

INSTRUCTION MANUAL

Tandem roller HD 13 / HD 14

H201 Series	0001 Valid from serial no.
01.04.2010 Date of first issue	
2137992 Order number	en Language



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Name of the document 2137992_04_BAL_HD 13_HD 14_H201_en
Original instruction manual

SMC document version 1444651898976_H201_10

Date of first issue 01.04.2010

Date of change 19.02.2016

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This instruction manual is valid for the following roller types:

TANDEM ROLLER HD 13 VV
 HD 13 VO
 HD 14 VV
 HD 14 VO

COMBINATION ROLLER HD 13 VT
 HD 14 VT

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1 GENERAL



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

000-01

1.00 Introduction

1.00.01 Preface to the instruction manual

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

This instruction manual helps you:

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

Adhering to this instruction 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 instruction manual, the instructions given in the safety instructions, 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. All the components of this machine have 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 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 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 instruction manual are intended for the operating personnel. Thus, keep this manual always at hand!

1.00.03 Warranty

No guarantee claims with:

- Operating errors.
- In the case the spare parts used are no original 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 manufacturer.
- In the case of deficient maintenance.
- In the case of any processes that conflict with this instruction manual.

1.00.04 Modifications / reservations

We are committed to provide you with correct and updated instruction 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 how it is operated 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 yourself for any damage upon reception of your goods. In the case of damage, the devices must not be put into operation. Damaged 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 instruction manual are to help you use this instruction manual and the device in a safe and fast manner.

Note  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.

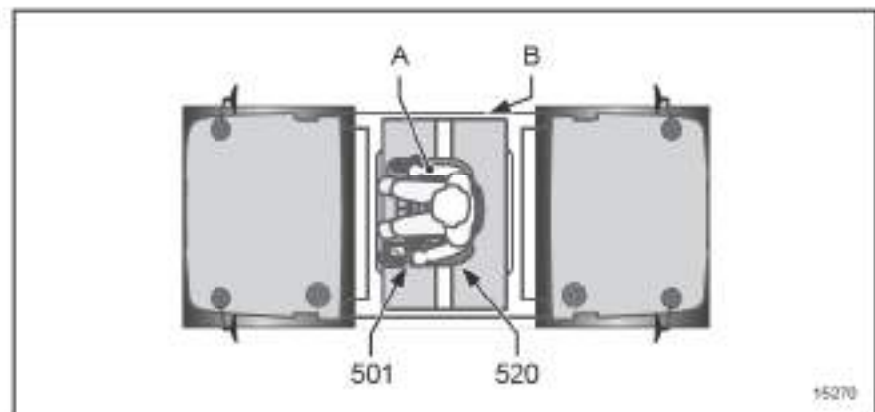
Directions Information on directions contained in these instructions such as left or right and/or front or rear always refer to the directions of the machine driving forwards.

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

Example: (see page 134 sqq.)

Positioning of illustrations The positions of illustrations are represented with letters and numbers. The items marked with letters in alphabetical order, are only explained in the associated text section, each of which starts anew for every single description. The items 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 52 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 any difficulty 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 driving direction and 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.

001-01

▲ WARNING

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

002-01

▲ CAUTION

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

003-01

NOTICE

Refers to a situation that may cause property damage.

004-01



1.01 Documentation

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

The entire instruction manual consists of:

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

The entire instruction 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 and understood this instruction manual. In case you do not understand this instruction manual or individual parts, please ask us prior to starting these activities. The instruction manual includes valuable information in order to operate the machine safely, appropriately and economically.

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 foreseeable misuse or residual risks without restricting the machine's intended functionality.

The machine's intended use is:

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

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

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

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

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

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

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

1.02.02 Abnormal use

Any abnormal use or any misuse of the machine will void the manufacturer's warranty obligation, and the owner will bear the sole responsibility in this case.

Abnormal uses shall be deemed to include:

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

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

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

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

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

The machine may cause risk to the environment 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 144](#) 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).

002-02

**Extensive ambient
temperature, extensive
height**

See instruction 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.

Electrical / electronic system / battery Electrical / electronic 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 EC conformity



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

000-45

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



The pictogram represents the machine's conformity with relevant EU Directives. The CE mark of the machine is part of the type plate.



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

EC declaration of conformity



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



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: 0515¹

measured L_{WA} [dB(A)]:

guaranteed L_{WA} [dB(A)]:

Power [kW/min⁻¹]:

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

Applied harmonised standards, in particular:

- EN 500-1:2006+A1:2009: Mobile road construction machinery - Safety
Part 1: Common requirements
- EN 500-4:2011: Mobile road construction machinery - Safety
Part 4: Specific requirements for compaction machines
- EN 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 Zertifizierungsinstitut, Fachbereich Baumaschinen - Landsberger Straße 309 - D-80687 München (Germany)

1.06 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.

000-45

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 43](#)).





The VIN [E] indicates the type series and the serial number of the machine e.g. H2001234.

The first four characters represent the type series (H200), the following characters the serial number of this type series (1234).

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 auxiliary devices at the same time and approved by the manufacturer (e.g., chip spreader).

No additional ballasting is allowed.

 HAMM		
Homologation	[A]	
Designation	[B]	
Type	[C]	Year of construction [D]
Chassis No. / Serial No.	[E]	Leergewicht / Basic Weight [G] kg
Motorleistung / Engine Power [F]	kW/min ⁻¹	Betriebsgewicht / Operating Weight [H] kg
Max. Betriebsgewicht / Maximum Operating Weight	[J]	kg
Zul. Gesamtgewicht STVZO / Admissible total Weight STVZO	[K]	kg
Zul. Achslast vorne / hinten STVZO / Admissible axle load front / rear STVZO	[L]	kg
Hersteller: HAMM AG – Hammsstraße 1 – D – 95643 Tirschenreuth – Germany Made in Germany		

17961

- | | |
|---|--|
| [A] Homologation (for example the registration number for driving 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 44](#)).

HAMM	
Gültig für Baureihe / Typ Valid for Series / Type [A]	
ROPS Part 1 [B]	ROPS SN 1 [D]
ROPS Part 2 [C]	ROPS SN 2 [E]
FOPS Ident. Nr. FOPS Part No. [F]	Baujahr Year of Manufacture [G]
Geprüft bis Max. Betriebsgewicht Tested to Maximum Operating Weight [H] kg	
DIN EN ISO 3471:2010 DIN EN ISO 5449:2004	
Hersteller: HAMM AG Hamnstraße 1 – D – 95643 Tirschenreuth – Germany	

17956

[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.

Für Fz. Ident. Nr. For Serial No.	(A)	
Hersteller Motor Manufacturer Engine	(B)	
Ident. Nr. Motor Serial No. Engine	(D)	
Typgenehmigung Nr. Type Approval No.	(E)	
Abgasstufe EU / USA Emission Standards EC / USA	(F)	
Abgasnachbehandlung Exhaust gas aftertreatment	(G)	

17957

[A]	Vehicle identification number	[B]	Engine Supplier
[C]	Type	[D]	Engine identification number
[E]	Number of the type approval	[F]	Emission level EU / USA
[G]	Exhaust gas after-treatment		

1.07 Noise and vibration requirements

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

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

Sound power level **Sound indication of the machine**

The guaranteed sound power level is specified in the machine's Technical Details ([see page 148](#) sqq.).

Sound intensity level **Sound indication on operator panel**

The sound intensity level on the driver's seat is specified in the machine's Technical Details ([see page 148](#) sqq.) (measurement inaccuracy according to EN ISO 11201).



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

Vibration indication on the operator panel **Whole body vibration**

The rms values of the acceleration (which have been assessed according to EN 1032) with whole body vibrations on the driver's seat of $a_w = 0.5 \text{ m/s}^2$ are not exceeded.

Hand arm vibrations

The rms values of the acceleration (which have been assessed according to EN 1032) with hand arm vibrations of $a_{hw} = 2.5 \text{ m/s}^2$ are not exceeded.

1.08 Personnel

1.08.01 Qualification and duties

Operating personnel All activities at the machine must be carried out by authorised operating personnel only. In this instruction manual the term operating personnel refers to all authorised persons that are responsible for operating, maintaining, installing, 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.

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

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

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).

1.09 General safety instructions

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

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

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

Electrical system During 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.

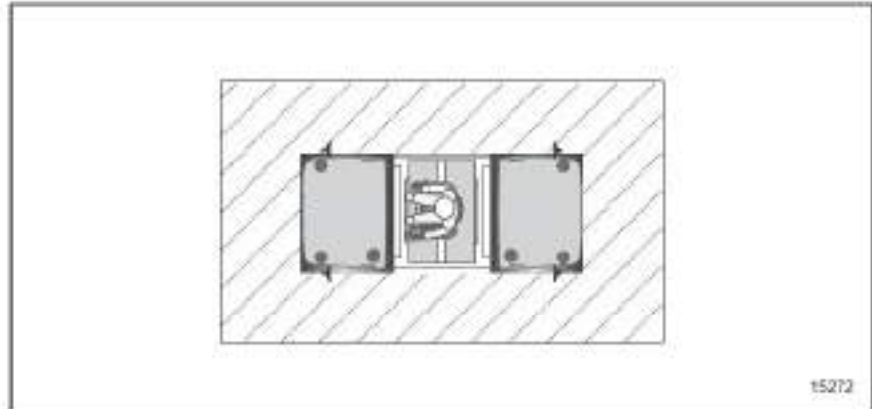
ROPS roll-over protection The machine frame in way of the ROPS mounting may not be distorted, bent or torn (deformed). The reinforcement elements of the cabin / roll-over bar must not show rust, damage, fissures or open fractures. All screwed connections of the reinforcement elements must comply with 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 165](#) sqq.).

1.10 Danger zone



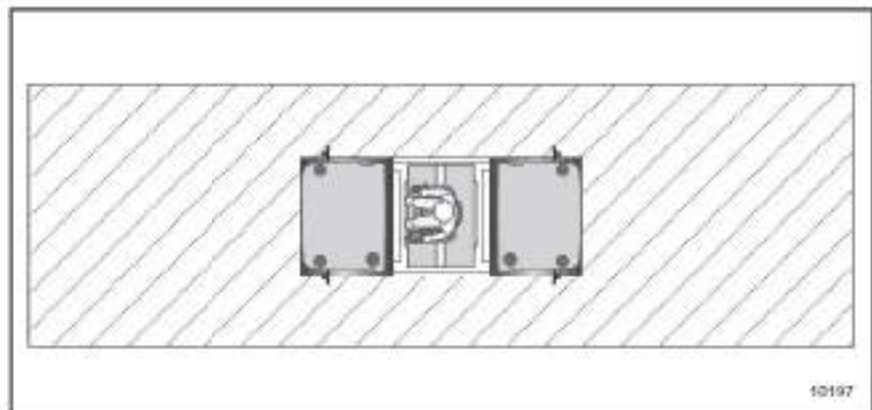
The machine's danger zone is divided into the areas inactive and moving.

Zone "inactive"



If the machine is at a standstill and the diesel engine is switched off, the danger zone is defined as the area within 1 metre from the machine. No entry is allowed to the danger zone unless to operating personnel.

Zone "moving"



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

13 metres In front of and in the rear of the machine

3 metres To the left and right of the machine

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

1.11 Loading and transporting

Regulations and Provisions When loading rollers onto lorries, trailers or semitrailers, it is obligatory to secure the load properly.

The laws, regulations, guidelines and standards applicable at the place of use must be observed. 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.

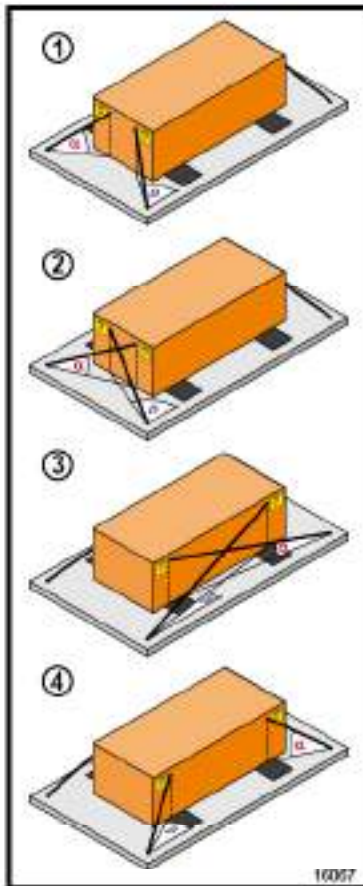
Sufficient knowledge about the loading of vehicles as well as about their behaviour under load are required for loading and transporting the machine. The machine may only be loaded by trained loading staff. The machine must be fixed or stowed in transport-safe way to the vehicle by an form-locked or 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:

- Adhere to section Transport as specified in the safety instructions.
- Observe weight and dimensions ([see page 148](#) 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 $\mu \geq 0.6$, e.g. by use of anti-slide mats.
- 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.

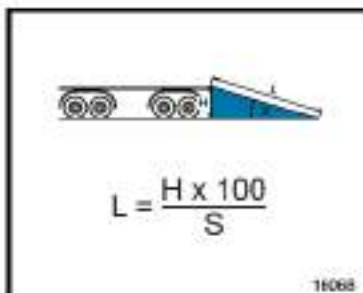
Load securing Special notes



- Variant ① and variant ② may be combined. The lashing devices must not necessarily be arranged crosswise.
- Do not use any lashing device unless it is of sufficient dimension, bears the corresponding marking, and has been subjected to a valid inspection.
- Lash the machine with appropriate lashing devices onto the loading area, using only the marked lashing 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 chart).
- 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 $\mu \geq 0.6$) under every roller drum / tyre.



Maximum permissible ramp slope: see loading chart

[L] Ramp length (mm)

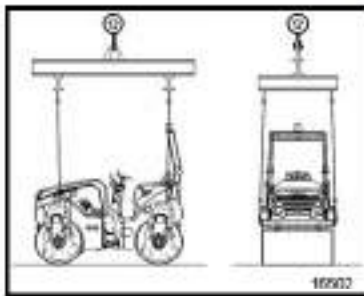
[H] Difference in height (mm)

[S] Ramp slope (%)



Make certain to use a proper load distribution plan.

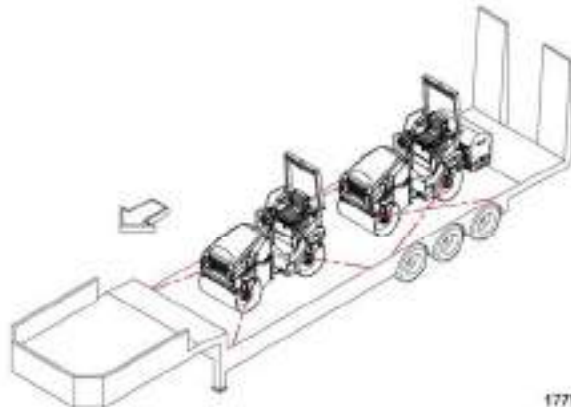
[☉] Center of gravity

Crane loading **Special notes**

- The crane vehicle must be positioned on flat ground providing the bearing capacity required while observing all relevant safety regulations.
- The crane's load table must correspond to the weight and the centre of gravity of the machine to be lifted.
- Take suitable precautions to block access to the lifting area in order to prevent any person from moving or staying within the danger zone.
- Hoisting gears may only be attached to the appropriate lifting lugs provided for them.
- Observe the lifting capacity of the sling gear.
- Use lifting frames or spreader beams if necessary.

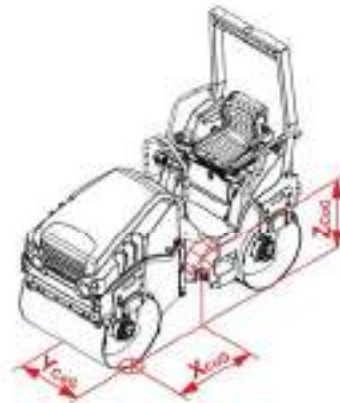
Loading chart

Diagram of the transport position

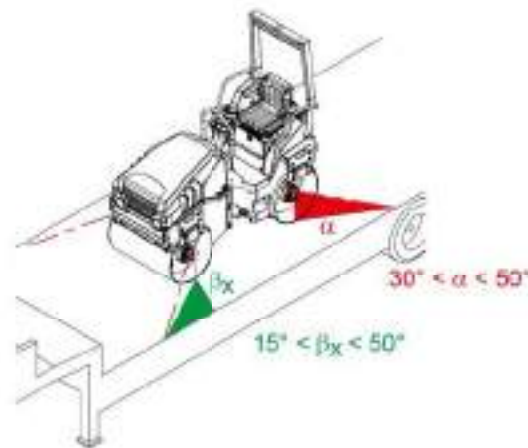


Lashing variant 1

Diagram of the centre of gravity specifications:



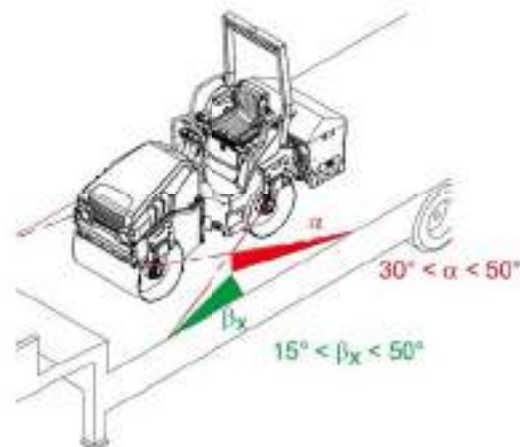
17758



17759

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

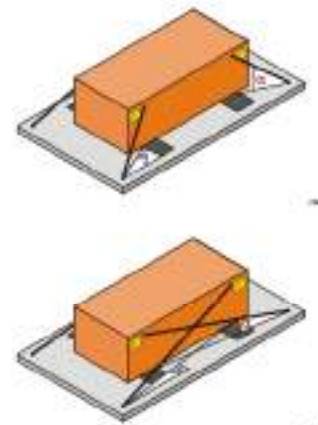
Lashing variant 2



17760

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

Machine parameters	
Weight of machine [t]	1.5 t < m < 5.7 t
Area of center of gravity [mm]	X _{CoG} = 778 - 1048 Y _{CoG} = 428 - 753 Z _{CoG} = 650 - 1030
Identification reference point:	Centre drum, front left
Interface parameters:	
Type of contact:	Non-skid material
Frictional force [μ]:	0.6
Heavy load capacity:	yes
Contact points:	under contact pair
Vertical lashing angle α :	$30^\circ < \alpha < 50^\circ$
Longitudinal, horizontal angle β_x :	$15^\circ < \beta_x < 40^\circ$



Specification of attachment points on the load:			
Tensile capacity of lashing point [daN]:	2000		
Marking of lashing point:	Symbol ISO 6405-1		
Number of lashing points:	4		
Specification of lashing points on the means of transport:			
Tensile capacity of lashing point [daN]:	≥ 2000		
Number of lashing points:	4		
Load securing equipment:			
Wedge blocks:	no	Quantity: 0	Miscellaneous:
Other types of blocking:	Positive blocking longitudinally / transversely to the direction of travel		
Lashing equipment capacity [daN]:	2000	Quantity: 4	Miscellaneous:
Recommended type of lashing equipment:	Chain (5/8 2200 daN), Belt (2000 daN) as an alternative		
Connecting pieces to the lashing point:	Hook with safety latch		



Specific safety instructions

- Drive the machine slowly onto the loading area in working speed, using the medium speed setting of the diesel engine (ECO or 2/3).
- Observe maximum permissible ramp slope (28.5 %, approx. 16°)
- Secure the clamping devices
- On rubber wheeled rollers with tyre filling system, the tyre filling system must be set to 0.6 MPa (6 bar, 87 psi).
- Check the inflation pressure at least every 24 hours and, if refill the air, if necessary.

Miscellaneous:

- Slot in the seat console, close the cabin doors

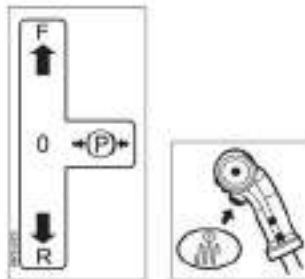
1.12 Stickers on the machine

You will find the precise arrangement of stickers in the spare parts catalogue.

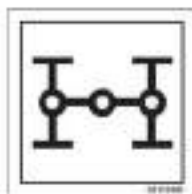
The safety manual contains the warning labels.

1.12.01 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



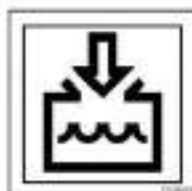
All-wheel lock



Engine speed



Water sprinkling



Water tank filling



Water tank outlet



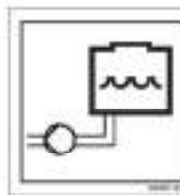
Additive sprinkling



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



Inflation pressure
Tyre with water filling



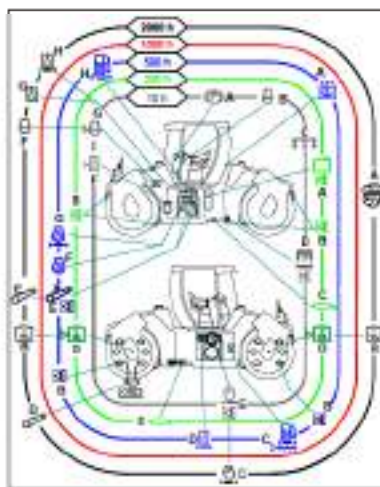
Guaranteed sound power level



First-aid kit



Expert inspection test badge



Maintenance overview

2 DESCRIPTION



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

000-01

2.00 Technical characteristics of the machine

Transmission Hydrostatic all-wheel drive

- Infinitely variable
- Single lever operation

Compaction system Dynamic oscillatory system due to vibration / oscillation

- Direct hydrostatic drive

Steering Hydrostatic assisted steering via articulated pendulum centre pivot steering

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

Track offset Mechanical track offset

- Infinitely variable
- Track offset to the right

Service brake During operation, the machine is braked with the hydrostatic drive.

- 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 actuation
- Interval automatic

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.

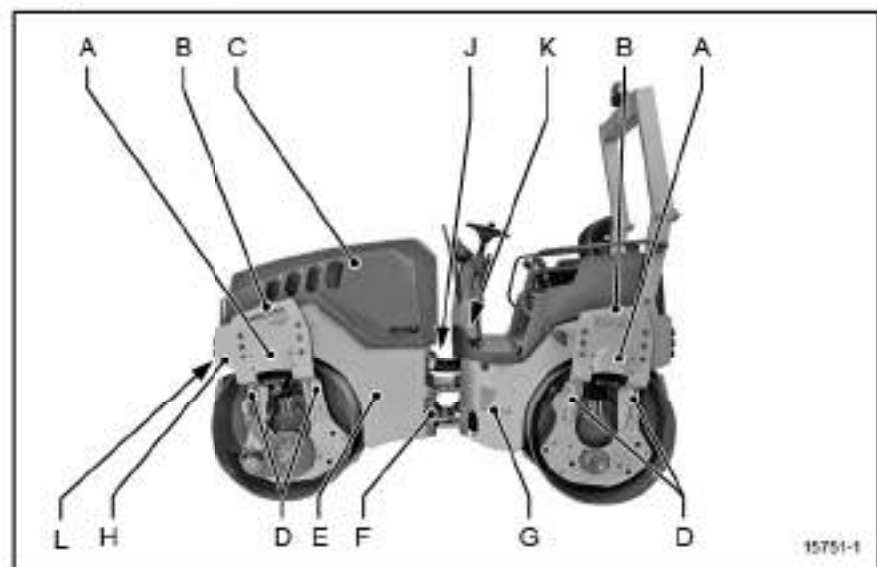
000-03



Please observe chapter 6, too. Here you find the description, operator control and maintenance of auxiliary equipment.

000-64

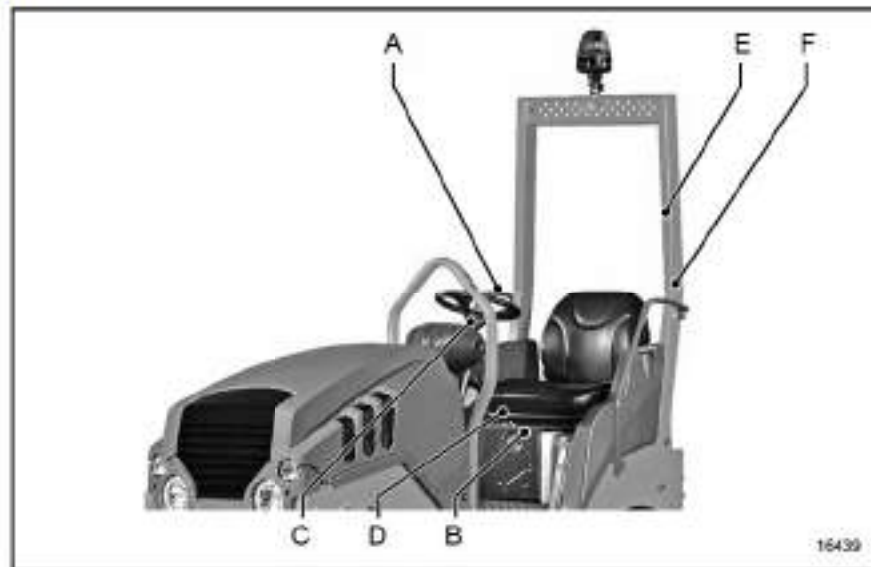
2.01.01 Chassis / safety devices



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

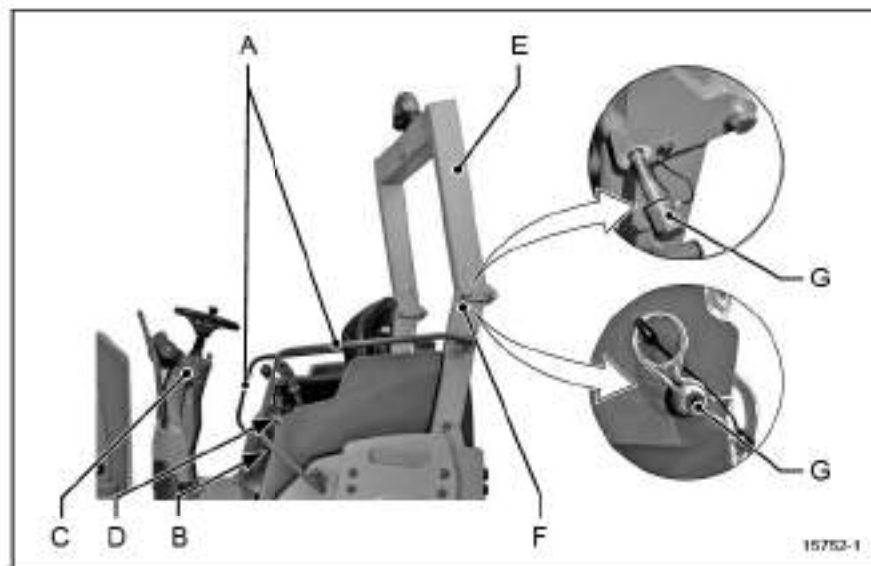
2.01.02 Control stand

ROPS roll-over bar (rigid)

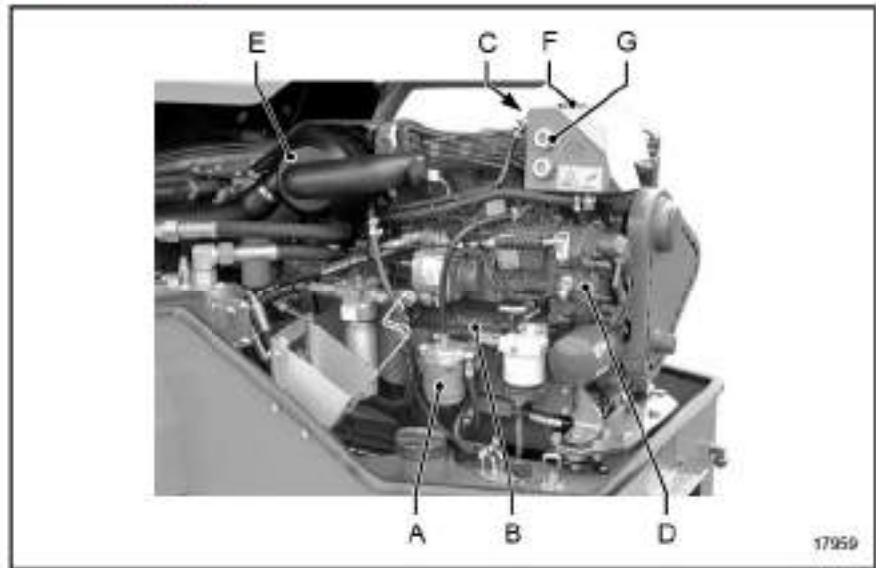


[A]	Handles	[B]	Stacker for operating manual / first aid kit
[C]	Steering column	[D]	Operator's seat console
[E]	Roll-over bar	[F]	ROPS roll-over bar type plate

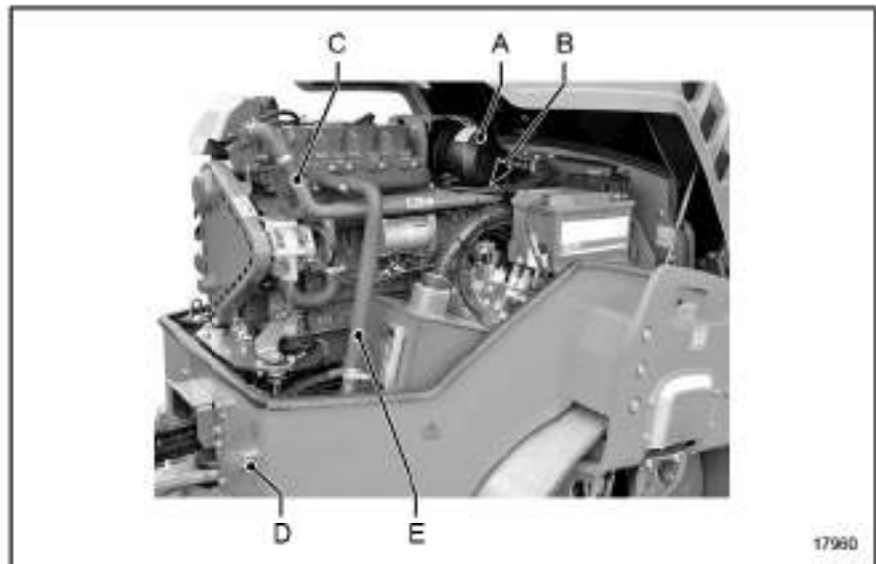
ROPS roll-over bar (folding)



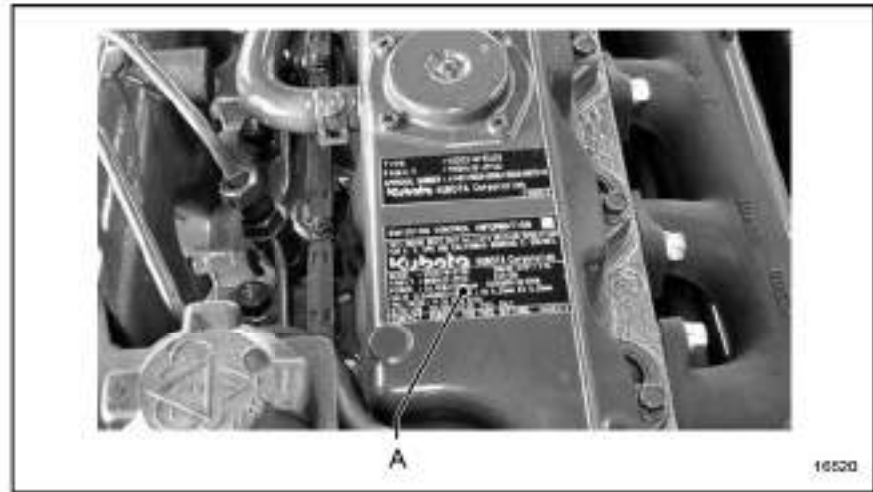
[A]	Handles	[B]	Stacker for operating manual / first aid kit
[C]	Steering column	[D]	Operator's seat console
[E]	Roll-over bar	[F]	ROPS roll-over bar type plate
[G]	Locking pin		

2.01.04 Drive unit / diesel engine


- | | | | |
|-----|-------------------------|-----|--------------------------------|
| [A] | Fuel system | [B] | Oil gauge stick |
| [C] | Oil inlet | [D] | Diesel engine with drive units |
| [E] | Air filter | [F] | Coolant inlet |
| [G] | Coolant level indicator | | |

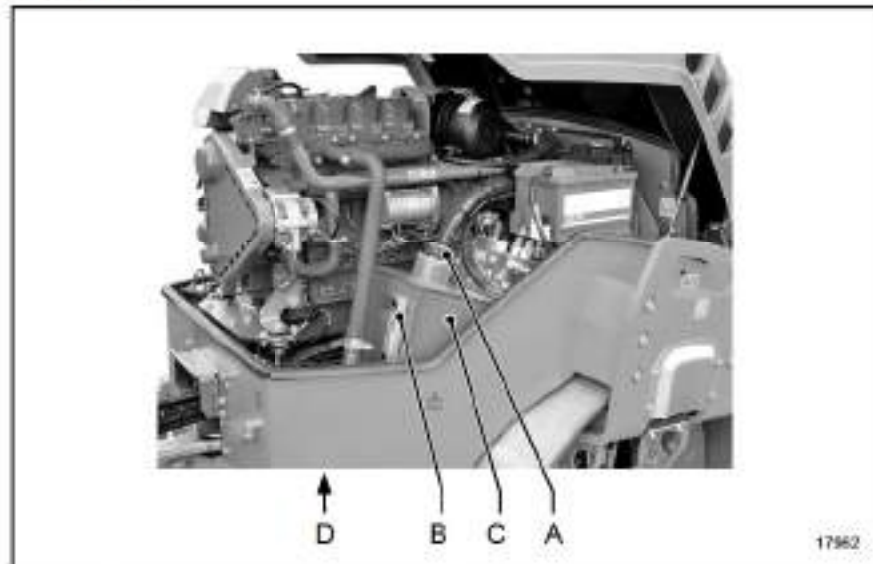


- | | | | |
|-----|----------------|-----|-------------------------|
| [A] | Air filter | [B] | Dust discharge valve |
| [C] | Cooling system | [D] | Diesel engine oil drain |
| [E] | Exhaust system | | |

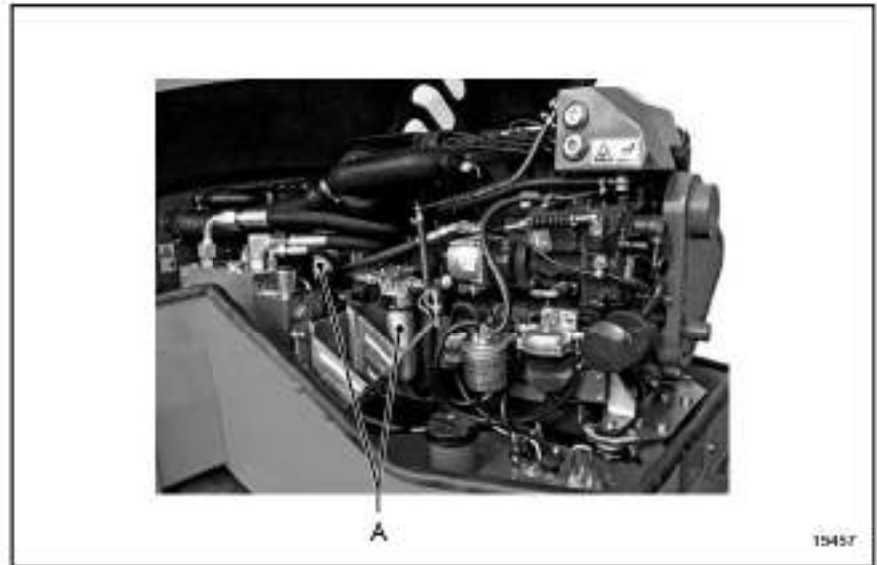


[A] Diesel engine type plate

2.01.05 Hydraulic oil supply



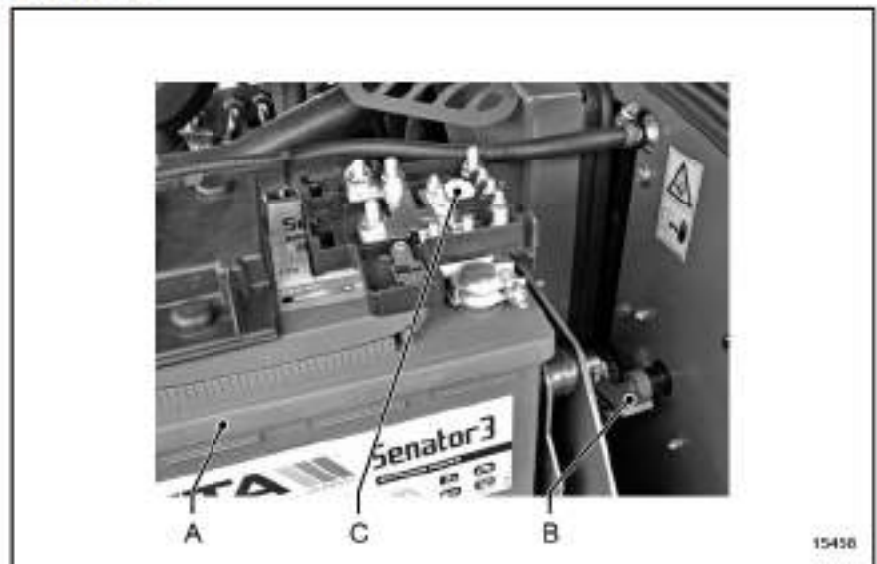
[A] Oil inlet	[B] Level indicator
[C] Hydraulic oil reservoir	[D] Oil outlet



[A] Hydraulic oil filter

2.01.06 Electrical equipment

Engine compartment

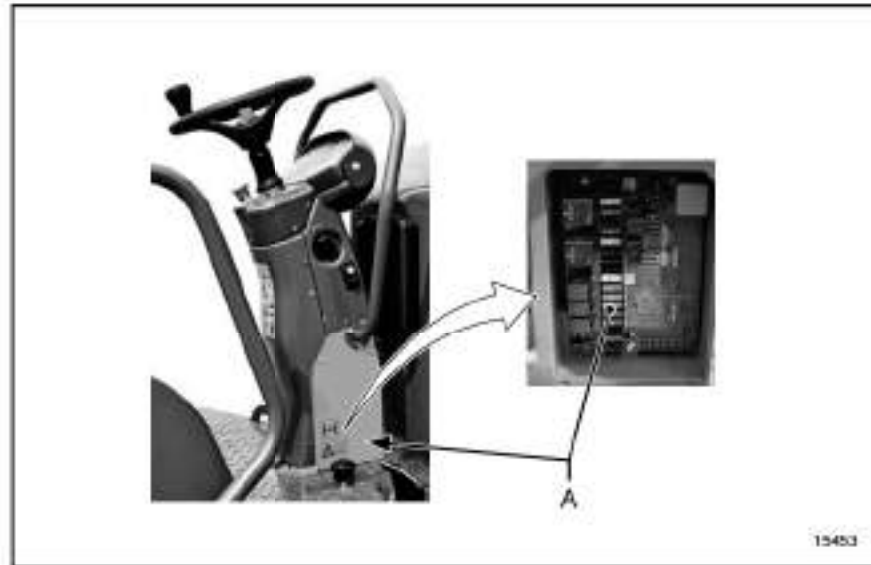


[A] Battery

[B] Battery isolating switch

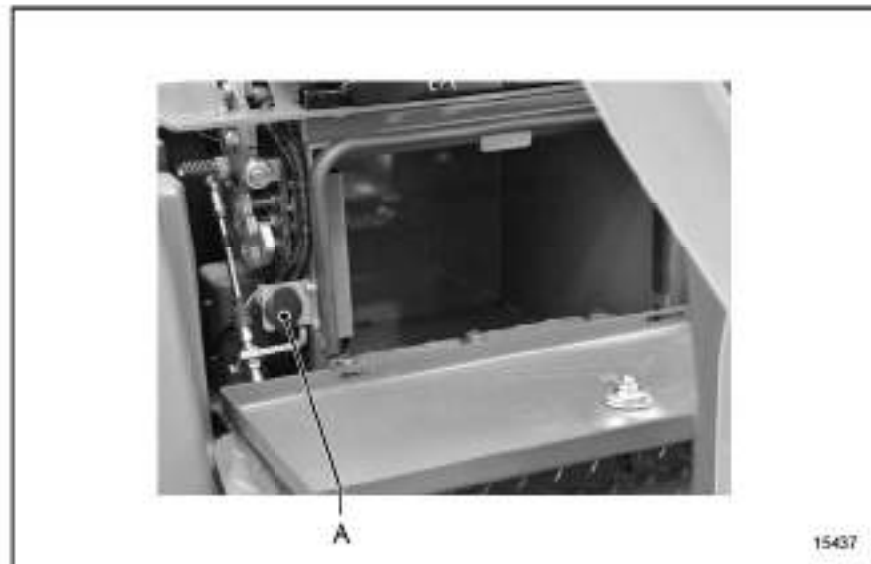
[C] Main fuse

Fuses



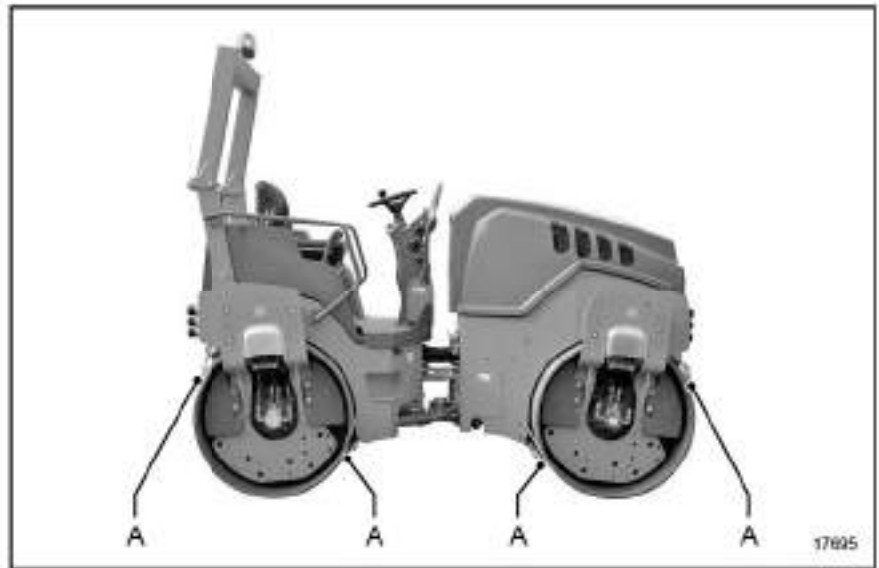
[A] Fuses

Socket



[A] Socket 12 V

2.01.08 Drive
Roller drum scraper



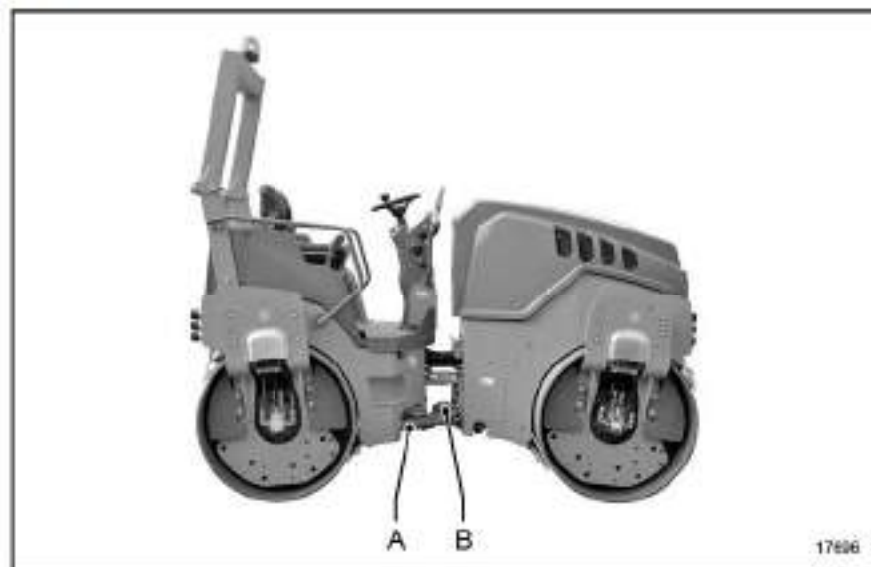
[A] Scraper

Scraper for roller drum and tyres



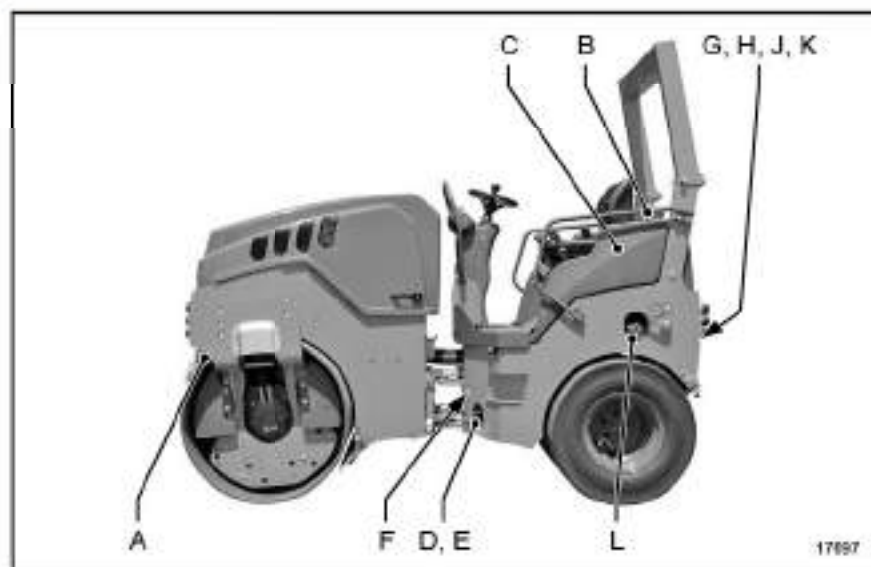
[A] Scraper

2.01.09 Steering system



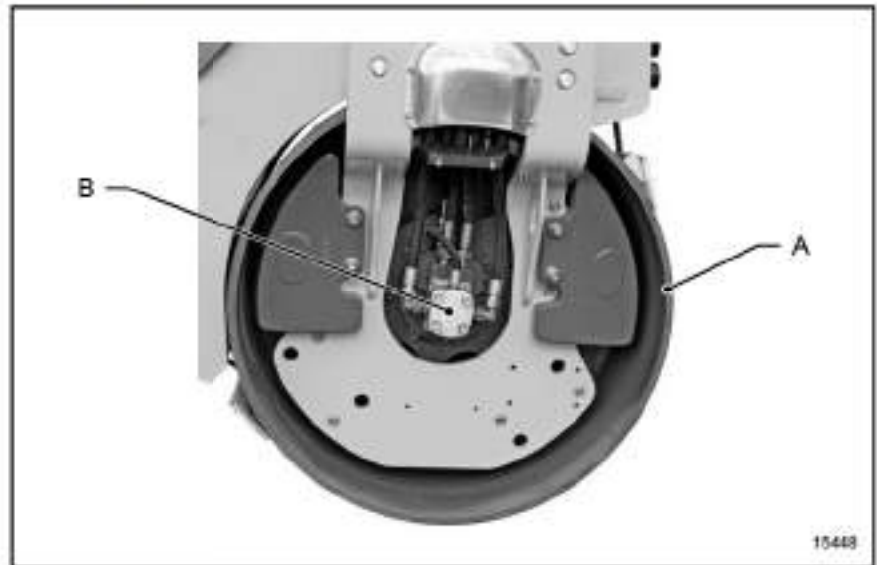
[A] Steering cylinder [B] Articulated pendulum joint

2.01.12 Water system



[A]	Sprinkling nozzles	[B]	Water tank filling
[C]	Water tank	[D]	Water outlet
[E]	Water filter	[F]	Water pump
[G]	Additive sprinkling nozzles	[H]	Additive tank
[J]	Additive sprinkling water pump	[K]	Additive tank outlet
[L]	Inlet additive tank		

2.01.26 Vibration / Oscillation



[A] Roller drum with vibra- [B] Vibration drive motor
tor

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.

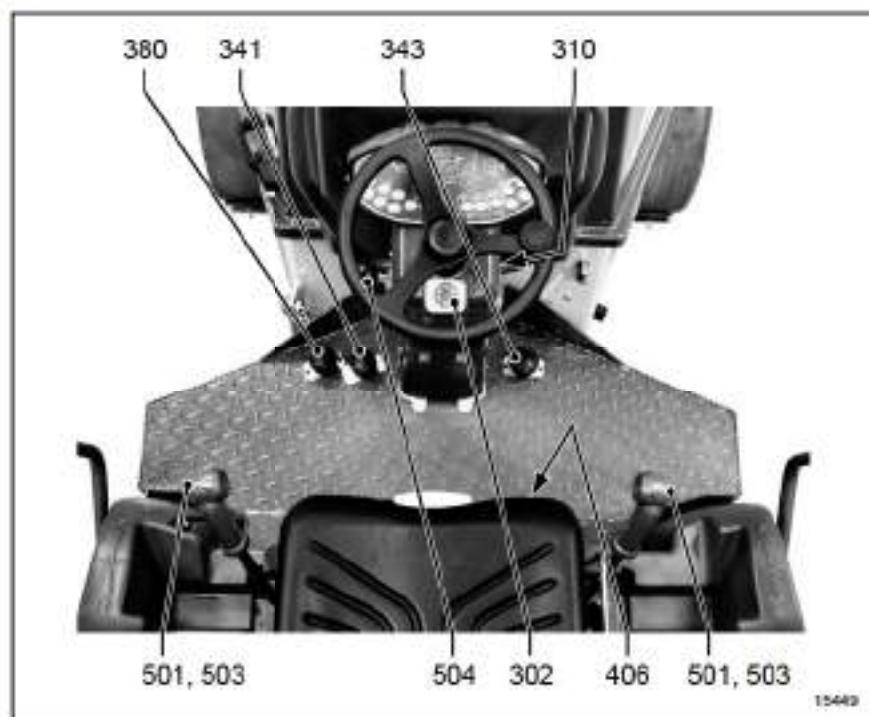
000-04



Please observe chapter 6, too. Here you find the description, operator control and maintenance of auxiliary equipment.

000-64

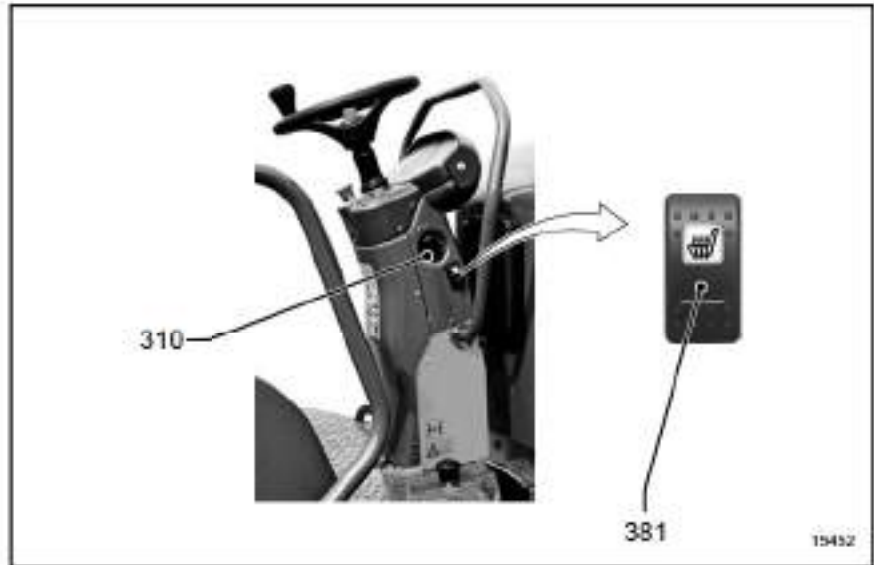
2.02.02 Control stand Operator's platform



[302]	EMERGENCY STOP switch	[310]	Switch electrical system / engine start
[*341]	Switch sprinkling	[*343]	Switch all-wheel lock
[*380]	Switch additive sprinkling	[406]	Socket 12 V
[501]	Driving lever	[503]	Multifunctional handle
[504]	Engine speed		



Steering column



[310] Switch electrical system / engine start

[*381] Switch seat heating

Driver's seat



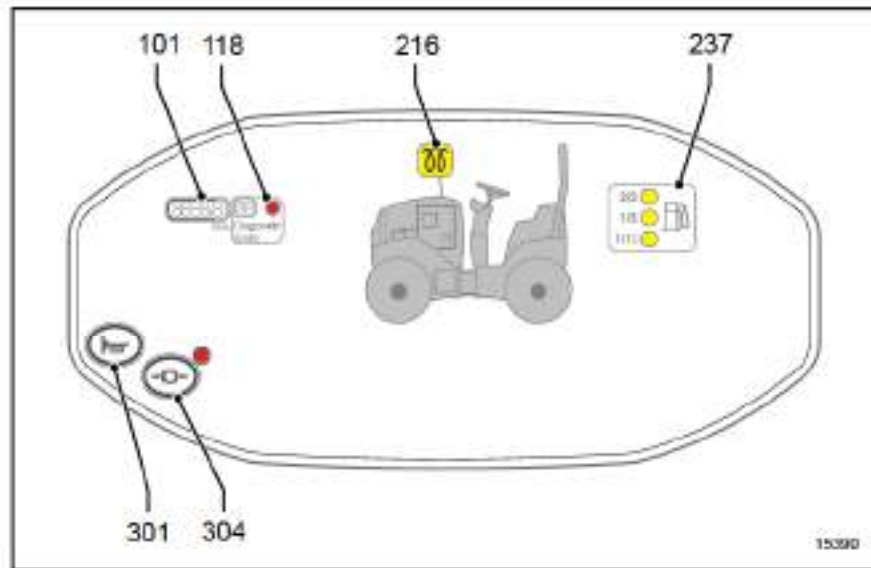
[520] Seat adjustment weight

[521] Seat adjustment forward - backward

[522] Seat adjustment back-rest

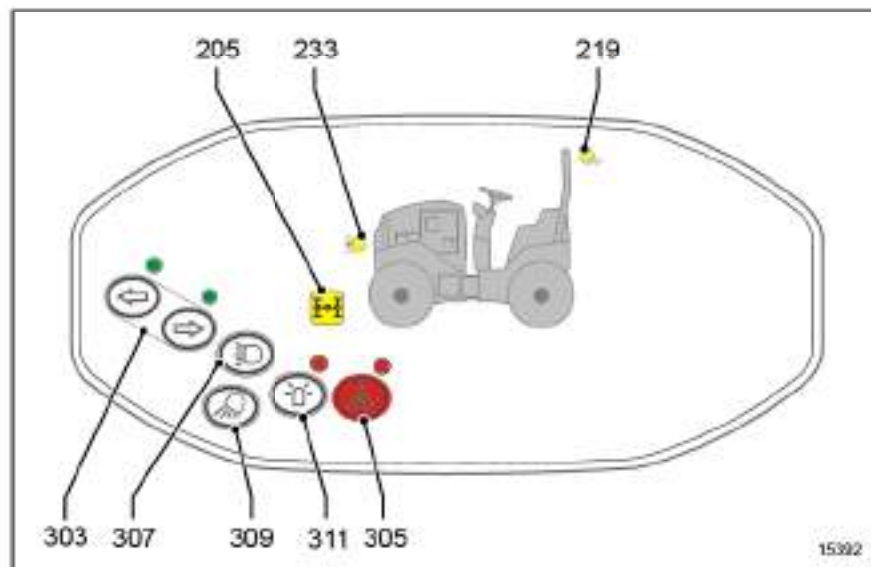
[525] Seat adjustment left - right

Normal mode control unit



- | | | | |
|-------|-----------------------------------|-------|--------------------------------|
| [101] | Indicator hourmeter | [118] | Indicator diagnostic code |
| [216] | Pilot light cold start assistance | [237] | Pilot light fuel filling level |
| [301] | Switch signal horn | [304] | Switch parking brake |

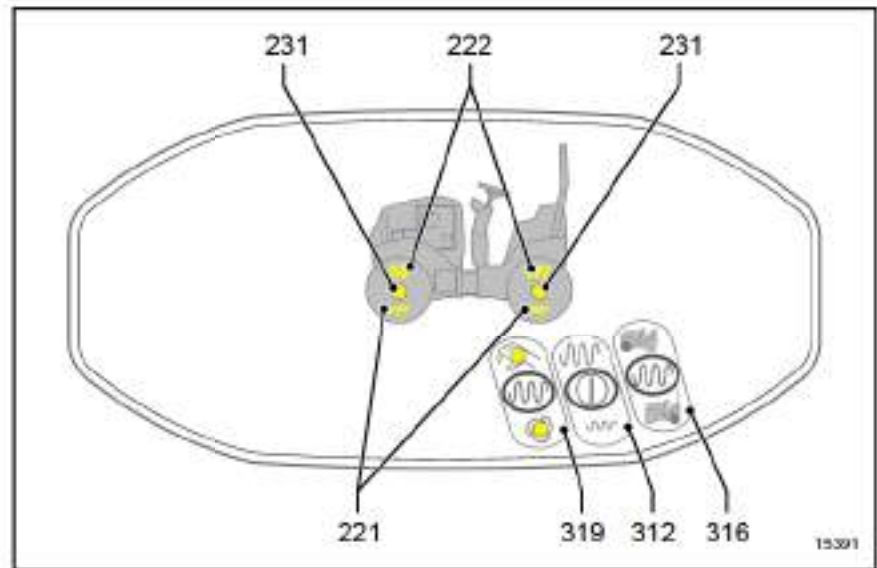
Driving control unit



- | | | | |
|--------|----------------------------|--------|--------------------------------|
| [*205] | Pilot light all-wheel lock | [*219] | Pilot light working spotlights |
| [*233] | Pilot light driving light | [*303] | Switch blinker |
| [*305] | Switch warning flasher | [*307] | Switch driving light |
| [*309] | Switch working spotlights | [*311] | Switch rotating light |

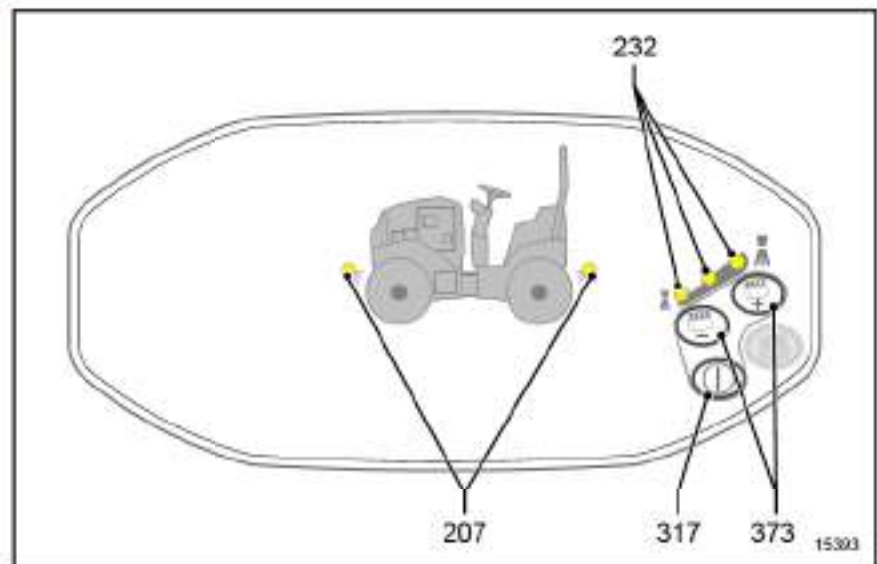


Control unit vibration / oscillation

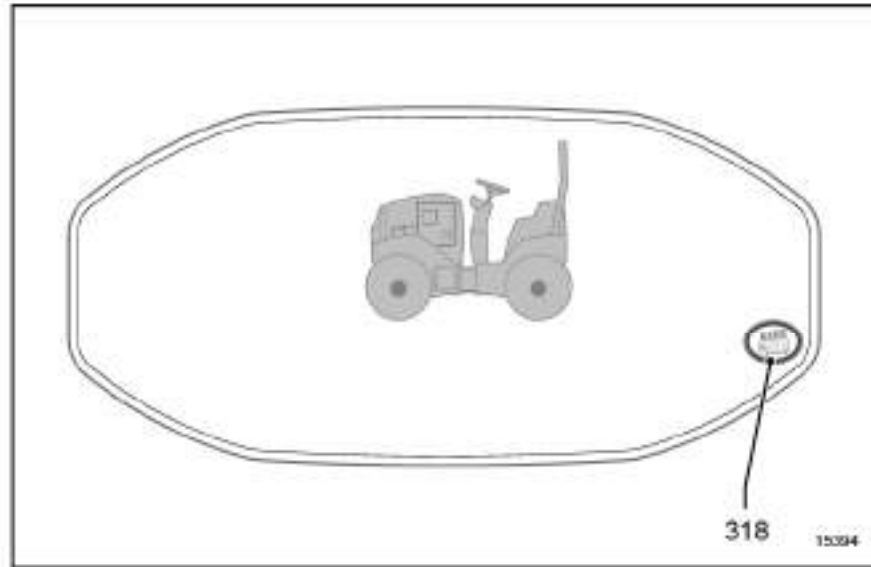


- | | | | |
|-------|--|-------|--|
| [221] | Pilot light amplitude small vibration activated | [222] | Pilot light amplitude large, vibration activated |
| [231] | Pilot light for vibrator preselection, vibration deactivated | [312] | Switch vibration |
| [316] | Switch vibrator preselection | [319] | Switch Vibration mode manual-automatic |

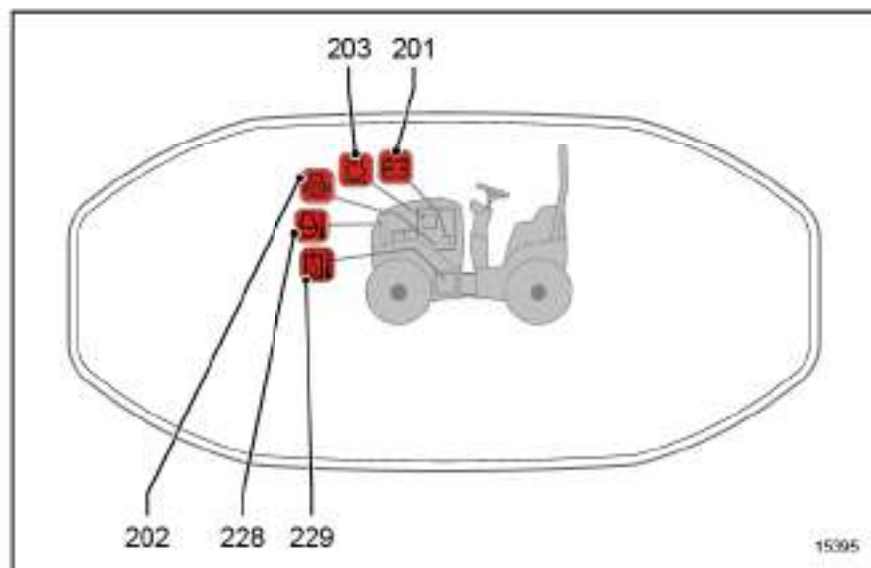
Water sprinkling control unit



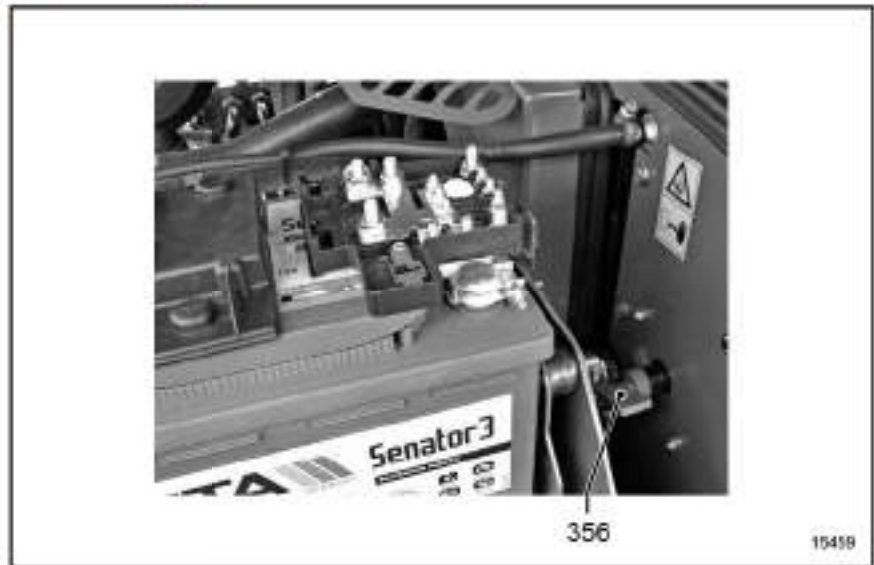
- | | | | |
|-------|------------------------|-------|------------------------------|
| [207] | Pilot light sprinkling | [232] | Pilot light sprinkling stage |
| [317] | Switch sprinkling | [373] | Switch sprinkling stage |

**Control unit additive
sprinkling**


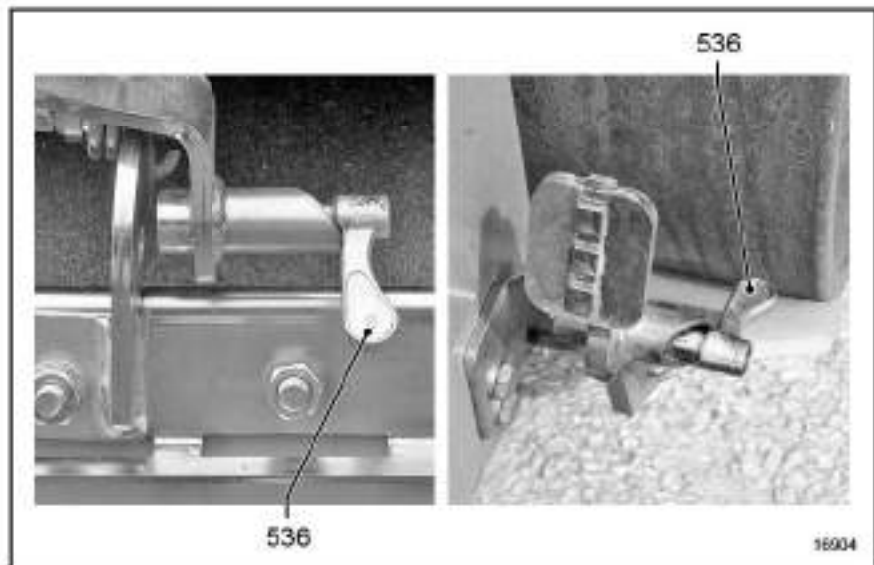
- [318] Switch additive sprinkling (only if with combination roller equipped)

**Warning lamps control
unit**


- | | | | |
|-------|---|-------|--------------------------------|
| [201] | Pilot light charge current | [202] | Pilot light oil pressure |
| [203] | Pilot light air filter | [228] | Pilot light engine temperature |
| [229] | Pilot light oil temperature, hydraulic system | | |

2.02.04 Drive unit / diesel engine**Engine compartment**

[356] Battery isolating switch

2.02.05 Transmission**Roller drum scraper**

[536] Locking device of scraper

Scraper tyres, model 1



[536] Locking device scraper

Scraper tyres, model 2



[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.

000-05



Please observe chapter 6, too. Here you find the description, operator control and maintenance of auxiliary equipment.

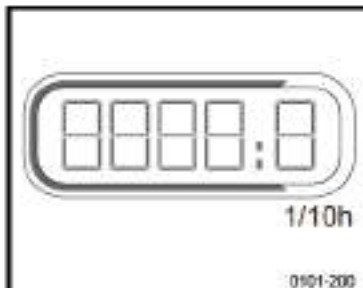
000-64

3.00.01 Indicators, displays

Electrical system

When switching on the electrical system with the switch [310] all pilot lights and indicators are activated for approx. 2 seconds to check the functionality. Check whether all elements are operable. You find further explanations in the section Operational monitoring ([see page 86](#) 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



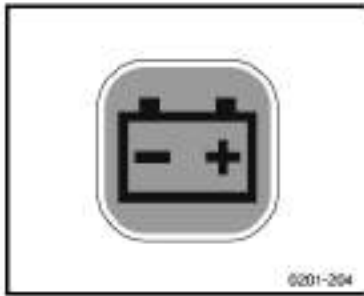
During operation, machine malfunctions are displayed by flashing pilot lights. A number code on the indicator identifies the corresponding malfunction. Table for diagnostic codes [see page 148](#) sqq.



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



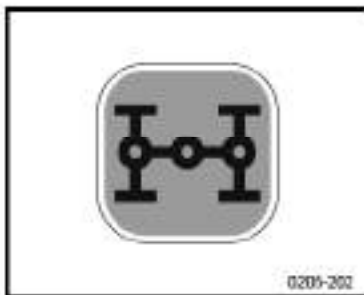
Flashing during operation indicates insufficient oil pressure.

203 Air filter



Flashing during operation indicates a clogged air filter cartridge.

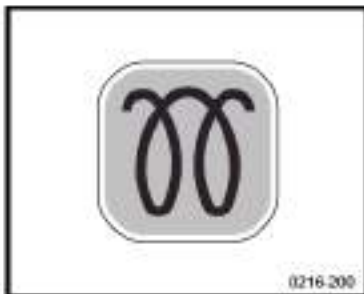
205 All-wheel lock



If the four-wheel blocking is switched on, the pilot light illuminates and indicates full traction force for each drive side.

207 Water sprinkling

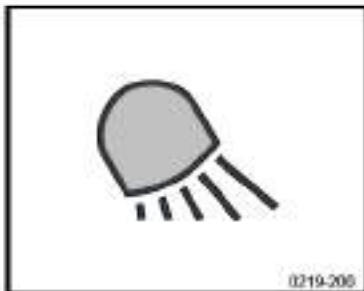
The pilot light illuminates when the water pump runs during sprinkling.

216 Cold start assistance

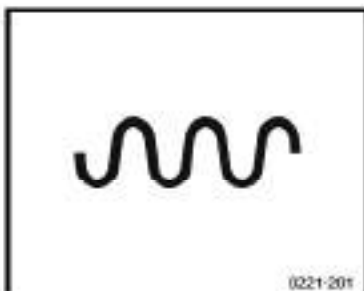
At an outside temperature below 10 °C (50 °F), preheat diesel engine with cold start assistance (switch [310] position II). After reaching start temperature, the indicator switches off; then start the diesel engine.



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

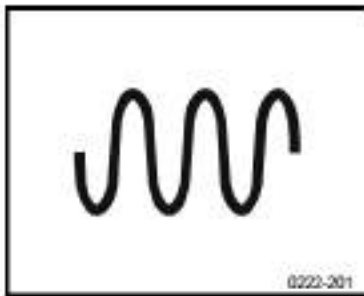
219 Working spotlight

Pilot light illuminates if the working spotlights are switched on.

221 Amplitude small, vibration / oscillation activated

Pilot light illuminates if vibration / oscillation with small amplitude is activated.

222 Amplitude large, vibration / oscillation activated



Pilot light illuminates if vibration / oscillation with large amplitude is activated.

228 Engine temperature



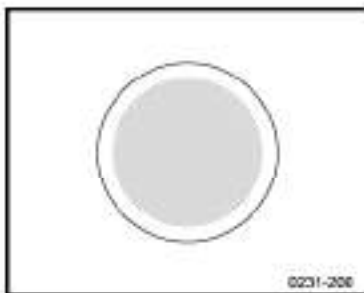
Flashing during operation indicates improper engine temperature.

229 Oil temperature of hydraulic system

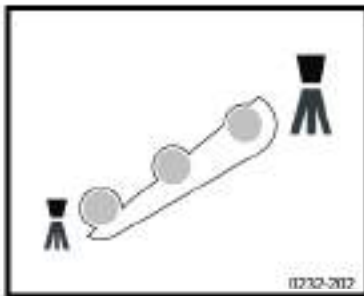


Flashing during operation indicates improper hydraulic oil temperature.

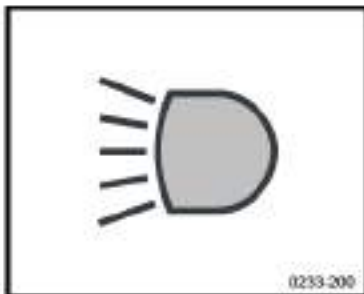
231 Preselection vibrator vibration system, vibration / oscillation deactivated



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

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 level, a light point moves between 2/3, 1/3 and 1/10, correspondingly. If the level drops below 1/10 the light 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.

002-03

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 – position **DOWN**

To disengage EMERGENCY STOP, turn push button clockwise.

Off – position **UP**

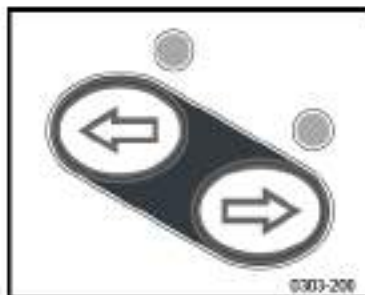


After actuating the EMERGENCY STOP switch, the machine must be brought into its start position.

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 Flashing lights



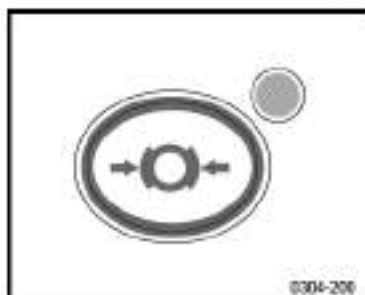
Pressing the switch turns the direction indicator on or off. The arrows indicate the actuation direction for the corresponding turning direction of the machine.

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.

002-40

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

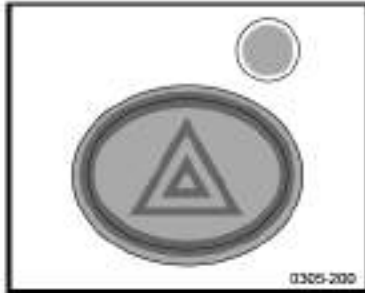
Applied — **PRESS**
(pilot light lights)

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 (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



The drum illumination is also switched on or off using this switch.

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.

000-28



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 lights)

Off — **PRESS** again

312 Vibration / Oscillation


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

Large amplitude — **PRESS**

(pilot light [222] lights up)

Deactivation — **PRESS** again

(pilot light [231] lights up)

Amplitude small — **PRESS** again

(pilot light [221] lights up)

Deactivation — **PRESS** again

(pilot light [231] lights up)

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

316 Preselecting vibration / oscillation


Pressing the pushbutton preselects the vibration system in the front drum, in the rear drum, or in both drums.

This pilot light (symbol without oscillation) indicates a pre-selected vibrator / oscillator in case of de-activated vibration / oscillation.

Each actuation of the switch switches one step ahead.

Front vibration / oscillation — **PRESS**

Rear vibration / oscillation — **PRESS** again

Double vibration / oscillation — **PRESS** again

If the vibration / oscillation system is activated with switch [312], the pilot light changes over to vibration / oscillation 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 87 sq.](#)



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.



The switch has no function on equipment with a chip spreader.

319 Vibration mode manual - automatic



The operating mode for the vibration / oscillation is set with the switch. The vibrator / oscillator can be switched on or off manually or automatically.

Manual — **PRESS**

(upper pilot light illuminates)

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

Automatic — **PRESS** again

(lower control light lights up)

Switching on and off the vibration / oscillation 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 initial switching on.

The vibration / oscillation can be switched on or off at any time with the switch on the multifunctional handle, even in automatic mode.

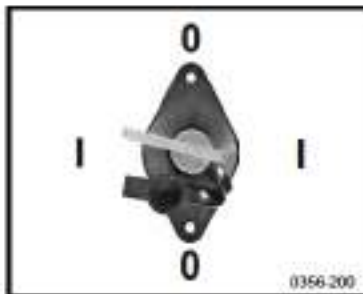
341 Water sprinkling



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

343 All-wheel lock

The all-wheel lock is switched on as long as the 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!

004-03

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

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

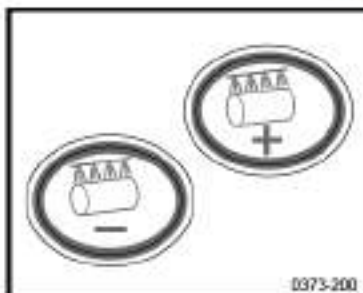
Electrical circuit closed — position **I**
(key latched)

***371 KAG sprinkler**

With water irrigation switched on [317], the switch can be used to switch the sprinkling on and off for the edge pressing and cutting device (KAG).

KAG sprinkler on — position **I**

KAG sprinkler off — position **0**

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.

Increasing the stage — **PRESS +**

Reduce the state — **PRESS -**

380 Additive sprinkling

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

381 Seat heating

On — position **I**

Off — position **0**

3.00.04 Sockets, lights**406 Socket 12 V / cigarette lighter****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 Operating 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 — push lever **FORWARD**

Reverse travelling — push lever **BACK**

Braking — lever to **CENTRE**

Stop — lever in **CENTRE**

The driving speed is proportional to the magnitude of the lever displacement. 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 Multifunctional handle



Vibration / oscillation

If the vibration / oscillation system [312] is activated, the vibrator / oscillator can be switched on or off at switch [A] at any time.

Vibrator / oscillator on — **PRESS**

Vibrator / oscillator 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.

Idle speed — **MIN**

2/3 max. speed — **2/3 MAX**

Max. speed — **MAX**



The vibration frequency is coupled to the engine speed. The adjustment of the engine speed will change the vibration frequency (see Technical Data).

Driver's seat

▲ WARNING
Uncontrolled movements!

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

- Operate the machine only in an admissible 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.

002-41



[520] Seat adjustment weight

[521] Seat adjustment forward - backward

[522] Seat adjustment back-rest

[525] Seat adjustment left - right

520 Seat adjustment weight

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



The weight adjustment 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 pressed down against the stop. The weight adjustment switches then automatically back to the starting position (50 kg).

521 Seat adjustment forward - backward

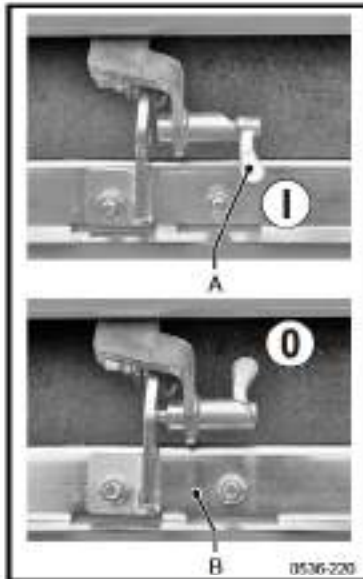
After lifting the lever, the upper part of the seat can be shifted in forward or backward direction in increments of 15 mm.

522 Seat backrest adjustment

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

525 Seat adjustment left - right

After lifting the lever, the entire seat console can be displaced to the left or to the right.

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)

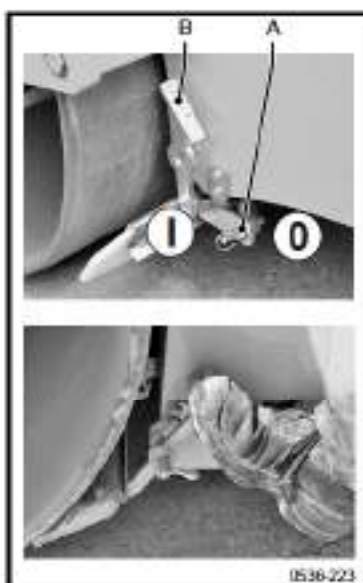
Catch closed — position **0**
 (Scraper held away from drum)

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 position **0** (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.

536 Locking device of scraper

Variant 1

Version: tyres

By means of the stop screw the scraper is fixed in a specified position or attached to the tyres.

Scraper attached — Stop screw **released**

Scraper released — Stop screw **tightened**



Variant 2

Version: tyres

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

Catch open — position **I**
(Scraper placed on the tyre)

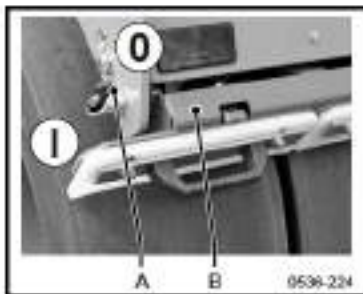
Catch closed — position **0**
(Scraper held away from the tyre)

Attach scraper:

1. Move the locking lever into position **I** until the catch releases the scraper (scraper places itself on the tyre). To do this, lift the scraper bracket [B] slightly.
2. Turn stop lever to position **0** again.

Move the scraper away:

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



3.01 Prior to machine start

General

▲ WARNING

Operating errors!

Risk of injury due to improper use.

Prior to every start-up:

- Check the machine for operational and traffic safety.
- Read and adhere to the instruction manual and the safety 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] (if available) — position **I**
2. Perform inspection and maintenance work ([see page 100](#) 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 144](#) sqq. See also Safety instructions.

Water

1. Check the filling level of the water tank.
2. Fill up to the lower edge of the filler neck. Only use clean water!

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.

000-37

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 pedestal position.

- Operate the machine only in an admissible 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.

002-41

3.02 Engine start

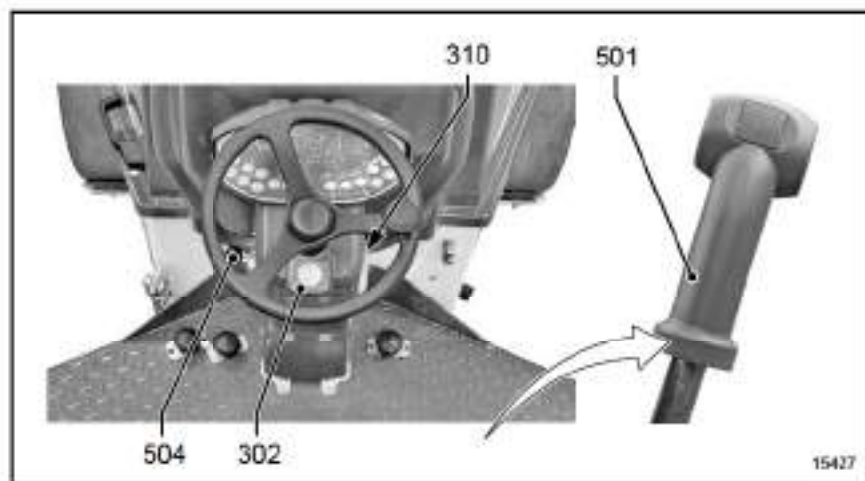
General The start sequence may only be continued for a maximum 20 seconds, otherwise the starter will overheat and be destroyed. There must be pauses between the individual starting processes in order to allow the starting motor to cool down. If the diesel engine does not start after two starting attempts,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

When the battery is discharged, the diesel engine can be restarted by an external power source ([see page 94](#) 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.

Initial 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

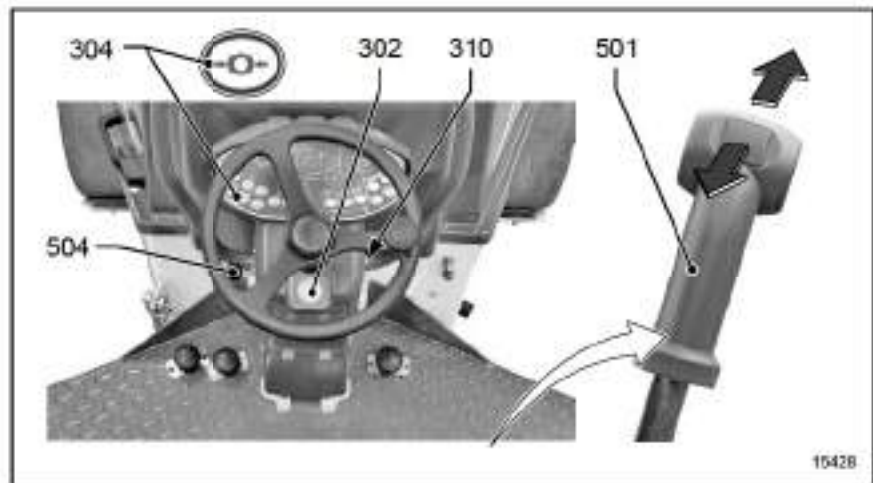
Long stopping distance!

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) .

002-15

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!

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. Prior to moving off actuate the signal horn [301] briefly.
4. 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 [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.

002-96

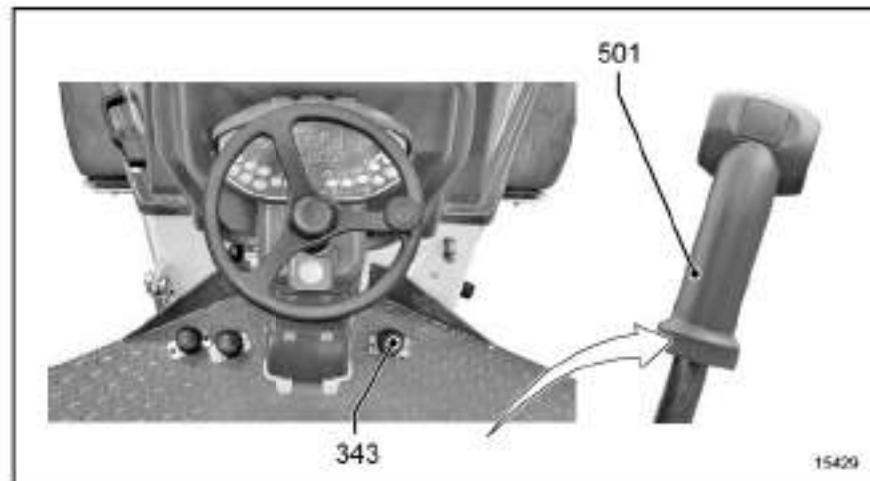
This machine is equipped with a seat contact switch. The machine is automatically braked if the operator leaves his seat while driving. There is an initial time delay, after which the brakes are applied abruptly. The function of the seat contact switch is not intended to be used as a control element 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**
2. 0-position lock [502] – position **0**

All-wheel lock



The machine is equipped with a hydraulic four-wheel drive, which is driven by a variable displacement pump. The blower output is fed to both hub motors in the drum. The driving power of the machine is used for the locomotion according to the surface conditions and the corresponding drift. If the coefficient of friction between the ground and a drum drops to the extent that a drum starts slipping, the entire pump oil flow will empty across the hub motor of the turning drum, thereby substantially reducing the tractive force of the still-standing hub motor. The switching on of the four-wheel blocking triggers the automatic division of the oil flow. Every gear hub motor is now provided with a separate oil flow, which ensures a constant traction force for each roller drum without pressure compensation.

The four-wheel blocking can be switched on when driving on difficult surfaces, as long as both drums are still turning. If the machine is at a standstill while the drum is still turning, the drive lever [501] should be placed in the 0 position before the four-wheel blocking is applied. To drive away, move the drive lever slowly and smoothly until both drums are driven. Once the machine is driving, the four-wheel blocking can be switched off again. The all-wheel lock is applied only as long as the switch [343] is pressed.



When the machine is loaded, the all-wheel lock must be applied before driving onto the loading ramp.

3.04 Driving with vibration / oscillation

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.

002-19

▲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.

002-20

NOTICE

Collapse or damage!

Risk of collapse 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.

004-26

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.

In the oscillation mode the roller drum is shifted to tangential oscillations. The compression of the material to be compacted is conducted by flexing movements.

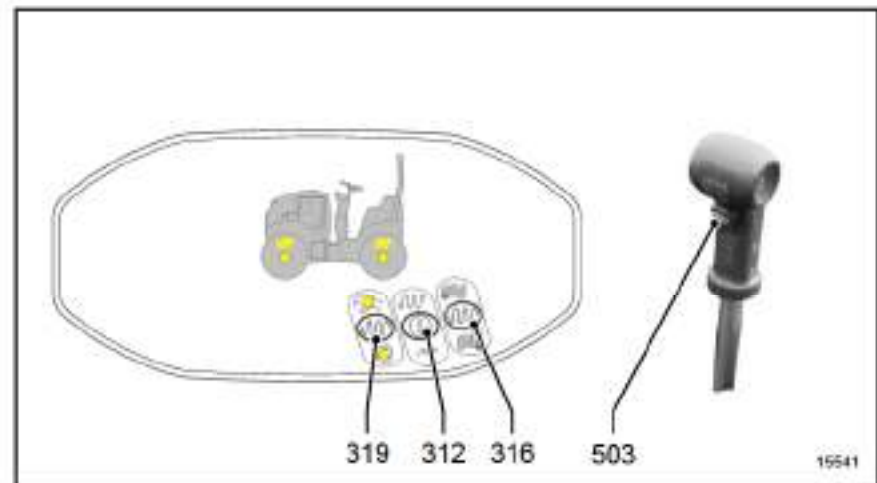
Vibration / oscillation may only be used at maximum diesel engine speed and can be operated as single or double vibration.

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.

Oscillation vibrations are developed predominantly on the surface of the ground and spread only in front of the roller drum and on its rear. Thus the damaging force is reduced considerably.

Vibration / oscillation

Pressing pushbutton [316] preselects the vibration system in the front drum, in the rear drum, or in both drums.

The control light (symbol without vibration) indicates a pre-selected but de-activated vibration system. Each actuation of the switch switches one step ahead.

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

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

**Manual - automatic
operating mode**

The operating mode for the vibration / oscillation 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

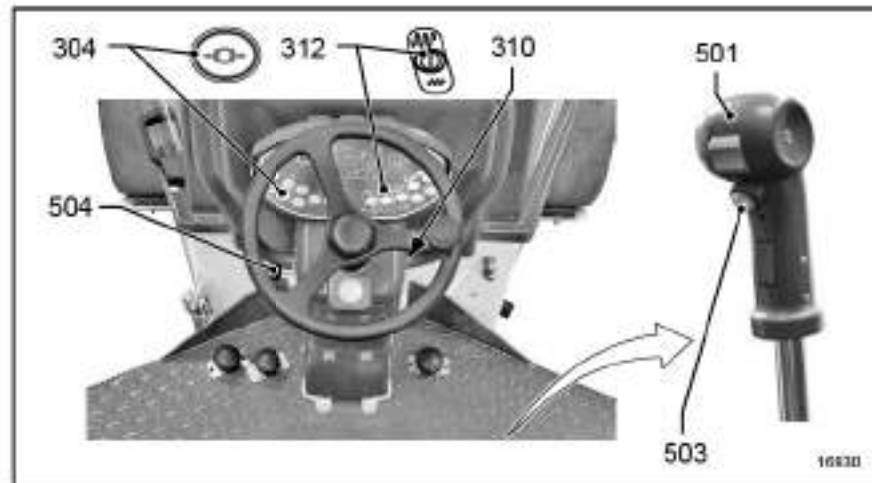
Uncontrolled driving behaviour!

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.

002-22

Stopping



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

The hydrostatic drive brings the machine to a stop.

Before switching off the Diesel engine

1. Vibration / oscillation [312] — **OFF**
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).

000-02

Leaving the machine

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



Automatic engine stop If the machine is fitted with an automatic engine stop, under certain conditions, the diesel engine is switched off automatically after a fixed set time.

Prerequisites:

1. Driving lever is locked in position 0.
2. The machine is at operating temperature.
3. Driver is not sitting in the driver's seat.

Only if these conditions are fulfilled, will the diesel engine diesel engine be switched off automatically after a fixed set time.

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.

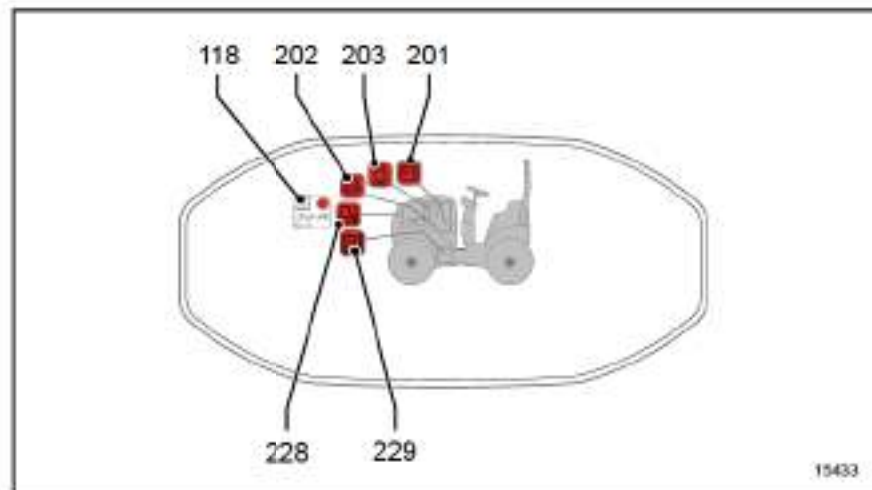
3.06 Operation monitoring

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 three 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 vibration is switched on. No action necessary.

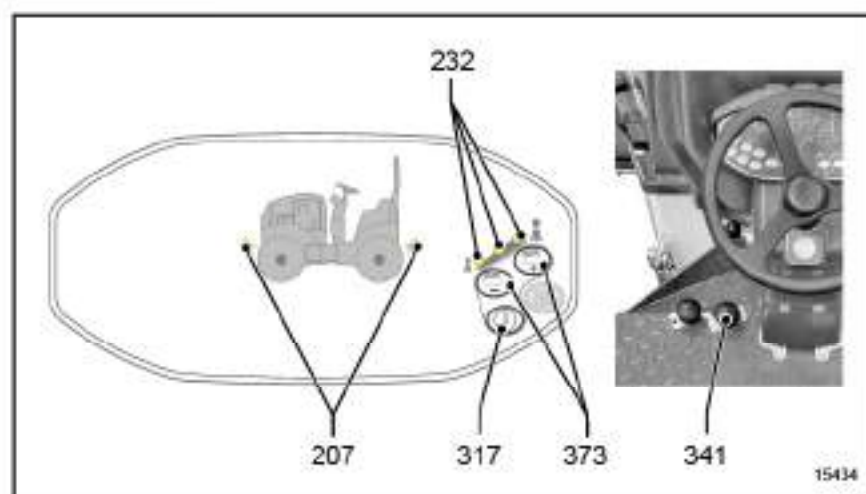
3.07 Water sprinkling

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 supplying.



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

**Sprinkler nozzle check
when engine is at a
standstill**

Requirement:

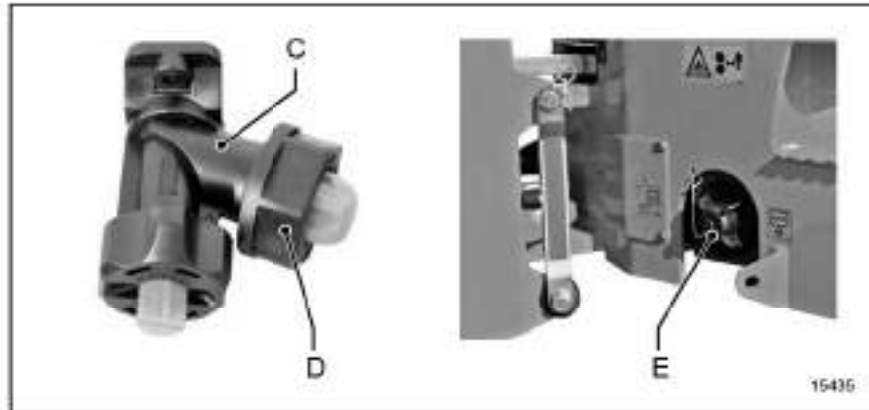
1. Engine stopped
2. EMERGENCY STOP [302] — position **DOWN**
3. Switch [310] — position **I**
4. Parking brake [304] — **APPLIED**
5. Driving lever [501] — max. to the **FRONT**
6. Switch [317] — **ON**

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

To switch off:

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

On risk of frost



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

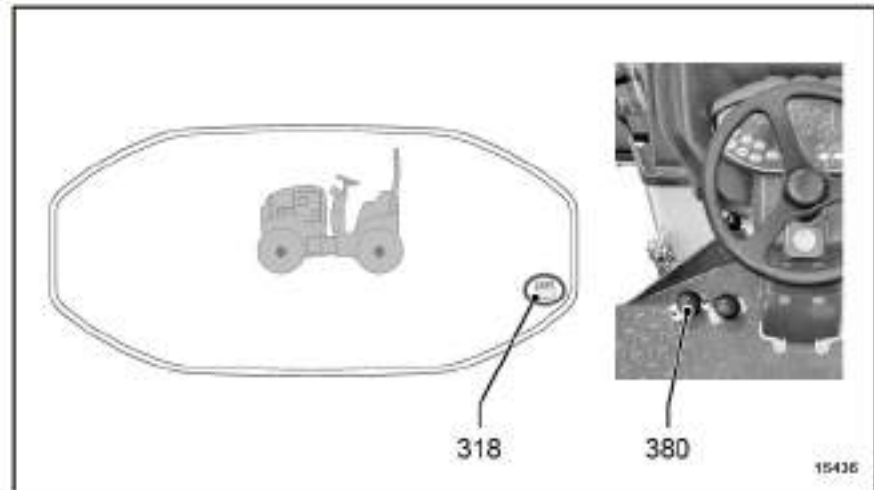
Emptying the water sprinkling system:

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 compression spring (observe gasket ring on filter head).
3. Pull the filter insert from the water tank.
4. Clean filter insert, compression spring, and filter head and store in tool cabinet.
5. Re-fit filter insert, compression 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.

On risk of frost

▲ WARNING

Uncontrolled movements!

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

- Secure machine against rolling away.

002-21

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.

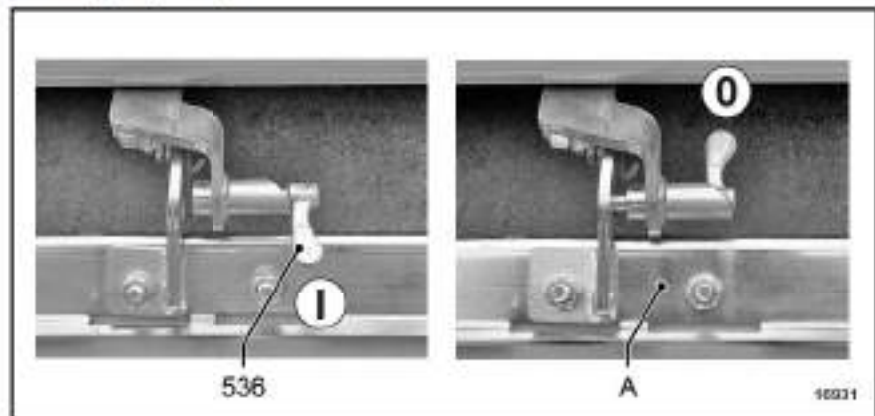
Rinse out dirt embedded between roller drums / tyres with water jet. Remove strongly adhesive dirt with spatula or similar tool.

3.09.01 Rigid roller drum scraper



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.

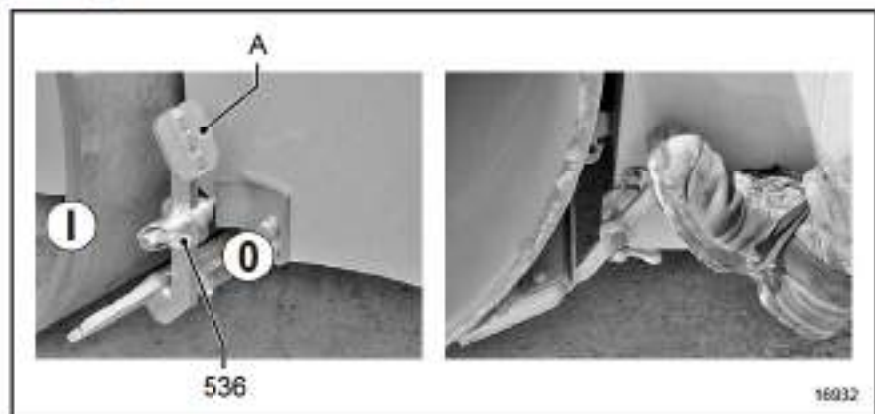
3.09.02 Roller drum scraper, top



- 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 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 Scrapper tyres

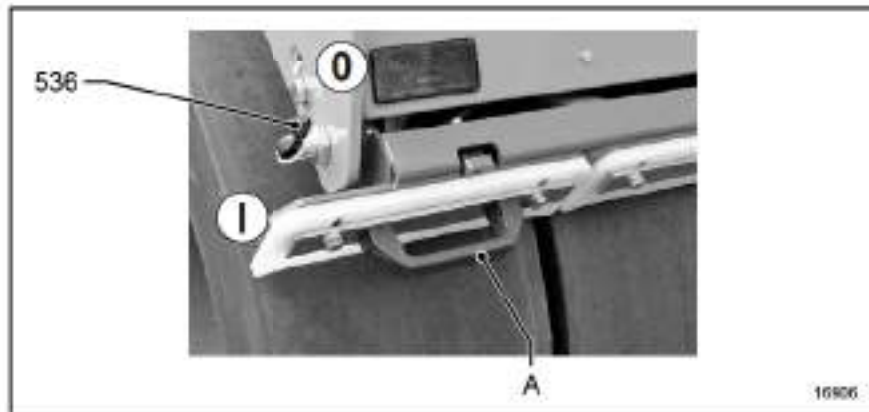
Variant 1



- Attach scraper**
1. Switch off diesel engine and remove ignition key.
 2. Loosen the stop screw [536] and put the scraper on the tyres.

- Moving the scraper away**
1. Switch off diesel engine and remove ignition key.
 2. Lift scraper console and tighten stop screw [536].

Variant 2



- 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 Track offset

General Compacting work along kerbs or similar borders cannot be carried out, or only in a limited way, without track movement of the drums. A track adjustment especially developed for this problem enables the machine to drive very precisely along such problem areas.

Adjust track movement

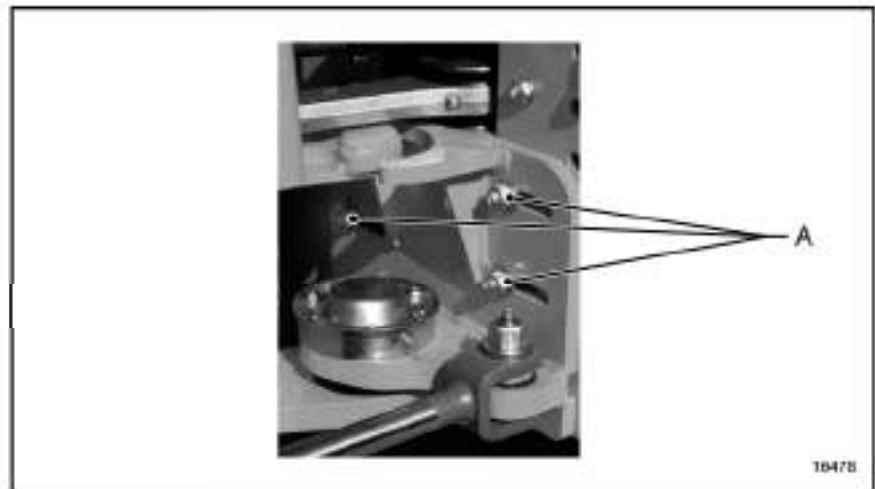
▲ WARNING

Unintentional movement!

Risk of injury due to unintentional movement during adjustment works.

- Put machine on a safe surface (even, capable of bearing, horizontal).
- Secure machine against rolling away.

002-42

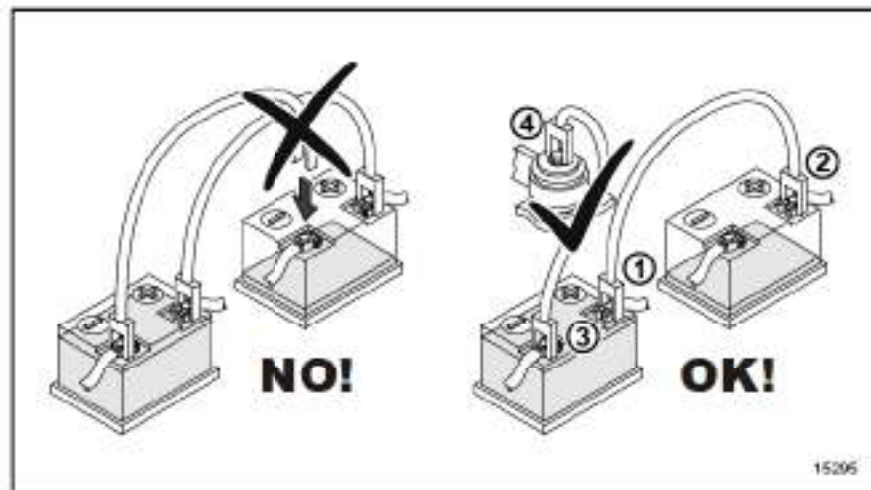


1. Switch off diesel engine and remove ignition key.
2. Loosen the hexagon nuts [A] of the clamp connection at maximum by two turns (6x).
3. The track is offset to the left or right by shifting the console with a suitable tool (e.g. squared timber).
4. Tighten the hexagon nuts [A] (starting torque [see page 142](#) sqq.).

3.11 Start with jump leads

- Preparation**
- Observe precaution measures for handling batteries (see Safety instructions).
 - 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

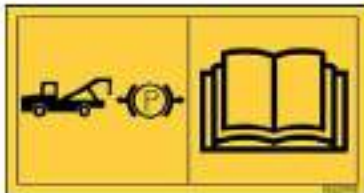
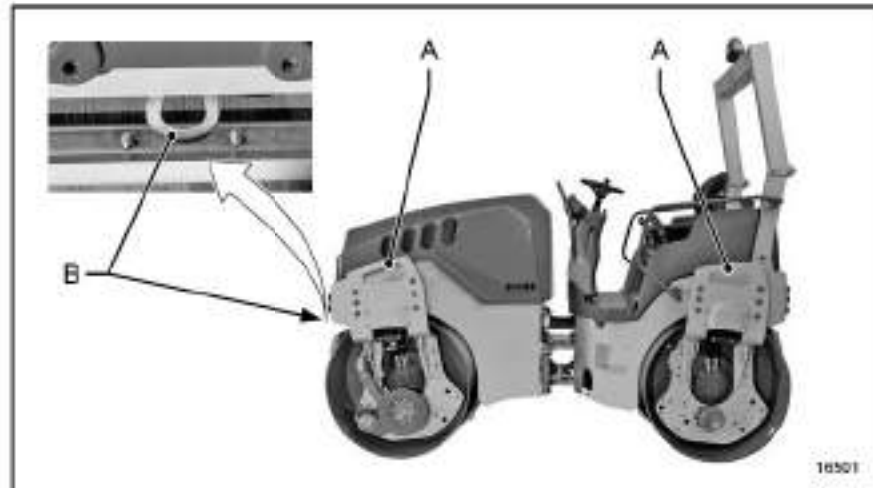
▲WARNING

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.

002-23

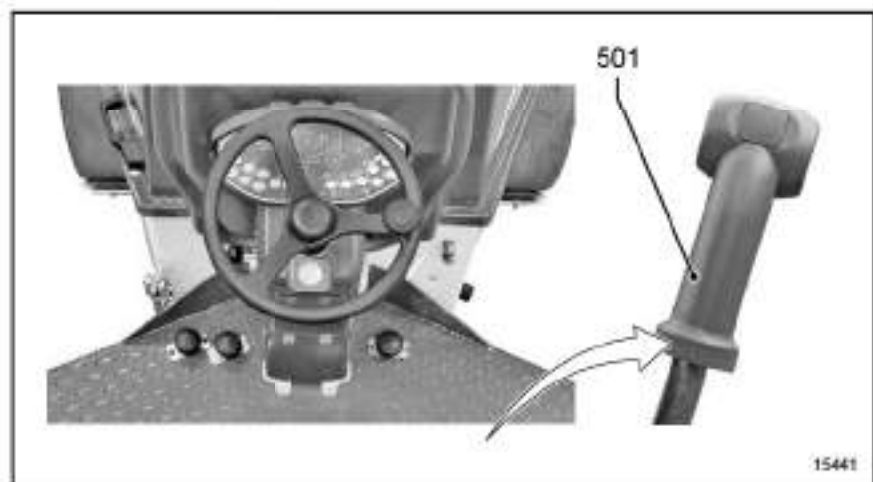


Towing the machine requires sufficient knowledge about the functioning of the hydrostatic drive and about the operation of the spring accumulators. The preparations for towing may only be carried out by experienced personnel who are aware of the dangers. The machine may only be attached at the towing point [A] or *towing eye [B], and may only be towed with a tow 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 lock nut [A] at the drive pump [C].
2. Screw in the locking screw [B] until the screw end flushes with the lock nut.

- Activating the hydrostatic drive power train**
1. Screw out the locking screw [B] until the stop.
 2. Tighten lock nut [A].

**Putting parking brake out
of operation**

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.

**Putting parking brake in
operation**

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

3.13 Driving on public roads

3.13.01 The following is applicable in Germany (StVZO - German Road Traffic Licensing Regulations)

The government of Upper Palatinate grants an exemption 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.
 - To improve roadworthiness, the lamp guard and / or ramming guard installations need to be removed before driving on any public road.

3.13.02 Applicable in the User's Country

The laws, regulations, guidelines and standards applicable at the place of use must be observed.

4 MAINTENANCE



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

000-01



Please observe chapter 6, too. Here you find the description, operator control and maintenance of auxiliary equipment.

000-64

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

The maintenance intervals are determined according to the running time of the operating 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 instruction 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 instruction manual for diesel engine (see )!

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



Maintenance work must be carried out at least once a year. This applies, in particular, when the operating hours indicated in the maintenance intervals are not reached within a year.

Every 10 operating hours



Checking the function of the parking brake

[see page 112](#)



Inspecting the EMERGENCY STOP function when engine at standstill

[see page 113](#)



Checking hydraulic oil level

[see page 126](#)



Cleaning sprinkler nozzles

[see page 140](#)



Checking air pressure in the tyres

[see page 134](#)



Checking engine oil level





Checking coolant level

[see page 123](#)



Checking and cleaning air filter / dust valve











[see page 120](#)
[see page 119](#)



Cleaning filter for water sprinkling

[see page 140](#)

Every 250 operating hours


- 
 Checking scrapers / lubricating scrapers [see page 130](#),
- 
 Changing engine oil 
- 
 Exchanging lubrication oil filter of diesel engine 
- 
 Checking V-belt tension 
- 
 Lubricating pivoted bearing [see page 137](#)
- 
 Lubricating steering cylinder bolt [see page 138](#)
- 
 Checking radiator [see page 122](#)

Every 500 operating hours


- 
 Replacing fresh air filter of the operator's cabin [see page 174](#)
- 
 Replacing filter insert of pressure filter for hydraulic system [see page 128](#)
- 
 Checking damping elements [see page 141](#)
- 
 Checking wheel nuts / wheel bolts for tightness [see page 134](#)
- 
 Replacing valve cover seal 
- 
 Replacing filter cartridge for the fuel filter [see page 116](#)
- 
 Replacing the preliminary fuel filter [see page 117](#)
- 
 Changing filter cartridge for the fuel prefilter [see page 118](#)
- 
 Draining water separator [see page 118](#)
- 
 Replacing air filter cartridge [see page 120](#)
- 
 Checking drive lever function [see page 130](#)



Every 2000 operating hours

2000h



Inspecting the EMERGENCY STOP function when driving

[see page 113](#)



Cleaning water sprinkling unit

[see page 139](#)



Replacing hydraulic oil

[see page 127](#)



Replacing V-belt





Changing coolant

[see page 124](#)



Changing safety cartridge

[see page 121](#)



Replacing ventilation filter of hydraulic oil tank

[see page 127](#)




Changing the toothed belt for the oscillation drive

[see page 141](#)

4.00.03 Running-in regulations



For engine maintenance see instruction manual for diesel engine ().

After 50 operating hours Servicing diesel engine

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

Maintenance of hydraulic system

1. Replace hydraulic oil filter.




Maintenance of the tyre mounting

1. Checking wheel nuts / wheel bolts for tightness.

4.00.04 Required maintenance parts

HD 13, HD 14 all types (v2203)

H2010001 → H2010169

Quantity	Maintenance part			first time after 50	Servicing intervals in operating hours			
					every 250	every 500	every 1000	every 2000
9.5 l	Engine oil			50 D	D			
33.0 l	Hydraulic oil							D
9.5 l	Coolant							D
1	V-belt	Generator	2471268		A			D
1	Air filter cartridge		147170		A	D		
1	Safety filter cartridge		147171					D
1	Filter cartridge	Lubricating oil	251496	50 D	D			
1	Filter cartridge	Fuel	2127329	50 D		D		
1	Fuel prefilter		2127331	50 D		D		
1	Filter insert	Hydraulic system (low pressure)	2038889	50 D		D		
1	Filter insert	Hydraulic system (high pressure)	2038889	50 D		D		
1	Ventilation filter	Oil tank	2247029					D
1	*Ventilation filter	Oil tank	2206829					D
1	Filter insert	Water filter	2033909		A			
1	*Filter insert	Operator's cabin Fresh air	2272156			D		
1	Seal	Valve cover	2158269			D		
12	Damping elements for the drum suspension		1487116			A		
1	Wirtgen Group Anti Stick asphalt release agent	for smooth tyre						

A = check, replace if necessary, D = replace

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

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

899-00

HD 13, HD 14 all types (v2203)

H2010170 →

Quantity	Maintenance part			first time after 50	Servicing intervals in operating hours			
					every 250	every 500	every 1000	every 2000
9.5 l	Engine oil	<input type="checkbox"/>		50 D	D			
33.0 l	Hydraulic oil	<input type="checkbox"/>						D
9.5 l	Coolant	<input type="checkbox"/>						D
1	V-belt (without cab)	Generator	2471268		A			D
1	V-belt (with cab)	Generator	1220357		A			D
1	Air filter cartridge		147170		A	D		
1	Safety filter cartridge		147171					D
1	Filter cartridge	Lubricating oil	251496	50 D	D			
1	Filter cartridge	Fuel	2091354	50 D		D		
1	Fuel prefilter		2164645	50 D		D		
1	Filter insert	Hydraulic system (low pressure)	2038889	50 D		D		
1	Filter insert	Hydraulic system (high pressure)	2038889	50 D		D		
1	Ventilation filter	Oil tank	2247029					D
1	*Ventilation filter	Oil tank	2206829					D
1	Filter insert	Water filter	2033909		A			
1	*Filter insert	Operator's cabin fresh air	2272156			D		
1	Seal	Valve cover	2158269			D		
1	Toothed belt	Oscillation drive	2311603					D
12	Damping elements for the drum suspension		1487116			A		
1	Wirtgen Group Anti Stick asphalt release agent	for smooth tyre						

A = check, replace if necessary, D = replace

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

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

899-00

4.00.05 Maintenance parts (service kits)

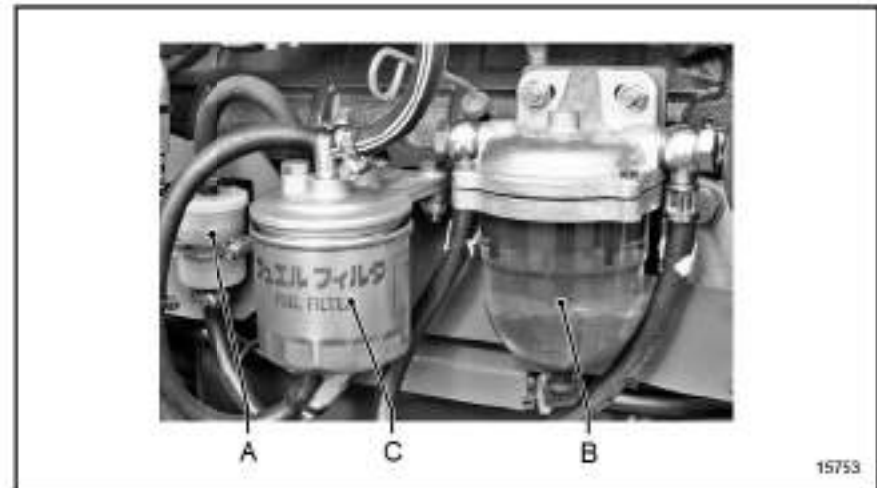
HD 13, HD 14 all types (v2203)



Determine the parts to be serviced (service kits) according to the design of the water separator.

Variant 1 Version: Preliminary fuel filter and water separator separated

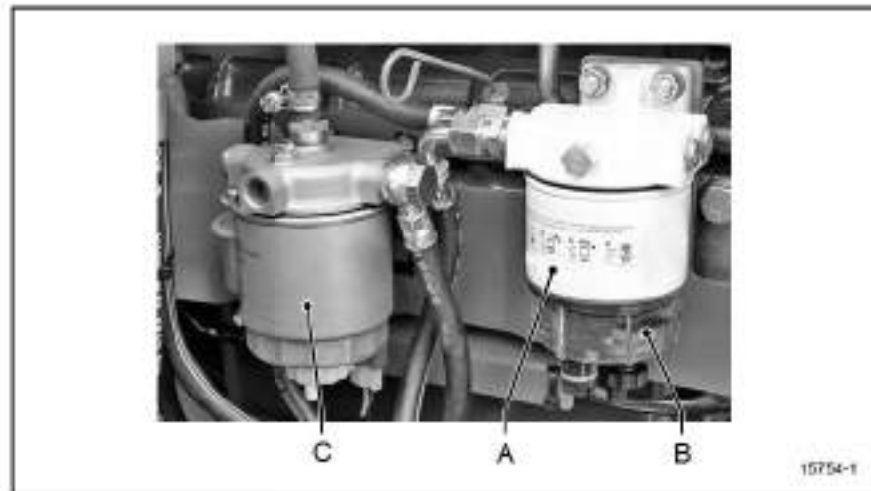
H2010001 → H2010169



- | | |
|---------------------------|---------------------|
| [A] Fuel prefilter | [B] Water separator |
| [C] Filter cartridge fuel | |

Quantity	Maintenance part	first time after 50	Servicing intervals in operating hours			
			every 250	every 500	every 1000	every 2000
1	All required maintenance parts for the corresponding maintenance intervals	2151922	251496	2151924		2151927

Variant 2 Version: Fuel prefilter with water separator
H2010170 →



- [A] Filter cartridge for fuel pre-filter [B] Water separator pre-filter
- [C] Fuel filter cartridge

Quantity	Maintenance part	first time after 50	Servicing intervals in operating hours			
			every 250	every 500	every 1000	every 2000
1	All required maintenance parts for the corresponding maintenance intervals (machine without cab)	2171507	251496	2171508		2171509
1	All required maintenance parts for the corresponding maintenance intervals (machine with cab)	2171507	251496	2271368		2271371

4.00.06 Important information about maintenance work

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.

002-37

▲ WARNING**Inadmissible engine start!**

Risk of injury due to starting engine during maintenance works.

- Prior to maintenance works fasten a warning label on the operator platform.
- Remove the earthing strip from the battery strip before starting maintenance work.

002-68

▲ 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.

002-09

▲ 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.

002-10

▲ WARNING**Explosion, acid!**

Risk of injury due to moving parts and caustic acids.

- Do not put any tools on the battery.

002-11

▲ 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.

002-12

▲ 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.

002-13

▲ WARNING

Work above floor level

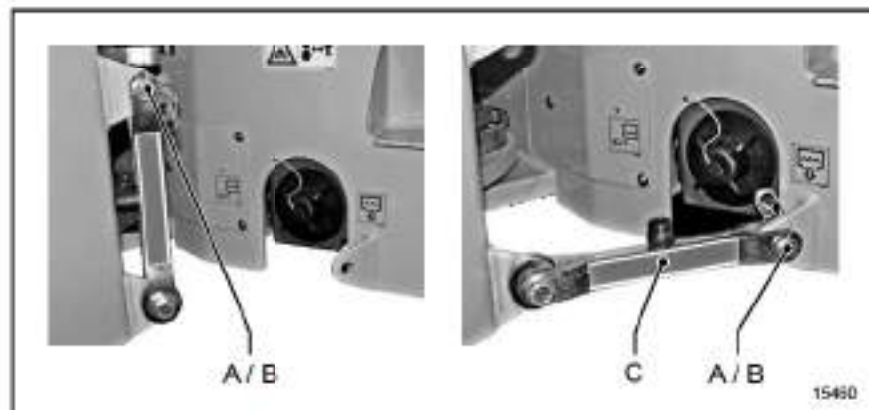
Risk of injury by falling.

- 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.

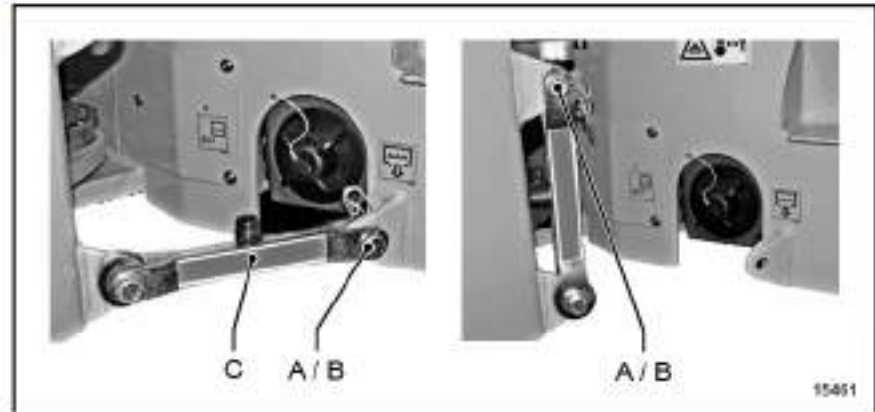
002-59

4.00.07 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.

4.00.08 Welding work on the machine

- Preparation**
- Observe the instruction 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 only the welds with live electrodes. 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 inflammable 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.

000-39

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 and/or non-readable 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

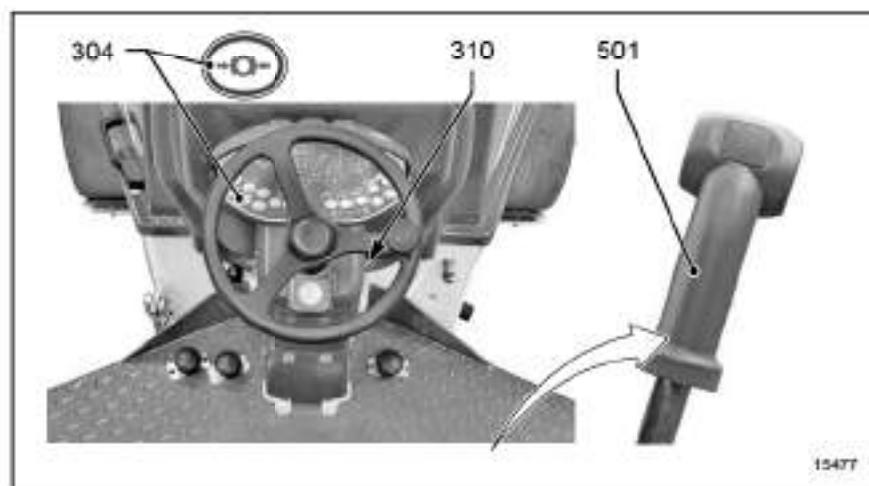
▲WARNING

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.

002-26



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!

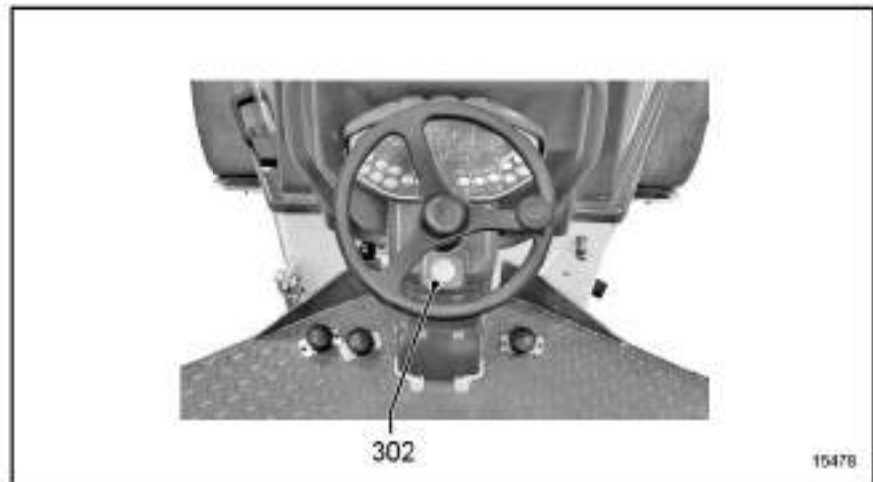
4. Switch drive lever [501] back to central position.

4.01.03 Checking 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.

002-03

**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.

4.04 Drive unit - diesel engine

4.04.01 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!

002-29

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.

004-12

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.

004-08



Be sure to vent the fuel system after performing any work on the open fuel system or when the fuel tank has run empty. Make a test run to inspect the fuel system for leaks.

Adhere to running-in regulations, servicing intervals and care measures for diesel engine as specified in the instruction 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:

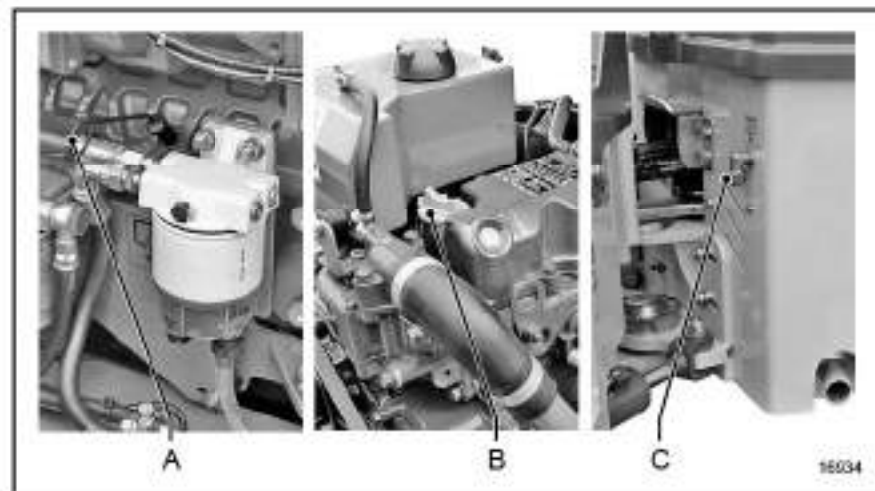
- Continuous ambient temperature below $-10\text{ }^{\circ}\text{C}$ ($14\text{ }^{\circ}\text{F}$) or lubricating oil temperature below $60\text{ }^{\circ}\text{C}$ ($84\text{ }^{\circ}\text{F}$).
- Operation using biodiesel fuel



Maintenance work must be carried out at least once a year. This applies, in particular, when the operating hours indicated in the maintenance intervals are not reached within a year.

4.04.02 Maintenance points at the Diesel engine when changing oil


For engine maintenance see instruction manual for diesel engine!



[A] Oil gauge stick

[B] Oil filler

[C] Oil drain screw



Lubricant only admissible if containing this marking (see [page 142](#) sqq.).

4.04.03 Replacing filter cartridge for the fuel filter

▲WARNING

Inflammable 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!

002-29



Replacing filter cartridge

1. Switch off diesel engine and remove ignition key.
2. Allow machine to cool down to a temperature under 30 °C (86 °F).
3. Open the vent screw [B].
4. Unscrew the filter cartridge [A] and dispose of it properly.
5. Slightly oil the rubber seal before installing the new filter cartridge [A].
6. Screw the new filter cartridge [A] to the filter head until the seal makes contact. Tighten the filter cartridge by hand further by half a turn.
7. Switch on the electrical system [310] until fuel runs out of the vent hole [B].
8. Screw in and tighten the vent screw [B].
9. Check for tightness after assembly.

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

4.04.04 Replacing the preliminary fuel filter

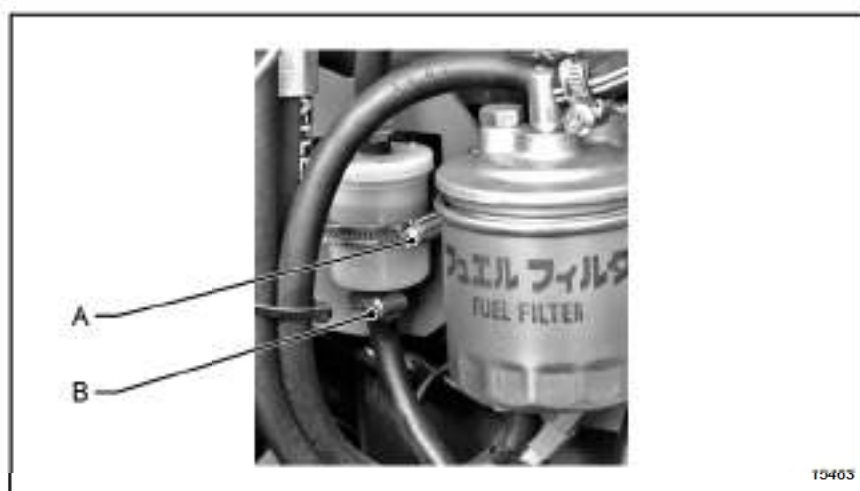
▲ WARNING

Inflammable 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!

002-29



15405

Replacing filter cartridge

1. Switch off diesel engine and remove ignition key.
2. Allow machine to cool down to a temperature under 30 °C (86 °F).
3. Loosen mounting clips [A] of the fuel prefilter.
4. Loosen the hose clamps [B] on both sides and pull off the fuel hose from the used filter.
5. Remove filter from mounting clip and replace with new filter. Tighten mounting clip.
6. Mount fuel hoses on new filter and tighten hose clamps. Observe the flow direction!



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.

4.04.05 Changing filter cartridge for the fuel prefilter

▲WARNING

Inflammable 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!

002-29



15585

Replacing filter cartridge

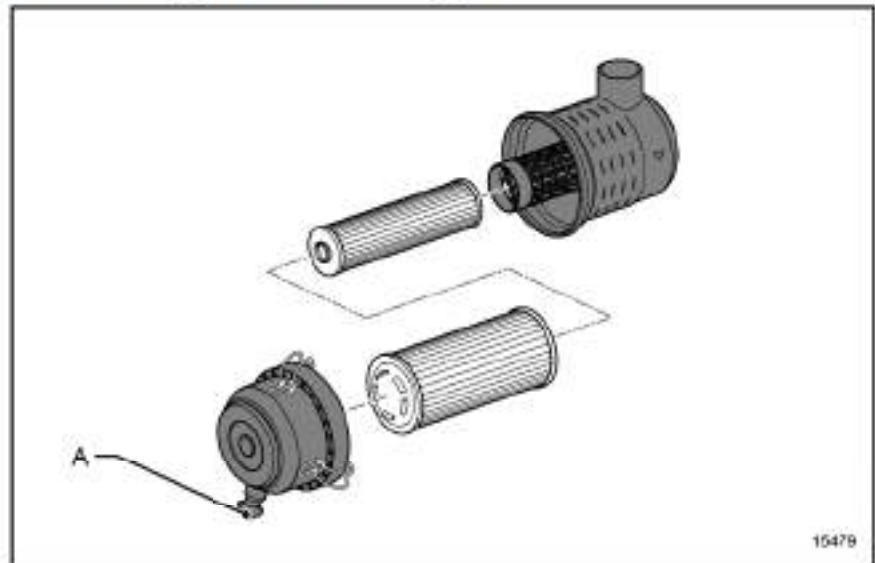
1. Switch off diesel engine and remove ignition key.
2. Allow machine to cool down under a temperature of 30 °C (86 °F).
3. Open the drain valve [A] (screw conical nipple into housing).
4. Open the vent screw [D].
5. Drain waste water from the filter.
6. Unscrew filter cartridge [C].
7. Unscrew the drain 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 purge screw [F] at the fuel filter cartridge [G] by one turn.
13. Switch on the electrical system [310] until fuel runs out of 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 prefilter must be drained at the drain valve [A] from time to time depending on the water content in the fuel.

4.04.06 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.

4.04.07 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.

002-30

NOTICE

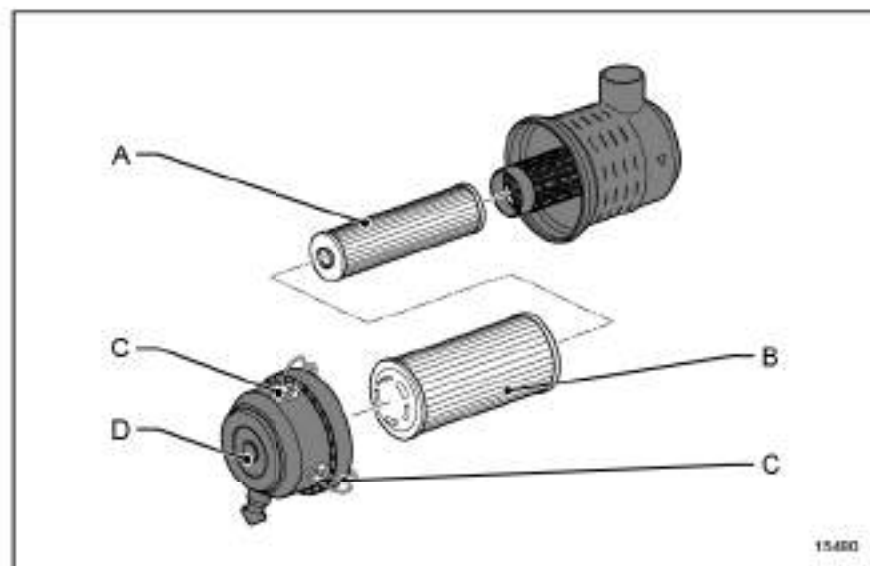
Air filter cartridge / safety cartridge damaged or missing!

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.

004-10

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.

810-19

Replacing the air filter cartridge

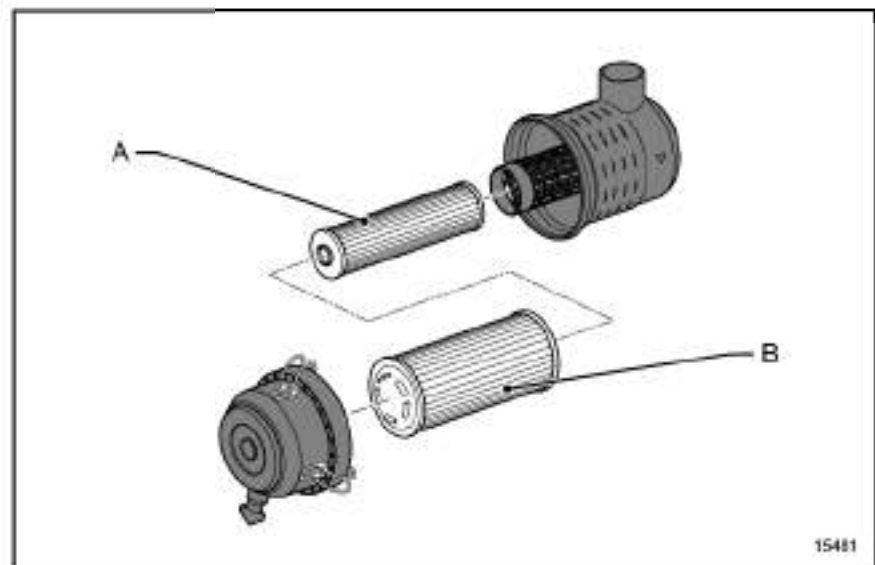
1. Switch off diesel engine and remove ignition key.
2. Allow machine to cool down under a temperature of 30 °C (86 °F).
3. Fold up clip [C].
4. Remove dust container [D].
5. Clean the inside of the dust collectors.
6. Replace the air filter cartridge [B].
7. Re-assemble in reverse order.

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.

810-20

4.04.08 Changing safety cartridge**Safety filter cartridge**

- 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.

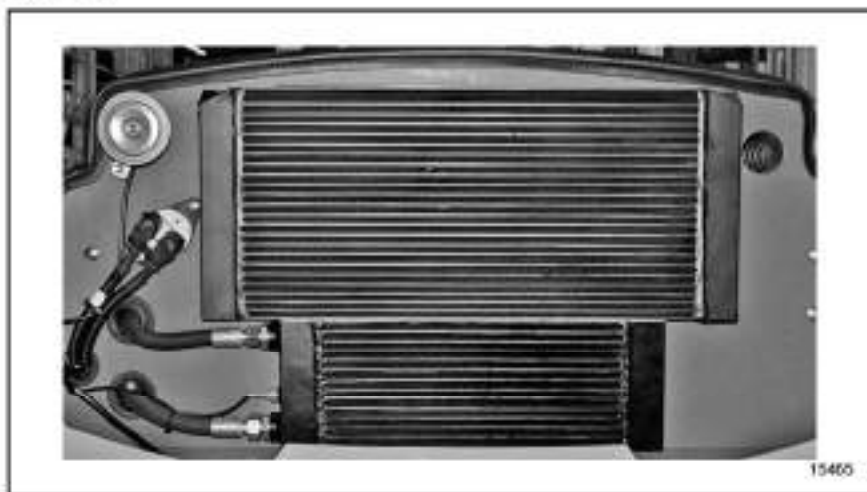
Changing safety cartridge

1. Switch off diesel engine and remove ignition key.
2. Allow machine to cool down to a temperature under 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.

4.04.09 Checking radiator



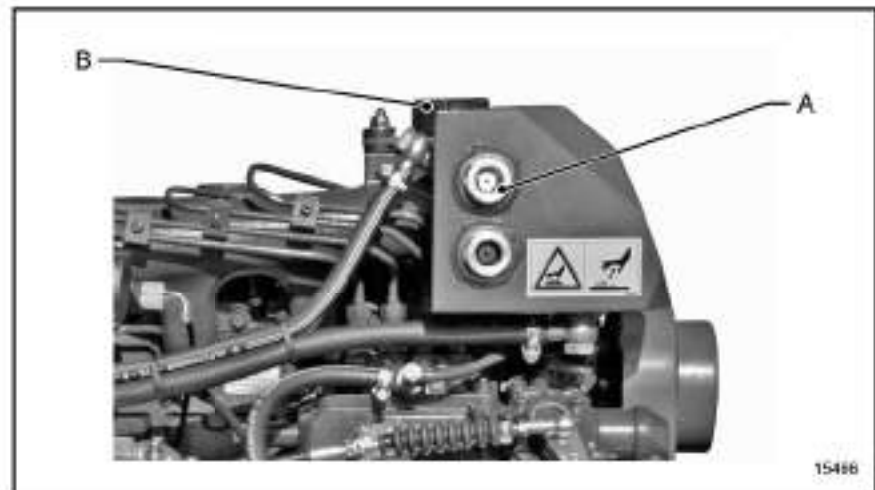
1. Switch off diesel engine and remove ignition key.
2. Allow machine to cool down to a temperature under 30 °C (86 °F).
3. Check the cooling fins of the radiator for contamination.



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

4. Clean the radiator carefully with a high-pressure cleaner.

4.04.10 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.



Lubricant only admissible if containing this marking ([see page 142](#) sqq.).

4.04.11 Changing coolant

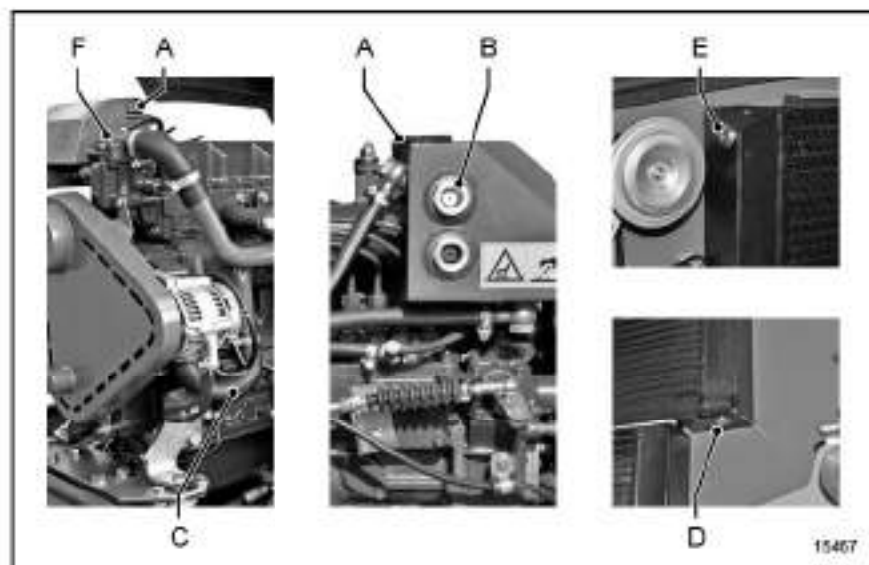
▲WARNING

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!

002-31



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. Fill coolant up 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.



Lubricant only admissible if containing this marking ([see page 142](#) sqq.).

4.05 Hydraulic oil supply

4.05.01 General

All lines, hoses and screwed connections must be checked for leaks and visible damage (at least once per year).

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

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, replace filters or pressure filters in the hydraulic system after 50 and after 125 operating hours.

4.05.02 Checking hydraulic oil level



1. Switch off diesel engine and remove ignition key.
2. Perform this control only when the engine is cold, 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.

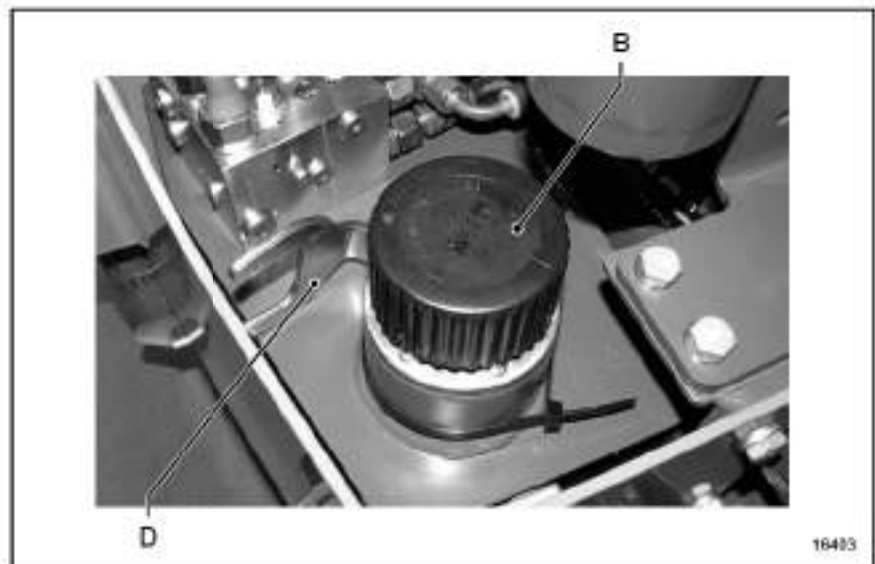
 Lubricant only admissible if containing this marking ([see page 142](#) sqq.).

4.05.03 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.

002-10

Variant 1**Variant 2**

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 the ventilation filter [B] (for variant 2, use a special key [D] to loosen it before) and replace it with a new filter.
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. Pipes and hoses are filled with oil and purged.
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 the hydraulic system for leaks.

 Lubricant only admissible if containing this marking ([see page 142](#) sqq.).

4.05.04 Replacing filter insert of pressure filter for hydraulic system

▲WARNING

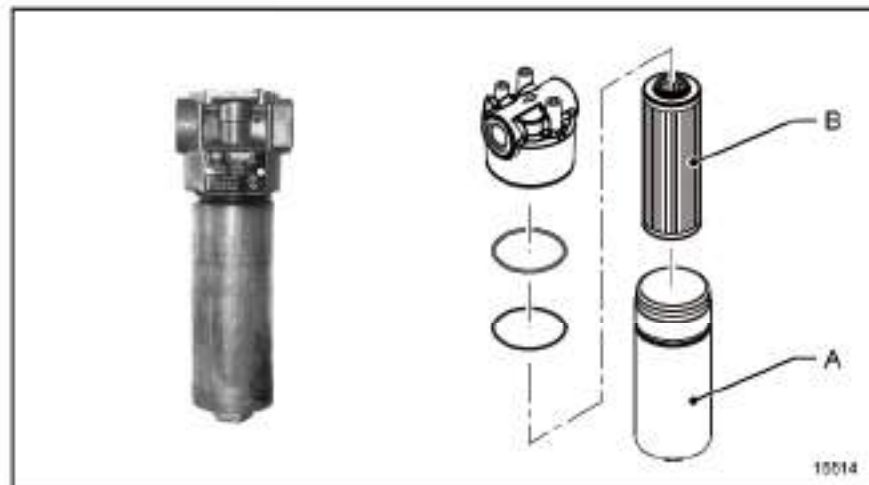
Hot surface, hot fluids!

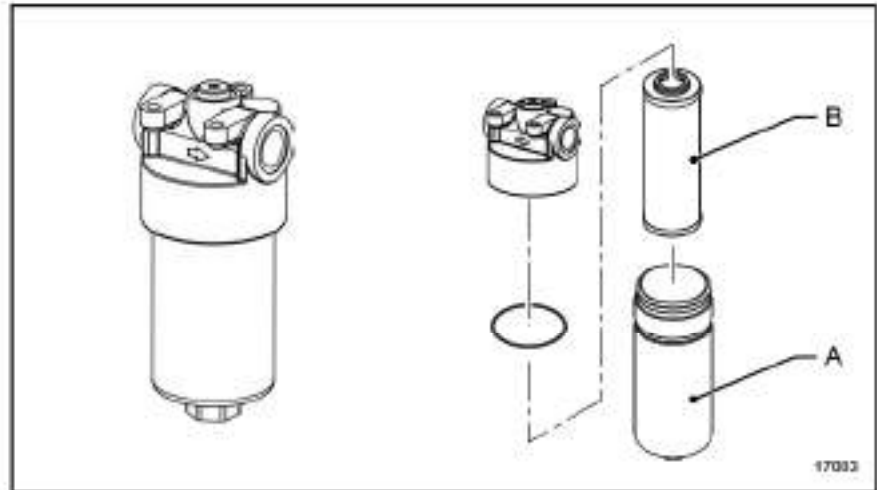
Risk of burns due to hot surfaces and fluids.

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

002-32

Variant 1

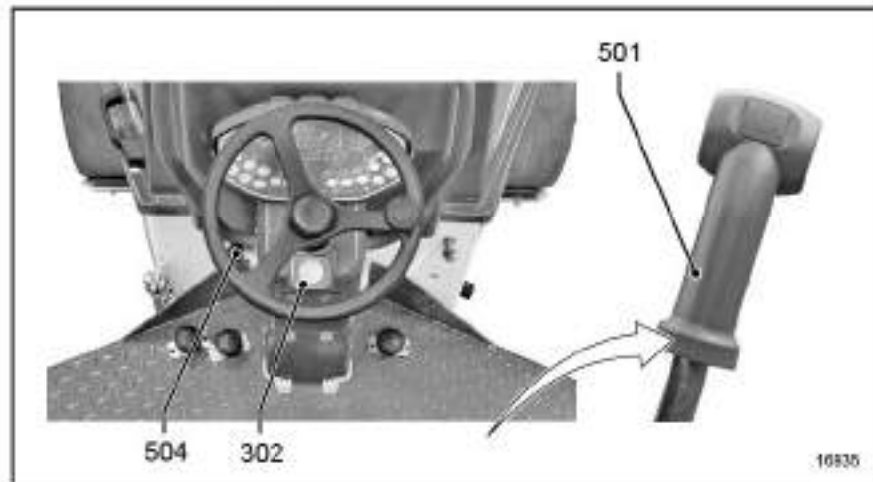


Variant 2

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 the cup-shaped housing [A].
4. Variant 1: Pull the filter insert [B] from the filter head and replace with a new one.
5. Variant 2: Unscrew the filter insert [B] from the filter head and replace with a new one.
6. Clean the inside of the cup-shaped housing, screw it back to the filter head and tighten.

4.08 Drive

4.08.01 Checking drive lever



- Function test**
1. Switch off diesel engine and remove ignition key.
 2. Move the drive lever [501] forward and back completely. The drive lever must allow even movement in both directions without using excessive force.

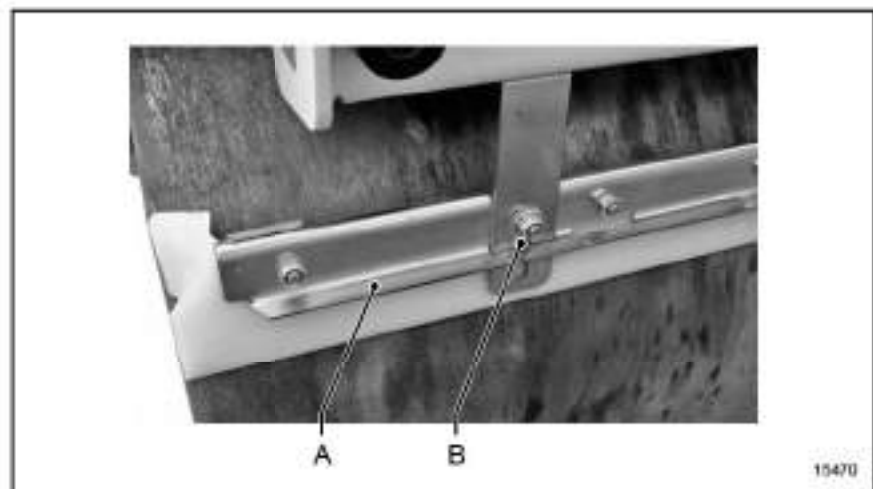


No machine operation is permitted if the drive lever binds or is sluggish. Call the customer service!

4.08.02 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.

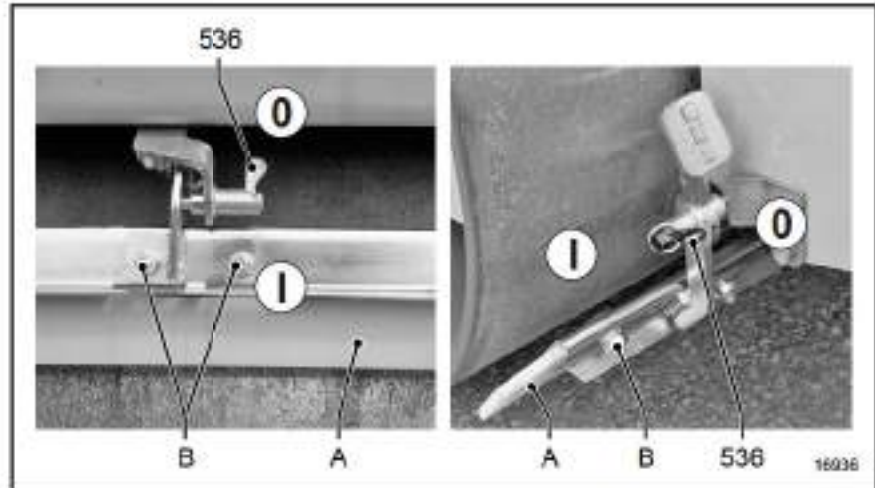
Rigid scraper



If the scrapers are worn to such an extent 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 clamp 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



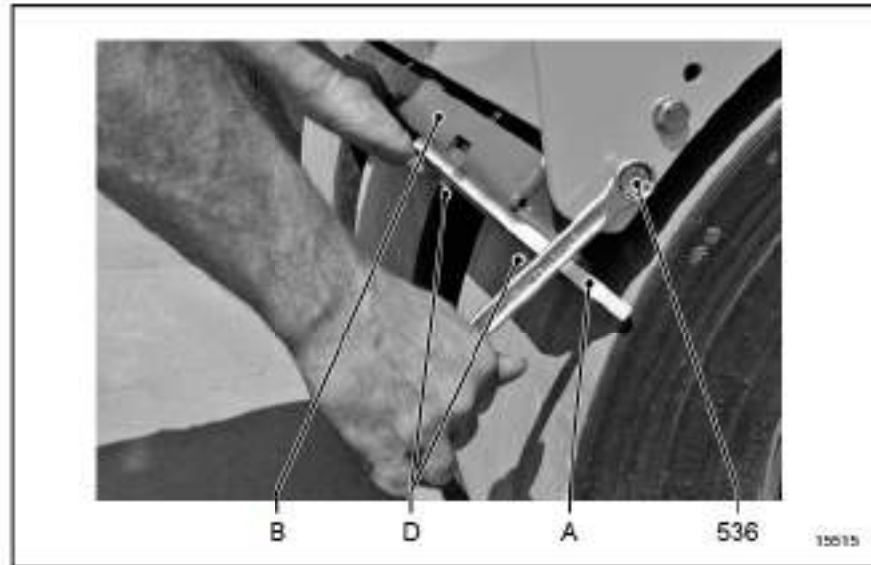
Drive the machine over an inspection pit in order to obtain easier access to the clamps to change the scraper.

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

4.08.03 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.

Variant 1



If the scrapers are worn to such an extent that the scrapers do not rub against the roller drum with the stop screw [536] loose, the scrapers must be re-adjusted at the clamp connection [CD].

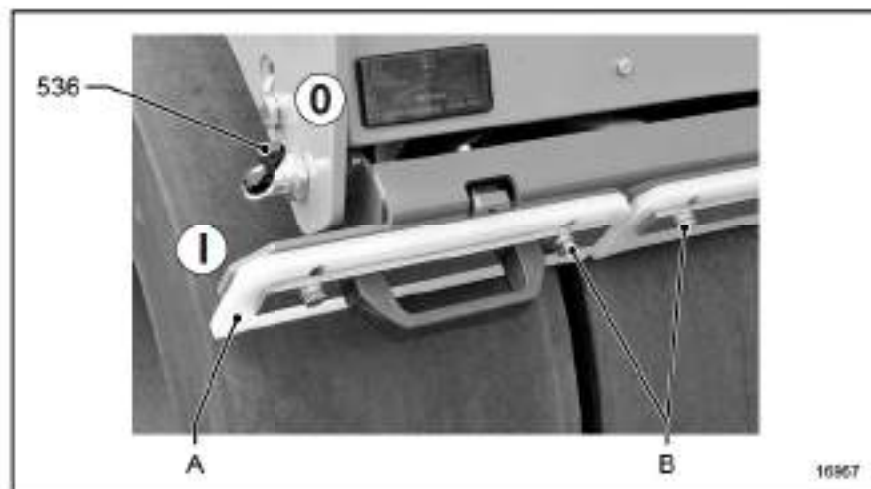
Readjusting the scraper

1. Switch off diesel engine and remove ignition key.
2. Tighten the drain plug [G] again.
3. Tighten the stop screw.
4. Loosen clamp connection [CD] (2x).
5. Push scraper [A] to the tyres. Establish a clearance of 10 mm between the tyres and the scrapers.
6. Tighten clamp connection [CD].
7. Loosen the stop screw [536] to bring the scrapers in contact with the tyres again.



When installing a new scraper, make certain that the screws are at the lowest positions in the elongated holes.

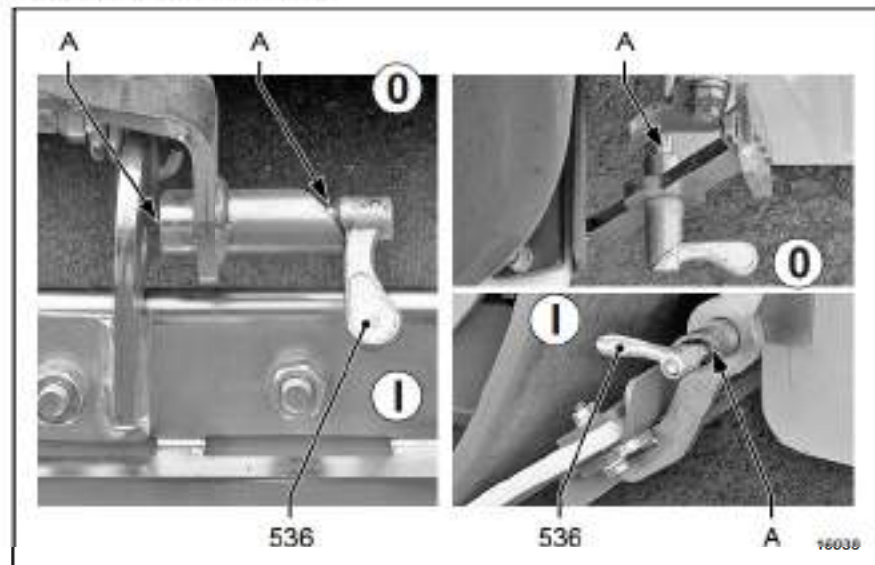
Variant 2



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.

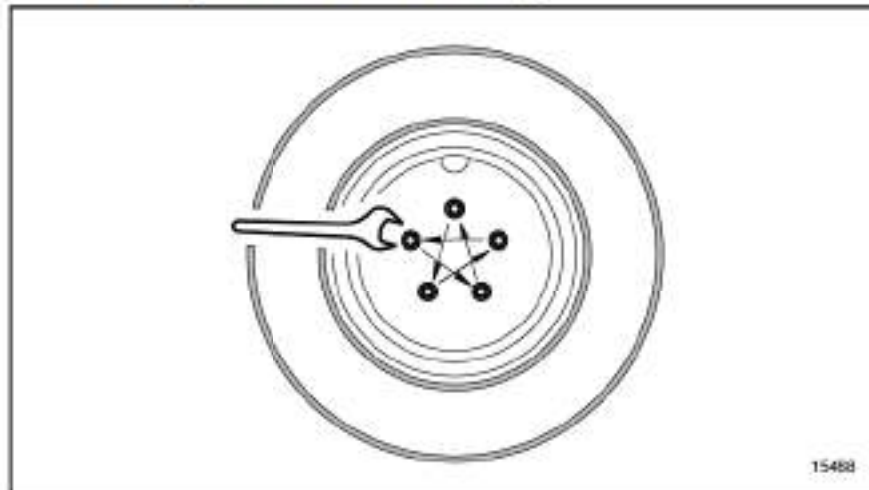
**Readjusting the scraper
(basic setting)**

1. Switch off diesel engine and remove ignition key.
2. Turn stop lever [536] to **0** position and move the scraper [A] 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].

4.08.04 Lubricating 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.

4.08.05 Checking wheel nuts / wheel bolts for tightness



1. Switch off diesel engine and remove ignition key.
2. Tighten the wheel nuts / wheel bolts crosswise.
For tightening torque see Technical data ([see page 148](#) sqq.).

4.08.06 Checking 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.

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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 148](#) sqq.).

4.08.07 Wheel change



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

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- 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 by the specified suspension points using suitable hoisting gear and take into account the weights ([see page 148](#) 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 148](#) sqq.). Install if possible with two persons.
- Disassembly**
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.
- Assembly**
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 nuts onto the tyre bolts and tighten by applying the specified tightening torque ([see page 148](#) sqq.).
 6. Press the valve extension hose back in the fixing device.
 7. Lift the machine and remove the liners.

4.09 Steering system

4.09.01 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.

4.09.02 Lubricating pivoted bearing

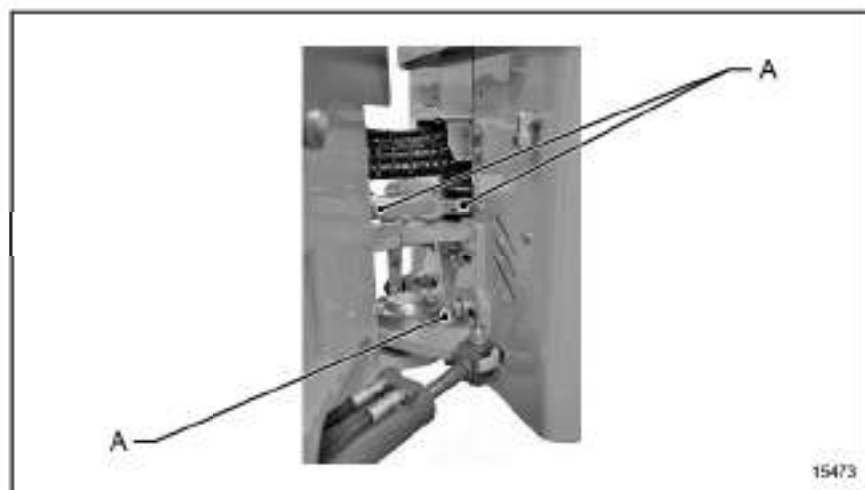
▲ WARNING

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.

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



Lubricant only admissible if containing this marking ([see page 142](#) sqq.).

4.09.03 Lubricating steering cylinder bolt

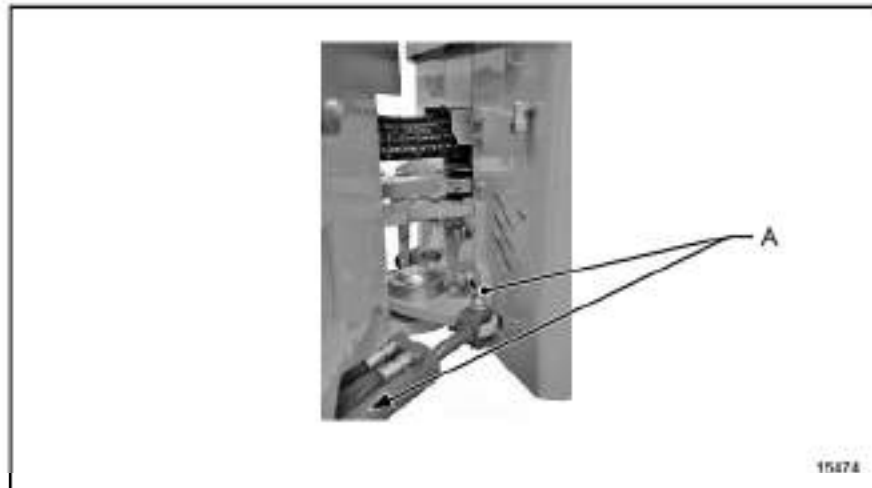
▲WARNING

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.

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



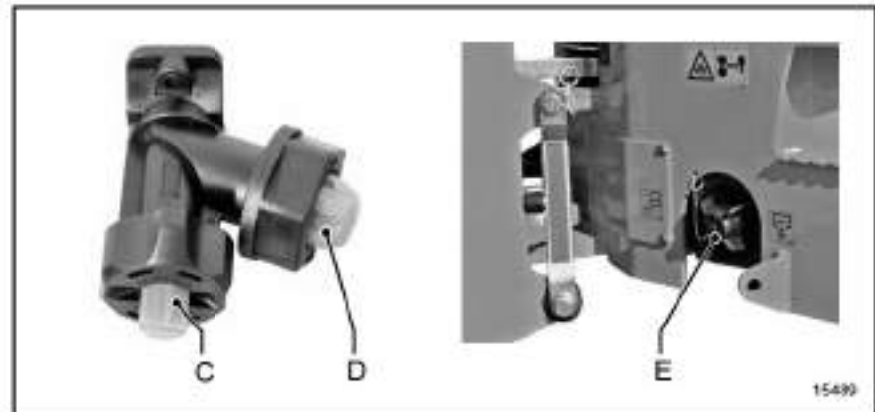
Lubricant only admissible if containing this marking ([see page 142](#) sqq.).

4.12 Sprinkling

4.12.01 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. Only use clean water!

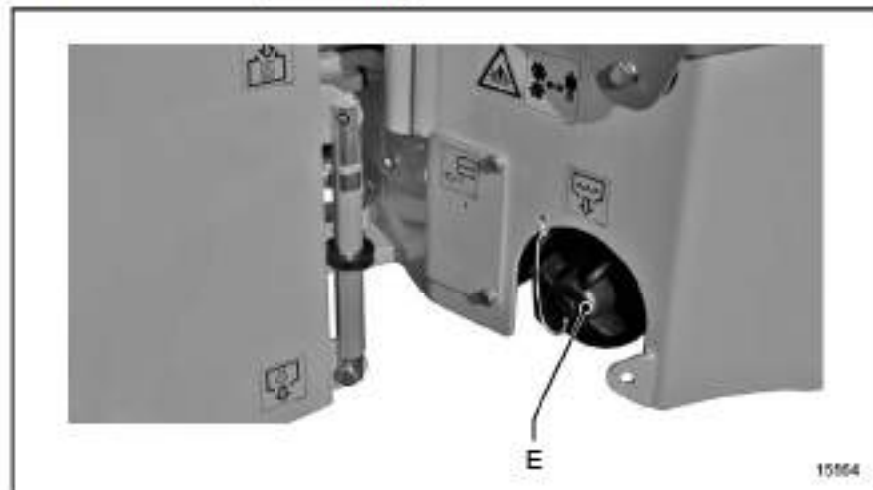
4.12.02 Cleaning water sprinkling unit



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 compression 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.

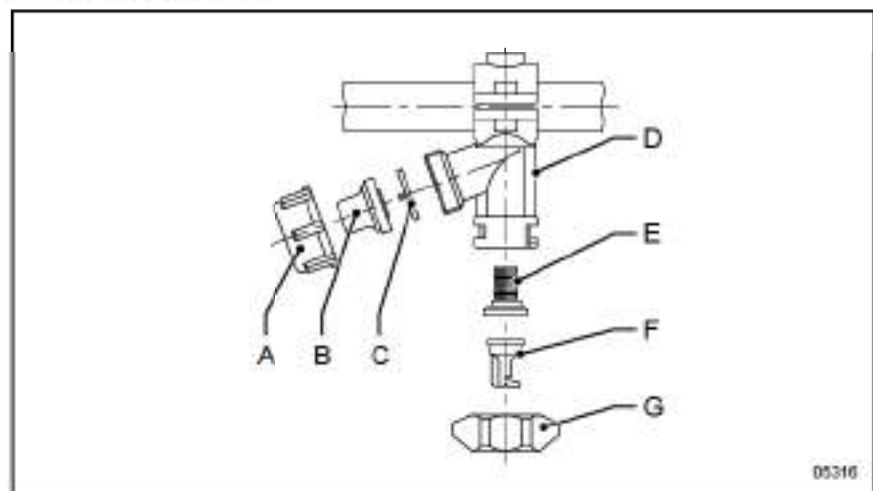
4.12.03 Cleaning filter for water sprinkling



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

Re-assemble in reverse order.

4.12.04 Cleaning sprinkler nozzles

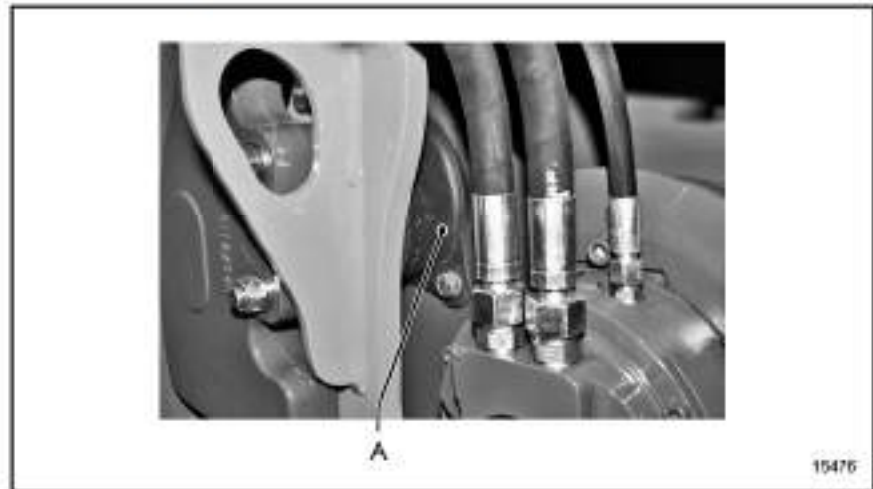


1. Switch off diesel engine and remove ignition key.
2. Loosen the cap nut [G] and remove it together with sprinkler nozzle [F] and filter [E].
3. Remove the filter and the sprinkler nozzle from the cap nut and clean them.
4. Unscrew the cap nut [A].
5. Remove valve insert [B] and membrane [C].
6. Flush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

Re-assemble in reverse order.

4.26 Vibration / oscillation

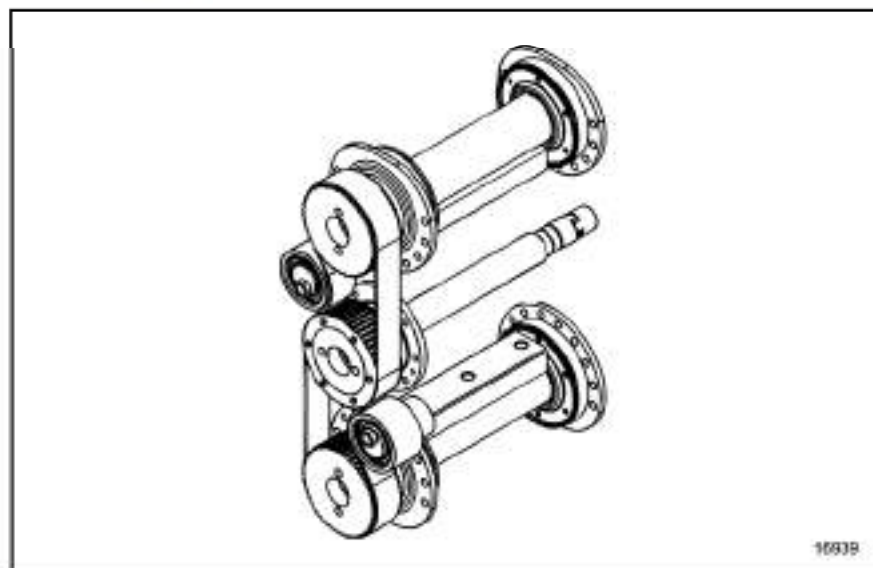
4.26.01 Checking damping elements



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.

4.26.02 Changing the toothed belt for the oscillation drive



In order to avoid longer downtimes of the machine, we recommend to replace the toothed belts for the oscillation drive after 2,000 operating hours.



This work may only be carried out by trained personnel.
Call the customer service!

5 TABLES



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

000-01

5.00 Technical data

5.00.01 Engine oil



Engine oil grade

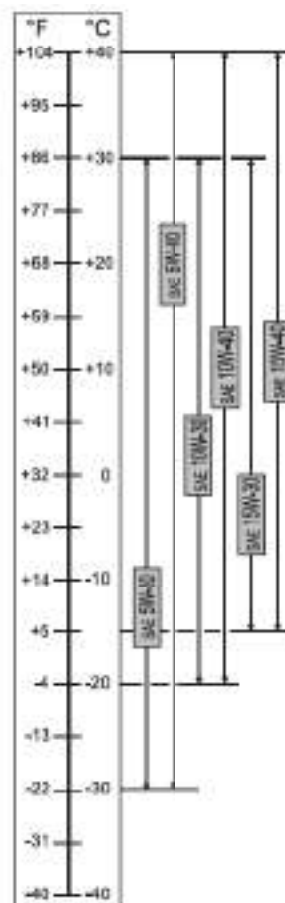
Do not operate the diesel engine unless using engine oil as specified in the consumables indications [see page 145](#).

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.

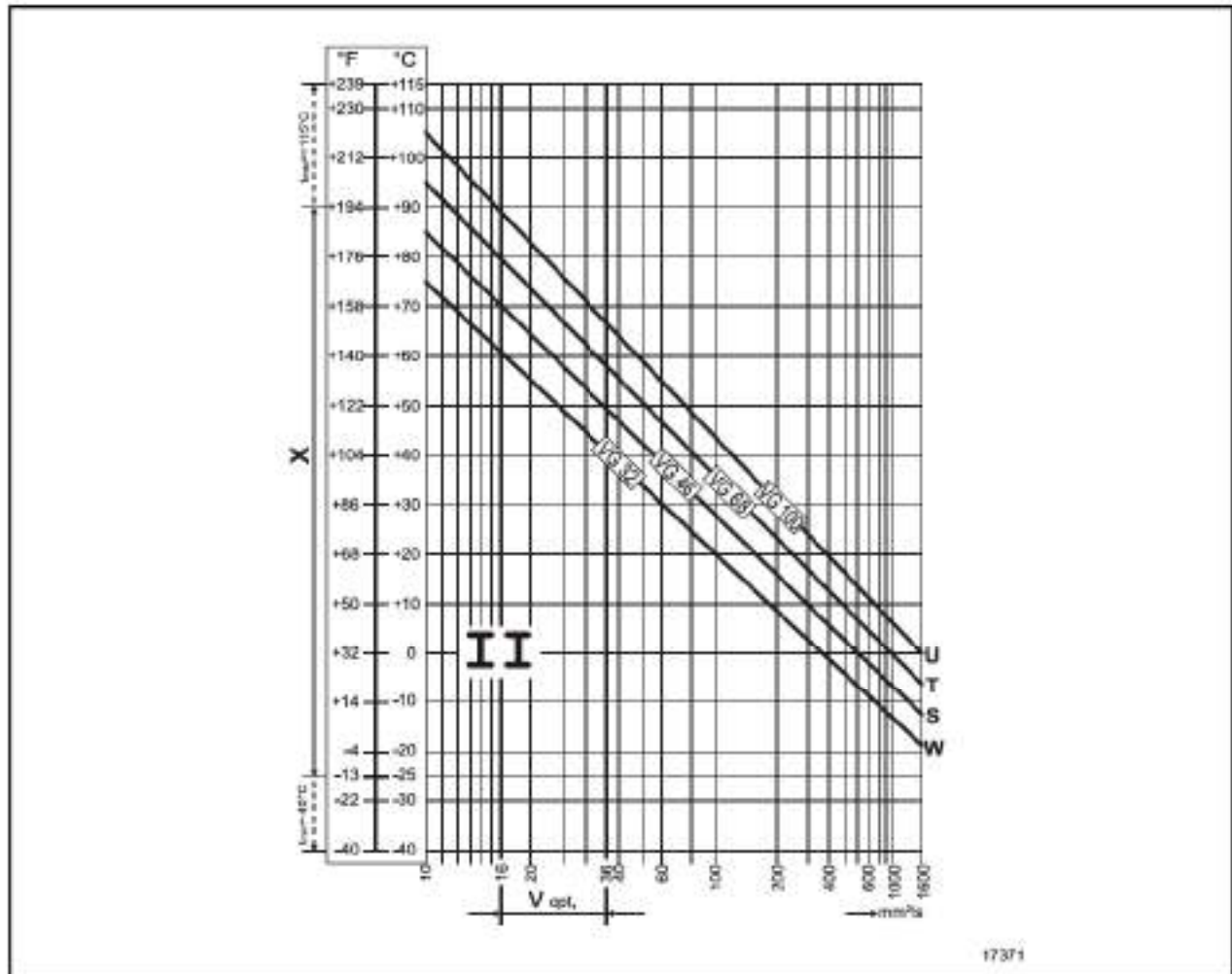
We recommend using multigrade oil for year-round use.



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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_{min} = -25 °C)

5.00.03 Use of biologic hydraulic oil

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

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

- Only biological hydraulic oil based on special synthetic saturated complex esters may be used. The products used and recommended by HAMM are shown in the overview of lubricant details ([see page 145](#) sqq.). Other oils used must correspond to the specifications of the oil above mentioned. The neutralisation value (oil acid) may 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 HAMM Customer service. All filters in the oil circuit are to be replaced 50 operating hours after oil replacement. After that, the filter change intervals given in this instructions apply again.
- Used biological oil must be disposed at a reliable place of disposal, just like mineral oil.

5.00.04 Coolant conditioning

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

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 checked with commercially available test devices (e.g. gefo glycomat ®).

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

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

The products used and recommended by HAMM are shown in the chapter lubricant details ([see page 142](#) sqq.) (without nitrite, amine and phosphate). The factory filled coolant blend consists of 40 parts cooling system protective liquid and 60 parts water. This guarantees freezing protection up to -25 °C (-13 °F). The cooling system protective agent can be purchased from HAMM customer service.

5.00.05 Fuel



Diesel 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 instruction 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 down -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	Identification
Engine oil The oil quality must correspond to the API / ACEA classification.	API: CG-4 or higher ACEA: E5-02 or higher	See chart	□
Hydraulic oil (mineral oil) 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 HAMM special oil is admissible.			◇
Gear box oil with Limited-Slip-Additions. The oil quality must correspond to 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.			○
Lubricating grease Lithium soaped multipurpose 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 according to DIN 934 and screws with headrest according to DIN 931 (frictional coefficient $\mu_{\text{total}} = 0.12$) unless otherwise specified.



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.

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5.01.01 HD 13 VV

Designation	Value	Unit
Dimensions and weights		
Basic weight without ROPS roll-over bar	3645	kg
Operating weight with ROPS roll-over bar	3965	kg
Axle load front / rear	2005 / 1960	kg
Working width / max. working width	1300 / 1350	mm
Turning radius inside / outside	2690 / 3990	mm
Diesel engine		
Manufacturer	Kubota	
Type	V2203	
Number of cylinders	4	
Power (ISO 14396) / rated speed	34.6 / 2700	kW / rpm
Emission level EU / USA	III A / Tier 4i	
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	
Stage 1: Frequency / speed	60 / 3600	Hz / rpm
Stage 1: Maximum amplitude	0.51	mm
Stage 2: Frequency / speed	51 / 3060	Hz / rpm
Stage 2: Maximum amplitude	0.31	mm
Steering		
Steering angle to both sides	33	°
Pendulum compensation upwards and downwards	8	°
Track offset		
Track offset to the right	50	mm

Designation	Value	Unit
Capacities		
Fuel	73.00	l
Engine oil (for oil change)	9.50	l
Coolant of diesel engine	9.50	l
Hydraulic oil	33.00	l
Water sprinkling	285.00	l
Sound power level		
Sound power LW(A), guaranteed	104	dB(A)
Sound power LW(A), representatively measured	103	dB(A)
Sound intensity level		
Sound pressure LP(A), measured near the cab	Not existing	
Sound pressure LP(A), measured near the ROPS	88	dB(A)
Electrical system		
Operating voltage	12	V

5.01.02 HD 13 VO

Designation	Value	Unit
Dimensions and weights		
Basic weight without ROPS roll-over bar	3695	kg
Operating weight with ROPS roll-over bar	4015	kg
Axle load front / rear	2005 / 2010	kg
Working width / max. working width	1300 / 1350	mm
Turning radius inside / outside	2690 / 3990	mm
Diesel engine		
Manufacturer	Kubota	
Type	V2203	
Number of cylinders	4	
Power (ISO 14396) / rated speed	34.6 / 2700	kW / rpm
Emission level EU / USA	III A / Tier 4i	
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	
Stage 1: Frequency / speed	60 / 3600	Hz / rpm
Stage 1: Maximum amplitude	0.51	mm
Stage 2: Frequency / speed	51 / 3060	Hz / rpm
Stage 2: Maximum amplitude	0.31	mm
Oscillation		
Oscillation	rear	
Stage 1: Frequency / speed	39 / 2340	Hz / rpm
Stage 1: Tangential amplitude	1.44	mm
Stage 2: Frequency / speed	30 / 1800	Hz / rpm
Stage 2: Tangential amplitude	1.44	mm
Steering		
Steering angle to both sides	33	°

Tables

Technical data



Designation	Value	Unit
Pendulum compensation upwards and downwards	8	°
Track offset		
Track offset to the right	50	mm

Designation	Value	Unit
Capacities		
Fuel	73.00	l
Engine oil (for oil change)	9.50	l
Coolant of diesel engine	9.50	l
Hydraulic oil	33.00	l
Water sprinkling	285.00	l
Sound power level		
Sound power LW(A), guaranteed	104	dB(A)
Sound power LW(A), representatively measured	103	dB(A)
Sound intensity level		
Sound pressure LP(A), measured near the cab	Not existing	
Sound pressure LP(A), measured near the ROPS	88	dB(A)
Electrical system		
Operating voltage	12	V

5.01.03 HD 13 VT

Designation	Value	Unit
Dimensions and weights		
Basic weight without ROPS roll-over bar	3495	kg
Operating weight with ROPS roll-over bar	3825	kg
Axle load front / rear	2005 / 1820	kg
Wheel load per tyre	455	kg
Working width / max. working width	1300 / 1338	mm
Turning radius inside / outside	2690 / 3990	mm
Diesel engine		
Manufacturer	Kubota	
Type	V2203	
Number of cylinders	4	
Power (ISO 14396) / rated speed	34.6 / 2700	kW / rpm
Emission level EU / USA	III A / Tier 4i	
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	10.5/80-16	
Number of tyres rear	4	items
Weight of tyres	60	kg
Air pressure	0.3 / (3.0) / (44)	MPa / (bar) / (psi)
Starting torque wheel nut	170	Nm
Vibration		
Vibration	front	
Stage 1: Frequency / speed	60 / 3600	Hz / rpm
Stage 1: Maximum amplitude	0.51	mm
Stage 2: Frequency / speed	51 / 3060	Hz / rpm
Stage 2: Maximum amplitude	0.31	m
Steering		

Designation	Value	Unit
Steering angle to both sides	33	°
Pendulum compensation upwards and downwards	8	°
Track offset		
Track offset to the right	50	mm

Designation	Value	Unit
Capacities		
Fuel	73.00	l
Engine oil (for oil change)	9.50	l
Coolant of diesel engine	9.50	l
Hydraulic oil	33.00	l
Water sprinkling	285.00	l
Additive sprinkling	18.00	l
Sound power level		
Sound power LW(A), guaranteed	104	dB(A)
Sound power LW(A), representatively measured	103	dB(A)
Sound intensity level		
Sound pressure LP(A), measured near the cab	Not existing	
Sound pressure LP(A), measured near the ROPS	88	dB(A)
Electrical system		
Operating voltage	12	V

5.01.04 HD 14 VV

Designation	Value	Unit
Dimensions and weights		
Basic weight without ROPS roll-over bar	4025	kg
Operating weight with ROPS roll-over bar	4345	kg
Axle load front / rear	2175 / 2170	kg
Working width / max. working width	1380 / 1430	mm
Turning radius inside / outside	2650 / 4030	mm
Diesel engine		
Manufacturer	Kubota	
Type	V2203	
Number of cylinders	4	
Power (ISO 14396) / rated speed	34.6 / 2700	kW / rpm
Emission level EU / USA	III A / Tier 4i	
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	
Stage 1: Frequency / speed	60 / 3600	Hz / rpm
Stage 1: Maximum amplitude	0.51	mm
Stage 2: Frequency / speed	51 / 3060	Hz / rpm
Stage 2: Maximum amplitude	0.31	mm
Steering		
Steering angle to both sides	33	°
Pendulum compensation upwards and downwards	8	°
Track offset		
Track offset to the right	50	mm

Designation	Value	Unit
Capacities		
Fuel	73.00	l
Engine oil (for oil change)	9.50	l
Coolant of diesel engine	9.50	l
Hydraulic oil	33.00	l
Water sprinkling	285.00	l
Sound power level		
Sound power LW(A), guaranteed	104	dB(A)
Sound power LW(A), representatively measured	103	dB(A)
Sound intensity level		
Sound pressure LP(A), measured near the cab	Not existing	
Sound pressure LP(A), measured near the ROPS	88	dB(A)
Electrical system		
Operating voltage	12	V

5.01.05 HD 14 VO

Designation	Value	Unit
Dimensions and weights		
Basic weight without ROPS roll-over bar	4115	kg
Operating weight with ROPS roll-over bar	4435	kg
Axle load front / rear	2175 / 2260	kg
Working width / max. working width	1380 / 1430	mm
Turning radius inside / outside	2650 / 4030	mm
Diesel engine		
Manufacturer	Kubota	
Type	V2203	
Number of cylinders	4	
Power (ISO 14396) / rated speed	34.6 / 2700	kW / rpm
Emission level EU / USA	III A / Tier 4i	
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	
Stage 1: Frequency / speed	60 / 3600	Hz / rpm
Stage 1: Maximum amplitude	0.51	mm
Stage 2: Frequency / speed	51 / 3060	Hz / rpm
Stage 2: Maximum amplitude	0.31	mm
Oscillation		
Oscillation	rear	
Stage 1: Frequency / speed	39 / 2340	Hz / rpm
Stage 1: Tangential amplitude	1.37	mm
Stage 2: Frequency / speed	30 / 1800	Hz / rpm
Stage 2: Tangential amplitude	1.37	mm
Steering		
Steering angle to both sides	33	°

Tables

Technical data



Designation	Value	Unit
Pendulum compensation upwards and downwards	8	°
Track offset		
Track offset to the right	50	mm

Designation	Value	Unit
Capacities		
Fuel	73.00	l
Engine oil (for oil change)	9.50	l
Coolant of diesel engine	9.50	l
Hydraulic oil	33.00	l
Water sprinkling	285.00	l
Sound power level		
Sound power LW(A), guaranteed	104	dB(A)
Sound power LW(A), representatively measured	103	dB(A)
Sound intensity level		
Sound pressure LP(A), measured near the cab	Not existing	
Sound pressure LP(A), measured near the ROPS	88	dB(A)
Electrical system		
Operating voltage	12	V

5.01.06 HD 14 VT

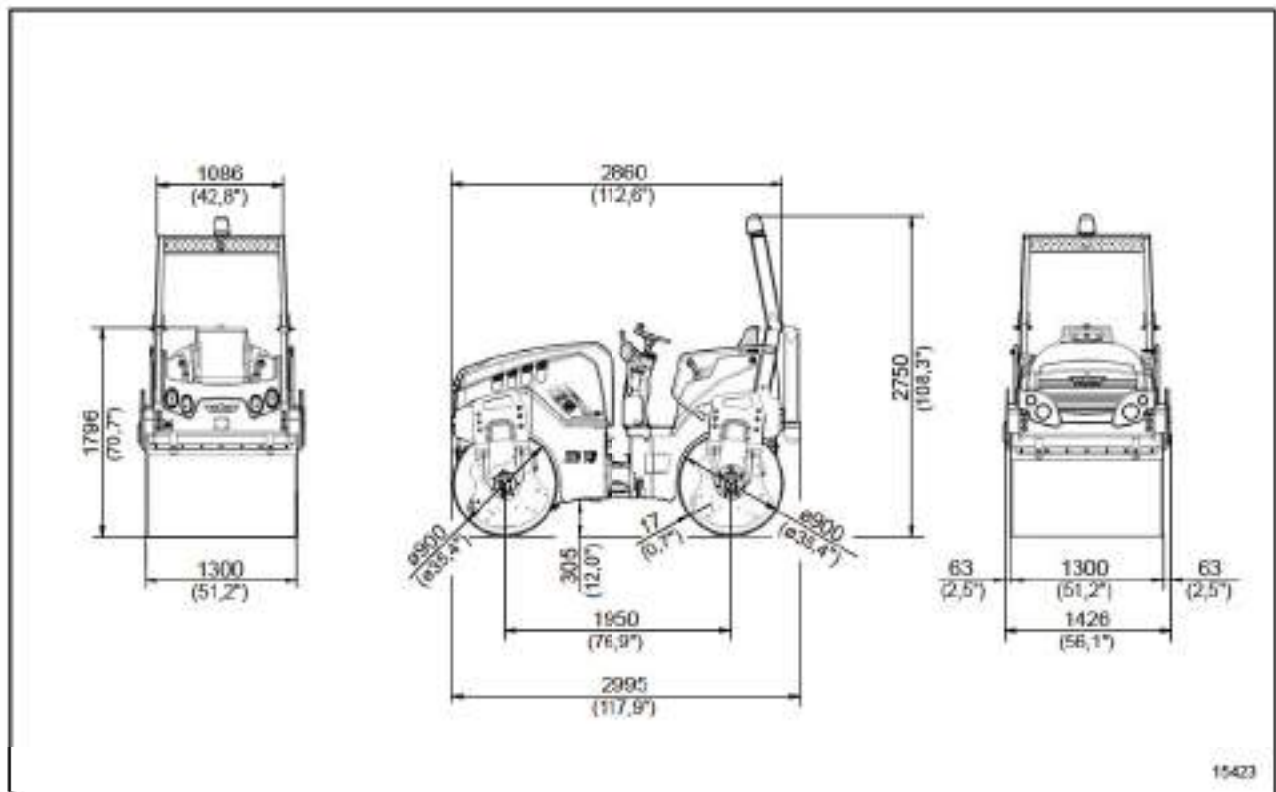
Designation	Value	Unit
Dimensions and weights		
Basic weight without ROPS roll-over bar	3656	kg
Operating weight with ROPS roll-over bar	3995	kg
Axle load front / rear	2175 / 1820	kg
Wheel load per tyre	455	kg
Working width / max. working width	1380 / 1380	mm
Turning radius inside / outside	2650 / 4030	mm
Diesel engine		
Manufacturer	Kubota	
Type	V2203	
Number of cylinders	4	
Power (ISO 14396) / rated speed	34.6 / 2700	kW / rpm
Emission level EU / USA	III A / Tier 4i	
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	10.5/80-16	
Number of tyres rear	4	items
Weight of tyres	60	kg
Air pressure	0.3 / (3.0) / (44)	MPa / (bar) / (psi)
Starting torque wheel nut	170	Nm
Vibration		
Vibration	front	
Stage 1: Frequency / speed	60 / 3600	Hz / rpm
Stage 1: Maximum amplitude	0.51	mm
Stage 2: Frequency / speed	51 / 3060	Hz / rpm
Stage 2: Maximum amplitude	0.31	mm
Steering		

Designation	Value	Unit
Steering angle to both sides	33	°
Pendulum compensation upwards and downwards	8	°
Track offset		
Track offset to the right	50	mm

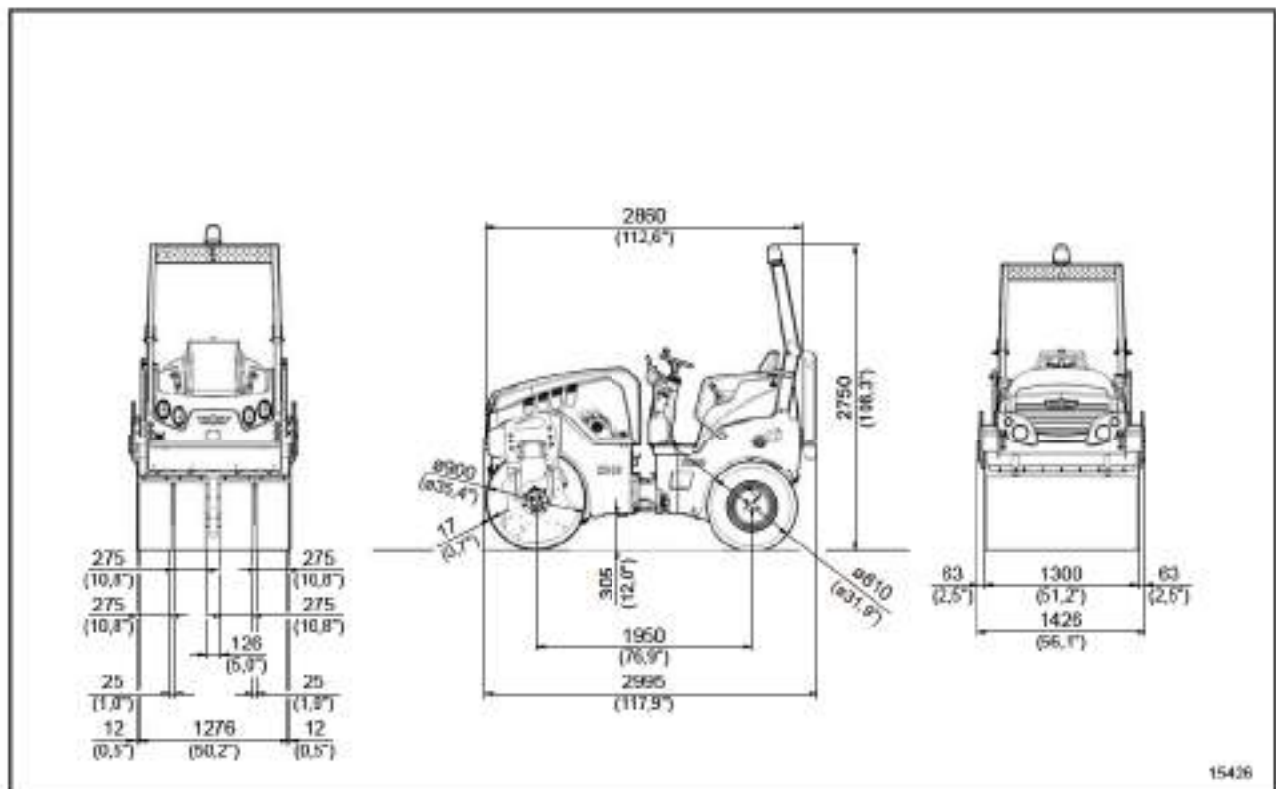
Designation	Value	Unit
Capacities		
Fuel	73.00	l
Engine oil (for oil change)	9.50	l
Coolant of diesel engine	9.50	l
Hydraulic oil	33.00	l
Water sprinkling	285.00	l
Additive sprinkling	18.00	l
Sound power level		
Sound power LW(A), guaranteed	104	dB(A)
Sound power LW(A), representatively measured	103	dB(A)
Sound intensity level		
Sound pressure LP(A), measured near the cab	Not existing	
Sound pressure LP(A), measured near the ROPS	88	dB(A)
Electrical system		
Operating voltage	12	V

5.02 Dimension sheet

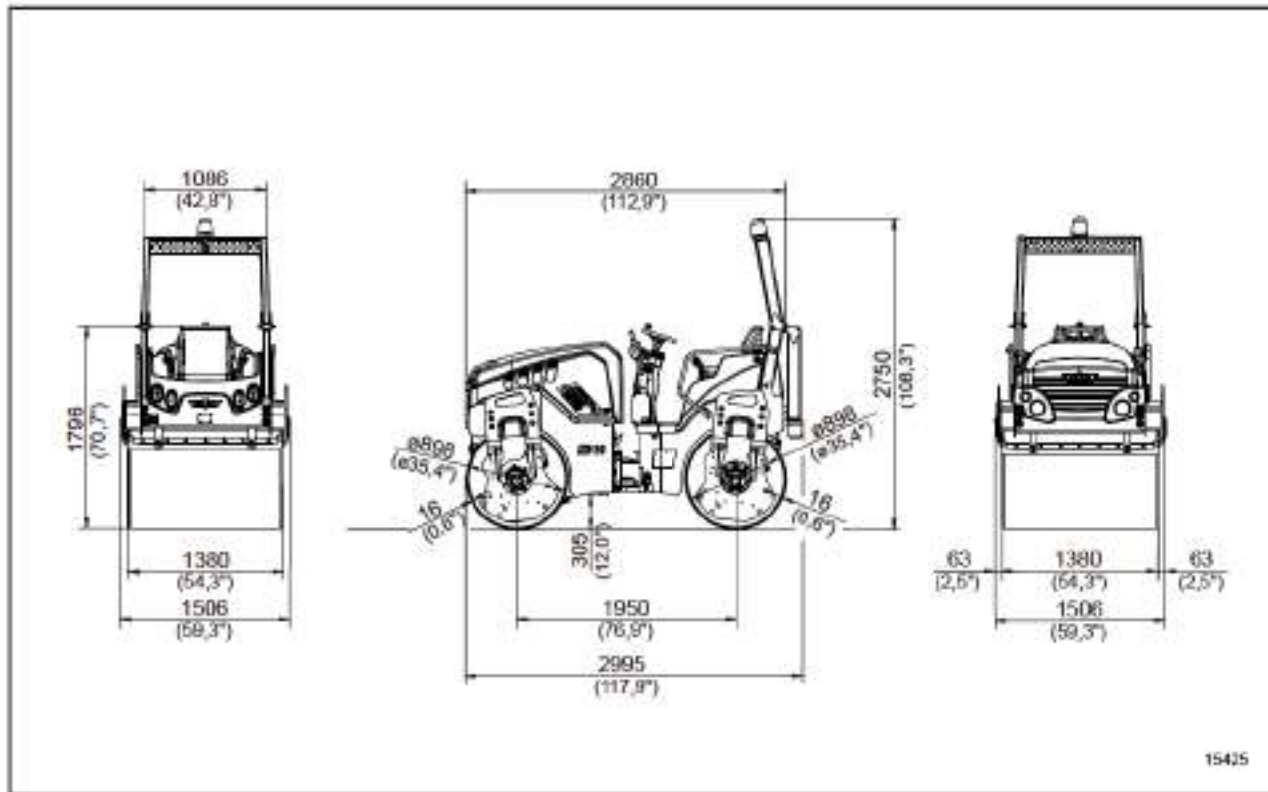
5.02.01 HD 13 VV, HD 13 VO



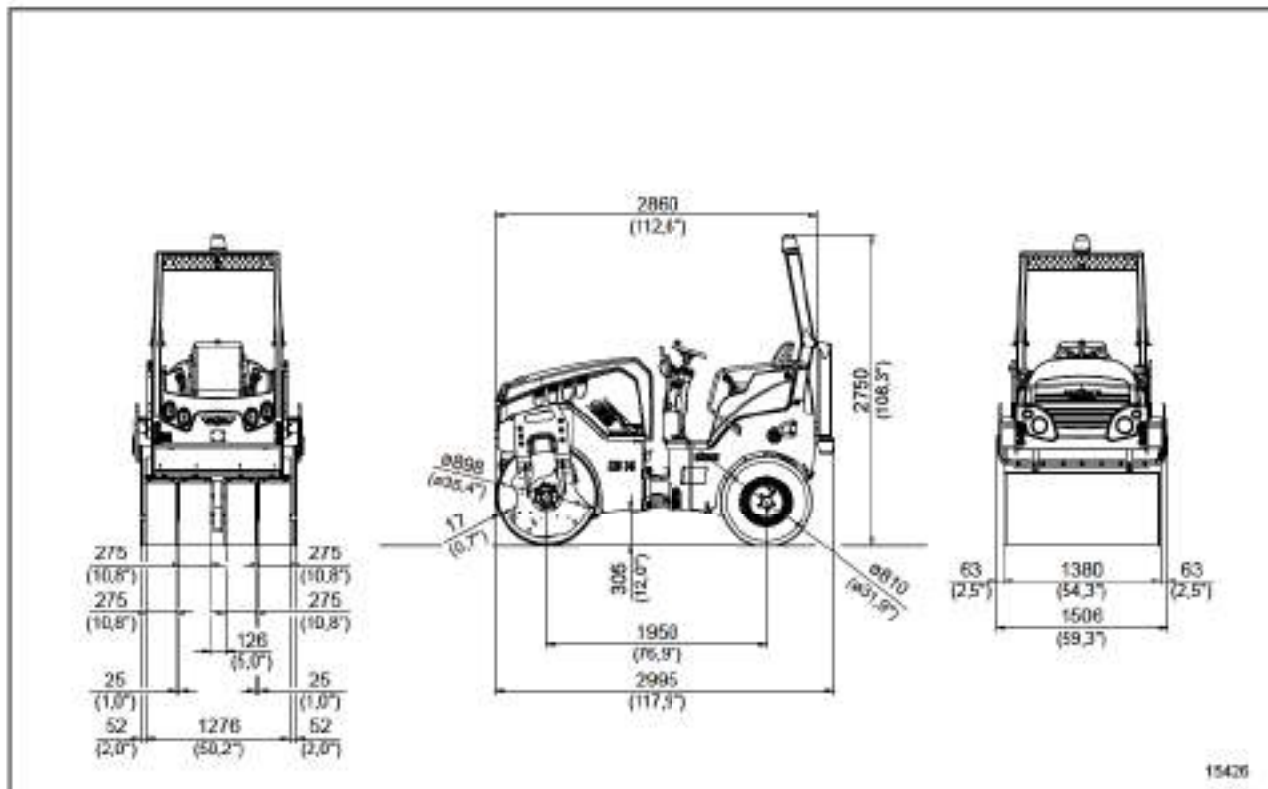
5.02.02 HD 13 VT



5.02.03 HD 14 VV, HD 14 VO



5.02.04 HD 14 VT



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.

002-46

Fuses

Position	Fuse assignment	Fuse
F01	Main fuse on the battery	80 A
F1	All-wheel lock	5 A
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	Cold start assistance pilot light	5 A
F9	not used	5 A
F10	Pedal switch sprinkling	15 A
F11	Pedal switch additive sprinkling, seat heating	15 A
F12	not used	
F13	Socket	15 A
F14	Signal horn	15 A
F15	Additive sprinkling pump	15 A
F16	Water sprinkling 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
16	Solenoid valve KAG up	Short-circuit, line break
17	Solenoid valve KAG down	Short-circuit, line break
18	Solenoid valve rear vibration or solenoid valve amplitude	Short-circuit, line break
19	Solenoid valve vibration rear	Short-circuit, line break
20	Solenoid valve amplitude large / small	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 sprinkling pump	Line rupture
28	Water sprinkling pump	Short-circuit
29	Alternator	Short-circuit, line break
30	Parking light	Short-circuit

6 ASSEMBLY INSTRUCTIONS AND AUXILIARY DEVICES



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

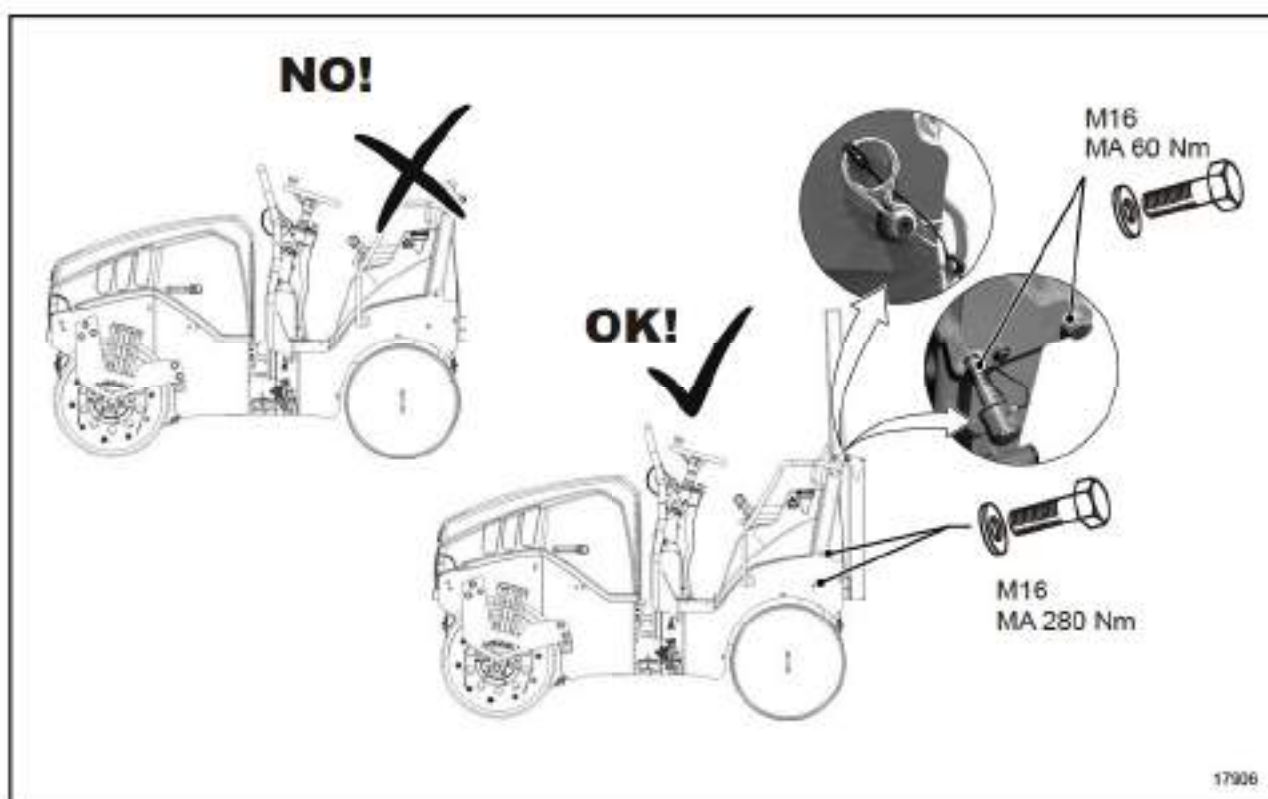
000-01



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.

000-23

6.00 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 dismantled (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.

002 34

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

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 ROPS cabin



General The enclosed, roll-over protected driver's cab gives the driver additional comfort while working. Heating and ventilation create a good climate inside the cab. Large windows provide optimal all-round visibility.



Because of the additional, lateral space requirement of the driver's cab, the track must not be offset. Non-compliance limits the steering angle. This can cause material damage.

000-32

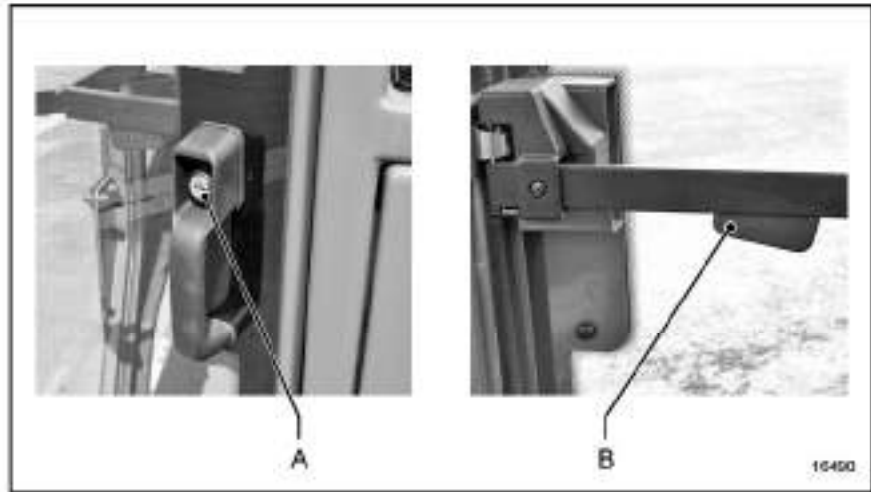
6.01.01 Operator's cabin overview

Operator's cabin



[A]	Handles	[B]	Operator's seat console
[C]	Operator's cabin	[D]	Stacker for operating manual / first aid kit
[E]	ROPS cabin type plate	[F]	Position for *fire extinguisher

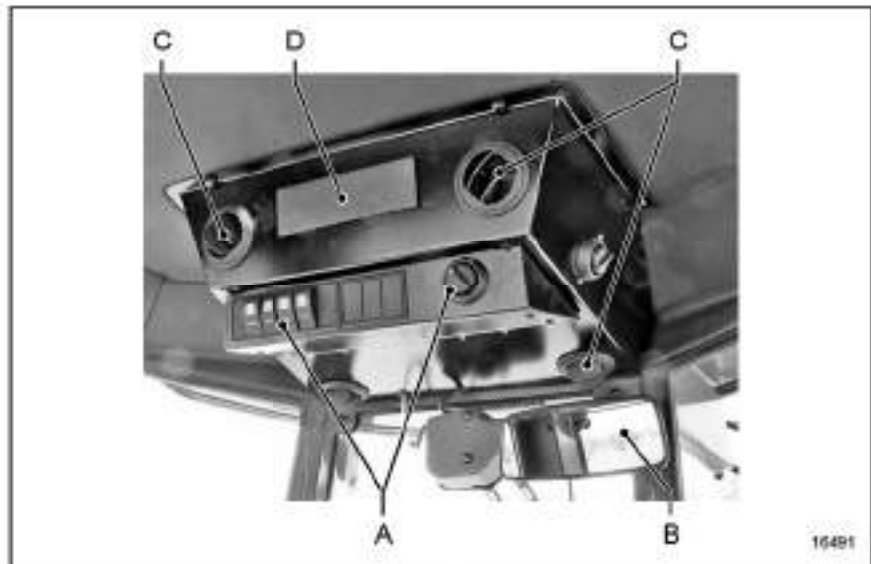
Door lock



[A] Lock operation, outside

[B] Lock operation, inside

Roof section

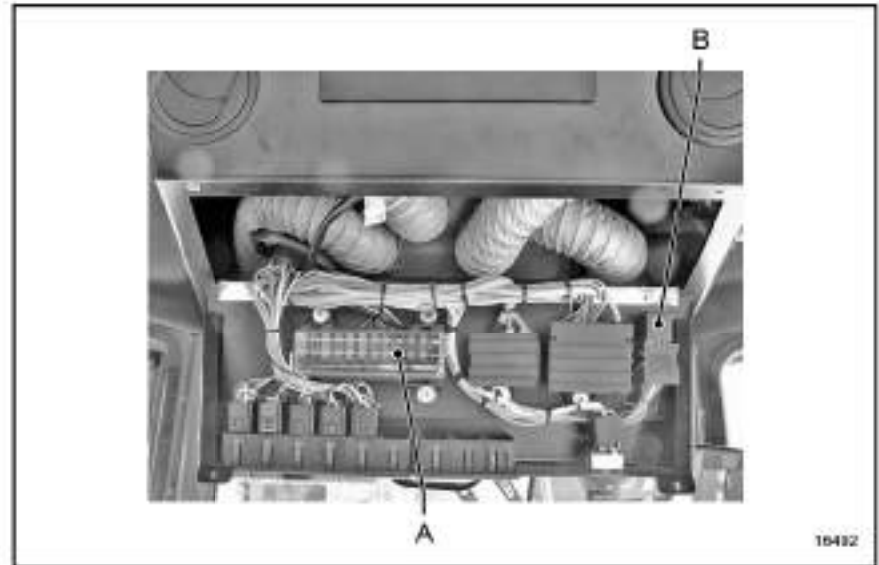


[A] Switch unit

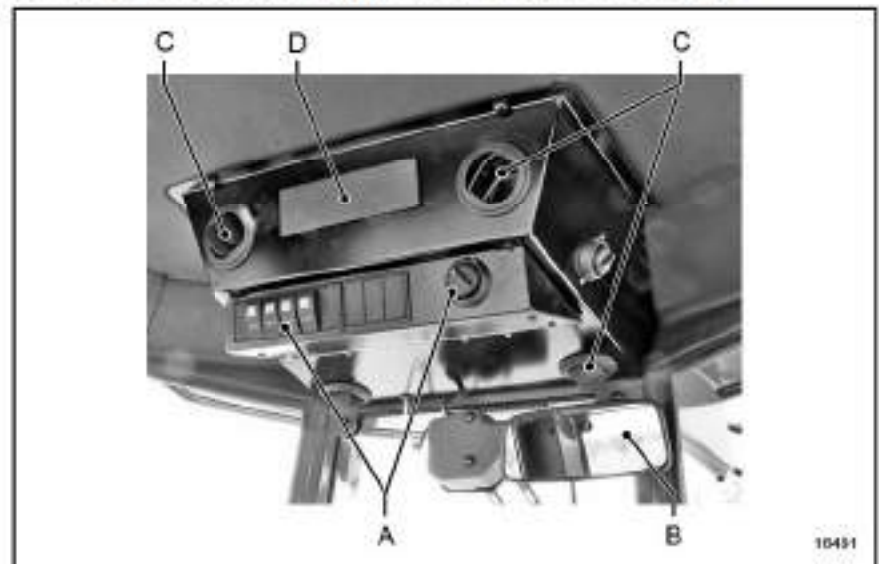
[B] Inside mirror

[C] Ventilation nozzles

[D] Position for *radio /
*tachograph

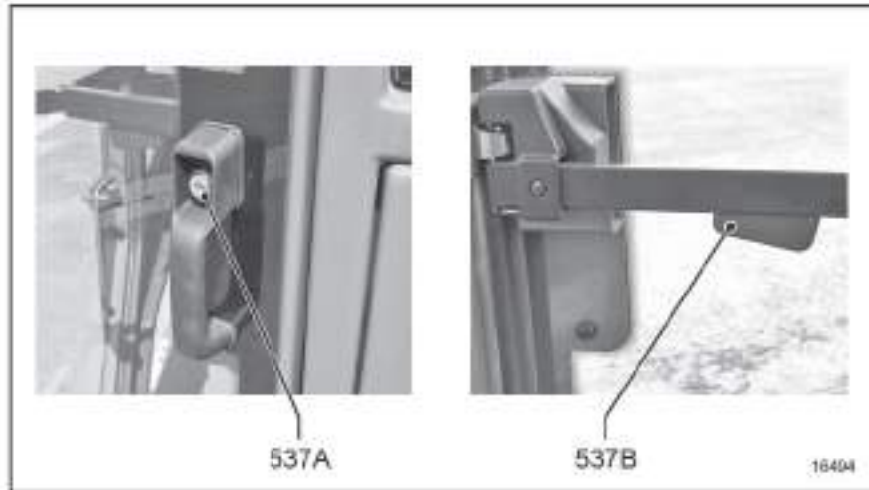
Fuses


[A] Fuses, operator's cabin [B] Working spotlight relay

6.01.02 General view of instruments and operating elements
Roof section


[A]	Switch unit	[B]	Inside mirror
[C]	Ventilation nozzles	[D]	Position for *radio / *tachograph

Door lock



[537A] Lock operation, outside

[537B] Lock operation, inside

6.01.03 Switch

309 Working spotlight, cabin



Pressing the switch turns the working spotlights on the cabin on or off.

- On — position **I**
(push button lights up)
- Off — position **0**

311 Rotating light



- On — position **I**
(push button lights up)
- Off — position **0**

330 Cabin heating blower



The switch regulates the blower for the cabin ventilation.

- Air current Off — position **0**
- Air current stage 1 — position **I**
- Air current stage 2 — position **II**
- Air current stage 3 — position **III**



332 Front windscreen wiper



On — position **I**

Off — position **0**

333 Rear windshield wiper



On — position **I**

Off — position **0**

338 Windscreen washer system



By pressing the switch up or down, the delivery pump of the windscreen washer and the wiper are switched on. Only as long as the switch is pressed a moistening of the windscreen takes place.

Washing and wiping the front windscreen — position **I**

Off — position **0**

Washing and wiping the rear window — position **II**

347 Cabin heating temperature regulation



The heat exchanger for the cabin-heating is connected to the diesel engine cooling circuit. The heat exchanger temperature is continuously adjustable with the switch.

Minimum temperature — stop **RIGHT**

Maximum temperature — stop **LEFT**

6.01.04 Sockets, lights

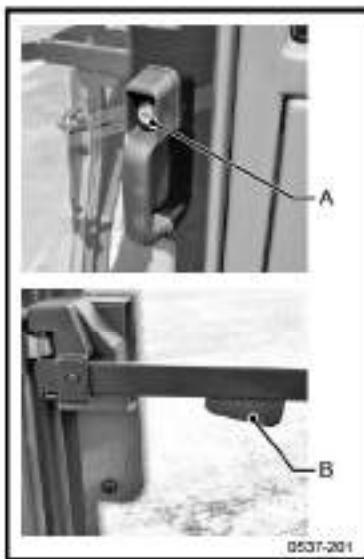
410 Cab lighting



This works even if the electrical system is switched off.

6.01.05 Operating levers, adjustment handles

537 Lock operation



The door of the driver's cab is locked by a latch lock. Elements [A] or [B] only have to be actuated in order to open the door. The door is locked by pressing it into the lock.

Opening the door:

Lock operation from outside:

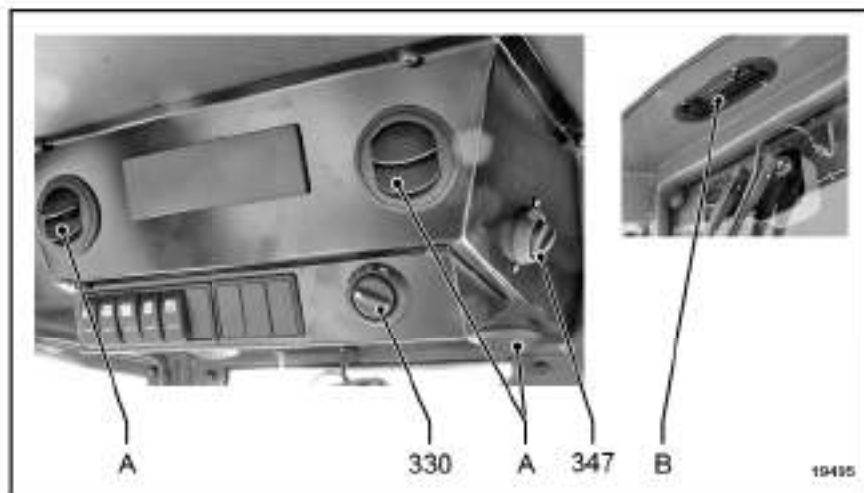
Push button [A] — **PRESS**

Lock operation from inside:

Handle [B] into the frame section — **PRESS**

6.01.06 Heating system / Ventilation

General The comfort, well-being and good condition of the driver are largely dependent on a properly set heating and ventilation. This especially applies for the cold seasons. An especially designed heating and ventilation system ensures an optimal compartment climate.

Cabin ventilation


[A]	Ventilation nozzle	[B]	Aspiration duct
[330]	Cabin heating switch Fan	[347]	Cabin heating switch, temperature regulation

The air flow enters the cabin through the ventilation nozzles [A] that can be opened or closed by adjusting the discs. The direction is set by turning the disc ring. For drying or de-icing of the front or rear window the air flow must be directed to the windows.

Heating system The heat exchanger for the heating is connected to the engine cooling circuit. After the ventilation fan [330] is switched on, the air flow which passed through the heat exchanger is guided into the cabin. The heating temperature [347] is infinitely variable.

Ventilation If the switch [347] is set to minimum (right stop), the system runs in ventilation operation. Three ventilation steps [330] ensure an optimal air circulation in the cabin.

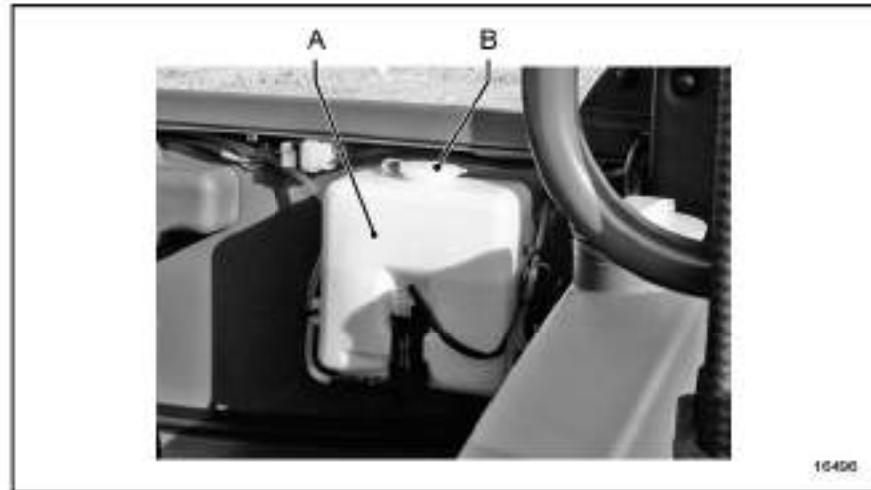
6.01.07 Maintenance


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

000-01

General The instructions itemized in the "Important information about maintenance work" chapter ([see page 108](#)) must always be followed during all maintenance work.

Checking fill level of the windscreen washer

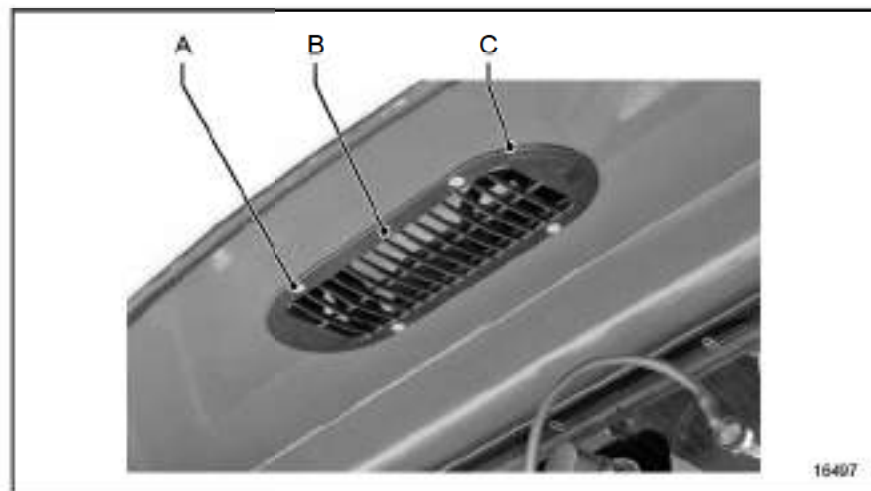


The tank [A] of the windscreen washer is located in the operator's cabin. Fill up windscreen washer in good time.

Pure water can be used to wash the windscreen. Antifreeze must be added when outdoor temperatures are below freezing point. Make sure you use the mixing ratio specified by the manufacturer!

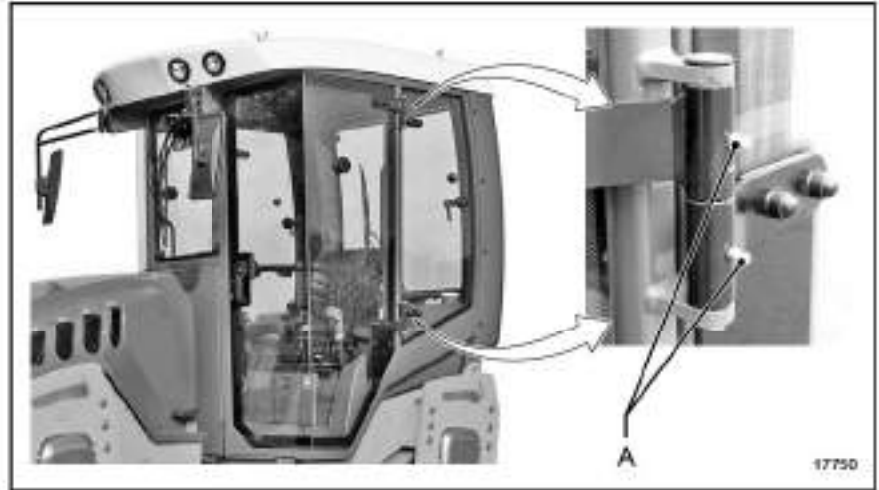
1. Open lid [B], and fill the tank with the appropriate windscreen washing liquid.
2. Close the tank lid [B] again.

Replacing fresh air filter of the operator's cabin



Replace the filter depending on the dusty conditions.

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

**Lubricating hinges of the
cabin doors**

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



Lubricant only admissible if containing this marking ([see page 142](#) sqq.).

6.01.08 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.

000-30

Operator's cabin

Designation	Value	Unit
Weights		
Cabin weight	320	kg

HD 13 VV

Designation	Value	Unit
Weights		
Basic weight with cabin	3970	kg
Operating weight with cabin	4225	kg
Axle load with cabin front / rear	2025 / 2200	kg

HD 13 VO

Designation	Value	Unit
Weights		
Basic weight with cabin	4020	kg
Operating weight with cabin	4275	kg
Axle load with cabin front / rear	2025 / 2250	kg

HD 13 VT

Designation	Value	Unit
Weights		
Basic weight with cabin	3810	kg
Operating weight with cabin	4075	kg
Axle load with cabin front / rear	2025 / 2410	kg

HD 14 VV

Designation	Value	Unit
Weights		
Basic weight with cabin	4350	kg
Operating weight with cabin	4605	kg
Axle load with cabin front / rear	2195 / 2410	kg

HD 14 VO

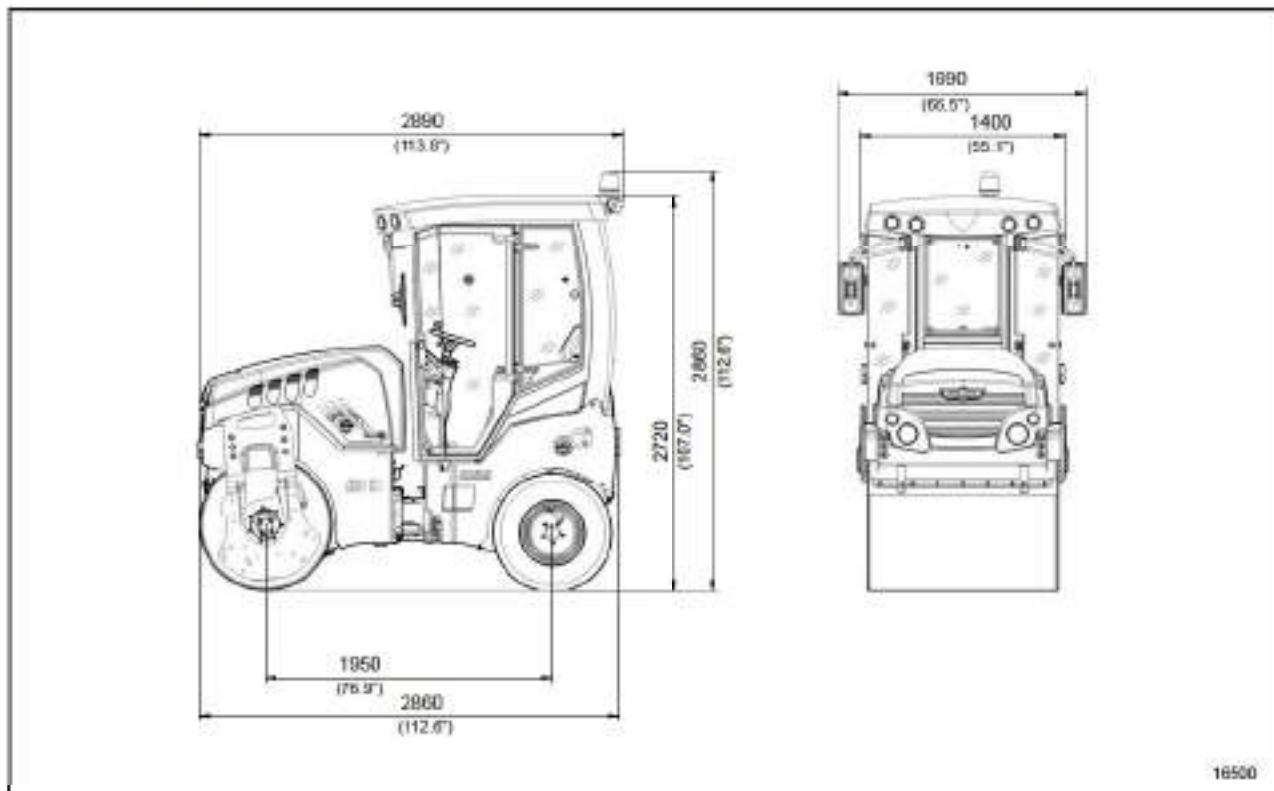
Designation	Value	Unit
Weights		
Basic weight with cabin	4430	kg
Operating weight with cabin	4685	kg
Axle load with cabin front / rear	2195 / 2490	kg

HD 14 VT

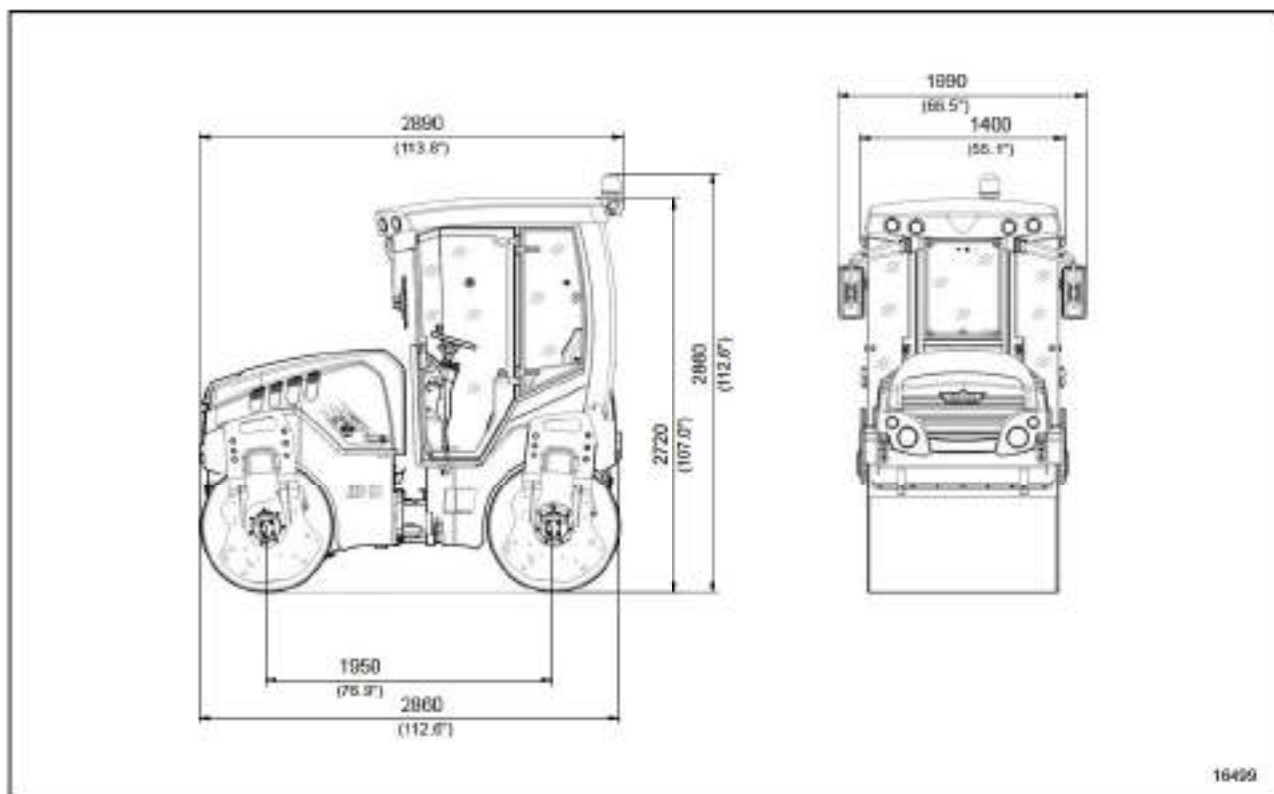
Designation	Value	Unit
Weights		
Basic weight with cabin	3980	kg
Operating weight with cabin	4245	kg
Axle load with cabin front / rear	2195 / 2050	kg

6.01.09 Dimension sheet

HD 13 VT, HD 14 VT



HD 13 VV, HD 13 VO, HD 14 VV, HD 14 VO



6.01.10 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.

002-46

Position	Fuse assignment	Fuse
F101	Rotating light	10 A
F102	Front windscreen wiper	15 A
F103	Windscreen washer system	10 A
F104	Rear windshield wiper	15 A
F105	Working spotlight at the cabin	10 A
F106	Fan	10 A
F107	Illumination for control devices	5 A
F108	Radio (terminal 15)	5 A
F109	not used	
F110	Cab lighting	5 A
F111	Radio (terminal 30)	5 A
F112	not used	
F113	Working spotlights right	20 A
F114	Working spotlights left	20 A
F115	not used	
F116	not used	

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

6.02 Comfort seat

General A driver's seat that is correctly adjusted and always functional is essential for maintaining your efficiency and health. An incorrectly adjusted driver's seat can harm the driver's back. In order to prevent such harm from occurring, the suspension range must be adjusted to the driver's weight each time before the machine is brought into operation and each time the driver is changed. This largely absorbs sudden shocks from the unsprung machine. You maintain the functional condition by regular care and function tests.

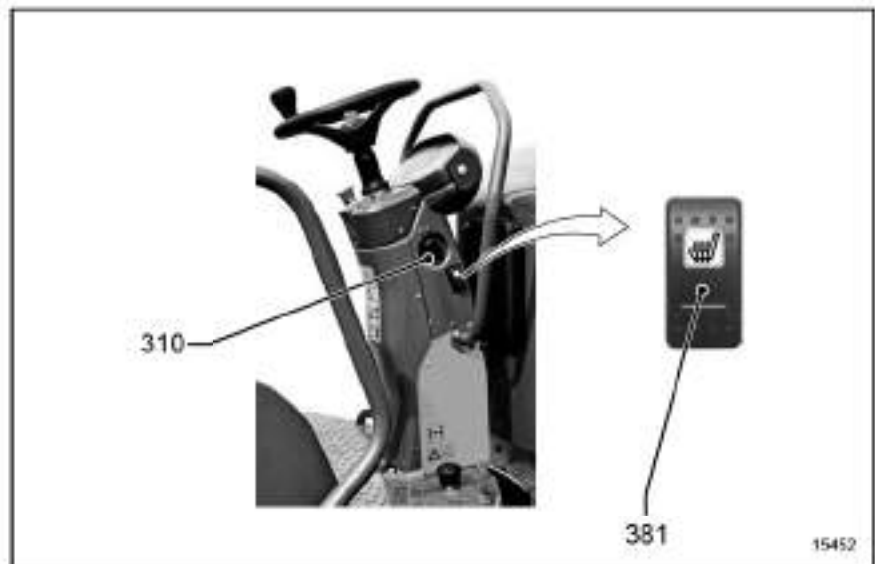
6.02.01 Overview



[A]	Seat pedestal	[B]	Back rest
[C]	Head rest	[D]	Armrest
[E]	Seat heating switch	[F]	Lumbar spine support

6.02.02 General view of instruments and operating elements
Driver's seat


[381]	Seat heating switch	[520]	Seat adjustment weight / height
[521]	Seat adjustment forward - backward	[522]	Seat backrest adjustment
[523]	Seat adjustment elbow-rest	[529]	Seat adjustment, lumbar spine support

Steering column


[310]	Switch Electrical system / engine start	[381]	Seat heating switch
-------	---	-------	---------------------

6.02.03 Switch

381 Seat heating



On — position **I**

Off — position **0**

381 Seat heating



On — position **I**

Off — position **0**

6.02.04 Operating levers, adjustment handles

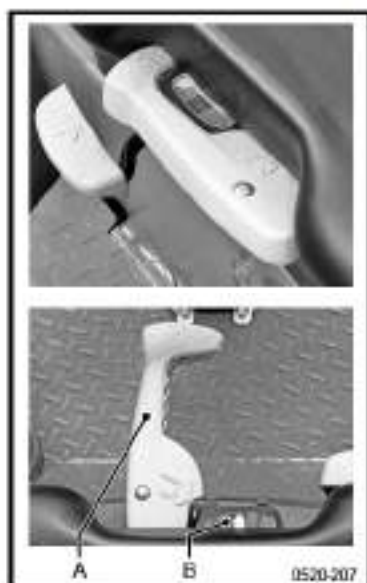
▲WARNING

Uncontrolled movements!

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

- Operate the machine only in an admissible 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.

002-41

520 Seat adjustment weight


In order to absorb impulsive machine movements using the installed attenuation system, this must be adjusted to the weight of the driver. The setting is made with lever [A] and display [B] folded out.

Increase weight — **PULL lever up**

Reduce weight — **PUSH lever down**

At the correct setting, the arrow must lie in the centre of the display [B]. Reaching the upper and lower stops is indicated by a no-load stroke. Fold the lever in after making the setting.

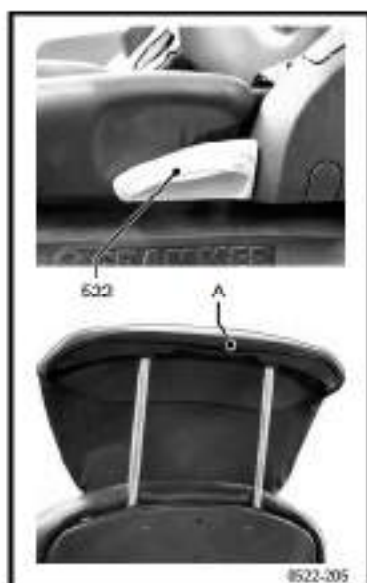


Adjust the driver's seat to the driver's weight before starting work.

000-33

521 Seat adjustment forward - backward

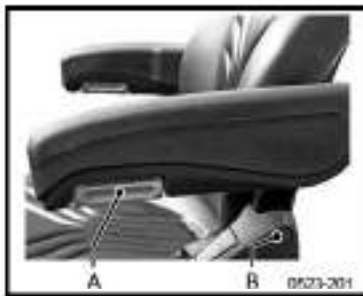

After lifting the lever, the upper part of the seat can be shifted in forward or backward direction in increments of 15 mm.

522 Seat backrest adjustment


The inclination of the backrest can be adjusted in forward or backward direction by lifting the lever.

The head rest [A] is adjusted pulling it up or pressing it down into the back rest. The head rest [A] is removed from the back rest by raising it to the upper stop, and giving it a powerful tug.

523 Seat adjustment elbow-rest



The inclination of the elbow-rest can be adjusted in upward or downward direction by turning the handwheel [A].

The height of the elbow-rest can be adjusted after losing the locking screw [B]. This requires removal of the cover cap.

529 Seat adjustment, lumbar spine support



The curvature of the back rest is adjusted by turning the handwheel.

No curvature — position **0**

Curvature in the upper area — in the direction **II**

Curvature in the lower area — in the direction **I**

6.02.05 Operation

General

An ergonomically adjusted driver's seat plays an important part in maintaining the driver's efficiency and health. The correct distance to the machine's operating controls also prevents premature tiredness.

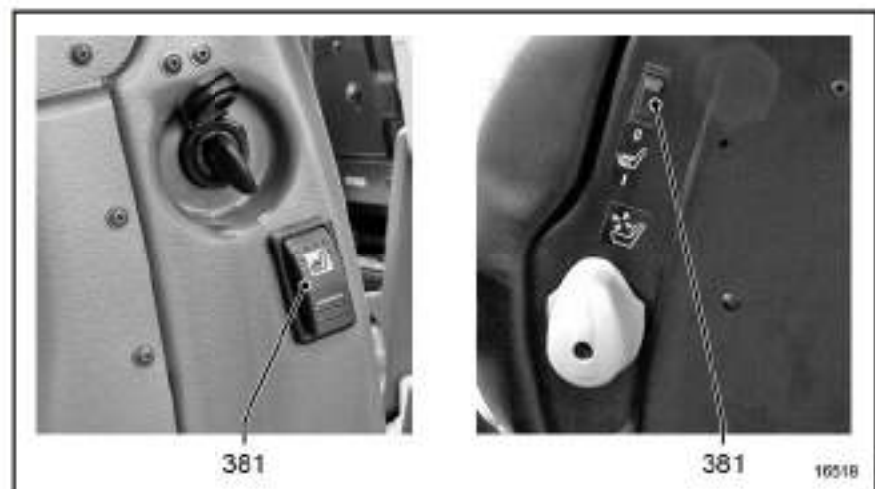
Adjust the operator's seat



The driver's seat must be adjusted to the driver before the machine is brought into operation or when the driver is changed.

1. Weight [520] — arrow in the display **CENTRE** position
2. Seat pedestal [521] — position **FORWARD / BACKWARD**
3. Back rest [522] — position **FORWARD / BACKWARD**
4. Head rest [522A] — position **UP / DOWN**
5. Elbow-rest [523] — position **UP / DOWN**
6. Lumbar spine support [529] — position **UP / DOWN**

Seat heating



The seat heating is switched on and off with the switches [381]. The seat heating is only on when both switches are in position [].

6.02.06 Maintenance



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

000-01

General The instructions itemized in the "Important information about maintenance work" chapter ([see page 108](#)) must always be followed during all maintenance work.

Care



Dirt can impair the function of the driver's seat. Therefore keep the driver's seat clean!

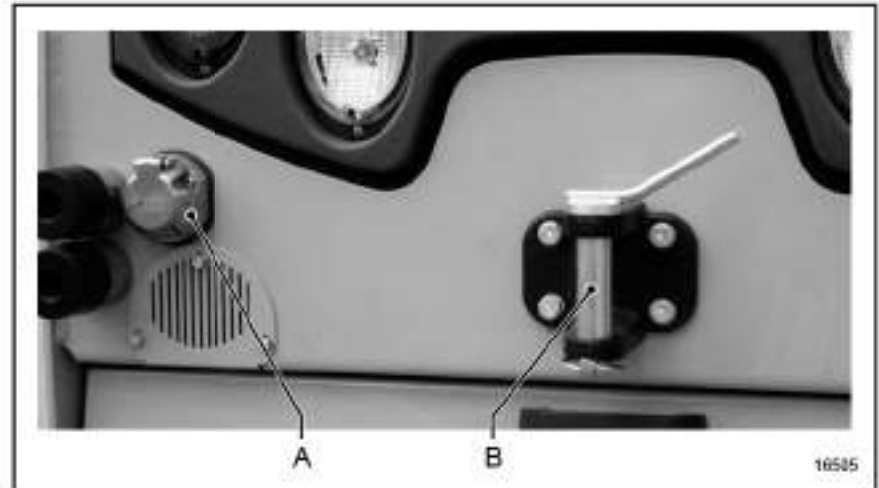
- Use only cloths and soapy water to clean the driver's seat.
- Avoid soaking the padding.
- Do not clean the driver's seat with a water jet or high-pressure cleaner.

6.03 Socket, 7 pole for the trailer

General When driving on public roads, the trailer must also be equipped with functional lighting. A socket is provided for the electrical connection between machine and trailer.

6.03.01 Overview

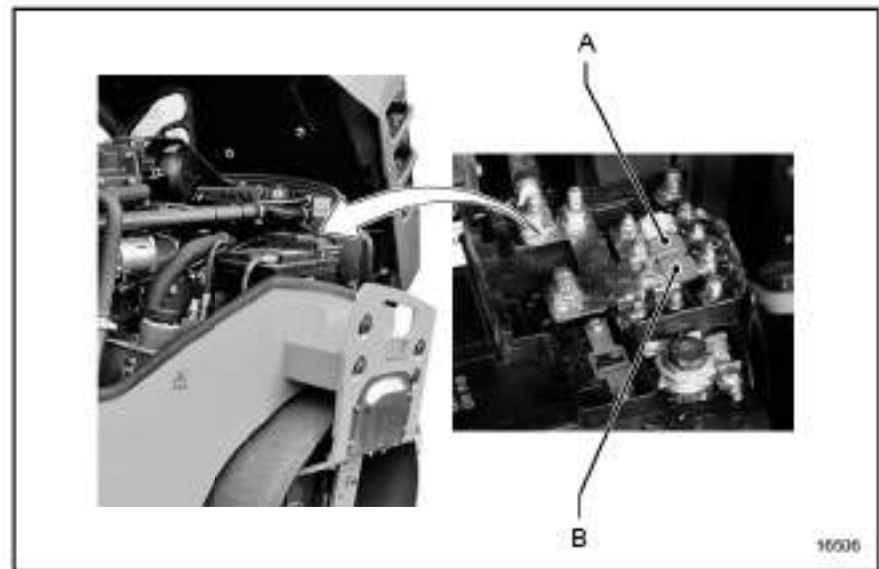
Socket 7 pole



[A] Socket 7 pole

[B] Towing device

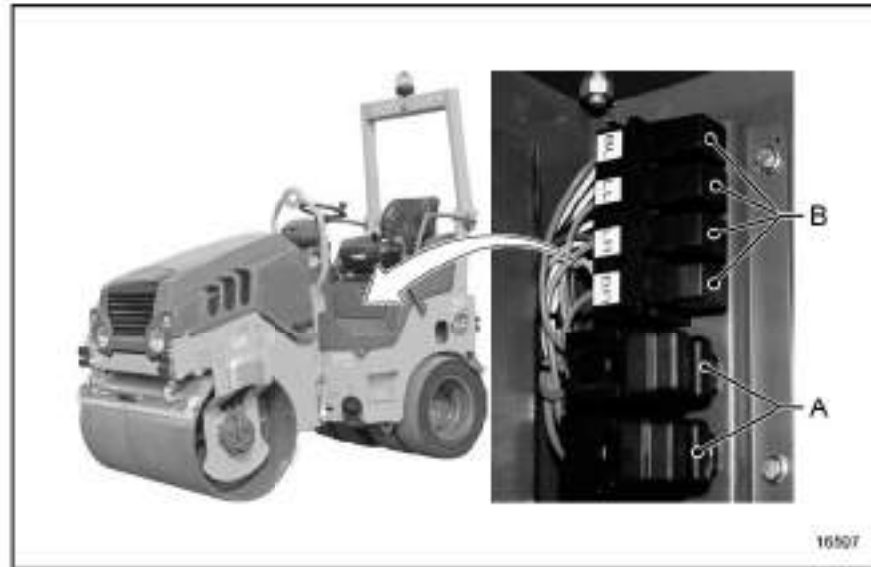
Main fuses



[A] Lighting left

[B] Lighting right

Fuses and relays



[A] Fuses

[B] Relay

6.03.02 Fuses and relays

▲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.

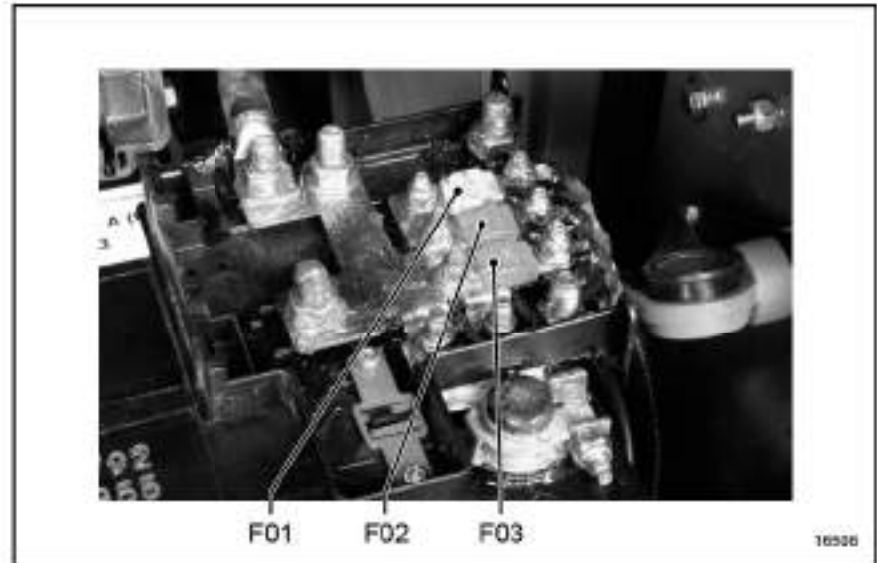
002-13

▲WARNING

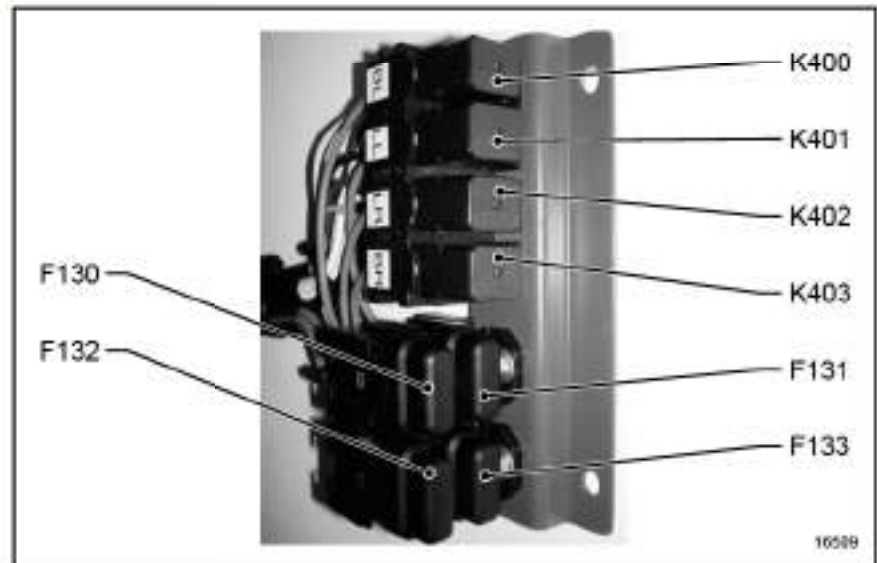
Fire hazard if fuses are not inserted correctly!

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

002-46

Main fuses


Position	Fuse assignment	Fuse
F01	On-board electrical system (terminal 30)	80 A
F02	Lighting left	30 A
F03	Lighting right	30 A

Fuses and relays

Fuses

Position	Fuse assignment	Fuse
F130	Flashing lights left	10 A
F131	Light left	10 A
F132	Light right	10 A
F133	Flashing lights right	10 A

Relay	Position	Relay
	K400	Flashing lights left
	K401	Light left
	K402	Light right
	K403	Flashing lights right

6.04 Precision chip spreader



During all activities, also comply with the manufacturer's instruction manual for the chip spreader.



General

NOTICE

High linear load of the drum!

Movements and cracks may occur in the asphalt layer.

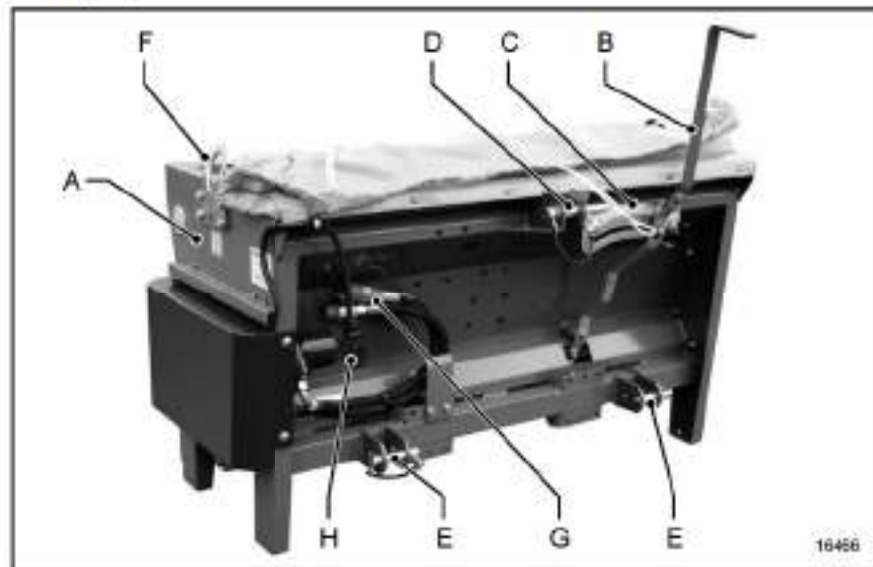
- Do not drive with a fully loaded storage tank into the hot asphalt.

004-09

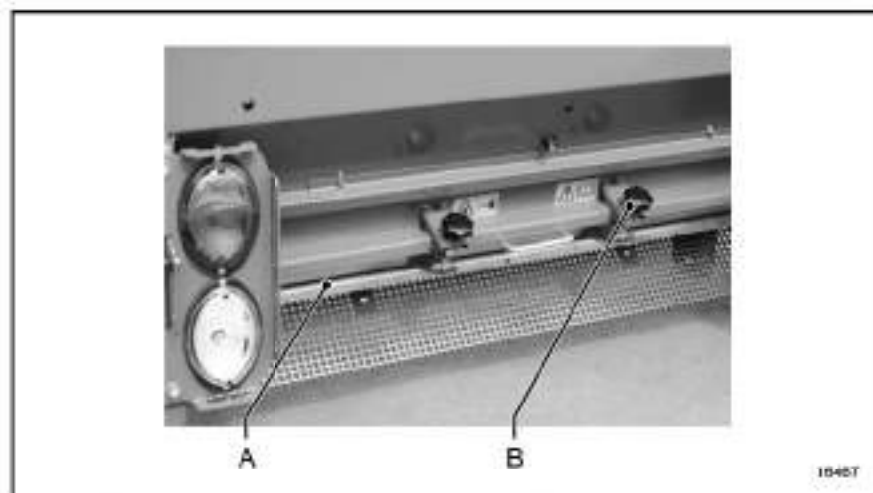
With the chip spreader as an additional device a regulated output of grit and simultaneous rolling in into the road surface is possible. An optimal output of the grit depends on an exact setting of the grit components.

6.04.01 Overview of chip spreader

Chip spreader



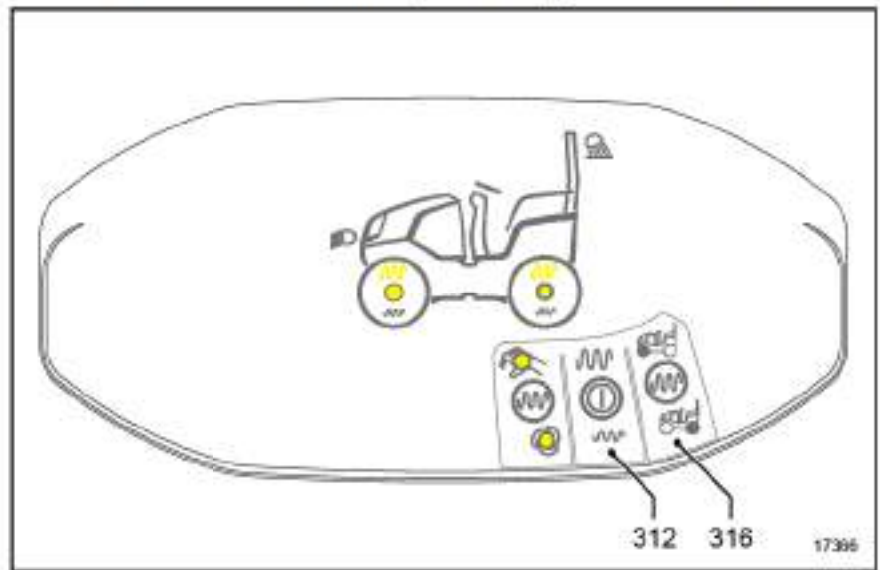
[A]	Reservoir	[B]	Stop valve
[C]	Sprinkle value scale	[D]	Coupling point for upper connecting rod
[E]	Coupling point for lower connecting rod	[F]	Suspension eyelets
[G]	Hydraulic connections	[H]	Lighting connection



[A]	Spreader floor	[B]	Fixing screw
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6.04.02 General view of instruments and operating elements

Switch

**[312]** Vibration switch**[316]** Switch vibrator preselection

Operating levers, adjustment handles

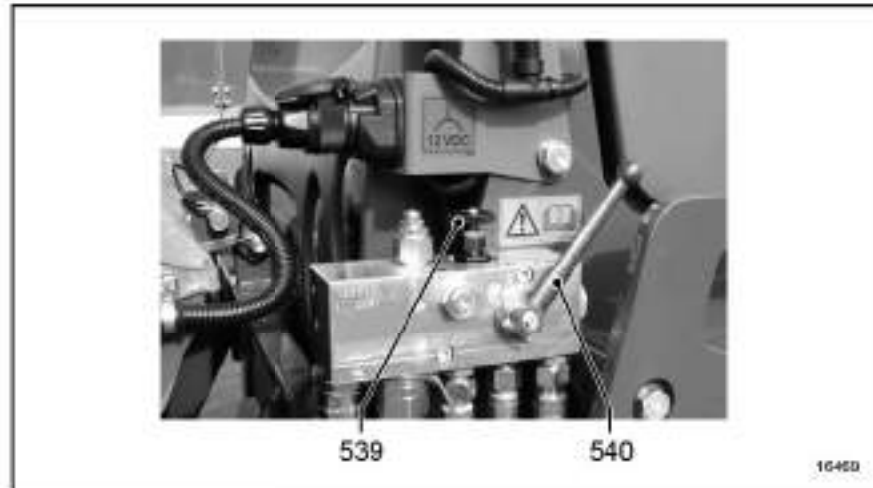


Figure 1: Rear roller drum version

- | | | | |
|-------|-------------------------|-------|-------------------------------------|
| [539] | Speed of spreader shaft | [540] | Vibration selection / chip spreader |
|-------|-------------------------|-------|-------------------------------------|

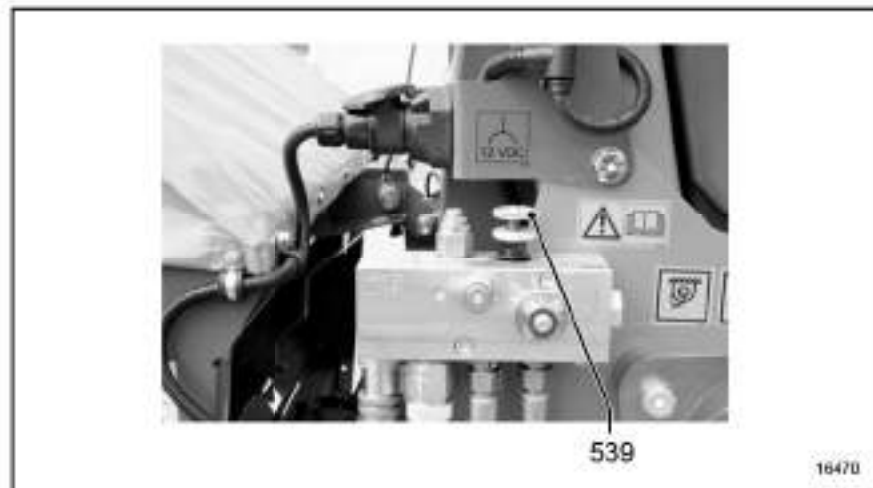
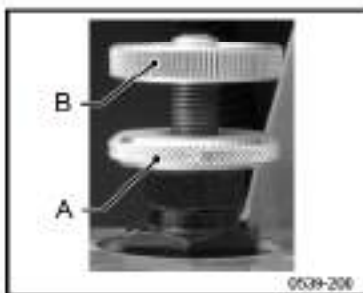


Figure 2: Rear tyre version

- | | |
|-------|-------------------------|
| [539] | Speed of spreader shaft |
|-------|-------------------------|

6.04.03 Operating levers, adjustment handles

539 Speed of spreader shaft



After loosening the lock nut [B], the speed of the spreader rotor can be regulated continuously between minimum and maximum with the adjusting screw [A].

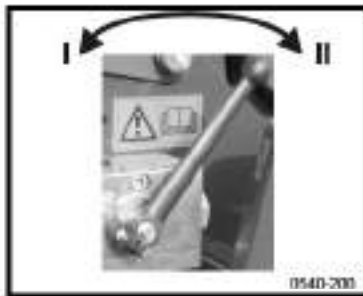
Minimum speed — screw in completely

Maximum speed — screw out completely

After adjusting, fixate the adjustment screw with the lock nut [B].



540 Vibration selection / chip spreader



Vibration or chip spreader can be preselected for the rear drum with the lever.

Vibration — position **I**

Chip spreader — position **II**

6.04.04 Operation

▲ WARNING

Exposed, rotating parts!

Risk of injury due to rotating parts.

- Carry out adjustments and maintenance work only when the engine is stopped.

002-48

NOTICE

Spreader rotor blocked by jammed chips!

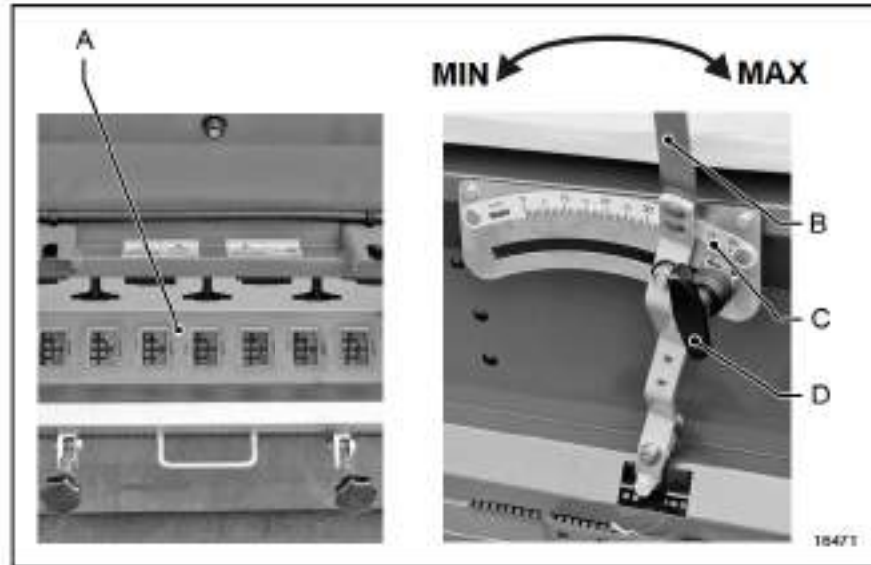
Damage to or destruction of the drive elements.

- Completely open the spreader apertures before switching on the spreader rotor.
- With the machine is at a standstill, only allow the spreader rotor to start with a low speed, and increase to working speed after a short time.
- Set the spreader apertures to the working cross-section.

004-13

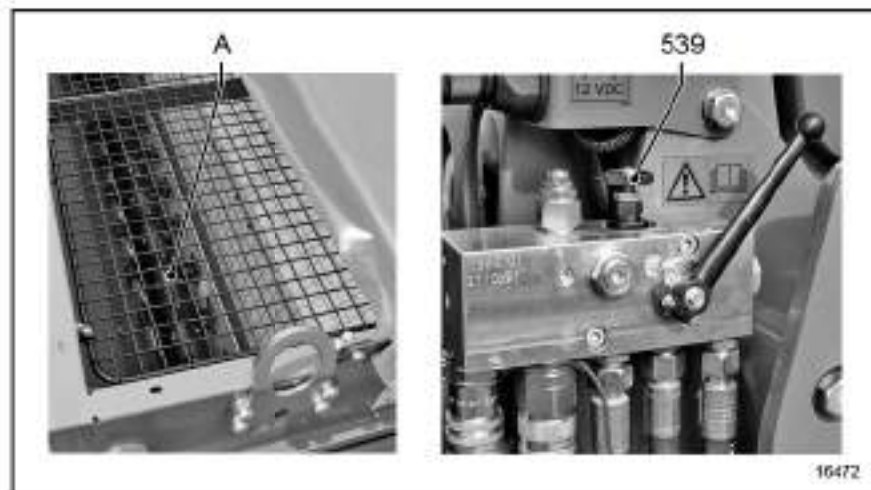
When driving with the chip spreader switched off and a full storage container, vibrations cause the spreader rotor to become covered by chips. This can block the spreader rotor. With the machine is at a standstill, allow the spreader rotor to start at low speed with the spreader apertures completely open.

Stop valve

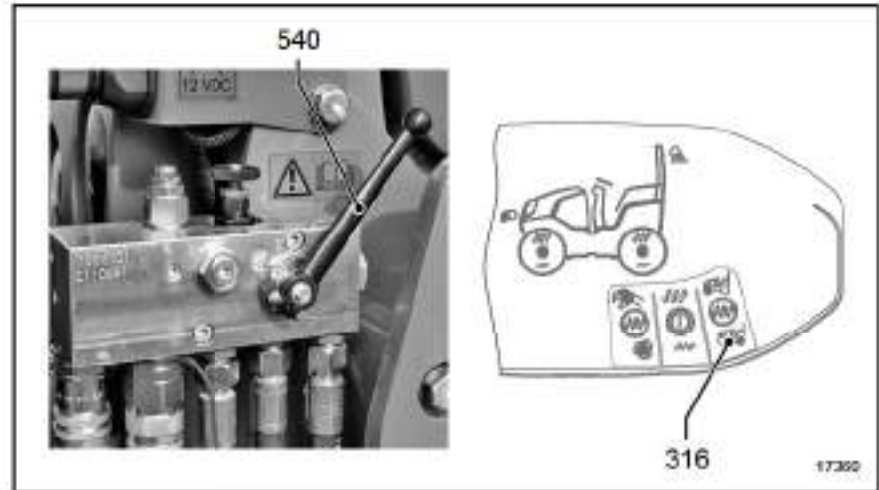


More or less chips trickle out of the storage container according on the size of the spreader apertures [A]. The apertures in the spreader floor are adjusted with the lever [B]. The grit grain size and the output amount influence the opening cross section. The spreader apertures are closed when the slider is at the minimum stop position. An already determined aperture setting can be repeated by using the adjustable stop [D] on the scale [C]. Close the spreader apertures after completing the spreading work to prevent any more chips trickling out.

Spreader rotor



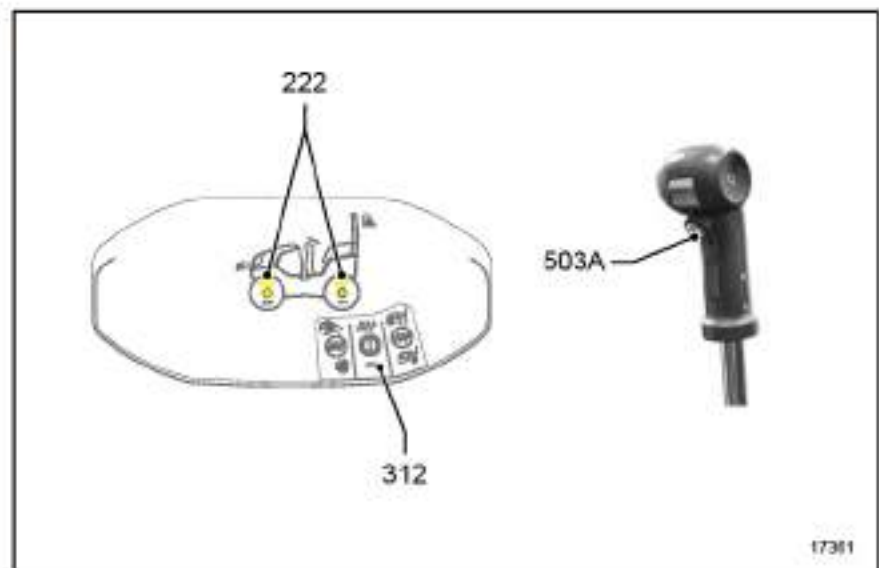
The spreader rotor [A] ensures that the chips are distributed equally to the spreader apertures. According on the speed setting [539], more or less chips are conveyed to the spreader apertures.

Selecting chip spreader


The hydraulic drive of the chip spreader is coupled to the vibration drive. With the rear drum model, chip spreader or vibration is preselected with the lever [540]. To run the chip spreader, the rear vibrator has to be preselected on switch [316].



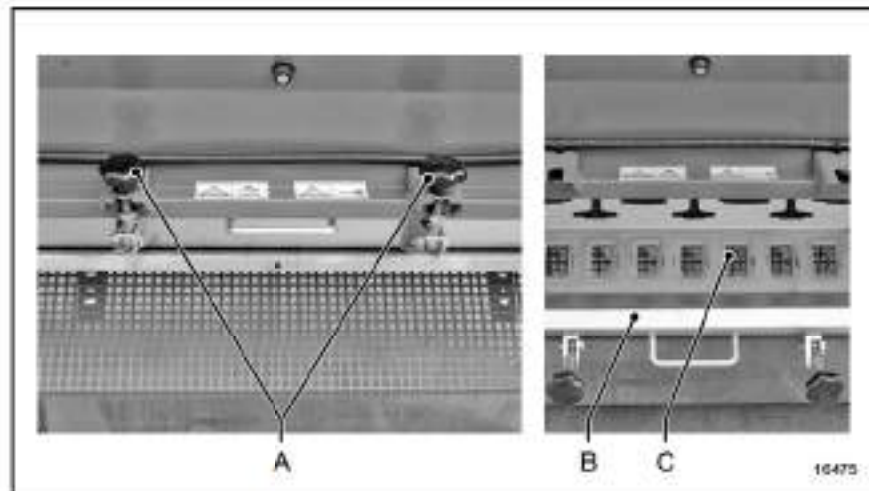
Vibration and chip spreading cannot be active simultaneously on the axle with the chip spreader.

Activating / deactivating chip spreader


With the switch [312] the chip spreader is also activated or deactivated. Control light [222] indicates an activated chip spreader.

Chip spreader switch on / off An activated chip spreader can be switched on and off on the multi-function lever [503A].

Emptying storage container



1. At the end of the spreading work, with the machine at a standstill, empty most of the remaining chips out of the storage container.
2. Switch off diesel engine and remove ignition key.
3. Loosen the fixing screws [A] (from the outside to the inside), and swing down.
4. After loosening the last fixing screw, the spreader floor [B] can be flapped down.
5. Remove the rest of the chips, and clean the spreader apertures [C].

Re-assemble in reverse order.

Determine the quantity of chips

The exact setting for the quantity of chips is determined by tests conducted according to the following procedure:

1. Open the lock gate (set lever to scale value 20).
2. Set the spreader speed [539] to maximum speed.
3. Perform a sprinkle test by passages a paper sheet 297 x 210 mm (DIN A4) with constant driving speed.
4. Weigh the grit from the paper sheet or fill it into a metering box (size 100 ml, matches the volume of a cigarette packet).
5. Compare amount with tabular value.
6. Change stop valve or driving speed and repeat the test until the correct amount to be spread is reached.

Rough estimate for the quantity of chips on a 297 x 210 mm sheet of paper at a chip density of about 1.6 kg/dm³.

Quantity of chips required kg/m ²	Weight of chips on the sheet of paper g	Volume of chips on the sheet of paper ml	Part of the amount in the metering box
0.5	31	20	1/5
1.0	62	40	2/5
1.5	94	60	3/5
2.0	125	80	4/5
2.5	156	100	5/5

6.04.05 Assembly

⚠ WARNING

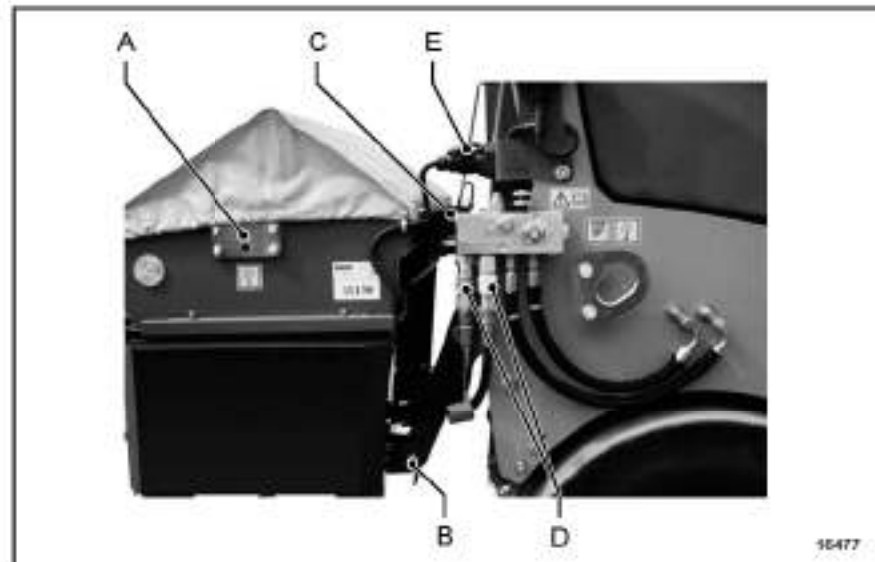
High own weight of the chip spreader!

Crushing or trapping when mounting can cause serious injuries or fatality.

- Perform installation work on firm ground (flat, stable, horizontal).
- Carry out fitting work only when the engine is stopped.
- Mount only when the storage tank is empty.
- Do not step underneath suspended loads.

002-49

Mounting chip spreader



16477

1. Use appropriate lifting devices and hoisting equipment. Observe weight (see type plate of chip spreader).
2. Lift the chip spreader on to the suspension eyelets [A]
3. Connect the lower connecting rod [B] with cotter pins and secure with split-pins.
4. Connect the upper connecting rod [C] with cotter pins and secure with split-pins.
5. Connect the hydraulic connectors [D].
6. Connect the lighting connector [E].

6.04.06 Maintenance



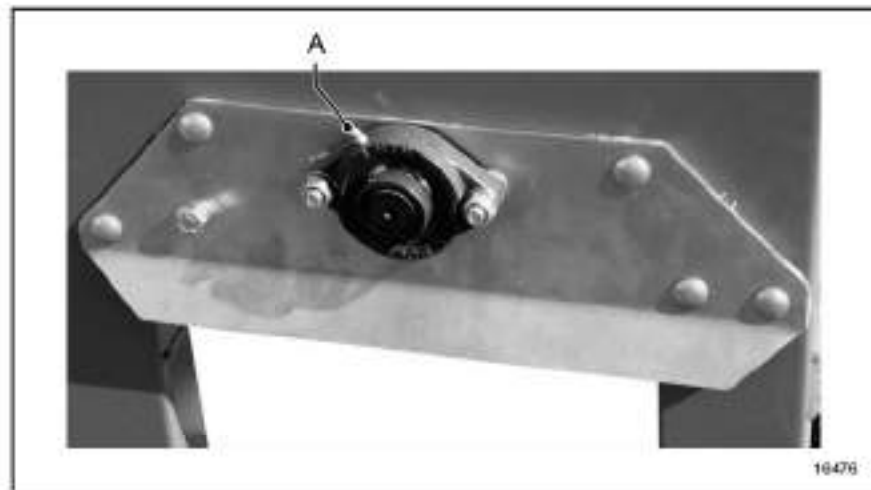
When working at the machine please always adhere to the instructions given in your Safety instructions!

000-01

General The instructions itemized in the "Important information about maintenance work" chapter ([see page 108](#)) must always be followed during all maintenance work.

- Chassis / safety features**
- Check operating and safety notes on the chip spreader. Replace damaged and/or non-readable signs.
 - Check that hinges, links and threads move easily and lubricate lightly.
 - Grease slide surfaces of the stop valve and adjusting lever.
 - Check lighting.
 - Check screw connections which are heavily loaded and make sure they have a tight seat, e.g. mounting bracket.

Grease bearings



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

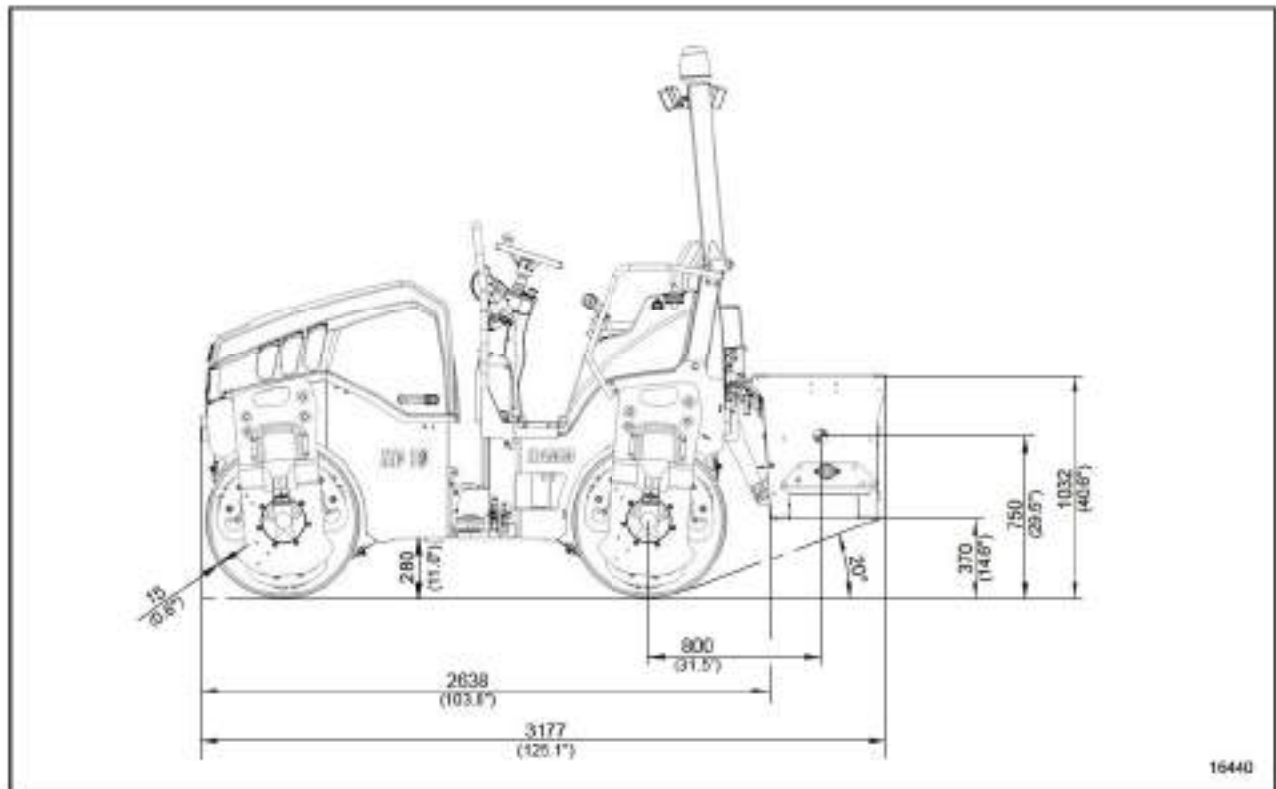


Lubricant only admissible if containing this marking ([see page 142](#) sqq.).

6.04.07 Technical data UKS 100

Designation	Value	Unit
Basic weight of chip spreader	128	kg
Weight of the attachment device	22	kg
Operating weight with chips (calculated at a chip weight of 1,600 kg/m ³)	500	kg
Content, storage reservoir	200	l
Working width	1000	mm
Working speed	0-5.0 (0-3.1)	km/h (mph)

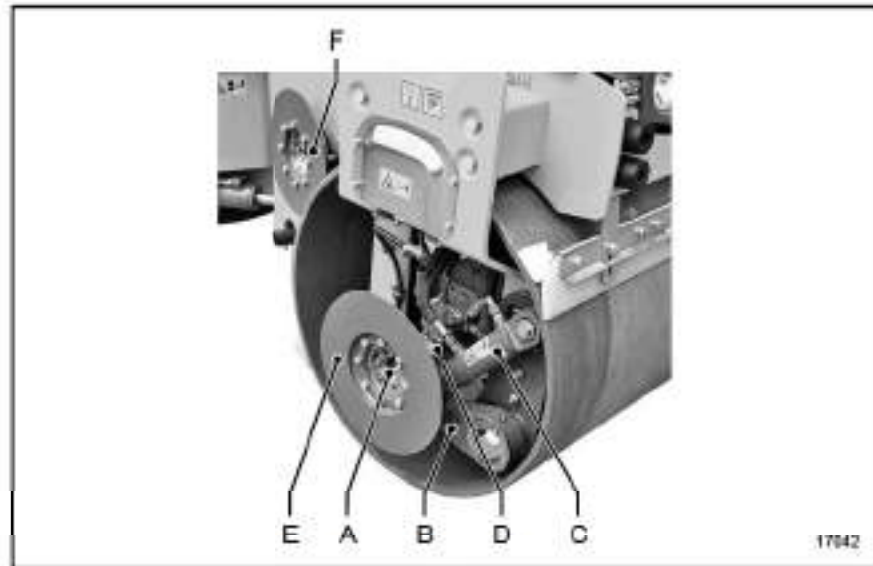
6.04.08 Dimension sheet UKS 100



6.05 Edge Pressing and Cutting Device (KAG)

General The edge pressing and cutting device (KAG) creates the longitudinal edges of asphalt surfaces. The still hot and malleable asphalt can be shaped and cut with interchangeable tools, such as pressure rollers and the cutting wheel. The tools are raised and lowered hydraulically, and are actuated by switches on the driving lever. The tools are sprinkled with water to prevent bitumen from sticking to them.

6.05.01 Overview Edge pressing and cutting device



[A]	Tool carrier	[B]	Lever
[C]	Hydraulic cylinder	[D]	Sprinkling nozzle
[E]	Cutting wheel	[F]	Pressure roller

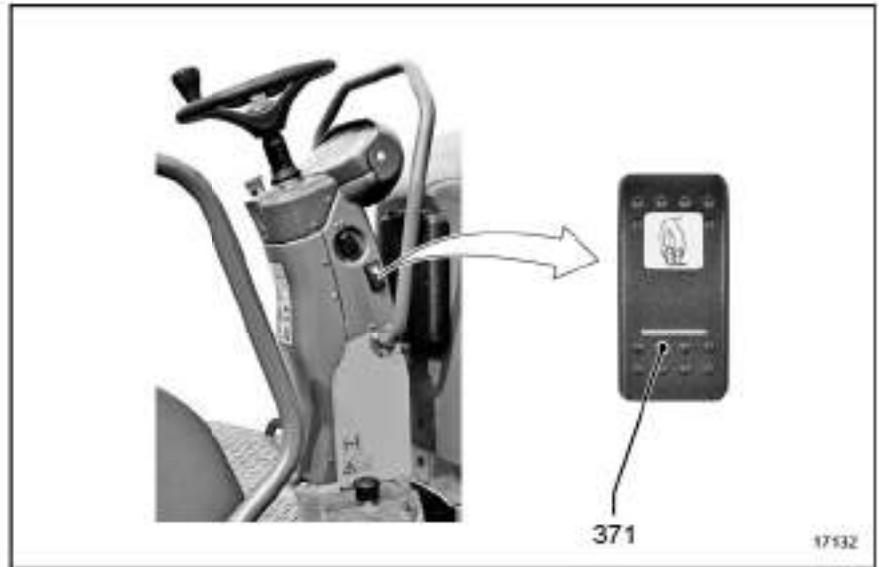
6.05.02 General view of instruments and operating elements Operating elements



[503B] KAG switch



Steering column



[371] KAG sprinkler switch

6.05.03 Switch

*371 KAG sprinkler



With water irrigation switched on [317], the switch can be used to switch the sprinkling on and off for the edge pressing and cutting device (KAG).

KAG sprinkler on — position **I**

KAG sprinkler off — position **0**

6.05.04 Operating levers, adjustment handles

503 Multifunctional handle



KAG

NOTICE

Risk of damage to the edge pressing and cutting assembly (KAG)!

Damage due to unfavourable force transmission.

- Apply KAG only when travelling forward!

004-06

The edge pressing and cutting equipment (KAG) is lifted and lowered as long as one side of the switch [B] is pressed.

Lift KAG — **UP**

Lower KAG — **DOWN**

If equipped with KAG on both sides, the switch of the relevant side is pressed.

KAG left — **LEFT DRIVE LEVER**

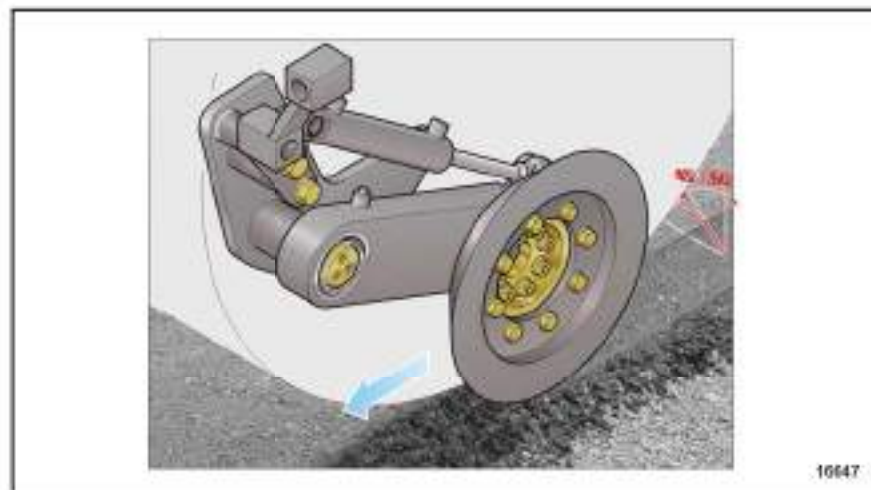
KAG right — **RIGHT DRIVE LEVER**

6.05.05 Operation

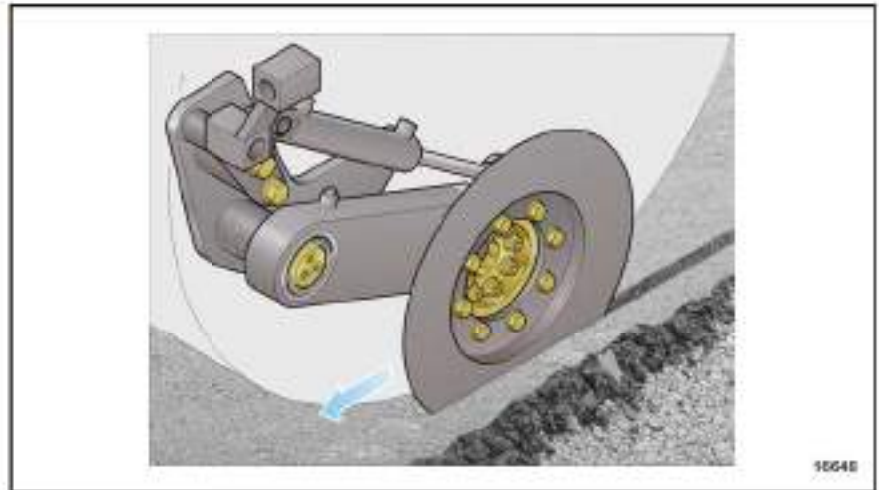
General

When driving forward to work the asphalt surface, the tools should be drawn behind the pivot of the lever arm. If the tools are pushed when in front of the pivot (reversing), there is a risk of the tool and the suspension being damaged by disadvantageous transmission of forces or jamming. Only hot and still malleable asphalt may be worked with the KAG.

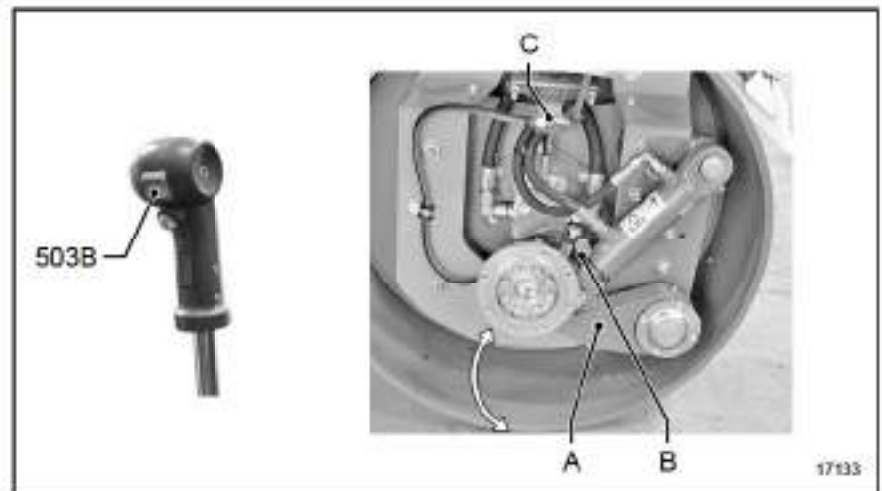
Pressure roller



The edges of asphalt surfaces are tapered with conical pressure rollers. Pressure rollers for different layer thicknesses and tapers can be mounted on the lever arm.

Cutting wheel

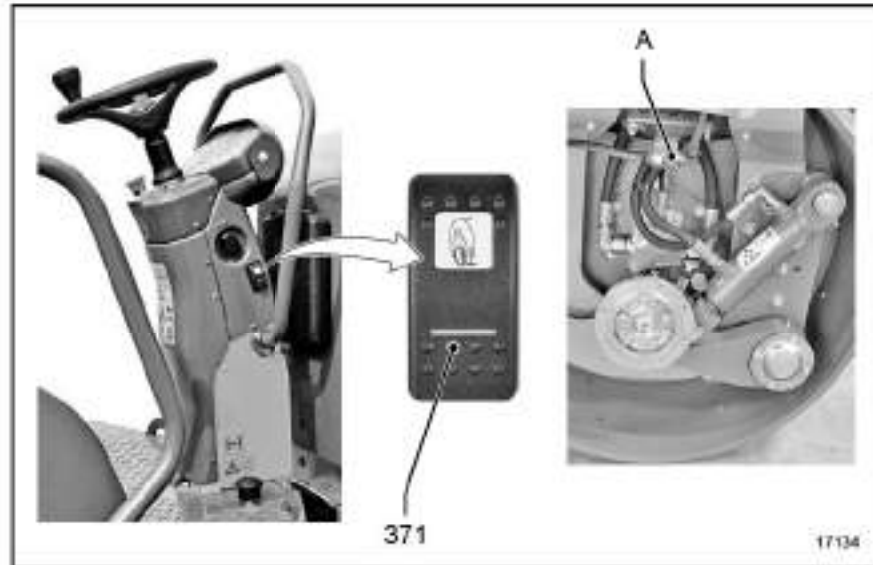
The cutting wheel is used to cut off overhanging ends of asphalt surfaces.

Raising and lowering the KAG

The lever arm [A] is raised and lowered by actuating the switch [503B]. If equipped with KAG on both sides, the switch [503B] of the relevant side is pressed.

KAG sprinkler The pressure roller or cutting wheel can only be sprinkled with water if the sprinkler is switched on [317]. Opening the stop cock [C] supplies water to the sprinkler nozzle [B].

KAG sprinkler with switch



With water irrigation [317] switched on and the stop cock [A] open, the KAG sprinkling can be switched on and off with the switch [371].

6.05.06 Maintenance



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

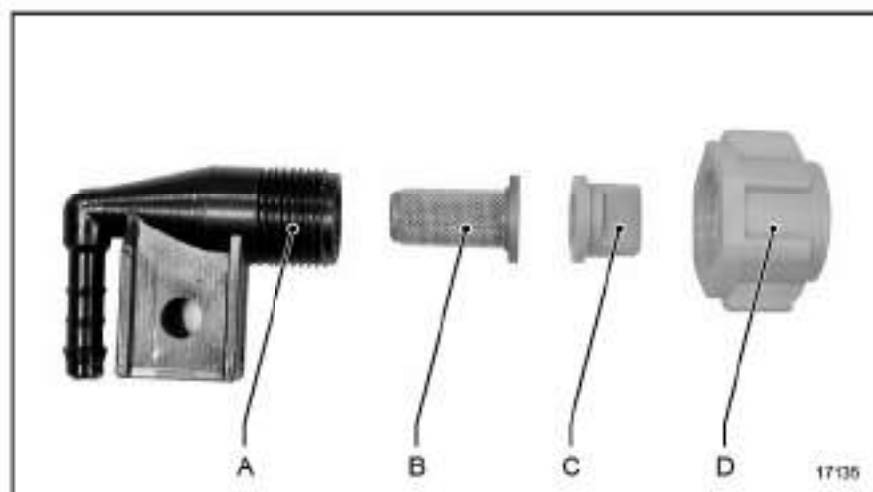
000-01

General The instructions itemized in the "Important information about maintenance work" chapter ([see page 108](#)) must always be followed during all maintenance work.

Adhere to the following instructions:

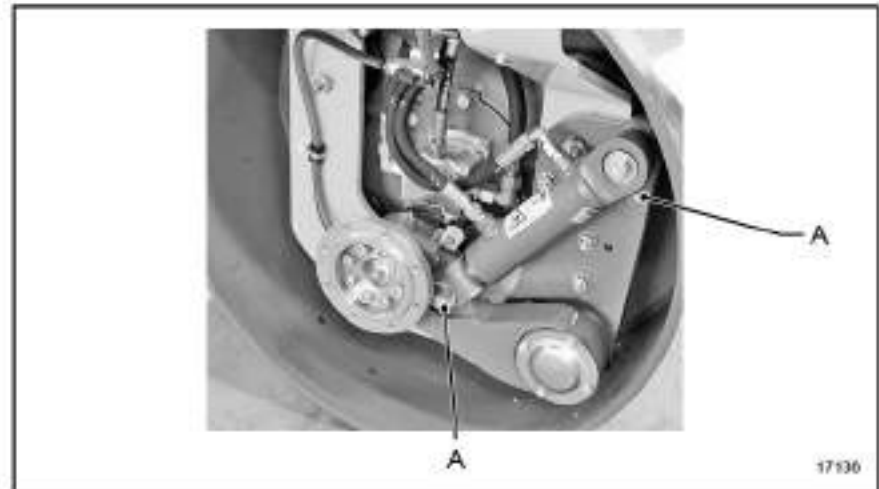
- Clean deposits of dirt off the KAG.
- Replace damaged and/or non-readable signs.
- Check that the screw connections on the bracket are tight.

Cleaning sprinkler nozzles



1. Switch off diesel engine and remove ignition key.
2. Loosen the cap nut [D] and remove it together with sprinkler nozzle [C] and filter [B].
3. Remove the filter and the sprinkler nozzle from the cap nut and clean them.
4. Flush the housing [A] with the sprinkling system.

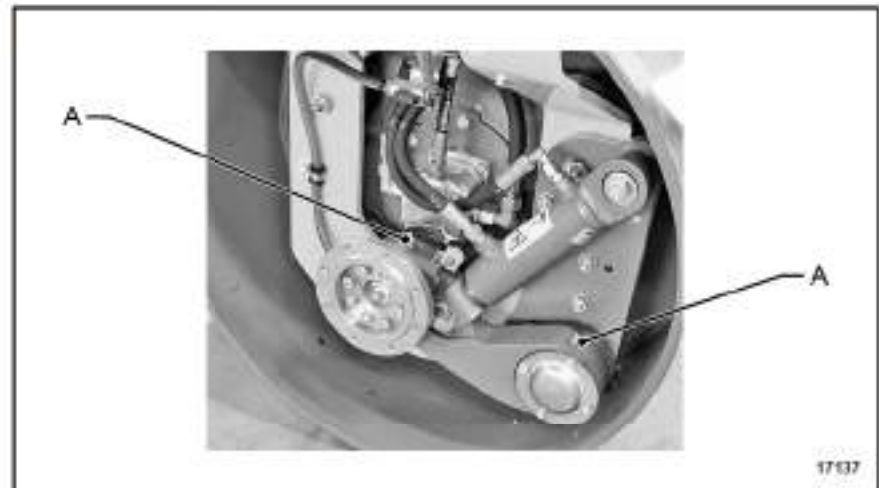
Re-assemble in reverse order.

Lubricating KAG cylinder bolts

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



Lubricant only admissible if containing this marking ([see page 142](#) sqq.).

Lubricate the KAG lever bearing

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

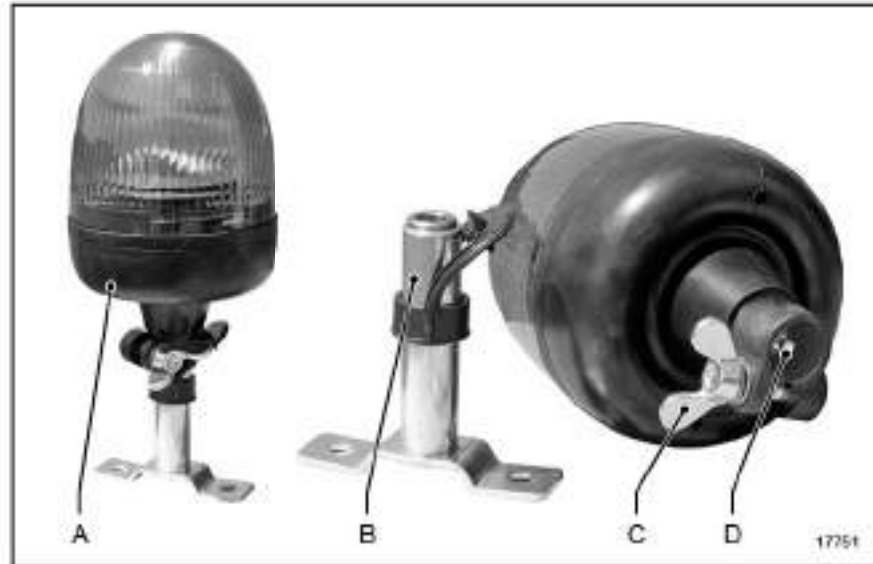


Lubricant only admissible if containing this marking ([see page 142](#) sqq.).

6.06 Rotating light removable

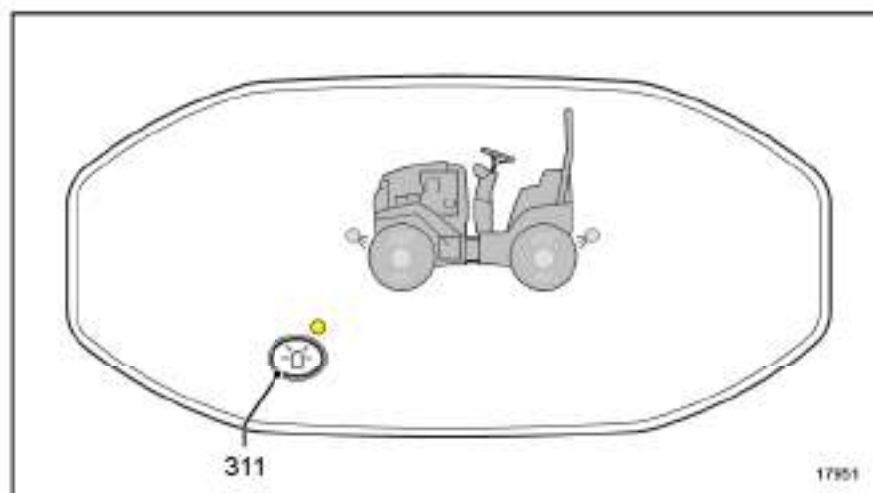
General When switched on, the rotating light warns against possible hazards caused by the machine. After parking the machine, the rotating light [A] can be removed from the contact tube [B] and be stowed inside the cab.

6.06.01 Overview



[A]	Rotating light mounted	[B]	Contact tube
[C]	Clamping screw	[D]	Plug contact

6.06.02 General view of instruments and operating elements



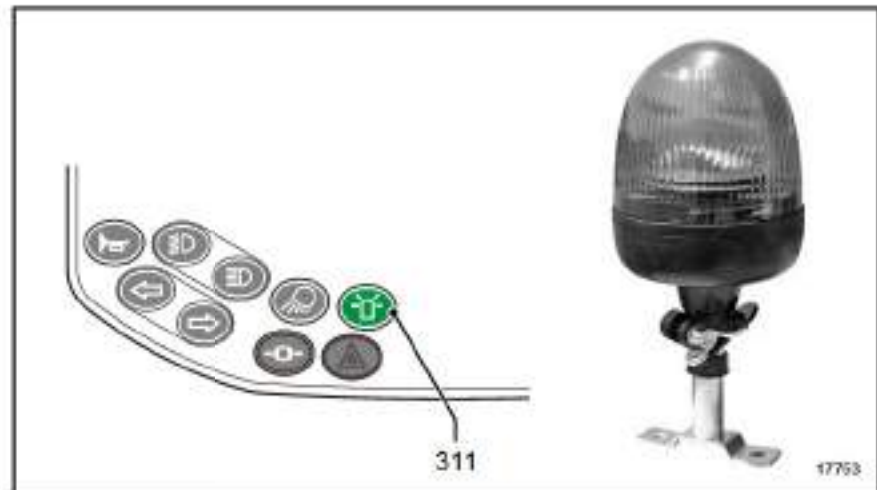
The form of the switch [311] and its location in the machine can vary according to the machine type. For the specific design and location, please refer to ident. number 311 in Chapters 2 and 3.

000-65

6.06.03 Operation

General The rotating light must be placed on the outside of the machine and set to on at all times during operation.

Switching on and off rotating light The rotating light must be placed on the outside of the machine and set to on at all times during operation.



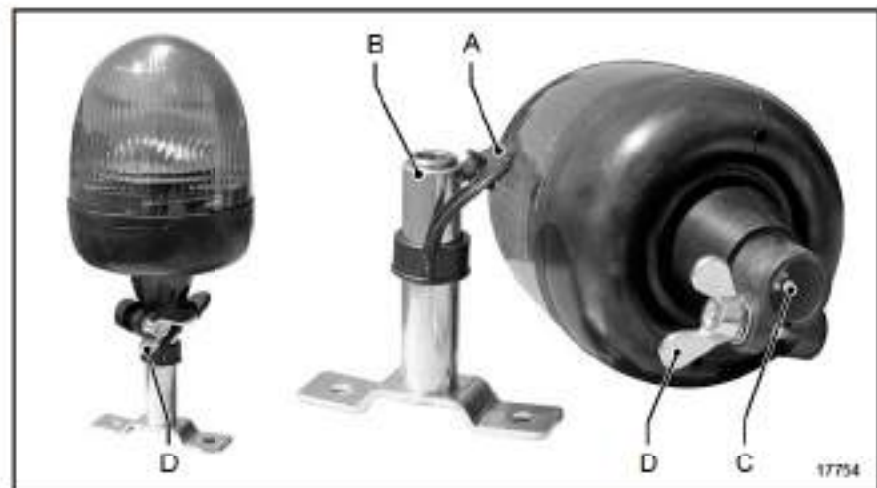
Pressing the switch turns the rotating light on or off.

On — **PRESS**
(push button lights up)

Off — **PRESS** again

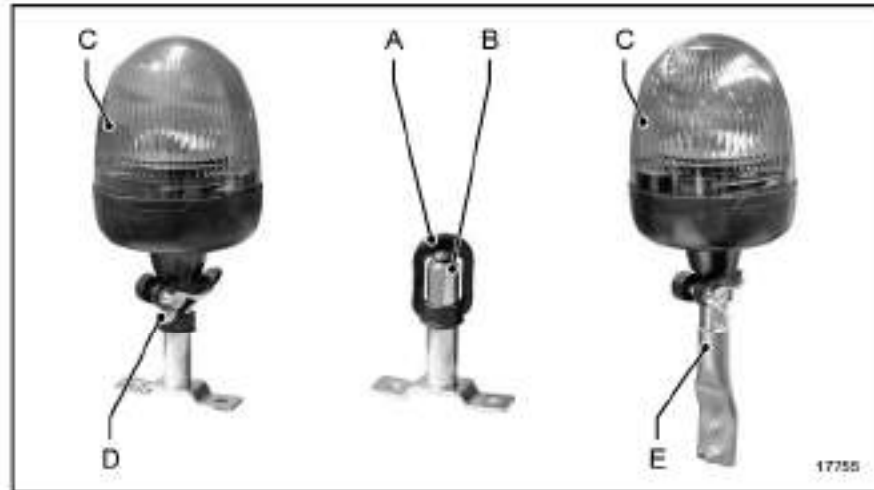
6.06.04 Assembly

Mounting rotating light



1. Swivel the protective cap [A] to the side.
2. Put the locating hole [C] of the rotating light on the contact tube [B] and slide it up to the stop. This will establish the electrical connection.
3. Tighten the clamping screw [D].
4. Use the switch [311] to set the rotating light to on and check its function.

Removing rotating light



1. Unscrew the clamping screw [D] and slide the rotating light [C] off the contact tube [B].
2. Close the contact tube [B] with the protective cap [A].
3. Stow the rotating light [C] on the holder [E] inside the cab.

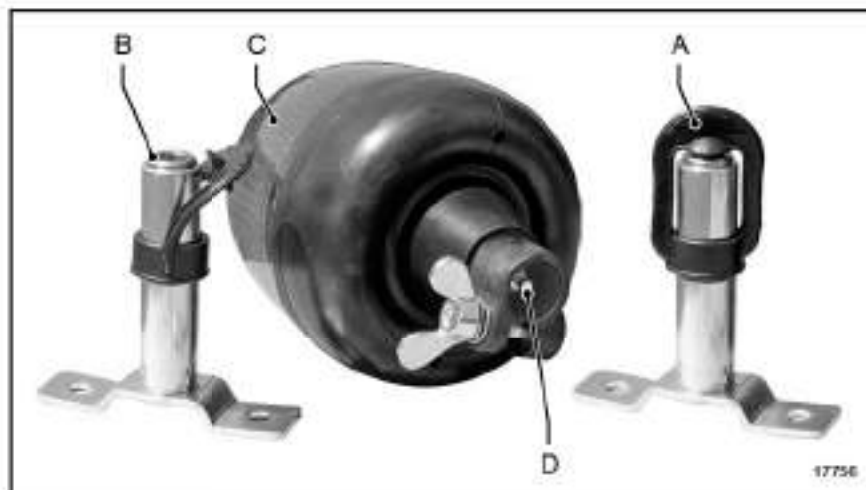
6.06.05 Maintenance



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

000-01

General The instructions itemized in the "Important information about maintenance work" chapter ([see page 108](#)) must always be followed during all maintenance work.

Care

Dirt can impair the function of the rotating light. Therefore keep the rotating light clean!

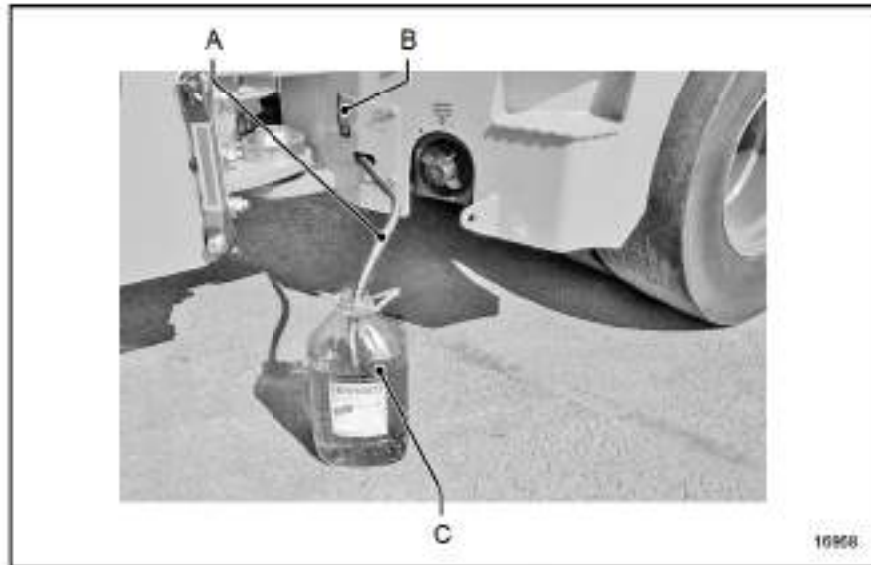
- To clean the rotating light [C], use only a sponge and soap water.
- Do not clean the rotating light with a water jet or high-pressure cleaner.
- Dust or sand can impair the function of the rotating light [C]. Avoid any dust or sand contamination of the contact tube [B]. Use the protective cap [A] to blank off the contact tube [B] after removing the rotating light.
- Ensure that the electrical contacts of the contact tube [B] and of the rotating light [D] are kept clean. Remove any dust or sand immediately. Spray contacts using a contact spray if necessary.

6.07 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.

6.07.01 Overview

Anti-freeze compound injection



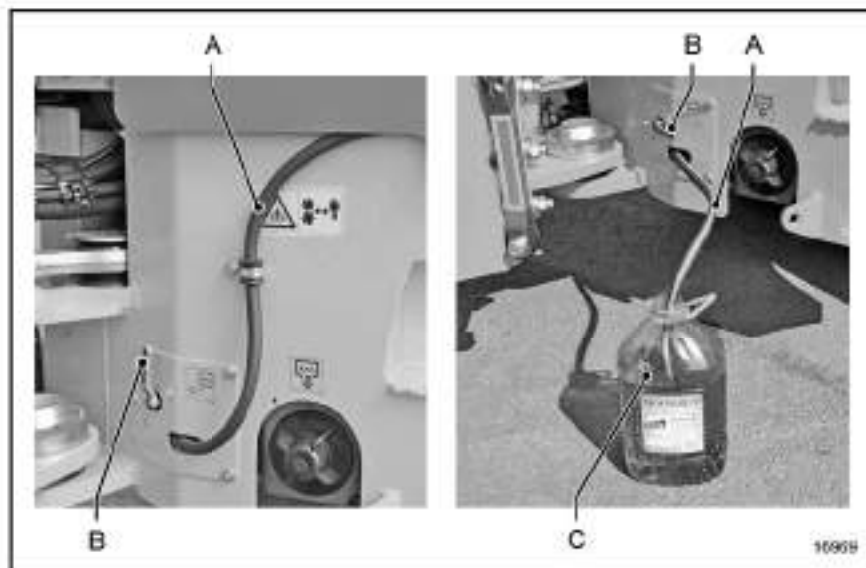
[A] Injection hose

[B] Change-over valve

[C] Vessel for antifreeze solution

6.07.02 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).