

# BOMAG

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## FAYAT GROUP

### Operating instructions Maintenance instructions

*Original operating instructions*

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**BPR 25/40 / BPR 25/50**

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S/N 101 690 46 ..... > / 101 690 47 ..... >



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**Reversible Vibrating Plate**

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We sell worldwide for the brands: Genie, Terex, JLG, MultiQuip, Mikasa, Essick, Whiteman, Mayco, Toro Stone, Diamond Products, Generac Magnum, Airman, Haulotte, Barreto, Power Blanket, Nifty Lift, Atlas Copco, Chicago Pneumatic, Allmand, Miller Curber, Skyjack, Lull, Skytrak, Tsurumi, Husquvarna Target, Stow, Wacker, Sakai, Mi-T-M, Sullair, Basic, Dynapac, MBW, Weber, Bartell, Bennar Newman, Haulotte, Ditch Runner, Menegotti, Morrison, Contec, Buddy, Crown, Edco, Wyco, Bomag, Laymor, EZ Trench, Bil-Jax, F.S. Curtis, Gehl Pavers, Heli, Honda, ICS/PowerGrit, IHI, Partner, Imer, Clipper, MMD, Koshin, Rice, CH&E, General Equipment, Amida, Coleman, NAC, Gradall, Square Shooter, Kent, Stanley, Tamco, Toku, Hatz, Kohler, Robin, Wisconsin, Northrock, Oztec, Toker TK, Rol-Air, APT, Wylie, Ingersoll Rand / Doosan, Innovatech, Con X, Ammann, Mecalac, Makinex, Smith Surface Prep, Small Line, Wanco, Yanmar

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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**These BOMAG machines are products from the wide range of BOMAG machines for earth work, asphalt and refuse compaction as well as stabilizers/recyclers.**

**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 guarantee 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 after you have been instructed and in compliance with 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 and maintenance 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!*

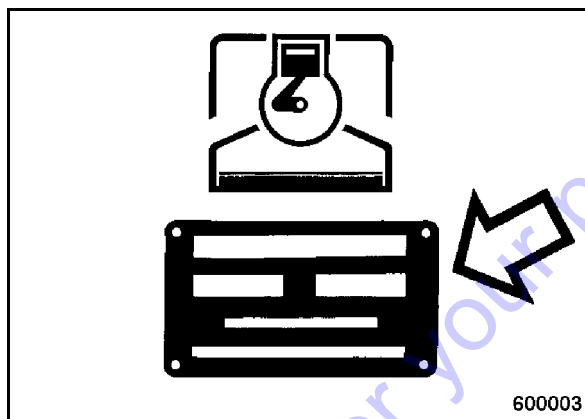


Fig. 1

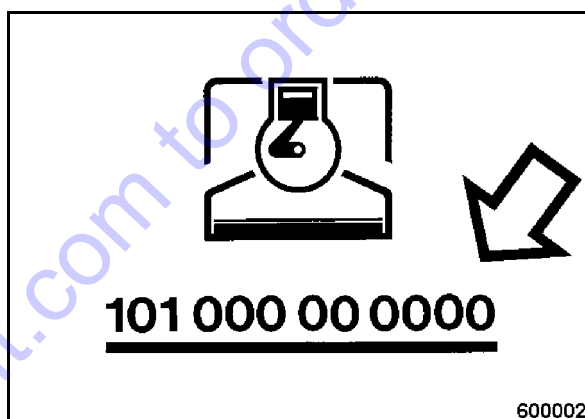


Fig. 2

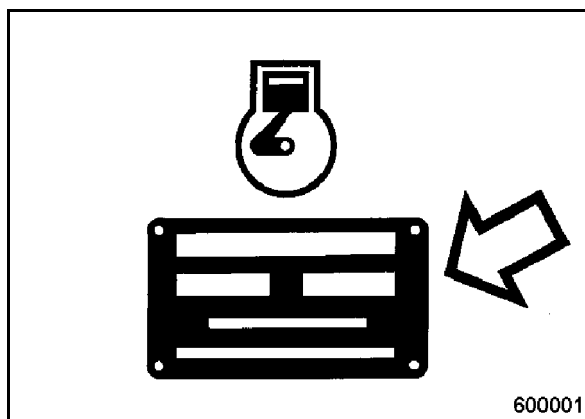


Fig. 3

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## 1 Technical Data

Go to [Discount-Equipment.com](http://Discount-Equipment.com) to order your parts

## Technical Data

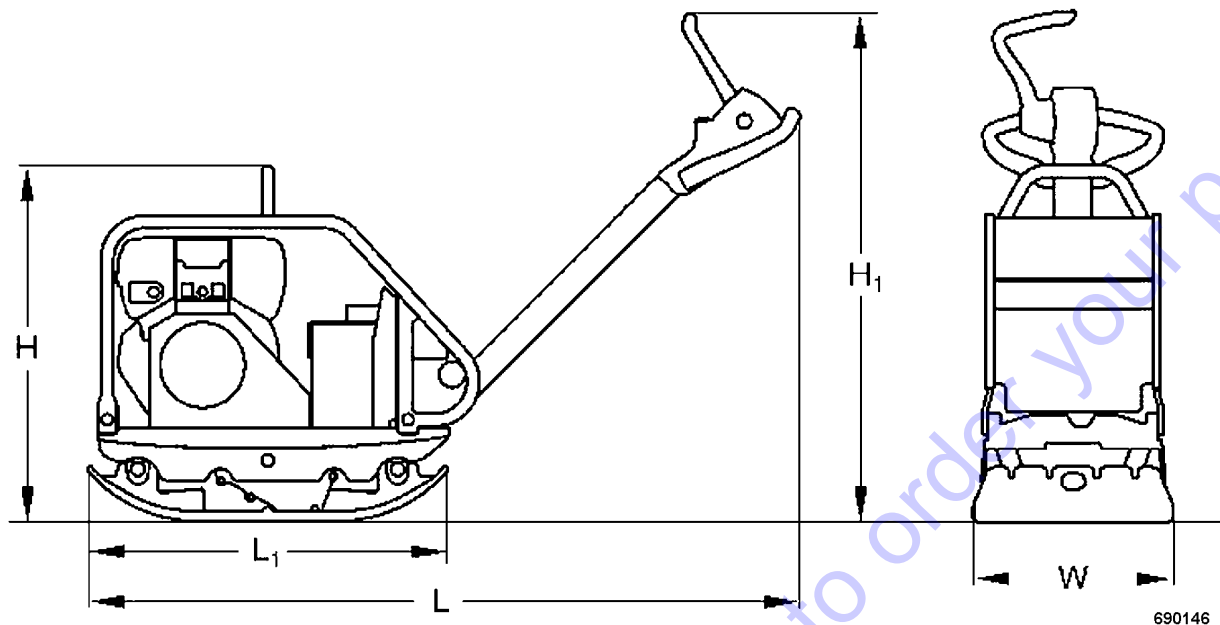


Fig. 4

Dimensions in mm	H	H <sub>1</sub>	L	L <sub>1</sub>	W
<b>BPR 25/40</b>	660	870	1460	650	400
<b>BPR 25/50</b>	660	870	1460	650	500

\*

**BPR 25/40**

**BPR 25/50**

### Weights

Operating weight (CECE)	kg	111	120
Basic weight	kg	108	117

### Travel characteristics

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

### Drive

Engine manufacturer		Honda	Honda
Type		GX 160	GX 160
Cooling		Air	Air
Number of cylinders		1	1
Rated power ISO 9249	kW	3.6	3.6
Rated speed	min <sup>-1</sup>	3600	3600
Starting device		Recoil starter	Recoil starter
Fuel		Gasoline	Gasoline
Drive system		mechanical	mechanical



*		BPR 25/40	BPR 25/50
<b>Exciter system</b>			
Frequency	Hz	85	85
Centrifugal force	kN	25	25
<b>Filling capacities</b>			
Fuel	l	3	3
Water	l	12	12
Engine oil	l	0.6	0.6

\* Subject to technical alterations.

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## Technical Data

The following noise and vibration data acc. to

- EC Machine Regulation edition 2006/42/EC
- 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 on the place of the operator:**

BPR 25/40:  $L_{pA} = 91$  dB(A) with tube frame, determined acc. to ISO 11204 and EN 500

BPR 25/50:  $L_{pA} = 91$  dB(A) with tube frame, determined acc. to ISO 11204 and EN 500

**Guaranteed sound power level:**

BPR 25/40:  $L_{WA} = 104$  dB(A) with tube frame, determined acc. to ISO 3744 and EN 500

BPR 25/50:  $L_{WA} = 104$  dB(A) with tube frame, 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**

BPR 25/40:  $a_{hv} = 5.9$  m/sec<sup>2</sup> with tube frame, on crushed rock determined acc. to ISO 5349 and EN 500

BPR 25/50:  $a_{hv} = 5.9$  m/sec<sup>2</sup> with tube frame, 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.**

Furthermore, the following obviously also applies:

- 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 soils
- Repair work on all types of soil
- Paving of walkways
- Work in trenches
- Underfilling and compaction of hard shoulders

### Unintended use

Dangers may arise from the machine when it is used for purposes other than the one it is intended for.

Any danger caused by intended use is the sole responsibility of the customer or driver/operator, the manufacturer cannot be made liable.

Examples for unintended use are:

- Dragging the machine along as a measure of transportation
- Throwing the machine off the transport vehicle
- Attaching an additional weight to the machine

It is not permitted to stand on the machine while working.

Any transport ropes fastened to the machine must be removed before operation.

Starting and operation of the machine in explosive environments and in underground mining is prohibited.

### Remaining dangers, remaining risks

Despite careful work and compliance with standards and regulations it cannot be ruled out that further dangers may arise when working with and handling the machine.

Both the machine as well as all other system components comply with the currently valid safety regulations. Nevertheless, remaining risks cannot be ruled out completely, even when using the machine for the purpose it is intended for and following all information given in the operating instructions.

A remaining risk can also not be excluded beyond the actual danger zone of the machine. Persons remaining in this area must pay particular attention to the machine, so that they can react immediately in case of a possible malfunction, an incident or failure etc.

All persons remaining in the area of the machine must be informed about the dangers that arise from the operation of the machine.

### Regular safety inspections

Have the machine inspected by an expert (capable person) as required for the condition the machine is working under, but at least once every year.

## 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.

## Damage, deficiencies, misuse of safety installations

Machines which are not safe to operate must be immediately taken out of service and shall not be used, until these deficiencies have been properly rectified.

Safety installations and switches must neither be removed nor must they be made ineffective.

## Notes on safety in the operating and maintenance instructions:

### **Danger**

Paragraphs marked like this highlight possible dangers for persons.

### **Caution**

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

### **Note**

Paragraphs marked like this contain technical information for the optimal economical use of the machine.

### **Environment**

Paragraphs marked like this point out practices for safe and environmental disposal of fuels and lubricants as well as replacement parts.

**Observe environmental regulations.**

## Loading the machine

Use only safe lifting gear of sufficient load bearing capacity

Fasten the lifting gear only at the specified lifting points.

Check lifting eye for damage before use. Do not use a damaged or in any other way impaired lifting eye.

Persons are highly endangered if

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

The machine must not swing about when being lifted.

Secure the machine on the transport vehicle against rolling, 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, etc.). Wear ear defenders.

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.

## Safety regulations

Use only machines which are serviced at regular intervals.

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

### Starting and operation of the machine is closed rooms and trenches

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

### Operation

The machine must only be operated with the steering rod folded down.

Guide the machine in a way that hands do not knock against hard materials. Danger of injury.

Watch out for unusual noises and smoke when operating the plate. Investigate the cause and have the fault corrected.

The vibratory plate must only be operated at full engine speed, as otherwise the centrifugal clutch may be destroyed.

Never leave the plate unattended with the engine running..

### Parking the machine

Park the machine on level, firm ground.

Before leaving the machine:

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

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

### Filling in fuel

Do not inhale any fuel fumes.

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.

Keep dirt and water away from the fuel.

### Maintenance work

Maintenance work must only be performed by qualified and authorized persons.

Keep unauthorized persons away from the machine.

Do not perform maintenance work while the motor is running.

Park the machine on level, firm ground.

### 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 contaminated materials in a separate, specially marked container and dispose of environmentally.

### Working on the fuel system

Avoid open fire, do not smoke, do not spill any fuel.

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

### Cleaning work

Do not perform cleaning work while the motor is running.

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

When using a steam cleaner for cleaning do not subject electrical parts and insulation material to the direct jet or cover these items beforehand.

Do not guide the water jet directly into air filter and air intake or exhaust muffler.

### After maintenance work

After all maintenance work is completed reinstall all guards and safety installations.

### Repair

Repair work must only be performed by qualified and authorized persons. Use our repair instructions for this work.

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

Mark defective machines by attaching a warning note to the steering handle.

### Welding

Before starting welding work on the machine disconnect the battery and cover the fuel tank with insulating material.

**Safety stickers on the machine**

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

Replace damaged and illegible safety stickers.

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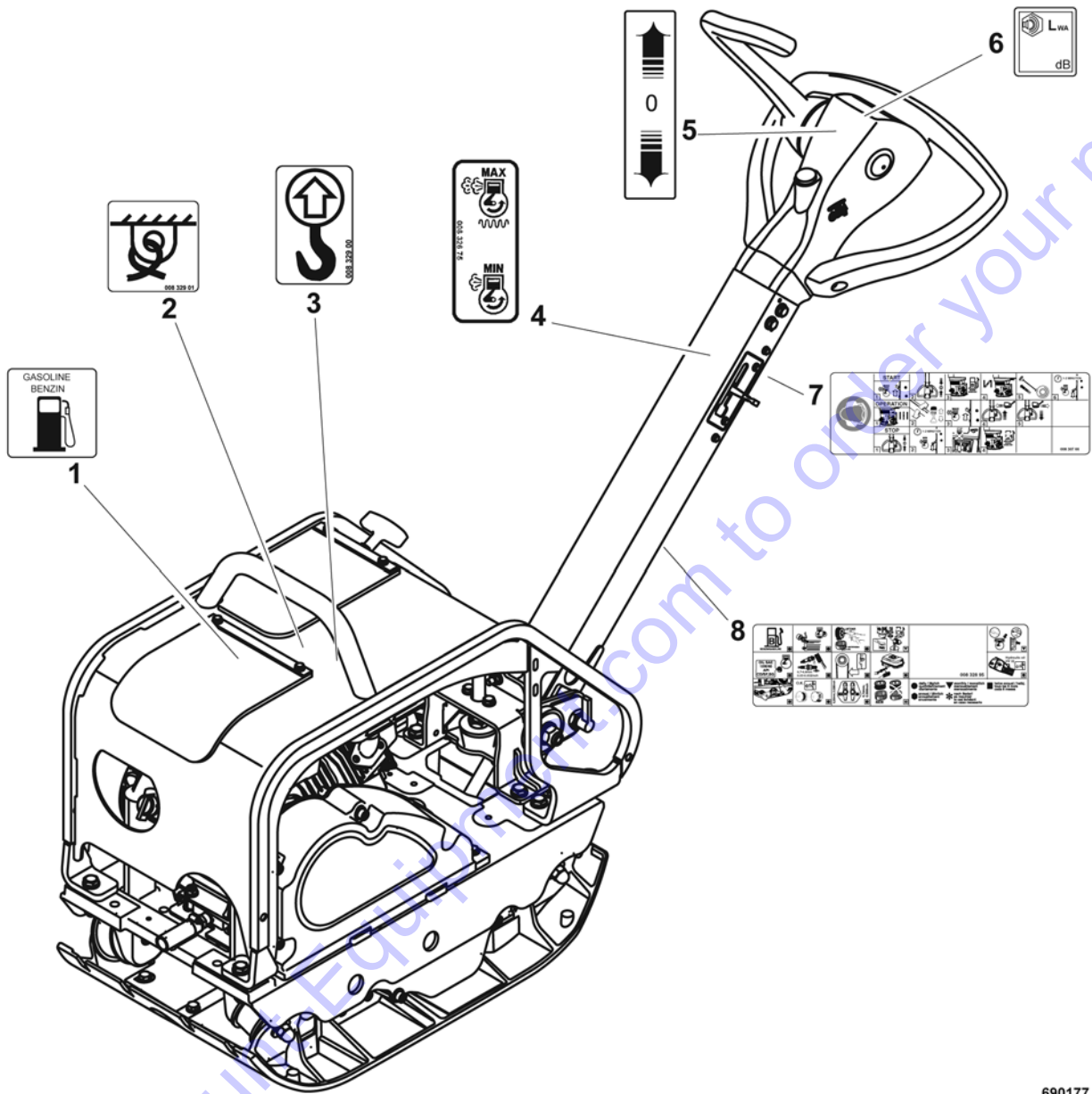


Fig. 5

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**Stickers and decals BPR 25/40, BPR 25/50**

- |   |   |   |                              |
|---|---|---|------------------------------|
| 1 | Information sticker "Gasoline"                        | 7 | Brief operating instructions |
| 2 | Information sticker "Lashing points"                  | 8 | Maintenance sticker          |
| 3 | Information sticker "Lifting point"                   |   |                              |
| 4 | Information sticker "Throttle lever"                  |   |                              |
| 5 | Information sticker "Travel lever"                    |   |                              |
| 6 | Information sticker "Guaranteed sound capacity level" |   |                              |



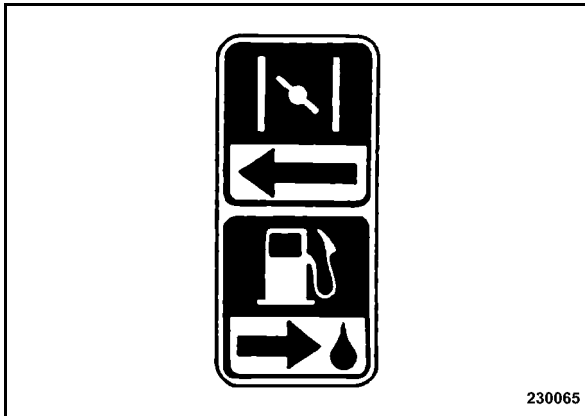


Fig. 6

**Information sticker "Open choke and fuel valve"**

Go to Discount-Equipment.com to order your parts

### 3 Indicators and Controls

Go to [Discount-Equipment.com](http://Discount-Equipment.com) to order your parts

### 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 Description of indicators and control elements

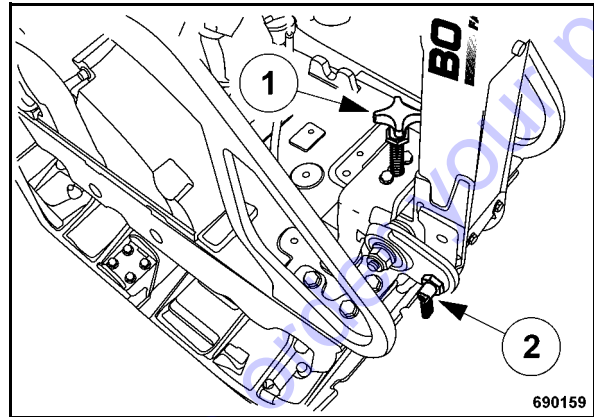


Fig. 7

**No. 1 = Steering rod height adjustment**

**No. 2 = Steering rod lock**

#### **i Note**

*The steering rod lock is released by pulling out the locking bolt.*

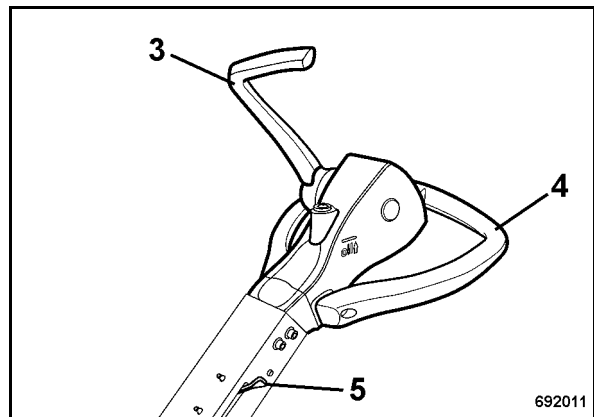


Fig. 8

**No. 3 = Travel lever**

**No. 4 = Handle**

**No. 5 = Throttle lever**

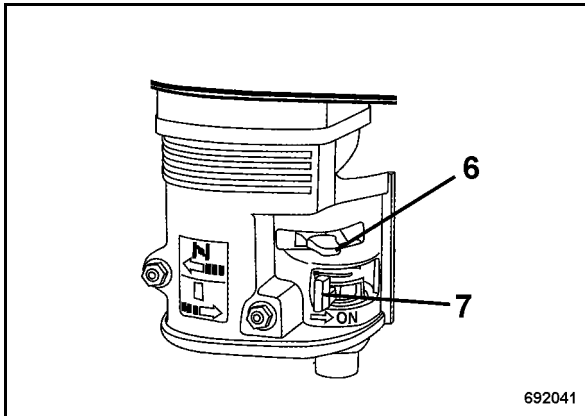


Fig. 9

**No. 6 = Choke lever**

Position "left" = Choke closed

Position "right" = Choke open

**No. 7 = Fuel cock**

Position "left" = Fuel tap closed.

Position "right" = Fuel tap open

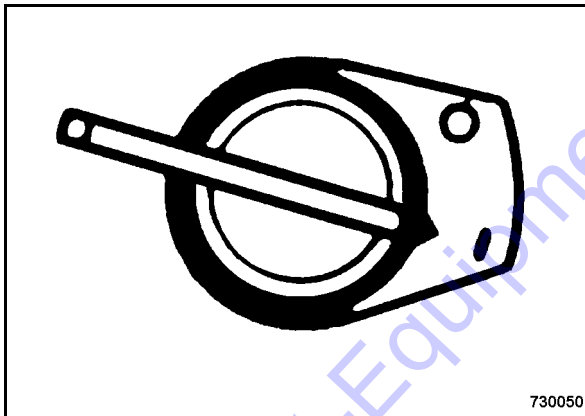


Fig. 10

**No. 8 = Ignition switch**

Position "0" = Ignition off

Position "I" = Ignition on

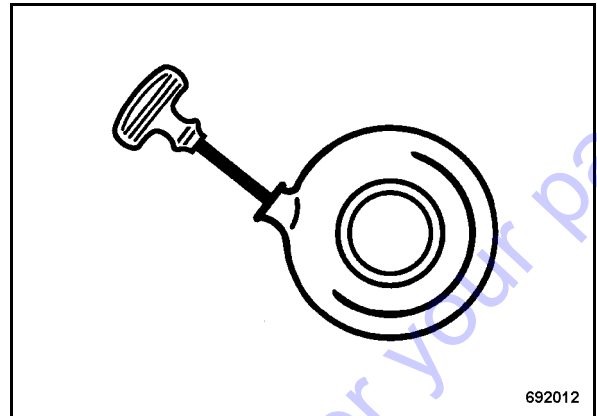


Fig. 11

**No. 9 = Recoil starter**

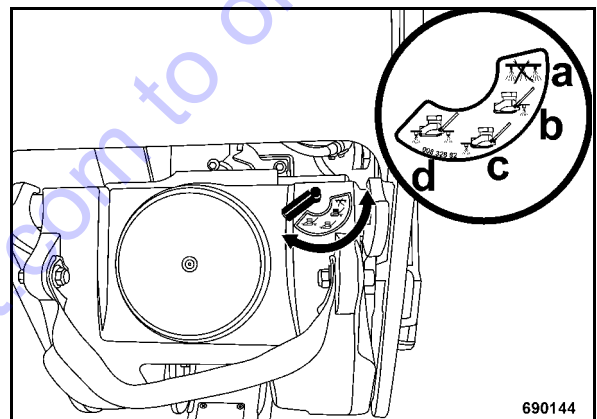


Fig. 12

**No. 10 = Lever for water sprinkling system \***

Position "a" = Sprinkling system switched off

Position "b" = Sprinkling through rear spray bar

Position "c" = Sprinkling through front spray bar

Position "d" = Sprinkling through both spray bars

\* Optional equipment

## 4 Operation

Go to [Discount-Equipment.com](http://Discount-Equipment.com) to order your parts

### 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

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

#### **⚠ Danger**

**Danger of accident!**

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

- Park the machine on ground as level as possible.
- Cleaning the machine.

#### **Check:**

- condition of engine and machine
- fuel tank and fuel lines for leaks
- screw joints for tight fit

#### **i Note**

*For a description of the following tasks refer to the chapter "Daily maintenance".*

- Engine oil level, top up if necessary
- Fuel level, top up if necessary.
- Water level\*, top up if necessary.

\* Optional equipment

### 4.3 Folding down the steering rod

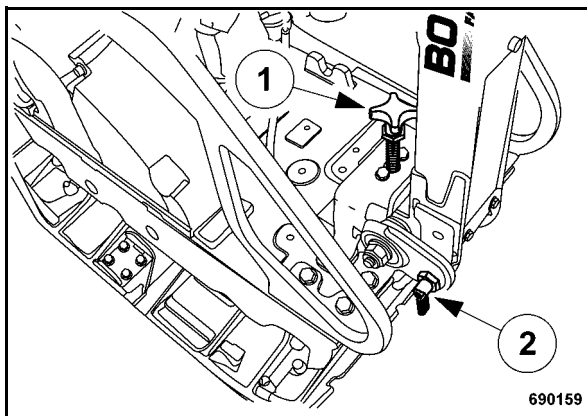


Fig. 13

- Pull out and turn the locking bolt (2) (Fig. 13).
- Fold down the steering rod, so that it can swing freely.
- Adjust the steering rod with the height adjustment (1) to the height of your body.

### 4.4 Starting the engine

**⚠ Danger**

Exhaust gases are highly dangerous!

Always ensure an adequate supply of fresh air when starting and operating in closed rooms and trenches!

**⚠ Danger**

Danger of accident!

Before starting make sure that there are no persons in the danger area of engine or machine and that all safety installations are in place.

Always hold on to the machine.

Always keep an eye on a running machine.

**⚠ Danger**

Loss of hearing!

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

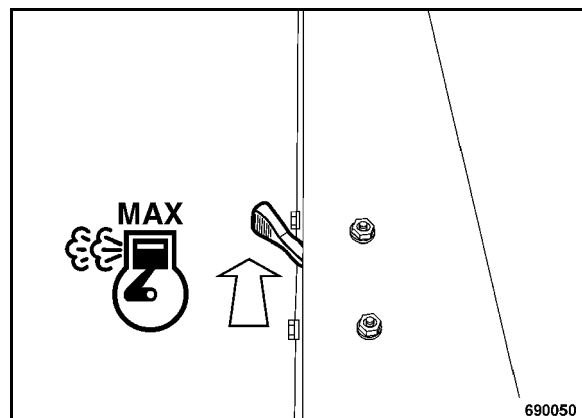


Fig. 14

- Set the throttle lever (Fig. 14) to position "MAX".

## Operation

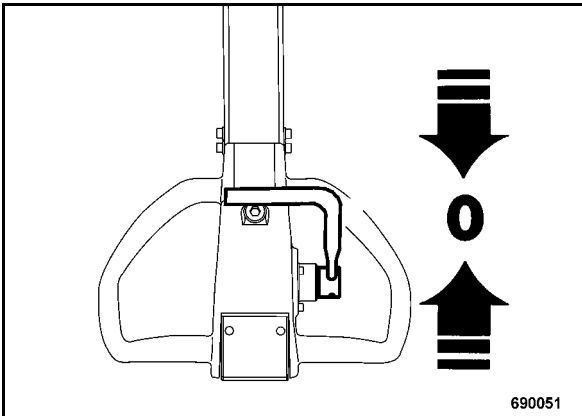


Fig. 15

- Shift the travel lever (Fig. 15) to position "0".

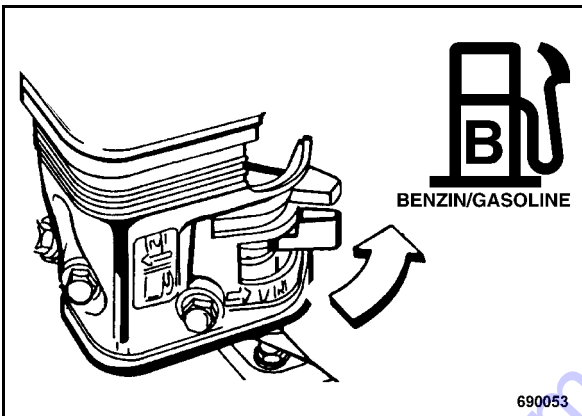


Fig. 16

- Open the fuel cock (Fig. 16) by turning in direction of arrow to the end stop.

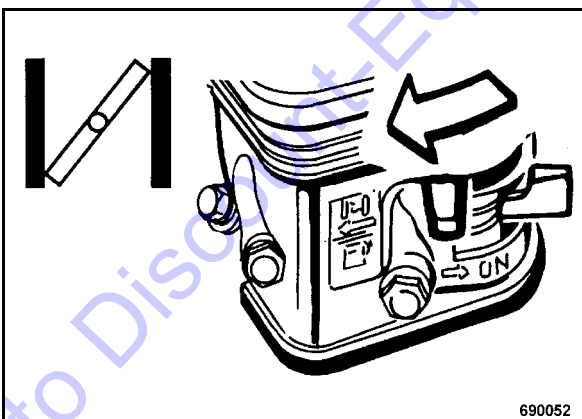


Fig. 17

- Close the choke (Fig. 17) completely by shifting the lever in direction of arrow against the end stop.

### Caution

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

### Caution

The engine is equipped with low oil level safety shut-down. The engine cannot be started if the oil level is too low.

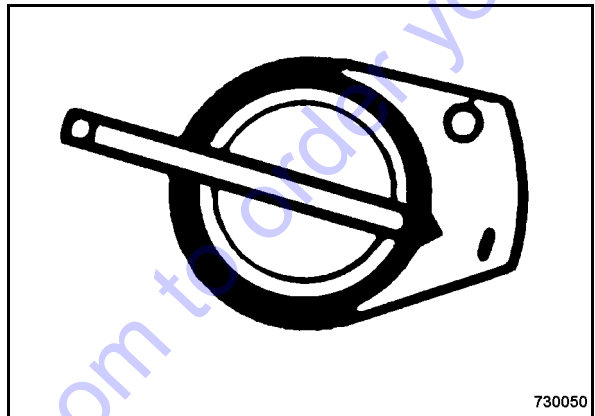


Fig. 18

- Turn the ignition switch to position "I" (Fig. 18).

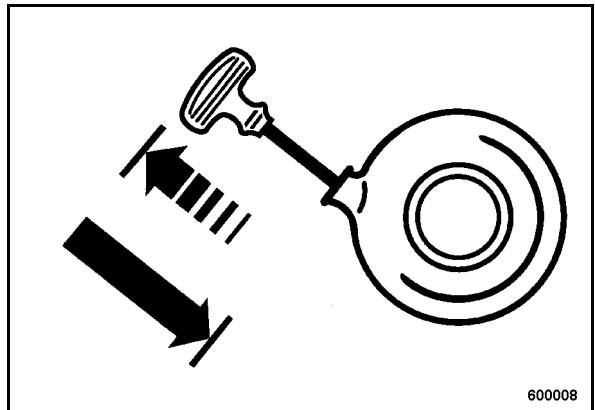


Fig. 19

- Slightly pull the starter handle (Fig. 19), until resistance can be felt (compression pressure), but do not pull out completely.
- Guide the starter rope back by hand.



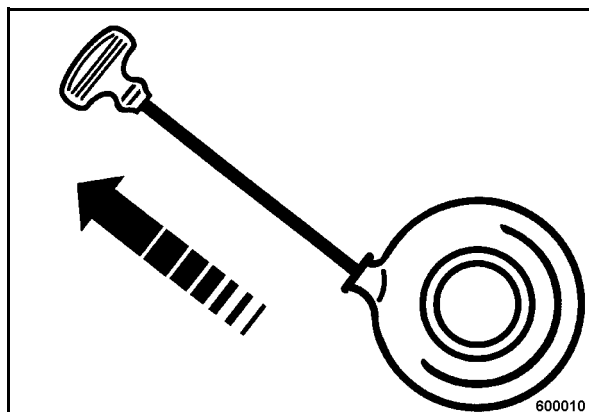


Fig. 20

- Pull the rope by the starter handle quickly and powerful as far out as possible (Fig. 20).

**⚠ 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.

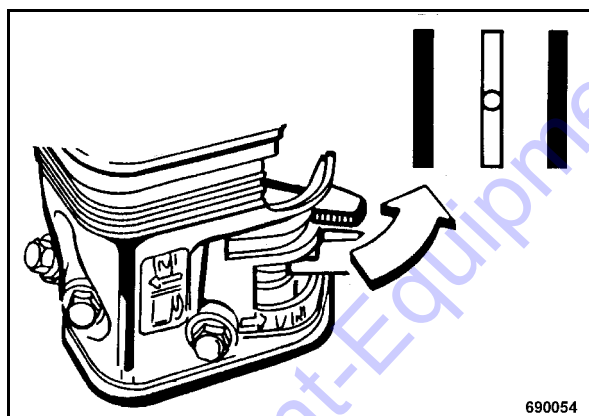


Fig. 21

- As the engine warms up open the lever (Fig. 21) of the choke slowly.

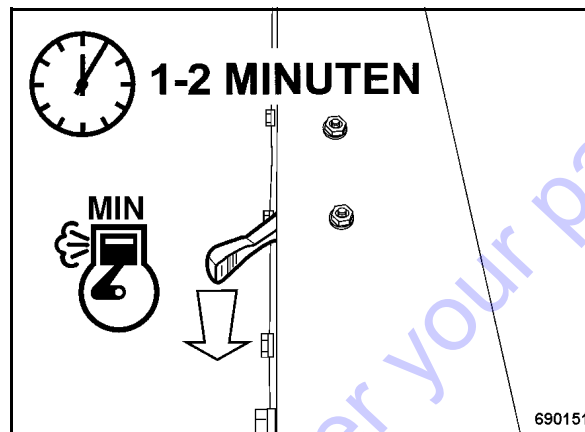


Fig. 22

- Set the throttle lever (Fig. 22) to position "MIN".
- Run the engine warm for approx. 1 to 2 minutes in idle speed.

**i Note**

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

**⚠ Caution**

**When the engine is running leave the ignition switch in position "I".**

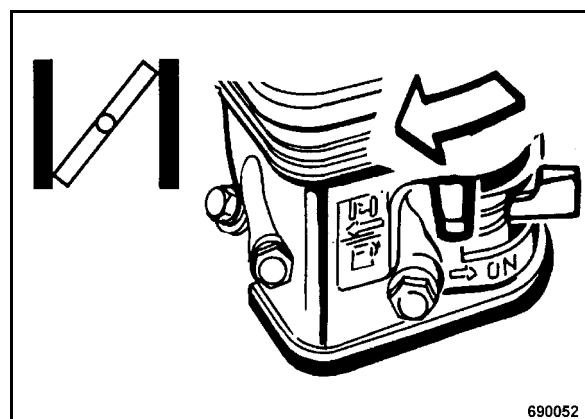


Fig. 23

- If the engine stops again after approx. 3 to 5 seconds, close the choke again with the lever (Fig. 23) and repeat the starting process.

### 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.
- 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!**

Operate the machine only with the steering rod folded down.

Guide the machine only by the steering rod.

#### **⚠** Caution

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

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

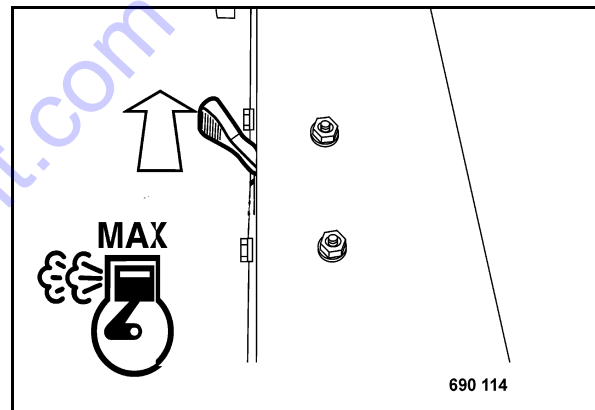


Fig. 24

- Set the throttle lever (Fig. 24) to position "MAX".

### Drive forward

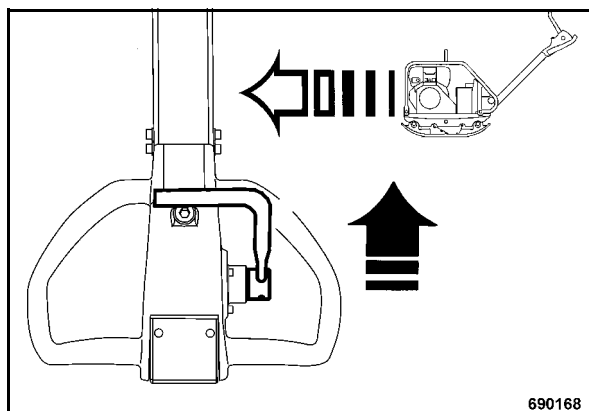


Fig. 25

- Push the travel lever (Fig. 25) forward, until the vibratory plate has reached the desired speed.

The machine drives with a speed which corresponds with the travel lever position.

**i Note**

*If the machine moves forward with considerably reduced speed, pull the travel lever completely back and shift it forward again.*

### Drive backwards

**⚠ Danger**

**Danger of accident!**

**As a measure to avoid injury the machine must only be guided from the side by the steering handle**

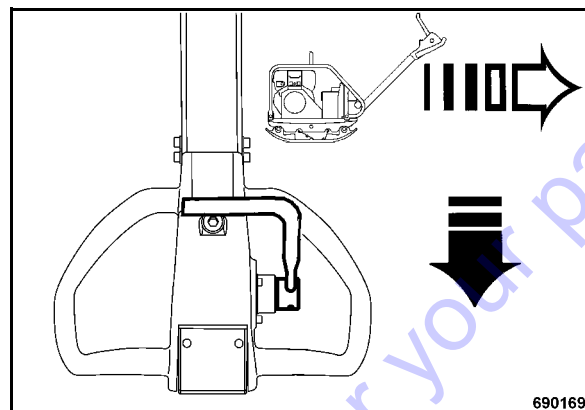


Fig. 26

- Pull the travel lever (Fig. 26) back, until the vibratory plate has reached the desired speed in reverse.

The machine vibrates backwards with a speed which corresponds to the travel lever position.

### If the vibratory plate got stuck

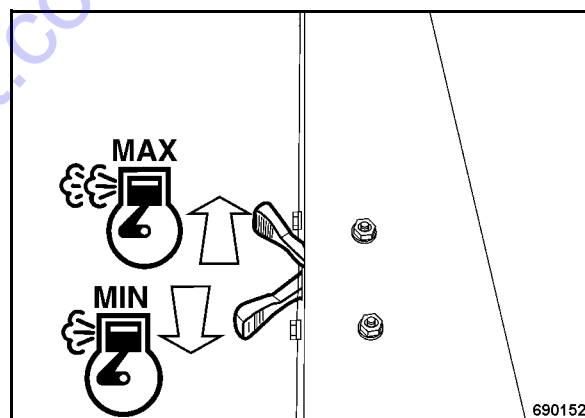


Fig. 27

- Keep shifting the throttle lever (Fig. 27) between "MIN" and "MAX" positions.
- At the same time pull the vibratory plate by the steering rod to the right and left, until it comes free.

## 4.6 Shut down the engine

**⚠ Caution**

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

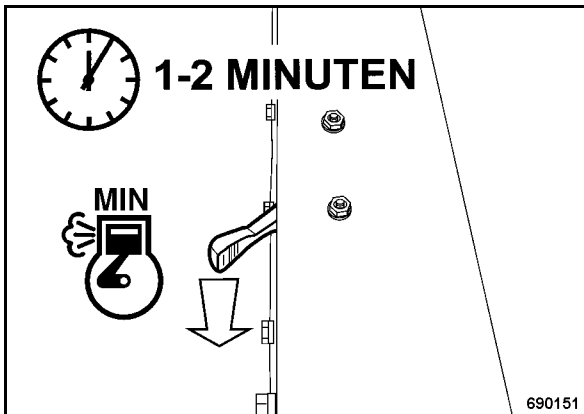


Fig. 28

- Shift the throttle lever (Fig. 28) to position "MIN" and let the engine run with idle speed for a short while.
- Vibration is shut down.

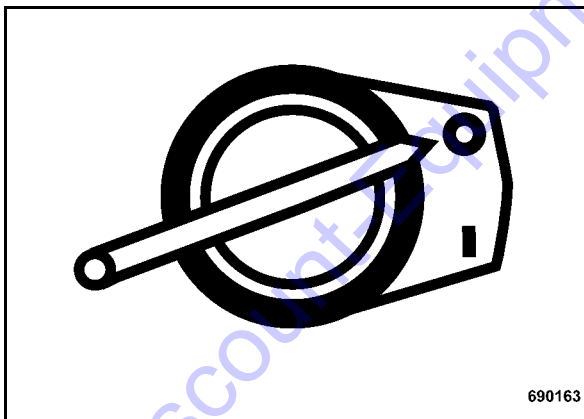


Fig. 29

- Turn the ignition switch (Fig. 29) to position "0".

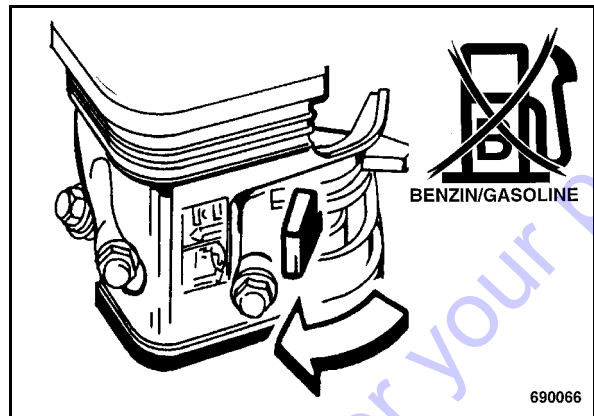


Fig. 30

- Close the fuel tap (Fig. 30) by turning in direction of arrow.

## 4.7 Loading

### **⚠ 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 lifting point (cross strut on the engine protection bow).

Check lifting eye for damage before use. Do not use a damaged or in any other way impaired lifting eye.

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

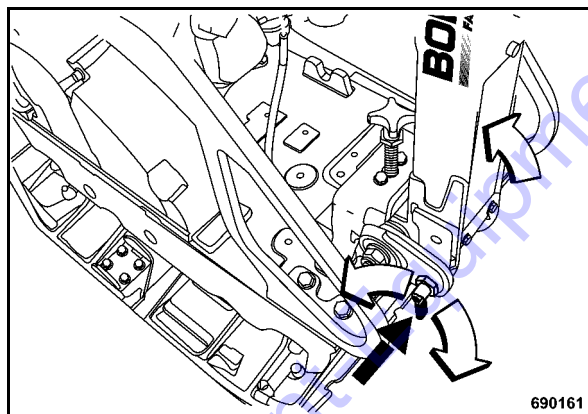


Fig. 31

- Set the steering rod (Fig. 31) to upright position.
- Engage the locking pin securely.

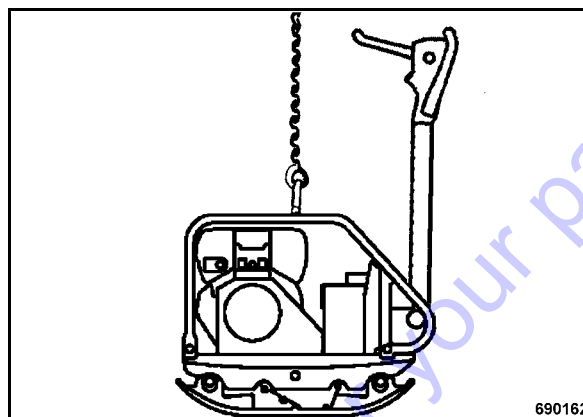


Fig. 32

- Always attach the lifting gear (rope) to the lifting eye to load the vibratory plate on a transport vehicle (Fig. 32).

### **⚠ Danger**

**Danger of accident!**

Minimum lifting 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!

## 5 Maintenance

Go to [Discount-Equipment.com](http://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 engine shut down.

#### 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 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 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.

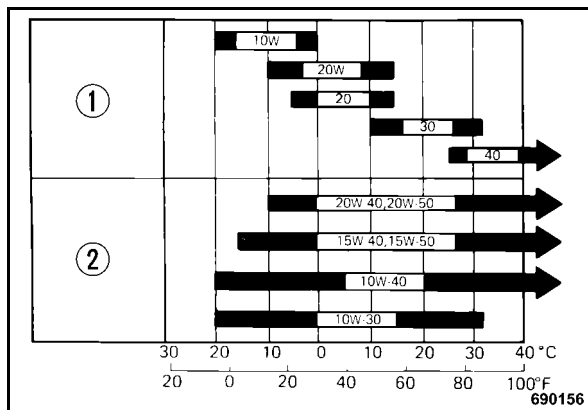


Fig. 33

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.

### Oil quality

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

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.

### Oil change intervals

The longest permissible time the lubrication oil should remain in an engine is 1/2 year or 100 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), 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.

#### Mineral oil based hydraulic oil

The hydraulic system is operated with hydraulic oil HV 32 (ISO) with a kinematic viscosity of  $32\text{ mm}^2/\text{s}$  at  $40\text{ }^{\circ}\text{C}$ . For topping up or for oil changes use only high-quality hydraulic oil, type HVLP according to DIN 51524, part 3, or hydraulic oils



## Maintenance

type HV according to ISO 6743/3. The viscosity index (VI) must be at least 150. (Observe the information of the manufacturer).


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### 5.3 Table of fuels and lubricants

Assembly	Fuel or lubricant		Quantity approx.  Attention Observe the level marks
	Summer	Winter	
Engine - Engine oil	Engine oil API SF or SG SAE 10W/30 (-20 °C to +30 °C) SAE 10W/40 (-20 °C to +40 °C) SAE 10W/40 (-15 °C to +40 °C) SAE 30 (+10 °C to +30 °C)   SAE 10 W (-20 °C to 0 °C) SAE 40 (+25 °C to +45 °C)   SAE 20W/20 (-10 °C to +10 °C)		0,6 l to oil level mark
- Fuel	Gasoline (unleaded)		3 l
Water tank	Water	Water with anti-freeze agent	12 l
Vibrator shaft housing	as engine oil		0.4 l
Steering rod	Hydraulic oil: HV 32		0.4 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.
- Check the oil level in the vibrator housing.

## 5.5 Maintenance table

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

No.	Maintenance work	Comment	daily	weekly	monthly	half-annually	annually	as required
5.6	Clean machine / engine		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 the 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	Change the engine oil	at least every 100 operating hours				X		
5.13	Clean, check the spark plug					X		
5.14	Clean the slurry filter					X		
5.15	Check the oil level in the exciter housing					X		
5.16	Check the V-belt tension, if necessary replace the V-belt					X		
5.17	Check, adjust the valve clearance	at least every 300 operating hours Intake: 0,20 mm Exhaust: 0,15 mm					X	
5.18	Clean the fuel screen						X	
5.19	Change the oil in the vibrator housing	at least every 500 operating hours					X	
5.20	Check the hydraulic oil level						X	
5.21	Check the rubber buffers						X	
5.22	Change the dry air filter							X
5.23	Tighten all bolted connections							X
5.24	Engine conservation							X

## 5.6 Clean machine / engine

### 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.

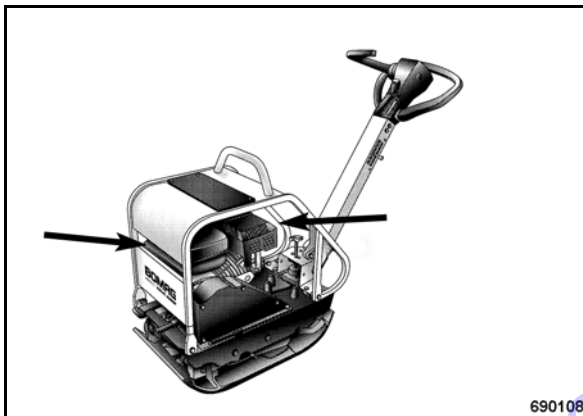


Fig. 34

### Caution

Do not guide the water jet directly into the cooling air openings of the recoil starter, into the dry air filter and on electrical equipment (Fig. 34).

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

## 5.7 Check the engine oil level

### Caution

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

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

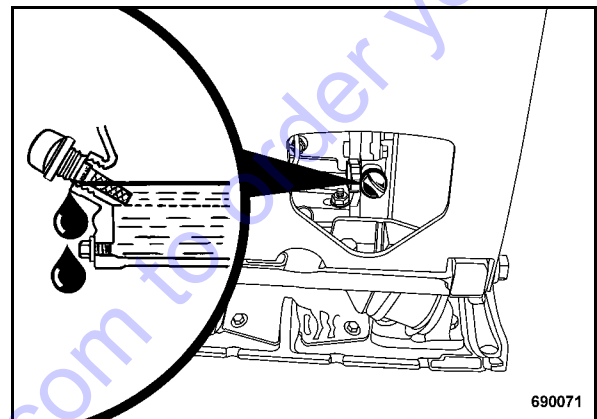


Fig. 35

- Shut down the engine.
- Pull out the dipstick (Fig. 35) and wipe it clean with a lint-free, clean cloth.
- Insert the dipstick into the oil filler socket, do not screw it in, but pull it out again to check the oil level.
- If the oil level is near or below the bottom limit mark on the dipstick, fill in recommended oil up to the top dipstick mark (bottom edge of oil filler neck). Do not overfill.

## 5.8 Check the fuel level

### **⚠ Danger**

Fire hazard!

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

Do not refuel in closed rooms.

Shut down the engine.

### **⚠ Danger**

Health hazard!

Do not inhale any fuel fumes.

### **♻ Environment**

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

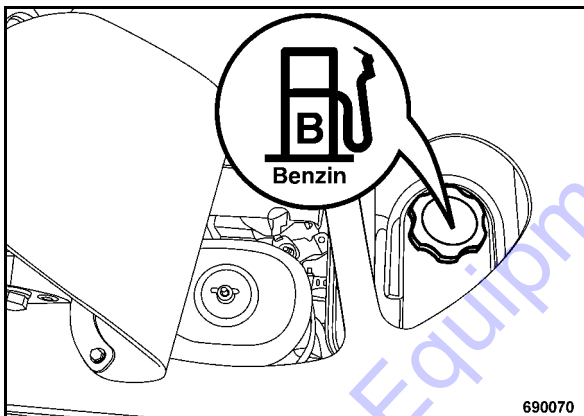


Fig. 36

- Clean the area around the filler cover, unscrew the filler cover (Fig. 36).

### **⚠ Caution**

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

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

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

## 5.9 Filling the water tank\*

### **⚠ Caution**

Dirty or contaminated water can block the nozzles!

Fill only with clean water.

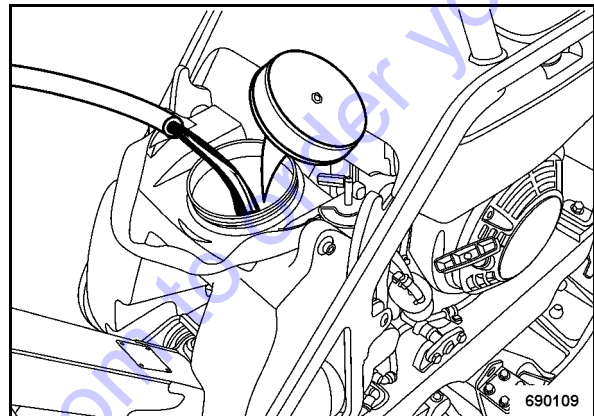


Fig. 37

- Open the water tank (Fig. 37) 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.

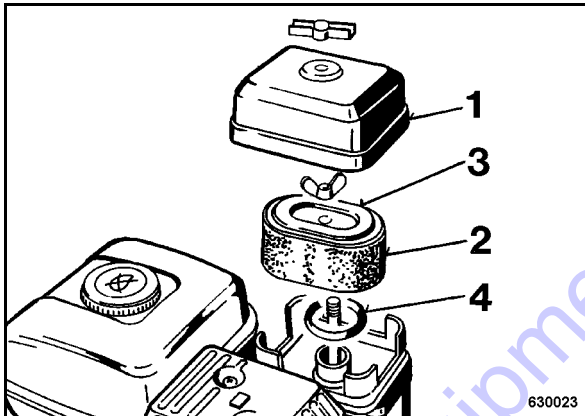


Fig. 38

- Remove cover (1) (Fig. 38) 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.

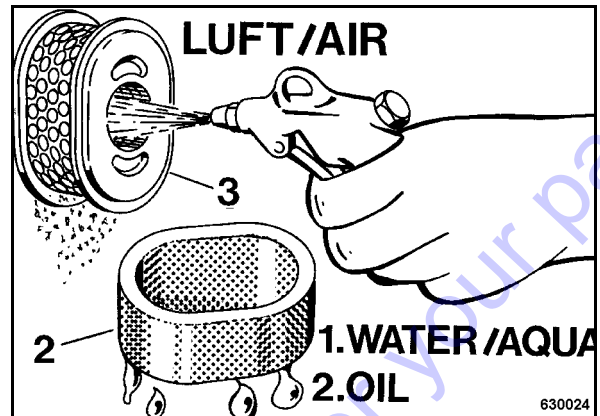


Fig. 39

### Cleaning the filter

- Clean the paper insert (3) (Fig. 39) 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.

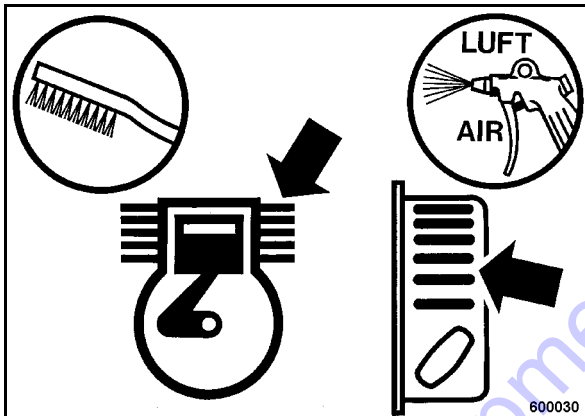


Fig. 40

- Loosen dried on dirt with a suitable brush (Fig. 40) 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 the cooling air openings of the recoil starter, into the dry air filter and on electrical equipment.

- 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 Change the engine oil

### **⚠ Danger**

**Danger of scalding!**

**When draining off hot oil.**

### **⚠ Caution**

**Environmental damage!**

**Catch old oil and dispose of environmentally.**

### **i Note**

*Drain the engine oil only when the engine is warm.*

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

*Observe the information on fuels and lubricants.*

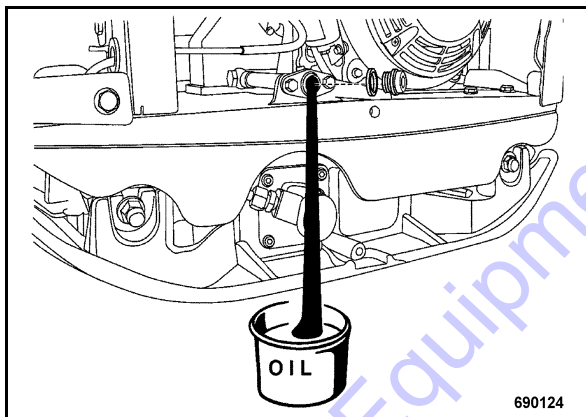


Fig. 41

- Unscrew the oil drain plug and catch running out old oil (Fig. 41).
- Clean the oil drain plug and screw it back in with a new seal ring.

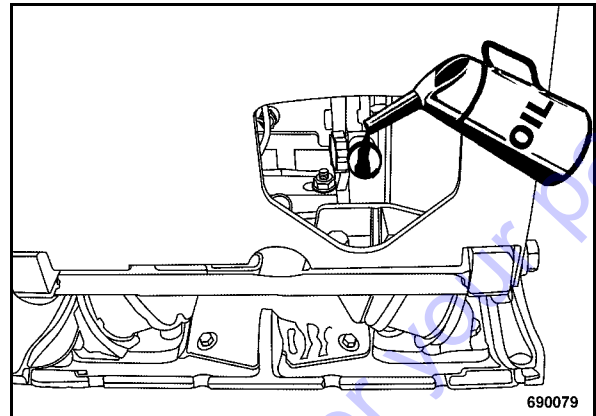


Fig. 42

- Fill in fresh engine oil through the filler opening (Fig. 42).

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

- Screw the oil filler plug back in.
- Perform a test run, inspect drain plug and oil filter for leaks.

## 5.13 Checking, cleaning the spark plug

**⚠ Danger**

Danger of burning on hot engine!

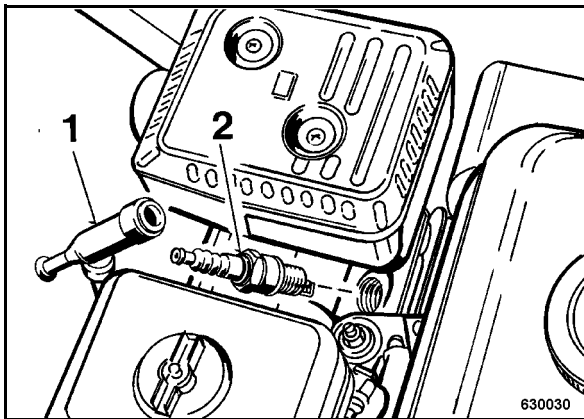


Fig. 43

- Pull off the spark plug socket (1) (Fig. 43) and unscrew the spark plug (2).



Fig. 44

- Check the spark plug visually and clean it if necessary (Fig. 44).

**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**

**Fire hazard!**

Gasoline is easily inflammable, do not spill any gasoline.

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

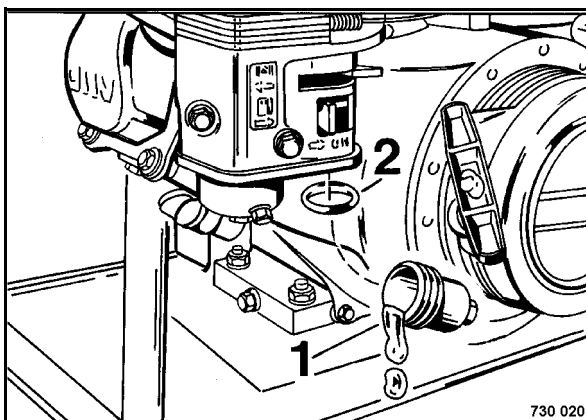


Fig. 45

- Close the fuel cock, unscrew fuel sludge filter 1 (Fig. 45) and wash it out with gasoline.
- Check the O-ring for damage, if necessary use a new one.
- Turn the fuel sludge filter in tightly and mind the O-ring (2).

## 5.15 Check the oil level in the vibrator housing

**i Note**

Park the machine on level ground.

- Clean the area around the level plug.

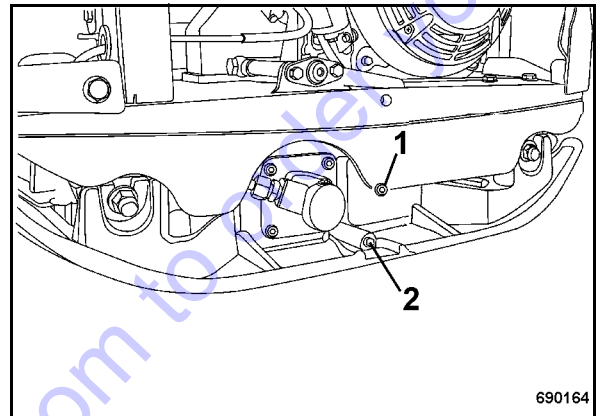


Fig. 46

- Unscrew the bleeding screw (1) (Fig. 46).
- Unscrew the oil drain plug (2) and check the oil level.

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

- 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.**

- Clean the oil drain plug and screw it in with Omnifit FD 10 BOMAG P/N 00970016.
- Screw the bleeding screw back in.

## 5.16 Check the V-belt tension, if necessary replace the V-belt

### Checking the V-belt

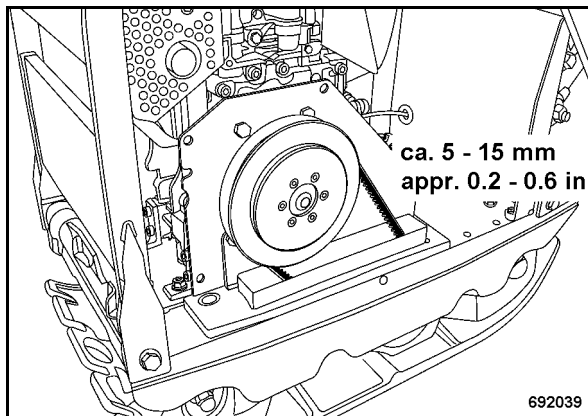


Fig. 47

- Remove the V-belt guard (Fig. 47).
- Check condition and tightness of V-belt

#### **i** Note

Compression measurement approx. 5 - 15 mm.

#### **⚠** Caution

Replace a damaged V-belt.

The V-belt cannot be tightened manually. Always replace the V-belt, if the compression measurement is exceeded.

### Changing the V-belt

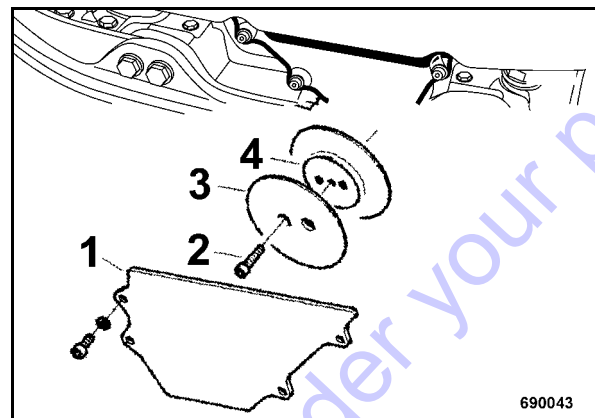


Fig. 48

- Disassemble the safety cover (1) (Fig. 48).
- Loosen screw (2).
- Remove the front disc (3) from the centrifugal clutch.
- Take off the V-belt and replace it by a new one.
- Attach the front disc (3).
- Tighten the screws (2).
- Refit the safety cover (1).
- Assemble the top V-belt guard (Fig. 47).

## 5.17 Checking, adjusting the valve clearance

### **i** Note

Check and adjust only when the engine is cold.

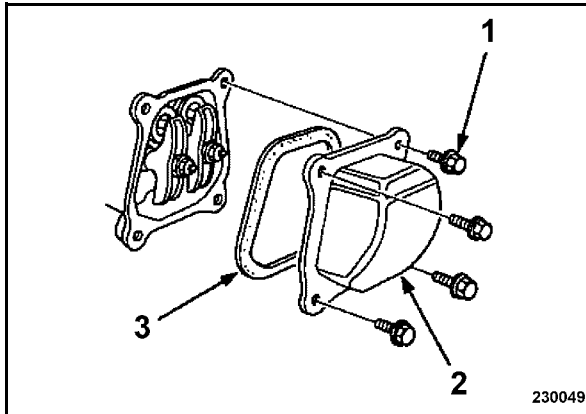


Fig. 49

- Loosen the screws (1) and take off the valve cover (2) (Fig. 49) with gasket (3).

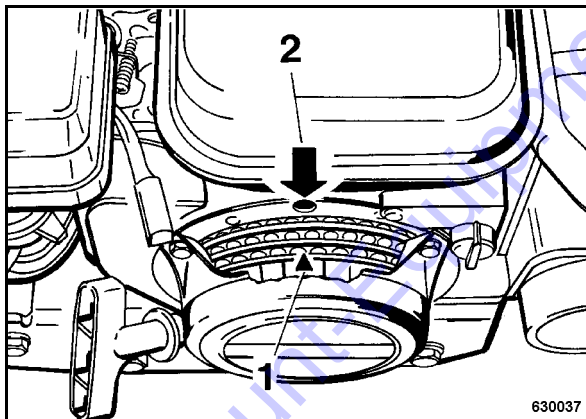


Fig. 50

- Set the piston to top dead centre position of the compression stroke.
- For this purpose align triangle mark (1) (Fig. 50) on the starter disc to the top bore (2).

## Check the valve clearance

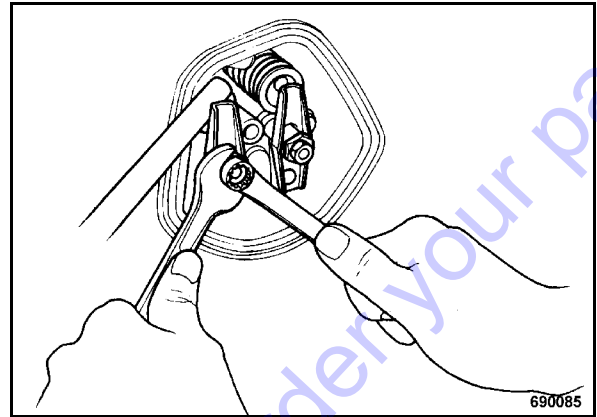


Fig. 51

- Check the valve clearance with a feeler gauge on both valves (1) (Fig. 51).

### **i** Note

Exhaust valve clearance: 0.20 mm

Intake valve clearance: 0.15 mm

## Adjust the valve clearance

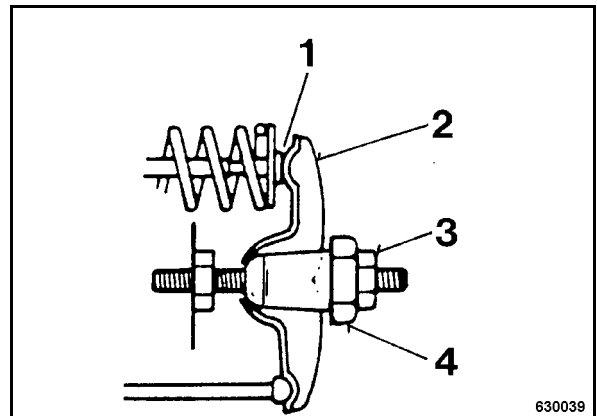


Fig. 52

- Hold hexagon nut (4) (Fig. 52) on the rocker lever and loosen counter nut (3).
- Adjust hexagon nut (4) on the rocker arm so that the feeler gauge fits between rocker arm and valve shaft (1) with noticeable resistance after retightening counter nut (3).
- Install the valve cover with a new gasket and tighten the screws evenly.

## 5.18 Clean the fuel screen

### **i** Note

Clean the fuel screen filter only when the engine is cold.

### **⚠** Caution

**Fire hazard!**

Gasoline is easily inflammable, do not spill.

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

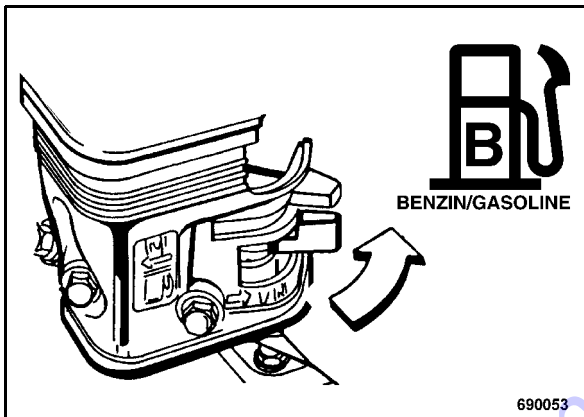


Fig. 53

- Open the fuel tap (Fig. 53) by turning in direction of arrow.

### **⚠** Caution

**Environmental damage!**

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

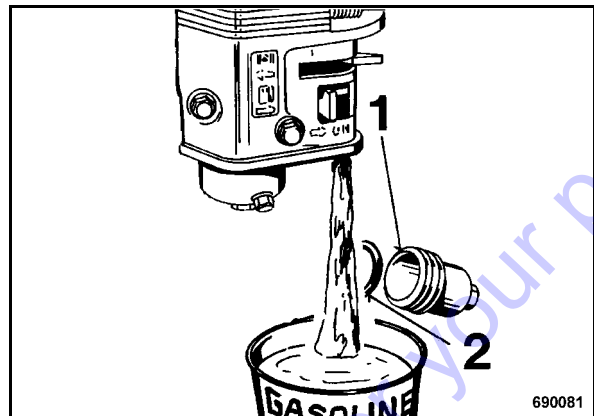


Fig. 54

- Unscrew the fuel sludge filter 1 (Fig. 54) and drain off all gasoline.
- Check seal ring (2) for cracks, replace the seal if damaged.
- Screw the fuel sludge filter with sealing ring (2) in tightly.

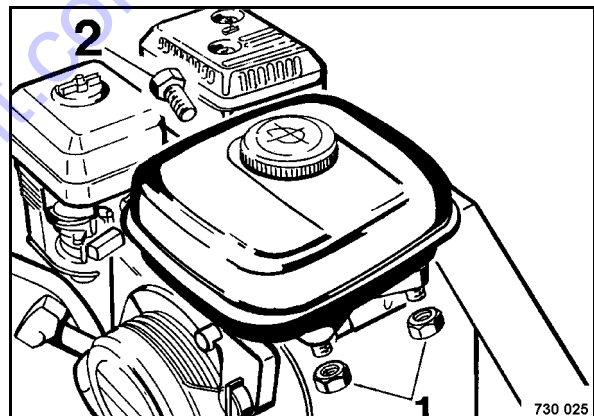


Fig. 55

- Remove the fuel tank.
- For this purpose unscrew hexagon nut (1) (Fig. 55) and hexagon screw (2).

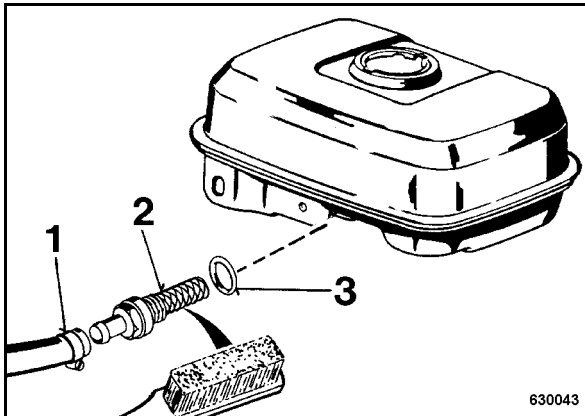


Fig. 56

- Open the hose clamp 1 (Fig. 56), pull off the hose.
- Unscrew fuel screen (2).
- Clean the fuel screen, check the condition of the screen (holes), replace if necessary.

**i Note**

Check seal (3), replace the seal if damaged.  
Turn the fuel screen filter tightly in with the seal.

## 5.19 Change the oil in the vibrator housing

**i Note**

Park the machine on even and level ground.

**Environment**

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

- Clean the area around breather and drain plug.

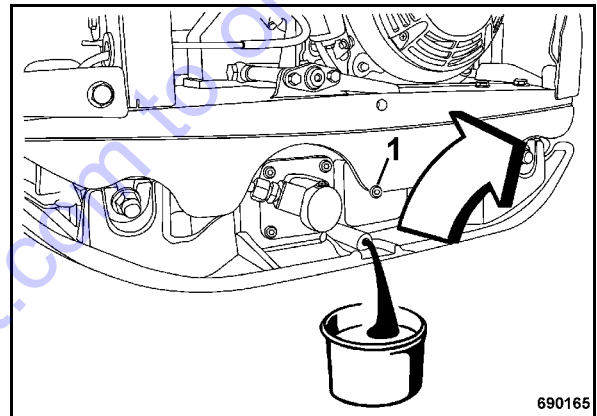


Fig. 57

- Tilt the machine to the side with the oil drain plug and support it safely (Fig. 57).
- Unscrew the bleeding screw (1).
- Unscrew the oil drain plug, let the old oil run out and catch it.
- Turn the oil drain plug back in with a new seal ring.

## Maintenance every year

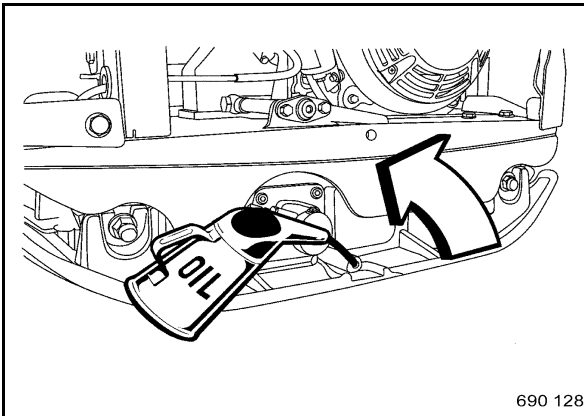


Fig. 58

- Tilt the machine to the opposite side and secure it properly (Fig. 58).
- Fill in oil through the filler and level inspection bore.

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

- Park the machine on level ground.

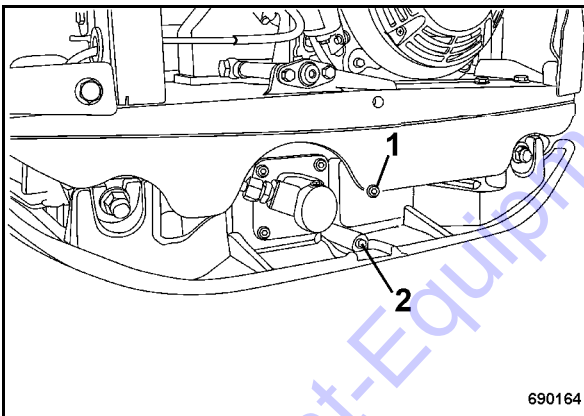


Fig. 59

- Check the oil level.

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

- Clean the oil drain plug (2) (Fig. 59) and screw in with Omnifit FD 10 BOMAG PIN 00970016.
- Screw vent plug (1) tightly back in.

## 5.20 Check the hydraulic oil level

### **Caution**

Park the machine horizontally.

### **Environment**

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

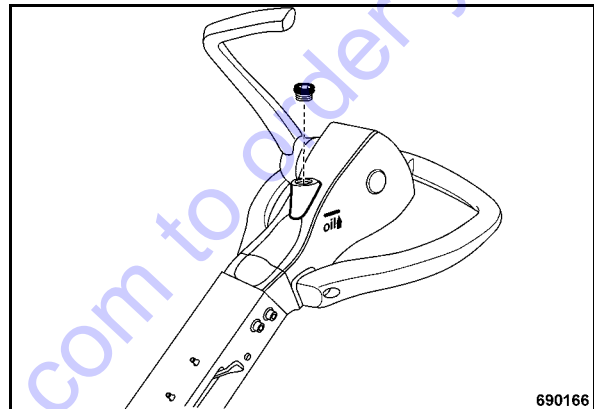


Fig. 60

- Adjust the steering rod with height adjustment (Fig. 60) so that the area with the level inspection plugs is horizontal.
- Unscrew the plug.

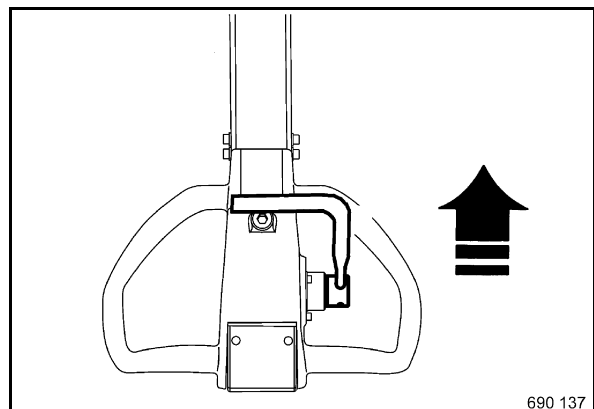


Fig. 61

- Hold the travel lever in forward position (Fig. 61).



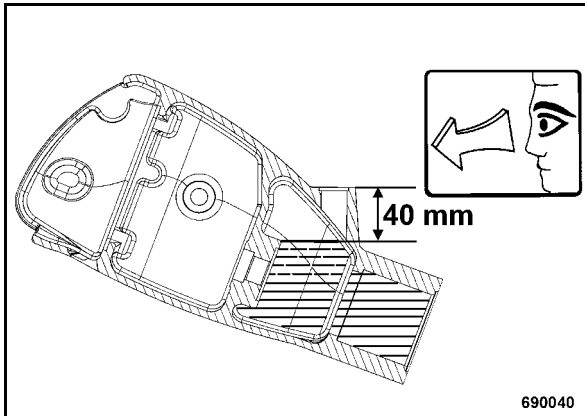


Fig. 62

- Check whether the hydraulic oil level is approx. 40 mm below the filler opening (Fig. 62) (see mark on steering rod head), top up hydraulic oil if necessary.

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

### Filling up hydraulic oil

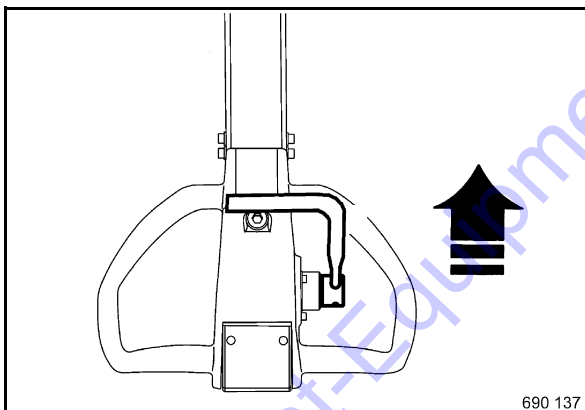


Fig. 63

- Shift the travel lever forward against the stop (Fig. 63).

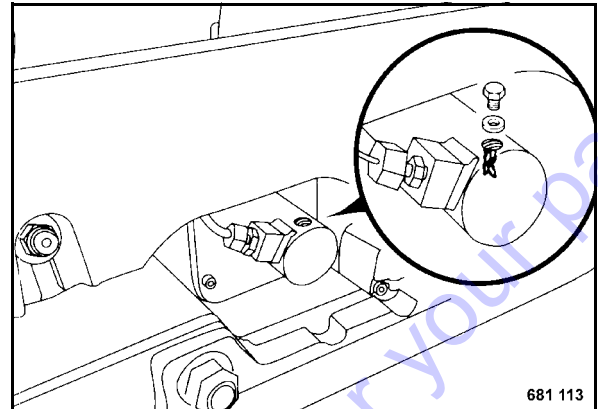


Fig. 64

#### **i** Note

Lay a cloth down before loosening the venting screw.

- Slacken the bleeding screw (Fig. 64).
- Wait until all air has escaped, then tighten the bleeding screw.

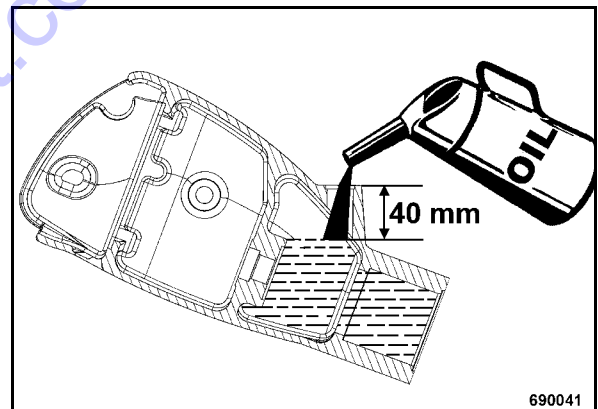


Fig. 65

- Fill in hydraulic oil to approx. 40 mm below the edge of the filler opening (Fig. 65).

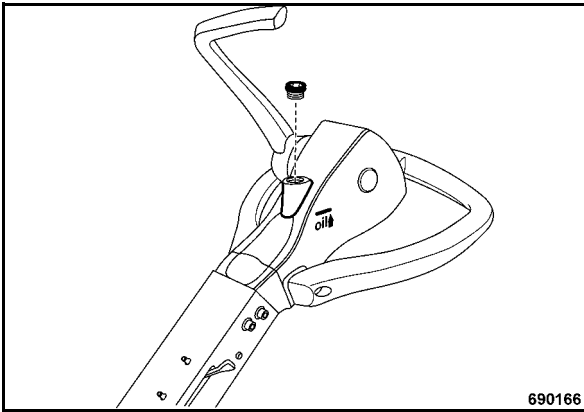


Fig. 66

- Screw in and tighten the plug (Fig. 66).

## 5.21 Check the rubber buffers

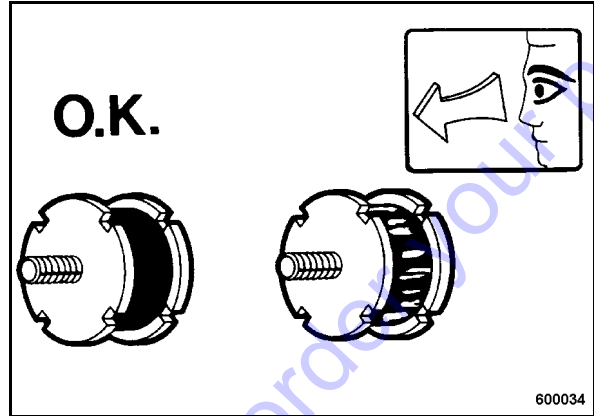


Fig. 67

- Check all rubber buffers (Fig. 67) for tight fit, cracks and damage and replace immediately if damaged.

## 5.22 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.*

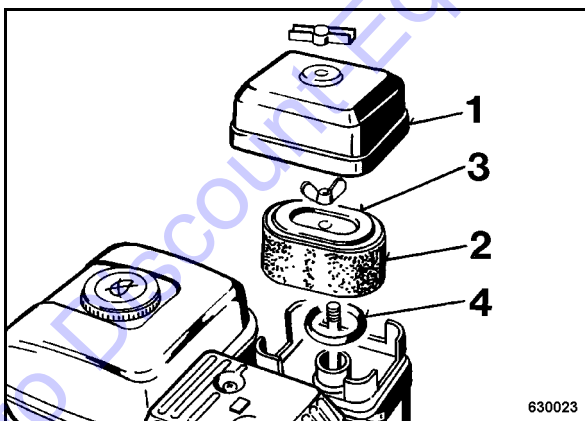


Fig. 68

- Unscrew the wing nut (1) (Fig. 68) and take off the housing cover.
- Clean the housing cover from inside.

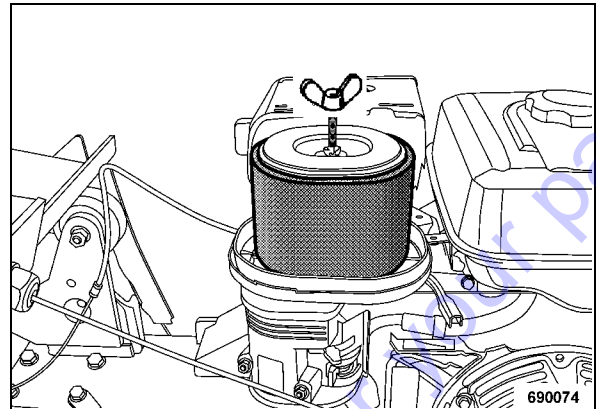


Fig. 69

- Unscrew the wing nut and pull the air filter cartridge out (Fig. 69).

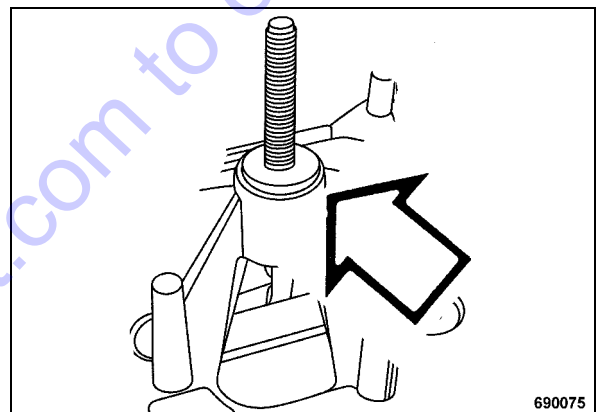


Fig. 70

- Check the rubber seal, replace the rubber seal if damaged (Fig. 70).
- Clean out the air filter housing with a cloth.

### Caution

Contaminants or dirt must not enter into the intake channel.

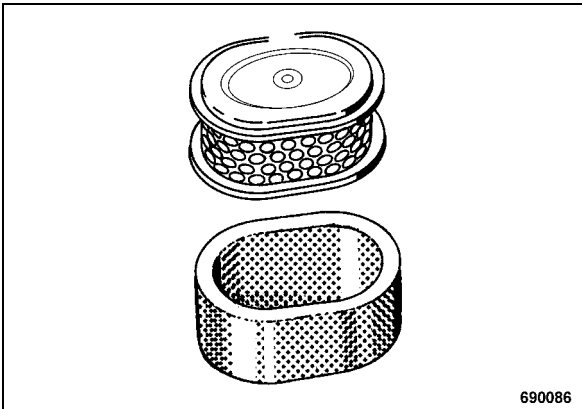


Fig. 71

- Pull the foam rubber insert over the paper element (Fig. 71).
- 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.

## 5.23 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. 72

\*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 MoS<sub>2</sub> lubricants.

## 5.24 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](http://Discount-Equipment.com) to order your parts

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### 6.1 General notes

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**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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