Operating manual

Tandem roller / Combination roller
RD 18

Roller type	RD 18
Issue	01
Document order number	5100010710
Language	en
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Supplier

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Original operating manual

created: 01.02.2015
changed: 01.02.2015

This operating manual is valid for the following roller types:

TANDEM ROLLER	RD 18-80 RD 18-100
COMBINATION ROLLER	18-100 C

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EC DECLARATION OF CONFORMITY

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

CE

EC DECLARATION OF CONFORMITY

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

We hereby declare that the

Designation of the machinery:

Type:

Serial no.:

complies with the following provisions:

- EC Machinery directive 2006/42/EC
- EMC Directive 2004/108/EC
- EC Sound directive 2000/14/EC

with evaluation form:	Annex VIII
Notified Body:	Notified Body Number: 0515 [1]
measured L_{WA} [dB(A)]:	
guaranteed L_{WA} [dB(A)]:	
Power [kW]:	

- Emissions standard EU/USA:
- Exhaust gas after-treatment:

Original EC Declaration of Conformity (en)

Applied harmonised standards, in particular:

- EN 500-1:2006+A1:2009:	Mobile road construction machinery - Safety Part 1: Common requirements
- EN 500-4:2011:	Mobile road construction machinery - Safety Part 4: Specific requirements for compaction machines
- EN 13309:2010:	Construction machinery - Electromagnetic compatibility of machines with internal electrical power supply
- EN ISO 3744:2010:	Allocation of the sound capacity level of sound sources

Authorised agent for the composition of the relevant technical documents:

Mr. Patrick Fest, HAMM AG (CE representative)

Tirschenreuth, _____
Date

_____
Dr. Axel Römer, General Manager Technics

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

1 FOREWORD

This operating manual contains information and procedures for the safe operation and maintenance of your Wacker Neuson machine. In the interest of your own safety and to prevent accidents, you should carefully read through the safety information, familiarize yourself with it and observe it at all times.

This operating manual is not a manual for extensive maintenance and repair work. Such work should be carried out by Wacker Neuson service or authorized specialists.

The safety of the operator was one of the most important aspects taken into consideration when this machine was designed. Nevertheless, improper use or incorrect maintenance can pose a risk. Please operate and maintain your Wacker Neuson machine in accordance with the instructions in this operator's manual. Your reward will be troublefree operation and a high degree of availability.

Defective machine parts must be replaced immediately!

Please contact your Wacker Neuson representative if you have any questions concerning operation or maintenance.

We expressly reserve the right to make technical modifications – even without special notice – which aim at further improving our machines or their safety standards.

1.00 Introduction

1.00.01 Preface for the operating manual

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

This operating manual helps you:

- To become familiar with the machine.
- To avoid malfunctions due to improper use.

Adhering to this operating manual:

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

It is absolutely necessary to adhere to this operating manual, supplementary information and all regulations and provisions applying at the building site (e.g. accident prevention regulations).

Maintenance and care of the diesel engine have to be performed according to the instructions for the motor. The safety instructions must be observed.

1.00.02 Product information

You have received a quality product from Wacker Neuson. All the components of this machinehave been carefully inspected and tested. As a result, they comply with the quality that you expect.

The reliability of the machine is preserved through correct use and careful maintenance. This includes the use of the specified operating supply items and the use of original Wacker Neuson spare parts.

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

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

The safety, operating and maintenance instructions given in this operating manual are intended for the operating personnel. For this reason, always keep it handy!

1.00.03 Guarantee

No guarantee claims with:

- Operating errors.
- In the case the spare parts used are no original Wacker Neuson spare parts.
- In the case wrong operating supply items have been used.
- In the case any additional devices have been refitted and/or installed that have not been approved by Wacker Neuson.
- In the case of deficient maintenance.
- In the case of any processes that conflict with these operating manual.

1.00.04 Modifications / reservations

We are committed to provide you with correct and updated operating manual. However, we cannot guarantee the correctness of all data given. To be able to keep pace with changing trends, it may be necessary to amend or modify the product and/or its operating console without prior notice. We assume no liability for malfunctions, downtimes and resulting damage.

1.00.05 Packaging and storage

We have carefully packed our products to ensure proper protection in transit. Please check both packaging and the goods yourselv for any damage upon reception of your goods. In the case of damage, the devices must not be put into operation. Damged cables and connections are a safety risk and must not be used.

In such a case, please contact your supplier.

If the devices are not put into operation upon unpacking, they must be protected against humidity and dirt.

1.00.06 Signs and symbols

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

Note i Informs about application hints and useful information. No dangerous or harmful situation.

Enumeration ● Indicates a listing of issues or possibilities.

Operating steps 1. Are listed according to their succession each starting from 1 for each individual process.

Option * Indicates special equipment which varies from the standard.

Directions Information on directions contained in these instructions such as left or right and/or front or rear always refer to the directions of the machine driving forwards.

Cross-references

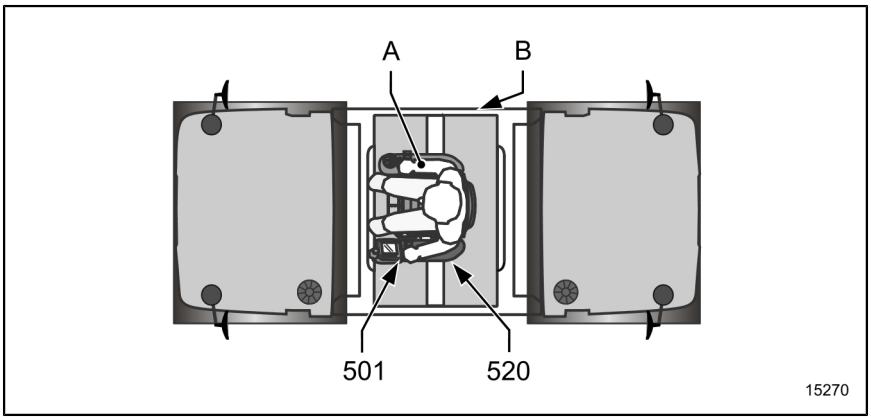
Cross-references help you to find quickly sections in this operating manual which supply you with additional important information. The cross-reference shows you the page of the relevant section. The abbreviation sqq. means "and the following pages".

Example: (see page 134 sqq.)

Positioning of illustrations

The positions of illustrations 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 marked with numbers apply to operating elements, control units and switches. They are identical to the numbers in the section Overview of Instruments and Operating Elements (see page 50 sqq.). These numbers in squared brackets are used as a reference in the description of the elements. Amongst others, this ensures that important and additional information can be found immediately and without difficulties in the descriptions of the elements. The end of the positioning line is marked as dot or arrow. In the illustration the dot marks a visible element and an arrow an invisible element which is in arrow direction.

Example



Legend

[A] Driver

[B] Engine compartment

Descriptive text

The drive lever [501] determines the direction of travel and the speed.

Using the lever [520] you can adjust the pretension of the attenuation system to the driver's weight.

1.00.07 Signal words

A signal word identifies a source of dangers and residual risks.

⚠ DANGER

Identifies immediate danger. If this risk is not prevented, this causes death or severe personal injuries.

⚠ WARNING

Refers to situations that may be dangerous. If this situation is not avoided, fatality or very serious injuries may be caused.

⚠ CAUTION

Refers to situations that may be dangerous. If this situation is not avoided, minor or light injuries may be caused.

NOTICE

Refers to a situation that may cause property damage.

1.01 Documentation

This operating manual is intended to make the operating personnel familiar with basic work steps / activities of and with the machine.

The entire operating manual consists of:

- Operating manual of the machine
- Operating manual of the diesel engine
- If necessary, additional information

The entire operating manual must always be available at the machine and be accessible to the authorized operating personnel at all times. Prior to operating the machine, you must have carefully read und understood this operating manual. In case you do not understand this operating manual or individual parts, please ask us prior to starting these activities. The operating manual contains important information, which will ensure that the machine can be operated in a safe, proper and economic manner.

1.02 Use

1.02.01 Intended use

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

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

The maschine's intended use is:

- pave roads and traffic areas.
- ramming and smoothing of loose earth, road bedding, pavement or similar ramable subgrade in layers.

The machine may only be deployed on surfaces that can support it.

Subgrade not capable of bearing is e.g. high fillings, batters, roadside ditches.

The machine must **not** be used with explosive areas, on landfill sites and with mining.

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

The machine must be operated by authorised operating personnel only if in proper technical condition and according to this operating manual.

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

1.02.02 Reasonably foreseeable misuse

In the case of reasonably foreseeable misuse and/or improper use of the machine, the manufacturer's guarranty period will expire and the operator will solely be responsible.

Reasonably foreseeable misuse is:

- Non-compliance with this operating manual.
- Operating errors by operating personnel not qualified or not instructed.
- Conveyance of passangers.
- Leaving the driver's position during operation.
- Starting, using the machine outside the driver's position.
- Errors due to "reflexive behaviour" and/or "chosing the easiest way".
- Operating the machine if it is not in a proper technical condition.
- Using the machine with improper ambient conditions (e.g. temperature, gradient, transverse gradient).
- Using the machine with the protective equipment removed.
- Spraying with high-pressure cleaners or fire extinguishing equipment.
- Towing trailing loads.
- Non-compliance with maintenance intervals.
- Omission of measurements and tests to detect damages early.
- Omission of replacing wear parts.
- In the case the spare parts used are no original Wacker Neuson spare parts.
- Omission of maintenance and repair works.
- Improper maintenance and repair works.
- Unauthorised modifications of the machine.

1.02.03 Residual risks

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

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

- Special warnings at the machine.
- General safety instructions in this operating manual.
- Special warnings in this operating manual.
- Operating instructions of the operator.

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

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

The machine may cause risk to the environment with:

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

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

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

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

- Improper operation.

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

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

1.02.04 Climatic conditions

Low ambient temperature

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

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

Please note:

The acceleration and braking behaviour of the machine are influenced by viscous hydraulic oil. Prior to cold seasons (autumn, winter) please adjust all operating supply items (coolants, oils etc.) to low temperatures.

Please use fuels suitable in winter or additives improving the flow with temperatures below 0 °C (32 °F) (see page 133 sqq.). Do not charge batteries with temperatures below 0 °C (32 °F) .

⚠ WARNING

Explosion!

Risk of injury due to burns and moving parts.

- Do not use aerosol start-up aid (e.g. aether).
- Do not use any liquids as start-up aid (e.g. alcohol).

Extensive ambient temperature, extensive height

See operating manual of diesel engine.

1.03 Environmental protection

Packing materials, cleaning agents and used or residual operating supply items are to be disposed according to relevant environmental provisions at the building site using the recycling systems provided.

1.04 Disposal

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

Operating supply items

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

Materials (metal, plastics)

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

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

Electical / electronical system / battery

Electrical / electronical components are not subject to Directive 2002/96/EC and relevant national regulations (in Germany e.g. ElektroG).

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

1.05 Type plate

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

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

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

Machine type plate

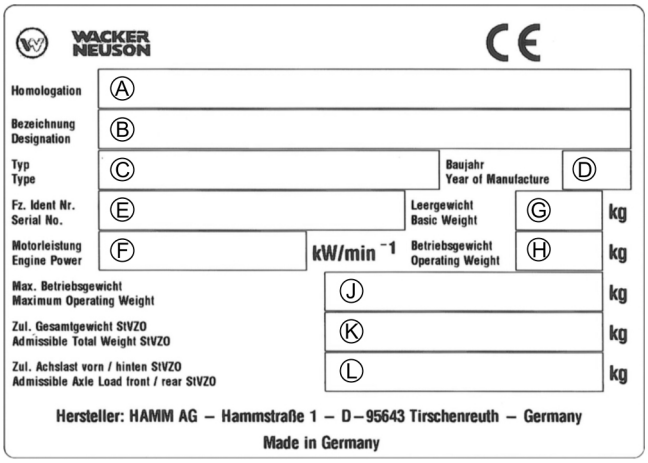
The type plate is fixed to the machine frame (see page 41).

The VIN [E] indicates the type series and the serial number of the machine e.g. WNCR0601JHAA00160.

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

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

No additional ballasting is allowed.



[A] Homologation (e.g. registration number for use on public roads in Italy)

[B] Designation

[C] Type

[D] Year of construction

[E] Vehicle identification number (VIN / PIN)

[F] Engine power / nominal speed

[G] Basic weight

[H] Operating weight

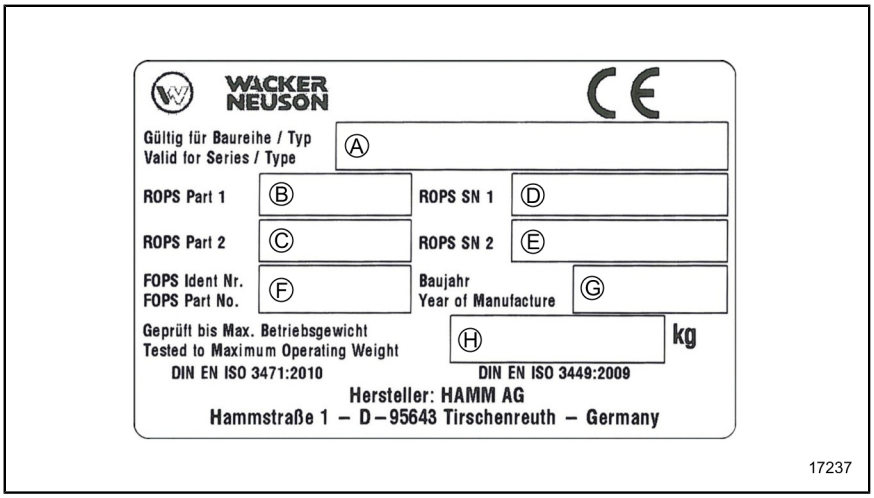
[J] Maximum operating weight

[K] Gross vehicle weight rating STVZO (only valid on public roads)

[L] Permissible axle load, front / rear STVZO (only valid on public roads)

Type plate roll-over protection ROPS

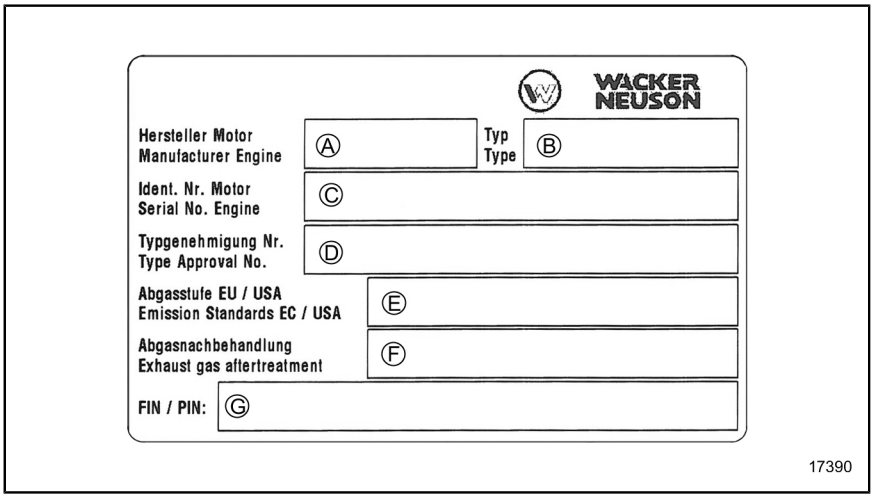
The roll-over protection, ROPS, approved by the manufacturer for this machine is marked by a type plate attached at the cabin / roll-over bar (see page 42).



[A]	Series / type (part of the VIN / PIN)	**[B]**	Cabin / ROPS identification number 1
[C]	Cabin / ROPS identification number 2	**[D]**	Cabin / ROPS serial number (if available) 1
[E]	Cabin / ROPS serial number (if available) 2	**[F]**	FOPS identification number (if installed)
[G]	Year of construction	**[H]**	Tested up to the maximum operating weight

Engine nameplate

The engine approved by the manufacturer for this machine is also indicated by a specially produced type plate. As a rule, this is located near the machine type plate.



[A]	Engine manufacturer	**[B]**	Type
[C]	Engine identification number	**[D]**	Type approval number
[E]	Emission level EU / USA	**[F]**	Exhaust after-treatment
[G]	FIN / PIN		

1.06 Noise and vibration requirements

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

The sound and vibration indications on the driver's seat are in line with the requirements of the EC Machinery Directive in the version 2006/42/EC.

Sound power level

Sound indication of the machine

The guaranteed sound power level is specified in the machine's Technical Details (see page 136 sqq.).

Sound intensity level

Sound indication on operator panel

The noise level at the operator's seat is specified under Technical data (see page 136 sqq.) (measurement uncertainty in accordance with EN ISO 11201).

However, when working in the immediate vicinity of the machine, values may exceed 85 dB(A). In this case wear always your personal noise protection (ear protection).

Vibration indication on the operator panel

Whole body vibration

The weighted rms values of the acceleration with whole body vibrations on the operator's seat have been accessed in accordance with EN1032 and do not exceed a_w = 0.5 m/s².

Hand arm vibrations

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

1.07 Personnel

1.07.01 Qualification and duties

Operating personnel

All activities at the machine must be carried out by authorised operating personnel only. In this operating manual the term operating personnel refers to all authorised persons that are responsible for operating, maintaining, instaling, setting up, cleaning, repairing or transporting the machine.

This comprises the following persons:

- Machine operator
- Maintenance personnel

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

Operating personnel qualification

All activities must be carried out by qualified personnel only.

The authorised personnel must:

- be 18 years of age.
- Be trained in and capable of performing first aid.
- Know and be able to apply the accident prevention regulations and safety instructions for the machine.
- Possess the physical and mental capabilities to carry out his responsibilities, tasks and activities on the machine.
- Be suitably trained and instructed for his responsibilities, tasks and activities on the machine.
- Understand and be capable of practically applying the technical documentation in accordance with his responsibilities, tasks and activities on the machine.

Persons employed to operate the machine independently must also fulfil the following requirements:

- Have been instructed how to operate the machine.
- Must have a valid driving licence for machines approved for road use.
- Have proven their ability to drive the machine to their employer.
- Be able to meet the expectation that they will reliably fulfil the tasks they have been given.
- Have been appointed by the employer / company to operate the machine.

Please adhere to the following instructions:

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

Banksman

Only persons are to marshal independently that:

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

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

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

Please adhere to the following instructions:

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

1.08 General Safety Instructions

Please make yourself familiar with these safety instructions prior to working with the machine.

Guidelines and regulations

In addition to this operating manual, it is also necessary to adhere to all laws, standards, regulations and provisions applicable in the country of use and at the building site. The vandslism protection for the lighting is not permitted by the StVZO (Germany) and must be removed when travelling on public roads.

Additional information

In case you should obtain additional technical and/or safety-relevant information, they also must be adhered to and need to be attached to the operating manual.

Electrical system

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

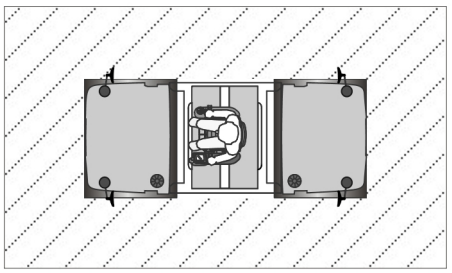
ROPS roll-over protection

The machine frame in way of the ROPS mounting may not be distorted, bent or torn (deformed). The reinforcement elements of the cabin / roll-over bar 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 starting torque values! Bolts and nuts must not be damaged, bent or deformed. It is absolutely forbidden to modify or repair / level the reinforcement elements in any way (see page 145 sqq.).

1.09 Danger zone

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

Zone "inactive"



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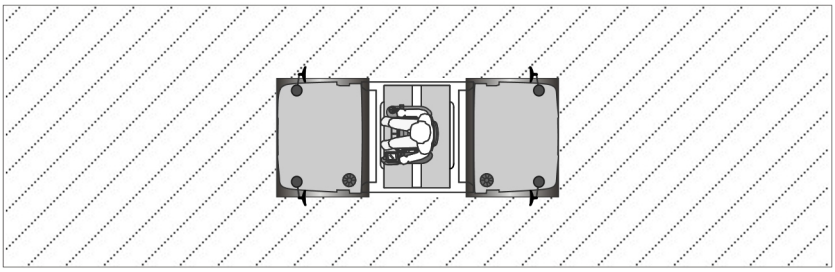
With the machine put out of operation and with the diesel engine switched off, an area 1 metre around the machine is defined as danger zone. Only authorised operating personnel is allowed to enter the danger zone.

Zone "moving"



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

10 metres	In front of and in the rear of the machine
1 metre	To the left and right of the machine

During compaction and transport works no persons are allowed to be within the danger zone.

1.10 Loading and Transporting

Guidelines and Regulations

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

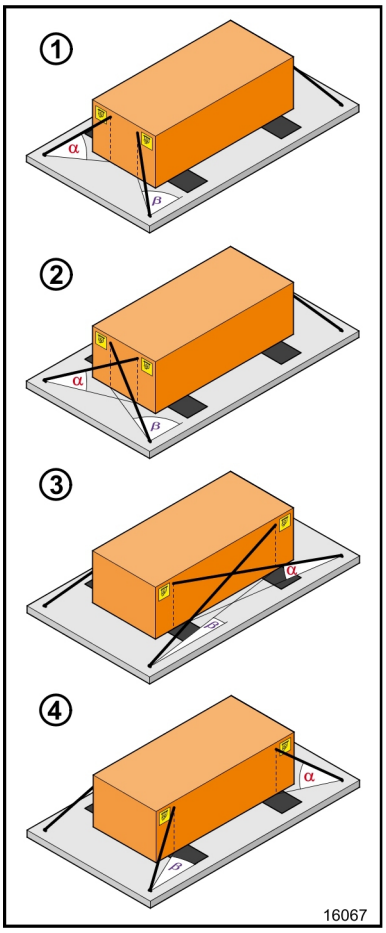
The transport company involved is always responsible for the safe transport of the machine and accessories.

Loading instructions

When loading please observe the following instructions:

- Observe weight and dimensions (see page 136 sqq.).
- Observe the legally required maximum height.
- Only use approved gantries or planks that are provided with an antiskid coating. Never drive with metal on metal.
- Gantries, planks and loading areas must be swept clean and free of grease, dirt and ice etc. Clean roller drums and tyres prior to driving on the gantries. Please ensure a friction factor is μ ≥ 0.6, e.g. by use of anti-slide mats.
- Drive the machine slowly onto the loading area with ¾ diesel engine speed.
- Either remove every loose or movable part in or at the machine, or secure such parts separately.
- In case of rollers with articulated steering, the safety strut must always be activated for transport.
- Remove wedges and lashing devices completely before unloading. Unblock steering system by unblocking the safety strut.
- Drive the roller slowly and carefully from the loading area.
- For crane loading, always attach appropriate sling equipment at the lifting lugs provided for them. The crane vehicle must be positioned on flat ground providing the bearing capacity required while observing all relevant safety regulations. In addition, take suitable precautions to block access to the lifting area in order to prevent any person from moving or staying within the danger zone. The crane's load table must correspond to the machine to be lifted. No crane loading must be performed unless all these items have been complied with.

Securing the load



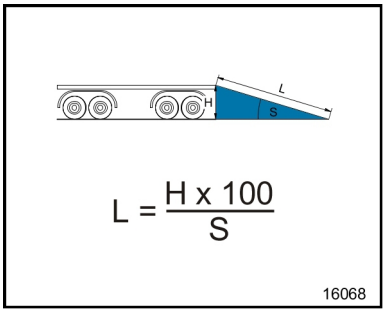
Special notes

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

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

- On rubber wheeled rollers the inflation pressure must be set to 0.6 MPa (6 bar, 87 psi).
- Check and, if necessary, re-adjust the inflation pressure for every tyre at least every 24 hours.
- Number of securing devices required: 4

Maximum permissible ramp slope: 28.5 % (~ 16°)

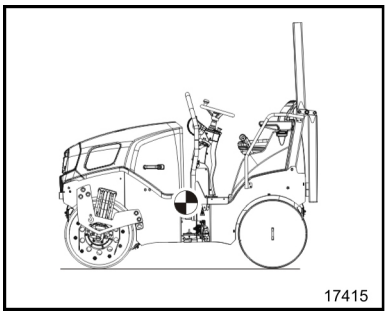


[L] Ramp length (mm)

[H] Difference in height (mm)

[S] Ramp slope (%)

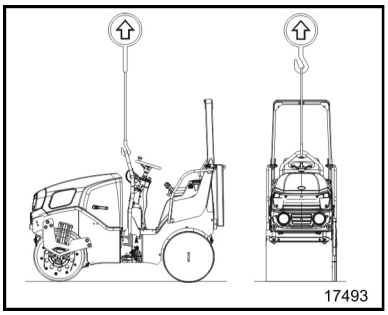
Make certain to use a proper load distribution plan.



[◓] Center of gravity

Crane loading

Special notes



- Take note of the centre of gravity and weight of the machine!
- Use appropriate hoisting equipment!
- Observe the lifting capacity of the sling gear.
- Use lifting frames or spreader beams if necessary.

Specific safety precautions

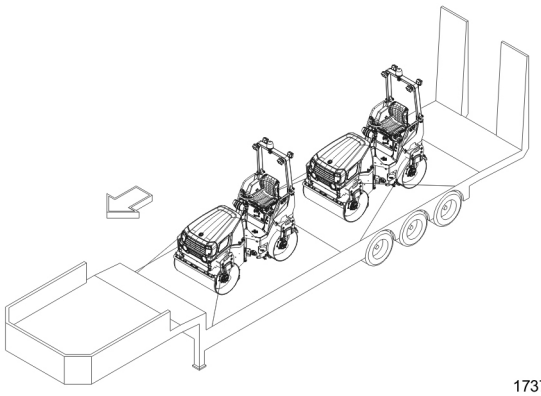
- Areas must be swept clean and free of grease, dirt and ice etc
- Use approved gantries or planks that are provided with an antiskid coating
- Never drive with metal on metal
- Observe maximum permissible ramp slope (28.5 %, approx. 16°)
- Apply safety strut - after loading on means of transport
- Remove safety strut - before unloading from the means of transport -
- Secure the clamping tools

Miscellaneous:

- Slowly drive the machine up/down with the speed set to 2/3 and the drive lever at the 1/4 position
- Lock the seat console in position
- Observe the user instructions

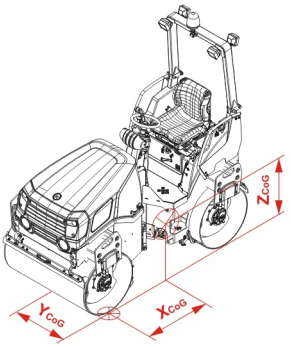
Loading chart

Travelling position general sketch



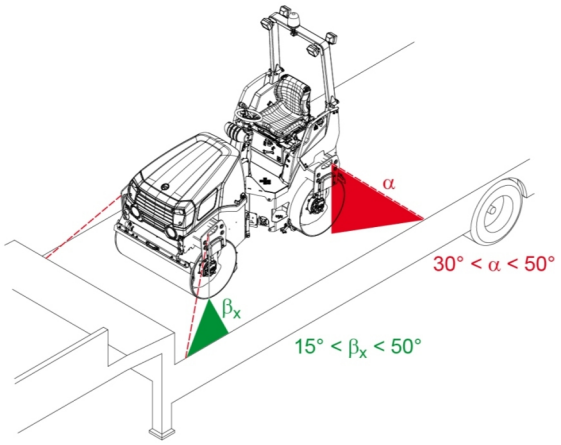
17372

Centre of gravity general sketch:



17373

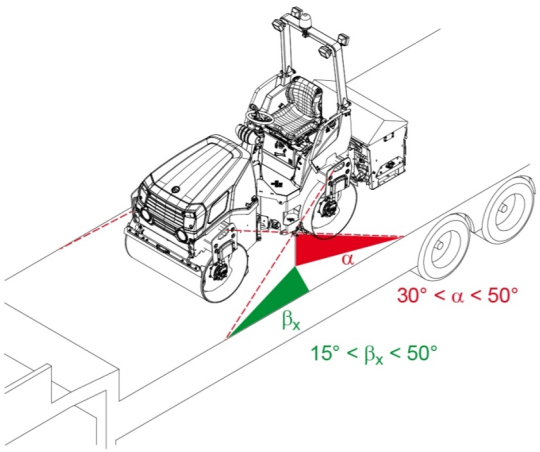
Lashing variant 1



17374

Weight class [t]	Lashing force LC (μ=0.6) [daN]
to 5.7	2000

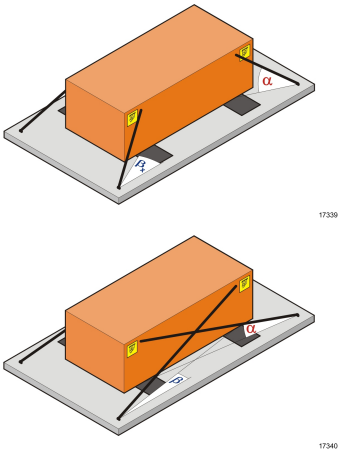
Lashing variant 2



17379

Weight class [t]	Lashing force LC (μ=0.6) [daN]
to 5.7	2000

Machine parameters	
Machine weight [t]	1.5 t < m < 5.7 t
Permitted centre of gravity [mm]	X_{CoG} = 778-1048 Y_{CoG} = 428-753 Z_{CoG} = 650-1030
Reference point identification:	Roller drum centre at front left
Interface paramters:	
Type of contact:	Non-skid material
Coefficient of sliding friction [µ]:	0.6
Heavy-load capability:	yes
Contact points:	Pairing the contacts
Vertical lashing angle α:	30° < α < 50°
Longitudinal horizontal angle βx:	15° < βx < 50°

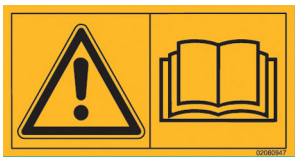


Attaching point specification at load:			
Lashing point tensile force [daN]:	2000		
Lashing point location identification:	Symbol ISO 6405-1		
Lashing point number:	4		
Lashing points specification at the means of transport:			
Lashing point tensile force [daN]:	≥ 2000		
Lashing point number:	4		
Load securing equipment:			
Blocking wedges:	no	Number: 0	Miscellaneous:
Other types of blocking:	Form-locking blocks along / at right angles to the direction of travel or between two rollers		
Lashing device capacity [daN]:	2000	Number: 4	Miscellaneous:
Recommended type of lashing device:	Chain (6/8 2200 daN),		
	Belt (2000 daN) as an alternative		
Links to the lashing point:	Hook with safety catch		

1.11 Stickers on the machine

Below you will find all used stickers. You will find the precise arrangement of stickers in the spare parts catalogue.

1.11.01 Warning labels



Read documentation

Read operating manual before you start working with the machine or maintaining it. Ignoring this instructions can cause serious injuries or fatality.

Seat belt obligatory (only with ROPS cabin or ROPS roll-over bar)

Risk of being thrown out of tipping machine can cause serious injuries or fatality. Put on safety belt.

Hearing protection

Dangerous noise level! May cause damage to the hearing. Wear personal protective equipment.

Water jets

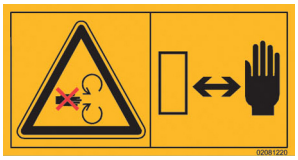
Dangerous situation! Fluid may enter control units and cause injury and/ or damage to the machine. Do not spray components with water.

Motor Stop

Hazard due to rotating parts! With the machine running, serious injuries or fatality may be caused. Prior to maintenance work, shut down engine and remove ignition key. Wait until all machine components have come to a standstill.

Hot surface

Risk of burns! Surfaces can be very hot. Do not touch surface. Keep away.



Chip spreader

Hazard due to rotating parts! Moving machine components can cause serious injuries or fatality. Prior to maintenance and adjustment works, shut down machine and remove ignition key.

Edge pressing assembly

Danger of crushing! Pinch point can cause serious injuries or fatality. Keep away. Prior to maintenance and adjustment works, shut down machine and remove ignition key.

Fan blade

Hazard due to rotating parts! With the machine running, serious injuries or fatality may be caused. Prior to maintenance work, shut down engine and remove ignition key. Wait until all machine components have come to a standstill.

V-belt

Risk of trapping! Open belts or chains. With the machine running, serious injuries or fatality may be caused. Prior to maintenance work, shut down engine and remove ignition key. Wait until all machine components have come to a standstill.

Articulated joint

Danger of crushing! Pinch point can cause serious injuries. Keep away.

Danger of overturning

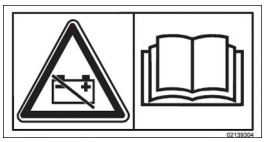
Pay attention that there is sufficient stability when working with rollers of small roller drum width. Pay attention to permitted machine tilt.

Danger of crushing

Pinch point can cause serious injuries. Keep away.

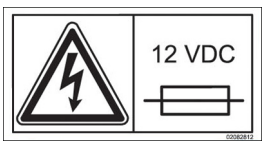
Lashing not allowed

Dangerous situation! Do not use as a lashing or lifting point. Lifting not allowed.



Battery isolating switch

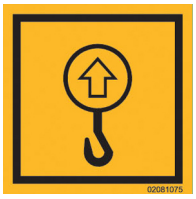
Dangerous situation. Activate the battery isolating switch only with the enginge stopped. Prior to starting service work, read the operating and maintenance instructions.



Fuses 12 V

Safety strut

Marking of a safety strut.

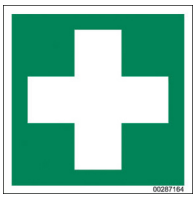


Towing eye for crane loading

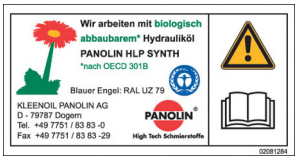
Lashing point

Read documentation

Read operating manual before you start working with the machine or maintaining it.



First-aid kit

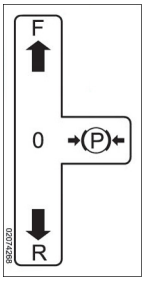


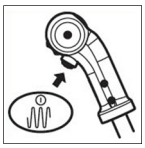
Panolin

Biodegradable hydraulic oil in use.

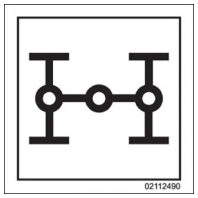
1.11.02 Information sign

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



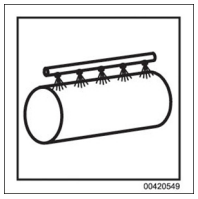


Drive lever function

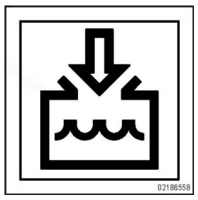


All-wheel lock

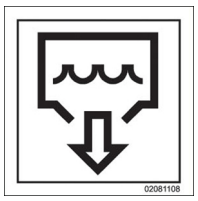
Engine speed



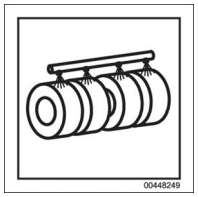
Water sprinkling



Water tank filling



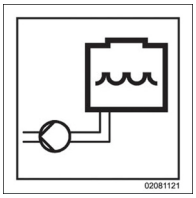
Water tank outlet



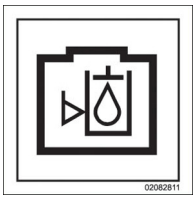
Additive sprinkling

Water tank inlet of additive sprinkling

Water tank outlet of additive sprinkling

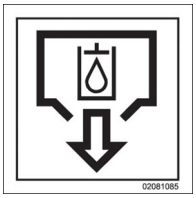


Water pump

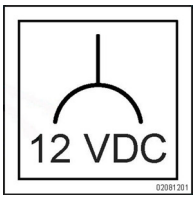


Hydraulic oil filling level

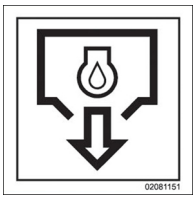
Hydraulic oil reservoir inlet



Hydraulic oil reservoir outlet

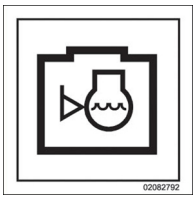


Socket 12V



Engine oil outlet

Water sump fuel filter outlet



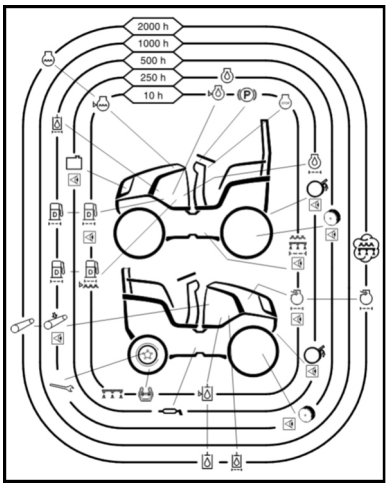
Coolant filling level

Coolant inlet

Inflation pressure

Tyre without water filling

Guaranteed sound power level



Maintenance overview

2 DESCRIPTION

2.00 Technical characteristics of the machine

Transmission Hydrostatic all-wheel drive

- Infinitely variable
- Single lever operation

Vibration Direct hydrostatic drive

Steering Hydrostatic servo-assisted steering via centre pivot assembly

- Large steering angle to both sides
- Pendulum compensation upwards and downwards

Track offset Mechanical track offset

- Track offset to the right
- no track offset for RD 18-100 C

Service brake During use, the machine is braked by the hydrostatic transmission.

- Wear-free brakes

Parking brake Spring-operated brake acting upon each hydromotor of the drive

- Manually and automatically

EMERGENCY STOP brake Machine is braked with spring-operated brakes and hydrostatic drive.

Water sprinkling Pressure sprinkling

- Manual operation and automatic interval system

Additive sprinkling Pressure sprinkling

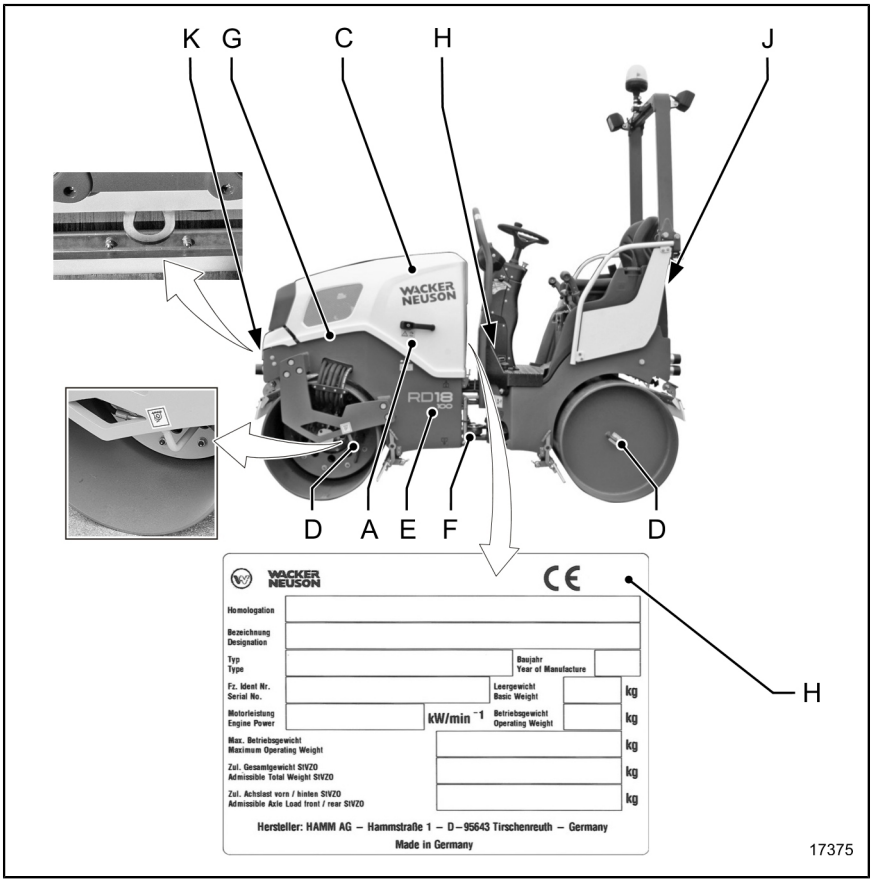
- Manual actuation

Electrical system Operating voltage 12 V

2.01 General view of machine

This operating manual applies to several types of this series. Therefore it is possible that these instructions include descriptions of operating elements not installed on your machine.

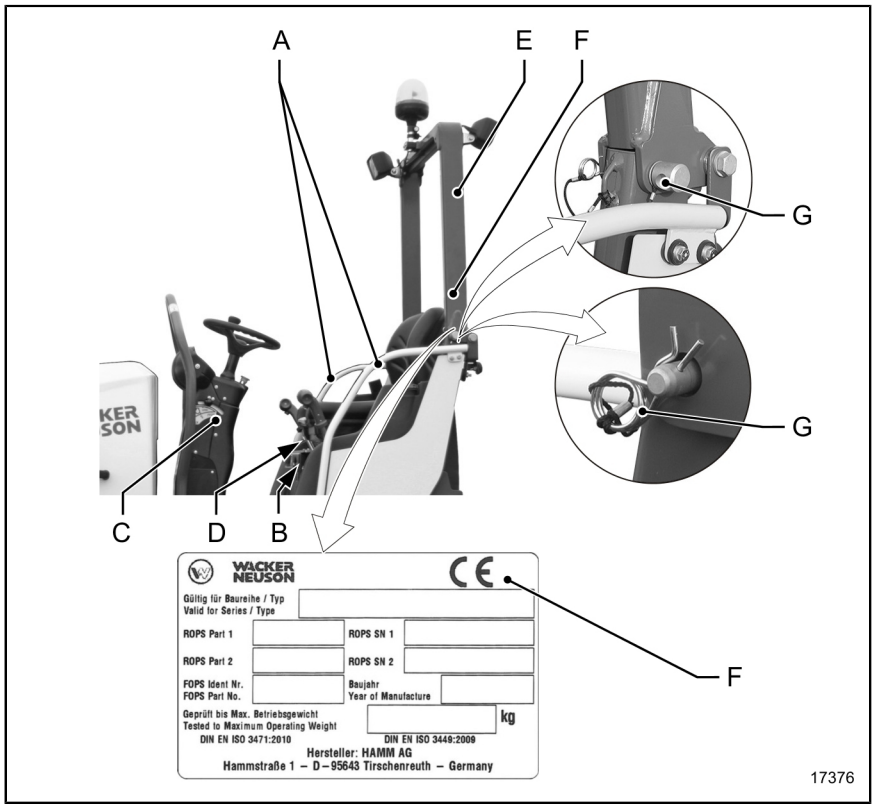
2.01.01 Chassis / safety devices



[A]	Stickers indicating dangers	**[B]**	Towing eye for crane loading
[C]	Engine hood	**[D]**	Lashing point
[E]	Chassis	**[F]**	Safety strut
[G]	Vehicle identification number (VIN) (on the right side)	**[H]**	Machine type plate (on the right side)
[J]	Position for *fire extinguisher	**[K]**	Towing eye

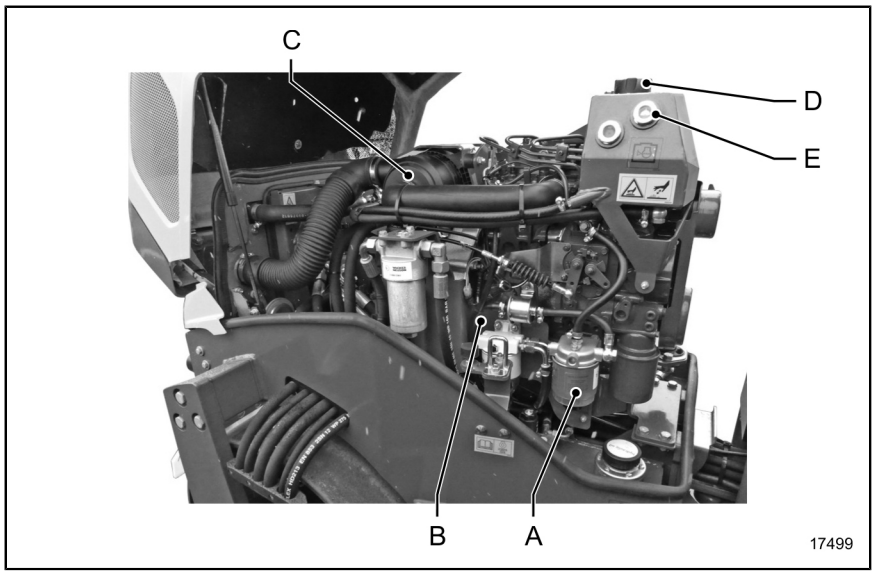
2.01.02 Control stand

ROPS roll-over bar (folding)

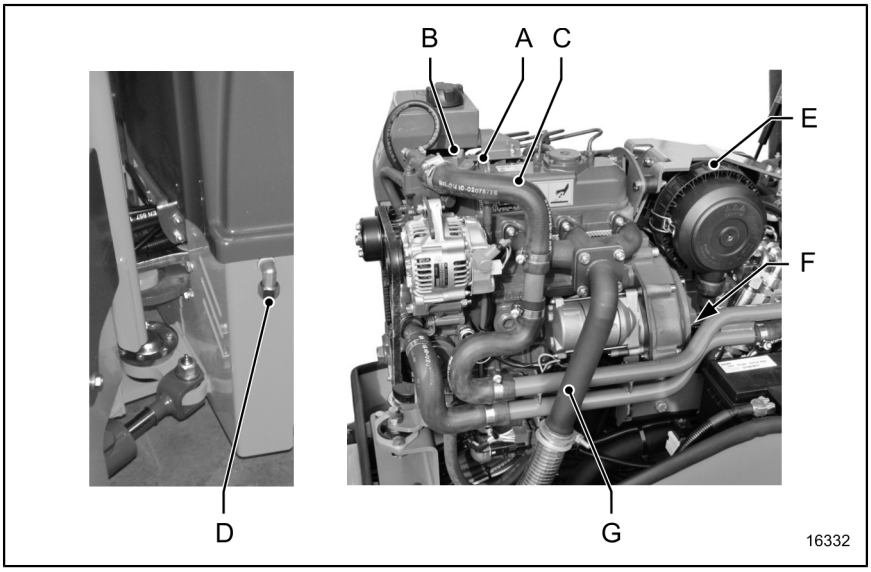


[A] Handles
[B] Stacker for operating manual / first aid kit
[C] Steering column
[D] Operator's seat console
[E] Roll-over bar
[F] ROPS roll-over bar type plate
[G] Locking pin / safety split pin

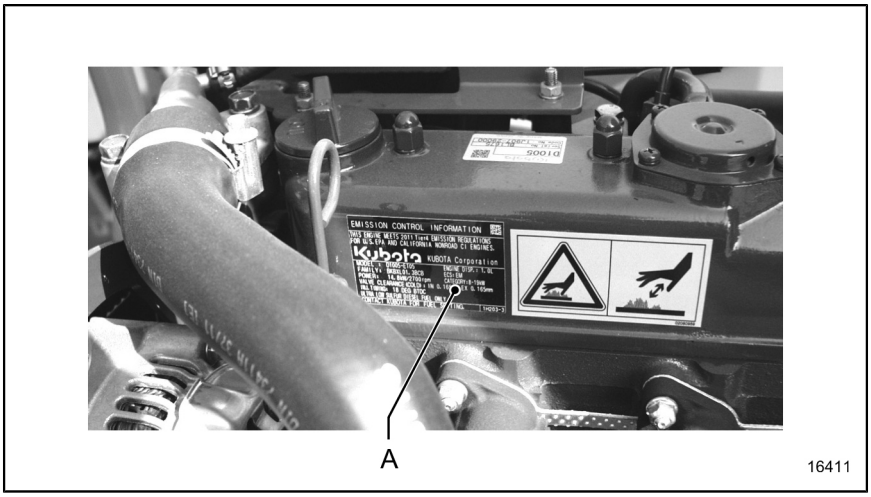
2.01.03 Drive unit / diesel engine



[A] Fuel system
[B] Diesel engine with drive units
[C] Air filter
[D] Coolant intake
[E] Coolant level indicator

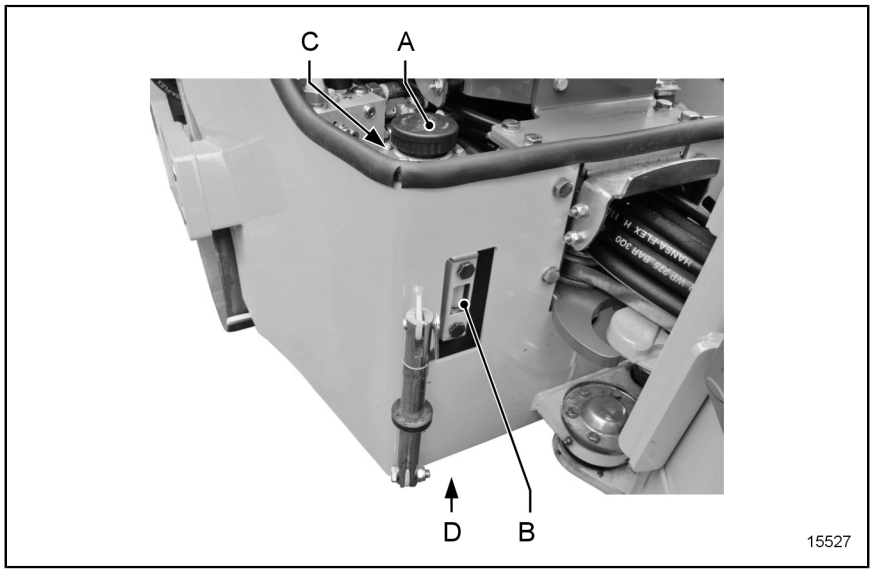


[A] Oil gauge stick
[B] Oil inlet
[C] Cooling system
[D] Oil outlet
[E] Air filter
[F] Dust discharge valve
[G] Exhaust system

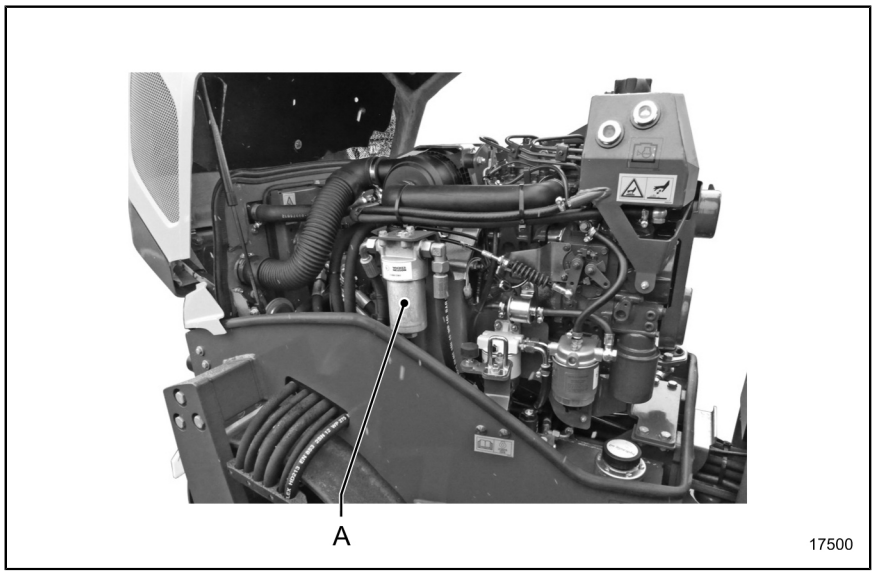


[A] Diesel engine type plate

2.01.04 Hydraulic oil supply



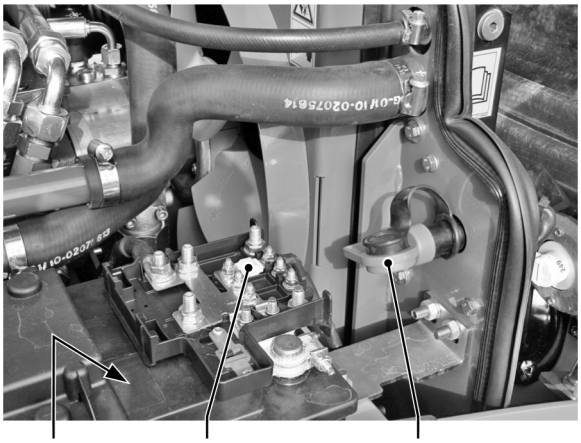
[A] Oil inlet
[B] Level indicator
[C] Hydraulic oil reservoir
[D] Oil outlet



[A] Hydraulic oil filter

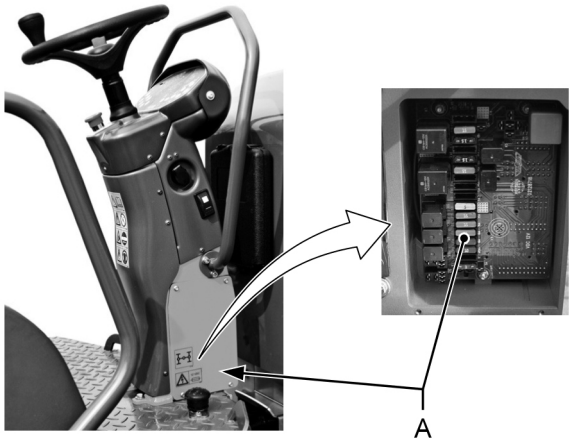
2.01.05 Electrical equipment

Engine compartment



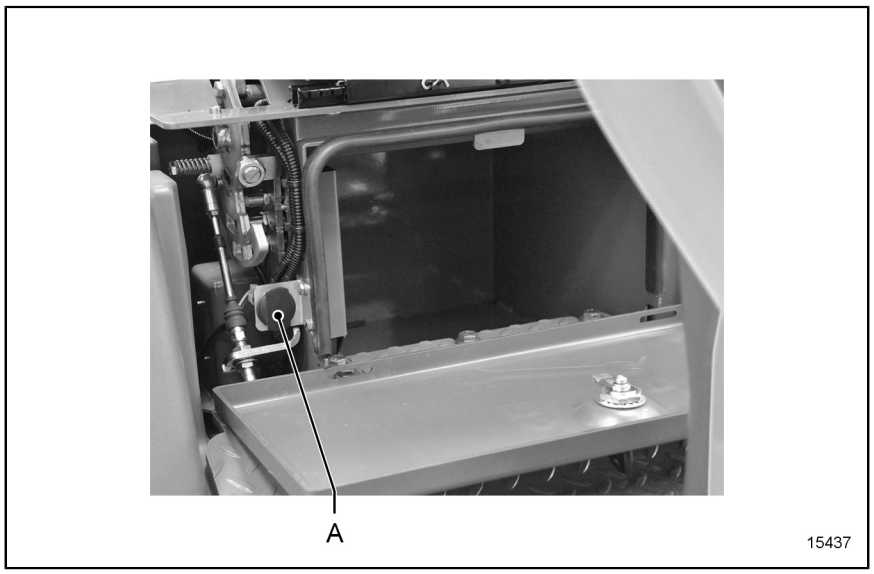
[A] Battery
[B] Battery isolating switch
[C] Main fuse

Fuses



[A] Fuses

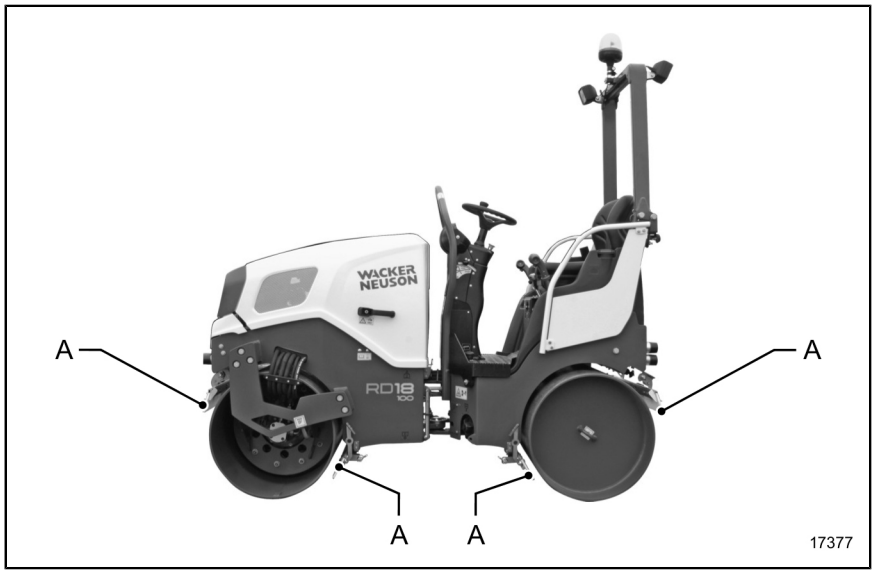
Socket



[A] Socket 12 V

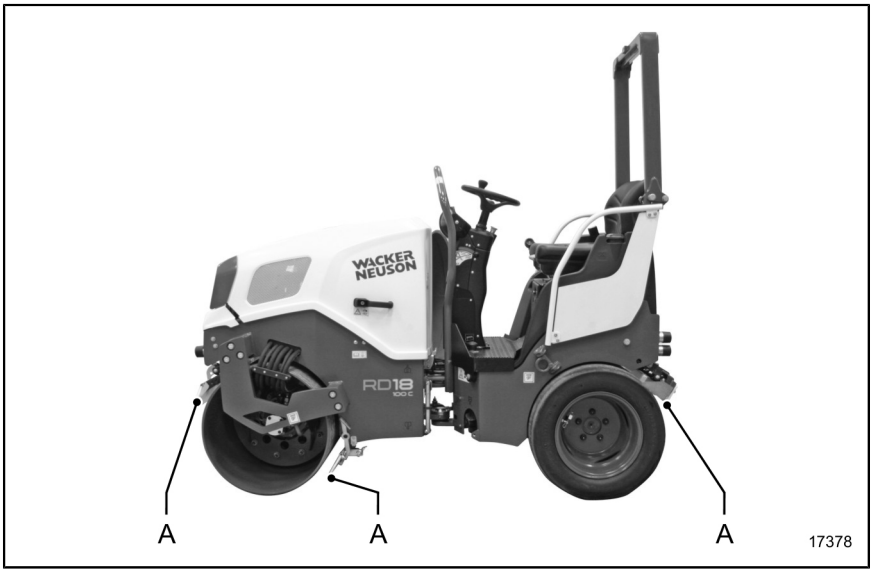
2.01.06 Drive

Drums scraper



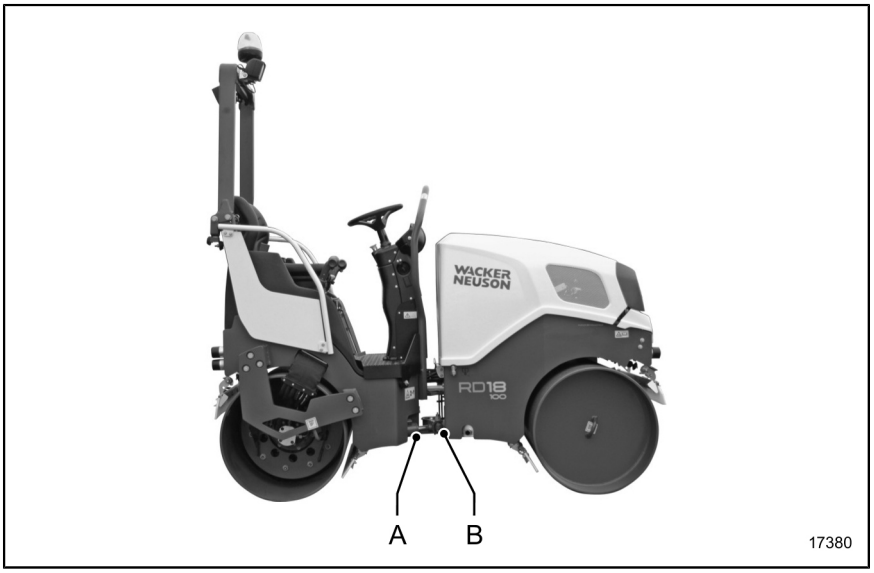
[A] Scraper

Scraper for roller drum and tyres



[A] Scraper

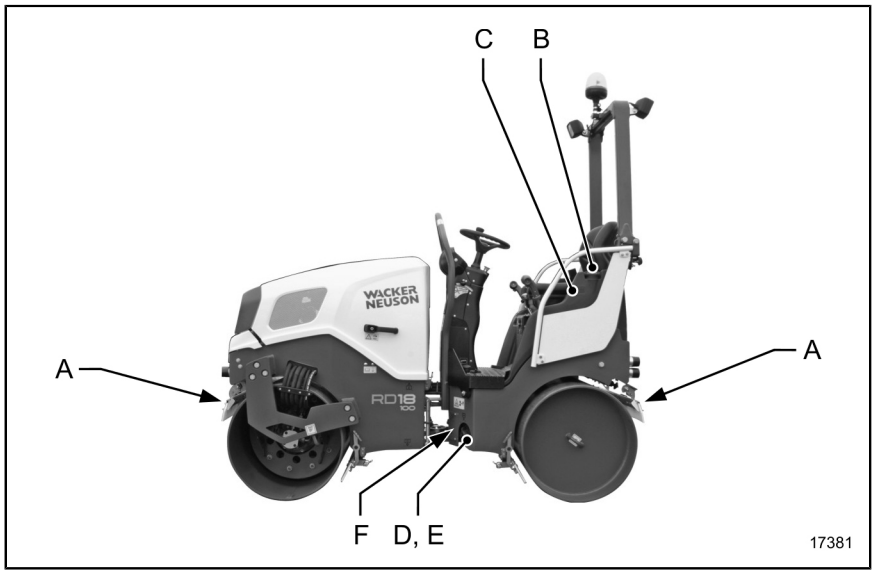
2.01.07 Steering system



[A] Steering cylinder **[B]** Articulated pendulum joint

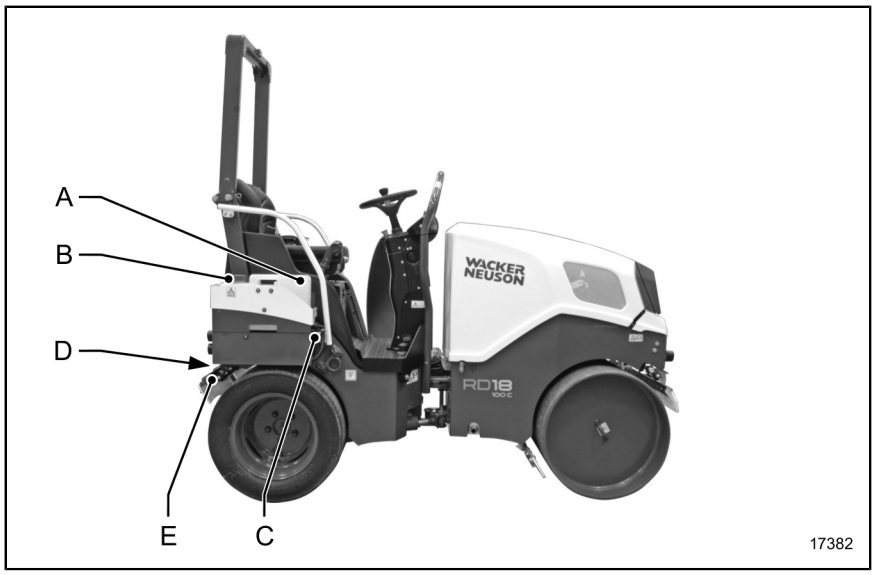
2.01.08 Water system

Water sprinkling



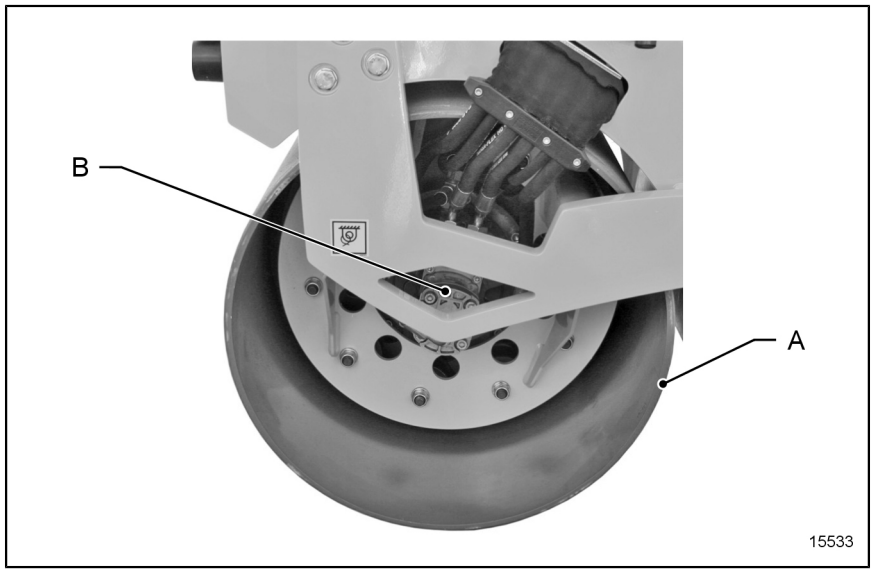
[A] Sprinkling nozzles
[B] Water tank filling
[C] Water tank
[D] Water outlet
[E] Water filter
[F] Water pump

*Additive sprinkling



[A] Additive tank
[B] Inlet additive tank
[C] Additive tank outlet
[D] Additive sprinkling water pump
[E] Additive sprinkling nozzles

2.01.09 Vibration



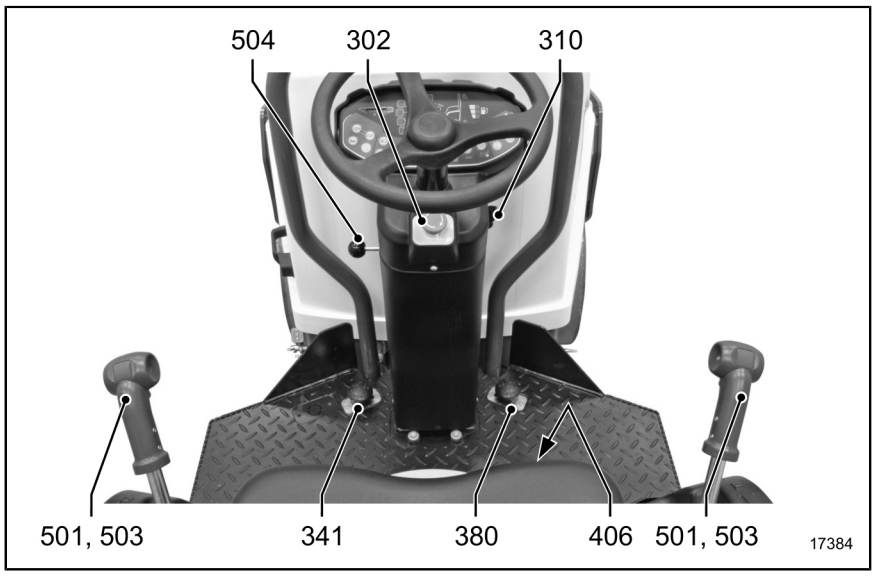
[A] Roller drum with vibrator **[B]** Vibration drive motor

2.02 General view of instruments and operating elements

All instruments and operating elements are marked by numbers. You will find a description in chapter 3 under the corresponding element.

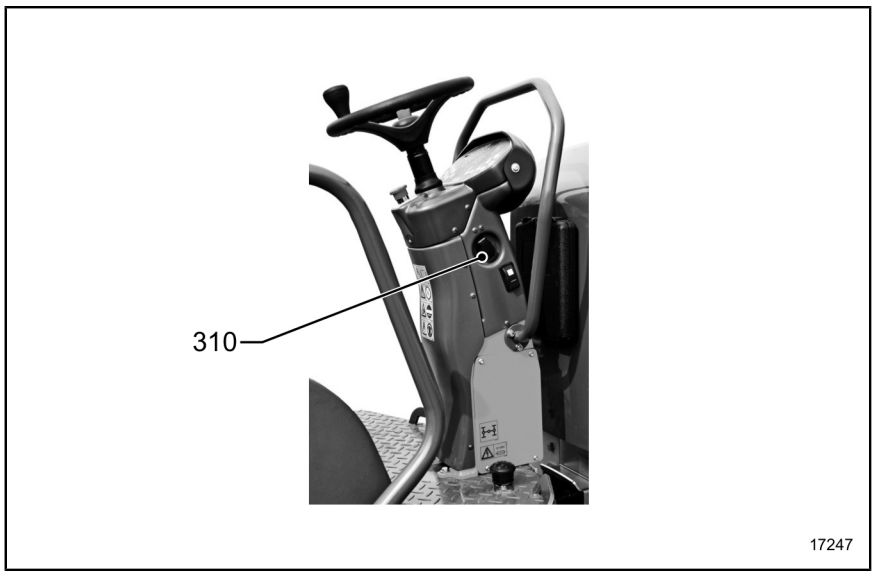
2.02.01 Control stand

Operator's platform



[302] EMERGENCY STOP switch
[310] Electrical system / engine start switch
[341] Sprinkling switch
[*380] Additive sprinkling switch
[406] Socket 12 V
[501] Drive lever
[503] Multifunctional handle
[504] Engine speed

Steering column



[310] Electrical system / engine start switch

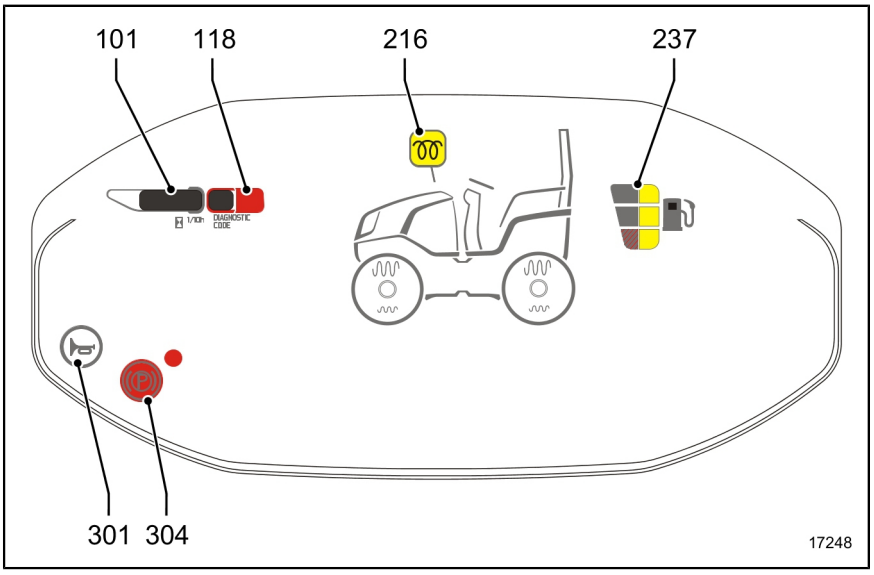
Driver's seat

[520] Seat adjustment weight / height

[521] Seat adjustment forwards - backwards

[522] Seat adjustment backrest

Normal mode control unit



[101] Hourmeter indicator

[118] Display of diagnostic code

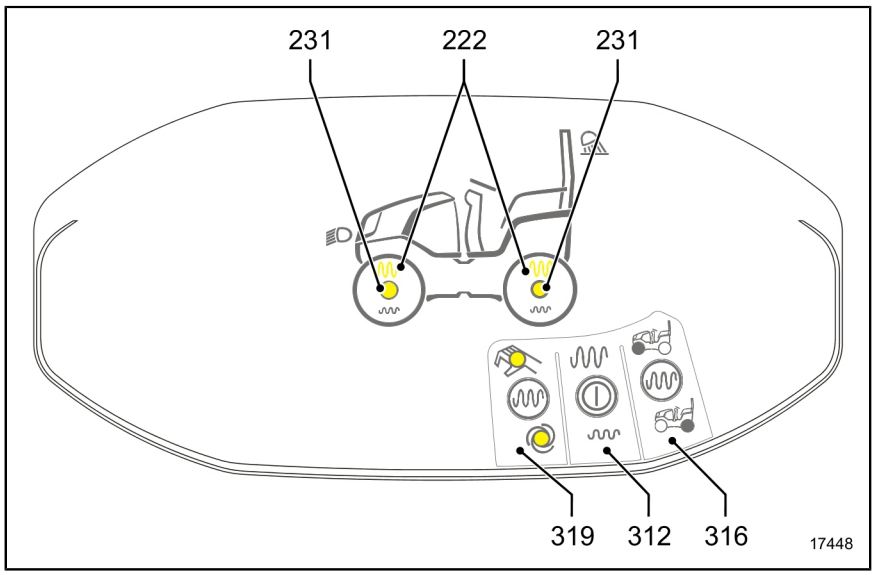
[216] Pilot light, cold start assistance

[237] Fuel level pilot light

[301] Signal horn switch

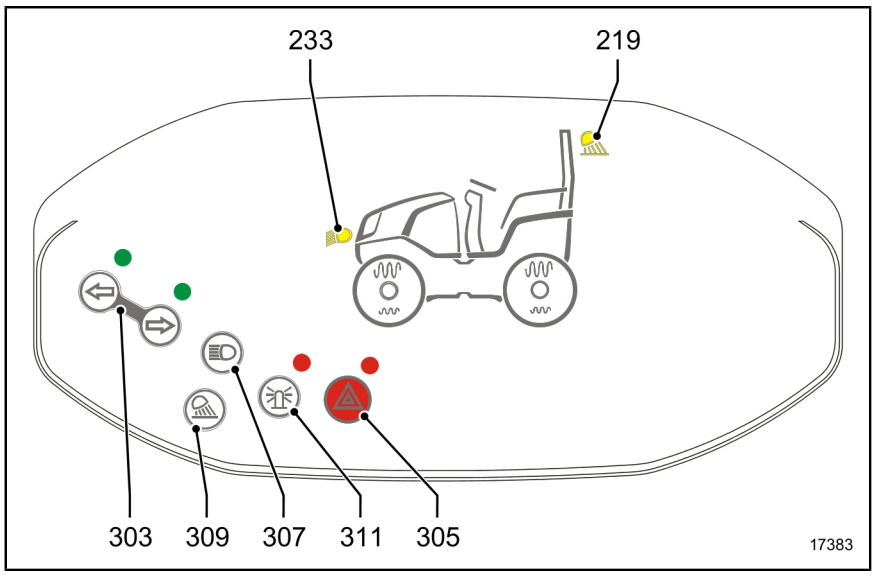
[304] Parking brake switch

Vibration control unit



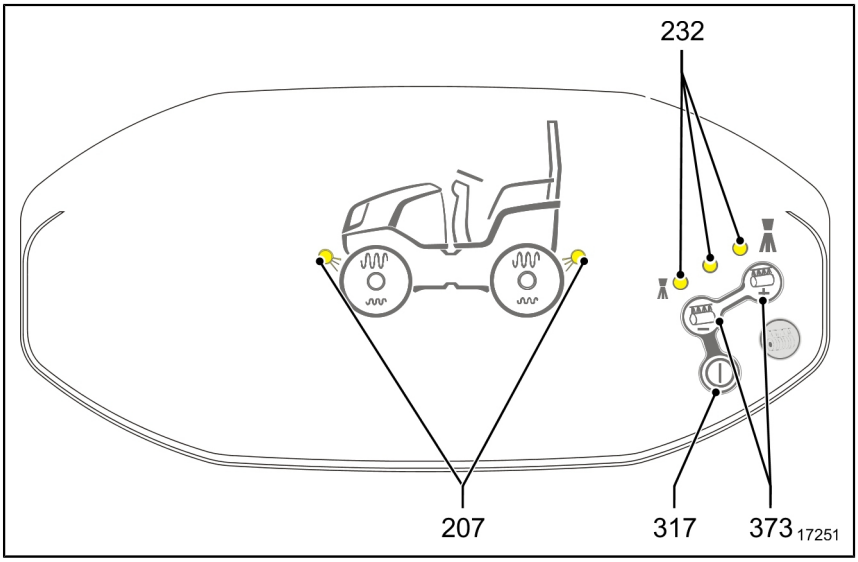
[222] Pilot light amplitude, vibration activated
[231] Control light preselection, vibration deactivated
[312] Vibration switch
[316] Switch vibrator preselection
[319] Switch vibration mode manual-automatic

Driving control unit



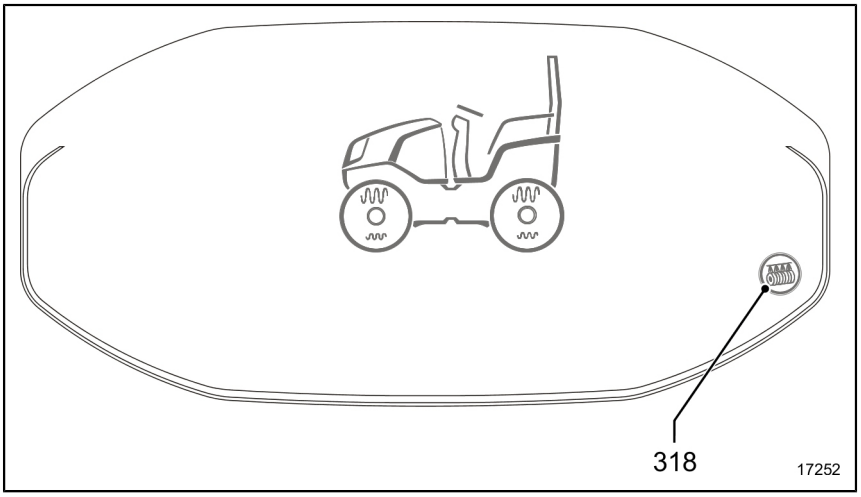
[*219] Pilot light working spotlights
[233] Driving light pilot lamp
[303] Flashing indicator switch
[305] Warning flasher switch
[307] Driving light switch
[*309] Working lights switch
[*311] Rotating light switch

Sprinkling control unit



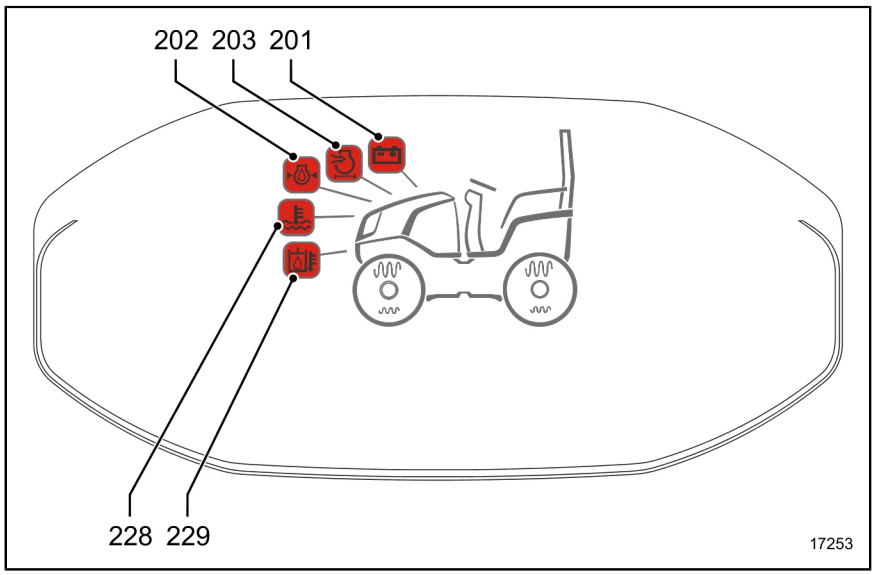
[207] Water sprinkling pilot light
[232] Pilot light sprinkling stage
[317] Sprinkling switch
[373] Switch sprinkling stage

Control unit additive sprinkling



[*318] Switch additive sprinkling (only if with combination roller equipped)

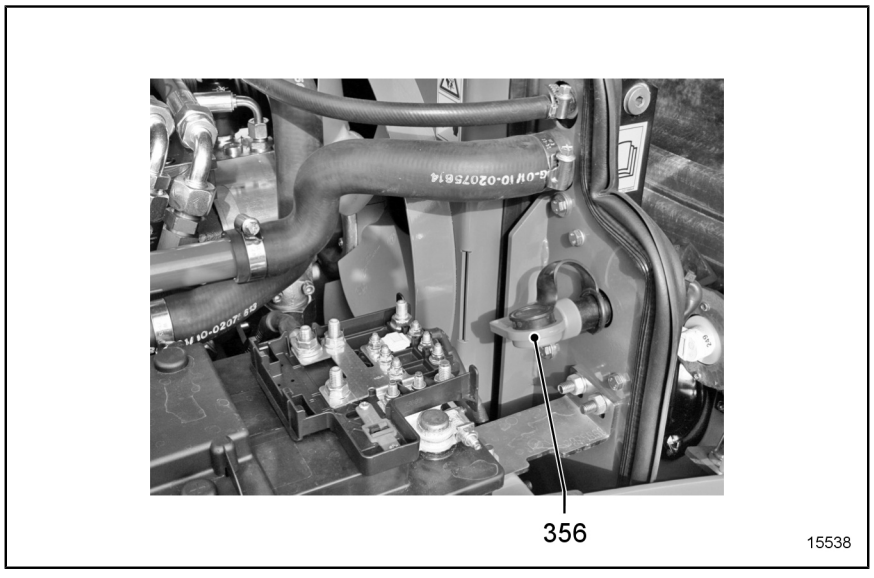
Warning lamps control unit



[201] Charge current pilot light
[202] Oil pressure pilot light
[203] Air filter pilot light
[228] Engine temperature pilot light
[229] Oil temperature pilot light, hydraulic system

2.02.02 Drive unit / diesel engine

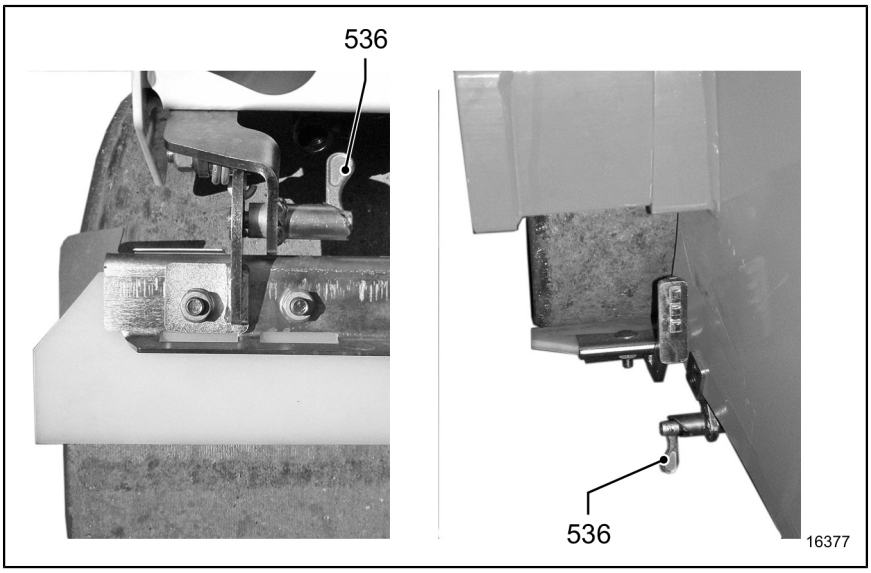
Engine compartment



[356] Battery isolating switch

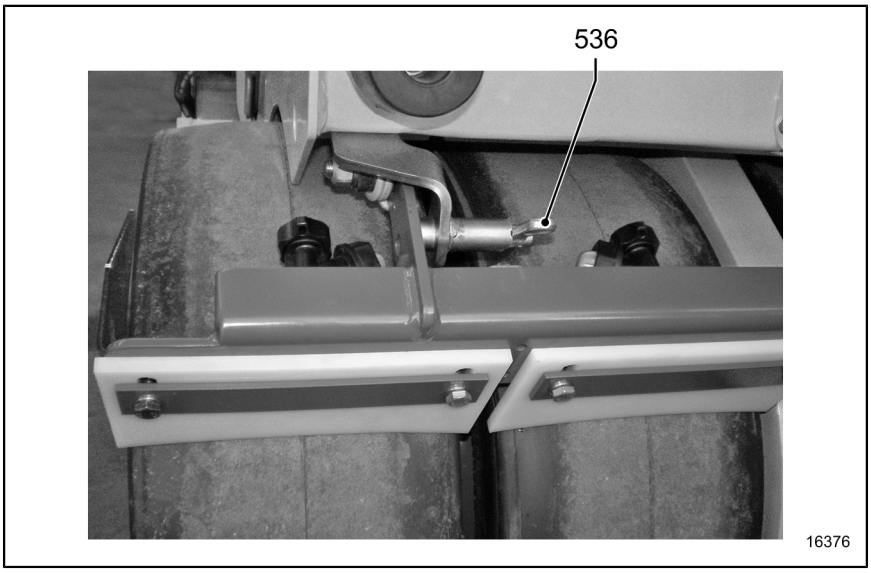
2.02.03 Drive

Roller drum scraper



[536] Locking device of scraper

Scrapper tyres



[536] Locking device of scraper

3 OPERATION

3.00 Instruments and operating elements

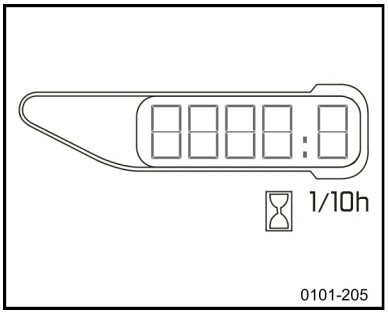
The instruments and operating elements are arranged in this section in ascending order according to their number. These numbers in squared brackets are used as a reference in the description of the elements.

3.00.01 Indicators, displays

Electrical equipment

When switching on the electrical system with the switch [310] all pilot lights and indicators are activated for ca 2 seconds . Check whether all elements are operable. You find further explanations in the section Operational monitoring (see page 83 sqq.).

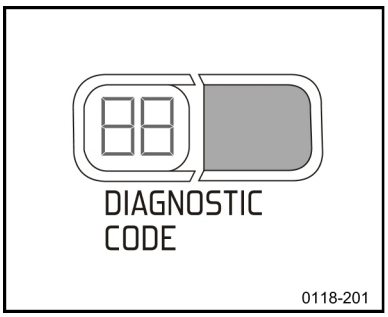
101 Operating hour meter



After the electrical system is switched on, the operating hours of the machine are shown in the display field. Maintenance work has to be carried out according to the accumulated operating hours.

The current software status is shown in the first 2 seconds.

118 Diagnostic Code

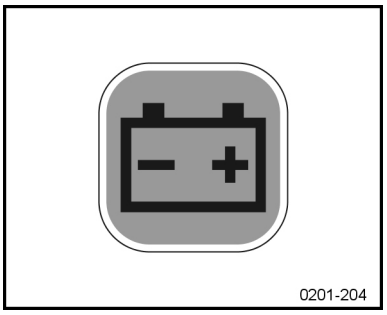


During operation, machine malfunctions are displayed by flashing pilot lights. A number code on the indicator identifies the corresponding malfunction. Table for diagnostic codes see page 136 sqq.

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

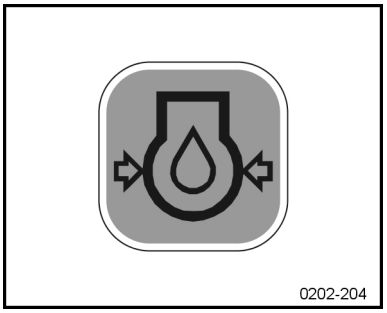
3.00.02 Pilot lights

201 Charge current



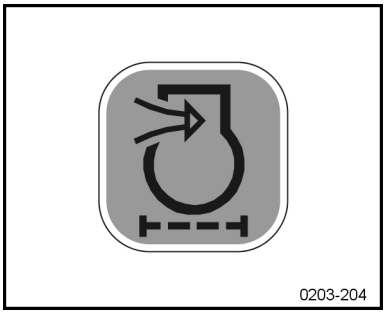
Flashing during operation indicates missing charging current.

202 Engine oil pressure



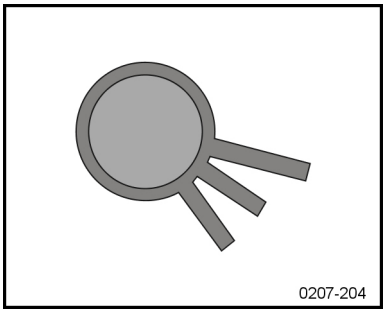
Flashing during operation indicates insufficient oil pressure.

203 Air filter



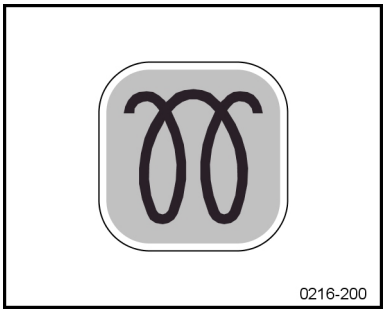
Flashing during operation indicates a clogged air filter cartridge.

207 Sprinkling



The pilot light illuminates when the water pump runs during sprinkling.

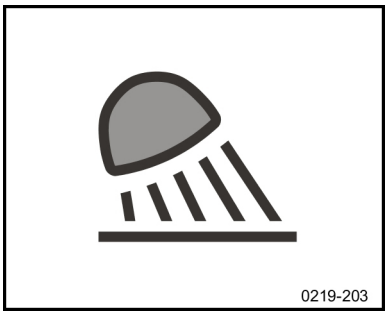
216 Cold start assistance



At an outside temperature below 10 °C (50 °F), preheat diesel engine with cold start assistance (switch [310] position II). After reaching start temperature, the indicator switches off; then start the diesel engine.

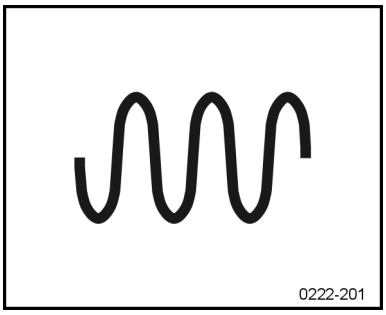
Preheating is time controlled only. Preheat twice at low temperatures if necessary.

*219 Working spotlight



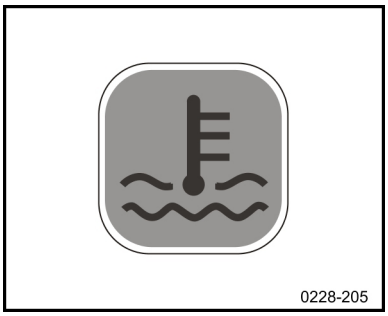
Pilot light illuminates if the working spotlights are switched on.

222 Amplitude, vibration activated



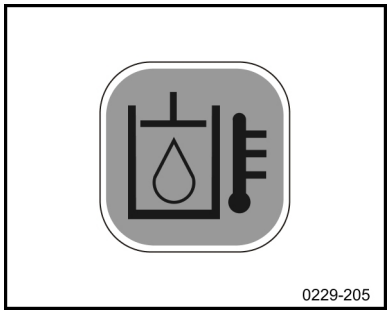
The pilot light lights up when the vibration system is activated.

228 Engine temperature



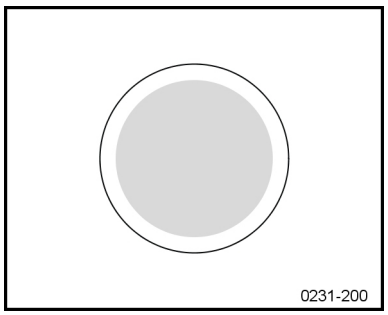
Flashing during operation indicates improper engine temperature.

229 Oil temperature of hydraulic system



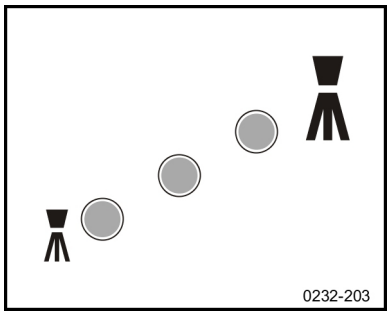
Flashing during operation indicates improper hydraulic oil temperature.

231 Vibrator preselection, vibration deactivated



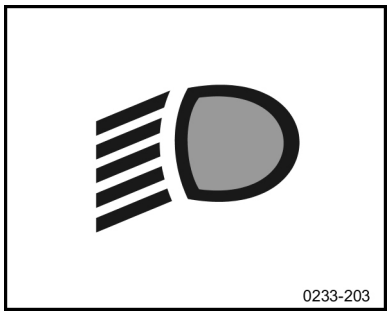
This pilot light indicates a pre-selected vibrator in case of de-activated vibration.

232 Sprinkling stage



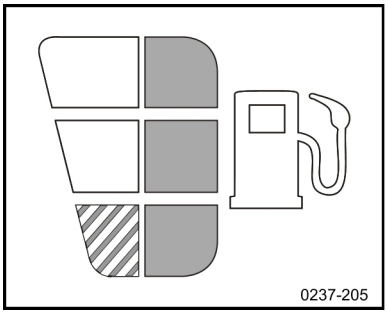
The sprinkling stage is displayed by the pilot lights. A luminous point shows the pre-selected sprinkling stage.

233 Driving light



Pilot light illuminates if the lighting is switched on.

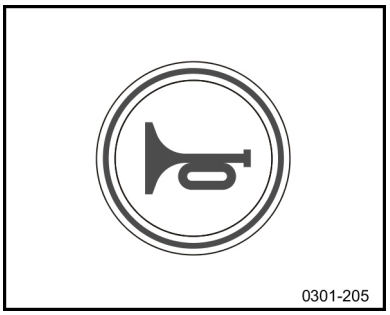
237 Fuel filling level



The fuel tank filling level is displayed by an illuminated pilot light. According to the filling level, the luminous point moves between 2/3, 1/3 and 1/10. If the level drops below 1/10 the luminous point flashes. Refuelling is necessary!

3.00.03 Switch

301 Signal horn



The signal horn sounds as long as this switch is pressed.

302 EMERGENCY STOP

⚠ WARNING

Full braking!

Danger of injuries due to strong braking force.

- Activate EMERGENCY STOP only in the event of danger.
- Do not use the EMERGENCY STOP as operation brake.

Pressing the switch:

- Stops the hydraulic drive,
- Switches off the diesel engine,
- Activates the hydraulic brakes
- And the code 21 is displayed on the indication [118].

On — **DOWN**

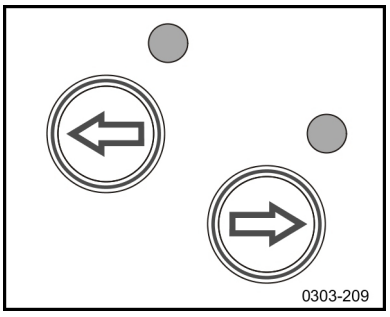
To disengage EMERGENCY STOP, turn push button clockwise.
Off — **UP**

After actuating the EMERGENCY STOP switch, the machine must be brought into its start position.

Start position:

1. Switch off the electrical system [310].
2. Latch drive lever [501] in 0-position.
3. Release EMERGENCY STOP switch.
4. Start the diesel engine.

303 Flashers

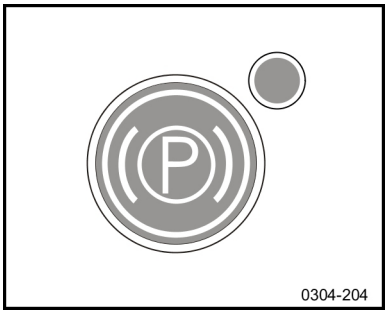


Pressing the switch turns the direction indicator on or off. The arrows indicate the actuation direction for the corresponding turning direction of the machine.

On — **PRESS**
(pilot light flashes)

Off — **PRESS** again

304 Parking brake



⚠ WARNING

Full braking!

Danger of injuries due to strong braking force.

- Only put parking brake in operation when engine at standstill.
- Do not use the parking brake as the service brake.

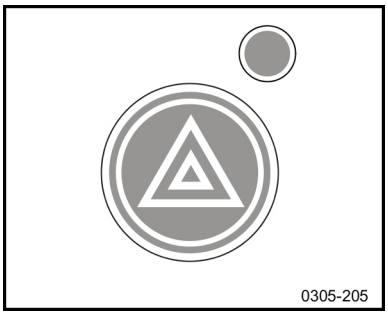
By pressing the switch you apply the parking brake or release it.

Applied — **PRESS**
(pilot light illuminates)

Released — **PRESS** again

The parking brake can only be released, if the drive lever [501] is locked in central position.

305 Warning flashers

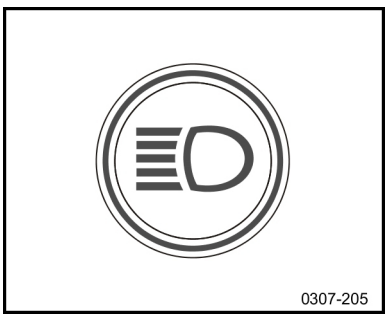


Pressing the switch turns the warning flasher system on or off.

On — **PRESS**
(pilot light flashes)

Off — **PRESS** again

307 Driving light

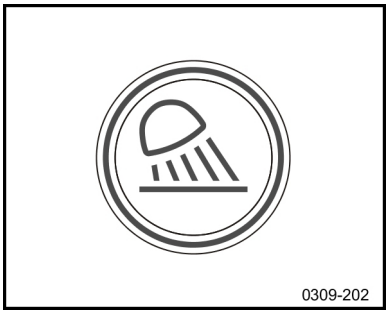


If the electrical system is switched off (switch [310] in position 0) and you press this switch, only the parking lights are switched on or off. If the electrical system is switched on (key switch [310] in position I) and you press this switch, the driving light is switched on or off.

On — **PRESS**
(pilot light [233] lights up)

Off — **PRESS** again

*309 Working spotlight

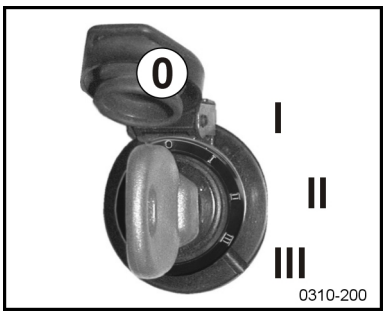


Pressing the switch turns the working spotlights on or off.

On — **PRESS**
(pilot light [219] lights up)

Off — **PRESS** again

310 Electrical system / engine start



The switch (ignition key) supplies the electrical components with power, and starts and stops the diesel engine.

0-position
Electrical system — **OFF**
Diesel engine — **STOP**
(key released)

Position I
Electrical system — **ON**

Position II — **PREHEAT**

Position III — **ENGINE START**
Key turns back to position I after starting.

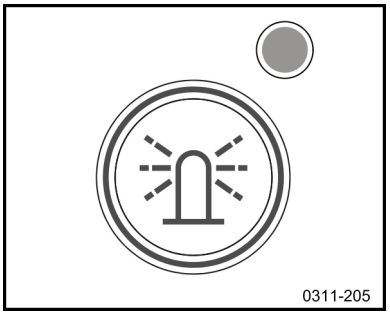
When the engine is at a standstill and the electrical system is switched on for a longer period (position I), the battery discharges rapidly.

The machine may not be operated for safety reasons when an attempt is made to start the diesel engine while the emergency stop button is pressed.

To activate the machine:

1. Latch drive lever [501] in 0 position.
2. Release EMERGENCY STOP switch [302].

*311 Rotating light

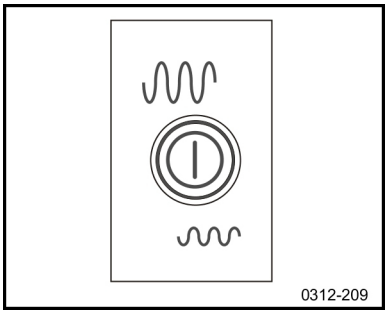


Pressing the switch turns the rotating light on or off.

On — **PRESS**
(pilot light illuminates)

Off — **PRESS** again

312 Vibration



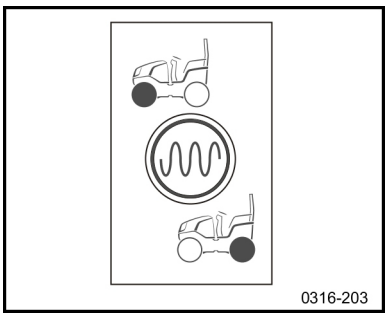
Pressing the switch activates or deactivates the vibration system. Each actuation of the switch switches one step ahead.

Activation — **PRESS**
(pilot light [222] lights up)

Deactivation — **PRESS** again
(pilot light [231] lights up)

When the vibration system is activated, the vibrator can be switched on or off at the multifunction handle [503].

316 Vibrator preselection



By pressing the switch, the vibrator in the front drum, in the rear drum, or in both drums, is preselected.
This pilot light (symbol without oscillation) indicates a pre-selected vibrator in case of de-activated vibration. Each actuation of the switch switches one step ahead.

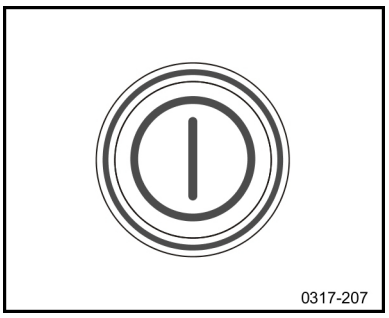
Front vibrator — **PRESS**

Rear vibrator — **PRESS** again

Double vibrator — **PRESS** again

If the vibration system is activated with switch [312], the pilot light changes over to Vibration activated (symbol with oscillation).

317 Water sprinkling



The switch turns the sprinkling on or off.

Water consumption is optimized via a multi-stage automatic interval system. The sprinkling stage can be selected with the switches [373].

On — **PRESS**

Off — **PRESS** again

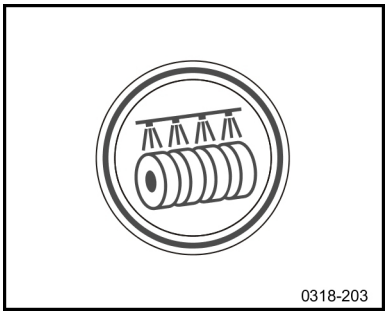
Continuous pressing of the switch will cause permanent sprinkling. As long as the switch is pressed, the pump runs in continuous operation.

Continuous operation — **PRESS** continuously

Inspection of sprinkling see page 84 sqq.

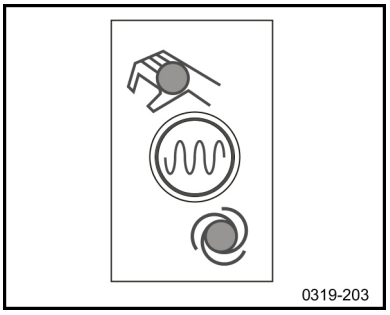
When the machine is at a standstill, the sprinkling is without function.

*318 Additive sprinkling



The sprinkling is activated as long as this switch is pressed.

319 Vibration mode manual - automatic



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

Manually — **PRESS**
(upper pilot light illuminates)

The vibration can be switched on or off at any time with the switch on the multifunction handle [503].

Automatically — **PRESS again**
(lower pilot light illuminates)

The switching on and off of the vibration is coupled to the road speed. Vibration is switched off when at low or high speed.

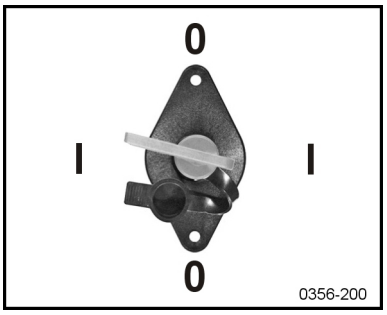
The automatic mode must be activated with the switch on the multifunctional handle [503] after initially switching it on.

Also in automatic mode, the vibration can be switched on or off at any time by means of the switch on the multifunctional grip.

341 Sprinkling

The sprinkling is activated as long as this switch is pressed.

356 Battery isolating switch



NOTICE

Voltage spikes!

Damage or destruction of electrical components.

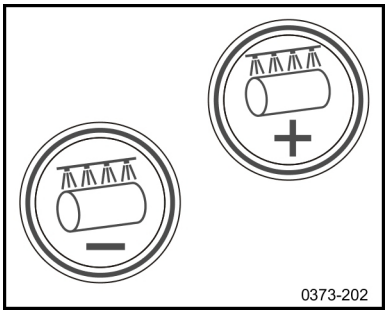
- Only interrupt the circuit at the battery isolating switch when the engine is at a standstill and when the electrical system is switched off!

The circuit to the minus terminal of the battery is interrupted at the battery isolation switch. All electric components will be off.

Electrical circuit interupted — position **0**
(key released)

Electrical circuit closed — position **I**
(key latched)

373 Sprinkling stage



When the sprinkling [317] is switched on, the water consumption can be selected from several sprinkling stages. Each actuation of the switch causes a stage increment. An illuminated pilot light [232] indicates the selected level.

Increase level — **PRESS +**

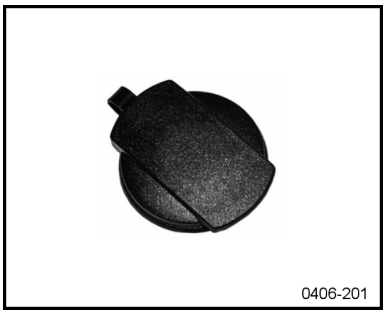
Decrease level — **PRESS -**

*380 Additive sprinkling

The sprinkling is activated as long as this switch is pressed.

3.00.04 Sockets, lights

406 Socket 12 V



***Cigarette lighter**

Press the cigarette lighter until it engages (spiral-wound filament is heated). After a short time the lighter springs out and can be removed from the socket.

Socket 12 V

Power can be taken off from the cigarette lighter socket using the special plug. The maximum load on the socket is 100 W (8 A).

3.00.05 Operation levers, adjustment handles

501 Drive lever

The machine can be equipped with a second drive lever (option). Both drive levers are coupled to each other. The following description applies for both drive levers.

The drive lever determines the driving direction and speed.

Forwards travelling — lever to the **FRONT**

Reverse travelling — lever to the **REAR**

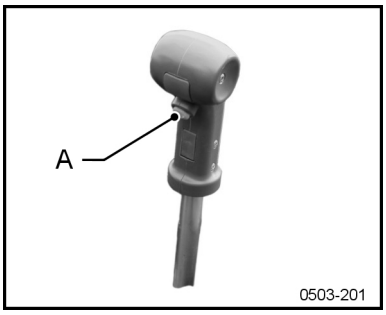
Braking — lever to the **CENTRE**

Stop — lever in **CENTRE**

The driving speed is proportional to the magnitude of the lever rash. It is also influenced by the engine speed.

If the machine is equipped with a *back-up alarm, an acoustic signal sounds when travelling reverse.

503 Multifunction handle



Vibration

If the vibration system is activated, the vibrator can be switched on or off at switch [A] at any time.

Vibrator on — **PRESS**

Vibrator off — **PRESS** again

504 Engine speed

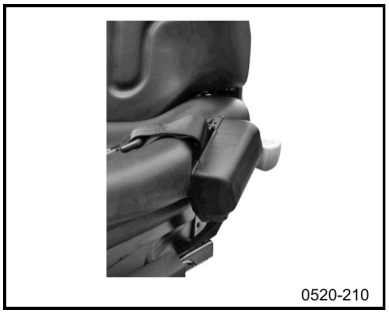
The speed of the diesel engine can be regulated between idling speed and maximum speed using the adjusting lever. The lever can be engaged in three positions. The lever can also be positioned between this positions.

Idling speed — **MIN**

2/3 max. speed — **2/3 MAX**

Max. speed — **MAX**

520 Seat adjustment weight



⚠ WARNING

Uncontrolled movements!

Risk of injury due to uncontrolled movements when changing the seat pedestral position.

- Operate the machine only in an admissable seat position.
- Only drive the machine with latched seat pedestal.
- Do not adjust the seat pedestal during driving.
- Adjust the seat pedestal only on an even surface.

In order to absorb impulsive machine movements using the installed attenuation system, this must be adjusted to the weight of the driver.

The weight adjusment handle may only be pressed downwards during weight adjustment.

The driver's weight can be adjusted in 9 steps between 50 kg and 130 kg. To reach the starting position (50 kg), the adjustment handle must be pressend down against the stop. The weight adjustment switches then automatically back to the starting position (50 kg).

521 Seat adjustment forwards - backwards

⚠ WARNING

Uncontrolled movements!

Risk of injury due to uncontrolled movements when changing the seat pedestral position.

- Operate the machine only in an admissable seat position.
- Only drive the machine with latched seat pedestal.
- Do not adjust the seat pedestal during driving.
- Adjust the seat pedestal only on an even surface.

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

522 Seat adjustment backrest

⚠ WARNING

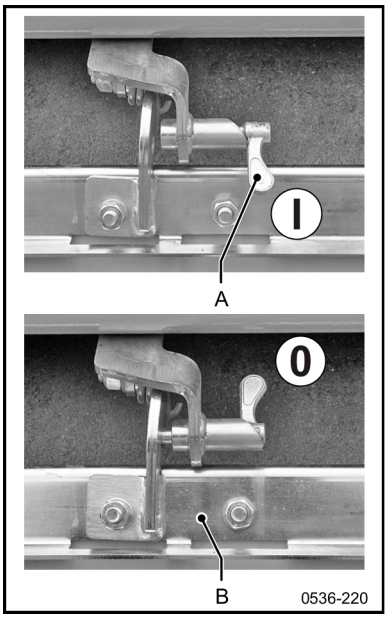
Uncontrolled movements!

Risk of injury due to uncontrolled movements when changing the seat pedestral position.

- Operate the machine only in an admissable seat position.
- Only drive the machine with latched seat pedestal.
- Do not adjust the seat pedestal during driving.
- Adjust the seat pedestal only on an even surface.

The inclination of the backrest can be adjusted after the lever has been lifted by shifting the seat forward or backward.

536 Locking device of scraper



Version: Upper roller drum

The scraper can be held away from the drum by a catch. The catch holds or releases the scraper according to the position of the locking lever [A].

Catch open — position **I**
(Scraper lies on drum)

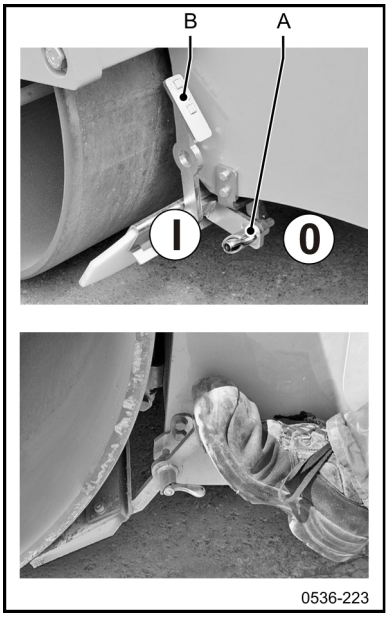
Catch closed — position **0**
(Scraper held away from drum)

Attach scraper:

1. Move the locking lever into position **I** until the catch releases the scraper (scraper lies on the drum). To do this, lift the scraper bracket slightly.
2. Turn stop lever to position **0** again.

Move the scraper away:

1. Turn stop lever to **0** position (if necessary).
2. Lift the scraper bracket [B] until the catch latches in.



Version: Roller drum down

The scraper can be held away from the drum by a catch. The catch holds or releases the scraper according to the position of the locking lever [A].

Catch open — position **I**
(Scraper lies on drum)

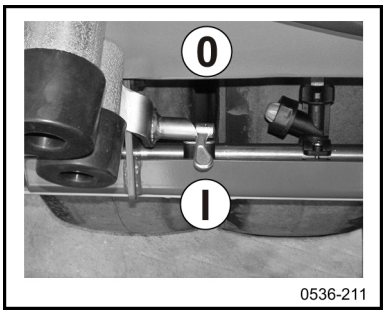
Catch closed — position **0**
(Scraper held away from drum)

Attach scraper:

1. Move the locking lever into position **I** until the catch releases the scraper (scraper lies on the drum).
2. Turn stop lever to position **0** again.

Move the scraper away:

1. Turn stop lever to position **0** (if necessary).
2. Press the pedal [A] until the catch latches in.



Version: tyres

Depending on the position of the stop lever the scraper rubs against the tyre or not.

Scraper attached — position **I**

Scraper released — position **0**

Switch stop lever:

1. Lift scraper console.
2. Turn stop lever.

3.01 Prior to machine start

General

⚠ WARNING

Operating errors!

Risk of injury due to improper use.

Prior to every taking into use:

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

What must be done prior to start of work?

1. Battery isolating switch [356] — position **I**
2. Perform inspection and maintenance work (see page 96 sqq.).
3. Check the flasher system [303] and the warning flasher system [305], as well as the signal horn [301], *the back-up alarm [501] and the lighting [307].
4. Check the parking brake [304].
5. Adjust the operator's seat.
6. Adjust the rear and operation mirrors so that you can watch the traffic in the rear.

Fuel

1. Never drive the machine until the fuel tank is empty. Check the filling level of the fuel tank in time. Fill up the fuel tank already in the evening. This avoids the formation of condensed water in the fuel tank.
2. Fill up to the lower edge of the filler neck. Only use clean fuel!

Advice about fuel see page 131 sqq.

Water

1. Check the filling level of the water tanks.
2. Fill up to the lower edge of the filler neck. Use clean water only!

***Additive**

1. Check the filling level of the additive tank.
2. Fill up to the lower edge of the filler neck.

***Air**

1. Check the air pressure in the tyres.

Control stand Safety belt

[A] Safety belt

The driver must wear a safety belt while driving machines with a ROPS cab or a ROPS roll-over bar.

If the machine is provided with a safety belt, this belt needs to be inspected for wear or damage before starting the engine. If damaged, replace the belt promptly. When closing the belt, make certain to apply it tightly across the hip (not across the belly). Do not twist the belt. Replace the safety belt every 3 years. Belts are strained by accidents and need to be replaced immediately when an accident has occurred.

Seat adjustment

⚠ WARNING

Uncontrolled movements!

Risk of injury due to uncontrolled movements when changing the seat pedestral position.

- Operate the machine only in an admissable seat position.
- Only drive the machine with latched seat pedestal.
- Do not adjust the seat pedestal during driving.
- Adjust the seat pedestal only on an even surface.

3.02 Engine start

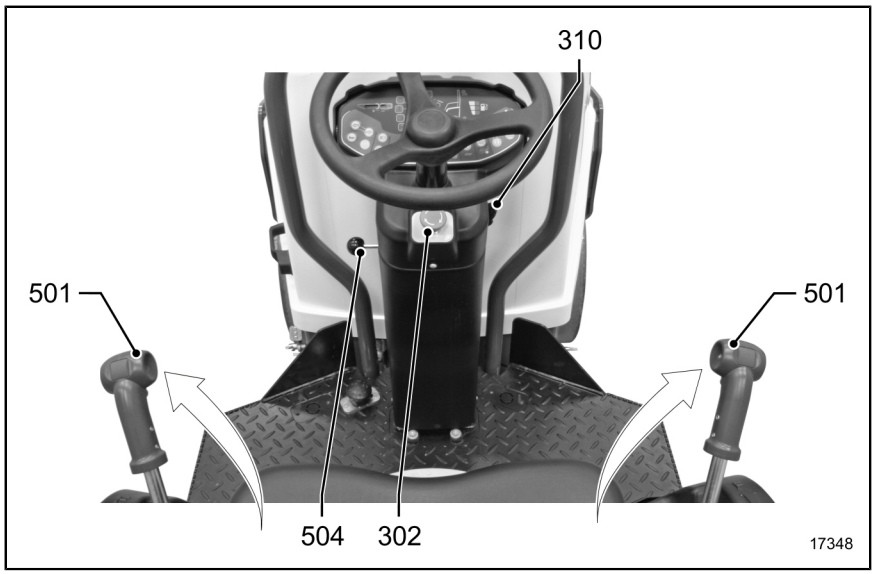
General

The start sequence may only be continued for a maximum 20 seconds, otherwise the starter will overheat and be destroyed. There must be pauses between the individual starting processes in order to allow the staring motor to cool down. If the diesel engine does not start after two starting attempts, find out and eliminate the cause. Observe the operating manual of the diesel engine. The diesel engine cannot be started by means of towing. Damage to the drive elements would be the consequence.

When the battery is discharged, the diesel engine can be restarted by an external power source (see page 91 sqq.).

Do not operate the starter unless the diesel engine is stopped. Starter operation while the diesel engine is still running may destroy the starter.

Basic position prior to starting



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

1. Drive lever [501] — **CENTRE**
2. Engine speed [504] — **MIN**
3. EMERGENCY STOP [302] — position **UP**

Only when the drive lever is in central position, is the starting motor connected to the switch [310] via the starter protection device. This is the only way to start the diesel engine.

Engine start

1. Key [310] — **0** → **I**
   (electrical system ON)
   If the key is turned to position I, all pilot lights light up shortly for function control purposes.
2. Do not start the diesel engine until the pilot light [216] has gone out.
   Key [310] — **I** → **III**

After the start of the engine the parking brake is always applied.

Before driveaway

⚠ WARNING

Long stopping distance!

A delay in braking caused by a highly viscous hydraulic oil can lead to serious injuries or death.

- In case of low external temperatures, in particular when below freezing, 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 approx. +20 °C (68 °F) .

The acceleration and braking behaviour of the machine are influenced by viscous hydraulic oil. If the machine is frozen to the ground, take care that no clods of earth stick to the roller drum / tyre, since these could damage the scrapers. Therefore, park the machine on planks or dry gravel if frost is likely!

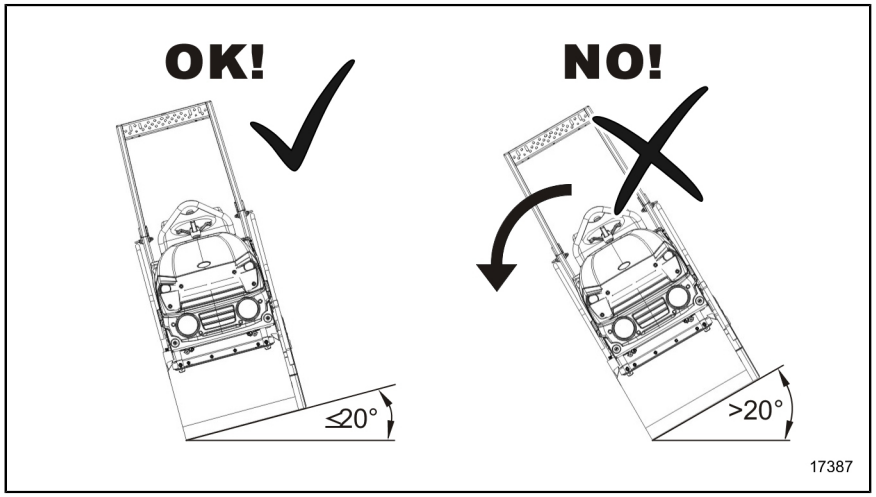
Notes about the danger of the machine tipping over

⚠ WARNING

Narrow-width drums and a machine with high centre of gravity!

If the machine tips over sideways, there is a danger of serious injuries or death.

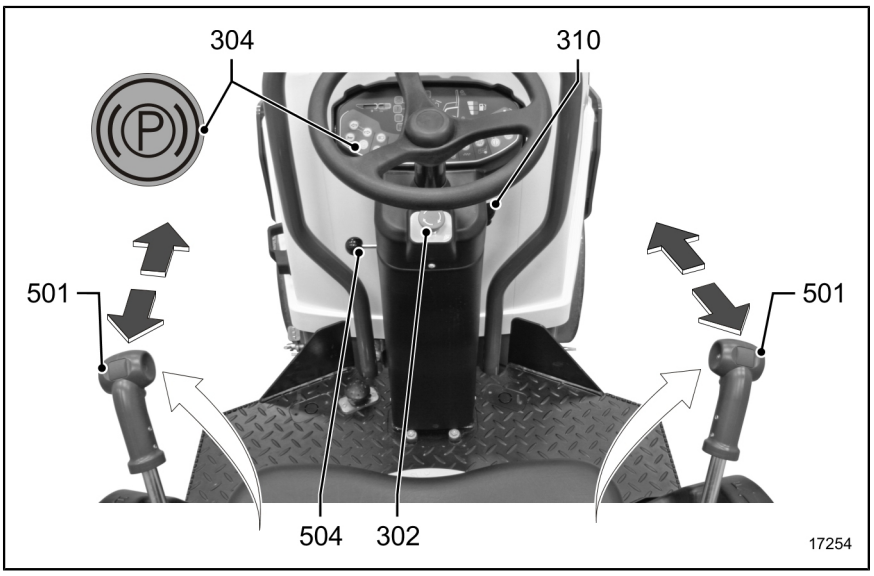
- When driving, do not allow the drums to cross the edge of a road, kerbs, rain gutters etc.
- Drive around potholes and objects projecting above road level (such as manholes).
- Do not drive on transverse slopes steeper than permitted in the technical specifications.
- Be aware of the dynamic handling of the machine when driving on slopes and cornering at high speeds.



The machine's small roller drum width and its high centre of gravity increase the danger of overturning during hard cornering. To avoid this, use a moderate speed when driving the machine over uneven ground.

3.03 Driving

Driveaway



1. Engine speed [504] — **MAX**
2. Parking brake [304] — **RELEASED**
   (pilot light goes out)

   The parking brake can only be released, if the drive lever [501] is locked in central position.
3. Drive lever [501] — **FORWARD**
   or — **BACKWARD**

If the machine is equipped with a *back-up alarm, an acoustic signal sounds when travelling reverse. In ascending or descending slopes, reduce the driving speed at the drive lever and increase engine speed [504].

In case of danger only:

In the case of danger, the machine can be brought to a standstill with the EMERGENCY STOP switch [302].
A further possibility to bring the machine to a standstill in the event of danger is to switch off the electrical system with the switch [310].

Driving Machine may only be operated from the operator platform.

Seat contact switch

⚠ WARNING

Extended braking distance!

A delay in the effect of the automatic application of the brakes can lead to serious injuries or death.

- Do not use the function of the seat contact switch to stop the machine.
- Do not get up from the driver's seat while driving.
- Brake and stop the machine with the driving lever.

This machine is equipped with a seat contact switch. The machine is automatically braked if the operator leaves his seat while driving. There is an initial time delay, after which the brakes are applied abruptly. The function of the seat contact switch is not intended to be used as a control element to stop the machine.

If the machine is unintentionally stopped by function of the seat contact switch, the machine has to be brought into the basic position before driving can be resumed.

Start position:

1. Drive lever [501] – **CENTRE**

3.04 Driving with vibration

General

⚠ WARNING

Explosion!

Risk of injury due to burns and moving parts.

- Prior to switching on the vibration function, it must be ensured that there are no lines laid in the underground.

⚠ WARNING

Reduced road adhesion!

Risk of falling or tipping due to reduced lateral stability when having switched in vibration.

- Do not switch in vibration function when driving across inclines or on hard underground.

NOTICE

Collapse or damage!

Risk of collaps or damage at buildings or on the pipe system in the ground.

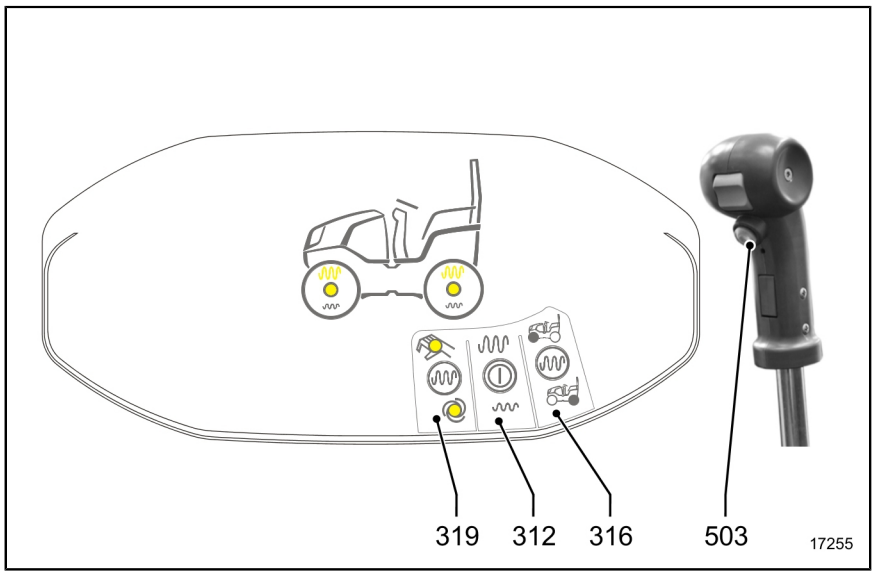
- Do not switch on the vibration system near buildings!
- Prior to switching on the vibration function, ensure that there are no lines (e.g. gas, water, electricity, sewage lines) are laid in the underground.

When the vibration system is switched on, the roller drum will vibrate according to the speed of the vibrator. These hammering impacts produce a manifold increase in the compaction force of the machine. Vibration may only be used at maximum diesel engine speed and can be operated as single or double vibration. An elastic suspension of the roller drums prevents the transfer of vibration oscillations to the machine frame.

Vibrations

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

Vibration



By pressing the switch [316], the vibrator in the front drum, in the rear drum, or in both drums, is preselected.
This pilot light (symbol without oscillation) indicates a pre-selected vibrator in case of de-activated vibration. Each actuation of the switch switches one step ahead.

If the vibration system is activated with switch [312], the pilot light changes over to Vibration activated (symbol with oscillation).

When the vibration system is activated, the vibrator can be switched on or off at the multifunction handle [503].

Manual-automatic operating mode

The operating mode for the vibration is set with the switch [319]. The vibrator can be switched on or off manually or automatically.

3.05 Stopping, switching off engine, leaving machine

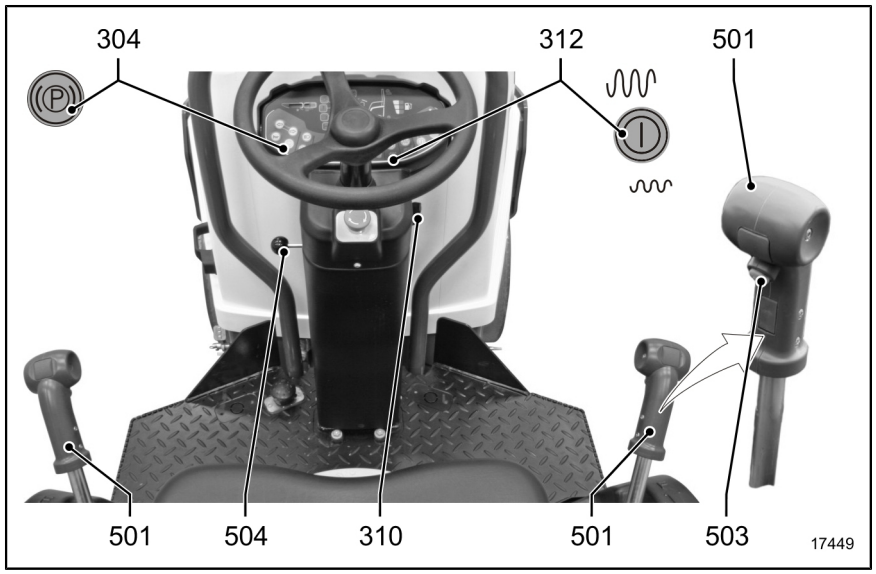
⚠ WARNING

Uncontrolled driving behaviour!

Autonomous movement of the machine can lead to serious injuries or death.

- Switch off diesel engine even if you leave the operator platform only for short time.

Stopping



1. Vibration [503] — **OFF**
2. Drive lever [501] — **CENTRE**

The hydrostatic drive brings the machine to a stop.

Before switching off the Diesel engine

1. Vibration [312] — position **0**
2. Parking brake [304] — **APPLIED**
3. Engine speed [504] — **MIN**
4. Fully lower attached accessory equipment.

Shut down the diesel engine

Do not switch off engine directly after full load operation. Instead, let it run for 1-2 minutes with idling speed for temperature compensation purposes.

1. Key [310] — **I** → **0**

The battery discharges rapidly if the engine is at a standstill and the electrical system is switched on (switch [310] in position I).

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 driver's seat console is latched in the centre of the machine.
- The ignition key is disconnected.
- The machine is switched off at the battery isolating switch (if applicable) and the key is removed.
- The cabin doors resp. the instrument panel covering, as well as all cladding covers are locked.

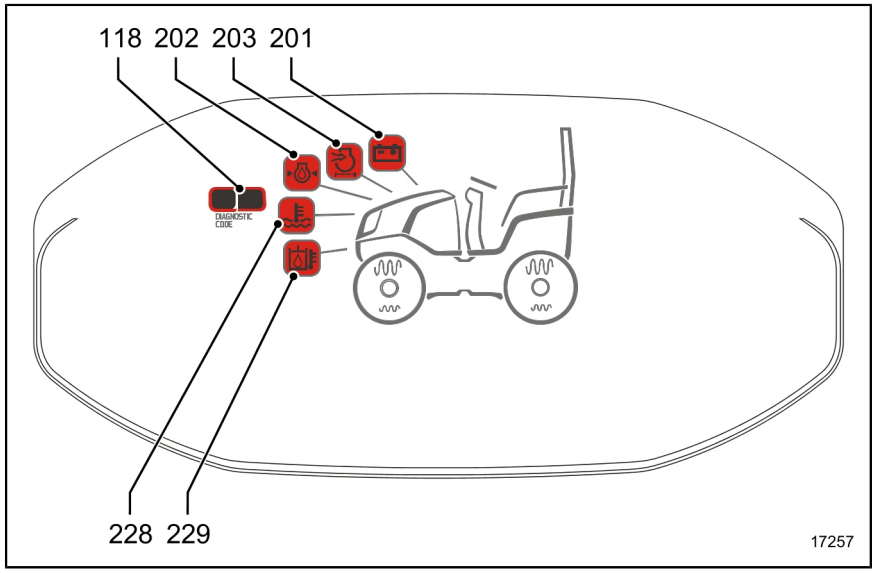
3.06 Operation monitoring

3.06.01 Filling levels

Pay attention to the filling level for operating supply items (fuel etc.).

1. Fill up tanks in time.
2. Never drive the machine until the fuel tank is empty.

3.06.02 Pilot lights



Observe the control and indication instruments on the dashboard from time to time. Pilot lights inform the driver about the operating stages of the individual machine components and indicate faults. The urgency of taking action is subdivided into two stages.

Danger, important reminder

A red pilot light [201, 202, 203, 228, 229] is activated, additionally you hear a permanent acoustic signal. The cause of the fault is displayed by a corresponding symbol of the active pilot lights. Also the red pilot light of the indicator [118] issues severe malfunctions. They can be identified by the displayed codes. Further operation of the machine is inadmissible.

1. Park the machine out of the danger zone and switch off the diesel engine.
2. Rectify the cause immediately.

Switch-in check

A pilot light indicates that a machine component e.g. the sprinkling is switched on. No action necessary.

3.07 Sprinkling

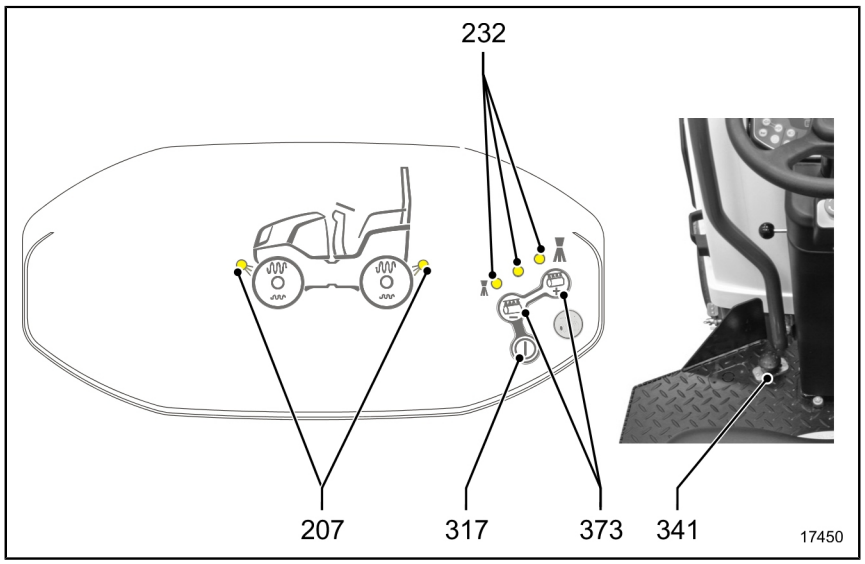
General

The pressure sprinkling ensures a reliable moistening of the roller drums during blacktop works and thus prevents bituminous materials from adhering to the drums.

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

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

Water sprinkling



The automatic sprinkling system is switched on and off with the switch [317]. The pilot light [232] indicates the current sprinkling stage. As long as the switch [317] or [341] is pressed, the pump runs in continuous operation. The switches [373] allow to increase (+) or decrease (-) water consumption. The pilot light [207] indicates that a water pump is in operation.

When the machine is at a standstill, the interval sprinkling is without function.

Sprinkler nozzle check when engine is at a standstill

Requirement:

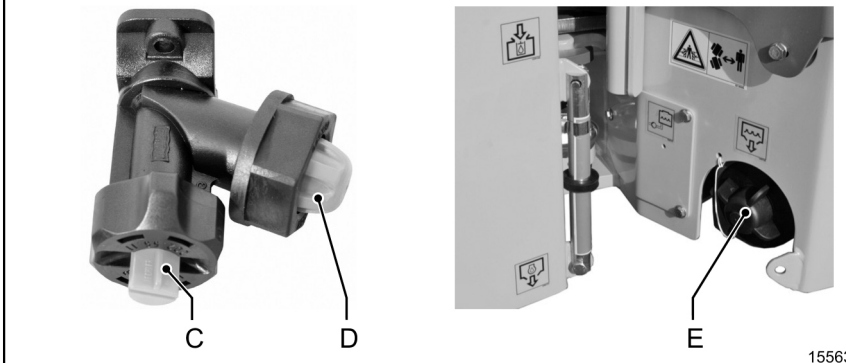
1. Engine stopped
2. EMERGENCY STOP switch [302] — **DOWN** position
3. Switch [310] — position **I**
4. Parking brake [304] — **APPLIED**
5. Drive lever [501] — max. to the **FRONT**
6. Switches [317] — **ON**

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

To switch off:

1. Switches [317] — **OFF**
2. Drive lever [501] — **CENTRE**
3. EMERGENCY STOP switch [302] — **UP**

When there is danger of frost

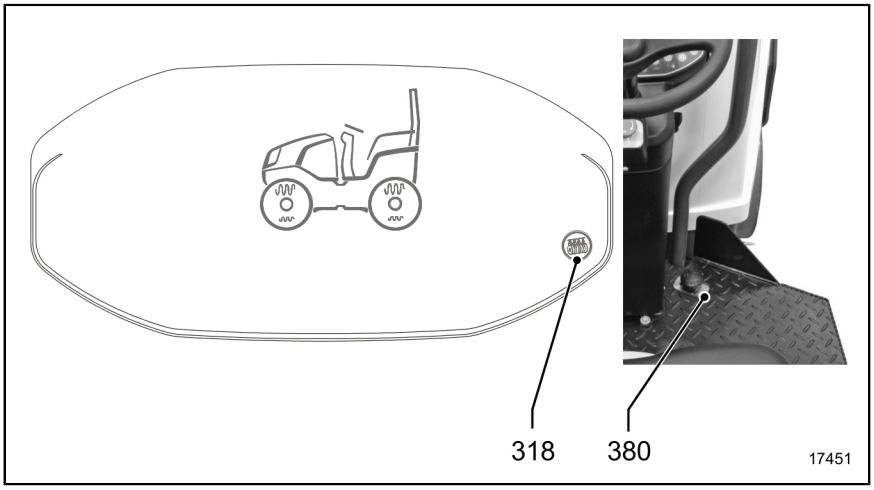


Frozen water leads to damage to the sprinkler system. Therefore, it must be drained before frost begins.

Emptying the water sprinkling system:

1. Unscrew lateral cap nut [D] from the sprinkler nozzles [C] and remove together with valve insert and membrane. Reassemble spraying nozzle after emptying the nozzle casing.
2. Unscrew filter head [E] at the water tank and remove it together with the pressure spring (observe gasket ring on filter head).
3. Pull the filter insert from the water tank.
4. Clean filter insert, pressure spring, and filter head and store in tool cabinet.
5. Re-fit filter insert, pressure spring and filter head only before starting work.

3.08 *Additive sprinkling



General

The additive sprinkling enables a moistening of the wheels with a separating compound. This prevents that bitumen sticks on tyres when laying blacktops. This is the only way to make a neat and even covering. The emulsion may only be mixed of parting agent concentrate and water according to the indications of the parting agent producer (Observe regulations for environment protection).

Additive sprinkling

The additive sprinkling is switched on and off using the switch [*318] or [*380]. As long as the switch is pressed, the tyres are sprinkled.

The frequency of sprinkling depends on the temperature of the tyres. Cold tyres must be moistened more often than warm ones. Prior to driving on hot blacktops take care that the running surfaces of the wheels are clean and sufficiently moistened.

When there is danger of frost

⚠ WARNING

Uncontrolled movements!

Unintentional rolling away of the machine can lead to serious injuries or death.

- Secure machine against rolling away.

After the long standstill period in the winter we recommend, to drain and clean the container for the additive sprinkling.
If strongly diluted separating compound is used, the container and the pump for the additive sprinkling must be drained when frost is likely.

Empty additive sprinkling system:

1. Remove pressure hose from hose connection piece.
2. Switch on the pump until intake pipe and pump is free of fluids.
3. Mount pressure hose on hose connection piece.

3.09 Scraper

General

The scrapers [A] are designed to remove clogging dirt from the surface of the roller drums / tyres when working on soft, adhesive ground. With grounds that are not clingy or with transporting operations the scrapers can be lifted away from the roller drums / tyres. This prevents premature wear.

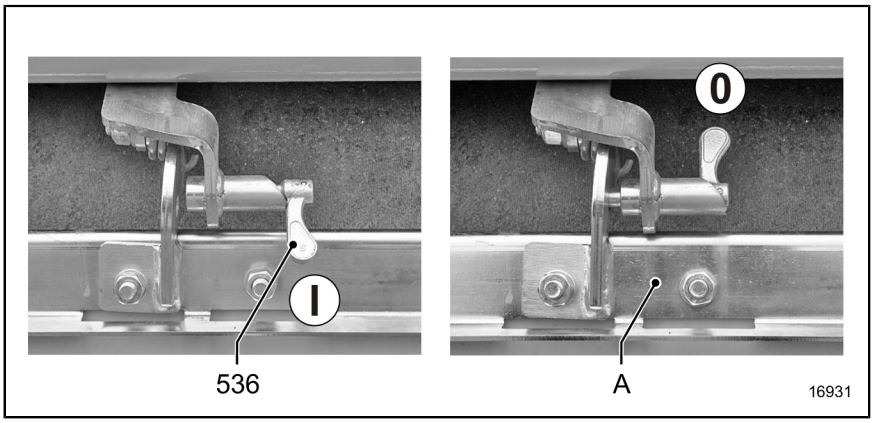
Rinse out dirt embedded between roller drums / tyres with water jet. Remove strongly adhesive dirt with spatula or similar tool.

3.09.01 Roller drum scraper, rigid

The scraper for the roller drum are rubbing constantly on the roller drums. They are pressed against the roller drums with spring force and cannot be lifted up.

3.09.02 Roller drum folding scraper - top

Attach scraper



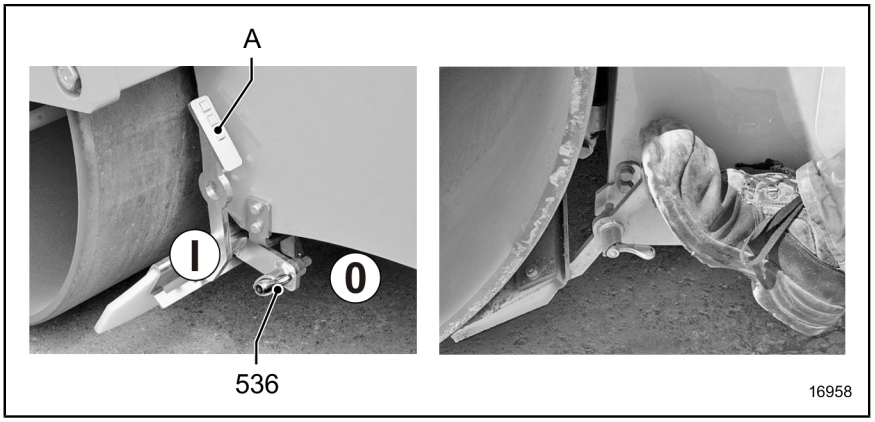
1. Switch off diesel engine and remove ignition key.
2. Turn stop lever [536] to **I** position for a short time.

Moving the scraper away

1. Switch off diesel engine and remove ignition key.
2. Lift the scraper bracket [A] until the catch latches in.

3.09.03 Roller drum folding scraper - down

Attach scraper



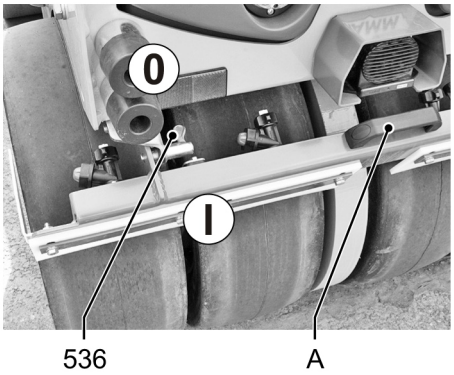
1. Switch off diesel engine and remove ignition key.
2. Turn stop lever [536] to **I** position for a short time.

Moving the scraper away

1. Switch off diesel engine and remove ignition key.
2. Press the pedal [A] until the catch latches in.

3.09.04 Tyres scraper

Attach scraper



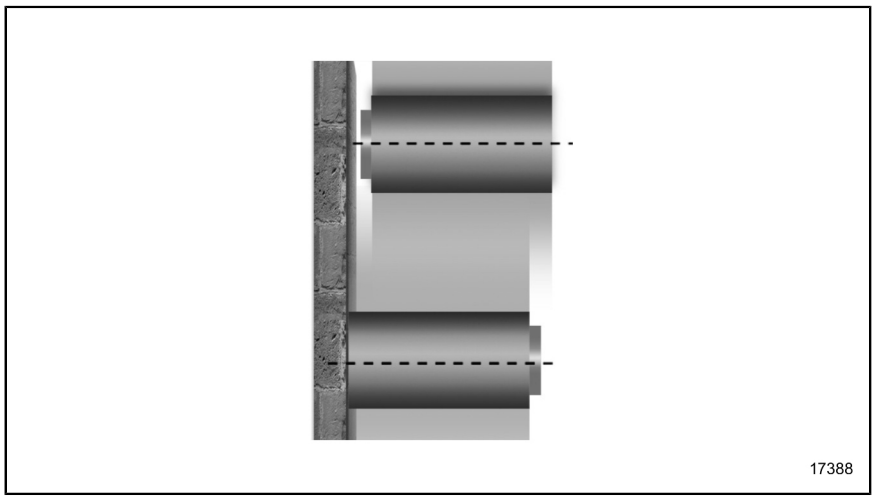
1. Switch off diesel engine and remove ignition key.
2. Turn stop lever [536] to **I** position for a short time.

Moving the scraper away

1. Switch off diesel engine and remove ignition key.
2. Lift the scraper bracket [A] until the catch latches in.

3.10 Clear Side - compacting up to edge

General



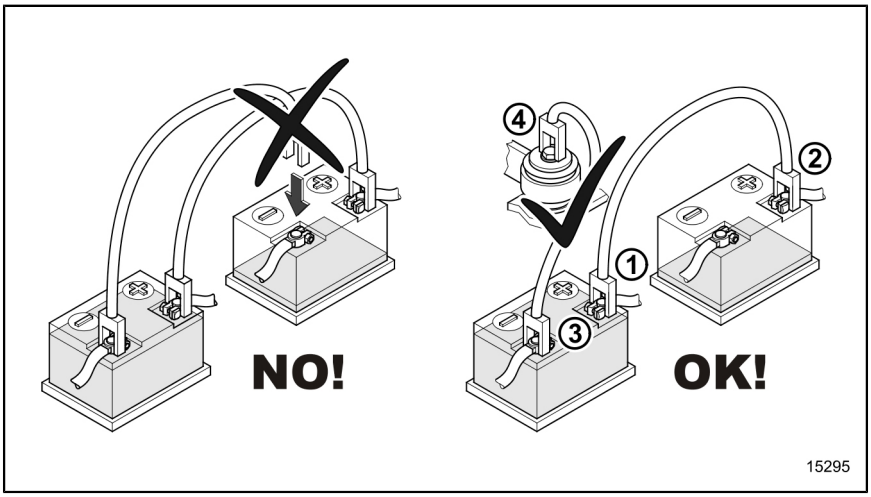
The clever "Clear Side" design of the RD 18-80 and RD 18-100 allows compaction directly up to the edge. The drums are suspended on a single side, and present a lateral offset of 56 mm with regard to one another. No component projects beyond the working width either. The offset of the drums ensures that the roller is always manoeuvrable as it allows to make a steering movement at all times.

3.11 Starting with jump leads

Preparation

- Observe precaution measures for handling batteries.
- Pay attention to the nominal voltage of the batteries.
- A discharged battery can freeze already at 0 °C (32 °F). It is essential that you defrost a frozen battery in a warm room before connecting it with jump leads.
- Use jump leads with an insulated terminal clamp and a cross section of at least 25 mm².
- The terminal clamps of one lead may not come in contact with those of the other.
- Do not disconnect the battery from the vehicle's supply system.
- Charging vehicle and discharged vehicle may not come in contact with each other.

Connecting leads



1. Connect one terminal clamp of one wire with the positive terminal of the charged battery (plus sign).
2. Connect the other terminal clamp of this lead to the positive terminal of the discharged battery (plus sign).
3. Connect one terminal clamp of the second wire with the negative terminal of the charged battery (minus sign).
4. Connect the other terminal clamp of the second wire with the discharged vehicle e.g. at the engine block or at the fastening screw of the engine suspension. Do not connect the terminal clamp with the negative terminal of the discharged battery (risk of explosion) but as far away from the discharged battery as possible.
5. Lay leads such that they are not drawn into rotating parts and that they can be taken off even with a running diesel engine.

Starting process

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

Removing leads

1. To prevent overloads in the electrical system, switch on an electrical component in the discharged vehicle (e.g. driving light) before removing the jump leads.
2. Remove the jump leads in reverse order.

3.12 Towing

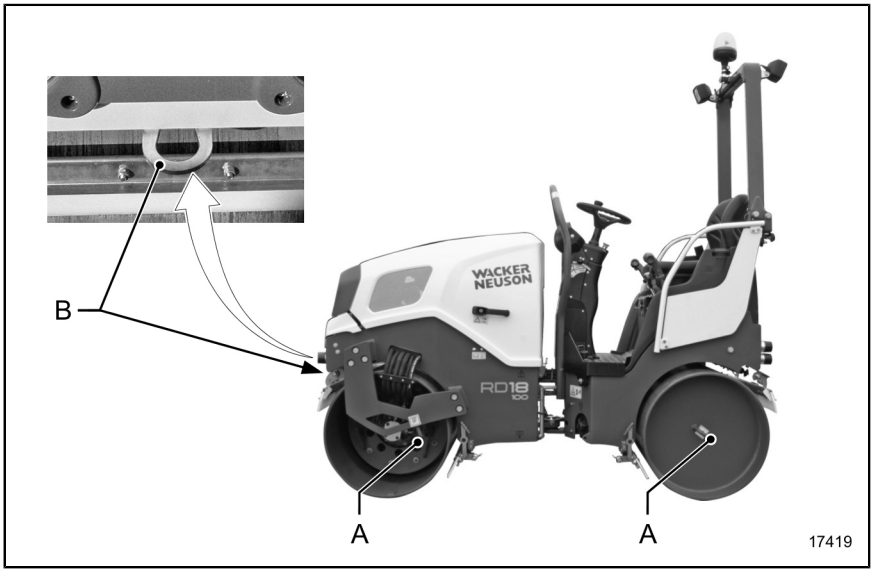
General

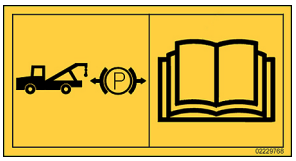
⚠ WARNING

Brake out of order!

Unintentional rolling away of the machine can lead to serious injuries or death.

- Prior to releasing the brake, secure the machine against rolling away with wedges.

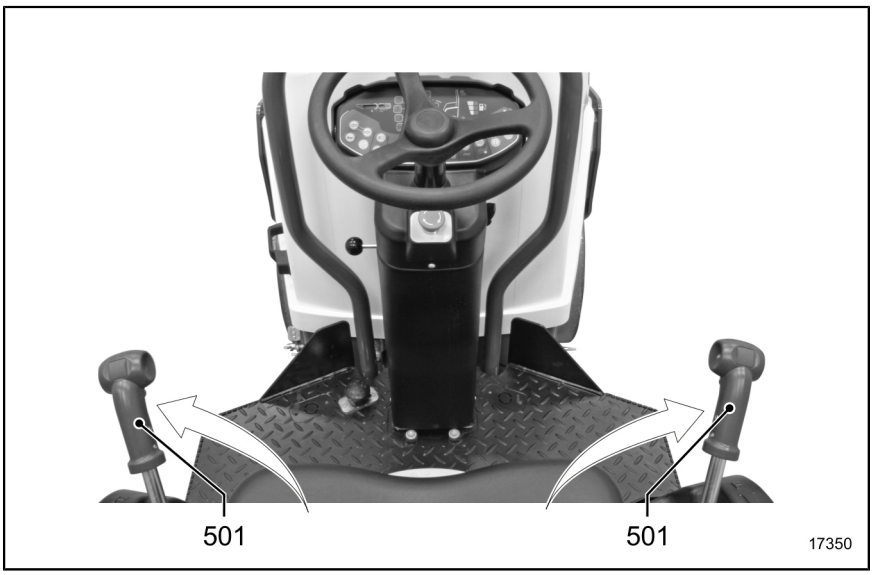




Towing the machine requires sufficient knowledge about the functioning of the hydrostatic drive and about the operation of the spring accumulators. The preparations for towing may only be carried out by experienced personnel who are aware of the dangers. The machine may only be fastened at the lifting points [A] or the *towing eye and only be towed with a towing bar. Replace damaged pipes and hoses from which oil leaks before towing (environment protection).

In hazardous situations: A hauling rope or hauling chains may also be used to recover the machine uphill (brakes not released).

Prior to towing



1. Drive lever [501] — **CENTRE**
2. Shut down diesel engine, if still functional.
3. Secure machine against rolling away with wedges or blocks.
4. Interrupt frictional connection of the hydrostatic drive (see text below).
5. Disable parking brakes (see text below).
6. Tow only with towing bar (brakes not functional).

Towing

The machine may only be towed with low speed 1 km/h (0.6 mph). The maximum towing distance is 500 m.

After towing

1. Shut down the diesel engine.
2. Secure machine against rolling away with wedges or blocks.
3. Reestablish frictional connection of the hydrostatic drive (see text below)
4. Actuate parking brakes (see text below).
5. Remove towing bar.

Separating the hydrostatic drive power train

Only if the oil flow can circulate without pressure in the hydraulic system, can the machine be towed.
For this, perform the following at both high pressure valves:

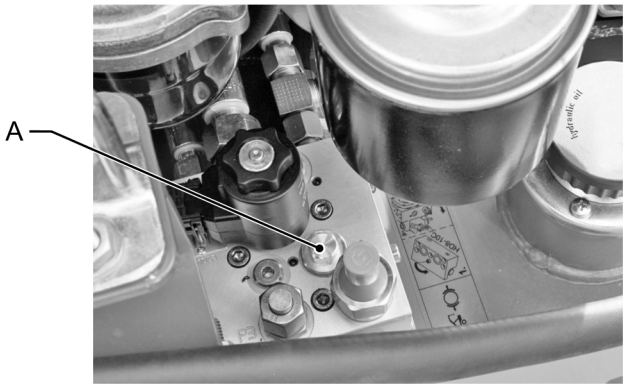
1. Loosen locking screw [A] by 3 complete turns to the left.

Do not screw out the screw by more than 3 turns out of the housing; otherwise, hydraulic oil may flow out between screw and housing or air may enter into the system.

Activating the hydrostatic drive power train

1. Screw out the locking screw [A] until the stop.

Disengaging the parking brake



The pretension of the spring-operated brakes may only be reduced when towing with a defective diesel engine or hydraulic system.

1. Loosen screw [A] and screw out by hand until a resistance can be noted (approximately 5 rotations).
2. Release the spring-operated brakes by turning the steering wheel to the left until increased turning power is required.
3. During towing, the spring-operated brakes must be kept open by repeated releasing with the steering wheel due to interior leaks.

Making parking brake operational

1. Screw in screw [A] up to the valve seat (max. 30 Nm).

3.13 *Driving on public roads (German Road Traffic Type Approval Law, StVZO)

The government of Upper Palatinate grants an exception permit (see the details indicated on the original) for this machine pursuant to section 70, subsections 1 and 2 of the German Road Traffic Type Approval Law (StVZO).

General instructions

- This exemption permit may be revoked at any time and applies to the corresponding vehicle owner only.
- A corresponding driving licence (class L as of 2010) is required for operating this vehicle on public roads.
- The exemption may not be used unless an insurance cover is available.
- Both the ORIGINAL exemption permit and the ORIGINAL proof of insurance must be carried when driving the machine.

4 MAINTENANCE

4.00 General maintenance instructions

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 servicing intervals and the care measures for the diesel engine can be found in the operating manual of the engine manufacturer and must be observed.

4.00.01 Operation monitoring

Air filter The operability of the air filter cartridge and the safety cartridge is monitored by an electric contamination indicator. Only if the pilot light [203] flashes, must the air filter cartridge or the safety filter cartridge be replaced.

4.00.02 Maintenance overview

For engine maintenance see operating manual for diesel engine ( )!

Lubricating oil change intervals

These intervals depend, e.g., on:

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

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

- Continuous ambient temperature below –10 °C (14 °F) or lubricating oil temperature below 60 °C (84 °F).
- Operation using biodiesel fuel

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

Every 10 operating hours 10 h

Checking the function of the parking brake	see page 104
Inspecting the EMERGENCY STOP function when engine at standstill	see page 105
Checking hydraulic oil level	see page 117
Clean spray nozzles	see page 129
Checking the air pressure in the tyres	see page 124
Checking engine oil level	
Checking coolant level	see page 114
Checking and cleaning air filter / dust valve	see page 111
Cleaning the filter for sprinkling	see page 129
Draining water separator	see page 110

Every 250 operating hours 250 h

Checking scrapers / Lubricting scrapers	see page 120, see page 122 / see page 122
Changing engine oil	
Exchanging lubrication oil filter of diesel engine	
Checking V-belt tension	
Lubricating pivoted bearing	see page 126
Lubricate the steering cylinder bolts	see page 126
Check the radiator	see page 113

Every 500 operating hours 500 h

Replacing filter insert of pressure filter for hydraulic system	see page 119
Checking damping elements	see page 130
Checking wheel nuts / wheel bolts for tightness	see page 123
Replacing valve cover seal	
Replacing filter cartridge for the fuel filter	
Replacing air filter cartridge	see page 111
Checking the drive lever function	see page 120

Every 2000 operating hours

2000 h

Inspecting the EMERGENCY STOP function when driving	see page 105
Clean the water sprinkling system	see page 128
Replacing hydraulic oil	see page 118
Replacing V-belt	
Changing coolant	see page 115
Replace the safety cartridge	see page 112
Replacing ventilation filter of hydraulic oil tank	see page 118

4.00.03 Running-in regulations

For engine maintenance see operating manual for diesel engine ( )!

After 50 operating hours

Diesel engine maintenance

1. Change engine oil.
2. Replace lubrication oil filter.
3. Replace fuel filter.
4. Replace the preliminary fuel filter.

Maintenance of hydraulic installation

1. Replace hydraulic oil filter.

Maintenance of the tyre mounting

1. Checking the wheel nuts / wheel bolts for tightness.

4.00.04 Important information about maintenance works

General 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.

Safety The following safety instructions apply for all maintenance works.

⚠ WARNING

Unintentional movement!

Unexpected movement during maintenance work can lead to serious injuries or death.

- Carry out maintenance work only when the engine is stopped.
- Put machine on a safe surface (even, capable of bearing, horizontal).
- Keep away from batters.
- Secure machine against rolling away.

⚠ WARNING

Inadmissable engine start!

Risk of injury due to starting engine during maintenance works.

- Prior to maintenance works fasten a warning label on the operator platform.
- Prior to maintenance work, pull off the key from the battery isolating switch (if applicable).
- If no battery isolating switch exist, remove the ground strap from the battery.

⚠ WARNING

Uncovered, rotating parts!

Risk of injury due to rotating parts.

- Only open the engine hood or engine room doors when the engine is at a standstill.

⚠ WARNING

Hot surface, hot fluids!

Risk of burns due to hot surfaces and fluids.

- Prior to maintenance works, allow machine to cool down to a temperature under 30 °C (86 °F) .
- Do not touch hot machine parts.
- Check filling levels only when machine is cooled down.

⚠ WARNING

Explosion, acid!

Risk of injury due to moving parts and caustic acids.

- Do not put any tools on the battery.

⚠ WARNING

Fluids under pressure!

Risk of injury due to fluids spurting out under pressure.

- Carry out maintenance works only with depressurized hydraulic systems.
- Park the machine on level ground and secure against rolling away.
- Put lifted machines on the ground.
- Wait at least 1 minute after you switched off the motor until the pressure is relieved.

⚠ WARNING

Electrical voltage!

Risk of injury due to electric shock.

- Prior to maintenance work, pull off the key from the battery isolating switch (if applicable).
- If no battery isolating switch exist, remove the ground strap from the battery.

⚠ WARNING

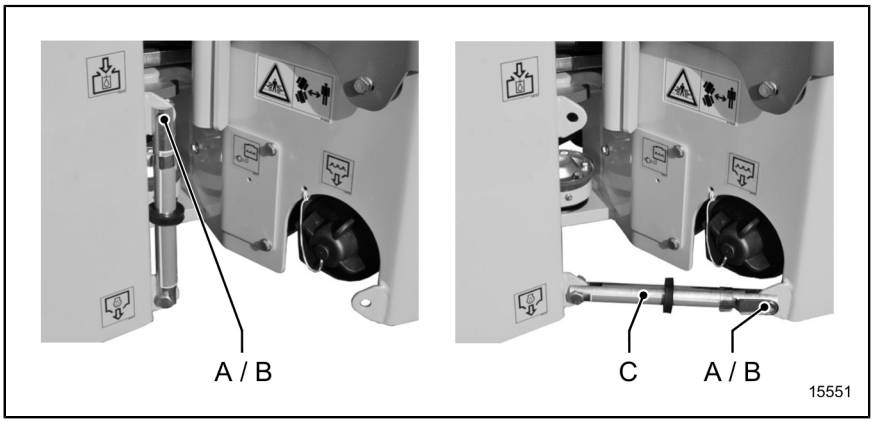
Work above floor level

Risk of injury by falling.

- Do not perform any maintenance or repair work (e.g., to replace a defective incandescent lamp at the operator's cabin, or replace a wiper blade at the windscreen wiper, etc.) unless using a fall-safe ladder or a maintenance scaffold.
- Do not climb on any machine part to perform maintenance or repair work.

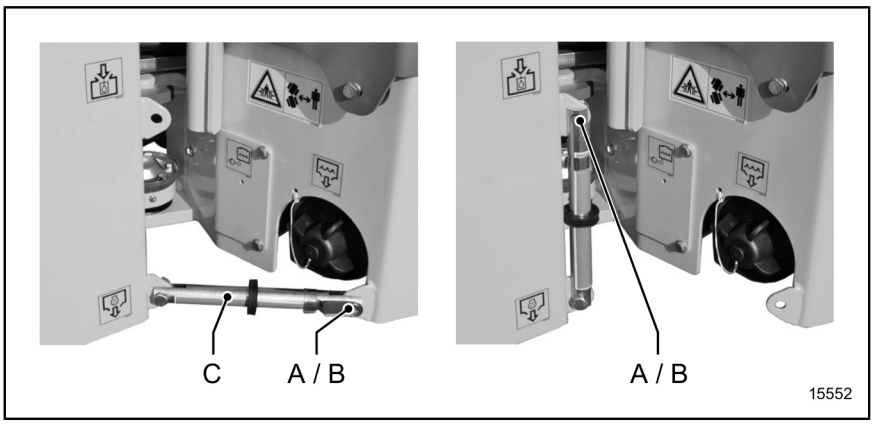
4.00.05 Safety strut

Applying safety strut



1. Open bolt retainer [A] and remove together with the bolt [B].
2. Turn coupling bar [C] to the opposed locking device and secure with the bolt [B].
3. Mount the bolt retainer [A] on the bolt [B] and lock the retainer.

Releasing safety strut



1. Open bolt retainer [A] and remove together with the bolt [B].
2. Turn coupling bar [C] to the frame and fasten it with the bolt [B] on the frame.
3. Mount the bolt retainer [A] on the bolt [B] and lock the retainer.

4.00.06 Welding works on the machine

Preparation

- Observe the operating manual of the diesel engine.
- In order to protect electronic components as e. g. central processing unit, monitor unit, sensors, relays etc., all connectors must be pulled out prior to welding work.
- The negative terminal of the welding appliance must be applied in the vicinity of the weld directly on the component to be welded. Pay attention that it has good contact and remove insulating colour coats.
- If possible, keep welding leads away from the leads of the machine (induction). If not possible, the welding leads must cross the machine leads.
- Touch with live electrodes only the welds. Other components may be damaged if coming in contact with the electrodes. Prior to welding works remove components which may get damaged by heat or welding work.
- Ensure that there are no inlfammable or combustible materials / gases (e.g. fuel, oil, etc.) can get into the vicinity of the welds.

Procedure

1. Switch off diesel engine and remove ignition key.

Maintain an after-running time of 2 minutes.

2. Disconnect battery, first negative then positive terminal.
3. Connect negative terminal of the welding appliance in the vicinity of the weld.
4. Pay attention to the components in the vicinity of the weld.
5. Reconnect all connection plugs after welding.

4.01 Chassis / safety features

4.01.01 General

Adhere to the following instructions:

- Check operating and safety instructions on the machine. Replace damaged or non-legible signs.
- Ensure that hinges and links move easily and lubricate lightly.
- Check the warning devices (signal horn, reflectors, *back-up alarm, blinkers and warning flashers).
- Check lighting.
- Check heavily loaded screw connections for being properly tightened e.g. pivoted links, roller drum suspensions, drum drives.

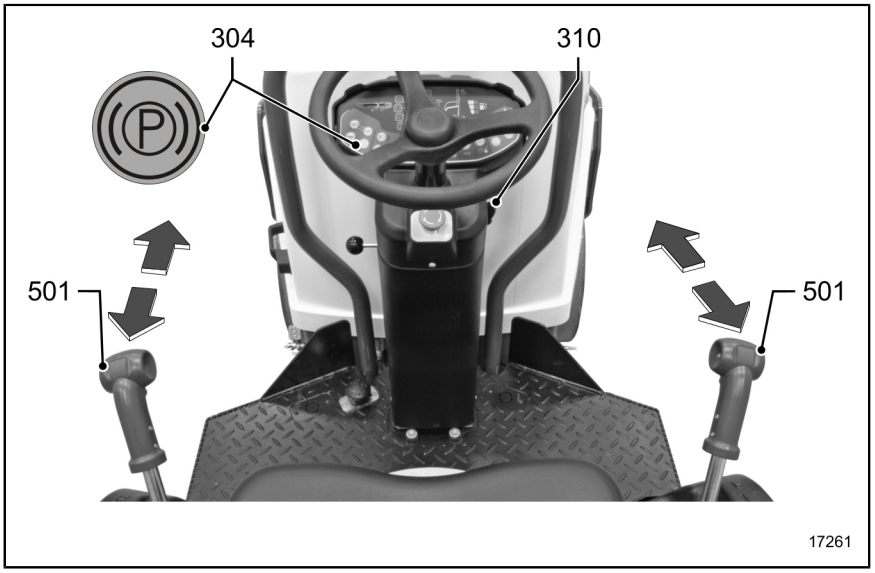
4.01.02 Checking the function of the parking brake

⚠ WARNING

Uncontrolled driving behaviour!

Autonomous movement of the machine can lead to serious injuries or death.

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



Only inspect the parking brake when engine at standstill.

Function test

1. Start the diesel engine [310].
2. Apply parking brake [304].
3. Push the drive lever [501] shortly in forward direction.

   If the drive blocks, the parking brake works properly. If the brake is worn in a way that driving is possible even if the parking brake is applied, the brake must be inspected or replaced.

   Operation of the machine is inadmissible! Call the customer service!
4. Switch drive lever [501] back to central position.

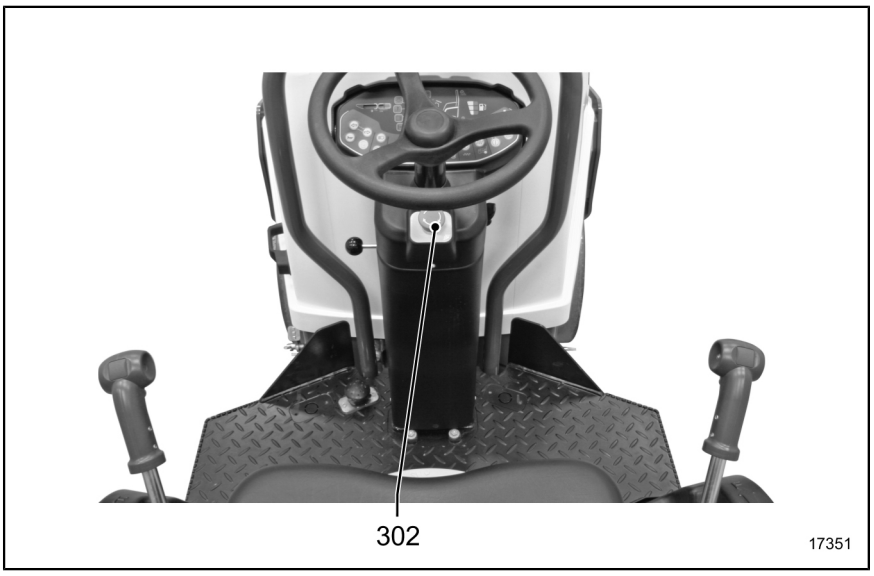
4.01.03 Checking the EMERGENCY STOP function

⚠ WARNING

Full braking!

Danger of injuries due to strong braking force.

- Activate EMERGENCY STOP only in the event of danger.
- Do not use the EMERGENCY STOP as operation brake.



Function test when engine at standstill (daily)

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

1. Press EMERGENCY STOP [302] when engine at standstill.

The machine:

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

Function test during driving operation (yearly)

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

1. Press EMERGENCY STOP [302] with low speed 0.5 km/h (0.3 mph).

The machine:

- Stops immediately.
- Switches off the working functions.
- Shuts down the diesel engine.

4.02 Drive unit - diesel engine

4.02.01 General

⚠ WARNING

Inflamable fuel!

Risk of injury due to fire and explosion.

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

NOTICE

Inadmissible fuel or inadmissible lubricating oil for the diesel engine!

Risk of damage to the diesel engine or to the system for exhaust treatment.

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

NOTICE

Damage to engine due to soiling!

Dirt in the fuel system damages the diesel engine.

Prior to work on the fuel system:

- Clean components and their vicinity thoroughly (e.g. with high pressure washer).
- Ensure no soiling or dust enters the fuel system (cover soiled areas with plastic film).
- Dry cleaned, wet areas with compressed air.

The fuel system must be deaerated after all works on the open fuel system or after the tank has run out of fuel. Performing a test run check fuel system for leaks.

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

Lubricating oil change intervals

These intervals depend, e.g., on:

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

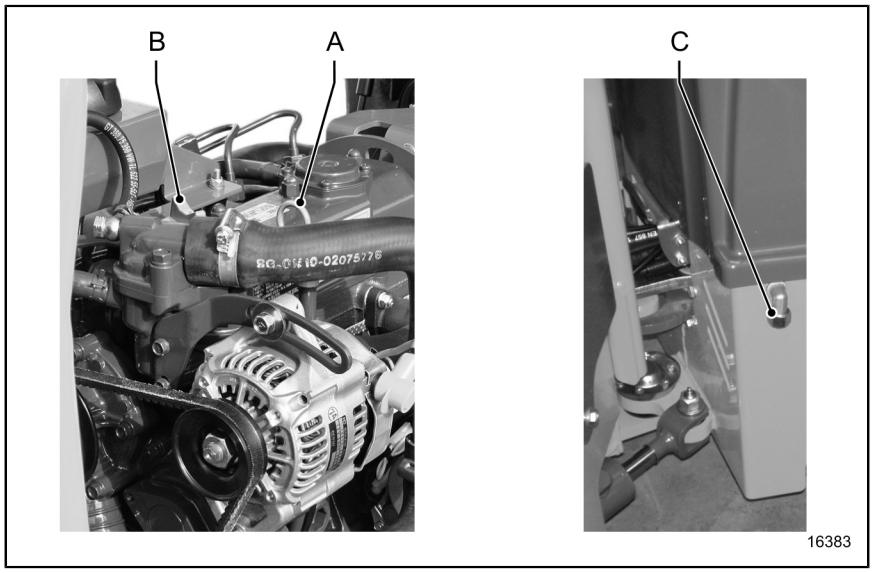
Change lubricating oil after half the interval indicated, e.g., when at least one of the following conditions is true:

- Continuous ambient temperature below –10 °C (14 °F) or lubricating oil temperature below 60 °C (84 °F).
- Operation using biodiesel fuel

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

4.02.02 Maintenance points at the Diesel engine when changing oil

For engine maintenance see operating manual for diesel engine!



[A] Oil gauge stick
[B] Oil filler
[C] Oil drain screw

Lubricant only admissible if containing this marking (see page 131 sqq.).

4.02.03 Changing the filter cartridge for the fuel pre-filter

⚠ WARNING

Inflamable fuel!

Risk of injury due to fire and explosion.

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

Replacing filter cartridge

1. Switch off diesel engine and remove ignition key.
2. Allow machine to cool down under a temperature of 30 °C (86 °F).
3. Open the drain valve [A] (screw conical nipple into housing).
4. Open the vent screw [D].
5. Drain the fuel and the water sump from the filter.
6. Unscrew filter cartridge [C].
7. Unscrew the drain housing [B] from the filter cartridge and clean it.
8. Remove contamination from drain valve [A] (check function).
9. Screw the drain housing [B] with a new gasket ring to the filter cartridge [C] and tighten by hand. Close drain valve [A] (unscrew the conical nipple from the housing until the stop).
10. Prior to assembly apply a thin coat of oil to the rubber seal and screw the new filter cartridge [C] to the filter head until the seal makes contact. Tighten the filter cartridge by hand further by half a turn.
11. Screw in and tighten the vent screw [D].
12. Open the vent screw [F] of the fuel filter cartridge [G] by one turn.
13. Power on electrical system [310] as long as fuel comes from the vent hole [F] of the fuel filter cartridge.
14. Screw in and tighten the vent screw [F].
15. Check for tightness after assembly.

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 1 minute between the individual starting processes in order to allow the starter to cool down.

The fuel pre-filter must be drained at the drain valve [A] from time to time depending on the water content in the fuel.

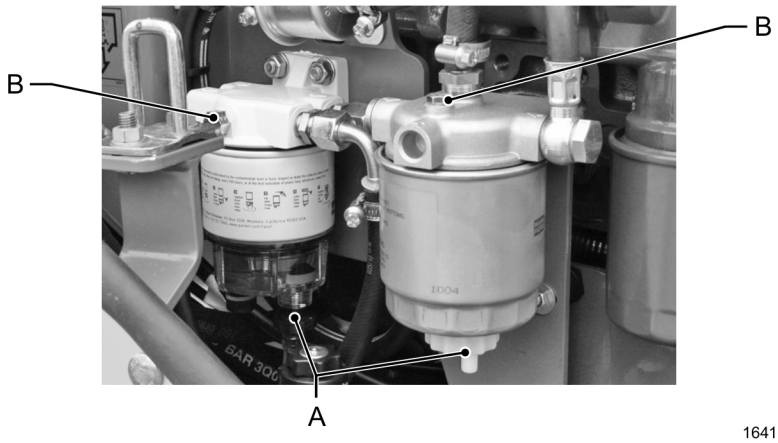
4.02.04 Draining water separator

⚠ WARNING

Inflamable fuel!

Risk of injury due to fire and explosion.

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



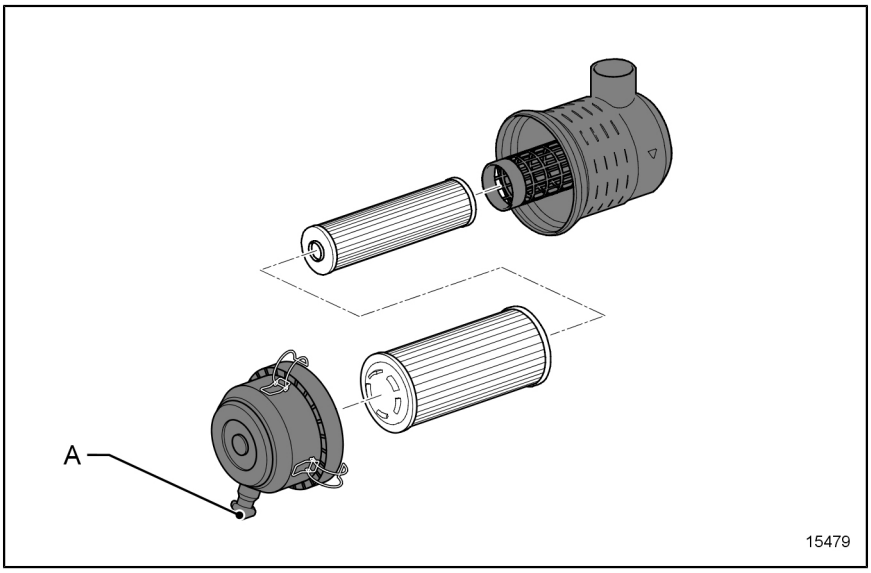
General

To avoid damage to the diesel engine, the water separator must be drained at the drain valve [A] depending on the water content in the fuel. If the fuel has a high water content, the water separator must be drained more often.

Draining water sump

1. Open the vent screw [B].
2. Open drain valve [A].
3. Allow water sump to drain off.
4. Close drain valve.
5. Close the venting plug.

4.02.05 Checking and cleaning dust discharge valve



Prior to start of work check whether the opening of the dust discharge valve [A] is clogged with moist dirt deposits.

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

4.02.06 Checking and replacing the air filter

⚠ WARNING

Exposed, rotating parts!

Risk of injury due to rotating parts.

- Start the diesel engine only with closed engine hood resp. closed engine room doors.
- Ensure that there are no persons or objects in the danger zone of the machine.

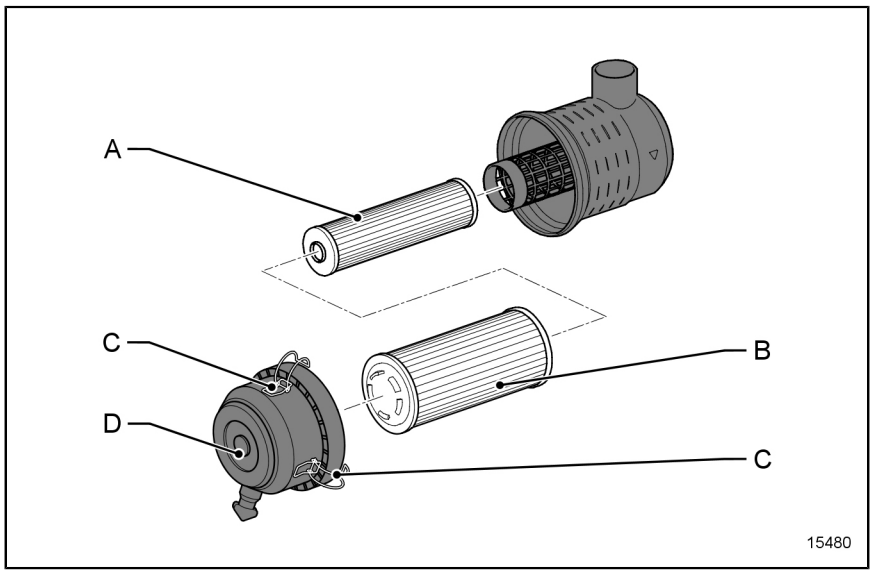
NOTICE

Air filter cartridge / safety cartridge damaged or missing!

Engine damaged by dirt in the intake air.

- Replace dirty air filter cartridge, do not clean it.
- Replace damaged air filter cartridge immediately.
- The safety filter cartridge may only be taken from the housing for replacement purposes. The safety cartridge must not be cleaned.
- Clean the interior parts of the casing only with a moist, fiber-free cloth, never with compressed air.
- Ensure that no dirt gets into the clean air side of the air filter.
- The diesel engine must not be operated without air filter cartridge and safety filter cartridge.

General



The operability control of the air filter cartridge and the safety cartridge must be performed with the diesel engine running.

1. Start diesel engine and shortly rev up to maximum speed.

If the pilot light [203] does not light up, both filter cartridges are still completely operable. If the pilot light flashes, the air filter cartridge [B] resp. the safety cartridge [A] must be replaced.

Replacing the air filter cartridge

1. Switch off diesel engine and remove ignition key.
2. Allow machine to cool down under a temperature of 30 °C (86 °F).
3. Fold up clip [C].
4. Remove dust container [D].
5. Clean the inside of the dust collectors.
6. Replace the air filter cartridge [B].
7. Re-assemble in reverse order.

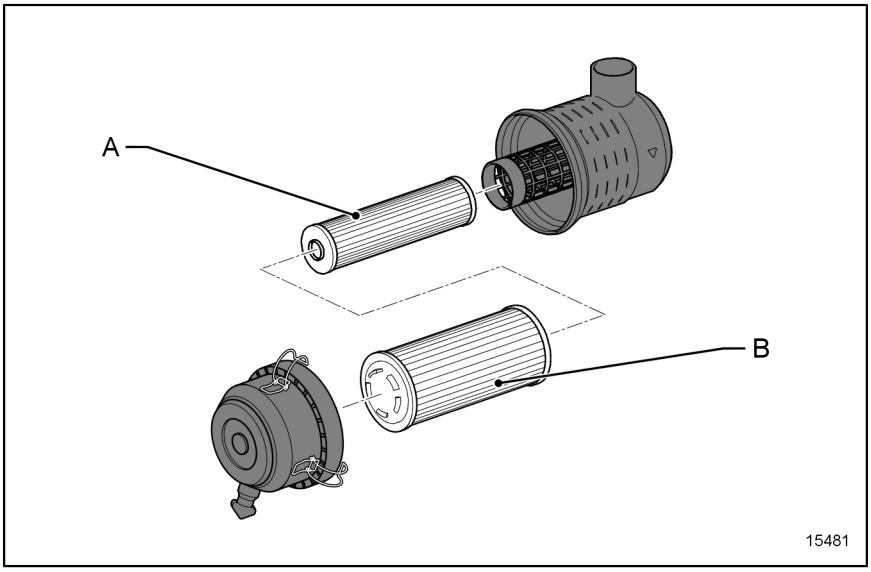
The operability check for the safety filter cartridge [A] is performed together with the replacement of the air filter cartridge [B]. To test that, start the diesel engine when the filter housing is open and the new air filter cartridge is inserted. Shortly rev up to maximum speed. If the pilot light [203] does not light up during this process, the safety filter cartridge is still completely operable. If the pilot light flashes, the safety filter cartridge must be replaced.

4.02.07 Changing safety cartridge

Change the safety filter cartridge in the following intervals:

- After having changed the air filter cartridge five times.
- After 2000 operating hours at the latest.
- If the pilot light [203] does not go out after having changed the air filter cartridge.
- If the air filter cartridge is defective.

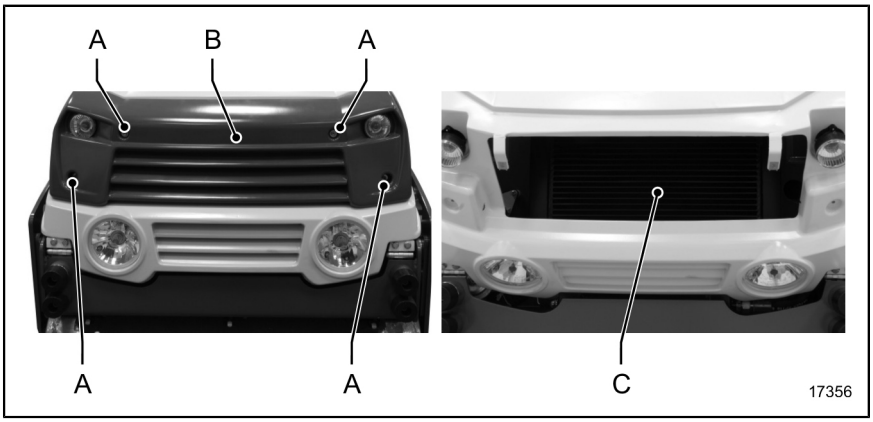
Changing safety cartridge



1. Switch off diesel engine and remove ignition key.
2. Allow machine to cool down under a temperature of 30 °C (86 °F).
3. Remove the air filter cartridge [B].
4. Pull out safety filter cartridge [A].
5. Insert a new safety filter cartridge.
6. Insert the air filter cartridge [B].

The safety filter cartridge may only be taken from the housing for replacement purposes. The safety cartridge must not be cleaned. The diesel engine must not be operated without air filter cartridge and safety filter cartridge.

4.02.08 Checking the radiator

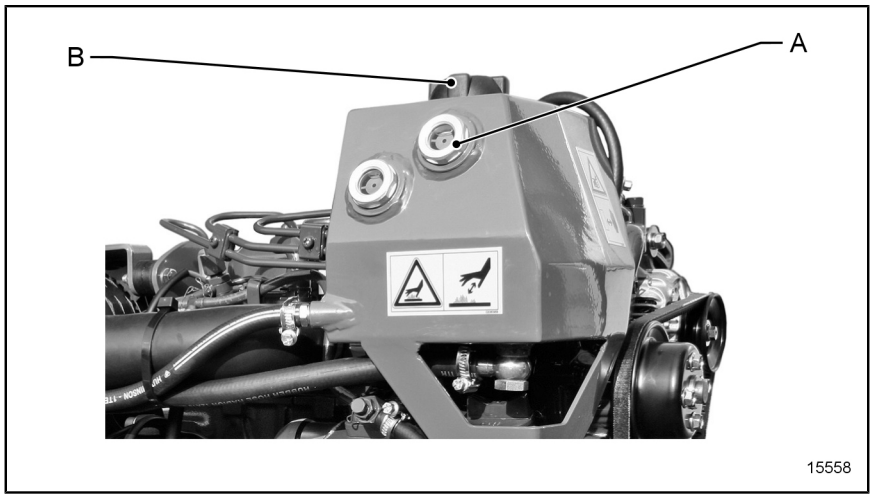


1. Switch off diesel engine and remove ignition key.
2. Allow machine to cool down to a temperature under 30 °C (86 °F).
3. Check the cooling fins of the radiator for fouling.

If the radiator is contaminated it must be cleaned thoroughly and immediately.

4. Loosen the fastening screws [A], and remove the cladding [B].
5. Clean the radiator [C] carefully using a power washer, and while proceeding from inside to outside.
6. Mount the cladding [B] and tighten fastening screws [A].

4.02.09 Checking coolant level



1. Switch off diesel engine and remove ignition key.
2. Only check the coolant level when the diesel engine is cold.
3. Correct coolant level: Centre of inspection glass [A] on compensator tank.
   Do not exceed this level!
4. In case of a lack of coolant, only fill up coolant in the specified concentration through filling opening [B] at the compensator tank.
5. In case of bigger coolant losses, find out and eliminate the cause.

◯ Only lubricant with this sign allowed (see page 131 sqq.).

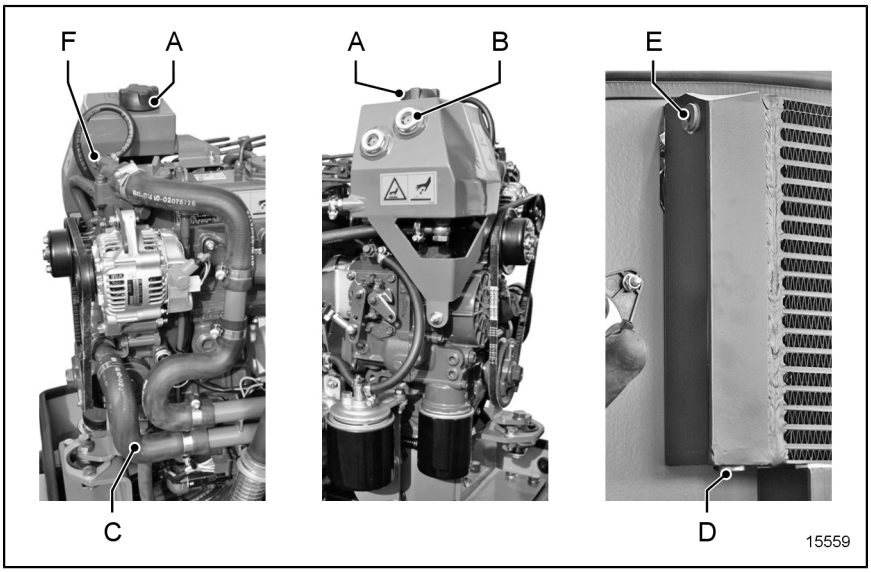
4.02.10 Changing the coolant

⚠ WARNING

Hot surface, hot fluids!

Risk of burns due to hot surfaces and fluids.

- Prior to maintenance works, allow machine to cool down to a temperature under 30 °C (86 °F) .
- Do not touch hot machine parts.
- Check filling levels only when machine is cooled down.
- Open the sealing cap of the compensator tank only when the diesel engine is cooled down!



1. Switch off diesel engine and remove ignition key.
2. Open the sealing cap [A] at the compensator tank.
3. Remove the drain plug [D] from the radiator and discharge the coolant in a provided receptacle.
4. Dismount lower coolant hose [C] and discharge coolant into a provided receptacle.
5. Screw in again and tighten drain plug [D] and install coolant hose [C] to the connection piece.
6. Loosen vent screw [E] on the radiator in 2 turns (do not remove!).
7. Open the hollow-core screw [F] of the bleed pipe at the engine block by 2 turns (do not remove!).
8. Fill in coolant in the compensator tank [A] until coolant runs out of the vent screw [E].
9. Tighten vent screw [E] at the radiator.
10. Fill in coolant in the compensator tank until it runs out of the hollow-core screw [F] on the engine block.
11. Tighten the hollow-core screw [F].
12. Top up coolant to the centre of the inspection glass [B].
13. Close the filling opening with the sealing cap [A].

14. Start the diesel engine and bring it to operating temperature (thermostat opens).
15. Switch off diesel engine and remove ignition key.
16. Check coolant level when the diesel motor is cold, fill up as necessary.
17. Correct coolant level: Centre of inspection glass [B] on compensator tank.

◯ Only lubricant with this sign allowed (see page 131 sqq.).

4.03 Hydraulic oil supply

4.03.01 General

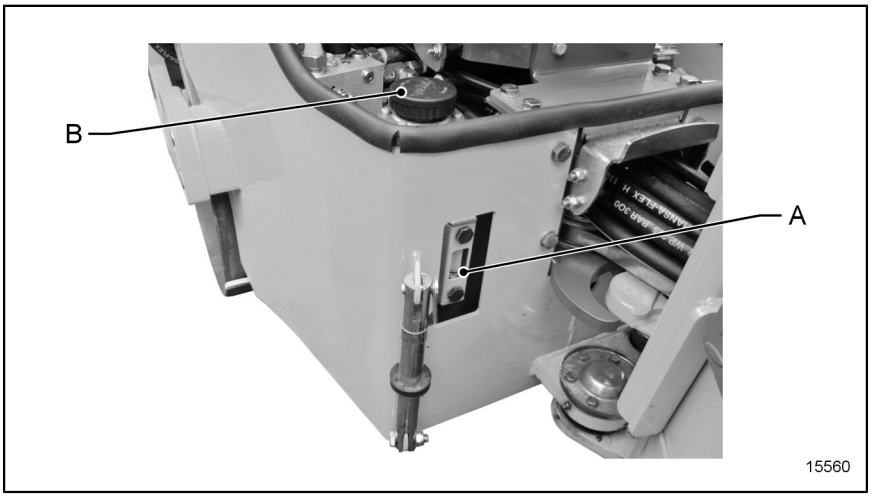
Check all lines, hoses and screwed connections regularly (at least 1x yearly) for leaks and visible damage.

Damaged parts must be replaced immediately. Further operation is inadmissible. Oil spurting out can lead to injuries and fire.

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.

4.03.02 Checking filling level hydraulic oil



1. Switch off diesel engine and remove ignition key.
2. Check only when the engine is cooled down to approx. 20 °C (68 °F).
3. Correct oil level: Centre of inspection glass [A].
   Do not exceed this level!
4. If the oil level is too low, fill in appropriate oil through filling opening [B].
5. In case of bigger oil losses, find out and eliminate the cause.

Only lubricant with this sign allowed (see page 131 sqq.).

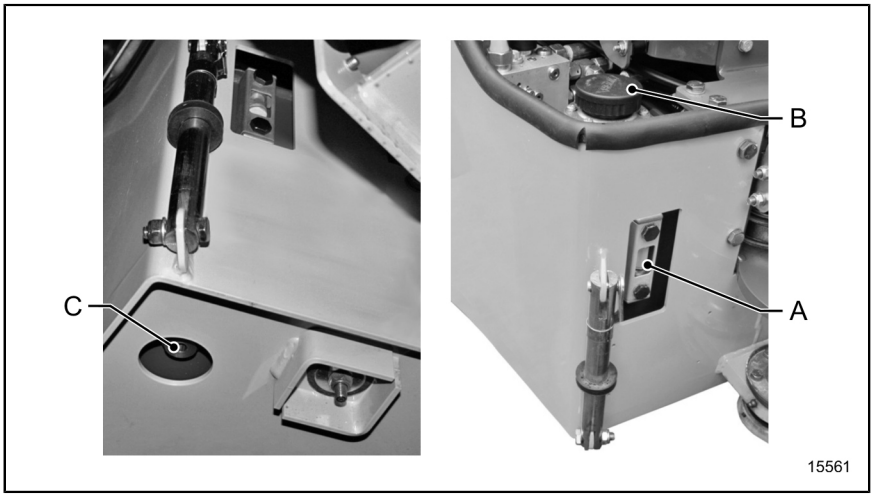
4.03.03 Changing hydraulic oil and ventilation filter

⚠ WARNING

Hot surface, hot fluids!

Risk of burns due to hot surfaces and fluids.

- Prior to maintenance works, allow machine to cool down to a temperature under 30 °C (86 °F) .
- Do not touch hot machine parts.
- Check filling levels only when machine is cooled down.



1. Switch off diesel engine and remove ignition key.
2. Allow machine to cool down to a temperature under 30 °C (86 °F).
3. Unscrew oil drain screw [C] down on the oil tank and discharge the used oil drain into a provided receptacle.
4. Remove ventilation filter [B] and replace by a new one.
5. Screw in oil drain screw [C] and tighten.
6. Fill in specified oil through filling opening [B] to the centre of the inspection glass [A].
7. Tighten ventilation filter [B].
8. Start the diesel engine, actuate drive lever [501] with low engine speed until the drive activates, furthermore actuate the steering. The pipes and hose lines will be filled with oil and vented.
9. Check the oil level of the diesel engine with the engine at a standstill. If necessary fill up to the centre of the inspection glass [A].
10. Check hydraulic system for leaks.

Lubricant only admissible if containing this marking (see page 131 sqq.).

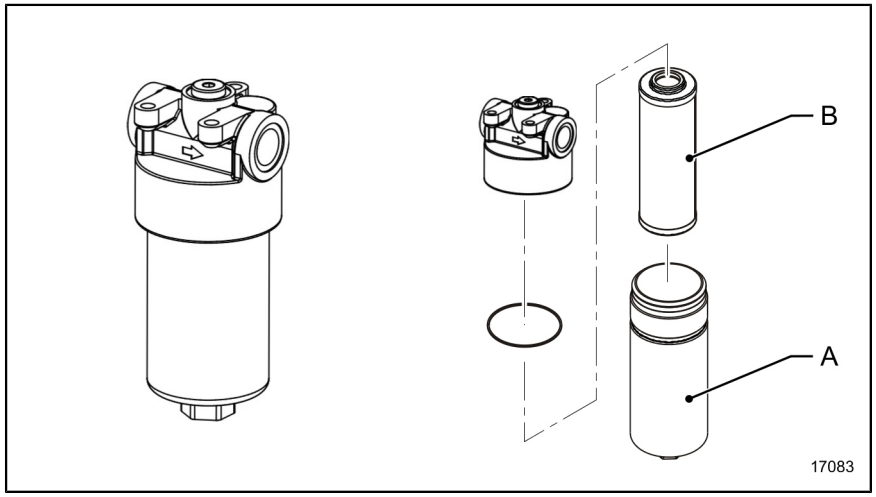
4.03.04 Replacing filter insert of pressure filter for hydraulic system

⚠ WARNING

Hot surface, hot fluids!

Risk of burns due to hot surfaces and fluids.

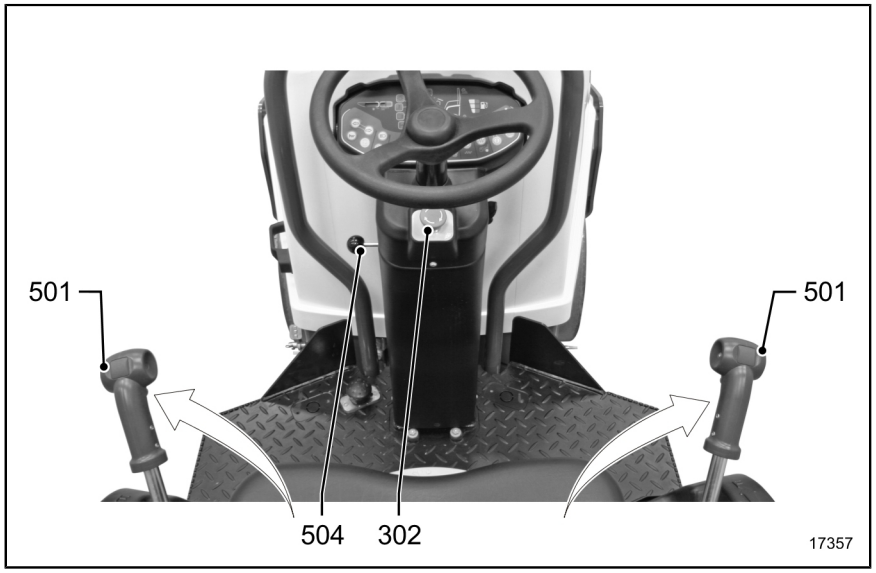
- Prior to maintenance works, allow machine to cool down to a temperature under 30 °C (86 °F) .
- Do not touch hot machine parts.



1. Switch off diesel engine and remove ignition key.
2. Allow machine to cool down below a temperature of 30 °C (86 °F).
3. Unscrew the cup-shaped housing [A].
4. Pull the filter insert [B] from the filter head and replace with a new one.
5. Clean the inside of the cup-shaped housing, screw it back to the filter head and tighten.

4.04 Drive

4.04.01 Check the drive lever



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

1. Drive lever [501] — **CENTRE**
2. Engine speed [504] — **MIN**
3. EMERGENCY STOP [302] — position **UP**

Function test

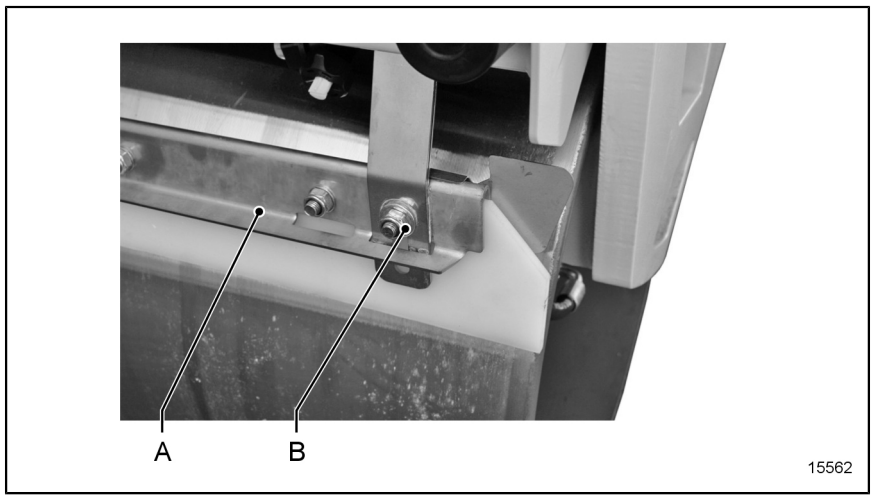
1. Move the drive lever [501] forward and back completely. The drive lever must allow even movement in both directions without using excessive force.

No machine operation is permitted if the drive lever binds or is sluggish. Call the customer service!

4.04.02 Checking the roller drum scraper

General Only correctly adjusted scrapers ensure a clean roller drum surface. Check the condition of the scrapers. Replace worn scrapers in good time.

Rigid scraper

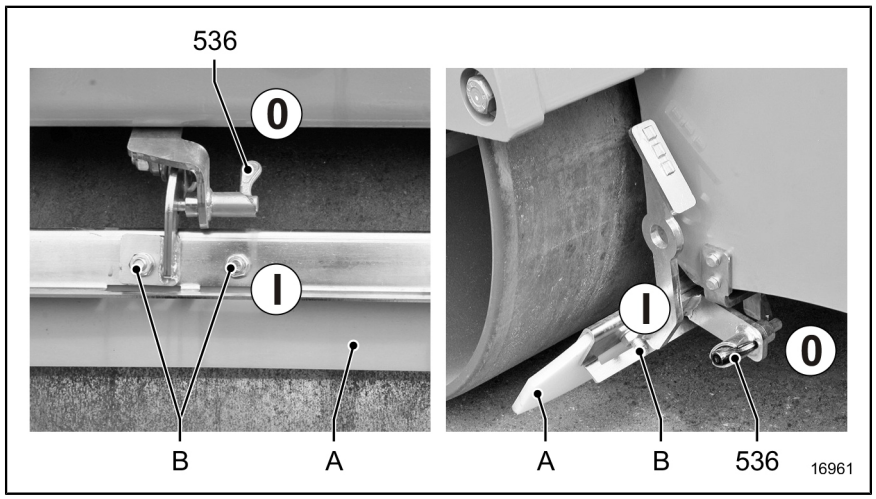


If the scrapers are worn to such an extend that the scrapers do not rub against the roller drum, the scrapers must be re-adjusted at the clamp connection [B].

Readjusting the scraper

1. Switch off diesel engine and remove ignition key.
2. Loosen clamp connection [B].
3. Push scraper [A] to the roller drum.
4. Tighten the clamping connection.

Folding scraper



The scraper must be changed if it is worn to the extent that dirt adhering to the drum is no longer removed when the machine is laying asphalt.

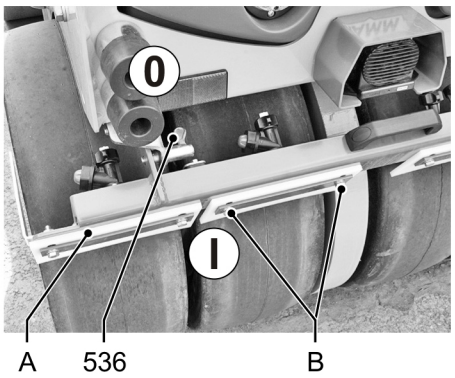
Exchanging the scraper

Drive the machine over an inspection pit in order to obtain easier access to the clamps to change the scraper.

1. Switch off diesel engine and remove ignition key.
2. Turn stop lever [536] to position **0** and move the scraper away.
3. Loosen clamp connection [B].
4. Exchange the scraper [A].
5. Tighten the clamp connection.

4.04.03 Checking scraper tyre

General Only with scrapers that are properly adjusted you will achieve a clean tyre surface. Check the condition of the scrapers. Replace worn scrapers in good time.

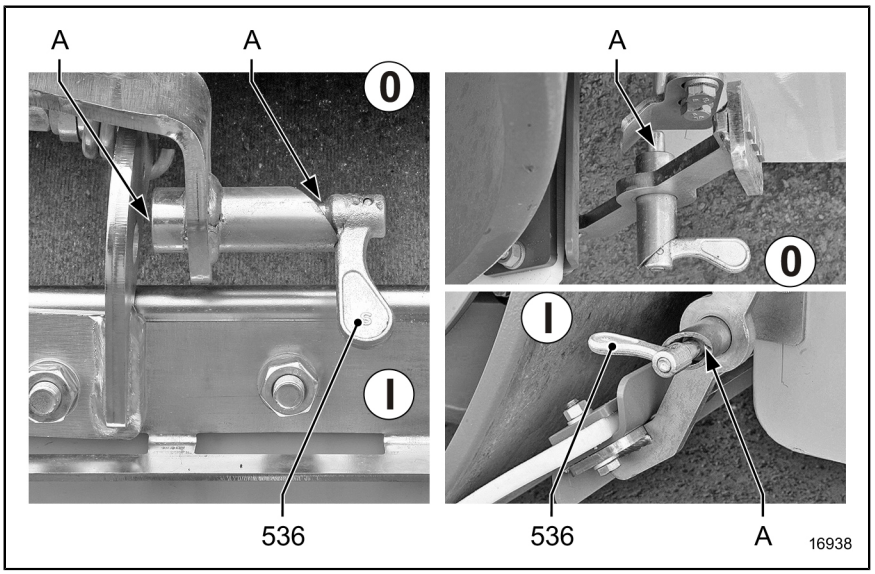


If the scrapers are worn to the extent that dirt adhering to the tyres is no longer removed during work, the scrapers must be re-adjusted or changed.

Readjusting the scraper (basic setting)

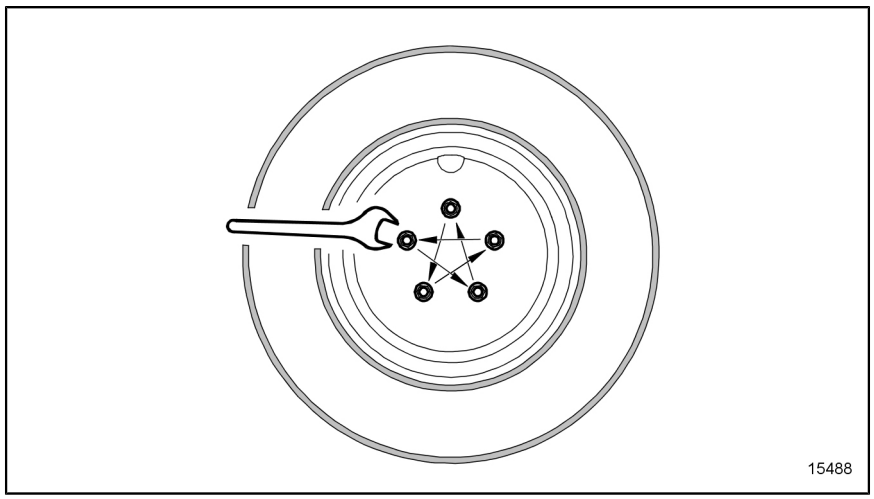
1. Switch off diesel engine and remove ignition key.
2. Turn stop lever [536] to **0** position and move the scraper away.
3. Loosen clamp connection [B] (2x).
4. Push scraper [A] to the tyres. Establish a clearance of 10 mm between the tyres and the scrapers.
5. Tighten clamp connection [B].

4.04.04 Lubricate the scraper stop lever



1. Switch off diesel engine and remove ignition key.
2. Clean off dirt adhering to the catch [536].
3. Turn stop lever [536] to **I** position.
4. Lubricate the guide bolt of the locking lever with oil at positions [A].
5. Move the locking lever to and fro several times between positions **0** and **I** to distribute the lubricant in the guide.

4.04.05 Checking the wheel nuts / wheel bolts for tightness



1. Switch off diesel engine and remove ignition key.
2. Tighten the wheel nuts / wheel bolts crosswise.
   For starting torque see Technical data (see page 136 sqq.).

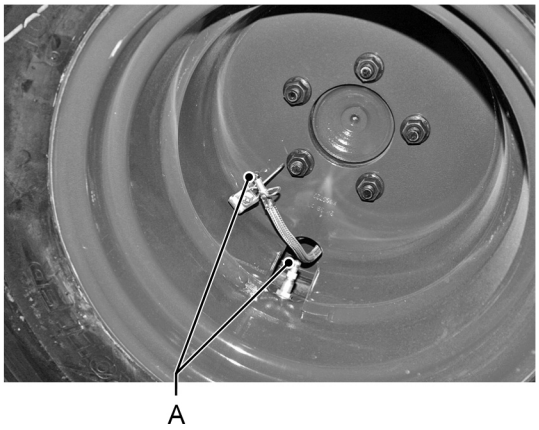
4.05 Checking the air pressure in the tyres

⚠ WARNING

Explosion, fluids under pressure!

Risk of injury due to flying parts and fluids spurting out under pressure.

- Change damaged tyres.
- When filling, do not exceed the values of the specified air pressure.
- Use only suitable filling devices with a pressure indicator.
- Fill tyres with water filling only in UPSIDE valve position.
- When filling the tyres, be always next to the tyre, not in front of it.



Visually inspect the tyre pressure daily. In case of visible air deficiency fill the tyres with suitable filling devices to the specified air pressure.

1. Switch off diesel engine and remove ignition key.
2. Fasten filling hose to the valve [A] and fill the tyre till it reaches the specified air pressure (air pressure see page 136 sqq.).

4.06 Changing the tyres

After every wheel change, check the firm seat of every wheel nut / wheel lug bolt after 50 operating hours.

Preparation

- Only persons familiar with changing tyres and aware of dangers are allowed to change the tyres.
- Put machine on a safe surface (even, capable of bearing, horizontal).
- Lift the machine only with suitable lifting equipment at the specified lifting points considering the weights (see page 136 sqq.).
- When jacking up the machine, use only stable liners capable of bearing (e.g. squared timber of sufficient size)
- Observe the weight of the tyres (see page 136 sqq.). Install if possible with two persons.

Dismantling

1. Switch off diesel engine and remove ignition key.
2. Lift the machine until the tyres are clear from the ground.
3. Put machine on the machine frame on liners capable of bearing (tyres may not be in contact with the ground).
4. Press the valve extension hose out of the fixing device.
5. Unscrew wheel nuts.
6. Remove the circlips.
7. Remove the wheels from the wheel hub.

Installation

1. Lead the valve extension hose through the cutout of the rim outwards.
2. Put the inner wheel on the wheel hub (tyre bolts must align with the fixing holes).
3. Put the outer wheel on the tyre bolt so that both valves align. Lead the valve extension hose through the cutout of the rim outwards.
4. Put the circlip on the tyre bolt.
5. Screw the wheel nut on the tyre bolt and tighten with the starting torque (see page 136 sqq.).
6. Press the valve extension hose back in the fixing device.
7. Lift the machine and remove the liners.

4.07 Steering system

4.07.01 General

Any work in the danger zone of the articulated steering may only be performed with the engine at a standstill and with the electrical system switched off! Furthermore, the safety strut must be latched.

4.07.02 Lubricating pivoted bearing

⚠ WARNING

Uncontrolled movements!

If the machine rolls away, this can lead to serious injuries or death.

- Secure machine against rolling away.
- Prior to maintenance works, apply the safety strut in the hazard area.

1. Switch off diesel engine and remove ignition key.
2. Lubricate lubrication nipple [A].

△ Only lubricant with this sign allowed (see page 131 sqq.).

4.07.03 Lubricate the steering cylinder bolts

⚠ WARNING

Uncontrolled movements!

If the machine rolls away, this can lead to serious injuries or death.

- Secure machine against rolling away.
- Prior to maintenance works, apply the safety strut in the hazard area.

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

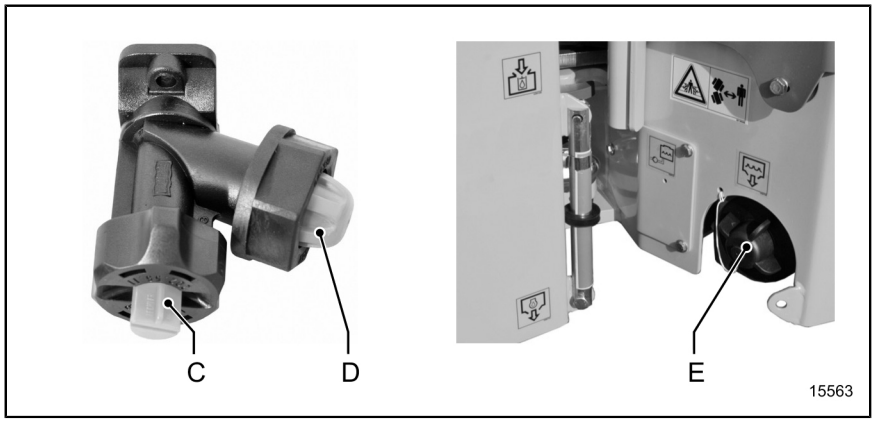
△ Only lubricant with this sign allowed (see page 131 sqq.).

4.08 Sprinkling

4.08.01 General

A high-volume, rustproof water filter, arranged upstream the water pump, prevents a premature contamination of pump, lines and spraying nozzles, thus ensuring a trouble-free operation. Its maintenance depends on the purity of the water used. Use clean water only!

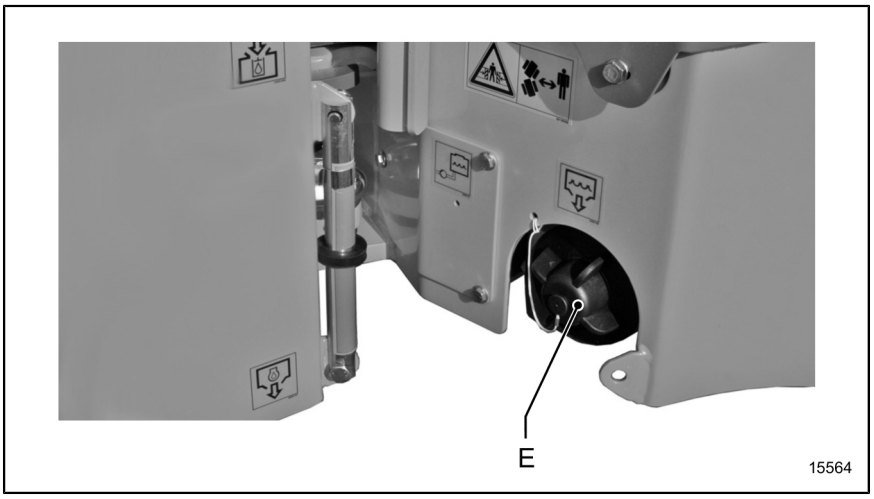
4.08.02 Cleaning the water sprinkling unit



1. Switch off diesel engine and remove ignition key.
2. Remove the valve insert [D] with the membrane as well as the sprinkler nozzles [C] with filter from the sprinkler nozzle housing.
3. Unscrew filter head [E] at the water tank and remove it together with the pressure spring (observe gasket ring on filter head).
4. Pull the filter insert from the water tank.
5. Clean water tank thoroughly with pressure washer (if available) or water jet.
6. Flush the sprinkler nozzle housings and the hoses.

Re-assemble in reverse order.

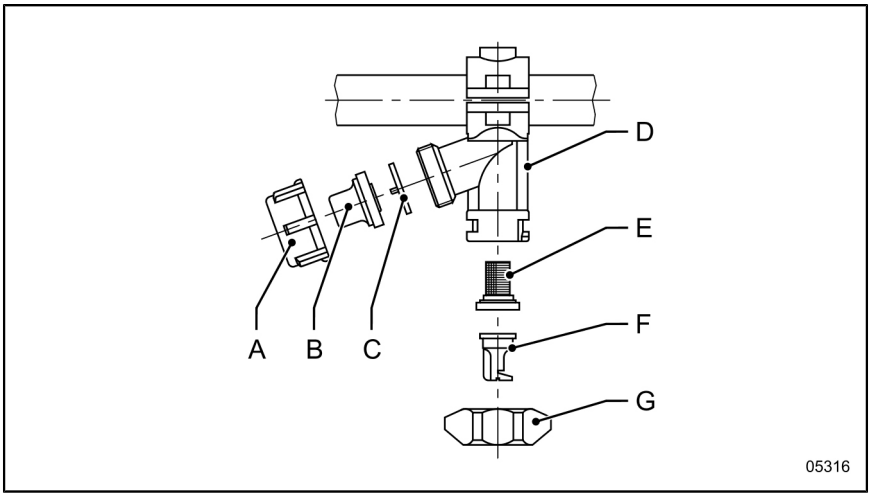
4.08.03 Cleaning the filter for sprinkling



1. Switch off diesel engine and remove ignition key.
2. Unscrew filter head [E] at the water tank and remove it together with the pressure spring (observe gasket ring on filter head).
3. Clean filter insert with pressure spring.

Re-assemble in reverse order.

4.08.04 Cleaning the spay nozzles

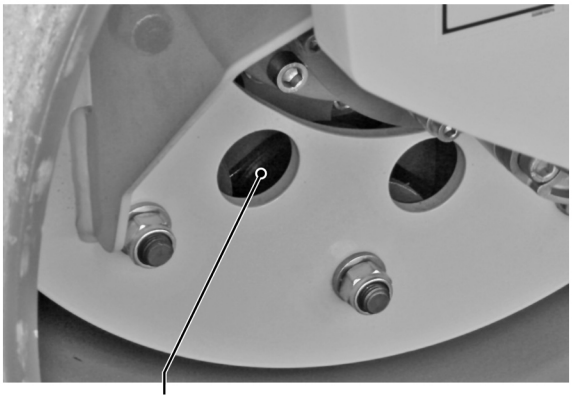


1. Switch off diesel engine and remove ignition key.
2. Loosen the cap nut [G] and remove it together with sprinkler nozzle [F] and filter [E].
3. Remove the filter and the sprinkler nozzle from the cap nut and clean them.
4. Unscrew the cap nut [A].
5. Remove valve insert [B] and membrane [C].
6. Flush the housing [D] with the sprinkling system switched on.

Re-assemble in reverse order.

4.09 Vibration

4.09.01 Checking the damping elements



1. Switch off diesel engine and remove ignition key.
2. Check the damping elements [A] of the roller drum suspension for cracks.

Replace damaged damping elements by new ones.

5 TABLES

5.00 Technical data

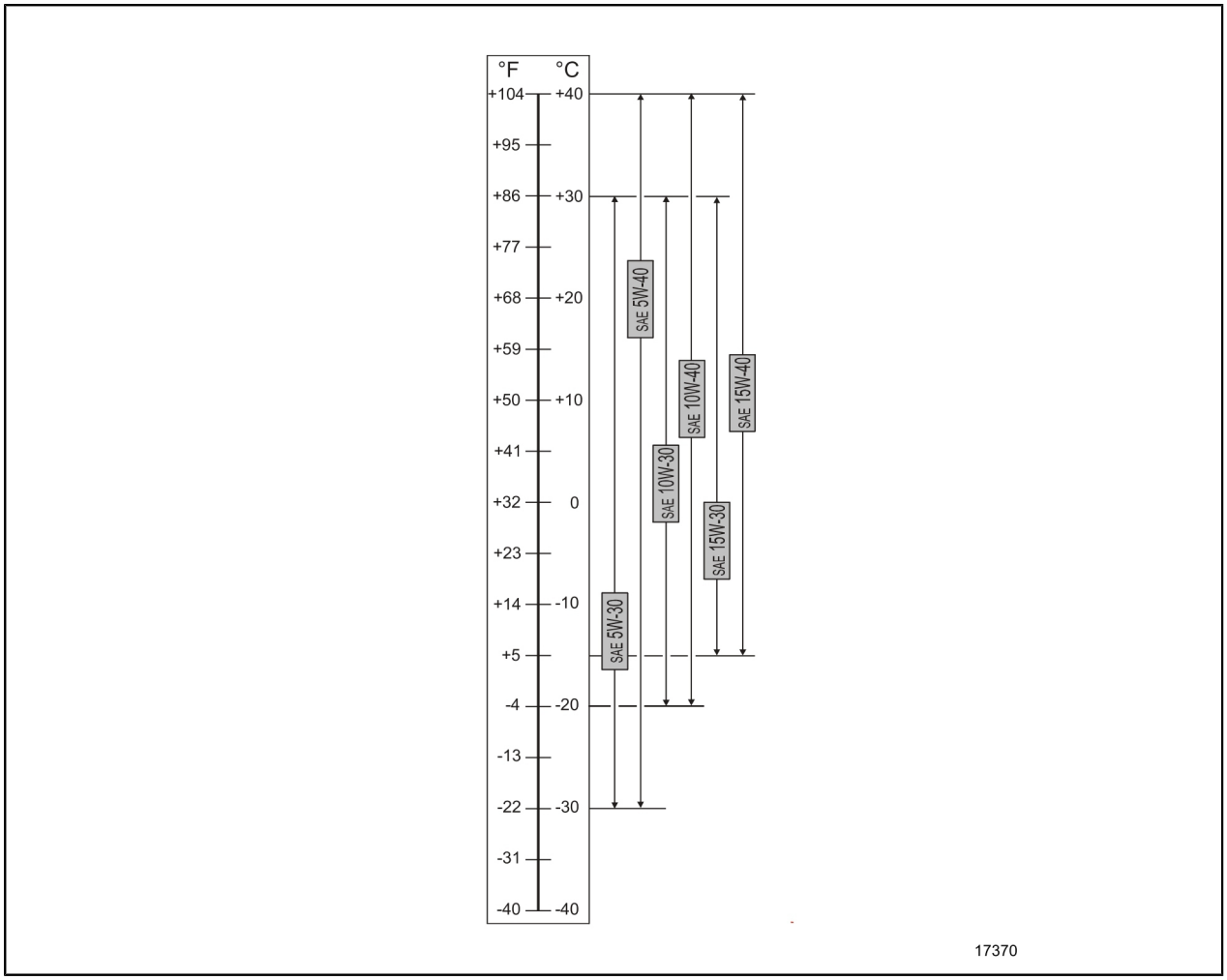
5.00.01 Engine oil

Viscosity - Temperature range

The viscosity of the lubricating oil is selected by SAE class according to the following table.

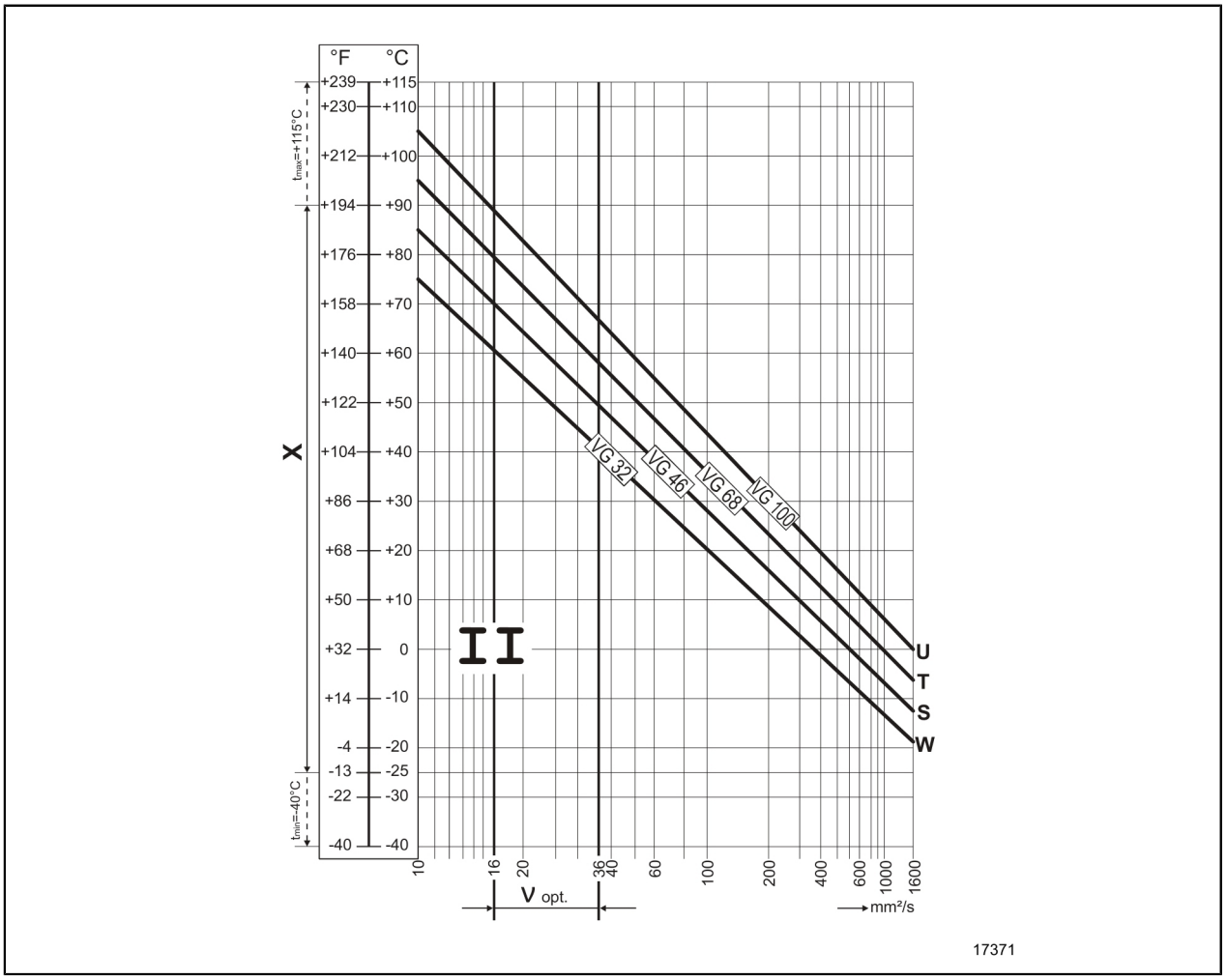
The ambient temperature is crucial for the correct selection. If the temperature falls briefly below the lower limit, the cold starting ability may be affected, but this will not damage the engine. In order to minimize wear, the upper temperature limit should not be exceeded for lengthy periods.

We recommend using multigrade oil for year-round use.



5.00.02 Hydraulic oil

The most important characteristic of a pressure fluid is its viscosity. Compliance with the permissible viscosity ranges is especially important for pumps and hydraulic motors. Too high a viscosity leads to cavitation, too low a viscosity increases leak losses = overheating, and thus a further fall in the viscosity. In the end, the limit of the lubricating capability is reached.



[W]	Winter conditions in Central Europe
[S]	Summer conditions in Central Europe or in enclosed premises
[T]	Tropical conditions or in premises subject to high amounts of heat
[U]	Excessive amounts of heat (for example from combustion engines)
[X]	Pressure fluid temperature range
[V_{opt}]	Optimal operating viscosity range
[1000 =]	Maximum permissible (short-term) viscosity
[II =]	100 mm²/s (t_{max} = +90 °C) ... 1000 mm²/s (t_{rpm} = -25 °C)

5.00.03 Use of biohydraulic oil

The hydraulic system of the machine is normally filled with mineral oil in the 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 hydraulic oil based on special synthetic saturated complex esters may be used. The products recommended by Wacker Neuson can be seen in the overview of the fuel, lubricant and coolant specification (see page 134). Other oils used must comply with the specifications of the above stated oil. The neutralization value (acid of the oil) must not exceed 2.
- Hydraulic oil replacement (biological hydraulic oil replaces mineral oil; mineral oil replaces biological hydraulic oil) may only be performed in accordance with special instructions. You can request for these instructions at Wacker Neuson Customer service. All filters in the oil circuit are to be replaced 50 operating hours after oil replacement. Thereafter, the intervals for filter change as specified in these instructions apply.
- Used biological oil must be disposed at a reliable place of disposal, just like mineral oil.

5.00.04 Coolant treatment

For liquid-cooled diesel engines, special care must be taken for the conditioning and the inspection of the coolant; otherwise, corrosion, cavitation and freezing can cause damage on the diesel engine. The coolant is prepared by adding a cooling system protective agent to the cooling water.

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

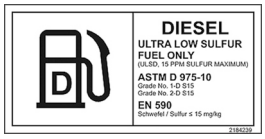
The concentration of the cooling system protection agent can be done with commercially available test devices (e. g. gefo glycomat ®).

The cooling system protective agent in the coolant should not exceed the following concentration:

Coolant antifreeze	Water
max. 45 Vol. %	55 %
min. 35 Vol. %	65 %

The products used and recommended by Wacker Neuson are shown in the chapter lubricant details (see page 131 sqq.) (without nitrite, amine and phosphate). The factory filled coolant blend consists of 40 parts cooling system protective liquid and 60 parts water. This ensures frost protection to -25 °C (-13 °F). The cooling system protective agent can be purchased from Wacker Neuson Customer service.

5.00.05 Fuel



Use only the diesel fuel commercially available which contains a sulphur content below 15 mg/kg (15 ppm). The engine oil replacement intervals specified here apply only for diesel fuel.

Approved diesel fuel specifications are:

- EN 590
- ASTM D 975-10 Grade-No. 1-D S15 and 2-D S15

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

The certification measurements to measure the compliance with statutory emission limits are carried out using the test fuels specified by law. These fuels comply with the diesel fuels specified in this operating manual according to EN 590 and ASTM D 975. For all other fuels specified in this operating manual we cannot guarantee any emission value.

Winter operation with diesel fuel

No admixture of petroleum and no addition of flow additives is admissible.

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

- Below an ambient temperature of 0 °C (32 °F) it is necessary to use winter diesel fuel (up to -20°C (-4 °F)) (gas stations provide them early enough prior to winter time).
- For arctic climate zones up to -44 °C (-47 °F) it is possible to use special diesel fuels.

5.00.06 Overview of lubricant details

Lubricant	Quality	Viscosity	Marking
Engine oil The oil quality must correspond to the API / ACEA classification.	API: CG-4 or higher ACEA: E5-02 or higher	see diagram	□
Hydraulic oil (mineral oil) see page 132 The viscosity is determined in accordance with DIN standard 3448 (ISO-VG: viscosity grade).	HVLP	**Conditions** ISO VG 22 arctic ISO VG 32 winter ISO VG 46 summer ISO VG 68 tropical ISO VG 100 extreme heat	▭
Hydraulic oil (biological hydraulic oil) Synthetic, saturated ester (ISO-VG: viscosity grade).	HEES		
Special oil Only Wacker Neuson special oil is admissible.			◇
Gear box oil with Limited-Slip-Additions. The oil quality must meet the API classification.	API GL-5	SAE 85W-90	⬡
Coolant for diesel engine, liquid-cooled (free of nitrite, amine and phosphate). Mixture: 40 % coolant concentrate, 60 % water.			○
Grease Lithium saponified multi-purpose grease with high-pressure additives. Temperature application range from -25 °C (-13 °F) to +120 °C (248 °F).			△

5.00.07 Starting torques

The starting torques indicated within the tables apply to nuts in accordance with DIN 934 and screws with headrest according to DIN 931 (frictional coefficient μ_{total} = 0.12) unless otherwise specified.

i Check screws and nuts regularly for tight seat, if necessary, retighten.

Starting torques for regular type screw threads

Threads	Starting torques MA (Nm)		
	8.8	**10.9**	**12.9**
M4	2,7	4,0	4,7
M5	5,5	8,1	9,5
M6	9,5	14	16,5
M8	23	34	40
M10	46	68	79
M12	79	117	135
M14	125	185	215
M16	195	280	330
M18	280	390	460
M20	390	560	650
M22	530	750	880
M24	670	960	1120
M27	1000	1400	1650
M30	1350	1900	2250

Starting torques for fine threads

Threads	Starting torques MA (Nm)		
	8.8	**10.9**	**12.9**
M8x1	24,5	36	43
M10x1.25	49	72	84
M12x1.25	87	125	150
M12x1.5	83	122	145
M14x1.5	135	200	235
M16x1.5	205	300	360
M18x1.5	310	440	520
M20x1.5	430	620	720
M22x1.5	580	820	960
M24x2	730	1040	1220
M27x2	1070	1500	1800
M30x2	1490	2120	2480

5.01 Technical data

The version valid at the time the technical data was prepared for this version of the manual was used (see impressum: change date). Other values may apply if modifications are made to the machine in the course of its further development.

5.01.01 RD 18-80

Designation	Value	Unit
Dimensions and weights		
Basic weight without ROPS roll-over bar	1420	kg
Operating weight with ROPS roll-over bar	1580	kg
Axle load front / rear	765 / 815	kg
Working width / max. Working width	856 / 856	mm
Turning radius inside / outside	2230 / 3065	mm
Diesel engine		
Supplier	Kubota	
Type	D1005	
Number of cylinders	3	
Power (ISO 14396) / rated speed	14.8 / 2700	kW / rpm
Emission level EU / USA	– / Tier 4	
Transmission		
Working gear speed	0-11.0 / (0-6.8)	km/h / (mph)
Climbing ability, vibration on / off	30 / 40	%
Max. longitudinal gradient allowed	20	°
Max. transverse gradient allowed	20	°
Vibration		
Vibration	front / back	
Frequency / speed	65 / 3900	Hz / rpm
Maximum amplitude	0.50	mm
Steering		
Steering angle to both sides	33	°
Pendulum compensation upwards and downwards	8	°
Capacities		
Fuel	33.00	l
Engine oil (for oil change)	5.10	l
Coolant of diesel engine	6.10	l
Hydraulic oil	26.00	l
Water sprinkling	70.00	l

Designation	Value	Unit
Noise data		
Guaranteed sound power level L_{WA}	104	dB(A)
Measured noise level at operator platform with ROPS roll-over bar	86	dB(A)
Electrical system		
Operating voltage	12	V

5.01.02 RD 18-100

Designation	Value	Unit
Dimensions and weights		
Basic weight without ROPS roll-over bar	1510	kg
Operating weight with ROPS roll-over bar	1670	kg
Axle load front / rear	815 / 855	kg
Working width / max. Working width	1056 / 1056	mm
Turning radius inside / outside	2130 / 3165	mm
Diesel engine		
Supplier	Kubota	
Type	D1005	
Number of cylinders	3	
Power (ISO 14396) / rated speed	14.8 / 2700	kW / rpm
Emission level EU / USA	– / Tier 4	
Transmission		
Working gear speed	0-11.0 / (0-6.8)	km/h / (mph)
Climbing ability, vibration on / off	30 / 40	%
Max. longitudinal gradient allowed	20	°
Max. transverse gradient allowed	20	°
Vibration		
Vibration	front / back	
Frequency / speed	65 / 3900	Hz / rpm
Maximum amplitude	0.45	mm
Steering		
Steering angle to both sides	33	°
Pendulum compensation upwards and downwards	8	°
Capacities		
Fuel	33.00	l
Engine oil (for oil change)	5.10	l
Coolant of diesel engine	6.10	l
Hydraulic oil	26.00	l
Water sprinkling	70.00	l
Noise data		
Guaranteed sound power level L_{WA}	104	dB(A)
Measured noise level at operator platform with ROPS roll-over bar	86	dB(A)
Electrical system		
Operating voltage	12	V

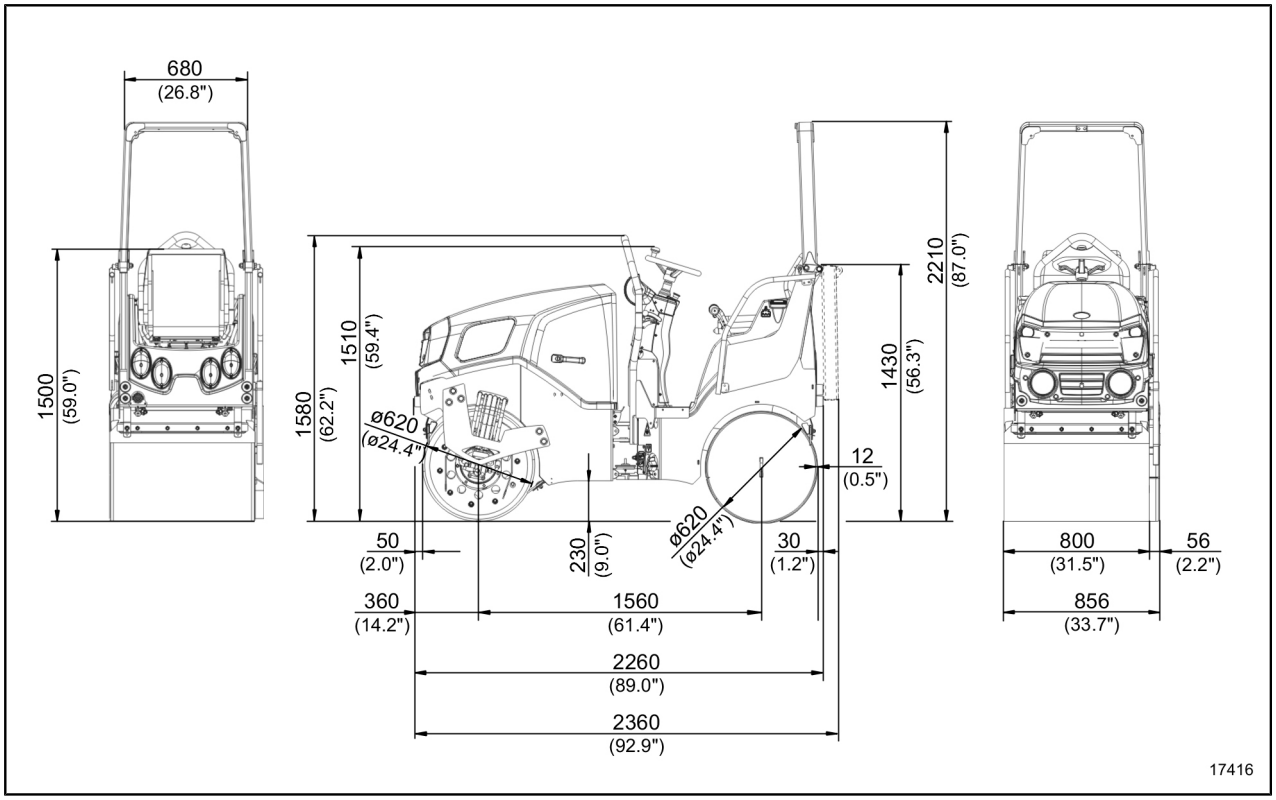
5.01.03 18-100 C

Designation	Value	Unit
Dimensions and weights		
Basic weight without ROPS roll-over bar	1470	kg
Operating weight with ROPS roll-over bar	1630	kg
Axle load front / rear	805 / 825	kg
Wheel load per tyre	206.25	kg
Working width / max. Working width	1000 / 1000	mm
Turning radius inside / outside	2130 / 3165	mm
Diesel engine		
Supplier	Kubota	
Type	D1005	
Number of cylinders	3	
Power (ISO 14396) / rated speed	14.8 / 2700	kW / rpm
Emission level EU / USA	– / Tier 4	
Transmission		
Working gear speed	0-11.0 / (0-6.8)	km/h / (mph)
Climbing ability, vibration on / off	30 / 40	%
Max. longitudinal gradient allowed	20	°
Max. transverse gradient allowed	20	°
Tyres		
Tyre size	205/60-R15	
Number of tyres rear	4	items
Weight of tyres	30	kg
Air pressure	0.3 / (3.0) / [44]	MPa / (bar) / [psi]
Tightening torque, wheel nut	170	Nm
Vibration		
Vibration	front	
Frequency / speed	65 / 3900	Hz / rpm
Maximum amplitude	0.45	mm
Steering		
Steering angle to both sides	33	°
Pendulum compensation upwards and downwards	8	°

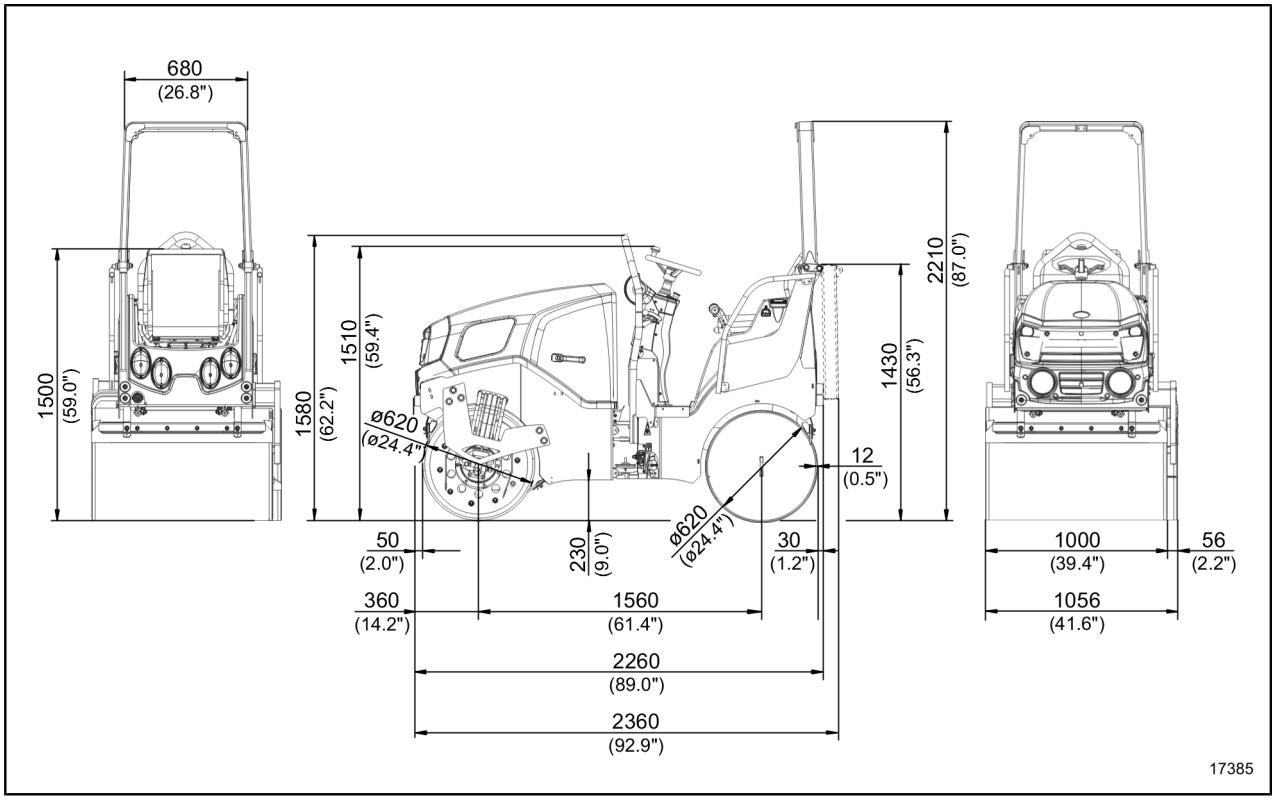
Designation	Value	Unit
Capacities		
Fuel	33.00	l
Engine oil (for oil change)	5.10	l
Coolant of diesel engine	6.10	l
Hydraulic oil	26.00	l
Water sprinkling	70.00	l
Additive sprinkling	9	l
Noise data		
Guaranteed sound power level L_{WA}	104	dB(A)
Measured noise level at operator platform with ROPS roll-over bar	86	dB(A)
Electrical system		
Operating voltage	12	V

5.02 Dimension sheet

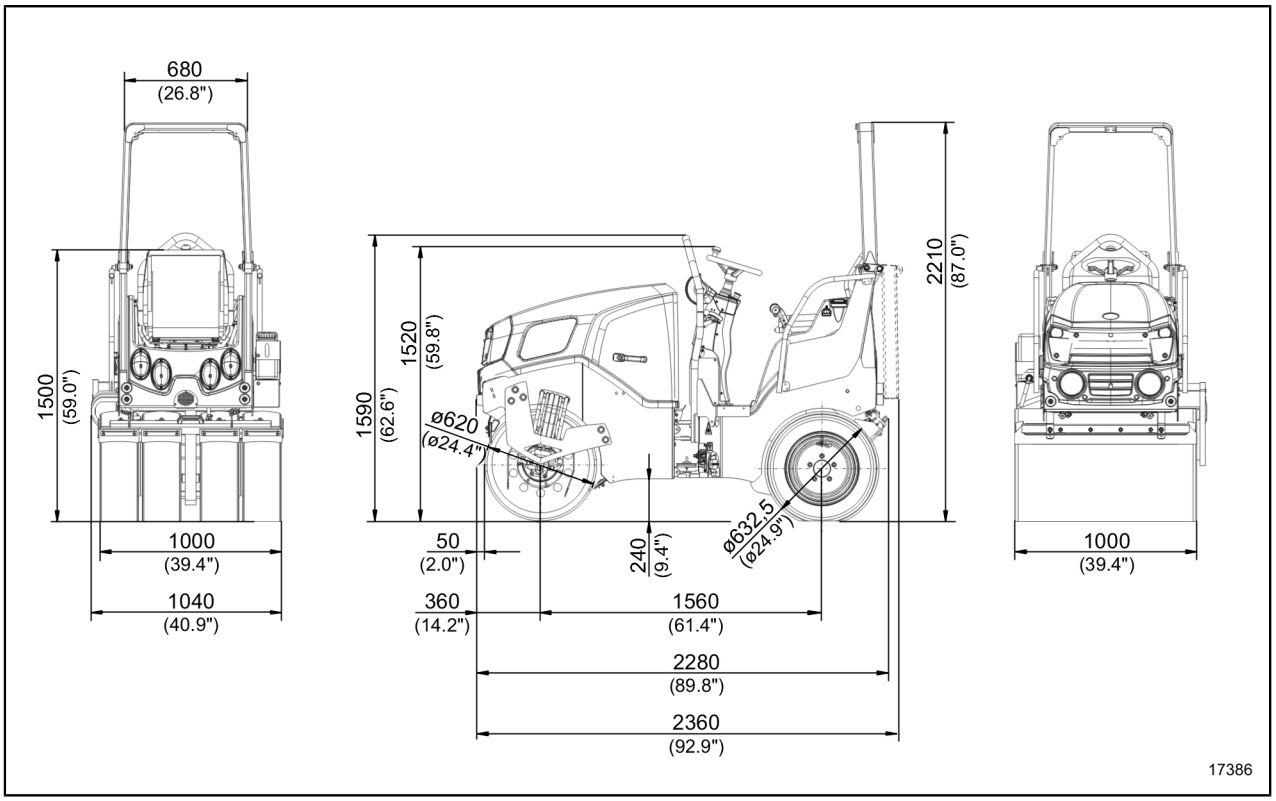
5.02.01 RD 18-80



5.02.02 RD 18-100



5.02.03 18-100 C



5.03 Fuses

⚠ WARNING

Fire hazard if fuses are not inserted correctly!

- Insert only specified fuses (no fuses with a higher amperage!).
- Do not install a bypass to the fuses.

Fuses

Position	Fuse assignment	Fuse
F01	Main fuse on the battery	80 A
F1	Unoccupied	
F2	Time relay cold start assistance	1 A
F3	Drum edge lighting	15 A
F4	Driving light, left	10 A
F5	Driving light, right	10 A
F6	Reversing lights	15 A
F7	*Working spotlight	15 A
F8	Pilot light, cold start assistance	5 A
F9	Unoccupied	
F10	Pedal switch sprinkling	15 A
F11	*Pedal switch additive sprinkling	15 A
F12	Unoccupied	
F13	Socket	15 A
F14	Horn	15 A
F15	*Additive sprinkling pump	15 A
F16	Water irrigation pump	15 A
F17	*Rotating light	15 A
FT	Header for fuse test	

The green light-emitted diode (LED) lights up when the fuse is functional.

5.04 Diagnostic Code

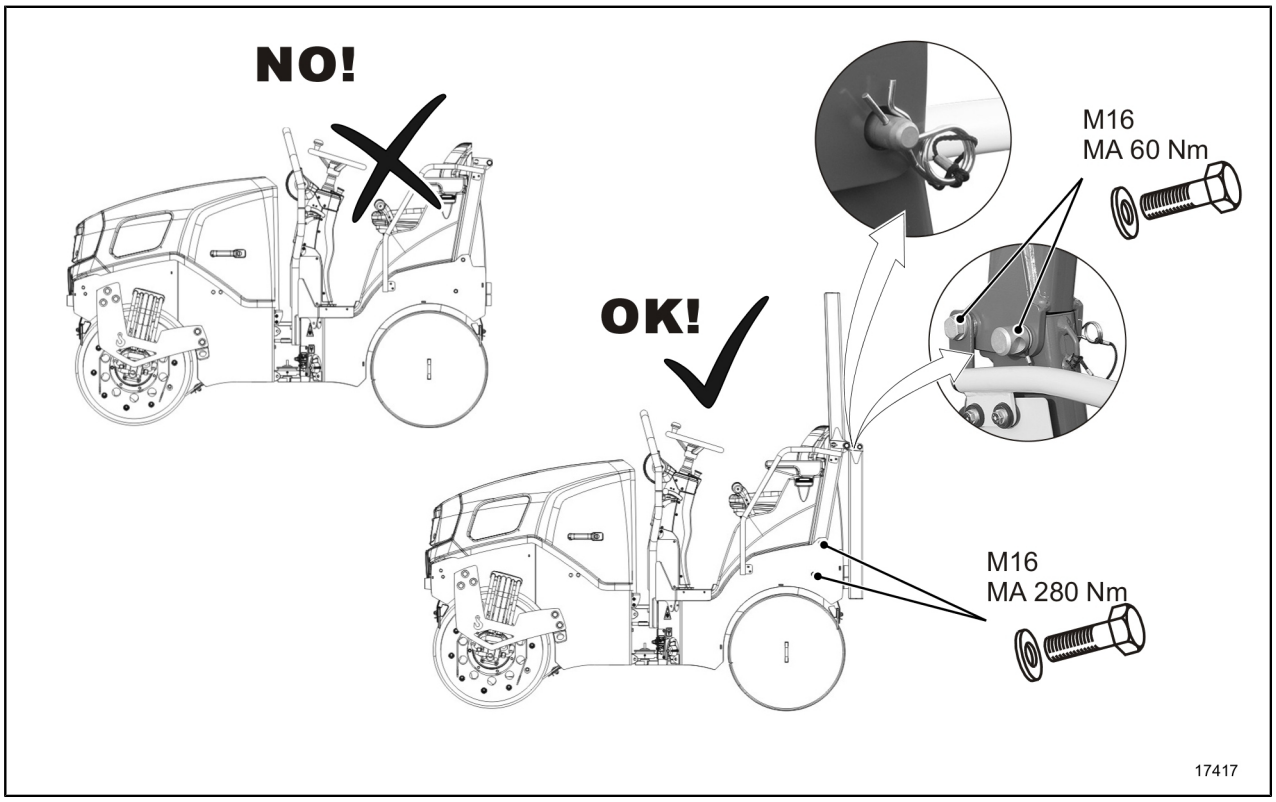
Code No.:	Component	Cause
00		No malfunction
01	Reversing lights	Short-circuit
03	*Working spotlights left	Short-circuit
05	*Working spotlights right	Short-circuit
07	*Lighting roller drum	Short-circuit
09	*Additive sprinkling pump	Short-circuit
11	Driving light, left	Short-circuit
13	Driving light, right	Short-circuit
18	Solenoid valve rear vibration or Solenoid valve amplitude	Short-circuit, line break
19	Solenoid valve vibration rear	Short-circuit, line break
21	Solenoid valve EMERGENCY STOP or Solenoid valve vibration front	Short-circuit, line break
22	Solenoid valve EMERGENCY STOP	Short-circuit, line break
23	Solenoid valve vibration front	Short-circuit, line break
26	*Rotating light	Short-circuit
27	Water irrigation pump	Line rupture
28	Water irrigation pump	Short-circuit
29	Alternator	Short-circuit, line break
30	Parking light	Short-circuit

6 ASSEMBLY INSTRUCTIONS AND AUXILIARY DEVICES

Please also consider the parts included in the scope of supply. They may be different from the parts list content indicated here due to further developments in the product.

6.00 Instructions for installation and retrofitting

6.00.01 Safety device ROPS roll-over bar



General The ROPS roll-over bar is a safety device in the case the machine tilts or rolls over. It avoids that the driver is crushed to death based on the high self-weight of the machine. In case the ROPS roll-over bar was dismounted (from the machine) due to transport or repair reasons, the ROPS roll-over bar needs to be remounted according to instructions prior to operating the machine again.

Assembly instructions ROPS roll-over bar

⚠ WARNING

High self-weight of machine!

If the machine overturns backwards, forwards or sideways there is a danger of serious injuries or death.

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

Assembly

1. Use appropriate lifting devices and hoisting equipment. Observe weight (see type plate of ROPS safety device).
2. Lift ROPS roll-over bar onto platform and align with fixing holes.
3. Screw ROPS roll-over bar with operator platform. Apply the specified tightening torque (see fig.).
4. With a ROPS design (hinged): Fold up the upper bar component, and screw into place with locking bolts. Apply the specified tightening torque (see fig.).

Visual test

The machine frame in way of the ROPS mounting may not be distorted, bent or torn (deformed).

The reinforcement elements of the ROPS roll-over bar must not show rust, damage, fissures or open fractures.

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

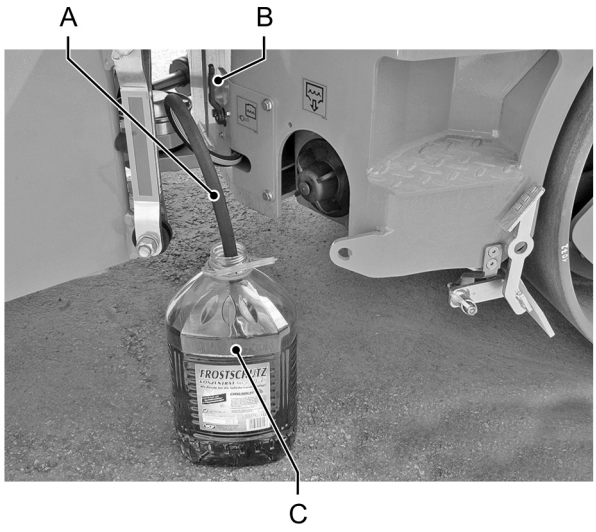
It is absolutely forbidden to modify or repair / level the reinforcement elements in any way.

6.01 *Injection of antifreeze for the sprinkler

General During the part of the year in which there is a danger of frost at night, the sprinkling system pipes can be filled with an antifreeze solution. This prevents the system from being damaged by frost.

6.01.01 Overview

Anti-freeze compound injection

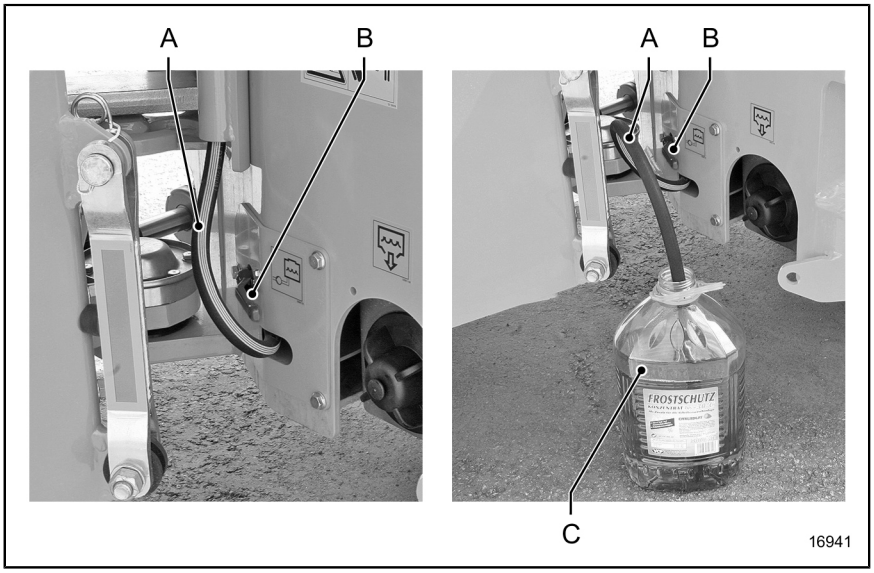


[A] Injection hose
[B] Change-over valve
[C] Vessel for antifreeze solution

6.01.02 Operation

General We recommend filling the piping system with a commercially available antifreeze solution for windscreen washing systems. The mixing ratio with water must be matched to the expected temperatures.

Fill the piping system



1. Shut down the diesel engine.
2. Switch the sprinkler to spray nozzle control when the machine is at a standstill.
3. Take the injection hose [A] out of its holder, and clean the end of the hose if necessary.
4. Insert the injection hose into the container [C] containing antifreeze solution.
5. Set the switchover valve [B] to antifreeze injection (lever horizontal).
6. Fill the piping system until the antifreeze solution exudes out of all the spray nozzles.
7. Switch off the sprinkler.
8. Switch off the electrical system, and remove the ignition key.
9. Put the injection hose [A] back in its holder.
10. Set the switchover valve [B] to sprinkle (lever vertical).

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