



# BOMAG

FAYAT GROUP

## Operating instructions Maintenance instructions

Original operating instructions

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**BPR 35/60**

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S/N 101 690 45 1916 >



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**Reversible Vibrating 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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## 1 Foreword

**BOMAG manufactures machine for earth, asphalt and refuse compaction, stabilizers/recyclers as well as milling machine and finishers.**

**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.**

This manual comprises:

- Safety regulations
- Operating instructions
- maintenance instructions
- Trouble shooting

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.

These operating and maintenance instructions are part of the machine.

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.**

**For your machine BOMAG offers service kits to make maintenance easier.**

**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

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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!

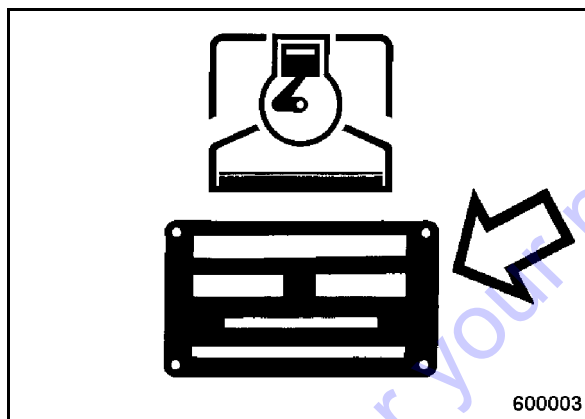


Fig. 1

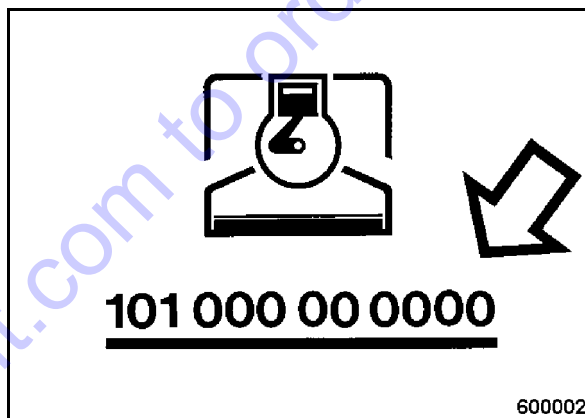


Fig. 2

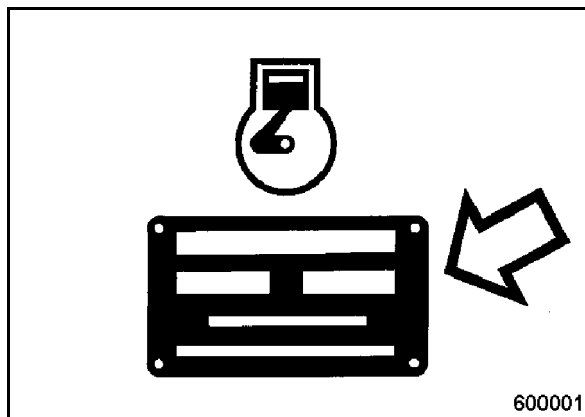


Fig. 3

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## 2 Technical Data

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## Technical Data

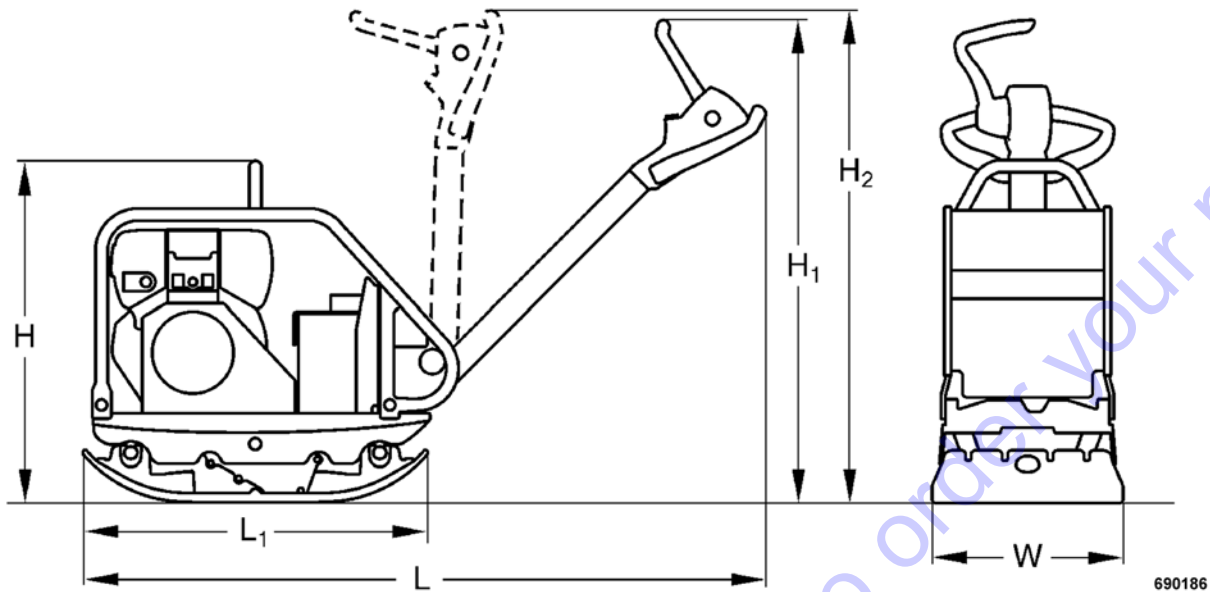


Fig. 4

<b>BPR 35/60</b>	H	H <sub>1</sub>	H <sub>2</sub>	L	L <sub>1</sub>	W
Dimensions in mm	647	800	1220	1510	762	600
Dimensions in inch	25.5	31.5	48.0	59.4	30.0	23.6

### BPR 35/60

#### Weights

Operating weight (CECE)	195 kg	430 lbs
Basic weight	192 kg	423 lbs
Full engine protection cover <sup>1</sup>	+ 18 kg	+ 40 lbs
Transport wheels <sup>1</sup>	+ 5 kg	+ 11 lbs

#### Travel characteristics

Working speed max.	27 m/min	89 ft/min
Max. gradability (depending on soil)	32%	32%

#### Drive

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

**BPR 35/60**

Rated power ISO 9249	3.6 KW	4.8 hp
Rated speed	3600 min <sup>-1</sup>	3600 rpm
Drive system	mechanical	mechanical

**Exciter system**

Frequency	80 Hz	4800 vpm
Centrifugal force	35 kN	7868 lbf

**Filling capacities**

Fuel (gasoline)	3.6 l	1.0 gal us
Engine oil	approx. 0.6 litres	approx. 0.16 gal us

1 Optional equipment

**i Note**

*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:

$L_{pA} = 91$  dB(A), determined acc. to ISO 11204 and EN 500

Guaranteed sound power level:

$L_{WA} = 108$  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

$a_{hv} = 5.9$  m/s<sup>2</sup> on crushed rock determined acc. to ISO 5349 and EN 500

#### **Caution**

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

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### **3 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 operate the machine?

Only trained, instructed and authorized persons of at least 18 years of age are permitted to drive and operate this machine. For operation of the machine the responsibilities must be clearly specified and complied with.

Persons under the influence of alcohol, medicine or drugs are not allowed to operate, service or repair the machine.

Maintenance and repair work requires specific knowledge and must therefore only be performed by trained specialists.

## Changes and conversions to the machine

Unauthorized changes to the machine are prohibited 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 safety.

The manufacturer explicitly excludes any liability for damage caused by 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 the regulations for the protection of the environment.

## Loading/transporting the machine

Make sure that persons are not endangered by the machine tipping or sliding off.

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

Loads must only be attached and hoisted by an expert (capable person).

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.

Do not lift or lower the machine jerkily.

The tension must always be effective in vertical direction.

The machine must not swing about when being lifted.

Do not step or stand under suspended loads.

Always use suitable lashing gear on the lifting points to lash down the machine.

When lashing down the machine disassemble the transport wheels<sup>1</sup> from the base plate.

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

<sup>1</sup> Optional equipment

### 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.

When starting with recoil starter check the starter rope for chafing before starting, replace if necessary. A damaged rope can break and cause injuries during starting.

Use only machines which are serviced at regular intervals.

Do not use starting aid sprays or other inflammable fluids for starting.

#### 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

Operate the machine only with the steering rod folded down.

Guide the machine only by the steering rod.

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

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

Always keep an eye on a running machine.

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.

#### 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.

#### Refuelling

Do not inhale any fuel fumes.

Do not swallow fuel.

Avoid contact with skin and eyes.

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.

A leaking fuel tank can cause an explosion. Ensure tight fit of the fuel tank cover, if necessary replace immediately.

#### Fuel stabilizer

Fuel stabilizer is inflammable. No open fire, do not smoke. Do not spill any fuel stabilizer.

Do not inhale any fuel stabilizer fumes.

Do not swallow fuel stabilizer.

Avoid contact with skin and eyes.

#### Maintenance work

Comply with the maintenance work described in the operating and maintenance instructions, including the information concerning the replacement of parts.

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

Keep unauthorized persons away from the machine.

Do not touch hot engine parts.

Generally perform maintenance work only with the engine shut down and the spark plug socket disconnected.

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**

Do not inhale any fuel fumes.

Do not swallow fuel.

Avoid contact with skin and eyes.

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.



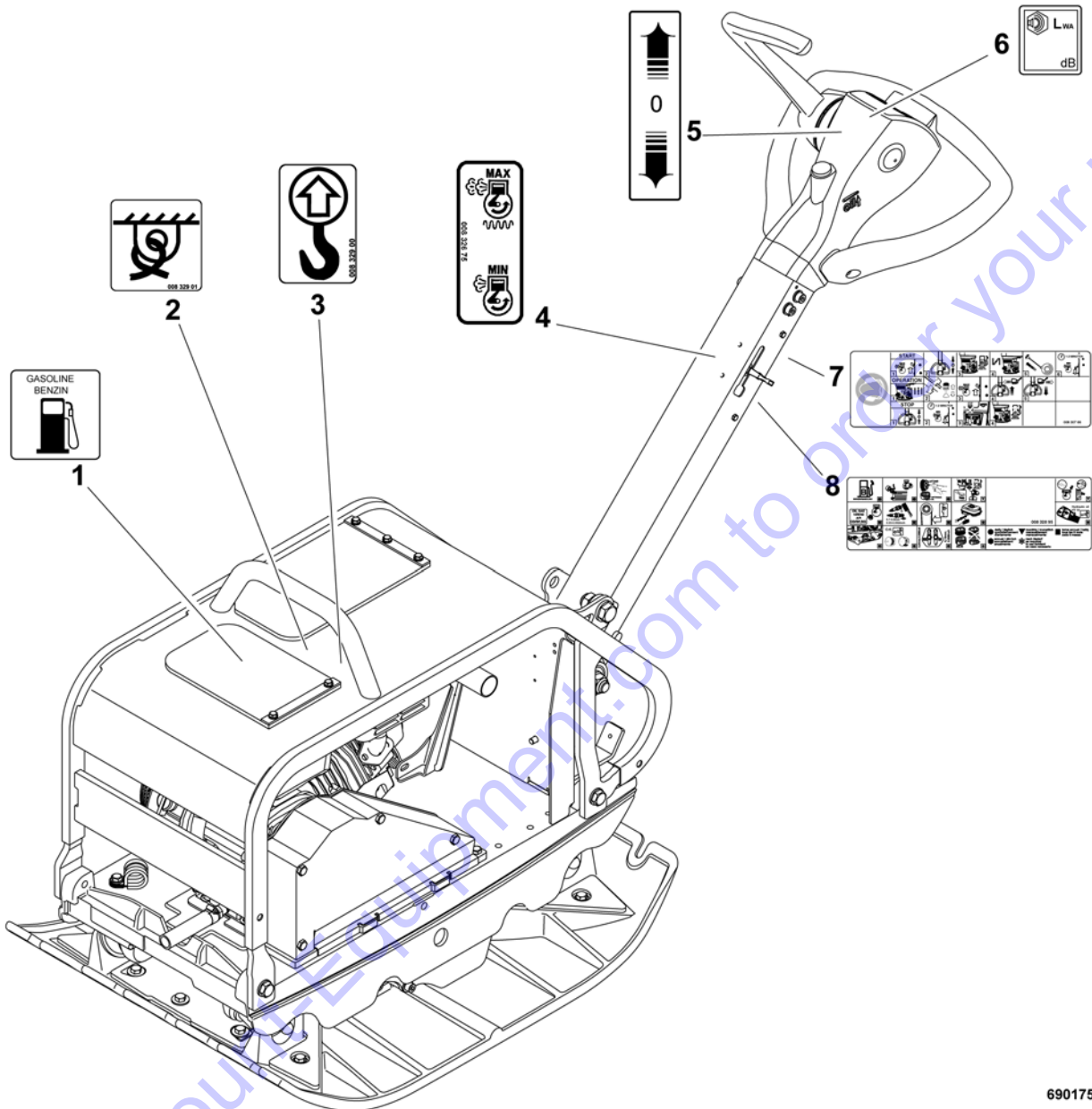


Fig. 5

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**Stickers and decals BPR 35/60**

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

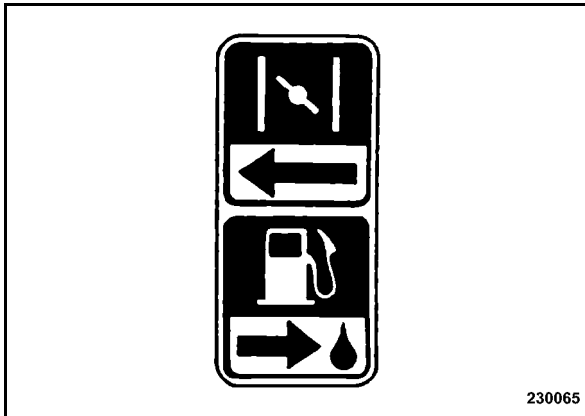


Fig. 6

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

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## 4 Indicators and Controls

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### 4.1 General notes

If you are not yet familiar with the control and display elements on this machine you should read this section thoroughly before starting any operation on the machine. Here all functions are described in detail.

The section "Operation" contains only brief descriptions of the individual control steps.

### 4.2 Description of indicators and control elements

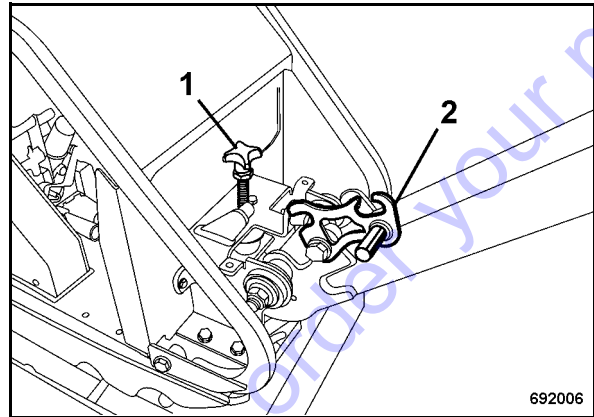


Fig. 7

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

**No. 2 = Locking pawl lever**

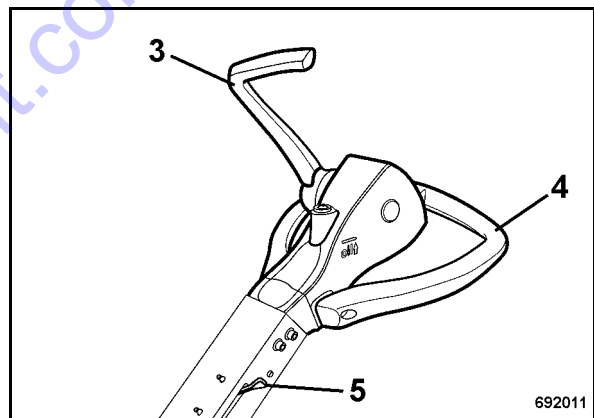


Fig. 8

**No. 3 = Travel lever**

**No. 4 = Handle**

**No. 5 = Throttle lever**

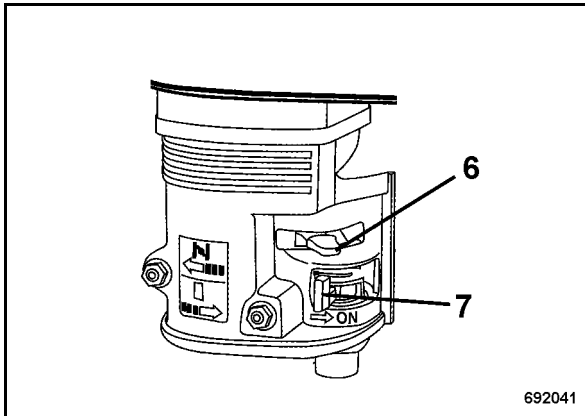


Fig. 9

**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

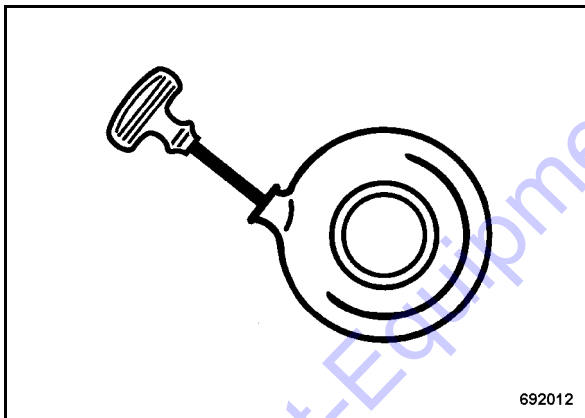


Fig. 10

**No. 8 = Recoil starter**

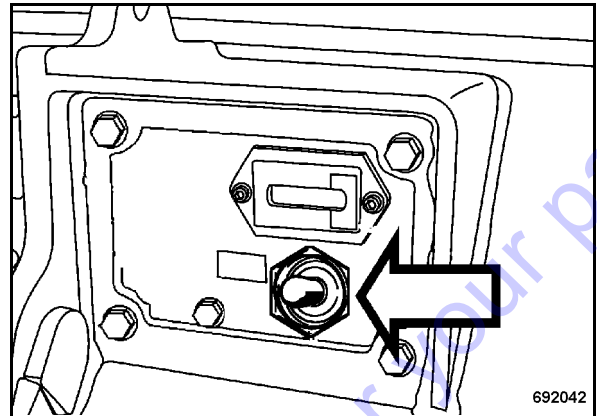


Fig. 11

**No. 9 = Engine stop button**

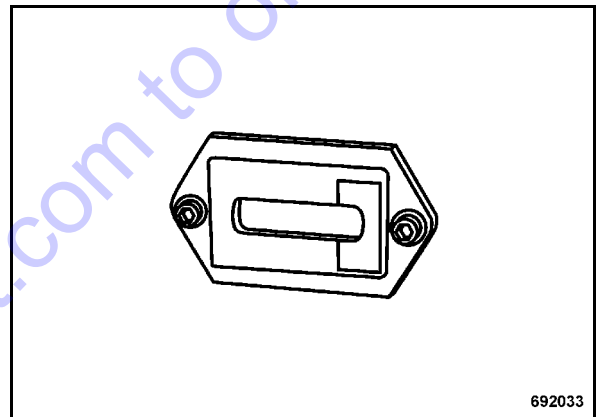


Fig. 12

**No. 10 = Operating hour meter**

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## 5 Operation

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## 5.1 General

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

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

## 5.2 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 the corresponding section 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 connections for tight fit.

### **i Note**

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

- Check the engine oil level, top up if necessary.
- Check the fuel level, top up if necessary.

### 5.3 Folding down the steering rod

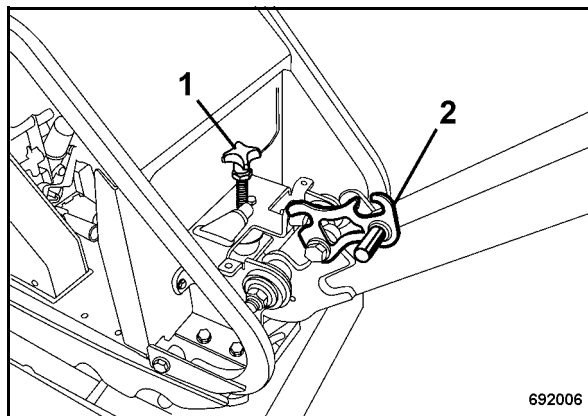


Fig. 13

- Pull the locking pawl lever (2) (Fig. 13) and lower the steering rod, so that it can swing freely.
- Adjust the steering rod with the height adjustment (1) to the height of your body.

### 5.4 Starting the engine

**⚠ Danger**

Exhaust gases are extremely 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.

Before starting check the starter rope for chafing, replace if necessary. A damaged rope can break and cause injuries during starting.

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.

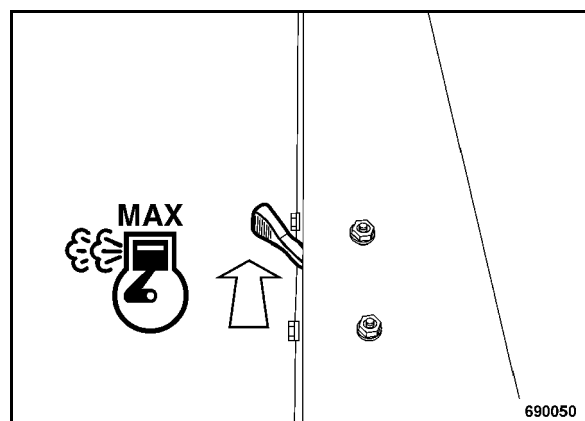


Fig. 14

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



## Operation

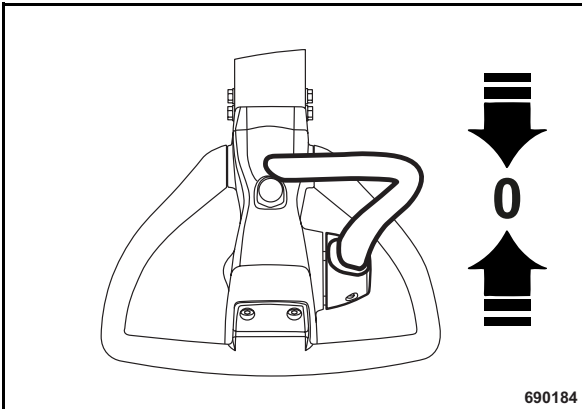


Fig. 15

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

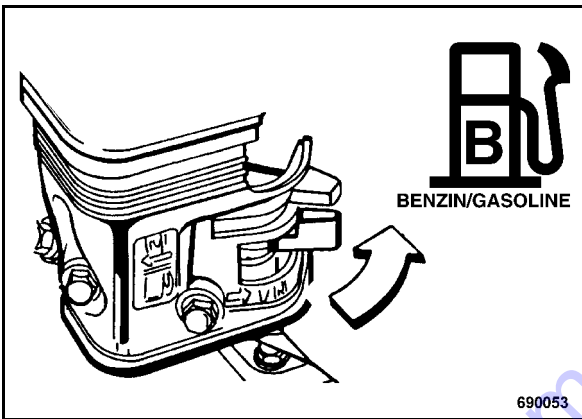


Fig. 16

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

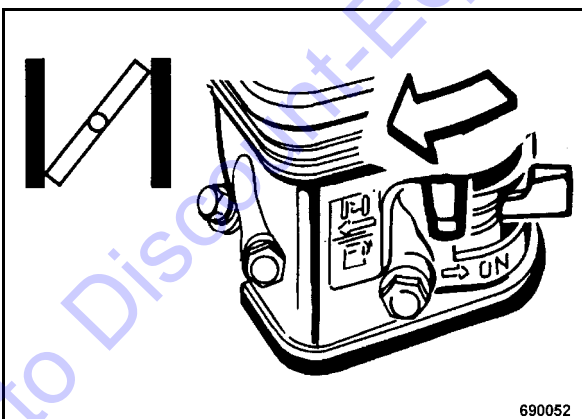


Fig. 17

- 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.

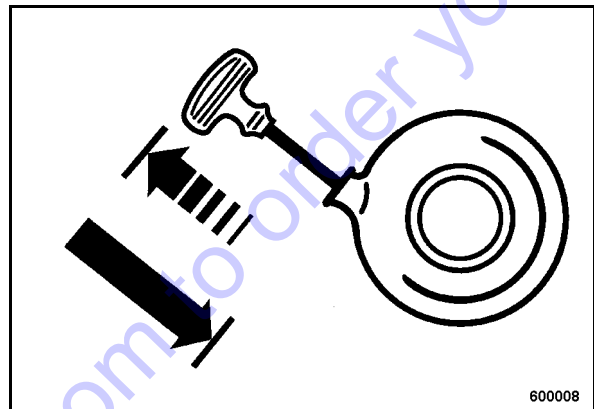


Fig. 18

- Slightly pull the starter handle (Fig. 18), until resistance can be felt (compression pressure), but do not pull out completely.
- Guide the starter handle back to initial position by hand.

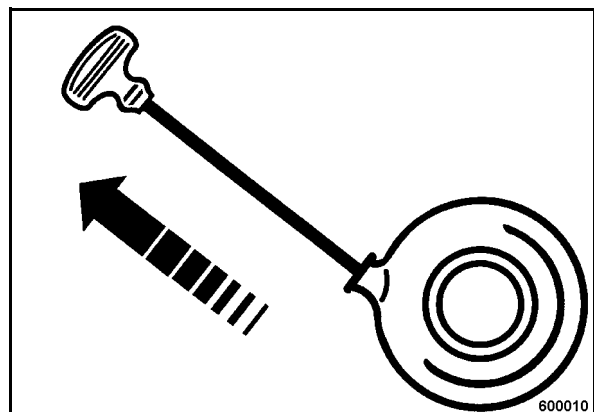


Fig. 19

- Pull the rope by the starter handle quickly and powerful as far out as possible (Fig. 19).

### Caution

Do not let the starter handle hit back, but guide it back.

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

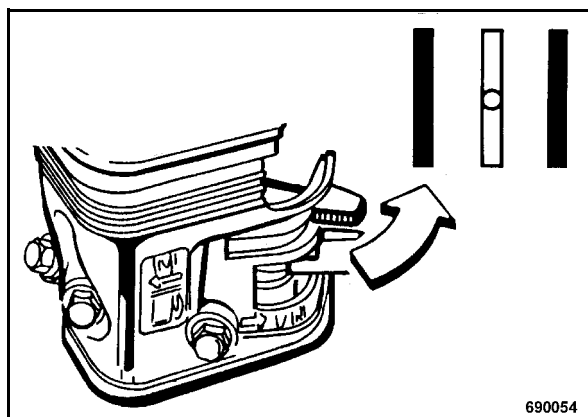


Fig. 20

- As the engine warms up open the lever (Fig. 20) of the choke slowly.



Fig. 21

- Set the throttle lever (Fig. 21) 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.

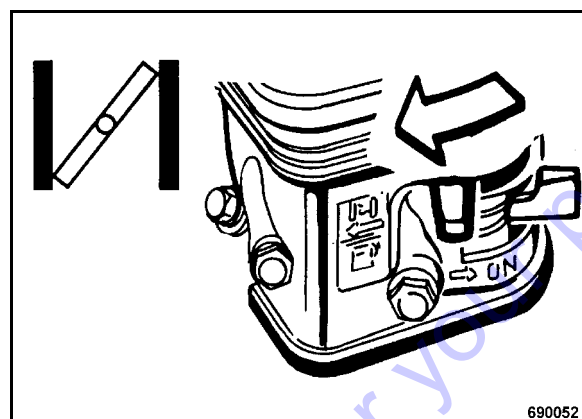


Fig. 22

- If the engine stops again after approx. 3 to 5 seconds, close the choke again with the lever (Fig. 22) 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.

## 5.5 Work/operation

### **⚠ Danger**

**Danger of accident!**

Operate the machine only with the steering rod folded down.

Guide the machine only by the steering rod.

Guide the machine so that your hands do not hit against solid objects.

Always keep an eye on a running machine.

### **⚠ 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.

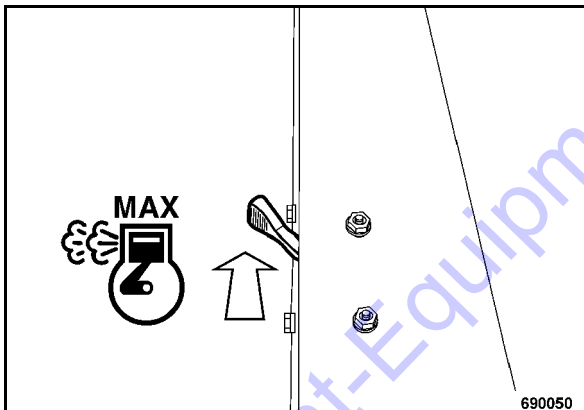


Fig. 23

- Set the throttle lever (Fig. 23) to position "MAX".

## Drive forward

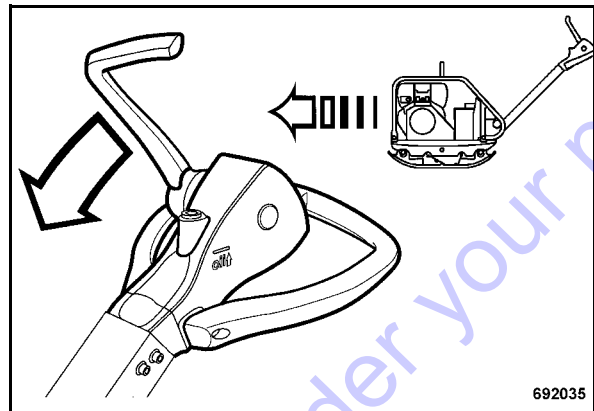


Fig. 24

- Push the travel lever (Fig. 24) 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

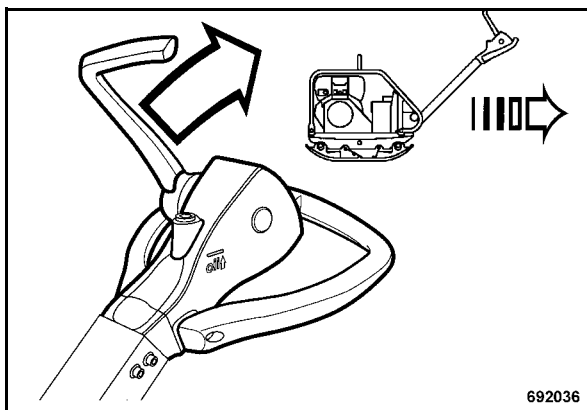


Fig. 25

- Pull the travel lever (Fig. 25) 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

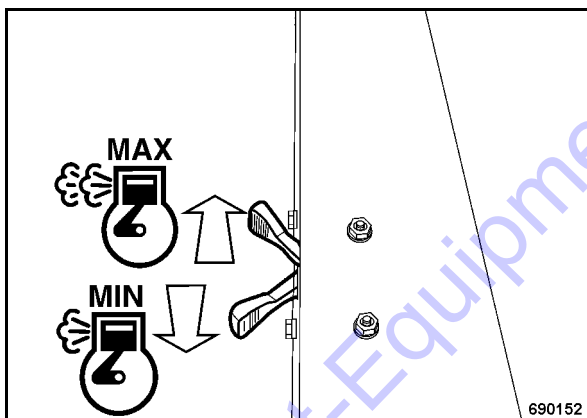


Fig. 26

- Keep shifting the throttle lever (Fig. 26) 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.

## 5.6 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.

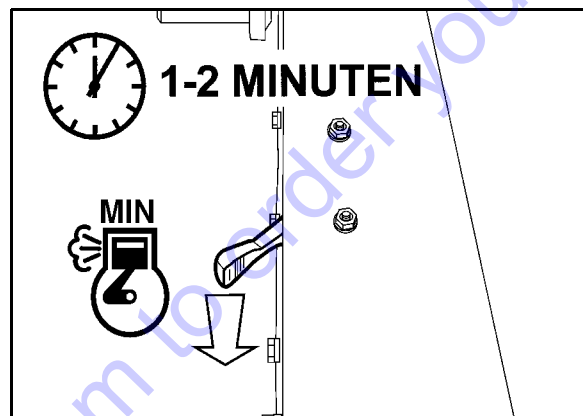


Fig. 27

- Shift the throttle lever (Fig. 27) to position "MIN" and let the engine run with idle speed for a short while.

Vibration is shut down.

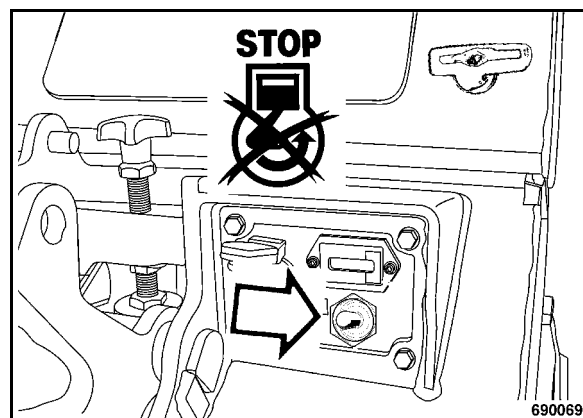


Fig. 28

- Press the engine stop button (Fig. 28), the engine will stop.

### i Note

If the engine stop button is not pressed long enough, the engine will accelerate again.

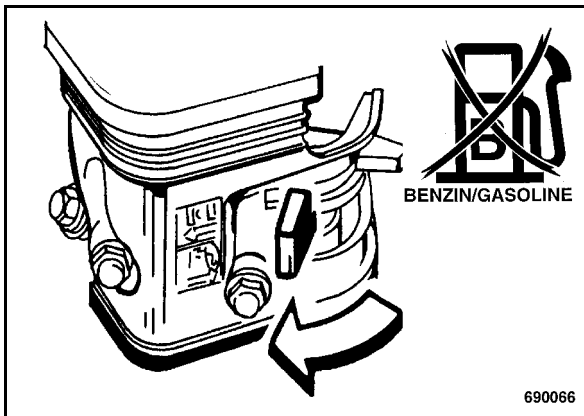


Fig. 29

- Close the fuel tap (Fig. 29) by turning in direction of arrow.

## 5.7 Assembling the transport wheels<sup>1</sup>

### **⚠ Danger**

**Danger of injury!**

**By the machine tipping over when assembling or disassembling the transport wheels**

### **⚠ Caution**

**Shut down the engine.**

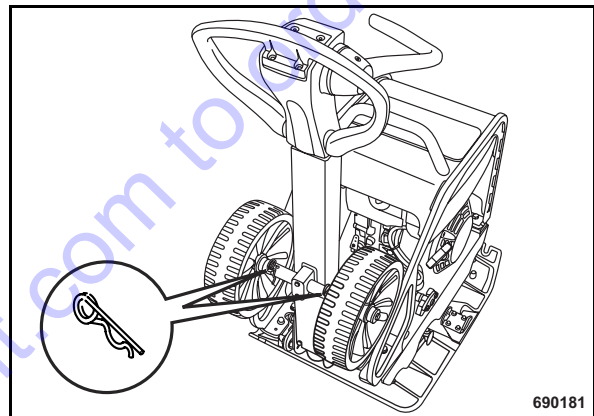


Fig. 30

- Adjust the steering rod upright and lock it. Engage the locking pawl lever securely.
- Remove the spring cotter (Fig. 30) and pull the transport wheels out of the bracket on the steering rod.

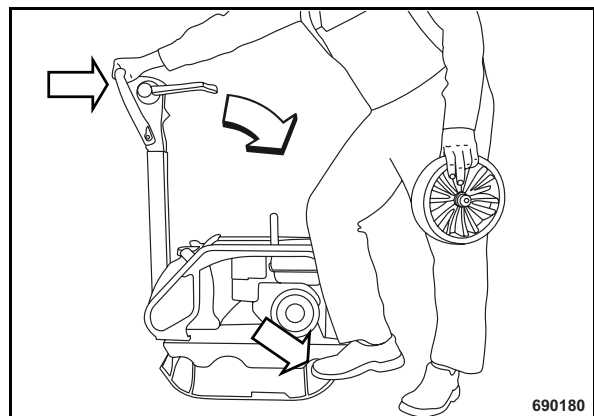


Fig. 31

- Stand at the side of the machine.

<sup>1</sup> Optional equipment

- Tilt the machine forward by the steering rod (Fig. 31).

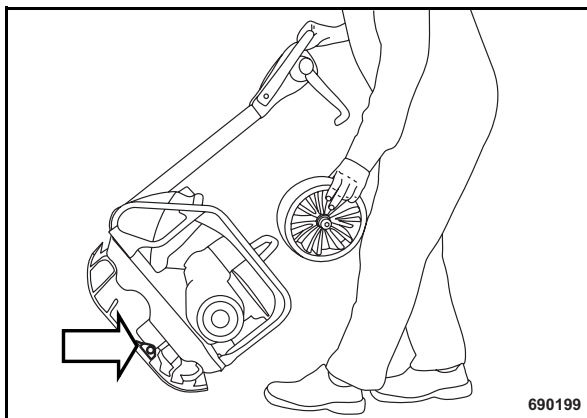


Fig. 32

- Insert the transport wheel into the bracket (Fig. 32) on the base plate.

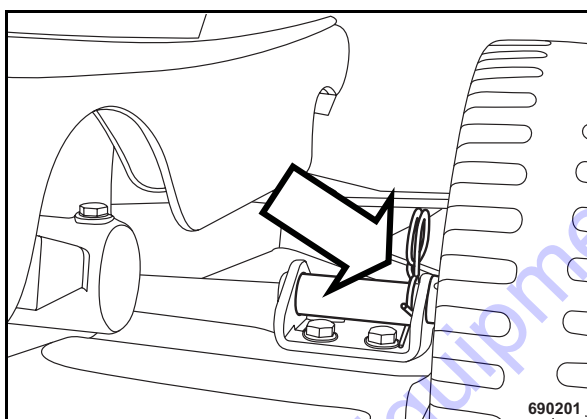


Fig. 33

- In the bracket secure the transport wheel with the spring cotter (Fig. 33).
- Insert the second wheel into the bracket on the opposite side of the base plate and secure it with the spring cotter.

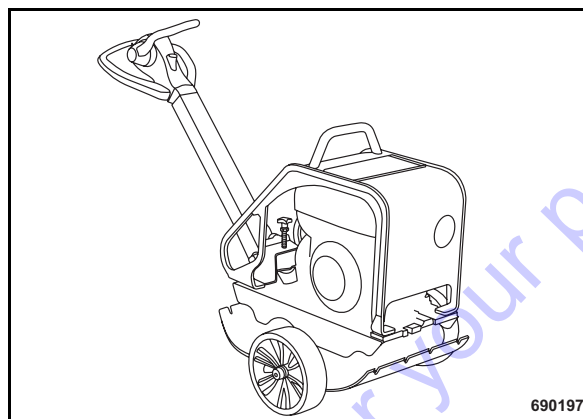


Fig. 34

- Unlock the steering rod and fold it down (Fig. 34).
- Lock the steering rod in working position. Engage the locking pawl lever securely.

The machine can now be moved.

## 5.8 Loading/transport

### ⚠ Danger

**Danger of accident! Life hazard!**

Make sure that persons are not endangered by the machine tipping or sliding off.

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

Loads must only be attached and hoisted by an expert (capable person).

For lifting the machine attach the lifting gear only to the lifting eye provided for this purpose.

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

Do not lift or lower the machine jerkily.

The tension must always be effective in vertical direction.

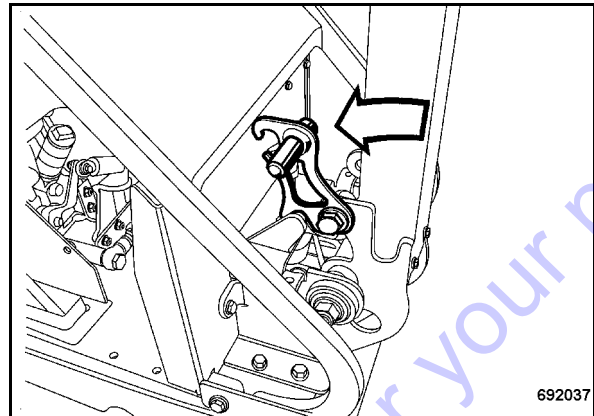
The machine must not swing about when being lifted.

Do not step or stand under suspended loads.

Always use suitable lashing gear on the lifting points to lash down the machine.

When lashing down the machine disassemble the transport wheels<sup>1</sup> from the base plate.

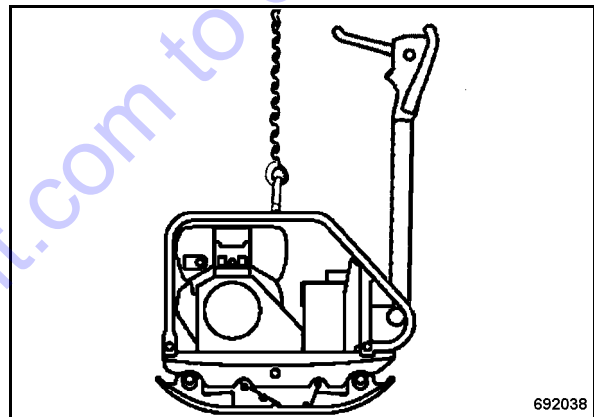
Lash the machine down, so that it is secured against rolling, sliding and turning over.



692037

Fig. 35

- Adjust the steering rod upright and engage the locking lever (Fig. 35).



692038

Fig. 36

- Always attach the lifting tackle to the lifting eye to load the vibratory plate (Fig. 36) on a transport vehicle.
- Lash the vibratory plate down to the transport vehicle, so that it is secured against rolling, sliding and turning over. Fasten the lashing tackle at the marked lashing points.

<sup>1</sup> Optional equipment

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## 6 Maintenance

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



### 6.1 General notes on maintenance

When performing maintenance work ensure strict compliance with the respective safety instructions and particularly the safety regulations mentioned in the corresponding section 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.
- Do not touch hot engine parts.
- Generally perform maintenance work only with the engine shut down and the spark plug socket disconnected.

#### 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.**

**Keep used filters in a separate waste container and dispose of environmentally.**

#### Notes on the fuel system

The lifetime of the engine mainly depends on the purity of the fuel.

- Keep fuel clean of any contamination and water.
- When choosing the storage place for fuel make sure that spilled fuel will not harm the environment.

Fresh fuel should not be stored for longer than 3 months, if no fuel stabilizer has been added.

When storing for longer than 3 months:

- Directly after buying fresh fuel add the correct amount of fuel stabilizer to the fuel (follow the instructions of the manufacturer).

#### 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 our customer service 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 our customer service department.

## 6.2 Fuels and lubricants

### Engine oil

#### Oil viscosity

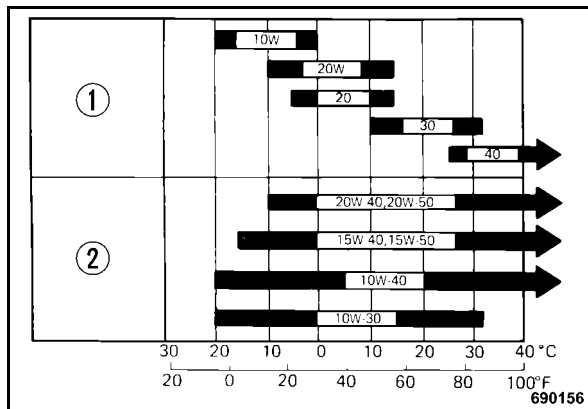


Fig. 37

Choose the oil viscosity in dependence on the ambient temperature at the operating location of the engine (see diagram).

Occasional falling short of the temperature limit (e.g. use of SAE 15W-40 down to  $-15^{\circ}\text{C}$  ( $+5^{\circ}\text{F}$ )) may effect 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/SG or higher.

#### Lubrication oil change intervals

6 months or 100 operating hours

#### **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: one contains ethanol and the other one 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.

#### Fuel stabilizer

If the machine is only occasionally used (i.e. if it is out of use for longer than 4 weeks), mix in the correct amount of fuel stabilizer (BOMSAG 009 940 20) directly after you have purchased fresh fuel (follow the instructions of the manufacturer).

The fuel stabilizer has a limited shelf life. The effect diminishes over the course of time (store for max. 2 years after opening the bottle).

Fuel cannot be regenerated by using fuel stabilizer.

#### 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  $40^{\circ}\text{C}$  ( $104^{\circ}\text{F}$ ).

For topping up or for oil changes use only high-quality hydraulic oil, type HVLP according to DIN 51524, part 3, or hydraulic oils type HV according to ISO 6743/3. The viscosity index (VI) should be at least 150 (observe information of manufacturer).

### 6.3 Table of fuels and lubricants

Assembly	Fuel or lubricant		Quantity approx. <b>Attention!</b> Observe the level marks
	Summer	Winter	
Motor - Engine oil	Engine oil API SF or SG  SAE 10W-30 (-20 °C to +30 °C) (-4 °F to +86 °F) SAE 10W-40 (-20 °C to +40 °C) (-4 °F to +104 °F) SAE 15W-40 (-15 °C to +40 °C) (+5 °F to +104 °F)		0.6 l (0.16 USgal) to oil level mark
	SAE 30 (+10 °C to +30 °C) (+50 °F to +86 °F)	SAE 10W (-20 °C to 0 °C) (-4 °F to +32 °F)	
	SAE 40 (+25 °C to +45 °C) (+77 °F to +113 °F)	SAE 20W (-10 °C to +10 °C) (+14 °F to +50 °F)	
- Fuel	Gasoline (unleaded)		3.6 l (1.0 USgal)
Vibrator shaft housing	as engine oil		0.4 l (0.11 USgal)
Steering rod	Hydraulic oil: HV 32		0.4 l (0.11 USgal)

## 6.4 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.

## 6.5 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
6.6	Clean the machine		X					
6.7	Check the engine oil level	Dipstick mark	X					
6.8	Check the fuel level		X					
6.9	Check, clean the air filter, replace if necessary	in case of extreme dust check every day replace at least 1 x year		X				
6.10	Clean the cooling fins and the cooling air intake openings				X			
6.11	Change the engine oil	at least every 100 operating hours				X		
6.12	Check, clean the spark plug, replace if necessary					X		
6.13	Clean the slurry filter					X		
6.14	Check the oil level in the exciter housing					X		
6.15	Check the V-belt tension, if necessary replace the V-belt					X		
6.16	Check, adjust the valve clearance	at least every 300 operating hours Intake valve: 0.15 mm (0.006 in) Exhaust: 0.20 mm (0.008 in)					X	
6.17	Clean the fuel screen						X	
6.18	Replace the starter rope						X	
6.19	Change the oil in the exciter shaft housing	at least every 500 operating hours					X	
6.20	Check the hydraulic oil level						X	
6.21	Check the rubber buffers						X	
6.22	Tighten all bolted connections							X

No.	Maintenance work	Comment	daily	weekly	monthly	half-annually	annually	as required
6.23	Engine conservation							X

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## 6.6 Cleaning the machine

### ⚠ Caution

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

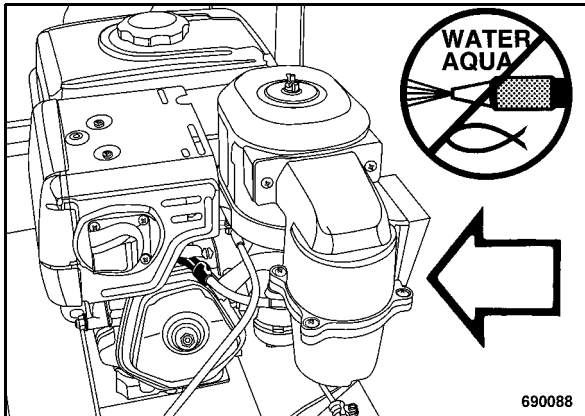


Fig. 38

### ⚠ Caution

Do not guide the water jet directly into the dry air filter intake opening (Fig. 38) and into the opening for the cyclone. Cover the electric equipment against the direct water jet.

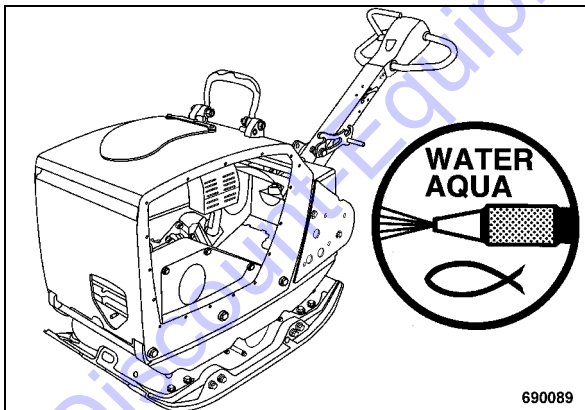


Fig. 39

- Use cold cleansing agent if the engine is soiled with oil and wash it off with a steam cleaner after a sufficient soaking time (Fig. 39).
- After wet cleaning run the engine warm to evaporate all water residues and to avoid corrosion.

## 6.7 Check the engine oil level

### ⚠ Caution

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

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

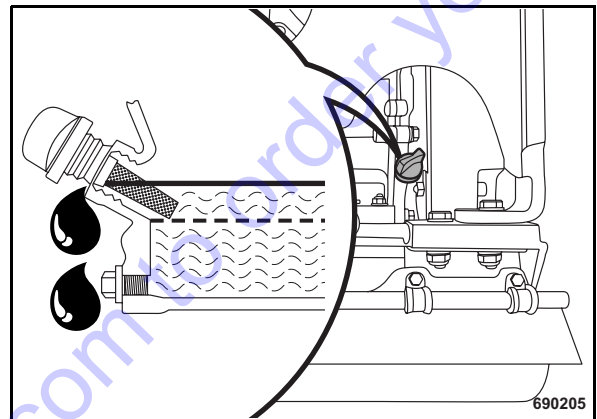


Fig. 40

- Shut down the engine.
- Pull out the dipstick (Fig. 40) 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.

## 6.8 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.

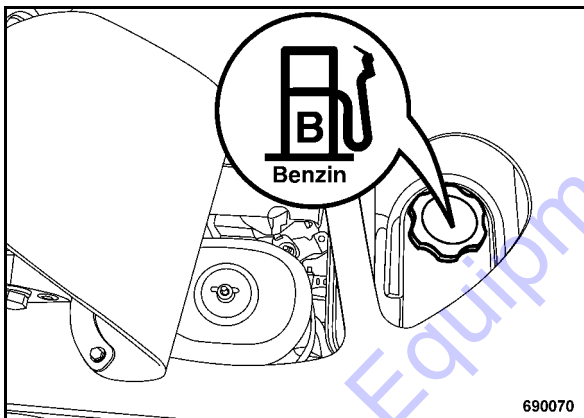


Fig. 41

- Clean the area around the filler cover, unscrew the filler cover (Fig. 41).

### **⚠ 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".



## 6.9 Check, clean the air filter, replace if necessary

### ⚠ Caution

Do not run the engine without air filter.

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

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

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

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

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

Incorrectly handled air filters 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.

### i Note

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

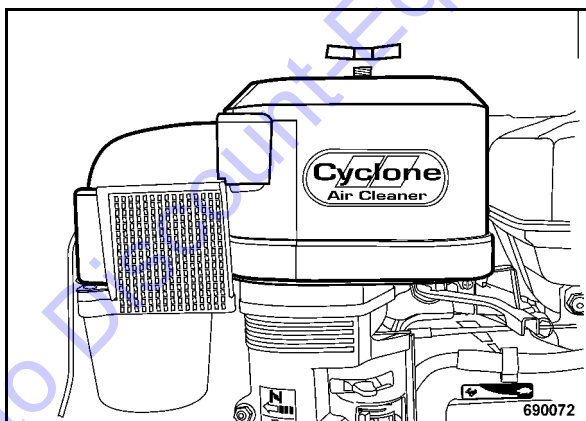


Fig. 42

- Unscrew the wing nut and remove the air filter cover (Fig. 42).
- Clean the air filter cover from inside.

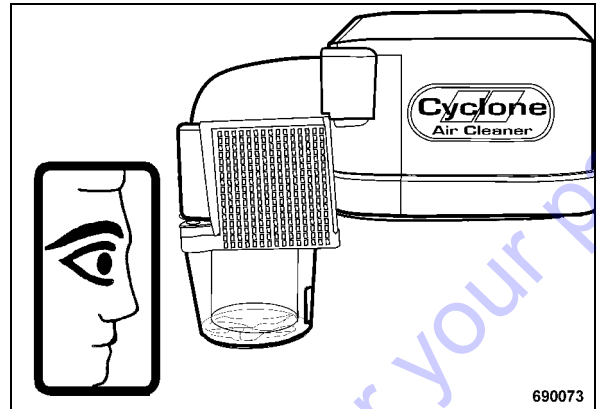


Fig. 43

- Check the cyclone on the air filter cover for dirt or blockage, remove and clean if necessary (Fig. 43).
- Thoroughly clean the parts after cleaning.

### ⚠ Caution

When reassembling the cyclone the screen filter must be fitted into the groove in the housing cover.

Install the air guidance in the correct direction.

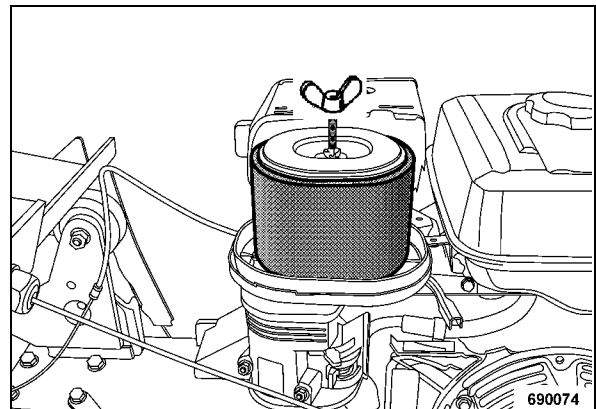


Fig. 44

- Unscrew the wing nut and remove the air filter (Fig. 44).

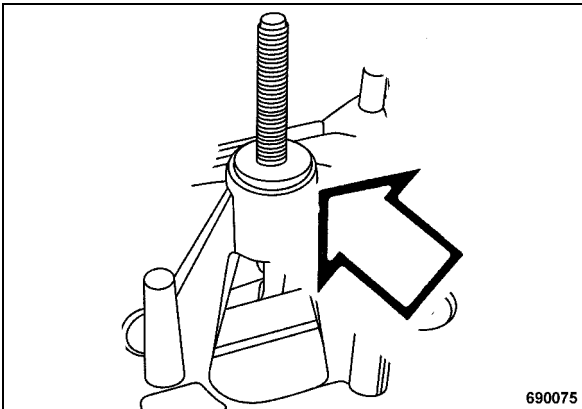


Fig. 45

- Check the rubber seal (Fig. 45), replace the rubber seal if it is damaged.
- Clean out the air filter housing with a cloth.

**⚠ Caution**

**Contaminants or dirt must not enter into the intake channel.**

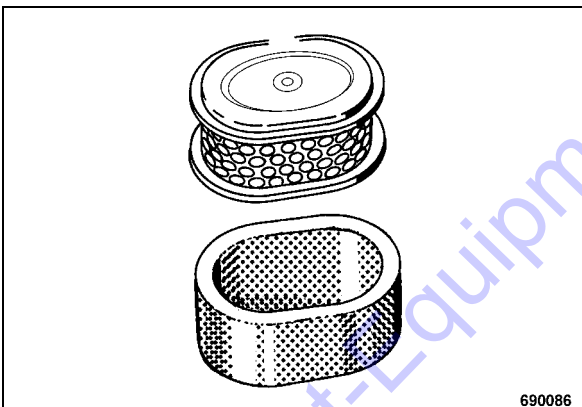


Fig. 46

- Separate the foam rubber and the paper element of the air filter (Fig. 46).
- Check both elements carefully for signs of damage, replace damaged elements.

**⚠ Danger**

**Danger of injury!**

**Always wear protective clothes (goggles, gloves) when working with compressed air.**

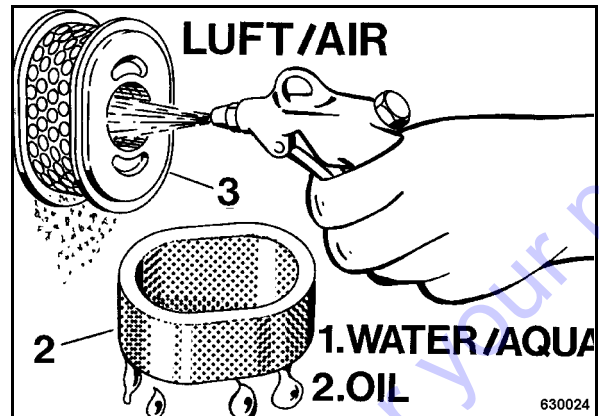


Fig. 47

- Blow the paper element (3) (Fig. 47) carefully out from inside to outside with dry, clean compressed air (do not exceed 29bar). In case of excessive contamination 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 and press excessive oil out.
- Pull the foam rubber insert over the paper element .
- 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 air filter cover with the wing nut.

## 6.10 Clean the cooling fins and the cooling air intake openings

**⚠ Danger**

**Danger of injury!**

Always wear protective clothes (goggles, gloves) when working with compressed air.

**⚠ 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.

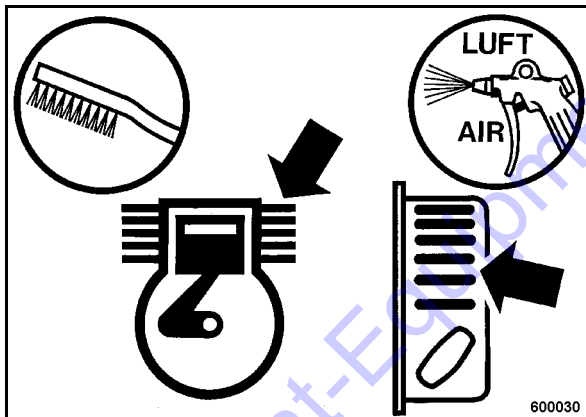


Fig. 48

- Loosen dried on dirt with a suitable brush (Fig. 48) 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 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 our customer service.

## 6.11 Change the engine oil

### **⚠ Danger**

**Danger of scalding!**

**When draining off hot oil.**

### **⚠ Caution**

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

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

### **🌱 Environment**

**Catch running out oil and dispose of environmentally.**

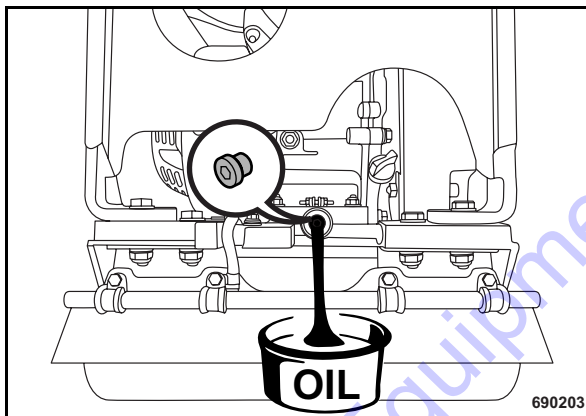


Fig. 49

- Clean the drain hose from dust and dirt.
- Unscrew the oil drain plug and catch any oil running out (Fig. 49).
- Clean the oil drain plug and screw it back in (tightening torque: 15 Nm (11 ft.lbs)).

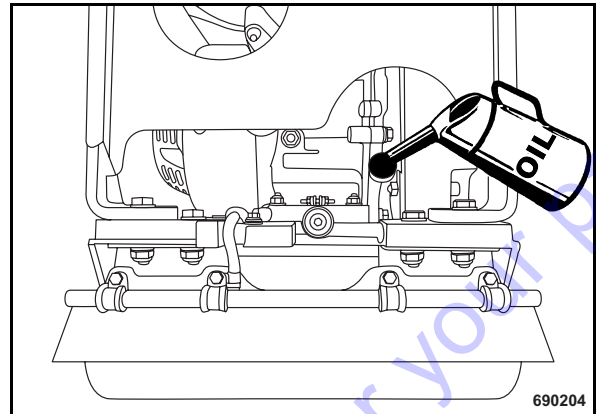


Fig. 50

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

- Fill in fresh engine oil through the filler opening (Fig. 50).
- Screw the oil dipstick back in.
- Perform a test and check the oil level, correct if necessary.
- Check the drain plug for leak tightness.

## 6.12 Check, clean the spark plug, replace if necessary

### **⚠ Danger**

**Danger of burning!**

Let the engine cool down before unscrewing the spark plug.

### **⚠ Caution**

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

Do not use spark plugs with incorrect heat value. An incorrect spark plug can cause damage to the engine.

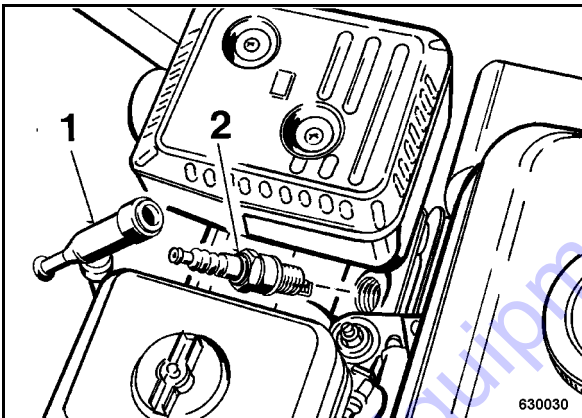


Fig. 51

- Pull off the spark plug socket (1) (Fig. 51) and unscrew the spark plug (2).

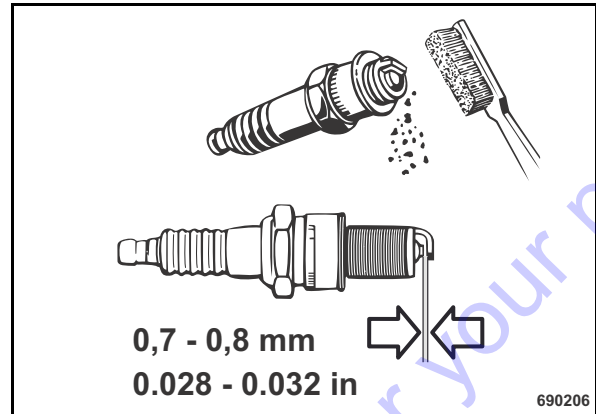


Fig. 52

- Check the spark plug (Fig. 52) visually and clean it if necessary.
- Check the electrode gap with a feeler gauge, if necessary adjust the gap to 0.7 - 0.8 mm (0.028 - 0.032 in).
- Turn the spark plug carefully in by hand.
- Once the sealing surface of the new spark plug is in contact tighten for another 1/2 turn with the spark plug spanner.
- Once the sealing surface of the used spark plug is in contact tighten for another 1/8 to 1/4 turn with the spark plug spanner.

### **⚠ Caution**

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

### 6.13 Clean the slurry filter

**⚠ Danger**

**Fire hazard!**

Gasoline is easily inflammable, do not spill.  
When working on the fuel system do not use open fire, do not smoke.

**⚠ Danger**

**Health hazard!**

Do not inhale any fuel fumes.

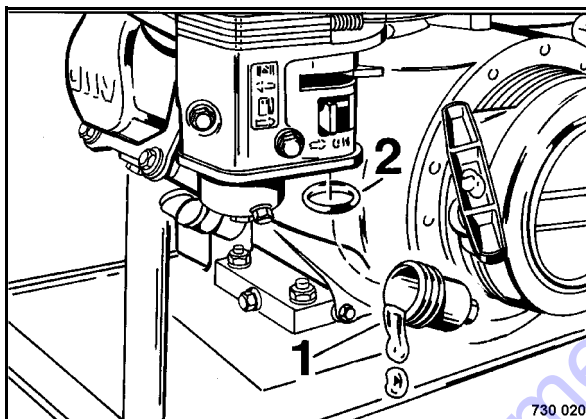


Fig. 53

- With the fuel tap closed unscrew the fuel sludge filter (1) (Fig. 53) and wash out in fuel.
- Check the O-ring (2) for damage, replace if necessary.
- Turn the fuel sludge filter in tightly and mind the O-ring.

### 6.14 Check the oil level in the exciter housing

**⚠ Caution**

Park the machine on level ground.

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

- Clean the area around breather and drain plug.

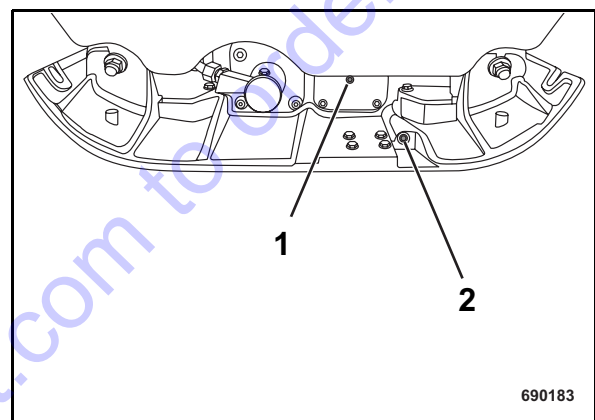


Fig. 54

- Unscrew the bleeding screw (1) (Fig. 54).
- Unscrew the oil drain plug (2) and check the oil level.

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

- If the oil level is too low top up oil immediately.
- Clean oil drain and bleeding screw and assemble both screws with sealing compound (e.g. BOMAG part-no. 00970016).

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

### Checking the V-belt

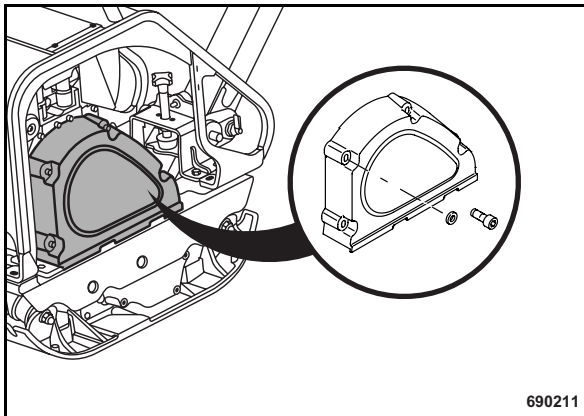


Fig. 55

- Remove the V-belt guard (Fig. 55).

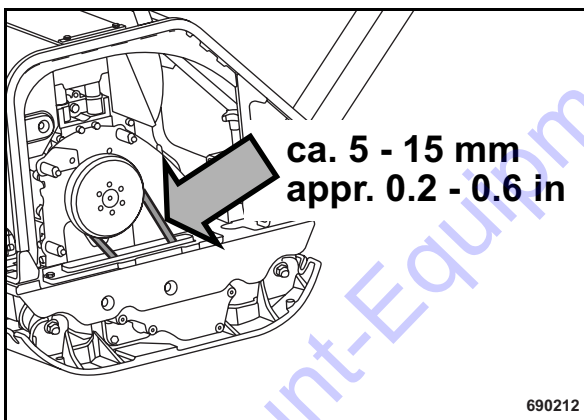


Fig. 56

- Check condition and tightness of V-belt (Fig. 56).

#### **i** Note

Compression measurement approx. 5 - 15 mm (02 - 06 in)

#### **⚠** Caution

Replace a damaged V-belt.

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

### Replacing the V-belt

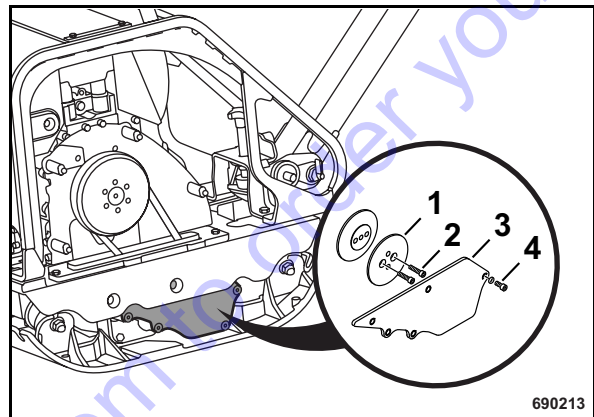


Fig. 57

- Remove the safety cover (3) (Fig. 57).
- Loosen screw (2).
- Remove the front disc (1) from the centrifugal clutch.
- Take off the V-belt and replace it by a new one.
- Attach the front disc (1).
- Tighten the screws (2) (tightening torque: 35 Nm (26 ft.lbs)).
- Reinstall the protective cover (3) and tighten the screws (4) (tightening torque 15 Nm (11 ft.lbs)).
- Install the top V-belt guard (Fig. 55).

## 6.16 Check, adjust the valve clearance

### ⚠ Caution

We recommend to have this work carried out by trained personnel or our after sales service.

Check and adjust only when the engine is cold (approx. 20 °C (68 °F)).

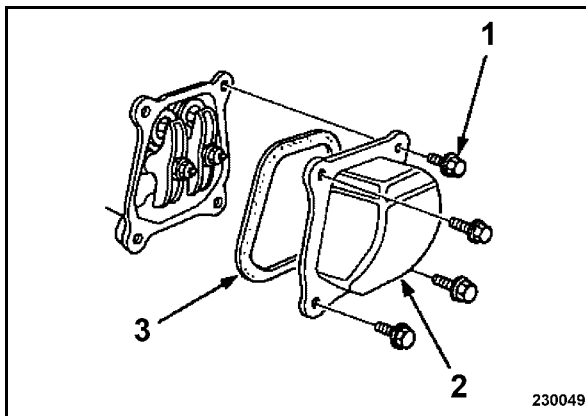


Fig. 58

- Loosen the screws (1) (Fig. 58) and take off the valve cover (2) with gasket (3).

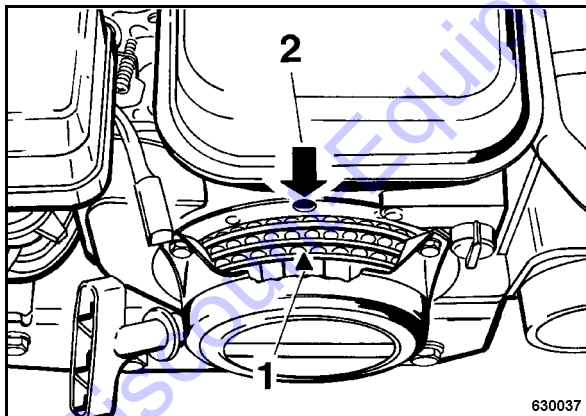


Fig. 59

- Set the piston to top dead centre position of the compression stroke.
- For this purpose align the alignment mark (1) (Fig. 59) on the starter disc to the top bore (2).

### Check the valve clearance

Valve clearance:

Intake valve = 0.15 mm (0.006 in)

Exhaust valve = 0.20 mm (0.008 in)

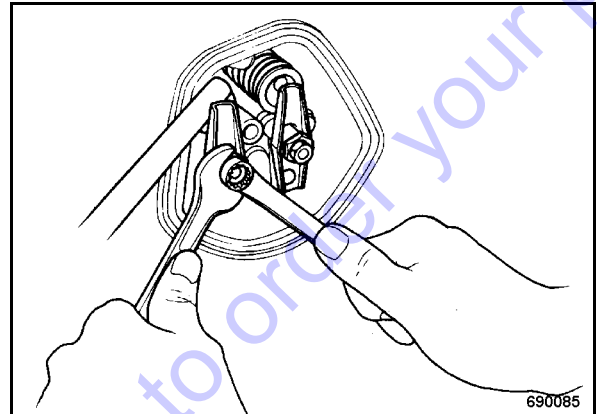


Fig. 60

- Check the valve clearance with a feeler gauge on both valves (Fig. 60).

### Adjust the valve clearance

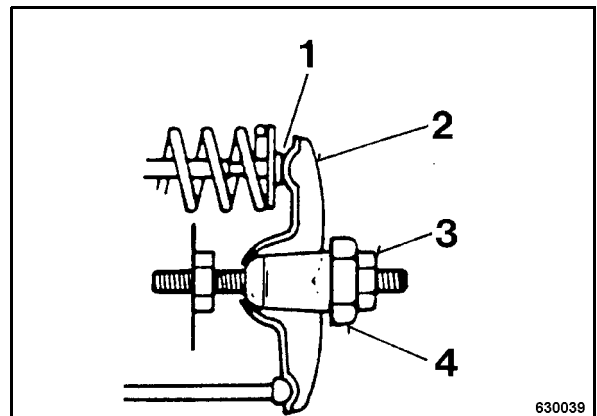


Fig. 61

- Hold hexagon nut (4) (Fig. 61) on the rocker lever and loosen counter nut (3).
- Adjust hexagon nut on the rocker arm so that the feeler gauge fits between rocker arm (2) and valve shaft (1) with noticeable resistance after retightening counter nut.
- Install the valve cover with a new gasket and tighten the screws evenly.



## 6.17 Cleaning the fuel screen

### **⚠ Danger**

**Fire hazard! Danger of burning!**

Gasoline is easily inflammable, do not spill.

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

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

### **⚠ Danger**

**Health hazard!**

Do not inhale any fuel fumes.

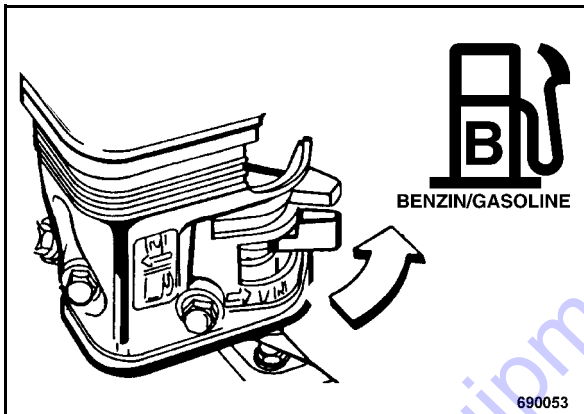


Fig. 62

- Open the fuel tap (Fig. 62) by turning in direction of arrow.

### **♻ Environment**

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

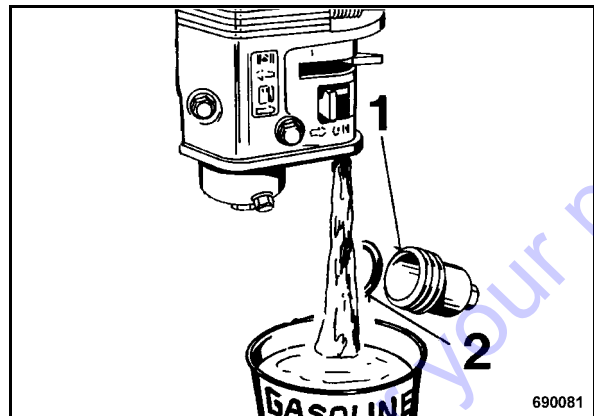


Fig. 63

- Unscrew the sediment filter (1) (Fig. 63), drain off and catch all fuel.
- Check the seal (2) for damage, change if necessary.
- Screw the sediment filter with sealing ring in tightly.

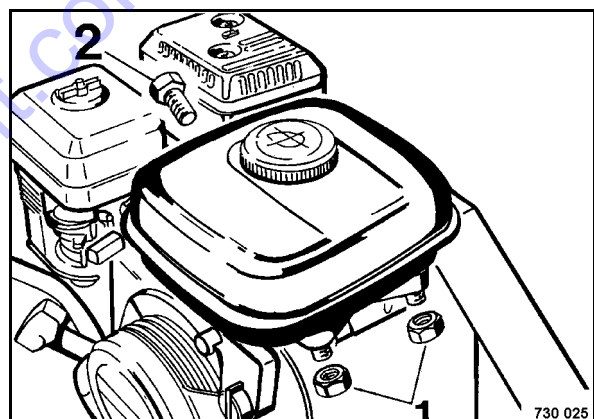


Fig. 64

- Unscrew the hexagon nut (1) (Fig. 64) and the hexagon screw (2) and take off the fuel tank.

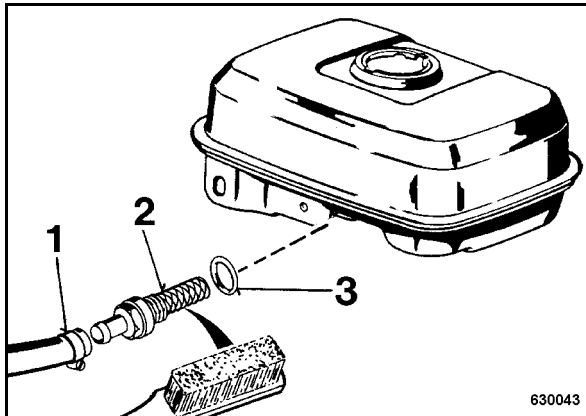


Fig. 65

- Open the hose clamp (1) (Fig. 65) and 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), replace if necessary.
- Turn the fuel screen filter tightly in with the seal.
- Fasten the hose and reassemble the fuel tank.

## 6.18 Replacing the starter rope

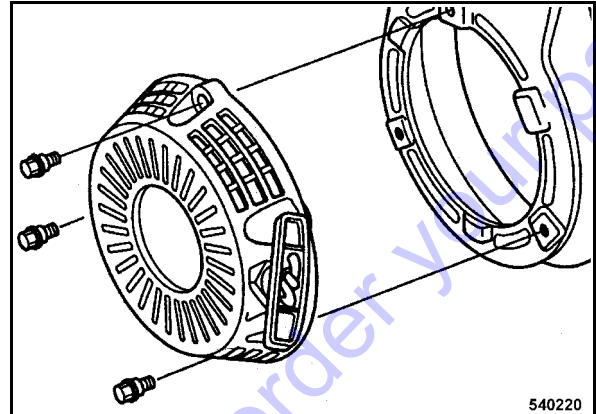


Fig. 66

- Disassemble the recoil starter from the engine housing (Fig. 66).

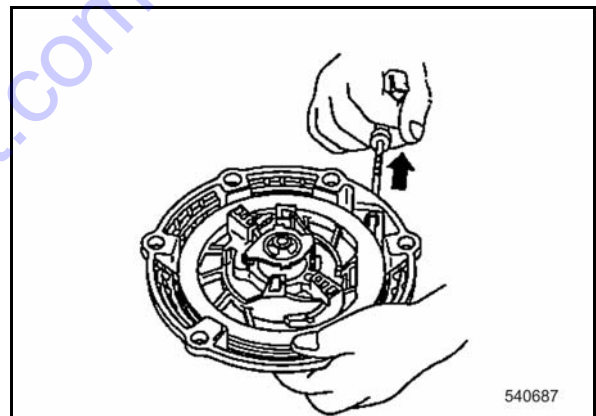


Fig. 67

- Pull the starter rope completely out by the starter handle (Fig. 67).

## Maintenance every year

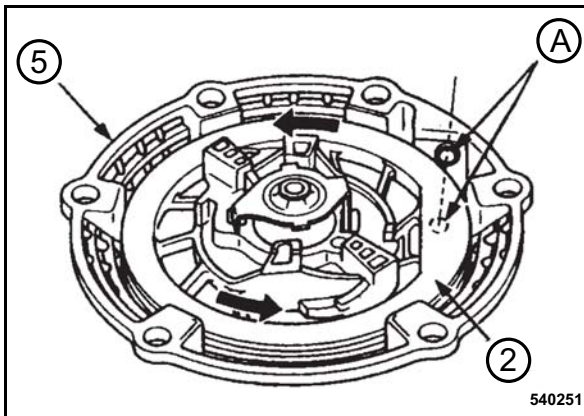


Fig. 68

If the starter rope has been torn or the coil has been turned back:

- Before assembling the rope turn the coil (2) (Fig. 68) 5 revolutions in anti-clockwise direction and align the rope openings on coil and housing (5) to match (A).

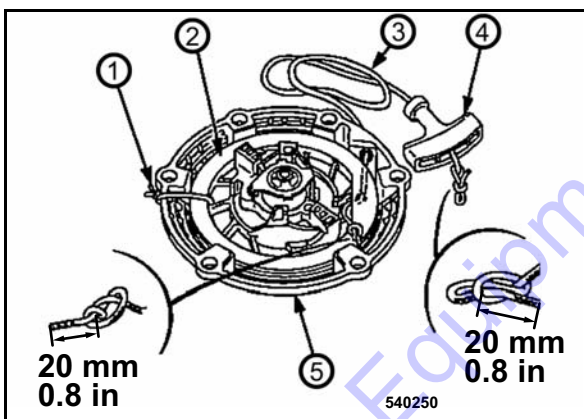


Fig. 69

- Secure the coil (2) (Fig. 69) against winding up. For this purpose fix coil and housing (5) with a cable strap (1).
- Loosen the knots in the starter rope at both ends and remove the old starter rope.
- Thread in the new starter rope (3) and fix at both ends with knots.

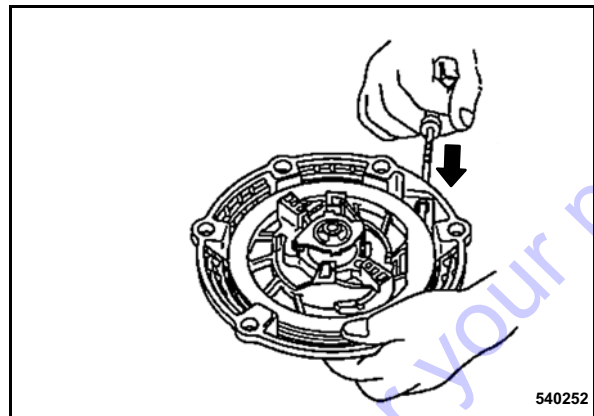


Fig. 70

### **⚠ Danger**

#### **Danger of injury!**

**Do not allow the starter handle to hit back, but guide it back slowly. Do not let the starter handle hit back, but guide it back.**

- Remove the coil fixture and guide the starter handle slowly back to initial position (Fig. 70).
- Pull the starter handle to check the function and light movement of the recoil starter.
- Mount the recoil starter to the engine housing .

## 6.19 Change the oil in the exciter shaft housing

### ⚠ Caution

Park the machine on level ground.

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

### ♻ 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.

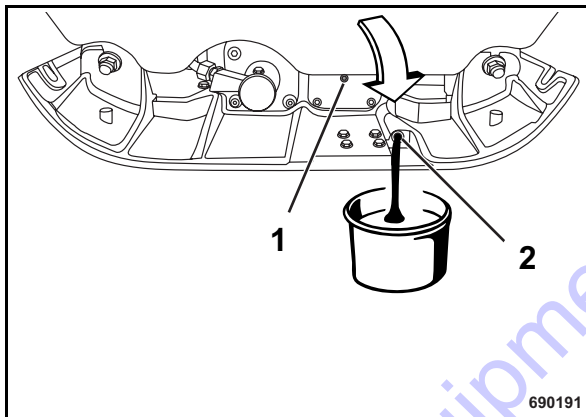


Fig. 71

- Tilt the machine to the side with the oil drain plug and support it safely.
- Unscrew the bleeding screw (1) (Fig. 71).
- Unscrew oil drain plug (2), drain and catch running out old oil.

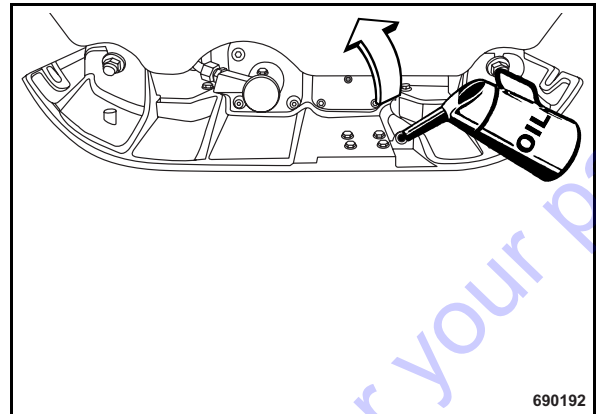


Fig. 72

- Tilt the machine to the opposite side and secure it properly.
- Fill in fresh engine oil through the drain opening (Fig. 72).
- Park the machine on level ground.

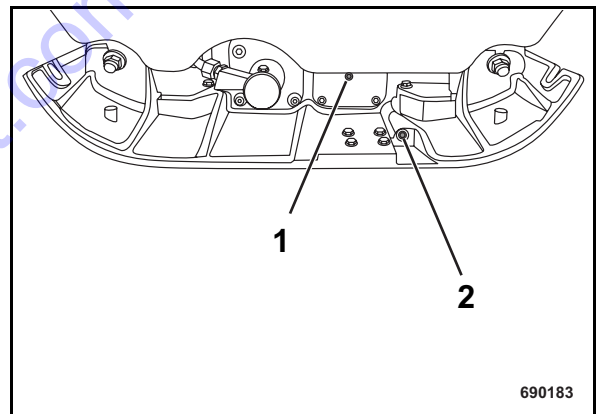


Fig. 73

- Check the oil level.

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

- Clean oil drain (2) (Fig. 73) and bleeding screw (1) and assemble both screws with sealing compound (e.g. BOMAG part-no. 00970016).

## 6.20 Check the hydraulic oil level

**Caution**

Park the machine horizontally.

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

**Environment**

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

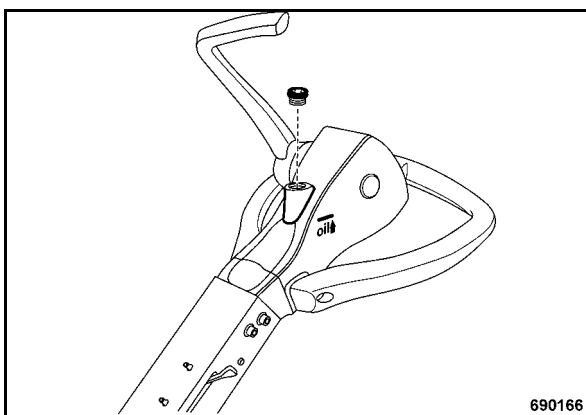


Fig. 74

- Adjust the steering rod with height adjustment (Fig. 74) so that the area with the level inspection plugs is horizontal.
- Unscrew the plug.

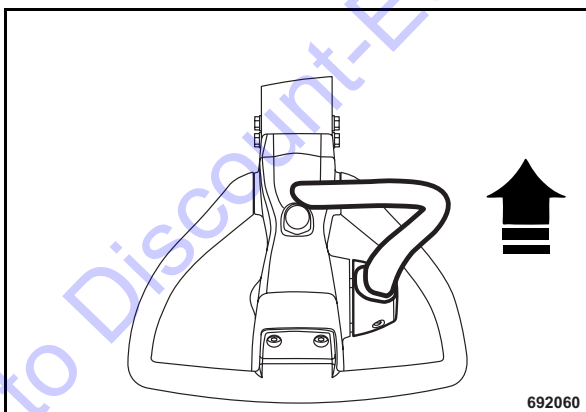


Fig. 75

- Hold the travel lever in forward position (Fig. 75).

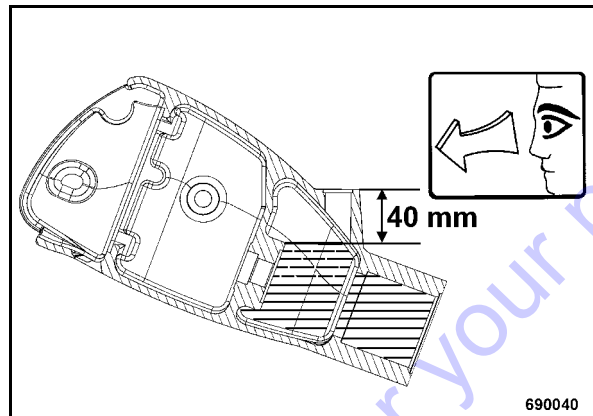


Fig. 76

- Check whether the hydraulic oil level is approx. 40 mm (1.6 in) below the filler opening (Fig. 76) (see also mark on steering rod head), top up hydraulic oil if necessary.

### Filling up hydraulic oil

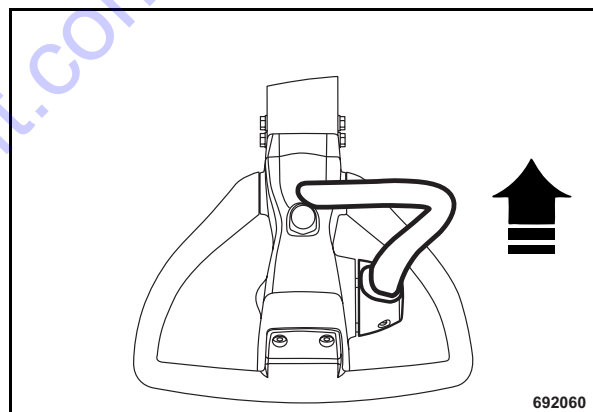


Fig. 77

- Shift the travel lever forward against the stop (Fig. 77).

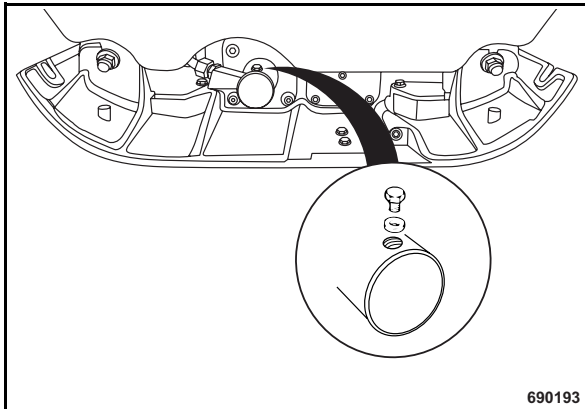


Fig. 78

**i Note**

Lay a cloth down before loosening the venting screw.

- Slacken the bleeding screw (Fig. 78).
- Wait until all air has escaped, then tighten the bleeding screw.

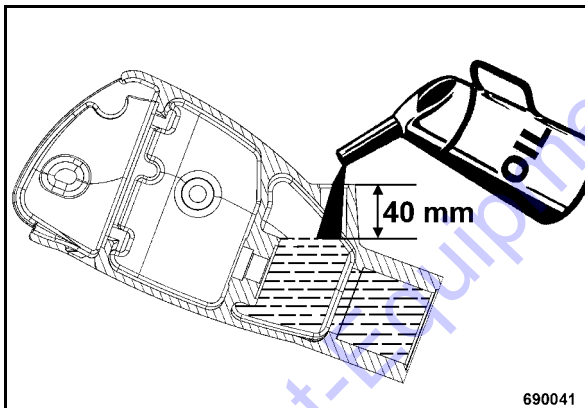


Fig. 79

- Fill in hydraulic oil to approx. 40 mm (1.6 in) below the edge of the filler opening (Fig. 79).

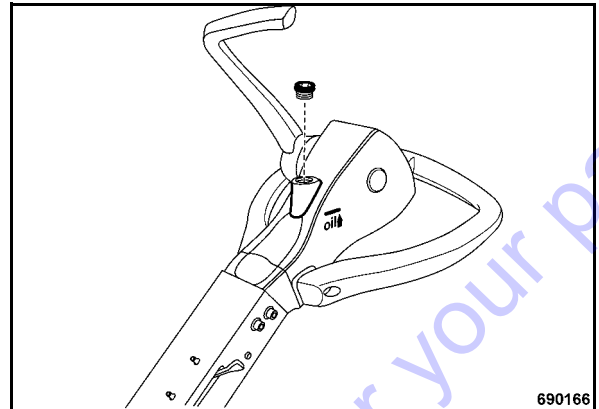


Fig. 80

- Screw in and tighten the plug (Fig. 80).

## 6.21 Check the rubber buffers

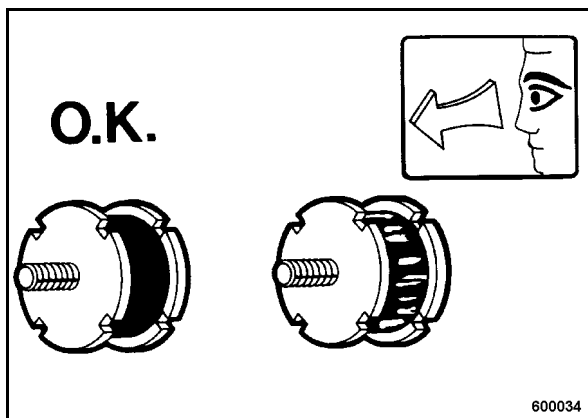


Fig. 81

- Check all rubber buffers (Fig. 81) for tight fit, cracks and damage and replace immediately if damaged.

## 6.22 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. 82

\*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  $\mu_{\text{total}} = 0.14$ .

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.

## 6.23 Engine conservation

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

- Clean the engine: For this purpose use cold cleansing agent or, even better, a steam cleaner.
- Run the engine warm and shut it down.
- Drain the still warm engine oil and fill in fresh engine oil.

### **⚠** Danger

**Fire hazard!**

**Gasoline is easily inflammable, do not spill.**

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

- Close the fuel cock.
- Remove and empty the fuel sludge filter.
- Open the fuel tap and let the fuel run out into a suitable vessel.
- Reassemble the fuel sludge filter and tighten it correctly.
- Drain the carburettor by slackening the drain plug.
- Unscrew the spark plug and fill approx. 1 table spoon full of clean engine oil into the cylinder. Crank the engine several times and turn the spark plug back in.
- Set the piston to top dead centre position of the compression stroke; intake and exhaust valves are closed.
- Take the V-belt off and spray the grooves of the V-belt pulleys with anti-corrosion oil. Remove the anti-corrosion oil before taking the machine back into service.
- Close air intake on air filter and exhaust opening tightly.
- On machines with electric starter remove the battery and recharge it once every month.
- Cover the engine and stand it on a wooden pallet.



## As required

### **i** Note

*Depending on weather conditions these conservation measures will protect the machine for approx. 6 to 12 months.*

### **⚠** Caution

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

Go to Discount-Equipment.com to order your parts

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## **7 Trouble shooting**

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### 7.1 General notes

**Please observe strictly the safety regulations in the corresponding section of these operating and maintenance instructions.**

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 our customer service department.

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## 7.2 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 the spark plug Replace the engine switch
Engine start	Engine does not turn when operated Starter defective	Replace the starter
Low engine power	Throttle control defective Air filter clogged Engine defective Carburettor defective	Have the fault repaired Clean or replace the air filter Replace the engine/have the fault corrected Clean carburettor Repair carburettor
No vibration	Centrifugal clutch defective V-belt broken	Replacing the centrifugal clutch Replacing the V-belt
Compression of engine	Valve clearance	Checking and adjusting 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 the fuel screen in the carburettor

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## 8 Disposal

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### 8.1 Final shut-down of machine

If the machine can no longer be used and needs to be finally shut down you must carry out the following work and have the machine disassembled by an officially recognized specialist workshop.

#### Environment

**Catch all fuels and lubricants, do not let them seep into the ground and dispose of in compliance with legal regulations.**

- Empty the fuel tank.
- Drain lubrication oil from engine and exciter housing.
- Drain off hydraulic oil.

#### Danger

**Danger of explosion!**

**Parts that previously contained combustible fluids must not be cut with a cutting torch.**

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Model:	<input type="text"/>
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