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PULSFOG K4

Operator's manual English



June 2004 - version 3.3

Read this operation manual thoroughly before use

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HAVE YOUR MACHINE CHECKED AND INSPECTED
BY A SPECIALIST
ONCE A YEAR

Notice:

The information in this operator's manual can be altered without any previous notice. No rights can be derived from this Operator's manual.

Frans Veugen Bedrijfshygiëne BV can not be held responsible for any damage or injuries that are the result of misuse or use that does not correspond with the instructions in this operators manual.

Introduction:

The Pulsfog K4 is a thermal fogging machine. In the combustion chamber the fluid, that is to be fogged, is transformed into fog. The machine works according to the jet-motor principle and has self-combustion. The K4 is the biggest machine of the thermal fogging machine line of Pulsfog. The big capacity makes sure that a fog-range of 120 meters* can be established. The K4 has a capacity that can vary from 60 till 150 ltr/h*.

* These values are dependent on the environment, the used fluid and the size of the sprayers.

Technical Data:

- * Weight: 45 kg
- * Material: completely stainless steel 2 mm.
- * Power: 125 HP / 79200 Kcal/h.
- * Volume combustion chambers: 3 liters.
- * Fog range low cultivation: 120 meters.
- * Capacity: 60 - 150 ltr/h.
- * Capacity of fuel tank: 20 ltr. (tank is removable)
- * 2 fluid tanks: 2 x 30 ltr.
- * Electric ignition 12 volts.
- * 6 sprayers
- * 3 carburetors
- * Bio-system 2 separated fluid lines

Safety precautions and injury prevention:

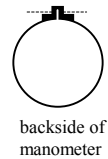
Important: Read, understand and respect the following safety precautions before you start working with the machine. Not respecting these safety rules can lead to a fire accident. The operators manual has to be thoroughly read by the user, before he/she starts fogging with the machine.

- Always check if the machine is functional, when running stationary, before you actually start fogging.
- Never let the fogging machine run without supervision. The operator always has to be able to turn the fluid lever closed if the machine should stop running.
- Never refill the fuel tank with fuel if the motor is still hot.
- Never put fuel in the fluid tanks
- There should never be smoking or open fire when you refill the tanks with a flammable fluid or when there are reparations done on the fogging machine. The spark plug cap and the battery lid should always be detached when the carburetor is opened.
- Do not fog in spaces where there can a dust explosion can occur or where there is a lot of dust in the air.
- Do not fog any fluids of which the combustion temperature is lower then 75 degrees Celsius.
- When fogging fluids of which the combustion temperature is higher then 75 degrees Celsius, only use fogging equipment that provides an automatic turn off system of the fogging fluid or the machine has to have a double cooling jacket.
- When fogging flammable fluids with a Pulsfog fogging machine you can only use the so called "O"-types or the "BIO" type which has a separate water injection.
- Never fog more then 2.5 liters of a flammable fluid or a fluid on water base with less then 50% water, per 1000 (m³) space.
- Do not fog with flammable fluids in a pipe or tunnel without ventilation (explosion hazard). An exception is the Pulsfog "BIO"-type that has a separated water injection.

User's Manual:**Starting:**

Before the first usage or the first usage after a long time or after the transportation of the machine over a big distance, you have to take these following actions.

1. Tighten all three of the six sided nuts on the three carburetors (pic. #1). Check this thoroughly **after the first time** you used the device.
2. Check if all fuel lines are attached correctly and if necessary tighten the tube holders.
3. Tighten the carburetor caps on all three carburetors.
4. Check if all sprayers are attached and tightened. Check this thoroughly **after the first time** you used the device.
5. If the fuel tank is full, check if the prescribed junction is closed properly. Immediately remove dust and dirt from the joining, otherwise there will be interruptions in the fuel supply. Besides a loose tube causes fire hazard (pic #3 and 4).
6. **Before the first time** you use the device, the air flow out of the manometer has to be opened. Open the door with the manometer. On top of the manometer is a rubber cap with a tip. Cut off this tip to let air into the manometer.

**Directions on starting:****A. Preparation:**

1. Attach the filled fuel tank to the machine (pic #2), fasten and then attach fuel tube (pic. #3 and 4). Make sure the fuel tank has been filled for at least 3/4 with fuel.
2. Turn the air supply notch at the tank closure at least 5 times to the left (pic. #5)
3. Open fuel tap (pic. #5)
4. Make sure that if the machine turns to the left or the right, it can not flip over with it's cart.
5. Hook up 12V-battery
6. Fill Bio-tank #1 (30, 60 or 100 liter) with water.
7. Close the central closure
8. Bring the junction with "normal tube" (plastic tube) and "single searcher" through the little hole and close with the tank lid.
9. Attach pressure tube (black rubber tube) to the air column.
10. Attach water tube (without subscript) to the water connection (subscript "water") (pic. #6)
11. Fill fluid tank #2 with the desired concentrate of the fluid that is going to be fogged (use funnel with the sieve).
12. Close central closure
13. Bring the junction with "normal tube" (plastic tube) and "single searcher" through the little hole and close with the tank lid.
14. Attach pressure tube (black rubber tube) to the air column (subscript "air-solution") (pic. #6)
15. Attach spray fluid tube (without subscript) to the spray fluid column (subscript "middle") (pic. #6)
16. Place both tanks on the same level as the machine
17. Secure all the tubes from both tanks to the machine so they do not
 - * pinch off
 - * touch any hot parts of the machine
 - * get any currency while fogging

The setup and filling of the tanks has to be done before you start the machine.

B. Starting:

1. Put on ear protection.
2. Open the right adjustable notch #2 till it is in starting position (white field on red arrow, pic. #8)
3. Push start button and slowly open at the same time the adjustable notch on the left #1, till the machine starts. If it does not start (carburetor could be greasy), close adjustable notch on the left and hold down the start button for approximately 10-20 seconds (blows carburetor clean). After that repeat starting sequence as described above.
4. Open both of the adjustable notches evenly till the machine runs stationary with deep humming tones. The machine should not run with high humming tones, but with low ones and sometimes you should hear "little explosions".
5. If necessary, tune with adjustable notch #3 on the carburetor (pic. #9)

C. Fogging:

Let the machine warm up a bit first and then start fogging after approximately 1 minute.

1. First open the Bio-Fog tab (upper water tab) (pic. #6)
2. The Bio-Fog tab stays open when the machine runs with full power
3. After some seconds you open the fog-tap (lower spray fluid tap) (pic #6). The pressure manometer on the machine has to indicate 0.3 till 0.5 bar depending on the amount of fluid that is in the tanks.
If that is the case the machine fogs on it's maximum power. If the pressure runs up from 0.4 bar and the machine is running with a high tone again then the junction with the fluid tank or the pressure tubes on other places are not connected properly. When both of the fogging tabs are opened and the machine starts to fog, both the adjustable notches have to be opened further equally, till the deep powerful humming tone is established.

D. Quitting

1. Close the fogging tab #5 (fluid tab) with your hands (pic. #6)
2. Close the fogging tab #4 (water tab) with your hands after 20-30 seconds (pic. #6)
3. Turn both adjustable notches to the right, till the machine stops.
4. Release the pressure from the Bio-tank and the fluid tank
5. If you pause for a longer time periode close the head fuel tab (pic. #3)
6. If possible clean the fluid tank after every use.

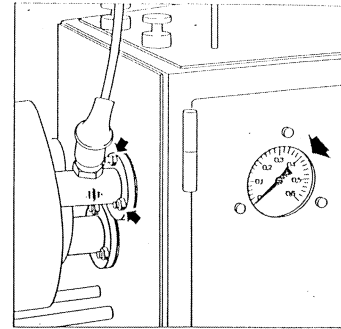
E. In General

After long usage and when the machine is strongly heated, let the machine cool off before starting it again. This makes the starting easier and more certain. **Never** refill a hot machine with fuel. **BURNING HAZARD.** Always keep the safety precautions in mind!

Graphic explanation machine:

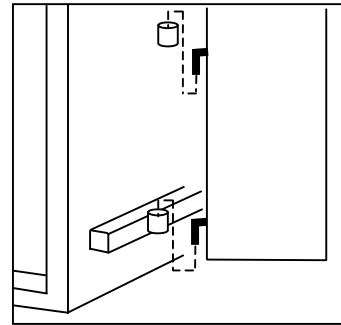
Pic. #1

Tighten 9 sided notches and check manometer.



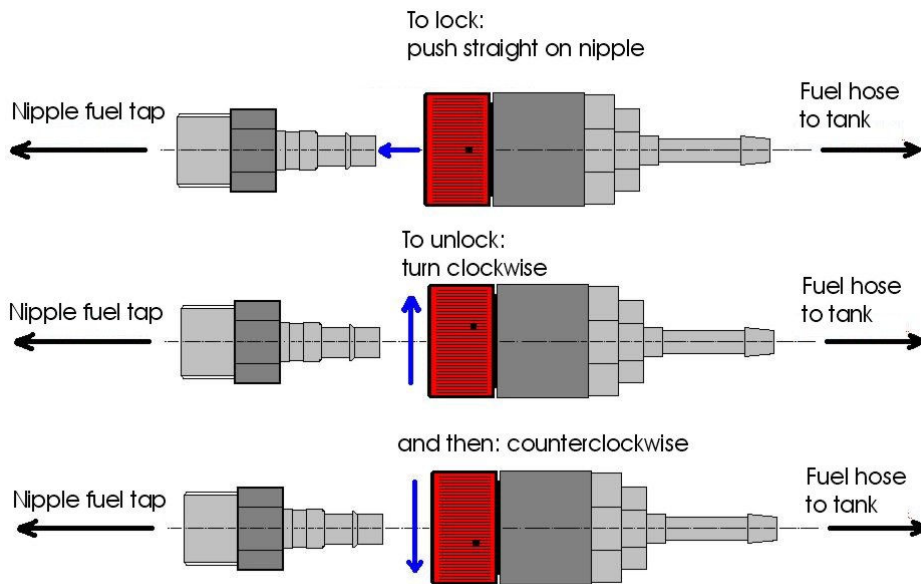
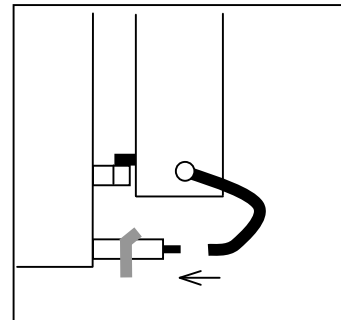
Pic. #2

Hang the fuel tank with the tree pins in the designated holes



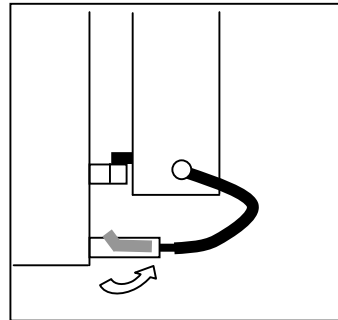
Pic. #3 and 4

Click the fuel tube junction on the fuel supply on the machine. The speed junction is self closing. In unclosed condition there can be no fuel leakage. The fuel tab is closed.



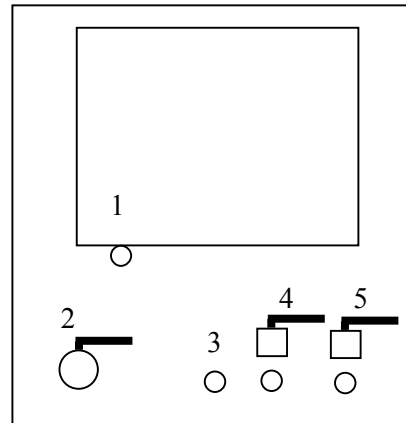
Pic. #5

If the fuel tube is attached, the fuel tab can be opened.

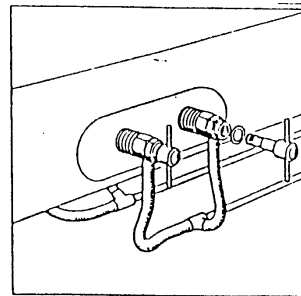
Pic. #6

Backside of the machine

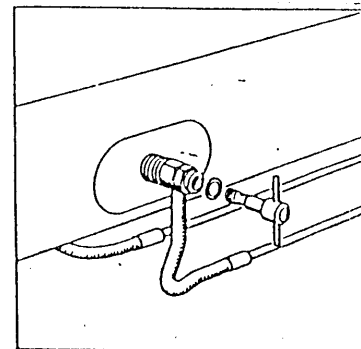
- 1 Fuel tank with speed junction
- 2 Fuel tab
- 3 Cable for battery
- 4 Fluid tab and air supply
- 5 Fluid tab / water tab and air supply

Pic. #7

4 Radius pipes and 4 sprayers lying facing each other (for fluid supply). Check before each usage if they are tight. Facing sprayers always have to be the same size.

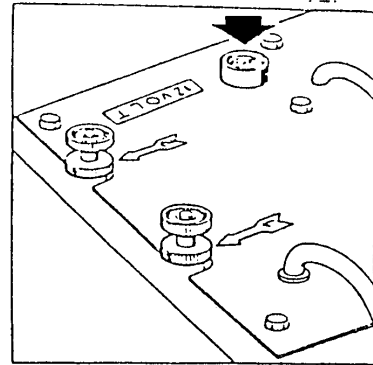
Pic. #7.1

2 Radius pipes and 2 sprayers lying facing each other (Bio edition normally for water supply). Check if they are tight before each usage. Facing sprayers always have to be the same size.

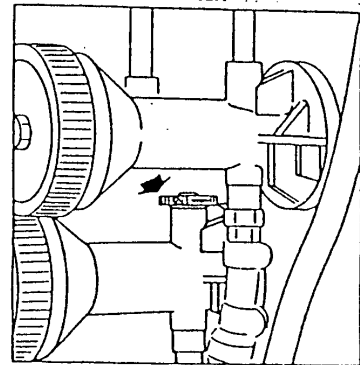


Pic. #8

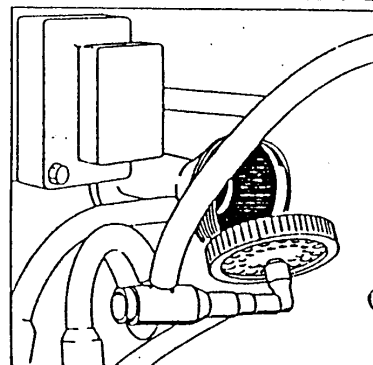
Open the adjustable notch on the right #2 in the starting position (white field on red arrow #2)
 Push starting button and at the same time slowly turn the adjustable notch #1 till the machine starts. Slowly turn both notches further till the machine runs with powerful deep tones.

Pic. #9

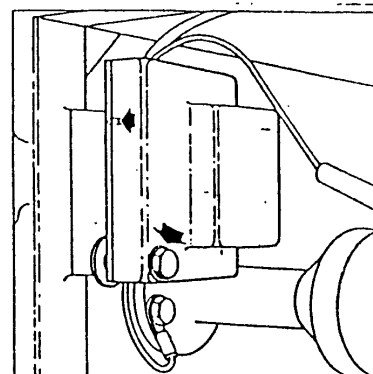
Adjustable notch for carburetor #3 (lower middle carburetor). This adjustable notch #3 is only used with the first usage of the machine.

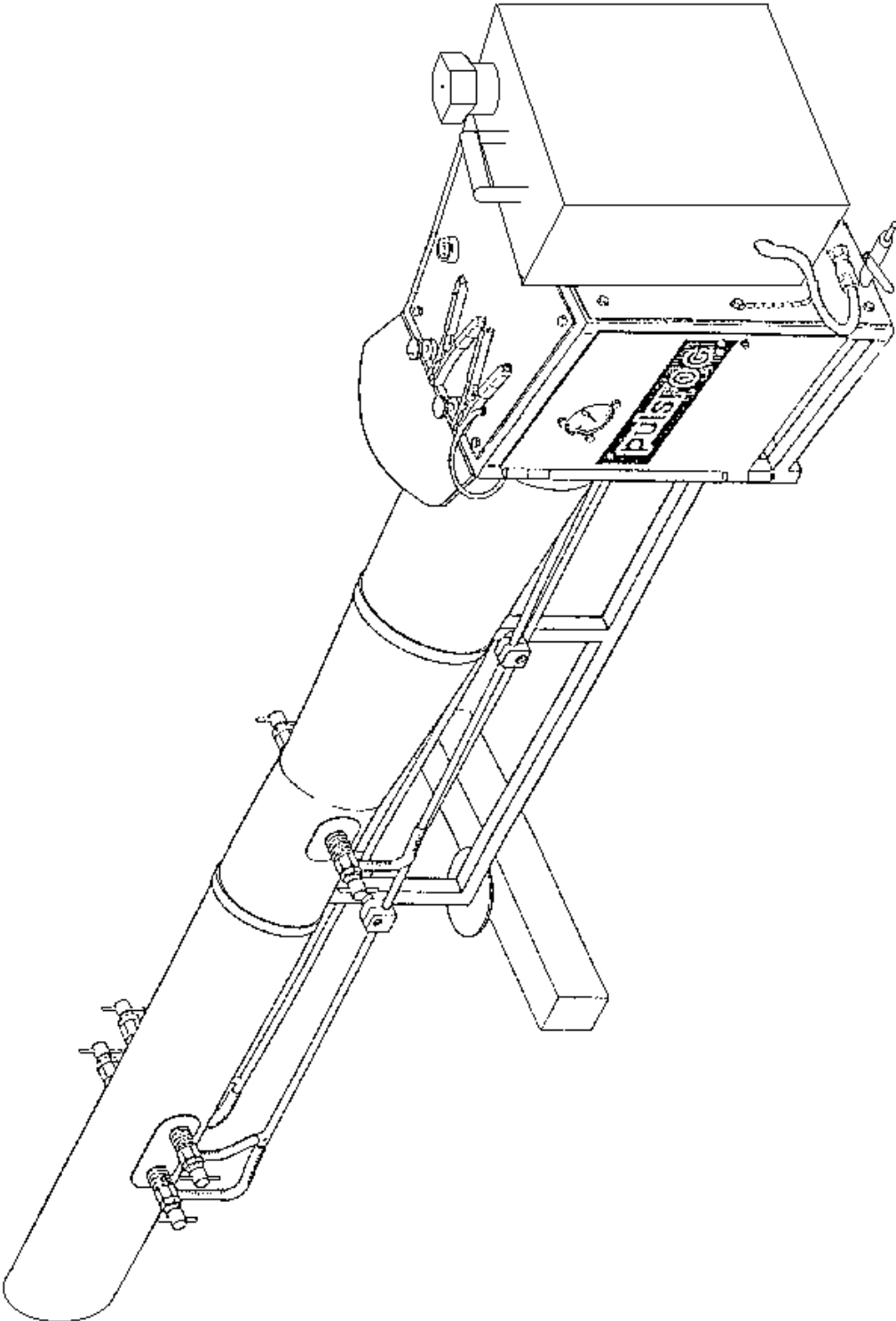
Pic. #10

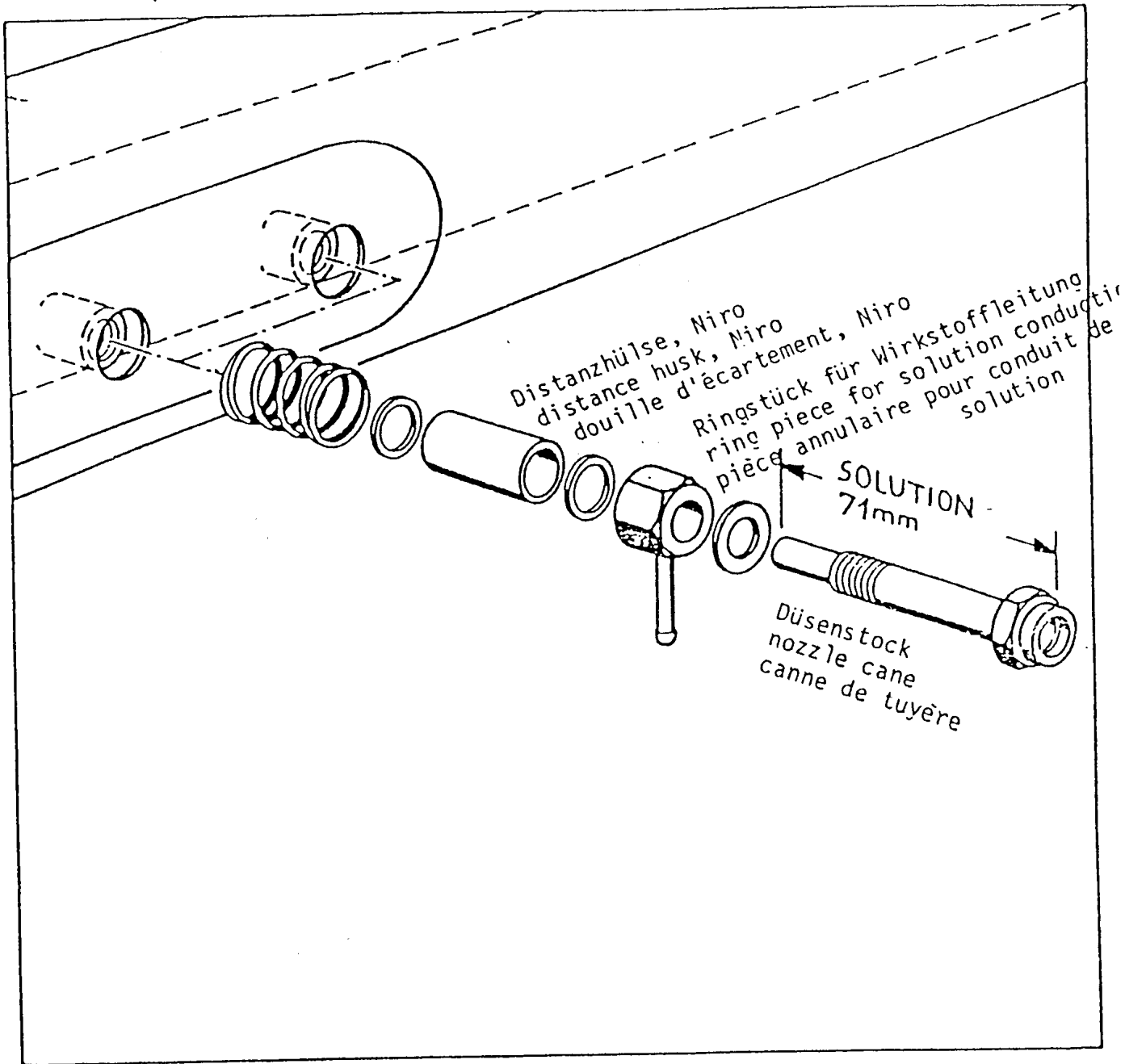
Cap on the carburetor. If the carburetor is over greasy, then take of the spark plug lighter, take of carburetor cap and remove the superfluous fuel with a cloth and let it dry. After that repeat the starting procedure. **Never start the machine without the screw cap on the carburetor.** This causes a shooting flame.

Pic. #11

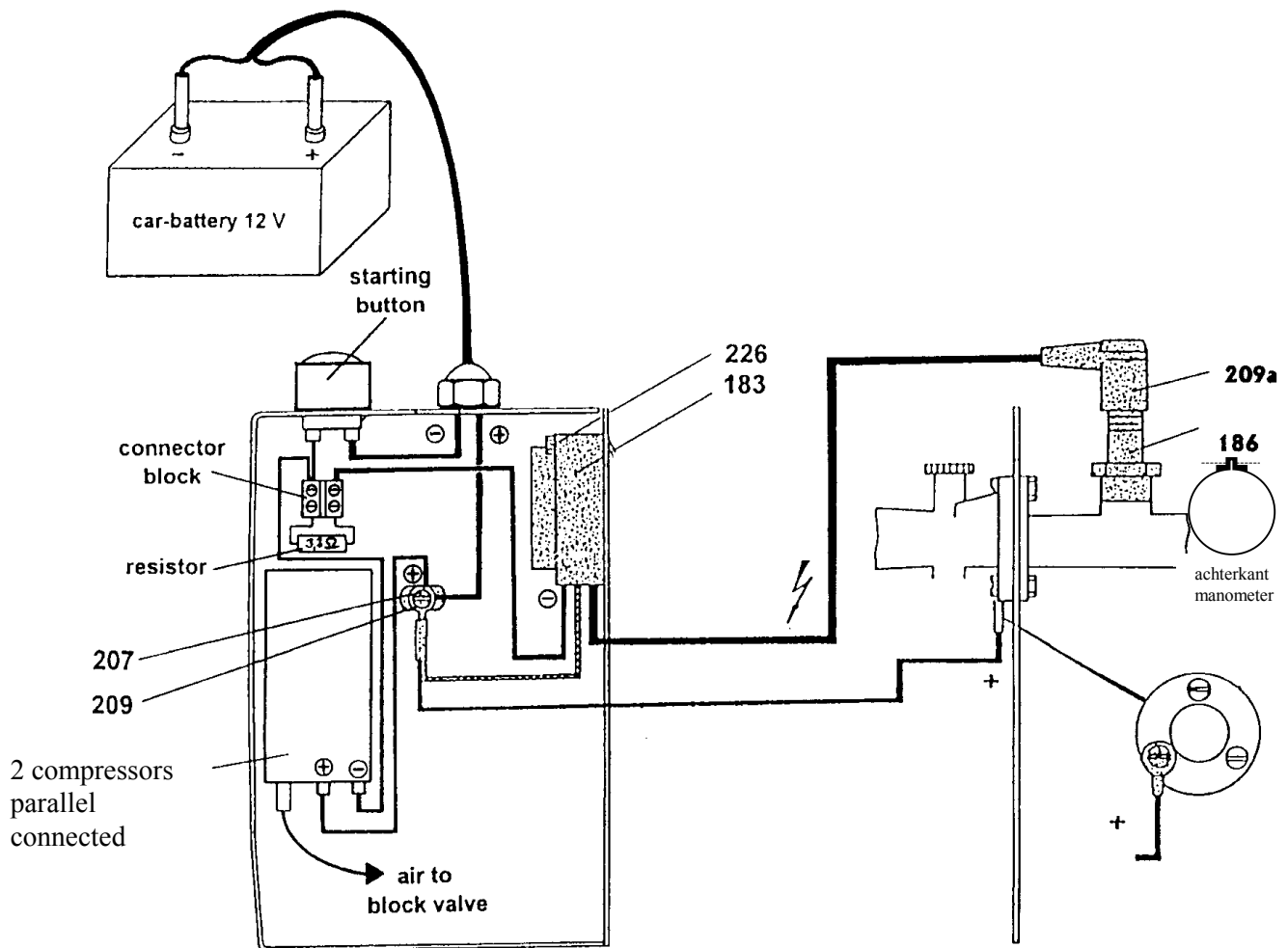
Recognize the ignition with the 6 sided head screw. To prevent turning we placed a pin there. Attach the mass cable to the 6 sided screw for the carburetor.





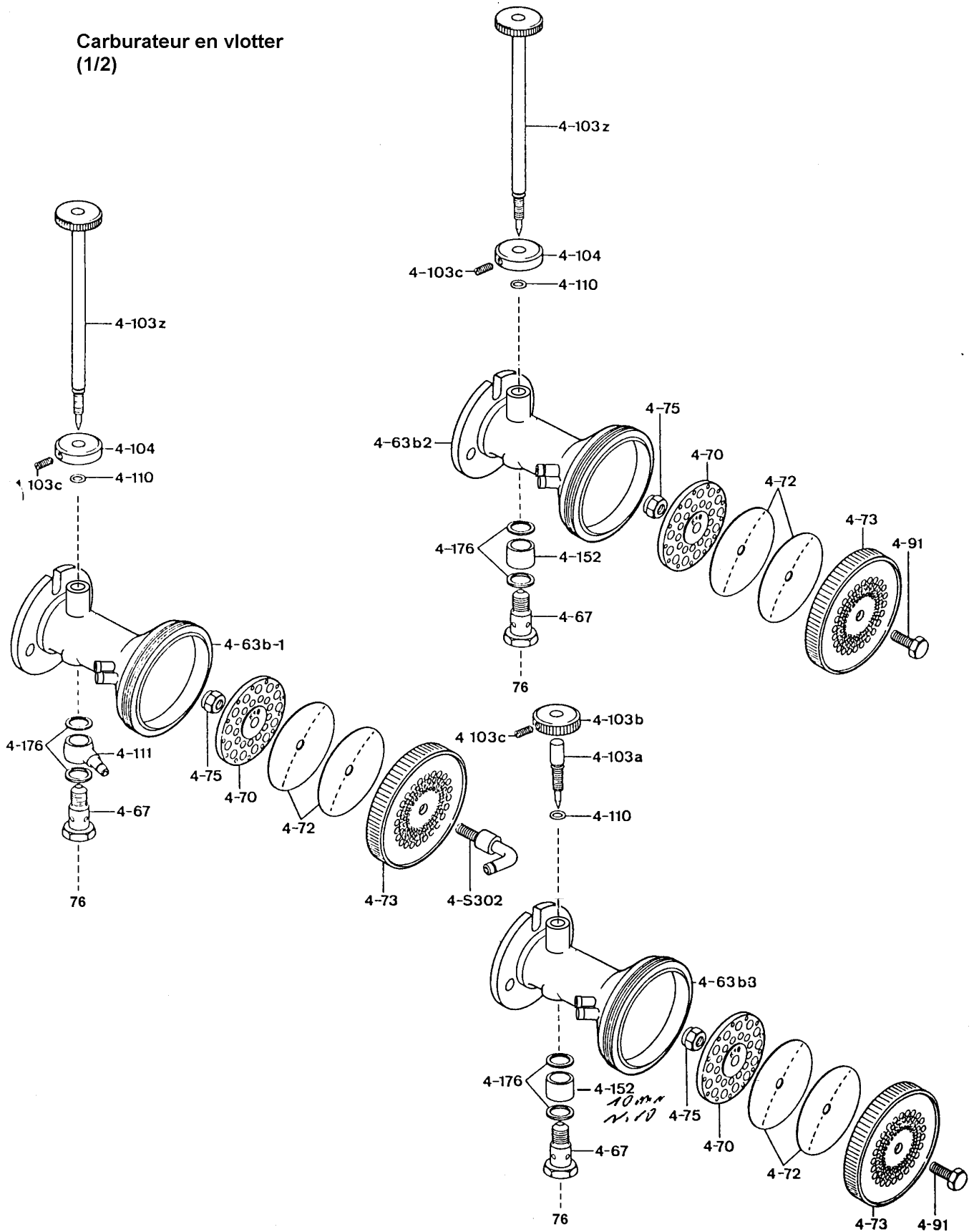


Electric ignition scheme



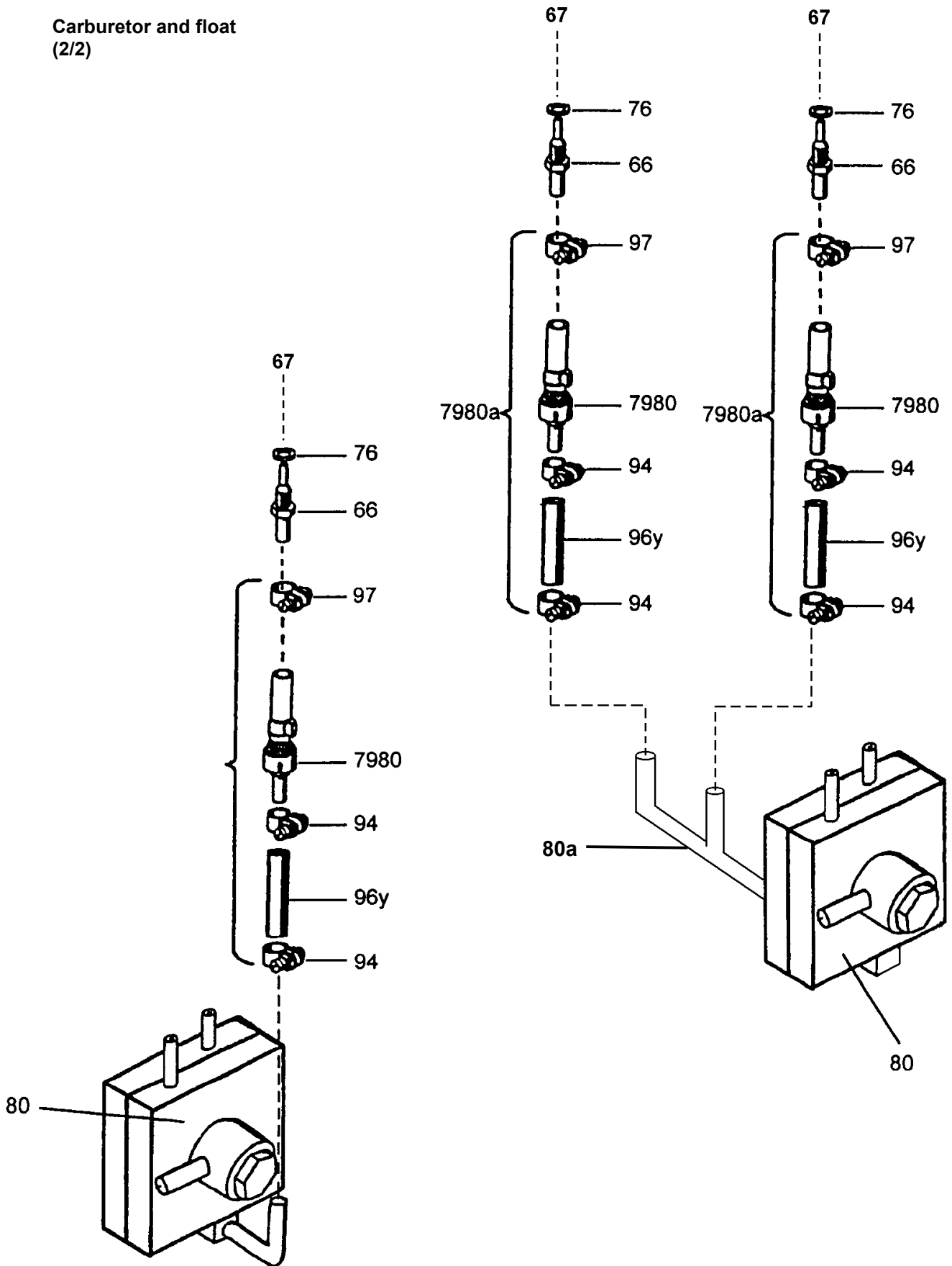
| Pos. Nummer. | Omschrijving | Order nummer |
|--------------|------------------------------------|--------------|
| 183 | Ignition device | 900.211.01 |
| 186 | Sparking plug M14 x 1,25 EA 1,1 mm | 900.212.00 |
| 207 | Fillister head screw M5 x 6 | 999.001.07 |
| 209 | Tooth lock washer A5 DIN 6797 | 997.006.03 |
| 209a | Spark plug cap | 900.211.02 |
| 226 | Hexagon screw M5 x 30 DIN 931 | 999.004.04 |

Carburateur en vlotter
(1/2)

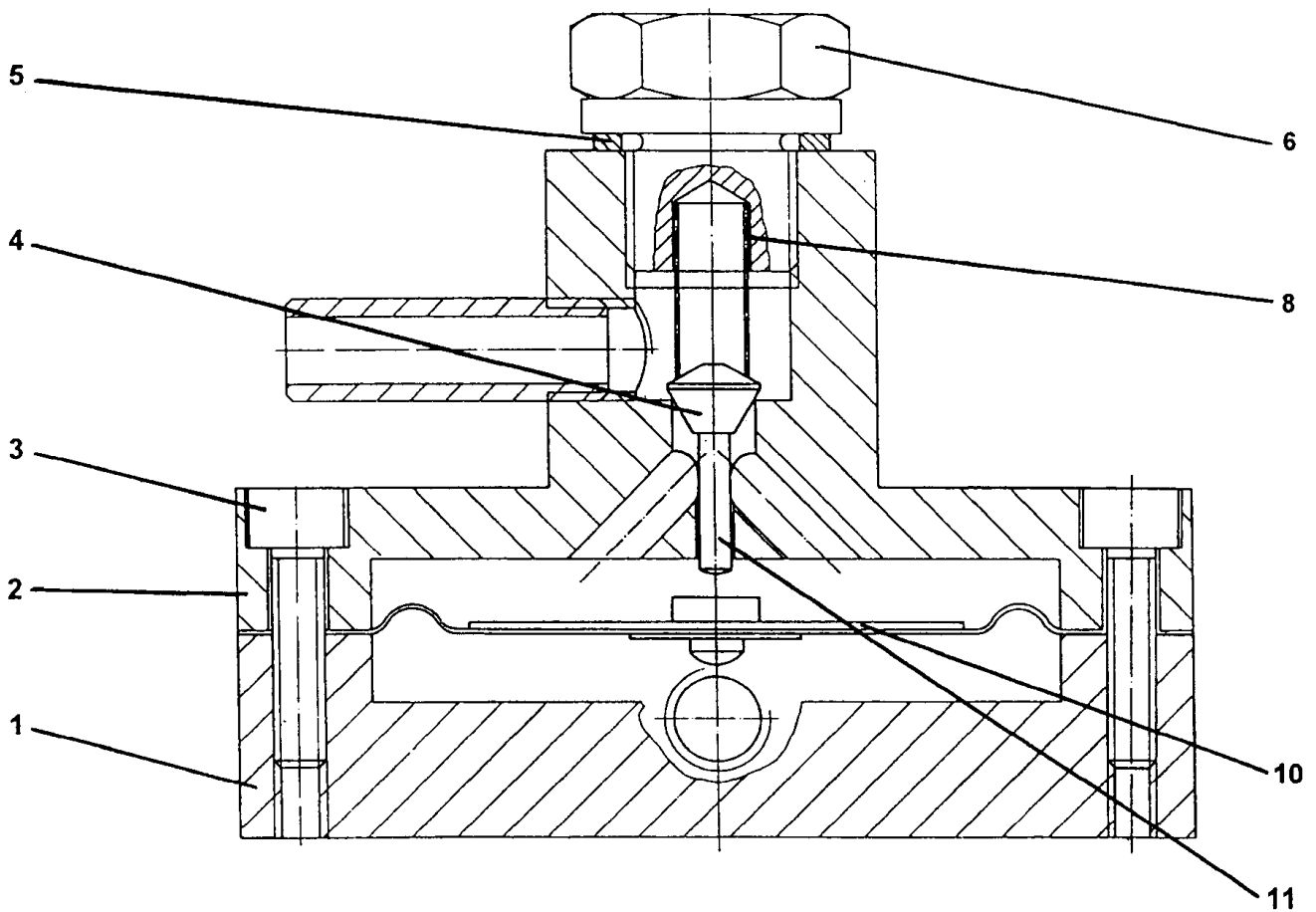


Never start the machine without a carburetor cap on the carburetor
This yields a blowtorch

Carburetor and float
(2/2)

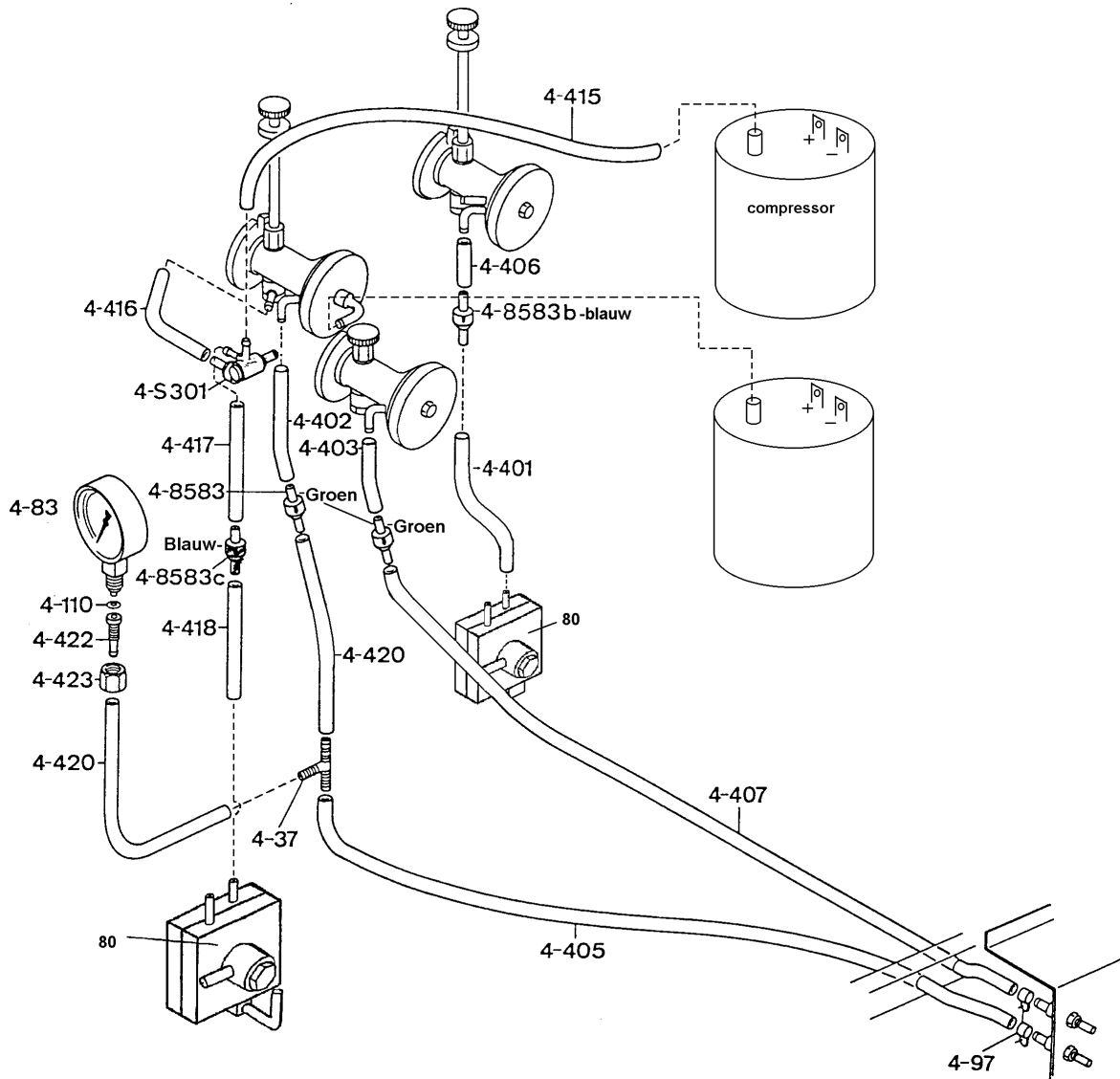


Cross Section of membrane float:



| Pos. No. | Definition | Order no. |
|----------|----------------------------|------------|
| 80 | Membrane-floater complete | 923.380.00 |
| 80/1 | Floater underside | 923.381.00 |
| 80/2 | Floater upside | 923.382.00 |
| 80/3 | Screw M3 x 20 DIN 84 | 999.001.02 |
| 80/4 | Valve conical | 923.380.01 |
| 80/5 | Blockage ring 10/14/1 Fi | 993.002.02 |
| 80/6 | Bolt M10 x 1 | 923.380.02 |
| 80/8 | Pressure spring 4.2 x 12.7 | 923.380.03 |
| 80/10 | Diaphragm M149 | 923.380.04 |
| 80/11 | Parallel pin 2x12 | 923.380.05 |

Airsupply scheme:



Partlist Pulsfog K4

Ordernumber. Name

| | |
|--------|--|
| 4-1 | Frame / carrier |
| 4-2 | frontplate |
| 4-2a | frontplate "Reinzeit" |
| 4-3 | cover |
| 4-4 | left door with hole (manometer) |
| 4-4a | linchpin |
| 4-4b | screw M3 |
| 4-4c | securing nut M3 |
| 4-5 | right door |
| 4-6 | backside |
| 4-7 | heatshield |
| 4-10 | fixing clamp large 120 - 140 mm |
| 4-11 | fixing clamp small 90 – 110 mm |
| 4-12 | cover plate with one hole (short) |
| 4-13 | cover plate with two holes (long) |
| 4-14 | clamping disk used as tooth profile disk |
| 4-30 | hollow scew for fuel tank |
| 4-31 | resonator |
| 4-31a | nut R12 |
| 4-32 | elbow piece EO |
| 4-33 | coupling piece with hose nipple |
| 4-34 | nippel for coupling |
| 4-35 | fuel tap |
| 4-36 | "Y" piece exposed |
| 4-37 | "T" piece exposed |
| 4-38 | level control, left, 1 output |
| 4-39 | level control, right, 2 outputs |
| 4-40 | fuel splitter |
| 4-41 | compressor - 12 V |
| 4-41a | hose nipple 90° (12 V compressor) |
| 4-42-1 | battery clamp 1 x red |
| 4-42-2 | battery clamp 1 x black |
| 4-44 | connecting nipple (air pressure) M8 |

- 4-45 connection nipple 2 outputs
- 4-46 fluid hose for adapter, Viton 2m
- 4-46 cylinderplate screw 3.9 x 9.5
- 4-47 cooling jacket
- 4-47 air hose for adapter, transparent 2m
- 4-48 gummy cap for spark plug wire
- 4-49 startbutton
- 4-50 cover plate for fog taps
- 4-50a connection for fog tap cover plate
- 4-51 spacer for compressor-suspension 50 mm M5 inside - M5 outside
- 4-53 hexagonal screw for fog tap connection
- 4-54 hexagonal screw M6 x 45 for connection of automat
- 4-56 spacer 28 mm for connection of fog tap
- 4-57 linchpin for auomat rod
- 4-58 electric cable holder
- 4-59 flangehead screw M5 x 40 for holder
- 4-60 holder for fluid pipe
- 4-61 hexagonal screw M6 x 100 for plastic clips
- 4-62 hexagonal screw M6 x 10
- 4-63-1 carburetor left complete with cap, long adjustable screw, mixing sprinkler with ring

R4

- 4-63a-1 startcarburetor without cap, left, mixing sprinkler with ring R4, long adjustable screw
- 4-63b-1 startcarburetor, exposed, left
- 4-63-2 carburetor right with cap, long adjustable screw, mixing sprinkler, spacer without ring
- 4-63a-2 carburetor right without cap, long adjustable screw, mixing sprinkler, spacer
- 4-63b-2 carburetor, exposed, right
- 4-63-3 carburetor middle, short adjustable screw, cap, mixing sprinkler, without ring, with spacer
- 4-63a-3 carburetor middle with short adjustable screw, mixing sprinkler with spacer, without ring, without cap
- 4-63b-3 carburetor, exposed, middle
- 4-66 fuelnozzle (10)
- 4-67 banjobolt
- 4-68 carburetorcap with startnozzle, left
- 4-68a carburetorcap without startnozzle, right and middle
- 4-70 holderplate

| | |
|--------|---|
| 4-72 | membrane |
| 4-73 | membrane nut (carburetorcap) |
| 4-74 | follow ring |
| 4-75 | nut M6, self-locking |
| 4-78 | carburetor packing |
| 4-80 | ball snap lock 2.5 gr. |
| 4-80a | manifold float K4 |
| 4-81 | copper sealing ring 12 x 16 x 1 mm |
| 4-82 | pin for float fastener |
| 4-83 | manometer |
| 4-83a | cap for fixing manometer |
| 4-84 | knurled ring \varnothing 8 |
| 4-85 | adjustment plate for automat |
| 4-86 | spring for sprinkler cover |
| 4-91 | hexagonal screw M16x18, with spline for carburetor cap |
| 4-92 | knurled ring \varnothing 6 |
| 4-94 | hose coupling Norma 8 |
| 4-97 | hose coupling Norma 9 |
| 4-97a | hose coupling Norma 10 |
| 4-103d | adjusting screw, long (left and right) |
| 4-103x | adjusting screw, long (left and right) incl. incl. O-ring 4-110 |
| 4-103z | adjusting screw, short (middle), incl. incl. O-ring 4-110 |
| 4-103c | adjusting screw |
| 4-103b | pin screw |
| 4-104 | spacer disk (adjustable) |
| 4-110 | O-ring |
| 4-111a | hexagonal nut 40 mm for spinkler |
| 4-111 | nut vor carburetor R6 |
| 4-120 | fog tap for BIO |
| 4-120a | fog tap for fluid |
| 4-122a | fluid pipe BIO, short |
| 4-122b | fluid pipe, fogging agent, long |
| 4-122y | hose VITON, red, fluidpipe nut on sprinkler 150 mm |
| 4-124 | hose VITON, red, fluidpipe nut on sprinkler 90 mm |
| 4-129 | support sping |
| 4-141a | support spring |

- 4-143 hose VITON, red, for fog tap 250 mm
- 4-149a dosage sprinkler BIO
- 4-149b dosage springkler fluid (agent)
- 4-150 copper sealing ring 8 x 12 x 1
- 4-151 sprinkler 71 mm
- 4-152a spacer tube NIRO
- 4-152 spacer tube 10 mm for carburator 4-63-2 and 4-63-3 and fog tap holder
- 4-153 copper sealing ring 10 x 14 x 1
- 4-165 fuel tank, 20 liter
- 4-165a venting screw
- 4-165b compression spring for venting screw
- 4-165c linch pin for venting screw
- 4-175 nut M8
- 4-183 ignition device
- 4-183a hexagonal screw, plastic M5 x 30
- 4-186 sparking plug
- 4-201 knurled ring ϕ 5
- 4-209a sparking plug pin
- 4-209b sparking plug cable
- 4-226 spacer tube for automat
- 4-227 spacer tube Ms
- 4-229 screw M6 x 70
- 4-230 wood, square (package)
- 4-231 chain
- 4-231a spring plug
- 4-233 plastic connector
- 4-234 hexagonal screw M6x30, NIRO
- 4-235 cilinder head screw M4x10
- 4-235a nut M4
- 4-235b ring (with tongue) R5
- 4-277b fluid tank 30 liter
- 4-277c fluid tank 60 liter
- 4-302 sealing for fog tap TEFLON
- 4-308 nut M5 self-locking
- 4-309 hexaxongal screw M5 x 40 for fixing manometer
- 4-323 screw M5 x 20

- 4-401 venting screw float right, 220 mm, transparant
- 4-402 transparant hose for carburator left from pressure valve to Y-piece, 75 mm
- 4-403 transparant hose for carburator middle from pressure valve to Y-piece, 45 mm
- 4-404 transparant hose from Y-piece to T-piece, 45 mm
- 4-405 transparant hose from T-piece to nipple pressure-/fluid tank
- 4-406 transparant hose from carburator right to pressure valve, 45 mm
- 4-407 transparant hose from pressure valve carburator right to pressure nipple (BIO-tank,
650 mm
- 4-408 transparant hose carburator right to stabilizing valve, 420 mm
- 4-409 transparant hose from stabilizing valve to automat, 45 mm
- 4-410 transparant hose from float right to fuel spreader, 190 mm
- 4-411 transparant hose from fuel supply to Y-piece, 70 mm
- 4-412 transparant hose from Y-piece to float right, 110 mm
- 4-413 transparant hose from Y-piece to black fuel valve, 45mm
- 4-414 transparant hose from black fuel valve to float left, 45 mm
- 4-415 transparant hose from compressor 12 V to block valve, 300 mm
- 4-416 transparant hose from block valve to carburator ring left, 90 mm
- 4-417 transparant hose from from block valve to black fuel valve, 110 mm
- 4-418 transparant hose from black fuel valve to float left, 90 mm
- 4-419 transparant hose from block valve to startnozzle carburator, left, 45 mm
- 4-420 air hose, 300 mm
- 4-423 hose VITON, for fog tap 60 mm
- 4-500 automat
- 4-502 follow-on ring
- 4-503 automatrod above 90 mm
- 4-503a automatrod atstang below 90 mm
- 4-504 nut M4
- 4-504a nut M4 self-locking
- 4-508 screw M4 x 30 (for adjusting automatrod)
- 4-7980 fuel valve, red, exposed
- 4-7980a fuel valve gray/red, with hoses
- 4-8583c fuel valve, black
- 4-8583 pressure valve green/gray
- 4-8583b venting valve gray/gray
- 4-s301 block valve blue/blue
- 4-s302 startnozzle

MEMBRANE FLOAT PARTLIST

| <u>NO.</u> | <u>NAME</u> | <u>NUMBER</u> |
|------------|--|---------------|
| 1 | Floor | 1 |
| 2 | cover piece | 1 |
| 3 | cylinderhead screw M3 x16 DIN 912 | 4 |
| 4 | valve cone | 1 |
| 5 | sealing ring 10/14/1/Fi | 1 |
| 6 | lock screw M10 x 1 | 1 |
| 7 | hose spout MS | 2 |
| 8 | pressure spring 4,2 x 12,7 | 1 |
| 9 | cylinder pin 2 ϕ x 10 | 2 |
| 10 | membrane M - 149 | 1 |
| 11 | cylinder pin 2 ϕ x 10 | 1 |
| 12 | pipe bend 90°/6 ϕ x 1,0/M6 | 1 |
| 13 | hexagonal headscrew M6 x 10 DIN 931 Niro | 2 |
| 14 | knurled ring A 6 DIN 6797 | 2 |

Safety instructions and accident prevention

Important: Read, understand and respect the following safety instructions before you start working with the device. Ignorance of these instructions can cause fire hazard and burn down buildings.

Before one starts fogging with the device, the user should have read this manual attentively.

- Always check if the machine is functional, when running stationary, before you actually start fogging.
- Never have the device running without attendance. The operator must always be able to close the fluid lever in a case that the machine suddenly turns off.
- Never refill the fuel tank with fuel when the engine is still hot.
- Never fill the fluid tank with fuel.
- Never smoke or use open fire when working with flammable fluids or working with the device.
- Always take off the sparking plug cap and open the lid of the batteries when the carburator will be opened.
- Do not use the fogging device in rooms where dust explosions can occur, or where a lot of dust is in the air.
- Do not use fluids with a flash point lower than 75°C.
- When fogging fluids of which the combustion temperature is higher than 75 degrees Celsius, only use fogging equipment that provides an automatic turn off system of the fogging fluid or the machine has to have a double cooling jacket.
- When fogging flammable fluids with a Pulsfog fogging machine you can only use the so called "O"-types or the "BIO" type which has a separate water injection.
- Never fog more than 2.5 liters of a flammable fluid or a fluid on water base with less than 50% water, per 1000 (m³) space.
- Do not fog with flammable fluids in a pipe or tunnel without ventilation (explosion hazard). An exception is the Pulsfog "BIO"-type that has a separated water injection.

HAVE YOUR MACHINE CHECKED AND INSPECTED BY A SPECIALIST ONCE A YEAR