en **Operator's manual**

Wheel loader

Document ID

ORIGINAL OPERATOR'S MANUAL

Order number: 12228543
Issued: 01-2019
Version: 07
Author: LBH / Technical Documentation Department

Product ID

Manufacturer: Liebherr-Werk Bischofshofen GmbH
Type: L 556
Type no.: 1332 (USA / CAN)
From Serial no.: 46854

Contact

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1.2.10 Working hydraulics

Type: “Load sensing” swash plate variable displacement pump with power controller and flow controller, pressure cut-off in control block

Cooling: Hydraulic oil cooling with thermostatically controlled fan and oil cooler

Filter: Return filter in 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	$360^{\pm 5}$ $5{,}221.33^{\pm 72.52}$
Max. operating pressure with industrial lift arms	bar psi	$380^{\pm 5}$ $5{,}511.41^{\pm 72.52}$

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 s	5.5 5.5
Tilting out	s s	2.3 2.3
Lowering (empty)	s s	2.7 2.7

Working cycle time at rated load with industrial lift arms

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

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	Designation	Unit	Value		
	Cutting tool		C)	C)	C)
	Lift arm length	mm in	2600 8‘ 6“	3000 9‘ 10“ D)	3000 9‘ 10“ D)
	Bucket capacity as per ISO 7546 E)	m^3 yd^3	3.3 4.32	2.8 3.66	3.0 3.92
	Bucket width	mm in	2700 8‘ 10“	2700 8‘ 10“	2700 8‘ 10“
	Specific material weight	t/m^3 lb/yd^3	1.8 3,000	1.8 3,000	1.6 2,700
A	Dump height at maximum lifting height and 45° tilt-out angle	mm in	2850 9‘ 4“	3520 11‘ 7“	3460 11‘ 4“
B	Dump height	mm in	3500 11‘ 6“	4100 13‘ 5“	4100 13‘ 5“
C	Maximum bucket base height	mm in	3795 12‘ 5“	4360 14‘ 4“	4360 14‘ 4“
D	Maximum bucket pivot point height	mm in	4075 13‘ 4“	4640 15‘ 3“	4640 15‘ 3“
E	Maximum bucket top height	mm in	5620 18‘ 5“	6120 20‘ 1“	6160 20‘ 3“
F	Reach at maximum lifting height and 45° tilt-out angle	mm in	1174 3‘ 10“	960 3‘ 2“	1015 3‘ 4“
G	Digging depth	mm in	80 3.15“	80 3.15“	80 3.15“
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	8605 28‘ 3“	9000 29‘ 6“	9080 29‘ 9“
	Turning radius over bucket outer edge	mm in	6650 21‘ 10“	6850 22‘ 6“	6885 22‘ 7“
	Breakout force (SAE)	kN lb_f	130 29,230	134 30,120	125 28,100
	Tipping load when straight	kg lb	14400 31,746	12000 26,455	11800 26,014
	Tipping load when fully articulated (ISO 14397-1)	kg lb	12400 27,337	10300 22,707	10100 22,266
	Operating weight	kg lb	19500 42,990	19700 43,430	19750 43,541

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

herr at no charge to the owner at any authorized Liebherr Dealer. Any such part repaired or replaced prior to the first scheduled replacement point will be warranted for the remainder of the period prior to the first scheduled replacement point. The owner will not be charged for diagnostic labor that leads to the determination that a warranted part is in fact defective, so long as such diagnostic work is performed by an authorized Liebherr Dealer. If a warranted part fails because of a defect, Liebherr will repair or replace it at any authorized Liebherr Dealer. Any other engine components damaged by the failure of a warranted part will also be repaired or replaced at no charge to the owner.

1.3.6 Warranted parts

Following are the only parts warranted under this Emission Control Warranty.

1. Fuel Injection System
2. Intake Manifold
3. Turbocharger System
4. Charge Air Cooling System
5. Exhaust Gas Recirculation (EGR) System
6. EGR Control System
7. Exhaust Manifold
8. Diesel Particulate Filter System
9. Diesel Oxidation Catalyst
10. Fuel Additive Devices
11. Selective Catalyst Reduction
12. Reductant Containers
13. Electronic Control Unit, Sensors, Solenoids and Wiring Harnesses
14. Emission Control Information Label

1.3.7 Exclusions

This warranty does not cover:

- Malfunctions in any part caused by abuse, misuse, alterations, tampering, disconnection, or improper or inadequate maintenance.
- Damage resulting from fire, accident, negligence, act of God or other events beyond the control of Liebherr.
- Consequential damages such as loss of use of the engine or equipment powered by the engine, towing, machine transportation, loss of time, downtime, inconvenience, telephone, travel, lodging, or any other indirect or direct damages.
- Loss or damage to personal property, loss of revenue, commercial loss or any other matters not specifically included in this warranty statement.
- Any replacement part may be used in the performance of any maintenance or repairs. However, the manufacturer is not liable for non-manufacturer parts.
- Any damages resulting from use of non-genuine Liebherr parts.

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– **P**roduct **I**ndentification **N**umber

2.5 Safety instructions

2.5.1 General safety instructions

1. Familiarise yourself with the **operator's manual** before starting up the machine.
   Make sure that you are in possession of additional instructions for any special equipment installed on your machine, and that you have read and understood them.
2. Only expressly authorised personnel may operate, service or repair the machine.
   Observe the legal minimum ages.
3. Only trained or instructed personnel may operate the machine. Clearly assign responsibility for operation, rigging, maintenance and repair work.
4. The operator of the machine must ensure that no persons are in the operating area of the machine on the basis of a risk assessment conducted in respect of the operating site.
5. Clearly establish the driver's responsibilities (also with respect to traffic regulations) and authorise him to refuse to carry out unsafe instructions from third parties.
6. Personnel undergoing training and instruction, or who are not yet fully qualified, may only be allowed to work on the machine under constant supervision by an experienced person.
7. Now and again, check that your personnel are working safely and are aware of possible dangers in observance of the **operator's manual**.
8. Wear safe working clothes when working on the machine.
   Do not wear rings, wristwatches, ties, scarves, unbuttoned jackets, loose clothing or similar garments, as they can become caught in the machinery and cause injury.
   Certain tasks require: safety glasses, safety boots, hard hats, protective gloves, reflective vests, ear protection etc.
9. Ask the site manager about any special safety regulations in force on the construction site.
10. Do not hold onto the steering column, the control panel or the control levers when getting on or off the machine.
    You might inadvertently trigger movements which could lead to accidents.
11. Never jump down from the machine. Use the steps, ladders and platforms provided for getting on and off.
12. Keep all handles, steps, rails, gangways, platforms and ladders free from oil, grease, mud snow and ice. This reduces the risk of slipping, tripping up or falling.
13. Familiarise yourself with the emergency exit through the right cab door and/or the rear window.
14. Unless there are other instructions, perform maintenance and repair work as follows:

    Procedure:
    - Park the machine on firm, level ground and lower the working attachment to the ground.
    - Move all control levers to neutral.
    - Turn off the diesel engine and take out the ignition key.

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Criteria:
- Damage to the outer layer penetrating to the inner layer (e.g. abrasion, cuts and cracks)
- Embrittlement of the outer layer (cracks in the hose material)
- Deformation of the natural shape of the hose or the hose line, both when pressurised and depressurised, or at bends, e.g. layer separation, blistering
- Leaks
- Failure to observe installation requirements
- Damage or deformation of the hose fittings, which reduces the strength of the fittings or the connection between the fitting and the hose
- Slippage of the hose out of the fitting
- Corrosion of the fitting, impairing its function and strength
- Exceeded storage time or service life

8. Only use genuine spare parts to replace hoses and hose lines.
9. Lay and fit hoses and hose lines in the proper manner. Do not switch the connections.

2.5.17 Roll over protective structure (ROPS) and falling object protection structure (FOPS)

The machine is equipped with a certified operator's cab that is designed to protect the driver in the event of rolling over (ROPS) and falling objects (FOPS).

Preventing accidents

Depending on the job and the way the machine is operated, hazards can arise even when the protective apparatus is intact. Avoid all unsafe working practices.

The roll-over protection structure cannot guarantee safety if the maximum permitted total machine weight (see identification plate) is exceeded.

The following modifications to the machine can lead to the maximum total weight being exceeded:
– Using attachments that are too heavy
– Changing the working attachment
– Attachments or modifications to the machine

Never use a machine whose operator's cab protection system (ROPS, FOPS) has been damaged.

Damage to the operator's cab can be caused by the following operations and events:
– Welding, cutting or drilling holes
– Attaching brackets
– Deformation after an accident
– Falling objects

Structural modifications and any kind of repairs are prohibited.

Preventing injuries

The operator's cab roll-over protection system can only protect the driver if he or she is wearing a safety belt.

Any modifications to the interior of the cab, such as installing accessories, may not impair the operator's working space.

Objects carried in the cab may not project into the operator's working space. Loose objects must be stored securely.

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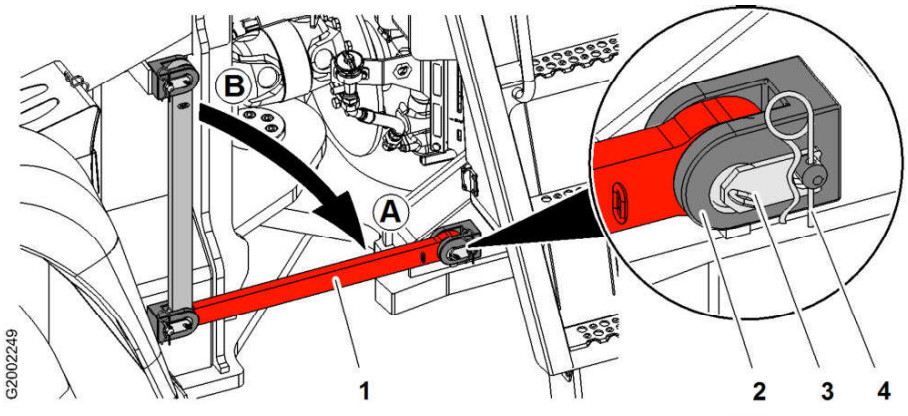

Fig. 61: Engaging the articulation lock

1	Locking bar	**3**	Pin
2	Bracket	**4**	Split pin

- ▶ Release the locking bar **1** from position **B** and move it to position **A**.
- ▶ Place the safety bar **1** in the holder **2**.
- ▶ Insert the pin **3** and secure it using the split pin **4**.

Troubleshooting
If the articulation lock will not engage:

- ▶ Start diesel engine.
- ▶ Using careful steering movements, move the safety bar **1** into position.
- ▶ Turn off diesel engine.
- ▶ Insert the pin **3** and secure it using the split pin **4**.

Releasing the articulation lock

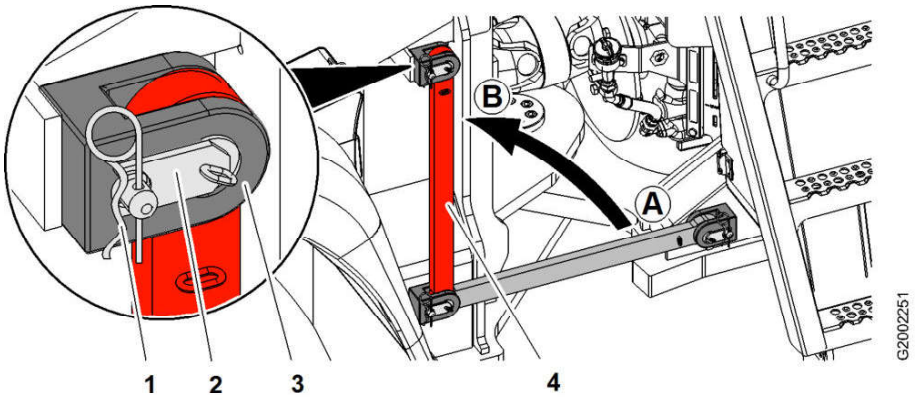

Fig. 62: Releasing the articulation lock

1	Split pin	**3**	Bracket
2	Pin	**4**	Locking bar

- ▶ Release the locking bar **4** from position **A** and move it to position **B**.
- ▶ Place the safety bar **4** in the holder **3**.
- ▶ Insert the pin **2** and secure it using the split pin **1**.

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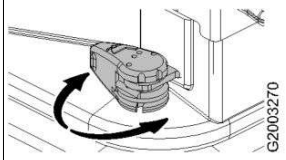
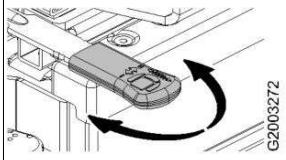
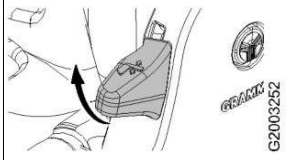
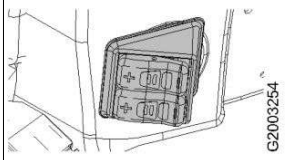
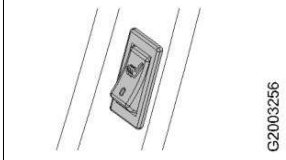
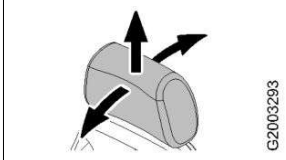
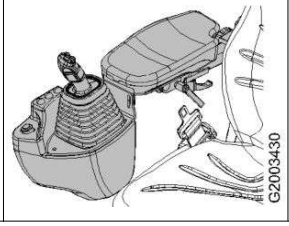
	Adjustment options	
5	 G2003270	**Longitudinal absorption** Turn the lever to the left or right to activate or deactivate longitudinal absorption.
6	 G2003272	**Lateral absorption** Turn the lever forward or back to activate or deactivate lateral absorption.
7	 G2003252	**Backrest adjustment** Pull the 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 84)

Tab. 21: Driver's seat: Grammer Premium

To set the operating mode:

Operating mode	Adjustment time for operating mode	Damping
1	1 second	Soft
2 A)	3 seconds	
3	5 seconds	
4	7 seconds	

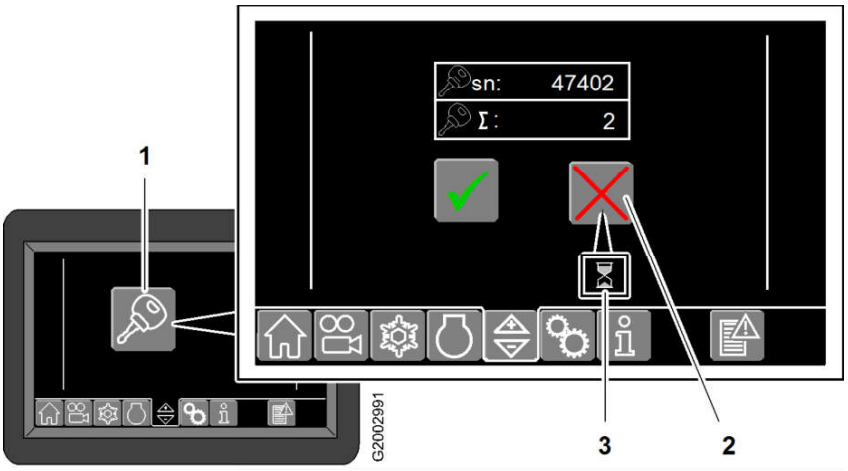


Fig. 122: Deleting programmed ignition keys

1 *Electronic immobilizer* button
2 *Delete programming* button
3 Egg timer symbol

▶ Insert master key **3** (see: fig. 120, page 89) into starting switch **1** (see: fig. 120, page 89) and put into position **I**.

▶ Open the display screen using button **1**.

▶ Press button **2**.
▷ Hourglass symbol **3** appears on the display for a few seconds.
▷ All programmed ignition keys **2** (see: fig. 120, page 89) are deleted.

Ignition key serial number display

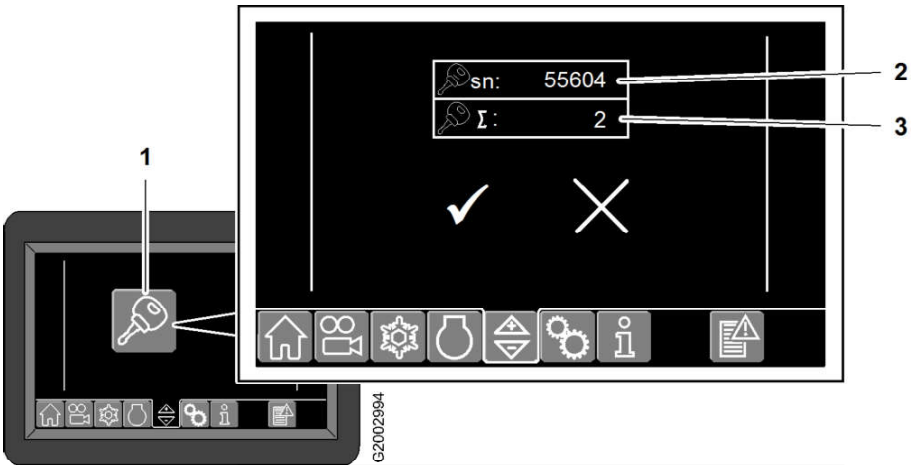


Fig. 123: Ignition key serial number display

1 *Electronic immobilizer* button
2 *Ignition key serial number* display
3 Display *of number of programmed keys* (including master key)

▶ Insert programmed ignition key **2** (see: fig. 120, page 89) into starting switch **1** (see: fig. 120, page 89) and move to position **I**.

▶ Open the display screen using button **1**.
▷ Serial number **2** of the programmed ignition key **2** (see: fig. 120, page 89) is displayed.

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Warning symbols	Designation
	SCR system: error
	Diesel engine power reduction

Tab. 27: Warning symbols

Warning symbol for the diesel particulate filter (option)	Designation
	High exhaust temperature – Lights up if the exhaust temperature exceeds 300 °C (572 °F) at the outlet of the exhaust pipe when the diesel particulate filter is regenerating. (For more information see: 3.3.7 Regenerating the diesel particulate filter, page 186)
	Regenerate diesel particulate filter prompt – Lights up when the condition of the diesel particulate filter (soot particles) requires regeneration. (For more information see: 3.3.7 Regenerating the diesel particulate filter, page 186)
	Diesel engine warning – Lights up when the exhaust counterpressure threshold in the diesel particulate filter has been exceeded (excessive soot). (For more information see: 3.3.7 Regenerating the diesel particulate filter, page 186)

Tab. 28: Diesel particulate filter warning symbols

Menu buttons	Designation
	Start page (For more information see: Menu: start page, page 102)
	Reversing camera (For more information see: Menu: reversing camera, page 103)
	Heating, air conditioning (For more information see: Menu: heating, air conditioning, page 104)
	Displaying units (For more information see: Menu: Operating status, page 105)
	System settings (For more information see: Menu: System settings, page 107)

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Display brightness setting

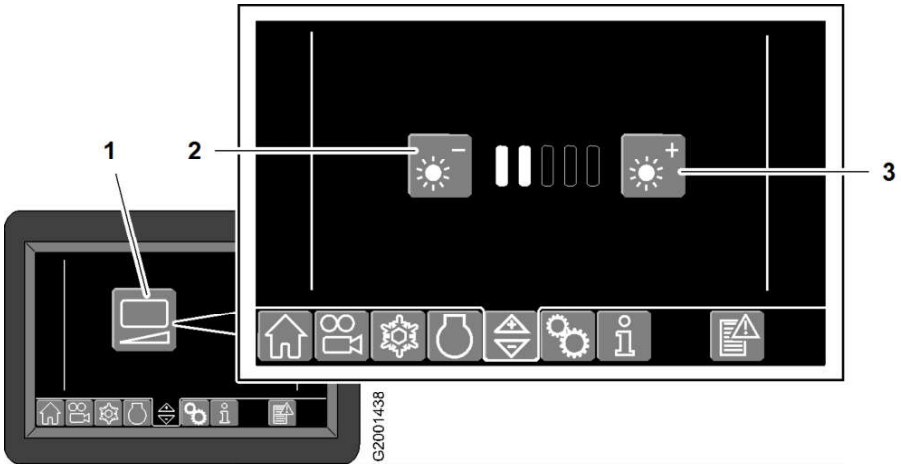

Fig. 165: Display brightness setting

1 *Display brightness* button
2 Decrease brightness
3 Increase brightness

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

▶ Set the brightness using buttons **2** and **3.**

Reversing camera

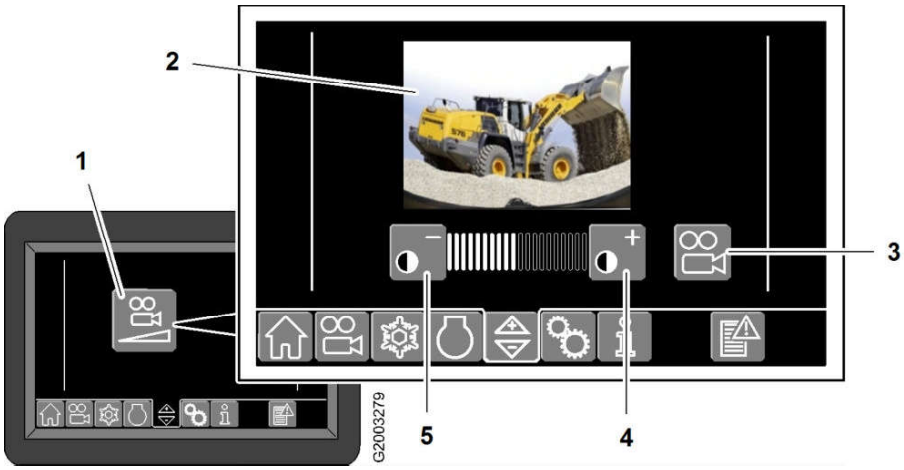

Fig. 166: Reversing camera

1 *Reversing camera* button
2 *Reversing camera* display
3 *Reversing camera in start page* button (option)
4 *Increase brightness* button
5 *Reduce brightness* button

If you want to display the reversing camera in the start page:
▶ Press button **3.**
▷ Symbol on button **3** turns green.

If you want to adjust the brightness of the display **2**:
▶ Press button **4** or **5.**

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Working attachment: changing tilt speed

Note
In the case of a large working attachment, changing the tilt-out speed is locked at the factory.

▶ Change tilt-out speed: contact Liebherr customer service.

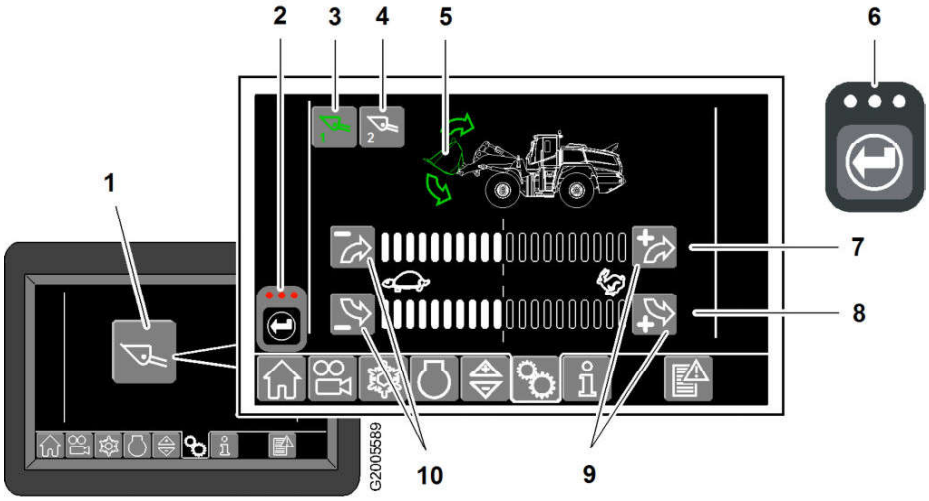

Fig. 196: Working attachment: changing tilt speed

1	*Working attachment: tilt speed* button	**6**	*Confirmation* key
2	*Confirmation required* status symbol	**7**	Tilt-in speed
3	*Working attachment 1* button [43)]	**8**	Tilt-out speed
4	*Working attachment 2* button [43)]	**9**	*Increase tilt speed* button
5	Working attachment	**10**	*Reduce tilt speed* button

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

▶ Press button **3** or **4**.
▷ Status symbol **2** flashes.

▶ Press key **6**.
▷ Selected button **3** or **4** is shown in green.
▷ The tilt speed setting for the selected working attachment is displayed.

▶ If necessary: use the buttons **9** and **10** to change the tilt speed.

Reversible fan drive

This equipment is optional.

The function is used to clean the cooling system.

[43)] If mini-joystick function setting is activated, working attachment button is only displayed as a symbol. The required working attachment can be selected in the mini-joystick function setting.

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Controlling the working attachment

Move the control lever to operate the working attachment.

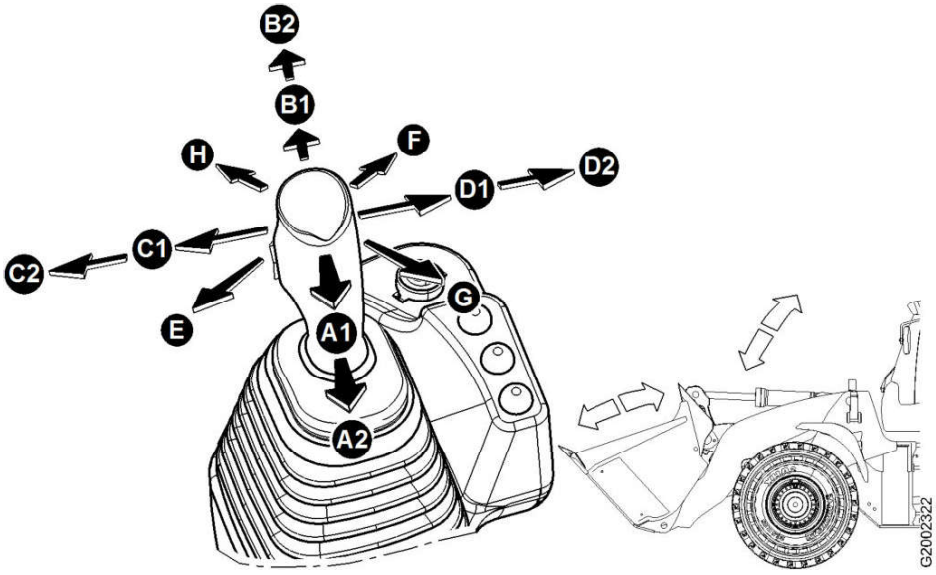

Fig. 211: Controlling the working attachment

Direction of control lever movement		Working attachment function	
A1	Back to action point	The lift arms are raised.	Standard
A2	Back to limit	Auto lift arm position	Standard
B1	Forward to action point	The lift arms are lowered.	Standard
B2	Forward to limit	The lift arms are quickly lowered.	Standard
		Float position	Standard
		Auto lowering	Standard
C1	Left to action point	The bucket is tilted in.	Standard
C2	Left to limit	Bucket return-to-dig	Standard
D1	Right to action point	The bucket is tilted out.	Standard
D2	Right to limit	Bucket return-to-dig	Standard
E	Diagonal	The lift arms are raised while the bucket is tilted in.	Standard

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Note

All the functions of the heating and air conditioning unit can be set on the display.

Only the *automatic mode*, *temperature*, *blower speed*, *recirculated air*, *fresh air* and *defrost mode* functions can be set on the control unit. (For more information see: 3.1.3 Control unit, page 66)

Automatic mode

This equipment is optional.

The function can be activated on the display or on the control unit.

Operation on the display		Operation on the control unit	
	Automatic mode: green symbol		Automatic mode: the LEDs light up.

Tab. 44: Automatic mode

Note

To switch to manual mode:

▶ Press the *automatic mode*, *blower speed* or *air distribution* button.

Air conditioning mode

The function can only be deactivated on the display.

Operation on the display	
	Air conditioning mode: green symbol

Tab. 45: Air conditioning mode

Note

Dehumidify the cab!

On cold, damp days, you can use the air conditioning system to dehumidify the cab.

▶ Switch on the air conditioning system in addition to the heater.

Recirculated air mode

You can temporarily shut off the fresh air supply if there are unpleasant smells outside. The air inside the cab is recirculated.

The function can be activated on the display or on the control unit.

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Note

The central control unit records the time during which the machine is operated with a low grease level.

▶ Fill the grease reservoir. (For more information see: 5.18.1 Central lubrication system: Checking the grease level in the reservoir, page 345)

Cycle error

If the set cycles could not be performed in the time specified:
– All the LEDs on the *central lubrication system* button flash.
– A service code appears on the display.

Possible causes:
– Lubrication point, lubricant supply line or distributor blocked.

To rectify faults:

▶ Contact Liebherr customer service.

3.2.26 Reversing alarm

This equipment is optional.

The reversing alarm system warns anyone standing behind the machine while it is reversing.

Versions:
– Audible reversing alarm
– Visible reversing alarm

The reversing alarms can also be installed in combination.

The reversing alarm can also be deactivated.

Audible reversing alarm

The reversing alarm is automatically activated when the machine is reversed.

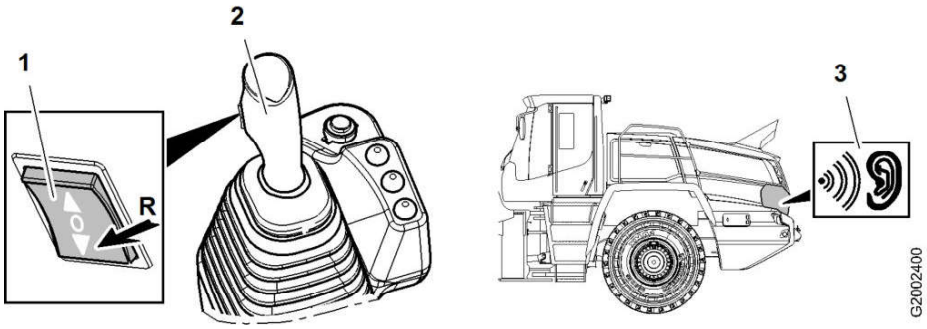

Fig. 264: Audible reversing alarm

1 *Travel direction* switch
2 Control lever
3 Reversing alarm
R Reverse travel direction

▶ Press the switch **1** in travel direction **R**.
▷ The reversing alarm **3** installed in the engine compartment emits an audible warning signal (intermittent tone).

Deactivating the audible reversing up alarm

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Topping up diesel exhaust fluid

Make sure that following requirements are fulfilled:
- ❑ Machine is in operating position.
- ❑ The working attachment is lying flat on the ground.
- ❑ Diesel engine is switched off.
- ❑ Specified diesel exhaust fluid is available. (For more information see: 5.3.4 Diesel exhaust fluid, page 264)

NOTICE
Diesel fuel in the diesel exhaust fluid tank!
Damage to the engine.

▶ Do not start the engine.

▶ Contact Liebherr customer service.

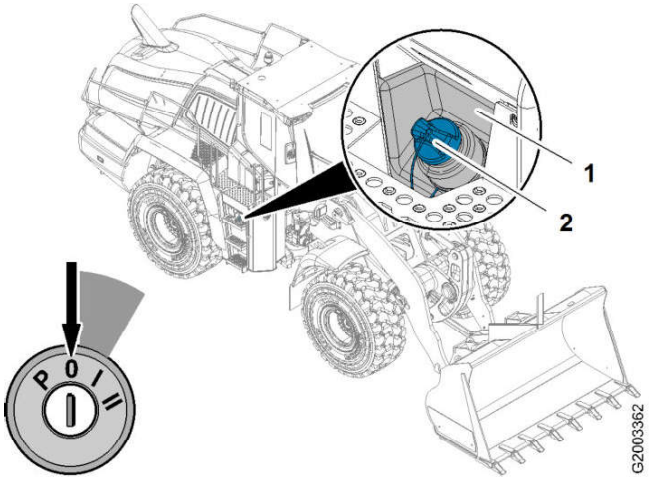

Fig. 276: Topping up diesel exhaust fluid

1 Diesel exhaust fluid tank **2** Tank filler cap

▶ Turn the tank filler cap **2** anticlockwise and take it off.

▶ Top up the diesel exhaust fluid.

▶ Put on the tank filler cap **2**, turn it clockwise and lock it.

3.3.2 Starting diesel engine

Note

The engine cannot be started by pushing or towing.

The following precautions help you start the engine at cold temperatures:
- – Fully charged battery
- – Auxiliary heater (option)

Starting procedure

Make sure that the following requirements are fulfilled:
- ❑ The machine is in the operating position.
- ❑ You have fastened your safety belt.

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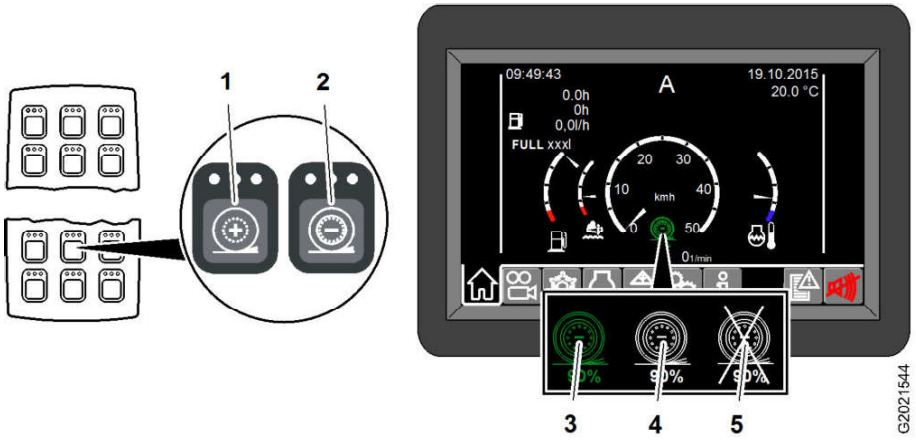

Fig. 290: Reversing

1 *Increase tractive force* button
2 *Reduce tractive force* button
3 Tractive force adjustment active
4 Tractive force adjustment inactive
5 Tractive force adjustment deactivated

Reducing the tractive force

▶ Press button **2.**
▷ The tractive force is shown in the display while you press the button.
▷ The LEDs on the button light up according to the selected tractive force.

Increasing the tractive force

▶ Press button **1.**
▷ The tractive force is shown in the display while you press the button.
▷ The LEDs on the button light up according to the selected tractive force.
▷ When the tractive force has reached 100% all the LEDs on the buttons **1** and **2** go out.

Tractive force adjustment active

Make sure that the following preconditions are met:
❑ The working attachment is in the loading position.
❑ The forward travel direction is active.

▶ Note the information in the display.
▷ Tractive force adjustment active **3** (see: fig. 290, page 171) is displayed.

Tractive force adjustment inactive

Make sure that one of the requirements is fulfilled:
❑ The working attachment is not in the loading position.
❑ The reverse travel direction is active.
❑ The Kick-Down function is active.

▶ Note the information in the display.
▷ Tractive force adjustment inactive **4** (see: fig. 290, page 171) is displayed.

Tractive force adjustment deactivated

▶ Press the Kick-Down button twice in succession briefly.
▷ The tractive force adjustment is deactivated.

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▶ Move the control lever in direction **E**.
▷ The lift arms are raised while the bucket is tilted in.

To raise the lift arms while tilting the bucket out:

▶ Move the control lever in direction **G**.
▷ The lift arms are raised while the bucket is tilted out.

Lowering the lift arms while tilting the bucket in or out

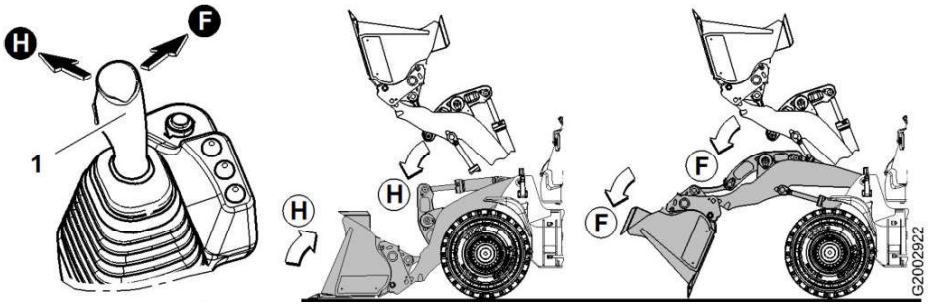

Fig. 304: Lowering the lift arms while tilting the bucket in or out

1 Control lever

To lower the lift arms while tilting the bucket in:

▶ Move the control lever in direction **H**.
▷ The lift arms are lowered while the bucket is tilted in.

To lower the lift arms while tilting the bucket out:

▶ Move the control lever in direction **F**.
▷ The lift arms are lowered while the bucket is tilted out.

Float position

The float position allows the working attachment to lie on the ground under its own weight and to move freely on uneven ground.

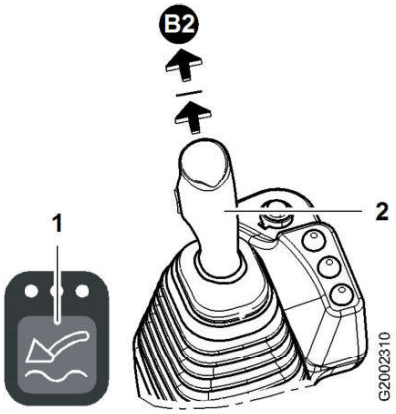

Fig. 305: Float position

1 *Float position* button **2** Control lever

▶ Place the working attachment flat on the ground.

▶ Move the control lever **2** as far as it will go in direction **B2** and hold it there.
▷ Float position is activated until you let go of the control lever **2**.

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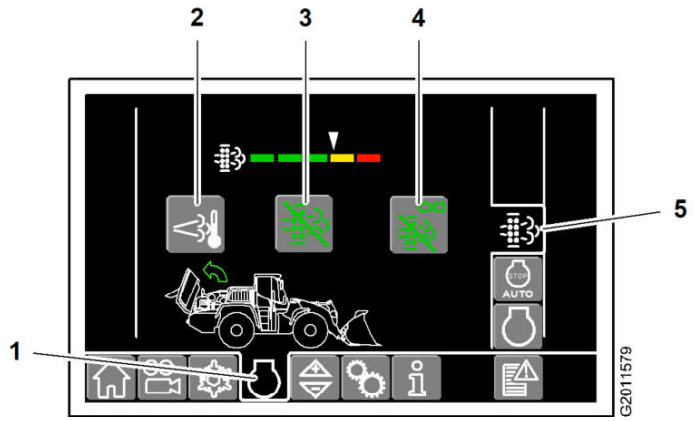

Fig. 323: Regeneration mode permanently disabled

1 *Operating status* button
2 *Manual regeneration mode* button
3 *Regeneration mode disabled* button
4 *Regeneration mode permanently disabled* button
5 *Regenerate diesel particulate filter* button

▶ Call up the display screen using button **5**.

▶ Set button **4** to green.
▷ Regeneration of the diesel particulate filter is always disabled.
▷ Button **2** is white.
▷ The machine can be operated without any loss of power until symbol **4** (see: fig. 320, page 188) lights up.

Manual regeneration mode

Select this mode in an environment that is protected and where fire is not a hazard. The operator determines when regeneration begins.

Make sure that the following preconditions are met:
❑ The diesel engine is warmed up (coolant temperature is above 85 °C (185 °F)).
❑ The machine is parked on level ground.
❑ There is sufficient fuel in the tank.
❑ The engine bonnet is open.

Note

Regeneration mode for fire resistant and protected environments.

Do not leave the machine during manual regeneration.

During manual regeneration, only turn off the diesel engine in an emergency!

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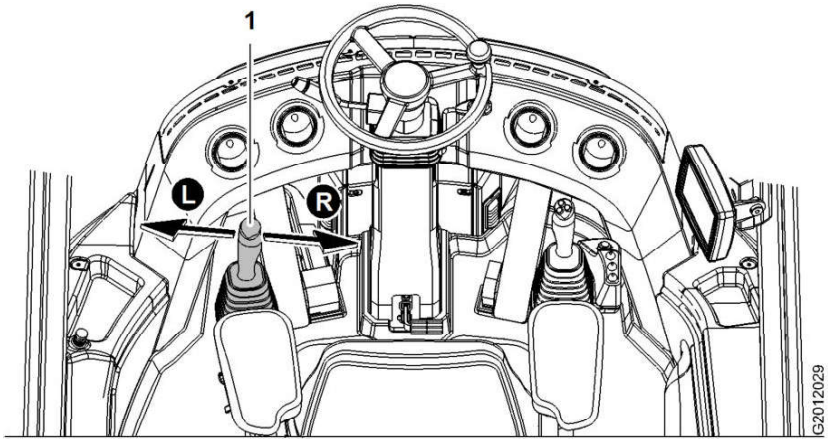

Fig. 331: Steering procedure

1 Joystick

Note
The machine turns faster or slower depending on how far you turn the wheel!

▶ Finish the steering manoeuvre by releasing the joystick.

▶ To turn the machine to the left: move the Joystick **1** in the **L** direction.

▶ To turn the machine to the right: move the Joystick **1** in the **R** direction.

Deactivating joystick steering

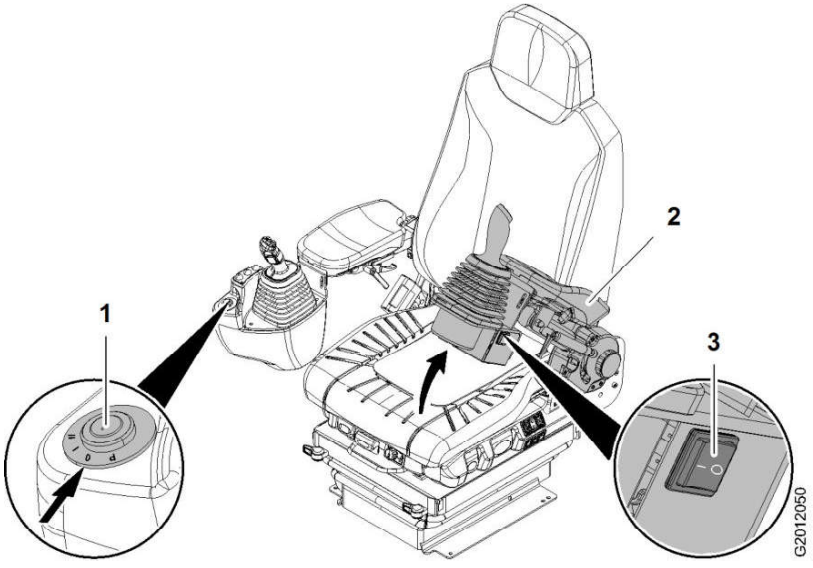

Fig. 332: Deactivating joystick steering

1 Starting switch
2 Left armrest
3 *Joystick steering* switch

Deactivate the joystick steering using one of the options listed below:

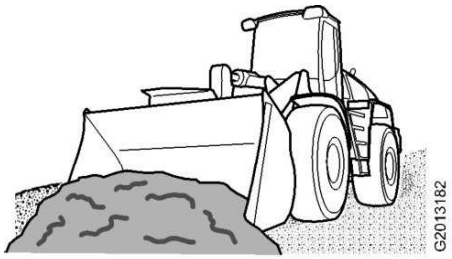

Fig. 344: Grading in forward travel direction

NOTICE
Incorrect use of the working attachment!
Damage to the machine.

▶ Do not grade in forward travel direction with the working attachment tilted out.

▶ Keep the working attachment parallel to the ground or tip it down slightly.

Grading in reverse travel direction

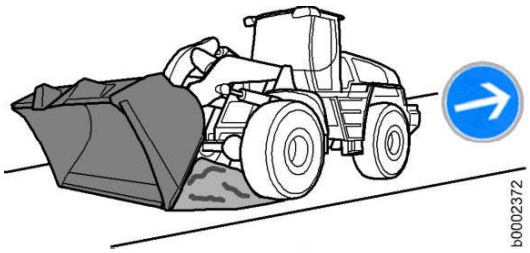

Fig. 345: Grading in reverse travel direction

NOTICE
Grading with the working attachment fully tilted out!
Damage to the lift arms.

▶ Do not tilt the bucket all the way out.

▶ Tilt the working attachment down and drive backwards.

3.4.7 Removing material from a slope or wall

Removing material from a slope

This is how to remove normal material such as sand or gravel.

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▷ The working attachment **6** is locked.

Checking that the working attachment is locked

The fact that the attachment can be changed from the operator's cab does not release the operator from his / her duty to check it afterwards.

Every time you change the attachment, make a *visual inspection* and a *mechanical check* to make sure that the working attachment is correctly locked.

DANGER
Falling equipment!
Risk of fatal injury.

▶ Do not carry out any working movements of the attachment before checking whether it is locked.

Visual inspection

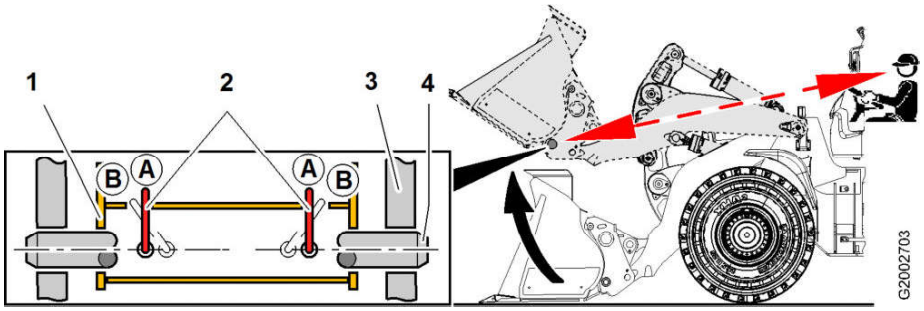

Fig. 358: Visual inspection

1	Quick coupler	**4**	Locking pin
2	Locking indicator	**A**	Locked position
3	Working attachment	**B**	Unlocked position

▶ Move the lift arms until you can see the quick coupler from the cab.

▶ Make a visual inspection on both sides.
▷ The lock indicator **2** should be in the locked position **A**.
▷ The locking pins **4** must have retracted as far as the outer hole on the working attachment **3**.

Mechanical check

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Note
Towing the machine can present problems and is always in the responsibility of the operator.

▶ The manufacturer will not be held liable for damage or accidents caused by towing.

There are two different methods of towing:
– Towing with the diesel engine running
– Towing with the diesel engine off

Towing with the diesel engine running

Keep the towing as short as possible and only do it on solid ground.

Make sure that the following requirements are fulfilled:
❑ The service brake and steering are working.
❑ Wheel wedges are available.
❑ Sufficiently strong slinging gear and towing equipment is available.
❑ The machine is in maintenance position 2.

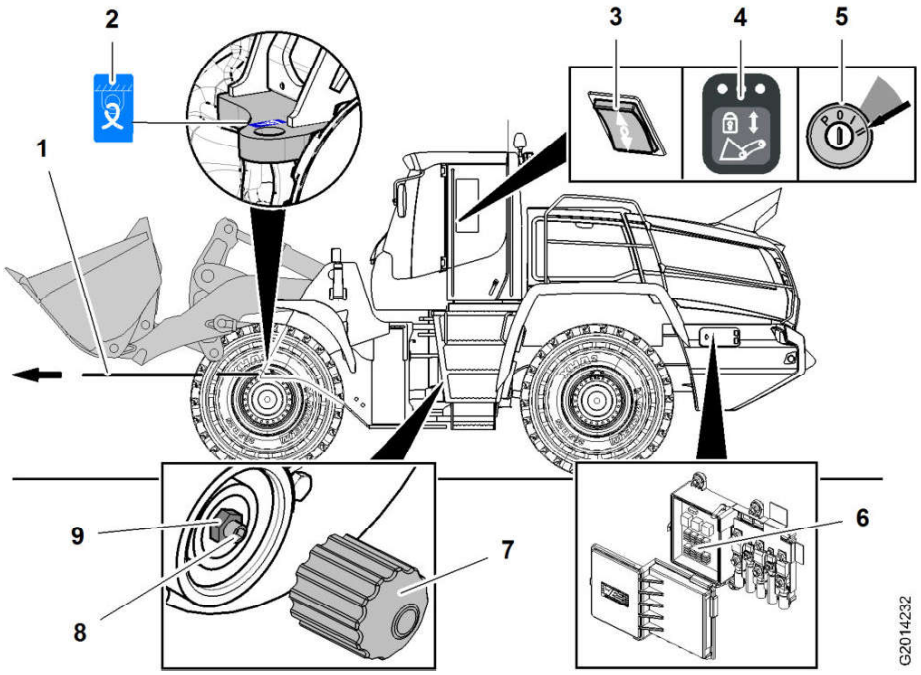

Fig. 368: Towing with the diesel engine running

1	Slinging gear	**6**	Fuse board A4a
2	Lashing points	**7**	Cover
3	*Travel direction* switch	**8**	Adjusting screw
4	*Working hydraulics lockout* button	**9**	Nut
5	Starting switch		

▶ Fasten the slinging gear **1** to the lashing points **2** on both sides.

▶ Remove the plug-in fuse F24 on the fuse board **6**.
▷ The travel functions of the machine are now out of operation.
▷ The service code appears in the display.

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Malfunction	Cause	Remedy
The engine only starts with difficulty.	Leak or insufficient pressure in the low pressure fuel system	Check for leaks. Contact Liebherr customer service.
	Engine compression too weak	Contact Liebherr customer service.
	Heating flange defective (at low temperatures)	Have the heating flange inspected and changed if necessary. Contact Liebherr customer service.
	Malfunction in the electronics	Check the error log of the engine control unit. Contact Liebherr customer service.
The engine turns itself off.	Power supply interrupted	Contact Liebherr customer service.
	Leak or insufficient pressure in the low pressure fuel system	Check for leaks. Contact Liebherr customer service.
	Malfunction in the electronics	Check the error log of the engine control unit. Contact Liebherr customer service.
Low engine power (poor performance)	Problem in the fuel system (clogged, leaking)	Carry out a visual inspection and look for leaks. Change the fuel fine filter. Contact Liebherr customer service.
	Charge pressure too low	Tighten loose clips. Change the seals and hoses. Clean the air filter. Repair the turbocharger. Contact Liebherr customer service.
	Charge air temperature too high (engine control unit automatically reduces the power)	Clean the intercooler Check the fan power. Reduce the ambient temperature. Contact Liebherr customer service.
	Coolant temperature too high (engine control unit automatically reduces the power)	Check that the cooler is clean. Check the fan and the thermostat. Check the coolant level. Contact Liebherr customer service.
	Fuel temperature too high (engine control unit automatically restricts the power)	Contact Liebherr customer service.
	Working more than 1800 m (5905‘ 6“ ft-in) above sea level	There is no remedy, the engine power is automatically restricted.
	Injection valves blocked or do not inject.	Contact Liebherr customer service.
	Engine compression too weak	Contact Liebherr customer service.
	Malfunction in the electronics	Check the error log of the engine control unit. Contact Liebherr customer service.
	Exhaust treatment system clogged	Contact Liebherr customer service.
Poor engine braking	Engine brake valve not working	Contact Liebherr customer service.
	Malfunction in the electronics	Contact Liebherr customer service.

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Fuse	Value	Unit	Designation/function
F10	3	A	Emergency mode position signal
F11	3	A	Articulation angle sensor 2
F12	3	A	Vcc armrest active
F13	5	A	Steering wheel angle 2 Vcc lock

Tab. 65: Fuses on fuse board A4b in the operator's cab

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Symbol	Designation	Symbol	Designation	Symbol	Designation
 b0000648	Perform lubrication.	 b0000762	Fluid filling point	 b0000763	Observe the operating manual.

Tab. 70: Lubrication chart symbols

Industrial lift arm lubrication chart

This equipment is optional.

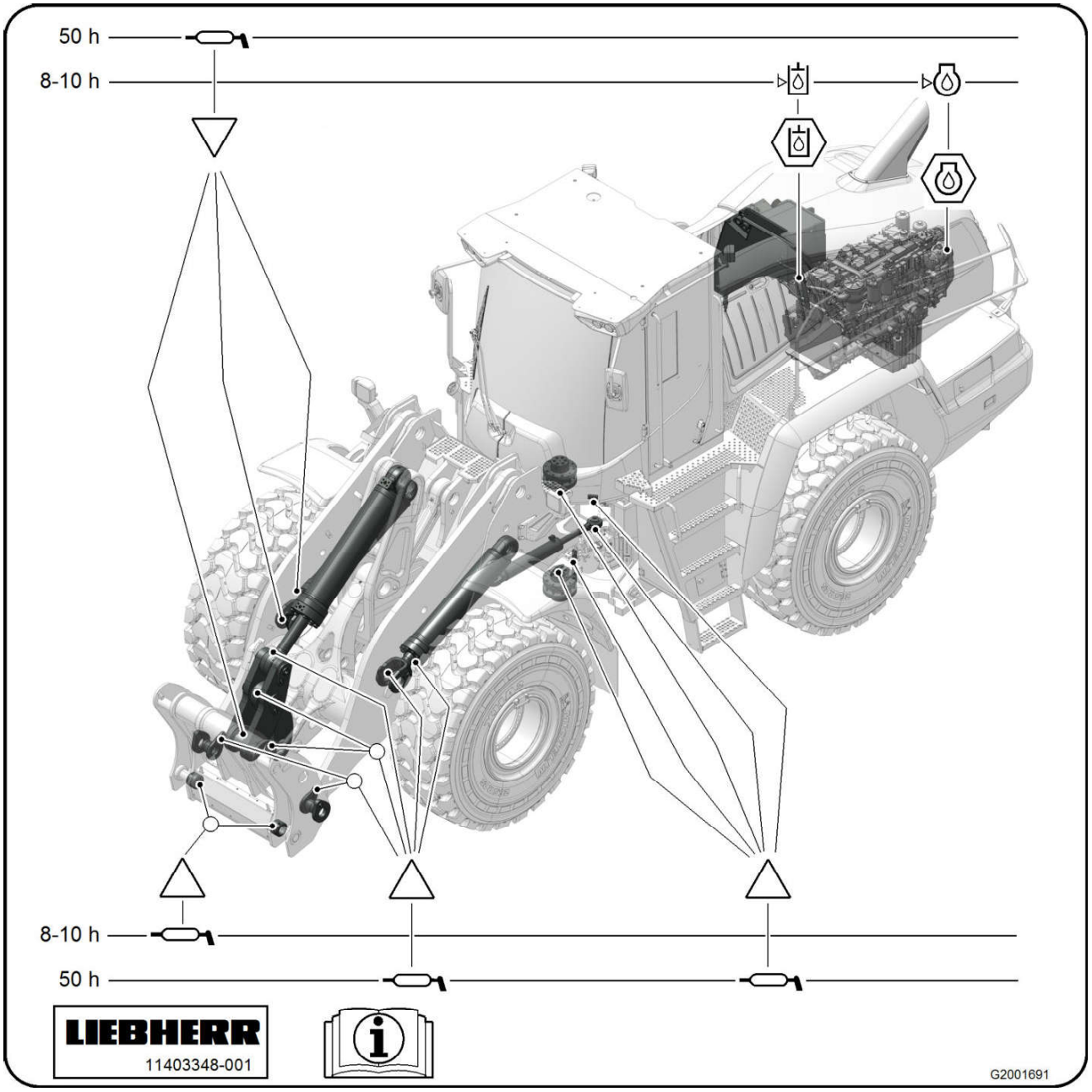

Fig. 410: Industrial lift arm lubrication chart

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5.4 Safety precautions

Observe the relevant **safety instructions** when carrying out all maintenance, inspection or repair work. Local health and safety regulations, accident prevention regulations and national laws must be observed.

(For more information see: 2.5.11 Measures for ensuring safe maintenance, page 56)

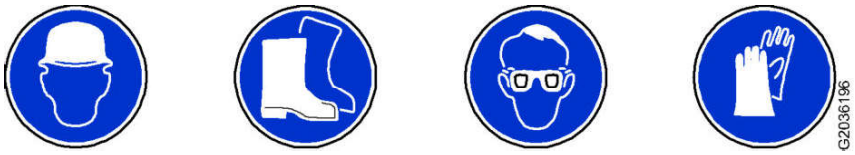

Fig. 411: Safety precautions

Make sure that following requirements are fulfilled:
- ❑ Suitable protective equipment is present.
- ❑ The driver and maintenance staff are in visual contact.

Protective equipment must be worn for some tasks:
- Hard hat
- Safety footwear
- Safety glasses
- Protective gloves

WARNING
Persons in the danger area!
Risk of injury.

▶ Make sure there is nobody in the danger area.

▶ Wear appropriate working clothing.

▶ Always maintain visual contact with the maintenance staff.

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The type of damage determines whether the hydraulic line is renewed or whether the machine can be operated with the damaged hydraulic line.

The general safety instructions must be observed when working on the hydraulic system. (For more information see: 2.5 Safety instructions, page 51)

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

Minor damage to the hydraulic lines

Wear or damage to the outer jacket of the hydraulic line

Wear or damage to the outer jacket of the hydraulic line is caused by friction or contact with other components. As long as the steel fabric of the hydraulic line is not damaged or not visible, this is classified as minor damage.

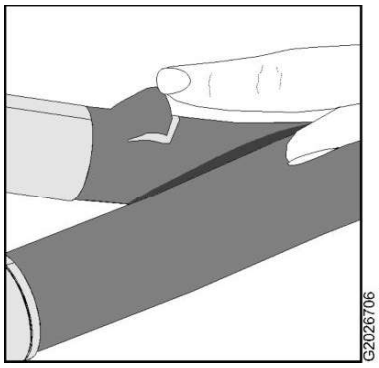

Fig. 421: Wear or damage to the outer jacket of the hydraulic line

▶ Document the damage and observe whether the condition deteriorates.

▶ Check the routing of the hydraulic line, contact Liebherr customer service if necessary.

If the condition deteriorates:
▶ Have the hydraulic lines replaced by Liebherr customer service.

Moist surfaces, no visible oil leak

Moist spots can be seen on the surface. An oil leak or oil drops are not visible. As long as you do not observe an obvious oil leak, it is classified as minor damage.

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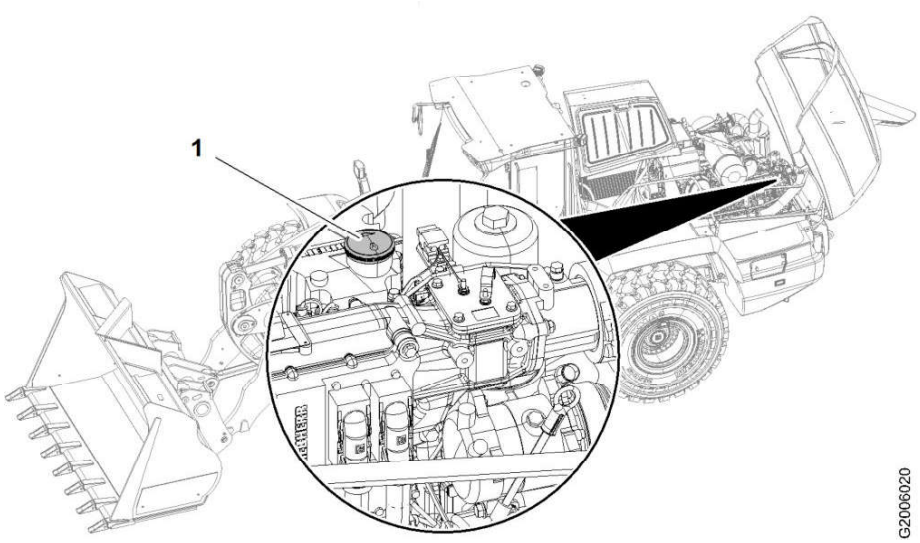

Fig. 431: Topping up oil

1 Cover

▶ Open the cover **1**.

NOTICE
Non-approved oil!
Damage.

▶ Only use oil that meets the Liebherr specifications.

▶ Top up appropriate amount of engine oil via filler pipe cover **1**. (For more information see: 5.3.5 Engine oils, page 265)

▶ Do not fill diesel engine oil above maximum level.

▶ Clean cap **1**, place it on the filler neck and tighten it.

5.7.2 Checking diesel engine belt drive

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

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❑ The engine has cooled down.

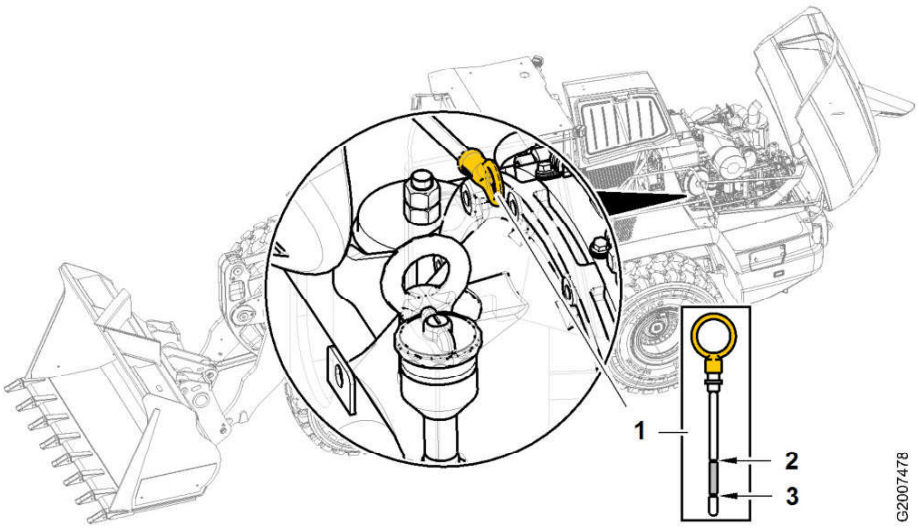

Fig. 442: Checking the oil level

1 Dipstick
2 Maximum oil level
3 Minimum oil level

▶ Pull out the dipstick **1**, wipe it clean, and re-insert it.

▶ Pull out the dipstick **1** once again and read off the oil level.
▷ The oil level on the dipstick **1** must be between the maximum **2** and minimum **3**.

If the oil level is below the minimum **3**:
▶ Top up the oil. (For more information see: Topping up the oil, page 301)

Troubleshooting
If the oil is above the maximum level **2**:

▶ Contact Liebherr customer service.

Topping up the oil

Make sure that the following requirements are fulfilled:
❑ The machine is in maintenance position 1.
❑ The service access is open.
❑ The machine is level.
❑ The engine has cooled down.

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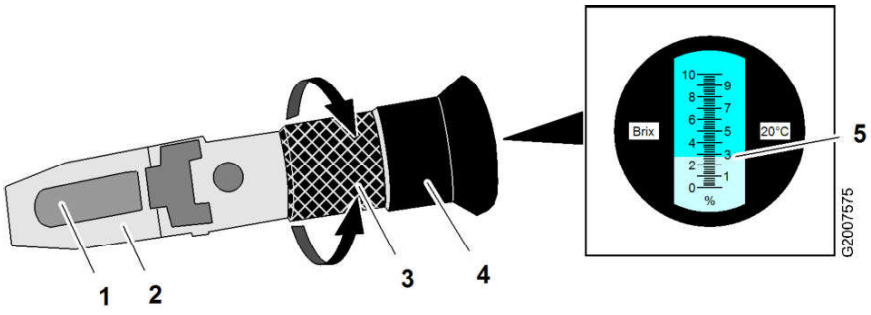

Fig. 450: Checking the corrosion inhibitor concentration

1 Prism
2 Cover
3 Adjusting ring
4 Eyepiece
5 Dividing line

▶ Carefully clean the prism **1** and cover **2** of the refractometer.

▶ Place one or two drops of coolant on the prism **1**.

▶ Close the cover **2**.
▷ The fluid spreads out.

▶ Look through the eyepiece **4** against a light background and focus the scale using the adjusting ring **3**.

▶ Read the Brix value on the dividing line **5**.

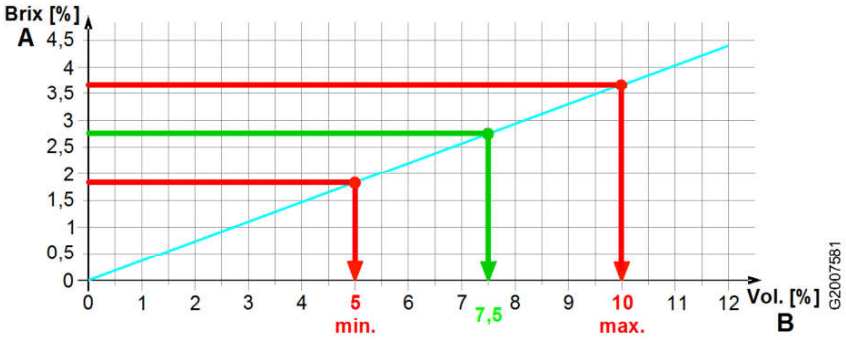

Fig. 451: Converting Brix-value to corrosion inhibitor concentration

A Brix value
B Corrosion inhibitor concentration

▶ CovertBrix-value **A** on diagram to corrosion inhibitor concentration **B**.

▶ Check whether corrosion inhibitor concentration is correct.

Description	Unit	Value
Corrosion inhibitor concentration	% %	7.5 ±2.5 7.5 ±2.5

If required value is reached:

▶ Close cap **1** (see: fig. 449, page 310) of equalising reservoir **2** (see: fig. 449, page 310) .

If required value is not reached:

▶ Correct corrosion inhibitor concentration.

Correcting the corrosion inhibitor concentration

▶ Place a receptacle under the machine.

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5.12 Electrical system

5.12.1 Checking function of the lighting and horn

Make sure that the following requirements are fulfilled:
- ❑ The machine is parked in a safe place.
- ❑ The electrical system of the machine is switched on.

All the lights can be tested without starting the machine. Start the machine when testing the reversing headlights.

WARNING
The working headlights can become hot!
Burns, fire.

▶ Observe the minimum interval of 1 m (3‘ 3“ ft-in) to persons and material.

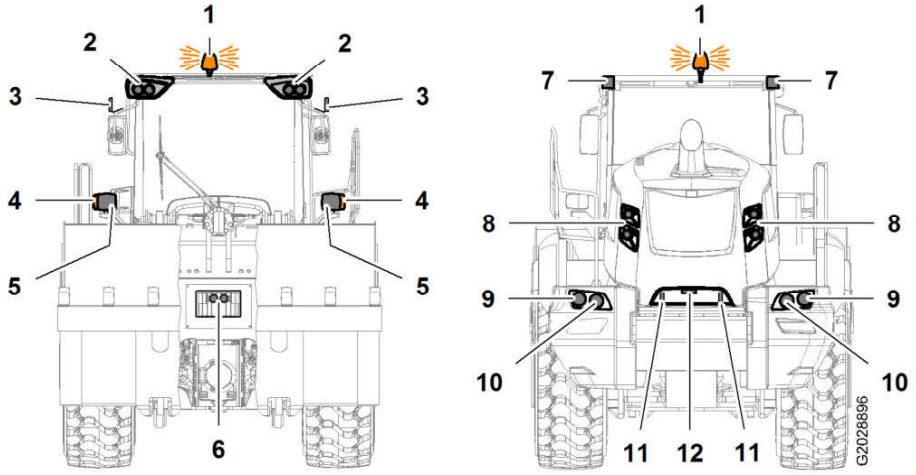

Fig. 459: Lighting

1 Flashing beacon (optional)
2 Front working headlights
3 Marker light (optional)
4 Front indicator light
5 Driving headlights
6 Front section working headlight (optional)
7 Rear working headlight (optional)
8 Engine bonnet working headlight
9 Brake light, tail light, rear indicator
10 Reversing light
11 Flash (optional)
12 License plate light (optional)

▶ Turn on all the lights.

▶ Check all the lights work properly.

When you are checking the brake light:
▶ Press the inching brake pedal.

To check the reversing light:

▶ Start the machine.

▶ Release the parking brake.

▶ Select reverse travel direction.

▶ Test the reversing light.

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5.15.4 Right cab access: Lubricating moving parts with penetrating oil

Make sure that the following requirements are fulfilled:
- ❑ The machine is in maintenance position 1.
- ❑ The right cab access is extended.

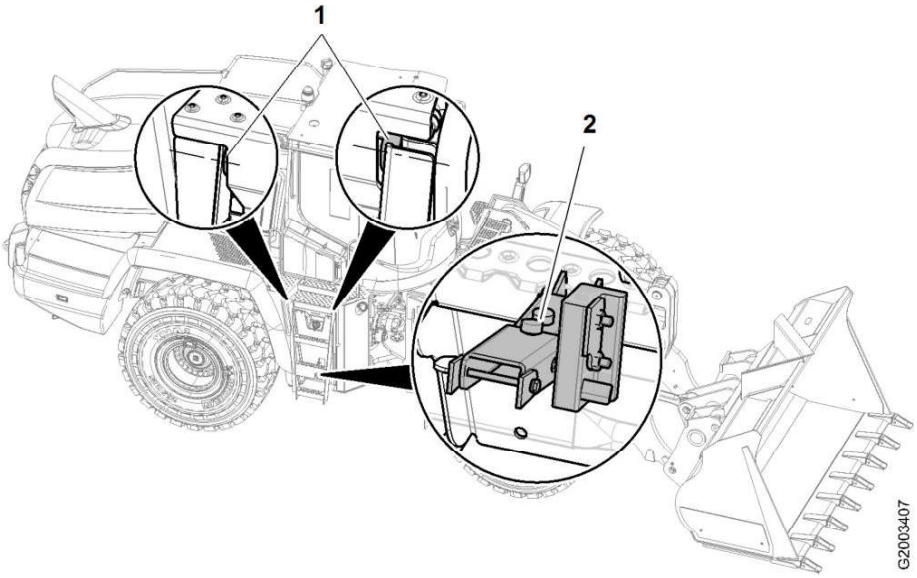

Fig. 468: Right cab access: Lubricating moving parts with penetrating oil

1 Sliding bearing **2** Locking mechanism

▶ Lubricate the sliding bearing **1** and locking mechanism **2** with Ballistol spray (item code 10025514).

▶ (For more information see: Right cab access, page 276)

5.15.5 Service hatches: Cleaning and maintaining the seals

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

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Cleaning the recirculated air filter

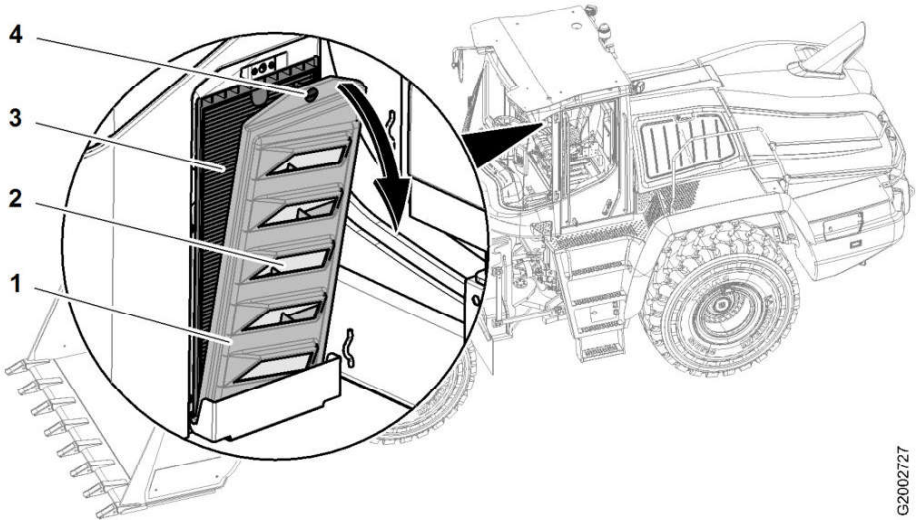

Fig. 477: Cleaning the recirculated air filter

1	Filter cartridge	**3**	Recirculated air filter
2	Pre-filter	**4**	Knurled screw

▶ Unscrew the knurled screw **4**.
▷ The filter cartridge **1** is unlocked.

▶ Move the filter cartridge **1** forward and take it out.

▶ Take the pre-filter **2** out of the filter cartridge **1** and clean it (by blowing it out or washing it).

▶ Take out the recirculated air filter **3** and clean it (blow it out).

▶ Put in the clean recirculated air filter **3**.

▶ Put the pre-filter **2** into the filter cartridge **1** and fit them.

▶ Screw in the knurled screw **4**.
▷ The filter cartridge **1** is locked.

5.17.2 Safety belt: Checking the condition and function

Make sure that the following requirements are fulfilled:
❑ The machine is in maintenance position 1.

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