INSTRUCTION MANUAL

Pneumatic-tyre roller
HP 280

H249 Series	**0001** Valid from serial no.
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Version 05

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This instruction manual is valid for the following roller types:

PNEUMATIC TYRE ROLLER	HP 280

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1 GENERAL

When working at the machine please always adhere to the instructions given in your Safety instructions!

1.00 Preface

1.00.01 Preface to the instruction manual

This chapter contains important instructions for the operating personnel on how to operate the machine and to use this instruction manual.

Read the instruction manual carefully and get to know the machine.

Following the instruction manual:

- Helps to avoid risks.
- Helps to avoid malfunctions due to improper use.
- Increases the reliability when working on the construction site.
- Increases the service life.
- Reduces maintenance costs and downtimes.

Please note:

- the instruction manual.
- the safety manual.
- supplementary information.
- regulations and provisions applying at the building site (e.g. accident prevention regulations).

Maintain and care the diesel engine according to the instructions for the motor. Observe the safety instructions.

1.00.02 Product information

You have received a quality product. All the components of this machine have been carefully inspected and tested. Therefore they comply with the quality that you expect.

The reliability of the machine is preserved through correct use and careful maintenance. Only use the specified operating supply items and the original HAMM spare parts of the machine manufacturer.

Our representations will help you to keep your roller in perfect operating condition.

After the warranty period, our representatives will also assist you with advice and service. They will supply you with our original spare parts which do not only meet the technical requirements but also ensure exchangeability and quality.

The instruction manual contains

- safety instructions,
- operating instructions and
- maintenance instructions.

They are intended to be used by the operating personnel. Thus, keep the instruction manual always at hand!

1.00.03 Guarantee

Warranty claims can only be accepted:

- if you operate the machine correctly.
- if you use original spare parts.
- if you use the specified operating supply items.
- if you install the accessory equipment that the manufacturer has approved.
- if you maintain the machine as prescribed.
- if you use the machine how described in the instruction manual.

In all other cases, the warranty is excluded.

1.00.04 Modifications/reservations

The instruction manual describes the current version of the machine. But we may not exclude errors completely. We can modify the product and its operation so that we do not lose our technological lead. We assume no liability for malfunctions, downtimes and resulting damage.

1.00.05 Packaging and storage

We pack the machine carefully for shipment. Please check both packaging and the machine for any damage to the machine upon receipt of the goods. The machines must not be operated if they are damaged. Only use undamaged cables and plug connections.

Please contact your supplier if the machine damaged.

After unpacking, protect the machine from moisture and contamination if it is not going to be brought into operation immediately.

1.00.06 Signs and symbols

The signs and symbols used in this instruction manual are to help you use this instruction manual and the machine in a safe and fast manner.

Note

Informs about application hints and useful information.

Enumeration

- Unordered lists list various possibilities.

Operating step

▶ Action steps describe the activities required to use the machine correctly and safely.

Result

✔ Describes the result of a sequence of action steps.

Directions

Information on directions always describe to the directions of the machine driving forwards. Possible is information on directions like:

- left or right
- front or rear

Cross-references

Cross-references allow you to quickly find certain sections in the operating manual that provide additional important information. The cross-reference provides the page for the relevant section.

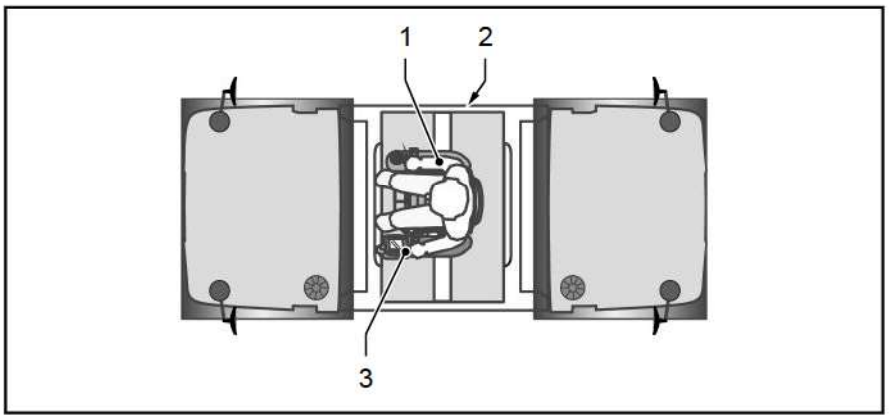
Example: (see "Hydraulic oil supply", page 176)

Positioning in illustrations

Figures are labelled with numbers.
Item lines connect the correct items in the figure with the numbers. The numbers only annotate the items for the text section to which the figure belongs. The numbering starts anew for each figure.
In descriptive text, these numbers are in square brackets. So you can obtain important and additional information quickly.
The end of the item line is a point or an arrow. A point marks a visible element in the figure. An arrow marks an invisible element, which lies in the direction of the arrow.

If necessary, figures have legends to provide the information required.

Example



[1]	Driver	[2]	Engine compartment
[3]	Drive lever		

Descriptive text

You use the drive lever [3] to determine the direction of travel and driving speed.

1.00.07 Explanation of Abbreviations

Abbreviations are used for machine elements and processes in this instruction manual

Abbreviations that are not in the list are explained at the first positions in the text that they occur in the instruction manual.

Abbreviation	Meaning
DOC	Diesel oxidation catalyst Exhaust gas after-treatment system
DPF	Diesel Particulate Filter

Abbreviation	Meaning
	Exhaust gas after-treatment system
FOPS	Falling Object Protective Structure *Protective structures for the driver's cabin and driver's cab to protect against falling objects*
HMV	HAMM Measurement Value *Measured value for HAMM compaction indicator*
RMV	Resonance Measurement Value *Measured value for the resonance behaviour of the compaction system*
ROPS	Roll Over Protective Structure *Roll-over protection structure for the driver's cabin and driver's cab*
SCR	Selective Catalytic Reduction *Exhaust gas after-treatment system*

1.00.08 Warning notes

Warning notices inform about sources of danger, and state risks and how to avoid them.
Always follow the instructions to avoid risks!

Warning notices always apply to the complete section of the instruction manual that they precede.

Signal words

The signal word indicates the particular seriousness of the danger to persons and machines, objects and the environment.

⚠DANGER

Indicates an immediate danger to persons.
If the danger is not averted, death or the most serious, irreversible injuries will ensue.

⚠WARNING

Indicates a possible danger to persons.
If it is not averted, death or the most serious, irreversible injuries could ensue.

⚠CAUTION

Indicates a possible danger to persons.
If this situation is not avoided, minor or light injuries may be caused.

NOTICE

Indicates a danger to machines, objects or the environment.
If it is not averted, material damage will ensue.

1.01 Documentation

This instruction manual is intended to make the operating personnel familiar with the basic work and activities on and with the machine.

The entire instruction manual consists of:

- Safety manual
- Instruction manual of the machine
- Instruction manual of the diesel engine
- If necessary, additional information (e. g. QR code)

This instruction manual must be kept on the machine at all times. Read this instruction manual carefully. Let someone explain to you the things that you do not understand. Until this has been done, do not carry out any work with or on the machine.

1.02 Use

1.02.01 Intended use

The machine represents state-of-the-art technology and complies with all valid safety regulations concerning its intended use at the time the machine was launched on the market.

When designing the machine it was not possible to avoid all possible foreseeable misuse or residual risks without restricting the machine's intended functionality.

The machine's intended use is:

- To pave roads and traffic areas.
- To ram and smooth loose earth, road bedding, pavement or similar ramable subgrade in layers.

Use the machine only on load-bearing soil.

Not capable of bearing are e.g. high fillings, batters, roadside ditches.

The machine may not be used in explosive areas, on landfill sites and in mining.

The machine is only used for commercial applications within fenced construction sites.

The machine must only be operated by authorized operating personnel and only if in proper technical condition and in accordance with this instruction manual.

All unintended use and/or all machine-related activities not described in this instruction manual is to be deemed as unauthorised misuse outside the legal limits of indemnity of the manufacturer.

1.02.02 Abnormal use

Any abnormal use or any misuse of the machine can cause serious personal injury and/or death and will void the manufacturer's warranty obligation, and the owner will bear the sole responsibility in this case.

Abnormal uses shall be deemed to include:

- Non-compliance with this instruction manual.
- Operating errors by operating personnel not qualified or not instructed.
- Conveyance of passengers.
- Leaving the driver's position during operation.
- Starting, using the machine outside the driver's position.
- Errors due to reflexive behaviour and/or choosing the easiest way.
- Operating the machine if it is not in a proper technical condition.
- Using the machine with improper ambient conditions (e.g. temperature, gradient, transverse gradient).

- Using the machine with the protective equipment removed.
- Spraying with high-pressure cleaners or fire extinguishing equipment.
- Towing trailing loads.
- Non-compliance with maintenance intervals.
- Omission of measurements and tests to detect damages early.
- Omission of replacing wear parts.
- In the case the spare parts used are no original spare parts.
- Omission of maintenance and repair work.
- Improper maintenance and repair work.
- Unauthorized modifications of the machine.

1.02.03 Residual risks

Residual risks have been analysed and evaluated prior to starting the construction and planning the machine. Existing residual risks are referred to in the documentation. However, the manufacturer cannot foresee all situations that may pose a risk in practice.

You can avoid existing residual risks if you comply with and implement the following instructions:

- Special warnings at the machine.
- General safety instructions in this instruction manual and in the safety instructions.
- Special warnings in this instruction manual.
- Instructions contained in the safety instructions.
- Operating instructions of the operator.

Danger of life/risk of personal injury when operating the machine due to:

- Misuse.
- Improper operation.
- Transport.
- Missing protective equipment.
- Defective and/or damaged components.
- Operation/usage by personnel not trained and/or instructed.

The machine may cause risk to the environment e.g. with:

- Improper operation.
- Operating supply items (lubricants etc.).
- Noise emission.

Property damage may occur at the machine e.g. with:

- Improper operation.
- Non-compliance with operating and maintenance instructions.
- Improper operating supply items.

Property damage may occur at further assets within the machine's operating area e.g. with:

- Improper operation.

Reduction in performance and/or the machine's functionality may occur at the machine e.g. with:

- Improper operation.
- Improper maintenance and/or repair work.
- Improper operating supply items.

1.02.04 Climatic conditions

The permissible ambient temperature range for using the machine is –20 °C (–4 °F) up to 55 °C (130 °F).

Operation outside this temperature range requires the express authorization of the manufacturer. Use under extreme climatic conditions places special demands on equipment and fuel.

⚠WARNING

Explosion!
Severe injury and death due to burns and moving parts.

- Do not use aerosol start-up aid (e.g. ether).
- Do not use any liquids as start-up aid (e.g. alcohol).
- Adapt operating materials, such as oils and coolant, to the ambient temperature.
- Observe the instruction manuals for the battery and diesel engine.

Low ambient temperature

The diesel engine's starting behaviour and the machine's operation depend on:

- The fuel used.
- The viscosity of the motor, gear and hydraulic oil.
- The battery's charge state.

Please note:

The acceleration and braking behaviour of the machine are influenced by viscous hydraulic oil. Before starting operation at a low ambient temperature, adapt the operating materials (coolant, oils etc.) to the low temperatures.

At temperatures below 0 °C (32 °F), use winter-grade fuel. Do not charge batteries at temperatures below 0 °C (32 °F).

Extensive ambient temperature, extensive height

At high ambient temperature and/or use of the machine at high altitudes:

- Do not completely fill the fuel and operating liquid tanks/ reservoirs.
- Adjust the control system to reduce the amount of fuel injected quality fuel engine.

Observe the instruction manual for the diesel engine.

1.03 Environmental protection

Send packaging, cleaning materials and used or residual operating materials for recycling. Observe the environmental protection regulations applicable at the place of use.

When operating the machine, observe the notes in this instruction manual in order to avoid unnecessary impact on the environment.

1.04 Disposal

Conservation of nature is one of our major tasks. Properly disposed devices avoid negative impacts on human beings and the environment and allows re-using our precious resources.

Operating supply items

Please dispose all operating supply items according to relevant specifications and local regulations of the relevant country.

Materials (metal, plastics)

To be able to dispose materials professionally, these materials need to be correctly sorted. Cleanse materials of adhesive impurities.

Please dispose all materials as demanded by local provisions of the relevant country.

Electrical/electronic system/battery

Electrical/electronical components are not subject to Directive 2012/19/EC and relevant national regulations (in Germany e.g. ElektroG).

Dispose electrical/electronic components directly at a specialised recycling company.

1.05 EC conformity

The declaration of conformity is part of the documentation provided separately and will be submitted to you together with the machine.

The pictogram represents the machine's conformity.

For machines without EC Conformity, neither an EC Declaration of Conformity nor a CE type plate can be issued. This is the case if, for example, the machine does not have a drum drive, drum brake or ROPS.

If the machine type plate does not bear a CE pictograph, the machine does not correspond to the applicable EU Directives. Any operation of this machine in the European Economic Area (EEA), in Switzerland and in Turkey is inadmissible.

In case the machine has been modified in a way that has not been agreed by the manufacturer, the EC declaration of conformity expires.

EC declaration of conformity

HAMM

Manufacturer: HAMM AG - Hammstraße 1 - D-95643 Tirschenreuth

CE

EC DECLARATION OF CONFORMITY
according to EC Machinery Directive 2006/42/EC, Annex II A

Original EC Declaration of Conformity (en)

We hereby declare that the

Designation of the machinery:

Type:

Serial no.:

complies with the following provisions:

- EC Machinery directive 2006/42/EC
- EMC Directive 2014/30/EU
- EC Sound directive 2000/14/EC
  - with evaluation form: Annex VIII
  - Notified Body: Notified Body Number: 0515 [1]
  - measured L_{WA} [dB(A)]:
  - guaranteed L_{WA} [dB(A)]:
  - Power [kW/min^{-1}]:
- Emissions standard EU/USA:
- Exhaust gas after-treatment:

Applied harmonised standards, in particular:

- EN 500-1:2006+A1:2009:	Mobile road construction machinery - Safety Part 1: Common requirements
- EN 500-4:2011:	Mobile road construction machinery - Safety Part 4: Specific requirements for compaction machines
- EN ISO 3744:2010:	Allocation of the sound capacity level of sound sources

Authorised agent for the composition of the relevant technical documents:

Mr. Matthias Löb, HAMM AG (CE representative)

Tirschenreuth, _____
Date

Dr. Axel Römer
Head of Research and Development

[1] Notified Body, Kenn-Nr. 0515 - DGUV Test, Prüf- und Zertifizierungsstelle, Fachbereich Bauwesen - Landsberger Straße 309 - D-80687 München (Germany)

1.06 Type plate

The entire marking represents an official document and must not be altered or effaced.

The pictogram represents the machine's conformity.

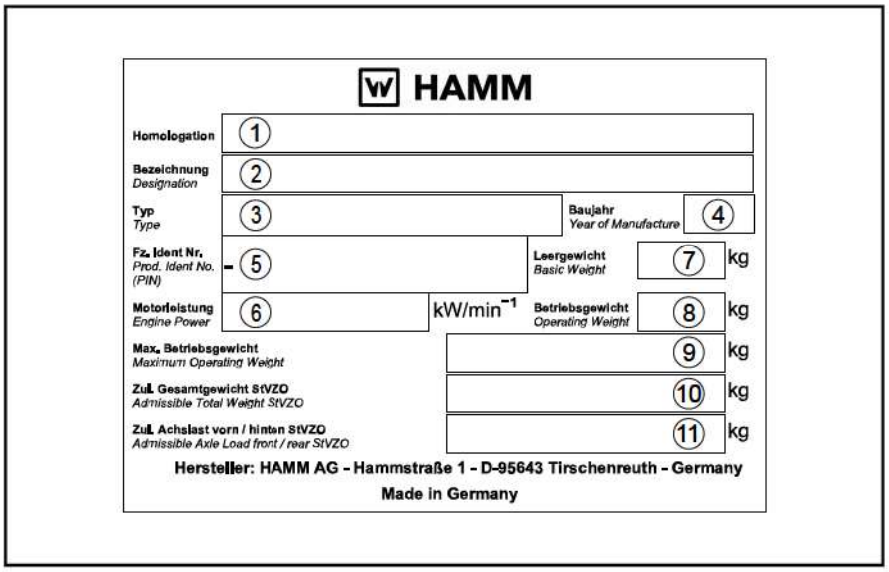
If the machine type plate does not bear a CE pictograph, the machine does not correspond to the applicable EU Directives. Any operation of this machine in the European Economic Area (EEA), in Switzerland and in Turkey is inadmissible.

The EAC (Eurasian Conformity) pictogram confirms the conformity of the machine with the requirements of the Eurasian Customs Union

Please state the vehicle identification number (VIN) and the type of your machine for every spare part order.

Machine type plate

The type plate is fixed to the machine frame ("Chassis/safety devices", page 38).



[1]	Homologation (for example the registration driving on public roads)	[2]	Description
[3]	Type	[4]	Year of construction
[5]	Vehicle identification number (VIN / PIN)	[6]	Engine power / Nominal speed
[7]	Basic weight	[8]	Operating weight
[9]	Max. Operating weight	[10]	Gross vehicle weight rating STVZO (only valid on public roads)
[11]	Permissible axle load, front / rear STVZO (only valid on public roads)		

17-digit vehicle identification number

The vehicle identification number [5] is used to identify, among other data, the machine's series and serial number, e.g., WGH0H184CHAA01234. Digits # five to eight indicate the series (H184), while the last four digits represent the serial number within this series (1234).

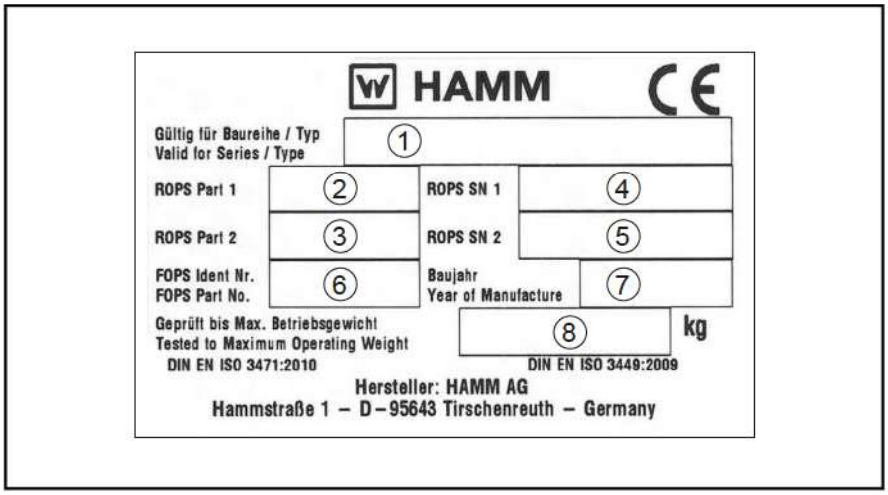
The maximum operating weight [9] is the static weight of the machine including:

- Working substances and lubricants
- 100 % fuel tank contents × 0.84 specific weight
- 100 % water & additive tank contents
- 75 kg for the driver
- the static weight of all options or attachments manufacturer the same time and approved by manufacturer (e.g., chip spreader).

No additional ballasting is allowed.

ROPS/FOPS type plate

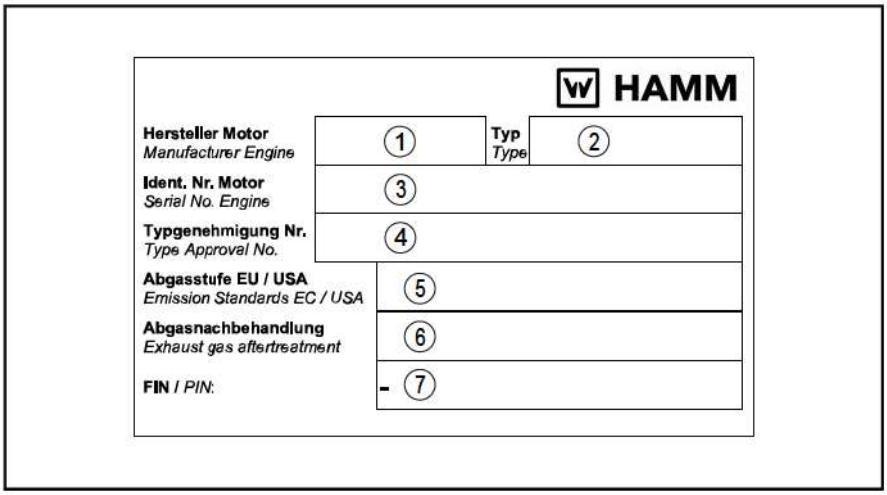
The ROPS (cab, roll-over bar) and/or FOPS (falling-object protective structure) approved for this machine by the manufacturer is identified by a nameplate and is fastened to the cab/roll-over bar ("Control stand", page 44).



[1]	Series / type (part of the VIN / PIN)	[2]	Cabin / ROPS identification number 1
[3]	Cabin / ROPS Identification number 2	[4]	Cabin / ROPS Serial number (if available) 1
[5]	Cabin / ROPS Serial number (if available) 2	[6]	FOPS identification number (if installed)
[7]	Year of construction	[8]	Tested up to the maximum operating weight

Engine nameplate

The engine approved by the manufacturer for this machine is also indicated by a specially produced type plate. It is located on the side of the machine type plate (in the engine compartment).



[1]	Engine Supplier	[2]	Type
[3]	Engine identification number	[4]	Number of the type approval
[5]	Exhaust emissions category EU / USA	[6]	Exhaust gas after-treatment
[7]	Vehicle identification number		

1.07 Noise and vibration requirements

The sound emission of the machine was measured according to the CE Sound Emission Directive in the version 2000/14/EC.

The noise and vibration data at the driver's seat correspond to the requirements of the EC Machinery Directive, version 2006/42/EC.

Sound power level

Sound indication of the machine

The guaranteed sound power level is specified in the technical data (see "Technical data").

Emissions sound pressure level

Noise data at the driver's seat

The emissions sound pressure level at the driver's seat is specified in the technical data (see "Technical data") (measurement uncertainty in accordance with DIN EN ISO 11201).

When working in the immediate vicinity of the machine, values may exceed 85 dB(A). In this case, please always wear personal protective equipment (ear protection).

Vibration data at the driver's seat

Whole-body vibrations

The weighted effective acceleration values, as per DIN EN 1032, for whole-body vibrations at the driver's seat of a_w = 0.5 m/s² are not exceeded.

Hand arm vibrations

The weighted rms values of the acceleration with hand arm vibrations have been accessed in accordance with DIN EN 1032 and do not exceed a_{hw} = 2.5 m/s².

1.08 Personnel

1.08.01 Qualification and duties

Operating personnel

All activities at the machine must be carried out by authorised operating personnel only. For the purpose of this instruction manual, operating personnel shall be deemed to include every authorized person entrusted with operating, maintaining, installing, setting, cleaning or transporting the machine.

This comprises the following persons:

- Machine operator
- Maintenance personnel

Persons are deemed as authorised that have been trained, qualified and instructed for carrying out relevant activities at the machine and that have proven their skills to the operating organization. The operating personnel must be authorized by the operating organization for those activities at the machine.

In addition to the qualifications specified in the safety instructions, the operating personnel must:

- Have read and understood the instruction manual.
- Be trained and instructed according to the rules of action in case of trouble.

Please adhere to the following instructions:

- Please drive the machine only if you are entirely familiarized with the operating and control elements and the method of operation.
- Please use this machine only according to its intended purpose.
- In case you detect any defects, such as at the safety equipment, that may affect the safe operation of the machine, please immediately notify the supervising body.
- With defects that may endanger persons, please stop operating the machine immediately.
- Please ensure that the machine is compliant with all requirements concerning traffic law.

Banksman/Spotter

Only such persons are allowed to instruct others in machines independently who also:

- Have been trained in instructing others (the machine).
- Have successfully proven their participation in such a course.
- Have proven their skills to the operating organization.
- Fulfil their tasks in a reliable manner.
- Have been appointed by the operating organization as a banksman/spotter.

The meaning of signals must be unambiguous between driver and banksman/spotter.

To avoid ambiguities, clarify hand signal, such as specified by the German BG Directive "Safety and Health Protection Signals at Work", must be used.

Please adhere to the following instructions:

- Please make yourself familiar with the machine's and the loading vehicle's dimensions.
- Wear reflective clothing.
- For instructing please use voice radio (e.g when loading with a crane) or via hand signals (e.g. when reversing the machine).

1.09 General safety instructions

Safety manual

The safety manual is part of the instruction manual. Please make yourself familiar with these safety instructions prior to working with the machine.

Warning notes

Observe and follow the warning notes in this instruction manual and on the machine (warning signs) without fail.

Regulations and Provisions

In addition to this instruction manual, it is also necessary to adhere to all laws, standards, regulations and provisions applicable in the country of use and at the building site.

Additional information

If you obtain additional technical and/or safety-relevant information for the machine, they also must be adhered to and need to be attached to the instruction manual.

Electrical system

During working at the electrical system, the machine must be de-energised at the battery isolation switch (if available) or by disconnecting the negative terminal (ground strap) at the battery.

ROPS/FOPS protective structures

The machine frame in the area of the ROPS/FOPS mounting must not be warped, bent or cracked (deformation). The reinforcing elements of the cab/roll-over bar (ROPS)/protective roof (FOPS) must not show any signs of rust, damage, hairline cracks or overt breakages. All screwed connections for the reinforcing elements must meet the prescribed specifications and must be securely screwed together. Pay attention to the tightening torques! Screws and nuts must not be damaged, bent or deformed. Any changes or repairs/fixes to the reinforcing elements are prohibited (see chapter "Auxiliary equipment").

It is absolutely necessary to use a safety belt in proper working condition to be protected by the protective structures of the machine.

Safety belt

The condition and function of the machine's safety belt must not show any damage or unacceptable wear such as to make the safety belt non-functional. It is absolutely necessary to use a safety belt in proper working condition. It is absolutely necessary to use a safety belt in proper working condition.

1.10 Driving on public roads

The laws, regulations, guidelines and standards applicable at the place of use must be observed (for example those concerning the lighting and warning systems).

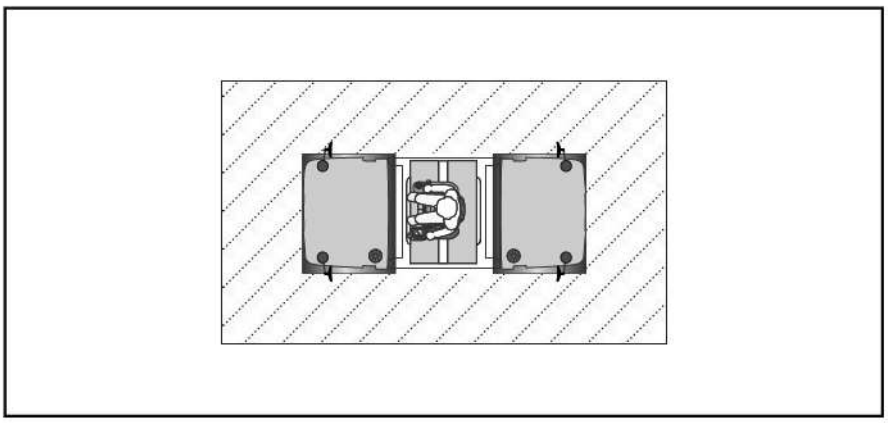
Increasing road safety
Before driving on public roads, remove the protective grille from the lighting package and/or the protective bar from the water tank.

1.11 Danger zone

The machine's danger zone is divided into the areas inactive and moving.

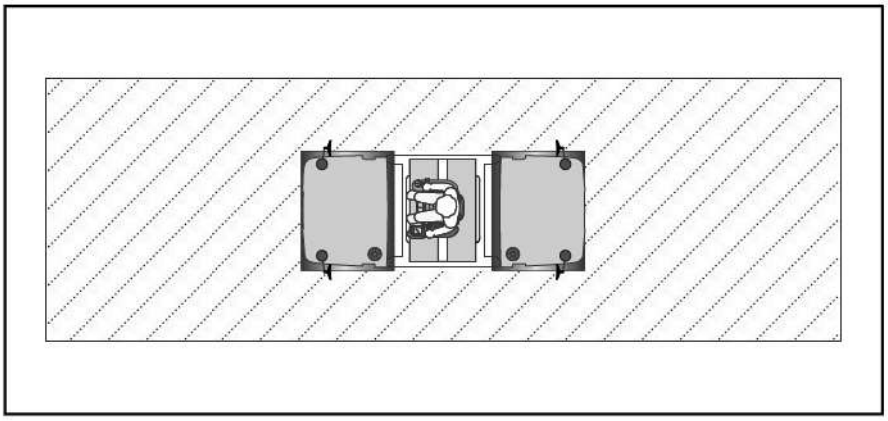
There are other danger areas when the machine is loaded by crane and transported. Also observe the instruction manual and the notes for the loading and transporting machines.

Zone "inactive"



With the machine put out of operation and with the diesel engine switched off, an area 1 metre around the machine is defined as danger zone. No entry is allowed to the danger zone unless to operating personnel.

Zone "moving"



For a moving machine the danger zone is defined as follows:

13 metres	In front of and in the rear of the machine
3 metres	To the left and right of the machine

During compacting work and transport operations ensure that no persons are within the danger area.

2 DESCRIPTION

2.00 Information on the machine

When working at the machine please always adhere to the instructions given in your Safety instructions!

2.00.01 Technical characteristics

Drive	Hydrostatic all-wheel drive for the rear axle ▪ infinitely variable ▪ Single lever operation
Steering	Hydrostatic servo-assisted steering ▪ Large steering lock to both sides ▪ Level compensation upwards and downwards (on the front axle)
Service brake	During operation, the machine is braked by the hydrostatic drive and a hydraulic foot brake. ▪ Wear-free braking (with the hydrostatic drive) ▪ Spring-operated brake and disc brake (for the hydraulic foot brake)
Parking brake	Spring-operated brake acting upon each hydro motor of the drive. ▪ Manual and automatic
EMERGENCY STOP	Machine is braked with spring-operated brakes and hydrostatic drive.
Water sprinkling	Pressure sprinkling ▪ Manual operation and automatic interval system
Additive sprinkling	Pressure sprinkling ▪ Manual actuation
Electrical system	Operating voltage 12 V
Drive system	Diesel engine

2.00.02 List of auxiliary equipment

The following list shows possible (optional) special attachments. This operating manual also describes special attachments that may not be present on your machine. Please contact your customer service if you have any questions about availability.

Special attachments are not specifically marked in the operating manual. Please observe chapter 6. You will find more detailed information about special attachments here.

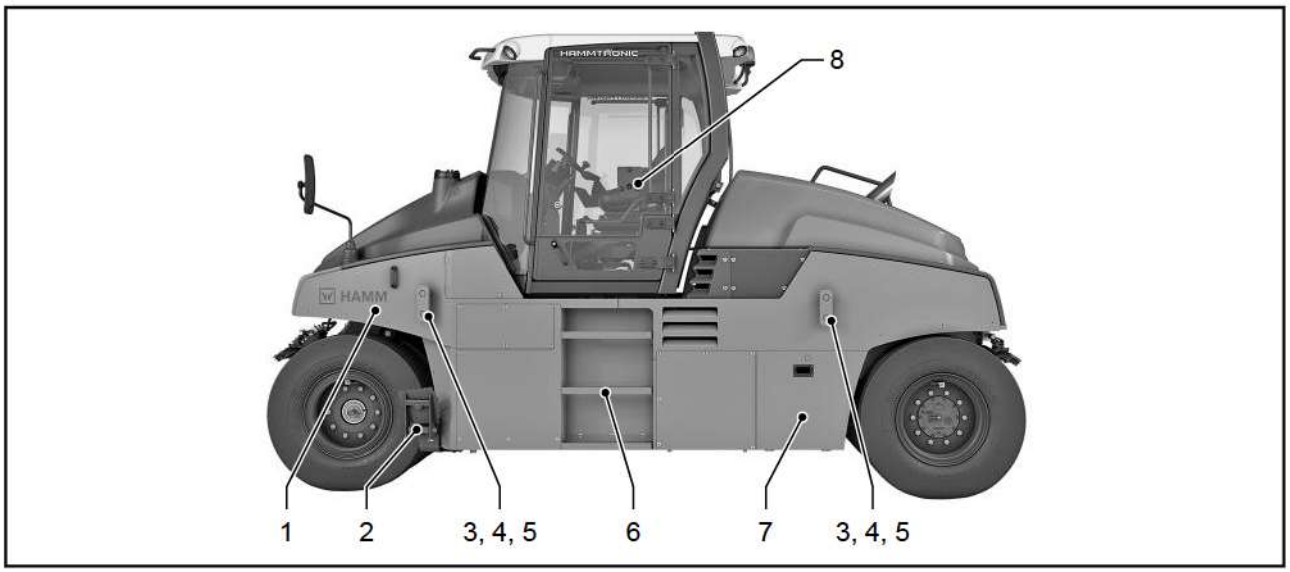
Auxiliary devices may change the sequence of action steps or events. This is indicated by an additional note in the text, for example: **For versions with an air conditioning system**.

- ROPS cab
- ROPS (roll-over bar) with/without protective roof
- FOPS
- Heating and air-conditioning system
- Steering column with adjustment
- Multifunction armrest with adjustment, with/without folding function
- Mechanical seat adjustment
- Automatic engine stop
- Seatbelt monitoring
- Edge pressing and cutting device
- Tachograph
- Thermal aprons
- Anti-freeze filling system
- HAMM temperature meter
- Rear area camera
- Reversing alarm
- Lighting package for driving on public roads
- Protective grille for lighting package
- Working spotlights
- Rotating beacon
- Spare wheel bracket
- Tyre-inflation system
- Tyre lighting
- Near-field side lighting
- Electronic battery isolation switch
- Fire extinguisher
- Lockable water tank cover
- Disc brakes for front axle
- Coming Home function

2.01 General view of machine

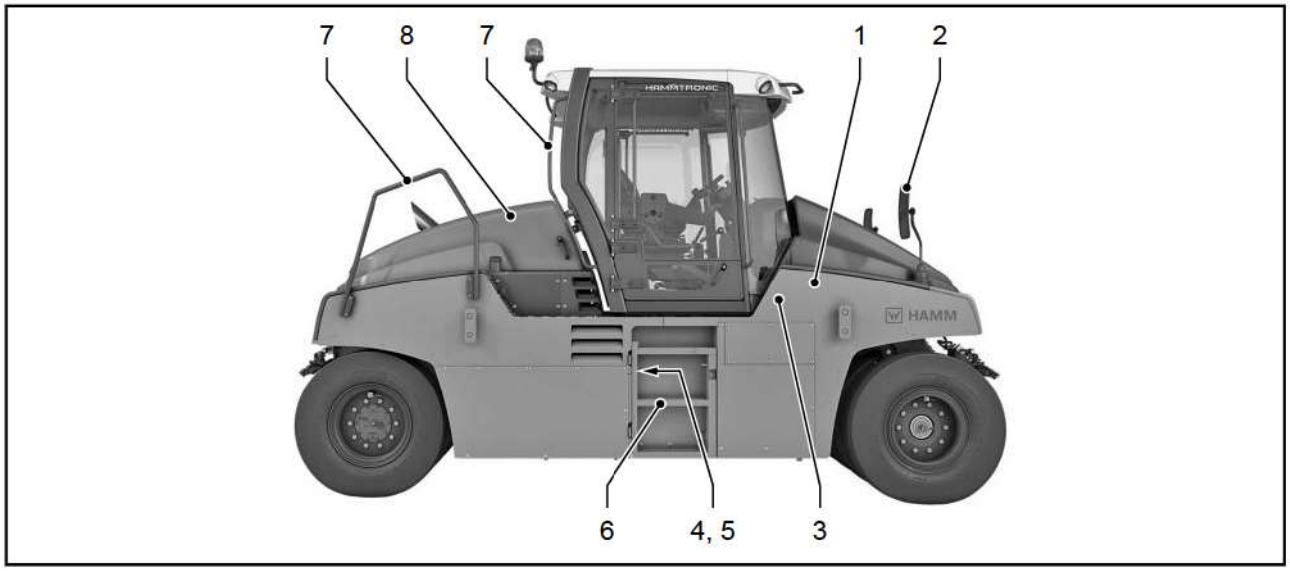
2.01.01 Chassis/safety devices

Machine, left



[1]	Chassis	[2]	Step
[3]	Towing eye for crane loading	[4]	Lashing point
[5]	Towing eye	[6]	Steps, fixed
[7]	Tool box	[8]	Seat belt

Machine, right



[1]	Chassis	**[2]**	Operation mirror
[3]	Vehicle identification number (VIN)	**[4]**	Machine type plate
[5]	Engine nameplate	**[6]**	Swing-out steps
[7]	Handrails	**[8]**	Engine hood

2.01.02 Stickers on the machine

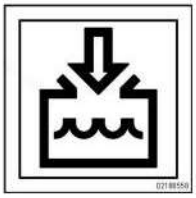
Below please find a list of warning signs and information signs affixed to the machine. The images and values may vary according to the type of machine.

For the detailed arrangement of warning and information signs, please refer to the spare parts catalogue.

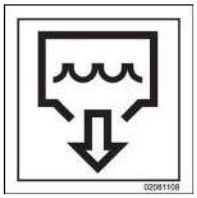
Be sure to observe the warning signs and information signs affixed to the machine and strictly follow their instructions.

Information signs

Below is a list of examples of the information signs. The images and values may vary according to the machine type.



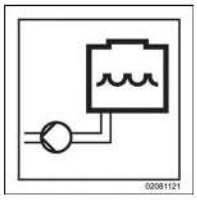
Filling opening for water tank



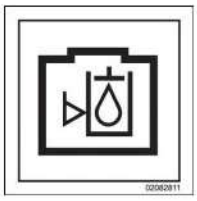
Drain outlet for water tank

Filling opening for water tank for additive sprinkling

Drain outlet for water tank for additive sprinkling



Water pump

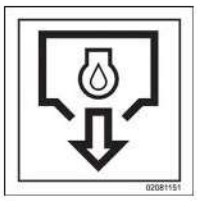


Hydraulic oil fill level

Filling opening for hydraulic oil tank

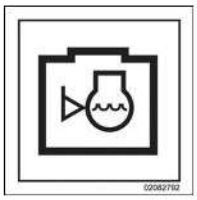
Drain outlet for hydraulic oil tank

12 V socket



Drain outlet for engine oil

Drain outlet for filter water sump



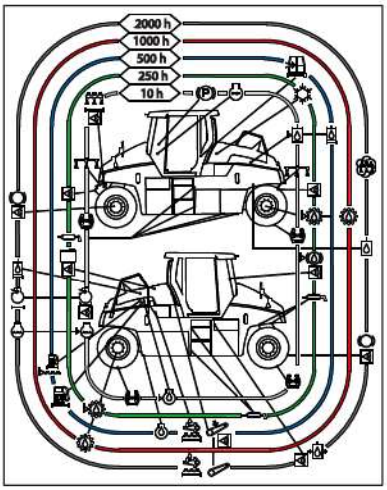
Coolant fill level

Coolant inlet

Tyre pressure
Tyre without water filling

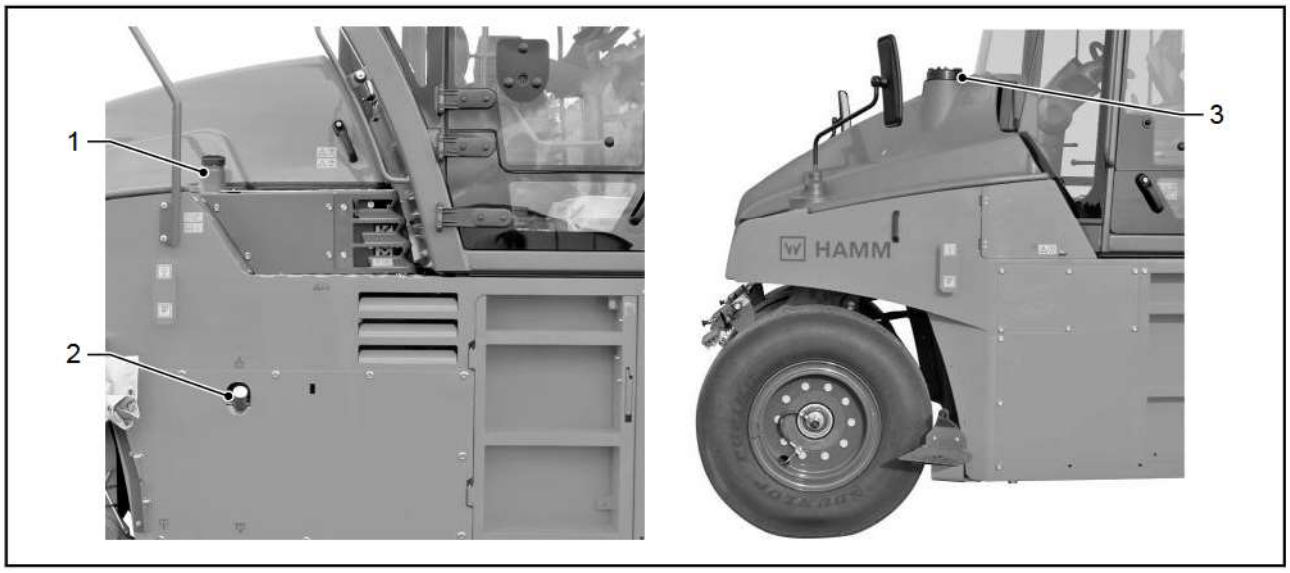
Guaranteed sound power level

Expert inspection test badge



Maintenance overview

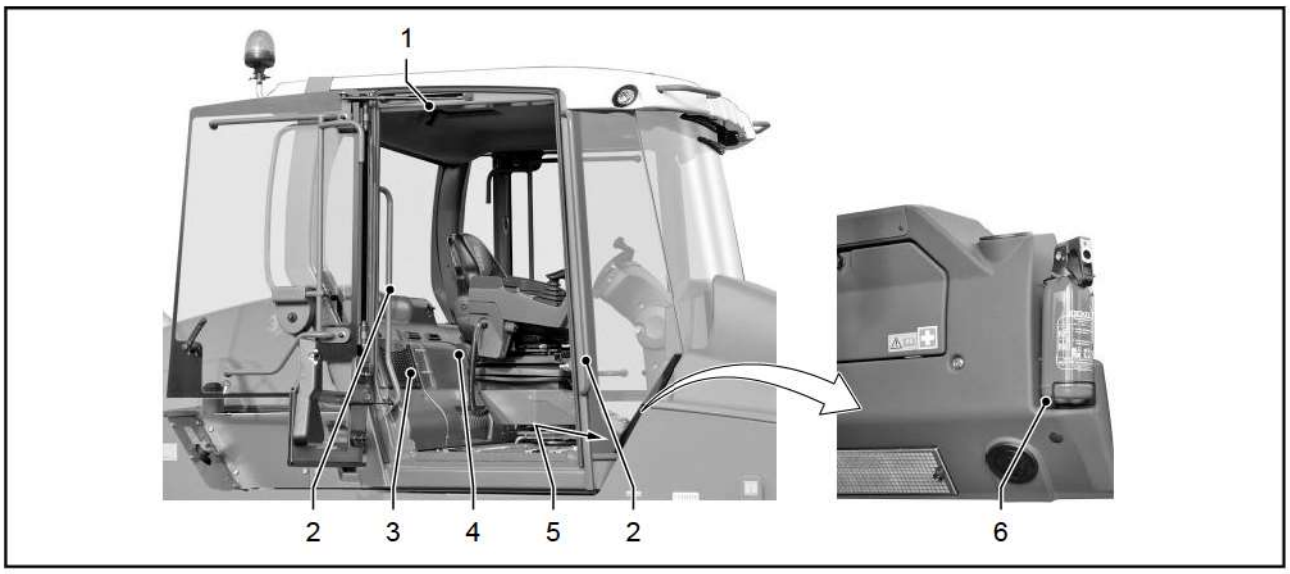
2.01.03 Consumable fill holes



[1]	Fuel	[2]	Additive sprinkling
[3]	Water sprinkling		

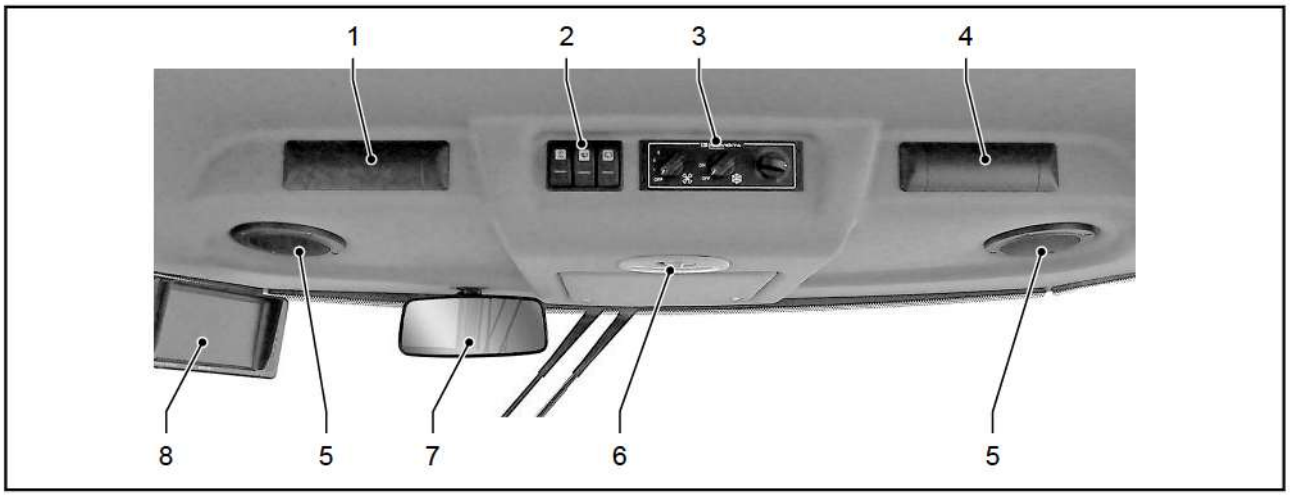
2.02 Control stand

2.02.01 Cab



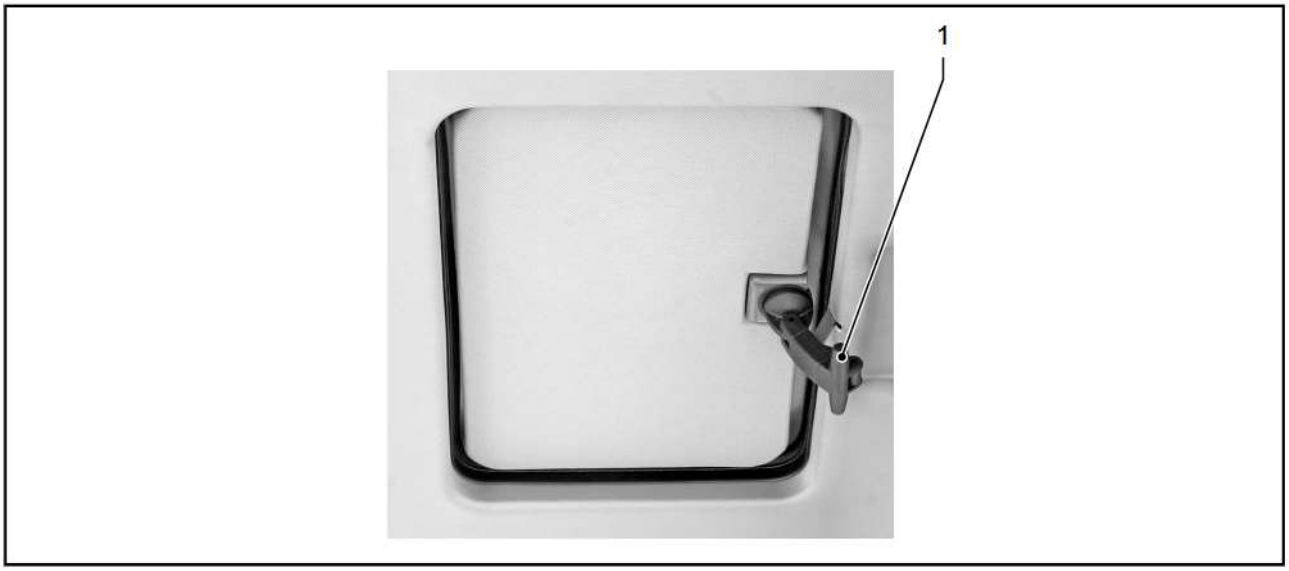
[1]	Operator's cab	[2]	Handrails
[3]	Stacker for instruction manual/first aid kit	[4]	Reservoir for windscreen washer fluid
[5]	ROPS cabin type plate	[6]	Position for fire extinguisher

Cab roof section



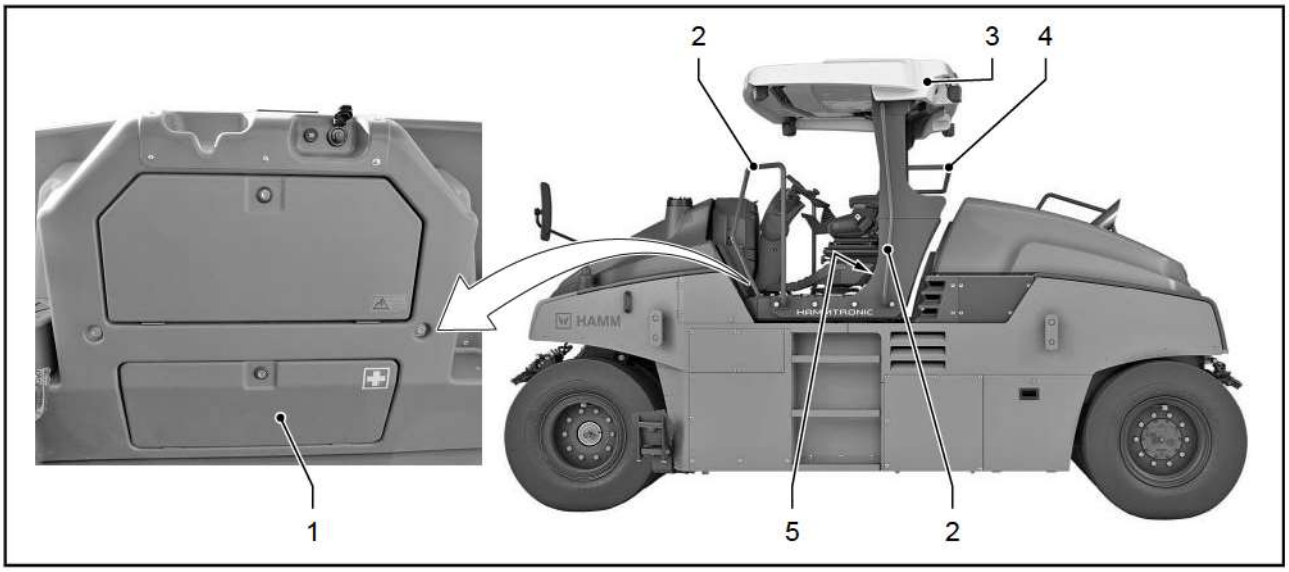
[1]	Position for radio	[2]	Windscreen wiper switch unit
[3]	Switch unit, heating/air conditioning system	[4]	Position for tachograph
[5]	Loudspeaker	[6]	Interior lighting
[7]	Inside mirror	[8]	Monitor

Roof hatch



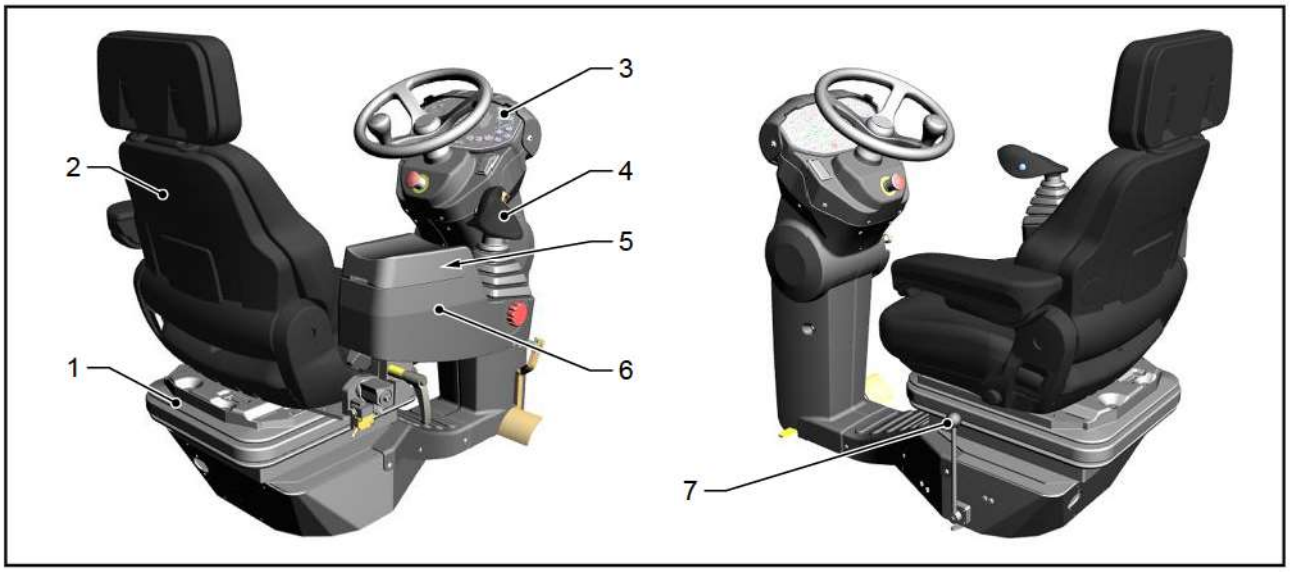
[1]	Roof light deflexion lever

2.02.02 ROPS



[1]	Storage compartment for operating manual/first aid kit	[2]	Handrails
[3]	Weather protection roof	[4]	ROPS (roll-over bar)
[5]	ROPS type plate (roll-over bar)		

2.02.03 Seat console

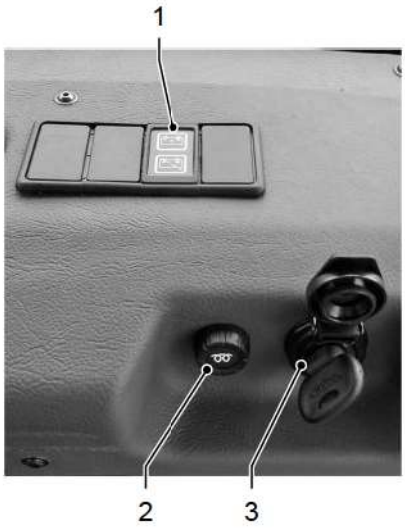


[1]	Seat console	[2]	Driver's seat
[3]	Steering column	[4]	Drive lever
[5]	Machine diagnostic interface	[6]	Multifunction armrest
[7]	Seat console adjustment		

2.02.04 Steering column

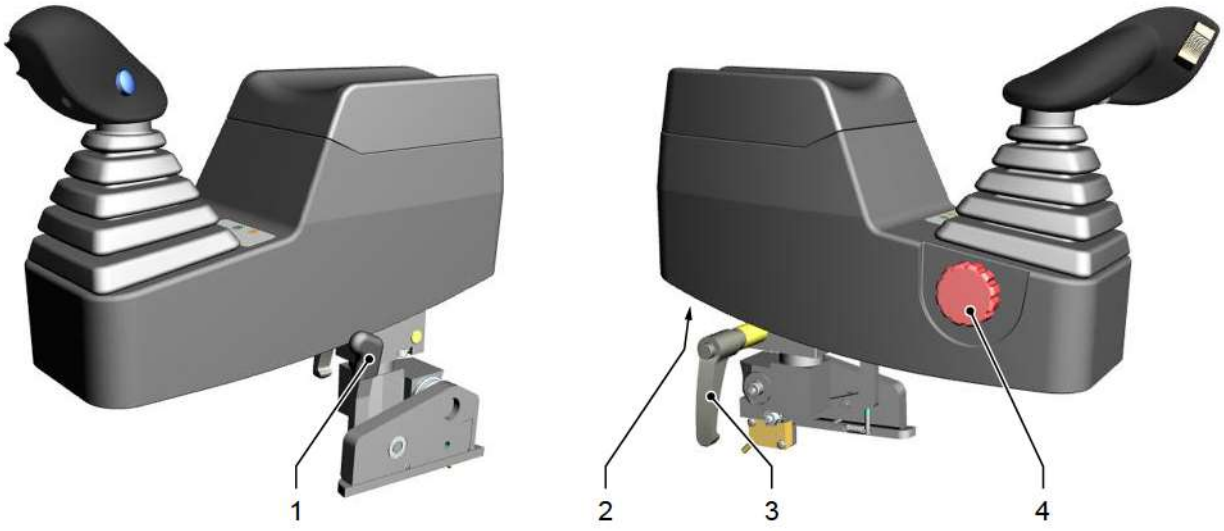
[1]	Steering wheel	[2]	EMERGENCY STOP switch
[3]	Steering column	[4]	Lever for easy exit
[5]	Control panel	[6]	Additive admixture switch
[7]	Control panel adjustment	[8]	Brake pedal

2.02.05 Dashboard



[1]	Battery cut-off control unit switch	[2]	Cold start assistance LED
[3]	Electrical system/engine start switch		

2.02.06 Multifunction armrest

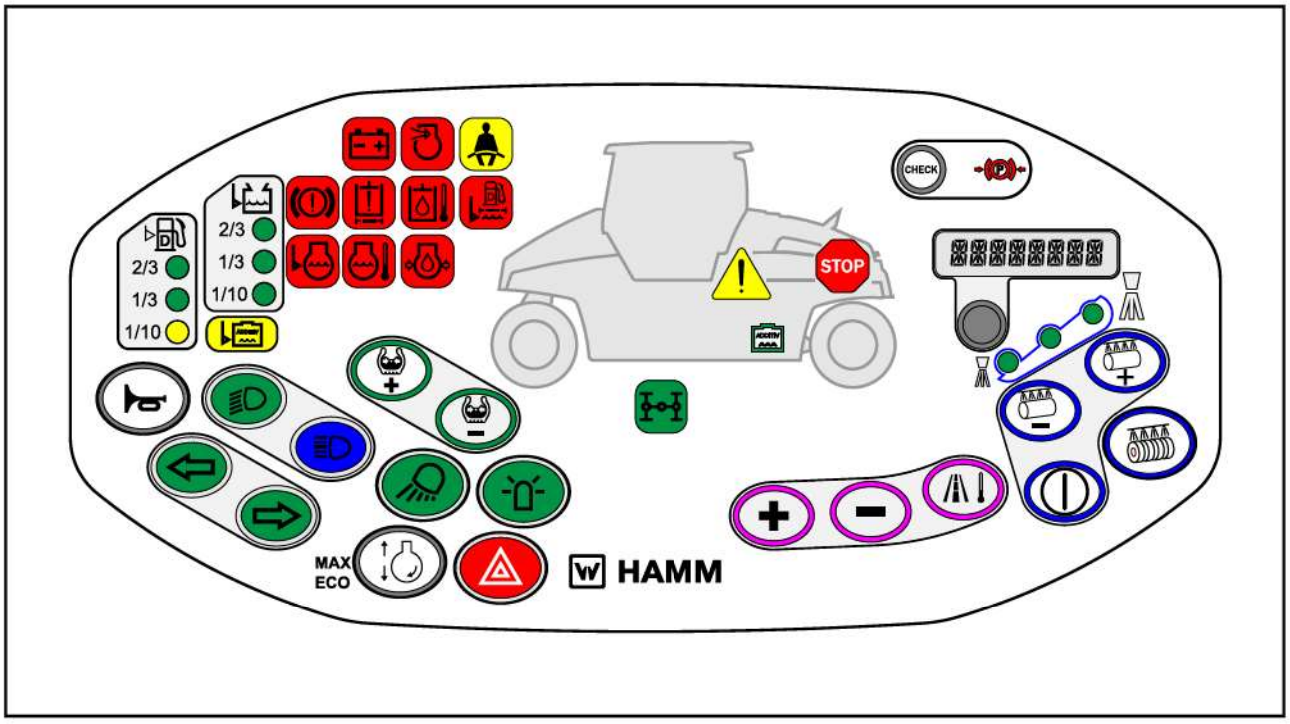


[1]	Locking lever	[2]	12 V socket
[3]	Clamping lever	[4]	Final speed handwheel

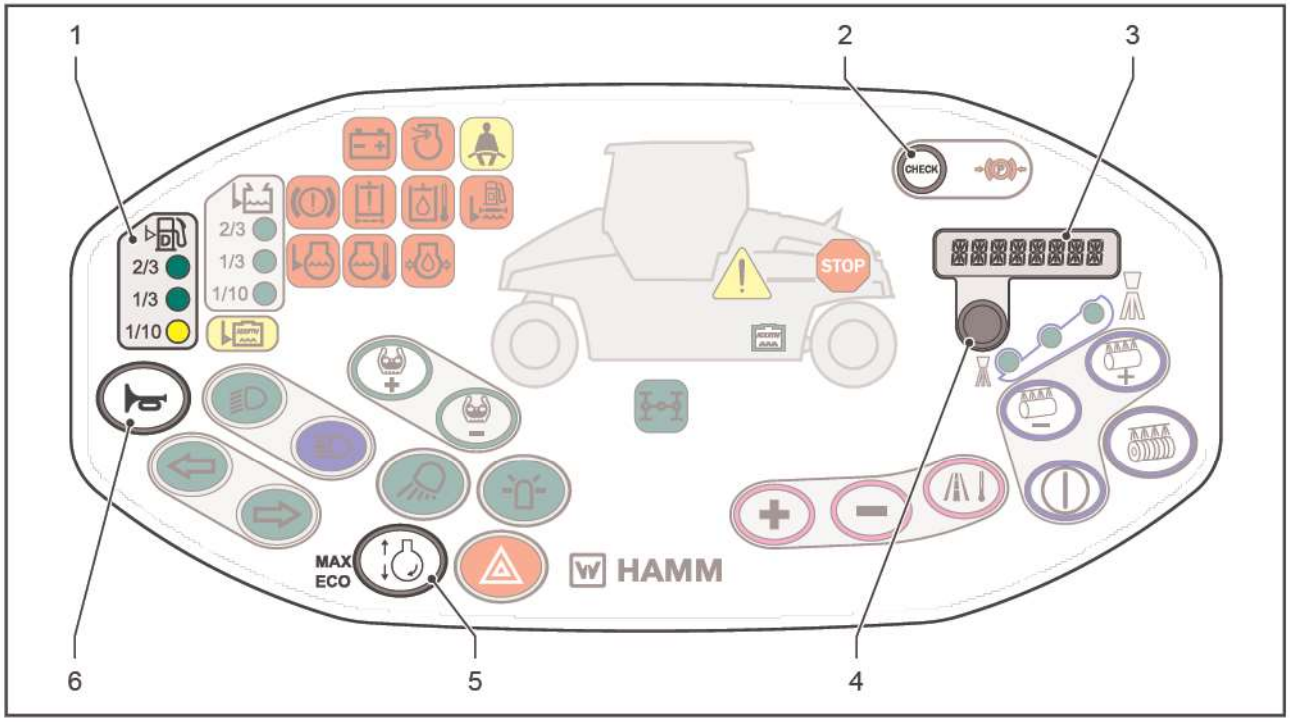
2.02.07 Control panel - Steering column

The controls on the control panel are colour-coded according to their operating functions. The images below show the controls for the individual operating phases.

Complete overview

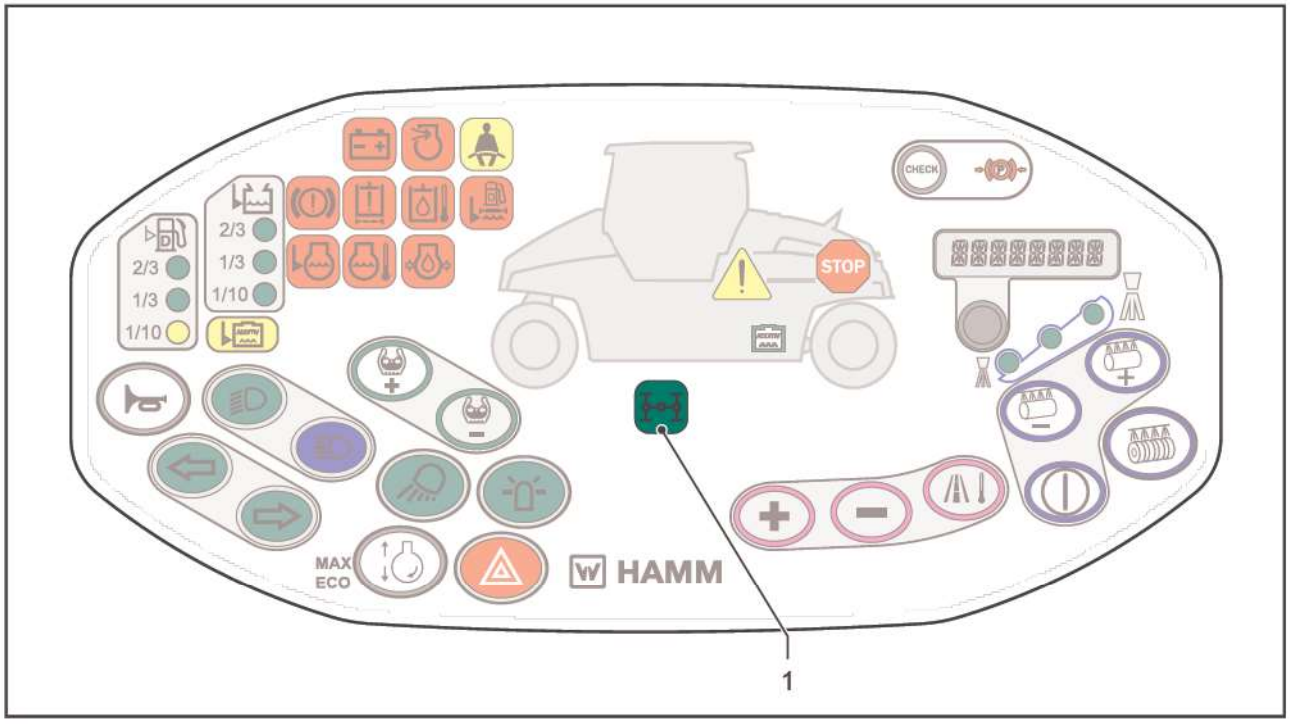


Normal operation



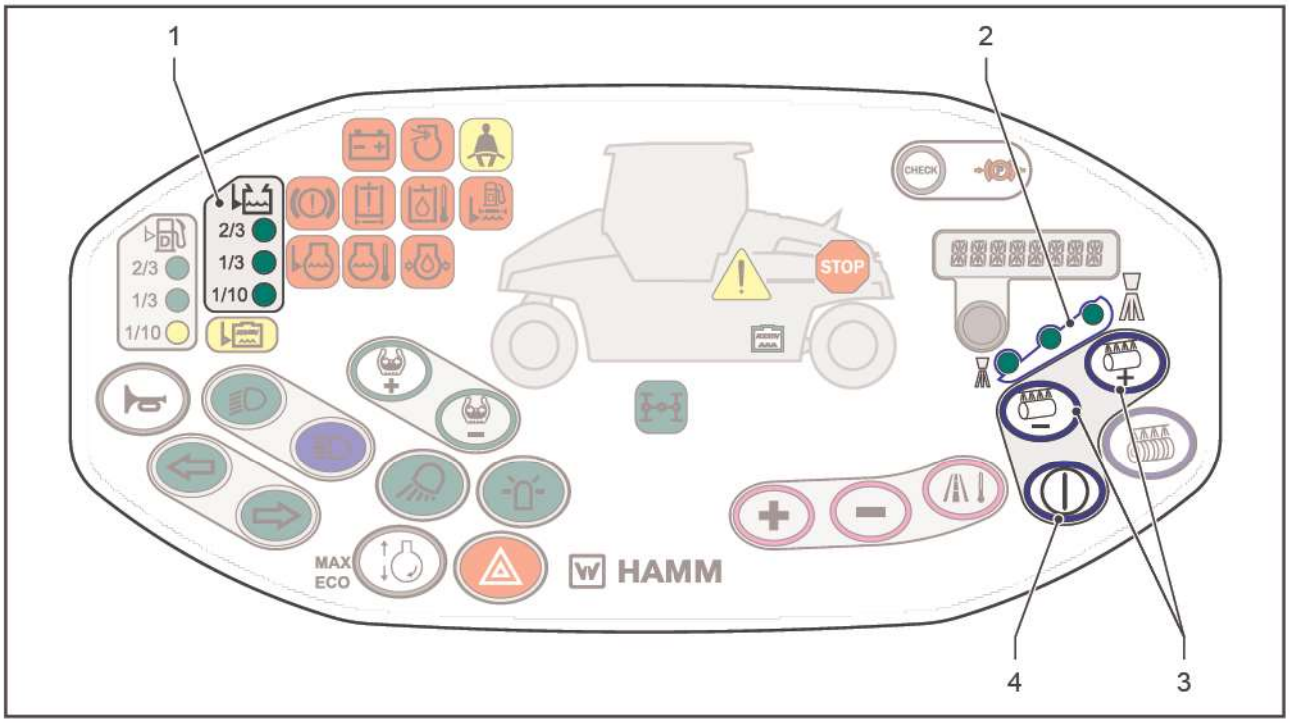
[1]	Fuel fill level indicator	[2]	Parking brake check switch
[3]	System info display	[4]	System info switch
[5]	Engine management switch	[6]	Signal horn switch

Driving



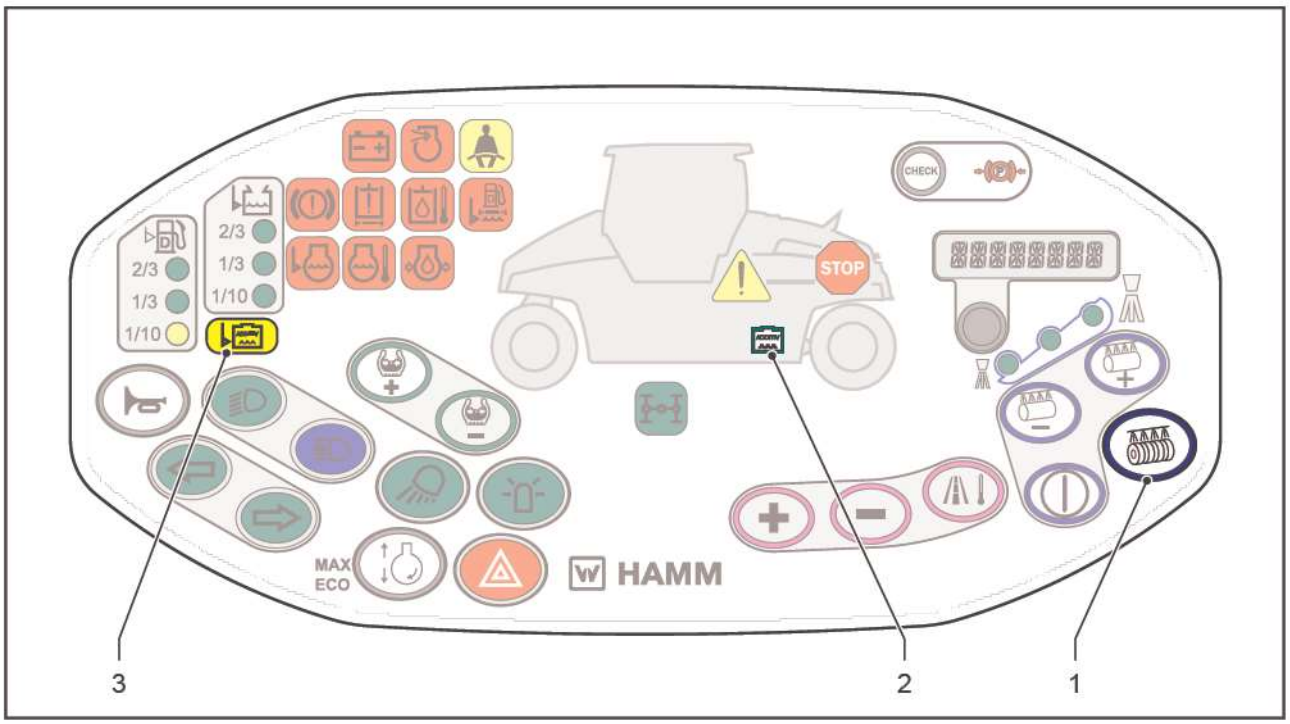
[1]	Indicator light for automatic slip control (ASC)

Water sprinkling



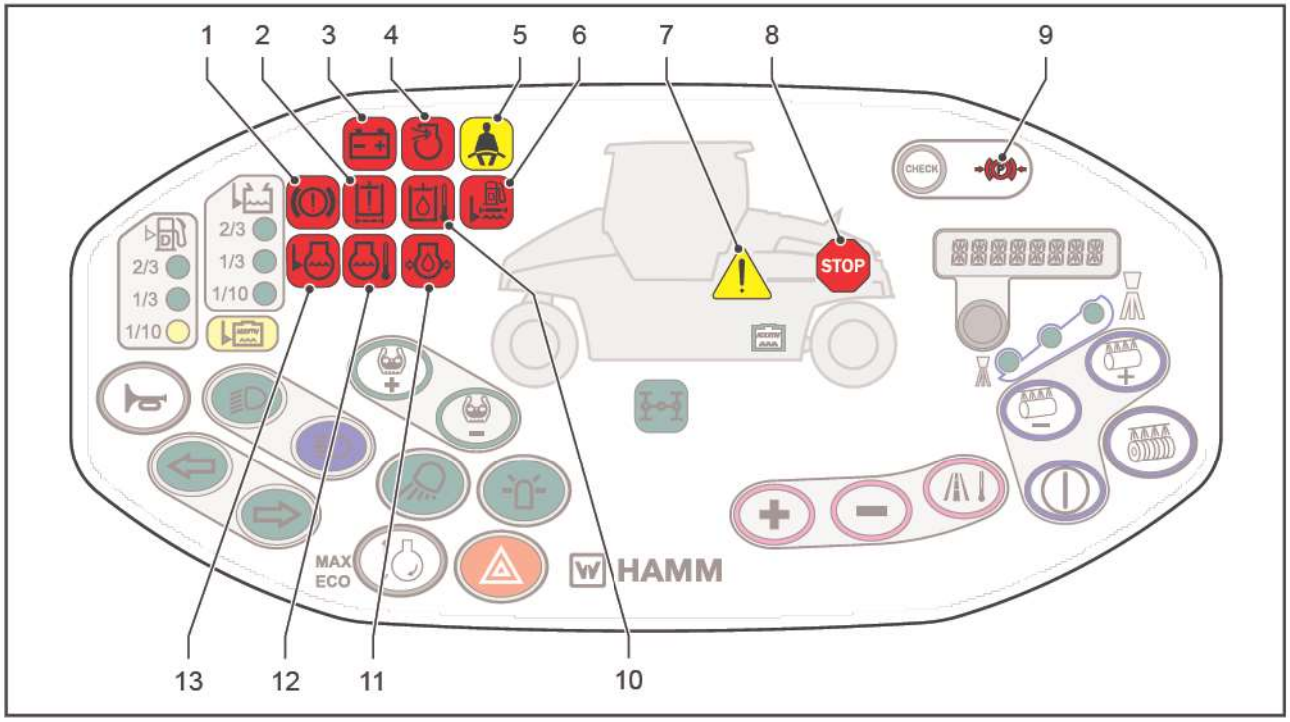
[1]	Water sprinkling fill level indicator	[2]	Sprinkling stage indicator light
[3]	Sprinkling stage switch	[4]	Switch for water sprinkling system

Additive sprinkling



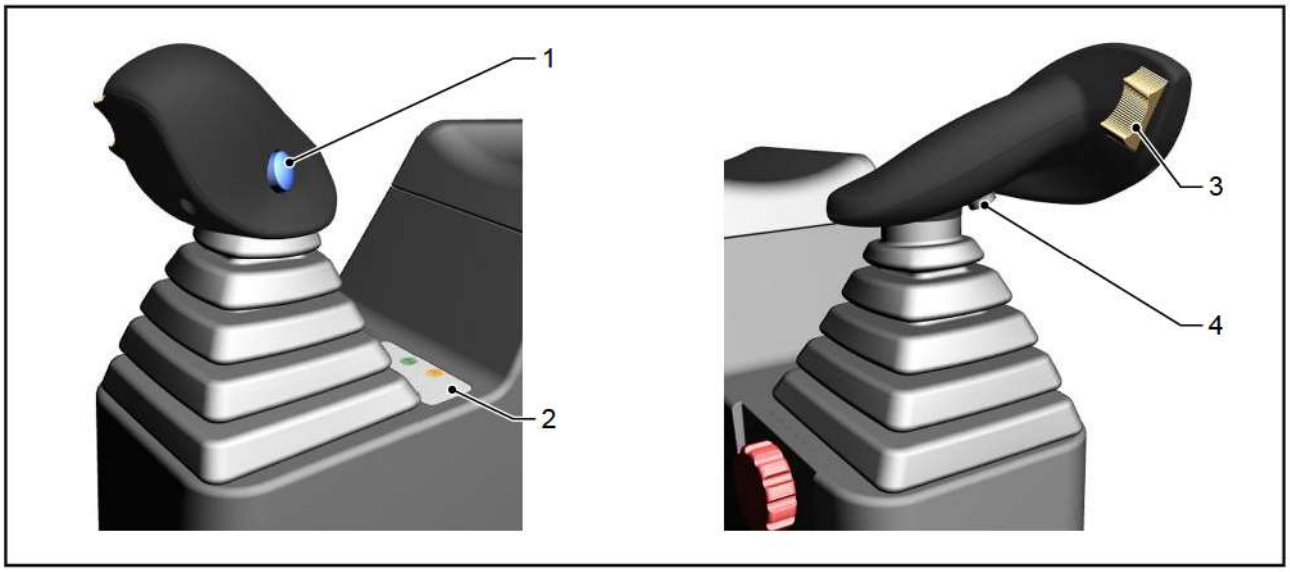
[1]	Switch for additive sprinkling system	[2]	Additive sprinkling indicator light
[3]	Additive sprinkling fill level indicator		

Warning lights



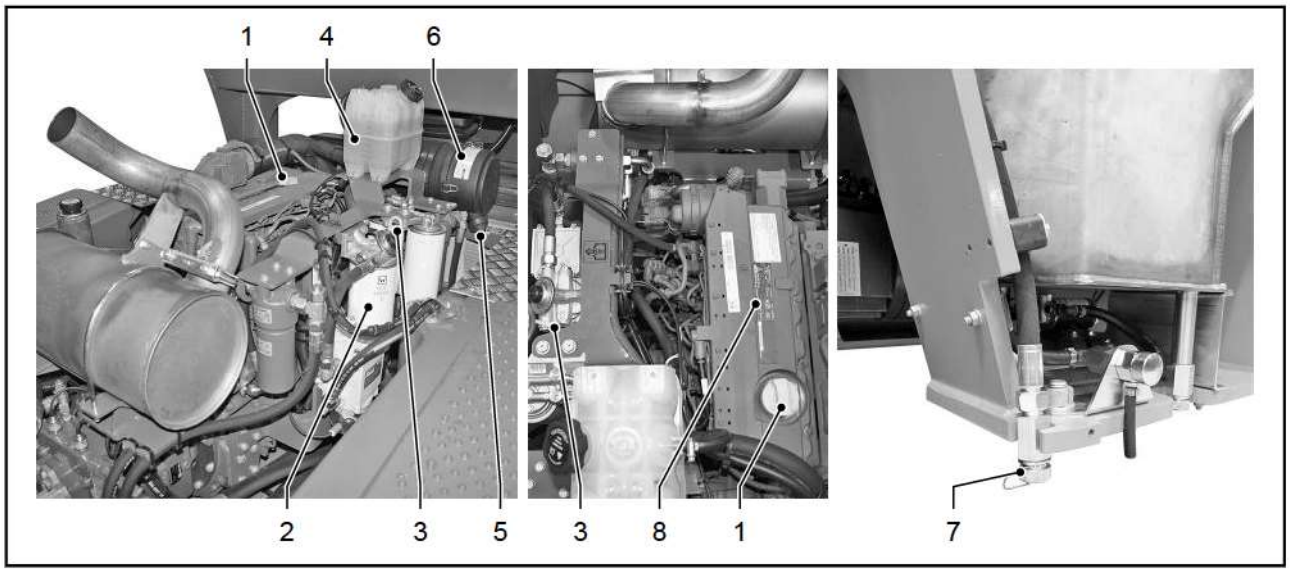
[1]	Brake system	[2]	Pressure filter hydraulics
[3]	Charge current (battery)	[4]	Air filter
[5]	Seat belt	[6]	Water sump fuel prefilter
[7]	Warning, notification, fault	[8]	Serious fault
[9]	Parking brake	[10]	Hydraulic oil temperature
[11]	Engine oil pressure	[12]	Engine temperature
[13]	Coolant level		

2.02.08 Drive lever



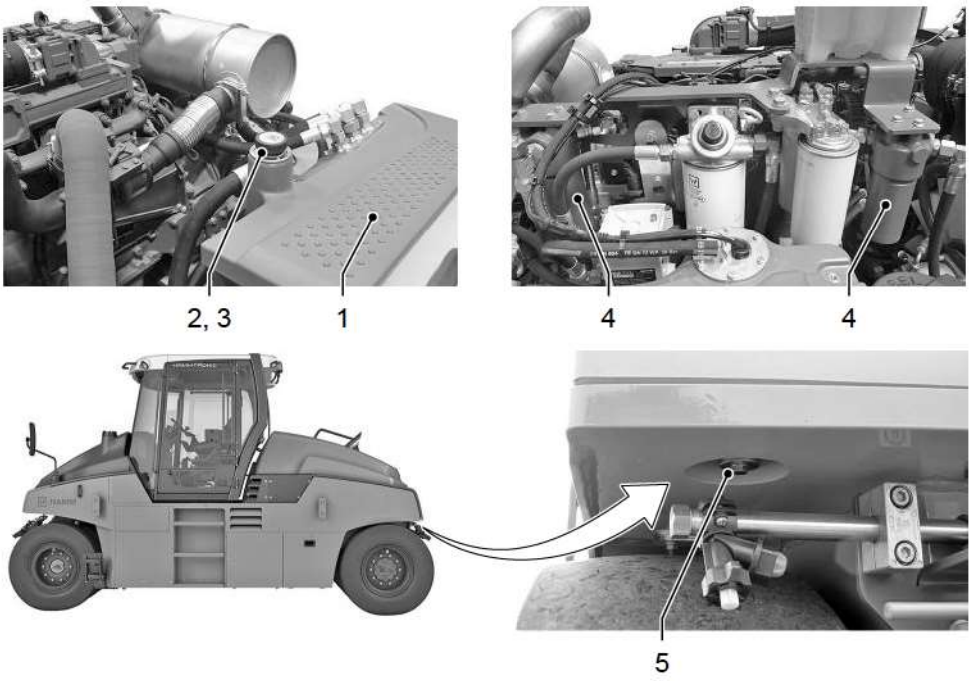
[1]	Switch for water sprinkling system	[2]	Indicator plate showing the drive lever function
[3]	Switch for edge pressing and cutting device	[4]	Signal horn switch

2.04 Drive unit/diesel engine



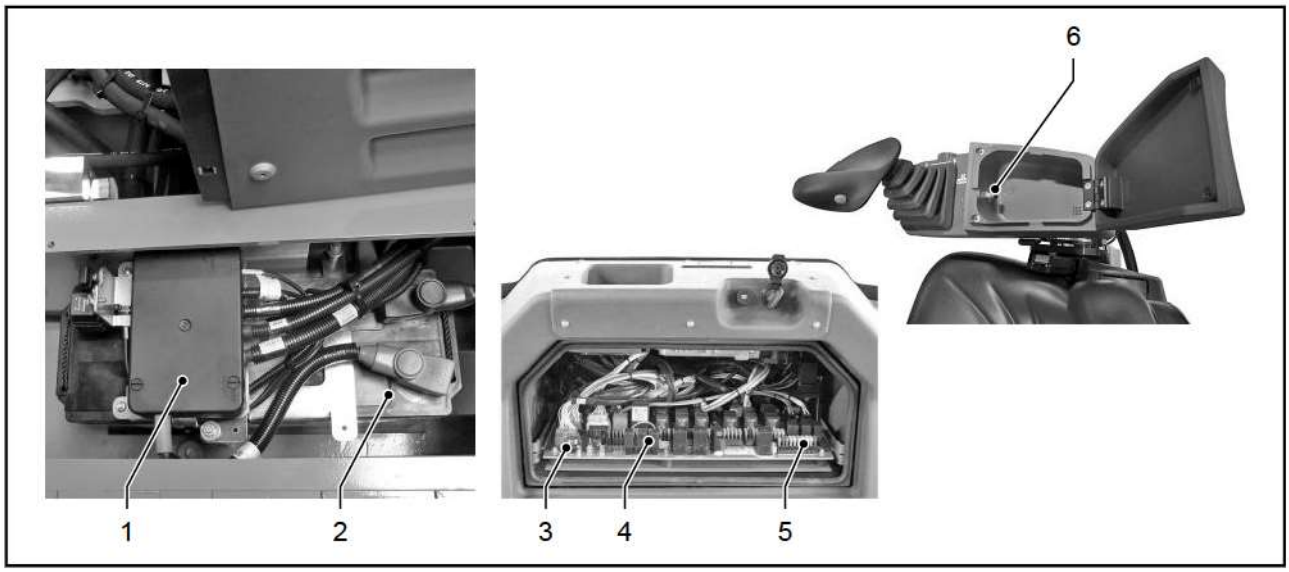
[1]	Filling opening for engine oil	[2]	Fuel system
[3]	Dipstick	[4]	Cooling system
[5]	Dust valve	[6]	Air filter
[7]	Drain outlet for engine oil	[8]	Engine type plate

2.05 Hydraulic oil supply



[1]	Hydraulic oil tank	[2]	Filling opening for hydraulic oil
[3]	Ventilation filter with dipstick	[4]	Hydraulic oil filter
[5]	Drain outlet for hydraulic oil		

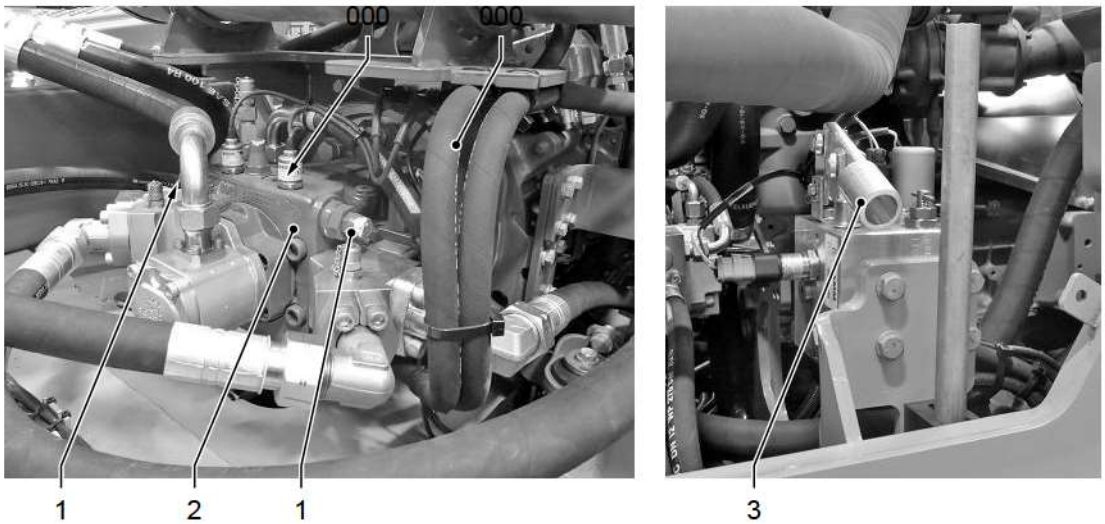
2.06 Electrical system



[1]	Main fuses	[2]	Battery
[3]	Engine diagnostic interface	[4]	Relay
[5]	Fuses	[6]	Machine diagnostic interface

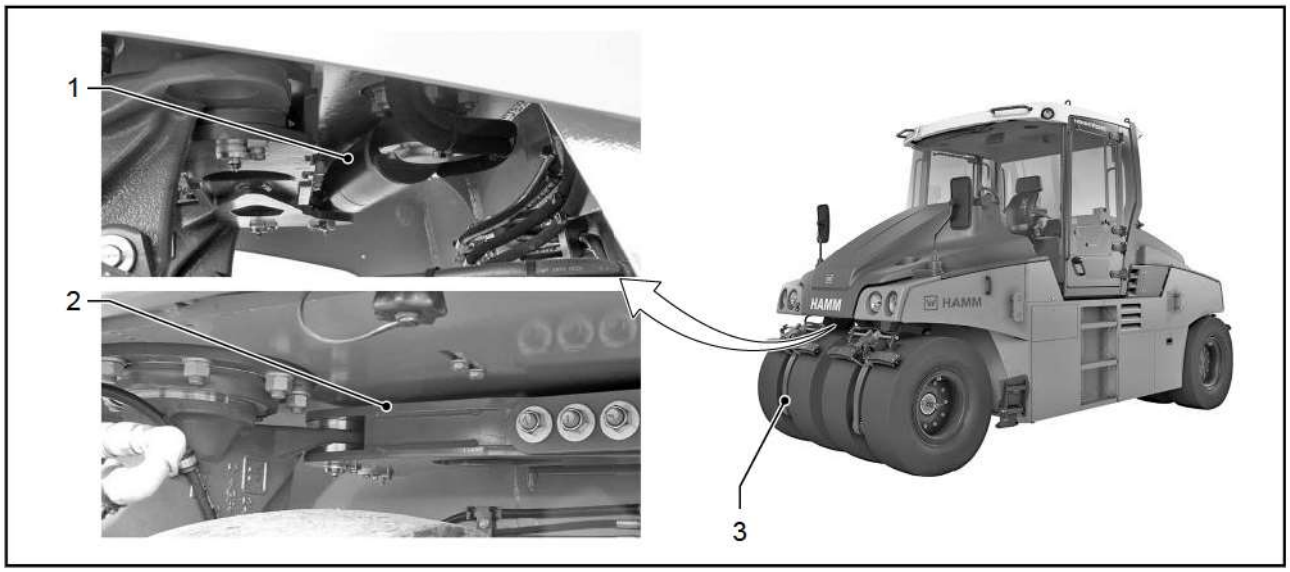
2.08 Transmission

[1]	Scraper	[2]	Tyre inflation system



[1]	HD valve	[2]	Drive variable displacement pump
[3]	Manual pump		

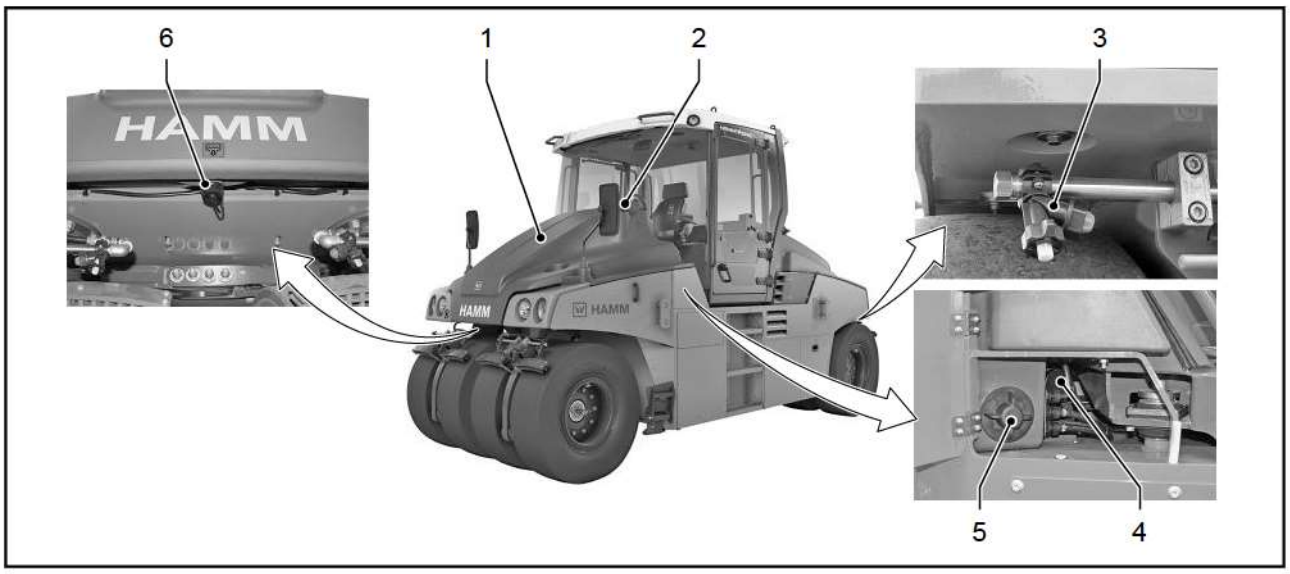
2.09 Steering system



[1]	Steering cylinder	[2]	Tie rod
[3]	Wheel suspension		

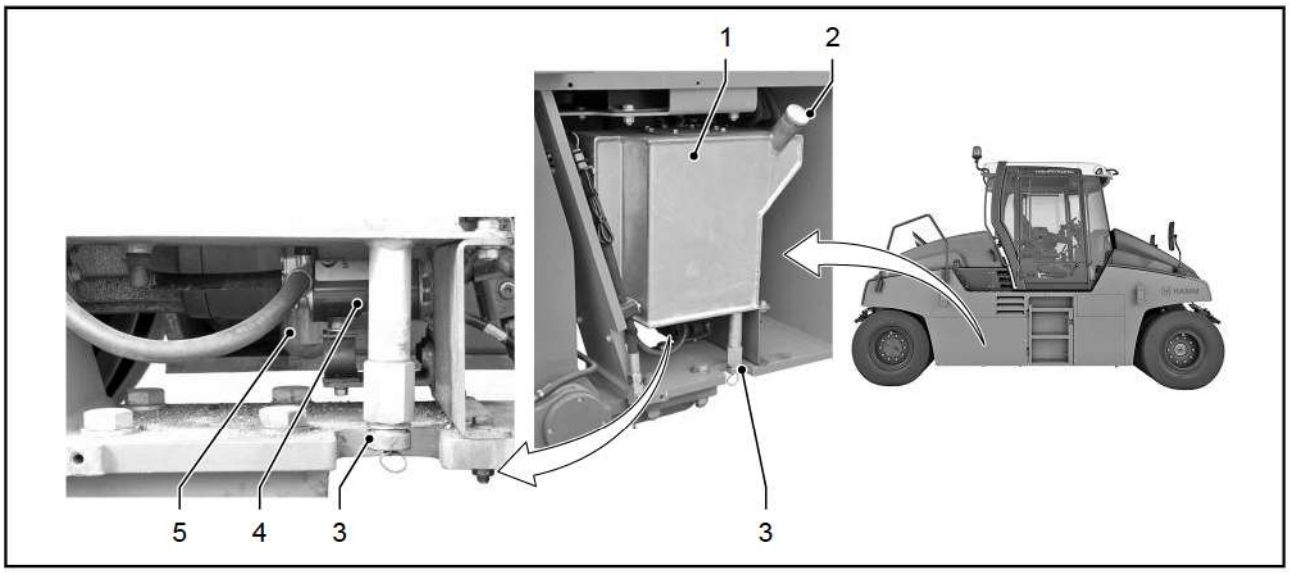
2.12 Water system

2.12.01 Water sprinkling system



[1]	Water tank	[2]	Water tank filling opening
[3]	Water-sprinkling nozzles	[4]	Water pump
[5]	Water filter	[6]	Water tank drain outlet

2.12.02 Additive sprinkling



[1]	Additive tank	[2]	Additive tank fill hole
[3]	Additive tank drain outlet	[4]	Additive pump
[5]	Additive filter		

3 OPERATION

3.00 Important information about operating the machine

Operating the machine requires specialist knowledge about driving construction machines. Only authorized operating personnel may operate the machine.

The following safety instructions apply to all operating activities machine.

⚠DANGER

Operating errors!

Danger to life and limb and risk of injuries and material damage through improper operation of the machine.

- Check the machine for operational and traffic safety.
- Read and observe the instruction manual and the safety manual.
- Ensure that there are no persons or objects in the danger zone of the machine.

⚠DANGER

Uncontrolled driving behavior!

Risk of fatal injury due to the machine's own driving movements or due to any uncontrolled movement.

- Do not continue to operate the machine in the event of error messages about safety-related components. Switch off the machine, park it in a safe place, and inform customer service.
- Allow only specially trained and authorized personnel to work on safety and control-relevant components.
- After work on control-relevant component, the control system must be reset by authorized service personnel.

⚠WARNING

Restricted view!

An accident caused by an obstructed view of the area outside of the driver's cab may result in serious injuries or even death.

- Before starting work, if the windows are frozen, snow-covered, dirty or misted, they must be cleaned and cleared to such an extent that guarantees an unobstructed view all around the outside and operating area from the cab.
- If the view is restricted during work: Securely park the machine outside of the hazard area and re-establish an unobstructed view.

⚠WARNING

Exposed, rotating parts!

Risk of being trapped, pulled in, and injured by rotating engine parts.

- Operate the machine only with the engine bonnet and the engine compartment door closed.
- Do not perform any testing and adjusting work in the area of the engine unless the diesel engine has been switched off.
- Do not lay down any object or tool in the engine compartment.

⚠WARNING

Unintended machine movement!

Serious injuries or death through unexpected movement of the machine during testing and setting work, and outside the operation.

- Do not carry out any testing and adjusting work unless the engine has been stopped and the ignition has been switched off.
- Park the machine on safe ground, i.e., flat and horizontal ground with sufficient bearing capacity.
- Secure machine against rolling away.

⚠WARNING

Unintended engine start!

Severe injury and death caused in case of an unintended engine start during testing and adjusting work.

- Do not carry out any testing and adjusting work unless the engine has been stopped and the ignition has been switched off.
- Before starting testing and adjusting work, set the battery isolating switch to off in order to de-energize the electrical system. As an alternative, disconnect the earthing/grounding strip from the battery.
- To avoid any unintended engine start by any third person, affix a warning notice at the driver's position indicating that work is in progress on the machine.

⚠WARNING

Work above floor level!

Severe injuries caused by falling.

- Maintenance and repair work above floor level (e.g. changing wiper blades, cleaning windows) must only be carried out using a stable ladder or on maintenance scaffolding.
- To reach the maintenance points on the machine, use the designated steps and treads. Do not step on any other machine element or attachment.

⚠WARNING

Noxious exhaust gases!

Risk of serious injury or death caused by poisoning or suffocation after breathing in exhaust gases when operating the machine in an enclosed space.

- Only operate the machine outdoors.
- If the engine has to run in enclosed spaces:
  - Guide the exhaust gases outside (extension hose).
  - Ensure that there is a sufficient supply of fresh air, e.g. by using a ventilation system or by opening the doors.

NOTICE

High self-weight of machine!

Material damage under the heavy weight of the machine.

- When loading and transporting the machine use hoisting gear and means of transport suitable for the weight of the machine.
- Use the machine only on sufficient load-bearing soil.

NOTICE

Engine hood swinging range!

Material damage when opening the engine hood.

- Keep a sufficient distance to other objects located either above or at the rear.

3.01 Loading and Transporting

⚠WARNING

Open doors, windows and hatches during loading and transport!

Serious injuries or material damage can be caused by doors, windows and hatches that have become unfastened during loading and transport.

- Keep doors, windows and hatches closed and locked during loading and transport.
- Check the locks after loading by crane and strong vibrations.

Observe all regulations when loading and transporting the machine to and from its place of use!

Regulations and Provisions

When loading rollers onto trucks, trailers or semitrailers, it is essential to secure the machine properly on the carrying vehicle. The duty for tie-down on street vehicles arises from StVO § 22, StVO § 23, StVZO § 30, StVZO § 31, HGB § 412 as well as from VDI guideline 2700 or other national requirements. Loading and transporting the machine requires sufficient knowledge about the loading of vehicles and their behavior under load. The machine may only be loaded by trained loading personnel. The machine must be fixed or stowed in transport-safe way to the vehicle by an form-locked or friction-locked manner or by a combination with friction. The machine must not change its position on the vehicle during normal traffic loads. Typical transport stresses also include emergency braking, evasive manoeuvres and unevenness of the road. If it is impossible to secure the machine properly onto the vehicle, or if the loading vehicle shows visible defects which do not ensure safe transport, loading must not be performed. This condition or requirement also applies to too little or damaged lashing tackle.

The transport company involved is always responsible for the safe transport of the machine and accessories.

Loading instructions

When loading please observe the following instructions:

- Adhere to section Transport as specified in the safety instructions.
- Note the weight and dimensions ("Technical data", page 214).
- Observe the legally required maximum height.
- Only use approved gantries or planks that are provided with an antiskid coating.
- Never drive with metal on metal.
- Keep all loading bridges, planks and loading areas clean. Remove grease, dirt, ice, etc.
- Clean roller drums and tyres prior to driving on the gantries.
- Either remove every loose or movable part in or at the machine, or secure such parts separately.
- Lower attachments.

- When transporting rollers with articulated steering, insert the steering block.
- Remove wedges and lashing devices completely before unloading. Unblock steering system by unblocking the safety strut.
- Drive the roller slowly and carefully from the loading area.

Transport precautions for machines with thermal aprons

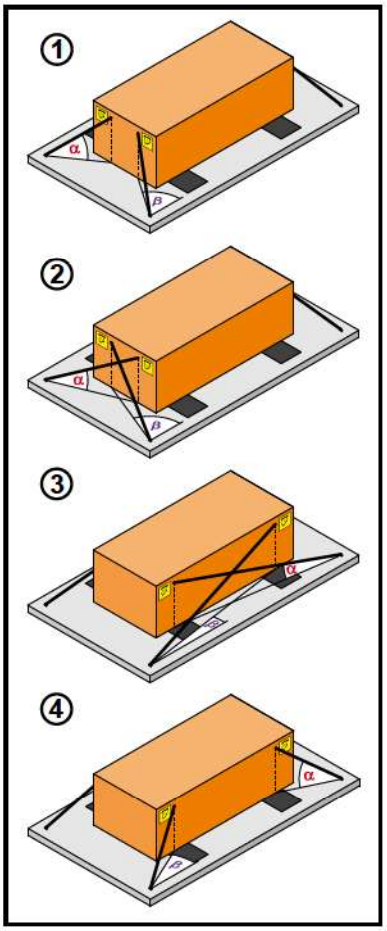
NOTICE

Collision between thermal aprons and lashing devices!
Damage to thermal aprons by chafing or crushing.

- Before tying them down, roll up the thermal aprons and secure them using the closing straps.
- For tying down, preferably used tying variant 2 (crosswise tying).

[1] Thermal apron secured using closing straps

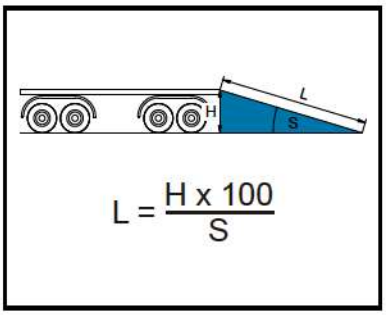
Load securing



Special notes

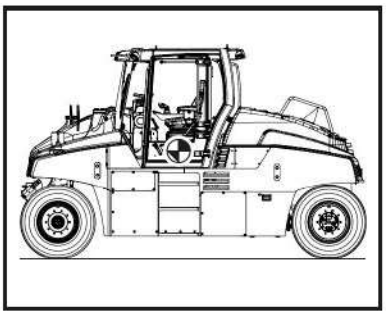
- Variant ① and variant ② may be combined. The lashing devices must not necessarily be arranged crosswise.
- Do not use any lashing device unless it is of sufficient dimension, bears the corresponding marking, and has been subjected to a valid inspection.
- Lash the machine with appropriate lashing devices onto the loading area, using only the marked lashing eyes.
- Observe the load for the lashing point(s) at the vehicle/load platform and at the load/roller. Do not overload the lashing points with a tensioning device (see the loading chart).
- To increase load safety, use additional precautions for securing the load including, e.g., wheel stop wedges, or a positive fit at the goose-neck.

Store the machine on the load platform, placing two continuous and clean strips of anti-slide mats (grammage approx. 10 kg/m², loadable up to 630 t/m², 10 mm thick, friction factor μ ≥ 0.6) under every roller drum/tyre.



Maximum permissible ramp slope: see loading charts

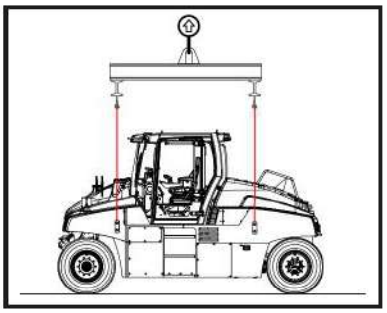
[L]	Ramp length [mm]
[H]	Difference in height [mm]
[S]	Ramp slope [%]

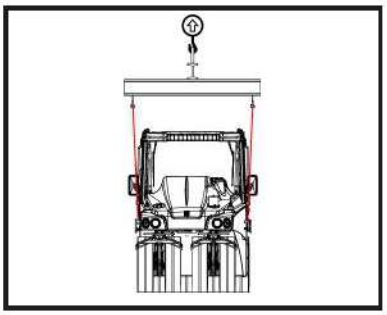


Make certain to use a proper load distribution plan.

[⊕]	Centre of gravity

Crane loading





Special notes

- The crane vehicle must be positioned on flat ground providing the bearing capacity required. To do so observe all relevant safety regulations.
- The crane's load table must correspond to the weight and to the centre of gravity of the machine to be lifted.

If the weight of the machine is not known, set the maximum operating weight (see type plate).

- Take suitable precautions to block access to the lifting area in order to prevent any person from moving or staying within the danger zone.
- Attach hoisting gears to the appropriate lifting lugs provided for them.
- Observe the lifting capacity of the hoisting gears.
- Use lifting frames or spreader beams if necessary.

Loading chart

Diagram of the transport position

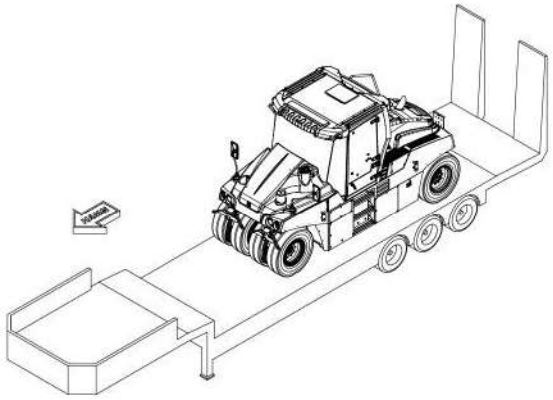
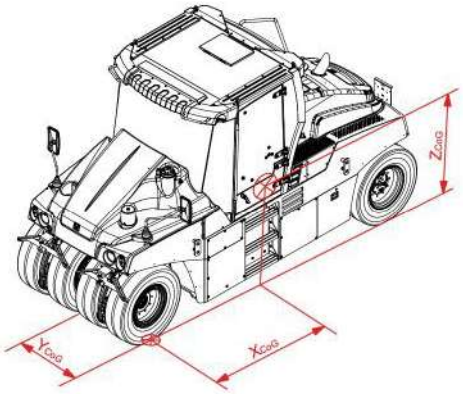
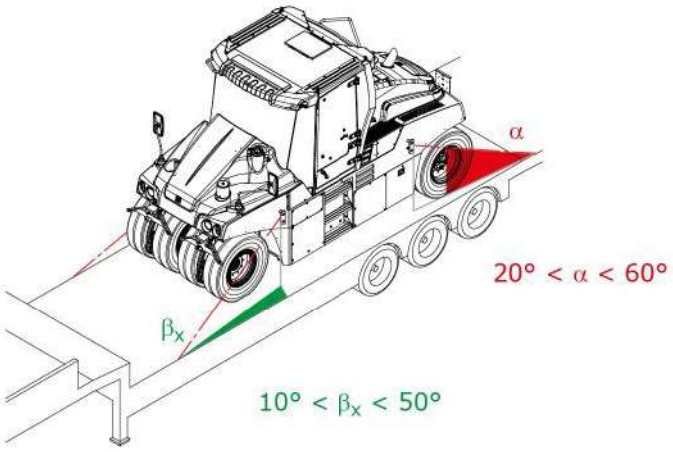


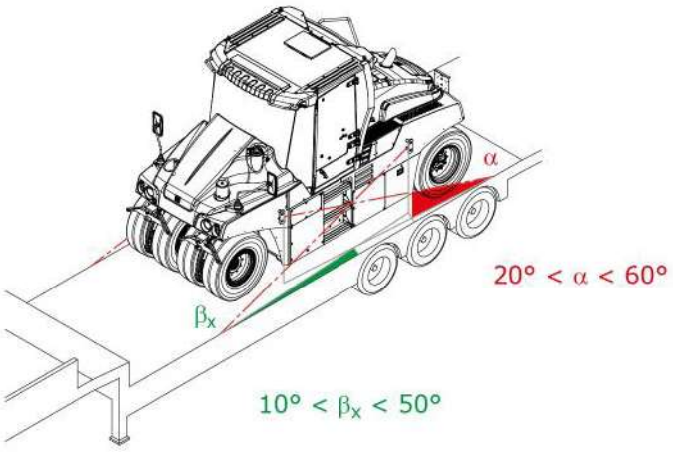
Diagram of the centre of gravity specifications





Lashing variant 1

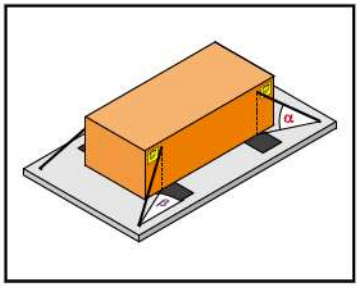
Weight class [t]	Lashing capacity LC (μ=0.6) [daN]
to 28.5	10000

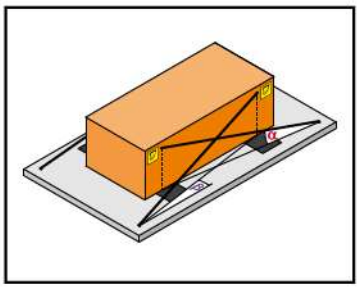


Lashing variant 2

Weight class [t]	Lashing capacity LC (μ=0.6) [daN]
to 28.5	10000

Machine parameters	
Weight of machine [t]	8.5 t < m < 28.5 t
Area of centre of gravity [mm]	X_{CoG} = 1790–2185 Y_{CoG} = 1083 Z_{CoG} = 930–1210
Identification reference point:	Centre drum, front left
Interface parameters:	
Type of contact:	Slip-resistant material
Frictional force [µ]:	0.6
Heavy load capacity:	yes
Contact points:	under contact pair
Vertical lashing angle α:	20° < α < 60°
Longitudinal, horizontal angle β_x:	10° < β_x < 50°





Specification of attachment points on the load:			
Tensile capacity of lashing point [daN]:	10000		
Marking of lashing point:	Symbol ISO 6405-1		
Number of lashing points:	4		
Specification of lashing points on the means of transport:			
Tensile capacity of lashing point [daN]:	≥ 10000		
Number of lashing points:	4		
Load securing equipment:			
Wedge blocks:	no	Quantity: 0	Miscellaneous:
Other types of blocking:	Positive blocking longitudinally/transversely to the direction of travel		
Lashing equipment capacity [daN]:	10000	Quantity: 4	Miscellaneous:
Recommended type of lashing equipment:	Chain (13/8 10000 daN),		
	Belt (10,000 daN) as an alternative		
Connecting pieces to the lashing point:	Hook with safety latch		

Specific safety instructions

- Drive the machine onto/off the loading area, with the diesel engine under automatic speed control (Hammtronic) and at the preset speed (maximum 2 km/h (1.2 mph)).
- Observe the maximum permissible ramp slope (21.0%, approx. 12°).
- Secure the clamping devices.
- On pneumatic-tyred rollers with a tyre-inflation system, the tyre pressure must be set to 0.6 MPa (6 bar, 87 psi).
- Check the tyre pressure at least every 24 hours and refill with air, if necessary (see Technical data).

Miscellaneous

- Slot in the seat console, close the cab doors, set down attachments.
- Completely close and block door panes and the roof hatch.

3.02 Functional tests before starting work

Check the following to ensure safe operation of the machine:

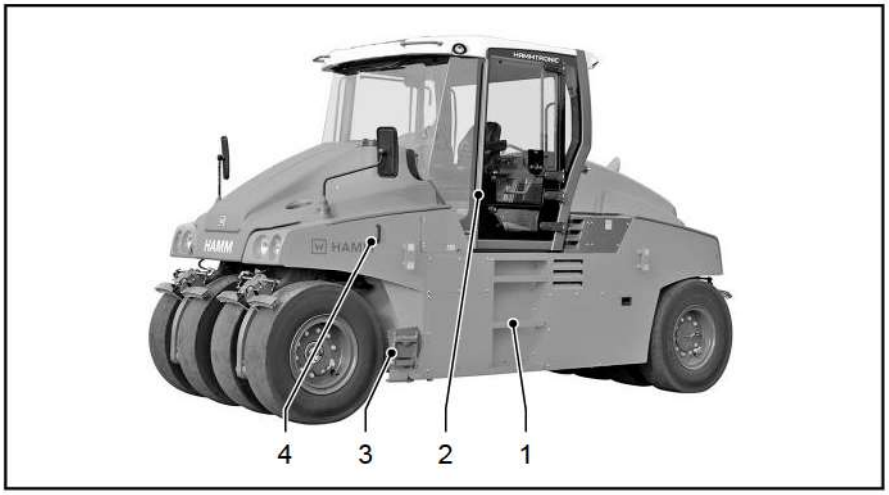
Check	Refer to
Can the machine be accessed safely?	"Access to the machine", page 72
Are the cab doors in the correct positions?	"Operating Doors and Windows", page 76
Has the driver's seat been adjusted?	"Adjust the operator's seat", page 81
Has the seat belt been tested?	"Using the seat belt", page 83
Has the position of the seat been adjusted?	"Adjust the operator's seat", page 81
Has the seat console been adjusted?	"Adjusting the Seat Console", page 92
Has the multifunction armrest been adjusted?	"Adjusting the multifunction armrest", page 85
Has the steering column been adjusted?	"Adjusting the steering column", page 84
Has the power supply to the battery disconnect control unit been switched on?	"Switching the electrical system/on-board power supply on and off", page 89
Are the turn signal and hazard warning lights working?	"Switching the signal horn and lighting on and off", page 95
Is the signal horn working?	"Switching the signal horn and lighting on and off", page 95
Are the lights working?	"Switching the signal horn and lighting on and off", page 95
Is the reversing warning system working?	"Driving in normal operation", page 107
Is the rotating beacon working?	"Switching the signal horn and lighting on and off", page 95
Are the rear-view and working mirrors adjusted?	"Adjusting the inside mirror, working mirror and rear-view mirror", page 88
Is the parking brake working?	"Checking that the parking brake is working properly", page 156
Is the foot brake working?	"Checking that the foot brake is working properly", page 157
Is the seat contact switch working?	"Checking that the seat contact switch is working properly", page 158
Is the EMERGENCY STOP working?	"Checking the EMERGENCY STOP function", page 160
Has the fuel tank fill level been checked?	"Control panel – fill level control indicator", page 122
Has the coolant fill level been checked?	"Checking the coolant fill level", page 175
Hydraulic oil tank fill level checked?	"Checking the hydraulic oil fill level", page 178
Has the water tank fill level been checked?	"Control panel – fill level control indicator", page 122
Has the windscreen washer system fill level been checked?	"Checking fill level of the windscreen washer", page 163
Has the air pressure in the tyres been checked?	"Checking air pressure in the tyres", page 186
Have the scrapers been checked?	"Checking scraper tyre", page 184

3.03 Access to the machine

⚠WARNING

Slipping when climbing in and out!
Risk of injury caused by slipping when climbing into and out of the machine.

- Use only the ladders, handrails and steps provided.
- Only climb into or out of the machine when it is at a standstill and secured in place.
- When climbing in and out, always ensure that any three of your hands and feet are in secure contact with the machine at all times.
- Keep ladders and steps clean and free of frost.
- If the anti-slip surfaces of the steps and treads are worn, repair or replace these.



[1]	Step to driver's cab	[2]	Handrails
[3]	Step	[4]	Handhold

3.03.01 Access to the operator's platform

The access to the operator's platform are on the left-hand side in direction of travel. Steps and handrails are arranged so that they are within easy reach and offer secure footing and handholds.

Emergency exit

The access to the operator's platform on the right hand side in the direction of travel is designed and marked as an emergency exit. Use the emergency exit only in emergency cases.

3.03.02 Forward step

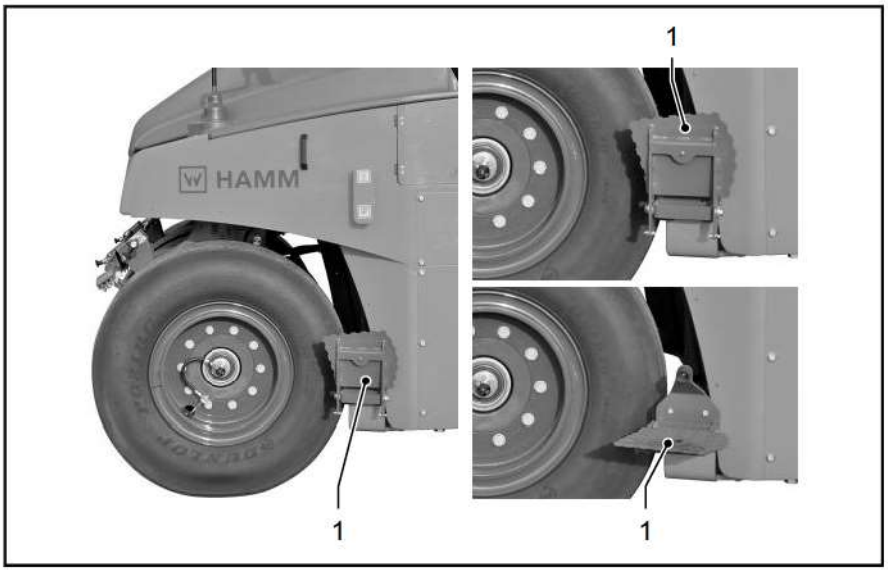
⚠CAUTION

Machine parts projecting out!

Injuries caused by impacts and crushing, as well as material damage caused by projecting machine parts.

- While driving and operating the machine, keep all machine parts that can be folded in and out (steps, engine compartment door) folded in or closed and locked.

The steps are intended solely for reaching higher service and maintenance points (e.g. water tank).



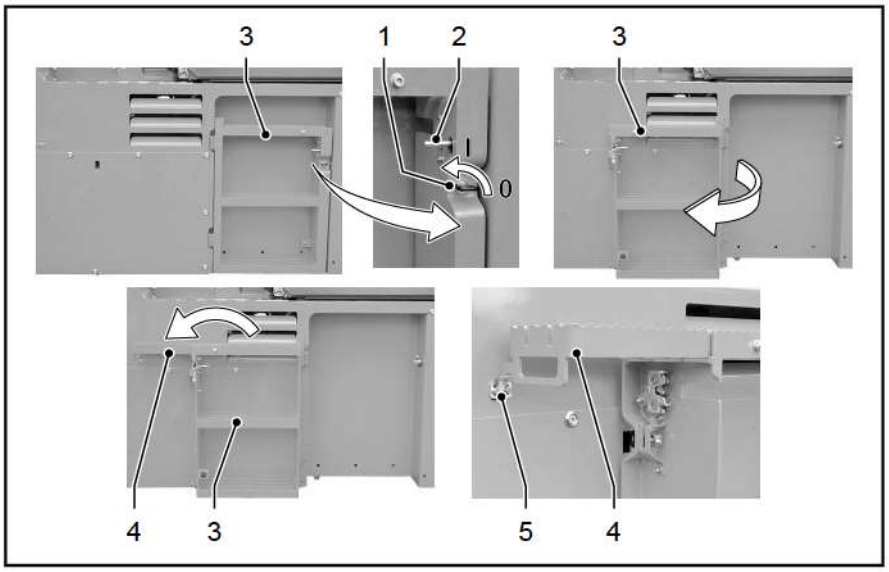
Folding out step

- ▶ Pull the step [1] out of the holder with a strong tug.
- ▶ Fold the step [1] down as far as it will go.

Folding in step

- ▶ Fold the step [1] up as far as it will go.
- ▶ Press the step [1] back in the fixing device.

3.03.03 Stairs to engine hood



Folding out step

- Open the lock [1] with the ignition key in position I.
- Press down the lock actuator [2].
- Swing out the steps [3] up to the chassis.
- Fold out and hang up the step [4] in the securing bracket [5].

Folding in step

- Fold back the step [4] to the steps [3].
- Swing in the steps [3] to the chassis and press the steps into the catch lock [2].
- Close the lock [1] with the ignition key in position 0.
- Pull off the ignition key.

3.03.04 Open and close engine hood

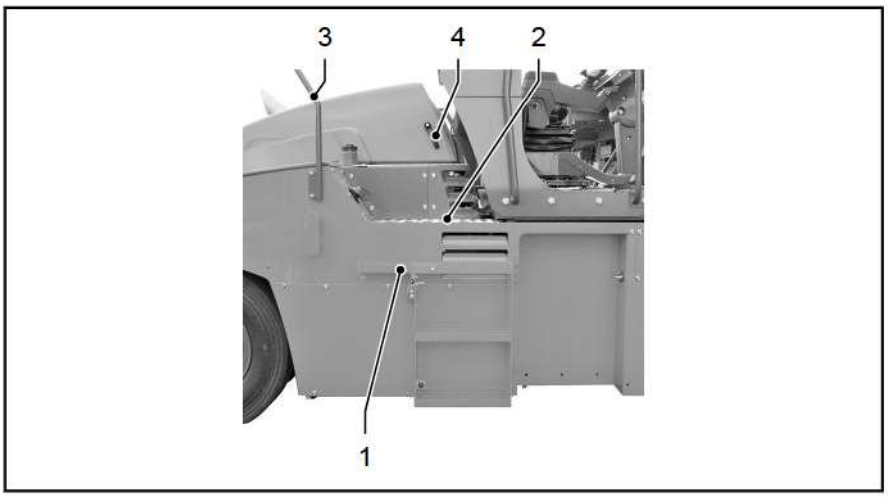
⚠WARNING

Large swivel range of the engine hood!
Injuries caused by movable machine parts.

- Ensure that there are no persons or objects in the danger zone of the machine.
- The engine cowling may only be opened when the engine is switched off.
- Make sure that there is adequate space above/behind.
- Carry out maintenance works only with the engine hood opened completely.
- Keep your body and limbs (e.g., hands) away from any movable part when closing the engine hood.

⚠WARNING

Steps not suspended properly!
Injury caused by falling.
- Do not step on the steps unless the fold-away step is safely suspended in the securing bracket.



Opening the engine hood

- ▶ Fold out and secure the steps [1].
- ▶ Stand on the standing surface [2].
- ▶ Put your left hand on the handhold [3] to ensure that you are standing safely.
- ▶ Press the push button [4] with your right hand.
- ▶ When passing the tipping point, the engine hood will open automatically.

Closing the engine hood

- ▶ Stand on the standing surface [2].
- ▶ Put your left hand on the handhold [3] to ensure that you are standing safely.
- ▶ Lower the engine hood while holding the handle [4] with your right hand, and press it into the lock.
- ▶ Fold in and lock the steps [1].

The engine hood must be locked while the machine is operating.

3.04 Operating Doors and Windows

⚠CAUTION

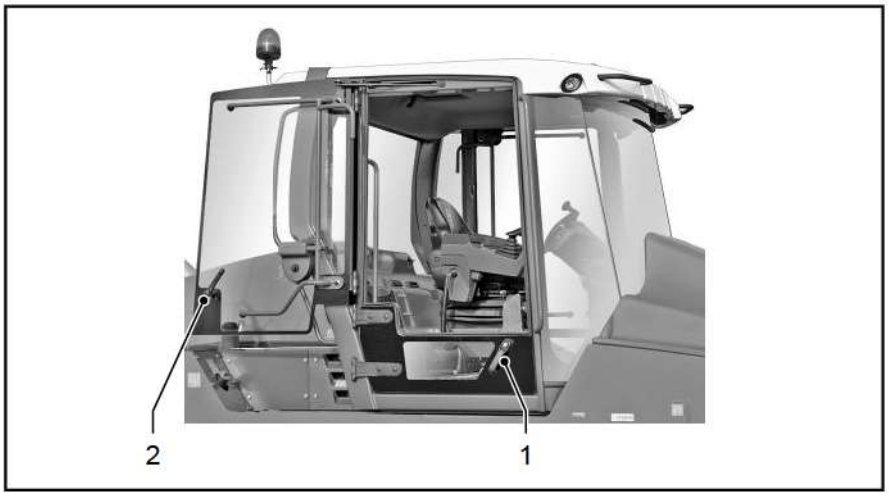
Projecting cab doors or windows!
Injuries caused by impacts and crushing, as well as material damage caused by cab doors or windows that are not locked.

- Before opening cab doors or windows, make sure that no persons or objects are in the danger zone of the machine.
- Keep the cab doors closed while driving and operating the machine. (at split cab door: lower door halves).
- Keep the windows locked in a completely closed or completely open position while driving and operating the machine. (Exception: ventilation position).
- Use the 90° position of the cabin door and window only to climb up or down the machine.

⚠CAUTION

Force exerted by gas-pressure spring!
Injuries caused by impacts with fast moving cab doors or windows.

- When opening and closing cab doors and windows, hold them against the forces exerted by gas-pressure springs and their dead weight.

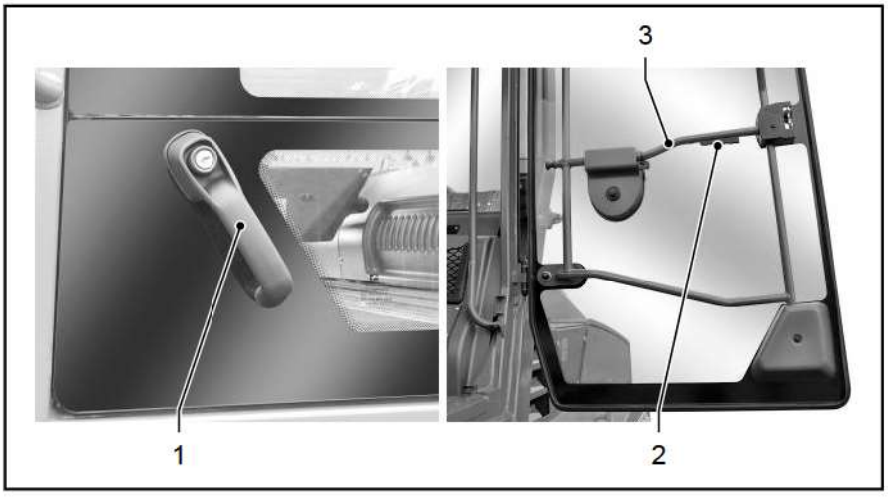


When equipped with a split cabin door [1], [2], the door window [2] can be opened separately.

Door panes that can be opened, must always be locked against falling down. If your cabin door is split, the lower half door must be closed and latched in place in the lock while driving.

3.04.01 Cabin door unsplit

Actuating doors



The door of the driver's cab is locked by a latch lock.
The door can be locked from the outside with the ignition key.

Open door from outside

- ▶ Press the push button at the handle [1].
- ▶ Pull the door by the handle [1] and swing out the door to its final click-stop position.
- ✔ The door is opened at a 90° position.

Open door from inside

- ▶ Press the handle [2] into the fastening frame [3].
- ▶ Swing out the door by the fasting frame [3] to the final click-stop position.
- ✔ The door is opened at a 90° position.

Closing and locking the door

- ▶ Close the door and push or pull it into the lock.
- ✔ Door is closed and locked.

Locating doors in position

Open door completely

Requirement: The door is at the 90° click-stop position.

- ▶ Swing out the door by the handle [1] beyond the 90° click-stop position and press the door into the locking device [4].
- ✔ The door is locked in place in the 180° position.

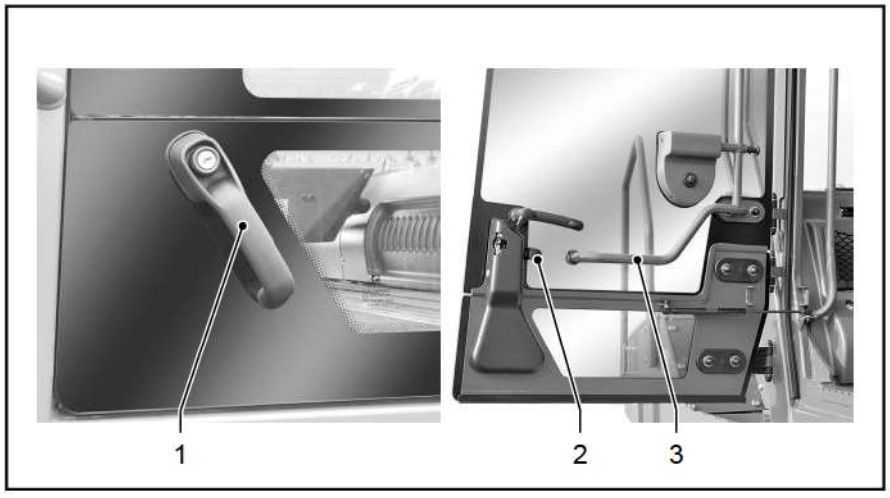
Releasing and shutting the door from the locked position

Requirement: The door must be locked in place in the 180° position.

- ▶ Press the actuation button [3] or pull the pulling knob [2].
- ✔ The door is now released from the locking device.
- ▶ Close the door using handle [1] and push or pull it into the lock.
- ✔ The door is closed and locked.

3.04.02 Cabin door split

Actuating doors



The door of the driver's cab is locked by a latch lock.
The door can be locked from the outside with the ignition key.

Open door from outside

- ▶ Press the push button at the handle [1].
- ▶ Pull the door at the handle [1], and swing out up to the stop.
- ✔ The door is opened at a 90° position.

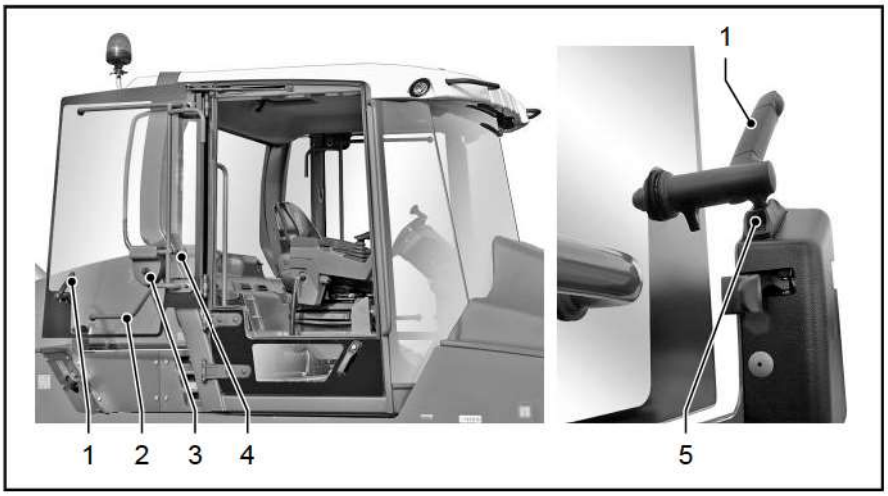
Open door from inside

- ▶ Pull handle [2] in direction of the seat console.
- ▶ Pull the door at the mountin frame [3], and swing out up to the stop.
- ✔ The door is opened at a 90° position.

Closing and locking the door

- ▶ Close the door and push or pull it into the lock.
- ✔ Door is closed and locked.

Actuating door windows



Complete opening of door window

Requirement: The door has to be closed completely.

- ▶ Fold the locking lever [1] up as far as it will go.
- ✔ The outer rotary lever releases the door window.
- ▶ Swivel the door window on the mounting frame [2] over the latching point 90° outwards and push it into the lock [3].
- ✔ The door window is locked in place in the 180° position.

Move the door window into the ventilation position

Requirement: The door has to be closed completely.

- ▶ Fold the locking lever [1] up as far as it will go.
- ▶ The outer rotary lever releases the door window.
- ▶ Press the door window to the outside by the locking lever [1], and lock it in the groove [5] by using the inner rotary lever.
- ✔ The door window is locked in the ventilation position.

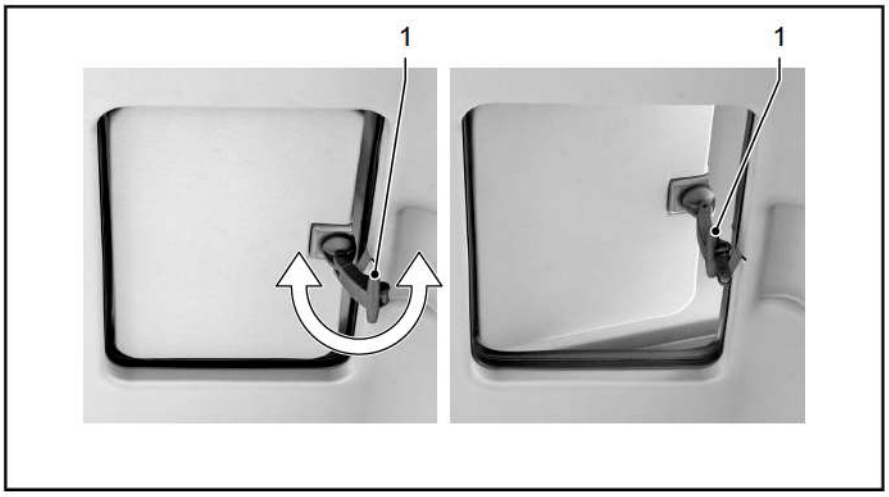
Releasing the door window from the locking device and shutting it

Requirement: The door window must locked in place in the 180° position.

- ▶ Press the actuation button [3], or pull the pulling knob [4].
- ✔ The door window is now released from the locking device.
- ▶ Shut the door window by the fastening frame [2].
- ▶ Pull the door window completely towards the driver's door with the locking lever [1].
- ▶ Fold down the locking lever [1] with the outer rotary lever in the groove [5].
- ✔ Door window is closed and locked.

3.05 Actuating roof hatch

The roof hatch is used to regulate the fresh air supply to the driver's cab. It is **not** designed as and must not be used as an emergency exit.



Opening roof hatch

- ▶ Throw the deflexion lever [1] over the tipping point.
- ▶ Swing up the deflexion lever [1] until reaching the stop.
- ✔ The roof light is now open and locked in place.

Closing roof hatch

- ▶ Swing down the deflexion lever [1] over the tipping point.
- ▶ Throw the deflexion lever [1] over the tipping point.
- ✔ The roof light is closed and locked in place.

3.06 Adjust the operator's seat

⚠WARNING

Uncontrolled motion!
Injuries due to uncontrolled movements when changing the driver's seat position when driving.

- Only drive with latched operator's seat.
- Do not adjust the driver's seat during travel.
- Free access to bodywork and engine parts.

The seat is adjusted to suit the size of the driver's body with the various setting options.

Setting driver's weight

There is damping built into the driver's seat that compensates for shock-like machine movements. For this damping to function optimally, the seat must be adjust to the weight of the driver.

- ▶ Turn the knob [1] until the desired driver's weight is set.
- ✔ The indicator [2] shows the set driver's weight.

Raising the driver's seat

- ▶ Raise the operator's seat with both hands until the desired height has been set.
- ✔ The operator's seat latches in every 30 mm.

Lowering the operator's seat

- ▶ First raise the operator's seat with both hands up to the stop.
- ▶ Then completely lower the operator's seat with both hands.
- ✔ The operator's seat goes down to its lowest position.
- ▶ Raise the driver's seat accordingly from the lowest setting.

Adjusting the seat face

- To move the seat face forwards: Lift the lever [6] and slide the seat face forwards.
- To move the seat face backwards: Lift the lever [6] and slide the seat face toward the rear.
- Release the lever [6].

Setting the slope of the backrest

- Tilting the backrest forwards: Lift the lever [5] and tilt the backrest forwards.
- Tilting the backrest backwards: Lift the lever [5] and tilt the backrest backwards.
- Release lever [5].

Setting the slope of the armrest

- Slope the armrest upwards: Turn the hand wheel [3] to the right.
- Move armrest down: Turn the hand wheel [3] to the left.

Setting armrest height

- Unscrew clamping screw [4].
- Raise the armrest Pull the armrest up the guideway.
- Lower the armrest: Push the armrest down the guideway.
- Tighten clamping screw [4] again.

3.07 Using the seat belt

⚠WARNING

Driving without safety belt!
Serious injuries or death can occur if the machine brakes suddenly or tips over and the seat belt is damaged or not worn correctly.

- Only drive the machine when wearing the seat belt.
- Put on the seat belt correctly and do not twist it.
- Make a visual examination of the seat belt when putting it on.
- Have the seat belt immediately replaced by an authorized service provider:
  - If it is worn or damaged
  - After an accident
  - As a general rule, every 3 years

Fastening the seat belt

When putting on and taking off the seat belt, avoid pulling it jerkily or tightening it excessively.

- ▶ Pull the seat belt out of the winding in a straight line.
- ▶ Pull the seat belt closely over the hips.
- ▶ Push the locking plate [1] into the belt lock [2].
- ✔ Seat belt is in position and closed.

Releasing the seat belt

- ▶ Push the button on the belt lock [2].
- ▶ Allow the seat belt to slide straight back into the winding.
- ✔ The seat belt is released.

Monitoring of seat belt use

When the safety belt is not fastened, a warning lamp lights up on the operator control panel (see "Operator control panel – Warning and pilot lights") and an audible signal is heard.

3.08 Adjusting the steering column

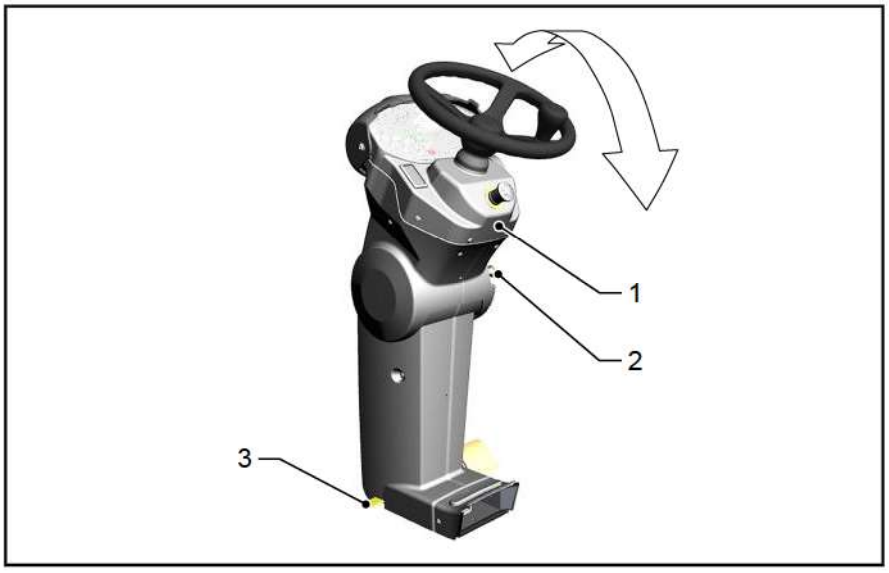
⚠WARNING

Uncontrolled motion!
Injuries due to uncontrolled movements when changing the steering column position when driving.

- Only drive with latched unit of control panel with steering wheel.
- Do not adjust the steering column when the machine is driving.
- Free access to bodywork and engine parts.

The steering column can adapted to suit the driver.

The angle between the control panel unit and the steering wheel is adjustable. This enables an ergonomic operating position to be achieved.



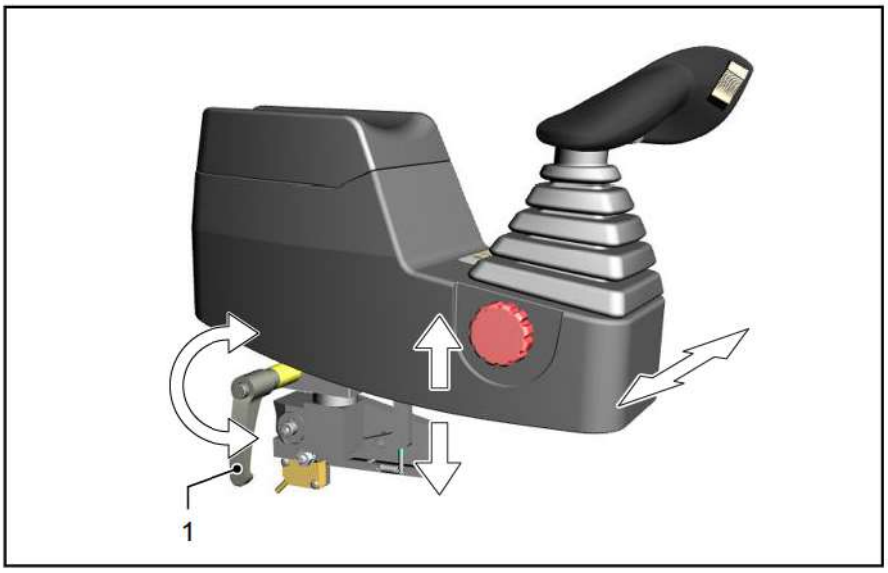
Ergonomic adjustment

- ▶ Pull the spring pin [2].
- ▶ The control panel with steering wheel unit [1] is swiwelled forward/backward.
- ▶ Release the spring pin [2] when the desired setting position is reached.
- ✔ The steering column is set and locked.

Adjusting the easy exit function

- ▶ Press the foot lever [3].
- ▶ Swing the operator control panel unit with the steering wheel [1] forward/backward up to the stop.
- ▶ Release the foot lever [3] when the stop is reached.
- ✔ The operator control panel unit with steering wheel [1] is locked in place in the end position.

3.09 Adjusting the multifunction armrest



Adjusting the height/side position of the multifunction armrest

- ▶ Turn the lever [1] to the left.
- ✔ Lock is released.
- ▶ Adjust the multifunction armrest.
- ▶ Turn the lever [1] to the right.
- ✔ The multifunction armrest is locked.

Multifunction armrest with folding function

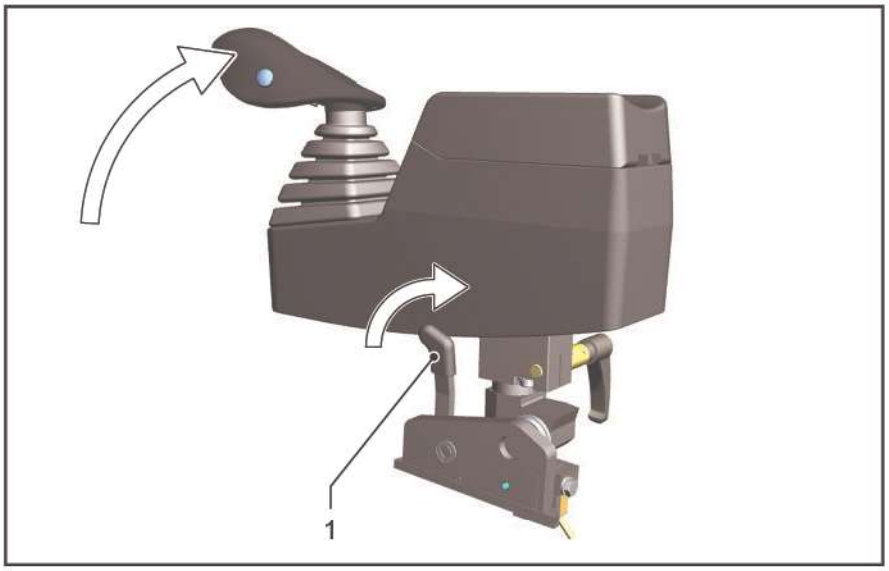
⚠WARNING

Fast automatic braking!

Delayed, fast braking of the machine that starts automatically can lead to serious injuries or death.

- Do not fold back the multifunction armrest when driving.
- Do not use the function of the safety switch to stop the machine.
- Brake and stop the machine with the driving lever.

In this version, the multifunction armrest can be folded back to make access to the driver's seat easier. A safety switch monitors the end position and enables the work functions.



Folding the multifunction armrest backwards

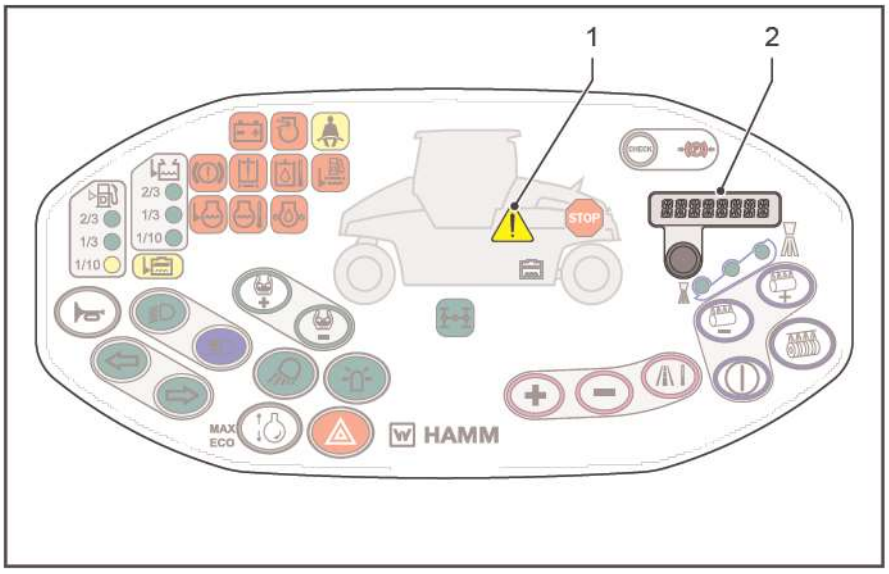
Prerequisite: The machine is at a standstill, drive lever is in P or 0.

- ▶ Push the lever [1] backwards and fold the armrest upwards.
- ✔ Driving and work functions are deactivated.

Folding the multifunction armrest forwards

- ▶ Fold the multifunction armrest down until it locks into place.
- ✔ Driving and work functions are activated.

End position monitoring



The multifunction armrest has a safety switch.

If the multifunction armrest is folded back while driving, the machine brakes after a delay. This can be avoided by folding the multifunction armrest down in good time.

- ▶ The multifunction armrest is folded back while driving.
- ✔ The indicator light [1] lights up on the control panel.
- ✔ The info display [2] shows fault code 426.
- ▶ If the driver does not react,

- ✔ an acoustic signal sounds after **1.5 seconds**.
- ▶ If the driver still does not react,
- ✔ the machine is quickly braked to a standstill after a total of **four seconds** and the operating functions are deactivated.
- ✔ The diesel engine continues running.

If the multifunction armrest is returned to the locked down position within four seconds of being folded back, braking is not initiated. The indicator light [1] and the fault code in the info display go out.

If the machine is unintentionally braked by the safety switch, the machine has to be brought into the home position before operation can be resumed.

Bring the machine to the home position – drive on after the delayed braking

Prerequisites:

- Machine is at a standstill, after delayed braking.
- Driver is sitting on the seat again.
- Multifunction armrest locked in the lower position.
- Diesel engine is running.

- ▶ Move the drive lever to position 0.
- ✔ Indicator light [1] goes out.
- ✔ The info display no longer displays the fault code [2].
- ✔ Driving and work functions are active again.

3.10 Adjusting the inside mirror, working mirror and rear-view mirror

Adjust the mirrors so that you can watch the traffic in the rear of the machine.

⚠WARNING

Falling off the machine!
Severity injuries or death through falling off the machine while adjusting the working mirrors.

- Adjust the working mirrors only when the machine has been safely parked.
- To reach the working mirrors use only the ladders, handrails and steps provided.

Clean mirrors at regular intervals.
Replace defective mirrors immediately.

Adjusting the working mirror and rear-view mirror

- The working mirror is adjusted by two persons:
  - The person on the outside of the machine adjusts the working and rear-view mirrors manually.
  - The driver inside checks the setting from a seated position.
- Align the mirror to the work edge of the roller drum/tyre.
- Adjust the mirrors so as to ensure that you still see the machine at the inside of the mirrors. This is the only way of avoiding a blind spot.

Folding in the working mirror and rear-view mirror

- Fold in the mirror.
- Turn the mirror holder until the mirror is locked.

Fold in and lock the operation mirror before transporting the machine on a lorry.

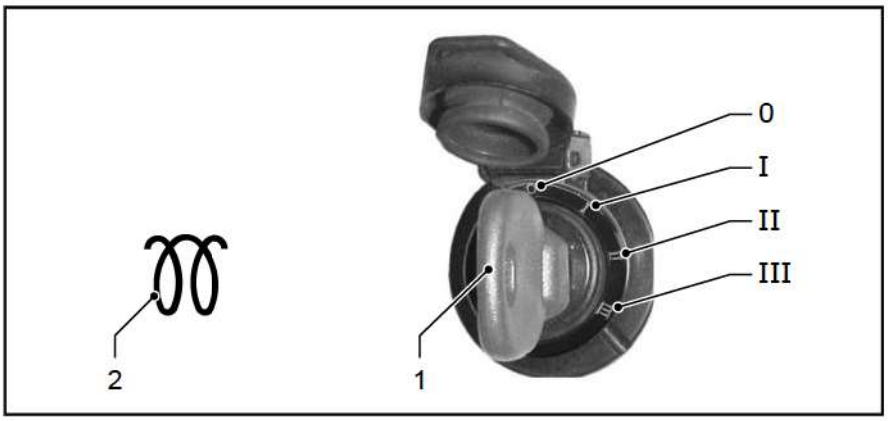
Adjusting the inside mirror

- Adjust the mirror from the driver's seated position.
- Adjust the mirror so as to ensure that you can see the area behind the machine in the mirror.

3.11 Switching the electrical system/on-board power supply on and off

Ignition key

The electrical system is switched on and off and the diesel engine started and stopped with the ignition key.



The pilot light for cold start assistance can also look different in different machine types.

Switching on the electrical system

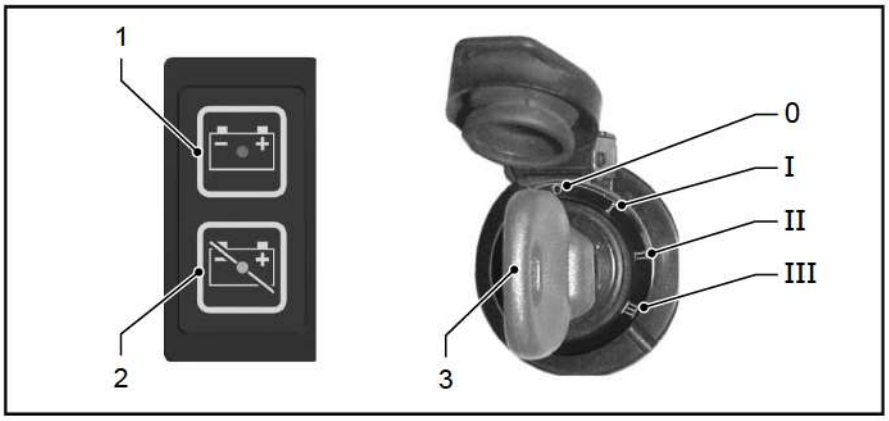
- ▶ Turn the ignition key [1] to position I.
- ✔ The electrical system is switched on.
- ✔ Functional control of warning and indicator lights.
- ✔ Indicator light for cold start assistance [2] lights up until the start temperature is reached.
- ✔ The diesel engine remains switched off.

Switching off the electrical system

- ▶ Turn the ignition key [1] to position 0.
- ✔ The diesel engine is stopped.
- ✔ The electrical system is switched off.

For versions with electronic battery switch-off

By switching off the battery, the internal power supply can be disconnected from the voltage source.
The electrical system can only be started if the on-board power supply is connected to the battery voltage.



The battery is disconnected if the machine is to be shutdown time for a

- lengthy time (night, weekend, lengthy transport).
- During maintenance and repair work, especially on the electrical system.

After the battery is switched off, the power supply from the battery remains disconnected even when the electrical system is switched on (ignition key [3] in position I). The displays on the operating panel are switched off and the diesel engine cannot be started.

Battery switch-off control unit

The control unit with the on [1] and off [2] switches ensures a controlled, time-delayed switching off of the battery power. This ensures that the required testing and storage routines may be performed in the control unit for the diesel engine.

Pressing the switch [2] starts the battery switch-off. However, the switch off does not take place until the electrical system has been switched off (ignition key [3] in position 0) and after an after-running time of approx. 2 minutes.

Activating control unit of battery switch-off

Requirement:
electrical system ON (ignition key [3] in position I)

- ▶ Press switch [1].
- ✔ LED lights up green.
- ✔ Control unit is activated.

Requirement:
electrical system OFF (ignition key [3] in position 0)

- ▶ Press switch [1].
- ✔ LED flashes green.
- ✔ Control unit in standby mode.

Switch off with preselection

Prerequisites:

- electrical system ON (ignition key [3] in position I)
- Control unit of battery switch-off is activated

- ▶ Press switch [2].
- ✔ Battery switch-off is preselected, LED lights up red.
- ▶ Switching off electrical system: ignition key [3] in position 0.
- ✔ After-running time starts, LED flashes red.
- ✔ The battery is disconnected after approx. 2 minutes.
- ✔ Control unit switches to standby mode.
- ✔ All LEDs off.

Switch off without preselection

Prerequisites:

- electrical system OFF (ignition key [3] in position 0)
- Control unit of battery switch-off is activated

- ▶ Press switch [2].
- ✔ After-running time starts, LED flashes red.
- ✔ The battery is disconnected after approx. 2 minutes.
- ✔ Control unit switches to standby mode.
- ✔ All LEDs off.

Standby mode

Requirement:
Control unit of battery switch-off is activated

- ▶ Switching off electrical system: ignition key [3] in position 0.
- ✔ Control unit in standby mode, LED flashes green.
- ✔ Battery is disconnected after approx. 24 hours.
- ▶ Circuit breaker [2] is pressed in stand-by mode.
- ✔ After-running time of approx. 2 minutes starts, LED flashes red.
- ✔ Battery is disconnected after expiry of the after-running time.
- ▶ Electrical system switched on in standby mode (ignition key [3] in position I).
- ✔ Machine can be operated normally, the control LED of the control unit is off.
- ✔ The control unit remains in stand-by mode.

Switch on battery power, start diesel engine

After the battery has been disconnected, the control unit has to be activated in order to switch on the battery voltage. The battery voltage is switched on without delay.

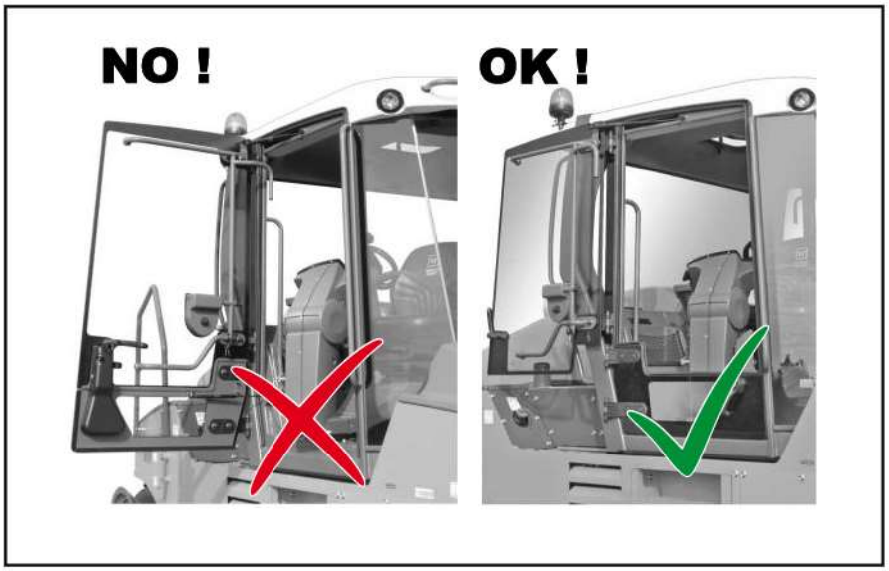
- ▶ Press switch [1].
- ✔ LED flashes green.
- ▶ Switch on electrical system: ignition key [3] in position I.
- ✔ LED lights up green.
- ✔ Brief functional check of all pilot lights
- ✔ The diesel engine can be started.

3.12 Adjusting the Seat Console

⚠WARNING

Fall and collision!
Injury to parts of the body projecting out of the machine.
Damage to parts of the seat console projecting out of the machine.

- Operate the machine only in an admissable seat position.
- Always position/adjust the seat console so that is does not project out of the machine.



Inadmissable seat position

It is not admissable to operate the machine if parts protrude the steering console or the seat pedestal on the side of the cabin/ ROPS.

Admissable seat position

Use it for earth moving work only if the seat position is in the centre of the operator platform.

The outer seat position is admissable only when working on asphalt.

Use it for transportation only if the seat position is in the centre of the operator platform.

Seat console with mechanical seat adjustment

⚠WARNING

Uncontrolled movements!
Injury due to uncontrolled movements when changing the seat console position.

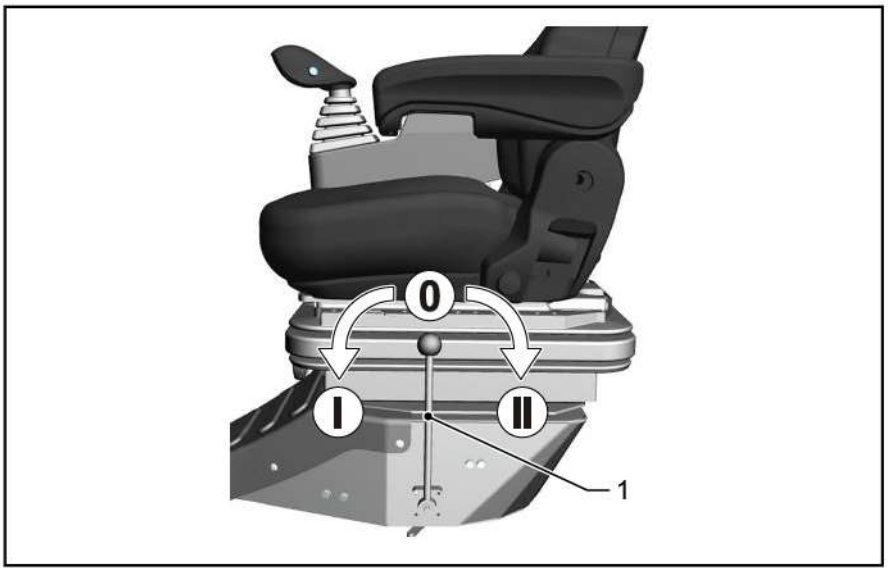
- Only drive with latched seat console.
- Do not adjust the seat pedestal during driving.
- Adjust the seat console only when the machine is standing on a level surface.

NOTICE

Restricted seat adjustment!

Material damage to the seat or the machine when moving or turning the seat console.

- Restrict the maximum lateral offset of the seat console in such a way that it is possible to turn and adjust the seat/seat console without colliding with parts of the driver's cab.
- Do not store any objects in the foot area of the driver's cab.



Rotating the seat console

The seat console can be turned into snap-in positions a maximum of 90° to the left or right.

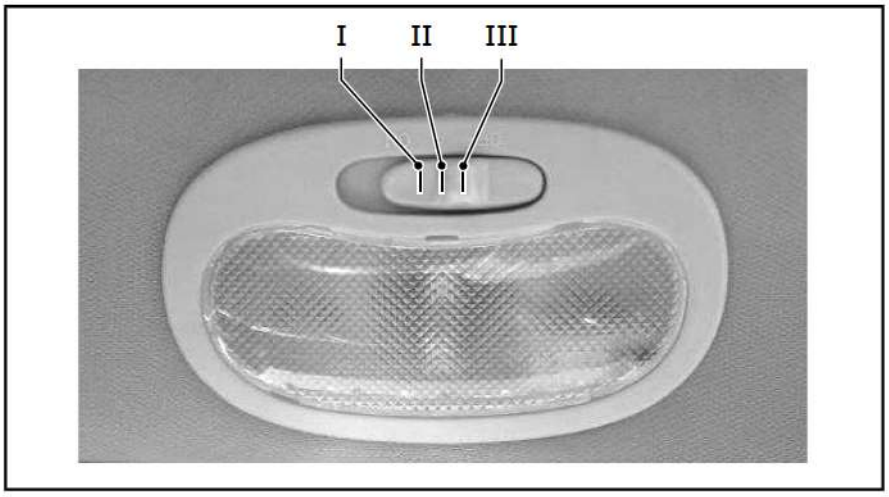
- ▶ Swivel the lever [1] to position I and hold it there.
- ✔ The lock is released.
- ▶ Use physical force to turn the seat console to the desired position.
- ▶ Release lever [1].
- ▶ Use physical force to move the seat console to the left and right until it locks into place.
- ✔ The seat console is locked.

Shifting the seat console to the left and right

The seat console can be shifted into snap-in positions to the left or right.

- ▶ Swivel the lever [1] to position II and hold it there.
- ✔ The lock is released.
- ▶ Use physical force to shift the seat console to the desired position.
- ▶ Release lever [1].
- ✔ Use physical force to move the seat console to the left and right until it locks into place.
- ✔ The seat console is locked.

3.13 Interior lighting



Setting the light permanently to on

- ▶ Move switch in position I.

Switching the light on and off automatically

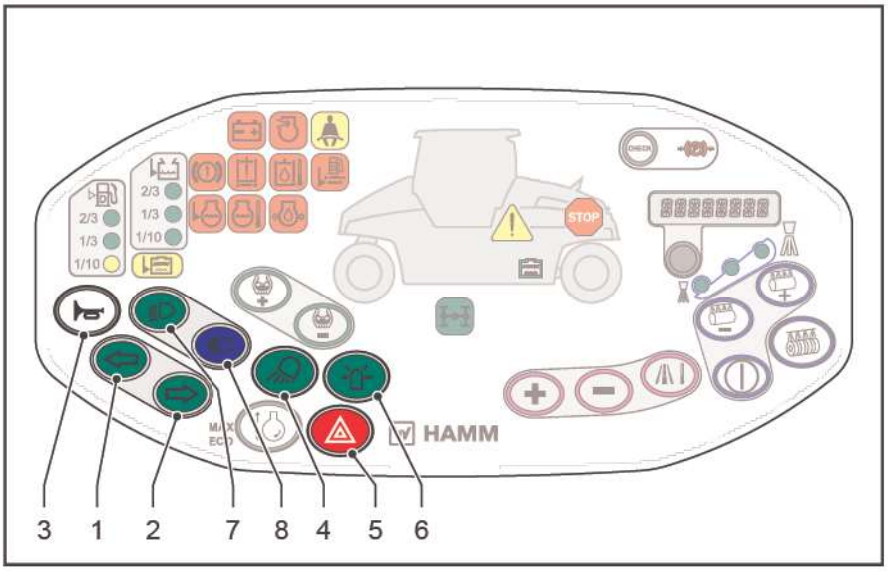
- ▶ Move switch in position II.
- ✔ The door contact switch switches the lighting on and off.

Setting the light permanently to off

- ▶ Move switch in position III.

3.14 Switching the signal horn and lighting on and off

When the lights are set to on for a longer period of time although the engine is stopped, the battery will be discharged quickly.



Actuating signal horn

Requirement: Electrical system is ON.

- ▶ Press the signal horn switch [3].
- ✔ A short acoustic signal sounds when a fault is detected.

Switching the hazard warning lights on and off

- ▶ Press switch [5].
- ✔ Switch [5] flashes: The hazard warning light is switched on.
- ▶ Press the switch [5] again.
- ✔ Switch [5] is not lit up: The hazard warning light is switched off.

Signalling left/right

Prerequisite: The electrical system is ON.

- ▶ Press switch [1] for signalling left.
- ▶ Press switch [2] for signalling right.
- ✔ The relevant switch [1/2] flashes: The turn signal light is switched on.
- ▶ Press the switch [1/2] again.
- ✔ Switch [1/2] is not lit up: The turn signal light is switched off.

Switching the parking light on and off

Prerequisite: The electrical system is OFF.

- ▶ Press switch [7].
- ✔ Switch [7] lights up: The parking light is switched on.
- ▶ Press the switch [7] again.
- ✔ Switch [7] is not lit up: The parking light is switched off.

Switching the driving light on and off

Prerequisite: The electrical system is ON.

- ▶ Press switch [7].
- ✔ Switch [7] lights up: The driving light is switched on.

- ▶ Press the switch [7] again.
- ✔ Switch [7] is not lit up: The driving light is switched off.

When it is set to on, the parking light will automatically change to driving light as soon as the electrical system is set to on.
When it is set to on, the driving light will automatically change to parking light as soon as the electrical system is switched off.

Switching the high beam on and off

Prerequisite: The electrical system is ON.

- ▶ Press switch [8].
- ✔ Switch [8] lights up: The high beam is switched on.
- ▶ Press the switch [8] again.
- ✔ Switch [8] is not lit up: The high beam is switched off.

If the high beam is switched on, it switches off as soon as the electrical system is switched off.

Switching the work light on and off

Depending on the machine's configuration, the working light can consist of various components, e.g.

- front and/or rear working spotlights.
- Drum edge lighting.

Prerequisite: The electrical system is ON.

- ▶ Press switch [4].
- ✔ Switch [4] lights up: The work light is switched on.
- ▶ Press the switch [4] again.
- ✔ Switch [4] is not lit up: The work light is switched off.

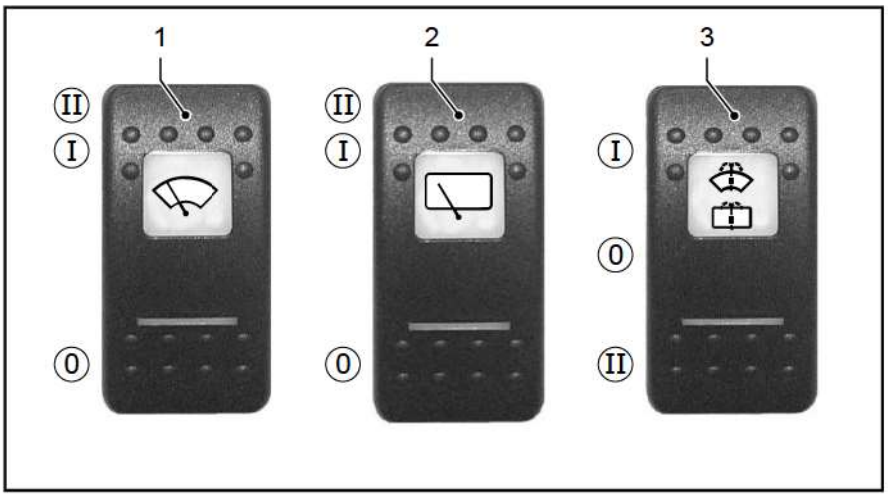
Switching the rotating beacon on and off

Prerequisite: The electrical system is ON.

- ▶ Press switch [6].
- ✔ Switch [6] lights up: The rotating beacon is switched on.
- ▶ Press the switch [6] again.
- ✔ Switch [6] is not lit up: The rotating beacon is switched off.

3.15 Switching the windscreen wiper and windscreen washer system on/off

Before starting a journey, check that the windscreen wipers and the windscreen washer system are working. Check the windscreen washer system fill level. Top up the windscreen washer system tank if necessary.



[1]	Front windscreen wiper switch	[2]	Rear windscreen wiper switch
[3]	Windscreen washer system switch		

Switching on the windscreen wiper

- ▶ Push the corresponding switch [1] or [2] into position I.
- ✔ The windscreen wiper is now working at stage 1.
- ▶ Push the corresponding switch [1] or [2] into position II.
- ✔ The windscreen wiper is now working at stage 2.

Switching off the windscreen wiper(s)

- ▶ Push the corresponding switch [1] or [2] into position 0.
- ✔ Windscreen wiper off.

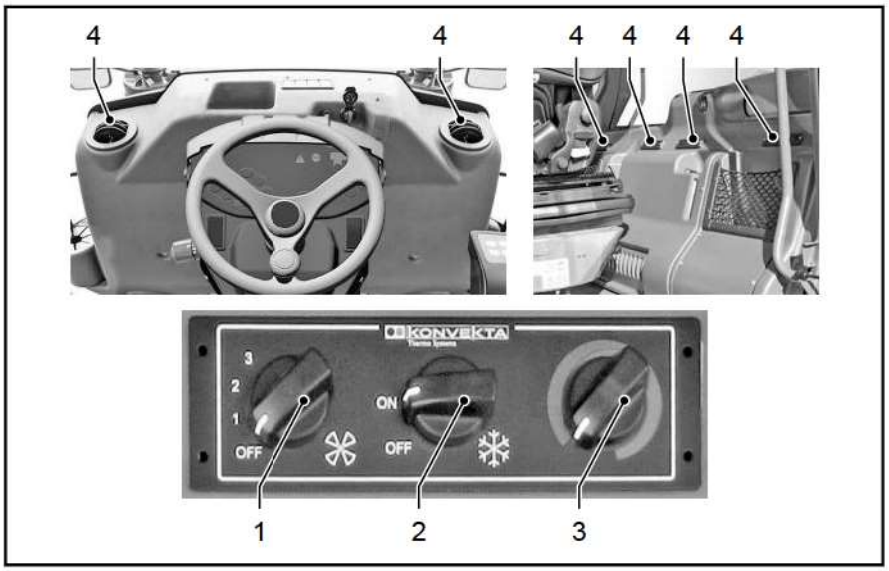
Switching the windscreen washer system on/off

- ▶ Push the switch [3] into position I and hold it there.
- ✔ The front windscreen is wetted.
- ▶ Push the switch [3] into position II and hold it there.
- ✔ The rear windscreen is wetted.
- ▶ Release the switch [3] or push it into position 0.
- ✔ Windscreen washer system off.

3.16 Heating and air-conditioning system

The heating and ventilating system enables the driver to set an optimum room air condition inside the cab and maintain free visibility through the window panes. You can adjust temperature and air supply.

The air flow can be cooled if the machine is equipped with an air conditioning system.



3.16.01 Fan

Switching on the fan/setting the ventilation stage

Requirement: electrical system ON.

- Turn the switch [1] to position 1, 2 or 3.
- Open or close ventilation nozzles [4]. Fold the slats open or shut.
- Set the direction of the ventilation nozzles [4]: Turn the lamella ring in the desired direction.

For drying or deicing the front or rear window: Direct an airflow toward the windows.

Switch off fan

- Turn switch [1] in position OFF.

✔ Fan is switched off.

3.16.02 Heating

The heat exchanger for the heating is connected to the engine cooling circuit. The airflow is warmed in the heat exchanger, and fed into the cab.

Switch on the heating system/set the ventilation stage

- ▶ Set the ventilation stage: Turn the switch [1] to position 1, 2 or 3.
- ▶ Set the heating temperature: Turn the continuously variable switch [3].

Switching off heating system

- ▶ Turn switch [1] in position OFF.
- ✔ The heating system is turned off.

3.16.03 Cooling

Switch on air conditioning at least 1 per month (even in winter) for approx. 15 minutes.

Switching on the air conditioning system/setting the ventilation stage

- ▶ Close the cab windows and doors to air condition the cab quickly.
- ▶ Switch on air conditioning system: Turn the switch [2] to the ON position.
- ✔ Air-conditioning is switched on.
- ▶ Set temperature: Turn the continuously variable switch [3].

Switch off air conditioning system

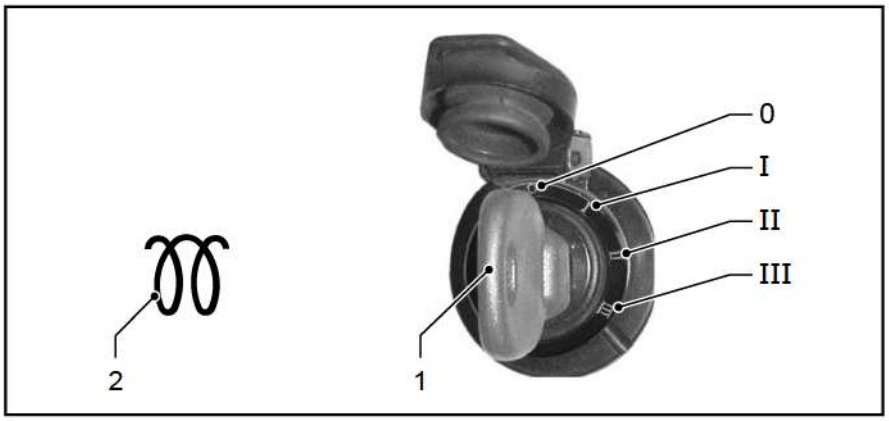
- ▶ Move switch [2] in position OFF.
- ✔ Air conditioning system is switched off.
- ✔ The system only runs in ventilation mode.

3.17 Starting the machine

Requirement: Fill levels for the operating materials, for example fuel, water etc., are adequate.

Before starting the machine, check all functions and settings (see "Function tests before starting work").

The electrical system is switched on and off and the diesel engine started and stopped with the ignition key.



[0]	Electrical system OFF, diesel engine STOP	**[I]**	Electrical system ON
[II]	without function	**[III]**	Engine start

The pilot light for cold start assistance can also look different in different machine types.

When the engine is at a standstill and the electrical system is switched on for a longer period (position I), the battery discharges rapidly.

Switching on the electrical system

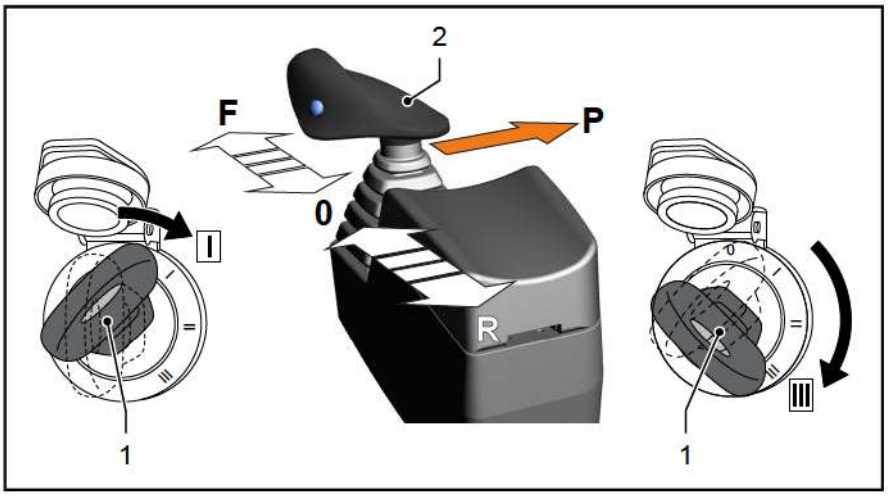
- ▶ Turn the ignition key [1] to position I.
- ✔ The electrical system is switched on.
- ✔ Functional control of warning and indicator lights.
- ✔ Indicator light for cold start assistance [2] lights up until the start temperature is reached.
- ✔ The diesel engine remains switched off.

Starting the diesel engine

NOTICE

Damage of the starter!
Damage or destruction of the starter as a result of an excessively long start phase.

- Keep the ignition key not lonager than 5 seconds in position III.
- If a starting attempt fails, make a fault diagnosis.



The starter is only connected to the start switch when the drive lever is in position P. This is the only way to start the diesel engine.

Conditions for starting the engine:

- The drive lever [2] is latched into the P position.
- The EMERGENCY STOP button is released.
- Internal power supply and electrical system are switched on: ignition key [1] in position I.
- Cold starting device pilot light is off.

▶ Turn the ignition key [1] to position III and hold it there until the diesel engine starts.

✔ Diesel engine starts.

✔ Ignition key turns back to position I after releasing.

3.18 Driving

⚠WARNING

Braking delay!
Severe injury or death due to a longer braking distance at a low operating temperature and especially when freezing.

- After starting the diesel engine, wait for a few minutes before driving off until the machine reaches the operating temperature.
- Whilst the hydraulic oil temperature warning light is on, drive the machine at only a moderate speed.

⚠WARNING

Full braking!
Severe injuries caused by a strong braking force.

- Drive with foresight and adjust your speed to the environmental and weather conditions.
- In case of visible obstacles reduce speed in good time.

NOTICE

Contamination!
Material damage to scrapers and other parts of the machine as a result of soiled drums or tires.

- Before driving off, ensure that there are no clumps of earth sticking to the drums or tyres.
- Park machine on boards or dry gravel if there is a risk of frost.

Operate the machine sitting on the operator's seat only! Multiple safety systems prevent the machine from being driven further as soon as the driver stands up from his seat.

3.18.01 Seat contact switch

The machine may only be operated from the driver's seat. The machine is equipped with a seat contact switch to ensure this. If the driver rises from their seat while driving, the seat contact switch is activated and the machine brakes after a delay.

⚠WARNING

Fast automatic braking!
Delayed, fast braking of the machine that starts automatically can lead to serious injuries or death.

- Only drive the machine when seated.
- Do not use the function of the safety switch to stop the machine.
- Brake and stop the machine with the driving lever.

Driver's seat monitoring

- ▶ If the operator leaves their seat while driving, the machine brakes after a delay.
- ▶ If the driver does not react,
- ✔ an acoustic signal sounds after **1.5 seconds**.
- ▶ If the driver still does not react,
- ✔ the machine is braked to a standstill after a total of **4 seconds** and the operating functions are deactivated.
- ✔ The diesel engine continues running.

Braking is not initiated if the driver returns to their seat within 4 seconds of leaving it.

If the machine is unintentionally braked by the safety switch, the machine has to be brought into the home position before operation can be resumed.

Bring the machine into the home position – drive on after the delayed braking

Prerequisites:

- The machine is at a standstill, after delayed braking.
- Driver sitting on the seat again.
- Diesel engine is running.

- ▶ Move the drive lever to position 0.
- ✔ The operating functions are active again.

3.18.02 Hammtronic - Electronic machine management

The Hammtronic monitors the engine and vehicle functions. It monitors the adaptation of travel drive and motor speed to the current operating conditions. Bringing together all the machine data ensures perfect machine coordination, and achieves optimal compaction quality.

Drive unit

The hydraulic drive is optimized. Features such as preselection of the final speed, constant speed function, limited load control etc. guarantee the best traction.

Final speed

When starting the engine the selected final speed is reduced for safety reasons. The value can be increased to the maximum final speed when working.

Constant speed function

The set driving speed is held constant in normal operation by the constant speed function. Factors such as engine speed changes are monitored and included in the calculation of the road speed.

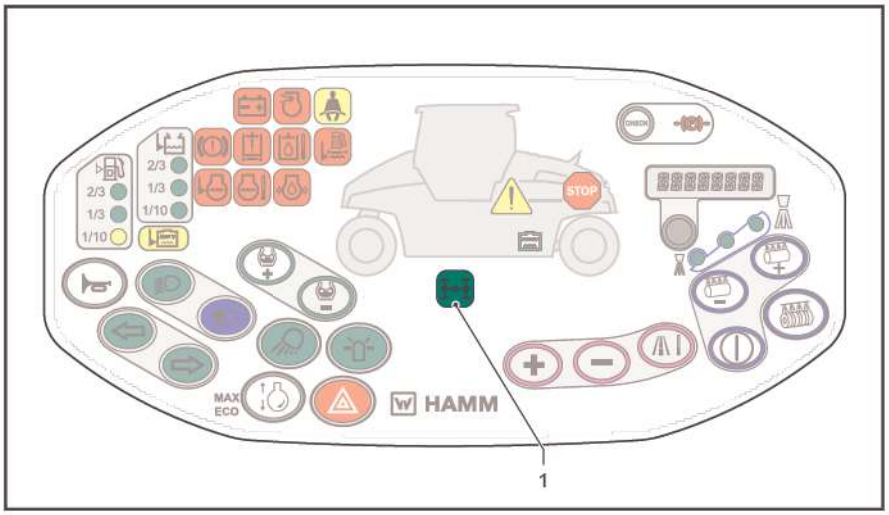
Limited load control

If the speed of the diesel engine drops below a certain value as a result of an increased load (e.g. uphill driving), the control device will automatically switch over to limited load control. At the same

time, the driving speed is reduced to such an extent as to prevent an overloading of the diesel engine. If the load is reduced (e.g. driving on level ground), the driving speed is increased back up to the original value.

3.18.03 Automatic slip control (ASC)

Drive wheel traction is constantly monitored by Hammtronic. Any change in soil conditions which would cause the drive wheels to partially spin will be compensated by modifying the driving torque in the hydraulic motors.



ASC light active

Prerequisite: Drive lever in position F or R.

- ✔ The drive torques of the hydro motors are not equal.
- ✔ Control indicator [1] lights up.

ASC light inactive

Prerequisite: Drive lever in position F or R.

- ✔ The drive torques of the hydro motors are equal.
- ✔ Control indicator [1] is not active.

3.18.04 Engine management (ECO/MAX)

NOTICE

Increased wear and emission!

High stress on the machine and increased exhaust emission with engine management in MAX mode.

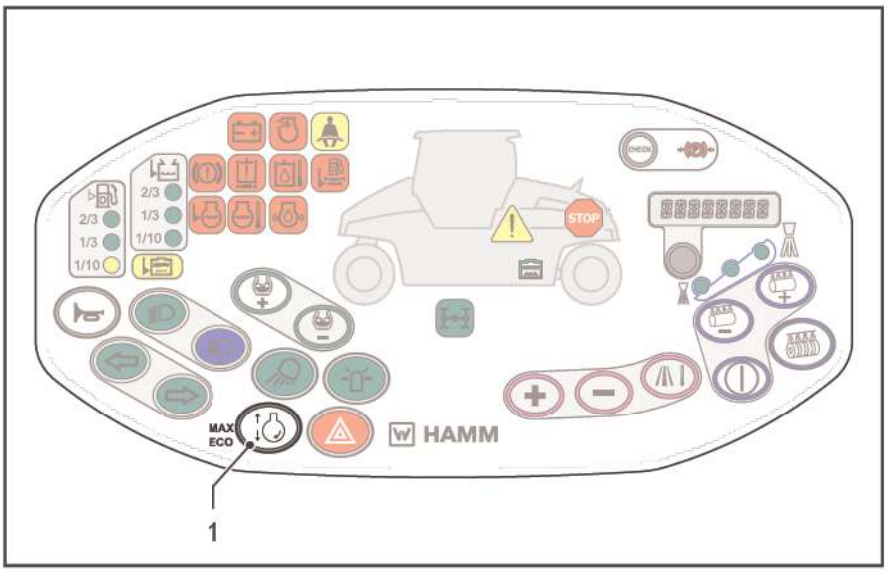
- Only use engine management MAX mode when necessary.
- Under normal field service conditions, always run the diesel engine in ECO mode.
- Never switch off the diesel engine in MAX mode as this can lead to faults in the engine management and exhaust gas treatment.

The Hammtronic has two different modes:

- Engine management ECO and
- Engine management MAX.

Engine management ECO assists fuel-saving ways of working and driving. The electronic controller continually calculates the optimal speed of the diesel engine, and the engine is controlled automatically. ECO engine management mode is always set after the engine has started.

MAX engine management should only be activated infrequently because the diesel engine always runs at maximum speed. If extreme performance requirements are placed on the machine, the Hammtronic allows switching to MAX mode. Do not switch off the diesel engine while in MAX mode.



Setting engine management ECO

Switch [1] lights up red: The engine control is in MAX mode.

▶ Press switch [1].

✔ Switch [1] is not lit up: The engine control is in ECO mode.

Setting engine management MAX

Switch [1] is not lit up: The engine control is in ECO mode.

▶ Press switch [1].

✔ Switch [1] lights up red: The engine control is in MAX mode.

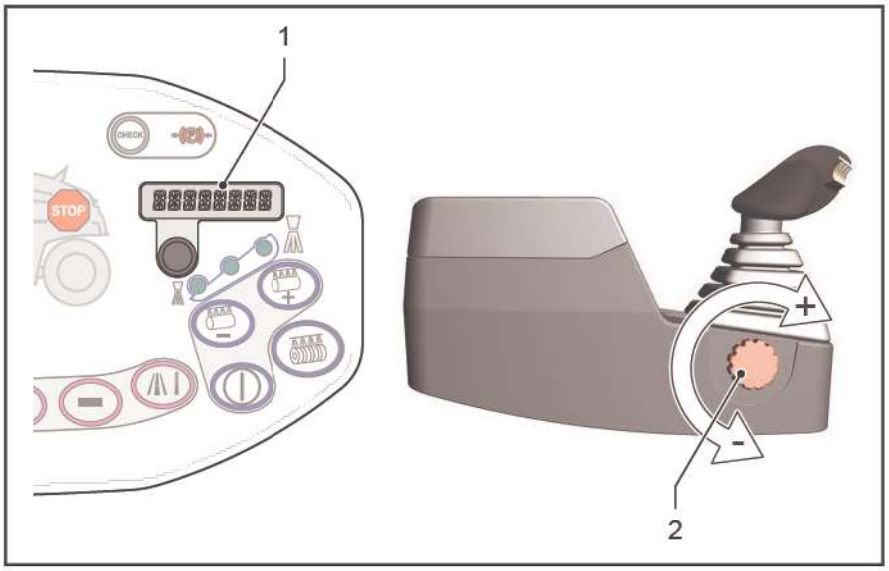
3.18.05 Presetting the final speed

The final speed is preset to 2 km/h (1.25 mph) every time the engine is started.

The machine reaches the preset final speed at maximum deflection of the drive lever.

Setting the final speed:

- The final speed can be set up to the maximum speed while driving.
- At a standstill, the final speed can be set up to the maximum speed.
- The minimum speed that can be set is 1 km/h (0.62 mph).



Increase final speed

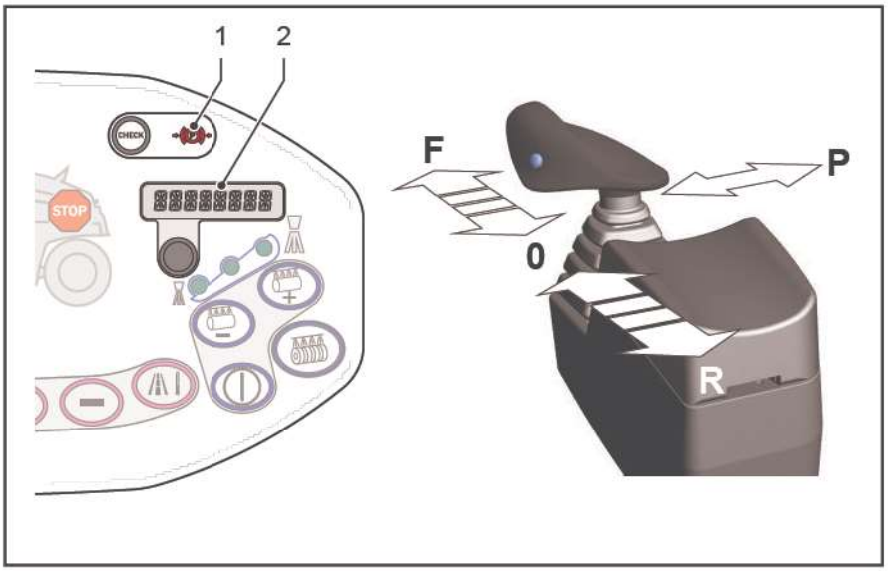
- ▶ Turn the final speed handwheel [2] forwards.
- ✔ The infodisplay [1] shows the preset value for 3 seconds, then the current speed will be indicated.

Descreasing final speed

- ▶ Turn the final speed handwheel [2] backwards.
- ✔ The infodisplay [1] shows the preset value for 3 seconds, then the current speed will be indicated.

Maximum speed of the machine: See "Technical data", page 214

3.19 Driving in normal operation



Make ready to drive/release parking brake

Requirement: Engine management ECO is set

- ▶ Press drive lever from the P position to the left into the 0 position.
- ✔ Parking brake indicator light [1] is out. Machine is ready to start.
- ✔ The engine speed is automatically increased.

Driving forwards

- ▶ Move the drive lever in the F direction.
- ✔ The engine speed is automatically increased.
- ✔ The machine travels forwards, at maximum up to the preset speed.
- ✔ The infodisplay [2] shows the current driving speed.

Driving backwards

- ▶ Move the drive lever in the R direction.
- ✔ The reversing lights are on.
- ✔ The engine speed is automatically increased.
- ✔ The machine travels in reverse, at maximum up to the preset final speed.
- ✔ The infodisplay [2] shows the current driving speed.

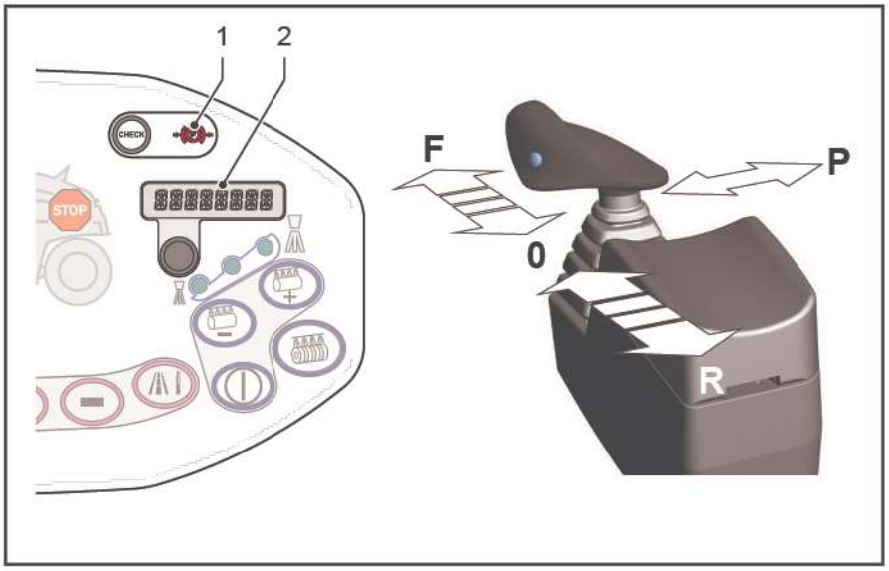
For versions equipped with a back-up alarm, an audible signal is heard as soon as the drive lever is in position R.

Reversing

- ▶ Quietly and steadily move the drive lever in the opposite direction via the zero position.
- ✔ The machine brakes to a standstill and accelerates in the opposite direction, maximally up to the preset final speed.
- ✔ The infodisplay [2] shows the current driving speed.

3.20 Stopping the machine in normal operation

Stopping



- ▶ Quietly and steadily move the drive lever to position 0 and stop it/let it click into place there.
- ✔ The engine speed is automatically reduced.
- ✔ The hydrostatic transmission brakes the machine to a standstill.
- ✔ The parking brake has been applied.

Activating parking brake

- ▶ Press the drive lever from 0 position to the right, in position P.
- ✔ The engine speed is automatically reduced (Idle speed).
- ✔ The drive lever is blocked.
- ✔ The parking brake pilot light [1] flashes: Parking brake is active.

STOP function with drive lever

⚠WARNING

Full braking!
Sudden stopping of the machine can lead to serious injuries or death.

- Calmly and steadily operate the drive lever. Jerky movements trigger the STOP function.
- Only use the STOP function in case of danger.
- Do not use the STOP function as operation brake.

If the drive lever is moved jerkily, the STOP function immediately becomes active.

- ▶ Move the drive lever jerkily – preferably against the direction of travel.
- ✔ The machine quickly stops the drive and brakes the machine to a standstill.

Driving off after using the STOP function

Prerequisite: The drive lever is in the deflected position.

- ▶ Move the drive lever to position 0 and leave it there for a short time.
- ✔ The machine is ready to go again.

Foot brake

To assist the service brake (hydrostatic travel drive), it is also possible to brake the machine by using the foot brake. Using the foot brake is recommended especially when the machine carries a heavy ballast and when driving on a downward slope.

Pressing the foot brake

- ▶ Brake pedal [1] pressed while driving.
- ✔ The speed is reduced, at the most down to machine standstill.
- ▶ Brake pedal [1] fully released.
- ✔ The machine accelerates to the vehicle speed set at the drive lever.

The tractive force of the travel drive is reduced as long as the brake pedal is pressed. It is not possible to drive away when the brake pedal is pressed.

3.21 Stopping the machine in an emergency – EMERGENCY STOP

⚠WARNING

Full braking!
Stopping the machine suddenly can lead to serious injuries or death.
- Only use the EMERGENCY STOP in the event of danger.
- Do not use the EMERGENCY STOP as the service brake.

NOTICE

Incorrect performance of an EMERGENCY STOP!
Material damage to electronic or mechanical components of the machine as a result of incorrect performance of an EMERGENCY STOP.
- Always use the EMERGENCY STOP function to switch off the machine in the event of danger.

In the event of danger, press the EMERGENCY STOP switch

In an emergency, the EMERGENCY STOP brings the machine to a controlled stop and switches it off.
Using the EMERGENCY STOP is the only way to guarantee that all operating functions will be disabled immediately without causing any further danger to driver, the machine or the environment.

▶ Press down hard on the EMERGENCY STOP button [1].

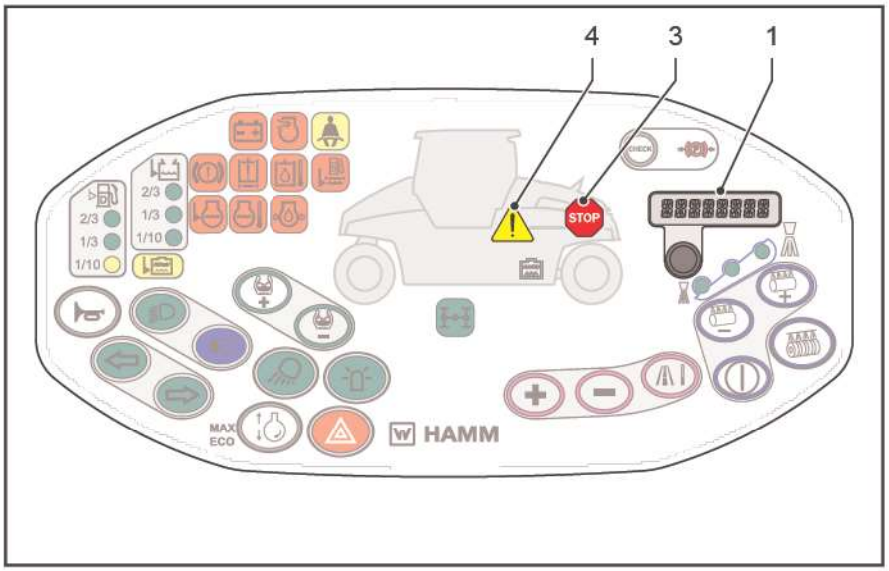
✔ The machine will disable all operating functions automatically and
- stop the transmission immediately.
- switch the diesel engine off.
- apply the brakes.

✔ STOP is shown in the info display [2].

Restarting the machine after an EMERGENCY STOP

- ▶ Switch off the electrical system using the ignition key.
- ▶ Engage drive lever in position P.
- ▶ To release the EMERGENCY STOP button [1]: Turn the button clockwise until the lock is released.
- ▶ Switch on the electrical system using the ignition key.
- ✔ STOP is no longer shown in the info display [2].
- ✔ The diesel engine can be started.

3.22 Stopping the machine because of a fault



NOTICE

Severe malfunctions!

Damage or destruction of machine components caused by continuing operation despite serious faults.

- If the STOP icon is displayed, immediately park the machine safely outside the danger area.
- Determine and remove the cause of the alfuction.
- Do not use the machine again until the fault has been rectified.

Note on a fault

If there is a deviation from the normal operating status:

- ✔ The indicator light lights up [4].
- ✔ An acoustic signal sounds briefly.
- ✔ At least one warning light lights up.
- ✔ The system info [1] displays an error code.

- ▶ Further operation of the machine is admissible for a short period of time.
- ▶ Park the machine out of the danger zone.
- ▶ Rectify the cause of the fault without delay, no later than at the end of the work shift.

No further operation of the machine is admissible unless the error messages indicated do not cause any immediate risk to the safety of people, machinery or environment.

The STOP symbol appears when:

- Hydraulic oil temperature is too high
- Hydraulic oil filter is dirty
- Engine temperature is too high
- Engine oil pressure is too low

- Coolant level is too low
- Fault in the brake system

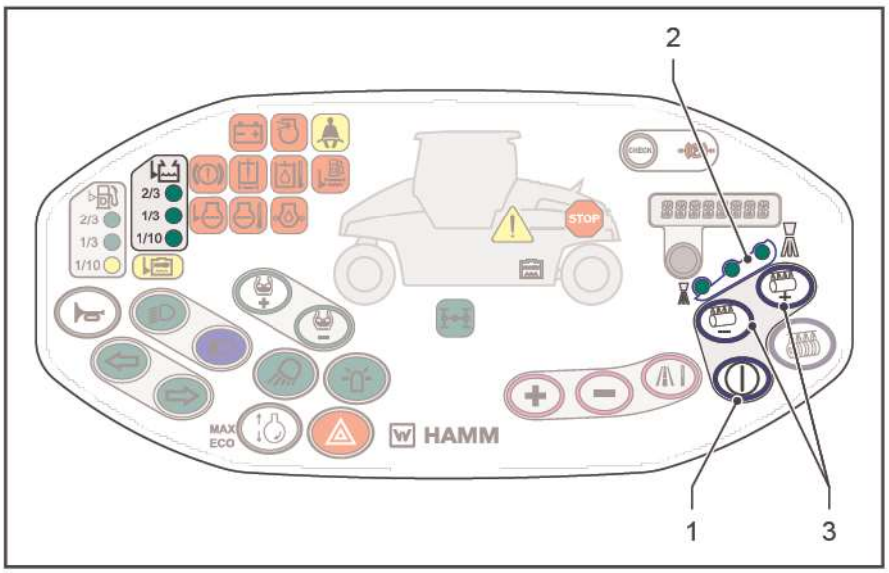
3.23 Driving with water sprinkling system

After each engine start water sprinkling system is deactivated.

The water sprinkling system wets the drums/tyres and the edge pressure and cutting device with water. The wetting prevents that bitumen sticks on roller drums/tyres when laying blacktops. This is the way to make a neat and even covering.

An electric water pump supplies the water sprinkling system with water. The built-in automatic sprinkling unit adjusts the water consumption to match the conditions of use optimally. A multilevel automatic interval system determines the minimum use of water for optimum moisturing, using a combination of spray quantity and pump pause time. The water pump can also be switched manually to continuous operation at any time.

The sprinkling control is switched off at a road speed of less than 0.5 km/h (0.3 mph).



Switching the water-sprinkling system on and off

Activating the water sprinkling system

Prerequisite: Electrical system is ON

- ▶ Press switch [1].
- ✔ The illuminated dots [2] show the current sprinkling stage.

Deactivating the water sprinkling system

- ▶ Press the switch [1] again.
- ✔ The illuminated dots [2] are off.

When the water sprinkling system is activated, water consumption can be regulated using the sprinkling stages.

Ensure that the drums/tyres are wetted evenly.

Selecting sprinkling stage

Requirement: Water sprinkling system is activated.

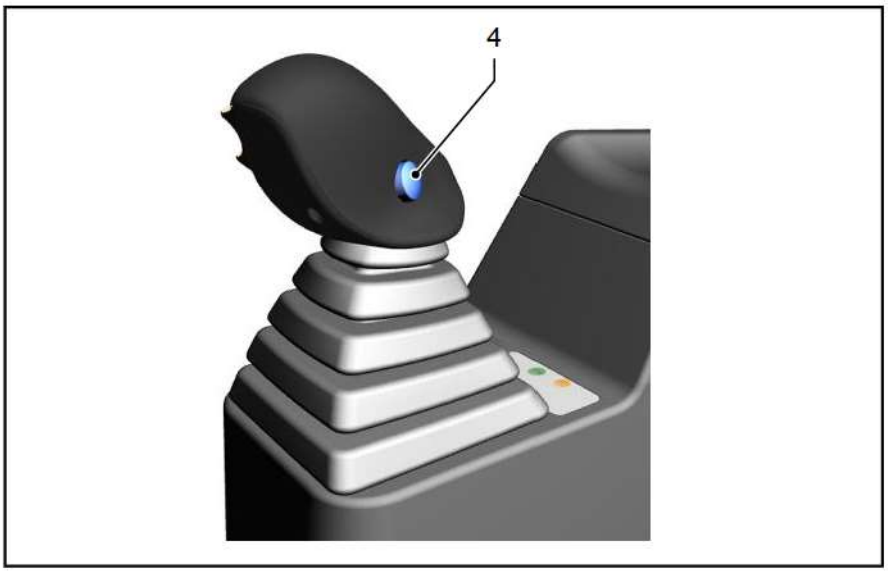
- ▶ Press switch [3] + (plus).
- ✔ Sprinkling increases by one stage.
- ✔ The luminous spots [2] show the the set sprinkling stage.
- ▶ Press switch [3] – (minus).
- ✔ Sprinkling decreases by one stage.
- ✔ The luminous spots [2] show the the set sprinkling stage.

Sprinkling the roller drum/tyres

Requirement: Diesel engine is running, water sprinkling system is activated.

- ▶ When the driving speed exceeds 0.5 km/h (0.3 mph) the sprinkling is switched on.
- ▶ When the machine is at a standstill, the sprinkling is switched off.

Switching continuous water sprinkling on and off



Prerequisite: The water sprinkling system is activated.

- ▶ Press and hold switch [4].
- ✔ The tyres are sprinkled with water while the switch is held in. If additive sprinkling is switched on, the tyres are sprinkled with release agent emulsion.
- ✔ Sprinkling also is possible when the machine is stationary.

Water sprinkling system function test

Switching on the functional test

Prerequisite: Diesel engine is off, drive lever is in position P, electrical system is ON.

- ▶ Press the switch [1].
- ▶ Press and hold the + (plus) and – (minus) switches [3] at the same time for two seconds.
- ✔ All illuminated dots [2] flash.
- ✔ Water is sprinkled for around three minutes.

- ▶ Check that the drums/tyres are evenly sprinkled.

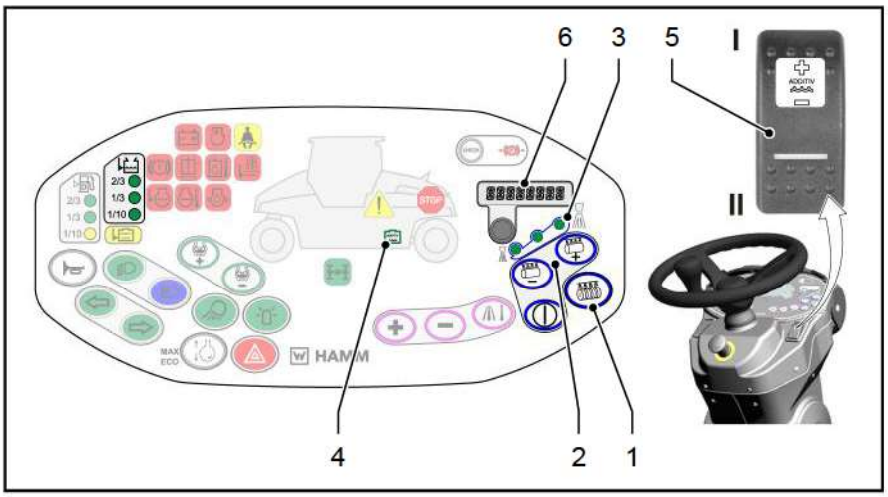
Switching off the functional test

- ▶ Press switch [1].
- ✔ The illuminated dots [2] are off.

3.24 Driving with additive sprinkling system

For additive sprinkling, a parting agent concentrate is added to the sprinkling water from a separate tank.
When placing bituminous pavement, moistening the tyres with this separating compound helps to prevent bitumen from sticking to the tyres.
The consistency of the separating compound can be varied according to several mixing levels.

The quantity added depends on the temperature of the tyres. A cold tyre needs a higher added quantity than a hot one. Before driving on hot bituminous pavement, be sure to clean and sufficiently moisten the tyre treads with separating compound.



When additive sprinkling is switched on, water sprinkling is also activated. The volume of liquid for moistening the tyres depends on the sprinkling stage (water volume) that is set. The consistency of the release agent emulsion is set via the mixing stage. When additive sprinkling is switched off, water sprinkling is also deactivated.

Switching additive sprinkling on and off

Switching on additive sprinkling

Prerequisite: Electrical system is ON

- ▶ Press switch [1].
- ✔ The indicator light [4] lights up.
- ✔ The info display [6] shows the current mixing stage for five seconds.
- ✔ The illuminated dots [3] show the current sprinkling stage.
- ✔ The tyres are sprinkled with more or less release agent emulsion, depending on the sprinkling stage.

The water quantity/sprinkling stage can be varied by pressing the + (plus) and - (minus) switches [2].

Switching off additive sprinkling

- ▶ Press the switch [1] again.
- ✔ Indicator light [4] off: Additive sprinkling is switched off.
- ✔ Illuminated dots [3] off: Water sprinkling is deactivated.

Selecting a mixing stage

Prerequisite: Additive sprinkling is activated.

- ▶ Push switch [5] briefly to position I (+ plus) or to position II (– minus).
- ✔ The info display [6] shows the current mixing stage for five seconds.
- ▶ Push switch [5] again briefly to position I (+ plus) within five seconds.
- ✔ Concentrate admixture is increased by one stage.
- ✔ The info display [6] shows the set mixing stage for five seconds.
- ▶ Briefly push switch [5] to position II (– minus).
- ✔ Concentrate admixture is decreased by one stage.
- ✔ The info display [6] shows the set mixing stage for five seconds.

Functional test for the additive sprinkling system

Switching on the functional test

Prerequisite: Diesel engine is off, drive lever is in position P, electrical system is ON.

- ▶ Press the switch [1].
- ✔ The indicator light [4] lights up.
- ▶ Press and hold the + (plus) and – (minus) switches [2] at the same time for two seconds.
- ✔ All illuminated dots [3] flash.
- ✔ The info display [6] shows the current mixing stage for five seconds.
- ✔ Additive is sprinkled for around three minutes.
- ▶ Check that the drums/tyres are evenly sprinkled.

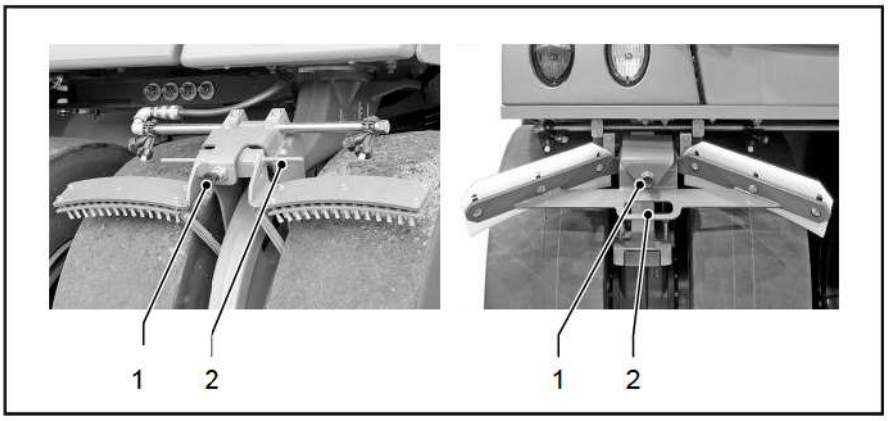
Switching off the functional test

- ▶ Press the switch [1].
- ✔ The indicator light [4] and illuminated dots [3] are off.

3.25 Adjusting scrapers

The scrapers (brushes or plates) remove dirt that is adhering to the surface of the tyres.

During transportation, apply the scrapers to the tyres. This prevents premature wear to the scraper bracket caused by vibration.



Attach scraper

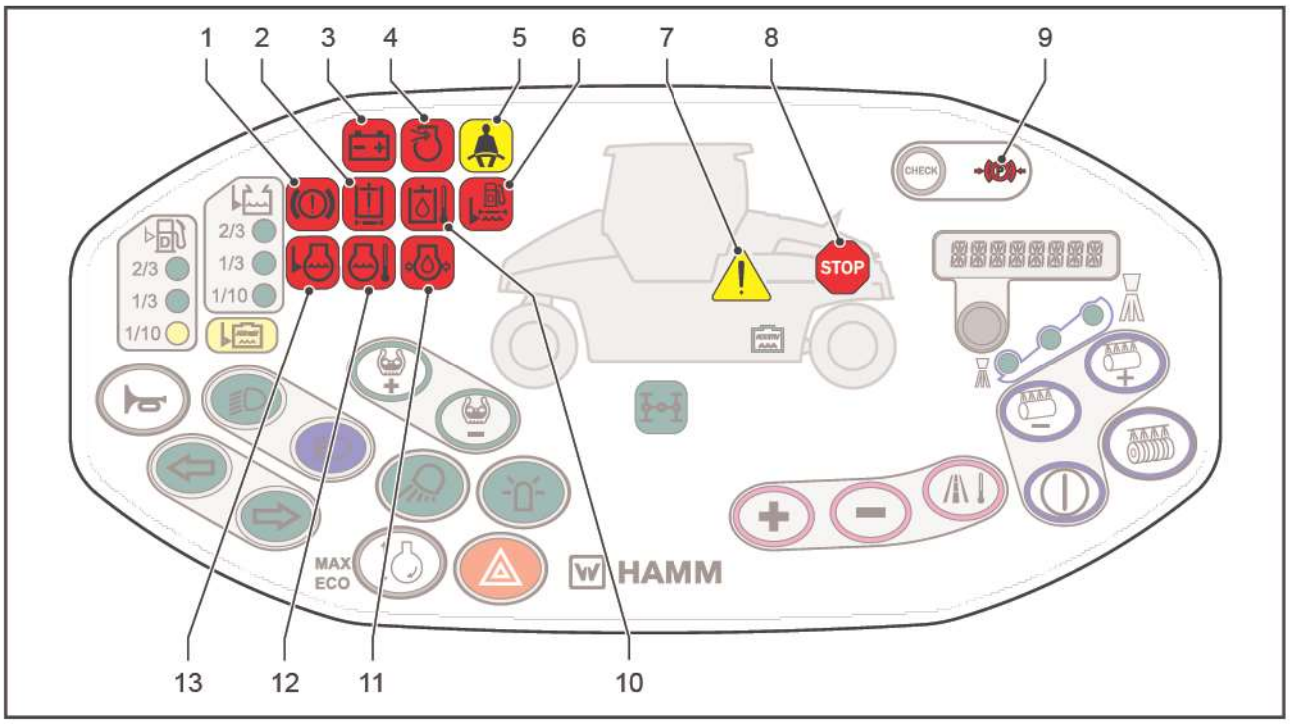
- Switch off diesel engine and remove ignition key.
- Lift scraper console a little at the handle [2].
- Pull the control button [1] and apply the scraper console to the tyre.

Moving the scraper away

- Switch off diesel engine and remove ignition key.
- Lift the scraper console a little at the handle [2] until the control button locks into place by itself.

3.26 Operation monitoring

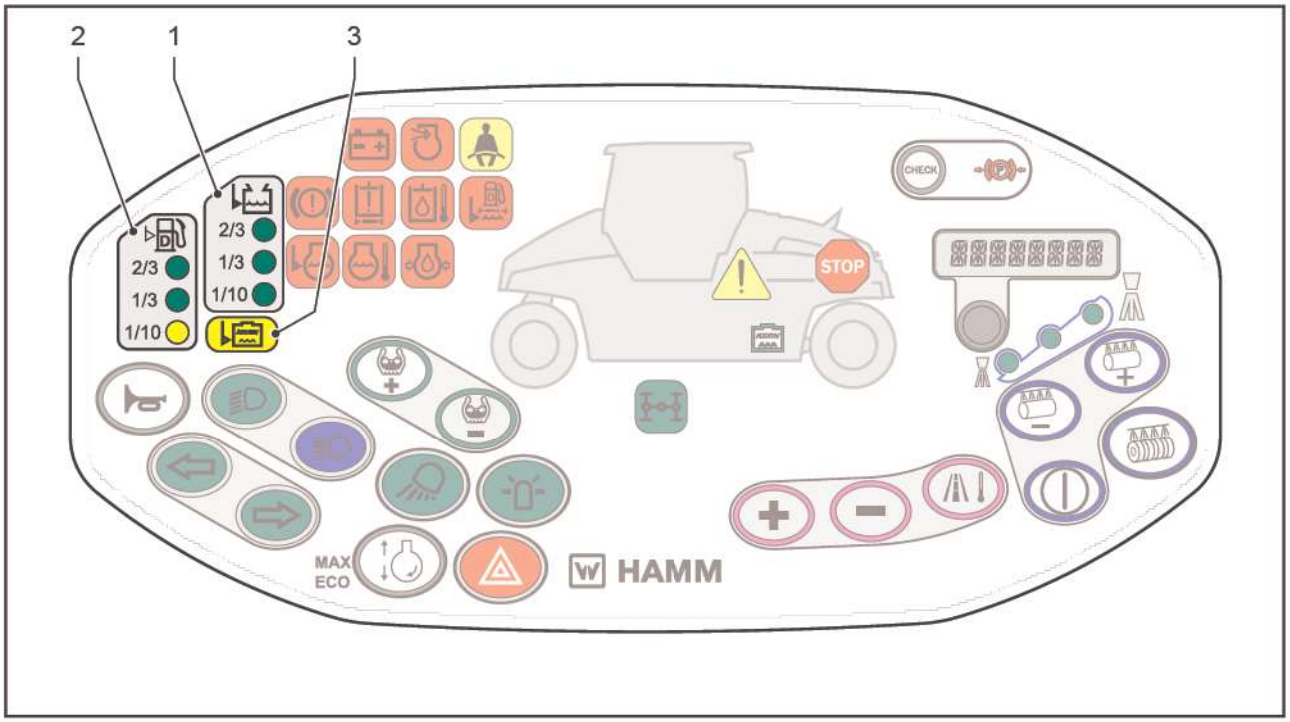
3.26.01 Control panel – warning and indicator lights



No.	Symbol	Warning and indicator light	Status	Meaning/measure
[1]		Brake system	lights up red	Fault in the brake system. The brake fluid fill level is too low. Check the brake fluid fill level. Contact customer service.
[2]		Pressure filter hydraulics	lights up red	Filter cartridge of the hydraulic oil filter is contaminated. Replace the filter insert of the pressure filter for the hydraulic system.
[3]		Charge current (battery)	lights up red	No charge current: Check the electrical system. Contact customer service.
[4]		Air filter	lights up red	The air filter cartridge is contaminated. Check the air filter.
[5]		Seat belt	lights up yellow and an acoustic signal sounds	Seat belt is not fastened. Fasten the seat belt.
[6]		Water sump fuel prefilter	lights up red	Water sump in the fuel prefilter too high. Drain the filter cartridge in the fuel prefilter.

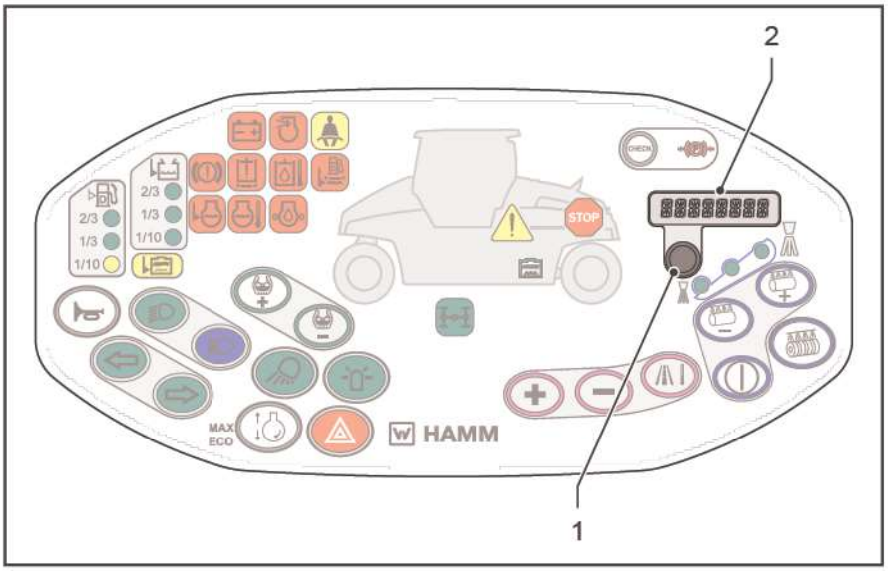
No.	Symbol	Warning and indicator light	Status	Meaning/measure
[7]		Warning, notice or malfunction	lights up yellow	Deviation from the normal operating status (entry in the fault list, e.g. engine fault, machine fault).
[8]		Serious fault	Flashes and an acoustic signal sounds.	
[9]		Parking brake	lights up red	Parking brake is applied or EMERGENCY STOP is active
[10]		Hydraulic oil temperature	lights up red	Hydraulic oil temperature is high.
			Flashes red	Hydraulic oil temperature has overheated.
[11]		Engine oil pressure	Flashes red	Engine oil pressure is too low. Check the engine oil fill level.
[12]		Engine temperature	lights up red	Engine temperature is high.
			Flashes red	Engine has overheated.
[13]		Coolant fill level	Flashes red	Coolant fill level is too low. Check the coolant fill level.

3.26.02 Control panel – fill level control indicator



No.	Symbol	Indicator	Status	Meaning/measure
[1]		Water-sprinkling fill level	lights up green	Water available
			lights up yellow	Fill level approx. 10%–20%: Top up water-sprinkling system
			flashes yellow	Fill level below 10%: Top up water-sprinkling system
[2]		Fuel fill level	lights up green	Fuel available
			lights up yellow	Fill level approx. 10%–20%: Top up fuel
			flashes yellow	Fill level below 10%: Top up fuel
[3]		Additive fill level	is not lit	Separating agent concentrate available
			lights up yellow	Fill level approx. 10%–20%: Topping up separating agent concentrate
			flashes yellow	Fill level below 10%: Topping up separating agent concentrate

3.26.03 Info display - System info



System info

The driver can use the info display [2] to access information about the machine status, settings and system messages. The relevant display can be selected using the switch [1]. Level 1 is always activated after the electrical system is switched on.

Moving to the next display

The display moves one step further each time the switch [1] is pressed.

- Briefly press the switch [1].

Level 1: Machine information

Operating hours

After the electrical system is switched on, the operating hours of the machine are shown in the display field. Carry out maintenance work according to the accumulated operating hours.

Engine speed

Engine speed display (revolutions per minute, RPM).

Driving speed

Display of the driving speed (km/h, mph).

Diagnostic codes

A short acoustic signal sounds when a fault is detected. The display shows all of the existing faults one after the other with a diagnostic code.

The information shown in the info display [2] varies depending on the machine equipment.

Level 2: Service data

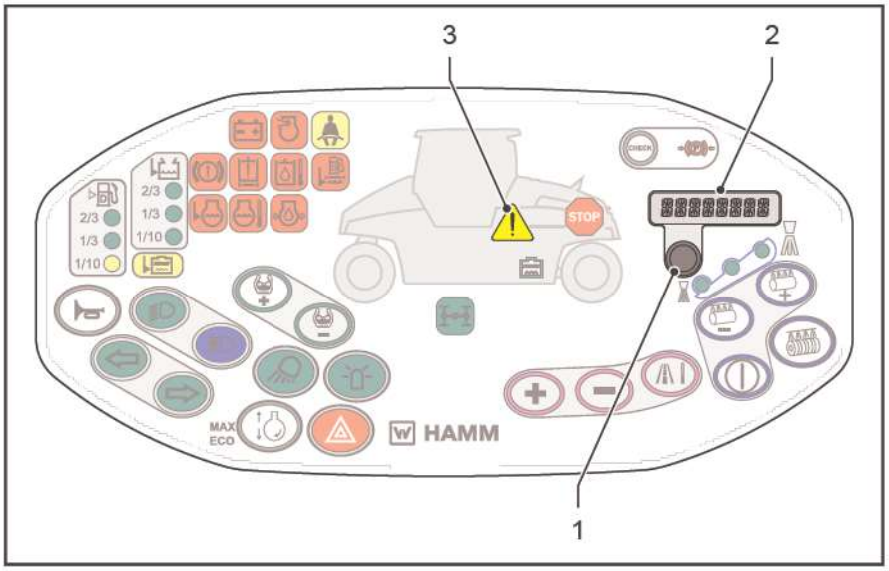
Change to level 2

- Press and hold switch [1] for two seconds.

Indicator

- Software version – Control panel
- Software version – Machine computer
- Software version – Light module

3.26.04 Info display – Diagnostic codes



After switching on the electrical system, an internal component test is performed. If a fault is detected, an acoustic signal sounds briefly and the warning light [3] comes on. The info display [2] shows all the existing faults one after the other in the form of diagnostic codes.
Other warning lights can indicate the cause of a fault.

Faults that occur during operation are also shown in the info display [2] after an acoustic signal sounds. The individual categories, such as operating hours, engine speed, diagnostic code, etc., can be selected with switch [1].

Fault class

There are two different fault classes:

- ERR_xxx — Machine component fault e.g. display, travelling, vibration, etc.
- ENGINE_xx — Diesel engine fault.

The complete diagnostic code is required in order to determine the type of fault.

Example 1:

For the ERR_ fault class, the number indicates the type of fault (e.g. ERR_304).

The diagnostic code is: ERR_304.

Example 2:

The number indicates diesel engine faults in fault class ENGINE_. In order to determine the type of fault, the engine's own SPN code (e.g. S_523914) and FMI code (e.g. F_1) are also displayed after each individual fault message (e.g. ENGINE_2).

The diagnostic code for engine fault 2 is:

ENGINE_2 — S_523914 — F_1.

Note all the pending fault codes from the fault list, and contact the HAMM Customer Service without delay.

3.27 Switch off the diesel engine

Requirement: Diesel engine is running.

- ▶ Engage drive lever in the P-position.
- ▶ Fully lower attached accessory equipment.
- ▶ Switch off accessory equipment.
- ✔ Parking brake is applied.
- ✔ Diesel engine is running in idle speed.
- ▶ Allow the diesel engine to continue to idle for 1 to 2 minutes.
- ▶ Turn ignition key to position 0.
- ✔ Diesel engine is switched off.
- ✔ Electrical system is switched off.

3.28 Automatic engine stop

The automatic engine stop system automatically shuts down the diesel engine when the machine is stopped for a longer time. This is done after a preset period of inactivity when the following conditions are met:

- Diesel engine is running.
- Motor management in ECO position
- Working functions set to off.
- The drive lever is latched into the P position.

The automatic engine stop system will react unless any of the above conditions changes during the period of inactivity:

- ✔ Diesel engine is switched off.
- ✔ Functions, such as parking light and warning flashers, function in this case as well.

The automatic engine stop system will not react whenever any of the above conditions required changes before the period of inactivity is over.

After activation of the engine stop automatic, a machine is **NOT** regarded as being switched off and safely parked.

Bringing the machine back into operation

After activation of the engine stop automatic, the machine has to be restarted in order to resume operation.

- ▶ Turn ignition key to position 0.
- ✔ Machine is switched off and can be restarted (see "Starting machine").

3.29 Shutting down and leaving the machine safely

⚠WARNING

Unintended machine movement!

Severe injury or death due to unexpected machine movements.

- The driver may only leave the machine when it has been properly and safely shut down.
- Observe the road traffic regulations.
- Park the machine on safe ground, i.e., flat and horizontal ground with sufficient bearing capacity.
- Secure machine against rolling away.

Prior leaving the machine

- ▶ Apply parking brake.
- ▶ Switch off the diesel engine.
- ▶ Latch the seat console in the centre of the machine.
- ▶ Pull off the ignition key.
- ▶ Switch off the machine at the battery isolation switch (if applicable).
- ▶ Completely close and block door panes and the roof hatch.
- ▶ Lock cabin doors, the instrument panel covering, as well as all cladding covers.
- ▶ Use suitable precautions (e.g., parking chock) to secure the machine against rolling away in addition when parking on an uphill or downhill gradient.

3.30 Towing the machine

An inoperable machine can be towed by another vehicle for short distances.

For distances longer than 500 m, the machine must be loaded for further transport.

⚠WARNING

Spring-operated brake out of function!
Severe injury or death due to machine rolling away.
- Prevent the machine from rolling away with chocks before releasing the spring-operated brake.
- Do not attach the machine for towing unless at the points intended for this.
- Use a towing vehicle with enough pulling power.
- Tow machine only with low speed 1 km/h (0.6 mph).
- Only tow the machine for short distances (max. 500 m).

Towing of the machine requires sufficient knowledge of the functioning of the hydrostatic transmission and the operation of the spring-operated brake.
Only allow towing to be performed by persons with towing experience, who have been informed of the dangers.

Necessary towing tool

- **Towing bar**
  Use a towing bar with adequate pulling power (at least the operating weight of the machine) for a normal case of use on a flat surface with the spring-operated brake released.

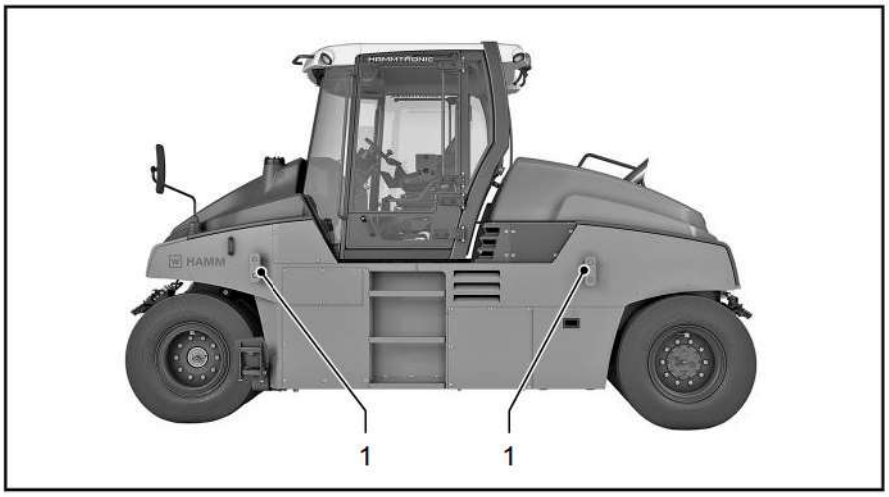
To recover the machine from hazardous situations, the machine can be lifted (see Loading and transporting).
Alternatively, the machine can be pulled out of hazardous situations using towing ropes or towing chains (pulling power at least double the machine's operating weight).

When using towing ropes or chains:

⚠WARNING

Towing equipment live!
Serious injuries or death due to tensioning or tearing towing equipment.
- Keep your distance from towing equipment (at least the length of the towing rope or chain).
- The tractive force of the towing equipment must correspond to at least double the operating weight of the machine.
- Keep the length of the towing equipment as short as possible in accordance with the rescue situation.

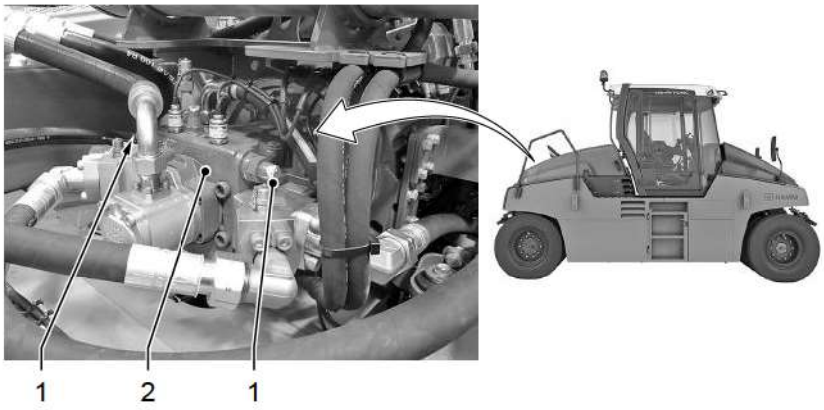
3.30.01 Preparing machine for towing



- ▶ Push the drive lever from position 0 to the right into position P.
- ✔ The drive lever is blocked.
- ✔ The parking brake indicator light lights up: The parking brake is active.
- ✔ The drive is not active.
- ▶ Shut down the diesel engine if it is still operational.
- ▶ Use parking chocks to secure the machine against rolling away.
- ▶ Replace any damaged pipes or hoses which are leaking oil before towing (to protect the environment).
- ▶ Attach towing tools to the machine's lashing points [1] and the towing vehicle.
- ▶ Depressurise the hydraulic system (see "Depressurising the hydraulic system").
- ▶ Release the spring-operated brake (see "Releasing the spring-operated brake").

3.30.02 Depressurising the hydraulic system

The hydraulic system must be depressurized before towing starts.
Only if the oil flow can circulate without pressure in the hydraulic system, can the machine be towed.



Separating the hydrostatic drive power train

- ▶ Remove cover.
- ▶ Loosen Allen head screw [1] on both multi-function valves of the driving pump [2] by two complete turns to the left.
- ✔ Frictional connection is interrupted: Machine is ready to be towed.

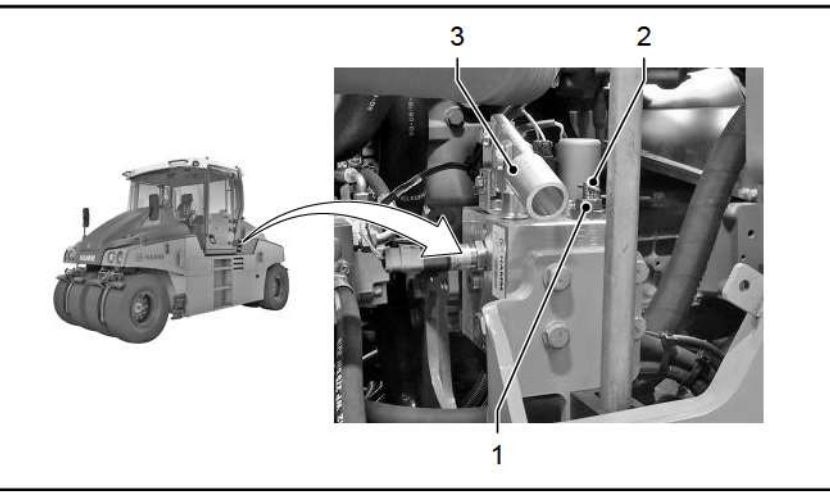
Do not screw out the screw by more than 2 turns out of the housing; otherwise, hydraulic oil may flow out between screw and housing or air may enter into the system.

Reconnecting the hydrostatic transmission

- ▶ Screw in the hexagon socket screw [1] as far as possible.
- ▶ Fit the cover.
- ✔ Frictional connection created: machine is ready to be repaired.

3.30.03 Releasing the spring-operated brake

The spring-operated brake must be released before towing starts.



- ▶ Loosen the lock nut [1] up to the locking pin.
- ▶ Press the gear shift slide [2] into the valve block.

- ▶ Aerate the spring-operated brakes by pumping at lever [3], approx. 30 pump strokes.
- ▶ During towing, the spring-operated brakes must be kept open by constant and slow pumping due to interior leaks.
- ✔ Pretension force of the spring-operated brake is reduced.
- ✔ The parking brake is non-functional.
- ✔ The machine can be towed.

Enable the spring-operated brake again

- ▶ Pull the gear shift slide [2] out of the valve block.
- ▶ Tighten Lock nut [1].
- ✔ Parking brake is applied again.
- ✔ The machine can be repaired.

3.30.04 After towing/before repair

Parking machine safely at the location to which it has been towed

- ▶ Prevent the machine from rolling away with suitable protective measures (e.g. chocks).
- ▶ Enable the parking brake again (see "Release spring-operated brake").
- ▶ Reconnect the hydrostatic transmission (see "Depressurize the hydraulic system").
- ▶ Remove towing tool.
- ✔ Machine safely shut down.
- ✔ The prerequisites for repair are fulfilled.

After the repair: The machine must not be brought back into use until a complete function test has been made.

3.31 Start with jump leads

Preparation for start assistance

- Observe precaution measures for handling batteries (see Safety instructions).
- A discharged battery can freeze already at 0 °C (32 °F). Thaw a frozen battery in a warm room. Remove the plug.
- Do not disconnect the battery from the vehicle's internal power supply.

Connecting jump leads

⚠WARNING

Explosion and electric shock!
Severe injury and death due to moving parts, burns or electric shock.

- Charging vehicle and discharged vehicle may not come in contact with each other.
- The pole terminals of the jump leads must not be allowed to touch each other.
- Move the pole terminal on the vehicle ground of the unloaded vehicle as far as possible away from the negative pole of the discharged vehicle.
- Pay attention to the nominal voltage of the batteries.
- Use jump leads with an insulated terminal clamp and a cross section of at least 25 mm².

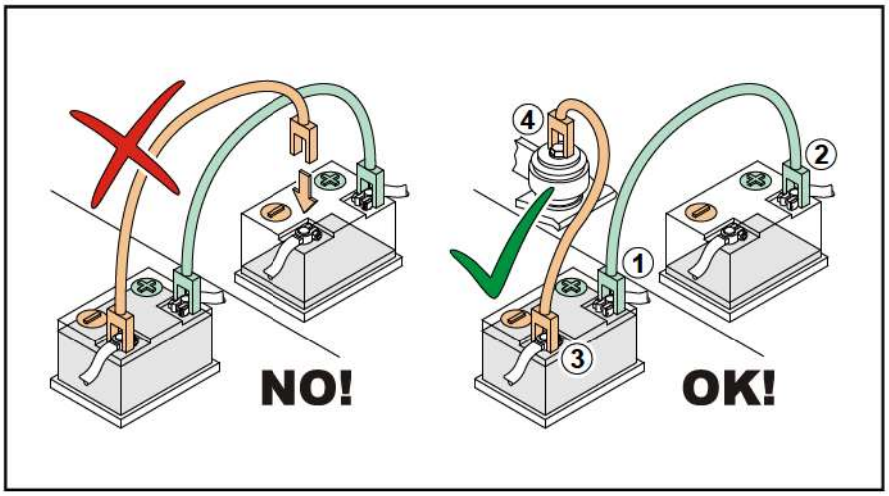
⚠WARNING

Exposed, rotating parts!
Risk of being trapped, pulled in, and injured by rotating engine parts.

- Ensure that no parts of the body or items of clothing can be drawn into rotating or moving engine parts.
- Do not reach into the engine compartment during the start assistance process.
- Route cables such that they cannot be drawn into rotating engine parts.
- Always lay the leads so that they can be removed safely even when the engine is running.

The positive pole of a battery is marked by a Plus (+) sign. The negative pole of a battery is marked by a Minus (–) sign.

The vehicle ground is, for example, the engine block or the fastening screw of the engine mounting.



- Remove the terminal caps from the poles of the batteries.
- Connect the pole terminal [1] of the first lead to the positive pole of the charged battery.
- Connect the other terminal clamp [2] of the first lead to the positive terminal of the discharged battery.
- Connect one terminal clamp [3] of the second lead to the negative terminal of the charged battery.
- Connect the other terminal clamp [4] of the second lead with the ground of the discharged vehicle.

Starting process

- Start the engine of the charging vehicle and let it run with medium engine speed.
- Start the diesel engine of the discharged vehicle after approx. 5 min.
- For approx. 3 min let both engines run with medium engine speed and the jump leads connected.

Removing jump leads from the batteries

- Switch on an electric consumer on the discharged vehicle (e.g. driving light) in order to avoid overvoltages in the electrical system.
- Remove the jump leads in reverse order: Disconnect pole terminal [4], then [3], then [2], then [1].
- Put the terminal caps on the poles of the batteries.

3.32 Machine ballasting

⚠WARNING

Heavy weight!
Serious injuries or death caused by crushing or getting caught during assembly.

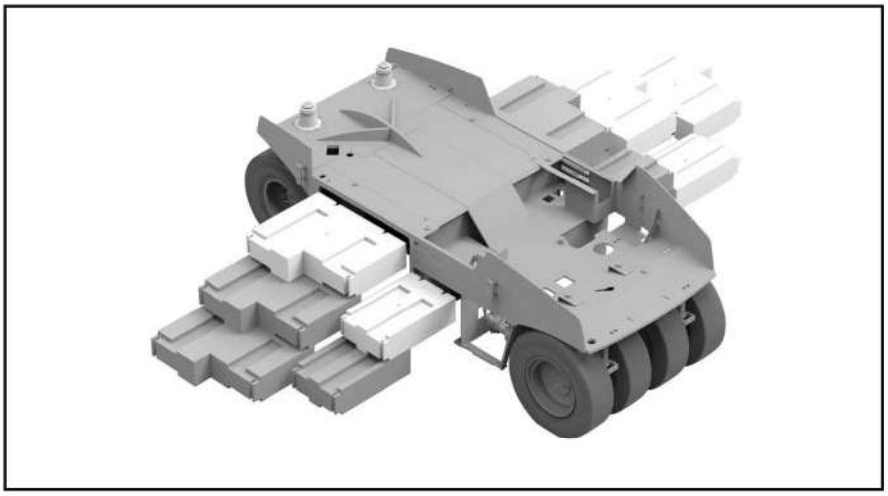
- Perform installation work on firm ground (flat, stable, horizontal).
- Carry out fitting work only when the engine is stopped.
- Use suitable load suspension and hitching gear with an adequate loading capacity.
- Do not step underneath suspended loads.

NOTICE

Unilateral weight distribution
Uneven compaction when placing material due to asymmetric distribution of the ballast weight relative to the axis.

- Be sure to always put the same number of ballast weight elements on both sides of the machine.
- Always place the heavy ballast weights (steel) at the lowest level.

Ballast can be added or reduced in a flexible manner so as to adapt to different wheel loads. To allow this, two ballast compartments are arranged on both machine sides.



Weight for 1 piece	Steel [kg]	Heavy concrete [kg]	Concrete [kg]
Large ballast weight	2100	1010	640
Small ballast weight	1050	485	–

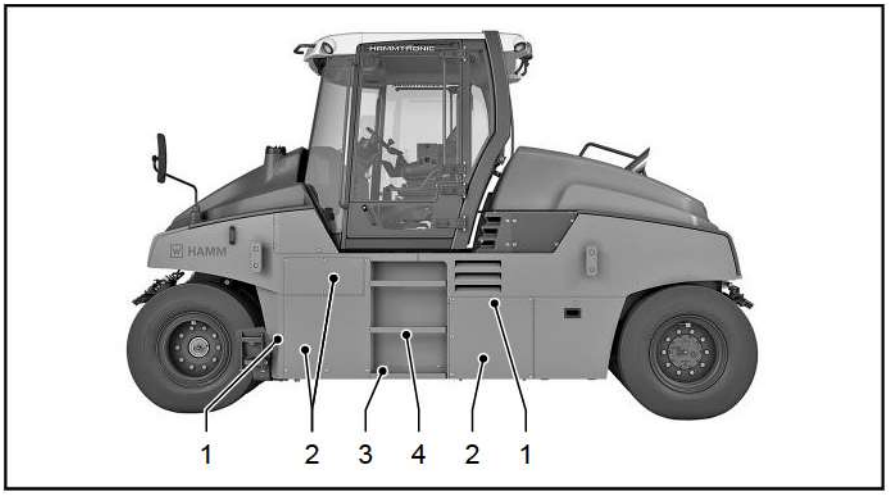
3.32.01 Instructions for transport

As different ballast weights may be installed, the precise weight of the machine can only be determined by weighing. The carrying

capacity of the transport vehicle must correspond to the real weight of the machine. If it is not possible to weigh the machine, the carrying capacity of transport vehicle must correspond to the maximum operating weight as indicated on the machine's nameplate.

3.32.02 Removing/installing fairing parts

Remove fairing parts from both machine sides.
Do not remove any heavy fairing part unless using suitable lifting gear.



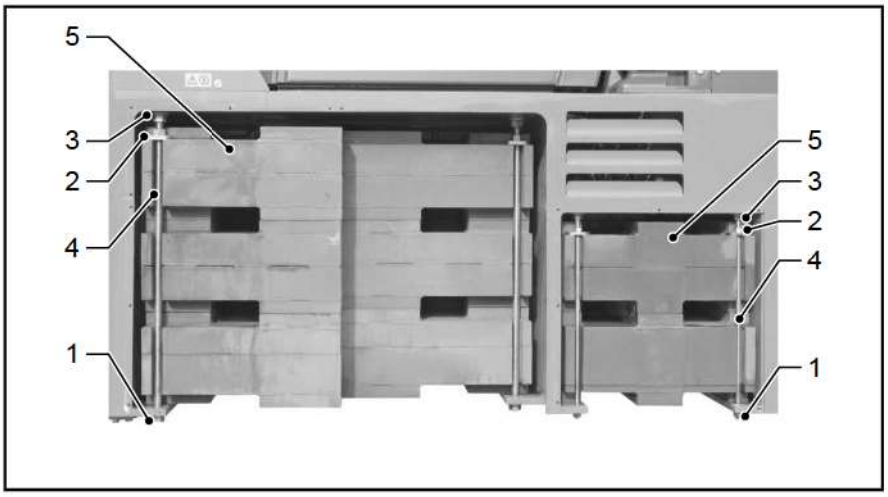
Removing fairing parts

- Remove the fastening screws [1].
- Remove the fairing [2].
- Remove the fastening screws [3].
- Remove the steps [4].

Mount the panels

- Install the steps [4] at the chassis.
- Install the fairing [2] at the chassis.
- Tighten fastening screws [1] and [3].

3.32.03 Removing/installing securing rods



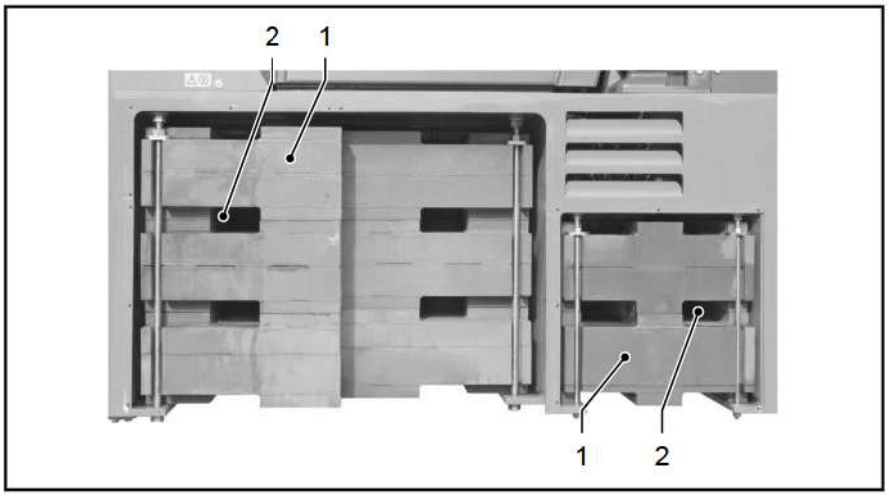
Removing a securing rod

- ▶ Unscrew and remove the lock nut [1].
- ▶ Turn the clamping nut [2] counterclockwise until the check nut [3] rests against the clamping nut [2].
- ✔ The securing rod [4] moves downwards.
- ▶ Screw the check nut [3] and the clamping nut [2] upwards (counterclockwise) until the securing rod [4] is released from the upper borehole.
- ▶ Tilt the securing rod [4] forwards and pull it out of the lower borehole.

Installing a securing rod

- ▶ Insert a securing rod [4] with its end without a lock nut [1] into the lower borehole.
- ▶ Tilt the securing rod [4] backwards.
- ▶ Put the clamping nut [2] with a washer on the ballast weight [5].
- ▶ Screw the lock nut [1] flush onto the securing rod.
- ▶ Turn the clamping nut [2] clockwise until the securing rod extends through the upper borehole and clamps the ballast weight in place. If, necessary, turn the check nut [3] downwards (clockwise).
- ✔ The securing rod [4] is moved upwards.
- ▶ Turn the check nut [3] counterclockwise until it makes contact with the machine frame. Tighten Lock nut [3].

3.32.04 Removing/inserting a ballast weight



Removing a ballast weight

- Use a suitable lifting gear (e.g., a fork lift) to lift a ballast weight [1] in its recesses [2].
- Carefully lift the ballast weight [1] out of the machine.

Inserting a ballast weight

- Use a suitable lifting gear (e.g., a fork lift) to lift a ballast weight [1] in its recesses [2].
- Carefully lift a ballast weight [1] into the machine.

3.33 Shutting down

3.33.01 Temporarily shutting down the machine and starting it up again

⚠WARNING

Dangerous operating materials!
Risk to health and the environment caused by operating materials that have not been disposed of properly.

- Dispose of operating materials in accordance with the applicable safety and environmental regulations.
- Wear personal protective equipment when disposing of the materials.

If the machine will not be used for an extended period of time, it must be decommissioned and stored correctly.

After storage, the machine must be prepared for recommissioning before it is used again.

The work to temporarily shut down and to recommission the machine requires expert knowledge and may require special tools and equipment.
This work must only be carried out by trained specialists.

The work steps listed below are **NOT INSTRUCTIONS**. They are a non-exhaustive list of examples of work that must be carried out in order to temporarily shut down and/or recommission the machine.
For precise information or for carrying out the decommissioning and/or recommissioning process, contact customer service.

Decommissioning – temporarily shutting down

All activities that are carried out for the temporary shutdown must be documented. This is the only way to guarantee that the machine can be properly recommissioned following a temporary shutdown.

Catch all liquids in suitable containers and dispose of them properly in accordance with the relevant specifications and national regulations.

- ▶ Wear personal protective equipment:
  - Protective work wear
  - Safety goggles
  - Protective gloves
  - Safety shoes.
- ▶ Thoroughly clean the inside and outside of the machine.
- ▶ Preserve any sealing elements using acid-free grease.
- ▶ Check the drive unit, auxiliary units, hoses, hose connections and flange-mountings for leaks and/or escaping operating and auxiliary materials. If there are any anomalies, repair any affected components.

- Remove the batteries and store them in a frost-free environment.
  Follow the battery manufacturer's instruction manual.
- Drain and preserve the fuel system.
- Fill the AdBlue®/DEF reservoir to 25%.
- Check the coolant level and, if required, top it up.
- Drain the engine oil and preserve the engine using running-in preserving oil.
- Check the gear oil level and, if required, top it up.
- Drain the liquids from the tanks for water sprinkling, additive sprinkling and the windscreen washer system.

Storage

- Store the machine and machine components in well-ventilated, lockable, temperature-controlled and dry rooms.
- When storing outdoors, place the machine and machine components on suitable underlays in order to protect them against moisture and cover them using tarpaulins that open at the bottom. Secure the tarpaulins using suitable lashings.

Recommissioning

- Check the drive unit, auxiliary units, hoses, hose connections and flange-mountings for leaks and/or escaping operating and auxiliary materials. If there are any anomalies, repair or replace any affected components.
- Drain and dispose of the preserving liquids.
- Fill pipe systems with operating and auxiliary materials e.g.: engine coolant, engine oil, gear oil, AdBlue®/DEF, water sprinkling, additive sprinkling.
- Check and, if required, repair all of the components.

3.33.02 Permanently shutting down and disposing of the machine

⚠WARNING

Dangerous operating materials!
Risk to health and the environment caused by operating materials that have not been disposed of properly.

- Dispose of operating materials in accordance with the applicable safety and environmental regulations.
- Wear personal protective equipment when disposing of the materials.

If the machine is no longer designated or suitable for the intended use, it must be decommissioned in accordance with the applicable regulations.

The work to permanently decommission the machine requires expert knowledge and may require special tools and equipment.
This work must only be carried out by trained specialists.

The work steps listed below are **NOT INSTRUCTIONS**. They are a non-exhaustive list of examples of work that must be carried out in order to permanently decommission the machine.
For precise information or for carrying out the decommissioning, contact customer service.

Disposing of operating materials

Catch all liquids in suitable containers and dispose of them properly in accordance with the relevant specifications and national regulations.

- Wear personal protective equipment:
  - Protective work wear
  - Safety goggles
  - Protective gloves
  - Safety shoes.
- Remove the batteries and dispose of them in accordance with the statutory provisions.
  Follow the battery manufacturer's instruction manual.
- Drain the fuel tank.
- Drain the AdBlue®/DEF reservoir.
- Drain the hydraulic oil tank.
- Drain the engine coolant circuit.
- Drain the engine oil circuit.
- Evacuate the air-conditioning system.
- Drain the gear oil.
- Drain the tanks for water sprinkling, additive sprinkling and the windscreen washer system.

Disposing of the machine

- Hand over any electrical/electronic components to a specialised recycling company.
- Hand over the machine to an approved recycling company so that it can be destroyed and disposed of.
- Observe any national and, if required, regional disposal regulations.

4 MAINTENANCE

When working at the machine please always adhere to the instructions given in your Safety instructions!

4.00 General maintenance instructions

This section describes the work on the machine required for its care and to maintain operational safety.

The extent and the frequency of the maintenance work depends on the operating and deployment conditions, which may differ in many cases. In case of more difficult operating conditions, the machine must have maintenance in shorter intervals as scheduled for normal operation.

The maintenance intervals are based on the operating time indicated by operating hours meter.

Various warning and pilot lights make the driver aware of essential interventions during operation.

Additional maintenance work must be carried out in the running-in time.They are described in the running-in regulations.

The running-in regulations, servicing intervals and care measures for diesel engine muast be adhered as specified in the instruction manual of the diesel engine manufacturer.

4.00.01 Important information about maintenance works

Testing and maintenance work require expert knowledge. Only trained, specialist personnel may perform the maintenance work.

The warning notices indicated below apply to all maintenance work:

⚠WARNING

Unintended machine movement!

Severe injury or death due to unexpected machine movements during maintenance work.

- Park the machine on safe ground, i.e., flat and horizontal ground with sufficient bearing capacity.
- Secure machine against rolling away.
- Do not carry out any maintenance work unless the engine has been stopped and the ignition has been switched off.
- On machines with safety strut, apply the safety strut before maintenance work.

⚠WARNING

Unintended engine start!

Severe injury and death caused in case of an unintended engine start during maintenance work.

- Do not carry out any maintenance work unless the engine has been stopped and the ignition has been switched off.
- Before starting maintenance work, set the battery isolating switch to off in order to de-energize the electrical system. As an alternative, disconnect the earthing/grounding strip from the battery.
- To avoid any unintended engine start by any third person, affix a warning notice at the driver's position indicating that work is in progress on the machine.

⚠WARNING

Exposed, rotating parts!

Risk of being trapped, pulled in, and injured by rotating engine parts.

- Do not perform any testing, adjusting or maintenance work in the area of the engine unless the diesel engine has been switched off.
- Do not reach with your hands into the area of the engine unless after every part has come to a standstill.
- Do not lay down any object or tool in the engine compartment.
- Keep a safety distance when making a visual inspection while the diesel engine is running.

⚠WARNING

Hot surfaces, hot fluids!

Injury by burns on hot surfaces or by hot fluids.

- Before starting any work on the diesel engine, the cooling system, the exhaust system, or the hydraulic system: Allow machine to cool down less than 30 °C (86 °F).
- Do not touch hot machine parts.
- Do not check the filling level, do not drain or top up any fluid unless the machine has cooled down.

⚠WARNING

Fluids under pressure!

Serious injury can be caused by liquids escaping under high pressure.

- Do not perform any maintenance work on the hydraulic system, the cooling system, the fuel system, or the air conditioning system unless the lines have turned off.
- Lower raised devices to the ground.
- After switching off the diesel engine, wait at least 1 minute until the pressure has been reduced.
- Wear personal protective equipment.

⚠WARNING

Work above floor level!

Injury caused by falling.

- Do not perform any maintenance or repair work above ground level unless using a stable ladder or a maintenance scaffold.
- To reach the maintenance points on the machine, use the steps indicated. Do not step on any other machine element or add-on part.

⚠WARNING

Noxious exhaust gases!

Risk of serious injury or death caused by poisoning or suffocation after breathing in exhaust gases when operating the machine in an enclosed space.

- Only operate the machine outdoors.
- If the engine has to run in enclosed spaces:
  - Guide the exhaust gases outside (extension hose).
  - Ensure that there is a sufficient supply of fresh air, e.g. by using a ventilation system or by opening the doors.

⚠CAUTION

Electrical voltage!

Risk of injury due to electric shock.

- Before starting maintenance work, set the battery isolating switch to off in order to de-energize the electrical system. As an alternative, disconnect the earthing/grounding strip from the battery.
- Wear personal protective equipment.
- When working on the electrical system, be sure to only use suitable and approved tools.

NOTICE

Short-circuits on electrical components!

Destruction or damage of machine parts by a short-circuit.

- Before starting maintenance work, set the battery isolating switch to off in order to de-energize the electrical system. As an alternative, disconnect the earthing/grounding strip from the battery.
- Observe the operating instructions when using a jumper cable.
- Do not lay any tool or machine element on the battery.

NOTICE

Engine hood swinging range!

Material damage when opening the engine hood.

- Keep a sufficient distance to other objects located either above or at the rear.

Note on the environment:
Catch and properly dispose of any liquid escaping or drained during any maintenance work.

4.00.02 Running-in instructions

After 50 operating hours

Axle maintenance

▶ Check that wheel nuts/wheel bolt connections are tight.

Servicing hydraulic system

▶ Replace filter insert of pressure filter for hydraulic system.

Maintenance driving gear

▶ Change driving gear oil.

4.00.03 Maintenance overview

For engine maintenance, see instruction manual for diesel engine.

Every 10 operating hours

10 h

Checking that the parking brake is working properly	see page 156
Checking that the foot brake is working properly	see page 157
Checking that the seat contact switch is working properly	see page 158
Checking the safety switch function of the multifunction armrest	see page 159
Checking the EMERGENCY STOP function when the machine is at a standstill	see page 160
Checking the hydraulic oil fill level	see page 178
Cleaning the nozzles	see page 196
Checking the air pressure in the tyres	see page 186
Checking the engine oil fill level	see the instruction manual for the diesel engine
Draining the water sump	see page 168
Checking the coolant fill level	see page 175
Checking and cleaning the air filter/dust valve	see page 173 see page 172
Cleaning the filter for the water-sprinkling system	see page 195
Cleaning the filter for the additive-sprinkling system	see page 197

Every 250 operating hours

250 h

Checking the scrapers	see page 184
Checking the V-belt tension	see the instruction manual for the diesel engine
Checking the air-conditioning system's V-belt tension	see page 161
Lubricating the steering cylinder pins	see page 192
Lubricating the steering tie rod bearing	see page 192

	Checking the radiator	see page 175
	Checking the driving gear oil fill level	see page 190
	Checking the air-conditioning system	see page 161
Every 500 operating hours, at least once a year	500 h	
	Replacing the fresh air filter for the driver's cab	see page 162
	Replacing the circulating air filter for the driver's cab	see page 163
	Replacing the filter insert in the pressure filter for the hydraulic system	see page 180
	Checking the wheel nuts/wheel bolts for tightness	see page 185
	Changing the engine oil	see page 167
	Replacing the lubrication oil filter in the diesel engine	see the instruction manual for the diesel engine
	Replacing the filter cartridge on the fuel filter	see page 168
	Replacing the filter cartridge for the fuel prefilter	see page 168
	Cleaning/replacing the filter insert for the dirt and water separator	see page 171
	Replacing the air filter cartridge	see page 173
	Checking/cleaning the seat adjustment guides	see page 164
	Checking the starter battery	see page 181
Every 1000 operating hours, at least once a year	1000 h	
	Checking the EMERGENCY STOP function when driving	see page 160
	Changing the driving gear oil	see page 190
Every 2000 operating hours, at least every two years	2000 h	
	Cleaning the water-sprinkling system	see page 195

	Changing the hydraulic oil	see page 179
	Replacing the V-belt	see the instruction manual for the diesel engine
	Replacing the V-belt on the air-conditioning system	see page 161
	Changing the coolant	see page 176
	Replacing the safety cartridge	see page 174
	Replacing the hydraulic oil tank ventilation filter	see page 180
	Replacing the brake oil	see page 191

4.00.04 Required maintenance parts

The specifications for the filling capacities of liquids and operating materials refer to the standard version of machine. However, they may deviate, e.g. for hydraulic oil and where attachments and auxiliary devices are installed.
Always observe the operating manual when filling. Fill liquids and operating materials up to the respective mark.

HP 280 (TCD 2012 L04 2V)

H2490001 → H2490156

Quantity	Maintenance part			first time after	Maintenance intervals in operating hours			
					every 250	every 500 or once a year	every 1000 or once a year	every 2000 or every 2 years
11.5 l	Engine oil	□				D		
80.0 l	Hydraulic oil	▭						D
22.0 l	Coolant	○						D
(2 ×) 8 l	Driving gear oil	☆		50 D	A		D	
0.2 l	Brake oil	▭						D
1	V-belt	Generator	2043529		A			D
1	V-belt	Coolant pump	2651319		A			D
1	*V-belt	Air-conditioning system	324485		A			D
1	Air filter cartridge		2051604		A	D		
1	Safety cartridge		2051606					D
1	Filter cartridge	Lubrication oil	234486			D		
2	Filter cartridge	Fuel	2043673			D		
1	Filter cartridge	Fuel prefilter	1292404			D		
1	*Filter insert	Dirt and water separator	2147028			D		
1	Seal	Valve cover	2064824					D
2	Filter insert	Hydraulic system	2574029	50 D		D		
1	Ventilation filter	Oil tank	2597272					D
1	Filter insert	Water filter	2033909		A			
1	*Dryer	Air-conditioning system	2463624					D
1	Filter insert, driver's cab	Recirculating air	2326587			D		

Quantity	Maintenance part			first time after	Maintenance intervals in operating hours			
					every 250	every 500 or once a year	every 1000 or once a year	every 2000 or every 2 years
1	Filter insert, driver's cab	Fresh air	2146978			D		
1	*Filter cartridge	Air-dryer	1292951					D
1	*Filter insert	Additive sprinkling	280283		A			D
1	*Sight glass	Additive sprinkling	293598		A			D
1	Service kit			2647040		2647044		2647045
A = Check! Replace/Refill if required. D = Replace!								

All necessary maintenance parts for the corresponding maintenance interval are included in the service kit. You can find the current order numbers for individual service kits in the WIRTGEN GROUP document "Parts and more".

Maintenance parts marked as options (*) are not included in the service kit.

HP 280 (TCD 2012 L04 2V)

H2490157 →

Quantity	Maintenance part			First time after	Maintenance intervals in operating hours			
					Every 250	Every 500 or 1 × per year	Every 1000 or 1 × per year	Every 2000 or every 2 years
11.5 l	Engine oil	□				D		
80.0 l	Hydraulic oil	▭						D
22.0 l	Coolant	○						D
(2 ×) 8 l	Driving gear oil	☆		50 D	A		D	
0.2 l	Brake oil	▭						D
1	V-belt	Alternator	2043529		A			D
1	V-belt	Coolant pump	2651319		A			D
1	*V-belt	Air-conditioning system	324485		A			D
1	Air filter cartridge		2051604		A	D		
1	Safety cartridge		2051606					D
1	Filter cartridge	Lubricating oil	234486			D		
2	Filter cartridge	Fuel	2043673			D		
1	Filter cartridge	Fuel prefilter	2175352			D		
1	*Filter insert	Dirt and water separator	2147028			D		
1	Seal	Valve cover	2064824					D
2	Filter insert	Hydraulic system	2574029	50 D		D		
1	Ventilation filter	Oil tank	2597272					D
1	Filter insert	Water filter	2033909		A			
1	*Dryer	Air-conditioning system	2463624					D
1	Filter insert, driver's cab	Recirculating air	2326587			D		
1	Filter insert, driver's cab	Fresh air	2146978			D		
1	*Filter cartridge	Air dryer	1292951					D
1	*Filter insert	Additive-sprinkling system	280283		A			D

Quantity	Maintenance part			First time after	Maintenance intervals in operating hours			
					Every 250	Every 500 or 1 × per year	Every 1000 or 1 × per year	Every 2000 or every 2 years
1	*Sight glass	Additive-sprinkling system	293598		A			D
1	Service kit			2647040		2958995		2958996
A = Check! Replace/Refill if required. D = Replace!								

All necessary maintenance parts for the corresponding maintenance interval are included in the service kit. You can find the current order numbers for individual service kits in the WIRTGEN GROUP document "Parts and more".

Maintenance parts marked as options (*) are not included in the service kit.

4.00.05 Welding work on the machine

Welding work on the machine must only be carried out by specially trained and authorised personnel.

Welding work on the machine may change the properties of the machine and is only permitted with the agreement of the manufacturer.

Welding work on safety-relevant components must only be carried out by the manufacturer's authorised customer service.

⚠WARNING

Fire and explosion!

Serious injuries or death as a result of ignition or explosion of combustible materials (fuels, oil, gases).

- Make sure that there are no flammable or explosive materials in the vicinity of the welding work.
- Put down welding covers.
- Wear personal protective equipment.

⚠WARNING

Toxic fumes and dust!

Risk of serious injury or death caused by poisoning or suffocation after breathing in toxic fumes or particles when welding.

- Wear personal protective equipment (protective mask).
- Remove any paint within at least a 100 mm radius of the areas that are affected by the heat from welding.
- Avoid breathing in dust when sanding paint.
- Do not use solvents or paint strippers to remove paint in enclosed spaces if there is not sufficient supply of fresh air.
- Do not breathe in the fumes from solvents or paint strippers.
- Before welding:
  - Remove any solvent and paint stripper residues using water and soap.
  - Allow the fumes from solvents or paint strippers to evaporate for at least 15 minutes.
  - Remove any containers for solvents and paint strippers (or any other flammable liquids) from the operating area.

NOTICE

Overvoltage and heat!
Material damage to electric/electronic components of the machine caused by electric current or the effects of heat.

- Before starting electrical welding work, remove all connection plugs from electronic components of the machine.
- Connect negative terminal of the welding appliance at the component to be welded in the vicinity of the weld.
- Remove insulating layers of paint before starting welding work.
- Keep welding leads away from the electrical leads of the machine. If not possible, the welding leads cross the machine leads.
- Touch only the welds with live electrodes.
- Prior to welding work remove components which may get damaged by heat or welding work.
- Observe the instruction manual of the diesel engine.

Procedure

- ▶ Switch off diesel engine and remove ignition key.
- ▶ Wait for the 2 minutes after-running time of the machine to pass.
- ▶ Disconnect battery, first negative then positive terminal.
- ▶ Remove plug of the control devices of the machine.
- ▶ Connect negative terminal of the welding appliance in the vicinity of the weld.
- ▶ Do not get too close to other components when welding.
- ▶ Reconnect all connection plugs after welding.
- ▶ Attach battery.

4.01 Chassis/safety devices

⚠WARNING

Uncontrolled driving behaviour!

Severe injury or death due to separate machine movements.

- Ensure that there are no persons or objects in the danger zone of the machine (moved).
- Do not check functioning of safety devices in case there is not enough space.

The machine must not be used if the safety devices do not work.
Call the customer service!

4.01.01 Basic maintenance work

- Check operating and safety instructions on the machine: Replace damaged and/or non-readable signs.
- Ensure that hinges and links move easily and lubricate lightly.
- Check the function of the warning systems (e.g. signal horn, reflectors, back-up alarm, blinker and warning flasher). Repair/ change defective alarm devices/defective parts of the alarm devices.
- Check the function of the lighting. Replace defective lamps.
- Check the firm fit of the screw connections which are subjected to high loads, e.g. articulated joint, tie rod, drum suspension, wheel suspension, drum drive, wheel drive.
- Check that the air filter system is undamaged (e.g. no cracks in hoses or enclosures). Replace defective parts.

4.01.02 Checking and replacing steps/slip-resistant surface

Regularly check the non-slip property of the surfaces of the steps and in the driver's cab (e.g. sand-coated foil).

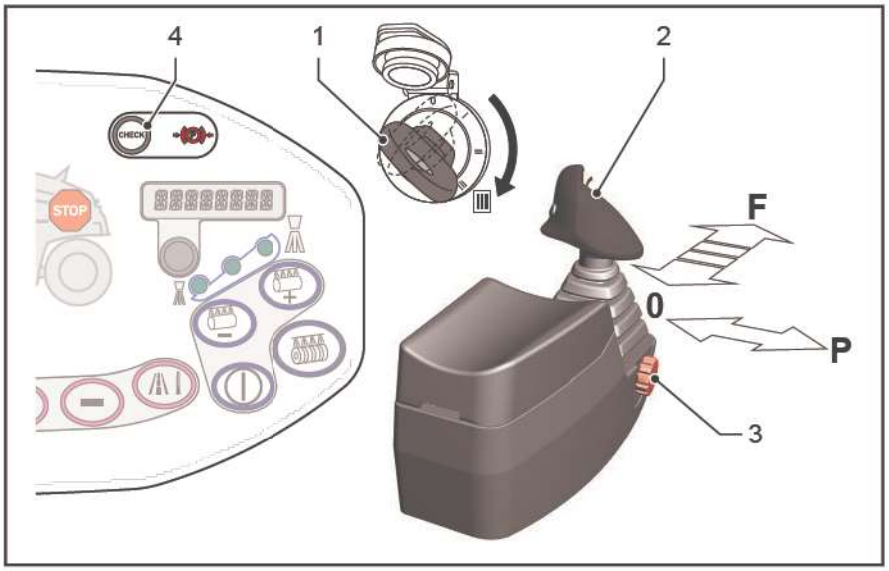
For steps:

▶ Replace or regrind non-slip profiles with a minimum height of 1 mm.

For sand-coated foils:

▶ Replace ineffective or worn foils.

4.01.03 Checking that the parking brake is working properly

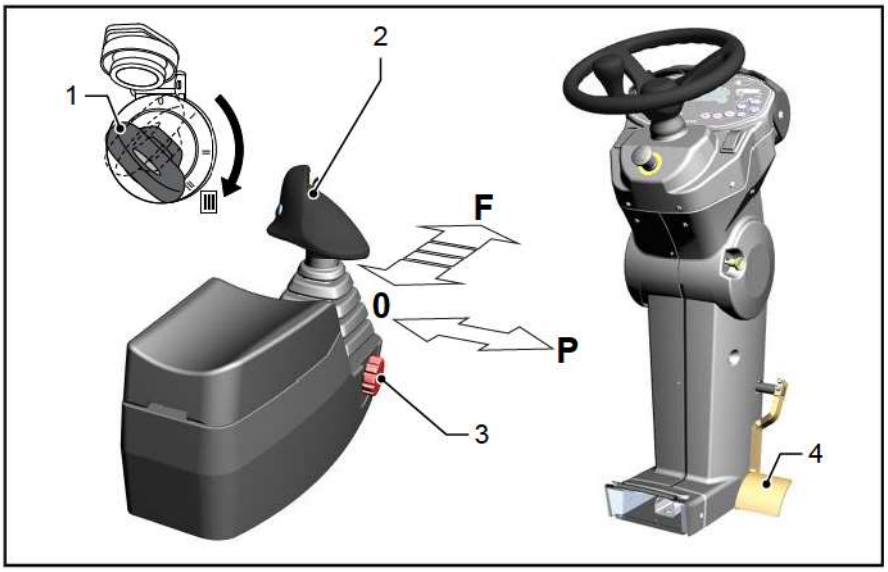


Checking the parking brake when the machine is stationary

- ▶ Start the diesel engine [1].
- ▶ Set the final speed [3] to 2 km/h (1.2 mph).
- ▶ Press and hold the switch [4].
- ▶ Push the drive lever [2] out of position P to the left and into position 0.
- ▶ Briefly push the driving lever [2] forwards.
- ✔ The parking brake is working correctly if driving is prevented when the switch [4] is pressed.
- ▶ After performing the check: First move the drive lever [2] into position P, and then release the switch [4].
- ✔ Machine is ready to start.

If the brake discs are worn to such an extent that driving off is possible even when the switch [4] is pressed, the parking brake must be inspected or replaced. The machine must not be operated until this has been completed.
Contact customer service!

4.01.04 Checking that the foot brake is working properly

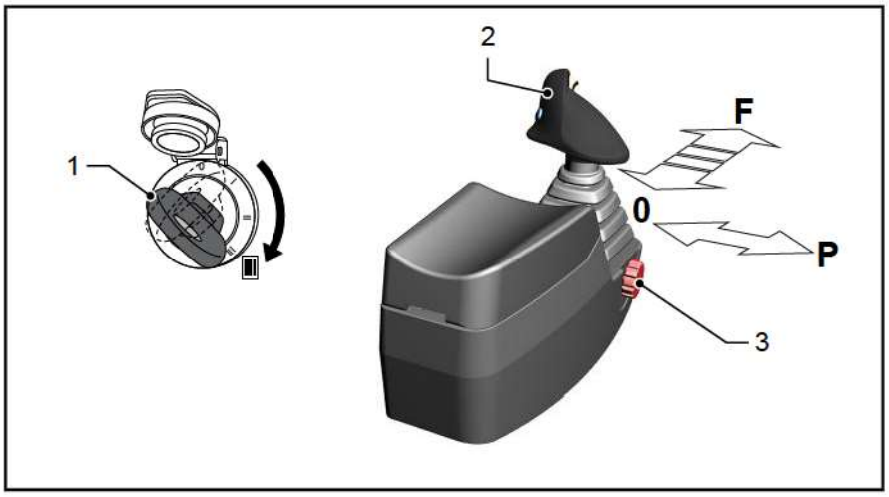


Inspecting the foot brake when engine at standstill

- ▶ Start the diesel engine [1].
- ▶ Set the final speed [3] to 2 km/h (1.2 mph).
- ▶ Press and hold the brake pedal [4].
- ▶ Press drive lever [2] from the P position to the left into the 0 position.
- ▶ Push the drive lever [2] shortly in forward direction.
- ✔ The foot brake is in good order when the travel drive remains without function when the brake pedal [4] is pressed.
- ▶ After inspection: First set the drive lever [2] to the P position and then release the brake pedal [4].
- ✔ Machine is ready to start.

If it is possible to start driving even though the brake pedal [4] is pressed, the foot brake must be checked or replaced. The machine must not be used until this has been done. Request assistance from customer services!

4.01.05 Checking that the seat contact switch is working properly



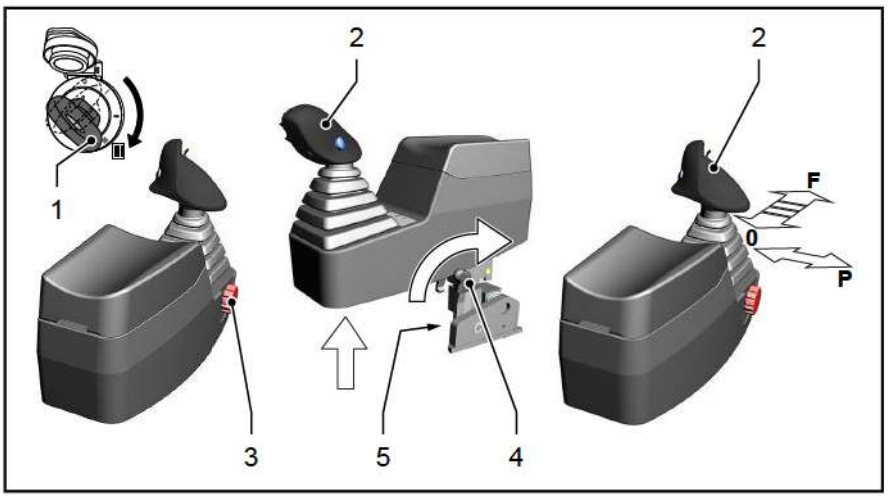
Checking the seat contact switch when the machine is stationary

- ▶ Start the diesel engine [1].
- ▶ Set the final speed [3] to 0.5 km/h (0.3 mph).
- ▶ Stand up from the driver's seat (looking forwards). Be sure of your footing and hold on tight.
- ▶ Push the drive lever [2] out of position P to the left and into position 0.
- ▶ Briefly push the driving lever [2] forwards.
- ✔ The machine does not start moving: The seat contact switch is working properly.
- ✔ The machine starts moving: The seat contact switch is not working properly.

If the seat contact switch does not work, it must be tested and repaired without delay. The machine must not be operated until this has been completed. Contact customer service!

4.01.06 Checking the safety switch function of the multifunction armrest

For versions with multifunction armrest with folding function.

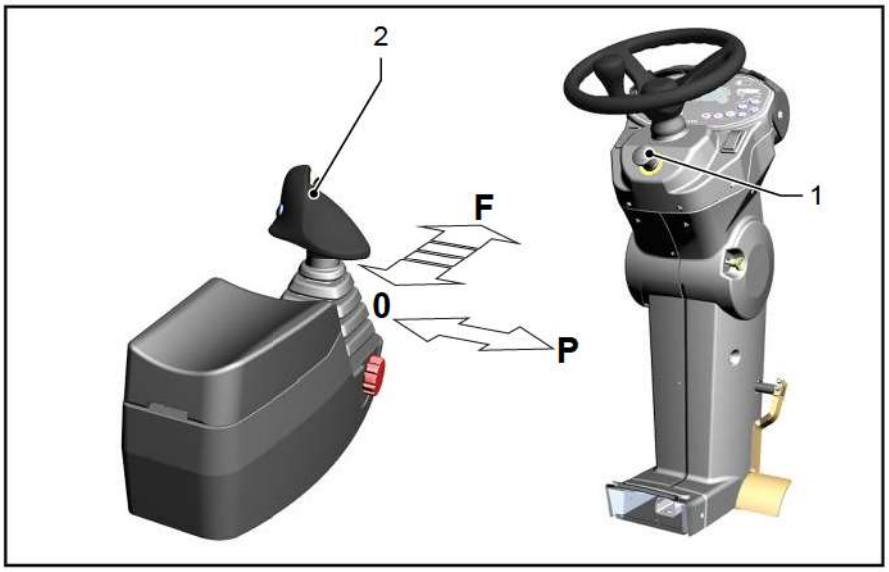


Checking the function when the machine is at a standstill

- ▶ Start the diesel engine [1].
- ▶ Set the final speed [3] to 0.5 km/h (0.3 mph).
- ▶ With your right hand, push lever [4] in backwards.
- ▶ Fold the multifunction armrest with your left hand about 5 cm backwards (looking forwards).
- ▶ LED [5] off.
- ▶ Push the drive lever [2] out of position P to the left and into position 0.
- ▶ Briefly push the drive lever [2] forwards.
- ✔ The machine does not start moving: The safety switch for the multifunction armrest is working properly.
- ✔ The machine starts moving: The safety switch for the multifunction armrest is not working properly.

If the safety switch on the multifunction armrest seat is not working, it must be checked and repaired without delay. The machine must not be operated until this work has been carried out. Request assistance from customer service.

4.01.07 Checking the EMERGENCY STOP function



Checking function with machine at standstill (daily)

- ▶ Start the diesel engine.
- ▶ Parking brake active: The drive lever [2] is latched into the P position.
- ▶ Press EMERGENCY STOP [1] when engine at standstill.

The machine:

- ✔ Shuts down the diesel engine.

Checking function during machine operation (annually)

Perform the functional test while the diesel engine is running.

- ▶ Press EMERGENCY STOP [1] with low speed 0.5 km/h (0.3 mph).

The machine:

- ✔ Stops immediately.
- ✔ Shuts down the diesel engine.

If the machine reacts other than as described above or if the EMERGENCY STOP does not work, it must be tested and repaired without delay. The machine must not be used until this has been done. Request assistance from customer services!

4.02 Control stand

4.02.01 Maintaining air conditioning system

⚠CAUTION

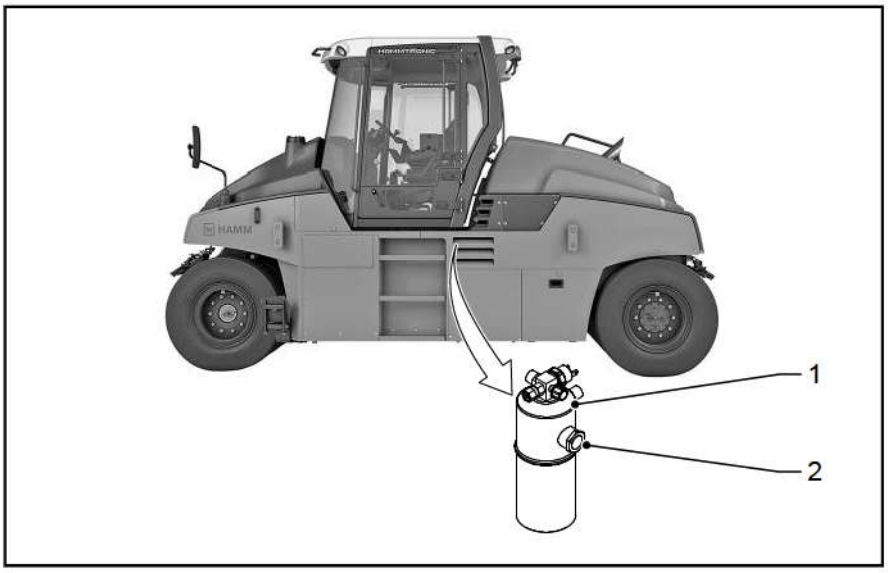
Refrigerating agent harmful to health!

Injuries as a result of freezing or inhaling harmful vapors.

- Do not touch any part of the air-conditioning system until it has reached room temperature.
- Do not open the pipe system of the air conditioning.
- Wear personal protective equipment.

Maintenance work on the air-conditioning system may only be performed by the customer service or trained, skilled personnel with suitable workshop equipment.

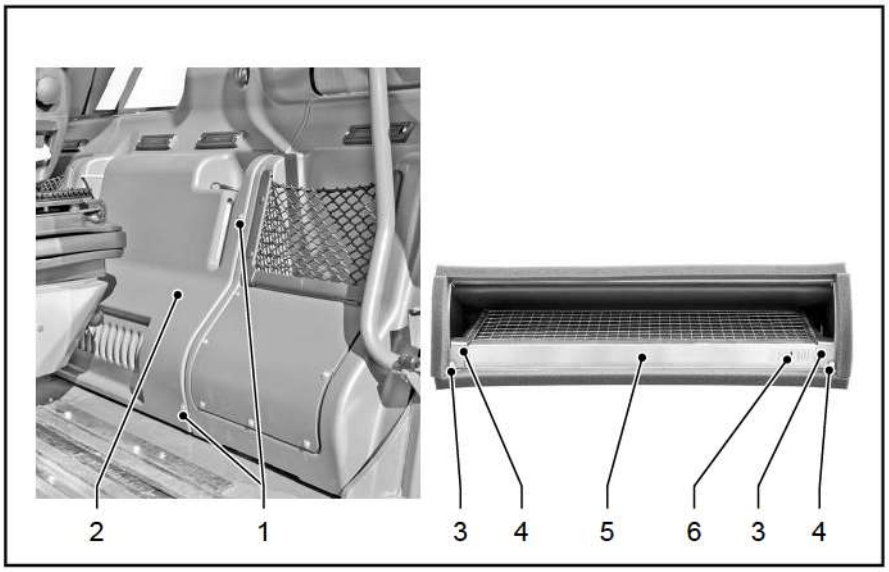
Switch on air conditioning at least 1 per month (even in winter) for ca. 15 minutes.



Replacing drain bottle

▶ Change the drain bottle [1] when the indicator beads [2] change colour.

4.02.02 Replacing fresh air filter of the operator's cabin



Change the filters according to the amount of dust accumulated.

- Switch off diesel engine and remove ignition key.
- Loosen screws [1] and remove with the cover [2].
- Unscrew and remove the screws [3] together with the fixing brackets [4].
- Remove filter element [5] from the ventilation system and replace with a new filter element.
- Align the filter element as indicated [6].
- Install and tighten the fixing brackets [4] with the screws [3].
- Install and tighten the cover [2] with the screws [1].

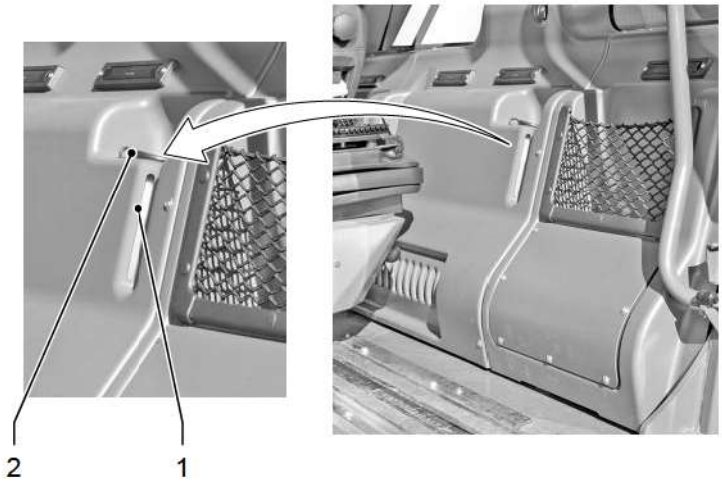
Check the proper alignment of the filter element (airflow - ↑).

4.02.03 Replacing circulating air filter of the air conditioning system

Change the filters according to the amount of dust accumulated.

- Switch off diesel engine and remove ignition key.
- Loosen screws [1] and remove with the cover [2] and remove the filter element [3].
- Replace the filter element [3] by a new one.
- Mount the cover [2] with the filter element [3] and tighten screws [1].

4.02.04 Checking fill level of the windscreen washer



The tank [1] for the windscreen washer fluid is located in the driver's cab.

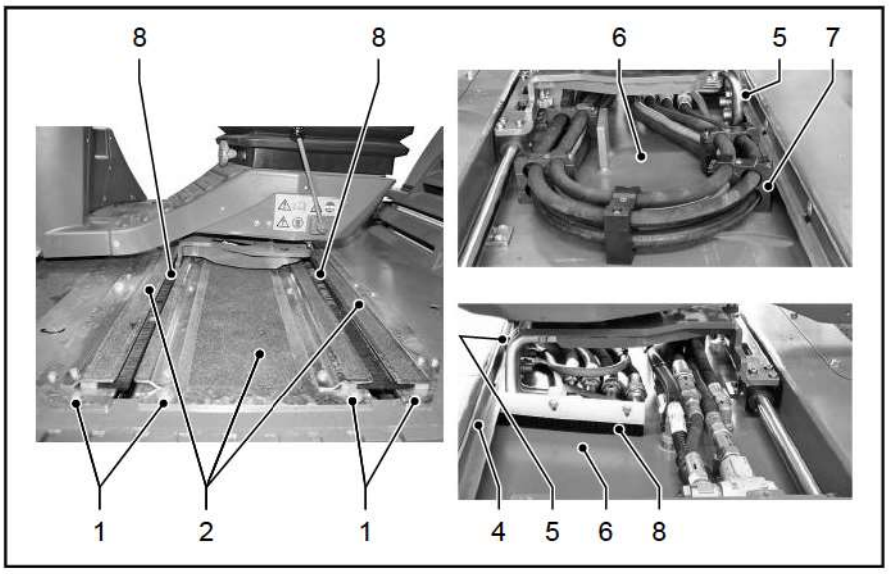
Pure water can be used to wash the windscreen. However, we recommend adding a standard windscreen washer fluid.

Add an antifreeze solution when outdoor temperatures are below the freezing point of water. Make sure you use the mixing ratio specified by the manufacturer.

Top up windscreen washer fluid in good time.

- Open the cover [2] and top up the reservoir [1] with windscreen washer fluid.
- Close the tank by replacing the lid [2].

4.02.05 Checking/cleaning the seat adjustment guides



Dirt can make it difficult to adjust the seat.

Cleaning guides and base plate

- Slide the seat console into the end position.
- Remove the hexagonal screws [1] and covers [2].
- Clean the base plate [6] (for example with a vacuum cleaner).
- Clean off any dirt adhering to the track [4] and track roller [5].
- Check the condition of the slide blocks [7]: Renew worn sliding blocks.
- Check the condition of the brushes [8]: Renew worn brushes.
- Check that the seat adjustment moves freely.
- Replace the covers [2] and screw in the hexagonal screws [1] tightly.

4.04 Drive unit/diesel engine

⚠WARNING

Inflammable fuel!

Severe injury and death due to fire, explosion and moving parts.

- Do not smoke. No open fire!
- Do not inhale fuel fumes.
- Catch spilling fuel or water sump, do not allow to seep away into the ground!

⚠WARNING

Fuel is under very high pressure!

Serious injury can be caused by liquids escaping under very high pressure.

- Carry out maintenance works only with depressurized fuel system.
- Wait 1 minute after you switched off the diesel engine until the pressure is relieved.
- Work on the high-pressure lines of the fuel injection system may be carried out by trained specialised personnel only.
- Wear personal protective equipment.

NOTICE

Inadmissible fuel or inadmissible lubricating oil for the diesel engine!

Property damage to the diesel engine or to the system for exhaust treatment.

- Only use the fuel specified in the operating instructions.
- Only use the engine oil specified in the operating instructions.
- Observe the indicating labels affixed at the filler necks for fuel and engine oil.

NOTICE

Dirt in the fuel system!

Material damage to the diesel engine as a result of contamination in the fuel system.

- Ensure that no dirt or dust can get into the fuel system (cover dirty areas with foil).
- Thoroughly clean and dry components and the surrounding areas (e.g. with a high-pressure cleaner).

NOTICE

Contaminated inlet air

When it is defective, clogged, or contaminated, the air filter can damage the engine.

- Inspect all lines, flexible tubes and the casing of the air filter for tightness and integrity on a regular basis (at least once per year).
- Immediately replace any damaged part. Further operation is inadmissible.
- Check the operating readiness of the air filter on a regular basis.
- Regularly clean the air filter casing.
- Do not clean but always replace the air filter cartridge and the safety cartridge.
- Never run the diesel engine without an air filter cartridge and a safety cartridge in the air filter.

The fuel system must be bled after all work on an open fuel system or if the fuel tank has been run empty.
Check the fuel system for leaks with a trial run!

Adhere to running-in regulations, servicing intervals and care measures for diesel engine as specified in the instruction manual of the engine manufacturer.

4.04.01 Lubricating oil change intervals

These intervals depend, e.g., on:

- Lubricating oil quality
- Fuel sulphur content
- The mode in which the diesel engine is used

Change lubricating oil after half the interval indicated, e.g., when at least one of the following conditions is true:

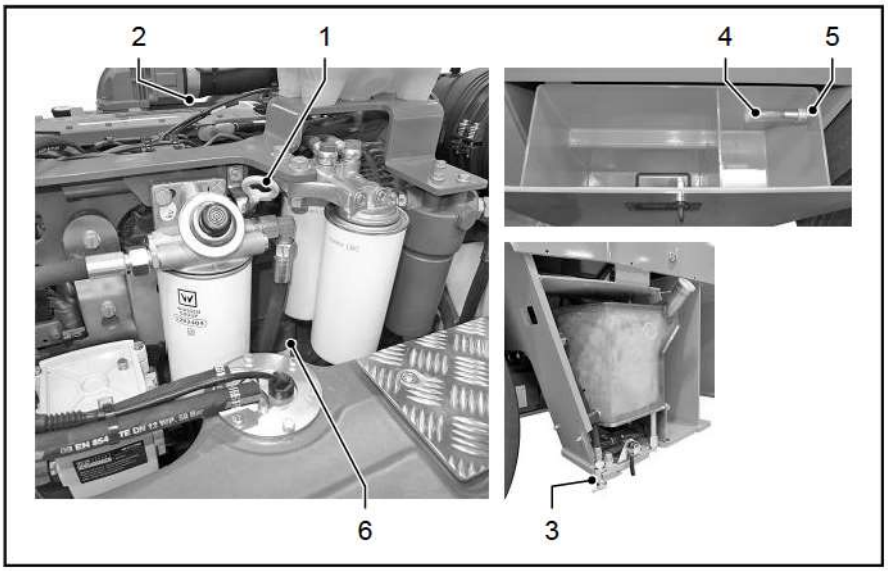
- Continuous ambient temperature below –10 °C (14 °F) or lubricating oil temperature below 60 °C (140 °F)
- Operation using biodiesel fuel

Change the lubricating oil at least once per year if the lubricating oil change intervals are not reached before the year ends.

4.04.02 Maintenance points on the diesel engine when changing oil

For engine maintenance see instruction manual for diesel engine!

☐ Only lubricants with this symbol are permitted ("Technical data", page 199).



[1]	Dipstick	[2]	Oil filler neck
[3]	Drain valve	[4]	Service support
[5]	Bracket	[6]	Lubrication oil filter

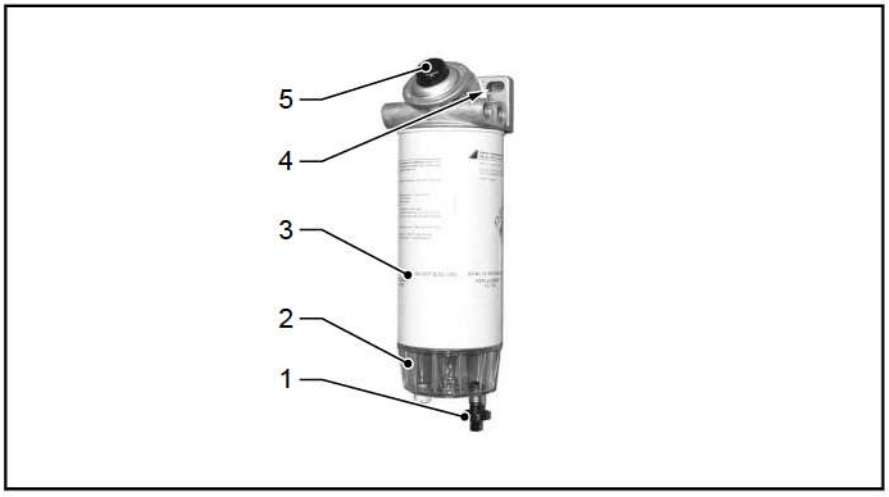
4.04.03 Changing engine oil

- ▶ Switch off the diesel engine and remove the ignition key.
- ▶ Allow the machine to cool down to below 30 °C (86 °F).
- ▶ Unscrew the sealing cap from the drain valve [3].
- ▶ Unscrew the service support [4] from the bracket [5] and screw it onto the drain valve [3].
- ✔ The drain valve opens and the engine oil can flow out.
- ▶ Catch any old oil in a suitable container.
- ▶ Unscrew the service support [4] from the drain valve [3] and screw it onto the bracket [5].
- ✔ The drain valve closes.
- ▶ Close the drain valve [3] with the sealing cap.
- ▶ Seal the oil filler pipe [2] and allow the diesel engine to run briefly.
- ▶ Switch off the diesel engine and remove the ignition key.
- ▶ Check the engine status when the diesel engine is cold; top up with engine oil, if required.
- ▶ Correct oil level: Between the Min. and Max. marks on the dipstick [1].

4.04.04 Replace the filter cartridge for the fuel filter

- Switch off the diesel engine and remove the ignition key.
- Allow the machine to cool down to below 30 °C (86 °F).
- Unscrew the filter cartridge [1] and dispose of it properly.
- Before fitting, apply a thin coat of oil to the rubber seal and screw new filter cartridges [1] to the filter head until the seal makes contact. Further tighten the filter cartridge by hand by half a turn.
- Bleed the fuel system.

4.04.05 Changing filter cartridge for the fuel pre-filter



Replacing filter cartridge

- Switch off diesel engine and remove ignition key.
- Allow machine to cool down to below 30 °C (86 °F).
- Close the fuel shut-off valve if present (only if the fuel tank is installed in the high position).
- Open the bleed screw [4].
- Open the drain valve [1] (screw the conical nipple into the housing).
- Drain fuel and/or the water sump from the filter.

- Screw in and tighten the bleed screw [4].
- Unscrew filter cartridge [3].
- Unscrew the drain housing [2] from the filter cartridge and clean it.
- Remove contamination from the drain valve [1] (check that it works properly).
- Screw the drain housing [2] with a new gasket ring to the filter cartridge [3] and tighten by hand. Close the drain valve [1] (fully unscrew the conical nipple out of the housing).
- Before fitting the new filter cartridge, apply a thin coat of oil to the rubber seal, and screw the filter cartridge [3] to the filter head until the seal makes contact. Tighten the filter cartridge by hand further by half a turn.
- Open the fuel stop cock if present (only if the fuel tank is installed in the high position).
- Bleed the fuel system.

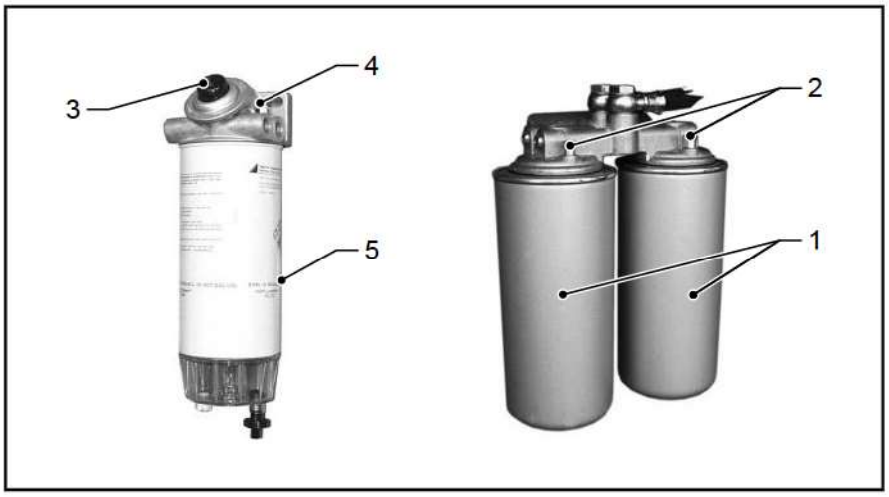
Draining water sump

NOTICE

Water sump in the fuel!
Property damage to the diesel engine by water sump in the fuel system.
- Dewater the fuel prefilter/water trap regularly according to the water content of the fuel.
- If the fuel has a high water content, dewatering must be performed more frequently.

- Open the bleed screw [4].
- Open the drain valve [1] (screw the conical nipple into the housing).
- Drain the water sump from the filter.
- Close the drain valve [1] (fully unscrew the conical nipple out of the housing).
- Screw in and tighten the bleed screw [4].
- Bleed the fuel system.

4.04.06 Bleeding the fuel system



Air in the fuel system is fully vented when starting the diesel engine. For this, several starting attempts may be necessary. The start process can be activated for a maximum of 20 seconds at a time; otherwise, the starter winding will overheat and be destroyed. There must be pauses of at least 1 minute between the individual starting processes in order to allow the starter to cool down.

- Open the bleed screw [4] on the fuel prefilter [5].
- Actuate the manual pump [3] until fuel emerges from the bleed hole [4].
- Screw in and tighten the bleed screw [4].
- Open the bleed screw [2] on the fuel filter [1].
- Continue to actuate the manual pump [3] until fuel emerges from the bleed holes [2] on the fuel filter [1].
- Screw in and tighten the bleed screws [2].
- Continue to actuate the manual pump [3] until resistance can be felt at the actuation button.
- Then start the diesel engine and run it at idle speed for 1 minute.
- Inspect all components of the fuel system for leaks.

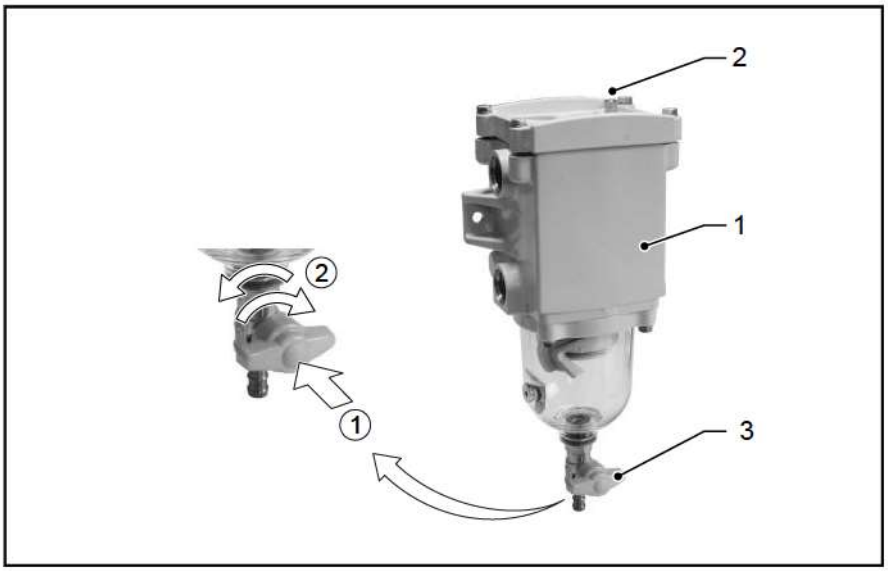
4.04.07 Draining the water separator

NOTICE

Water sump in the fuel!

Material damage to the diesel engine caused by a water sump in the fuel system.

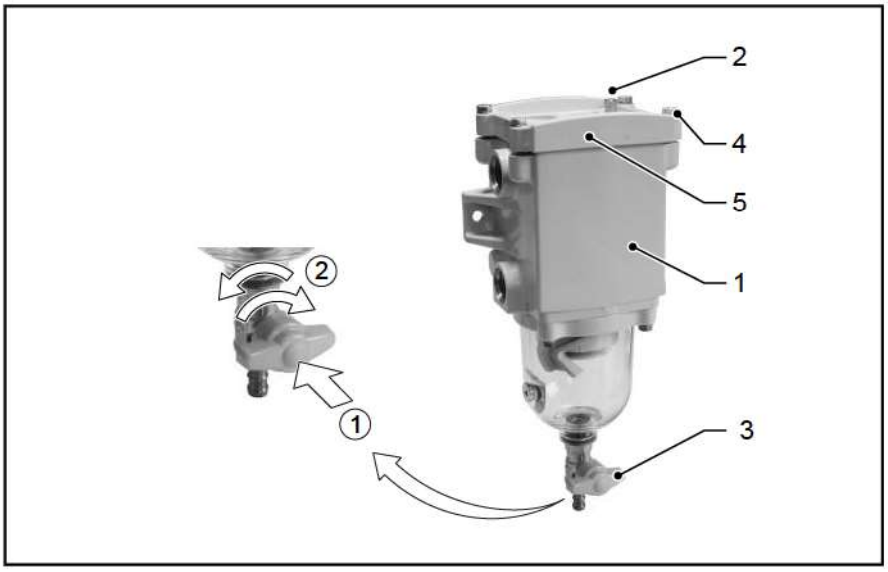
- Drain the water sump as soon as the fuel prefilter indicator light flashes.
- Drain the water separator regularly according to the water content in the fuel.



The water separator can only be bled when the bleed screw is closed.

- Open the bleed screw [2] on the water separator [1].
- Open the drain valve [3].
- Drain the water sump.
- Close the drain valve [3].
- Screw in and tighten the bleed screw [2].
- Bleed the fuel system.
- Then start the diesel engine and run it at idle speed for 1 minute.
- Inspect all components of the fuel system for leaks.

4.04.08 Cleaning/replacing the filter insert in the dirt and water separator

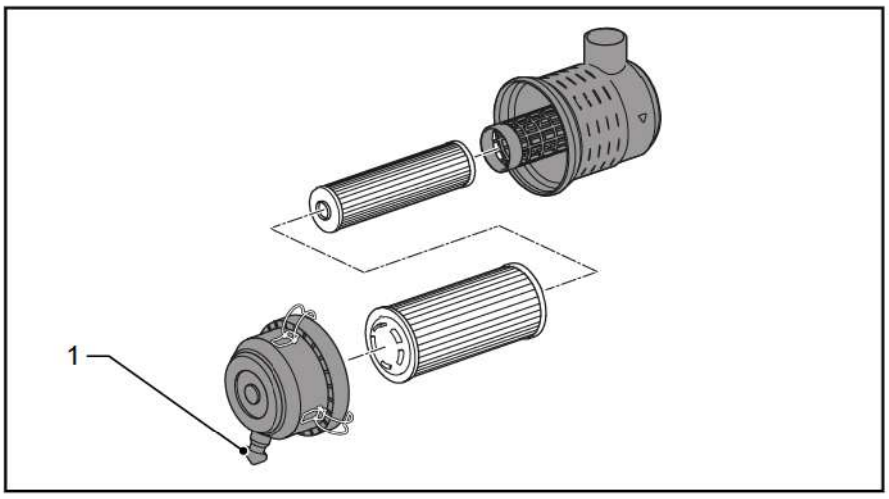


The water separator can only be bled when the bleed screw is closed.

Replacing the filter insert

- Switch off diesel engine and remove ignition key.
- Allow machine to cool down to below 30 °C (86 °F).
- Close the fuel shut-off valve if present (only if the fuel tank is installed in the high position).
- Open the bleed screw [2] on the water separator [1].
- Open the drain valve [3].
- Drain fuel and/or the water sump from the filter.
- Screw in and tighten the bleed screw [2].
- Close the drain valve [3].
- Undo and remove four screws [4] (the screws are initially spring-loaded).
- Remove the cover [5].
- Remove the internal spring casing.
- Take the filter insert out of the housing, and clean it or replace it with a new one.
- Mount the spring casing and cover [5] (tighten the bolts [4] crosswise).
- Open the fuel stop cock if present (only if the fuel tank is installed in the high position).
- Bleed the fuel system.

4.04.09 Check and clean the dust discharge valve at the air filter



Before starting work, check the proper passage through the dust discharge valve:

- Switch off diesel engine and remove ignition key.
- Squeeze the dust discharge valve [1] and clean the discharge slot.

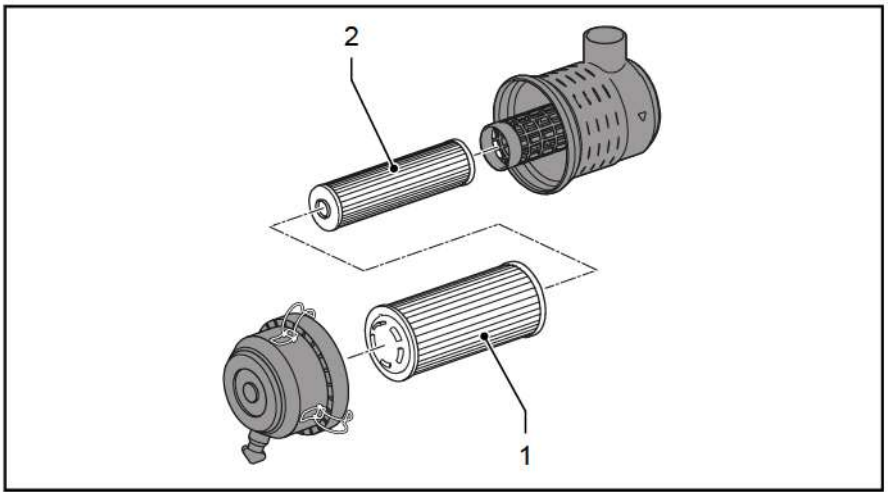
4.04.10 Check the air filter

NOTICE

High pressure by high-pressure cleaner!

Damage of the air filter by power washer.

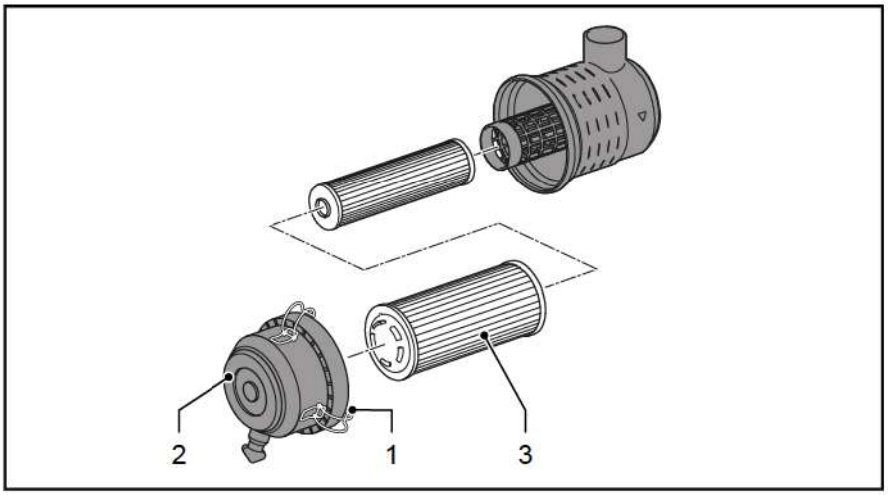
- Never use compressed air or a high-pressure cleaner for cleaning any casing part.
- Clean the interior parts of the casing only with a moist, fibre-free cloth.



Check the operating readiness of the air filter while the diesel engine is running:

- ▶ Start diesel engine and shortly rev up to maximum speed.
- ✔ The air filter pilot light is not flashing on the information display: Air filter cartridge [1] and the safety cartridge [2] are ready for operation.
- ✔ Air filter pilot light flashing on the information display: Replace the air filter cartridge [1] and/or the safety cartridge [2].

4.04.11 Replacing air filter cartridge



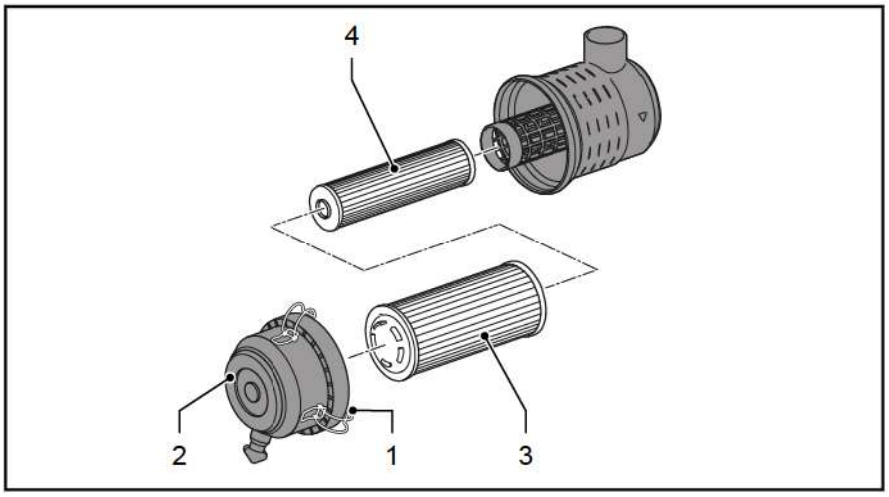
- ▶ Switch off diesel engine and remove ignition key.
- ▶ Allow machine to cool down less than 30 °C (86 °F).

- Fold up the clips [1].
- Remove dust collection container [2].
- Clean the inside of the dust collectors.
- Pull out the air filter cartridge [3].
- Insert a new air filter cartridge.
- Put on the dust receiver bin [2].
- Snap shut the clips [1].
- Check the operating readiness of the air filter.

4.04.12 Replacing the safety cartridge at the air filter

Replace the safety cartridge:

- after having changed the air filter cartridge five times.
- After 2000 operating hours at the latest.
- If the air filter pilot light is flashing on the information display after having replaced the air filter cartridge.
- If the air filter cartridge is defective.



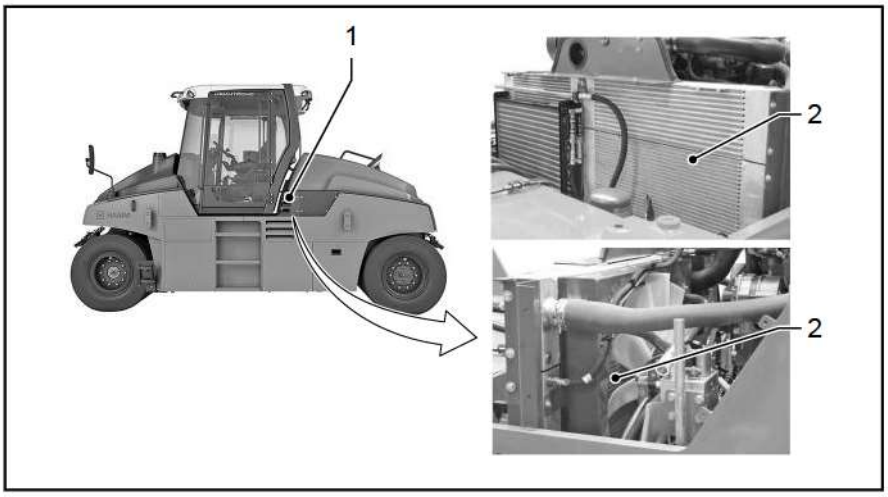
Changing safety cartridge

- Switch off diesel engine and remove ignition key.
- Allow machine to cool down less than 30 °C (86 °F).
- Fold up the clips [1].
- Remove dust container [2].
- Clean the inside of the dust container.
- Pull the air filter cartridge [3] out of the air filter.
- Pull out safety filter cartridge [4].
- Slide in a new safety cartridge.
- Slide a new air filter cartridge [3] into the air filter.
- Put on the dust receiver bin [2].
- Snap shut the clips [1].
- Check the operating readiness of the air filter.

4.04.13 Checking/cleaning radiator

NOTICE

High water pressure by high-pressure cleaner!
Damage of radiator when cleaning with high-pressure cleaner.
- Maintain a safe distance between the lance of the high-pressure cleaner and the radiator.
- Use a directed spray.
- Guide the directed spray parallel (not at an angle) to the cooling fins of the radiator.



Check the radiator

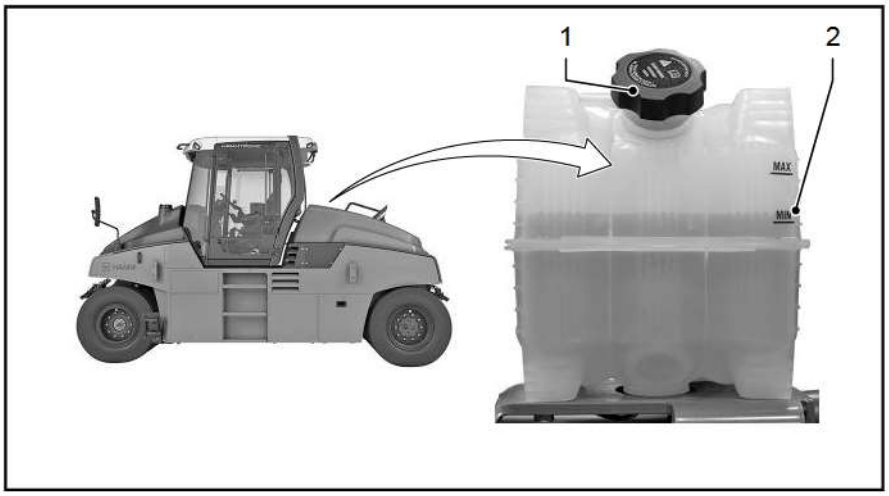
- ▶ Check the cooling fins of the radiators [2] for contamination.
- ✔ Cooling fins not soiled: The machine is ready for operation.
- ✔ Cooling fins contaminated: Clean the cooling fins thoroughly and without delay.

Cleaning radiator

- ▶ Switch off diesel engine and remove ignition key.
- ▶ Allow machine to cool down to a temperature under 30 °C (86 °F).
- ▶ Remove the protective screen [1].
- ▶ Clean the radiator [2] carefully with a high-pressure cleaner from all sides.
- ▶ Install the protective screen [1].

4.04.14 Checking the coolant fill level

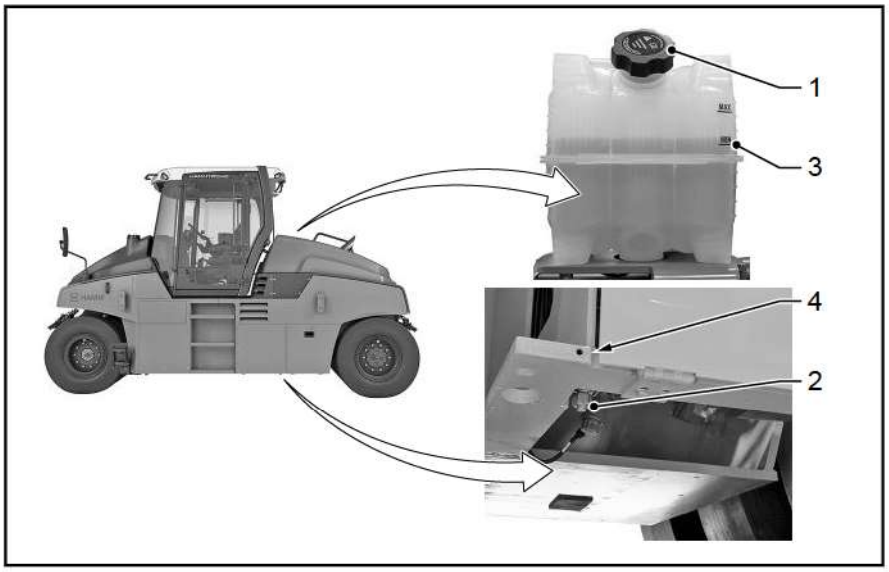
○ Only lubricants with this symbol are permitted ("Technical data", page 199).



- Switch off diesel engine and remove ignition key.
- Only check the coolant level when the diesel engine is cold.
- Correct coolant level: Centre of fill level indicator [2] on the compensation tank. Do not exceed this level!
- If there is insufficient coolant, only fill up coolant with the specified mixing ratio through the filling opening [1] on the compensation tank.
- In case of bigger coolant losses, find out and eliminate the cause.

4.04.15 Changing the coolant

O Only lubricants with this symbol are permitted ("Technical data", page 199).



- Switch off diesel engine and remove ignition key.
- Open the sealing cap [1] at the compensation tank.
- Unscrew the plug [2] at the end of the drain hose [4] and discharge the coolant in a provided receptacle.
- Screw in again the plug [2].

- Set the temperature regulator for the cabin heating to maximum temperature.
- Fill coolant up to the centre of the fill level indicator [3].
- Close the filling opening again with the sealing cap [1].
- Start the diesel engine and bring it to operating temperature (thermostat opens).
- Switch off diesel engine and remove ignition key.
- Check the coolant level when the diesel engine is cold. Top up coolant if required.
- Correct coolant level: there is a mark [3] at the compensation tank.

4.05 Hydraulic oil supply

⚠WARNING

Leaks in hydraulic hoses!
Injuries or fire as a result of oil squirting out of a leaking hydraulic system.

- All lines, hoses and screwed connections of the hydraulic system must be checked for leaks and visible damage (at least once per year).
- Immediately replace any damaged part. Further operation of the machine is inadmissible.

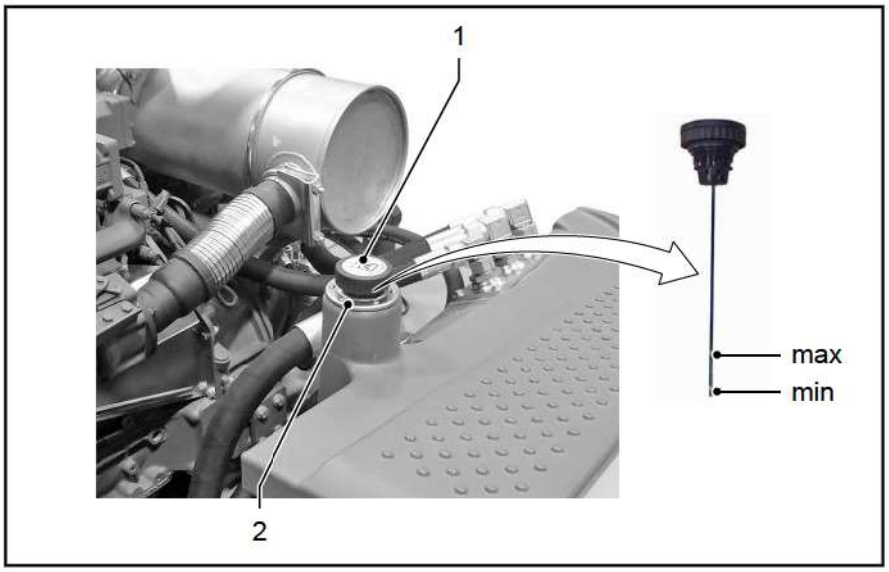
NOTICE

Foreign objects in the hydraulic system!
Consequential damage to the hydraulic system caused by foreign objects in the hydraulic system as a result of earlier damage.

- After a each damage to the hydraulic system, with a foreign object having entered the oil circuit, the entire hydraulic system must be cleaned.
- After cleaning, replace all suction, return and pressure filters in the hydraulic system after 50 hours and again after 125 operating hours.
- This work may only be performed by trained specialised personnel. Call the customer service!

4.05.01 Checking the hydraulic oil fill level

▭ Only lubricants with this symbol are permitted ("Technical data", page 199).

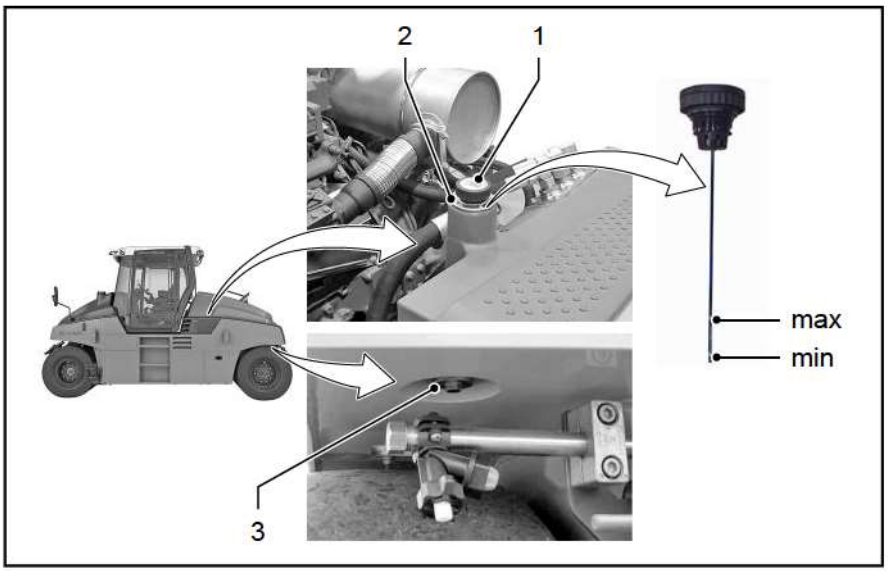


- ▶ Switch off diesel engine and remove ignition key.
- ▶ Allow machine to cool down less than 30 ° (86 °F).
- ▶ Unscrew ventiltion filter [1].
- ▶ Correct oil level: Between the min. and max. marks on the oil dipstick when the ventilation filter [1] is screwed in.

- If the oil level is too low, fill in appropriate oil through fill opening [2].
- In case of bigger oil losses, find out and eliminate the cause.

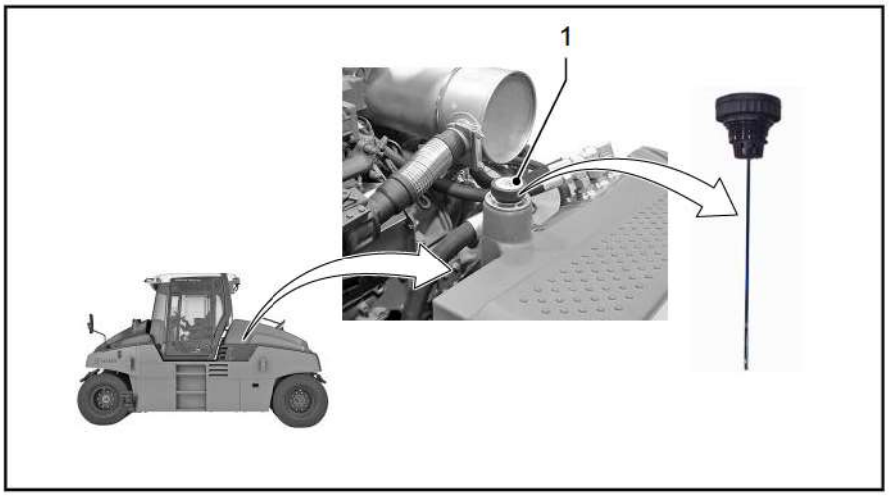
4.05.02 Changing the hydraulic oil

▭ Only lubricants with this symbol are permitted ("Technical data", page 199).



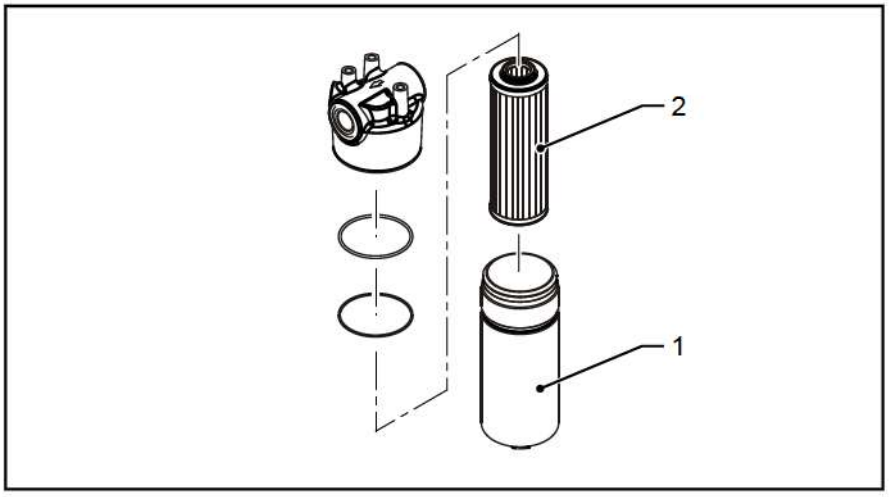
- Switch off diesel engine and remove ignition key.
- Allow machine to cool down less than 30° (86 °F).
- Unscrew ventiltion filter [1].
- Unscrew oil drain screw [3] down on the oil tank and discharge the used oil drain into a provided receptacle.
- Screw in oil drain screw [3] and tighten.
- Fill up specified oil through filling spout [2].
- Correct oil level: Between the min. and max. marks on the oil dipstick when the ventilation filter [1] is screwed in.
- Start the diesel engine.
- Actuate drive lever with low engine speed until the transmission activates.
- Also actuate the steering.
- ✔ The pipes and hose lines will be filled with oil and vented.
- Check oil level with the diesel engine at a standstill and top up oil if necessary.
- Check hydraulic system for leaks.

4.05.03 Replacing the ventilation filter for the hydraulic oil tank



- Switch off diesel engine and remove ignition key.
- Allow machine to cool down less than 30 °C (86 °F).
- Unscrew ventilation filter [1] and replace by a new one.

4.05.04 Replacing filter insert of pressure filter for hydraulic system



Perform the maintenance work on 2 filters!

- Switch off diesel engine and remove ignition key.
- Allow machine to cool down less than 30 °C (86 °F).
- Unscrew the cup-shaped housing [1].
- Pull the filter insert [2] from the filter head and replace with a new one.
- Clean the inside the barrel casing.
- Screw in and tighten the cup-shaped housing in the filter head again.
- Check hydraulic system for leaks.

4.06 Electrical system

4.06.01 Starter battery

⚠WARNING

Explosion!

Serious injuries or burns caused by exploding gases.

- Naked flames and smoking are prohibited when handling any battery. Be sure to avoid any sparking.
- Do not store or charge the battery unless in a well ventilated room.
- Do not store or charge the battery unless at a temperature of between –15 °C and 45 °C (5 °F and 113 °F).
- Avoid exposure to direct sunlight.
- When charging the battery, be sure to follow the manufacturer's instructions and the operating manual.
- To charge the battery, use direct current only.

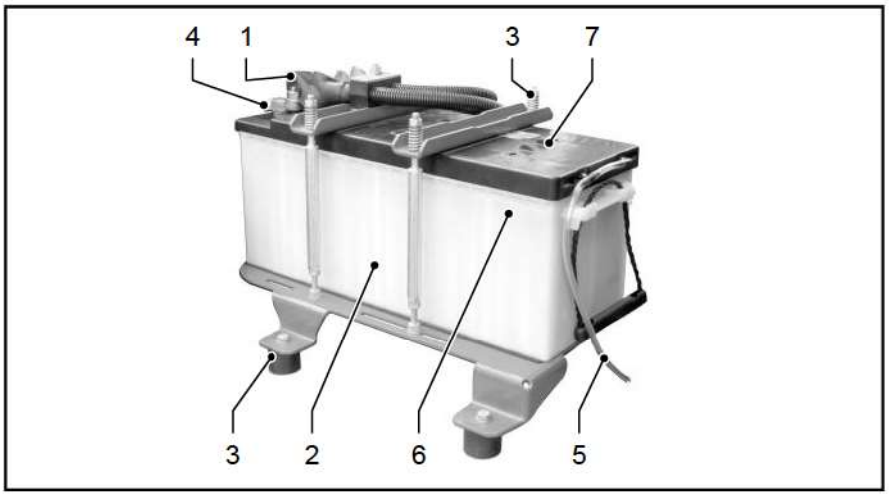
⚠WARNING

Toxic and caustic electrolytic liquid!

Serious injuries as a result of poisoning or chemical burning by contact with electrolytic liquid.

- Wear personal protective equipment when working on or handling any battery, i.e., protective clothing, glasses, face mask, acid-proof rubber gloves.
- Do not tip the battery.
- Use suitable means for binding and disposing of any spilled liquid.
- In case of contact with electrolyte fluid, rinse the area affected with clear water, and consult a physician.
- In case of having inhaled or swallowed any electrolyte fluid, initiate emergency medical aid immediately.

Perform maintenance work only in adequately ventilated rooms.



[1]	Pole retaining rings	[2]	Battery case
[3]	Battery fixing and mount	[4]	Battery terminals and terminal clamps
[5]	Degassing hose	[6]	Electrolyte level marking
[7]	Sealing plugs (x6)		

Maintenance

These intervals depend on:
- Storage and ambient temperatures
- Acid level and acid concentration
- Service conditions

Do not open batteries without plugs, or VRLA batteries!
The battery must be replaced if the electrolyte level or the acid concentration falls below the minimum.

Never top up already filled batteries with acid or enhancing agents!
Top up only with distilled water.

- ▶ Switch off diesel engine and remove ignition key.
- ▶ Wear personal protective equipment.
- ▶ Remove the terminal caps [1] from the battery.
- ▶ Check the battery casing [2] for external damage.
- ▶ Check the battery mounting and storage [3].
- ▶ Clean the battery terminals and terminal clamps [4] and treat with battery terminal grease.
- ▶ Replace the terminal caps [1] on the battery.
- ✔ Battery securely positioned, sealed, undamaged and with its connectors preserved.
- ▶ Check the entire length of the degassing hose [5], and clean it if necessary.
- ✔ Degassing hose is intact.

- ▶ Check the electrolyte level at the inner or outer casing mark [6] or as indicated in the closing plug [7].
- ▶ Top up distilled water or replace the battery as necessary.
- ▶ If possible, check the acid concentration. (1.28 kg/l ±0.1).
- ▶ Clean the battery casing [2] with a damp or antistatic cloth.
- ✔ Correct acid concentration.
- ✔ Correct electrolyte level.
- ▶ Check the battery open-circuit voltage (must be at least 11.9 V) with suitable means, and recharge if necessary.
- ✔ Full starter power.

External charging

Deeply discharged batteries must be removed from the machine for recharging.
Observe the manufacturer's specifications for charger and battery during every charging work step.
Do not charge the battery unless in a well ventilated room.

- ▶ Remove the battery from the machine.
- ▶ Before recharging, ensure that the battery degassing is intact.
- ▶ Before charging, check the electrolyte level and correct if necessary.
- ▶ Connect the battery charger according to the manufacturer's specifications, and then start recharging.
- ▶ Always watch the charging process and stop charging when the acid temperature exceeds 55 °C or in case of acid spill.
- ✔ Battery charged.
- ▶ Switch off and disconnect the charger from the battery.
- ▶ If necessary, remount the battery.
- ✔ Battery is ready for use.

4.08 Transmission

4.08.01 Checking scraper tyre

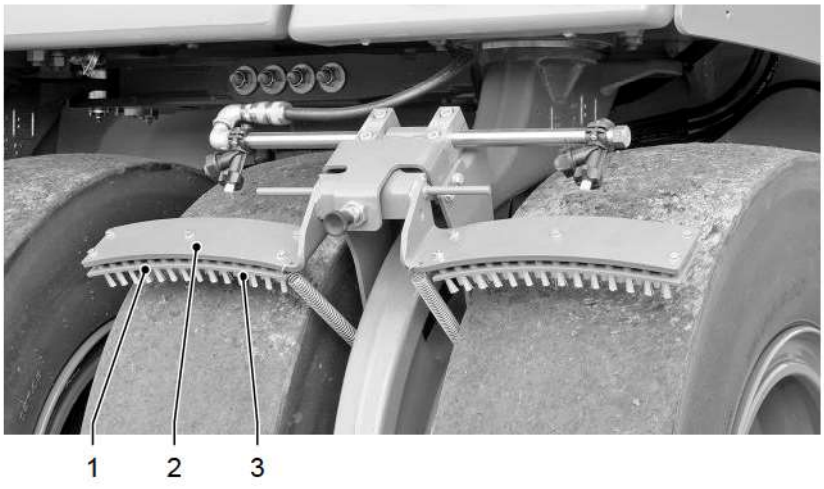
Only scrapers in correct condition ensure a clean roller drum/type surface.

- Check scraper for cleanliness. Clean soiled scrapers.
- Check the condition of the scrapers. Replace worn scrapers in good time.
- Check setting of the scrapers. Adjust preset scrapers.

4.08.02 Cleaning roller drum/tyre scraper

- Rinse out dirt embedded between scrapers and roller drums/ tyres with water jet.
- Remove strongly adhesive dirt with spatula or similar tool.

4.08.03 Replacing scraper brushes



Before carrying out any work on the scrapers:

- Safely park the machine and secure it against rolling away.
- Switch off the diesel engine and remove the ignition key.

- Move the scraper [1] away.
- Loosen clamp connection [2].
- Replace scraper [1] by a new one.
- Tighten clamp connection [2].

4.08.04 Adjusting/replacing the scraper plate

If they are worn-out to such an extent that sticking dirt is not removed from the roller drums/tyres during work any longer, the scrapers must be readjusted or replaced.

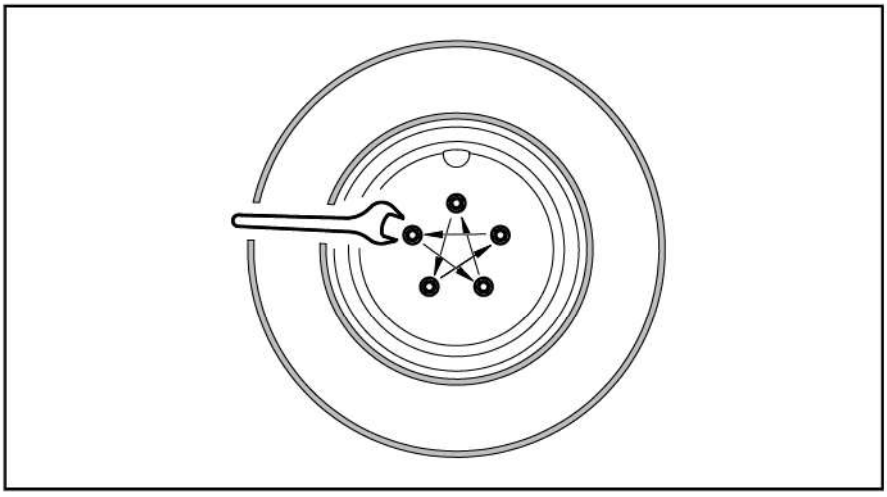
Before carrying out any work on the scrapers:

- Safely park the machine and secure it against rolling away.
- Switch off the diesel engine and remove the ignition key.

Adjusting/changing

- Raise the scraper bracket [3] until the lock clicks into place.
- Loosen the clamp connection [2].
- If required, replace the scraper [1] with a new one.
- Push the scraper [1] towards the tyre.
- Establish a clearance of 10 mm between the scraper and the tyre.
- Tighten the clamp connection [2].

4.08.05 Check that wheel nuts/wheel bolt connections are tight

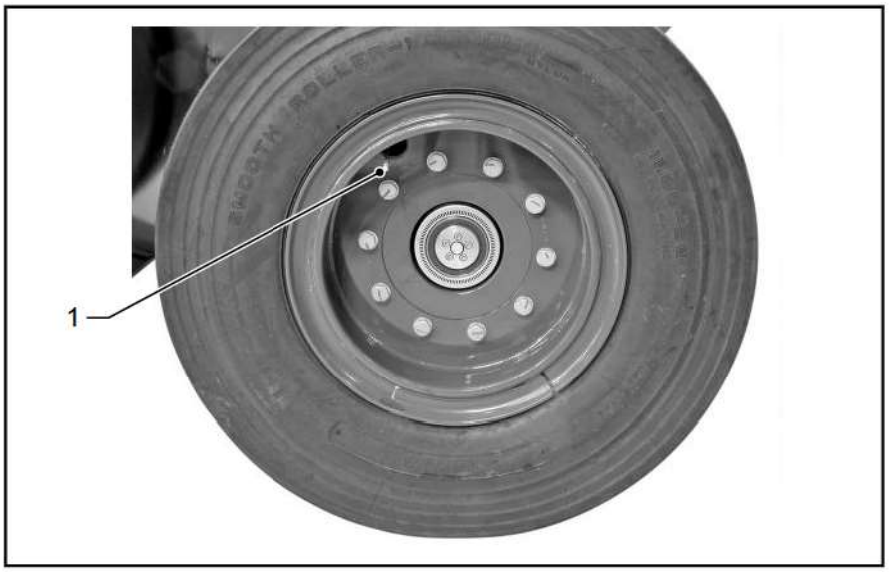


- Switch off diesel engine and remove ignition key.
- Tighten the wheel nuts/wheel bolts crosswise. For the tightening torque, see the technical data (see page 214).

4.08.06 Checking air pressure in the tyres

⚠WARNING

Explosion!
Severe injury and death due to explosion and moving parts.
- Change damaged tyres.
- When filling, do not exceed the values of the specified air pressure.
- Use only suitable filling devices with a pressure indicator.
- When filling the tyres, be always next to the tyre, not in front of it.
- Use a tyre cage.



- ▶ Visually inspect the tyre pressure daily.
- ✔ There is no visible air shortage: The machine is ready for operation.
- ✔ Visible air shortage: Obtain the specified air pressure with appropriate filling devices.
- ▶ Switch off diesel engine and remove ignition key.
- ▶ Secure the filling hose to the valve [1] and fill the tyres with the specified air pressure ("Technical data", page 214).

For a version with a tyre filling system: The prescribed air pressure cannot be established unless by the tyre filling system.

4.08.07 Changing the tyres

⚠WARNING

Tipping over the machine!

Serious injuries or death through the machine tipping over sideways because of a shift in the center of gravity.

- On one axle, only mount and use tyres that are the same type and have the same design, profile and diameter.
- Always set the tyre pressure the same for the tyres of the same axle.

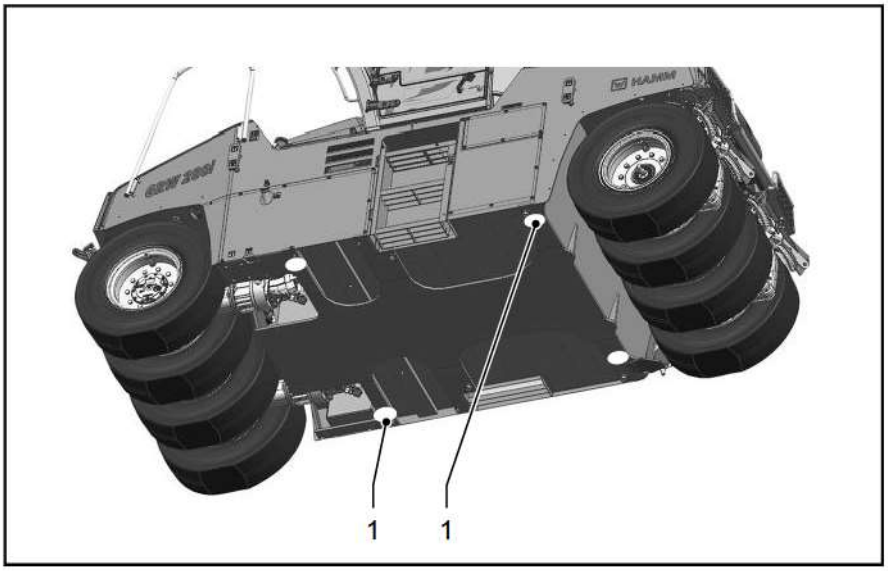
NOTICE

Increased material wear!

Material damage through increased wear on tyres, running gear and drive parts as a result of a combination of different tyres on each axle.

- On one axle, only mount and use tyres that are the same type and have the same design, profile and diameter.
- Always set the tyre pressure the same for the tyres of the same axle.

Preparation



[1] Jacking point/jack stand application point

When using a jack, do not place metal on metal.

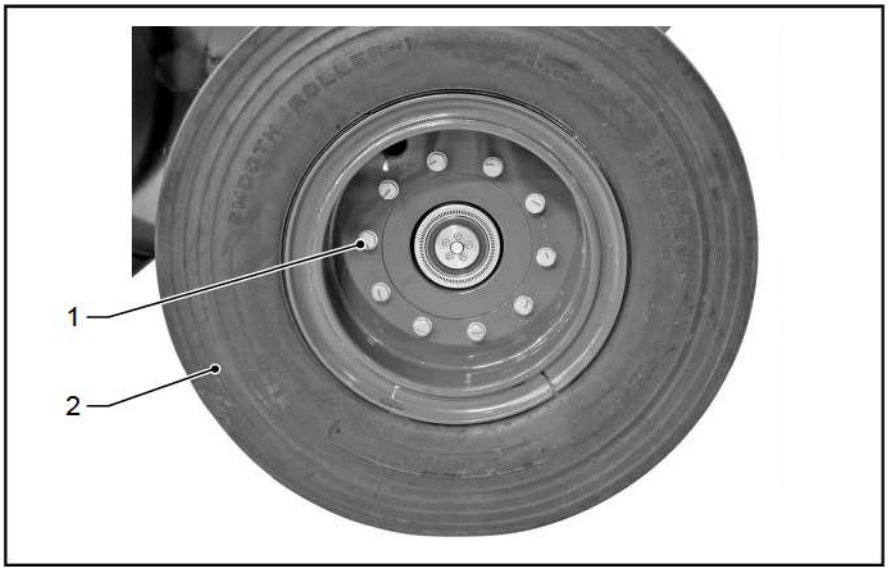
- ▶ Put machine on a safe surface (even, capable of bearing, horizontal) and secure against rolling away
- ▶ Switch off diesel engine and remove ignition key.
- ▶ Have hoisting gear ready that is appropriate for the weight of the machine and wheels.
- ▶ Lift the machine until the wheels leave the ground:

- Apply a jack with sufficient lifting capacity to the marked lifting points on the chassis, or
- Lift the machine only by the marked suspension points using suitable hoisting gear (crane with round sling/chain).

▶ Put/jack machine on the machine frame on liners capable of bearing (tyres may not be in contact with the ground).

Only persons familiar with changing tyres and aware of dangers are allowed to change the tyres.
When jacking up the machine, use only stable liners capable of bearing (e.g. support timber of sufficient size).
Perform the work with two fitters!

Version without tyre filling system



Disassembly

▶ Loosen and unscrew the wheel lug bolts [1] together with the retaining rings.

▶ Remove the wheel [2] from the wheel hub.

Assembly

▶ Clean/derust the contact surface between the wheel rim and hub.

▶ Put the wheel [2] on the wheel hub (Be sure to align the fastening holes.)

▶ Manually screw in the wheel lug bolts [1] with the retaining rings.

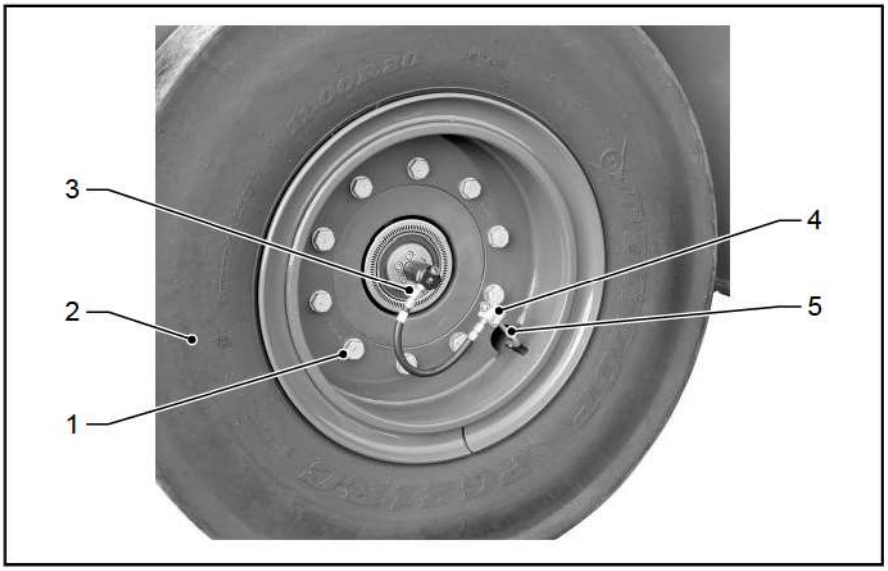
▶ Tighten the wheel lug bolts [1] by applying the prescribed tightening torque.

▶ Lift the machine and remove the liners.

▶ Put machine down, until the wheels may be in contact with the ground.

Check that wheel nuts/wheel bolt connections are tight after 50 operating hours ("Starting torques", page 209).

Version with tyre filling system



Disassembly

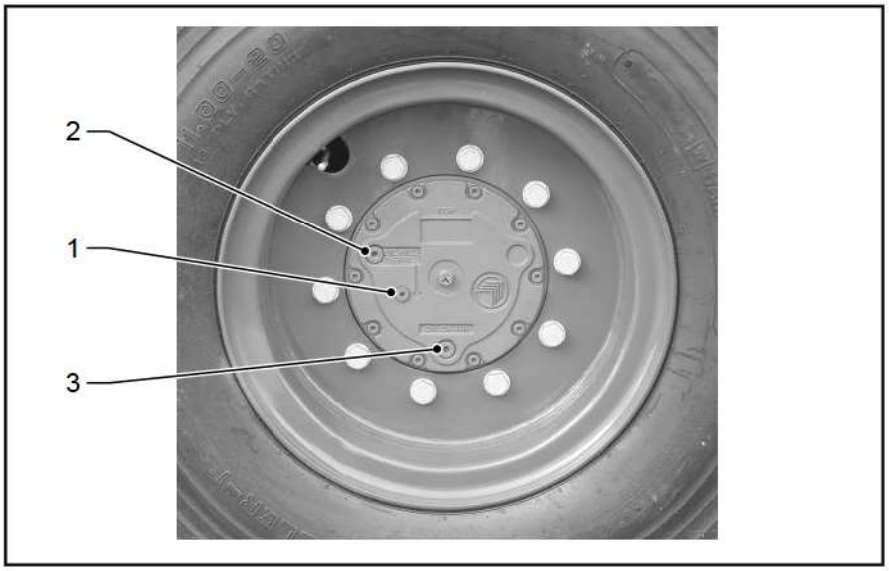
- Bleed-off the tyre pressure via the tyre filling system down to the minimum pressure.
- Unscrew the tyre inflator hose from the nozzle [3].
- Carefully unscrew the pressure maintenance valve [4] from the valve [5] (the remaining air pressure will escape).
- Loosen and unscrew the wheel lug bolts [1] together with the retaining rings.
- Remove the wheel [2] from the wheel hub.

Assembly

- Clean/derust the contact surface between the wheel rim and hub.
- Put the wheel [2] on the wheel hub (Be sure to align the fastening holes.)
- Manually screw in the wheel lug bolts [1] with the retaining rings.
- Tighten the wheel lug bolts [1] by applying the prescribed tightening torque.
- Screw the pressure maintenance valve [4] onto the valve [5].
- Screw on and tighten the tyre inflator hose on the nozzle [3].
- Lift the machine and remove the liners.
- Put machine down, until the wheels may be in contact with the ground.

Check that wheel nuts/wheel bolt connections are tight after 50 operating hours ("Starting torques", page 209).

4.08.08 Checking the fill level of the driving gear oil at the rear wheels

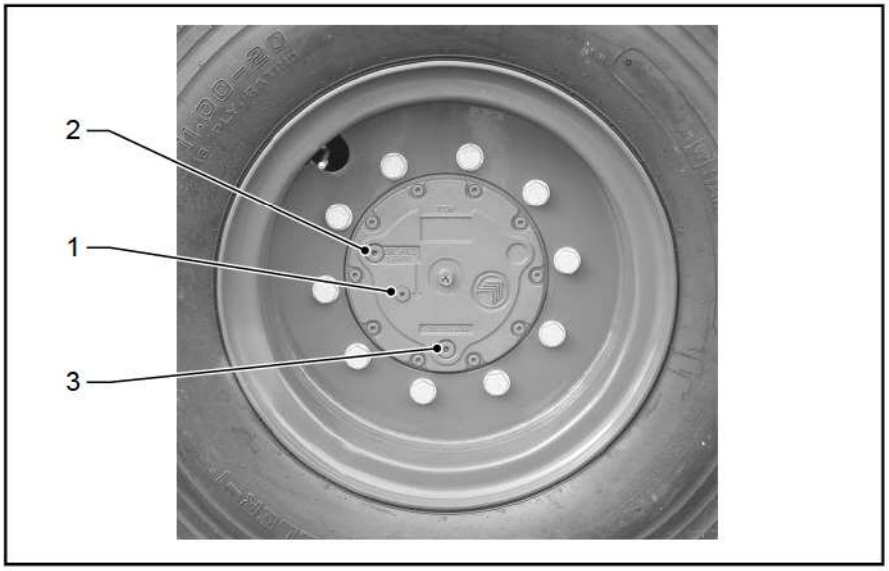


Drive the machine slowly until the oil drain screw [3] is exactly perpendicular below the axle.

- Switch off diesel engine and remove ignition key.
- Allow machine to cool down less than 30 °C (86 °F).
- Screw out the control screw [1]; if the oil level is correct, some oil must flow out of the control bore.
- If the oil level is insufficient, fill in oil through the filler bore [2].
- Screw in and tighten the check plug [1].

4.08.09 Changing driving gear oil at the rear wheels

☆ Only lubricants with this symbol are permitted ("Technical data", page 199).



- Drive the machine slowly until the oil drain screw [3] is exactly perpendicular under the axle.
- Switch off the diesel engine and remove the ignition key.
- Allow machine to cool down to a temperature under 30 °C (86 °F).
- Remove filling screw [2] for pressure equalization purposes.
- Screw out oil drain screw [3] and let the used oil drain into a provided receptacle.
- Screw in and tighten the oil drain screw [3] with gasket ring.
- Screw out the control screw [1].
- Fill oil of the prescribed grade into the inlet bore [2] until oil flows out of the check bore [1].
- Screw in and tighten the filler plug [2] and control screw [1] with the corresponding gasket ring.

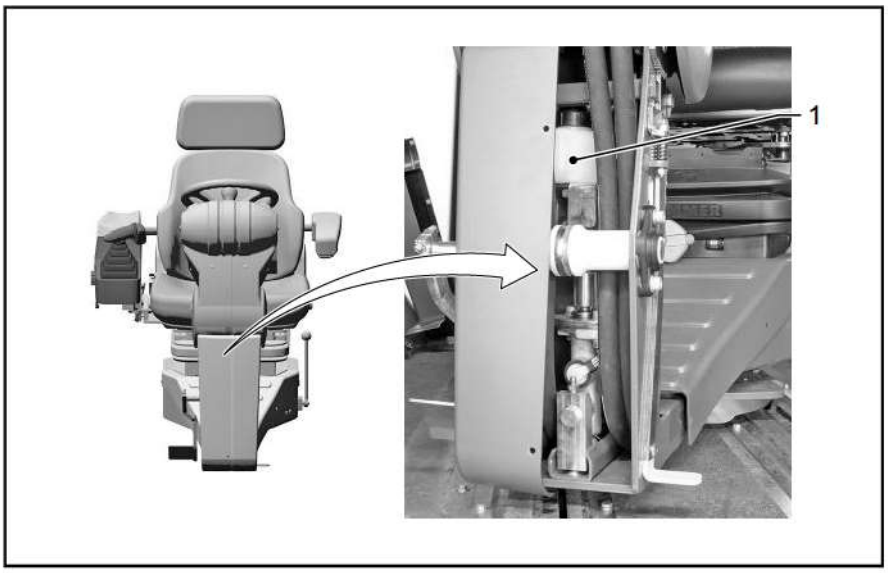
4.08.10 Replacing the brake oil

⚠WARNING

Delayed braking performance!
Severe injury or death caused by malfunction when using any unsuitable brake fluid.

- Fill in the specified brake fluid only.
- When using bio-hydraulic oil or when changing the oil type, observe the information in the technical data (see "Technical data")

No maintenance work must be performed on the brake unless by the customer service or by specialist personnel trained in such work and having suitable workshop equipment.
Request assistance from customer services!



Changing the brake oil for the foot brake (reservoir [1]).

4.09 Steering system

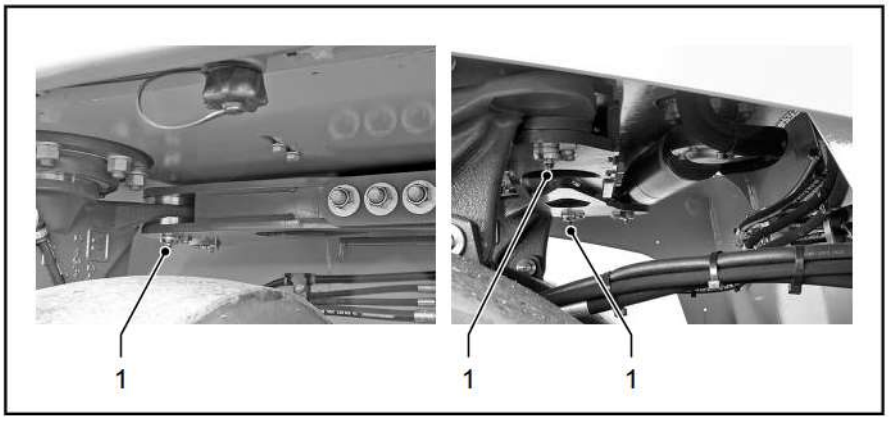
⚠WARNING

Uncontrolled movements!
Serious injuries or death caused by unexpected steering movements.

- Perform work on the steering system with the engine at rest and the electrical system switched off.
- On machines with safety strut, apply the safety strut before maintenance work.
- To avoid any unintended engine start by any third person: affix a warning notice at the driver's position indicating that work is in progress on the machine.

4.09.01 Lubricating the bearing of steering tie rod

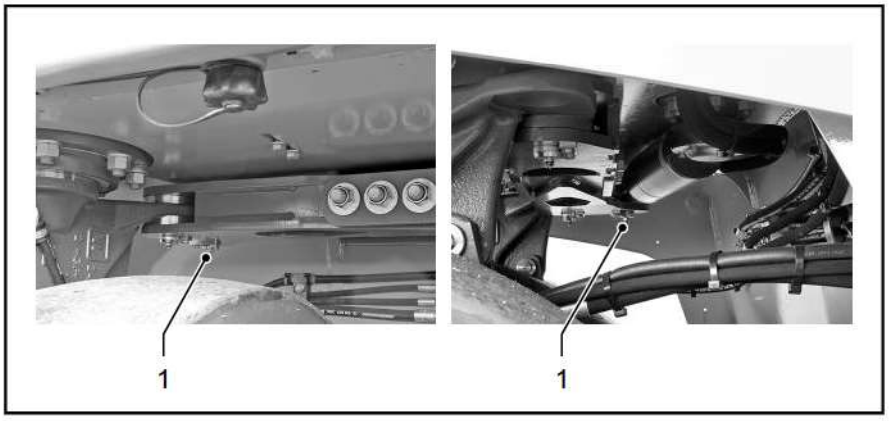
△ Only lubricants with this symbol are permitted ("Technical data", page 199).



- ▶ Switch off diesel engine and remove ignition key.
- ▶ Lubricate lubrication nipple [1] (2 nipples).

4.09.02 Lubricating the steering cylinder bolts

△ Only lubricants with this symbol are permitted ("Technical data", page 199).



- ▶ Switch off diesel engine and remove ignition key.
- ▶ Lubricate lubrication nipple [1] (2 nipples).

4.12 Water sprinkling system

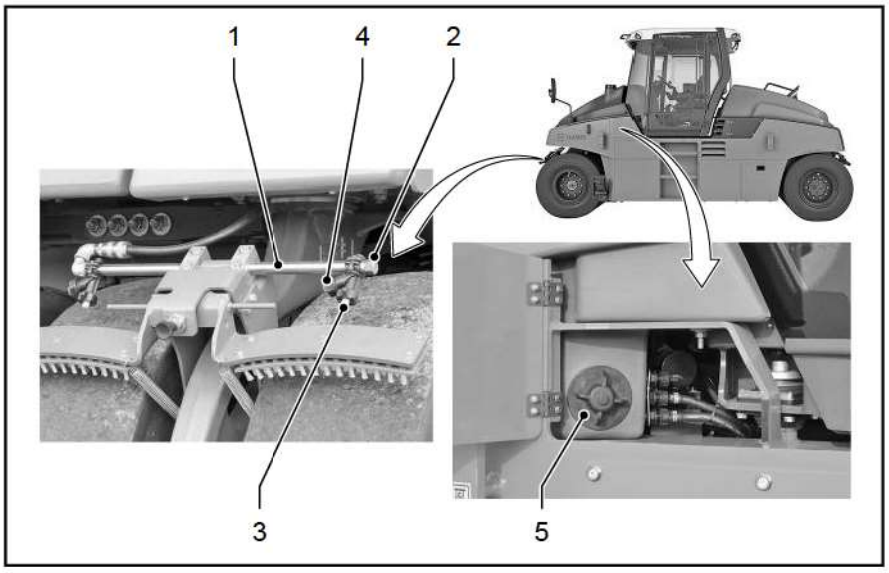
NOTICE

Corrosion and frost!
Material damage to sprinkler installations due to corrosion and frost.
While the machine is going to be parked for an extended period of time and/or in case of danger of freezing:

- Empty and clean the water sprinkling unit/additive sprinkling system.
- Remove and clean the sprinkler nozzles.
- Carry out antifreeze work, if available.

A large, corrosion-free water filter is arranged upstream of the water pump. It prevents premature contamination of pump, lines and spraying nozzles, thus ensuring trouble-free operation. The maintenance of the water filter depends on the purity of the water used. Only use clean water!

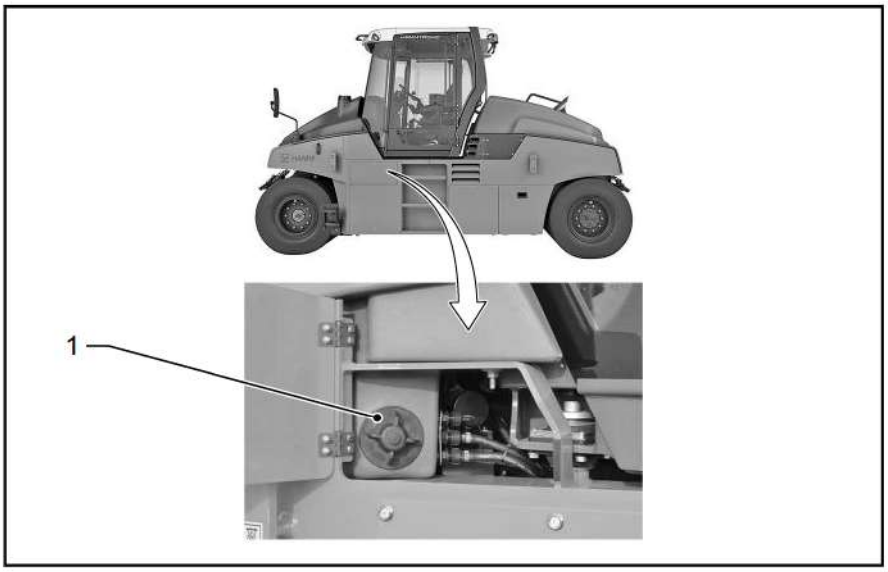
4.12.01 Cleaning water sprinkling unit



- ▶ Switch off diesel engine and remove ignition key.
- ▶ Remove a sealing cap [2] per sprinkler pipe [1] (observe internal gasket ring).
- ▶ Remove the valve insert [4] with the membrane as well as the sprinkler nozzles [3] with filter from the sprinkler nozzle housing.
- ▶ Unscrew filter head [5] at the water tank and remove it together with the compression spring (observe gasket ring on filter head).
- ▶ Pull the filter insert from the water tank.
- ▶ Clean water tank thoroughly with pressure washer (if available) or water jet.

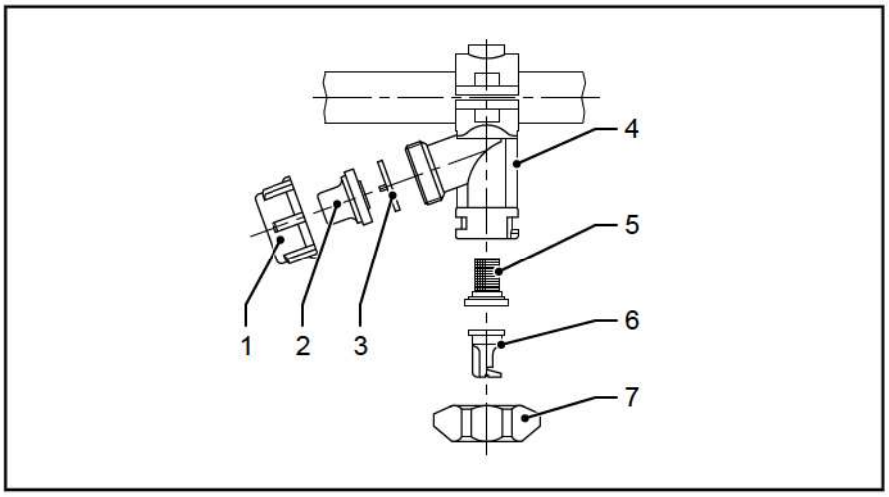
- Flush the sprinkler nozzle housings and the hoses.
- Insert filter insert in the water tank.
- Screw the filter head [5] together with the compression spring into the water tank.
- Insert valve insert [4] with the membrane as well as the sprinkler nozzles [3] with filter from the sprinkler nozzle housing.
- Screw sealing caps [2] per sprinkler pipe [1] (observe internal gasket ring).

4.12.02 Cleaning filter for water sprinkling



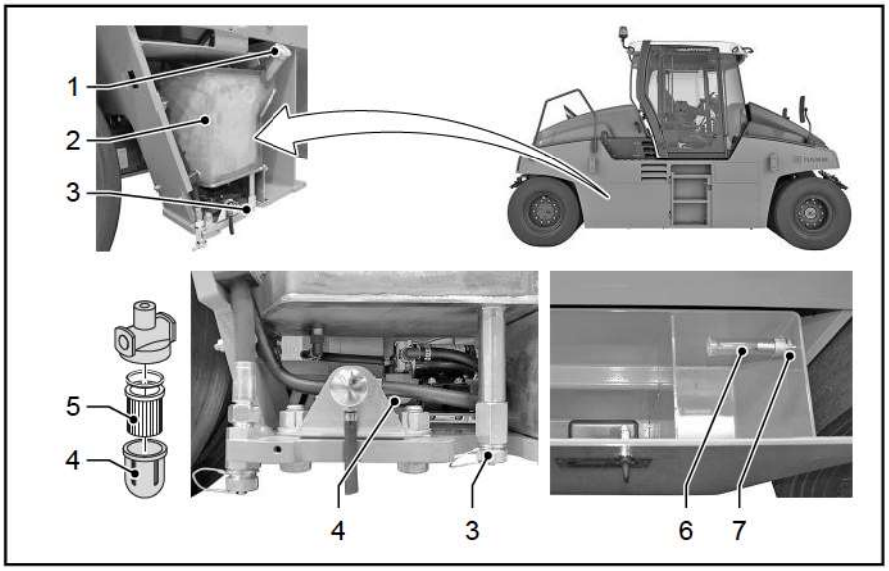
- Switch off diesel engine and remove ignition key.
- Unscrew filter head [1] at the water tank and remove it together with the compression spring (observe gasket ring on filter head).
- Pull the filter insert out of the water tank and clean it.
- Insert filter insert in the water tank.
- Screw the filter head [1] together with the compression spring into the water tank.

4.12.03 Cleaning spay nozzles



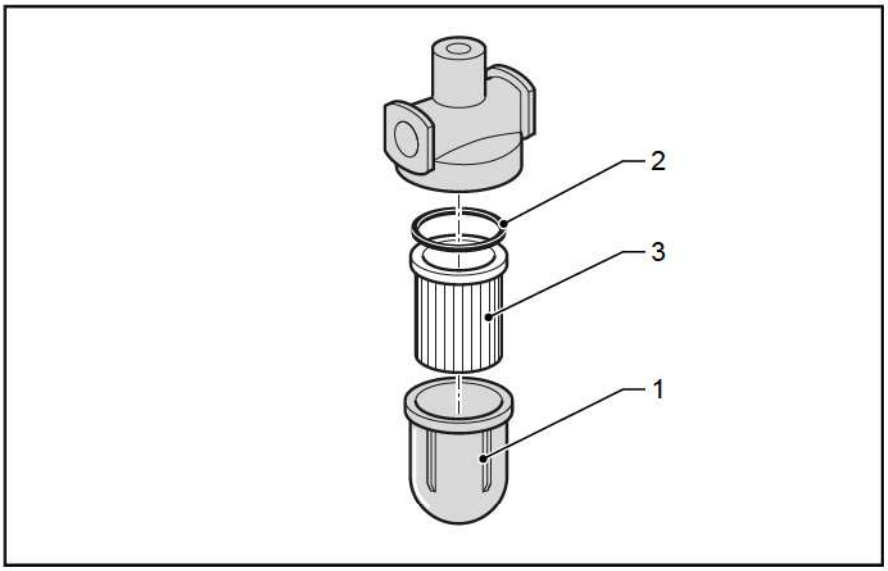
- Switch off diesel engine and remove ignition key.
- Loosen the cap nut [7] and remove it together with sprinkler nozzle [6] and filter [5].
- Remove the filter and the sprinkler nozzle from the cap nut and clean them.
- Unscrew the cap nut [1].
- Remove valve insert [2] and membrane [3].
- Flush the housing [4] with the sprinkling system.
- Insert the valve core [2] and diaphragm [3] into the union nut [1].
- Screw the union nut [1] together with the valve core [2] and diaphragm [3] onto the enclosure [4].
- Insert the filter [5] and spray nozzle [6] into the union nut [7].
- Screw the union nut [7] together with the spray nozzle [6] and filter [5] onto the enclosure [4].

4.12.04 Clean the additive sprinkling system



- ▶ Switch off diesel engine and remove ignition key.
- ▶ Unscrew the seal cap from the drain valve [3].
- ▶ Unscrew the service neck [6] from the support and screw it onto the drain valve [3].
- ✔ The drain valve opens and the remaining parting agent concentrate can flow out.
- ▶ Catch the parting agent in a reservoir placed beneath.
- ▶ Unscrew the sight glass [4] from the filter for additive sprinkling (observe the seal ring at the filter head).
- ▶ Pull the filter insert [5] out of the filter head.
- ▶ Clean all components thoroughly. Replace parts as necessary.
- ▶ Thoroughly clean the inside of the additive tank [2] using a power washer (if installed) or a water jet applied through the filling hole [1].
- ▶ Allow the dirty water to drain.
- ▶ Unscrew the service neck from the drain valve [3] and screw it onto the support [6].
- ✔ The drain valve closes.
- ▶ Close the drain valve [3] with the seal cap.
- ▶ Install the filter insert [5] with the sight glass [4] at the filter head.

4.12.05 Cleaning/replacing the additive sprinkling filter



- ▶ Draining the additive tank (see the section on cleaning the additive sprinkler system)
- ▶ Unscrew the sight glass [1] (check the seal ring [2] at the sight glass).
- ▶ Pull the filter unit [3] out of the filter head.
- ▶ Clean all components thoroughly. Replace parts as necessary.

- Install the filter unit [3] on the filter head.
- Install the sight glass [1] with the seal ring [2] at the filter head.

5 TABLES

When working at the machine please always adhere to the instructions given in your Safety instructions!

5.00 Technical data

5.00.01 Engine oil

NOTICE

Wrong engine oil!

Using the wrong engine oil damages the engine, increases wear, lowers operational reliability and shortens the service life of the engine.

- Use engine oil of the prescribed quality.
- Choose engine oil with a viscosity suitable for the operating temperature.
- Change the engine oil at the specified intervals!
- Do not mix different engine oils.

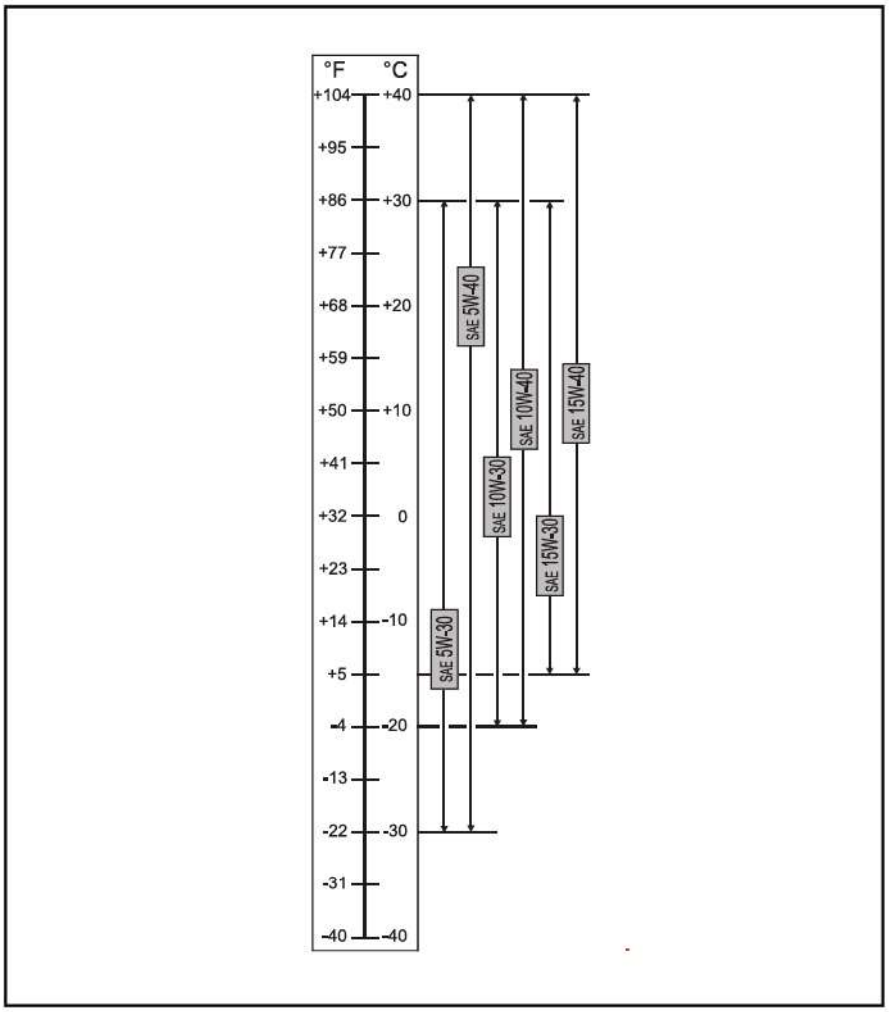
The lubricating oil quality (standard: API or ACEA) characterizes the properties of the lubricating oil. Lubricating oils below the prescribed quality limits must not be used.

In order to avoid damaging the engine, each lubricating oil must have the viscosity suitable for its intended use.

Lubricating oil viscosity is classified in SAE viscosity grades. The following diagram shows the SAE viscosity grades in relation to the operating temperature.

Select the engine oil suitable for your operating temperature. Take account of the SAE viscosity grades. Use multigrade oils for work in widely ranging temperatures.

The cold starting ability of the engine can suffer if the temperature falls below the limit for a short period.


°F
°C
+104
+40
+95
+86
+30
+77
+68
+20
+59
+50
+10
+41
+32
0
+23
+14
-10
+5
-4
-20
-13
-22
-30
-31
-40
-40
SAE 5W-40
SAE 10W-40
SAE 15W-40
SAE 10W-30
SAE 15W-30
SAE 5W-30

5.00.02 Fuel

NOTICE

Wrong fuel!

Using the wrong diesel fuel damages the engine, increases wear, lowers operational reliability and shortens the service life of the engine.

Statutory emission limits breached through using the wrong diesel fuel.

- Only use sulphur-free diesel fuel in diesel engines which have an exhaust gas after-treatment system (sulphur content ≤ 15 mg/kg).
- Only use diesel fuels that comply with EN 590 and ASTM D 975.

The certification measurements to measure the compliance with statutory emission limits are carried out using the test fuels specified by law. These test fuels correspond to the diesel fuels that comply with EN 590 and ASTM D 975, which are described in this operating manual. If other fuels are used, compliance with the legally specified emission values is not guaranteed.
The guarantee only applies to diesel fuels which comply with the permissible diesel fuel specifications.

The permissible diesel fuel specifications are:

- EN 590 (sulphur content ≤ 10 mg/kg (10 ppm))
- ASTM D 975-10 grade no. 1-D S15 and 2-D S15 (sulphur content ≤ 15 mg/kg)

Winter operation with diesel fuel

NOTICE

Low operating temperature!

Engine damage caused by adding liquids or additives to the diesel fuel at low operating temperatures.

Using the wrong diesel fuel can cause clogging of the fuel system at low operating temperatures.

- Do not add any benzene, petrol or fluidity additive to the diesel fuel.
- Use winter diesel fuel for working at temperatures between 0 °C (32 °F) and –20 °C (–4 °F)
- Use special diesel fuels for working in arctic climatic zones with temperature down to –44 °C (–47 °F).

5.00.03 Cooling liquid (coolant)

NOTICE

Wrong coolant additives!
Using the wrong coolant additives damages or impairs the function of the cooling system.

- Only use coolant additives recommended by manufacturer.
- Only mix cooling system protecting agents/additives with the same specification.

If no coolant or the wrong coolant is used, liquid-cooled diesel engines may be damaged by corrosion, cavitation and freezing.

Continually check the coolant level and the concentration of the cooling system protecting agent in liquid-cooled diesel engines. Create the necessary concentration of cooling system protecting agent by adding a cooling system protecting agent to the cooling water. Check the concentration of the cooling system protection agent with commercially available test devices (e. g. gefo glycomat®).

The concentration of the cooling system protection agent in the coolant must be as follows:

Crystallisation point	Coolant antifreeze	Water (distillate or completely demineralised)
–26 °C (–15 °F)	40 Vol.%	60 %
–37 °C (–34 °F)	50 Vol.%	50 %
–40 °C (–40 °F)	52 Vol.%	48 %

HAMM uses and recommends products free of nitrites, amines, silicates and phosphates. These are listed in the "Overview of service fluid specifications" section (see page 208). HAMM supplies all the machines filled with coolant blend of 50 parts cooling system protective liquid and 50 parts water. This ensures frost protection to –37 °C (–34 °F).

5.00.04 Hydraulic oil (mineral oil)

NOTICE

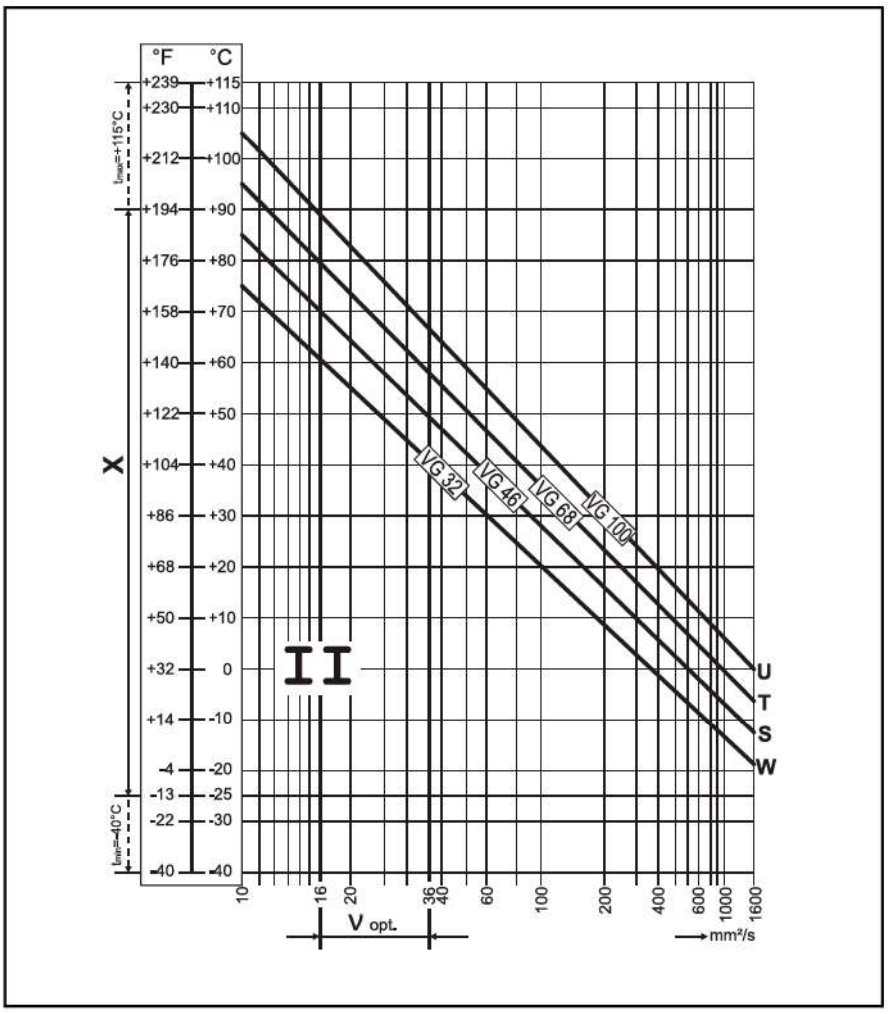
Wrong hydraulic oils!
Using the wrong hydraulic oils can damage or impair the function of the hydraulic system.

- Only use hydraulic oils recommended by manufacturer.
- Use only hydraulic oil with a viscosity appropriate for the working temperature.
- Only mix hydraulic oils with the same specification.

In order to avoid damaging the hydraulic system, each hydraulic oil must have the viscosity appropriate for its intended use.

The viscosity of hydraulic oil is classified in viscosity grades. The following diagram shows the viscosity grades as a function of the ambient temperature.

Select the hydraulic oil suitable for your ambient temperature. Take account of the viscosity grades.



[W] Winter conditions in Central Europe

[S]	Summer conditions in Central Europe or in enclosed premises
[T]	Tropical conditions or in premises subject to high amounts of heat
[U]	Excessive amounts of heat (for example from combustion engines)
[X]	Pressure fluid temperature range
[V_{opt}]	Optimal operating viscosity range
[1000 =]	Maximum permissible (short-term) viscosity
[II =]	100 mm²/s (t_{max} = +90 °C) ... 1000 mm²/s (t_{min} = –25 °C)

5.00.05 Biological hydraulic oil

NOTICE

Wrong hydraulic oils!

Using the wrong hydraulic oils can damage or impair the function of the hydraulic system.

- Only use hydraulic oils recommended by manufacturer.
- Use only hydraulic oil with a viscosity appropriate for the working temperature.
- Only mix hydraulic oils with the same specification.

The hydraulic system of the machine is supplied filled with mineral oil. All maintenance intervals in this maintenance manual relate to mineral oil.

Bio-hydraulic oil may be used under the following conditions:

- Use only bio-hydraulic oil based on specific, synthetic, saturated complex esters. The products used and recommended by manufacturer are listed in the "Overview of service fluid specifications" section. see page 208). Use other oils only when they correspond to the specifications of the oil above mentioned. The neutralization value (oil acid) may not exceed 2.
- When switching from bio-hydraulic oil to mineral oil or from mineral oil to bio-hydraulic oil, all filters in the oil circuit must be changed again after 50 operating hours.
  Then comply with the filter change intervals stated in this manual.
- Take old bio-oil and mineral oil to a reliable disposal center.
- Organic hydraulic fluid is easily biodegradable.

5.00.06 Wirtgen Group Asphalt Anti Stick

NOTICE

Incorrect mixing ratio of the asphalt separating agent!
Using the wrong mixing ratios can damage or ruin the rubber tires.

- Only use diluted Wirtgen Group Asphalt Anti Stick.
- Do not exceed the maximum mixing ratio (1:10).
- Follow this order: Always stir Wirtgen Group Asphalt Anti Stick into water.
- Only mix Wirtgen Group Asphalt Anti Stick with clean water.

Wirtgen Group Asphalt Anti Stick is an asphalt separating agent for pneumatic tired and combination rollers. It is supplied as a concentrate and has to be mixed with water. Wirtgen Group Asphalt Anti Stick is quickly biodegradable and non-toxic.

Processing:

Mix Wirtgen Group Asphalt Anti Stick with water in the desired ratio while stirring. Ensure thorough mixing.

A mixing ratio of 1:1 gives the most reliable results. However, this depends on the composition of the asphalt mix. Wirtgen Group Asphalt Anti Stick can be mixed with water in a mixing ratio of up to about 1:10.

5.00.07 Refrigerant in air conditioning plants

Contains flourinated greenhouse gas HFC – R134a	
Quantity:	0,75 kg
CO_2 equivalent:	1,1 tons
Global warming potential:	1430

2603974

The European F-Gas Regulation 517/2014 requires the identification of media which contain F-gas and are used in refrigerating plants or in air conditioning plants.

A label is affixed to the machine for this identification.

The label provides information on:

- Type of refrigerant, e.g. R 134a
- Fill volume in kg
- CO_2 equivalent in t
- GWP value (global warming potential), e.g., 1430 for refrigerant R 134a

The information provided on the label indicates to the owner whether the system has been subjected to the corresponding tests.

5.00.08 Overview of lubricant details

Lubricant specifications

Lubricant	Quality	Viscosity	Marking
Engine oil The oil quality must correspond to the API/ACEA classification.	API: CG-4 or higher ACEA: E5-02 or higher	See diagram	□
Hydraulic oil (mineral oil) The viscosity is defined in accordance with ISO 3448 (ISO-VG: Viscosity grade).	HVLP	**Conditions** ISO VG 22 arctic ISO VG 32 winter ISO VG 46 summer ISO VG 68 tropical ISO VG 100 extreme heat	▭
Hydraulic oil (bio-hydraulic oil) Synthetic saturated ester (ISO-VG: Viscosity grade).	HEES		
Special oil Only HAMM special oil is admissible.			◇
Special oil Only HAMM special oil is admissible.			☆
Gearbox oil with limited slip additives. The oil quality must meet the API classification.	API GL-5	SAE 85W-90	⬡
Coolant for diesel engine, liquid-cooled (nitrite, amine and phosphate free). Mixture: 40% coolant concentrate, 60% water.			○
Grease Lithium saponified multi-purpose grease with high-pressure additives. Temperature application range from –25 °C (–13 °F) to +120 °C (248 °F).			△

For order numbers and pack size, see the WIRTGEN GROUP "Parts and More" document and WIRTGEN GROUP lubricants ("Wirtgen Group Lubricants", page 210).

5.00.09 Starting torques

The starting torques indicated within the tables apply to

- nuts and screws with headrest according to ISO 4014, 4032, 4762... (frictional coefficient μ_{total}=0.095) unless otherwise specified.

Check the tightening torques of nuts and bolts at regular intervals. Tighten if necessary.

Starting torques for regular type screw threads

Threads (wrench size SW)	Starting torques MA (Nm)		
	8.8	10.9	12.9
M4 (SW7)	2.7	4.0	4.7
M5 (SW8)	5.5	8.1	9.5
M6 (SW10)	9.5	14	16.5
M8 (SW13)	21	30	36
M10 (SW16)	41	60	71
M12 (SW18)	71	104	122
M14 (SW21)	113	165	195
M16 (SW24)	175	255	300
M18 (SW27)	250	355	420
M20 (SW30)	350	500	580
M22 (SW34)	480	680	800
M24 (SW36)	600	860	1000
M27 (SW41)	880	1260	1470
M30 (SW46)	1200	1700	2000

Starting torques for fine threads

Threads (wrench size)	Starting torques MA (Nm)		
	8.8	10.9	12.9
M8x1 (SW13)	22	32	38
M10x1.25 (SW16)	43	63	74
M12x1.25 (SW18)	76	111	130
M12x1.5 (SW18)	73	108	126
M14x1.5 (SW21)	120	175	205
M16x1.5 (SW24)	183	265	315
M18x1.5 (SW27)	270	390	455
M20x1.5 (SW30)	380	540	630
M22x1.5 (SW34)	510	725	850
M24x2 (SW36)	640	910	1070
M27x2 (SW41)	930	1330	1550
M30x2 (SW46)	1300	1840	2150

5.00.10 Wirtgen Group Lubricants

General

Intensive testing and development work with leading mineral oil companies has analysed the complex and high requirements of Wirtgen Group machines. The results have been translated into optimal specifications and used for the first filling at the factory.
This results in a wide range of premium lubricants from a single source accompanied by highly functional accessories for filling and lubrication.

Premium lubricants

Wirtgen Group lubricants have tailor-made specifications that combine high-quality base oils and additives. The advantages for you:

- Compatibility with the first filling
- Wear protection
- Corrosion prevention
- Traceability in the event of damage

One-stop supply

HAMM rollers can be lubricated with the Wirtgen Group lubricant appropriate for the area of application. Together with the carefully coordinated mixture of container sizes, this results in optimised ordering, storage and filling processes.

Filling and lubricating accessories

Highly functional accessories, such as canister pumps and grease guns, are available to assist you in filling and lubricating your machines.

Engine oil ☐			
Designation	**Description**	**Pack-ing size**	**Order no.**
WIRTGEN GROUP Engine Oil 15W-40	High-performance engine oil from high-quality base oils and additives for high output yield and the operational safety of your machine.	5 l	2065020
		20 l	2065025
		208 l	2065026

Engine oil ☐			
Designation	**Description**	**Packing size**	**Order no.**
		1000 l IBC	2118572
WIRTGEN GROUP Engine Oil 10W-40	Low-viscosity engine oil for the modern synthesis technology with high wear protection and purification capacity. Allows longer maintenance intervals according to the engine manufacturer.	5 l	2112355
		20 l	2112354
		208 l	2219171
		1000 l IBC	2118569

Hydraulic oil ▭			
Designation	**Description**	**Packing size**	**Order no.**
WIRTGEN GROUP Hydraulic Oil HVLP 32	High-grade multi-range hydraulic oil with zinc for a high level of protection against wear, even under difficult operating conditions. Enhanced specification results in much longer replacement intervals.	20 l	2118573
WIRTGEN GROUP Hydraulic Oil HVLP 46	High-grade multi-range hydraulic oil with zinc for a high level of protection against wear, even under difficult operating conditions. Enhanced specification results in much longer replacement intervals.	20 l	2065028
		208 l	2065029
		1000 l IBC	2118571
WIRTGEN GROUP Hydraulic Oil HVLP 68	High-grade multi-range hydraulic oil with zinc for a high level of protection against wear, even under difficult operating conditions. Enhanced specification results in much longer replacement intervals.	20 l	2118574

Biological hydraulic oil ▭			
Designation	**Description**	**Packing size**	**Order no.**
WIRTGEN GROUP Bio Hydraulic Oil 46	Biodegradable multi-use hydraulic oil made from all-synthetic esters and ash-free additives results in optimal lubricating properties and a reduced load on the environment. Bears the EU Ecolabel for Lubricants.	20 l	2118575
		208 l	2270558
WIRTGEN GROUP Bio Hydraulic Oil 68	Biodegradable multi-use hydraulic oil made from all-synthetic esters and ash-free additives results in optimal lubricating properties and a reduced load on the environment. Bears the EU Ecolabel for Lubricants.	20 l	2124179

Transmission oil ⬡			
Designation	**Description**	**Packing size**	**Order no.**
WIRTGEN GROUP Gear Oil 85W-90	Mineral gearbox oil for versatile use in gearboxes and axle drives. Impresses with a high level of protection against wear and oxidation. Note: Do not use in HAMM vibration bearings or drum drives.	5 l	2065030
		20 l	2065031
		208 l	2065032

Special gear oil ◇			
Designation	**Description**	**Packing size**	**Order no.**
WIRTGEN GROUP Special Gear Oil	Special fully synthetic, high-performance gearbox oil for HAMM vibration bearings. Highly resistant to pressure and temperature. Note: Do not mix with mineral gearbox oil.	5 l	1238051
		20 l	2065037
		208 l	2065038

Special gear oil ☆			
Designation	**Description**	**Packing size**	**Order no.**
WIRTGEN GROUP Special Gear Oil	Special fully synthetic, high-performance gearbox oil for HAMM drum drives. Highly resistant to pressure and temperature. Note: Do not mix with mineral gearbox oil.	5 l	2571293
		20 l	2571294
		208 l	2571300

Greases △			
Designation	**Description**	**Packing size**	**Order no.**
WIRTGEN GROUP Multi-purpose Grease	Highly refined multi-purpose grease for a wide range of lubrication tasks, such as on pivot pins and wheel bearings. Modern additive technology makes this product particularly suitable for use in conditions subject to impacts and vibration.	400 g	2065035
WIRTGEN GROUP Drum Bearing Grease	Exclusive grease for lubricating HAMM drum bearings. Highly resistant to temperature and pressure.	1 kg	1205757
WIRTGEN GROUP Drive Bearing Grease	Special high-performance grease for use in HAMM drive bearings. Extremely resistant to pressure and water-repellent.	1 kg	1227114

Coolant of diesel engine ○			
Designation	**Description**	**Packing size**	**Order no.**
WIRTGEN GROUP Antifreezing Compound	Anti-corrosion agents, coolants and anti-freeze for diesel engines.	5 l	2173022
		20 l	2173023
		208 l	2173024

Miscellaneous			
Designation	**Description**	**Packing size**	**Order no.**
WIRTGEN GROUP Asphalt Anti Stick	Specially developed solution for combination and pneumatic tyre rollers from HAMM: It prevents bitumen from adhering to the rubber tyres. The emulsion is based on a non-toxic solution and is biodegradable.	5 l	2117378
		20 l	2117379

5.01 Technical data

The version valid at the time the technical data was prepared for this version of the manual was used (see impressum: change date). Other values may apply if modifications are made to the machine in the course of its further development.

5.01.01 HP 280

Designation	Value	Unit
Dimensions and weights		
Basic weight without cab	8690	kg
Operating weight with cab	9480	kg
Front/rear axle load	4275/5205	kg
Flexible ballasting, min./max.	9480/26950	
Min. front/rear wheel load per tyre	1069/1301	kg
Max. front/rear wheel load per tyre	3505/3065	kg
Front wheels non-braked, additional load to maximum permitted total weight (StVZO)	20,000	kg
Front wheels braked, additional load to maximum operating weight	26950	kg
Working width	2084	mm
Inside/outside turning radius	6200/9200	mm
Diesel engine		
Manufacturer	Deutz	
Type	TCD 2012 L04 2V	
Number of cylinders	4	
Power (ISO 14396)/rated speed	89,0/2000	kW/rpm
Exhaust emissions category EU/USA	III A/Tier 3	
Carbon dioxide emissions (CO_2)(1)	712	g/kWh
Drive		
Speed, infinitely variable	0–19.0/(0–10.8)	km/h / (mph)
Climbing ability, with/without ballast	25/35	%
Max. permitted longitudinal incline	30	°
Max. permitted transverse incline	30	°
Tyres		
Size of tyres front/rear	11.00–20/11.00–20	
Number of tyres front/rear	4/4	units
Tyre weight	130	kg
Air pressure	0.4–0.8/(4.0–8.0)/[58–116]	MPa/(bar)/[psi]
Wheel nut tightening torque	430	Nm
Steering		
Steering lock to both sides	30	°

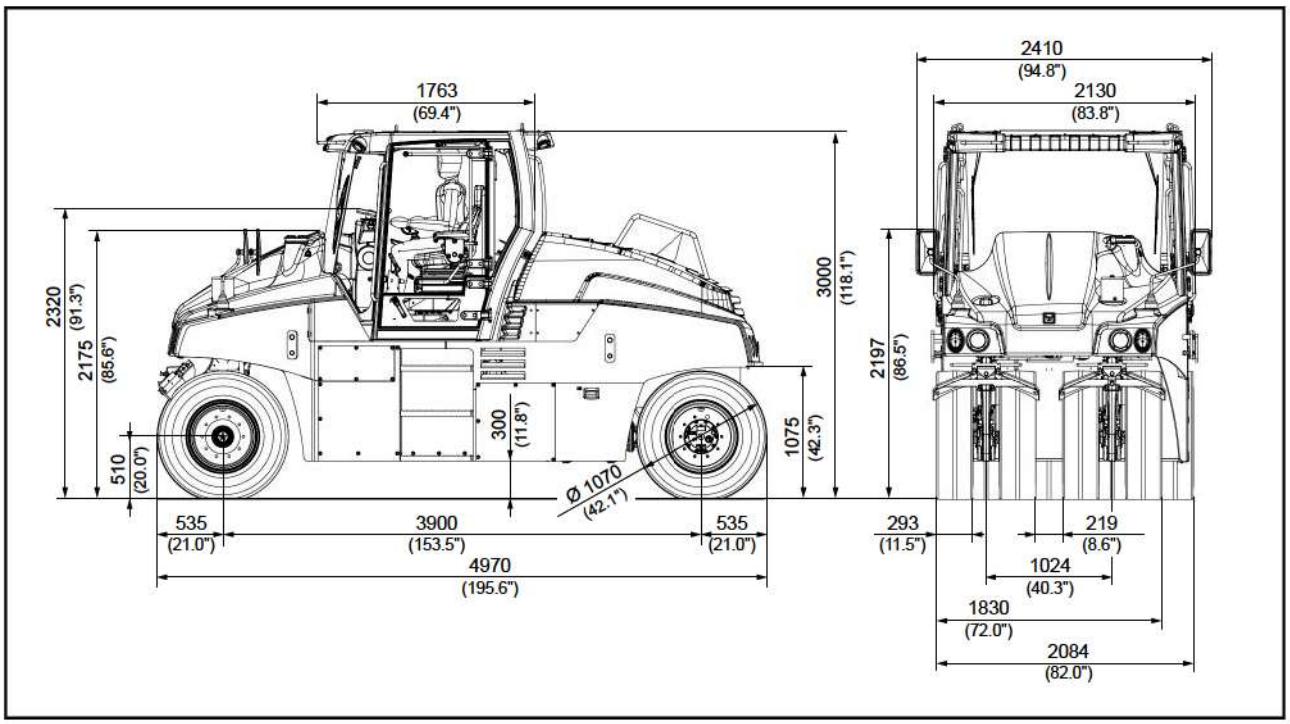
Designation	Value	Unit
Pendulum compensation upwards and downwards	2	°
Level compensation, front	±65	mm
Filling capacities(3)		
Fuel	235	l
Engine oil (for oil change)	11.5	l
Diesel engine coolant	22	l
Hydraulic oil	80	l
Level compensation	1	l
Driving gear oil	(2 ×) 8	l
Brake oil	0.2	l
Water sprinkling	650	l
Additive sprinkling	28	l
*Air-conditioning system (R134a)	1.6	kg
Sound power level		
Sound power level L_{WA}, guaranteed	103	dB(A)
Sound power level L_{WA}, representative measurement	100	dB(A)
Emissions sound pressure level at the driver's seat		
Sound pressure level L_{PA}, measured with cab, max.	82	dB(A)
Sound pressure level L_{PA}, measured with ROPS, max.	88	dB(A)
Electrical system		
Operating voltage	12	V

(1) This CO_2 measurement is the result of testing a (parent) engine that is representative of the engine type or the engine family in a fixed test cycle under laboratory conditions, and it does not represent an explicit or implicit guarantee for the performance of a specific engine.

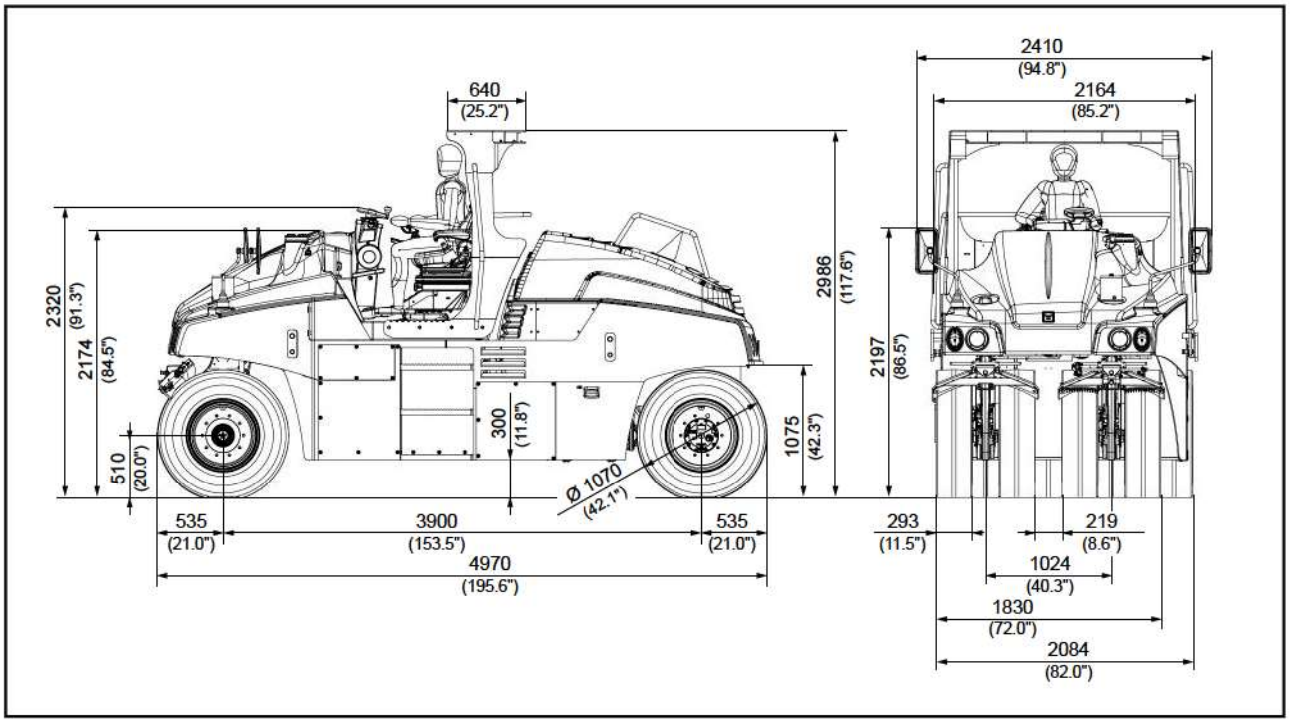
(3) The specifications for the filling capacities of liquids and operating materials refer to the standard version of machine. However, they may deviate, e.g. for hydraulic oil and where attachments and auxiliary devices are installed. Always observe the operating manual when filling. Fill liquids and operating materials up to the respective mark.

5.02 Dimension sheet

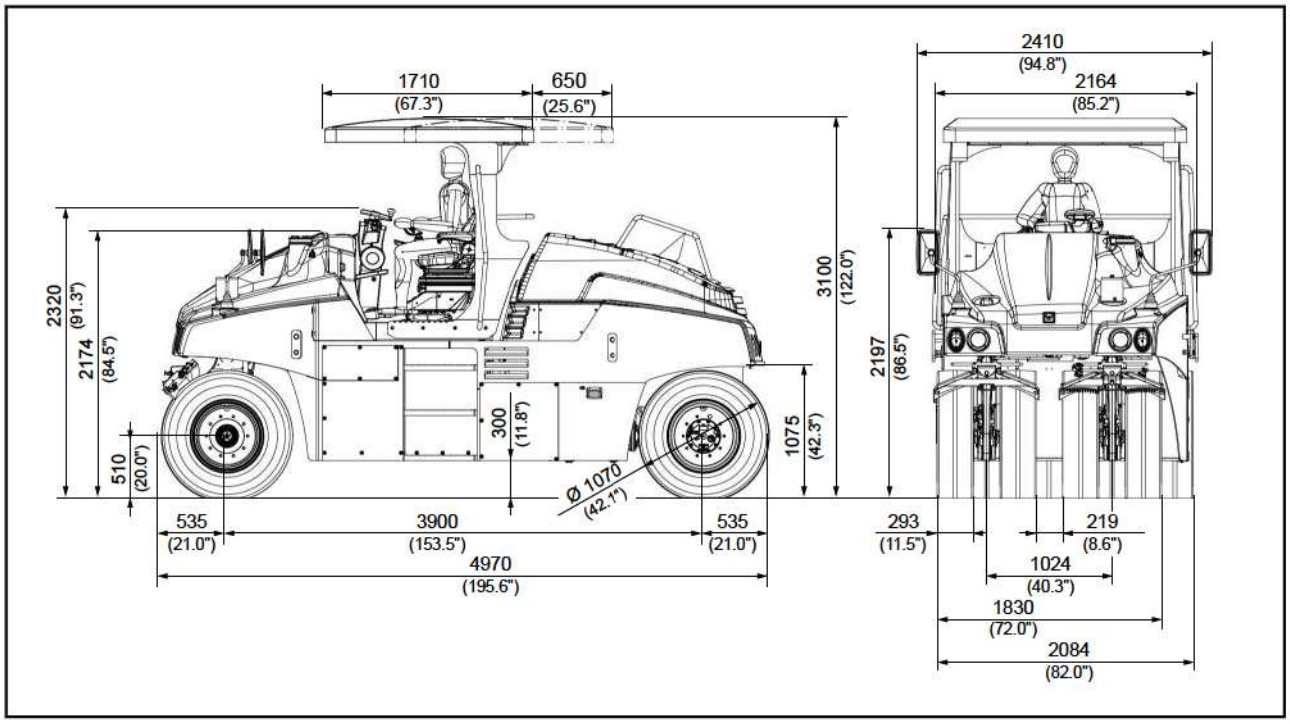
5.02.01 HP 280 with cab



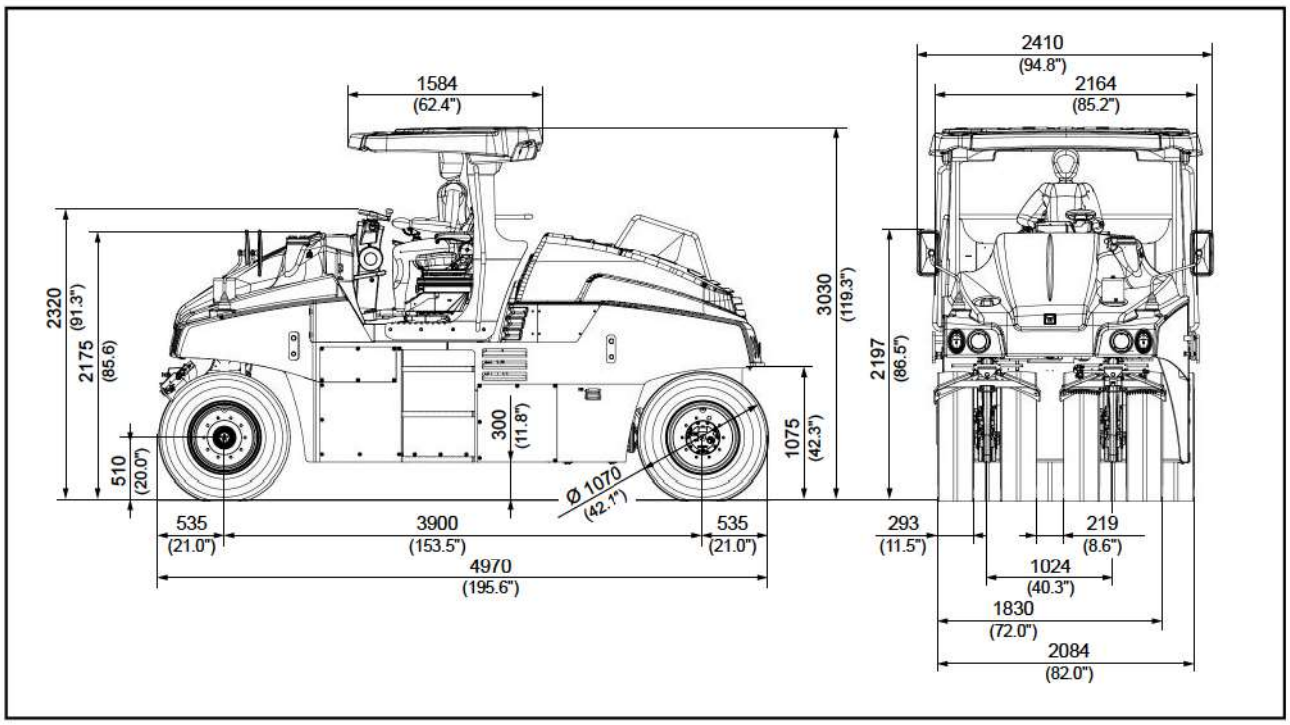
5.02.02 HP 280 with ROPS



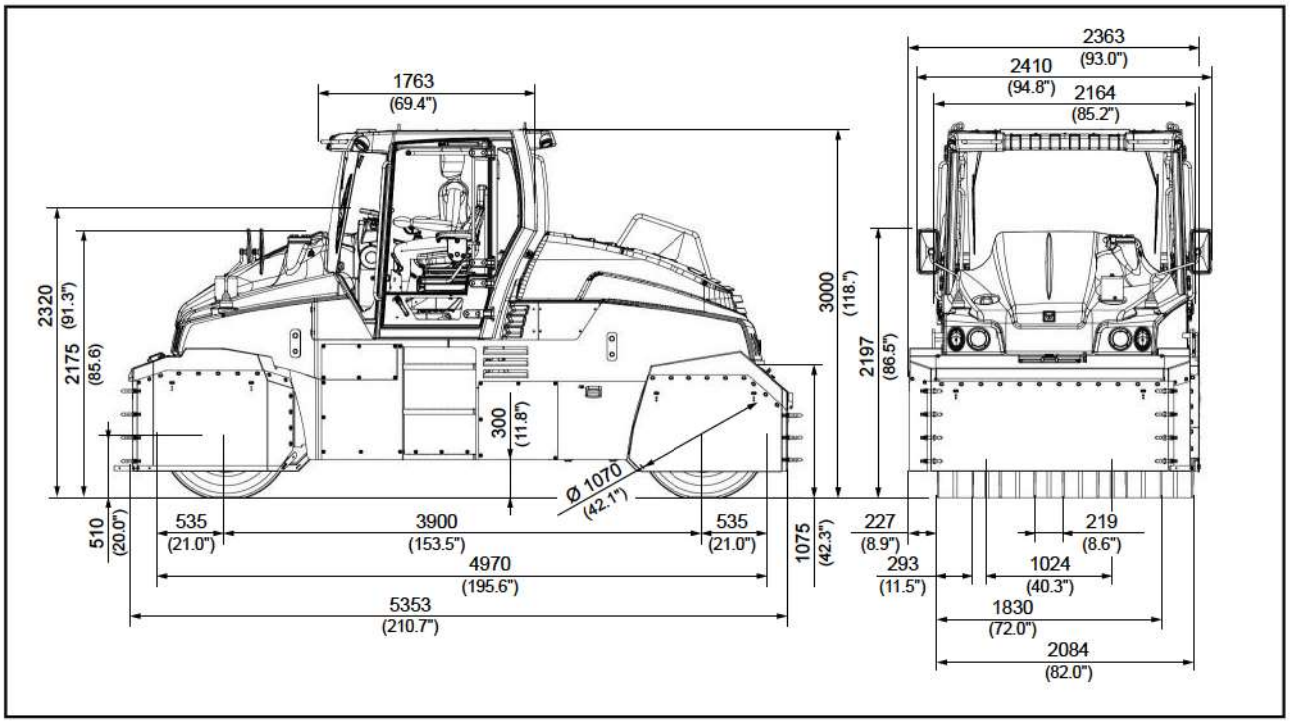
5.02.03 HP 280 with sunroof



5.02.04 HP 280 with weather protection roof



5.02.05 HP 280 with thermal apron

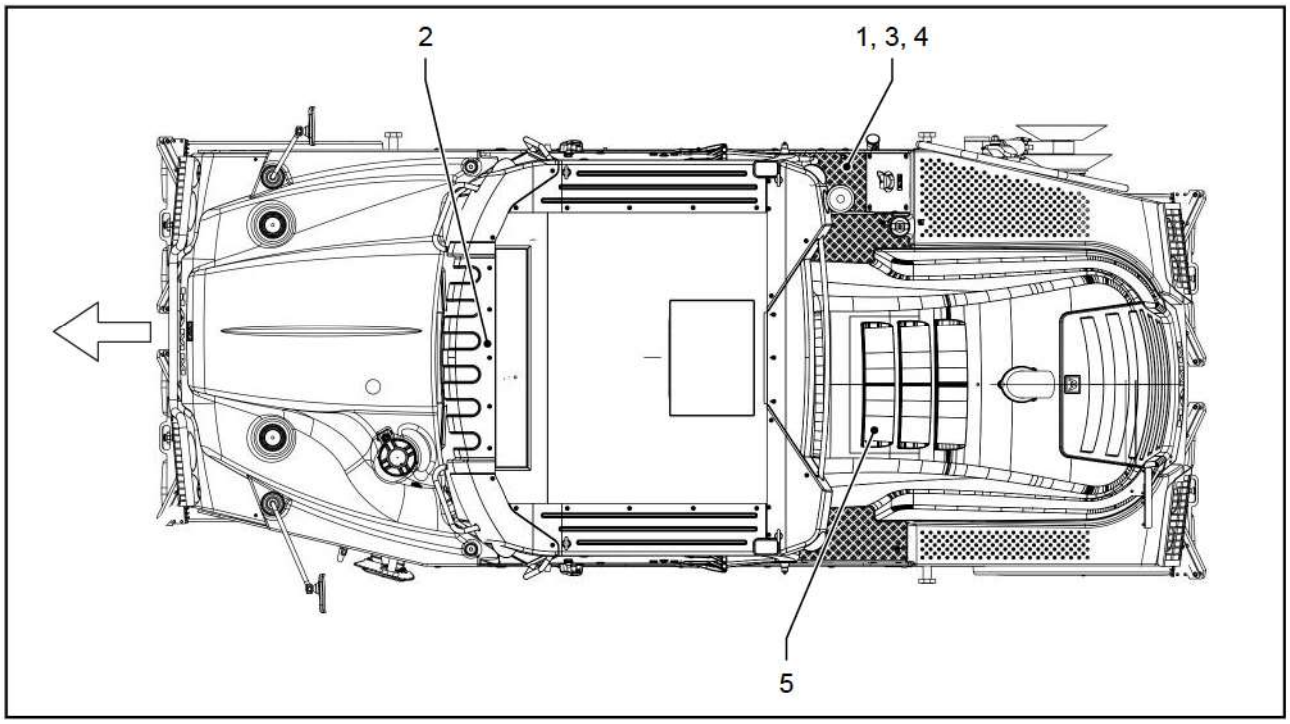


5.03 Fuses

⚠WARNING

Fire in the machine electrical system!
Serious injuries or death or material damage as a result of fire caused by using fuses not meeting specifications.
- Only use fuses specified by the manufacturer (not fuses with a higher amperage).
- Do not bridge fuses.

The fuse assignment indicates a fully equipped machine. Depending on the machine configuration (special attachments), slots are correspondingly free or occupied by fuses. Please follow the fuse assignment shown on the adhesive label in the engine compartment.



[1]	Main fuses	[2]	Central electrical system
[3]	Battery isolation switch control unit	[4]	Preheating monitoring
[5]	Generator D+		

5.03.01 Engine compartment

[1] Main fuses

Component	Fuse assignment	Fuse
F01.1	Generator B+	150 A
F01.2	On-board electrical system (terminal 30)	150 A
F01.3	Cold starting device	100 A
F01.4	Starter relay	30 A

[3] Battery isolation switch

Component	Fuse assignment	Fuse
F04	Battery isolation switch, control unit	7.5 A

[4] Preheating monitoring

Component	Fuse assignment	Fuse
F06	Preheating monitoring	1 A

[5] Generator

Component	Fuse assignment	Fuse
F07	Generator D+	5 A

5.03.02 Driver's platform

[2] Central electrical system

Component	Fuse assignment	Fuse
A1F1	Not assigned	5 A
A1F2	Air filter	5 A
A1F3	Right-hand parking light	5 A
A1F4	Left-hand parking light	5 A
A1F5	Diesel engine control unit	20 A
A1F6	Diesel engine control unit, main relay	5 A
A1F7	Turn signals/lighting (terminal 30)	15 A
A1F8	High beam, right	15 A
A1F9	Left-hand driving light	10 A
A1F10	High beam, left	15 A
A1F11	Right-hand driving light	10 A
A1F12	Not assigned	5 A
A1F13	Not assigned	15 A
A1F14	Sensors 1 power supply	3 A
A1F15	Not assigned	10 A
A1F16	Add-on devices (terminal 15)	15 A
A1F17	Foot brake	15 A
A1F18	Not assigned	15 A
A1F19	Sensors 2 power supply	3 A
A1F20	Not assigned	1 A
A1F21	Not assigned	7.5 A
A1F22	Not assigned	5 A
A1F23	Not assigned	15 A
A1F24	Not assigned	1 A
A1F25	Not assigned	15 A
A1F26	Not assigned	30 A

Component	Fuse assignment	Fuse
A1F27	Not assigned	30 A
A1F28	Rotating beacon	15 A
A1F29	Not assigned	15 A
A1F30	Reversing lights	15 A
A1F31	Wheel lighting	15 A
A1F32	Driver's seat socket (terminal 30)	15 A
A1F33	Microcontroller on	1 A
A1F34	Not assigned	15 A
A1F35	Additive sprinkling	15 A
A1F36	Driver's seat console (terminal 15)	15 A
A1F37	Horn/reversing warning system	15 A
A1F38	Water pump	15 A
A1F39	Cab/ROPS socket (terminal 15)	15 A
A1F40	Wiper system	30 A
A1F41	Fan/air conditioning	25 A
A1F42	Add-on devices (terminal 30)	15 A
A1F43	Driver's seat console (terminal 30)	10 A
A1F44	RC electronics microcontroller	5 A
A1F45	RC electronics power outputs	30 A
A1F46	Additional lighting 1	20 A
A1F47	Driver's cab (terminal 30)	15 A
A1F48	Rear working spotlights	20 A
A1F49	Brake light	20 A
A1F50	Front working spotlights	20 A
A1F51	Ignition (start) switch (terminal 30)	10 A

You can use the fusible test receptacle to check a fuse.
The green light-emitted diode (LED) lights up when the fuse is functional.

6 AUXILIARY EQUIPMENT

The section describes the mounting and dismounting, operation and maintenance of special attachments.

Please consider the parts included in the scope of supply. They may be different from the parts list content indicated here due to further developments in the product.

Safety Instructions

The "Special attachments" section describes components of the machine, that can be operated in addition to the equipment previously described in the manual.

For the special attachments, observe **ALL** the general warning and safety notices listed in the Operation and Maintenance chapter.

- "Important information about operating the machine"
- "Important information about maintenance works"

When working at the machine please always adhere to the instructions given in your Safety instructions!

6.00 Falling-object protective structure (FOPS)

The FOPS safety equipment is a design that prevents the driver from being injured by falling objects.

If available, the FOPS safety equipment is integrated into the cabin roof, sunroof or weather-protection roof, depending on the machine's equipment. The FOPS material number is then shown on the ROPS type plate.

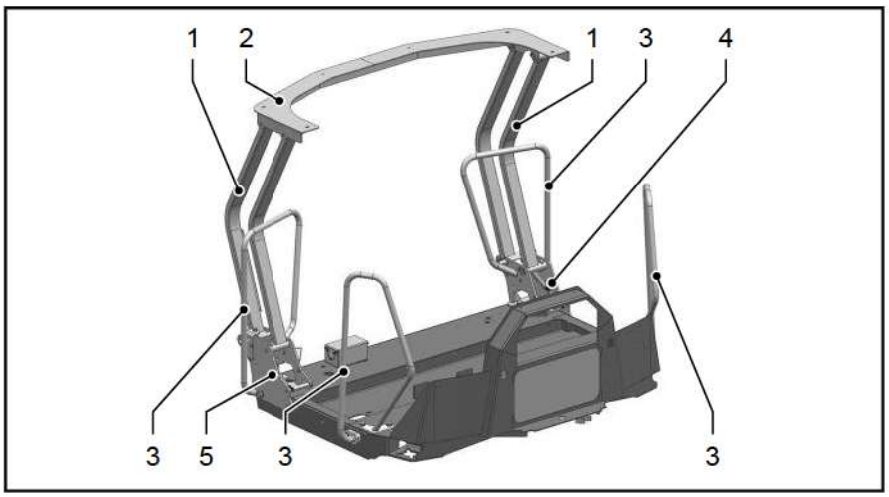
If a design with FOPS safety equipment is dismounted from the machine for transport or repair, it must be remounted according to specifications before the machine is used again.

Installation

A damaged FOPS component must only be installed or replaced by specialist personnel who are trained to do so. Inform customer service.

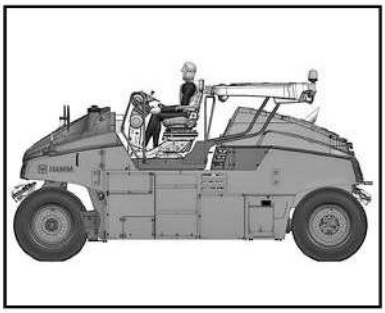
6.01 Weather protection roof, folding

6.01.01 Overview



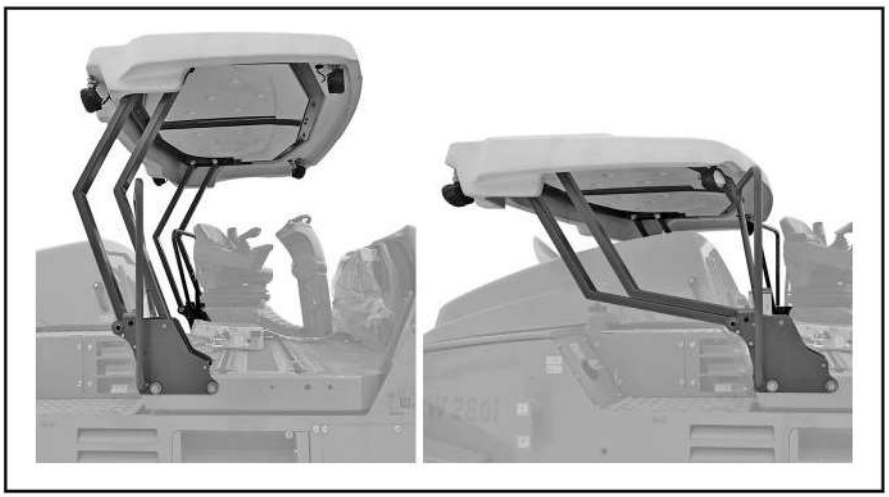
[1]	Square tube for folding roof frame	[2]	Weather protection roof holder
[3]	Handrail	[4]	Gas spring
[5]	Foot		

6.01.02 Description



With the folding weather protection roof, the machine's loading height can be significantly reduced and the machine can still be operated from the driver's platform. This means that container loading, for example, is possible without having to remove the roof structure.

Thanks to the handrails remaining in place on the machine, the operator can climb in and out of the machine unhindered, even when the roof is folded down.

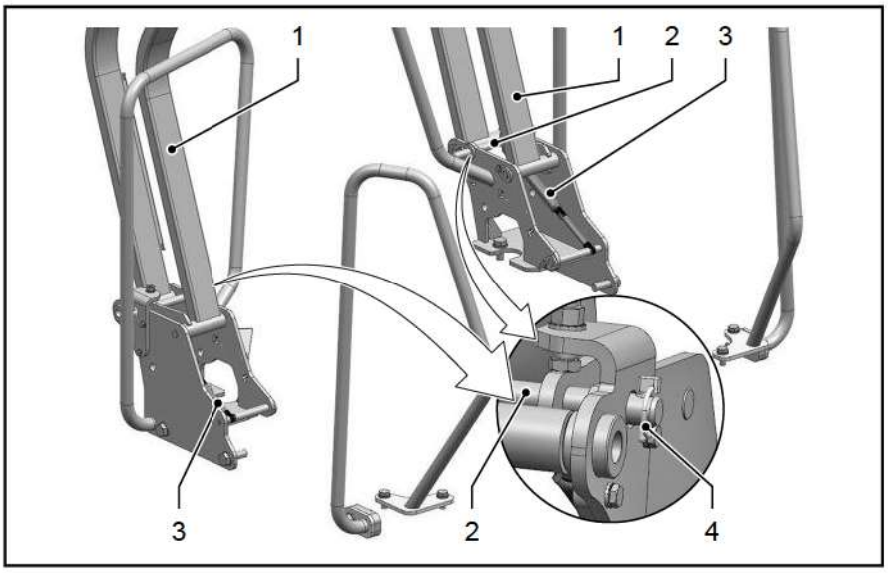


⚠WARNING

Changed machine height and view!
Risk of injury or death, along with a risk to others when the machine is driven with the weather protection roof folded down.
When the weather protection roof is folded down:

- The machine must only be driven by suitably trained personnel.
- The machine must only be moved manually for loading purposes when on flat substrate.
- Attention must be paid to any obstacles in the driver's head area during loading. Wear a safety helmet!
- When driving backwards, the safety of the area behind the machine must be guaranteed by a guide.

6.01.03 Operation



Folding down the weather protection roof

- ▶ On both sides, pull the linchpin [4] out of the locking bolt [2].
- ▶ On both sides, pull out the locking bolt [2] towards the inside from the foot and square tube [1].
- ✔ The frame can now be freely moved backwards.
- ▶ Fold the frame backwards at the square tubes [3].
- ✔ The weather protection roof is lowered. In doing so, the frame is held by gas springs [3].
- ▶ Keep the locking bolt [2] and linchpin [4] safe.

Folding up the weather protection roof

- ▶ Fold the frame forwards at the square tubes [3].
- ✔ The weather protection roof is raised. In doing so, the frame is held by gas springs [3].
- ▶ On both sides, pull out the locking bolt [2] from the inside through the foot and square tube [1].
- ▶ On both sides, secure the locking bolt [2] with the linchpin [4].
- ✔ The weather protection roof is aligned and secured.

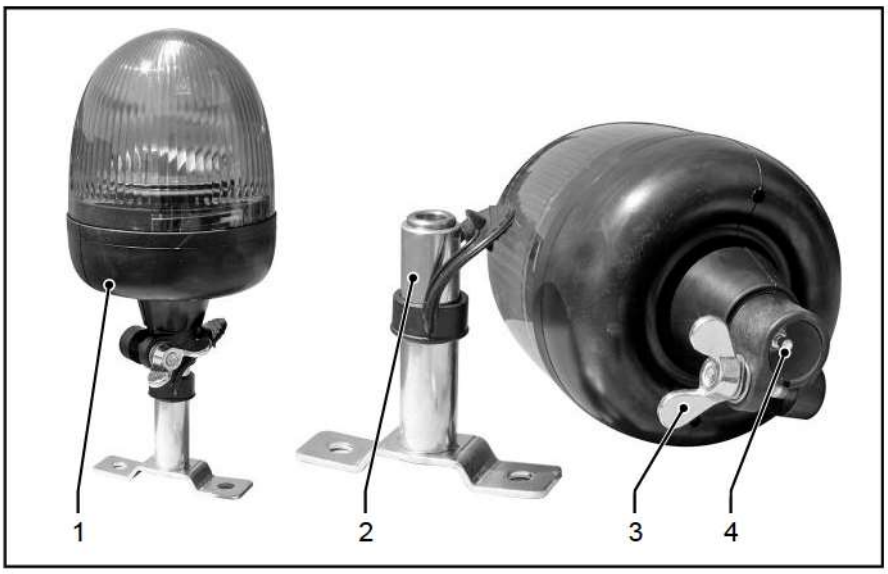
6.01.04 Maintenance

The folding weather protection roof is maintenance-free.

Any dirt must be cleaned from the moving parts on the weather protection roof's holder and on the foot. If the folding mechanism is difficult to move, lightly oil these points.

6.02 Rotating beacon

6.02.01 Overview



[1]	Rotating light mounted	[2]	Contact tube
[3]	Clamping screw	[4]	Plug contact

6.02.02 Description

The rotating beacon is an orange warning light that radiates light over a 360° area.

A switched on rotating beacon visual identifies, marks and safeguards danger areas.

6.02.03 Mounting/Dismounting

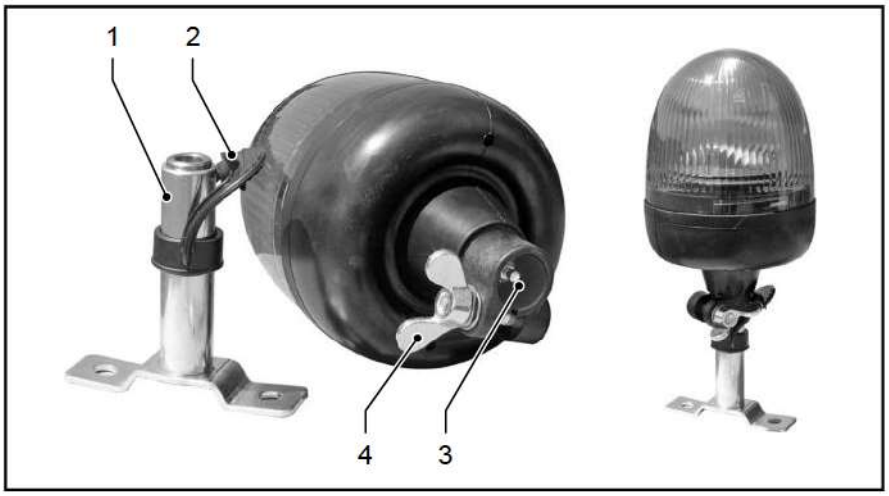
⚠WARNING

Work above floor level!

Risk of injury caused by falling.

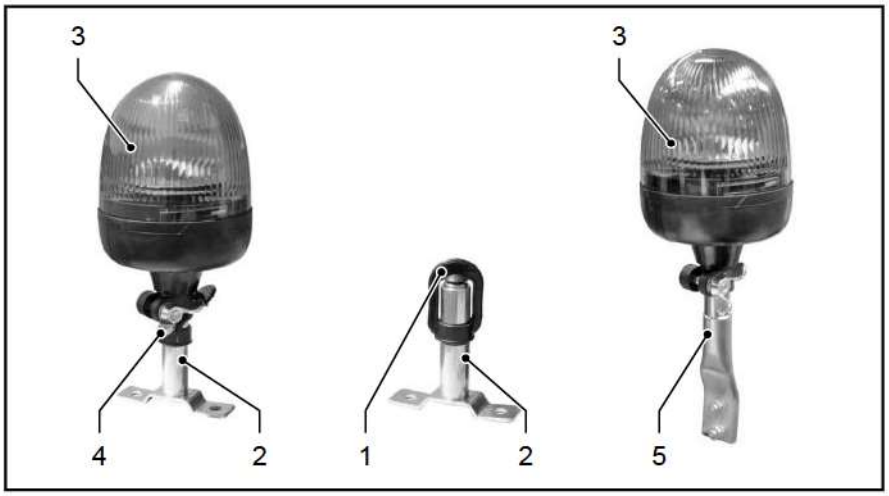
- All work above floor level must only be carried out using a stable ladder or on maintenance scaffolding.
- To reach the maintenance points on the machine, use the designated steps and treads. Do not step on any other machine element or add-on part.

Mounting rotating beacon



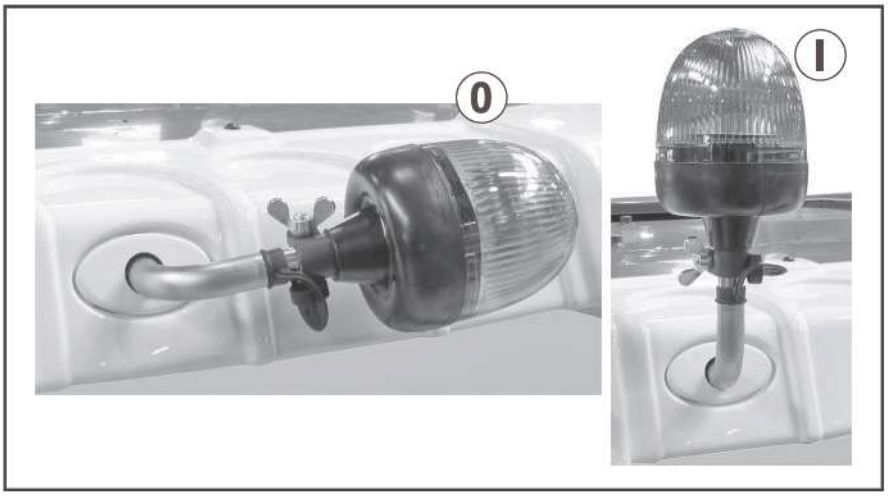
- ▶ Swivel the protective cap [2] to the side.
- ▶ Put the locating hole [3] of the rotating beacon on the contact tube [1] and slide it up to the stop.
- ✔ The electrical connection has been made.
- ▶ Tighten clamping screw [4].

Dismounting/removing rotating beacon



- ▶ Unscrew the clamping screw [4] and slide the rotating beacon [3] off the contact tube [2].
- ▶ Close the contact tube [2] with the protective cap [1].
- ▶ Stow the rotating beacon [3] on the holder [5] inside the cab.

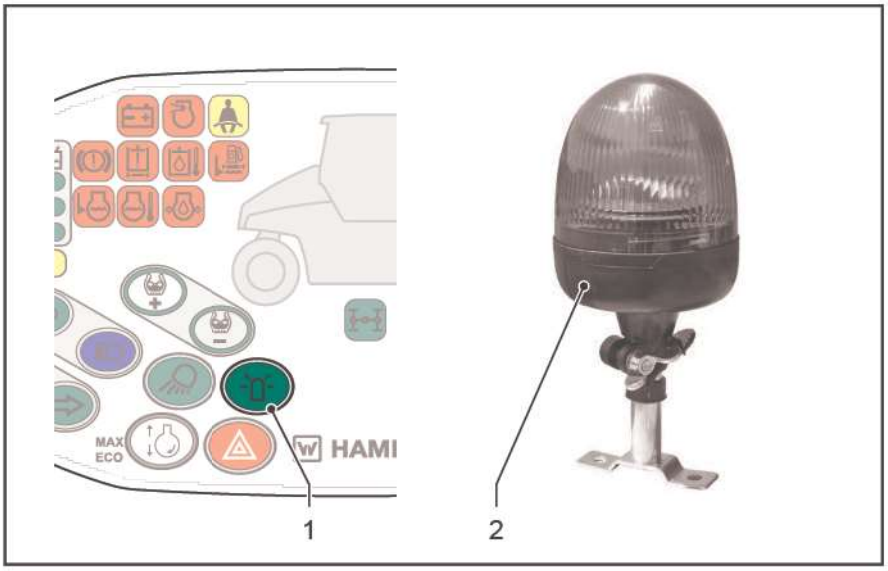
Rotating beacon, foldable



The rotating beacon can be turned through 90 degrees to reduce the height of the machine for transport on a low loader or truck.

- ▶ Move the rotating beacon to lock-in position 0 for transport.
- ▶ Move the rotating beacon to lock-in position I for work.

6.02.04 Operation



Switching on rotating beacon

- ▶ Press the rotating beacon switch [1] on the control panel.
- ✔ LED on: Rotating beacon [2] lights.

Switching off rotating beacon

- ▶ Press the rotating beacon [1] switch on the control panel again.
- ✔ LED off: Rotating beacon [2] off.

6.02.05 Maintenance

⚠WARNING

Work above floor level!
Injury caused by falling.

- Do not perform any maintenance or repair work above ground level unless using a stable ladder or a maintenance scaffold.
- To reach the maintenance points on the machine, use the steps indicated. Do not step on any other machine element or add-on part.

Dust or sand can impair the function of the rotating beacon.

Cleaning

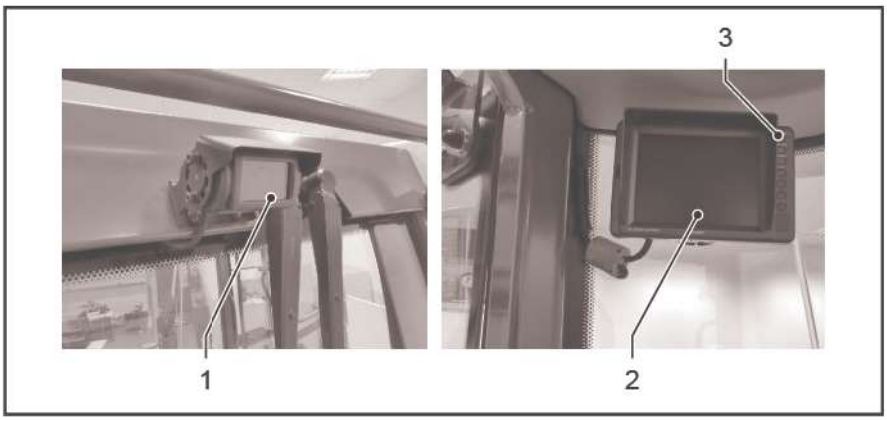
- ▶ Use a sponge and soap water to clean the rotating beacon.
- ▶ Do not clean the rotating beacon with a water jet or high-pressure cleaner.

Maintenance

- ▶ Spray electrical contacts using a contact spray.

6.03 Rear area monitoring

6.03.01 Overview



[1]	Camera	[2]	Cab monitor
[3]	AUTO POWER switch		

6.03.02 Description

The camera monitoring system for monitoring the rear area improves the vision behind the roller. The system also enables the rear area to be monitored when the machine is moving.

The system is a valuable aid to the driver, but it does not release him from his duty of care when manoeuvring the vehicle.

HAMM shall not be liable for damage caused by misuse or malfunction of the product.

6.03.03 Operation

Also follow the manufacturer's operating manual during all activities.

The monitor enables the system to be activated automatically or manually by pressing a button [3] ("AUTO POWER") at "Ignition ON".

- ▶ Select AUTO POWER ON/AUTO.
- ✔ The system switches on automatically when the ignition is turned ON.
- ✔ The system switches off automatically when the ignition is turned OFF.
- ▶ Select AUTO POWER OFF.
- ✔ The system can be switched on manually when the ignition is turned ON.
- ✔ The system switches off automatically when the ignition is turned OFF.

A sensor enables the monitor to adjust automatically to the brightness of the surroundings.

6.03.04 Maintenance

⚠WARNING

Work above floor level!
Injury caused by falling.

- Do not perform any maintenance or repair work above ground level unless using a stable ladder or a maintenance scaffold.
- To reach the maintenance points on the machine, use the steps indicated. Do not step on any other machine element or add-on part.

Care

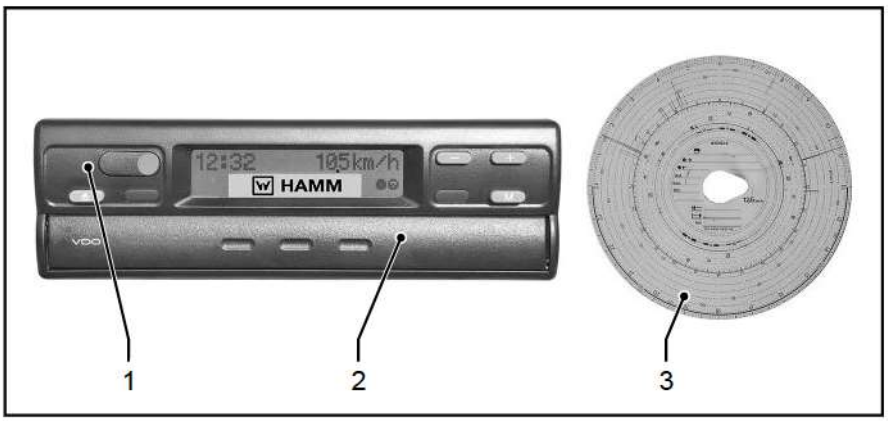
Clean the monitor and camera regularly with a soft, damp cloth.

6.03.05 Disposal

Only dispose of the device at recycling collection points for electrical and electronic devices.

6.04 Tachograph

6.04.01 Overview

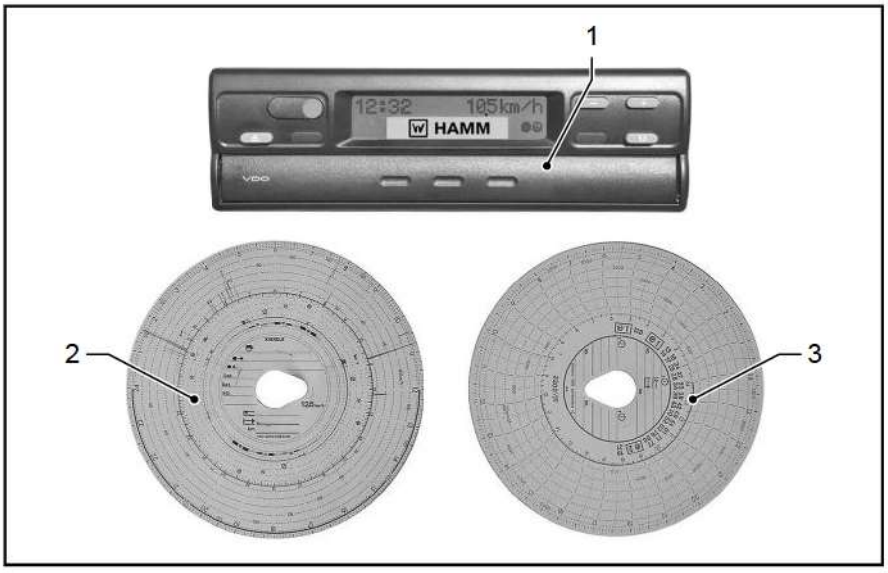


[1]	Tachograph	[2]	Drawer for record sheet
[3]	Record sheet		

6.04.02 Description

After the electrical system has been switched on, the trip recorder displays the various machine functions on the record sheet. These include:

- Driving and stopping times
- Driving speed
- Electrical system on/off



Driving speed

When the machine is moving, the tachograph display shows the driving speed [1] to one decimal place. The point in the display window indicates the decimal point. The speed is also shown on the record sheet [2] with one digit after the decimal point. Example: A peak in the curve at 105 km/h corresponds to a real driving speed of 10.5 km/h.

Electrical system

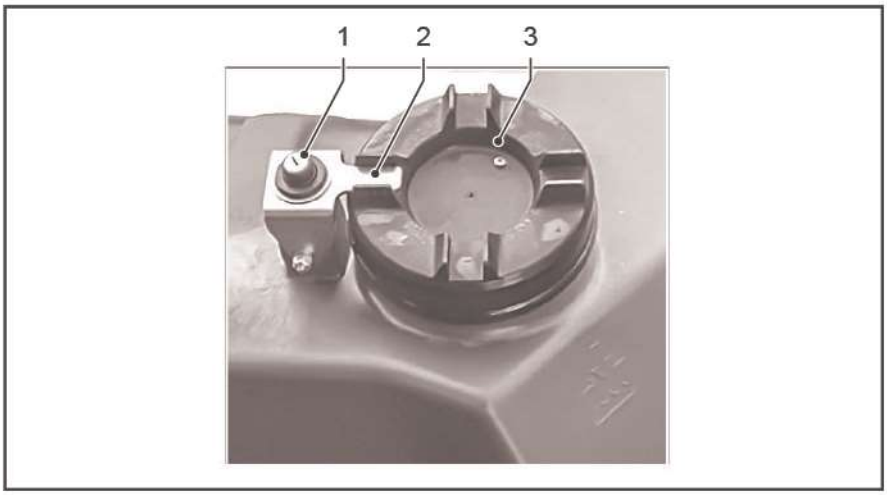
The trip recorder logs the switching on of the electrical system on the back of the record sheet (Electrical system ON/OFF) [3].

6.04.03 Operation

The operation of the trip recorder is described in the manufacturer's instruction manual. This corresponds to the version current when the machine is delivered.

6.05 Water tank cover, lockable

6.05.01 Overview



[1]	Locking cylinder	[2]	Locking lever
[3]	Water tank cap		

6.05.02 Description

The lockable tank cap locks the water tank to make unauthorized opening more difficult.

6.05.03 Operation

Opening

- ▶ Unlock the locking cylinder [1] with the ignition key.
- ▶ Fold back [2] the locking lever.
- ▶ Release the cap of the water tank [3].
- ✔ Water tank open, refilling possible.

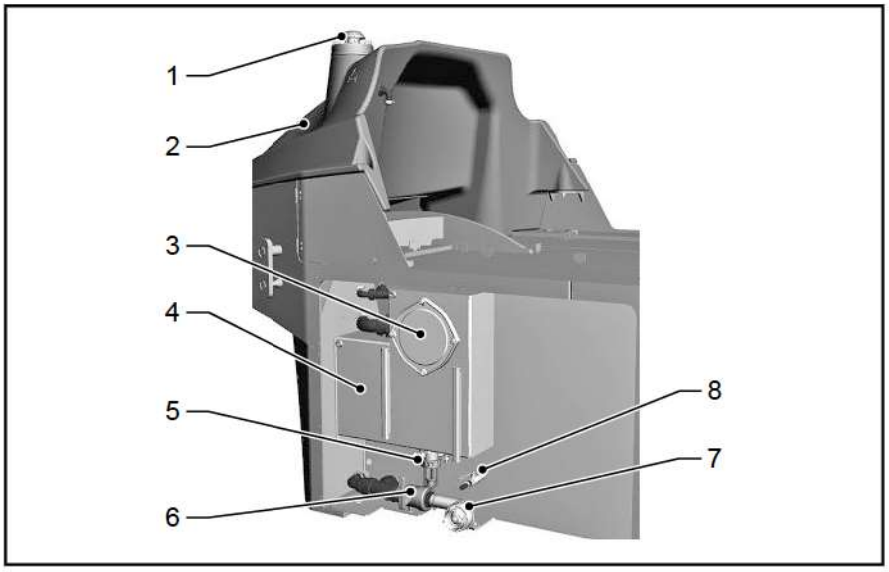
Closing

- ▶ Lock the cap of the water tank [3].
- ▶ Fold the locking lever [2] onto the cap of the water tank [3].
- ▶ Lock the locking cylinder [1] with the ignition key.
- ✔ Water tank is locked.

Lubricate and move the locking cylinder [1] and the locking lever [2] from time to time to keep them movable.

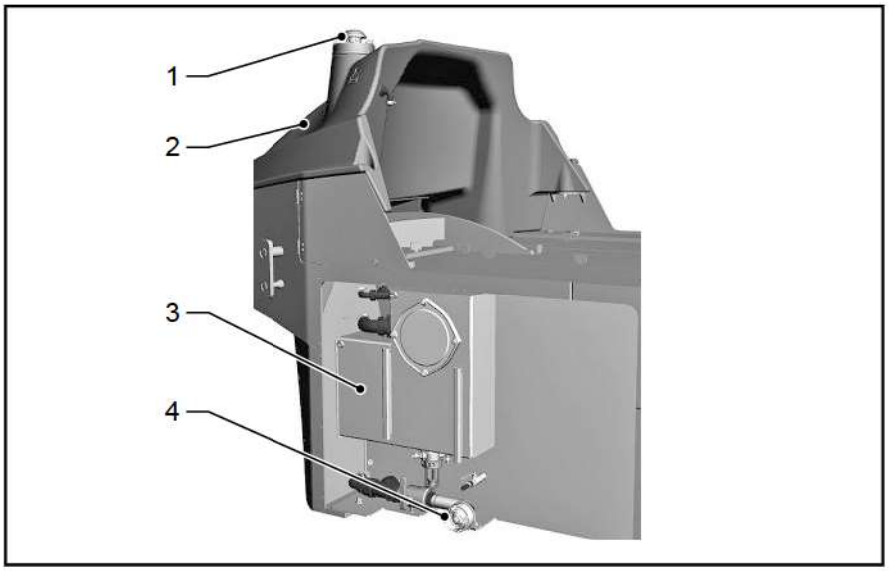
6.06 Additional water tank

6.06.01 Overview



[1]	Tank vent	[2]	Water tank
[3]	Cover for cleaning opening	[4]	Additional water tank
[5]	Water filter	[6]	Stop cock
[7]	Hose coupling filling connection	[8]	Drain cock

6.06.02 Description



The machine has a large additional water tank [3], which:

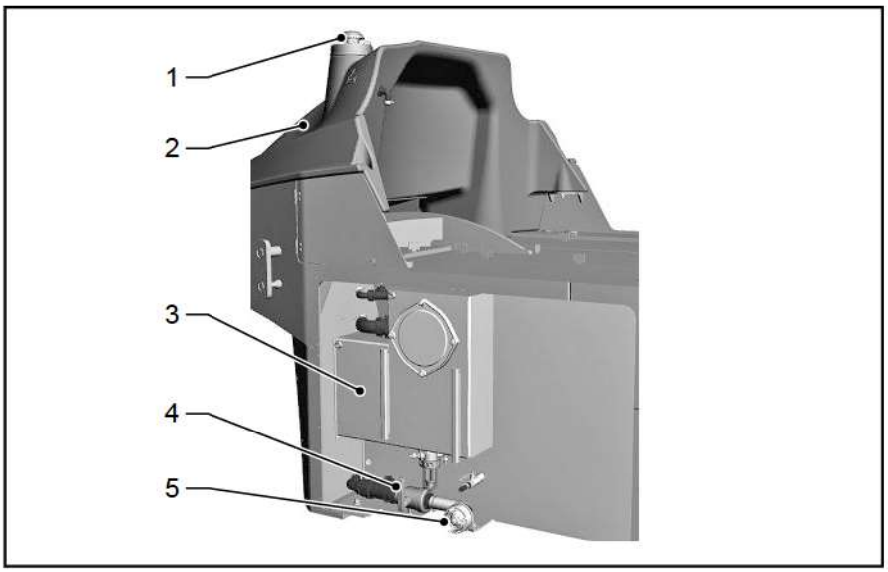
- Increases the water reserve for the water sprinkling system,
- Provides water ballast in order to vary the operating weight,
- Can supply other construction site vehicles with water.

The water tank [2] and additional water tank [3] are connected to each other and form a total reserve. They are filled

- using a water hose (1") at the tank vent [1] on the upper water tank [2]
- or using the Storz hose-coupling system [4], size C, on the additional water tank [3].

6.06.03 Operation

Filling the water tank



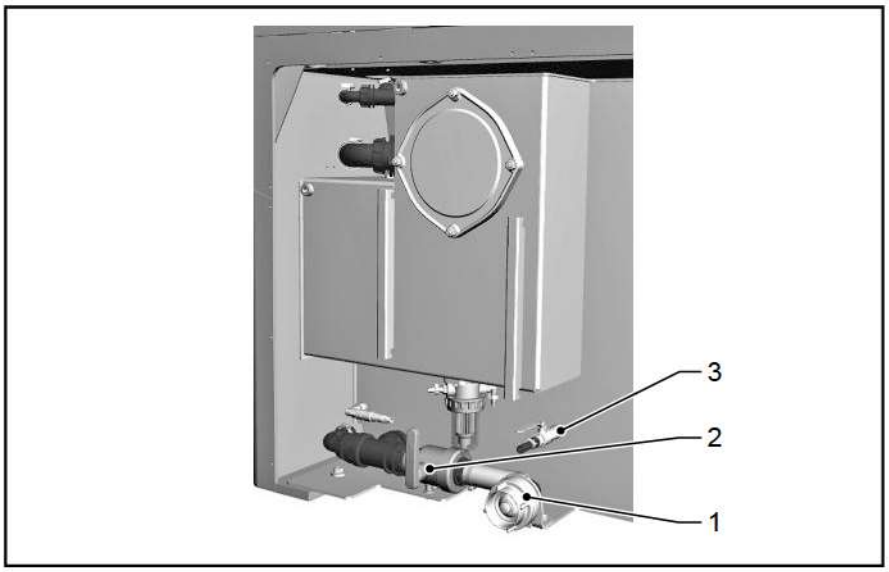
Using a 1" water hose

- ▶ Unscrew the cap on the tank vent [1].
- ▶ Insert the water hose into the opening of the tank vent [1] on the upper water tank [2].
- ▶ Fill with water until the water overflows at the opening on the tank vent [1] on the water tank [2].
- ▶ Screw in the tank vent [1] cap.

Using a Storz hose-coupling system, size C

- ▶ Remove the blind coupling [5].
- ▶ Attach the Storz hose-coupling system to the connection.
- ▶ Open the stop cock [4] and fill the additional water tank [3] until the water overflows at the tank vent [1] on the water tank [2].
- ▶ Close the stop cock [4].
- ▶ Remove the Storz hose-coupling system.
- ▶ Seal the connection using a blind coupling [5].

Withdrawing water



Do not use the water reserve as drinking water!

The connections [1] and [3] are intended for withdrawing water.

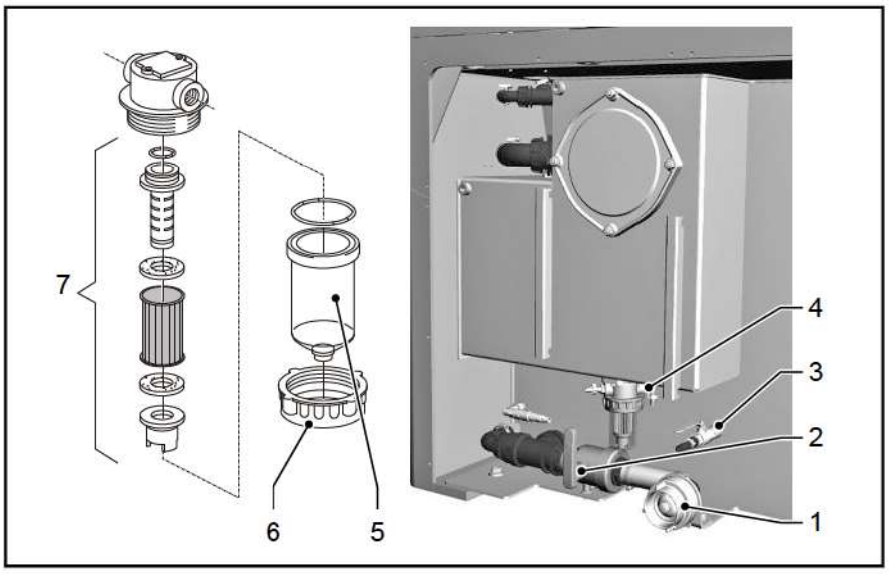
Withdrawing larger volumes of water:

- ▶ Remove the blind coupling [1].
- ▶ Open the stop cock [2].
- ✔ Larger volumes of water can be withdrawn.
- ▶ Close the stop cock [2].
- ▶ Screw in the blind coupling [1].

Withdrawing smaller volumes of water:

- ▶ Open the connection [3].
- ✔ Smaller volumes of water can be withdrawn.

Emptying the water-sprinkling system with additional water tank



NOTICE

Corrosion and frost!
Material damage to sprinkler installations due to corrosion and frost.
While the machine is going to be parked for an extended period of time and/or in case of danger of freezing:
- Empty and clean the water sprinkling unit/additive sprinkling system.
- Remove and clean the sprinkler nozzles.
- Carry out antifreeze work, if available.

The water tank can hold large volumes of water. Before draining, ensure that water that flows out does not damage the ground or environment. If possible, pump the water away using suitable equipment.

- ▶ Drain the upper water tank in accordance with the information in the instruction manual.
- ▶ Loosen the union nut [6] on the water filter [4] and remove it along with the sight glass [5] (pay attention to the sealing ring on the sight glass).
- ▶ Pull the filter unit [7] out of the filter head.
- ▶ Clean the filter unit [7], sight glass [5] and union nut [6] and store them in the toolbox.
- ▶ Remove the blind coupling [1].
- ▶ Open the stop cock [2] and drain cock [3] and allow the water to drain completely.
- ✔ The water-sprinkling system with additional water tank is empty.
- ▶ Close the stop cock [2] and drain cock [3] again before starting work on the machine.
- ▶ Refit the filter unit [7], sight glass [5], union nut [6] and blind coupling [1] before starting work.

6.06.04 Maintenance

Maintenance overview

Every 10 operating hours

10 h

Cleaning the filter for the water-sprinkling system

Every 2000 operating hours

2000 h

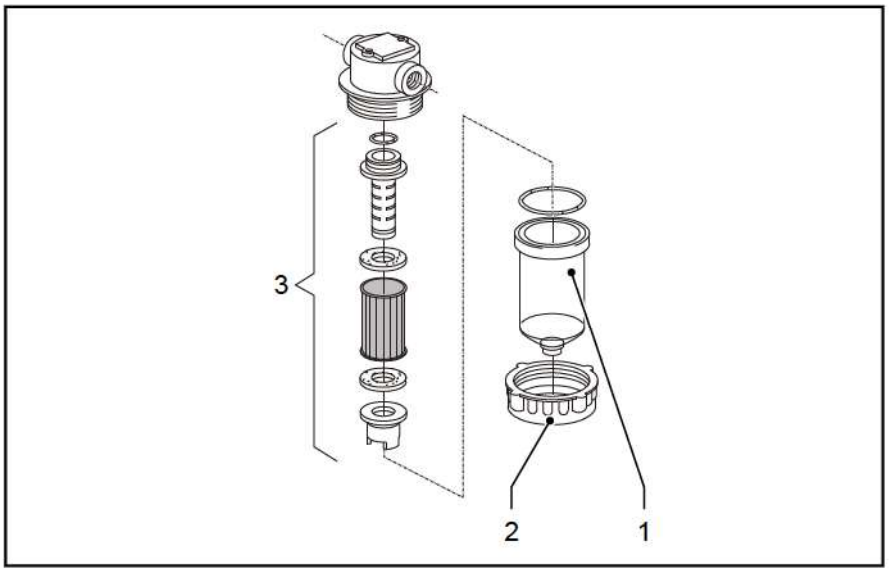
Cleaning the additional water tank

Required maintenance parts

Additional water tank

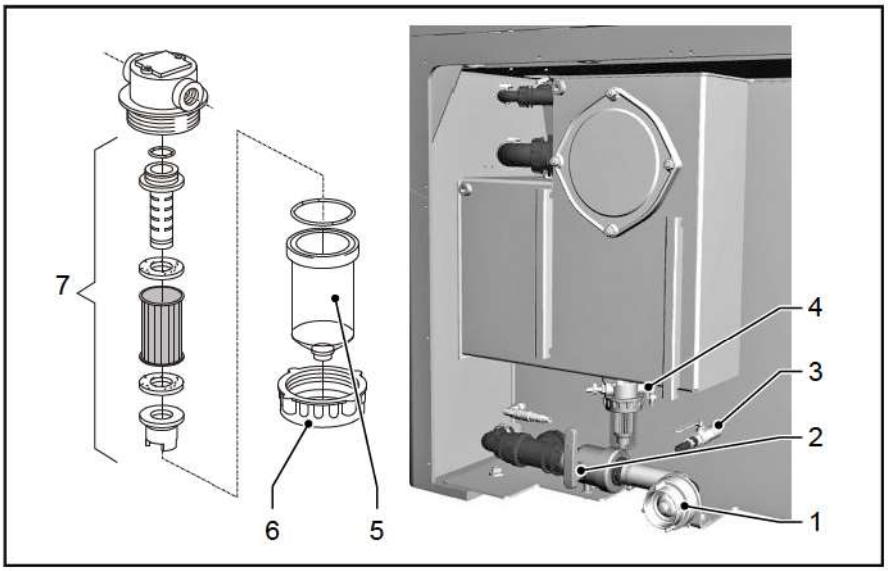
Quantity	Maintenance part			first time after	Maintenance intervals in operating hours			
					every 250	every 500 or once per year	every 1000 or once per year	every 2000 or every 2 years
1	Filter insert	Water filter	386596		A			
2	Sealing ring	Cleaning cover	576476					D
A = Check! Replace/Refill if required. D = Replace!								

Cleaning the filter for the water-sprinkling system



- Switch off the diesel engine and remove the ignition key.
- Loosen the union nut [2] and remove it along with the sight glass [1].
- Pull the filter unit [3] out of the filter head and remove it.
- Clean all components thoroughly.
- Assemble the filter unit [3] and insert it into the filter head.
- Install the sight glass [1] with union nut [2] on the filter head (pay attention to the sealing ring on the sight glass) and tighten these.

Cleaning the additional water tank

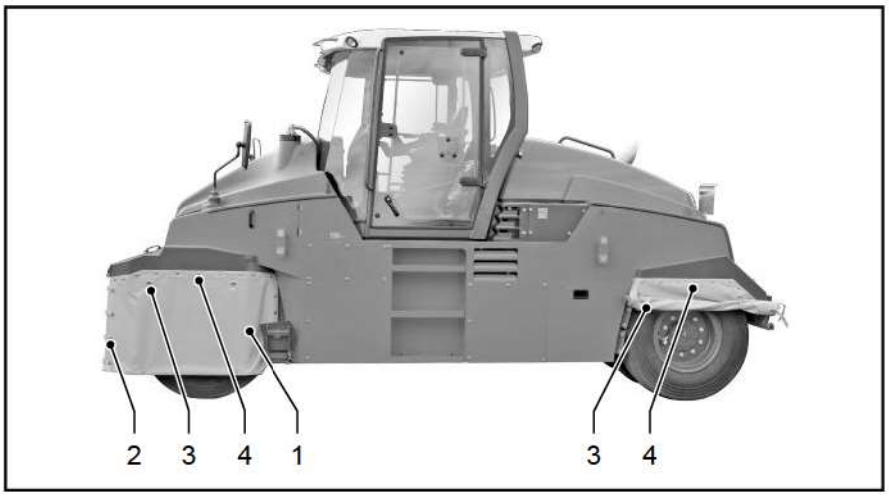


The water tank can hold large volumes of water. Before draining, ensure that water that flows out does not damage the ground or environment. If possible, pump the water away using suitable equipment.

- Switch off the diesel engine and remove the ignition key.
- Remove the blind coupling [1].
- Open the stop cock [2] and drain cock [3] and allow the water to drain completely.
- Remove and clean the cleaning opening [8] along with the sealing ring.
- Loosen the union nut [6] on the water filter [4] and remove it along with the sight glass [5] (pay attention to the sealing ring on the sight glass).
- Pull the filter unit [7] out of the filter head and remove it.
- Clean all components thoroughly.
- Thoroughly clean the inside of the additional water tank with a high-pressure cleaner (if available) or with a jet of water.
- Install the cleaning opening cover [8] with a new sealing ring.
- Assemble the water filter [4].
- Close the stop cock [2] and drain cock [3] and fit the blind coupling [1].

6.07 Thermal aprons

6.07.01 Overview



[1]	Thermal apron	[2]	Locking strap
[3]	Holding strap (interior)	[4]	Rotary locking device

6.07.02 Description

The thermal aprons keep the rising heat near the machine's tyres when laying asphalt. Concentrating the heat ensures that the tyres heat up quickly, and prevents asphalt from sticking to the tyres.

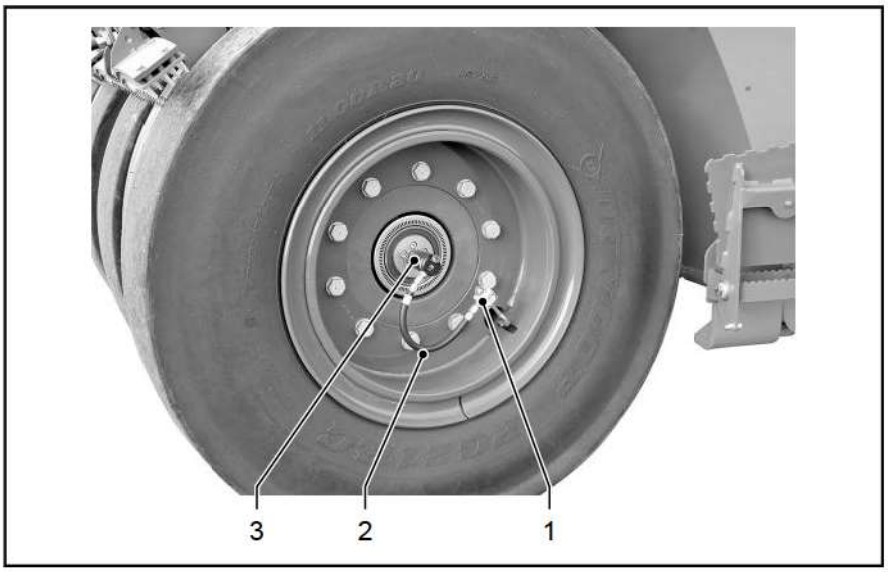
6.07.03 Operation

To heat up the tyres, drive over the hot asphalt with the thermal skirts closed. The thermal skirts prevent the tyres from cooling down when the outdoor temperature is low or there is wind. If the machine is not being used for laying asphalt, the thermal aprons can be rolled up, and secured by the holding straps. To obtain better access to the tyres for maintenance purposes or to prevent premature wear of the thermal aprons, they can be quickly removed from the machine by releasing the rotary locking devices.

6.08 Tyre inflation system

6.08.01 Overview

Tyres



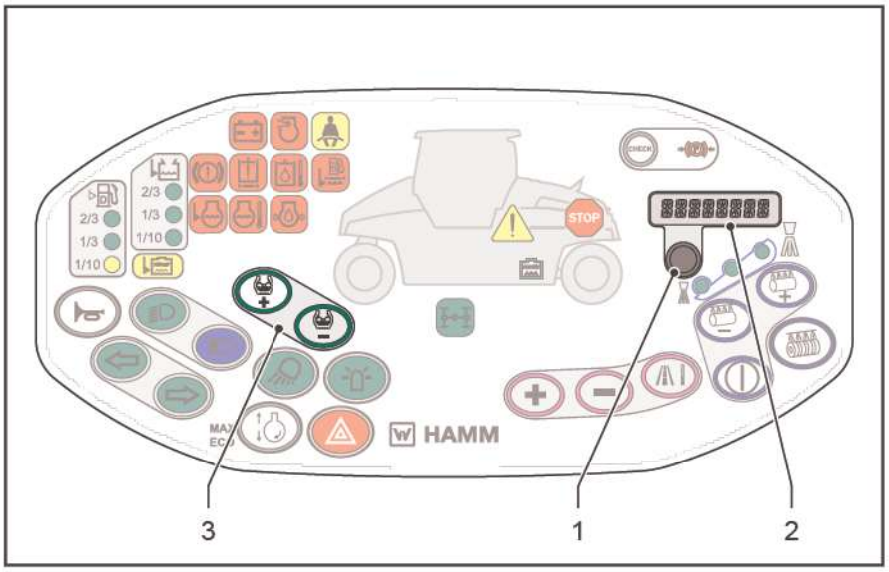
[1]	Valve	[2]	Filling hose
[3]	Axis rotor		

6.08.02 Description

The tyre filling system allows reducing or increasing the air pressure in the tyres within a determined range even while driving. The contact area of the tyres will be changed. The compaction depth of the soil changes depending on the contact area. A pressure maintenance valve prevents the tyre pressure from falling under the minimum value.
This enables you to adapt the machine in an optimum fashion to the conditions of use for bituminous pavement or earthwork.

6.08.03 Operation

Control panel



[1]	System info switch	[2]	Tyre pressure info display
[3]	Setpoint adjustment switch		

Moving to the next display

The display moves one step further each time the switch [1] is pressed.

- ▶ Briefly press the switch [1].

Level 1: Machine info

- Operating hours
- Engine speed
- Driving speed
- Current tyre pressure
- Diagnostic codes

The information shown in the info display [2] varies depending on the machine equipment.

Displaying the current tyre pressure

- ▶ Use switch [1] to switch to the relevant display.
- ✔ The info display [2] displays the current value.

Setting the tyre pressure

Prerequisite: The diesel engine is running.

- ▶ Briefly press the + (plus) or – (minus) switch [3].
- ✔ The info display [2] shows the set target value for five seconds.
- ✔ After five seconds, the info display [2] shows the current tyre pressure again.
- ▶ Press the + (plus) or – (minus) switch [3] within five seconds, or press and hold this switch.
- ✔ The target value in the info display [2] is increased or decreased.
- ✔ The info display [2] displays the preselected target value for five seconds.

- ✔ After five seconds, the info display [2] shows the current tyre pressure again.
- ✔ The tyre pressure is set to the target value.

6.08.04 Maintenance

Maintenance overview

Every 2000 operating hours

2000 h

Change the filter cartridge for the air dryer

Required maintenance parts

Tyre-inflation system

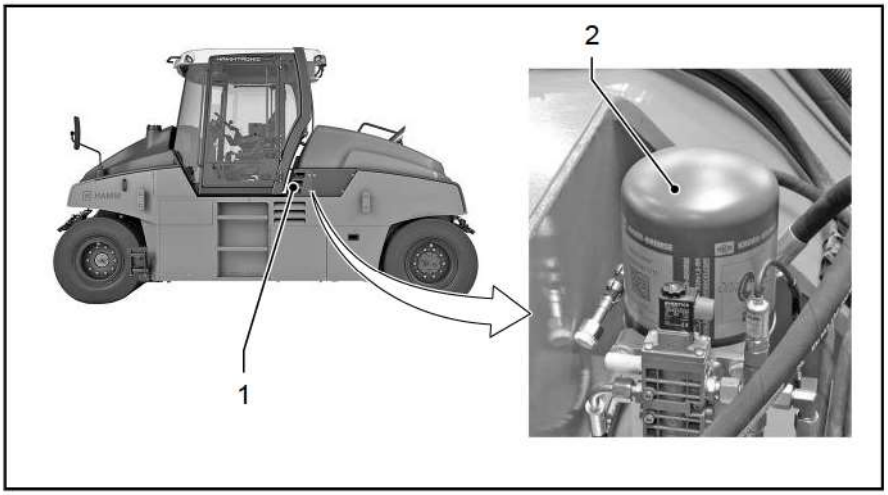
H24900001 →

Quantity	Maintenance part			first time after	Maintenance intervals in operating hours			
					every 250	every 500 or once per year	every 1000 or once per year	every 2000 or every 2 years
1	Filter cartridge	Air dryer	1292951					D

A = Check! Replace/Refill if required. D = Replace!

Change the filter cartridge for the air dryer

Do not change the filter cartridge unless the air dryer is depressurized. To ensure this, fill the compressed air system until reaching the shut-off pressure of the pressure controller before changing the filter.

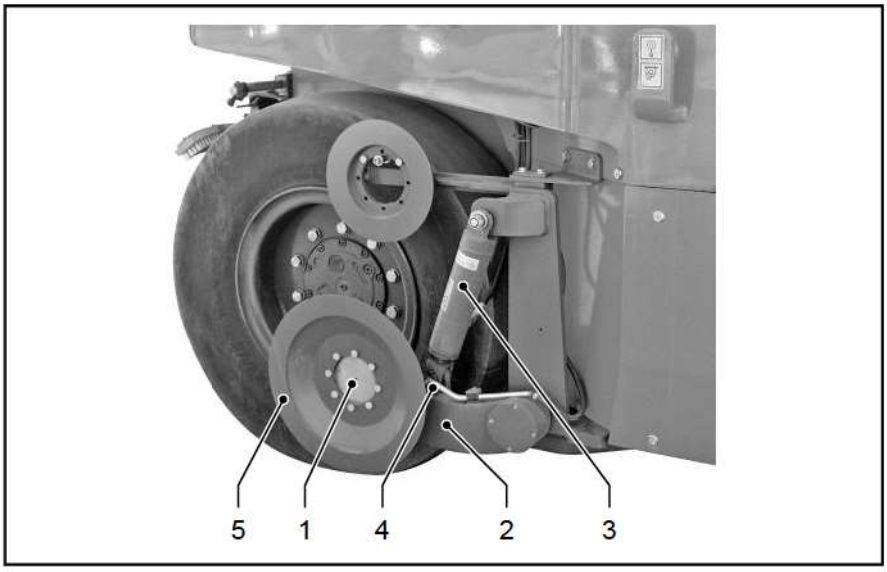


- ▶ Switch off diesel engine and remove ignition key.
- ▶ Allow machine to cool down less than 30 °C (86 °F).
- ▶ Remove the protective screen [1].
- ▶ Screw off the filter cartridge [2].

- Prior to assembly apply a thin coat of oil to the rubber seal and screw the new filter cartridge [2] to the filter head until the seal makes contact. Tighten the filter cartridge by hand further by half a turn.
- Install the protective screen [1].

6.09 Edge pressing and cutting device

6.09.01 Overview



[1]	Tool carrier	[2]	Lever
[3]	Hydraulic cylinder	[4]	Water spray nozzle
[5]	Tool		

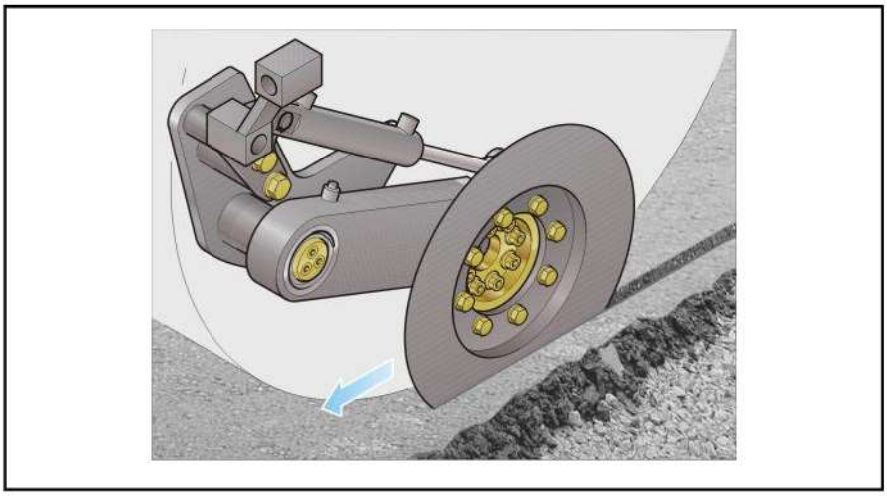
6.09.02 Description

The edge pressing and cutting device cuts or shapes the lateral edges of warm asphalt.

The tool is raised and lowered hydraulically. The water sprinkling prevents bitumen adhering to the tool.

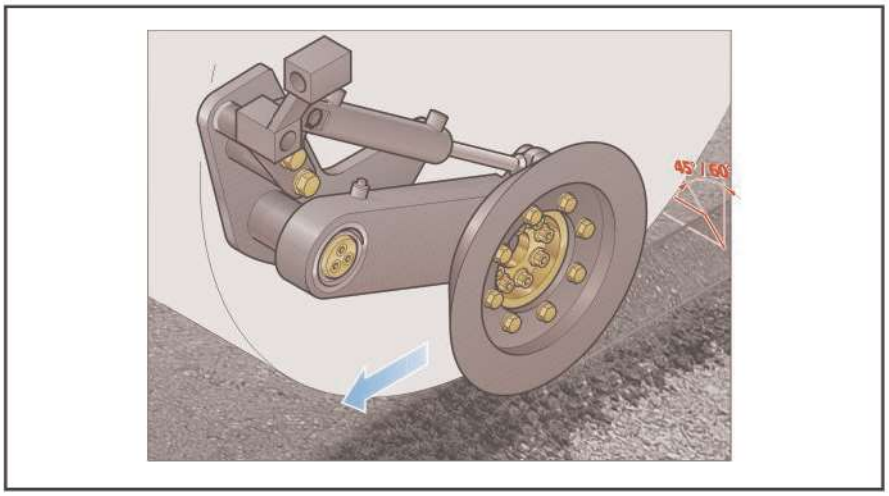
The cutting discs and pressing roll are exchangeable.

Cutting wheel



The cutting disc trims projections off the asphalt surfaces.

Pressure roller



Conical pressing rolls chamfer the edges of asphalt surfaces. The pressing rolls can be changed to match different layer thicknesses and produce different chamferings.

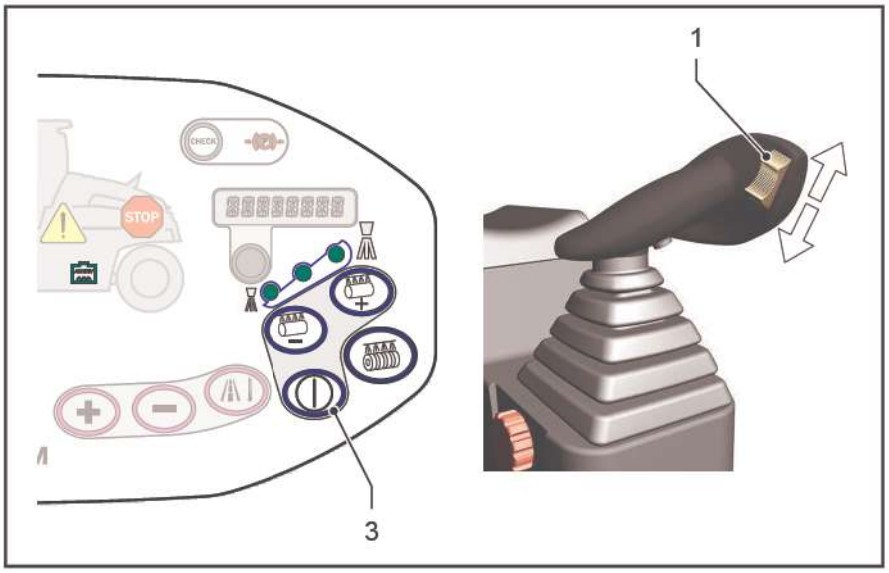
6.09.03 Operation

NOTICE

Unfavorable force transmission!

Material damage to the edge pressing and cutting device caused by unfavourable force transmission.

- Only carry out work with the edge pressing and cutting device when driving forwards.
- Use only to work on hot, malleable asphalt.



Lowering the edge pressing and cutting device

- ▶ Press the switch [1] down at the drive lever until the desired position is reached.
- ✔ The edge pressing and cutting device is lowered and is in use.

Raising the edge pressing and cutting device

- ▶ Press the switch [1] up at the drive lever until the desired position is reached.
- ✔ The edge pressing and cutting device is lifted from the surface course.

Sprinkling system for the edge pressing and cutting device

The edge pressing and cutting device can only be sprinkled with water if the water-sprinkling system is switched on.

- ▶ Press switch [3].
- ✔ Water sprinkling system is switched on.

Switching on the sprinkling system

- ▶ Lowering the edge pressing and cutting device
- ✔ The sprinkling system starts automatically.

Switching off the sprinkling system

- ▶ Raising the edge pressing and cutting device
- ✔ The sprinkling system is off if the edge pressing and cutting device is raised for at least 2 seconds.

6.09.04 Maintenance

Basic maintenance tasks

- Remove dirt deposits.
- Replace damaged and/or non-readable warning signs.
- Check that the screw connections on console, levers, cutting disc and pressing roll are tight.

Maintenance overview

Every 250 operating hours

250 h

Cleaning sprinkler nozzles

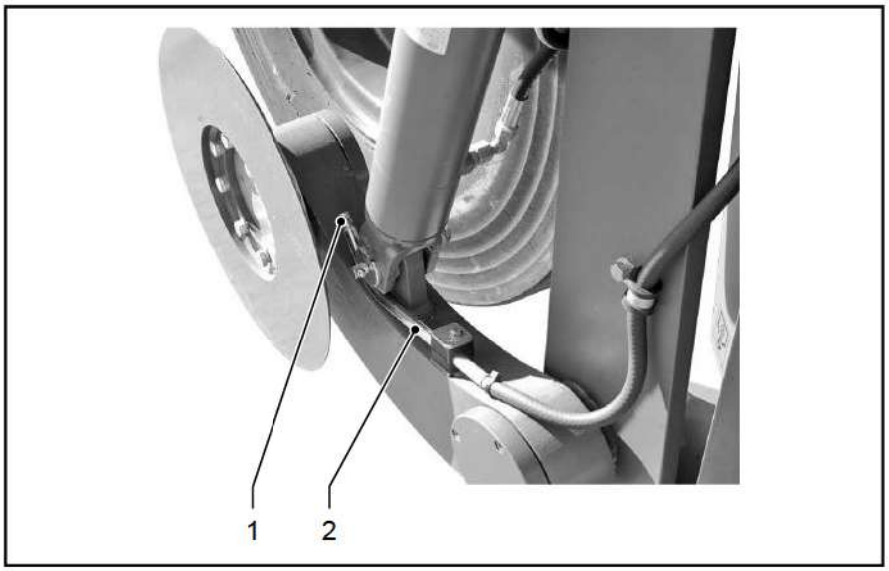
Lubricating the cylinder pins for the edge pressing and cutting device

Every 1000 operating hours

1000 h

Checking the edge pressing and cutting device's accumulator

Cleaning sprinkler nozzles

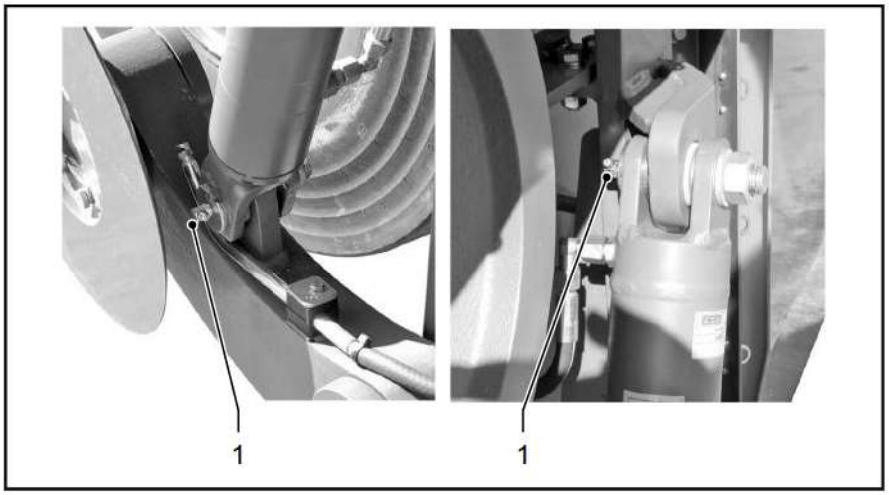


To switch on the water-sprinkling system, the edge pressing and cutting device must be lowered while the electrical system is switched on. The machine is operating during this time and must be secured accordingly.

- Switch off diesel engine and remove ignition key.
- Unscrew and clean the spray nozzle [1].
- Flush the pipeline [2] with the water sprinkling system.
- To switch off the water-sprinkling system: Lift the edge pressing and cutting device.
- Screw in the spray nozzle.

Lubricating the cylinder pins for the edge pressing and cutting device

△ Only lubricants with this symbol are permitted ("Technical data", page 199).



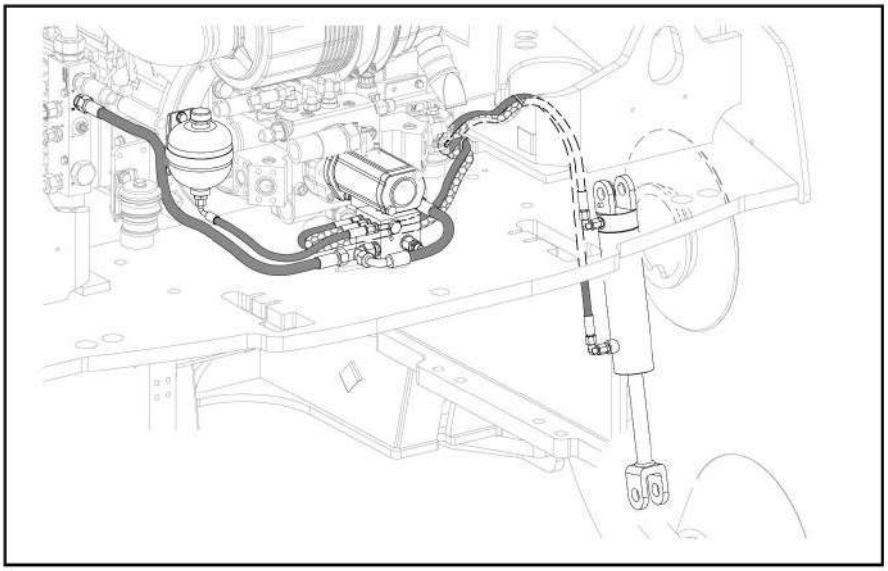
- Switch off diesel engine and remove ignition key.
- Lubricate lubrication nipple [1] (2 nipples).

Checking/topping up priming pressure in the pressure reservoir

⚠WARNING

Explosion and aggressive media!
Severe injury or death due to flying parts or contact with aggressive media.

- Do not work on any hydraulic system unless the system has been depressurized.
- Do not perform any welding, soldering, brazing or mechanical work on the membrane reservoir.
- No work must be carried out on the membrane reservoir unless exclusively by trained service personnel.
- Do not check or top up the membrane reservoir with nitrogen unless using suitable filling and testing equipment.

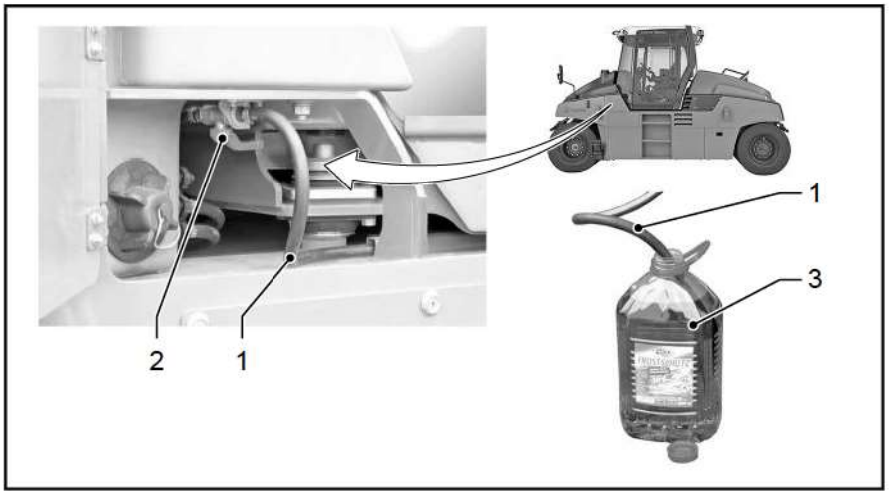


To guarantee that the edge pressing and cutting device works correctly, the pre-charging pressure in the accumulator must be checked and, if required, topped up.

This work may only be carried out by trained personnel! Request assistance from customer services!

6.10 Anti-freeze filling system for water sprinkling

6.10.01 Overview



[1]	Hose	[2]	Change-over valve
[3]	Vessel for antifreeze solution		

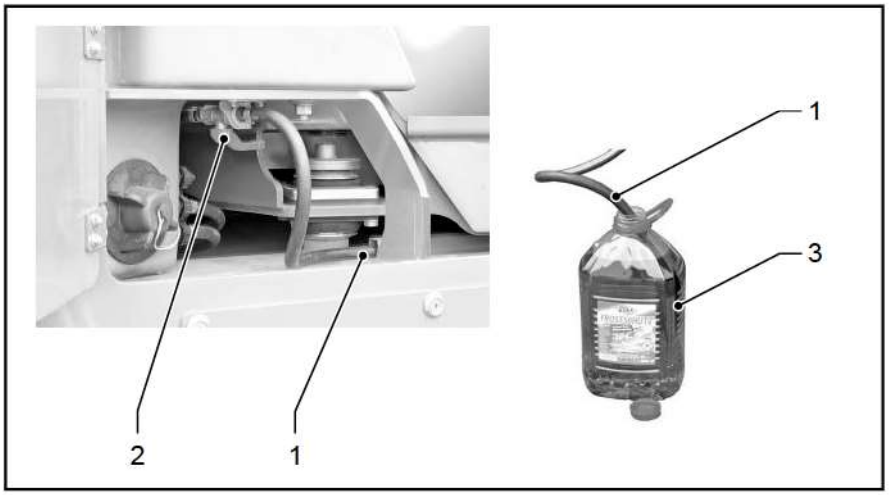
6.10.02 Description

The anti-freeze filling system fills the pipes of the water sprinkling unit with antifreeze. This helps to prevent the sprinkler system from freezing and thus the sprinkler nozzles from being destroyed when there is any risk of frost.

6.10.03 Operation

- Use a commercially available antifreeze solution for windscreen washing systems when filling the piping system.
- Match the mixing ratio with water to the expected temperatures.

Fill the piping system

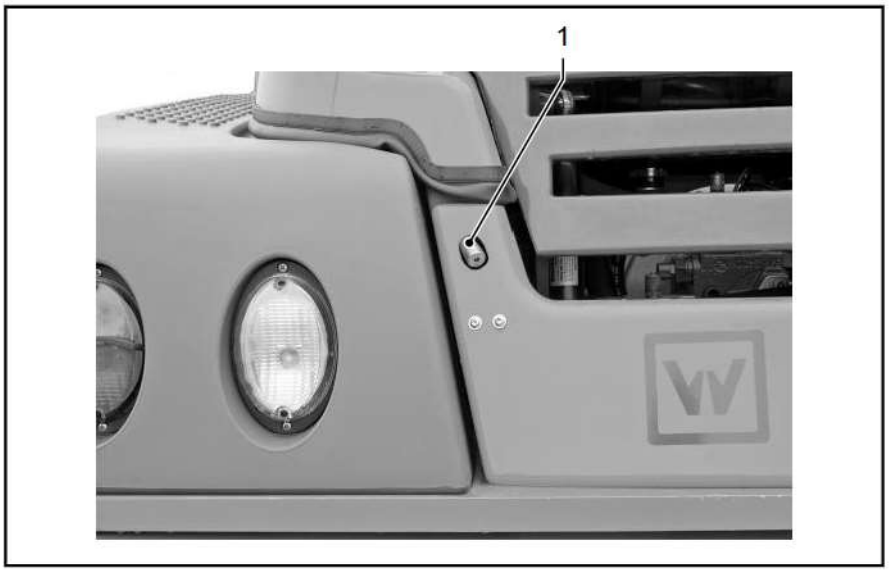


- Switch off the diesel engine.
- Water sprinkling system functional test: Switch the water sprinkling system on when the machine is at a standstill (see page 114).
- Take the hose [1] out of its holder.
- Clean the end of the hose if it is dirty.
- Insert the hose into the container [3] containing antifreeze solution.
- Set the change over valve [2] to the anti-freeze filling system position.
- Fill the piping system until the antifreeze solution exudes out of all the spray nozzles.
- Switch off the sprinkler.
- Switch off the electrical system, and remove the ignition key.
- Put the hose [1] back in its holder.
- Set the switchover valve [2] to sprinkle.

6.11 HAMM Temperature Meter

Only if equipped with such a thermometer are data about asphalt temperatures displayed on the indicators.

6.11.01 Overview



[1] Temperature sensor

6.11.02 Description

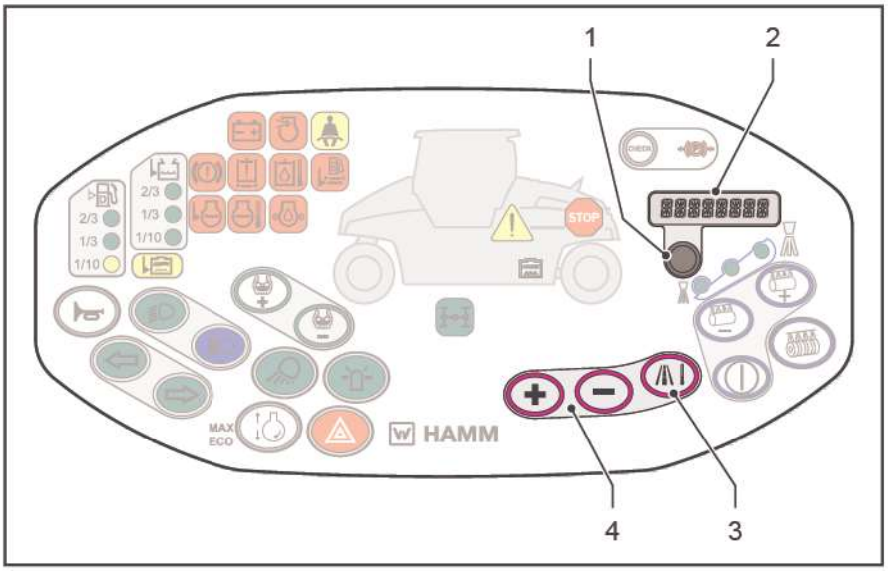
Asphalt compaction can only be done in a special temperature range.

With an unfavorable asphalt temperature, the following damage can occur:

- Damage caused by "pushing" the asphalt when the asphalt temperature is too high.
- Asphalt matrix destruction when compacting at an excessively low temperature.

The asphalt temperature measuring system (HAMM Temperature Meter) informs the driver of the surface temperature of the asphalt beneath the roller. This enables the driver to avoid the above-mentioned damage and achieve optimal compaction.

6.11.03 Operation



Different temperature limits apply to compaction depending on the asphalt composition.
The upper limit value (HI) and the lower limit value (LO) are determined on site and saved in the system. The range between the LO and HI limit values represents the required compaction temperature.
Since the asphalt continues to cool down after installation, the driver must pay attention to the temperature underneath the drum during compaction. If the machine measures a temperature that is outside the compaction temperature, the info display switches between the asphalt temperature and the temperature limit that was exceeded (HI) or not reached (LO).

Moving to the next display

The info display [2] moves one step further each time the switch [1] is pressed.

- ▶ Briefly press the switch [1].

Level 1: Machine info

- Operating hours
- Engine speed
- Driving speed
- Current asphalt temperature
- Diagnostic codes

The information shown in the info display [2] varies depending on the machine equipment.

Asphalt temperature

- ▶ Press switch [1].
- ▶ Set the info display [2] to the current asphalt temperature.
- ✔ The info display [2] shows the asphalt temperature underneath the machine.

Displaying/selecting a limit value

- ▶ Press switch [3]
- ✔ The info display [2] displays HI (upper limit value) and the set limit value for five seconds.

- ▶ Press the switch [3] again
- ✔ The info display [2] displays LO (lower limit value) and the set limit value for five seconds.
- ▶ Press the switch [3] again
- ✔ The info display [2] permanently displays the current asphalt temperature underneath the machine.

Setting the limit value

Prerequisite: The info display [2] displays the asphalt temperature.

- ▶ Use switch [3] to select HI (upper limit value) or LO (lower limit value).
- ✔ The info display [2] shows HI (upper limit value) or LO (lower limit value) and the assigned limit value for five seconds.
- ▶ Press the + (plus) or - (minus) switch [4] within five seconds, or press and hold this switch.
- ✔ The limit value in the info display [2] is increased or decreased.
- ▶ Press the switch [3] again within five seconds.
- ✔ The set limit value is saved.
- ✔ The info display [2] shows HI (upper limit value) or LO (lower limit value) and the assigned limit value for five seconds.
- ✔ After five seconds, the info display [2] reverts back to showing the current asphalt temperature below the machine.

If you want the info display to only show the current asphalt temperature underneath the machine during operation, set the upper limit value to 255 °C (491 °F) and the lower limit value to 5 °C (41 °F).

6.11.04 Maintenance

The temperature sensors can be mounted at the front and/or back of the machine, depending on the design of the measuring system. The temperature sensor must have a clear view of the asphalt. Dirt in the measuring hole or projecting components impair the function of the sensor.

Do not use any dry cloth for cleaning the sensor. This will scratch and damage the optics.
Do not use any ammonia or cleaning agent containing ammonia. They can cause permanent damage to the optics.

- ▶ Keep the senor's sensing head clean.
- ▶ Do not allow the measuring hole to become blocked.
- ▶ Use a brush or Compressed air to clean the measuring borehole.
- ▶ Do not spray a jet of water directly into the measuring hole.
- ▶ In case of harder dirt use Water, glass cleaner, alcohol or ethanediol to initially dissolve and then remove the dirt using a soft linen cloth soaked in liquid.

6.12 Coming Home Function

6.12.01 Description

The coming home function activates the working spotlights to safely leave the machine at dark. The environment of the machine will be illuminated for a short period of time after shutting down the diesel engine. This enables the driver to safely leave the machine.

6.12.02 Operation

The Coming Home function is automatically switched on once the diesel engine is switched off.

Requirement:

- Diesel engine is running.
- Sufficient battery state of charge.
- The working spotlights are operating.

If a prerequisite is not met, the Coming Home function is not switched on once the diesel engine is switched on.

Switching on the Coming Home function

▶ Switch off the diesel engine and remove the ignition key.

✔ Switch off the working spotlights after approx. one minute.