

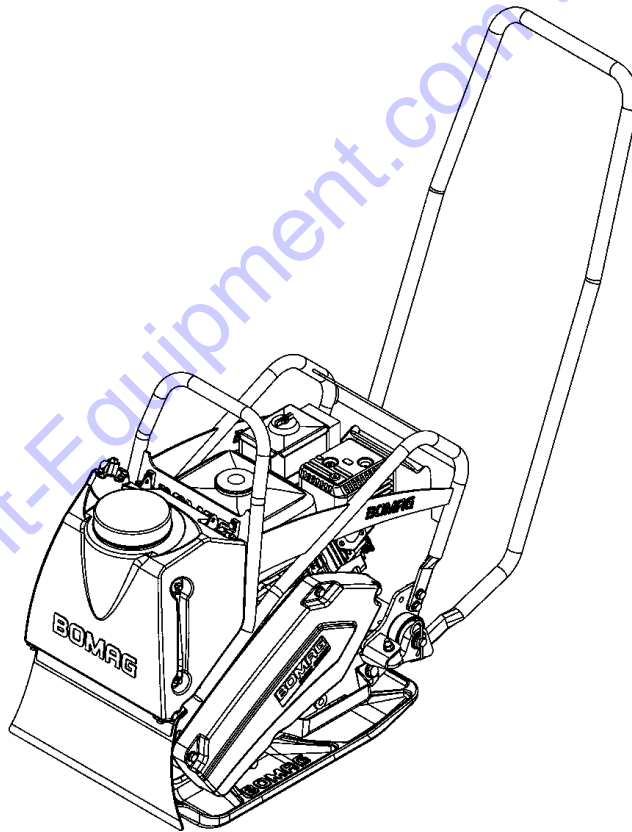
BOMAG

FAYAT GROUP

Operating instructions Maintenance instructions

BP 12/40 / BP 20/50 / BP 25/50

S/N 101 230 01 >S/N 101 230 03 > S/N 101 230 05 >



Vibratory plate



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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.

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BOMAG machines are products from the wide range of BOMAG compaction equipment. BOMAG's vast experience in connection with state-of-the-art production and testing methods, such as lifetime tests of all important components and highest quality demands guarantees maximum reliability of your machine.

Using these instructions will

- help you to become familiar with the machine.
- avoid malfunctions caused by unprofessional operation.

Compliance with the maintenance instructions will

- enhance the reliability of the machine on construction sites,
- prolong the lifetime of the machine,
- reduce repair costs and downtimes.

BOMAG will not assume liability for the function of the machine

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

No warranty claims can be lodged in case of damage resulting from

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

Please note!

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

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

Strictly observe the safety regulations.

Please observe also the guidelines of the Civil Engineering Liability Association "Safety Rules for the Operation of Road Rollers and Soil Compactors" and all relevant accident prevention regulations.

For your own personal safety you should only use original spare parts from BOMAG.

In the course of technical development we reserve the right for technical modifications without prior notification.

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

Apart from that, the spare parts catalogue is available from your BOMAG dealer against the serial number of your machine.

Your BOMAG dealer will also supply you with information about the correct use of our machines in soil and asphalt construction.

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

We wish you successful work with your BOMAG machine.

BOMAG GmbH

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)

i 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!

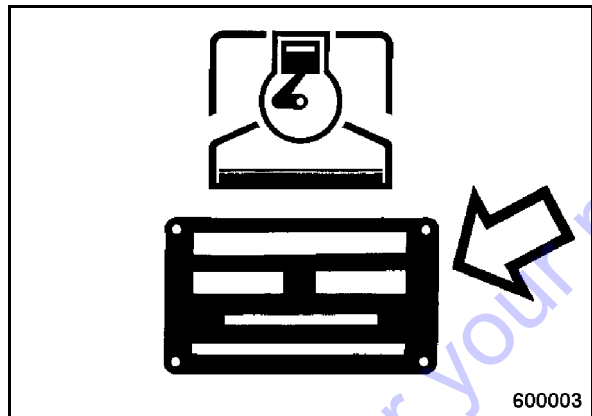


Fig. 1

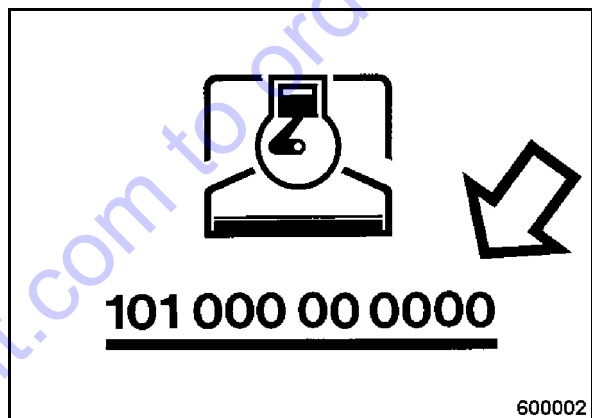


Fig. 2

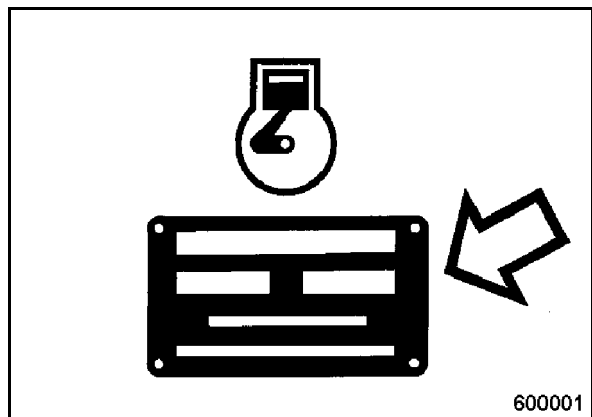
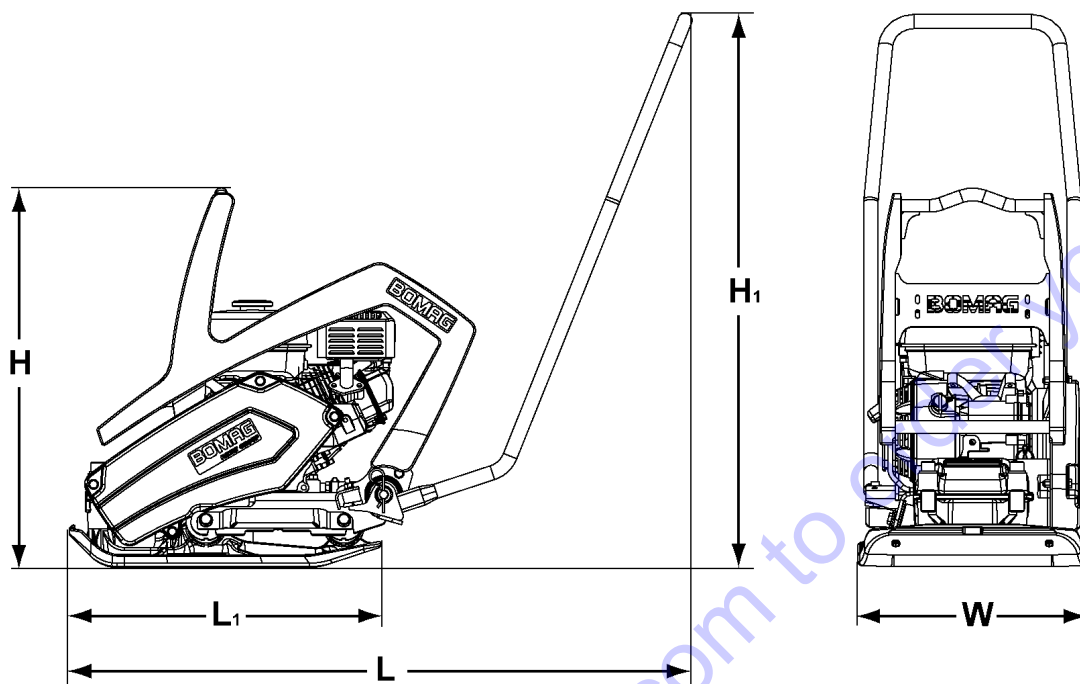


Fig. 3

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1 Technical Data

Technical Data



230027

Fig. 4

Dimensions in mm	H	H1	L	L1	W
BP 12/40	663	962	1084	542	400
BP 20/50	663	962	1084	545	500
BP 25/50	663	962	1084	545	500

*

BP 12/40

BP 20/50

BP 25/50

Weights

Basic weight	kg	75	90	100
Operating weight (CECE)	kg	82,5	91	100

Travel characteristics

Working speed max.	m/min	25	25	25
Max. gradability (depending on soil)	%	30	30	30

Drive

Engine manufacturer	Honda	Honda	Honda
Type	GX 160	GX 160	GX 160
Cooling	Air	Air	Air
Working cycles	4	4	4
Number of cylinders	1	1	1

Technical Data

*		BP 12/40	BP 20/50	BP 25/50
Rated power ISO 9249	kW	4	4	4
Rated speed	rpm	3600	3600	3600
Vibration system				
Frequency	Hz	90	90	90
Centrifugal force	kN	12	20	25
Water sprinkling system**				
Type of sprinkling		Gravity feed	Gravity feed	Gravity feed
Water tank capacity	l	11	15	15
Filling capacities				
Fuel tank	l	3,6	3,6	3,6

* The right for technical modifications remains reserved

** Optional equipment

Technical Data

The following noise and vibration data acc. to

- EC Machine Regulation edition 98/37/EC and
- the noise regulation 2000/14/EG, noise protection guideline 2003/10/EC
- Vibration Protection Regulation 2002/44/EC

were determined during conditions typical for this type of equipment and by application of harmonized standards.

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

Noise value

Sound pressure level at the place of operation:

BP 12/40: $L_{pA} = > 87$ dB(A), determined acc. to ISO 11204 and EN 500

BP 20/50: $L_{pA} = > 87$ dB(A), determined acc. to ISO 11204 and EN 500

BP 25/50: $L_{pA} = > 87$ dB(A), determined acc. to ISO 11204 and EN 500

Guaranteed sound power level:

BP 12/40: $L_{WA} = 108$ dB(A), determined acc. to ISO 3744 and EN 500

BP 20/50: $L_{WA} = 108$ dB(A), determined acc. to ISO 3744 and EN 500

BP 25/50: $L_{WA} = 108$ dB(A), determined acc. to ISO 3744 and EN 500

Danger

Loss of hearing!

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

Vibration value

Hand-arm vibration:

Vector total of the weighted effective acceleration in three orthogonal directions:

Weighted total vibration value

BP 12/40: $a_{hw} = x, x$ m/s² on crushed rock determined acc. to ISO 5349 and EN 500

BP 20/50: $a_{hw} = x, x$ m/s² on crushed rock determined acc. to ISO 5349 and EN 500

BP 25/50: $a_{hw} = x, x$ m/s² on crushed rock determined acc. to ISO 5349 and EN 500

Caution

Observe the daily vibration load (Industrial safety acc. to 2002/44/EEC).

2 Safety regulations

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General

This BOMAG machine has been built in compliance with the latest technical standard and complies with the applicable regulations and technical rules. However, dangers for persons and property may arise from this machine, if:

- it is used for purposes other than the ones it is intended for.
- it is operated by untrained personnel.
- it is changed or converted in an unprofessional way.
- the safety instructions are not observed.

Each person involved in the operation, maintenance and repair of the machine must therefore read and comply with these safety regulations. If necessary, this must be confirmed by obtaining the signature of the customer.

Moreover, the following instructions and regulations must obviously also be adhered to:

- applicable accident prevention instructions,
- generally accepted safety and road traffic regulations,
- country specific safety regulations. It is the duty of the operator to be acquainted with these instructions and to apply these accordingly. This applies also for local regulations concerning different types of handling work. Should the recommendations in these instructions be different from the regulations valid in your country, you must comply with the safety regulations valid 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 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.

Changes and conversions to the machine

Unauthorized changes to the machine are not allowed for safety reasons.

Original parts and accessories have been specially designed for this machine. We wish to make explicitly clear that we have not tested or approved any parts or accessories not supplied by us. The installation and/or use of such products may have an adverse effect on the active and/or passive driving safety.

The manufacturer explicitly excludes any liability for damage caused by 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 that 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 utilization of the machine.

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 or stand under loads being lifted,
- the machine must not swing about when 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 principle of the machine and the working area.

Wear your personal protective outfit (hard hat, safety boots, ear defenders, etc.).

Before starting the machine check whether:

- the machine shows any obvious faults,
- all guards and safety elements are in place,
- the controls are fully functional,
- the machine is free of oily and combustible material,
- all grips are free of grease, oils, fuel, dirt, snow and ice.

Use only machines which are serviced at regular intervals.

For starting move your feet out of the danger zone of the base plate.

Do not use any starting aids like start pilot or ether.

Starting in closed rooms

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

Operation

Operate the machine only with the steering rod attached.

Guide the machine so that your hands do not hit against solid objects, danger of injury.

Watch out for unusual noises and development of smoke. Perform trouble shooting and have the fault corrected.

Operate the machine only with full engine speed, as otherwise the centrifugal clutch will be destroyed.

Do not let the machine run unattended.

Parking the machine

Park the machine on level, firm ground.

Before leaving the machine:

- park the machine so that it cannot turn over,
- shut the engine down.

Mark machines, which could be in the way, with a clearly visible sign.

Filling in fuel

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.

Do not inhale any fuel fumes.

Do not fill the tank to the top.

Make sure that the tank lid is properly closed.

Maintenance work

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.

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 oil running out and dispose of environmentally.

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

Working on the fuel system

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

Catch fuel running out, 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 inflammable substances for cleaning purposes.

When using steam cleaning equipment do not subject electric parts of the machine or insulation materials to a direct jet of water, rather cover them beforehand.

Do not guide the water jet into the air intake opening.

After maintenance work

Always reattach all guards and safety devices once all maintenance work is completed.

Repair

Repairs must only be carried out by qualified and authorized personnel and by following our repair instructions.

Exhaust gases are highly dangerous! Always ensure an adequate supply of fresh air when starting the engine indoors!

Always mark defective machines by attaching a sign to the steering rod.

Compaction machines must be checked by a specialist with respect to safety according to the application and operating condition, but at least once every year.

3 Indicators and Controls

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.

3.2 Controls

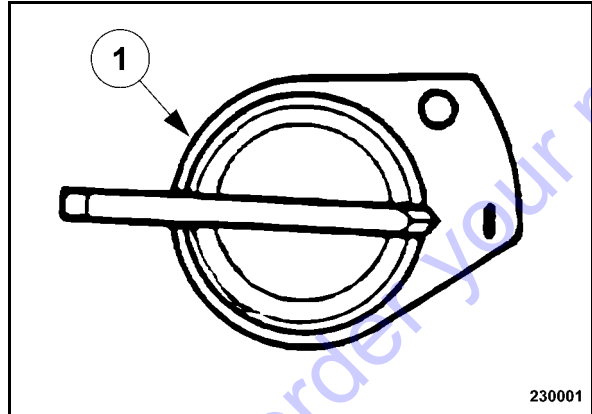


Fig. 5

No. 1 = Engine switch

Position "0" = Ignition off

Position "I" = Ignition on

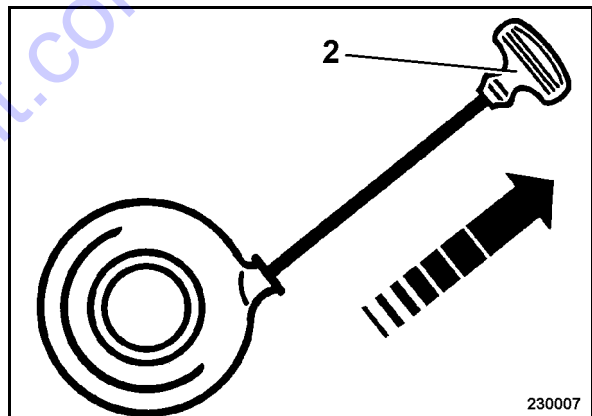


Fig. 6

No. 2 = Starter rope with handle

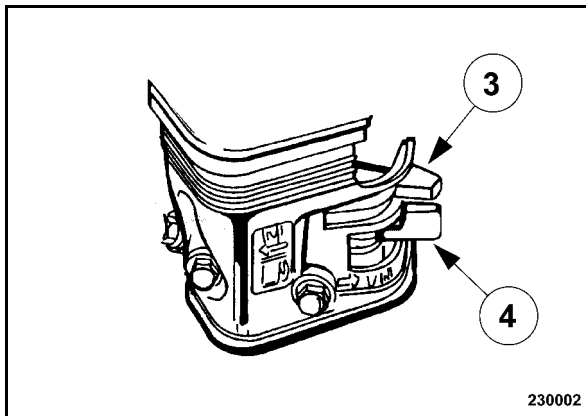


Fig. 7

- No. 3 = Choke
- No. 4 = Fuel cock

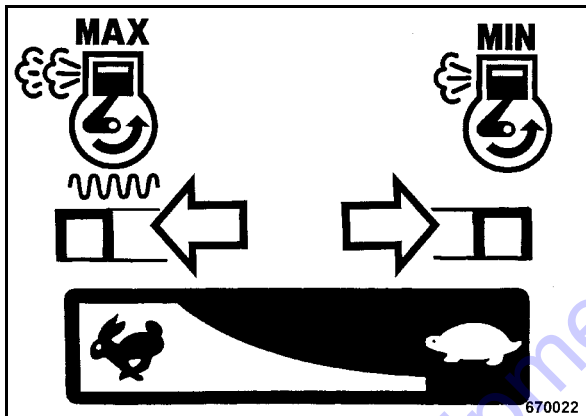


Fig. 8

- No. 5 = Throttle lever

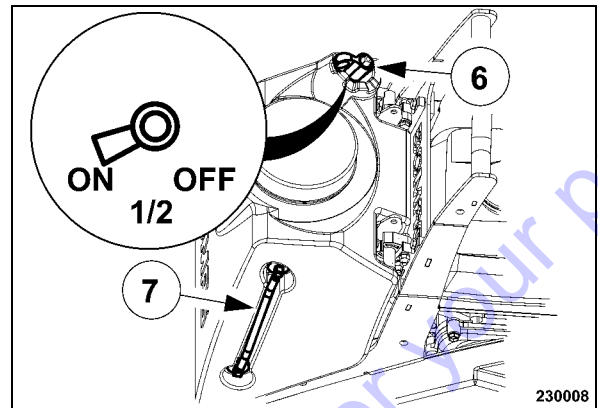


Fig. 9

- No. 6 = Shut-off tap for water sprinkling system*
- Position "OFF" = Sprinkling system switched off
- Position "1/2" = Sprinkling switched on, half the flow rate
- Position "ON" = Sprinkling switched on, full flow rate
- No. 7 = Sprinkling system filling level indicator

* Optional equipment

4 Operation

4.1 General

If you are not yet acquainted with the controls and indicating elements on this machine you should thoroughly read chapter 3 "Indicators and control elements" before starting work.

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

4.2 Tests before taking into operation

⚠ Danger

Loss of hearing!

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

Strictly observe the safety regulations.

Refer also to the detailed description in the maintenance instructions.

i Note

The running in time of the vibratory plate is 25 operating hours.

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

- Park the machine on level ground.
- Top up missing lubricants according to the maintenance instructions.
- Check fuel tank and fuel lines for leaks.
- Check condition of engine and machine.
- Check bolted connections for tight fit.
- Check the engine oil level.
- Check the fuel level.
- Check the water level in the sprinkler system*.

* Optional equipment

4.3 Mounting the steering bow

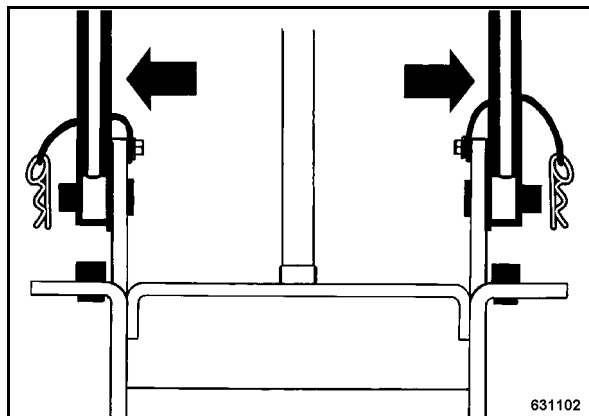


Fig. 10

- Force the steering bow (Fig. 10) apart and plug it onto the bracket.
- After attaching the steering bow secure on both sides with spring-type cotter pins.

4.4 Starting the engine

⚠ Caution

The engine is equipped with low oil level safety shut-down. If the oil level is too low, the engine cannot be started or it goes out during operation.

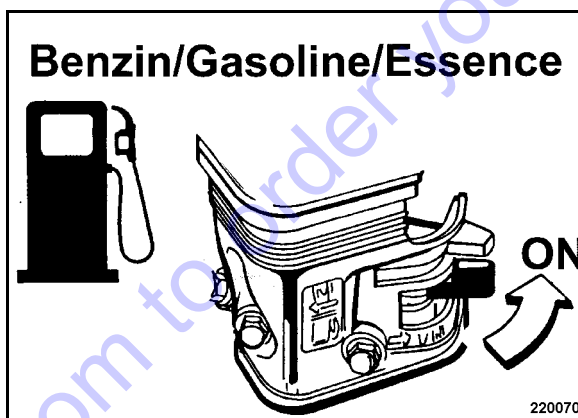


Fig. 11

- Open the fuel cock (Fig. 11) by turning in direction of arrow to the end stop.

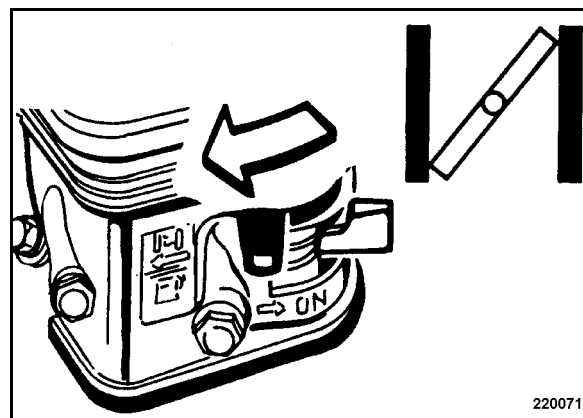


Fig. 12

- Close the choke completely by shifting the lever (Fig. 12) in direction of arrow against the end stop.

i Note

Do NOT operate the choke lever when the engine is warm or at high ambient temperatures. Also operating position.

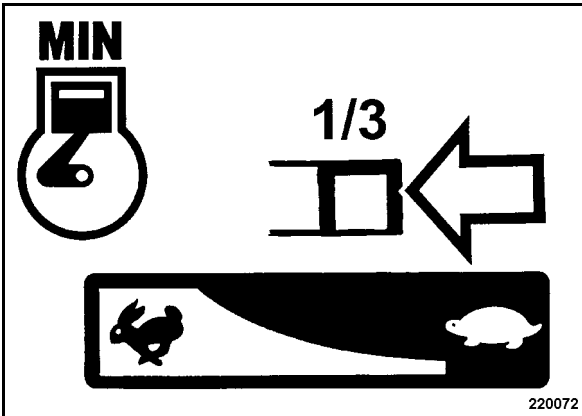


Fig. 13

- Set the throttle lever (Fig. 13) to 1/3 throttle position.

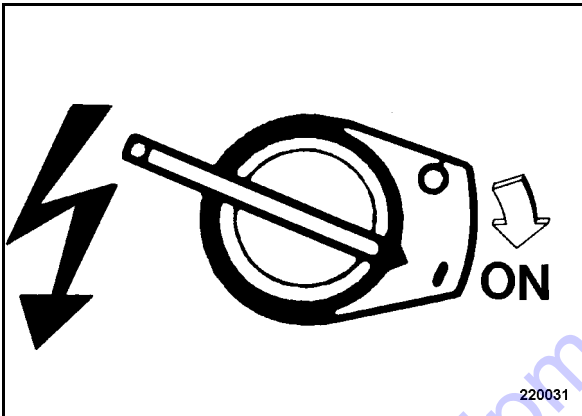


Fig. 14

- Turn the ignition key (Fig. 14) to position "ON".

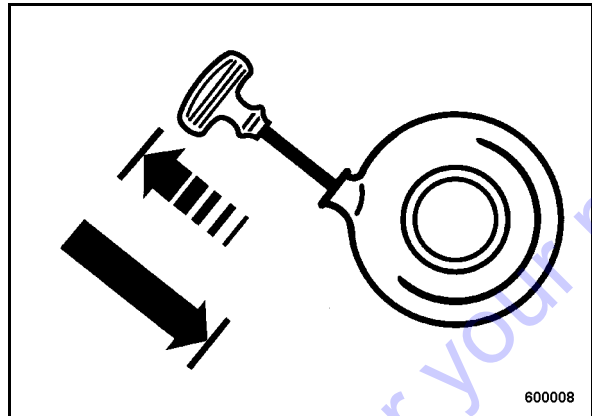


Fig. 15

- Slightly pull the starter handle (Fig. 15), until resistance can be felt (compression pressure), but do not pull out completely.
- Guide the starter rope back to initial position by hand.

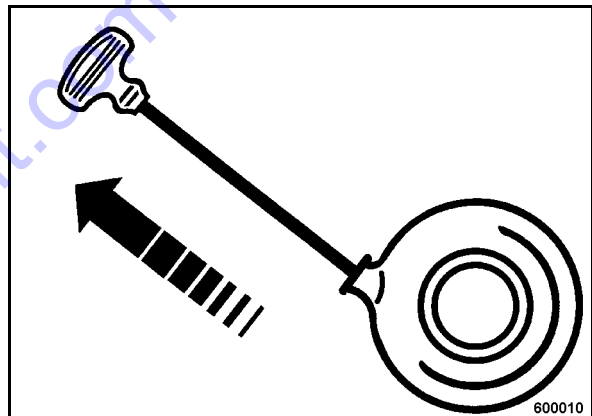


Fig. 16

- Pull the rope by the starter handle quickly and powerful as far out as possible (Fig. 16).

⚠ Caution

Do not let the starter handle hit back against the engine.

- If the engine does not start during the first attempt, repeat the starting process.

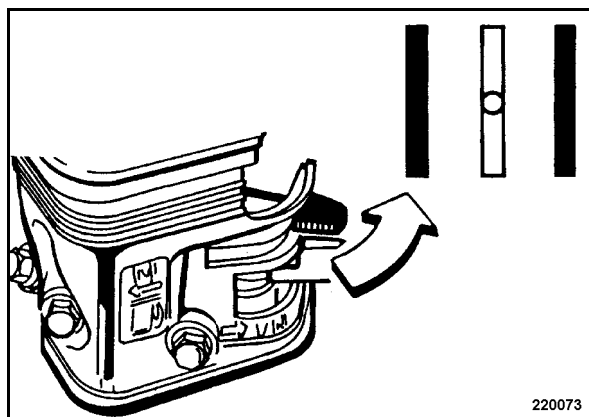


Fig. 17

- As the engine warms up open the lever (Fig. 17) of the choke bit by bit.

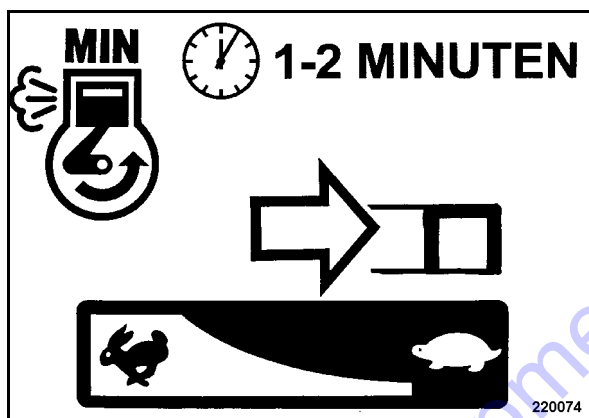


Fig. 18

- Move the throttle lever (Fig. 18) back to idle speed position.

i Note

Run the engine warm for approx. 1 to 2 minutes in idle speed.

Operation of the vibratory plate can be started as soon as the engine responds to short throttle commands.

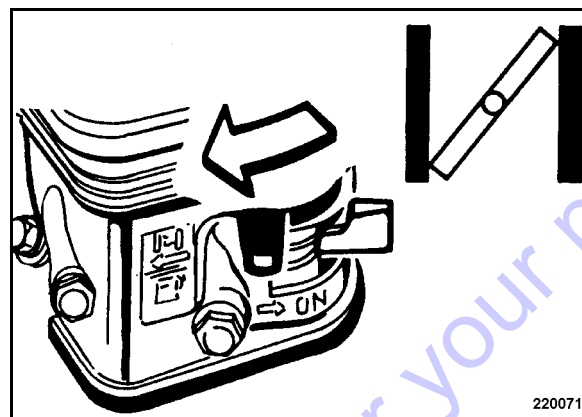


Fig. 19

- If the engine stops again after approx. 3 to 5 seconds, close the choke again with the lever (Fig. 19) and repeat the starting process.

⚠ Caution

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

Engine "drowned"

i Note

When the choke is closed and the starter rope is pulled several times, the engine draws in too much fuel and will probably not start.

Remedy

- Close the fuel cock.
- Open the choke.
- Set the throttle lever to full speed position.
- Operate the recoil starter until the engine starts.

i Note

If the engine does not start after 10 to 20 attempts

- Open the choke.
- Set the throttle lever to full speed position.
- Pull off the spark plug socket.
- Unscrew the spark plug.
- Operate the starter several times.

Operation

- Dry the spark plug with a clean cloth or blow it dry with compressed air. If necessary clean with a wire brush.
- Screw the spark plug back in and plug the spark plug socket back on.
- Repeat the starting procedure.

4.5 Work/operation

⚠ Danger

Danger of accident!

Steer the vibratory plate only by the steering handle.

Wear your personal noise protection (ear defenders).

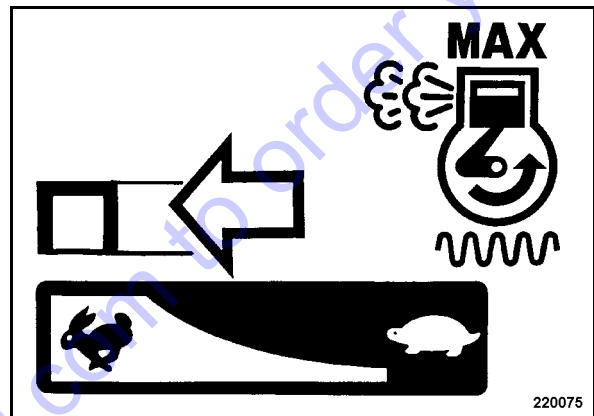


Fig. 20

- Shift the throttle lever (Fig. 20) in direction of arrow to full load position. The vibratory plate works with highest frequency.

⚠ Caution

Operate the vibratory plate only with full engine speed, as otherwise the centrifugal clutch may burn.

i Note

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

4.6 Switching the water sprinkling system* on/off

i Note

Fill the water tank beforehand.

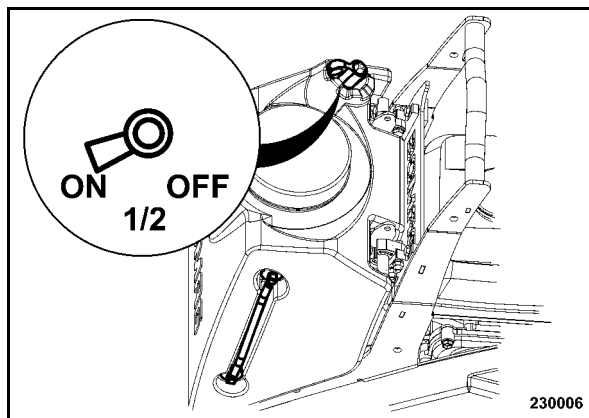


Fig. 21

- Set the lever (Fig. 21) to position "1/2" or "ON". The sprinkling system is switched on.
- Set the lever to position "OFF". The sprinkling system is switched off.

4.7 Switching the motor off

⚠ Caution

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

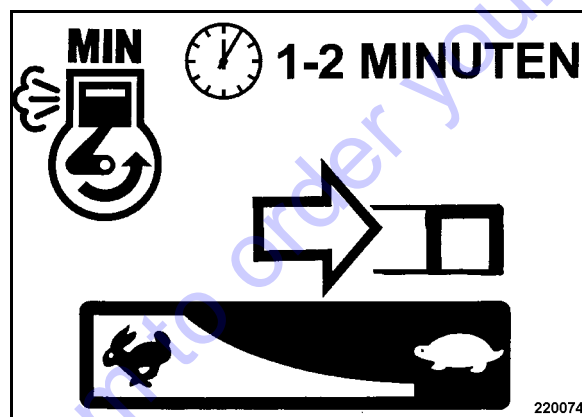


Fig. 22

- Move the throttle lever (Fig. 22) back to idle speed position.

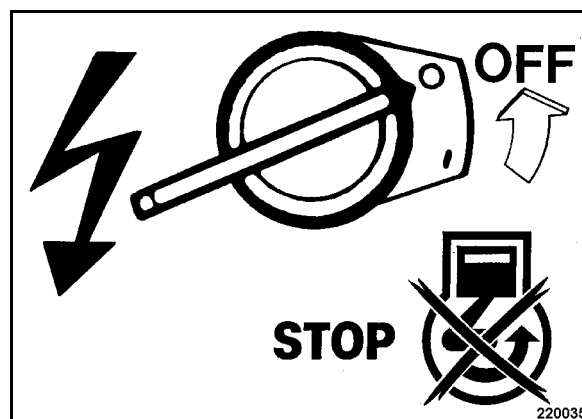


Fig. 23

- Turn the ignition switch to position OFF (Fig. 23), the engine will stop.

* Optional equipment

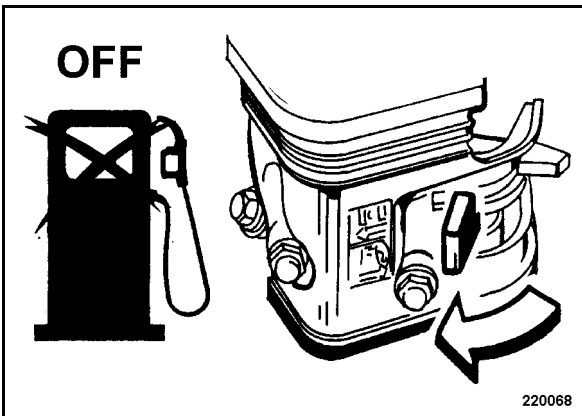


Fig. 24

- Close the fuel tap (Fig. 24) by turning in direction of arrow.

4.8 Loading/transport

⚠ Danger

Danger of accident!

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.

For lifting the machine attach the lifting gear only to the cross strut on the engine protection bow.

The machine must not swing about when being lifted.

Do not step or stand under suspended loads.

Use only safe lifting gear of sufficient load bearing capacity

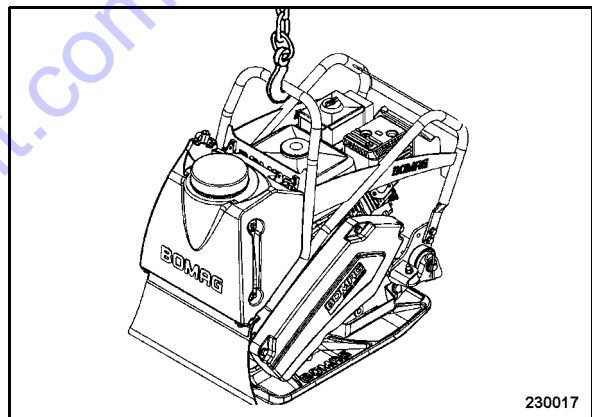


Fig. 25

- Attach the lifting tackle to the cross-strut to load the vibratory plate on a transport vehicle (Fig. 25).

⚠ Danger

Danger of accident!

Minimum load bearing capacity of lifting gear: see operating weight in chapter "Technical Data".

⚠ Danger

Danger of accident!

Tie the machine down on the transport vehicle, so that it is secured against slipping, sliding and turning over!

Go to Discount-Equipment.com to order your parts

5 Maintenance

Go to Discount-Equipment.com to order your parts

5.1 General notes on maintenance

When performing maintenance work ensure strict compliance with the respective safety instructions and particularly the safety regulations mentioned in chapter 2 of these operating and maintenance instructions.

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.

- 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 motor switched off.

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 and fuels environmentally.

Notes on the fuel system

The lifetime of the diesel engine mainly depends on the purity 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.
- Keep used filters in a separate waste container and dispose of environmentally.
- The fuel drum must rest for a longer period of time before drawing off fuel.
- Under no circumstances must the drum be rolled to the tapping point just before drawing out fuel.
- When choosing the storage place for fuel make sure that spilled fuel will not harm the environment.

- 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.

Frequent causes of faults

- Operating errors
- Incorrect, inadequate maintenance

If you cannot locate the cause of a fault or rectify it yourself by following the trouble shooting chart, you should contact the service departments at our branch offices or dealers.

5.2 Fuels and lubricants

Engine oil

Use winter grade engine oil for winter operation!

In order to assure perfect cold starting it is important to choose the viscosity (SAE-class) of the engine oil according to the ambient temperature.

For winter operation below $-10\text{ }^{\circ}\text{C}$ the oil change intervals must be shortened.

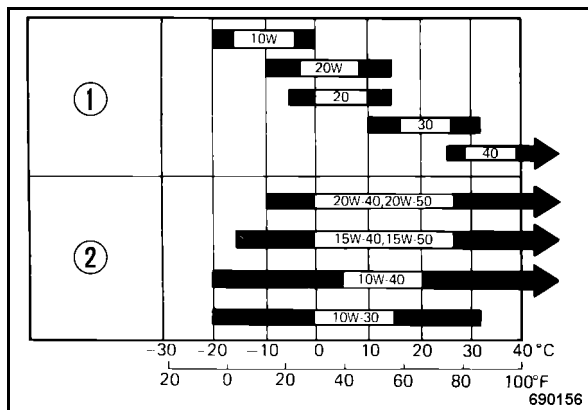


Fig. 26

Lubrication oil with a too high viscosity index causes starting difficulties, the temperature when starting the engine is therefore of highest importance when choosing the viscosity of engine oil for winter operation.

Oil viscosity

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) (see diagram).

SAE10W-30 is recommended for general use under any temperature. When using single purpose oil you must choose the correct viscosity for the area of use.

Occasional falling short of the temperature limit (e.g. use of SAE 15W/40 down to $-15\text{ }^{\circ}\text{C}$) may affect the cold starting ability of the engine, but will not cause any engine damage.

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

Regular lubrication oil changes

The longest permissible time the lubrication oil should remain in an engine is 1/2 year.

Oil quality

You should preferably use oils of API-quality class SF or SG, SHPD oils or CCMC-D4-D5-PD2 oils.

Lubrication oil quality classes

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

The oil manufacturer is solely responsible for assigning a product to a certain quality class.

i Note

When changing to a higher alloyed oil quality after a longer period of operation, it is recommended to perform the first oil change of the higher quality oil already after 25 operating hours.

Fuel quality

Use automobile gasoline (preferably unleaded fuel or fuel with a low lead content, in order to reduce the combustion residues to a minimum).

Do not use oil-gasoline mixes or contaminated gasoline. Protect the fuel tank against dirt, dust or water.

Alcohol containing gasoline

If you decide on using alcohol containing gasoline (Gasohol), you should make sure that the octane number is at least as high as for unleaded gasoline.

There are two types of "Gasohol" available: the one type contains ethanol, the other one contains methanol. Do not use "Gasohol" with more than 10% ethanol. Do not use any gasoline with admixed methanol (methyl or methyl alcohol/Holzalkohol), which does not contain solvents or corrosion protection for methanol. Do not use gasoline with more than 5% methanol, even if it contains solvents and corrosion protection agents.

5.3 Table of fuels and lubricants

Assembly	Fuel or lubricant		Quantity approx.
	Summer	Winter	Attention Observe the level marks
Engine	Engine oil API SF or SG SAE 10W/30 (-20 °C to +30 °C) SAE 10W/40 (-20 °C to +40 °C) SAE 15W/40 (-15 °C to +40 °C)		0,6 l to oil level mark
	SAE 30 (10 °C to 30 °C) SAE 40 (25 °C to 45 °C)	SAE 10 W (-20 °C to 0 °C) SAE 20W/20 (-10 °C to +10 °C)	
- Fuel	Gasoline (unleaded)		3,6 l
Vibrator shaft housing	as engine oil		0,2 l

5.4 Running-in instructions

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

⚠ Caution

During the running-in period, up to approx. 200 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 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 on air filter exhaust, fuel tank and other attachments.
- Retighten the bolted connections on the machine.
- Check the vibration drive V-belts.

5.5 Maintenance chart

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

No.	Maintenance work	Remark	every day	weekly	every month	every six month	every year	as required
5.6	Clean the machine		X					
5.7	Check the engine oil level	Dipstick mark	X					
5.8	Check the fuel level		X					
5.9	Fill the water tank		X					
5.10	Clean air filter	in case of extreme dust clean every day		X				
5.11	Clean the cooling fins and the cooling air intake openings				X			
5.12	Engine oil change	at least every 250 operating hours				X		
5.13	Check, clean the spark plug					X		
5.14	Clean the fuel sludge filter					X		
5.15	Clean the fuel screen					X		
5.16	Check the V-belt, tighten, replace if necessary					X		
5.17	Check the rubber buffers					X		
5.18	Check the oil level in the vibrator housing					X		
5.19	Check, adjust the valve clearance						X	
5.20	Change the oil in the vibrator housing	at least every 500 operating hours					X	
5.21	Change the dry air filter	at least every year						X
5.22	Retighten bolted connections							X
5.23	Engine conservation							X

5.6 Clean the machine

Caution

Dirty operating conditions, particularly lubrication oil and fuel deposits on the cooling fins of the engine and the cooling air intake opening have an adverse effect on the cooling of the engine.

You should therefore immediately seal any oil or fuel leaks near fuel tank, cylinder or cooling air intake.

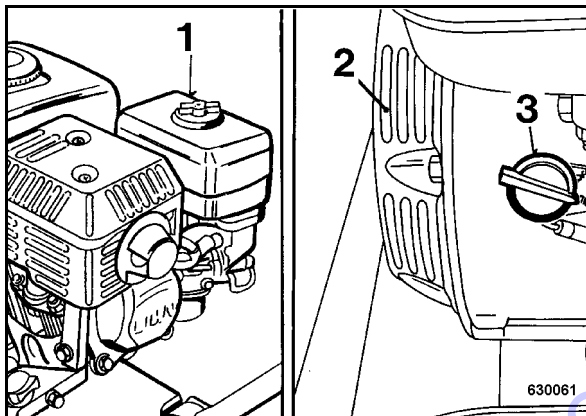


Fig. 27

Caution

Do not guide the water jet directly into air filter/ carburettor (1) (Fig. 27), starter/air intake (2) and motor switch (3).

- After wet cleaning run the engine warm to evaporate all water residues and to avoid corrosion.

5.7 Check the engine oil level

Note

Park the machine on level ground so that the engine is in horizontal position.

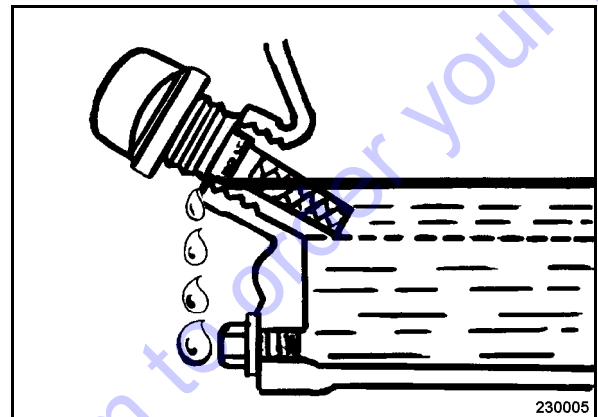


Fig. 28

- Unscrew the oil filler plug (Fig. 28).
- The oil level must reach the edge of the oil filler socket, if necessary fill up oil.

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

- Check the seal on the oil filler plug, replace if damaged.
- Screw in the oil filler plug.

5.8 Check the fuel level

⚠ 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!

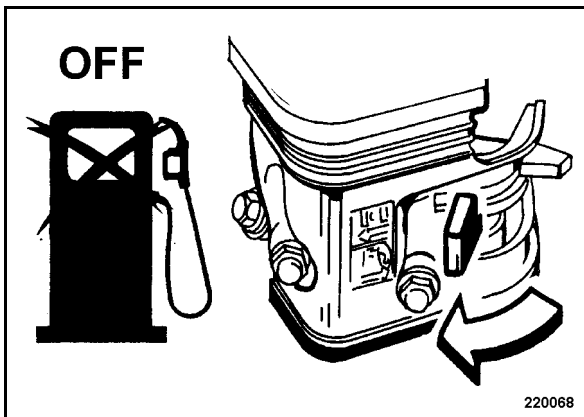


Fig. 29

- Close the fuel cock (Fig. 29).

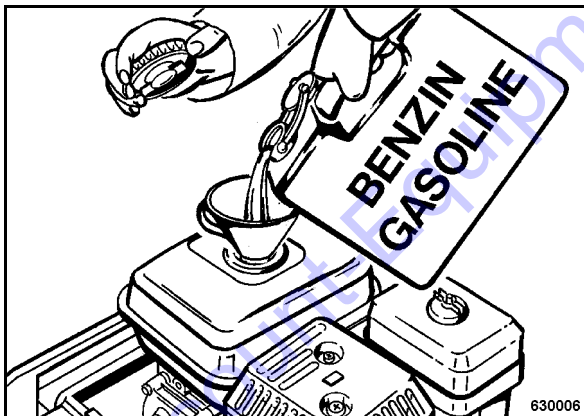


Fig. 30

- Clean the area around the filler cover, unscrew the filler cover.

⚠ Caution

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

- Fill in fuel through a funnel with screen filter (Fig. 30).

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

i Note

Do not fill the tank to the top. Fill the tank up to approx. 25 mm below the top of the fuel tank to leave some space for the expansion of the fuel.

- Close the tank again.

5.9 Filling the water tank*

⚠ Caution

Dirty or contaminated water can block the nozzles!

Fill only with clean water.

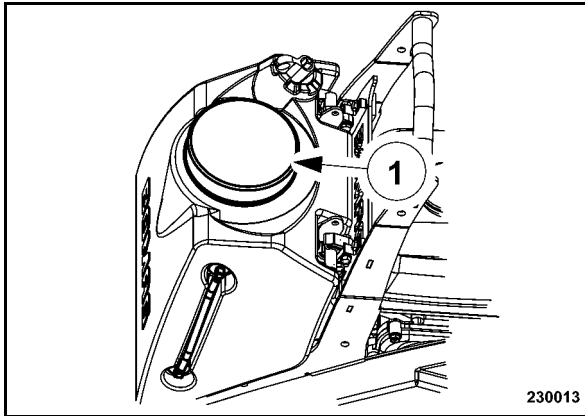


Fig. 31

- Open the water tank (Fig. 31) and fill in clean water.

* Optional equipment

5.10 Clean air filter

⚠ Danger

Do not use gasoline or cleansers with a low flash-point to clean the air filter element. This could cause fire or an explosion.

⚠ Caution

Do not run the engine without an air filter, since this could cause premature wear of the engine.

Contamination of the air filter depends mainly on the proportion of dust in the intake air, if necessary clean several times a day.

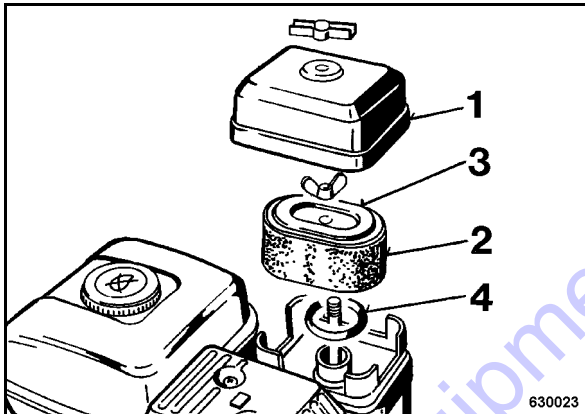


Fig. 32

- Remove cover (1) (Fig. 32) and pull the foam insert (2) off the paper element (3).

⚠ Caution

Make sure that no dirt falls into the carburettor.

i Note

Check the seal ring (4), replace if necessary.

Visual inspection/cleaning

- Examine the filter thoroughly for perforations and cracks and replace if damaged.

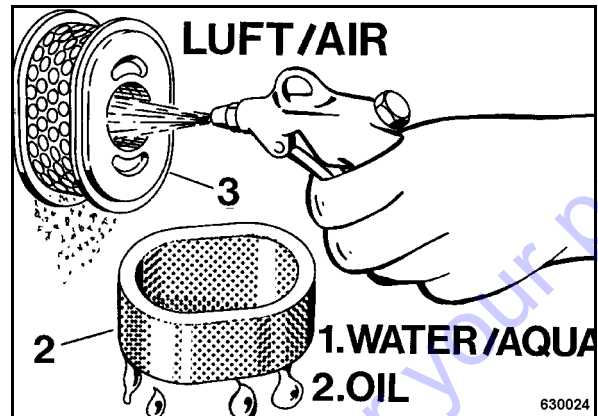


Fig. 33

Cleaning the filter

- Clean the paper insert (3) (Fig. 33) carefully by light banging or blow it carefully out from inside to outside with dry, clean compressed air (max. 2 bar).
- In case of excessive dirt replace the paper element.
- Clean the foam insert (2) in warm soapy water, rinse it and let it dry thoroughly.
- Soak the foam insert in clean engine oil. Then squeeze out excess oil.

5.11 Clean the cooling fins and the cooling air intake openings

⚠ Caution

Dirty operating conditions, particularly lubrication oil and fuel deposits on the cooling fins of the engine and the cooling air intake opening have an adverse effect on the cooling of the engine.

You should therefore immediately seal any oil or fuel leaks near fuel tank, cylinder or cooling air intake.

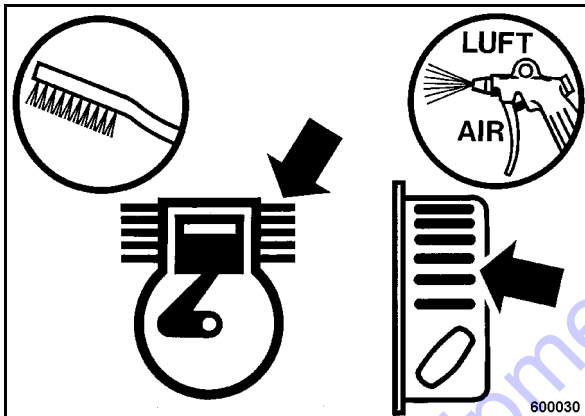


Fig. 34

- Loosen dried on dirt with a suitable brush (Fig. 34) from all cooling fins and cooling air intake openings and blow it off with compressed air.

⚠ Danger

Fire hazard!

Do not use any inflammable solvents.

⚠ Caution

Do not guide the water jet directly into air filter/ carburettor, starter/air intake and oil warning light/ignition switch.

- On a oil contaminated engine use a cold cleansing agent for cleaning.

- After a sufficient soaking time clean off with a water or steam jet and blow out with compressed air.
- Run the engine warm for a while to avoid corrosion.

⚠ Caution

Look for the cause of oily contamination and have any leaks sealed by the customer service of BOMAG.

5.12 Engine oil change

Caution

Park the machine on level ground.

Drain the engine oil only when the engine is warm.

Environment

Catch running out old oil, do not let it seep into the ground and dispose off environmentally.

Danger

Danger of scalding when draining off hot engine oil.

Note

Tilt the machine towards the guide handle.

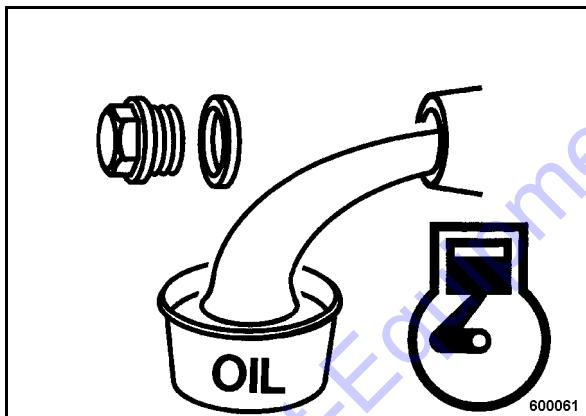


Fig. 35

- Unscrew the oil filler plug.
- Unscrew the oil drain plug (Fig. 35), let the old oil run out and catch it.
- Turn the oil drain plug back in with a new seal ring.



Fig. 36

- Stand the engine horizontally and fill in oil through the filler bore (Fig. 36).

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

- The oil level must reach the edge of the oil filler socket, if necessary fill up oil.
- Check the seal on the oil filler plug, replace if damaged.
- Screw in the oil filler plug.

5.13 Checking, cleaning the spark plug

⚠ Danger

Danger of burning on hot engine!

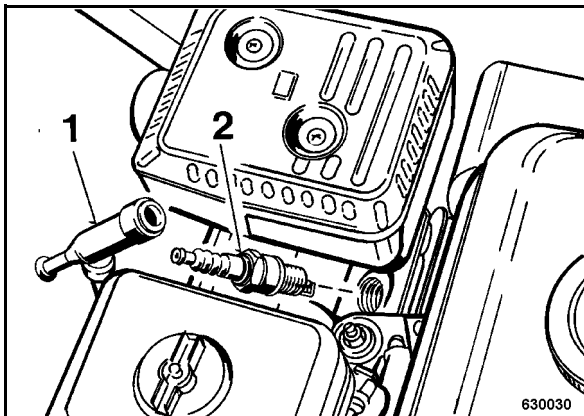


Fig. 37

- Pull off the spark plug socket (1) (Fig. 37) and unscrew the spark plug (2).

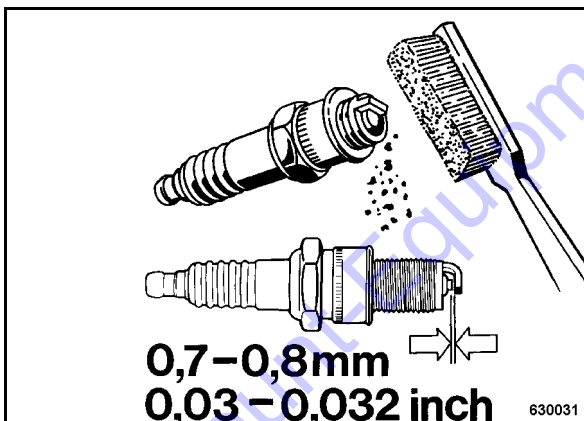


Fig. 38

- Check the spark plug visually and clean it if necessary (Fig. 38).

i Note

In case of excessive combustion residues, burned off electrodes or torn insulator replace the spark plug.

⚠ Caution

Make sure to use a spark plug with correct heat value.

- Check the electrode gap with a feeler gauge, if necessary adjust the gap to 0,7 to 0,8 mm.
- Screw the spark plug in by hand and tighten it until it bottoms.

i Note

A new spark plug needs to be tightened by another 1/2 turn after contact, so that the seal is compressed. If an old spark plug is to be used again, tighten it for another 1/8 - 1/4 turn after contact, in order to compress the seal ring.

- Tighten the spark plug.

⚠ Caution

The spark plug must be correctly tightened. An incorrectly tightened spark plug can get very hot and cause engine damage.

5.14 Cleaning the fuel sludge filter

⚠ Danger

Gasoline is easily inflammable, do not spill any gasoline.

Do not smoke, no open fire.

Do not inhale any fuel fumes.

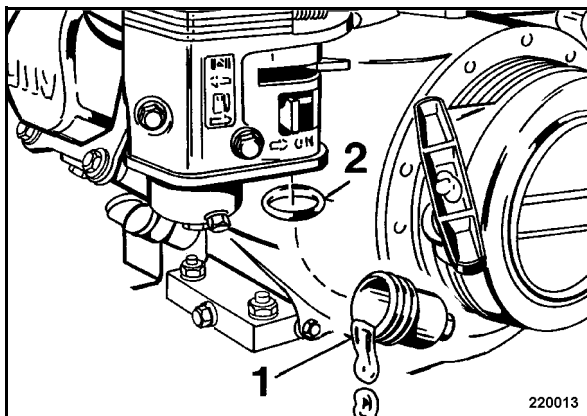


Fig. 39

- Unscrew the fuel sludge filter 1 (Fig. 39) with the fuel cock closed and wash it out with fuel.
- Turn the fuel sludge filter in tightly and mind the O-ring (2).

5.15 Clean the fuel screen

⚠ Danger

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

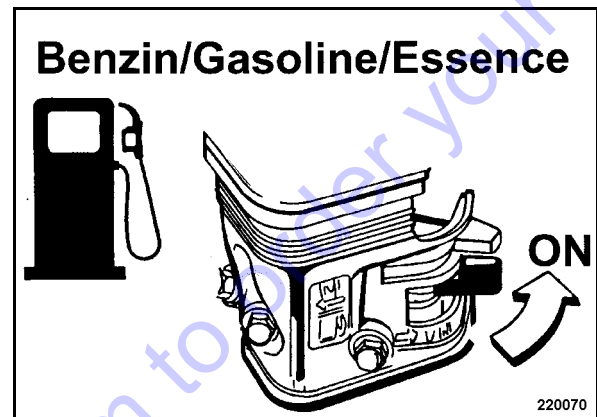


Fig. 40

- Open the fuel tap (Fig. 40) by turning in direction of arrow.

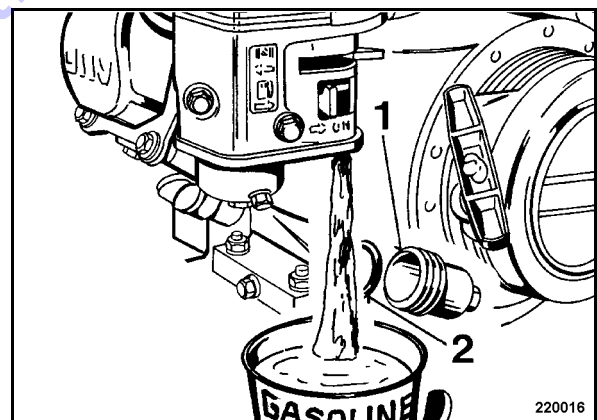


Fig. 41

- Unscrew the fuel sludge filter 1 (Fig. 41) and drain off all gasoline.
- Screw the fuel sludge filter with sealing ring (2) in tightly.

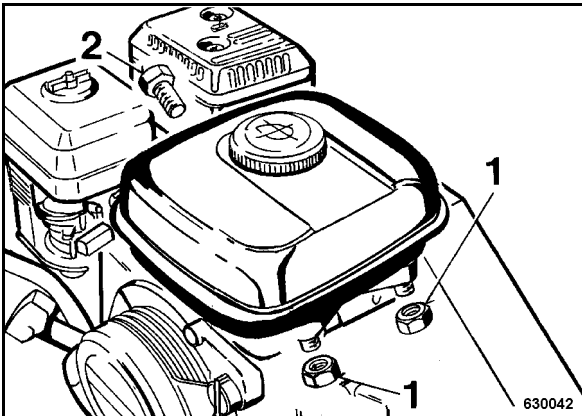


Fig. 42

- Remove the fuel tank.
- For this purpose unscrew hexagon nuts (1) (Fig. 42) and hexagon screw (2).

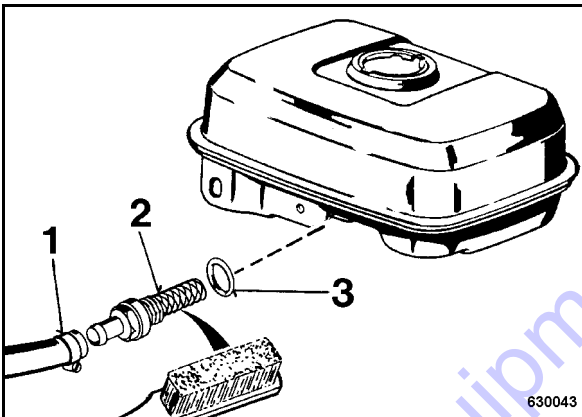


Fig. 43

- Open the hose clamp 1 (Fig. 43), pull off the hose.
- Unscrew fuel screen (2).
- Clean the fuel screen, check the condition of the screen (holes), replace if necessary.
- Check the seal (3).
- Screw in the fuel screen filter, tightening torque: 2 Nm.
- Fill in fuel and check for leaks.

5.16 Check the V-belt, tighten, replace if necessary

Checking the V-belt

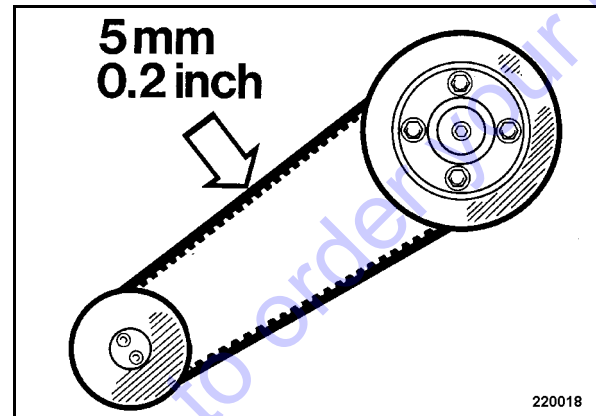


Fig. 44

- Remove the V-belt guard.
- Check the condition and tension of the V-belt, replace the V-belt if damaged.
- Compression measurement approx. 5 mm (Fig. 44).

Changing the V-belt

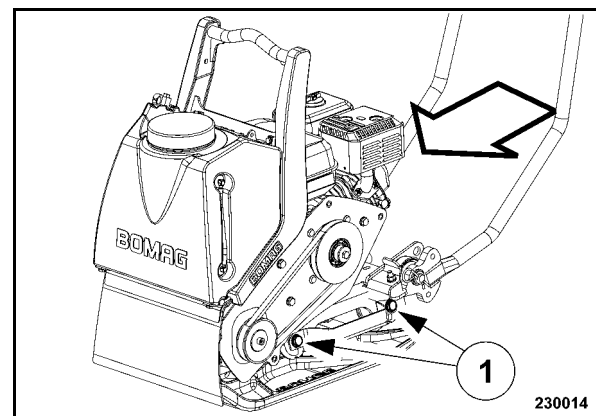


Fig. 45

- Slightly loosen two fastening screws (1) (Fig. 45) on both sides of the engine carrier.
- Push the motor carrier forward and take the V-belt off.
- Install the new V-belt.

Tightening the V-belt

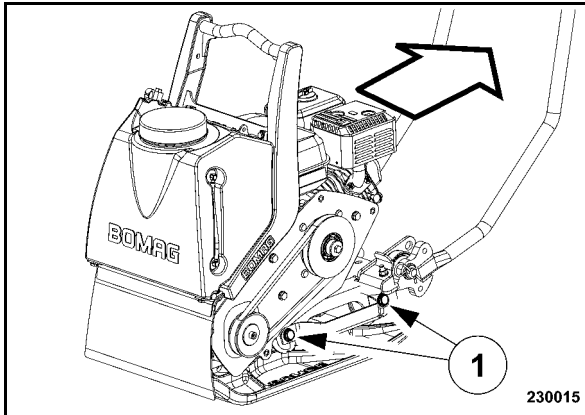


Fig. 46

- Pull the engine carrier back (Fig. 46) until the correct V-belt tension is achieved and tighten the four fastening screws.
- Assemble the V-belt guard.

Caution

Check the V-belt tension again after a running time of approx. 25 operating hours, retighten if necessary.

5.17 Checking the Rubber Buffers

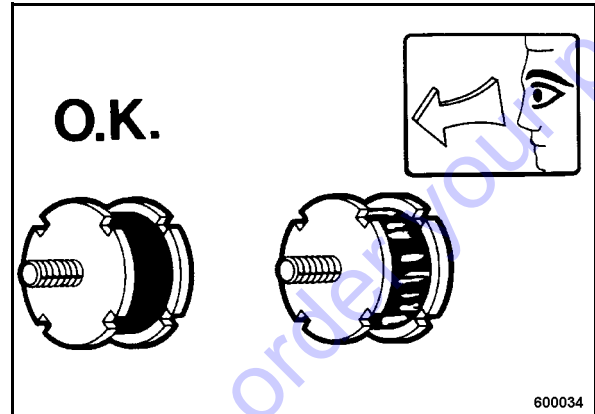


Fig. 47

- Check the condition and tight fit of all rubber buffers and exchange if necessary (Fig. 47).

5.18 Check the oil level in the vibrator housing

i Note

Park the machine on level ground.

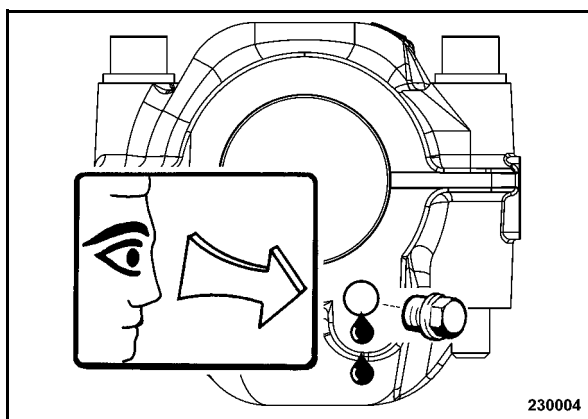


Fig. 48

- Unscrew the plug (Fig. 48) and check the oil level.

The oil level must reach the bottom edge of the opening, if necessary fill in oil.

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

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

5.19 Check, adjust the valve clearance

i Note

Check and adjust only when the engine is cold.

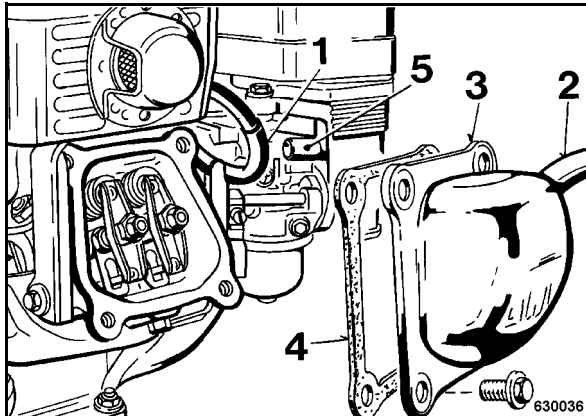


Fig. 49

- Pull off spark plug socket 1 (Fig. 49).
- Pull off ventilation hose (2).
- Remove valve cover (3) with gasket (4).
- Set the piston to top dead centre position of the compression stroke.

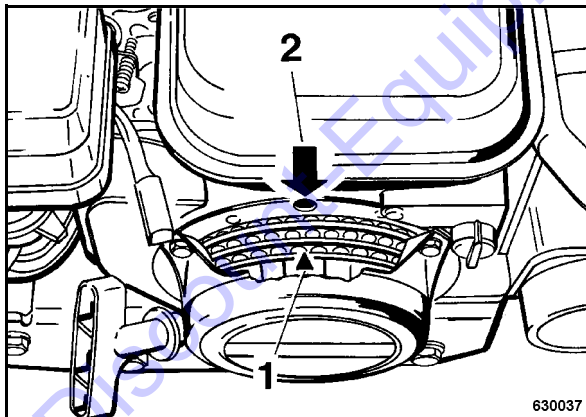


Fig. 50

- For this purpose align triangle mark 1 (Fig. 50) on the starter disc to the top bore (2).

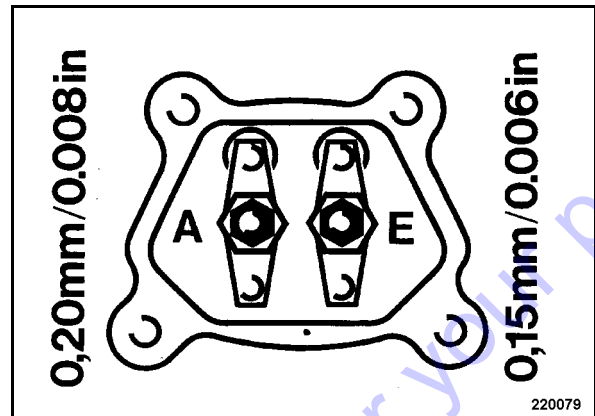


Fig. 51

Valve clearance(Fig. 51):

Exhaust valve (A) = $0,20 \pm 0,02$ mm

Intake valve (E) = $0,15 \pm 0,02$ mm

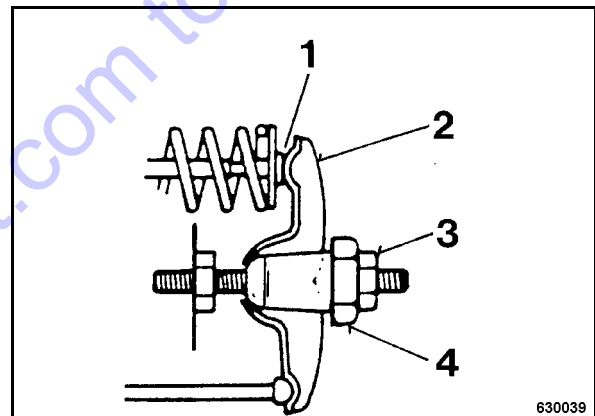


Fig. 52

- Check the valve clearance (1) (Fig. 52) with a feeler gauge.
- In order to adjust the valves hold the hexagon nut (4) on the rocker lever and loosen the counter nut.
- Adjust hexagon nut (4) on the rocker arm so that the feeler gauge fits between rocker arm and valve shaft with noticeable resistance after retightening counter nut (3).
- Assemble the valve cover (3) (Fig. 49) with a new gasket and tighten it evenly.
- Push the ventilation hose (2) into the socket (5).

5.20 Change the oil in the vibrator housing

- Tilt the machine slightly towards the oil drain side and support it safely.

Environment

Catch running out old oil, do not let it seep into the ground and dispose off environmentally.

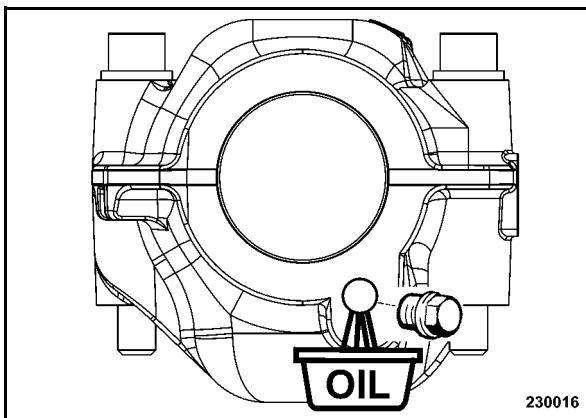


Fig. 53

- Unscrew plug (Fig. 53), catch old oil.
- Screw the plug back in.
- Put the machine in horizontal position.

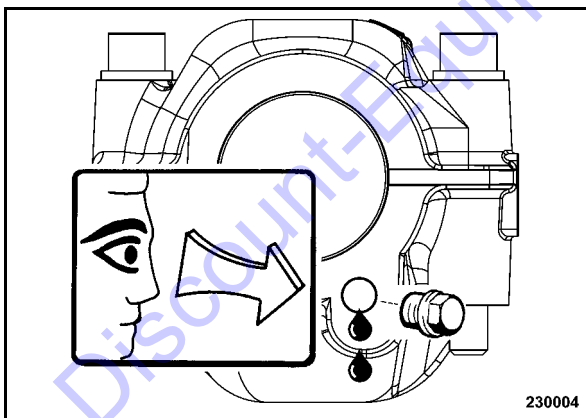


Fig. 54

- Unscrew plug (Fig. 54) and fill in engine oil.

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

i Note

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

- Screw the plug back in.

5.21 Change the dry air filter

Caution

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

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

The dry air filter element must be changed after several times cleaning, but at the latest after 1 year.

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

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

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

In case of wet or oily dirt replace the filter element.

Note

Under extremely dusty conditions it may be necessary to clean several times a day.

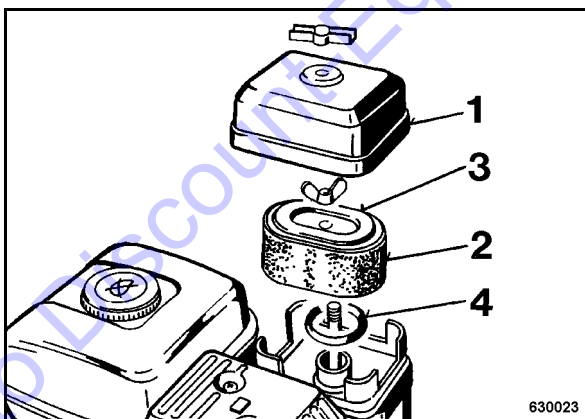


Fig. 55

- Unscrew the wing nut (1) (Fig. 55) and take off the housing cover.
- Clean the housing cover from inside.

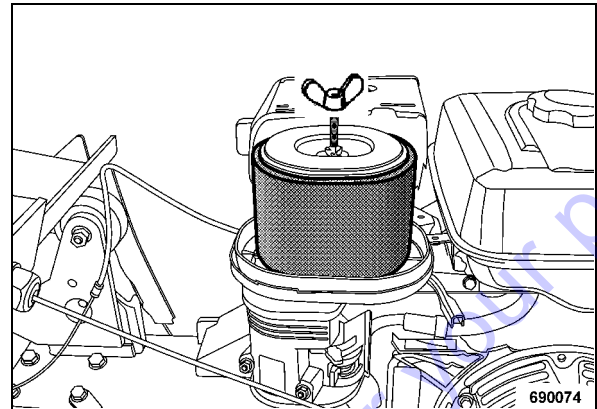


Fig. 56

- Unscrew the wing nut and pull the air filter cartridge out (Fig. 56).

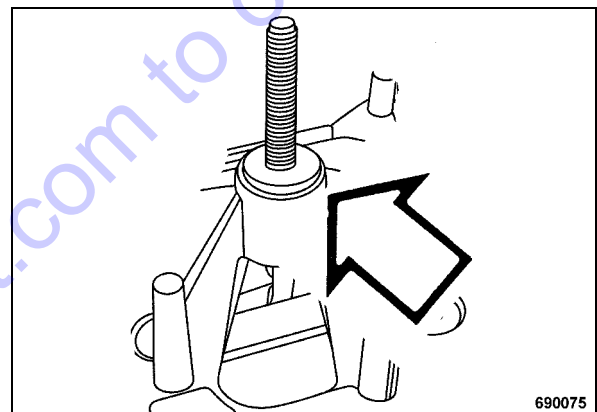


Fig. 57

- Check the rubber seal, replace the rubber seal if damaged (Fig. 57).
- Clean out the air filter housing with a cloth.

Caution

Contaminants or dirt must not enter into the intake channel.

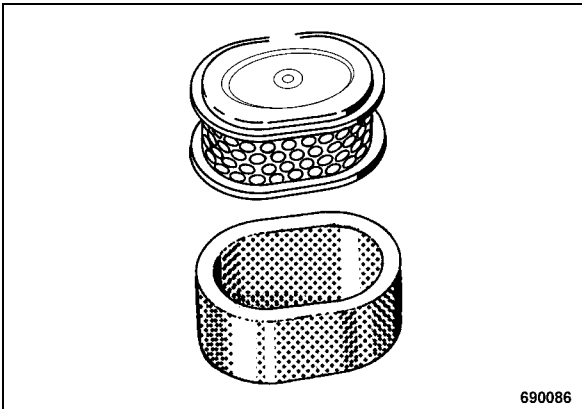


Fig. 58

- Pull the foam rubber insert over the paper element (Fig. 58).
- Insert the air filter correctly and tighten the wing nut.

⚠ Caution

If the air filter is not correctly inserted, dust and foreign particles can enter into the air intake channel.

- Fasten the housing cover with the wing nut.

5.22 Tightening the screws

i Note

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

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. 59

*Strength classes for screws with untreated, non-lubricated surfaces. The quality designations are stamped on the screw heads.

8.8 = 8 G

10.9 = 10 K

12.9 = 12 K

The values result in a 90% utilization of the screw's yielding point at a coefficient of friction of $\mu_{total} = 0.14$.

The compliance with the tightening torques is to be checked with torque wrenches.

The tightening torques are not applicable when using MoS₂ lubricants.

5.23 Engine conservation

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

- Clean the engine including the cooling system: with cold cleansing agent or, even better, with a steam cleaner.
- Run the engine warm and shut it down.
- Drain the still warm engine oil and fill in anti-corrosion engine oil.
- Drain the fuel from the fuel tank, mix it well with 10% anti-corrosion oil and fill it in again. Instead of mixing anti-corrosion oil with the fuel it is also possible to fill the tank with injection pump testing oil with anti-corrosive properties (e.g. Calibration Fluid B).
- Run the engine for 10 minutes until all lines, filters, pump and nozzles are filled with the conserving mixture and the new engine oil is distributed to all parts.
- After running the engine remove the valve cover and spray the rocker chamber with a mixture of diesel fuel and 10% anti-corrosion oil. After this screw the cover back on.
- Crank the engine several times by hand (throttle lever in stop position) to spray the combustion chamber.
- Take the V-belt off and spray the grooves in the V-belt pulleys with anti-corrosion oil. Remove the anti-corrosion oil before taking the machine back into operation.
- Close the air intake opening on the air filter and the exhaust tube.

i Note

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

The conserving oil must be replaced by engine oil according to the API- (MIL) classification before taking the machine into service.

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

⚠ Caution

Mark a machine with a conserved engine by attaching a clearly visible warning tag.

6 Trouble shooting

Go to Discount-Equipment.com to order your parts

6.1 General notes

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

Strictly observe the safety regulations.

Malfunctions are frequently caused by incorrect operation of the machine or insufficient maintenance. Whenever a fault occurs you should therefore thoroughly read these instruction on correct operation and maintenance. If you cannot locate the cause of a fault or rectify it yourself by following the trouble shooting chart, you should contact the service departments at our branch offices or dealers.

On the following pages you will find a selection of fault remedies. It goes without saying that not all possible reasons for faults could be listed.

Go to Discount-Equipment.com to order your parts

6.2 Engine problems

Fault	Possible cause	Remedy
Engine does not start	Fuel tank empty Fuel system clogged Fuel nozzle clogged No ignition spark Engine switch defective	Fill in fuel Clean the fuel screen in the carburettor Clean the fuel nozzle Clean spark plug Replace spark plug Replace the engine switch
Start engine	Engine does not turn when operated Starter defective	Replace starter
Low engine power	Throttle control defective Air filter clogged Engine defective Carburettor defective	Have the fault repaired Clean or replace the filter cartridge Replace the engine/have the fault corrected Clean carburettor Repair carburettor
No vibration	Centrifugal clutch defective V-belt torn	Change the centrifugal clutch Change the V-belt
Compression of engine	Valve clearance	Check and adjust the valve clearance
Engine over-heating	Lack of cooling air	Clean air filter and/or engine
Engine stops	Lack of oil Fuel level too low Clean fuel screen in carburettor	Return engine for repair, do not continue work (risk of total damage) Fill in fuel clean

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Model:	<input type="text"/>
Description:	<input type="text"/>
Part Number:	<input type="text"/>
Quantity:	<input type="text"/>
Notes:	<input type="text"/>

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