Ambu®

Description and Function of the Ambu® Uni-Suction Pump

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Operation precautions

- The pump should only be used by staff who have practised pharyngeal and/or tracheal suction techniques.
- Automatic operation by oxygen should only take place away from smoking and exposure to naked flames.
- The pump should never be oiled or greased.
- These directions for use should be followed carefully to ensure correct assembly after disassembly.
- The pump should be tested whenever it has been reassembled to check that it functions correctly.
- The pump should never be connected to an oxygen or compressed air supply with a pressure exceeding 5.5 bar (80 psi).
- The pressure hose for connection to the oxygen or compressed air supply must be secured by hose clips at both ends.

Introduction

The Ambu® Uni-Suction Pump is a portable suction unit intended for pharyngeal and tracheal suction.
The pump can be operated automatically by compressed oxygen, or – if this is not available – it can be operated just as efficiently by foot or by hand.
Compressed oxygen has been chosen as a power supply because this is usually available for ventilation purposes in the situations where the pump is used.
The working principle of the pump ensures high efficiency combined with a very low consumption of oxygen, which means that the pump can be used even with very small portable oxygen cylinders.

LIST OF CONTENTS AND ILLUSTRATIONS:

1. Specifications

Free air flow during automatic operation at an operating rate of 125 strokes/min:
Alternating: max. 29 l/min.
mean value: 20 l/min.

Oxygen consumption (idle): Approx. 9 l/min.

Max. negative pressure:

Supply pressure		Max. negative pressure	
bar	(psi)	bar	(mm Hg)
3	(42,5)	0.36	(270)
4	(57,0)	0.50	(370)
5	(71,0)	0.60	(450)

The supply pressure should never exceed 5.5 bar (80 psi)

Manual operation:
approx. 0.6 bar (approx. 450 mm Hg)
With activated vacuum limiting valve (accessory):
0.2–0.27 bar (150–200 mm Hg) both during automatic and manual operation

Materials:
see list of spare parts and accessories, page 7.

Dimensions: length 26 cm
width 17 cm
height 13 cm

Weight: 2 kg

Working temperature
(without significant)
change of performance): -20°C–+50°C

Storage temperature: -40°C–+70°C

Storage: Unit should be stored in suitable emergency case, similar to our stock number 219 200 205, or other case that does not permit the unit to get wet or dirty. This procedure should be followed for both inside and outside storage. Outside storage within above temperatures is permitted but unit should be stored within working temperatures for 24 hours before use. If stored properly, inspections should take place yearly as a minimum. No special packing for preservation is necessary.

Ref. Service Manual:
Please see the service manual for complete list of parts and accessories. Many small repair parts indicated are only available for sale in larger sub-assemblies.

2. Connection to compressed gas supply

Operation pressure: 3-5 bar (42.5-71 psi).
The pump is delivered with a quick coupler valve fitted to the frame of the pump (see fig. 1).

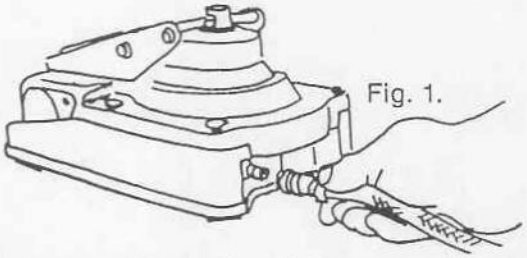


Fig. 1.

Tube for connection to the quick coupler valve: 6 mm (¼") internal diameter reinforced pressure hose secured with hose clips at both ends.

NB:
The pump should never be connected to a low pressure outlet for O_2 therapy without professional approval of the intended installation:
See »Appendix« for examples of installation.

3. Adjustment of the operating rate (free air flow)

At the factory the pump is adjusted to a rate of 125 strokes/min when the inlet pressure is 4 bar.
Measured at the suction tip, the free air flow characteristic of the pump resulting from an operating rate of 125/min is as shown in fig. 2.

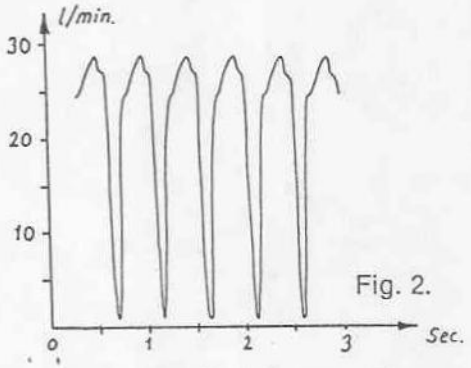


Fig. 2.

Usually this adjustment of the operating rate is recommended, but if a higher or lower free air flow is required, it may be changed.

Adjustment procedure:

1. Remove the cover over the adjustment screw »Rate« (see fig. 3).
2. Start operation of the pump with the required inlet pressure.
   Place a screwdriver in the slot on the adjustment screw and turn towards » + « for a higher rate or towards »–« for a lower rate.
   Check the rate by counting the pump strokes for one minute.
4. After adjustment of the free air flow, the cover should be pushed into place again and the tube blocked by a finger until the max. negative pressure is obtained and the pump nearly stops.
   Note that the pump automatically increases the operating rate to obtain the max. negative pressure as quickly as possible.
   Remove the finger and check that the pump reassumes function at the set rate.

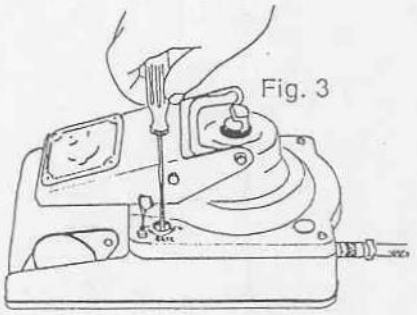


Fig. 3

4. Fitting in a rescue vehicle

The overflow protection of the pump has been designed in such a way that it can function in any position between horizontal and vertical **with the liquid container pointing downwards.**
As an accessory a wall hanging bracket is available (see fig. 4).

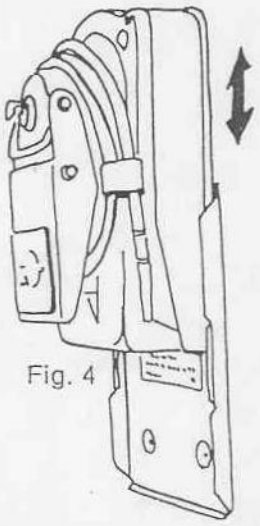


Fig. 4

The wall hanging bracket is installed by means of four screws. Push the pump downwards from above so that the edge of the bottom plate is held by the two guides of the wall hanging bracket. In this way the pump can be hung up or taken down very easily for use outside the vehicle as well as for cleaning and service.

5. Description and function

Fig. 5 shows the individual parts of the pump:

1. Frame #150 000 507
2. Upper housing #150 000 505
3. Container #150 040
4. Base plate #150 011
5. Pedal #150 000 504
6. Coupling link (in # 150 000 504)
7. Lower diaphragm flange #150 049
8. Upper diaphragm flange (in #150 000 002)
9. Pump rod (in #150 000 002)
10. Pump rod hook (in #150 000 002)
11. Outlet valve and retaining pawl #150 000 511
12. Valve mechanism (in #150 000 002)
13. Shifting rod (in #150 000 002)
14. Ball float #150 000 514
15. Connecting nipple (in #150 000 507)
16. Rubber connector (in #150 000 507)
17. Trap chamber #150 000 508
18. Cover (in #150 000 507)
19. Inlet valve #150 000 506
20. Outlet valve (in #150 000 511)
21. Compressed gas connector to motor chamber 150000509
22. Exhaust outlet from motor chamber 150000507
23. Quick coupler valve #150 060
24. Booster valve #150 000 510
25. Pump chamber (in #150 000 507)
26. Motor chamber (in #150 000 507)
27. Motor diaphragm #150 000 012
28. Pump diaphragm #150 047
29. Return spring #150 000 503
30. Suction tube #150 000 513

The pump diaphragm and the motor diaphragm are shown in the lower position so that the pump and motor chambers have minimum volume.
When compressed gas flows into the motor chamber (26), the diaphragm flange is pushed upwards, thus increasing the volume of the pump chamber (25) and creating suction.

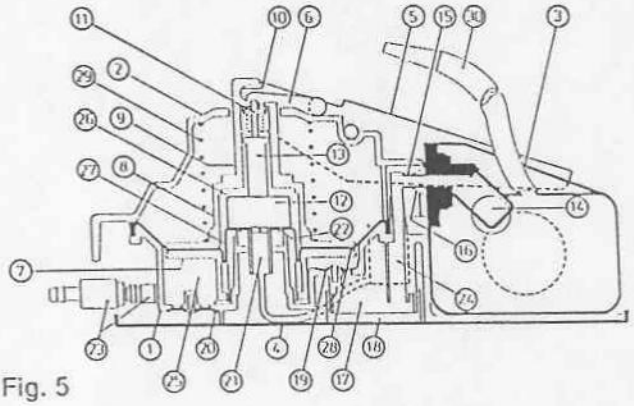


Fig. 5

5.1 Automatic operation

When the suction tube is blocked, the pump will nearly stop as soon as the pressure in the motor chamber balances the negative pressure in the pump chamber. In this case the pump maintains the max. negative pressure without using any oxygen.
The booster valve is controlled by the negative pressure in the container and automatically increases the oxygen flow to the motor chamber when a vacuum is needed quickly.

5.2 Manual operation

For manual operation of the pump, the coupling link on the pedal should be pushed into the pump rod hook (10). In this way the outlet valve (11) is operated so that air can flow freely in and out of the motor chamber, independent of the position of the valve mechanism.

When the pump is operated without suction occurring (idle), the return spring causes the only resistance to the downstroke of the pedal. If, however, a vacuum has been created, increasing power is required to overcome the increasing vacuum, and thus it is easy to feel when and how the pump is sucking.

NB:
The coupling link on the pedal should be disconnected from the pump rod hook to make automatic operation possible.

5.3 Vacuum limiting valve (accessory)

A special container cover with a built-in vacuum limiting valve is available as an accessory (fig. 6).

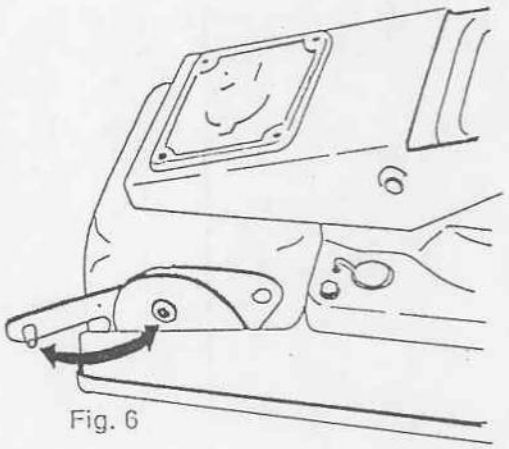


Fig. 6

When the plug is on, the valve is closed and full suction capacity can be obtained.
When the plug is removed as shown in fig. 6, the valve allows air to enter at a negative pressure of 0.2-0.27 bar (150-200 mm Hg), which is then the max. negative pressure limit both during automatic and manual operation. This limit is recommended when the pump is used on small children.

6. Operating procedure

6.1 Automatic operation

a. The pump should be placed in any position between horizontal and vertical **with the container pointing downwards.**

NB:
If the pump is turned upside down during automatic operation, the ball float will block the inlet to the pump, and it will stop.
The ball float will remain stuck even when the pump is turned again.
The container must be pulled back far enough to relieve the vacuum, thus releasing the ball float, and then be pushed into place again.

b. Connect the gas supply.

c. Press the quick coupler valve on to the nipple in the front cavity of the pump frame until a »clicking« sound is heard.
The pump is in operation and ready for use.

d. Turn off the gas supply after use!

6.2 Manual operation

a. Place the pump as described under 6.1 a.

b. Push the coupling link on the pedal into the pump rod hook. (fig. 7).

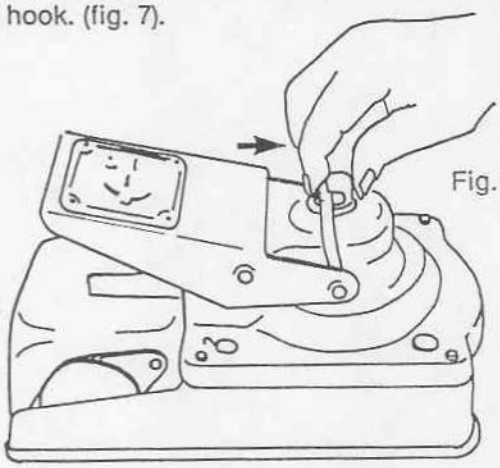


Fig. 7

c. The pump can be operated by foot or by hand. Press the pedal at a moderately quick rate, i.e. corresponding to the operating rate used during automatic operation.

6.3 How to handle the container

The ball float in the overflow protection is guided at an angle of 45°. This means that the pump will function correctly in any position between horizontal and vertical with the container pointing downwards.
If the container is filled, thereby activating the overflow protection, then the following should be done:
ull the container backwards (see 7. »Disassembly and assembly«). Remove one of the covers and pour out the contents. Put the cover on and push the container into place. The pump is now ready for suctioning to be continued.

7. Disassembly and assembly

7.1 Disassembly for cleaning purposes

The container should be removed and cleaned whenever the pump has been used. This is done as shown in fig. 8.

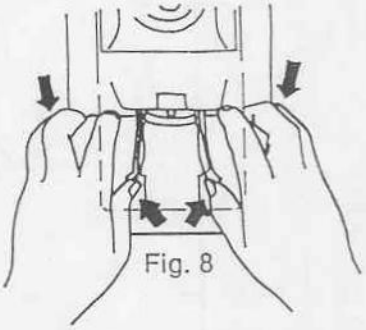


Fig. 8

Release the retaining pawls with the thumbs and pull the container backwards simultaneously with the forefingers.
Remove the two covers, but let them remain secured by the straps. Rinse out the container under running water.
The overflow protection can be removed by a firm pull at the rubber flange at the top (see fig. 9).

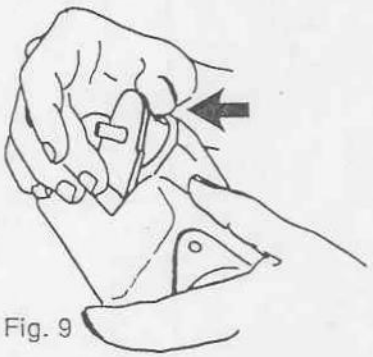


Fig. 9

The flange on the overflow protection stopper should be fitted into the indentation on the container when it is pushed into place. It must be pushed in as far as possible when reinstalled.
If secretion is found on the connector, the trap chamber should be examined and if necessary cleaned as follows:
Remove the base plate while the pump is being held in a horizontal position (see fig. 10).

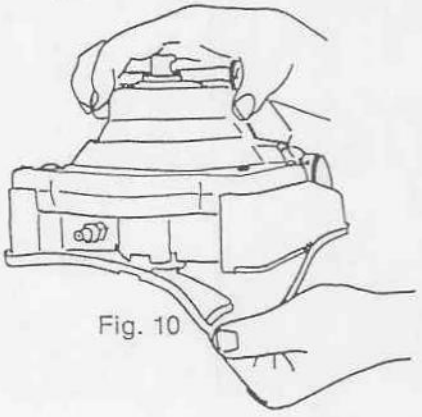


Fig. 10

Remove the rubber cover (see fig. 11) while the pump is still being held in a horizontal position. The trap chamber can now be inspected and cleaned without further disassembly of the pump.

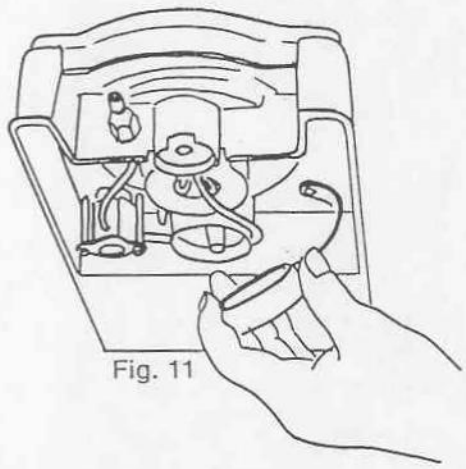


Fig. 11

7.2 Disassembly in main parts

For further cleaning and service, the pump can be disassembled in main parts as follows (see fig. 12).

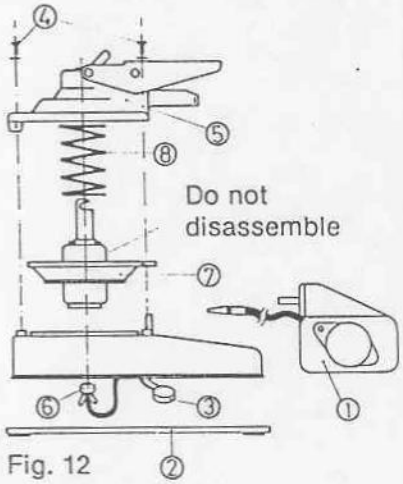


Fig. 12

1. Remove the container (1).
2. Remove the base plate (2).
3. Take off the trap chamber cover (3).
4. Unscrew the 4 screws (4) securing the upper housing (5) while the housing is being held down (the return spring (8) pushes upwards) (fig. 13).
5. Lift the upper housing straight up and remove it (fig. 14).
6. Unscrew the motor inlet connector (6) by anticlockwise turning of the wire wings (fig. 15).
7. Now the unit (7): pump rod, diaphragm plates, diaphragms and lower bearing can be released (fig. 16).
   Important: This unit should never be disassembled by the user, as correct assembly can be difficult.
8. The pump chamber is now accessible for inspection and cleaning.

Assembly takes place in reverse order, but note the following:

a. The hole in the diaphragm edge should encircle the nipple on the top side of the pump frame. Make sure that the edge of the diaphragm is pulled out over the extended rim all around the pump chamber (fig. 17).
b. The motor inlet connector should be tightened **moderately.**
c. Assembly of the upper housing:
   Catch the spring with the upper housing and press down carefully until the pump rod is guided in its bearing. Hold on to the upper housing until 2 of the screws have been fastened with the fingers.
d. Fit the base plate, cover and container as described previously.

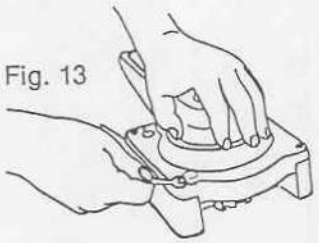


Fig. 13

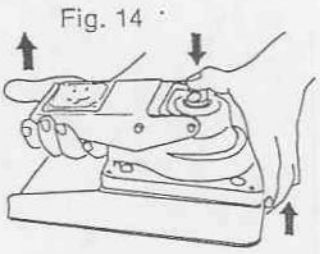


Fig. 14

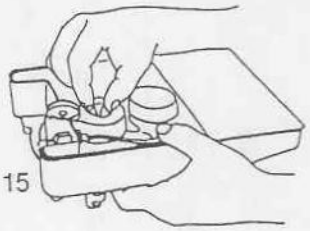


Fig. 15

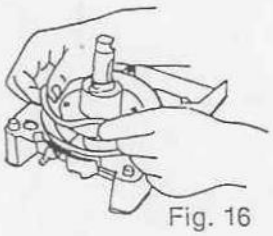


Fig. 16

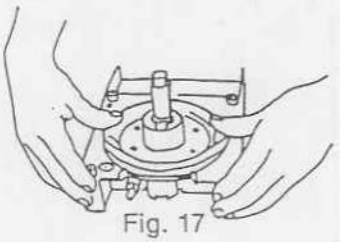


Fig. 17

8. Testing

After disassembly and assembly the pump should be tested in the following way:

8.1 Automatic operation:

1. Connect the gas supply.
2. Check that the pump is working at the normal rate.
3. Block the suction tube and check that the rate increases for a short time and then decreases until the pump nearly stops.
4. Release the suction tip and check that the rate is unchanged.

8.2 Manual operation:

1. Check that the pump rod can move freely up and down when the coupling link on the pedal has been pushed into the pump rod hook.
2. Block the suction tip and check that the pedal offers increasing resistance after a few strokes.
3. Release the suction tip and listen for a momentary powerful suction of air through the tube.

In case of defects, see under 15. »Troubleshooting«.

9. Cleaning

9.1 Container and suction tube

After disassembly as described under 7.1 it is recommended to rinse all parts on the inside and outside under running water. Then wash off with soapy water and rinse thoroughly again afterwards.

9.2 Pump unit

If secretion is found in the connector on the container, the trap chamber should be examined and if necessary cleaned (see under 8). Occasionally the pump should be separated into main parts so that the pump chamber can be rinsed and washed with a mild detergent (see under 7.2).

10. Disinfection

Most chemical disinfection solutions of the glutaraldehyde type will be able to offer efficient disinfection, if container and tubing are submerged.
Follow carefully the manufacturer's directions for disinfection of rubber and plastic parts. Rinse thoroughly afterwards.
Disinfection of the pump chamber is most easily done by means of a surface disinfectant spray. The pump should never be submerged.

11. Sterilisation

When disassembled, all container and tube parts can be autoclaved at 121° C.

12. Maintenance

The pump is manufactured from materials resistant to corrosion and requires no regular maintenance. All bearing materials are self-lubricating.

NB: The pump should never be oiled or lubricated.

13. Accessories

Container cover with vacuum limiting valve, 0.2-0.27 bar (150-200 mm Hg)	no. 155000001
Negative pressure manometer	no. 151001000
Wall hanging bracket	no. 59158

Oxygen supply valve, complete, (Robertshaw), with stepwise adjustable oxygen flow to the resuscitator – 2, 4, 6, 10 and 15 l/min. + helical wound tube. On-off valve with reinforced pressure hose and quick coupler valve to the pump no. 171000

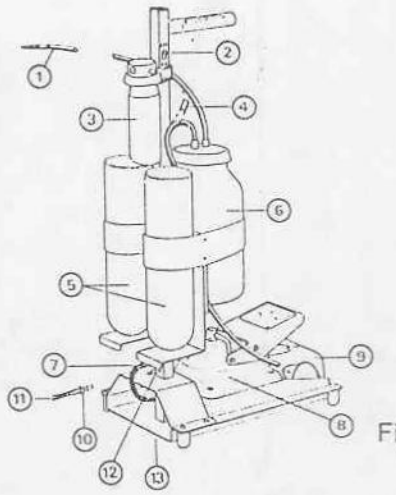


Fig. 18

14. Ambu® Surgi-Suction Pump

(Uni-Suction Pump + stand with 2-litre container, fig. 18).

1. Suction tube
2. On-off valve
3. Suction Booster
4. Connection of the suction tube by-passing the 2-litre container. During this by-pass the 2-litre container can be emptied as the system can be used with the 0.6 l container alone.
5. 2 × 1-litre catheter holders
6. 2-litre container (can be autoclaved at 121° C together with the suction tubing).
7. Tube with quick coupler valve for connection between the Uni-Suction Pump and the on-off valve.
8. Uni-Suction Pump
9. 0.6 l container
10. Quick coupler valve
11. Gas supply
12. Connection for gas supply
13. The central rod can be separated from the base when the screw at the bottom is unscrewed with a coin.

Main data of the Surgi-Suction Pump

	Assembled and ready for use:	Disassembled and packed:
Dimensions:		
Length:	37 cm	approx. 82 cm
Width:	22 cm	approx. 22 cm
Height:	66 cm	approx. 24 cm
Weight:	6 kg	
Time required to obtain a vacuum of -0.4 bar (-300 mm Hg)	4.5 sec.	
Oxygen consumption and max. negative pressure:	The same values as indicated for the Uni-Suction Pump (see page 2).	

15. Troubleshooting

Defect	Possible cause	Correction
Leakage.	Cracks, damage or dirt on the sealing surfaces of the container.	Clean or exchange.
The pump continues to function during automatic operation – although at a reduced operating rate – **when the suction tip is blocked,** instead of stopping or reducing its stroke rate to a minimum.	The »Rate« adjustment cap is defective or has been removed.	Exchange: Remove upper housing (4 screws). Cut the strap to the old cap and pull the new strap through the hole, heat the end on a hotplate until it is shaped like a ball.
During manual operation **the pedal can be pressed down without much resistance, also when the suction tube is blocked.**	Diaphragm defective.	Send in the pump to the supplier for service.
	If the defect does not occur when the container is removed and the rubber connector under the pedal is closed, the defect is caused by the inlet valve shutter.	Disassemble the pump in the main parts. Examine the inlet valve shutter in the pump chamber. Clean around the seat and exchange the shutter if it is defective. It is not necessary to loosen the screw and the washer holding the shutter, as it can be rolled on and off.
	Yellow outlet valve shutter/seat defective or dirty.	**Remove base plate:** Roll valve shutter off without loosening screw and washer. Clean around seat and shutter and exchange, if necessary.
	Sealing surface for pump diaphragm damaged or wrongly fitted.	Same disassembly procedure as described above. Examine the diaphragm and check that it is fitted correctly round the extended rim along the pump chamber.
Automatic operation. **The pump stops in the top position.**	Valve mechanism defective.	Send in the pump for service.
The pump stops in the lower position.	Contamination of the pump chamber on top of the rubber gasket preventing the sliding parts from reaching the bottom position.	Disassemble the pump in the main parts (see under 7.2) and clean the pump chamber. If the malfunction is not corrected in this way, the pump should be sent in for service.

Defect	Possible cause	Correction
Automatic operation. When the suction tube has been blocked and is released, **the pump works at a very high rate.**	Booster valve defective.	The pump should be serviced.
When the suction tube is blocked, **the rate does not increase for a short time, but decreases steadily,** and it takes a long time to obtain the max. negative pressure.	The pump is not connected correctly to the gas supply.	Check the connection (see Appendix section 2.1).
	Booster valve defective.	The pump should be serviced.
The pump does not start or works at a very slow rate during automatic operation. At the same time it is impossible or very difficult to press down the pedal even when the suction tip is open.	The ball float in the overflow protection blocks the container outlet. (This will happen if the pump is for instance turned upside down during automatic operation or if not placed as described under 6., i.e. in any position between horizontal or vertical with the container pointing downwards).	Place the pump correctly, pull the container backwards until the nipple is released thus releasing in turn the ball float. Push back the container.
	Blocking.	Remove the container and try to operate the pump. Then remove the rubber cover from the trap and try to establish in this way where the block is. If no defect is found here, then remove the upper housing of the pump (4 screws). Find out if the inlet valve is sticking or is blocked.
Automatic operation. **The pump does not start or operates at a very slow rate** with free suction tip. Manual operation is normal.	The pump is not connected correctly to the gas supply.	Check the connection (see Appendix section 2.1).
	Booster valve not correctly adjusted.	Remove the cap on the booster valve. Place a small screwdriver in the slot of the adjustment screw. Turn to the left until the required rate is obtained.

APPENDIX

2.1 Connection to different compressed gas systems

2.1.1 Central gas pipeline system, inlet pressure 3-5 bar (fig. 1)

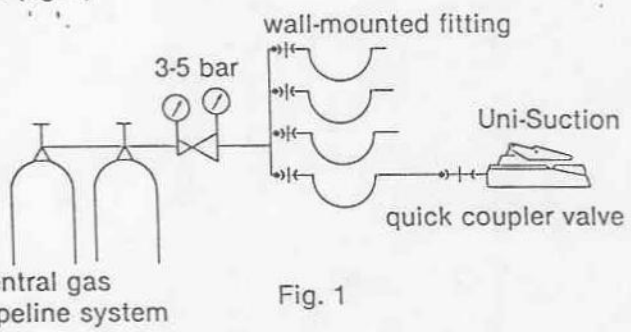


Fig. 1

The pump is connected directly via the pressure hose with the quick coupler valve at one end. The operating rate can be adjusted by means of the adjustment screw »Rate« on the pump (see under 3). The max. negative pressure of the pump is determined by the inlet pressure (see table, fig. 2 on page 3).

2.1.2 Central gas pipeline system, inlet pressure higher than 5 bar (fig. 2)

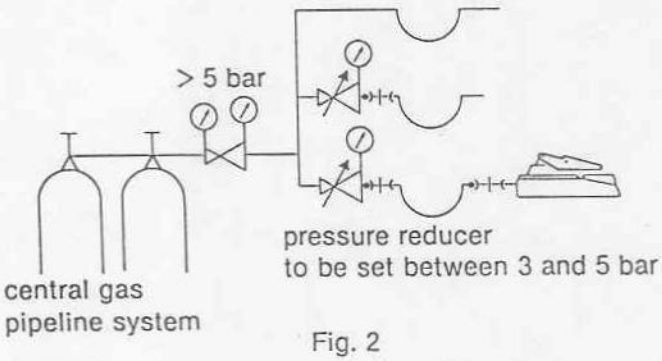


Fig. 2

A pressure reducer should be connected between the system outlet and the pump and set at approx. 4 bar. It is possible to adjust both the max. negative pressure of the pump (the pressure reducer) and/or the operating rate (the adjustment screw on the pump, »Rate«).

2.1.3 Portable cylinder with two connections (fig. 3)

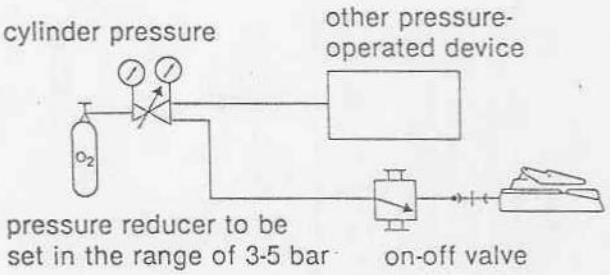
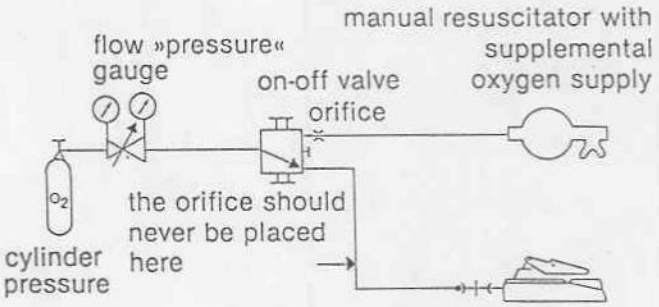


Fig. 3

The pressure reducer is set between 3-5 bar. The pump is connected to one outlet, and a gas-operated device could be connected to the other one.

2.1.4 Portable cylinder with »flow« pressure gauge (fig. 4)



When the pump is in use, the pressure reducer should be set in the range of 3-5 bar

Fig. 4

Information on the relation between the flow reading and the pressure should be obtained from the manufacturer of the oxygen regulator. Use the flow value corresponding to approx. 4 bar for pump operation.

NB:

The pump should never be connected in series with any fixed or adjustable orifice, as this will reduce the efficiency.

The correct connection is shown on fig. 4 where the orifice is placed in one outlet after an on-off valve, while the pump is connected to the other outlet without an orifice.

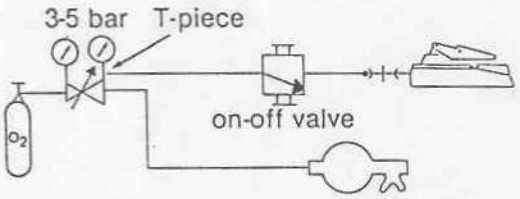


Fig. 4a

Fig. 4a shows an alternative connection. A T-piece has been inserted between the flow meter and the pressure reducer.

2.1.5 Portable cylinder 3-5 bar with needle valve and flow meter (fig. 5)

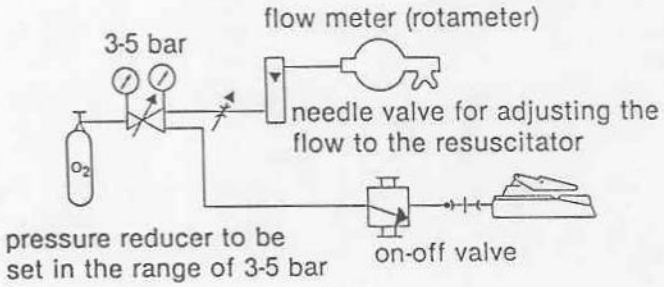
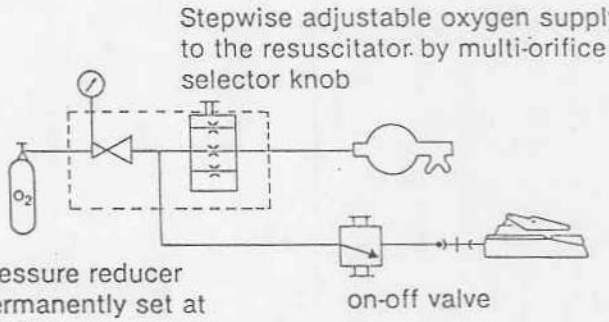


Fig. 5

Also in this case the pump should be connected **upstream** in relation to the needle valve.

2.1.6 Portable cylinder, 3-5 bar with stepwise adjustable oxygen supply (fig. 6)

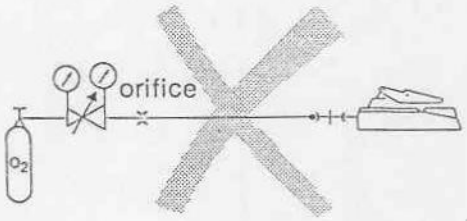


an example of this combined valve is the Robertshaw, type P/N 900-002-170-02

Fig. 6

A direct outlet on the pressure reducer supplies the pump via an on-off valve. A stepwise adjustable oxygen flow to the resuscitator can be obtained by a multi-orifice selector knob.
Ambu International can supply a valve of the type shown:
Manufacturer: Robertshaw Controls Company (Ambu cat. no. 171000).

2.1.7



the pump should never be connected in series with any fixed or adjustable orifice

Fig. 7

This connection should never be made. The pump is connected by mistake in series with an orifice. Note that the orifice is often built into the pressure reducer which is then fitted with a flow meter (see fig. 4 for correct connection).

Ambu®

Service Manual for the Ambu Uni-Suction Pump

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Ambu®

For NSN 6515-01-241-7531

Aspirator, Portable, Light Weight
Compressed Gas or Manually Operated

LIST OF CONTENTS AND ILLUSTRATIONS:

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INFORMATION FOR ORDERING ACTIVITIES

Prompt payment discount: None (net 30 days)

Time of delivery: less than 45 days. Emergency delivery of 72 hours (Customer pays diff. of normal vs. preminum rates)

FOB Point: Destination - 50 states, District of Columbia, & Puerto Rico

Ordering address:

Ambu Inc.
7476 New Ridge Road
Hanover, MD 21076

Payment address: Same as above

Repair parts: Lists and net prices are contained in this price list

Service and Distribution point: Same as above

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Ambu Inc. warrants its products to be free from defects in workmanship and materials for one (1) year from the date of purchase, when used for the intended purpose and cared for in accordance with recommended procedure. Should any product be found to be defective, obtain a return authorization number from Ambu Inc. and return freight collect. Repair or replacement will be made at no charge.

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EXCHANGE OF THE MOTOR VALVE ASSEMBLY 150000012

DISASSEMBLY

1. Disassemble the pump into the main parts as described in the directions for use (7.2).

2. Remove the 6 screws on the pump motor unit no. 150000002 (fig. 1).

3. Lift the upper diaphragm flange slightly by means of the pump rod and turn 90°, then release it completely (fig. 2).

4. Unscrew the flange nut round the oxygen connector by means of the hexagon spanner no. 150088. Pull out the black plastic bearing (fig. 3).

5. Release the diaphragm from the lower diaphragm flange no 150049. Pull out the motor valve assembly valve no. 150000012 carefully thus releasing the diaphragm support ring no. 150074 as well (fig. 4, fig. 5).

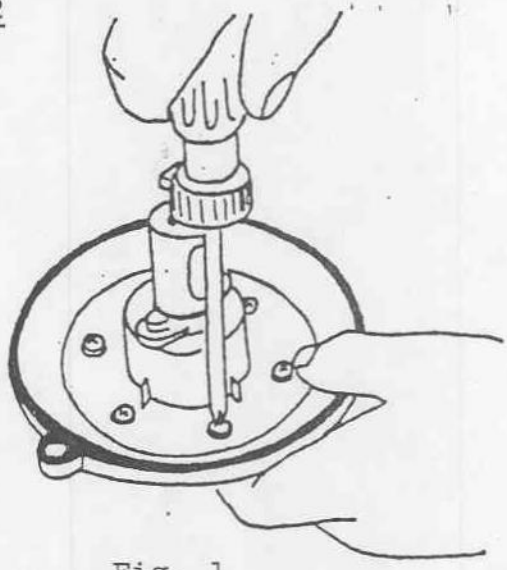


Fig. 1

Fig. 2

REASSEMBLY

6. Attach the diaphragm support ring to the new motor valve assembly. (IMPORTANT: one side of the ring is rounded while the other side has a 90° angle. The angle should be against the valve and the rounded part against the diaphragm) (fig. 6).

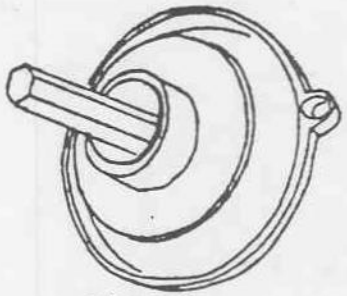


Fig. 3

7. Place the thread nipple of the valve in the center hole of the diaphragm in such a way that the sealing bead on the diaphragm is turned away from the valve side.

   It is important that the diaphragm is pressed down completely all round the thread nipple.

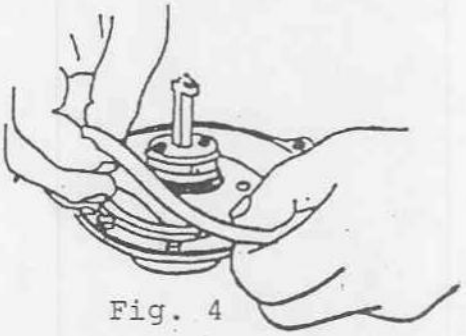


Fig. 4

Turn the valve in the diaphragm until the 2 red outlet valve seats are exactly opposite the 2 holes in the diaphragm.

Press down the diaphragm all round the 2 seats (fig. 7).

8. When fixing the black plastic bearing take care that the 2 red valve seats fit into the 2 holes in the bearing and that the diaphragm support ring is placed correctly (fig. 8).

9. Place the flange nut on the hexagon spanner and tighten the nut moderately. Fold back the diaphragm and check that the diaphragm support ring is placed correctly.

   Now tighten the nut.

10. Fit the plastic bearing into the lower diaphragm flange and attach the pump diaphragm to the 6 thread nipples. Take care that the diaphragm is attached evenly all way round between the plastic bearing and the cylindrical part of the diaphragm flange.

11. Place the upper diaphragm flange on top of the valve and take care that the hook of the pedal coupling link is placed transversely to the direction from the centre towards the hole in the edge of the pump diaphragm.

    Lower the upper housing until it is 5-10 mm above the lower diaphragm flange and then turn 90° so that the coupling link hook is turned towards the hole of the pump diaphragm.

    Tighten the 6 screws in the diaphragm flanges.

12. Check that the plastic bearing can be pulled in and out so that the alternations of the motor valve assembly can be heard in the two opposite positions.

13. Reassemble the main parts as described in the directions for use (7.2).

14. Finally test the pump as recommended in the directions for use (8).

Fig. 5

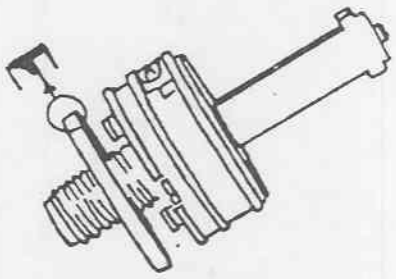


Fig. 6

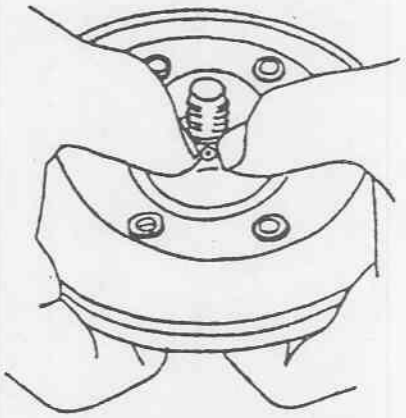


Fig. 7

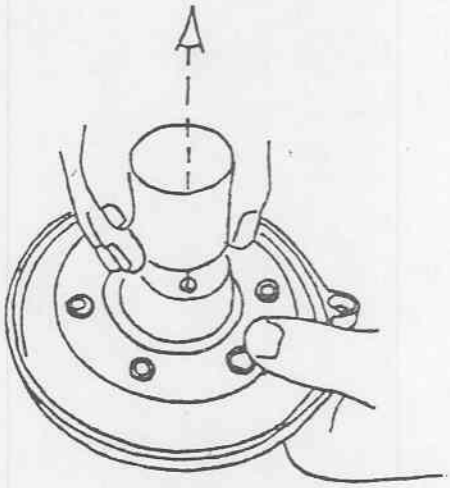


Fig. 8

DISASSEMBLY AND ASSEMBLY OF THE DEMAND VALVE 150000010

DISASSEMBLY:

The numbers are mentioned can be seen from the assembly drawing (fig. 15).

1. Disassemble the pump into main parts as described in the directions for use (7.2).

2. Remove the 2 screws + bushings + bracket securing the housing of the demand valve.

3. Release the valve.
   If the housing is not to be exchanged, do not remove the tubing. Otherwise unscrew the tube nipples, no. 150071 (fig. 9).

Fig. 9

4. Remove the piston no. 150009 with diapragm no 150047 + spring.

5. Remove the upper disc no. 150075 in the valve housing carefully by placing a pointed wooden stick or metal rod in the center hole (avoid damage of the sealing surface) (Fig. 10).

6. Remove the 2 O-rings no. 150078 and 150090 under the disc and take out the lower disc no. 150076.

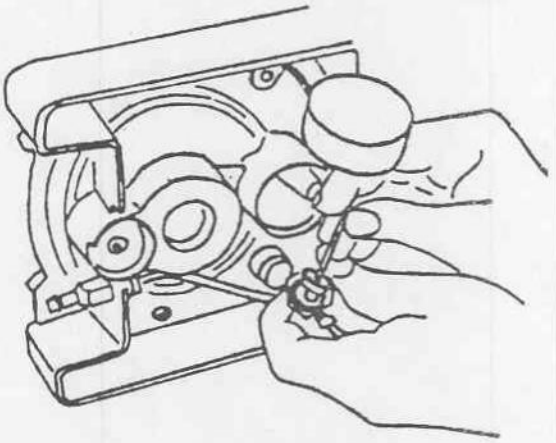


Fig. 10

ASSEMBLY:

Order of assembly: see fig. 11 and also the assembly drawing fig. 15.

1. Place the lower flat disc no. 150076 in the valve housing with the central cavity for the small O-ring upwards.

2. Lubricate the small O-ring with silicone grease, Wacker no. 410 or Dow's (WARNING: Other types of oil or grease should never be used because of the danger of fire). Place the O-ring in the central cavity.

3. Place the large O-ring no. 150078. It should be quite flat in the corner along disc under the internal groove in the housing.

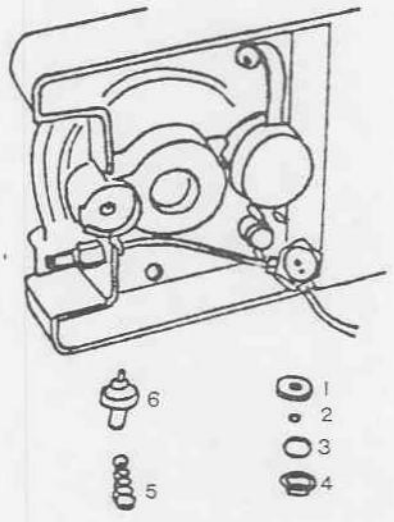


Fig. 11

4. Place the upper disc no. 150075. The indentation should be upwards and the external recess down towards the large O-ring no. 150078. The valve housing is now ready for assembly. Make the following preparations before assembly:

5. Attach the rubber cover with the strap on the underside of the frame. Seal the nipple to the demand valve tightly, and if required the connector to the negative pressure manometer. Connect the nipple on the upper part of the frame to another suction pump so that a vacuum can be created in the valve (fig. 12).

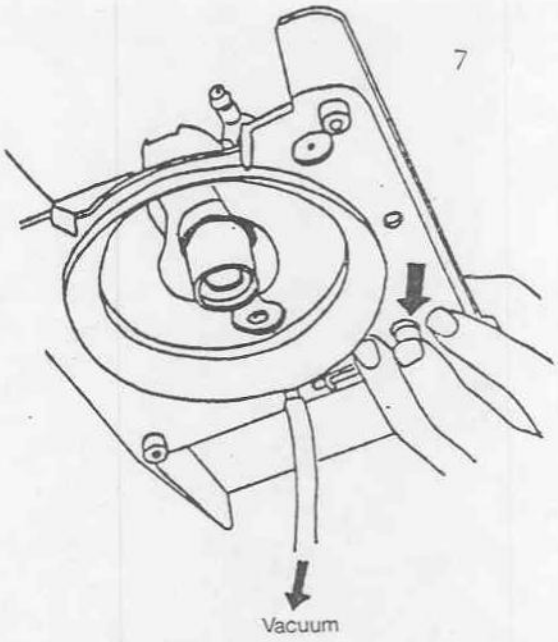


Fig. 12

6. Place the conical spring no. 150010 with the largest coil at the bottom of the indentation on the frame.

7. Press the piston no. 150009 with the diaphragm no. 150047 into the spring. The needle should turn away from the frame. Press down the piston as much as possible against the spring (fig. 13). Attach the diaphragm on the edge while the piston is in the bottom position and create a negative pressure in the system simultaneously. The negative pressure will keep the piston in the bottom position, and the valve housing with shutters and O-rings can be fitted on. As soon as the housing has been placed correctly, the negative pressure may be removed while the housing is being held down against the spring resistance during the fitting of screws, bracket and bushings (fig. 14).

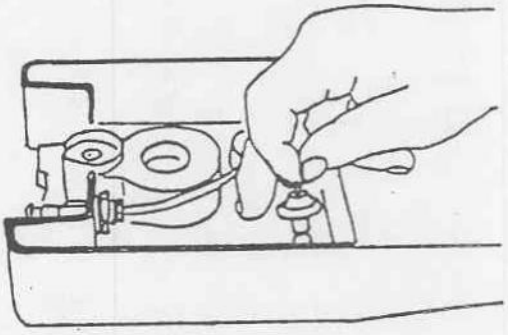


Fig. 13

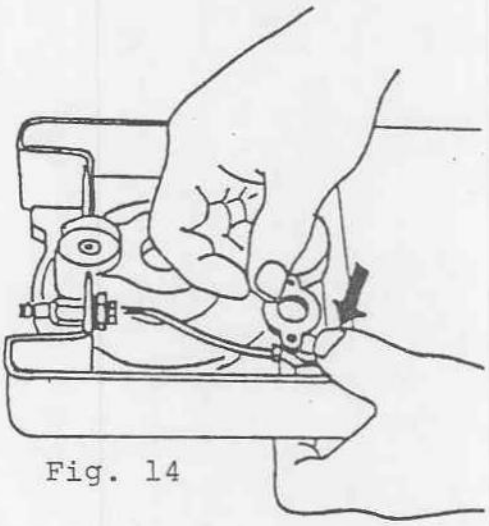


Fig. 14

8. Assemble the main parts as described in the directions for use (7.2).

9. Test the pump as described in the directions for use (8).

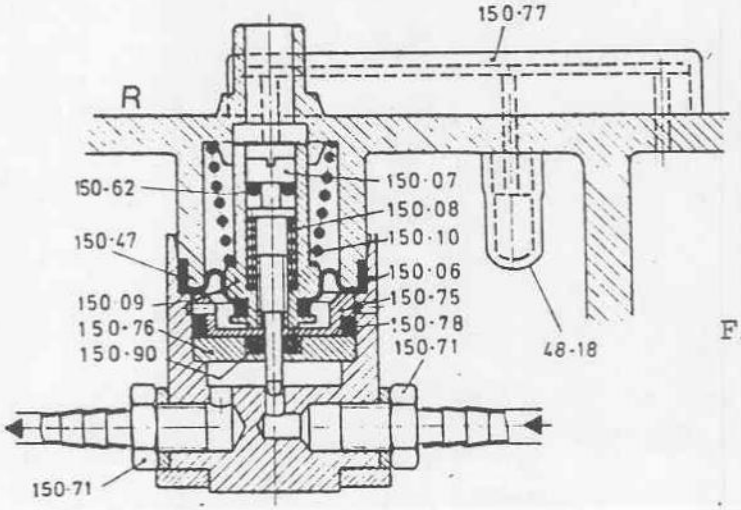


Fig. 15

INSTALLATION OF NEGATIVE PRESSURE MANOMETER CONVERSION SET,

cat. nr. 155001000

A negative pressure manometer can easily be added to the Uni-Suction Pump. To do this a conversion set is required.

The procedure is as follows:

1. Disassemble the pump into main parts: (see under 7.2).
2. Remove the red rubber cap at the bottom of the pump. It can be found between the trap chamber and the demand valve.
3. Insert the plastic tube on the conversion set through the hole on the top side of the frame and connect it to the nipple where the red rubber cap is usually fitted (see fig.a).
4. Fasten the rubber connector in the other end of the tube on top of the frame in the proper indentation. Screw it on with moderate force and check that the shutter is placed correctly under the screw (see fig. b).
5. Remove the plastic stopper from the housing of the pump. Fasten the nipple to the negative pressure manometer (see fig. c). Turn the negative pressure manometer so that it can be read from the container side. Tighten the connector as much as possible. If the position of the manometer has to be changed after it should always be turned in a clockwise direction even, if necessary, making a complete turn.
6. Reassemble the pump. During the reassembly of the upper part the brass connector should be linked to the rubber connector on the frame.

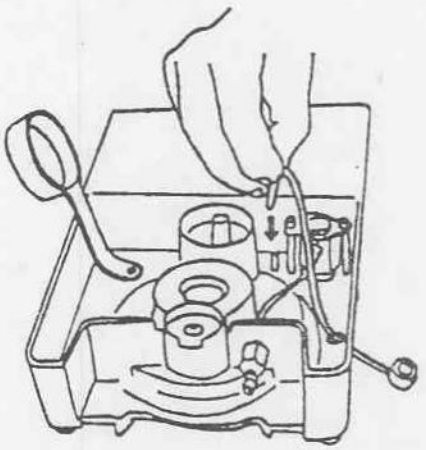


Fig. a

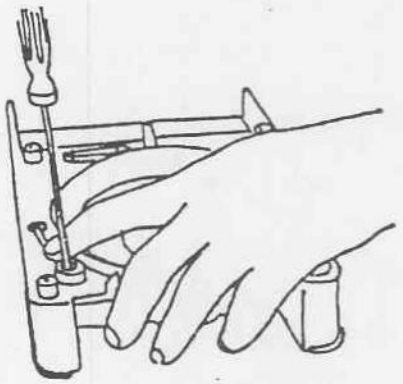


Fig. b

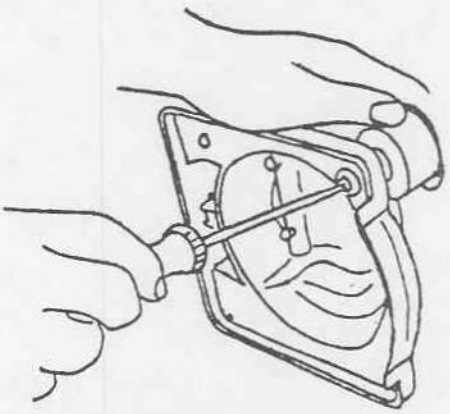
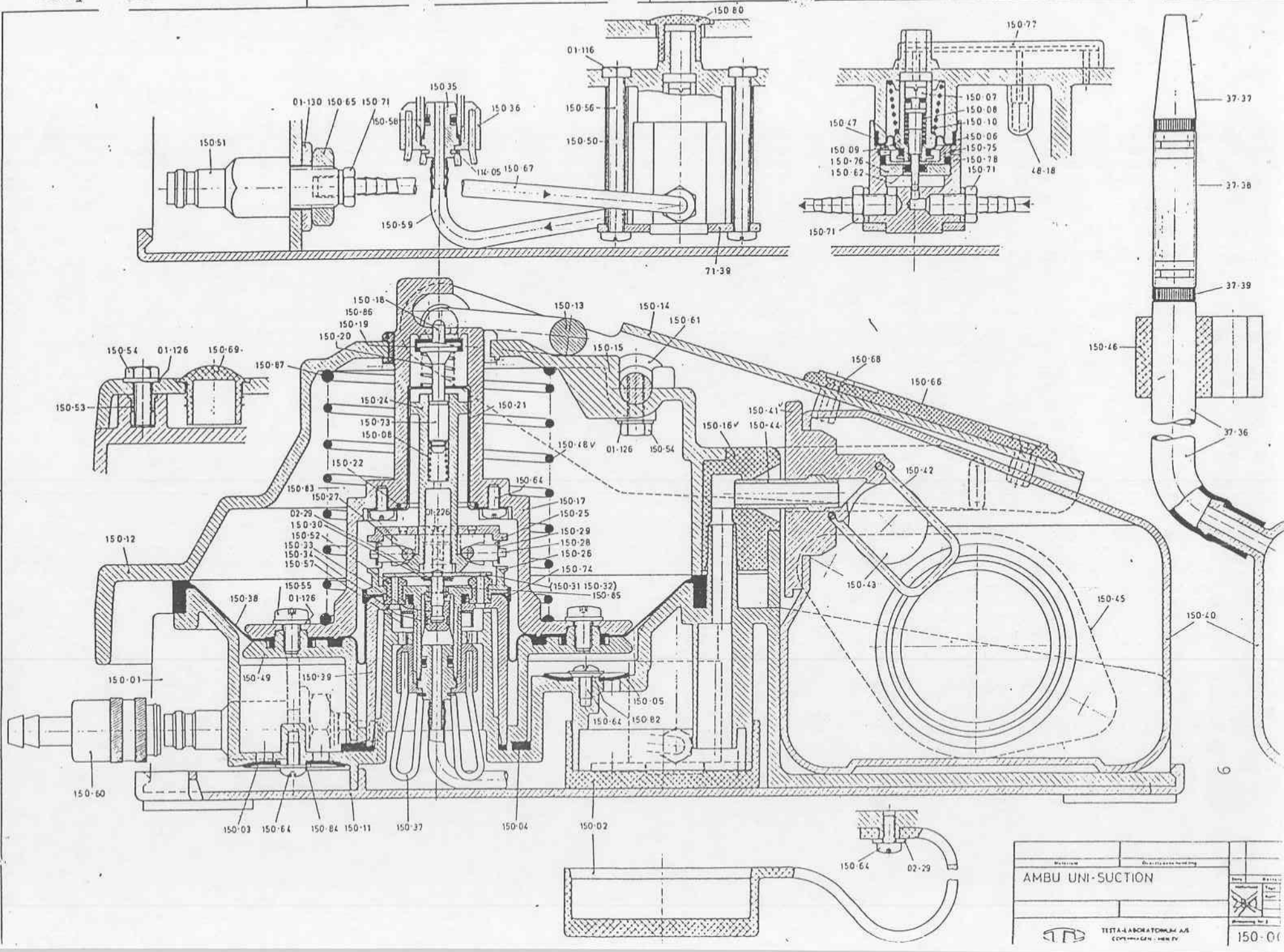


Fig. c

For illustration purposes.
Many parts are sold in kits per SFPPL.



Ambu®

01 October 1989

Complete Parts List

For: NSN 6515-01-241-7531
Aspirator, Portable, Light Weight
Compressed Gas or Manually Operated

Effective 01 January 1989

Stock Number	Description	Cost	Fig.#	Inclu.parts below not sold separate
37 037	Catheter Holder	$12.54	150-00	37-37,37-38,37-39,
59 158	Slide in Wall Bracket	$19.80	-	none
150 009	Piston	$25.29	150-00	none
150 010	Spring Conical	$0.57	150-00	none
150 011	Base Plate	$4.70	150-00	none
150 045	End Cap, Reservoir	$4.70	150-00	none
150 047	Piston Diaphragm	$9.20	150-00	none
150 049	Lower Diaphragm Flange	$68.97	2	none
150 055	Motor Unit Assbly Screws	$0.18	150-00	none
150 060	Female Q/C to Hose stem	$10.35	150-00	none
150 074	Diaphragm Support Ring	$25.86	4	none
150 075	Upper Discs	$2.30	150-00	none
150 076	Lower Discs	$2.30	150-00	none
150 078	O-Rings	$0.57	150-00	none
150 088	Hexagon Spanner	$21.16	2	none
150 090	O-Rings	$0.57	150-00	none
150 410	Silicone Lubricant	$11.50	150-00	none
150 000 501	Reservoir,Cplt w/Tube	$59.30	150-00	37-37,37-38,37-39, 37-36,150-40,150-45, 150-42,150-46,150-43
150 000 502	Motor Unit Kit,Cpltw/Rod Diaph.(Old #150 000 002)	$124.52	1	150-07,150-08,150-10, 150-75,150-78,150-71, 150-47,150-09,150-76, 150-71,48-18,150-38, 150-55,150-49,150-17, 150-29,150-28,150-26, 150-57,150-34,150-33, 150-30,02-29,150-27, 150-32,150-85,150-22, 150-73,150-24,150-21, 150-06,150-77,150-62 01-126,150-25,150-74, 150-52,150-31,150-08, 150-20
150 000 503	Return Spring Kit	$12.02	150-00	150-87
150 000 504	Pedal w/clamp & stoppers	$68.19	150-00	150-13,150-14,150-15, 150-68,150-66
150 000 505	Upper Housing w/pedal	$88.30	150-00	150-12,150-13,150-14, 150-68,150-66,150-61, 150-54,150-16,150-41, 150-53,150-69,150-15, 01-126,150-44

(continued)

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Compressed Gas or Manually Operated

Effective 01 January 1989

Stock Number	Description	Cost	Fig.#	Inclu.parts below not sold separate
150 000 506	Inlet Membrane Kit	$8.36	150-00	150-03,150-64,150-84, 150-04
150 000 507	Frame, Complete	$150.27	150-00	150-12,150-13,150-14, 150-68,150-66,150-61, 150-54,150-16,150-41, 150-53,150-69,150-16, 150-44,150-02,150-64, 150-15,01-126,150-44, 150-41,02-29
150 000 508	Trap Chamber Kit	$8.36	150-00	150-16,150-41,150-44
150 000 509	Motor Inlet Conn. Kit	$12.02	150-00	150-51,150-65,01-130, 150-71
150 000 510	Demand Valve (Booster) (old #150 000 010)	$36.31	150-00	150-58,150-35,150-36, 150-67,150-59,150-50, 150-80,01-116,71-39 114,05,150-56
150 000 511	Outlet Membrane Kit	$5.23	150-00	150-64,150-82,150-05, 150-04
150 000 512	Motor Valve Assembly (old #150 000 012)	$33.44	2	150-07,150-08,150-10, 150-75,150-78,150-71, 150-47,150-09,150-76, 150-71,48-18,150-62 150-06,150-77
150 000 513	SiliconeTube & tip,1400m	$26.39	150-00	37-37,37-38,37-39,
150 000 514	Overflow Ball Valve	$14.42	150-00	150-42,150-43,150-45
150 000 515	Reservoir End Cap w/limit Valve, to 275 mm Hg.	$24.04	150-00	none
153 000 501	Negative Press.GaugeKit	$70.54	150-00	none
155 001 000	Adapter for above	$8.62	150-00	none
237 023 000	Oxygen Supply Valve Valve & Tube w/ Q/C cpl for suction pump	$198.50		none

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