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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.

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Bomag (ϵ)

EC - Declaration of Conformity

sider your parts as defined by Machinery Directive 89/392 EEC, Annex II A

Herewith we declare that this series production machine

Designation:	Vibratory	plate
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BPR 25/32, BPR 25/40, BPR 25/40 D Type:

BOMAG GmbH & Co. OHG, Boppard Manufacturer:

(see information on type plate) Serial number:

complies with the substantial provisions of EEC-Directive:

Machinery:

89/392/EEC, amended by directice 91/368/EEC + 93/44/EEC + 93/68/EEC

EMC:

89/336/EEC, amended by directive 91/263/ECC + 92/31/ECC + 93/68/ECC

and the harmonized standards:

EN 500-1 and 500-4

A specimen of the above mentioned product has been checked and approved by the committee civil engieneering/testing and certificated under the number 95441-E.

This EU-declaration of conformity is only valid together with the appropriate scope of delivery and clearly visible CE-sign on the machine integrated in the type plate.

Boppard, 12/99

BOMAG GmbH & Co. OHG

i.V. R. Traincollo R. Steinadler

Project Manager

BOMAG GmbH & Co. OHG, Industriegebiet Hellerwald, D-56154 Boppard, German

(GB)

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sider your parts

Machines marked with the (ϵ) -sign are in accordance with the latest improved safety regulations for the market within the European Union.

For machines to be used outside this area and where these regulations are not binding, BOMAG recommends the application of the same safety standards. These BOMAG - machines are products from the wide product range of BOMAG compaction equipment. BOMAG's vast experience, coupled with the most modern production and testing methods, such as lifetime tests of all important components and highest quality demands, ensure highest reliability of your machine.

Using these instructions will

- help you to become acquainted with the machine.
- avoid faults caused by unprofessional operation.

Observing the maintenance instructions will

- increase the reliability of the machine during use on site,
- prolong the lifetime of the machine,
- reduce repair costs and downtime.

BOMAG does not assume liability for the function of the machine

- if the machine is handled in a way, which does not comply with the use it is intended for,
- if it is used for purposes other then the ones mentioned in these instructions.

No warranty claims can be lodged for damage resulting from

- operating errors,
- insufficient maintenance and
- the use of wrong fuels and lubricants.

Please note!

This manual was written for operators and maintenance personnel on construction sites.

You should only operate the machine after you have been instructed to do so and by following these instructions.

Please observe strictly the safety regulations.

Please observe also the guidelines of the civil engineering liability association "safety rules for the operation of road rollers and soil compaction equipment", as well as the applicable instructions for the prevention of accidents.

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

To comply with the technical development we reserve the right of modifications without prior notification.

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

In addition you can obtain a spare parts catalogue from your BOMAG dealer by just stating the serial number of your machine.

Information for the correct use of our machines in earth and asphalt construction is also available from your BOMAG-dealer.

The notes mentioned above do not constitute an extension of the warranty and liability conditions, which are part of the general terms of business of BOMAG.

We wish you much success with your BOMAG machine.

BOMAG GmbH & Co. OHG

Printed in Germany

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Foreword

Please fill in

Machine type (Fig. 1)

Serial No. (Fig. 1 and 2)

Engine type (Fig. 3)

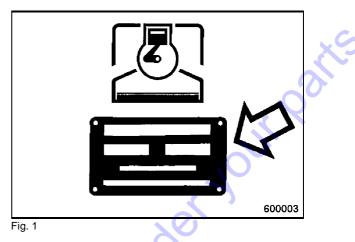
Engine No. (Fig. 3)

j Note

Fill in the above listed data when receiving the machine.

Upon receipt of the machine our organization will instruct you about correct operation and maintenance.

Please observe strictly all safety regulations and notes on potential dangers!



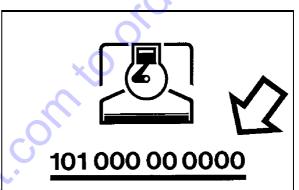


Fig. 2

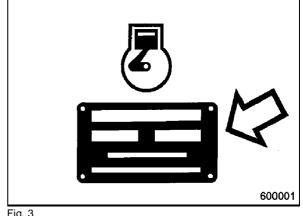
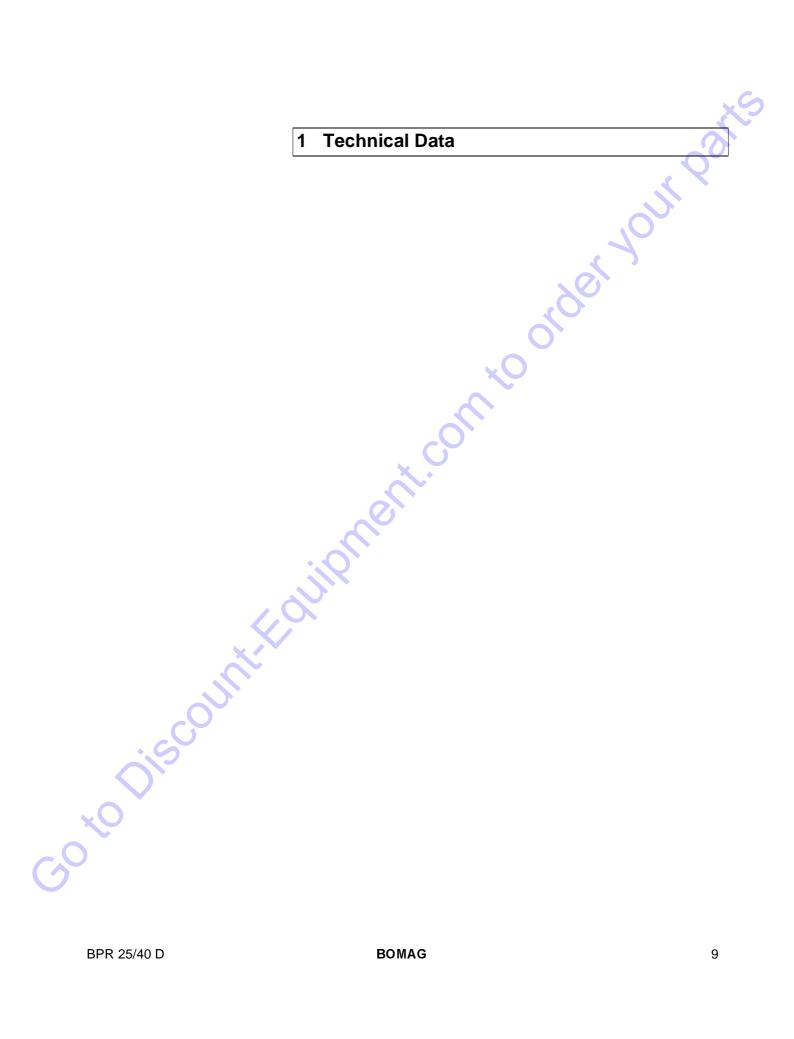


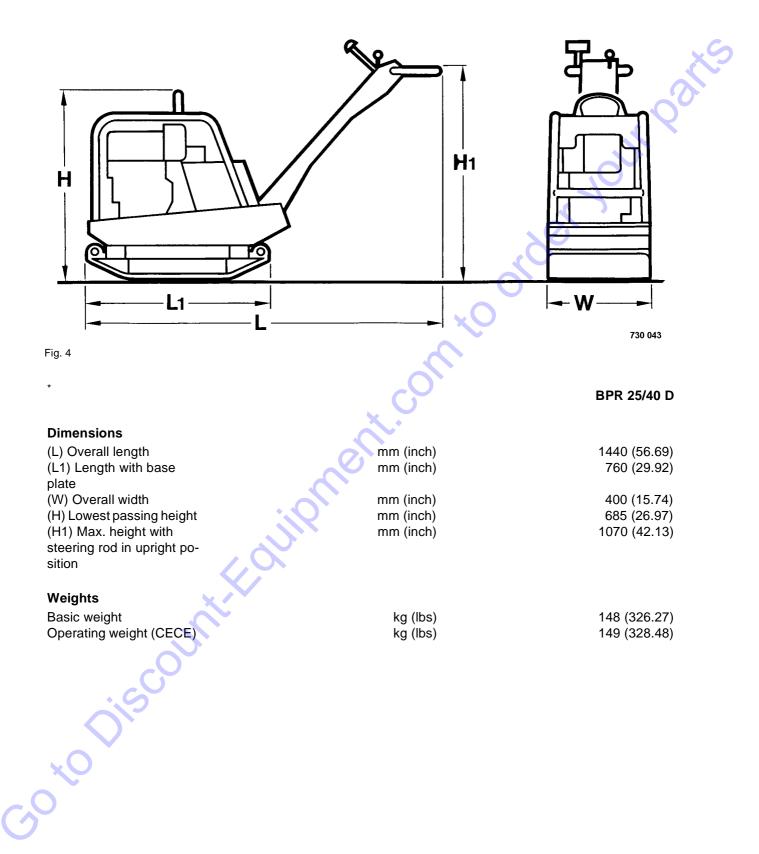
Fig. 3

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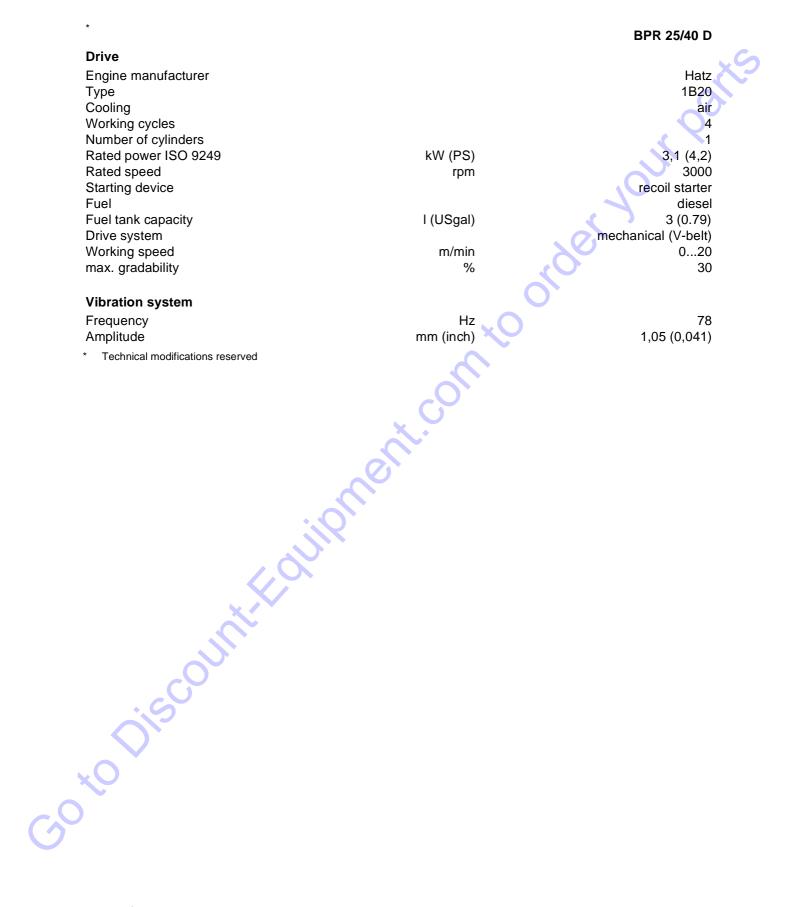
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Technical Data



Technical Data



Technical Data

The following noise and vibration data according to the EC-machine regulation, edition (93/68/EWG) were determined at operating conditions, which are typical for the machine, with vibration and over a pre-determined travel distance (DIN 45635).

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

Noise values

The noise measured according to enclosure 1, paragraph 1.7.4. f of the EC-machine regulation is for the

sound pressure level at the operator's place:

 $L_{pA} = 96,0$

sound capacity level:

 $L_{pA} = 106,6$

These noise values were determined according to ISO 6081 for the sound pressure level (L_{DA}) and ISO 3744, DIN 45635 for the sound capacity level (L_{WA}).

Vibration values

The vibration data according to enclosure 1, paragraph 2. 2 or 3. 6. 3. a of the EC-machine regulation are:

Hand-arm vibration values

The weighted effective acceleration value according to ISO 8662 Part 1, DIN 45675, part 9 is BPR 25/40 D = 4.5 m/sec^2

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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 all types of soil,
- repair work on all types of soil,
- reinforcement of pedestrian walkways,
- work in trenches,
- filling and compaction of hard shoulders.
- 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.

Who is allowed to work with the machine?

The machine must only be operated by trained and authorized persons who 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

Paragraphs marked like this highlight possible dangers for persons.

▲ Caution

Paragraphs marked this way highlight possible dangers for machines or parts of the machines.

j 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.

Safety stickers on the machine

Keep safety stickers in good condition and legible and follow their meaning.

Replace damaged and illegible safety stickers.

Loading the machine

Secure the machine against turning over or slipping off.

Persons are highly endangered if they

- step under loads being lifted or
- stand under loads being lifted

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

Starting the machine

Before starting

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.). Wear ear defenders.

Check before starting, whether:

- the machine shows any obvious defects
- all protective devices are properly secured in their place
- the control elements are fully functional
- the machine is free of any oily and combustible material
- all handles are free of grease, oils, fuels, dirt, snow and ice.

Use only machines which have been serviced at regular intervals.

Do not use any starting aids such as Startpilot or ether.

Starting in closed rooms

Exhaust fumes are life threatening! Always ensure an adequate supply of fresh air when starting in closed rooms!

Operation

Guide the machine in such a way, that your hands stay clear of any solid obstructions, risk of injury.

Watch out for unusual noises and development of smoke. Detect the cause and have the fault corrected.

Operate the vibratory plate only with full throttle, as otherwise the centrifugal clutch may be damaged.

Never let the machine run unattended.

Parking the machine

If possible, park the machine on level ground. Before leaving the machine:

- Park the machine so, that it cannot turn over.
- Shut the engine down and pull the ignition key out.

Always secure parked machines, which could be in the way, with appropriate measures.

Filling the fuel tank

Refuel only with the engine shut 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.

Maintenance

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

Keep unauthorized persons away from the machine.

Do not perform service work while the engine is running.

If possible, park the machine on level and firm ground.

Safety regulations

Working on the engine

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

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

Store used filters and other oil containing materials in a specially marked container and dispose of environmentally.

Working on electric components

Before starting to work on electric components disconnect the battery and cover it with insulating material.

Working on the battery

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

Do not let skin and clothes come in contact with acid.

In case of injuries caused by acid flush the respective parts with clear water and consult a doctor for medical advice.

Do not place any tools on the battery, danger of short circuit.

When recharging the battery remove all plugs to avoid an accumulation of explosive gases.

Dispose of old batteries environmentally.

Working on the fuel system

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.

Cleaning

Do not clean the machine while the engine is running.

Do not use gasoline or other combustible substances for cleaning purposes.

When using steam cleaning equipment do not subject electric parts to the direct water jet or cover it beforehand.

Do not guide the water jet directly into the air filter and into the air intake opening.

After maintenance work

Reinstall all protective devices after completing the maintenance work.

Repair

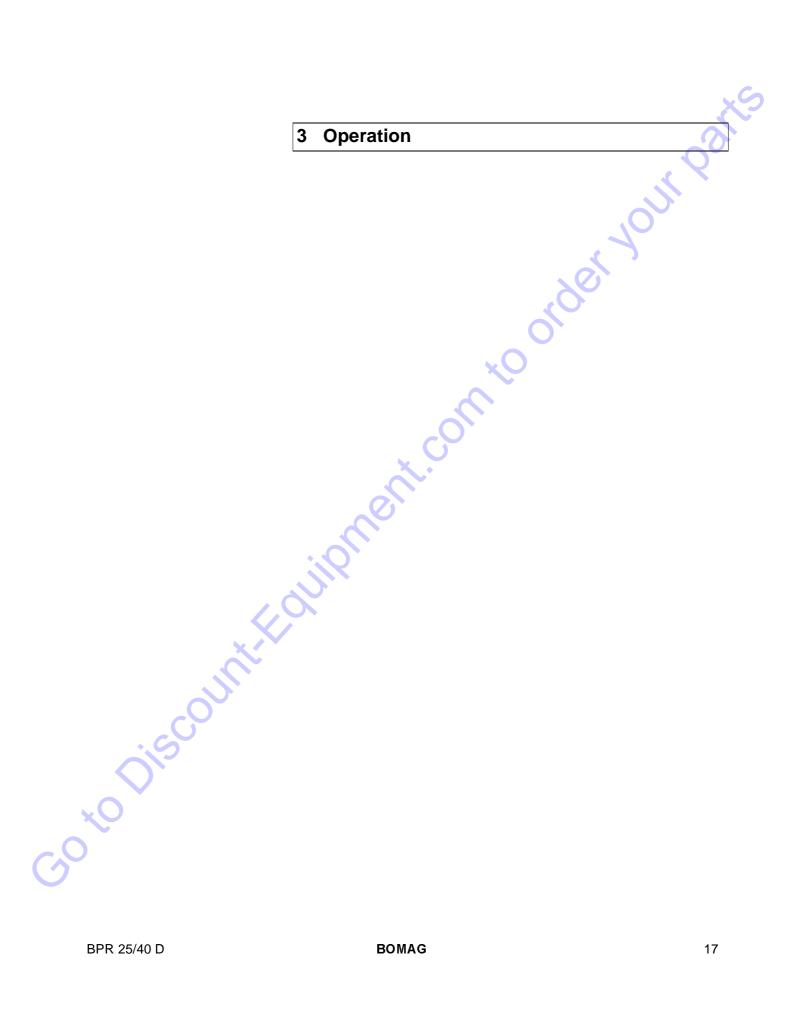
Repairs must only be performed by qualified and authorized personnel. Use our repair instructions for this purpose.

Exhaust gases are a threat to life! Always ensure an adequate supply of fresh air when starting in closed rooms!

If the machine is defective, attach a warning tag on the steering handle.

Test

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



3.1 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.

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3.2 Before starting work

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

Refer also to the detailed description in the chapter "Maintenance".

Top up missing fuels and lubricants according to the respective maintenance instruction.

- Stand the machine on level ground.
- Check fuel tank and lines for leaks.
- Check the engine oil level, if necessary top up to the upper mark.
- Check the fuel level, if necessary top up.
- Check the dry air filter maintenance indicator.
- Check the condition of the entire machine and check the screw connections for tight fit.

A Danger

Loss of hearing!

Wear your personal noise protection equipment (ear defenders) before starting operation.

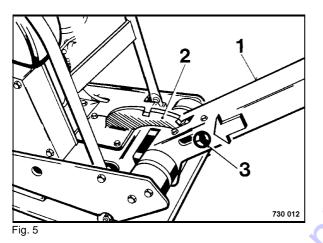
3.3 Folding the steering rod down

Danger

Danger of injury!

Impact caused by spring force!

The steering rod is resilient in operating position.



 Press the locking lever 3 (Fig. 5) in direction of arrow and fold the steering rod down, so that it can move freely.

3.4 Starting with recoil starter

Danger

Danger of explosion!

Do not use any starting aid sprays.

Before starting make sure that no persons are in the danger zone around the engine or the machine and that all guards and safety installations are in place.

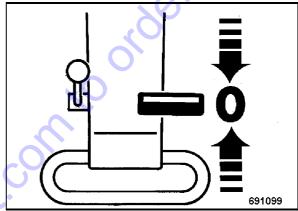


Fig. 6

 Set the travel lever (reversing lever) (Fig. 6) to position "0".

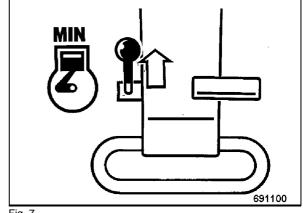
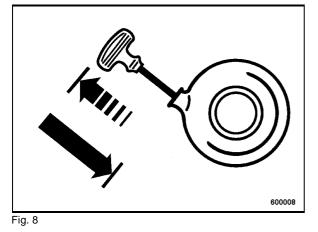


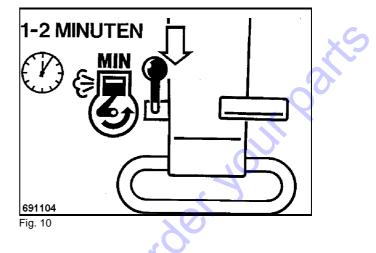
Fig. 7

• Shift the throttle lever (Fig. 7) to position "MIN." (idle speed).

Operation

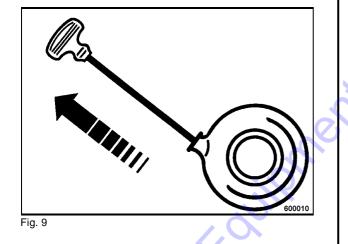


- Pull the rope with the starter handle (Fig. 8) out until a noticeable resistance can be felt.
- Let the starter handle run back to initial position.



▲ Caution

Before starting work allow the engine to warm up for a short while (Fig. 10).



▲ Caution

Do not let the starter handle run back after pulling.

- Pull the starter handle (Fig. 9) powerfully.
- If the engine does not start the first time, repeat the starting procedure.

▲ Danger

Danger of explosion!

Do not use spray-type starting aids or other inflammable liquids to assist the starting process.

3.5 Work/operation

i Note

As soon as the engine responds to short throttle actions you may start to operate the vibratory plate.

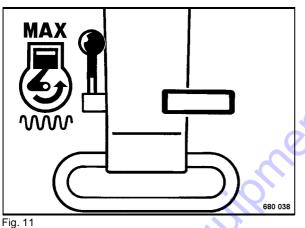
Danger

Danger of accident!

Operate the machine only with the steering rod folded down.

Steer the machine only with the steering rod.

Use your own noise protection means (ear defenders).



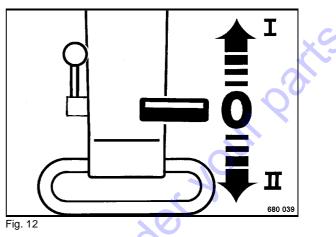
 Shift the throttle lever (Fig. 11) to position "MAX.".

▲ Caution

Operate the vibratory plate only with full throttle, as otherwise the centrifugal clutch may be damaged.

i Note

For short breaks return the throttle lever to idle speed position, this avoids premature wear of the centrifugal clutch.



• Move the travel lever (Fig. 12) to forward "I" or reverse "II", according to the desired speed.

The machine vibrates forward or reverse with a speed, which corresponds with the displacement of the travel lever.

Jammed up vibratory plate

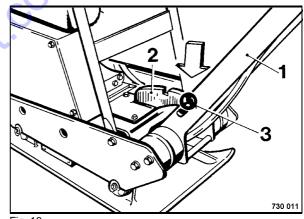
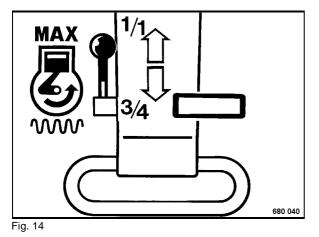


Fig. 13

 Lock the steering rod 1 (Fig. 13) with the locking lever (3) in the first locking position of the notched rail (2).



- Keep moving the throttle lever (Fig. 14) between 3/4 and full throttle position.
- At the same time pull the vibratory plate by the steering rod from right to left and vice versa, until the machine is free.

A Danger

Danger of accident!

To avoid injuries during reverse travel you should always guide the machine by the handle from the side.

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3.6 Shutting the engine down

▲ Caution

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

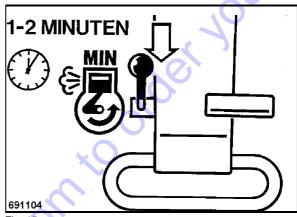


Fig. 15

Shift the throttle lever to position "Min" (Fig.
15) and let the engine run with idle speed for a short while.

Vibration is shut down.

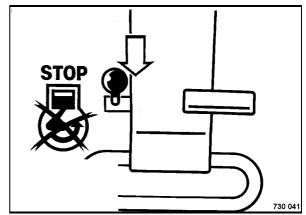


Fig. 16

• Shift the throttle lever to position STOP (Fig. 16), the warning buzzer sounds.

3.7 Loading

A Danger

Danger of accident!

Make sure that no persons are endangered by the machine tipping or slipping off.

Lash the machine down to secure it against slipping off, sliding or turning over.

To lift the machine attach the lifting gear to the lifting eye.

The machine must not swing about when being lifted.

Use only stable lifting gear of sufficient load bearing capacity.

Do not step or stand under loads being lifted.

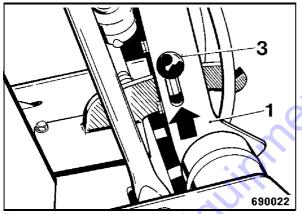
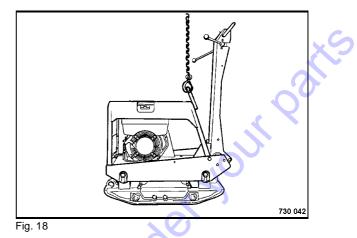


Fig. 17

• Adjust the steering rod 1 (Fig. 17) upright and lock the locking lever (3) in the notched rail.



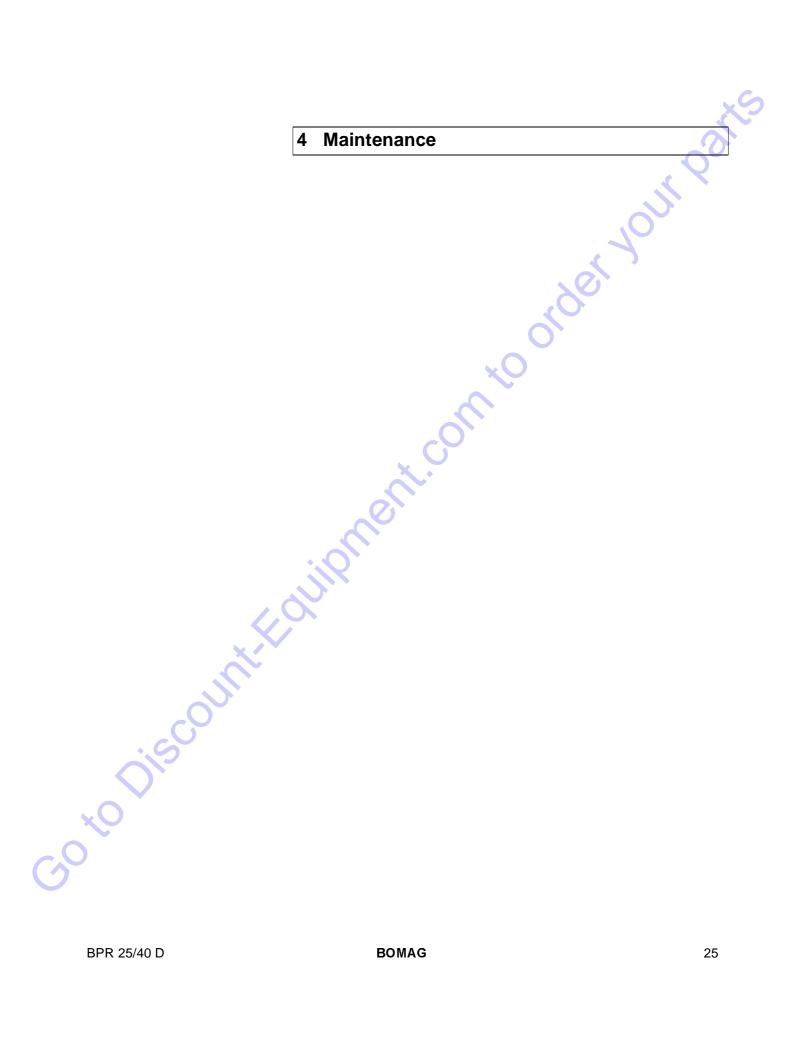
• For loading attach the lifting tackle (rope) to the engine protection frame of the vibratory plate.



Danger of accident!

Lash the vibratory plate to the transport vehicle, so that it is well secured against slipping and tipping off!

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4.1 General notes on maintenance

When performing maintenance work observe the applicable safety regulations and especially safety regulations in chapter 2 of these operating, maintenance and repair instructions.

Thorough maintenance of the machine ensures maximum reliability and prolongs the lifetime of important components. The effort necessary for this purpose is only of minor significance when being compared with the problems, which may arise, if these instructions are not observed.

- Clean machine and engine thoroughly before starting maintenance work.
- For maintenance work park the machine on level ground.
- Maintenance work must generally be carried out with the engine shut down.

🔂 Environment

During maintenance work catch all oils and fuels and do not let them seep into the ground. Dispose of oils and fuel environmentally.

Notes on the fuel system

The lifetime of the diesel engine is decisively depending on the cleanliness of the fuel.

- Keep the engine free of dirt and water as this could damage the injection elements of the engine.
- Zinc lined drums are not suitable for storing fuel.
- The fuel drum should rest for a longer period of time before drawing off fuel.
- Under no circumstances must the drum be rolled to the tapping pint just before drawing off fuel.
- When choosing the storage place for fuel, make sure that spilled fuel will not cause any damage.
- Do not let the suction hose disturb the sludge on the bottom of the drum.

- Do not draw off fuel from near the bottom of the fuel drum.
- Fuel left in the fuel drum is not suitable for the engine and should only be used for cleaning purposes.

Notes on the engine performance

Combustion air and fuel injection rates of the diesel engine have been carefully adjusted and determine the engine's performance and temperature level as well as the quality of the exhaust gas.

If your machine has to operate permanently in "thin air" (at high altitudes) and with full power, you should consult the after sales service of BOMAG or the service department of the engine manufacturer.

4.2 Fuels and lubricants

Engine oil

Use winter engine oil for winter operation!

To ensure perfect cold starting it is important to choose the viscosity (SAE grade) of the engine oil with respect to the ambient temperature.

During winter operation below -10°C the oil change intervals must be shortened.

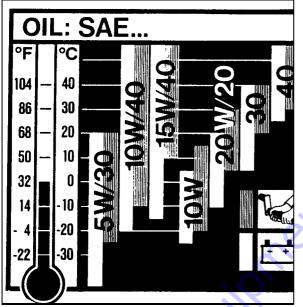


Fig. 19

Lubrication oil with a too high viscosity index will cause starting difficulties. The temperature when starting the engine is therefore decisive for selecting the correct viscosity for winter operation.

Oil viscosity

Since the viscosity of the lubrication oil changes with the temperature, the ambient temperature at the engine's operating location determines the viscosity class (SAE-grade) to be chosen (see diagram).

Although cold stating abilities may be impaired if the temperature occasionally drops below the limit (e.g. use of SAE 15W/40 down to -15°C), this will not cause any damage to the engine.

Temperature related lubrication oil changes can be avoided by using multi-purpose engine oils. The following oil change intervals apply also for multi-purpose oils.

Regular Iubrication oil changes

The longest permissible time for an oil filling in the engine is 1 year.

Oil quality

You should preferably use oils of API-quality class CD-CE-CF-CG, or CCMC-D4/D5/PD2 (SHPD). When using oils of lower quality standard the oil change intervals must be reduced.

Oil change intervals

Oil change intervals for oil quality

API: CD-CE-CF-CG = 6 months CCMC-D4/ D5/PD2 (SHPD) = 6 months

▲ Caution

These intervals apply when using a diesel fuel with a sulphur content of max. 0.5 % by weight and an ambient temperature higher than -10°C (14°F).

 When using fuel with a sulphur content of more than 0,5% to 1% or at ambient temperatures below -10°C (14°F) the oil change intervals in the table must be halved. For fuels with a sulphur content higher than 1% to 1,5% the engine oil must have a TBN of approx. 12 x %S-content when the oil change intervals are halved.

Lubrication oil quality classes

The API-classification is used to classify the oil quality.

The lubrication oil manufacturer is responsible for the correct classification of the product.

j Note

When changing to a higher alloyed oil quality after a longer operating periodm, we recommend the first oil change of this higher quality oil to be performed after approx. 25 operating hours.

Maintenance

Fuels

Quality

You should only use commercial brand diesel fuels with a sulphur content below 0,5% and ensure strict cleanliness when filling in fuel. A higher sulphur content has an effect on the oil change intervals. Use only winter diesel fuel for lower ambient temperatures. Top up fuel in time so that the fuel tank does not run dry.

The following fuel specifications are permitted:

EN 590 DIN 51601; Nato Codes F-54, F-75, F-76;

BS 2869: A1 and A2; ASTM D 975-78:

1-D and 2-D; VV-F-800 a: DF-A, DF-1 and DF-2.

Winter fuel

For winter operation use only winter diesel fuel, to avoid clogging of the fuel system due to paraffin separation. Under extremely low temperatures paraffin separation can also be expected with winter diesel fuel.

In most cases cold starting abilities can also be improved by mixing in a "flow enhancing agent" (fuel additive). Consult the engine manufacturer for more details.

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Table of fuels and lubri-4.3 cants

cants			0
Assemblies	Fuels	Fuels, Lubricants	
	Summer	Winter	Attention Observe level marks
Engine Engine		API: CD-CE-CF-CG	approx. 0,9 I
			(0.238 USgal)(BPR 30/ 38-35/38D-2) ca. 1,1 l (BPR 40/45-45/45D-2)
	SA	AE 10W/40	
	(-20°	(-20°C to +30°C)	
	(-4°	(-4°F to +86°F)	
	SA	SAE 15W/40	
	(-10	°C to +40°C)	
	(+14°F to +104°F)		
	SAE 30	SAE 10W	
	(+5°C to +30°C)	(-5°C to -30°C)	
	(+41°F to +86°F)	(+23°F to -22°F)	
	SAE 40	SAE 20W/20	
	(+25°C to +40°C)	(+10°C to -10°C)	
	(+77°F to +104°F)	(+50°F to +14°F)	
- Fuel	diesel	winter diesel fuel	3 I (0.793 USgal)(BPR 30/ 38-35/38D-2)
		(-12°C) (+10.4°F)*	5 I (BPR 40/45-45/45D-2)
Vibrator shaft	same	as engine oil	0,8 I (0.211 USgal)
housing			

*For lower temperatures refer to the mixing table in chapter 4.2

4.4 Running-in instructions

For the start-up or new machines of overhauled engines the following maintenance work must be performed:

▲ Caution

During the running-in period up to approx. 200 operating hours check the engine oil level two times every day.

Depending on the engine load the oil consumption will drop to its normal level after a running time of approx. 100 to 200 operating hours.

After 25 operating hours

- Change the engine oil.
- Check engine and machine for leaks.
- Check the valve clearance, adjust if necessary.
- Retighten the fastening screws for air filter, exhaust silencer, fuel tank and other attachments.
- Tighten the screw connections on the machine.
- Check the vibration drive V-belt, retighten it if necessary.

oto

4.5 **Maintenance chart**

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

Pos.	Description	Note
Mainte	enance every day	
4.6	Clean machine/engine	0
4.7	Check the fuel level	
4.8	Check the engine oil level	
Mainte	enance every month	
4.9	Checking the dry air filter, cleaning if necessary	
Mainte	enance every 6 months	0
4.10	Check the oil level in the vibrator housing	×0
4.11	Change the engine oil	
4.12	Clean the engine oil filter	
4.13	V-belt tension	
4.14	Check, adjust the valve clearance	
4.15	Clean cooling fins and cooling air intake opening	
4.16	Clean the exhaust screen	
4.17	Change the dry air filter	
Dim. r	nm (inch)	
4.18	Change the fuel filter	
4.19	Change the oil in the vibrator housing	
4.20	Check the rubber buffers	
4.21	Draw the water out of the fuel tank	
As rec	quired	
4.22	Retighten the bolted connections Check the machine visually	
¢,	Retighten the bolted connections Check the machine visually	

4.6 Cleaning machine/engine

j Note

Dirty operating conditions, especially lubrication oil and fuel deposits on the cooling fins of the cylinder and in the cooling air intake reduce the cooling power. You should therefore immediately seal any leaks in the area of the fuel tank, the cylinder or the cooling air intake and clean the cooling fins after.

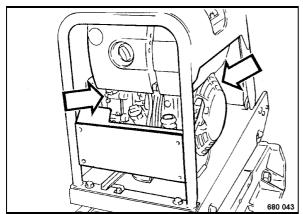


Fig. 20

- Do not hold the water jet directly into the cooling air intake on the recoil starter, into the dry air filter and electrical parts of the engine (Fig. 20).
- After each wet cleaning run the engine warm to evaporate all water and to avoid corrosion.

4.7 Checking the fuel level

A Danger

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

Do not refuel in closed rooms.

Refuel only with the engine shut down.

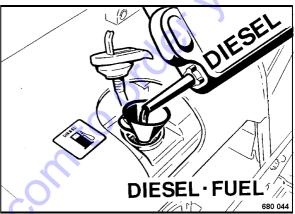


Fig. 21

• Clean the area around the fuel filler cap, remove the filler cap (Fig. 21).

▲ Caution

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

- Fill in fuel through a funnel with screen.
- Close the tank tightly.

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

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4.8 Checking the engine oil level

• Place the machine on level ground, so that the engine is in horizontal position.

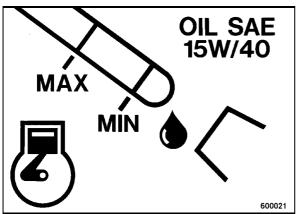


Fig. 22

- Shut the engine down.
- Unscrew the oil dipstick (Fig. 22), wipe it clean with a lint-free, clean cloth and reinsert it until it bottoms.
- Pull the dipstick out again and check the oil level.

Nominal value:

The oil level should reach the top mark. If the oil level is too low top up oil immediately.

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

- Check the seal on the dipstick, if necessary use a new one.
- Push the dipstick in until it bottoms.

4.9 Checking the air filter, cleaning if necessary

▲ Caution

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

Dry air filters with damaged filter element or seal ring must be replaced in any case. It is therefore recommended to keep at least one filter cartridge in stock.

Replace the air filter cartridge after five-times cleaning, but at the latest after 1/2 year.

Each cleaning interval should be marked on the filter cartridge.

In case of sooty deposit on the filter cartridge cleaning is useless. Use a new filter cartridge.

Incorrectly treated filter cartridges may be ineffective because of damage (e.g. cracks) and may cause damage to the engine.

In case of wet or oily contamination replace the filter cartridge.

Do not run the engine without air filter.

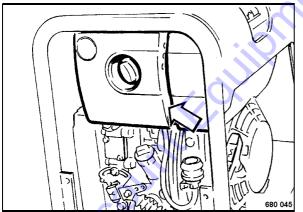
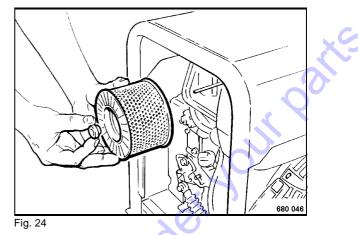
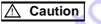


Fig. 23

• Remove the air filter cover (Fig. 23).



• Unscrew the knurled nut and take the air filter cartridge out (Fig. 24).



No dirt or foreign particles must enter the clean air side.

Do not blow the filter housing out with compressed air.

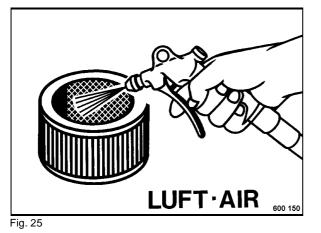
- Clean the inside of the filter housing only with a clean cloth.
- Clean the cover thoroughly.

Danger

Eye injury!

Wear protective goggles.

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- Blow the filter cartridge (Fig. 25) out with dry compressed air (max. 5 bar) from inside to outside.
- Check the filter cartridge for damage, replace if necessary.

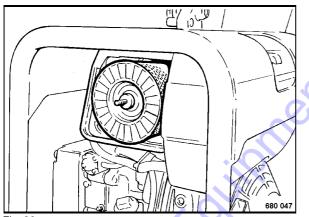


Fig. 26

- Insert the filter cartridge (Fig. 26) into the housing and fasten it with the knurled nut.
- Assemble the filter cover, ensure correct fit of cover and seal ring.

0

4.10 Checking the oil level in the vibrator housing

i Note

Stand the machine on level ground.

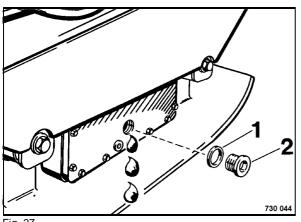


Fig. 27

• Unscrew the level plug (Fig. 27) and check the oil level.

The oil level must reach the bottom edge of the level bore, top up oil if necessary.

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

Screw the level plug back in with a new seal ring.

4.11 Changing the engine oil

▲ Caution

Stand the machine on level ground.

Drain the engine oil at operating temperature.

Environment

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

Danger

There is a danger of scalding when draining hot engine oil.

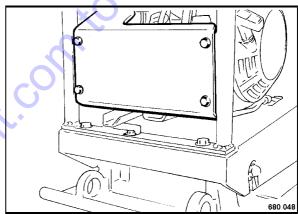


Fig. 28

• Remove the guards (Fig. 28).

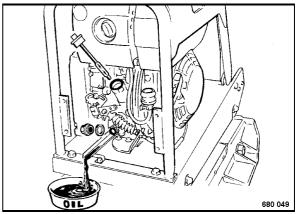


Fig. 29

 Remove the oil dipstick from the oil filler opening (Fig. 29).

×0 0

- Unscrew the oil drain plug and catch running out oil.
- Clean the plug and screw it back in with a new seal ring.

▲ Caution

Clean the engine oil filter before filling in new oil, refer to the next section.

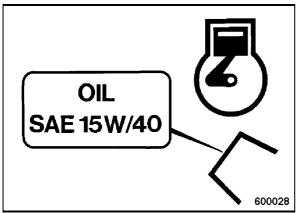


Fig. 30

• Fill in new engine oil (Fig. 30).

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

- Insert the oil dipstick.
- After a short test run check drain plug and oil filter for leaks.
- Reassemble the guards.

Discount

4.12 Cleaning the engine oil filter

<u>∧</u> Caution

Remove and clean the engine oil filter after draining the engine oil.

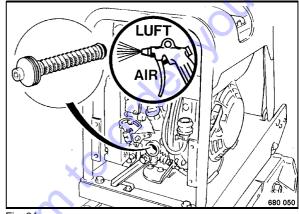


Fig. 31

- Loosen the fastening screw and pull the engine oil filter out of the housing (Fig. 31).
- Blow the engine oil filter out with compressed air from inside to outside.
- Apply a thin coat of oil to the seal.
- Insert the engine oil filter into the housing and tighten the fastening screw.
- After filling in engine oil perform a short test run and check for leaks, if necessary retighten the fastening screw.

4.13 Checking, tensioning, changing the V-belt

Checking the V-belt

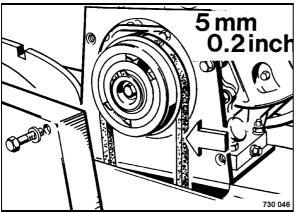


Fig. 32

- Remove the V-belt guard.
- Check the condition and tension of the V-belt (Fig. 32), replace a damaged V-belt.

For compression measurement see illustration.

• Replace a damaged V-belt.

Tensioning the V-belt

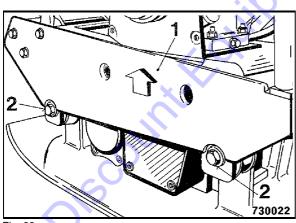


Fig. 33

- Loosen the two mounting screws 2 (Fig. 33) first of all on the V-belt side.
- Pull the engine base plate (1) up and tighten the screws.
- Then loosen the two mounting screws on the starting side.

- Pull the engine base plate up and tighten the screws.
- Check the V-belt tension again.

Exchanging the V-belt

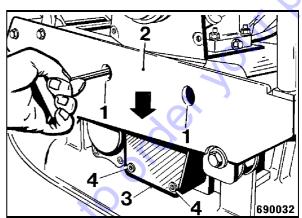


Fig. 34

- Remove the V-belt guard.
- Slacken the fastening screws 1 (Fig. 34) on the V-belt side.
- Press the engine carrier plate (2) down.
- Unscrew the fastening screws (1) through the bores.
- Unscrew the socket head cap screws (4).
- Take the cover plate (3) off.
- Change the V-belt.
- Attach the cover plate.
- Screw the socket head cap screws (4) back in.
- Screw the fastening screws (1) back in.

Tighten the V-belt.

• Install the V-belt guard.

4.14 Checking, adjusting the valve clearance

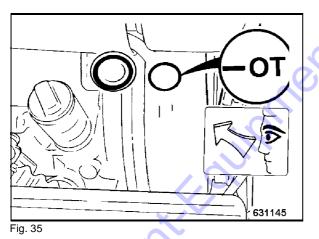
i Note

Check and adjust only when the engine is cold (20 +/- 10 °C).

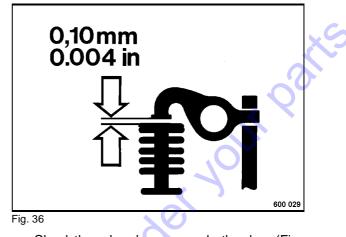
Always change the gasket for the cylinder head cover.

Checking the valve clearance

- Remove the complete protection frame.
- Remove the cover plate with the noise insulation hood.
- Clean the area around the cylinder head.
- Remove the cylinder head cover.
- Turn the engine crankshaft in sense of rotation until compression resistance can be felt.



- Remove the rubber cap from the inspection hole (Fig. 35).
- Turn the crankshaft 360° further in sense of rotation and adjust it exactly to the upper dead centre mark.



• Check the valve clearance on both valves (Fig. 36) with a feeler gauge.

Adjusting the valve clearance

- Slightly slacken the counter nut.
- Adjust the adjustment screw so that the feeler gauge can be pulled through the gap between rocker arm and valve with only little resistance after retightening the counter nut.
- Attach the cylinder head cover with a new gasket and tighten the screws evenly.
- Reinsert the rubber caps into the inspection hole.
- Check the cylinder head cover for leaks after a short test run.

4.15 Cleaning cooling fins and cooling air intake opening

j Note

Dirty operating conditions, especially lubrication oil and fuel deposits on the cooling fins of the cylinder and in the cooling air intake reduce the cooling power. You should therefore immediately seal any leaks in the area of the fuel tank, the cylinder or the cooling air intake and clean the cooling fins after.

Dry dirt

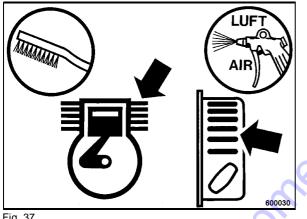


Fig. 37

Dry clean the entire cooling air area like cylinder head, cylinder flywheel blower and blow it out with compressed air (Fig. 37).

Wet or oily dirt

Danger

Fire hazard!

Do not use any inflammable solvents.

Caution

Do not spray directly on electric assemblies and plug connectors or dry them with compressed air immediately after.

Find the cause of oily dirt and have leaks sealed by the after sales service of BOMAG. Do not hold the water jet directly into the air filter, the exhaust and the electric system (if present).

- Disconnect the battery^{*}.
- Spray the entire cooling air area with cleaning solution (e.g. cold cleansing agent), let it soak in for a while and clean off with a sharp water iet.
- Run the engine warm for a short while to avoid corrosion.

Option

4.16 Cleaning the exhaust screen

Danger

Danger of burning!

The exhaust is very hot during and after operation. Perform this work only after cooling down.

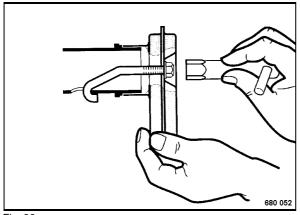


Fig. 38

Unscrew the fastening nut (Fig. 38), remove • the exhaust screen and the fastening bracket.

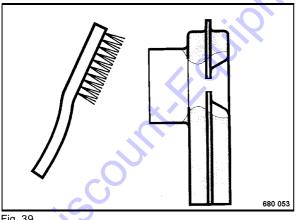
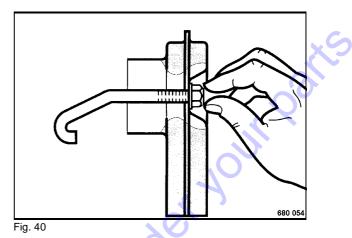


Fig. 39

- Clean deposits on the screen insert with a suitable wire brush (Fig. 39).
- Examine the exhaust screen for cracks or fractures, replace if necessary.



Insert the fastening bracket into the opening in the exhaust screen and screw the fastening nut for approx. 1 turn (Fig. 40).

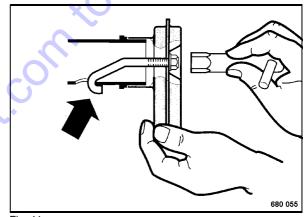


Fig. 41

- Slide the exhaust screen on with the fastening bracket (Fig. 41).
- Hook the fastening bracket into the bore and tighten the fastening nut.

4.17 Changing the dry air filter

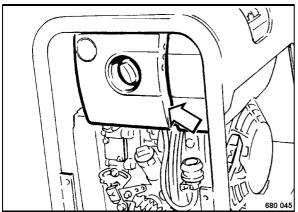
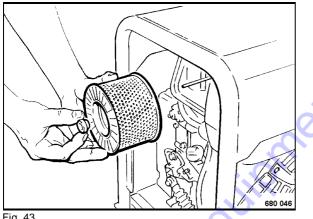


Fig. 42

Remove the air filter cover (Fig. 42). •





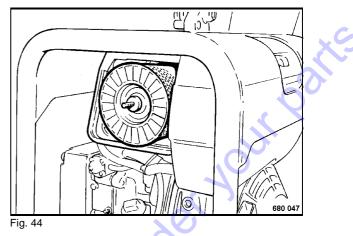
Unscrew the knurled nut and take the air filter • cartridge out (Fig. 43).

Caution

No dirt or foreign particles must enter the clean air side.

Do not blow the filter housing out with compressed air.

- Clean the inside of the filter housing only with • a clean cloth.
- Clean the cover thoroughly.



- Insert the filter cartridge (Fig. 44) into the • housing and fasten it with the knurled nut.
- Assemble the filter cover, ensure correct fit of • cover and seal ring.

4.18 Changing the fuel filter

▲ Danger

When working on the fuel system do not use open fire, do not smoke, fire hazard! Do not spill any fuel, do not inhale any fuel fumes.

▲ Caution

The change interval of the fuel filter depends on the cleanliness of the fuel. If necessary the maintenance must be performed every six months.

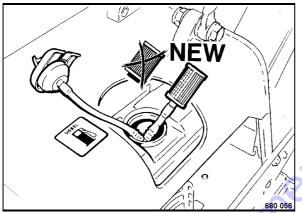


Fig. 45

- Open the quick lock on the tank (Fig. 45).
- Pull the fuel filter by the hose out of the tank.
- Pull the fuel hose off the fuel filter and push it onto the new fuel filter.

🔂 Environment

Dispose of the used filter environmentally.

 Insert the fuel filter into the tank and attach the quick lock.

i Note

The fuel system is automatically bled.

4.19 Changing the oil in the vibrator housing

Tip the machine slightly to the side with the oil drain bore and support it safely.

🔂 Environment

Environmental hazard!

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

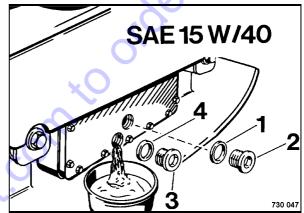


Fig. 46

- Remove the screw 3 (Fig. 46) and catch the old oil.
- Turn the screw with a new sealing ring (4) tightly back in.
- Stand the machine horizontally.
- Unscrew the screw (2) and fill the engine.

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

j Note

The oil must reach the lower edge of the bore.

• Turn the screw with a new sealing ring (1) tightly back in.

4.20 Checking the rubber buffers

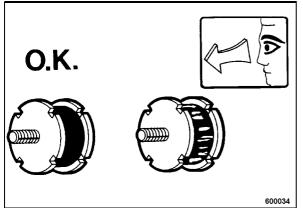


Fig. 47

- Check all rubber buffers (Fig. 47) for cracks and broken out bits and replace if damaged.
- Check the rubber buffers for tight fit.

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4.21 Drawing the water out of the fuel tank

▲ Danger

When working on the fuel system do not use open fire, do not smoke, fire hazard! Do not spill any fuel. Fire hazard!

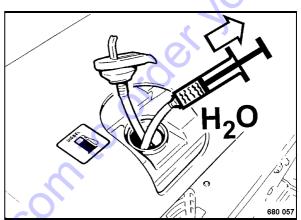


Fig. 48

- Open the quick lock on the tank (Fig. 48).
- Fit an approx. 350 mm long PE-hose to a conventional injection syringe (>20 ml).
- Insert the hose down to the bottom of the tank and draw off the water/fuel mixture.
- Repeat this procedure until only fuel is visible.

公 Environment

Catch the fuel/water mixture and dispose of environmentally.

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4.22 Retightening the bolted connections

- Check all bolted connections for tight fit, • retighten if necessary.
- Check the machine for damage and leaks, have repaired if necessary.



5.1 General notes

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

On the following pages you will find a selection of fault remedies. It is quite obvious that we were not able to list all possible causes for faults.

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5.2 Replacing the injection pump

Disassembly

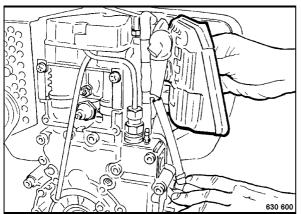
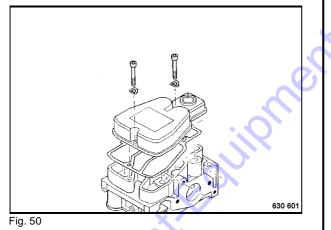


Fig. 49

• remove the air filter bracket (Fig. 49).



• Remove the valve cover (Fig. 50).

Danger

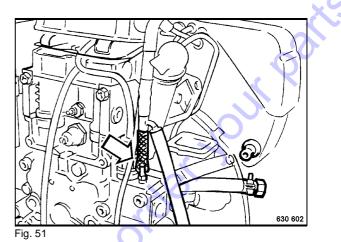
Fire hazard!

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

Do not spill any fuel, do not inhale any fuel fumes.

Environment Environmental damage!

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



- Pull the fuel hose off the leakage socket on the pump (Fig. 51).
- Place a suitable container under the hose socket to catch running out fuel.

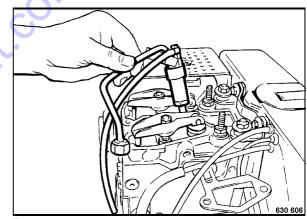
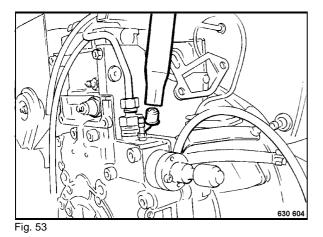


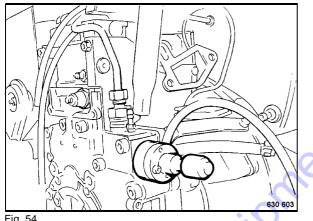
Fig. 52

• Disassemble the injection nozzle (Fig. 52) completely with the nozzle connection.

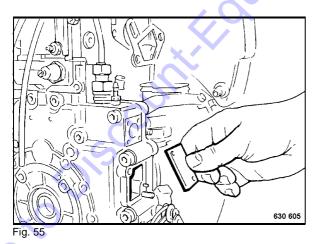
Trouble shooting



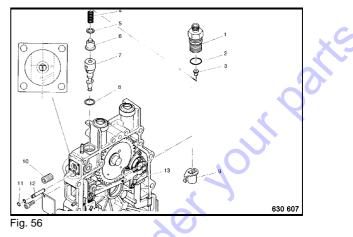
Remove the crankcase ventilation socket (Fig. • 53).



- Fig. 54
- Unscrew the oil shut-off valve (Fig. 54). •



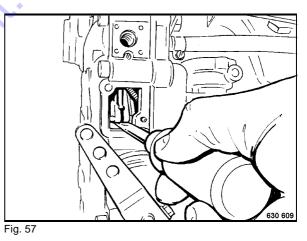
Take the locking plate (Fig. 55) off. •



- Screw the pressure valve holder 1 (Fig. 56) on • with the O-ring (2).
- Remove filling piece (3), spring (4), seal ring • (5) and pressure valve (6).

Caution |

After pressing the pump element out hold the control sleeve (9) so that it does not drop into the engine case!



Unhook the pump piston (Fig. 57) from the • rocker arm to the injection pump.

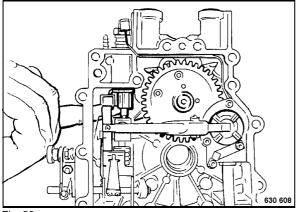


Fig. 58

- Press the pump element (Fig. 58) up with your finger through the opening on the side and lift it out with a magnetic rod.
- Take the compensation shim 8 (Fig. 56) out.

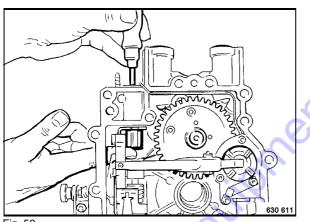


Fig. 59

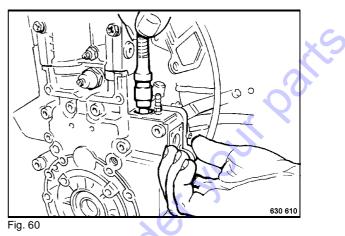
• Insert a screwdriver from the top to secure the control sleeve (Fig. 59) against falling down.

Assembly

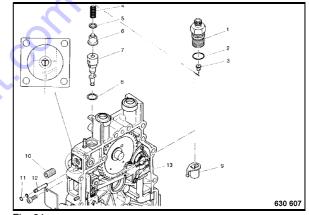
▲ Caution

Before inserting the pump element hold the control sleeve 9 (Fig. 56), so that it cannot fall into the engine housing!

- Hold the control sleeve and take the previously inserted screwdriver out.
- Insert the compensation shim 8 (Fig. 56).



• Insert the pump element (Fig. 60), ensure correct position of the suction hole (bore with taper) and of the element flag (the number with 400 or 4.. should be on the side opposite the suction bore).





- When inserting the element group make sure that the plunger flag is inserted through the control sleeve (for easier installation slightly turn the control sleeve from side to side) and that the eccentric pin (12) engages in the groove of the element cylinder (Fig. 61).
- Attach the pump piston to the injection pump rocker arm.
- Assemble parts 6...1, tighten the pressure valve holder only lightly (approx. 10 Nm).
- Turn the throttle lever fully to the right and lock it.
- Lift the pump piston up for approx. 2 mm.
- Now check the position of the starting slot to the suction bore (through the bore which held the low oil level shut-off device). The starting

Trouble shooting

t. on to order your parts slot must be in line with the suction bore or max. 1 slot width displaced to the left. If this condition is not met remove the flap (11) with a marking needle and correct the position by turning the eccentric (12).

Tighten the pressure valve holder with 35+/-2Nm.

Goto

Assemble the engine. •

5.3 Engine faults

Faults	Possible cause	Remedy
Engine does not start or poor starting	Engine start button not pressed and/or too long waiting time	Press the start button and start within 10 seconds.
	Fuel supply not correct Fuel tank empty	Fill in fuel
	Incorrect valve clearance	Check the valve clearance, adjust it if nec essary.
	Fuel filter clogged (can be noticed if no fuel runs after pulling the fuel line off).	Change the fuel filter, fill in fuel
	Charge level of battery too low	Charge the battery
Engine hard to crank	Oil of too high viscosity	Drain the oil and fill in oil with lower vis- cosity
Engine has no compression	No valve clearance	Check and adjust the valve clearance
Black exhaust fumes The en- gine power may also be low (speed drops) This is not caused by the injection pump	Air filter clogged	Clean the air filter
	Valve clearance not correct	Adjust the valve clearance
	Injection nozzle defective	Change the injection nozzle
	Too much oil in the crankcase	Drain the oil down to the 'Max'-mark on the dipstick
Poor engine power (engine speed drops)	The throttle lever does not stay in the cho- sen position.	Tighten the nuts
No exhaust fumes	Air in the injection system	Check the function of the bleeding valve
	Fuel filter dirty	Change the fuel filter
Engine over- heating	Cooling air flow restricted	Clean the cooling air inlet Clean the cool ing fins
	Injection system not working correctly	Have the injection system examined
	Too much oil in the crankcase	Drain the oil down to the 'Max'-mark on the dipstick

Trouble shooting

Faults	Possible cause	Remedy
Engine stalls	Fuel supply not correct	
	Fuel tank empty	Fill in fuel
	Fuel filter clogged (can be noticed if no fuel runs after pulling the fuel line off).	Change the fuel filter Check the function of the bleeding valve
	Vacuum in the fuel tank	Clear the ventilation bore in the tank filler cap.
	The throttle lever returns to "stop"-posi- tion by itself	Tighten the nuts
Lack of	Lack of oil	Have the engine repaired, stop work im- mediately (risk of total engine damage!)
Engine runs at	Centrifugal clutch defective	Change the centrifugal clutch
high speed, but no vibration	V-belt	Check tension, replace if necessary
	a jipment.	
	ountrainment	

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