en **Operator's manual**

Machine for Industrial Applications

Document ID

ORIGINAL OPERATOR'S MANUAL

Order number: 12221612
Issued: 2018-12-14
Version: 01
Author: LHB / Technical Documentation Department

Product ID

Manufacturer: Liebherr-Hydraulikbagger GmbH
Type: LH 30 C Litronic
Type no.: 1526
From Serial no.: 89795

Conformity: CE

Contact

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LHB/12221612/01/2018-12-14/en

1.1.3 Undercarriage

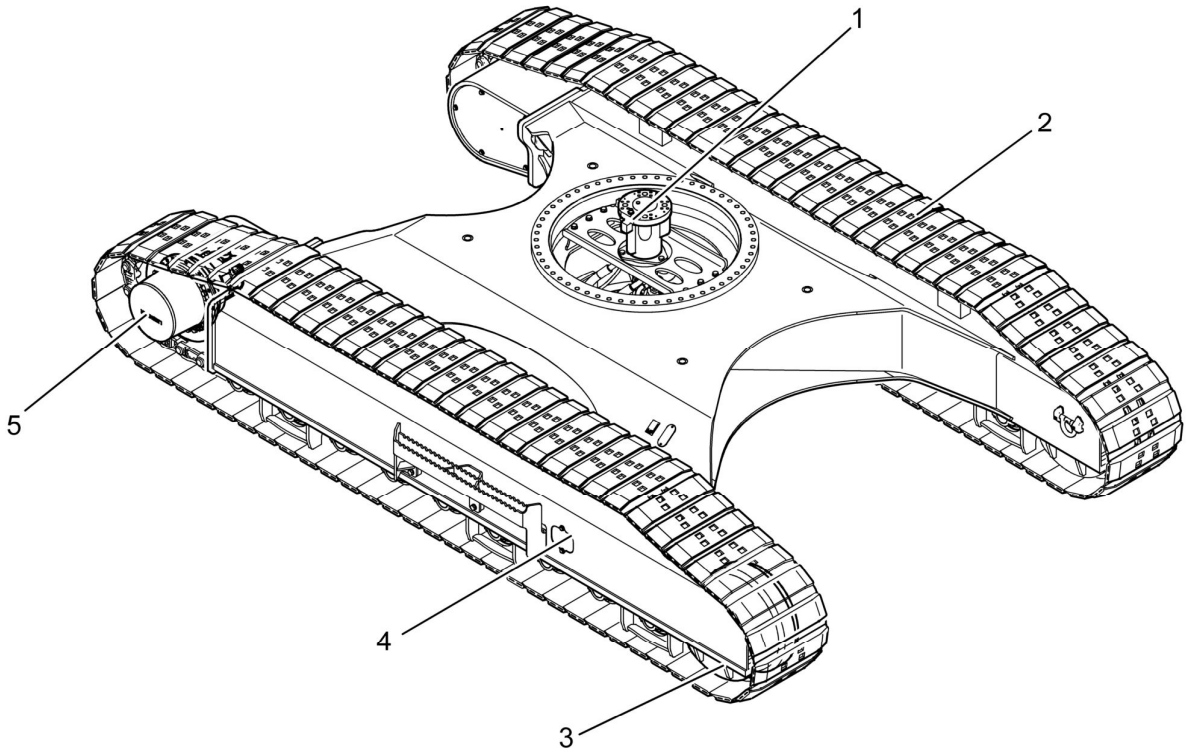

Fig. 4: Undercarriage

1	Rotary connection	**3**	Idler	**5**	Travel gear mechanism with sprocket wheel
2	Track	**4**	Track tensioner		

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Fuel Efficiency

Low Engine Speeds
Compared to the predecessor model, the engine speed has been reduced from 1,800 rpm to 1,700 rpm. The machine's operating point has thus been optimised for outstanding fuel efficiency at maximum handling capacity.

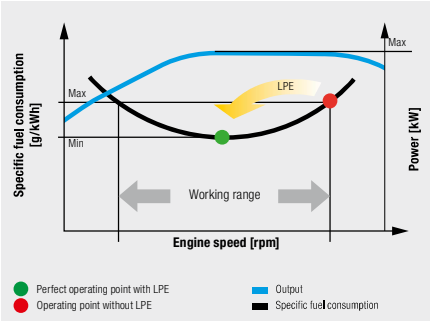
Engine Idling and Engine Shut-down
The standard automatic idling function reduces the engine speed to idle as soon as the operator takes his hand from the joystick so that no hydraulic function is activated. Proximity sensors in the joystick levers restore the original engine speed as soon as the operator's hand is moved towards the lever again. This ensures that the set engine speed is available immediately. The result is a combination of fuel saving and reduced noise levels. Operating costs can be reduced even further with the optional automatic engine shut-down function.

Closed Hydraulic Circuit for the Swing Mechanism
The closed slewing circuit feeds the braking energy back into the system when the uppercarriage is braked. Here, new standards are set in terms of efficiency and economy. Simple yet effective.

Increased Productivity

Working Tools and Quick Coupling Systems
Liebherr offers a wide selection of working tools for every application to increase the productivity of its material handling machines. In addition the material handlers can be fitted with a Liebherr quick coupling system which increase the productivity of the machine by up to 30 %. The matching working tool and quick coupling system combined with the outstanding dynamics of a Liebherr handler ensures highest handling capacity and maximum productivity.

Efficient Management
LiDAT, Liebherr's own data transmission and positioning system, facilitates efficient management, monitoring and control of the entire fleet park in terms of machinery data recording, data analysis, fleet park management and service. All of the important machinery data can be viewed at any time in a web browser. LiDAT offers you comprehensive work deployment documentation, greater availability thanks to shorter downtimes, faster support from the manufacturer, quicker detection of strain/overload and subsequently a longer service life of the machine as well as greater planning efficiency in your company. This service includes 1 year of use without charge as standard for the material handlers LH 30 and LH 35.

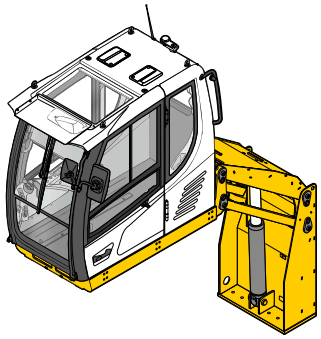


Low Fuel Consumption Thanks to Intelligent Machine Control
- Liebherr-Power Efficiency (LPE) optimises the interaction of the drive components in terms of efficiency
- LPE enables machine operation in the area of the lowest specific fuel use for less consumption and greater efficiency with the same performance

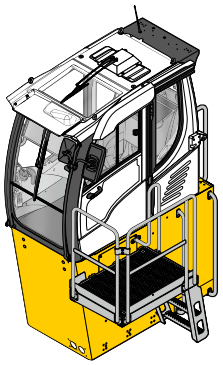
Liebherr-Working Tools
- Robust and service-friendly slewing drive, can be turned 360°
- Optimum filling and clamping performance for effective material handling
- Finite element method (FEM) optimised for a perfect relationship between grapple weight, volume and a very long service life

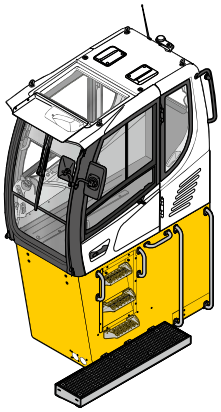
Eco-Mode
- Reducing the engine speed by pressing a button
- Lower fuel consumption with unchanged high performance
- Economical and environmentally friendly working guaranteed
- Ideal for light to medium operations

Cab Elevations



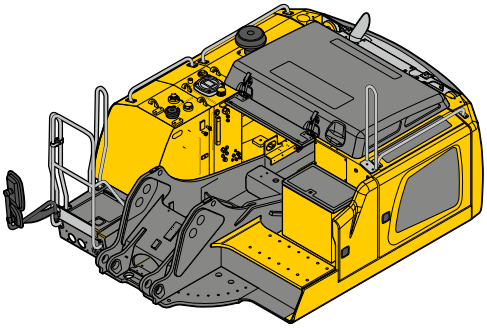
Hydraulic cab elevation



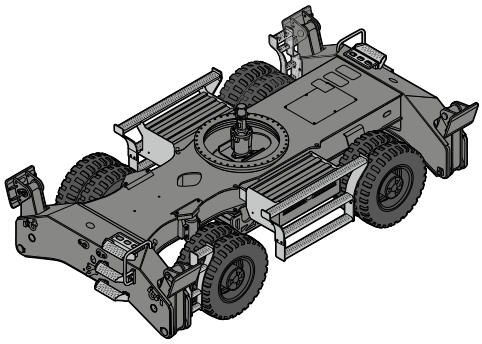


Rigid cab elevation

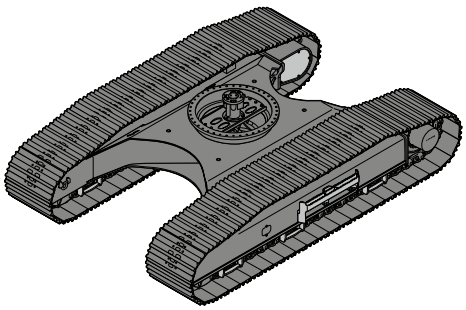
Uppercarriage



Undercarriage

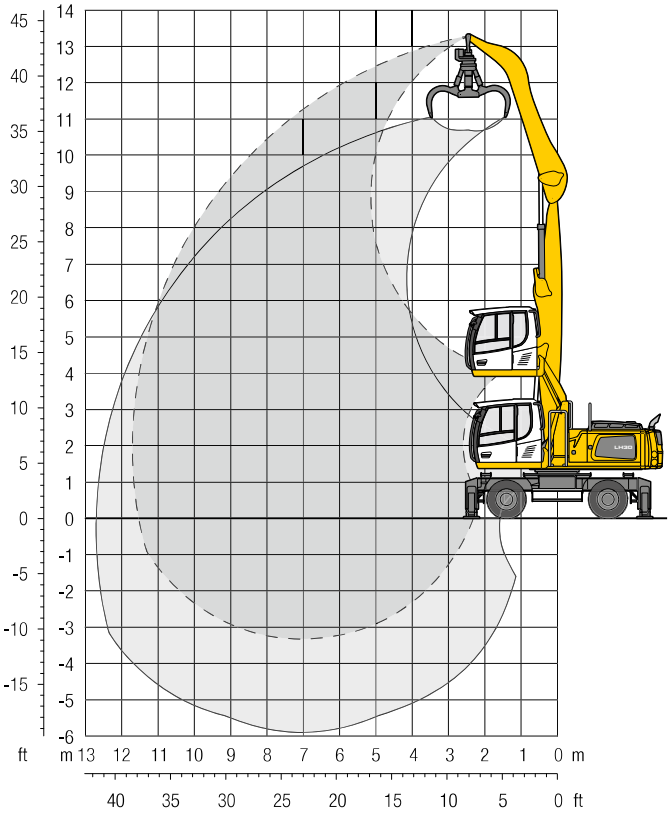


Mobile



Crawler

LH 30 M – Attachment GA12

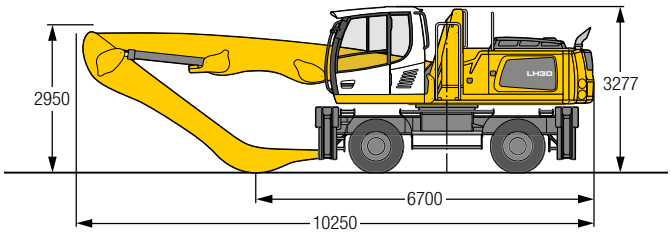


Operating Weight

The operating weight includes the basic machine with 4 point outriggers, hydr. cab elevation, 8 solid tyres plus intermediate rings, straight boom 6.80 m, angled stick 5.00 m and grab GM 65/0.60 m³ semi-closed tines.

Weight	28,400 kg

Dimensions

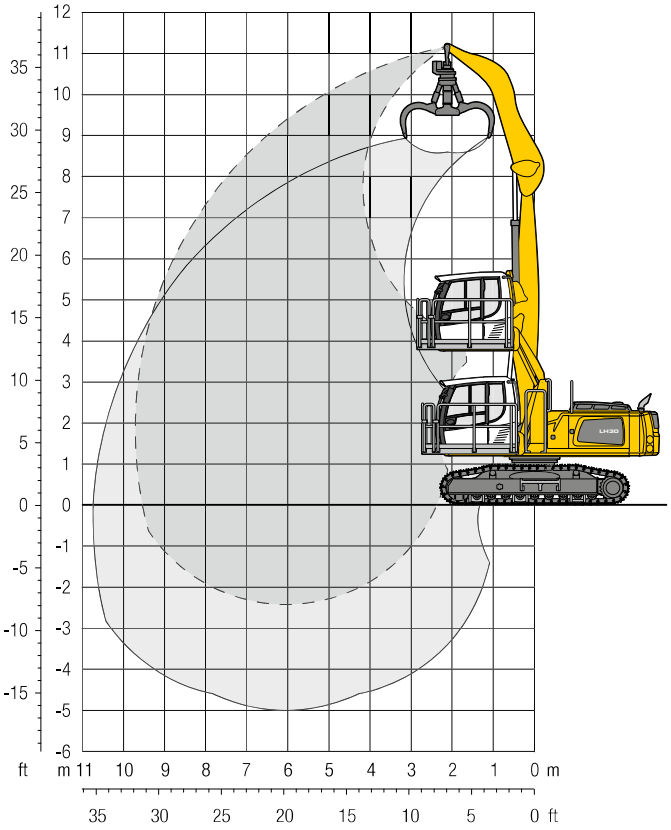


m	Undercarriage	3.0 m		4.5 m		6.0 m		7.5 m		9.0 m		10.5 m		12.0 m		13.5 m		15.0 m				m
12.0	Stabilizers raised			8.4*	8.4*															5.8	6.1*	5.9
	4 pt. outriggers down			8.4*	8.4*															6.1*	6.1*	
10.5	Stabilizers raised					6.0	7.9	4.1	5.4											3.6	4.8	8.0
	4 pt. outriggers down					8.1*	8.1*	6.2*	6.2*											5.0*	5.0*	
9.0	Stabilizers raised					6.1	7.9*	4.2	5.5	3.0	4.0									2.8	3.7	9.3
	4 pt. outriggers down					7.9*	7.9*	6.9*	6.9*	5.6*	5.6*									4.6*	4.6*	
7.5	Stabilizers raised					6.0	7.9	4.1	5.5	3.0	4.0									2.3	3.1	10.3
	4 pt. outriggers down					8.0*	8.0*	7.0*	7.0*	6.0	6.1*									4.3*	4.3*	
6.0	Stabilizers raised			9.1	10.0*	5.8	7.6	4.0	5.3	3.0	4.0	2.2	3.0							2.0	2.8	11.0
	4 pt. outriggers down			10.0*	10.0*	8.4*	8.4*	7.1*	7.1*	5.9	6.2*	4.6	5.3*							4.2	4.2*	
4.5	Stabilizers raised	10.0*	10.0*	8.4	11.4*	5.4	7.2	3.8	5.1	2.8	3.8	2.2	3.0							1.8	2.6	11.4
	4 pt. outriggers down	10.0*	10.0*	11.4*	11.4*	8.9*	8.9*	7.4*	7.4*	5.8	6.2*	4.5	5.3*							3.9	4.2*	
3.0	Stabilizers raised	13.5	15.7*	7.4	10.4	4.9	6.7	3.6	4.8	2.7	3.7	2.1	2.9							1.7	2.4	11.7
	4 pt. outriggers down	15.7*	15.7*	12.7*	12.7*	9.5*	9.5*	7.4	7.6*	5.6	6.3*	4.4	5.2*							3.8	4.2*	
1.5	Stabilizers raised	2.3*	2.3*	6.6	9.4	4.5	6.3	3.3	4.6	2.6	3.5	2.0	2.8							1.7	2.4	11.7
	4 pt. outriggers down	2.3*	2.3*	13.2*	13.2*	9.7*	9.7*	7.1	7.6*	5.4	6.1*	4.3	5.0*							3.7	3.8*	
0	Stabilizers raised	2.8*	2.8*	6.1	8.8	4.2	5.9	3.1	4.4	2.4	3.4	2.0	2.8							1.7	2.4	11.5
	4 pt. outriggers down	2.8*	2.8*	9.1*	9.1*	9.3*	9.3*	6.9	7.3*	5.3	5.8*	4.3	4.5*							3.4*	3.4*	
–1.5	Stabilizers raised			5.9	8.6	4.0	5.7	3.0	4.3	2.4	3.3	1.9	2.7							1.9	2.6	10.9
	4 pt. outriggers down			8.6*	8.6*	8.2*	8.2*	6.5*	6.5*	5.1*	5.1*	3.7*	3.7*							3.2*	3.2*	
–3.0	Stabilizers raised					4.0	5.7	3.0	4.2											2.4	3.4	8.8
	4 pt. outriggers down					6.5*	6.5*	5.2*	5.2*											4.0*	4.0*	

Height **Can be slewed through 360°** **In longitudinal position of undercarriage** **Max. reach** *** Limited by hydr. capacity**

The lift capacities on the stick end without attachment are stated in metric tons (t) and are valid on a firm, level supporting surface with blocked oscillating axle. These capacities can be slewed through 360° with the undercarriage in the transverse position. Capacities in the longitudinal position of the undercarriage (+/– 15°) are specified over the steering axle with the stabilizers raised and over the rigid axle with the stabilizers down. Indicated loads based on the ISO 10567 standard and do not exceed 75 % of tipping or 87 % of hydraulic capacity. The lift capacity of the unit is limited by its stability, the lifting capability of the hydraulic elements, or the maximum permissible lifting capacity of the load hook.
In accordance with the harmonised European Standard EN 474-5, hydraulic excavators used for lifting operations must be equipped with pipe fracture safety valves, an overload warning device, a load hook and a lift capacity chart.

LH 30 C LC – Attachment GA10

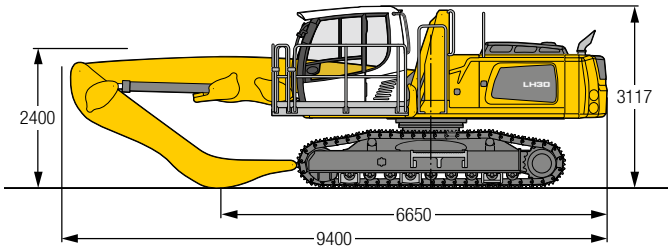


Operating Weight and Ground Pressure

The operating weight includes the basic machine with hydr. cab elevation, straight boom 5.80 m, angled stick 4.00 m and grab GM 65/0.60 m³ semi-closed tines.

Weight	28,600 kg
Pad width	600 mm
Ground pressure	on request

Dimensions



m	Undercarriage	3.0 m		4.5 m		6.0 m		7.5 m		9.0 m		10.5 m		12.0 m		13.5 m		15.0 m				m
10.5	LC	10.9*	10.9*																	8.4*	8.4*	**4.1**
9.0	LC			10.5*	10.5*	7.8	7.9*													6.4*	6.4*	**6.4**
7.5	LC			10.5*	10.5*	7.9	8.9*	5.5	7.2*											5.1	5.8*	**7.8**
6.0	LC			10.9*	10.9*	7.8	9.1*	5.5	7.8*											4.3	5.5*	**8.8**
4.5	LC	13.5*	13.5*	11.7	11.9*	7.6	9.5*	5.4	7.9*	4.1	6.2									3.9	5.4*	**9.3**
3.0	LC	20.1*	20.1*	11.0	13.2*	7.2	10.0*	5.3	8.0*	4.0	6.2									3.7	5.5*	**9.7**
1.5	LC	5.0*	5.0*	10.3	13.9*	6.9	10.2*	5.1	7.9	4.0	6.1									3.6	5.2*	**9.7**
0	LC	4.9*	4.9*	9.9	13.1*	6.7	9.7*	5.0	7.4*	3.9	5.4*									3.6	4.5*	**9.6**
–1.5	LC			9.8	10.7*	6.6	8.3*	4.9	6.2*											4.1	4.5*	**8.7**

Height **Can be slewed through 360°** **In longitudinal position of undercarriage** **Max. reach** *** Limited by hydr. capacity**

The lift capacities on the stick end without attachment are stated in metric tons (t) and can be slewed through 360° on a firm, level supporting surface. Capacities are valid for 600 mm wide triple grouser pads. Indicated loads based on the ISO 10567 standard and do not exceed 75 % of tipping or 87 % of hydraulic capacity. The lift capacity of the unit is limited by its stability, the lifting capability of the hydraulic elements, or the maximum permissible lifting capacity of the load hook.
In accordance with the harmonised European Standard EN 474-5, hydraulic excavators used for lifting operations must be equipped with pipe fracture safety valves, an overload warning device, a load hook and a lift capacity chart.

– Exclusively mount and use special working attachments with approval and as per stipulations of manufacturer of basic machine.

Note

▶ Any other use or use beyond the stated use is improper use.

2.2.3 Foreseeable misuse

Do not use machine in following cases:
– Transport of persons without mounted and functioning safety equipment
– Lifting of persons without mounted and functioning safety equipment
– Driving with attached load
– Work in explosive environment without corresponding and necessary equipment
– Work in contaminated environment without corresponding and necessary equipment
– Sweeping on side (with working attachment)
– Stamping
– Striking
– Lifting loads without suitable means
– Pulling and pushing of vehicles or objects without suitable towing attachments and brakes on machine

Note

▶ The manufacturer is not liable for damage caused by improper use.

2.2.4 Operating conditions

– Operate machine in an ambient temperature of -10 °C to 40 °C.
– In case of divergent ambient temperatures, contact Liebherr customer service.
– In case of regular deployments at below -10 °C, adhere to diesel fuel quality (For more information see: 5.3.1 Diesel fuels, page 249) .

Danger to life

Operation during thunderstorms or storms

– If possible stop operation before a thunderstorm or storm.
– Put working attachment on the ground in flattest position possible.
– Secure machine correctly.
– Close window.
– Shut off diesel engine or electric motor immediately.
– Set ignition key to **0**.
– Make sure there are no persons in area around machine.

Lightning strike

– Remain in operator's cab.
– Do not leave machine until all components are voltage-free.

Contact with high voltage cable

– Do not move machine and working attachment.
– Remain in operator's cab.

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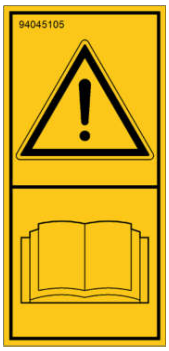
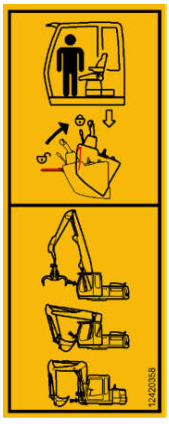
Sign	Description
	**Service brake and parking brake** Valid for wheeled excavators and handling machines with wheeled undercarriage. Do not apply service brake and parking brake at the same time when machine is in operation. Before leaving machine, block exclusively with parking brake.
	**Operator's manual** Read accident prevention instructions in operator's manual.
	**Accident prevention** Applies to machines with safety lever. Before leaving operator's seat pull up safety lever. Working attachment reaches as far as the operator's cab. Be careful when working attachment is retracted.
	**Accident prevention** Applies to machines with folding console. Move folding console up before leaving operator's seat. Working attachment reaches as far as the operator's cab. Be careful when working attachment is retracted.

2.5.6 Falling object protective structures (FOPS and FGPS)

Danger to life

Damaged falling object protective structures

- Do not put machine into service with damaged falling object protective structures.
- Do not put machine into service with deformed falling object protective structures.
- Do not use falling object protective structures with structural changes.
- Do not use repaired falling object protective structures.
- Do not perform welding on falling object protective structures.
- Do not cut or saw falling object protective structures.
- Do not drill falling object protective structures.

2.6 Emergency equipment on the machine

2.6.1 Emergency exit (standard)

Danger to life

Incorrect labelling

- Make sure that all information signs are present.
- Make sure that all information signs are legible.

Incorrect equipment

- Make sure that emergency hammer is present.
- Make sure that position of emergency hammer is known.

2.6.2 Fire extinguisher (option)

Danger to life

Incorrect behaviour

- Make sure that all fastening points of fire extinguishers on the machine are known.
- Make sure that everyone is able to operate the fire extinguishers.
- Make sure that everyone knows the local fire alarm possibilities.
- Make sure that everyone knows the local fire-fighting possibilities.
- Before starting machine, unlock all locks of hoods and doors of machine.

2.6.3 Emergency command devices of machine

Depending on equipment, machine has following emergency command devices:
- Emergency stop device
- Emergency cut-off device

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- If the tightening torque is not prescribed by the supplied documentation: Find prescribed tightening torque in Liebherr factory standard.
- If the tightening torque is not prescribed by the Liebherr factory standard: Find tightening torque in valid DIN standard, EN standard or ISO standard.

2.9.2 Heavy parts

Danger to life

Incorrect handling

- Exclusively use machine for load-lifting with sufficient loading capacity.
- Exclusively use suitable and functioning lifting accessories with sufficient loading capacity.
- Make sure there are no persons underneath raised loads.
- Exclusively task qualified and experienced persons with the attaching of loads.
- Exclusively task qualified and experienced persons with the directing of operators.
- Make sure that the spotter can be seen by the operator.
- Make sure that spotter and operator are in voice contact if necessary.

Injury

Incorrect protective equipment

- Put on gloves when handling wire ropes.

2.9.3 Regular checks

Danger to life

Incorrect performance of checks

- Make sure that safety checks are performed regularly on the machine.
- Make sure that all checks are performed by suitable, competent and authorised persons.
- Adhere to national regulations.

2.10 Modifications to the machine

2.10.1 Modifications, add-ons and retrofittings

Danger to life

Incorrect changes to the machine

- Have changes, add-ons or retrofittings that could affect safety approved by the manufacturer.
- Have installation and adjustment of safety equipment and safety valves approved by the manufacturer.

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Symbol	Meaning
	Main movements of working attachment and slewing gear blocked
	Main movements of working attachment and slewing gear; neutral position required
	Hoist cylinder protection switched off
	Stick cylinder protection switched off
	Boom line break safety open
	Stick cylinder shut-off active
	Stick cylinder shut-off bypassed
	Stick cylinder shut-off for heavy working tool active
	Stick cylinder shut-off for heavy working tool bypassed
	Hoist cylinder shut-off active
	Hoist cylinder shut-off bypassed
	Height limitation bypassed, height limitation switched off
	Height limitation; upper shut-off point reached
	Depth limitation; lower shut-off point reached

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Rail guide system

Symbol	Meaning
	Rail guide system: Additional tyres blocked
	Automatic mode not active
	Neutral position required
	Rail guide system automatically blocked

Tab. 20: Status symbols of rail guide system

3.2.3 *Start page* menu

Menu call: 

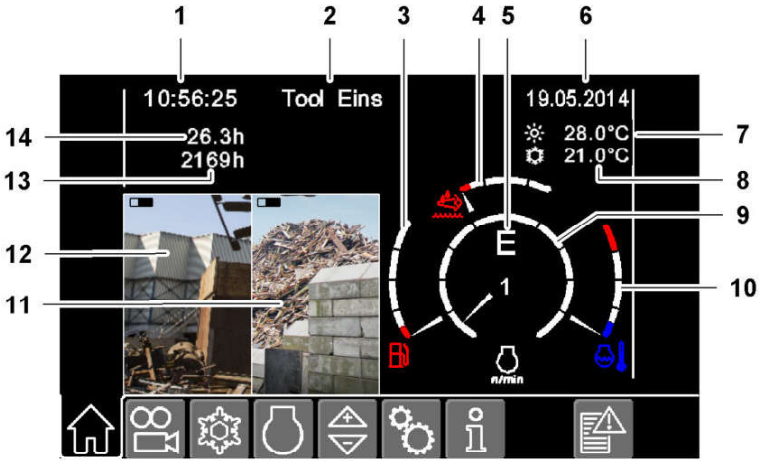

Fig. 221: Start page menu

1 Time
2 Selected working tool
3 Fill level in fuel tank
4 Fill level in diesel exhaust fluid tank
5 Operating mode
6 Date
7 Outside temperature
8 Selected cab temperature
9 Rev counter
10 Coolant temperature
11 Image of side area camera
12 Image of rear area camera
13 Total operating hours
14 Daily operating hours

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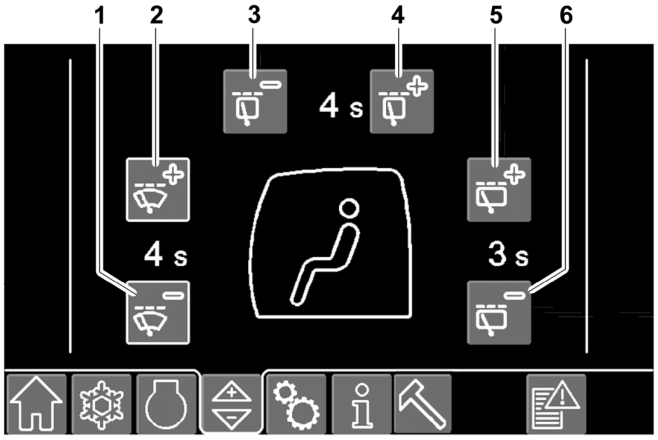

Fig. 251: Windscreen wiper interval submenu[4)]

1 *Reducing windscreen wiper interval* button
2 *Increasing windscreen wiper interval* button
3 *Reducing roof glass panel windscreen wiper interval* button
4 *Increasing roof glass panel windscreen wiper interval* button
5 *Increasing rear windscreen wiper interval* button
6 *Reducing rear windscreen wiper interval* button

3.2.12 *Radio remote control* submenu

Menu call: >

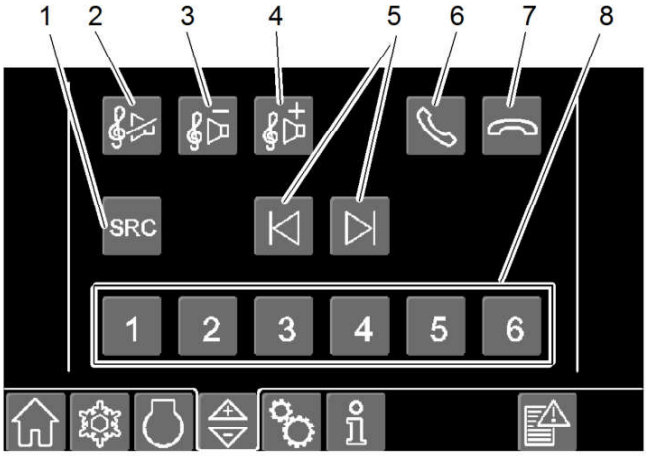

Fig. 252: Radio remote control submenu

1 *Selecting audio source* button
2 *Mute* button
3 *Volume down* button
4 *Volume up* button
5 *Changing radio station or track* buttons
6 *Answering phone call* button
7 *Ending phone call* button
8 *Selecting stored radio station* buttons

[4)] Quantity of windscreen wipers depending on machine type and equipment

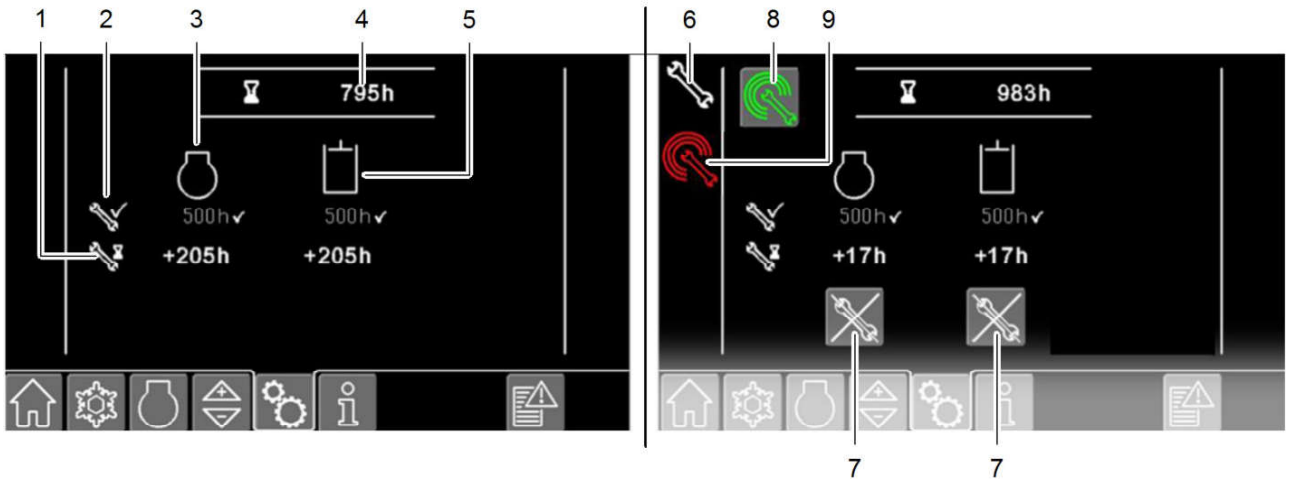

Fig. 291: Maintenance submenu

1	Remaining time to next maintenance	**4**	Total operating hours	**7**	*Confirmation of maintenance due message* button
2	Operating hour meter at last maintenance	**5**	Hydraulic system maintenance	**8**	*Teleservice* button
3	Maintenance of diesel engine	**6**	*Maintenance due* status symbol	**9**	*Teleservice activated* status symbol

Maintenance

If *maintenance due* status symbol **6** appears:

▶ Contact Liebherr customer service and have maintenance performed.

▶ Confirm display: Press *confirmation of maintenance due message* button **7**.
▷ *Maintenance due* status symbol **6** disappears.

Teleservice

Via Teleservice Liebherr customer service reads and modifies parameters of machine control online if necessary.

Activating write access

DANGER
Unexpected machine movement!
Danger to life.

▶ Make sure there are no persons in working area of machine.

Note
Malfunctions in machine control!

▶ Do not operate machine during write access by Liebherr customer service.

▶ Press *teleservice* button **8** when prompted by Liebherr customer service.
▷ *Teleservice* button **8** is displayed in green.
▷ *Teleservice activated* status symbol **9** appears.
▷ Online connection is enabled.
▷ Liebherr customer service has write access to machine control parameters.

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3.2.40 *Tool Control* menu

Menu call: 

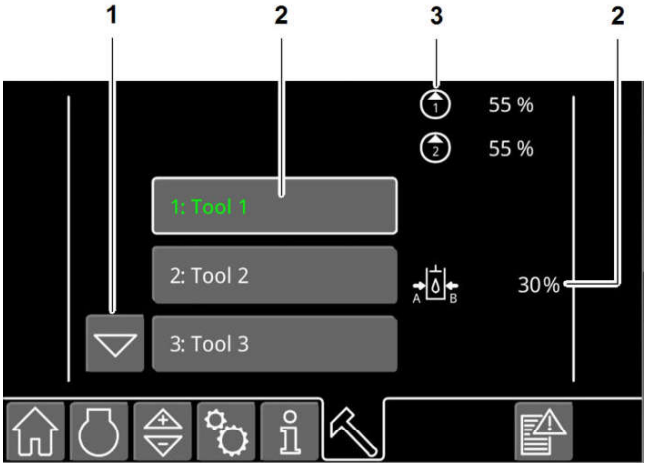

Fig. 323: Tool Control menu

1	*Scroll* buttons	**3**	Flow rate setting for working tool
2	*Working tool* button	**4**	Pressure setting for working tool

The *Tool Control* menu contains hydraulic settings for working tool:
- Flow rate setting for working tool
- Pressure setting for working tool
- Designation of working tools

NOTICE
Incorrect settings!
Damage to working tool.

▶ Have hydraulic settings for working tool programmed exclusively by Liebherr customer service.

▶ Pre-select working tool: Press *scroll* button **1**.
  ▷ Pre-selection is outlined.
  ▷ Stored working tool settings appear on the display.

▶ Activate working tool: Press *working tool* button **2**.
  ▷ Working tool is activated.
  ▷ Name of working tool is displayed in green.

3.2.41 *Service codes* menu

The *service codes* menu lists information and error messages in form of text messages.

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Adjusting backrest

Fig. 346: Adjusting backrest

Adjusting head restraint

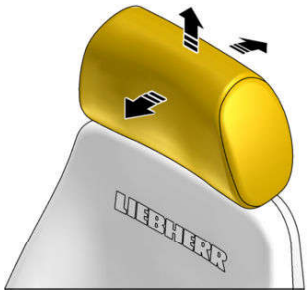

Fig. 347: Adjusting head restraint

Adjusting shock absorption

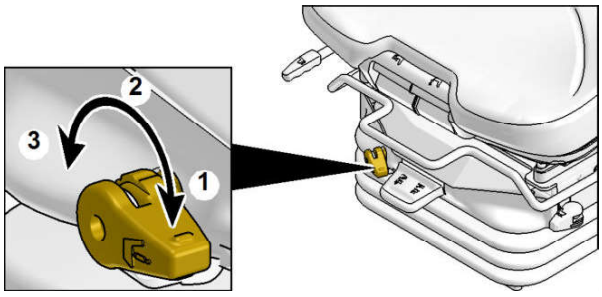

Fig. 348: Adjusting shock absorption

1 Shock absorption “hard”
2 Shock absorption “medium”
3 Shock absorption “soft”

Lower windscreen

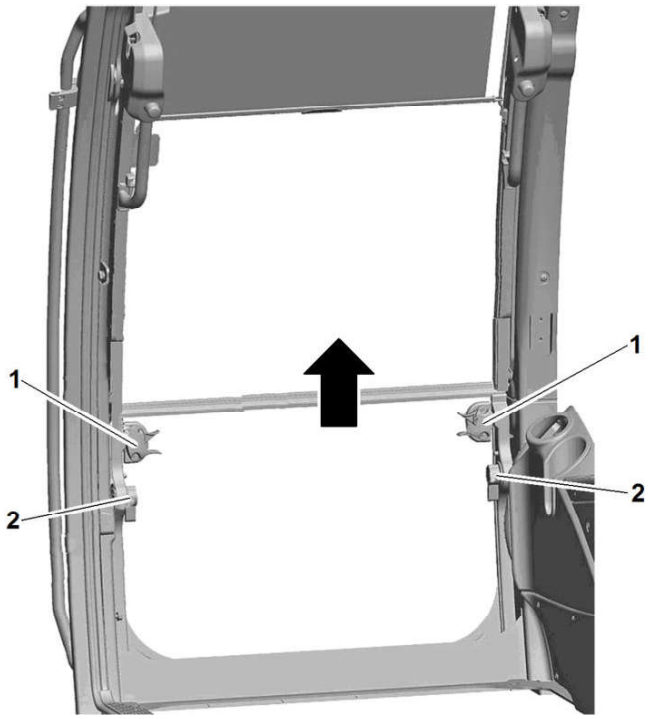

Fig. 374: Lower windscreen

1 Locking mechanism **2** Extender wheel

Opening lower windscreen

- ▶ Turn extender wheels **2** upwards simultaneously.
- ▶ Unlock lower windscreen: Press levers of locking mechanism **1** together simultaneously.
- ▶ Push lower windscreen upwards until it engages.

Closing lower windscreen

- ▶ Unlock lower windscreen: Press levers of locking mechanism **1** together simultaneously.
- ▶ Pull lower windscreen downwards until it engages.
- ▶ Simultaneously turn extender wheels **2** downwards.

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3.4 Operation

3.4.1 Inspection tour before putting into service

- ▶ Before putting machine into service, always perform inspection tour.
- ▶ Secure the machine before the inspection tour to prevent rolling away.
- ▶ Make sure there is free access to areas that have to be checked.
- ▶ Carry out inspection tour according to the following schedule.

Checkpoint	Activity
Overall status	Check the machine for loose pins, cracks, wear, damage and tightness. Never put defective machine into service. Have damage repaired immediately.
Warning signs	Check the warning signs for completeness and readability. Replace damaged signs. Replace unreadable signs.
Protective devices and safety devices	Check completeness and function of protective devices and safety devices (for example safety belt, mounting of pressure sensors and angle sensors).
Intake area	Clean engine bonnet and uppercarriage in the area of cooling air and combustion air intake to remove dirt, ice and snow.
Window panes and mirrors	Clean contaminated window panes and mirrors. Adjust mirrors.
Windscreen washer system	Check fill level. Check antifreeze concentration. Make sure that lines of windscreen washer system contain windscreen washer fluid.
Doors and covers	Close all hoods, covers and doors. Do not lock hoods, covers and doors, so that the source of any fire can be accessed quickly. Secure windows against inadvertent movements.
Diesel engine	Check oil level.
Cooling system	Check coolant level. Check radiator for damage. Clean contaminated radiator.
Fuel system	Check fuel lines for damage and tightness. Drain water from fuel pre-filter.
Hydraulic system	Check oil level. Check hydraulic lines for damage and tightness.
Tyres[A)]	Check tyres for damage. Check wheel nuts for completeness and mounting. Check tyre pressure. Check tread depth. Have defects repaired immediately.
Travel gear[A)]	Check the travel gear for damage, missing or loose parts. Have defects repaired immediately.
Persons in the danger zone	Make sure no-one is working on machine in the danger zone of the machine. Sound horn to warn bystanders before starting machine. Do not start operation if people do not leave danger zone in spite of being warned.
Climbing facilities	Have missing steps, railings and handles renewed. Have defective steps, railings and handles replaced. Clean contaminated, slippery climbing facilities.

Tab. 36: Inspection tour

A) depending on travel gear type

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▶ Wait until operating temperature for hydraulic oil and coolant has been reached.
▷ Machine is ready for operation.

3.4.12 Engine speed and operating mode

Engine speed and operating mode depend on each other:
– Changing the operating mode automatically results in a change to the matching speed step.
– Changing the speed step automatically results in a change of operating mode.

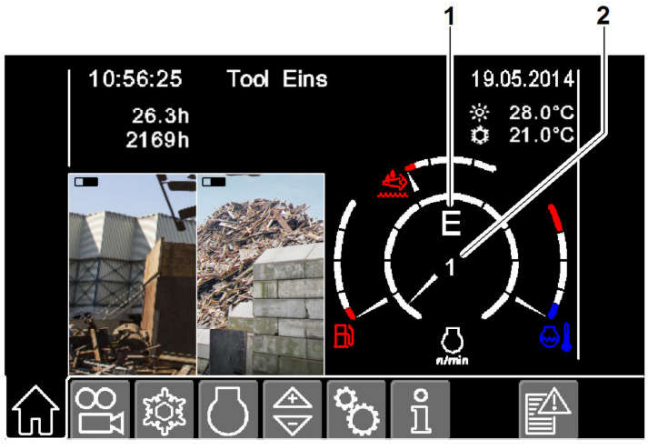
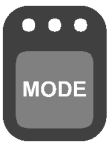


Fig. 429: Engine speed and operating mode

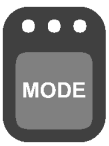
1 Operating mode **2** Speed step

Operating mode			Application
Key	**Status of LEDs**	**Mode**	
	☀ ○ ○	S (SENSITIVE)	For especially precise work or lifting loads.
	○ ☀ ○	E (ECO)	For particularly economical and environmentally friendly work.
	○ ○ ☀	P (POWER)	For high transfer loading performance and heavy-duty applications.
	☀ ☀ ☀	P+ (POWER PLUS)	For maximum load handling performance and heavy-duty applications.

Tab. 37: Operating modes

Operating mode S, E and P

Selecting operating mode with *MODE* key



▶ Press *MODE* key until required operating mode is active.
▷ Control selects speed step for selected operating mode.
▷ Operating mode appears on the display.
▷ LEDs in *MODE* key display selected operating mode.

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Left joystick

Function	Operation
Retract stick.	Move in direction retracting stick **A**.
Extend stick.	Move in direction extending stick **B**.
Turn uppercarriage left.	Move in direction turning uppercarriage left **C**.
Turn uppercarriage right.	Move in direction turning uppercarriage right **D**.

Tab. 43: Left joystick

Right joystick

Function	Operation
Tilt bucket in.	Move in direction tilting bucket in **E**.
Tilt bucket out.	Move in direction tilting bucket out **F**.
Raise boom.	Move in direction raising boom **G**.
Lower boom.	Move in direction lowering boom **H**.

Tab. 44: Right joystick

Double pedal

Function	Operation
Lower two-piece boom.	Press double pedal **1**.
Raise two-piece boom.	Press double pedal **2**.

Tab. 45: Double pedal

3.4.21 Turning and braking uppercarriage

Turning uppercarriage

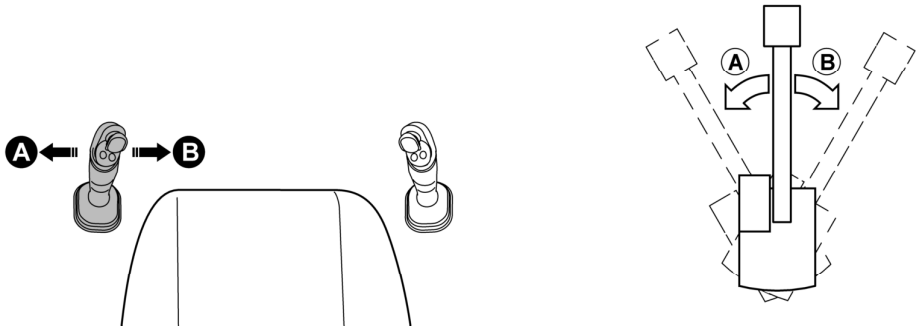

Fig. 458: Turning uppercarriage

Make sure the following preconditions are met:
- ❑ Slewing brake is released.

▶ Move joystick in direction **A**.

Swivelling working tool

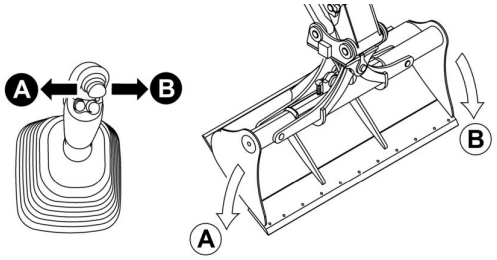

Fig. 488: Swivelling working tool

- ▶ Swivel working tool in direction **A**: Move mini-joystick in direction **A**.
- ▶ Swivel working tool in direction **B**: Move mini-joystick in direction **B**.

Quick coupler

- ▶ Follow operator's manual of the quick coupler manufacturer.

3.4.29 Changing over control of right mini-joystick (option)

The option can be used to assign the control of the working tool from mini-joystick to the joystick.

Note
It is not possible to control the tipping mechanism if the control of the working tool is switched to the right joystick.

- ▶ Change control of working tool to right mini-joystick.

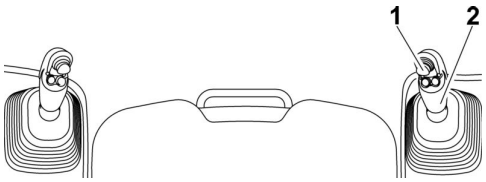

Fig. 489: Right joystick

1 Right mini-joystick **2** Right joystick

Controlling working tool with right joystick

Changing over control

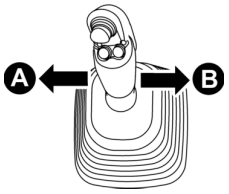

Fig. 490: Controlling working tool with joystick

- ▶ Measure reaches.
- ▶ Make sure that the set minimum and maximum values are not exceeded.

Bypassing stick cylinder shut-off

- ▶ Press *bypassing stick cylinder shut-off* button.
- ▶ Press confirmation button.
  - ▷ *Stick cylinder shut-off bypassed* status symbol appears.

  - ▷ Warning sound sounds.
  - ▷ Shut-off points are bypassed for 10 seconds.
  - ▷ It is possible to move the stick without restrictions.

3.5.2 Hoist cylinder shut-off (option)

Hoist cylinder shut-off prevents collision between working attachment and obstacles in workspace.

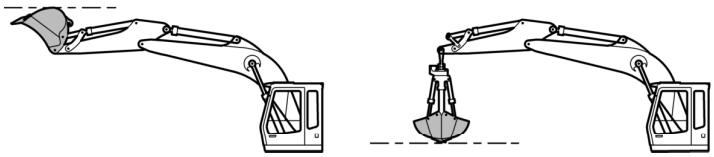

Fig. 532: Maximum height with bucket, minimum height with grapple

Depending on constellation of working tool and working attachment, the actual highest or lowest point is above or below the shut-off point of the hoist cylinders.

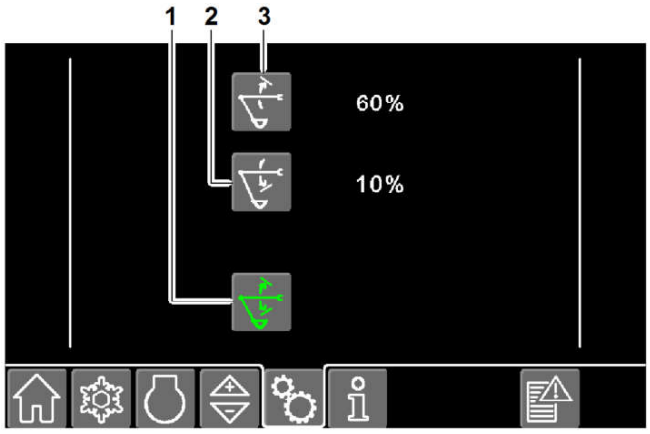

Fig. 533: Hoist cylinder shut-off menu

1 *Hoist cylinder shut-off* button
2 *Lower shut-off point* button
3 *Upper shut-off point* button

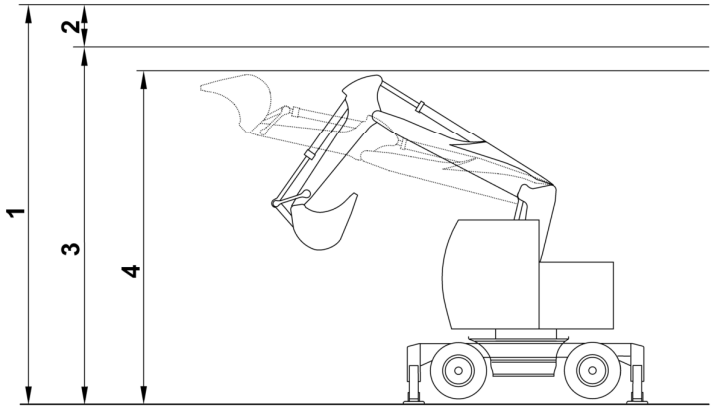

Fig. 576: Height limitation

1	Restricting height	**3**	Maximum working height
2	Prescribed safe distance	**4**	Reduced working height (option)

The height limitation calculation is based on the maximum radius of largest Liebherr bucket (1.75 m). If the Tool Management option is activated, the maximum radius of working tool is determined by settings in Tool Management.

Maximum working height

DANGER
Height limitation setting incorrect!
Danger to life.

▶ Make sure that working attachment does not exceed maximum working height in entire working area.

The limit value of maximum working height depends on following factors:
– Position of working attachment
– Machine is working on a slope.
– Machine is working on uneven ground.
– Lowest point of restricting height
– Type of support
– One-sided support

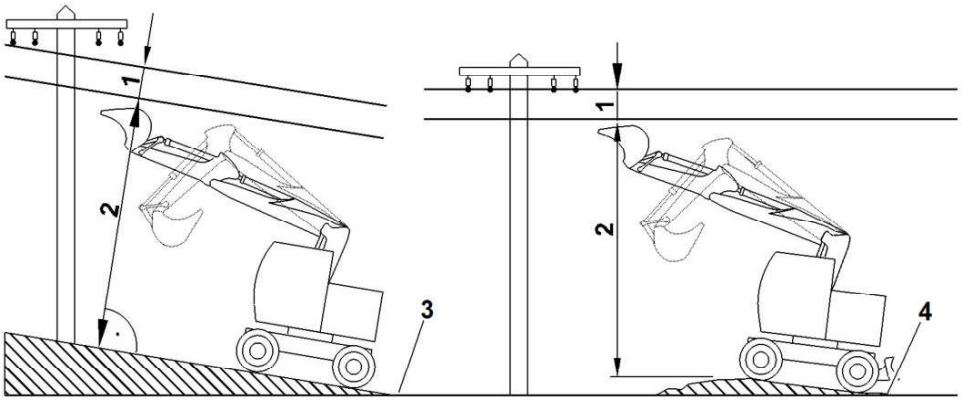

Fig. 577: Example factors for setting maximum working height

1	Safe distance	**3**	Pitch
2	Maximum working height	**4**	Uneven ground

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NOTICE
Damage to the machine due to incorrect handling of the tool attachment!
High pressures, torques and stresses can build up in the working attachment when working tools are used. The load is at its greatest when the hydraulic cylinders are completely extended or retracted (limit position) or the attachment is fully extended. Incorrect handling of the working tool can exceed the load limit. Attachment components, hydraulic cylinders and machines can be damaged!

- ▶ Do not move the hydraulic cylinders in or out all the way.
- ▶ Move the hydraulic cylinders carefully and slowly in the area of the limit positions (boundary area).
- ▶ When turning working tools, maintain a distance of at least 10° from the limit position of the bucket cylinder.

NOTICE
Damage to ballcocks!
Ballcocks are not used for controlling fluid flows, but for shutting off pipelines. Ballcocks must always be completely opened or closed. If the lever is in an intermediate position, the seals in the ballcock can be damaged.

- ▶ Always turn the lever of the ballcock all the way to the stop. The ballcock must be completely opened or closed.

3.6.2 Putting machine in working position

NOTICE
Unapproved use of parking brake!
Damage to travel gearbox.

- ▶ During work exclusively use service brake.

Putting machine with wheeled undercarriage with two axles in working position

- ▶ Make sure that travel direction switch is in neutral position.
- ▶ Make sure that parking brake is released.
- ▶ Lock service brake.
- ▶ Lock oscillating axle.
- ▶ Support machine.

Putting machine with wheeled undercarriage with more than two axles in working position

- ▶ Extend folding wings.
- ▶ Support machine.

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3.8 Parking machine

- ▶ Park machine on level and firm ground.
- ▶ Lower working attachment to the ground.
- ▶ Put control elements in neutral position.
- ▶ Move folding console up.
- ▶ Shut off diesel engine.
- ▶ Pull out ignition key.

If machine is equipped with wheeled undercarriage:
- ▶ Release service brake.
- ▶ Secure machine with chocks to prevent it rolling away.

If machine is equipped with energy recuperation cylinder and block type ball valves on hoist cylinders:
- ▶ Close block type ball valves on hoist cylinders.
- ▶ Lock all doors and flaps and remove key.

If machine will not be used for a long time:
- ▶ Set battery main switch to **0**.

Note
Extended downtimes!
Discharged battery.

- ▶ Check charging state of battery.

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Symbol	Meaning	Effect, characteristic	Remedy
	Control circuit of hydraulic system is depressurised.	Control of working attachment and uppercarriage is not possible.	Shut off diesel engine and restart. If symbol is still displayed: Contact Liebherr customer service.
	A general control error has occurred.	Functionality is restricted. Machine is damaged.	Shut off diesel engine. Contact Liebherr customer service.
	Software parameters missing after software update.	Diesel engine does not start.	Contact Liebherr customer service.
	Machine and attachment parameters do not match.	Diesel engine output is reduced automatically.	Contact Liebherr customer service.
	Prewarning: Diesel particulate filter is heavily contaminated.		Start manual filter regeneration.
	Diesel particulate filter is excessively contaminated.	Diesel engine output is reduced automatically.	Contact Liebherr customer service.
	Prewarning: DPF: Diesel exhaust fluid level is low.		Fill with diesel exhaust fluid.
	DPF: Diesel exhaust fluid level is too low.	Diesel engine output is reduced automatically.	Fill with diesel exhaust fluid.
	SCR: Diesel exhaust fluid level is too low.	Diesel engine output is reduced automatically.	Fill with diesel exhaust fluid.
	Malfunction of oscillating axle.	Machine stability is at risk.	Shut off diesel engine. Contact Liebherr customer service.
	Oil temperature of pump distributor gear is too high.	Pump distributor gear is damaged.	Shut off diesel engine. Reduce load. Clean hydraulic oil cooler. If symbol is still displayed: Contact Liebherr customer service.

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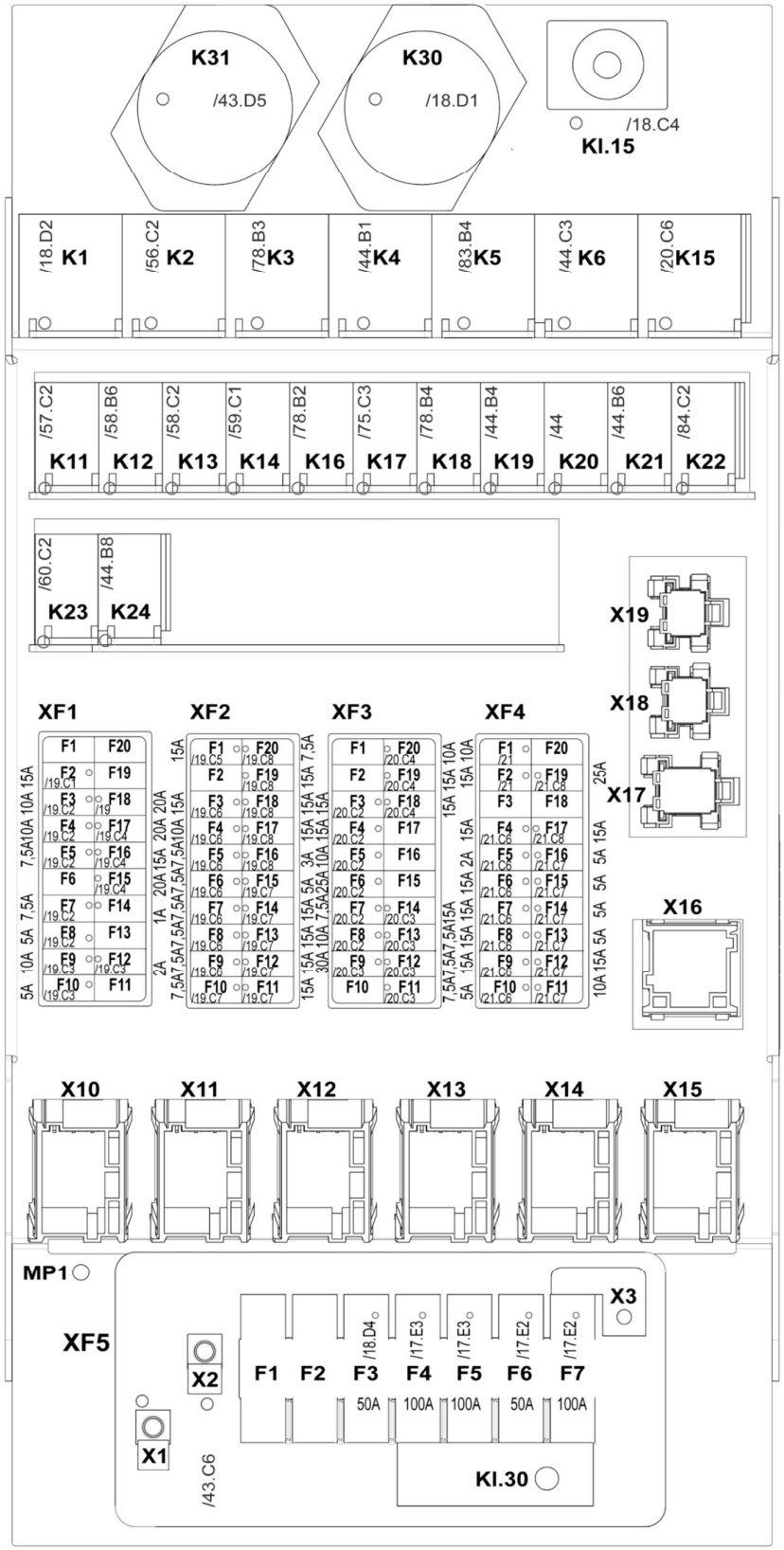

Fig. 681: Electric cabinet A214

Relay	Consumer
K3	Turn indicator

Tab. 64: Additional printed circuit board A166

Make sure the following preconditions are met:
- ❑ Battery main switch is set to **OFF**.

▶ Fold backrest forwards.

▶ Open cover **1**.

▶ Replace fuse.

▶ Close cover **1**.

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5.2.2 Lubricating chart

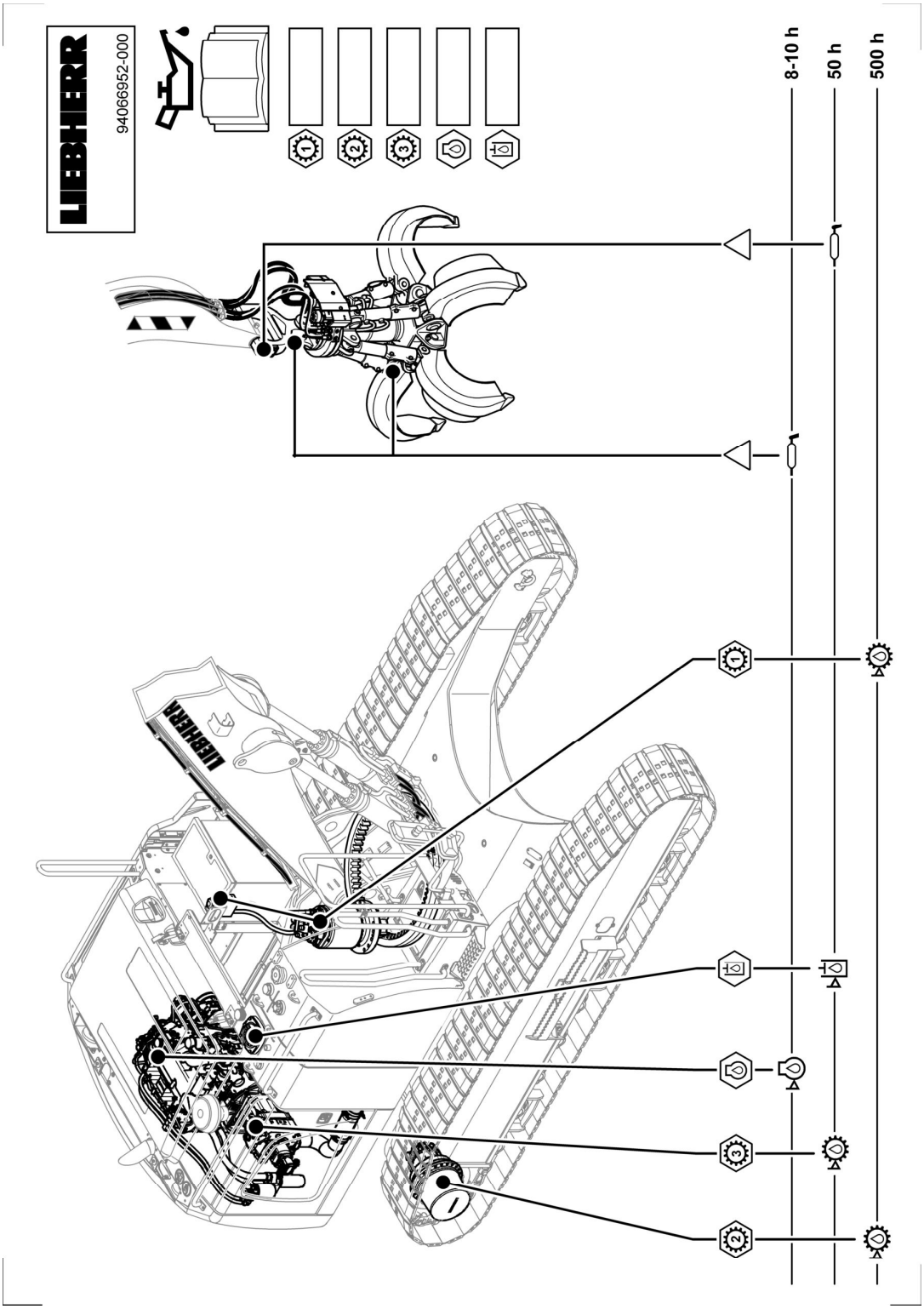

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Fig. 685

If gear oils from other manufacturers are used, information on change intervals must be obtained from respective manufacturer or supplier.

5.3.9 Greases

Liebherr recommendation

Ambient temperature	Description
Down to -20 °C	Liebherr Universalfett 9900
Down to -55 °C	Liebherr Universalfett Arctic

Tab. 95: Liebherr recommendation

Minimum quality requirements

Thickener	Shelf life	Specification
Soap-based (lithium complex)	At least 3 years	Pumpable according to KP 2 K (DIN 51502)
		VKA welding force: ≥ 2300 N (DIN 51350/4, ASTM D 2596)

Tab. 96: Minimum quality requirements

5.3.10 Windscreen washer fluid

Liebherr recommendation

Liebherr recommends commercial washer fluid with anti-freeze.

Minimum quality requirements

Use mixture of water and denatured alcohol.

5.3.11 Lubricants and care products for electrical and mechanical systems

Liebherr recommendation

Application	Product
Contact spray for slip rings	Cramolin
Lubricant for pistons, piston nuts and piston bearing installation on hydraulic cylinders	Gleitmo 800
Special corrosion inhibitor for installation spaces of sealing elements on hydraulic cylinders	Rostilo Tarp CFX Fuchs Lubritech
Assembly paste for installation of pumps and coupling	Optimol Paste White T

Tab. 97: Liebherr recommendation

LHB/12221612/01/2018-12-14/en

5.7 Complete machine

5.7.1 Checking machine for proper condition and tightness

Before putting the machine into service, perform the following activities:

- ▶ Check machine for proper condition and cleanliness.
- ▶ Check hoses and pipes for leaking fluids.
- ▶ Check hoses and pipes of lubrication system for leaking grease.

5.7.2 Checking components for cracks

Special attention should be paid to following parts when checking for cracks:
- – Undercarriage steel construction – axle bearing, transmission bearing, support, lower slewing ring support with tower and slewing ring
- – Uppercarriage steel construction – bearing block for boom, bearing block for hoist cylinder, upper slewing ring support, cab suspension, mounting of slewing gearbox and mounting of counterweight
- – Climbing aids, ladders and fastening elements

- ▶ Carefully check frame components and bearings in operator's cab, uppercarriage and undercarriage for cracks or hairline cracks by means of visual inspection.
- ▶ Suspected cracks or difficult-to-see areas: Apply dye penetrant examination.

If there are cracks or hairline cracks:
- ▶ Do not put machine into service.
- ▶ Have machine checked and repair work performed by Liebherr customer service.

5.7.3 Lubricating hinges, locks and gas pressure springs of doors, hoods and windows

- ▶ Lubricate hinges regularly with oil or grease.
- ▶ Regularly lubricate locks with resin-free oil or commercially available door lock care product (with graphite or MoS2 compounds).
- ▶ Lubricate the joints of the gas pressure springs regularly with oil or grease.

5.7.4 Cleaning and treating rubber seals on doors and hoods

Rubber seals are treated with a rubber care product:
- – to prevent premature wear
- – to prevent freezing at low temperatures

Recommended care products: Silicone, talcum, deer tallow

- ▶ Clean and service rubber seals on doors and panels as required.

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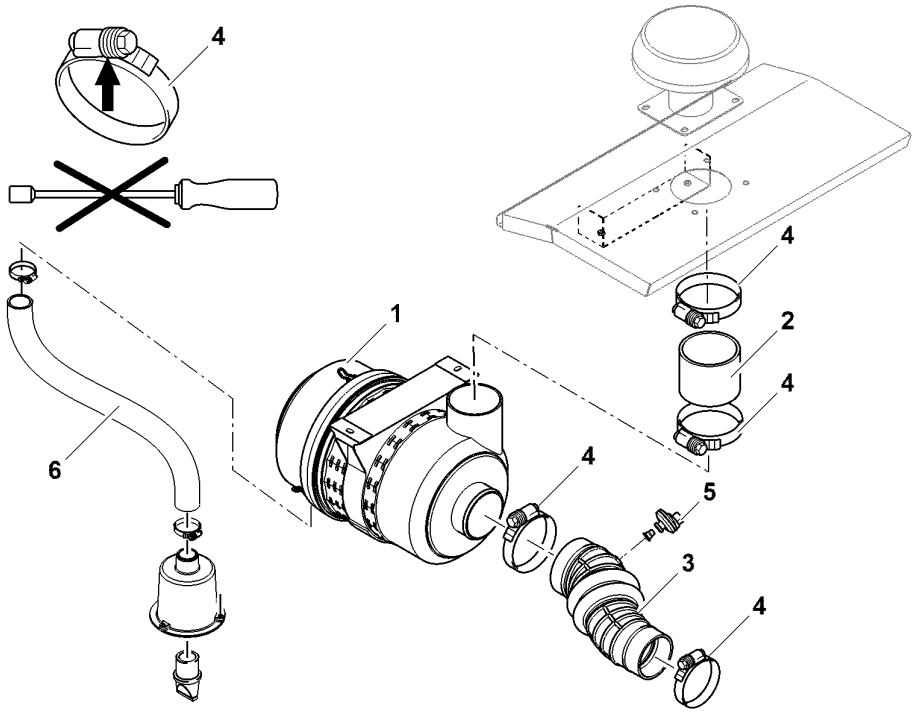

Fig. 705: Filter housing, clean air line and air hose with hose clamps

1	Filter housing	**4**	Hose clamp with spring plate package
2	Air hose	**5**	Vacuum switch
3	Clean air line	**6**	Air hose

NOTICE
Loose or damaged hose connections!
Diesel engine damage.

- ▶ Regularly check hose connections and hose clamps.
- ▶ Replace damaged hose connections.
- ▶ Replace hose clamps on loose or damaged hose connections.
- ▶ Observe prescribed tightening torques.

Check the following air lines:
- Between air filter and turbocharger
- Between turbocharger and intercooling air cooler
- Between intercooling air cooler and diesel engine

The hose clamps **4** with spring plate package compensate any diameter changes.

- ▶ For loose hose connections replace hose clamp **4**.
- ▶ Tighten hose clamp, observe prescribed tightening torque specified in table.

Check following components for condition, mounting and tightness:
- Filter housing **1**
- All mounting clamps
- All intake lines
- All intake pipes

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- ▶ Fill coolant no faster than 8 l/min into coolant container **3** until coolant container **3** is completely filled with coolant.
- ▶ Fill coolant no faster than 8 l/min into expansion chamber **1** until sight glass **5** is half filled with coolant.
- ▶ Close sealing cover **4**.
- ▶ Close bleeding cover **2**.

Bleeding cooling system

- ▶ Start diesel engine.
- ▶ Turn on operator's cab heating.
- ▶ Set operator's cab heating to highest level.
- ▶ Let diesel engine run at idle speed for 5 minutes.
- ▶ Shut off diesel engine.
- ▶ Check coolant level, refill coolant if necessary. (For more information see: Filling with coolant, page 286)

When machine has cooled down:

- ▶ Check coolant level, refill coolant if necessary. (For more information see: Filling with coolant, page 286)

5.9.2 Checking cooling system and heat exchanger for contamination and cleaning

NOTICE
Incorrect cleaning!
Damage to condenser fins.

- ▶ Never clean condenser fins by machine or by steam cleaning.
- ▶ Clean condenser fins exclusively with compressed air.

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5.12 Travel gear

5.12.1 Checking track tension

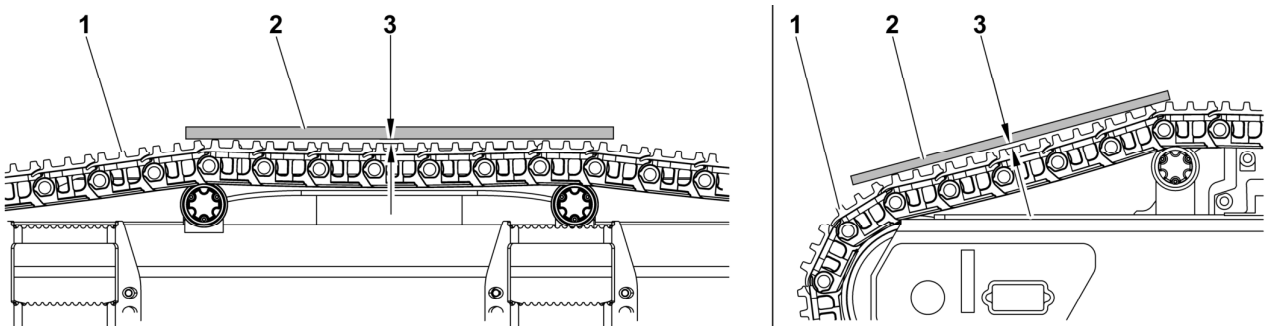

Fig. 745: Checking track tension

1 Track **2** Measuring bar **3** Distance

Number of carrier rollers	Permitted distance
2 carrier rollers	20 $^{+10}$ mm
3 carrier rollers	15 $^{+5}$ mm

Tab. 106: Checking track tension

- ▶ Release track **1** by moving machine forwards and backwards.
- ▶ Secure machine against rolling away.
- ▶ Place measuring bar **2** between two carrier rollers.
- ▶ Measure distance **3** in centre between lower edge of measuring bar **2** and upper edge of track **1**.
- ▶ Place measuring bar **2** between carrier roller and idler-wheel.
- ▶ Measure distance **3** in centre between lower edge of measuring bar **2** and upper edge of track **1**.
- ▶ Tension track **1** if necessary. (For more information see: 5.12.2 Tightening track, page 298)

or

Relax track **1**. (For more information see: 5.12.3 Slackening track, page 299)

- ▶ Check track tension on second track of travel gear.

LHB/12221612/01/2018-12-14/en

3	*6 temperature levels* temperature display (for emergency mode of automatic air conditioning)	**11**	*Heating and air conditioning* menu
4	*12 temperature levels* temperature display (for air conditioning)	**12**	*Lower blower power* button
5	*Raise temperature* button	**13**	*Automatic mode* button (not for emergency mode of automatic air conditioning and air conditioning)
6	Operating status of air outlets	**14**	*ECON* button (not for emergency mode of air conditioning)
7	*Head area air outlets* button	**15**	*Recirculated air* button
8	*Chest area air outlets* button	**16**	*Defrosting and defogging* button

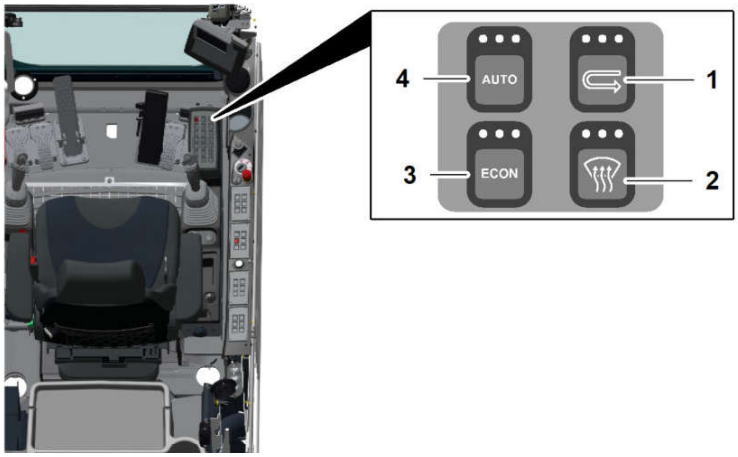

Fig. 754: Operation

1	*Recirculated air* key	**3**	*ECON* key
2	*Defrosting and defogging* key	**4**	*Automatic mode* key

▶ Start diesel engine.

▶ Run machine warm. (For more information see: 3.4.11 Bringing machine to operating temperature, page 146)

▶ Open air outlets in operator's cab.

▶ Switch on automatic mode.

▶ Switch on defrosting and defogging.

▶ Switch on recirculated air.

▶ Check heating air flow for sufficient air outlet output.

▶ Clean air outlet if necessary.

LHB/12221612/01/2018-12-14/en