HAMM

INSTRUCTION MANUAL

Compactor
3516 / 3518 / 3520

H176 Series	**1502** valid from serial no.
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17976

Version 06

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This instruction manual is valid for the following roller types:

COMPACTOR	3516
	3516 P
	3518
	3518 P
	3520
	3520 P

TABLE OF CONTENTS

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 operating manual

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

This operating manual helps you:

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

Adhering to this operating manual:

- helps to avoid risks.
- increases the reliability when working on the construction site.
- increases the life span.
- reduces maintenance costs and downtimes.

It is absolutely necessary to adhere to this operating 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 these motor instructions. Any safety notes have to be followed.

609-08

1.00.02 Product information

You have purchased a HAMM Quality product. All parts of this machine have been checked and tested carefully, thus corresponding to the quality 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 HAMM spare parts.

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

Our representations will be at your disposal whenever you need consultation and service even after the warranty period. They will supply you with our original HAMM spare parts which do not only meet the technical requirements but also ensure exchangeability and quality.

The safety, operating and maintenance instructions given in this operating manual are intended for the operating personnel. Thus, keep this manual always at hand!

609-06

1.00.03 Guarantee

No guarantee claims with:

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

609-07

1.00.04 Modifications / reservations

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

609-09

1.00.05 Packaging and storage

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

In such a case, please contact your supplier.

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

609-10

1.00.06 Signs and symbols

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

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

Enumeration ● Indicates a listing of issues or possibilities.

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

Option * Indicates special equipment which varies from the standard.

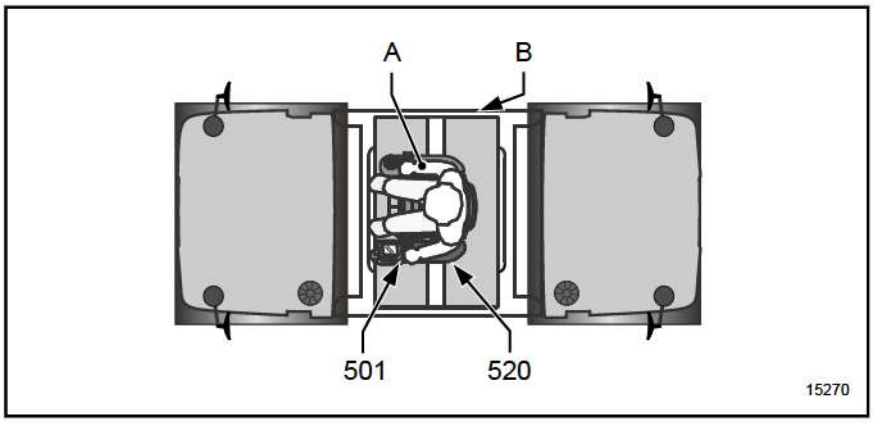
Directions Information on directions contained in these instructions such as left or right and/or front or rear always refer to the directions of the machine driving forwards.

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

Example: (see page 134 sqq.)

Positioning of illustrations The positions of illustrations are represented with letters and numbers. The positions identified with letters in alphabetical order are only explained in the corresponding text segment, beginning new for each single figure. The positions marked with numbers apply to operating elements, control units and switches. They are identical to the numbers in the section Overview of Instruments and Operating Elements (see page 56 sqq.). These numbers in squared brackets are used as a reference in the description of the elements. Amongst others, this ensures that important and additional information can be found immediately and without difficulties in the descriptions of the elements. The end of the positioning line is marked as dot or arrow. In the illustration the dot marks a visible element and an arrow an invisible element which is in arrow direction.

Example



Legend

[A]	Driver	[B]	Engine compartment

Descriptive text

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

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

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1.00.07 Signal words

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

609-12

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

The entire operating manual consists of:

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

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

613-00

1.02 Use

1.02.01 Intended use

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

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

The maschine's intended use is:

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

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

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

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

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

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

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

611-01

1.02.02 Abnormal use

In the case of abnormal use and/or improper use of the machine, the manufacturer's guaranty period will expire and the operator will solely be responsible.

Abnormal use is:

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

611-00

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, HAMM cannot forsee 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 instrucitons in this operating manual and in the safety instructions.
- special warnings in this operating 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 additional 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.

611-03

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 186 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 operating manual of diesel engine.

611-04

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.

614-00

1.04 Disposal

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

Operating supply items

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

Materials (metal, plastics)

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

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

Electical / electronical system / battery

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

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

615-00

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 (ROPS) protection.

000-45

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

The pictogram represents the machine's conformity.

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

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

616-00

EC declaration of conformity

HAMM

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

CE

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

We hereby declare that the

Designation of the machinery:

Type:

Serial no.:

complies with the following provisions:

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

Original EC Declaration of Conformity (en)

Applied harmonised standards, in particular:

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

Authorised agent for the composition of the relevant technical documents:

Mr. Matthias Löb, HAMM AG (CE representative)

Tirschenreuth, _____
Date

_____
Dr. Axel Römer
Head of Research and Development

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

616-03

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 (ROPS) 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.

602-01

Machine type plate The type plate is fixed to the machine frame (see page 47).

The VIN [E] indicates the type series and the serial number of the machine e.g. H1841234. The first four characters represent the type series (H184), 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 attachments mountable at the same time and approved by HAMM AG (e.g., chip spreader).

No additional ballasting is allowed.

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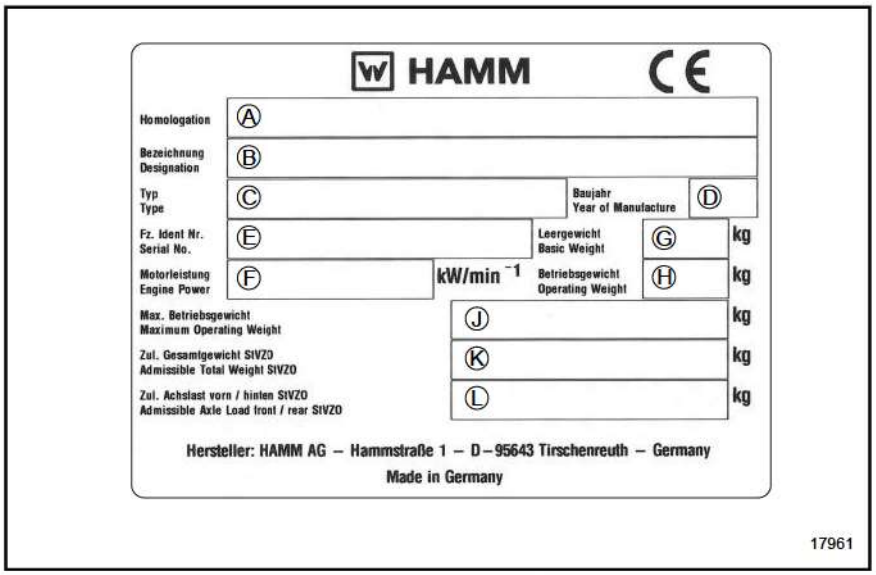
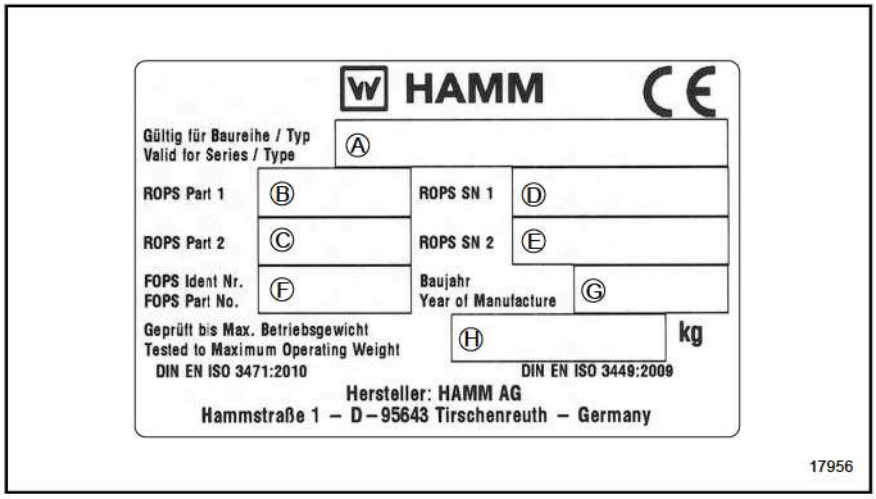


[A]	Homologation (for example the registration number for driving on public roads)	[B]	Designation
[C]	Type	[D]	Year of construction
[E]	Vehicle identification number (VIN. / PIN)	[F]	Engine power / Nominal speed
[G]	Basic weight	[H]	Operating weight
[J]	Maximum operating weight	[K]	Gross vehicle weight rating STVZO (only valid on public roads)
[L]	Permissible axle load, front / rear STVZO (only valid on public roads)		

ROPS / FOPS type plate

The ROPS (roll-over bar) and / or FOPS (falling-object protective structure) approved for this machine by the manufacturer is identified by a nameplate and is fastened to the cab / roll-over bar (see page 48).

602-03

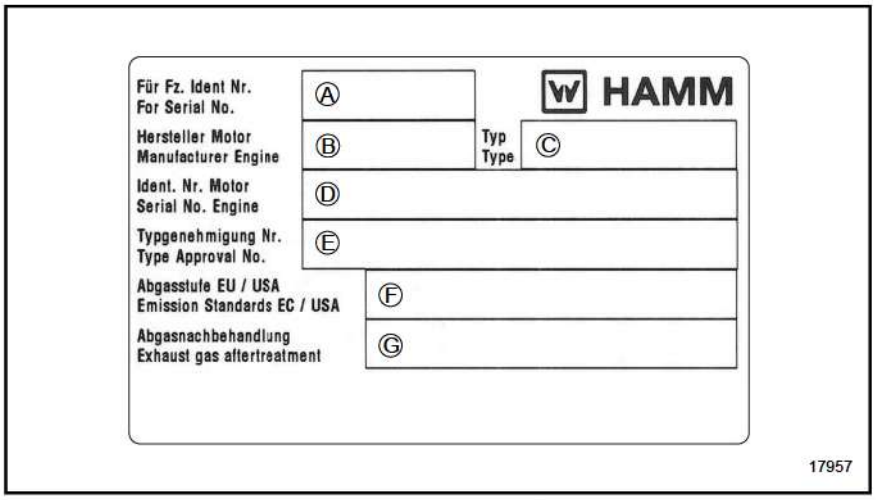


[A]	Series / type (part of the VIN / PIN)	[B]	Cabin / ROPS identification number 1
[C]	Cabin / ROPS identification number 2	[D]	Cabin / ROPS serial number (if available) 1
[E]	Cabin / ROPS serial number (if available) 2	[F]	FOPS identification number (if installed)
[G]	Year of construction	[H]	Tested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

Engine nameplate (HAMM)

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.

602-04



[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 EC Sound Emission Directive in the version 2000/14/EC.

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

Sound power level

Sound indication of the machine

The guaranteed sound power level is specified in the machine's Technical Details (see page 192 sqq.).

Sound intensity level

Sound indication on operator panel

The noise level at the operator's seat is specified under Technical data (see page 192 sqq.) (measurement uncertainty in accordance with EN ISO 11201).

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

Vibration indication on the operator panel

Whole body vibration

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

Hand arm vibrations

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

602-06

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 operating manual the term operating personnel refers to all authorised persons that are responsible for operating, maintaining, instaling, setting up, cleaning, repairing or transporting the machine.

This comprises the following persons:

- Machine operator
- Maintenance personnel

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

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

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

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/Spotter

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

- 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/spotter.

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

To avoid ambiguities, clarify hand signal, such as specified by the German BG Directive "Safety and Health Protection Signals at Work", 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 instructing please use voice radio (e.g when loading with a crane) or via hand signals (e.g. when reversing the machine).

602-07

1.09 General safety instructions

Safety instructions

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

Guidelines and Regulations

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

Additional information

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

Electrical system

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

ROPS / FOPS protective structures

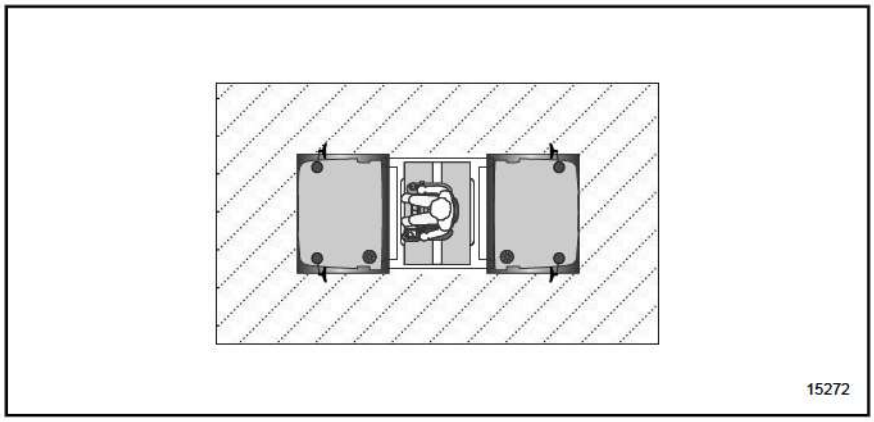
The machine frame in way of the ROPS or/and FOPS mounting may not be distorted, bent or torn (deformed). The reinforcement elements of the cabin / roll-over bar (ROPS) / canopy (FOPS) must not present any rust, damage, fissure or open fracture. All screwed connections of the reinforcement elements must comply with the given specifications and must be screwed tightly to each other. Observe starting torque values! Bolts and nuts must not be damaged, bent or deformed. It is absolutely forbidden to modify or repair / level the reinforcement elements in any way (see page 209 sqq.).

610-05

1.10 Danger zone

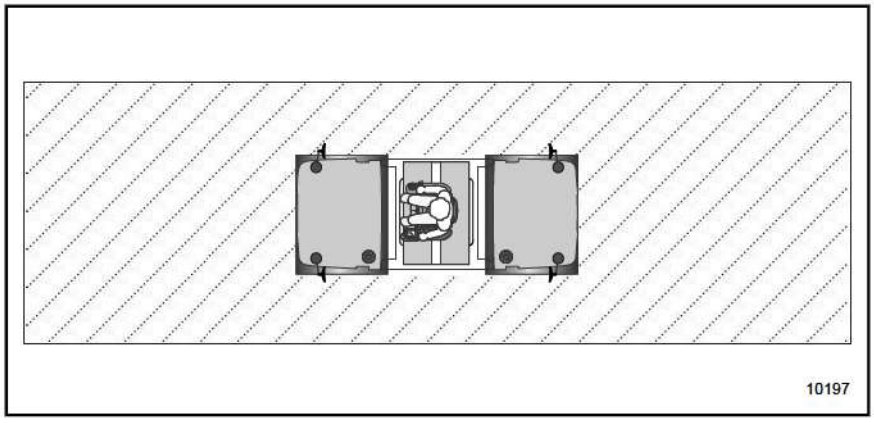
The machine's danger zone is divided into the areas inactive and moving.

Zone "inactive"



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

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 metre	To the left and right of the machine

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

610-06

1.11 Loading and Transporting

Guidelines and Regulations

When loading rollers onto lorries, trailers or semitrailers, it is obligatory to secure the load properly. The duty for tie-down on street vehicles arises from StVO § 22, StVO § 23, StVZO § 30, StVZO § 31, HGB § 412 as well as from VDI guideline 2700 or other national 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. Normal traffic situations also include emergency braking, evasion manoeuvres and unevenness of roads. 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.

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Loading Instructions

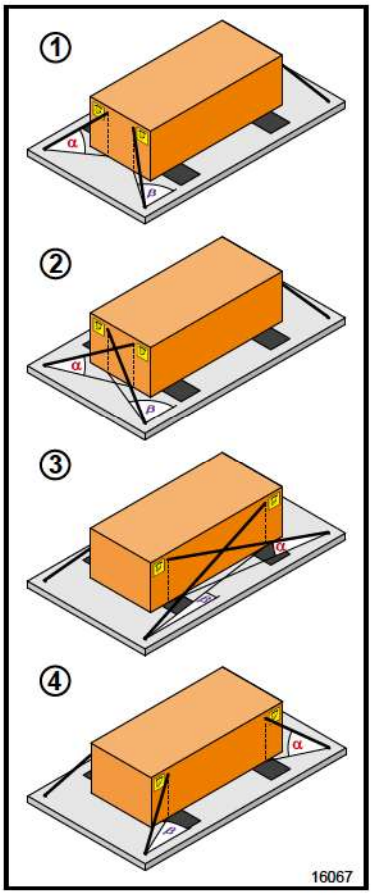
When loading please observe the following instructions:

- Adhere to section Transport as specified in the safety instructions.
- Observe weight and dimensions (see page 192 sqq.).
- The legally stipulated maximum height must be observed.
- 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.
- Drive the machine slowly onto the loading area with ¾ diesel engine speed.
- Either remove every loose or movable part in or at the machine, or secure such parts separately.
- In case of rollers with articulated steering, the safety strut must always be activated for transport.
- Remove wedges and lashing devices completely before unloading. Unblock steering system by unblocking the safety strut.

- Drive the roller slowly and carefully from the loading area.
- For crane loading, always attach appropriate sling equipment at the lifting lugs provided for them. The crane vehicle must be positioned on flat ground providing the bearing capacity required while observing all relevant safety regulations. In addition, take suitable precautions to block access to the lifting area in order to prevent any person from moving or staying within the danger zone. The crane's load table must correspond to the machine to be lifted. No crane loading must be performed unless all these items have been complied with.

716-12

Load securing

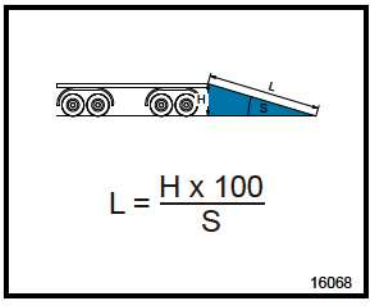


Special notes

- 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 μ ≥ 0.6) under every roller drum / tyre.

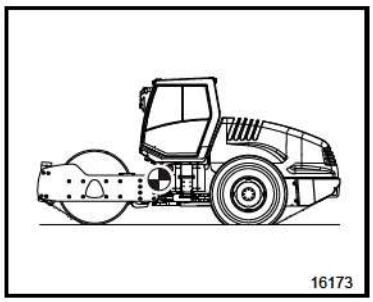
716-10



Maximum permissible ramp slope: see the loading tables

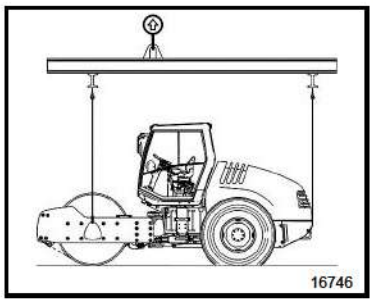
[L]	Ramp length (mm)
[H]	Difference in height (mm)
[S]	Ramp slope (%)

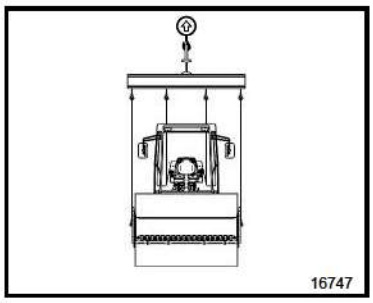
Make certain to use a proper load distribution plan.



[⊕] Centre of gravity

Crane loading



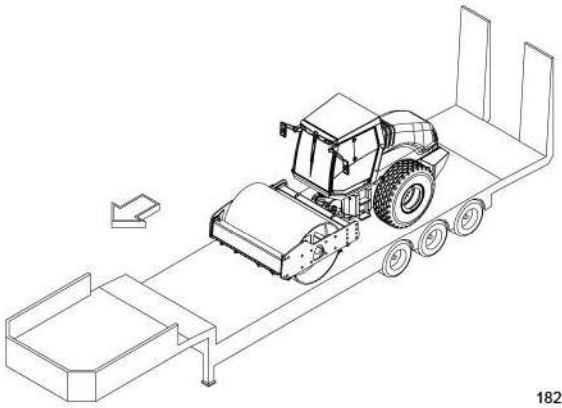


Special notes

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

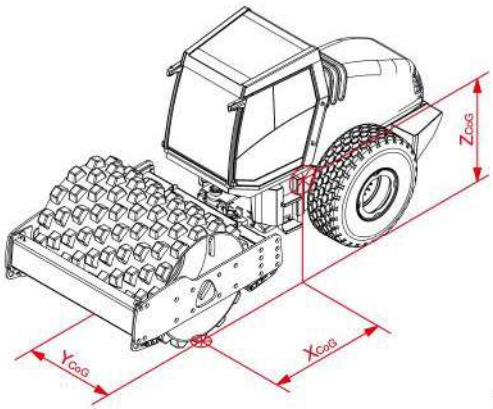
Loading chart

Diagram of the transport position



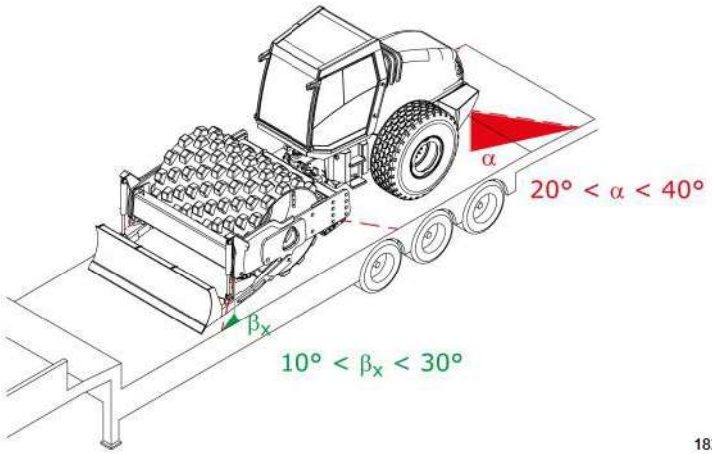
18283

Diagram of the centre of gravity specifications:



18284

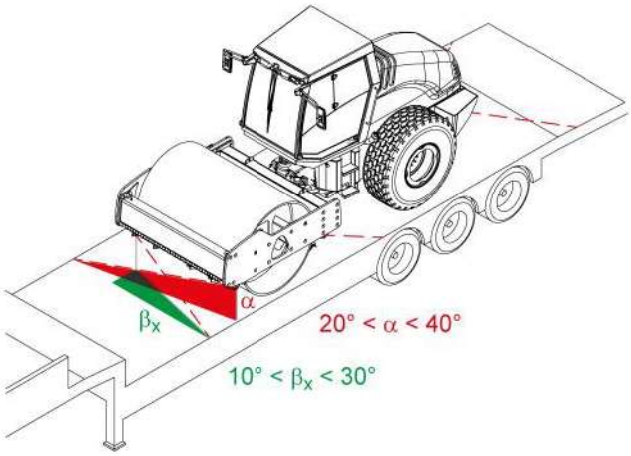
Lashing variant 1



18285

Weight class [t]	Lashing capacity LC (μ=0.6) [daN]
to 23.5	6000

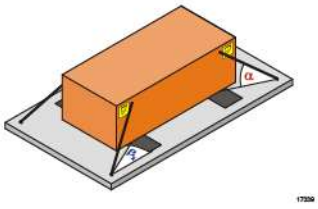
Lashing variant 2

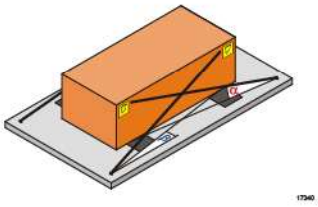


18286

Weight class [t]	Lashing capacity LC (μ=0.6) [daN]
to 23.5	6000

Ramp slope Observe maximum permissible ramp slope (23 %, approx. 13°).
Driving onto a loading platform Engage working speed and slowly drive the machine up/down with the speed of the diesel engine set to 3/4.





Machine parameters	
Weight of machine [t]	15.5 t < m < 23.5 t
Area of centre of gravity [mm]	X_{CoG} = 931-1265 Y_{CoG} = 1070-1110 Z_{CoG} = 870-970
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:	20° < α < 40°
Longitudinal, horizontal angle βx:	10° < βx < 30°

Specification of attachment points on the load:			
Tensile capacity of lashing point [daN]:	6000		
Marking of lashing point:	Symbol ISO 6405-1		
Number of lashing points:	6		
Specification of lashing points on the means of transport:			
Tensile capacity of lashing point [daN]:	≥ 6000		
Number of lashing points:	6		
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]:	6000	Quantity: 6	Miscellaneous:
Recommended type of lashing equipment:	Chain (10/8 6300 daN),		
	Belt (10000 daN) as an alternative		
Connecting pieces to the lashing point:	Hook with safety latch		

Specific safety instructions

- 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.
- Completely close and block door panes and the roof hatches.

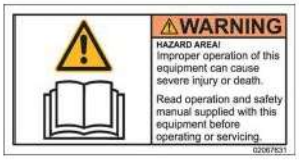
1.12 Stickers on the machine

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

1.12.01 Warning labels

Read documentation

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

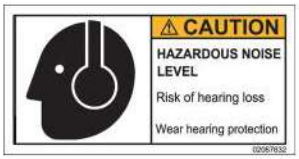


Seat belt obligatory (only with ROPS cabin or ROPS roll-over bar)

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

Hearing protection

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



Water jets

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

Motor Stop

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

Hot surface

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

Air conditioning

Risk of burns! Coolant of the air-conditioning can cause serious injuries or fatality. Follow operating and maintenance instructions.

Chip spreader

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

Edge pressing assembly

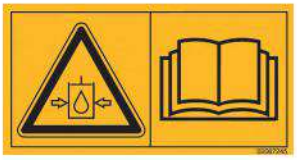
Risk of crushing! Pinch point can cause serious injuries or fatality. Keep away. Prior to maintenance and adjustment works, shut down machine and remove ignition key.

Fan blade

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

V-belt

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



Accumulator

Tank under pressure. System contains accumulator. Prior to starting service work, read operating and service manual.

Folding joint

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

Running over hazard

Machine movements can cause serious injuries or fatality. Keep away.

Danger of overturning

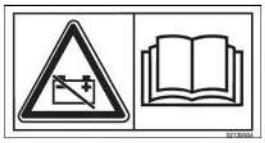
Pay attention that there is sufficient stability when working with rollers of small roller drum width. Pay attention to permitted machine tilt.

Risk of crushing

Pinch point can cause serious injuries. Keep away.

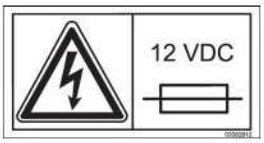
Lashing not allowed

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

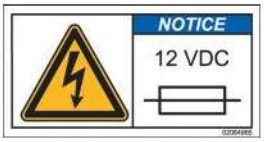


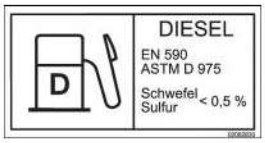
Battery isolating switch

Dangerous situation. Actuate the battery isolating switch only with the enginge stopped. Before you start with service works, read the operating and maintenance instructions.



12 V fuses





Diesel

Diesel tank! Use diesel with a sulphur content of less than 0.5 %. Pay attention to standards.

Safety strut

Marking of a safety strut.

Towing loop for crane loading

Lashing point

Read documentation

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

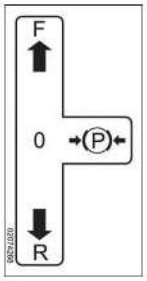
First-aid kit

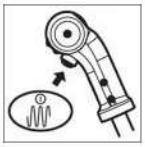
Panolin

Biodegradable hydraulic oil in use.

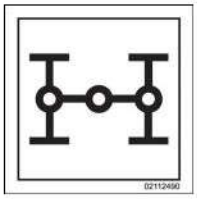
1.12.02 Information sign

In the following you will find a list of all information signs. Illustrations and values of the signs may vary depending on the machine type.



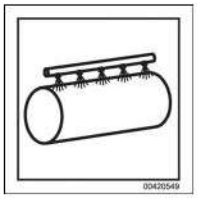


Drive lever function

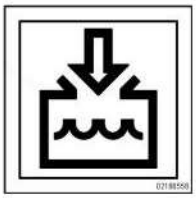


All-wheel lock

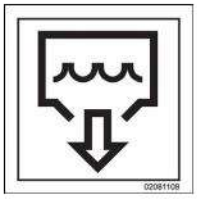
Engine speed



Sprinkling



Water tank filling

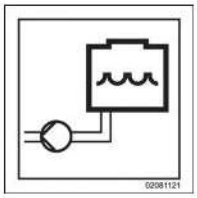


Water tank outlet

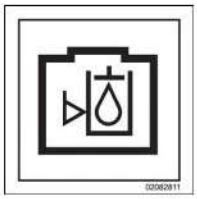
Additive sprinkling

Water tank inlet of additive sprinkling

Water tank outlet of additive sprinkling



Water pump

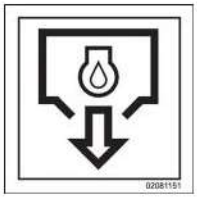


Hydraulic oil filling level

Hydraulic oil reservoir inlet

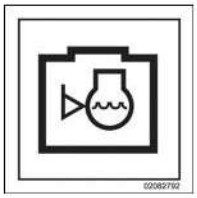
Hydraulic oil reservoir outlet

Socket 12V

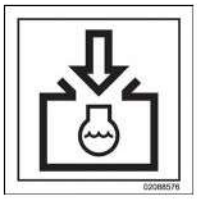


Engine oil outlet

Water sump fuel filter outlet



Coolant filling level



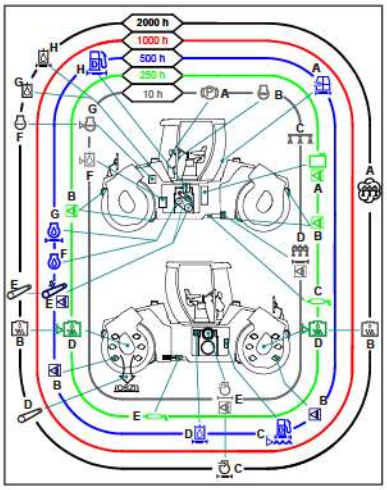
Coolant inlet

Inflation pressure
Tyre without water filling

Inflation pressure
Tyre with water filling

Guaranteed sound power level

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

Drive Hydrostatic all-wheel drive

- infinitely variable
- Single lever operation

Vibration Direct hydrostatic drive

Steering Hydrostatic servo-assisted steering via centre pivot assembly

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

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.

Electrical system Operating voltage 12 V

100-14

2.01 General view of machine

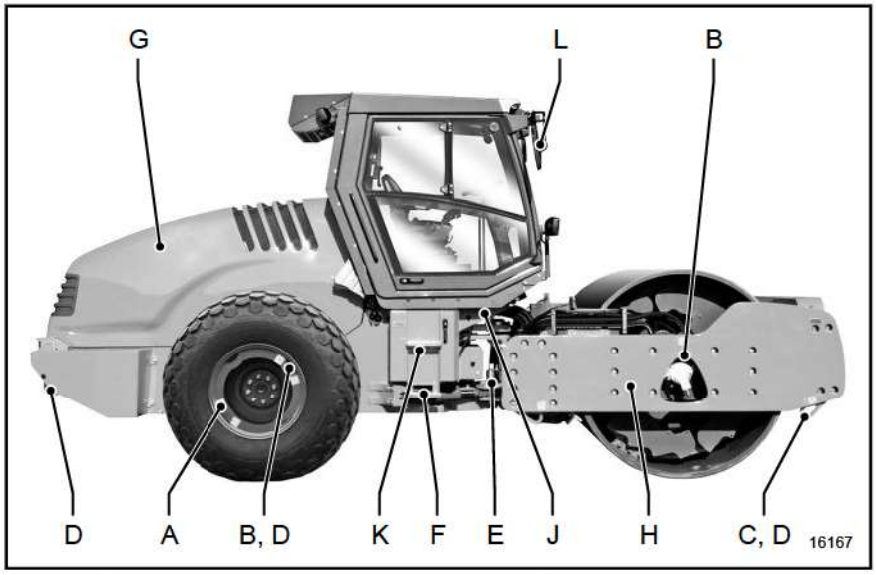
This operating manual applies to several types of this series. Therefore it is possible that these instructions include descriptions of operating elements not installed on your machine.

000-03

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

000-64

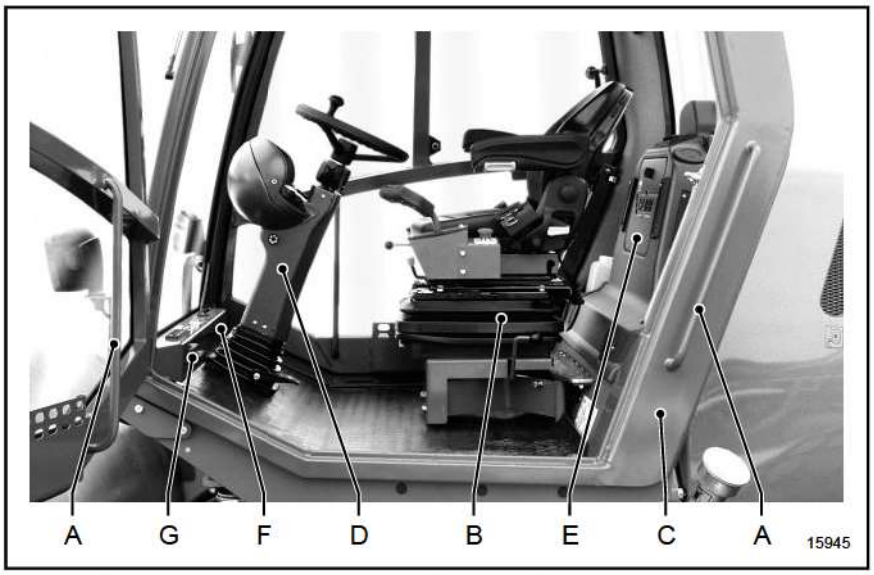
2.01.01 Chassis / safety devices



[A]	Stickers indicating dangers	[B]	Towing eyes for crane loading
[C]	Towing eye	[D]	Lashing point
[E]	Safety strut	[F]	Steps
[G]	Engine hood	[H]	Chassis
[J]	Vehicle identification number (VIN)	[K]	Machine type plate
[L]	Operation mirror / rear-view mirror		

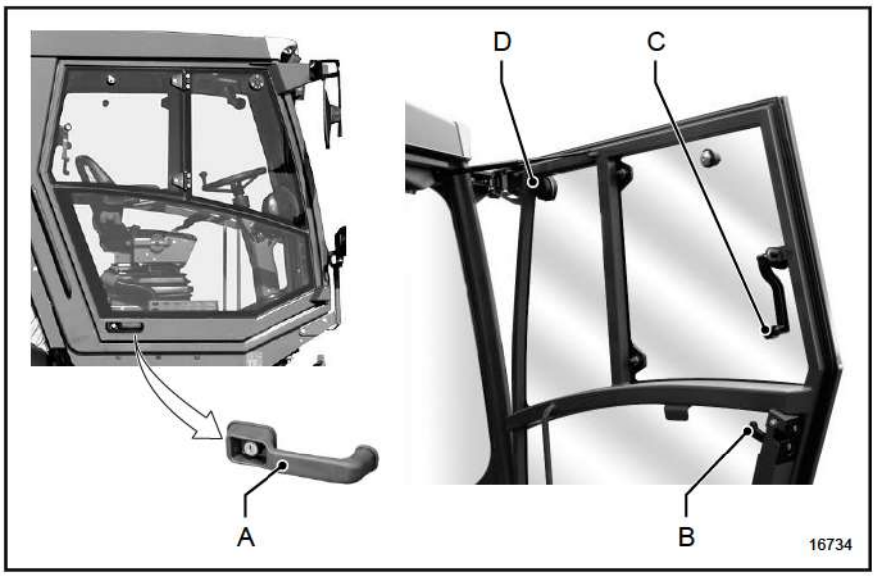
2.01.02 Control stand

ROPS cabin



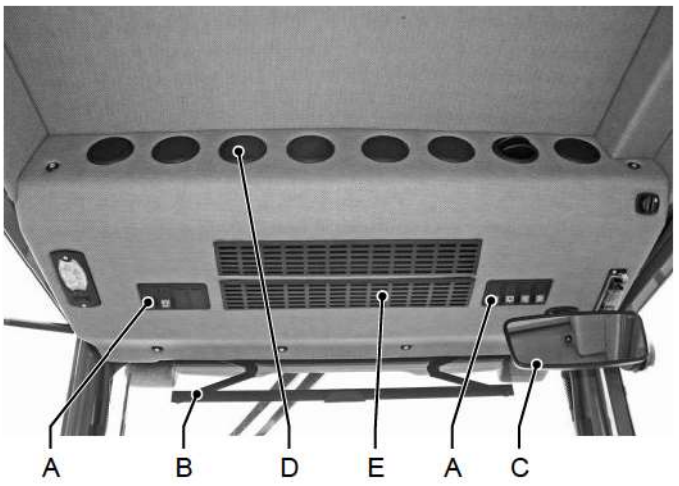
[A]	Handles	[B]	Operator's seat console
[C]	Operator's cabin	[D]	Steering console
[E]	Stacker for operating manual / first aid kit	[F]	ROPS cabin type plate
[G]	Position for *fire extinguisher		

Cabin door

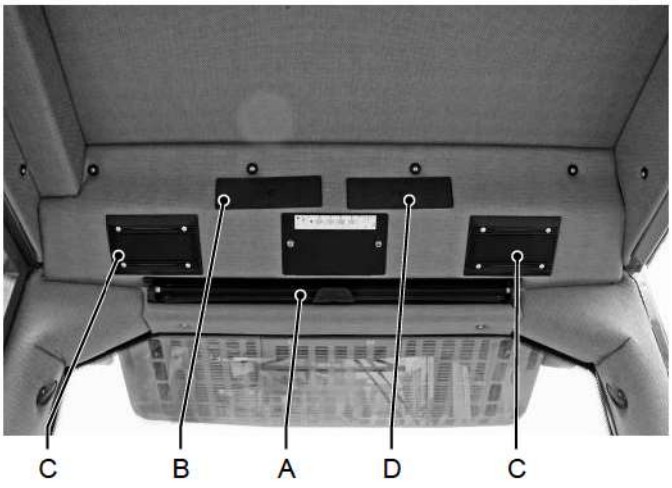


[A]	Lock operation, outside	[B]	Lock operation, inside
[C]	Door glass locking lever	[D]	Door glass locking device

Operator's cabin roof section

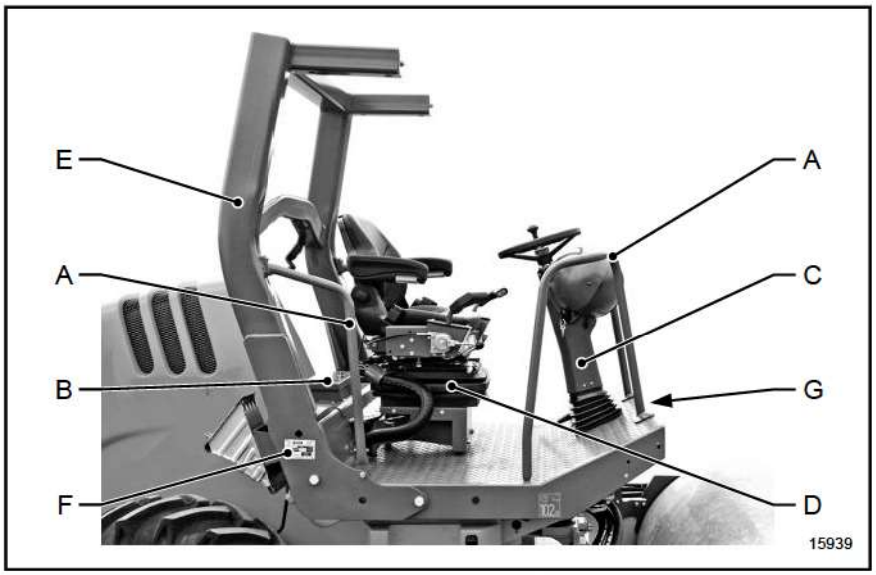


[A]	Switch unit	[B]	Roll-up sunshield
[C]	Inside mirror	[*D]	Air conditioning ventilation nozzles
[*E]	Aspiration duct for air conditioning		



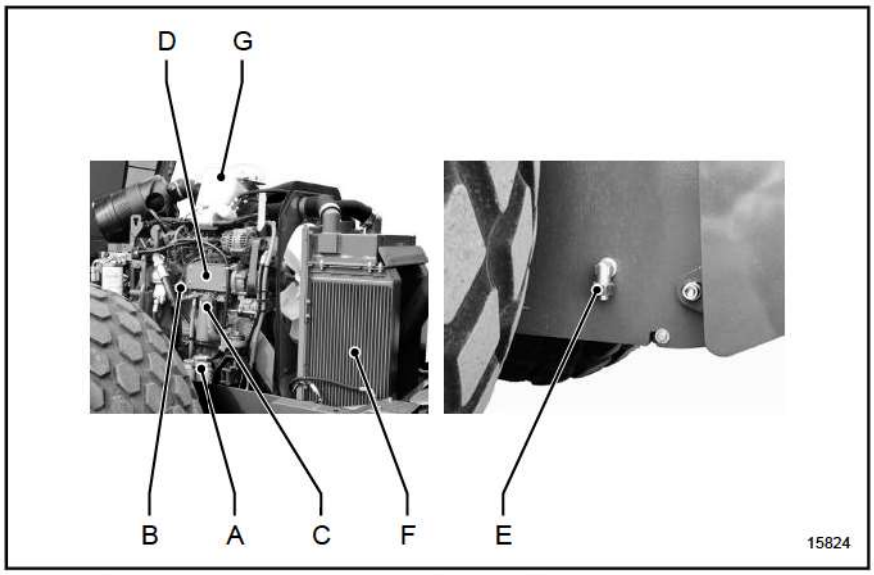
[A]	Roll-up sunshield	[B]	Position for *radio
[C]	Loudspeaker	[D]	Position for *tachograph

ROPS roll-over bar

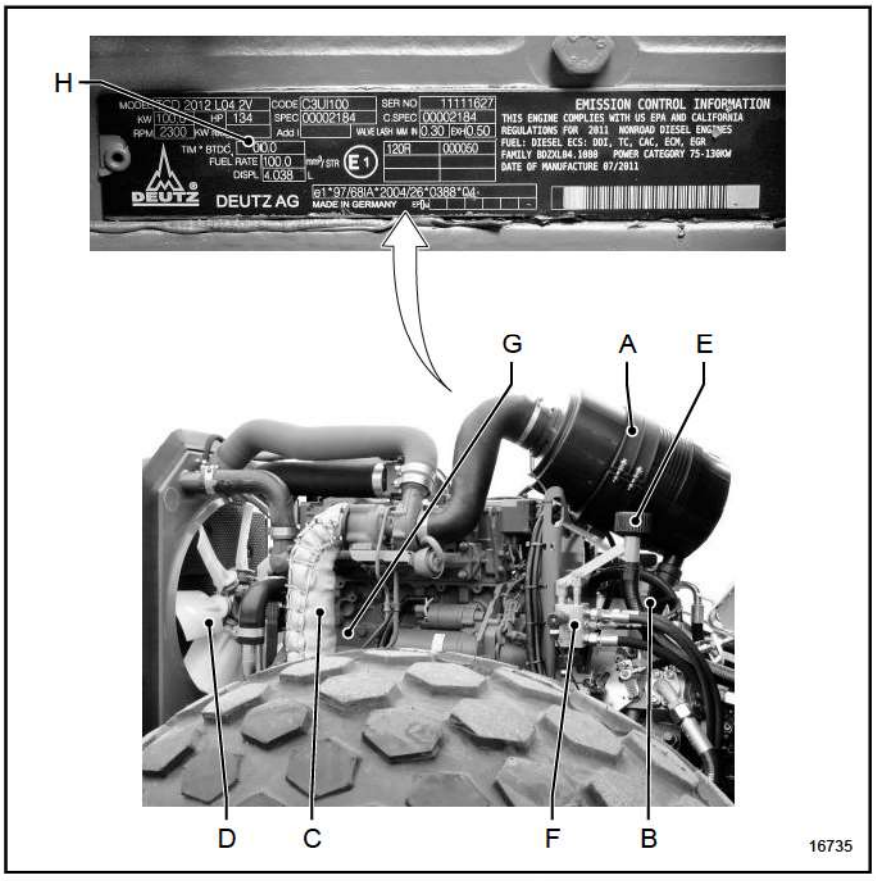


[A]	Handles	[B]	Stacker for instruction manual / first aid kit
[C]	Steering column	[D]	Operator's seat console
[E]	Roll-over bar	[F]	ROPS roll-over bar type plate
[G]	Position for *fire extinguisher		

2.01.04 Drive unit / diesel engine

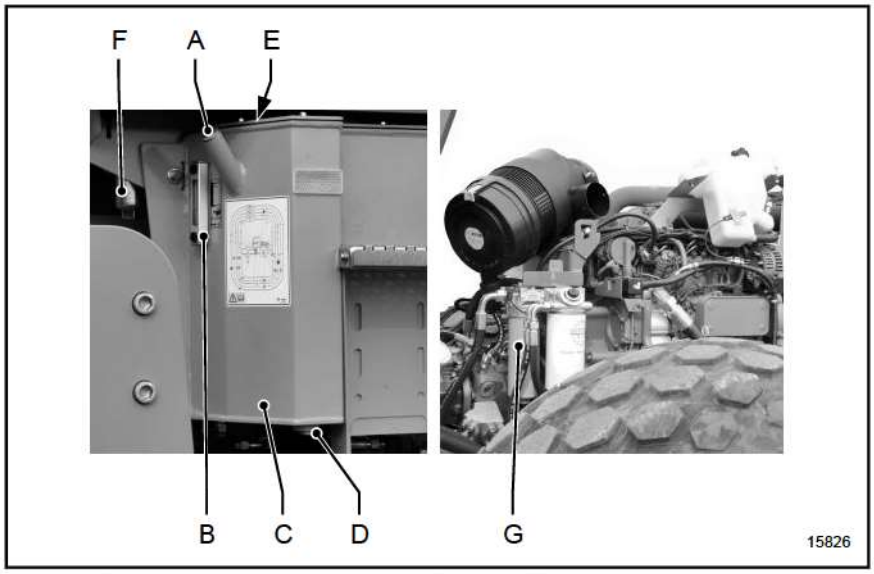


[A]	Fuel system	[B]	Oil dip stick
[C]	Oil inlet	[D]	Diesel engine with drive units
[E]	Oil outlet	[F]	Cooling system
[G]	Coolant inlet / coolant filling level		



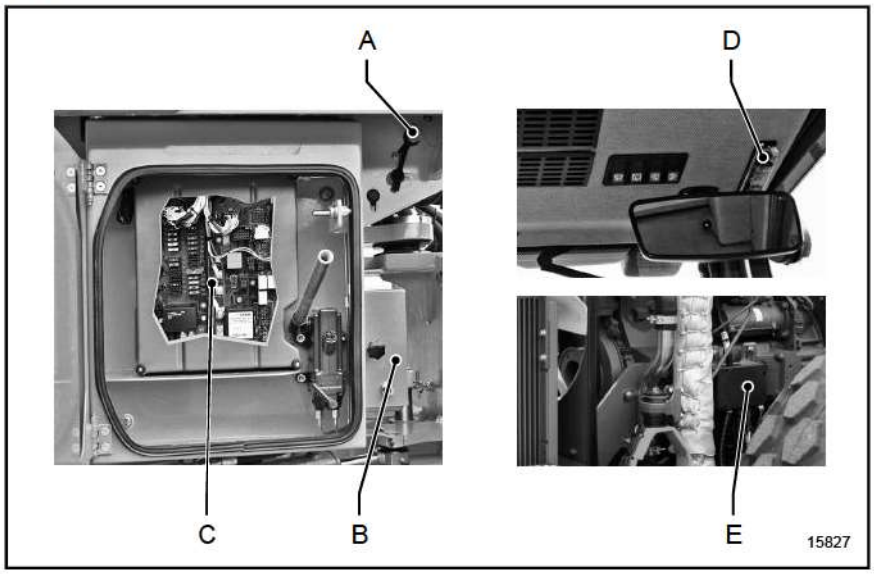
[A]	Air filter	[B]	Dust discharge valve
[C]	Exhaust system	[D]	Cooling system
[E]	Fuel tank ventilation filter	[F]	Manual pump, parking brake
[G]	Diesel engine	[H]	Diesel engine type plate

2.01.05 Hydraulic oil supply



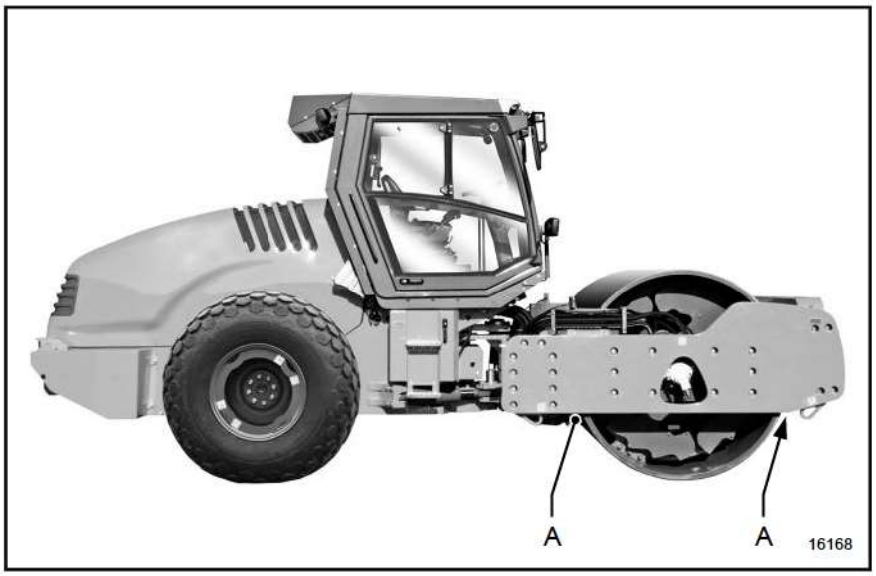
[A]	Oil inlet	[B]	Level indicator
[C]	Hydraulic oil reservoir	[D]	Oil outlet
[E]	Ventilation filter of hydraulic oil tank	[F]	Steering hydraulic oil filter
[G]	Hydraulic oil filter		

2.01.06 Electrical equipment



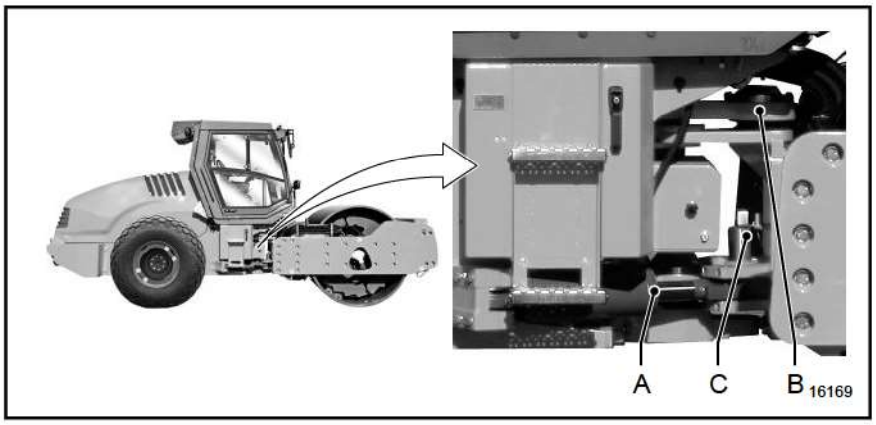
[A]	Battery isolating switch	[B]	Battery
[C]	Fuses, electric box	[D]	Fuses, operator's cabin
[E]	Main fuses		

2.01.08 Drive



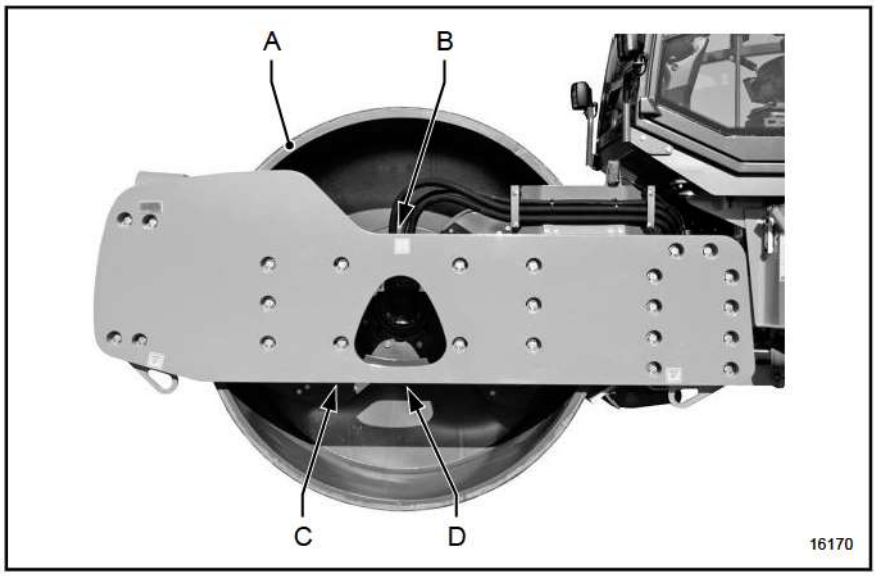
[A]	Scraper

2.01.09 Steering system



[A]	Steering cylinder	**[B]**	Articulated pendulum joint
[C]	Safety strut		

2.01.26 Vibration



[A]	Drum with vibrator	**[B]**	Oil inlet for vibrator
[C]	Fill level indicator of vibrator	**[D]**	Oil outlet for vibrator

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.

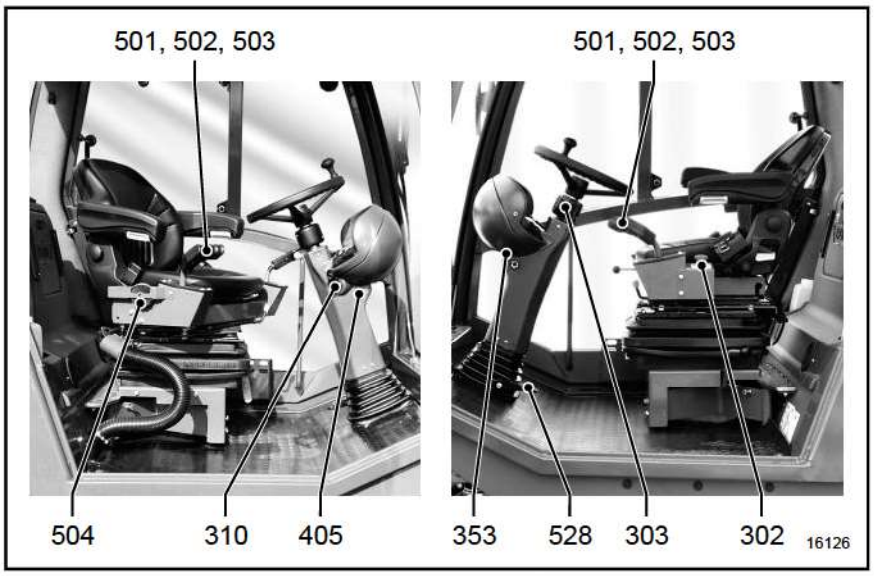
000-04

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

000-64

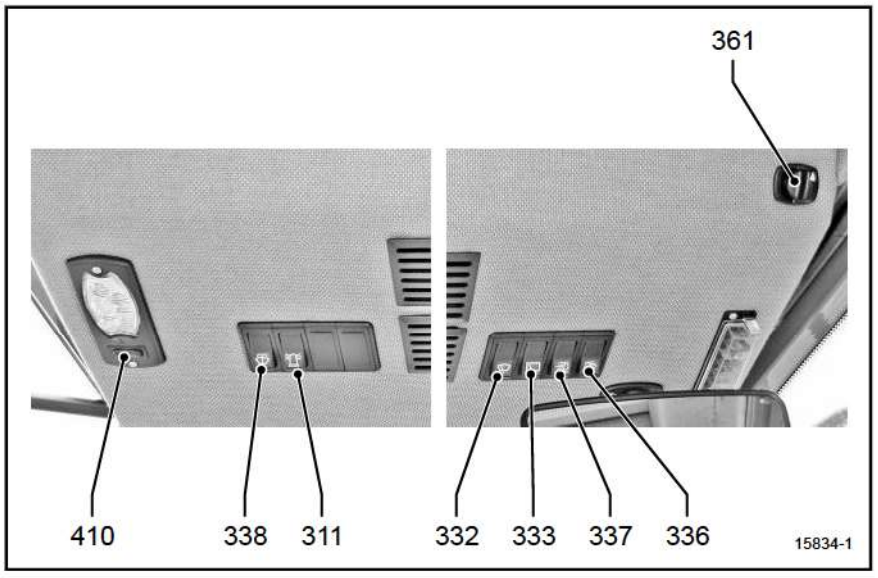
2.02.02 Control stand

Operator platform



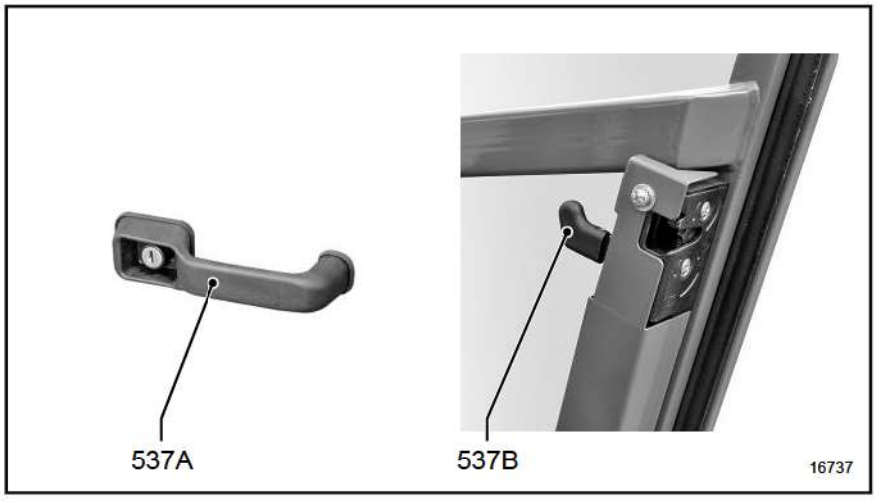
[302]	EMERGENCY STOP switch	**[*303]**	Flashing lights / lighting switch
[310]	Electrical system / engine start switch	**[353]**	Switch, parking brake monitoring
[405]	Socket 12 V	**[501]**	Drive lever
[502]	0 position lock / parking brake	**[503]**	Multifunction handle
[504]	Engine speed	**[528]**	Steering console adjustment

Operator's cabin roof section



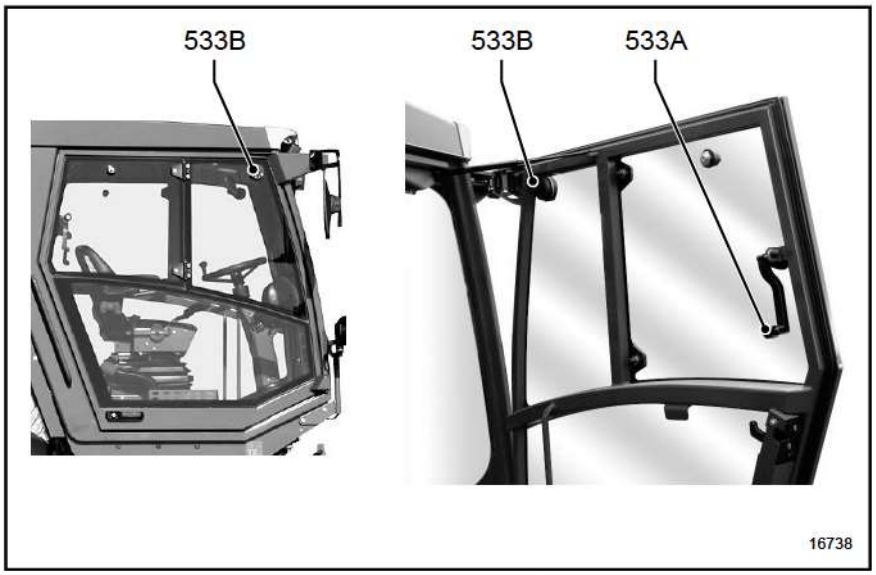
[*311]	Rotating light switch	**[332]**	Front windscreen wiper switch
[333]	Rear windshield wiper switch	**[336]**	Rear working lights switch
[337]	Front working lights switch	**[338]**	Switch, windshield washer
[*361]	Air conditioning temperature switch / fan	**[410]**	Cab lighting

Door lock



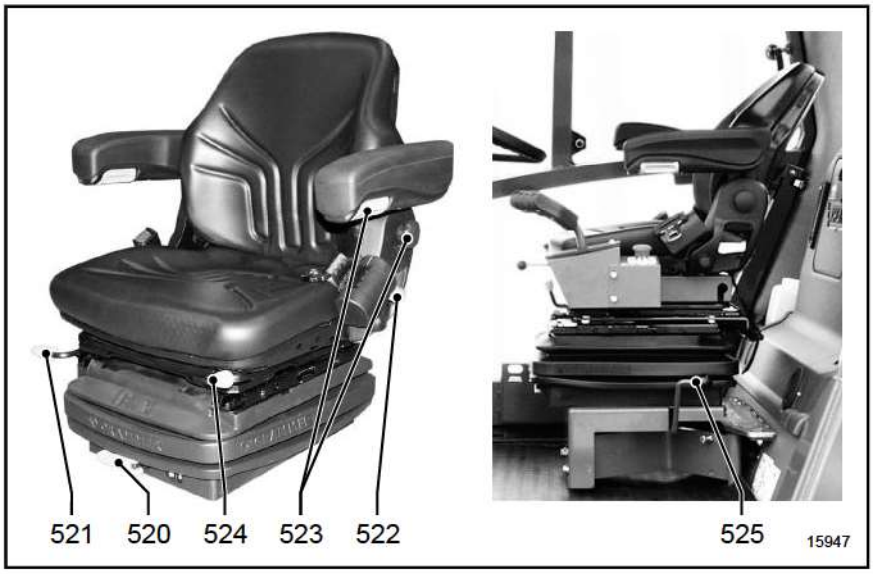
[537A]	Lock operation, outside	**[537B]**	Lock operation, inside

Door glass lock



[533A]	Locking lever	**[533B]**	Door glass locking device with stop knob

Operator's seat

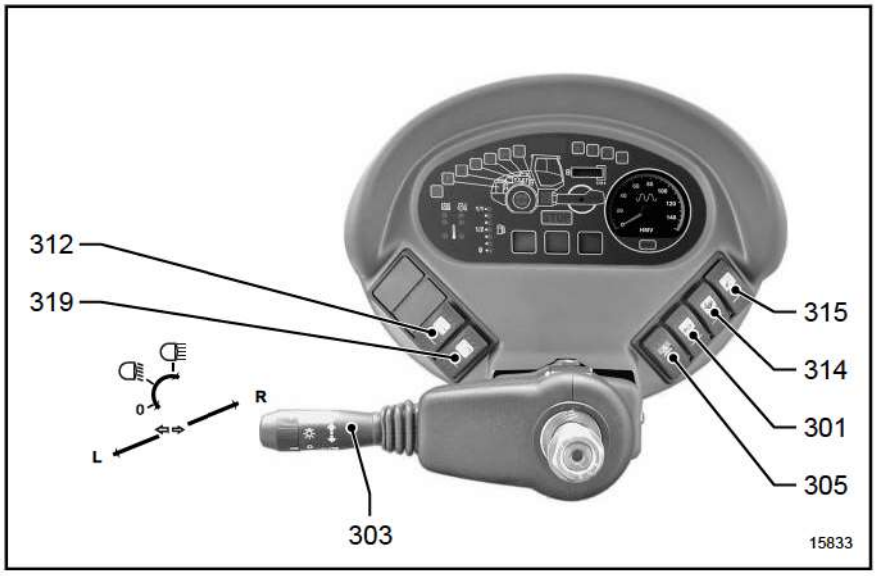


[520]	Seat adjustment weight / height	**[521]**	Seat adjustment forward - backward
[522]	Seat backrest adjustment	**[523]**	Seat adjustment elbow-rest
[524]	Seat adjustment rotation	**[525]**	Seat adjustment left - right

Cabin heating

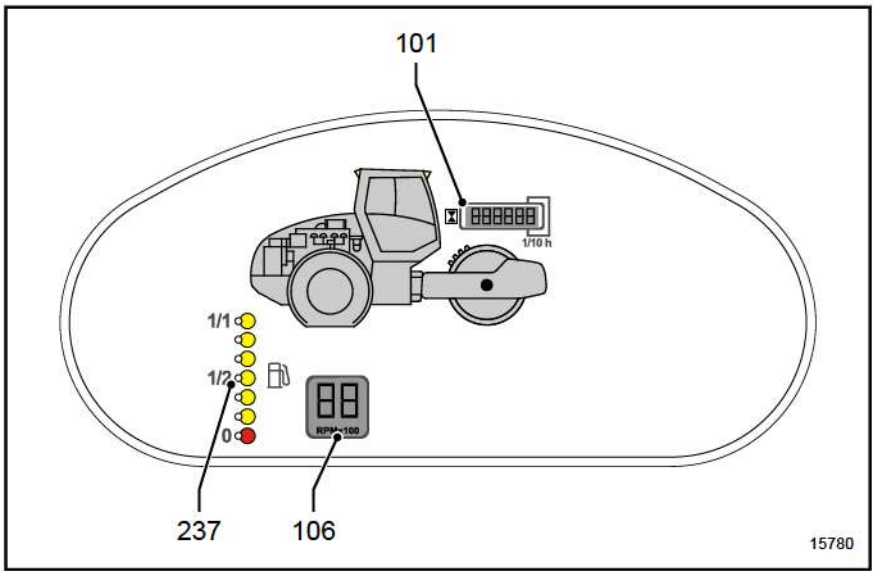
[330]	Cabin heating fan switch	[347]	Switch cabin temperature regulation

Instrument console



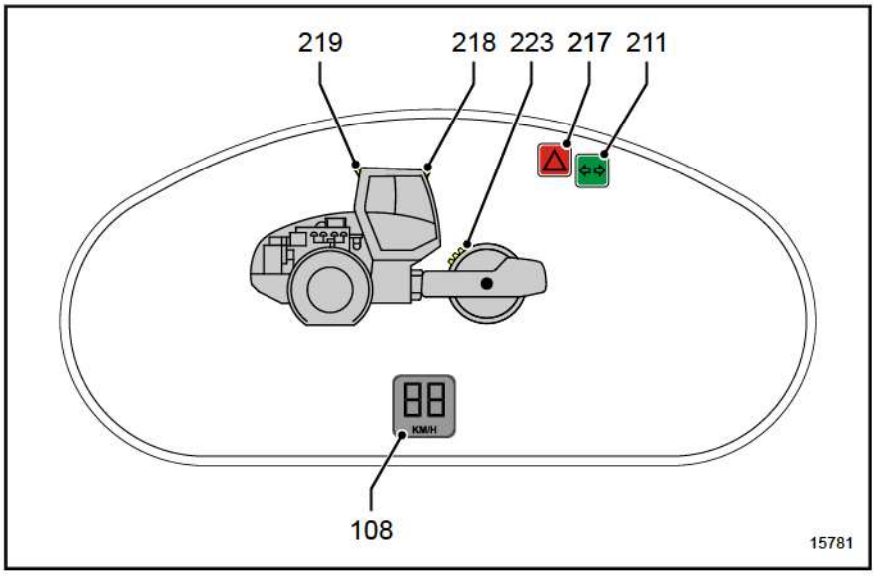
[301]	Signal horn switch	[*303]	Flashing lights / lighting switch
[*305]	Warning flasher switch	[312]	Vibration switch
[314]	Gear shifting switch	[315]	Traction control switch
[*319]	Switch vibration mode manual-automatic		

Normal mode control unit



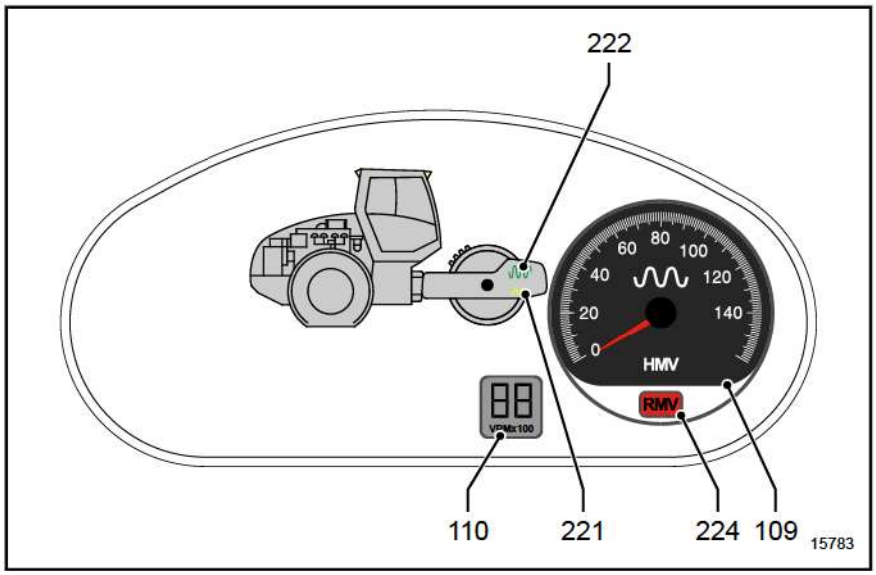
[101]	Hourmeter indicator	**[106]**	Engine speedometer
[237]	Fuel level pilot light		

Driving control unit



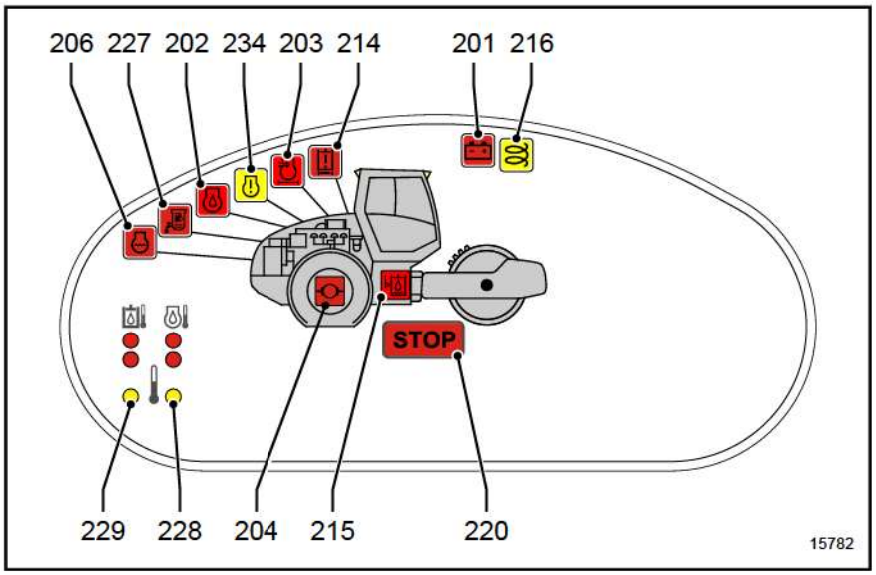
[108]	Driving speed indicator	**[*211]**	Flashing indicator pilot light
[*217]	Warning flasher pilot light	**[218]**	Front working floodlight pilot light
[219]	Rear working floodlight pilot light	**[223]**	Function not existing

Vibration control unit



[*109]	Compression indicator HMV	[*110]	Vibration frequency indicator
[221]	Small amplitude pilot light	[222]	Large amplitude pilot light
[*224]	RMV indicator (jump operation)		

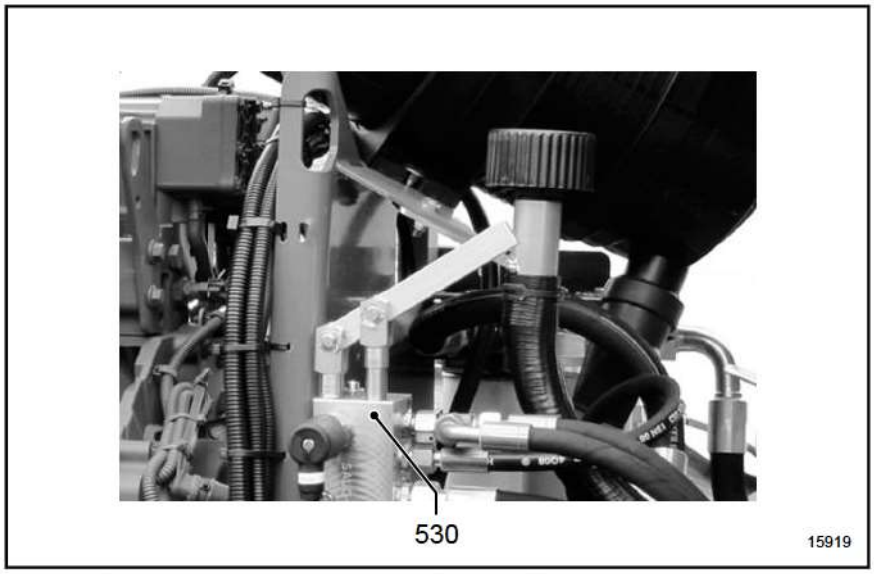
Warning lamps control unit



[201]	Charge current pilot light	**[202]**	Oil pressure pilot light
[203]	Air filter pilot light	**[204]**	Parking brake pilot light
[206]	Coolant level pilot light	**[214]**	Pilot light, hydraulic oil filter
[215]	Function not existing	**[216]**	Cold start assistance pilot light
[220]	STOP pilot light	**[227]**	Pilot light, water sump fuel prefilter
[228]	Engine temperature pilot light	**[229]**	Oil temperature pilot light, hydraulic system
[234]	Diesel engine pilot light		

2.02.04 Drive unit / diesel engine

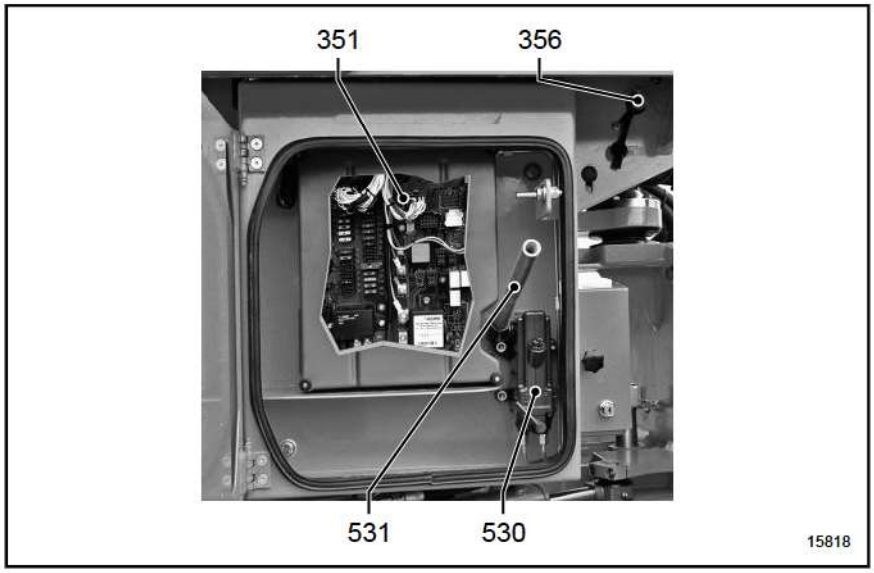
Engine compartment



[530]	Manual pump, parking brake

2.02.05 Electrical system

Electrical box



[351]	Link plug jumper	**[356]**	Battery isolating switch
[530]	Manual pump, engine hood	**[531]**	Actuating pipe

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.

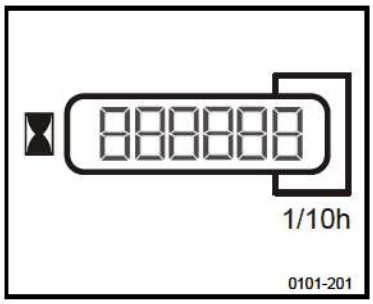
000-64

3.00.01 Indicators, displays

Electrical equipment When switching on the electrical system with the switch [310] all pilot lights and indicators are activated for ca 2 seconds . Check whether all elements are operable. You find further explanations in the section Operational monitoring (see page 99 sqq.).

100-06

101 Hourmeter



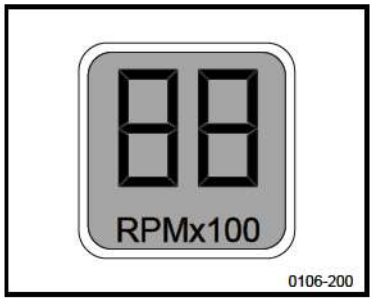
After the electrical system is switched on, the operating hours of the machine are shown in the display field. Maintenance work has to be carried out according to the accumulated operating hours.

101-06

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

000-12

106 Engine speed



The actual engine speed is calculated from a multiplication of the indicated value by 100.

106-08

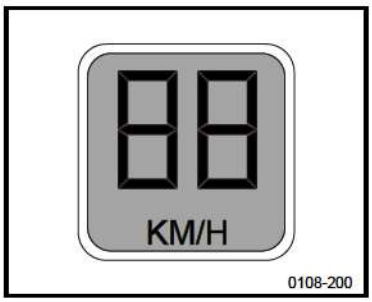
After switching on the electric system, an internal test code is displayed for 2 seconds.

000-12

Diagnostic codes
In the event of a fault, "ER" and a diagnostic code appear alternately in the display.
If a diagnostic code is displayed, write down all messages and contact your HAMM Customer Service. The diagnostic codes can only be interpreted by a HAMM service partner.

000-13

108 Driving speed



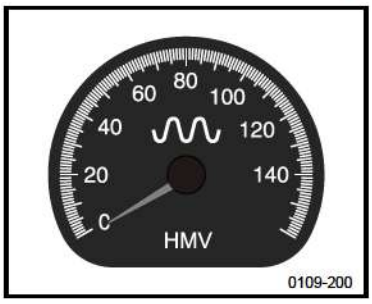
Indication of the driving speed in km/h or mph. The unit is set with a jumper [351] and is also displayed.

108-11

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

000-12

*109 Compression HMV



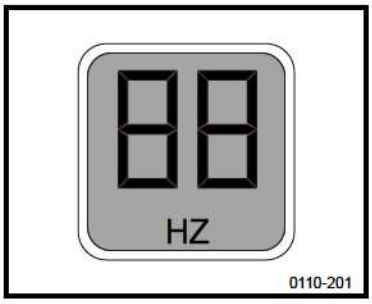
The magnitude of the indicated value depends on the material to be compressed. In case of compression work with the vibration turned on, increasing HMV values show an increasing material densification, or carrying capacity. If the value remains constant at a pre-compressed place, this place cannot be compressed further. Use is only permissible with vibration in earthmoving applications

109-04

If the machine is not equipped with a computer unit for HMV, no display appears.

000-14

*110 Vibration frequency



Indication of the current frequency in Hz or vpm. The set unit appears in the indicator. The actual value is calculated from a multiplication of the indicated value by 100.

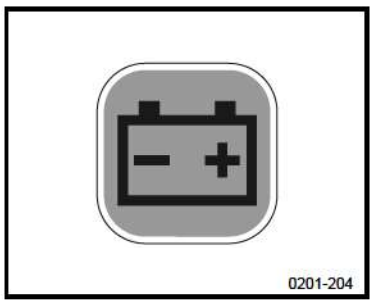
110-10

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

000-12

3.00.02 Pilot lights

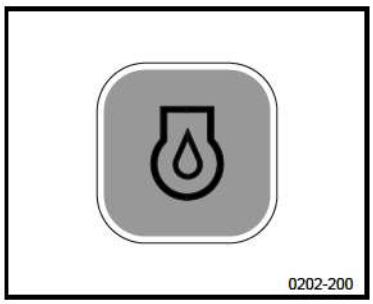
201 Charge current



Flashing during operation indicates missing charging current.

201-06

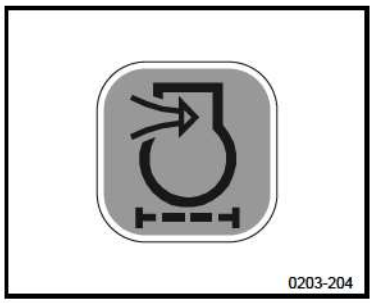
202 Engine oil pressure



Flashing during operation indicates insufficient oil pressure.

202-07

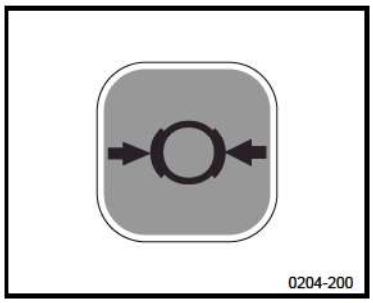
203 Air filter



Flashing during operation indicates a clogged air filter cartridge.

203-04

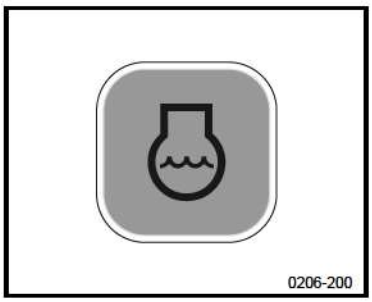
204 Parking brake



The pilot light flashes when the parking brake is applied and after the actuation of the EMERGENCY STOP switch [302]. A flashing pilot light when driving indicates that the oil pressure is not sufficient for opening the parking brake.

204-06

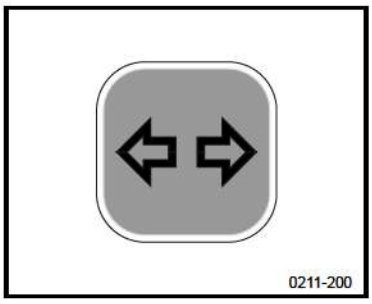
206 Coolant level



Flashing during operation indicates that the coolant level in the cooling system of the diesel engine is not sufficient.

206-02

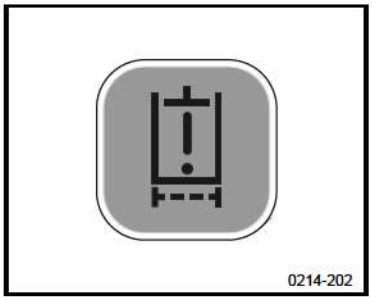
*211 Flashing lights



Pilot light illuminates if the direction indicator is switched on.

211-02

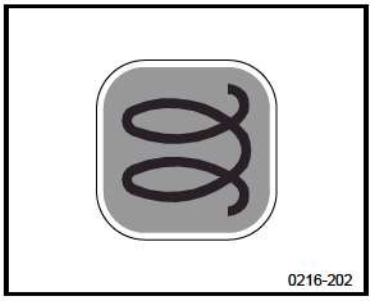
214 Hydraulic oil filter



Flashing during operation indicates a clogged filter cartridge of the hydraulic oil filter.

214-01

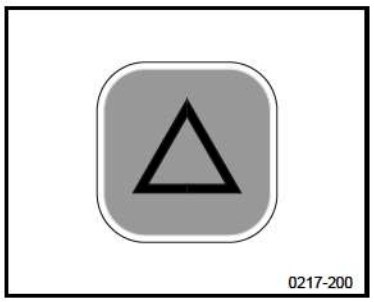
216 Cold start assistance



When the electric system is switched on (switch [310] in position I), this indicator lights up. After reaching start temperature, the indicator switches off; then start the diesel engine.

216-04

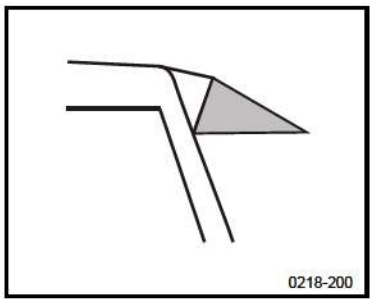
*217 Warning flashers



Pilot light flashes when the warning flashes are switched on.

217-00

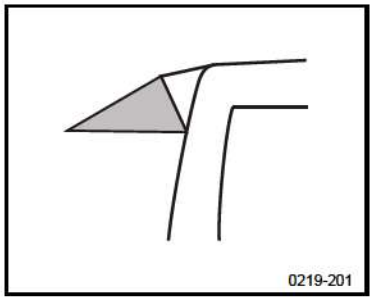
218 Front working spotlights



Pilot light illuminates if the front working lights are switched on.

218-00

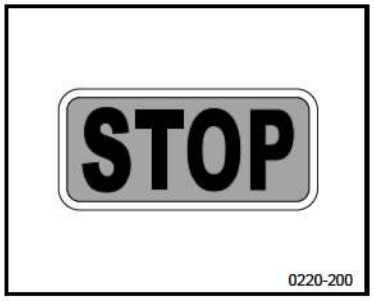
219 Rear working spotlights



Pilot light illuminates if the rear working lights are switched on.

219-00

220 STOP



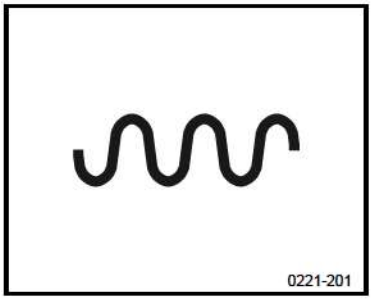
Flashing during operation indicates a serious malfunction of the machine. At the same time an acoustic signals sounds.

Further operation is inadmissible!

1. Park the machine out of the danger zone.
2. Shut down the diesel engine **immediately**
3. Rectify the cause immediately.

220-02

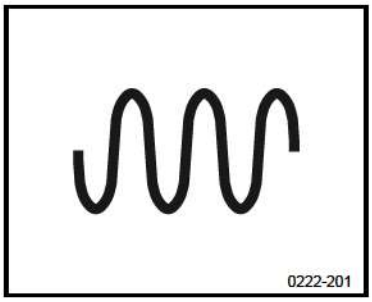
221 Small amplitude



Pilot light illuminates if vibration with small amplitude is activated.

221-00

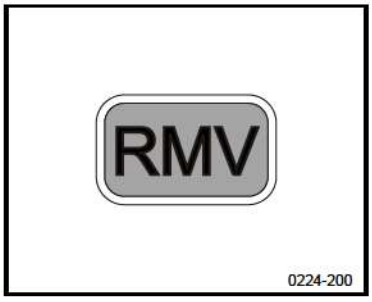
222 Large amplitude



Pilot light illuminates if vibration with large amplitude is activated.

222-00

*224 RMV (jump operation)

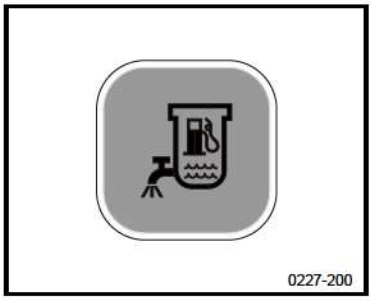


The vibrating drum must not be lifted from the ground (jump operation) during compression in earth moving work.
A slow flashing of the display indicates that the drum is immediately before jump operation.
A fast flashing of the display indicates that the drum is in jump operation.

No even compression measurement can be realised during jump operation. In this case, the values of the compression display [109] are not reliable any longer.

224-00

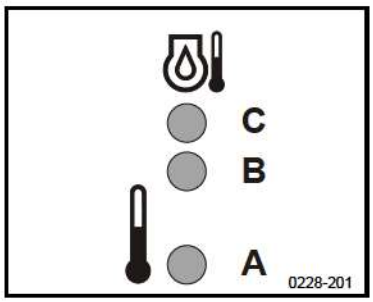
227 Water sump fuel prefilter



Flashing during operation indicates an excessively high water sump in the fuel pre-filter.

227-03

228 Engine temperature



Lighting up during operation indicates improper engine temperature.

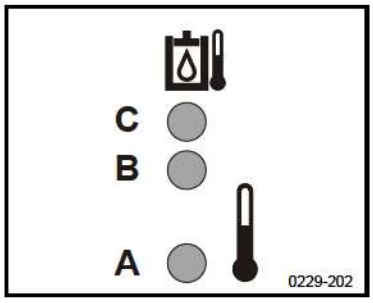
Warm-up phase [A] — lights up **YELLOW**

Increased [B] — lights up **RED**

Overheating [C] — flashes **RED**

228-05

229 Oil temperature of hydraulic system



Lighting up during operation indicates improper hydraulic oil temperature.

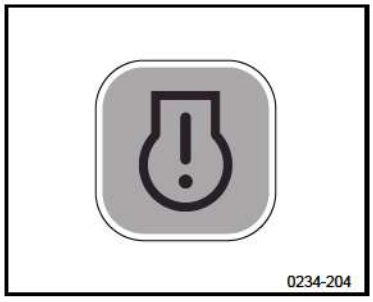
Warm-up phase [A] — lights up **YELLOW**

Increased [B] — lights up **RED**

Overheating [C] — flashes **RED**

229-05

234 Diesel engine



Lighting up during operation indicates a malfunction of the diesel engine.

1. Stop machine.
2. Contact your HAMM customer service.

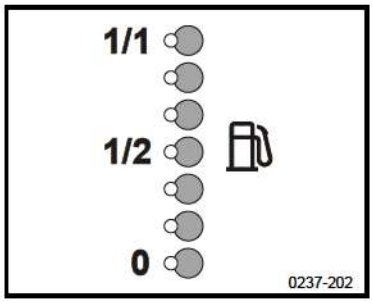
As long as the engine works with normal speed, the machine can be operated further.

Only if the diesel engine automatically limits its speed to emergency operation, the machine must be parked outside of the danger area.

1. Stop machine.
2. Shut down the diesel engine.
3. Contact your HAMM customer service.

234-04

237 Fuel filling level

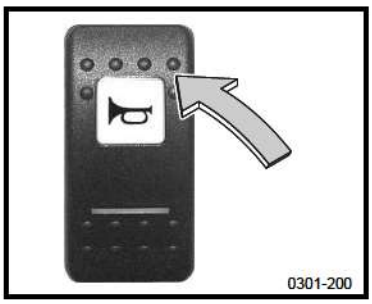


The fuel tank filling level is displayed by an illuminated pilot light. A luminous spot moves between 1/1 and 0 corresponding to the motion of the level sensor. When the light point is flashing refuelling is necessary.

237-02

3.00.03 Switch

301 Signal horn



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

301-03

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

On — position **DOWN**

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

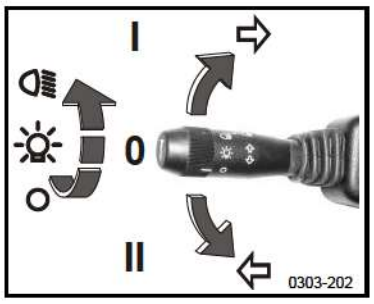
After actuating the EMERGENCY STOP switch, the machine must be brought into its start position.

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.

302-25

*303 Flashing lights / lighting



Flashing lights

Steer right — position **I**
(pilot light [211] flashes)

Off — position **0**

Steer left — position **II**
(pilot light [211] flashes)

Lighting

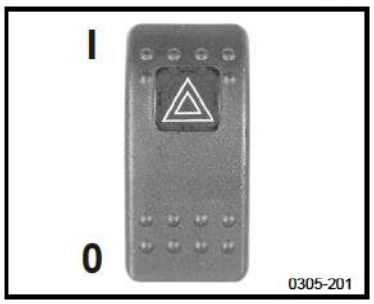
Off — position ○

Parking light — position

Driving light — position

303-11

*305 Warning flashers



On — position **I**
(push button flashes)

Off — position **0**

305-02

310 Electrical system / engine start

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

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

Position I
Electrical system — **ON**

Position II — without function

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

310-08

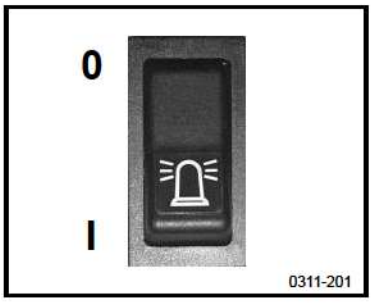
When the engine is at a standstill and the electrical system is switched on for a longer period (position I), the battery discharges rapidly.

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].

000-29

*311 Rotating light

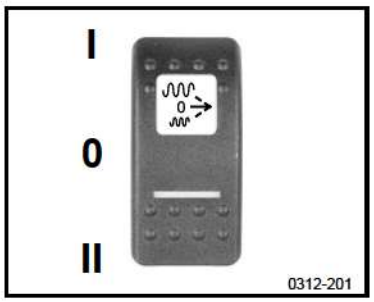


On — position **I**

Off — position **0**

311-07

312 Vibration



The switch activates or deactivates the vibration. The vibration works with small or large amplitude, according to switch position.

Activate the large amplitude position **I**
(pilot light [222] lights up)

Deactivating position **0**

Activate the small amplitude position **II**
(pilot light [221] lights up)

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

312-07

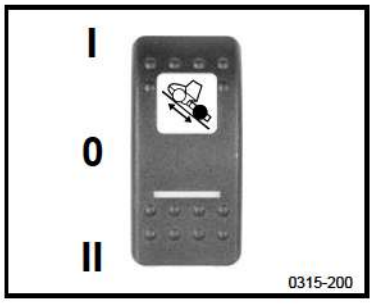
314 Gear shifting

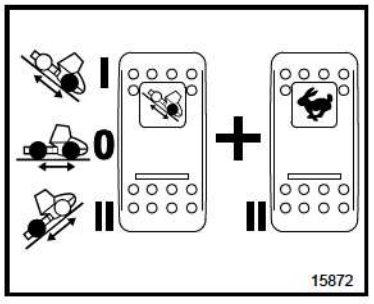
Transport speed position **I**
(push button lights up)

Working speed position **II**

314-03

315 Traction control





Toggling the traction force is only possible in the working speed.

The driving force of drum and rear wheels is set at the switch. Depending on the switch position, a large portion of the traction power is displaced to the drum or to the rear wheels, respectively. In 0 position both drives have the same traction power.

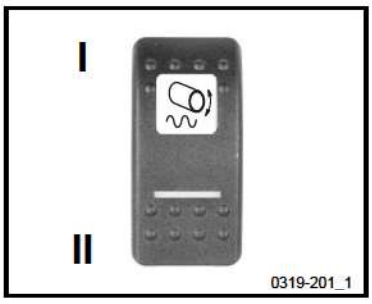
Uphill, drum in front
Strong traction force on rear wheels — position **I**
(push button lights up)

Same traction power
on both drives — position **0**

Uphill, rear wheel in front
Strong traction force on drum — position **II**
(push button lights up)

315-01

*319 Vibration mode manual-automatic



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

Manual — position **II**

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

Automatic — position **I**
(switch button lights up)

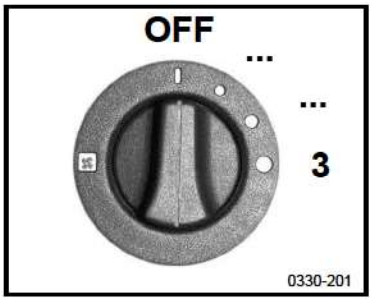
The switching on and off of the vibration is coupled to the road speed. Vibration is switched off when at low or high speed.

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

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

319-10

330 Cabin heating blower



Use this switch to toggle the fan for cabin heating either on or off.

Air current Off — position **OFF**

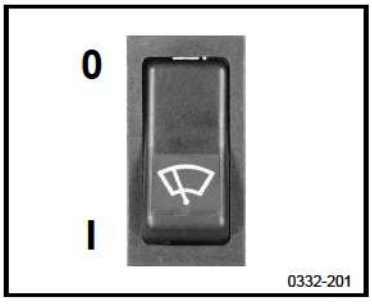
Air current stage 1 — position **1**

Air current stage 2 — position **2**

Air current stage 3 — position **3**

330-06

332 Front windshield wiper

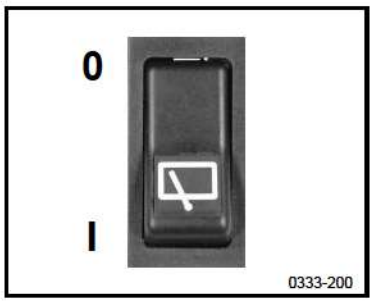


On — position **I**

Off — position **0**

332-04

333 Rear windshield wiper



On — position **I**

Off — position **0**

333-03

336 Rear working lights

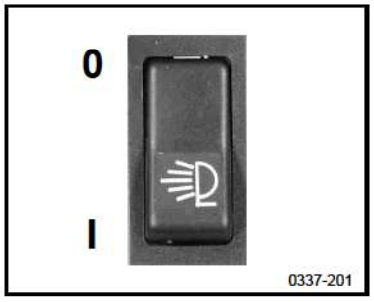
Pressing the pushbutton switches on or off the rear work floodlight on the cab / ROPS / weather protection roof.

On — position **I**

Off — position **0**

336-04

*337 Front working spotlights



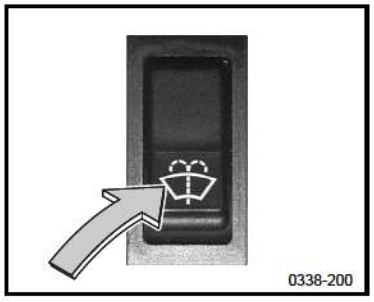
Pressing the pushbutton switches on or off the front work floodlight on the cab / ROPS / weather protection roof.

On — position **I**

Off — position **0**

337-04

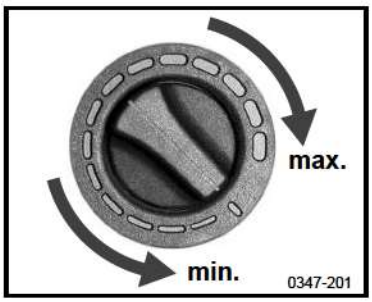
338 Windscreen washer system



By pressing the switch the pump of the washer system is switched on. Only as long as the switch is pressed a moistening of the windscreen takes place.

338-03

347 Cabin-heating temperature regulation



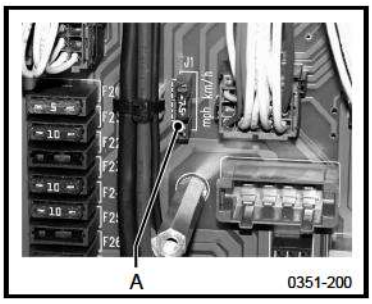
The heat exchanger for the cabin-heating is connected to the diesel engine cooling circuit. The heat exchanger temperature is continuously adjustable with the switch.

Minimum temperature — stop **LEFT**

Maximum temperature — stop **RIGHT**

347-02

351 Jumper link plug



The unit for the speed display is set with a jumper link plug [A].

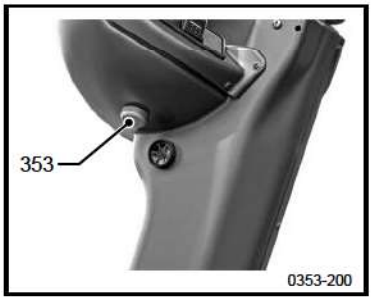
km/h — jumper **UP**

mph — jumper **DOWN**

Perform the toggling only when the electrical system is switched off (switch [310] position **0**)

351-02

353 Parking brake inspection



⚠WARNING

Full braking!

Danger of injuries due to strong braking force.

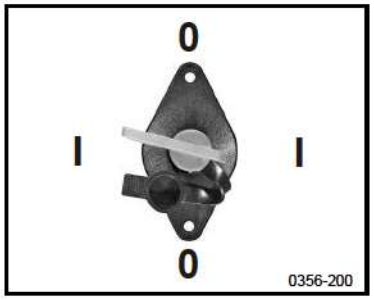
- Only inspect the parking brake when the engine is at a standstill.
- Do not use the parking brake as the service brake.

002-04

The parking brake is applied only as long as the switch is pressed (pilot light [204] flashes).

353-02

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

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

356-01

*361 Air conditioning temperature / fan

Use this switch to toggle cooling and the fan for the air conditioning system either on or off. The air flow is cooled down through the heat exchanger of the air conditioning system.

Off — position **0**

Air current stage 1 — position **I**

Air current stage 2 — position **II**

Air current stage 3 — position **III**

361-05

3.00.04 Sockets, lights

405 Socket 12 V

The maximum load on the socket is 100 W (8 A).

405-01

410 Cab lighting

This works even if the electrical system is switched off.

410-00

3.00.05 Operation levers, adjustment handles

501 Drive lever

The drive lever determines the driving direction and speed.

Forwards travelling — push lever **FORWARD**

Reverse travelling — push lever **BACKWARD**

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.

501-18

In case of danger the machine can also be brought to a standstill with the EMERGENCY STOP switch [302].

000-18

502 0 position lock / parking brake

For latching, the right drive lever must be pushed in central position into the 0-position lock. Two functions are assigned to this position. For unlatching, press the driving lever towards the driver's seat.

0-position lock

The 0-position lock is a safety device. It avoids unintended movement of the machine.

Latched — drive lever position **0**
(drive lever [501] is latched in central position)

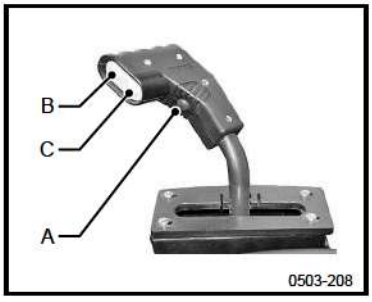
Unlatched — drive lever position **I**
(drive lever is free)

Parking brake

If the drive lever is latched in the 0 position lock, the parking brake is applied. If the parking brake is applied, the pilot light [204] flashes.

502-03

503 Multifunction handle



Vibration

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

Vibrator on — **PRESS**

Vibrator off — **PRESS** again

*Push plate

The push plate is lifted and lowered as long as one side of the switches [B] or [C] is pressed. If both switches are pressed simultaneously for about 2 seconds, the lifting and lowering movement of the push plate is released. Then it can adapt to soil irregularities.

Pressing a switch [B] or [C] cancels the release of the push plate.

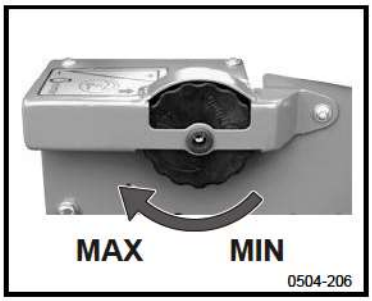
Lift push plate — **PRESS** switch [B]

Lower push plate — **PRESS** switch [C]

Push plate released — **PRESS** switches [B] and [C] for about 2 seconds

503-19

504 Engine speed



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

Idle speed — **MIN**

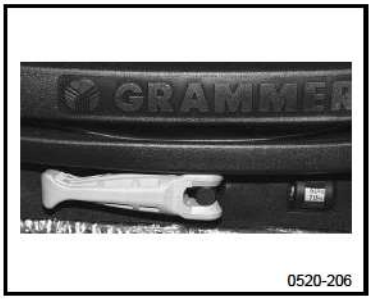
max. speed — **MAX**

504-06

The vibration frequency is coupled to the engine speed. The adjustment of the engine speed will change the vibration frequency (see page 192).

000-71

520 Seat adjustment weight / height

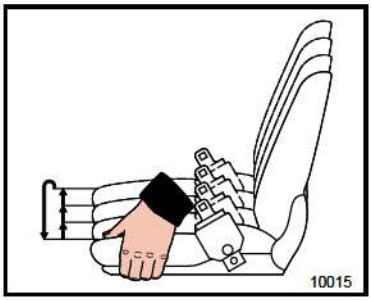


⚠WARNING

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

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

002-41



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

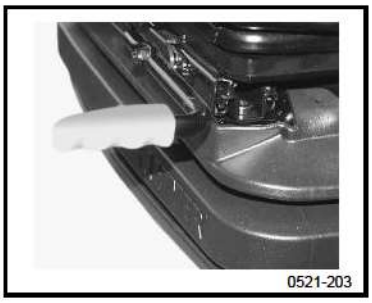
The pretension of the attenuation system can be adjusted continuously to the driver's weight by turning the lever to the left or right between 50 kg and 130 kg . The adjusted weight is displayed in the adjacent window.

The seat height can be adjusted to several levels. The seat latches to the next higher level by lifting it manually by approximately 30 mm.

For lowering, the seat must first be lifted to the stop. After that it can be lowered to the lowest level.

520-04

521 Seat adjustment forward - backward



⚠WARNING

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

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

002-41

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

521-00

522 Seat backrest adjustment

⚠WARNING

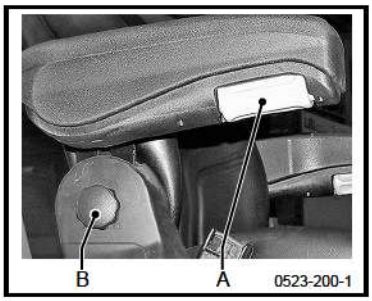
Uncontrolled movements!
Risk of injury due to uncontrolled movements when changing the seat pedestal position.
- Operate the machine only in an admissable seat position.
- Only drive the machine with latched seat pedestal.
- Do not adjust the seat pedestal during driving.
- Adjust the seat pedestal only on an even surface.

002-41

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

522-03

523 Seat adjustment elbow-rest



⚠WARNING

Uncontrolled movements!
Risk of injury due to uncontrolled movements when changing the seat pedestal position.
- Operate the machine only in an admissable seat position.
- Only drive the machine with latched seat pedestal.
- Do not adjust the seat pedestal during driving.
- Adjust the seat pedestal only on an even surface.

002-41

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 loosing the locking screw [B].

523-02

524 Seat rotation adjustment


0524-200

⚠WARNING

Uncontrolled movements!
Risk of injury due to uncontrolled movements when changing the seat pedestal position.
- Operate the machine only in an admissable seat position.
- Only drive the machine with latched seat pedestal.
- Do not adjust the seat pedestal during driving.
- Adjust the seat pedestal only on an even surface.

002-41

NOTICE

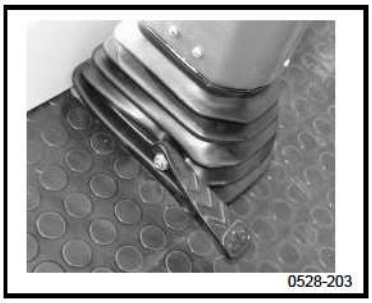
Damage to property on the operator platform!
Damage due to shocks or strokes.
- Before turning, the seat console must be displaced to the centre of the cabin.
- Before transporting the machine, lock the seat in the centre of the cab.

004-02

After lifting the lever, the seat can be turned to the left or to the right in increments of 10°. The seat can be rotated freely if the lever is pulled upward into the latching position. For locking, the lever must be pushed downwards over the latch.

524-04

528 Steering console adjustment


0528-203

⚠WARNING

Uncontrolled movements!
Risk of injury due to uncontrolled movements when changing the steering console position.
- Only drive the machine with latched steering console.
- Do not adjust the steering console when the machine is driving.
- Adjust the steering console only on an even surface.

002-25

After releasing the lock with the foot lever, the complete steering panel can be rotated to the front or to the rear.

Locking device released — **PRESS** foot lever

Before driveaway latch steering console in the desired position.

528-02

530 Manual pump

Engine hood

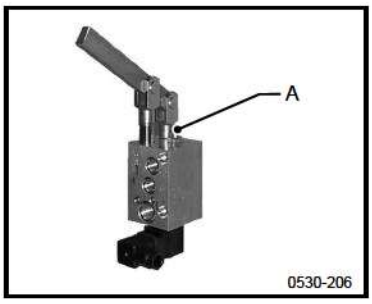
The manual pump opens and closes the engine hood

Open engine hood — lever position ↑

Close engine hood — lever position ↓

530-09

530 Manual pump



Parking brake

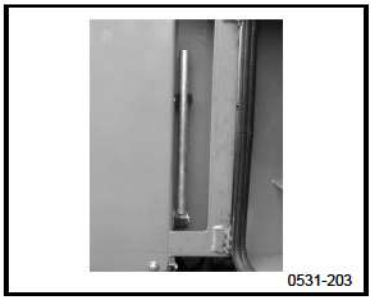
The spring-operated brakes must be released using the manual pump in order to tow the machine.

Screw position, normal operation
Screw [A] — **OPEN**

Screw position, towing operation
Screw [A] — **CLOSED**

530-10

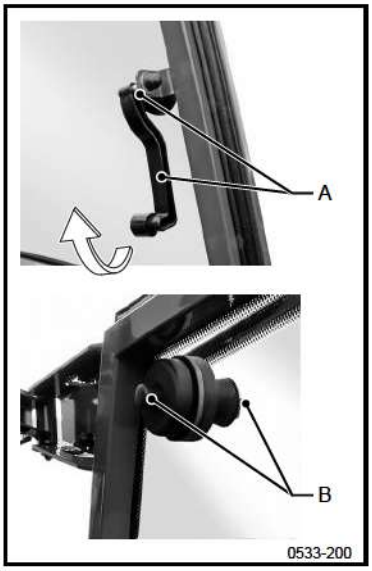
531 Actuating pipe



The manual pump is actuated with the actuating pipe.

531-03

533 Door glass actuator



⚠WARNING

Open doors, windows or rooflights during transportation!
Open doors, windows or rooflights can come loose as a result of the machine suffering shocks or vibration during transportation. This can lead to serious injuries or death.

- Ensure that all doors, windows and rooflights are closed and locked during transportation.

002-108

Move door glass out

1. Turn the locking lever [A] inside and upwards.
2. Press the locking lever [A] with the door glass towards the outside and hook it into the lock pin.

Locking is only possible in the end position.

Open the door glass completely

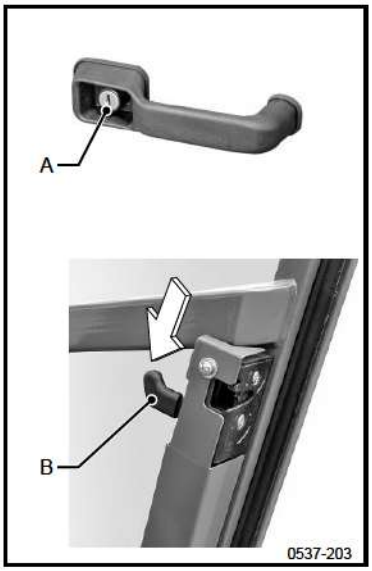
1. When the door glass is opened, press the locking lever [A] away from the lock pin and take it out of the guide.
2. Fold out the door glass until it locks in place at the locking device [B].

Close the door glass

1. Press the stop knob inside at the locking device [B].
2. Fold in the door glass.
3. Use the locking lever [A] to put the lock pin into the guide.
4. Pull the door glass completely to the driver's door.
5. Turn down the locking lever [A] and lock the door glass.

533-00

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**

537-01

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 Operating manual and the Safety instructions.
- Ensure that there are no persons or objects in the danger zone of the machine.

002-07

What must be done prior to start of work?

1. Battery isolating switch [356] — position **I**
2. Perform inspection and maintenance work (see page 111 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 [303].
4. Check the parking brake [353].
5. Adjust the operator's seat.
6. Adjust the rear and operation mirrors so that you can watch the traffic in the rear.

701-20

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 186 sqq. and also see Safety instructions.

701-13

Air

1. Check the air pressure in the tyres.

701-16

Control stand

Seat belt

[A] Seat 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.

701-25

Seat adjustment

⚠WARNING

Uncontrolled movements!

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

- Operate the machine only in an admissable seat position.
- Only drive the machine with latched seat pedestal.
- Do not adjust the seat pedestal during driving.
- Adjust the seat pedestal only on an even surface.
- Use it for transporting only if the driver doors are closed and the seat is in central position of the cabin.

002-05

Cabin door

⚠WARNING

Cabin door projecting out!

Danger of collision with items and vehicles driving past. Risk of injury due to shocks or crushing.

- Prior to opening the cabin door ensure that there are no persons or objects in the danger zone of the machine.
- Observe the traffic moving next to the machine.
- Do not leave the cabin door in its 90° position unless for getting on or off the machine.
- Do not move the machine neither for work nor for transportation unless the cabin door is closed and locked in place.
- If the cabin door or the door glass are split, both half doors must be locked

002-95

Door glasses which can be opened must be locked in the cabin during driving.

701-45

3.02 Engine start

General

The starting process may last 20 seconds as a maximum; otherwise, the starting motor will be overheated and destroyed. There must be pauses between the individual starting processes in order to allow the staring motor to cool down. If the diesel engine does not start after two starting attempts, find out and eliminate the cause. Observe the operating manual of the diesel engine.
The diesel engine cannot be started by means of towing. Drive component damage would be the consequence.

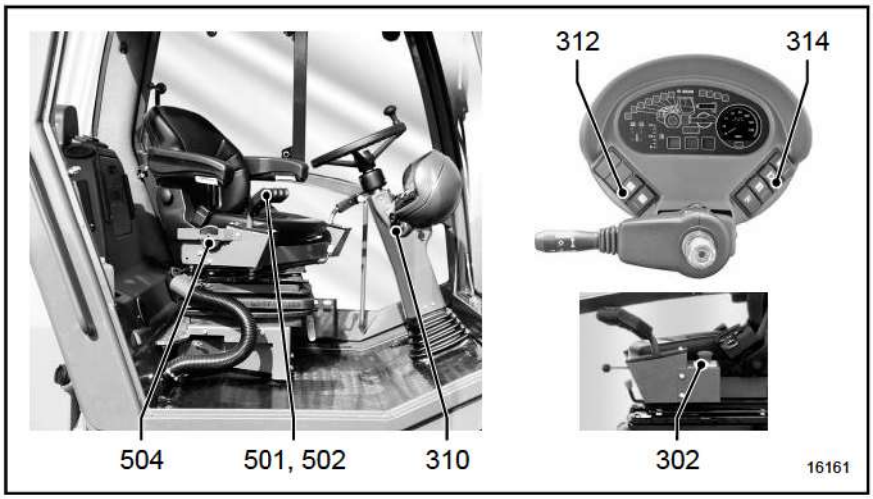
When the battery is discharged, the diesel engine can be restarted by an external power source (see page 101 sqq.).

703-04

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

000-46

Start position before starting



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

1. Drive lever [501] — **CENTRE**
2. 0-position lock / parking brake [502] — position **0**
3. Engine speed [504] — **MIN**
4. EMERGENCY STOP [302] — position **UP**
5. Vibration [312] — position **0**
6. Gear shifting [314] — position **II**

702-28

Only when the 0-position lock is latched, is the starting motor connected to the switch [310] via the starter protection device. This is the only way to start the diesel engine.

000-49

Engine start

1. Engine speed [504] — **1/4** after **MAX**
2. 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.
3. Do not start the diesel engine until the pilot light [216] has gone out.
   Key [310] — **I** → **III**

704-24

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) .

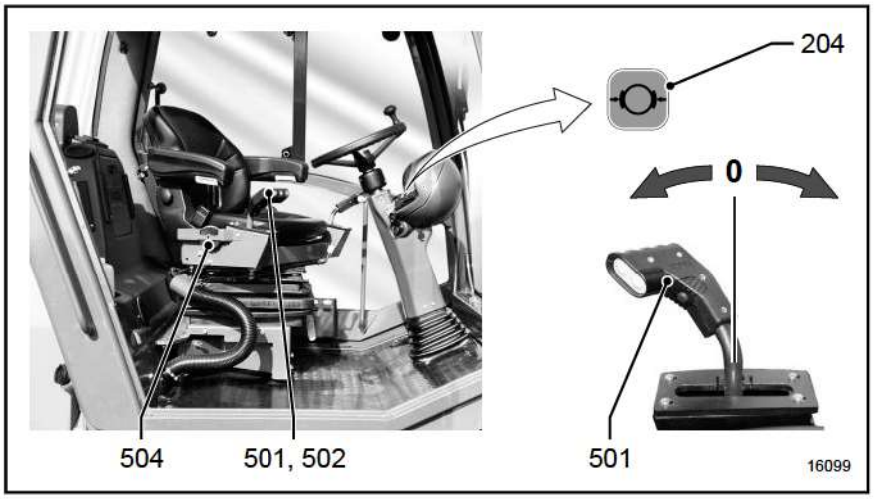
002-15

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!

705-05

3.03 Driving

Driveaway



1. Engine speed [504] — **MAX**
2. 0-position lock / parking brake [502] — **UNLATCHED** (pilot light [204] goes out)
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 engine speed [504].

706-26

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].

000-59

Driving Machine may only be operated from the operator platform.

707-10

Gear shifting

⚠WARNING

Full braking!

Danger of injuries by strong acceleration or braking

- Shift gears only when the machine is at standstill.
- Use transportion gear only to manoeuver on paved roads.
- In case of visible obstacles reduce speed in good time.
- Longer uphill or downhill slopes must always be driven in working speed.
- Work may only be performed in the working gear.

002-55

Only operate the gear shift when the machine is at a standstill. If the gear shift is operated when the machine is moving, it will be essentially decelerated or accelerated.

The machine has a working gear and a transportation gear. These can be toggled with the switch (314]. The driving speed can be regulated variably with the driving lever [501].

708-03

Traction control

Traction control can influence the traction power for the drum or for the rear wheels. Optimum climbing performance of the machine can only be obtained if the axle directed downhill has a bigger drive torque. This can almost completely prevent slipping. The driving force is adjusted with the switch [315]. The three switching positions of the driving gear lever [501] for the working gear each have a different final speed (see page 178 sqq.).

732-01

3.04 Driving with vibration

General

⚠WARNING

Explosion!
Risk of injury due to burns and moving parts.
- Prior to switching on the vibration function, it must be ensured that there are no lines laid in the underground.

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

004-26

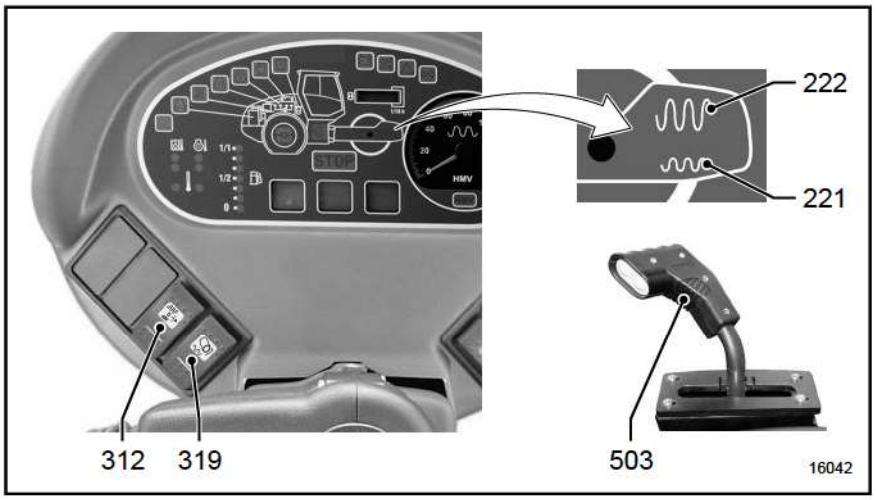
When the vibration system is switched on, the roller drum will vibrate according to the speed of the vibrator. This hammering will increase the compacting force of the machine several times over. Vibration may only used at maximum diesel engine speed and can be operated in two amplitude ranges with the assigned frequency values. 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.

712-36

Vibration



The switch [312] activates or desactivates the vibration. The pilot lights [221] or [222] indicate the selected amplitude. When the vibration system is activated, the vibrator can be switched on or off at the multifunction handle [503].

712-37

*Manual - automatic operating mode

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

712-30

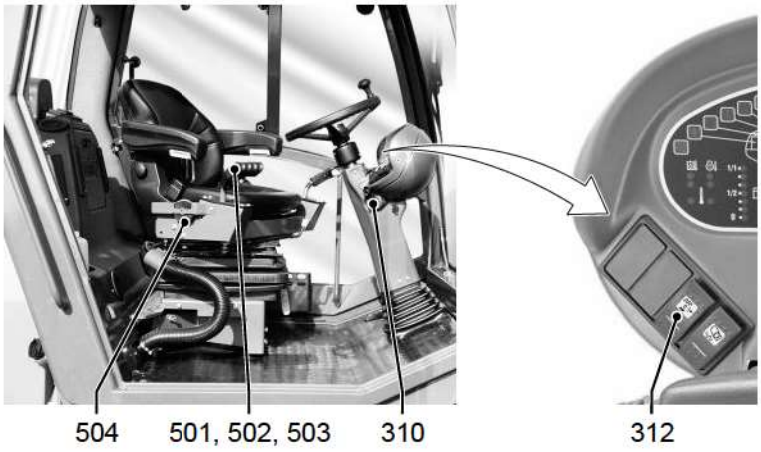
3.05 Stopping, switching off engine, leaving machine

⚠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

Stop



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

The hydrostatic drive brings the machine to a stop.

Before switching off the Diesel engine

1. Vibration [312] — position **0**
2. Engine speed [504] — **MIN**
3. 0-position lock / parking brake [502] — position **0**
4. Fully lower attached accessory equipment.

713-34

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.

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.

714-09

3.06 Operation monitoring

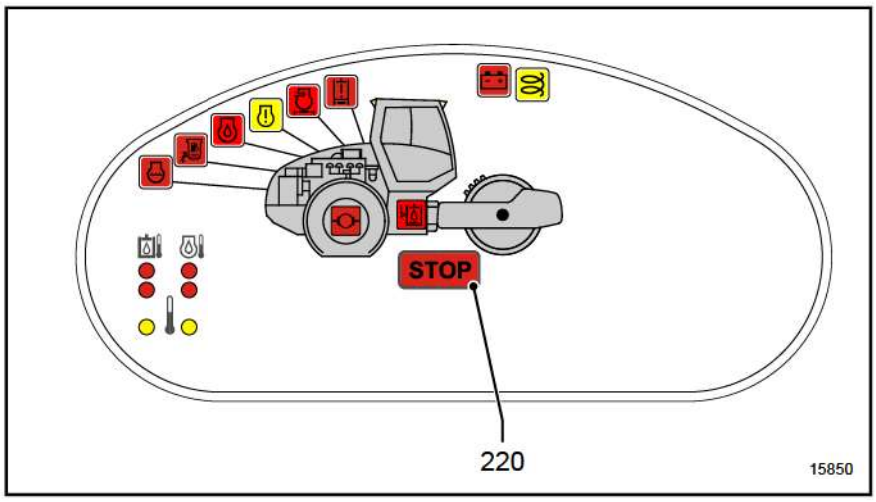
3.06.01 Filling levels

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.

711-30

3.06.02 Pilot lights



Keep an eye on the control and indication instruments on the instrument board during operation. 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

The pilot light STOP [220] is active. In addition, you hear a permanent acoustic signal. Further operation of the machine is inadmissible. The cause of the fault is displayed by further active pilot lights.

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

Warning, notice, malfunction

A pilot light displays the fault. Further operation of the machine is admissible for a short period of time.

1. Rectify the cause of the fault without delay, at least at the end of the working shift.

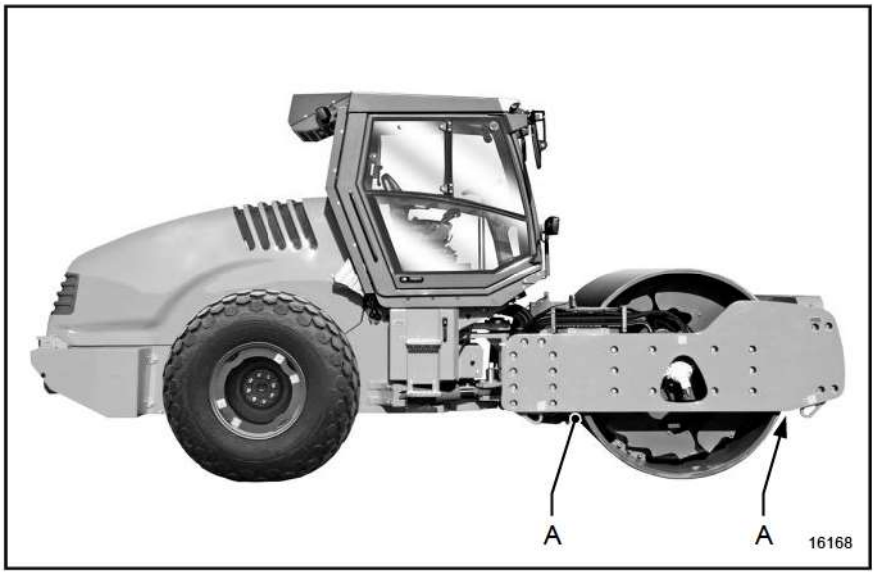
Switch-in check

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

711-17

3.07 Scraper

General

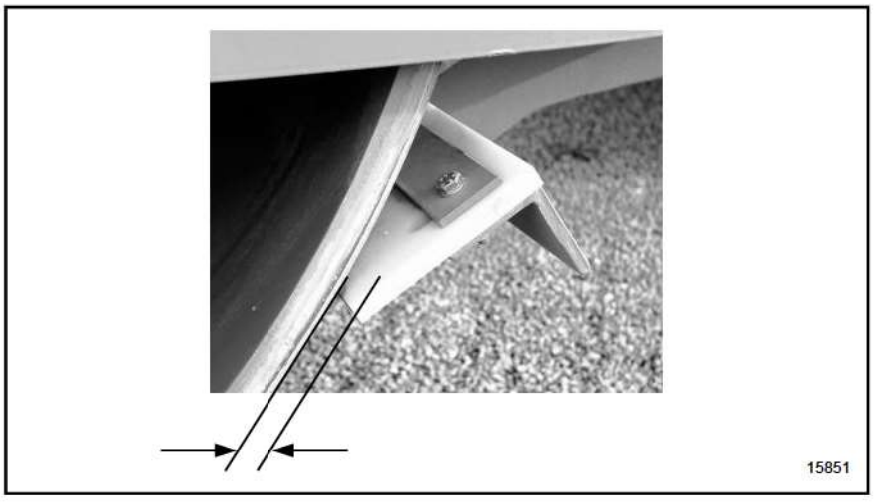


The scrapers [A] are designed to remove clogging dirt from the surface of the drum when working on soft, adhesive ground. With a padfoot drum, the dirt can only be removed from between the padfoot segments.

Rinse out dirt embedded between roller drum and the scraper with water jet. Remove strongly adhesive dirt with spatula or similar tool.

744-07

Scraper



The scrapers are mounted on a rigid console. Because the drum is suspended elastically, the scraper must not touch the drum. Therefore a clearance must be maintained between the scraper and the drum.

Smooth drum clearance — **10 mm**

Padfoot drum clearance — **15 mm**

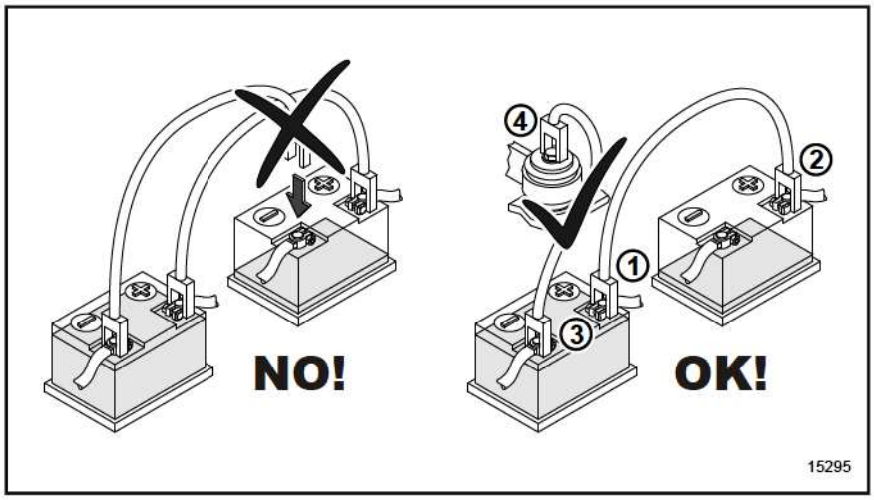
744-08

3.08 Starting 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 mm^2.
- 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 lead 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.

743-00

3.09 Towing

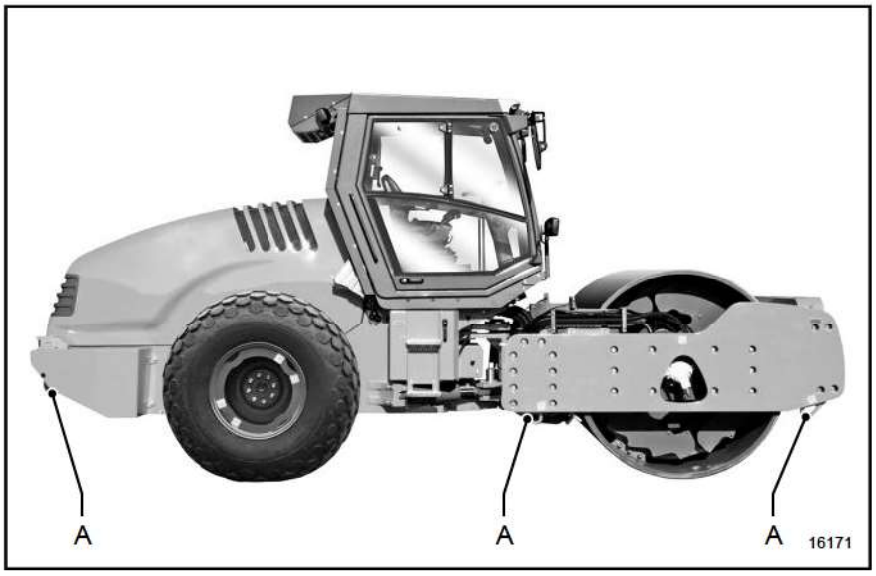
General

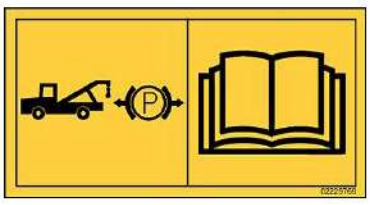
⚠WARNING

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



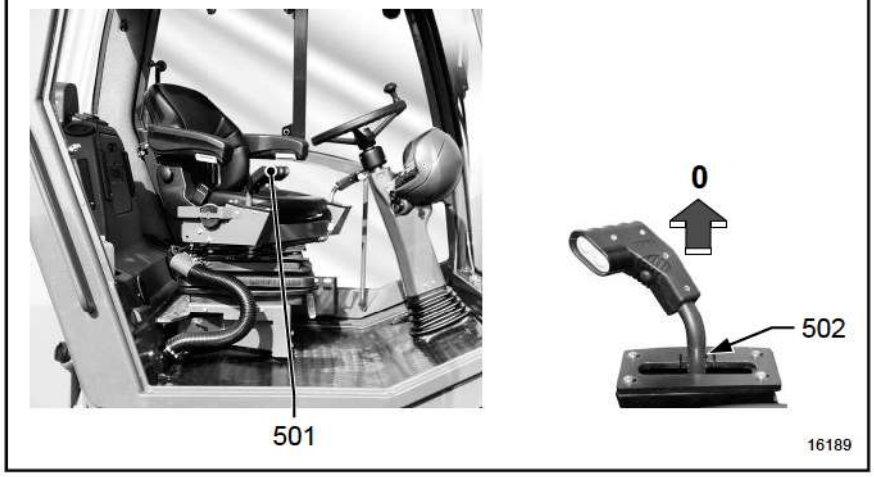


Towing of the machine assumes sufficient knowledge of the functioning of the hydrostatic drive and the operation of the spring-operated brake. The preparations for towing may only be carried out by experienced personnel who are aware of the dangers. The machine may only be fastened at the lifting points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

In dangerous situations: You can also use a towing rope or towing chains when salvaging the machine on an uphill slope (brakes not released).

717-10

Before towing



1. Drive lever [501] — **CENTRE**
2. 0-position lock [502] — position **0**
3. Shut down diesel engine, if still functional..
4. Secure machine against rolling away with wedges or blocks.
5. Interrupt frictional connection of the hydrostatic drive (see text below).
6. Disable parking brakes (see text below).
7. Tow using towing bar only (brakes not functional).

Towing

Start, if possible, the engine (for steering hydraulics). The machine may only be towed with low speed 1 km/h (0.6 mph) . The maximum towing distance is 500 m.

If the diesel engine fails, the machine can only be steered in a restricted way and with a high amount of force at the steering wheel (emergency steering). Before moving, remove wedges or blocks.

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.

717-07

Separating the hydrostatic drive power train

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

1. Remove covering cap.
2. Loosen the hexagon socket screw [A] at both multifunctional valves of the drive pump [B] by rotating counter-clockwise 2 turns.

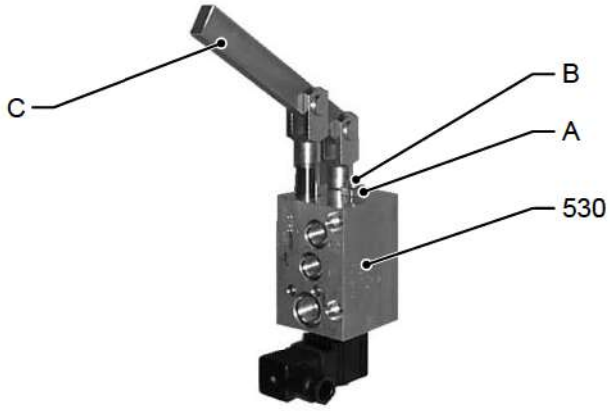
Do not screw out the screw by more than 2 turns out of the housing; otherwise, hydraulic oil may flow out between screw and housing or air may enter into the system.

Activating the hydrostatic drive power train

1. Screw in the hexagon socket screw as far as possible.
2. Mount cap.

718-06

Making the parking brakes inoperational



Only for the purpose of towing in case of a defective diesel engine or defective hydraulic system the pretension of the spring-loaded brakes may be reduced using the manual pump [530].

1. Loosen counternut [A]
2. Screw in screw [B] up to the valve seat.
3. Aerate the spring-operated brakes by pumping at lever [C] (approx. 30 pump strokes).
4. During towing, the spring-operated brakes must be kept open by constant and slow pumping due to interior leaks.

Making parking brake operational

1. Unscrew screw [B] with two turns.
2. Tighten lock nut [A].

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

719-15

3.10 Heating / ventilation / cooling

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. By opening the ventilation nozzles required, a temperature distribution is achieved with the pleasant effect of having warm feet but a cool head. A special heating and ventilation system in conjunction with an air conditioning ensures an optimal compartment climate. The cabin ventilation is achieved through mixer operation, i.e. the exhaust flow simultaneously sucks air out of the operator's cabin and draws in fresh outside air. Dirty filters must be replaced depending on the dust load.

720-18

Cabin ventilation

[A]	Ventilation nozzle	**[B]**	Aspiration duct for fresh air
[C]	Aspiration duct for recirculating air	**[330]**	Cabin heating switch Fan
[347]	Cabin heating 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.

760-01

Heating system

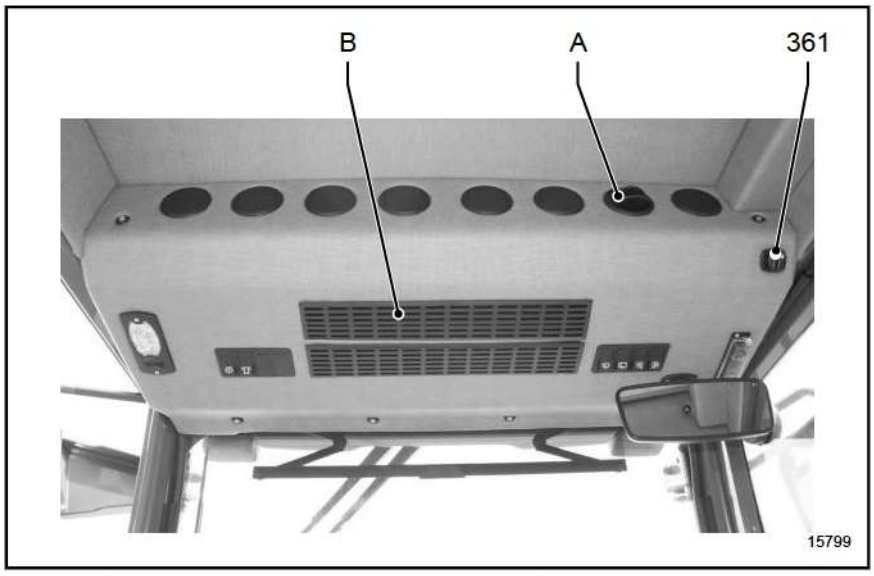
The heat exchanger for the heating is connected to the engine cooling circuit. After the ventilation fan [330] is switched on, the air flow which passed through the heat exchanger is guided into the cabin. The heating temperature [347] is infinitely variable.

761-01

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

762-01

***Cooling**



[A]	Vent	**[B]**	Aspiration duct for recirculating air
[361]	Air conditioning temperature switch		

If the machine is equipped with a *air conditioning, the air flow for cabin aerating can be cooled down at high outside temperatures. Doors and windows should be closed in order to obtain a fast cooling of the cabin if the air conditioning is turned on. This obtains a further cooling of already cooled inside air.

Switch [361] is used to switch the system on and off. Several ventilation steps ensure an optimal air circulation in the cabin. The air flow enters the cabin through the ventilation nozzles [A] that can be opened or closed by adjusting the discs.

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

763-01

3.11 Opening and closing engine hood

General

⚠WARNING

Large swivel range of the engine hood!
Risk due to rotating parts.

- Ensure that there are no persons or objects in the danger zone of the machine.
- Only open the engine hood when the engine is at a standstill.
- Make sure that there is adequate space above and behind.
- Only open and shut from the machine side, and only with the actuating pipe.
- Maintenance work may only be performed with the bonnet completely opened and the ↑ lever position.
- Keep all parts of the body (e.g. hands) away from moving parts when closing it.

002-56

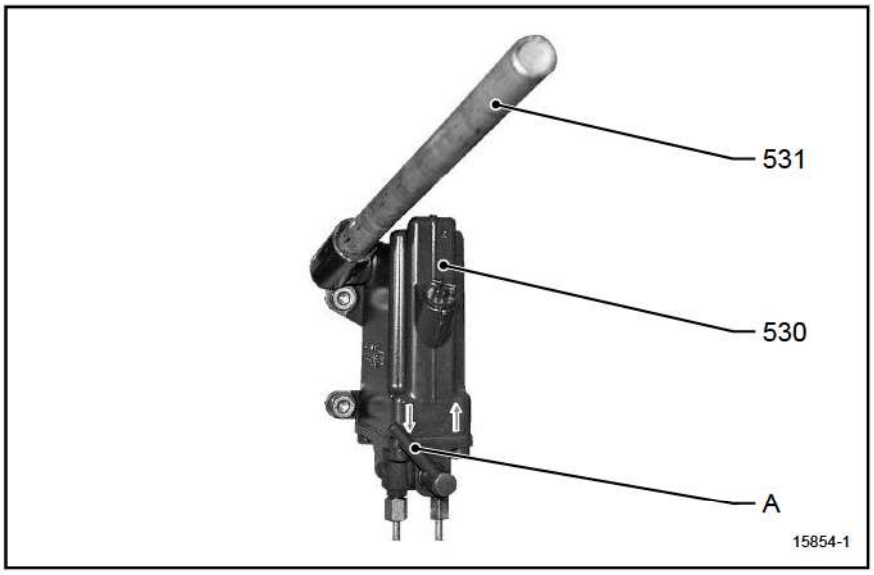
The motor hood may only be opened by one person. This person must be familiar with the work, and have been instructed about the dangers.

Prior to opening the engine hood:

1. Switch off diesel engine and remove ignition key.
2. Close the cabin doors.

723-05

Opening the engine hood



1. Turn the lever [A] in the direction of opening — lever position ↑.
2. Insert the actuating pipe [531] in the cutout on the manual pump [530] and raise the hood to the tilting point by gradual pumping.

After passing the tilting point, the hood is opened to the stop by its own weight.

3. Remove the actuating pipe.

Maintenance work may only be performed with the engine hood completely opened and the ↑ lever position.

Closing the engine hood

Completely remove all loose tools from the engine compartment, replaced maintenance parts and other items not belonging to the machine.

1. Turn the lever [A] in the direction of closing — lever position ↓.
2. Insert the actuating pipe [531] in the cutout on the manual pump [530] and lower the hood to the tilting point by gradual pumping.

After passing the tilting point, the engine hood closes by itself due to its basic weight. The automatic closing process can be stopped by turning the lever [A] towards the direction of opening.

3. When the hood is in its final position, tighten it by continued pumping to a notable resistance.
4. Remove the actuating pipe.

723-04

3.12 Driving on public roads

3.12.01 Applicable in the User's Country

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

749-03

4 MAINTENANCE

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

000-01

4.00 General maintenance instructions

This machine requires care and maintenance like any other technical device. The extent and the frequency of the maintenance work depends essentially of the operating and deployment conditions, which are very different in many cases. In case of more difficult operating conditions, the machine must have maintenance in shorter intervals as scheduled for normal operation.

The maintenance intervals are determined according to the running time of the operation hours counter; for this, additional maintenance work has to be performed during the running-in time according to the running-in regulations. The works necessary for care and the conservation of the operational safety of the machine are listed in the following sections.

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

800-06

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.

810-16

Pressure filter hydraulics The pressure filters for the hydraulic system are monitored by an electrical contamination display. Only if the pilot light [214] flashes, must the filter insert of the hydraulic filters be replaced prematurely.

A prematurely contaminated filter can be a first hint for a damage in the hydraulic system.

819-05

Preliminary fuel filter According to the water content in the fuel, more or less water precipitates in the drain housing of the fuel pre-filter. If the pilot light [227] flashes, the water sump must be drained.

837-17

Coolant of diesel engine The coolant level in the diesel engine's cooling system is monitored electrically. If the pilot light [206] flashes, the coolant level in the cooling system must be checked.

815-07

4.00.02 Maintenance overview

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

Lubricating oil change intervals

These intervals depend, e.g., on:

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

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

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

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

804-01

Every 10 operating hours

10 h

	Checking the function of the parking brake	see page 133
	Inspecting the EMERGENCY STOP function when engine at standstill	see page 134
	Checking hydraulic oil level	see page 154
	Checking the air pressure in the tyres	see page 161
	Checking engine oil level	
	Checking coolant level	see page 152
	Checking and cleaning air filter / dust valve	see page 148
	Draining water separator	see page 146

Every 250 operating hours

250 h

Checking scrapers	see page 159
Checking vibrator oil filling level	see page 175
Checking driving gear oil level	see page 163
Checking differential gear oil level	see page 171
Lubricating pivoted bearing	see page 173
Lubricating steering cylinder bolt	see page 174
Lubricating hinges of the engine hood	see page 135
Lubricating hinges of the electric box	see page 136
Checking radiator	see page 151
Checking V-belt tension	
*Checking V-belt tension of air conditioning	see page 137
*Checking air conditioning system	see page 137

Every 500 operating hours, at least once a year

500 h

	Replacing circulating air filter of the operator's cabin	see page 138.
	Replacing fresh air filter of the operator's cabin	see page 138
	Replacing filter insert of pressure filter for hydraulic system	see page 157
	Replacing filter insert of pressure filter for steering system	see page 158
	Checking damping elements	see page 177
	Checking wheel nuts / wheel bolts for tightness	see page 160
	Changing engine oil	
	Exchanging lubrication oil filter of diesel engine	
	Replacing filter cartridge for the fuel filter	see page 143
	*Cleaning / replacing filter insert of the dirt and water trap	see page 147
	Changing filter cartridge for the fuel pre-filter	see page 144
	Replacing air filter cartridge	see page 149

Every 1000 operating hours, at least once a year

1000 h

	Changing driving gear oil	see page 167
	Changing differential gearbox oil	see page 172
	Changing vibrator oil	see page 176

Every 2000 operating hours, at least every 2 years

2000 h

	Inspecting the EMERGENCY STOP function when driving	see page 134
	Replacing valve cover seal	
	Replacing hydraulic oil	see page 155
	Replacing V-belt	
	*Replacing V-belt of air conditioning system	see page 137
	Changing coolant	see page 152
	Changing safety cartridge	see page 150
	Replacing ventilation filter for fuel tank	see page 145
	Replacing ventilation filter of hydraulic oil tank	see page 156

4.00.03 Running-in regulations

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

After 50 operating hours

Axle maintenance

1. Checking wheel nuts / wheel bolts for tightness.

After 150 operating hours

Servicing hydraulic system

1. Replace filter insert of pressure filter for hydraulic system.
2. Replace filter insert of pressure filter for steering system.

Drum maintenance

1. Change driving gear oil.

Axle maintenance

1. Change differential gearbox oil.

803-28

4.00.04 Required maintenance parts

3516, 3516 P (TCD 2012 L06 2V)

H1761502 → H1762488

Quantity	Maintenance part			first time after	Servicing intervals in operating hours			
					every 250	every 500 or once per year	every 1000 or once per year	every 2000 or every 2 years
15.5 l	Engine oil	□				D		
50.0 l	Hydraulic oil	▭						D
22.0 l	Coolant	○						D
(2x) 1.6 l	Vibrator oil	◇			A		D	
2.0 l	Driving gear oil	☆		150 D	A		D	
14.0 l	Differential gearbox oil	⬡		150 D	A		D	
1	Poly-v-belt		1290991		A			D
1	* V-belt	Air conditioning system	201359		A			D
1	Air filter cartridge		1266748		A	D		
1	Safety cartridge		1266721					D
1	Filter cartridge	Lubricating oil	234486			D		
2	Filter cartridge	Fuel	2043673			D		
1	Filter cartridge	Preliminary fuel filter	1292404			D		
1	* Filter insert	Dirt and water separator	2147028			D		
1	Seal	Valve cover	2043677					D
1	Filter insert	Hydraulic system	1285491	150 D		D		
1	Filter insert	Steering	2031492	150 D		D		
2	Ventilation filter	Oil tank, fuel	1259334					D
1	* Dryer	Air conditioning system	2122425					D
1	Filter insert	Operator's cabin recirculating air	1274325			D		

Quantity	Maintenance part			first time after	Servicing intervals in operating hours			
					every 250	every 500 or once per year	every 1000 or once per year	every 2000 or every 2 years
2	Filter insert	Operator's cabin fresh air	1502751			D		
22	Damping elements for the drum suspension		2039965			A		
A = check, replace if necessary, D = replace								
1	All required maintenance parts for the corresponding maintenance intervals			2622989		2218061		2218064

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.

3516, 3516 P (TCD 2012 L06 2V)

H1762489 → H1763055

Quantity	Maintenance part			first time after	Servicing intervals in operating hours			
					every 250	every 500 or once per year	every 1000 or once per year	every 2000 or every 2 years
15.5 l	Engine oil	□				D		
50.0 l	Hydraulic oil	▭						D
22.0 l	Coolant	○						D
(2x) 1.6 l	Vibrator oil	◇			A		D	
2.0 l	Driving gear oil	☆		150 D	A		D	
14.0 l	Differential gearbox oil	⬡		150 D	A		D	
1	Poly-v-belt		1290991		A			D
1	* V-belt	Air conditioning system	2467891		A			D
1	Air filter cartridge		1266748		A	D		
1	Safety filter cartridge		1266721					D
1	Filter cartridge	Lubricating oil	234486			D		
2	Filter cartridge	Fuel	2043673			D		
1	Filter cartridge	Fuel prefilter	1292404			D		
1	* Filter insert	Dirt and water separator	2147028			D		
1	Seal	Valve cover	2043677					D
1	Filter insert	Hydraulic system	1296396	150 D		D		
1	Filter insert	Steering	1296396	150 D		D		
2	Ventilation filter	Oil tank, fuel	2673740					D
1	* Dryer	Air conditioning system	2122425					D
1	Filter insert	Operator's cabin recirculating air	1274325			D		
2	Filter insert	Operator's cabin fresh air	1502751			D		

Quantity	Maintenance part			first time after	Servicing intervals in operating hours			
					every 250	every 500 or once per year	every 1000 or once per year	every 2000 or every 2 years
22	Damping elements for the drum suspension		2039965			A		
A = check, replace if necessary, D = replace								
1	All required maintenance parts for the corresponding maintenance intervals			2622991		2501680		2501681

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.

3516, 3516 P (TCD 2012 L06 2V)

H1763056 →

Quantity	Maintenance part			first time after	Servicing intervals in operating hours			
					every 250	every 500 or once per year	every 1000 or once per year	every 2000 or every 2 years
15.5 l	Engine oil	□				D		
50.0 l	Hydraulic oil	▭						D
22.0 l	Coolant	○						D
(2x) 1.6 l	Vibrator oil	◇			A		D	
1.4 l	Driving gear oil	☆		150 D	A		D	
14.0 l	Differential gearbox oil	⬡		150 D	A		D	
1	Poly-v-belt		1290991		A			D
1	* V-belt	Air conditioning system	2467891		A			D
1	Air filter cartridge		1266748		A	D		
1	Safety filter cartridge		1266721					D
1	Filter cartridge	Lubricating oil	234486			D		
2	Filter cartridge	Fuel	2043673			D		
1	Filter cartridge	Fuel prefilter	1292404			D		
1	* Filter insert	Dirt and water separator	2147028			D		
1	Seal	Valve cover	2043677					D
1	Filter insert	Hydraulic system	1296396	150 D		D		
1	Filter insert	Steering	1296396	150 D		D		
2	Ventilation filter	Oil tank, fuel	2673740					D
1	* Dryer	Air conditioning system	2122425					D
1	Filter insert	Operator's cabin recirculating air	1274325			D		
2	Filter insert	Operator's cabin fresh air	1502751			D		

Quantity	Maintenance part			first time after	Servicing intervals in operating hours			
					every 250	every 500 or once per year	every 1000 or once per year	every 2000 or every 2 years
22	Damping elements for the drum suspension		2039965			A		
A = check, replace if necessary, D = replace								
1	All required maintenance parts for the corresponding maintenance intervals			2622991		2501680		2501681

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.

3518, 3518 P, 3520, 3520 P (TCD 2012 L06 2V)
H1761502 → H1762488

Quantity	Maintenance part			first time after	Servicing intervals in operating hours			
					every 250	every 500 or once per year	every 1000 or once per year	every 2000 or every 2 years
15.5 l	Engine oil	□				D		
50.0 l	Hydraulic oil	▭						D
22.0 l	Coolant	○						D
(2x) 1.8 l	Vibrator oil	◇			A		D	
4.0 l	Driving gear oil	☆		150 D	A		D	
14.0 l	Differential gearbox oil	⬡		150 D	A		D	
1	Poly-v-belt		1290991		A			D
1	* V-belt	Air conditioning system	201359		A			D
1	Air filter cartridge		1266748		A	D		
1	Safety cartridge		1266721					D
1	Filter cartridge	Lubricating oil	234486			D		
2	Filter cartridge	Fuel	2043673			D		
1	Filter cartridge	Preliminary fuel filter	1292404			D		
1	* Filter insert	Dirt and water separator	2147028			D		
1	Seal	Valve cover	2043677					D
1	Filter insert	Hydraulic system	1285491	150 D		D		
1	Filter insert	Steering	2031492	150 D		D		
2	Ventilation filter	Oil tank, fuel	1259334					D
1	* Dryer	Air conditioning system	2122425					D
1	Filter insert	Operator's cabin recirculating air	1274325			D		
2	Filter insert	Operator's cabin fresh air	1502751			D		

Quantity	Maintenance part			first time after	Servicing intervals in operating hours			
					every 250	every 500 or once per year	every 1000 or once per year	every 2000 or every 2 years
22	Damping elements for the drum suspension		2039965			A		
A = check, replace if necessary, D = replace								
1	All required maintenance parts for the corresponding maintenance intervals			2622989		2218061		2218064

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.

3518, 3518 P, 3520, 3520 P (TCD 2012 L06 2V)

H1762489 → H1763055

Quantity	Maintenance part			first time after	Servicing intervals in operating hours			
					every 250	every 500 or once per year	every 1000 or once per year	every 2000 or every 2 years
15.5 l	Engine oil	□				D		
50.0 l	Hydraulic oil	▭						D
22.0 l	Coolant	○						D
(2x) 1.8 l	Vibrator oil	◇			A		D	
4.0 l	Driving gear oil	☆		150 D	A		D	
14.0 l	Differential gearbox oil	⬡		150 D	A		D	
1	Poly-v-belt		1290991		A			D
1	* V-belt	Air conditioning system	2467891		A			D
1	Air filter cartridge		1266748		A	D		
1	Safety filter cartridge		1266721					D
1	Filter cartridge	Lubricating oil	234486			D		
2	Filter cartridge	Fuel	2043673			D		
1	Filter cartridge	Fuel prefilter	1292404			D		
1	* Filter insert	Dirt and water separator	2147028			D		
1	Seal	Valve cover	2043677					D
1	Filter insert	Hydraulic system	1296396	150 D		D		
1	Filter insert	Steering	1296396	150 D		D		
2	Ventilation filter	Oil tank, fuel	2673740					D
1	* Dryer	Air conditioning system	2122425					D
1	Filter insert	Operator's cabin recirculating air	1274325			D		
2	Filter insert	Operator's cabin fresh air	1502751			D		

Quantity	Maintenance part			first time after	Servicing intervals in operating hours			
					every 250	every 500 or once per year	every 1000 or once per year	every 2000 or every 2 years
22	Damping elements for the drum suspension		2039965			A		
A = check, replace if necessary, D = replace								
1	All required maintenance parts for the corresponding maintenance intervals			2622991		2501680		2501681

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.

3518, 3518 P, 3520, 3520 P (TCD 2012 L06 2V)

H1763056 →

Quantity	Maintenance part			first time after	Servicing intervals in operating hours			
					every 250	every 500 or once per year	every 1000 or once per year	every 2000 or every 2 years
15.5 l	Engine oil	□				D		
50.0 l	Hydraulic oil	▭						D
22.0 l	Coolant	○						D
(2x) 1.8 l	Vibrator oil	◇			A		D	
7.0 l	Driving gear oil	☆		150 D	A		D	
14.0 l	Differential gearbox oil	⬡		150 D	A		D	
1	Poly-v-belt		1290991		A			D
1	* V-belt	Air conditioning system	2467891		A			D
1	Air filter cartridge		1266748		A	D		
1	Safety filter cartridge		1266721					D
1	Filter cartridge	Lubricating oil	234486			D		
2	Filter cartridge	Fuel	2043673			D		
1	Filter cartridge	Fuel prefilter	1292404			D		
1	* Filter insert	Dirt and water separator	2147028			D		
1	Seal	Valve cover	2043677					D
1	Filter insert	Hydraulic system	1296396	150 D		D		
1	Filter insert	Steering	1296396	150 D		D		
2	Ventilation filter	Oil tank, fuel	2673740					D
1	* Dryer	Air conditioning system	2122425					D
1	Filter insert	Operator's cabin recirculating air	1274325			D		
2	Filter insert	Operator's cabin fresh air	1502751			D		

Quantity	Maintenance part			first time after	Servicing intervals in operating hours			
					every 250	every 500 or once per year	every 1000 or once per year	every 2000 or every 2 years
22	Damping elements for the drum suspension		2039965			A		
A = check, replace if necessary, D = replace								
1	All required maintenance parts for the corresponding maintenance intervals			2622991		2501680		2501681

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

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

4.00.05 Important information about maintenance works

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

800-07

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

Inadmissable engine start!
Risk of injury due to starting engine during maintenance works.

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

002-08

⚠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.

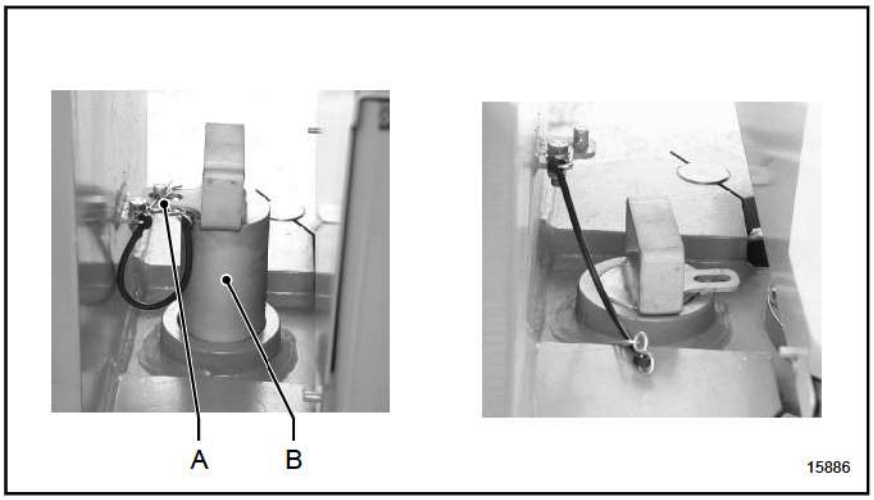
- Do not perform any maintenance or repair work (e.g., to replace a defective incandescent lamp at the operator's cabin, or replace a wiper blade at the windscreen wiper, etc.) unless using a fall-safe ladder or a maintenance scaffold.
- Do not climb on any machine part to perform maintenance or repair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

002-59

800-09

4.00.06 Safety strut

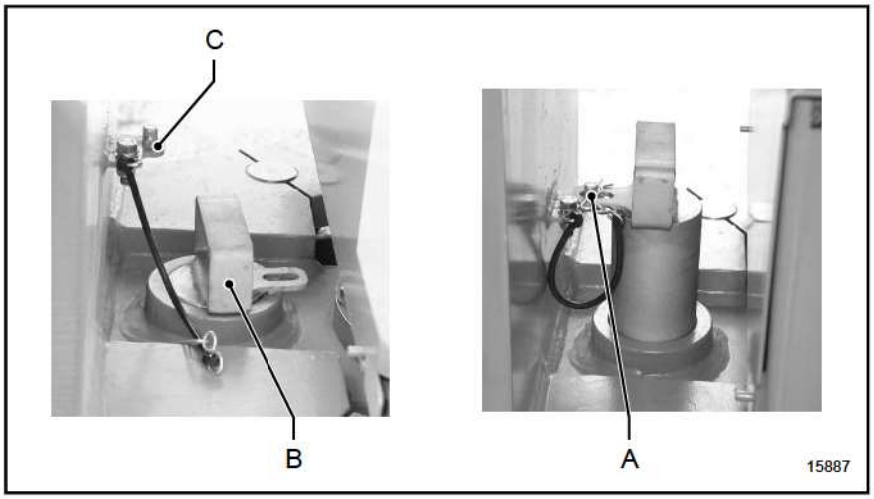
Applying safety strut



1. Align articulated joint for travelling straight ahead (no steering angle).
2. Remove the bolt retainer [A].
3. Lift the locking pin [B], turn it through 180°, and lock the articulated joint.

800-13

Releasing safety strut



1. Lift the locking pin [B], turn it through 180°, and hook it into bracket [C].
2. Mount the bolt retainer [A].

800-14

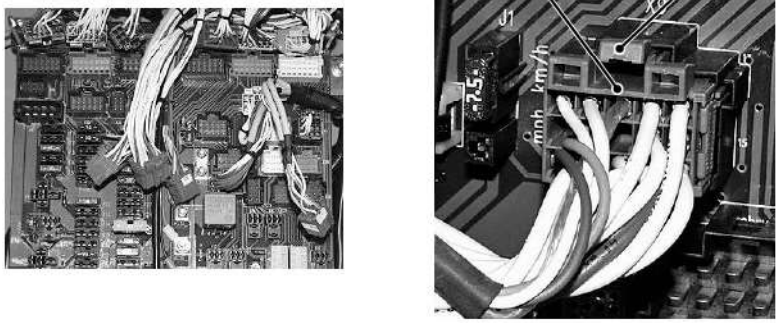
4.00.07 Welding works on the machine

Preparation

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

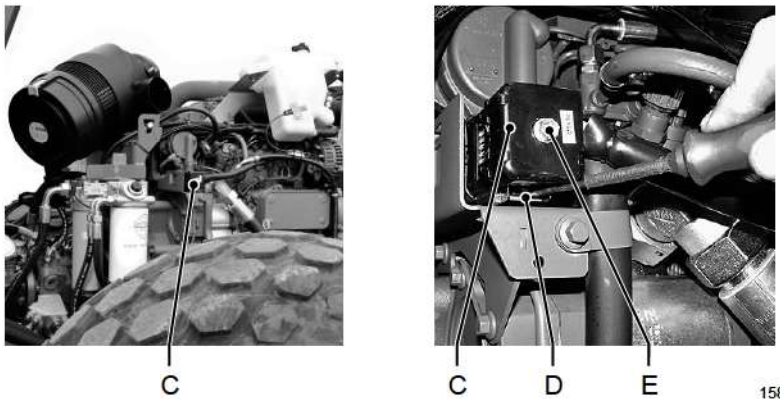
885-00

Fusible board



15888

Engine control unit at the diesel engine



15889

Procedure

1. Switch off diesel engine and remove ignition key.
2. Disconnect battery, first negative then positive terminal.
3. To disconnect fusible board:
   - Press catch [A] downwards.
   - Take all connectors [B] from the support by jiggling and pulling is carefully.
4. To disconnect engine control unit [C] at the diesel engine:
   - Press catch [D] upwards with a screw driver.
   - Separate plug connection with screw [E] (anti-clockwise).
5. Connect negative terminal of the welding appliance in the vicinity of the weld.
6. Pay attention to the components in the vicinity of the weld.
7. Reconnect all connection plugs after welding.

885-03

4.01 Chassis / safety features

4.01.01 General

Adhere to the following instructions:

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

883-00

4.01.02 Checking the function of the parking brake

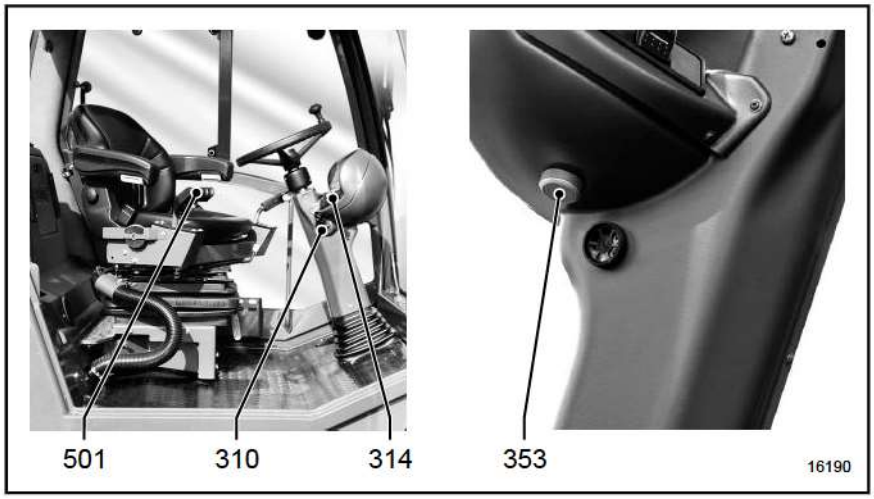
⚠WARNING

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. Engage working gear [314].
3. Keep the switch [353] pushed.
4. Push the drive lever [501] shortly in forward direction.

If the switch [353] is pushed and the drive blocks, the parking brake works properly. If the brake discs of the brakes are worn in a way that driving is possible even if the switch is pushed, the parking brake must be inspected or replaced.

Operation of the machine is inadmissible! Call the customer service!

5. Bring the drive lever [501] into central position again before releasing the switch [353].

813-16

4.01.03 Checking the EMERGENCY STOP function

⚠WARNING

Full braking!
Danger of injuries due to strong braking force.
- Activate EMERGENCY STOP only in the event of danger.
- Do not use the EMERGENCY STOP as operation brake.

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.

813-20

Function test during driving operation (yearly)

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

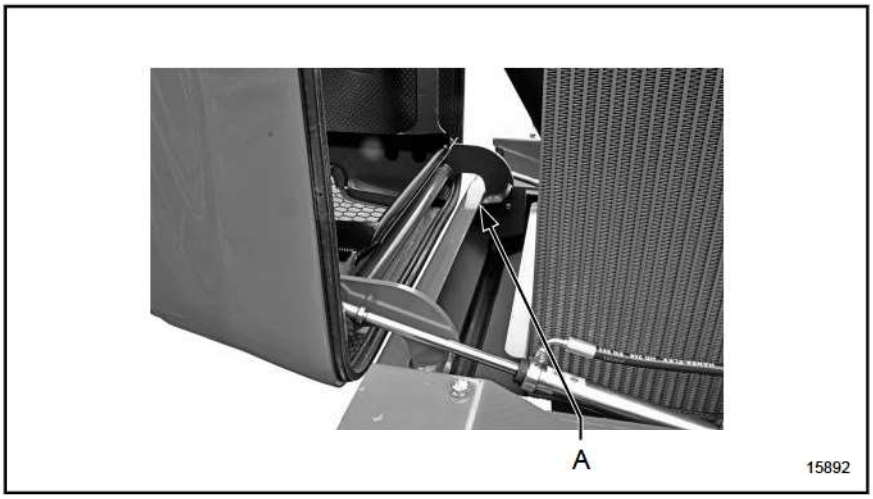
1. Press EMERGENCY STOP [302] with low speed 0.5 km/h (0.3 mph).

The machine:

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

813-15

4.01.04 Lubricating hinges of the engine hood

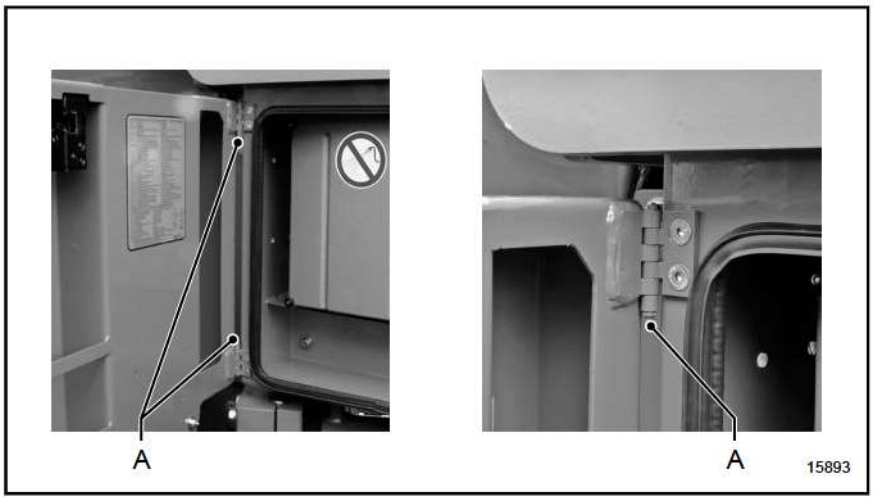


1. Switch off diesel engine and remove ignition key.
2. Lubricate lubrication nipple [A] (2 nipples).

Only lubricant with this sign allowed (see page 178 sqq.).

821-04

4.01.05 Lubricating hinges of the electric box



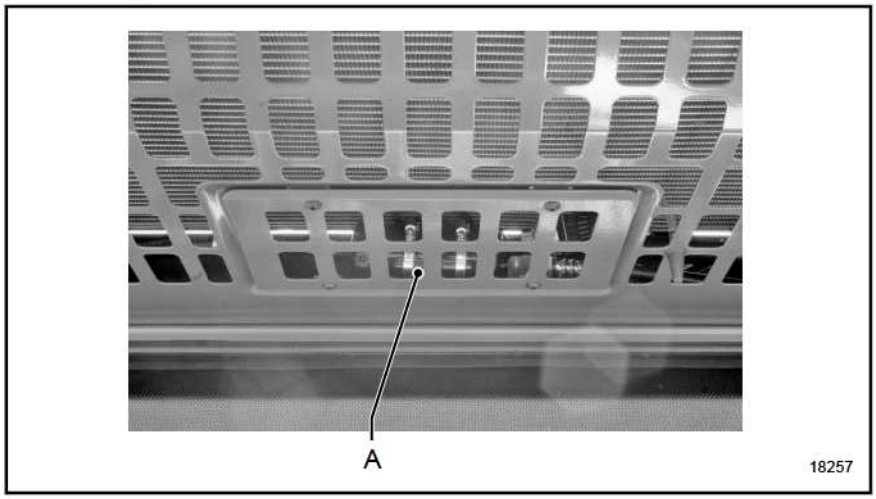
1. Switch off diesel engine and remove ignition key.
2. Lubricate lubrication nipple [A] (2 nipples).

Only lubricant with this sign allowed (see page 178 sqq.).

821-04

4.02 Control stand

4.02.01 *Air conditioning system



[A] Drain bottle

⚠WARNING

Fluids under pressure!

Risk of injury due to fluids spurting out under pressure.

- Perform maintenance works only if the air conditioning is not under pressure and empty.
- Wear your safety equipment.

002-27

⚠WARNING

Refrigerating agent harmful to health!

Risk of injury due to frostbite and harmful vapours.

- Do not touch air conditioning components.
- Do not open the pipe system of the air conditioning.

002-28

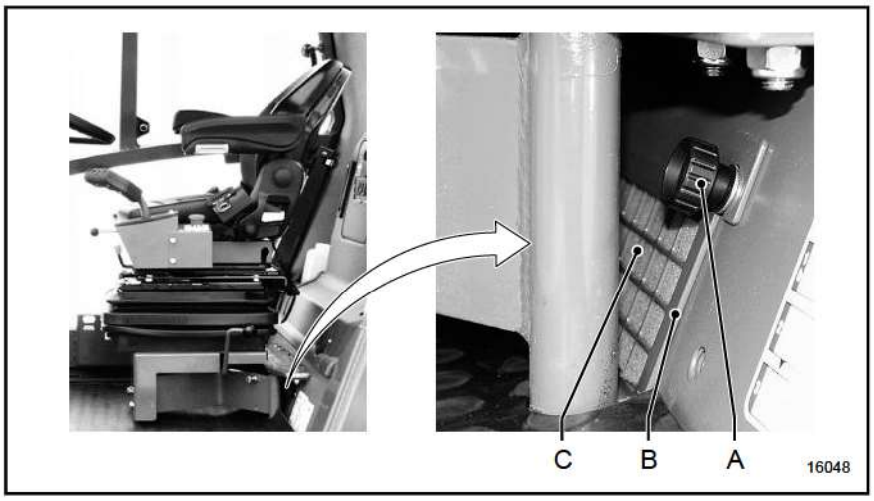
If the machine is equipped with a *air conditioning, it must be maintained according to the manufacturer's instructions. Only trained, specialised staff with the corresponding workshop equipment is allowed to perform these works.

886-00

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

000-27

4.02.02 Replacing circulating air filter of the operator's cabin

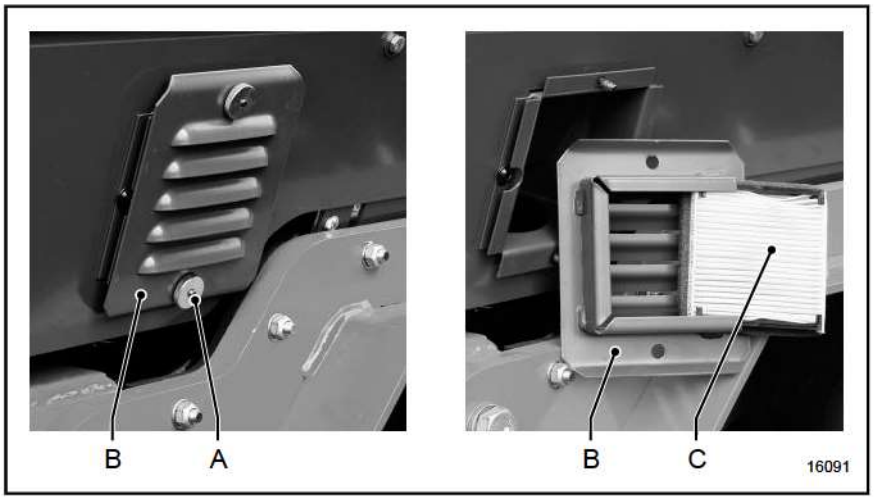


Replace the filter depending on the dusty conditions.

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

887-00

4.02.03 Replacing fresh air filter of the operator's cabin



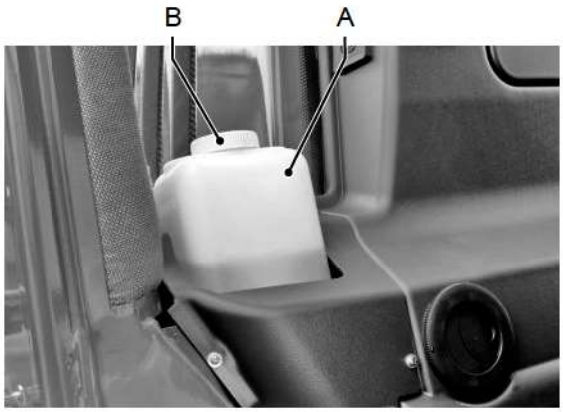
Replace the filters depending on the dusty conditions.

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

Perform maintenance on both intake openings.

887-02

4.02.04 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.

884-00

4.04 Drive unit - diesel engine

4.04.01 General

⚠WARNING

Fuel under high pressure!

Risk of injury due to fluids spurting out under pressure. Fluids spurting out under pressure may get on your skin or eyes.

- Carry out maintenance works only with depressurized fuel systems.
- Wait 1 minute after you switched off the diesel engine and the pressure is relieved.
- Special knowledge is necessary for works on the high pressure lines of the injection system. Therefore only trained specialist personnel are to carry out these works.
- Wear your personal protective equipment (e.g. safety glasses, protective suit) during test run of the diesel engine.

002-47

⚠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

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

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

000-08

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

800-08

Lubricating oil change intervals

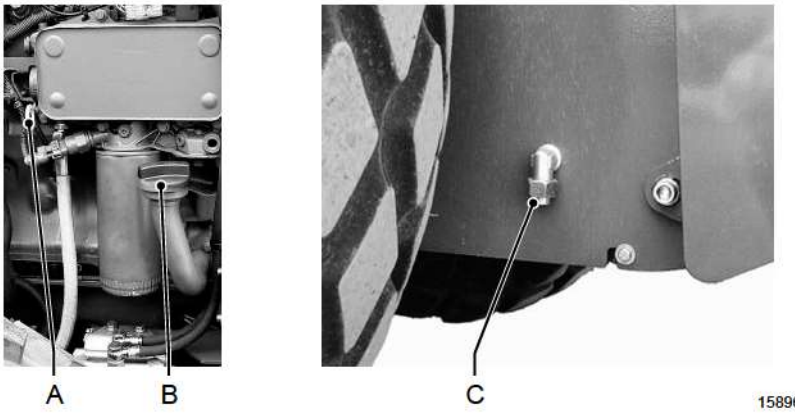
These intervals depend, e.g., on:
- Lubricating oil quality
- Fuel sulphur content
- The mode in which the diesel engine is used

Change lubricating oil after half the interval indicated, e.g., when at least one of the following conditions is true:
- Continuous ambient temperature below –10 °C (14 °F) or lubricating oil temperature below 60 °C (84 °F).
- Operation using biodiesel fuel

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

804-01

4.04.02 Maintenance points at the Diesel engine when changing oil



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

For engine maintenance see instruction manual for diesel engine!

Lubricant only admissible if containing this marking (see page 178 sqq.).

872-01

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. Prior to assembly apply a thin coat of oil to the rubber seal and 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.
6. Fill the filter by actuating the hand pump [C] until fuel comes from the purge bore [B].
7. Screw in and tighten the vent screw [B].
8. Check for tightness after assembly.

837-12

4.04.04 Changing the filter cartridge for the fuel pre-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 drain valve [A] (screw conical nipple into housing).
4. Open the vent screw [D].
5. Drain fuel and 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. Fill the filter with fuel using the manual pump [E] until fuel comes from the purge bore.
12. Screw in and tighten the vent screw [D].
13. Open the vent screws [F] at the fuel filter cartridges [G].
14. Keep on actuating the manual pump until fuel comes out of the purge bores of the fuel filter cartridges.
15. Screw in and tighten the vent screw [F].

16. Continue to actuate the manual pump until there is a notable resistance at the actuation button.
17. Check for tightness after assembly.

Purging of the fuel system is performed by starting the diesel engine. For this, several starting attempts may be necessary. The starting process may last 20 seconds as a maximum; otherwise, the starter winding will be overheated and destroyed. There must be pauses of a minimum of 1 minute between the individual starting processes in order to allow the starter to cool down.

The fuel pre-filter must be drained at the drain valve [A] from time to time depending on the water content in the fuel. If the pilot light [227] flashes, the water sump must be drained immediately in order to avoid damage on the diesel engine.

837-18

4.04.05 Replacing ventilation filter for fuel tank

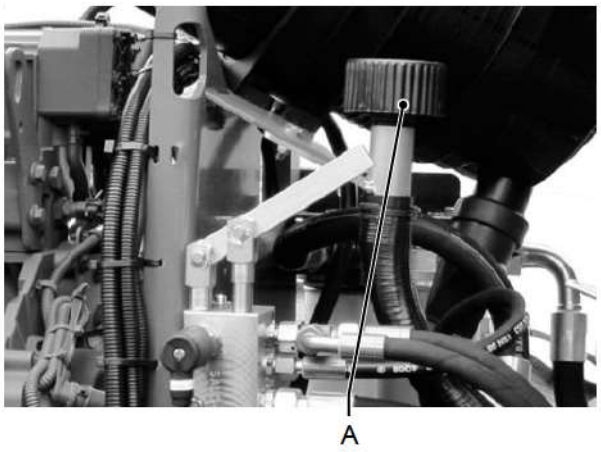
⚠WARNING

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



15897

1. Switch off diesel engine and remove ignition key.
2. Allow machine to cool down under a temperature of 30 °C (86 °F).
3. Unscrew ventilation filter [A] and replace by a new one.

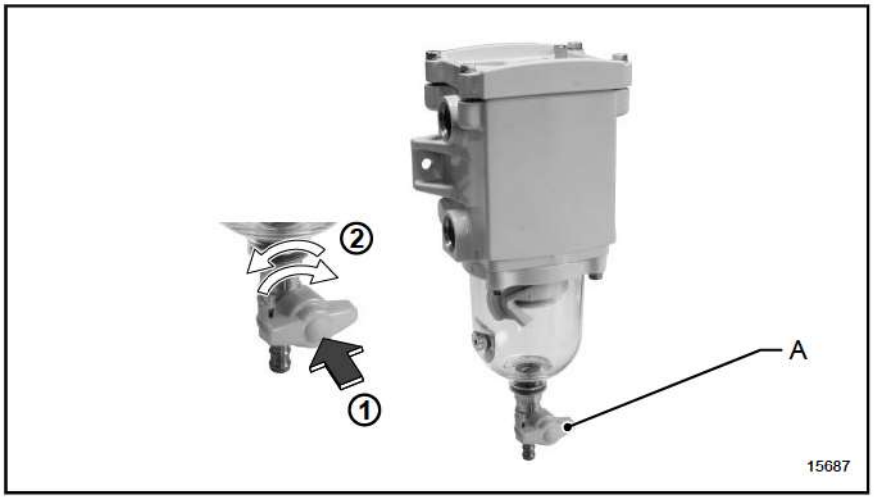
809-00

4.04.06 *Draining water separator

⚠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



General To avoid damage to the diesel engine, the water separator must be drained at the drain valve [A] depending on the water content in the fuel. If the fuel has a high water content, the water separator must be drained more often. If the pilot light [227] flashes, the water sump must be drained immediately in order to avoid damage on the diesel engine.

Draining water sump
1. Open drain valve [A].
2. Allow water sump to drain off.
3. Close drain valve [A].

897-01

4.04.07 *Cleaning / replacing filter insert of the dirt and water separator

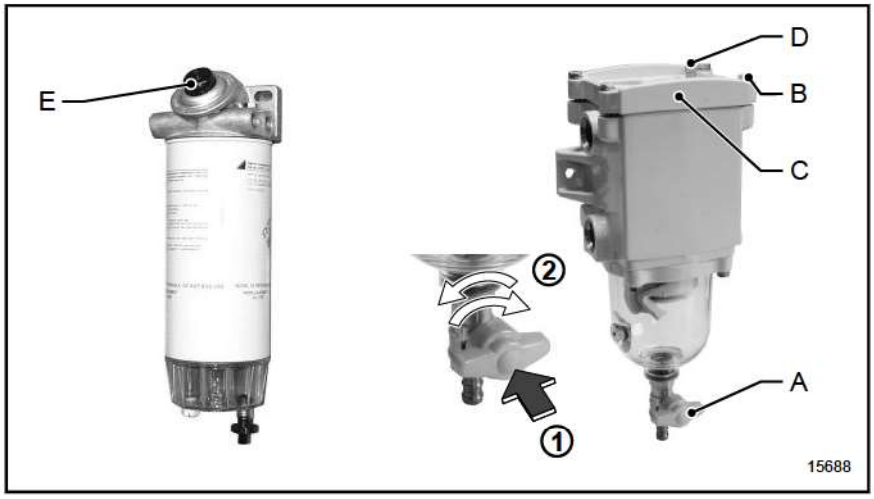
⚠WARNING

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



Changing filter insert

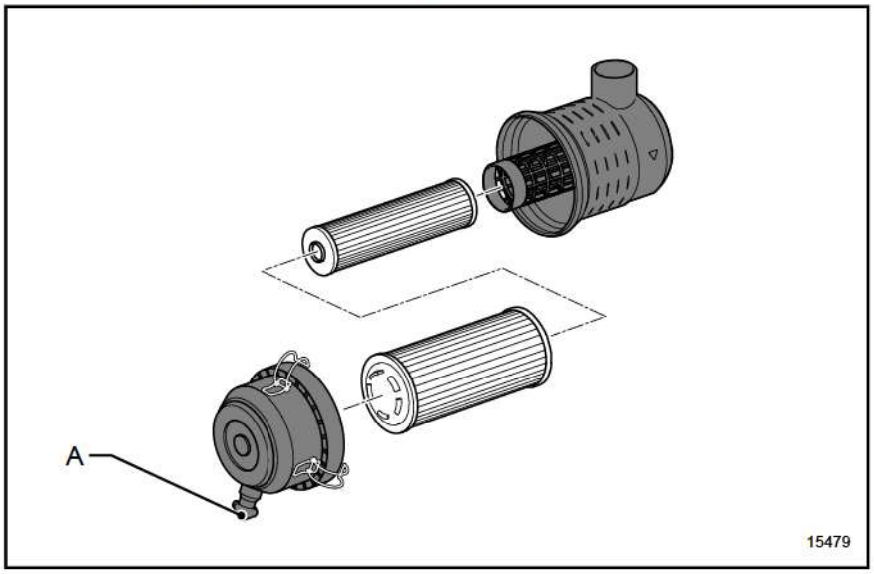
1. Switch off diesel engine and remove ignition key.
2. Allow machine to cool down under a temperature of 30 °C (86 °F).
3. Close the fuel shutoff valve if existing (only if the fuel tank is installed in high position).
4. Open drain valve [A].
5. Open the vent screw [D].
6. Drain the fuel and the water sump from the filter.
7. Loosen 4 screws [b] and remove (screws are spring-loaded at the beginning).
8. Removing cover [C]
9. Remove internal spring cage.
10. Take the filter insert out of the casing, and clean it or replace it by a new one.
11. Mount the spring casing and cover [C] (tighten the screws [B] in diagonal order).
12. Close drain valve [A].
13. Open the fuel stop cock if existing (only if the fuel tank is installed in high position).
14. Fill the water separator with fuel using the manual pump [E] on the fuel prefilter until fuel comes from the purge bore [D].
15. Screw in and tighten the vent screw [D].

16. Continue to actuate the manual pump until there is a notable resistance at the actuation button.
17. Check for tightness after assembly.

Purging of the fuel system is performed by starting the diesel engine. For this purpose, 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 at least 1 minute between the individual starting processes in order to allow the starter to cool down.

882-00

4.04.08 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.

810-18

4.04.09 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.

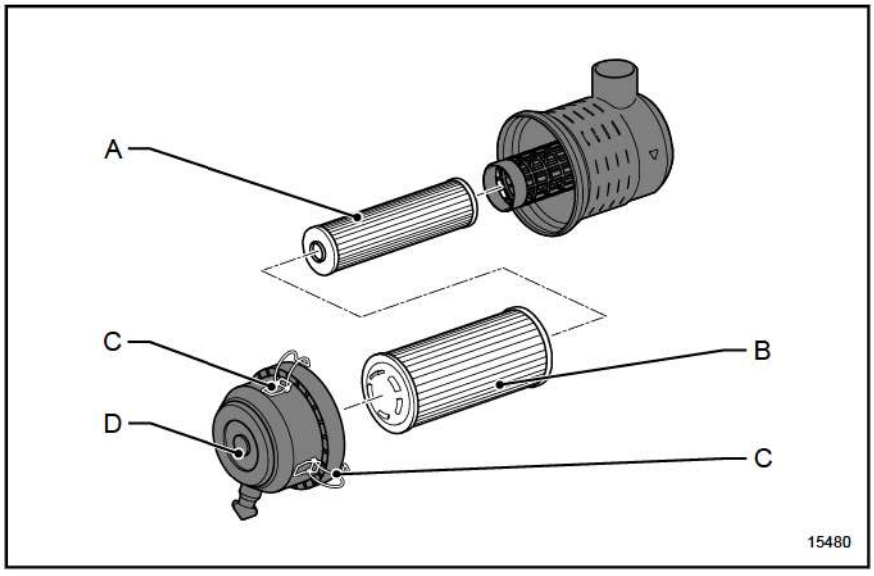
002-30

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

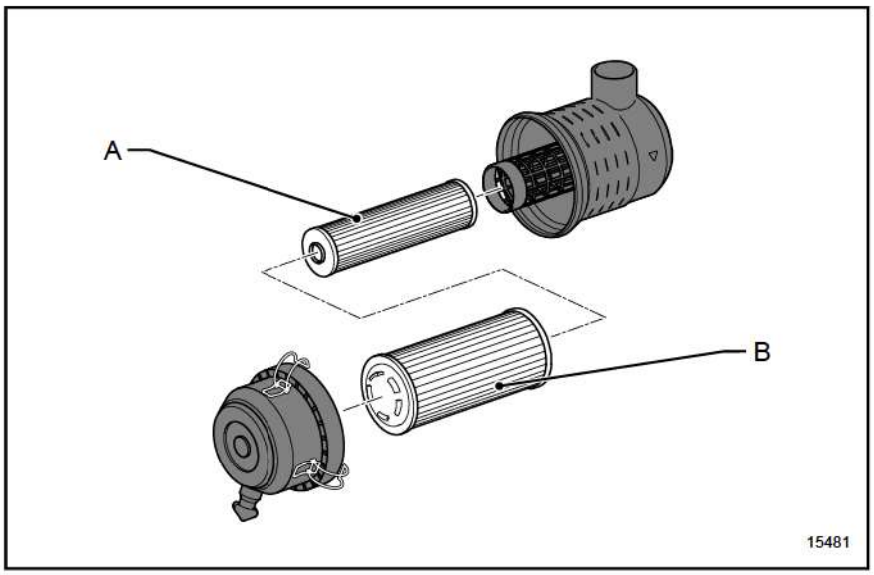
4.04.10 Changing safety cartridge

Change the safety filter cartridge in the following intervals:

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

861-05

Changing safety cartridge

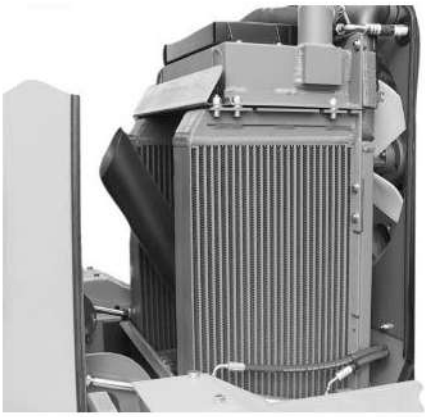


1. Switch off diesel engine and remove ignition key.
2. Allow machine to cool down under a temperature of 30 °C (86 °F).
3. Remove the air filter cartridge [B].
4. Pull out safety filter cartridge [A].
5. Insert a new safety filter cartridge.
6. Insert the air filter cartridge [B].

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

861-06

4.04.11 Checking radiator


15898

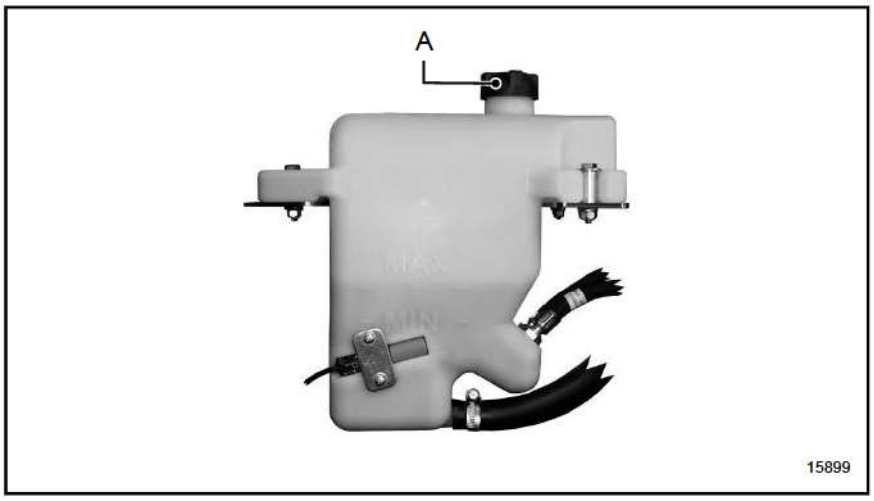
1. Switch off diesel engine and remove ignition key.
2. Allow machine to cool down to a temperature under 30 °C (86 °F).
3. Check the cooling fins of the radiators for contamination.

The coolers must be cleaned thoroughly and immediately when they are contaminated.

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

824-03

4.04.12 Checking coolant level

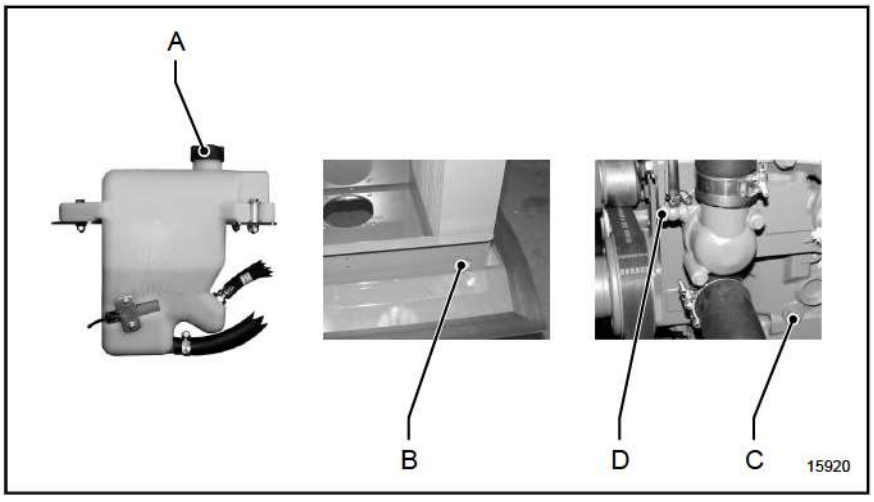


1. Switch off diesel engine and remove ignition key.
2. Only check the coolant level when the diesel engine is cold.
3. Correct coolant level: Between the Min. and Max. mark at the compensation tank.
   Do not exceed this level!
4. In case of a lack of coolant, only fill up coolant in the specified concentration through filling opening [A] 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 178 sqq.).

815-03

4.04.13 Changing coolant



1. Switch off diesel engine and remove ignition key.
2. Open the sealing cap [A] at the compensator tank.
3. Remove the drain plug [B] from the radiator and discharge the coolant in a provided receptacle.

4. Drain the engine block at the drain plug [C] according to the engine operating manual.
5. Screw in again the drain plug [B, C].
6. Open the hollow screw [D] of the purge line at the engine block by three turns (do not remove).
7. Set the temperature regulator for the cabin heating to maximum temperature.
8. Fill coolant into the filling opening [A] of the compensation tank, until coolant spills from the hollow screw [D].
9. Tighten the hollow screw [D].
10. Top up coolant up to the max. mark of the compensation tank.
11. Close the filling opening with the sealing cap [A].
12. Start the diesel engine and bring it to operating temperature (thermostat opens).
13. Switch off diesel engine and remove ignition key.
14. Check coolant level when the diesel motor is cold, fill up as necessary.
15. Correct coolant level: Between the Min. and Max. mark at the compensation tank.

Lubricant only admissible if containing this marking (see page 178 sqq.).

866-04

4.05 Hydraulic oil supply

4.05.01 General

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

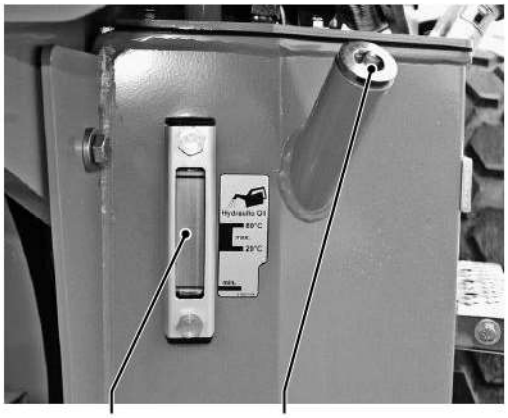
Damaged parts must be replaced immediately. Further operation is inadmissible. Oil spurting out can lead to injuries and fire.

Avoid subsequent damage! After a damage to the hydraulic system, with a foreign object having entered the oil circuit, the entire hydraulic system must be cleaned. This work may only be performed by trained specialised personnel! Call the customer service!

After that, replace all suction filters, return filters or pressure filters in the hydraulic system after 50 and after 125 operating hours.

888-00

4.05.02 Checking hydraulic oil level



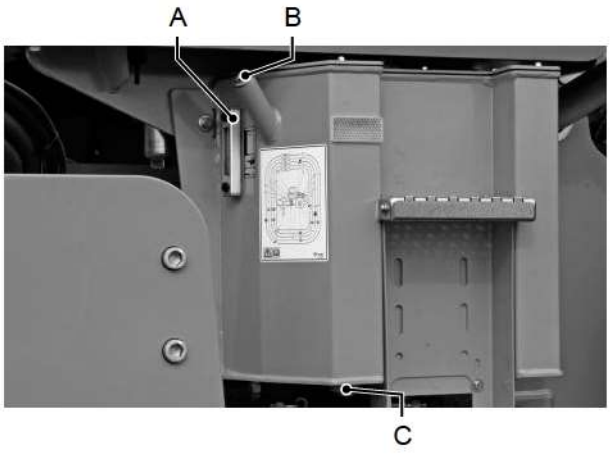
15921

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 178 sqq.).

811-03

4.05.03 Replacing hydraulic oil

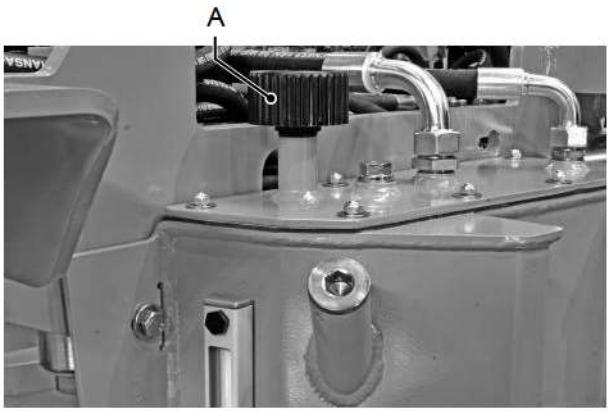


1. Switch off diesel engine and remove ignition key.
2. Allow machine to cool down under a temperature of 30 °C (86 °F).
3. Unscrew oil drain screw [C] down on the oil tank and discharge the used oil drain into a provided receptacle.
4. Screw in oil drain screw [C] and tighten.
5. Fill in specified oil through filling opening [B] to the centre of the inspection glass [A].
6. 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.
7. 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].
8. Check the hydraulic system for leaks.

Lubricant only admissible if containing this marking (see page 178 sqq.).

860-14

4.05.04 Replacing ventilation filter for hydraulic oil tank



1. Switch off diesel engine and remove ignition key.
2. Allow machine to cool down under a temperature of 30 °C (86 °F).
3. Unscrew ventilation filter [A] and replace by a new one.

809-00

4.05.05 Replacing filter insert of pressure filter for hydraulic system

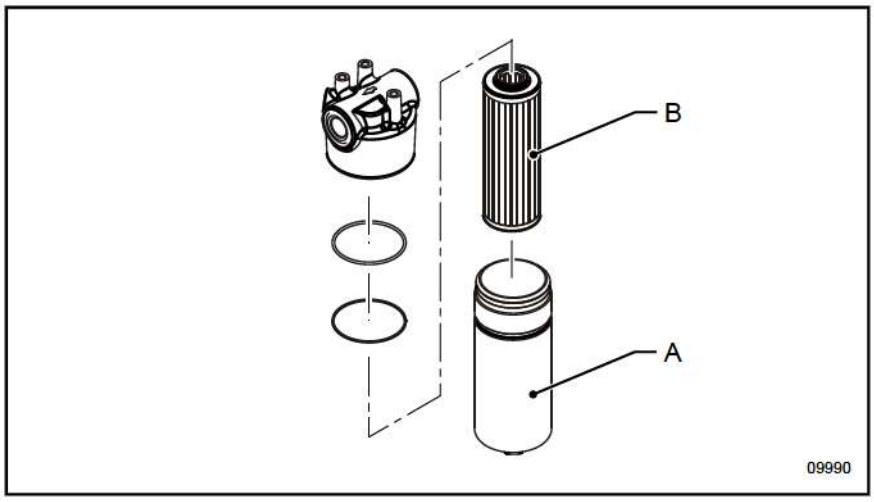
⚠WARNING

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



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

836-05

4.05.06 Replacing filter insert of pressure filter for steering system

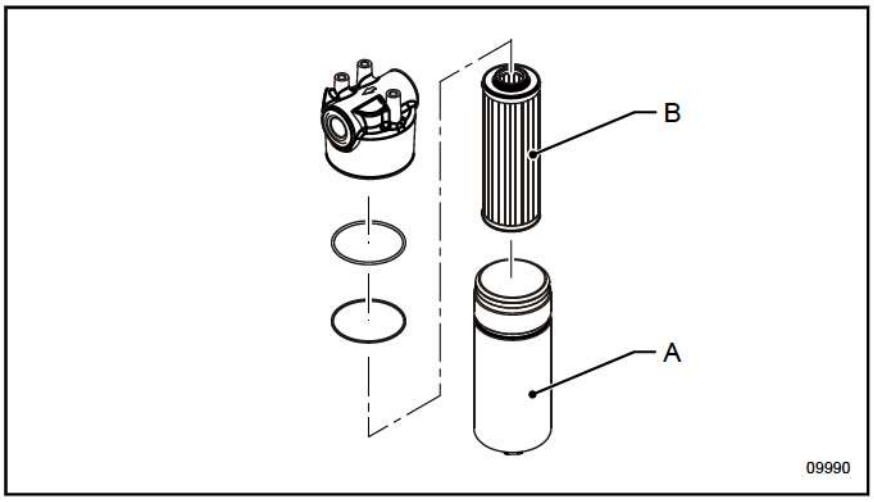
⚠WARNING

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



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

836-05

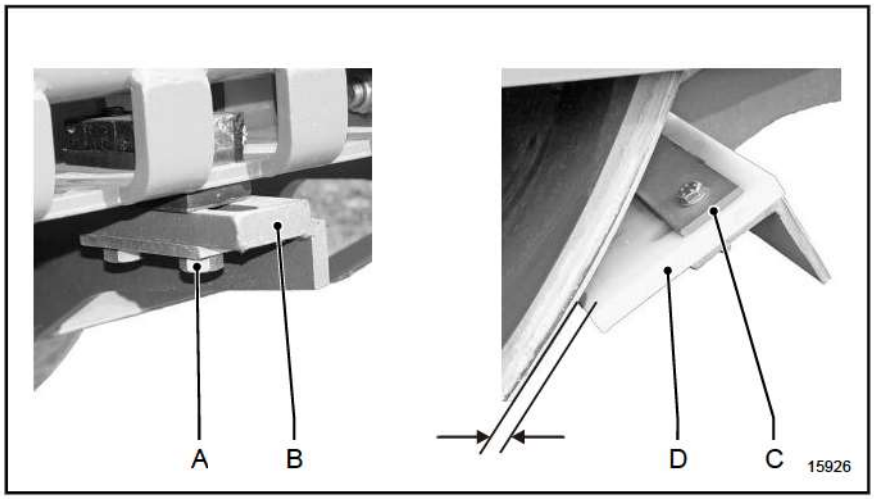
4.08 Drive

4.08.01 Inspecting smooth drum scrapers

General

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

825-15



If the scrapers are worn to the extent that dirt adhering is no longer removed from the drum while the machine is working, the scraper must be readjusted to the correct clearance.
Smooth drum clearance — **10 mm**

Basic setting of scraper

1. Switch off diesel engine and remove ignition key.
2. Loosen hexagonal screw [A].
3. Push scraper console [B] to the clearance of the drum.
4. Tighten hexagonal screw [A].

Readjusting the scraper

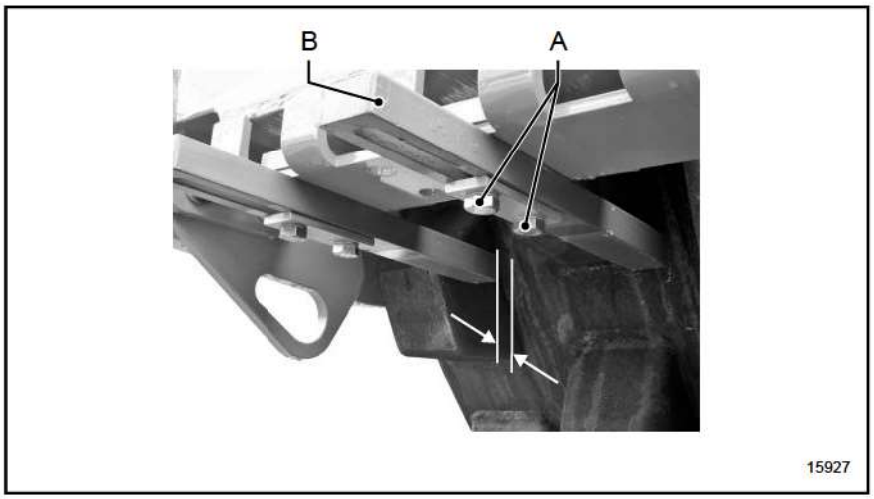
1. Switch off diesel engine and remove ignition key.
2. Loosen clamp connection [C].
3. Push scraper [D] to the clearance of the drum.
4. Tighten clamp connection [C].

825-23

4.08.02 Inspecting scrapers of the padfoot drum

General Only correctly positioned scraper teeth can remove the dirt from between the padfoot segments optimally.

825-24



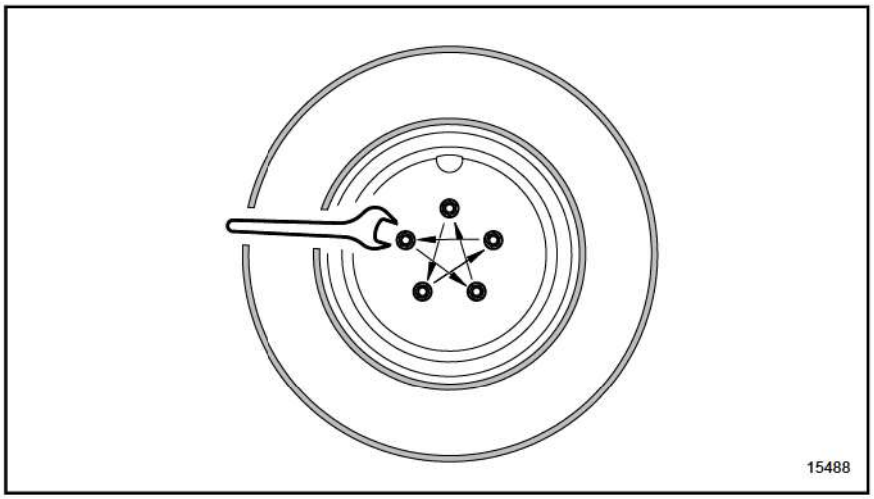
Padfoot drum clearance — **15 mm**

Basic setting of scraper

1. Switch off diesel engine and remove ignition key.
2. Loosen hexagonal screw [A].
3. Push scraper tooth to the clearance of the drum.
4. Tighten hexagonal screw [A].

825-25

4.08.03 Checking the wheel nuts / wheel bolts for tightness



1. Switch off diesel engine and remove ignition key.
2. Tighten the wheel nuts / wheel bolts crosswise.
   For starting torque see Technical data (see page 192 sqq.).

879-00

4.08.04 Checking the air pressure in the tyres

⚠WARNING

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

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

002-43

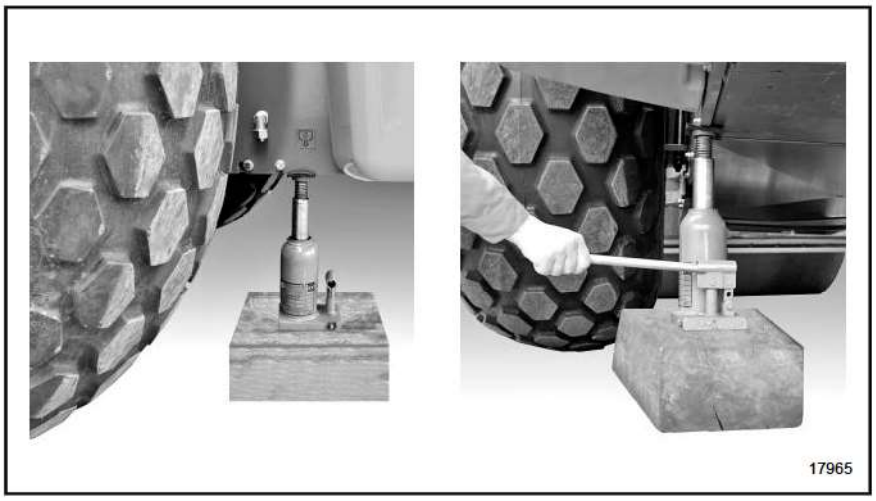
15928

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 until it reaches the specified air pressure (air pressure see page 192 sqq.).

898-00

4.08.05 Changing the tyres



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 192 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 192 sqq.). Install if possible with two persons.

Dismantling

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

Installation

1. Put the wheels on the wheel hub (tyre bolts must align with the fixing holes).
2. Screw the wheel nut on the tyre bolt and tighten with the starting torque (see page 192 sqq.).
3. Lift the machine and remove the liners.

896-03

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

000-26

4.08.06 Checking driving gear oil level (Series 3516; → H1763055)

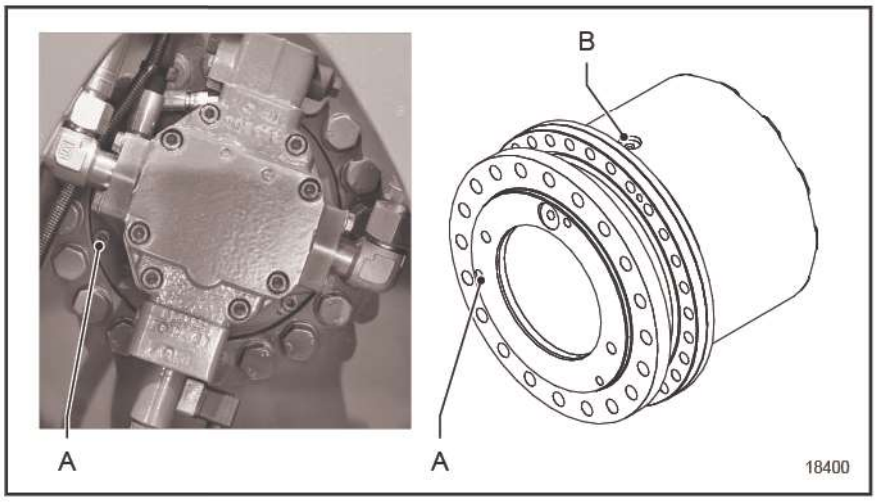
⚠WARNING

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



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

☆ Lubricant only admissible if containing this marking (see page 178 sqq.).

827-03

4.08.07 Checking driving gear oil level (Series 3516; H1763056 →)

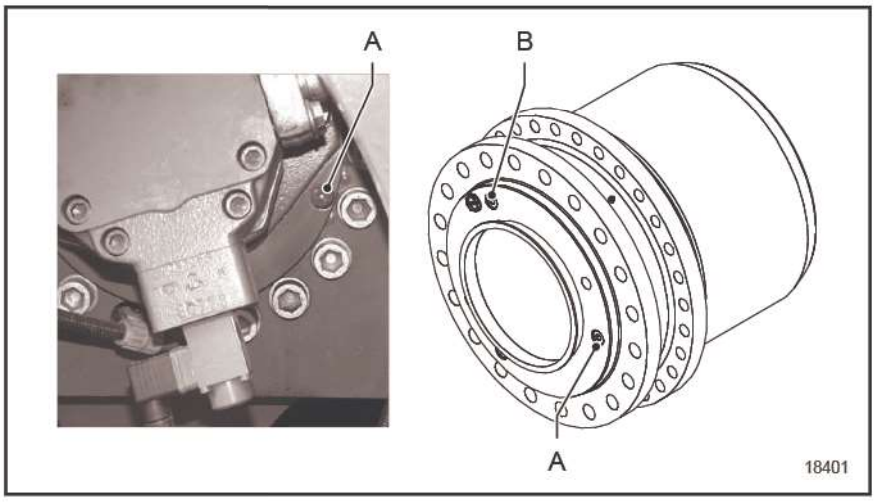
⚠WARNING

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



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

☆ Lubricant only admissible if containing this marking (see page 178 sqq.).

827-03

4.08.08 Checking driving gear oil level (Series 3518, 3520; → H1763055)

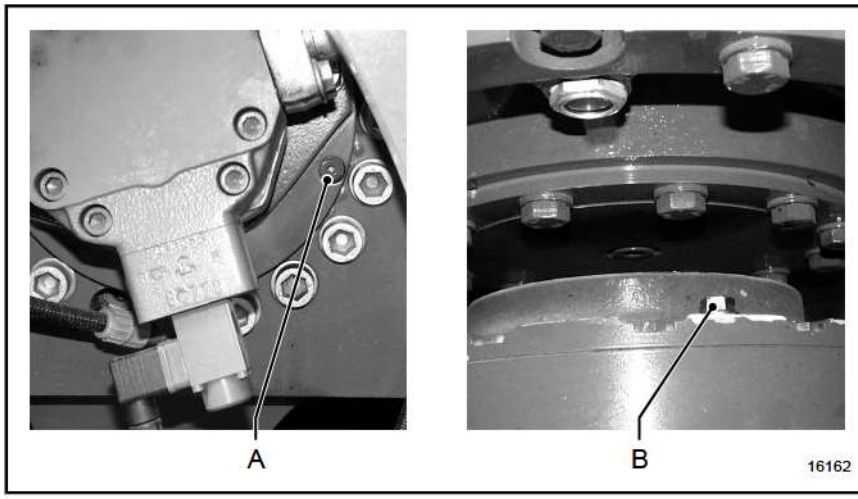
⚠WARNING

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



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

☆ Lubricant only admissible if containing this marking (see page 178 sqq.).

827-03

4.08.09 Checking driving gear oil level (Series 3518, 3520; H1763056 →)

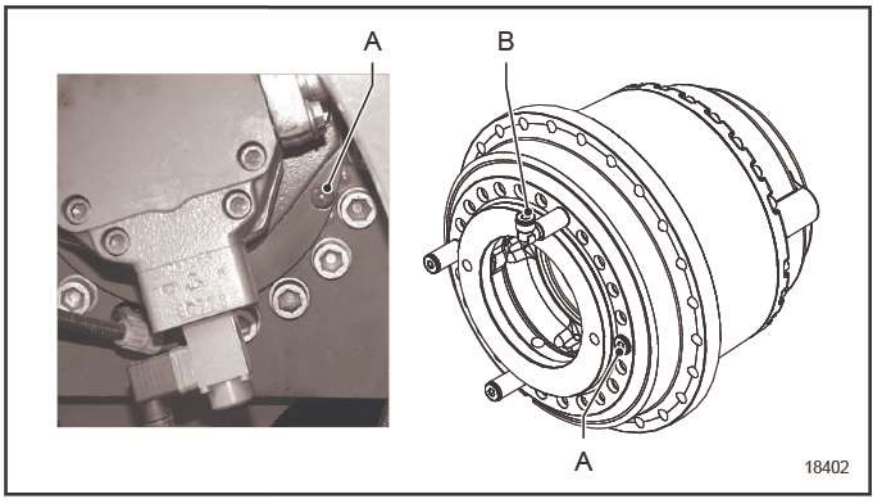
⚠WARNING

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



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

☆ Lubricant only admissible if containing this marking (see page 178 sqq.).

827-03

4.08.10 Changing driving gear oil (Series 3516; → H1763055)

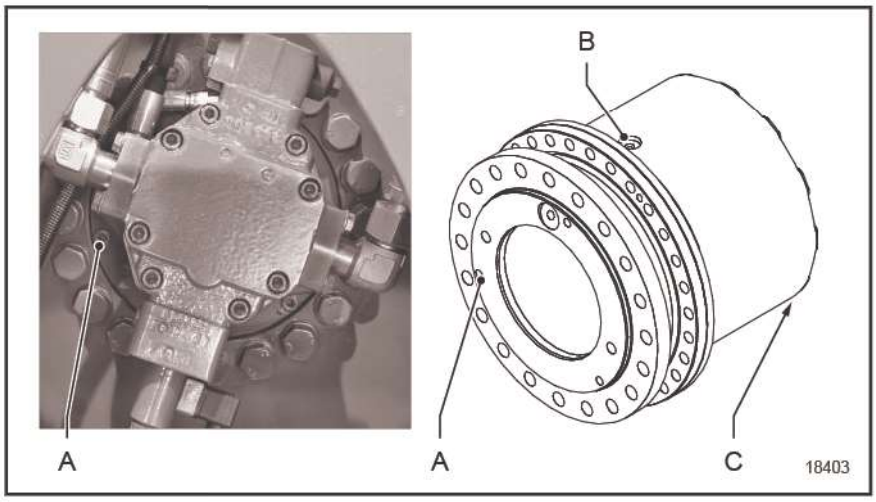
⚠WARNING

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



1. Switch off diesel engine and remove ignition key.
2. Allow machine to cool down under a temperature of 30 °C (86 °F).
3. Slowly drive the machine to a position at which the filling screw [B] is at the top, and the drain screw [C] points vertically downwards.
4. Remove filling screw [B] carefully for pressure compensation purposes.
5. Screw out oil drain screw [C] and let the used oil drain into a provided receptacle.
6. Screw in oil drain screw [C] and tighten.
7. Screw out the check plug [A].
8. Fill in the specified oil type though the filling bore [B] until oil comes out of the control bore [A].
9. Screw in filler plug [B] and tighten the check plug [A].

☆ Lubricant only admissible if containing this marking (see page 178 sqq.).

862-08

4.08.11 Changing driving gear oil (Series 3516; H1763056 →)

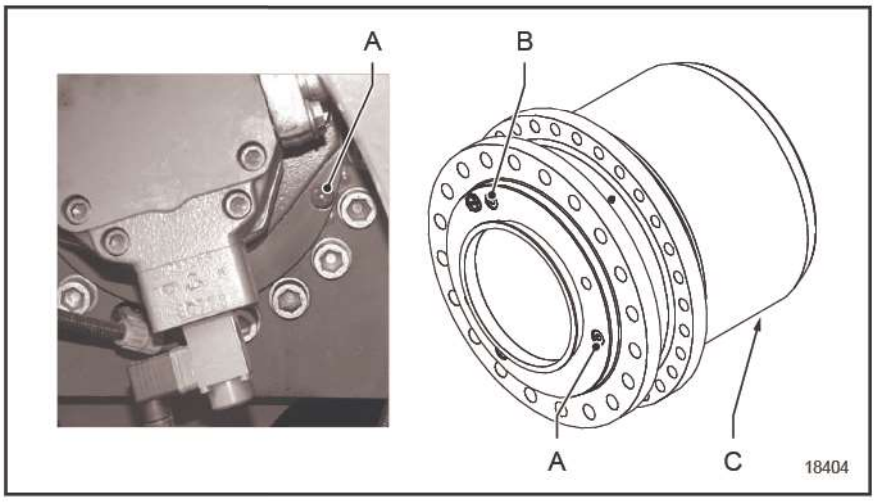
⚠WARNING

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



1. Switch off diesel engine and remove ignition key.
2. Allow machine to cool down under a temperature of 30 °C (86 °F).
3. Slowly drive the machine to a position at which the filling screw [B] is at the top, and the drain screw [C] points vertically downwards.
4. Remove filling screw [B] carefully for pressure compensation purposes.
5. Screw out oil drain screw [C] and let the used oil drain into a provided receptacle.
6. Screw in oil drain screw [C] and tighten.
7. Screw out the check plug [A].
8. Fill in the specified oil type though the filling bore [B] until oil comes out of the control bore [A].
9. Screw in filler plug [B] and tighten the check plug [A].

☆ Lubricant only admissible if containing this marking (see page 178 sqq.).

862-08

4.08.12 Changing driving gear oil (Series 3518, 3520; → H1763055)

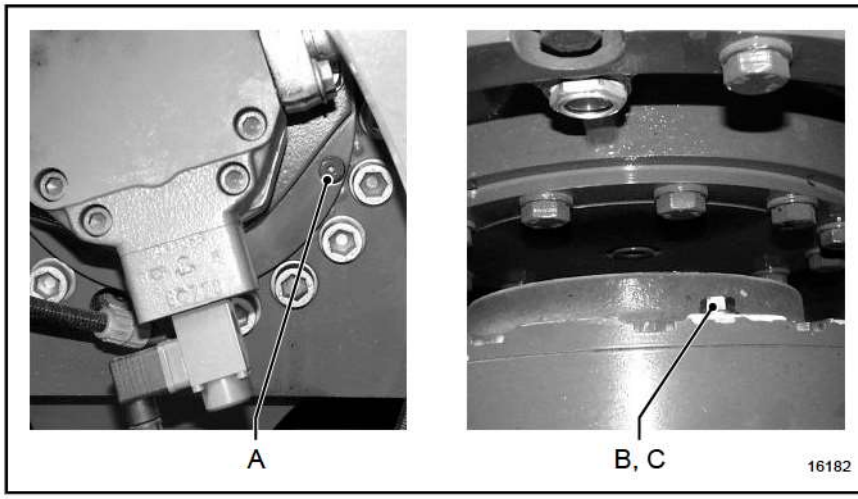
⚠WARNING

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



1. Switch off diesel engine and remove ignition key.
2. Allow machine to cool down under a temperature of 30 °C (86 °F).
3. Slowly drive the machine to a position at which the filling screw [B] is at the top, and the drain screw [C] points vertically downwards.
4. Remove filling screw [B] carefully for pressure compensation purposes.
5. Screw out oil drain screw [C] and let the used oil drain into a provided receptacle.
6. Screw in oil drain screw [C] and tighten.
7. Screw out the check plug [A].
8. Fill in the specified oil type though the filling bore [B] until oil comes out of the control bore [A].
9. Screw in filler plug [B] and tighten the check plug [A].

☆ Lubricant only admissible if containing this marking (see page 178 sqq.).

862-08

4.08.13 Changing driving gear oil (Series 3518, 3520; H1763056 →)

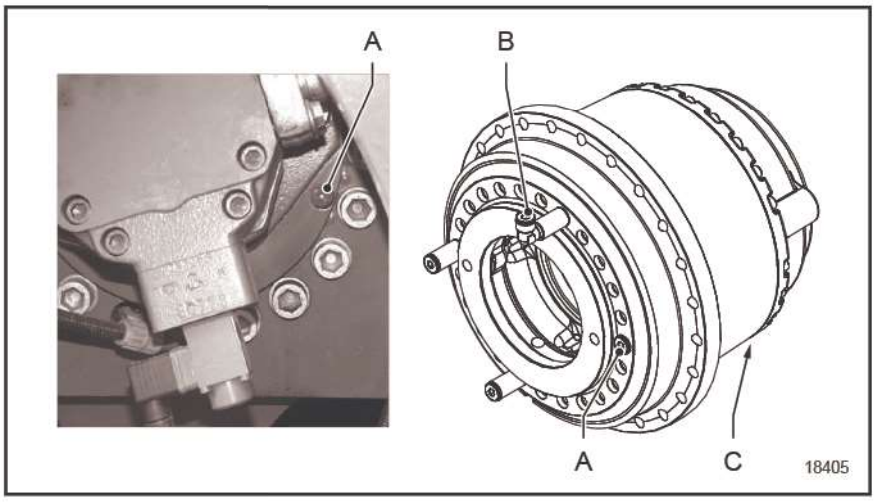
⚠WARNING

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



1. Switch off diesel engine and remove ignition key.
2. Allow machine to cool down under a temperature of 30 °C (86 °F).
3. Slowly drive the machine to a position at which the filling screw [B] is at the top, and the drain screw [C] points vertically downwards.
4. Remove filling screw [B] carefully for pressure compensation purposes.
5. Screw out oil drain screw [C] and let the used oil drain into a provided receptacle.
6. Screw in oil drain screw [C] and tighten.
7. Screw out the check plug [A].
8. Fill in the specified oil type though the filling bore [B] until oil comes out of the control bore [A].
9. Screw in filler plug [B] and tighten the check plug [A].

☆ Lubricant only admissible if containing this marking (see page 178 sqq.).

862-08

4.08.14 Checking differential gear oil level

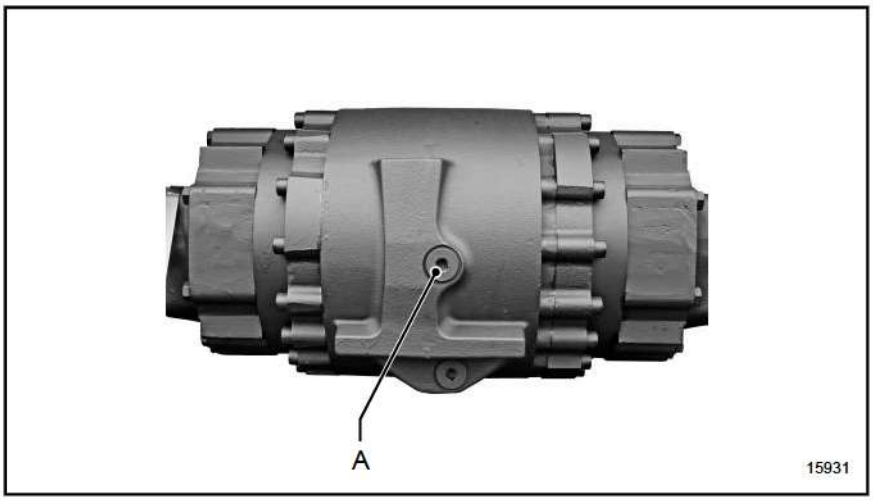
⚠WARNING

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



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 filler / check plug [A]; if the oil level is correct, some oil must flow out of the control bore.
4. If the oil level is insufficient, fill in oil through the filler / control bore [A].
5. Screw in and tighten the check plug [A].

Lubricant only admissible if containing this marking (see page 178 sqq.).

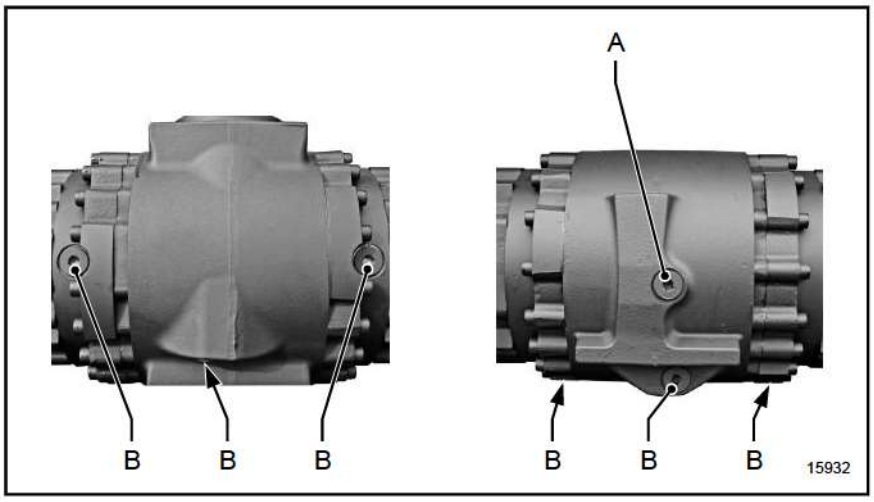
826-01

4.08.15 Changing differential gearbox oil

⚠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



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 filler / check plug [A] carefully for pressure compensation purposes.
4. Screw out oil drain screws [B] (3 items) and let the used oil drain into a provided receptacle.
5. Screw in and tighten oil drain screws [B].
6. Fill in the specified oil type though the filling /control bore [A] until oil comes out of the bore.
7. Screw in and tighten filler / check plug [A].

Lubricant only admissible if containing this marking (see page 178 sqq.).

864-01

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.

889-00

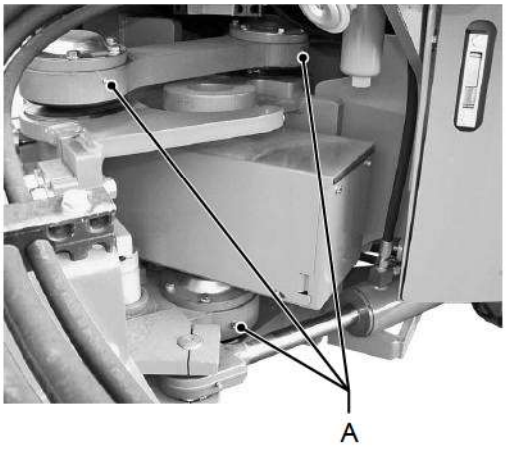
4.09.02 Lubricating pivoted bearing

⚠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.

002-33



15933

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

△ Only lubricant with this sign allowed (see page 178 sqq.).

820-04

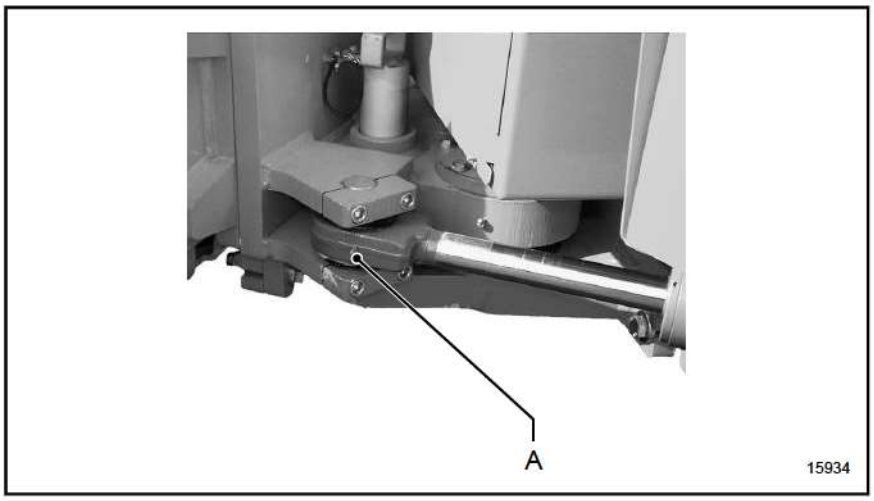
4.09.03 Lubricating steering cylinder bolt

⚠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.

002-33



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

△ Only lubricant with this sign allowed (see page 178 sqq.).

821-04

4.26 Vibration

4.26.01 General

Prior to maintenance works clean roller drums thoroughly.

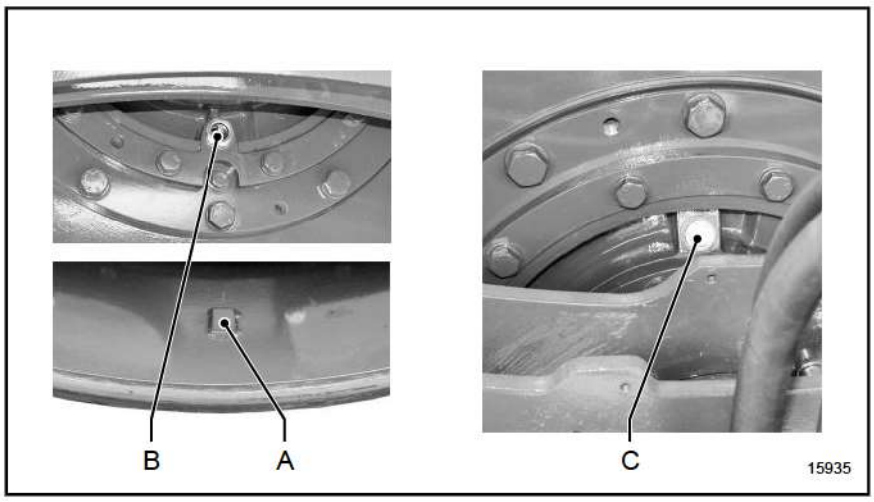
⚠WARNING

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

891-00

4.26.02 Checking vibrator oil filling level



Vibration version

Drive the machine slowly until the mark [A] is exactly perpendicular below the axle.

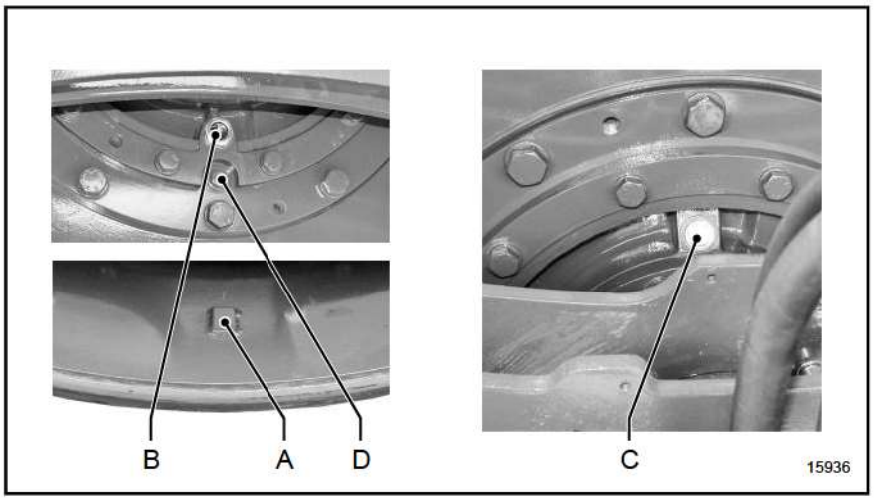
1. Switch off diesel engine and remove ignition key.
2. Allow machine to cool down under a temperature of 30 °C (86 °F).
3. Correct oil level: centre of inspection glass [B].
4. If the oil level is insufficient, fill in oil through the filler bore [C].

The check must be performed at the right and the left drum side.

Lubricant only admissible if containing this marking (see page 178 sqq.).

814-03

4.26.03 Changing vibrator oil



Vibration version

Drive the machine slowly until the mark [A] is exactly perpendicular below the axle.

1. Switch off diesel engine and remove ignition key.
2. Allow machine to cool down under a temperature of 30 °C (86 °F).
3. Remove filling screw [C] for pressure equalization purposes.
4. Screw out oil drain screw [D] and let the used oil drain into a provided receptacle.
5. Screw in and tighten the oil drain screw [D] with gasket ring.
6. Fill in the specified oil type through the filler bore [C]. Correct oil level: centre of inspection glass [B].
7. Screw in and tighten the filling screw [C] with gasket ring.

The oil change must be performed at the right and the left drum side.

Lubricant only admissible if containing this marking (see page 178 sqq.).

838-03

4.26.04 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.

880-01

5 TABLES

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

000-01

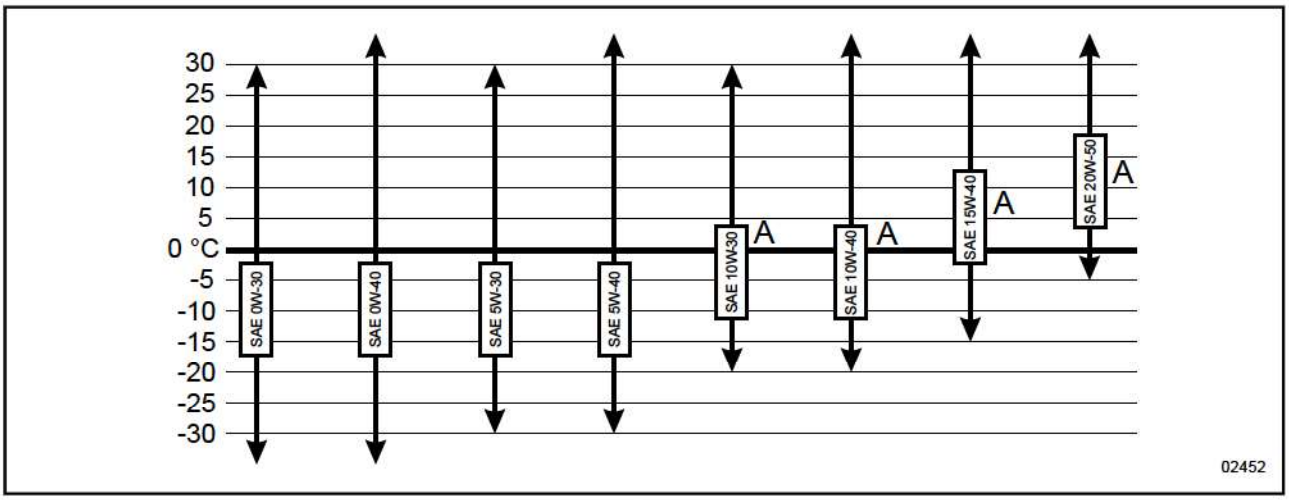
5.00 Technical data

5.00.01 Lubrication indications

Viscosity - temperature range

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

The following chart applies only for engine oil.



[A] Pre-heating only

Lubrication indications

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.			◇
Special oil Only HAMM special oil is admissible.			☆
Gear oil with Limited Slip additions. The oil quality must meet the API classification.	API GL-5	SAE 85W-90	⬡
Coolant for diesel engine, liquid-cooled (free of nitrite, amine and phosphate). Mixture: 40 % coolant concentrate, 60 % water.			○
Lubricating grease Lithium-based multi-purpose grease with high-pressure additives. Temperature application range from -25 °C (-13 °F) to +120 °C (248 °F).			△

For order numbers and packing size see WIRTGEN GROUP Document Parts and More and Wirtgen Group lubricants (see page 181 sqq.).

804-02

5.00.02 Organic hydraulic fluid

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 on the basis of special synthetic saturated complex esters may be used. The products used and recommended by HAMM can be taken from the lubricant indications (see page 178 sqq.). Other oils used must correspond to the specifications of the oil above mentioned. The neutralisation value (oil acid) may not exceed 2.
- When replacing organic hydraulic fluid by mineral oil or mineral oil by organic hydraulic fluid, all filters in the oil circuit must be replaced after 50 operating hours. After that, the filter change intervals given in this instructions apply again.
- Used biological oil must be disposed at a reliable place of disposal, just like mineral oil.
- Organic hydraulic fluid is easily biodegradable.

801-01

5.00.03 Wirtgen Group Lubricants

General

Intensive testing and development work with leading mineral oil companies has analysed the complex and high requirements of Wirtgen Group machines. The results have been translated into optimal specifications and used for the first filling in the factory. The results are impressive:

a wide range of premium lubricants from one source augmented by highly functional accessories "Made in Germany" for filling and lubrication. The new Wirtgen Group lubricants are the "elixir of life" for your fleet.

Premium lubricants

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

- A longer oil change interval according to the oil analysis by the Wirtgen Group
- Compatibility with the first filling
- Optimal protection against wear
- Perfect prevention of corrosion
- Retracing in the event of damage

Wirtgen Group lubricants not only increase the performance and service life of your machines but also permanently reduce your running costs. Why try to make savings in the wrong place?

Everything from one source

All Wirtgen Group machines – Wirtgen milling machines, Vögele pavers and HAMM rollers – can be filled and lubricated with the Wirtgen Group lubricant appropriate for the particular area of application.* Together with the sophisticated container mix, this leads to clearly optimized ordering, storage and filling.

*Exceptions are shown

Filling and lubricating accessories

We support you with highly functional accessories "Made in Germany" for filling and lubrication, such as canister pumps and grease guns.

804-03

Wirtgen Group Engine Oil 15W40

Strong heavy-duty motor oil made from excellent basic oils and special additives. It increases the power output of your engine and gives the highest operational reliability.

Packing size: 5 l, 20 l, 208 l

Classes: ACEA E7 / E5, API CI-4 / SL

Manufacturer standards: Daimler Chrysler MB 228.3, Caterpillar CAT ECF-1, Cummins CES 20078/7/6/2/1, Mack EO-M Plus, Volvo VDS-3, MAN M3275

804-04

Wirtgen Group Hydraulic Oil HVLP 46

High quality, multirange hydraulic oil with a high viscosity index for the best protection against wear under the most difficult operating conditions. A new refined specification enables very long oil change intervals. Guaranteed optimal cold start performance.

Packing size: 20 l, 208 l

Classes: Dension HF-0, Vickers M-2950-S, DIN 51524 part 3, HVLP, ISO6743/4 type HV

804-05

Wirtgen Group Gear Oil 85W90

Latest generation mineral gear oil for multi-purpose use in gearboxes and axle drives. It provides impressive protection against wear and oxidation.

Packing size: 5 l, 20 l, 208 l

Classes: API GL-5

Manufacturer standards: Daimler Chrysler MB 235.0, ZF-TE-ML05A/07A/16C/17B/19B, MAN 342 type N

Do not use for Wirtgen milling drum gears, HAMM vibratory bearings and drum drives, and Vögele pump splitter gearboxes and travel drives.

804-06

Wirtgen Group Special Gear Oil

Special fully synthetic, high-performance gear oil for HAMM drum drives. Extremely resistant to pressure and temperature.

Packing size: 5 l, 20 l, 208 l

Do not mix with mineral gear oil.

804-07

Wirtgen Group Special Gear Oil

Special fully synthetic, high-performance gear oil for HAMM drum drives. Extremely resistant to pressure and temperature.

Packing size: 5 l, 20 l, 208 l

Do not mix with mineral gear oil.

804-28

Wirtgen Group Multipurpose Grease

The finest multipurpose grease for a wide range of lubricating tasks, such as pivot pins and wheel bearings. State-of-the-art additive technology makes it especially suitable for use under shock and vibrating conditions.

Packing size: 400 g cartridge

804-08

Wirtgen Group Drum Bearing Grease

Exclusive grease for lubricating HAMM drum bearings. Extremely temperature-resistant and and pressure-stable.

Packing size: 1 kg

804-09

Wirtgen Group Drive Bearing Grease

Special heavy-duty grease for use in HAMM drive bearings. Extremely pressure stable and water repellent.

Packing size: 1 kg

804-10

Wirtgen Group Asphalt Anti Stick

Asphalt release agent for rubber tyre and combination rollers. Wirtgen Group Asphalt Anti Stick is supplied as a water-mixable concentrate. It is used in an emulsified form diluted in water in a ratio of approx. 1:10.

Processing: Mix Wirtgen Group Asphalt Anti Stick with water in the desired ratio while stirring. Ensure thorough mixing.

The most reliable results are obtained at a mixing ratio of 1:1 but this may vary depending on the mixing material to be processed.

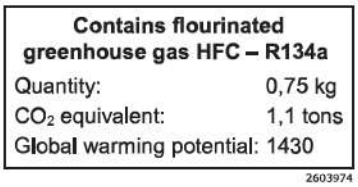
Wirtgen Group Asphalt Anti Stick is quickly biodegradable and non-toxic.

Packing size: 5 l, 20 l

Use only clean water for mixing. Be sure to observe the proper sequence.

804-16

Refrigerant in air conditioning plants



The national F-Gas Regulation 517/2014 requires the identification of media which contain F-gas and are used in refrigerating plants or in air conditioning plants.

A label is affixed to the machine for this identification.

The label provides information on:

- Type of refrigerant, e.g. R 134a
- Fill volume in kg
- CO2 equivalent in t
- GWP value (global warming potential), e.g., 1430 for refrigerant R 134a

The information provided on the label indicates to the owner whether the system has been subjected to the corresponding tests.

804-29

Overview of Wirtgen Lubricants

Designation	Identification	Packing size	Order No.
Wirtgen Group Engine Oil 15W40	□	5 l	2065020
		20 l	2065025
		208 l	2065026
Wirtgen Group Engine Oil 10W40	□	5 l	2112355
		20 l	2112354
Wirtgen Group Hydraulic Oil HVLP 46	▭	20 l	2065028
		208 l	2065029
Wirtgen Group Gear Oil 85W90	⬡	5 l	2065030
		20 l	2065031
		208 l	2065032
Wirtgen Group Special Gear Oil	◇	5 l	1238051
		20 l	2065037
		208 l	2065038
Wirtgen Group Special Gear Oil	☆	5 l	2571293
		20 l	2571294
		208 l	2571300
Wirtgen Group Asphalt Anti Stick		5 l	2117378
		20 l	2117379
Wirtgen Group Multipurpose Grease	△	400 g	2065035
Wirtgen Group Drum Bearing Grease	△	1 kg	1205757
Wirtgen Group Drive Bearing Grease	△	1 kg	1227114
Radiator antifreeze agent	○	5 l	2120296
		20 l	2120298

804-11

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 products used and recommended by HAMM are shown in the chapter lubricant details (see page 178 sqq.) (without nitrite, amine and phosphate). The factory filled coolant blend consists of 50 parts cooling system protective liquid and 50 parts water. This ensures frost protection to - 37 °C (-34 °F). The cooling system protective agent can be purchased from HAMM customer service.

802-01

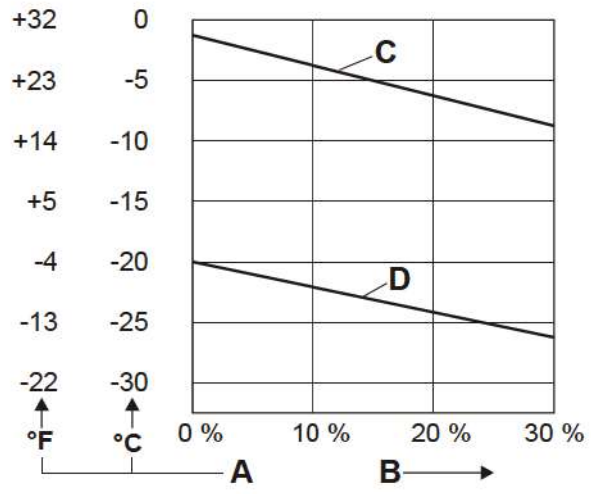
5.00.05 Fuel

Use only the diesel fuel commercially available which contains a sulphur content below 0,5 % . The engine oil replacement intervals specified here apply only for diesel fuel.

Approved diesel fuel specifications are:

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

In case other fuels are used that do not comply with the afore mentioned requirements, we do not accept any guarantee.
With diesel fuels with a sulfur content over 0,5 % to 1,0 % or permanent ambient air temperatures below -10 °C (-14 °F) the change intervals of the motor oil need to be halved.
The certification measurements to measure the compliance with statutory emission limits are carried out using the test fuels specified by law. These fuels comply with the diesel fuels specified in this operating manual according to EN 590 and ASTM D 975. For all other fuels specified in this operating manual we cannot guarantee any emission values.



10209

[A]	Exterior temperature	[B]	Admixture fraction petroleum
[C]	Summer diesel fuel	[D]	Winter diesel fuel

Winter operation with diesel fuel

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

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

In case it is necessary to use summer diesel fuels below 0 °C (32 °F) , it is also possible to add petroleum up to 30 % as indicated in the diagram.
Sufficient cold resistance may be achieved by adding flow improver.

715-01

5.00.06 Tightening torques – applicable to spare parts supplied up until 31 August 2016

The tightening torques indicated within the tables apply to

- nuts according to DIN 934 and screws with headrest according to DIN 931 (frictional coefficient μ_{total} = 0.12) unless otherwise specified.

Check the tightening torques of nuts and bolts at regular intervals. Tighten if necessary.

Tightening torques for regular type screw threads

Threads	Tightening 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

Tightening torques for fine threads

Threads	Tightening 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

5.00.07 Tightening torques – applicable to spare parts supplied as from 1 September 2016

The tightening torques indicated within the tables apply to

- nuts and screws with headrest according to ISO 4014, 4032, 4762... (frictional coefficient μ_{total} = 0.095) unless otherwise specified.

Check the tightening torques of nuts and bolts at regular intervals. Tighten if necessary.

Tightening torques for regular type screw threads

Threads (wrench size SW)	Tightening torques MA (Nm)		
	8.8	10.9	12.9
M4 (SW7)	2.7	4.0	4.7
M5 (SW8)	5.5	8.1	9.5
M6 (SW10)	9.5	14	16.5
M8 (SW13)	21	30	36
M10 (SW16)	41	60	71
M12 (SW18)	71	104	122
M14 (SW21)	113	165	195
M16 (SW24)	175	255	300
M18 (SW27)	250	355	420
M20 (SW30)	350	500	580
M22 (SW34)	480	680	800
M24 (SW36)	600	860	1000
M27 (SW41)	880	1260	1470
M30 (SW46)	1200	1700	2000

Tightening torques for fine threads

Threads (wrench size)	Tightening torques MA (Nm)		
	8.8	10.9	12.9
M8x1 (SW13)	22	32	38
M10x1.25 (SW16)	43	63	74
M12x1.25 (SW18)	76	111	130
M12x1.5 (SW18)	73	108	126
M14x1.5 (SW21)	120	175	205
M16x1.5 (SW24)	183	265	315
M18x1.5 (SW27)	270	390	455
M20x1.5 (SW30)	380	540	630
M22x1.5 (SW34)	510	725	850
M24x2 (SW36)	640	910	1070
M27x2 (SW41)	930	1330	1550
M30x2 (SW46)	1300	1840	2150

5.01 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 3516

Designation	Value	Unit
Dimensions and weights		
Basic weight without cab	15085	kg
Operating weight with cabin	15755	kg
Axle load front / rear	9305 / 6450	kg
Working width	2140	mm
Turning radius inside / outside	4360 / 5830	mm
Diesel engine		
Manufacturer	Deutz	
Type	TCD 2012 L06 2V	
Number of cylinders	6	
Power (ISO 14396) / rated speed	155.0 / 2300	kW / rpm
Emission level EU / USA	III A / Tier 3	
Drive		
Working gear speed	0-4,4 / (0-2,7) 0-5,9 / (0-3,6) 0-6,9 / (0-4,3)	km/h / (mph)
Transport speed	0-11.3 / (0-7.0)	km/h / (mph)
Climbing ability, vibration on / off	47 / 52	%
Max. longitudinal gradient allowed	30	°
Max. transverse gradient allowed	30	°
Tyres		
Tyre size	AW 23.1-26 12 PR	
Number of tyres	2	items
Total weight per tyre ▪ Tyre with rim ▪ Water filling ▪ Magnesium chloride	760 210 450 100	kg kg l kg
Air pressure	0.17/ (1.7) / [24.5]	MPa / (bar) / [psi]
Tightening torque, wheel nut	640	Nm

Designation	Value	Unit
Vibration		
Vibration	front	
Stage 1: Frequency / speed	30 / 1800	Hz / rpm
Stage 1: Maximum amplitude	1.90	mm
Stage 2: Frequency / speed	40 / 2400	Hz / rpmStage 2:
Stage 2: Maximum amplitude	0.90	mm
Steering		
Steering angle to both sides	32	°
Pendulum compensation upwards and downwards	10	°
Filling quantities		
Fuel	290.0	l
Engine oil (for oil change)	15.5	l
Coolant of diesel engine	22.0	l
Hydraulic oil	50.0	l
Differential gear	14.0	l
Driving gear ▪ → H1763055 ▪ H17630356 →	 2.0 1.4	 l l
Vibrator right / left	1.6 / 1.6	l
* Air conditioning (R134a) (Version: condenser at cab outside)	1.6	kg
* Air conditioning (R134a) (Version: condenser under operator's position inside	1.0	kg
Sound power level		
Sound power L_{WA}, guaranteed	105	dB(A)
Sound power L_{WA}, representatively measured	103	dB(A)
Sound intensity level		
Sound pressure L_{pA}, measured near the cab	79	dB(A)
Electrical system		
Operating voltage	12	V

5.01.02 3516 P

Designation	Value	Unit
Dimensions and weights		
Basic weight without cab	15185	kg
Operating weight with cabin	15855	kg
Axle load front / rear	9405 / 6450	kg
Working width	2140	mm
Padfoot, number	140	items
Padfoot, height	100	mm
Padfoot, end face	152	cm²
Turning radius inside / outside	4360 / 5830	mm
Diesel engine		
Manufacturer	Deutz	
Type	TCD 2012 L06 2V	
Number of cylinders	6	
Power (ISO 14396) / rated speed	155.0 / 2300	kW / rpm
Emission level EU / USA	III A / Tier 3	
Drive		
Working gear speed	0-4,5 / (0-2,8) 0-6.0 / (0-3.7) 0-7,1 / (0-4,4)	km/h / (mph)
Transport speed	0-11,6 / (0-7,0)	km/h / (mph)
Climbing ability, vibration on / off	49 / 54	%
Max. longitudinal gradient allowed	30	°
Max. transverse gradient allowed	30	°
Tyres		
Tyre size	TR 23.1-26 12 PR	
Number of tyres	2	items
Total weight per tyre ▪ Tyre with rim ▪ Water filling ▪ Magnesium chloride	850 225 500 125	kg kg l kg
Air pressure	0.17 / (1.7) / [24.5]	MPa / (bar) / [psi]
Tightening torque, wheel nut	640	Nm
Vibration		

Designation	Value	Unit
Vibration	front	
Stage 1: Frequency / speed	30 / 1800	Hz / rpm
Stage 1: Maximum amplitude	1.86	mm
Stage 2: Frequency / speed	40 / 2400	Hz / rpm
Stage 2: Maximum amplitude	0.88	mm
Steering		
Steering angle to both sides	32	°
Pendulum compensation upwards and downwards	10	°
Filling quantities		
Fuel	290.0	l
Engine oil (for oil change)	15.5	l
Coolant of diesel engine	22.0	l
Hydraulic oil	50.0	l
Differential gear	14.0	l
Driving gear ▪ → H1763055 ▪ H1763056 →	 2.0 1.4	 l l
Vibrator right / left	1.6 / 1.6	l
* Air conditioning (R134a) (Version: condenser at cab outside)	1.6	kg
* Air conditioning (R134a) (Version: condenser under operator's position inside	1.0	kg
Sound power level		
Sound power L_{WA}, guaranteed	105	dB(A)
Sound power L_{WA}, representatively measured	103	dB(A)
Sound intensity level		
Sound pressure L_{pA}, measured near the cab	79	dB(A)
Sound pressure L_{pA}, measured near the ROPS	85	dB(A)
Electrical system		
Operating voltage	12	V

5.01.03 3518

Designation	Value	Unit
Dimensions and weights		
Basic weight without cab	17155	kg
Operating weight with cabin	17825	kg
Axle load front / rear	10785 / 7040	kg
Working width	2220	mm
Turning radius inside / outside	4180 / 6400	mm
Diesel engine		
Manufacturer	Deutz	
Type	TCD 2012 L06 2V	
Number of cylinders	6	
Power (ISO 14396) / rated speed	155.0 / 2300	kW / rpm
Emission level EU / USA	III A / Tier 3	
Drive		
Working gear speed	0-4,2 / (0-2,6) 0-5,6 / (0-3,5) 0-6,7 / (0-4,2)	km/h / (mph)
Transport speed	0-11.3 / (0-7.0)	km/h / (mph)
Climbing ability, vibration on / off	48 / 53	%
Max. longitudinal gradient allowed	30	°
Max. transverse gradient allowed	30	°
Tyres		
Tyre size	AW 23.1-26 12 PR	
Number of tyres	2	items
Total weight per tyre ▪ Tyre with rim ▪ Water filling ▪ Magnesium chloride	760 210 450 100	kg kg l kg
Air pressure	0.17 / (1.7) / [24.5]	MPa / (bar) / [psi]
Tightening torque, wheel nut	640	Nm
Vibration		
Vibration	front	
Stage 1: Frequency / speed	27 / 1620	Hz / rpm
Stage 1: Maximum amplitude	2.00	mm

Designation	Value	Unit
Stage 2: Frequency / speed	30 / 1800	Hz / rpm
Stage 2: Maximum amplitude	1.19	mm
Steering		
Steering angle to both sides	32	°
Pendulum compensation upwards and downwards	10	°
Filling quantities		
Fuel	290.0	l
Engine oil (for oil change)	15.5	l
Coolant of diesel engine	22.0	l
Hydraulic oil	50.0	l
Differential gear	14.0	l
Driving gear ▪ → H1763055 ▪ H1763056 →	 4.0 4.5	 l l
Vibrator right / left	1.8 / 1.8	l
* Air conditioning (R134a) (Version: condenser at cab outside)	1.6	kg
* Air conditioning (R134a) (Version: condenser under operator's position inside	1.0	kg
Sound power level		
Sound power L_{WA}, guaranteed	105	dB(A)
Sound power L_{WA}, representatively measured	103	dB(A)
Sound intensity level		
Sound pressure L_{pA}, measured near the cab	79	dB(A)
Sound pressure L_{pA}, measured near the ROPS	85	dB(A)
Electrical system		
Operating voltage	12	V

5.01.04 3518 P

Designation	Value	Unit
Dimensions and weights		
Basic weight without cab	17355	kg
Operating weight with cabin	18025	kg
Axle load front / rear	10985 / 7040	kg
Working width	2220	mm
Padfoot, number	150	items
Padfoot, height	100	mm
Padfoot, end face	152	cm²
Turning radius inside / outside	4180 / 6400	mm
Diesel engine		
Manufacturer	Deutz	
Type	TCD 2012 L06 2V	
Number of cylinders	6	
Power (ISO 14396) / rated speed	155.0 / 2300	kW / rpm
Emission level EU / USA	III A / Tier 3	
Drive		
Working gear speed	0-3.8 / (0-2.3) 0-5,3 / (0-3,3) 0-5,9 / (0-3,7)	km/h / (mph)
Transport speed	0-11,1 / (0-6,9)	km/h / (mph)
Climbing ability, vibration on / off	55 / 60	%
Max. longitudinal gradient allowed	30	°
Max. transverse gradient allowed	30	°
Tyres		
Tyre size	TR 23.1-26 12 PR	
Number of tyres	2	items
Total weight per tyre ▪ Tyre with rim ▪ Water filling ▪ Magnesium chloride	850 225 500 125	kg kg l kg
Air pressure	0.17 / (1.7) / [24.5]	MPa / (bar) / [psi]
Tightening torque, wheel nut	640	Nm
Vibration		

Designation	Value	Unit
Vibration	front	
Stage 1: Frequency / speed	27 / 1620	Hz / rpm
Stage 1: Maximum amplitude	1.93	mm
Stage 2: Frequency / speed	30 / 1800	Hz / rpm
Stage 2: Maximum amplitude	1.15	mm
Steering		
Steering angle to both sides	32	°
Pendulum compensation upwards and downwards	10	°
Filling quantities		
Fuel	290.0	l
Engine oil (for oil change)	15.5	l
Coolant of diesel engine	22.0	l
Hydraulic oil	50.0	l
Differential gear	14.0	l
Driving gear ▪ → H1763055 ▪ H1763056 →	 4.0 4.5	 l l
Vibrator right / left	1.8 / 1.8	l
* Air conditioning (R134a) (Version: condenser at cab outside)	1.6	kg
* Air conditioning (R134a) (Version: condenser under operator's position inside	1.0	kg
Sound power level		
Sound power L_{WA}, guaranteed	105	dB(A)
Sound power L_{WA}, representatively measured	103	dB(A)
Sound intensity level		
Sound pressure L_{pA}, measured near the cab	79	dB(A)
Sound pressure L_{pA}, measured near the ROPS	85	dB(A)
Electrical system		
Operating voltage	12	V

5.01.05 3520

Designation	Value	Unit
Dimensions and weights		
Basic weight without cab	19130	kg
Operating weight with cabin	19800	kg
Axle load front / rear	12490 / 7310	kg
Working width	2220	mm
Turning radius inside / outside	4180 / 6400	mm
Diesel engine		
Manufacturer	Deutz	
Type	TCD 2012 L06 2V	
Number of cylinders	6	
Power (ISO 14396) / rated speed	155.0 / 2300	kW / rpm
Emission level EU / USA	III A / Tier 3	
Drive		
Working gear speed	0-4,2 / (0-2,6) 0-5,6 / (0-3,5) 0-6,7 / (0-4,2)	km/h / (mph)
Transport speed	0-11.3 / (0-7.0)	km/h / (mph)
Climbing ability, vibration on / off	50 / 55	%
Max. longitudinal gradient allowed	30	°
Max. transverse gradient allowed	30	°
Tyres		
Tyre size	AW 23.1-26 12 PR	
Number of tyres	2	items
Total weight per tyre ▪ Tyre with rim ▪ Water filling ▪ Magnesium chloride	760 210 450 100	kg kg l kg
Air pressure	0.17 / (1.7) / [24.5]	MPa / (bar) / [psi]
Tightening torque, wheel nut	640	Nm
Vibration		
Vibration	front	
Stage 1: Frequency / speed	27 / 1620	Hz / rpm
Stage 1: Maximum amplitude	2.00	mm

Designation	Value	Unit
Stage 2: Frequency / speed	30 / 1800	Hz / rpm
Stage 2: Maximum amplitude	1.19	mm
Steering		
Steering angle to both sides	32	°
Pendulum compensation upwards and downwards	10	°
Filling quantities		
Fuel	290.0	l
Engine oil (for oil change)	15.5	l
Coolant of diesel engine	22.0	l
Hydraulic oil	50.0	l
Differential gear	14.0	l
Driving gear ▪ → H1763055 ▪ H1763056 →	 4.0 4.5	 l l
Vibrator right / left	1.8 / 1.8	l
* Air conditioning (R134a) (Version: condenser at cab outside)	1.6	kg
* Air conditioning (R134a) (Version: condenser under operator's position inside	1.0	kg
Sound power level		
Sound power L_{WA}, guaranteed	105	dB(A)
Sound power L_{WA}, representatively measured	103	dB(A)
Sound intensity level		
Sound pressure L_{pA}, measured near the cab	79	dB(A)
Sound pressure L_{pA}, measured near the ROPS	85	dB(A)
Electrical system		
Operating voltage	12	V

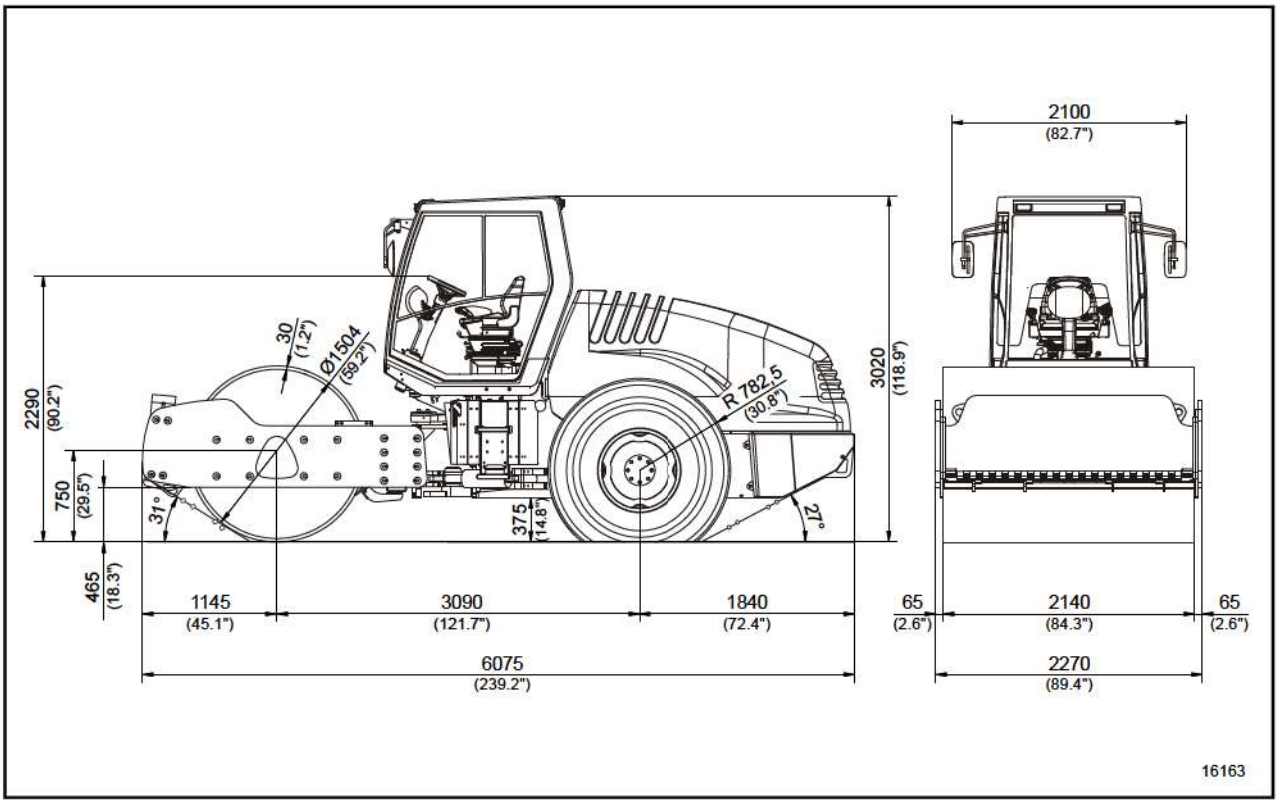
5.01.06 3520 P

Designation	Value	Unit
Dimensions and weights		
Basic weight without cab	19330	kg
Operating weight with cabin	20000	kg
Axle load front / rear	12690 / 7310	kg
Working width	2220	mm
Padfoot, number	150	items
Padfoot, height	100	mm
Padfoot, end face	152	cm²
Turning radius inside / outside	4180 / 6400	mm
Diesel engine		
Manufacturer	Deutz	
Type	TCD 2012 L06 2V	
Number of cylinders	6	
Power (ISO 14396) / rated speed	155.0 / 2300	kW / rpm
Emission level EU / USA	III A / Tier 3	
Drive		
Working gear speed	0-3.8 / (0-2.3) 0-5,3 / (0-3,3) 0-5,9 / (0-3,7)	km/h / (mph)
Transport speed	0-11,1 / (0-6,9)	km/h / (mph)
Climbing ability, vibration on / off	51 / 56	%
Max. longitudinal gradient allowed	30	°
Max. transverse gradient allowed	30	°
Tyres		
Tyre size	TR 23.1-26 12 PR	
Number of tyres	2	items
Total weight per tyre ▪ Tyre with rim ▪ Water filling ▪ Magnesium chloride	850 225 500 125	kg kg l kg
Air pressure	0.17 / (1.7) / [24.5]	MPa / (bar) / [psi]
Tightening torque, wheel nut	640	Nm
Vibration		

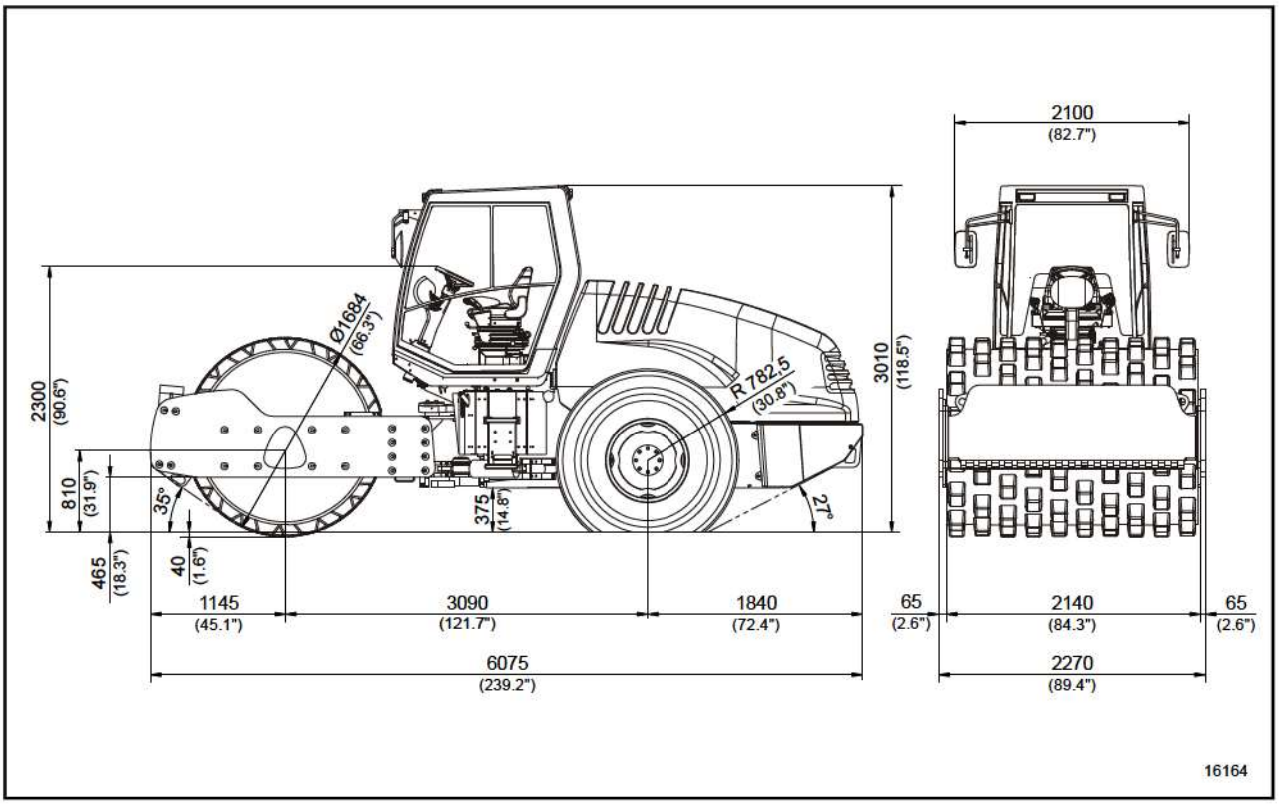
Designation	Value	Unit
Vibration	front	
Stage 1: Frequency / speed	27 / 1620	Hz / rpm
Stage 1: Maximum amplitude	1.93	mm
Stage 2: Frequency / speed	30 / 1800	Hz / rpm
Stage 2: Maximum amplitude	1.15	mm
Steering		
Steering angle to both sides	32	°
Pendulum compensation upwards and downwards	10	°
Filling quantities		
Fuel	290.0	l
Engine oil (for oil change)	15.5	l
Coolant of diesel engine	22.0	l
Hydraulic oil	50.0	l
Differential gear	14.0	l
Driving gear ▪ → H1763055 ▪ H1763056 →	 4.0 4.5	 l l
Vibrator right / left	1.8 / 1.8	l
* Air conditioning (R134a) (Version: condenser at cab outside)	1.6	kg
* Air conditioning (R134a) (Version: condenser under operator's position inside	1.0	kg
Sound power level		
Sound power L_{WA}, guaranteed	105	dB(A)
Sound power L_{WA}, representatively measured	103	dB(A)
Sound intensity level		
Sound pressure L_{pA}, measured near the cab	79	dB(A)
Sound pressure L_{pA}, measured near the ROPS	85	dB(A)
Electrical system		
Operating voltage	12	V

5.02 Dimension sheet

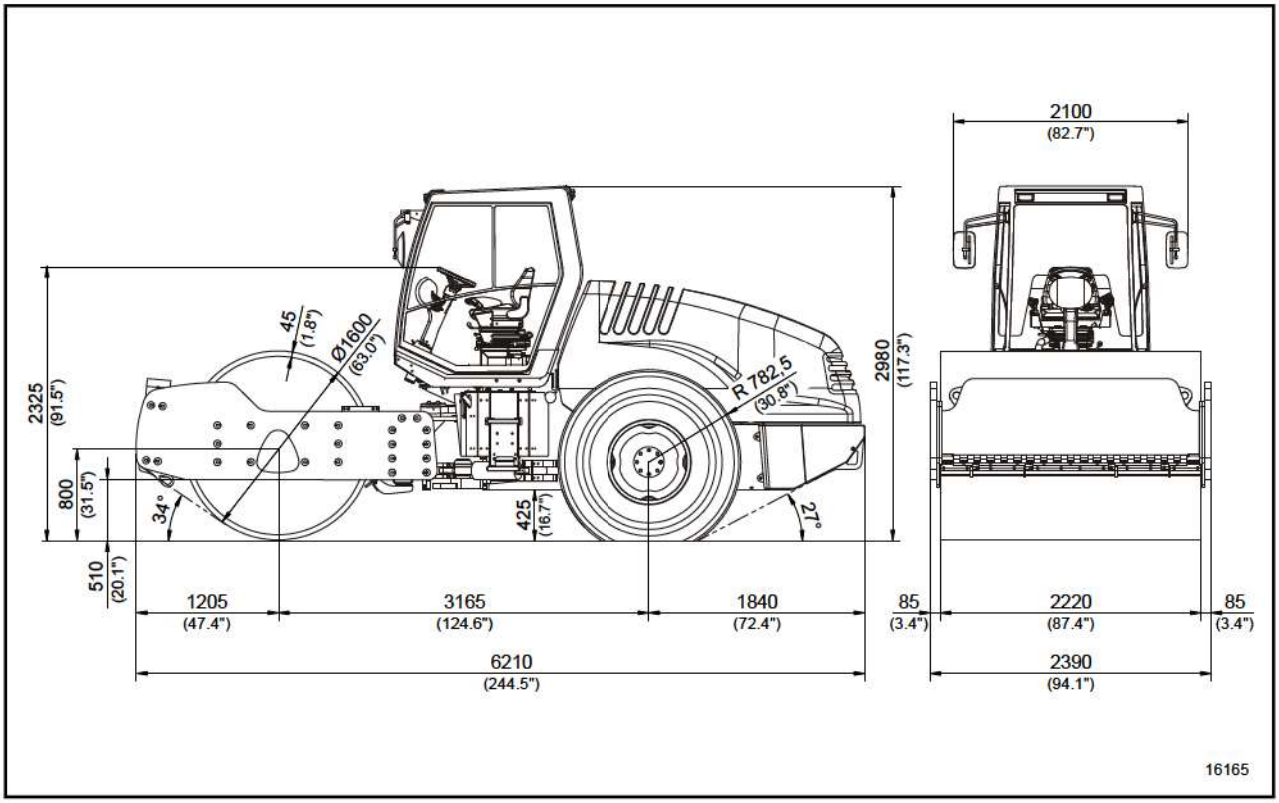
5.02.01 3516



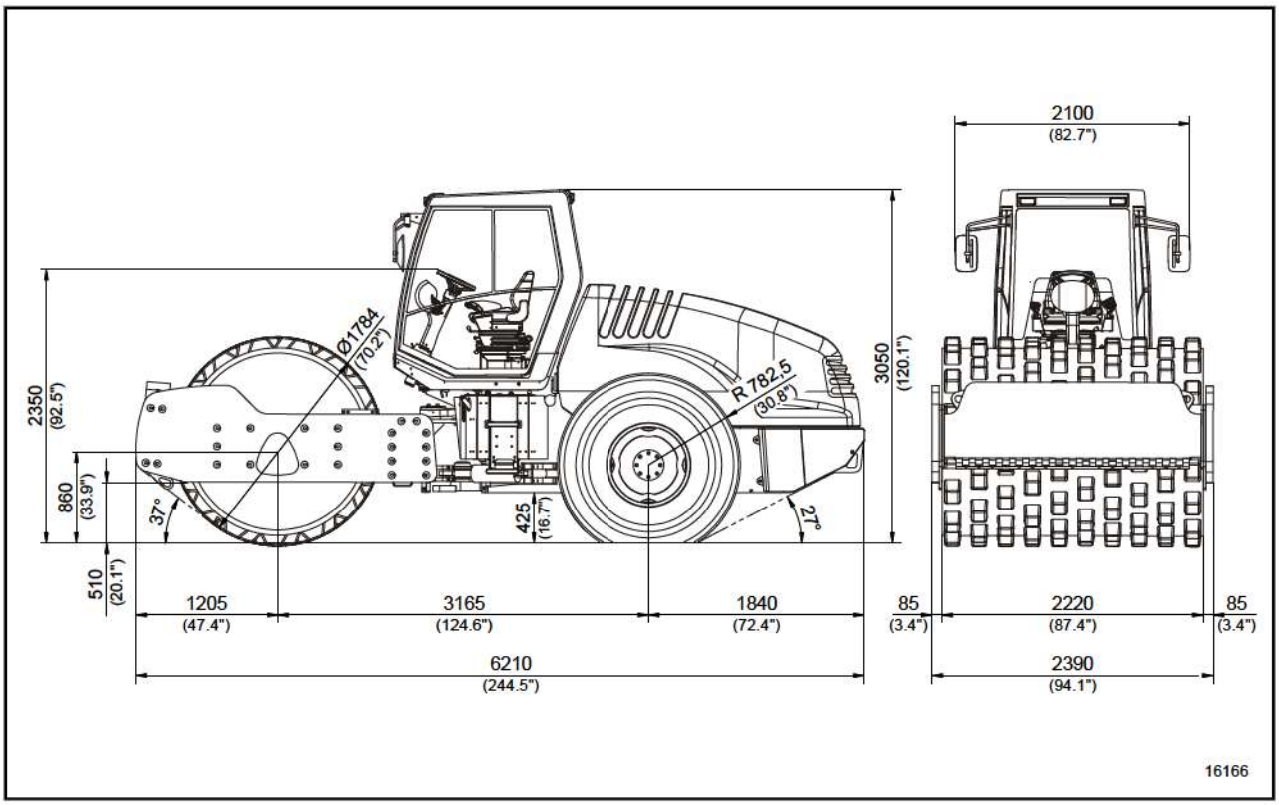
5.02.02 3516 P



5.02.03 3518, 3520



5.02.04 3518 P, 3520 P



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.

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5.03.01 Main fuses

Fuses

Position	Fuse occupancy	Fuse
F01	On-board electrical system (terminal 30)	100 A
F02	Alternator B+	100 A
F03	Cold starting device	150 A
F04	not used	

400-27

5.03.02 Fuses, electrical box

Fuses

Position	Fuse occupancy	Fuse
F1	not used	
F2	not used	
F3	Sensors for: – Coolant level – Air filter	5 A
F4	Sensors for: – *Vibration frequency – *Driving speed	5 A
F5	Fuel level transmitter *Filling pump control	5 A
F6	Multifunction handle *Push plate	7.5 A
F7	EMERGENCY STOP Diesel engine controller (EMR) (terminal 15)	7.5 A
F8	*Driving light, right	7.5 A
F9	*Driving light, left	7.5 A
F10	*Parking light, right	5 A
F11	*Parking light, left	5 A
F12	Signal horn	10 A

Position	Fuse occupancy	Fuse
F13	*Warning flasher (terminal 15)	10 A
F14	*Filling pump	25 A
F15	*Backup alarm	7.5 A
F16	*Fuel pre-heating	30 A
F17	Vibration	7.5 A
F18	*Compaction meter (HCM)	7.5 A
F19	not used	
F20	Alternator D+	5 A
F21	Display (terminal 15)	7.5 A
F22	not used	
F23	Socket	10 A
F24	Gear shifting	10 A
F25	Diesel engine speed adjustment	7.5 A
F26	not used	
F27	*Heating, air conditioning (terminal 15)	15 A
F28	*Seat contact switch	10 A
F29	Cabin (clamp 15)	30 A
F30	Electrical system (terminal 30)	10 A
F31	Diesel engine controller (EMR) (terminal 30)	25 A
F32	*Lighting (terminal 30)	15 A
F33	*Warning flasher (terminal 30)	10 A
F34	Cabin (clamp 30)	30 A
FL	Receptacle for fusible test	

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

400-28

5.03.03 Fuses, operator's cabin

Fuses

Position	Fuse occupancy	Fuse
1	Illumination for control devices (terminal 58)	10 A
2	Interior cab lighting, tachograph (terminal 30)	10 A
3	Working lights at the cabin (terminal 15)	25 A
4	Windshield washer, rotating light (terminal 15)	15 A
5	Windshield wiper front / back (terminal 15)	15 A
6	Radio (terminal 30)	10 A
7	*Air conditioning system	40 A
8	*Air conditioning system	40 A

403-09

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

6.00.01 Safety device ROPS cabin

General

The ROPS cabin 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 cabin was demounted (from the machine) due to transport or repair reasons, the ROPS cabin needs to be remounted according to instructions prior to operating the machine again.

Assembly instructions ROPS cabin

⚠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

Installation

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

Visual test

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

The reinforcement elements of the ROPS cabin 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.

619-00

6.00.02 Safety device ROPS roll-over bar

General

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

Assembly instructions ROPS roll-over bar

⚠WARNING

High self-weight of machine!

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

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

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Installation

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. Observe specified starting torque (see picture).

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.

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