# INSTRUCTION MANUAL

## Tandem roller
## HD+ 120 / HD+ 140

| | |
|---|---|
| **H259**<br>Series | **0001**<br>valid from serial no. |
| **01.06.2018**<br>Date of first issue | |
| **2625347**<br>Order number | **en**<br>Language |




Version 01

| | |
|---|---|
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This instruction manual is valid for the following roller types:

**TANDEM ROLLER**

HD+ 120 VV
HD+ 120 VO

HD+ 140 VV
HD+ 140 VO

**ROLLER DRUMS**

| | front | rear |
|---|---|---|
| VV | Vibration | Vibration |
| VO | Vibration | Oscillation |

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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 help you to find quickly sections in this instruction manual which supply you with additional important information.
The cross-reference shows you the page of the relevant section.
The abbreviation sqq. means "and the following pages".

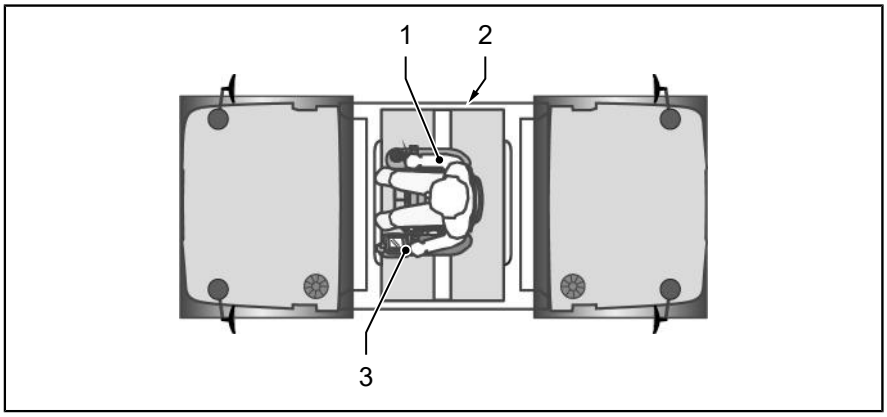
Example: (see "Hydraulic oil supply", page 176)

**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 |
|---|---|
| DPF | Diesel Particulate Filter<br>*Exhaust gas after-treatment system* |

| Abbreviation | Meaning |
|---|---|
| FOPS | Falling Object Protective Structure<br>*Protective structures for the driver's cabin and driver's cab to protect against falling objects* |
| HMV | HAMM Measurement Value<br>*Measured value for HAMM compaction indicator* |
| KAG | Edge pressing and cutting device<br>*Edge forming device* |
| RMV | Resonance Measurement Value<br>*Measured value for the resonance behaviour of the compaction system* |
| ROPS | Roll Over Protective Structure<br>*Roll-over protection structure for the driver's cabin and driver's cab* |
| SCR | Selective Catalytic Reduction<br>*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.

Please use fuels suitable in winter with temperatures below 0 °C (32 °F) (page 184 sqq.). Do not charge batteries with 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.

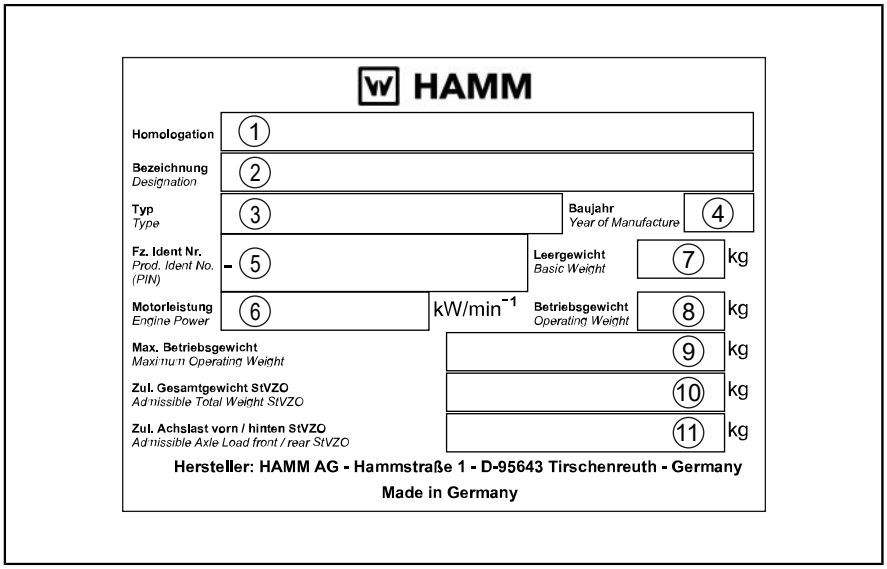
The EAC (Eurasian Conformity) pictogram confirms the conformity of the machine with the requirements of the Eurasian Customs Union

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 37).




| | | | |
|---|---|---|---|
| **[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:

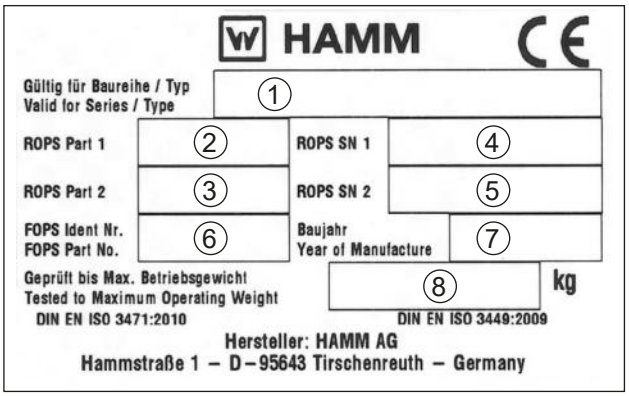
- Working substances and lubricants
- 100 % fuel tank contents x 0.84 specific weight
- 100 % water & additive tank contents
- 75 kg for the driver
- the static weight of all options or attachments manufacturer the same time and approved by manufacturer (e.g., chip spreader).

No additional ballasting is allowed.

**ROPS / FOPS type plate**

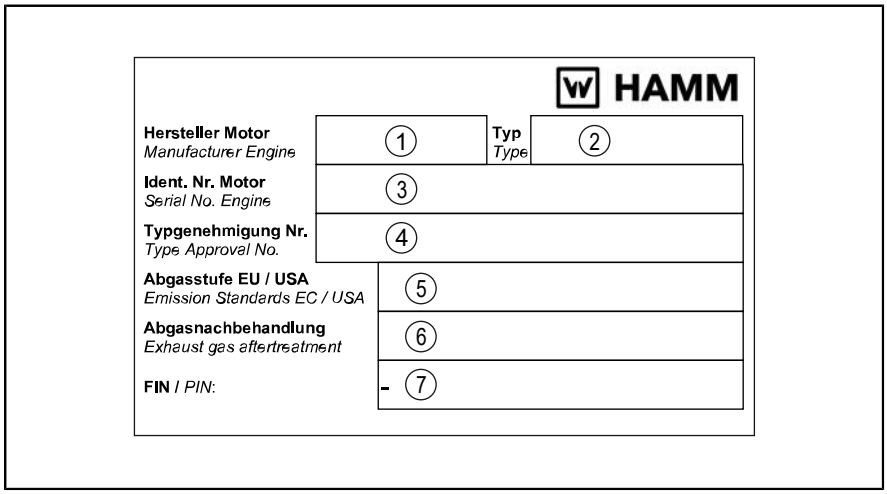
The ROPS (cab, roll-over bar) and / or FOPS (falling-object protective structure) approved for this machine by the manufacturer is identified by a nameplate and is fastened to the cab / roll-over bar ("Control stand", page 43).




| | | | |
|---|---|---|---|
| **[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 sound and vibration indications on the driver's seat correspond to the requirements of the CE Machinery Directive in the version 2006/42/EC.

**Sound power level**

**Sound indication of the machine**

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

**Sound pressure level**

**Sound indication on operator panel**

The sound intensity level on the driver's seat is specified in the machine's technical data (see "Technical data" sqq.) (measurement inaccuracy according to 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 indication on the operator panel**

**Whole body vibration**

The weighted rms values of the acceleration with whole body vibrations on the operator's seat have been accessed in accordance with DIN EN 1032 and do not exceed $a_w$ = 0.5 m/s².

**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 way of the ROPS or/and FOPS mounting may not be distorted, bent or torn (deformed). The reinforcement elements of the cab / roll-over bar (ROPS) / protective roof (FOPS) must not present any rust, damage, fissure or open fracture. All screwed connections of the reinforcement elements must comply with the given specifications and must be screwed tightly to each other. Observe starting torque values! Bolts and nuts must not be damaged, bent or deformed. It is absolutely forbidden to modify or repair / level the reinforcement elements in any way (see section on "auxiliary equipment" et seq.).

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).

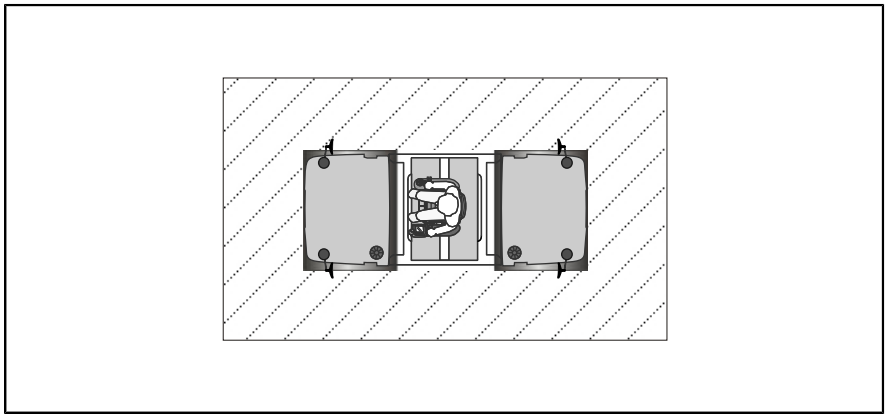
**Increasing road safety**
Before driving on public roads, remove the protective grille from the lighting package and/or the protective bar from the water tank.

# 1.11 Danger zone

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

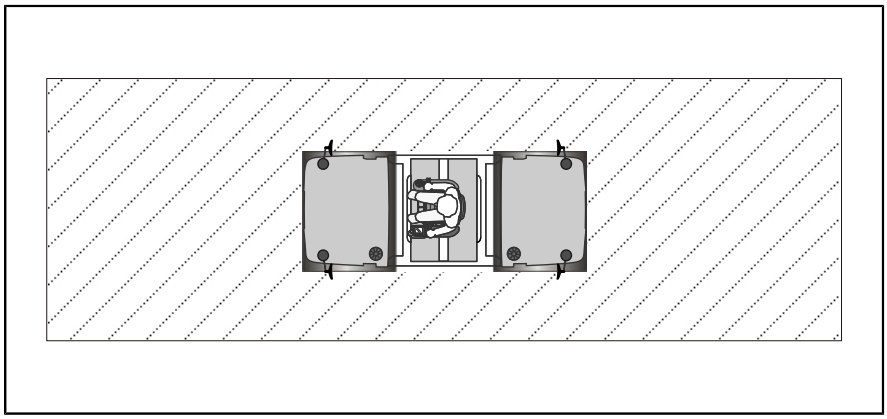
There are other danger areas when the machine is loaded by crane and transported. Also observe the instruction manual and the notes for the loading and transporting machines.

**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

| | |
|---|---|
| **Transmission** | Hydrostatic all-wheel drive<br>▪ infinitely variable<br>▪ Single lever operation |
| **Dynamic compaction system** | Direct hydrostatic drive |
| **Steering** | Hydrostatic assisted steering via 3-point pendulum articulated joint<br>▪ Large steering lock to both sides<br>▪ Pendulum compensation upwards and downwards |
| **Track offset** | Hydrostatic track offset, infinitely variable<br>▪ Offset to both sides |
| **Service brake** | During operation, the machine is braked by the hydrostatic drive.<br>▪ Wear-free brakes |
| **Parking brake** | Spring-operated brake acting upon each hydromotor of the drive.<br>▪ Manual and automatic |
| **EMERGENCY STOP** | Machine is braked with spring-operated brakes and hydrostatic drive. |
| **Water sprinkling system** | Pressure sprinkling<br>▪ Manual operation and automatic interval system |
| **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**.

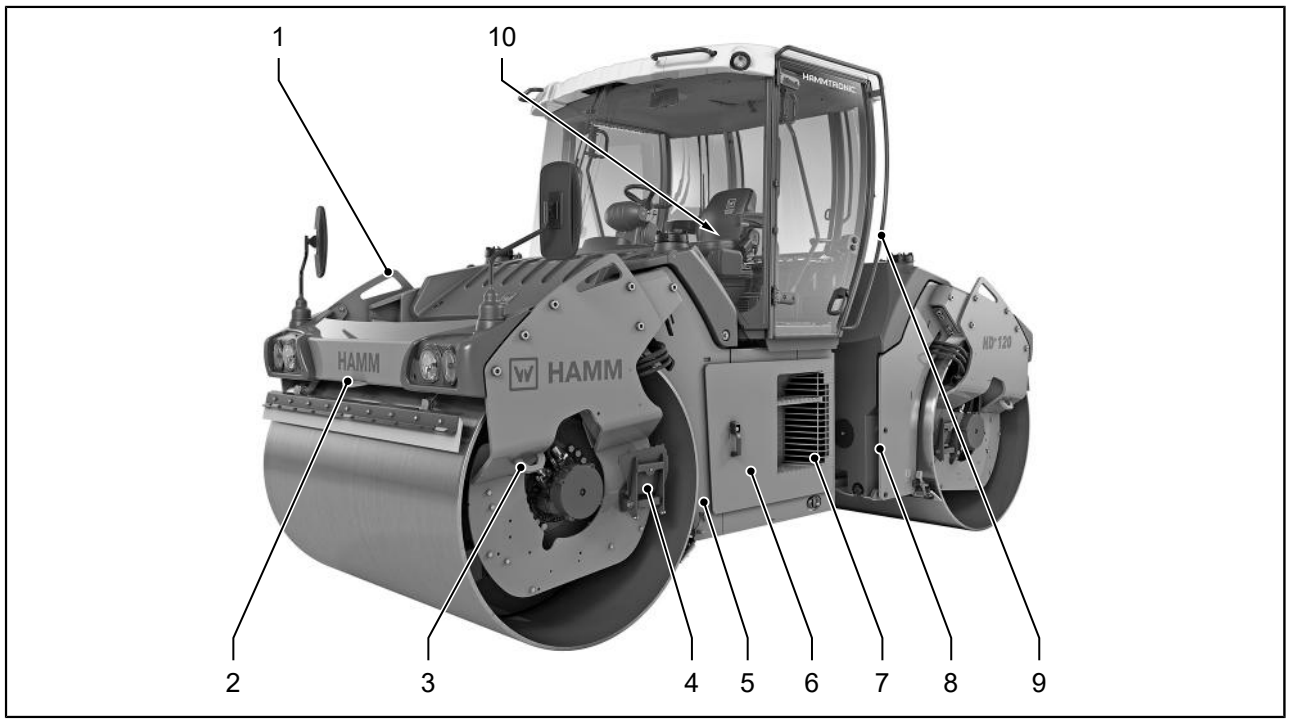
- ROPS cabin
- ROPS (roll-over bar) with/without protective roof
- FOPS
- Heating and air conditioning system
- Steering column with adjustment
- Seat rotation adapter
- Tachograph
- Seatbelt monitoring
- Edge pressing and cutting device
- Track indicator
- Antifreeze filling system
- Frequency controller
- HAMM Compaction Meter
- HAMM Temperature Meter
- Track offset indicator
- Reversing alarm
- Lighting package as per road traffic regulations
- Working spotlight
- Rotating beacon
- Drum lighting
- Fire extinguisher
- Protective grille for lighting package
- Water tank cover, lockable
- Water separator for fuel

# 2.01 General view of machine

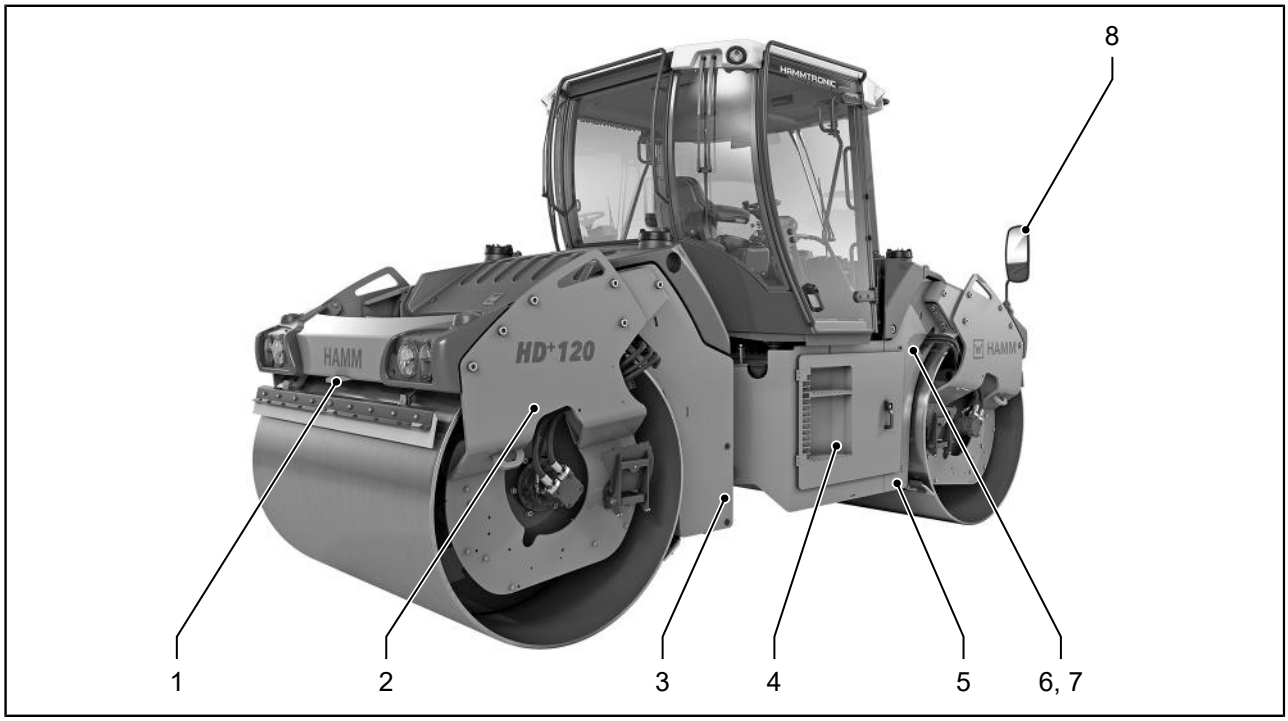
## 2.01.01 Chassis / safety devices

**Machine, left**




| | | | |
|---|---|---|---|
| **[1]** | Lifting lug for crane loading | **[2]** | Towing eye |
| **[3]** | Lashing point | **[4]** | Step |
| **[5]** | Chassis | **[6]** | Engine compartment door |
| **[7]** | Steps | **[8]** | Safety strut |
| **[9]** | Handrails | **[10]** | Seat belt |

## Machine, right




| | | | |
|---|---|---|---|
| **[1]** | Towing eye | **[2]** | Stickers indicating dangers |
| **[3]** | Machine type plate | **[4]** | Steps |
| **[5]** | Chassis | **[6]** | Engine type plate |
| **[7]** | Vehicle identification number (VIN) | **[8]** | Operation mirror |

## 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.

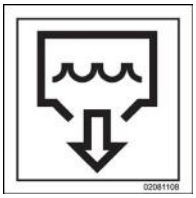
For the detailed arrangement of warning and information signs, please refer to the spare parts catalogue.

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

**Information sign**

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

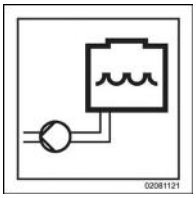
**Inlet water tank**



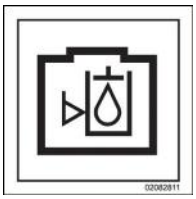
**Water tank outlet**


**Water tank inlet of additive sprinkling**


**Water tank outlet of additive sprinkling**



**Water pump**

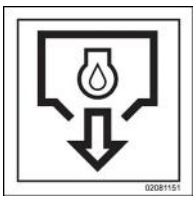


**Hydraulic oil filling level**

**Hydraulic oil reservoir inlet**

**Hydraulic oil reservoir outlet**

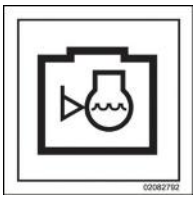

**Socket 12V**



**Engine oil outlet**

**Water sump fuel filter outlet**



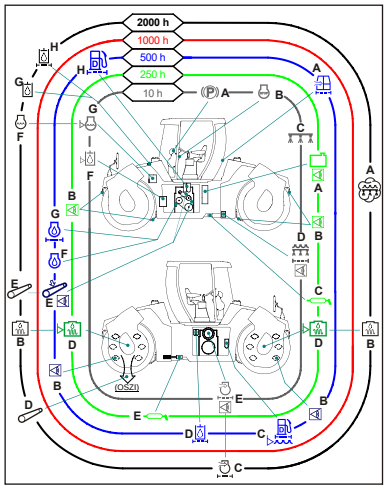
**Coolant filling level**

**Coolant inlet**


**Inflation pressure**
Tyre without water filling

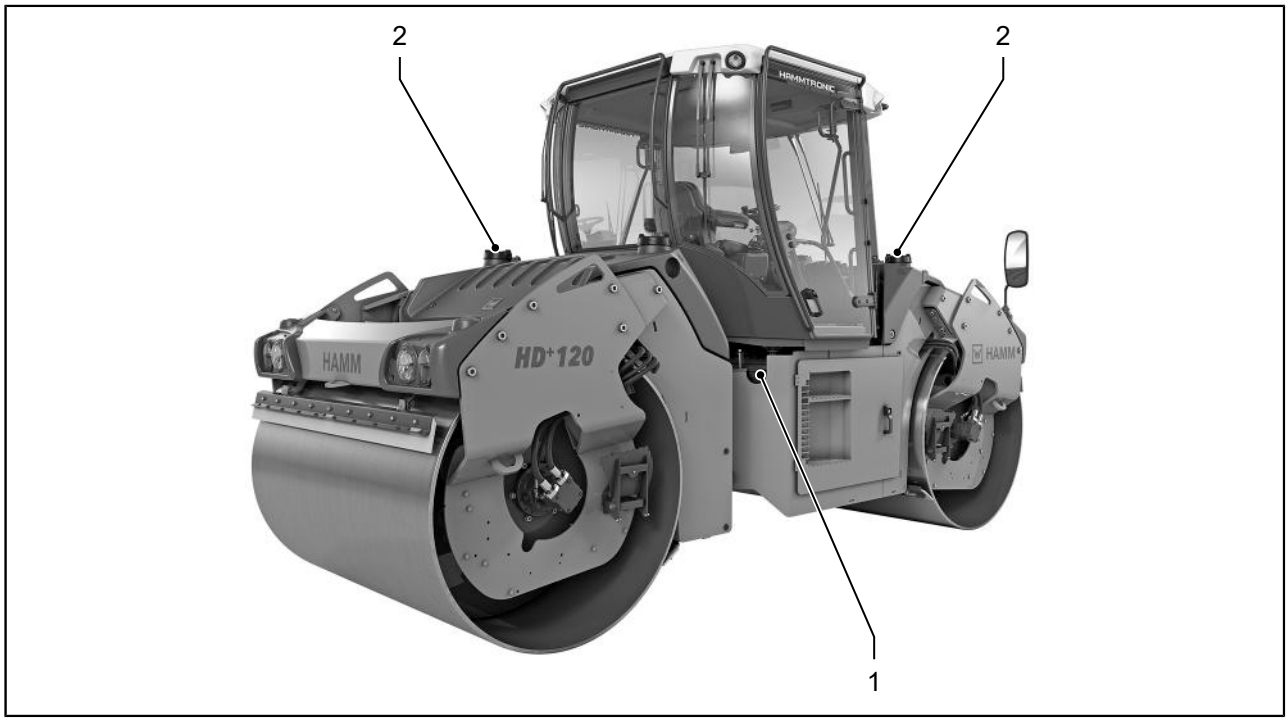

**Guaranteed sound power level**


**Expert inspection test badge**




**Maintenance overview**

## 2.01.03 Consumable fill holes

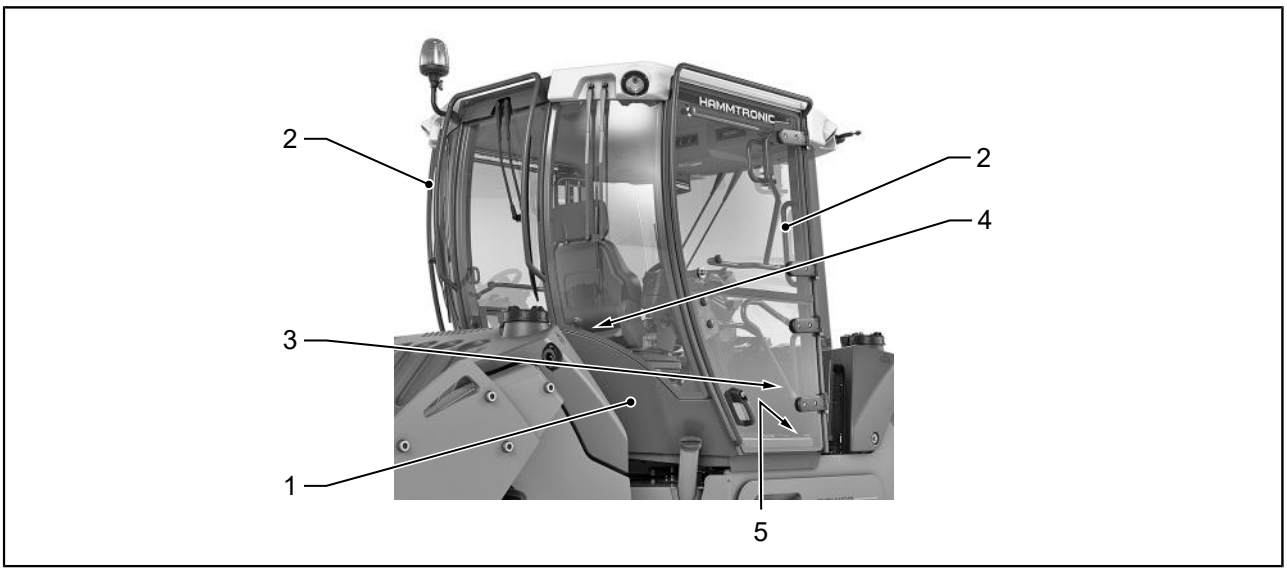



| | | | |
|---|---|---|---|
| **[1]** | Fuel | **[2]** | Water sprinkling system |

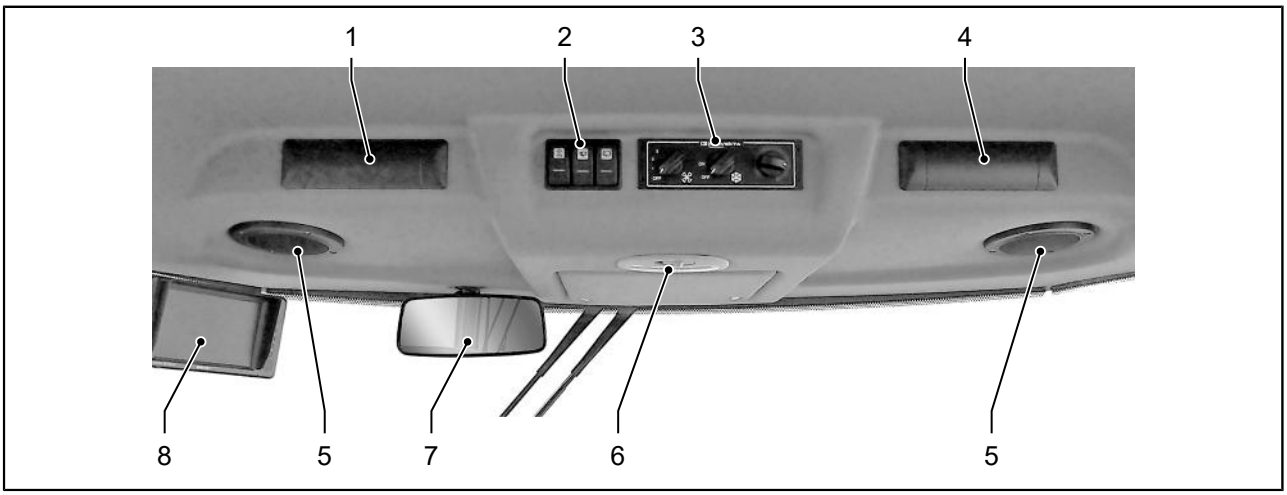
# 2.02 Control stand

## 2.02.01 Cab



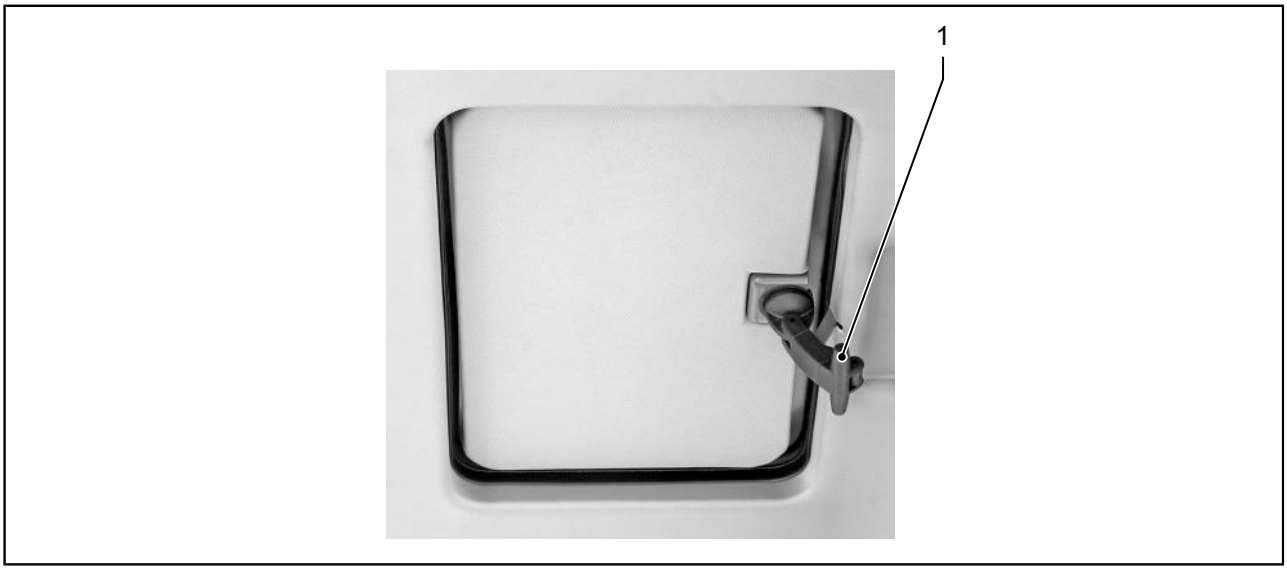

| | | | |
|---|---|---|---|
| **[1]** | Operator's cab | **[2]** | Handles |
| **[3]** | Stacker for instruction manual / first aid kit | **[4]** | Position for fire extinguisher |
| **[5]** | ROPS cabin type plate | | |

**Cab roof section**



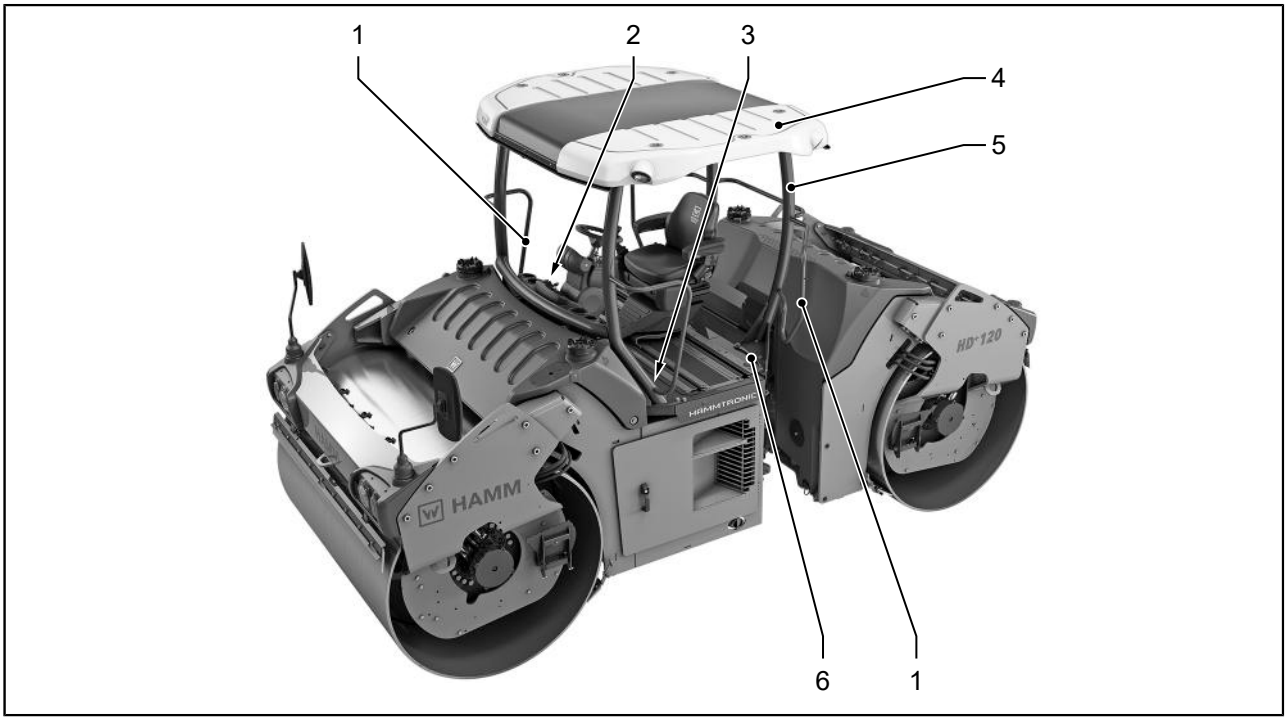

| | | | |
|---|---|---|---|
| **[1]** | Position for radio | **[2]** | Windscreen wiper switch unit |
| **[3]** | Switch unit, heating / air conditioning system | **[4]** | Position for tachograph |
| **[5]** | Loudspeaker | **[6]** | Interior lighting |
| **[7]** | Inside mirror | **[8]** | Monitor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

**Roof hatch**




| | |
|---|---|
| **[1]** | Roof light deflexion lever |

## 2.02.02 ROPS

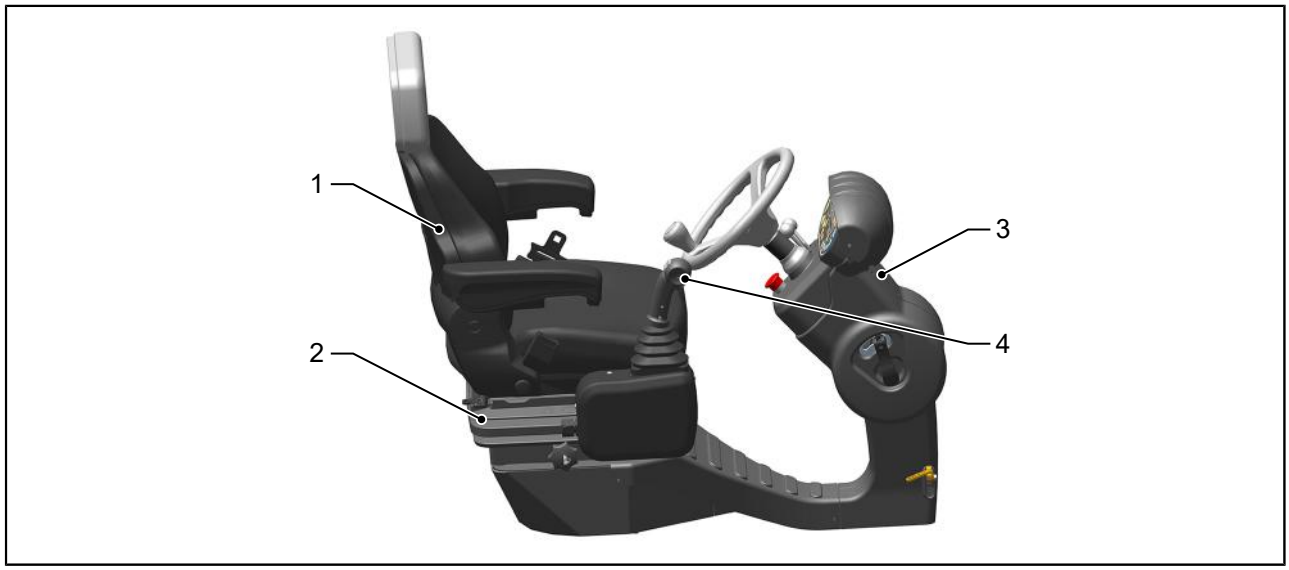



| | | | |
|---|---|---|---|
| **[1]** | Handrails | **[2]** | Storage compartment for instruction manual/first aid kit |
| **[3]** | Position for fire extinguisher | **[4]** | Weather protection roof |
| **[5]** | ROPS (roll-over bar) | **[6]** | ROPS type plate (roll-over bar) |

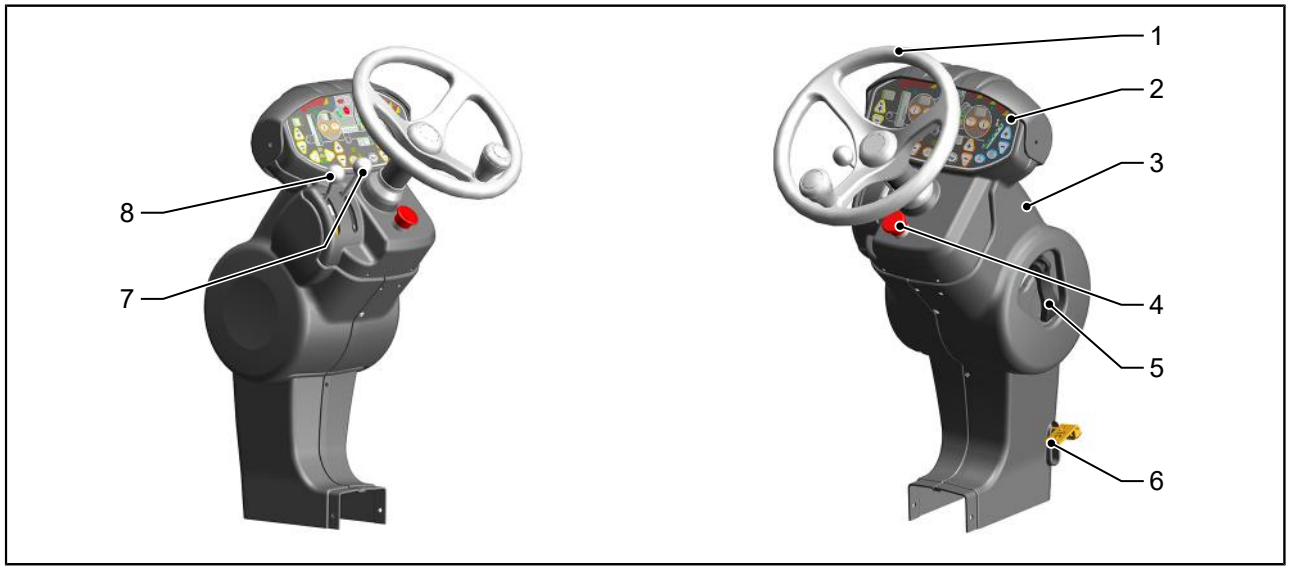
## 2.02.03 Seat console

**Seat console**



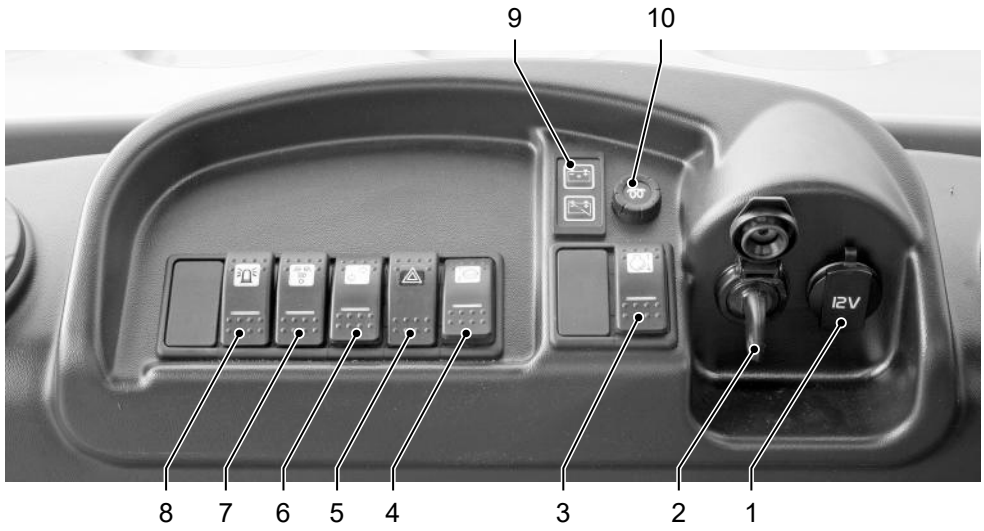

| | | | |
|---|---|---|---|
| **[1]** | Driver's seat | **[2]** | Seat console |
| **[3]** | Steering column | **[4]** | Drive lever |

## 2.02.04 Steering column




| | | | |
|---|---|---|---|
| **[1]** | Steering wheel | **[2]** | Control panel |
| **[3]** | Steering column | **[4]** | EMERGENCY STOP |
| **[5]** | Control panel adjustment | **[6]** | Lever for easy exit |
| **[7]** | Rotating the seat console | **[8]** | Left/right seat console |

## 2.02.05 Dashboard



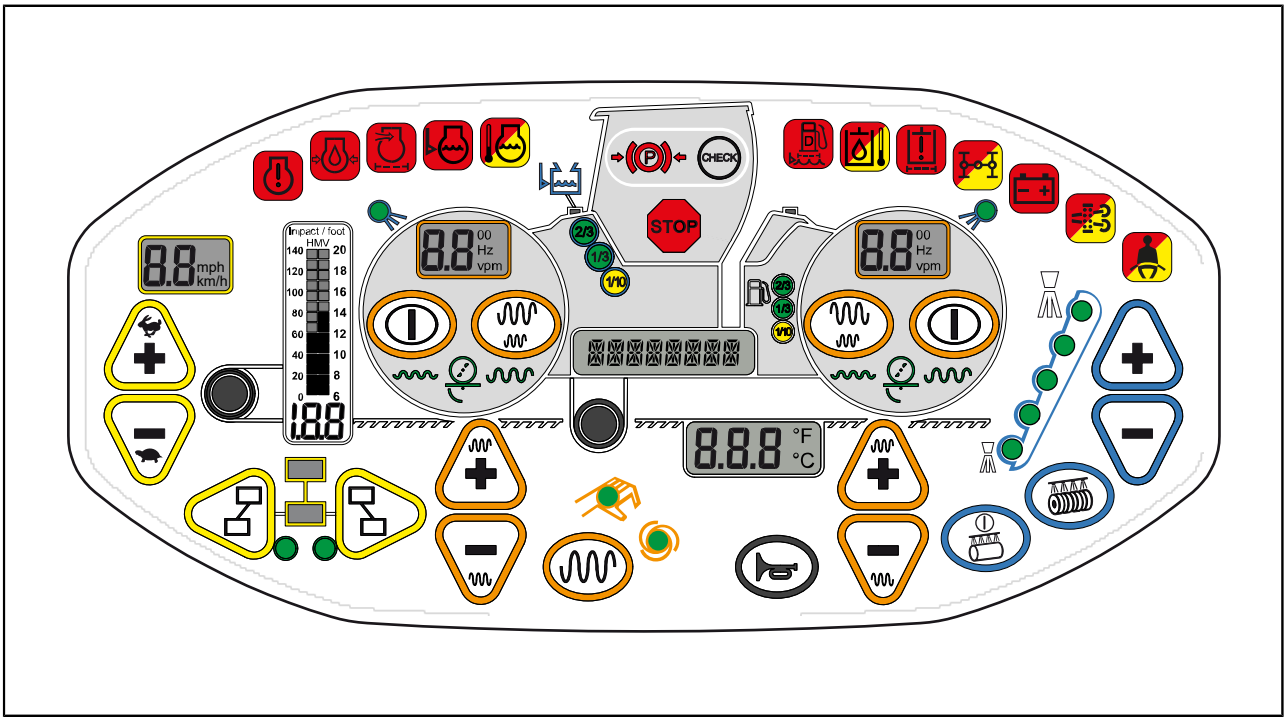

| | | | |
|---|---|---|---|
| **[1]** | 12 V socket | **[2]** | Electrical system/engine start switch |
| **[3]** | Engine management switch | **[4]** | Water pump preselection switch |
| **[5]** | Hazard warning light switch | **[6]** | Turn signal switch |
| **[7]** | Work light switch | **[8]** | Rotating beacon switch |
| **[9]** | Battery cut-off control unit switch | **[10]** | Cold start assistance indicator LED |

## 2.02.06 Control panel - Steering column

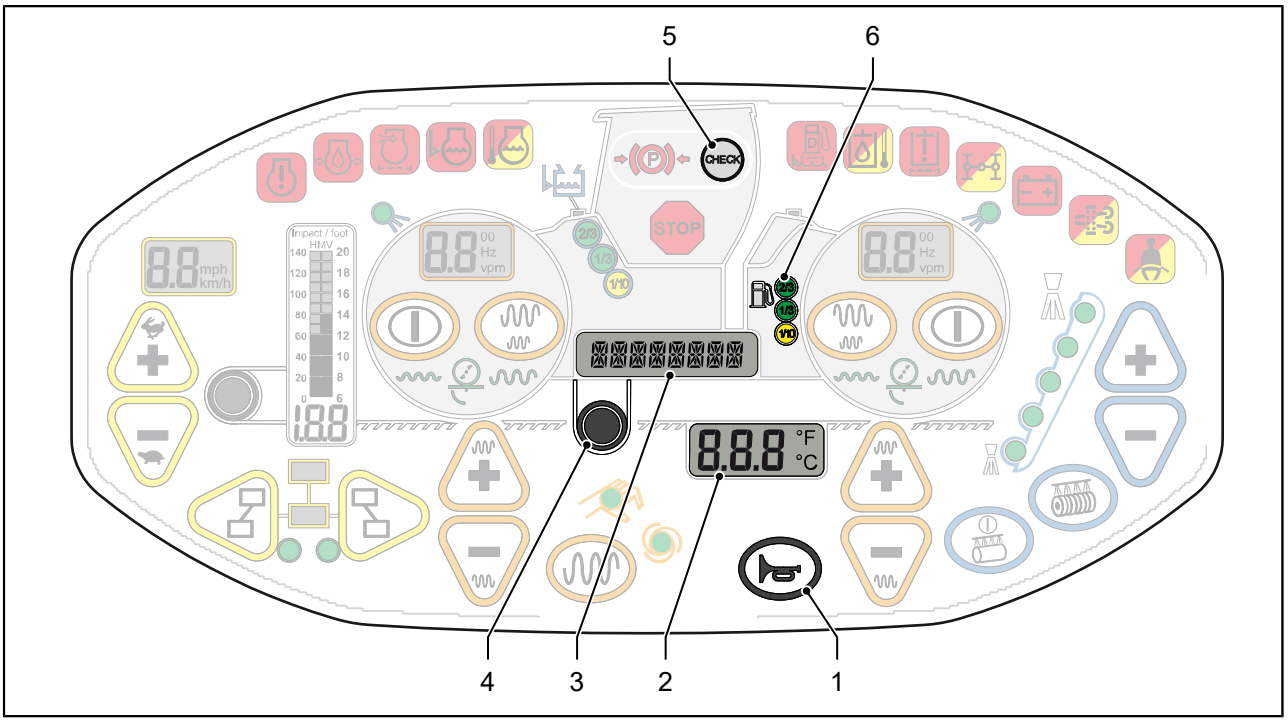
The controls on the control panel are colour-coded according to their operating functions. The images below show the controls for the individual operating phases.

## Complete overview

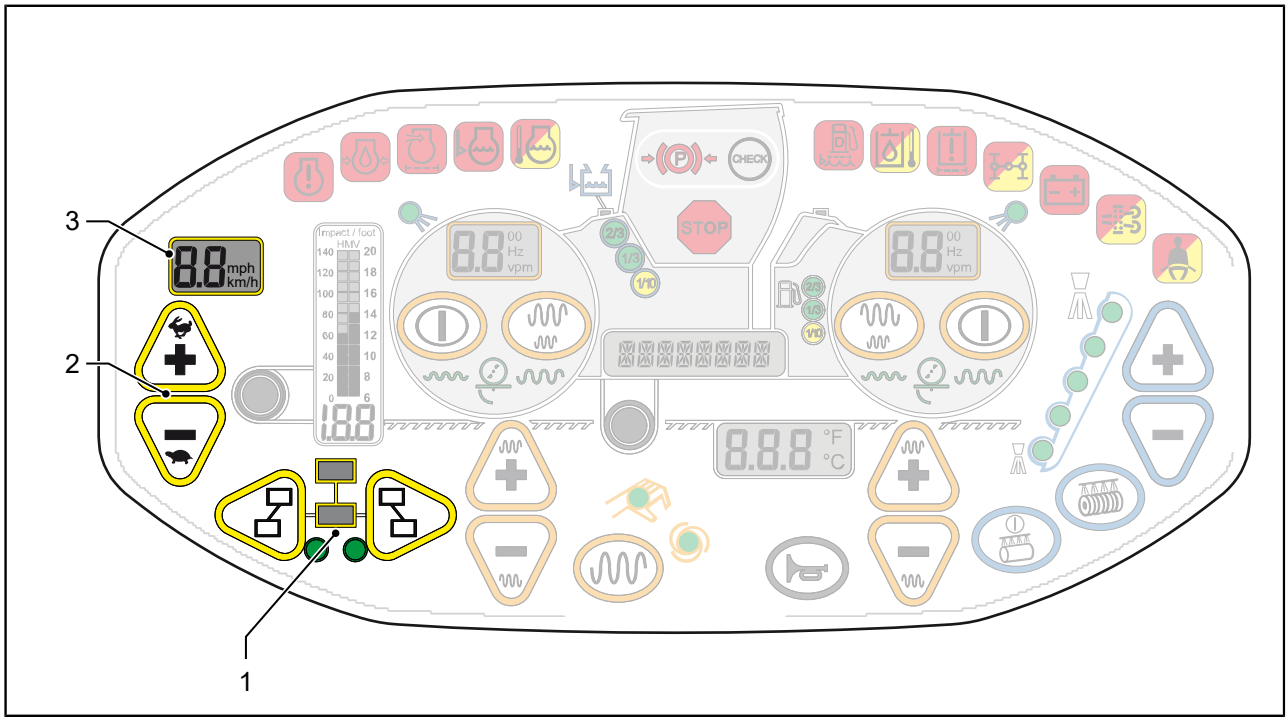



## Normal operation




| | | | |
|---|---|---|---|
| **[1]** | Horn | **[2]** | Asphalt temperature info display |
| **[3]** | System info display | **[4]** | System info |
| **[5]** | Parking brake inspection | **[6]** | Fuel fill level |

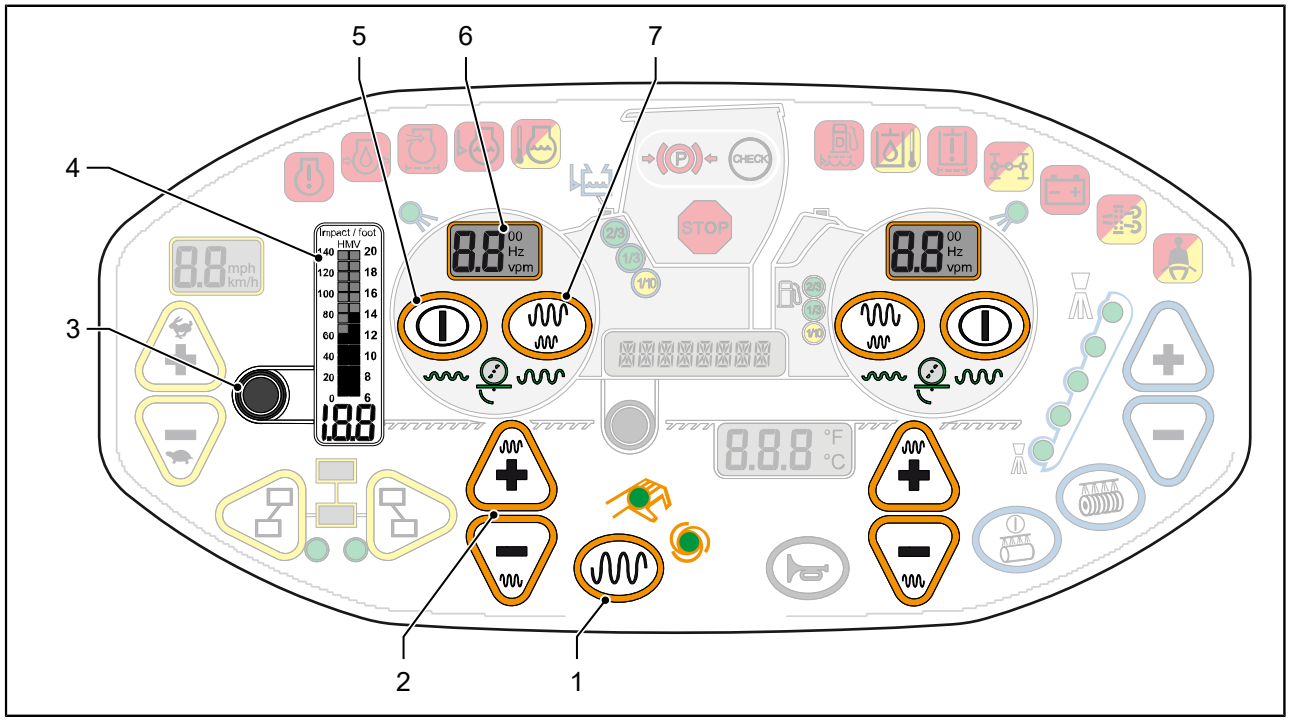
## Driving




| | | | |
|---|---|---|---|
| **[1]** | Track offset | **[2]** | Final speed preselection |
| **[3]** | Driving speed info display | | |

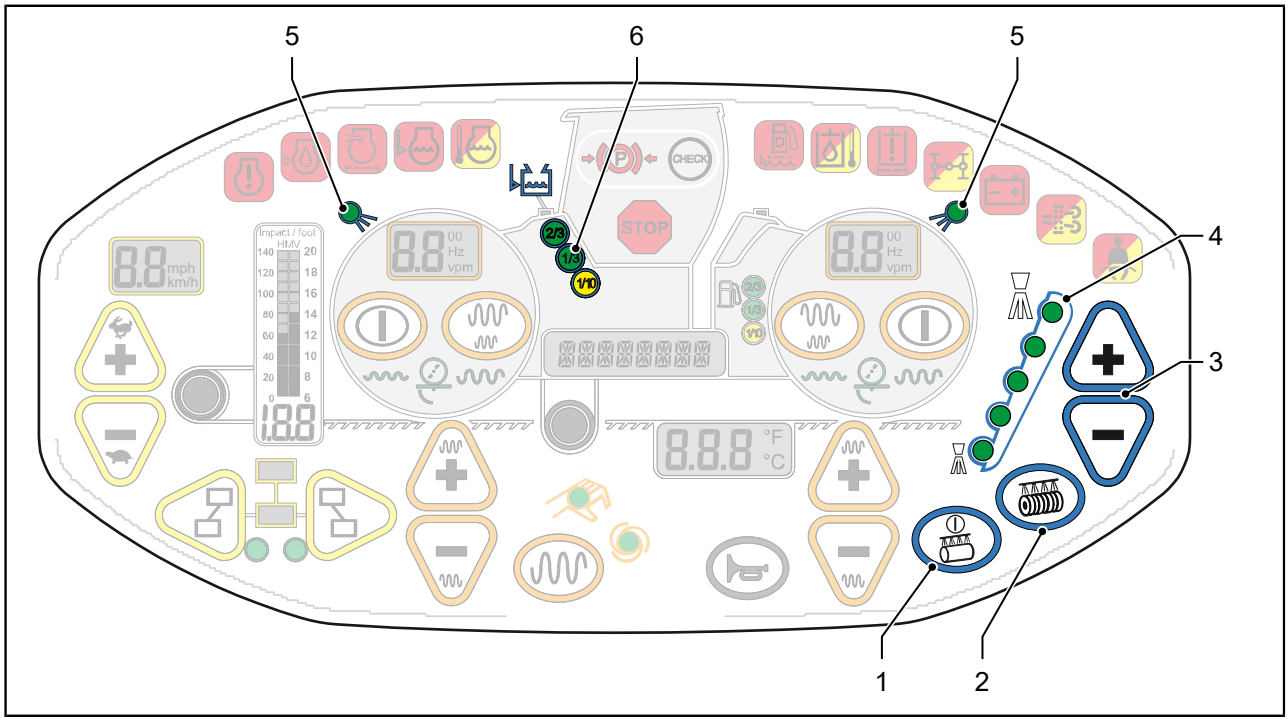
 

**Dynamic compaction system**




| | | | |
|---|---|---|---|
| **[1]** | Operating mode | **[2]** | Frequency |
| **[3]** | HMV/Impact per foot | **[4]** | HMV/Impact per foot info display |
| **[5]** | Compaction system preselection | **[6]** | Frequency info display |
| **[7]** | Amplitude | | |

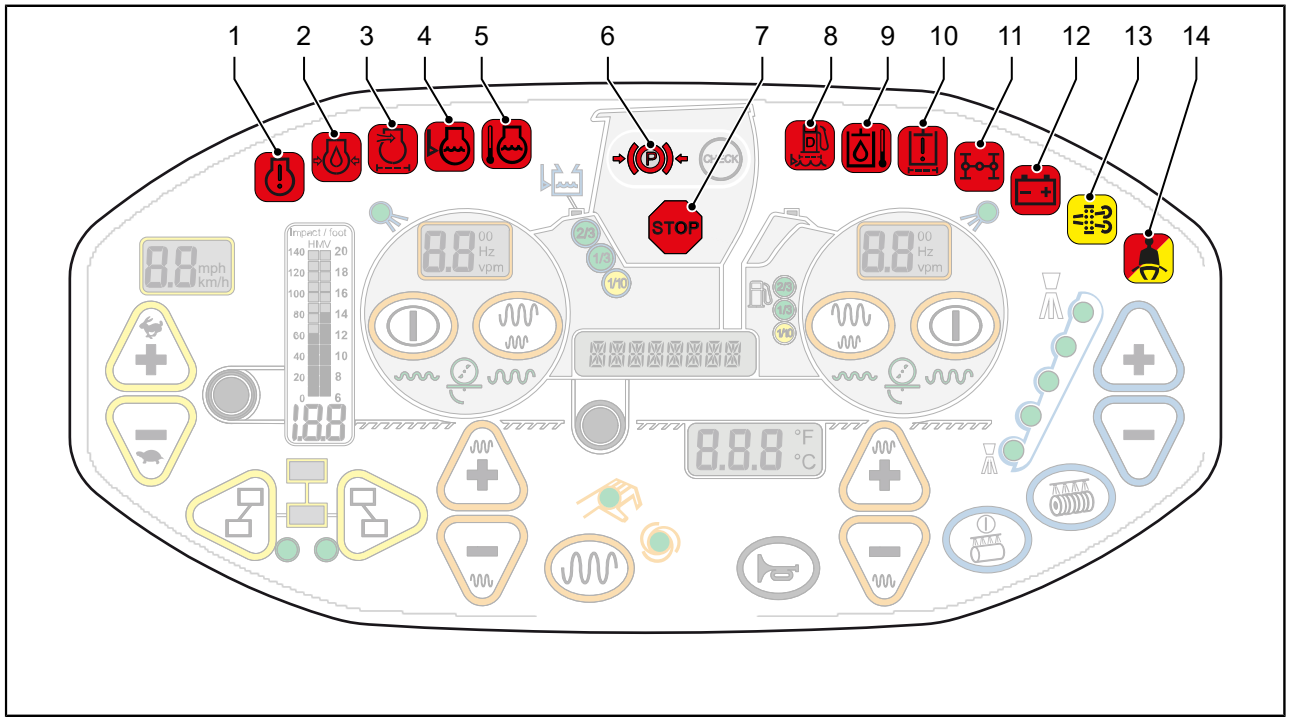
## Water sprinkling system




| | | | |
|---|---|---|---|
| **[1]** | Water sprinkling system | **[2]** | without function |
| **[3]** | Sprinkling stage | **[4]** | Indicator LED for the sprinkling stage |
| **[5]** | Indicator LED for the water sprinkling system | **[6]** | Water sprinkling system fill level |

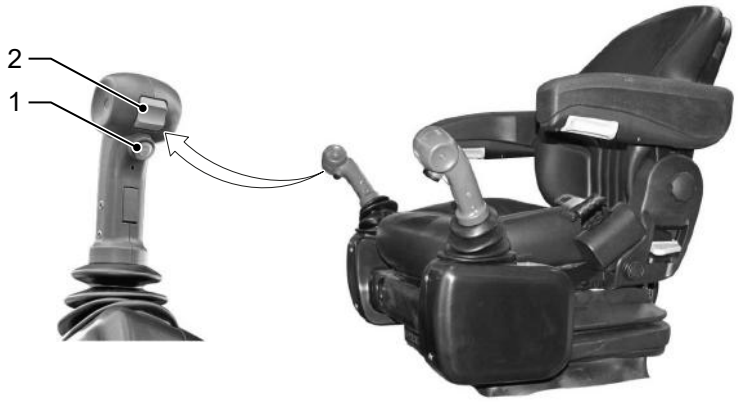
 

## Warning lights




| | | | |
|---|---|---|---|
| **[1]** | Diesel engine | **[2]** | Engine oil pressure |
| **[3]** | Air filter | **[4]** | Coolant level |
| **[5]** | Engine temperature | **[6]** | Parking brake |
| **[7]** | Stop | **[8]** | Water sump fuel prefilter |
| **[9]** | Hydraulic oil temperature | **[10]** | Pressure filter hydraulics |
| **[11]** | without function | **[12]** | Charge current (battery) |
| **[13]** | without function | **[14]** | Seat belt |

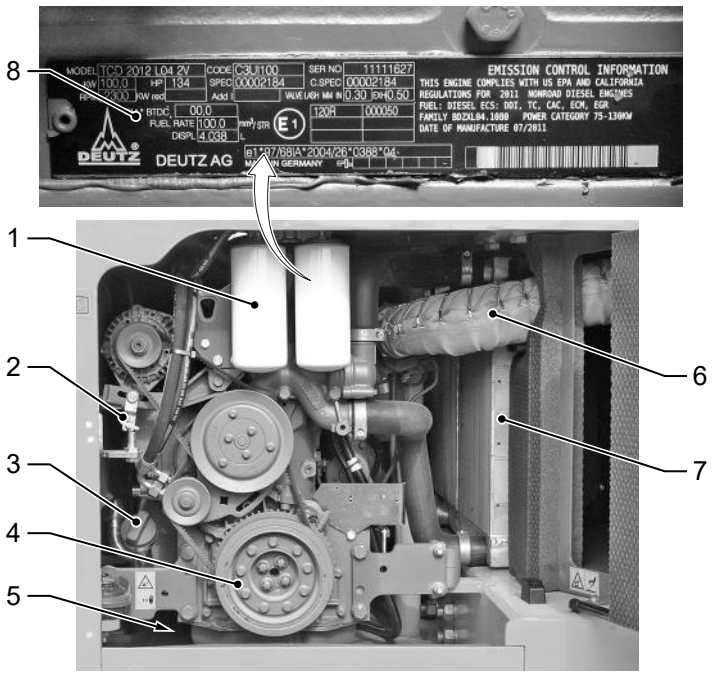
## 2.02.08 Drive lever



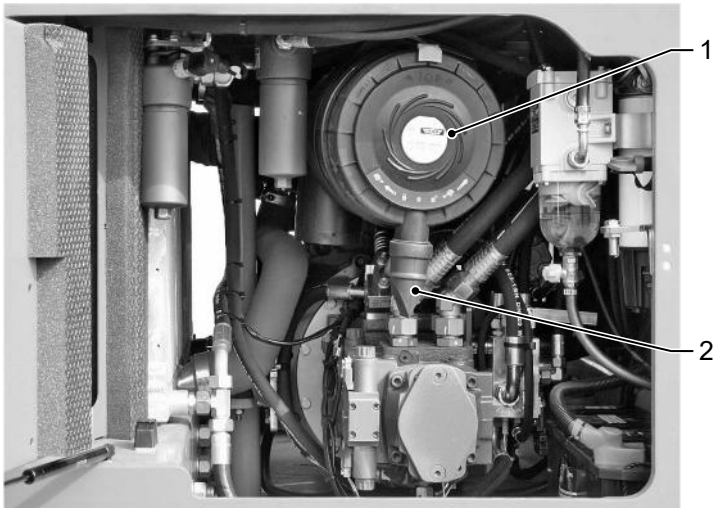

| | | | |
|---|---|---|---|
| **[1]** | Dynamic compaction system switch | **[2]** | Edge pressing and cutting device (KAG) switch |

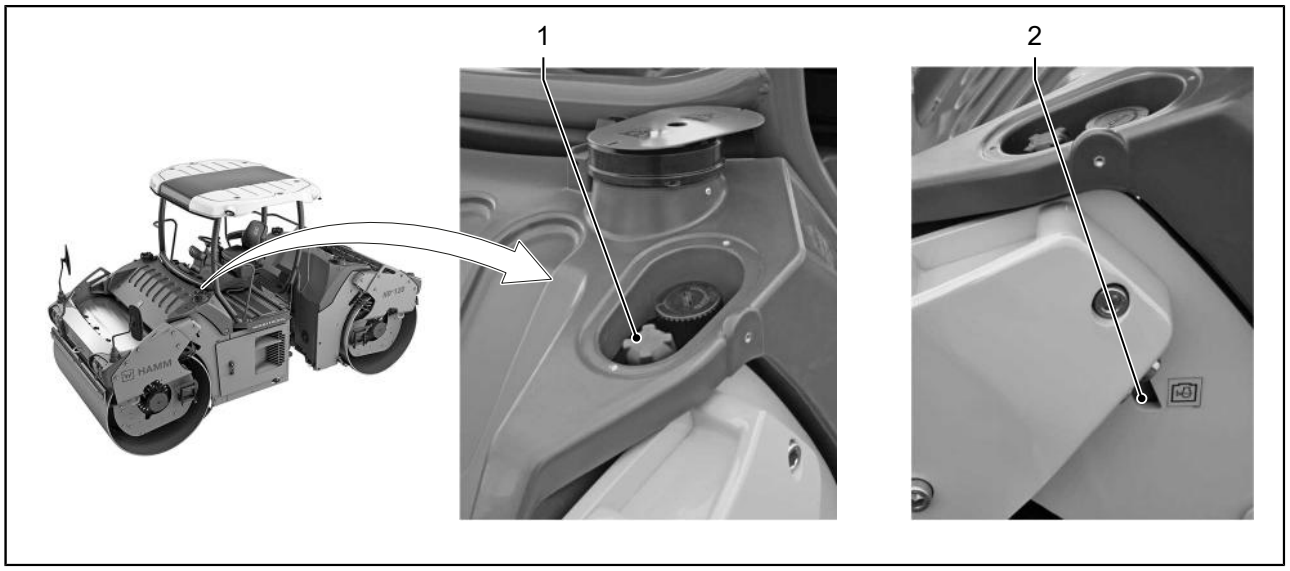
# 2.04 Drive unit / diesel engine




| | | | |
|---|---|---|---|
| **[1]** | Fuel system | **[2]** | Oil dipstick |
| **[3]** | Oil inlet | **[4]** | Diesel engine with drive units |
| **[5]** | Oil outlet | **[6]** | Exhaust system |
| **[7]** | Cooling system | **[8]** | Diesel engine type plate |



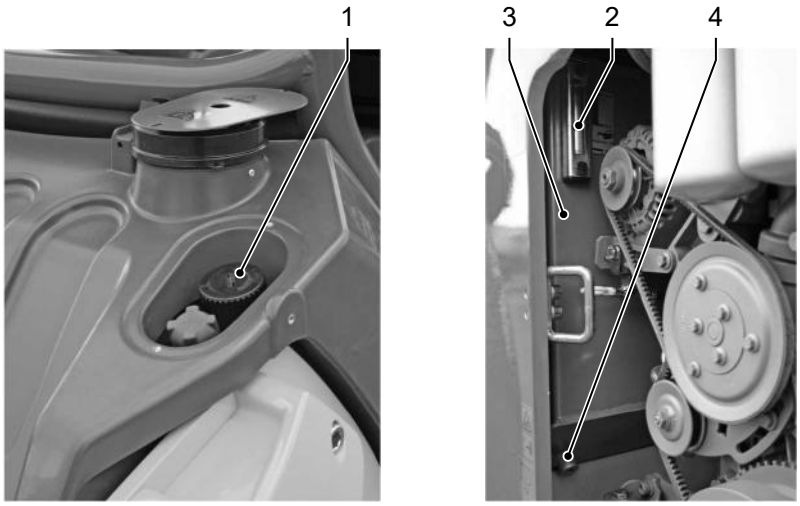

| | | | |
|---|---|---|---|
| **[1]** | Air filter | **[2]** | Dust discharge valve |



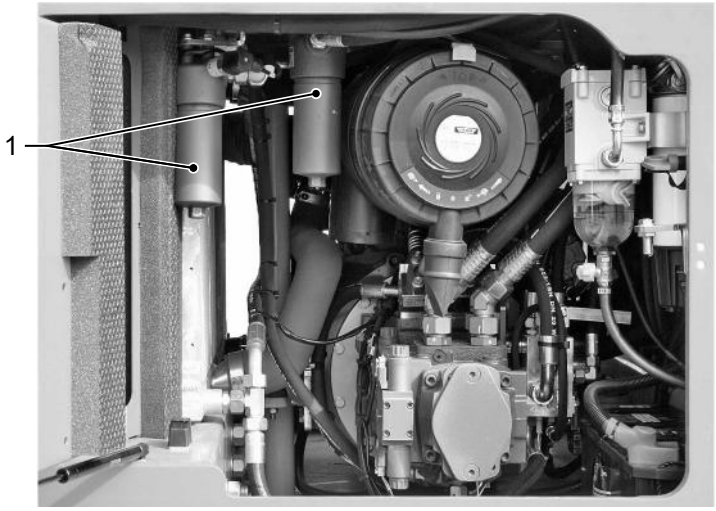

| | | | |
|---|---|---|---|
| **[1]** | Coolant inlet | **[2]** | Coolant fill level indicator |

# 2.05 Hydraulic oil supply

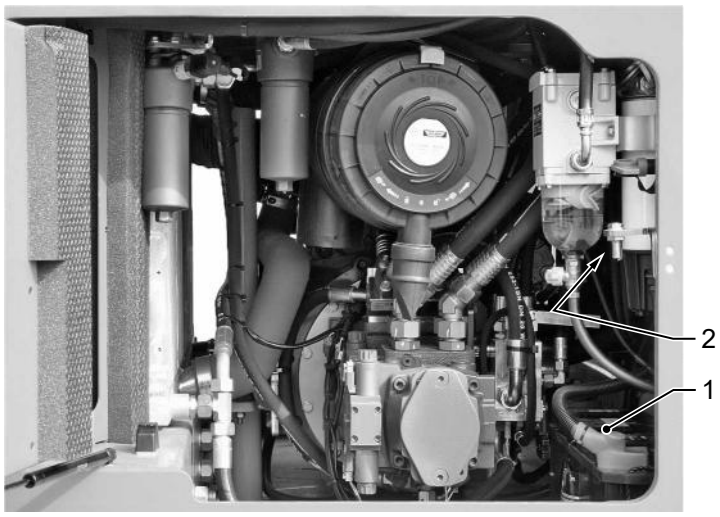


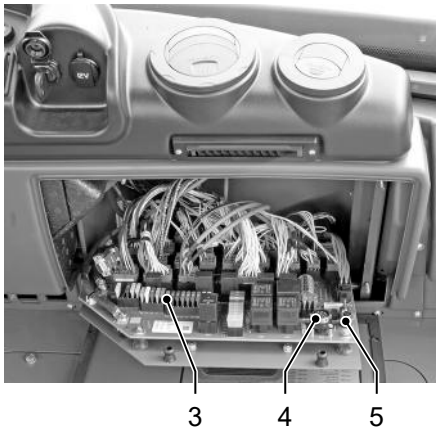

| | | | |
|---|---|---|---|
| **[1]** | Filling opening for hydraulic oil/ventilation filter | **[2]** | Fill level indicator of hydraulic system |
| **[3]** | Hydraulic oil reservoir | **[4]** | Drain outlet for hydraulic oil |




| | |
|---|---|
| **[1]** | Hydraulic oil filter |

# 2.06 Electrical system

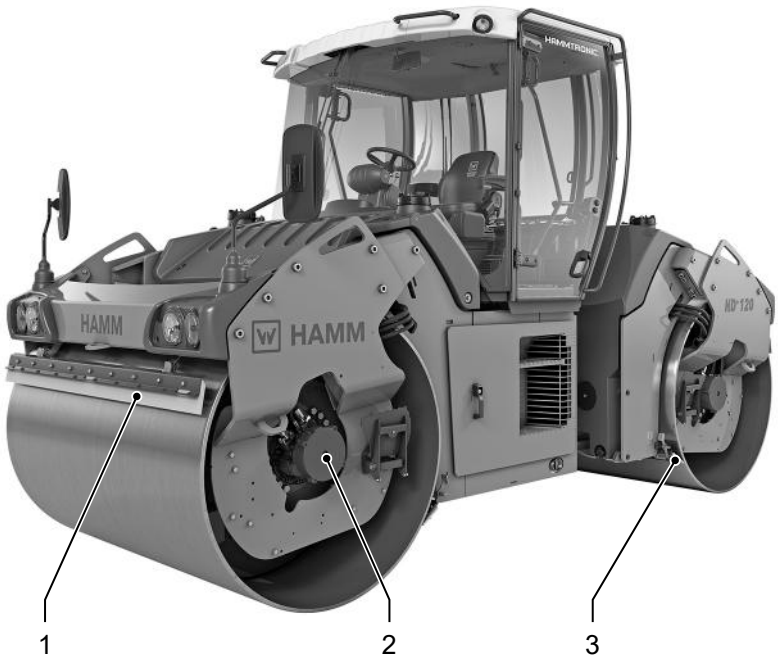


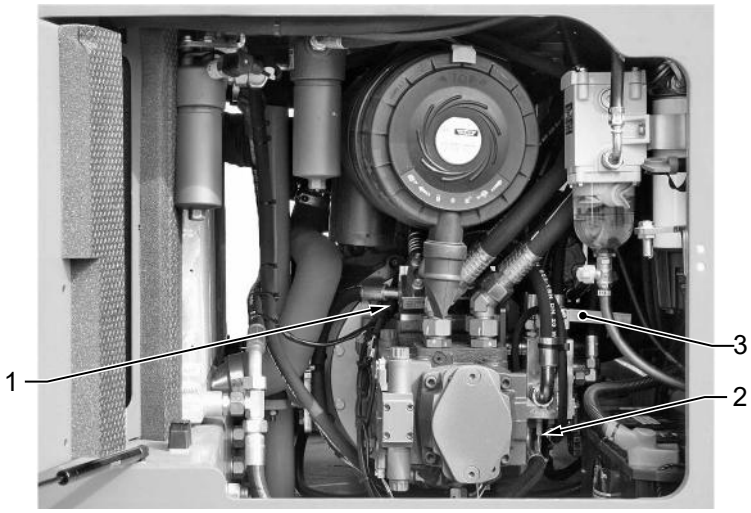

| | | | |
|---|---|---|---|
| **[1]** | Battery | **[2]** | Main fuses |
| **[3]** | Fuses | **[4]** | Relay |
| **[5]** | Machine diagnostic interface | **[6]** | Motor diagnostic interface |

# 2.08 Transmission

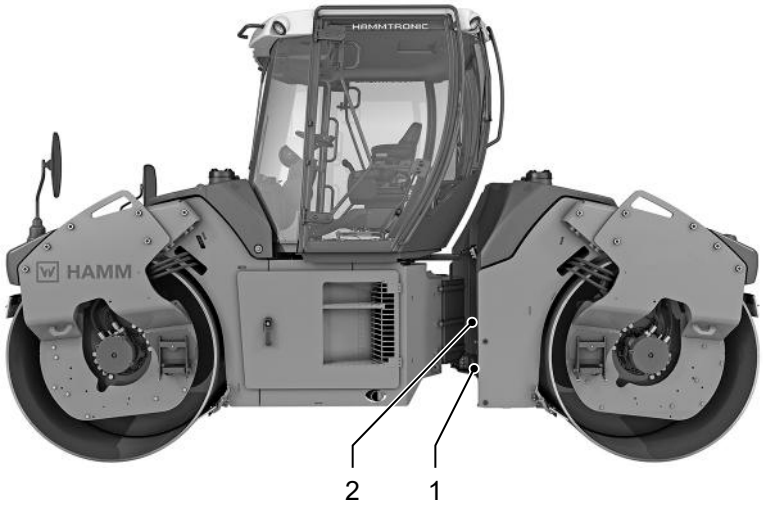



| | | | |
|---|---|---|---|
| **[1]** | Top drum scraper | **[2]** | Wheel hub motor for drum |
| **[3]** | Bottom drum scraper | | |




| | | | |
|---|---|---|---|
| **[1]** | Drive variable displacement pump | **[2]** | High-pressure valve |
| **[3]** | Manual pump | | |

# 2.09 Steering system

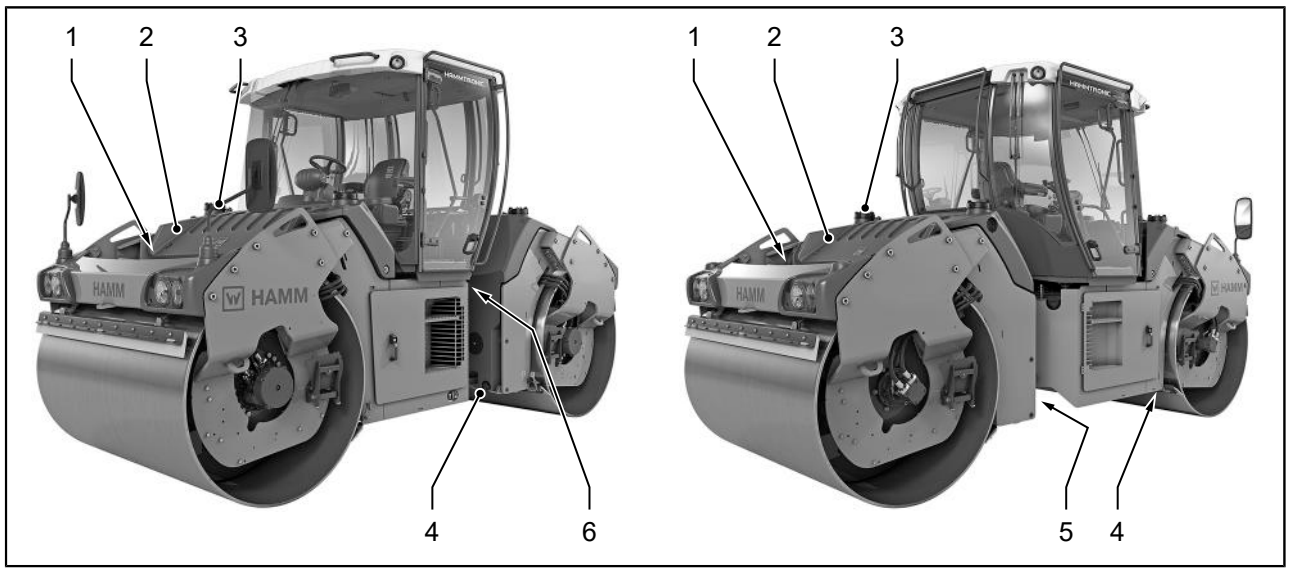



| | | | |
|---|---|---|---|
| **[1]** | Steering cylinder | **[2]** | 3-point pendulum articulated joint |

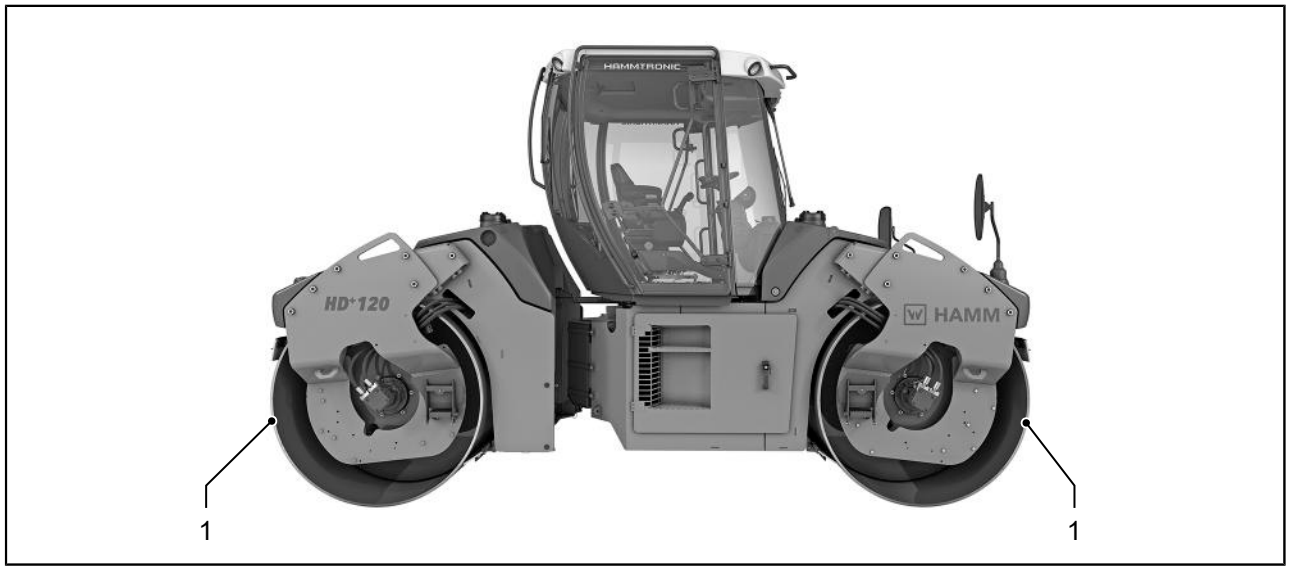
## 2.12 Water system

### 2.12.01 Water sprinkling system




| | | | |
|---|---|---|---|
| **[1]** | Water sprinkler nozzles | **[2]** | Water tank inlet |
| **[3]** | Water tank | **[4]** | Water outlet |
| **[5]** | Water filter | **[6]** | Water pump |

## 2.26 Dynamic compaction system




| | |
|---|---|
| **[1]** | Drum with vibrator/oscillator |

# 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**

**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.

***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***

**Swivel range of the engine compartment door!**

Material damage while opening the engine compartment door.

- Keep an adequate lateral distance from other vehicles and objects.
- Before opening the engine compartment door, completely close, or completely open and lock the cab door and the cab window. Do not let doors or windows project outwards from the cab.

# 3.01 Safety strut

**⚠WARNING**

**Unintentional movement of the machine!**
Severe injury or death due to unexpected machine movement during setting work.

- Do not connect or disconnect the safety strut unless the engine is stopped and the ignition is set to off.
- Park the machine on safe ground, i.e., flat and horizontal ground with sufficient bearing capacity.
- Secure machine against rolling away.

The safety strut is used to prevent uncontrolled steering system movements. This helps to prevent, e.g., the machine's front end or rear ends from swinging out.

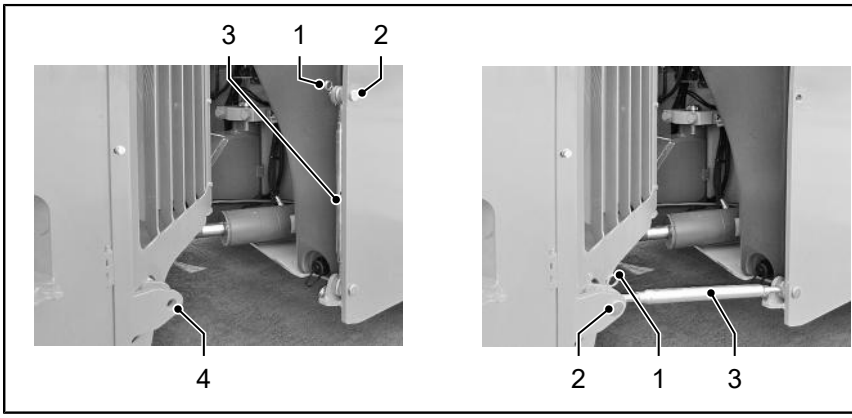
Applying safety strut **always** before:

- crane loading the machine.
- transporting the machine.
- maintenance and repair work.

Before inserting the safety strut, safely stop the machine

- Remove any steering angle (set the steering system to straight-line motion) and
- Remove any track offset.

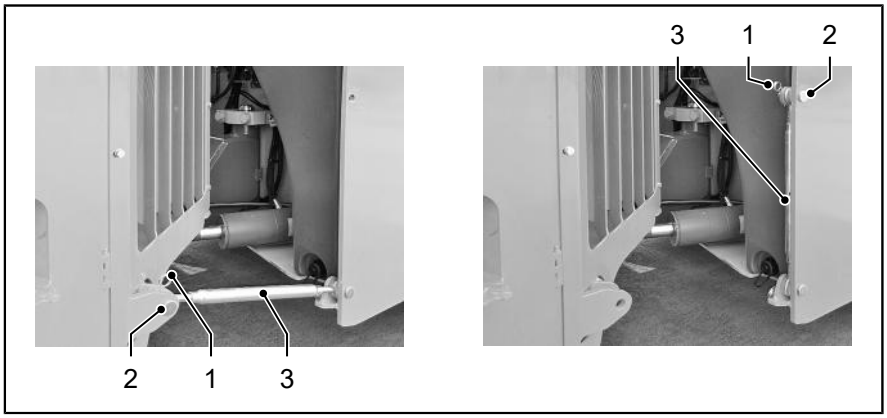
**Applying safety strut**




- ▶ Pull the spring cotter pin [1] out of the bolt [2].
- ▶ Pull out the bolt [2].
- ▶ Release the coupling bar [3] and swing it to the holder [4] located opposite.
- ▶ Use the bolt [2] to lock the coupling bar [3] in the holder [4].
- ▶ Slide the spring cotter pin [1] into the bolt [2].
- ✔ The safety strut is now installed.

## Releasing safety strut




- ▶ Pull the spring cotter pin [1] out of the bolt [2].
- ▶ Pull out the bolt [2].
- ▶ Swing the coupling bar [3] upwards and press it down.
- ▶ Use the bolt [2] to lock the coupling bar [3] in place.
- ▶ Slide the spring cotter pin [1] into the bolt [2].
- ✔ The safety strut is released.

# 3.02 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**

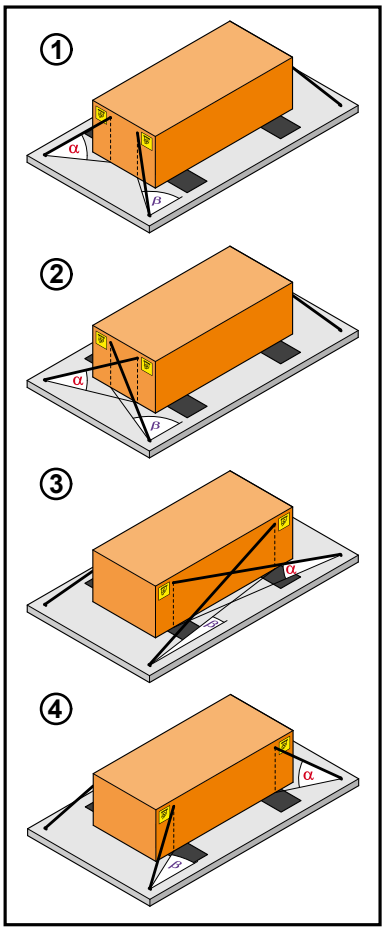
When loading please observe the following instructions:

- Adhere to section Transport as specified in the safety instructions.
- Observe weight and dimensions ("Technical data ", page 198 sqq.).
- 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.
- Gantries, planks and loading areas must be swept clean and free of grease, dirt and 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.

- In case of rollers with articulated steering, the safety strut must always be activated for transport.
- 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.

## Load securing

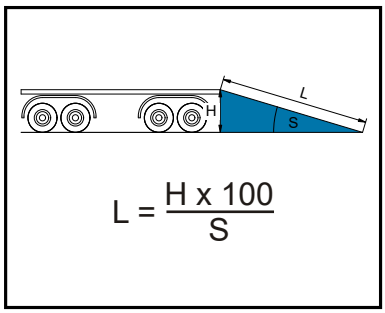



## Special notes

- 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.

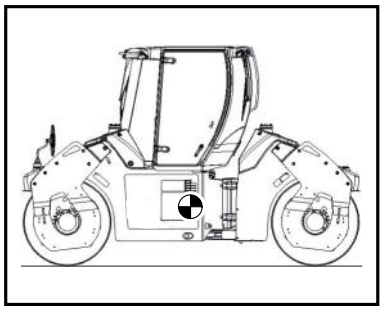
 




Maximum permissible ramp slope: see loading charts

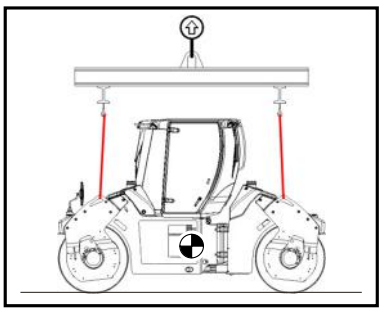
| | |
|---|---|
| **[L]** | Ramp length [mm] |
| **[H]** | Difference in height [mm] |
| **[S]** | Ramp slope [%] |

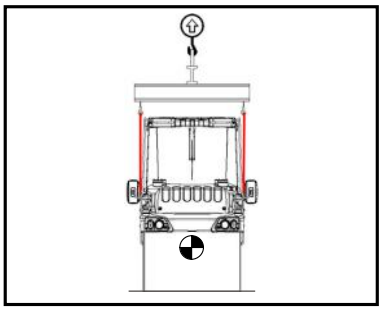
Make certain to use a proper load distribution plan.



| | |
|---|---|
| **[ ◓ ]** | 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

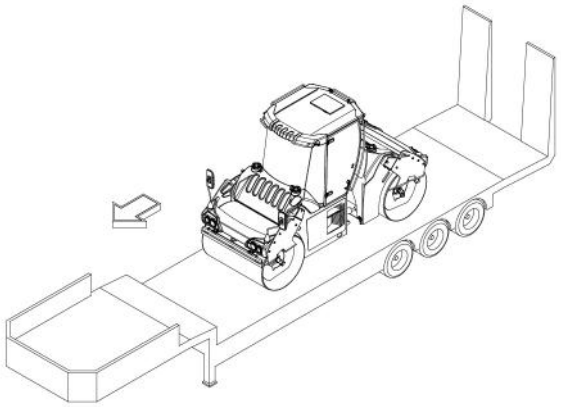
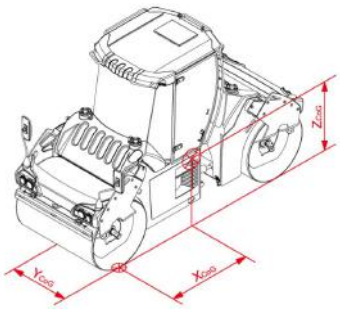
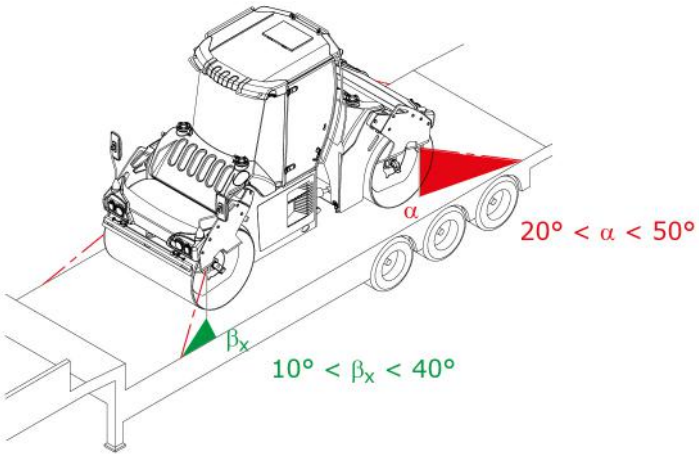


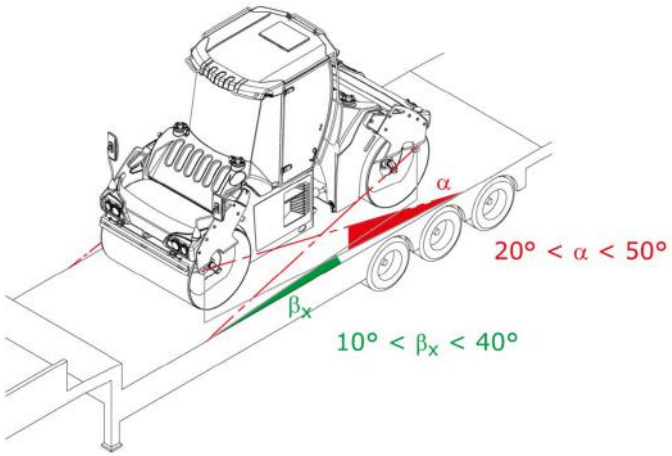
Diagram of the centre of gravity specifications






Lashing variant 1

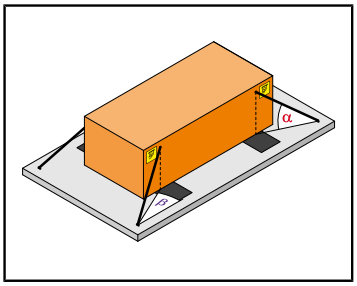
| Weight class [t] | Lashing capacity LC (μ=0.6) [daN] |
|---|---|
| up to 14.8 | 4000 |

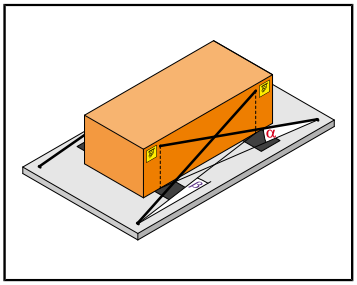



Lashing variant 2

| Weight class [t] | Lashing capacity LC (μ=0.6) [daN] |
|---|---|
| up to 14.8 | 4000 |

| **Machine parameters** | |
|---|---|
| Weight of machine [t] | 11.5 t < m < 14.8 t |
| Centre of gravity range [mm] | $X_{CoG}$ = 1761–1983<br>$Y_{CoG}$ = 990–1070<br>$Z_{CoG}$ = 850 |
| Identification reference point: | Centre drum, front left |
| **Interface parameters:** | |
| Type of contact: | Anti-slip<br>Material |
| Frictional force [µ]: | 0.6 |
| Heavy load capacity: | Yes |
| Contact points: | Under contact pair |
| Vertical lashing angle α: | 20° < α < 50° |
| Longitudinal, horizontal angle βx: | 10° < βx < 50° |




| **Specification of attachment points on the load:** | | | |
|---|---|---|---|
| Tensile capacity of lashing point [daN]: | 4000 | | |
| 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]: | ≥ 4000 | | |
| 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]: | 4000 | Quantity: 4 | Miscellaneous: |
| Recommended type of lashing equipment: | Chain (8/8 4000 daN), | | |
| | Belt (4000 daN) as an alternative | | |
| Connecting pieces to the lashing point: | Hook with safety latch | | |

**Specific safety instructions**

- Drive the machine onto and off a loading platform, with the diesel engine under automatic speed control (Hammtronic) and in the preset speed (maximum 2 km/h (1.2 mph)).
- Observe maximum permissible ramp slope (28.5 %, approx. 16° ).
- Secure the clamping devices.
- On rubber wheeled rollers with tyre filling system, the tyre filling system must be set to 0.6 MPa (6 bar, 87 psi).
- Check the inflation pressure at least every 24 hours and, if refill the air, if necessary (see Technical data).

**Miscellaneous**

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

# 3.03 Function tests before starting work

Check the following to ensure safe operation of the machine:

| Test | Refer to |
|---|---|
| Can the machine be accessed safely? | "Access to the machine", page 73 |
| Are the cab doors in the correct positions? | "Operating doors and windows", page 76 |
| Has the driver's seat been adjusted? | "Adjusting operator's seat", page 80 |
| Has the seat belt been tested? | "Using the seat belt", page 82 |
| Has the position of the seat been adjusted? | "Adjusting operator's seat", page 80 |
| Has the seat console been adjusted? | "Adjusting the seat console", page 88 |
| Has the steering column been adjusted? | "Adjusting the steering column", page 83 |
| Has the power supply to the battery disconnect control unit been switched on? | "Switching on/off electrical system/internal power supply", page 85 |
| Are the turn signal and hazard warning lights working? | "Switching the turn signals/hazard warning lights on and off", page 93 |
| Is the horn working? | "Actuating the horn", page 95 |
| Are the lights working? | "Switching the parking light, driving light and work light on/off", page 91 |
| Is the reversing warning system working? | "Rear area monitoring", page 226 |
| Is the rotating beacon working? | "Rotating beacon ", page 212 |
| Are the rear and working mirrors adjusted? | "Set interior, operation and rear mirror", page 84 |
| Is the parking brake working? | "Check that the parking brake is working properly", page 149 |
| Is the seat contact switch working? | "Check the function of the seat contact switch", page 150 |
| Is the EMERGENCY STOP working? | "Testing the EMERGENCY STOP function", page 151 |
| Has the fuel tank fill level been checked? | "Control panel – Fill level control indicator", page 125 |
| Has the coolant fill level been checked? | "Checking coolant level", page 165 |
| Has the hydraulic oil reservoir fill level been checked? | "Check the hydraulic oil fill level", page 167 |
| Has the water tank fill level been checked? | "Control panel – Fill level control indicator", page 125 |
| Has the windscreen washer system fill level been inspected? | "Checking fill level of the windscreen washer", page 153 |
| Has the scraper been tested? | "Checking roller drum / tyre scraper", page 173 |

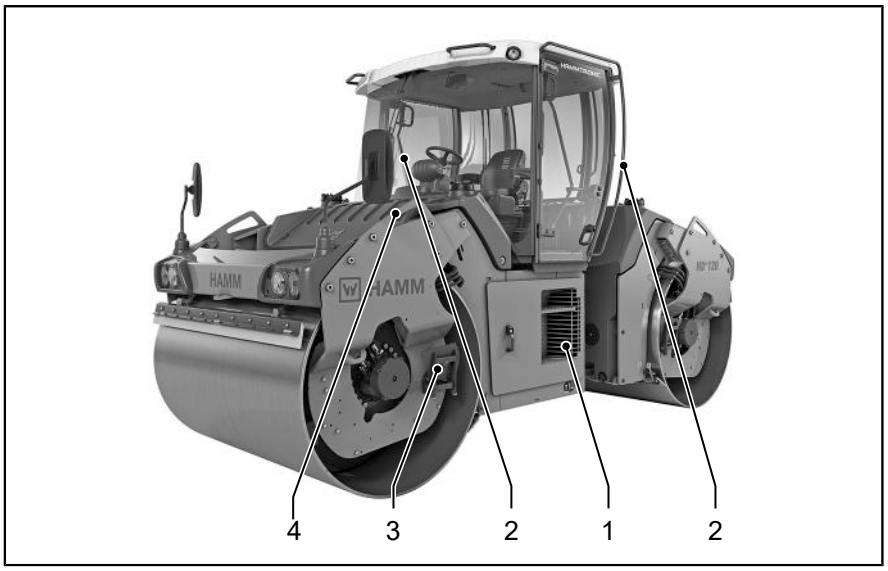
# 3.04 Access to the machine

**⚠WARNING**

**Danger of slipping when climbing up and down!**
Risk of injury caused by slipping when climbing onto and off the machine.

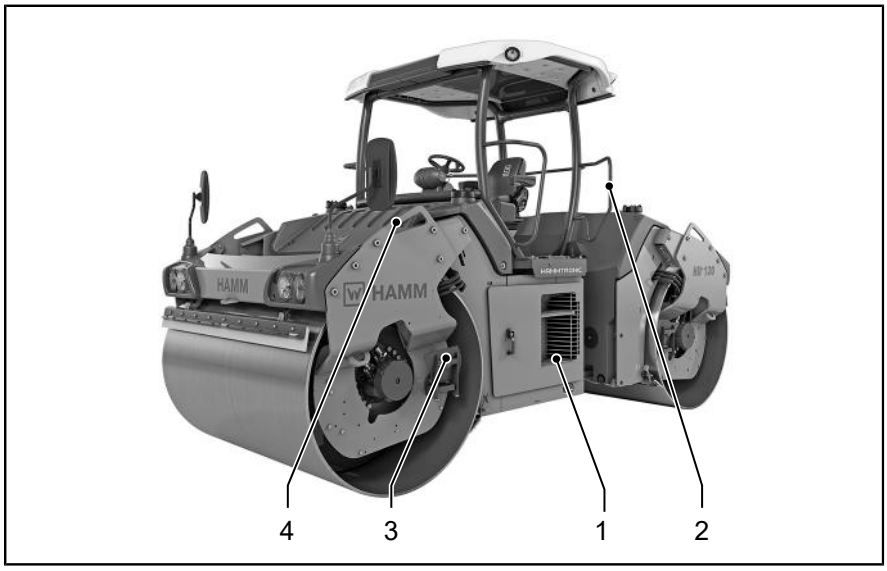
- Use only the ladders, climbing handholds and steps provided.
- Only climb up and down on machines that are stationary and secured.
- When climbing up and down with hands and feet, maintain three points of contact with the machine at all times.
- Keep ladders and steps clean and free of frost.
- Repair or replace worn anti-slip surfaces of the steps.

**Cab**




| | | | |
|---|---|---|---|
| [1] | Step to the driver's platform | [2] | Handrails |
| [3] | Step | [4] | Handhold |

**ROPS**




| | | | |
|---|---|---|---|
| **[1]** | Step to the driver's platform | **[2]** | Handrail |
| **[3]** | Step | **[4]** | Handhold |

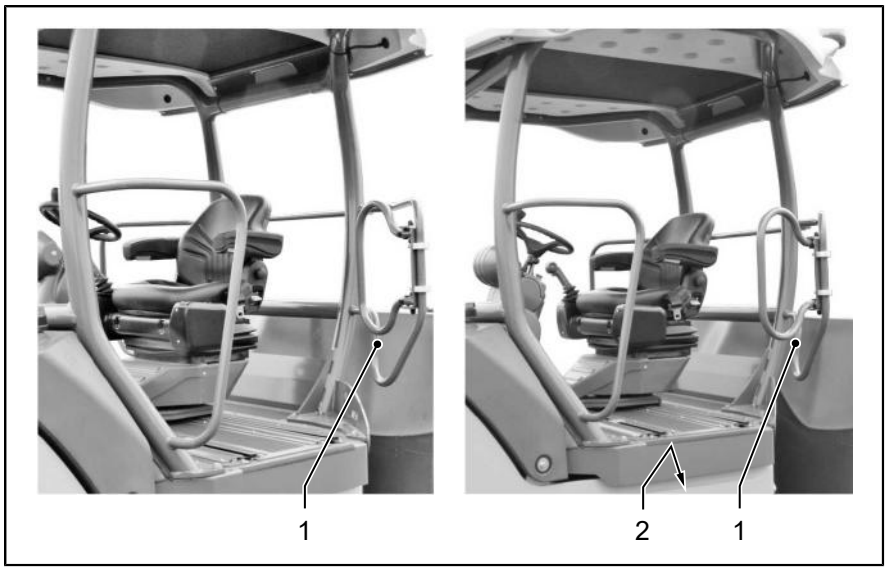
## 3.04.01 Access to the operator’s platform

The access to the operator’s platform are on the left-hand side in direction of travel. Ladders and climbing handholds are arranged so that they are within easy reach and offer secure foot 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.

**Folding ROPS grab handle in/out**



The steps to the driver's cab are on the left-hand side of the machine. Only here are the handholds and steps ergonomically arranged according to international regulations. The steps on the right-hand side of the machine are only intended as an emergency exit, and may only be used in the event of an emergency or danger.

- Fold out handhold [1] before climbing up or down.
- Climb up and down with the aid of the steps [2].
- Fold handhold [1] in again after climbing up or down.

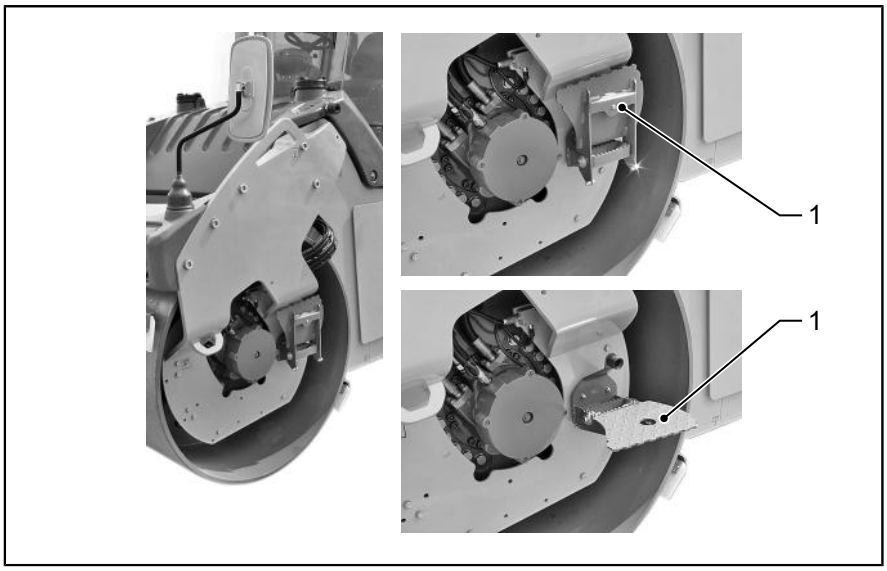
## 3.04.02 Step

**⚠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.

# 3.05 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.

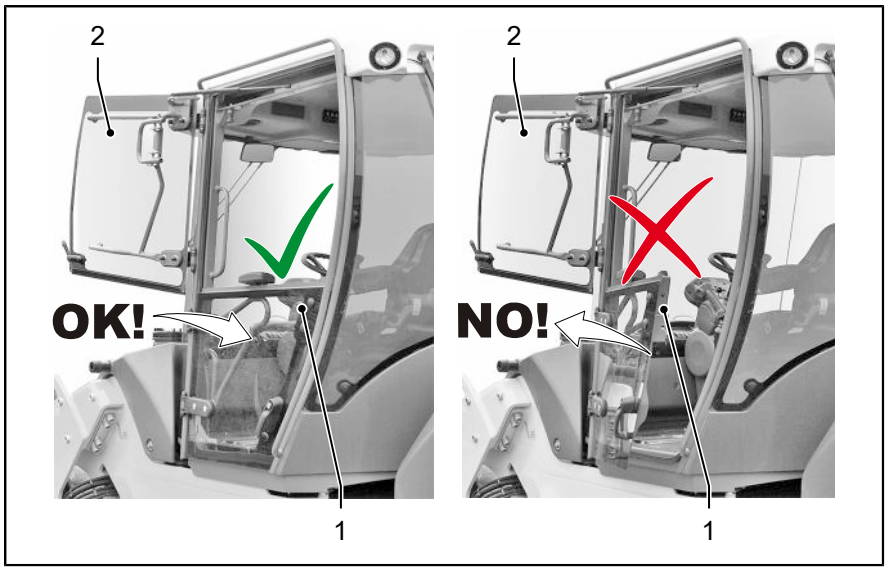
- Before opening cab doors or windows, make sure that no persons or objects are in the danger zone of the machine.
- Keep the cab doors closed while driving and operating the machine. (at split cab door: lower door halves).
- Keep the windows locked in a completely closed or completely open position 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.



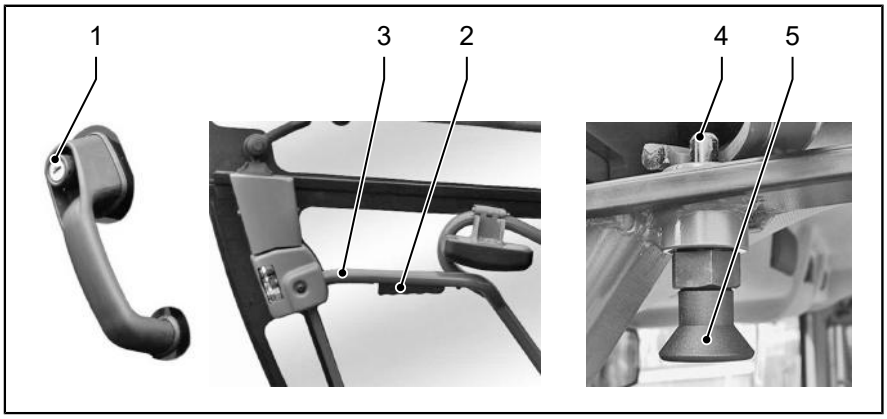

When equipped with a split cabin door [1], [2], the door window [2] can be opened separately.

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.

## 3.05.01 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 at the handle [1], and swing out up to the stop.
- ✔ The door is opened at a 90° position.

**Opening door from inside**

- ▶ Press the handle [2] into the fastening frame [3].
- ▶ Pull the door at the mountin frame [3], and swing out up to the stop.
- ✔ The door is opened at a 90° position.

**Complete opening of door**

Requirement: The door is at 90° at the stop.

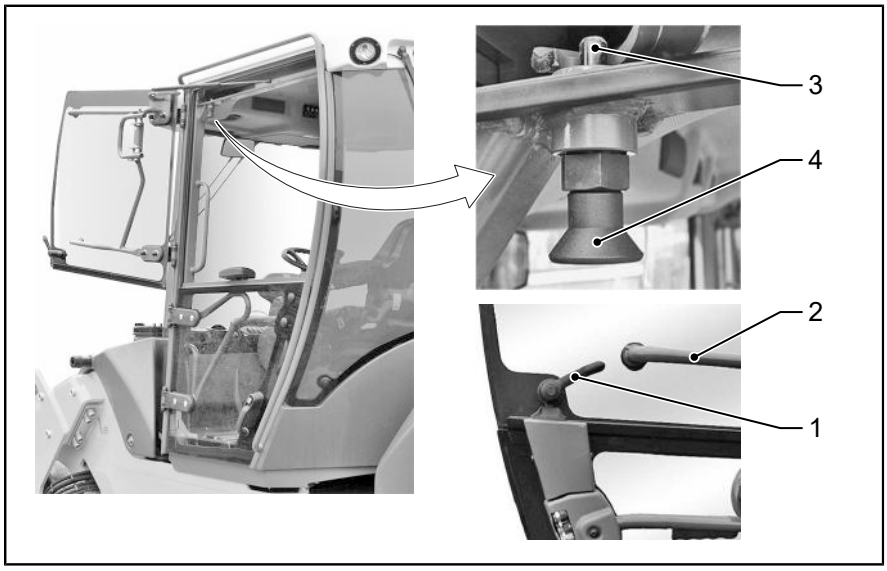
- ▶ Pull down the limitation pin [4] at the actuation button [5] and swing out the door.
- ✔ The door is kept fully open by a gas strut.
- ✔ The door is opened in the 180° position.

**Closing and locking the door**

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

## 3.05.02 Cabin door split

**Actuating door windows**




### Complete opening of door window

Requirement: The cab 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.
- ▶ Swing out the door window up to the stop by its mounting frame [2].
- ▶ Pull down the limitation pin [3] at the actuation button [4], and swing out the door window.
- ▶ The door window is kept fully open by a gas strut.
- ✔ The door window is open in the 180° position.

### Closing door window

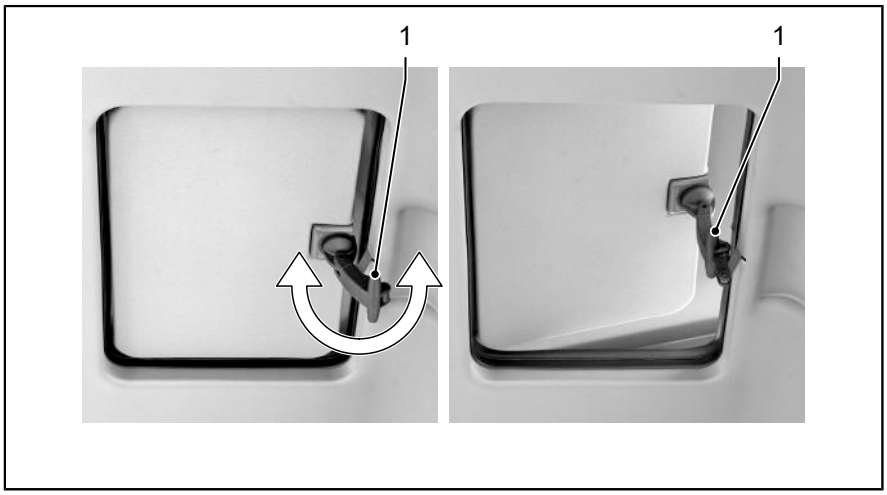
Requirement: The door window must locked in place in the 180° position.

- ▶ 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.
- ✔ Door window is closed and locked.

# 3.06 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**

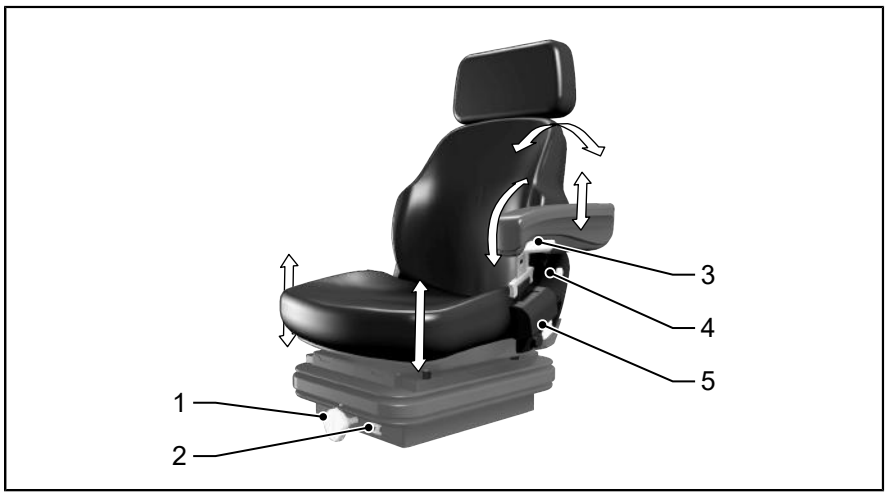
- ▶ Swing down the deflexion lever [1] over the tipping point.
- ▶ Throw the deflexion lever [1] over the tipping point.
- ✔ The roof light is closed and locked in place.

# 3.07 Adjusting 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 operator’s seatt from the lowest position to the desired height.

### 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.

# 3.08 Using the seat belt

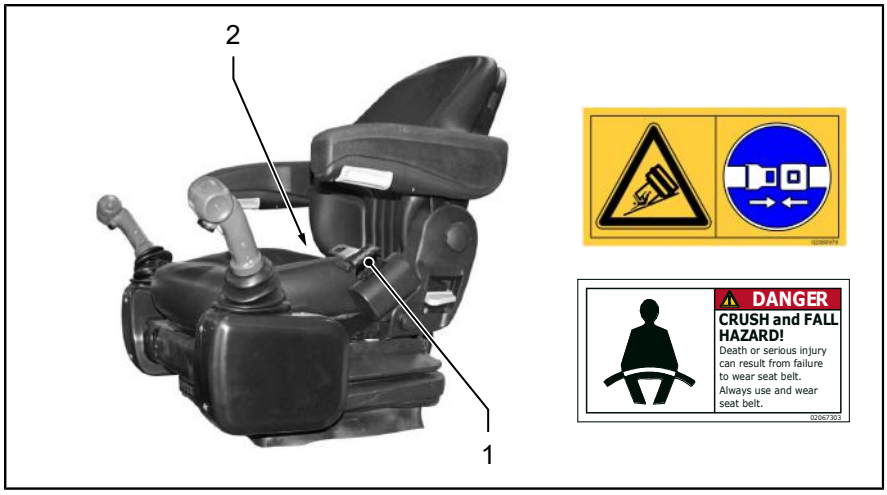
**⚠WARNING**

**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.

# 3.09 Adjusting the steering column

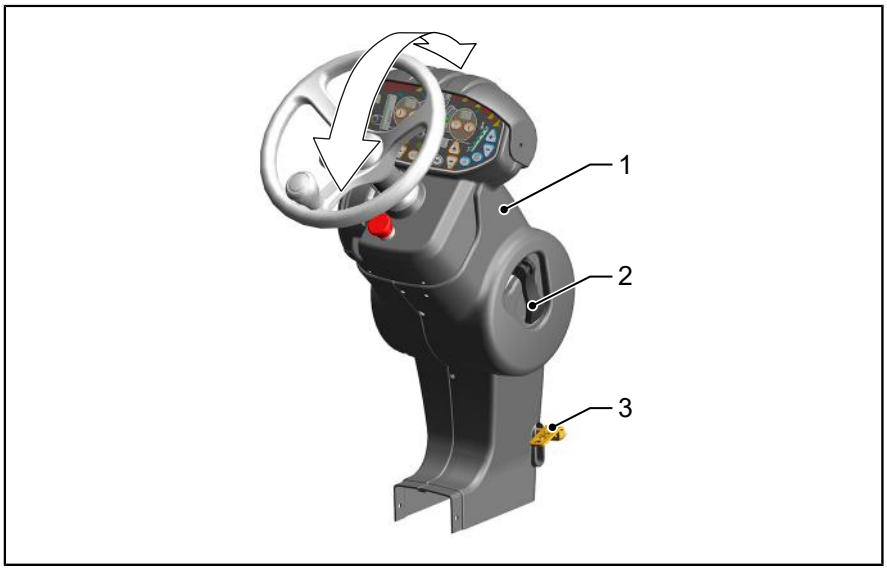
**⚠WARNING**

**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**

- ▶ Loosen the lever [2].
- ▶ Move the control panel with steering wheel unit [1] forwards/ backwards.
- ▶ Tighten the lever [2] when the required adjustment position is reached.
- ✔ The steering column is adjusted 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.

# 3.10 Set interior, operation and rear 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, climbing handholds and steps provided.

Clean mirrors at regular intervals.
Replace defective mirrors immediately.

**Set operation and rear mirror**

- The operation mirror is adjusted by two persons.
  - The person on the outside of the machine adjusts the operation and rear 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.

**Fold operation and rear 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.

**Setting the inside mirror**

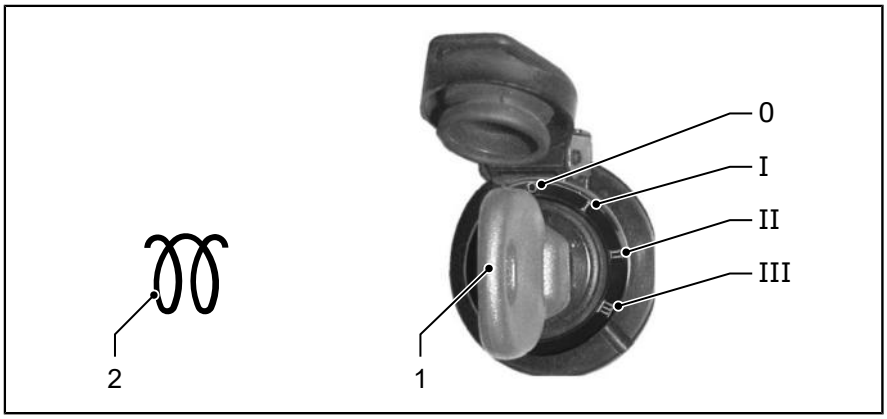
- Adjust the mirror from a operator’s seated position.
- Adjust the mirror so as to ensure that you can see the area behind the machine in the mirror.

# 3.11 Switching on/off electrical system/internal power supply

**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 electrical system**

- ▶ Turn ignition key [1] to position I.
- ✔ Electrical system is ON.
- ✔ Functional control of warning and pilot lights
- ✔ The cold start assistance pilot light [2] is on until the starting temperature is reached.
- ✔ Diesel engine remains switched off.

**Switching off electrical system**

- ▶ Turn ignition key [1] to position 0.
- ✔ The diesel engine is stopped.
- ✔ Electrical system is OFF.

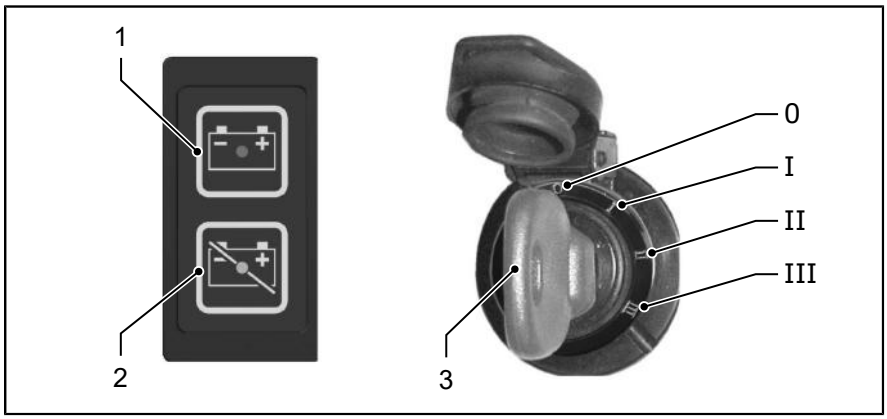
**For versions with electronic battery switch-off**

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.

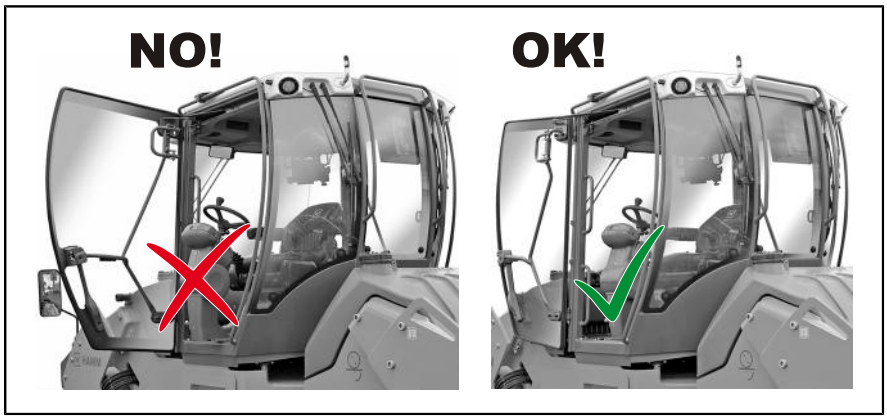
- ▶ Press switch [1].
- ✔ LED flashes green.
- ▶ Switch on electrical system: ignition key [3] in position I.
- ✔ LED lights up green.
- ✔ Brief functional check of all pilot lights
- ✔ The diesel engine can be started.

# 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.

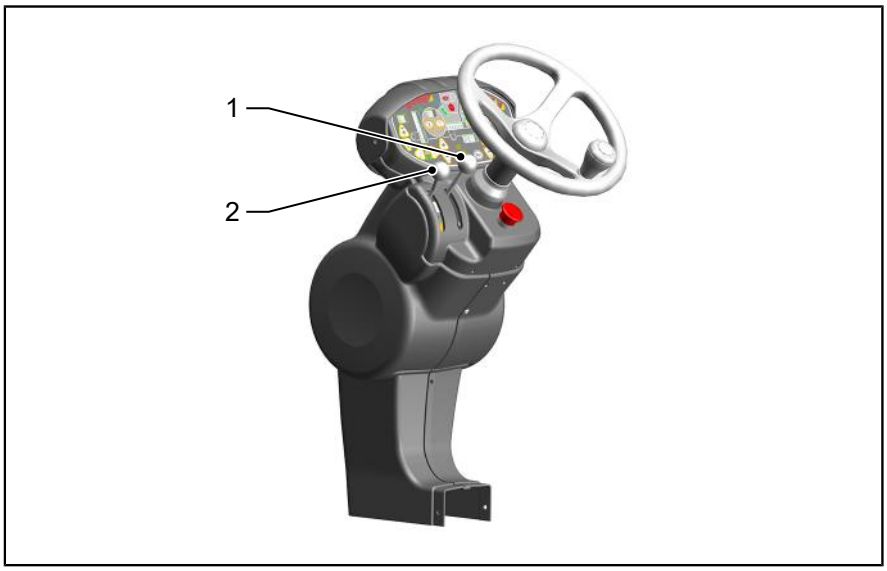
**Seat console with mechanical seat adjustment**

**⚠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.



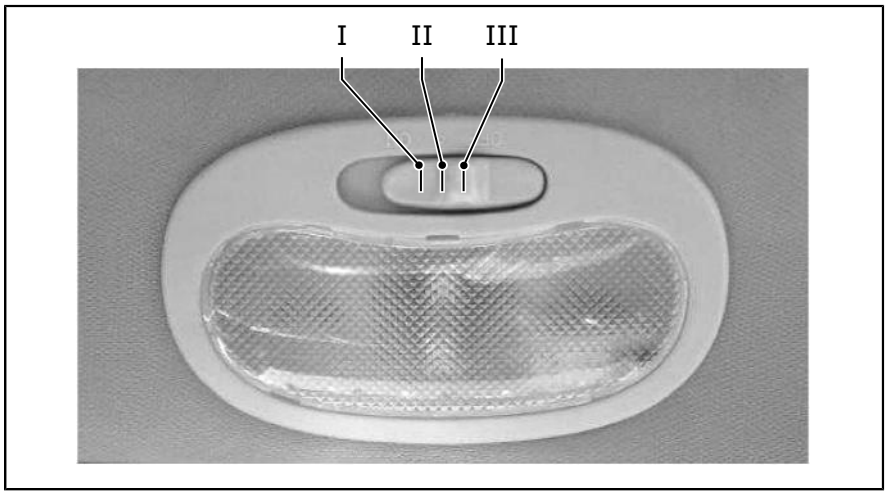

The seat console can be turned into snap-in positions a maximum of 90° to the left or right.

- ▶ Move the lever [1] down.
- ✔ The lock is released.
- ▶ Use physical force to turn the seat console to the desired position.
- ▶ Move the lever [1] up.
- ▶ Use physical force to turn the seat console until it locks into place.
- ✔ The seat console is locked.

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

- ▶ Move the lever [2] down.
- ✔ The lock is released.
- ▶ Use physical force to shift the seat console to the desired position.
- ▶ Move the lever [2] up.
- ▶ Use physical force to move the seat console 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.

**Setting the light to automatically on/off**

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

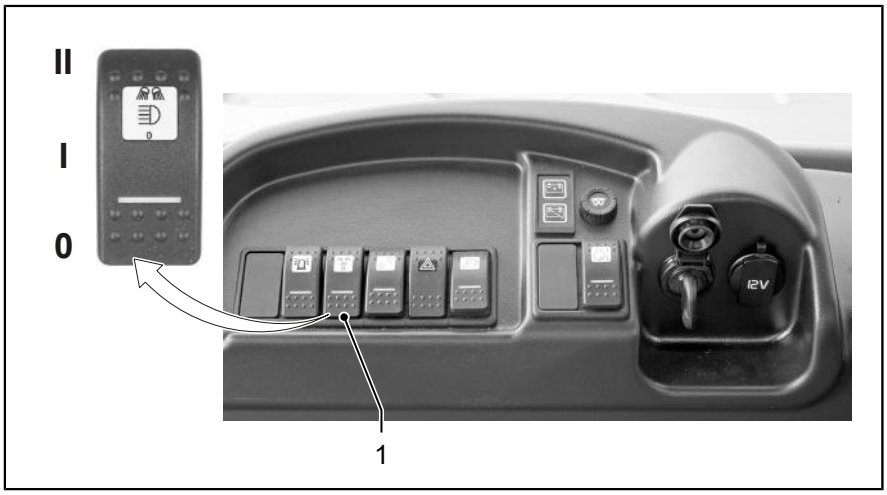
**Setting the light permanently to off**

- ▶ Move switch in position III.

# 3.14 Switching the parking light, driving light and work light on/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.




**Switching the parking light on/off**

Prerequisite: The electrical system is OFF.

- ▶ Push the switch [1] to position I.
- ✔ The parking light switches on .
- ▶ Push the switch [1] to position 0.
- ✔ The parking light is switched off.

**Switching the driving light/dipped beam on/off**

Prerequisite: The electrical system is ON.

- ▶ Push the switch [1] to position I.
- ✔ The button lights up: The driving light switches on.
- ▶ Push the switch [1] to position 0.
- ✔ 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 work light on/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.

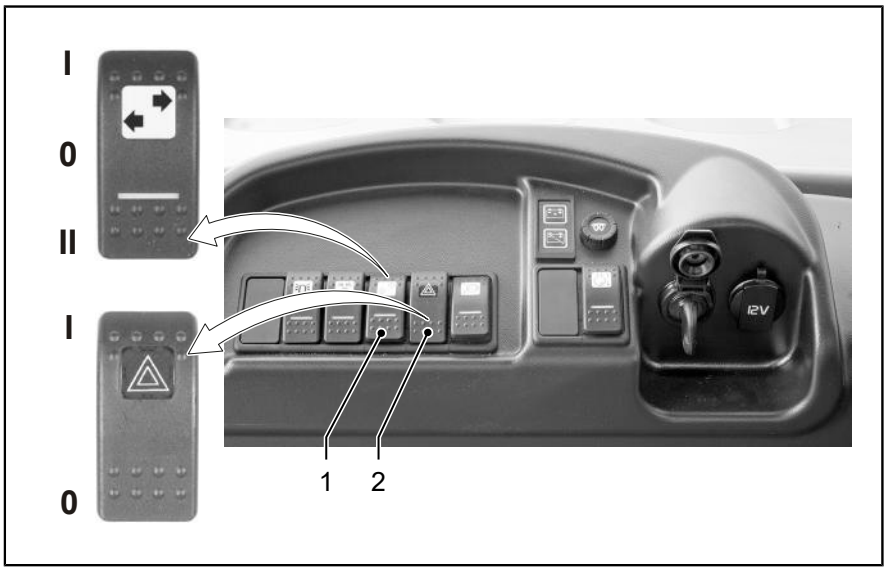
Prerequisite: The electrical system is OFF.

- ▶ Push the switch [1] to position II.
- ✔ The work light is switched on.

- ▶ Push the switch [1] to position I.
- ✔ The work light is switched off.

# 3.15 Switching the turn signals/hazard warning lights on and off




**Turning left/right**

Prerequisite: The electrical system is ON.

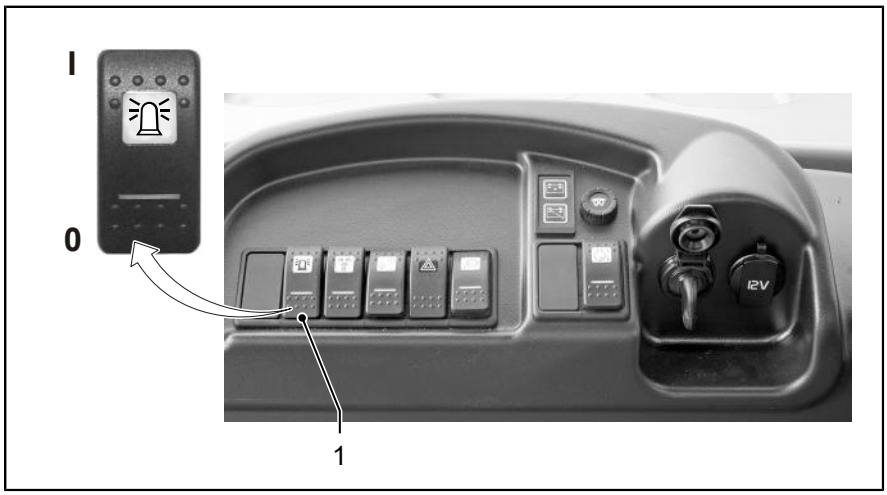
- ▶ Push the switch [1] for turning left to position II.
- ▶ Push the switch [1] for turning right to position I.
- ✔ The button flashes: The flashing light is switched on.
- ▶ Push the switch [1] to position 0.
- ✔ The flashing light is switched off.

**Switching the hazard warning lights on/off**

- ▶ Push the switch [2] to position I.
- ✔ The button flashes: The hazard warning light is switched on.
- ▶ Push the switch [2] to position 0.
- ✔ The hazard warning light is switched off.

When the incandescent lamp in one of the flashing lights is defective, the pilot light/switches will be flashing quickly. To ensure road safety, the defective light bulb must be replaced as quickly as possible.

# 3.16 Switching the rotating beacon on and off



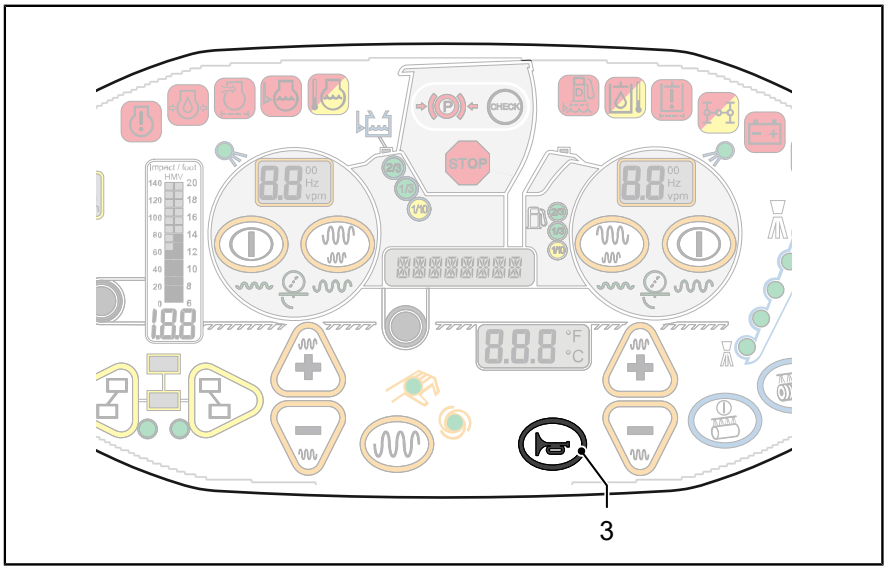

**Switching the rotating beacon on/off**

Prerequisite: The electrical system is ON.

- ▶ Push the switch [1] to position I.
- ✔ The button lights up: The rotating beacon switches on.
- ▶ Push the switch [1] to position 0.
- ✔ The rotating beacon is switched off.

## 3.17 Actuating the horn

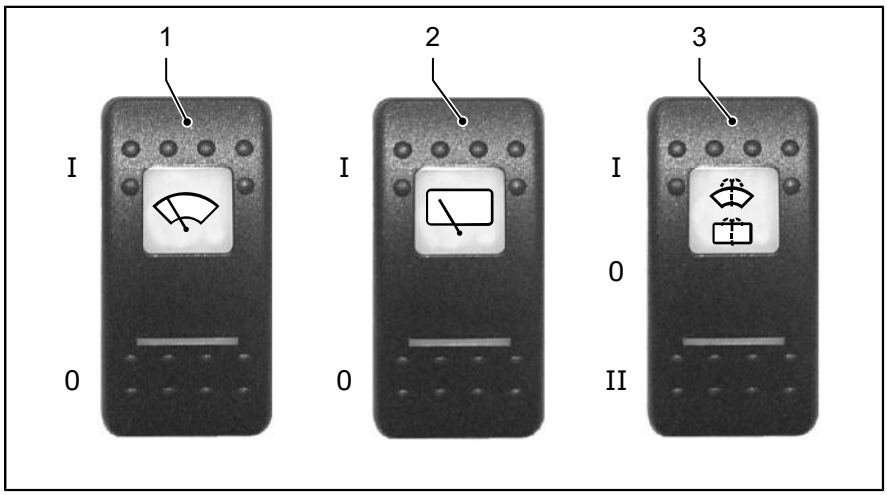



Requirement: Electrical system is ON.

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

# 3.18 Switching windscreen wiper / washer system on / off

Before starting a journey, check that the windscreen wipers and the windscreen washer unit are working. Inspect windscreen washer system level. Top up the tanks of the windscreen washer system if necessary.




| | | | |
|---|---|---|---|
| **[1]** | Front windscreen wiper switch | **[2]** | Rear windshield wiper switch |
| **[3]** | Switch window washer | | |

**Switching on windscreen wiper**

- ▶ Press corresponding switch [1] oder [2] into position I.
- ✔ Windscreen wiper on.

**Switching off windscreen wiper**

- ▶ Press corresponding switch [1] oder [2] into position 0.
- ✔ Windscreen wiper off.

**Switching windscreen washer system on / off**

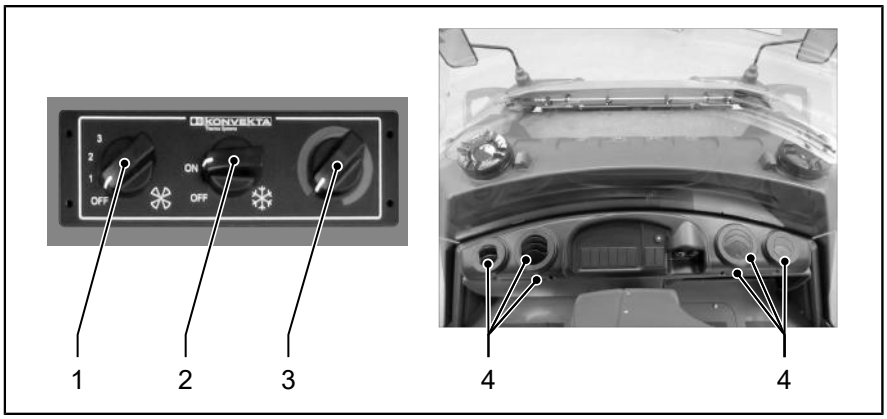
- ▶ Press switch [3] in position I and keep it pressed.
- ✔ Front windscreen is the edge.
- ▶ Press switch [3] in position II and keep it pressed.
- ✔ Rear windscreen is moistened
- ▶ Press switch [3] in position 0.
- ✔ Windscreen washer system off.

# 3.19 Heating and air conditioning

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.




## 3.19.01 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.

## 3.19.02 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.

## 3.19.03 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.

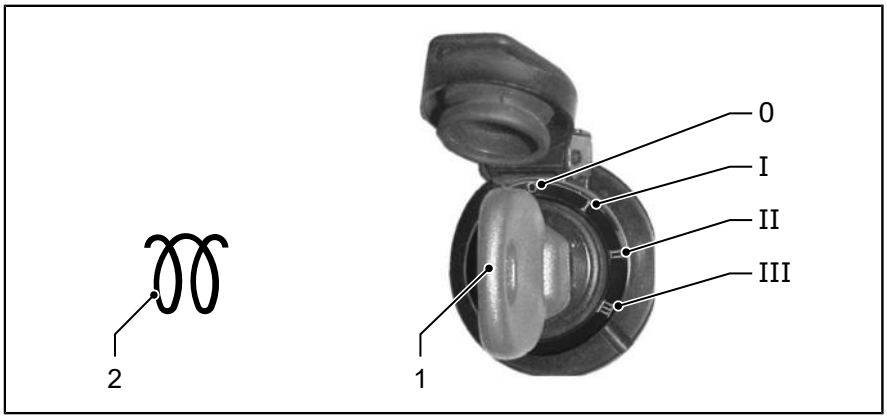
 

# 3.20 Starting the machine

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 |

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 electrical system**

- ▶ Turn ignition key [1] to position I.
- ✔ Electrical system is ON.
- ✔ Functional control of warning and pilot lights
- ✔ The cold start assistance pilot light [2] is on until the starting temperature is reached.
- ✔ Diesel engine remains switched off.

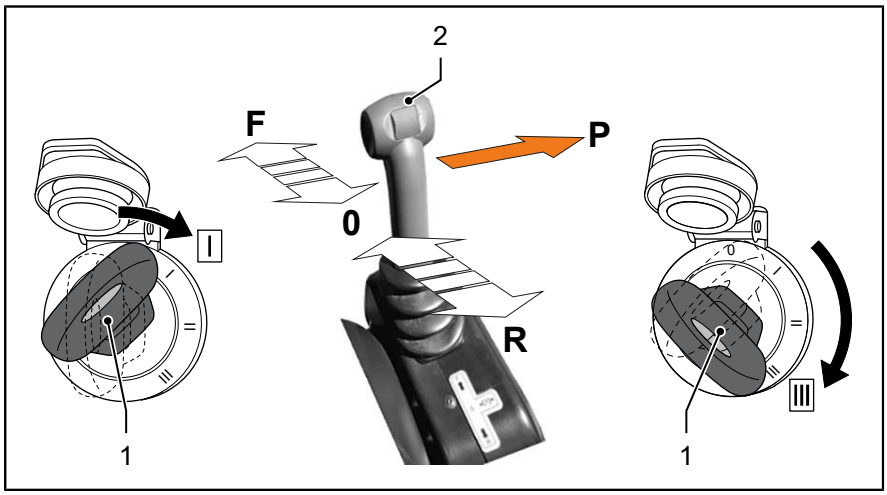
**Starting the diesel engine**

***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.

# 3.21 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.
- Drive the machine at moderate speed until the yellow hydraulic oil temperature warning light goes out.

***NOTICE***

**Contamination!**
Material damage to scrapers and other parts of the machine as a result of soiling of 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.

## 3.21.01 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.

## 3.21.02 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.

## 3.21.03 Engine management (ECO/MAX)

**NOTICE**

**Increased wear and emission!**

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

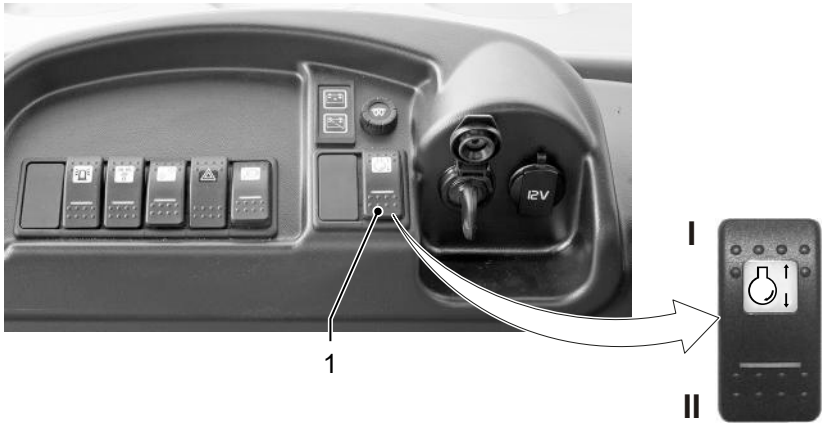
- Only use engine management MAX mode when necessary.
- Under normal field service conditions, always run the diesel engine in ECO mode.
- Never switch off the diesel engine in MAX mode as this can lead to faults in the engine management and exhaust gas treatment.

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**

- ▶ Push the engine management switch [1] briefly to position II.
- ✔ The engine controller is in ECO mode. The speed of the diesel engine is controlled by the Hammtronic.

**Setting engine management MAX**

- ▶ Push the engine management switch [1] briefly to position I.
- ✔ The engine controller is in MAX mode. The diesel engine continuously runs at maximum speed.

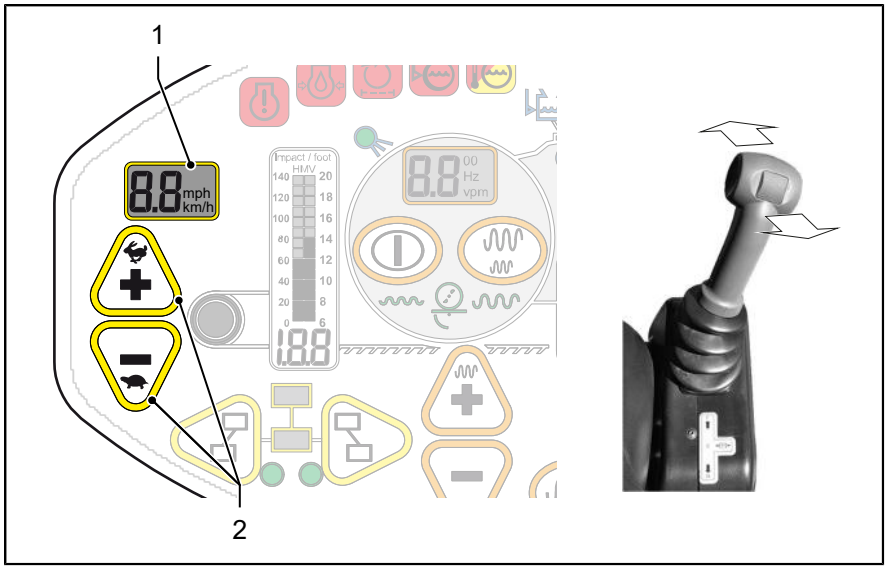
## 3.21.04 Presetting the final speed/changing gear

**⚠WARNING**

**Full braking!**
Danger of injuries due to strong braking force.
- Use transportion gear only to manoeuver on paved roads.
- In case of visible obstacles reduce speed in good time.
- Longer uphill or downhill slopes must always be driven in working speed.
- Work may only be performed in the working gear.

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.




The machine has a working gear and a transportation gear. An upper range limit is set for every gear (see "Technical data").

The final speed can be adjusted using the switches [2]. When the drive lever is pushed as far as it will go, the driving speed is limited to the preselected final speed.

The gear is changed automatically. The machine engages the working gear or transportation gear depending on the final speed that is set when the machine is stationary.

- Working gear: High traction, lower final speed.
- Transportation gear: Less traction, high final speed.

**Setting final speed**

- When driving, the final speed can be increased up to the upper range limit (working speed or transport speed).
- 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).

**Increasing the final speed**

- ▶ Press the + (plus) switch [2].
- ✔ The info display [1] shows the preset value for 3 seconds, then the current speed will be indicated.

**Decreasing the final speed**

- ▶ Press the - (minus) switch [2].
- ✔ The info display [1] shows the preset value for 3 seconds, then the current speed will be indicated.

**Gear shifting**

Shifting from working speed to transport speed and vice versa is only possible at machine standstill.

Prerequisites:

- Machine is in standstill
- Diesel engine is running

**Setting the working gear**

- ▶ Press the - (minus) switch [2]. Set the value to less than 5 km/h (3.1 mph).
- ✔ The info display [1] shows the preset value for 3 seconds.
- ✔ The final speed can be increased up to the upper range limit (working gear) while driving.

**Setting the transportation gear**

- ▶ Press the + (plus) switch [2]. Set the value to more than 7 km/h (4.3 mph).
- ✔ The info display [1] shows the preset value for 3 seconds.
- ✔ The final speed can be increased up to the maximum speed (transportation gear) while driving.

If the final speed is readjusted to a value less than 5 km/h (3.1 mph) while driving, the electronics will only switch to working speed (high tractive force) during the next machine standstill. Toggling during driving is not possible.

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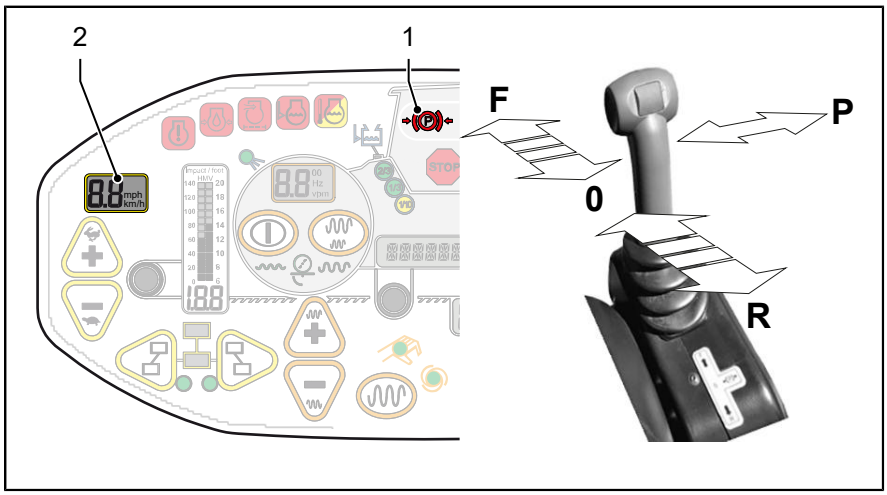
# 3.22 Driving in normal operation




**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.

**Reversing**

- ▶ Move the drive lever in direction R.
- ✔ An acoustic signal sounds.
- ✔ The reversing lights are switched on.
- ✔ The engine speed is automatically increased.
- ✔ The machine reverses, at maximum up to the preset final speed.
- ✔ The info display [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.

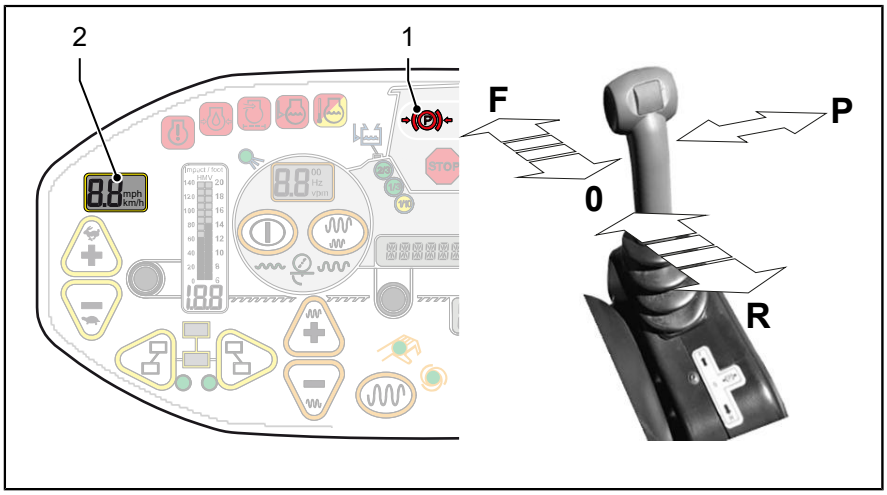
**Reversing**

- ▶ Move the drive lever quickly through the zero position into the opposite direction.
- ✔ 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.

# 3.23 Stopping the machine in normal operation

**Stopping**




- ▶ Move drive lever in position 0.
- ✔ 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.
- Use STOP function only in the event of danger.
- Do not use the STOP function as operation brake.

If the drive lever is suddenly moved against the driving direction,the STOP function becomes active immediately.

- ▶ Move the drive lever against the direction of travel.
- ✔ The machine quickly stops the transmission and brakes the machine to a standstill.
- ✔ The dynamic compaction system is switched off and can no longer be switched on using the drive lever. The preselection is retained.

**Driving off after using the STOP function**

Prerequisite: The drive lever is pushed as far as it will go.

- ▶ Move the drive lever to position 0 and leave it there for a short time.

- ✔ The machine is ready to go again.
- ✔ The dynamic compaction system is active again.

# 3.24 Stopping the machine in an emergency – EMERGENCY STOP

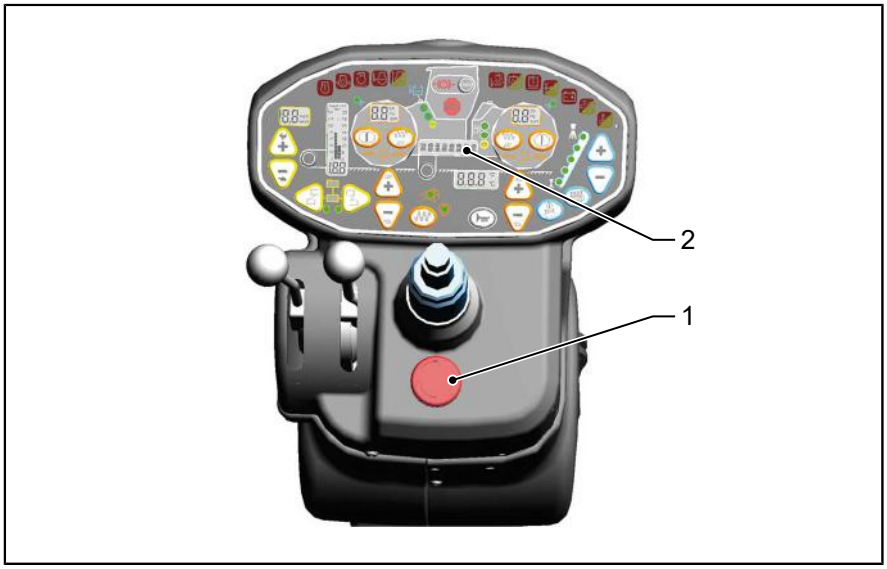
**⚠WARNING**

**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.

**Performing an EMERGENCY STOP in the event of danger**




In an emergency, the EMERGENCY STOP brings the machine to a controlled stop and switches it off.
Only the EMERGENCY STOP guarantees that all work functions are immediately disabled without causing any more danger to operator, 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.

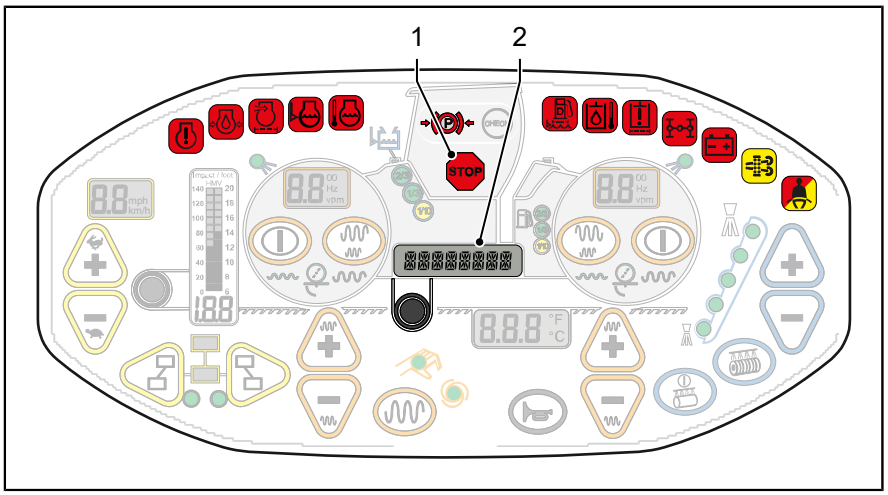
✔ STOP is shown in the info display [2].

**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.

# 3.25 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.

**In the event of a serious fault:**

- ✔ an acoustic signals sounds.
- ✔ the STOP icon [1] lights up.
- ✔ at least one warning light lights up.
- ✔ the system info [2] displays an error code.
- ▶ Park the machine out of the danger zone.
- ▶ Switch off the diesel engine immediately.
- ▶ Rectify the cause immediately.

**A serious fault is indicated in the following events:**

- Hydraulic oil temperature is too high
- Engine temperature is too high
- Water in diesel (water sump fuel prefilter)
- Missing charge current when the diesel engine is running.

# 3.26 Driving with the dynamic compaction system

**⚠WARNING**

**Reduced road adhesion!**
Serious injuries or death through the machine tipping over because of reduced ground adhesion.

- Never switch on the dynamic compaction system when traveling across a slope or on hard ground.

**⚠WARNING**

**Explosion!**
Severe injury or death by gas explosion.

- Before switching on vibration, make certain that no gas line is buried in the ground you will be working on.

***NOTICE***

**Vertical oscillations caused by vibration.**
Collapse or damage at buildings or on lines laid in the underground.

- Do not switch on vibration system near buildings!
- Prior to switching on the vibration function, it must be ensured that there are no lines laid in the underground in the vibration area.

**Vibration**

In the vibration mode the roller drum is shifted to vertical oscillations. These hammering impacts produce a manifold increase in the compaction force of the machine.

**Effect on the environment:**

Vibration oscillations can spread in the ground over a wide area. They are generated in circles around the roller drum and effect also the deeper ground. This may cause a damage to buildings or pipe systems under the machine.

**Amplitudes / frequency:**

For the vibration two amplitudes with aligned frequency ranges can be selected.

**Frequency regulation**

**For versions without frequency control:**

The vibration/oscillation frequency is coupled to the engine speed. The adjustment of the engine speed will change the vibration/ oscillation frequency.

**For versions with frequency control:**

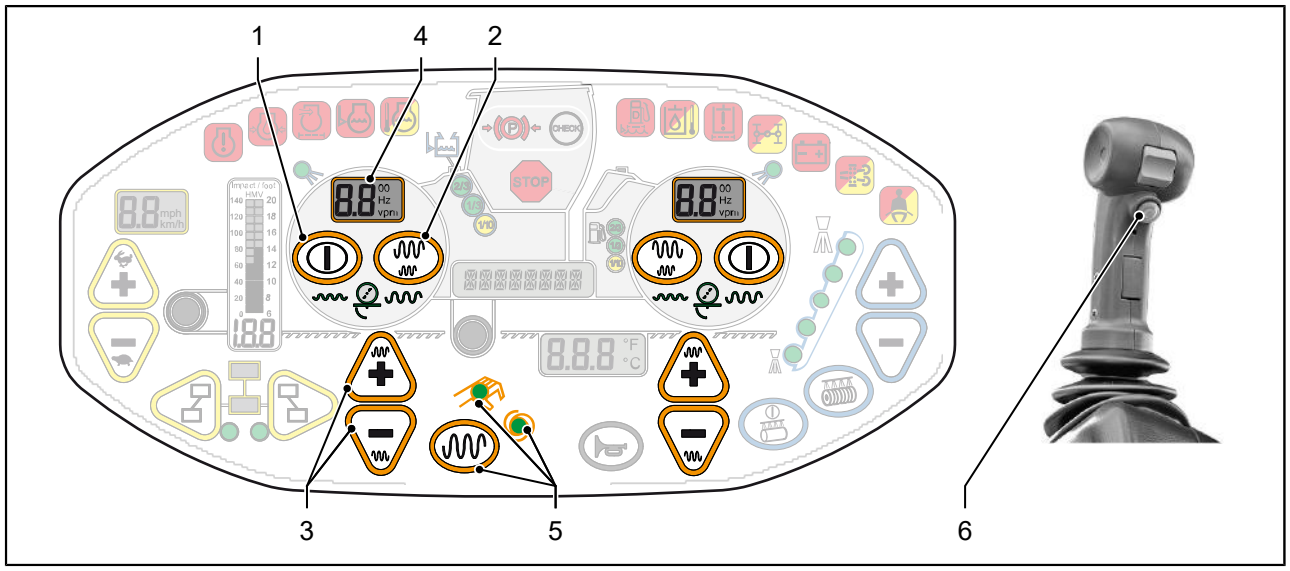
The hydraulic drive for vibration/oscillation is controlled by Hammtronic. It keeps the set frequency constant during the operation.

Disturbances possibly occurring (e.g., variations in diesel engine speed as soil or travel drive absorb varying amounts of energy) are compensated by comparing actual and setpoint values.

## 3.26.01 Switching the compaction system on and off

The dynamic compaction system is deactivated every time the engine is started.




| No. | Symbol | Meaning |
|---|---|---|
| [1] | | Compaction system preselection switch |
| [2] | | Amplitude switch |
| | | Small amplitude |
| | | Large amplitude |
| | | Oscillation |
| [3] | | Frequency switch |
| | | Increase value |
| | | Decrease value |
| [4] | | Info display |
| [5] | | Operating mode switch |
| | | Manual |
| | | Automatic |
| [6] | | Dynamic compaction system/chip spreader ON/OFF switch |

## Preparing for working with dynamic compaction system

Requirement: Electrical system ON

### Selecting manual operating mode

- ▶ Press switch [5].
- ✔ The *Manual* LED lights up green.
- ✔ Use the switch [6] at the drive lever to set the dynamic compaction system to ON or OFF.

### Selecting automatic operating mode

- ▶ Press switch [5].
- ✔ The *Automatic* LED lights up green.
- ✔ The dynamic compaction system is switched on/off automatically depending on the vehicle speed. The dynamic compaction system is switched off when at low or high speed.

Always preset manual mode when restarting the machine.

## Activating compaction system

The dynamic compression of the roller drums can be performed both in combination and single for every roller drum.

The info display [4] shows the selection and the set frequency.

### Activating when driving forwards

- ▶ Press the switch [1] on the left.
- ✔ Button lights up: The drum is preselected in the forward direction of travel.

### Deactivating when driving forwards

- ▶ Press the switch [1] on the left again.
- ✔ The drum is deactivated in the forward direction of travel.

### Activating when reversing

- ▶ Press the switch [1] on the right.
- ✔ Button lights up: The drum is preselected in the reverse direction of travel.

### Deactivating when reversing

- ▶ Press the switch [1] on the right again.
- ✔ The drum is deactivated in the reverse direction of travel.

## Preselecting vibration / amplitude

### In forward driving direction

Requirement: Front compaction system is activated.

- ▶ Small amplitude: Press switch [2] on the left.
- ▶ Large amplitude: Press switch [2] on the left again.
- ✔ *Small amplitude* or *Large amplitude* icon lights green.
- ✔ The drum works with a small or large amplitude in the forward direction of travel.

**In reverse driving direction**

Requirement: Rear compaction system is activated.

- ▶ Small amplitude: Press switch [2] on the right.
- ▶ Large amplitude: Press switch [2] on the right again.
- ✔ *Small amplitude* or *Large amplitude* icon lights green.
- ✔ The drum works with a small or large amplitude in the reverse direction of travel.

The previously used amplitude is always preset each time the machine is restarted.

**Vibration frequency for versions without frequency controller**

The vibration frequency is coupled to the engine speed. Any adjustments to the engine speed will change the vibration frequency.

**Adjusting the vibration frequency**

Prerequisite: The compaction system is activated.

The frequency can be adjusted while vibration is active.

- ▶ Press the + (plus) or - (minus) switch [3].
- ✔ The frequency is increased or decreased.
- ✔ The info display [4] shows the setpoint.

The previously used frequency is always preset each time the machine is restarted.

**Oscillation for versions without frequency control**

The oscillation frequency is coupled to the engine speed. Any adjustments to the engine speed will change the oscillation frequency.

**Preselecting oscillation**

**In reverse driving direction**

Requirement: Compaction system is activated.

- ▶ Press the switch [1] on the right.
- ✔ The oscillation icon lights green.
- ✔ Roller drum in reverse direction operates with oscillation.

**Adjusting the oscillation frequency**

Prerequisite: The compaction system is activated.

The frequency can be adjusted while oscillation is active.

- ▶ Press the + (plus) or - (minus) switch [3].
- ✔ The frequency is increased or decreased.
- ✔ The info display [4] shows the setpoint.

The amplitude cannot be changed.
Switch [2] has no function.

**Setting drum in vibration**

Requirement: Diesel engine is running.

- ▶ Press switch at drive lever [6].
- ✔ In accordance with the settings, the compaction system works immediately (manual) or when driving starts (automatic).

**Switch off vibrations**

- Press switch at drive lever [6] again.

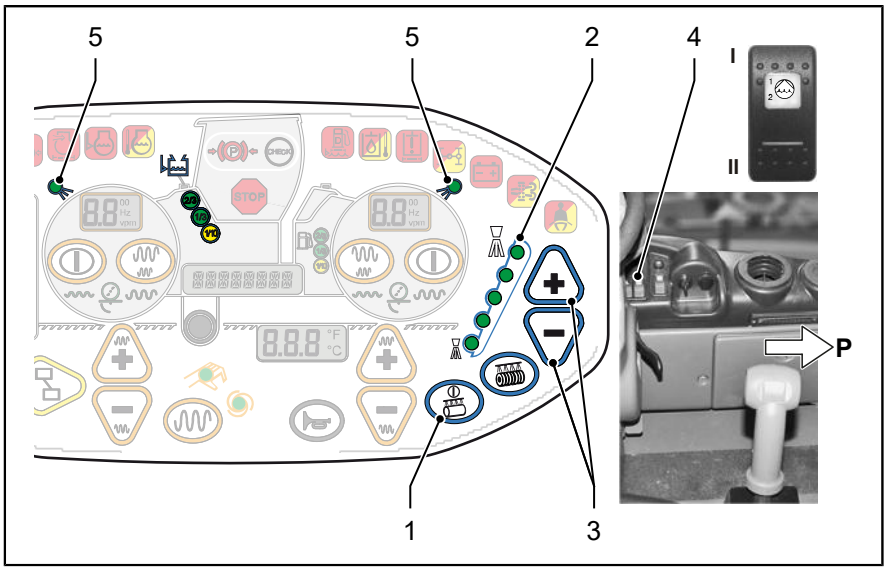
# 3.27 Driving with water sprinkling system

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 the switch [1].
- ✔ The indicator LED [5] signifies that the water pump is running.
- ✔ The illuminated dots [2] show the current sprinkling stage.

### Deactivating the water sprinkling system

- ▶ Press the switch [1] again.
- ✔ The indicator LEDs [5] are off: The water sprinkling system is deactivated.
- ✔ 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.

### Preselecting the water pump

**NOTICE**

**Corrosion!**
Damage and failure of the water pumps by corrosion.
- Operate water pumps alternately.
- Regularly check water sprinkling level and top up.

The operational reliability of the water sprinkling system is ensured by two water pumps. The water sprinkling system can be supplied by pump 1 or pump 2.

Prerequisite: The water sprinkling system is activated.

- ▶ Push the switch [4] to position I.
- ✔ Pump 1 is active.
- ▶ Push the switch [4] to position II.
- ✔ Pump 2 is active.

### Switching continuous water sprinkling on and off

Prerequisite: The water sprinkling system is activated.

- ▶ Press and hold the switch [1].
- ✔ The indicator LED [5] signifies that the water pump is running.
- ✔ The stage 5 [2] illuminated dot lights up.
- ✔ The drums/tyres are sprinkled with water while the switch is pressed.
- ✔ 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].
- ✔ The indicator LED [5] signifies that the water pump is running.
- ▶ Press and hold the + (plus) and - (minus) switches [3] simultaneously for 3 seconds.
- ✔ All illuminated dots [2] flash.
- ✔ Water is sprinkled for approx. 3 minutes.
- ▶ Check that the drums/tyres are evenly sprinkled.

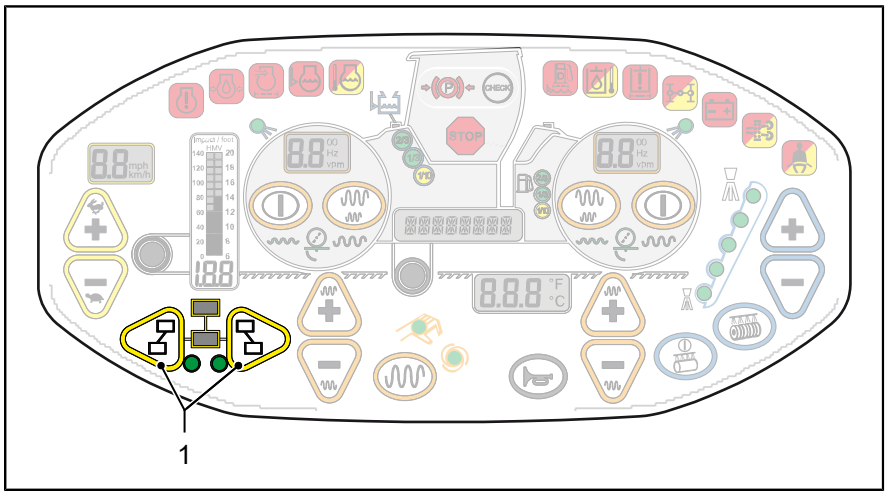
### Switching off the functional test

- ▶ Press the switch [1].
- ✔ The indicator LEDs [5] are off: The water sprinkling system is deactivated.
- ✔ The illuminated dots [2] are off.

# 3.28 Driving with track offset

In case of straight-line motion without track offset, the roller drums run on the same track.

For edge pressing or to reduce roller drum edges in the asphalt, the roller drums are laterally offset with regard to one another by applying the track offset.




**Adjusting the track offset of the rear roller drum**

- ▶ Track offset to the right: Press and hold the right switch [1].
- ▶ Track offset to the left: Press and hold the left switch [1].

**For versions with track offset display**

- ✔ Right indicator LED is lit: Rear roller drum offset to the right.
- ✔ Left indicator LED is lit: Rear roller drum offset to the left.

**Adjusting the track offset of the rear roller drum (straight run)**

- ▶ Press and hold the right or left switch [1] until the rear roller drum is returned.
- ▶ Check straight running using a visual inspection of the drum setting or by driving the machine.

**For versions with track offset display**

- ▶ Press both switches [1] at the same time.
- ✔ The track offset is automatically reset.
- ✔ Indicator LED is off: Drums are running in a straight line.

| Symbol | Meaning |
|---|---|
|  | Rear roller drum offset to the right |
|  | Rear roller drum offset to the left |
|  | Roller drum in straight run (no track offset) |

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# 3.29 Adjusting scrapers

The scrapers remove dirt adhering to the surfaces of the drums/ tyres.

For transport driving, move the scrapers away from the drums/ tyres. This prevents premature wear.

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

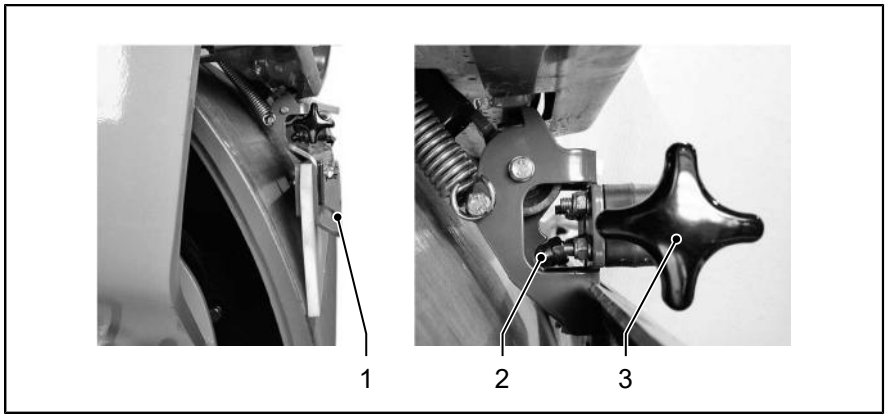
**⚠CAUTION**

**Spring mechanism under tension.**

Injury when caught and pinched.

- Do not put your hands or fingers between scraper and roller drum/tyre when applying or lifting off the scrapers.

## 3.29.01 Roller drum scraper




**Attaching the scraper**

- ▶ Switch off diesel engine and remove ignition key.
- ▶ Lift the scraper console slightly at the handle [1].
- ▶ Turn the spacer bolt [2] with locking handle [3] to the CENTRE or LOWER position.

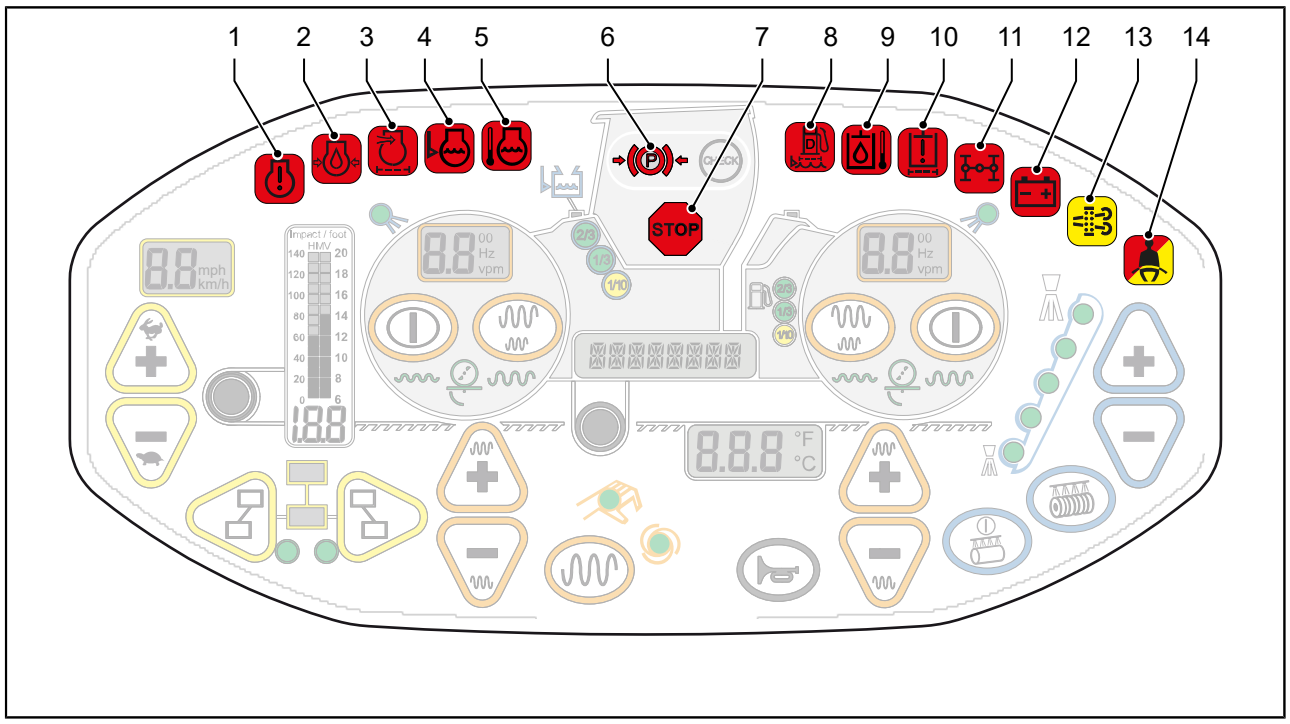
**Moving the scraper away**

- ▶ Switch off diesel engine and remove ignition key.
- ▶ Lift the scraper console slightly at the handle [1].
- ▶ Turn the spacer bolt [2] with locking handle [3] to the UPPER position.

# 3.30 Operation monitoring

## 3.30.01 Control panel – Warning and pilot lights

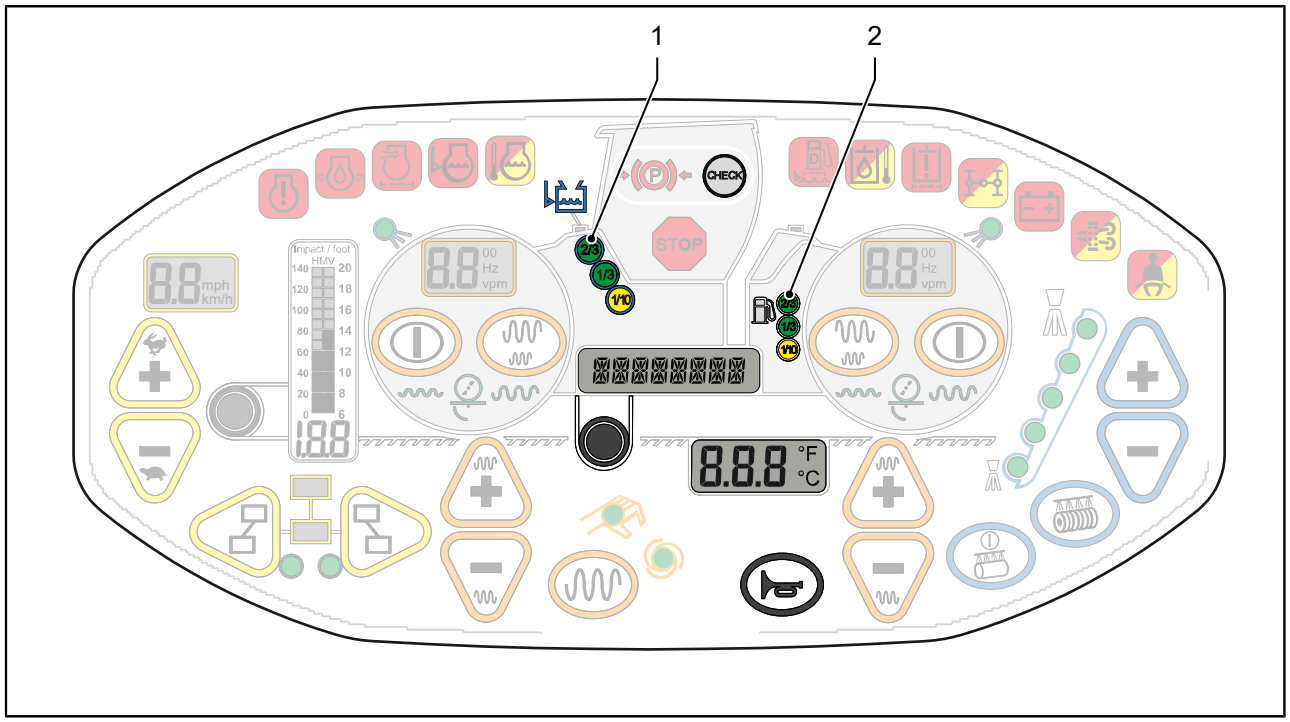



| No. | Symbol | Warning and pilot light | Status | Meaning/action |
|---|---|---|---|---|
| [1] | | Warning, notice or malfunction | lights up red | Deviation from the normal operating status (entry in the fault list, e.g. engine fault, machine fault) |
| [2] | | Engine oil pressure | flashes red | The engine oil pressure is too low.<br>Check the engine oil fill level. |
| [3] | | Air filter | flashes red | The air filter cartridge is contaminated.<br>Check the air filter. |
| [4] | | Coolant fill level | flashes red | The coolant fill level is too low.<br>Check the coolant fill level. |
| [5] | | Engine temperature | lights up yellow | Warm-up phase |
| | | | lights up red | Engine temperature is high. |
| | | | flashes red | Engine has overheated. |
| [6] | STOP | Serious fault | flashes and an acoustic signal sounds | Indicates a serious fault.<br>At least one warning light is flashing and an error code is displayed.<br>Stop using the machine. |

| No. | Symbol | Warning and pilot light | Status | Meaning/action |
|---|---|---|---|---|
| [7] |  | Parking brake | flashes red | Parking brake is applied or EMERGENCY STOP is active |
| [8] |  | Water sump fuel prefilter | flashes red | Water sump in the fuel prefilter too high. Drain the filter cartridge in the fuel pre-filter. |
| [9] |  | Hydraulic oil temperature | lights up yellow | Warm-up phase |
| | | | lights up red | Hydraulic oil temperature is high. |
| | | | flashes red | Hydraulic oil temperature has overheated. |
| [10] |  | Pressure filter hydraulics | flashes red | Filter cartridge of the hydraulic oil filter is contaminated. Change the filter insert of the pressure filter for the hydraulic system. |
| [11] | | without function | without function | |
| [12] |  | Charge current (battery) | flashes red | No charge current: Check the electrical system.<br>Contact customer service. |
| [13] | | without function | without function | |
| [14] |  | lights up yellow and an acoustic signal sounds. | Seat belt is not fastened. Fasten the seat belt. | |

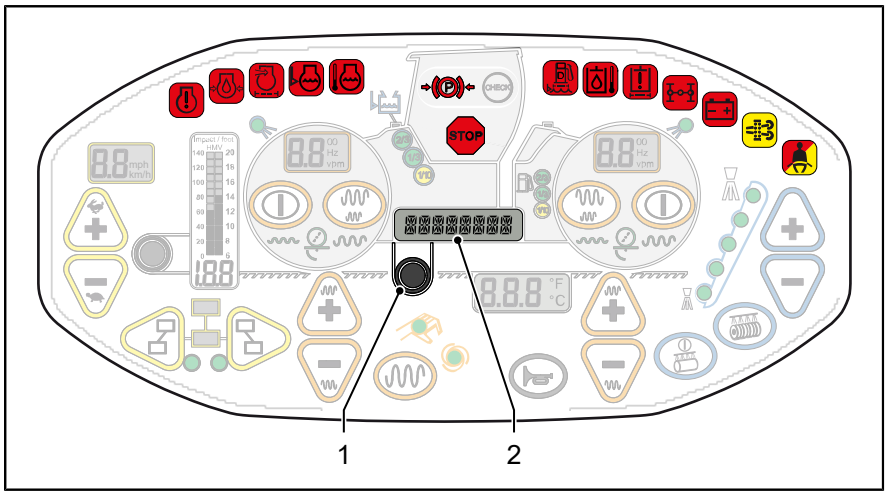
 

## 3.30.02 Control panel – Fill level control indicator




| No. | Symbol | Indication | Status | Meaning/action |
|---|---|---|---|---|
| [1] | | Water sprinkling system fill level | lights up green | Water available |
| | | | lights up yellow | Water fill level approx. 10–20%:<br>Top up the water sprinkling system. |
| | | | flashes yellow | Water fill level below 10%:<br>Top up the water sprinkling system. |
| [2] | | Fuel fill level | lights up green | Fuel available |
| | | | lights up yellow | Fuel fill level approx. 10–20%:<br>Top up the fuel. |
| | | | flashes yellow | Fuel fill level below 10%:<br>Top up the fuel. |

## 3.30.03 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).

**Diagnostic codes**

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

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

**Level 2: Service data**

**Change to level 2**

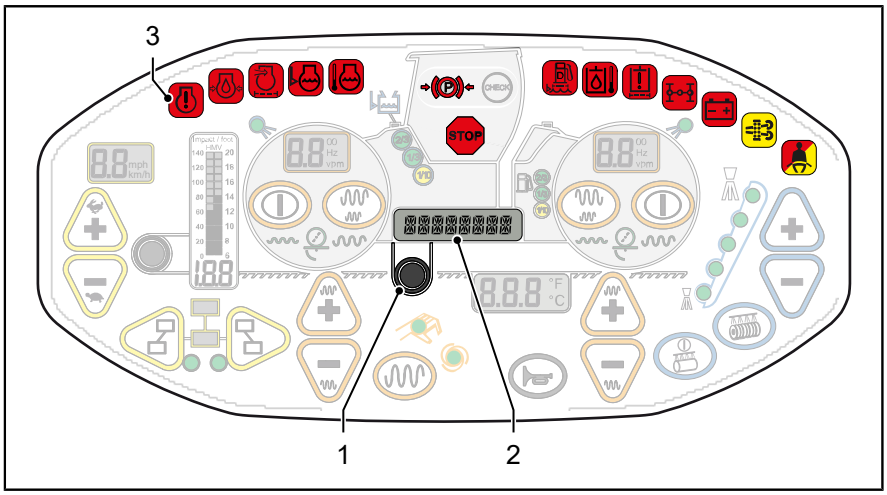
- Press the switch [1] for 2 seconds.

**Indication**

- Machine type
- Exhaust emissions category – Diesel engine
- Software version – Control panel
- Software version – Machine computer
- Software version – HCM (if installed)

## 3.30.04 Info display – Diagnostic codes




After switching on the electrical system, an internal component test is performed. A short acoustic signal sounds when a fault is detected. The info display [2] shows all the existing faults one after the other in the form of diagnostic codes.
If the fault is caused by the diesel engine, the warning light [3] is also lit.
Other warning lights can indicate the cause of a fault.

Faults that occur during operation are also indicated by an acoustic signal in the info display [2]. The individual categories, such as operating hours, engine speed, diagnostic code etc., can be selected with the 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:**

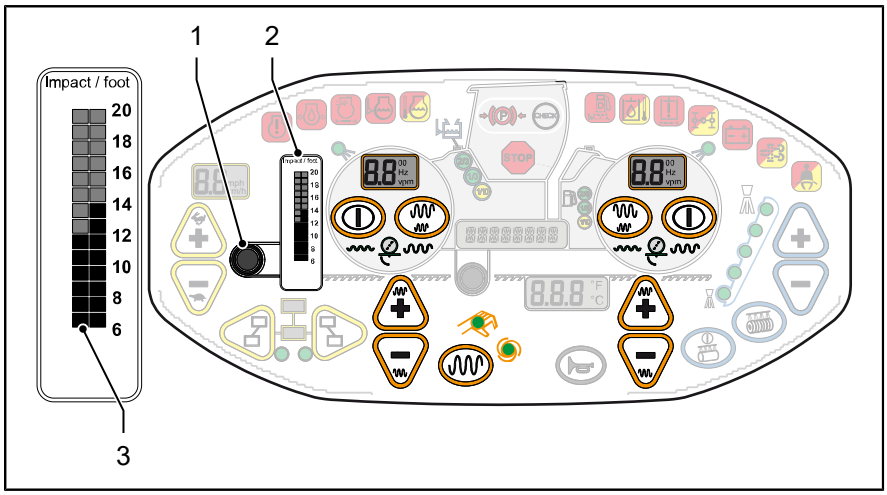
The number indicates diesel engine faults in fault class ENGINE_. In order to determine the type of fault, the engine's own SPN code (e.g. S_523914) and FMI code (e.g. F_1) are also displayed after each individual fault message (e.g. ENGINE_2).

The diagnostic code for engine fault 2 is:

ENGINE_2 — S_523914 — F_1.

If the acoustic signal indicates a fault, please write down all the pending messages and contact your customer service agent. The diagnostic codes can only be interpreted by a service partner.

## 3.30.05 Info display - Compaction process data




### Impact per foot indicator

While the compaction system is in operation, the impact/ft indicator informs the driver of the number of compaction impacts per foot (foot = non-metric unit of measurement). The number depends on the driving speed and the vibrator frequency. The values on the left-hand side of the info display apply to the front drum. The values on the right-hand side of the info display apply to the rear drum.

### Viewing impact per foot process data

Prerequisite: The dynamic compaction system is working.

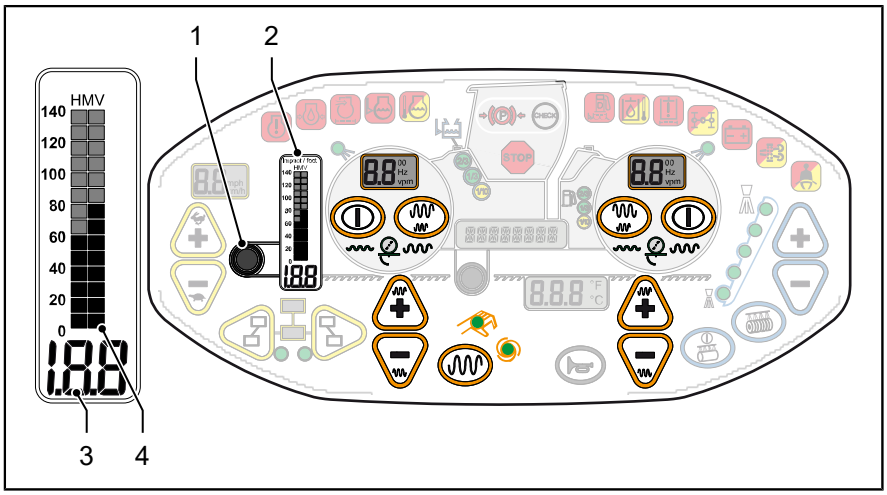
### Switching to the impact per foot process data view

Only for versions with HCM (Hamm Compaction Meter).

- ▶ Press the switch [1].
- ✔ The info display [2] shows impact/foot with the scales for the front and rear drum.

| No. | Condition | Meaning |
|---|---|---|
| [3] | Bar height | Graphic depiction of the compaction impacts per foot. |




### HM/RM value indicator (HAMM Compaction Meter)

Machines with a HAMM Compaction Meter show the stiffness of the subsoil (HM value) in the info display.

The HMV value indicates the currently achieved compaction. The driver can see whether the subgrade needs further compaction or where there is a weak point. If the machine is not equipped with a computer unit for HMV, nothing will be displayed.

### Viewing process data on compaction and jump operation

Prerequisite: The dynamic compaction system is working.

### Switching to the HMV compaction process data view

- ▶ Press the switch [1].
- ✔ The info display [2] shows the HMV with the HMV scale (both display bars run synchronously).
- ✔ The HM value is displayed by numbers.

| No. | Condition | Meaning |
|---|---|---|
| [3] | | Actual compaction value (HMV) |
| [4] | Bar height | The bar height indicates the actual compaction value (0–160 HMV) |
| | Jump operation (RMV) | The display bars and numbers for the HM value flash |
| | flashes slowly | Drum is about to change to jump operation |
| | flashes quickly | Drum is in jump operation |

# 3.31 Switching off diesel engine

Requirement: Diesel engine is running.

- ▶ Engage drive lever in the P-position.
- ▶ Switch off dynamic compaction system.
- ▶ Fullly lower 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.

# 3.32 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.

# 3.33 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).

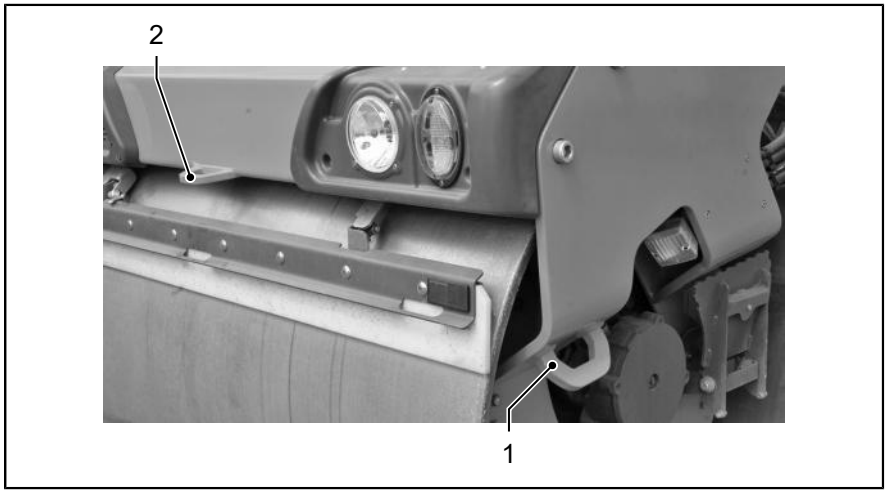
Towing of the machine requires sufficient knowledge of the functioning of the hydrostatic transmission and the operation of the spring-operated brake.

Only allow towing to be performed by persons with towing experience, who have been informed of the dangers.

**Necessary towing tool**

- **Tow bar (normal towing)**
  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-loaded brake released.
- **Hauling lines or hauling chains (for machine recovery from a dangerous situation)**
  Hauling lines or hauling chains with a sufficient tensile force (at least twice the operating weight of the machine) for recovering the machine uphill and/or when the spring-loaded brake is not released.

## 3.33.01 Preparing machine for towing

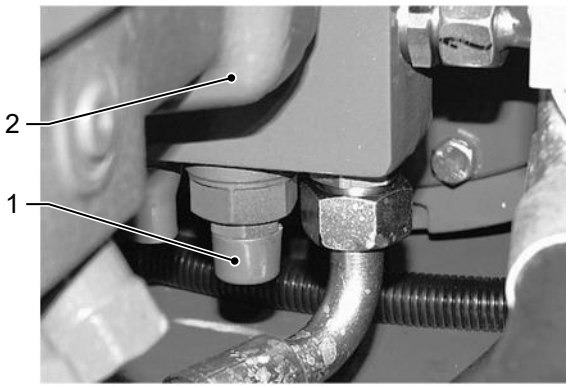


- ▶ Press the drive lever from 0 position to the right, in position P.
- ✔ The drive lever is blocked.
- ✔ Parking brake indicator light lights up: Parking brake is active.
- ✔ The transmission is not active.
- ▶ Shut down the diesel engine if is is still functional.
- ▶ Use parking chocks to secure machine against rolling away.
- ▶ Replace damaged pipes and hoses from which oil leaks before towing (environment protection).
- ▶ Attach towing tools to the lashing points [1] or to the towing eye [2] of the machine and the towing vehicle.
- ▶ Depressurize the hydraulic system. (see "Depressurize the hydraulic system").
- ▶ Releasing spring-operated brake (see "Release spring-operated brake").

## 3.33.02 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.

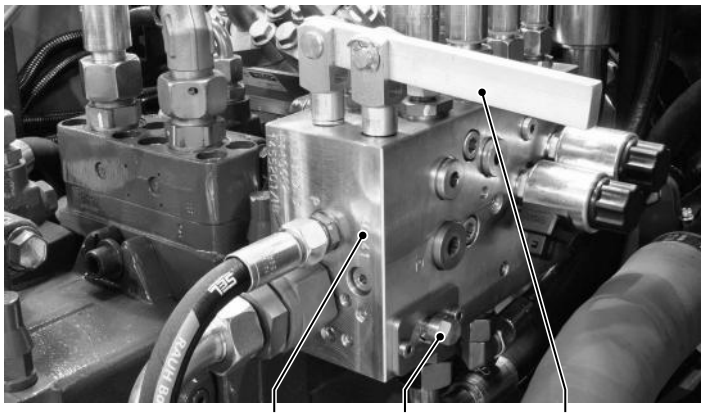
Do not screw out the screw by more than 2 turns out of the housing; otherwise, hydraulic oil may flow out between screw and housing or air may enter into the system.

**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.

## 3.33.03 Releasing the spring-operated brake

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




**Putting spring-powered brake out of operation**

- ▶ Turn the hexagon screw [2] at the valve block [1] clockwise as far as possible.
- ▶ 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.

**Enabling spring-operated brake again**

- ▶ Turn the hexagon bolt [2] counterclockwise up to the stop.
- ✔ Parking brake is applied again.
- ✔ The machine can be repaired.

## 3.33.04 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.

# 3.34 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!**

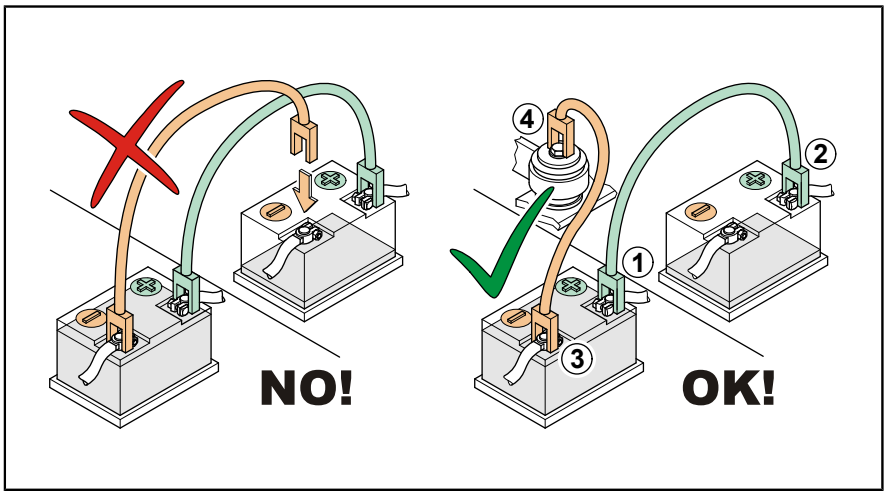
Risk of being trapped, pulled in, and injured by rotating engine parts.

- Lay leads 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.

# 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.

**⚠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**

**Uncontrolled movements!**
Damage to machine or environment by uncontrolled steering system movements and by consequent front or rear end swings.
- Applying safety strut before:
  - crane loading the machine.
  - transporting the machine.
  - maintenance and repair work.

**NOTICE**

**Swivel range of the engine compartment door!**
Material damage while opening the engine compartment door.
- Keep an adequate lateral distance from other vehicles and objects.
- Before opening the engine compartment door, completely close, or completely open and lock the cab door and the cab window. Do not let doors or windows project outwards from the cab.

**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 250 operating hours** **Hydraulic system maintenance**

▶ Replace filter insert in the pressure filter for hydraulic system (see page 169).

## 4.00.03 Maintenance overview

For engine maintenance, see instruction manual for diesel engine.

### Every 10 operating hours

10 h

| | |
|---|---|
| Check that the parking brake is working properly | see page 149 |
| Check the function of the seat contact switch | see page 150 |
| Test the EMERGENCY STOP function with the machine stationary | see page 151 |
| Check the hydraulic oil fill level | see page 167 |
| Clean the sprinkler nozzles | see page 179 |
| Check the engine oil fill level | see the instruction manual Diesel engine |
| Check the coolant fill level | see page 165 |
| Check/clean the air filter/dust valve | see page 162 see page 162 |
| Clean the filter for the water sprinkling system | see page 178 |

### Every 250 operating hours

250 h

| | |
|---|---|
| Check/lubricate the scraper | see page 173 ff. |
| Check the vibrator oil fill level | see page 180 |
| Check the V-belt tension | see the diesel engine instruction manual |
| Check the V-belt tension of the air conditioning system | see page 152 |
| Lubricate the pivoted bearing | see page 175 |
| Lubricate the steering cylinder bolts | see page 175 |
| Check the radiator | see page 164 |
| Check the air conditioning system | see page 152 |

### Every 500 operating hours, at least once a year

500 h

| | |
|---|---|
| Replace the fresh air filter of the operator's cab | see page 153 |

| | | |
|---|---|---|
|  | Replace the filter insert in the pressure filter for the hydraulic system | see page 169 |
|  | Check the damping elements | see page 180 |
|  | Change the engine oil | see the instruction manual Diesel engine |
|  | Replace the lubrication oil filter in the diesel engine | see the instruction manual Diesel engine |
|  | Replace the filter cartridge in the fuel filter | see page 157 |
|  | Change the filter cartridge for the fuel prefilter | see page 158 |
|  | Clean/replace the filter insert in the dirt and water separator | see page 161 |
|  | Replace the air filter cartridge | see page 163 |
|  | Check and clean the seat adjustment guides | see page 154 |
|  | Check the starter battery | see page 170 |

**Every 1000 operating hours, at least once a year**


| | | |
|---|---|---|
|  | Change the vibrator oil | see page 181 |

**Every 2000 operating hours, at least every two years**


| | | |
|---|---|---|
|  | Test the EMERGENCY STOP function when engine is in driving mode | see page 151 |
|  | Clean the water sprinkling system | see page 177 |
|  | Replace the valve cover seal | see the diesel engine instruction manual |
|  | Change the hydraulic oil | see page 168 |
|  | Replace the V-belt | see the diesel engine instruction manual |
|  | Replace the V-belt of the air conditioning system | see page 152 |
|  | Change the coolant | see page 166 |

Change the safety cartridge see page 163

Replace the ventilation filter in the hydraulic oil reservoir see page 168

## 4.00.04 Required maintenance parts

### HD+ 120, HD+ 140 all types (TCD 2012 L4 2V)

H2590001 →

| 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 |
| 11.5 l | Engine oil | □ | | | | D | | |
| 40.0 l | Hydraulic oil | ▭ | | | | | | D |
| 16.0 l | Coolant | ○ | | | | | | D |
| (2x) 10.7 l | Vibrator oil (HD+ 120, for drum with vibration) | ◇ | | | A | | D | |
| (2x) 13.2 l | Vibrator oil (HD+ 140, for drum with vibration) | ◇ | | | A | | D | |
| 1 | V-belt | Generator | 2043529 | | A | | | D |
| 1 | V-belt | Coolant pump | 1213156 | | A | | | D |
| 1 | ✻V-belt | Air conditioning system | 1220357 | | A | | | D |
| 1 | Air filter cartridge | | 2051200 | | A | D | | |
| 1 | Safety cartridge | | 2051202 | | | | | D |
| 1 | Filter cartridge | Lubricating 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 |
| 2 | Filter insert | Hydraulic system | 2574029 | 250D | | D | | |
| 1 | Seal | Valve cover | 2064824 | | | | | D |
| 1 | Ventilation filter | Oil tank | 1259334 | | | | | D |
| 1 | Filter insert | Water filter | 2033909 | | A | | | |
| 1 | ✻Dryer | Air conditioning system | 2071188 | | | | | D |
| 2 | Filter cartridge | Heating housing | 2146978 | | | D | | |
| 2 | Operator's cab filter mat | Fresh air | 2545574 | | | D | | |
| 24 | Damping elements for the roller drum suspension | | 1524771 | | | A | | |
| 1 | Service kit | | | 2638943 | | 2638945 | | 2638946 |

| Quan-tity | 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 |
| A = check, replace if necessary, D = replace | | | | | | |

All necessary maintenance parts for the corresponding maintenance interval are assembled in a service kit. You 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 may only be performed by specifically trained and authorized personnel.

Welding work on the machine may change the characteristics of the machine, and are only permissible with the agreement of the manufacturer.

Welding work on safety-related components may only be performed by the authorized customer service of the manufacturer.

**⚠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.

***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:

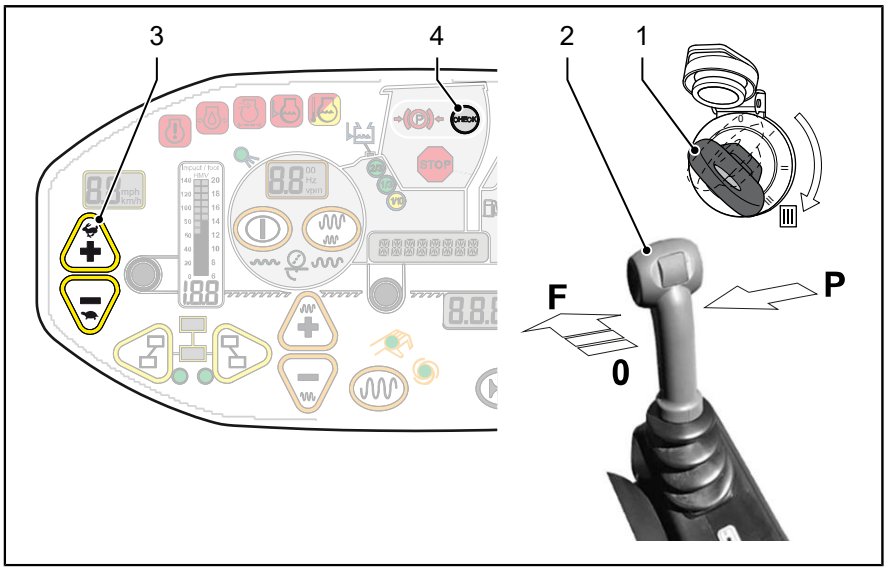
▶ Replace or regrind non-slip profiles with a minimum height of 1 mm.

For sand-coated foils:

▶ Replace ineffective or worn foils.

## 4.01.03 Check that the parking brake is working properly

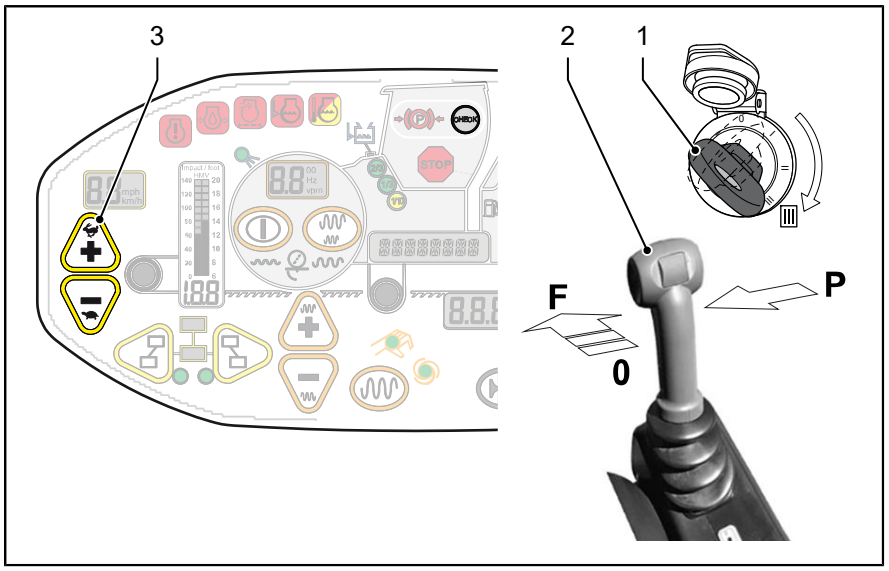



**Checking the parking brake when the machine is stationary**

- ▶ 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 Check the function of the seat contact switch



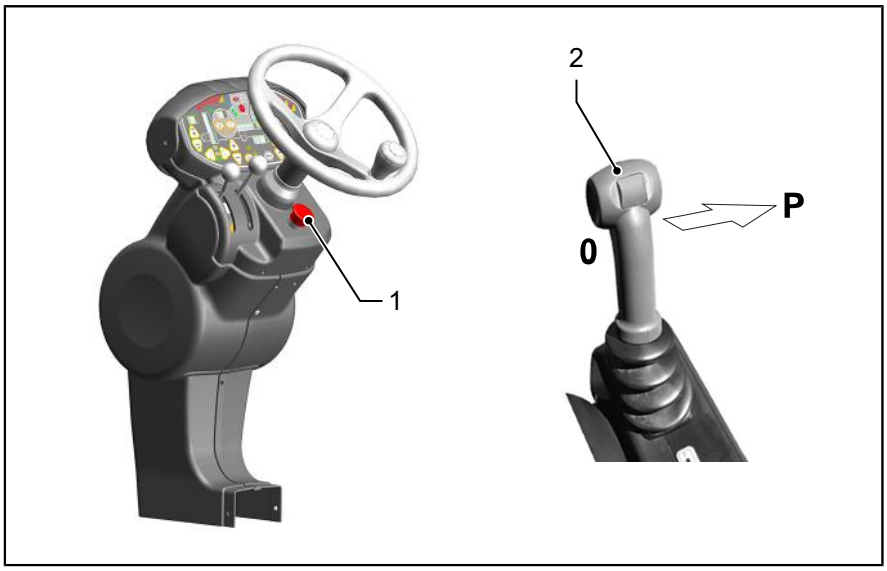

**Checking the seat contact switch when the machine is stationary**

- ▶ 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!

## 4.01.05 Testing 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:

- ✔ Switches off the working functions.
- ✔ Shuts down the diesel engine.

**Checking function during machine operation (annually)**

Carry out functional tests with the diesel engine running and the work functions (e.g. vibration) switched on.

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

The machine:

- ✔ Stops immediately.
- ✔ Switches off the working functions.
- ✔ 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**

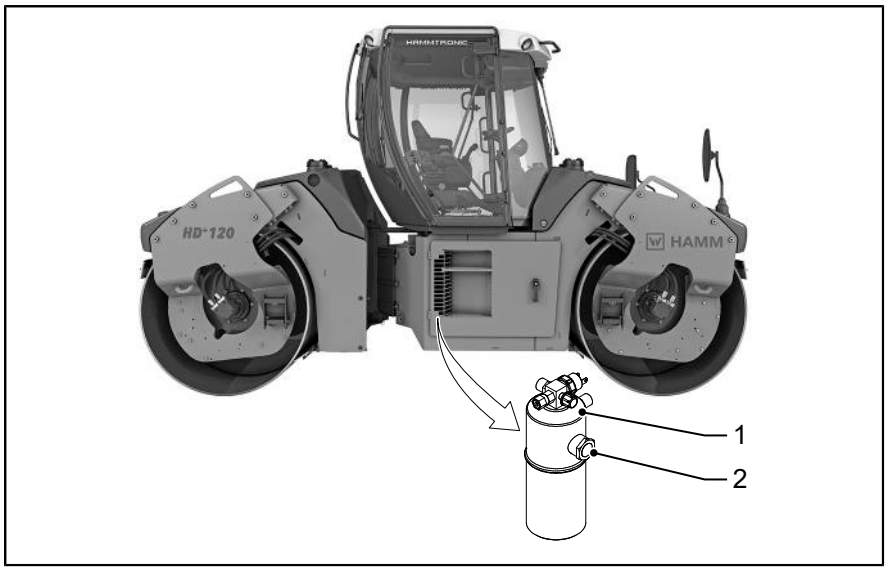
**Refrigerating agent harmful to health!**

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.

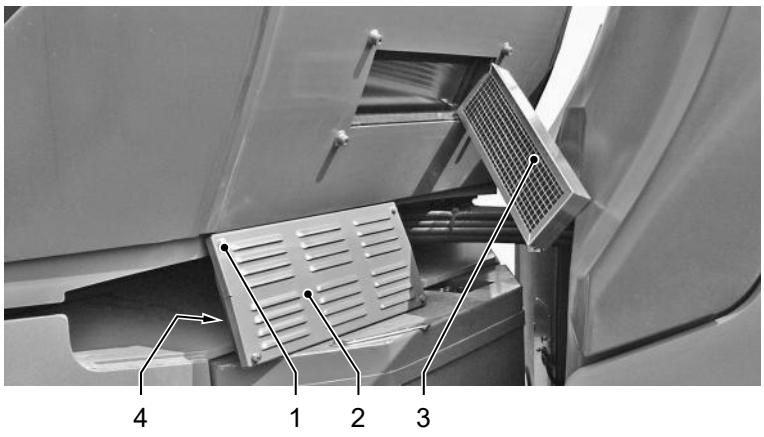



**Replacing drain bottle**

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

## 4.02.02 Replacing fresh air filter of the operator's cabin

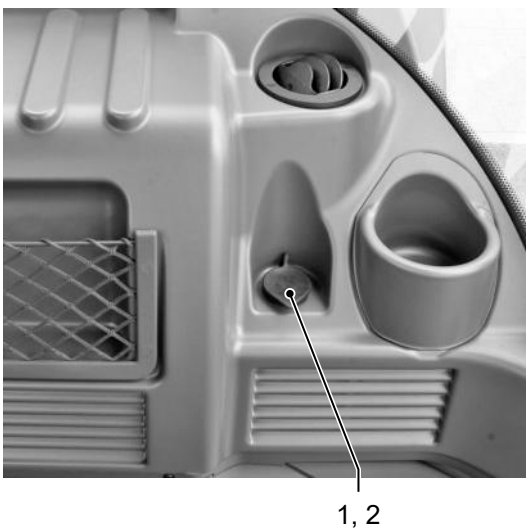



Change the filters according to the amount of dust accumulated.

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

- Switch off diesel engine and remove ignition key.
- Loosen screws [1] and remove with the cover [2].
- Remove filter element [3] from the ventilation system and replace with a new filter element.
- Replace the filter mat [4] in the cover [2].
- Install and tighten the cover [2] with the screws [1].

## 4.02.03 Checking fill level of the windscreen washer



The tank [1] of the windscreen washer is located in the operator's cabin.

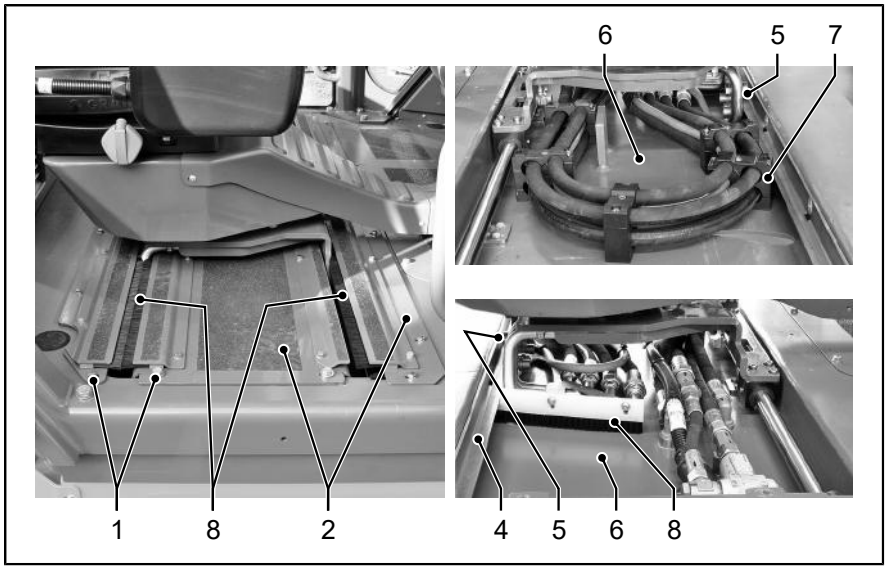
Pure water can be used to wash the windscreen.

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

Fill up windscreen washer 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].

## 4.02.04 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

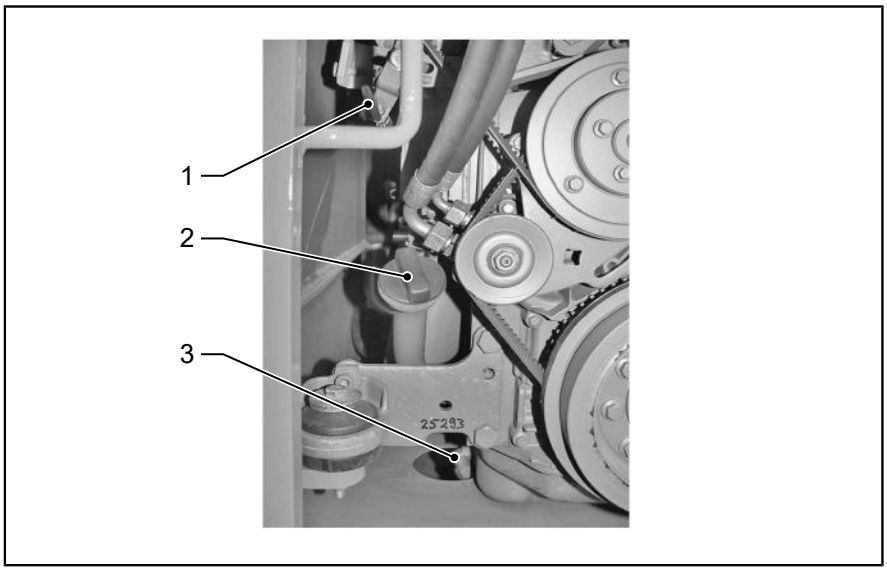
Change the lubricating oil at least once per year if the lubricating oil change intervals are not reached before the year ends.

## 4.04.02 Maintenance points on the diesel engine when changing oil

For engine maintenance see instruction manual for diesel engine!

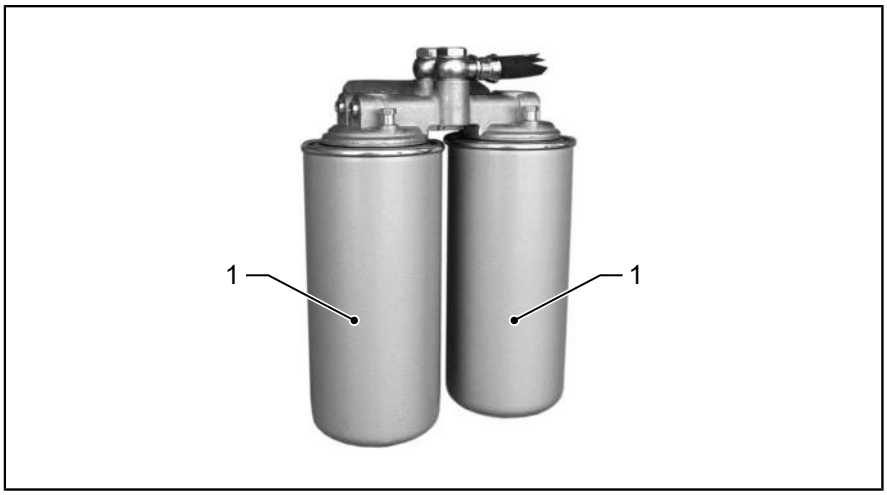
☐ Only lubricants with the following marking are permitted ("Technical data ", page 182 sqq.).



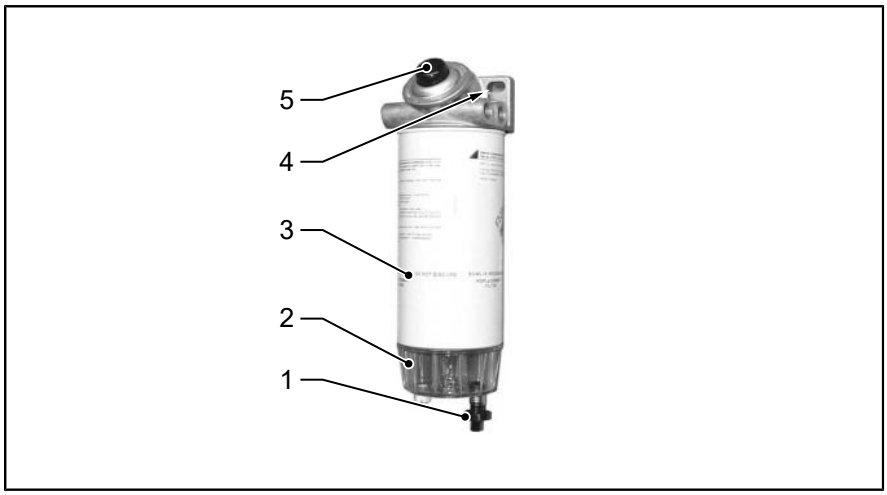

| | | | |
|---|---|---|---|
| [1] | Oil dipstick | [2] | Oil filler |
| [3] | Oil drain screw | | |

## 4.04.03 Replace the filter cartridge for the fuel filter




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

## 4.04.04 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***

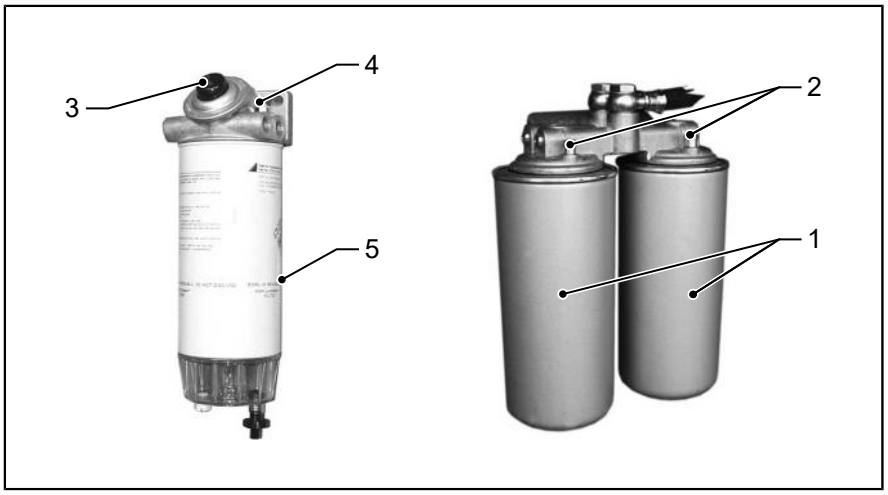
**Water sump in the fuel!**
Property damage to the diesel engine by water sump in the fuel system.

- 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.

## 4.04.05 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.

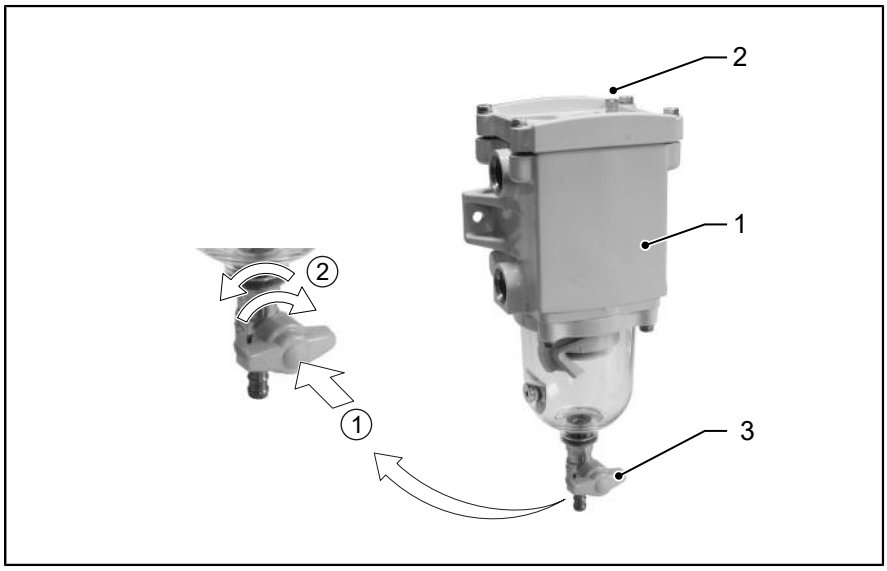
- Open the bleed screw [4] on the fuel prefilter [5].
- Actuate the manual pump [3] until fuel emerges from the bleed hole [4].
- Screw in and tighten the bleed screw [4].
- Open the bleed screw [2] on the fuel filter [1].
- Continue to actuate the manual pump [3] until fuel emerges from the bleed holes [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.

## 4.04.06 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 immediately if the pilot light of the fuel prefilter flashes.
- Drain the water separator regularly according to the water content in the fuel.

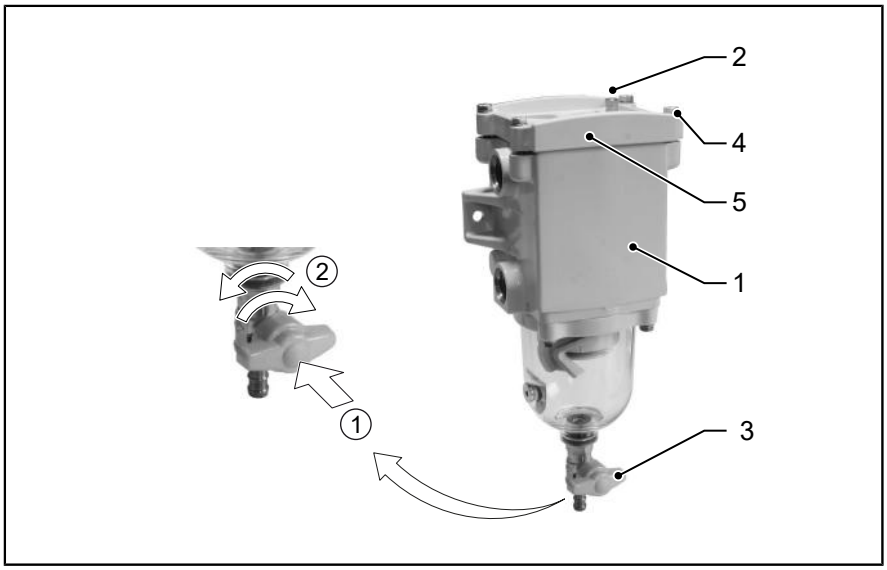



The water separator can only be bled when the bleed screw is closed.

- ▶ 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.

## 4.04.07 Cleaning/replacing the filter insert in the dirt and water separator

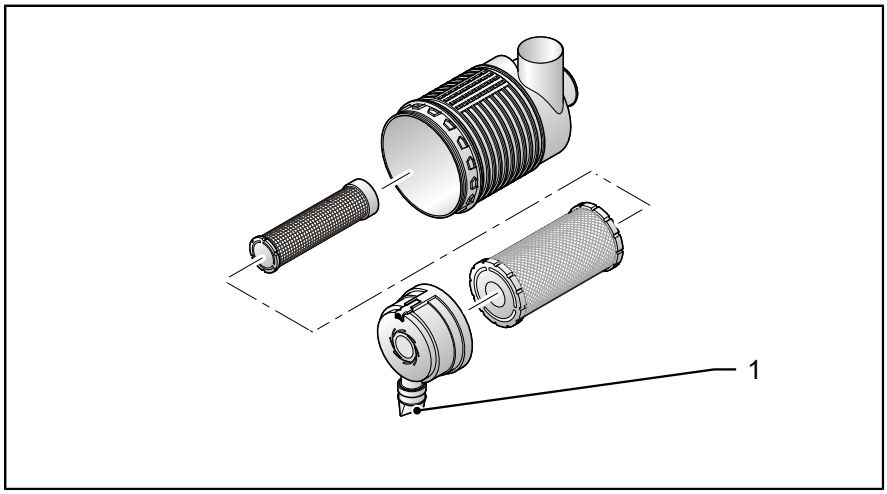



The water separator can only be bled when the bleed screw is closed.

**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.

## 4.04.08 Check and clean the dust discharge valve at the air filter.




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

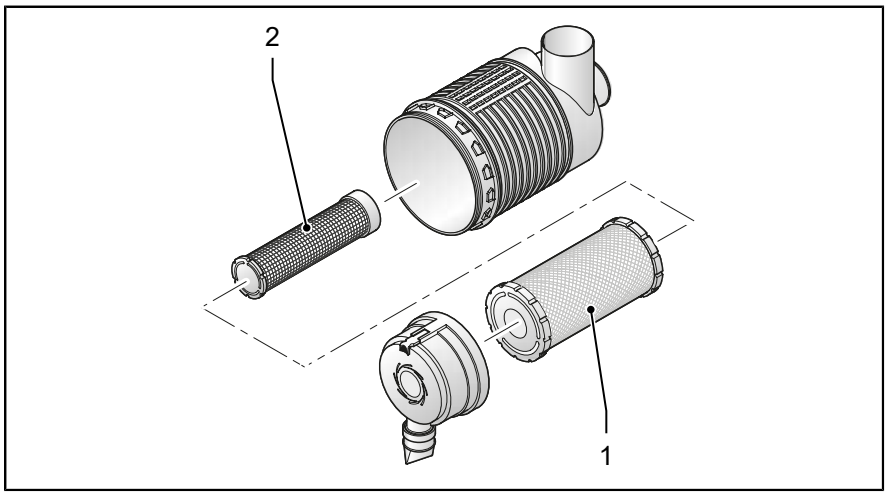
- Switch off diesel engine and remove ignition key.
- Squeeze the dust discharge valve [1] and clean the discharge slot.

## 4.04.09 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:

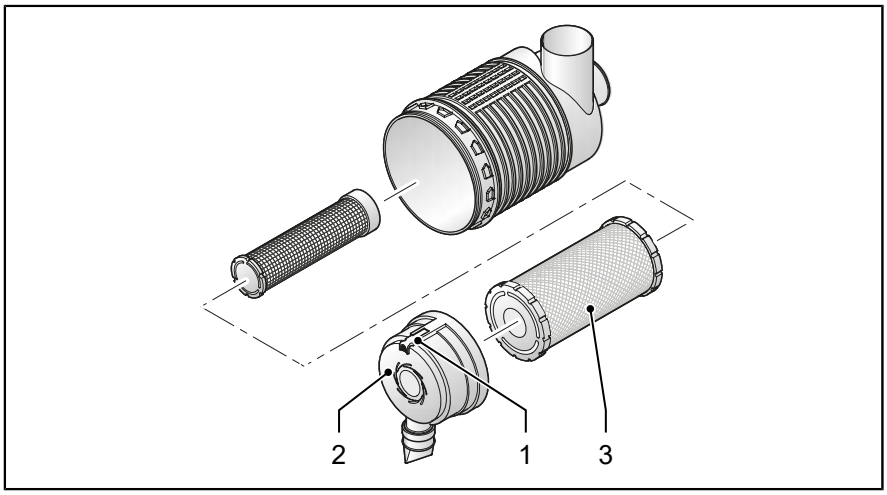
- Start diesel engine and shortly rev up to maximum speed.
- ✔ The air filter pilot light is not flashing on the information display: Air filter cartridge [1] and the safety cartridge [2] are

ready for operation.

✔ Air filter pilot light flashing on the information display: Replace the air filter cartridge [1] and/or the safety cartridge [2].

## 4.04.10 Replacing air filter cartridge

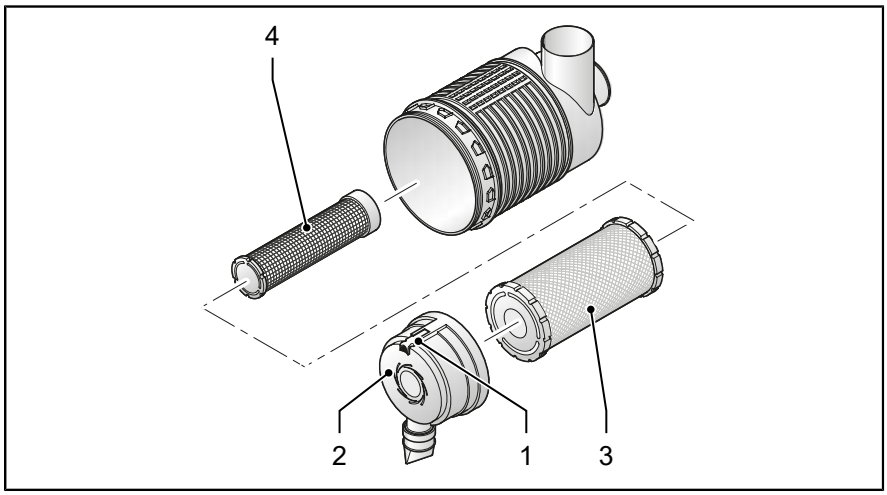



- ▶ Switch off diesel engine and remove ignition key.
- ▶ Allow machine to cool down less than 30 °C (86 °F).
- ▶ Pull out anti-rotation device [1].
- ▶ Turn the dust container [2] anti-clockwise (approx. 10°) and remove it.
- ▶ Clean the inside of the dust collectors.
- ▶ Pull out the air filter cartridge [3].
- ▶ Insert a new air filter cartridge.
- ▶ Put on the dust receiver bin and turn it clockwise to fasten.
- ▶ Insert the anti-rotation device [1].
- ▶ Check the operating readiness of the air filter.

## 4.04.11 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).
- Pull out rotary protection [1].
- Turn the dust container [2] anti-clockwise (approx. 10°) and remove it.
- 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] and turn it clockwise to fasten.
- Slide in the anti-rotation device [1].
- Check the operating readiness of the air filter.

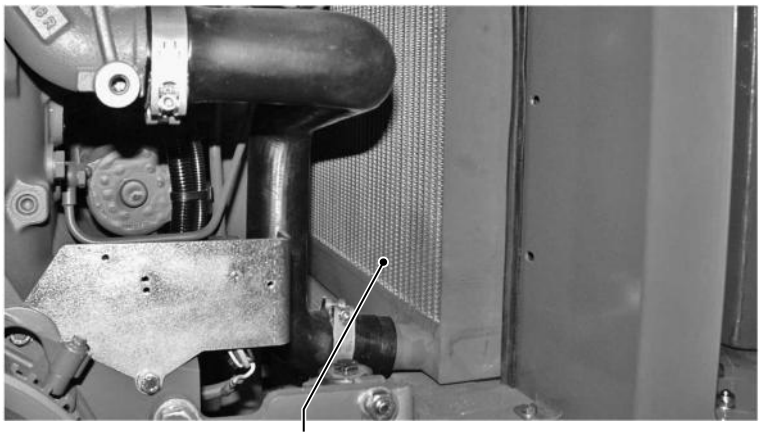
## 4.04.12 Checking/cleaning radiator

**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**

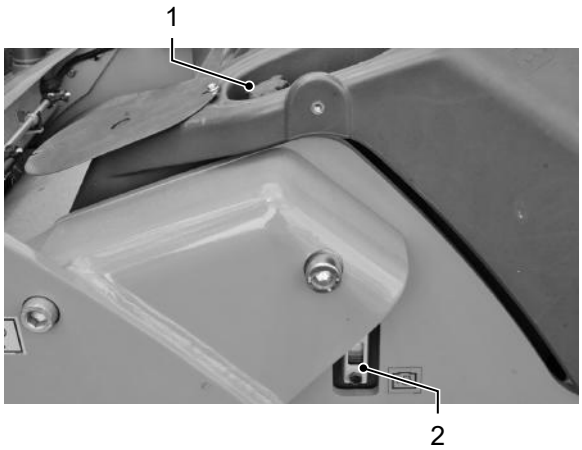
- ▶ Check the cooling fins of the radiators [2] for contamination.
- ✔ Cooling fins not soiled: The machine is ready for operation.
- ✔ Cooling fins contaminated: Clean the cooling fins thoroughly and without delay.

**Cleaning radiator**

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

## 4.04.13 Checking coolant level

○ Lubricant only admissible if containing this marking ("Technical data ", page 182 sqq.).

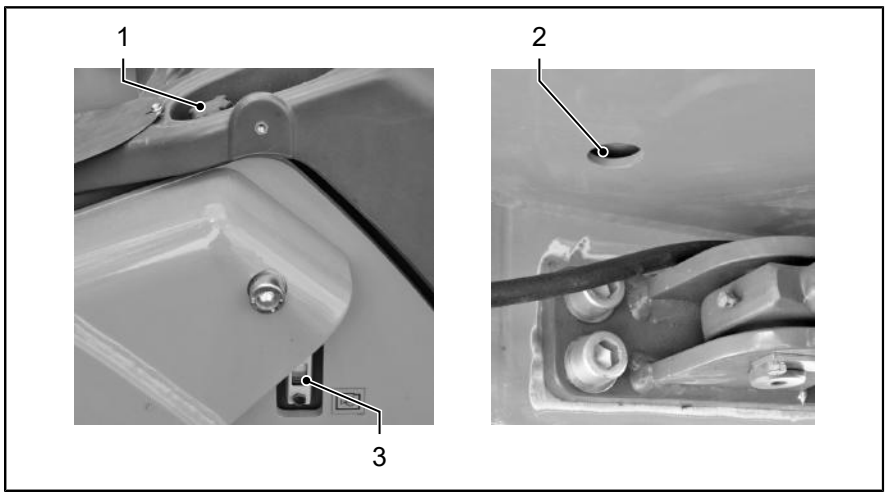



- ▶ Switch off diesel engine and remove ignition key.
- ▶ Only check the coolant level when the diesel engine is cold.

- Correct coolant level: Centre of inspection glass [2] on compensator tank. Do not exceed this level!
- In case of a lack of coolant, only fill up coolant in the specified concentration through filling opening [1] at the compensator tank.
- In case of bigger coolant losses, find out and eliminate the cause.

## 4.04.14 Changing coolant

○ Lubricant only admissible if containing this marking ("Technical data ", page 182 sqq.).




- Switch off diesel engine and remove ignition key.
- Open the sealing cap [1] at the compensation tank.
- Remove the drain plug [2] from the radiator and discharge the coolant in a provided receptacle.
- Drain the engine block according to the indications of the engine operating instructions.
- Screw in again the drain plug [2].
- Set the temperature regulator for the cabin heating to maximum temperature.
- Fill coolant up to the centre of the inspection glass [3].
- Close the filling opening 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: Centre of inspection glass [3] on compensator 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!

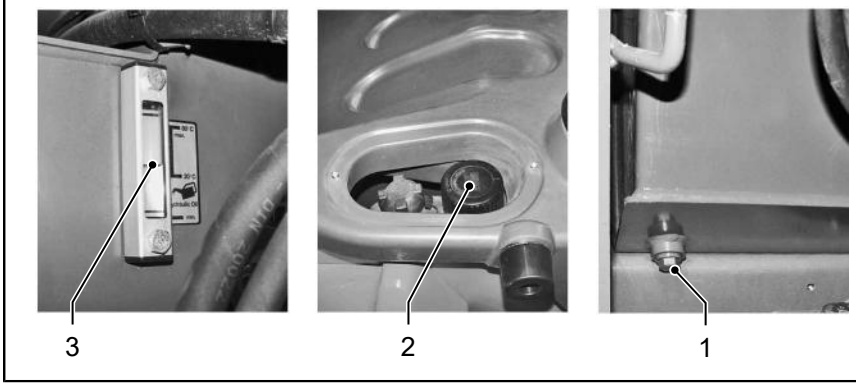
## 4.05.01 Check the hydraulic oil fill level

▭ Only lubricants with the following marking are permitted ("Technical data ", page 182 sqq.).


- ▶ Switch off diesel engine and remove ignition key.
- ▶ Allow machine to cool down less than 30 °C (86 °F).
- ▶ Correct oil level: centre of sight glass [2].
- ▶ If the oil level is too low, fill in appropriate oil through fill opening [1].
- ▶ In case of bigger oil losses, find out and eliminate the cause.

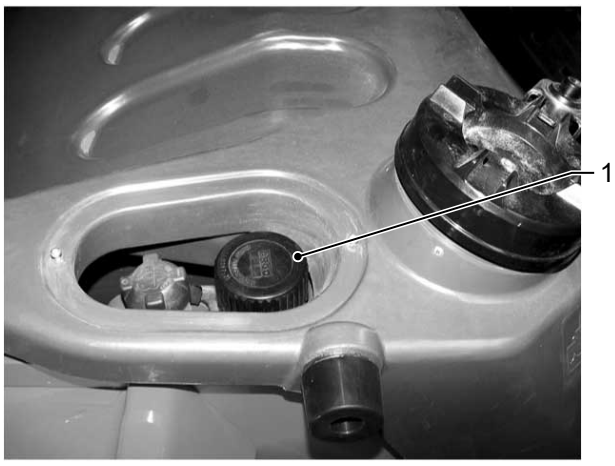
## 4.05.02 Change the hydraulic oil

▭ Only lubricants with the following marking are permitted ("Technical data ", page 182 sqq.).




- ▶ Switch off diesel engine and remove ignition key.
- ▶ Allow machine to cool down less than 30 °C (86 °F).
- ▶ Unscrew oil drain screw [1] down on the oil tank and discharge the used oil drain into a provided receptacle.
- ▶ Screw in oil drain screw [1] and tighten.
- ▶ Fill in specified oil through filling opening [2] to the centre of the sight glass [3].
- ▶ 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 the oil level of the diesel engine with the engine at a standstill. If necessary fill up to the centre of the sight glass [3].
- ▶ Check hydraulic system for leaks.

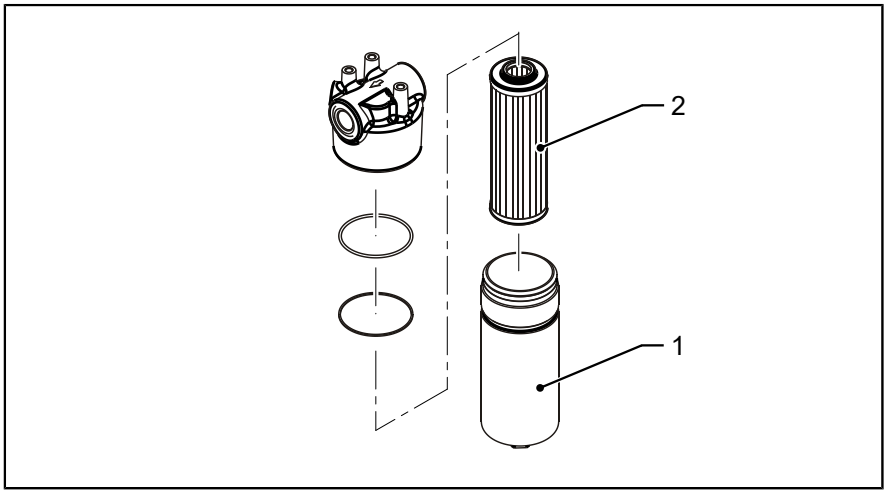
## 4.05.03 Replacing the ventilation filter for the hydraulic oil tank



- 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 [2].
- Pull the filter insert [1] 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**

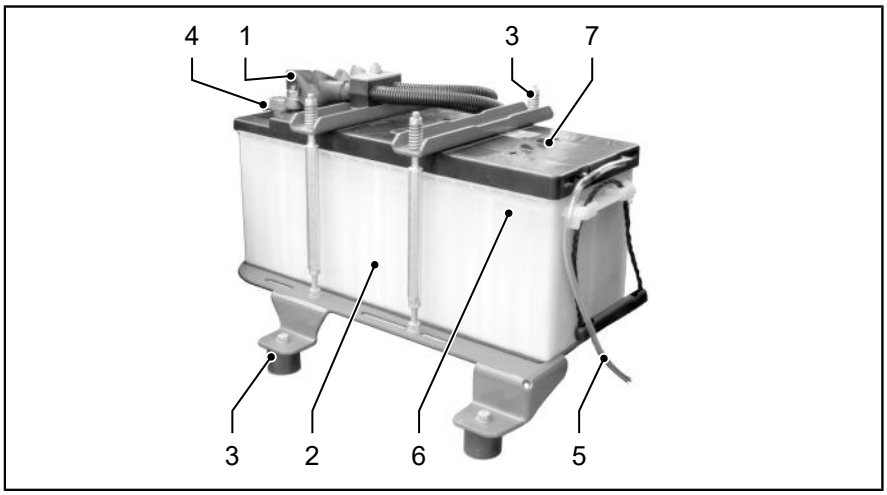
**Toxic and caustic electrolytic liquid!**

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 mounting and fastening | **[4]** | Battery terminals and terminal clamps |
| **[5]** | Degassing hose | **[6]** | Electrolyte level marking |
| **[7]** | Sealing plugs (6 pcs.) | | |

**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 roller drum / tyre scraper

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

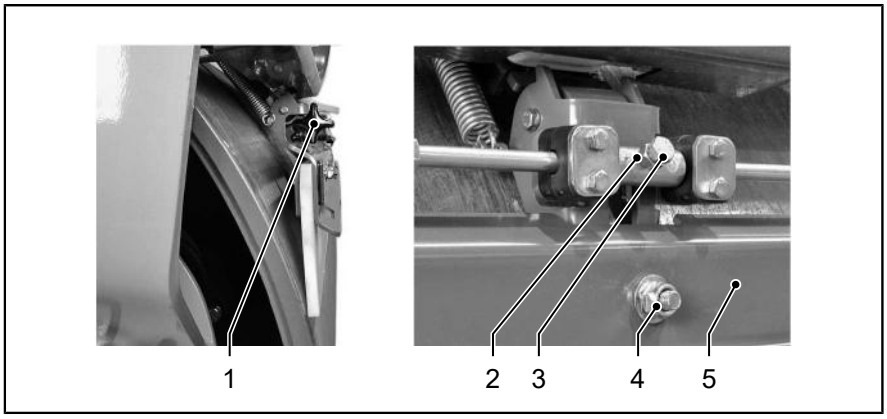
- Check scraper for cleanliness. Clean soiled scrapers.
- Check the condition of the scrapers. Replace worn scrapers in good time.
- Check setting of the scrapers. Adjust preset scrapers.

## 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 Adjusting/replacing the drum scraper

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.




**Basic setting of scraper**

- Switch off diesel engine and remove ignition key.
- Turn the spacer bolt with locking handle [1] to the CENTRE position.
- Undo the lock nut [2] (2x) and place the scraper with spacer bolt [3] on the drum.
- Tighten the lock nut [2].

**Changing the scraper**

- Switch off diesel engine and remove ignition key.
- Turn the spacer bolt with locking handle [1] to the CENTRE position.
- Undo the lock nut [2] (2x) and lift the scraper with spacer bolt [3] away from the drum.
- Undo the fastening nut [4] (2x).
- Remove the scraper console [5] from the bracket.

- Undo the clamp connections and replace the scraper with a new one.
- Tighten the clamp connection.
- Fit the scraper console [5] to the bracket horizontally.
- Tighten the fastening nut [4] (2x).
- Place the scraper with spacer bolt [3] on the drum.
- Tighten the lock nut [2].

# 4.09 Steering system

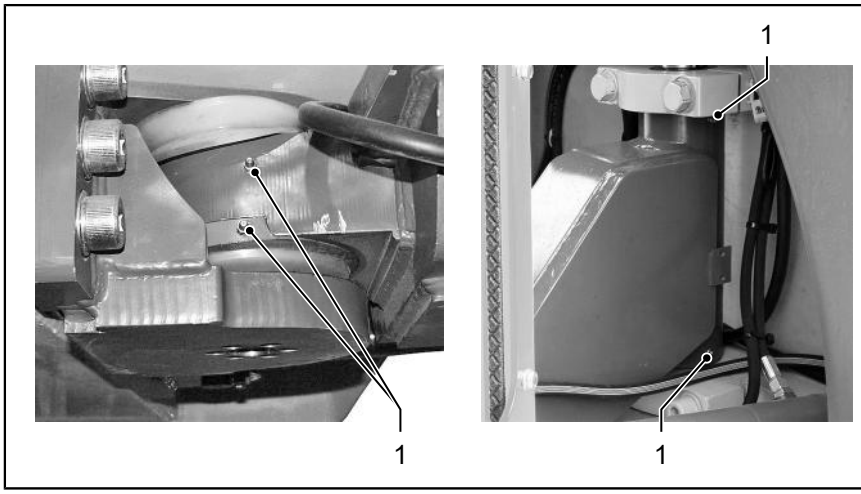
**⚠WARNING**

**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 Lubricate the pivoted bearing

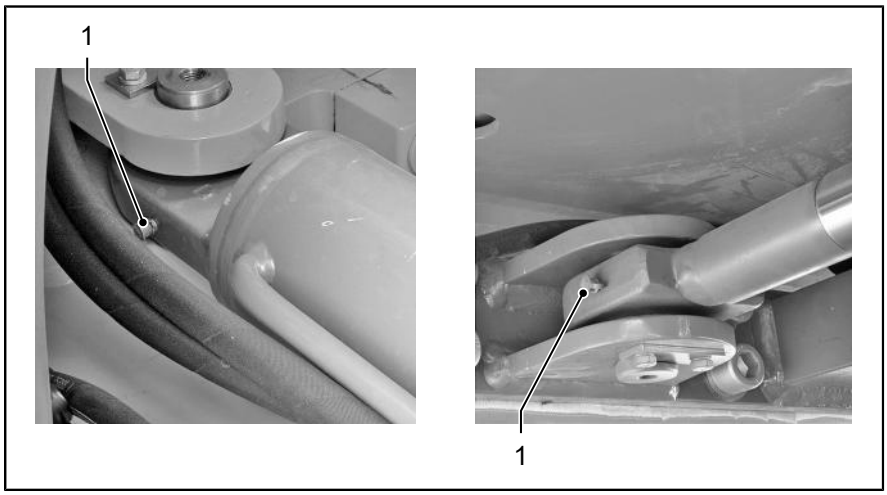
△ Only lubricants with the following marking are permitted ("Technical data ", page 182 sqq.).




- ▶ Switch off diesel engine and remove ignition key.
- ▶ Apply the articulated frame steering blocking.
- ▶ Grease lubricating nipple [1].

## 4.09.02 Lubricating steering cylinder bolts

△ Lubricant only admissible if containing this marking ("Technical data ", page 182 sqq.).




- Switch off diesel engine and remove ignition key.
- Apply the articulated frame steering blocking.
- Grease lubricating nipple [1].

# 4.10 Water sprinkling

**NOTICE**

**Corrosion and frost**

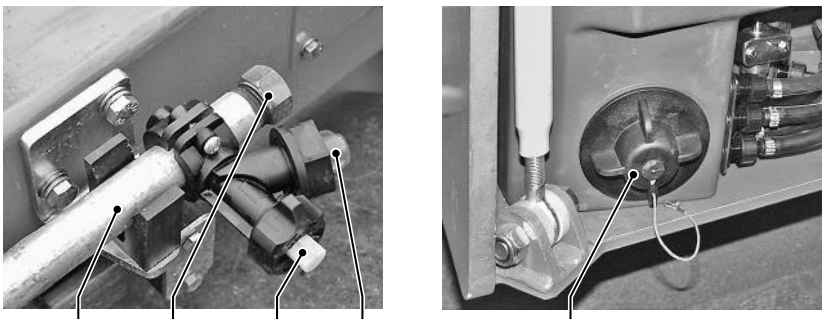
Material damage to sprinkler installations due to corrosion and frost.

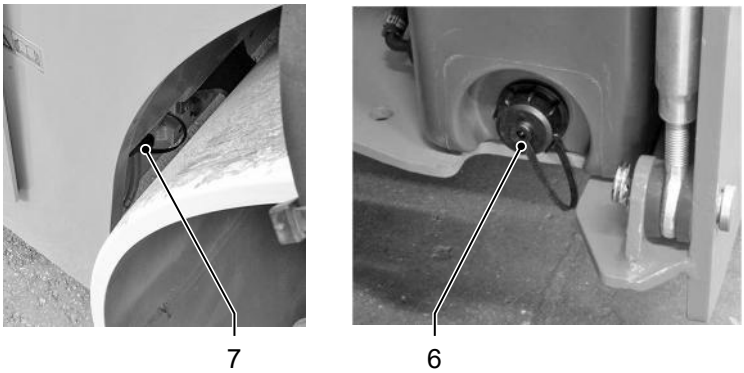
While the machine is going to be parked for an extended period of time and/or in case of danger of freezing:

- 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!

## 4.10.01 Emptying and cleaning the water sprinkling system

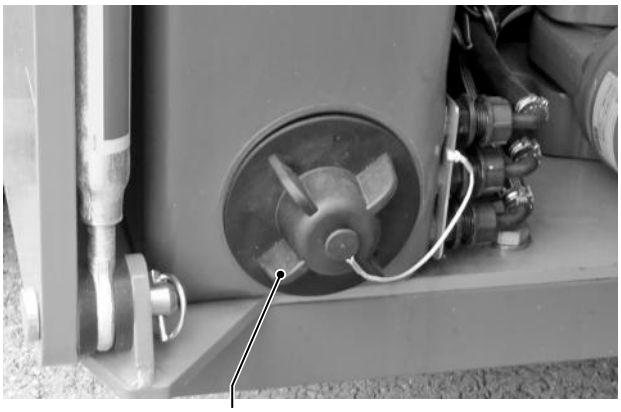



- ▶ Switch off diesel engine and remove ignition key.
- ▶ Remove a sealing cap [2] per sprinkler pipe [1] (observe internal gasket ring).

- Remove the valve insert [4] with the membrane and the sprinkler nozzles [3] with filter from the sprinkler nozzle housing.
- Unscrew the discharge caps [6], [7] from the discharge connection.
- 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.
- Screw the discharge caps [6], [7] onto the discharge connection.
- 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 and the sprinkler nozzles [3] with filter from the sprinkler nozzle housing.
- Screw sealing caps [2] per sprinkler pipe [1] (observe internal gasket ring).

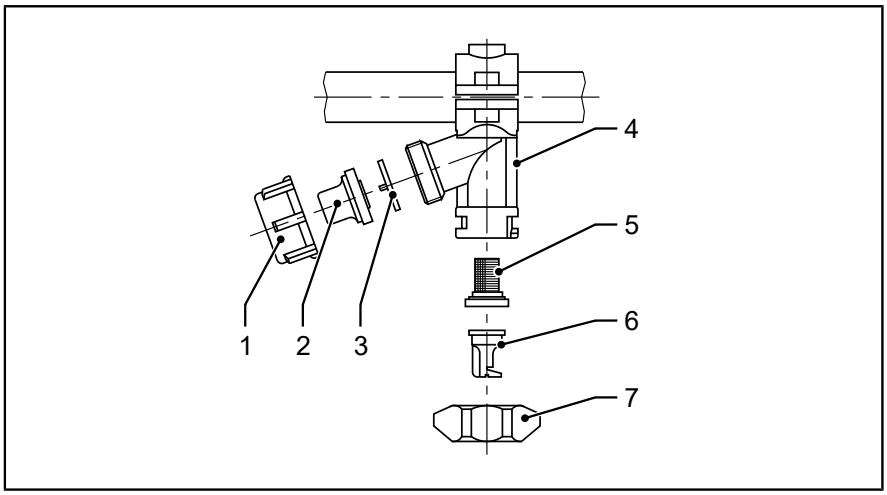
## 4.10.02 Cleaning filter for water sprinkling




- 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.

## 4.10.03 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].

# 4.26 Dynamic compaction system

Prior to maintenance works clean roller drums thoroughly.

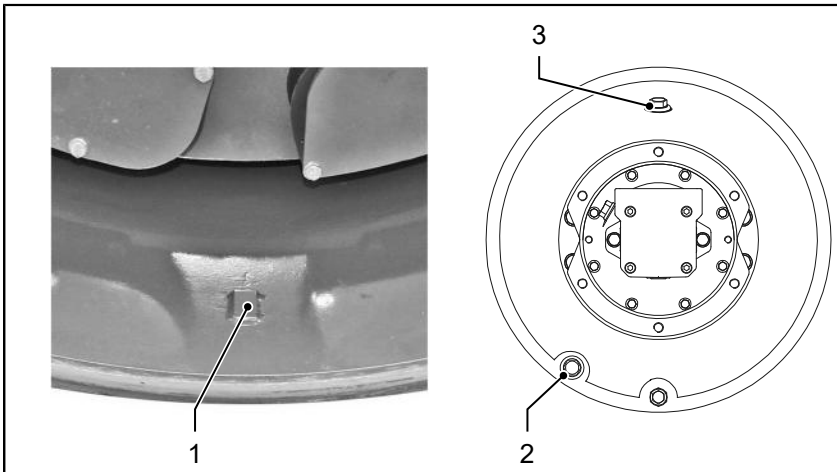
## 4.26.01 Checking damping elements


- Switch off diesel engine and remove ignition key.
- Check the damping elements [1] of the roller drum suspension for cracks.
- Let replace damaged damping elements by new ones. Contact the customer service.

## 4.26.02 Check the vibrator oil fill level

◇ Only lubricant with this marking is permitted ("Technical data ", page 182 ff.).

**Only with undivided roller drum and vibration**




- Drive the machine slowly until the mark [1] is exactly perpendicular below the axle.
- Switch off the diesel engine and remove the ignition key.

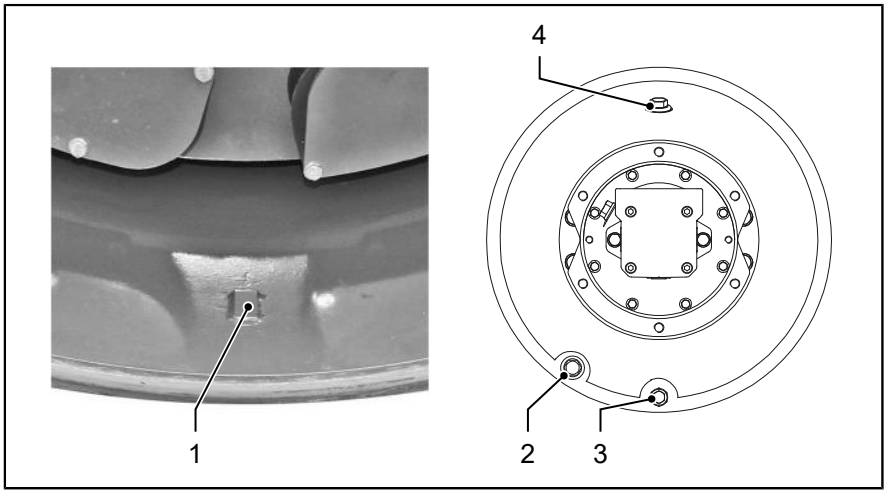
 

- Allow the machine to cool down to below 30 °C (86 °F).
- Unscrew the control screw [2]; if the oil level is correct, some oil should flow out of the control bore.
- If the oil level is insufficient, fill in oil through the filler bore [3].

## 4.26.03 Changing vibrator oil

◇ Only lubricant with this marking is permitted ("Technical data ", page 182 ff.).

**Only with undivided roller drum and vibration**




- Drive the machine slowly until the mark [1] is exactly perpendicular below the axle.
- Switch off the diesel engine and remove the ignition key.
- Allow the machine to cool down to below 30 °C (86 °F).
- Remove the filler plug [4] for the pressure equalisation purposes.
- Unscrew the oil drain screw [3] and let the used oil drain into the container provided.
- Screw in and tighten the oil drain screw [3] with gasket ring.
- Unscrew the control screw [2].
- Add the specified oil type through the filling bore [3] until oil comes out of the control bore [2].
- Screw in and tighten the filler plug [4] and control screw [2] with the corresponding gasket ring.

# 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.

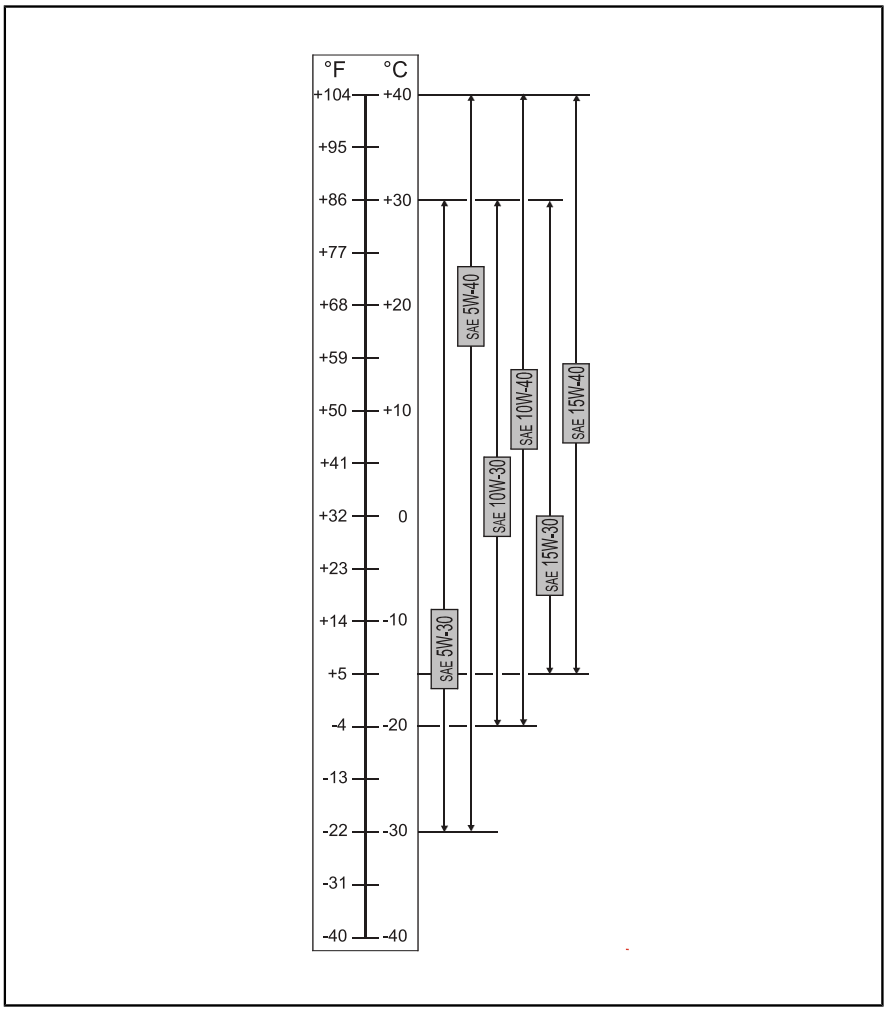
In order to avoid damaging the engine, each lubricating oil must have the viscosity suitable for its intended use.

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

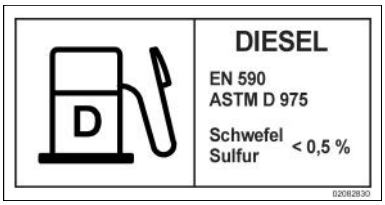
Select the engine oil suitable for your operating temperature. Take account of the SAE viscosity grades. Use multigrade oils for work in widely ranging temperatures.

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
0
+32
+23
+14
-10
+5
-4
-20
-13
-22
-30
-31
-40
-40
SAE 5W-30
SAE 5W-40
SAE 10W-30
SAE 10W-40
SAE 15W-30
SAE 15W-40

## 5.00.02 Fuel




Use only the diesel fuel commercially available which contains a sulphur content below 0.5 %. The engine oil replacement intervals specified here apply only for diesel fuel.

**Approved diesel fuel specifications are:**

- DIN EN 590
- ASTM D 975 Grade-No. 1-D and 2-D
- JIS K 2204 Grade 1 Fuel and Grade 2 Fuel, with lubricating properties corresponding to diesel fuel EN 590 (HFFR max. 460 micrometer in accordance with EN ISO 12156)

In case other fuels are used that do not comply with the afore mentioned requirements, we do not accept any guarantee.

With diesel fuels with a sulfur content over 0.5 % to 1.0 % or permanent ambient air temperatures below -10 °C (-14 °F) the change intervals of the motor oil need to be halved.

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. For all other fuels specified in this instruction manual we cannot guarantee any emission value.

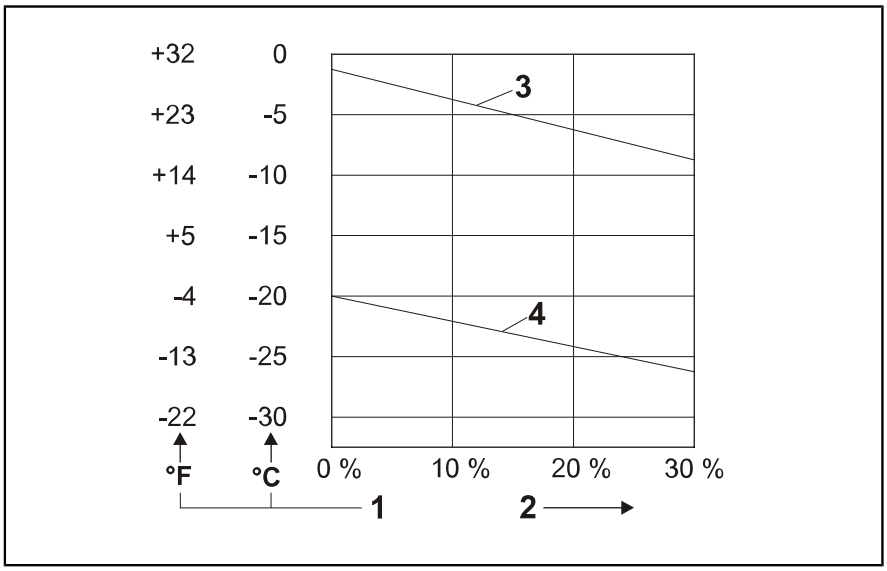
**Winter operation with diesel fuel**

***NOTICE***

**Low operating temperature!**
Congestions of the fuel system by paraffin excretions at low operating temperatures.

- Use winter diesel fuel for working at temperatures between 0 °C (32 °F) and -20 °C (-4 °F).
- For use below -20 °C (-4 °F) add petroleum according to manufacturer's instructions.
- Use special diesel fuels for working in arctic climatic zones with temperature down to -44 °C (-47 °F).




| | | | |
|---|---|---|---|
| **[1]** | Exterior temperature | **[2]** | Admixture fraction engine petroleum |
| **[3]** | Summer diesel fuel | **[4]** | Winter diesel fuel |

With lower ambient temperatures paraffin precipitations may result in congestions of the fuel system and, thus, in malfunctions.

- Below an ambient temperature of 0 °C (32 °F) it is necessary to use winter diesel fuel (up down -20 °C (-4 °F)) (gas stations provide them early enough prior to winter time).
- Below -20 °C (-4 °F) it is necessary to add engine petroleum. For the mixture ratios required please see diagram.
- For arctic climate zones up to -44 °C (-47 °F) it is possible to use special diesel fuels.

In case it is necessary to use summer diesel fuels below 0 °C (32 °F) , it is also possible to add engine petroleum up to 30 % as indicated in the diagram.

Sufficient cold resistance may be achieved by adding flow improver.

## 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 192). 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**

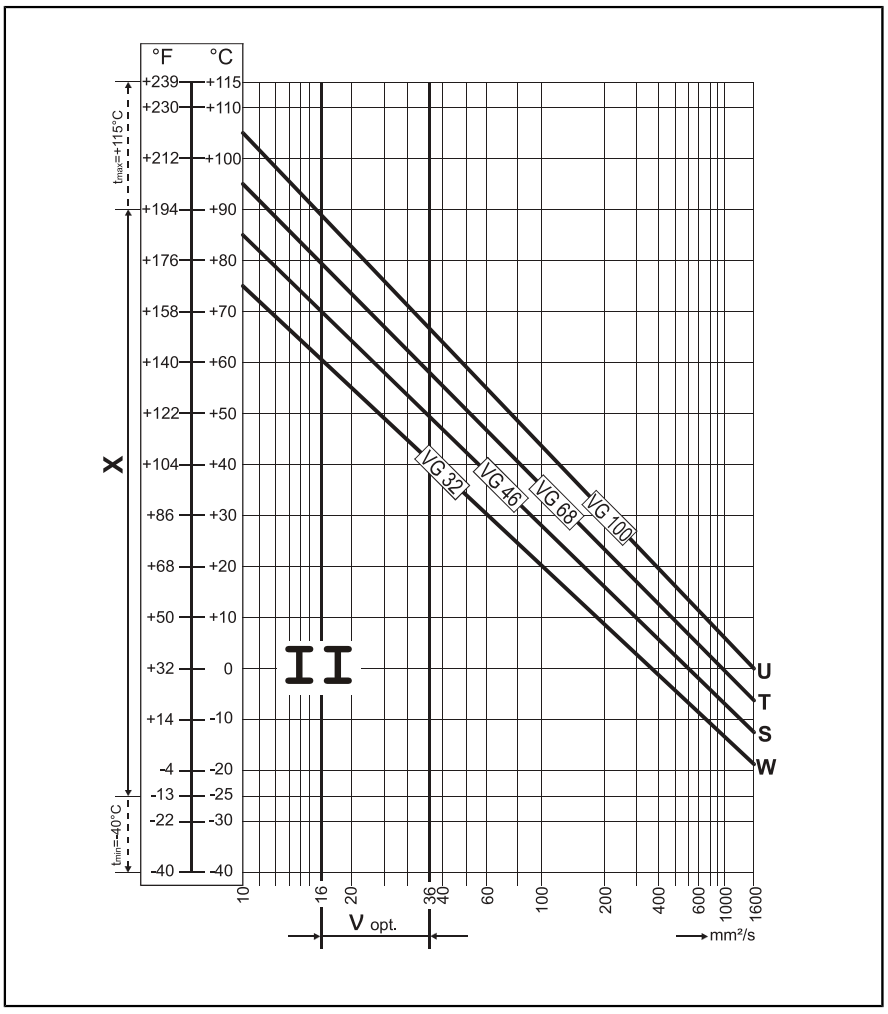
**Wrong hydraulic oils!**
Using the wrong hydraulic oils can damage or impair the function of the hydraulic system.

- 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 $mm^2$ / s ($t_{max}$ = +90 °C) ... 1000 $mm^2$ / 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 192). 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 replacing organic hydraulic fluid by mineral oil or mineral oil by organic hydraulic fluid, all filters in the oil circuit must be replaced once more 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 rubber 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.

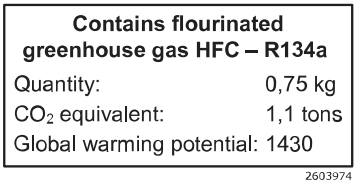
**Processing:**

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




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 details**

| Lubricant | Quality | Viscosity | Identi-fication |
|---|---|---|---|
| Engine oil<br>The oil quality must correspond to the API / ACEA classification. | API: CG-4 or higher<br>ACEA: E5-02 or higher | See chart | □ |
| Hydraulic oil (mineral oil)<br>The viscosity is determined in accordance with ISO 3448 (ISO-VG: viscosity grade). | HVLP | **Conditions**<br>ISO VG 22 arctic<br>ISO VG 32 winter<br>ISO VG 46 summer<br>ISO VG 68 tropical<br>ISO VG 100 extreme heat | ▭ |
| Hydraulic oil (biological hydraulic oil)<br>Synthetic, saturated ester<br>(ISO-VG: viscosity grade). | HEES | | |
| Special oil<br>Only HAMM special oil is admissible. | | | ◇ |
| Special oil<br>Only HAMM special oil is admissible. | | | ☆ |
| Gear box oil with Limited-Slip-Additions.<br>The oil quality must meet the API classification. | API GL-5 | SAE 85W-90 | ⬡ |
| Coolant for diesel engine, liquid-cooled (free of nitrite, amine and phosphate).<br>Mixture: 40 % coolant concentrate, 60 % water. | | | ○ |
| Lubricating grease<br>Lithium saponified multi-purpose grease with high-pressure additives.<br>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 194).

## 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 $\mu_{total}$=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 in the factory. The results are impressive:
a wide range of premium lubricants from one source augmented by highly functional accessories "Made in Germany" for filling and lubrication. The new Wirtgen Group lubricants are the "elixir of life" for your fleet of vehicles.

### Premium lubricants

Wirtgen Group lubricants combine the best basic oils and unique additives in customized specifications. The advantages for you:

- Compatibility with the first filling
- Optimum protection against wear
- Perfect protection against corrosion
- Traceability in the event of damage

Wirtgen Group lubricants consequently improve the performance and service life of your machines while at the same time durably cutting their running costs. The sensible way to save money!

### 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 “made in Germany”, such as canister pumps and grease guns, are available to assist you in filling and lubricating your machines.

| Engine oil ☐ | | | |
|---|---|---|---|
| **Designation** | **Description** | **Packing size** | **Order no.** |
| WIRTGEN GROUP Engine Oil 15W-40 | Strong heavy-duty motor oil made from excellent basic oils and special additives. It increases the power output of your engine and gives the highest operational reliability. | 5 l | 2065020 |
| | | 20 l | 2065025 |
| | | 208 l | 2065026 |
| | | 1000 l IBC | 2118572 |
| WIRTGEN GROUP Engine Oil 10W-40 | The smooth-running engine oil produced using modern synthesis technology with outstanding wear protection and cleaning characteristics is suitable for excellent and safe operating properties. Enables longer maintenance intervals as approved by 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 optimum protection against wear, even in the most difficult service conditions. Enhanced specification leads to extended lifespan and longer replacement intervals. | 20 l | 2118573 |
| WIRTGEN GROUP Hydraulic Oil HVLP 46 | High-grade multi-range hydraulic oil with zinc for optimum protection against wear, even in the most difficult service conditions. Enhanced specification leads to extended lifespan and 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 optimum protection against wear, even in the most difficult service conditions. Enhanced specification leads to extended lifespan and longer replacement intervals. | 20 l | 2118574 |

| Biological hydraulic oil ▭ | | | |
|---|---|---|---|
| **Designation** | **Description** | **Packing size** | **Order no.** |
| WIRTGEN GROUP Bio Hydraulic Oil 46 | Easily biodegradable multi-use hydraulic oil made from all-synthetic esters and ash-free additives results in excellent lubricating properties and protects the environment. Bears the ecolabel for lubricants of the EU. | 20 l | 2118575 |
| | | 208 l | 2270558 |
| WIRTGEN GROUP Bio Hydraulic Oil 68 | Easily biodegradable multi-use hydraulic oil made from all-synthetic esters and ash-free additives results in excellent lubricating properties and protects the environment. Bears the ecolabel for lubricants of the EU. | 20 l | 2124179 |

| Transmission oil ⬡ | | | |
|---|---|---|---|
| **Designation** | **Description** | **Packing size** | **Order no.** |
| WIRTGEN GROUP Gear Oil 85W-90 | Mineral high-performance gear oil for versatile use in gearboxes and axle drives. Stands out through maximum 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 gear oil for HAMM vibration bearings. Extremely resistant to pressure and temperature. Note: Do not mix with mineral gear 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 gear oil for HAMM drum drives. Extremely resistant to pressure and temperature. Note: Do not mix with mineral gear oil. | 5 l | 2571293 |
| | | 20 l | 2571294 |
| | | 208 l | 2571300 |

| Greases △ | | | |
|---|---|---|---|
| **Designation** | **Description** | **Packing size** | **Order no.** |
| WIRTGEN GROUP Multipurpose Grease | Highly refined multipurpose grease for a wide range of lubrication tasks such as on pivot pins and wheel bearings. State-of-the-art 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. Extremely 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 | Anti-corrosion agents, coolants and anti-freeze for diesel engines. | 5 l | 2173022 |
| | | 20 l | 2173023 |

| Coolant of diesel engine ○ | | | |
|---|---|---|---|
| **Designation** | **Description** | **Packing size** | **Order no.** |
| Antifreezing Compound | | 208 l | 2173024 |

| Miscellaneous | | | |
|---|---|---|---|
| **Designation** | **Description** | **Packing size** | **Order no.** |
| WIRTGEN GROUP Asphalt Anti Stick | The perfect solution for combi wheel and rubber wheel rollers from HAMM: It prevents bitumen from adhering to the rubber wheels. The emulsion is based on a non-toxic solution and is thus rapidly 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 HD+ 120 VV

| Designation | Value | Unit |
|---|---|---|
| **Dimensions and weights** | | |
| Basic weight without cab | 11,340 | kg |
| Operating weight with cab | 12,570 | kg |
| Front/rear axle load | 6345/6225 | kg |
| Working width/max. working width | 1980/2150 | mm |
| Inside/outside turning radius | 5285/7260 | mm |
| **Diesel engine** | | |
| Manufacturer | Deutz | |
| Type | TCD 2012 L04 2V | |
| Number of cylinders | 4 | |
| Power (ISO 14396)/nominal speed | 100.0/2300 | kW/rpm |
| Exhaust emissions category EU / USA | III A/Tier 3 | |
| **Transmission** | | |
| Working gear speed | 0–6.0/(0–3.7) | km/h/(mph) |
| Transport speed | 0–12.0/(0–7.4) | km/h/(mph) |
| Hill climbing ability with/without dynamic compaction system | 30/35 | % |
| Max. longitudinal gradient allowed | 30 | ° |
| Max. transverse gradient allowed | 30 | ° |
| **Vibration** | | |
| Vibration | front / back | |
| Stage 1: Frequency/speed | 40/2400 | Hz/rpm |
| Stage 1: Max. amplitude | 0.88 | mm |
| Stage 2: Frequency/speed | 50/3000 | Hz/rpm |
| Stage 2: Max. amplitude | 0.35 | mm |
| **Steering** | | |
| Steering lock to both sides | 30 | ° |
| Pendulum compensation upwards and downwards | 10 | ° |
| **Track offset** | | |
| Track offset to both sides | 170 | mm |
| **Filling quantities** | | |

| Designation | Value | Unit |
|---|---|---|
| Fuel | 180 | l |
| Engine oil (for oil change) | 11.5 | l |
| Diesel engine coolant | 16 | l |
| Hydraulic oil | 40 | l |
| Water sprinkling system | 1160 | l |
| Vibrator | (2x) 10.7 | l |
| ⁎Air conditioning (R134a) | 1.6 | kg |
| **Sound power level** | | |
| Sound power $L_{WA}$, guaranteed | 108 | dB(A) |
| Sound power $L_{WA}$, measured representatively | 107 | dB(A) |
| **Sound pressure level** | | |
| Sound pressure level $L_{pA}$, measured on the cab | 83 | dB(A) |
| Sound pressure level $L_{pA}$, measured on the ROPS | 90 | dB(A) |
| **Electrical system** | | |
| Operating voltage | 12 | V |

## 5.01.02 HD+ 120 VO

| Designation | Value | Unit |
|---|---|---|
| **Dimensions and weights** | | |
| Basic weight without cab | 11,510 | kg |
| Operating weight with cab | 12,740 | kg |
| Front/rear axle load | 6345/6225 | kg |
| Working width/max. working width | 1980/2150 | mm |
| Inside/outside turning radius | 5285/7260 | mm |
| **Diesel engine** | | |
| Manufacturer | Deutz | |
| Type | TCD 2012 L04 2V | |
| Number of cylinders | 4 | |
| Power (ISO 14396)/nominal speed | 100.0/2300 | kW/rpm |
| Exhaust emissions category EU / USA | III A/Tier 3 | |
| **Transmission** | | |
| Working gear speed | 0–6.0/(0–3.7) | km/h/(mph) |
| Transport speed | 0–12.0/(0–7.4) | km/h/(mph) |
| Hill climbing ability with/without dynamic compaction system | 30/35 | % |
| Max. longitudinal gradient allowed | 30 | ° |
| Max. transverse gradient allowed | 30 | ° |
| **Vibration** | | |
| Vibration | front | |
| Stage 1: Frequency/speed | 40/2400 | Hz/rpm |
| Stage 1: Max. amplitude | 0.88 | mm |
| Stage 2: Frequency/speed | 50/3000 | Hz/rpm |
| Stage 2: Max. amplitude | 0.35 | mm |
| **Oscillation** | | |
| Oscillation | rear | |
| Frequency/speed | 36/2160 | Hz/rpm |
| Tangential amplitude | 1.25 | mm |
| **Steering** | | |
| Steering lock to both sides | 30 | ° |
| Pendulum compensation upwards and downwards | 10 | ° |
| **Track offset** | | |
| Track offset to both sides | 170 | mm |
| **Filling quantities** | | |
| Fuel | 180 | l |
| Engine oil (for oil change) | 11.5 | l |

| Designation | Value | Unit |
|---|---|---|
| Diesel engine coolant | 16 | l |
| Hydraulic oil | 40 | l |
| Water sprinkling system | 1160 | l |
| Vibrator | (1x) 10.7 | l |
| ∗Air conditioning (R134a) | 1.6 | kg |
| **Sound power level** | | |
| Sound power $L_{WA}$, guaranteed | 108 | dB(A) |
| Sound power $L_{WA}$, measured representatively | 107 | dB(A) |
| **Sound pressure level** | | |
| Sound pressure level $L_{pA}$, measured on the cab | 83 | dB(A) |
| Sound pressure level $L_{pA}$, measured on the ROPS | 90 | dB(A) |
| **Electrical system** | | |
| Operating voltage | 12 | V |

## 5.01.03 HD+ 140 VV

| Designation | Value | Unit |
|---|---|---|
| **Dimensions and weights** | | |
| Basic weight without cab | 11,700 | kg |
| Operating weight with cab | 12,930 | kg |
| Front/rear axle load | 6525/6405 | kg |
| Working width/max. working width | 1980/2150 | mm |
| Inside/outside turning radius | 5205/7340 | mm |
| **Diesel engine** | | |
| Manufacturer | Deutz | |
| Type | TCD 2012 L04 2V | |
| Number of cylinders | 4 | |
| Power (ISO 14396)/nominal speed | 100.0/2300 | kW/rpm |
| Exhaust emissions category EU / USA | III A/Tier 3 | |
| **Transmission** | | |
| Working gear speed | 0–6.0/(0–3.7) | km/h/(mph) |
| Transport speed | 0–12.0/(0–7.4) | km/h/(mph) |
| Hill climbing ability with/without dynamic compaction system | 30/35 | % |
| Max. longitudinal gradient allowed | 30 | ° |
| Max. transverse gradient allowed | 30 | ° |
| **Vibration** | | |
| Vibration | front / back | |
| Stage 1: Frequency/speed | 40/2400 | Hz/rpm |
| Stage 1: Max. amplitude | 0.84 | mm |
| Stage 2: Frequency/speed | 50/3000 | Hz/rpm |
| Stage 2: Max. amplitude | 0.35 | mm |
| **Steering** | | |
| Steering lock to both sides | 30 | ° |
| Pendulum compensation upwards and downwards | 10 | ° |
| **Track offset** | | |
| Track offset to both sides | 170 | mm |
| **Filling quantities** | | |
| Fuel | 180 | l |
| Engine oil (for oil change) | 11.5 | l |
| Diesel engine coolant | 16 | l |
| Hydraulic oil | 40 | l |
| Water sprinkling system | 1160 | l |
| Vibrator | (2x) 13.2 | l |

| Designation | Value | Unit |
|---|---|---|
| ⁎Air conditioning (R134a) | 1.6 | kg |
| **Sound power level** | | |
| Sound power $L_{WA}$, guaranteed | 108 | dB(A) |
| Sound power $L_{WA}$, measured representatively | 107 | dB(A) |
| **Sound pressure level** | | |
| Sound pressure level $L_{pA}$, measured on the cab | 83 | dB(A) |
| Sound pressure level $L_{pA}$, measured on the ROPS | 90 | dB(A) |
| **Electrical system** | | |
| Operating voltage | 12 | V |

## 5.01.04 HD+ 140 VO

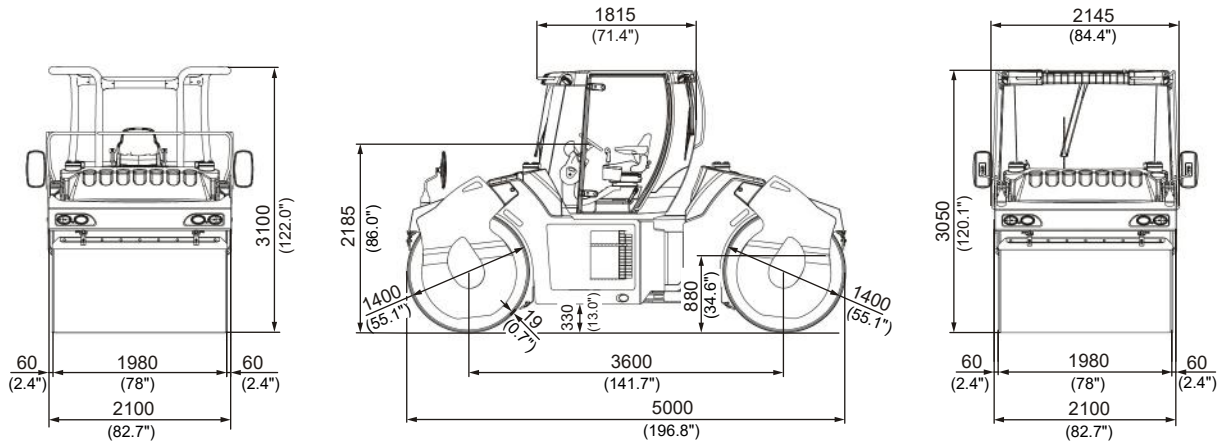
| Designation | Value | Unit |
|---|---|---|
| **Dimensions and weights** | | |
| Basic weight without cab | 11,815 | kg |
| Operating weight with cab | 13,045 | kg |
| Front/rear axle load | 6525/6520 | kg |
| Working width/max. working width | 2140/2310 | mm |
| Inside/outside turning radius | 5205/7340 | mm |
| **Diesel engine** | | |
| Manufacturer | Deutz | |
| Type | TCD 2012 L04 2V | |
| Number of cylinders | 4 | |
| Power (ISO 14396)/nominal speed | 100.0/2300 | kW/rpm |
| Exhaust emissions category EU / USA | III A/Tier 3 | |
| **Transmission** | | |
| Working gear speed | 0–6.0/(0–3.7) | km/h/(mph) |
| Transport speed | 0–12.0/(0–7.4) | km/h/(mph) |
| Hill climbing ability with/without dynamic compaction system | 30/35 | % |
| Max. longitudinal gradient allowed | 30 | ° |
| Max. transverse gradient allowed | 30 | ° |
| **Vibration** | | |
| Vibration | front | |
| Stage 1: Frequency/speed | 40/2400 | Hz/rpm |
| Stage 1: Max. amplitude | 0.84 | mm |
| Stage 2: Frequency/speed | 50/3000 | Hz/rpm |
| Stage 2: Max. amplitude | 0.33 | mm |
| **Oscillation** | | |
| Oscillation | rear | |
| Frequency/speed | 36/2160 | Hz/rpm |
| Tangential amplitude | 1.25 | mm |
| **Steering** | | |
| Steering lock to both sides | 30 | ° |
| Pendulum compensation upwards and downwards | 10 | ° |
| **Track offset** | | |
| Track offset to both sides | 170 | mm |
| **Filling quantities** | | |
| Fuel | 180 | l |
| Engine oil (for oil change) | 11.5 | l |

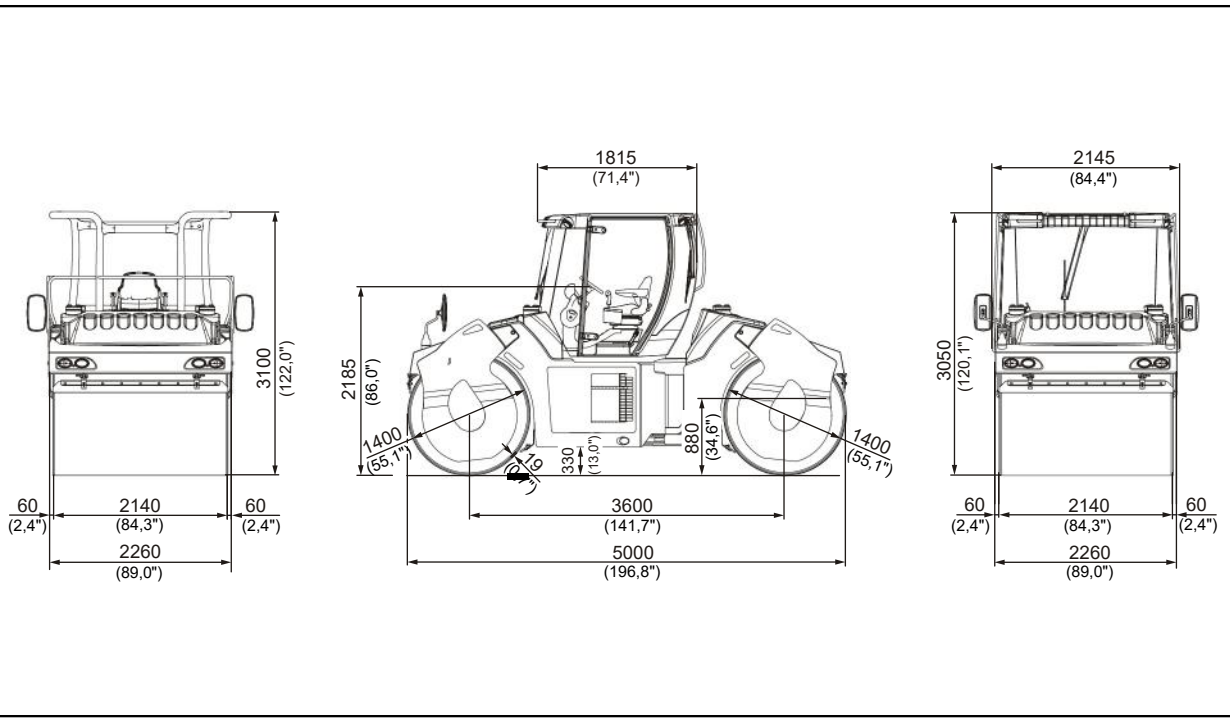
| Designation | Value | Unit |
|---|---|---|
| Diesel engine coolant | 16 | l |
| Hydraulic oil | 40 | l |
| Water sprinkling system | 1160 | l |
| Vibrator | (1x) 13.2 | l |
| ∗Air conditioning (R134a) | 1.6 | kg |
| **Sound power level** | | |
| Sound power $L_{WA}$, guaranteed | 108 | dB(A) |
| Sound power $L_{WA}$, measured representatively | 107 | dB(A) |
| **Sound pressure level** | | |
| Sound pressure level $L_{pA}$, measured on the cab | 83 | dB(A) |
| Sound pressure level $L_{pA}$, measured on the ROPS | 90 | dB(A) |
| **Electrical system** | | |
| Operating voltage | 12 | V |

# 5.02 Dimension sheet

## 5.02.01 HD + 120 VV, HD + 120 VO




## 5.02.02 HD + 140 VV, HD + 140 VO



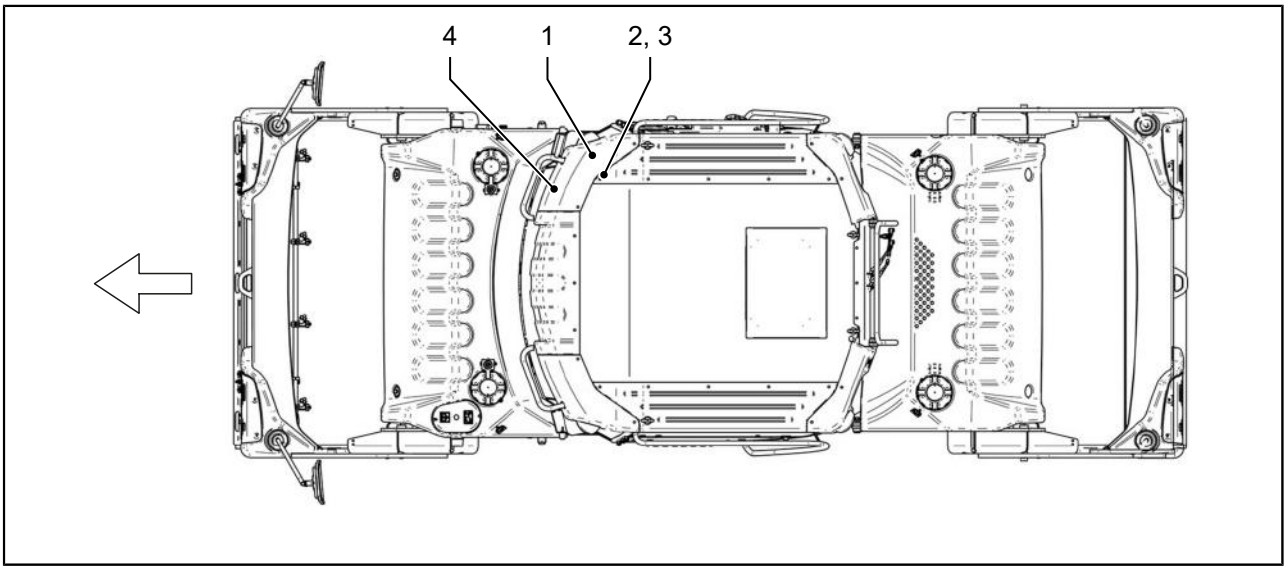

 

# 5.03 Fuses

**⚠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 on the machine | [2] | Preheating monitoring |
| [3] | Battery isolation switch control unit | [4] | Central electrical system |

## 5.03.01 Engine compartment

### [1] Main fuses

| Item | Fuse assignment | Fuse |
|---|---|---|
| **F01** | On-board electrical system (terminal 15) | 100 A |
| **F02** | Generator B+ | 150 A |
| **F03** | Cold starting device | 125 A |
| **F04** | On-board electrical system (terminal 30) | 80 A |

### [2] Preheating monitoring

| Item | Fuse assignment | Fuse |
|---|---|---|
| **F05** | Preheating monitoring | 1 A |

**[3] Battery isolation switch for control unit**

| Item | Fuse assignment | Fuse |
|---|---|---|
| **F06** | Battery isolation switch, control unit | 5 A |

## 5.03.02 Operator platform

**[4] Central electrical system**

| Item | Fuse assignment | Fuse |
|---|---|---|
| **F1** | Unoccupied | A |
| **F2** | Unoccupied | A |
| **F3** | RC control section | 7.5 A |
| **F4** | RC power outputs, group 1 | 25 A |
| **F5** | RC power outputs, group 2 | 25 A |
| **F6** | Ignition (start) switch/diagnostics interface WIDIAG (terminal 30) | 15 A |
| **F7** | Diesel engine, EMR power section | 25 A |
| **F8** | Turn signals/lighting (terminal 30) | 10 A |
| **F9** | Cabin/socket of rear control panel (terminal 30) | 15 A |
| **F10** | Display/driver's seat console | 5 A |
| **F11** | Sensors/RC control section – Electrical system ON | 5 A |
| **F12** | Diesel engine, EMR control section | 7.5 A |
| **F13** | HCQ/WIFMS | 7.5 A |
| **F14** | Signal horn/rotating beacon | 10 A |
| **F15** | Reserve (terminal 15) | 10 A |
| **F16** | Turn signals/lighting (terminal 15) | 10 A |
| **F17** | Dynamic compaction system | 10 A |
| **F18** | Additional lighting/reversing lights | 15 A |
| **F19** | Drum lighting | 15 A |
| **F20** | Unoccupied | A |
| **F21** | Driving light, right | 10 A |
| **F22** | Driving light, left | 10 A |
| **F23** | Cab working spotlight/ROPS | 25 A |
| **F24** | Reversing lights | 10 A |
| **F25** | Water sprinkling pump 2 | 15 A |
| **F26** | Cabin (terminal 15) | 15 A |
| **F27** | Additive sprinkling | 15 A |
| **F28** | Water sprinkling pump 1 | 15 A |
| **F29** | Front and rear windscreen wiper/windscreen washer system | 30 A |
| **F30** | Heating/air conditioning system | 30 A |
| **F31** | Diagnostics/generator D+ | 3 A |
| **F32** | Parking light, right | 5 A |

| Item | Fuse assignment | Fuse |
|---|---|---|
| **F33** | Parking light left | 5 A |

# 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 Roll-over protection structure (ROPS)

The ROPS safety device (cab / roll-over bar) is a rollover protection structure in the case the machine tilts or rolls over. It avoids that the driver is crushed to death based on the high self-weight of the machine.

If the ROPS safety equipment is dismounted from the machine for transport or repair, it must be remounted according to specifications before the machine is used again.

**⚠WARNING**

**High self-weight of machine!**
If the machine overturns backwards, forwards or sideways there is a danger of serious injuries or death.

- Operate machine only with the ROPS safety device installed according to instructions and while wearing the safety belt.
- With detectable defects of the ROPS safety device or of its fixation it is not allowed to operate the machine.

**Assembly**

**⚠WARNING**

**High self-weight of ROPS safety device!**
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.

Observe the service manual for mounting the ROPS safety equipment.

- Use appropriate lifting devices and hoisting equipment. Observe weight (see type plate of ROPS safety device).
- Lift ROPS safety device onto platform and align with fixing holes.
- Screw ROPS safety device with operator platform. Observe specified starting torque values.

**Visual test**

The machine frame must not be warped, bent or cracked in the ROPS fixing area (deformation).

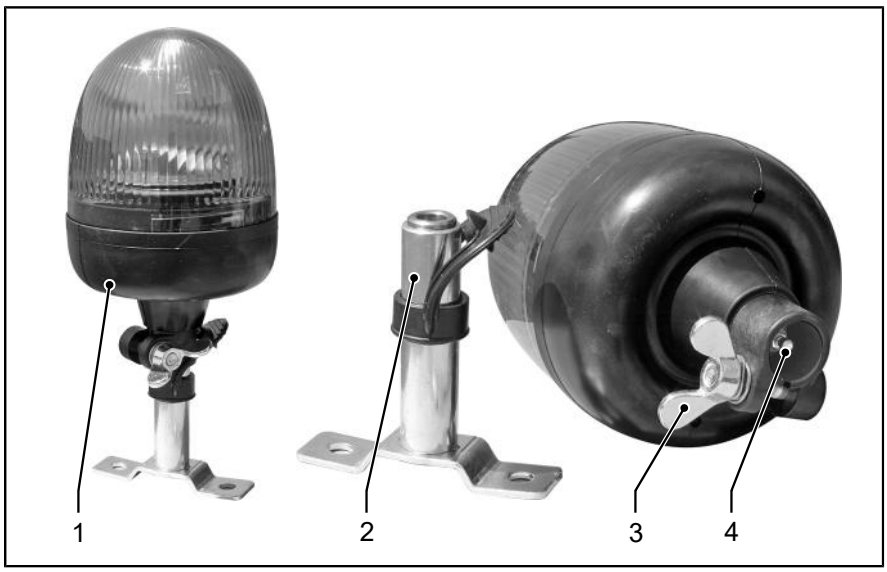
The reinforcement elements of the ROPS safety device must not show rust, damage, fissures or open fractures.

All screw connections of the reinforcement elements must comply with the given specifications and must be screwed tightly to each other (observe starting torque values). Bolts and nuts must not be damaged, bent or deformed.

It is absolutely forbidden to modify or repair / level the reinforcement elements in any way.

# 6.01 Rotating beacon

## 6.01.01 Overview




| | | | |
|---|---|---|---|
| **[1]** | Rotating light mounted | **[2]** | Contact tube |
| **[3]** | Clamping screw | **[4]** | Plug contact |

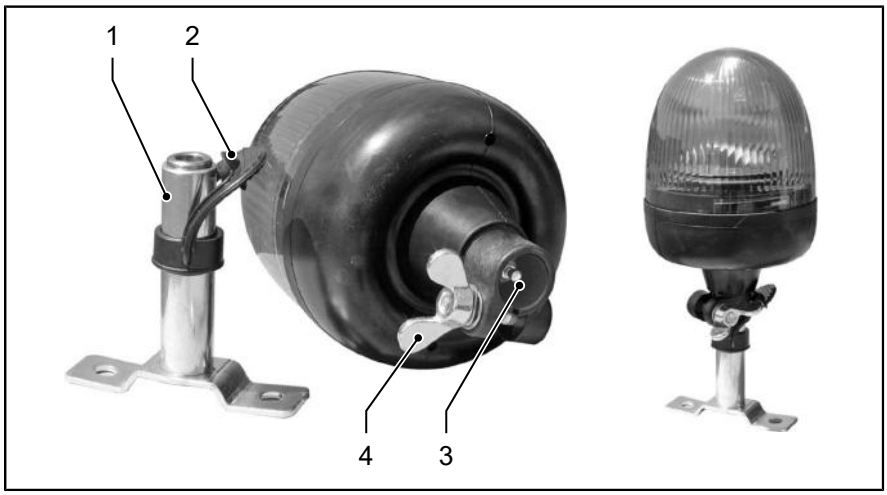
## 6.01.02 Description

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.

## 6.01.03 Mounting / Dismounting

**Mounting rotating beacon**

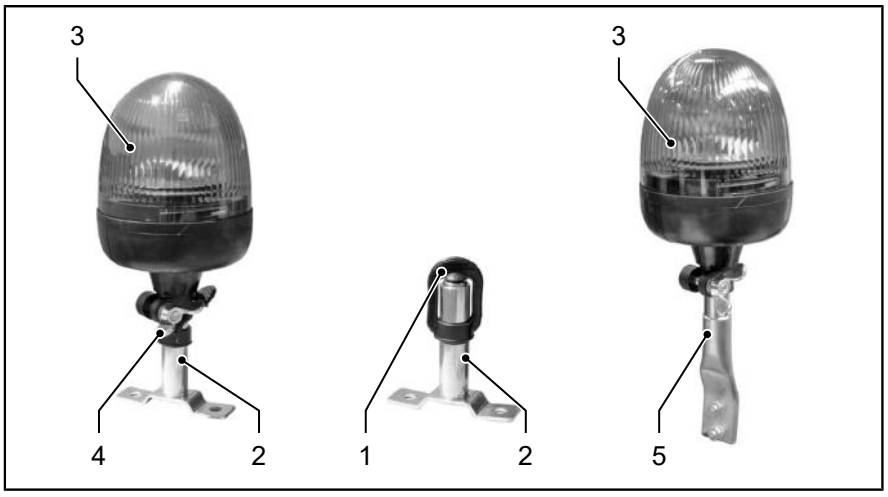



- ▶ Swivel the protective cap [2] to the side.
- ▶ Put the locating hole [3] of the rotating beacon on the contact tube [1] and slide it up to the stop.
- ✔ The electrical connection has been made.

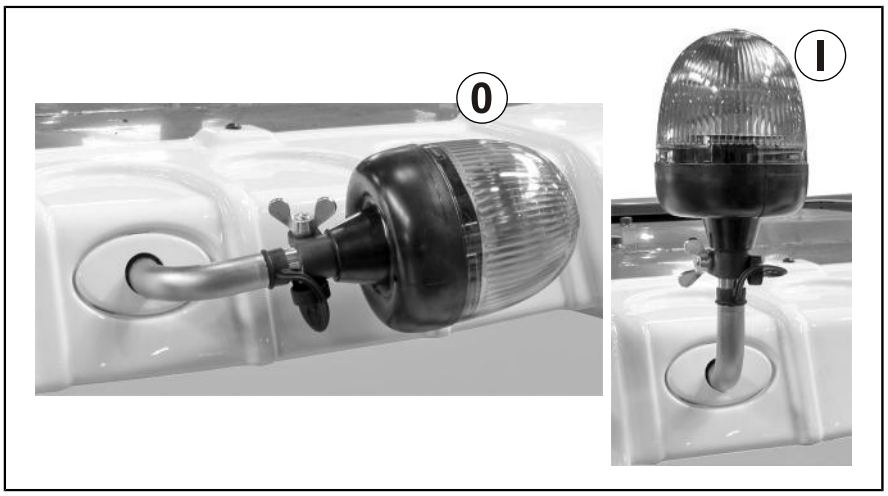
- Tighten clamping screw [4].

**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.

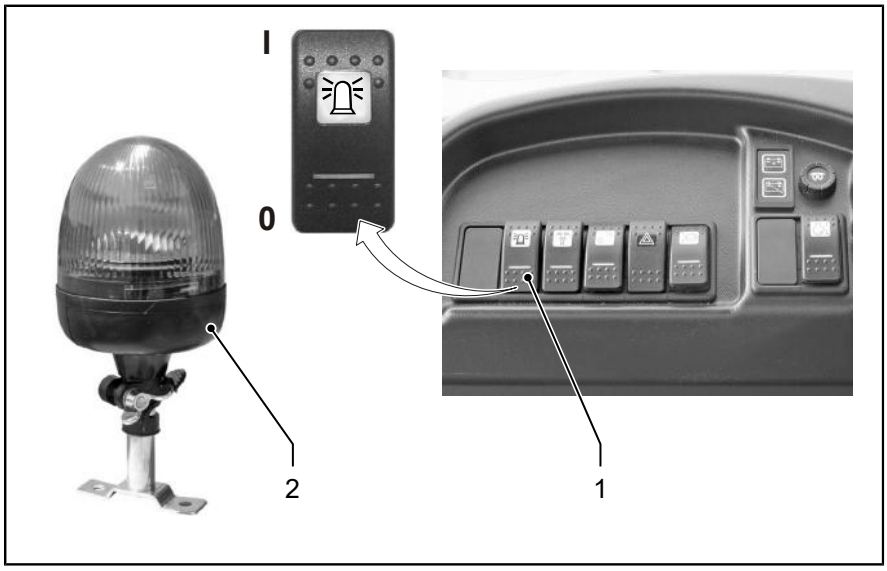
**Rotating beacon, foldable**




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 the lock-in position 0 for transport.
- Move the rotating beacon to the lock-in position I for work.

## 6.01.04 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 switch [1] on the control panel again.
- ✔ LED off: Rotating beacon [2] off.

## 6.01.05 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**

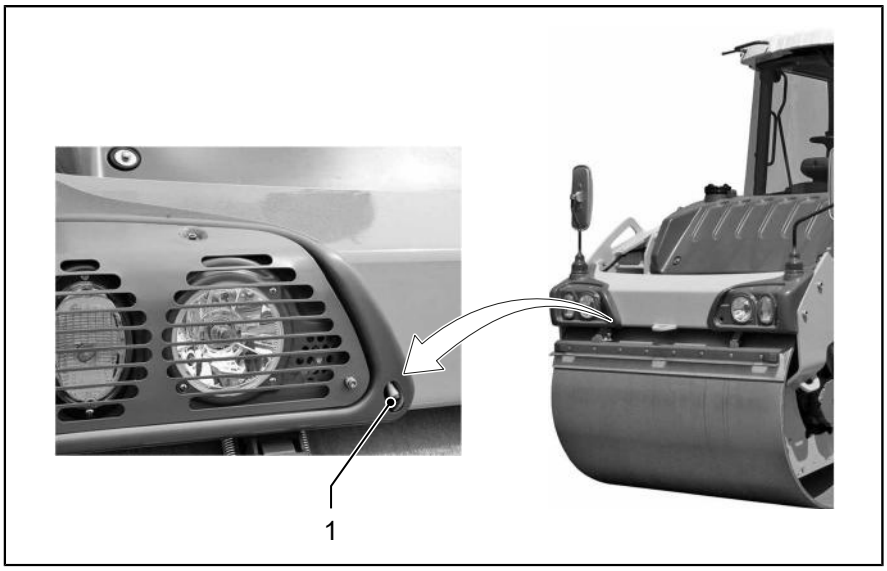
- ▶ Spray electrical contacts using a contact spray.

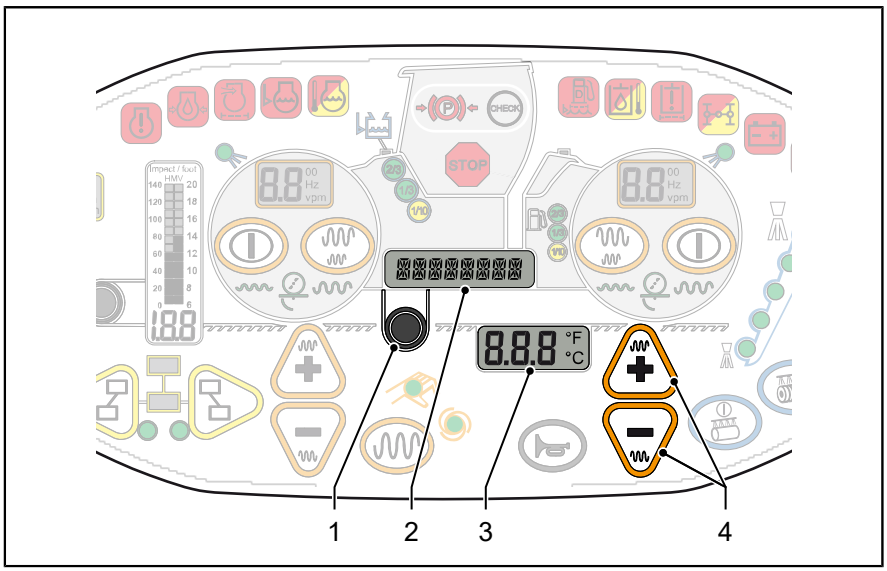
# 6.02 HAMM Temperature Meter

Only if equipped with such a thermometer are data about asphalt temperatures displayed on the indicators.

## 6.02.01 Overview




| | |
|---|---|
| [1] | Temperature sensor |




| | | | |
|---|---|---|---|
| [1] | System info | [2] | System info display |
| [3] | Asphalt temperature info display | [4] | Limit value adjustment |

## 6.02.02 Description

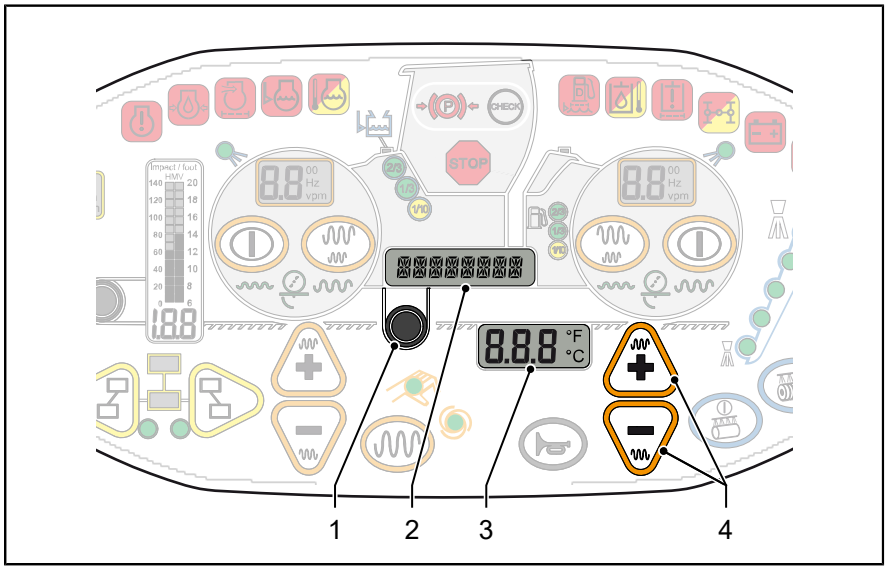
Asphalt compaction can only be done in a special temperature range.

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.

## 6.02.03 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
- Upper limit value for asphalt temperature
- Lower limit value for asphalt temperature
- Diagnostic codes

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

**Asphalt temperature**

- ▶ Press the switch [1].
- ▶ Set the info display [2] to operating hours or engine speed.
- ✔ The info display [3] shows the asphalt temperature underneath the machine.

**Displaying/selecting a limit value**

- ▶ Press the switch [1].
- ▶ Set the info display [2] to TEMP_HI (upper limit value) or TEMP_LO (lower limit value).
- ✔ The info display [3] shows the limit value for 10 seconds.
- ✔ After 10 seconds, the info display [3] reverts back to showing the current asphalt temperature underneath the machine. The info display [2] switches back to the standard display (e.g. operating hours, engine speed).

**Setting the limit value**

- ▶ Use the switch [1] in the info display [2] to select TEMP_HI (upper limit value) or TEMP_LO (lower limit value).
- ✔ The info display [3] shows the set limit value for 10 seconds.
- ▶ Press the + (plus) or - (minus) switch [4] within 10 seconds, or press and hold this switch.
- ✔ The limit value in the info display [3] is increased or decreased.
- ▶ Press the switch [1] within 10 seconds.
- ✔ The set limit value is saved. The info display [2] moves one step forwards.
- ✔ After 10 seconds, the info display [3] 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).

## 6.02.04 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.

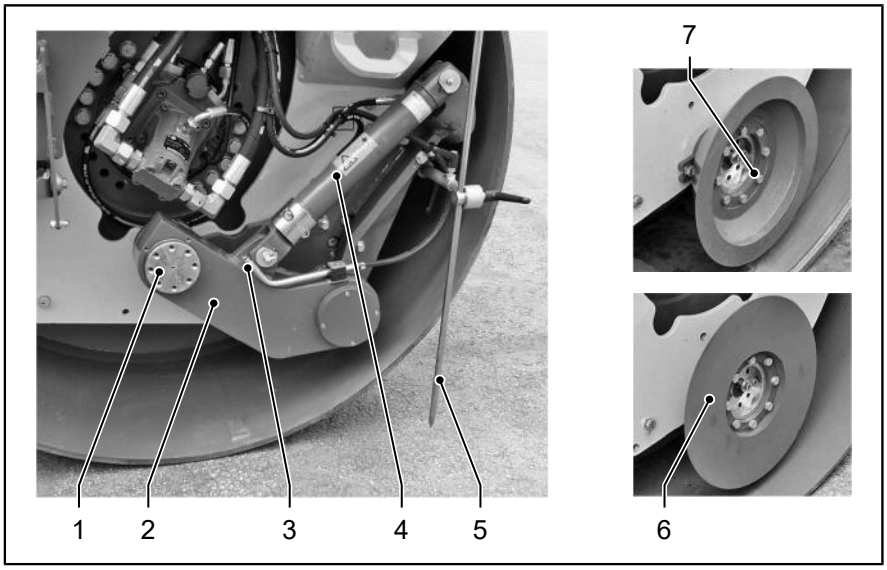
- ▶ Keep the senor's sensing head clean.
- ▶ Do not allow the measuring hole to become blocked.

- 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.

# 6.03 Edge pressing and cutting device (KAG)

## 6.03.01 Overview




| | | | |
|---|---|---|---|
| [1] | Tool carrier | [2] | Lever |
| [3] | Water spray nozzle | [4] | Hydraulic cylinder |
| [5] | Track indicator | [6] | Cutting wheel |
| [7] | Pressure roller | | |

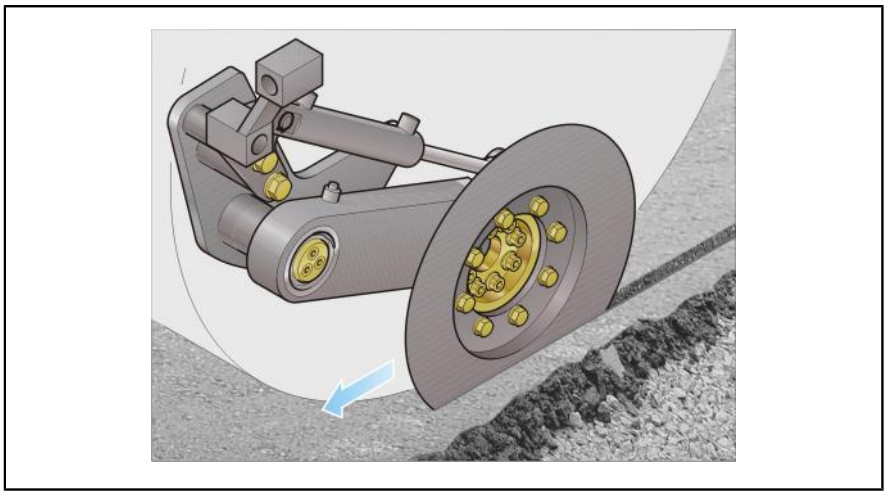
## 6.03.02 Description

The edge pressure and cutting device (KAG) cuts or forms the longitudinal edges of hot asphalt.

The tool is raised and lowered hydraulically. The water sprinkling prevents bitumen adhering to the tool.

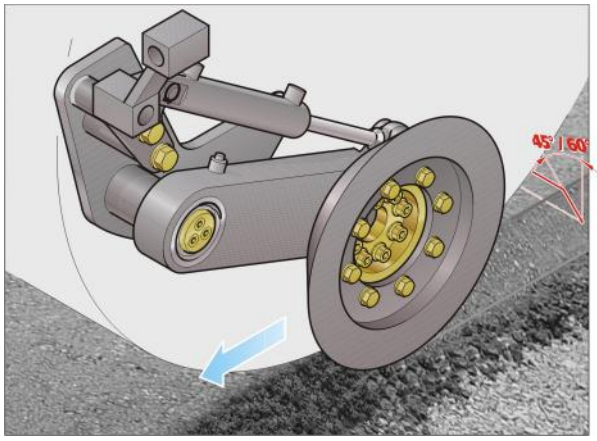
The cutting discs and pressing roll are exchangeable.

**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.

**Track indicator (option)**

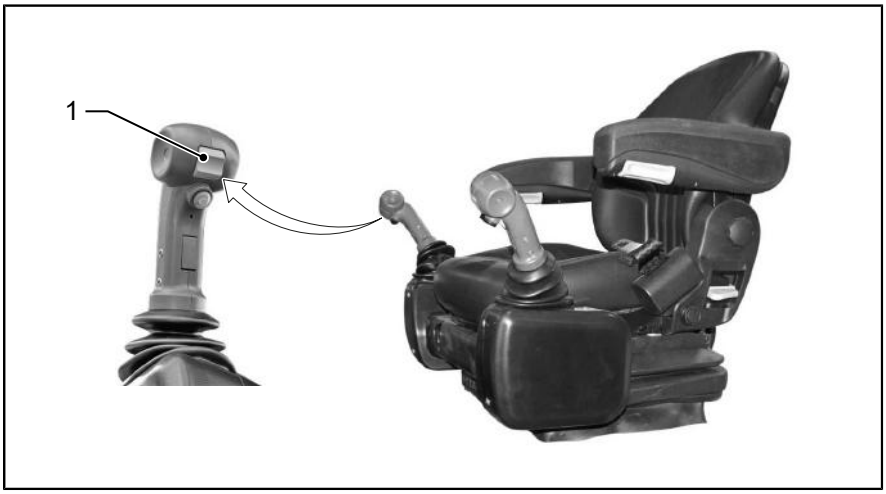
With the aid of the track indicator, the driver can align the tire track with a previously marked working line.

## 6.03.03 Operation

***NOTICE***

**Unfavourable force transmission!**
Material damage to the edge pressure and cutting device (CTR) caused by unfavourable force transmission.

- Work with the KAG only when driving forwards.
- Do not adjust the track offset with the CTR lowered.
- Only work on hot, malleable asphalt.




**Lowering the KAG**

Prerequisite: The diesel engine is running

- ▶ Press the switch [1] on the drive lever down until the required position is reached.
- ✔ The KAG lowers and starts operation.
- ✔ The sprinkling system starts automatically.

**Raising the KAG**

Prerequisite: The diesel engine is running

- ▶ Press the switch [1] on the drive lever up until the required position is reached.
- ✔ The KAG rises from the asphalt surface.
- ✔ The sprinkling system is off if the KAG is raised for at least 2 seconds.

## 6.03.04 Maintenance

The instructions itemized in the "Important information about maintenance work" must always be followed during all maintenance work.

**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**

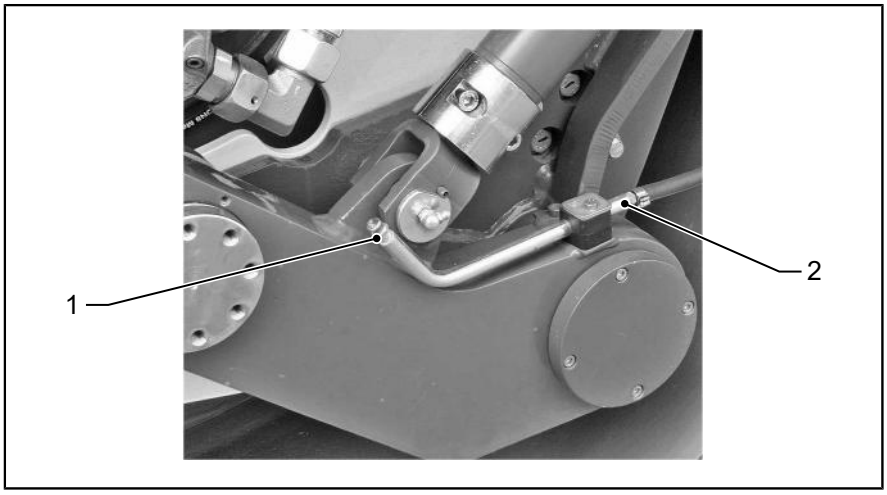
**Every 250 operating hours**

250 h

Cleaning sprinkler nozzles

Lubricating KAG cylinder bolts

**Cleaning sprinkler nozzles**



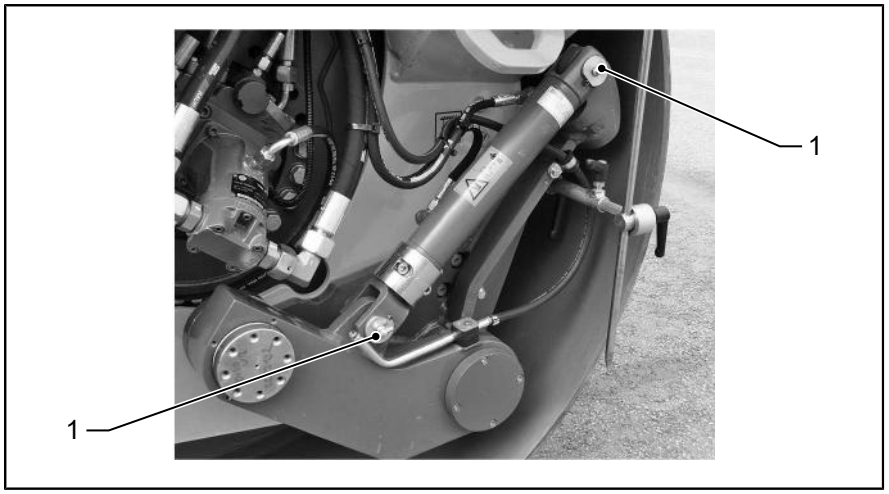

To switch on the water sprinkling, the CTR must be lowered with the electrical system switched on. During this time, the machine is in operation, and must be appropriately secured.

- ▶ Switch off diesel engine and remove ignition key.
- ▶ Unscrew and clean the spray nozzle [1].

- Flush the pipeline [2] with the water sprinkling system.
- Switch off the water sprinkling system Lift KAG.
- Screw in the spray nozzle.

**Lubricating KAG cylinder bolts**

△ Lubricant only admissible if containing this marking ("Technical data ", page 182 sqq.).

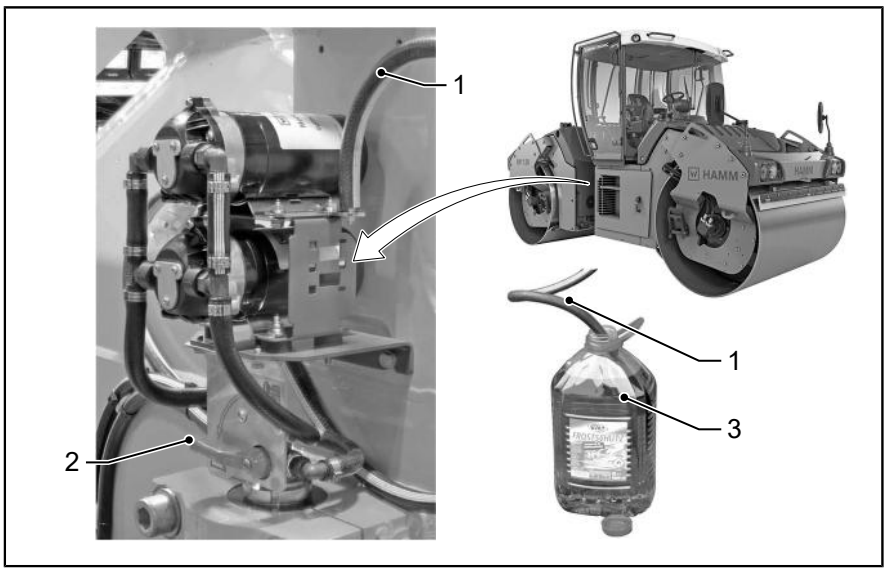



- Switch off diesel engine and remove ignition key.
- Lubricate lubrication nipple [1] (2 nipples).

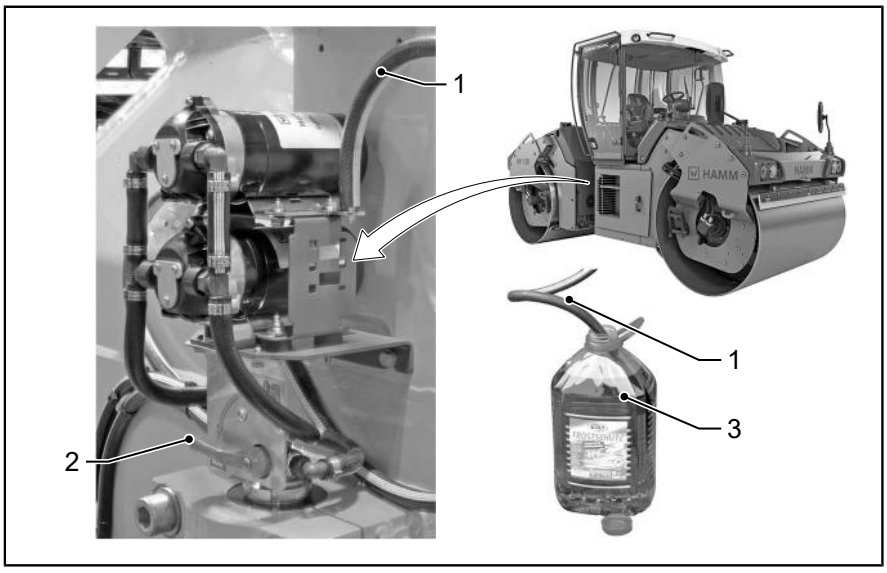
# 6.04 Anti-freeze filling system for water sprinkling

## 6.04.01 Overview




| | | | |
|---|---|---|---|
| **[1]** | Hose | **[2]** | Change-over valve |
| **[3]** | Vessel for antifreeze solution | | |

## 6.04.02 Description

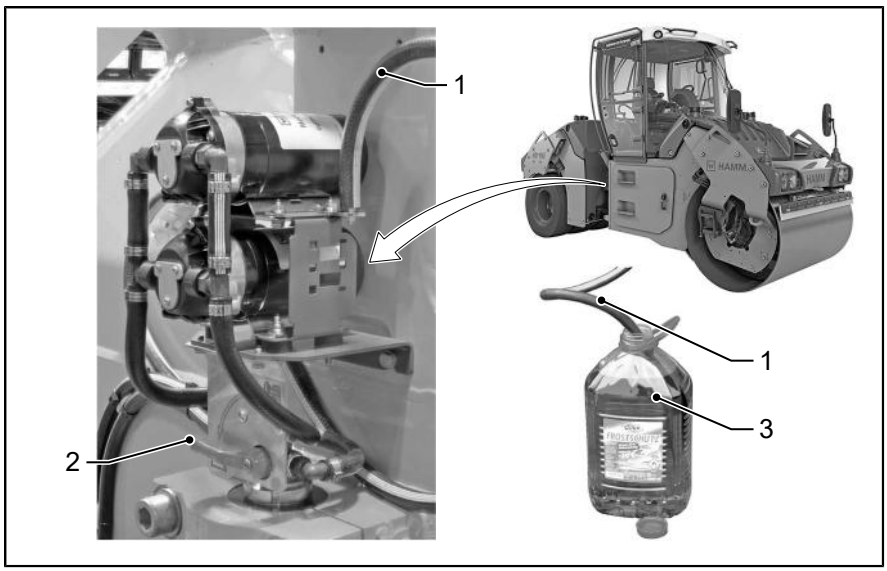



| | | | |
|---|---|---|---|
| **[1]** | Hose | **[2]** | Change-over valve |
| **[3]** | Vessel for antifreeze solution | | |

## 6.04.03 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**

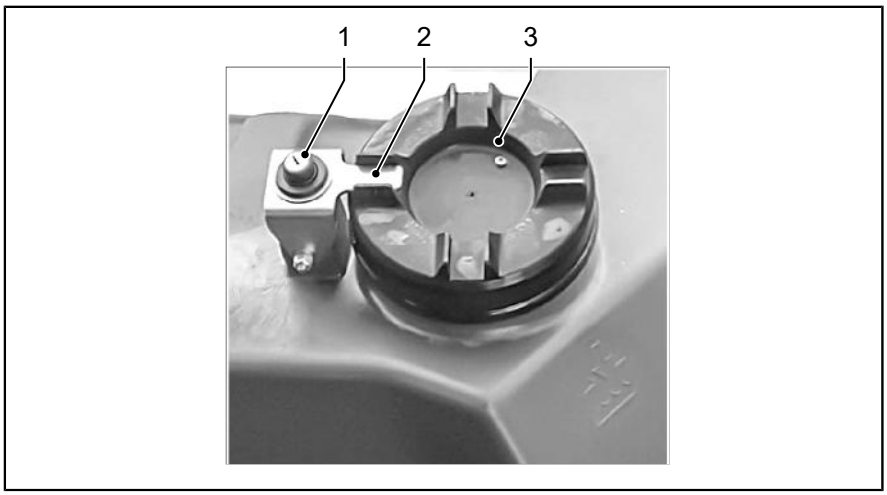



1. Switch off the diesel engine.
2. Water sprinkling system functional test: Switch the water sprinkling system on when the machine is at a standstill (see page 117).
3. Take the hose [1] out of its holder.
4. Clean the end of the hose if it is dirty.
5. Insert the hose into the container [3] containing antifreeze solution.
6. Set the change over valve [2] to the anti-freeze filling system position.
7. Fill the piping system until the antifreeze solution exudes out of all the spray nozzles.
8. Switch off the sprinkler.
9. Switch off the electrical system, and remove the ignition key.
10. Put the hose [1] back in its holder.
11. Set the switchover valve [2] to sprinkle.

# 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.

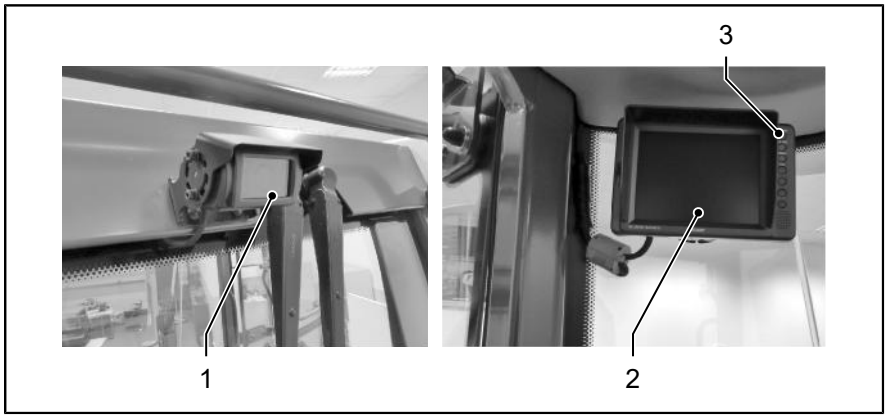
**Closing**

- ▶ 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 Rear area monitoring

## 6.06.01 Overview




| | | | |
|---|---|---|---|
| [1] | Camera | [2] | Cab monitor |
| [3] | AUTO POWER switch | | |

## 6.06.02 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.

## 6.06.03 Operation

Also follow the manufacturer's operating manual during all activities.

With the electrical installation ON, the system can already be activated manually or automatically with the AUTO POWER [3] switch on the monitor:

- ▶ Selecting AUTO switch [3].
- ✔ The system switches on automatically when the electrical system is ON.
- ✔ The system switches off automatically when the electrical system is OFF

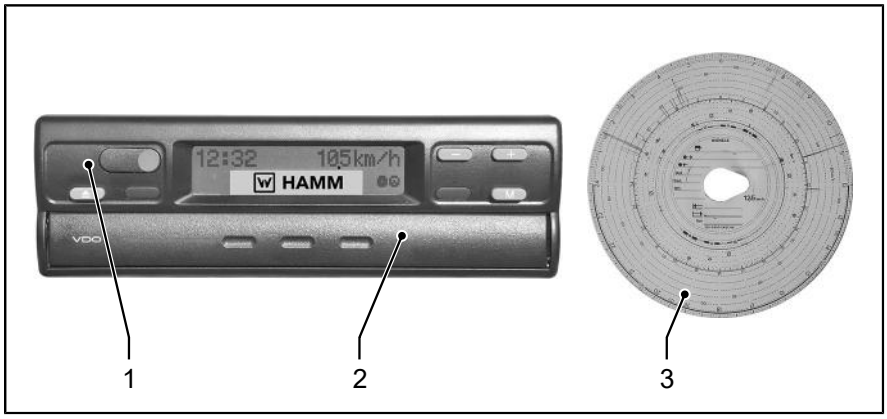
- ▶ Select OFF switch [3].
- ✔ The system can be switched on manually when the electrical system is ON.
- ✔ The system switches off automatically when the electrical system is OFF

| | |
|---|---|
| | The monitor is automatically adjusted to the brightness of the surroundings. |
| **Care** | Clean the monitor and camera regularly with a soft, damp cloth. |
| **Disposal** | Dispose of the device only by taking it to reception points for electrical and electronic devices. |

# 6.07 Tachograph

## 6.07.01 Overview

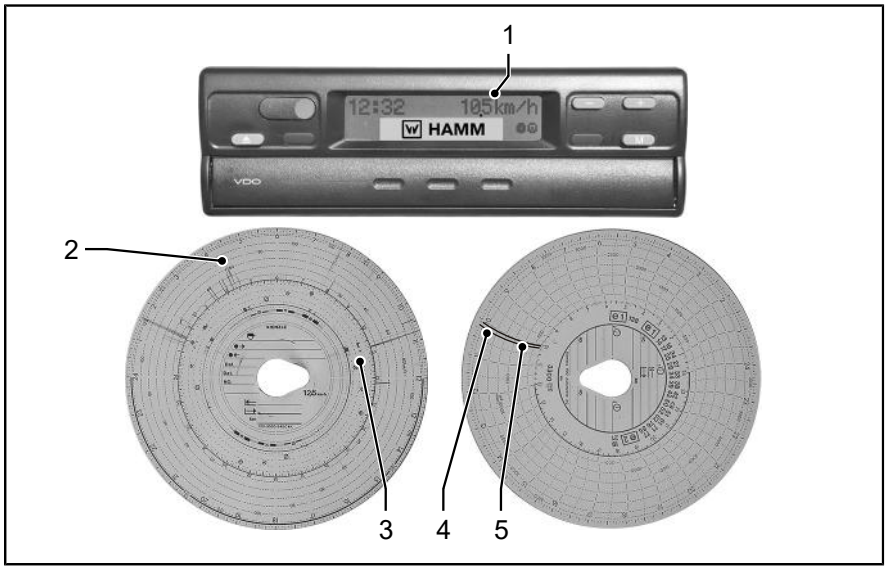



| | | | |
|---|---|---|---|
| **[1]** | Tachograph | **[2]** | Drawer for record sheet |
| **[3]** | Record sheet | | |

## 6.07.02 Description

After the electrical system has been switched on, the trip recorder displays the various machine functions on the record sheet. These include amongst others:

- Driving and stopping times
- Driving speed
- Vibration amplitude
- Vibrator speed




**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.

**Vibrator speed**

The frequency of rotation [4] for the vibrator is recorded by the tachograph on the rear of the record sheet. The recording shows the revolutions per minute. The device also logs the switching on of the electrical system (electrical system ON/OFF) [5].

**Vibration amplitude**

The area [3] under the driving speed [2] is used to record the amplitude of the vibrations. A thick bar indicate a large amplitude, a thin bar a small amplitude. On machines with double vibration, the recording of the front drum is given priority. If the machine works with mixed vibration amplitudes, that is one drum works with a large and the other with a small amplitude, only the large amplitude is shown on the record sheet.

## 6.07.03 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.