

# swingfog® SN 50

Handbook

Spare Parts List

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## 1.0 Safety precautions

**swingfog**® appliances are fully tested and are provided with safety devices. However, failure can occur as a result of servicing errors or misuse, therefore, be aware of the safety precautions provided and read the instruction manual before you use the appliance. Only qualified personnel are authorized to operate the appliance.

Read, understand and obey the operating and maintenance instructions and keep them in a legible condition. We guarantee correct operation and function of the appliance, if it is used and maintained in accordance with this instruction manual. No liability will be accepted for damage to personnel, people, material or consequential damage, when the appliance is not used, operated or maintained in accordance with the instructions contained in the instruction manual.

Warnings and Notes are highlighted in this manual as follows:



**Warning:**

Identifies information related to safety.



**Note:**

Identifies user tips and other useful information.



Wear ear protection



Hot surface

## 1.1 Usage

**swingfog**® appliances process pre-mixed chemical preparations or chemical preparations that are mixed with a carrier substance, into a fine aerosol fog.

The appliances are exclusively for the following areas of application in both open and confined spaces:

- Mosquito and pest control
- Locust control
- Pest control in warehouses
- Plant protection in plantations and greenhouses
- Application of plant fertilizer
- Desinfection
- Deodorization
- Production of fog for effect or training purposes (e.g. film, fire service etc.)

The selection and use of chemical preparations and carrier substances is subject to legally binding regulations and the respective manufacturer's user guidelines.

The fogging mixture supply parts and the spraying tank are made from stainless steel, polyethylene and Teflon. Only use fogging substances, that are compatible with, and do **not** attack these materials.

Unauthorized modifications and changes made to the appliance are not approved, on the grounds of safety. The manufacturer's warranty becomes invalid in such an event. The same applies if, during maintenance and/or repair, original spares are not used.

## 1.2 Appliance handling

- The appliance is suitable for portable (shoulder carried), mobile or stationary use. If used mobile or stationary, the appliance must be positioned horizontally and stable.
- During portable use, carry the machine with the carrying strap over your shoulder with the fog mixing tube pointing rearwards. Hold the appliance horizontally or incline it slightly downwards. The tank side of the appliance has to show towards your person. Walk only forward.
- During start and operation of the appliance, do not let persons, animals or combustible materials go near the outlet of the fog mixing tube.
- Before you operate the appliance, make sure that it is assembled correctly (especially the fog mixing tube, refer to § 5.1). The spraying tank and fogging mixture supply parts, as well as the fuel tank and carburettor must be serviceable and not damaged.
- Make sure the appliance does not leak (seals and gaskets, tank caps and chemical solution lines).
- Because the heat conducting parts of the appliance become very hot during operation, do not touch them (danger of burning). Make sure that the protective grid (refer to Spare Parts Illustration 01) is installed correctly. The protective grid should prevent any form of direct contact with the extremely hot cooling jacket. Do not touch this part, as it becomes hot through heat-radiation. After shutdown of the appliance, leave a suitable amount of time for the appliance to cool down.
- At full power, the appliance develops a sound level equivalent to 95 dBA. Therefore, it is necessary to wear ear protection. With a muffler (optional accessory) the sound level is 90 dBA.
- Starting of the appliance is achieved using an electronic ignition coil. Personnel with heart pacemakers must consult their doctor before they attempt to start the appliance. The same applies for repairing the ignition system. During operation, the ignition coil is inactive.
- When the appliance does not start by e.g. wrong pumping, the carburettor might be flooded with fuel and has to be ventilated. Refer to § 6.0.
- When the appliance stops due to lack of fuel or a handling error, immediately close the chemical solution tap, and point the fog mixing tube downwards to allow the chemical fogging mixture residue to run out. Small quantities of combustible fogging mixtures can ignite and have to be extinguished immediately. This action prevents fogging mixture from entering into the hot combustion chamber of the appliance. Machines which are equipped with a chemical solution cut-off device automatically switch off the supply of fogging mixture at the fog solution socket, and thereby prevents any fogging mixture from entering into the hot resonator where it could ignite or discharge in an unfogged condition (see § 11.0).
- An appliance that is still warm from operation must not be transported in closed vehicles (fire hazard). When transporting the appliance, make sure that it stable and secure.

### 1.3 Operation and application

- Before use, operators must be aware of all safety protection measures.



**Warning:**

The appliance has to be attended and observed by the operator all times during operation.

- The selection of chemical formulations and carrier substances is subject to legally binding regulations and the manufacturer's user guidelines. Follow the chemical supplier's instructions for the safety and mixing of chemicals. Do not mix or prepare more chemical preparation than is required. Incorrect application of chemical preparations can cause damage and unsatisfactory effects.
- Use breathing protection apparatus when health is at risk from the inhalation of vapors and suspended particles. In confined spaces, e.g. greenhouses use a full mask with combined filters (gas filter type A, gas filter class 2 and particle filter minimum P III). When there is more than 1% (by volume) of gas pollution, or less than 15% (by volume) oxygen content, use an independent breathing apparatus system (typically fed through hoses directly from compressed air bottles).
- Wear suitable protective clothing (overall, gloves, head cover), to protect your skin from exposure to fogging mixtures. Wear suitable ear protection. Always fog in such a way that contact with the fog is avoided as much as possible.
- Do not let people go into rooms, buildings and areas being treated by fogging. Put appropriate warning signs where people can see them.
- Close off areas where harmful substances have been dispersed and only enter them when the fog has settled, or when wearing protective clothing and breathing apparatus. Make sure that rooms are ventilated thoroughly before you give clearance for them to be used again.
- Plan your work program in such a way that the appliance draws in as little fog as possible. In open spaces, fog in the direction of the wind, in confined spaces, so that you can make your way to the exit, without having to go through treated areas. Make sure that your route is clear and that an excessive fog concentration does not develop.
- Make sure that the connections of the chemical solution line are tight and sealed, in order to prevent damage through the leakage of concentrated fogging mixture. When effecting plant protection, do not spray directly onto the plants. For stationary application in greenhouses, position the appliance either at the main entrance or cover the planted area directly in front of the appliance with a sheet.
- Do not direct the fog against permanent obstructions or walls, maintain a minimum distance of approximately 3 m.
- Never leave the appliance in direct sunlight or in the vicinity of heat sources.
- After switching off the appliance, open the tank cap of the spraying tank to release the tank pressure.
- Do not put unwanted fuel, chemicals or other hazardous materials in any form of public drainage system. Only dispose of hazardous substances in accordance with local health and safety regulations or other applicable legal requirements.

## 1.4 Repair

- Only trained, qualified and authorized personnel are allowed to repair the equipment. Only use original parts, supplied by the manufacturer.
- Before you start a repair, switch off the appliance and let it cool.
- After repair work, reassemble the safety devices (e.g. protective grid) and check the correct assembly and installation of all parts. Make sure that the tank caps and the gaskets are serviceable.
- On completion of repair/maintenance, do a functional test of the appliance using water as the fogging agent.
- Avoid contact with the high-tension ignition components (spark plug, ignition coil) during start and repair/maintenance.
- We recommend that the appliance is inspected and checked by a qualified and authorized specialist (company service representative) on a regular basis (e.g. annually).

## 1.5 Fire hazard

- Always observe the prevailing rules and regulations related to precautionary measures for fuel-operated equipment.
- Do not smoke during refueling or operation of the equipment. In enclosed areas, make sure that there are no naked flames or similar open heat sources.
- Do not spill fuel when refueling the appliance. If a spillage occurs, wipe it up immediately. Under no circumstances should the appliance be filled with fuel when it is in a hot condition. Remove all residual fuel and fog solution from the tanks when the appliance is placed in long-term storage.
- Do not use the appliance in the vicinity of combustible substances.
- Clean the appliance at regular intervals (refer to § 8.0), in order to prevent ignition or sparking through residues and carbon build-up in the resonator.
- When fogging in confined spaces, make sure that a fire extinguisher is in close proximity. If a fuel or chemical fire occurs, attempt to smother the flames with a fire blanket and/or use a fire extinguisher, which is approved for burning fuel and chemicals.
- Do not start the appliance, either during normal use or repair and maintenance, when the swirl vane part no. 194 7730 and/or the non-return valve part no. 200 3410 are not installed. Fuel can ignite and flames can be discharged from the bores of these parts.  
As a safety precaution, always disconnect the spark plug cap from the spark plug, if the starting unit and/or the non-return valve are disassembled.
- A basic fire hazard cannot be discounted, because the appliance is operated with an open flame in the resonator. As a result, it is not permitted to use the appliance in enclosed areas, in which there is a danger of explosion (e.g. grain silos).

Possible causes of fire include:

- If the settings of the appliance are incorrect, then a naked flame could be discharged from the resonator. This flame could ignite either combustible materials close to the appliance, or combustible fogging substances.
- Incorrect operation: Before you switch off the appliance, close the chemical solution tap at the spraying tank. Allow the appliance to run for approx. 1/2 minute until remaining fogging mixture is fogged out to clear the chemical solution line. Only switch off the engine once the above task has been performed. If the appliance is stopped with the chemical solution tap open, the overpressure in the spraying tank will release by forcing the fogging mixture to flow unfogged into the hot resonator. In case your machine is equipped with an automatic chemical solution cut-off device, and you have either switched off the machine, or the appliance stops due to a lack of fuel or a handling error, the automatic solution cut-off device acts and prevents fogging mixture from entering into the hot combustion chamber due to the overpressure in the spraying tank. In this case, do not operate the operating lever of the solution cut-off device because this would release again the flow of fogging mixture. This is especially dangerous in case the chemical solution tap was not closed.



Combustible fogging mixtures will ignite and burn out of the resonator respectively out of the fog mixing tube. Burning fogging mixtures can even drop out of the machine. Water-based non combustible fogging mixtures will boil in the resonator/combustion chamber. In both cases residues of the fogging mixture will settle down in the carburettor, making a re-start of the appliance difficult.

- When the appliance stops due to lack of fuel or a handling error, immediately close the chemical solution tap, and point the fog mixing tube downwards to allow the chemical fogging mixture residue to run out. Small quantities of combustible fogging mixtures can ignite and have to be extinguished immediately. This action prevents fogging mixture from entering into the hot combustion chamber of the appliance.



**Warning:**

It is compulsory that only appliances with factory mounted automatic chemical solution cut-off devices are used when oil-based or combustible chemical mixtures are fogged.

- Contact of the hot fog mixing tube with combustible materials.
- Emission of sparks from a dirty resonator.

Due to the reasons above, the appliance must never be operated unattended.

- When using combustible substances (e.g. diesel oil, kerosene, agricultural white oil) or combustible formulations in confined spaces, make sure that an over-intensive level of combustible vapors does not develop. The recommended safety level of concentration is a maximum of 3 l/1000 m<sup>3</sup>.

**Warning:**

Never use the high-performance fog mixing tube for the application of combustible or oil-based chemical preparations, because these types of substances can ignite in the high performance fog mixing tube (discharge of flames from the fog mixing tube).

The high-performance fog mixing tube was developed for optimizing the droplet spectrum when fogging non-combustible and water-based chemical preparations.

If, in accordance with our recommendations, combustible vaporization inhibiting substances, such as glycol or emulsifiable white oil, are added to the mixture, then their share must not exceed 20 % of the total fogging mixture. If the share exceeds 20%, then the standard fog mixing tube must be used.

## 1.6 Guarantee

Read and obey the operating and maintenance instructions and keep them in a legible condition. We guarantee correct operation and function of the appliance, if it is used and maintained in accordance with this instruction manual. No liability will be accepted for damage to personnel, people, material or consequential damage, when the appliance is not used, operated or maintained in accordance with the instructions contained in the instruction manual.

Liability will also not be accepted for damage to personnel, people, material or consequential damage caused by chemicals or carrier substances.

For reasons of safety, arbitrary alterations and modifications are forbidden. Such actions will also invalidate our guarantee. The same is valid when no original parts are used for maintenance and repair.

## 2.0 Technical data

<b>Power, combustion chamber</b>	18.7 kW/25.4 hp (16,100 kcal/h)			
<b>Fuel tank</b>				
Stainless steel, capacity	approx. 1.4 l			
Feed pressure	approx. 0.12 up to 0.13 bar			
Fuel	standard grade petrol, leaded or unleaded, at least 74 octane			
Fuel consumption	approx. 2 l/h			
<b>Spraying tank</b>	SN 50	SN 50 PE	SN 50-10	SN 50-10 PE
Capacity	6.5 l	7.0 l	9.0 l	10.0 l
Feed pressure	stainless steel	Polyethylene	stainless steel	Polyethylene
	approx. 0.3 up to 0.35 bar (depending on dosage nozzle used)			
<b>Ignition</b>	electronic ignition coil, 4 dry batteries 1,5 V/ea. in series, negative on ground (optional accessory)			
<b>Output</b> (measured with water, approx.)	dosage nozzles, stainless steel			
	0.7	10 l/h		
	0.8	14 l/h		
	0.9	17.5 l/h		
	1.0	20.5 l/h		
	1.1	23.5 l/h		
	1.2	27 l/h		
	1.4	32 l/h		
	1.7	42 l/h		
<b>Dimensions</b>	SN 50/SN 50 PE:		133 x 29 x 33 cm	
	SN 50-10/SN 50-10 PE		133 x 34 x 33 cm	
<b>Weight (empty)</b>	SN 50	SN 50 PE	SN 50-10	SN 50-10 PE
	8.75 kg	8.7 kg	9.1 kg	9.0 kg
<b>Automatic chemical solution cut-off device</b>	all SWINGFOG SN 50 versions can also be supplied with factory-mounted automatic chemical solution cut-off device for the fogging mixture			
<b>Special version Swingfog SN 50 A</b>	with factory-mounted automatic chemical solution cut-off device and special fog outlet to fog directly into smallest holes and into sewage systems, available with the following spraying tanks: SN 50/A, 6.5 l stainless steel SN 50 PE/A, 7.0 l polyethylene SN 50-10/A, 9.0 l stainless steel SN 50-10 PE/A, 10.0 l polyethylene			

**Standard accessories**

for all versions

- fogging tube, stainless steel
- dosage nozzles, stainless steel 0.8 / 1.0 / 1.2 (nozzle 1.0 already installed)
- fuel funnel with strainer, stainless steel
- chemical funnel with strainer, stainless steel
- filter insert spraying tank, stainless steel
- tool kit
- cleaning equipment
- set of spares (gaskets, O-rings, diaphragms)
- carrying strap
- ear protection (2 sets)
- dip stick, level indicator spraying tank (for **swingfog**® SN 50 and SN 50-10 only)
- instruction manual including spare parts list

**Optional accessories**

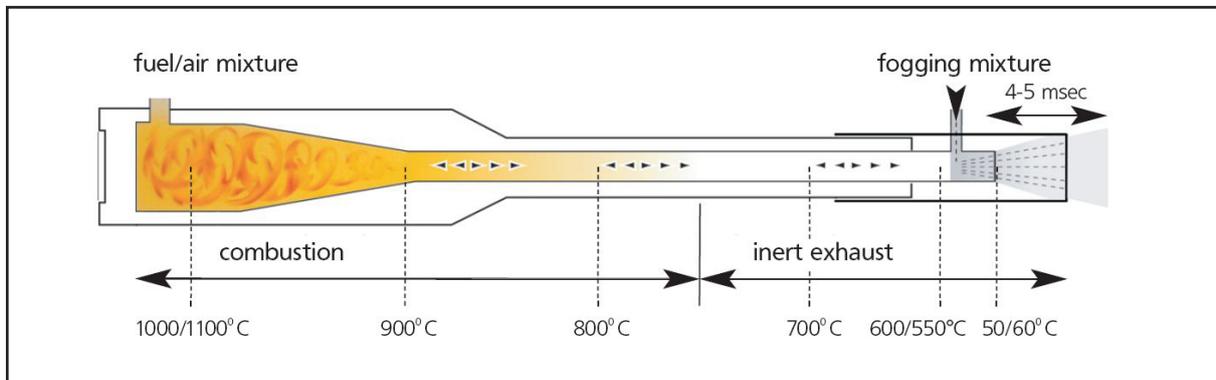
(available at extra charge)

for all versions

- Dosage nozzles, stainless steel 0.7 / 0.9 / 1.1 / 1.4 / 1.7
- High performance fogging tube, stainless steel to optimize the droplet spectrum, no deposits of larger drops in front of the unit (solely for water-based fogging mixtures)
- Silencer all versions
- Manometer set for workshop use

Subject to technical modifications.

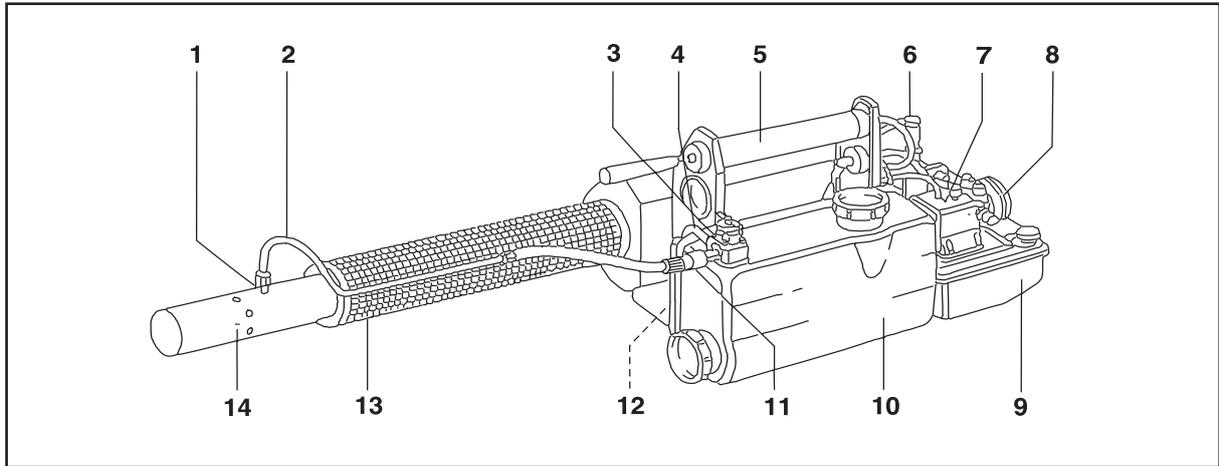
### 3.0 swingfog® working principles



#### III. 1 Combustion chamber and resonator of **swingfog®** fogging appliances

swingfog® fogging appliances are fuel-driven and operate according to the „Swingfire“ process. A fuel/air mixture is ignited in the combustion chamber and produces a column of gas in the resonator tube which oscillates approximately 90 times per second. The fogging mixture is fed into the high-speed discharge airflow at the end of the resonator, where it is converted into fine aerosol droplets, which produce a light floating fog. Fuel and the fogging mixture are supplied by a slight over-pressure in the respective tanks. With the exception of synthetic diaphragms, the system has no mechanically moving parts and, therefore, practically no wear. Electrical energy is required only for starting the machine. Once the unit is running, electrical energy is not needed any longer. Electrical energy is supplied by 4 dry batteries 1,5 V each.

The temperature after the entry point of the fogging mixture is approximately 50 – 60° C (dependent on the carrier substance and output rate), and this for a dwell time of 4 to 5 milliseconds only. For this reason, temperature-sensitive substances can also be used, without suffering any damage.



III. 2

1 Fog solution socket  
 2 Chemical solution line  
 3 Chemical solution tap  
 4 Pressure hose  
 5 Starter pump

6 Spark plug  
 7 Carburettor  
 8 Non-return valve  
 9 Fuel tank  
 10 Spraying tank

11 Dosage nozzle  
 12 Battery holder  
 13 Cooling pipe  
 and resonator  
 14 Fog mixing tube

## 4.0 Application guidelines



### Warning:

Chemical preparations or biological products must only be used, as specified, in accordance with the preparation manufacturers instructions.

Preparations are available, that have been specially formulated for the fogging process, which do not require additional carrier substances for application.

Always ask the preparation manufacturer (or sales person), whether or not the preparation is suitable for the fogging process, and also what the dosing instructions are.

## 4.1 Fogging mixture

Principally preparations of the chemical industry and biological products, which can be mixed either with water or with oily carrying mediums, can be fogged.

There are also preparations on the market which are formulated “ready to use” for the fogging method. Such preparations can be used without additional carrier substances.

Check always with the manufacturer of the chemical preparation respectively with the seller, whether the chemical preparation is suitable to the nebulization method, and ask for dosage prescriptions.

### Guidelines for fogging mixtures (preparation + carrier substance) in the most important areas of application\*:

- |   |                             |
|---|-----------------------------|
| - Plant protection in greenhouses:                                | 3 - 5 l/1000 m <sup>2</sup> |
| - Stock protection, pest control<br>and vector control - indoors: | 1 - 3 l/1000 m <sup>3</sup> |
| - Vector control - outdoors:                                      | 2 - 6 l/ha                  |
| - Plant protection measures for tropical plantations:             | 3 - 6 l/ha                  |

\* Disinfection measures in the livestock industry (poultry, pigs) require higher quantities of fogging mixtures of approx. 20 l/1000 m<sup>3</sup>.

Suitable appliances are **swingfog**® SN 81-20 PE, SN 81 Pump, SN 101 M, SN 101 E, SN 101 Pump.

### Calculating the fogging mixture for oil-based chemical preparations

Quantity of the preparation in accordance with instructions  
of the manufacturer in gram or milliliter = X g or ml

+ oil-based carrier substances in milliliter = Y ml

Total fogging mixture in milliliter  
in accordance with standard values given above = Z ml

Typical carrier substances for oil-based preparations include diesel oil, heating oil, kerosene and vegetable oil or white oil with a viscosity similar to diesel oil.

### **Calculating the fogging mixture for water-based chemical preparations**

Quantity of the preparation in accordance with instructions of the manufacturer in gram or milliliter	= X g or ml
+ water as carrier substance in milliliter	= Y ml
+ Anti-evaporation agent	= <u>5 – 10 % of Z ml</u>
Total fogging mixture in milliliter in accordance with standard values given above	= Z ml

Typical vaporization inhibiting substances, which can be used, include glycol or emulsifiable white oil or special fogging carrier substance.



**Note:**

The addition of vaporization inhibiting agents for water-based fogging mixtures is necessary, in order to prevent a rapid evaporation of the fine fog droplets. If the relative humidity is higher than 90%, then 5% anti-evaporation agent is sufficient, for a relative humidity below 90%, we recommend up to 10%.

The addition of vaporization inhibiting substances is generally necessary for all chemical preparations, which are intended for use in agricultural applications. In the public health sector (vector and pest control) water-based chemical preparations are also available, which already contain vaporization inhibiting substances in the manufacturer's formulation. When using such preparations, the addition of vaporization inhibiting substances is not necessary.



**Note:**

When using oil-based chemical preparations, the addition of vaporization inhibiting substances is not necessary, as the nominated carrier substances have a vaporization inhibiting effect. The same applies to pre-mixed fogging preparations mentioned above.



**Note:**

Powder preparations should only be used for fogging if they stay in a suspended state (the powder must not settle down). Also, the fogging mixture has to be sufficiently free-flowing. In some cases it might be necessary to increase the carrier quantity.

When using water-based fogging mixtures, the fog itself is not very visible. However, this has no effect on the effectivity of the application. Visible fog is desirable, especially for applications out in the open. The visual effect can be improved by increasing the quantity of the vaporization inhibiting substance. This measure is only for improving the visibility of the fog and has no effect on the effectivity of the application.

**Note:**

For water-based fogging mixtures we strongly recommend the use of our high performance fogging tube (optional accessory, order number 196 4260) see 12.1.



For oil-based fogging mixtures never ever use the high performance fogging tube. Use the standard fogging tube only.

## 4.2 Application in confined spaces

In greenhouses an area of approximately 1000 m<sup>2</sup> can be treated from one position. Larger areas are treated in sections, each being approximately 1000 m<sup>2</sup>.

For pest and vector control measures, for instance in warehouses, a volume of approximately 2000 m<sup>3</sup> can be treated from one position. Larger volumes are treated in sections of approximately 2000 m<sup>3</sup> each.

Fog treatment is a spatial treatment.

Because of the application of concentrated fogging liquids, do not fog directly to the plants.

## 4.3 Application in open spaces

### 4.3.1 Wind force / wind direction / swath width

Wind speed is especially important for making the most of air currents for the distribution of fog.

The following Beaufort scale gives an overview of wind forces, with corresponding air speeds. The observation of visible signs in the area contributes to the correct evaluation of wind conditions. Additionally, the swath widths and effective ranges, which are dependent on the wind speed, are also given. The swath width is of special importance for the calculation of the flow rate (l/h) and the walking respectively the driving speed.

Windless conditions or low wind speeds only allow for small swath widths of up to 50 m. At a wind force of 2 or 3 (up to 20 km/h), greater swaths of up to 150 m and more are possible. This also results in enhanced saturation of vegetation and higher particle impact. This is especially desirable for the contact effect on flying pests in adult vector control in the public health sector.

Wind force	Description	Observations	Wind speed		Effective range/ swath width <sup>1)</sup> in m
			m/s	km/h	
Force 0	calm	smoke rises vertically	0.0 - 0.2	0.0 - 0.7	25 - 50
Force 1	light whiff	observable drift of smoke	0.3 - 1.5	1.1 - 5.4	35 - 70
Force 2	light breeze	rustle of leaves	1.6 - 3.3	5.8 - 11.9	50 - 100
Force 3	soft breeze	leaves and twigs are moving constantly	3.4 - 5.4	12.2 - 19.4	75 - 150
Force 4	moderate breeze	moving of small branches, whirl of dust and paper	5.5 - 7.9	19.8 - 28.4	application not recommended

Table 1

<sup>1)</sup> effective swath width = total swath width  $\cdot$  overlap (approximately 30 %)

Application at wind force 4 is not recommended, because the fog cloud swirls too much and therefore its effectivity is affected. However, if application does take place under these conditions, then for the same total application quantity the walking speed must be reduced, in order to compensate for the reduced concentration of the fog cloud.



**Important Note:**

The wider effective swath widths in Table 1 refer to application in an open area. The height and density of vegetation, buildings and other obstacles prevent the fog from spreading. The higher and denser the vegetation and other such obstacles become, the less the effective swath width becomes. In such cases, as a rule of thumb, a reduction of 50 % of swath width can be assumed.

The direction of the wind is also significant, since the application of concentrated chemicals should, on no account, be performed against the direction of the wind. The following figure shows, for the given wind direction, the area, within which can be treated.

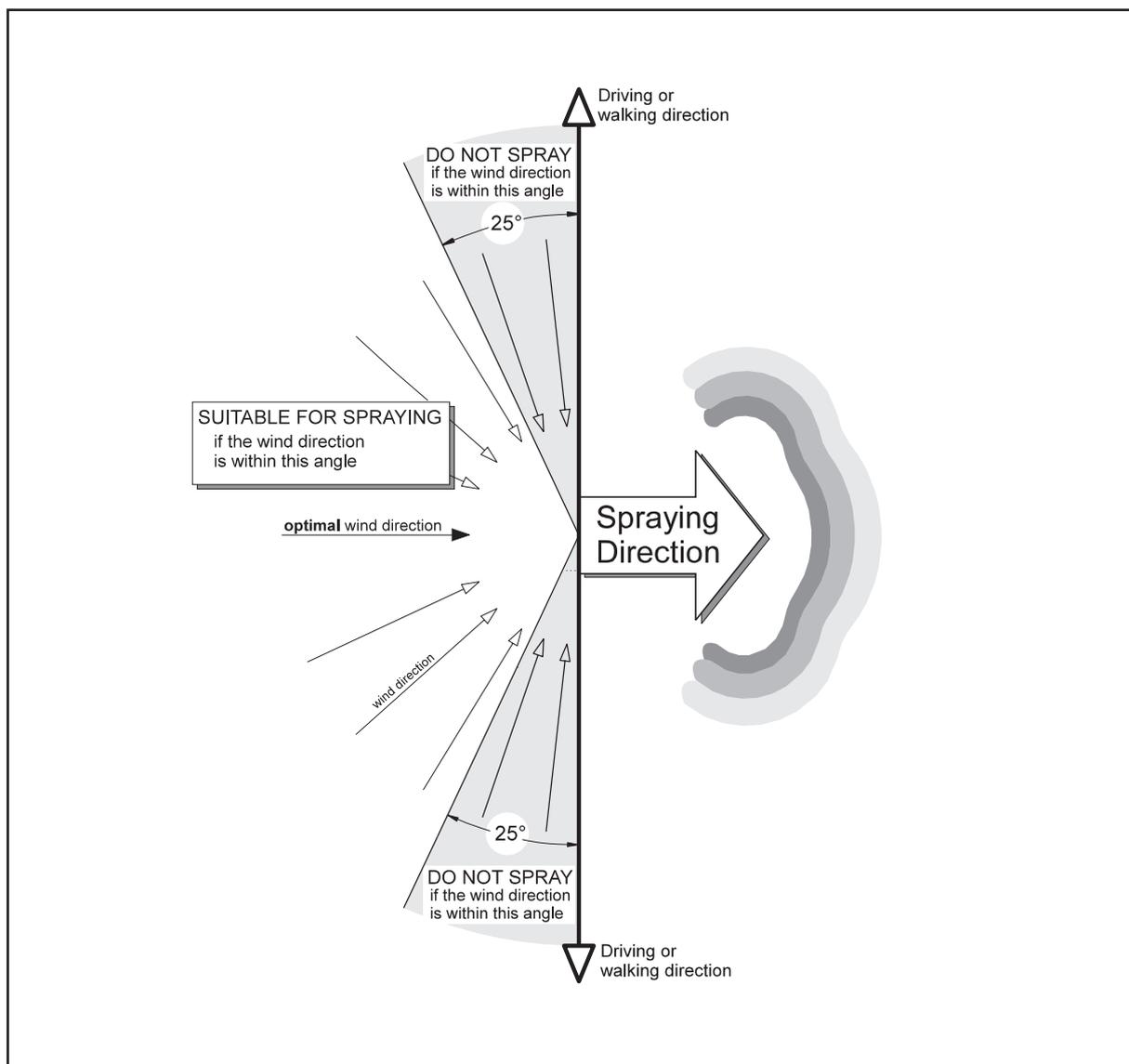


Figure 1

### 4.3.2 Calculating the output rate

Abbreviations:

m	=	meter
km	=	kilometer (1000 m)
l	=	liter
h	=	hour
ha	=	hectare (10000 m <sup>2</sup> )

The flow rate of the appliance in l/h is determined by the following parameters:

- Walking or driving speed (km/h = 1000 m/h)
- Effective swath width in accordance with Table 1 (m)
- Quantity of the chemical preparations in accordance with manufacturers instructions (l/ha = l/10000 m<sup>2</sup>) including carrier substances.

It is calculated using the following formula:

$$\text{Speed (m/h)} \times \text{swath width (m)} \times \text{quantity (l/ha)} = \text{output quantity (l/h)}$$

The nozzle, corresponding to the calculated output quantity, must be installed. Any subsequent differences between the calculated output quantity and the nozzle-specified output quantity are to be corrected by adjusting the speed (refer to § 4.3.3).

Example:

Walking speed:	4 km/h = 4000 m/h
Effective swath width:	40 m
Dosage:	2 l/ha (l/10000 m <sup>2</sup> )

$$\frac{4000 \cancel{\text{ m}} \times 40 \cancel{\text{ m}} \times 2 \text{ l}}{\text{h} \times 10000 \cancel{\text{ m}^2}} = \frac{4 \times 4 \times 2 \text{ l}}{\text{h}} = 32 \text{ l/h}$$

### 4.3.3 Calculating the walking speed or the vehicle speed

The speed is calculated as follows:

- Effective swath width in accordance with Table 1 (m)
- Quantity of the chemical preparation in accordance with manufacturer's instructions per hectare (l), including any carrier substances
- Area (m<sup>2</sup>)
- Output rate (l/h), in accordance with the nozzle used

The following formula is used:

$$\frac{\text{Area (m}^2\text{) x output rate (l/h)}}{\text{Quantity per ha (l) x swath width (m)}} = \text{Speed (m/h)}$$

Example:

Effective swath width	40 m
Quantity per ha	2 l
Area	10000 m <sup>2</sup>
Output rate	32 l/h

$$\frac{10000 \text{ m}^2 \times 32 \text{ l}}{2 \text{ l} \times 40 \text{ m} \times \text{h}} = \frac{32000 \text{ m}}{8 \text{ h}} = 4000 \text{ m/h} = 4 \text{ km/h}$$

#### 4.3.4 Consideration for differing viscosities / Checking the output quantity

The output quantities of the nozzles, as specified in Technical Data (Chapter 2.0), are correct if you are using fluids with the viscosity of water, or fluids with a viscosity similar to water.

For preparations or mixtures with differing viscosity, the flow rate changes and no longer corresponds to the given values (higher viscosities reduce the flow rate, lower viscosities increase the flow rate).

The correct output quantity for such fogging mixtures can be determined as follows (refer to ill. 8 respectively 8a):

- Remove the chemical solution line (ill. 8-2) and the fog solution socket (ill. 8-1) from the appliance, and fix again the fog solution socket at the chemical solution line. When your machine is equipped with an automatic chemical solution cut-off device, remove the chemical solution line (ill. 8a-2) and the valve housing (ill. 8a-1) from the appliance, then fix again the valve housing at the chemical solution line.
- Prepare a suitable container to collect the fog liquid (ill. 8-3).
- Start the machine (§ 6).
- Open the chemical solution tap (ill. 8-5). When your machine is equipped with an automatic chemical solution cut-off device, lock the operating lever according to § 11.1, Section 2 (permanent fogging). Only then open the chemical solution tap.
- Collect during 6 minutes the liquid flowing out of the fog solution socket respectively the valve housing in the container .
- Measure the time, from the moment of opening the solution tap, with a stop watch, and close the solution tap exactly after 6 minutes.
- Switch off the appliance.
- Measure the quantity of liquid which was collected during the 6 minutes (liter).
- Multiply the quantity by 10. The result you get is the output quantity liter per hour.
- Install the chemical solution line and the fog solution socket, respectively the valve housing as described in § 5.1.

### 4.3.5 Treatment procedure

Figures 2 and 3 show two typical examples of effecting treatment: Figure 2 shows a plan for vector control/public health, Figure 3 an agricultural application.

#### Vector control/ public health

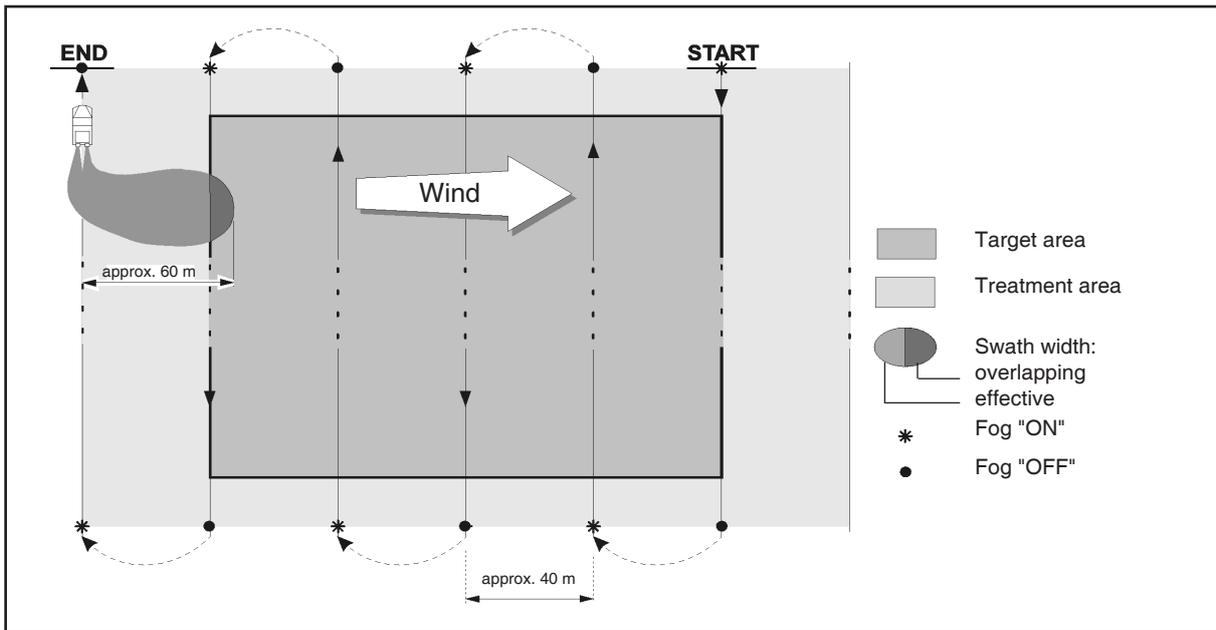


Figure 2

For this example, we have assumed a wind force of 1 (wind speed approximately 1.1 - 5.4 km/h). This will produce a total swath width of approximately 60 m, whereby the effective swath width achieved is around 40 m and there is an overlap of approximately 20 m. The overlap guarantees complete and even coverage of the target area. It is also practical to extend the actual treatment area beyond the target area, in order to prevent a new onset of vectors from untreated areas as long as possible. Especially for application in residential areas, the treatment area must be much larger than the target area.

Every time the operator stops, fogging should also be stopped; this also applies when traveling from one fogging area to the next (refer to Figure 2, distance • to \*).

## Agriculture (e.g. plantations)

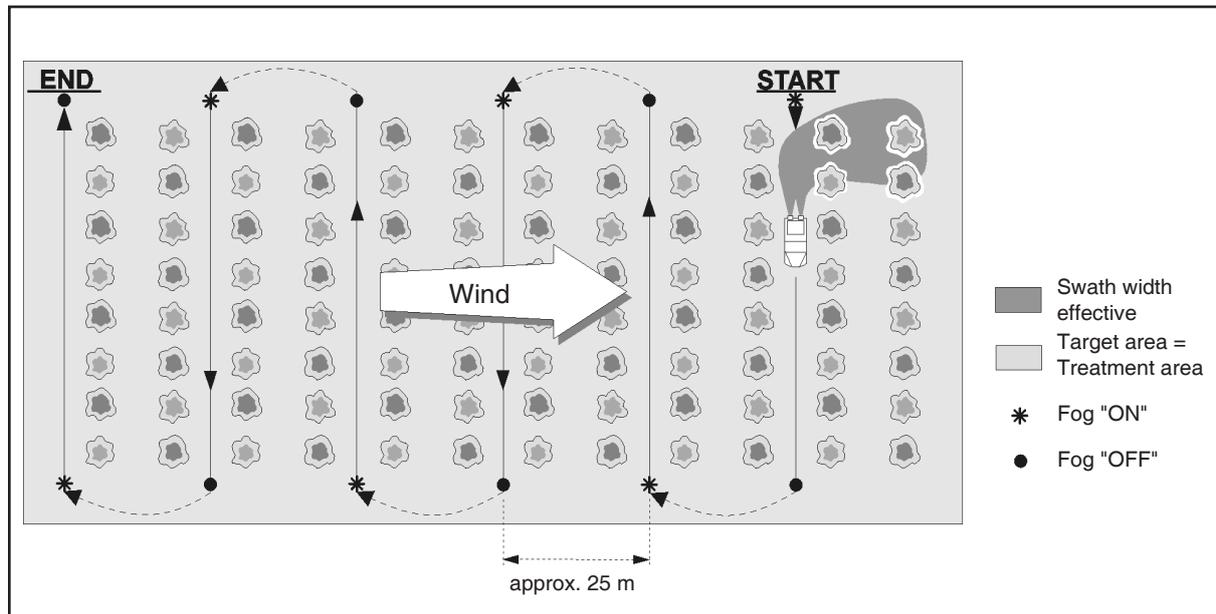


Figure 3

In principle, the previous statements related to vector control treatment, also apply to this application.

However, in contrast to vector control treatment, in this case the treatment area and the target area are practically identical and overlapping only plays a minor role, because the distance between the fogging sections is much smaller. Due to the dense vegetation and the large mass of foliage, the effective swath widths are much smaller.

The resulting fogging section width, as shown in the example, is approximately 25 m.

### 4.4 Suitable application time

We recommend the following application times for the **swingfog**<sup>®</sup> fog appliance considering thermal conditions (please observe also the recommendations of the preparation manufacturers):

#### Indoors

- Greenhouses - late afternoon or evening, the fog sinks slowly and assures maximum penetration
- Other rooms - any time

#### Outdoors

- before sunrise, if the fog should sink down or move near the ground
- early morning or late afternoon, if the fog should rise slightly

## 4.5 Selection of dosage nozzles

The flow rate of the fogging mixture can be determined by using different nozzles. The nozzles are marked with the numbers 0.7/0.8/0.9/1.0/1.1/1.2/1.4 and 1.7. The flow rate (liter per hour) is given below. When the equipment is initially supplied, nozzle 1.0 is already installed. Nozzles 0.8 and 1.2 are included in the standard accessories kit, and nozzles 0.7/0.9/1.1/1.4 and 1.7 are available as optional accessories.



### Note:

The outputs vary according to the liquid employed. The values given should be considered as guidelines, measured with water. Flow rates of fogging mixtures with different viscosity have to be determined according to § 4.3.4.

Make sure that the bore of the nozzle is not blocked and remove eventual residuals with the cleaning tool (Ill. 7-3).

### Available dosage nozzles

Nozzles with the following flow rates are available

Nozzle No.	Flow rate liter per hour (measured with water)
0.7	10
0.8	14
0.9	17.5
1.0	20.5
1.1	23.5
1.2	27
1.4	32
1.7	42

For **water based** fogging mixtures choose nozzles up to Ø 1.0 mm. Smaller nozzles reduce the drop-let spectrum. The high performance fogging tube allows the use of the next three larger nozzles 1.1, 1.2 and 1.4 (max.).

For **oil based** fogging mixtures we recommend nozzle sizes Ø 1.0 - 1.7 mm. Then use the standard fog mixing tube only.

The **smallest recommended nozzle** is nozzle 0.8. Nozzle 0.7 is available on special request only.



### Warning:

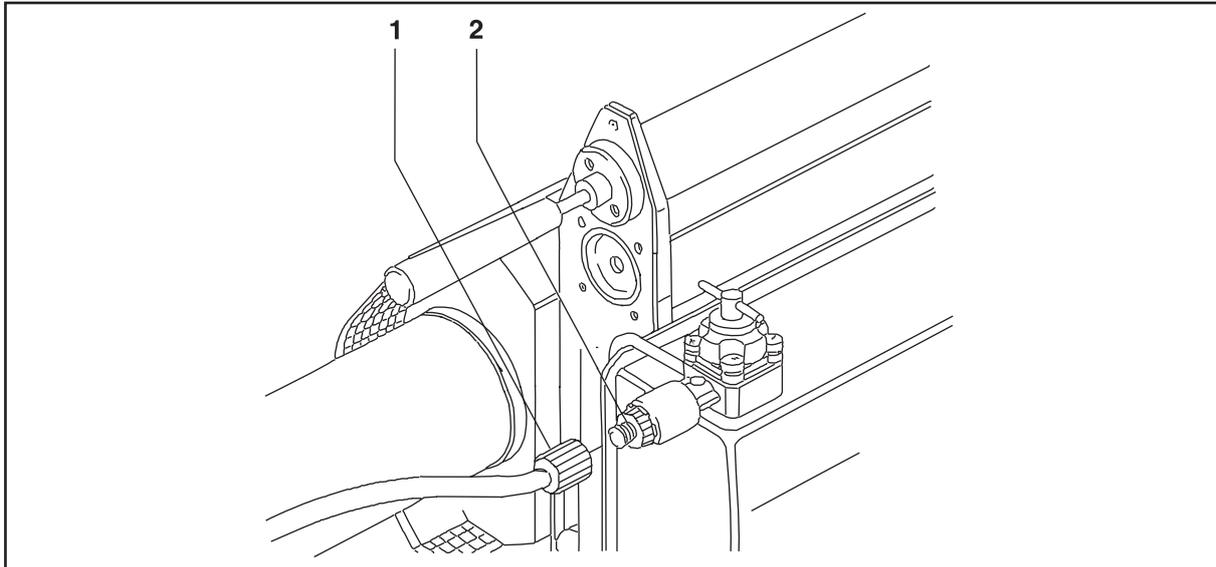
The high performance fogging tube must never be used for fogging oil-based fogging mixtures. For oil-based fogging mixtures the standard fogging tube has to be installed.



### Warning:

The above application guidelines in § 4.0 - § 4.5 are based on international application methods and experiences. Since a correct application is beyond our control, we cannot be held responsible for any liability for damages and consequential damages to operating personnel, people, goods or material or unsuccessful application, which are caused by using incorrect chemical preparations or application methods.

#### 4.5.1 Changing of nozzles



III. 3

1 Coupling nut  
2 Dosage nozzle

- Screw in the desired nozzle (ill. 3-2) (the inserted gasket has to face the chemical solution tap).
- Attach the coupling nut (ill. 3-1) of the chemical solution line at the dosage nozzle.

## 5.0 Preparation of the machine

When you remove the appliance from its packaging, check the accessories for completeness.

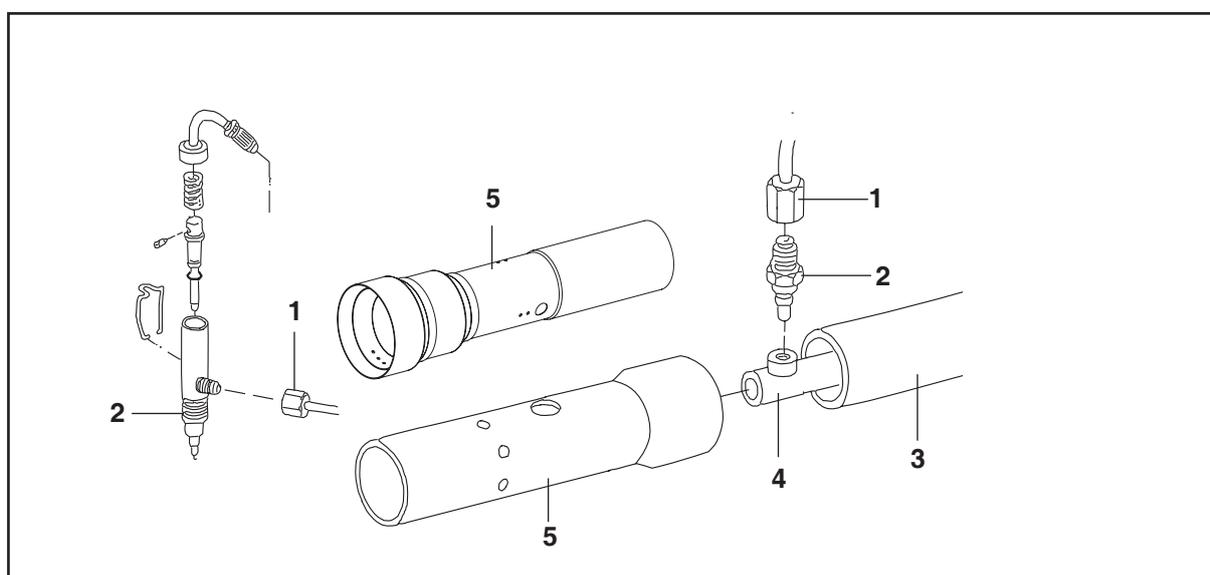


### Warning:

Only operate the appliance when you have read and understood the instruction manual, especially § 1.0 Safety precautions.

In order to prevent appliance overheating, only operate the appliance **with** the fog mixing tube (ill. 4-5) installed on the cooling pipe (ill. 4-3). This also applies to test runs for cleaning and test fogging purposes. The fog mixing tube is not installed for ease of shipping.

### 5.1 Install the fog mixing tube (standard fog mixing tube or high performance fogging tube)



Ill. 4

1 Chemical solution line  
2 Fog solution socket/valve housing  
3 Cooling pipe

4 Resonator  
5 Fog mixing tube (standard or high performance fogging tube)

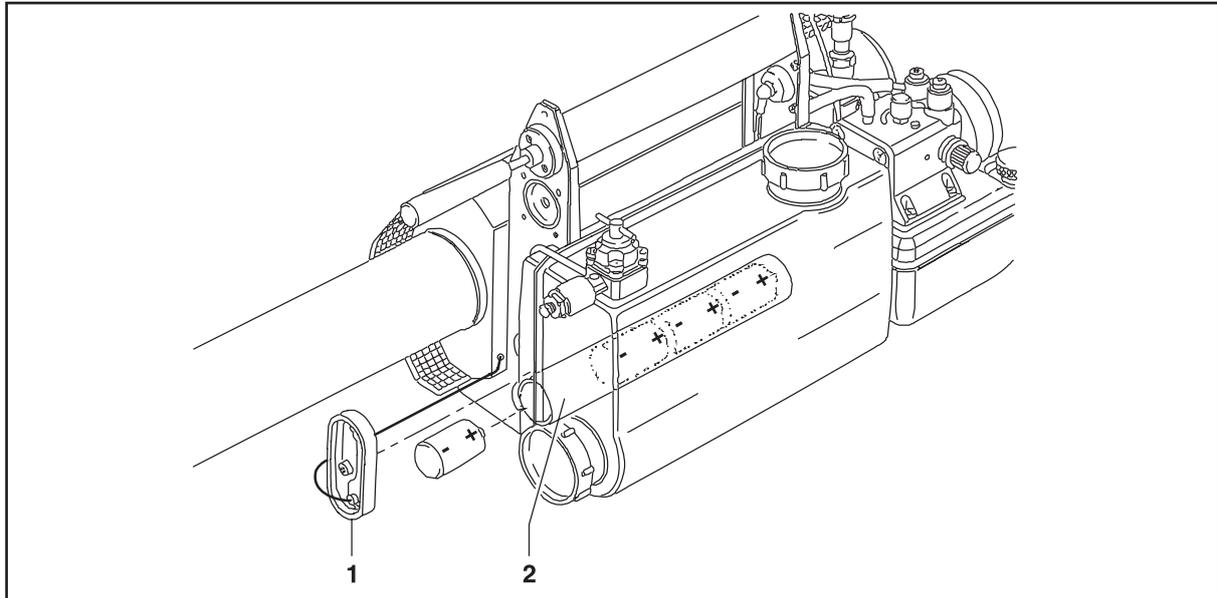
- Detach the chemical solution line (ill. 4-1) from the fog solution socket respectively from the valve housing (ill. 4-2), then unscrew the fog solution socket respectively the lower part of the valve housing.

- The fog mixing tube can be fitted to the cooling pipe only in one direction. Slip the fog mixing tube over the cooling pipe allowing the hole in the tube to line up with the resonator thread (ill. 4-4).

- The fog mixing tube has to be easily movable on the cooling pipe, to allow heat expansion of the resonator. Check this also at a later run to avoid damages to the resonator.

- Tighten the fog solution socket slightly. Attach the chemical solution line tightly with the wrench 17 and counterhold with the wrench 13 at the hexagon of the fog solution socket. In case the unit is equipped with a chemical solution cut-off device, screw in the valve housing up to the end but do not tighten it. Adjust the valve housing by turning it back counter-clockwise to a position in which the chemical solution line can be installed and attach the chemical solution line with a wrench 17 tightly.

## 5.2 Fit batteries



III. 5

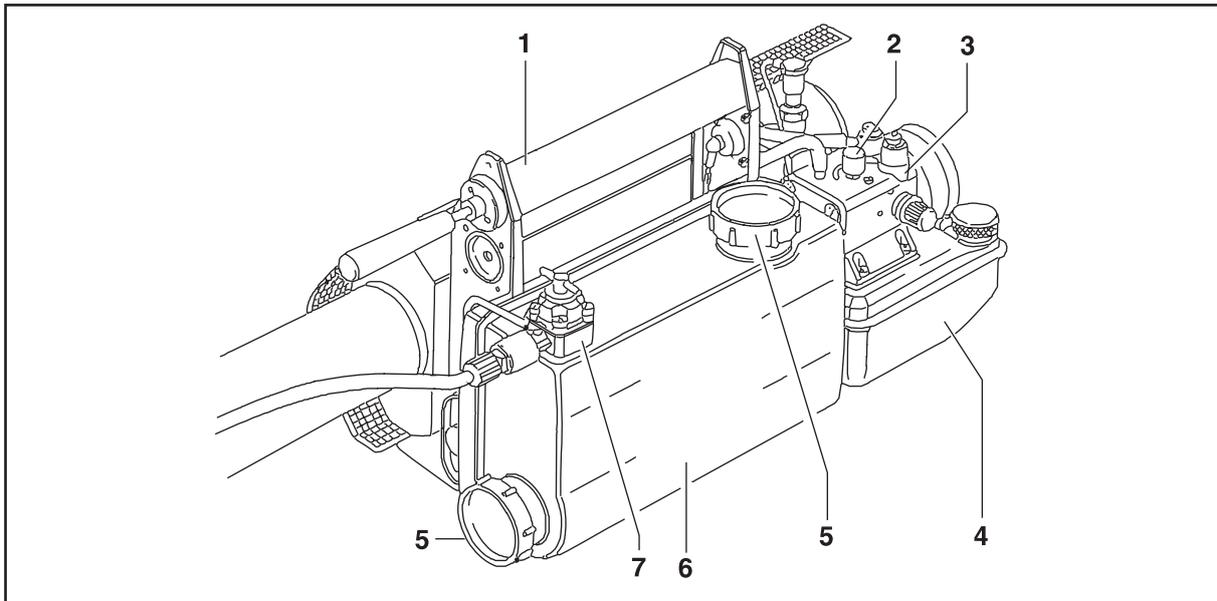
- 1 Cover
- 2 Battery holder

For ignition four round cells 1.5 volts with approx.  $\varnothing$  33 mm, 61 mm long are required (code e.g. IEC R 20 1,5 V). "Leak-proof" type is necessary to prevent contacts in the battery holder from corroding.

- Turn out the recessed head screw of the cover with the screw driver.
- Take off cap (ill. 5-1) and fit batteries as shown in illustration (refer also to the print at the machine).

### 5.3 Ignition check

When operating the starter pump (ill. 6-1) the ignition is activated by means of a push button. When doing so, a buzzing of the ignition coil is to be heard.



Ill. 6

- 1 Starter pump
- 2 Stop button
- 3 Carburettor
- 4 Fuel tank

- 5 Tank cap, spraying tank
- 6 Spraying tank
- 7 Chemical solution tap

### 5.4 Fill the fuel tank (ill. 6-4)

- Always use the small fuel funnel with strainer. Only use clean standard grade petrol with a minimum of 74 octane (lead-free or leaded). High-octane fuel does not provide any advantages and should not be used.
- Always fill the fuel tank completely. A low fuel level might cause starting problems.
- After refueling, tighten the tank cap by hand. A full tank will provide enough fuel for approximately 40 minutes of operation.



**Warning:**

Let the appliance cool down before you fill the fuel tank, so that during refueling spilled fuel does not ignite when it comes into contact with hot parts of the appliance. If a fire occurs, use a fire extinguisher or a fire blanket to smother the flames.

## 5.5 Fill the spraying tank (ill. 6-6)

- Take care that the chemical solution tap (ill. 6-7) is closed (turned counter-clockwise).
- For filling use the large chemical funnel with strainer. Only fill with the amount required for the application, to avoid the necessity of emptying or the built-up of fogging mixture residues in the tank.
- The spraying tank is equipped with an additional filter insert.
- After filling close tank cap (ill. 6-5) tightly.
- The content of the spraying tank can be checked as follows:
  - SN 50 PE and SN 50-10 PE at the scale on the spraying tank
  - SN 50 and SN 50-10 by means of the dip stick (see standard accessories, ill. 09) and the liter marks on the tank.

Take care that the machine is horizontally levelled when measuring the content of the spraying tank.



**Warning:**

Only use clean containers for fuel and fogging mixture.

## 6.0 Starting the appliance

Obey all valid and applicable rules and regulations when operating fuel driven devices. To prevent accidents, make sure that you read and obey the Safety Precautions in this manual.

**Note:**

Always start the machine with a full fuel tank to provide best starting behaviour. A lower fuel level might cause starting problems.

When filling the spraying tank, also top-up the fuel tank. This measure provides best conditions for restarting and prevents stopping of the appliance during application due to lack of fuel.

- Take care that the chemical solution tap (ill. 6-7) is closed (turned counter-clockwise).
- Close the red stop button (ill. 6-2) by turning it fully clockwise.
- Ventilate the appliance by pumping approx. 5 times with the starter pump (ill. 6-1).
- Open the red stop button by turning it fully to the left, then turn it back minimally. The appliance starts automatically while pumping further in this position. A low fuel level requires more and stronger pump strokes. Start only with the tank topped up.
- When the appliance has run for some seconds, open the red stop button fully (= normal operating position).
- Should the appliance not start after approx. 10 strokes, close the red stop button and pump until the appliance starts for a short time (residual fuel in the carburettor is burnt). Then open the stop button again and repeat the starting process.
- If the machine still does not start refer to § 10.2.
- After start let the appliance warm up for about 1 to 2 minutes.
- Open the chemical solution tap. The appliance will fog. When the appliance is equipped with an automatic cut-off device, the fogging function is activated by lifting the operating lever (see § 11.1).

**Warning:**

When using combustible chemical preparations and/or carrying mediums, it is absolutely necessary to use a machine which is equipped with the safety element "automatic chemical solution cut-off device". The proper function of the chemical solution cut-off device has to be checked every time the machine is used according to § 11.2. The machine must only be operated when the chemical solution cut-off device is working correctly.

## 7.0 Appliance shutdown

- Close the chemical solution tap.
- Keep the appliance running for about half a minute, until no fog is emitted any longer. During this time residual fog solution in the chemical solution line is blown out automatically, and crystallization or cloggings of chemical residues in the dosage nozzle, the chemical solution line and the fog solution socket are avoided.
- Once the fog discharge ceases, close the red stop button at the carburettor slowly. The appliance will stop.
- Release the pressure in the spraying tank by unscrewing the spraying tank cap by 1 to 2 turns. Then retighten the cap.



### Warning:

When using an appliance **without** automatic chemical solution cut-off device take the following urgent measures when the appliance stops unexpectedly due to a lack of fuel or a handling error:

- Close the chemical solution tap.
- Hold the machine with the fog mixing tube pointing downwards.

When the chemical solution tap is closed no fogging mixture will be conveyed by the overpressure in the spraying tank. No un-fogged fogging mixture can flow into the hot resonator where it could cause an accumulation of vapour and even a smoke cloud could come out of the carburettor. Dirt could deposit in the carburettor, and flammable fogging mixtures could ignite.

The appliance has to be held with the fog mixing tube pointing downwards to allow the chemical fogging mixture residue to run out. Small quantities of combustible fogging mixture can ignite and have to be extinguished immediately.

When using an appliance **with** automatic chemical solution cut-off device the conveying of fogging mixture stops automatically when the unit is switched off or when it stops due to handling error or lack of fuel. Nevertheless close the chemical solution tap immediately, because the spraying tank is still under pressure, and fogging mixture can flow back into the hot resonator when the operating lever is lifted by mistake. In this case the flow of fogging mixture would be released again. This is dangerous, especially when combustible substances are fogged, which will ignite in the resonator tube/combustion chamber (refer to § 11.0).



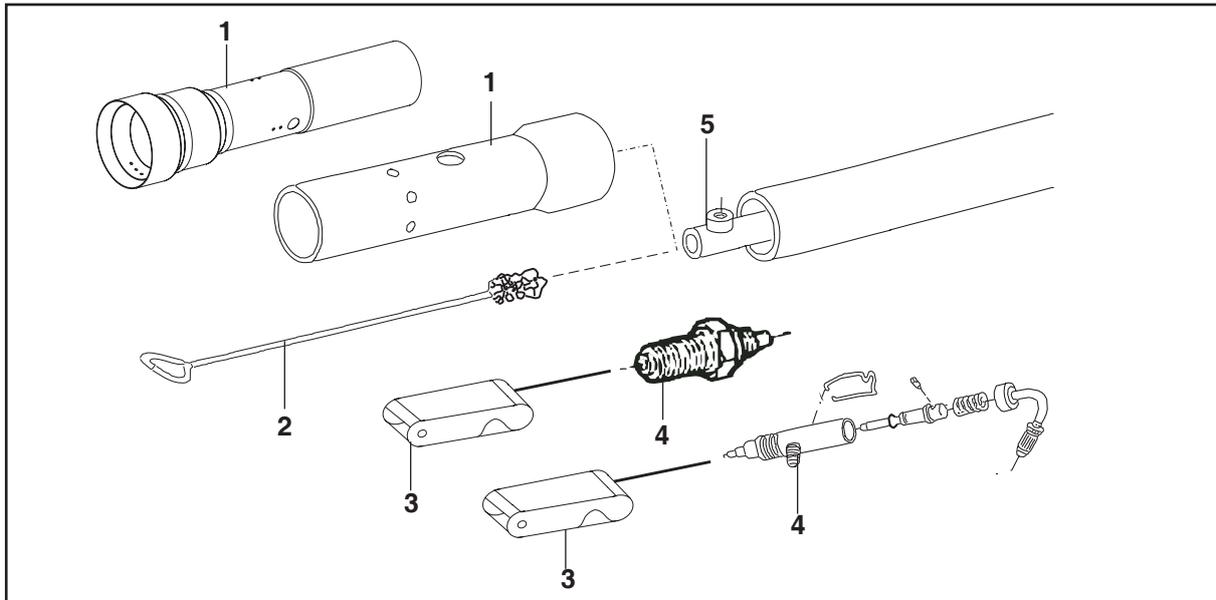
### Warning:

Do not transport the appliance inside an enclosed vehicle while it is still hot from operation. Make sure that, when you transport the appliance, it is stable, secure and cannot tilt.

## 8.0 Cleaning

Your appliance has been optimally set and operates extensively free from wear. Reliable and continuous function and operation is optimized through the following tasks:

### 8.1 Normal cleaning during constant use



#### III. 7

- |  |                                     |
|--|-------------------------------------|
| 1 Fog mixing tube<br>(standard or high performance fogging tube) | 3 Cleaning tool                     |
| 2 Wire brush   | 4 Fog solution socket/valve housing |
|  | 5 Resonator                         |

- Clean the external surfaces of the appliance with a cloth; **do not** use a high-pressure hose or a steam cleaner.
- When wettable powder preparations or suspensions are applied which do not dissolve easily, the spraying tank has to be drained and flushed daily after application.
- Remove the chemical solution line (ill. 8-2/8 a-2), turn out the fog solution socket respectively the lower part of the valve housing (ill. 7-4) and then remove the fog mixing tube (ill. 7-1).
- Remove deposits in the resonator end (ill. 7-5) with the wire brush (ill. 7-2) and in the fog solution socket respectively in the valve housing with the cleaning tool (ill. 7-3). Clean the fog mixing tube with the wire brush.
- Powder-based preparations especially have the tendency to leave deposits in the fog mixing tube and in the end of the resonator. To clean the fog mixing tube, first let it soak in water so that the coating comes off.
- After cleaning re-install the fog mixing tube and the fog solution socket, respectively the valve housing and the chemical solution line as described in § 5.1.



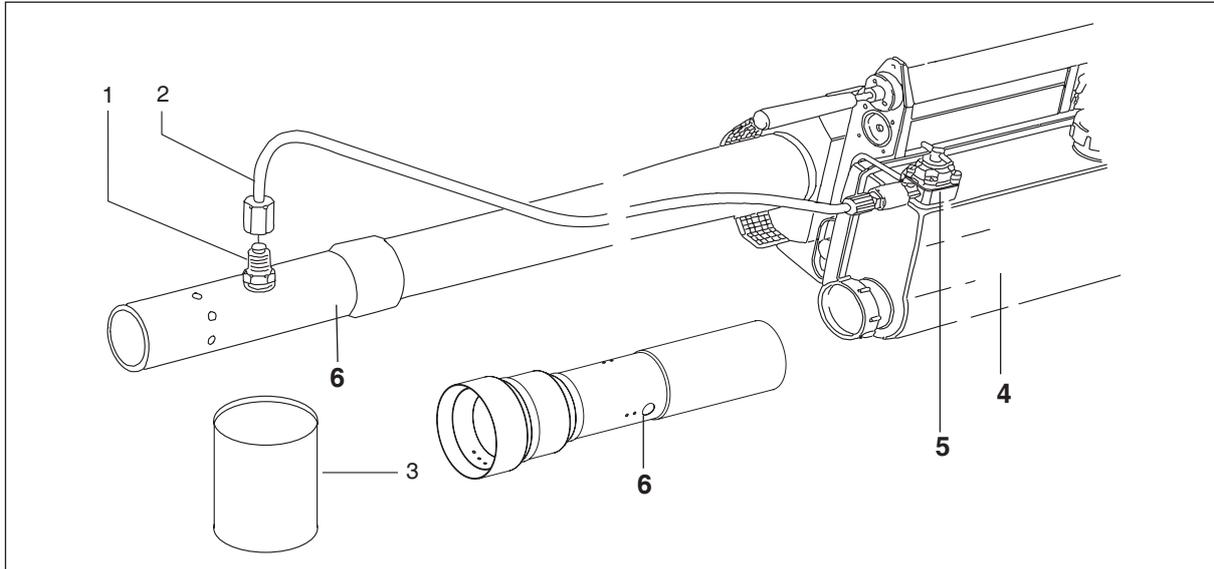
#### Warning:

In case chemical preparations are used which contain chlorine, and when the appliance is equipped with a stainless steel spraying tank, the spraying tank has to be **carefully** flushed and cleaned after **each** application. Chlorine and water develop hydrochloric acid which attacks and destroys stainless steel.

Also clean the chemical solution line according to § 8.2.

## 8.2 Long-term shutdown and storage

In case the appliance is not operated more or less regularly, and to avoid deposits in the chemical system, please proceed as follows.



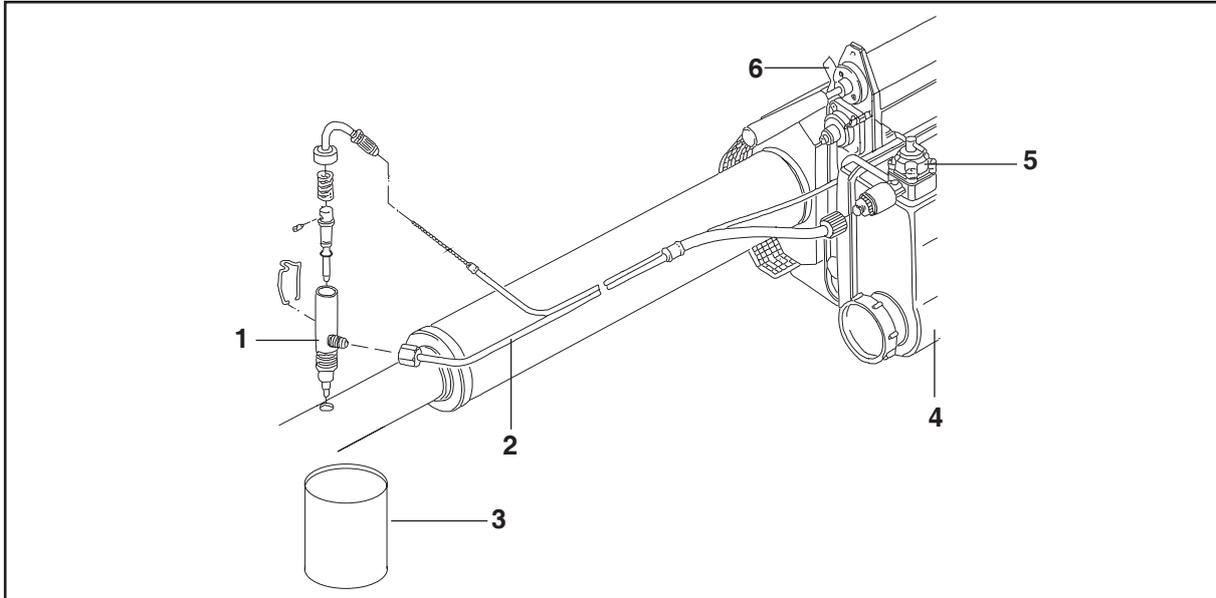
### Ill. 8

1 Fog solution socket  
2 Chemical solution line  
3 Container

4 Spraying tank  
5 Chemical solution tap  
6 Fog mixing tube/standard or high performance fogging tube

- Drain off residual fogging mixture and then flush the spraying tank thoroughly. Make sure that the waste fogging mixture is disposed of correctly, in accordance with local health and safety regulations.
- In order to prevent crystallization of chemical residues in the chemical solution supply parts, fill the spraying tank (ill. 8-4) with a sufficient quantity of non-resinous oil such as diesel or heating oil or paraffin, in cases oil-based chemical mixtures had been fogged. When water-based chemical mixtures had been applied, use water instead. Shake the machine.
- Disconnect the chemical solution line (ill. 8-2) from the fog solution socket (ill. 8-1) in the resonator. The fog solution socket and the fog mixing tube remain installed on the appliance.
- Prepare a container to collect the flushing oil respectively the water.
- Start the machine and let it warm up for approximately 2 minutes.
- Open the chemical solution tap (ill. 8-5) and collect the liquid in the container (ill. 8-3). Close the chemical solution tap. Wait until no liquid is emitted any longer. Then stop the machine.
- Re-install the chemical solution line again at the fog solution socket, as described in § 5.1.
- Drain off residual liquid in the spraying tank (ill. 8-4).
- Drain off the fuel.
- Take off the starter batteries (see § 5.2).

When your machine is equipped with an automatic chemical solution cut-off device, proceed as follows.



III. 8 a

- 1 Valve housing
- 2 Chemical solution line
- 3 Container

- 4 Spraying tank
- 5 Chemical solution tap
- 6 Operating lever

- Disconnect the chemical solution line (ill. 8 a-2) from the valve housing (ill. 8 a-1) in the resonator. The valve housing and the fog mixing tube remain installed on the appliance.
- Prepare a container to collect the flushing oil respectively the water.
- Start the machine and let it warm up for approximately 2 minutes.
- Open the chemical solution tap (ill. 8 a-5) and lift the operating lever (ill. 8 a-6) of the solution cut-off device permanently. Collect the liquid in the container (ill. 8 a-3). Close the chemical solution tap, and wait until no liquid is emitted any longer. Release the operating lever. Then stop the machine.
- Re-install the chemical solution line again at the valve housing, as described in § 5.1.
- Drain off residual liquid in the spraying tank (ill. 8 a-4).
- Drain off the fuel.
- Take off the starter batteries (see § 5.2).

## 9.0 Maintenance



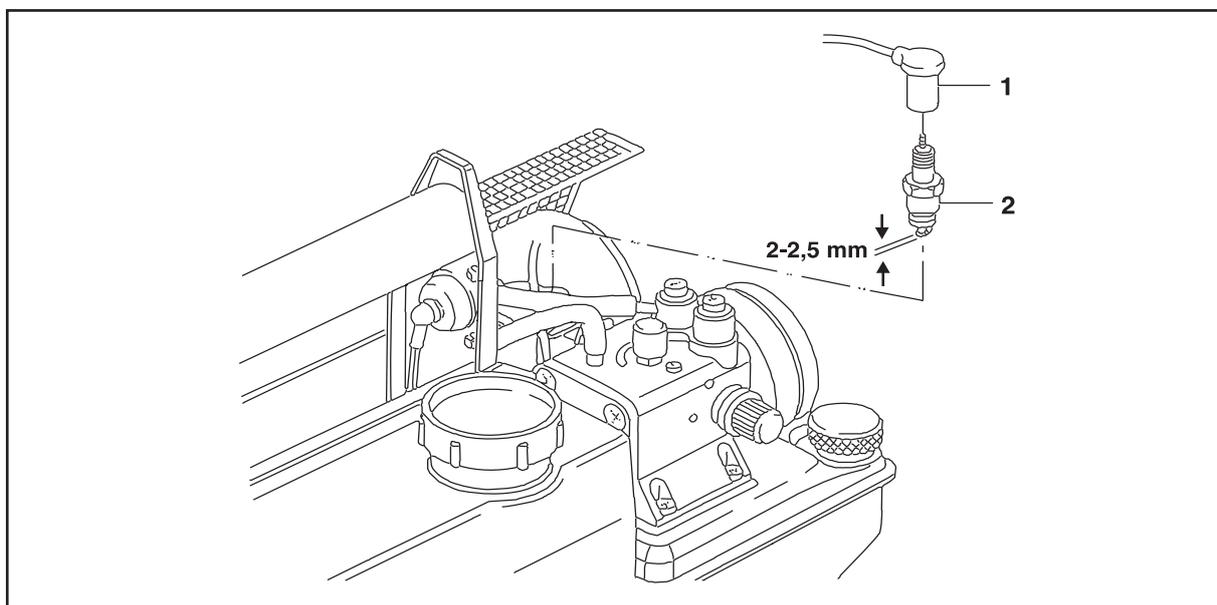
### Warning:

When working on the carburettor, the fuel pipes and at the fuel tank, take care of the fire and explosion risk.

No smoking, no heat or open flame.

We recommend the following maintenance tasks after approximately **50 operating hours**. Before you start maintenance, make sure that the external surfaces of the appliance are clean and free from dirt and fogging mixture residues.

### 9.1 Clean the spark plug



III. 9

1 Spark plug cap

2 Spark plug

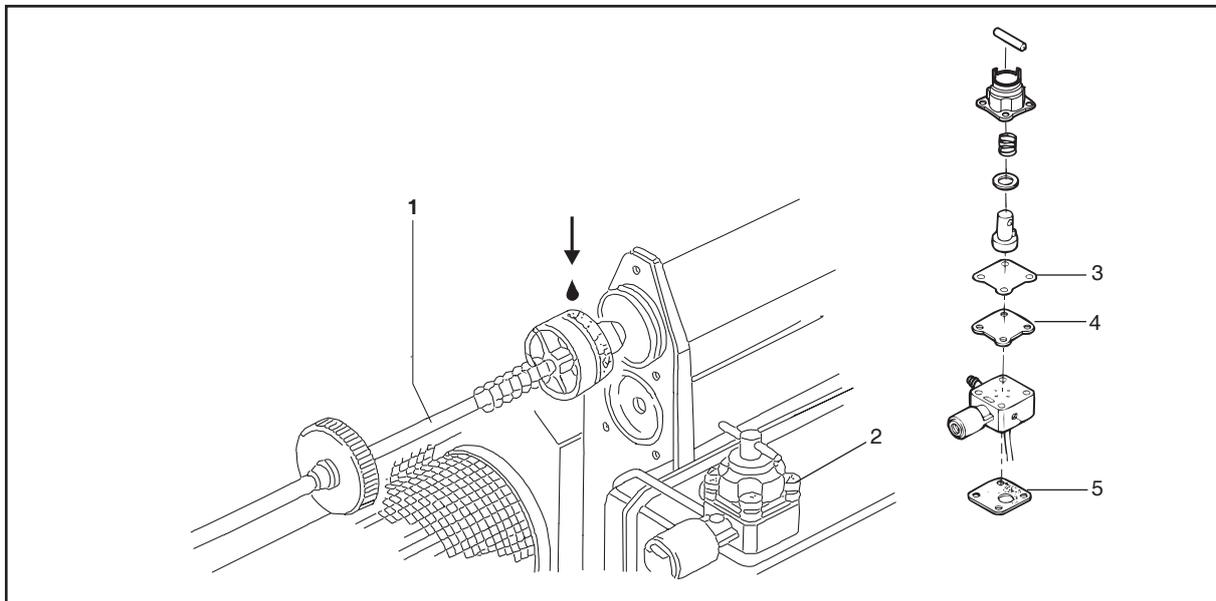


### Note:

The spark plug should not be screwed in or out when the machine is hot, otherwise the thread may be destroyed.

- Pull the spark plug cap (ill. 9-1) vertically off the spark plug (ill. 9-2).
- Turn the spark plug in a counter-clockwise direction to remove it. Use a wire brush to clean the plug in the area of the electrodes. Make sure that the thread of the spark plug is free of oil, so that the oil does not build up residues.
- If necessary, set the electrode gap to between 2 and 2.5 mm.  
Replace corroded spark plugs.
- Re-install the spark plug and only tighten it lightly. Re-connect the spark plug cap on the spark plug.

**9.2 Grease the pump collar of the starter pump  
Check the chemical solution tap**



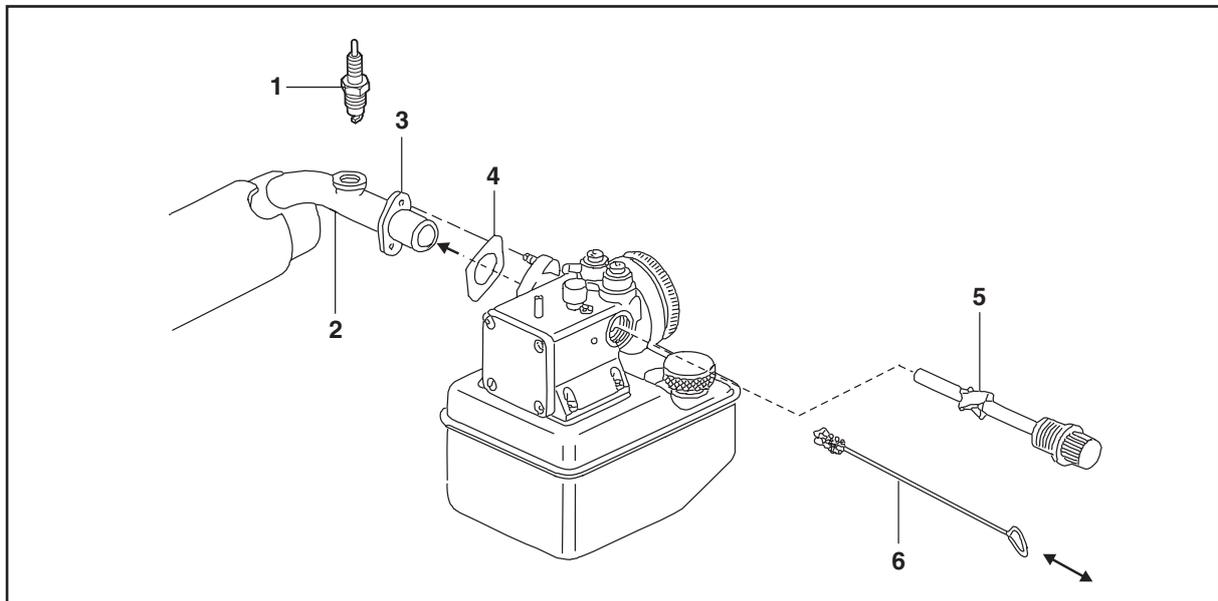
III. 10

1 Pump plunger with collar  
2 Screws  
3 Gasket

4 Gasket  
5 Gasket

- Loosen the cap on the pump handle side with a wrench.
- Grease the pump collar and the plunger of the starter pump (ill. 10-1) for easy operation.  
If the pump collar is damaged, it has to be replaced.
- If necessary, retighten the screws on the chemical solution tap with a screw driver (ill. 10-2).
- When the solution tap is leaking in spite of retightening the screws, replace the gaskets (ill. 10-3, 4, 5).

### 9.3 Clean the swirl vane and the fuel/air mixing duct



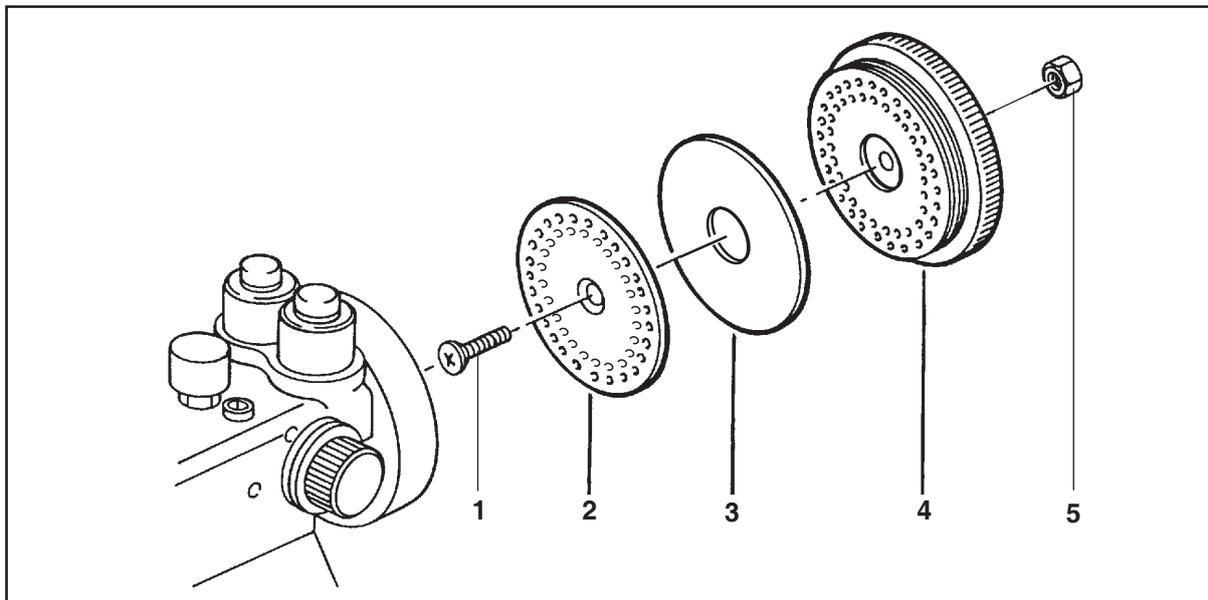
#### Ill. 11

1 Spark plug  
2 Fuel/air mixing duct  
3 Resonator flange

4 Gasket  
5 Swirl vane  
6 Wire brush

- Remove the spark plug (ill. 11-1).
- Remove the swirl vane (ill. 11-5), and remove deposits and residues with a towel or with the wire brush (ill. 11-6).
- Clean the fuel/air mixing duct (ill. 11-2) through the opening for the swirl vane in the carburettor with the wire brush (refer to the arrows in ill. 11).

## 9.4 Clean the non-return valve



Ill. 12

1 Screw

2 Distance plate

3 Diaphragm

4 Cover plate

5 Nut

- Unscrew the nonreturn-valve counter-clockwise and disassemble it by removing the screw (ill. 12-1).
- Take care not to loose parts (ill. 12-1,5).
- Clean distance plate (ill. 12-2), the cover plate (ill. 12-4) and the diaphragm (ill. 12-3) with a soft cloth and if necessary, with fuel. Make sure that the diaphragm is not bent or damaged.
- During assembly put the diaphragm on the distance plate and make sure that it does not move when you attach the cover plate.
- Re-assemble the complete sub-assembly to the carburettor.



**Warning:**

If the diaphragm is bent or otherwise damaged, then it must be replaced because reliable operation of the appliance is dependent on this part.

## 10.0 Troubleshooting

**Note:**

During repair, observe and obey the safety precautions in accordance with § 1.4.

**On failure, first check:**

- is the fuel tank cover on properly and tight?
- are the spraying tanks covers on properly and tight?
- the condition of the cover gaskets.
- is fuel in the tank (at least  $\frac{3}{4}$  of the fuel tank capacity)?
- is a sufficient quantity of fogging mixture in the spraying tank?
- is the starter pump faulty (refer to § 9.2)?
- are batteries installed and are the batteries in good condition (4 starter batteries 1.5 V each, refer to § 5.2)?
- is the spark plug in order (refer to § 9.1)? The electrode gap of the spark plug must be between 2 and 2.5 mm.
- do you hear the ignition coil buzzing while pumping? (repair acc. to § 10.2.1-10.2.3)
- is the diaphragm in the non-return valve serviceable? (disassemble and clean in accordance with § 9.4)

### 10.1 Appliance runs, but does not fog or fogs irregularly

A condition for a proper function is the quality of the fogging mixture. It should be a thin liquid with a viscosity similar to diesel oil, kerosene or water. Take care that there are no soilings in the fogging mixture, which could block the nozzle. For this reason always use the chemical funnel with strainer. When using suspensions with wettable powders, take care that the mixture is homogeneous and with an equivalent viscosity.

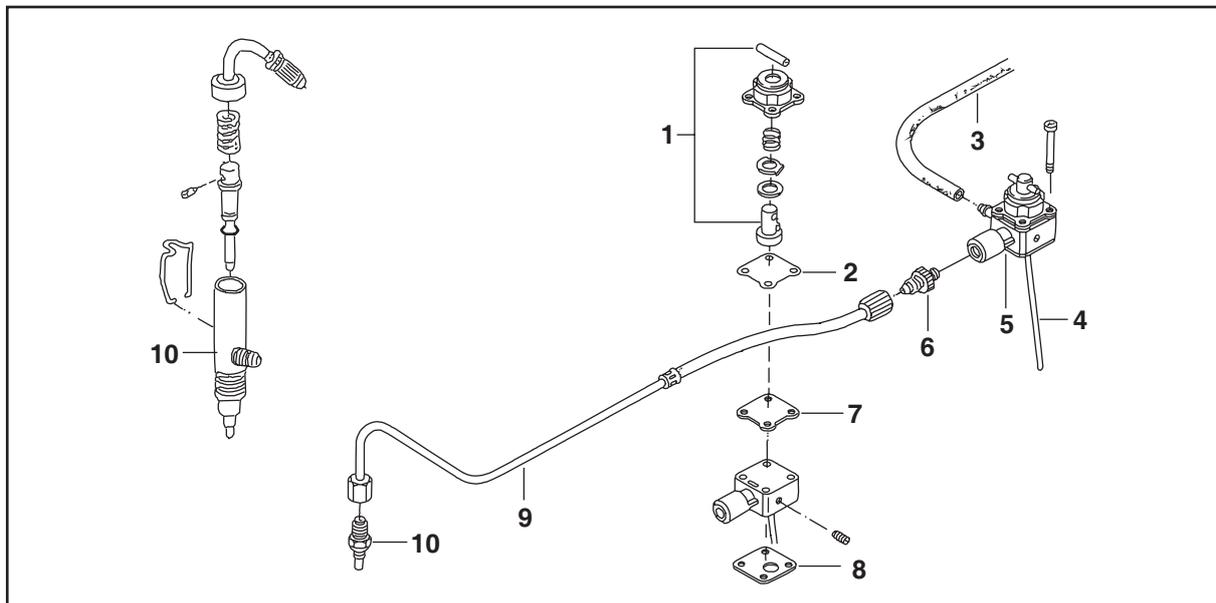
**Note:**

For the following tests it is recommended to use water as fogging liquid.

**Possible causes**

- Fogging mixture supply parts are blocked.
- Pressure hose (ill.13-3) is not sealing well (check the hose for damage and proper connection).
- No or insufficient pressure in the spraying tank.
- Automatic chemical solution cut-off device is not working (in case your machine is equipped with an automatic solution cut-off device). Refer to § 11.4.

### 10.1.1 Check the nozzle and the fogging mixture system



Ill. 13

1 Chemical solution tap, upper part

2 Gasket

3 Pressure hose

4 Ascending hose

5 Chemical solution tap

6 Dosage nozzle

7 Gasket

8 Gasket

9 Chemical solution line

10 Fog solution socket/valve housing

- The main cause of problems is the result of a blocked dosage nozzle (ill. 13-6) and a blocked fog solution socket (ill. 13-10). Unscrew and remove these parts. Check the borings of both parts and, if necessary, clean them with the cleaning tool (ill. 7-3) which is included in the tool kit. When using an appliance with chemical solution cut-off device, check instead the valve housing (ill. 13-10) of the cut-off device.

- Also check the pressure hose (ill. 13-3). The connections should be tight, and the hose itself must not be damaged.



**Warning:**

Let the hot fog solution socket respectively the valve housing cool down prior to disassembly.



**Note:**

Cause for a blockage of the dosage nozzle are dirt particles in the spraying tank which can block a cleaned nozzle immediately again. For this reason, flush the spraying tank carefully and use the chemical funnel with strainer when re-filling the tank.

- Screw in the nozzle and start the machine. Hold a container under the nozzle and open the chemical solution tap (ill. 13-5). There should be a strong jet of liquid coming out of the nozzle. If not, check the pressure in the spraying tank according to § 10.1.3.  
There is also a pressure gauge set available (optional accessory, see § 12.3).

- In case the spraying tank pressure is in order, and the unit still does not fog, check the chemical solution line, the solution tap and the ascending hose according to § 10.1.2.

- Take off the chemical solution line (ill. 13-9). The solution line can be blown through by pressurized air, or has to be replaced if it cannot be blown free.
- Install the chemical solution line and the fog solution socket, respectively the valve housing as described in § 5.1.

### 10.1.2 Check chemical solution tap and ascending hose

- Remove the chemical solution tap (ill. 13-5) from the spraying tank.
- Check the ascending hose (ill. 13-4) and remove obstructions with a wire.  
Check the gaskets (ill. 13-2, 7, 8) for damage and flexibility and, if necessary, replace the gaskets.



**Note:**

The sequence of gaskets for reassembly from top to bottom is important:

(ill. 13-2) black

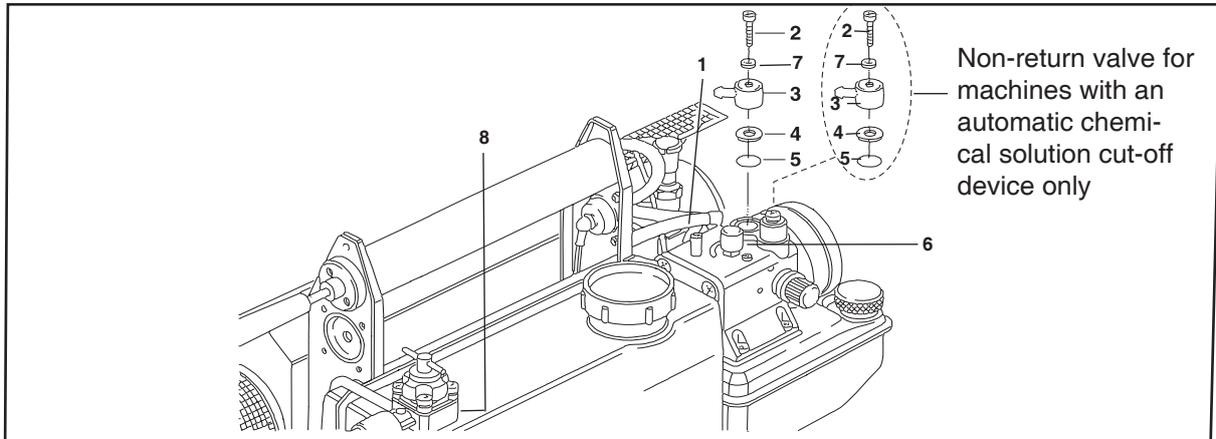
(ill. 13-7) green

(ill. 13-8) black

Wrong assembly will inhibit a correct tap function!

- Should the unit not fog after above steps have been taken, the pressure in the spraying tank is not correct (refer to § 10.1.3).

### 10.1.3 No or insufficient pressure in the spraying tank



Ill. 14

1 Pressure hose	4 Diaphragm	5 Gasket
2 Oval head screw	5 Gasket	6 Stop button
3 Cover		7 Gasket
		8 Chemical solution tap

- Check that the pressure hose (ill. 14-1) is connected correctly to the cover (ill. 14-3) and to the chemical solution tap on the spraying tank, and that the hose is not damaged.

- Check the pressure in the spraying tank as follows:

- Fill approximately 2 liter of water into the spraying tank.
- Close the chemical solution tap (ill. 14-8) and start the machine.
- Let the unit warm up for approximately one minute.
- Open the chemical solution tap and fog the water for approximately one up to two minutes.
- Close the chemical solution tap.
- Stop the machine by closing the STOP button (ill. 14-6).
- Open the upper spraying tank cap cautiously; air is blowing out audibly.

- If your machine is equipped with an automatic chemical solution cut-off device, proceed as follows:

- Close the chemical solution tap and start the machine (no water is needed).
- Let the unit warm up for approximately one minute.
- Open the chemical solution tap and wait one to two minutes.
- Close the chemical solution tap.
- Stop the machine by closing the STOP button.
- Open the upper spraying tank cap cautiously; air is blowing out audibly.

To measure the pressure, you can also use the pressure gauge set (optional accessory, refer to § 12.3). The pressure should be approximately 0.3 up to 0.35 bar. When no pressure is built-up, check the chemical solution tap according to § 10.1.2 and the diaphragm (ill. 14-4) below the cover (ill. 14-3) as follows.

- Disconnect the pressure hose from the cover. Use a screw driver to remove the screw (ill. 14-2) and the gasket (ill. 14-7) from the cover. Check the black diaphragm (ill. 14-4) for elasticity, cleanliness and any form of damage. If necessary replace the diaphragm. Examine the gasket (ill. 14-5) which is in the seat of the cover. The seat must be clean. Make sure that, during assembly, the black diaphragm (ill. 14-4) is installed exactly central. Make sure that you do not tighten the attaching screw (ill. 14-2) too tightly.

**Note:**

If the unit is still not fogging, and when the machine is equipped with an automatic chemical solution cut-off device, the correct function of the cut-off device has to be checked according to § 11.4. Also the non-return valve for the cut-off device (ill. 14) has to be checked as described above.

## 10.2 Appliance does not start

**Note:**

Make sure that the basic checks according to paragraph 10.0 „On failure first check“ have been done.

Possible causes:

- No ignition
- No fuel supply
- No pressure in the fuel tank (refer to §10.3/Fuel tank pressure)
- Carburettor is dirty
- Wrong adjustment of the machine (refer to §10.2.5)

### 10.2.1 Check ignition

- Close the red stop button at the carburettor.
- Make some pump strokes with the starter pump. During the forward movement of the pump, you should hear a buzzing sound of the ignition coil. In this case the ignition coil and the battery connections are in order.
- Check the spark plug and the ignition cable.  
Pull the spark plug cap (ill. 9-1) and unscrew the spark plug. Then push the spark plug cap onto the plug.  
Take care that the electrode gap at the spark plug is between 2 and 2.5 mm.  
Put the spark plug with the thread to the protective grid in such a way that the electrodes can be observed.  
Make some pump strokes with the starter pump.

**Warning:**

During pumping do not touch the spark plug and the spark plug cap.

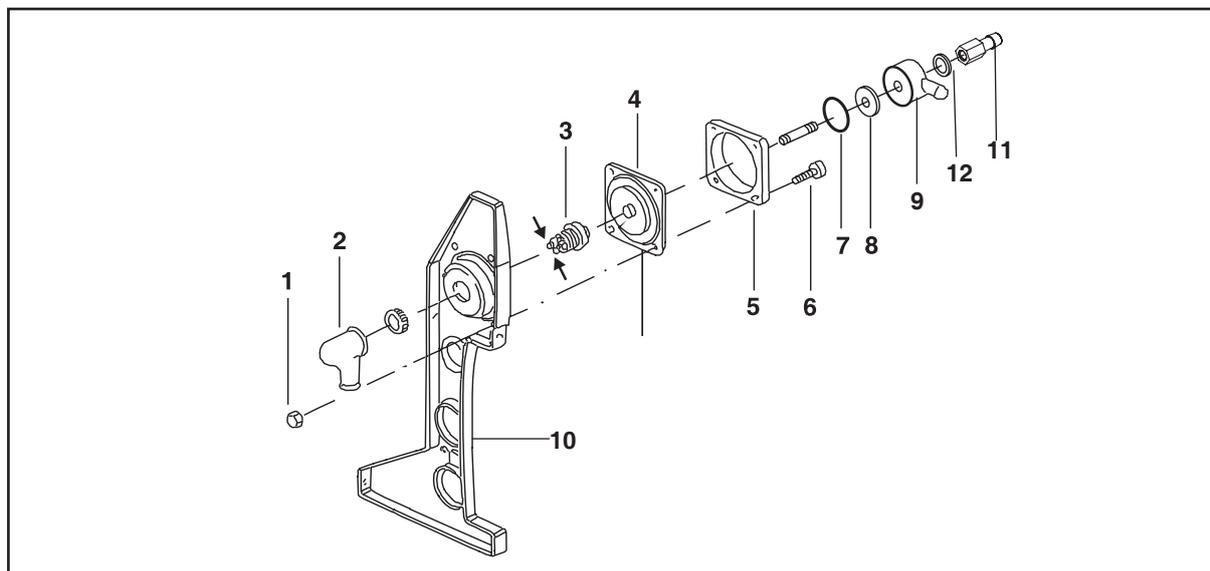
During forward movement of the pump you should see permanent sparks between the spark plug and the protective grid respectively between the electrodes.

If there is no spark, the ignition cable or the spark plug cap or the spark plug is defect and have to be replaced.

**Note:**

The spark plug should not be screwed in or out when the machine is hot, otherwise the threads may be destroyed.

## 10.2.2 Check the push button and diaphragm



Ill. 15

1 Hexagon nut  
 2 Rubber cap  
 3 Push button  
 4 Diaphragm  
 5 Pressure cell  
 6 Oval head screw

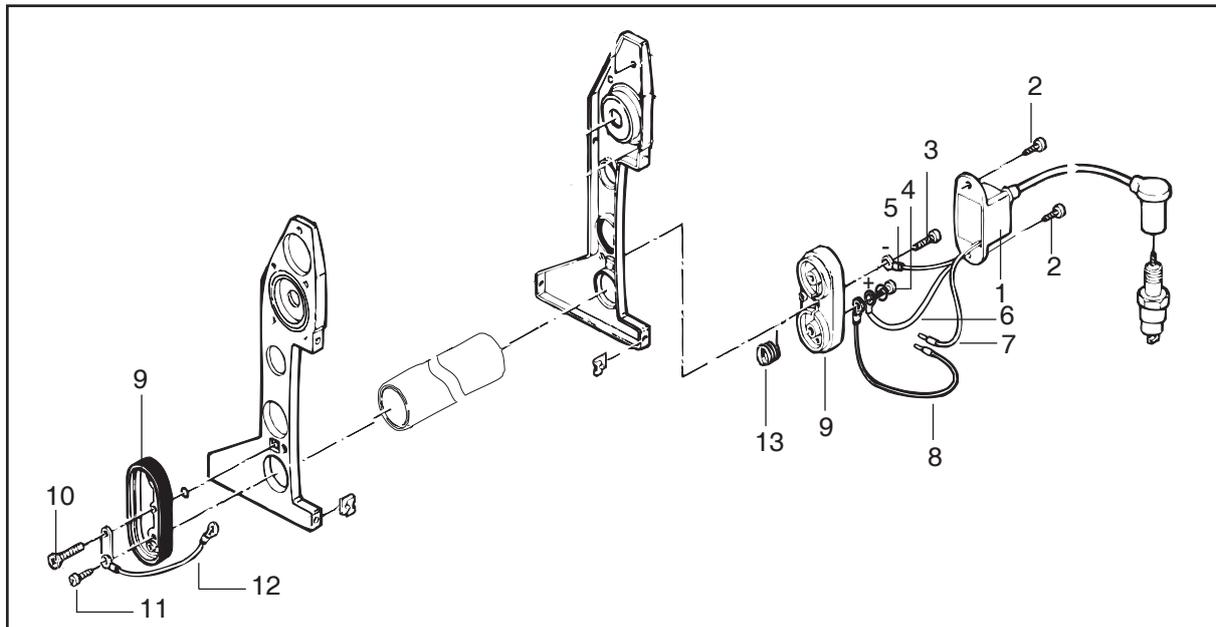
7 Gasket  
 8 Diaphragm  
 9 Cover  
 10 Support  
 11 Nipple  
 12 Gasket

When no buzzing sound of the ignition coil can be heard, the pressure cell with the push button and diaphragm, the ignition coil and the battery connections have to be checked.

- Pull the rubber cap (ill. 15-2) off the push button (ill. 15-3) and connect both contacts with a short cable (refer to arrow). If no buzzing is heard after the short-circuiting, either the ignition coil is faulty or the battery connections are corroded and have to be checked for corrosion according to § 10.2.3. If there is no corrosion, the ignition coil is faulty and has to be replaced (also refer to § 10.2.3).
- If a buzzing is heard, the push button or the diaphragms are faulty.
- To check unscrew the 4 screws (ill. 15-6) at the pressure cell (ill. 15-5), counterholding with the wrench 8 at the nuts (ill. 15-1). Take off the pressure cell with the diaphragm (ill. 15-4). Now the push button is visible. Check the function by pressing the button. When a buzzing sound is heard the push button is in order.  
 If no buzzing is heard, replace the push button.
- If a buzzing is heard when pressing the push button, most probably the green diaphragm (ill. 15-4) is defect. Check it for damages and replace if necessary. The diaphragm has a bulge around the brim, and a corresponding groove in the support (ill. 15-10). Take care that the bulge fits into the groove.

- Check also the black diaphragm (ill. 15-8) for elasticity, cleanliness and any form of damage. If necessary replace the diaphragm. Examine the gasket (ill. 15-7) which is in the seat of the cover (ill. 15-9). The seat must be clean. Make sure that during assembly the black diaphragm is installed exactly central.
- Re-assemble the pressure cell, and take care that both diaphragms are positioned correctly and that they are not damaged when re-assembling.
- Check now the ignition coil according to § 10.2.3.

### 10.2.3 Check and replace ignition coil



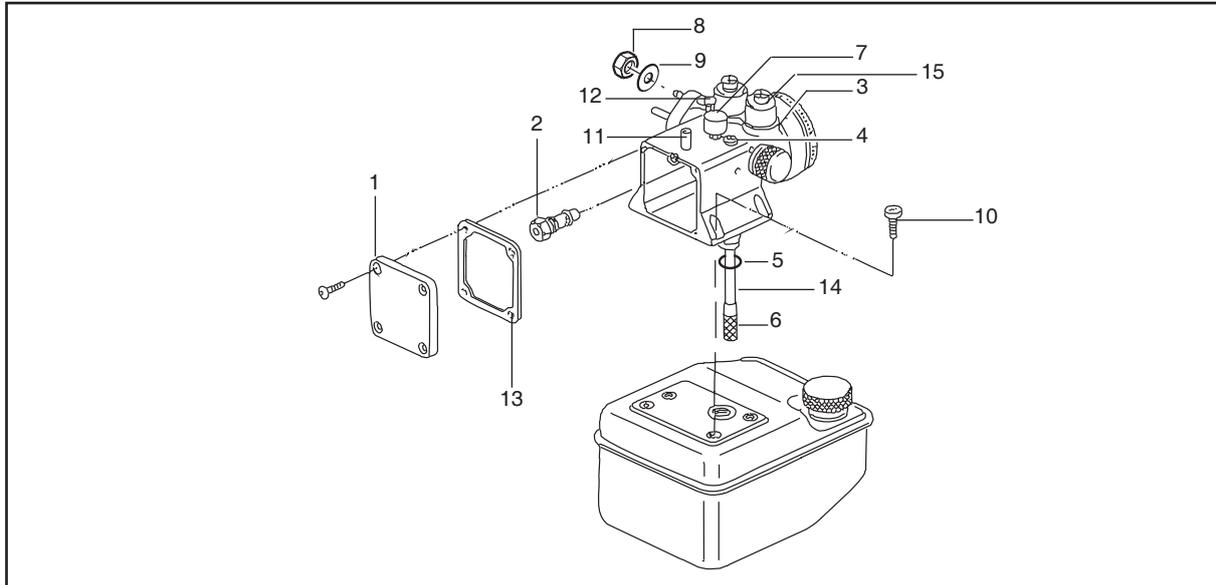
Ill. 16

- |                       |                                    |
|-----------------------|------------------------------------|
| 1 Ignition coil       | 8 Cable black                      |
| 2 Oval head screw     | 9 Battery cover                    |
| 3 Screw               | 10 Screw                           |
| 4 Screw               | 11 Screw                           |
| 5 Cable, brown, minus | 12 Ground cable to protection grid |
| 6 Cable, black, plus  | 13 Spring                          |
| 7 Cable red           |                                    |

- Pull the spark plug cap off the spark plug.
- First check eventual corrossions at the screws (ill. 16-10 and ill. 16-11). Check also the connections of cable (ill. 16-12, ground connection) for corrossions. Take also care that the screw and connection at the protection grid are in order.
- To check corrossion at the opposite side, take off the ignition coil. To do this, the carburettor/fuel tank assembly has to be removed from the resonator flange by loosening the nuts (ill. 17-8) and removing the washers (ill. 17-9). Take off the tubes (ill. 17-11 and 17-12). If the machine is equipped with an automatic solution cut-off device also take off tube (ill. 17-15).

- Disassemble the ignition coil (ill. 16-1) by taking off the two screws (ill. 16-2) from the battery cover,
- Disconnect the cable (ill. 16-5, brown, minus) by removing the screw (ill. 16-3).
- Disconnect the cables (ill. 16-6, black, plus and ill. 16-8, black) by removing the screw (ill. 16-4). Disconnect also the cables (ill. 16-7, red and ill. 16-8, black) from the push button (ill. 15-3).
- Now the battery cover can be taken off to check the spring (ill. 16-13). The spring must not be corroded.
- When the above described elements are corrosion-free or when any corrossions were removed, install the battery cover and connect all cables. When you fix the screw (ill. 16-4) take care that the spring is mounted correctly into the slot of the battery cover. The screw (ill. 16-4) is fixing the spring at the battery cover. Check that the spring cannot be removed by pulling.
- Fit the cable (ill. 16-5, brown, minus) into the screw (ill. 16-3) and fix the screw through the battery cover to the frame. Now check the function of the ignition coil again by pumping, after installing again the tubes (ill. 17-11 and ill. 17-12 and eventually tube ill. 17-15) to the carburettor. There must be an audible buzzing. If in spite of corrosion-free battery contacts or in spite of removing any corrosion, no buzzing can be heard, the ignition coil is defect and has to be replaced. Install the new ignition coil and take care that all cables are correctly connected at the battery cover and the push button. Take especially care that the spring is correctly mounted as described above. When connecting the red cable (ill. 16-7) and the black cable (ill. 16-8) at the push button it doesn't matter at which pole of the push button the cables are connected. Fix the ignition coil with the screws (ill. 16.2).
- Install again the fuel tank carburettor assembly.

### 10.2.4 Check fuel supply



Il. 17

- |                     |  |
|---------------------|--|
| 1 Carburettor cover | 9 Washer                                 |
| 2 Two-way jet       | 10 Screw                                 |
| 3 Carburettor       | 11 Tube connection to the pressure cell  |
| 4 Regulating needle | 12 Tube connection to the pressure hose  |
| 5 O-Ring            | 13 Gasket                                |
| 6 Filter            | 14 Fuel pipe                             |
| 7 Red stop button   | 15 Tube connection to the cut-off device |
| 8 Nut               |  |



**Note:**

Take the following measures only with the fuel tank **topped up, and remove the spark plug cap. Close the chemical solution tap.**

After each modification or removal of the regulating needle (ill. 17-4) the appliance must be adjusted according to § 10.2.5.

- Check first if the fuel tank cap is closed and sealing well. Check the proper function of the starter pump and the tightness of the air-conveying tube between the starter pump and the nipple (ill. 15-11) at the pressure cell (ill. 15-9), and the tube connection from the pressure cell to the carburettor (ill. 17-11).

Did you check the non-return valve according to § 9.4?

- Check the regulating needle (ill. 17-4).

Take off the plastic cap and turn out the regulating needle with a suitable screwdriver. Check whether the o-ring is damaged. Pump strongly several times. When fuel squirts out of the thread of the regulating needle, the fuel supply to the regulating needle is in order.

- Now screw in the regulating needle and check the red stop button (ill. 17-7). The regulating needle must be even with the top edge of the brass socket. From this position turn it in 7 to 8 more complete turns. This is the position in which normally the machine is starting (see § 10.2.5). Check whether the red stop button (in open position) can be pushed and is moving back into its initial position. Take off the red stop button using a wrench 10 and check whether the o-ring is in order. Pump strongly. Now some fuel should come out of the hole. If this is the case, the fuel supply is in order.
- Re-install the red stop button, connect the spark plug cap to the spark plug and try to start the machine. When the unit is not starting, the carburettor has to be cleaned as described below. If fuel does not squirt out either through the hole for the regulating needle nor through the hole of the red stop button, there is a blockage in the carburettor and the carburettor has also to be cleaned.
- To do this, **pull the spark plug cap off the spark plug again** and detach the complete carburettor/fuel tank assembly from the resonator flange by loosening the nuts (ill. 17-8) and the washers (ill. 17-9). Take off the tubes from the connections (ill. 17-11 and ill. 17-12) and, when your machine is equipped with an automatic solution cut-off device, tube (ill. 17-15). Remove the four screws (ill. 17-10) to detach the carburettor from the fuel tank. Take care that no fuel spills out of the tank, and that the fuel pipe is not bent during removal. Also take care that the o-ring (ill. 17-5) is not getting lost. Take off the filter (ill. 17-6) from the fuel pipe (ill. 17-14). Clean the filter if necessary.
- Now check the two-way jet (ill. 17-2).

**Hint**

Do not use sharp tools for cleaning the two-way jet.

Detach the four screws fixing the carburettor cover (ill. 17-1) and take off the cover and the gasket (ill. 17-13). Unscrew the two-way jet using a box wrench 10, and check the o-ring for damages. Unscrew the insert of the two-way jet with a wrench 8, counter-holding with the box wrench. Check that all borings of both parts are clean and have no obstructions. Take special care that the four fine borings at the side of the two-way jet are free and clean. If necessary clean all borings with a thin wire.

- Before assembling the carburettor again, blow through the complete fuel system of the carburettor by applying compressed air; blow through the openings for the regulating needle, for the red stop button and the fuel pipe. Doing this, close alternatively the other openings with your thumb. Take care that the regulating needle, the red stop button, the two-way jet and the fuel filter are not installed.
- Re-assemble the carburettor/fuel tank assembly.
  - Install the two-way jet, the gasket and the carburettor cover.
  - Install the red stop button and the regulating needle.
  - Re-fit the filter to the fuel pipe and fix the carburettor to the fuel tank. Take care that the o-ring (ill. 17-5) between the carburettor and the fuel tank is placed correctly in the groove of the fuel tank. A damaged o-ring has to be replaced. Install the tubes again to the connections (ill. 17-11 and ill. 17-12 and eventually tube ill. 17-15) at the carburettor.
- Tune the appliance exactly according to § 10.2.5.

### 10.2.5 Tuning of the appliance (in idle running)

During factory testing, the regulating needle (ill. 17-4) is set correctly and secured with a plastic cover. The tuning should only be altered in the event of unsatisfactory appliance operation, or after cleaning and re-installation of the carburettor, or after adjustment of the regulating needle. Do the tuning **exactly** in accordance with the following procedure:



**Note:**

Only do the tuning when the fuel tank is **full**.

- Turn out the regulating needle using a suitable screw driver. Re-insert the regulating needle in the thread, then turn and install the regulating needle until it is even with the top edge of the brass socket (approx. 5 full turns). Screw in the regulating needle exactly 7 up to 8 more complete turns.
- Start the appliance after the red stop button (ill. 17-7) is opened (counterclockwise).
- The machine is now running but is not yet correctly tuned, and there might be a flame coming out at the end of the resonator tube. Only after a running warm phase of **minimum 2 minutes, slowly** turn the regulating needle in a clockwise direction. The sound will be more even and the flame at the end of the resonator should not be visible anymore.
- Screw in the regulating needle further clockwise until you hear an even very slight decrease in the sound of the machine. Then turn out the regulating needle in a counter-clockwise direction,  $\frac{1}{2}$  up to  $\frac{3}{4}$  turns. The basic adjustment is now OK.
- Check the flame formation: Stand approximately 1 - 2 m away and look, at an **angle**, into the resonator tube. The flame should be inside the resonator tube (refer to ill. 1). Make sure that you wear suitable eye protection (goggles).
- For fine adjustment, you can screw the regulating needle approximately +/- 1/4 turn, either in or out. Once the tuning is correct, the appliance runs strong and evenly and no flames should discharge from the end of the resonator.



**Warning:**

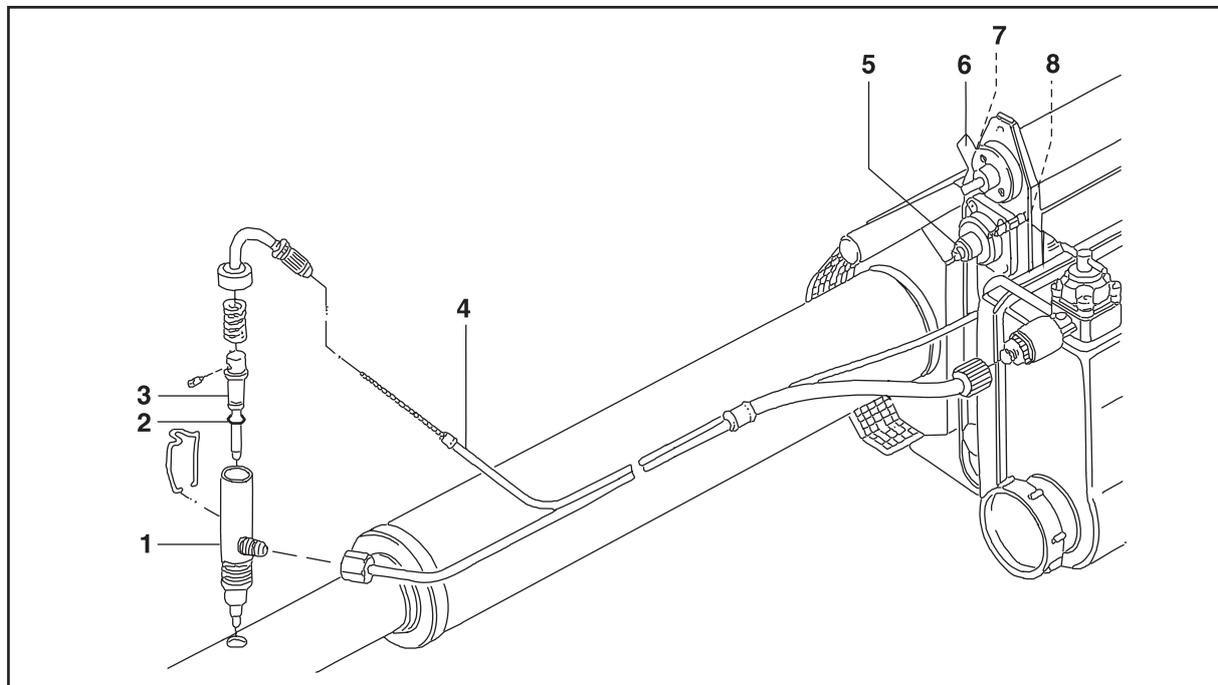
Never touch the regulating needle again, once the appliance has been adjusted. Otherwise you will have to repeat the entire procedure again.

### 10.3 Appliance starts, runs unevenly or stops

#### Possible causes

- Built-up of carbon in the resonator (clean in accordance with § 8.1).
- Built-up of carbon in the fuel/air mixing duct (clean in accordance with § 9.3).
- Diaphragm in the non-return valve is damaged or dirty (refer to § 9.4).
- Diaphragm (ill. 15-8) and/or gasket (ill. 15-7) in the pressure cell are damaged or not sealing well. If necessary, replace both parts according to § 10.2.2.
- Incorrect appliance tuning (refer to § 10.2.5).
- Two-way insert dirty (for cleaning refer to § 10.2.4).
- Fuel tank is leaking:
  - Check the tightness of the fuel tank, look for damages.
  - Check that the tank cap is tight.
  - Check that the thread of the tank and the thread of the tank cap are in good order.
  - Check that the O-Ring (ill. 17-5) is correctly installed and not damaged.
  - The correct tank pressure can be measured with the pressure gauge (optional accessory, see § 12.3). The correct pressure is in the range of at least 0.12 to 0.13 bar.
- Check the resonator. Remove the resonator and check the resonator for holes and/or tightness of the welded seams (a defective resonator cannot be repaired and has to be replaced).

## 11.0 Automatic chemical solution cut-off device



III. 18

1 Valve housing  
2 O-ring  
3 Valve pin  
4 Bowden cable

5 Pressure cell  
6 Securing lever  
7 Operating lever  
8 Locking pin

The Swingfog SN 50 can be delivered on request with the automatic chemical solution cut-off device. Please also observe the safety precautions in § 1.2 and 1.5.



**Warning fire hazard:**

When using combustible chemical preparations and/or carrying mediums it is absolutely necessary to use a machine which is equipped with an automatic chemical solution cut-off device.



**Warning:**

The proper function of the automatic chemical solution cut-off device has to be checked every time the machine is used. The machine must only be operated when the chemical solution cut-off device is working properly.

The automatic chemical solution cut-off device is a safety element and correct function must be checked before fog operation is started, according to § 11.2.

## 11.1 Function

The spraying tank is under pressure to convey the chemical fogging mixture. Should the machine stop unexpectedly due to a lack of fuel or a handling error, the chemical solution cut-off device will automatically cut-off the fogging mixture supply at the valve housing.

No un-fogged fogging mixture can flow into the hot resonator where it would cause an accumulation of vapour and even a smoke cloud coming out of the carburettor. Dirt could deposit in the carburettor, and flammable fogging mixtures could ignite.



### **Warning Fire Hazard:**

If the automatic chemical solution cut-off device is not working, flammable fogging mixture can drop down and ignite and has to be extinguished with a suitable fire extinguisher or a fire blanket.

**There are two ways of operating the chemical solution cut-off device:**

1. Interval fogging
2. Permanent fogging

### **1. Interval fogging**

After opening the chemical solution tap, operate only the operating lever (ill. 18-7) which is connected to the bowden cable (ill. 18-4) for fogging. As soon as this lever is released, the flow of fogging mixture is stopped automatically. Do not operate the securing lever (ill. 18-6). Interval fogging is only possible when the securing lever for permanent fogging does not lock the operating lever.

### **2. Permanent fogging**

Operate the operating lever (ill. 18-7) and lock its position by lifting the securing lever (ill. 18-6). For fogging, open the chemical solution tap. In order to stop fogging with the operating lever locked, close the chemical solution tap. To release the securing lever switch off the machine by closing the red stop button at the carburettor.

### **Stopping the unit:**

- Always close the chemical solution tap first. Wait until no more fog is produced and then close the stop button. The chemical solution cut-off device will be unlocked automatically.
- When the machine stops due to lack of fuel or a handling error, the chemical solution cut-off device unlocks automatically and stops the flow of fogging mixture.



### **Warning:**

If the unit stops, close the chemical solution tap immediately, because the spraying tank is under pressure, and fogging mixture will flow when the operating lever is activated by mistake. Open the upper tank cap of the spraying tank to release the pressure. Close the tank cap again.

## 11.2 Check of function

- After start and warming-up phase open the chemical solution tap and operate the operating lever (ill. 18-7) 1 - 3 times. At every operation the unit must fog. Now it is sure that the valve pin (ill. 18-3) opens and closes correctly. Should the unit not fog, check the bowden cable and the valve pin according to § 11.4.1.
- Now check the pressure cell of the cut-off device. Close the chemical solution tap. Set the machine into "permanent fogging" mode by operating the operating lever (ill. 18-7) and locking its position by lifting the securing lever (ill. 18-6). The securing lever is locked by the locking pin (ill. 18-8). If this is not possible, the pressure cell has to be repaired (refer to § 11.4.2).  
Close, with the operating lever locked, the red stop button slowly. Before the unit stops, the chemical solution cut-off device acts. In this case the automatic chemical solution cut-off device system functions correctly.
- If the automatic chemical solution cut-off device does not function, check the system according to § 11.4.

## 11.3 Maintenance

- For lubricating moving parts and particularly the bowden cable operated valve pin, you may use oil or grease with emergency running properties such as „Molykote“

Lubrication points are:

- Locking pin (ill. 18-8) (also refer to spare parts list, Ill. 07, Art.-No. 401 3860)
  - Bowden cable (ill. 18-4) (also refer to spare parts list, Ill. 07, Art.-No. 401 0770)
  - Valve pin (ill. 18-3) (also refer to spare parts list, Ill. 07, Art.-No. 400 9590)
- 
- Check regularly the adjustment and function of the bowden cable and clean the O-ring, valve pin and seating of the valve pin (refer to § 11.4.1).

## 11.4 Troubleshooting

### Possible causes for malfunctions:

- Valve pin does not close
- Decrease of pressure in the solution cut-off device system
- Appliance is tuned to low (refer to § 10.2.5)

### 11.4.1 Checking the valve pin and the bowden cable

The proper function of the cut-off device depends largely on the smooth working and adjustment of the bowden cable (ill. 18-4) and the proper function of the valve pin (ill. 18-3). Take care that the operating lever and the securing lever are running smoothly and do not jam.

- With the unit switched off, make sure that the valve pin (ill. 18-3) closes. When the operating lever is released, this can be heard. If this is not the case, the bowden cable has to be adjusted or the valve pin has to be checked for free moving.
- The setting of the bowden cable is done with the adjustment screw at the valve housing (ill. 18-1). A free motion of approx. 2 mm is required at the operating lever. Secure the position of the adjustment screw with the counter nut.
- Check also that the O-ring (ill. 18-2) is not damaged and take care that the valve pin and the seating of the valve pin are not dirty.

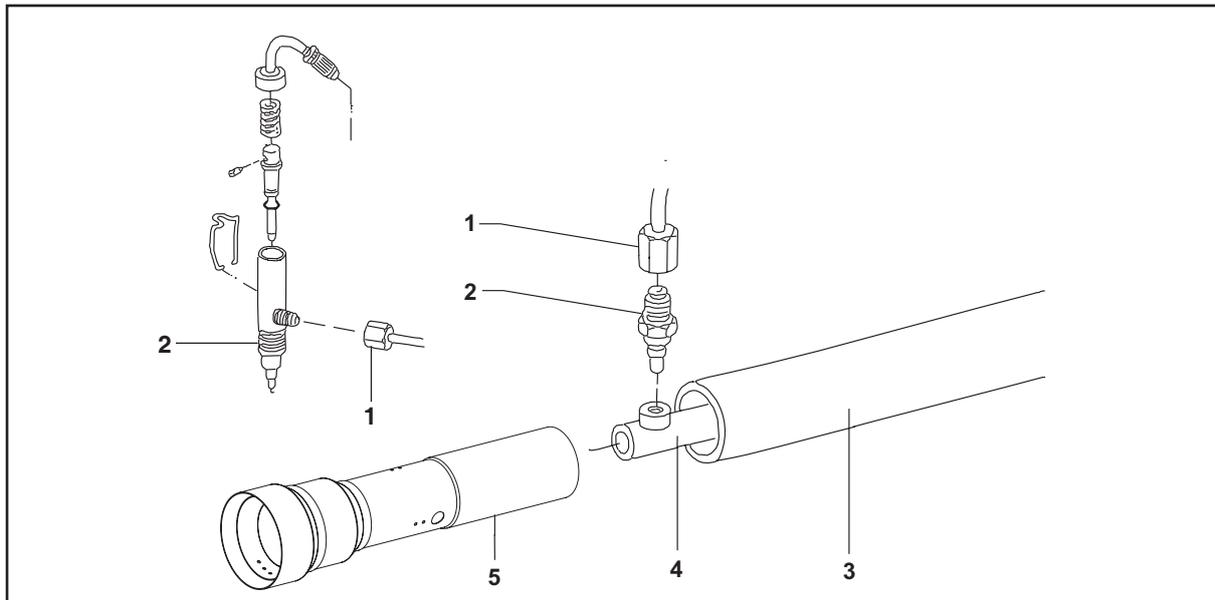
### 11.4.2 Checking the pressure cell

With the machine running, the locking pin (ill. 18-8) has to lock the operating lever (ill. 18-7) in the upper position when the securing lever (ill. 18-6) is lifted.

- If it is not possible to lock the operating lever when the machine is running, the pressure in the pressure cell is insufficient. In this case check the diaphragm (ill. 14-4) and the gasket (ill. 14-5) of the non-return valve for the automatic chemical solution cut-off device (ill. 14) as described in § 10.1.3.
- Check also the diaphragm in the pressure cell (ill. 18-5). The diaphragm has to be clean, elastic and undamaged (replace if necessary). Check by pressing the screw in the diaphragm with a finger, whether the locking pin is easily movable (forwards and backwards). When this function is in order, the locking pin is moved back by the spring into the pressure cell, and the operating lever and the securing lever jump back automatically to the original position when the machine stops. In an instant the valve pin (ill. 18-3) is acting and stops the flow of the fog solution.
- When reassembling, take care that the diaphragm is not squeezed and do not over-tighten the screws. The diaphragm has a bulge around the brim, and a corresponding groove at the frame. Take care that the bulge fits into the groove. Take also care that the gaskets 120 0650 and 401 6430 (see spare parts list ill. 07) are not damaged and installed correctly.
- After completion of the tests maintenance and eventual repairs, repeat the function test according to § 11.2 in order to make sure that the automatic chemical solution cut-off device is functioning correctly.

## 12.0 Optional accessories

### 12.1 High performance fogging tube 196 4260



III. 19

1 Chemical solution line  
2 Fog solution socket/valve housing  
3 Cooling pipe

4 Resonator  
5 High performance fogging tube 196 4260

The high performance fogging tube is recommended for the application of waterbased fogging mixtures. Using this special tube, an excellent homogeneous droplet spectrum is provided, avoiding the deposition of the big droplets next to the front of the machine and thus waste of chemicals.



**Warning:**

Never operate the machine with the high performance fogging tube when oil based fogging mixtures with carriers like diesel oil, kerosine or similar inflammable substances are applied.

### 12.1.1 Installation

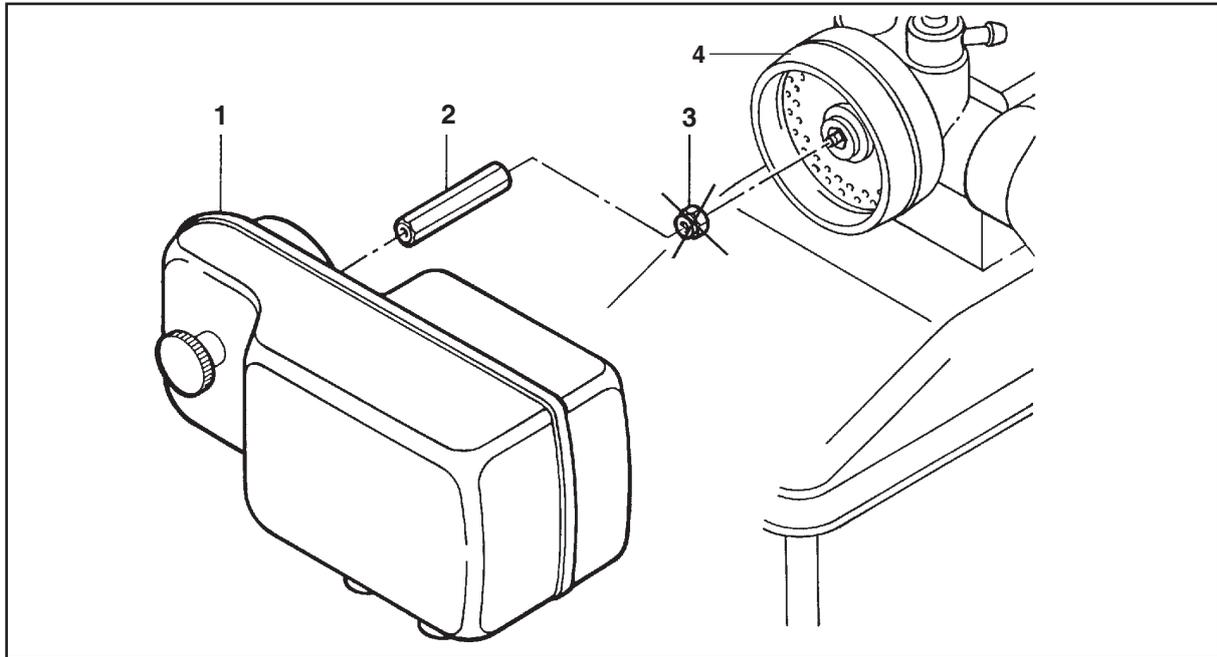
- Detach the chemical solution line (ill. 19-1) from the fog solution socket respectively from the valve housing (ill. 19-2), then unscrew the fog solution socket, respectively the lower part of the valve housing.
- The high performance fogging tube can be fitted to the cooling pipe only in one direction. Slip the high performance fogging tube over the cooling pipe allowing the hole in the tube to line up with the resonator thread (ill. 19-4).
- The high performance fogging tube has to be easily movable on the cooling pipe, to allow heat expansion of the resonator. Check this also at a later run to avoid damages to the resonator.
- Tighten the fog solution socket slightly. Attach the chemical solution line with the wrench 17 and counterhold with the wrench 13 at the hexagon of the fog solution socket.  
In case the unit is equipped with a fog solution cut-off device, screw in the valve housing up to the end but do not tighten it. Adjust the valve housing by turning it back counter-clockwise to a position in which the chemical solution line can be installed and attach the solution line with a wrench 17 tightly.



**Note:**

Clean the high performance fogging tube regularly from fogging mixture deposits, especially when wettable powder fogging mixtures are applied.

## 12.2 Silencer 196 5210



Ill. 20

1 Silencer	196 5210	3 Self-locking nut
2 Adapter	402 6310	4 Non-return valve

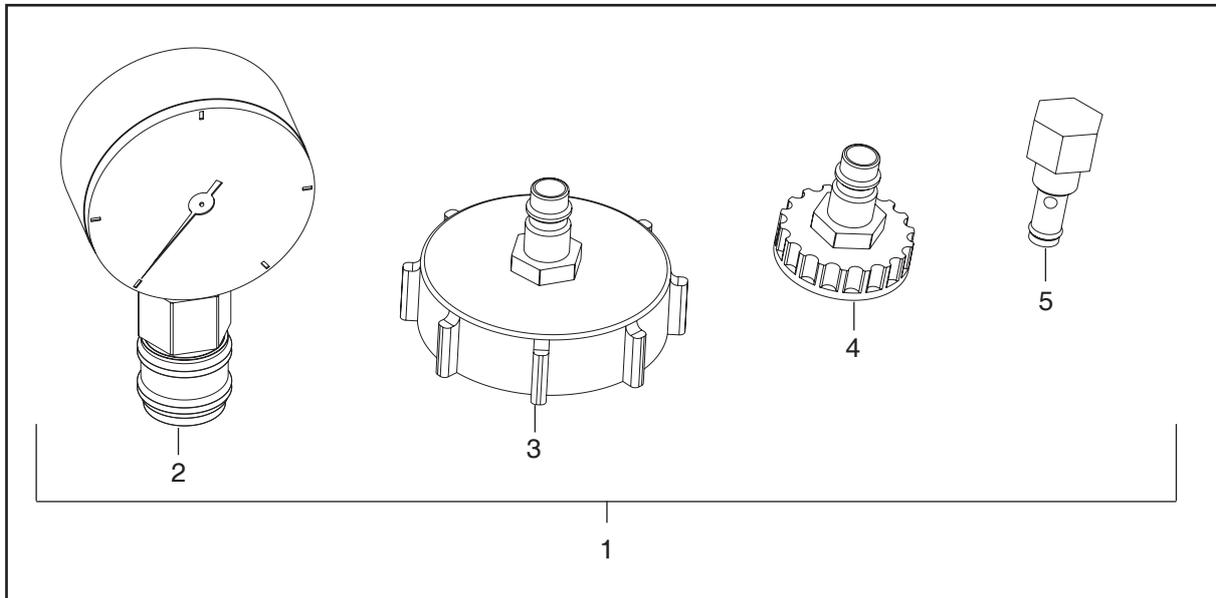
- Take off the non-return valve (ill. 20-4), loosen the screw opposite the nut (ill. 20-3) and replace the nut with the adapter (ill. 20-2), which is supplied with the silencer (ill. 20-1). Fix the adapter by tightening the screw.

- Install the non-return valve again.

- Place the silencer horizontally at the nonreturn-valve with the four suction openings pointing downwards. Tighten the knurled screw at the silencer.

The silencer needs **no maintenance**.

### 12.3 Special tools for workshop use 210 1030 (For all types of swingfog® machines)



Ill. 21

1 Pressure gauge set, cpl.	210 1030
2 Pressure gauge with quick-release coupling	210 1110
3 Tank cap spraying tank with quick-release coupling	210 1120
4 Tank cap fuel tank with quick-release coupling	210 1130
5 Blanking nozzle	196 1540



**Warning:**

Both checks should be made with full tanks.

**Check the correct spraying tank pressure**

- Fix the pressure gauge (ill. 21-2) on the (large) spraying tank cap (ill. 21-3) and install the tank cap with the pressure gauge at the spraying tank.
- Exchange the dosage nozzle against the blanking nozzle (ill. 21-5).
- Start the machine, let it warm up, and open the tap at the spraying tank.
- The pressure gauge must show a pressure of approx. 0.3 up to 0.35 bar.

**Check the correct fuel tank pressure**

- Screw the fuel tank cap (ill. 21-4), with the quick release coupling to the fuel tank and fix the pressure gauge (ill. 21-2) at the quick release coupling.
- Start the machine and let it warm up.
- The correct pressure is approx. 0.12 up to 0.13 bar.

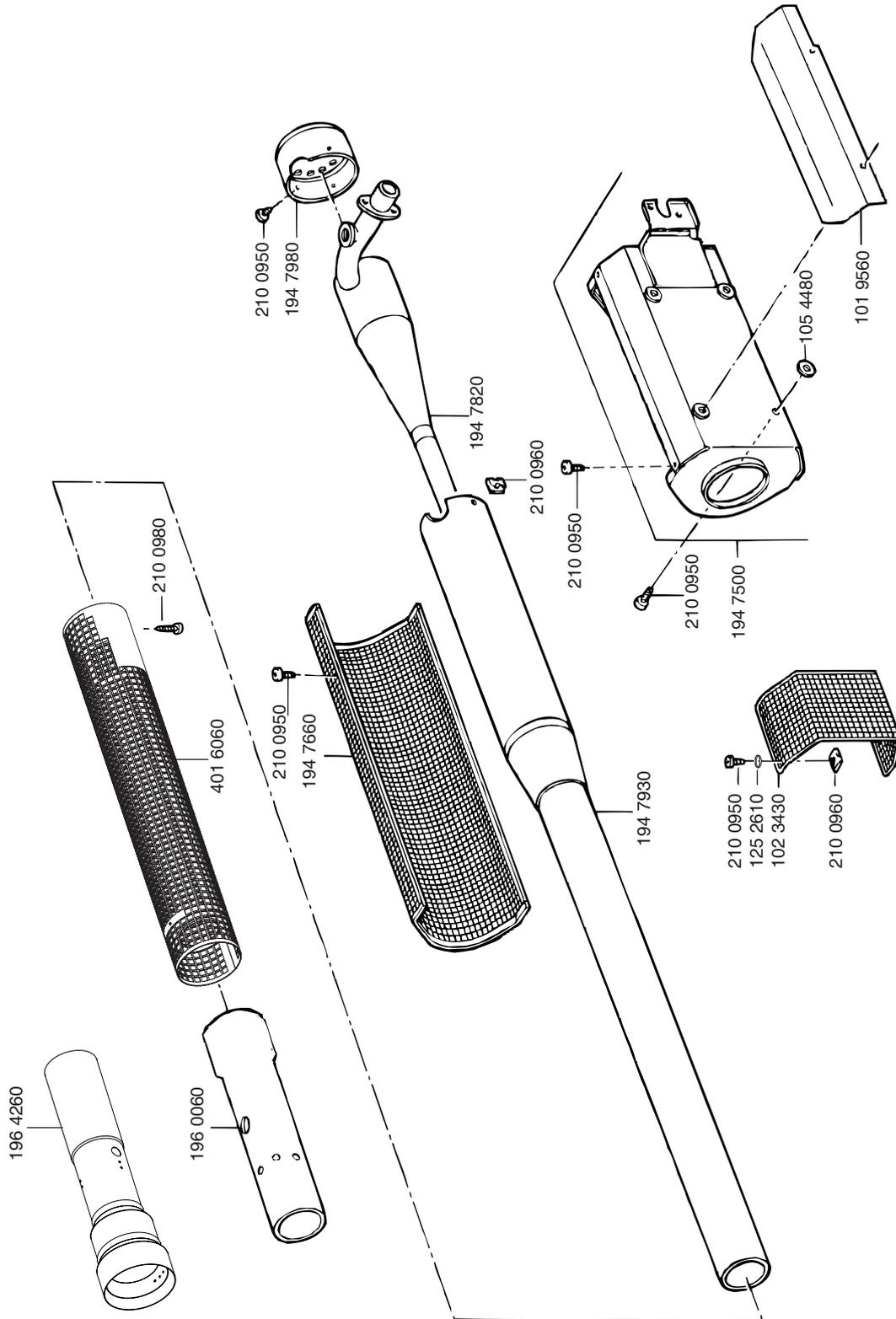
### 13.0 Spare parts list

To avoid queries, please let us have information on the quantity, description and order number of the spare parts needed as well as the type of your **swingfog**<sup>®</sup> appliance.

Resonator/Resonator Resonateur/Resonador		III. 01	
Art.-No.	Bezeichnung	Description	Description
101 9560	Strahlblech	Protection shield	Chapa reflectora
102 3430	Schutzgitter SN 50, SN 50-10	Protection guard SN 50, SN 50-10	Rejilla protectora SN 50, SN 50-10
105 4480	Dichtung	Gasket	Empaquetadura
125 2610	Scheibe	Washer	Arandela
194 7500	Schutzblech	Guard plate	Chapa protectora
194 7660	Schutzgitter	Protection guard	Rejilla protectora
194 7820	Resonator	Resonator	Resonador
194 7930	Kühlmantel	Cooling pipe	Tubo refrigerador
194 7980	Haube	Cover	Cubierta
196 0060	Nebelrohr, Edelstahl	Fog mixing tube, stainless steel	Tubo nebulizador, acero inoxidable
196 4260	Hochleistungsnebelrohr, Edelstahl	High performance fogging tube, stainless steel	Tubo nebulizador de alto rendimiento, acero inoxidable
210 0950	Schraube	Screw	Tornillo
210 0960	Mutter	Nut	Tuerca
210 0980	Schraube	Screw	Tornillo
401 6060	Schutzgitter	Protection guard	Rejilla protectora

Resonator/Resonator  
Resonateur/Resonador

III. 01






**Wirkstoff-Förderung/Chemical conveying system**  
**Transport du produit/Transporte de mezcla**

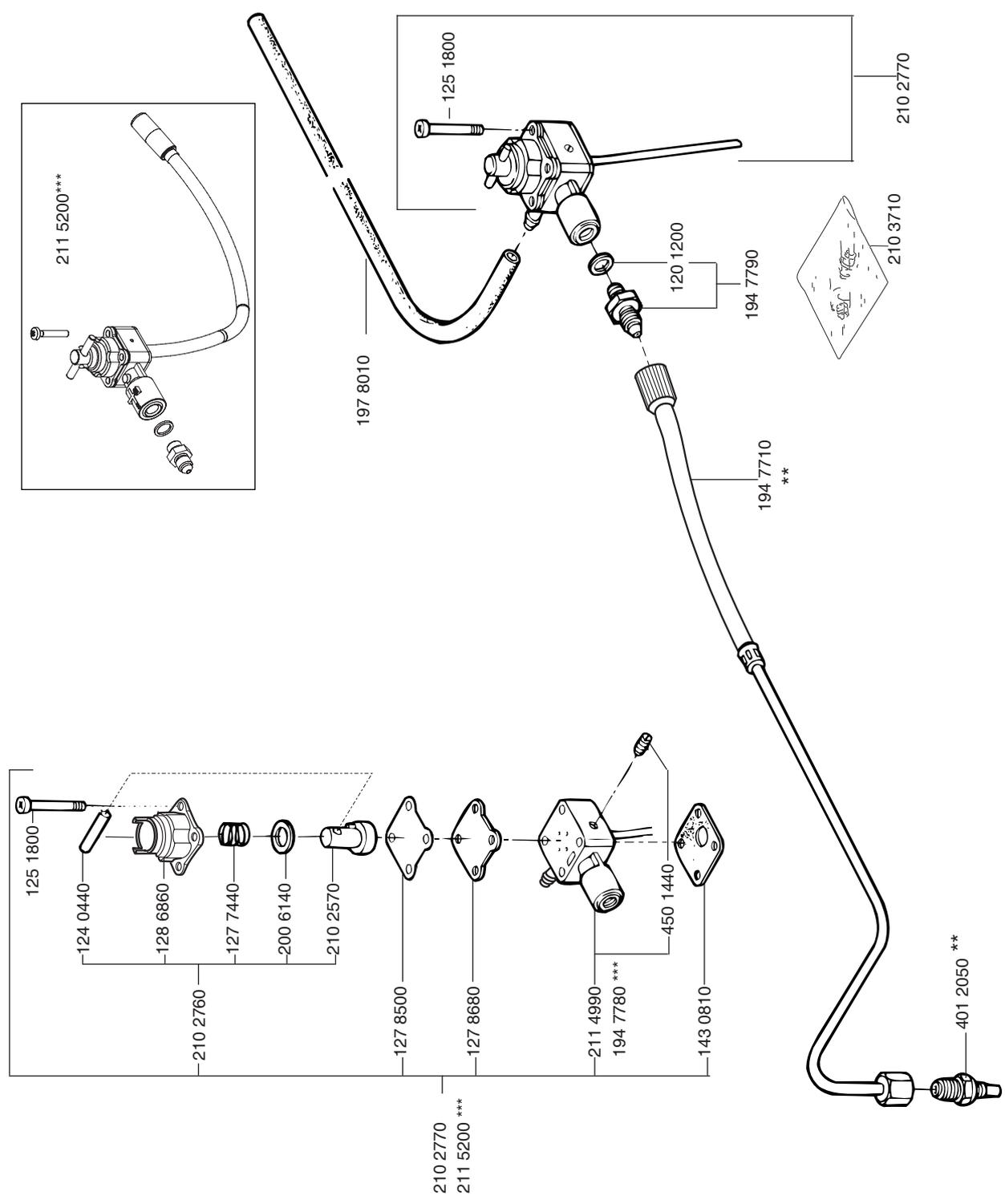
III. 02

Art.-No.	Bezeichnung	Description	Description	Descripción
120 1200	Dichtring	Gasket	Joint	Empaquetadura
124 0440	Knebelkerbstift	Dowel pin	Goupille	Pasador estribo
125 1800	Schraube	Screw	Vis	Tornillo
127 7440	Feder	Spring	Ressort	Resorte
127 8500	Dichtung	Gasket	Joint	Empaquetadura
127 8680	Dichtung	Gasket	Joint	Empaquetadura
128 6860	Wirkstoffhahn-Oberteil	Solution tap, upper part	Robinet à produit, partie supérieure	Llave de mezcla, parte superior
143 0810	Dichtung	Gasket	Joint	Empaquetadura
** 194 7710	Wirkstoffleitung, Edelstahl	Chemical solution line, stainless steel	Conduite à produit, acier inoxydable	Tubo de mezcla, acero inoxidable
*** 194 7780	Wirkstoffhahn-Unterteil mit FKM-Schlauch und Sucher	Solution tap, bottom part with FKM-hose and solution pickup	Robinet à produit, partie inf., avec tube FKM et cre pine balai	Llave de mezcla, parte inf., con tubo FKM y recogida de mezcla
194 7790	Wirkstoffdüse 1,0 mm, Edelstahl, mit Dichtung	Dosage nozzle 1.0, stainless steel, with gasket	Buse 1,0, acier inoxydable, avec joint	Boquilla 1,0, acero inoxidable, con empaquetadura
194 8020	Wirkstoffdüse 0,7 mm, Edelstahl, mit Dichtung*	Dosage nozzle 0.7, stainless steel, with gasket*	Buse 0,7, acier inoxydable, avec joint*	Boquilla 0,7, acero inoxidable, con empaquetadura*
194 8030	Wirkstoffdüse 0,8 mm, Edelstahl, mit Dichtung*	Dosage nozzle 0.8, stainless steel, with gasket*	Buse 0,8, acier inoxydable, avec joint*	Boquilla 0,8, acero inoxidable, con empaquetadura*
194 8040	Wirkstoffdüse 0,9 mm, Edelstahl, mit Dichtung*	Dosage nozzle 0.9, stainless steel, with gasket*	Buse 0,9, acier inoxydable, avec joint*	Boquilla 0,9, acero inoxidable, con empaquetadura*
194 8050	Wirkstoffdüse 1,1 mm, Edelstahl, mit Dichtung*	Dosage nozzle 1.1, stainless steel, with gasket*	Buse 1,1, acier inoxydable, avec joint*	Boquilla 1,1, acero inoxidable, con empaquetadura*
194 8060	Wirkstoffdüse 1,2 mm, Edelstahl, mit Dichtung*	Dosage nozzle 1.2, stainless steel, with gasket*	Buse 1,2, acier inoxydable, avec joint*	Boquilla 1,2, acero inoxidable, con empaquetadura*
194 8070	Wirkstoffdüse 1,4 mm, Edelstahl, mit Dichtung*	Dosage nozzle 1.4, stainless steel, with gasket*	Buse 1,4, acier inoxydable, avec joint*	Boquilla 1,4, acero inoxidable, con empaquetadura*
194 8080	Wirkstoffdüse 1,7 mm, Edelstahl, mit Dichtung*	Dosage nozzle 1.7, stainless steel, with gasket*	Buse 1,7, acier inoxydable, avec joint*	Boquilla 1,7, acero inoxidable, con empaquetadura*
197 8010	Druckschlauch	Pressure hose	Conduite à produit	Manguera de presión

Wirkstoff-Förderung/Chemical conveying system				III. 02
Transport du produit/Transporte de mezcla				
Art.-No.	Bezeichnung	Description	Description	Descripción
200 6140	Scheibe	Washer	Rondelle	Arandela
210 2570	Druckstück, Edelstahl	Thrust piece, stainless steel	Pièce de pression, acier inoxydable	Tensador, acero inoxidable
210 2760	Wirkstoffhahn-Oberteil, kpl.	Solution tap, upper part, cpl.	Robinet à produit, partie supérieure, cpl.	Llave de mezcla, parte superior, cpl.
210 2770	Wirkstoffhahn, kpl.	Solution tap, cpl.	Robinet à produit, cpl.	Llave de mezcla, cpl.
210 3710	Standard-Düsensatz, kpl. (0,8/1,0/1,2)	Standard nozzle set, cpl. (0,8/1,0/1,2)	Jeu de buses standard, cpl. (0,8/1,0/1,2)	Juego de boquillas estandar, cpl. (0,8/1,0/1,2)
211 4990	Wirkstoffhahn-Unterteil mit flexiblen PE-Schlauch	Solution tap, bottom part with flexible PE-hose and	Robinet à produit, partie inf. avec tuyau PE flexible	Llave de mezcla, parte inf. con tubo PE flexible
****211 5200	Wirkstoffhahn kpl. mit flexiblen FKM-Schlauch und Wirkstoff-Sucher	Solution tap, cpl. with flexible FKM-hose and solution pick-up	Robinet à produit, cpl. avec tuyau FKM flexible et crépine balai	Llave de mezcla, cpl. con tubo FKM flexible y recogida de mezcla
** 401 2050	Nebelstutzen, Edelstahl	Solution socket, stainless steel	Tubulure de nébulisation, acier inoxydable	Tubuladura nebulizadora, acero inoxidable
450 1440	Gewindestift	Threaded pin	Vis sans tête	Espiga enroscable
*	* bildlich nicht dargestellt	* not illustrated	* sans illustration	*sin ilustración
**	** Für Geräte mit Wirkstoff-Schnellabschaltung, siehe Ill. 07	** For machines with automatic cut-off device, refer to Ill. 07	** Pour appareils avec système d'arrêt automatique, voir Ill. 07	** Para equipos con dispositivo desconexión automática, vide Ill. 07
**	** Ventilgehäuse	Valve housing	Boîte à soupapes	Carcasa de válvula
**	** Siehe Ill. 07 (194 4620) Wirkstoffleitung	** See Ill. 07 (194 4620) Chemical solution line	** Voir Ill. 07 (194 4620) Conduite à produit	** Vide Ill. 07 (194 4620) Tubo de mezcla
**	** Siehe Ill. 07 (197 6030)	** See Ill. 07 (197 6030)	** Voir Ill. 07 (197 6030)	** Vide Ill. 07 (197 6030)

Wirkstoff-Förderung/Chemical conveying system  
 Transport du produit/Transporte de mezcla

III. 02



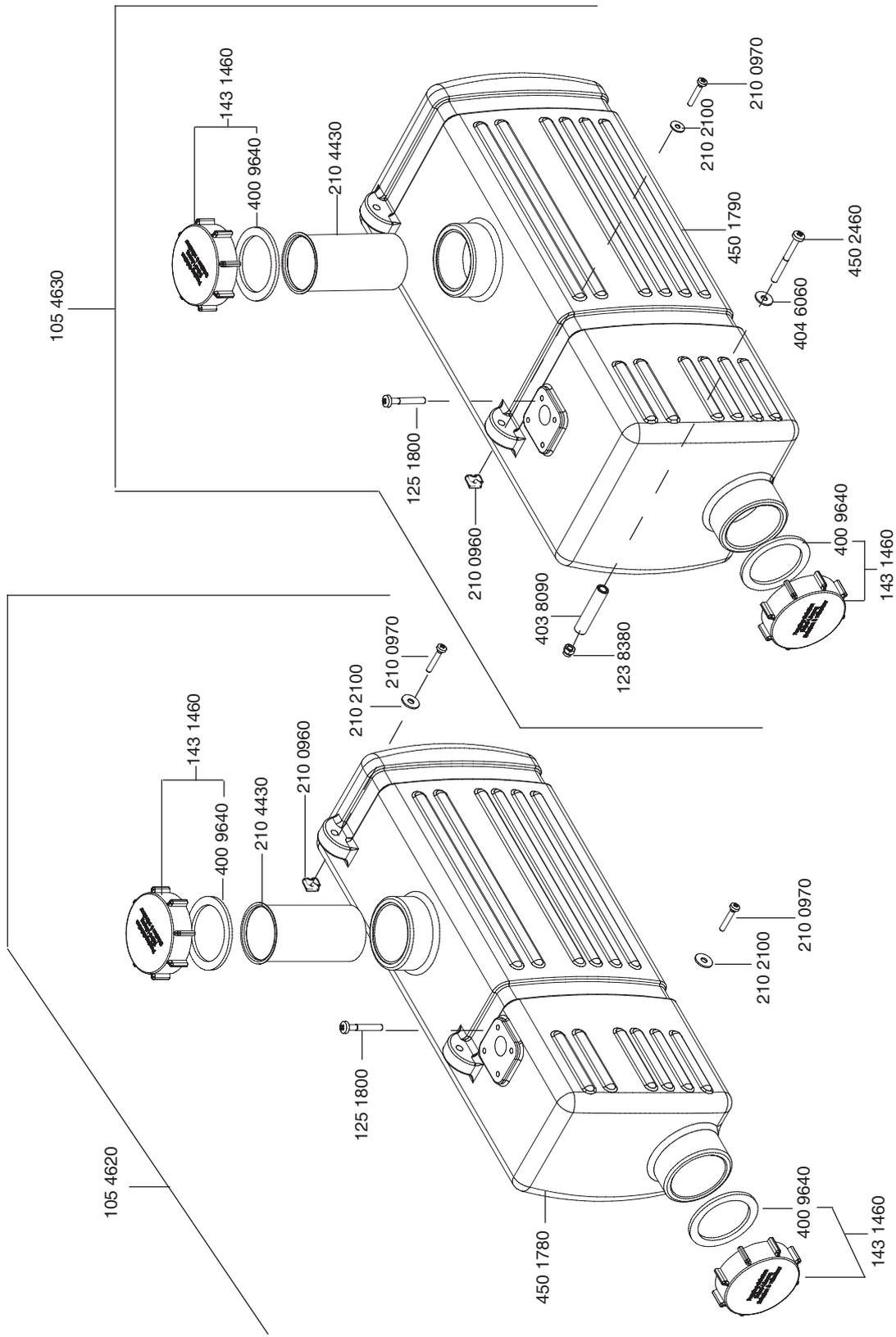
<b>Wirkstofftank/Edelstahl / Spraying tank/stainless steel</b>			
<b>Rés. à produit/acier inoxydable / Dep. de mezcla/acero inoxidable</b>			<b>III. 03</b>
<b>Art.-No.</b>	<b>Bezeichnung</b>	<b>Description</b>	<b>Description</b>
105 2110	Wirkstofftank 6,5 l, Edelstahl	Spraying tank 6.5 l, stainless steel	Réservoir à produit 6,5 l, acier inoxydable
105 2150	Wirkstofftank 9,0 l, Edelstahl	Spraying tank 9.0 l, stainless steel	Réservoir à produit 9,0 l, acier inoxydable
105 4230	Wirkstofftank 6,5 l, Edelstahl, kpl.	Spraying tank 6.5 l, stainless steel, cpl.	Réservoir à produit 6,5 l, acier inoxydable, cpl.
105 4260	Wirkstofftank 9,0 l, Edelstahl, kpl.	Spraying tank 9.0 l, stainless steel, cpl.	Réservoir à produit 9,0 l, acier inoxydable, cpl.
123 8380	Mutter	Nut	Ecrou
125 1800	Schraube	Screw	Vis
143 1460	Tankverschluß mit Dichtung	Tank cap with gasket	Couvercle de réservoir avec joint
210 0950	Schraube	Screw	Vis
210 0960	Mutter	Nut	Ecrou
210 4430	Filtereinsatz Wirkstofftank, Edelstahl	Filter insert spraying tank, stainless steel	Filtereinsatz à produit, acier inoxydable
400 9640	Dichtung	Gasket	Joint
403 8090	Distanzstück	Spacer pipe	Pièce d'écartement
404 4280	Schraube	Screw	Vis
			Tuerca
			Tornillo
			Tapa de depósito con empaquetadura
			Tornillo
			Tuerca
			Cartucho filtrante depósito de mezcla, acero inoxidable
			Empaquetadura
			Pieza de distancia
			Tornillo



Wirkstofftank/Polyethylen / Spraying tank/Polyethylene Rés. à produit/Polyéthylène / Dep. de mezcla/Polietileno				III. 04
Art.-No.	Bezeichnung	Description	Description	Descripción
105 4620	Wirkstofftank 7,0 l, kpl., Poliethylen	Spraying tank 7.0 l, cpl., polyethylene	Réservoir à produit 7,0 l, cpl., polyéthylène	Depósito de mezcla 7,0 l, cpl., polietileno
105 4630	Wirkstofftank 10,0 l, kpl., Poliethylen	Spraying tank 10.0 l, cpl., polyethylene	Réservoir à produit 10,0 l, cpl., polyéthylène	Depósito de mezcla 10,0 l, cpl., polietileno
123 8380	Mutter	Nut	Ecrou	Tuerca
125 1800	Schraube	Screw	Vis	Tornillo
143 1460	Tankverschluß mit Dichtung	Tank cap with gasket	Couvercle de réservoir avec joint	Tapa de depósito con empaquetadura
210 0960	Mutter	Nut	Ecrou	Tuerca
210 0970	Schraube	Screw	Vis	Tornillo
210 2100	Scheibe	Washer	Rondelle	Arandela
210 4430	Filtereinsatz Wirkstofftank, Edelstahl	Filter insert spraying tank, stainless steel	Filtere réservoir à produit, acier inoxydable	Cartucho filtrante depósito de mezcla, acero inoxidable
400 9640	Dichtung	Gasket	Joint	Empaquetadura
403 8090	Distanzstück	Spacer pipe	Pièce d'écartement	Pieza de distancia
404 6060	Scheibe	Washer	Rondelle	Arandela
450 1780	Wirkstofftank 7,0 l, Poliethylen	Spraying tank 7.0 l, polyethylene	Réservoir à produit 7,0 l, polyéthylène	Depósito de mezcla 7,0 l, polietileno
450 1790	Wirkstofftank 10,0 l, Poliethylen	Spraying tank 10.0 l, polyethylene	Réservoir à produit 10,0 l, polyéthylène	Depósito de mezcla 10,0 l, polietileno
450 2460	Schraube	Screw	Vis	Tornillo

Wirkstofftank/Polyethylen / Spraying tank/Polyethylene  
 Rés. à produit/Polyéthylène / Dep. de mezcla/Polietileno

III. 04

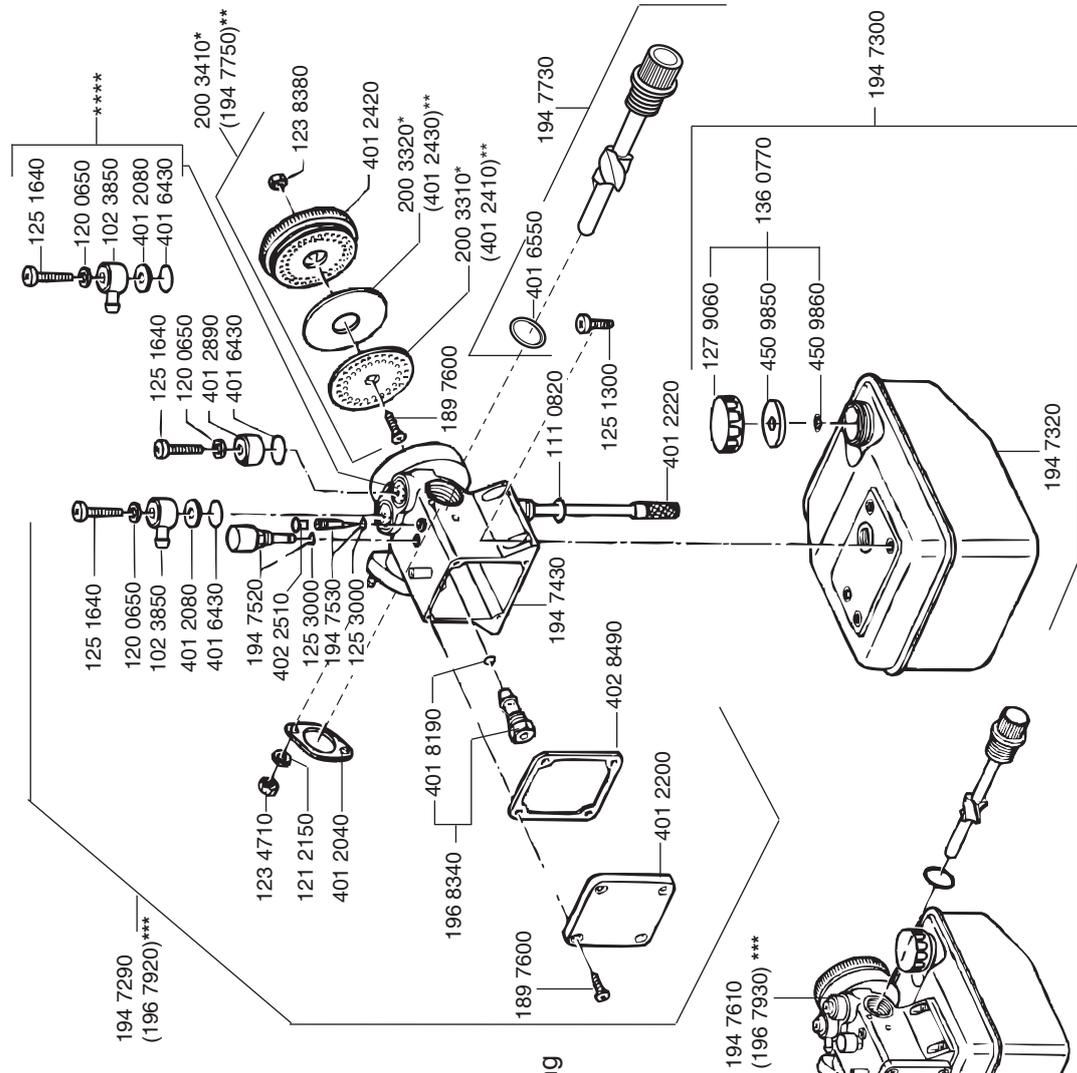



Vergaser/Benzintank / Carbuirettor/fuel tank Carburateur/rés. d'essence / Carburador dep. de gasolina				III. 05
Art.-No.	Bezeichnung	Description	Description	Descripción
102 3850	Abdeckkappe, rot	Cover, red	Capuchon, rouge	Tapa, roja
111 0820	O-Ring	O-ring	Bague-O	Anillo-O
120 0650	Dichtung	Gasket	Joint	Empaquetadura
121 2150	Federscheibe	Spring washer	Rondelle élastique	Arandela de presión
123 4710	Mutter	Nut	Ecrou	Tuerca
123 8380	Mutter	Nut	Ecrou	Tuerca
125 1300	Schraube	Screw	Vis	Tornillo
125 1640	Schraube	Screw	Vis	Tornillo
125 3000	O-Ring Viton	O-ring Viton	Bague-O Viton	Anillo-O Viton
127 9060	Tankverschluß	Tank cap	Couvercle de réservoir	Tapa de depósito
136 0770	Tankverschluß, kpl.	Tank cap, cpl.	Couvercle de réservoir, cpl.	Tapa de depósito, cpl.
189 7600	Schraube	Screw	Vis	Tornillo
194 7290	Vergaser, kpl.	Carbuirettor, cpl.	Carburateur, cpl.	Carburador, cpl.
194 7300	Benzintank, Edelstahl, kpl., mit Tankverschluß	Fuel tank, stainless steel, cpl., with tank cap	Réservoir d'essence, acier inoxydable, cpl., avec couvercle	Depósito de gasolina, acero inoxidable, cpl., con tapa
194 7320	Benzintank, Edelstahl	Fuel tank, stainless steel	Réservoir d'essence, acier inoxydable	Depósito de gasolina, acero inoxidable
194 7430	Vergasergehäuse	Carbuirettor housing	Corps du carburateur	Carcasa de carburador
194 7520	Abstellknopf mit O-Ring	Stop button with O-ring	Bouton d'arrêt avec Bague-O	Botón de cierre con Anillo-O
194 7530	Regelnadel mit O-Ring	Regulating needle with O-ring	Aiguille régulatrice avec Bague-O	Aguja de regulación con Anillo-O
194 7610	Vergaser mit Benzintank	Carbuirettor with fuel tank	Carburateur avec réservoir d'essence	Carburador con depósito de gasolina
194 7730	Drallkörper	Swirl vane	Corps de torsion	Elemento de torsión
194 7750	Rückschlagventil, kpl. für Geräte bis Serien-Nr. 023916	Non-return valve, cpl. for applicators up to serial No. 023916	Soupape de non-retour, cpl. pour appareils jusqu'au no. de série 023916	Válvula de admisión de aire, cpl. para máquinas hasta No. de serie 023916
196 7920	Vergaser, kpl. nur für Geräte mit Wirkstoffschneidabschaltung	Carbuirettor, cpl. for machines with automatic solution cut-off device only	Carburateur, cpl. seulement pour appareils avec arrêt automatique de produit	Carburador, cpl. solamente para equipos con desconexión de mezcla automática
196 7930	Vergaser mit Benzintank nur für Geräte mit Wirkstoffschneidabschaltung	Carbuirettor with fuel tank for machines with automatic solution cut-off device only	Carburateur avec réservoir d'essence seulement pour appareils avec arrêt automatique de produit	Carburador con depósito de combustible solamente para equipos con desconexión de mezcla automática

<b>Vergaser/Benzintank / Carbuerttor/fuel tank</b> <b>Carburateur/rés. d'essence / Carburador/dep. de gasolina</b>				<b>III. 05</b>
<b>Art.-No.</b>	<b>Bezeichnung</b>	<b>Description</b>	<b>Description</b>	<b>Descripción</b>
196 8340	Zweiwegdüse mit O-Ring	Two-way jet with O-Rings	Gicleur à deux voies avec Bague-O	Boquilla de doble acción con Anillo-O
200 3310	Distanzplatte, schwarz für Geräte ab Serien-Nr. 023917	Spacer plate, black for applicators from serial No. 023917 on	Plaque d'écartement, noir pour appareils à partir du no. de série 023917	Plancha de distanciamiento, negra para máquinas a partir del No. de serie 023917
200 3320	Membrane für Geräte ab Serien-Nr. 023917	Diaphragm for applicators from serial No. 023917 on	Membrane pour appareils à partir du no. de série 023917	Membrana para máquinas a partir del No. de serie 023917
200 3410	Rückschlagventil, kpl. für Geräte ab Serien-Nr. 023917	Non-return valve, cpl. for applicators from serial No. 023917 on	Souape de non-retour, cpl. pour appareils à partir du no. de série 023917	Válvula de admisión de aire, cpl. para máquinas a partir del No. de serie 023917
401 2040	Dichtung	Gasket	Joint	Empaquetadura
401 2080	Membrane	Diaphragm	Membrane	Membrana
401 2200	Vergaserdeckel	Carbuerttor cover	Couvercle du carburateur	Tapa de carburador
401 2220	Filter	Filter	Filter	Filtero
401 2410	Distanzplatte, rot für Geräte bis Serien-Nr. 023916	Distance plate, red for applicators up to serial No. 023916	Plaque d'écartement, rouge pour appareils jusqu'au no. de série 023916	Plancha de distanciamiento, roja para máquinas hasta No. de serie 023916
401 2420	Deckplatte	Cover plate	Plaque de recouvrement	Tapa enroscable
401 2430	Membrane für Geräte bis Serien-Nr. 023916	Diaphragm for applicators up to serial No. 023916	Membrane pour appareils jusqu'au no. de série 023916	Membrana para máquinas hasta No. de serie 023916
401 2890	Abdeckkappe, schwarz	Cover, black	Capuchon, noir	Tapa, negra
401 6430	Dichtung	Gasket	Joint	Empaquetadura
401 6550	O-Ring	O-ring	Bague-O	Anillo-O
401 8190	O-Ring	O-ring	Bague-O	Anillo-O
402 2510	Plastikkappe	Plastic cap	Capuchon en plastique	Tapita de plástica
402 8490	Dichtung	Gasket	Joint	Empaquetadura
450 9850	Dichtung	Gasket	Joint	Empaquetadura
450 9860	Federring	Locking ring	Anneau de sécurité	Anillo de seguridad

**Vergaser/Benzintank / Carbuettor/fuel tank  
Carburateur/rés. d'essence / Carburador/dep. de gasolina**

III. 05

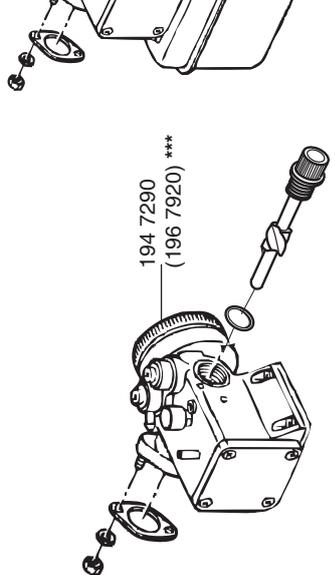


\* für Geräte ab Serien-Nr. 023917  
for applicators from serial No. 023917 on  
pour appareils à partir de no. de série 023917  
para máquinas a partir del No. de serie 023917

\*\* (für Geräte bis Serien-Nr. 023916  
for applicators up to serial No. 023916  
pour appareils jusqu'au no. de série 023916  
para máquinas hasta No. de serie 023916)

\*\*\* (196 7920) (196 7930)  
nur für Geräte mit Wirkstoffschneidabschaltung  
for machines with automatic solution cut-off  
device only  
seulement pour appareils avec arrêt auto-  
matique de produit  
solamente para equipos con desconexión  
de mezcla automática

\*\*\*\* nur für Geräte mit Wirkstoffschneidabschaltung  
for machines with automatic solution cut-off  
device only  
seulement pour appareils avec arrêt auto-  
matique de produit  
solamente para equipos con desconexión  
de mezcla automática





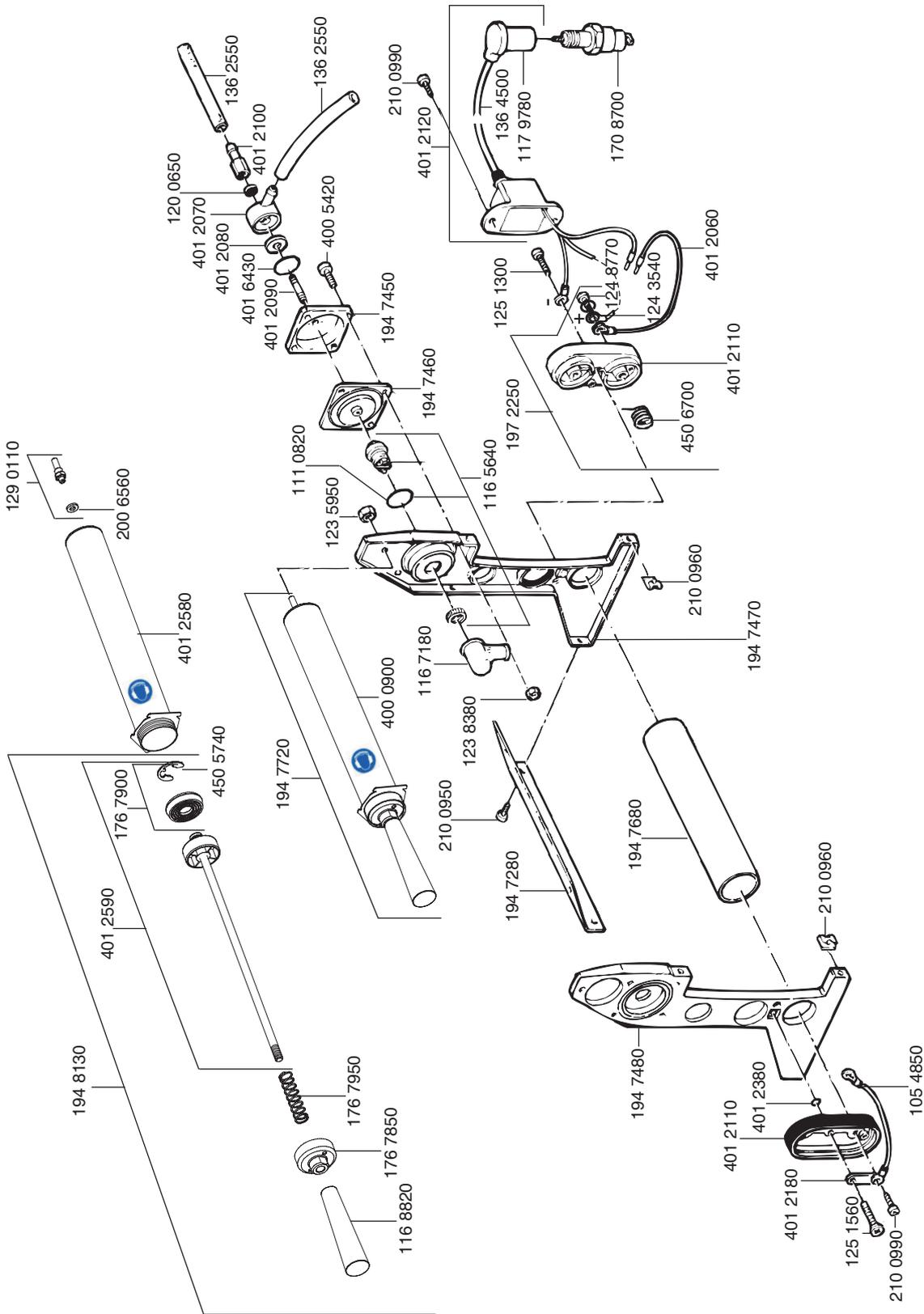

**Startluftpumpe/elektr. Ausrüstung / Starter air pump/electr. equipment**  
**Pompe à air/équipement électrique / Bomba de aire/equipamiento eléctrico III. 06**

Art.-No.	Bezeichnung	Description	Description	Descripción
105 4850	Masse-Kabel	Ground cable	Câble de mise à la masse	Cable a masa/tierra
111 0820	O-Ring	O-ring	Bague-O	Anillo-O
116 5640	Drucktaste	Push button	Bouton	Botón
116 7180	Gummikappe	Rubber cap	Capsule en caoutchouc	Tapa de goma
116 8820	Griff	Handle	Poignée	Mango
117 9780	Zündkerzenstecker	Spark plug socket	Cosse de bougie	Enchufe para bujía
120 0650	Dichtung	Gasket	Joint	Empaquetadura
123 5950	Mutter	Nut	Ecrou	Tuerca
123 8380	Mutter	Nut	Ecrou	Tuerca
124 3540	Scheibe	Washer	Rondelle	Arandela
124 8770	Schraube	Screw	Vis	Tornillo
125 1300	Schraube	Screw	Vis	Tornillo
125 1560	Schraube	Screw	Vis	Tornillo
129 0110	Nippel mit Dichtung	Nipple with gasket	Raccord avec joint	Boquilla con empaquetadura
136 2550	Schlauch	Hose	Tube	Manguera
136 4500	Zündkabel	Ignition cable	Câble d'allumage	Cable de encendido
170 8700	Zündkerze	Spark plug	Bougie	Bujía
176 7850	Rohrverschraubung	Tube screwing	Raccord de tube	Atomilladura de tubo
176 7900	Manschette mit Sicherungs-scheibe	Pump collar with securing washer	Manchette de pompe avec rondelle de sécurité	Embolo de bomba con arandela de seguridad
176 7950	Druckfeder	Pressure spring	Ressort de pression	Resorte de presión
194 7280	Strahlblech	Protection shield	Plaque en acier	Chapa reflectora
194 7450	Druckdose	Pressure cell	Carter de pression	Caja de presión
194 7460	Membrane mit Teller	Diaphragm with plate	Membrane avec disque	Membrana con plato
194 7470	Halterung (Zündspulenseite)	Support (ignition coil side)	Support (côté bobine d'allumage)	Soporte (lado bobina)

**Startluftpumpe/elektr. Ausrüstung / Starter air pump/electr. equipment  
Pompe à air/équipement électrique / Bomba de aire/equipamiento eléctrico III. 06**

<b>Art.-No.</b>	<b>Bezeichnung</b>	<b>Description</b>	<b>Description</b>	<b>Descripción</b>
194 7480	Halterung (Batterieeinführseite)	Support (battery insert side)	Support (côté piles d'introduction)	Soporte (lado introducción de baterías)
194 7680	Batteriehalterohr	Battery holding pipe	Boîte de piles	Soporte para baterías
194 7720	Pumpe mit Nippel, kpl.	Pump with nipple, cpl.	Pompe avec raccord, cpl.	Bomba con boquilla, cpl.
194 8130	Pumpenstange, kpl.	Pump plunger, cpl.	Tige de pompe, cpl.	Varilla de bomba, cpl.
197 2250	Zündspulenhalterung	Ignition coil support	Support de bobine d'allumage	Soporte de bobina
200 6560	Dichtung	Gasket	Joint	Empaquetadura
210 0950	Schraube	Screw	Vis	Tornillo
210 0960	Mutter	Nut	Ecrou	Tuerca
210 0990	Schraube	Screw	Vis	Tornillo
400 0900	Schild "Gehörschutz"	Label "Ear protection"	Autocollant "Protection acoustique"	Plaqueta "Protector de oídos"
400 5420	Schraube	Screw	Vis	Tornillo
401 2060	Kabel mit Öse	Cable with eyelet	Cable avec oeillet	Cable con ojal
401 2070	Abdeckkappe, schwarz	Cover, black	Capuchon, noir	Tapa, negra
401 2080	Membrane	Diaphragm	Membrane	Membrana
401 2090	Bolzen	Bolt	Boulon	Bulón
401 2100	Nippel	Nipple	Nipple	Niple
401 2110	Batterieabdeckung	Battery cover	Couvercle de boîte de piles	Tapa de baterías
401 2120	Zündspule mit Zünd- kabel und Zünd- kerzenstecker	Ignition coil with ignition cable and spark plug socket	Bobine d'allumage avec cable d'allumage et cosse de bougie	Bobina de encendido con cable de encendido y enchufe para bujía
401 2180	Kontaktblech	Contact strip	Tôle de contact	Plancha de contacto
401 2380	O-Ring Viton	O-ring Viton	Bague-O Viton	Anillo-O Viton
401 2580	Pumpenrohr	Pump barrel	Tube de pompe	Tubo de bomba
401 2590	Pumpenstange mit Manschette und Sicherungsscheibe	Pump plunger with collar and securing washer	Tige de pompe avec embout et rondelle de sécurité	Varilla de bomba con émbolo y arandela de seguridad
401 6430	Dichtung	Gasket	Joint	Empaquetadura
450 5740	Sicherungsscheibe	Securing washer	Rondelle de sécurité	Arandela de seguridad
450 6700	Kontaktfeder	Contact spring	Ressort de contact	Resorte de contacto

**Startluftpumpe/elektr. Ausrüstung / Starter air pump/electr. equipment**  
**Pompe à air/équipement électrique / Bomba de aire/equipamiento eléctrico III. 06**






**Option: Schnellabschaltung/Chemical solution cut-off device**  
**Arrêt automatique/Desconexión automática**

III. 07

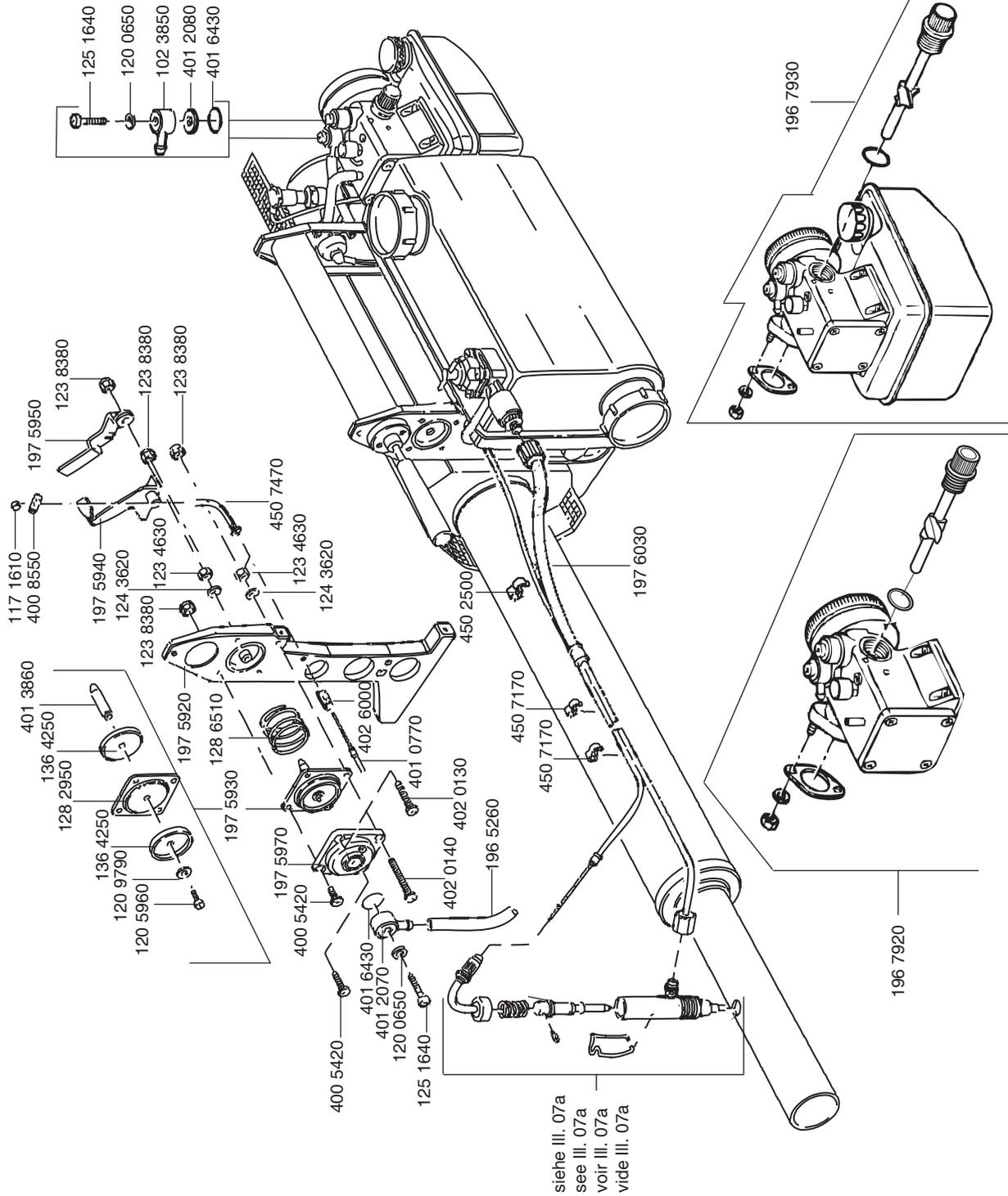
Art.-No.	Bezeichnung	Description	Description	Descripción
102 3850	Abdeckkappe, rot	Cover, red	Capuchon, rouge	Tapa, roja
106 1810	Scheibe	Washer	Rondelle	Arandela
117 1610	Plombe	Seal	Plomb	Precinto
120 0650	Dichtung	Gasket	Joint	Empaquetadura
120 5960	Schraube	Screw	Vis	Tornillo
120 9790	Scheibe	Washer	Rondelle	Arandela
123 4630	Mutter	Nut	Ecrou	Tuerca
123 8380	Mutter	Nut	Ecrou	Tuerca
124 3620	Federscheibe	Spring washer	Rondelle élastique	Arandela de presión
125 1640	Schraube	Screw	Vis	Tornillo
125 3420	O-Ring Viton	O-ring Viton	Bague-O Viton	Anillo-O Viton
128 2950	Membrane	Diaphragm	Membrane	Membrana
128 6510	Druckfeder	Pressure spring	Ressort de pression	Resorte de presión
136 4250	Teller	Plate	Disque	Plato
194 4620	Ventilgehäuse, Edelstahl, kpl.	Valve housing, stainless steel, cpl.	Boîte à soupapes, acier inoxydable, cpl.	Carcasa de válvula, acero inoxidable, cpl.
194 4830	Umlenkbogen	Cable guide	Coude de guidage	Codo
196 5260	Schlauch	Hose	Tuyau	Manguera
196 7920	Vergaser, kpl.	Carburettor, cpl.	Carburateur, cpl.	Carburador, cpl.
196 7930	Vergaser mit Benzintank	Carburettor with fuel tank	Carburateur avec réservoir d'essence	Carburador con depósito de combustible
197 5920	Halterung	Support	Support	Soporte
197 5930	Membrane, kpl.	Diaphragm, cpl.	Membrane, cpl.	Membrana, cpl.
197 5940	Bedienungshebel	Operating lever	Manette coudée	Palanca de mando
197 5950	Sicherungshebel	Securing lever	Manette de sécurité	Palanca de seguridad
197 5970	Druckdose mit Düse	Pressure cell with nozzle	Carter à pression avec buse	Caja de presión con boquilla
197 6030	Wirkstoffleitung, Edelstahl, kpl.	Chemical solution line, stainless steel, cpl.	Conduite à produit, acier inoxydable, cpl.	Tubo de mezcla, acero inoxidable, cpl.
210 6410	Gehäuse mit Ventilstift	Housing with valve pin	Boîte avec goupille de soupape	Carcasa con expiga de válvula

**Option: Schnellabschaltung/Chemical solution cut-off device**  
**Arrêt automatique/Desconexión automática**
**III. 07**

<b>Art.-No.</b>	<b>Bezeichnung</b>	<b>Description</b>	<b>Description</b>	<b>Descripción</b>
400 4820	Drahtspange	Wire catch	Agrafe en fil métallique	Hebilla de alambre
400 4890	Druckfeder	Pressure spring	Ressort de pression	Resorte de presión
400 5420	Schraube	Screw	Vis	Tornillo
400 8540	Gewindestift	Threaded pin	Vis	Espiga enroscable
400 8550	Nippel	Nipple	Manchon	Niple
401 0770	Bowdenzug	Bowden cable	Câble Bowden	Cable Bowden
401 2070	Abdeckkappe, schwarz	Cover, black	Capuchon, noir	Tapa, negra
401 2080	Membrane	Diaphragm	Membrane	Membrana
401 3860	Arretierstift	Locking pin	Goupille de blocage	Espiga de detención
401 6430	Dichtung	Gasket	Joint	Empaquetadura
402 0130	Schraube	Screw	Vis	Tornillo
402 0140	Schraube	Screw	Vis	Tornillo
402 6000	Schraube	ScREW	Vis	Tornillo
450 2500	Kabelschelle	Clamp	Attache de câble	Abrazadera
450 7170	Kabelschelle	Clamp	Attache de câble	Abrazadera
450 7470	Umlenkbogen	Cable guide	Coude de guidage	Codo
451 3690	C-Ring	C-ring	Bague-C	Anillo-C

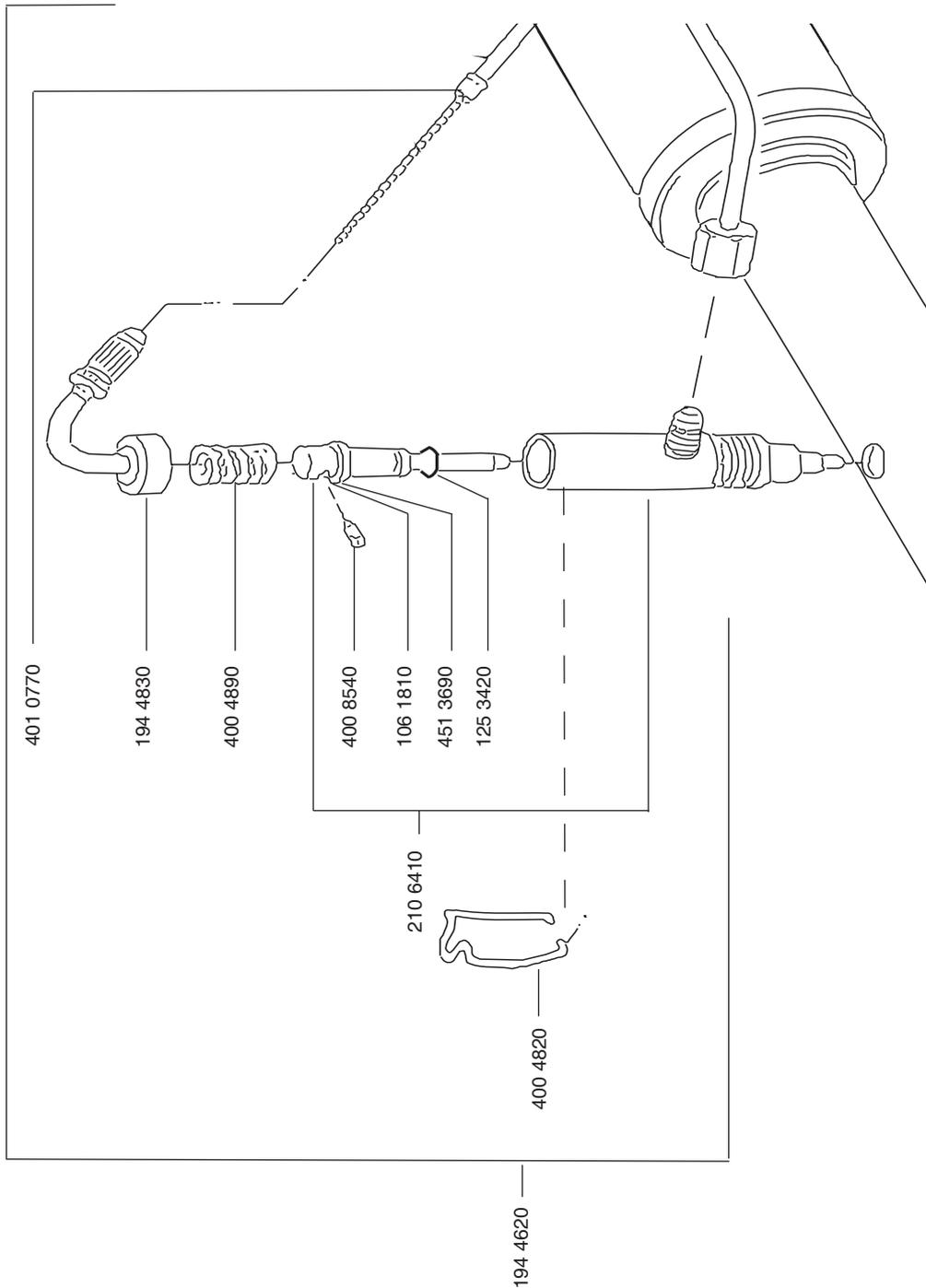
**Option: Schnellabschaltung/Chemical solution cut-off device**  
**Arrêt automatique/Desconexión automática**

III. 07



**Option: Schnellabschaltung/Chemical solution cut-off device**  
**Arrêt automatique/Desconexión automática**

III. 07a



SN 50







**Sonderausführung SWINGFOG SN 50 A (siehe § 2.0 Technische Daten, Seite 9)**  
**Special version SWINGFOG SN 50 A (refer to § 2.0 Technical data, page 9)**  
**Version spéciale SWINGFOG SN 50 A (voir § 2.0, Données techniques, page 9)**  
**Versión especial SWINGFOG SN 50 A (véase § 2.0, Datos técnicos, página 9)**

III. 08

Art.-No.	Bezeichnung	Description	Description	Descripción
102 3850	Abdeckkappe, rot	Cover, red	Capuchon, rouge	Tapa, roja
106 1810	Scheibe	Washer	Rondelle	Arandela
108 0560	Wirkstoffleitung, Edelstahl, kpl.	Chemical solution line, stainless steel, cpl.	Conduite à produit, acier inoxydable, cpl.	Tubo de mezcla, acero inoxidable, cpl.
108 0700	Ventilgehäuse, Edelstahl, kpl.	Valve housing, stainless steel, cpl.	Boîte à soupapes, acier inoxydable, cpl.	Carcasa de válvula, acero inoxidable, cpl.
117 1610	Plombe	Seal	Plomb	Precinto
120 0650	Dichtung	Gasket	Joint	Empaquetadura
120 5960	Schraube	Screw	Vis	Tornillo
120 9790	Scheibe	Washer	Rondelle	Arandela
123 4630	Mutter	Nut	Ecrou	Tuerca
123 8380	Mutter	Nut	Ecrou	Tuerca
124 3620	Federscheibe	Spring washer	Rondelle élastique	Arandela de presión
125 1640	Schraube	Screw	Vis	Tornillo
125 3420	O-Ring Viton	O-ring Viton	Bague-O Viton	Anillo-O Viton
128 2950	Membrane	Diaphragm	Membrane	Membrana
128 6510	Druckfeder	Pressure spring	Ressort de pression	Resorte de presión
136 4250	Teller	Plate	Disque	Plato
194 4830	Umlenkbogen	Cable guide	Coude de guidage	Codo
194 7300	Benzintank, Edelstahl mit Tankverschluß, kpl.	Fuel tank, stainless steel with lid, cpl.	Réservoir d'essence, acier inoxydable avec couvercle, cpl.	Depósito de combustible, acero inoxidable, cpl.
196 5260	Schlauch	Hose	Tuyau	Manguera
196 7920	Vergaser, kpl.	Carburettor, cpl.	Carburateur, cpl.	Carburador, cpl.
196 7930	Vergaser mit Benzintank	Carburettor with fuel tank	Carburateur avec réservoir d'essence	Carburador con depósito de combustible

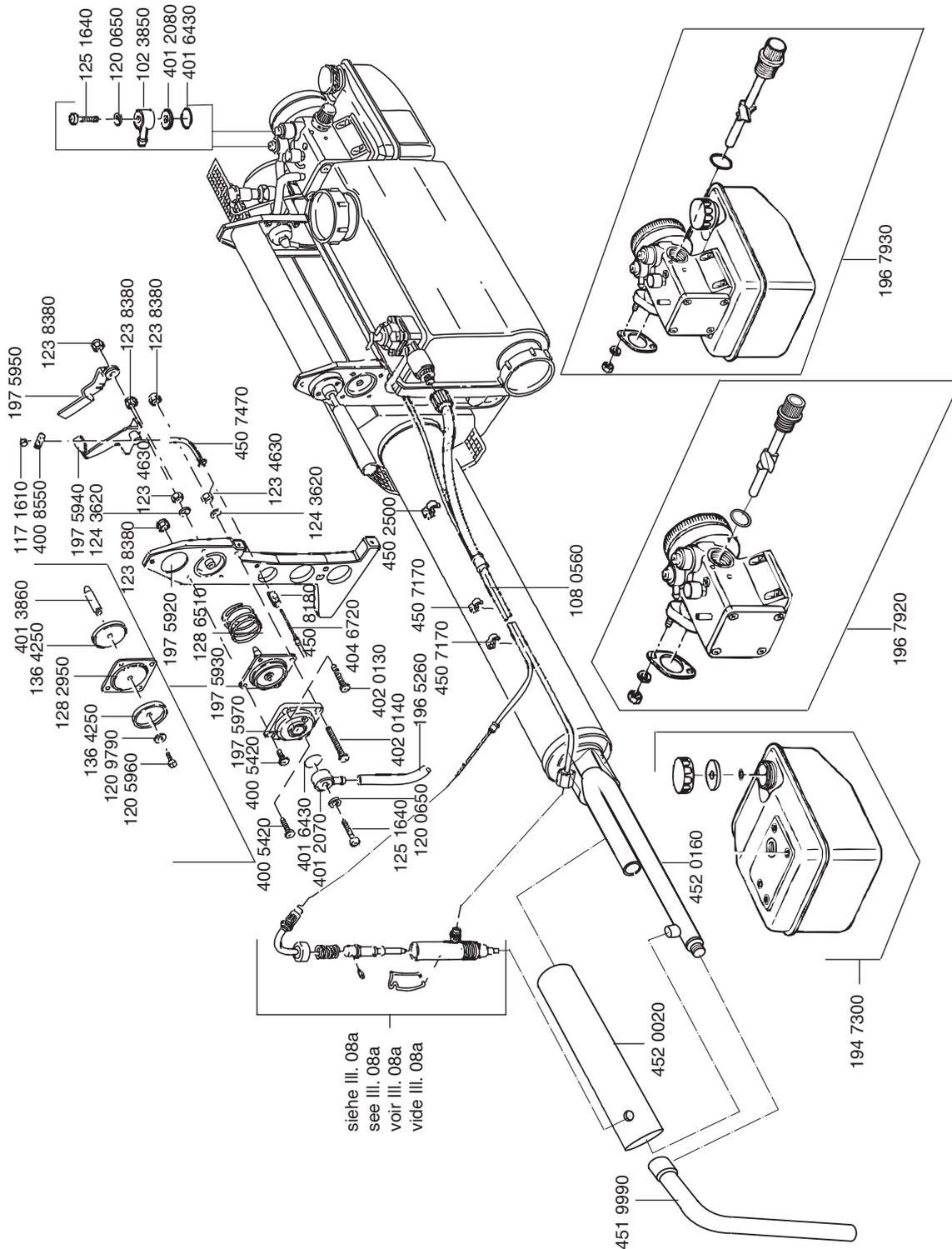
**Sonderausführung SWINGFOG SN 50 A (siehe § 2.0 Technische Daten, Seite 9)**  
**Special version SWINGFOG SN 50 A (refer to § 2.0 Technical data, page 9)**  
**Version spéciale SWINGFOG SN 50 A (voir § 2.0, Données techniques, page 9)**  
**Versión especial SWINGFOG SN 50 A (véase § 2.0, Datos técnicos, página 9)**

**III. 08**

<b>Art.-No.</b>	<b>Bezeichnung</b>	<b>Description</b>	<b>Description</b>	<b>Descripción</b>
197 5920	Halterung	Support	Support	Soporte
197 5930	Membrane, kpl.	Diaphragm, cpl.	Membrane, cpl.	Membrana, cpl.
197 5940	Bedienungshebel	Operating lever	Manette coudée	Palanca de mando
197 5950	Sicherungshebel	Securing lever	Manette de sécurité	Palanca de seguridad
197 5970	Druckdose mit Düse	Pressure cell with nozzle	Carter à pression avec buse	Caja de presión con boquilla
210 6410	Gehäuse mit Ventilstift	Housing with valve pin	Boîte avec goupille de soupape	Carcasa con expiga de válvula
400 4820	Drahtspange	Wire catch	Agrafe en fil métallique	Hebilla de alambre
400 4890	Druckfeder	Pressure spring	Ressort de pression	Resorte de presión
400 5420	Schraube	Screw	Vis	Tornillo
400 8540	Gewindestift	Threaded pin	Vis	Espiga enroscable
400 8550	Nippel	Nipple	Manchon	Niple
401 2070	Abdeckkappe, schwarz	Cover, black	Capuchon, noir	Tapa, negra
401 2080	Membrane	Diaphragm	Membrane	Membrana
401 3860	Arretierstift	Locking pin	Goupille de blocage	Espiga de detención
401 6430	Dichtung	Gasket	Joint	Empaquetadura
402 0130	Schraube	Screw	Vis	Tornillo
402 0140	Schraube	Screw	Vis	Tornillo
404 6720	Bowdenzug	Bowden cable	Câble Bowden	Cable Bowden
450 2500	Kabelschelle	Clamp	Attache de câble	Abraudera
450 7170	Kabelschelle	Clamp	Attache de câble	Abrazadera
450 7470	Umlenkbogen	Cable guide	Coude de guidage	Codo
450 8180	Schraube	Screw	Vis	Tornillo
451 3690	C-Ring	C-ring	Bague-C	Arnillo-C
451 9990	Rohrbogen	Elbow	Tube Coudé	Codo
452 0020	Nebelrohr	Fog mixing tube	Tube de nébulisation	Tubo nebulizador
452 0160	Resonator	Resonator	Resonateur	Resonador

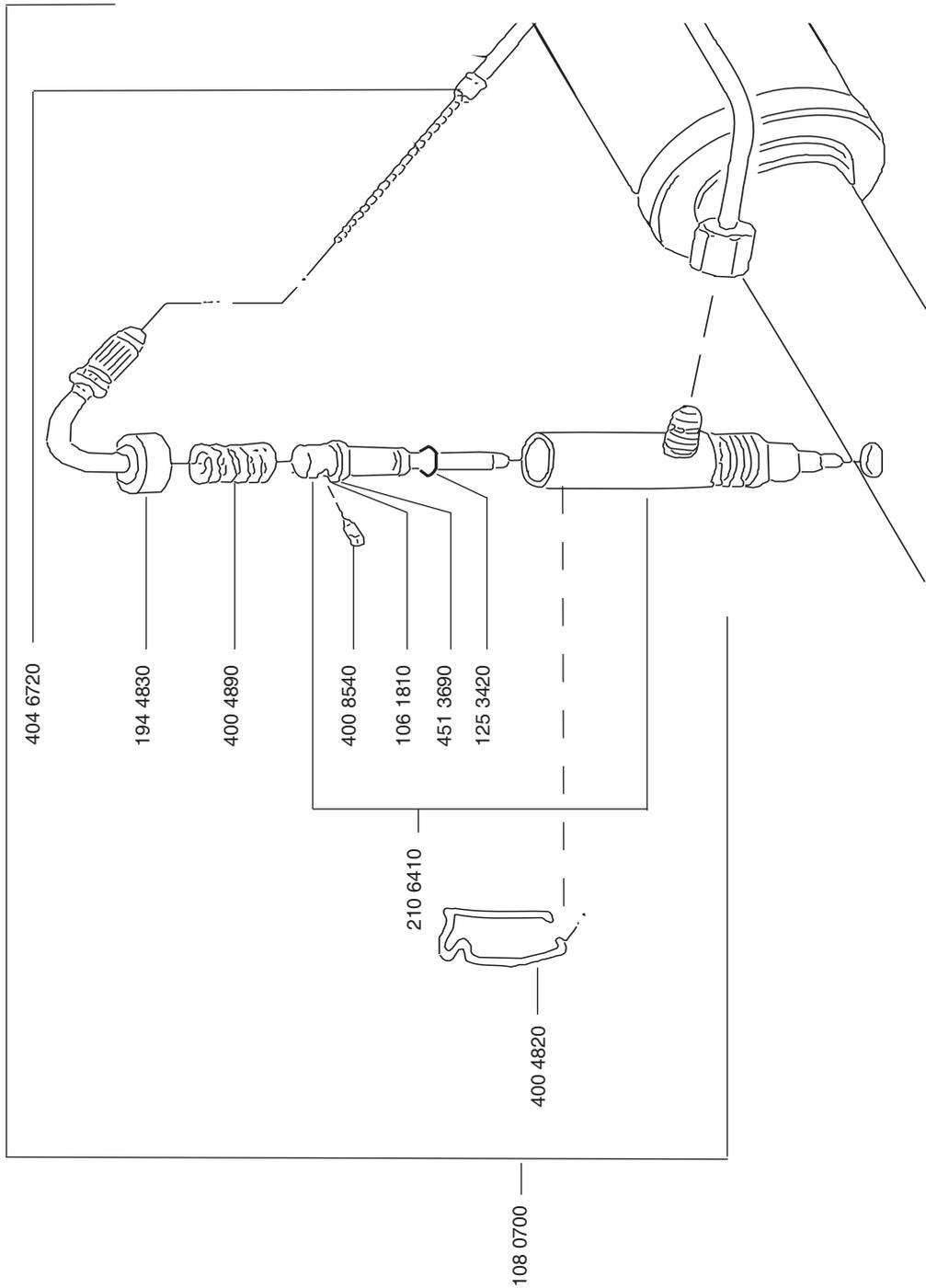
**Sonderausführung SWINGFOG SN 50 A (siehe § 2.0 Technische Daten, Seite 9)**  
**Special version SWINGFOG SN 50 A (refer to § 2.0 Technical data, page 9)**  
**Version spéciale SWINGFOG SN 50 A (voir § 2.0, Données techniques, page 9)**  
**Versión especial SWINGFOG SN 50 A (véase § 2.0, Datos técnicos, página 9)**

III. 08



Sonderausführung SWINGFOG SN 50 A (siehe § 2.0 Technische Daten, Seite 9)  
 Special version SWINGFOG SN 50 A (refer to § 2.0 Technical data, page 9)  
 Version spéciale SWINGFOG SN 50 A (voir § 2.0, Données techniques, page 9)  
 Versión especial SWINGFOG SN 50 A (véase § 2.0, Datos técnicos, página 9)

III. 08a



SN 50




Werkzeugsatz/Set of tools Jeu d'outils/Juego de herramientas			III. 09
Art.-No.	Bezeichnung	Description	Description
108 0350	Werkzeugtasche mit Inhalt	Tool bag with content	Pochette d'outils avec contenu
121 9750	Doppelmaulschlüssel 8 x 10	Double-headed wrench 8 x 10	Clé à fourche double 8 x 10
124 2810	Schraubendreher	Screw driver	Tournevis
127 7100	Reinigungswerkzeug	Cleaning tool	Outil de nettoyage
128 4650	Drahtbürste	Wire brush	Brosse métallique
128 4730	Tragriemen	Carrying strap	Bretelles
130 0520	Kraftstofftrichter mit Sieb, Edelstahl	Fuel funnel with strainer, stainless steel	Entonnoir à essence avec tamis, acier inoxydable
166 0150	Wirkstofftrichter mit Sieb, Edelstahl	Chemical funnel with strainer, stainless steel	Entonnoir à produit avec tamis, acier inoxydable
167 1750	Doppelmaulschlüssel 13 x 10	Double-headed wrench 13 x 10	Clé à fourche double 13 x 10
196 0570	Wirkstoffdüsensatz (0,8/1,2)	Set of dosage nozzles (0.8/1.2)	Jeu de buses (0,8/1,2)
196 0580	Werkzeugsatz	Set of tools	Jeu d'outils
197 8290	Dichtungssatz	Set of gaskets	Jeu de joints
210 0060	Gehörschutzstöpsel, 2 Sätze	Ear protection, 2 sets	Protection acoustique, 2 jeux
210 2220	Füllstandsmesser Wirkstofftank (nur für <b>swingfog</b> ® SN 50 und SN 50-10)	Dip-stick, level indicator spraying tank (for <b>swingfog</b> ® SN 50 and SN 50-10 only)	Indicateur de niveau, réservoir à produit (seulement pour <b>swingfog</b> ® SN 50 et SN 50-10)
401 3640	Maulschlüssel 17	Wrench 17	Clé à fourche 17
401 3900	Werkzeugtasche	Tool bag	Pochette d'outils
402 0320	Doppelmaulschlüssel 17 x 21	Double-headed wrench 17 x 21	Clé à fourche double 17 x 21
450 1770	Sieb, Wirkstofftrichter, Edelstahl	Strainer, chemical funnel, stainless steel	Tamis, entonnoir à produit, acier inoxydable
450 8130	Sieb, Kraftstofftrichter, Edelstahl	Strainer, fuel funnel, stainless steel	Tamis, entonnoir à essence, acier inoxydable
			Estuche de herramientas con contenido
			Llave de doble boca 8 x 10
			Destornillador
			Herramienta de limpieza
			Escobilla de acero
			Cinto de transporte
			Embudo de combustible con tamiz, acero inoxidable
			Embudo de mezcla con tamiz, acero inoxidable
			Llave de doble boca 13 x 10
			Juego de boquillas (0,8/1,2)
			Juego de herramientas
			Juego de empaquetaduras
			Protección acústica, 2 parejas
			Medidor de nivel del tanque del agente activador (o substancia) (sólo para <b>swingfog</b> ® SN 50 y SN 50-10)
			Llave de boca 17
			Estuche portaherramientas
			Llave de doble boca 17 x 21
			Tamiz, embudo de mezcla, acero inoxidable
			Tamiz, embudo de combustible, acero inoxidable

**Werkzeugsatz/Set of tools**  
**Jeu d'outils/Juego de herramientas**

III. 09

