

solo[®]

433

Instruction manual

**Motorized high
pressure sprayer**

Important!

Read this instruction manual carefully
before first operation and strictly observe
the safety regulations!



We congratulate you on the purchase of your new high quality SOLO product and hope that you are well satisfied with it.

Your high pressure sprayer is driven by a high performance, modern combustion engine. A single cylinder two-stroke engine with Nikasil coated cylinder walls in conjunction with proven SOLO technology ensures high performance, low fuel consumption and a long operational life.

SOLO constantly strives to further develop its products. Consequently, SOLO must reserve the right to make changes in form, shape, fittings and technology.

No claims can be derived from any of the illustrations or from information contained in these operating instructions.

To maintain satisfactory operation and high performance of this product over a long period, all operating instructions and maintenance guide lines should be strictly adhered to.

For any further questions or further information required regarding this product, please contact your specialist dealer who will be pleased to assist.

Symbols

The following symbols are used in the manual and on the product:

In the manual:



Read instruction manual



Special care required



Wear eye and ear protection



Do not smoke!



No open flame!



Wear protective gloves!



Toxic exhaust gas emission!

On the machine:



Fuel tank lid



T- Idling set screw

The choke is closed when the lever points in the direction as shown by the arrow (starting with cold engine)

L- Low speed mixture screw

H- High speed mixture screw



Declaration of Conformity

In accordance with EC Guide Lines 98/37/EG, 2000/14/EG and 89/336/EWG (modified with 92/31/EWG),

SOLO Kleinmotoren GmbH,
Stuttgarter Strasse 41,
D-71069 Sindelfingen

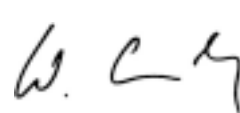
declares that the company assumes sole responsibility for the product and confirms that the product complies with the requirements of the machinery guide lines.

Sound power level (Din45635)

Guaranteed
Measured

95 db(A)
94,2 db(A)

Sindelfingen,
1st June 2004
SOLO Kleinmotoren GmbH


Wolfgang Emmerich
Managing Director

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1. Safety regulations

1.1 General safety hints



Read the manual thoroughly before using the machine for the first time. Keep the manual in a safe place.



Use this machine carefully and with caution.

Ignoring these safety hints may endanger your life. Also observe all rules and regulations for the prevention of accidents as issued by the respective trade associations. This manual must be available for reference at the place of use of the product. The manual has to be read by every person who is requested to use, maintain, service or repair the machine.

- You should request and receive instructions from the vendor on the safe operation if you are using this type of product for the first time.
- The high pressure pump may only be used within the prescribed scope of application as stated in section 9 "Scope of Application".
- Children and persons under the age of 18 are not allowed to use this machine.
- No other persons or animals should be within the work area. Never spray towards other persons, animals or objects which would suffer damage. The sprayer generates high pressure at the nozzle which may be dangerous. The operator is responsible for any accidents or damage caused towards other persons or property.
- This High Pressure Sprayer may only be passed on or lent to other persons if that person is familiar with the safe use of this product and is familiar with the instruction manual. Always supply the manual with the machine.
- Ensure you are rested and in good health when using this product.
- Persons under the influence of alcohol or drugs, including prescription drugs, are not allowed to use the machine as their ability to quickly react to potential danger may be impaired.
- Never alter, change or modify any safety equipment or functional assemblies on this machine.
- The engine driven sprayer should only be used when the unit is in good, safe condition. Always check the machine prior to use. **Danger of Accident!**
- Only use parts and accessories which were approved and supplied by the manufacturer.
- The reliability and safe operation of your machine depend on the quality of parts used with the machine. Only use original spare parts. Original spare parts are identical with genuine production parts and guarantee best quality in material, measurements, function and safety. Original parts and accessories are available from your specialist dealer. Your specialist dealer has been supplied with correct documentation to determine the correct parts. The specialist dealer is frequently supplied with updates about improvements to the equipment. Please note that the use of non-original parts will void your warranty.
- Always store the machine in a safe place and in such a way that it will not pose any danger. Stop the engine when the machine is not used. Drain and clean the liquid tank according to the details provided in section 10.3 "Draining and cleaning liquid tank". Unauthorized persons should have no access to the machine.

Persons who disregard safety instructions, operating instructions or maintenance instructions may be liable for any damage or consequential damage.

1.2 Working with chemicals safely

- This high pressure sprayer is suitable for the application of approved plant protection chemicals, fungicides, pesticides and herbicides as well as liquid fertilizers which are available from authorized specialized shops. Only use plant protection chemicals which have been approved by the respective authorities in your country or state.
- Do not use liquids with a temperature above 40°C.
- To avoid personal injury and for the protection of the environment only use approved chemicals. Always read and follow all recommendations of the chemical manufacturer.
- Never drain excess chemicals into the public water drainage system and never pour excess chemicals on unused land or in ponds and lakes. Avoid return suction of chemicals into the hose while filling the mixing container with tap water. Never add plant protection chemicals to goods for domestic garbage and refuse collection. Collect plant protection chemicals in a suitable container and deliver the container to a designated collection point for chemicals. Check with your local authorities regarding the availability and address of such a collection point.
- Avoid direct contact with chemicals.
- If you feel drowsy and unwell while using the sprayer, stop work immediately. If drowsiness persists, see a medical practitioner.
- Children or persons unfamiliar with the handling and application of chemicals are not allowed to use the sprayer.
- Thoroughly clean the tank before using different spray chemicals. After cleaning the tank, use fresh water to

operate the sprayer for a short time. This will remove residual chemicals from the pump and the hose system. This will avoid possible chemical reactions.

- Do not spray in small or closed rooms - there is a danger of poisoning from chemicals and from exhaust fumes. Use motorized equipment in glass houses only if there is sufficient ventilation. Recently treated glass houses should be marked to prevent access before the spray has settled and full ventilation is completed.
- Drain and clean the chemical tank on the sprayer after the spraying job has been completed. Follow the instructions provided in section 10.3 "Draining and cleaning chemical tank". Wash hands and face with fresh water and soap. Change work clothing and have it cleaned.

1.3 Work clothing

Always wear appropriate clothing and protective equipment whenever this sprayer is used.

- Wear appropriate protective clothing which covers all body parts. This includes gloves, head protection, foot protection, body protection and possibly an apron or breathing mask
- Clothing should be suitable, i.e. tight without being obstructive.
- Do not wear a scarf, necktie, jewellery or any clothing which can get caught on shrubs or branches.
- Wear firm shoes with good traction, preferably safety shoes.



Wear protective gloves with non-slip grip.



Use personal ear protection and a face mask or safety goggles to protect against spray drift or airborne debris.

- When working between close and tall plants, in badly ventilated glass houses or when using highly toxic chemicals, always wear a suitable, approved breathing mask.
- Any clothing soaked with chemical or petrol should be changed immediately.

1.4 Transporting the sprayer

- Always stop the engine to transport the sprayer.
- Considering road traffic hazards it is advisable to secure the sprayer firmly and safely before transporting the unit.
- Ensure there are no chemical or petrol leaks. Always check the chemical tank, pump, fuel tank and all hoses and pipes for the chemical solution and fuel supply for leakage. Prior to transporting the sprayer, drain the chemical tank as per instructions provided in section 10.3 "Draining and cleaning chemical tank".

1.5 Fuelling



Petrol is very light and highly flammable. Do not get close to an open flame and do not spill any fuel. Do not smoke at the operating site or at and near the refuelling site!

- Stop the engine prior to refuelling.
- The engine should be allowed to cool down before refuelling - fire danger!
- Open the tank lid slowly to allow the safe escape of any excess pressure in the tank without the danger of petrol spray.
- Avoid breathing in fuel vapour.
- The refuelling site should be well ventilated.
- Avoid any soil spillage of fuel or oil. (Protection of the environment). Use a suitable mat.
- Immediately clean any spilled fuel on the machine. Contaminated clothing should be changed without delay.
- Firmly tighten all tank lids. This will reduce the risk of spillage from lids which have become loose from engine vibrations.
- Check for petrol leaks. Do not start the machine or work with the machine if there is a petrol leak. Life threatening danger from burns!
- Store fuel and oil in approved and correctly labelled containers.

1.6 Preparation for starting

Check the complete machine for operational safety.

- The stop button should function properly.
- The throttle lever has to move easily and smoothly.
- Check the chemical tank, pump, fuel tank and all hoses and pipes for chemicals and fuel for possible leakage.
- Ensure the spark plug cap and the ignition cable are connected firmly. A loose connection may cause a spark which can ignite any existing fuel-air mixture - fire hazard!
- Should the check reveal any irregularities or recognizable damage (also to the frame), incorrect adjustments or reduced efficiency of the machine, do not commence work. Take the motorized high pressure sprayer to a specialized workshop and have it checked.

1.7 Starting

- Start the machine no less than 3 metres from the refuelling location. Never start the machine in an enclosed area.
- Ensure secure, firm footing for starting.
- Only one person is allowed to operate the motorized high pressure sprayer. No other person should be within 5 meters when the machine is started or operated.
- The trigger handle on the spray wand should be closed during the starting process. Ensure the spray wand is directed away from persons and objects.
- Continue with the starting procedure as described in section 8. "Starting engine / Stopping engine".

1.8 Working with the machine



While running, the engine produces toxic exhaust gas which is odourless and invisible. Never start or operate the machine in closed rooms. Ensure for adequate ventilation in confined areas such as ditches or dips.



Remain within calling distance to other persons who would be able to provide assistance if needed. Provide for regular and in-time rest periods.

Do not smoke in the vicinity of the machine or at the work site. Smoking increases the danger of fire!

- Operate the machine with as little noise and exhaust gas emission as possible - only run the engine when necessary. Consider that noise is an environmental hazard. Respect and observe any quiet periods which may vary locally.
- Do not touch the muffler and exhaust while still hot. Danger of burns!
- Never operate the machine without a muffler or with a damaged muffler. Danger of burns and loss of hearing!
- The machine should be stopped when not in use and secured to prevent danger of injury to others.

1.9 Maintenance and repairs

The machine has to be maintained regularly. Only do those maintenance jobs and repairs yourself which are described in this manual. All other jobs should be done by a specialized service centre.

- Do not maintain, repair or store the machine in the vicinity of an open flame.
- Always stop the engine before attempting any cleaning, repair or maintenance jobs. An exception is the adjustment of the carburettor or idling speed.
- Only remove the pressure hose (14), the trigger handle (15), the spray wand (17) and the nozzle insert (18) when the engine has been switched OFF and the system is fully depressurised. To achieve this, with the engine switched OFF, insert the spray wand (17) into the liquid tank or into a container suitable for the liquid concerned, and operate the trigger handle (15).
- For any repairs only use original parts from the manufacturer.
- Do not modify, alter or change the machine as this may impact on the safety of and with the machine and lead to accidents and injury!

2. Technical Specifications

Engine type		SOLO single cylinder two stroke engine
Engine capacity	cm ³	25 ccm
Bore / stroke	mm	33 / 30
Engine performance	kW at rpm	0.75 / 6500
Medium idling speed	rpm	2800
Max. Admissible engine speed	rpm	6700
Fuel tank capacity	l	0,3
Fuel mix ratio:	with "CASTROL SUPER TT" with other two stroke oils	1:50 (2%) 1:25 (4%)
Carburettor		All-position diaphragm carburettor with primer and integrated fuel pump
Air filter		Compressed fibre filter with foam material insert
Ignition		Electronically controlled magneto ignition, maintenance free
Capacity of liquid tank	l	24
Nominal volume	l	23
Liquid inlet filter mesh size	mm	0,65
Residual liquid volume in tank after machine stops regular spray output	ml	< 200
Operating pressure	bar	5 - 30
Output volume with standard nozzle	l/min	
at 5 bar operating pressure		0,7
at 10 bar operating pressure		1,2
at 20 bar operating pressure		1,7
at 30 bar operating pressure		2,0
Spray Wand	Material Length in mm Connecting thread	Steel tube 50 19 windings/inch
Spray hose	Length in mm Pressure resistant to bar	128 > 50
Spray nozzle, standard		Double flat spray
Work site related L_{peg} to EN ISO 11200 idling / full speed	dB(A)	82
Sound pressure level L_{Wpn} to EN ISO 3744 measured / guaranteed 95%	dB(A)	94,2 / 95
Weighted average of acceleration to ISO 7916 handle at max. engine speed	m/s ²	< 2,0
Total weight (ready to go - empty liquid tank)	kg	8,3
Dimensions without spray wand and spray hose	mm	Height: 630 / Width: 440 / Depth: 320

3. Goods Supplied

The SOLO 433 High Pressure Pump is supplied complete with the following equipment:

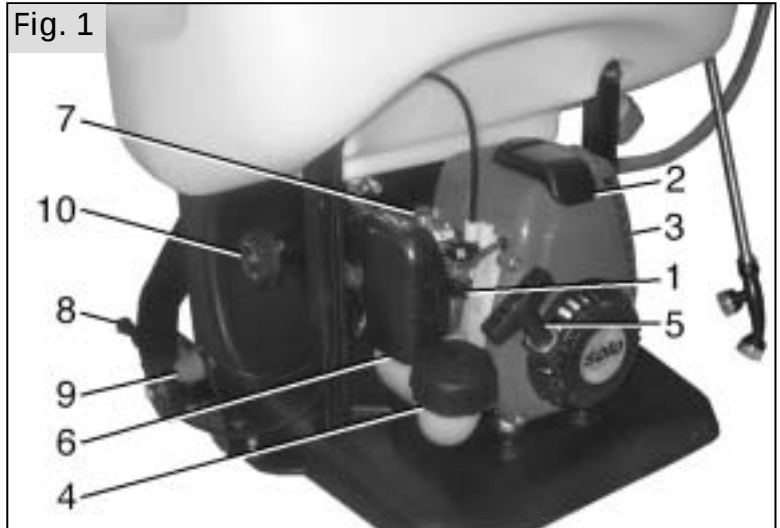
- Basic unit
 - Complete unit but without spray wand
- Spray wand with pre-assembled nozzle set
- Instruction manual

4. Important functional assemblies

Engine unit:

1. Choke lever
2. Spark plug cap
3. Muffler
4. Fuel tank lid
5. Starter handle
6. Air filter
7. Primer
8. Throttle adjustment lever
9. Stop button
10. Pressure regulator

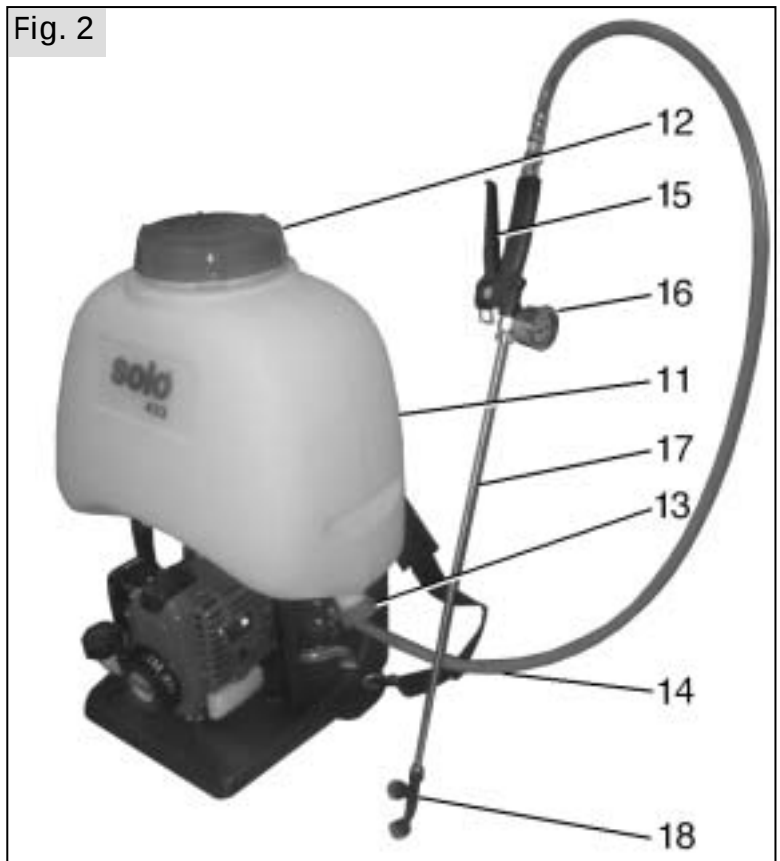
Fig. 1



Spray equipment:

11. Liquid tank
12. Tank lid -
Opening to fill liquid into tank
(Removable filter basket is
supplied in the filler opening.)
13. Lid for drainage of spray liquid
14. Pressure hose
15. Trigger handle
16. Pressure gauge
17. Spray wand
18. Nozzle insert

Fig. 2

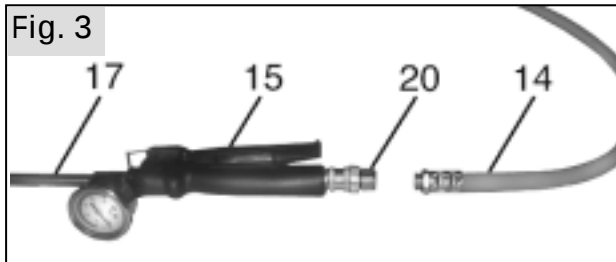


5. Preparation for use

5.1 Assembly

The high pressure sprayer may only be used after complete assembly and after the carrying straps have been adjusted correctly!

To facilitate packing and transport, the spray wand (17) and trigger handle (15) are not attached to the pressure hose (14).



Fasten the pressure hose (14) to the trigger handle (15) by tightening the hex. Nut (20).

5.2 Adjustment of carrying straps



Adjust the length of the carrying strap with the buckle (21).

The strap is shortened by moving the buckle upwards. Move the buckle downwards to lengthen the strap.

The carrying straps are correctly adjusted when the back cushion of the machine is resting firmly and securely against the back of the operator.

Do not adjust carrying straps while the machine is carried on the back.

5.3 Prior to first use and after extended storage periods

Prior to using the engine driven high pressure sprayer for the first time and after extended storage periods we recommend that you check the correct operation of the complete machine. Also check all parts and hoses which carry fuel and chemical liquid for any leakage. This should be done before you mix the chemical solution. After reading the manual thoroughly test the machine as described in the following paragraph.

Observe all safety instructions while testing the machine.

Test run:

Fill the liquid tank with approx. 5 litres of water after carrying out a successful visual check of the machine. Fill the fuel tank with the correct fuel mixture as described in section 6 "Fuelling " and start the high pressure sprayer as described in section 8 "Starting engine / Stopping engine" for a test run. Check all parts and hoses which carry fuel or chemical liquid for leakage. Check the efficient operation of the throttle lever (8), the operating handle (15), pressure gauge (16) and the stop button (9).

Hint: To get a feel for the machine and to gain confidence in the high pressure sprayer we suggest you carry out several spray trials with water only at various pressure settings.

Note: The pressure gauge will only provide a pressure reading when the operating handle is in open position during the spraying process.

If irregularities, leakages, visual damage (even on the carrying frame), limited function or incorrect adjustments are detected, do not start any spray operations but have the high pressure sprayer checked by a specialized service centre.

6. All about fuel

6.1 Fuel information

The power for this machine is supplied by a high performance two stroke engine operated with a petrol / oil mixture (petrol + oil = fuel mixture) or with a special fuel mixture for two stroke engines available from specialists. The fuel mixture can be made up with standard lead-free petrol or with lead-free premium grade petrol. The minimum octane rating for petrol is 92 ROZ.

Unsuitable petrol or deviations in the mixing ratio may lead to serious engine damage!



Avoid direct skin contact with petrol and avoid inhaling petrol fumes - health hazard!

6.2 Mixing ratio

Always use a fuel ratio of 25 : 1 (4%) for the first five tank fillings.

After that we recommend a ratio of 50:1 (2%) with the use of special two-stroke oil "Castrol Super TT" which is offered by our company.

With the use of other brand two stroke oils we recommend a ratio of 25:1 (4%).

Never store fuel mixture longer than 3 - 4 weeks.

Fuel mixture table

Petrol in litres	Oil in litres	
	Castrol Super TT 2% (50 : 1)	Other two stroke oils 4% (25 : 1)
1	0,020	0,040
5	0,100	0,200
10	0,200	0,400
15	0,300	0,600
20	0,400	0,800

6.3 Fuelling

While fuelling always follow all safety instructions and take all safety precautions.

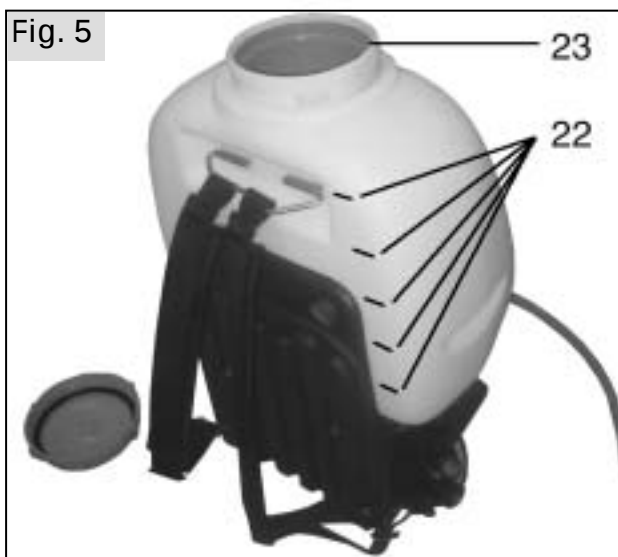
Handle fuel only with the engine turned off. Carefully clean the area around the filler inlet. Place the machine with the fuel inlet pointing upwards. Unscrew the tank lid and fill the fuel mixture to the lower edge of the fuel tank neck. Use a funnel with filter to prevent tank contamination. After filling the tank replace the tank lid and tighten firmly.

7. Preparation of spray chemicals, filling of liquid container



Always observe all safety instructions and safety precautions when handling spray chemicals. Refer to the safety instructions provided in this manual, especially section 1.2 "Safe handling of spray chemicals" and the instructions provided by the chemical manufacturer.

Additional basic rules for filling liquid containers



The liquid tank of the high pressure sprayer has a maximum fill capacity of 23 litres. The back of the container is marked (22) to indicate the volume of liquid in the tank. Do not fill correctly mixed spray chemicals above the upper marking (23) or the lower edge of the inlet filter (23).

The inlet filter (23) has a mesh size of 0.65 mm. The filter has to be used for the filling process. Check the filter prior to use. If the filter is damaged, replace it with the original replacement part, part number 06 10 03 926 006.

To fill and refill the spray tank stop the engine, take off the sprayer and place it on a suitable cover sheet on the ground.

Avoid contamination of water systems and drainage / rain water systems. Chemical spillages should be cleaned up immediately.

Before filling the tank ensure the trigger handle is closed and the tank drainage cap (13) is tightened firmly. Never prepare and mix spray chemicals in the chemical tank of the machine.

After filling the chemical tank with the required spray volume replace the tank lid and tighten firmly to prevent chemical leakage.

Liquid volume

Prepare spray liquid according to the requirements of the chemical manufacturer. Match the spray volume to the actual requirement.

General volume data for plant protection:

- Ground plants 0,3-0,5 l for 10 m²
- Low shrubs and bushes 1,0-1,5 l for 10 m²
- Trellis crops, spindle bushes 0,5-1,0 l each
- Larger bushes 2,0 l each

Preparation of spray chemicals

Prepare plant protection chemicals in the open air, never in living areas, stables or storage areas for food stuff or fodder.

Plant protection chemicals in powder form:

- Prepare the spray mixture in a separate container. Do not prepare the mixture in the chemical tank of the machine!
- Mix the solution well, then pour into the chemical tank of the high pressure sprayer. Use the tank inlet filter!
- Use the spray wand to stir the spray solution in the chemical tank of the machine.

Plant protection chemicals in liquid form:

- Fill chemical tank of machine $\frac{1}{4}$ with water,
- Pre-mix spray chemical with water in separate container according to the instructions of the chemical manufacturer,
- Pour pre-mixed spray chemical into the chemical tank of the high pressure sprayer. Use inlet filter.
- Add water according to the instructions of the chemical manufacturer.
- Stir the spray solution in the spray tank with the spray wand.

Biological spray solutions should be poured through a strainer before pouring the solution into the spray tank via the inlet filter. This will prevent repeated clogging of the inlet filter.

8. Starting engine / stopping engine

8.1 Preparation for starting

To prevent the pump from running dry, always fill liquid into the tank (11) before starting the machine.

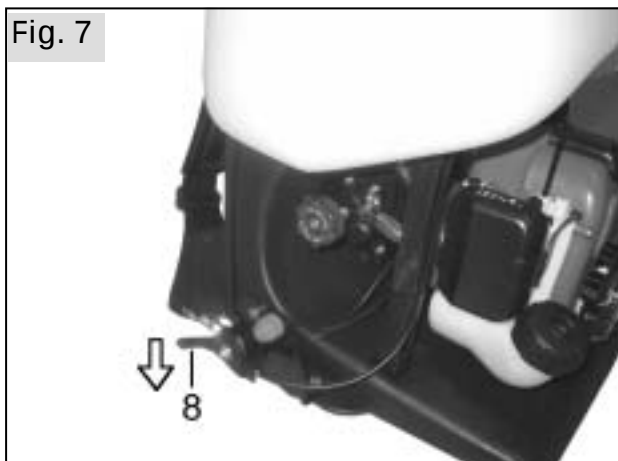
When the sprayer is used for the first time or after extended storage or after the liquid tank has been completely run dry (brief dry run of the pump), the pump has to be primed. This is easily done by holding the spray wand (17) into the liquid tank or in a suitable container for spray liquid and press the operating lever (15). This will allow liquid from the tank to re-fill the pump.



Set the choke as follows:

If the engine is cold, move the choke lever (1) upwards as shown by the arrow.

If the engine is warm, move the choke lever (1) downwards.



Move the throttle lever (8) to idling position (down). Turn the pressure regulator (10) counter-clockwise to set a low pressure for starting.

When starting the engine for the first time or after the fuel tank has been run dry, press the primer bulb (7) at least five times until fuel is visible in the primer bulb.

8.2 Starting

Fig. 8



Place the high pressure sprayer on the ground. Ensure the sprayer and the person to start the machine are in a steady position. Ensure the trigger handle on the spray wand is closed and not open for continuous spraying.

Use one hand to push the machine down on the tank lid of the liquid tank. Use the other hand to slowly pull up the starter handle until resistance is felt. Then pull the starter handle quickly and forcefully in a straight line from the rope guide. Do not jam the cord on the rope guide. Avoid pulling the handle to the full length of the rope as this might cause the rope to break. Slowly guide the starter back to the starting position.

If the engine is cold:

Start with the choke lever (fig. 6.1) in upward position until the engine briefly starts (fires). Immediately switch off the choke (push choke lever downward) and restart the engine until it runs.

If the engine is warm:

Leave the choke lever (Fig. 6.1) switched off (down position) and start the engine until it runs.

After the engine runs adjust the throttle lever (8) to obtain the required engine speed. Use full throttle if the sprayer is set for high spray pressure. If lower pressures are required, only use $\frac{3}{4}$ throttle. This will save fuel. Then turn the pressure regulator (10) to set the required pressure which is indicated by the pressure gauge (16) fitted to the operating handle (15). Also note the hints provided in section 9.2 "Pressure Regulation".

Caution:

void clutch slippage. If needed increase the engine speed with the throttle lever after setting the spray pressure with the pressure regulator.

The following hints serve to extend the service life of the starter rope and the starter mechanism:

- Always pull up the starter rope in a straight line.
- Do not let the rope rub against the edge of the rope eyelet to prevent fraying.
- Do not pull out the rope over its full length to prevent breakage.
- Guide the starter handle to its initial position rather than letting the handle slam against the starter housing.

A damaged starter rope can be replaced by a service specialist.

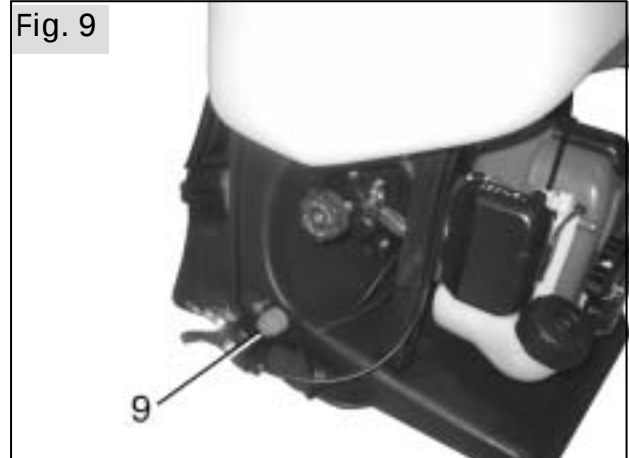
8.3 Engine will not start

If the engine fails to start despite several starting attempts, check all previously described adjustments and settings and try to start the engine again. If the engine still fails to start, the combustion chamber in the cylinder is likely to be flooded.

In that case we recommend to proceed as follows:

- Remove spark plug cover.
- Pull spark plug cap from spark plug.
- Remove spark plug and dry fuel mixture from electrodes.
- Move throttle lever upwards to full throttle position. Pull starter handle several times (with removed spark plug) to clear combustion chamber.
- Move throttle lever downwards to idling position, refit spark plug, plug cap and plug cover.
- Start engine with choke lever (Fig. 6.1.) in downward (off) position.

8.4 Stopping engine:



Press stop button (9) until the engine stops.

9. Use of High Pressure Pump

9.1 Scope of Application

This high pressure pump is suitable for the application of approved liquid plant protection material, pesticides, herbicides and liquid fertilizers available from authorized trade outlets. We recommend to only use plant protection chemicals which have been approved by your local, regional, state or federal authorities. In Germany, the Federal Institute for Biology (BBA) is responsible for the approval of plant protection chemicals.

The areas of application for this high pressure pump are agriculture, viticulture and horticulture.

The machine is not to be used in windy and rainy conditions to prevent the spread of the spray material over a large area.

Check the wind direction prior to commencing work.

Never spray towards open doors, windows, cars, animals, children or anything that may be damaged by chemicals.

Exercise extreme caution while spraying.

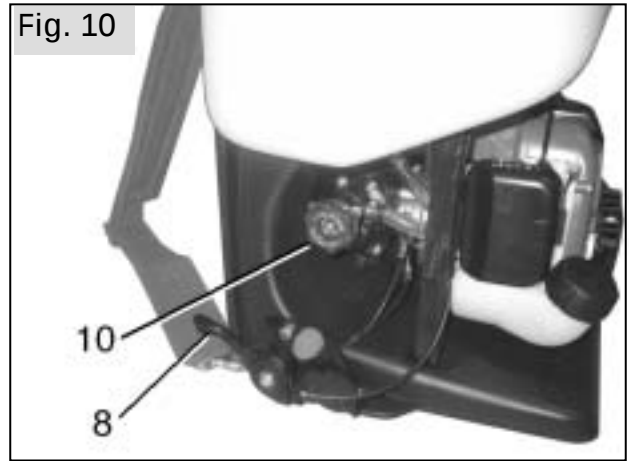
Generally there is less wind and air movement during early morning and early evening hours. It is recommended to spray during that time. Only wet those plants and objects which are targeted. In any case we recommend caution during the spray operation.

9.2 Pressure Regulation

A certain spray pressure has to be maintained depending on nozzle adjustment, nozzle type, type of spray chemical, walking speed etc. The pressure should be even and continuous. A pressure gauge (16) fitted to the trigger handle (15) indicates the pressure in the liquid delivery system.

Note: The pressure gauge only shows the pressure while liquid is flowing through the pressure handle during actual spray operation.

Fig. 10



Spray pressure can be altered by:

- a) Changing the engine speed via the **throttle adjustment lever (8)**

- Lower engine speed → lower pressure

For high pressure set the throttle lever to full throttle. For lower pressure adjust to $\frac{3}{4}$ throttle. This will save fuel.

- b) Adjustment to **Pressure Regulator (10)**

- Turn clockwise to the right
→ increased pressure,
- turn anti-clockwise to the left
→ lower pressure.

Spray pressure should not exceed 30 bar. (Red field on pressure gauge).

Hint:

While the engine is running, leave the spray pressure set at low while using the throttle to achieve the required engine speed. Then turn the pressure regulator (10) to adjust to the required pressure. This way the engine does not have to work against high pump pressure during the transition from idling speed to operating speed.

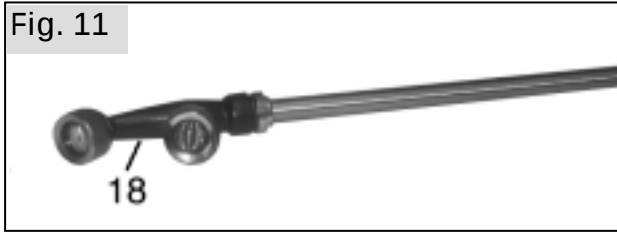
Caution:

Avoid clutch slippage. If needed increase the engine speed with the throttle lever after adjusting the spray pressure with the pressure regulator.

Never operate the engine for longer periods with the pressure handle in the CLOSED position. This applies particularly when high spray pressure has been selected.

9.3 Spray nozzle / Output volume

Fig. 11



A double nozzle (18) is supplied as standard equipment with the sprayer.

The following general output data is valid for this nozzle.

Spray Pressure in bar	Output volume in l/min
5	0,7
10	1,2
20	1,7
30	2,0

9.4 Excess spray chemical / Completing spraying operation

Stop the engine of the high pressure sprayer as soon as air is pumped through the nozzle (this can be heard and seen by the formation of fog like spray drift). At that point the remaining spray chemical in the tank is less than 200 ml. Unless you want to refill the tank and continue with the spray operation, dilute the remaining spray volume with 2 litres of water. Apply the dilution over the already treated area.

Never operate the engine without liquid in the spray tank. The pump will suffer damage if operated dry.

After finishing the spray operation, stop the engine by pressing the stop button (9) until the engine stops. Let the engine cool down. Empty and clean the machine according to section 10.3 "Emptying and cleaning of chemical tank". Thoroughly wash face and hands with water and soap. Remove the work clothing after spraying. Clean work clothing regularly.

Note:

After extended operating periods of the high pressure sprayer, the engine and some parts (such as the muffler) around the engine can get very hot. To prevent any consequential damage we recommend the running of the engine at idling speed for a short time after the engine has been used at full speed for longer periods before the engine is shut down as described.

10. Operating and Maintenance Instructions

10.1 General operating and maintenance hints

After a running-in period of approx. 5 hours all accessible screws, nuts and hose connections (except for carburettor mixture adjustment screws) have to be checked and re-tightened if necessary.

Always check the engine driven high pressure pump prior to commencing work to ensure the complete machine is in good and safe working order.

10.2 Checking output volume of spray chemical

Check the output volume of the machine (l/min) to ensure the measured data agrees with the spray volume stated in section 9.3 "Spray nozzle / Output volume". This should be done at least once per year, preferably at the beginning of the spray season.

Fill the liquid tank with water to the maximum fill mark on the tank. Operate the sprayer for exactly one minute at 10 bar pressure.

Stop the engine and measure the volume of water required to refill to the max. fill mark.

The measured volume is the output of the machine in l/min at 10 bar operating pressure. The ascertained data should not vary by more than 10% from the data provided in section 9.3 "Spray nozzle / Output volume".

If the measured volume is too small, the nozzle may be partially blocked. Clean the nozzle and repeat the test procedure.

If the measured volume is too large, the nozzle may be damaged or worn. Replace the old nozzle with a new nozzle

(Part No. 06 10 03 12 00 503 - Nozzle
06 10 03 12 00 502 – Swirl plate).

While checking the output volume also check the nozzle for even output over the full spray pattern.

10.3 Emptying and cleaning liquid tank

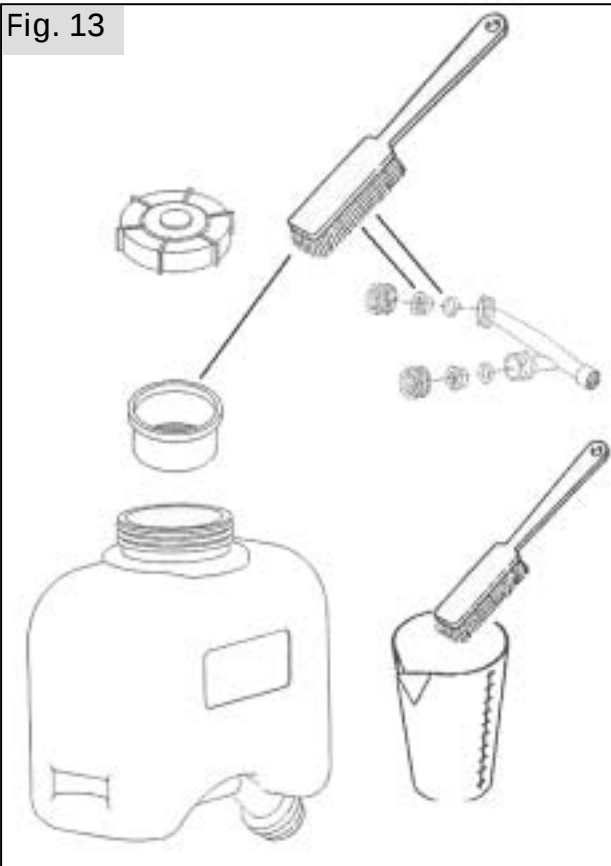
Fig. 12



To clean the liquid tank drain all residual chemicals via the drain plug (13) in a suitable container. If required, tilt the machine slightly to the side to ensure complete drainage of any remaining chemical solution. Before tilting the machine, ensure the fuel tank lid is tight and all fuel hoses and parts connected with the fuel system cannot leak fuel. The engine should have cooled down. Ensure the liquid will not drain over machine, especially the engine, but directly in a suitable container.

Drain and thoroughly rinse the liquid tank daily after use with fresh water. Observe any cleaning hints provided in the instructions supplied with the chemical. After cleaning, leave the tank to dry with the tank lid open.

Fig. 13

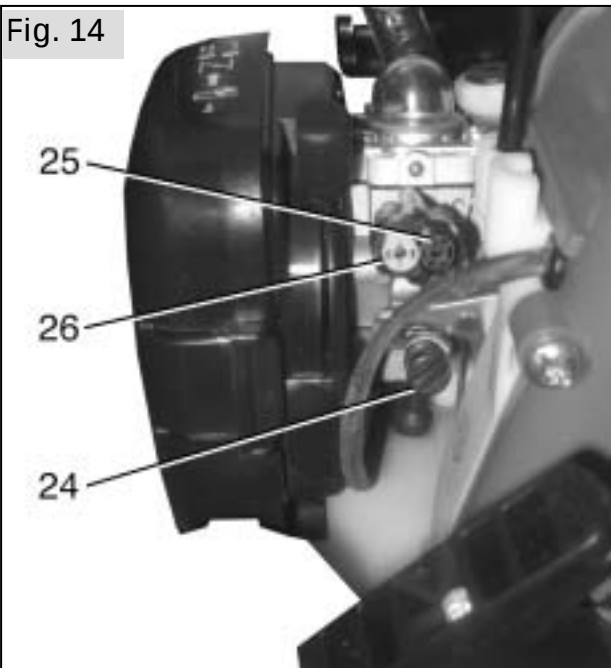


Regularly clean the inlet funnel filter and the spray nozzle with a soft brush. Never use the mouth to blow through the nozzle!

10.4 Carburettor adjustment

The carburettor has been adjusted optimally at the factory. Depending on the operational altitude (mountains or low lying areas) a re-adjustment of the carburettor may be required.

Fig. 14



Mod.: Carburettor with limitercaps

The carburettor has 3 adjustment screws:

- Idling set screw "T" (24)
- Low speed mixture screw "L" (25)
- High speed mixture screw "H" (26)

⚠ The regulating screws for idle mixture "L" (25) and full load mixture "H" (26) must only be adjusted by qualified mechanics.

Turn the idling set screw "T" (24) to adjust the idling speed to the data provided in the technical specifications. An engine speed counter should be used for this job.

- If the idling speed is too high, turn the idling set screw "T" anti-clockwise.
- If the idling speed is too low (engine stops) turn the idling set screw "T" clockwise until the engine runs smoothly.

If the idling speed cannot be set correctly with the idling set screw "T", an authorised service centre should be requested to tune the carburettor.

The following instructions are for authorised service shops

Using the D-CUT carburettor:

Key (SOLO part no: 00 80 537) to correct settings on the idle mixture screw "L" (25) and on the full load screw "H" (26).

Using the carburettor with limitercaps:

The regulating screws for idle mix and full charge mix can only be adjusted in a limited range.

Clean the air filter before adjusting the low speed adjustment screw!

Let the engine run warm before adjusting the engine speed.

Medium engine idling speed = 2800 rpm

Max. Admissible engine speed = 6700 rpm



The carburettor is tuned for optimal engine performance. An engine speed counter is required to adjust the carburettor correctly!

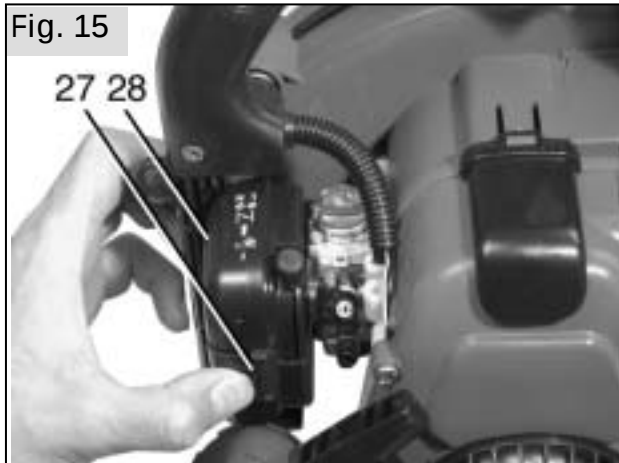
Do not adjust the engine to a higher speed.

Excessive engine speed can lead to major engine damage!

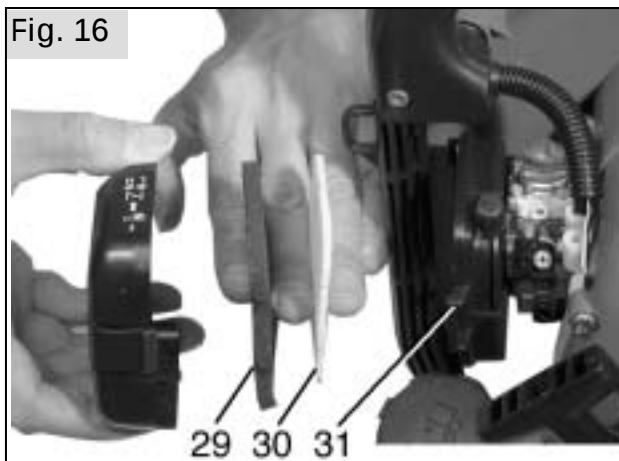
10.5 Air Filter Maintenance

Dirty air filters cause a reduction in engine performance and increase fuel consumption with more pollutants in the exhaust gas. Engines are less likely to start readily with a dirty and soiled air filter.

The following maintenance jobs should be carried out frequently.



Press clip (27), tilt and remove the filter cover (28). Clean around the filter.



Remove the pre-filter (29) and the main filter (30) from the filter body (31).

If the machine is used all day both pre-filter and main filter should be cleaned daily. Clean the filters more often in extreme dust conditions. For daily cleaning jobs simply tap the filters against a hard object or use compressed air. Damaged air filters should be replaced immediately. Warranty does not apply to engine damage caused by the lack of or improper maintenance.

Refit the new or cleaned pre-filter and main filter in the filter body (31), re-install the filter cover and secure with the clip.

Never install a damp or wet pre-filter or main filter!

10.6 Information about the spark plug

Do not turn the engine over while the spark plug has been removed or the spark plug cap has been disconnected from the high tension ignition cable. A spark may cause fire!

Check the spark plug regularly after 50 hours of operation.

- Remove the spark plug cover.
- Disconnect the spark plug cap.
- Unscrew the spark plug and dry the electrodes

The spark plug should be replaced after 100 hours of operation or if the electrodes are badly worn.

Spark plugs with resistor (thermal value 200) are available in different brands under the following description:

BOSCH WS6F

CHAMPION RCJ-6Y oder vergleichbar.

The correct electrode gap is 0.5 mm.

Only use spark plugs with a firm, fitted connecting nut towards the plug cap. Loose connectors may produce sparks which can cause a fire.

- Screw spark plug into cylinder and tighten.
- Place spark plug cap firmly over the spark plug
- Refit spark plug cover.

Before re-starting the engine, check the high tension ignition cable for any damage to the insulation and ensure the cable is connected securely to the plug cap.

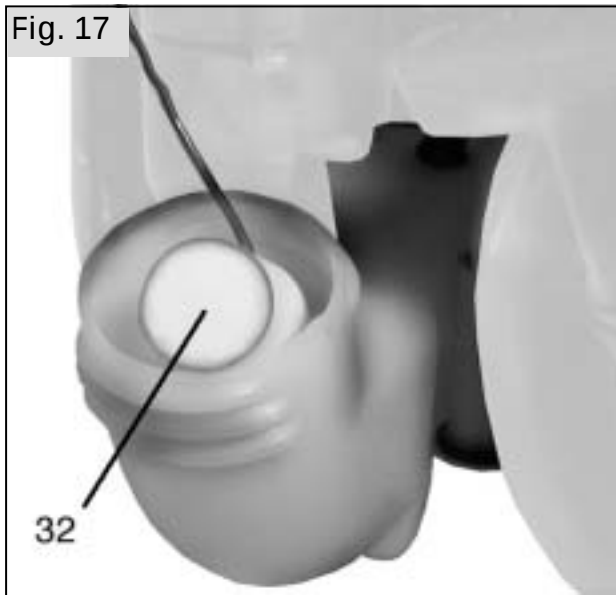
10.7 Hints concerning the exhaust system

Ensure the exhaust is in good order and condition before operating the machine. Never touch the exhaust while it is still hot.

Unsatisfactory engine performance, despite a clean air filter and a correctly adjusted carburettor, may well be due to a partially blocked or damaged exhaust. Please consult your specialist service centre.

10.8 Remove the fuel filter

We recommend to have the fuel filter (32) changed annually by a specialized service centre.



A trained mechanic can carefully remove the fuel filter via a wire loop through the fuel tank filler. Ensure that the thicker part of the fuel hose on the tank wall is not drawn into the fuel tank.

10.9 Shutdown and storage

Drain and clean the machine according to the instructions provided in section 10.3 "Emptying and cleaning liquid tank". The machine should be stored in a dry and secure place. The petrol tank should be full. Do not allow a fire or open flame in the vicinity. Prevent unauthorized access to the machine, particularly by children.

If the machine is expected to be out of action for longer than three weeks prepare the machine for storage as follows:

- Drain and clean the fuel tank in a well ventilated area.
- Start and run the engine with the fuel tank empty until the carburettor is dry and the engine stops. If the engine is not run dry, oil residue from the fuel mix are likely to block the carburettor jets which makes a re-start at a later stage more difficult.
- Thoroughly clean the machine, particularly the air intake system, cylinder cooling fins, air filter and around the fuel tank filler inlet.
- Store the machine in a dry and secure place as described above.

10.10 Maintenance Plan

The following hints are based on normal operating conditions. For special conditions, such as long, daily use, the recommended maintenance intervals should be shortened accordingly

		before starting work	daily	weekly	after 5 hours	after every 50 hours work	after every 100 hours work	as required	before spray season
Carburettor	Check idling speed	X							
	Adjust idling speed							X	
Air filter	Clean		X						
	Replace							X	
Spark plug	Adjust electrode gap					X			X
	Replace						X	X	
Cooling air inlet	Clean			X					X
Cylinder cooling fins	Clean			X					X
Fuel tank	Clean					X			X
Fuel filter	Replace								X
All accessible screws (except for adjustment screws)	Re-tighten				X ¹⁾				X
Operating controls (Stop-button, throttle lever, operating handle, pressure regulator)	Check function	X							
Exhaust	Visual check	X							
Spray output volume and distribution	Check								X
Liquid tank	Empty and clean		X						
Liquid tank inlet filter	Clean							X	X
Spray nozzle	Clean							X	X
Liquid or fuel leaks	Check	X							
Complete machine	Visual check	X							
	Test run with water								X
	Clean							X	X

¹⁾ → once

All maintenance jobs should be done regularly. If necessary, authorize a specialist service centre to maintain the machine for you. The owner of the machine is responsible for:

- Any damage caused by the lack of maintenance, improper maintenance or late maintenance and repairs
- Consequential damage - including corrosion - from improper storage

11. Guarantee

The manufacturer guarantees problem free quality and will cover the cost of replacing parts which are found to be faulty in material or show manufacturing defects within the prescribed guarantee period after the date of purchase. Please note that specific guarantee conditions may differ from country to country. When in doubt, please ask the vendor of the goods. The vendor of the product is responsible for guarantee applications.

We hope you will understand that we cannot be liable for damage resulting from these causes:

- Non-compliance with operating instructions.
- Neglecting required maintenance and repair jobs.
- Damage caused by improper carburettor adjustment.
- Wear from normal use.
- Obvious overload by continuously exceeding the upper performance limit of the product.
- Using non-approved tools.
- Use of force, improper treatment, misuse and accidents.
- Damage from excessive heat due to dirt build up around the cooling fan housing.
- Attempted adjustments and repairs by non-qualified persons.
- Use of unsuitable spare parts or non-original parts if such parts are the cause of the damage.
- Use of unsuitable or stale fuel.
- Damage caused by using the product in the hire or rental industry.

Normal cleaning, adjustments or maintenance jobs cannot be claimed as part of the guarantee.

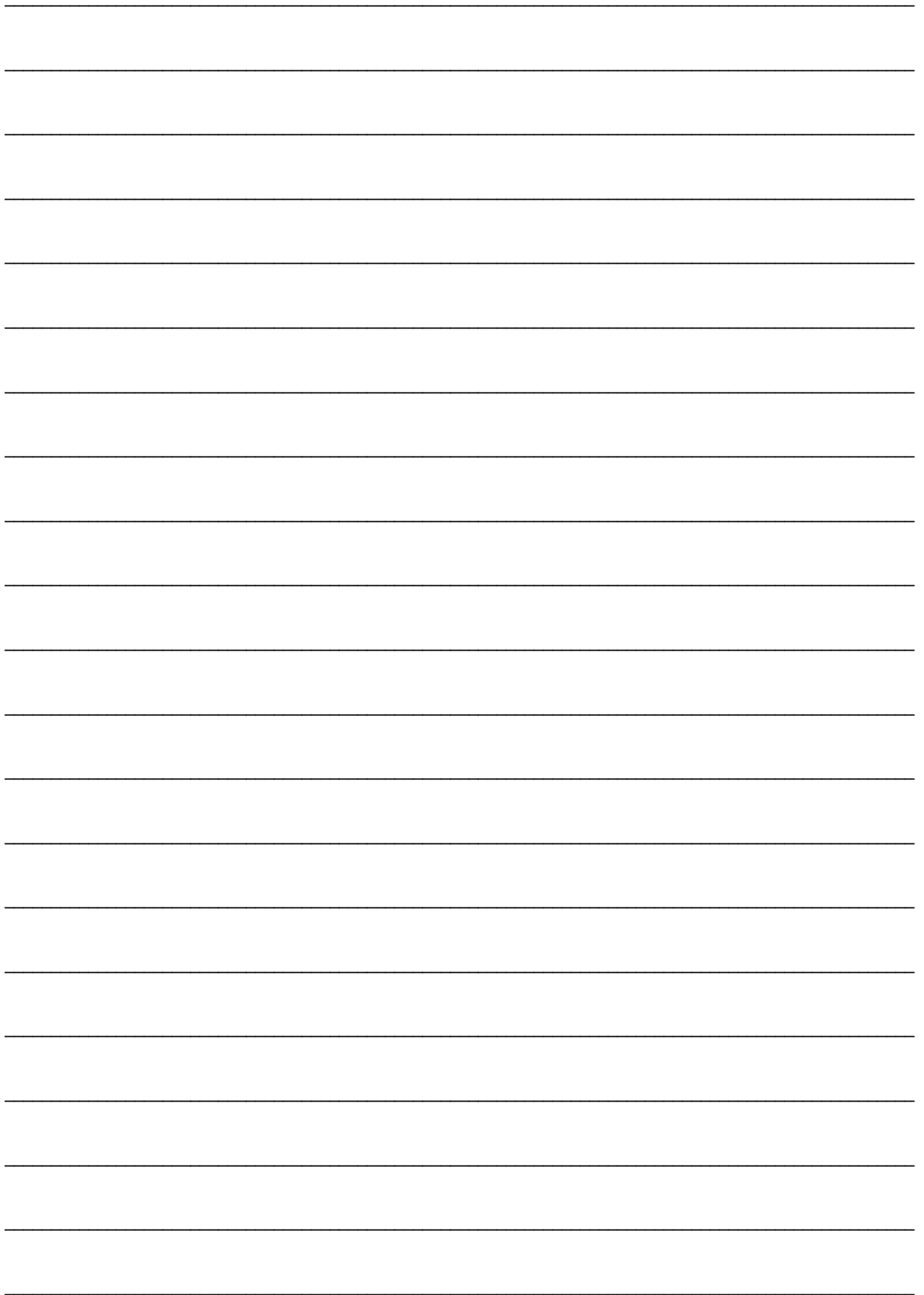
All guarantee work must be carried out by a service centre authorized by the manufacturer.

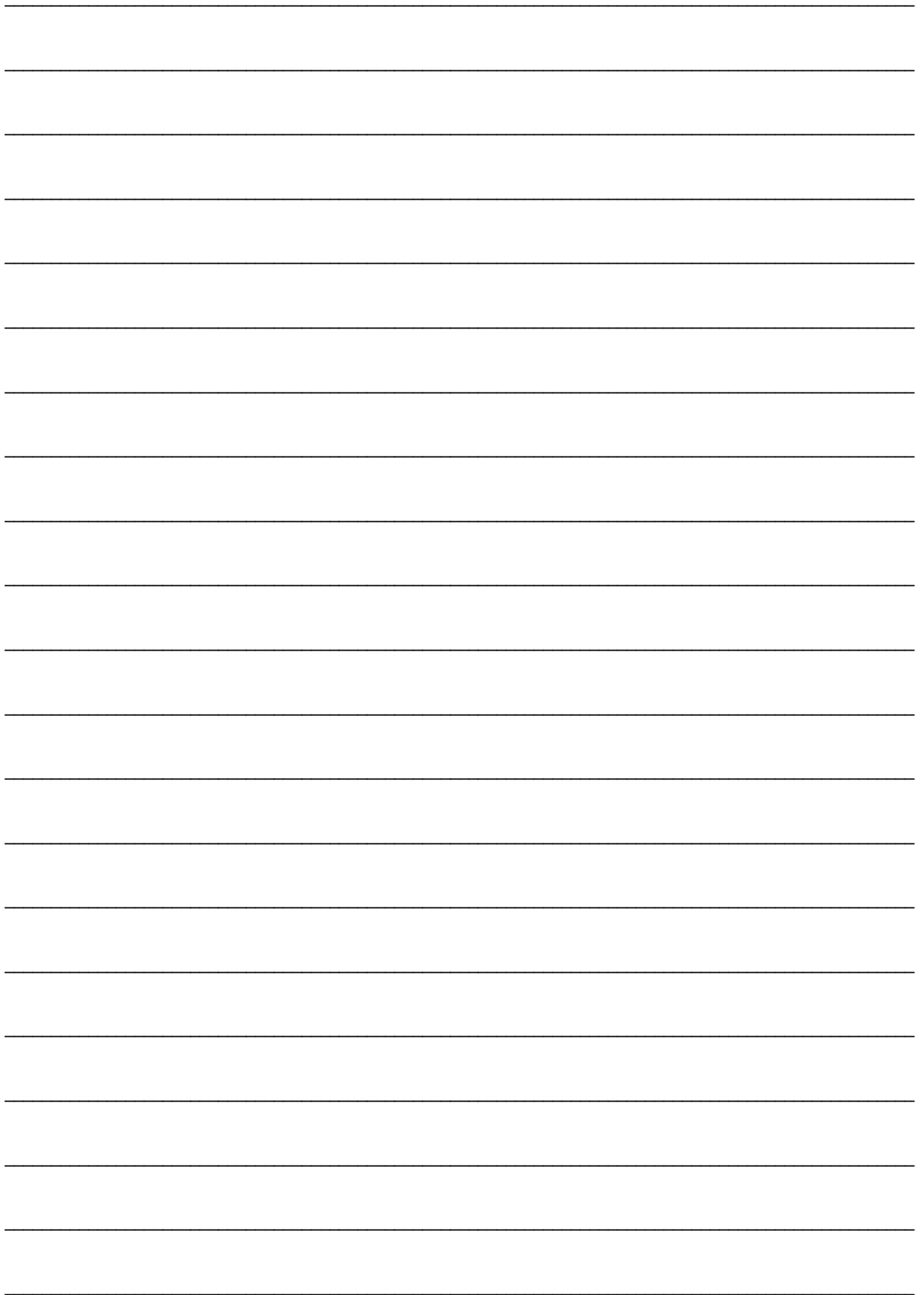
12. Parts subject to wear and tear

Various parts are subject to application-specific wear or to normal wear and must be replaced in good time if necessary. The following parts are subject to normal wear and are not covered by the manufacturers guarantee:

- Air filter
- Fuel filter
- All rubber parts which come into contact with the spray liquid
- Spark plug
- Starter

In the best interest of continued technological progress we reserve the right to change the design and configuration of any product without prior notice. For that reason, no claims can be accepted with reference to text and illustrations in this manual.





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