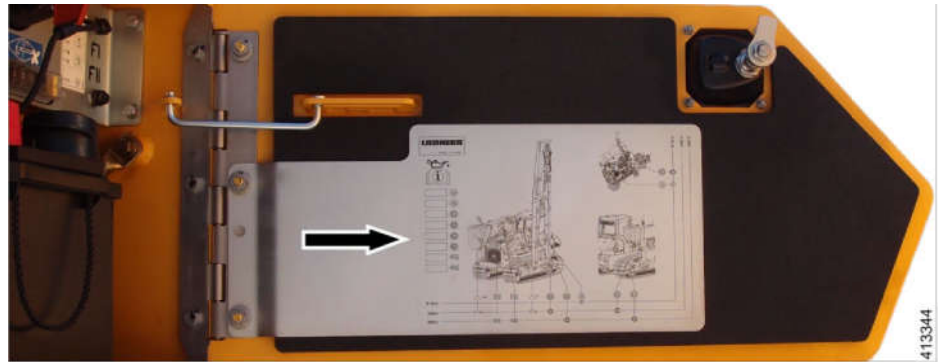


Fig. 32: Lubrication chart

The lubrication chart is located in the battery compartment.

The lubrication chart shows all parts that are filled with oil and grease, along with their inspection and replacement intervals.

Battery main switch sign

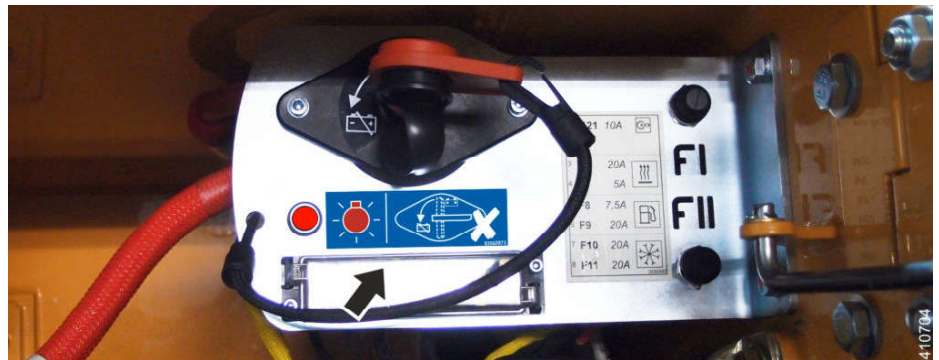


Fig. 33: Battery main switch sign

The sign is located on the battery main switch console.

Emergency exit sign

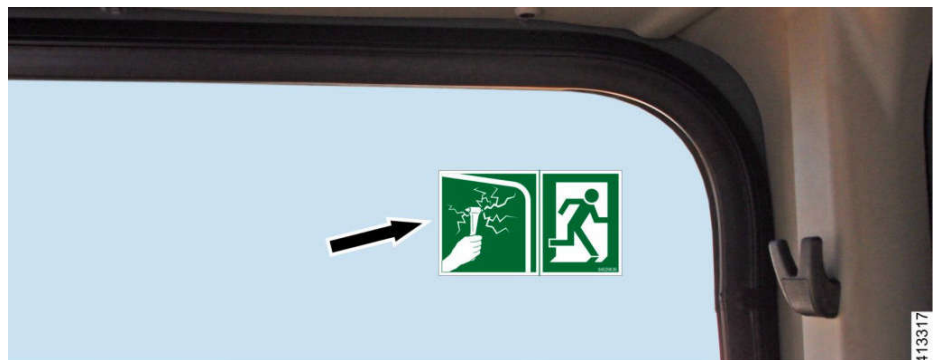


Fig. 34: Emergency exit sign

10. The operator must guide the loads as close as possible above the ground and avoid swinging.
11. The machine may only be driven with a raised load if the route is level.
12. Shock loads or sudden dropping of the load must be avoided. In this case, load strains could occur which would exceed the nominal capacity, which in turn could impair the equipment.
13. A worn or damaged winch rope must always be replaced with a new rope.
14. Use only tackle specifically tested and approved for the lifting application.
15. Lower the hook block to the ground or attach it safely before servicing, adjusting or repairing the winch.
16. Do not rip stuck loads loose with the machine, even if the weight of the stuck load does not exceed the permissible load carrying capacity.

2.4.8 Working in the vicinity of electrical overhead lines

1. When working with earthmoving equipment near electrical overhead lines and overhead contact lines, a safety distance depending on the nominal voltage of the overhead lines between them and the earthmoving machine and its working equipment must be observed to avoid current transfer. This also applies for the distance between lines and accessory equipment as well as attached loads.
2. When approaching electrical overhead wires, consider all working movements of the earthmoving machine, such as boom position, oscillation of ropes and dimensions of attached loads. Also observe ground unevenness, which can incline the earthmoving machine and therefore move it closer to the overhead wires.
3. In case of wind, overhead wires as well as working equipment can swing out and thereby reduce the distance.
4. If a sufficient distance from electrical overhead wires and contact wires cannot be retained, then the operator must carry out other safety measures in consultation with the owner or operator of the lines to avoid current transfer. Other safety measures against current transfer can include the following:
 - Turning the current off,
 - Rerouting the overhead wires,
 - Cabling,
 - Limitation of working range of earthmoving machines.
5. In case of a current transfer, the machine operator must try to move the earthmoving machine from the electric danger zone by lifting or lowering the working equipment, by driving or swinging out. If this is not possible, the following rules apply for the machine operator:
 - Do not leave the operator's platform;
 - Warn people in the vicinity not to approach or touch the machine;
 - Have the power turned off!

The following safety distances must be adhered to:

Nominal voltage	Safety distance
to 1000 V	1.0 m
above 1 kV to 110 kV	3.0 m
above 110 kV to 220 kV	4.0 m
above 200 kV to 380 kV	5.0 m
in case of unknown nominal voltage	5.0 m

Tab. 10

9. As a rule, always work with a guide for tasks with limited visibility or defective visual aids. Agree on hand signals, for difficult tasks use additional voice contact (for example via radio).
10. Use lights in bad visibility conditions and according to the valid regulations.
11. Restriction and securing of work area.
12. Observation of safety instructions.

2.4.22 Safety notes for working on the Common Rail System of Diesel engines

1. When the Diesel engine is running, the fuel lines are constantly under fuel pressure of up to 2200 bar.
 - When the Diesel engine is running, never release the fittings for the fuel high pressure side on the Common Rail System.
2. Fuel emerging under pressure can penetrate the skin and cause severe injuries. There is a danger of fires due to the fuel mist.
3. After stopping the Diesel engine, wait at least one minute until the pressure in the fuel lines has been relieved.
4. Avoid staying near the running Diesel engine.
5. Personnel with a pacemaker may not approach the running Diesel engine closer than 20 cm.
6. Do not touch energized parts on the electrical connection of the injectors when the Diesel engine is running.
7. Modern components of the Diesel injection consist of highly precise parts, which are subjected to extreme loads. Due to this high precision technology, ensure utmost cleanliness for all work on the fuel system. Dirt particles above 0.2 mm can already cause failure of components.
8. Before starting to work, **stringently** observe the following described measures:
 - Before working on the clean side of the fuel system, clean the Diesel engine and the Diesel engine compartment (steam jets), the fuel system must hereby remain closed.
 - Carry out a visual inspection for leaks or damage on the fuel system.
 - Do not spray directly on electrical parts with the steam jet, cover them first.
 - Bring the Diesel engine into a clean area in the workshop, where no work is carried out which can disperse dust (grinding, welding work, brake repairs, brake and performance tests, etc.).
 - Avoid air movements (possible dispersing dust caused by starting Diesel engines, the workshop ventilation or heaters, drafts, etc.).
 - Clean and dry the area of the still closed fuel system with pressurized air.
 - Remove loose dust particles, such as paint chips and insulation material with a suitable suction device (industrial vacuum cleaner).
 - Cover areas of the Diesel engine compartment, from which dirt particles could be released, with a new and clean protective sheeting.
 - Clean tools and work equipment before starting to work.
 - Use only tools, which are not damaged (cracked chrome coating).
 - Before starting disassembly work, wash your hands and put on clean work clothing.
9. While working, **stringently** observe the following described measures:
 - After opening the clean side of the fuel system, do not use pressurized air for cleaning.
 - Remove loose dirt during the installation work with a suitable suction device (industrial vacuum cleaner).
 - Use only lint-free cleaning cloths on the fuel system.
 - When removing and installing components, do not use materials such as rags, cartons or wood, since they could secrete particles and fibers.

16 Hoist limit switch button



Fig. 74: Hoist limit control



For lifting the hook block when the hoist limit switch is activated.

If hook block is raised too far, it is turned off by actuation of hoist limit switch. If the hook block must be raised further for installation and removal, press button 16.

NOTICE

Danger of damaging machine!

If the hook block is raised when hoist limit switch button is pressed, then the working attachment (winch, hook block, boom) can be damaged.

- Lift hook block carefully. As soon as the hook blocks are touching, stop the hoist procedure immediately.

17 Bypass overload warning device button



Fig. 76: Bypass overload warning device button

If overload warning device is not installed, press the bypass switch so that the working attachment functions.

20 Time bar for diesel engine rpm limitation



- Display if diesel engine rpm limitation is active. The display for the diesel engine rpm also flashes.
After the display turns off, the diesel engine rpm can be changed.

21 Automatic speed reduction⁷⁾ (option)



- Symbol lights up:
Display if automatic speed reduction is activated.
- Symbol flashes:
Display if diesel engine speed is reduced due to automatic speed reduction.

22 Open buckle (option)



- Display when buckle is open.
Goes off when buckle is closed.

Display - warning symbols

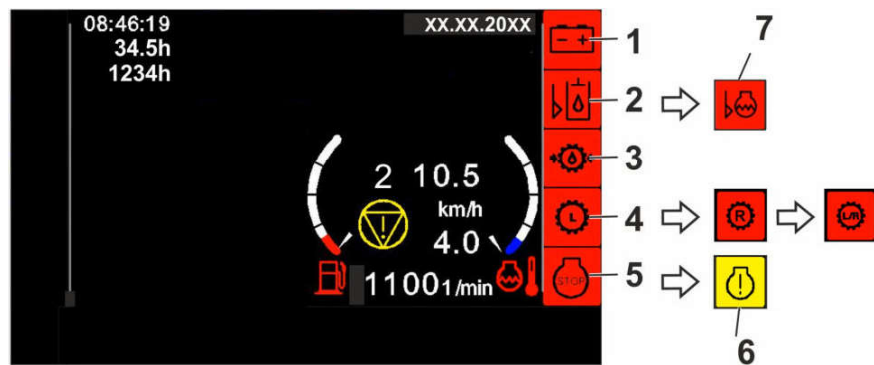
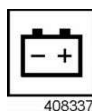


Fig. 117: Display - warning symbols

- | | | | |
|---|---|---|-----------------------|
| 1 | Battery charge - charge monitoring | 5 | Diesel engine stop |
| 2 | Hydraulic oil level | 6 | Diesel engine problem |
| 3 | Supply pressure | 7 | Coolant level |
| 4 | Travel gearbox - temperature monitoring | | |

1 Battery charge - charge monitoring

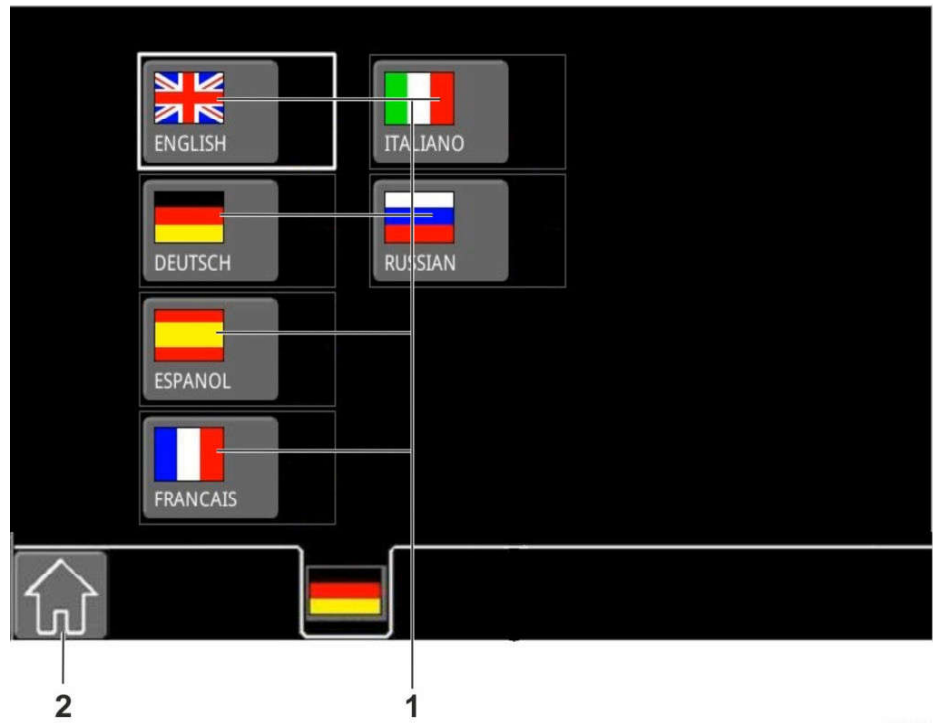


Goes out once the diesel engine has started up.

- Display, for example, if the V-belt is broken.
If the display lights up, turn the diesel engine off and remedy the problem.

⁷⁾ Except for RL46/RL56/RL66

Setting language

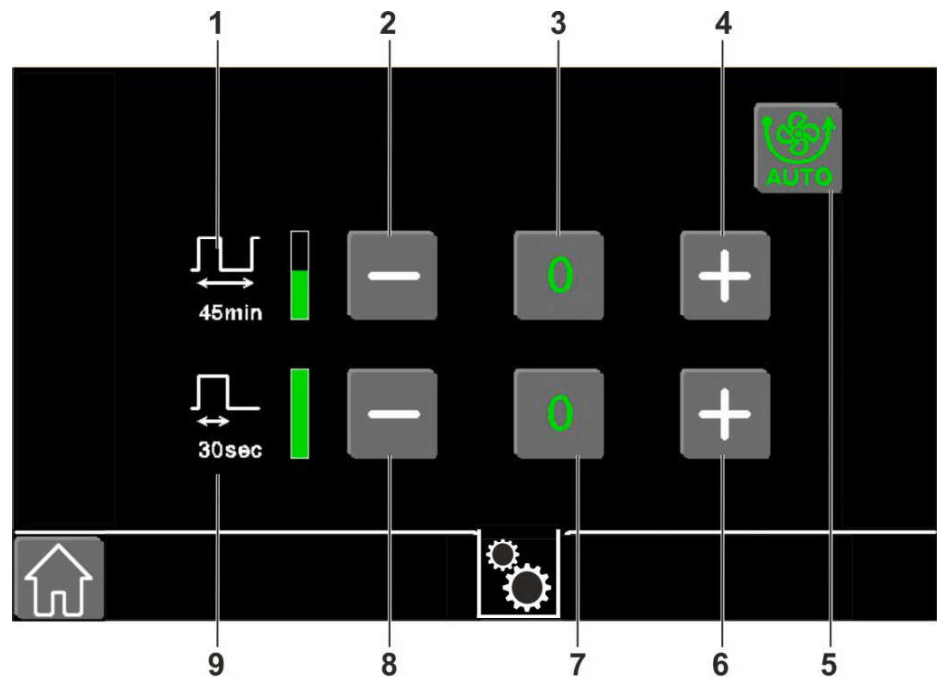


408309

Fig. 147: Set the display language

- 1 Language selection 2 Main menu symbol
- Select the desired language via symbol 1.
 - Leave the menu via the main menu 2 symbol.

Setting reversible fan (option)



410530

Fig. 157: Setting reversible fan

- | | | | |
|---|---|---|-------------------------|
| 1 | Reverse interval | 6 | Reverse duration long |
| 2 | Reverse interval short | 7 | Reverse duration medium |
| 3 | Reverse interval medium | 8 | Reverse duration short |
| 4 | Reverse interval long | 9 | Reverse duration |
| 5 | Turn automatic reverse operating on and off | | |

The reverse interval can be shorted by 10 minutes or extended by 15 minutes.

The reverse duration can be shorted by 10 seconds or extended by 15 seconds.

– Set reverse interval and reverse duration.

By turning the reversible fan off via symbol **5**, the reversible fan and the button in the cab are deactivated.

- ▷ Machine's electrical system is supplied with voltage.

Turning off battery main switch

NOTICE

Turning off of the power supply impermissibly!
Damage to the machine.

- ▶ Do not switch off the battery main switch until the indicator light has gone out.

Ensure that following requirements are met:

- Auxiliary heater ¹⁴⁾ is deactivated.

If the indicator light 1 has gone out:

- ▶ Set the battery main switch 3 to **OFF**.
 - ▷ Machine's electrical system is de-energised.

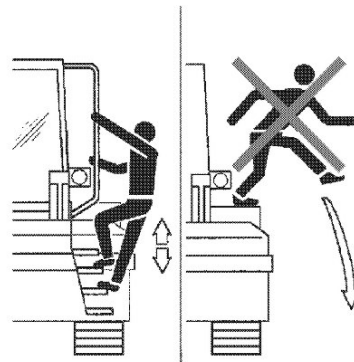
3.2.2 Entry

Enter and leave the machine using the ascending aids provided.

Clean the steps and tracks before access and check them for proper condition.

Enter and leave the operator's cab through the left-hand operator's cab door.

Familiarize yourself with the emergency exit on the right-hand side. See section "Emergency exit".



403132

Fig. 171: Entering and leaving the operator's cab



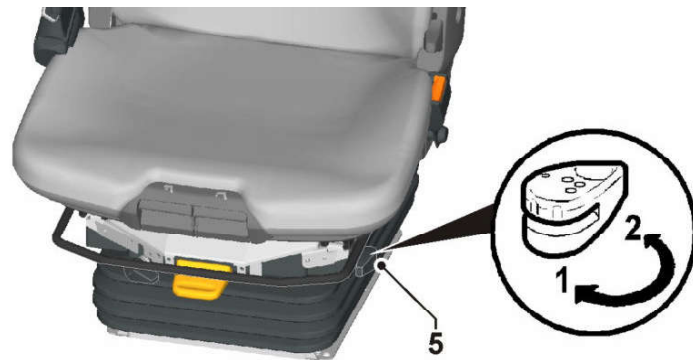
WARNING

Unsafely entering and leaving machine!
Falling.

- ▶ Exclusively enter and leave machine using access aids.
 - ▶ Do not use control elements as handles.
 - ▶ Never jump off machine.
-
- ▶ Enter and leave machine using ascending aids provided.

¹⁴⁾ Option

Adjusting the horizontal suspension



408375

Fig. 190: Adjusting the horizontal suspension

5 Horizontal suspension lever

Impact loads in travel direction can be absorbed better through the horizontal suspension.

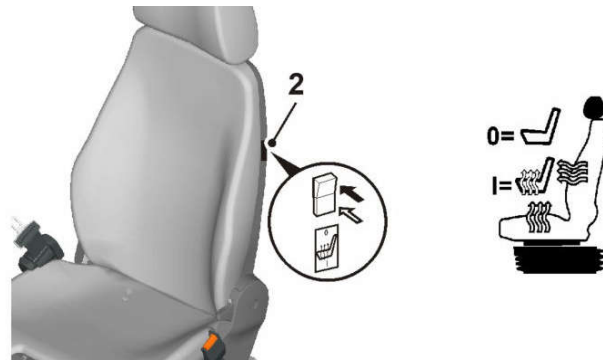
- Horizontal suspension OFF 1 position
- Horizontal suspension ON 2 position

- ▶ To turn the horizontal suspension on or off.
 - ▷ After turning the horizontal suspension off, the locking lever must engage in the desired position.

To turn the horizontal suspension off:

- ▶ Push the operator's seat back until you can hear it engage.
 - ▷ After it is locked, the operator's seat cannot be moved in any other position.

Seat heater



408372

Fig. 191: Seat heater

2 Seat heater switch

- ▶ Turn the seat heater on or off.
 - ▷ Position 0: Seat heater switched off
 - ▷ Position 1: Seat heater switched on

3.2.7 Premium operator's seat (option)

The ergonomically designed operator's seat provides a high level of seat comfort.

- a Lower air chamber
- c Lateral support
- ▶ Set the curvature of the backrest cushion by pressing the switch 4.

Adjusting the horizontal suspension



Fig. 208: Adjusting the horizontal suspension

5 Horizontal suspension lever

- ▶ Pull the lever 5 up.
 - ▷ Horizontal suspension ON
- ▶ Push the lever 5 down.
 - ▷ Horizontal suspension OFF

Adjusting the shock absorber



Fig. 209: Adjusting the shock absorber

6 Shock absorption lever

- ▶ Pull the lever 6 up.
 - ▷ Minimum damper force
- ▶ Push the lever 6 down.
 - ▷ Maximum damper force

410816

410813



Fig. 227: Full power

- ▶ Switch on air conditioning using main switch for air conditioning.
- ▶ Turn temperature dial 2 in an anticlockwise direction to stop to set lowest outflow temperature.
- ▶ Set the rotary switch for blower 1 to the highest blower stage.
- ▶ Turn the outflow vents away from the windows.

Dehumidifying the operator's cab

On cool humid days, the air conditioning unit can be used to dehumidify the operator's cab.

- ▶ Turn the air conditioning unit on along with the heating.
 - ▷ The operator's cab windows will not fog up.

3.2.13 Interior light of the operator's cab and reading light

The interior light of the cab and the reading light are located in the roof of the operator's cab.

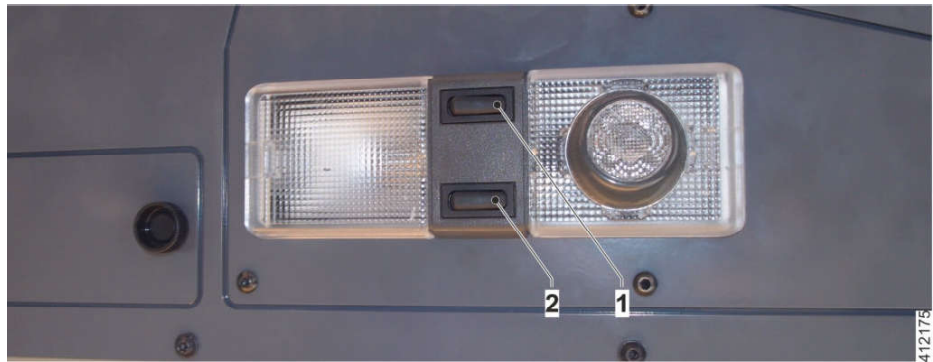


Fig. 228: Interior light of the operator's cab and reading light

- ▶ To switch the interior lighting on or off, actuate switch 1.
- ▶ To switch the reading light on or off, actuate switch 2.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

- Thank you very much for reading the preview of the manual.
- You can download the complete manual from: www.heydownloads.com by clicking the link below



- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

Closing service doors, service flaps and service hoods

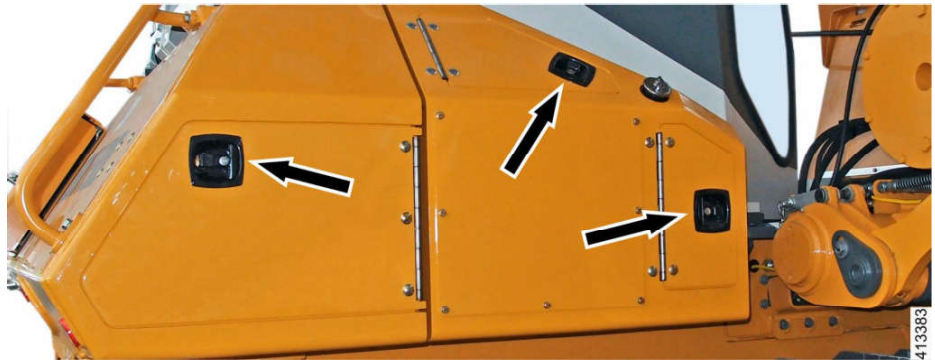


Fig. 243: Closing service doors, service flaps and service hoods

- ▶ Close all service doors, service flaps and service hoods.

Folding up ascending aid

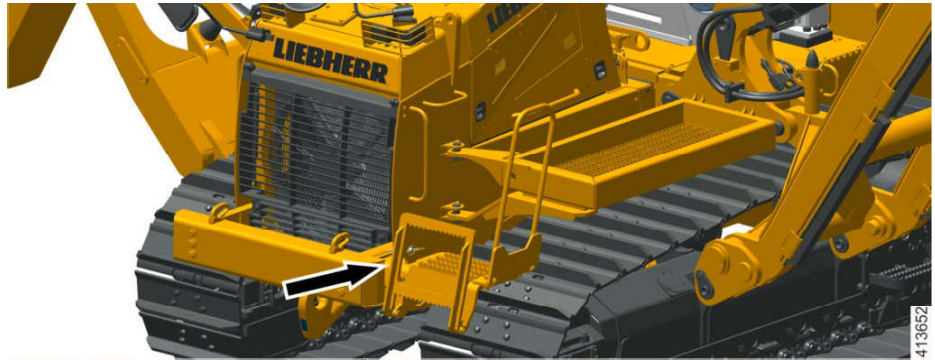


Fig. 244: Folding up ascending aid

- ▶ Fold up ascending aid on front left of machine and secure it with pins and a cotter pin.

Checking the lighting systems



Fig. 245: Headlight adjustment

- ▶ Check the lighting systems.

NOTICE

Risk of damaging diesel engine!

If the diesel engine is subjected to a full load when cold, it may be damaged.

- ▶ Let the diesel engine warm up.

- ▶ After starting procedure, leave engine speed controller at idling speed and wait until diesel engine is warm before subjecting it to a full load.

Carrying out starting procedure

Starting phase of control units

With the ignition key in contact position, the starting phase for all control units begins.



Fig. 263: Starting switch - Contact position

- ▶ Set starting switch to contact position.
 - ▷ The control units are started.



Fig. 264: Warning buzzer

- ▷ The warning buzzer **1** sounds.
- ▷ The display unit is started.

Reverse travel



Fig. 280: Reverse travel

- ▶ Move travel joystick slowly backward.
 - ▷ Machine drives backward.
 - ▷ Travel joystick remains in deflected position.
 - ▷ The further the travel joystick is moved backward, the higher the travel speed.

Steering

In addition to driving forward and backward, any desired steering movement with variable speeds is possible.

Turning left

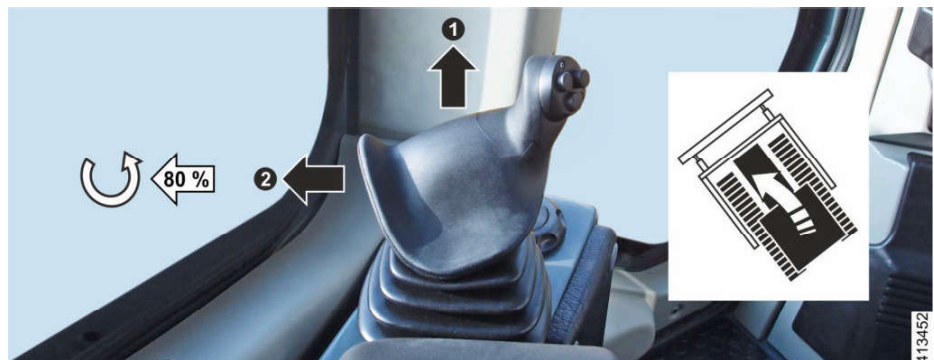


Fig. 281: Turning left

- ▶ Move travel joystick forward and push it left at the same time.
 - ▷ Machine drives forward in a slight left hand curve.
 - ▷ Both tracks turn forward.
- ▶ To drive in a tighter curve: move travel joystick further left.

If the travel joystick is deflected by 80%, then the track on the inside of curve stops, the track on the outside of track turns in the preselected speed. From 80% deflection on, the track on the inside of curve turns in the opposite direction to the track on the outside of curve. The further the travel joystick is deflected, the faster the track on the inside of the curve will turn in the opposite direction. The machine counter rotates.

- ▶ To turn on the spot: deflect the travel joystick more than 80 %.

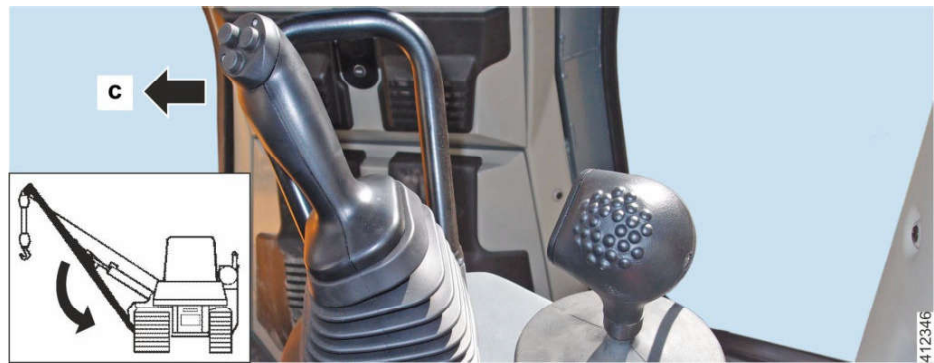


Fig. 298: Lower the boom

- ▶ Push the boom control lever to the left in direction **-c-**.
 - ▷ The boom is lowered.

The uppermost position of the hook block is secured by a limit switch. By lowering the boom, the hook block is raised and the limit switch can be triggered.

The working operation can be continued by lowering the hook block.

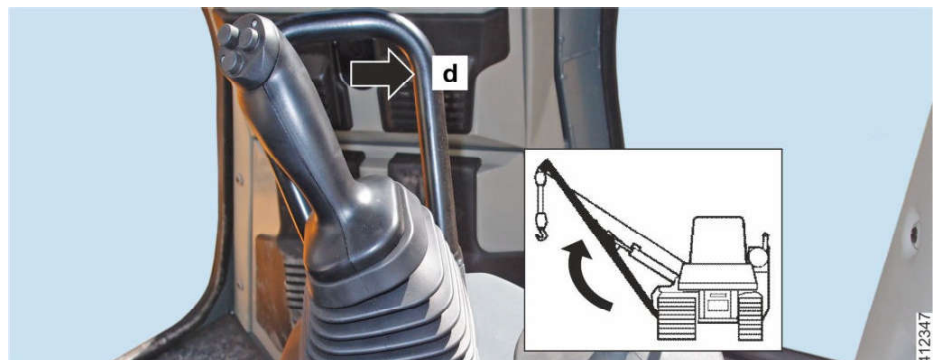


Fig. 299: Raise the boom

- ▶ Push the boom control lever to the right in direction **-d-**.
 - ▷ The boom is raised.

Warm up procedure for hoist winch



WARNING

Low oil temperature of hoist winch!

If the oil temperature is too low, it can lead to temporary brake slippage, which causes a raised load to suddenly drop.

- ▶ Allow the winch to warm up before operation. Especially in low ambient temperatures. Otherwise, temporary brake slippage can occur due to high return pressures.

Allowing the hoist winch to warm up before every operation is recommended, but especially at temperatures below 4°C.

- ▶ Allowing the winch warm up: run the winch at low speed and lift and lower it several times without a load on the hook to allow the warm hydraulic oil to distribute in the lines and to circulate the gear lube oil through the planetary gears.

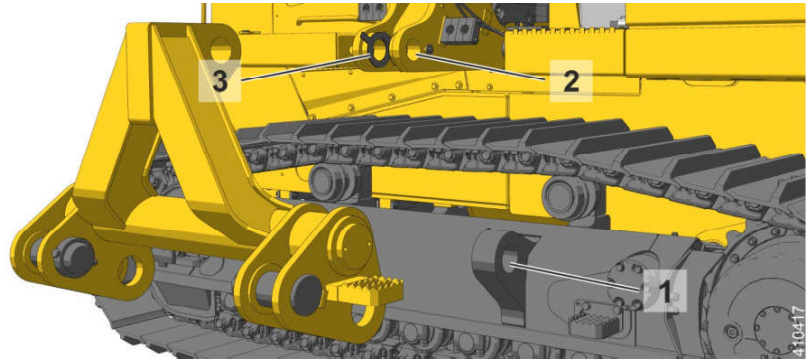


Fig. 315: Installing the frame

- ▶ Lift the frame with a suitable lifting device and install on the machine with pins 1 first on the travel gear, then with pins 2 and spacers 3 on the machine.
- ▶ Secure the pins with washers and screws.

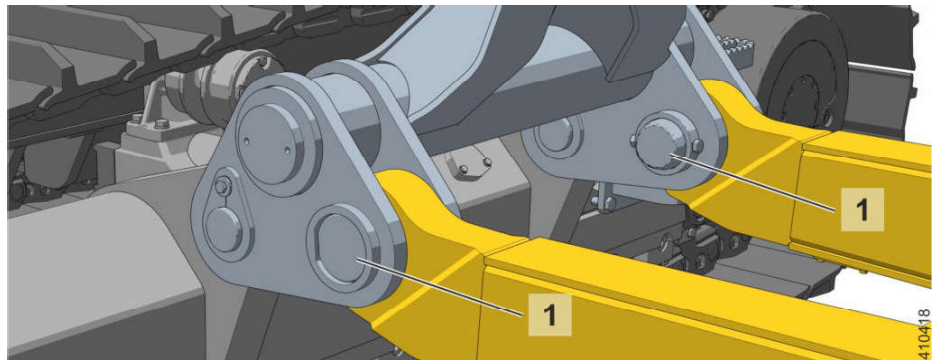


Fig. 316: Installing the boom

- ▶ Lift the boom with suitable lifting gear on the attachment points and install on the machine with pins 1.
- ▶ Secure the pin with a ring and retaining screw.
- ▶ Lower the boom to the ground.

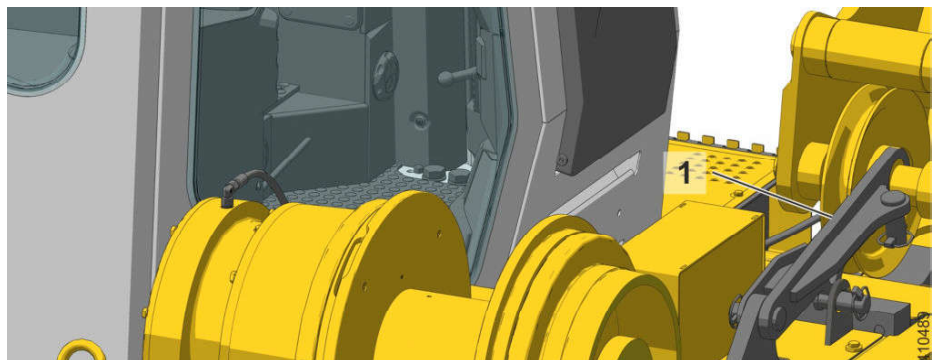


Fig. 317: Transport retainer on the changeover pulley

- ▶ Remove the transport retainer 1 on the changeover pulley.

**DANGER**

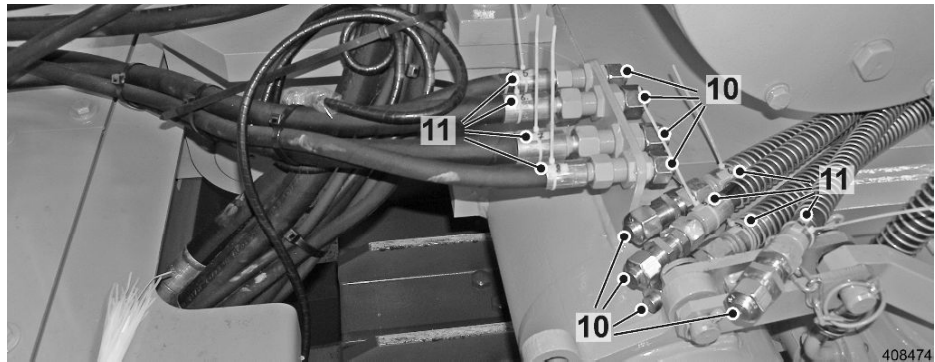
Danger of injury due to leakage of hydraulic fluid under high pressure!

- ▶ Do not start the diesel engine.
- ▶ Relieve the tank pretension.
- ▶ Do not actuate any functions of the working hydraulics.



403281

Fig. 342: Hydraulic pressure



408474

Fig. 343: Hose closures

- ▶ Remove the hose closures 10 from the hydraulic hoses.
- ▶ Connect the hydraulic hoses.

**Note**

- ▶ When connecting the hoses, pay attention to the existing numbers 11 on the hoses.
 - ▶ When removing the attachment, affix numbers to the hydraulic hoses!
 - ▶ When removing the attachment, use the hose closures at hand in the tool box!
-
- ▶ Add the hose closures 10 to the tool box.

8 units	Union nut	16S
8 units	Union nut	15L
8 units	Locking cone	16S
8 units	Locking cone	15L

- ▶ If necessary, remove a part of the working attachment before loading the machine with the crane.
- ▶ Pay attention to the weight and collision dimensions of the machine. For additional information, see section "Technical Data".
- ▶ Pay attention to the load bearing capacity and the length of the slinging gear. For additional information, see section "Technical Data".

Machine without rear working attachment

To load the machine with a crane, the following working attachments are required:

- Crane eyehooks on the rear - available as working attachment. Item code: RL 46 -12408040, RL 56 - 11391622, RL66 - 11393224.
- Suspension device, bar **2**

The machine is equipped on the front with standard eyehooks.

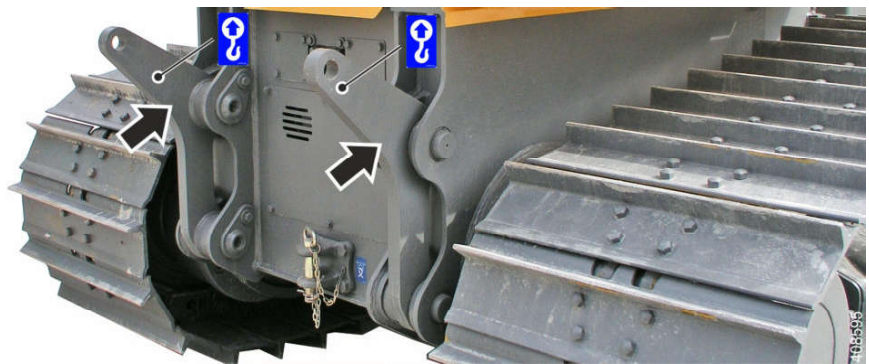


Fig. 365: Crane eyehooks on the rear

- ▶ Install crane eyehooks on the rear.

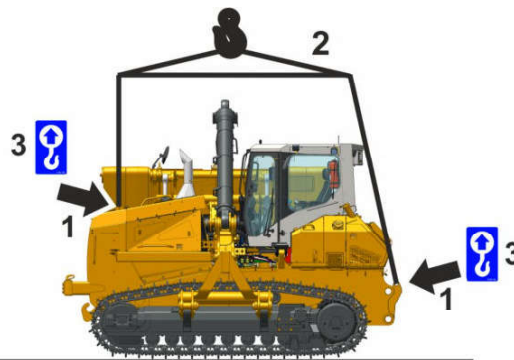


Fig. 366: Lifting points

- | | |
|---------------------------------|-----------------------------|
| 1 Lifting points | 3 Lifting point sign |
| 2 Suspension device, bar | |

- ▶ Install or hang the suspension device, bar **2** on the designated lifting points **1** on the machine.

Connecting the auxiliary battery



WARNING

Danger of accidents due to incorrect or careless procedure when starting with auxiliary batteries!

When connecting auxiliary batteries, increased gas formation can occur on old batteries. This can result in an **explosion**.

- ▶ Avoid open flames and any spark formation in the battery area.
- ▶ Wear safety glasses and protective gloves during the auxiliary jump start procedure.
- ▶ Use only auxiliary start cables with sufficient diameter.

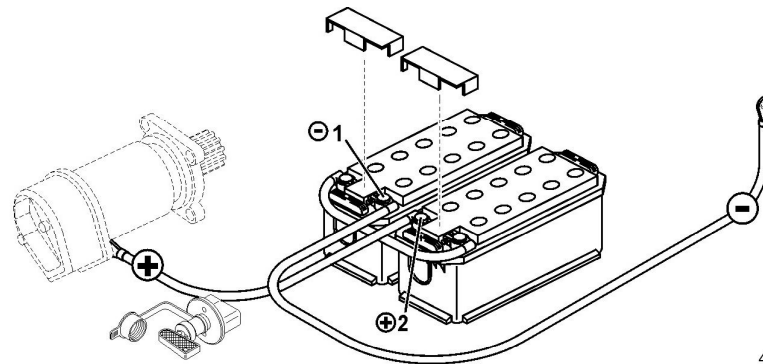


Fig. 382: Starting the machine with auxiliary battery

- | | |
|--|---|
| <p>1 Earthing point of the discharged batteries</p> | <p>2 Positive pole of the discharged batteries</p> |
|--|---|

- ▶ Connect the jumper cable to the positive pole of the discharged battery **2** first and then to the positive pole of the external battery.
- ▶ Connect the second jumper cable to the earthing point of the discharged battery **1** first and then to the negative pole of the external battery.
- ▶ Start diesel engine.

Disconnecting the auxiliary battery

- ▶ Before removing the auxiliary start cable, bring the diesel engine of the machine started with the auxiliary battery to idling speed.
- ▶ Before removing the auxiliary start cable, turn on large electrical users (such as floodlights) on the machine which was started with the auxiliary battery.
- ▶ First remove the jumper cable from the negative pole of the external battery and then from the earthing point of the discharged battery **1**.
- ▶ Then remove the second jumper cable from the positive pole of the external battery and then from the positive pole of the discharged battery **2**.

Fuses in the battery compartment

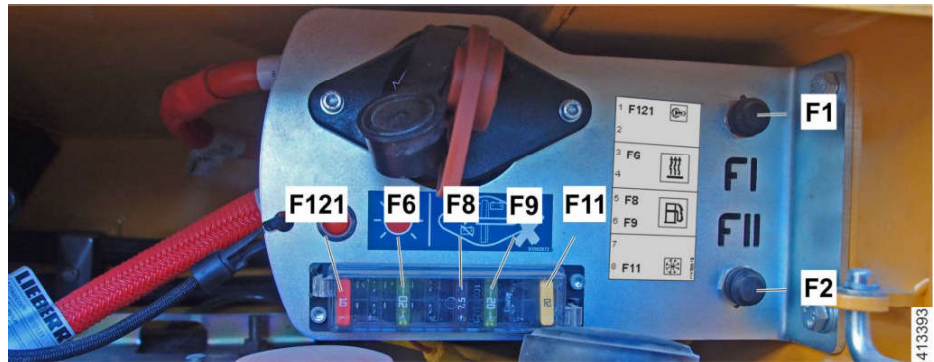


Fig. 386: Fuses in the battery compartment



Note

Before turning the automatic circuit breaker on:

- ▶ Find the cause of the overload first and fix it.
- ▶ To establish machine's power supply: press push button **F1** on battery main switch console.

To change fuses:

- ▶ Find the cause of the overload first and fix it.
- ▶ Open the battery compartment door and remove the fuse cover.
- ▶ Use the following table to identify defective fuses.

Fuse	Value	Unit	Name / Function
F1	45	A	Main fuse
F2	60	A	Intake air preheating
F6	7.5	A	Auxiliary heating ^{A)}
F7	7.5	A	Auxiliary heating ^{A)}
F8	7.5	A	Refuelling pump ^{A)}
F9	20	A	Refuelling pump ^{A)}
F11	20	A	Air conditioning unit condensers
F121	10	A	Starting switch

Tab. 14: Fuses in the battery compartment

A) Option

- ▶ Remove the fuse and check it.
- ▶ Replace the defective fuse with a new fuse (amperage depending on placement).

Customer:..... Machine type:..... Serial no.:..... Operating hours:..... Date:.....

Maintenance / inspection after service hours							Tasks to be performed				
On handover	All 8-10 h	All 50 h	All 500 h	All 1000 h	All 2000 h	Other intervals	Additional labelling	By maintenance staff	By authorised specialist staff	Confirm tasks	See page
								■ Once-only activity ● Repeat interval † If necessary ✱ Annually before the winter Additional labelling ††† Assistance required † Have this task carried out exclusively by a certified electrician	□ Once-only activity ○ Repeat interval ✧ If necessary		
			○	○	○			Clean heating fresh air filter and change it, if necessary (in dust intensive applications, shorten interval)			
								Inspection of air conditioning system by HVAC expert personnel (once a year).			295
						†		Check condenser for contamination and clean it, if necessary			295
			○	○	○			Check drier unit (moisture, fill, condition) - if necessary, renew drier unit, evacuate system and refill			
			○	○	○			Checking the drain valves for the air conditioning and cleaning them if necessary			
						○		Check cable routings and connections			
Drive gear											
	●	●	○	○	○			Check condition of travel gear			296
			○	○	○			Check the oil level and clean the magnetic plug			
			□			○6000h		Change travel gearbox oil and clean the magnetic plug (using oil analysis)			
			□		○			Change travel gearbox oil and clean the magnetic plug (without oil analysis)			
		●	○	○	○			Checking the oil level in the duo cone (slip ring) area			296
			□	○	○			Flush the duo cone (slip ring) area and replace the lube oil in the slip ring area (at least every 4 years)			
				○	○			Travel gearbox: Take oil sample before oil change and send it in for analysis			
Track components											
			○	○	○	■250h		Checking the nuts and bolts of the travel gear components are firmly seated			298
			○	○	○			Check the seals on the carrier rollers, track rollers and idlers			
			○	○	○			Check and adjust the idler guides			
						†		Check track tension and adjust, if necessary			299
						✧		Check track wear			
			□	○	○			Checking the oil fill of the axle bearings			
Working attachment											
			○	○	○			Check the boom equipment			
□			○	○	○			Check oil levels on the hoist winch - two separate oil chambers (at least every 3 months or immediately if a leak is detected)			

LWT193517379/01/01_08.2018/en

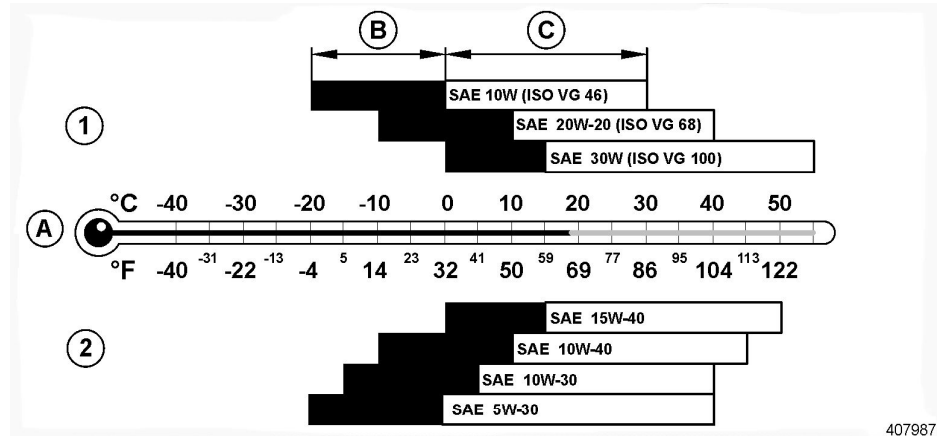


Fig. 397: Engine oil for use as hydraulic oil, temperature dependent selection of viscosity classification ²⁶⁾

- | | | | |
|---|---|---|-------------------|
| A | Ambient temperature | 1 | Single-grade oils |
| B | Cold start range with warm up guideline | 2 | Multi-grade oils |
| C | Operating range | | |

Warm up specification

The black bar **B** marks the ambient temperatures, which are up to 20 °C below the operating range **C**.

If a cold start is made at ambient temperatures within range **B**, the following warm up specification for hydraulic oil applies:

1. After starting, set the Diesel engine to medium rpm (to no more than maximum half of the highest rpm).
2. Carefully actuate the working hydraulic. Actuate the hydraulic cylinder and move it to stop for a short period.
3. After approx. 5 minutes actuate the travel hydraulic too. Total warm up period is approx. 10 minutes.

If the cold start is made at even lower ambient temperatures, the following warm up procedure applies: Warm up the hydraulic tank first before starting the engine. Then start the warm up specification with Pt. 1.

Biodegradable hydraulic oils

NOTICE

Improper mixing of hydraulic oils!

Mixing biodegradable hydraulic oils on ester basis or with mineral oils can cause aggressive reactions. Damage to the hydraulic system will be the result.

- ▶ Do not mix biodegradable hydraulic oils made by various manufacturers and do not mix them with mineral oils.

Liebherr recommends the following hydraulic oils for the machine, depending on the temperature range: **Liebherr Hydraulic Plus** or **Liebherr Hydraulic Plus Arctic**.

²⁶⁾ In case of deviating viscosity classification: Check with Service Dept.

Locations for taking oil samples

Hydraulic system



Fig. 425: Oil sampling location - hydraulic system

- ▶ Take an oil sample with the manual suction pump via the bleeder screw on the hydraulic tank.

or

Take an oil sample when changing the oil from the draining oil flow.

Cooling system



Fig. 426: Coolant oil sampling location



CAUTION

At or near operating temperature, the engine cooling system is hot and under pressure.

Danger of scalding when opening the cooler cap when engine cooling system is hot.

- ▶ Open cap of filler pipe of expansion tank exclusively when engine has cooled off.
- ▶ Open cap of expansion tank exclusively after it is cool enough to touch. Then turn the cover carefully to relieve the pressure.
- ▶ Make sure to avoid skin contact with coolant, observe manufacturer's guidelines.
- ▶ In event of an accidental splash, thoroughly rinse eyes or skin immediately with plenty of water.

5.6 Overall machine

5.6.1 Lubricating the working attachment

Ensure that the following requirements are met:

- The machine is in the maintenance position.
- A suitable access aid is on hand.



WARNING

Work under raised working attachment!

Any person who remains under a raised and unsupported working attachment can be crushed.

- ▶ Before carrying out any maintenance work, lower the working attachment.
- ▶ Turn off the diesel engine and actuate all functions to reduce the pressure in all hydraulic lines.
- ▶ Set the parking switch to the park position.
- ▶ If necessary, properly support the working attachment.

- ▶ Clean the grease nipple and lubricate all lubricating points according to the lubrication chart.

5.6.2 Checking the window wiper

Correcting the window wiper position

The wiper blade must be positioned vertically to the window.

- ▶ To set the windscreen wiper blade vertically: release the lock screw on the windscreen wiper arm and adjust the length of the guide arm.

Changing the windscreen wiper blade

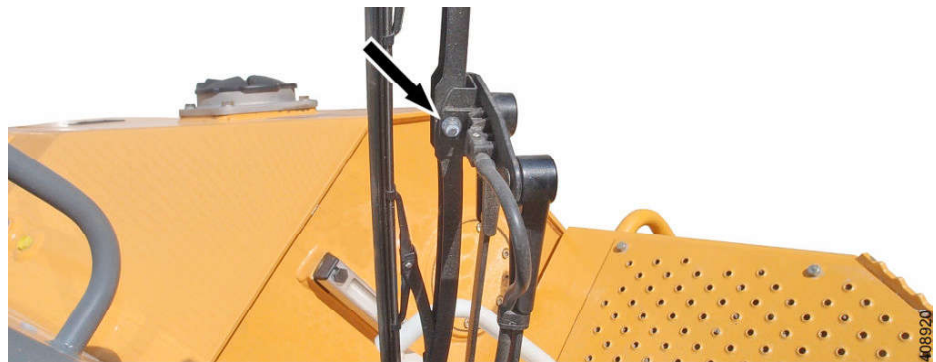


Fig. 438: Windscreen wiper

- ▶ Fold the wiper arm up.
- ▶ Remove the nut on the mounting screw.



Fig. 451: Fuel tank shut-off valve

- ▶ Place a suitable receptacle under the drain hose.
- ▶ Remove lock 3.
- ▶ Open shut-off valve 2 and drain condensation and sediments into a suitable receptacle until clean fuel emerges.
- ▶ Close shut-off valve 2.
- ▶ Attach lock 3.

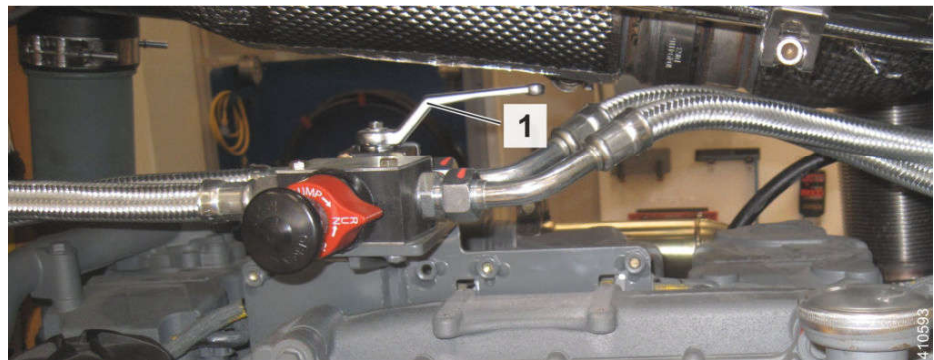


Fig. 452: Fuel system shut-off valve

- ▶ Open shut-off valve for the fuel system 1.

5.9.4 Emptying and cleaning the fuel tank

Emptying the fuel tank

If the filter becomes dirty often, the fuel tank must be emptied and cleaned.

The drain valve is located on the rear of the machine.

The shut-off valve for the fuel system is accessible via the right engine compartment door.

Ensure that following requirements are met:

- The machine is in the maintenance position.
- A sufficiently sized collecting pan is on hand.



Fig. 468: Filter covers

NOTICE

Return filter cover is not unlocked!

Risk of damaging the return filter cover if lock is not unlocked.

▶ Unlock the return filter covers with the key before opening.

- ▶ Unlock the return filter covers with the key.
- ▶ Turn the return filter covers to open.
- ▶ Remove the filter cover with the magnetic rod.



Fig. 469: Magnetic rod

- ▶ Check and clean magnetic rod 3.



Fig. 470: Filling with hydraulic oil

- ▶ Measure the distance between the lower edge of the ruler and the grouser.

The track under operating conditions should have a sag of 30 mm to 40 mm between carrier roller and idler or between carrier roller and sprocket.

NOTICE

The track is tensioned too much.

Excessively tensioned tracks increase dirt build up and wear.

- ▶ Adjust the track tension to the specified sag dimension by taking the operating conditions into account.
-

NOTICE

The track is not tensioned enough!

Tracks which are insufficiently tensioned can jump over and as a result damage the drive train.

- ▶ Adjust the track tension to the specified sag dimension by taking the operating conditions into account.
-

If the distance is larger or smaller:

- ▶ Adjust the track tension as described below.

Tensioning the track

Ensure that following requirements are met:

- The machine is in the maintenance position.
- The manual grease pump is on hand.

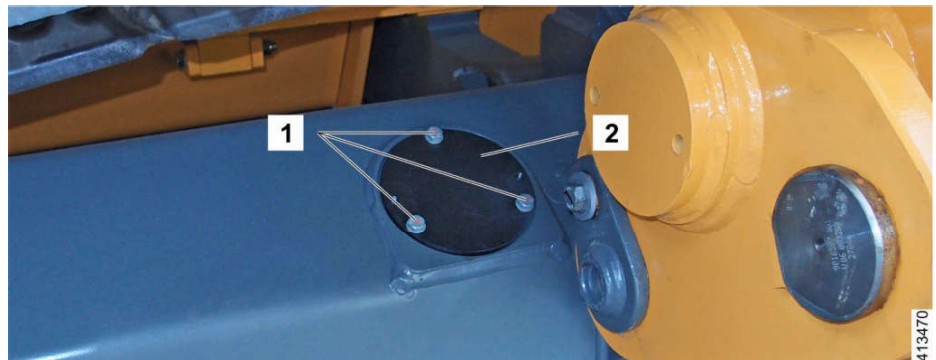


Fig. 480: Cover on the track roller frame

- ▶ Clean cover 2 and the surrounding areas on the track roller frame.
- ▶ Unscrew screw 1 and remove the cover 2.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

- Thank you very much for reading the preview of the manual.
- You can download the complete manual from: www.heydownloads.com by clicking the link below



- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL