en **Operator's manual**

Wheel loader

L 566-1168

From serial number 35542

Document ID

ORIGINAL OPERATOR'S MANUAL

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Manufacturer: Liebherr-Werk Bischofshofen GmbH
Type: L 566
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Conformity: CE

Contact

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Parking brake

Electrohydraulically actuated spring accumulator brake system on the transmission.

1.2.8 Steering

Type:
- Load sensing swash plate variable displacement pump with pressure cut-off and flow regulator.
- Central articulated joint with two dual-action steering cylinders with shock absorbers.

Emergency steering: Electrohydraulic emergency steering system

Description	Unit	Value
Angle of articulation to each side		40°

1.2.9 Working hydraulics

- Load sensing swash plate variable displacement pump with power regulator and flow regulator, pressure cut-off in control valve block.
- Hydraulic oil cooling with thermostatically controlled fan and oil cooler.
- Return filter in the hydraulic tank.
- Single-lever control, hydraulic servo system.

Lifting cycle:
- Lifting, neutral, lowering
- Float position using lockable control lever
- Automatic lift kick-out (this attachment is optional)

Tilting cycle:
- Tilt out, neutral, tilt in
- Automatic bucket return-to-dig function

Description	Unit	Value
Maximum flow	l/min	290
Maximum operating pressure for Z kinematics	bar	350 $^{\pm 5}$
Maximum operating pressure for industrial lift arms	bar	380$^{\pm 5}$

1.2.10 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

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	Designation	Unit	Value
	Breakout force (SAE)	kN	200
	Tipping load when straight	kg	15870
	Tipping load when articulated at 37°	kg	13950
	Tipping load when articulated at 40° (ISO 14397-1)	kg	13600
	Operating weight	kg	24150

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

A) Industrial lift arms with parallel movement including quick coupler
B) Earth bucket with short, straight base for quick coupler
C) Welded tooth holder with plug-in teeth
D) 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.

1.2.22 Attachment: Light material bucket

The values stated refer to the machine:

- In its standard version
- With 26.5R25 L3 tyres (For more information see: 1.2.17 Tyres, page 24)
- Including all lubricants
- With a full fuel tank
- With ROPS/FOPS cab and driver

Note
The tyres and working attachments affect the operating weight and tipping load.

▶ Note the information on the tyres and working attachment.

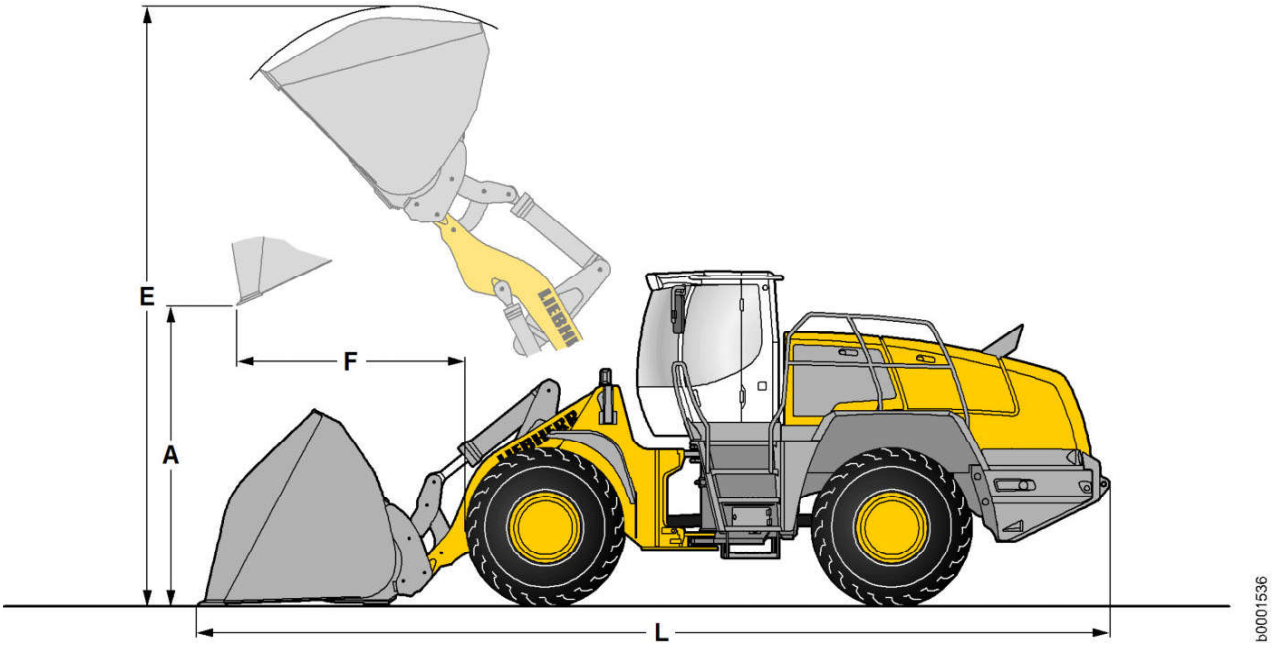

Fig. 6: Attachment: Light material bucket

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Safety belt decal

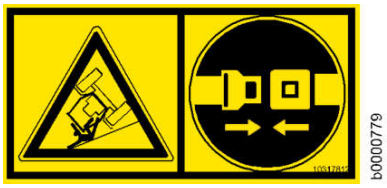

Fig. 21: Safety belt decal

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

Meaning: **Fasten your safety belt before starting up the machine.**

Coolant decal

Fig. 22: Coolant decal

Warns of the risk of scalding and severe injuries caused by coolant escaping under pressure.

Meaning: **Do not open the cap on the filler neck until the engine has cooled down.**

Engine shutdown decal

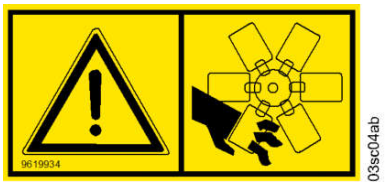

Fig. 23: Engine shutdown decal

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

Meaning: **Only open when the engine is shut down.**

Burn hazard decal

Fig. 24: Burn hazard decal

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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**.
16. Secure all loose parts of the machine.
17. Never start up a machine without first making a thorough tour of inspection and checking if any warning signs are missing or illegible.
18. Observe all signs with warnings or safety instructions.
19. Special safety apparatus must be fitted to the machine for certain applications. If this is the case, only work with this apparatus fitted and in working order.
20. Do not make any modifications, extensions or conversions to the machine with possible safety implications without the approval of the supplier. This also applies to installing and adjusting safety apparatus and valves, as well as to welding load-bearing components.
21. Avoid standing near the engine while it is running. People who have a pacemaker must not stand next to the diesel engine while it is running (minimum distance 50 cm).
22. Do not touch live components of the solenoid controlled unit pumps on their electrical connections.

2.4.2 Instructions on preventing crushing injuries and burns

1. Do not work under the attachment if it is not resting on the ground or supported.
2. Do not use any ropes or chains which are damaged or which have insufficient load bearing capacity.
   Wear protective gloves when handling wire ropes.
3. When working with the attachment, never align the boreholes with your fingers, instead, use a suitable mandrel for this purpose.
4. Make sure no objects come into contact with the fan when the engine is running.
   Objects which fall or project into the fan will be thrown back out or destroyed and could damage the fan.
5. When the machine is near operating temperature, the engine cooler system is hot and pressurised.
   Do not touch parts carrying cooling water.
   This can lead to burns.
6. Only check the coolant level once the cap on the expansion tank has cooled down enough to touch.
   Carefully open the cap to let out excess pressure.
7. When running at or near the operating temperature, the engine oil and hydraulic oil are hot.
   Avoid touching hot oil or parts which carry oil.
8. Wear goggles and safety gloves when working on the battery.
   Avoid sparks and naked lights.
9. Never let anyone move the bucket or other working attachments into position by hand.

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Preventing injuries

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

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

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

2.4.18 Attachments and accessories

1. Attachments and accessories produced by third-party manufacturers or those which have not been generally approved by LIEBHERR for installation or for external fitting may not be installed or fitted on the machine without prior written consent from LIEBHERR.
2. The appropriate technical documentation should be made available to LIEBHERR for this purpose.
3. When adding or converting equipment or tyres, the stability of the machine must be tested and ensured in accordance with **EN 474**.
(For more information see: 1.2 Technical data, page 18)

2.4.19 Protection against vibrations

1. The vibrations to which mobile construction machines are subjected are mainly due to the way they are used.

   The following parameters in particular have a great effect:
   - Terrain conditions: bumps and potholes.
   - Operating methods: speed, steering, braking, use of the controls while driving and while working.
2. The amount of vibration depends to a large extent on the machine operator, because he determines the speed, gear ratio, working methods and distance covered.
   This results in a wide range of different vibrations for the same type of machine.
3. The machine operator can reduce overall vibration by following these recommendations:
   - Select a suitable machine, equipment and accessories for the job.
   - Use a machine equipped with a suitable seat (i.e. for earthworking machines, a seat which complies with EN ISO 7096).
   - Keep the seat in good repair and adjust the position and cushioning according to the height and weight of the driver.
   - Regularly check the suspension and adjustment mechanisms of the seat and make sure the seat is kept in the condition specified by the manufacturer.
   - Check the service condition of the machine, especially the tyre pressure, brakes, steering, mechanical connections etc.
   - Do not steer, brake, accelerate, shift gears or load the working attachment of the machine suddenly.
   - Adjust the speed of the machine to the distance to be driven in order to reduce vibrations.
     Slow down when driving over difficult terrain.
     Drive around obstacles and avoid difficult terrain.
   - Keep the area on which the machine is operated in a tidy condition.
     Remove any large rocks and obstacles.
     Fill in any trenches or holes.

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Leaving the driver's cab

Fig. 58: Leaving the driver's cab

1 Cab door **2** *Door opener* lever

- ▶ Open the cab door **1** with the lever **2** and let it latch into the door holder. (see: fig. 57, page 70)
- ▶ Leave the cab, unlock the door and close it.
- ▶ If necessary, lock it using the ignition key.

3.2.4 Cab windows

The right window can be opened partially or all the way. The left window is fitted as an option.

Opening the right window

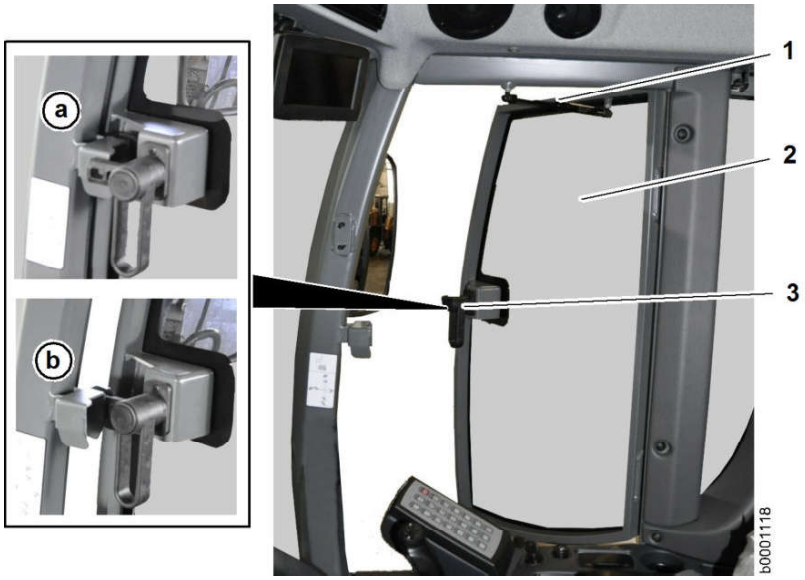

Fig. 59: Opening the right window

1 Gas-filled spring **3** *Window opener* lever
2 Window

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Premium seat

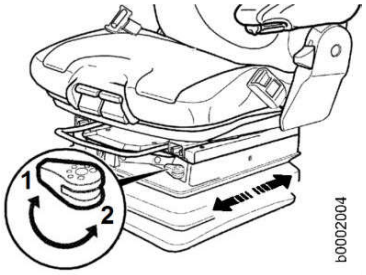

Fig. 77: Activating and deactivating the horizontal suspension on the driver's seat

1 Horizontal suspension OFF **2** Horizontal suspension ON

Adjusting the driver's seat shock absorber

Comfort seat

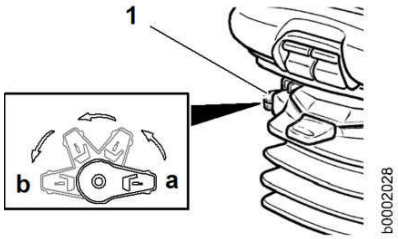

Fig. 78: Adjusting the driver's seat shock absorber

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

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

Seat heating and seat climate control

Comfort seat

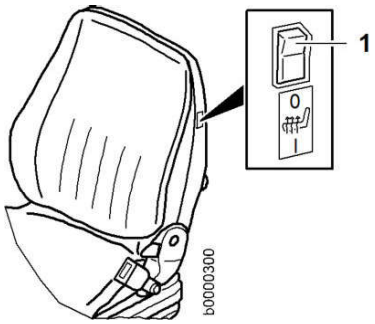

Fig. 79: Seat heating

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

3.2.13 Driver identification

This equipment is optional.

The *driver identification* option allows up to 5 driver profiles to be created. Special settings (relating to the operation of the machine) are stored in the driver profiles.

The following settings are saved in the driver profile:
- Travel range selected
- Air conditioning (temperature, blower, flaps, mode)
- Preselection of the working attachment functions (ride control, automatic lift kick-out, automatic bucket return-to-dig, float position, working hydraulics lockout)
- Joystick steering (enable joystick steering sensitivity button)
- 2in1 steering

Note
Risk of loss!
If the master key is lost, no starting keys can be programmed or deleted. The master controller must be replaced.

▶ Only use programmed ignition keys to operate the machine.

▶ Keep the master key in a safe place separate from the machine.

Saving the driver profile

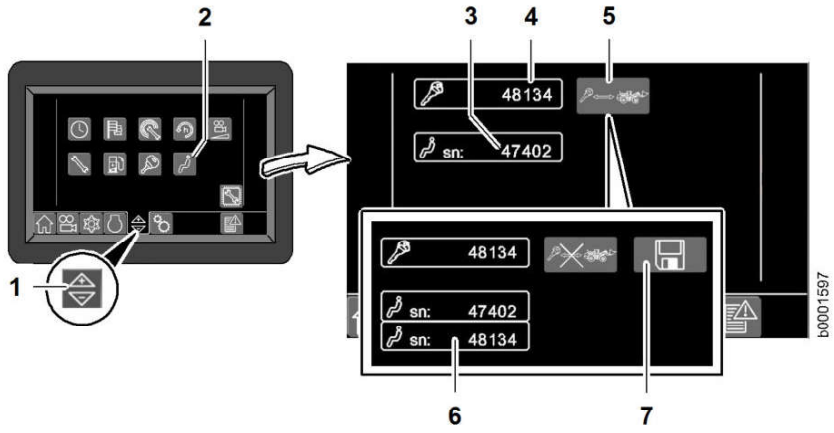

Fig. 93: Saving the driver profile

1 *Settings* button
2 *Driver identification* button
3 *Ignition key with saved driver profile* display
4 *Ignition key to be programmed* display
5 *Driver profile reservation* button
6 *Driver profile reservation* display
7 *Save driver profile* button

▶ Switch on the ignition using the ignition key.

▶ Open the display screen using button **1** and button **2**.

▶ Press the button **5**.
▷ The driver profile for ignition key **6** is reserved.

▶ Make the required driver profile settings for operation of the machine.

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Main menu

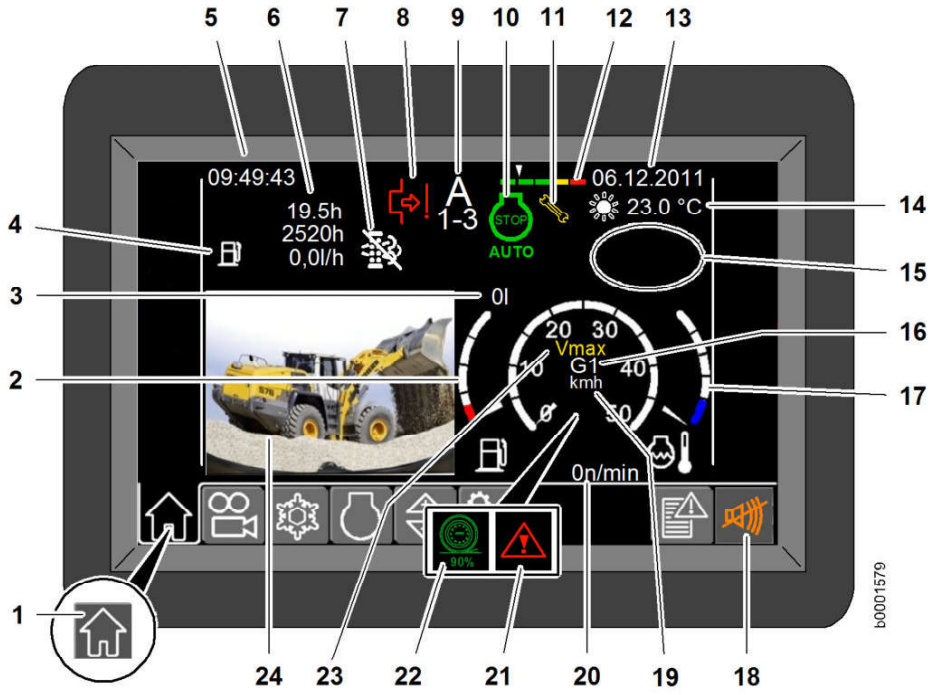

Fig. 105: Main menu

Item	Designation
1	*Main menu* button
2	Fuel level display
3	Remaining fuel level in litres
4	Fuel consumption - l/h
5	Time
6	Daily operating hours counter , total operating hours counter (the hourglass symbol is only displayed when the engine is running)
7	Diesel particle filter regeneration suppressed (For more information see: 3.3.7 Regenerating the diesel particulate filter, page 171)
8	Quick coupler device – appears when quick coupler device is unlocked.
9	Selected travel range (F1, F2, A1-2, A1-3, A2-3)
10	Engine shut down (active) (For more information see: Activating and deactivating automatic engine shut down, page 118)
11	Service notification *(prior warning time 100 h = constant yellow; post-warning time 100 h = flashing red)* (For more information see: Service management, page 108)
12	Diesel particle filter load condition
13	Date
14	Outside temperature (only with automatic air conditioning)

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

To carry out a remote service:
▶ Contact Liebherr customer service.

Electronic immobiliser

This equipment is optional.

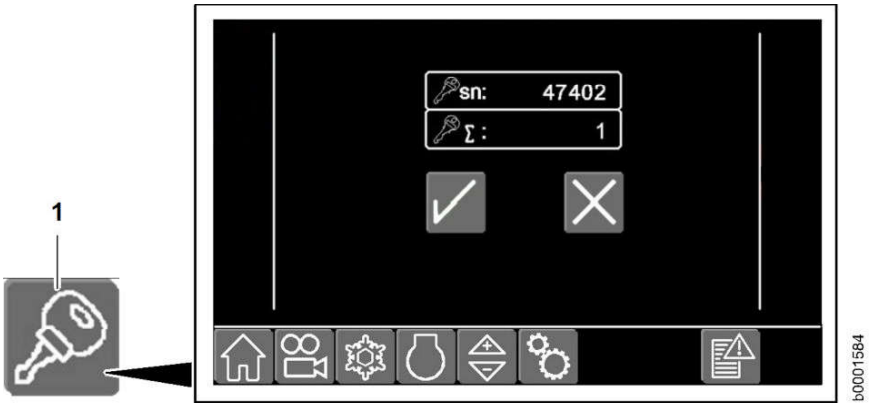

Fig. 117: Electronic immobiliser

1 *Electronic immobiliser* button

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

To teach a new ignition key:
▶

Reset daily operating hours

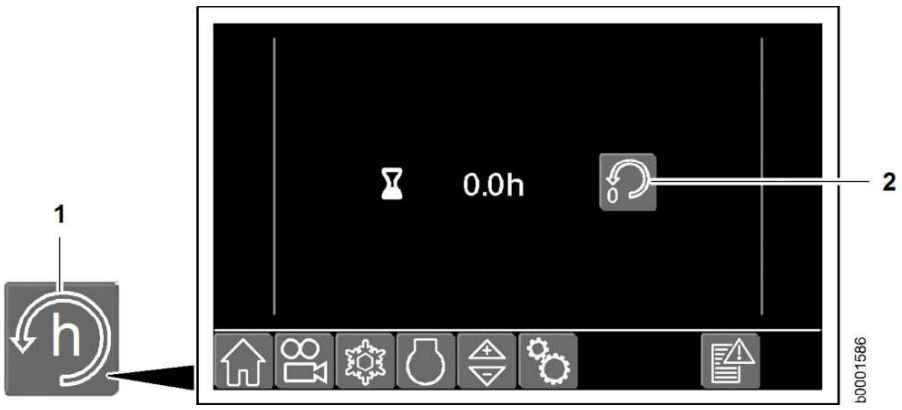

Fig. 118: Reset daily operating hours

1 *Reset daily operating hours* button **2** Reset daily operating hours counter

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

If you want to reset the daily operating hours:
▶ Press the button **2**.
▷ The daily operating hours meter is set to 0h.

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Activating the Kick-Down function

The “Kick-Down” function hydrostatically brakes the machine from any travel speed and automatically shifts it to first gear. Once the machine is in first gear the “Kick-Down” function remains active for 10 seconds.

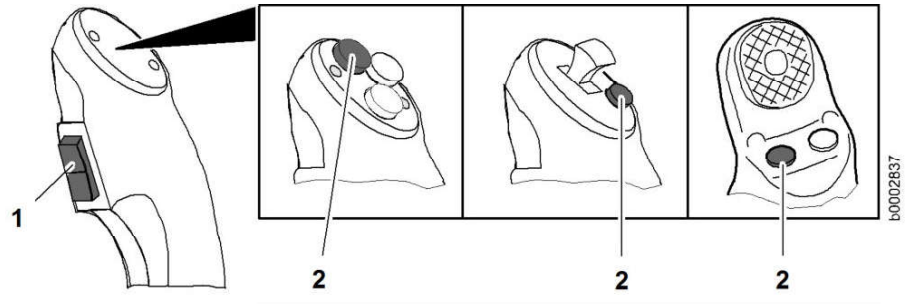

Fig. 132: Activating the Kick-Down function

1 *Travel direction* switch **2** *Kick-Down* button

▶ Press the button **2**.
  ▷ The machine shifts to first gear.
  ▷ The “Kick-Down” function is automatically deactivated after 10 seconds.

If you want to deactivate the “Kick-Down” function manually:
▶ Press the switch **1** in the reverse travel direction.

Controlling the working attachment

The working attachment is controlled by moving the control lever.

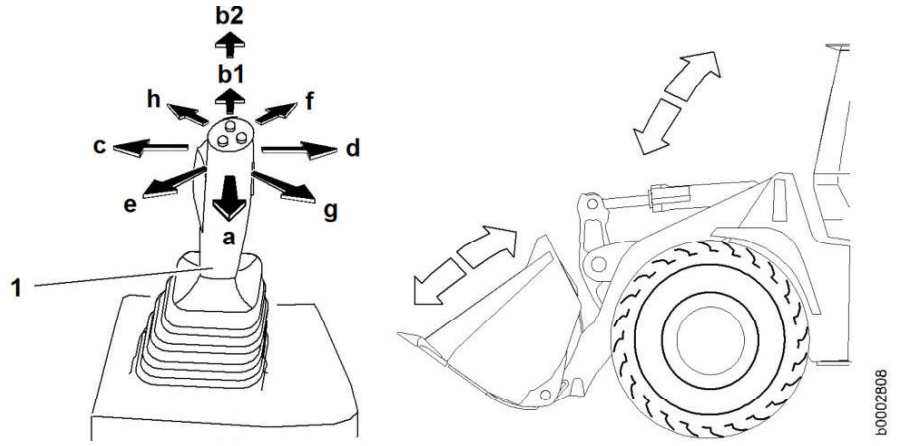

Fig. 133: Controlling the working attachment

Direction of movement of control lever		Working attachment function
a	Back	Raise the lift arms
b1	Forward to action point	Lower the lift arms
b2	Forward to limit	Lower the lift arms quickly
c	To the left	Tilt bucket in

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Changing the control of the working attachment

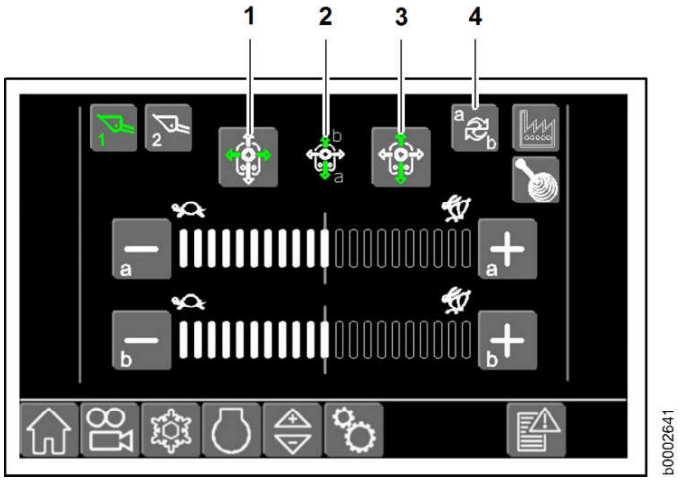

Fig. 142: Changing the control of the working attachment

1 *Control direction c-d* button [46)]
2 Control direction display
3 *Control direction a-b* button [46)]
4 *Change control direction* button.

▶ Press the **1** or **3** button.
▷ The selected control direction is shown in the display **2**.

▶ Press the button **4**.
▷ The control direction of the working attachment is changed.

Note
The setting remains stored after the ignition is switched off.

▶ This means that the function is active when the ignition is switched on again.

Changing the speed of movement

Here, the movement speed of the working attachment can be adapted to the requirements of the driver. The driver determines how fast the working attachment executes the control commands.

[46)] Selection only available for biaxial mini-joystick.

The central lubrication pump with grease reservoir is installed on the left-hand side of the machine, behind the cab access.

The *central lubrication system* button is located on the control unit in the driver's cab.

Note
The central lubrication system can also be operated using the display.

▶ (For more information see: Liebherr automatic central lubrication system , page 115)

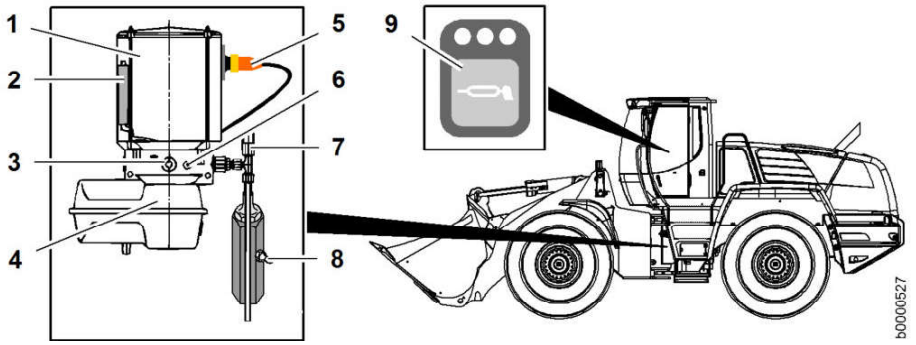

Fig. 160: Automatic central lubrication system

1	Grease reservoir	**6**	Grease fitting
2	Agitator	**7**	Pressure relief valve
3	Fast filling coupling	**8**	Lubrication nipple for manual lubrication
4	Central lubrication pump	**9**	*Central lubrication system* button
5	Level sensor connection		

Setting the lubrication cycles

To maintain the optimum lubrication at the lubrication points on the wheel loader, it is possible to configure different lubrication cycles on the central lubrication system, depending on the operating conditions.

The following lubrication cycles are available:
– Light use
– Moderate use
– Heavy use

Note
If the lubrication cycles cannot be set:
The software prevents a mode change.

▶ Contact Liebherr customer service.

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WARNING
Starting agents that contain ether can cause explosions!

▶ Do not use starting agents containing ethers.

Starting procedure

Make sure the following preconditions are met:
❑ The machine is in the operating position.
❑ You have fastened your safety belt.

▶ Turn the ignition key to position I.
▷ The system check is started.

Once the system check has been successfully completed, the following symbols remain lit:
▶ Note the information in the display.

Designation	
Preglow indicator lamp A)	
Battery charge	
Brake accumulator pressure B)	
Engine oil pressure	
Travel range	
Neutral position	
Working hydraulics lockout	
Parking brake	

Tab. 37: System check completed

A) Lights up at temperatures below 5 °C.
B) Only lights up when the brake accumulator pressure is too low.

If the *preglow indicator lamp* symbol is lit:
▶ Wait until the *preglow indicator lamp* symbol goes out.

▶ Turn the ignition key to the starting position II and release it.
▷ The engine starts automatically.

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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.
- ❑ The safety equipment is complete as defined by the **roadworthiness certification regulations**.
  - Warning triangle
  - Flashing beacon
  - First aid kit
  - Wheel wedges

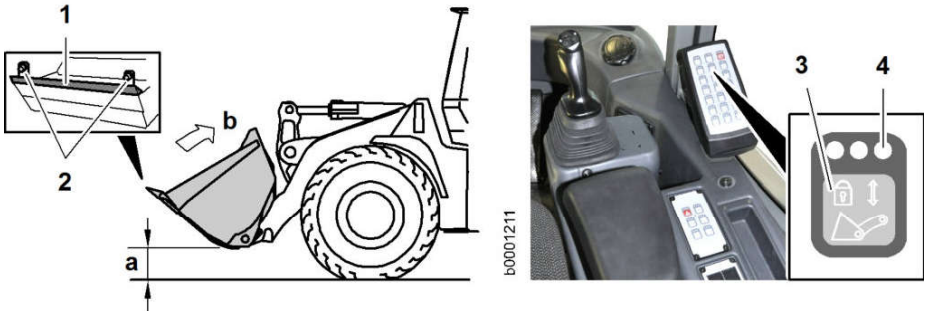

Fig. 188: Driving on public roads

1	Tooth guard	**4**	LED
2	Marker lights	**a**	Approx. 40 cm
3	*Working hydraulics lockout* button	**b**	Loading bucket at limit

▶ Remove coarse dirt from the machine and clean the tyre treads. (For more information see: 5.6.3 Cleaning the machine, page 255)

▶ Close all service hatches and if possible lock them.

▶ Attach the tooth guard **1** to the bucket.

▶ Secure the marker lights **2** and connect the cable.

▶ Put the machine in the transport position.
  ▷ The bucket pivot point must be about 40 cm above the ground.
  ▷ The bucket must be tilted in to the limit **b**.

▶ Press the button **3** to lock the working hydraulics and protect the working attachment from inadvertent use.
  ▷ The LEDs **4** light up.

▶ Drive with appropriate care.

▶ Observe the highway code.

3.3.5 Shutting down the machine

Take the following precautions before you switch off the engine and leave the machine.

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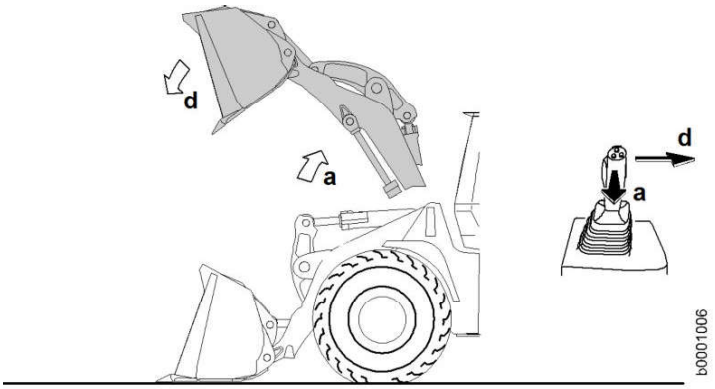

Fig. 203: Working with the return-to-dig function

To raise the lift arms:

▶ Move the control lever in direction **a**.

To tilt the bucket out in the raised position:

▶ Move the control lever in direction **d**.

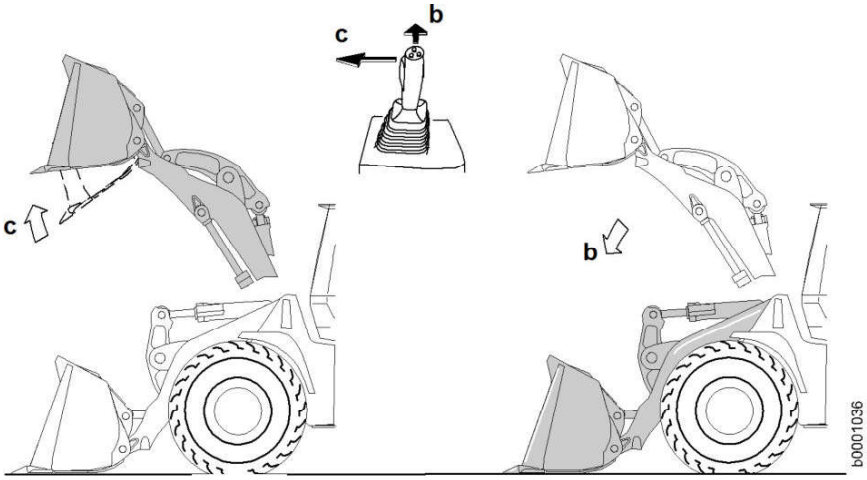

Fig. 204: Working with the return-to-dig function

Bucket return-to-dig (tilting in the bucket while raised):

▶ Move the control lever in direction **c** as far as it will go, then release it.
  ▷ The control lever is held in this position by magnetic force.
  ▷ The bucket is moved to the preliminary position for digging.
  ▷ As soon as the bucket is in the preliminary position, the joystick switches to a neutral position.

To lower the lift arms:

▶ Move the control lever in direction **b**.
  ▷ The bucket is moved to the digging position on the ground.

3.3.7 Regenerating the diesel particulate filter

The diesel particulate filter reduces the emission of soot particles. This increases the exhaust counterpressure (load condition) in the filter, which means it must be regenerated. During regeneration, soot particles in the filter are burned off.

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3.4 Working methods

This section describes the routine working methods.

3.4.1 Picking up material

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

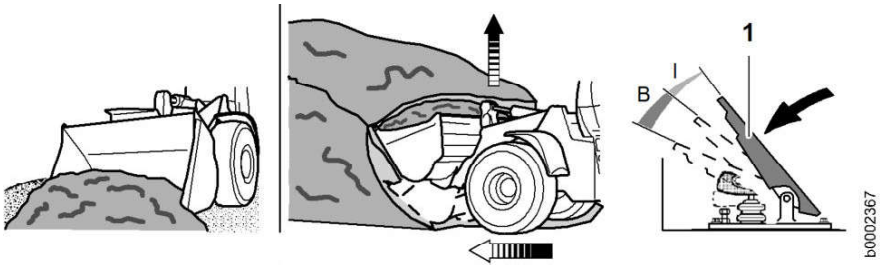

Fig. 214: Picking up material

1 Inch/brake pedal
I Inching
B Braking

- ▶ Do not work with a strong downwards pressure on the working attachment.
- ▶ To provide better support, gently tip the working attachment in and out while driving into the material.

Pressing the inch/brake pedal reduces tractive force, which makes loading easier.

- ▶ Also move the inch/brake pedal **1** within the range **I**.
  - ▷ The power of the travel hydraulics is reduced, thereby preventing the wheels from spinning.
  - ▷ The power of the working attachment is reduced.
  - ▷ The fuel consumption is reduced.

WARNING
There is a risk of the machine tipping over.
The machine might tip over when the lift arms are raised due to the shift in the centre of gravity.

- ▶ Observe the maximum permitted bulk material weight and the specified tipping loads.

- ▶ Tilt in the loaded working attachment as far as it will go and raise the lift arms.

3.4.2 Transporting and moving material

Ensure that the machine is stable and visibility is clear. The working attachment should be moved into the transport position when transporting and transferring materials.

Transport position

The transport position means
– The pivot point of the working attachment is approx. 40 cm above the ground.
– Attachment tilted in

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3 *Button control (hydraulic extension)* button
4 *Button control (hydraulic retraction)* button
5 *Proportional control* lever
8 Additional control lever
9 *Comfort control and button control* button

▶ Start the engine and let it run for around 10 seconds.

▶ Lower the lift arms to just above the ground.

▶ Turn off the engine.

▶ Switch on the ignition.

If the working attachment is operated with the additional control lever:
▶ Press and hold the button **1** while moving the additional control lever **8** in the direction of the arrow several times.
▷ The working attachment hydraulics have been depressurised.

If the working attachment is operated with comfort control:
▶ Press the switch **9** on the control unit.

▶ Press and hold the button **1** and, at the same time, press the button **2** and move the control lever **7** several times in the direction of the arrow.
▷ The working attachment hydraulics have been depressurised.

If the working attachment is operated with button control:
▶ Press the switch **9**.

▶ Press and hold the button **1** and while repeatedly pressing the buttons **3** and **4** on the control lever.
▷ The working attachment hydraulics have been depressurised.

If the working attachment is operated with proportional control:
▶ Press and hold the button **1** while moving the lever **5** in the direction of the arrow several times.
▷ The working attachment hydraulics have been depressurised.

If the working attachment is operated with the mini-joystick:
▶ Press and hold the button **1** while moving the mini-joystick **6** in the direction of the arrow several times.
▷ The working attachment hydraulics have been depressurised.

Disconnecting the hydraulic lines

If the working attachment has its own hydraulic supply, the hydraulic lines must be disconnected.

WARNING
There is a risk of accidents from pressurised hydraulic lines!

▶ Depressurise the hydraulic circuits before connecting or disconnecting hydraulic lines and couplings.

Make sure the following preconditions are met:
❑ The lift arms are lowered to just above the ground.
❑ Cylinders, valves, etc. on the working attachment are in the initial position or closed.
❑ The working attachment is tilted in.
❑ The hydraulics have been depressurised.

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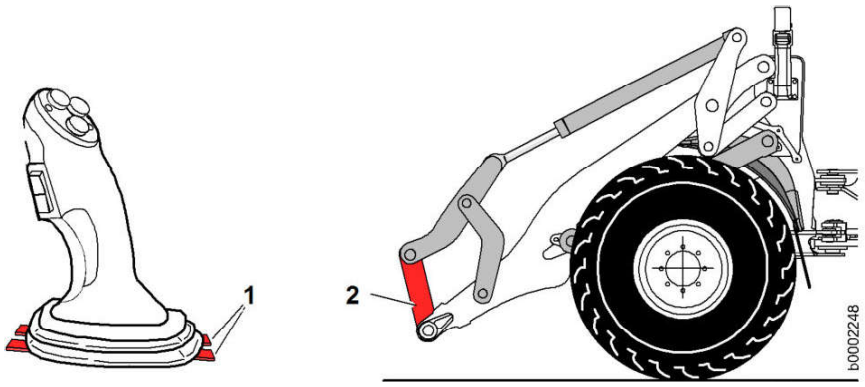

Fig. 242: Removing the transport safety retainer

1 Transport safety retainer **2** Transport safety retainer

▶ Remove the transport safety retainer **1**.

▶ Remove the transport safety retainer **2**.

NOTICE
There is a danger of damage to the tilt cylinder resulting from movements of the lift arms without quick-change device or with the bucket attached.

▶ Do not completely lift up the lift arms and tilt out simultaneously.

▶ Attach the quick-change device or bucket immediately after removing the transport safety retainers.

▶ Check the function of the equipment after installation.

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4 Malfunctions

Warning and error messages:
- Various faults are indicated by corresponding symbols or service codes in the display.
- Some warning functions are accompanied by audible warning signals.

Finding and eliminating errors and malfunctions:
- Faults can often be traced back to incorrect operation or servicing of the machine.
  Therefore, carefully read the appropriate section of the operating manual each time a fault occurs.
- **Analyse the cause of the fault and correct it immediately.**
- Describe the fault and all related circumstances if you contact **Liebherr Customer Service**. Precise information helps to locate and eliminate the cause of the fault. This means that the exact type and serial number of the machine need to be stated.
- Never perform any work for which you have not been trained or instructed.

Note
If cause of the fault cannot be detected or eliminated using the service code table.

▶ Contact Liebherr customer service.

4.1 Servicecodes

4.1.1 Service code indicator in the display

The control system monitors many of the machine's functions:
- Short circuit
- Cable rupture
- External voltage
- Incorrect input and output signals

In addition, the control system continuously checks the program sequence and communication with the control modules.

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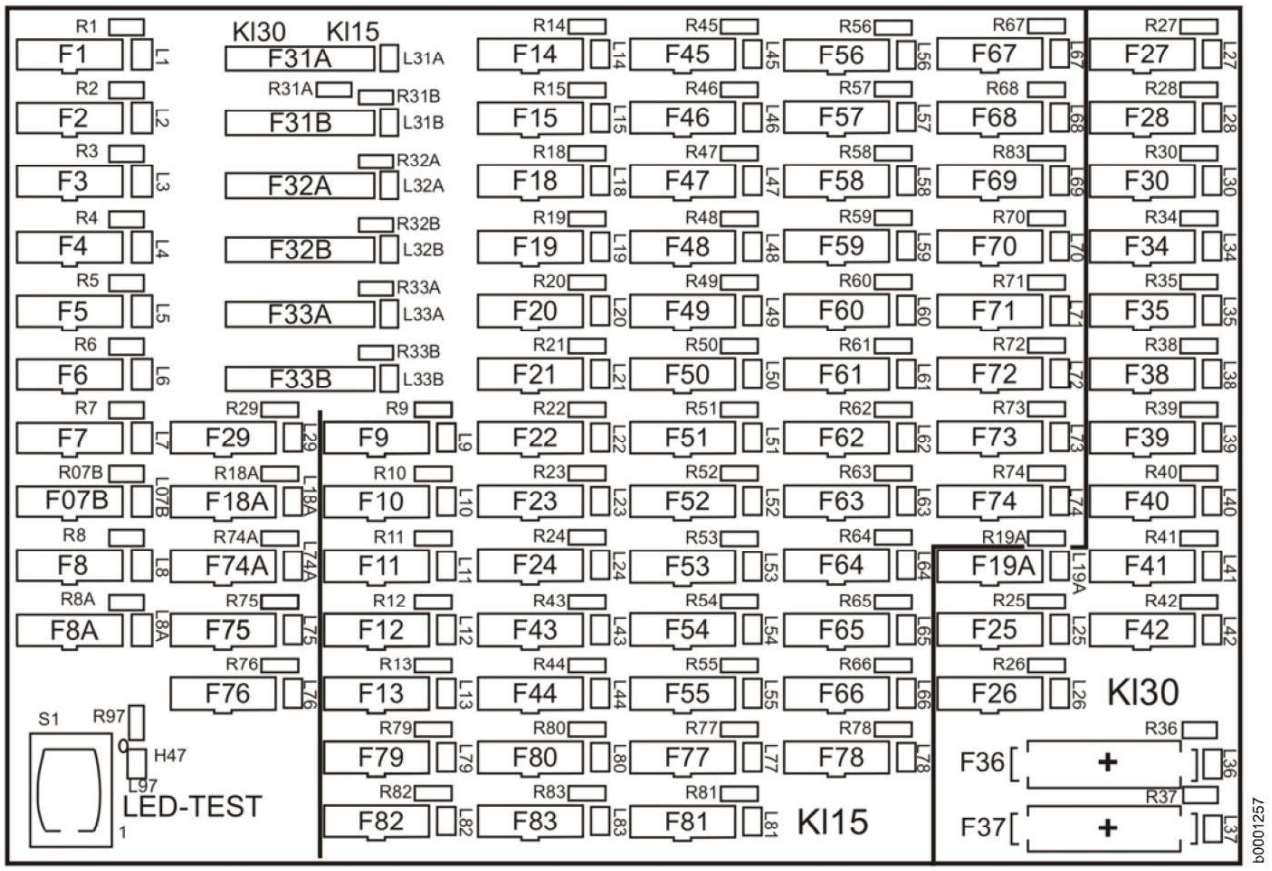

Fig. 258: Plug-in fuses on the relay and fuse board

- ▶ Use the table below to identify the defective fuse.
- ▶ Take out the defective fuse and replace it with a new one.

Fuse	Rating	Unit	Designation/function
F1	10	A	Spare
F2	7.5	A	Left high beam
F3	7.5	A	Right high beam
F4	7.5	A	Left low beam
F5	7.5	A	Right low beam
F6	3	A	Left marker light/parking light
F7	3	A	Right marker light/parking light
F07b	10	A	Hazard warning lights
F8	15	A	Compressor seat, seat heater, 12V socket
F8a	10	A	Interior lighting
F9	10	A	Control lever button, option keypad
F10	5	A	Display
F11	10	A	Pressure switches B32, B28
F12	20	A	Groeneveld central lubrication

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Designation	Recommended fuel or operating fluid	Symbol	Quantity
Engine cooling system, total capacity	Liebherr Antifreeze Mix Liebherr Antifreeze Concentrate	 06sy04ab	52 l
Windscreen washer system	Standard windscreen washer fluid or denatured alcohol	 b0000055	3.5 l
Air conditioning system refrigerant	R134a	 bsym0029	1250^{+50} g
Refrigerant oil for air conditioning compressor	ZXL 100 PG (PAG Oil)		200 cm^3

Tab. 45: Recommended fuel and operating fluids

5.2.3 Lubrication chart

The lubrication chart provides an overview of the location of the maintenance points on the machine and of the maintenance intervals.

Information on:
- Carrying out maintenance tasks (For more information see: 5.1 Maintenance and inspection schedule, page 225)
- Lubricants and fuels (For more information see: 5.3 Lubricants and fuels, page 235)
- Filling quantities (For more information see: 5.2 Filling quantities and lubrication chart, page 230)

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Product designation	Manufacturer
DCA 4 Diesel Coolant Additives	Fleetguard / Cummins Filtration
Caltex XLI / Delo XLI	Caltex (Asia)
Texaco XLI / Havoline XLI	Chevron (North and South America)
Havoline XLI	Arteco (Asia and Europe)

Tab. 53: Corrosion inhibitors without antifreeze

5.3.6 Hydraulic oil

The following oils may be used as hydraulic oils according to the following specifications.

Maximum water content of the hydraulic fluid: < 0.1 %

Liebherr hydraulic oil

Liebherr recommends the following hydraulic oils for the machine, according to the temperature range:

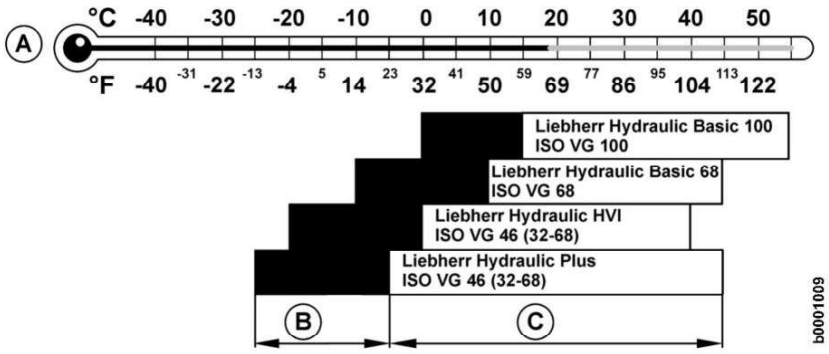

Fig. 267: Liebherr hydraulic oil, selection of viscosity class according to temperature

A Ambient temperature
B Cold start with warming-up procedure
C Operating range

Liebherr Hydraulic Plus is suitable as a bio oil as well as for long-term use.

If Liebherr oils cannot be purchased locally, you must use engine oils as described in the section on using “engine oil as hydraulic oil” (after consultation with customer service).

Using engine oil as hydraulic oil

When using non-Liebherr engine oils, we recommend that the customer first ask the oil manufacturer whether the product meets the following specifications.

Engine oils to be used as hydraulic oil must be selected according to the following specifications:

Single-grade oils (1)	API - CD / ACEA - E1
	(MB 226.0 and 227.0)

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- ▶ Set the machine down on level ground.
- ▶ The articulation lock.
- ▶ Lower the lift arms.
- ▶ Tilt the bucket out and set it down on the ground on its teeth or cutting edge.
- ▶ Engage the parking brake.
- ▶ Turn off the engine.
- ▶ Take out the ignition key.
- ▶ Turn off the battery main switch.

5.5.2 Opening the service accesses

CAUTION
Beware of injury when opening and closing hatches.

- ▶ Make sure you are standing safely when opening or closing the hatch.

Opening the engine compartment hatch

When the hatch is open, you can access the following components:
– Hydraulic pumps
– Hydraulic tank
– Hydraulic tank shut-off valve
– Air filter
– Battery main switch

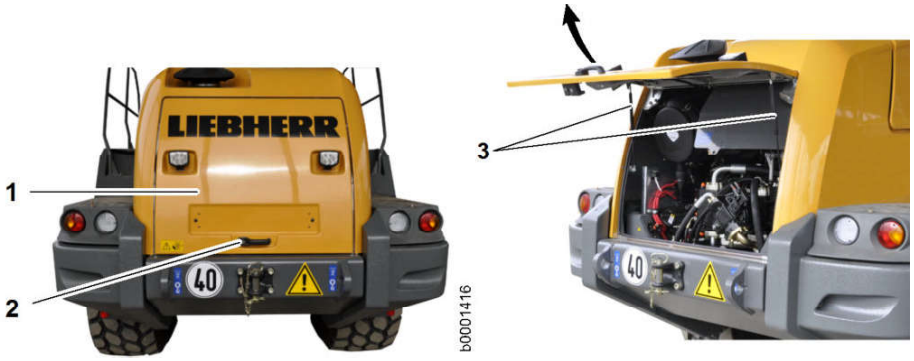

Fig. 280: Engine compartment hatch

1 Engine compartment hatch
2 Handle
3 Gas-filled spring

- ▶ Open the lock with the ignition key.
- ▶ Fully open the hatch **1** with the handle **2**.
  - ▷ The engine compartment hatch is held in this position by two gas-filled springs **3**.

Opening the engine compartment hood

When the hood is open, you can access the following components:
– Diesel engine
– Splitter box
– Hydraulic tank

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Hydraulic system

The hydraulic oil sample is taken via a test connection on the variable displacement pump.

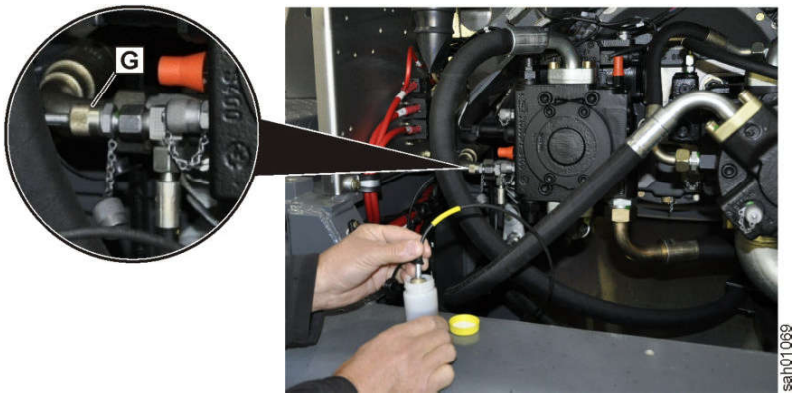

Fig. 284: Sampling point for hydraulic oil

- ▶ Start the engine and wait 3 minutes.
  ▷ The hydraulic oil is circulated.
- ▶ Engage the parking brake and secure the machine against rolling away.
- ▶ Connect the test line to the test connection **G**.
- ▶ 0.2 l Drain the hydraulic oil into the receptacle.
- ▶ Fill the sample container.
- ▶ Remove the test line and seal the test connection.

Diesel engine

The engine oil sample is taken via the dipstick pipe with a hand pump.

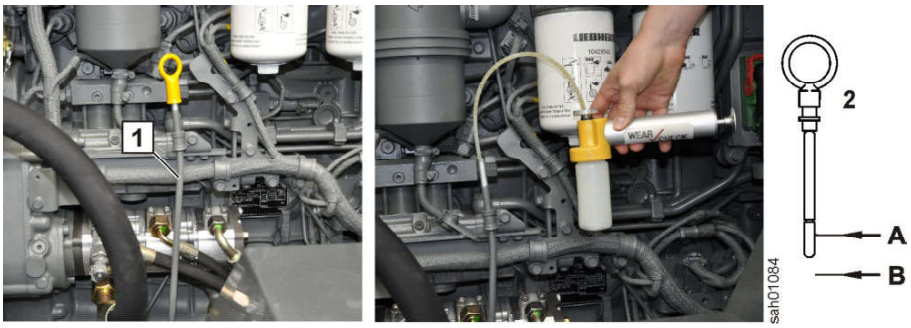

Fig. 285: Sampling point on the diesel engine

1	Oil dipstick tube	**A**	Oil level
2	Dipstick	**B**	Oil sampling depth

- ▶ Start the engine and let it run for 3 minutes at medium idling speed.
  ▷ The engine oil is circulated.
- ▶ Turn off the engine.
- ▶ Put the machine in maintenance position 1.

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5.7.6 Bleeding the fuel system

Bleeding the fuel filter is necessary after:
– Changing the fuel filter
– Emptying the fuel tank

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

DANGER
Beware of fire

▶ Naked flames and smoking are prohibited.

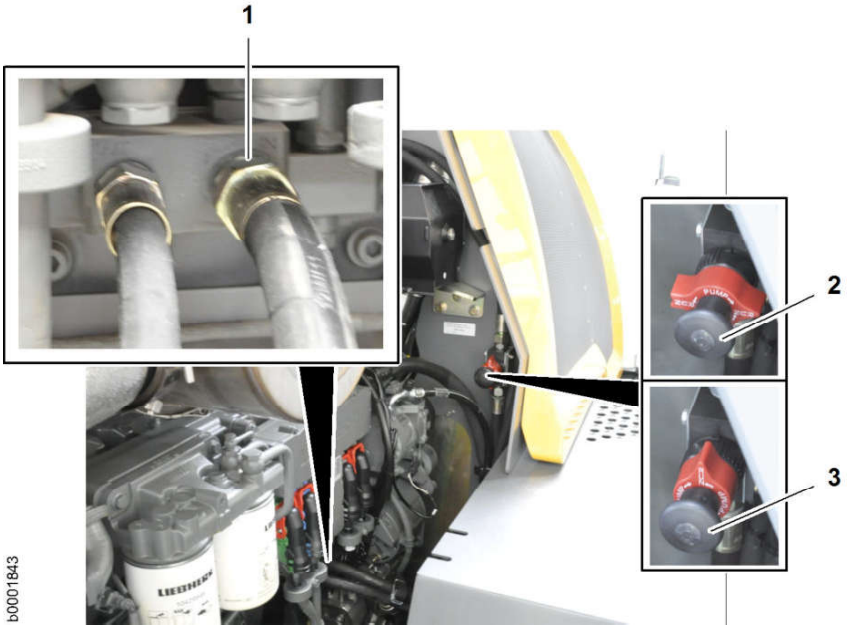

Fig. 295: Bleeding the fuel system

1 Engine “IN”
2 Hand pump in the PUMP position
3 Hand pump in the RUN position

CAUTION
Beware of fuel spurting out.

▶ Wear safety glasses.

▶ Unscrew the union nut of the fuel supply line at the engine “IN” **1** connection.

▶ Put the hand pump in the “PUMP” **2** position.

▶ Keep pressing the hand pump **1** until fuel comes out of the engine “IN” connection without bubbles.

▶ Close the opened fuel line engine “IN” **1**.

▶ Continue to operate the hand pump until you feel strong resistance.

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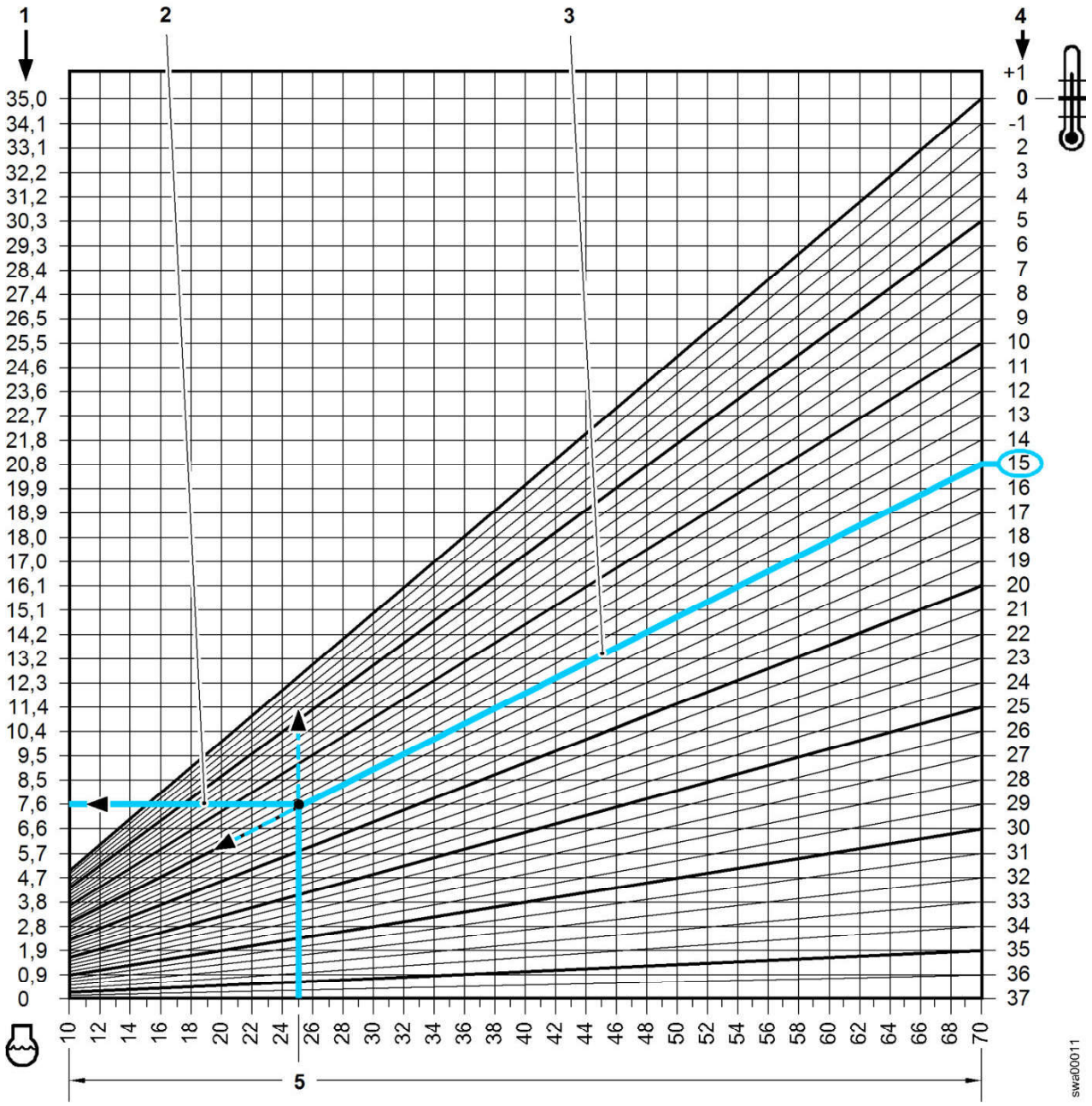

Fig. 306: Correcting the antifreeze concentration

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 filling capacity of the 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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5.13 Transmission

5.13.1 Checking the transmission oil level

Note
Checking the oil level

▶ Check the oil level with the engine running and at a gear oil temperature of $20^{\pm 10}$ °C.

Make sure that the following requirements are fulfilled:
❑ The working attachment is lying flat on the ground.
❑ The articulation lock is engaged.

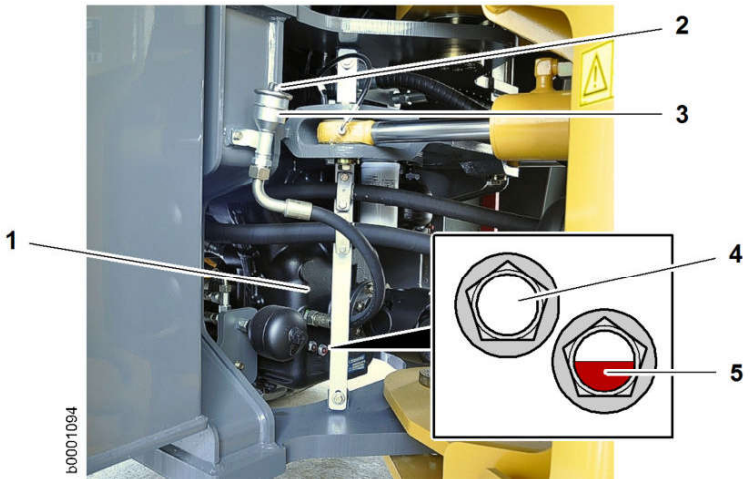

Fig. 318: Checking the transmission oil level

1 Transmission
2 Cap
3 Filling tube
4 Top sight glass
5 Bottom sight glass

▶ Start the engine and let it run at low idling speed.

▶ Check the oil level in the sight glasses **4, 5**.
▷ The oil level must be within the sight glass **5**.

Troubleshooting
If the oil level is too low:

▶ Switch off the engine and top up with the required amount of gear oil. (For more information see: 5.3.8 Lubricating oils for transmissions, page 245)

▶ Repeat the check.
If the oil level is too high:

▶ Contact Liebherr customer service.

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5.17 Cab, heating and air conditioning

5.17.1 Cleaning the fresh and recirculated air filters

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

Cleaning the fresh air filter

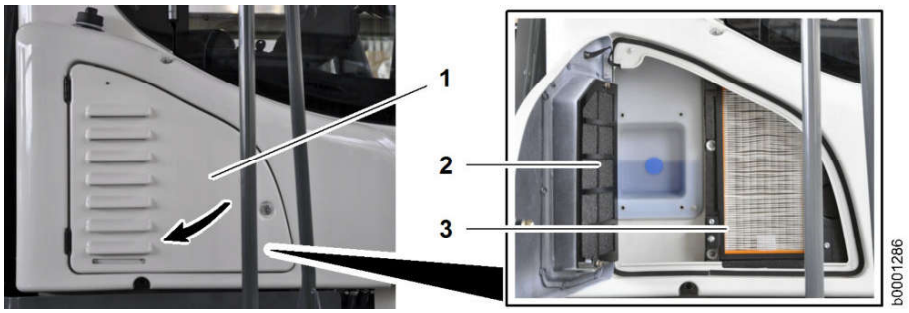

Fig. 330: Cleaning the fresh air filter

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. 331: Cleaning the recirculated air filter

1 Screw
2 Recirculated air filter

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