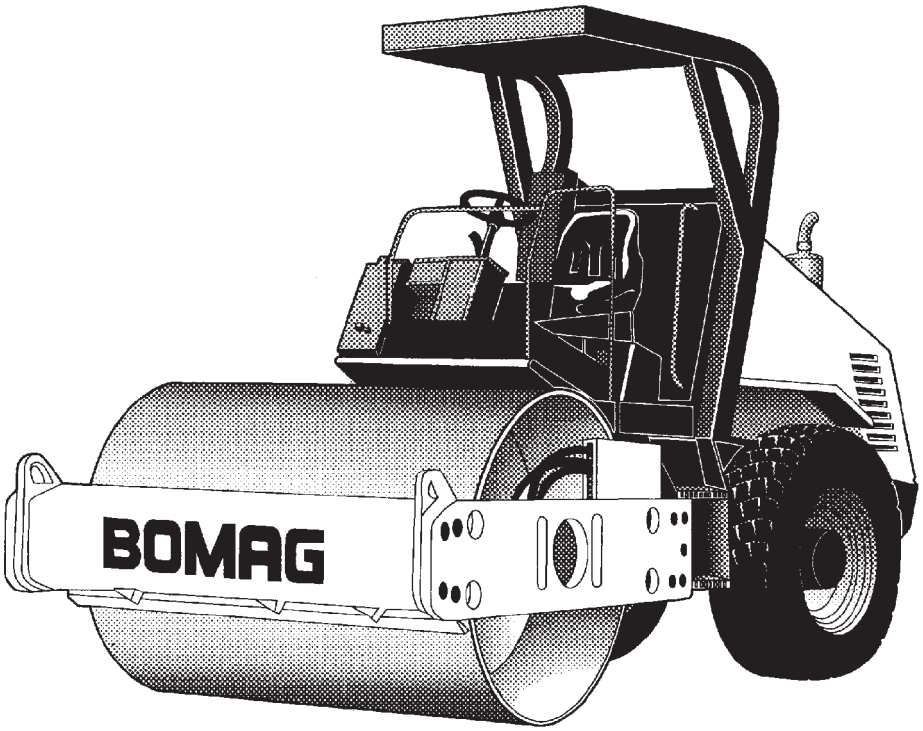
BOMAG

Operating Instructions
Maintenance Instructions

BW145D-3 / BW145DH-3 / BW145PDH-3

SN: 901581471001 > SN: 901581481001 >
SN: 901581491001 >



Single Drum Vibratory Roller

Catalog Number
00815708 **11/08**

If the machine is equipped with a battery :

CALIFORNIA
Proposition 65 Warning

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.
Wash hands after handling.

If the machine is equipped with a diesel engine :

CALIFORNIA
Proposition 65 Warning

The engine exhaust and some of its constituents are known to the state of California to cause cancer, birth defects, and other reproductive harm.

BOMAG machines are products from the wide range of BOMAG compaction equipment.

BOMAG's vast experience, together with the most up-to-date production and testing methods, including service life tests of all important components and highest quality demands, guarantee maximum reliability of your machine.

These instructions comprise:

- Safety regulations
- Operating instructions
- Maintenance instructions
- Trouble shooting

Using these instructions will

- help you to get to know the machine.
- avoid malfunctions caused by unexpert operation.

Compliance with the maintenance instructions will

- increase the reliability of your machine on the site,
- increase the service life of the machine,
- reduce repair costs and downtimes.

BOMAG shall not assume liability for safe functioning of the machine

- if it is handled in a way which does not comply with the usual modes of use,
- if it is used for purposes other than those mentioned in the instructions.

No warranty claims can be lodged for damage resulting from

- operating errors,
- insufficient maintenance and
- wrong fuels and lubricants.

Please note!

This manual has been written for the operator and the service personnel at the site.

Keep this manual always close at hand , e.g. in the tool compartment of the machine or in the container provided.

You should only operate the machine if you are fully familiar with the contents of these instructions.

You must also observe all applicable safety regulations.

Please observe also the guidelines of the Civil Engineering Liability Association "Safety Regulations for the Operation of Road Rollers and Soil Compactors" and the applicable accident prevention instructions.

For your own safety you should only use BOMAG-spare parts.

We reserve the right for technical modifications without prior notification.

These operating and maintenance instructions are also available in other languages.

A spare part catalogue can be obtained from your BOMAG dealer when giving him the serial number of your machine.

Information about the correct use of our machines in earth work and for asphalt applications can be obtained from your BOMAG dealer.

The above points do not constitute an extension of the warranty and liability conditions specified in the general terms of business of BOMAG.

We wish you much success with your BOMAG machines.

BOMAG GmbH & Co. OHG

Printed in Germany

Copyright by BOMAG

Foreword

Please fill in

. . . . . .

Machine type (Fig. 1)

. . . . . .

Serial-number (Fig. 1 and 2)

. . . . . .

Engine type (Fig. 3)

. . . . . .

Engine number (Fig. 3)

i Note

Supplement the above data together with the commissioning protocol.

During commissioning our organisation will instruct you in the operation and maintenance of the machine.

Please observe strictly the safety regulations and all notes on risks and dangers!

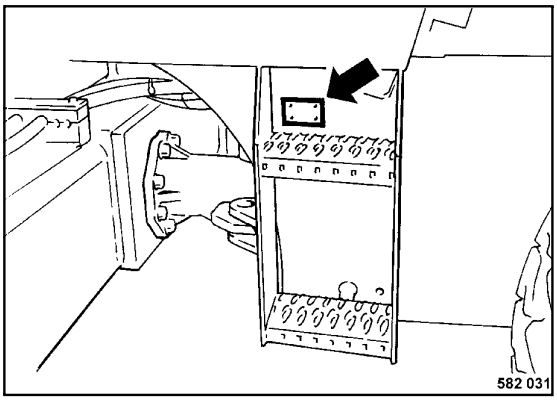


Fig. 1

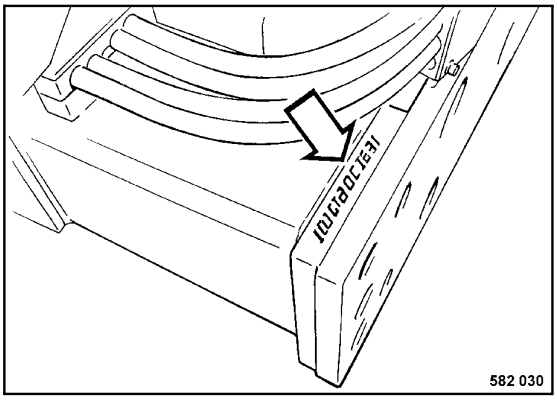


Fig. 2

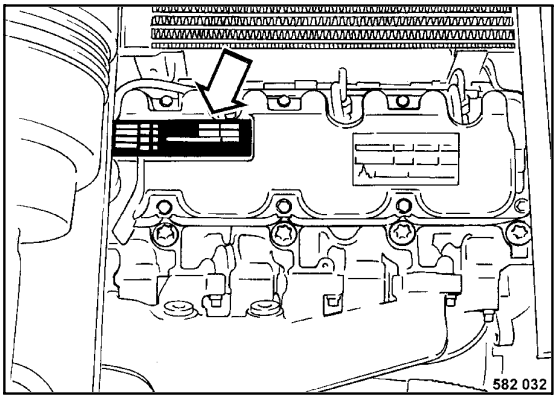


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1 Technical Data

Technical Data

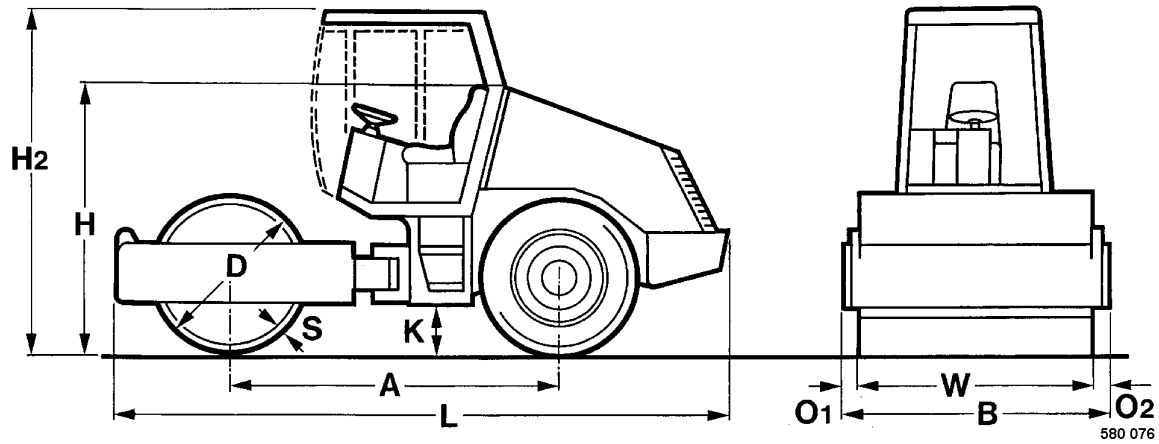


Fig. 4

Dimensions in mm	A	B	D	H	H2	K	L	O1	O2	S	W
BW 145 D-3	2222	1546	1058	1900	2750	313	4194	60	60	22	1426
BW 145 DH-3	2222	1546	1058	1900	2750	313	4194	60	60	22	1426
BW 145 PDH-3	2222	1546	1044	1900	2750	313	4194	60	60	15	1426

*		**BW 145 D-3**	**BW 145 DH-3**	**BW 145 PDH-3**
Weights				
Operating weight (CECE) with ROPS-cabin	kg	4990	5050	5330
Front axle load (CECE)	kg	2620	2680	2960
Rear axle load (CECE)	kg	2370	2370	2370
Static linear load	kg/cm	18,4	18,8	-
Travel characteristics				
Travel speed (1)	km/h	0 ... 6	0 ... 5	0 ... 5
Travel speed (2)	km/h	0 ... 10	0 ... 10	0 ... 10
Max. gradability with vibration	%	47	55	55

*		BW 145 D-3	BW 145 DH-3	BW 145 PDH-3
Drive				
Engine manufacturer		Deutz	Deutz	Deutz
Type		BF4L 2011	BF4L 2011	BF4L 2011
Cooling		Air/oil	Air/oil	Air/oil
Number of cylinders		4	4	4
Rated power ISO 3046	kW	56	56	56
Rated speed	rpm	2650	2650	2650
Fuel		Diesel	Diesel	Diesel
Electrical equipment	V	12	12	12
Drive system		hydrostatic	hydrostatic	hydrostatic
Driven axles		2	2	2
Brakes				
Service brake		hydrostatic	hydrostatic	hydrostatic
Parking brake		hydr.-mech.	hydr.-mech.	hydr.-mech.
Steering				
Type of steering		articulated	articulated	articulated
Steering operation		hydrostatic	hydrostatic	hydrostatic
Vibration				
Drive system		hydrostatic	hydrostatic	hydrostatic
Frequency	Hz	34	34	34
Amplitude	mm	1,7/0,85	1,7/0,85	1,4/0,7
Tires				
Tire size		335/80R20MPT81	335/80R20MPT81	340/80R18IT530
Air pressure	bar	1,8	1,8	1,8
Tank contents				
Hydraulic oil	Litres	44	44	44
Fuel	Litres	110	110	110
Engine oil	Litres	10,5	10,5	10,5

* The right for technical modifications remains reserved

The following noise and vibration values according to the EC-directive for machines, edition (91/368/ EEC) were measured at nominal engine speed and with the vibration switched on. The machine was standing on an elastic base.

During operation these values may vary because of the existing operating conditions.

Noise value

The sound level according to enclosure 1, paragraph 1.7.4. f of the EC-machine regulation is

sound pressure level at the work place of the operator (with cabin):

L_{pA} = 78,4 dB(A)

sound capacity level:

L_{wA} = 101,8 dB(A)

These sound values were determined according to ISO 3744 for the sound capacity level (L_{wA}) and ISO 6081 for sound pressure level (L_{pA}) at the place of the operator.

Vibration value

The vibration values according to enclosure 1, paragraph 3. 6. 3. a of the EC-machine regulation are:

Vibration of the entire boy (driver's seat)

The weighted effective acceleration value determined according to ISO 2631 part 1, is ≤ 0,5 m/sec^2.

Hand-arm vibration values

The weighted effective acceleration value determined according to ISO 8662 part 1, is ≤ 2,5 m/sec^2.

2 Safety regulations

General

This BOMAG machine is built in accordance with the latest technical standard and the valid technical rules and regulations. There is, however, a risk of danger for persons and property if:

- the machine is used for purposes other than those it is intended for
- the machine is operated by untrained personnel
- the machine is modified or converted in an unprofessional way
- the applicable safety regulations are not observed.

Each person involved in operation, maintenance and repair of the machine must therefore read and apply these safety regulations. This should be confirmed by obtaining the signatures of the customer, if necessary.

Furthermore the following regulations and instructions are obviously also valid:

- applicable accident prevention instructions
- generally acknowledged safety and road traffic regulations
- country specific safety regulations. It is the duty of the operator to know and observe these regulations. This applies also for local regulations and the regulations for various types of manual work. If the recommendations in this manual differ from the regulations valid in your country, you must strictly observe the regulations in your country.

Intended use

This machine must only be used for:

- compaction of bituminous materials, e.g. road surface layers. (AC and AD machines only)
- medium and heavy compaction tasks in earth work (road sub-bases)
- This machine must only be operated with fully functional safety equipment.
- The machine should be checked by an expert once every year.

Unintended use

Dangers may, however, arise from the machine if it is used by untrained personnel in an unprofessional way or if it is used for purposes other than those mentioned in these instructions.

Do not work with vibration on hard concrete, on a cured concrete layer or heavily frozen ground.

Starting and operation of the machine in an explosive environment is prohibited.

Who is allowed to work with the machine?

The machine must only be operated by trained and authorized persons which are at least 18 years of age. The responsibilities for the operation of the machine must be clearly specified and complied with.

Persons under the influence of alcohol, medication or drugs must not operate, service or repair the machine.

Maintenance and repair tasks require specific knowledge and must therefore only be carried out by trained and qualified personnel.

Conversions and alterations to the machine

Unauthorized conversions to the machine are prohibited for safety reasons.

Original parts and accessories have been specially designed for this machine. We wish to make expressly clear that we have not tested or authorized any original parts or special equipment not supplied by us. The installation and/or use of such products can impair the active and/or passive driving safety. The manufacturer expressly excludes any liability for damage resulting from the use of non-original parts or accessories.

Safety notes in the operating and maintenance instructions:

⚠ Danger

Sections marked like this point out possible dangers for persons.

⚠ Caution

Sections marked like this point out possible dangers for the machine or for parts of the machine.

i Note

Sections marked like this provide technical information concerning the optimal economical use of the machine.

Environment

Sections marked like this highlight activities for the safe and environmental disposal of fuels and lubricants as well as replaced parts.

Observe all environment protection regulations.

Information and safety stickers/decals on the machine

Keep stickers/decals complete (see spare parts catalogue) and fully legible and observe their meaning.

Replace damaged or illegible stickers/decals immediately.

Loading the machine

Use only strong and stable loading ramps. The ramp inclination must be lower than the gradability of the machine.

Secure the machine against turning over or slipping off.

Secure the machine on the transport vehicle against rolling off, slipping and turning over.

Persons are highly endangered if

- they step or stand under loads being lifted
- they remain in the drive range of the machine during a demonstration or during loading.

The machine must not swing about when lifted off the ground.

Use only safe lifting gear of sufficient load bearing capacity.

Attach the lifting gear only to the specified lifting points.

Towing the machine

Since the machine is not fitted with a towing hitch, the machine cannot be towed with a tow bar.

If the machine has to be towed urgently out of the danger zone because of other risks, this must only be done on level ground or uphill using chains and ropes. For this purpose towing ropes of sufficient tensile strength must be fastened on the lifting eyes.

After releasing the brake the machine can only be braked by the towing vehicle.

Before releasing the brake block the machine with chocks to prevent unintended rolling.

Checking the roll-over protection structure (ROPS)

The machine frame must not be distorted, bent or cracked in the area of the ROPS structure.

The ROPS structure must not show any rust, damage, hairline cracks or open fractures.

The ROPS must not rattle about when driving the machine. This would mean that the fastening screws are insufficiently fastened. All screwed connections must be tight and in accordance with the specifications (observe the tightening torques). Screws and nuts must not be damaged, distorted or deformed.

No additional parts must be welded or bolted on and no holes must be drilled without the permission of the dealer, since this may impair the strength of the structure.

Starting the machine

Before starting

Operation of the machine is only permitted when sitting in the operator's seat.

Use only machines which have been properly serviced at regular intervals.

Become acquainted with the equipment, the control elements, the working mode of the machine and the area you will be working in.

Use your personal protective outfit (hard hat, safety boots etc.).

Check before mounting the machine if:

- there are persons or obstructions beside or under the machine

- the machine is free of any oily and combustible material
- all handrails, steps and platforms are free of grease, oils, fuels, dirt, snow and ice
- the engine compartment hood is closed and locked

To climb onto the machine use steps and handrails.

Check before starting, whether:

- the machine shows any obvious defects
- all protective devices are properly secured in their place
- steering, brakes, control elements, lighting and warning horn are in order
- the seat is correctly adjusted
- the mirrors (if available) are clean and correctly adjusted.

Do not start the machine if any gauges, control lights or controls are defective.

Do not take any loose objects with you or fasten them to the machine.

On machines with ROPS you should always wear your seat belt!

Starting

Start and operate the machine only from the operator's seat

For starting set all control levers to "neutral position".

Do not use any starting aids such as Start Pilot or ether.

After starting check all gauges.

Starting with jump leads

Connect plus with plus and minus with minus (ground cable) - always connect the ground cable last and disconnect it first! Wrong connections may cause severe damage in the electric system.

Never start the engine by bridging the electrical connections on the starter, because the machine would probably start to move immediately.

Starting in closed rooms

Exhaust gases are toxic! Always ensure an adequate supply of fresh air when starting in closed rooms!

Driving the machine

Persons in the danger area

If the machine should turn over and the cabin door is closed, the right hand side cabin window can be used as an emergency exit.

Check if there are persons or obstacles in the danger area before starting or resuming work, especially when driving in reverse.

If necessary give warning signals. Stop work immediately, if persons remain in the danger area despite the warning.

Do not stand in the machine's articulation area while the engine is running. Danger of injury!

Driving

In emergency situations and in case of danger operate the emergency stop switch immediately. Do not use the emergency stop switch as service brake.

Resume operation only after eliminating the danger that has led to the actuation of the emergency stop.

If the machine comes in contact with high voltage power lines:

- do not leave the operator's stand
- warn others from coming close to the machine or touching it
- if possible move the machine out of the danger zone
- have the power shut off

Operate the machine only from the operator's stand.

Keep the cabin doors closed.

Do not adjust the operator's seat while driving.

Do not climb onto or off the machine while it is driving.

Choose the travel direction only when the machine is standing.

Do not use the machine to transport persons.

If you recognize unusual noises and the development of smoke, detect the cause and have the fault corrected.

Always keep a safe distance to excavations and embankments and avoid all activities which could impair the stability of the machine.

Do not work with vibration on hard concrete, cured asphalt or hard frozen ground.

When driving under flyovers, bridges, tunnels, power lines etc. ensure sufficient distance.

Driving on gradients and slopes

Do not drive on gradients which exceed the maximum gradability of the machine.

Always drive extremely carefully on slopes and always directly up or down the slope, never diagonally. Change to the lower speed range before approaching the inclination.

Wet and loose soils reduce the ground adhesion of the machine on gradients and slopes considerably. Higher risk of accidents!

Behaviour in traffic

Match your speed to the working conditions.

Always give way to loaded vehicles.

Switch the lights on if the visibility is poor.

Keep away from edges and embankments.

Check the effect of vibration

When compacting with vibration check the effect on nearby buildings and underground supply lines (gas, water, sewage, power lines) and stop vibratory compaction if necessary.

Never use the vibration on hard (frozen, concrete) ground. Risk of bearing damage!

Parking the machine

Park the machine on level and firm ground.

Before leaving the machine:

- move the travel control lever to neutral position
- apply the parking brake
- shut the engine down and pull the ignition key out
- lock the cabin door
- secure the cabin against unauthorized use.

Do not jump off the machine, but use access steps and hand rails.

Mark parked machines, which could be an obstruction, by attaching clearly visible signs.

Parking on gradients or slopes

Secure the machine against rolling away, place metal chocks in front of and behind the drums.

Filling the fuel tank

Do not inhale fuel fumes.

Refuel only after shutting the engine and the auxiliary heater down.

Do not refuel in closed rooms.

No open fire, do not smoke.

Do not spill any fuel. Catch running out fuel, do not let it seep into the ground.

Wipe off spilled fuel. Keep fuel free of dirt and water.

Leaking fuel tanks can cause explosions. Ensure tight fit of the fuel tank filling cover, replace it if necessary.

Fire protection measures

Make yourself acquainted with the location and the operation of fire extinguishers. Observe fire warning and fire fighting installations.

Maintenance work

Strictly apply the specified maintenance tasks, including the changing of parts.

Maintenance work must only be carried out by skilled and authorized personnel.

In case of maintenance and assembly work overhead make sure to use the prescribed or other safe access steps, ladders and gangways. Do not use parts of the machine as access steps.

Keep unauthorized persons away from the machine.

Do not perform maintenance work while the machine is driving or the engine is running.

Park the machine on ground as level and firm as possible.

Pull the ignition key out.

Secure the articulated joint with the articulation lock.

Working on hydraulic lines

Depressurize hydraulic lines before working on them. Hydraulic oil escaping under pressure can penetrate the skin and cause severe injury. Consult a doctor if you are injured by pressurized hydraulic oil as otherwise serious infections may result.

When adjusting the hydraulic system do not stand behind the drums/wheels.

Do not change the setting of high pressure relief valves.

Drain the hydraulic oil at operating temperature - danger of scalding!

Catch running out hydraulic oil and dispose of environmentally.

Always collect and dispose of biodegradable hydraulic oils separately.

Do not start the engine after draining the hydraulic oil.

Check all connections and fittings for leakages once all work is completed (with the lines still depressurized!).

Changing of hydraulic hoses

Hydraulic hoses must be examined visually at regular intervals.

Hydraulic hoses must be changed immediately in case of:

- damage to the outer surface down to the lining (e.g. chafings, cuts, cracks)
- embrittlement of the outer surface (development of cracks in the hose material)
- deformation under pressurized and depressurized conditions, which are not in accordance with the natural shape of the hydraulic hose
- deformation in bends such as squeezed spots, extreme bends, layer separation, formation of blisters
- leakages
- non-observance of installation requirements.
- separation of the hydraulic hose from the crimped fitting
- corrosion of the crimped fitting, which impairs the function and the strength
- do not mix up hoses by mistake
- damage or deformation of the fitting which effects the function and the strength or impairs the hose/hose connection.

Only the use of genuine BOMAG hoses ensures that the correct type of hose (pressure range) is used at the right place.

Working on the engine

Shut the engine down before opening the engine compartment hood.

Drain the hydraulic oil at operating temperature - danger of scalding!

Wipe off spilled oil, catch running out oil and dispose of environmentally.

Store used filters and other oily materials in a specially marked refuse container and dispose of environmentally.

Do not leave any tools or other parts, which could lead to damage, in the engine compartment.

Working in the electric system

Disconnect the battery and cover it with insulating material before starting to work in the electric system.

Do not use fuses with higher Ampere ratings and do not repair fuses with a piece of wire. Fire hazard!

Always disconnect the battery before starting to weld on the machine.

Working on the battery

When working on the battery do not smoke, do not use open fire.

Do not let hands or clothes come in contact with acid. Treat acid injuries with clear water and consult a doctor.

Metal objects (e.g. tools, rings, wrist watches) must not touch the battery poles - danger of short circuits and fire!

When recharging maintenance free batteries remove all plugs to avoid the accumulation of highly explosive gases.

Observe all relevant instructions when starting with an auxiliary battery.

Dispose of used batteries environmentally.

Shut the charging current down before disconnecting charging clamps.

Ensure an adequate supply of fresh air, especially if the battery is to be charged in a closed room.

Working on the fuel system

Do not inhale fuel fumes.

No open fire, do not smoke, do not spill any fuel.

Catch running out fuel, do not let it seep into the ground and dispose of environmentally.

Working on wheels and tires

Explosion-like bursting of tires and parts of tires and rims can cause most severe or even fatal injuries.

The assembly of tires must only be carried out by experienced personnel and with the correct equipment. If necessary have the tires assembled in a qualified workshop.

Always ensure correct tire pressure and do not exceed the max. permissible pressure.

Examine the tires every day for too low pressure, cuts, bulges, faulty rims, missing wheel studs or nuts. Do not drive with faulty tires or wheels.

Non-stick emulsion must only be mixed of water and non-stick additives according to the instructions of the non-stick agent manufacturer. Strictly observe the regulations for the protection of the environment.

Cleaning

Do not clean the machine while the engine is running.

Do not use gasoline or other easily inflammable substances for cleaning purposes.

When using high pressure cleaning equipment do not subject electrical parts and insulating materials to the direct water jet or cover them beforehand.

- Do not guide the water jet into the exhaust or into the air filter.

After maintenance work

Reinstall all protections and guards once all maintenance work is completed.

Repair

Attach a warning tag to the steering wheel if the machine is defective.

Repairs must only be performed by qualified persons who have been instructed for this purpose. Use our repair instructions.

Exhaust gases are highly dangerous! Always ensure an adequate supply of fresh air when starting in closed rooms!

Test

Depending on the type of application and the operating conditions vibratory equipment has to be examined by a specialist whenever required, but at least once every year.

3 Indicators and Controls

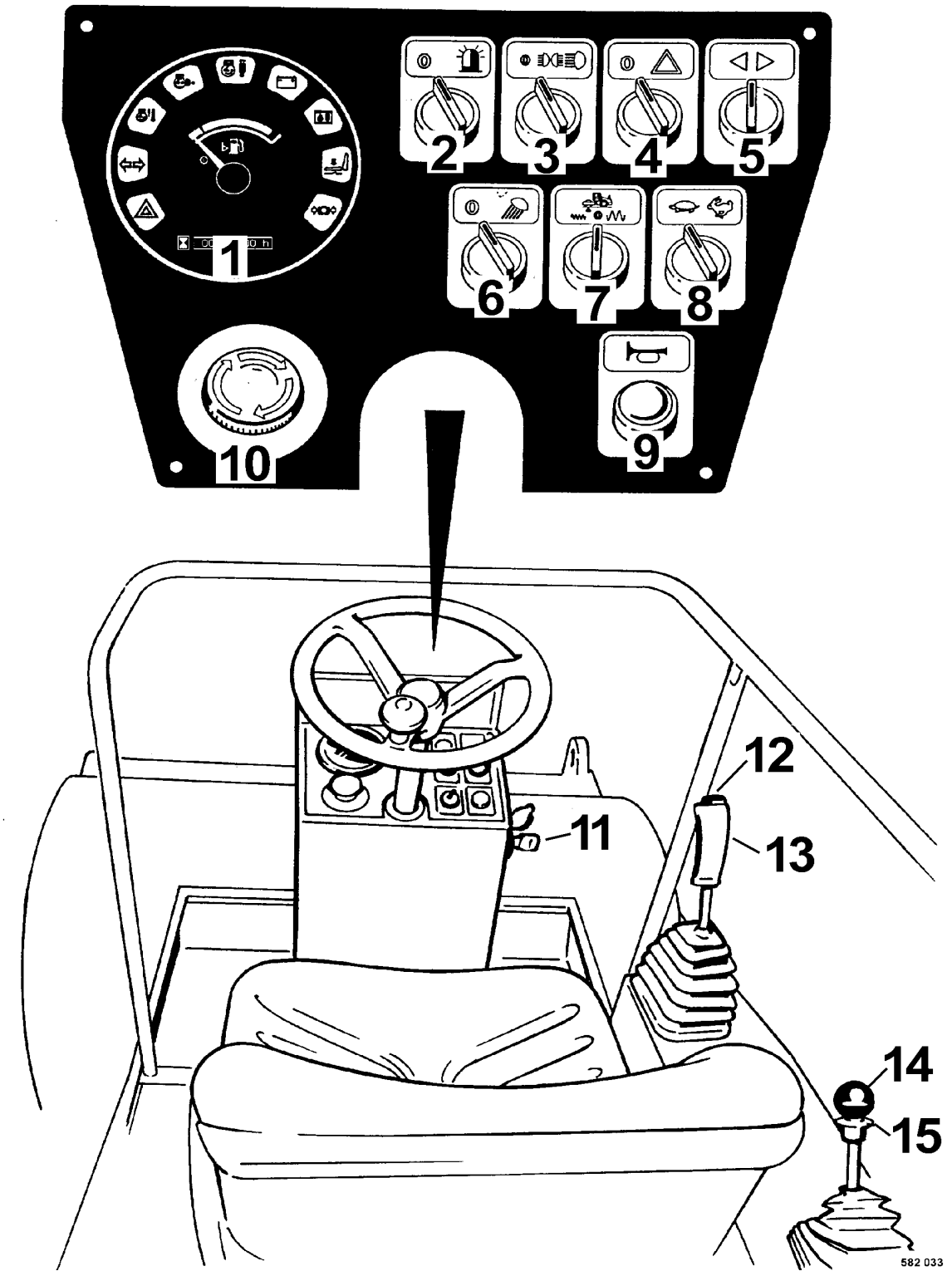


Fig. 5

1 Multi-function display
2 Rotary switch for flashing beacon*
3 Rotary switch for lighting (StVZO)*
4 Rotary switch for hazard light system*
5 Rotary switch for direction indicators left/right*
6 Rotary switch for working head lights*
7 Rotary switch vibration high/low frequency
8 Rotary switch for speed range selection
9 Push button for warning horn
10 Emergency stop push button
11 Ignition switch (at the side)
12 Push button for vibration
13 Travel lever
14 Throttle lever
15 Locking plate for throttle lever

* Optional equipment

3.1 General notes

Please read this section thoroughly before operating this machine if you are not yet conversant with the indicators and control elements. All functions are described in detail hereunder.

Paragraph 4 Operation contains only concise descriptions of the individual operating steps.

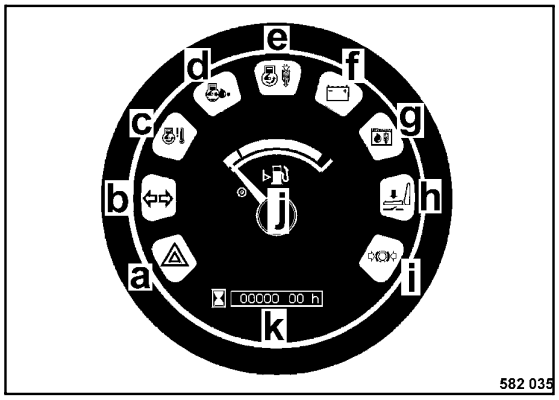


Fig. 6

No. 1 = Multi-function display

i Note

After switching the ignition on all lamps light up for approx. 3 seconds as a self-test.

The control and warning lamps light up while the engine is running:

a = Hazard light switched on

b = Direction indicator switched on

c = Engine oil temperature too high, warning buzzer sounds. Clean engine and radiator

d = Engine oil pressure too low, warning buzzer sounds. Check the engine oil level, if necessary have the engine repaired.

e = Air filter cartridge soiled. Clean, change the cartridge.

f = The battery is not being charged, check the V-belt, if necessary repair the generator.

= Light with ignition on and engine off.

g = Hydraulic oil filter soiled, the warning buzzer sounds. Replace the filter element, check the hydraulic system if it comes on too early.

h = not used

i = Brake closed or travel lever in second notched position

j = Fuel level gauge

k = Operating hour meter

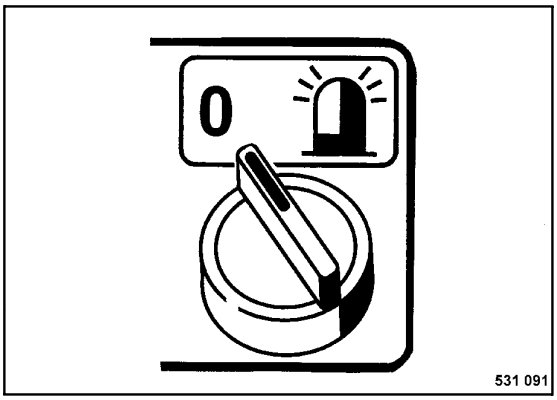


Fig. 7

No. 2 = Rotary switch for flashing beacon

Position "left" = Flashing beacon switched off

Position "right" = Flashing beacon switched on

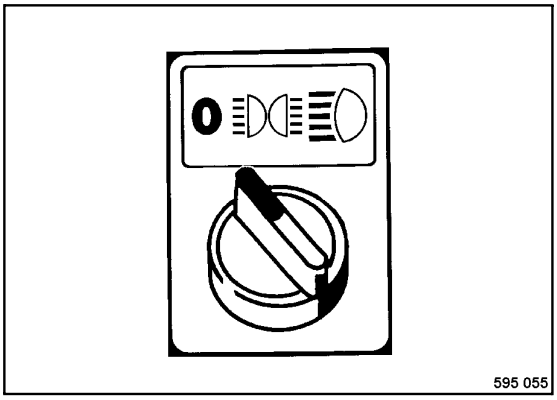


Fig. 8

No. 3 = Rotary switch, lighting (StVZO) *

Position "left" = light off

Position "middle" = fender lights on, with the ignition switch in position "I" or "P"

Position "right" = travel lights on, with ignition switch in position "I".

* Option

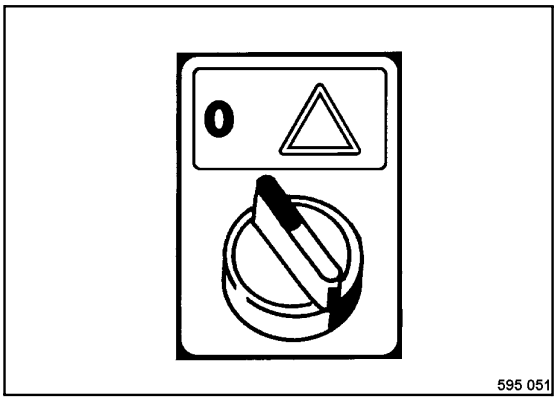


Fig. 9

No. 4 = Rotary switch for hazard light system*

Position "left" = hazard light switched off, the control lights go out.

Position "right" = hazard light switched on, control light 7 on fault monitoring board lights up.

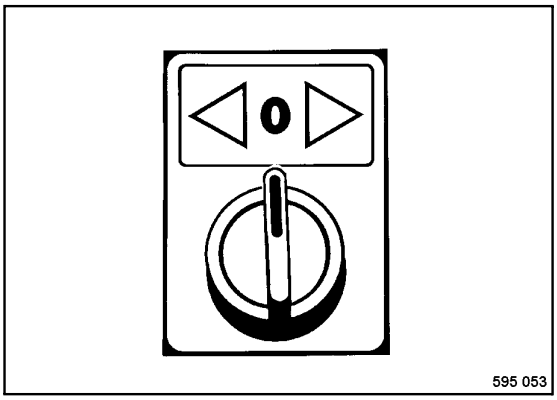


Fig. 10

No. 5 = Rotary switch for direction indicators left / right**

Position "middle" = direction indicator off

Position "left or right" = front and rear direction indicators on the respective side light up, the control light 6 in the fault monitoring board flashes

* Option
** Option

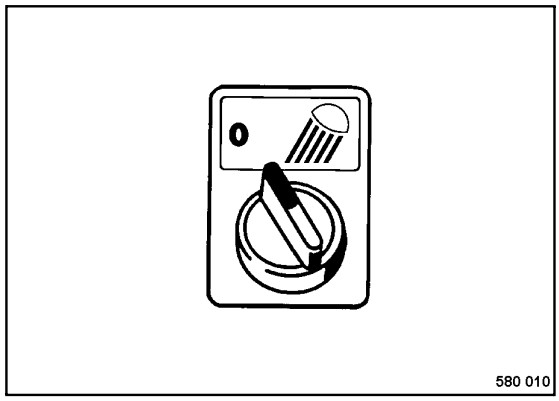


Fig. 11

No. 6 = Rotary switch working lights ***

Position "left" = light off

Position "right" = working lights on, with ignition switch in position "I".

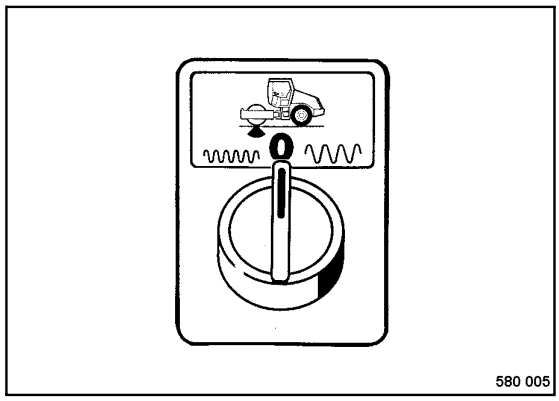


Fig. 12

No. 7 = Rotary switch, vibration

Position "middle" = vibration off

Position "left" = low amplitude, high frequency

Position "right" = high amplitude, low frequency

*** Option

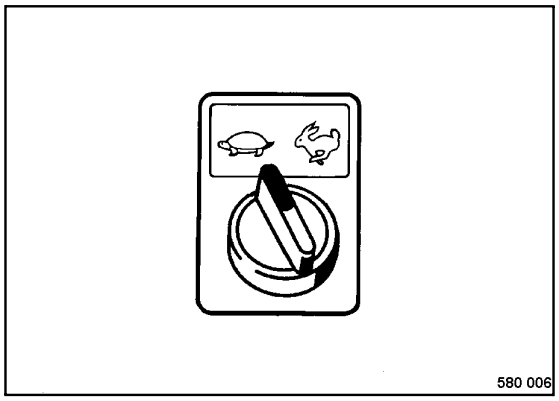


Fig. 13

No. 8 = Rotary switch for speed range selection

Position "turtle" = Working speed

Position "rabbit" = Transport speed

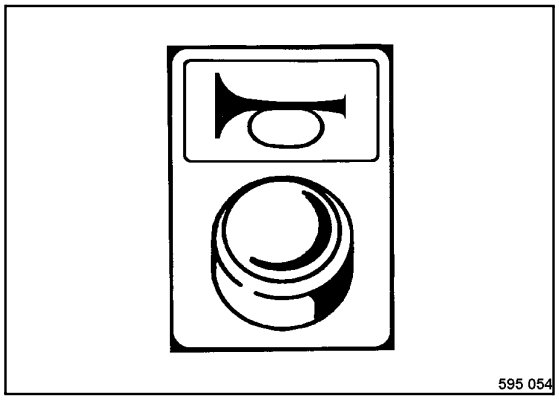


Fig. 14

No. 9 = Push button for warning horn

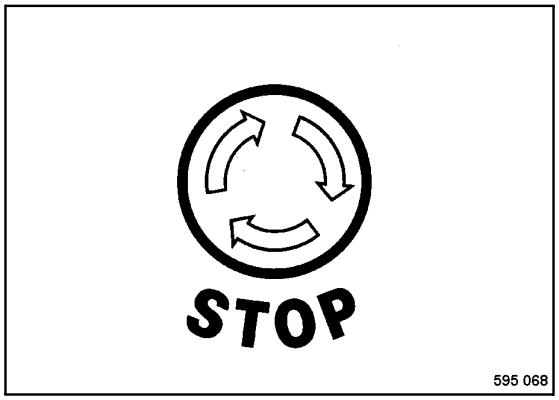


Fig. 15

No. 10 = Emergency stop switch

The engine will be shut down and the brake will close.

⚠ Danger

Danger of accident!

Operate only in emergency situations during operation, do not use as a service brake.

The machine should only be started again after the danger, that caused the actuation of the emergency stop switch, has been removed.

operate = push the button completely down, it will automatically lock in end position.

unlock = turn the button clockwise and release it.

to drive = move the travel lever first to braking position, then start the engine and choose the travel direction.

For safety reasons the travel system of the machine will only be enabled after the travel lever has been shifted back to braking position.

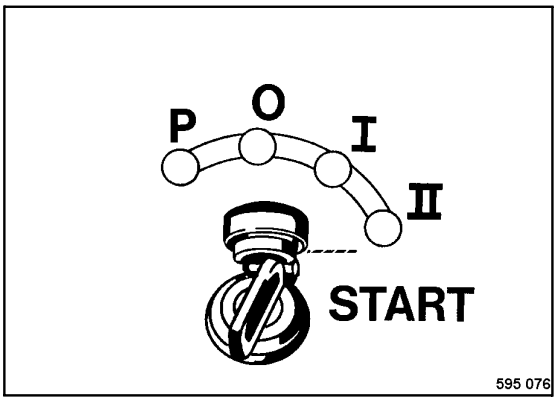


Fig. 16

No. 11 = Ignition switch

Position "P"/"0" = Ignition off, key can be pulled out, engine off

Position "I" = Ignition on, all control and warning lights in the multi-function display light up for a moment

i Note

The engine can only be started if both travel levers are in “neutral”.

The ignition switch is designed with a lock to prevent repetitive starting. For a new starting attempt the ignition key must first be turned back to position "0".

Position "II" = turn further against spring pressure, he engine starts, turn the ignition key back to position once the engine has started

⚠ Caution

Run the engine warm for a short while before starting work. Do not allow the engine to run longer than 10 minutes with idle speed.

Do not shut the engine down all of the sudden from full speed, but let it idle for a while for temperature equalization.

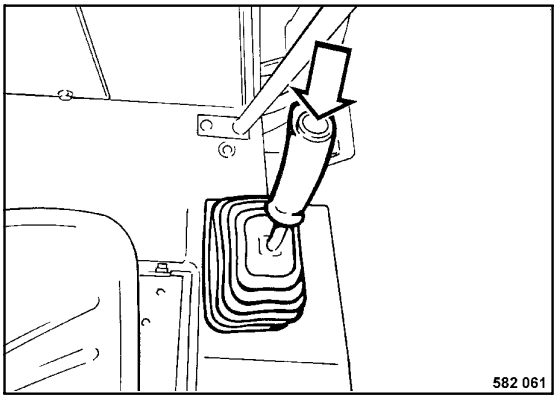


Fig. 17

No. 12 = Push button for vibration

- Select or actuate the frequencies with the vibration selector switch.
- Switch the vibration on or off by pressing the push button.

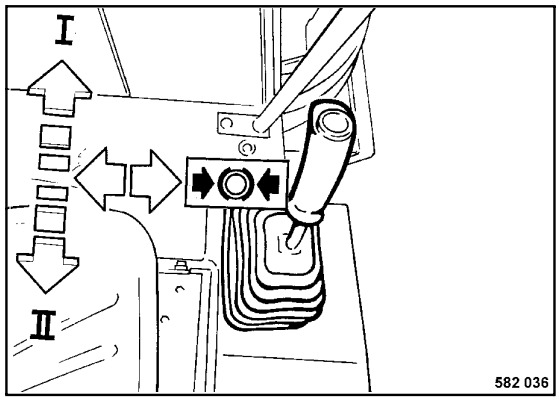


Fig. 18

No. 13 = Travel lever

Position "middle" = Braking position service brake

Position "middle, right" = Parking brake, to start the engine

Position "I" = Forward travel

Position "II" = Backwards travel

i Note

If the engine speed drops under load when driving on steep gradients, take the travel lever slightly back towards neutral. This relieves the hydraulic system and the diesel engine.

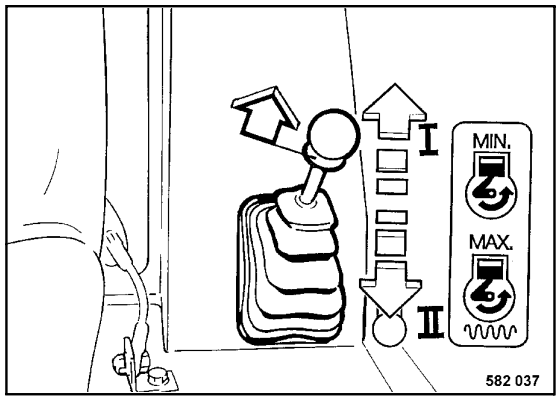


Fig. 19

No. 14 = Throttle lever

Position "I" = Idle speed position

Position "II" = Full load position, operating position for driving and vibration

⚠ Caution

Always drive and vibrate with max. engine speed! Control the travel speed only with the travel lever!

No. 15 = Locking plate for throttle lever

pull = The throttle lever can be moved to position "II"

release = The throttle lever locks in position "II".

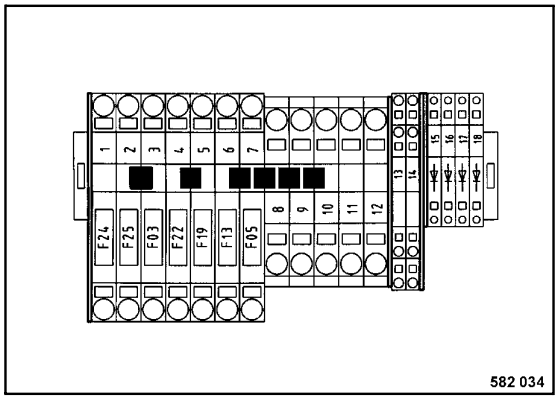


Fig. 20

No. 16 = Fuses in electric installation box

F03, 15A = Vibration

F05, 25A = Socket

F13, 30A = Starting

F19, 15A = Working head lights*

F22, 15A = Working head lights, rear*

F24, 15A = Monitoring, gauges

F25, 15A = Solenoid valve brake/travel

⚠ Danger

Fire hazard!

Do not use fuses with higher ampere ratings and do not bridge fuses.

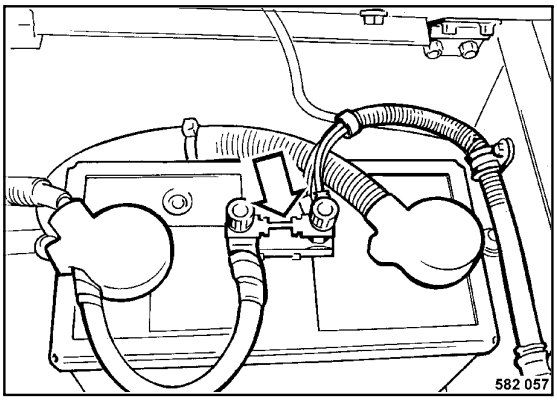


Fig. 21

No. 17 = Main fuse for battery

125A = (F00)

i Note

The main fuse is located in the battery box under the driver's seat

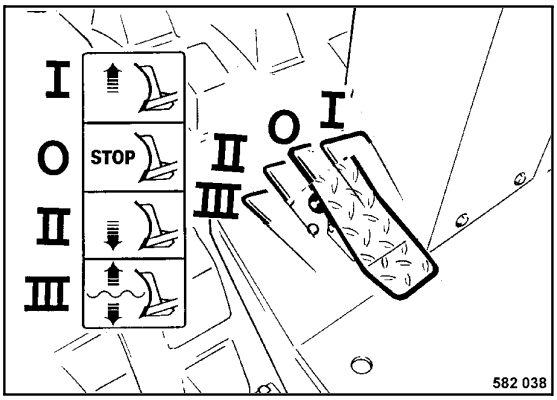


Fig. 22

No. 18 = Pedal for dozer blade*

Position "0" = Stop position. Dozer blade at rest

Position "I" = Dozer blade up

Position "II" = Dozer blade down

Position "II" = Float position to level loose soil when driving in reverse

⚠ Danger

Danger of squashing!

Do not work under the lifted, unsupported dozer blade, support the blade if necessary.

* Optional equipment

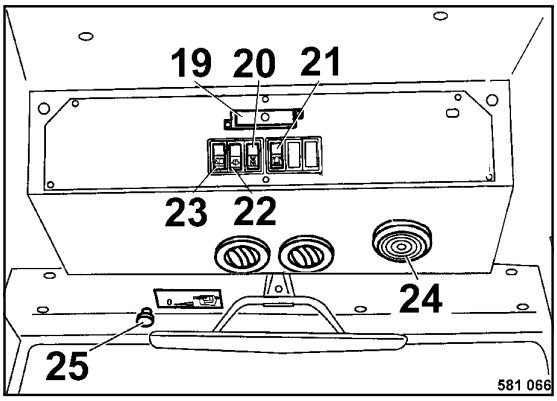


Fig. 23

No. 19 = Fuse box, cabin*

(1) - = not used

(2) 7,5A = Inside light

(3) 7,5A = Windscreen wiper/washer, rear

(4) 7,5A = Windscreen wiper/washer, front

(5) 7,5A = Flashing beacon

(6) 7,5A = Heating blower, radio

⚠ Danger

Fire hazard!

Do not use fuses with higher ampere ratings and do not bridge fuses.

No. 20 = Toggle switch, heating blower

No. 21 = Toggle switch, flashing beacon**

No. 22 = Toggle switch, windscreen wiper/ washer, front***

No. 23 = Toggle switch, windscreen wiper/ washer, rear****

No. 24 = Cabin light

switch on = turn lamp glass clockwise

switch off = turn lamp glass counter-clockwise

No. 25 = Vent for fresh air intake

to operate the slide loosen the adjustment button.

slide to the left = air circulation position

slide to the right = fresh air position

* Optional equipment
** Option
*** Option
**** Option

Switch on the auxiliary hot air blower

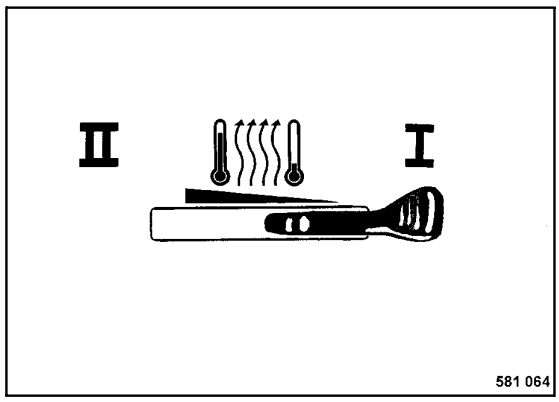


Fig. 24

No. 26 = Shut-off valve for cabin heater***

i Note

The heat exchanger of the cabin heater receives the heat energy from the lubrication oil in the engine.

Position "I" = Cabin heater switched off

Position "II" = Cabin heater full power

*****Optional equipment

4 Operation

4.1 General notes

Please read section 3 Indicators and Control Elements thoroughly before operating the machine if you are not yet fully familiar with the indicators and control elements of the machine.

All indicators and control elements are described in detail in this chapter.

4.2 Tests before taking into operation

The following inspections must be carried out before each working day or before a longer working period.

⚠ Danger

Danger of accident!

Please observe strictly the safety regulations in chapter 2 of this instruction manual!

- Park the machine on ground as level as possible.

Check:

- fuel tank and fuel lines for leaks
- screw joints for tight fit
- function of steering
- machine for cleanliness, damage
- presence of the appropriate operating and maintenance instructions
- check whether the machine has been properly serviced.

i Note

For a description of the following tasks refer to the chapter "maintenance every 10 operating hours".

- Engine oil level

i Note

In hydraulic systems filled with Panolin HLP Synth. 46 always use the same oil to top up. With other ester based oils consult the lubrication oil service of the respective oil manufacturer.

- Check the hydraulic oil level, top up if necessary.

⚠ Danger

Fire hazard!

Do not refuel in closed rooms.

- Check the fuel level, top up if necessary.
- Check water separator in fuel system, drain if necessary.

- Check the scrapers, adjust if necessary
- Check the air pressure in the tires For values refer to the technical data.

⚠ Caution

Ensure equal pressure in both tires.

4.3 Starting the engine

⚠ Danger

Danger of accident!

Always wear your seat belt.

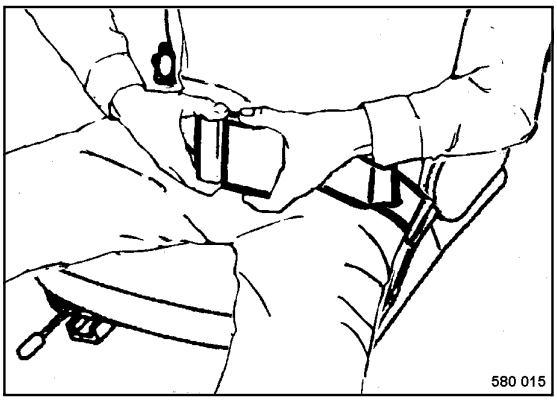


Fig. 25

- Fasten your seat belt (Fig. 25).

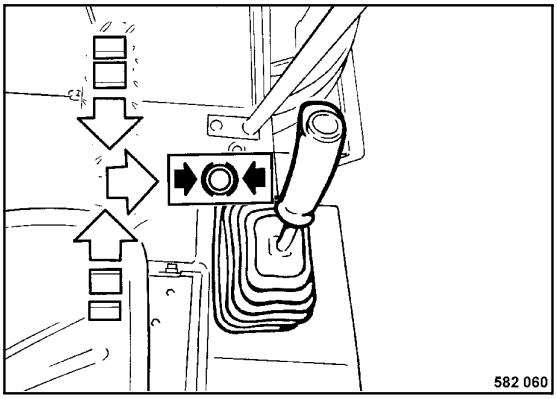


Fig. 26

- Check, whether the travel lever (Fig. 26) is engaged in brake position.

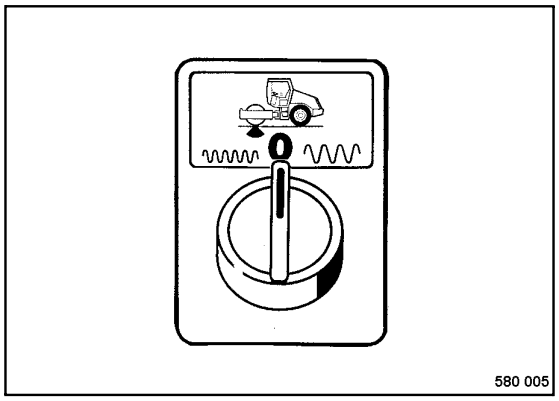


Fig. 27

- Turn the rotary vibration selector switch (Fig. 27) to position "0", vibration off.

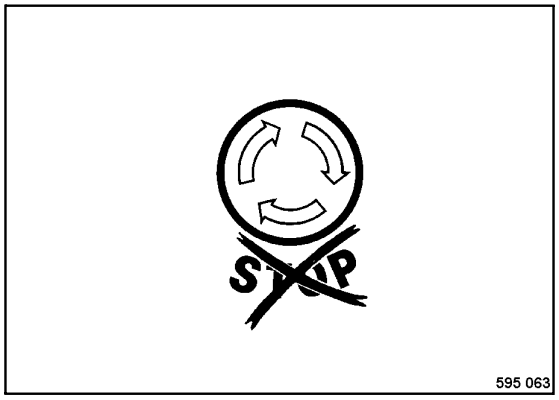


Fig. 28

- Check, whether the emergency stop switch (Fig. 28) is unlocked.

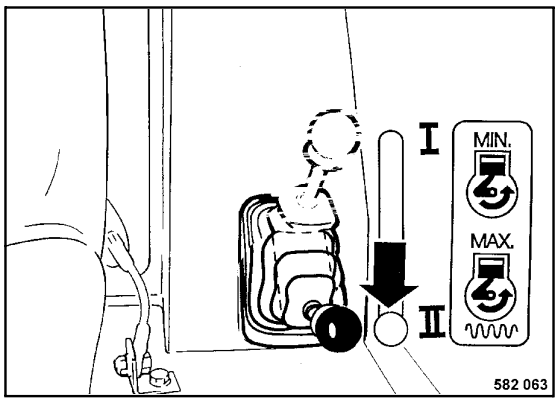


Fig. 29

- Set the throttle lever (Fig. 29) to position "II", full speed.

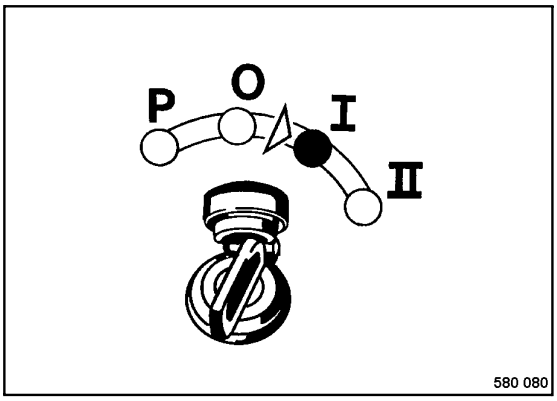


Fig. 30

- Turn the ignition key (Fig. 30) to position "I".

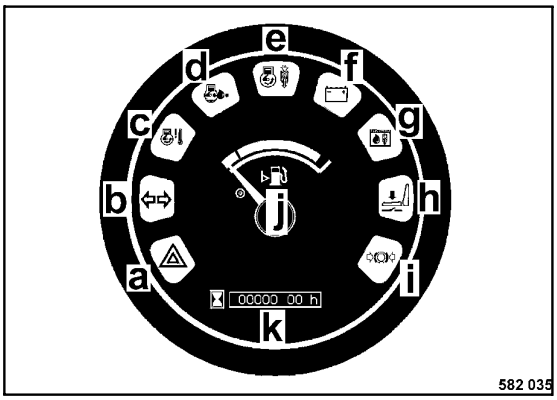


Fig. 31

All control and warning lights (Fig. 31) in the multi-function display light up for a few seconds as a self test.

Charge control light (f), engine oil pressure warning light (d) and brake warning light (i) stay on.

⚠ Caution

Perform the starting process for maximum 20 seconds without interruption and pause for a minute between starting attempts.

If the engine has not started after two attempts perform trouble shooting.

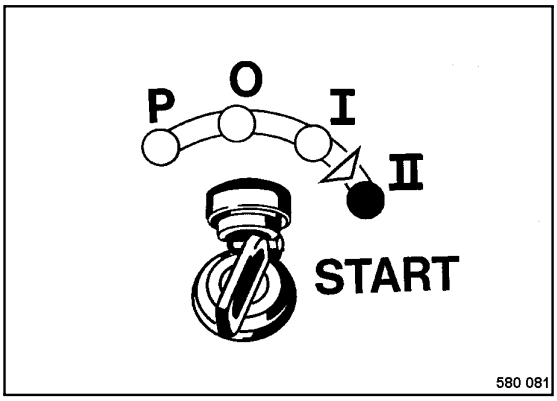


Fig. 32

- Turn the ignition key to position "II", the starter cranks the engine.
- As soon as the engine ignites return the ignition key to position "I".

Charge control light (f) and engine oil pressure warning light (d) go out.

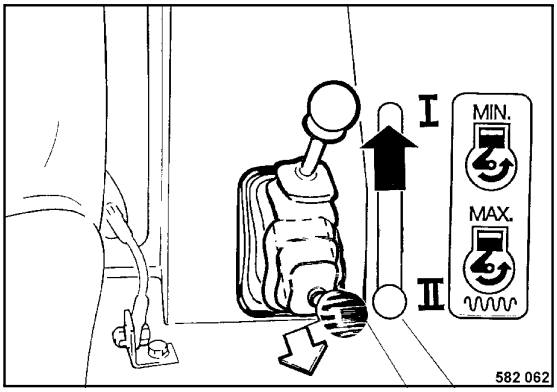


Fig. 33

- Once the engine runs correctly reduce the engine speed (Fig. 33) to position “I”, idle speed.

⚠ Caution

Run the engine warm for a short while, but do not run with idle speed for more than 10 minutes.

4.4 Starting with jump leads

⚠ Caution

Wrong connection will cause severe damage to the electrical system.

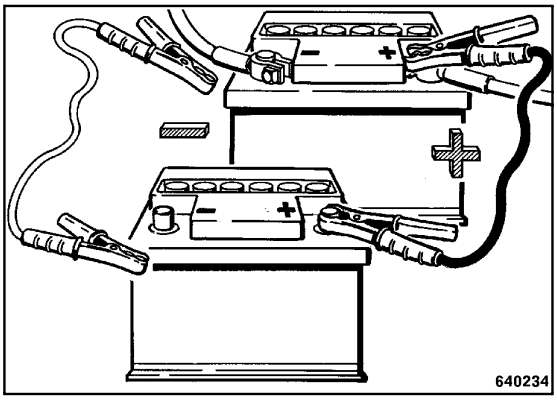


Fig. 34

- When starting with an external battery connect both plus poles (Fig. 34) first and both minus poles (earth cable) after.
- Perform the work steps described in the previous paragrapf.
- After starting disconnect the minus poles (earth cable) first and the plus poles after.

4.5 Driving the machine

⚠ Danger

Danger of accident!

Wet and loose soils considerably reduce the ground adhesion of the machine on inclinations and slopes.

Soil conditions and weather influences impair the gradability of the machine.

Do not drive up and down inclinations exceeding the maximum gradability of the machine (see technical data).

Do not drive without wearing your seat belt.

Always give way to loaded transport vehicles!

Before starting to drive make sure that the drive range is absolutely safe.

⚠ Caution

Select the travel speed range only when the machine is standing.

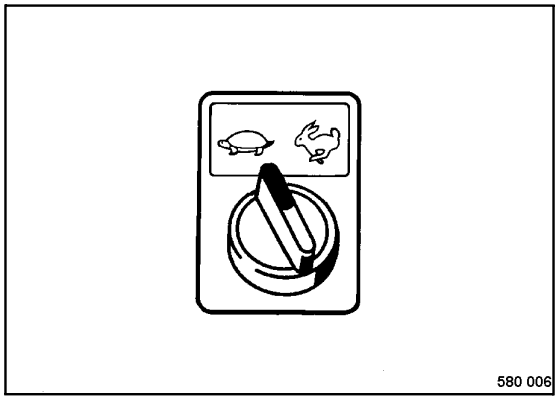


Fig. 35

- Select the desired travel speed range (Fig. 35).

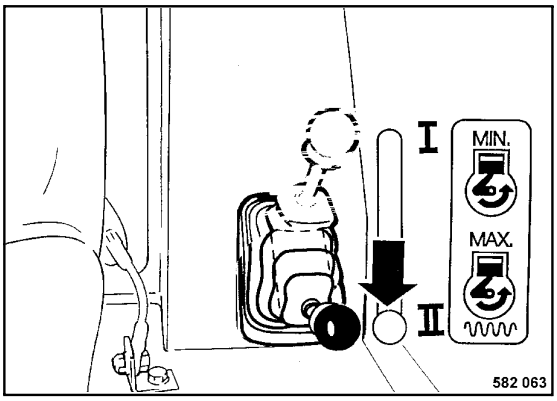


Fig. 36

- Shift the throttle lever to position "II" (Fig. 36) full load and lock it.

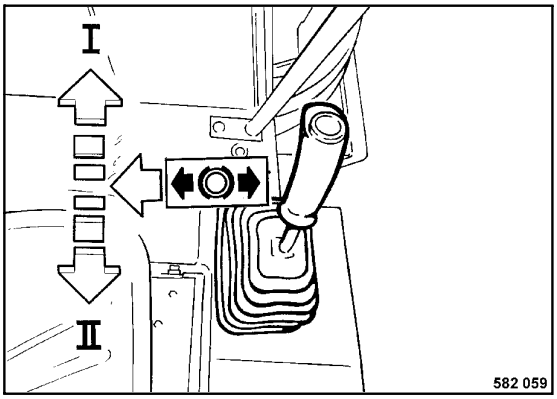


Fig. 37

- Push the travel lever (Fig. 37) to the left out of braking position and move it slowly to the desired travel direction.

The brake warning light (i) goes out.

i Note

Shift the travel lever out of "0"-position slowly to forward or reverse, the machine will drive forward or reverse at a speed which corresponds with the displacement of the travel lever.

Returning the travel lever towards neutral will brake the machine and in "0"-position of the travel lever the machine will stop.

⚠ Danger

Danger of accident!

On inclinations and slopes pull the travel lever to the right and lock it in braking position.

Important notes on travel operation

⚠ **Caution**

When changing the travel direction hold the travel lever for a moment in "0"-position, until the machine has stopped, before actuating to the new travel direction.

Do not operate jerkily!

Do not use the throttle lever to control the travel speed! Control the travel speed with the travel lever. During operation the throttle lever must remain in full load position.

When driving up and down inclinations move the travel lever slowly back towards neutral to brake the machine.

If the engine speed drops when driving up extreme inclinations move the ravel lever slightly back, if necessary change to the lower speed range.

Always use the lowest speed range (turtle) to drive up and down inclinations.

4.6 Emergency exit

If the machine should turn over and the cabin door is closed, the right hand side cabin window can be used as an emergency exit.

4.7 Operating the parking brake, stopping the machine

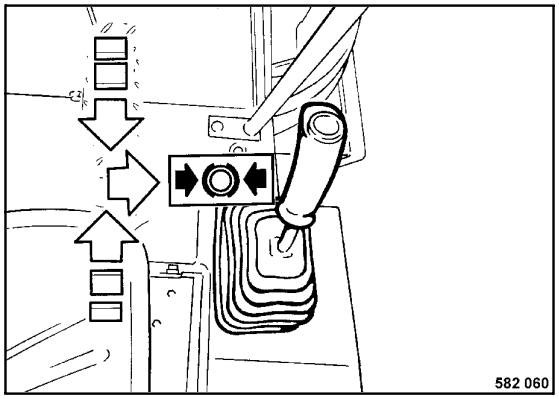


Fig. 38

- Return the travel lever (Fig. 38) slowly to "neutral"-position and engage it to the right parking brake position.

The hydrostatic drive brakes the machine automatically, the parking brake closes after approx. 2 seconds.

i Note

The parking brake also closes automatically when shutting the engine down.

4.8 Shutting the engine down

⚠ Caution

Straighten the articulated joint to provide easier access to the machine.

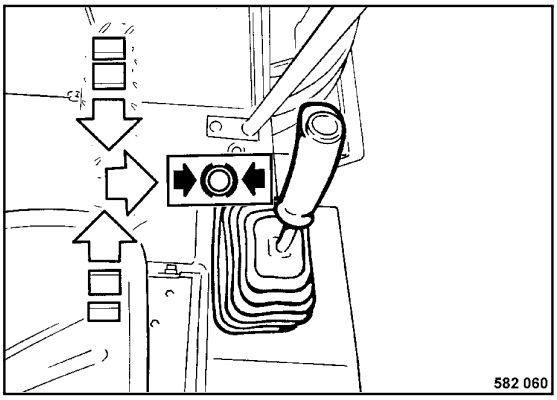


Fig. 39

- Return the travel lever (Fig. 39) slowly to "neutral"-position and engage it to the right in braking position.

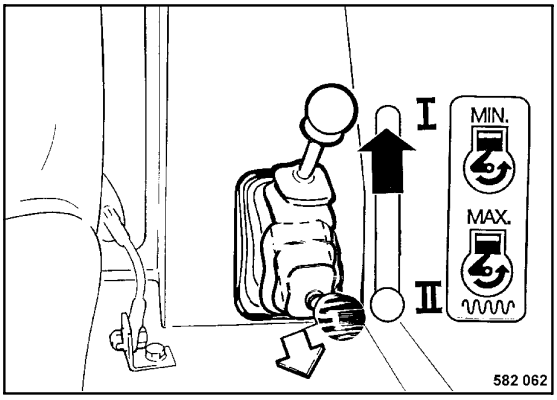


Fig. 40

- Pull the locking plate (Fig. 40) up and set the throttle lever to position "I" (idle speed).

i Note

Do not shut the engine down all of the sudden from full speed, but let it idle for a while for temperature equalization.

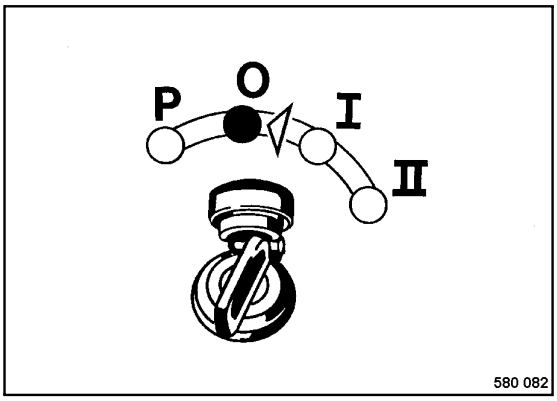


Fig. 41

- Turn the ignition key (Fig. 41) to position "0" or "P" and pull the ignition key out.

i Note

After shutting the engine down with the throttle lever the "central warning light" lights and the warning buzzer sounds, until the ignition switch is turned to position "0". The parking brake closes automatically when shutting the engine down.

⚠ Danger

Danger of accident!

On particularly steep inclinations place wheel chocks in front of or behind drum and wheels.

Secure the machine against unauthorized use, pull the ignition key out, lock the cabin door.

4.9 Switching the vibration on and off

⚠ Danger

Risk of damage!

When compacting with vibration you must check the effect of nearby buildings and underground supply lines (gas, water, sewage, electric power), if necessary stop compaction with vibration.

Do not activate the vibration on hard (frozen, concrete) ground. Danger of bearing damage!

⚠ Caution

When using the machine on asphalt

Vibration at standstill causes transverse marks, therefore:

- switch the vibration on only after shifting the travel lever to the desired travel direction.
- Switch the vibration off before stopping the machine.

Preselecting the vibration

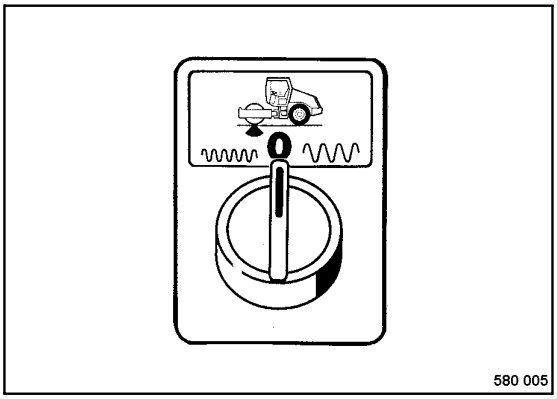


Fig. 42

- Preselect amplitude/frequency with the rotary switch (Fig. 42).

Switching the vibration on

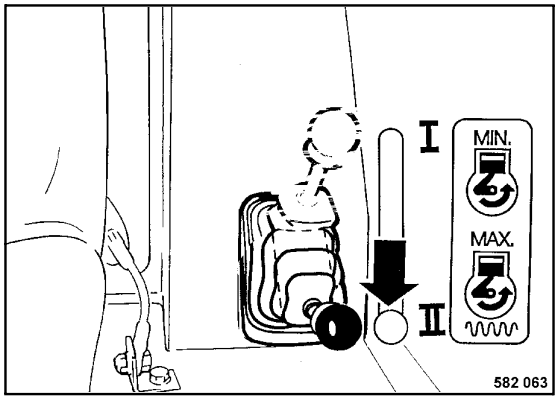


Fig. 43

- Set the throttle lever (Fig. 43) to position "II", full speed.

⚠ Caution

Switch the vibration on only at max. engine speed.

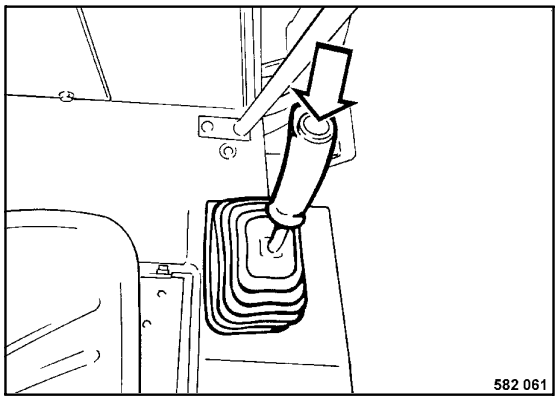


Fig. 44

- Press the push button (Fig. 44) in the travel lever while driving, the drum will vibrate.

Switching the vibration off

- Press the push button again and after work switch the rotary vibration switch to position "0".

4.10 Adjusting the seat

⚠ Danger

Danger of accident!

Do not adjust the driver's seat while driving.

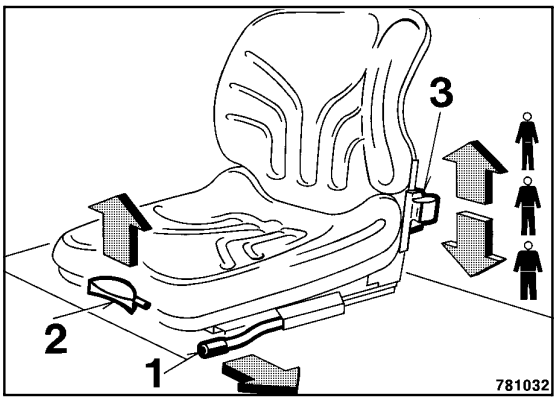


Fig. 45

- To adjust the seat in longitudinal direction disengage lever 1 (Fig. 45) and push the seat forward or back.
- To adjust the inclination of the backrest operate lever (2) and tilt the backrest forward or back.
- To adjust the weight adjust lever (3) accordingly.

i Note

In its adjustment the lever (3) is locked in upwards direction. This lock can be released by pressing the lever completely down against the stop. Then adjust to the weight of the operator by sliding the lever down.

4.11 Operating the hood

⚠ Danger

Danger of accident!

If the hood needs to be opened further for maintenance or repair work, support it safely.

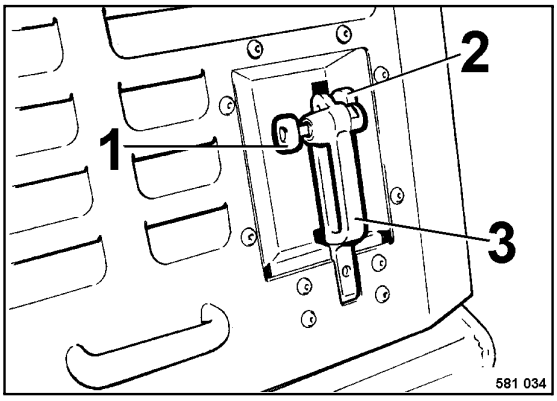


Fig. 46

- Unlock the lock 1 (Fig. 46).
- To unlock the hood press the latch (2) down and pull the handle (3) back.

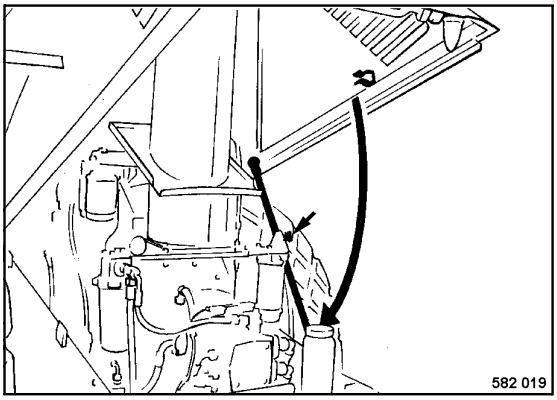


Fig. 47

- Pull the support (Fig. 47) out of the bracket in the hood and hook it at the bottom into the frame or at the top into the traverse.

4.12 Towing in case of an engine failure

⚠ Danger

Life hazard!

Since the machine is not fitted with a towing hitch, the machine cannot be towed with a tow bar.

If the machine has to be towed urgently out of the danger zone because of other risks, this must only be done on level ground or uphill using chains and ropes.

For this purpose towing ropes of sufficient tensile strength must be fastened on the lifting eyes.

After releasing the brake the machine can only be braked by the towing vehicle.

Before releasing the brake block the machine with chocks to prevent unintended rolling.

⚠ Caution

The max. towing speed must not exceed 2 km/h (development of heat in the drive section of the hydraulic motor).

The towing distance must not exceed 1 km, because the hydraulic circuit would run dry without the charge circuit in function.

- Secure the machine with wheel chocks against unintentional rolling.
- Attach the towing ropes safely to the front or rear lifting eyes.

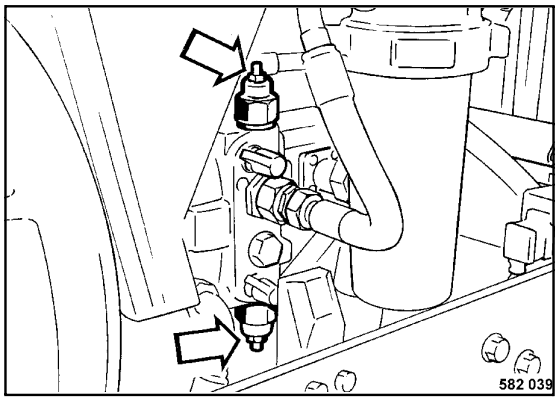


Fig. 48

- Slacken the counter nuts on both high pressure relief valves (Fig. 48) to create a by-pass around the travel pump.
- Turn the threaded spindle in until it is flush with the nut.
- Retighten the counter nut.

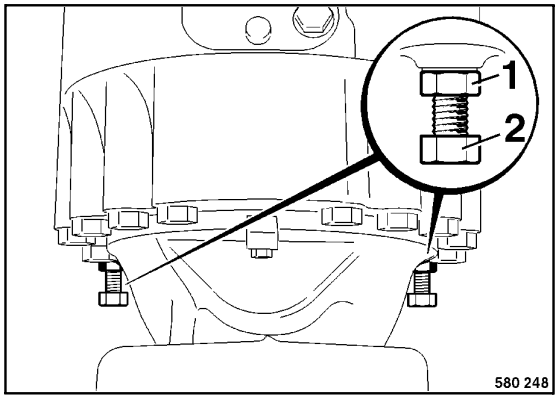


Fig. 49

- To release the brake turn counter nuts 1 (Fig. 49) approx. 8 mm back.
- Turn the brake releasing screws (2) completely in against the stop.
- Repeat this measure on the opposite side.

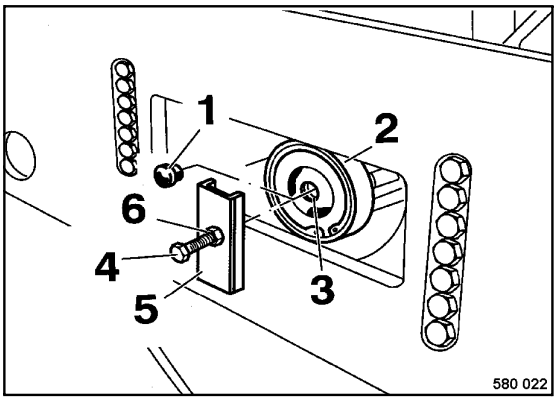


Fig. 50

- Remove plug 1 (Fig. 50).
- Place an U-section (5) across the brake housing (2) and turn the screw (4) into the tapped bore (3), until it bottoms.
- Turn the nut (6) down and tighten it approx. one revolution. The drum must rotate freely.

After towing

⚠ Caution

Before loosening ropes or chains block the machine with chocks to prevent unintended rolling.

- Turn the threaded spindle of the high pressure relief valves completely out again and tighten the counter nuts.
- Turn all brake releasing screws of the axle evenly back out, until they are light moving again.

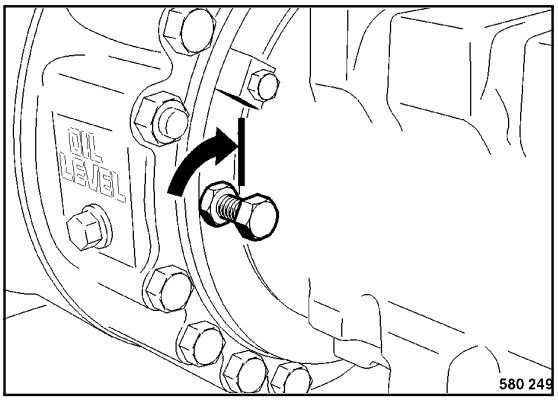


Fig. 51

- Turn the brake releasing screws (Fig. 51) back in again, until they abut against the brake piston.

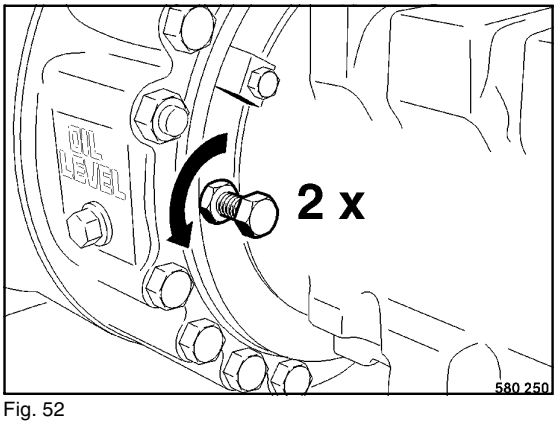


Fig. 52

- Unscrew the brake releasing screws (Fig. 52) for two turns and tighten the counter nuts.
- Repeat this adjustment procedure on the opposite wheel side.

i Note

If necessary replace the seal ring under the counter nut if it is leaking.

For this purpose completely unscrew the brake releasing screw, replace the seal ring and lubricate the screw with silicone grease.

Reinstall the screw with a new seal ring and adjust the protrusion as described above.

4.13 Transport

⚠ Danger

Danger of accident!

Use only stable loading ramps of sufficient load bearing capacity. Make sure that persons are not endangered by the machine tipping or sliding off.

Lash the machine down, so that it is secured against rolling, sliding and turning over.

Do not stand or step under loads being lifted. Always use shackles on the lifting points for loading, tying or lifting the machine.

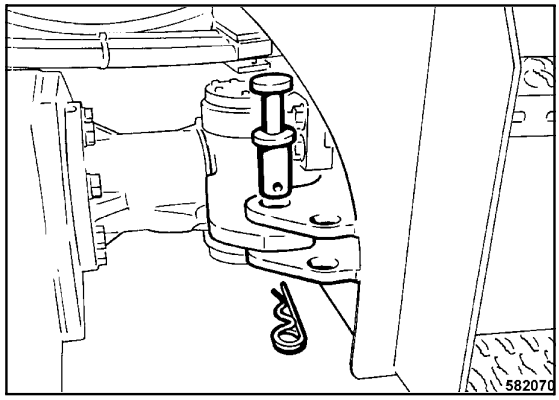


Fig. 53

- Attach the articulation lock (Fig. 53).

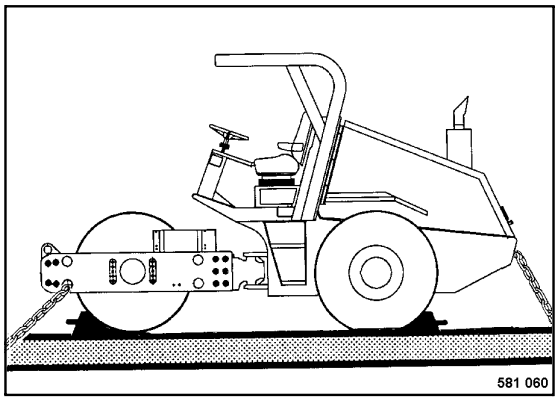


Fig. 54

- Lash the machine on the transport vehicle (Fig. 54), use the four lashing eyes on front and rear frame for this purpose.
- Support the front frame to avoid overstressing of the rubber buffers.

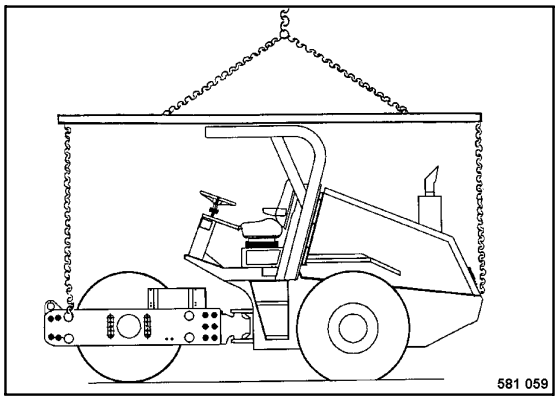


Fig. 55

- For lifting use also the four lifting eyes (Fig. 55) and appropriate lifting gear.

Weights: See technical data

- After transport release the articulation lock again and store it in the receptacle.

5 Maintenance

5.1 General notes on maintenance

When performing maintenance work always comply with the appropriate safety regulations.

Thorough maintenance of the machine guarantees far longer safe functioning of the machine and prolongs the lifetime of important components. The effort needed for this work is only little compared with the problems that may arise when not observing this rule.

The terms right/left correspond with travel direction forward.

- Always clean machine and engine thoroughly before starting maintenance work.
- For maintenance work stand the machine on level ground.
- Perform maintenance work only with the engine shut down.
- Relieve hydraulic pressures before working on hydraulic lines.
- Before working on electric parts of the machine disconnect the battery and cover it with insulation material.
- When working in the area of the articulated joint attach the articulation lock (transport lock).

Environment

During maintenance work catch all oils and fuels and do not let them seep into the ground or into the sewage system. Dispose of oils, coolant and fuels environmentally.

Notes on the fuel system

The lifetime of the diesel engine depends to a great extent on the cleanliness of the fuel.

- Keep fuel free of contaminants and water, since this will damage the injection elements of the engine.
- Drums with inside zinc lining are not suitable to store fuel.
- The fuel drum must rest for a longer period of time before drawing off fuel.
- Do not let the hose stir up the slurry at the bottom of the drum.
- Do not draw off fuel from near the bottom of the drum.
- The rest in the drum is not suitable for the engine and should only be used for cleaning purposes.

Notes on the performance of the engine

On diesel engines both combustion air and fuel injection quantities are thoroughly adapted to each other and determine power, temperature level and exhaust gas quality of the engine.

If your engine has to work permanently in "thin air" (at higher altitudes) and under full load, you should consult the customer service of BOMAG or the customer service of the engine manufacturer.

Notes on the hydraulic system

During maintenance work on the hydraulic system cleanliness is of major importance. Make sure that no dirt or other contaminating substances can enter into the system. Small particles can produce flutes in valves, cause pumps to seize, clog nozzles and pilot bores, thereby making expensive repairs inevitable.

- If, during the daily inspection of the oil level the hydraulic oil level is found to have dropped, check all lines, hoses and components for leaks.
- Seal external leaks immediately. If necessary inform the responsible customer service.
- Do not store drums with hydraulic oil outdoors, or at least under a cover. Water can be drawn in through the bunghole when the weather changes.
- Always use the filling and filtering unit (BOMAG part-no. 007 610 01) to fill the hydraulic system. This unit is fitted with a fine filter to clean the hydraulic oil, thereby prolonging the lifetime of the filter.
- Clean fittings, filler covers and the area around such parts before disassembly to avoid entering of dirt.
- Do not leave the tank opening unnecessarily open, but cover it so that nothing can fall in.

5.2 Fuels and lubricants

Engine oil

Quality

Lubrication oils are classified according to their performance and quality class. Oils according to other comparable specifications may be used.

Approved engine oils		
Deutz	DQC II	DQC III
ACAE	E3/96/E5-02	E4-99
API	CH-4/CG-4	-
DHD	DHD-1	-

The exact assignment of the approved oil qualities and oil change intervals can be taken from the following section "Lubrication oil change intervals".

Consult your local service station if in doubt.

Oil viscosity

Multi-purpose oils should be generally used.

Since lubrication oil changes its viscosity with the temperature, the ambient temperature at the operating location of the engine is of utmost importance when choosing the viscosity class (SAE-class) .

Optimal operating conditions can be achieved by using the opposite oil viscosity chart (Fig. 56) as a reference.

Occasionally falling short of the temperature limits will impair the cold starting ability, but will not cause any engine damage. In order to keep the occurring wear as low as possible, occassional exceeding of the limits should not happen over a longer period of time.

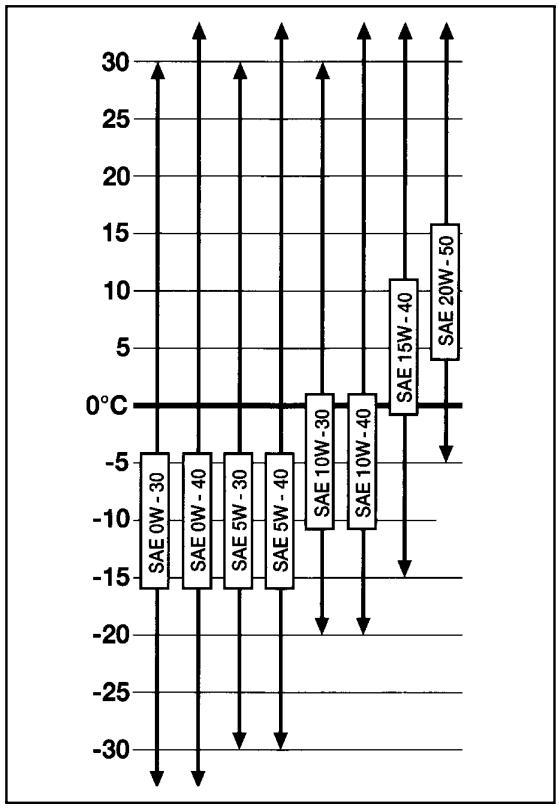


Fig. 56

With their better temperature and oxidation stability synthetic lubrication oils offer quite a few benefits.

Oil change intervals

The longest permissible time a lubrication oil should remain in an engine is 1 year. If the following oil change intervals are not reached over a period of 1 year, the oil change should be performed at least once per year, irrespective of the operating hours reached.

ACEA

E3-96/E5-02
E4-99 = 500 operating hours

API

CG-4/CH-4 = 500 operating hours

⚠ Caution

These intervals apply only when using a diesel fuel with maximum 0.5 % sulphur by weight and for ambient temperatures higher than -10 °C.

When using fuels with a sulphur content of more than 0.5% to 1% or under ambient temperatures below -10 °C the oil change intervals specified in the table must be halved. For fuels with a sulphur content of more than 1% you should consult the responsible service agency.

Fuels

Quality

You should only use commercially available brand diesel fuel with a sulphur content below 0.5% and ensure strict cleanliness when filling in. A higher sulphur content has a negative effect on the oil change intervals. Use only winter-grade diesel fuel under low ambient temperatures. The fuel level should always be topped up in due time so that the fuel tank is never run dry, as otherwise filter and injection lines need to be bled.

When using fuels with a Cetan number < 49 poor starting and white smoke can be expected, in particular in connection with low ambient temperatures.

The following fuel specifications are permitted: DIN/EN 590; DIN 51 601; Nato Codes: F-54, F-75; BS 2869: A1 and A2; ASTM D 975-78: 1-D and 2-D.

- DIN/EN 590
- BS 2869
- ASTM D 975-78: 1-D and 2-D.
- Nato Codes: F-54, F-34, F44 und XF63

Winter fuel

⚠ Danger

Diesel fuels must never be mixed with gasoline.

For winter operation use only winter diesel fuel, to avoid clogging because of paraffin separation. At very low temperatures disturbing paraffin separation can also be expected when using winter diesel fuel.

In most cases a sufficient cold resistance can also be achieved by adding flow enhancing fuel additives. Consult the engine manufacturer.

Operation with rape seed oil methyl ester (RME „Bio Diesel“)

Due to the extreme quality differences of RMEW-fuels available on the market, which are caused by the non-existence of a standardization, BOMAG does generally not approve any RME-fuels. If this is neglected the warranty will become null and void!

However, if you still intend to operate the machine with RME-fuels you should observe the following information:

- Reduced engine power (approx. 7%), higher fuel consumption.
- The quality of RME-fuel should be in compliance with DIN draft 51606.
- Avoid longer periods of standstill (formation of resin, corrosion in injection system)
- RME-fuel can damage the paint finish of the machine.
- Fuel dilution of engine oil, therefore shortening of oil change intervals to half.
- Rubber parts, such as leak fuel return lines, seats will be damaged in the long run and need to be replaced on a regular basis or should be replaced by parts made of fluorinated rubber. However, fluorinated rubber is not resistant against normal diesel fuel.
- If the fuel filter is clogged the filter change intervals must be shortened accordingly.

Hydraulic oil

The hydraulic system is operated with hydraulic oil HV 46 (ISO) with a kinematic viscosity of 46 mm^2/s at 40°C. For topping up or for oil changes use only high-quality hydraulic oil, type HVLP according to DIN 51524, part 3, or hydraulic oils type HV according to ISO 6743/3. The viscosity index (VI) should be at least 150 (observe information of manufacturer).

Bio-degradable hydraulic oil

On request the hydraulic system can also be filled with ester based biodegradable hydraulic oil (Panolin HLP Synth. 46). The biologically quickly degradable hydraulic oil meets all demands of a mineral oil based hydraulic oil according to DIN 51524.

In hydraulic systems filled with Panolin HLP Synth. 46 always use the same oil to top up. When changing from mineral oil based hydraulic oil to an ester based biologically degradable oil, you should consult the lubrication oil service of the oil manufacturer for details.

Check the filter more frequently after this change.

⚠ Caution

Oil change bio-degradable hydraulic oil:

Perform regular oil analyses for content of water and mineral oil.

Replace the hydraulic oil filter element every 500 operating hours.

Oil for drive axle

For the drive axle use only multi-purpose transmission oil of API-class GL5 with viscosity class SAE 90.

The additives in this oil ensure low wear lubrication under all operating conditions.

Lubrication grease

For lubrication use only EP-high pressure grease, lithium saponified (penetration 2).

5.3 Table of fuels and lubricants

Assembly	Fuel or lubricant		Quantity approx. Attention Observe the level marks
	Summer	Winter	
Engine	Engine oil ACEA: E3-96/E5-02 or API: CG-4/CH-4 SAE 10W/40 (-20 °C to +40 °C)		approx. 10.5 litres*
	Fuel		
	Diesel	Winter diesel fuel	approx. 110 litres
Hydraulic system	Hydraulic oil (ISO), HV46, kinem. viscosity 46 mm^2/s at 40 °C		approx. 44 litres
Vibration bearings	Engine oil SAE 15W/40		approx. 2,1 litres
Drive axle	Gear oil SAE 90, API GL5		approx. 6,7 litres
Planetary drive	Gear oil SAE 90, API GL5		approx. 1 litre per side
Tires	Water		68 litres
	Calcium chloride ($CaCl_2$) or magnesium chloride ($MgCl_{2)}$		29 kg

* Oil quantity with filter change

5.4 Running-in instructions

The following maintenance work must be performed when running in new machines or overhauled engines:

⚠ Caution

Up to approx. 250 operating hours check the engine oil level twice every day.

Depending on the load the engine is subjected to, the oil consumption will drop to the normal level after approx. 100 to 250 operating hours.

After 50 operating hours

- Retighten bolted connections on intake and exhaust tubes, oil sump and engine mounts.
- Check the engine for leaks.
- Retighten the bolted connections on the machine.
- Retighten all wheel fastening screws with the specified tightening torque.
- Check the V-belt tension, tighten if necessary
- Oil change diesel engine
- Oil filter cartridge diesel engine
- Check the valve clearance, adjust if necessary
- Oil change in drive axle
- Oil change in wheel hub of axle

After 500 operating hours

- Oil change vibration bearings

5.5 Maintenance chart

With all maintenance intervals perform also the work for shorter preceding service intervals.

No.	Designation	Note
Every 10 operating hours		
5.6	Check the engine oil level	Dipstick mark
5.7	Check the fuel filter water separator	
5.8	Check the fuel level	
5.9	Check the hydraulic oil level	Inspection glass
Every 250 operating hours		
5.10	Check the tire pressure	see technical data
5.11	Cleaning the cooling fins on the radiator	
5.12	Cleaning the cooling fins on the hydraulic oil cooler	
5.13	Check the oil level in the drive axle	
5.14	Check the oil level in the wheel hubs	
5.15	Check the oil level in the vibration bearings	
Every 500 operating hours		
5.16	Service the battery	distilled water, pole grease
5.17	Drain the sludge from the fuel tank	
5.18	Change engine oil and oil filter cartridge	min. 1x per year
5.19	Checking the V-belt tension, tightening	
Every 1000 operating hours		
5.20	Check, adjust the valve clearance	Intake = 0.3 mm, exhaust = 0.5 mm, on cold engine
5.21	Change the oil in the vibration bearings	min. 1x per year
5.22	Change the oil in the drive axle	min. 1x per year
5.23	Change the oil in the wheel hubs	min. 1x per year
5.24	Changing the fuel pre-filter	
5.25	Change the fuel filter cartridge	
5.26	Check the engine mounts	
5.27	Check the fastening of the axle on the frame	
5.28	Tighten the wheel nuts	
5.29	Check the ROPS	

No.	Designation	Note
Every 2000 operating hours		
5.30	Change hydraulic oil and breather filter*	at least every 2 years
5.31	Change the hydraulic oil filter*	at least every 2 years
Every 3000 operating hours		
5.32	Check the injection valves	
Every 5000 operating hours		
5.33	Replace the toothed belt	at least every 5 years
As required		
5.34	Clean, change the combustion air filter	min. 1x every year, safety cartridge at least every 2 years
5.35	Adjust the parking brake	
5.36	Change the tires	
5.37	Adjust the scrapers	
5.38	Change the fresh air filter in the cabin	
5.39	Tightening torques	
5.40	Engine conservation	

*Also in case of repairs in the hydraulic system.

5.6 Checking the engine oil level

i Note

With the machine on level ground shut the engine down and wait for about 15 minutes, so that all oil can flow back into the oil sump.

- Open the engine hood

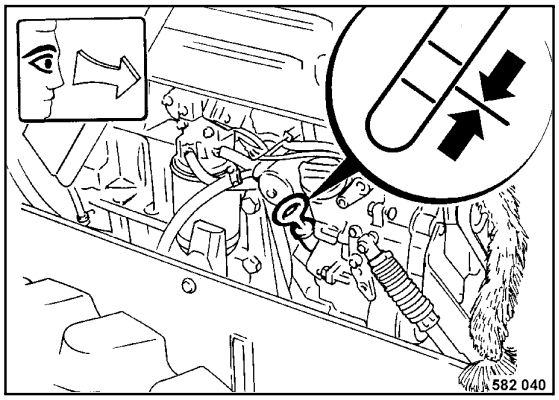


Fig. 57

- Pull the dipstick (Fig. 57) out, wipe it off with a lint-free, clean cloth and reinsert it until it bottoms.
- Pull the dipstick back out again.
- The oil level must be between both marks "Min" and "Max".
- If the oil level is too low top up oil immediately.
- If the oil level is too high, determine the cause and drain the oil off.

⚠ Caution

Before longer work periods you should always top the oil up to the "MAX"-mark.

For quality and quantity of oil refer to the table of fuels and lubricants

5.7 Checking the fuel filter water separator

⚠ Danger

Danger of injury!

Support the engine hood for all maintenance and repair work.

i Note

The service intervals for the water separator depend on the water content in the fuel and can therefore not be determined precisely. After taking the engine into operation you should therefore check the water separator every day for signs of water.

If a to high quantity is drained off, the filter must be refilled with fuel. See chapter "maintenance as required", bleeding the fuel system.

Environment

Catch running out fuel and dispose of environmentally.

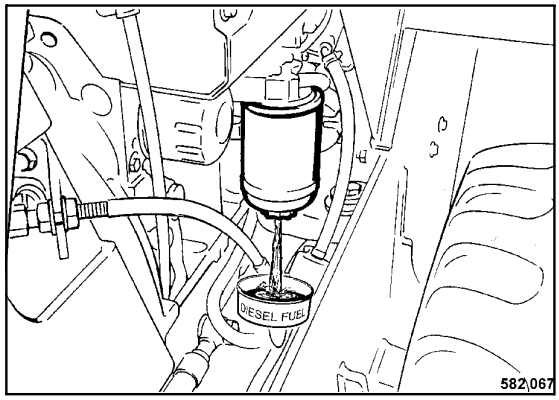


Fig. 58

- Slacken the drain plug (Fig. 58) for a few turns and catch running out fuel / water.
- Tighten the drain plug again and check for leaks, if necessary replace the seal ring.

5.8 Checking the fuel level

⚠ Danger

Fire hazard!

When working on the fuel system do not use open fire, do not smoke, do not refuel in closed rooms, do not inhale any fuel fumes.

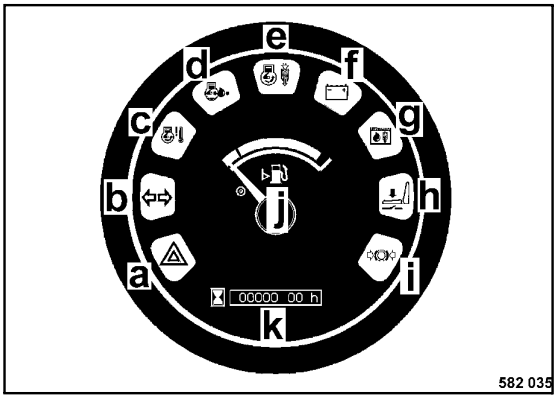


Fig. 59

- Check the fuel level on the fuel gauge “j” (Fig. 59).

i Note

Do not drive the fuel tank dry, as otherwise the fuel system needs to be bled.

- Clean the area around the filler opening.

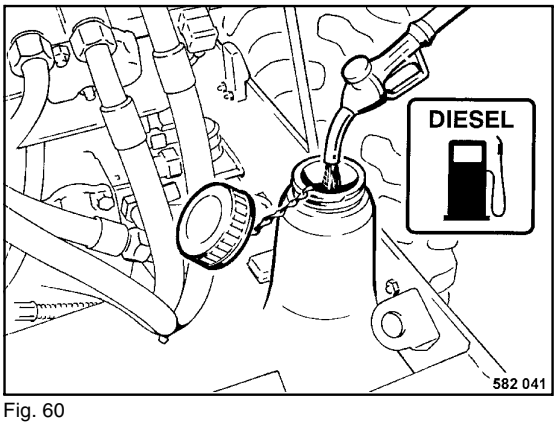


Fig. 60

- Open the fuel tank cover (Fig. 60).

⚠ Caution

Contaminated fuel can cause malfunction or even damage of the engine.

If necessary, fill in fuel through a funnel with screen.

- If necessary top up with fuel (diesel or winter diesel).

For quality of fuel refer to the table of fuels and lubricants.

5.9 Checking the hydraulic oil level

⚠ Caution

In hydraulic systems filled with Panolin HLP Synth. 46 always use the same oil to top up. With other ester based oils consult the lubrication oil service of the respective oil manufacturer.

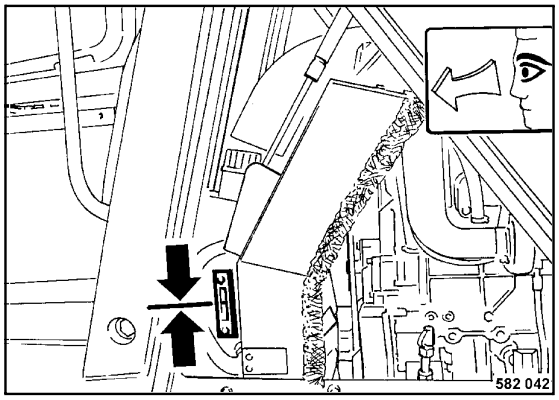


Fig. 61

- Check the hydraulic oil level in the inspection glass (Fig. 61).

Normal level

approx. 3 cm below the top edge of the inspection glass.

Minimum level

Middle of inspection glass.

⚠ Caution

If, during the daily inspection of the oil level the hydraulic oil level is found to have dropped, check all lines, hoses and components for leaks.

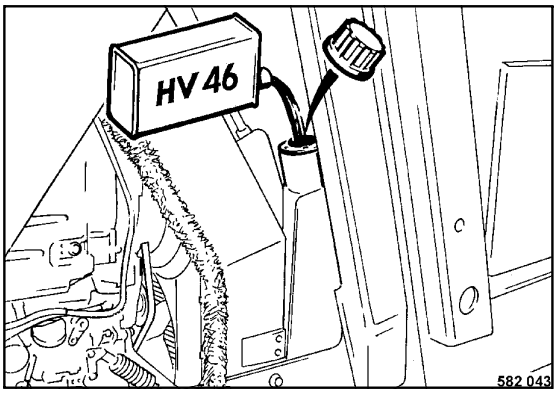


Fig. 62

- If necessary fill in hydraulic oil through the filler neck (Fig. 62).

For quality and quantity of oil refer to the table of fuels and lubricants.

5.10 Checking the tire pressure

⚠ Caution

Since the tires are filled with water, you should always turn the inflation valve to top position to check the tire pressure!

Always close the valves with the dust cap.

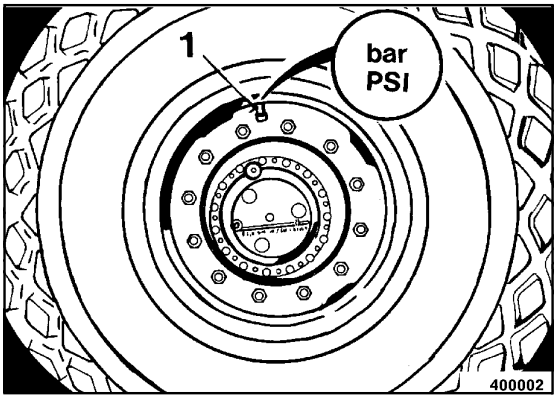


Fig. 63

- Check the tire pressure with a pressure gauge and the tire inflation valve 1 (Fig. 63) in top position.

Nominal value see "technical data".

i Note

Ensure even pressure in all tires.

- Screw the valve caps back on.

5.11 Cleaning the cooling fins on the radiator

⚠ Danger

Danger of injury!

Perform cleaning work only after the engine has cooled down and with the engine stopped.

i Note

Dirt on fan blades and oil cooler reduce the cooling effect. Dirt deposits in these areas are substantially supported by oil and fuel on these surfaces. For this reason you should always seal any oil or fuel leaks in the vicinity of the cooling fan or the oil cooler and clean the cooling surfaces after.

Cleaning with compressed air

i Note

Start to blow out from the exhaust side.

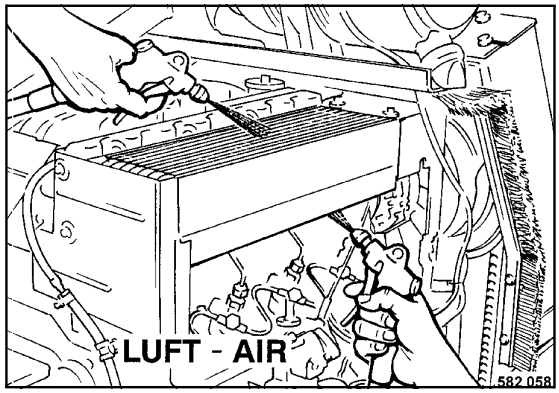


Fig. 64

- Take the cooling air duct cover off and blow the radiator (Fig. 64) out, starting from the air discharge side.
- Remove all dirt that has been blown into the air duct.

Cleaning with cold cleansing agent

⚠ Caution

In case of oily dirt spray the engine with a cold cleansing agent and let it soak in for about 10 minutes.

Protect electrical equipment such as generator, regulator and starter against the direct water jet.

- Spray the engine with a suitable cleansing agent, e.g. cold cleanser, let it soak in for a while and spray it off with a strong water jet.
- Reassemble the cooling air duct cover, run the engine warm for a while to avoid corrosion.

5.12 Cleaning the cooling fins on the hydraulic oil cooler

⚠ Danger

Danger of injury!

Perform cleaning work only after the engine has cooled down and with the engine stopped.

⚠ Caution

Do not damage any cooling fins on the cooler core when cleaning.

i Note

Dirt on fan blades and oil cooler reduce the cooling effect. Dirt deposits in these areas are substantially supported by oil and fuel on these surfaces. For this reason you should always seal any oil or fuel leaks in the vicinity of the cooling fan or the oil cooler and clean the cooling surfaces after.

Cleaning with compressed air

i Note

Start to blow out from the exhaust side.

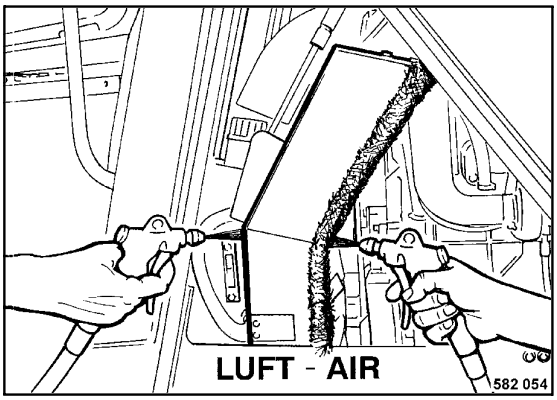


Fig. 65

- Blow the cooler (Fig. 65) out with compressed air.

Cleaning with cold cleansing agent

⚠ **Caution**

In case of oily dirt spray the cooler with a cold cleansing agent and let it soak in for about 10 minutes.

Protect electrical equipment such as generator, regulator and starter against the direct water jet.

- Spray the radiator with a suitable cleansing agent, e.g. cold cleanser, let it soak in for a while and spray it off with a strong water jet.
- Run the engine warm for a while to avoid corrosion.

5.13 Check the oil level in the drive axle

- Park the machine on level ground.

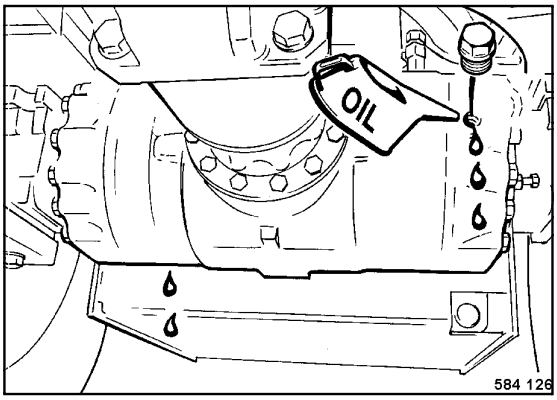


Fig. 66

- Unscrew the oil level inspection plug (Fig. 66) and check the oil level.

i Note

The second level inspection plug as at the back.

After filling in oil wait until the oil has evenly distributed inside the axle.

The oil level must reach the bottom edge of the level bore.

- Top up oil, if necessary.

For quality of oil refer to the table of fuels and lubricants.

- Turn the level inspection plug tightly back in.

5.14 Checking the oil level in left/ right wheel hubs

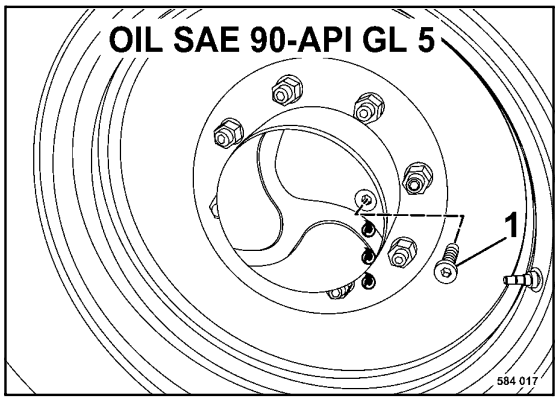


Fig. 67

- Move the machine until the oil level inspection plug 1 (Fig. 67) is in horizontal position.
- Clean and unscrew the plug.

The oil level must reach the bottom edge of the bore.

- Top up oil, if necessary.

For quality of oil refer to the table of fuels and lubricants.

- Screw the plug back in tightly.
- Repeat this inspection on the other side.

5.15 Checking the oil level in the vibration bearings

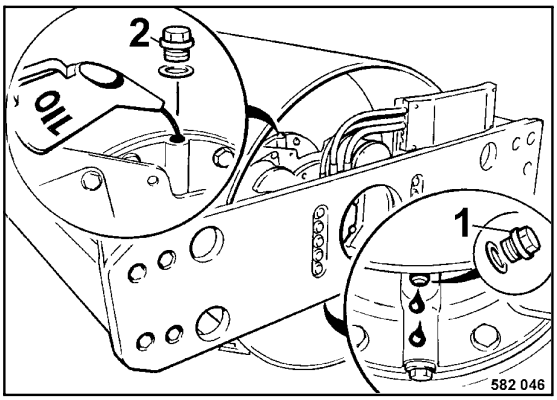


Fig. 68

- Drive the machine, until the oil level inspection plug 1 (Fig. 68) is vertically below the hub.
- Clean and unscrew the oil level inspection plug.

The oil level must reach the bottom edge of the bore.

- If necessary fill in oil through the filler and drain bore (2).

For quality of oil refer to the table of fuels and lubricants.

5.16 Servicing the battery

⚠ Danger

Danger of causticization !

When working on the battery do not use open fire, do not smoke!

Do not let acid come in contact with skin or clothes!

Wear protective clothing!

Do not lay any tools on the battery!

For recharging remove the plugs from the battery to avoid the accumulation of highly explosive gases.

Environment

Dispose of the old battery environmentally.

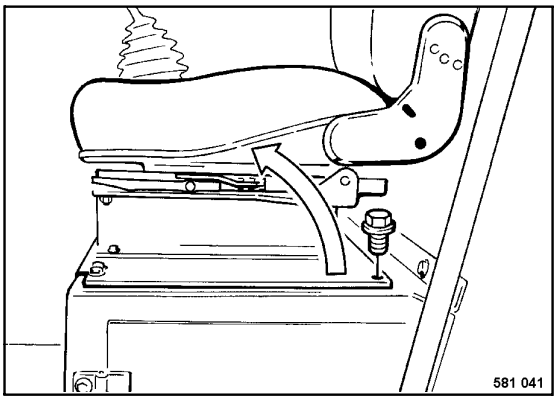


Fig. 69

- Unscrew both fastening screws (Fig. 69) from the seat console and fold the seat forward.

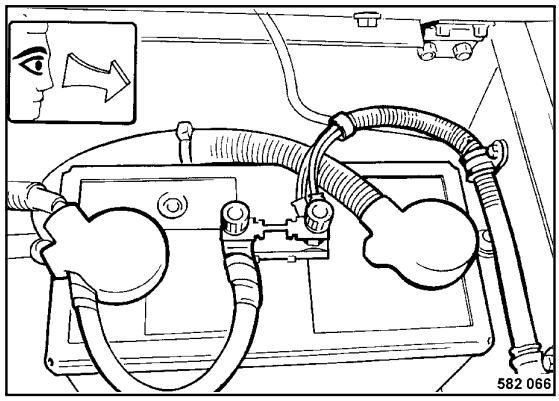


Fig. 70

- Remove the battery (Fig. 70) and clean the battery compartment.
- Clean the outside of the battery.
- Clean battery poles and pole clamps and grease them with pole grease (Vaseline).
- Check the fastening of the battery.
- On serviceable batteries check the acid level, if necessary top up to the filling mark with distilled water.

5.17 Draining the sludge from the fuel tank

⚠ Danger

Fire hazard!

When working on the fuel system do not use open fire, do not smoke!

Do not spill any fuel.

Catch running out fuel, do not let it seep into the ground.

Do not inhale any fuel fumes.

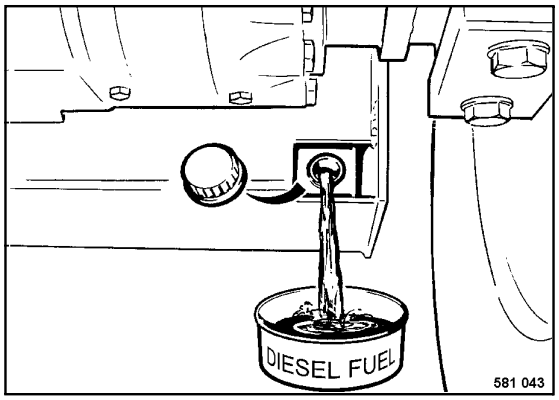


Fig. 71

- Unscrew the cap (Fig. 71) and drain off approx. 5 litres of fuel.
- Turn the cap tightly back in.

5.18 Change engine oil and oil filter cartridge

⚠ Caution

The oil change at 500 operating hours refers to the use of oils of oil quality class API CG-4/CH-4 or ACAE E3-96/E5-02 respectively.

See section 5.2 "Fuels and Lubricants".

Drain the engine oil only when the engine is warm.

⚠ Danger

Danger of scalding!

When draining off hot oil.

By hot oil when unscrewing the engine oil filter.

Environment

Catch running out oil and dispose of environmentally together with the engine oil filter cartridge.

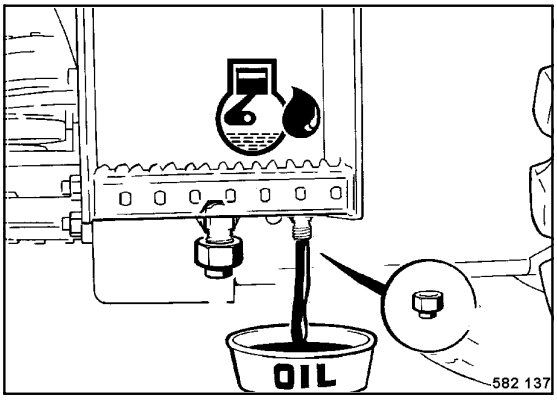


Fig. 72

- Unscrew the drain plug (Fig. 72) and catch running out oil.
- Turn the drain plug tightly back in.

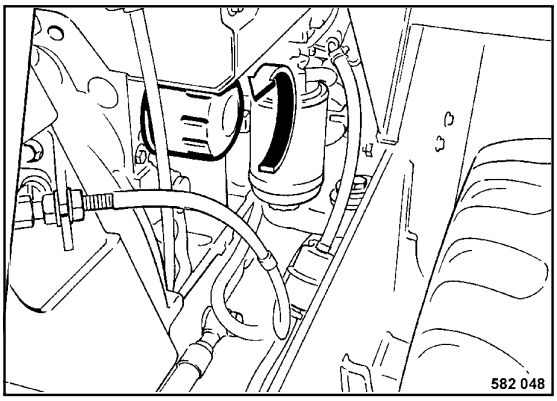


Fig. 73

- Unscrew the filter cartridge (Fig. 73) using an appropriate filter wrench.
- Clean the sealing face on the filter carrier from any dirt.
- Slightly oil the rubber seal on the new filter cartridge.
- Turn the new filter cartridge on by hand, until the seal contacts.
- Tighten the filter element for another half turn.

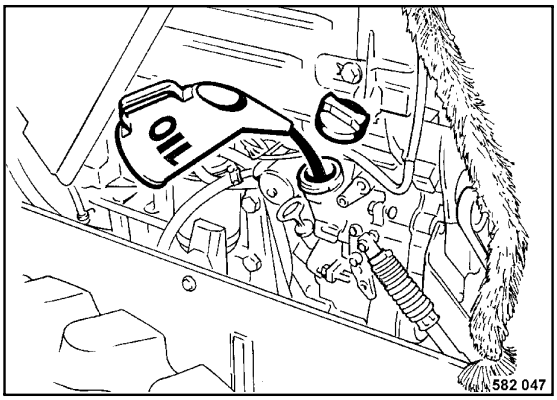


Fig. 74

- Fill in new engine oil (Fig. 74).

For quality and quantity of oil refer to the table of fuels and lubricants.

- Tighten the oil filler cap properly.

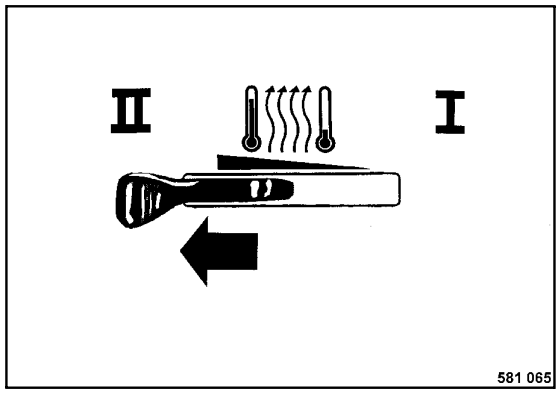


Fig. 75

- On machines with cabin set the lever for oil heat exchanger heating to position II.
- Run the engine for approx. 3 minutes at idle speed.
- Shut the engine down and set the lever for oil heat exchanger heating to position I.
- Wait for about 15 minutes, so that all oil can flow back into the oil sump.

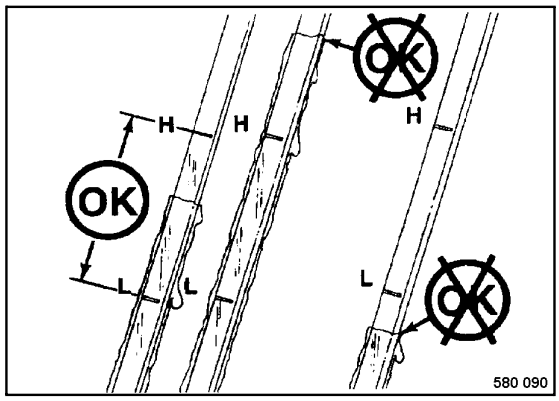


Fig. 76

- Check the oil level again (Fig. 76), if necessary fill up to the Max.-mark.
- Check filter cartridge and drain plug for leaks.

5.19 Checking the V-belt tension, tightening

Checking the V-belt

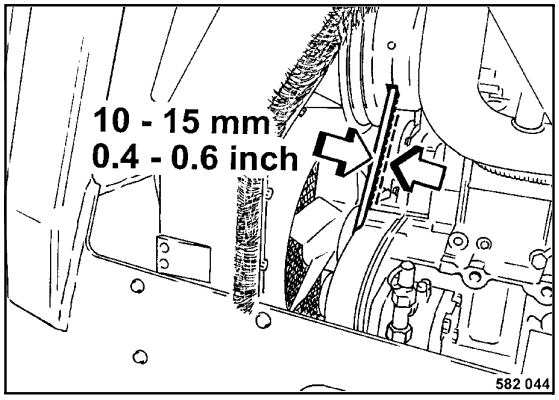


Fig. 77

- Inspect the entire circumference of the V-belt visually for damage and cracks.
- Replace damaged or cracked V-belts.
- Check with thumb pressure whether the V-belt can be depressed more than 10 ... 15 mm between the V-belt pulleys (Fig. 77), retighten the V-belt if necessary.

Retightening the V-belt

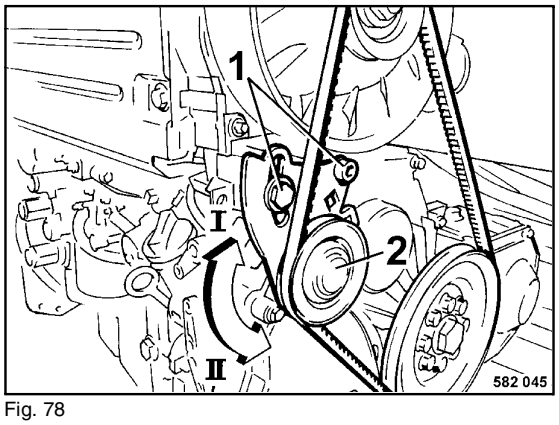


Fig. 78

- Slightly slacken the fastening screw 1 (Fig. 78).
- Press the idling pulley (2) in direction "I", until the correct V-belt tension is achieved.
- Tighten the fastening screws (1).

5.20 Checking, adjusting the valve clearance

⚠ Caution

Before checking the valve clearance let the engine cool down for at least 30 minutes. The engine oil temperature must be less than 60 °C.

Valve clearance

Intake valve = 0.3 mm

Exhaust valve = 0.5 mm

- Open the engine hood completely and support it safely.

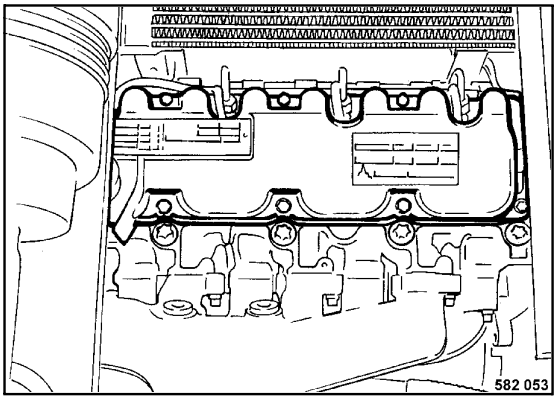


Fig. 79

- Remove the valve cover (Fig. 79).

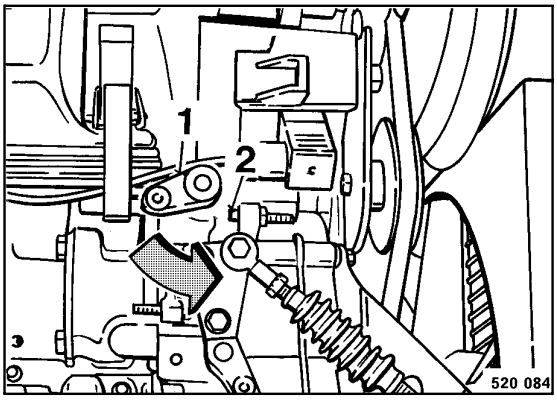


Fig. 80

- Press the engine shut-down lever 1 (Fig. 80) against the stop (2) and fasten it with a wire.

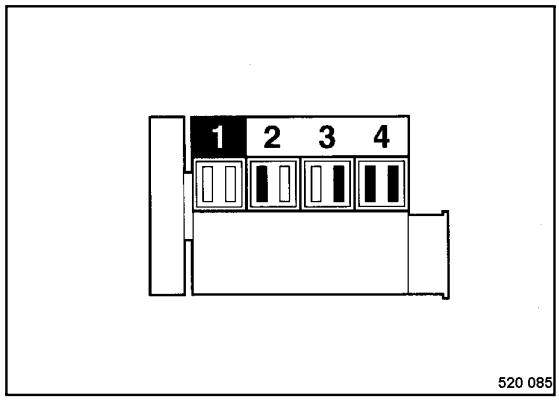


Fig. 81

- Crank the engine with the starter until both valves on cylinder 1 (Fig. 81) are “overlapping”.

i Note

Overlapping means that the exhaust valve is not yet completely closed and the intake valve starts to open.

The valves marked black (Fig. 81) can be checked and adjusted.

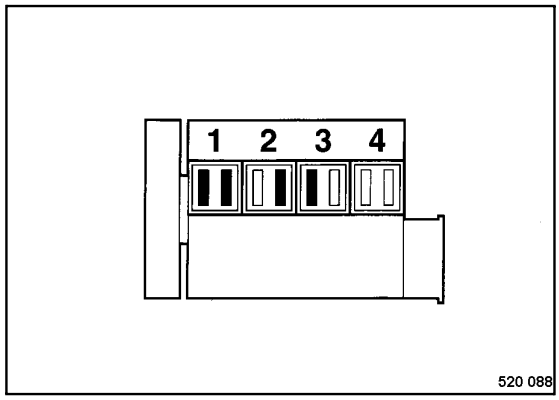


Fig. 82

- Crank the engine with the starter until both valves on cylinder 4 (Fig. 82) are “overlapping” (360° rotation of the crankshaft).

The valves marked black (Fig. 82) can be checked and adjusted.

- Assemble the cylinder head cover with a new gasket.

Adjusting the valve clearance

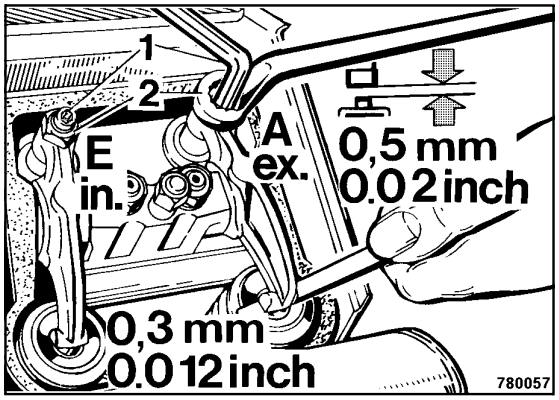


Fig. 83

- Loosen the counter 2 (Fig. 83) and regulate the setscrew (1), until the feeler gauge can be inserted and pulled out with little resistance after retightening the counter nut.

⚠ Caution

After a short test run check the engine for leaks.

5.21 Changing the oil in the vibration bearings

⚠ Caution

Drain oil only at operating temperature.

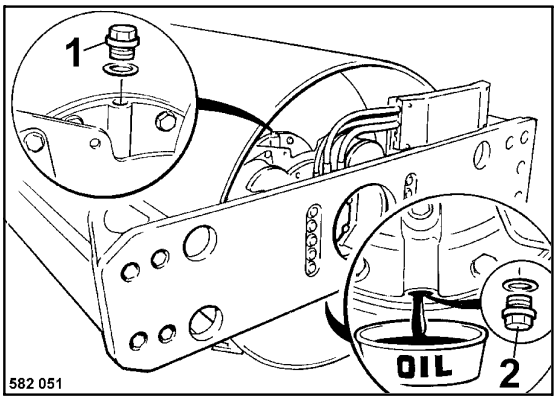


Fig. 84

- Move the drum, until the drain and filler plug 2 (Fig. 84) is in bottom position.
- Clean and unscrew the oil level inspection plug (1) as well as the drain and filler plug.

Environment

Catch running out oil.

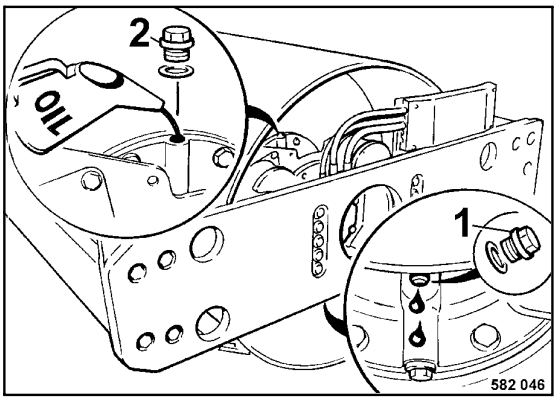


Fig. 85

- Once all oil has been drained off move the drum, until the oil level inspection plug 1 (Fig. 85) is positioned vertically under the hub.
- Fill in oil, until it starts to run out through the level inspection bore.

For quality and quantity of oil refer to the table of fuels and lubricants.

- Screw oil level inspection plug (1) and drain and filler plug (2) back in with new seal rings.

5.22 Change the oil in the drive axle

i Note

On other axle versions drain and filler plugs are of slightly different design. Perform the oil change accordingly.

⚠ Caution

Drain oil only at operating temperature.

Environment

Catch old oil and dispose of environmentally.

- Park the machine on level ground.

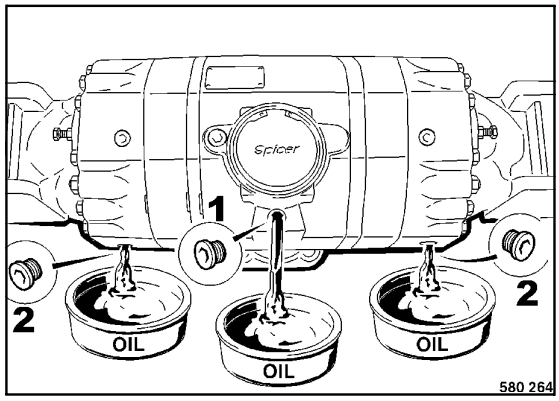


Fig. 86

- Clean and unscrew all level inspection and drain plugs (Fig. 86).
- Drain and catch all oil.
- Clean the drain plug and turn it back in with a new seal ring.

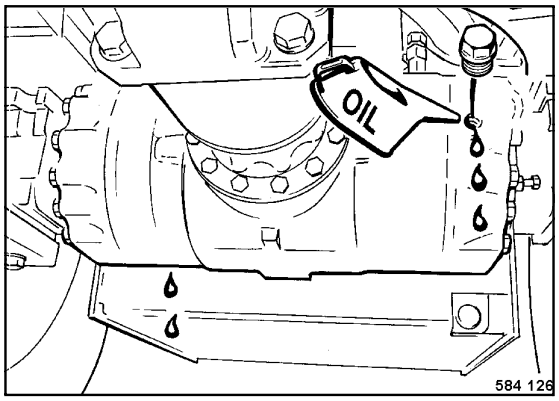


Fig. 87

- Fill in oil through the oil level inspection bores (Fig. 87), until it has reached the bottom edge of the bore.

i Note

The second level inspection plug as at the back.

After filling in oil wait until the oil has evenly distributed inside the axle.

For quality and quantity of oil refer to the table of fuels and lubricants.

- Retighten the filler and level inspection plug.

5.23 Change the oil in the wheel hubs

⚠ Caution

Drain oil only at operating temperature.

Change the oil on both sides of the axle.

Environment

Catch old oil and dispose of environmentally.

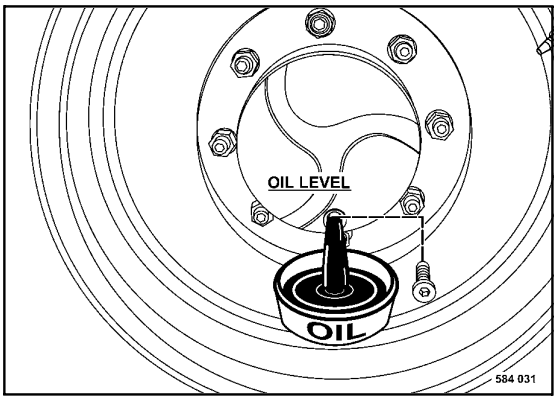


Fig. 88

- Move the drive wheel, until the plug (Fig. 88) is in bottom position.
- Clean and unscrew the plug.
- Drain and catch all oil.

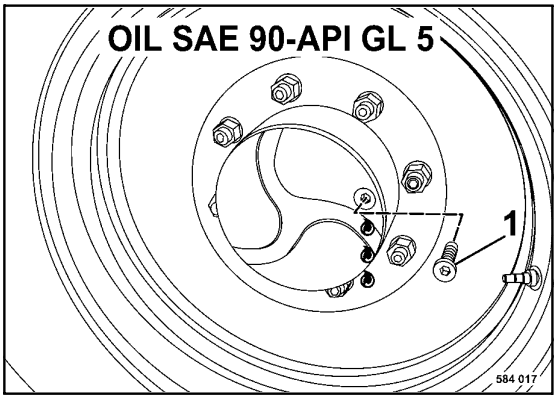


Fig. 89

- Move the drive wheel, until the plug (Fig. 89) is in horizontal position on the housing.
- Fill in oil, until it reaches the bottom edge of the bore.

For quality and quantity of oil refer to the table of fuels and lubricants.

- Turn the plug tightly back in.
- Change the oil also on the opposite side.

5.24 Changing the fuel pre-filter

⚠ Danger

Fire hazard!

When working on the fuel system do not use open fire, do not smoke and do not spill any fuel.

Catch running out fuel, do not let it seep into the ground.

Do not inhale any fuel fumes.

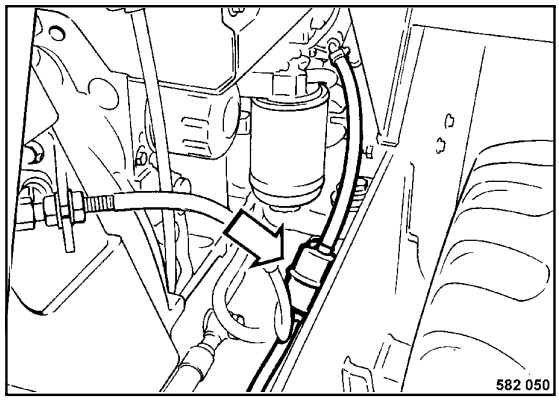


Fig. 90

- Remove the hose clamps and pull the fuel pre-filter (Fig. 90) out of the fuel hoses.

⚠ Caution

Observe the flow direction of the filter.

The arrow must point towards the fuel pump.

- Install the new fuel pre-filter.

5.25 Changing the fuel filter cartridge

⚠ Danger

Fire hazard!

When working on the fuel system do not use open fire, do not smoke and do not spill any fuel.

Catch running out fuel, do not let it seep into the ground.

Do not inhale any fuel fumes.

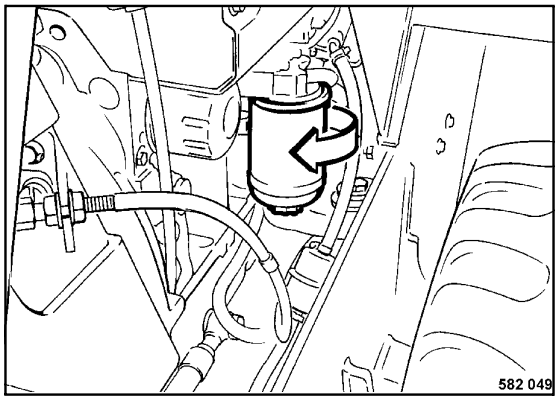


Fig. 91

- Unscrew the fuel filter cartridge (Fig. 91) using an appropriate filter wrench.
- Clean the sealing face on the filter carrier from any dirt.
- Cover the rubber seal on the new filter cartridge slightly with oil and fill in clean fuel.
- Turn the new fuel filter cartridge on by hand, until the seal contacts.
- Tighten the fuel filter cartridge for another half turn.
- After the test drive check the filter cartridge for leaks.

i Note

Bleeding of the fuel system is not necessary.

5.26 Checking the fastenings on the diesel engine

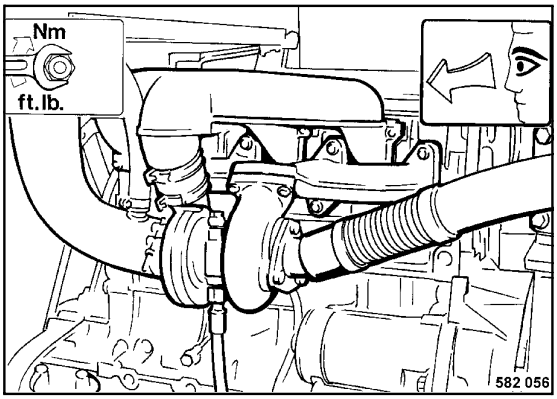


Fig. 92

- Check the fastening of intake and exhaust tubes (Fig. 92) on the cylinder heads for tight fit.
- Check sockets and clamps between air filter, exhaust turbocharger and charge air line as well as the lubrication air line for tight fit and leaks.
- Check fastening and tightness of the lubrication oil sump.

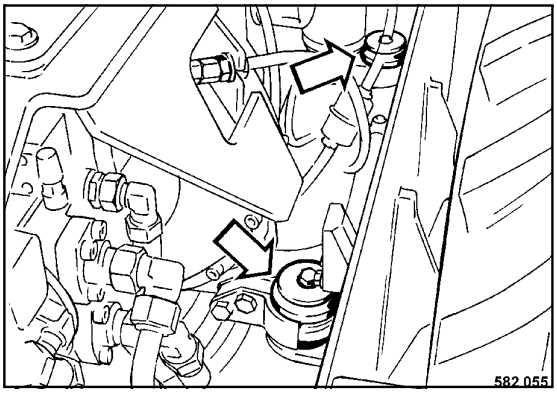


Fig. 93

- Check the condition and tight fit of the engine pillow blocks (Fig. 93).

5.27 Tightening the fastening of the axle on the frame

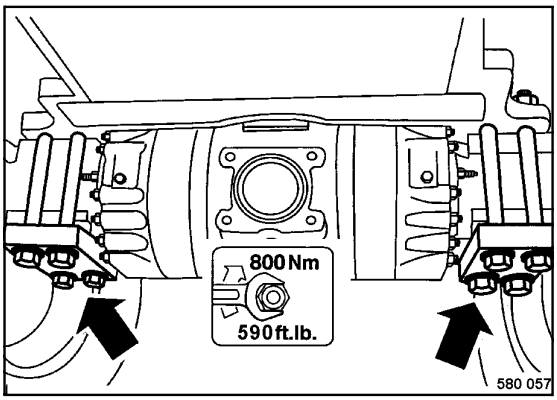


Fig. 94

- Check all fastening nuts for the axle studs for tight fit (Fig. 94).

5.28 Tightening the wheel nuts

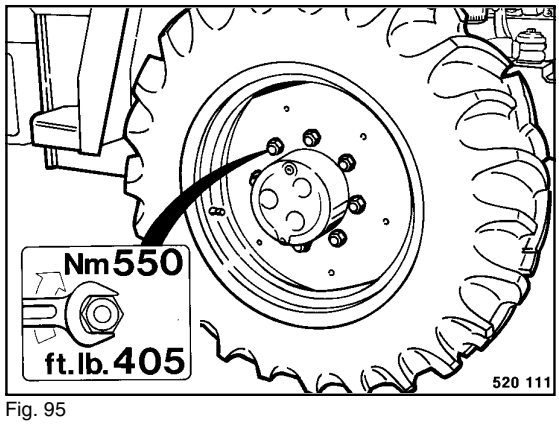


Fig. 95

- Tighten the wheel nuts (Fig. 95) in a crosswise pattern.

Tightening torques 550 Nm (405 ft-lb) (M22x1,5)

5.29 Checking the ROPS

i Note

With the cabin assembled the ROPS (Roll Over Protection Structure) is integrated in the cabin.

Please observe also the respective section in the safety regulations in this manual.

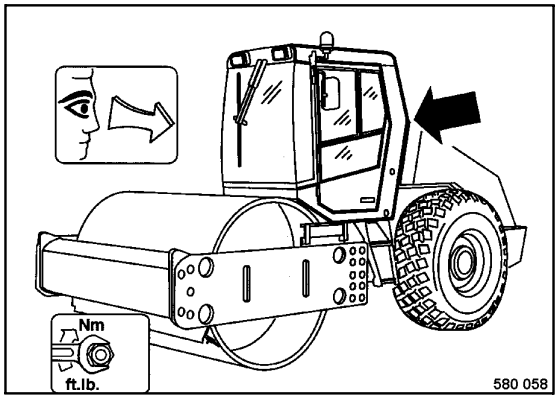


Fig. 96

- Check the cabin, especially the ROPS (Fig. 96) for cracks, corrosion, damage and missing fastening elements.

i Note

Unusual movements and noises (vibrations) during operation indicate damage or loose fastening elements.

- Check the fastening screws for the cabin (ROPS) to the operator's platform for tight fit.
- Check the suspension buffers for the operator's stand for tight fit.
- Check the condition and the fastening of the seat belt.

5.30 Changing hydraulic oil and breather filter

i Note

See also chapter 5.1 "Notes on the hydraulic system".

⚠ Caution

Apart from the normal oil change intervals, the hydraulic oil must also be changed after major repairs in the hydraulic system.

Perform the oil change when the hydraulic oil is warm.

Clean the area round hydraulic oil tank, filler opening and breather filter.

Do not use any detergents to clean the system.

Do not start the engine after draining the hydraulic oil.

Replace the hydraulic oil filter element with every hydraulic oil change.

⚠ Danger

Danger of scalding!

Danger of scalding by hot oil.

Environment

Catch running out oil and dispose of environmentally.

i Note

Generally replace the hydraulic oil filter element after the test run.

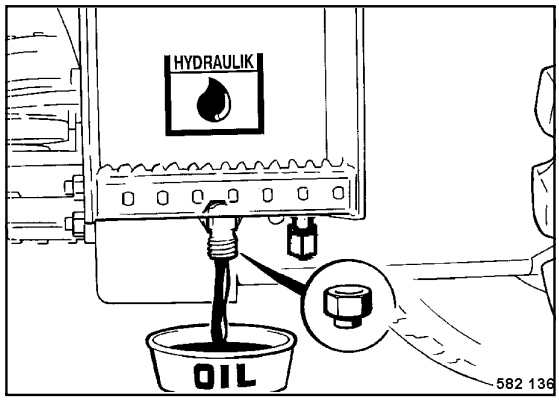


Fig. 97

- Unscrew the plug (Fig. 97) and drain off all hydraulic oil.
- Check the seal ring, replace if necessary and turn the plug tightly back in.

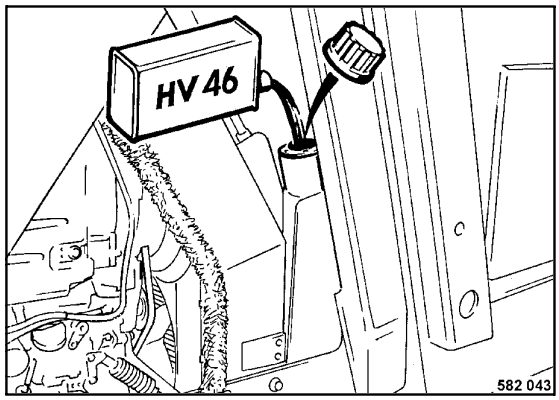


Fig. 98

- Remove the filler cap (Fig. 98).
- Fill in new hydraulic oil through the screen.

i Note

We recommend to use the filling and filtering unit (BOMAG part-no. 079 930 35) with fine filter to fill the hydraulic system. This ensures finest filtration of the hydraulic oil, prolongs the lifetime of the hydraulic oil filter and protects the hydraulic system.

- Check the oil level in the inspection glass.

Nominal value:

approx. 3 cm below the upper edge of the inspection glass

For quality and quantity of oil refer to the table of fuels and lubricants.

i Note

The breather filter for the hydraulic oil tank is integrated in the filler cap, you must therefore replace the complete filler cap.

- Close the tank with a new filler cap.

5.31 Changing the hydraulic oil filter

⚠ Danger

Danger of scalding!

There is a danger of scalding by hot oil when unscrewing the filter.

⚠ Caution

If the filter has to be changed together with the hydraulic oil, the filter should in any case be changed after the oil change and the test run.

Do not use the oil in the filter bowl.

Environment

Catch running out oil, dispose of oil and filter element environmentally.

i Note

The filter element must be changed with every hydraulic oil change and after major repairs in the hydraulic system.

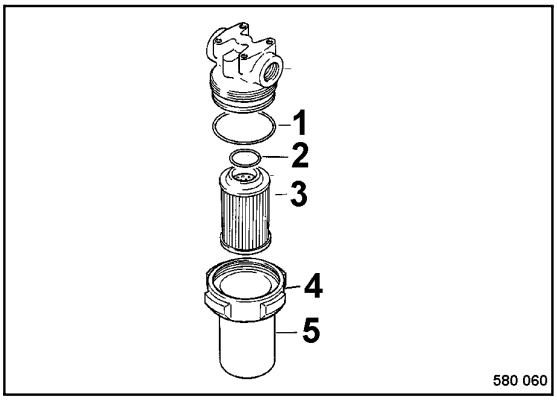


Fig. 99

- Unscrew the cap nut 4 (Fig. 99) and take the filter bowl (5) with the filter element (3) off.
- Examine the sealing face on the filter element thoroughly for any visible dirt.

⚠ Caution

Visible impurities may be an early indicator for a failure of system components and predict the

possible malfunction of important parts. In such a case you should perform trouble shooting and replace or repair the defective components. Nonobservance may lead to total damage of the hydraulic system.

Do not clean or reuse the filter element.

- Take the old filter element (3) out and clean the filter bowl and the thread.
- Reinstall the filter bowl with the new filter element, check the condition of the O-rings (1) and (2), replace if necessary.
- After a test run check the filter for leaks.

5.32 Checking the injection valves

i Note

This work must only be performed by authorized service personnel.

The injection valves must be replaced every 12000 operating hours.

5.33 Replacing the toothed belt

⚠ Caution

The toothed belt must only be changed by a specialist workshop or by the After Sales Service of BOMAG.

Do not retension toothed belts, replace them together with the idler pulley.

Replace a toothed belt at the latest after 5 years, even if the number of operating hours has not yet been reached.

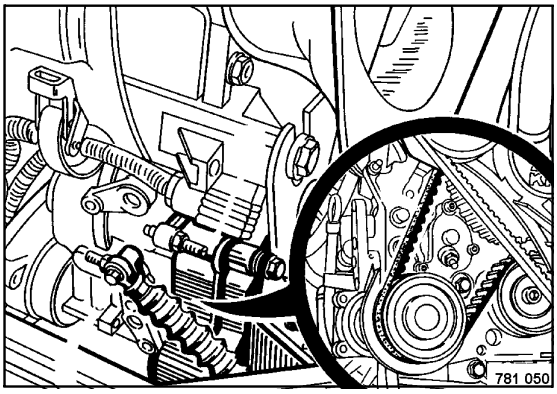


Fig. 100

- Have the toothed belt (Fig. 100) replaced by a specialist workshop.

5.34 Checking, cleaning, changing the combustion air filter

⚠ Caution

Perform cleaning, maintenance and repair work only with the engine shut down. Do not start the engine after removing the filter element.

Do not use gasoline or hot fluids to clean the filter element.

After cleaning the filter element must be inspected for damage using a torch.

Air filter elements with damaged paper bellows or seal lips must be replaced in any case.

The main filter element must be replaced after 3 times cleaning, but at the latest after one year, irrespective of the operating hours.

Each cleaning interval must be marked with a cross on the cover of the filter element.

Cleaning does not make sense if the air filter element is covered with a sooty deposit. Use a new filter element.

Incorrectly handled filter elements may become ineffective because of damage (e.g.: cracks) and cause engine damage.

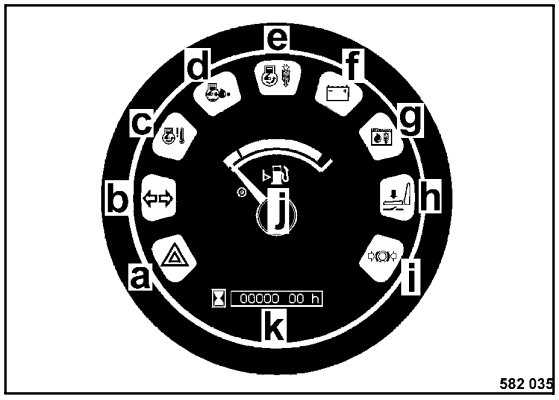


Fig. 101

Maintenance of the dry air filter is due when control light “e” (Fig. 101) in the multi-function display lights permanently when the engine is running, but at the latest after one year.

i Note

Once the air filter service indicator lights up, work may be continued until the end of the day.

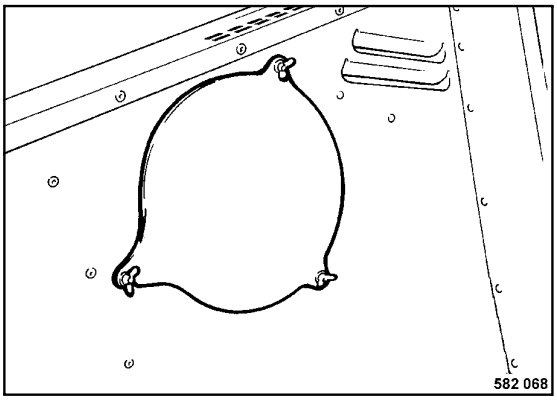


Fig. 102

- Remove the maintenance cover (Fig. 102).

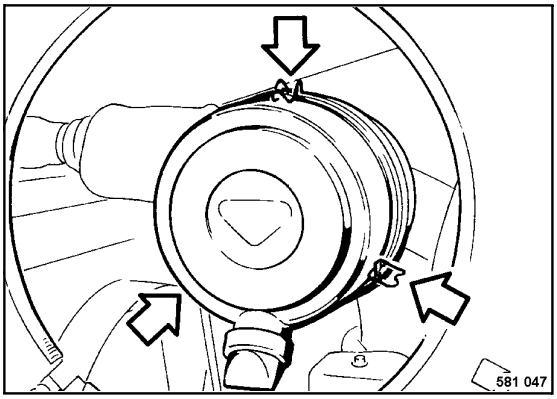


Fig. 103

- Release the locking hook (Fig. 103) and take the filter hood off.
- Clean filter hood and dust discharge valve.

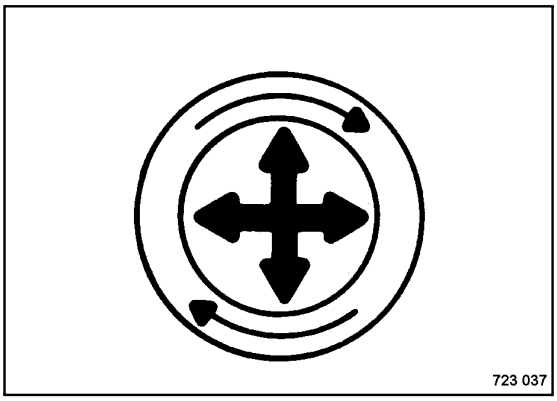


Fig. 104

- Carefully loosen the main filter element (Fig. 104).

The main filter element is located directly on the air intake tube, thereby providing a seal on the inside of the filter cover. Carefully remove the main filter element, in order to reduce the released amount of dust. To release the seal pull the main filter element carefully up, down and sideways or turn it (Fig. 104) .

⚠ Caution

Avoid contact between main filter element and housing.

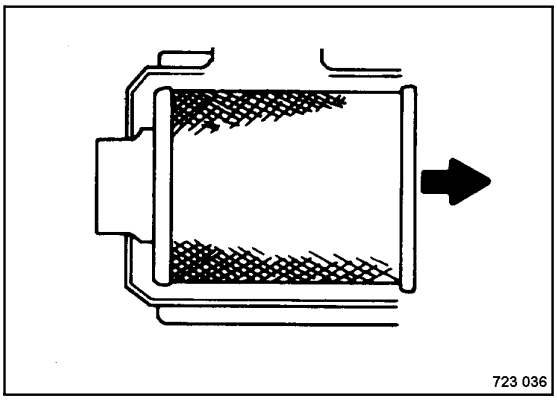


Fig. 105

- Pull the main filter element (Fig. 105) carefully out of the housing.

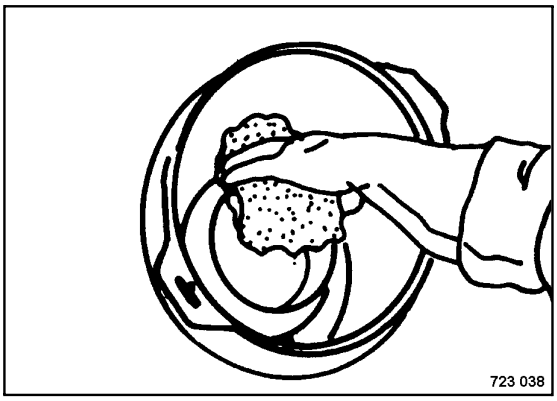


Fig. 106

- Clean the sealing face on the outlet tube (Fig. 106).

Dust on the outer diameter of the outlet tube can impair effective sealing.

- Check the old main filter element.

The old main filter element can be of help to discover foreign particles on the sealing face, which could lead to leaks. A line of dust on the clean air side of the filter may be a sign for such a leak. Eliminate this problem before installing a new main filter element.

- If the main filter element is damaged, the safety element must be replaced as well.
- Clean or replace the main filter element.

i Note

We generally recommend to change the filter. A new filter element is far less expensive than a possible engine damage.

- Examine the main filter element thoroughly for damage.

Before installing the new main filter element check it for possible damage from transport, cleaning or incorrect handling. Especially on the inside of the open end (sealing area). Do not install damaged filter elements.

- If necessary use safety elements.

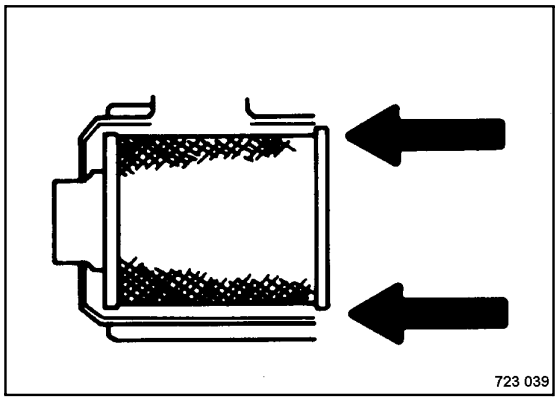


Fig. 107

- Insert the main filter element (Fig. 107).

The radial sealing area is located at the inside of the open filter edge. This critical sealing area must be under slight tension after the filter has been installed. In order to achieve a tight seal apply pressure to the outer edge of the filter and not to the moveable centre.

- Reinstall the filter hood with the dust discharge valve.

⚠ Caution

The dust discharge valve must point vertically downwards.

Dry cleaning of the main filter element

⚠ Danger

Eye injury!

Wear protective clothing (goggles, gloves).

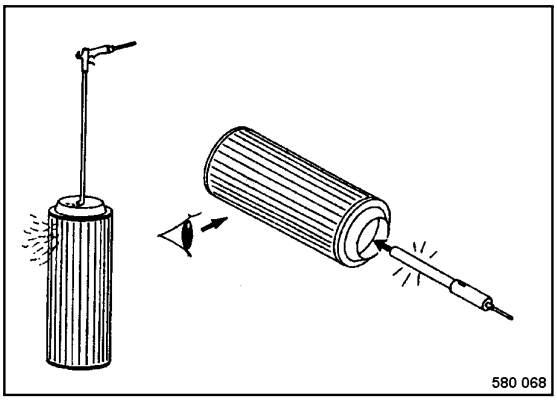


Fig. 108

i Note

For cleaning purposes fit a tube to the compressed air gun (Fig. 108), the end of which should be bent for approx. 90°.

The length should reach down to the bottom of the element.

- Blow the main filter element out with compressed air (max. 5 bar) from inside to outside by moving the tube up and down inside the element, until it if free of dust.
- Examine the main filter element with a torch for cracks and holes in the paper bellows.

⚠ Caution

Do not continue to use a damaged main filter element. If in doubt use a new main filter element.

Changing the safety filter element

⚠ Caution

The safety filter element must not be cleaned and should not be used again after it has been removed.

The safety filter element must be replaced:

if the main filter element is defective,

after three times cleaning of the main filter element,

at the latest after 2 years,

if the warning light comes on again after servicing the main filter cartridge.

- Remove the housing cover and pull the main filter element off.

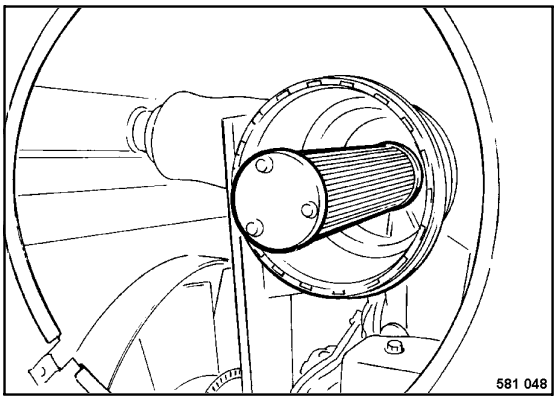


Fig. 109

- Pull the safety element (Fig. 109) out by turning it lightly.
- Push in a new safety filter element.
- Reassemble main filter element and cover.

5.35 Adjusting the parking brake

⚠ Caution

Have adjustment work on the brake performed by a specialist! Always adjust both sides.

- Secure the machine with chocks against unintentional rolling.
- Start the diesel engine to release the brake.

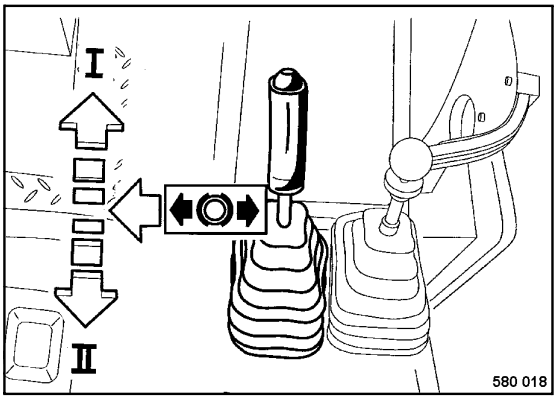


Fig. 110

- Unlock the travel lever (Fig. 110) by pushing it to the left, but do not actuate it to position "I" or "II".

The parking brake is released

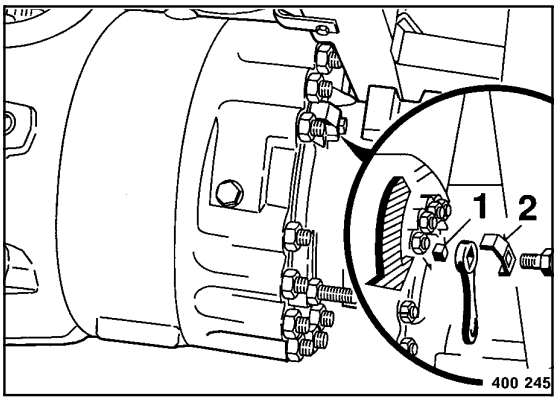


Fig. 111

- Unscrew the locking plate 2 (Fig. 111).
- Turn the square (1) in anti-clockwise direction against the end stop.

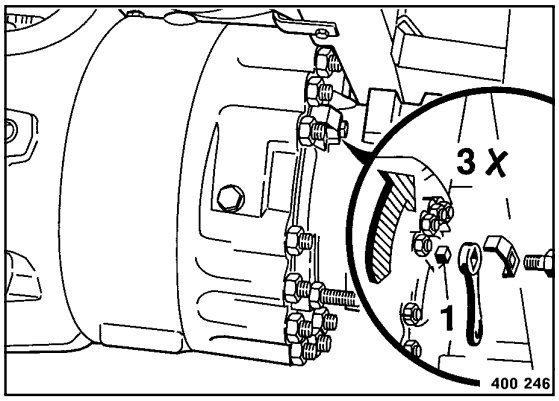


Fig. 112

- To adjust the clearance turn the square 1 (Fig. 112) three revolutions back in clockwise direction.
- Screw the locking plate back on.
- Pull the plug off the brake valve and try to drive.

The machine must be braked.

5.36 Changing the tires

⚠ Danger

Danger of accident!

Observe all safety notes for the lifting of loads.

- Place a jack (min. 5 t bearing capacity) under the rear frame and jack the machine up so that the wheel can turn freely.
- Unscrew the wheel nuts and take the wheel off.

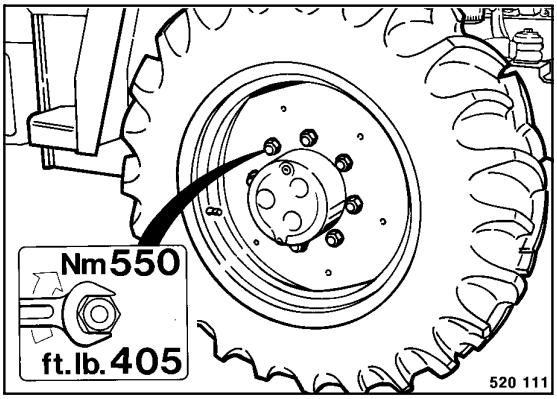


Fig. 113

- Attach the wheel (Fig. 113) and tighten the wheel nuts crosswise with 550 Nm (405 ft. lb.).
- Check the tire pressure, see technical data.

5.37 Adjusting the scrapers

smooth drum only

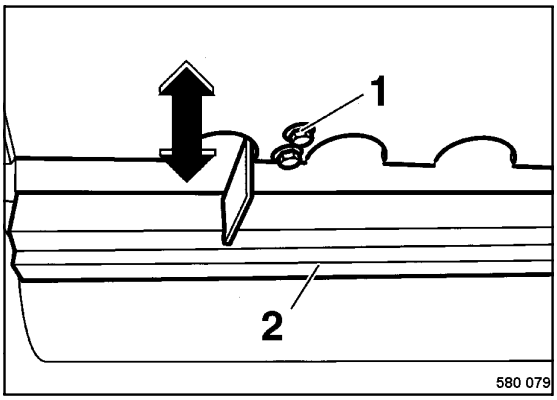


Fig. 114

- Check the condition and adjustment of the front and rear scrapers, adjust or replace the scraper rubber if necessary.
- To adjust the scrapers 1 (Fig. 114) loosen the fastening screws (2) in the slots and push the scraper bracket towards the drum until the scraper touches.
- Retighten the fastening screws.

padfoot drum only

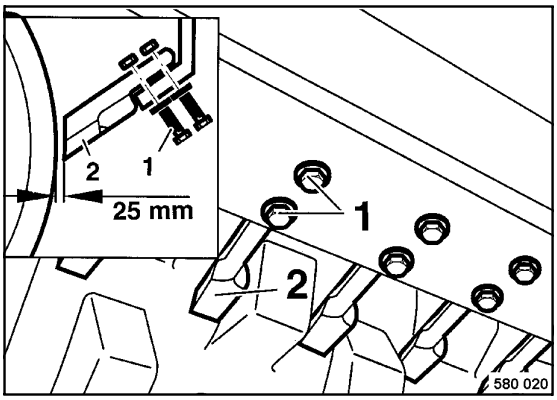


Fig. 115

- Check condition and adjustment of scrapers 2 (Fig. 115), adjust or replace the teeth if necessary.
- To adjust the scrapers (2) slacken the fastening screws (1) in the slots and move the scraper towards the drum, leaving a gap of approx. 25 mm.
- Retighten the fastening screws.

5.38 Changing the fresh air filter in the cabin

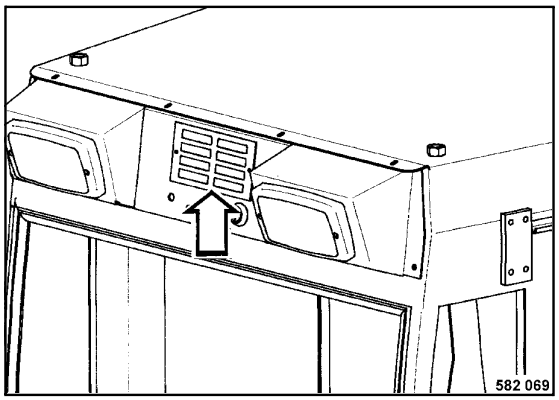


Fig. 116

- Remove the filter screen (Fig. 116) and take the filter out.
- Insert a new filter and reassemble the filter screen.

5.39 Tightening torques

Bolt dimensions	Tightening torques* ft - lb		
	8.8	10.9	12.9
M4	2	3	4
M5	4	7	7
M6	7	11	13
M8	18	26	33
M10	37	55	61
M12	65	91	108
M14	101	145	173
M16	156	221	264
M18	213	303	361
M20	304	426	513
M22	413	559	695
M24	524	738	885
M27	774	1092	1308
M30	1047	1482	1770

Fig. 117

* Strength classes for screws with untreated, non-lubricated surface. The screw quality is stamped on the screw heads.

8.8 = 8G

10.9 = 10K

12.9 = 12K

- Axle - frame

M 24 = 880 Nm

- Wheel nuts

M 22x1,5 = 550 Nm

The values result in a 90% utilization of the screws yielding point at a coefficient of friction of μ tot. = 0,14. The tightening torques are not valid when using MOS_2 lubricants.

i Note

Self locking nuts must always be replaced after they have been unscrewed.

5.40 Engine conservation

If the engine is to be shut down for a longer period of time (e.g. over winter), we recommend to apply the following conserving measures to avoid corrosion:

- Clean the engine, including the cooling system: With cold cleansing agent and a water jet or, even better, with a steam cleaner.
- Run the engine warm and shut it down.
- Drain off the still hot engine oil and fill in anti-corrosion engine oil.
- Drain off the coolant and fill in system protection agent.
- Drain the fuel from the tank, mix it well with 10% anti-corrosion oil and fill it back in.
- Run the engine for 10 minutes until all lines, filters, pumps and nozzles with this conserving mixture and the new engine oil has been distributed to all parts.
- Now crank the engine several times (without ignition) to spray the combustion chambers.
- Take the V-belts off and spray the grooves of the V-belts with anti-corrosion oil. Remove the anti-corrosion oil before resuming operation.
- Close intake and exhaust openings tightly.

i Note

Depending on the weather conditions these conserving measures will provide protection for approx. 6 to 12 months.

Before taking the engine back into operation all conserving oil must be drained off and replaced by regular engine oil, see chapter "Fuels and Lubricants" according to the API-(MIL)-classification.

Anti-corrosion oils are those that comply with the specification MIL-L-21260 B or TL 9150-037/2 or Nato Code C 640/642.

A machine with a conserved engine must be marked by attaching a clearly visible warning tag.

As required

6 Trouble shooting

6.1 General notes

The following work must only be carried out by qualified and trained personnel or by the sales service.

Please observe strictly the safety regulations in chapter 2 of these operating and maintenance instructions.

Faults occur frequently due to the fact, that the machine has not been properly operated or serviced. Therefore, whenever a fault occurs, read through these instructions on correct operation and maintenance. If you cannot locate the cause of the fault or eliminate it yourself by following the trouble shooting charts, you should contact our customer service departments at our branch office or dealers.

⚠ Danger

Danger of injury!

Keep away from rotating parts of the engine.

6.2 Engine

Faults	Possible cause	Remedy
The engine does not start	Starter defective or pinion not engaging	Have examined by a specialist
	Fuel tank empty	Fill and bleed the tank
	Temperature below starting limit	Use winter fuel and engine oil acc. to the ambient temperature.
	Fuel filter clogged, in winter due to paraffin separation.	Change the filter. use winter fuel
	Fuel lines leaking	Check all line connections for leakages and tighten the fittings.
	Battery discharged or not connected	Tighten the pole clamps, check the cable connections
	Injection valves or injection pump defective	Have examined by a specialist
The engine starts poorly and works irregularly with poor power	Battery power too low, battery clamps loose or oxidized, causing the starter to turn too slowly	Have the battery checked, clean the terminal clamps, tighten them and cover them with acid free grease
	Especially during winter: the use of too viscous engine oil	Use engine oil suitable for the ambient temperature
	Fuel supply restricted, in winter fuel system clogged due to paraffin separation	Change the fuel filter. Check the line connections for leaks and tighten the fittings. Use winter fuel in the cold season.
	Incorrect valve clearance	Adjust the valve clearance
	Injection valve defective	Have examined by a specialist
	Injection lines leaking	Check the lines for leakages
	Turbo charger defective	Have examined by a specialist
	Dry air filter dirty	clean, replace if necessary
	Excessive play in the throttle cable	Adjust the throttle cable, change it if necessary

Faults	Possible cause	Remedy
Excessive exhaust smoke	Engine oil level too high	Drain the oil to the upper dipstick mark
	Dry air filter dirty	clean, replace if necessary
	Exhaust gas turbo-charger defective	Have examined by a specialist
	Poor compression due to burned or broken compression rings or incorrect valve clearance	Have compression rings and pistons examined by a specialist, adjust the valve clearance
	Incorrect valve clearance	Adjust the valve clearance
Engine overheats, shut down immediately!	Cooling fins on radiator extremely soiled (the warning light "engine oil temperature" lights)	Clean the cooling fins
	Injection valve defective	Have examined by a specialist
	Engine oil level too low	Top up engine oil to the upper dipstick mark
	Filling capacity of the injection pump not correctly adjusted	Have adjusted by a specialist
	Cooling air flow restricted	Clean the cooling air duct
	V-belt loos or broken	Tension or replace the V-belt
Poor engine power	Engine oil level too high	Drain the engine oil down to the upper dipstick mark
	Dry air filter dirty	clean, change if necessary
	Exhaust gas turbo-charger defective	Have examined by a specialist
	Charge air hose leaking	Check fastening and connections
	Incorrect valve clearance	Adjust the valve clearance
	Injection valve defective	Have examined by a specialist
Engine oil pressure too low	Engine oil level too low (control light "engine oil pressure" lights, the warning buzzer sounds)	Top up oil
	Leakages in the lubrication system	Shut the engine down immediately, check fittings on oil lines, lubrication oil filter and oil cooler for leaks, if necessary tighten the fittings.
The charge control light lights during operation, the warning buzzer sounds	Generator speed too low	Check the V-belt tension, replace the V-belt if necessary
	The generator does not charge the battery, because generator or regulator is defective	Have examined by a specialis

Optional Pad foot/Smooth Shell Kit Maintenance

⚠ Caution

Units equipped with the optional Pad foot or Smooth shell kit requires maintenance. Failure to perform required maintenance will result in a shorten equipment life cycle and the voiding of the warranty.

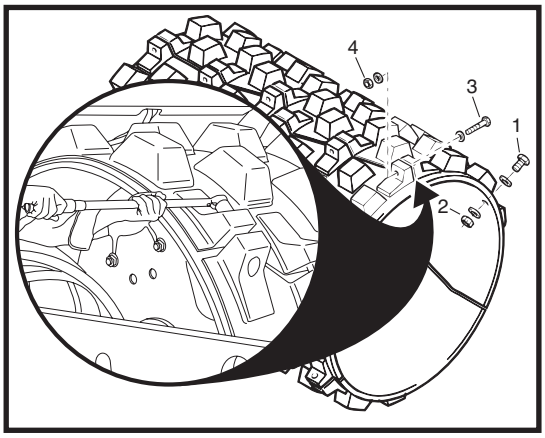
Units covered under this maintenance information are:
Pad foot shell kit:
BOMAG BW145D/DH, BW177D/DH, BW211D, BW213D/DH
HYPAC C820, C830 and C850 series of single drum rollers.

Smooth shell Kit:
BOMAG BW145PDH, BW177PDH, BW211PD, BW213PDH
HYPAC C822, C832, C842, C852

⚠ Caution

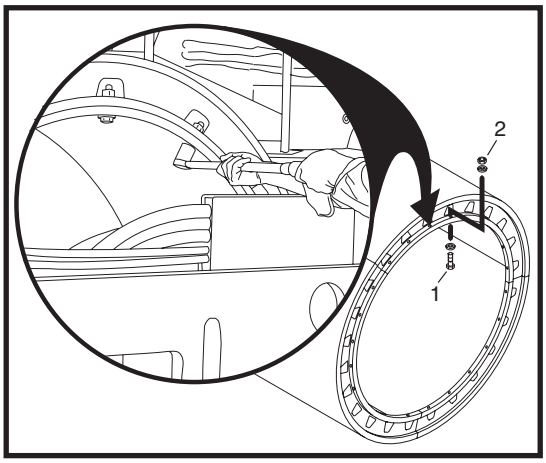
Maintenance must be performed every 50 hours or weekly which ever comes first. Failure to comply with the required maintenance with result in the voiding of the warranty.

Pad foot shell kit.

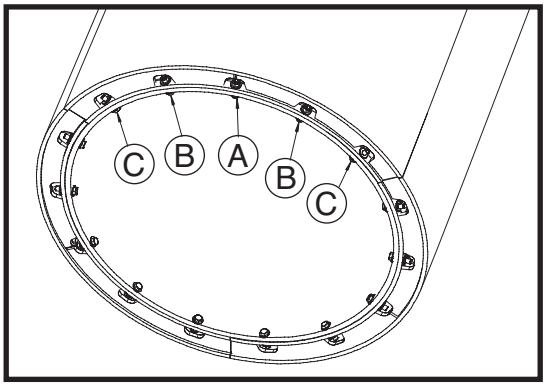


Pad foot Hardware Torque specifications:
Items 1 and 2. Grade 10.9 bolt/nut combination 221 ft. lb. (300 Nm). 2 Bolts.
Items 3 and 4. Grade 8.8 bolt/nut combination 156 ft. lb. (212 Nm). 18 Bolts.

Smooth shell kit.



Smooth Hardware Torque specifications:
Items 1 and 2.
BW145PDH, BW177PDH, C822 C832. Grade 10.9 bolt/nut combination 236 ft. lb. (320 Nm). 30 Bolts.
BW211PD, BW213PDH, C842, C852. Grade 10.9 bolt/nut combination 427 ft. lb. (580 Nm). 30 Bolts.



Smooth shell kit torque sequence.
First torque the bolt at the A position, then the 2 bolts at the B position and then the 2 bolts at the C position on both sides of the drum. Repeat the process for the remaining sections. Recheck the torque values.

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