en **Operator's manual**

Telescopic handler

Document ID

ORIGINAL OPERATOR'S MANUAL

Order number: 93517337
Issued: 01.02.2020
Version: 05
Author: LWT / Technical Documentation Department

Product ID

Manufacturer: Liebherr-Werk Telfs GmbH
Type: T 55-7 4FS
Type no.: 1708
From Serial no.: 16195

Conformity: CE

Contact

Liebherr-Werk Telfs GmbH
Hans Liebherr-Straße 35
A – 6410 Telfs

LWT/93517337/05/01.02.2020/en

Description	Unit	Value

A) For engine type TCD 3.6 L4
B) For engine type TCD 4.1 L4

1.2.4 Maximum operating weight

The maximum permissible operating weight of the machine may not be exceeded for reasons of machine safety and operating suitability.

In case the maximum operating weight is being exceeded due to special retrofit installations (for example front or rear installations or protective equipment), request a written approval from Liebherr.

The maximum permissible operating weight of the machine is: T46-7 = 12000 kg, T55-7 = 13000 kg and T60-9 = 13000 kg.

1.2.5 Static and dynamic tests

The telescopic handler passed the static and dynamic tests in accordance with the DIN EN 1459-1 standard.

1.2.6 Support loads

The tyres of telescopic handler must transfer significant forces into the ground.

In certain cases, a single tyre must absorb almost the entire weight of telescopic handler including the load and transfer it into the ground.

The ground must be able to support the support load in any case!

DANGER
Danger of tipping the machine if the ground does not have sufficient load bearing capacity!

▶ Inquire with construction site management or an expert about the permissible ground pressure. Do not exceed the ground pressure.

If the load bearing capacity of ground is not sufficient to deflect the support loads into the ground:

▶ Use support plates or wooden planks to increase the support surface.

DANGER
Machine tipping!
Danger to life.

▶ Use exclusively stable materials, such as wooden planks or support plates, to support the tyres underneath.

▶ To obtain even pressure distribution on the support surface, place the tyres in the centre of support.

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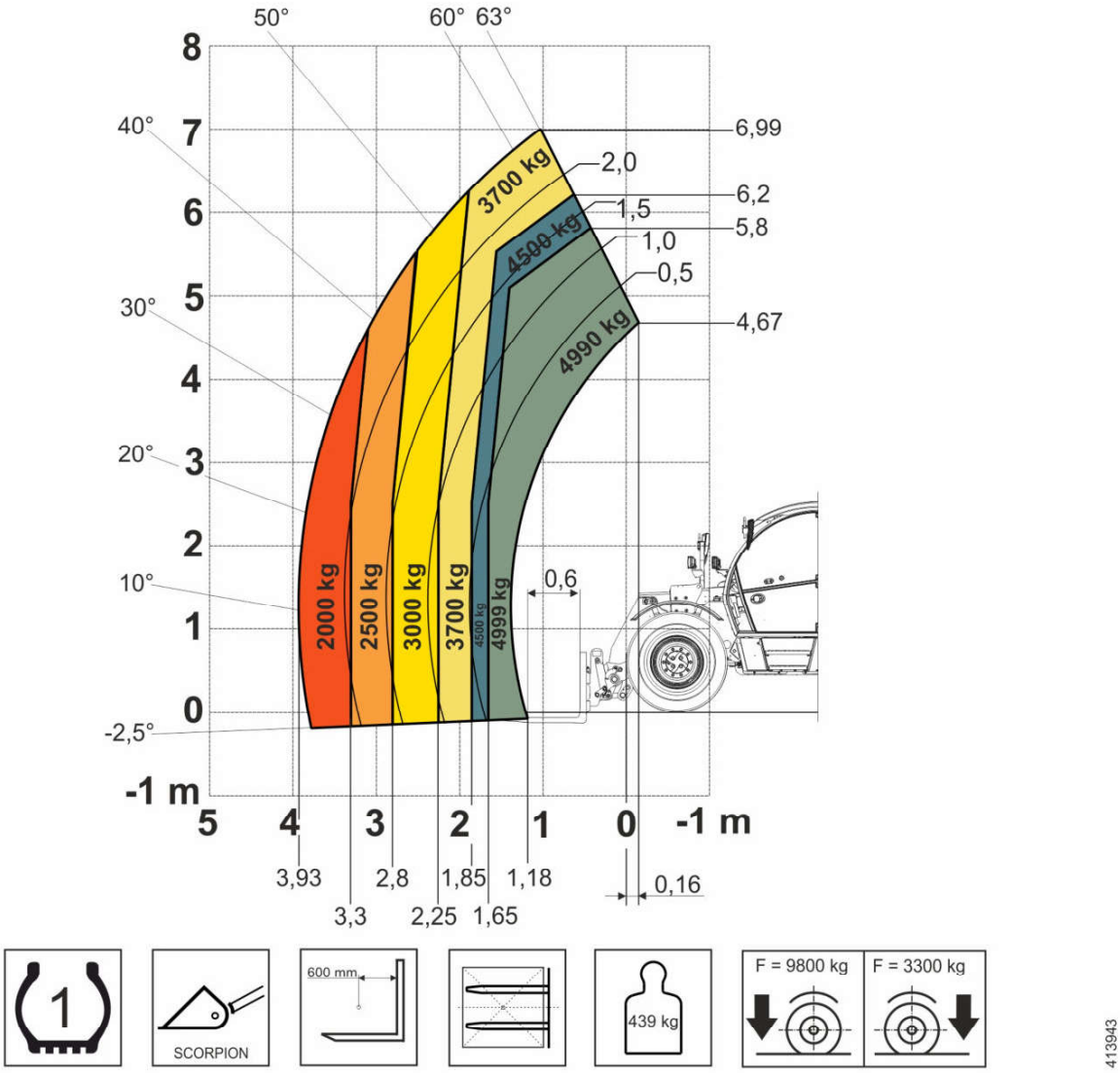
Load curve of standard fork for T55-7

Load curve: Id. No. 12571707



Tab. 8: Load curve of standard fork for T55-7

The load curve applies to all standard forks and to forks with the equivalent own weight and overall centre of gravity with Scorpion quick coupler and the following tyres:

Alliance 500/70 R24 550 Multiuse	Michelin 460/70 R24 Bibload
Dunlop 455/70 R24 SP T9	Michelin 460/70 R24 XMCL

Tab. 9

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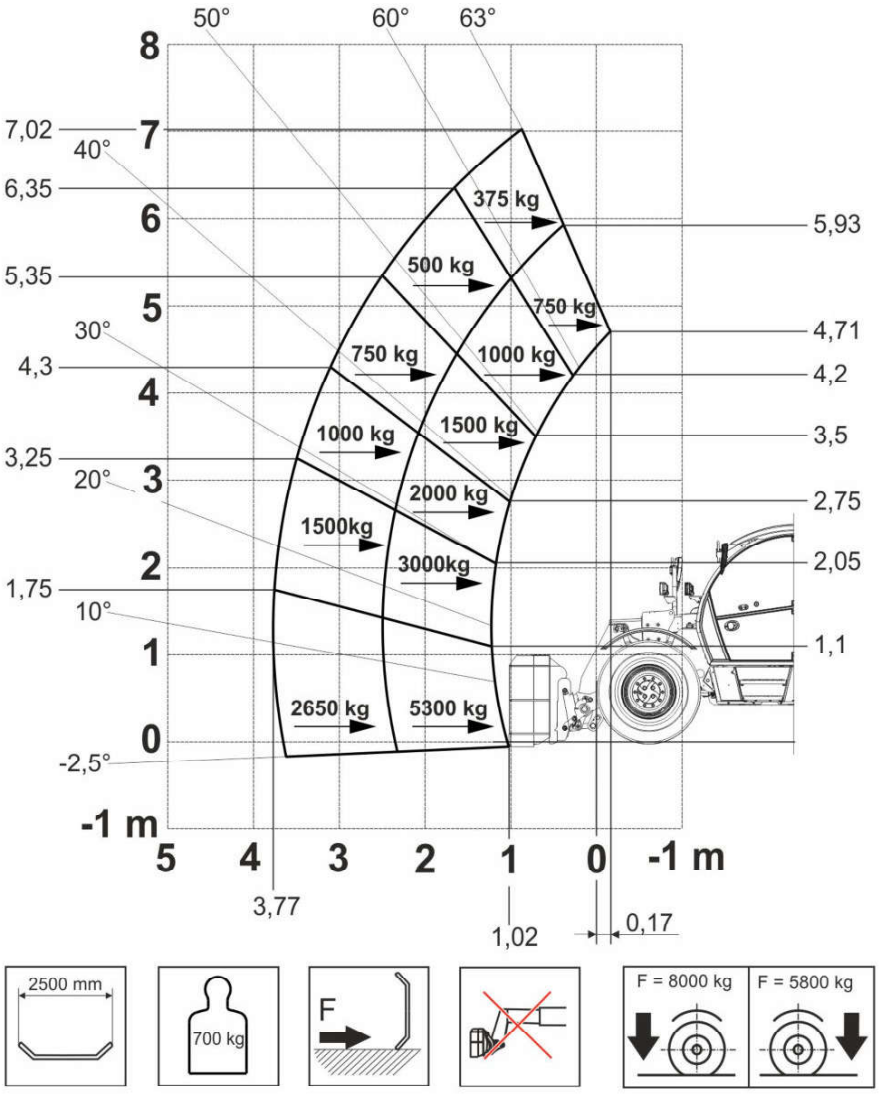
Load curve of blades for T55-7

Load curve: Id. No. 12812673



Tab. 20: Load curve of blades for T55-7

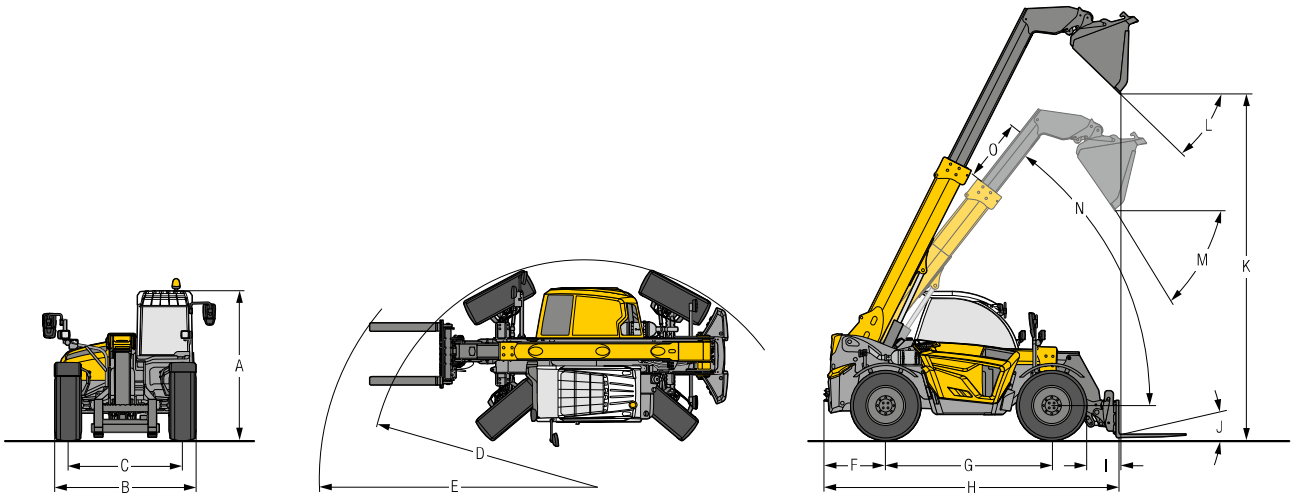
Load curve applies to pusher blades up to a maximum width of 2.5 m and a maximum own weight of 700 kg.

Efficiency

Make the Right Choice – Sustainable and Economical

More and more industrial companies rely on intelligent technology for more economic sustainability. The best example for this is modern regional district heating supply. This is where Liebherr's telescopic handlers guarantee adaptive adjustment of tractive and lifting power at low fuel consumption thanks to electronically controlling both drive system and work hydraulics.

Dimensions



Dimensions (all specifactions with standard tyres, standard fork or standard bucket)

			T 46-7s	T 55-7s	T 60-9s
A	Height over cab	mm	2,590/8'6" ft in	2,655/8'9" ft in	2,622/8'10" ft in
B	Overall width over standard tyres	mm	2,514/8'3" ft in	2,521/8'3" ft in	2,521/8'3" ft in
C	Track gauge	mm	2,040/6'8" ft in	2,040/6'8" ft in	2,040/6'8" ft in
D	Outside turning radius over tyres	mm	3,833/12'7" ft in	3,902/12'10" ft in	4,090/13'5" ft in
E	Outside turning radius over forks	mm	4,706/15'6" ft in	4,757/15'7" ft in	5,215/17'1" ft in
F	Rear overhang	mm	977/3'2" ft in	1,019/3'4" ft in	1,217/4' ft in
G	Wheels base	mm	2,950/9'8" ft in	2,950/9'8" ft in	3,150/10'4" ft in
H	Overall lenght to front carriage	mm	5,145/16'11" ft in	5,145/16'11" ft in	5,939/19'6" ft in
I	Reach at max. lifting height with extended telescope and max. tip out angle	mm	625/2'1" ft in	625/2'1" ft in	310/1'2" ft in
J	Max. tip out angle, lower pallet fork		20°	20°	20°
K	Dumping height at max. lifting angle of 63° at 7 m and 68° at 9 m with extendet telescope and max. tip out angle	mm	6,100/20'0" ft in	6,100/20'0" ft in	7,945/26'1" ft in
L	Max. tip out angle, standard bucket at max. lifting angle		42°	43,8°	43,8°
M	Max. tip out angle, standard bucket at 4 m loading edge		55°	55°	58,5°
	Ground clearance (middle of vehicle)	mm	410/1'4" ft in	410/1'4" ft in	438/1'5" ft in
	Max. rotation angle, machine mounting		152°	152°	152°

Metric standard thread and fine thread				Metric standard thread and fine thread			
At least one element of the screwed connection (screws, washers, nuts, ...) with following surface: flZn = zinc coating (LH standard 10021432, LH standard 10215295 flZnnc-480h-L valid ≥M6)				All elements of the screwed connection (screws, washers, nuts, ...) with following surface: black oxide or phosphated zinc plated (LH standard 10215295 Fe// ZnNi(12)5//Cn//T2)			
Minimum total coefficient of friction μ_G= 0.09				Minimum total coefficient of friction μ_G= 0.11			
Thread	Grade	Assembly prestressing forces F_M in kN	Tightening torques M_A in Nm	Thread	Grade	Assembly prestressing forces F_M in kN	Tightening torques M_A in Nm
M 27 x 2	8.8	270	880	M 27 x 2	8.8	260	1030
	10.9	400	1300		10.9	390	1500
	12.9	460	1500		12.9	460	1800
M 30	8.8	300	1140	M 30	8.8	290	1300
	10.9	440	1650		10.9	430	1950
	12.9	520	1950		12.9	510	2250
M 30 x 1.5	8.8	350	1240	M 30 x 1.5	8.8	350	1450
	10.9	520	1800		10.9	510	2150
	12.9	610	2150		12.9	590	2500
M 30 x 2	8.8	340	1220	M 30 x 2	8.8	330	1450
	10.9	500	1800		10.9	490	2100
	12.9	580	2100		12.9	570	2450
M 33	8.8	370	1550	M 33	8.8	370	1800
	10.9	550	2250		10.9	540	2600
	12.9	640	2600		12.9	630	3100
M 33 x 1.5	8.8	430	1650	M 33 x 1.5	8.8	420	1950
	10.9	630	2450		10.9	620	2900
	12.9	740	2800		12.9	730	3400
M 33 x 2	8.8	420	1600	M 33 x 2	8.8	410	1900
	10.9	610	2400		10.9	6020	2800
	12.9	720	2800		12.9	700	3300
M 36	8.8	440	1950	M 36	8.8	430	2300
	10.9	650	2900		10.9	630	3400
	12.9	760	3400		12.9	740	3900
M 36 x 1.5	8.8	520	2150	M 36 x 1.5	8.8	510	2600
	10.9	760	3200		10.9	750	3800
	12.9	890	3700		12.9	870	4400
M 36 x 3	8.8	470	2050	M 36 x 3	8.8	460	2400
	10.9	690	3000		10.9	680	3500
	12.9	810	3500		12.9	790	4100

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- If defects which affect safety occur: take the machine out of operation immediately.
- Carry out inspections of the machine prescribed by Liebherr in accordance with the inspection intervals.
- Carry out nationally prescribed inspections of the machine in accordance with the inspection intervals.
- Observe national legal requirements for the provision of machines and tools by the employer (hazard assessment and risk assessment by the operating company).
- Report every accident involving the machine to Liebherr:
  - With serious injuries
  - With significant property damage
- Allow Liebherr personnel to have unrestricted access to the machine in connection with the product monitoring obligation.
- Create an operational plan for the machine.
- Clearly define the responsibility of personnel (for operation, setup, maintenance and repair).
- Ensure that no modifications are carried out on the machine without prior consultation with the manufacturer.
- Use only original Liebherr spare parts.

2.4.4 Operator

Responsibility

The operator has the following duties:
- Read the operator's manual.
- Read the other documentation supplied:
  - Operator's manuals for the components
  - Operator's manuals of third-party manufacturers
  - Additional manuals
- Wear personal protective equipment.
- Operate the machine in accordance with the intended use.
- Avoid questionable working methods.
- Observe the safety regulations at the job site.
- Report all safety-impacting changes to the machine to the operating company.
- If a safe manner of working is no longer possible: stop operating the machine immediately.
- Modifications to the machine may only be carried out after prior consultation with the manufacturer.
- Use only original Liebherr spare parts.

Requirement

The operator possesses the following skills and qualifications:
- Has reached the minimum age prescribed by law.
- Is physically and mentally capable of operating the machine safely:
  - Sufficient vision
  - Sufficient hearing
  - Short reaction time
- Has the requisite authorisation to operate the machine.
- Is able to estimate distance, height and clearances.
- Knows all escape routes in the event of an emergency.
- Does not have any physical or mental impairment that impinges upon any of the stated requirements (e.g. alcohol, drugs, medication).

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Location of information signs

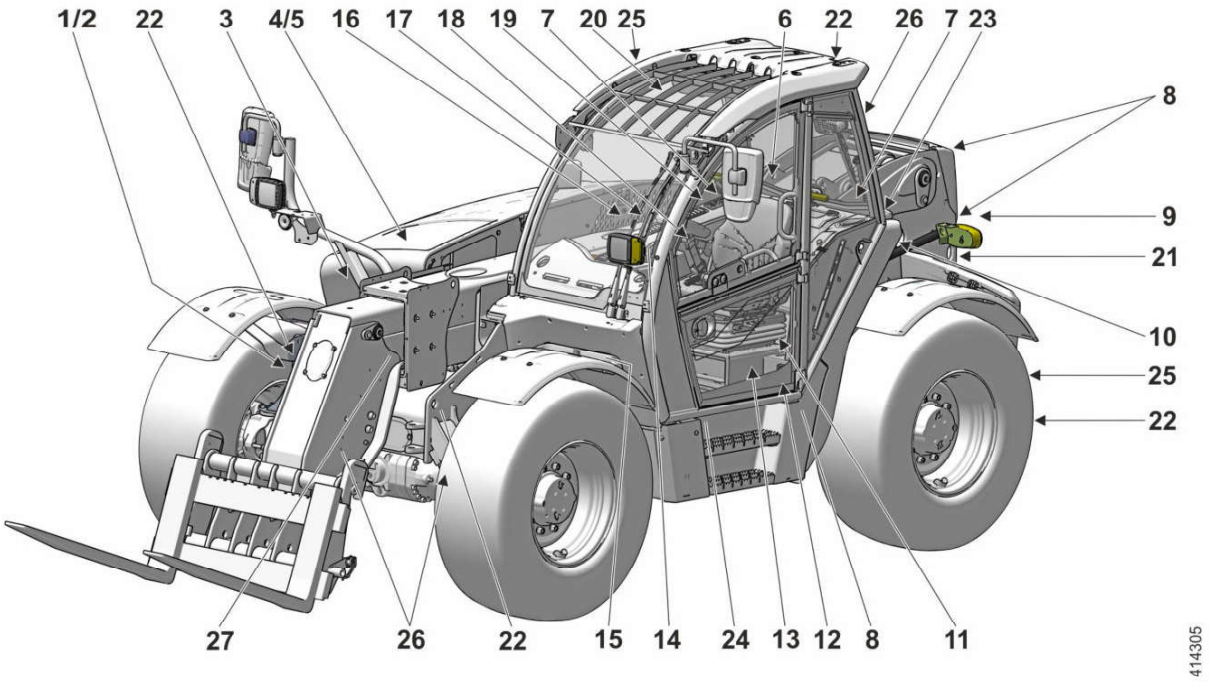

Fig. 68: Location of information signs

1	*Rigging point* sign	**10**	*Hydraulic oil* sign	**19**	*Rear hydraulics* sign[6)]
2	*Slinging / lifting point* sign	**11**	Lubrication chart	**20**	*Working headlights* sign[6)]
3	*CE conformity mark* sign	**12**	*Wheel lugs* sign	**21**	*Maximum support load* sign[6)]
4	*Coolant* sign	**13**	*ROPS/FOPS* sign	**22**	*Peak point* sign
5	*Windscreen washer fluid* sign	**14**	*Tyre inflation pressure* sign	**23**	*Tank nozzle* sign
6	*Noise protection* sign	**15**	*Brake oil* sign	**24**	*Preheating 230 V* sign[6)]
7	*Emergency exit* sign	**16**	*Load chart* sign	**25**	*Floating axle lock* sign[6)]
8	*Speed* sign	**17**	*Control lever* sign	**26**	*Manual lubricating points* sign[6)]
9	*Diesel exhaust fluid* sign	**18**	*Gradual travel device and manual throttle* sign[6)]	**27**	*Switching position* sign[6)]

[6)] Option

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The sign is located on the rear next to the trailer coupling.

Indicates the maximum support load of the trailer coupling.

Peak point sign

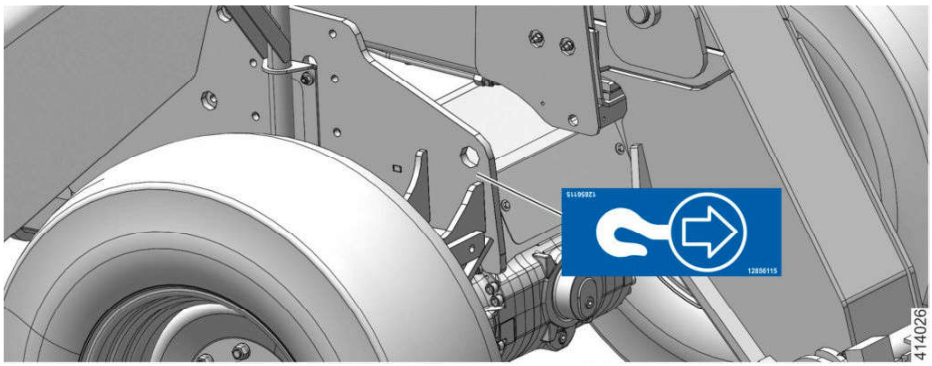

Fig. 90: Peak point sign

The sign is located on the machine's peak points.

Indicates the machine's peak points.

Tank nozzle sign

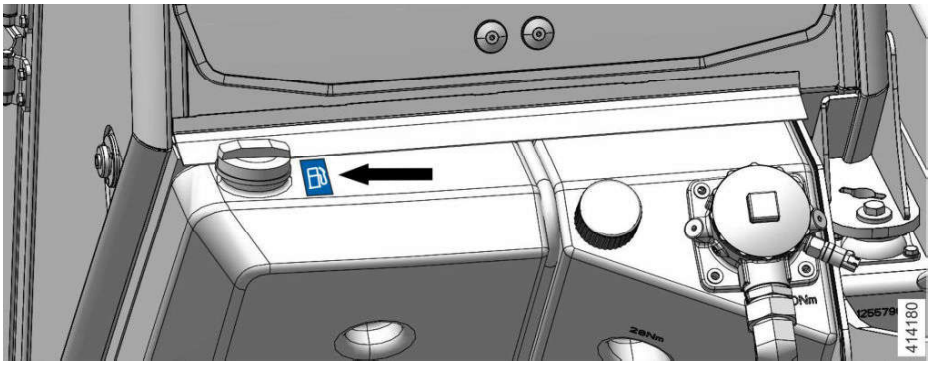

Fig. 91: Tank nozzle sign

The sign is located on the fuel tank next to the filler pipe.

Indicates the fuel filler pipe.

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7. A guide must signal the machine operator. Drive onto the ramp and onto the transport vehicle very carefully.
8. Have blocks and wedges ready to block the machine, if necessary, to prevent the machine from rolling backward.
9. Tilt the working attachment in and drive up the ramp. Always keep the working attachment close to the loading surface.
10. After the loading procedure, lower the attachment onto the loading surface.
11. Secure the machine and the remaining parts with chains and wedges to prevent them from slipping.
12. Relieve the pressure from the pressure lines, apply the parking brake, remove the ignition key, lock the driver's cab doors and all covers before leaving the machine.
13. Carefully check out the transport route beforehand, especially in regards to width, height and weight limitations.
14. Check that there is enough clearance underneath all electrical lines, bridges, underpasses and in tunnels.
15. During the unloading procedure, proceed with the same caution as during the loading procedure.
    Procedure:
    - Remove all chains and wedges. Start the engine as outlined in the Operating instructions.
    - Carefully drive off the loading platform down the ramp.
    - Keep the working attachment as close as possible above the ground.
    - Have another person guide and signal you.

2.6.11 Safety instructions for towing and recovering the machine

1. Always follow the correct procedure according to the instructions in the **operator's manual**, refer to section “Towing and recovering the machine”.
2. The machine may only be towed and recovered in exceptional circumstances, for example to move the machine from a dangerous area for repair.
3. Before recovering or towing, check all towing and pull devices for safety and stability.
4. The rod, which is used to tow the machine must be adequate to pull the machine and must be connected to the appropriate bores and towing devices. Damage or accidents which occur when towing or recovering the machine cannot be covered by manufacturer's guarantee under any circumstances.
5. During towing procedure, keep within required transport position, permissible speed and distance.
6. When returning machine to operation, proceed only as outlined in operator's manual.
7. After the towing or recovering procedure, be certain to return the machine to series condition.

2.6.12 Safety guidelines for maintenance

1. Never perform any maintenance or repairs for which you are not qualified or you do not understand.
2. Observe the stated intervals or time periods for repeat checks and inspections as outlined in the operating instructions. Always use appropriate tools to carry out maintenance work.
3. The chart in these operating instructions defines exactly who must or may carry out which type of work. The operator may only carry out work marked in the maintenance and inspection schedule with “by maintenance personnel”.

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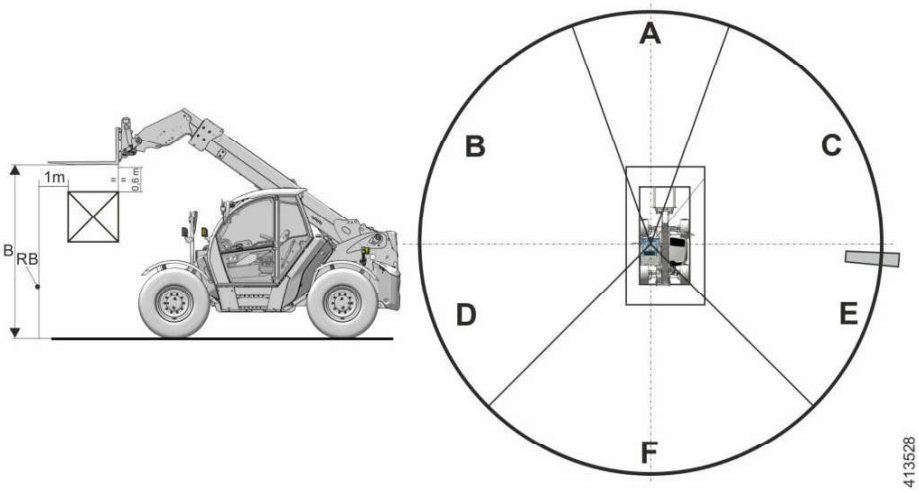

Fig. 99: Field of vision measurement with attached load

Height B = 2200 mm ± 50 mm.
RB = Right angled 1 m limit

The following visual shadows cannot be seen from the operator's seat:
– Areas with a grey background in the sector **E** indicate the restrictions of field of vision.

Restriction of field of vision for truck loading

The graphic describes the existing visual shadows at a retracted and raised telescopic boom of 1000 mm +- 50 mm in the field of vision radius of 12 metres.

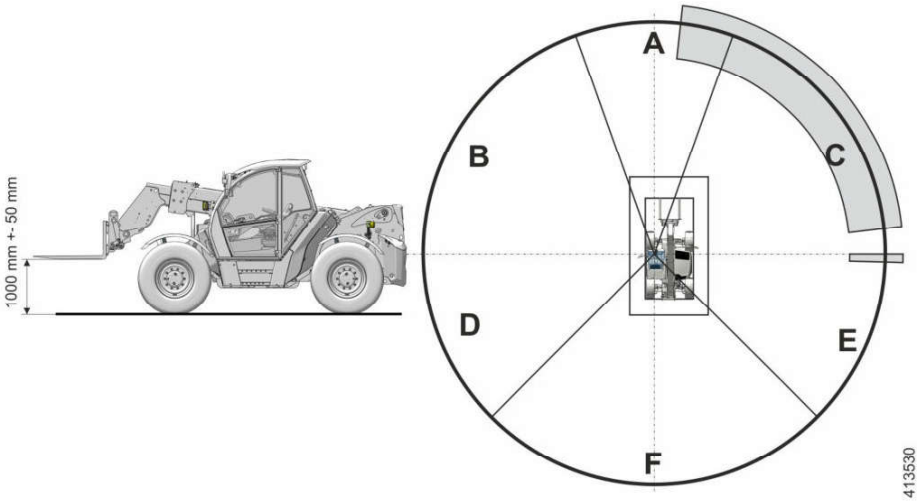

Fig. 100: Field of vision measurement for truck loading

The following visual shadows cannot be seen from the operator's seat:
– Areas with a grey background in the sector **A**, **C** and **E** indicate the restrictions of field of vision.

Measures before and during operation

1. Make sure that persons establish contact with the machine operator before they approach the machine.

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52 *Tipping cylinder lock* switch (option)


412383

Press top part of switch: *Tipping cylinder lock* function is deactivated.

Press bottom part of switch: *Tipping cylinder lock* function is activated.

Tipping cylinder lock indicator light lights up on display unit.

54 *Auto Power* switch (option)

412385

Press top part of switch: *Auto Power* function is deactivated.

Press bottom part of switch: *Auto Power* function is activated.

Auto Power symbol is shown on the display.

56 *Side window windscreen washer system* switch (option)


413225

Press top part of switch: *Side window windscreen wiper* is deactivated.

Press bottom part of switch: *Side window windscreen wiper* is activated.

Press bottom part of switch and hold (touch function): Side window windscreen washer system is activated.

57 *Trailer brake* button (option)


412505

Parking brake switch is activated.

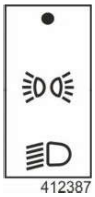
Press bottom part of button and hold it: Trailer brake is released.

Release button: Trailer brake is activated.

Control elements - roof console right

Fig. 125: Control elements - roof console right

60 *Parking light and driving light* switch


412387

Press top part of switch: Parking light, driving light and side marker lights are switched off.

Switch in centre position: Parking light and side marker lights are switched on.

Press bottom part of switch: Driving light and side marker lights are switched on.

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Status symbols	Name
 412273	Differential lock (For more information see: Differential lock (option), page 189)
 412226	Auto Power[A)] (For more information see: Auto Power (option), page 208)
 412228	High beam (For more information see: 3.1.11 Steering-column switch, page 129)
 412263	Quick coupler[A)] (For more information see: 3.5.2 Hydraulic quick coupler (option), page 288)
 412276	Shake/vibrate function[A)] (For more information see: Shake/vibrate function (option), page 226)
 412261	Tipping cylinder lock[A)] (For more information see: Tipping cylinder lock (option), page 225)
 412262	Bucket repositioning[A)] (For more information see: Bucket repositioning (option), page 213)
 412267	Diesel engine stop If this is displayed, turn off diesel engine and contact Liebherr customer service.
 413640	Maintenance display Contact Liebherr customer service.
 412233	Forward travel direction (For more information see: Forward travel, page 186)
 412234	Reverse travel direction (For more information see: Reverse travel, page 187)
 412227	Neutral position (For more information see: Before travel, page 185)
 412238	Front wheel steering (For more information see: Selecting front wheel steering mode, page 192)

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3.2 Operation

3.2.1 Entry

Enter and leave the machine using the ascending aids provided.

The cab access steps must be cleaned before access.

Enter and leave the operator's cab through the operator's cab door.

Familiarise yourself with the emergency exits. These are via the right cab window or through the rear cab window. (For more information see: 3.2.2 Emergency exit, page 132)

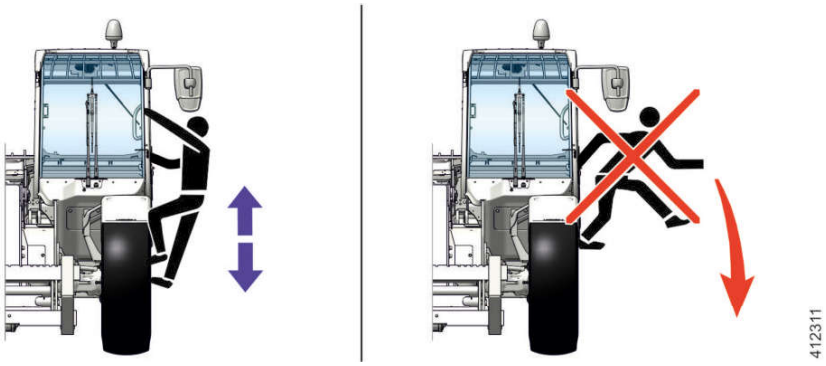

Fig. 161: Entering and leaving the operator's cab

WARNING
Improper entering and exiting!
Falling.

- ▶ When entering and exiting the machine, maintain three-point contact.
- ▶ Exclusively enter and leave machine using access aids.

Entering operator's cab

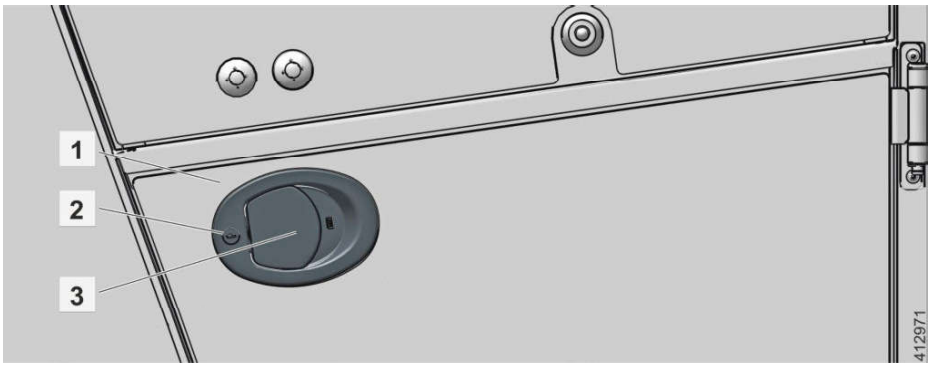

Fig. 162: Entering operator's cab

1 Cab door
2 Door lock
3 Door handle

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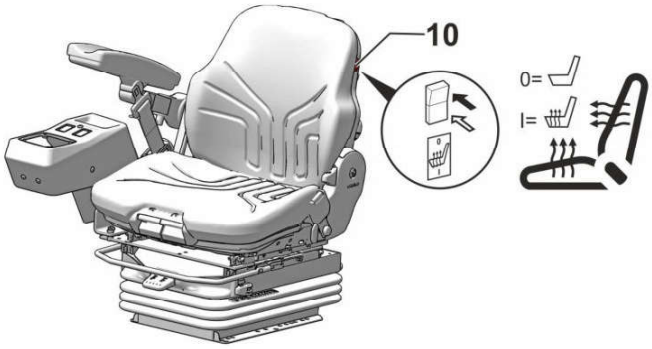
Seat heater



413376

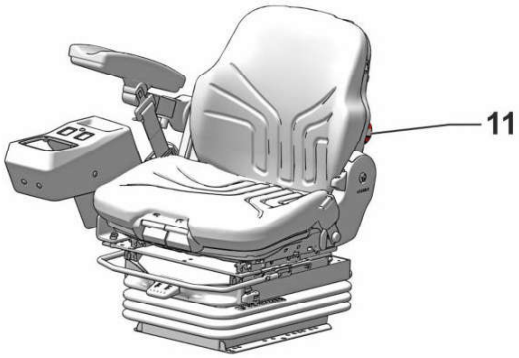
Fig. 181: Seat heater

10 *Seat heater* switch

▶ Press *Seat heater* switch **10** up.
▷ Seat heater is activated.

▶ Press *Seat heater* switch **10** down.
▷ Seat heater is deactivated.

Adjusting lumbar support



413377

Fig. 182: Adjusting lumbar support

11 Hand wheel *Lumbar support*

▶ Turn *Lumbar support* hand wheel **11** clockwise or anticlockwise.
▷ Lumbar support is set.

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Releasing safety belt

Fig. 201: Releasing safety belt

1 Unlock button **2** Buckle

▶ Press the unlock button **1** at the buckle **2**.

3.2.6 Adjusting the armrest

The armrest can be adjusted individually.

Armrest: adjusting the height

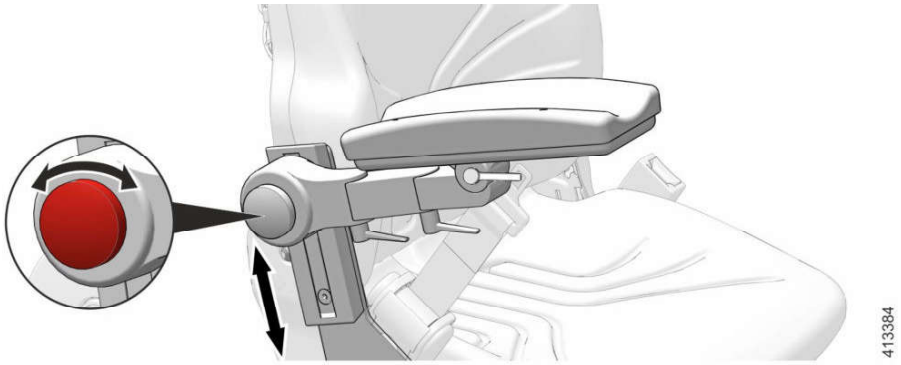

Fig. 202: Adjusting the height

▶ Loosen the hand wheel.

▶ Adjust the height of the armrest.

▶ Tighten the hand wheel again.

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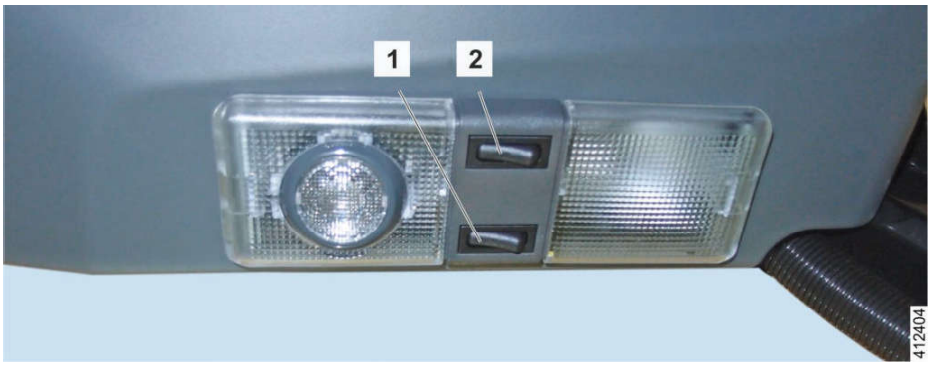

Fig. 222: Interior light of operator's cab and reading light

- ▶ To switch the interior lighting on or off, actuate switch **2**.
- ▶ To switch reading light on or off, actuate switch **1**.

3.2.12 Side marker lights

The side marker lights are located on the left and right rear headlight.

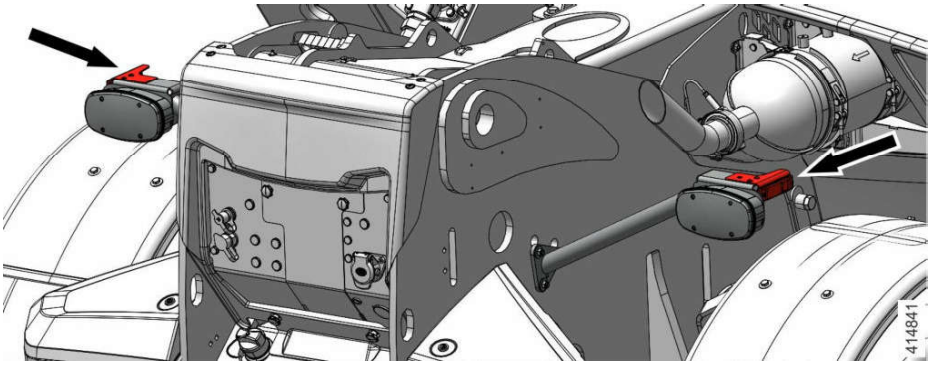

Fig. 223: Side marker lights

- ▶ Switch on the side marker lights: set *Parking light and driving light* switch to centre position.

or

Press *Parking light and driving light* switch down.

- ▶ Switch off side marker lights: Push *Parking light and driving light* switch up.

3.2.13 Interior and exterior mirrors

The machine is equipped with an interior mirror [11)] and four exterior mirrors.

[11)] Option

3.3 Operation

3.3.1 Operating machine on a daily basis

Ensure that following requirements are met:
- ❑ Daily maintenance tasks are taken care of.
- ❑ Working hydraulics are locked. (For more information see: Locking working hydraulics, page 197)

Adopting operating position

Connecting the battery

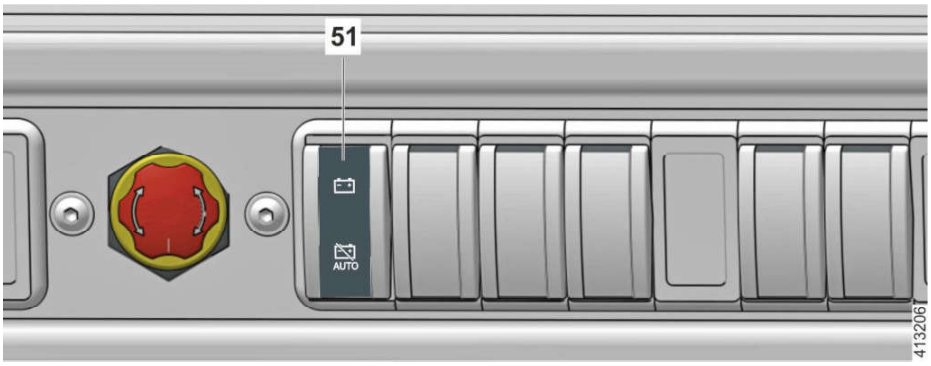

Fig. 242: Battery disconnecting switch

▶ Press button **51** upwards.
▷ The power supply is activated.

Closing service doors, service flaps and service hoods

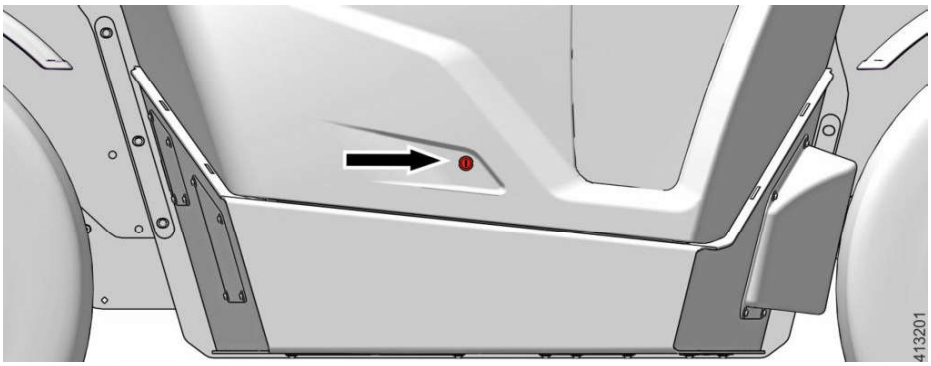

Fig. 243: Locking doors

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

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NOTICE
Improper use of the diesel engine!
Damage to the diesel engine.

▶ Let the diesel engine warm up before loading.

▶ After starting procedure, do not subject the diesel engine to a full load until after a short warm up period.

Preheating 230 V (option)

The preheating serves solely to heat the hydraulic oil and coolant before putting the machine into service at low ambient temperatures below -5 °C. The heating duration is dependent on the ambient temperature.

Continuous heating of the hydraulic oil and the coolant only takes place if the preheating is activated over a **longer period of time**.

The connector plug is located at the cab access to the operator's cab.

NOTICE
Incorrect use of the preheating!
Damage to the diesel engine.

▶ Only activate the preheating at temperatures below -5 °C.

Activating preheating

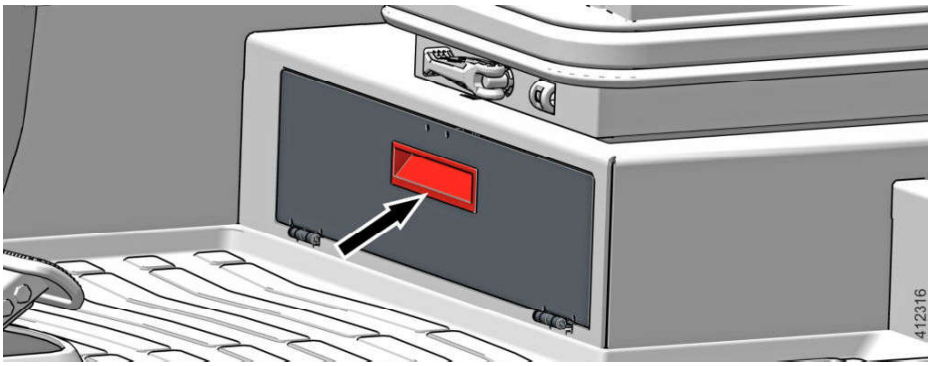

Fig. 260: Compartment

▶ Remove the extension cable from the compartment.

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4x4 shut-off (option)

The machine changes from all-wheel driving to front-wheel driving via the 4x4 shut-off.

The 4x4 shut-off enables a more economical driving style.

WARNING
Machine may slip!
Danger to life.

▶ Only switch off all-wheel drive on flat terrain or when driving on roads.

Ensure that following requirements are met:
❑ Machine is at a standstill.

Activating 4x4 shut-off

Fig. 283: Activating 4x4 shut-off

1 *4x4 shut-off* button

▶ Press the *4x4 shut-off* button **1**.
▷ The *4x4 shut-off* symbol is shown on the display.
▷ All-wheel drive is deactivated.

Deactivating 4x4 shut-off

Fig. 284: Activating 4x4 shut-off

1 *4x4 shut-off* button

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Activating parking brake

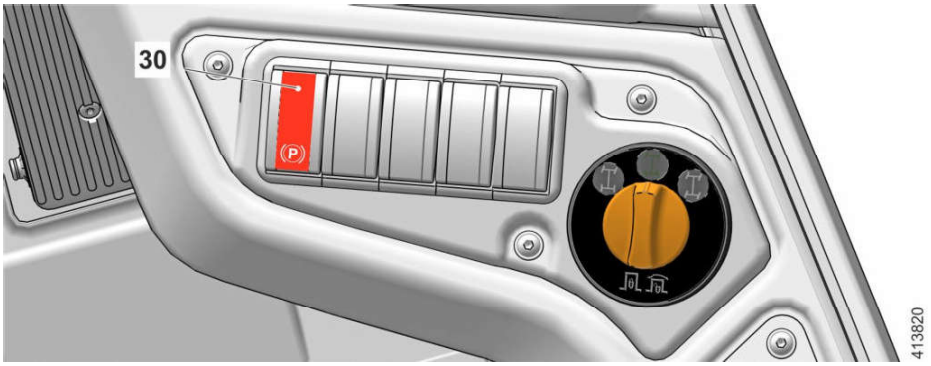

Fig. 301: Activating parking brake

▶ Press *parking brake* switch **30** down.
▷ The *parking brake* symbol lights up on the monitor.

Turning diesel engine off

WARNING
Turn the diesel engine off if it is running at full load!
Damage to the diesel engine.

▶ Only shut the diesel engine down at a low engine speed.

▶ Take foot off the accelerator pedal to reduce the engine rpm to low idle rpm.

▶ Continue to let the diesel engine run in low idle for a short time (1 minute).

▶ Turn all currently turned on users off (such as headlights or windscreen wipers).

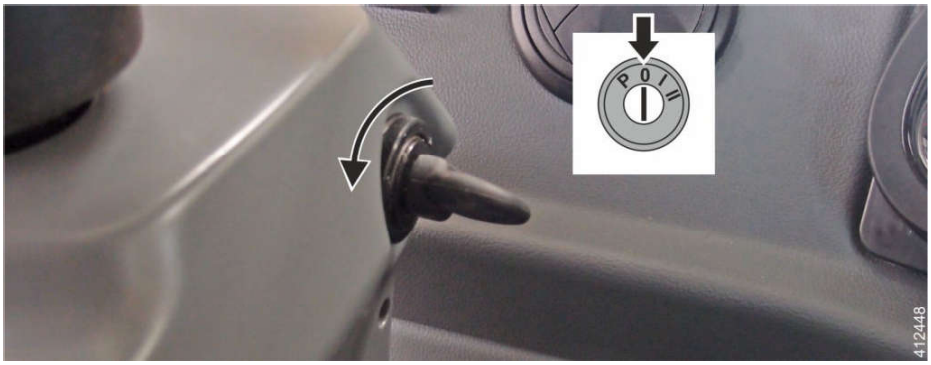

Fig. 302: Starting switch - zero position

▶ Turn starting switch to zero position and pull ignition key out.
▷ All indicator lights turn off.

Disconnecting the battery

▶ Before leaving the machine or before maintenance and repair work, disconnect the battery.

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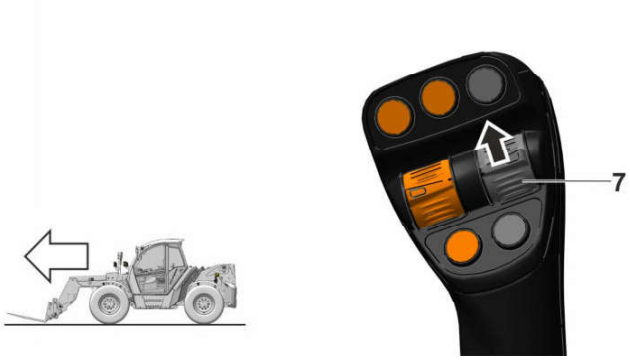

Fig. 319: Extending the telescopic boom

7 *Telescopic boom* rocker switch

▶ Press *telescopic boom* rocker switch **7** forward.
▷ The telescopic boom is extended.

▶ Release the *telescopic boom* rocker switch **7**.
▷ *Telescopic boom* rocker switch **7** resets itself to neutral position.
▷ The telescopic boom remains in set working position.

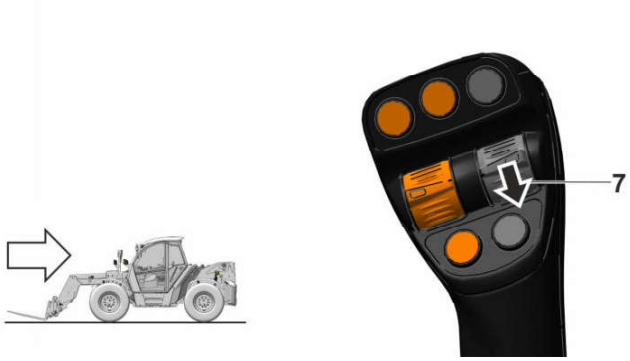

Fig. 320: Retracting the telescopic boom

7 *Telescopic boom* rocker switch

▶ Press *telescopic boom* rocker switch **7** backwards.
▷ Telescopic boom is retracted.

▶ Release the *telescopic boom* rocker switch **7**.
▷ *Telescopic boom* rocker switch **7** resets itself to neutral position.
▷ The telescopic boom remains in set working position.

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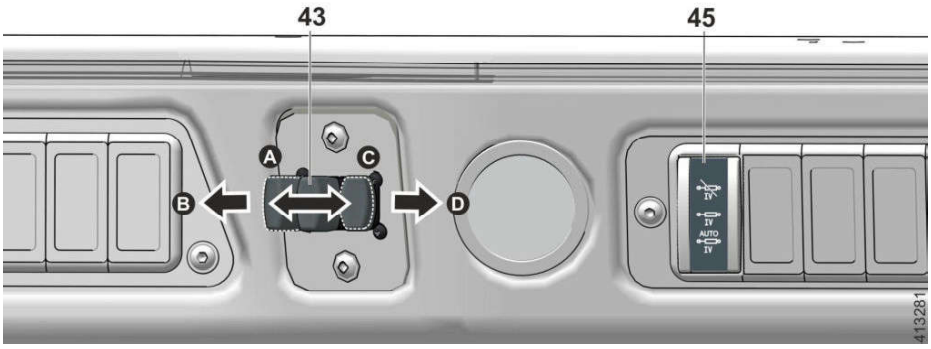

Fig. 337: Activating control circuit IV

43 *Rear hydraulics* control lever **45** *Control circuit IV* switch

▶ Set *control circuit IV* switch **45** to middle position.
  ▷ Additional control circuit IV is activated.
  ▷ *Control circuit IV* symbol is shown on the display.

▶ Push *rear hydraulics* control lever **43** forwards or backwards.
  ▷ Control circuit IV connections **A** are pressurised with hydraulic oil.

Control circuit IV flow volume (option)

The preset oil volume of control circuit IV can be changed by setting the flow volume.

Setting the flow volume

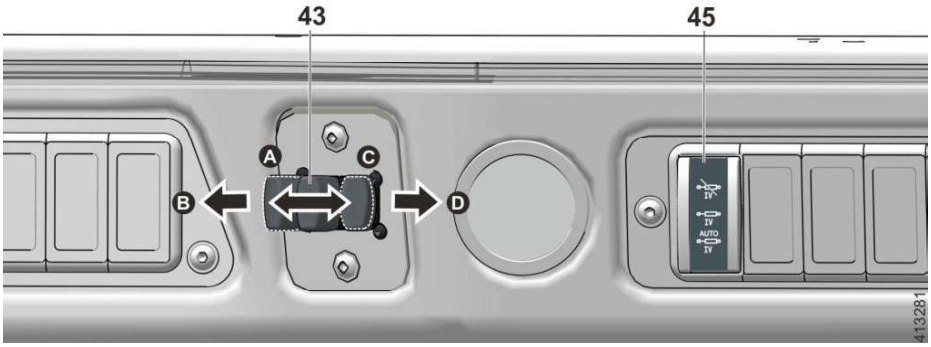

Fig. 338: Setting control circuit IV flow volume

43 *Rear hydraulics* control lever **45** *Control circuit IV* switch

▶ Set *control circuit IV* switch **45** to middle position.
  ▷ *Control circuit IV* symbol is shown on the display.
  ▷ Preset flow volume flashes on the display.

▶ Press *rear hydraulics* control lever **43** towards **A** or **C**.
  ▷ Flow volume changes in 1 % increments.
  ▷ Flow volume flashes on the display.

Saving and activating the flow volume

▶ Press *rear hydraulics* control lever **43** towards **A** or **C**.

▶ Press bottom part of *control circuit IV* switch **45**.

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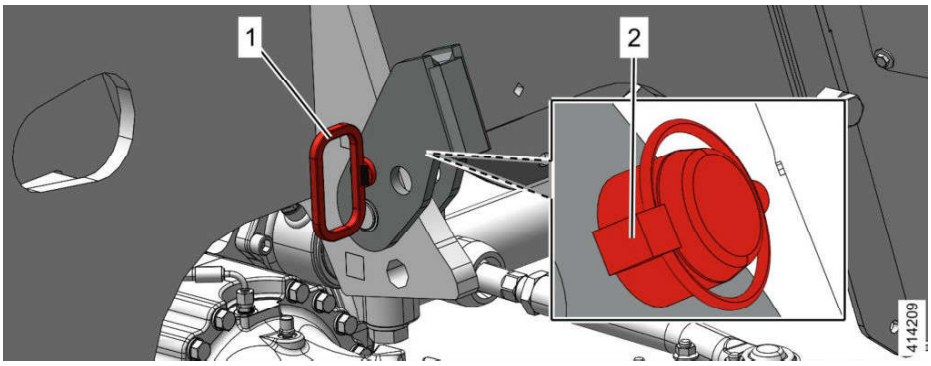

Fig. 355: Unlocking the floating axle

1 Pin
2 Cotter pin

▶ Insert the pin **1**.

▶ Secure the pin **1** with a cotter pin **2**.

▶ Repeat the procedure on the opposite side.
▷ Floating axle is unlocked.

3.3.10 Trailer couplings (option)

The trailer mirror needs to be installed if using a trailer coupling.

Automatic trailer coupling, height adjustable

Height adjustment of trailer coupling

Adjust the automatic trailer coupling to height of trailer prior to attachment.

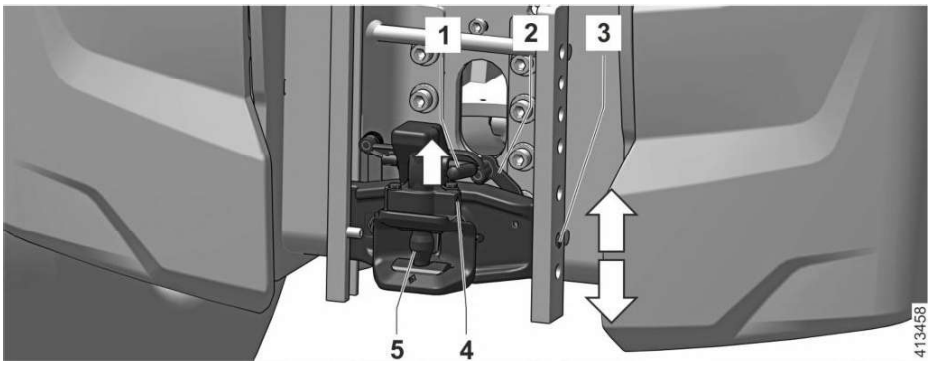

Fig. 356: Automatic trailer coupling, height adjustable

1 Lever
2 Handle
3 Locking pin
4 Retaining pin
5 Coupling pin

▶ Pull handle **2** up and to the right.
▷ Locking pins **3** are retracted.

▶ Move the trailer coupling up or down.

Once desired height is reached:
▶ Let go of handle **2**.
▷ The locking pins **3** lock in place in the receptacle plate.

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Automatic pin coupling

Opening automatic pin coupling

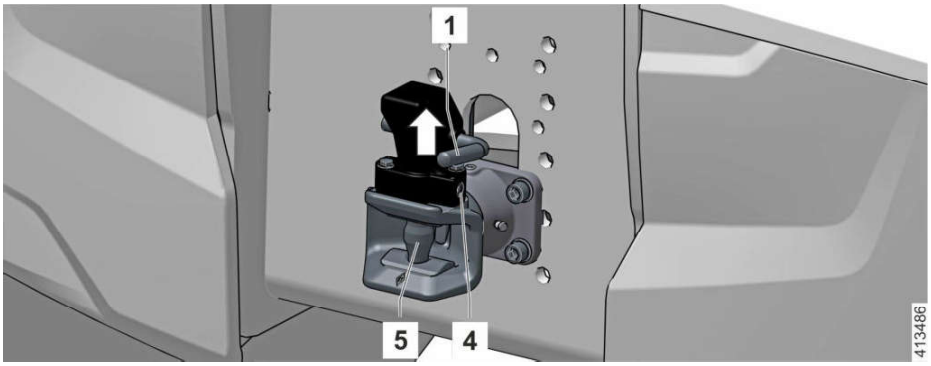

Fig. 364: Automatic pin coupling

1 Lever
4 Retaining pin
5 Coupling pin

▶ Pull lever **1** upward until it locks in place.
▷ Lateral retaining pins **4** are extended.
▷ The coupling pin **5** is pushed upward and locked.

CAUTION
The trailer coupling closes automatically!
Crushing injuries.

▶ Ensure that there are no body parts or objects inside of the closing range.

▶ Remove contamination from the automatic pin coupling with a suitable tool.

Connecting trailer

Ensure that following requirements are met:
❑ Trailer is secured against rolling away.
❑ Automatic pin coupling and the pull device of trailer are at the same height.
❑ Automatic pin coupling is open.

▶ Slowly move machine backward until the pull device of trailer has triggered the locking mechanism of automatic pin coupling.
▷ Coupling pin **5** is pressed downward.
▷ Lateral retaining pins **4** are retracted.
▷ The lever **1** falls down.

▶ Turn diesel engine off.

▶ Engage parking brake.

▶ Check whether the pull device of trailer is securely locked in the automatic pin coupling.

▶ Connect hydraulic connections, compressed air connections and electrical connections.

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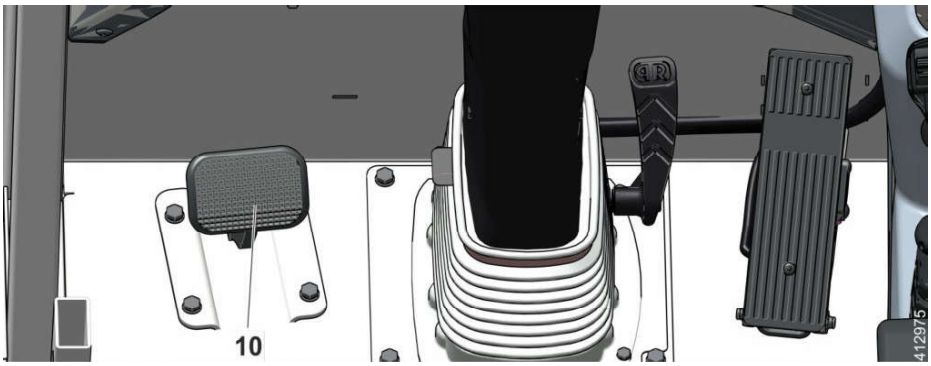

Fig. 381: Inching brake pedal

10 Inching brake pedal

When braking the machine with the inching brake pedal **10**, oil pressure is supplied to the hydraulic trailer brake and the trailer is braked.

▶ Actuate inching brake pedal **10**.
  ▷ The trailer is braked.

Disconnecting trailer brake hose

Ensure that following requirements are met:
❑ Machine is on horizontal and solid ground.

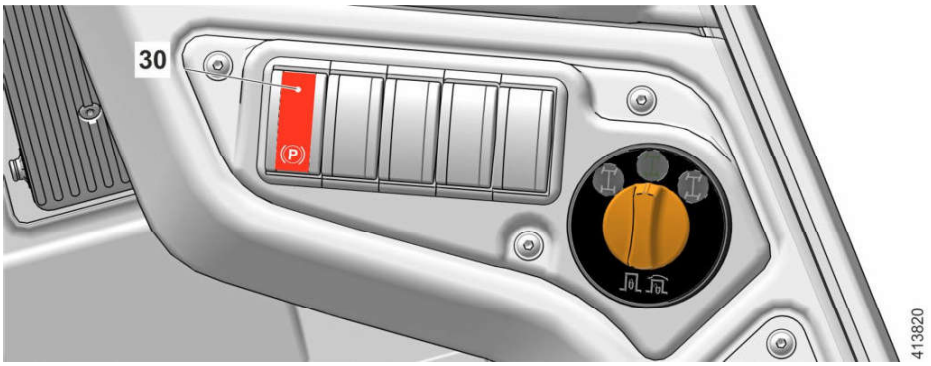

Fig. 382: Applying the parking brake

30 *Parking brake* switch

▶ Press bottom part of *parking brake* switch **30**.
  ▷ *Parking brake* symbol is shown on the display.
  ▷ Machine's parking brake is activated.
  ▷ Trailer's parking brake is activated.

▶ Turn diesel engine off.

▶ Pull key out.

▶ Secure trailer with chocks.

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3.4 Work methods

The routine working methods are described in this section.

3.4.1 Collision between quick coupler and working attachment

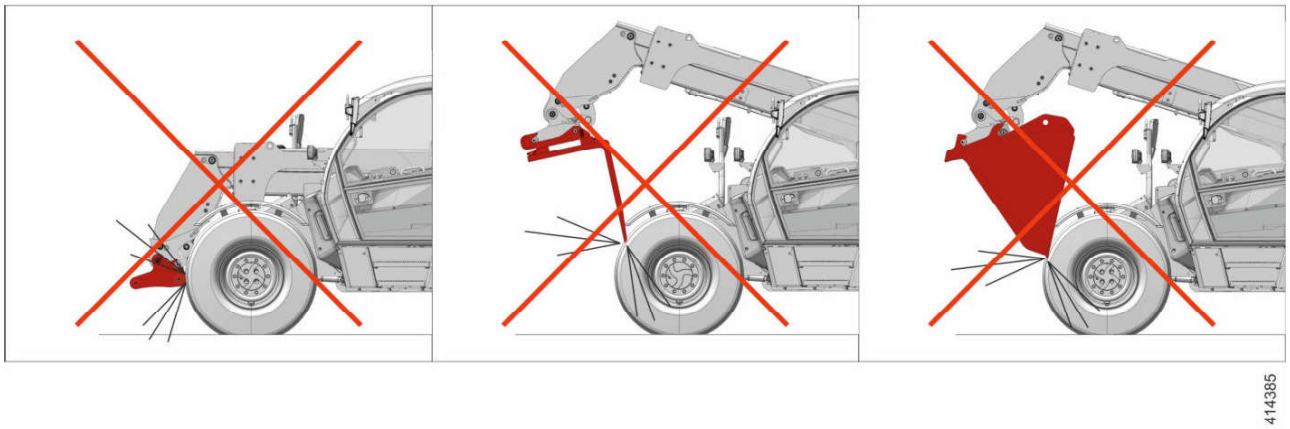

Fig. 405: Collision between quick coupler and working attachment

NOTICE
Working attachment collision!
Damage to tyres.

▶ When driving, tilt the working attachment in and lower it to the transport position.

If quick coupler is fully tilted out, quick coupler or working attachment may collide with machine.

3.4.2 Transport position

Only transport the loaded bucket and forklift in the transport position.

The maximum permissible travel speed at rated load is 10 km/h.

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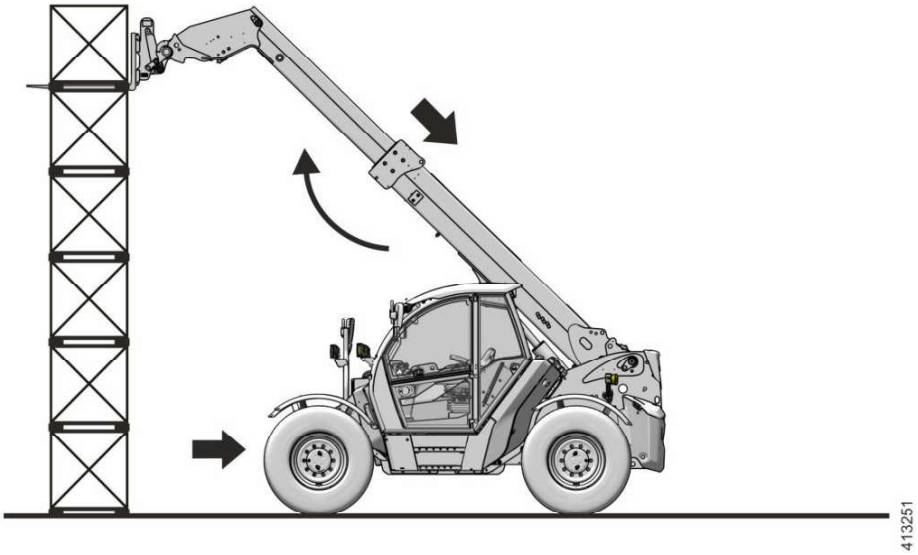

Fig. 422: Set the load on the stack

- ▶ Align the forklift horizontally.
- ▶ Set load down on stack carefully until forklift is relieved.
- ▶ Drive the machine back slowly.
- ▶ Retract telescopic boom.
- ▶ Lower the telescopic boom.

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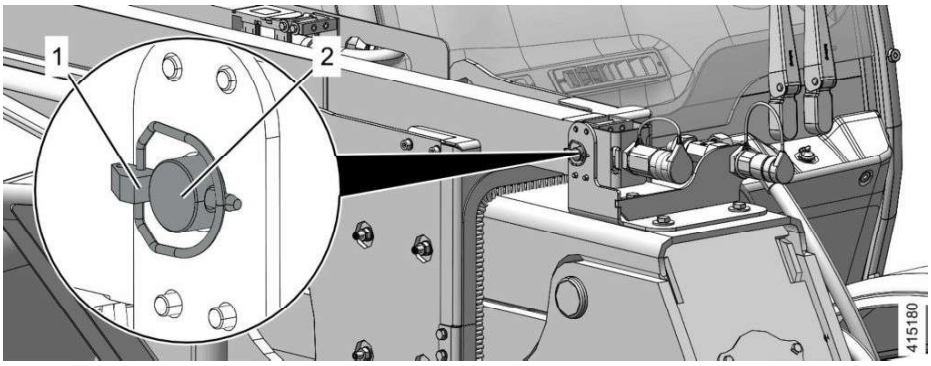

Fig. 441: Pin

1 Cotter pin **2** Pin

▶ Insert the pin **2**.

▶ Secure the pin **2** with a cotter pin **1**.

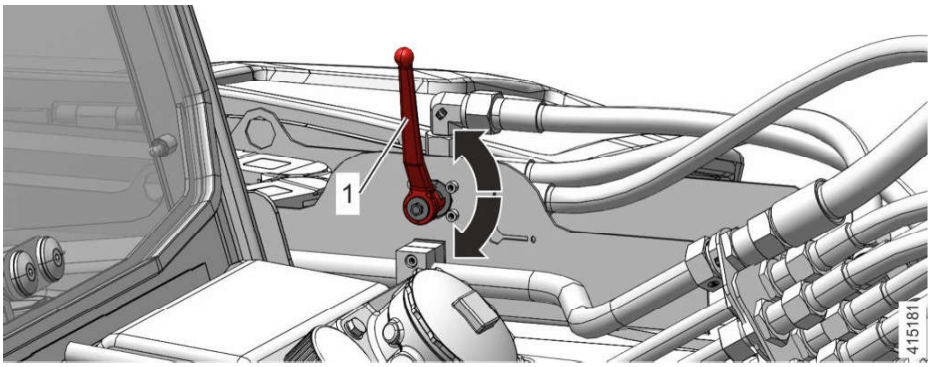

Fig. 442: Rear ball valve

1 Ball valve

▶ Turn ball valve **1** at rear of machine in an anti-clockwise direction.
▷ Tank return is released.

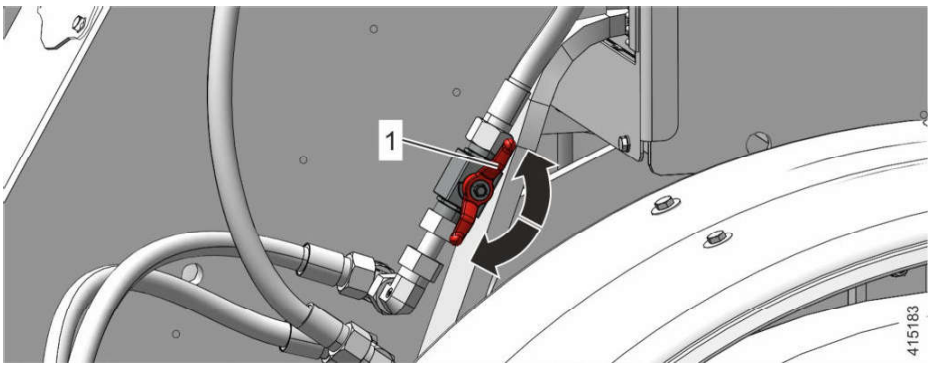

Fig. 443: Front ball valve

1 Ball valve

▶ Turn ball valve **1** at front of telescope in an anti-clockwise direction.
▷ Oil line is released.

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Fig. 463: Tilting out hydraulic quick coupler

▶ Move control lever to **A**.

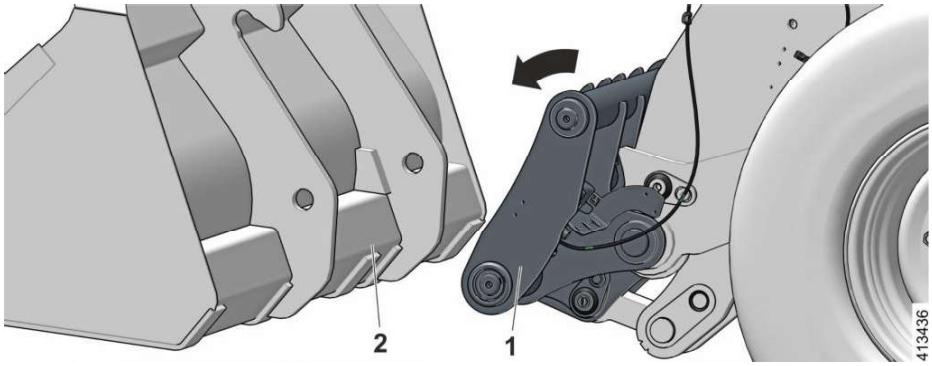

Fig. 464: Picking up working attachment

1 Hydraulic quick coupler **2** Working attachment

▶ Tilt hydraulic quick coupler **1** slightly to front.

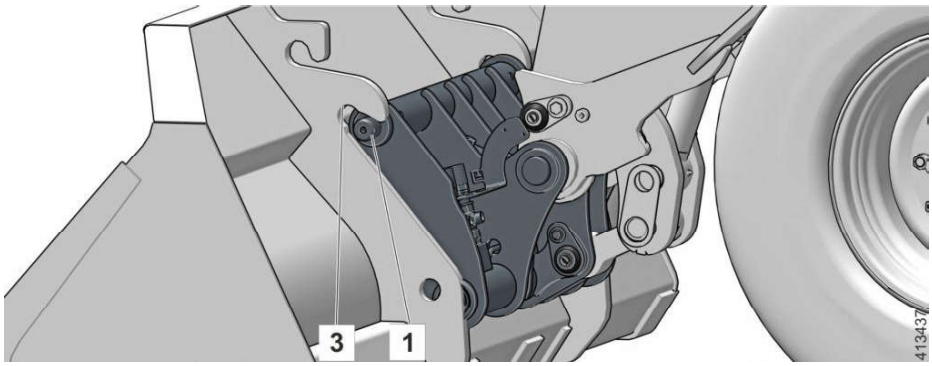

Fig. 465: Locking hydraulic quick coupler

1 Hydraulic quick coupler **3** Retaining fixture

▶ Carefully move hydraulic quick coupler **1** into retaining fixture **3** on top on working attachment.

Control circuit III change over (option)

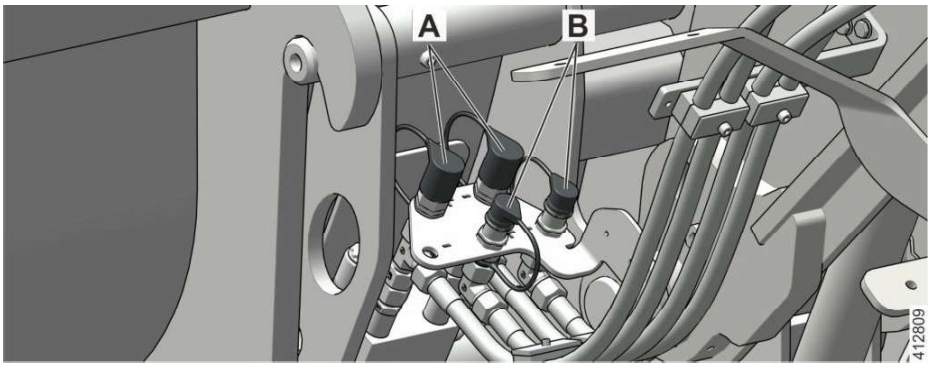

Fig. 485: Disconnecting the hydraulic lines

A Connections, control circuit III

B Connections, control circuit III change over (option)

▶ Disconnect hydraulic lines for the attached working attachment from control circuit III change over connections **B**.

▶ Attach protective caps to control circuit III change over connections **B**.

Leak oil port (option)

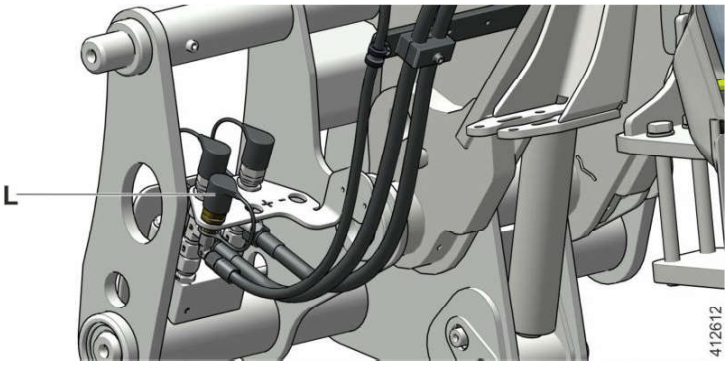

Fig. 486: Arrangement of leak oil line

L Leak oil port

▶ Disconnect the leak oil lines for the attached working attachment from the leak oil port **L**.

▶ Attach the protective cap to the leak oil port **L**.

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Preparing for transport

WARNING
Suspended and falling loads!
Danger to life, serious injuries.

▶ Make sure there is nobody in danger area around machine.

▶ If necessary, remove a part of the working attachment before loading the machine with the crane.

▶ Pay attention to the weight and cargo dimensions of the machine. For additional information, see section “Technical Data”.

▶ Pay attention to load bearing capacity and the length of slinging gear: for additional information, see section “Technical Data”.

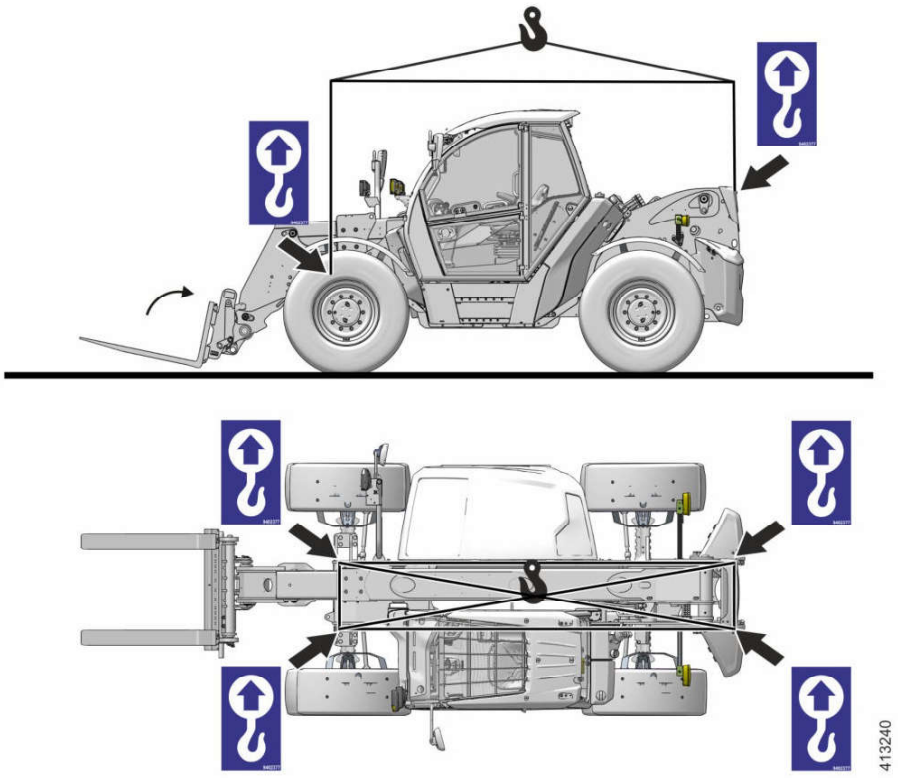

Fig. 507: Slinging / lifting points

▶ Install or hang the suspension on the designated slinging / lifting points on the machine.

Note

▶ The slinging / lifting points are marked with a corresponding sign.

▶ Carefully lift and load the machine.

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4 Operating problems

Warning and malfunction messages
- Various malfunctions are shown optically via the respective indicator lights or via the display instruments on the instrument panel.
- Warning functions are also acoustically supported.

Identification and remedy of malfunctions and errors
- Malfunctions can very often be traced back to incorrect operation or maintenance of the machine.
  For that reason, read the relevant chapter in the operating instructions again carefully for each malfunction.
- Analyze the cause of the malfunction and rectify it immediately!
- Describe the malfunction and all accompanying circumstances as precisely as possible when you contact **Liebherr Service**.
  Precise information makes it possible to find and rectify the cause of the malfunction quickly. Additionally, precise information on the type and serial number of the machine is also required.
- Do not carry out any work which you have not been trained or instructed to do.

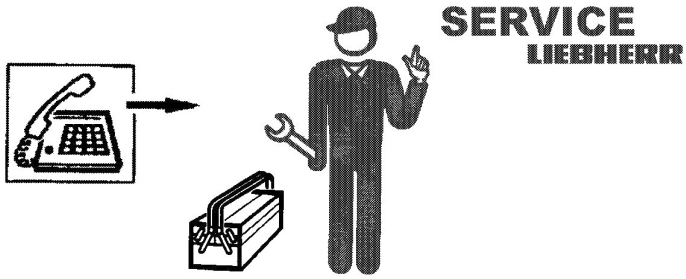

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Fig. 521: Liebherr Service

Note
Taking care of problems with the “Service code charts”?

▶ Contact Liebherr Service.

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SPN	FMI	Component	Problem detected	Possible cause	Effect	Remedy
002931	14	Level switch brake oil	Status signal for “Brake oil level low” active	Brake oil level too low; air / leak in the brake system	No machine response; braking effect unreliable! **Danger! Stop the machine!** 	Contact Liebherr customer service.
004212	02	Hydrostatic fan proportional valve	Measured current too high or too low: by 200 mA (by 10 mA in idle state) too high/too low for 2000 ms	Broken cable; short circuit to ground	Fan control not available; fan rotates at maximum speed	Contact Liebherr customer service.
004212	06	Hydrostatic fan proportional valve	Measured overload at the control unit output: greater than 5 A	Current load at the output too high	Fan control not available; fan rotates at maximum speed	Contact Liebherr customer service.
004212	14	Hydrostatic fan proportional valve	Shut off detected in the control unit safety circuit	Short circuit to supply; error in the control unit safety circuit; error in the output end stage; internal supply to the control unit output defective	Fan control not available; fan rotates at maximum speed	Contact Liebherr customer service.
520192	14	Display	Internal memory error		Display no longer operational	Contact Liebherr customer service.
520193	14	CAN 1 / communication I	Interference signal on CAN bus, communication not possible	CAN bus OFF; short circuit to supply; loose contact of ground pin to control unit	No machine response; machine not operational	Contact Liebherr customer service.

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SPN	FMI	Component	Problem detected	Possible cause	Effect	Remedy
520248	06	Auxiliary hydraulic motor proportional valve	Measured overload at the control unit output: greater than 5 A	Current load at the output too high	Auxiliary motor not available; maximum speed is not reached	Contact Liebherr customer service.
520248	14	Auxiliary hydraulic motor proportional valve	Shut off detected in the control unit safety circuit	Short circuit to supply; error in the control unit safety circuit; error in the output end stage; internal supply to the control unit output defective	Auxiliary motor not available; potentially reduced pulling force	Contact Liebherr customer service.
520249 B)	05	Level adjustment A	Measured current lower than 220 mA / overload detected at the control unit output for more than 2000 ms	Cable break / current load at the output too high	Level adjustment A not available	Contact Liebherr customer service.
520249 A)	05	Level adjustment A	Measured current too low for more than 2000 ms	Broken cable / short circuit to supply	Level adjustment A not available	Contact Liebherr customer service.
520249 B)	06	Level adjustment A	Measured output signal does not correspond to the command for more than 2000 ms	Short circuit to supply	Level adjustment A not available	Contact Liebherr customer service.
520249 A)	06	Level adjustment A	Measured overload at the control unit output: greater than 5 A	Current load at the output too high	Level adjustment A not available	Contact Liebherr customer service.
520249	14	Level adjustment A	Shut off detected in the control unit safety circuit	Short circuit to supply; error in the control unit safety circuit; error in the output end stage; internal supply to the control unit output defective	Level adjustment A not available	Contact Liebherr customer service.
520250 B)	05	Level adjustment B	Measured current lower than 220 mA / overload detected at the control unit output for more than 2000 ms	Cable break / current load at the output too high	Level adjustment B not available	Contact Liebherr customer service.

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SPN	FMI	Component	Problem detected	Possible cause	Effect	Remedy
520269	02	CAN 1 / communication I	CAN timeout of control circuit 3 signal or defective signal is received for more than 250 ms	CAN line to joystick disconnected; joystick not supplied; joystick has detected an error	Control circuit 3 not available	Contact Liebherr customer service.
520270	02	CAN 1 / communication I	CAN timeout of tilt signal or defective signal is received for more than 250 ms	CAN line to joystick disconnected; joystick not supplied; joystick has detected an error	PF3: tilt in and tilt out not available	Contact Liebherr customer service.
520271	02	Ride control rocker switch	Measured input signals are not suitable for the logic of the switch for more than 2000 ms	Short circuit to supply	Ride control not available	Contact Liebherr customer service.
520272	03	Battery + control box, working hydraulics	Measured voltage too high: >36 V for 2000 ms	Alternator faulty	Failures of any nature possible; inputs are being ignored, outputs not available	Contact Liebherr customer service.
520272	04	Battery + control box, working hydraulics	Measured voltage too low: <7 V for 2000 ms	Battery weak	Control unit A30 cannot work properly; proportional outputs not available	Contact Liebherr customer service.
520273	02	Working hydraulics control box sensor supply	Measured voltage too high or too low: <3.5 V for 2000 ms or >7.5 V for 2000 ms	Battery voltage too low; short circuit to ground or output overloaded; short circuit to supply;	Connected sensors cannot work properly and are not being evaluated	Contact Liebherr customer service.
520274	03	Battery + control box, working hydraulics	Measured voltage too high: >36 V for 2000 ms	Alternator faulty	Failures of any nature possible; inputs are being ignored, outputs not available	Contact Liebherr customer service.
520274	04	Battery + control box, working hydraulics	Measured voltage too low: <7 V for 2000 ms	Battery weak	Control unit A40 cannot work properly; proportional outputs not available	Contact Liebherr customer service.
520275	02	Retract telescope proportional valve	Measured current too high or too low: by 100 mA (by 10 mA in idle state) too high/too low for 2000 ms	Broken cable; short circuit to ground	Telescoping in not available	Contact Liebherr customer service.

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Malfunction / error	Cause	Remedy
Rpm changes are possible and diagnostics light lights up	Engine electronic has recognized system error and activates a replacement speed	Check error according to error code and remedy the error
Diesel engine gets too hot, temperature warning system does not respond	Vent line to expansion tank for coolant plugged up	Clean
	Injector defective	Replace
	Coolant heat exchanger dirty	Clean
	Coolant pump defective (V-belt broken or loose)	Check if broken or loose
	Lack of coolant	Add
	Resistance in cooling system too high / flow quantity too low	Check cooling system
	Fan or viscous coupling defective, V-belt broken or loose	Check or change or tension
	Intercooler dirty	Check or clean
	Air filter dirty / exhaust turbo charger defective	Check or change
	Restrictor flap defective	Check or change
	Coolant temperature sensor	Check or change
	Coolant thermostat defective	Check or change
	Coolant cover defective	Check or change
Diesel engine has insufficient power	Lube oil level too high	Check lube oil level and drain, if necessary
	Restrictor flap defective	Check or change
	Exhaust return, controller defective	Check or change
	Fuel intake temperature too high	Check system
	Fuel quality does not correspond to operator's manual	Change the fuel
	Air filter dirty / exhaust turbo charger defective	Check or change
	Air filter maintenance switch / air filter maintenance indicator defective	Check or change
	Fan defective / V-belt broken or loose	Check fan / V-belt and change if necessary
	Charge air line leaks	Check charge air line
	Intercooler dirty	Clean
	Exhaust counter pressure too high	Check or clean
	Injection line leaks	Check injection line
	Injector defective	Replace
	Exhaust turbo charger defective	Replace

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Fuses in operator's cab

The circuit board with the fuses is located to the left of the operator's seat behind the cover.

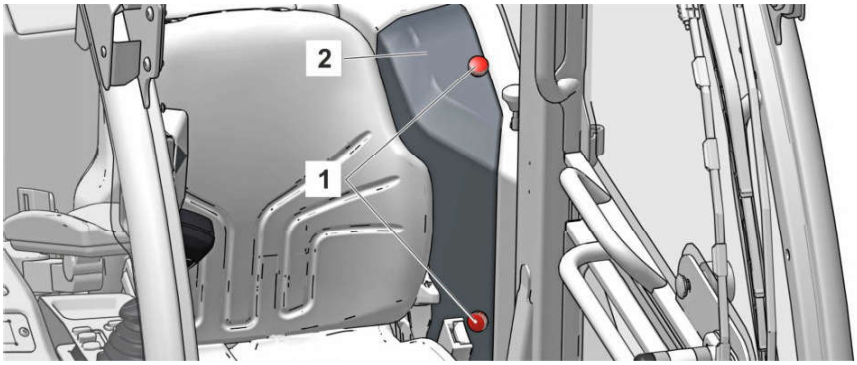

Fig. 532: Arrangement of fuses

1 Knurled screw (2x) **2** Cover

▶ Unscrew knurled screws **1** on cover **2**.

▶ Remove the cover **2**.

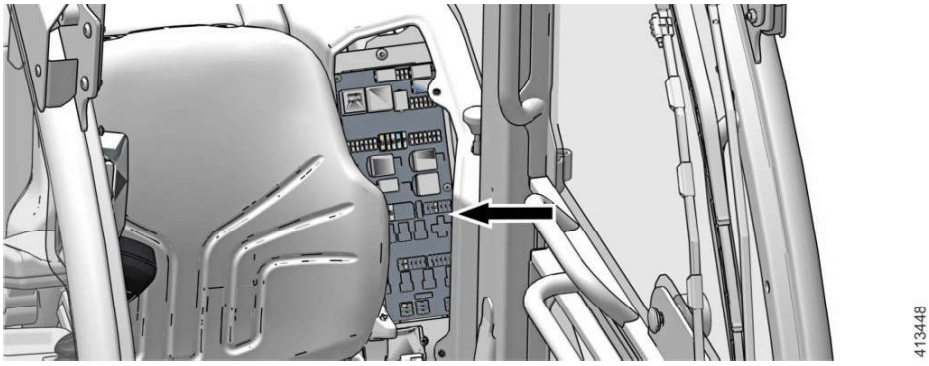

Fig. 533: Board with fuses

▶ Identify the fuse relating to the electrical failure determined using the following table.

▶ Replace faulty fuse.

Fuse	Value	Unit	Name / Function
F01	100	A	Main fuse
F02	60	A	Main fuse
F1	30	A	Engine control unit
F2	1	A	Start signal
F3	5	A	Joystick and display
F4	20	A	Working hydraulics
F5	2	A	Overload warning device
F6	15	A	Travel hydraulics

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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	Other intervals	Additional labelling	**By maintenance staff** ■ Once-only activity ● Repeat interval ✦ If necessary ❄ Annually before the winter **By authorised specialist staff** ☐ Once-only activity ❍ Repeat interval ✧ If necessary **Additional labelling** Assistance required Have this task carried out exclusively by a certified electrician	Confirm tasks	See page
Lubrication system										
☐		●	❍	❍	❍			Grease container: check the fill level		440
Options										
			❍	❍	❍			Air brake system: checking the compressor for tight seating		
			❍	❍	❍			Air brake system: cleaning external pressure tanks		
			❍	❍	❍			Checking air brake system for leaks		
						✦		Air brake system: checking the anti-freeze pump level and topping it up if necessary		
	●	●	❍	❍	❍			Air brake system: draining the pressure tank		443

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Specification
LH-00-UREA

Tab. 66: Minimum quality requirement

5.3.6 Hydraulic oils

Liebherr recommendation

Ambient temperature	Name
	Liebherr Mineral oil
15 to 55 °C	Liebherr Hydraulic Basic 100
10 to 45 °C	Liebherr Hydraulic Basic 68
-20 to 40 °C	Liebherr Hydraulic HVI
	Liebherr PAO[27] biodegradable
-25 to 45 °C	Liebherr Hydraulic Plus
-40 to 30 °C	Liebherr Hydraulic Plus Arctic

Tab. 67: Liebherr recommendation

Minimum quality requirement

Specification
EMT LH-00-Minimum-HYE

Tab. 68: Minimum quality requirement

When using hydraulic oils or filters of third party manufacturers, information about the change intervals is to be obtained from the respective manufacturer or supplier.

Oil analysis

		Dust intensive use	Normal use
Normal use (oil analysis optional)	**Liebherr Mineral oil**	Every 250 h, at least once a year	Every 1000 h, at least once a year
	Liebherr Hydraulic Basic 68		
	Liebherr Hydraulic Basic 100		
	Liebherr Hydraulic HVI		

[27] PAO = Poly-alpha-olefin

Fig. 560: Opening engine bonnet

▶ Unlock the lock with the key.

WARNING
Faulty gas cylinders!
Injury.

▶ Ensure that the open position is maintained by the gas cylinders.

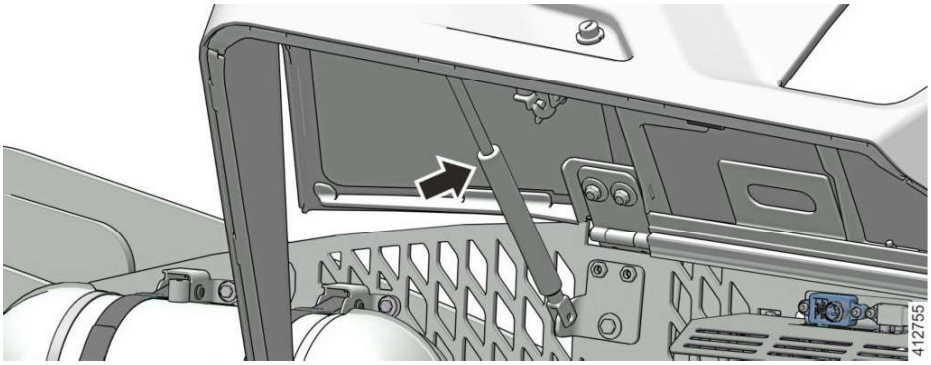

Fig. 561: Gas cylinder

▶ Open engine bonnet.
▷ Engine bonnet is held in this position by the gas cylinders.

Troubleshooting
Engine bonnet is not held?

▶ Replace the faulty gas cylinders.

DANGER
Hot exhaust system!
Beware of burns.

▶ Let the exhaust system cool down.

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5.7 Cooling system

5.7.1 Cooling system: checking the coolant level

Checking the coolant level

Expansion tank with filler pipe is located in the engine compartment.

Ensure that following requirements are met:
- ❑ Engine bonnet is open.
- ❑ Diesel engine has cooled down.

Fig. 573: Coolant container

When the coolant is below the mark **MIN**:
▶ Top up the coolant.

Topping up coolant

The coolant to be added must have the correct anti-freeze concentration.

Fig. 574: Risk of scalding

CAUTION
Hot. pressurised liquid!
Beware of burns.

▶ Let the engine cool down.

5.10 Hydraulic system

5.10.1 Checking the oil level in the hydraulic tank and topping up oil

Checking the hydraulic oil level

Ensure that following requirements are met:
❑ The hydraulic oil is cold.

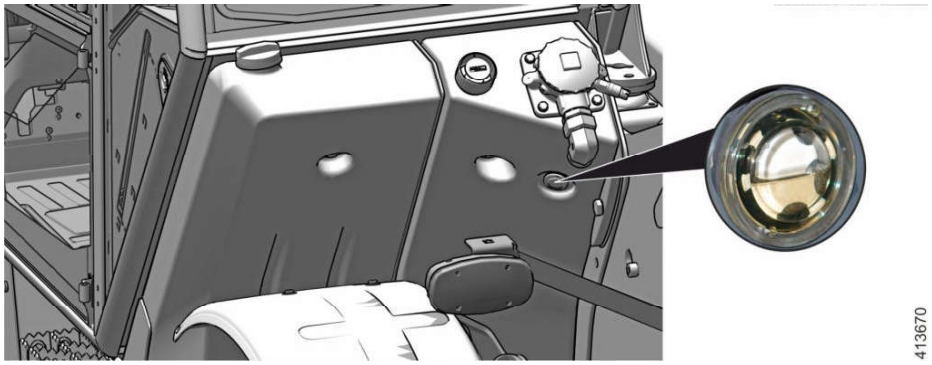

Fig. 587: Sight gauge

▶ Check the oil level on the sight gauge.

If the hydraulic oil is not visible in the sight gauge:
▶ Top up hydraulic oil.

Topping up hydraulic oil

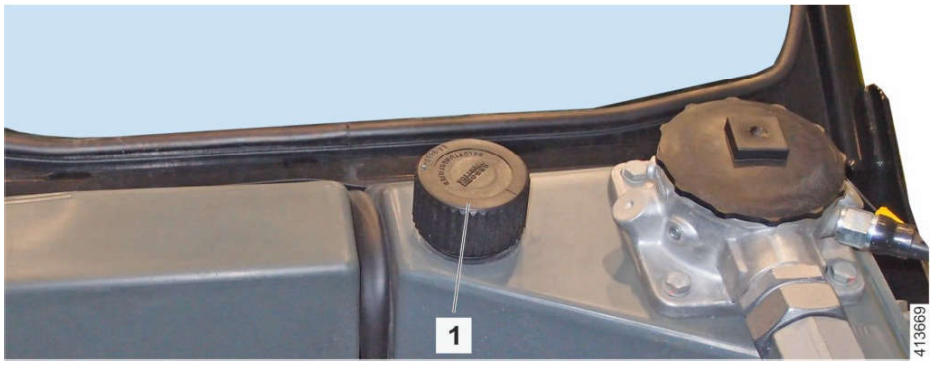

Fig. 588: Tank vent filter

▶ Unscrew the tank vent filter **1** on the hydraulic tank.

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Check the parking brake

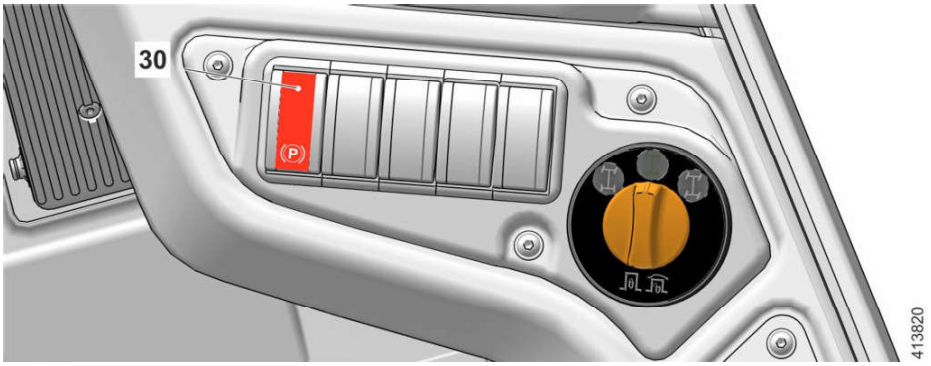

Fig. 601: Check the parking brake

- ▶ Start machine, select forward travel direction and travel approx. 3 km/h.
- ▶ While travelling, press the *parking brake* switch **30** downwards.
  - ▷ Machine comes to a standstill abruptly.
  - ▷ *Parking brake* symbol lights up on the monitor.

Troubleshooting
Little or no braking effect:

- ▶ Contact Liebherr customer service.
- ▶ Do not operate the machine in the meantime.

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5.19 Cleaning the machine

5.19.1 Wet cleaning machine

Notes for cleaning

NOTICE
Incorrect cleaning!
Damage to machine.

- ▶ Exclusively clean electrical systems, cables and wiring harnesses with low-pressure equipment.
- ▶ When new (or after respraying), do not clean machine with a high-pressure cleaner for two months.
- ▶ Observe operator's manual of high-pressure cleaner.

Cleaning the machine

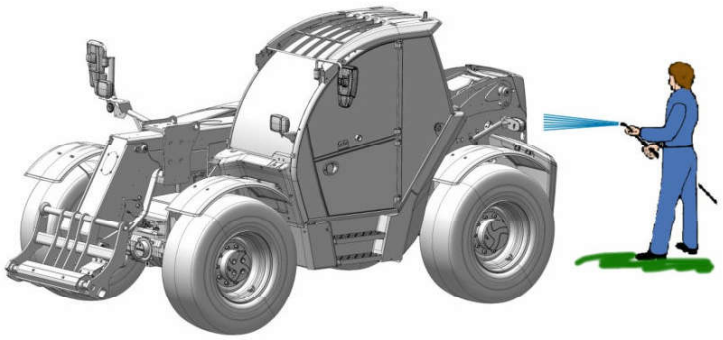

Fig. 614: Wet cleaning

- ▶ Wet clean the machine.
- ▶ All lubricating points on the machine must be greased again.

Cleaning the diesel engine

NOTICE
Penetration by moisture!
Damage to diesel engine.

- ▶ Do not expose electrical components (such as the engine electronics or relays) to a direct jet of water or steam.

- ▶ Clean the Diesel engine carefully.

In order to dry the diesel engine:
- ▶ Run the diesel engine until warm after the cleaning procedure.

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