en **Operator's manual**

Wheel loader

Document ID

ORIGINAL OPERATOR'S MANUAL

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Product ID

Manufacturer: Liebherr-Werk Bischofshofen GmbH
Type: L 550
Type no.: 1214 (USA / CAN)
From Serial no.: 54427

Contact

Liebherr-Werk Bischofshofen GmbH
Dr. Hans Liebherr-Straße 4
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Filter: Return filter in the hydraulic tank

Control: Single-lever control, electrohydraulic servo system

Lifting circuit: Lift, neutral, lower, float position using control lever, auto lift arm position and auto lowering via control lever

Tilting circuit: Tilt in, neutral, tilt out, automatic bucket return-to-dig for tilt in and tilt out via control lever

Description	Unit	Value
Maximum flow rate	l/min gal/min	234 61.82
Max. operating pressure with Z kinematics	bar psi	$330^{\pm 5}$ $4{,}786.22^{\pm 72.52}$
Max. operating pressure with industrial lift arms	bar psi	$350^{\pm 5}$ $5{,}076.30^{\pm 72.52}$

1.2.11 Lift arms

Lift arm versions:
- Z kinematics
- Industrial lift arms

Working cycle time at rated load with Z kinematics

Description	Unit	Value
Lifting	s	5.5
Tilting out	s	2.3
Lowering (empty)	s	2.7

Working cycle time at rated load with industrial lift arms

Description	Unit	Value
Lifting	s	5.5
Tilting out	s	3.5
Lowering (empty)	s	2.7

1.2.12 Cab

Design:
- Hydraulically mounted soundproof cab
- ROPS rollover protection in accordance with EN/ISO 3471/EN 474-1
- FOPS stone impact protection in accordance with EN/ISO 3449/EN 474-1, Cat. II
- Cab door with sliding window, sliding window on right side
- Front window in green-tinted compound safety glass as standard
- Side windows in single-pane safety glass
- Heated rear window

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	Designation	Unit	Value		
H	Height above operator's cab	mm in	3370 11‘ 1“	3370 11‘ 1“	3370 11‘ 1“
I	Height above exhaust	mm in	3020 9‘ 11“	3020 9‘ 11“	3020 9‘ 11“
J	Ground clearance	mm in	490 1‘ 7“	490 1‘ 7“	490 1‘ 7“
K	Wheelbase	mm in	3395 11‘ 2“	3395 11‘ 2“	3395 11‘ 2“
L	Overall length	mm in	8550 28‘ 1“	8940 29‘ 4“	9000 29‘ 6“
	Turning radius over bucket outer edge	mm in	6630 21‘ 9“	6830 22‘ 5“	6850 22‘ 6“
	Breakout force (SAE)	kN lb_f	125 28,100	136 30,570	134 30,120
	Tipping load when straight	kg lb	12800 28,219	10700 23,589	10600 23,369
	Tipping load when fully articulated (ISO 14397-1)	kg lb	11100 24,471	9200 20,282	9100 20,062
	Operating weight	kg lb	18700 41,226	18900 41,667	18950 41,777

Tab. 8: Complete machine with loading bucket (industrial lift arms)

A) Industrial lift arms with parallel guidance including quick coupler
B) Earth bucket with short, straight base for quick coupler
C) Welded tooth holder with plug-in teeth
D) High lift
E) In practice, the bucket capacity can be around 10% greater than as calculated using the ISO 7546 standard. The bucket filling level depends on the type of material.

1.2.23 Working attachment: light material bucket

Values stated refer to machine:

- In standard version
- With 23.5R25 L3 tyres (For more information see: 1.2.18 Tyres, page 23)
- Including all lubricants
- With a full fuel tank
- With ROPS/FOPS cab and operator
- On level and stable ground

Note
Tyres and working attachments affect operating weight and tipping load.

▶ Note the information about the tyres and working attachment.

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2 Safety instructions

2.1 Information on these instructions

2.1.1 Representation of warning messages

Warning symbol

	Warning symbol warns of potential dangers. Obey all measures marked with this symbol to avoid injury or death.

Tab. 13: Warning symbol

Grading of warning messages

Grading of warning messages is defined by following signal words:

DANGER
WARNING
CAUTION
NOTICE

Definition of warning levels

	**DANGER**	Indicates an immediately hazardous situation which, if not avoided, will result in death or serious injury.
	**WARNING**	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
	**CAUTION**	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
	NOTICE	Indicates a hazardous situation which, if not avoided, could result in property damage.

Tab. 14: Warning levels

2.1.2 Graphic symbols in these instructions

Symbol	Meaning
	**Note** Identifies useful information and tips.

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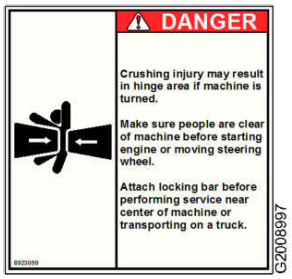
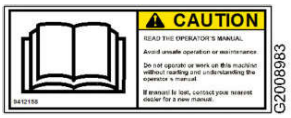
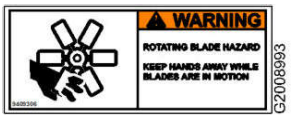
	Safety sign	Description
3		**Articulation area sign** Warns of the risk of accidents, possibly resulting in severe or even fatal injuries. Meaning: **Keep out of the articulation area when it is not secured.**
4		**Crushing injury sign** Warns of the risk of accidents, possibly resulting in severe injuries. Meaning: **There is an increased risk of crushing areas in this area.**
5		**Steering sign** Warns of the risk of accidents, possibly resulting in severe or even fatal injuries. Meaning: **The steering is only operational when the diesel engine is running.**
6		**Accident prevention sign** Refers to the instructions in the **operator's manual** for preventing accidents. Meaning: **Strictly observe the accident prevention instructions in the operator's manual when operating the machine.**
7		**Safety belt sign** Warns of the risk of accidents, possibly resulting in severe or even fatal injuries. Meaning: **Fasten your safety belt before starting up the machine.**
8		**Engine shutdown sign** Warns of the risk of accidents, possibly resulting in severe injuries. Meaning: **Only open when the diesel engine is shut down.**
9		**Burn hazard sign** Warns of the risk of burns, possibly resulting in severe injuries. Meaning: **Only touch when the parts have cooled down.**
10		**Scalding hazard sign** Warns of the risk of scalding and severe injuries caused by coolant escaping under pressure. Meaning: **Do not open the sealing cap on the filler pipe until the diesel engine has cooled down.**

Damage

Increased travel mode

– If machine is driven a lot: Stipulate use of special auxiliary systems for travel mode.
– Regulate speed to prevent swaying.

2.7.8 Operation of machine

Danger to life

Incorrect place of use

– Make sure that load capacity value of ground is sufficient.
– Do not exceed maximum inclination angle of machine while working.
– Do not exceed maximum inclination angle of machine when driving on ramps (side inclination).
– Make sure that ground offers sufficient grip.
– Assessment of subsoil conditions before starting work
– Adhere to safety gap from live overhead cables.
– Every line must be considered live.
– Keep a safe distance from overhangs, drops, slopes and unsafe terrain.

Incorrect use

– When working in following areas, adhere to the laws, regulations and rules applicable at the place of use.
  • Explosive area
  • Flammable area
  • Areas with underground lines (gas, electricity)
– Ensure that machines in enclosed spaces (for example, tunnels, hangars) are equipped with exhaust reduction components.
– Make sure that adequate ventilation and fresh air supply is ensured when operating in enclosed spaces.
– Never leave operator's seat while machine is still in motion.
– Never leave machine unattended with engine running.
– Clean machine regularly to remove flammable residues (for example dust, wood scraps).

Incorrect handling of electrical system

– Make sure there are no persons with a pacemaker in the vicinity of the running diesel engine.
– Before working on electrical system, make sure that affected parts are voltage-free.
– Before working on electrical system, make sure that neighbouring parts are isolated.
– Have work on electrical systems performed exclusively by a qualified electrician.

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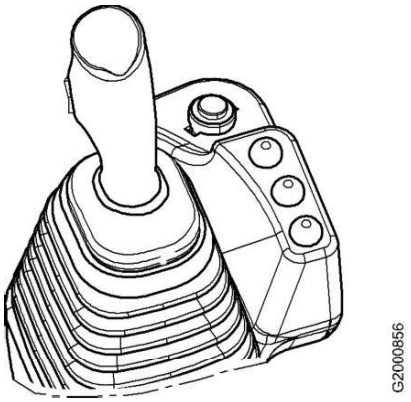

Fig. 59: Control lever

(For more information see: 3.2.17 Control lever, page 134)

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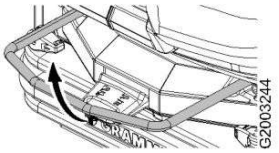
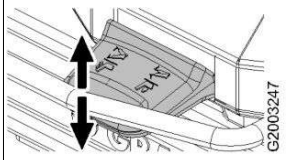
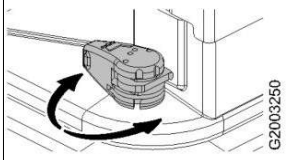
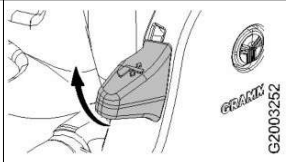
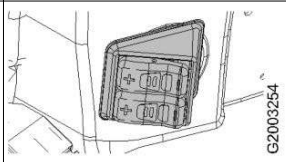
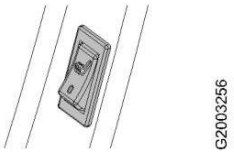
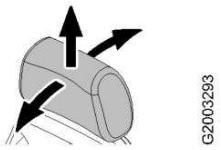
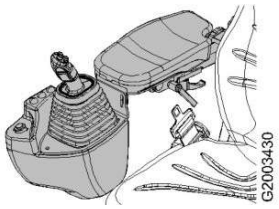
	Adjustment options	
4	 G2003244	**Horizontal adjustment** Pull the lever all the way up and move the driver's seat.
5	 G2003247	**Height adjustment** Pull or push the lever to adjust the seat height as required.
6	 G2003250	**Longitudinal absorption** Turn the lever to the left or right to activate or deactivate longitudinal absorption.
7	 G2003252	**Backrest adjustment** Pull the lever all the way up and move the backrest to the required position by pressing your upper body against it.
8	 G2003254	**Lumbar support adjustment** Press the button to adjust the contour of the backrest to your body.
9	 G2003256	**Seat heating** Press the seat heating button to switch the seat heating on or off.
10	 G2003293	**Head rest** Adjust the inclination and height of the head rest by pulling or pushing it.
11	 G2003430	**Adjusting the arm rest** (For more information see: Adjusting the driver's seat arm rest, page 86)

Tab. 21: Driver's seat: Grammer comfort

Driver's seat: Grammer Premium

Automatic adjustment of the seat suspension when the driver sits on the driver's seat. Adjustment begins automatically begins after 3 seconds. The adjustment must be completed before the vehicle moves off. The seat is automatically adjusted further during travel. If the compressor starts up several times, it does not indicate a fault.

3.2.11 Immobilizer

There are two types of immobilizers:
– Immobilizer with code input
– Electronic immobilizer

Immobilizer with code input

This equipment is optional.

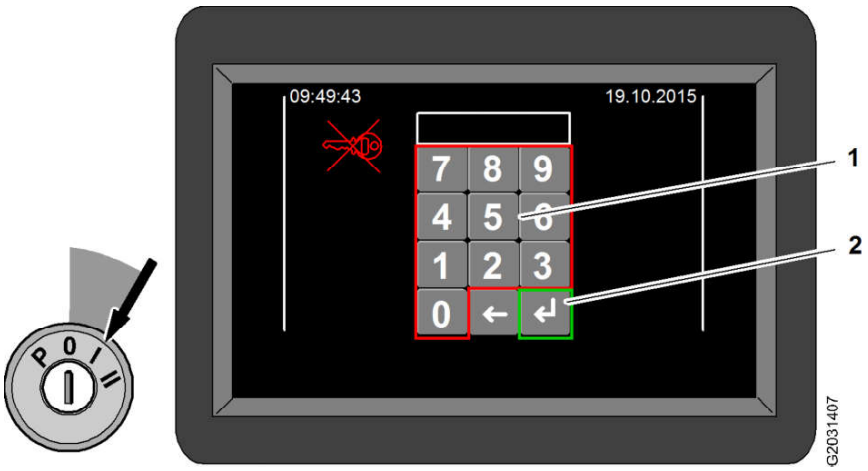


Fig. 119: Immobilizer with code input

1 Numeric keypad
2 *Enter* button

▶ Switch on the ignition.

▶ Enter the code using the numeric keypad **1** and confirm with the button **2**.

Note
If the immobilizer with code input cannot be deactivated:

▶ Contact Liebherr customer service.

Electronic immobilizer

This equipment is optional.

Machine comes with two blue ignition keys and a red master key. Only put the machine into operation with a programmed ignition key.

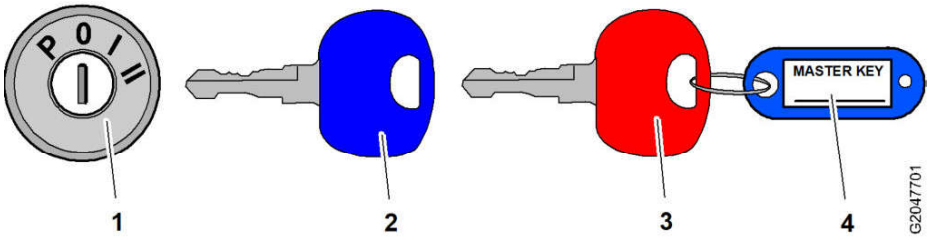


Fig. 120: Electronic immobilizer

1 Starting switch
2 Ignition key (blue)
3 Master key (red)
4 Type / serial number

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Status symbols	Designation
	High beam
	Safety belt with visual warning device (option)
	Confirmation required.

Tab. 30: Status symbols

Warning symbols	Designation
	Diesel engine malfunction.
	Turn off diesel engine.
	Transmission fault
	Gear oil: temperature too high
	Diesel engine: oil pressure too low.
	Flat battery.
	Brake accumulator pressure too low.
	Central lubrication system (option): grease reservoir level low The software switches to 8 lubrication cycles with an interval of 1 hour.
	Central lubrication system (option): grease reservoir empty The central lubrication system is switched off.
	Hydraulic oil: temperature too high.
	Emergency steering CHECK failed.

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System of units

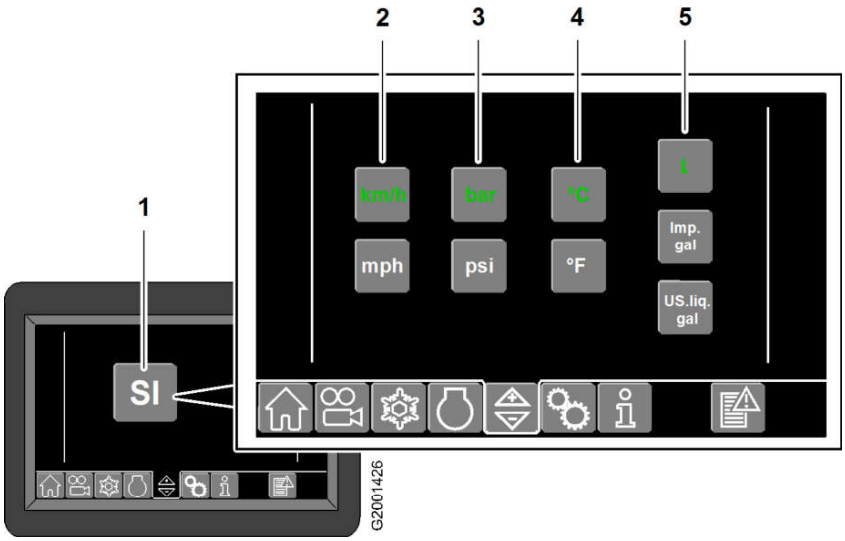

Fig. 164: System of units

1 *System of units* button
2 *Speed* button
3 *Pressure* button
4 *Temperature* button
5 *Volume* button

▶ Call up the display screen using button **1**.

▶ Set the units as required.

Setting the system language

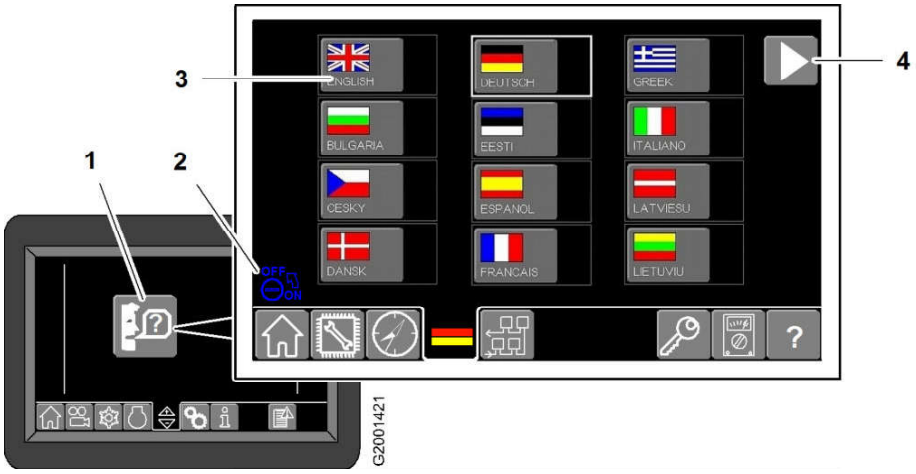

Fig. 165: Setting the system language

1 *Set system language* button
2 "Ignition OFF/ON" symbol (flashes after language selection)
3 Language selection
4 Further language selection

▶ Call up the display screen using button **1**.

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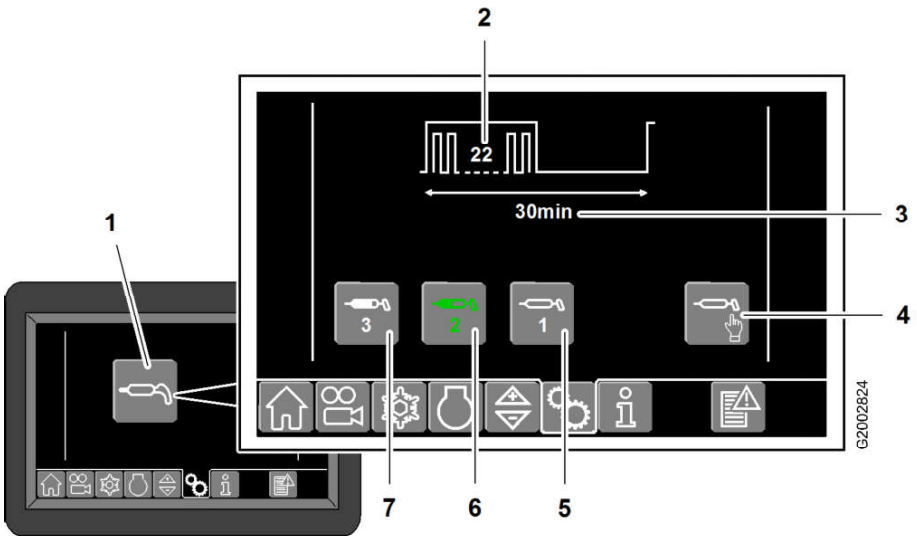

Fig. 199: Liebherr central lubrication system

1	*Central lubrication system* button	**5**	Central lubrication system mode 1 (light duty)
2	Remaining lubrication cycles	**6**	Central lubrication system mode 2 (medium duty)
3	Time until next lubrication	**7**	Central lubrication system mode 3 (heavy duty)
4	Non-scheduled lubrication		

▶ Call up the display screen using button **1**.

▶ Use buttons **5, 6** and **7** to set the lubrication intensity.
▷ Active settings are shown by a flashing green button.

▶ Use the button **4** to initiate an additional non-scheduled lubrication during the lubrication cycles.

Service management

Service message symbol:
– Prior warning time 100 hours (yellow symbol colour)
– Post-warning time 100 hours (red symbol colour)

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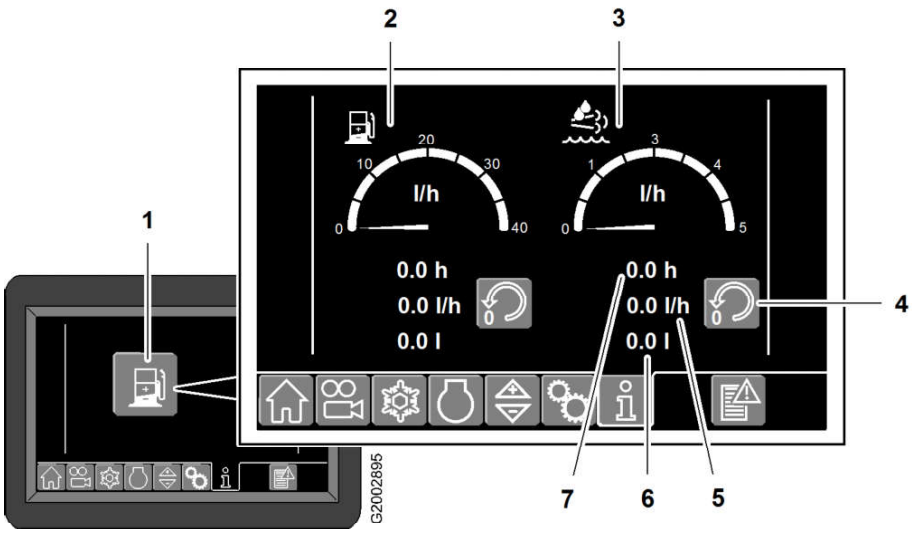

Fig. 216: Fuel consumption indicator

1 *Fuel consumption indicator* button
2 *Diesel engine fuel consumption* indicator
3 *Diesel exhaust fluid consumption* indicator
4 *Reset values* button
5 *Fuel consumption litres per operating hour* indicator
6 *Fuel consumption litres* indicator
7 *Operating hours* indicator

▶ Call up the display screen using button **1**.

If you want to reset a value to “0.0”:
▶ Press button **4**.

Tachometer

This equipment is optional.

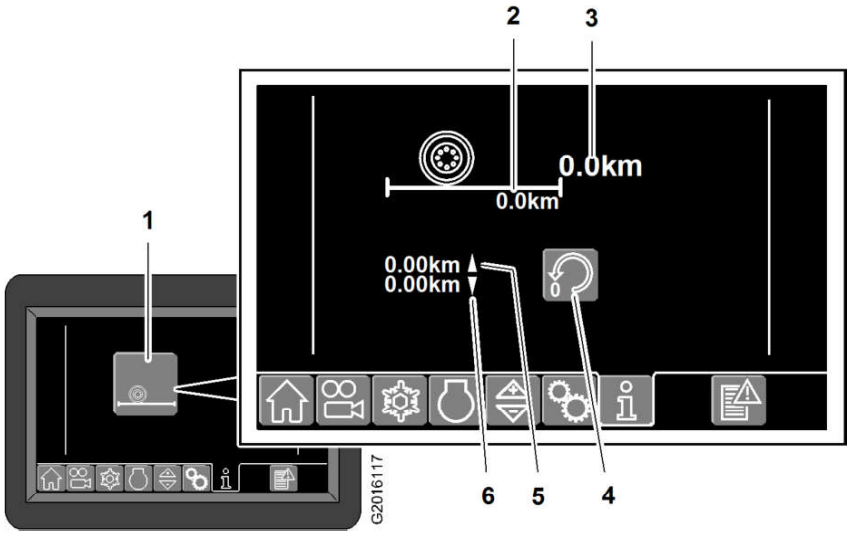

Fig. 217: Tachometer

1 *Tachometer* button
4 *Reset daily tachometer* button

See next page for continuation of the image legend

Item	Designation
1	One-way or two-way *mini joystick* button
2	Automatic return 3rd function button (For more information see: Settings for automatic return 3rd function, page 141)
3	Button to open working attachment setting (For more information see: Calling up the setting for the working attachment, page 142)
4	Button to change working attachment setting (For more information see: Changing the control of the working attachment, page 143)
5	Button to restore factory settings (For more information see: Restoring the factory settings, page 146)
6	Activate the continuous mode (control lever lock) button (For more information see: Working attachment continuous mode, page 144)
7	Button to change working attachment speed (For more information see: Changing the speed of movement, page 143)

Tab. 49: Mini joystick function settings

Settings for automatic return 3rd function

This equipment is optional.

Function is used for automatic tilt in, for example, of a high dump bucket when the function bucket return-to-dig is activated. High dump bucket is completely tilted in.

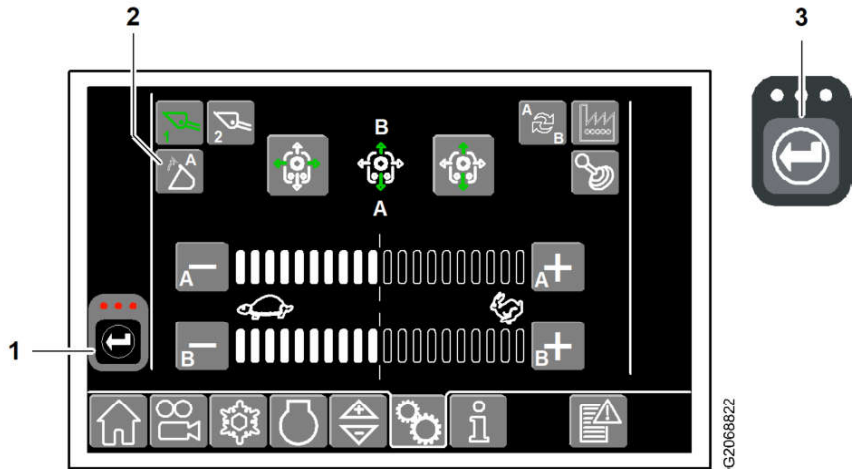

Fig. 236: Settings for automatic return 3rd function

1 *Confirmation required* status symbol
2 *Automatic return 3rd function* button
3 *Confirmation* key

Activate automatic return 3rd function:

▶ Press button **2**.
▷ Symbol **1** flashes.

▶ Press key **3**.
▷ Button **2** turns green.

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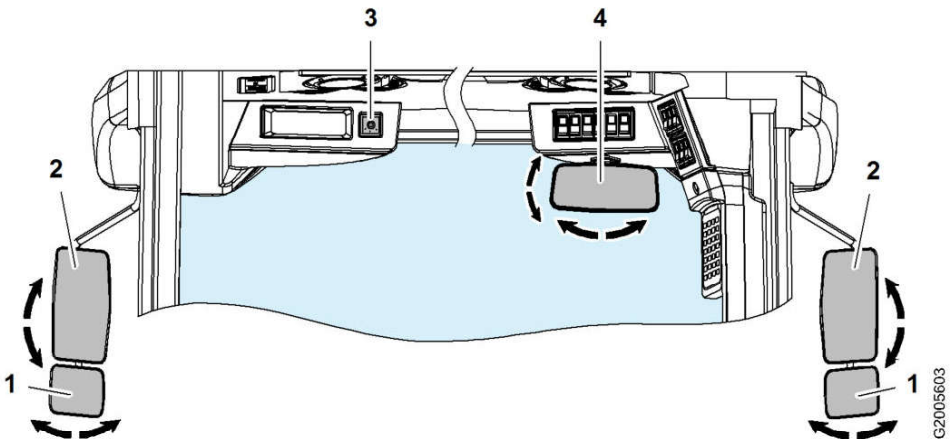

Fig. 267: Adjusting the mirrors

1	Wide-angle mirror (option)	**3**	Exterior mirror adjustment button (option)
2	Operator's cab exterior mirror	**4**	Operator's cab interior mirror

Note
Adjust the mirrors!

▶ The mirrors and other visual aids (such as the reversing camera) must always be adjusted to give the best possible all-round view.

▶ All mirrors can be adjusted individually.

Optionally, the exterior mirrors **2** can be adjusted electrically.

▶ Adjust the exterior mirrors **2** individually with button **3**.

3.2.22 Sun blind

The driver's cab is equipped with a sun blind.

Adjusting the sun blind

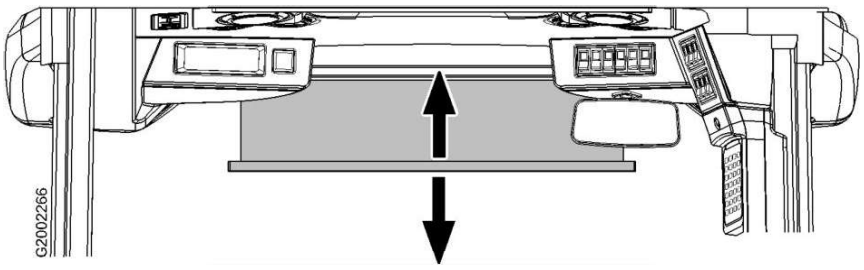

Fig. 268: Adjusting the sun blind

▶ Adjust the sun blind as required by pulling it down or pushing it up.

3.2.23 Radio

This equipment is optional.

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3.2.28 LiDAT

This equipment is optional.

LiDAT is a data transfer and positioning system for Liebherr machines and those of other manufacturers. Based on the latest data transfer technology, LiDAT supplies information for the localisation and operation of the machines and thereby enables efficient management, optimised deployment planning and remote monitoring.

With LiDAT all important machine data can be viewed at all times. According to the subscription the data is updated several times a day and can be accessed via a web browser at any time. Information that is particularly important such as leaving the machine out of a predefined zone or reports of certain operating states and deployment parameters can also be requested.

Activating data transmission manually

The LiDAT data is transferred between the machine and the LiDAT server via a GSM connection. The LiDAT data is transferred at multiple, predefined transmission times during the course of the day. The transmission times can be set by the LiDAT user.

If a GSM connection is not available at any of the transmission times, manual data transmission must be activated in an area with GSM connection. This ensures that LiDAT data is transmitted.

Examples for uses without GSM connection:
- Tunnel operation
- Operating the machine in closed halls
- Operating the machine in places without a GSM signal

Creating a GSM connection

▶ Park the machine in a place with an available GSM signal.

▶ Switch on the ignition.

▶ Check connection status. (For more information see: Checking connection status, page 163)

Activating data transmission manually

Make sure that the following requirements are fulfilled:
❑ A GSM connection is available. (For more information see: Checking connection status, page 163)

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Selecting travel ranges

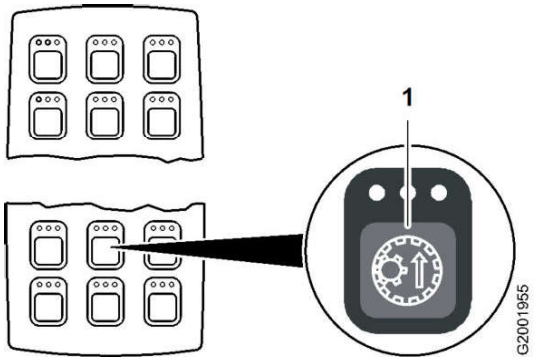

Fig. 291: Selecting travel ranges

1 *Travel range up* key

Press key **1** to shift through all travel ranges in succession.

▶ Press key **1** to select the required travel range.
▷ The travel range is indicated in the display.

Releasing the parking brake

The parking brake can only be released when the diesel engine is running.

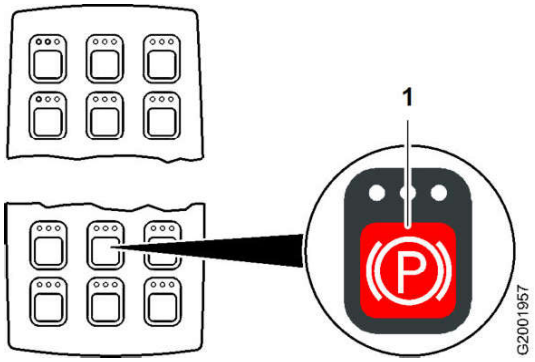

Fig. 292: Releasing the parking brake

1 *Parking brake* key

▶ Press key **1**.
▷ *Parking brake* symbol is not shown in display.

Selecting the travel direction

The travel direction cannot be selected while the parking brake is engaged.

Make sure that following requirements are met:
❑ Accelerator pedal is not pressed.
❑ The parking brake is released.

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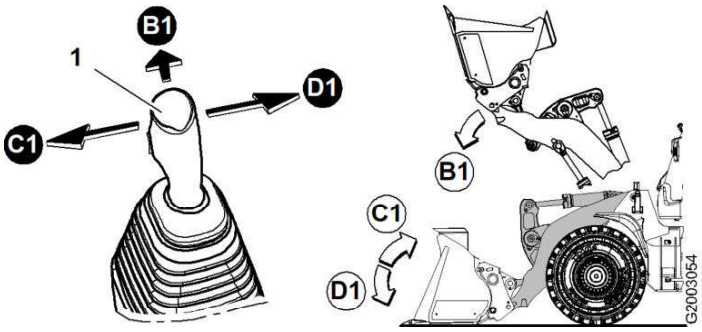

Fig. 305: Lowering the working attachment

1 Control lever

▶ Move the control lever **1** in direction **B1**.
▷ The lift arms are lowered.

▶ Lay the bucket down flat on the ground by moving the control lever **1** in direction **D1** or **C1**.

If a hydraulic working attachment (such as a side dump bucket or timber grabber) is fitted:

▶ Tilt in, close or lock the working attachment, depending on its function.

▶ Lower the lift arms until the working attachment lies on the ground.

Switch off the diesel engine

Do not turn off the diesel engine until the machine has come to a complete halt.

NOTICE
Insufficiently lubricated turbocharger!
Damage to the engine.

▶ Always make sure the machine is idle when you shut down the engine.

▶ Engage parking brake.

▶ Reduce the engine to idling speed by taking your foot off the travelling pedal.

▶ Let the diesel engine continue idling for another 10 to 15 seconds.

Fig. 306: Switch off the diesel engine

▶ Turn the ignition key to the **0** position and pull it out.
▷ All symbol LEDs go out.
▷ Working hydraulics lockout is activated.

Turning off the battery main switch

Make sure that following requirements are met:
❑ Diesel engine is switched off.

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To save the kick-out position:

▶ Press button **6**.
▷ Symbol **7** flashes.

▶ Press key **3**.
▷ The kick-out position is saved.

Bucket return-to-dig

The bucket return-to-dig function is used for jobs that repeatedly require a particular digging position. This factory-set bucket position can be changed if necessary.

The function can be activated in two different ways:
– With the control lever
– With the *bucket return-to-dig* key (option)

Procedure for saving bucket position of the bucket return-to-dig:
1. Define the work application.
2. Save bucket return-to-dig.

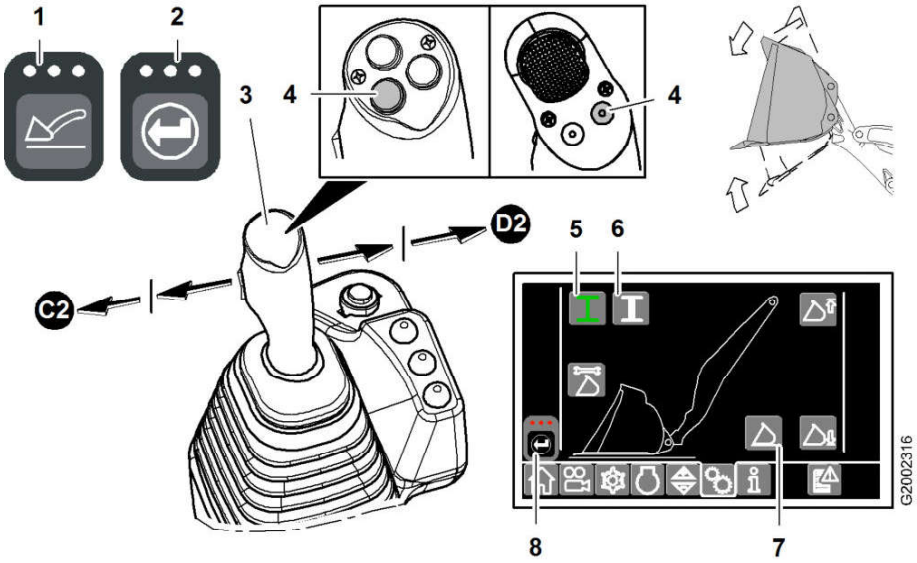

Fig. 319: Bucket return-to-dig

1 *Bucket return-to-dig* key
2 *Confirmation* key
3 *Control lever*
4 *Bucket return-to-dig* button (option)
5 *Work application I* button
6 *Work application II* button
7 *Bucket return-to-dig* button
8 *Confirmation prompt* symbol

WARNING
Unexpected movements of the working attachment!
Damage, injuries.

▶ Familiarise yourself with the working attachment in a secure area.

▶ Press key **1**.
▷ The LEDs light up.
▷ The bucket return-to-dig function is activated.

Note
Maintenance and inspection of the forklift!

▶ The customer is responsible for maintenance and inspection of the forklift, in particular the fork prongs, in accordance with the ISO 5057 standard!

Adjusting the prongs on the fork carrier

The fork prongs can be attached at any position on the fork carrier. The fork prong lock stops them from slipping.

Make sure the following preconditions are met:
❑ The forklift is around 10 cm (3.94“ in) above the ground.
❑ The engine is switched off.
❑ The wheel loader is secured against rolling away.

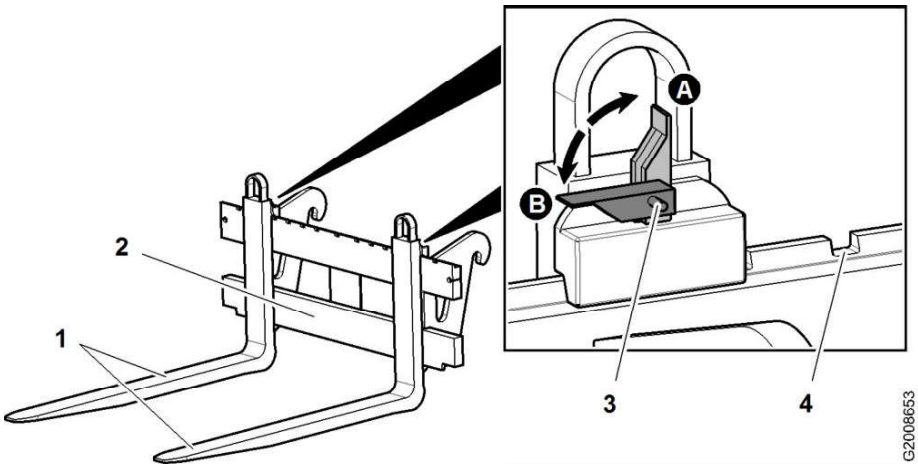

Fig. 337: Adjusting the prongs on the fork carrier

1	Fork prongs	**4**	Notch
2	Fork carrier	**A**	Fork prong lock open
3	Fork prong lock	**B**	Fork prong lock closed

▶ Open the fork prong lock **3**.

▶ Push the prongs **1** to the correct position.

▶ When closing the fork prong lock **3** let it latch in the notch **4**.
▷ The prongs are held tight.

Working with the forklift

– On lift arms with P kinematics or industrial lift arms, there is parallel movement of the load over the entire lifting range.
– On lift arms with Z kinematics, there is no parallel movement of the load over the entire lifting range.

Make sure that the following requirements are fulfilled:
– You have checked the forklift for cracks and damage.
– The prongs are locked on the fork carrier.

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▶ Select programmable button: press a button **2-4**.
▷ The selected button is shown in green.

▶ Select programmable function: press a button **5-12**.
▷ The selected button is shown in green.
▷ Programming completed.

▶ Restore factory setting: press button **1**.
▷ Button assignment is reset to factory setting.

Setting reaction speed of joystick steering

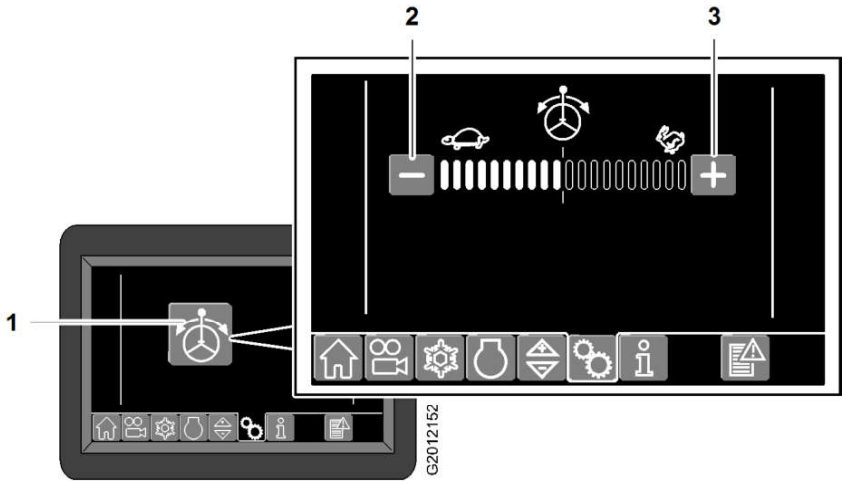

Fig. 353: Setting reaction speed of joystick steering

1 *Joystick steering setting side* button
2 *Reduce reaction speed* button
3 *Increase reaction speed* button

▶ Call up the display screen using button **1**.

▶ To change the reaction speed of the steering: press the button **2** or button **3**.
▷ The setting for the reaction speed is displayed.

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Moving the machine back

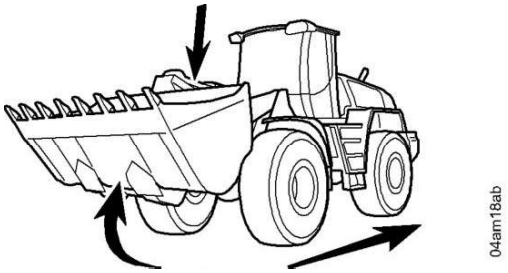

Fig. 369: Moving the machine back

- ▶ Tilt in the working attachment.
- ▶ When driving back, put the machine in the transport position.

3.4.9 Excavation

Excavating material

Use a working attachment with teeth for excavating hard material.

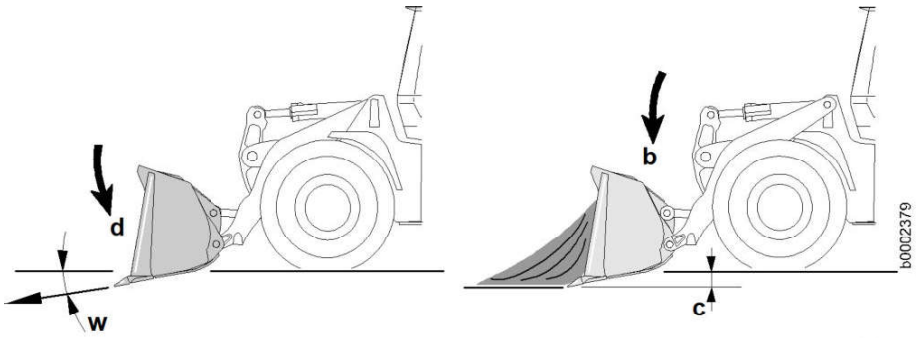

Fig. 370: Excavating material

- ▶ Lower the working attachment to the ground.
- ▶ Set a small cutting angle **W** of no more than 10°.
- ▶ Approach with the machine and press the lift arms down simultaneously, until a sufficient penetration depth **C** is reached.

Note
The following procedure is recommended to avoid any possible loss of traction.

- ▶ Do not work with a strong downwards pressure on the working attachment.

- ▶ Make horizontal cuts when driving forward.
- ▶ Raise and lower the lift arms slightly to provide better support.

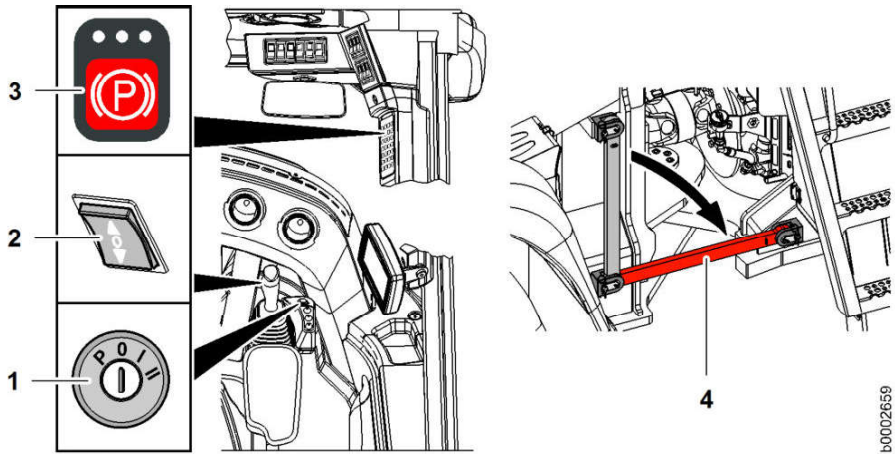

Fig. 380: Driving the machine onto the loading area

1	Starting switch	**3**	*Parking brake* key
2	*Travel direction* switch	**4**	Articulation lock

- ▶ Start the diesel engine with starting switch **1**.
- ▶ Press key **3** to release the parking brake.
- ▶ Preselect travel direction with switch **2**.
- ▶ Carefully drive the machine to the loading area and stop.
- ▶ Activate the parking brake using key **3**.
- ▶ Engage the articulation lock **4**.
- ▶ Lower the lift arms and lay the loading bucket down flat on the loading area.
- ▶ Start the diesel engine with the starting switch **1**.
- ▶ Close and lock the doors and service hatches on the machine.

Securing the machine

DANGER
Beware of the machine falling!
Danger to life.

- ▶ Fasten machine and components securely using chocks and lashing gear.

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Manual emergency steering

Manual emergency steering is used, for example, for towing the machine with the diesel engine shut down. This provides an emergency steering function for the machine for 40 seconds.

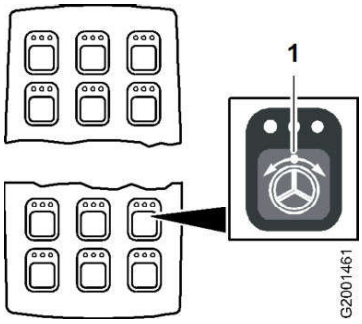

Fig. 389: Manual emergency steering

1 *Emergency steering* button

▶ Press and hold the *emergency steering* button **1** for the duration of the steering manoeuvre.

▶ Steer the machine out of the danger area within the 40 seconds available.

▶ Stop the machine.

▶ Contact Liebherr customer service.

3.7.4 Jump starting procedure

If you have problems starting, the machine can be jump started with external batteries.

Make sure that following requirements are fulfilled:
❑ Following safety precautions are observed.

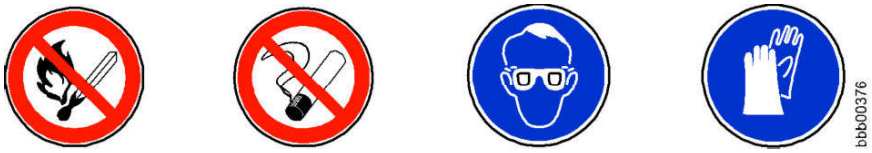

Fig. 390: Jump starting procedure

WARNING
Gas forming in the batteries!
Explosion.

▶ Avoid naked lights and fire.

▶ Wear safety glasses and protective gloves.

NOTICE
Flat battery and donor battery with different voltages!
Damage.

▶ Use batteries of the same voltage.

4.3 Problem remedy

4.3.1 Replacing fuses

NOTICE
Incorrect fuse rating!
Damage.

▶ Use a fuse of the correct rating.

Make sure that following requirements are met:
❑ The affected circuit has been checked.
❑ The battery main switch of the machine is turned off.

NOTICE
Live components!
Risk of injury.

▶ Turn off the battery main switch.

There are three fuse boards on the machine:
❑ Fuse board A4 in the operator's cab
❑ Fuse board A4a in the left ballast weight
❑ Fuse board A4b in the operator's cab

Fuses on fuse board A4 in the operator's cab

The board with the plug-in fuses is beside the operator's seat.

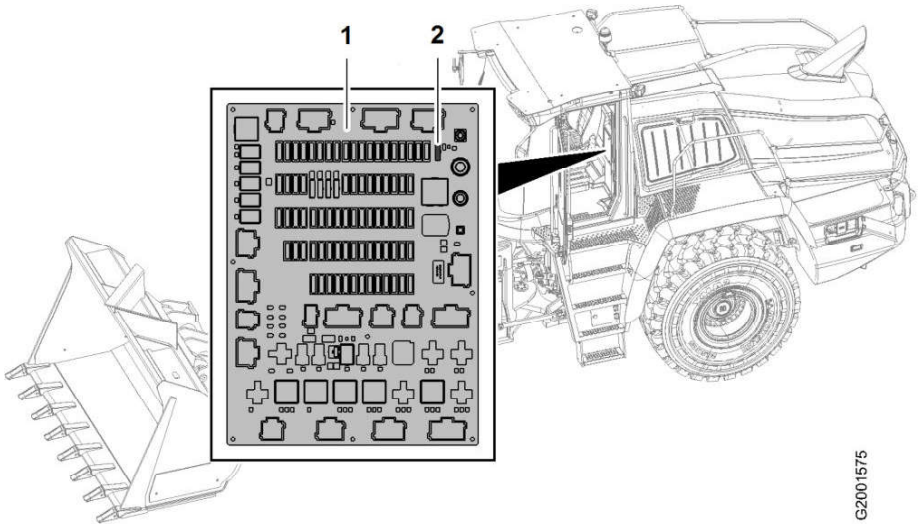

Fig. 419: Fuses on fuse board A4 in the operator's cab

1 Fuse board A4 **2** FUSE-TEST

If fuses have to be replaced:
▶ Switch off ignition.

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

Maintenance / inspection after service hours								Tasks to be performed		
On handover	All 8-10 h	All 50 h	All 500 h	All 1000 h	All 2000 h	Other intervals	Additional labelling	**By maintenance staff** ■ Once-only activity ● Repeat interval ✦ If necessary ❄ Annually before the winter **By authorised specialist staff** ☐ Once-only activity ❍ Repeat interval ✧ If necessary **Additional labelling** Assistance required Have this task carried out exclusively by a certified electrician	Confirm tasks	See page
				❍	❍			Fuel fine filter: Change the filter element.		
				❍	❍			Diesel exhaust fluid tank: check the ventilation.		
		●	●	❍	❍			Air filter system: Clean the service cover and dust discharge valve.		300
				❍	❍	✦		Clean or change the main element of the air filter system (when indicated by the vacuum switch, or at least once a year).		302
					❍	✦		Air filter system: Clean the safety element (after replacing the main element three times, or every year at the latest).		305
☐		●	●	❍	❍			Splitter box: Check the oil level.		306
				❍	❍			Splitter box: Change the oil.		
				❍	❍			Engine: Check that the intake and exhaust system is in good condition and not loose or leaking.		
		●	●	❍	❍			Check the diesel engine for leaks, contamination and damage.		308
						❍4500 h		Diesel particulate filter (option): clean the filter module.		
					❍			Compressed air system: Change the air dryer.		
					❍			Check the compressed air system.		
Cooling system										
	●	●	●	❍	❍			Cooling system: Check the coolant level.		310
					❍	❄		Check the concentration of anti-freeze and corrosion protection agent or corrosion inhibitor in the coolant (at least once a year).		311
						✦		Clean the cooling system.		318
						❍6000 h		Cooling system: Change the coolant (at least every 4 years).		
Hydraulic components										
☐	●	●	●	❍	❍			Hydraulic tank: Check the oil level.		320
				❍	❍			Hydraulic tank: Drain off condensate and sediment.		
				❍	❍			Hydraulic tank: Change the return filter insert.		
					❍			Hydraulic tank: Change the breather filter.		
						✧		Hydraulic tank: perform oil analysis. (For more information see: Oil analysis, page 274)		
						✧		Hydraulic tank: change oil. (For more information see: Oil change, page 274)		
Steering system										
☐	●	●	●	❍	❍			Steering: Check the function.		323

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Minimum quality requirement

Specification
DIN EN 590
ASTM D 975 1-D/2-D
LH-00-FUEL

Tab. 82: Minimum quality requirement

5.3.5 Diesel exhaust fluid

Liebherr recommendation

Designation
AdBlue® in Europe
DEF (Diesel exhaust fluid) in the USA
AUS 32 (aqueous urea solution)

Tab. 83: Liebherr recommendation

Minimum quality requirement

Specification
DIN 70 070
ISO 22241
LH-00-UREA

Tab. 84: Minimum quality requirement

5.3.6 Engine oils

Liebherr recommendation

Ambient temperature	Designation
-30 °C (-22 °F) to 35 °C (95 °F)	Liebherr engine oil 5W-30
-30 °C (-22 °F) to 35 °C (95 °F)	Liebherr engine oil 5W-30 low ash

Tab. 85: Recommendation for engine oils

For machines with a diesel particulate filter, the low ash engine oil must be used.

Other approved engine oils

Ambient temperature	Designation
-20 °C (-4 °F) to 45 °C (113 °F)	Liebherr engine oil 10W-40

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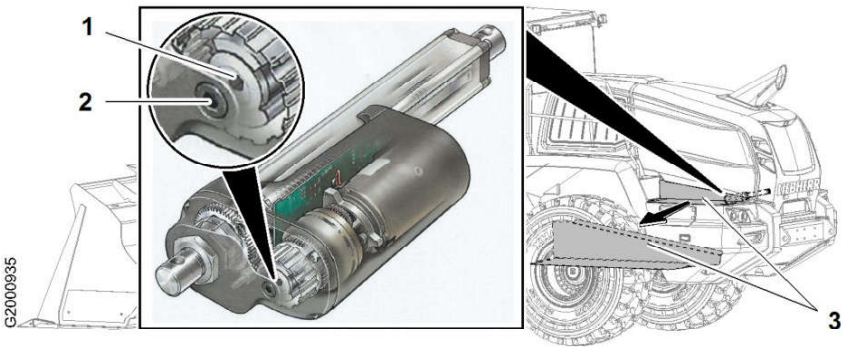

Fig. 433: Manual emergency operation of the engine bonnet

1 Drive gear
2 Screw plug
3 Battery compartment cover

▶ Remove the battery compartment cover **3**.
▷ The provides access to the emergency actuation mechanism.

▶ Unscrew the screw plug **2**.

▶ Turn the drive gear **1** by hand with an Allen key.
▷ The engine bonnet opens.

Note

Torque for emergency operation: 6 (4) to 8 Nm (6 ft-lb)

Opening and closing the cooler hood

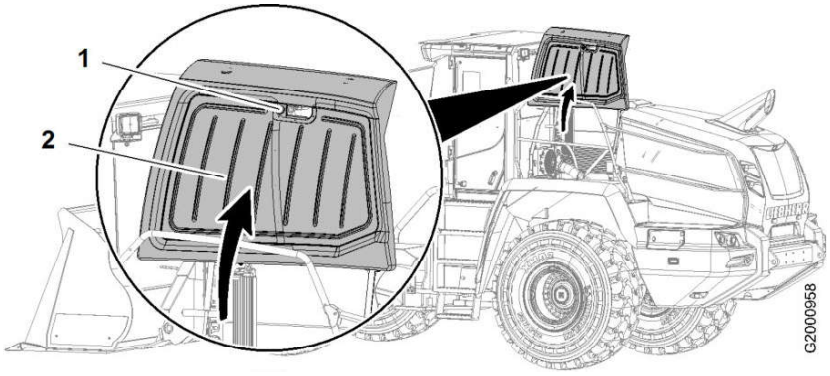

Fig. 434: Cooler hood

1 Handle
2 Cooler hood

To open the cooler hood:

▶ Fully open the cooler hood **2** with the handle **1**.
▷ The cooler hood **2** is held in this position by gas-filled springs.

Troubleshooting
If the gas-filled springs do not hold the hood open:

▶ Contact Liebherr customer service.

Regular cleaning prevents dirt and foreign particles from getting into the machine.

Clean the machine immediately after the following work:
– Working in salty environments (for example contact with road salt, or by the sea)
– Working with alkaline or acidic substances
– Working with corrosive materials (such as lime compounds or cement)

NOTICE
Always carry out cleaning correctly
Risk of damage to the machine.

▶ Only clean electrical systems, cables and wiring harnesses with low-pressure equipment.

▶ Only clean soundproofing material with low-pressure equipment.

▶ When new (or after respraying), do not clean the machine with a high-pressure cleaner for two months.

▶ Observe the operating manual of the high-pressure cleaner.

CAUTION
High-pressure jet!
Risk of injury.

▶ Wear protective clothing and safety glasses.

Cleaning the outside of the machine

Before cleaning

Make sure that the following requirements are fulfilled:
❑ The machine is in maintenance position 2.

Before washing with water or with a high-pressure cleaner, carry out the following tasks in order to prevent water from getting inside.

▶ Lubricate all bearings and pin connections.

▶ Clean oil, fuel and maintenance products from all connections and bolts.

If components behind openings have to be prevented from water getting in:

▶ Cover or mask the openings.

Components particularly at risk are:
– Electric motors
– Control units
– Electrical components
– Relay boards and fuse boards
– Plug connections
– Sensors
– Air filter
– Exhaust system

Cleaning

▶ Do not clean the machine with aggressive cleaning agents or combustible liquids.

▶ Soften up dirt with water.

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❑ Suitable protective equipment is used.

Cleaning the service cover

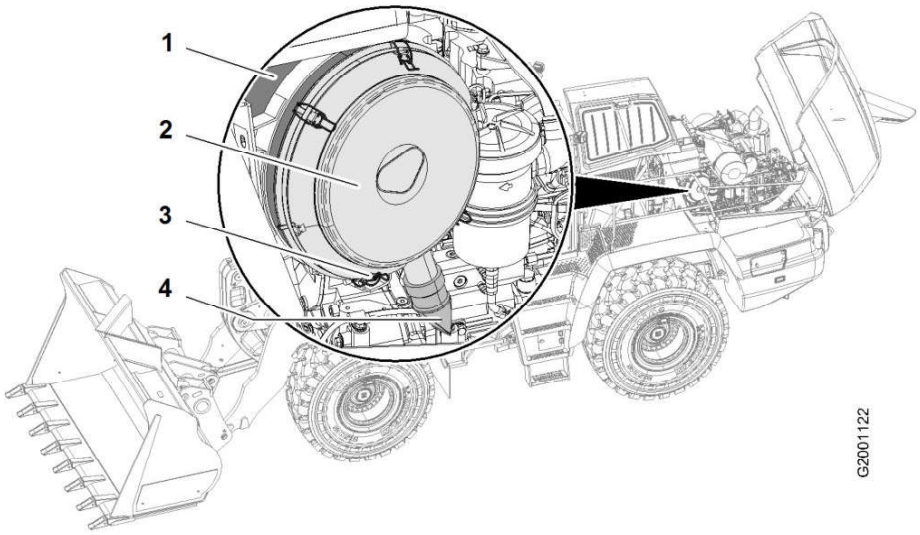

Fig. 453: Air filter system: Clean the service cover and dust discharge valve.

1	Filter housing	**3**	Fixing clips
2	Service cover	**4**	Dust discharge valve

▶ Open the fixing clips **3** and take off the service cover **2**.

▶ Clean the service cover **2** and place it back onto the filter housing **1**.
▷ The dust discharge valve **4** must face down.

▶ Place the service cover **2** fully over the filter housing **1**.

▶ Close the fixing clips **3**.

Cleaning the dust discharge valve

Note
When using the machine in dusty conditions:

▶ Check and empty the dust discharge valve more often.

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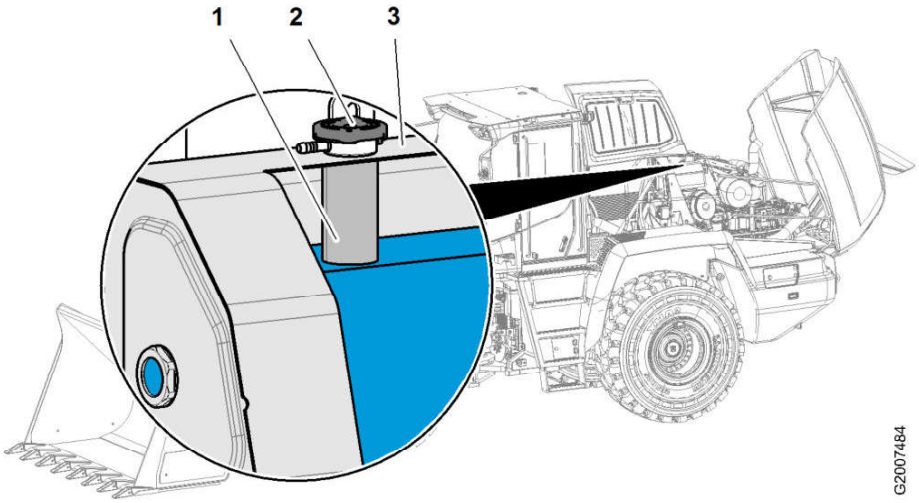

Fig. 464: Checking the coolant level

1 Filler neck
2 Cover
3 Equalising reservoir

CAUTION
Hot. pressurised liquid!
Beware of burns.

▶ Let the engine cool down.

▶ Carefully open the cap **2** of the equalising reservoir **3**.

NOTICE
Non-approved coolant!
Damage to the engine and cooling system.

▶ Only use coolant that meets the Liebherr specifications.

▶ Do not mix coolants with and without silicates.

▶ Top up coolant to the bottom of the filler neck **1**. (For more information see: 5.3.8 Coolant, page 273)

▶ Close the cover **2**.

5.8.2 Checking the concentration of anti-freeze and corrosion protection agent or corrosion inhibitor in the coolant

Checking the anti-freeze and corrosion agent concentration

The machine is delivered factory-filled with anti-freeze and corrosion protection agent.

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Topping up the oil

Make sure that the following requirements are fulfilled:
- ❑ The machine is in maintenance position 1.
- ❑ The machine is cold.
- ❑ The service access is open.

CAUTION
Poorly accessible maintenance point!
Risk of injury.

▶ Use suitable climbing aids.

Note
To top up the oil:

▶ Put the machine in maintenance position 1.

▶ Only top up oil through the return filter.

▶ Oil specification: (For more information see: 5.3.9 Hydraulic oil, page 274)

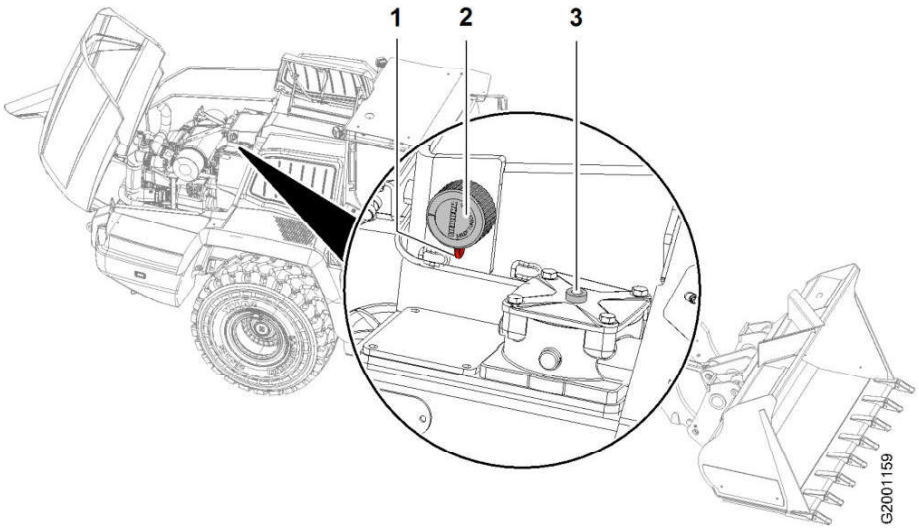

Fig. 472: Topping up the oil

1 Plug
2 Breather filter
3 Plug

▶ Insert the plug **1** in the breather filter.
▷ The anti-twist device of the breather filter is released.

▶ Unscrew the breather filter **2** on the hydraulic tank by two turns.
▷ The tank preload pressure is released.

▶ Unscrew the plug **3**.

NOTICE
Non-approved oil!
Damage to the hydraulic system.

▶ Only use oil that meets the Liebherr specifications.

▶ Do not mix different oils.

Troubleshooting
If the oil level is too high:

▶ Contact Liebherr customer service.

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Make sure that you have the following special tools for the installation of the undercut blade:
- ❑ Torque wrench with corresponding measurement range.
- ❑ Loctite 241

WARNING
Beware of falling components!
Injury.

▶ Secure teeth or undercut blade from detaching.

Checking the teeth or undercut blade for wear

▶ Check the teeth or undercut blade for cracks, excessive wear and broken parts.

If the teeth or undercut blades are worn:
▶ (For more information see: Replacing teeth with the Z system, page 341)

▶ (For more information see: Changing the undercut blade, page 342)

Replacing teeth with the Z system

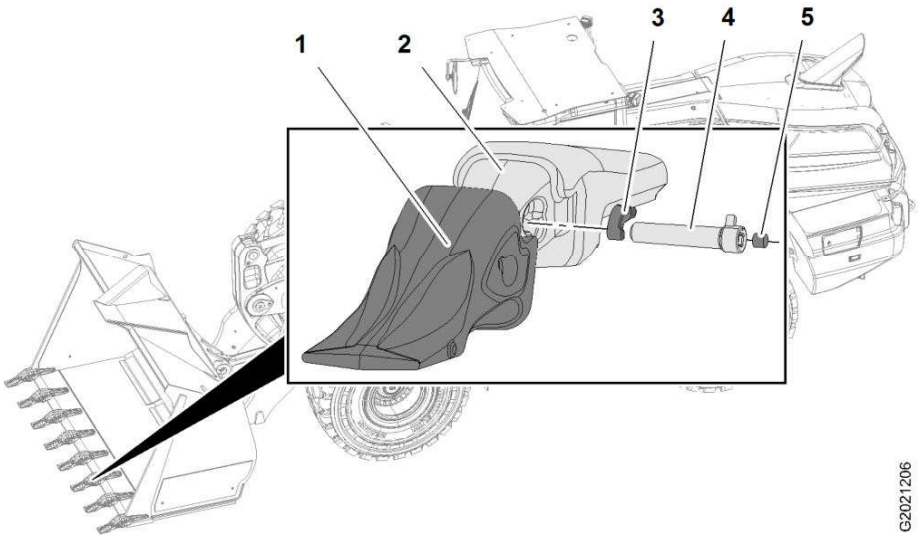

Fig. 491: Replacing teeth with the Z system

1 Tooth
2 Tooth adapter
3 Catch
4 Retaining pin
5 Plug

Removing a tooth

▶ Remove the plug **5**.

▶ Turn the retaining pin **4** with the square spanner about 30° in the direction of the tooth **1**.
▷ The lug of the retaining pin **4** slips out of the catch.

▶ Knock out the retaining pin **4** with a hammer and mandrel.

▶ Remove the tooth **1**.

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NOTICE
Dirty grease reservoir!
Damage to the central lubrication system.

▶ Pay attention to cleanliness when filling the grease reservoir.

To fill the grease reservoir:
▶ Fill the grease reservoir via the grease fitting **4**.
or

For rapid filling, connect the fast filling pump **6** to the filling coupling **5**.

5.18.2 Central lubrication system: Checking the pipes, hoses and lubrication points for leaks and damage

This equipment is optional.

Make sure that the following requirements are fulfilled:
❑ The machine is in maintenance position 2.

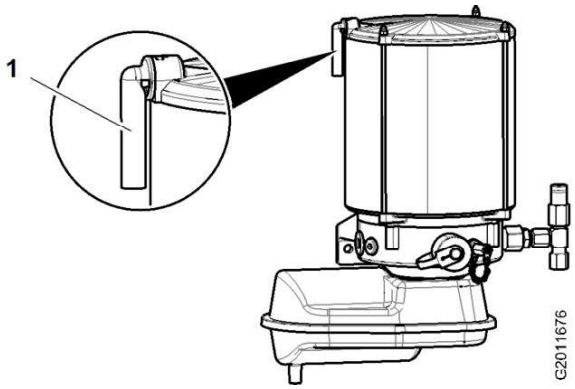

Fig. 501: Central lubrication system: Checking the pipes, hoses and lubrication points for leaks and damage

1 Bleed valve

▶ Check the bleed valve **1** on the central lubrication system for defects.

▶ Visually examine all hose lines for defects.

If there are defects:
▶ Find the cause and rectify it.

5.18.3 Central lubrication system: Checking the lubrication of the bearings

This equipment is optional.

Make sure that the following requirements are fulfilled:
❑ The machine is in maintenance position 2.

▶ Visually examine whether the metered quantities are sufficient at the bearings.

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