en **Operator's manual**

Material handling machine

Document ID

ORIGINAL OPERATOR'S MANUAL

Order number: 12213976
Issued: 2020-09-01
Version: 01
Author: LHB / Technical Documentation Department

Product ID

Manufacturer: Liebherr-Hydraulikbagger GmbH
Type: LH 35 M Litronic
Type no.: 1254 (USA / CAN)
From Serial no.: 89912

Contact

Liebherr-Hydraulikbagger GmbH
Liebherrstraße 12
D – 88457 Kirchdorf/Iller

LHB/12213976/01/2020-09-01/en

NOTICE
Malfunctions in diesel engine and exhaust treatment system!
High emission values.

- ▶ Adhere to error messages.
- ▶ Rectify malfunctions in diesel engine and exhaust treatment system immediately.

If malfunctions are not rectified:
- ▶ Take machine out of service.

NOTICE
Incorrect operation!
Damage to machine.

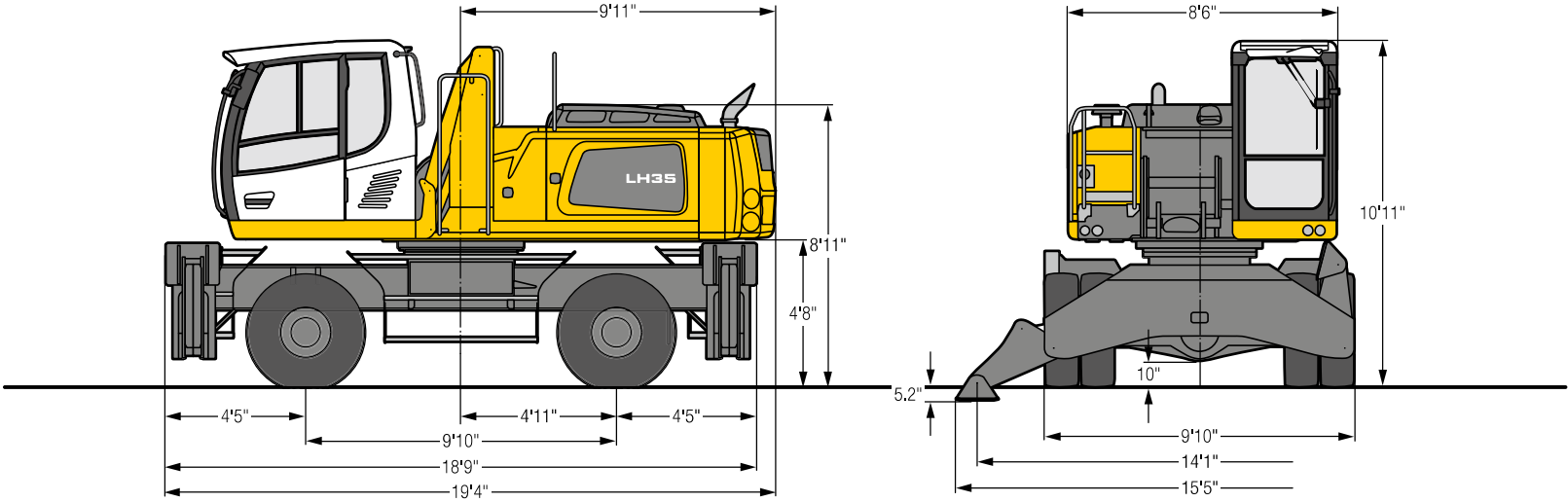
- ▶ Make sure that diesel engine and exhaust treatment system are operated and serviced exclusively according to operator's manual.

This CO_2 measurement results from testing over a fixed test cycle under laboratory conditions a(n) (parent) engine representative of the engine type (engine family) and shall not imply or express any guarantee of the performance of a particular engine.

Engine type	Nominal power	High idle rpm	Code	97/68/EC stage	CO_2 emissions during NRSC testing or RMC testing under standard laboratory conditions	CO_2 emissions during NRTC testing with warm start under standard laboratory conditions
D924 A7-04 SCRonly	129 kW	2200 rpm	F4HFE413G*B	IV	653.45 g/kWh	640.45 g/kWh
D924 A7-14 SCRT	129 kW	2200 rpm	F4HFE414G*B	IV	678.33 g/kWh	631.52 g/kWh
D934 A7-04	200 kW	1900 rpm	R04LQ7103	IV	682.18 g/kWh	726.85 g/kWh
D934 A7-14	140 kW	1900 rpm	R04LQ7102	IV	683.53 g/kWh	760.17 g/kWh
D934 A7-14	200 kW	1900 rpm	R04LU7101	IV	671.94 g/kWh	709.8 g/kWh
D936 A7-04	320 kW	1900 rpm	R06LQ7101	IV	650.74 g/kWh	694.6 g/kWh
D936 A7-14	320 kW	1900 rpm	R06LU7101	IV	664.06 g/kWh	673.06 g/kWh
D944 A7-04	200 kW	1900 rpm	R04KQ7102	IV	687.26 g/kWh	769.07 g/kWh
D944 A7-04	230 kW	1900 rpm	R04KQ7101	IV	682.36 g/kWh	750.86 g/kWh
D944 A7-14	200 kW	1900 rpm	R04KU7102	IV	686.43 g/kWh	731.46 g/kWh
D944 A7-14	230 kW	1900 rpm	R04KU7101	IV	681.03 g/kWh	713.34 g/kWh
D946 A7-04	330 kW	1900 rpm	R06KQ7102	IV	643.85 g/kWh	684.24 g/kWh
D946 A7-14	330 kW	1900 rpm	R06KU7101	IV	669.65 g/kWh	684.04 g/kWh
D9508 A7-04	455 kW	1900 rpm	V08MQ7102	IV	709.44 g/kWh	761.34 g/kWh
TCD 3.6 L4 DOConly / SCR	95 kW	2000 rpm	CFXI95BU	IV	713.39 g/kWh	730.75 g/kWh

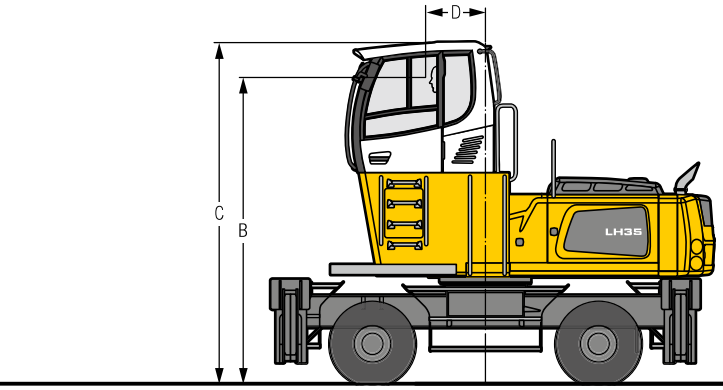
LHB/12213976/01/2020-09-01/en

LH 35 M – Dimensions



LH 35 M – Choice of Cab Elevationn

Cab Elevation LFC
(Rigid Elevation)



Increase type	LFC 120
Height	3'11"
B	13' 4"
C	14'11"
D	2' 7"

A rigid cab elevation has a fixed eye level height. For a lower transport height, the shell of the cab can be removed and replaced by a transport device. The dimension C is in this machine design for all rigid cab elevations 11'11".

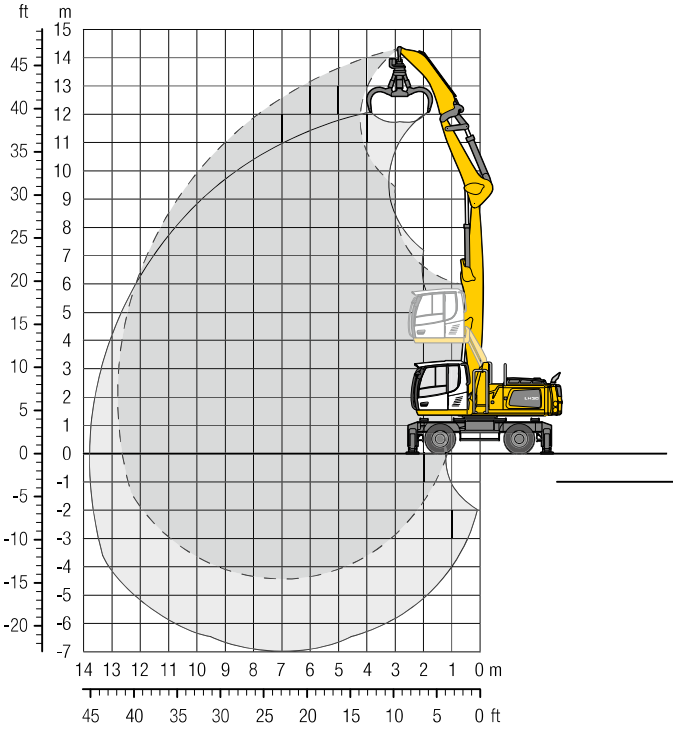
Cab Elevation LHC
(Hydraulic Elevation)

Increase type	LHC 255
B1	9' 5"
B2	17' 9"
C1	10'11"
C2	19' 4"
D1	4' 5"
D2	4'10"
E	10' 9"

The hydraulically adjustable cab allows the driver, that he can choose his field of view freely and at any time within the stroke.

Tires 12.00-20

LH 30 M – Equipment GSV13



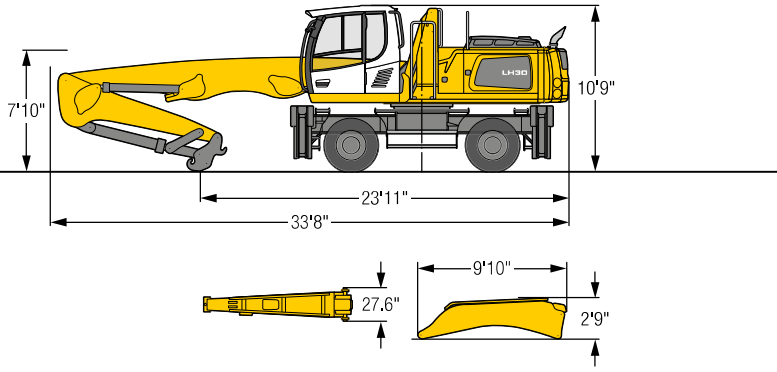
Operating Weight

The operating weight includes the basic machine with 4 point outriggers, hydr. cab elevation, 8 solid tires plus intermediate rings, straight boom 22'4", stick HD with tipping kinematics special 10'6", quick coupler SWA 48, stick extension 8'10" and multi-tine grab GM 65/ 0.78 yd³ semi-closed tines.

Weight	66,100 lb

A heavy counterweight (13,400 lb) is required for this attachment configuration.

Dimensions

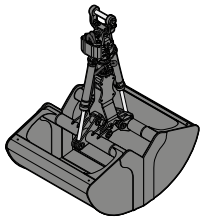


ft	Undercarriage	10 ft		15 ft		20 ft		25 ft		30 ft		35 ft		40 ft		45 ft				ft in
45	Stabilizers raised			14,3*	14,3*													12,3*	12,3*	16'11"
	4 pt. outriggers down			14,3*	14,3*													12,3*	12,3*	
40	Stabilizers raised					13,8*	13,8*	9,3	9,8*									8,8	9,0*	25' 7"
	4 pt. outriggers down					13,8*	13,8*	9,8*	9,8*									9,0*	9,0*	
35	Stabilizers raised					14,9*	14,9*	10,0	13,0*	6,7	9,1							6,0	7,6*	31' 2"
	4 pt. outriggers down					14,9*	14,9*	13,0*	13,0*	9,3*	9,3*							7,6*	7,6*	
30	Stabilizers raised							10,2	12,6*	7,0	9,4	4,7	6,6					4,6	6,5	35' 2"
	4 pt. outriggers down							12,6*	12,6*	11,1*	11,1*	7,3*	7,3*					6,9*	6,9*	
25	Stabilizers raised							10,1	12,6*	6,9	9,3	4,8	6,7					3,7	5,5	38' 1"
	4 pt. outriggers down							12,6*	12,6*	11,0*	11,0*	9,6*	9,6*					6,5*	6,5*	
20	Stabilizers raised					14,5	15,2*	9,6	12,8	6,7	9,1	4,7	6,6	3,2	4,8			3,2	4,8	40' 2"
	4 pt. outriggers down					15,2*	15,2*	12,9*	12,9*	11,1*	11,1*	9,6*	9,6*	6,6*	6,6*			6,3*	6,3*	
15	Stabilizers raised					13,4	16,2*	9,0	12,1	6,3	8,6	4,5	6,4	3,1	4,8			2,8	4,3	41' 6"
	4 pt. outriggers down					16,2*	16,2*	13,4*	13,4*	11,3*	11,3*	9,5*	9,5*	7,8	7,8*			6,2*	6,2*	
10	Stabilizers raised	15,0*	15,0*	19,2	22,9*	12,0	16,3	8,1	11,2	5,7	8,1	4,1	6,1	3,0	4,6			2,6	4,1	42' 2"
	4 pt. outriggers down	15,0*	15,0*	22,9*	22,9*	17,3*	17,3*	13,8*	13,8*	11,4*	11,4*	9,4*	9,4*	7,5*	7,5*			6,3*	6,3*	
5	Stabilizers raised	19,2*	19,2*	16,0	22,9	10,4	14,6	7,2	10,2	5,2	7,5	3,8	5,7	2,8	4,4			2,5	4,0	42' 4"
	4 pt. outriggers down	19,2*	19,2*	25,0*	25,0*	18,1*	18,1*	14,1*	14,1*	11,3*	11,3*	9,2*	9,2*	7,0*	7,0*			5,7*	5,7*	
0	Stabilizers raised	7,4*	7,4*	13,5	20,1	9,0	13,1	6,4	9,4	4,7	7,0	3,5	5,4	2,7	4,3			2,5	4,0	41'10"
	4 pt. outriggers down	7,4*	7,4*	25,0*	25,0*	18,0*	18,0*	13,8*	13,8*	10,9*	10,9*	8,5*	8,5*	6,1*	6,1*			4,8*	4,8*	
– 5	Stabilizers raised	8,3*	8,3*	12,2	18,6	8,1	12,2	5,8	8,8	4,4	6,6	3,3	5,2	2,6	4,2			2,6	4,0*	40' 6"
	4 pt. outriggers down	8,3*	8,3*	21,3*	21,3*	16,6*	16,6*	12,7*	12,7*	9,8*	9,8*	7,4*	7,4*	4,4*	4,4*			4,0*	4,0*	
–10	Stabilizers raised	10,5*	10,5*	11,7	18,0*	7,7	11,7	5,5	8,4	4,2	6,4	3,3	5,1					3,1	4,6*	36' 2"
	4 pt. outriggers down	10,5*	10,5*	18,0*	18,0*	13,8*	13,8*	10,6*	10,6*	8,0*	8,0*	5,3*	5,3*					4,6*	4,6*	
–15	Stabilizers raised																			
	4 pt. outriggers down																			

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

The lift capacities on the end of the stick extension without attachment are stated in lb x 1,000 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.

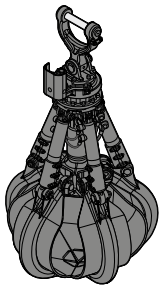
Attachments



Grab for Loose Material

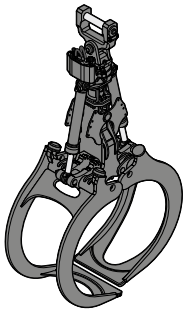
Shells for loose material with cutting edge (without teeth)

Grab model GM 20C							
Width of shells	ft in	3'11"	4'11"	5'9"	6'7"	7'5"	8'2"
Capacity	yd^3	1.57	1.96	2.29	2.62	2.94	3.27
Weight	lb	3,295	3,585	3,815	4,035	4,265	4,555



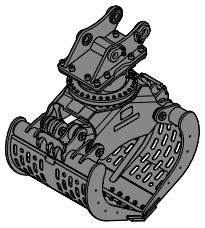
Multi-Tine Grab

		open		semi-closed		closed	
Grab model GM 64 (4 tines)							
Capacity	yd^3	0.52	0.78	0.52	0.78	0.52	0.78
Weight	lb	1,765	2,005	2,070	2,335	2,425	2,790
Grab model GM 65 (5 tines)							
Capacity	yd^3	0.52	0.78	0.52	0.78	0.52	0.78
Weight	lb	2,590	2,890	2,975	3,285	3,010	3,540



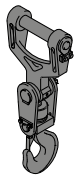
Wood Grab

Grab model GM 20B round-shaped (complete overlapping, vertical cylinders)						
Size	yd^2	1.20	1.55	1.79	2.03	2.27
Cutting width	ft in	2'8"	2'8"	2'8"	2'8"	2'8"
Height of grab, closed	ft in	8'5"	8'9"	8'11"	9'3"	9'6"
Weight	lb	3,405	3,470	3,515	3,585	3,880



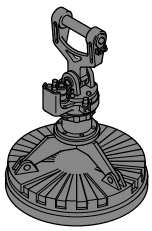
Sorting Grab

		ribbed	perforated	ribbed	perforated	ribbed	perforated
Grab model SG 30B							
Width of shells	ft in	3'3"	3'3"	3'11"	3'11"	4'7"	4'7"
Capacity	yd^3	0.98	1.11	1.18	1.31	1.37	1.50
Max. closing force	lbf	17,985	17,985	17,985	17,985	17,985	17,985
Weight incl. adapter plate SWA	lb	3,890	3,715	4,135	3,880	4,365	4,045



Load Hook

Max. load	lb	27,560
Height with suspension	ft in	3'1"
Weight	lb	300



Magnet Devices / Lifting Magnets

Generator	kW	13/17	13/17
Electromagnet with suspension			
Power	kW	8.8	10
Diameter of magnet	ft in	4'1"	4'5"
Weight	lb	2,890	3,750

* only magnet plate

– 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.
– Do not leave machine until all components are voltage-free.
– Make sure that all persons stay away from the machine and the high voltage cable.
– Have voltage switched off.

Damage

Incorrect operation in operating conditions deviating from intended use

– Equip machine according to operating conditions.

Following operating conditions deviate from intended use:
– Dust intensive applications
– Contaminated areas
– Lower or higher ambient temperatures

Incorrect operation in corrosive environment or with corrosive material

– Regularly clean machine to remove corrosive materials (for example salt, phosphate, fertiliser).
– Treat metallic surfaces with conservation wax if necessary.
– Derust, prime and repaint damaged and corroded steel parts.
– Make sure that piston rods of hydraulic cylinders are coated completely with an oil film.
– If piston rods are not coated completely with an oil film: Retract and extend piston rods along the entire stroke.
– If it is not possible to retract and extend the piston rods along the entire stroke: Clean and conserve piston rods.

2.2.5 Disposal

Danger to life

Unapproved disposal of gas containers and pressure vessels

– Before disposal, completely depressurise pressure vessel.
– Before disposal, professionally empty pressure vessel.
– Adhere to safety instructions of pressure vessel manufacturer.

Unapproved disposal of refrigerant

– Have refrigerant disposed of by refrigerant recycling point.
– Adhere to safety data sheet of refrigerant during disposal.

LHB/122139/76/01/2020-09-01/en

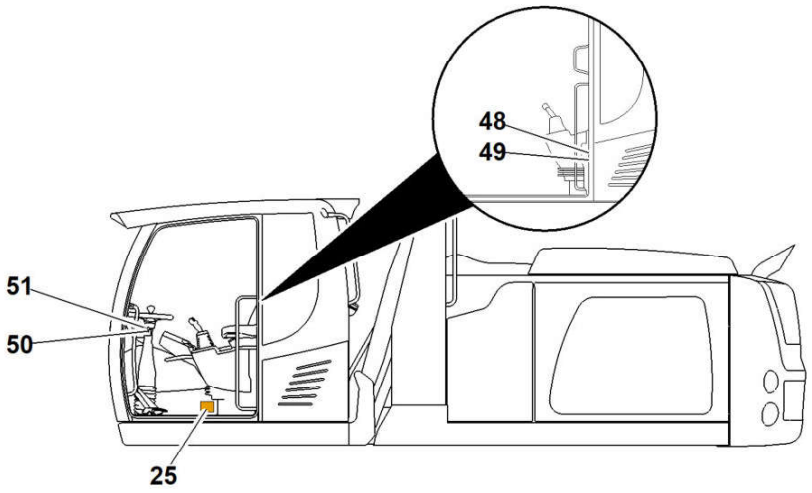


Fig. 19: Location of signs

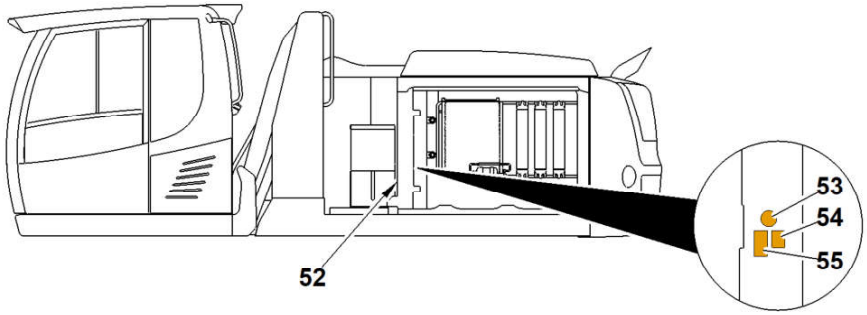


Fig. 20: Location of signs

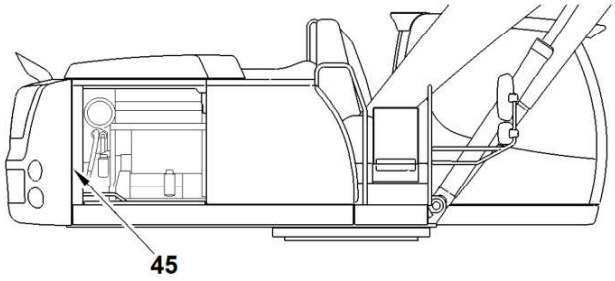


Fig. 21: Location of signs

LHB/122139/76/01/2020-09-01/en

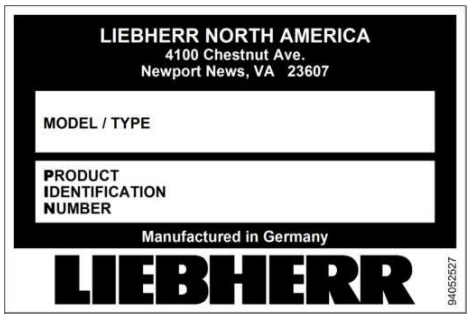


Fig. 77: Identification tag (USA) of the machine

2.5 Protective devices on the machine

2.5.1 Safety lever or folding console

Danger to life

Unwanted movements of machine

- Before leaving operator's seat pull up safety lever or folding console.
- Do not use safety lever as handle.
- Do not use control elements (for example folding console, joystick) as handle.

2.5.2 Operator's cab

Danger to life

Unapproved working method

- Put on safety belt before starting work.
- Make sure that changes in the operator's cab (for example installation of accessories) do not restrict the operator's workspace.

Injuries

Objects in the operator's cab

- Remove objects that are not necessary for the work from the operator's cab.
- Stow and fasten objects that are necessary for the work before starting.
- Make sure that objects carried do not protrude into the operator's workspace.

2.5.3 Height-adjustable operator's cab

Danger to life

Persons in the danger zone

- Make sure there are no persons in the danger zone under the operator's cab.

LHB/122139/76/01/2020-09-01/en

Burns

Incorrect maintenance

– Shut off engine before any maintenance or repair.

Hot pressurised engine cooling system

– Do not touch coolant and parts carrying coolant.
– Let the cover and parts carrying coolant cool down.

Incorrect heat protection

– Make sure that all holders and protective shields against vibration, chafing and heat build-up have been installed correctly.

Incorrect charging of battery

– Do not smoke.
– Avoid naked flames.
– Wear safety glasses.
– Put on protective gloves.

Incorrect handling of flammable liquids

– Exclusively transport flammable liquids on the machine in the designated tanks.
– Make sure that no oil squirts out of leaks.
– Regularly check lines, hoses and screwed connections for leaks and damage.
– Immediately seal leaks.
– Immediately replace damaged parts.

Incorrect refuelling

– Before refuelling, shut off diesel engine.
– Before refuelling, switch off auxiliary heater (option).
– Do not smoke.
– Avoid naked flames.
– Do not touch fuels with your skin.
– Do not inhale fuel vapours.

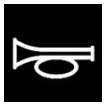
Damage to machine

– Before placing machine under heavy load, make sure that machine is at operating temperature.

Environmental pollution

– When working in following areas, adhere to the laws, regulations and rules applicable at the place of use.
  • Areas at risk of water (for example bodies of water)
  • Sound-sensitive areas
  • Emission-sensitive areas

LHB/122139 76/01/2020-09-01/en

Symbol	Description	Symbol	Description
	Lowering windscreen		Positioning slewing brake
	Horn		SVAB
	Quick-selection button		Teach-in
	Activating motor cable drum manually		Deactivating travel alarm
	Speed controller		

Tab. 9: General symbols

Control changeover

Symbol	Description	Symbol	Description
	Changing over control of function 1 and function 2 on double pedal		Changing over control of mini-joystick and double pedal
	Changing over control of shovel flap to double pedal		Changing over control of two-piece boom to up or side
	Changing over control of high pressure circuit 1 and two-piece boom		Changing over control
	Changing over control of bucket and high pressure circuit 1		Changing over control of tiltrotator and high pressure circuit 1

Tab. 10: Control changeover

Optional equipment

Symbol	Description	Symbol	Description
	Watering device		Sanding equipment

LHB/122139/76/01/2020-09-01/en

Symbol	Meaning
	Request denied
	Teleservice enabled
	Liebherr measuring system
	Socket on stick: Voltage 1
	Socket on stick: Voltage 2
	Socket on stick: Voltage 3
	Socket on stick; neutral position required for voltage 1

Tab. 19: General status symbols

Working attachment and working tools

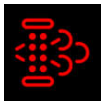
Symbol	Meaning
	Lowering boom active
	Boom adjustment active
	Boom adjustment; neutral position required
	Lateral boom adjustment active
	Lateral boom adjustment; neutral position required

LHB/122139776/01/2020-09-01/en

Symbol	Meaning
	Outrigger extension blocked
	Outrigger retraction blocked
	Support adjustment lever; neutral position required
	Outrigger support extended
	Support fully extended

Tab. 28: Status symbols of support

Diesel particulate filter

Symbol	Meaning
	Active regeneration
	Regeneration blocked
	Diesel particulate filter contaminated
	Diesel particulate filter heavily contaminated

Tab. 29: Status symbols of diesel particulate filter

SCR system

Symbol	Meaning
	Bleeding active

LHB/122139776/01/2020-09-01/en

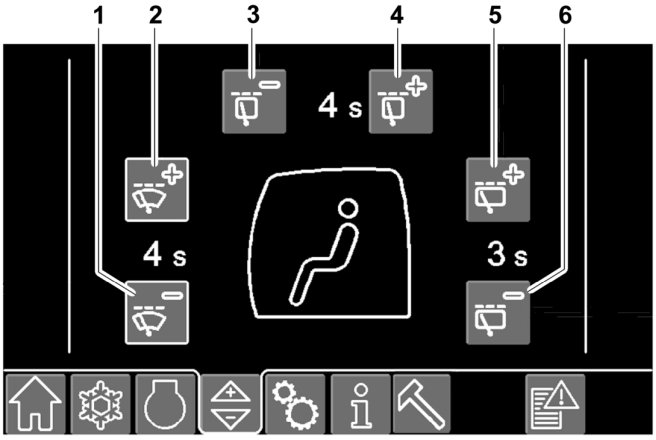


Fig. 415: Windscreen wiper interval submenu[5)]

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:  > 

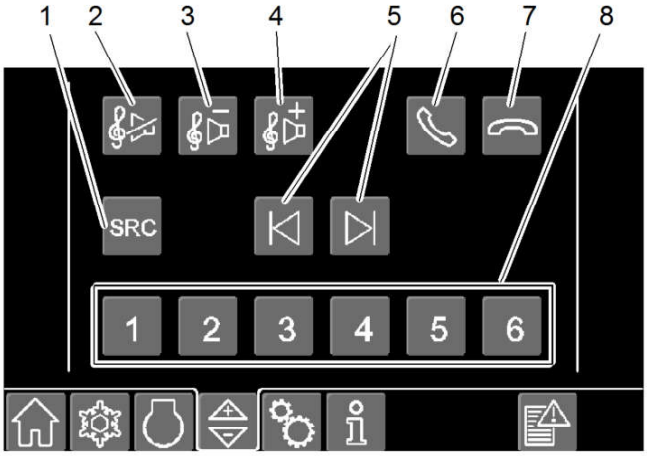


Fig. 416: Radio remote control submenu

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

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

LHB/122139/76/01/2020-09-01/en

Display

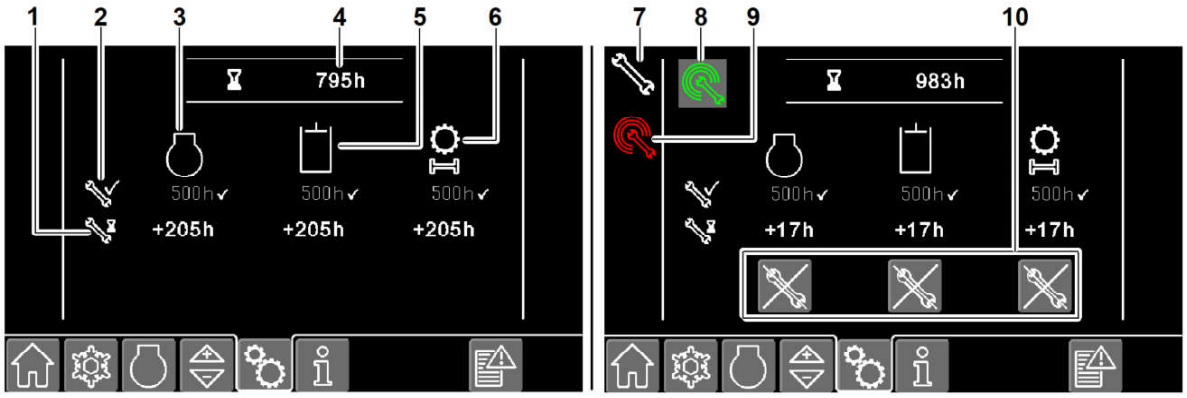


Fig. 455: Maintenance submenu

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

Maintenance

If *maintenance due* status symbol **7** appears:

▶ Contact Liebherr customer service and have maintenance performed.

▶ Confirm display: Press *confirmation of maintenance due message* button **10**.
▷ *Maintenance due* status symbol **7** 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.

6) Applies to machines with wheeled undercarriage

LHB/122139/76/01/2020-09-01/en

3.2.39 *Operating time* submenu

Menu call:  > 

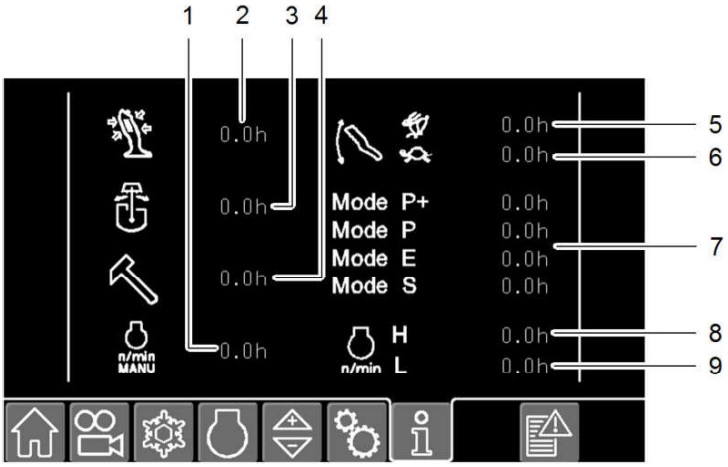


Fig. 486: Operating time submenu

1 No function assigned
2 Joysticks
3 Slewing gear
4 Working tool
5 Travelling in high gear
6 Travelling in creeper gear
7 Modes
8 Maximum engine speed
9 Minimum engine speed

3.2.40 *Fuel consumption* submenu

If machine is equipped with an SCR system, the *fuel consumption* menu additionally displays the values for the consumption of diesel exhaust fluid.

Menu call:  > 

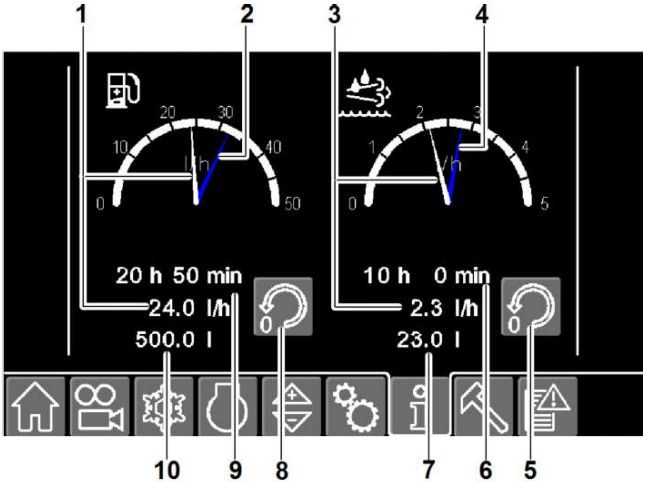


Fig. 487: Fuel consumption submenu

1 Average fuel consumption
6 Measurement period

See next page for continuation of the image legend

Adjusting seat position

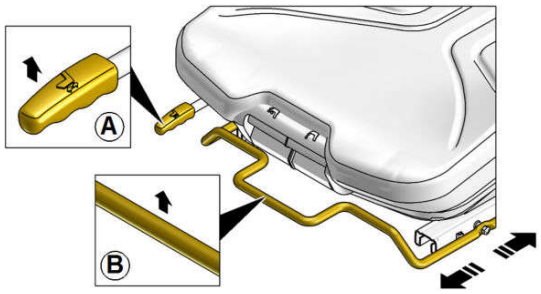


Fig. 507: Adjusting seat position

A Adjusting seat position without armrests

B Adjusting seat position with armrests

Adjusting armrests

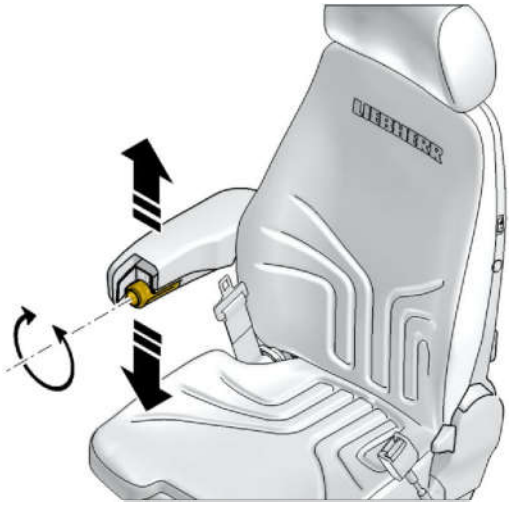


Fig. 508: Adjusting armrest angle

LHB/122139/76/01/2020-09-01/en

▷ Corresponding symbol on button is yellow.

▶ Activate function: Press confirmation button within 5 seconds.
▷ Corresponding symbol on button is green.

If function is not activated:
▶ Preselect and confirm function again.

Deactivating function via button on the display

▶ Preselect function: Press corresponding button on the display.
▷ *Confirmation required* status symbol appears on the display:

▷ Corresponding symbol on button is yellow.

▶ Deactivate function: Press confirmation button within 5 seconds.
▷ Corresponding symbol on button is white.

If function is not deactivated:
▶ Preselect and confirm function again.

3.3.12 Horn

Note
Different machine configuration!

▶ Observe control description sticker.

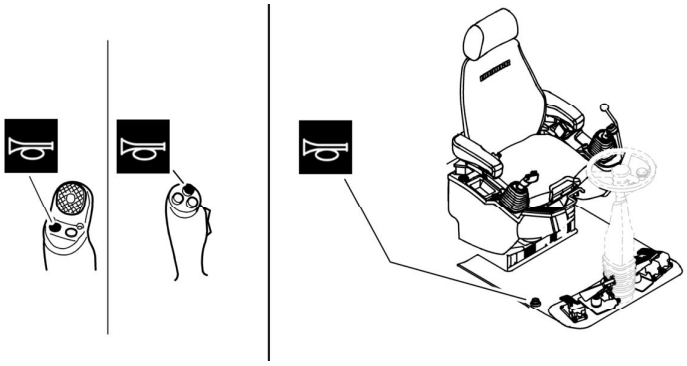
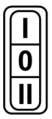


Fig. 539: Horn button

▶ Press *horn* button.
▷ Acoustic warning signal sounds.

LHB/122139776/01/2020-09-01/en



- ▶ Switch on cab lighting system: Set switch for cab lighting system **2** to II.
  - ▷ Cab lighting system switches on automatically when cab door is opened.
  - ▷ Cab lighting system switches off automatically when cab door is closed.
- ▶ Switch off cab lighting system: Set switch for cab lighting system **2** to 0.

Reading lamp

- ▶ Make sure that ignition key is set to 1.

- ▶ Switch on reading lamp: Set switch for reading lamp **3** to I.
- ▶ Switch off reading lamp: Set switch for reading lamp **3** to 0.

3.3.19 Beacon (option)

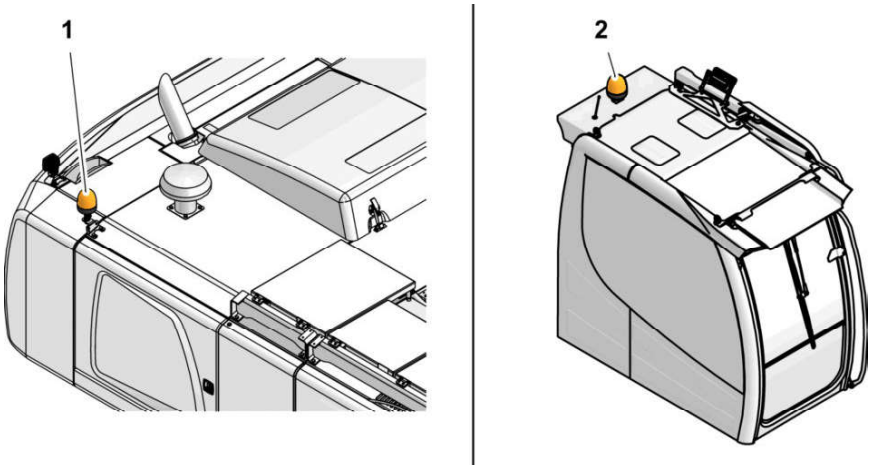


Fig. 568: Beacons

1 Beacon on uppercarriage

2 Beacon on operator's cab

Manual beacon (option)

- ▶ Switch on beacon: Press *beacon* key.
  - ▷ LEDs in key light up.
  - ▷ Beacon is lit.

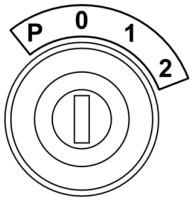
Automatic beacon (option)

- ▶ Switch off beacon: Fold down folding console.
  - ▷ LEDs in *beacon* key light up.
  - ▷ Beacon is lit.

LHB/122139776/01/2020-09-01/en

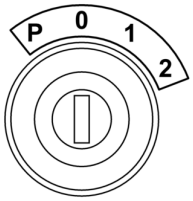
- ▶ Use blue ignition key **1** to set starting switch to 0.
- ▶ Pull out blue ignition key **1**.
- ▶ Teach in additional blue ignition key: Repeat last four steps.

Activating immobiliser



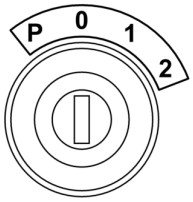
- ▶ Use blue ignition key **1** to set starting switch to 0.
  ▷ Immobiliser is activated.

Deactivating immobiliser



- ▶ Use taught-in blue ignition key **1** to set starting switch to 1.
  ▷ Immobiliser is deactivated.

Deleting ignition key



- ▶ Use red master key **2** to set starting switch to 1.
- ▶ Wait 20 seconds.
  ▷ All taught-in blue ignition keys are deleted.

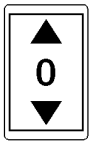
3.4.7 Preparing machine for dust intensive application

NOTICE
Contaminated hydraulic oil!
Damage to machine.

- ▶ Observe maintenance intervals.
- ▶ Make sure that machine is equipped with 0.59 / 0.20 th filter cartridges.

- ▶ Equip machine with bypass filters.
- ▶ Equip machine with attachment for “flow reversal for radiator cleaning”. (For more information see: 3.4.36 Reversible fan drive for radiator cleaning (option), page 194)

LHB/122139776/01/2020-09-01/en

Switch position		Symbol	Travel direction
	Top		Reverse
	0		Neutral
	Bottom		Forward

Tab. 52: Travel direction switch and status symbols

Note
Different machine configuration!

▶ Adhere to control description sticker in operator's cab.

If parking brake is applied:
▶ Press *parking brake* key.

If service brake is applied:
▶ Press retainer **3** downward.

▶ Select travel direction.

▶ Press accelerator pedal **5** slowly.

(For more information see: 3.6.3 Travelling at operating location, page 227)

(For more information see: 3.6.4 Travelling with load at operating location, page 228)

(For more information see: 3.6.5 Travelling under obstacles, page 229)

Braking

WARNING
Braking too hard and abruptly!
Injuries.

▶ Brake carefully.

▶ Carefully press pedal of service brake **4**.

Emergency brake

CAUTION
Maximum braking effect!
Injuries.

▶ Operate emergency brake exclusively in an emergency.

LHB/122139/76/01/2020-09-01/en

Double pedal

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

Tab. 65: Double pedal

3.4.24 Turning and braking uppercarriage

Turning uppercarriage

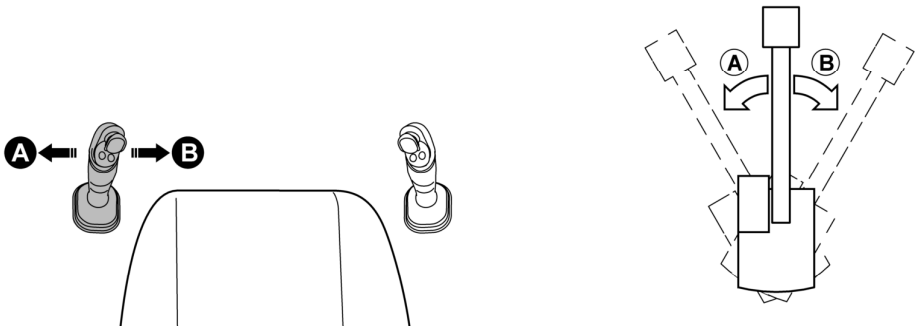


Fig. 671: Turning uppercarriage

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

▶ Move joystick in direction **A**.
  ▷ Uppercarriage turns to the left.

▶ Move joystick in direction **B**.
  ▷ Uppercarriage turns to the right.

Braking uppercarriage

▶ Release joystick.
  ▷ Uppercarriage is braked hydraulically.

▶ Move joystick in opposite direction.
  ▷ Uppercarriage is braked hydraulically to maximum extent.

LHB/122139 76/01/2020-09-01/en

Swivelling working tool

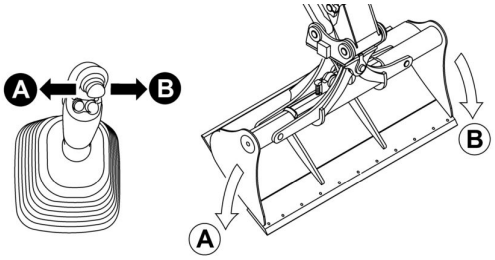


Fig. 701: Swivelling working tool

- ▶ 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.

3.4.32 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.

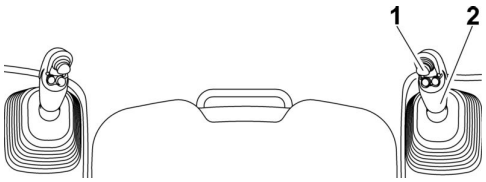


Fig. 702: Right joystick

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

Controlling working tool with right joystick

Changing over control

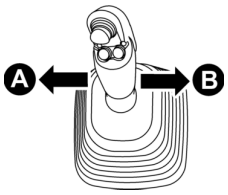


Fig. 703: Controlling working tool with joystick

LHB/122139776/01/2020-09-01/en

- ▶ 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.

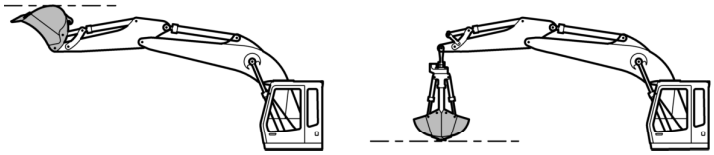


Fig. 741: Maximum height with bucket, minimum height with grapple

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.

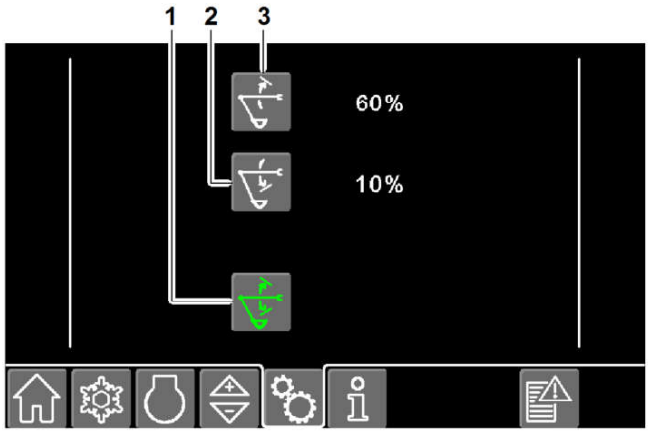


Fig. 742: Hoist cylinder shut-off menu

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

LHB/122139 76/01/2020-09-01/en

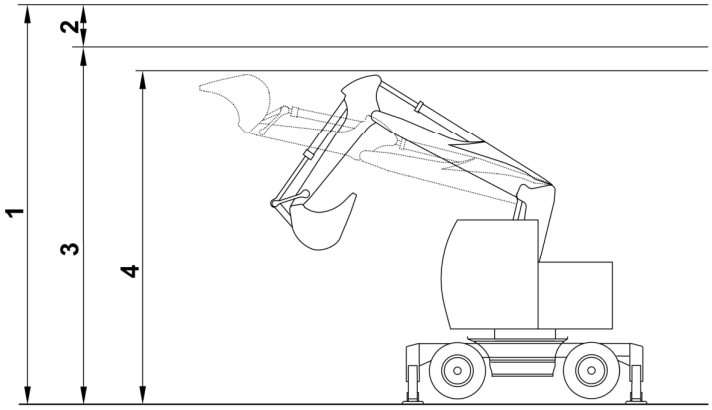


Fig. 785: Height limitation

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

The height limitation calculation is based on the maximum radius of largest Liebherr bucket (5‘ 9“ ft-in). If the Tool Management option is activated, the maximum radius of working tool is determined by settings in Tool Management.

Maximum working height

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

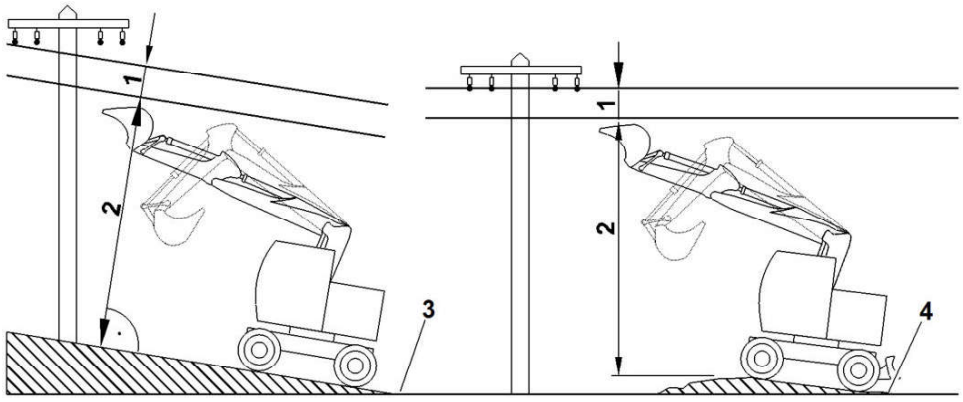


Fig. 786: Example factors for setting maximum working height

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

LHB/122139 76/01/2020-09-01/en

▶ Turn key to left for authorisation.

Switching on load moment limitation

If activated, load moment limitation is switched on when machine is started again. The signal lamp lights up.

DANGER
Machine tipping over!
Danger to life.

▶ Make sure that oscillating axle is locked.

Make sure the following preconditions are met:
❑ Load moment limitation is enabled.

Switching on load moment limitation using the display

▶ Press *load moment limitation* button **5**.

▶ Press confirmation button.
▷ LEDs in *load moment limitation* key on control unit A light up.
▷ *Load moment limitation* button lights up green:

▷ Warning buzzer sounds briefly.
▷ Signal lamp lights up.

Switching on load moment limitation using control unit A

▶ Press *load moment limitation* key on control unit A.

▶ Press confirmation button.
▷ LEDs in *load moment limitation* key on control unit A light up.
▷ *Load moment limitation* button lights up green:

▷ Warning buzzer sounds briefly.
▷ Signal lamp lights up.

Switching off load moment limitation

Make sure the following precondition is met:
❑ Load moment limitation is enabled.

Switching off load moment limitation using display

▶ Press *load moment limitation* button **5**.

▶ Press confirmation button.
▷ LEDs in *load moment limitation* key on control unit A go out.

LHB/122139/76/01/2020-09-01/en

3.6.6 Handling loads

Handling loads

DANGER
Machine tipping over!
Danger to life.

- ▶ Make sure there are no persons in hazard zone.
- ▶ Make sure that ground has sufficient load-bearing capacity.
- ▶ Carry out all movements steadily.
- ▶ Draw working attachment in close to machine and move load close to the ground.

WARNING
Incorrect handling of grapple!
Injuries.

- ▶ Make sure that grapple and load do not swing close to operator's cab.
- ▶ Prevent grapple and load from swinging: Move joystick carefully and slowly.

- ▶ Adhere to load lift chart.
- ▶ Carefully take up load.
- ▶ Carefully swivel load over unloading point.
- ▶ Put down load.

or

Empty grapple.

Travelling with load

- ▶ Observe instructions about travelling.
- ▶ Align uppercarriage parallel to undercarriage.

3.6.7 Loading transport vehicle

DANGER
Falling load!
Danger to life.

- ▶ Make sure there are no persons in danger zone.
- ▶ Make sure that there are no persons in transport vehicle.
- ▶ Do not slew working attachment over operator's cab of transport vehicle.

LHB/122139776/01/2020-09-01/en

4 Pin
5 Grapple suspension
9 Connection for turning grapple

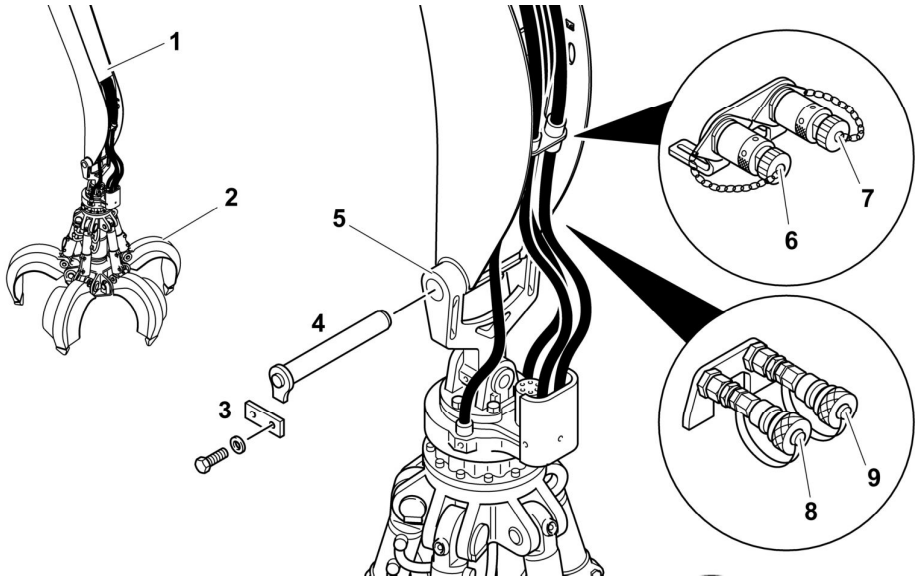


Fig. 863: Grapple on industrial stick, variant 2

1 Stick
2 Grapple
3 Pin retention
4 Pin
5 Grapple suspension
6 Connection for opening or closing grapple
7 Connection for opening or closing grapple
8 Connection for turning grapple
9 Connection for turning grapple

Installing grapple

CAUTION
Pressurised hydraulic lines!
Injuries.

▶ Before coupling and uncoupling depressurise hydraulic system.

NOTICE
Incorrect mixture of hydraulic oils!
Damage to hydraulic system.

▶ Do not mix hydraulic oils.

Make sure the following preconditions are met:
❑ Second person is available for support.
❑ Required hydraulic hoses for grapple operation are mounted on industrial stick.
❑ Tines of grapple are fully opened.
❑ Grapple stands safely on even surface.

▶ Depressurise hydraulic hoses. (For more information see: Depressurising hydraulic hoses, page 342)

▶ Position bearings of industrial stick for grapple between bearings of grapple suspension.

LHB/122139/76/01/2020-09-01/en

Emergency lowering lever in operator's cab

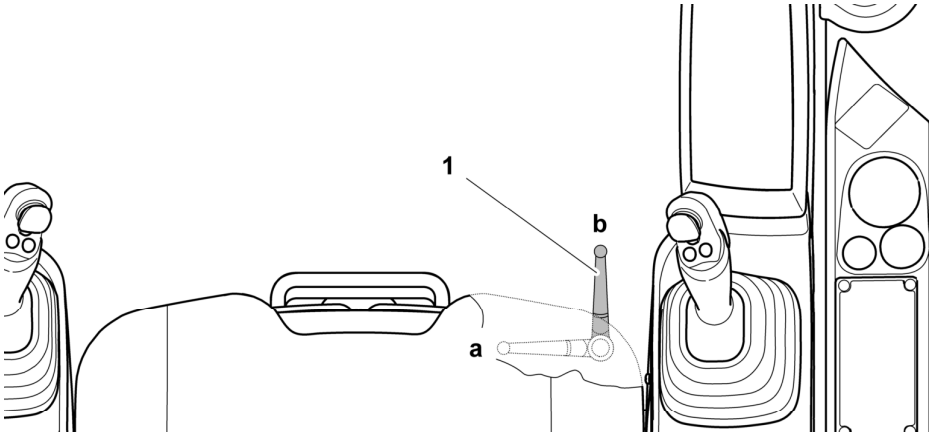


Fig. 873: Emergency lowering lever in operator's cab

1 Emergency lowering lever
a Cab adjustment mode position
b Emergency lowering position

▶ Move emergency lowering lever **1** to emergency lowering position **b**.
▷ Operator's cab is lowered.

▶ Stop lowering of operator's cab: Move emergency lowering lever **1** to cab adjustment mode position **a**.

Emergency lowering lever on pillar of cab lift frame

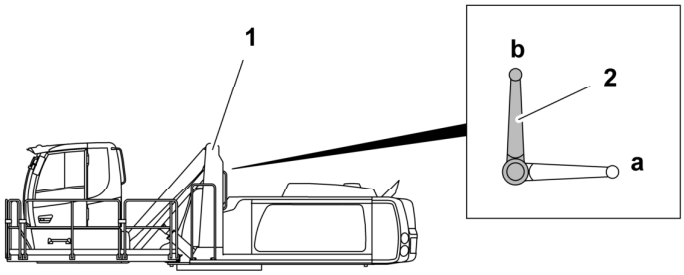


Fig. 874: Emergency lowering lever on pillar of cab lift frame

1 Pillar of cab lift frame
2 Emergency lowering lever
a Cab adjustment mode position
b Emergency lowering position

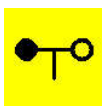
▶ Move emergency lowering lever **2** to emergency lowering position **b**.
▷ Operator's cab is lowered.

▶ Stop lowering of operator's cab: Move emergency lowering lever **2** to cab adjustment mode position **a**.

3.10.4 Towing

Towing is a stopgap measure and exclusively permitted in following situations:
– Tow machine out of danger area.
– Tow machine for repair.

LHB/122139/76/01/2020-09-01/en

Symbol	Meaning	Effect, characteristic	Remedy
	Grease container of central lubrication system is empty.	Bearings are damaged.	Fill with grease.
	Grease container 1 of central lubrication system is empty.		
	Grease container 2 of central lubrication system is empty.		
	While diesel engine is running: Pump defective. Necessary accumulator pressure is not reached.	No braking effect	Shut off diesel engine and contact Liebherr customer service.
	While switching on ignition: Necessary accumulator pressure is not reached.		Start diesel engine and wait 60 seconds. If symbol remains displayed: Contact Liebherr customer service
	Pressure sensor defective, wire break, failure of a brake circuit	Reduced braking effect	Contact Liebherr customer service.
	Parking brake is applied.	Damage to travel gearbox	Release parking brake during work. During work brake with service brake.
	Windscreen washer fluid level is too low.	Windscreen wiping is limited.	Fill with windscreen washer fluid.
	Fuel level of auxiliary heater is too low.	Auxiliary heater is not working.	Fill with fuel for auxiliary heater.
	Hoist cylinder protection is defective.	Hoist cylinder is damaged.	Contact Liebherr customer service.
	Stick cylinder shut-off is defective.	Stick cylinder is damaged.	Contact Liebherr customer service.
	Movement restrictions are switched off.	Working attachment is damaged.	Carefully move working attachment.
	Movement restrictions are switched off.	Working attachment is damaged.	Carefully move working attachment.
	Increased wind speed.	Working area is restricted.	Park and secure machine.

LHB/122139/76/01/2020-09-01/en

Fuse	Consumer	Rating [A]
F1	Not occupied	
F2	Counterweight working headlight	15
F3	Horn	10
F4	Beacon rotary stage	10
F5	Refuelling pump control voltage	7.5
F6	Not occupied	
F7	Right headlight	7.5
F8	Trailer brake light	5
F9	Switchable socket	10
F10	Engine control unit, terminal 15	5
F11	Not occupied	
F12	Magnet system ON	2
F13	Not occupied	
F14	Safety lever, inverse or folding console, inverse	1
F15	Auxiliary heater	20
F16	Step lighting	15
F17	Working headlight of working attachment, left	20
F18	Working headlight of working attachment, right	20
F19	Not occupied	
F20	Not occupied	

Tab. 100: Fuse strip A214.XF1

Fuse	Consumer	Rating [A]
F1	Supply voltage: Y6 parking brake, Y55 1st gear, Y56-1 front blade, Y56-2 rear blade, Y60 2nd gear, Y 66 oscillating axle locking, Y215 front left outrigger, Y216 front right outrigger, Y217 rear left outrigger, Y218 rear right outrigger	15
F2	Not occupied	
F3	Supply voltage: Y3 servo control, Y28-1 or Y28-2 quick coupler, Y200 lift frame up, Y201 lift frame down, Y554 joystick steering, B387-1 or B387-2 pressure relief high pressure circuit lines	15
F4	Power supply Y410 mower rake	10
F5	Reserve	7.5
F6	Reserve	7.5
F7	Reserve	7.5
F8	Supply voltage: Y563-1 or Y564 ride control	7.5
F9	Reserve, terminal 15	7.5
F10	Reserve, terminal 15	7.5

LHB/122139776/01/2020-09-01/en

LHB/122139776/01/2020-09-01/en

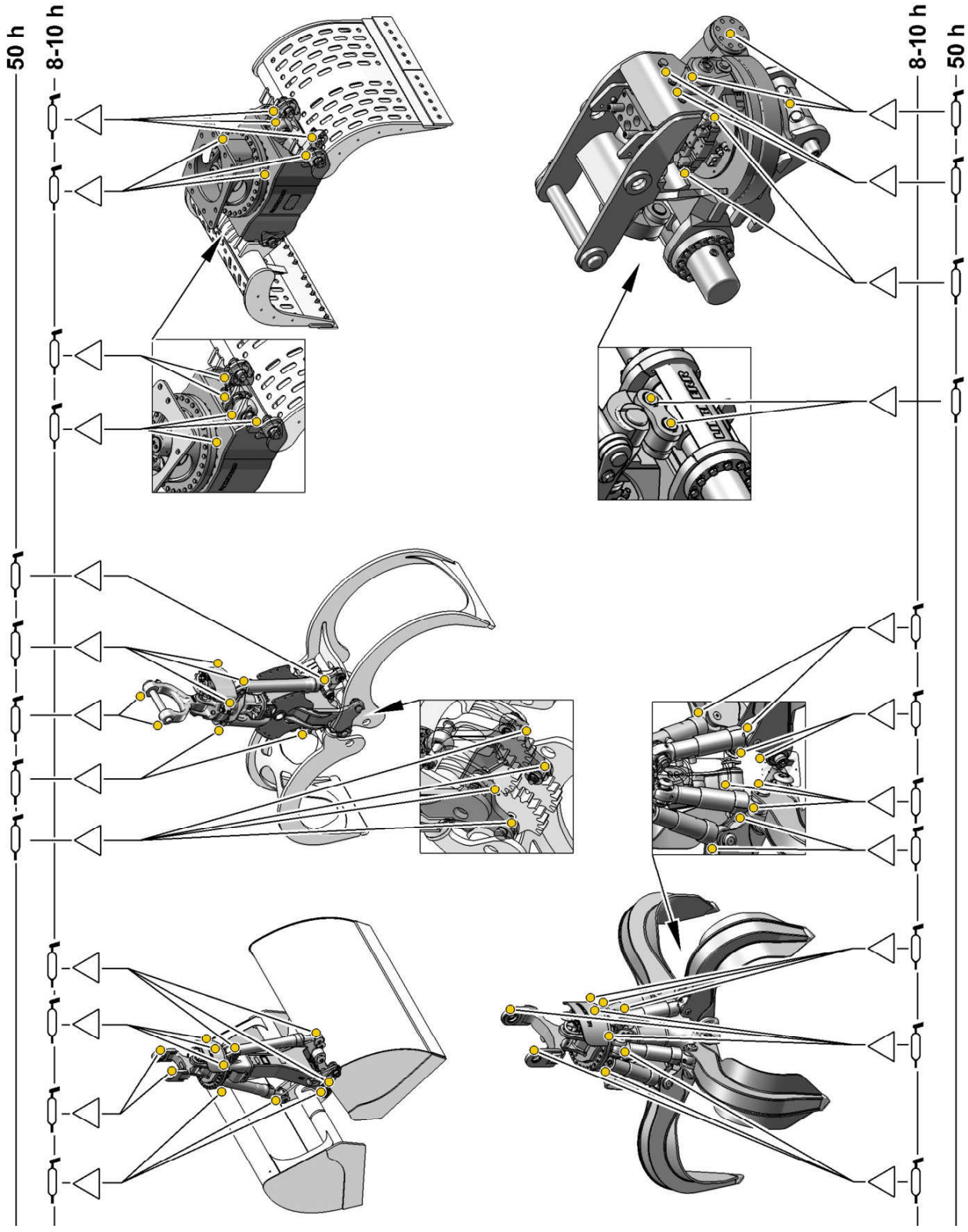


Fig. 957: Lubrication chart for working tools

5.3.9 Gear oils

Gear oils specified in the table are not suitable for following gearboxes:
- Transmission (For more information see: 5.3.10 Transmission oils, page 300)
- Pump distributor gear (For more information see: 5.3.11 Pump distributor gear oils, page 301)
- Automatic transmission

Liebherr recommendation

Ambient temperature	Description
-22 to 122 °F	Liebherr Gear Basic 90 LS
-31 to 122 °F	Liebherr Gear Plus 20W-40
-22 to 122 °F	Liebherr Gear Hypoid 90 EP
-13 to 122 °F	Liebherr Hypoid 85W-140 EP
-40 to 122 °F	Liebherr Syntogear Plus 75W-90

Tab. 137: Liebherr recommendation

Minimum quality requirements

Specification
API: GL-5
MIL-L: 2105 D or E, PRF-2105 D or E

Tab. 138: Minimum quality requirements

Adhere to device specifications according to ZF approvals.

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

For fuel and operating fluids that only meet the minimum requirements, it is possible that the oil service life may differ from that of the Liebherr recommendation.

5.3.10 Transmission oils

Liebherr recommendation

Description	Ambient temperature
Liebherr Motoroil 5W-30	To -40 °F
Liebherr Motoroil 5W-30 low ash	To -40 °F
Liebherr Motoroil 10W-40	To -31 °F
Liebherr Motoroil 10W-40 low ash	To -31 °F

Tab. 139: Liebherr recommendation

LHB/122139/76/01/2020-09-01/en

5.5.3 Putting machine in maintenance position

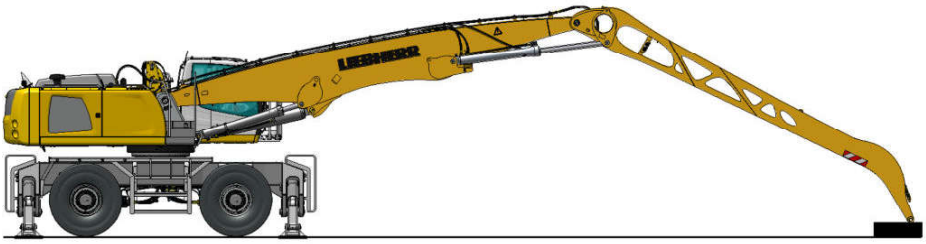


Fig. 969: Putting machine in maintenance position

- ▶ Park machine on firm and level ground.
- ▶ Place working attachment on firm ground.
- ▶ Switch off the diesel engine and let it cool.
- ▶ Pull out ignition key.
- ▶ Switch off battery main switch.

LHB/122139776/01/2020-09-01/en

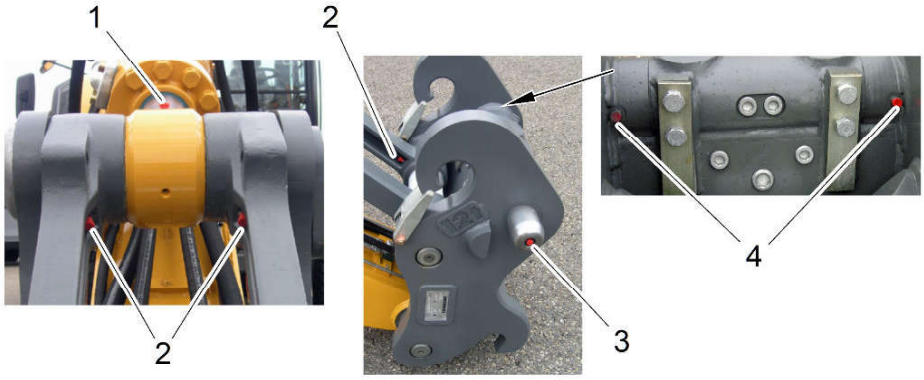


Fig. 976: Lubricating points

1	Bearings of piston rod	**3**	Bearing for pin of quick coupler
2	Bearings of change levers	**4**	Bearing for pin of quick coupler

NOTICE
Too little lubrication!
Damage to bearings.

- ▶ Check grease fitting for damage.
- ▶ Check lubricating bores for blockages.
- ▶ Check viscosity of grease.

Note
Reduce effort when lubricating with grease gun.

- ▶ Inject grease slowly.

- ▶ Prepare hand lever grease gun from on-board tool kit or commercially available grease gun.
- ▶ Observe lubrication chart.
- ▶ Remove protective cap before lubrication.
- ▶ Inject grease into grease fitting until grease emerges from bearings.
- ▶ Put on protective cap after lubricating.

If quick coupler bearings are lubricated:

- ▶ Fully retract bearing pin of quick coupler.
- ▶ Lubricate bearing for pin of quick coupler **3**.
- ▶ Lubricate bearing for pin of quick coupler **4**.

LHB/122139/76/01/2020-09-01/en

5.8.7 Air filter: Replacing safety filter cartridge

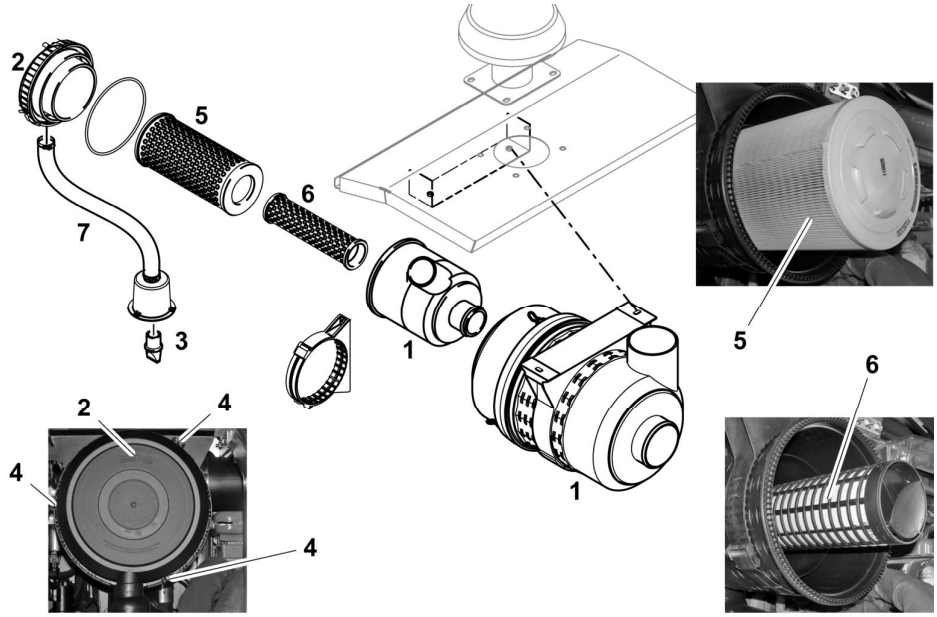


Fig. 983: Air filter: Replacing safety filter cartridge

1	Filter housing	**5**	Main filter cartridge
2	Bowl with prefilter	**6**	Safety filter cartridge
3	Dust dump valve	**7**	Air hose
4	Clamp		

- ▶ Shut off diesel engine.
- ▶ Switch off battery main switch.
- ▶ Loosen clamps **4** (3 pieces) on bowl **2**.
- ▶ Remove bowl **2**.
- ▶ Take out main filter cartridge **5**.
- ▶ Turn safety filter cartridge **6** counter-clockwise and remove.

NOTICE
Dirt entering open engine intake!
Damage to diesel engine.

- ▶ After taking out the contaminated safety filter cartridge immediately insert new safety filter cartridge.

- ▶ Turn new safety filter cartridge **6** and tighten slightly by hand.

NOTICE
Incorrect cleaning!
Damage to safety filter cartridge.

- ▶ Do not blow out filter housing with compressed air.

- ▶ Clean insides of bowl **2** and filter housing **1** with damp cloth.

LHB/122139761/01/2020-09-01/en

- ▶ Fill coolant no faster than 2.11 gal/min into coolant container **3** until coolant container **3** is completely filled with coolant.
- ▶ Fill coolant no faster than 2.11 gal/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 339)

When machine has cooled down:

- ▶ Check coolant level, refill coolant if necessary. (For more information see: Filling with coolant, page 339)

5.9.2 Checking cooling system and heat exchanger for contamination and cleaning

NOTICE
Incorrect cleaning!
Damage to condenser fins.

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

LHB/122139776/01/2020-09-01/en

5.12 Axles

5.12.1 Screw plug tightening torques

Thread size	Tightening torque (guide values)
M14x1.5	33 ft-lb
M16x1.5	44 ft-lb
M22x1.5	74 ft-lb
M24x1.5	89 ft-lb
M30x1.5	118 ft-lb
M42x1.5	192 ft-lb
M45x1.5	207 ft-lb

Tab. 161: Screw plug tightening torques

5.12.2 Lubricating axles

NOTICE
Insufficient lubrication!
Damage to bearings.

- ▶ Make sure that grease emerges at all lubricating points.
- ▶ Adapt lubricating interval to deployment.
- ▶ Exclusively use grease as per prescribed specification.

Manually lubricating oscillating axle

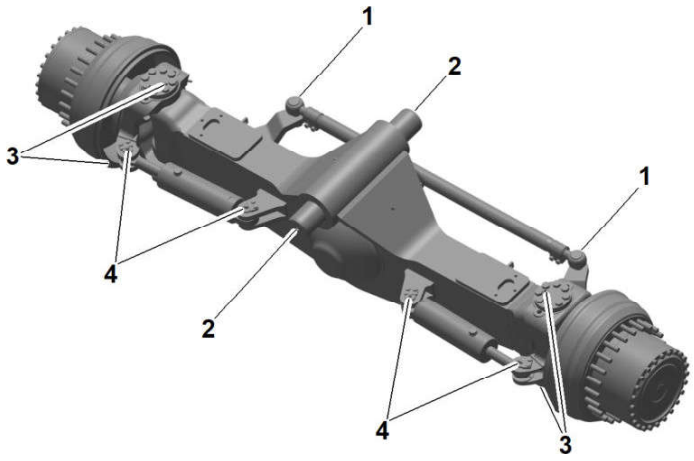


Fig. 1022: Lubricating points on oscillating axle

1 Grease fitting of tie rod bearings

3 Grease fittings of steering knuckle bearings

See next page for continuation of the image legend

LHB/122139/76/01/2020-09-01/en

5.15 Lubrication system

5.15.1 Lubrication system: Filling with grease

Uppercarriage

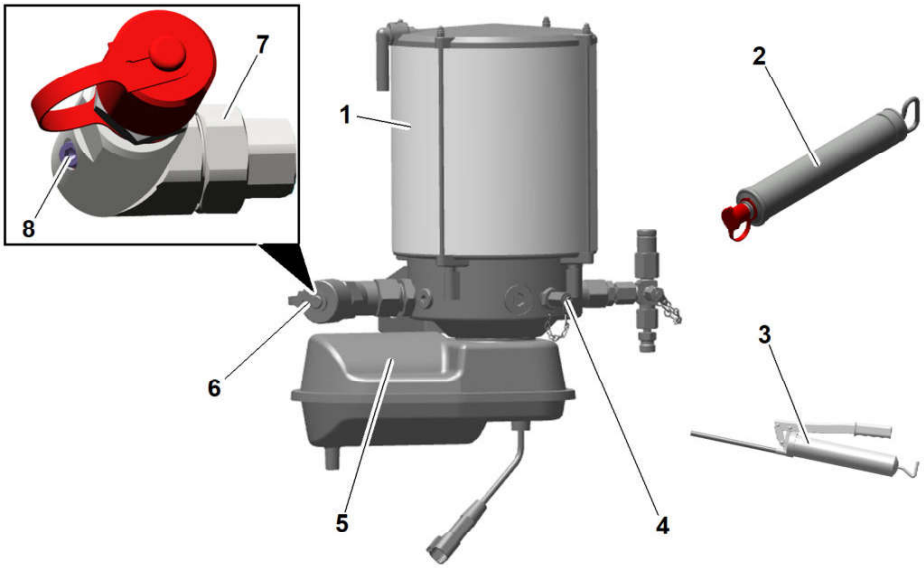


Fig. 1034: Filling grease container

1	Grease container	**5**	Lubricating pump
2	Filling pump	**6**	Adjustable quick-fill connection
3	Grease gun	**7**	Locknut
4	Grease nipple	**8**	Fixing screw

NOTICE
Incorrect filling of grease container!
Damage to machine.

▶ Exclusively fill grease container via adjustable quick-fill connection or grease nipple.

▶ Check fill level in grease container **1**.

▶ Loosen fixing screw **8**.

▶ Unscrew locknut **7**.

▶ Turn quick-fill connection **6** to suitable position.

▶ Tighten fixing screw **8**.

▶ Tighten locknut **7**.

▶ Connect filling pump **2** to quick-fill connection **6**.

▶ Press contents of grease cartridge into grease container **1**.

If no filling pump **2** is available:

▶ Fill grease container **1** with grease gun **3** via grease nipple **4**.

LHB/122139/76/01/2020-09-01/en