

GB Instruction Manual

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Wear Parts

Various operational parts are subject to normal wear and tear and have to be replaced as required. The following parts are not covered by the manufacturers guarantee: All parts which come in contact with fuel or spray chemicals and wear parts such as air filter or spark plug, for example.

CE 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.

Sindelfingen, 1st January 2002
SOLO Kleinmotoren GmbH


Wolfgang Emmerich
Managing Director

Prelude

We congratulate you on becoming the owner of a SOLO motorized backpack pressure sprayer and hope that you will be pleased with this modern equipment.

To maintain optimum performance of your motorized pressure sprayer over a long period, it is necessary for you to strictly adhere to the prescribed maintenance instructions.

SOLO products are subject to continuous research and development. It is for that reason that we reserve the right to change the shape, technology or other details at any time. No claims can be entertained based on illustrations or data provided in this manual.

Should you require further information after reading this manual, please contact your SOLO dealer.



Read this manual thoroughly prior to the initial use of this unit. Observe safety regulations and safety guide lines at all times!

Symbols

While studying this manual you will encounter these symbols:



Read instruction manual



Special care required



Not permitted!



Wear eye and ear protection



Do not smoke



No naked flame!



Start engine



Stop engine



Wear safety gloves



Fuel mixture



Choke shutter open



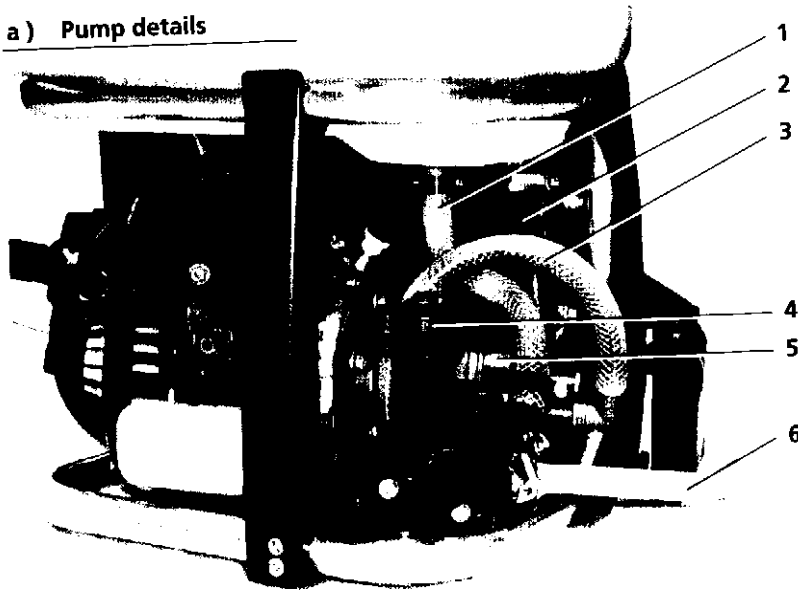
Choke shutter closed



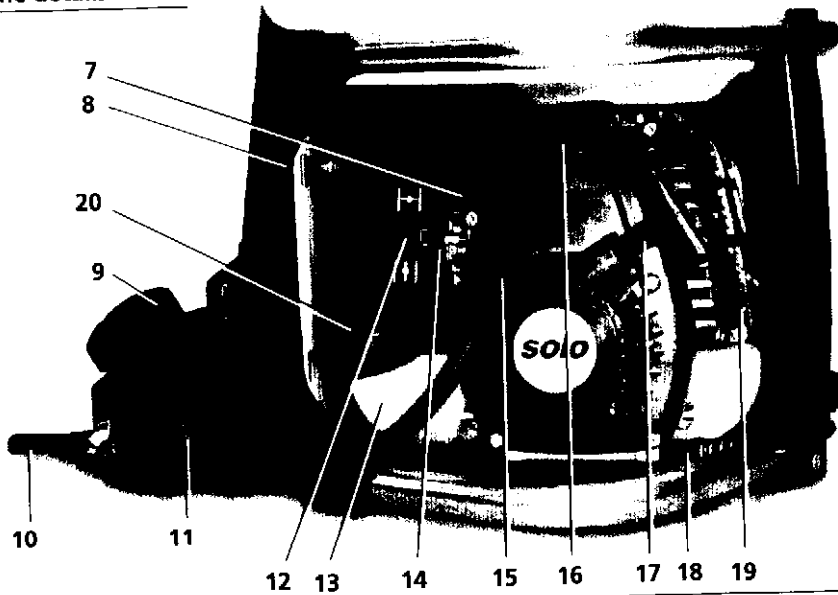
Harmful gas emission

1 Important Functional Assemblies

a) Pump details

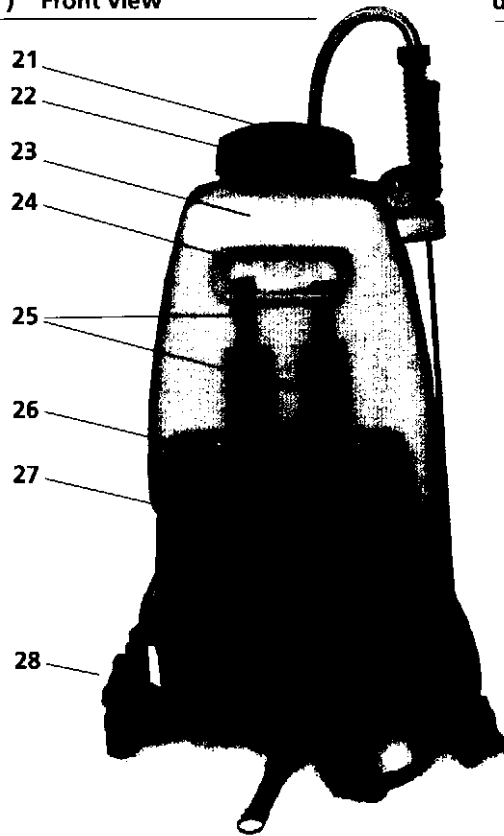


b) Engine details



- | | | |
|----------------------|-------------------|---|
| 1 Return hose | 7 Primer | 14 Choke lever |
| 2 Supply hose | 8 Back plate | 15 Throttle cable / cut out cable |
| 3 Connecting hose | 9 Strap lock | 16 Spark plug cover |
| 4 Pressure regulator | 10 Throttle lever | 17 Starter handle |
| 5 Pressure pump | 11 Stop switch | 18 Bottom plate with anti-vibration springs |
| 6 Pressure hose | 12 Air filter | 19 Exhaust |
| | 13 Fuel tank | 20 Fuel tank lid |

c) Front view



d) Rear view



- 21 Tank lid ventilated with filler basket
- 22 Trigger handle with pressure gauge
- 23 Tank, 20 litre capacity
- 24 Handle, integrated in tank

- 25 Carrying strap
- 26 Spray wand with adjustable nozzle
(other nozzles may be supplied at times)
- 27 Back cushion
- 28 Strap holder

Safety Guide Lines and General Hints



- First time operators should receive instructions by the seller or an experienced specialist
- The operator bears responsibility towards others within the operating area of the motorized backpack pressure sprayer
- Only use the machine while in good physical condition. Fatigue and illness leads to reduced level of concentration. Always operate with calm and with full attention to the job.
- Never work while under the influence of drugs or alcohol.
- The exit speed of liquids from the adjustable nozzle, when set to stream, is quite high. Never direct nozzle at animals or persons.
- While operating, engines emit toxic gas. Never operate an engine driven machine in closed or poorly ventilated areas. Danger from deadly fumes!

Safety Equipment for Personal Protection

Wear clothes and equipment that comply with regulations



- Clothing should be appropriate, i.e. reasonably tight without being obstructive. Do not wear loose coats, shorts, sandals, scarves, neckties, jewellery or other objects that may get caught on branches.
- Protect your face and eyes with a face mask or safety goggles.
- When required, wear a breathing mask to avoid inhalation of toxic gases.
- Always wear suitable ear protection (ear muffs, ear plugs etc.) to prevent the loss of hearing.
- Wear solid shoes with non-slip soles.

Operational Guide Lines

The machine must only be used for applications mentioned in this manual. Always observe safety guide lines while operating the machine. This motorized pressure sprayer is suitable for the application of liquid plant protection materials, which have been approved by the national authorities. Output volume is largely subject to adjustments to nozzle and spray pressure.

The SOLO motorized pressure sprayer is recommended for the application of approved liquid plant protection materials in horticulture, forestry, viticulture, special crops and for tree nurseries. The sprayer is not permitted to be used for the application of liquids with high acid content, liquids for etching, products with solvent or with combustible / explosive liquids.

All safety regulations applicable to this industry as well as generally accepted safety guidelines are to be observed. Liquids, other than approved plant protection materials, may only be used if any possible harm to persons, animals, the environment or the machine itself can be excluded. For checks on the resistance of materials, the operator/owner of the machine, possibly in conjunction with the manufacturer of the liquids to be applied, the manufacturer will provide details of the materials used for the machine. The manufacturer of the pressure sprayer is not liable for any damage caused by unauthorized changes and modifications to the pressure sprayer.

The motorized pressure sprayer must only be used for the purpose it has been designed for.

Protection of Environment

Care for your environment

- Watch out for persons and animals who may be present within the operational area
- Remember that noise emission is harmful to the environment. Where applicable, observe local noise reduction periods.

Safety Guide Lines

- Read the operating manual prior to using the machine
- Children and youngsters must not operate the machine. Exempt are persons over the age of 16 who are under supervision for educational and training purposes.
- The operator is liable towards others within the area of operation of the machine.
- Motorized pressure sprayers must only be used for their intended and approved scope of application.
- The intended and approved scope of application includes adherence to important guidelines provided in this manual and compliance with industry regulations.
- When applying plant protection chemicals or pesticides, always observe all safety regulations provided by the chemical manufacturer.
- Never direct spray against persons or animals. Chemicals or liquid pressure may lead to severe illness or injuries.
- When the ambient temperature is below 0 °C, always check on the suitability of the pressure sprayer first.
- The use of hot liquids is not permitted!
- The operator has to wear ear protection.
- Always thoroughly cleanse the motorized pressure sprayer after every use. Chemicals can be very dangerous for persons, animals, plants and for the environment.

- While using the sprayer, always wear protective clothing, goggles and a breathing mask to avoid any contact with chemicals.
- Always observe regulations for the disposal of residual spray liquid.
- The operator should be trained in the handling and use of chemicals as well as in First Aid.
- Prior to commencing spraying, adjust the carrying straps of the sprayer correctly.
- Any safety or protective devices installed on the sprayer must not be removed for spraying.
- Ensure the sprayer is in complete working order prior to commencing work.
- The valve lever must not be locked while operating the machine.
- After finishing, always release any pressure in the suction and delivery hose system.
- Maintenance jobs may only be carried out after all pressure in the sprayer has been released, the engine has completely stopped and the spark plug cap has been disconnected.
- Do not start the engine of the sprayer closer than 3 metres to the fuelling spot.
- Never store or service the sprayer near a naked flame.
- The combustion engine must not be started or operated in closed areas. Green houses should be well ventilated.
- Repairs should be carried out by a specialist service facility.
- Ensure all hose and screw connections are tight and firm prior to commencing any spraying job.
- The chemical tank should be closed.
- Check the wind direction prior to spraying.
- Never point the spray wand towards persons or animals.
- Always stop the engine for re-fuelling or for service jobs. Do not smoke and keep away from a naked flame.
- A full sprayer will change your normal body balance. Always ensure good balance and safe footing.
- Ensure the carrying straps are not twisted before shouldering the sprayer.

Maintenance and Care for SOLO Plant Protection Equipment

Motorized equipment should be maintained on a regular basis. Only do those repair and maintenance jobs which are described in this manual. An authorized Service Centre should make all other service jobs.

Proper care also includes:

- Checking of the liquid tank
- Checking all hoses and hose connections
- Cleaning of all filters and check for damage. After every use, thoroughly rinse the tank, pump and hoses with clean water. Never use solvent-containing cleaning substances
- In the event of unexpected problems, please contact your dealer.

Carburetor Adjustment

The carburetor has been adjusted optimally at the factory. Depending on the operational altitude of the machine, a re-adjustment of the carburetor may be necessary.

The carburetor is equipped with 3 adjustment screws:

1. **Idling Set Screw**
2. **Low speed mixture screw (L)**
3. **High speed mixture screw (H)**

The adjustment of the low speed and high speed mixture screws is limited.



Caution! The carburetor is adjusted for maximum engine performance. An engine speed counter is required for correct adjustment!

Engine Adjustment Data

The following data is provided for specialists only!
Basic adjustment data is for the sprayer complete with assembled spray wand:

Gently turn in the L-adjustment screw and H-adjustment screw as far as they can go. Do not use force. Unscrew both screws to the recommended basic setting.

The required engine speed can be adjusted with the set screw (picture 5). Adjust the engine speed to between 6300 rpm and 6700 rpm, then adjust the carburetor.

Idling speed: 3000 rpm
Max. permissible speed: 6300 rpm – 6700 rpm



Caution: Do not adjust to a higher speed as this may lead to engine or pump damage!

Pump

The pump is maintenance free and is largely unaffected by dry running. However, to maintain a long operational life for the pump, it is recommended to always use liquid when running the engine.

The operational life of the pump can be extended if the machine is operated below max. speed and below max. pressure.

Remedy for possible pump problems:

Loss of pressure indicates a sealing problem with the diaphragm. White emulsion, visible through the oil drainage plug, will confirm this. Both diaphragm and oil will have to be replaced to make the pump operational again.

The Oil fill volume is 60 g or approx. 72 ccm.

The oil quality should be AGIP ROTRA SX 75W90 or similar quality such as: SHELL AX 75W90 SPIRAX, MOBIL SHC 629 (ISO W615 9).

Air Filter

The air filter prevents dirt penetrating the engine when air is drawn into the cylinder for combustion. This reduces wear to the engine.

Regular maintenance and replacement of the filter will increase the service life of your sprayer.

Air filter cleaning

A dirty air filter will reduce engine performance, increase fuel consumption and increase the level of harmful substances in the exhaust gas. A dirty air filter also prevents easy starting of the engine.

When the machine is operated for most of the day, the air filter must be cleaned daily. When used under extreme dusty conditions, clean more frequently.

For cleaning, simply tap the filter against a hard, flat object. Under extreme dust conditions, gently clean the filter with compressed air from inside outwards. Severely clogged or damaged filters should be replaced. Engine damage caused by an incorrectly maintained filter is not covered by warranty.

Spark Plug

The spark plug (thermal value 200) is available in different brands under the following description:-

BOSCH WSR6F
CHAMPION RCJ-6Y or other brands with same specifications

The correct electrode gap is 0.5mm.



Check the spark plug every 50 hours of operation. Plugs with worn electrodes have to be replaced.

General Maintenance Hints

After a running-in period of approx. 5 hours, all screws, nuts and hose connections (with the exception of carburetor mixture screws) within reach have to be checked for tightness and must be re-tightened if necessary.

- Cleaning, repairs or maintenance should only be commenced after the engine has stopped and the spark plug cap has been removed.
- If the lid from the liquid tank is hard to tighten or to remove, apply some oil to the o-ring inside the lid.
- Ensure the tank ventilation valve in the lid (picture 1c, 1) is in good condition and operates perfectly.

General Maintenance Recommendations

- An authorised service centre should carry out all maintenance jobs, other than those described in this manual. Only use original SOLO parts.
- Do not modify, change or alter the motorized pressure sprayer – your own personal safety is at stake.
- Do not maintain or store the machine near an open flame.
- Regularly check and test the ventilation valve in the lid and ensure the lid seals correctly and tightly. Always use correct spark plugs that are in good order. Frequently check the ignition cable for damage.
- A motorized pressure sprayer operated without a muffler or with a defective muffler is a fire hazard and could damage hearing. Do not touch a hot muffler.



When transporting the pressure sprayer in a vehicle, ensure the machine is tied down securely and ensure there are no fuel leaks.

- When storing the machine for a longer period, always completely drain the liquid tank, hoses, pump and fuel tank.

Preparation for Storage

The motorized pressure sprayer should be covered and stored in a dry room not accessible to children.

Special steps to preserve the engine for storage are not required if our recommended 2-cycle oil "Castrol Supper TT" has been used.

Empty fuel tank prior to extended storage.

Even though the liquid tank is manufactured from UV-stabilized material, we recommend storing the sprayer away from direct sunlight and in a dry room that is inaccessible to children and animals.

In areas of possible danger of frost, always completely drain the tank, pump, pressure regulator and hoses.

Fuel



Petrol and Oil Mixture

Petrol: The engine of your pressure sprayer is a high performance two-cycle engine that has to be operated with a petrol/oil mix. The mix can be prepared by the operator or purchased from specialist dealers as pre-mixed special fuel for two-cycle engines.

Important: The fuel mix can be made of standard lead-free petrol, lead-free Euro petrol or lead-free Super petrol with a minimum rating of 92 ROZ.

Mix Ratio: The mix ratio of petrol / oil is **50:1 (2%)** when using our recommended special 2-cycle oil "Castrol Super TT". **If the recommended oil is not available, a mix ratio of 25:1 (4%) has to be used.**

Note: Never store fuel mix for longer than 3 – 4 weeks.
Castrol-Oil TT other brand 2-cycle oil

	Castrol-Oil TT 50:1(2%)	Marken 2-T-Oil 25:1(4%)
1000 cm ³ (1 Liter)	20 cm ³	40 cm ³
5000 cm ³ (5 Liter)	100 cm ³	200 cm ³
10000 cm ³ (10 Liter)	200 cm ³	400 cm ³

Running-In Instructions

For the first 5 tank fillings use a mix ratio of 25 : 1 (4%) even when using special two-cycle oil !

- Do not smoke or be near an open flame when handling fuel
- Let the machine cool down before re-fuelling
- Fuel can contain solvent-like substances. Avoid any skin and eye contact with mineral oil products. Wear gloves when handling fuel. Frequently change and clean all protective clothing. Do not inhale petrol fumes.
- Do not spill fuel or oil. Should a spill occur, immediately clean the pressure sprayer. Fuel should not enter the clothing of the operator. Should clothing become contaminated with fuel, change clothing without delay.
- Ensure no fuel or oil is spilled on the ground (protection of environment). Use a suitable ground cover when re-fuelling.
- Do not re-fuel in closed rooms. Fuel vapours collect at ground level (danger of explosion)
- Transport and store fuel and oil only in approved and specially marked containers. Fuel and oil should be kept inaccessible to children.
- When operating the sprayer, avoid inhaling exhaust gas. The use of this motorized sprayer is not permitted in closed areas.



Caution and care is required when handling fuel. Observe safety instructions at all times!

Only re-fuel after the engine is shut down !

- Thoroughly clean the fuel inlet area on the machine.
- Remove fuel tank lid and fill fuel only to the bottom of the filler inlet. Do not add more fuel and always use a funnel with filter if at all possible.
- Take care when re-fuelling and do not spill any fuel mix.
- Firmly re-tighten fuel tank lid.

Assembly

The sprayer has to be completely assembled prior to its first use.

Check list to ensure all parts were supplied:

- 1 off motorized pressure sprayer
- 1 off pre-assembled spray wand
- 1 off pre-assembled trigger valve with pressure hose
- 1 off clamp to fasten pressure hose
- 1 off spray wand holder
- 1 off operating manual

Preparing the sprayer for operation

The sprayer has been partially disassembled for transport reasons and has to be completed prior to its first use. (fig. 1a-d, 2,3,4,5) The sprayer may only be used when completely assembled.

- Connect the carrying strap holder with pre-assembled throttle lever (10) to the hinge on the back plate and secure with a screw. (fig. 2)
- Attach the spray wand bracket to the liquid tank. (fig. 3)
- The spray wand with adjustable nozzle is sealed to the trigger valve with an O-ring 16x3. Attach the wand to the trigger valve and tighten with the cap nut. (fig.4)
- The pressure hose (6) is attached to the outlet nipple of the regulator (4) and secured with a clamp.



Cold Engine Start

Ensure the trigger valve on the spray wand is closed.

- Set ignition switch to operating position 'I'. Trigger valve (fig.4) should be shut (**refer to page 8)
- Move throttle lever (5) to half-throttle position (fig.5)
- Close choke with choke lever (14)
- Push primer bulb (7) repeatedly until fuel is visible in the bulb.
- Place machine on the ground and securely hold it with your right hand. Use your left hand to slowly pull out the starter handle until some resistance is felt. Then pull through briskly and more forcefully until the engine "fires". Always pull the starter rope from the starter in a straight line and guide it back slowly. This will save excessive wear to the starter housing and the starter rope.
- Next move choke lever down into "open choke" position and continue with the starting procedure. When the engine runs, use the throttle lever (10) to control the engine speed.
- To bring the engine to idling speed, move the throttle lever to position "min".

Warm Engine Start (after engine has been briefly shut down)

Start the engine without choke, i.e. leave choke in open position.



Shutting down the engine

Move the throttle lever to idling/ stop position. Set ignition switch to position "o" until the engine shuts down.



Caution: Should the engine not start despite several starting attempts, the combustion chamber in the engine is likely to be 'flooded'.

In this case it is recommended to remove and dry the spark plug (fig.10). Move the ignition switch (11) to position 'O' and the throttle lever (10) to full throttle 'max'. Pull the starter handle several times while the spark plug is removed. This will clear the excess fuel in the combustion chamber. Re-fit the plug and repeat the starting procedure.

Adjusting the Carrying straps

Put the sprayer on the back and secure both straps in the quick release locks. (fig. 1b,9).

The straps are adjustable to the required length with buckles. (fig. 7) Tighten straps by pulling down the strap ends (a). By lifting the buckles, the strap tension is released (b).

Note: Adjust the straps in such a way to allow the back plate to rest firmly and securely against the back of the operator. An additional waist belt, part number 4900109, is available as an accessory from your specialized dealer. (fig.8)

Operational Hints

Before starting the machine and before commencing work, check the sprayer to ensure it is in good operating condition with all systems in good order. (Throttle system, ignition switch, protection system, carrying straps).

Also check for fuel and spray solution leaks. All hose connections should be tight and the trigger valve should be closed. The operator should have firm footing during the starting procedure and while working.

The body position should be secure and comfortable. The motorized pressure sprayer should be started at a distance of at least 3 metres from the re-fuelling spot.

Spray Solutions



Caution - Danger

Avoid direct contact with spray solutions. Observe additional safety instructions and safety guidelines on the label of the spray material. Immediately stop operating if you feel ill or excessively fatigued. If the condition persists, seek medical advice.

To refill spray solution, always stop the engine and take off machine.

Liquid Tank for Spray Solution

Filling of the tank

- Ensure the trigger valve on wand is closed.
- Always use the inlet filter when filling spray solution. After filling the tank, stir the spray solution to prevent chemical deposits on the tank floor.

Note: Ensure the trigger valve is shut before starting the engine.

- Always use the filter when pouring liquid into the tank. Dirt and impurities can lead to blocked hoses or blocked pump.
- The capacity of the spray tank is 20 litres.

Note: The markings on the side of the spray tank indicate 9, 10, 15 and 20 litres.

- Do not fill spray tank above the highest mark. Clean up any spilled spray solution.
- Exactly follow the recommendations by the chemical manufacturer.
- Never allow children or persons who are not familiar with the handling of chemicals to use the sprayer or handle chemicals.
- Keep the lid of the spray tank closed tightly to prevent spillage of spray solution.

Note: Never mix chemicals in the spray tank of the sprayer. Deposits and impurities can cause pump failure.

Reduction of Spray Drift

- Do not use the sprayer during periods of strong wind or rain to avoid uncontrolled chemical distribution over a large area.
- Check wind direction before spraying. Do not spray towards open doors or windows, cars, animals, children or towards anything which could be hurt or damaged by the spray.
- Be extremely careful while spraying. It is preferable to spray during early morning hours or in the evening when there is air movement. Ensure that spray is only applied to those plants for which the spray is intended. Always use caution, care and consideration.

Spray Volume

Prepare spray solutions according to the recommendation of the chemical manufacturer. Only prepare the actually required spray volume.

Approx. requirements for plant protection:

Low and ground covering crops	0,3-0,5 l for 10 sq.m.
Low growing shrubs	1,0-1,5 l for 10 sq.m
Trellis crops or pencil type bushes	0,5-1,0 l per unit.
Larger bushes and shrubs	2,0 l per unit.

Preparation of chemical solutions for plant protection

- Prepare solutions only in open air, never inside the house, stables or storage areas for food and animal feed. Chemical in powder form should be mixed well in a separate container (never in the spray tank of the sprayer), stirred and then filled in the spray tank!

Note: If required, the chemical solution in the spray tank can be stirred again with the spray wand.

- When using plant protection chemicals in liquid form, fill approx. of the spray tank with water and add the already diluted chemical solution to the tank. Fill tank to the required level with water and mix well.
- When using spray solution made from plant matter, ensure the solution is filtered before pouring it into the spray tank.



Always follow the safety directions from the chemical manufacturer !

Filling

- Always use the filter supplied with the machine and observe the complete filling process.
- The external filling hose should not come in contact with the chemical solution inside the spray tank.
- The spray solution is not to be drawn into the water distribution system.
- When filling spray solution it is required that the environment, natural surroundings and the water system does not come in contact with the spray solution.
- Run-off from overfilling, contamination of public waterways, water and drainage channels should be completely avoided.

Pressure Regulation

Select a certain spray pressure, depending on nozzle setting, nozzle type, spray solution, walking speed etc. The pressure should remain constant and can be checked on a pressure gauge attached to the trigger valve. Pressure can be changed by:

- a.) increase the engine speed (higher speed = higher pressure)
- b.) adjustment to the pressure regulator (turn towards the right – clockwise) = higher pressure. Turn towards the left (anti-clockwise) = lower pressure.

Spray Nozzle

- Generally (but this may vary depending on the order requirements) an adjustable nozzle is supplied with the sprayer.
- This nozzle allows the following output: Set for fine spray approx. 0.8 l/min atbar. Set for stream and for distance approx. 1.5 l/min. atbar.

Technical Specifications Motorized Pressure Sprayer 432

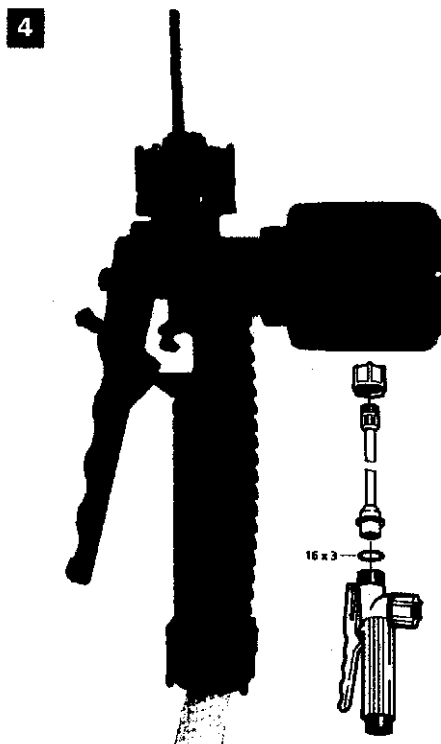
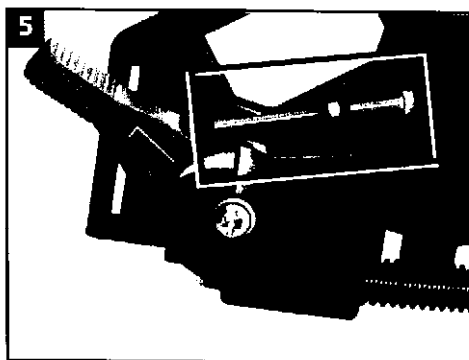
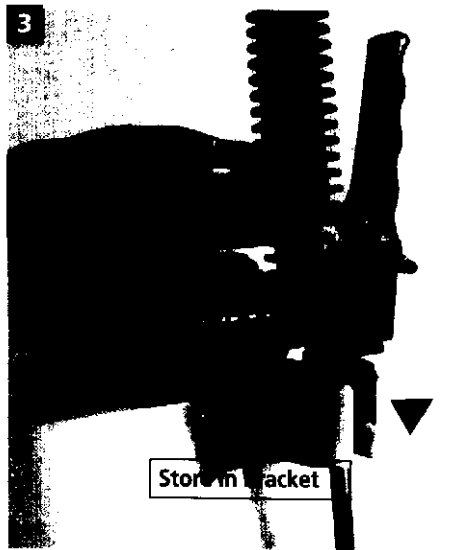
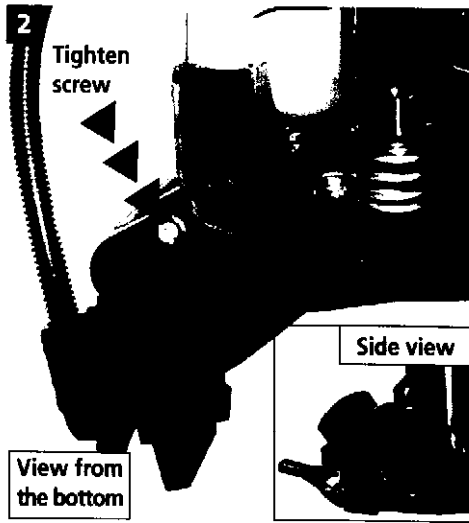
Engine type	SOLO single cylinder two cycle engine
Engine capacity	25cc
Bore / Stroke	33 / 30 mm
Engine power in kW at 1/min	0.75 / 6500
Average engine idling speed 1/min	2800
Carburetor	all-position diaphragm carburetor with primer and integrated fuel pump
Ignition	electronically controlled and maintenance free magneto ignition
Fuel tank capacity, litre	0.3
Capacity of spray tank, nominal litre	20
Measurements without spray wand height, width, depth, cm	67 / 38 / 26
Weight, kg	6.5
Work site related noise emission value LP to ISO 7182 ¹⁾ dB (A)	82
Sound pressure level LW dB/A to ISO 9270*, measured / guaranteed	94.2 / 95
Weighted medium value of acceleration coefficient to ISO 7505	< 2.0
Pump	Piston-Diaphragm pump
Flow rate, max.	3 l/min
Operating pressure, bar	1 – 8
Spray wand	brass, 500 mm
Spray nozzle	adjustable nozzle *
Spray hose	10 x 3 mm

Maintenance Chart

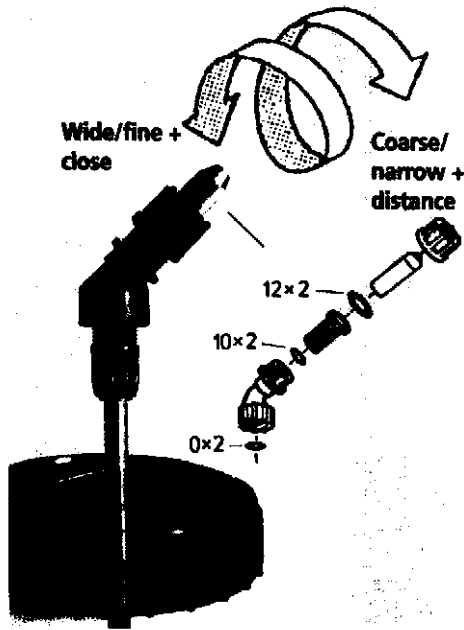
		before every use	daily	weekly	after 5 hours	after 50 hours	as required
Carburetor	check idling speed	X					X
Airfilter	clean		X				
	replace						X
Spark pug	re-adjust electrodes					X	
	replace						X
Cooling Air Inlet	clean			X			X
Cylinder fins	clean			X			
Fuel tank	clean					X	
All accessible screws (except carburetor mixture screws)	re-tighten				X ¹⁾		X
Operational control handle	check all functions	X					X
Complete machine	visual check	X					
	clean						X

1.) Data provided is based on equal parts for operational conditions in idling mode and in full speed mode.

* This may vary depending on order or supply requirements and availability



6 Nozzle adjustment



In the best interest of continued technological progress we reserve the right to change design and configuration of any product without prior or other notice. Therefore, please note that text and illustrations of this manual are not to be considered binding and do not constitute a basis for legal or other claims.

