en **Operator's manual**

Wheel loader

L 550-1562

From serial number 31334

Document ID

	ORIGINAL OPERATOR'S MANUAL
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Manufacturer:	Liebherr Machinery (Dalian) Co. Ltd.
Type:	L 550
Type no.:	1562
From Serial no.:	31334

Contact

Address:	Liebherr Machinery (Dalian) Co. Ltd. No.30, Wanli Street Dalian

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– Tyre tread
– Tyre pressure

The tyre pressure specifications refer to:
– Value set when delivered from the factory
– Cold tyres
– Machine ready for operation with standard equipment and permissible load

Note
Observe the maximum tyre pressure permitted by the tyre manufacturer.
When used for industrial timber handling or similar, higher tyre pressures are required.

▶ Check and adjust the tyre pressure. (For more information see: 5.13.1 Checking the tyre pressure, page 232)

Size and tread code		Change in operating weight	Loader width across tyres	Change in height	Air pressure		
					FA [A]	RA [B]	p - max. [C]
		kg	mm	mm	bar	bar	bar
23.5R25 Michelin XLD D2A *	L5	+604	2670	-9	3.00	2.00	4.50
23.5R25 Michelin X MINE **	L5	+752	2690	+26	3.50	3.00	6.50
23.5-25 Triangle TL612 20PR	L3	-236	2650	-15	3.50	3.00	3.90
23.5R25 Techking ETLOADER **	L3	0	2650	-2	5.25	5.00	6.50
23.5R25 Techking ET5A **	L3	0	2650	0	5.25	5.00	6.50
23.5-25 Techking TKPLUS II 20PR	L3	+260	2650	-15	4.50	3.75	5.00
23.5R25 Bridgestone VJT *	L3	+130	2670	-29	4.00	3.00	5.00
23.5R25 Techking ETD2 **	L5	+692	2650	+25	5.25	5.00	6.50
23.5R25 Techking ETDL5 **	L5	+916	2650	+35	5.25	5.00	6.50
23.5R25 Triangle TL538S+ **	L5	+604	2660	-5	4.50	5.50	6.50
23.5R25 Triangle TL559S+ **	L5	+768	2660	-5	6.50	5.50	6.50

Tab. 2: Tyres for the standard machine

A) Front axle
B) Rear axle
C) Maximum tyre pressure

Special tyres

Enter the specifications in the tables below as follows:
– **By the machine operator:** if the machine is retrofitted by the machine operator.

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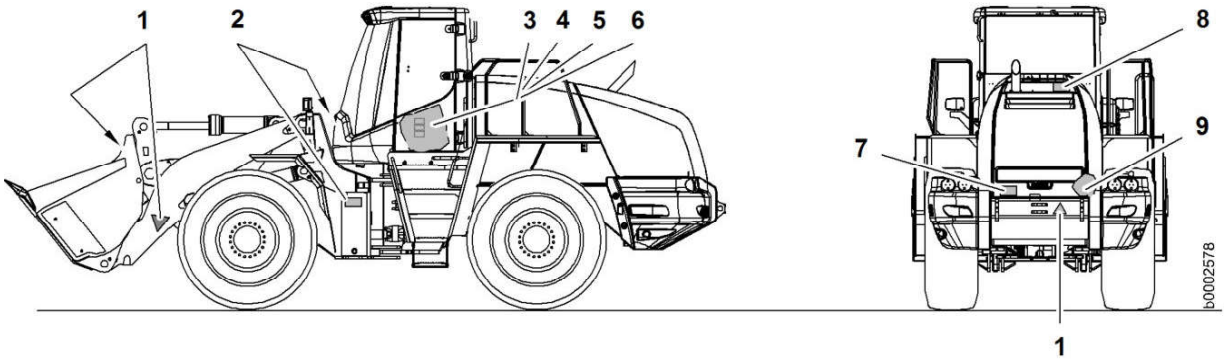

Fig. 11: Safety decals

1	*Working area* decal	**4**	*Steering* decal	**7**	*Engine shutdown* decal
2	*Articulation area* decal	**5**	*Safety belt* decal	**8**	*Coolant* decal
3	*Accident prevention* decal	**6**	*ROPS/FOPS* decal	**9**	*Voltage* decal

Danger area decal

Fig. 12: Danger area decal

Warns of the risk of accidents, possibly resulting in severe or even fatal injuries.

Meaning: **Keep out of the danger area.**

Articulation area decal

Fig. 13: Articulation area decal

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.**

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2.4 Safety instructions

2.4.1 General safety instructions

1. Familiarise yourself with the **"operating manual"** before starting up the machine.
   Make sure that you are in possession of and have read and understood additional instructions applicable to any special equipment installed on your machine.
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. 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.
5. Personnel undergoing training, instruction or who are not yet fully qualified may only be allowed to work on the machine under constant supervision by an experienced person.
6. Now and again check that your personnel are working safely and are aware of possible dangers in observance of the **"operating manual"** .
7. 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 goggles, safety boots, hard hats, gloves, reflective vests, ear protection etc.
8. Ask the site manager about any special safety regulations in force on the site.
9. 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.
10. Never jump down from the machine. Use the steps, ladders and platforms provided for getting on and off.
11. 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.
12. Familiarise yourself with the emergency exit through the right cab door and/or the rear window.
13. 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.
    - Shut down the engine and take out the ignition key.
14. Before starting any work on the hydraulic circuit, you must also press the working hydraulics lockout button and actuate all pilot control units (joystick and pedals) in both directions in order to reduce the control pressure and accumulated pressure in the operating circuits. You must then reduce the internal tank pressure.
15. Lock the working hydraulics to prevent accidental actuation before leaving the driver's cab.
    Lock the working hydraulics in accordance with the instructions in the **"operating manual"**.

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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.

2.4.17 Roll-over protection structure (ROPS) and falling object protection structure (FOPS)

The machine is equipped with a 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.

Note
Do not exceed the total machine weight

▶ When attaching tools and equipment, make sure that the total weight of the machine does not exceed the weight for which the roll-over protection system is certified. The roll-over protection structure cannot guarantee safety if the maximum permitted total machine weight (see type 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 cab protection system (ROPS, FOPS) has been damaged.

Damage to the 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.

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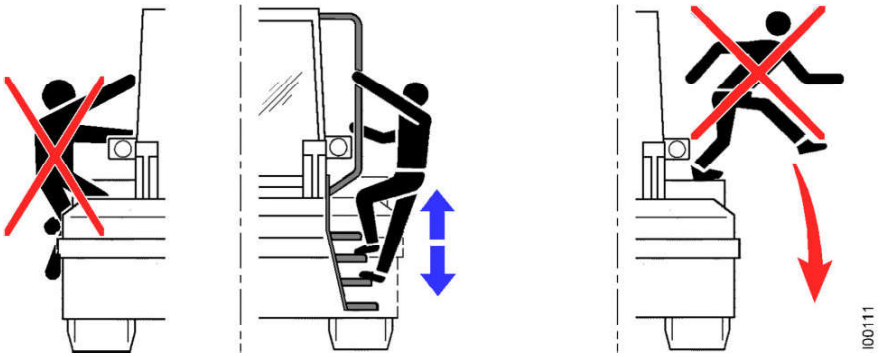

Fig. 50: Cab access

WARNING
You risk injury if you jump or fall off the machine.

- ▶ Use the steps, ladders and handles for getting on and off.
- ▶ Do not jump off the machine.

WARNING
You could be injured if the machine suddenly moves.
It is dangerous if the cab door is open and the engine is running.

- ▶ Do not hold onto the steering column, the control panel or the control levers when getting on or off.

Entering the driver's cab

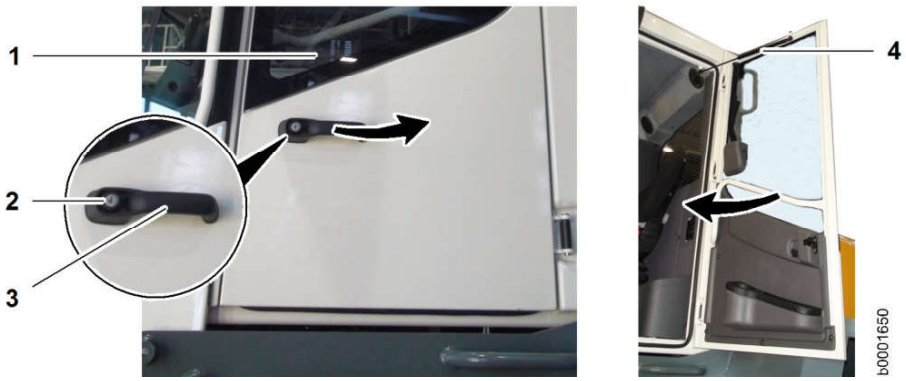

Fig. 51: Entering the driver's cab

1	Cab door	**3**	Door handle
2	Lock	**4**	Gas-filled spring

- ▶ Open the lock **2** with the ignition key.
- ▶ Push in the lock **2** and open the cab door **1** with the handle **3**.
  ▷ The cab door is opened and held in position by a gas-filled spring **4**.
- ▶ Get into the cab.
- ▶ Close the cab door again.

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Adjusting the driver's seat shock absorber

Comfort seat

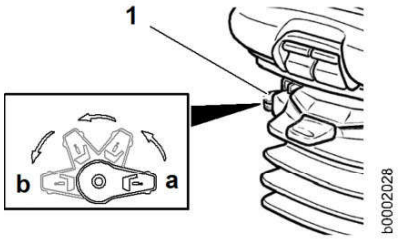

Fig. 69: Adjusting the driver's seat shock absorber

1 *Suspension adjustment* lever **b** Hard
a Soft

▶ Turn the lever **1** to the required position.

Seat heating and seat climate control

Comfort seat

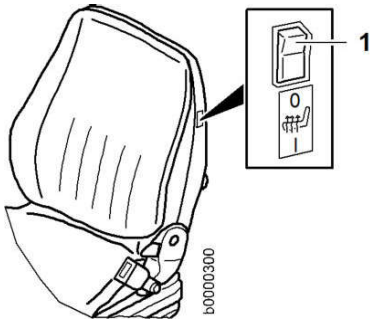

Fig. 70: Seat heating

1 *Seat heating* switch **I** Seat heating ON
0 Seat heating OFF

Adjusting the head rest

This equipment is optional.

▷ The reading lamp is switched on or off.

3.2.15 Display

The display shows status icons and warning symbols for the machine.

Each symbol field is assigned a colour.

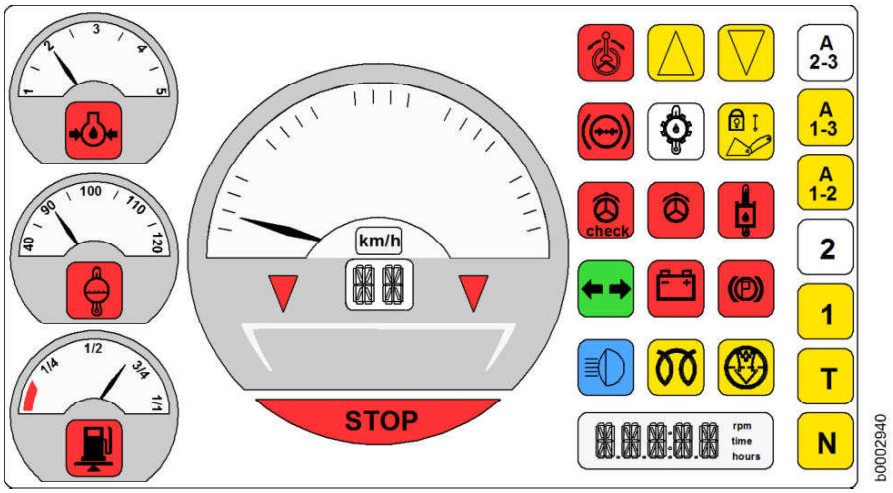

Fig. 86: Display

Machine status icons	Designation
N	“Neutral” travel direction
	“Forward” travel direction
	“Reverse” travel direction
	Working hydraulics lockout
A 1-3	Travel range A 1-3 - The machine automatically shifts to travel range **1**, **2** or **3**.
A 1-2	Travel range A 1-2 - The machine automatically shifts to travel range **1** or **2**.
1	Fixed gear 1 - Indicates that fixed gear 1 has been selected.

▷ The indicator lamp on the switch goes out.
▷ The rear window heater and mirror heater (optional) are switched off.

3.2.20 Interior and exterior mirrors

The driver's cab is equipped with one interior and two exterior mirrors.

Adjusting the mirrors

First make sure that the machine is in its operating position.

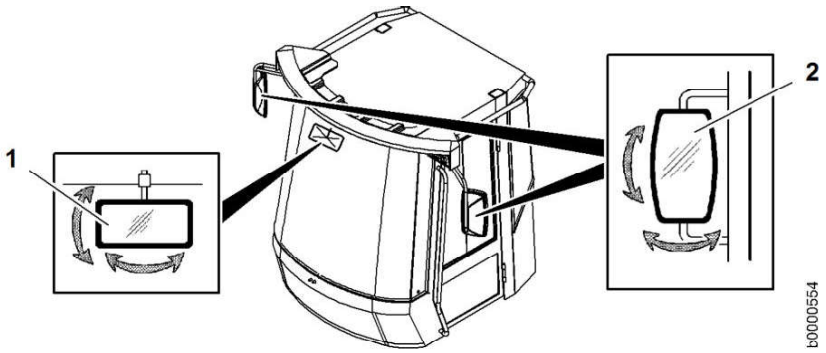

Fig. 98: Adjusting the mirror

1 Interior mirror **2** Exterior mirror

Note
Adjust the mirrors.

▶ Mirrors and other visual aids (such as the reversing camera) must always be adjusted to ensure the best possible all round vision. (For more information see: 2.4.20 See and be seen, page 53)

▶ All mirrors can be adjusted individually.

3.2.21 Sun visor

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

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3.3 Operation

3.3.1 Daily start-up

Make sure the daily maintenance tasks have been completed. (For more information see: 5.1 Maintenance and inspection schedule, page 169)

Putting the machine in the operating position

This is how to put the machine into the operating position:
– Turn on the battery main switch.
– Close the service doors, hatches and hoods.
– Release the articulation lock.

Turning on the battery main switch

The battery main switch is located in the engine compartment.

Fig. 109: Turning on the battery main switch

1 Battery main switch **2** ON position

▶ Turn the battery main switch **1** to the ON position.

Closing the service doors, hatches and hoods

▶ Close all service doors, hatches and hoods, and lock them if possible.

Releasing the articulation lock

WARNING
There is a risk of accidents if the steering is locked.
When the articulation lock is engaged, no steering functions are possible.

▶ Release the articulation lock.

▶ (For more information see: 3.2.2 Articulation lock, page 59)

Refuelling with diesel

Make sure that the following requirements are fulfilled:
❑ The machine is in the operating position.
❑ The working attachment is lying flat on the ground.

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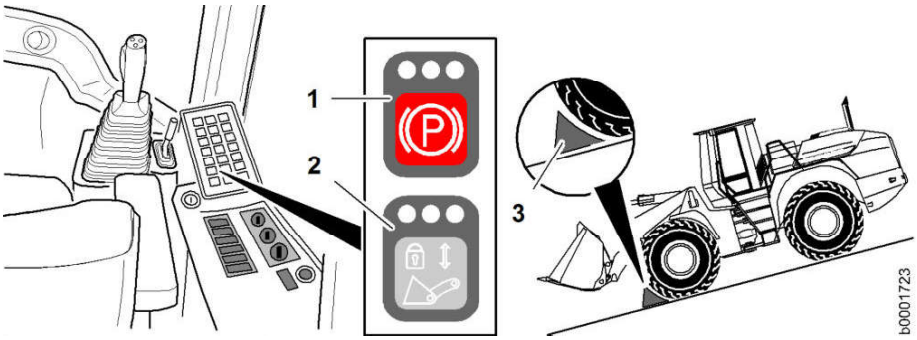

Fig. 123: After the machine stops

1 *Parking brake* button
2 *Working hydraulics lockout* button
3 Wheel wedges

▶ Activate the parking brake using the button **1**.
  ▷ All LEDs on the button light up.
  ▷ “Parking brake” symbol field in the display lights up.
  ▷ The parking brake is engaged.
  ▷ The travel direction is switched to neutral.

▶ Press the button **2** to prevent inadvertent operation of the working attachment.
  ▷ All LEDs on the button light up.
  ▷ “Working hydraulics lockout” symbol field in the display lights up.
  ▷ The working hydraulics are no longer operational.

DANGER
There is a risk of accidents if the machine rolls away on a slope.

▶ Secure the machine against rolling away.

▶ Use wheel wedges **3** to secure the machine against rolling away.

3.3.4 Driving on public roads

Before driving on public roads, find out about the route (roads, bridges, tunnels, underpasses, bottlenecks etc.) and any weight limits, bridge loads, width and height restrictions that apply.

Wheel loaders that are limited by design to a maximum speed of 20 km/h and have no official registration number must be labelled on both sides with the operating company’s address and require an operational liability insurance certificate.

The wheel loader may only be driven on public roads when unladen.

Make sure that the following requirements are fulfilled:
❑ The requirements for permission to drive on public roads are met.
  • Operating permit
  • Special license
❑ You are aware of the relevant safety regulations.

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Automatic bucket return-to-dig

The automatic bucket return-to-dig function is used for jobs that require a particular digging position time and time again. The factory setting for the proximity switched can be changed if necessary.

Note
To change the factory setting for the digging position:

▶ Contact Liebherr customer service.

Activating bucket return-to-dig

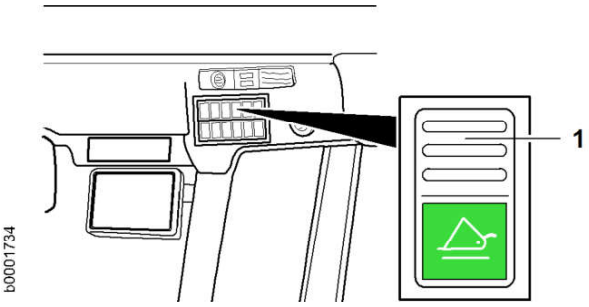

Fig. 138: Activating bucket return-to-dig

1 *Automatic bucket return-to-dig* switch

▶ Press the switch **1**.
▷ The automatic bucket return-to-dig function is activated.

Working with the return-to-dig function

Sequence of operations:
– Raise the lift arms.
– Tilt the bucket out in the raised position.
– Bucket return-to-dig (tilt in the bucket while raised)
– Lower the lift arms.

Make sure that the automatic bucket return-to-dig function is activated.

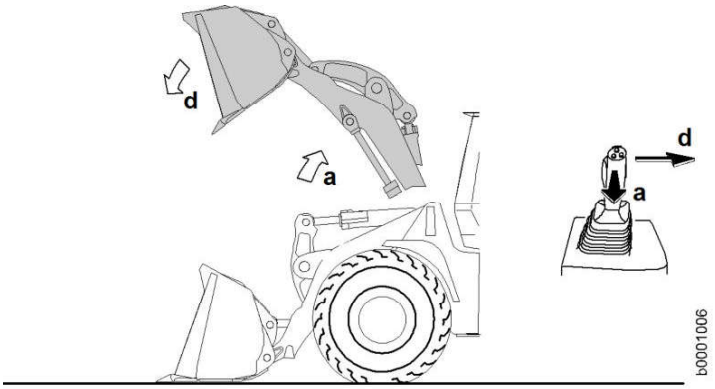

Fig. 139: Working with the return-to-dig function

To raise the lift arms:

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- ▶ Tip the material into the middle of the skip.
- ▶ Load long transport vehicles from front to back.

Working near overhead power lines

DANGER
Beware of current flash-overs when working close to overhead power lines.
There is a risk of fatal injury.

- ▶ Obtain the necessary information on safety clearances.
- ▶ Ensure that the electrical cables are not live.

Fig. 154: Working near overhead power lines

- ▶ Keep the machine and attachment a safe distance away from power lines.
- ▶ (For more information see: 2.4.6 Instructions for safe working, page 44)

Loading large rocks

Make sure that the loading surface of the transport vehicle can withstand the impact of large rocks.

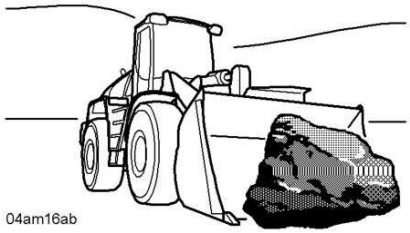

Fig. 155: Loading large rocks

- ▶ First put a load of smaller rocks into the transport vehicle.
- ▶ Carry on loading the transport vehicle.

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▶ Fix the lifting tackle to the slinging and lifting points **a, b, c, d** on the machine.

▶ Carefully lift the machine and load it.

Transporting the machine by lorry or rail

Observe the safety regulations when transporting the machine. (For more information see: 2.4.9 Transporting the machine safely, page 45)

Fig. 168: Transporting the machine by lorry or rail

The inclination of the ramp **W** may not exceed 30°.

Make sure that the following requirements are fulfilled:
❑ Wedges are available.
❑ Suitable tensioning ropes or chains are available to lash the machine down.
❑ A ramp is available for driving the machine onto the loading area.

Driving onto the loading area

WARNING
There is a risk of injury to the person giving directions.

To give directions safely:
▶ Take up a position outside the danger area of the machine.

▶ Stay in view of the operator or keep in spoken contact.

Make sure there is someone to give the driver the necessary signals.

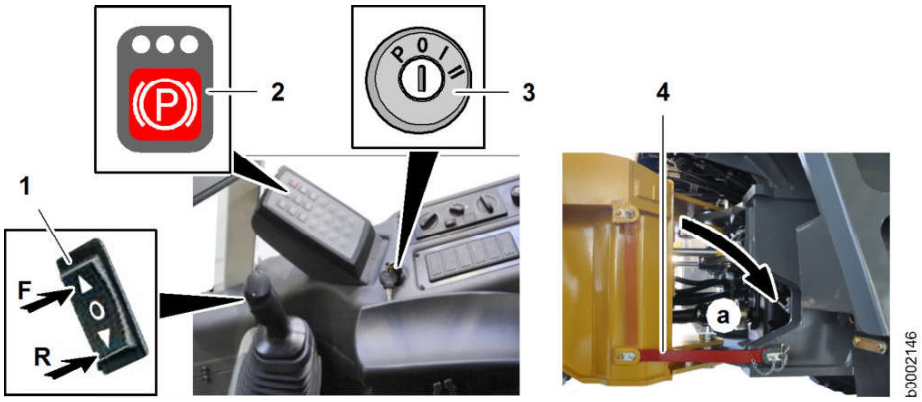

Fig. 169: Driving onto the loading area

1 *Travel direction* switch
2 *Parking brake* button
3 Starter switch
4 Articulation lock
a Articulation lock engaged
F Forward travel direction
R Reverse travel direction

▶ Start the engine.

▶ Release the parking brake.

▶ Select the travel direction.

▶ Do not tow at more than 2 km/h.

If you activate the emergency steering function:
▶ Switch on the electrical system of the machine.

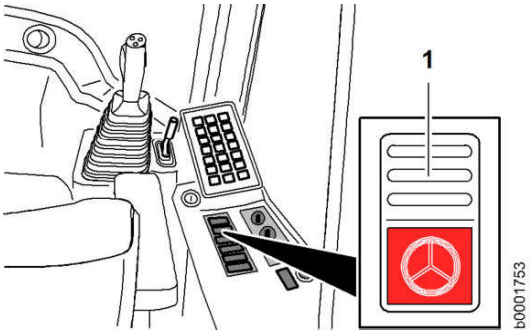

Fig. 182: Activating the emergency steering function

1 LED

2 *Emergency steering function* switch

▶ Press the switch **2** until the steering manoeuvre is complete.
▷ “Emergency steering” symbol field in the display lights up.
▷ The emergency steering function can only be activated for 10 seconds in total.

When towing has been completed:

WARNING
Beware of accidents if the machine starts moving.

▶ Secure the machine against rolling away.

▶ Only authorised, qualified staff may adjust the parking brake.

▶ Take the travel drive out of free circulation mode. (see: fig. 178, page 149)

▶ Contact Liebherr customer service.

3.7.3 Emergency steering

This equipment is optional.

If the steering pump fails while the machine is travelling, the emergency steering pump is automatically activated. The emergency steering pump provides emergency steering for the machine for approximately 40 seconds.

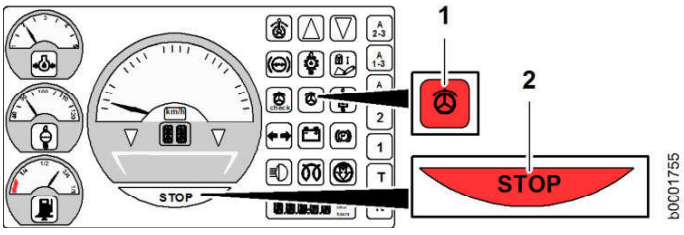

Fig. 183: Emergency steering

1 Emergency steering pump symbol field

2 STOP symbol field

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Servicecode	Effect	Cause	Remedy
M42B8	–	Control pressure (pump 2): no voltage at output	Check fuse F55
M42B9	Emergency steering does not work	Emergency steering: no voltage at output	Check fuse F56
M42BA	Fan reversal does not work	Fan reversal: no voltage at output	Check fuse F56
M42BB	Ride control does not work	Ride control: no voltage at output	Check fuse F56
M42BC	Float position / ride control does not work	Ride control / float position: no voltage at output	Check fuse F56
M42BD	–	Forward travel direction (pump 2): no voltage at output	Check fuse F52
M42BE	–	Reverse travel direction (pump 2): no voltage at output	Check fuse F52
M42BF	Additional equipment 1 does not work	Additional equipment 1: no voltage at output	Check fuse F52
M42C0	Additional equipment 2 does not work	Additional equipment 2: no voltage at output	Check fuse F52
M42C3	Joystick steering does not work	Joystick steering safety shut-down: no voltage at output	Check fuse F51
M42C4	Functions controlled by terminal 15 do not work	Supply shutdown to terminal 15 - electric keypad: no voltage at output	Check fuse F71
M42C9	Additional equipment 3 does not work	Additional equipment 3: no voltage at output	Check fuse F65
M42CA	Additional equipment 4 does not work	Additional equipment 4: no voltage at output	Check fuse F65
M42CB	Central lubrication system does not work	Central lubrication system: no power supply	Check fuse F53
M42CC	Flashing back-up alarm does not work	Flashing back-up alarm: no power supply	Check fuse F49
M42CD	Reversing light does not work	Reversing light: no power supply	Check fuse F61
M42CE	Back-up alarm not working	Back-up alarm: no power supply	Check fuse F62
M42E7	Fan turns at high speed (excessive cooling)	Fan: insufficient current at output	Check fuse F48
M42E8	–	DRE coupling solenoid: insufficient current at output	Check fuse F60
M42F0	Additional equipment option does not work	Option: short circuit at output	Check fuse F55
M42FF	Driving is not possible	Control pressure (pump 1): insufficient current at output	Check fuse F55
M4300	–	Control pressure (pump 2): insufficient current at output	Check fuse F55

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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	All 3000 h	Other intervals	**By maintenance staff** ■ Once-only activity ● Repeat interval ✦ If necessary ❄ Annually before the winter **with authorised specialist staff** ☐ Once-only activity ❍ Repeat interval ✧ If necessary	
			❍	❍	❍	❍		Checking the exhaust system for leaks and tight fitting	
Cooling system									
☐	●	●	❍	❍	❍	❍		Checking the coolant level	218
			❍	❍	❍	❍	❄	Checking the coolant antifreeze and corrosion inhibitor concentration	219
							✦	Cleaning the cooling system	223
						❍		Change the coolant (at least every 3 years)	
Working hydraulics									
☐	●	●	❍	❍	❍	❍		Checking the oil level in the hydraulic tank	225
☐		■	❍	❍	❍	❍	☐250h	Checking and cleaning the magnetic rod on the hydraulic tank	226
			❍	❍	❍	❍		Draining off condensate and sediment from the hydraulic tank	
				❍	❍	❍		Changing the hydraulic tank return and suction filter	
					❍			Changing the hydraulic tank breather filter	
							✧	Changing the oil in the hydraulic system in accordance with oil quality and oil analysis (For more information see: Changing the oil, analysing the oil, changing filters, page 186)	
				❍	❍	❍		Lubricating the solenoids, universal joints and tappets on the pilot control unit	
Steering system									
☐	●	●	❍	❍	❍	❍		Testing the steering	228
☐		●	❍	❍	❍	❍		Lubricating the bearing points on the steering cylinders	228
Brake system									
☐	●	●	❍	❍	❍	❍		Testing the service brake and parking brake	229
						❍		Checking the service brake discs for wear	
				❍	❍	❍		Checking the gap and wear on the parking brake linings	
Electrical system									
☐	●	●	❍	❍	❍	❍		Checking the lights	231
			❍	❍	❍	❍		Checking the batteries, fluid level and terminals	
				❍	❍	❍		Changing the travel direction rocker switch and cap (optional) on the control lever	
Transmission									
☐			❍	❍	❍	❍		Checking the transmission oil level	
			☐	❍	❍	❍		Changing the transmission oil	
Axles and cardan shafts									
☐			❍	❍	❍	❍		Checking the axle oil levels	
			☐	❍	❍	❍		Changing the axle oil	
			❍	❍	❍	❍		Checking the cardan shafts	

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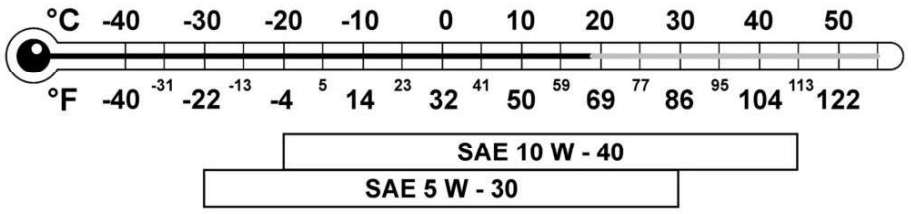

Fig. 197: Selection of the SAE class according to temperature

The following diesel engine oil is recommended for ambient temperatures from -20 °C to 45 °C:

Liebherr Motoroil 10W-40, specification ACEA E4

Liebherr Motoroil 10W-40 low ash, specification ACEA E4, E6, E7

The following diesel engine oil is recommended for ambient temperatures from -30 °C to 30 °C:

Liebherr Motoroil 5W-30, specification ACEA E4, E7

Lubricating oil change intervals

Changing intervals: (For more information see: 5.1 Maintenance and inspection schedule, page 169)

Change the oil according to the climate zone, sulphur content in the fuel and oil quality as shown in the following table.

Even if the specified number of service hours (h) is not reached in the course of a year, the engine oil and filter should be replaced at least once a year.

Various **complicating factors** (harsh operating conditions) can affect the maintenance interval.

Possible complicating factors are:
– Frequent cold-starts
– Sulphur content in the fuel
– Operating temperature

If complicating factors do play a role, the oil must be changed and the filter replaced in accordance with the specifications in the following table.

The use of diesel fuel with a sulphur content of less than 0.1% (1000 ppm) is strongly recommended.

Complicating factor	**Oil quality**	
	CI-4, CI-4 Plus, CJ-4, E4, E5	E6, E7
Sulphur content in the fuel	**Interval** [A)]	
up to 0.5%	250 h	500 h
over 0.5% to 1.0%	125 h	250 h

Tab. 31: Oil change intervals according to complicating factors

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5.4 Safety precautions

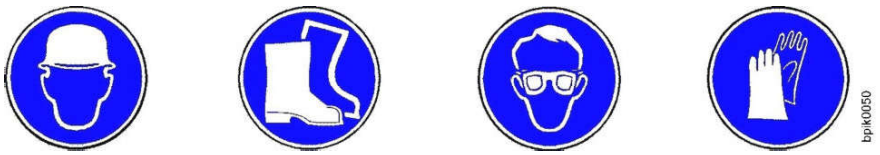

Fig. 206: Safety precautions

Make sure you are wearing safe working clothing.

Certain jobs not only require a hard hat and safety boots, but also goggles and safety gloves.

The relevant **safety regulations** must be observed whenever maintenance, inspection or repair work is carried out. Local health and safety regulations, accident prevention regulations and national laws must be observed.

(For more information see: 2.4.11 Measures for ensuring safe maintenance, page 46)

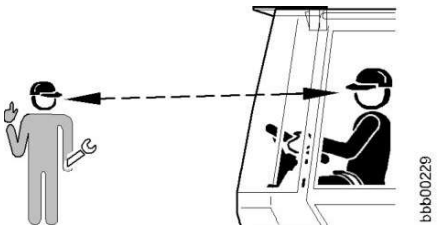

Fig. 207: Visual contact

Make sure that visual contact between the operator in the cab and maintenance personnel is always maintained.

WARNING
Beware of accidents during maintenance
The presence of unauthorised persons on the machine can place the maintenance personnel in extreme danger.

▶ Never enter a dangerous area of the machine without making your presence known.

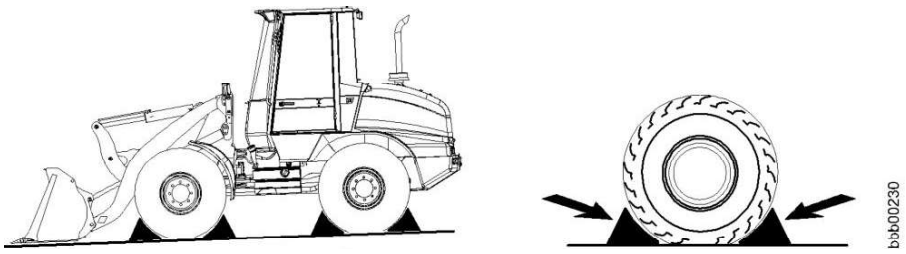

Fig. 208: Wheel wedges

▶ Use wheel wedges to prevent the machine from accidentally rolling away.

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▷ The self-adhesive seal ensures that the bag is firmly closed. The sample information form is protected in a separate plastic pocket on the outside.

Assessing the analysis results

There is no single element or measured value that in itself necessitates a warning or a recommendation to change the oil. It depends on the overall analysis of the oil sample, from the zinc content to the purity class.

For bio hydraulic oils:
If the zinc content in the oil exceeds 300 mg/kg and other critical values are exceeded, the zinc may saponify and block the filter systems. The system may fail completely.

Purity class:

Contamination of the hydraulic fluid directly affects the lifetime of the components. Therefore, the following minimum purity classes are required for Liebherr earth-moving machines:
– ISO 4406 Purity class: 21/17/14
– NAS 1638 Purity class: 8

If the values are slightly below these, they may be improved by using special filters systems (such as stationary filters) in consultation with the manufacturer. If subsequent trend analyses do not show an improvement, there is no option but to change the oil. Note that not only the oil in the hydraulic tank has to be drained, but also as much oil as possible from the units and cylinders.

Taking oil samples

Samples can be taken from the following fluids:
– Hydraulic oil from the hydraulic system
– Engine oil from the diesel engine
– Lubricating oil from the axles
– Lubricating oil from the transmission
– Coolant from the cooling circuit

Make sure that the following requirements are fulfilled:
❑ The machine is on firm and level ground.
❑ A suitable collecting pan for the flushing oil is available.
❑ You have an analysis set ready.

WARNING
Beware of injuries from rotating engine parts, hot surfaces and hot fluids.

▶ Wear protective clothing.

▶ Avoid touching hot surfaces and fluids.

▶ Watch out for rotating engine parts.

WARNING
Unauthorised operation of the machine can cause injury.

▶ Secure the machine against unauthorised operation.

Hydraulic system

The hydraulic oil sample is taken from the variable displacement pump via the replenishing pressure test connection.

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5.7.6 Changing the fuel pre-filter

Make sure that the following requirements are fulfilled:
- ❑ The machine is in maintenance position 1.
- ❑ The service access is open.
- ❑ You have a suitable receptacle ready.
- ❑ The engine has cooled down.
- ❑ Only use genuine Liebherr spare parts.

DANGER
Beware of fire

▶ Naked flames and smoking are prohibited.

Fig. 224: Changing the fuel pre-filter

1	Bleeder screw	**4**	Electrical connection
2	Snap ring	**5**	Water separator container
3	Filter cartridge	**6**	Drain valve

Note
To prevent condensate flowing back into the fuel tank:

▶ Open the bleeder screw in front of the drain valve.

▶ Place a receptacle under the fuel pre-filter housing.

▶ Carefully clean the fuel pre-filter housing and the area around it.

▶ Disconnect the electrical connection **4**.

▶ Open the bleeder screw **1** and drain valve **6**.
▷ Fuel flows out of the pre-filter until it is empty.

▶ Unscrew the snap ring **2** and remove the filter cartridge **3**.

▶ Unscrew the water separator container **5** from the filter cartridge **3**.

▶ Dispose of the filter cartridge **3**.

▶ Wash the water separator container **5** and dry it with compressed air.

▶ Lubricate the O-ring of the water separator tank **5** with clean fuel.

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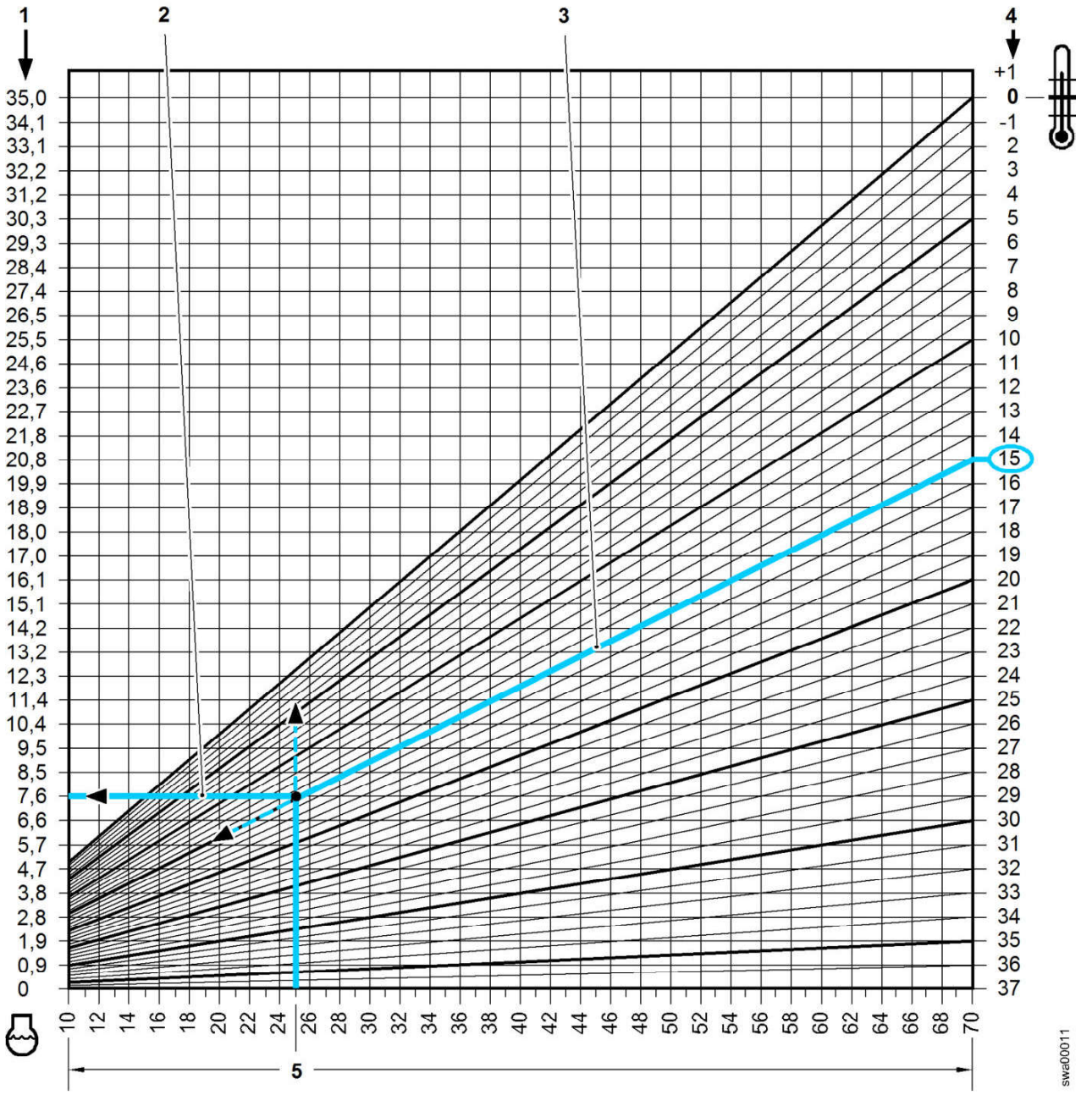

Fig. 234: Correcting the antifreeze concentration

1 Amount of pure antifreeze to be added in litres

2 Identified line for top-up quantity

3 Guide line(s) - example -15 °C

4 Measured coolant freezing point in °C

5 Total capacity of cooling system in litres (example 25 litres)

Example procedure

Assumption:
25 litres total filling quantity of the cooling system
-15 °C coolant temperature, measured in the cooling system

▶ In the diagram, go to the line showing the overall cooling system capacity **5** at 25 litres and follow it upwards.

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5.12 Electrical system

5.12.1 Checking the lights

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 headlight.

WARNING
Beware of accidents when testing the lighting equipment with another person.

- ▶ Always maintain visual contact with the other person.
- ▶ Do not allow anyone into the danger area of the machine.

CAUTION
Beware of fires caused by the heat of the working floodlights.

- ▶ Keep a distance of at least 1 m away.

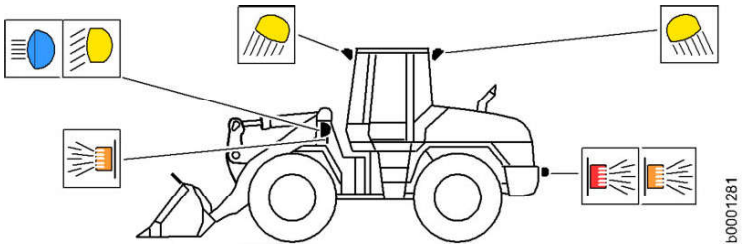

Fig. 246: Checking the lights

- ▶ Turn on all the lights. (For more information see: 3.2.13 Lighting, page 77)
- ▶ Check all the lights work properly.

When checking the brake lights:
- ▶ Push on the inch/brake pedal.

Checking the reversing headlights

- ▶ Start the machine.
- ▶ Release the parking brake.
- ▶ Select the “reverse” travel direction.
- ▶ Check the reversing headlight works properly.

When adjusting lights or replacing defective lamps:
- ▶ Contact Liebherr customer service.

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5.16 Cab, heating and air conditioning

5.16.1 Cleaning the fresh and recirculated air filters

Make sure that the following requirements are fulfilled:
- ❑ The machine is in maintenance position 1.
- ❑ Suitable protective equipment is used.

Cleaning the fresh air filter

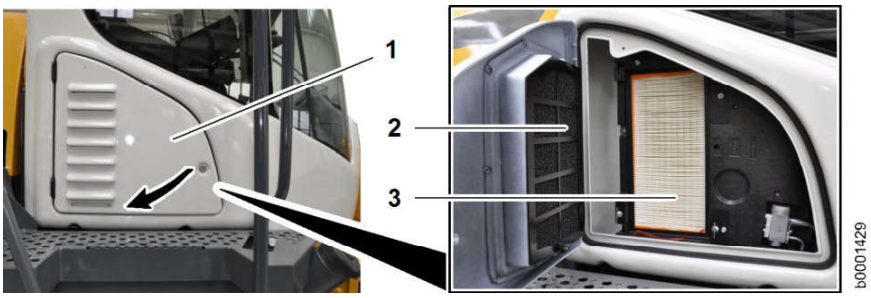

Fig. 258: Cleaning the fresh air filter

1 Door
2 Pre-filter
3 Fresh air filter

▶ Open the door **1**.

▶ Open the brackets for the filters **2, 3**.

▶ Take out the pre-filter **2** and clean it (blow it out or wash it) or replace it if necessary.

▶ Unscrew the fresh air filter **3** at the bottom on the front lug and clean it (blow it out).

▶ Put in the clean filter (making sure it is correctly fitted) and close the brackets.

▶ Close the door **1**.

Cleaning the recirculated air filter

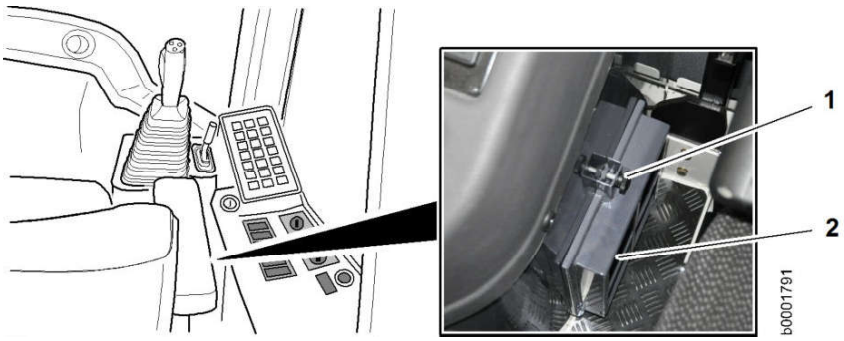

Fig. 259: Cleaning the recirculated air filter

1 Screw
2 Recirculated air filter

▶ Remove the screw **1**.