



HD 8 VV HD 10C VV

Applying from factory No. H1700001



15202-10

Operating instructions with safety notes

Ref. 2035481/03.08-en



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Operating instructions with safety notes

Tandem Roller

HD 8 VV
HD 10C VV

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1 GENERAL

1.1 INTRODUCTION

1.1.1 General

You have purchased a HAMM Quality product. All parts of this machine have been tested and verified carefully. They correspond to the quality you expect.

This machine has been built according to the current state-of-the-art and the current safety regulations. However it is indispensable to read and to observe the safety notes as well as the operating and the maintenance instructions prior to start-up. Every inappropriate use, or use not according to the intended use, of the machine will cause:

- Dangers to life and health of the user or to third parties
- Impairment of the machine and further properties of the user
- Dangers to the efficient work of the machine

The operating instructions of the combustion engine is a part of the overall operating instructions. Maintenance and care of the engine have to be performed according to these operating instructions. Any safety notes have to be followed.

Even if the regulations for safety, use and maintenance are followed, residual dangers will remain. Due to the high operating weight and to the high distance of gravity centres of

the machine, there is considerable danger of tilting, in particular during travels in transversal direction to slopes. The smooth surface of the drums or the tyres, respectively, decreases lateral stability of wet, uneven ground. Operation is not admitted on snow and ice. When driving on hard surfaces, and in particular when driving in transversal direction so slopes, lateral stability is decreased when the vibration is switched on (danger of falling).

The high reliability of the machine is preserved through correct use and careful maintenance. This includes the use of the obligatory operating resources and the use of original HAMM spare parts.

This manual will introduce you to the operation of the machine. You will find the following in it:

- Regulations for your safety
- The introduction of the machine and its characteristics
- The operation
- The maintenance instructions
- Indication on spare parts management and customer service

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

Our representations will be at your disposition with consulting and service even after the warranty period. They will provide our original HAMM spare parts which do not only correspond to the technical requirements but also ensure exchangeability and quality.

Our customer service training centre holds courses for roller drivers.

It will give drivers:

- General safety information
- Information on use and maintenance of the machine
- Information on the practical use of the roller
- Information of a more rational use with add-on devices

Furthermore, our specialist sales advisors are always at your disposition. They will offer you the optimum product solution for your application. The safety, operation and maintenance notes included in this manual are intended to be used by roller drivers and mechanics.

Thus, keep this manual always at hand!

1.1.2 Foreword to the operating instructions

These operating instructions shall facilitate the introduction to the machine and the use of their intended operational possibilities.

The operating instructions includes valuable information in order to operate the machine safely, appropriately and economically. The observation of the operating instructions will help to avoid dangers, decrease repair cost and downtimes, and to increase reliability and lifetime of the machine.

These operating instructions must be updated with instructions due to existing national accident prevention and environment protection regulations.

The operating instructions must always be present at the place of utilisation of the machine.

The operating instructions of the combustion engine are a part of the overall operating instructions of the machine. Maintenance and care of the engine have to be performed according to these operating instructions. Any safety notes have to be followed.



These operating instructions must be read and applied by all persons ordered with works with or on the machine, e.g.

- Operation including care, disposal of operating supply or auxiliary substances
- Servicing (maintenance, inspection, repair) and/or
- Transport.

Apart from these operating instructions and the binding accident prevention regulations applying in the country of use and at the place of utilisation, also the generally accepted specialist rules for appropriate and safe work have to be observed.

1.1.3 Special identifications in the text

The following symbols or notes are used for the identification of text which do not apply to all machine variants:

-  Only for machines with CE equipment
-  Only for machines without CE equipment
- Option** Special equipment

Positions in figures

The positions in the figures are represented with letters and numbers. The positions identified with letters in alphabetical order are only explained in the corresponding text segment, beginning new for each single figure. The positions identified with numbers correspond to the numbering of the plates for operating elements, control devices and switches. They are identical to the numbers of the individual operating and control elements. In the describing text, these position numbers are in brackets. Among other things, this ensures that important and additional information can be found immediately and without difficulties in the descriptions of the elements.

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No part of this publication may be reproduced, processed, copied and/or published in any way (imprint, photocopy, microfiche or any other procedures) without the written consent of HAMM. This also applies to the corresponding drawings and schemes.

HAMM reserves the right to change individual parts at any time without previously informing the customer. The contents of this publication can also be changed without prior announcement.

This publication applies to the standard design of the previously listed machine types. Therefore it is possible that these instructions include descriptions of components not installed in your machine. HAMM does not accept liability for possible damages resulting from the application of this publication on machines deviating from the standard design.

Please contact to the customer service of your supplier for all information about adjustment, maintenance or repair work not included in this publication.

1.2 USE

Arbitrary changes will exclude the manufacturer's liability for any damage resulting from this.

1.2.1 Intended use

The machine may only be deployed on surfaces that can support it. It is intended solely for deployment for compressing loose surfaces, road foundations, road surfaces and similar compactible foundations. Any other deployment or a deployment beyond this is not deemed as intended. The manufacturer/supplier is not liable for any damage resulting from this. The user will bear the complete risk.

The intended use also includes the observance of the operating instructions as well as the compliance with the inspection and maintenance requirements set out by the manufacturer.

This machine has been built according to the state-of-the-art and the generally accepted safety regulations. However, danger for life and health of the user or impairment of the machine and of other objects can arise during the use of the machine.

This machine may only be used in technically unobjectionable condition, as well as according to the intended use, and aware of safety issues and possible dangers, always observing the operating instructions. All safety devices removed for transport purposes (anti-rollover device ROPS, handles, silencers etc.) must be installed to the machine prior to using it. In particular, any troubles which could have effect on safety must be eliminated immediately.



1.3 NOTES

1.3.1 Indications on sound and vibration

The subsequently listed sound and vibration indications correspond to the requirements of the CE Machinery Directive in the version 2006/42/EG.

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

Sound indication for driver's seat

The sound pressure level at the place of the operator, required according to Appendix 1, section 1.7.4.2 of the CE Machinery Directive, is:

HD 8 VV	$L_{pA} = 84 \text{ dB(A)}$
HD 10C VV	$L_{pA} = 84 \text{ dB(A)}$

Sound emission of the machine

The sound power level of the machine, required according to Appendix 2 of the CE Sound Emission Directive, is:

HD 8 VV	$L_{WA} = 106 \text{ dB(A)}$
HD 10C VV	$L_{WA} = 106 \text{ dB(A)}$

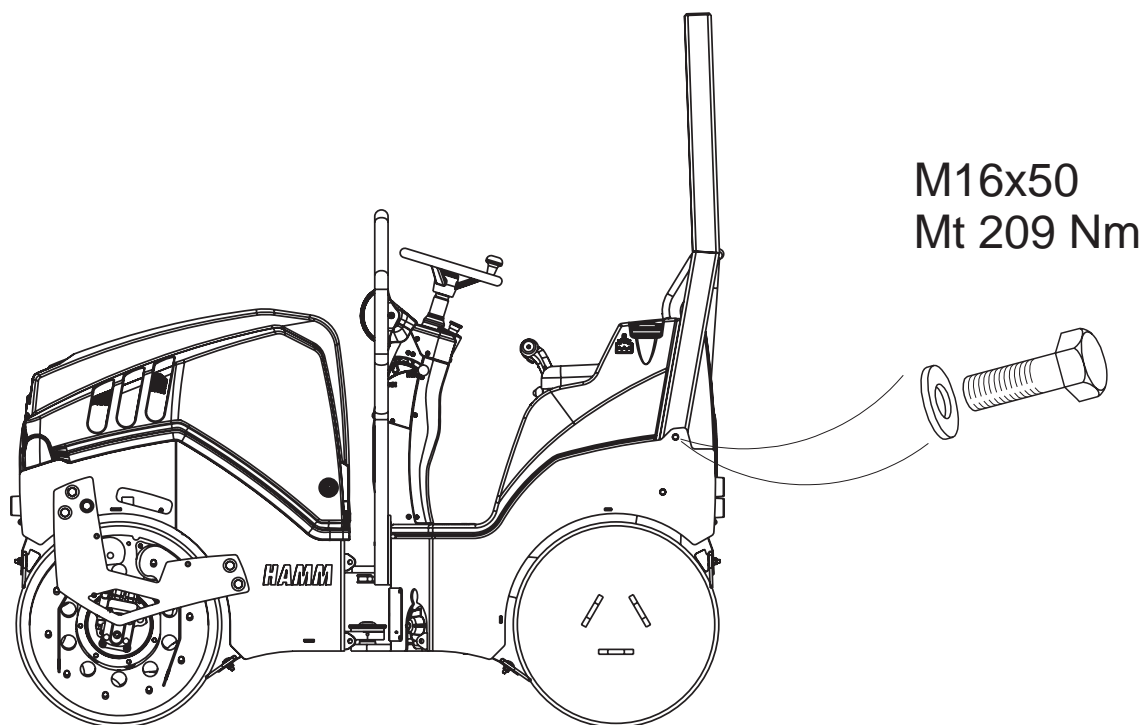
Vibration indication

The vibration indications for the whole-body vibration on the driver's seat, required according to Appendix 1, section 3.6.3.1 of the CE Machinery Directive (weighted effective acceleration calculated according to ISO 2631 part 1), are:

HD 8 VV	0.3 m/s^2
HD 10C VV	0.3 m/s^2

1.3.2 Installation instructions for safety device ROPS anti-rollover bar

⚠ The machine may only be operated with installed anti-rollover device!








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1.3.3 Safety

The safety notes summary applies to several machine types with different equipment. Thus, it may be possible that some safety notes are listed which do not apply to your machine type.

Warning notes and symbols

The following denominations or symbols are used in the operation instructions for indications of special importance. Please disclose these safety instructions also to other users.

-  Immediate danger; possible consequences:
Death or very severe injuries.
-  Possibly dangerous situation; possible consequences:
Death or very severe injuries.
-  Dangerous situation; possible consequences:
Light or insignificant injuries, warning of property damage.
-  Possibly detrimental situation; possible consequences:
The product or things in its surrounding may be damaged.
-  Hints on application and useful information.
No information warning against a dangerous or detrimental situation.

Principle; intended use

- This machine has been built according to the state-of-the-art and the generally accepted safety regulations. However, danger for life and health of the user or impairment of the machine and of other objects can arise during the use of the machine.
 - This machine may only be used in technically unobjectionable condition, as well as according to the intended use, and aware of safety issues and possible dangers, always observing the operating instructions. All safety devices removed for transport purposes (anti-rollover device ROPS, handles, silencers etc.) must be installed to the machine prior to using it. In particular, any troubles which could have effect on safety must be eliminated immediately.
 - Arbitrary changes will exclude the manufacturer's liability for any damage resulting from this.
 - The machine may only be deployed on surfaces that can support it. It is intended solely for deployment for compressing loose surfaces, road foundations, road surfaces and similar compactable foundations. Any other deployment or a deployment beyond this is not deemed as intended. The manufacturer/supplier is not liable for any damage resulting from this. The user will bear the complete risk.
- The intended use also includes the observance of the operating instructions as well as the compliance with the inspection and maintenance requirements set out by the manufacturer.

Organisational measures

- The operating instructions must always be stored readily available at the place of application of the machine (in the tool case or in the container for this purpose).
- The operating instructions of the combustion engine are a part of the overall operating instructions of the machine.
- The generally applying legal and other binding accident prevention and environment protection regulations must be observed and instructed supplementary to the operating instructions.
- Such duties may also concern, e.g., the handling of hazardous substances or the disposition/wearing of personal protection equipment, as well as provisions of traffic law or occupational health regulations.
- The operating instructions must be supplemented by instructions for taking into account factory-related particularities, including supervision and notification duties.
- The personnel ordered to perform activities with this machine must have read these operating instructions, and in particular the safety section. It is too late to do this during work. This is particularly true for staff only working occasionally on the machine, e.g. for repair and maintenance.
- The safety and danger awareness of the personnel during work, taking into account the operating instructions, must be controlled at least from time to time.
- The personnel must not wear open long hair, loose-fitting clothes, or jewelry, including rings. Danger of injury due to catching or pulling-in.
- Personal protection equipment must be used as far as necessary or as required by regulations.
- All safety and danger indications at the machine must be observed.
- All safety and danger indications on/at the machine must be kept complete and legible.
- Any changes, conversions, add-ons to the machine, which could impair safety, must not be performed without the approval of the manufacturer. This also applies to the installation and the adjustment of safety devices and valves as well as for welding on load-bearing parts.
- Spare parts must comply with the technical requirements determined by the manufacturer. This is always ensured for original spare parts.
- Hydraulic hoses must be replaced in the defined or appropriate intervals, even if safety-relevant defects cannot be detected.
- Any intervals for recurring inspections/ tests defined or indicated in the operating instructions must be kept.
- A workshop equipment corresponding to the work is absolutely necessary for performing servicing work.
- The installation of tires requires sufficient knowledge and appropriate mounting tools.
- The storage places and the use of fire extinguishers must be announced.
- Fire alarm and fire extinguishing possibilities must be observed.

Selection and qualification of staff; general duties

- Any work with or on the machine must only be performed by appropriate and reliable staff. The minimum legal age must be observed.
- Only trained or instructed staff may be used.
- The responsibility of the staff for operation, maintenance and servicing must be clearly defined.
- It must be ensured that the machine is only operated by staff ordered to do this.
- The responsibility of the machine operator - also with respect to traffic regulations - must be defined; these must allow him or her to reject unsafe instructions of third parties.
- Any staff to be trained, instructed, taught-in, or any staff within a general education measure, may only work on the machine under the continuous supervision of an experienced person.
- Any work on electrical equipment of the machine may only be performed by a specialised electrician or by instructed persons under the supervision of a specialised electrician and according to the rules of electric engineering.
- Any work on suspensions, braking and steering installations may only be performed by specialised staff trained for this.
- Only staff with specialist knowledge and experience of hydraulics may work on hydraulic installations.

Safety notes on certain operation phases

Normal operation

- All working modes which are questionable with respect to safety must not be performed.
- The operator must get familiar to the working environment at the place of utilisation prior to the start of work. The working environment includes e.g. the obstacles in the working and traffic area, the load carrying capacity of the underground and necessary safeguarding of the working site towards public traffic.
- Measures must be taken which only allow the operation of the machine in a safe and functional condition. Only operate the machine if all protection devices and safety-related devices, e.g. detachable protection equipment, EMERGENCY STOP devices (NOT-STOP), sound protection devices, aspiration devices, are existing and operative.
- The machine must be inspected with respect to visually detectable damages and defects at least once per shift. Any occurred changes (including changes of the operational behaviour) must be notified immediately to the responsible entity/person. If necessary, immediately shut down and secure the machine.
- In case of malfunctions, the machine must immediately be shut down and secured. Have the malfunction eliminated immediately.

- Starting the engine and conducting the machine may only be performed from the drivers seat. Do not start the engine by short-circuiting the electric connections at the starter, since the machine could immediately start moving. Also, the function of the starter protection switch must not be overridden.
- Get familiar with all devices and operating elements as well as with the functions of these prior to starting the engine. It is too late to do this during work.
- The acceleration and braking behaviour of the machine are influenced by viscous hydraulic oil. For this reason, warm up the machine during the warming phase with moderate speed and low load until the hydraulic oil has heated to 20 °C (68 °F).
- Always wear a safety belt during travel.
- Never adjust the driver's seat during travel.
- The vibration function must never be used in the immediate vicinity of buildings (danger of collapse). Prior to switching on the vibration function, ensure that any lines laid in the underground (gas, water, sewage, electricity lines) are not damaged or destroyed.
- Observe all switching processes and control displays according to the operating instructions.
- Prior to starting the machine ensure that nobody can be put into danger by the starting of the machine.

- Prior to driveaway, check for persons in the immediate vicinity of the machine.
 - Prior to driveaway/start of work, check whether the brakes, the EMERGENCY STOP device (NOT-STOP), the steering system, and the signaling and illumination installations are operative.
 - Check for sufficient vision. Adjust necessary mirrors correctly.
 - Prior to driveaway, always check the accident-safe storage of accessories. Lift attached add-on devices off the ground.
 - Never leave the driver's stand during travel.
 - ☞ In emergency situations and when there is a danger, bring the machine to an immediate stop by operating the EMERGENCY STOP switch (NOT-STOP).
 - ☞ Do not use the EMERGENCY STOP switch (NOT-STOP) as service brake.
 - ☒ In emergency situations and when there is a danger, bring the machine to an immediate stop by operating the parking brake!
 - ☒ Do not use the parking brake as the service brake.
 - When driving on public roads and places, observe the applying traffic regulations and bring the machine to an admissible condition with respect to traffic law, if necessary.
 - In case of bad visibility and in darkness always switch on the lights.
 - It is forbidden to transport passengers.
 - Always check for sufficient clearance when passing underpasses, bridges, tunnels, overhead lines etc.
 - Always keep sufficient distance to borders of excavation pits and batters.
 - Do not use any working procedure that would impair the stability of the machine.
 - The driving speed must always correspond to the conditions of the surroundings.
 - Do not drive slopes in transversal direction; keep working equipment and loaded goods always near to the ground, in particular when driving down slopes.
 - Avoid driving sudden curves when driving up or down slopes.
 - Always switch to a lower gear before a slope, never on the slope.
 - Before leaving the driver's stand, always prevent the machine making unintentional movements (0 position lock engaged, parking brake applied, engine switched off).
 - If the driver removes from the machine, he or she must pull out the ignition key and lock the cabin door and, if applicable, the cabin doors or the dashboard cover.
 - Lower down completely any installed additional devices prior to leaving the machine.
 - Never jump from the machine (risk of injury). Use the climbing steps and the grips.
 - Disconnect the engine from electrical supply with the battery disconnecter.
- Special work in the scope of machine utilisation, servicing work, as well as troubleshooting during working procedures; disposal**
- Comply with adjustment, maintenance and inspection work and schedules defined in the operating instructions as well as with indications on the replacement of parts/partial equipment. Only specialised staff is authorised to perform such works.
 - Inform operating staff prior to the start of special work and servicing work. Keep unauthorised persons off the machine during these works. Denominate a supervisor.
 - During all works concerning the operation, the production adaptation, the conversion or the adjustment of the machine and its safety-related devices, as well as inspection, maintenance and repair, observe processes for switching on and off according to the operating instructions as well as the notes for servicing work.
 - As far as necessary, safeguard the servicing area spaciouly.
 - Protect the machine against unexpected starting during maintenance and repair work.
For this:
 - Lock the main command devices and pull off the key
 - Pull off the key from the battery disconnecter and
 - Attach a warning sign to the steering wheel.

- Generally, all maintenance and servicing work may only be performed when the engine is at a standstill.
- Only open the engine hood when the engine is at a standstill.
- Keep away from moving, rotating or revolving parts; do not touch these (danger of accidents).
- Only perform maintenance and servicing work if the machine is parked on a level, stable ground and if it is secured against rolling away and buckling (danger of bruising).
- Perform maintenance and servicing work below the lifted driver's stand only when the lock is latched in. Engine bonnet always fully open (danger of life).
- After maintenance and servicing activities that require the lifting of the driver's stand, the driver's stand must be reattached/screwed to the engine frames. This is the only way to ensure the roll-over protection.
- Individual parts and bigger assemblies must be attached carefully to lifting equipment and safeguarded in a way that no danger can emanate from these. Only use appropriate and technically unobjectionable lifting equipment as well as load-carrying equipment with sufficient loading capacity. Do not rest or work under suspended loads.
- Only order experienced persons with the fixing of loads and the guidance of crane operators. The guiding person must be in visible range of the operator or have a speaking contact to him or her.
- During installation work above body height, use safe climbing aids and working platforms intended for this purpose. Do not use machine parts as climbing aids. In case of maintenance work in greater heights, wear fall protection. Keep all handles, steps, handrails, pedestals, platforms, ladders, free from dirt, snow and ice.
- Clean all oil, fuel, and care agent residues from the machine, in particular from connections and screwed connections, prior to maintenance and repair work (fire hazard). Do not use aggressive cleaning agents. Use fibre-free cleaning cloth.
- Prior to cleaning the machine with water, vapour stream (pressure washer) or other means of cleaning, cover/seal all apertures which must not be penetrated by water/steam/cleaning agent due to safety or functionality reasons. Electric motors and distribution cabinets are specially endangered in this respect.
- After cleaning, the covers/seals must be taken off completely.
- After cleaning, check all fuel lines, engine oil lines, and hydraulic liquid lines for leaks, loose connections, chafe marks, and damage. Eliminate detected defects immediately.
- Always tighten any screwed connections loosened during maintenance and servicing work.
- If the removal of safety devices is necessary for rigging, maintenance and repair, the safety devices have to be re-installed and checked immediately after the end of the maintenance and repair work.
- Take care for a safe and environment-friendly disposal of operating and auxiliary substances, replaced parts and contaminated cleaning material.

Notes with respect to special types of danger

Electrical energy

- Only use original fuses with the correct power value. Immediately shut down the machine in case of troubles in the electric power supply.
- During the start of the machine with battery connection cables, always connect the positive pole to the positive pole and the negative pole to the negative pole. Always connect the negative pole last and disconnect it first.
- Keep sufficient distance between the machine and overhead voltage lines. During works near electric overhead lines, the equipment must not come near to the overhead lines. Danger of life! Inform yourself about safety distances to be kept.
- After touching high-voltage lines:
 - Do not leave the machine
 - Drive the machine out of the danger area
 - Warn surrounding persons not to come nearer and not to touch the machine
 - Have the voltage shut down
 - Only leave the machine after it absolutely sure that the touched/damaged line is de-energised.
- Any work on electrical installations or operating resources may only be performed by a specialised electrician or by instructed

ed persons under the supervision of a specialised electrician and according to the rules of electric engineering.

- During works at the electric installation, the machine must be de-energised at the battery disconnecter or by disconnecting the negative pole (earthing strip) at the battery.
- Do not smoke during maintenance work at the battery (danger of explosion). Keep away igniting sparks or open flames.
- Dispose used batteries properly.
- The electrical equipment of a machine must be inspected/tested regularly. Any defects, as e.g. loose connections or burnt cables, must be eliminated immediately.
- Only use tools insulated against voltage.

Gas, dust, vapour, smoke

- Only operate combustion engines and fuel-operated heating systems in sufficiently ventilated areas. Take care for sufficient ventilation before starting in closed rooms (danger of poisoning). Observe the regulations applying for the respective place of application.
- The operation of the machine is inadmissible in places where flammable gases or dusts can occur (e.g. near fuel storage areas, coal storage areas, cereals storage areas, wood dust or similar).
- Unusual sounds and strong smoke exhaust of the engine during operation can point to dangers. Find out the cause and have the damage repaired.

- Welding, torching and grinding work may only be performed at the machine if this is expressly admitted. There may be fire and explosion hazard.
- Prior to welding, torching and grinding, clean the machine and its surroundings from dust and flammable substances and take care for sufficient ventilation (danger of explosion).

Hydraulic system, pneumatic system

- Only staff with specialist knowledge and experience of hydraulics may work on hydraulic installations.
- All lines, hoses and screwed connections must be checked for leaks and visible damage (at least once per year). Damaged parts must be replaced immediately. Further operation is inadmissible. Oil spurting out can lead to injuries and fire.
- Liquids spurting out under high pressure (hydraulic oil, fuel) can penetrate the skin. In case of such injuries consult a doctor immediately; otherwise, severe infections may occur.
- Prior to work on hydraulic lines, safeguard the machine against rolling away (parking brake, wedges). Lower down add-on devices completely. Only then remove the pressure from the lines.
- Remove the pressure from system sections to be opened and from pressure lines (hydraulics, compressed air) according to the assembly descriptions prior to beginning the repair work.

- Lay and install hydraulic and compressed air lines appropriately. Do not confuse connections. The fittings, the length and the quality of the hose lines must comply with the requirements.

Noise

- Sound protection devices at the machine must be in protection position during operation.

Fuel, oils, greases and other chemical substances

- Only appropriate and clean lubricants may be used. Otherwise the guarantee becomes void.
- During the handling of oils, greases and other chemical substances, observe the safety regulations applying for the respective product.
- Do not heat oil above 160 °C (320 °F); otherwise, oil or oil vapours may ignite.
- Prior to filling up fuel, switch off engine and heating and pull out the ignition key. Do not fill up fuel in closed rooms. Wipe away spilled fuel immediately.
- Be extremely careful when handling fuel - increased fire hazard. Never fill up fuel near open flames or igniting sparks. Do not smoke during filling up!
- Be careful during the handling of brake fluid and battery acid (noxious and caustic).
- Be careful during the handling of hot operation and auxiliary materials (danger of burning or scalding).

- Release emulsions for tires may only be mixed from water and release concentrate according to the indications of the release agent manufacturer. The environment protection regulations must be observed.

Transport and towing

- Only tow, load and transport according to the operating instructions.
- Only use appropriate transport means and lifting hoist with sufficient load capacity. Take into account the weight and the dimensions (technical data).
- Only use stable loading ramps with sufficient carrying capacity for loading. Take care not to endanger persons by tilting or sliding.
- Prior to loading ensure that the vehicle (e.g. trailer, flat bed etc.) cannot tilt upwards when driving onto the loading area.
- Do not step or rest under suspended loads (danger of life).
- Do not rest in the danger zone of the machine during the guidance and loading of the machine (danger of life).
- Use the specified gantries.
- Drive the machine slowly onto or from the loading area, respectively.
- Safeguard the machine with square timber, wedges and tensioning ropes against shifting. Safeguard the attenuation elements of the drum suspension against overload by means of a support.
- Remove square timbers, wedges and tensioning ropes completely before unloading.
- All safety devices removed for transport purposes (anti-rollover device ROPS, handles, silencers etc.) must be installed to the machine prior to using it.

- During towing, keep the specified transport position, the admissible speed and the travel path.

ROPS cabin

- The machine frame must not be warped, bent or cracked in the cabin fixing area (deformation).
- The reinforcement elements of the ROPS cabin must not show rust, damage, fissures or open fractures.
- All screwed connections of the reinforcement elements must comply with the given specifications and must be screwed tightly to each other (observe tightening torque values).
- Bolts and nuts must not be damaged, bent or deformed.
- Additional parts may not be installed to the reinforcement elements without the manufacturer's approval.
- Any change to the reinforcement elements which would decrease its strength, is inadmissible.

ROPS anti-rollover bar

- The machine frame must not be warped, bent or cracked in the ROPS fixing area (deformation).
- The ROPS must not show rust, damage, fissures or open fractures.
- All screwed connections must comply with the given specifications and must be screwed tightly to each other (observe tightening torque values).
- Bolts and nuts must not be damaged, bent or deformed.
- Additional parts may not be installed without the manufacturer's approval.
- Any change which would decrease the strength of the ROPS is inadmissible.

1.3.4 Fuel

⚠ Danger of explosion! Increased fire hazard! Danger of intoxication!
Be careful during the handling of fuel!
Prior to refilling fuel, the diesel engine and fuel-operated heating systems, if any, must be shut down.
Do not fill up fuel in closed rooms.
Wipe away spilled fuel immediately. Do not breathe in vapours.
Fuel is flammable and explosive. Thus, avoid open flames or igniting sparks during fuel handling, or even near fuel. Do not smoke! This also applies where the characteristic smell of fuel can be detected. In case of fuel smells in the machine itself, the cause must be detected and removed immediately.

Only operate the diesel engine with common diesel fuel with a sulphur content below 0.5 %. In case of a higher sulphur content, the engine oil change intervals must be shortened.

Admissible fuel specifications are:

- DIN EN 590
- JIS K 2204 Grade 1 and 2
- ASTM D 975-88: 1-D and 2-D

Marine Diesel Fuel, heating oils etc. may not be used.

The stated engine oil change intervals require a diesel fuel with a maximum sulphur content of 0.5 % and a continuous ambient temperature of a minimum of -10 °C (14 °F).

For diesel fuels with a fuel content between 0.5 % and 1.0 %, or continuous ambient temperatures below -10 °C (14 °F), the engine oil change intervals must be halved.

If diesel fuels with manufacturer-guaranteed winter properties are used, additives can be omitted until the guaranteed temperature is reached.

In case of low temperatures, fluidity and filterability of the diesel fuel are insufficient (crystallised paraffins).

Therefore, diesel fuels with increased low temperature properties are available in winter months. Prior to the cold period, take care to fill up winter diesel fuel.

In order to maintain fluidity and filterability for summer diesel fuel at low temperatures, a quantity of engine petroleum, depending on the external temperature (observe country-specific regulations), or commonly available fuel additives, so-called flow improvers, must be mixed into the vehicle tank. A dissolving of already crystallised paraffins is impossible.

A maximum of 30 % engine petroleum can be added:

External temperature (°C / °F)	Summer diesel fuel (%)	Addition (%)
±0 to -9 (32 to 15.8)	80	20
-10 to -14 (14 to 6.8)	70	30

At extremely low temperatures, add additive also to winter diesel fuel:

External temperature (°C / °F)	Winter diesel fuel (%)	Addition (%)
-15 to -25 (5 to -13)	70	30


The use of flow improvers keeps engine power constant and allows the use of the vehicle also for extremely low temperatures.

Observe the manufacturer's indications.

1.4 IDENTIFICATION OF THE ROLLER

1.4.1 Type sign, VIN.

The unique identification of the roller is given by the vehicle identification number (VIN). It can be found on the type sign together with the type designation and the weight indications. The type sign is fixed to the machine frame. It must neither be changed nor removed. If the type sign is not legible any longer, or if it has been lost, a replacement type sign must be ordered immediately at the HAMM customer service, stating the VIN embossed into the right front part of the machine frame, and fixed to the machine.

 Please state the VIN and the type designation of your machine for every spare part order.

1.5 TECHNICAL DATA

1.5.1 Loading and transport

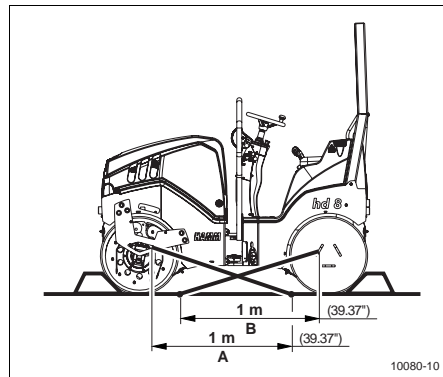
When loading rollers onto lorries, trailers or semitrailers, it is very important to secure the load properly. The duty for tie-down on street vehicles arises from StVO § 22, StVO § 23, HGB § 412 as well as from VDI guideline 2700. Sufficient knowledge about the loading of vehicles as well as about their behaviour under load are required for loading and transporting the machine. The machine may only be loaded by trained loading staff. It must be fixed to the vehicle in an form-locked or friction-locked and transport-safe way. The machine must not change its position of the vehicle during normal traffic loads. Emergency braking, change manoeuvres and uneven grounds count among normal traffic loads. 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.

The relevant accident prevention regulations as well as further generally acknowledged safety and traffic-related rules must be complied with.

- Weight and dimensions (technical data).
- It is very important to use a loading ramp when loading the machine onto a lorry.

- If necessary, support the loading area to the floor in order to prevent the vehicle (trailer) from tilting upwards when the roller is driven onto the loading platform.
- Only use appropriate gantries or planks. When driving the roller up the loading area, take care that the drums or tires have appropriate contact.
- Gantries and planks must be free from grease, dirt, ice etc.
- Drive the machine slowly onto the loading area with $\frac{1}{4}$ diesel engine speed.
- On rubber wheel rollers with tyre inflation system, the tyre pressure must be set to 6 bar (87 psi). The actuation element for tyre filling must set the the centre position after that.
- Shut down the machine and secure against unauthorised start (see section "Stopping, shutting down the engine, leaving the machine").
- In case of rollers with articulated steering, the steering blocking must always be activated for transport.
- Secure the drums or tires with wedges against shifting.
- Lash the machine with appropriate lashing devices onto the loading area, using only the marked lashing lugs (see figure).
- In case of crane loading, only fix ropes to the marked lifting lugs.

- Remove wedges and lashing devices completely before unloading. Unblock steering system by unblocking the articulated frame steering block.
- All safety devices removed for transport purposes (anti-rollover device ROPS, handles, silencers etc.) must be installed to the machine prior to using it.
- Drive the roller slowly and carefully from the loading area.

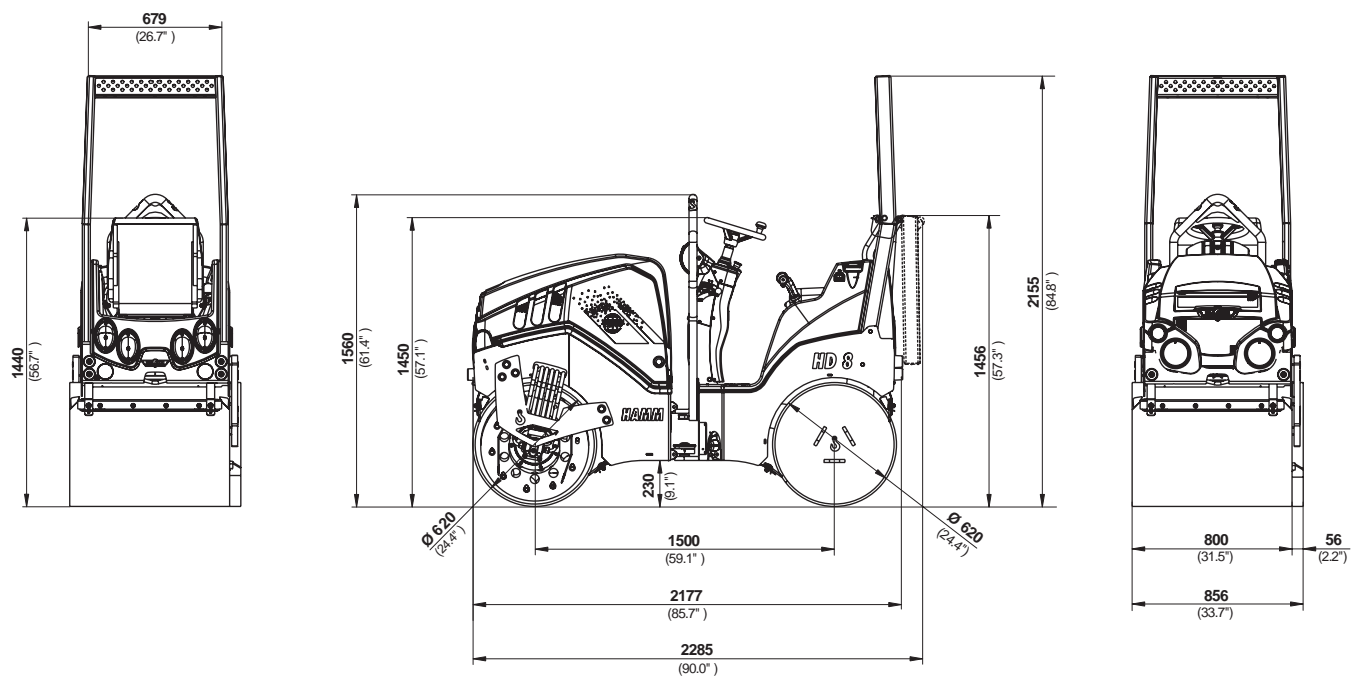


Load securing

- Position 2 wedges at each axis, as far to the outside as possible, flushing with drum or tyre, and fix them with 3 nails each to the loading area.
- The lashing devices A and B must be fixed to the lashing point of the machine and at the vehicle. The permitted tractive force must be at least 2000 daN also at the lashing point.

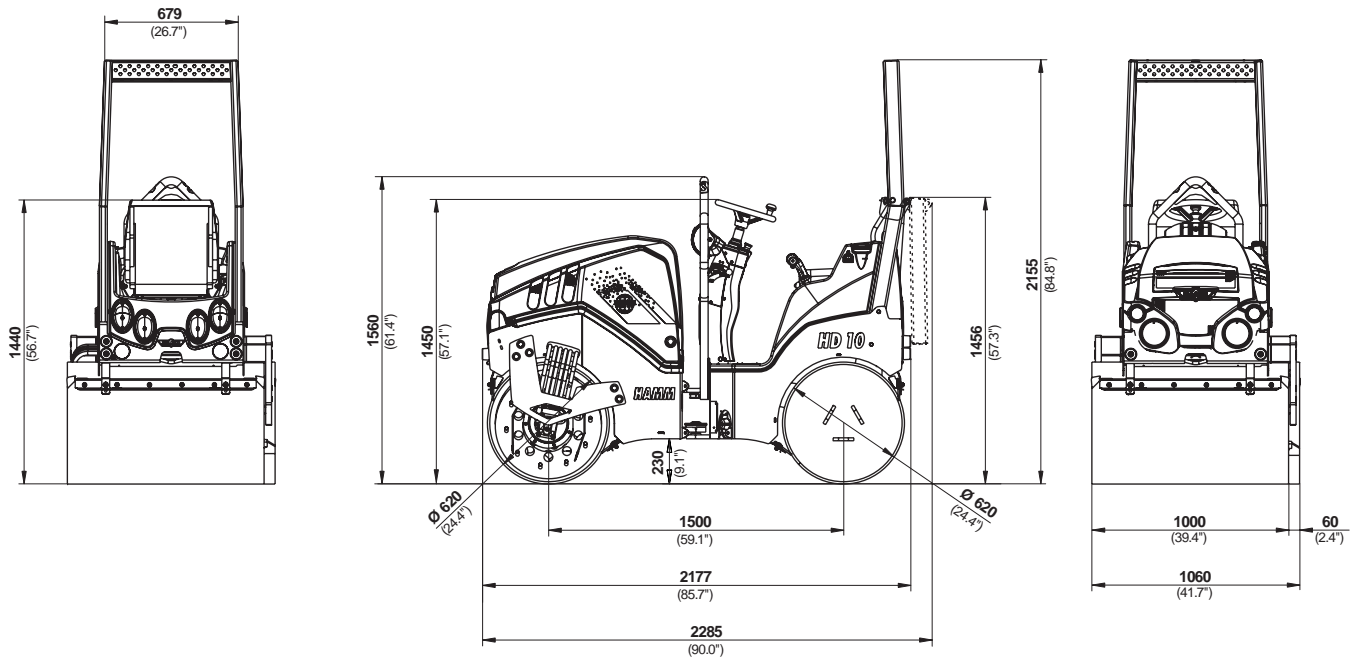
The arrangement of the lashing devices shown in the figure must be realised on both sides.

1.5.2 Dimension sheet HD 8 VV



10078-10

1.5.3 Dimension sheet HD 10C VV



10079-10

GENERAL



1.5.4 Technical data HD 8 VV

Dimensions and weights

Empty weight	1295 kg (2855 lbs)
Operational weight	1445 kg (3186 lbs)
Front axle load	710 kg (1566 lbs)
Rear axle load	735 kg (1621 lbs)
Vibration	front/back
Drum width/working width	800/856 mm (31.5/33.70")
Turning radius outside/inside	2960/2104 mm (116.54/82.83")
Drum diameter	620 mm (24.41")

Filling quantities

Fuel tank	30.00 l (7.92 US gal.)
Engine (for oil change)	4.00 l (1.06 US gal.)
Refrigerant	5.50 l (1.45 US gal.)
Oil container for hydraulic installation	26.00 l (6.86 US gal.)
Water container - irrigation for front and rear drum	75.00 l (19.8 US gal.)

Engine

Hatz diesel engine, four-stroke, 3 cylinders, liquid cooled, type	3W35
Power acc. to ISO 14396	15.7 kW/2700 rpm

**Electrical equipment**

Operation voltage	12 V
Battery 12 volts/66 Ah	

Drive

Hydrostatic drive, continuous, one-lever-operation	4x4
Speed	0-10 km/h (0-6.2 mph)
Gradeability with vibration up to	30 %
Gradeability without vibration up to	40 %

Vibration

Direct hydrostatic drive. Automatic vibration shut-off during reverse and at excessive speed.	
Frequency/amplitude	max. 62 Hz/0.45 mm (3720VPM/0.02")

Steering

Hydrostatic articulated frame steering.

Service brake

During operation, the machine is braked with the hydrostatic drive. Wear-free braking.

Parking brake

Spring-operated brake acting upon each hydromotor of the drive. Manually and automatically.

EMERGENCY STOP brake (NOT-STOP)

By hydrostatic drive and spring-operated brakes.

Water irrigation

Pressure irrigation, manual operation and automatic interval system.

Special equipment

On request, the machine can be equipped with extensive special equipment.

Changes in design, weight and dimensions reserved.

GENERAL



1.5.5 Technical data HD 10C VV

Dimensions and weights

Empty weight	1425 kg (3142 lbs)
Operational weight	1575 kg (3473 lbs)
Front axle load	770 kg (1698 lbs)
Rear axle load	805 kg (1775 lbs)
Vibration	front/back
Drum width/working width	1000/1060 mm (39/41.73")
Turning radius outside/inside	3060/2002 mm (120.47/78.82")
Drum diameter	620 mm (24.41")

Filling quantities

Fuel tank	30.00 l (7.92 US gal.)
Engine (for oil change)	4.00 l (1.06 US gal.)
Refrigerant	5.50 l (1.45 US gal.)
Oil container for hydraulic installation	26.00 l (6.86 US gal.)
Water container - irrigation for front and rear drum	75.00 l (19.8 US gal.)

Engine

Hatz diesel engine, four-stroke, 3 cylinders, liquid cooled, type	3W35
Power acc. to ISO 14396	15.7 kW/2700 rpm

**Electrical equipment**

Operation voltage	12 V
Battery 12 volts/66 Ah	

Drive

Hydrostatic drive, continuous, one-lever-operation	4x4
Speed	0-10 km/h (0-6.2 mph)
Gradeability with vibration up to	30 %
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Vibration

Direct hydrostatic drive. Automatic vibration shut-off during reverse and at excessive speed.	
Frequency/amplitude	max. 62 Hz/0.45 mm (3720VPM/0.02")

Steering

Hydrostatic articulated frame steering.

Service brake

During operation, the machine is braked with the hydrostatic drive. Wear-free braking.

Parking brake

Spring-operated brake acting upon each hydromotor of the drive. Manually and automatically.

EMERGENCY STOP brake (NOT-STOP)

By hydrostatic drive and spring-operated brakes.

Water irrigation

Pressure irrigation, manual operation and automatic interval system.

Special equipment

On request, the machine can be equipped with extensive special equipment.

Changes in design, weight and dimensions reserved.

2 OPERATION

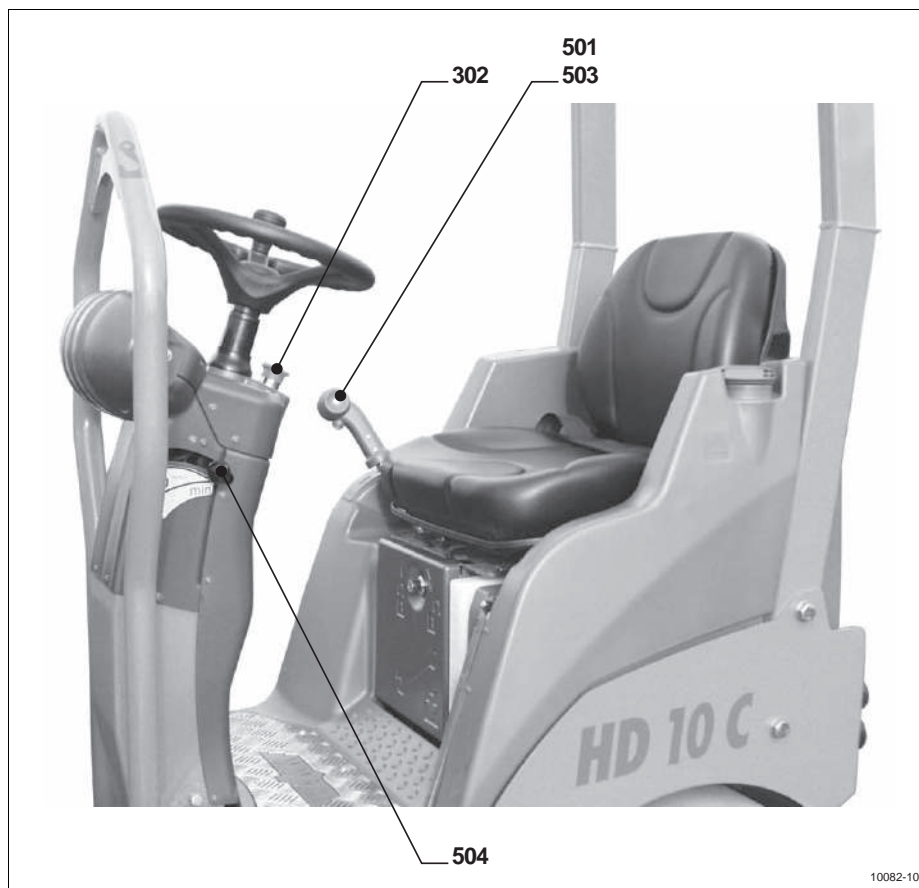
2.1 CONTROL AND OPERATION ELEMENTS

2.1.1 General

These operating instructions apply to several types of this series. Therefore it is possible that these instructions include descriptions of operation elements not installed in your machine. The position numbers refer to the description of the individual elements in this chapter. In the text for operation and maintenance, these position numbers are in brackets.

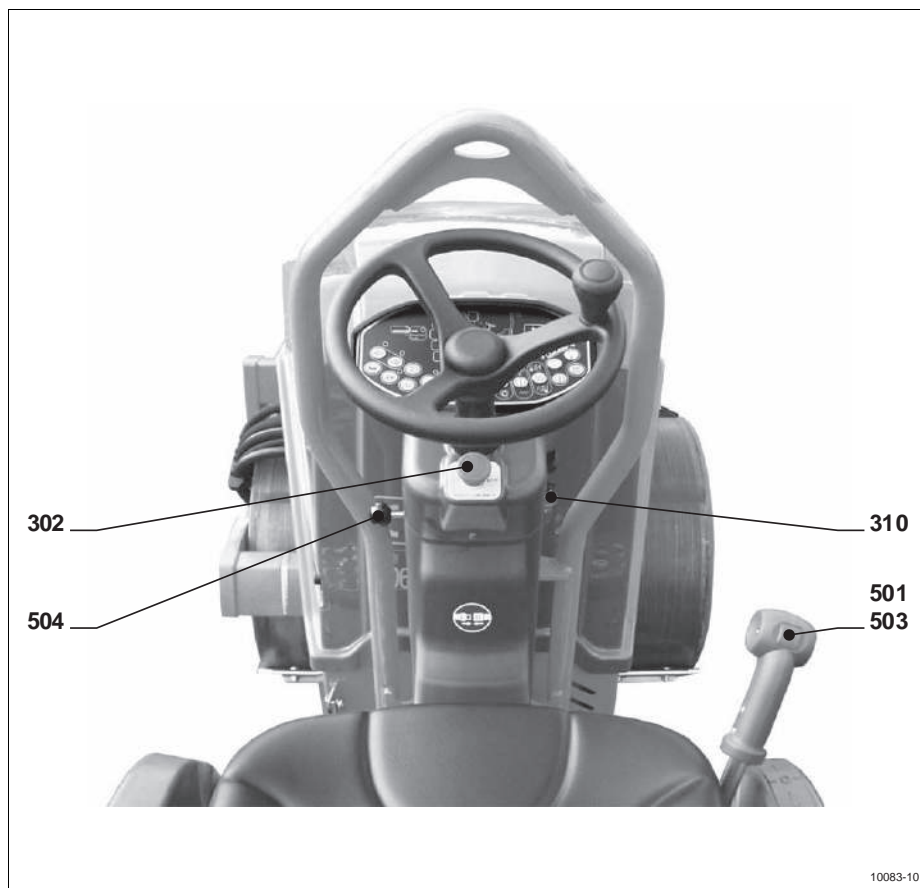
2.1.2 Overview

- 302 EMERGENCY STOP switch (NOT-STOP)
- 501 Driving lever
- 503 Multifunctional grip
Vibrator OFF-ON
- 504 Engine speed



10082-10

- 302 EMERGENCY STOP switch
(NOT-STOP)
- 310 Key switch electric system/engine start
- 501 Driving lever
- 503 Multifunctional grip
Vibrator OFF-ON
- 504 Engine speed

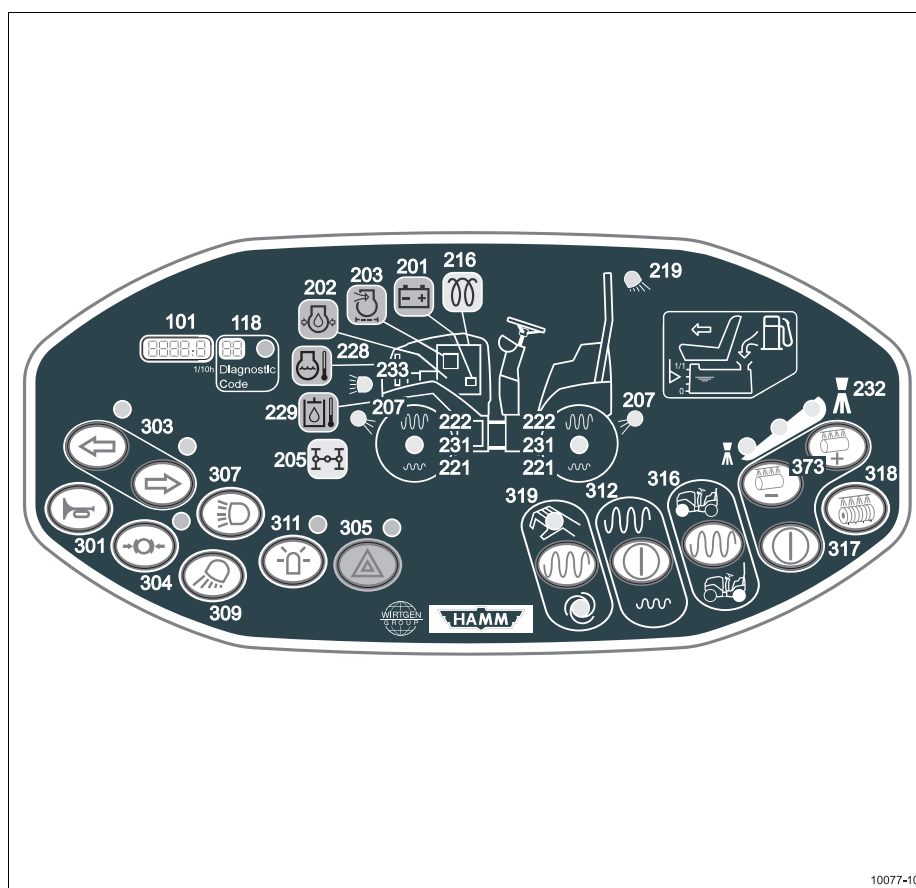


10083-10

OPERATION

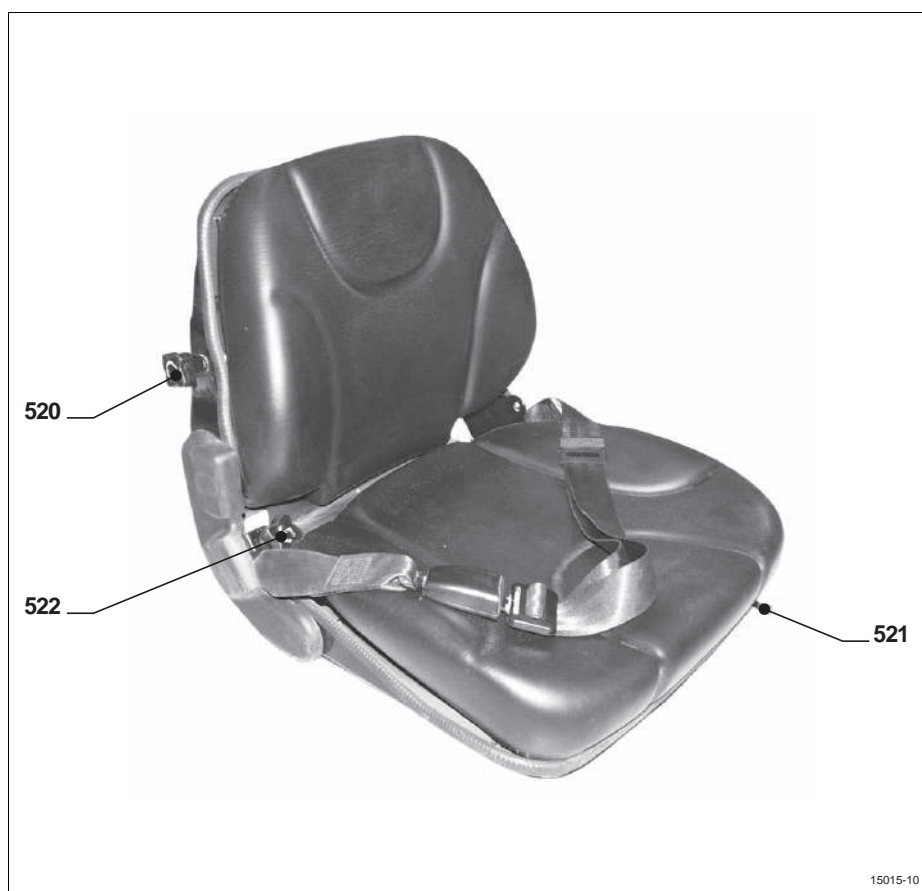


- 101 Operation hours counter display
- 118 Display of diagnostic code
- 201 Illuminated display for charging current
- 202 Illuminated display for engine oil pressure
- 203 Illuminated display for air filter
- 205 Function not existing
- 207 Illuminated display for water irrigation
- 216 Illuminated display for cold start assistance (option)
- 219 Illuminated display for working lights (option)
- 221 Function not existing
- 222 Illuminated display amplitude vibration activated
- 228 Illuminated display for engine temperature
- 229 Illuminated display for hydraulic system oil temperature
- 231 Illuminated display for vibrator preselection vibration deactivated
- 232 Illuminated display for irrigation level
- 233 Illuminated display for headlights (option)
- 301 Signal horn pushbutton
- 303 Turning light pushbutton (option)
- 304 Parking brake pushbutton
- 305 Warning lights pushbutton (option)
- 307 Headlights pushbutton (option)
- 309 Working lights pushbutton (option)
- 311 Rotating beacon pushbutton (option)
- 312 Vibration pushbutton
- 316 Vibrator preselector pushbutton
- 317 Water irrigation pushbutton
- 318 Function not existing
- 319 Vibration mode manual-automatic pushbutton
- 373 Irrigation level pushbutton



10077-10

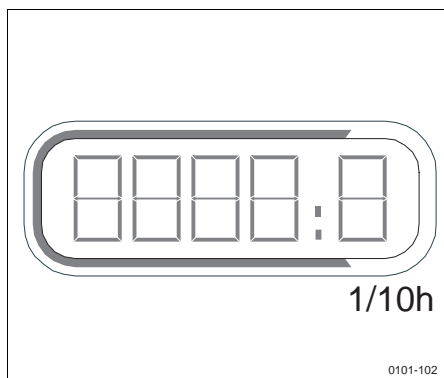
- 520 Seat adjustment weight
- 521 Seat adjustment forward - backward
- 522 Seat adjustment backrest



15015-10


2.1.3 Description of elements

The positions identified with numbers correspond to the numbering of the plates for operating elements, control devices and switches. They are identical to the numbers of the individual operating and control elements. In the describing text, these position numbers are in brackets. Among other things, this ensures that important and additional information can be found immediately and without difficulties in the descriptions of the elements.



101 Operation hours counter display


Registers the operating hours of the running diesel engine. Maintenance work has to be carried out according to the accumulated operating hours.

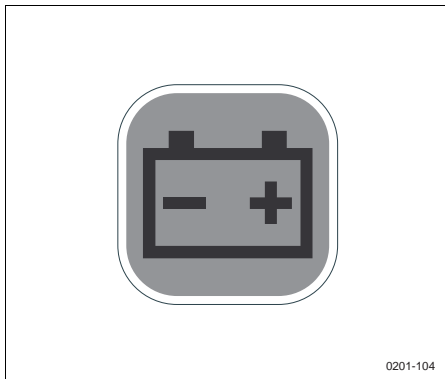
-  After switching on the electric system, an internal test code is displayed for 2 seconds.



118 Display of diagnostic code

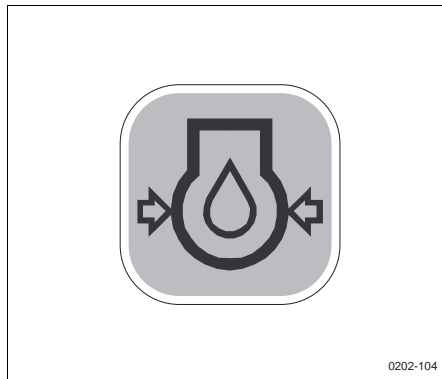
During operation, machine malfunctions are displayed by flashing indicators. A number code identifies the corresponding malfunction.

-  After switching on the electric system, an internal test code is displayed for 2 seconds.
See also section 4.1 Diagnostic Code in the operating instructions.



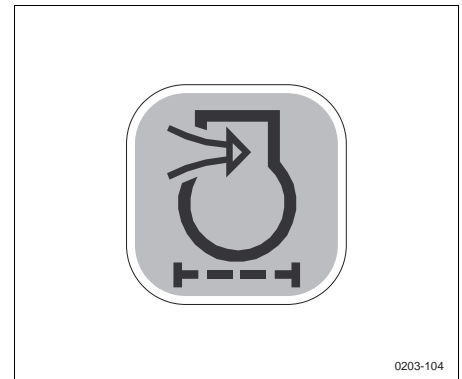
201 Illuminated display for charging current

When the electric system is switched on (key switch (310) in position I) and the engine does not run, this indicator must be illuminated. After the start of the engine the illumination must go out. Lighting up during operation indicates missing charging current. At the same time an acoustic signals sounds.



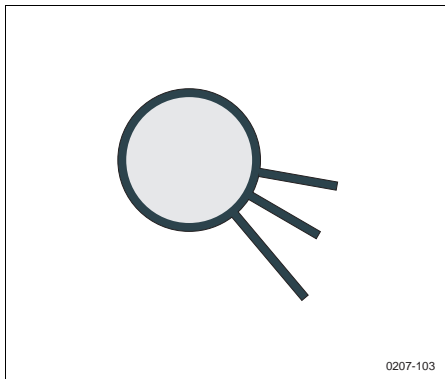
202 Illuminated display for engine oil pressure

When the electric system is switched on (key switch (310) in position I) and the engine does not run, this indicator must flash. After the start of the engine the illumination must go out. Flashing during operation indicates insufficient oil pressure. At the same time an acoustic signals sounds. Shut down the engine, determine and eliminate the cause. A flashing indicator with warm engine and idle speed is admissible, if the indicator stops flashing when the engine speed increases.



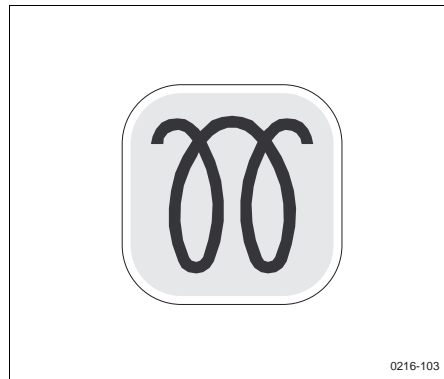
203 Illuminated display for air filter

Flashing during operation indicates a clogged air filter cartridge. At the same time an acoustic signals sounds.



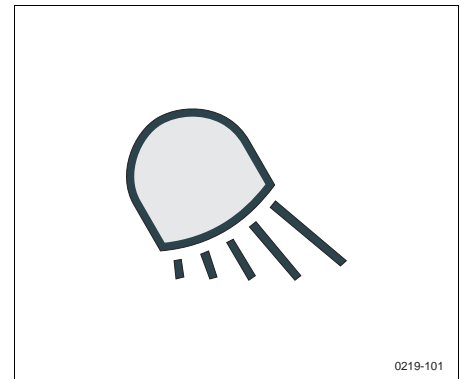
207 Illuminated display for water irrigation

The indicator lights up when the water pump runs during water irrigation.



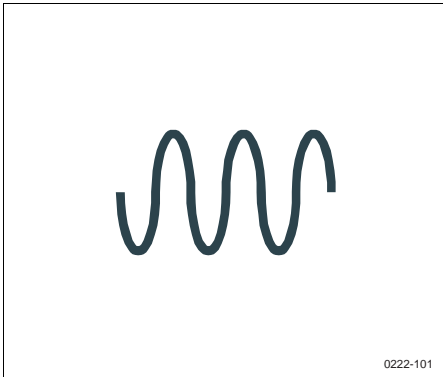
216 Illuminated display for cold start assistance (option)

When the electric system is switched on (key switch (310) in position I), this indicator lights up. The illumination goes out when the starting temperature is reached. Start the diesel engine.



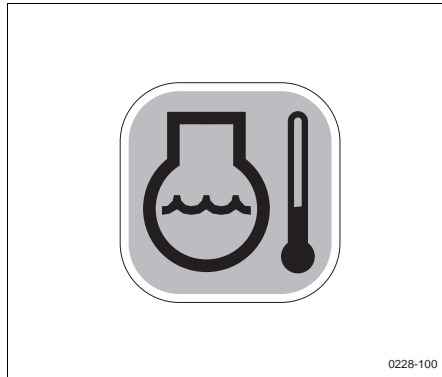
219 Illuminated display for working lights (option)

This indicator lights up when the working lights are switched on.



222 Illuminated display amplitude vibration activated

This indicator lights up when the vibration system is activated.



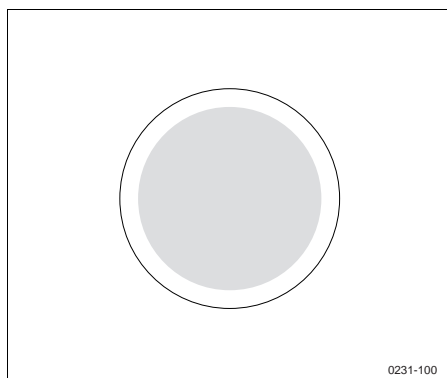
228 Illuminated display for engine temperature

Flashing during operation indicates overheating of the diesel engine. At the same time an acoustic signal sounds. Determine and eliminate the cause for overheating.



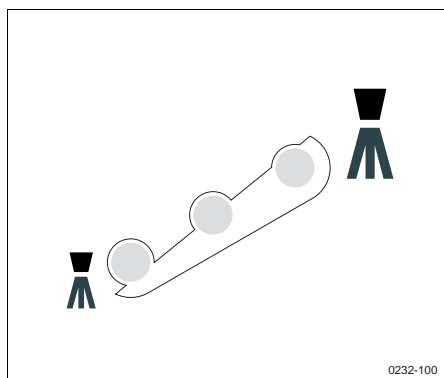
229 Illuminated display for hydraulic system oil temperature

Flashing during operation indicates hydraulic oil overheating. At the same time an acoustic signal sounds. Determine and eliminate the cause for overheating.



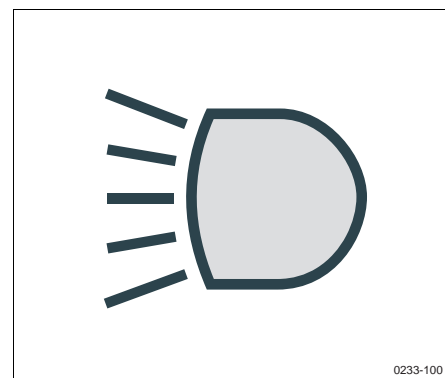
231 Illuminated display for vibrator preselection vibration deactivated

This illuminated indicator indicates a pre-selected vibrator in case of de-activated vibration.



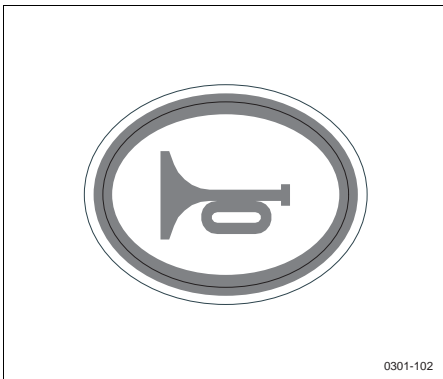
232 Illuminated display for irrigation level

This indicator lights up when the irrigation system is switched on. It indicates the irrigation level.



233 Illuminated display for headlights (option)

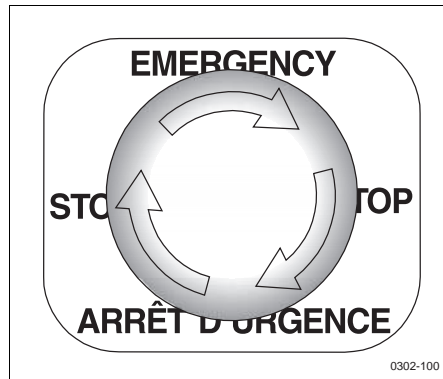
This indicator lights up when the lighting is switched on.



301 Signal horn pushbutton

The signal horn sound as long as this pushbutton is pressed.


On **PRESS**



302 EMERGENCY STOP switch (NOT-STOP)


When the EMERGENCY STOP switch (NOT-STOP) is pressed, the hydraulic drive is stopped, the vibration system is shut down, the diesel engine is shut off, and the hydraulic brakes are activated (illuminated indicators (201, 202) active).

On **DOWN**

 **Danger of injuries!**
The roller stops immediately without any delay!
Do not use the service brake!

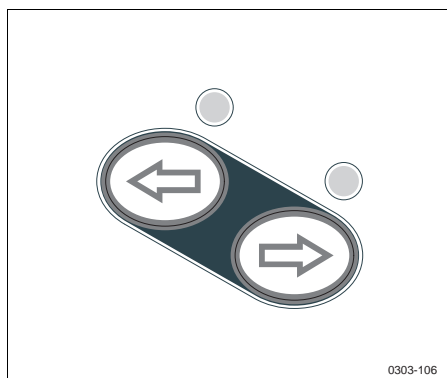
To disengage the switch knob, turn it clockwise. The illuminated indicators remain active.

Off **UP**

 After actuating the EMERGENCY STOP switch (NOT-STOP), the machine must be brought to its initial position. If the engine is started with the EMERGENCY STOP switch (NOT-STOP) pressed, the engine will not start for safety reasons.

Initial position:

- Latch driving lever (501) in position 0.
- Switch off vibration with pushbutton (312) (illuminated indicator (222) inactive).
- Release EMERGENCY STOP switch (NOT-STOP).
- Start the diesel engine.



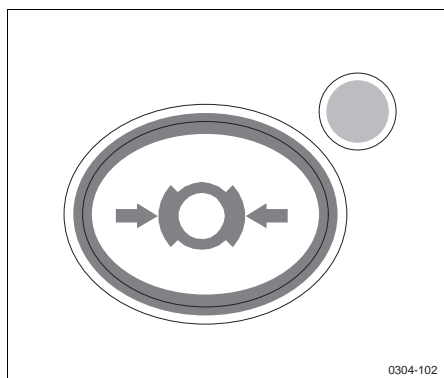
0303-106

303 Turning light pushbutton (option)

The arrows indicate the actuation direction for the corresponding turning direction of the machine.

When a turning light is switched on, the control light at the active pushbutton flashes.

On **PRESS**
Off **PRESS AGAIN**




0304-102

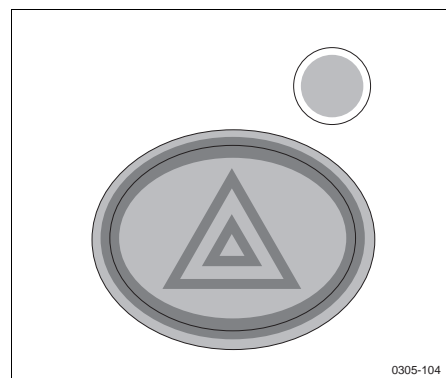
304 Parking brake pushbutton

Pressing the pushbutton applies or releases the parking brake.

Applied **PRESS**
(Control light lights up)

Released **PRESS AGAIN**
(Control light goes out)

 Use only for stopping and parking the machine. This is not a service brake! Check operation daily!




0305-104

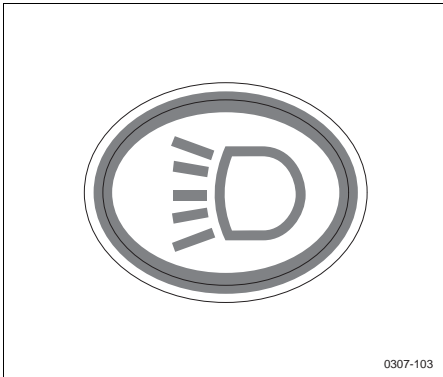
305 Warning lights pushbutton (option)

Pressing the pushbutton switches the warning lights on or off.

On **PRESS**
(Control light flashes)

Off **PRESS AGAIN**
(Control light goes out)

 Check the correct function of the warning lights prior to starting the engine!



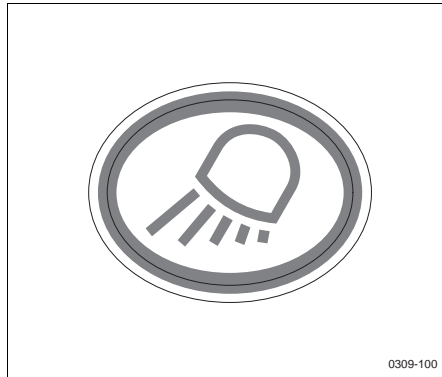
307 Headlights pushbutton (option)

When the electric system is switched off (key switch (310) in position 0) and this pushbutton is pressed, only the parking lights are switched on or off.

When the electric system is switched on (key switch (310) in position I) and this pushbutton is pressed, the headlights are switched on or off.

On **PRESS**
(Illuminated indicator (233) lights up)

Off **PRESS AGAIN**
(Illuminated indicator (233) goes out)



309 Working lights pushbutton (option)

Pressing the pushbutton switches the working lights on or off.

On **PRESS**
(Illuminated indicator (219) lights up)

Off **PRESS AGAIN**
(Illuminated indicator (219) goes out)



310 Key switch electric system/engine start

The electrical components are supplied with power through the key switch, and the Diesel engine is started and stopped.

Key position 0

Electric system **OFF**

Diesel engine **STOP**
(Key released)

Key position I

Electric system **ON**

Key position II **PREHEAT**

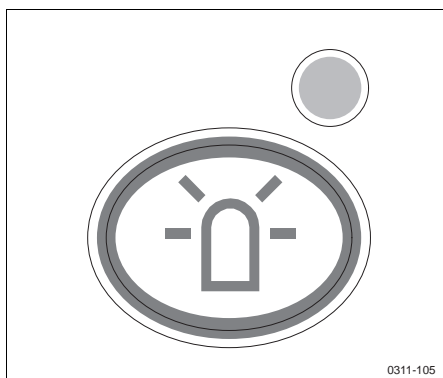
Key position III **ENGINE START**

(Key turns back to position I after starting)

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

If the engine is started with the EMERGENCY STOP switch (NOT-STOP) pressed, the engine will not start for safety reasons. To activate the machine:

- Latch driving lever in position 0.
- Release EMERGENCY STOP switch (NOT-STOP).

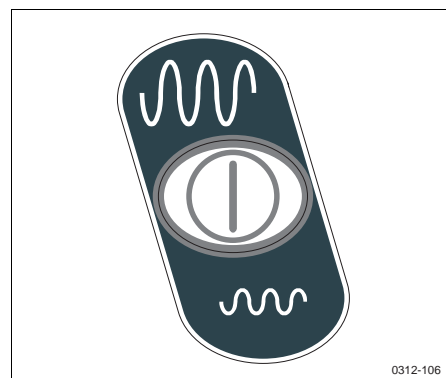


0311-105

311 Rotating beacon pushbutton (option)

Pressing the pushbutton switches the rotating beacon on or off.

On **PRESS**
(Control light lights up)
Off **PRESS AGAIN**
(Control light goes out)



0312-106

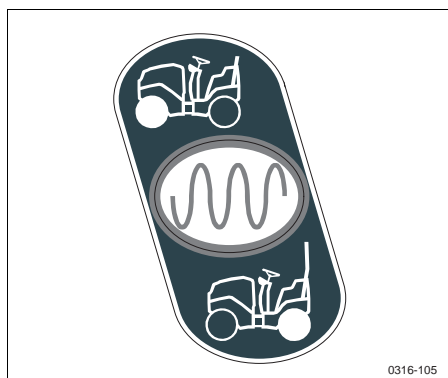
312 Vibration pushbutton

Pressing the pushbutton activates or deactivates the vibration system.

Activation **PRESS**
(Illuminated indicator (222) lights up)
Deactivation **PRESS AGAIN**
(Illuminated indicator (231) lights up)

When the vibration system is activated, the vibrator can be switched on or off at the multifunctional grip (503).

⚠ Danger of collapse!
Do not switch on the vibration system near buildings!



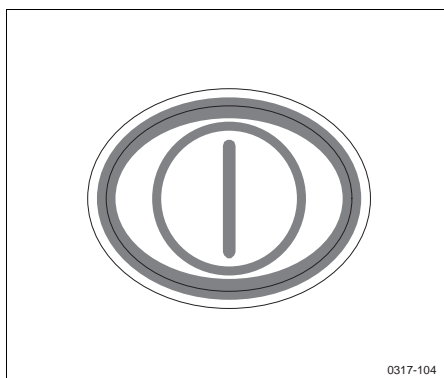
316 Vibrator preselector pushbutton

When this pushbutton is pressed, the vibrator in the front drum, in the rear drum, or in both drums, is preselected.

This illuminated indicator (symbol without oscillation) indicates a pre-selected vibrator in case of de-activated vibration. Each actuation of the pushbutton switches one step ahead in the circulation.

Front vibrator.....**PRESS**
Rear vibrator.....**PRESS AGAIN**
Double vibrator.....**PRESS AGAIN**

If the vibration system is activated with pushbutton (312), the illuminated indicator changes over to Vibration activated (symbol with oscillation).



317 Water irrigation pushbutton

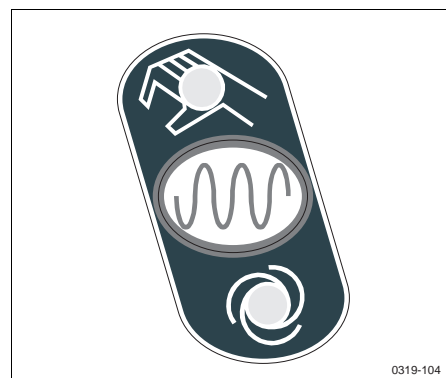
Pressing the pushbutton switches the water irrigation system on or off. Water consumption is optimised via a multi-stage automatic interval system. The irrigation levels can be selected with pushbuttons (373).

On**PRESS**
Off**PRESS AGAIN**

Continuous pressing of the pushbutton will cause permanent water irrigation. As long as the pushbutton is pressed, the pump runs in continuous operation.

Continuous operation.....**PRESS CONTINUOUSLY**

i When the machine is at a standstill, the irrigation system is without function.



319 Vibration mode manual-automatic pushbutton

The pushbutton sets the operating mode for the vibration system. The vibrator can be switched on or off manually or automatically.

Manually.....**PRESS**
(Upper control light lights up)

The vibration can be switched on or off at any time with the pushbutton on the multifunctional grip (503).

Automatically.....**PRESS AGAIN**
(Lower control light lights up)

OPERATION



The switching on and off of the vibration is coupled to the road speed. When the admissible road speed with vibration (8 km/h (4.97 mph)) is exceeded, vibration is switched off.

Braking

(below 1.5 km/h (0.93 mph)) **OFF**

Acceleration

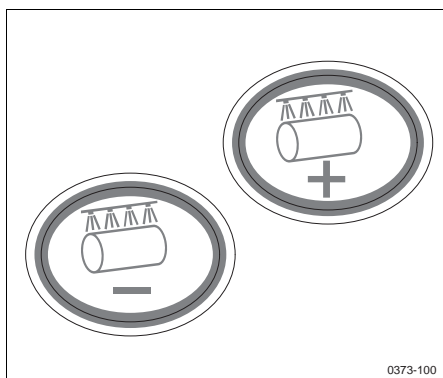
(more than 0.5 km/h (0.31 mph)) **ON**

Driving

(more than 8.0 km/h (4.97 mph)) **OFF**

☛ The automatic mode must be activated with the pushbutton at the multifunctional grip (503) after initial switching on.

The vibration can be switched on or off at any time with the pushbutton on the multifunctional grip.



0373-100

373 Irrigation level pushbutton

When the water irrigation system is switched on, water consumption can be selected from three irrigation levels. An illuminated indicator indicates the selected level. Each actuation of the pushbutton causes a level increment.

Increase level **PRESS +**

Decrease level **PRESS -**



0501-106

501 Driving lever

The driving lever determines the driving direction and speed.

Forward movement to the **FRONT**

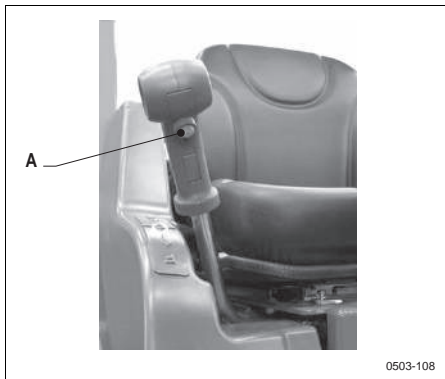
Backward movement to the **BACK**

Braking to the **CENTRE**

Stopping **CENTRE**

The speed is proportionate to the magnitude of the lever displacement.

Move the lever evenly and uninterruptedly. In ascending or descending slopes, reduce the driving speed at the driving lever and increase engine speed.



503 Multifunctional grip

Vibration

When the vibration system is activated, the vibrator can be switched on or off at the pushbutton A at any time.

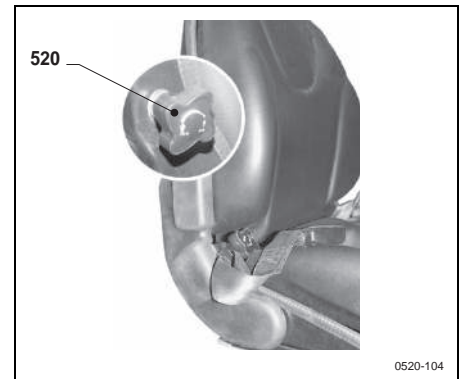
Vibrator on **PRESS**
Vibrator off **PRESS AGAIN**



504 Engine speed

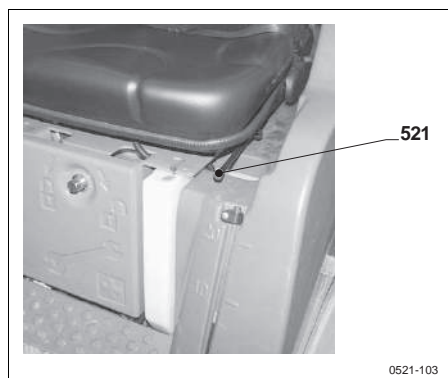
The speed of the diesel engine can be regulated between idle speed and maximum speed using the adjustment lever.

Idle speed **MIN**
max. speed **MAX**



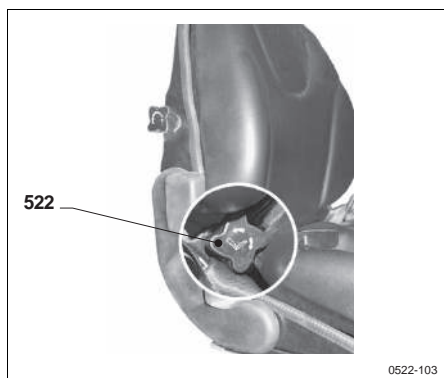
520 Seat adjustment weight

In order to absorb impulsive machine movements using the installed attenuation system, this must be adjusted to the weight of the driver. The pretension of the attenuation system can be adjusted continuously to a driver's weight between 50 kg (110 lbs) and 120 kg (265 lbs) by turning the hand wheel to the left or to the right.



521 Seat adjustment forward - backward

After lifting the lever, the upper part of the seat can be shifted in forward or backward direction in increments of 15 mm (0.59").



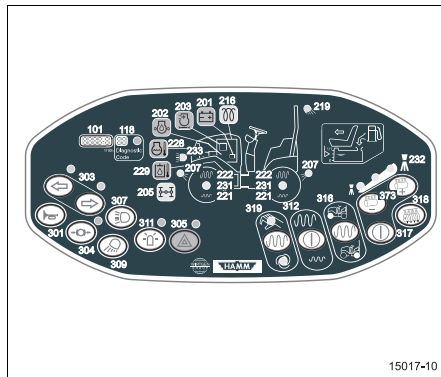
522 Seat adjustment backrest

The inclination of the backrest can be adjusted in forward or backward direction by turning the handwheel.

2.2 DRIVING

2.2.1 General

- ⚠ Danger of accidents by operating errors!
Prior to every start-up:
Check the machine for operational and traffic safety!
Read and observe the operating instructions and the safety notes!



What must be done prior to start of work?

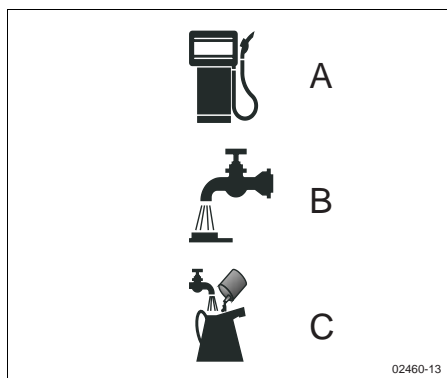
- Perform control and maintenance works (see maintenance section).
- Keep step-on surfaces and driver's stand free from stumbling hazards, grease, dirt, ice etc.
- Check the turning lights (303) and warning lights (305), as well as the signal horn (301) and the illumination (307).
- Check the parking brake (304).

- ⚠ Danger of explosion and increased fire hazard during fuel handling!
Only fill up fuel when the engine is at a standstill. Do not smoke during the filling-up process!
Never fill up fuel near open flames or igniting sparks. Do not fill up fuel in closed rooms!

- Never drive the machine until the fuel tank is empty. Check the filling level of the fuel tank in time. Fill up fuel tank in the evening; this avoids the precipitation of condensed water in the empty tank. Fill up to the lower edge of the filling spout. Only use clean fuel!

i Notes on filling up fuel, see section "Fuel".

- Check the filling level of the water tank. Fill up to the lower edge of the filling spout. Use clean water only!


**Symbols for operating substances**

The filling places for operating substances on the machine are identified with symbols. According to machine type and equipment, the following symbols are attached to the machine:

- A Fuel
- B Water irrigation
- C Additive irrigation

2.2.2 Precaution measures prior to machine start

The machine may only be started and driven by specialist persons authorised to do so.

 Danger of accidents and danger of injuries!

The operator must get familiar to the working environment at the place of utilisation prior to the start of work. The working environment includes e.g. obstacles in the working and traffic area, the load carrying capacity of the underground and necessary safeguarding towards public traffic. Make yourself familiar with all devices and operating elements of the machine and the function of these. It is too late to do this during work.

Ensure that nobody is in front of, under, or behind the machine. Do not allow anybody to stay in the danger zone of the machine. Ensure sufficient sight, adjust necessary mirrors correctly.

Keep operation and safety signs clean. Illegible or lost signs must be replaced immediately.

After maintenance and repair work requiring a removal of the driver's cabin/ROPS anti-rollover device, the driver's cabin/ROPS anti-rollover device must be screwed again securely to the machine frame. This is the only way to ensure the roll-over protection.

After maintenance work, check that all tools have been removed from the machine and that all protection devices have been re-attached and are in protection position.

The diesel engine may only be started from the driver's seat. The engine must not be started by short-circuiting the electric contacts at the starter.

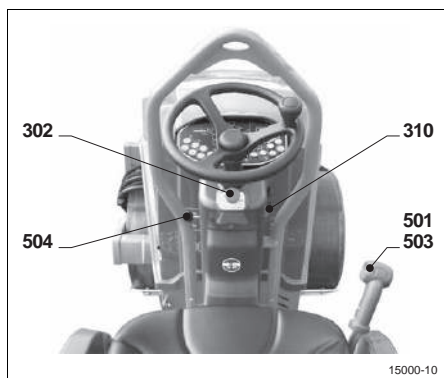
2.2.3 Start of engine

⚠ Danger of intoxication!
Combustion engines and fuel-operated heating systems may only be operated in sufficiently ventilated areas. Take care for sufficient ventilation prior to starting.

ⓘ Engine starting with maximum engine speed can lead to engine damage or damage at the hydraulic system.

The starting process may last 20 seconds as a maximum; otherwise, the starter will be overheated and destroyed. There must be pauses between the individual starting processes in order to allow the starter to cool down. If the engine doesn't start after two starting attempts, find out and eliminate the cause. Observe the instruction manual of the engine.

The engine cannot be started by towing, because the hydrostatic drive acts as a brake when the feeding pressure is missing. Drive component damage would be the consequence.

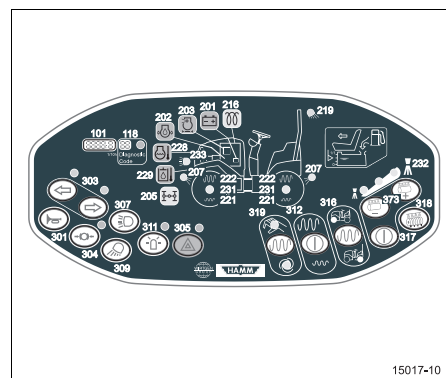


Initial position before starting

Set the operating elements to their initial position prior to the start of the engine.

- Engine speed (504)..... **MIN**
- Driving lever (501)..... **CENTRE**
- Vibration (312) **OFF**
- Parking brake (304) **APPLIED**
- EMERGENCY STOP (NOT-STOP) (302) **UP**

i Only when the driving lever is in centre position, is the start connected to the key switch via the starter protection device. This is the only way to start the engine.



Start of engine

- Engine speed (504)..... $\frac{1}{4}$ to **MAX**
- Key switch (310) **0 → I**
(Electrical system ON)

When the key switch is turned to position I, all illuminated indicators light up shortly for function control purposes.

- Key switch..... **I → III**

When the engine is running,

- the illuminated indicator for charging current (201)
- the illuminated indicator for engine oil pressure (202)

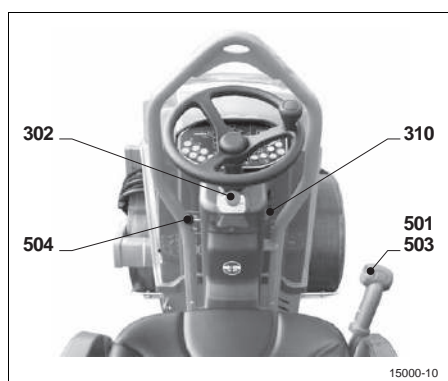
must go out.

Before driveaway

- ⚠ Danger of accidents!
Always use safety belt!
- The acceleration and braking behaviour of the machine are influenced by viscous hydraulic oil. In case of low external temperatures, in particular for temperatures below 0 °C (32 °F), wait a few minutes after starting the engine until driveaway. Warm up the machine during the warming phase with moderate speed and low load until the oil in the hydraulic system has heated to 20 °C (68 °F).
- If the machine is frozen to the ground, take care that no clods of earth stick to the drum, as these could damage the scrapers. Therefore, park the machine on planks or dry gravel if frost is likely!
- ⚠ Danger of falling!
For machines with driver's cabin, the lower door parts must always be closed during driving operation!
Always use safety belt!

- ⚠ Danger of accidents and danger of injuries!
It is forbidden to transport passengers.
Lift attached add-on devices off the ground.
Prior to driveaway, check for persons in the immediate vicinity of the machine.
In emergency situations and when there is a danger, bring the machine to an immediate stop by operating the EMERGENCY STOP switch (NOT-STOP).
Do not use the EMERGENCY STOP switch (NOT-STOP) as operation brake.
- The driving speed must always correspond to the conditions of the surroundings.
With increasing power requirements, take back the driving lever correspondingly (decrease driving speed); otherwise, the engine could stall.
In case of malfunctions at the steering or braking systems, immediately stop the machine and have the malfunctions eliminated.
Never leave the driver's stand during travel.
At borders of excavation pits and batters, drive the machine in a way that it cannot slide or tilt.

Always check for sufficient clearance when passing underpasses, bridges, tunnels, overhead lines etc.
Do not use any working procedure that would impair the stability of the machine. Avoid sudden curves when driving upward or downward slopes and during driving in transversal direction so slopes (danger of tilting).
The smooth surface of the drums decreases lateral stability in case of wet, uneven ground. Operation of the machine is not admitted on snow and ice.



2.2.4 Driving

- Engine speed (504)..... **MAX**
- Parking brake (304) **RELEASED**
- Driving lever (501) to the **FRONT**
or to the **BACK**

i Only when the driver is on his/her seat and the driving lever is in centre position, will driving operation be possible.

! Do not switch off the key switch (310) during travel (key position 0).

2.2.5 Driving with vibration

When the vibration system is switched on, the drum will vibrate according to the speed of the vibrator. This hammering will increase the compacting force of the machine several times over.

Vibration may only be used at maximum diesel engine speed and can be operated as single or double vibration.

An elastic suspension of the drums prevents the transfer of vibration oscillations to the machine frame.

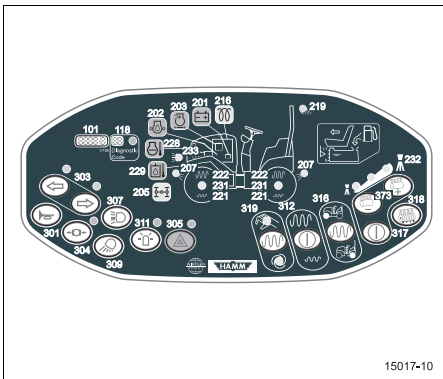
! **Danger of collapse!**
Vibration must not be used in the immediate vicinity of buildings or bridges as these can be damaged or destroyed by the vibration oscillation.

! **Danger of explosion!**
Prior to switching on the vibration function, it must be ensured that lines laid in the underground (gas, water, sewage, electricity lines) cannot be damaged or destroyed by the vibration oscillations.

! **Danger of falling!**
The oscillating drum decreases road adhesion. When driving on hard surfaces, and in particular when driving in transversal direction to slopes, lateral stability is decreased.

If intensive compacting with few transitions shall be obtained during earth-moving work, the machine must roll over the material to be

compacted with low driving speed and excite and compact it with the corresponding frequency.



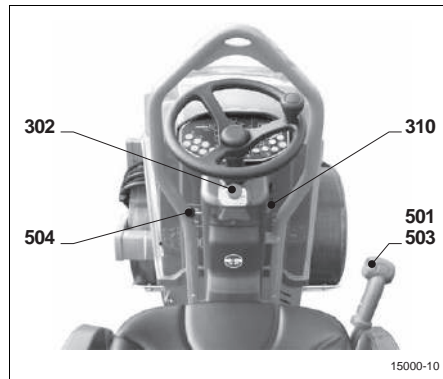
When pushbutton (316) is pressed, the vibrator in the front drum, in the rear drum, or in both drums, is preselected.

This illuminated indicator (symbol without oscillation) indicates a pre-selected vibrator in case of de-activated vibration. Each actuation of the pushbutton switches one step ahead in the circulation.

Front vibrator..... **PRESS**
Rear vibrator **PRESS AGAIN**
Double vibrator..... **PRESS AGAIN**

If the vibration system is activated with pushbutton (312), the illuminated indicator changes over to Vibration activated (symbol with oscillation).

Activation **PRESS**
Deactivation **PRESS AGAIN**



When the vibration system is activated, the vibrator can be switched on or off at any time with the pushbutton at the multifunctional grip (503).

The pushbutton (319) sets the operating mode for the vibration system. The vibrator can be switched on or off manually or automatically.

Manually..... **PRESS**
(Upper control light lights up)

The vibration can be switched on or off at any time with the pushbutton on the multifunctional grip (503).

Automatically..... **PRESS AGAIN**
(Lower control light lights up)

The switching on and off of the vibration is coupled to the road speed. When the admissible road speed with vibration (8 km/h (4.97 mph)) is exceeded, vibration is switched off.

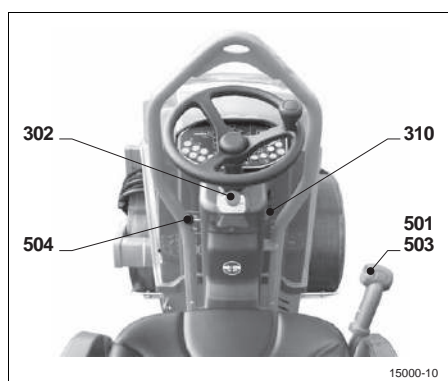
Braking
(below 1.5 km/h (0.93 mph)) **OFF**

Acceleration
(more than 0.5 km/h (0.31 mph)) **ON**

Driving
(more than 8.0 km/h (4.97 mph)) **OFF**

The automatic mode must be activated with the pushbutton at the multifunctional grip (503) after initial switching on.


The vibration can be switched on or off at any time with the pushbutton on the multifunctional grip.

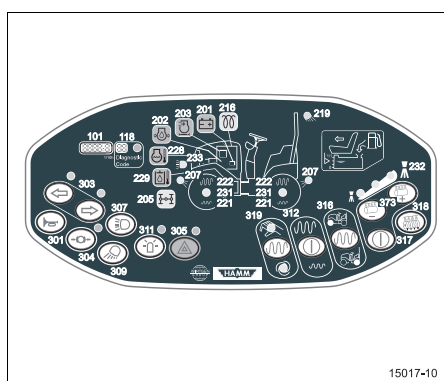


2.2.6 Stop, switch off engine, leave machine

Stop

- Vibration (312) **OFF**
 - Driving lever (501)..... **CENTRE**
- The hydrostatic drive brings the machine to a stop.

 **Danger of accidents and danger of injuries!**
When leaving the driver's stand, even for only a short time, the driver must shut down the engine!
Carry out maintenance work only when the engine is stopped!




Before switching off the engine

- Vibration (312) **OFF**
- Parking brake (304) **APPLIED**
- Engine speed (504)..... **MIN**
- Fully lower attached accessory equipment.

Switch off engine

- Key switch (310) **I → 0**

 Do not switch off engine from full load operation, instead, let it run for 1-2 minutes with idle speed for temperature compensation purposes.

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

Leaving the machine

The driver may only leave the machine when orderly parked. Traffic regulations have to be observed as well.

Before leaving the machine, the driver must ensure that

- the parking brake is applied (304), installed add-on devices are lowered, and that the engine is shut off.
- the key switch (310) is in latch position 0 and the ignition switch is pulled off.
- the cabin doors or the dashboard cover, as well as all cladding covers are locked.
- the machine is secured against rolling away with a wedge, in particular on slopes.
- the machine does not obstruct the traffic on public roads. If this cannot be avoided, set up warning signs (illumination) according to safety regulations.



Danger of falling!

Do not park the machine on batters or batter edges. Do not park the machine on loose or shortly dumped ground. On slopes, always park the machine on the hillside and secure it against rolling away with a wedge.

2.2.7 Operation monitoring

Observe the control and indication instruments on the dashboard from time to time.

If an illuminated indicator or the Diagnostic Code indicator indicates a malfunction, find out and eliminate the cause.

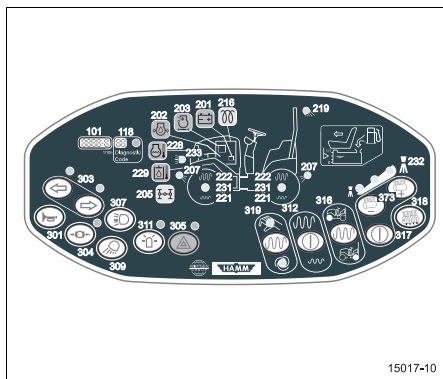
If an acoustic signal sounds, immediately shut down the engine.

Check the filling level for operating substances (fuel, water, additive). Fill up tanks in time. Never drive the machine until the fuel tank is empty.

The alternator is driven by a drive belt. If the drive belt tears, the battery charging current is interrupted. The illuminated indicator for charging current (201) lights up. Switch off the engine immediately to prevent battery discharge. Replace defect drive belt by a new one.

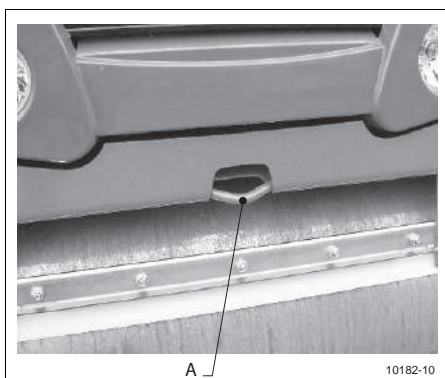
Observe the following items in order to maintain a proper function of the alternator:

- Do not interrupt the connection between battery and alternator when the engine is running.
- Do not confuse battery connections.
- Remove the earthing strip from the battery strip during welding work.



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In order to protect electronic components as e. g. central control unit, monitor unit, sensors, relays etc., all connectors must be pulled out prior to welding work; otherwise, the electronic components will be destroyed. The negative pole must be applied directly to the constructive part to be welded. Take care for a good contact!



2.2.8 Towing

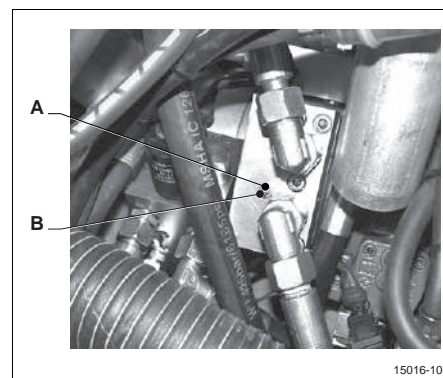
Towing of the machine assumes sufficient knowledge of the functioning of the hydrostatic drive and the operation of the spring locked multiple disc brake. The preparations for towing may only be carried out by experienced personnel who are aware of the dangers. The machine may only be towed using the towing points A and only with a towing bar. Replace damaged pipes and hoses from which oil leaks before towing (environment protection).

Before towing

- Driving lever (501).....**CENTRE**
- Shut down diesel engine, if still functional.
- Secure machine against rolling away with wedges or blocks.
- Separate the hydrostatic drive power train.
- Release parking brakes.
- Tow using towing bar only (brakes not functional).

Towing

The machine may only be towed with the engine at a standstill and with low speed (1 km/h (0.6 mph)). The maximum towing distance is 500 m (0.3 miles).



After towing

- Secure machine against rolling away with wedges or blocks.
- Reconnect the hydrostatic drive power train.
- Make parking brake operational.
- Remove towing bar.

Separate the hydrostatic drive power train

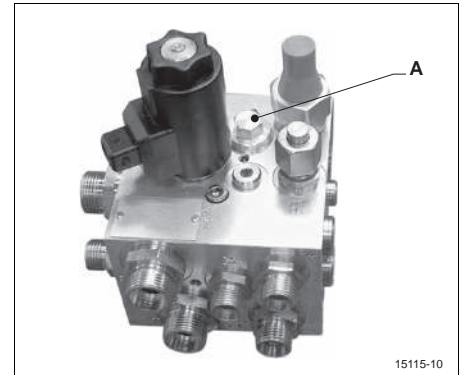
Only if the oil flow can circulate without pressure in the hydraulic system, can the machine be towed.

- Loosen counter nut A.
- Loosen Allen head screw B by three complete turns to the left.

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

Reestablish the hydrostatic drive power train

- Screw in the Allen head screw until the stop.
- Tighten the counternut.



Making the parking brakes inoperational



Danger of accidents!

The brake is out of function! The pretensioning power of the spring-operated brakes may only be reduced for towing purposes.

- Apply the articulated frame steering blocking.
- Loosen screw A and screw out by hand until a resistance can be noted (approximately 5 turns).
- Release the spring-operated brakes by turning the steering wheel to the left until increased turning power is required.

During towing, the spring-operated brakes must be kept open by repeated releasing with the steering wheel due to interior leaks.

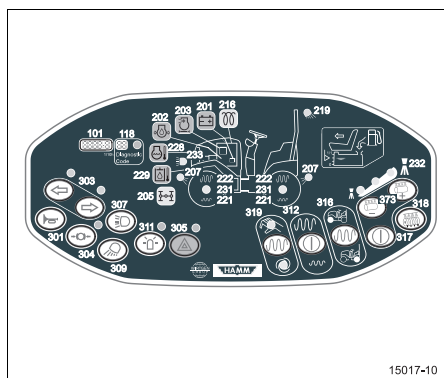
Make parking brake operational

- Screw in screw A up to the valve seat (max. 30 Nm).
- Release the articulated frame steering blocking.

2.2.9 Water irrigation

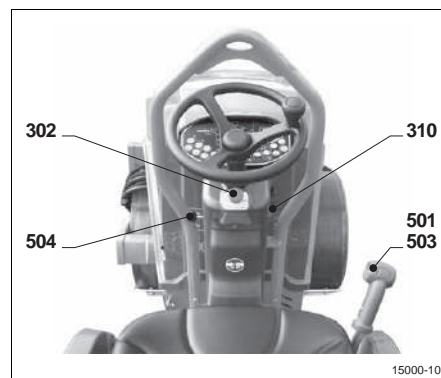
The pressure irrigation ensures a reliable moistening of the drums during blacktop works and thus prevents bituminous materials from adhering to the drums. An electric water pump supplies the irrigation system with water so that the water consumption can be optimally adjusted to the deployment conditions using the installed automatic irrigation system. A multilevel automatic interval system determines the minimum use of water for optimum drum moistening, 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 water irrigation control is switched off at a road speed of less than 0.5 km/h (0.31 mph). A high-volume, rust-proof water filter, arranged upstream the water pump, prevents a premature contamination of pump, lines and spraying nozzles, thus ensuring a trouble-free operation. The filter maintenance depends on the purity of the water used.

i When the machine is at a standstill, the interval irrigation system is without function.



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The automatic water irrigation system is switched on with pushbutton (317), for which the illuminated indicator (232) shows the current irrigation level. As long as the pushbutton is pressed, the pump runs in continuous operation. The pushbuttons (373) allow to increase (+) or decrease (-) water consumption. The illuminated indicator (207) indicates that the water pump is supplying.



15000-10

Spray nozzle check when engine is at a standstill

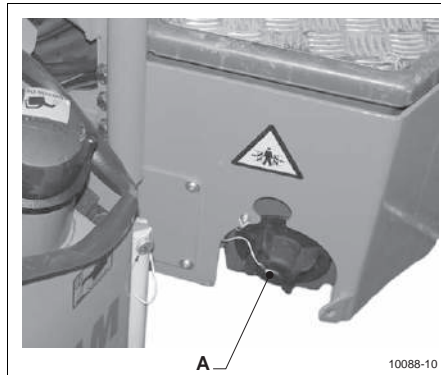
The following preconditions must be met for a functional check of the spray nozzles during machine standstill:

- EMERGENCY STOP switch (NOT-STOP) (302) **PRESS**
- Parking brake (304) **APPLIED**
- Engine stopped
- Electrical system (310) **ON**
- Driving lever (501) max. to the **FRONT**
- Pushbutton (317) **ON**

If these preconditions are met, the water pump runs in interval operation with the selected irrigation level.

To switch off:

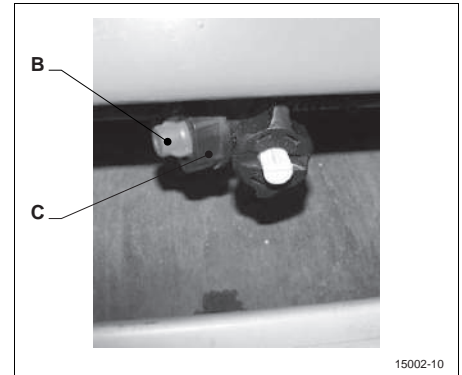
- Pushbutton (317) **OFF**
- Driving lever (501)..... **CENTRE**
- EMERGENCY STOP switch
(NOT-STOP) (302)..... **UP**



On risk of frost

Frozen water leads to damage to the irrigation system. Therefore, it must be drained before frost begins.

- Screw up filter head A at the water tank and remove it together with the pressure spring (observe sealing ring on filter head).
- Pull the filter insert from the water tank.



- Unscrew lateral collar nut from the spray nozzles C and remove together with valve seat B and membrane. Reassemble spraying nozzle after emptying the nozzle casing.
- Clean filter insert, pressure spring, and filter head and store in tool cabinet.
- Re-fit filter insert, pressure spring and filter head only before starting work.

3 MAINTENANCE

3.1 INTRODUCTION


3.1.1 General

This machine requires care and maintenance like any other technical device. The extent and the frequency of the maintenance work depends essentially of the operating and deployment conditions, which are very different 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 determined according to the running time of the operation hours counter; for this, additional maintenance work has to be performed during the running-in time according to the running-in regulations. The works necessary for care and the conservation of the operational safety of the machine are listed in the following sections. The running-in regulations, the maintenance intervals and the care measures for the diesel engine can be found in the operating instructions of the engine manufacturer and must be observed.

Specialist knowledge is necessary for the execution of some inspection and maintenance works; these cannot be given in the scope of these operating instructions. We recommend to have these works performed by trained specialised staff.

3.1.2 Notes on spare parts ordering

 In order to have your HAMM roller always optimally operative, we recommend that you keep the necessary maintenance parts listed in 3.2.2 always in stock.

Notes on spare parts ordering

The components of a HAMM roller are deliberately selected by our engineers. If you use original HAMM spare parts exclusively, you can be sure that your roller will bring ultimate performance and best use.

Please contact an agency in your area; only here can you find original HAMM spare parts which guarantee quality.

If you wish, our customer service network can put installers at your disposition who are familiar with the machine and the latest enhancements.

Ordering data

- Name and address of company
- Machine type and VIN
- Image No. and designation of the image or text page of the spare parts list
- Part No., designation and required quantity
- Shipment address, i. e. station post office of destination, if the spare parts are not to be delivered to your company site but instead to a construction site
- Specification on dispatch type, i.e. railway express etc.

Customer service

A world-wide, small-meshed network of authorised dealers and service stations ensures a fast, flawless and high-quality HAMM customer service.

If you use this service you can benefit from important advantages:

- Proper repair
- Trained mechanics
- Fast repair
- Short downtime of your machine
- Guarantee an work performed
- Guarantee on installed original HAMM spare parts

in other words: low cost, best service in return.

3.1.3 Safety

- ⚠** Danger of accidents and danger of injuries!
Observe safety and accident prevention regulations.

Carry out maintenance work only when the engine is stopped. Only open the engine hood when the engine is at a standstill. Keep away from moving, rotating or revolving parts; do not touch these (danger of accidents).

Only perform oil change when the engine has operating temperature. Danger of burning or scalding.

Perform maintenance works on the engine exclusively according to the operating instructions of the manufacturer.

Any work in the danger area of the articulated frame steering may only be performed with the engine at a standstill and with the electric system switched off. Prior to start of work, pull off the key from the battery disconnecter (if existing). If a battery disconnecter doesn't exist, remove the earthing strap from the battery (danger of life). If the machine is equipped with a locking device for the articulated frame steering, it must be latched prior to start of work.

The machine must stand on level ground for the control of liquid levels or for the change of liquids (fuel, oil, refrigerant, water). This is the only way to enable an exact determination of liquid quantities.

In order to protect electronic components as e. g. central control unit, monitor unit, sensors, relays etc., all connectors must be pulled out pri-

or to welding work; otherwise, the electronic components will be destroyed. The negative pole must be applied directly to the constructive part to be welded. Take care for a good contact!

- i** Only appropriate and clean lubricants may be used. Otherwise the guarantee becomes void.



Articulated frame steering blocking device latched



Articulated frame steering blocking device released

3.1.4 Use of biologic hydraulic oil

The hydraulic system of the machine is generally filled with mineral oil in factory. All maintenance intervals given in these maintenance instructions are related to mineral oil.

The use of biological hydraulic oil is admissible under the following circumstances:

- Only biological oil on the basis of special synthetic saturated complex esters may be used. The products used and recommended by HAMM can be taken from the lubricant indications 3.2.2. Other oils used must correspond to the specifications of the oil above mentioned. The neutralisation value (oil acid) may not be bigger than 2.
- When the hydraulic oil is changed (biological oil replaces mineral oil or vice versa), all filters in the oil circuit must be changed after 50 operating hours. After that, the filter change intervals given in this instructions apply again.
- Used biological oil must be disposed at a reliable place of disposal, just like mineral oil.

3.1.5 Refrigerant conditioning

For liquid-cooled engines, special care must be taken for the conditioning and the control of the refrigerant; otherwise, corrosion, cavitation and freezing can cause motor damage.

The conditioning of the refrigerant is performed by adding a cooling system protection agent to the refrigerant.

The cooling system requires constant monitoring. Apart from the control of the refrigerant level, this also implies the verification of the concentration of the cooling system protection agent.

The concentration of the cooling system protection agent can be done with commercially available test devices (example: gefo glycomat®).

The concentration of the cooling system protection agent in the refrigerant should not exceed or fall short of the following values:

Cooling system protection agent	Water
max. 45 Vol. %	55 %
min. 35 Vol. %	65 %

The products used and recommended by HAMM (free from nitrites, amines and phosphates) can be taken from the lubricant indications 3.2.2. The factory-filled refrigerant mixture consist of 40 % cooling system protection agent and 60 % water. This guarantees freezing protection up to -25 °C (-13 °F). The cooling system protection agent can be purchased from the HAMM customer service, ordering No. 313238.

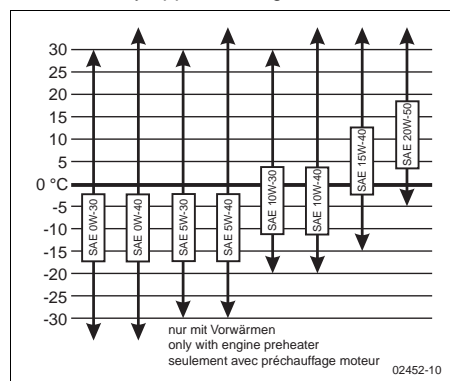
The use of the cooling system protection agent offers effective protection against corrosion, cavitation and freezing.

3.2 LUBRICATION INDICATIONS

3.2.1 Viscosity - temperature range

The viscosity of lubricant oil changes with the temperature. The ambient temperature at the place of utilisation determines the selection of the viscosity class (SAE class).








The chart only applies to engine oil.



	Quality	Viscosity		Identification
Engine oil The oil quality must correspond to the API classification.	CG-4 or higher	see chart		□
Hydraulic oil Viscosity is determined according to DIN standard 51519 (ISO-VG: viscosity grade).	HLP	Conditions		□
		VG 22	arctic	
		VG 32	winter	
		VG 46	summer	
		VG 68	tropical	
		VG 100	extreme heat	
Special oil Only HAMM special oil is admissible. Order No. 1238051				◇
Gear oil with Limited Slip additions. The oil quality must correspond to the API classification.	API GL-5	SAE 85W-90		⬡
Refrigerant for liquid-cooled engines. Mixture: 40 % refrigerate concentrate, 60 % water.				○
Lubricating grease Lithium soaped multipurpose grease with high-pressure additives. Temperature application range -25 °C (-13 °F) - +120 °C (+248 °F)				△


3.2.2 Lubricants used in delivery status

The machine is delivered with the products listed below. These products have been extensively tested by HAMM prior to their release and should be used preferably. If products of other manufacturers shall be used, they must be equivalent to the products listed below with respect to quality and viscosity!

Identification	Designation	Quality	Viscosity	Designation of manufacturer	Manufacturer
	Engine oil 261149	API	SAE 15W-40	Delvac MX	MOBIL
	Hydraulic oil (mineral oil) 261165	HLP	ISO VG 46	AZOLLA AF 46	TOTAL
	Hydraulic oil (biological hydraulic oil) 1229028	synthetic, saturated complex ester	ISO VG 46	Panolin HLP Synth 46	PANOLIN
	Special oil 1238051			1238051	HAMM
	Gear oil 261157	API GL-5	SAE 85W-90	EP-B 85W-90	TOTAL
	Engine refrigerant 313238	free from nitrite, amine and phosphate		Thermofreeze plus	TOTAL
	Lubricating grease 261858	lithium soaped multipurpose grease with high-pressure additives		Multis EP2	TOTAL

3.3 MAINTENANCE OVERVIEW

3.3.1 Maintenance plan

-  Observe the maintenance intervals of the running-in regulations 3.4!
Engine maintenance: see operating instructions for engine!

Point of maintenance	Monitoring see section	once every 10 operating hours see section	once every 250 operating hours see section	once every 500 operating hours see section	once every 1000 operating hours see section	once every 2000 operating hours see section
Operation monitoring	3.5.1					
Dry air filter	3.5.2	A 3.6.2				
Hydraulic oil		A 3.6.3				D 3.9.1
Refrigerant		A 3.6.4				D 3.9.2
EMERGENCY STOP (NOT-STOP)/parking brake		A 3.6.5				
Water filter		B 3.6.6				
Spray nozzles		B 3.6.7				
Articulated frame steering joint			C 3.7.1			
Steering cylinder rod			C 3.7.2			
Radiator			A 3.7.3			
Scraper			A 3.7.4			
Filter insert hydraulic system				D 3.8.1		
Preliminary fuel filter				D 3.8.2		
Water irrigation installation						B 3.9.3
A = check, B = clean, C = grease, D = replace						

3.3.2 Required maintenance parts HD 8 VV, HD 10C VV (3W35)

H1700001 ⇒ H1701269

Quantity	Maintenance part			first time after	maintenance intervals in operating hours			
					once every 250	once every 500	once every 1000	once every 2000
4.0 l (1.06 US gal.)	Engine oil	<input type="checkbox"/>		50 D	D	D	D	D
26.0 l (6.86 US gal.)	Hydraulic oil	<input type="checkbox"/>						D
5.5 l (1.45 US gal.)	Refrigerant	<input type="radio"/>						D
1	V-belt	Alternator	2035686		A		D	D
2	Air filter cartridge		1302272		A	D	D	D
1	Filter cartridge	Lubricating oil	2044150	50 D		D	D	D
1	Filter cartridge	Fuel	1302191	50 D		D	D	D
1	Preliminary fuel filter		2027225	50 D		D	D	D
1	Seal	Valve cover	2035675	50 D		D	D	D
1	Filter insert	Hydraulic system	2038889	50 D		D	D	D
1	Filter insert	Water filter	2033909		A			
A = check, replace if necessary, D = replace								

3.3.3 Maintenance parts (Service kits) HD 8 VV, HD 10C VV (3W35)

1	All required maintenance parts for the corresponding maintenance intervals	2044219		2044220	2044221	2044222
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3.3.4 Required maintenance parts HD 8 VV, HD 10C VV (3W35)

H1701270 ⇒

Quantity	Maintenance part			first time after	maintenance intervals in operating hours			
					once every 250	once every 500	once every 1000	once every 2000
4.0 l (1.06 US gal.)	Engine oil	□		50 D	D	D	D	D
26.0 l (6.86 US gal.)	Hydraulic oil	□						D
5.5 l (1.45 US gal.)	Refrigerant	○						D
1	V-belt	Alternator	2035686		A		D	D
2	Air filter cartridge		1302272		A	D	D	D
1	Filter cartridge	Lubricating oil	2044150	50 D		D	D	D
1	Filter cartridge	Fuel	2057140	50 D		D	D	D
1	Preliminary fuel filter		2027225	50 D		D	D	D
1	Seal	Valve cover	2035675	50 D		D	D	D
1	Filter insert	Hydraulic system	2038889	50 D		D	D	D
1	Filter insert	Water filter	2033909		A			
A = check, replace if necessary, D = replace								

3.3.5 Maintenance parts (Service kits) HD 8 VV, HD 10C VV (3W35)

1	All required maintenance parts for the corresponding maintenance intervals	2057805		2057806	2057807	2057808
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3.4 RUNNING-IN REGULATIONS

(see also engine operating instructions)

3.4.1 After 50 operating hours

Diesel engine maintenance

- Replace lubricating oil
- Replace lubricating oil filter cartridge
- Replace fuel filter cartridge
- Replace preliminary fuel filter cartridge
- Check valve clearance

Maintenance of hydraulic installation

- Replace hydraulic oil filter

3.5 OPERATION MONITORING

(see also engine operating instructions)

3.5.1 Operation monitoring

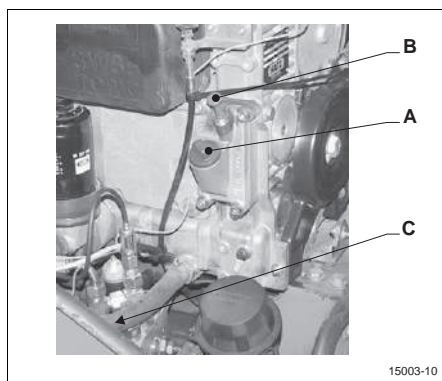
When the electric system is switched on with the key switch (310), all illuminated indicators are activated for approx. 2 seconds for function control purposes. Check whether all illuminated indicators are operable. Observe the control and indication instruments from time to time. If a illuminated indicator indicates a failure, determine and remove the cause. You can find an exact description of the elements in the operating instructions, section 2.1.3.

3.5.2 Dry air filter

The operability of the air filter is monitored by an electric contamination indicator. Only if the illuminated indicator (203) flashes must the air filter cartridge be replaced (see maintenance once every 10 operating hours).

3.6 MAINTENANCE ONCE EVERY 10 OPERATING HOURS

(see also engine operating instructions)

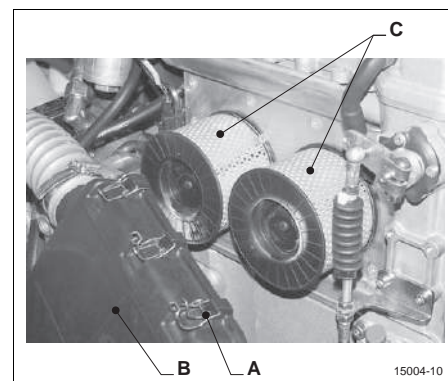


3.6.1 Maintenance points at the engine for engine oil change

The running-in regulations, the maintenance intervals and the care measures for the diesel engine can be found in the operating instructions of the engine manufacturer and must be observed.

- A Oil filling spout
- B Oil dipstick
- C Oil drain screw

☐ Only lubricants with this identification are admissible, see lubricant indications 3.2.



3.6.2 Check and clean dry air filter

The operability control of the air filter cartridges must be performed prior to start of work with the diesel engine running.

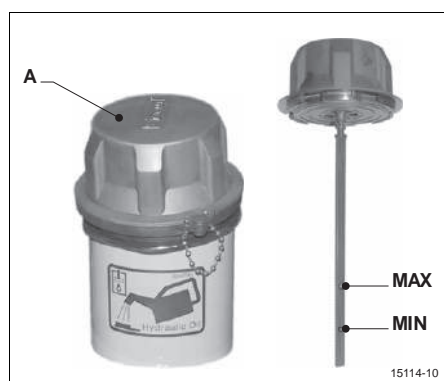
- Shortly rev up the diesel engine to maximum speed.

If the illuminated indicator (203) does not light up, both filter cartridges are still completely operable. If the illuminated indicator flashes, both air filter cartridges must be replaced. Observe the engine operation instructions!

Replacement of air filter cartridges

- Open the clamps A at the air filter housing and remove dust collector B in upward direction.
- Check seals, replace if necessary.

- Clean the inside of the dust collectors.
- Replace air filter cartridges C.
- Install in reverse order.



3.6.3 Control of oil level in the hydraulic oil tank

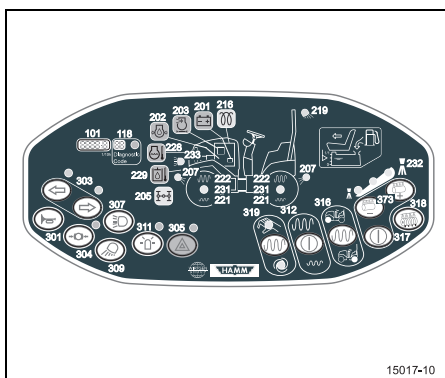
- Perform this control only when the engine is cold.
- Unscrew purge filter A.
- Correct oil level: Between the Min. and Max. there is a mark on the dipstick which applies when the purge filter is screwed in. Do not exceed this oil level!
- Fill in appropriate oil if the oil level is low.
- In case of bigger oil losses, find out and eliminate the cause.

☐ Only lubricants with this identification are admissible, see lubricant indications 3.2.



3.6.4 Control of refrigerant level for engine cooling system

- Only check the refrigerant level when the engine is cold.
 - Correct refrigerant level: Between the Min. and Max. mark at the compensation tank.
 - In case of a lack of refrigerant, only fill up refrigerant with the specified concentration.
 - In case of bigger refrigerant losses, find out and eliminate the cause.
- Only lubricants with this identification are admissible, see lubricant indications 3.2.

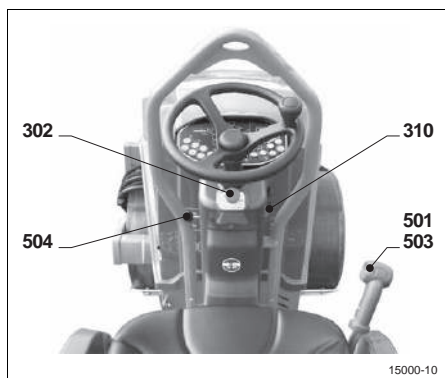


15017-10

3.6.5 Control of parking brake and EMERGENCY STOP function (NOT-STOP)

⚠ Danger of accidents and danger of injuries!

For this maintenance work, the drive must be actuated. Take care that nobody stays in the danger zone of the machine. Observe safety regulations!
Only trained specialised staff may perform works at the parking brake!
Call your customer service for works at the parking brake!

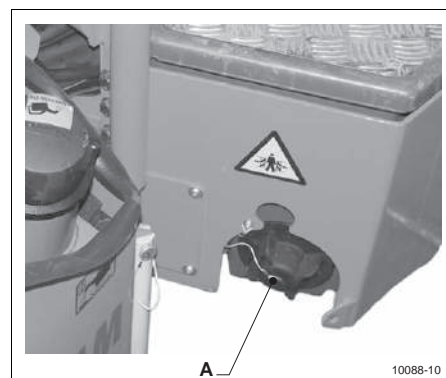


15000-10

- Apply parking brake (304).
- Push the driving lever (501) shortly in forward direction.

If the drive blocks, the parking brake works properly. If the machine moves even if the parking brake is applied, the brake must be inspected or replaced.

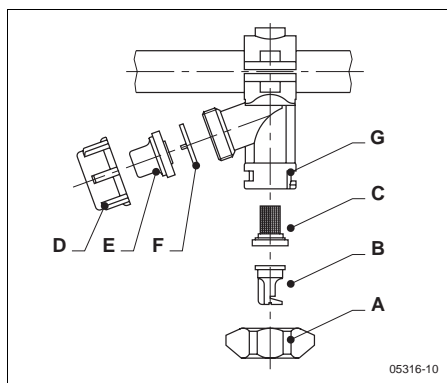
- Press the EMERGENCY STOP switch (NOT-STOP) (302). The drive doesn't react to movements of the driving lever (501).
- Bring the machine to its initial position (see control and operating elements No. 302).



10088-10

3.6.6 Clean the water filter for the pressure irrigation system

- Unscrew the filter head A at the water tank.
 - Pull the filter insert with the pressure spring out of the water tank and clean it.
- Re-assemble in reverse order.



3.6.7 Cleaning the spray nozzles

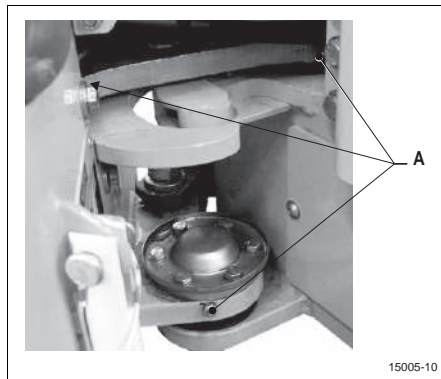
- Loosen the collar nut A and remove it together with spray nozzle B and filter C.
- Remove the filter and the spray nozzle from the collar nut and clean them.
- Unscrew collar nut D.
- Remove valve insert E and membrane F.
- Flush the casing G with the water irrigation system switched on.

Re-assemble in reverse order.

3.7 MAINTENANCE ONCE EVERY 250 OPERATING HOURS

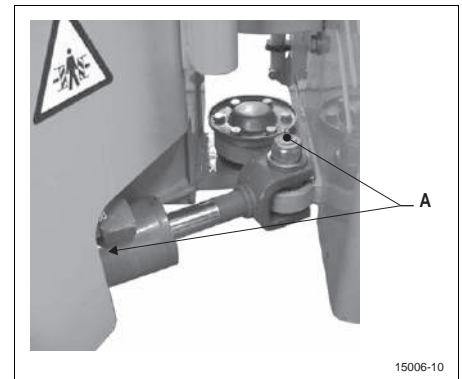
(see also engine operating instructions)

Perform all maintenance work as described under 10 operating hours. Additionally:



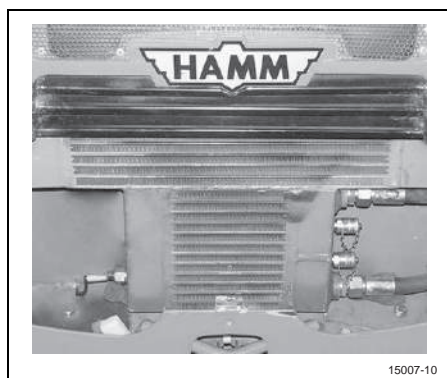
3.7.1 Lubricate articulated frame steering joint

- ⚠ **Danger of injuries!**
Any work in the danger area of the articulated frame steering may only be performed with the engine at a standstill and with the electric system switched off. Furthermore, the articulated frame steering blocking device must be latched.
- Lubricate lubricating nipple A.
- ⚠ **Only lubricants with this identification are admissible, see lubricant indications 3.2.**



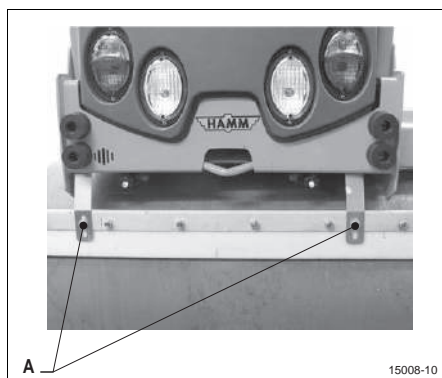
3.7.2 Lubrication of steering cylinder rod

- ⚠ **Danger of injuries!**
Any work in the danger area of the articulated frame steering may only be performed with the engine at a standstill and with the electric system switched off! Furthermore, the articulated frame steering blocking device must be latched.
- Lubricate lubricating nipple A.
- ⚠ **Only lubricants with this identification are admissible, see lubricant indications 3.2.**



3.7.3 Control of radiator

- Check the cooling fins of the radiators for contamination.
- If the cooling fins are contaminated they must be cleaned thoroughly and immediately.
- Clean the radiator with a pressure washer.



3.7.4 Control of the scrapers

Check whether the scrapers have proper contact to the drums. Adjust if necessary.

- Loosen hexagon screws A.
- Push the scraper console to the drum until the scrapers make contact.
- Tighten the hexagon screws.

3.8 MAINTENANCE ONCE EVERY 500 OPERATING HOURS

(see also engine operating instructions)

Perform all maintenance work as described under 10 and 250 operating hours. Additionally:

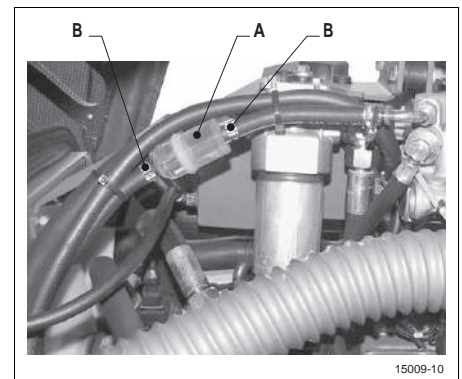


3.8.1 Replacing the filter insert for the hydraulic system



Danger of burning or scalding!

- Unscrew the cup-shaped housing.
- Pull the filter insert from the filter head and replace with a new one.
- Clean the inside of the cup-shaped housing from dirt deposits, screw it back to the filter head and tighten.




3.8.2 Replacing the preliminary fuel filter



Increased fire hazard during fuel handling!
Do not smoke! No open fire during works at the fuel system! Catch spilling fuel, do not let it seep away into the ground!

- Loosen the hose clamps B on both sides and pull off the fuel hose from the used filter A.
- Plug on new the filter and tighten the hose clamps. Observe the flow direction!

Bleeding the fuel system:

 Purging of the fuel system is performed by starting the Diesel engine. For this, several starting attempts may be necessary. The starting process may last 20 seconds as a maximum; otherwise, the starter winding will be overheated and destroyed. There must be pauses of a minimum of one minute between the individual starting processes in order to allow the starter to cool down.

To avoid damage to the diesel engine, the fuel filter must be drained at the drain valve from time to time depending on the water content in the fuel.

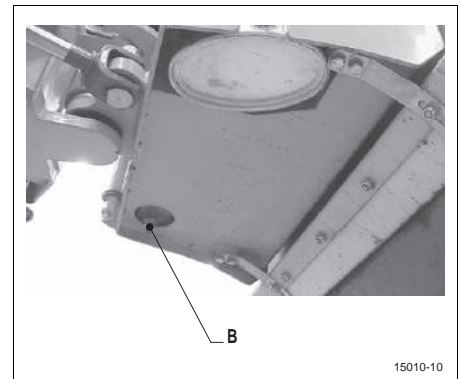
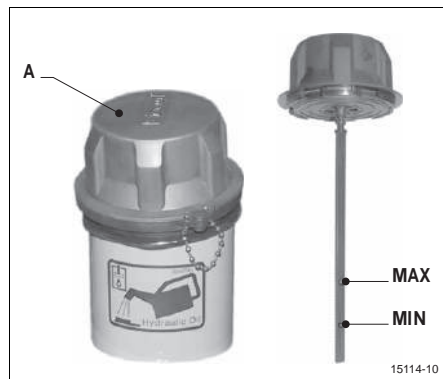
3.9 MAINTENANCE ONCE EVERY 2000 OPERATING HOURS, AT LEAST ONCE A YEAR

(see also engine operating instructions)

Perform all maintenance work as described under 10, 250 and 500 operating hours. Additionally:

General:

After longer standstill periods (e.g. winter) perform the following maintenance works prior to start of usage. Condensed water and dirt deposits can impair the function of the engine and of the hydraulic system.



3.9.1 Replacement of hydraulic oil

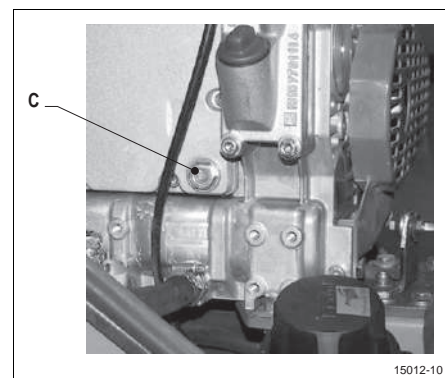


Danger of burning or scalding!
Do not use cleaning rag for cleaning!
Catch used oil in a receptacle and dispose of properly! Do not let it seep away into the ground!

- Unscrew purge filter A.
- Screw out oil drain screw B at the bottom of the oil tank and let the used oil drain out.
- Screw in oil drain screw and tighten.
- Fill up specified oil through filling spout.
- Correct oil level: Between the Min. and Max. there is a mark on the dipstick which applies when the purge filter is screwed in. Do not exceed this oil level!
- Start the engine, actuate driving lever (501) with low engine speed until the drive activates, furthermore actuate the steering.
- Pipes and hoses are filled with oil and purged.
- Check oil level with the motor at a standstill, please fill up oil as necessary.

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

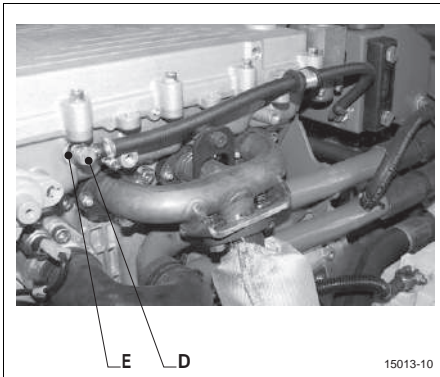
☐ Only lubricants with this identification are admissible, see lubricant indications 3.2.



3.9.2 Changing the refrigerant

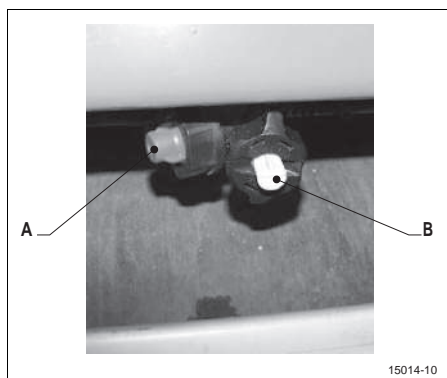
- ✎ Never open the cap of the compensation tank when the engine is hot!
Danger of burning or scalding by boiling refrigerant!
It is absolutely necessary to observe the engine operation instructions! Dispose of refrigerant properly! Only change the refrigerant when the engine is cold!

- Open the cap A at the compensation tank B.
- Screw out the drain screw at the bottom of the radiator or remove the lower refrigerant hose from the radiator and let the refrigerant drain into a provided receptacle.
- Drain the engine block C according to the indications of the engine operating instructions.
- Screw in the plug screws tightly.



- Correct refrigerant level: Between the Min. and Max. mark at the compensation tank B.
- Only lubricants with this identification are admissible, see lubricant indications 3.2.

- Open the hollow screw D of the purge line at the engine block by three turns (do not remove!). Hold up the screw-in fitting E at the hexagon!
- Fill new, properly mixed refrigerant into the filling spout A of the compensation tank, until refrigerant spills from the hollow screw.
- Tighten the hollow screw.
- Fill up refrigerant up to the max. mark of the compensation tank B.
- Close the filling spout.
- Start the engine and bring it to operating temperature (thermostat opens).
- Shut down the engine.
- Check refrigerant level when the motor is cold, fill up as necessary.



3.9.4 Visual inspection of hydraulic system

Check all lines, hoses and screwed connections regularly (at least once a year) for leaks and visible damage. Damaged parts must be replaced immediately. Further operation is inadmissible. Oil spurting out can lead to injuries and fire.

3.9.3 Cleaning the water irrigation system

i See also section 2.2.9 Water irrigation in the operating instructions.

- Remove the valve insert A with the membrane as well as the spray nozzles B with filter from the spray nozzle casing.
- Screw up filter head at the water tank and remove it together with the pressure spring (observe sealing 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 spray nozzle housings and the hoses.

Re-assemble in reverse order. Clean water filter and spray nozzles according to section 3.6.

4 TABLES

4.1 DIAGNOSTIC CODE

29	Alternator Short-circuit, line rupture
30	Parking light Short-circuit

00	no malfunction
01	Reversing lights (option) Short-circuit
03	Left working lamp (option) Short-circuit
05	Right working lamp (option) Short-circuit
07	Drum illumination (option) Short-circuit
11	Left headlight (option) Short-circuit
13	Right headlight (option) Short-circuit
18	Rear vibration solenoid or amplitude solenoid Short-circuit, line rupture
19	Rear vibration solenoid Short-circuit, line rupture
21	EMERGENCY STOP solenoid (NOT-STOP) or front vibration solenoid Short-circuit, line rupture
22	EMERGENCY STOP solenoid (NOT-STOP) Short-circuit, line rupture
23	Front vibration solenoid Short-circuit, line rupture
26	Rotating beacon (option) Short-circuit
27	Water irrigation pump Line rupture
28	Water irrigation pump Short-circuit

