

Service Manual

Ambu Man



List of contents

1. 1.1	Introduction Introduction	3
2.	Trouble shooting	4
3. 3.1 3.2	Disassembly and assembly in main parts Removal of head and chest skin with neck from base unit Assembly of head and chest skin with neck to base unit	
4. 4.1 4.2	Servicing parts in the head Exchanging the valve unit in the head Exchanging the lower jaw or the ear plugs	
5. 5.1	Servicing parts in neck/chest Exchanging the carotid pulse unit	17
6. 6.1 6.2 6.3	Servicing the base unit Exchanging the band-positioning thrust roller Removing and replacing parts in the base unit Assembling the base unit	22
7. 7.1 7.2	Servicing Ambu Defib Man Dissambly of parts Assembly of parts and testing	
8. 8.1 8.2 8.3 8.4	Test and calibration Leakage test Zero point check Calibrating the depth of compression and hand-positioning indicator Calibrating the zero point on the inflation volume indicator	34 35
9. 9.1 9.2 9.3	Spare parts and accessories Spare parts and accessories Service parts	39

1. Introduction

This service manual is intended as help in trouble-shooting, service and repair of the Ambu Man. It guides you through a complete disassembly of the main parts, so that you will be able to replace defect or worn parts.

The part list indicates the parts that we can supply. For practical or technical reasons some small parts cannot be supplied as individual parts and you will therefore sometimes receive a whole set to replace the defective parts.

The Ambu Man is updated on a current basis. Consequently, in such cases modifications will be forwarded as supplementary pages for insertion in the manual.

Warnings

The Ambu man should only be repaired by persons with adequate knowledge. After each dis- and reassembly the Ambu Man must be tested before it is put back into training.

For safety reasons only a specialist should repair the Ambu Defib Man with electrodes for defibrillation, as some parts may be exposed to high voltage during defibrillation.

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2. Troubleshooting

Fault	Possible cause	Remedy
Head correctly hyperextended, but insufflation not possible.	Head chain or nylon tie broken.	Replace with nylon tie.
Head correctly hyperextended, but after a few insufflations, air can no longer be insufflated.	Defective elastic net. Substantial leakage in system.	Replace elastic net. Check out system between head and lung/stomach bags, including stomach valve. Replace the defective parts.
Indication of stomach inflation despite correct volume and pressure insufflation.	Defective stomach valve.	Replace stomach valve.
No indication of stomach inflation despite high volume and pressure inflation.	Black plate over stomach bag not coupled to instrument.	Couple black plate correctly to instrument.
No insufflation, but constant indication of stomach inflation.	Black plate over stomach bag not coupled to instrument.	Couple black plate correctly to instrument
Hand position correct, but fault signalled.	Thrust roller or thrust roller holder at pressure point defective or missing.	Replace thrust roller and thrust roller holder
Hand position incorrect, but fault not signalled.	Missing or defective spring at thrust roller	Replace spring.
Wrong indication for insufflation volume.	Instrument wrongly adjusted.	Adjust instrument (see section 8)
Wrong indication for depth of compression.	Instrument wrongly adjusted.	Adjust instrument (see section 8)
Head loose.	Loose screws and nuts at head mounting. Parts have separated.	Insert screw and nut and then secure using a lock nut.

3.1 Removal of head and chest skin with neck from base unit



3.1-1 Ambu Man model C with monitoring instrument and socket for connection of computer/interface.



3.1-2 Serial number may be found under thorax adjustment



3.1-3 Remove arms if fitted. Pull the arms carefully away from the body. If necessary hold onto the mounting using a pair of polygrip pliers.



3.1-4 Insert a hook of approx. 2 mm through the hole in the arm hook. Detach the pin in the arm from the hook in the shoulder.



3.1-5 Remove the hook from the arm hook.



3.1- 6 Undo the strap at the back, gently using a schrewdriver.



3.1-7 On new models from serie 55376, the neck is attached with 4 buttons. This means that the skin can be detached easily. The following disassembly instructions and pictures will only show the "old" skin detachment.



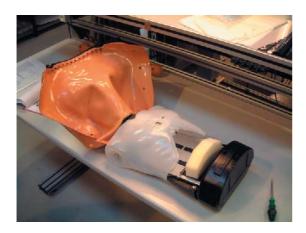
3.1- 8 Undo the chest skin and the two parts of the chest on the back of the Ambu Man.



3.1-9 Free the chest skin from the base unit.



3.1-10 Lift the skin gently off the torso.



3.1-11 Pull the chest skin over the head and carefully pull the chest skin free of the two hooks.



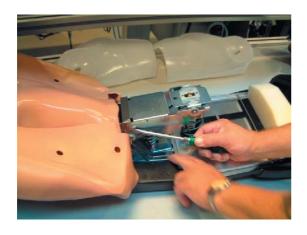
3.1-12 Remove by lifting each part of the chest. During removal, treat as gently as possible.



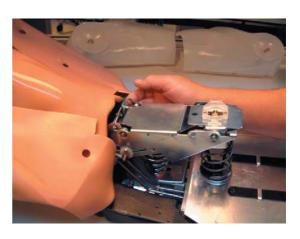
3.1-13 To free the part of the chest turn it completely.



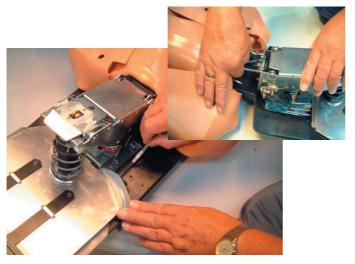
3.1-14 Remove the necktube from the connector.



3.1-15 Disengage the locking device



3.1-16 Disengage the head by lifting the head mounting free of the neck clamp pin.



3.1-17 Disconnect the thin tube from the rocker level and the other pulse tube from the base unit. Detach the chest skin and neck piece from the base unit.



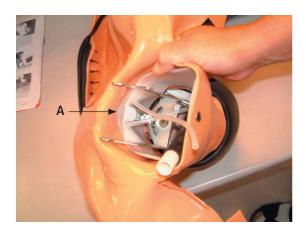
3.1-18 Turn back the chest skin and carefully pull the head and chest skin away from the base unit.



3.1-19 Loosen the skin on the neck mounting from the notch on the outside of the neck piece.



3.1-20 Remove the head from the chest skin.

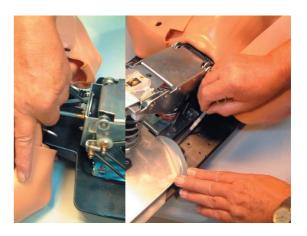


3.1-21 To detach the head from the neck, insert a flat piece of metal between the head mounting pin and the side of the notch inside the neck (A).

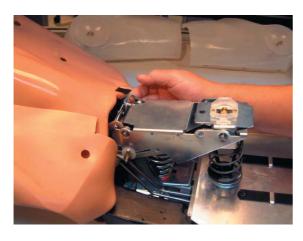
3.2 Assembly of head and chest skin with neck to base unit



3.2-1 Fit the chest skin onto the base unit. Replace the head by inserting the head mounting



3.2-2 Connect the two thin tubes - the short tube to the connector on the rocker lever assembly and the long tube to the extension tube on the base unit.



3.2-3 Fit the mounting with two hooks onto the neck clamp pin.



3.2-4 Mount the locking device.



3.2-5 Moisten the end of both parts with alcohol and mount the neck tube to the tube connector.



3.2-6 Refit the two parts of the chest on the rocker lever.



3.2-7 When repositioning the part of the chest, handle the mounting with care in order not to stress the materials. The retaining clamp for the two parts of the chest must be replaced if damaged. Drill out the two pop rivets, fit a new clamp, and re-rivet (see 6.1-16 and 17).



3.2-9 Attach the chest skin to the groove in the base unit



3.2-8 Fasten the parts of the chest and chest skin on the back. For models with arms carefully pull the hooks through the holes in the chest skin using a pair of pointed pliers. (Photo shows new "neck" model)



3.2-10 Lock the plastic straps on the backside, locking the skin to the base. Observe the groove at the skin.

4.1 Exchanging the valve unit in the head Follow the directions contained in section 3.1 to remove the head



4.1-1 Remove the silicone rubber bushing with the elastic net.



4.1-2 Disengage the sprint at the mounting (A) enabling the mounting to move freely.



4.1-3 Loosen the screw to free the mounting and nylon tie.



4.1-4 Disconnect the neck tube.



4.1-5 Disengage the spring washer from the shaft.



4.1-6 Remove the shaft while holding the large springs.



4.1-7 Hold onto one side of the bar in the lower jaw using polygrip pliers to avoid leaving marks where the nylon tie passes. Loosen the two screws on the side of the jaw.



4.1-8 Take off the jaw.



4.1-9 Disengage the springs and the jaw shaft.



4.1-10 Remove the four nuts and washers using a 7 mm socket wrench.



4.1-11 Grip the head mounting



4.1-12 Remove the head mounting together with the cover plate.



4.1-13 Remove the complete airway valve unit.



4.1-14 The complete airway valve unit should only be repaired by workshops experienced in this repair. Normally, the entire unit is replaced.



4.1-15 Insert a complete new valve unit. The edge of the valve seal should be at level with the outside of the skull.



4.1-16 Mount the cover plate.



4.1-17 Fit the head mounting. Make sure that the jaw is in position under the ear plugs on both sides. Tighten the nuts using a socket wrench. Lead the nylon tie through the hole in the valve.



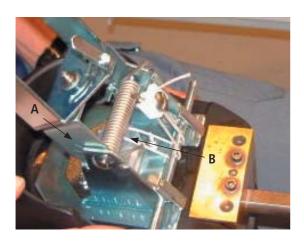
4.1-18 Place the jaw shaft with the two springs attached. Assemble the springs on the head mounting.



4.1-19 Assemble the shaft and big spring. Remember to lock with 2 spring washers.



4.1-20 Fit the nylon tie.



4.1-21 Fit the nylon tie and mounting. Tighten the screw only so much that the nylon tie is allowed to run easily through the retaining plate.

Tilt back the head unit until the corner of the fittings is just abreast of the two lowest lines (A) . Carefully pull the nylon tie (B) till the rubber part on the valve is only just moving.



4.1-22 Stretch the spring and secure the hook on the head mounting.



4.1-23 Hold onto one side of the bar in the lower jaw using polygrip pliers to avoid leaving marks where the nylon tie passes. Loosen the two screws on the side of the jaw. Keep the bar correctly positioned so as not to displace the springs and nylon ties. Fit replacement lower jaw and tighten the two screws while gripping the bar with the pliers.



4.1-24 Check that the jaw moves freely and activates the nylon tie and valve unit when pressed upwards against the skull. Check that the springs are secured.



4.1-25 Moisten the neck tube with alcohol and attach to the connector.

To reassemble the Ambu Man, follow the directions contained in section 3.2.

4.2 Exchanging the ear plugs



4.2-1 If the ear plug has come loose, remove the plug and clean the hole with a $7.9~\mathrm{mm}$ drill without point .



4.2-2 Put a new ear plug into the mounting tool (spanner). Warm (do not burn) the side of the head e.g. with a hair drier until it gets soft. Press the ear plug with the tool. Remember to turn the ear plug into correct position before fitting.

5.1 Exchanging the carotid pulse unit Follow the directions contained in section 3.1. to disassemble from the torso



5.1-1 Unbutton the chest skin from the neck piece.



5.1-2 Pull the neck piece free of the head (A), observe the lock tap. See also 3.1-20 and following instructions.



5.1-3 Remove the plastic tape and pull the pulse unit and two tubes free of the neck piece. Mount new pulse unit, push the tubes through the neck piece so that the pulse unit is in close proximity to the neck piece.



5.1-4 Detach the cover.



5.1-5 Fasten the pulse unit on the neck piece.



5.1-6 Fasten the head onto the neck piece.



5.1-7 Attach the skin with the four buttons (version with open neck).



5.1-8 Use destilled water for easy assembly.



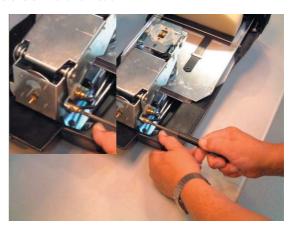
5.1-9 Fasten the chest skin onto the neck piece.

To reassemble the Ambu Man, follow the directions contained in section 3.2.

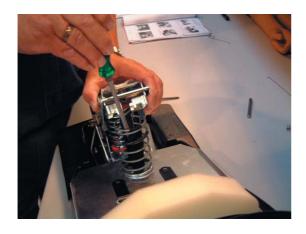
6.1 Exchanging the hand-positioning thrust roller Follow the directions contained in section 3.1. to remove the skind and head



6.1-1 The base unit is now ready for disassembly.



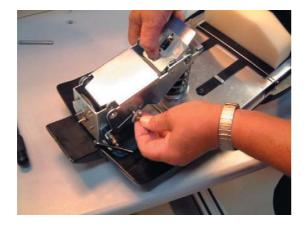
6.1-2 Loosen the spring screws and free the two tension rods.



6.1-3 Remove the rocker lever assembly from the spring by pulling.



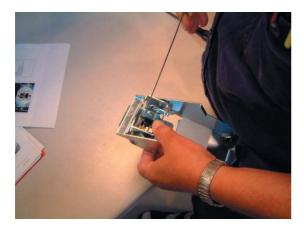
6.1-4 Remove the spindle from the rocker lever assembly and detach the rocker lever.



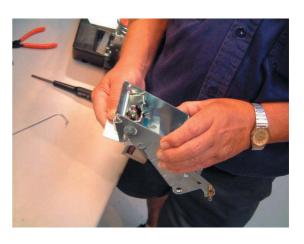
6.1-5 Detach the tension rod from the slit.



6.1-6 Remove the locking ring and detach the bar, thereby freeing the rocker mounting.



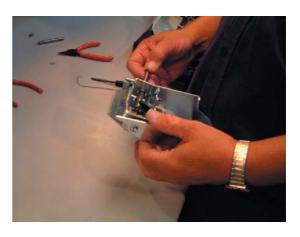
6.1-7 Remove the spring from the thrust roller using pliers.



6.1-8 Remove the thrust roller along with its holder and replace with a new set.



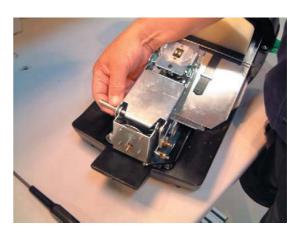
6.1-9 Insert the thrust roller as shown. Fit the thrust roller so that it snaps onto the flat bar on both sides.



6.1-10 Insert the bar and locking ring belonging to the rocker mounting.



6.1-11 Insert the spring between the rocker mounting and thrust roller holder.



6.1-12 Mount the rocker lever and insert the spindle.



6.1-13 Mount the tension rods in their bushings, the plain rod being nearest the head. Make sure that the screws engage the recesses in the tension rods.

For reassembly of other components follow the

directions in section 3.2.



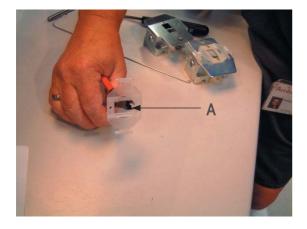
6.1-14 Lock the screws with locktite No. 222 thread-locking.



6.1-15 Press the rocker lever down over the spring.



6.1-16 Rocker shaft with chest holding device, attached with two rivets.

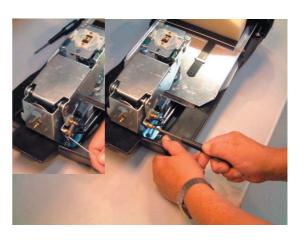


6.1-17 When attaching a new holding device, remember to cut off (A) the old spring tap.

6.2 Removing and replacing parts in the base unit



6.2-1 The base unit is now ready for disassembly.



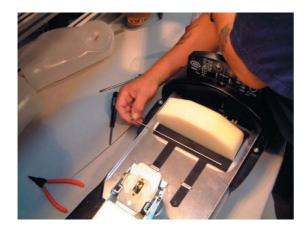
6.2-2 Loosen the spring screws and free the two tension rods.



6.2-3 Lift the rocker arm free of the spring by pulling or use a screwdriver.



6.2-4 The stomach plate is secured with a metal bar kept in place by two plastic tubes or star washers.



6.2-5 Pull out the plastic tube or cut off the washer and remove the metal bar.



6.2-6 Release the two tags from the pins and remove the stomach plate with the foam nylon pads by pushing the parts in the direction of the monitoring instrument until the tags are free of the clamps.



6.2-7 Lift the spring free of the lung plate.



6.2-8 Stretch the spring and hook it onto the edge of the opening in the black base plate.



6.2-9 Press down both sides of the lung plate while keeping the opposite end raised. Maintain pressure on the plate and pull free in the direction away from the monitoring instrument.



6.2-10 Release the connecting piece belonging to the stomach bag by pressing downwards and pushing in the direction of the instrument.



6.2-11 Lift out the stomach plate with the foam nylon pad/pads.



6.2-12 Pull the lung plate a short distance from the monitoring instrument.



6.2-13 The stomach bag can now be separated from the tube



6.2-14 Remove the two retaining screws for the basis plate.



6.2-15 Push the basis plate in the direction of the monitoring instrument until the pin is released at the rocker lever.



6.2-16 The basis plate with tubes, lung bag and stomach valve can now be removed.



6.2-17 The lung bag may now be carefully withdrawn from the bushing in the basis plate. The complete stomach valve unit may also be removed.



6.2-18 The tension rods and levers may now be detached.



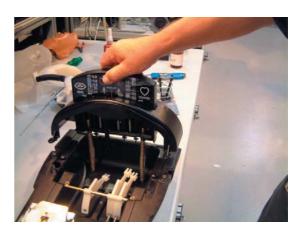
6.2-19 Release the instrument cover plate by disengaging the two tags with the cover plate positioned at almost top centre. Next, pull the cover plate upwards through the instrument casing.



6.2-20 Release and remove the four retaining screws for the instrument casing.



6.2-21 Cut the flannel tape.



6.2-22 The entire monitoring instrument may now be removed.

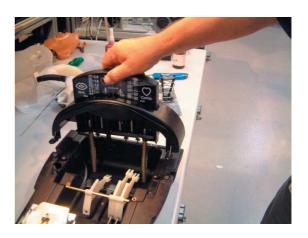


6.2-23 Push the instrument through the casing.

6.3 Assembling the base unit



6.3-1 Using a screw driver, hold down the pawl to enable the instrument to re-enter the casing.



6.3-2 Mount the instrument casing.



6.3-3 Mount the four retaining screws for the instrument casing. Remember to fit washers with the two long screws.



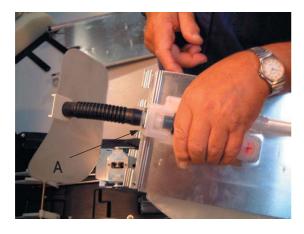
6.3-4 Insert the cover plate through the groove in the instrument casing and engage the two tags in the slots on the instruments.



6.3-5 Insert tension rods and levers.



6.3-6 Mount the levers on the instrument guide ways. Guide way no. 2 from the left must be left free.

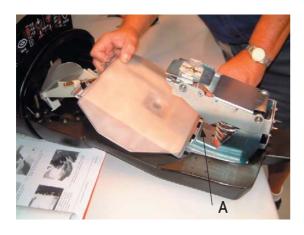


6.3-7 Mount the lung bag and stomach valve onto the basis plate.

Note: leave 2-3 mm space from the tube to the stomach valve (A).



6.3-8 Mount the complete basis plate unit, passing the corrugated tube under the lever bar.



6.3-9 Ensure that the projection on the basis plate engages the recess at the rocker spring (A).



6.3-10 Mount the basis plate, making sure it is correctly positioned in relation to the levers. Insert and tighten the two screws. Check that the three levers activate guides and indicator functions on the instrument.



6.3-11 Mount the stomach bag on the corrugated tube. Moisten the connections with alcohol.



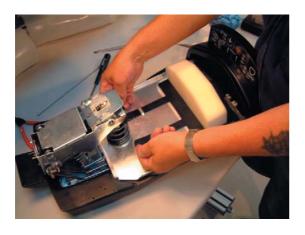
6.3-12 Insert the basis plate, making sure that the two small springs do not become displaced from the bushings.



6.3-13 Detail from the lung plate placed in the instrument casing.



6.3-14 Push the lung plate between the stomach bag and its holder until the two pins engage the holes in the lung plate.



6.3-15 The holes in the tags must fit onto the pins on the lung plate.



6.3-16 Insert the metal bar through the hole in the lung plate.



6.3-17 Secure the metal bar by putting on the star washer. The bar must be secured in both ends by star washers.



6.3-18 Bend the tap (A) slightly downwards.



6.3-19 The tag on the stomach plate must now be inserted between the two round pins on the guide way for indication of stomach inflation. Push the tags into place so that the openings are engaged by the pins on the stomach plate.



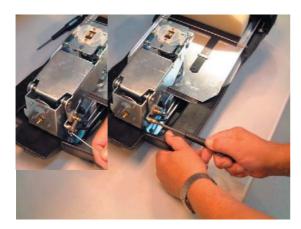
6.3-21 Replace the spring in the opening in the lung plate.



6.3-20 Press on both sides of the stomach plate and push towards the monitoring instrument until the two busings in the plate engage the two pins on the instrument casing.



6.3-22 Press the rocker lever on over the spring until it engages.



6.3-23 Mount the tension rods in the bushings, the plain tension rod being nearest the head. Ensure that the screws engage the recesses in the tension rods.

For safety reasons the Ambu Defib Man with electrodes for defibrillation should only be repaired by a specialist, as some of the parts may be exposed to high voltage during defibrillation.

7.1 Disassembly of Ambu Defib Man Detach the skin as described in chapter 3.1



7.1-1 Pull the chest skin over the head. For models with arms, carefully pull the chest skin free of the two hooks. Gently turn the right part of the chest and release it. (described in chapter 3.1)



7.1-2 Unscrew the cable clamp from the base unit and cut the cable clamp on the chest.



7.1-3 Remove the cable from the electrode.

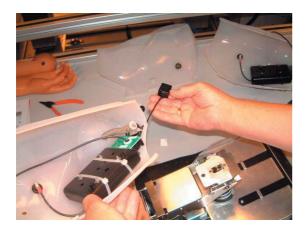


7.1-4 Gently turn the left part of the chest and release it. Remove the clamp from the electrode. The resistance box can now be removed by cutting the two cable clamps.



7.1-5 A new set of resistance box with cable holders, clamps and marking of holes.

7.2 Assembly of Ambu Defib Man



7.2-1 Fit the resistance box in correct position by means of the two cable clamps. Fit the cable for the electrodes on the left part of the chest.



7.2-2 Push the 2 cable holders on the black base and gently reposition the left part of the chest.



7.2-3 Fit the cable for the electrode on the right part of the chest on the cable holder and lead it behind the neck.



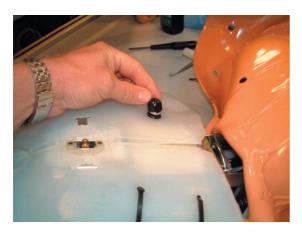
7.2-4 Fit the cable on the chest and gently reposition the right part of the chest.



7.2-5 Fit the cable in the cable holder.



7.2-6 Check that the cables are not caught between any metal parts. Pull back the chest skin.



7.2-7 If it is a new skin without electrode holes, put on the hole markers.



7.2-8 Use a punch knife to make new holes.

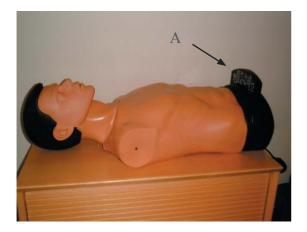


7.2-9 Press the hole markers through the new hole. Remove the marker and the electrode is "ready" for use.

Test of defibrillation electrodes and circuit

- A. Measure the resistance between the two electrodes by means of an ohmmeter. The reading should be approx. 50 ohm.
- B. Connect the Ambu Man to the computer. Defibrillate on the electrodes and check that defibrillation is registered on the computer (please refer to directions for use on the CPR/ECG module).

8.1 Leakage test



8.1-1 Insufflate approx. 1 litre with a bag resuscitator. Hold the bag compressed and make sure that there is a tight mask seal. The air pressure should stay at the same level (indicated on the instrument) for at least 5 secs. It is acceptable that the pressure drops very slowly. In this test, the air may not go in the stomach - if it does so, you have to change the stomach valve.

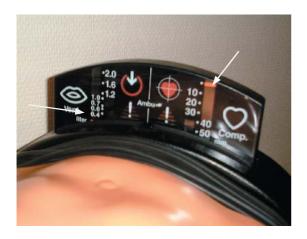


8.1-2 If the indicator drops fast, check all connections from the head to the stomach valve (eg. the necktube, see 3.1-14).

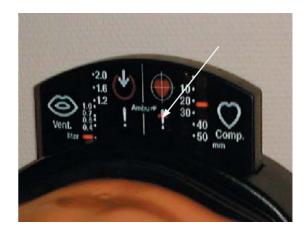
Also check that the four nuts holding the head mounting have been sufficiently tightened (see 4.1) or that the silicone rubber bushing with the elastic net inside the head is tight.

If all this is tight it is probably necessary to change the stomach valve.

8.2 Zero point check



8.2-1 Check that the indicator for volume and compression depth is at zero.

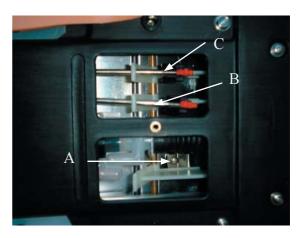


8.2-2 Check that two lines appear on the handpositioning indicator at 20 mm chest compression and incorrect hand positioning.

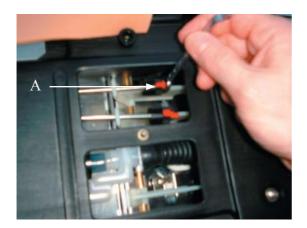
8.3 Calibrating the depth of compression and hand-positioning indicator



8.3-1 Remove the cover plate on the back of the Ambu Man to gain access to the adjusting nuts.



8.3-2 Overview of tension rods and adjusting screws:A: Screw for adjusting zero point for inflation volumeB: Tension rod for incorrect hand-positioningC: tension rod for depth of compression



8.3-3 Loosen the lock nut of the outer tension rod (A).



8.3-4 Set the reading for depth of compression by rotating the thumb but until the indicator points to zero. The indicator should move slightly as soon as a very light pressure is applied to the chest. After adjustment, make sure that one of the two openings in the thumb nut is locked into position facing upwards the cover plate.

It is necessary to adjust while the manikin is lying on the side. If the manikin lies flat on its stomach it will influence the adjustment.



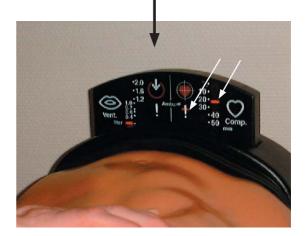
8.3-5 Tighten the lock nut and check again to make sure that the indicator moves slightly as soon as a very light pressure is applied to the chest.



8.3-7 Tighten the lock nut and check once more in accordance with instruction 8.3-5.



8.3-6 Loosen the lock nut on the inner tension rod (see 8.3-2). Adjust the thumb nut until 1½ red lines appear on the hand-positioning indicator at 20 mm chest depression and incorrect hard-positioning.



8.4 Calibrating the zero point on the inflation volume indicator



8.4-1 Rotate the adjusting screw (C) to the left until the indicator is set just above the zero mark at the ventilation side. A stop has been introduced at the zero mark. Set to the zero mark and give a half turn to the right.

Make sure that the tip of the screw rests inside the recess on the leaf spring.



8.4-2 Replace the cover plate.

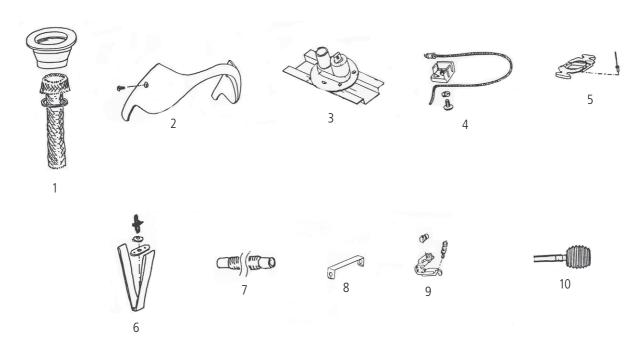
9. 1 AMBU MAN Spare Parts and Accessories

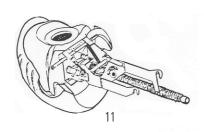
Spare parts	
Number:	Description
234000501	Elastic net with bushing
234000502	Lower jaw with two screws
234000503	Airway valve in head, complete
234000505	Holder with two pop rivets
234000506	Holder with mounting for chest parts
234000507	Carotid pulse bag
234000508	Hand positioning thrust roller
234000509	Head, complete with fittings
234000510	Stomach plate, complete
234000510	Bushing
234000511	Cover plate for stomach bag
234000512	Stomach valve
234000515	Monitoring instrument
234000515	Monitoring instrument
234000510	Stomach bag with holder
234000522	Tie with mounting
234000525	Belt mounting kit
234000527	Pulse bellows with nipples
234000527	Hook and ring for mounting of arms
234000528	Neck piece with rivet
234000534	
	Electrode with rubber bushing
234000537	Strap for Ambu Man training mat
234000538	Right arm, complete
234000539	Left arm, complete
234000541 234000545	Mounting kit Roll of paper
	Battery Pack (NiCd)
234000546 234000547	Interface for Ambu Man
234000547	Battery Pack (NiMH)
234000549	Spare 12 V adapter
234000549	CD ROM and cable
234000551	Soft Pack for CPR Printer Kit
234000551	Chesk skin, manufactured
234000559	Instrument box complete, Japan
234000562	Controller for CPR printer
234000563	Neck tube
234000564	Locking device neck clamps/rocker lever
234000565	Ear plug for Ambu Man
234000566	Lung bag
234000567	Silicone bushing for lung bag
234000568	Cover plate for instrument
234000569	Adjusting kit for pressure spring
234000570	Chest skin, complete
234000570	Cover Plate
234000572	L-shaped connector
234000571	Ambu Man ACD fitting
234000573	Rubber tube 10 m
234000574	Adjusting bracket complete
234000575	Mounting kit for tension rod
234000577	Spring kit for lung plate
234000577	Spring kit for lung plate Spring kit for head
257000570	Spring Kit for fledd

9.2 AMBU MAN Service Parts and Accessories

Accessories	
Number:	Description
234000702	Head bags
234000703	Face pieces
234000704	Arms complete
234000706	Arms, legs with jogging suit
234000709	Complete training suit, grey/red
234000717	Chest, set comprising right and left halves
234000718	ACD CPR base board
234000719	Chest shells
234000727	CPR Software with USB interface
234000728	Ambu CPR (Windows) Software
234000733	Ambu CPR Printer Counting
234000739	Ambu CPR Printer Kit
234000741	International Guide Lines 2000
234000742	Scale Plate Kit, set of 5
234000743	CPR Controller
234000783	Set of 5 face pieces, Japan
234000786	Ambu Manikin legs, new type
234000787	Update kit with new legs
234000788	Copper brush, set of 5
234000789	Carrying bag/training mat
234000790	Jogging suit jacket, red/grey
234000792	Jogging suit trousers, red/grey
234000793	Instruction for leg mounting

9.3 AMBU MAN Spare Parts and Accessories Head - description



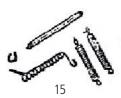




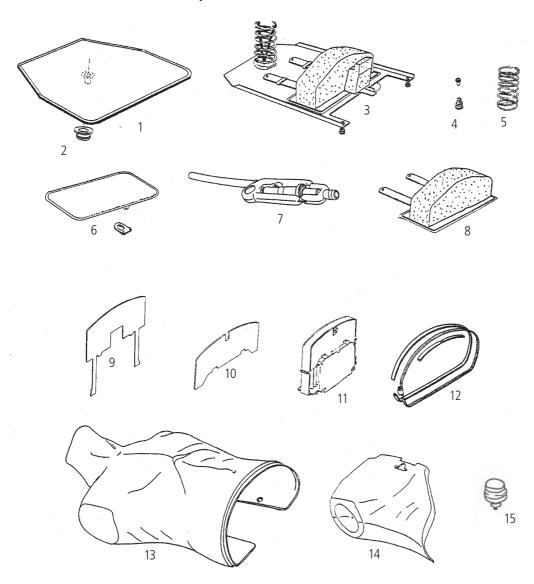




1	234000501	Elastic net with bushing
2	234000502	Lower jaw with two screws
3	234000503	Airway valve in head, complete
4	234000523	Tie with mounting
5	234000505	Holder with two pop rivets
6	234000506	Holder with mounting for chest parts
7	234000563	Neck tube
8	234000564	Locking device neck clamps/rocker lever
9	234000508	Hand positioning thrust roller with holder and spring
10	234000527	Pulse bellows with nipples
11	234000509	Head, complete with fittings
12	234000565	Ear plug for Ambu Man
13	234000507	Carotid pulse bag
14	234000534	Neck piece with rivet
15	234000578	Spring kit for head



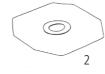
9.3 AMBU MAN Service Parts and Accessories Torso & Stomach - description

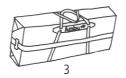


1	234000566	Lung bag
2	234000567	Silicone bushing for lung bag
3	234000510	Lung plate with stomach plate, complete
4	234000511	Bushing
5	234000577	Spring kit for lung plate
6	234000522	Stomach bag with holder
7	234000513	Stomach valve
8	234000512	Cover plate for stomach bag
9	234000568	Cover plate for instrument
10	234000741	International Guide Lines 2000
10	234000742	Scale Plate Kit, set of 5
11	234000515	Monitoring instrument, model I
11	234000516	Monitoring instrument, model C
12	234000525	Belt mounting kit
13	234000559	Chesk skin, manufactured, (japanese)
13	234000570	Chest skin, complete with neck and pulse
14	234000717	Chest, set comprising right and left halves
15	234000536	Electrode with rubber bushing

9.3 AMBU MAN Service Parts and Accessories General - description





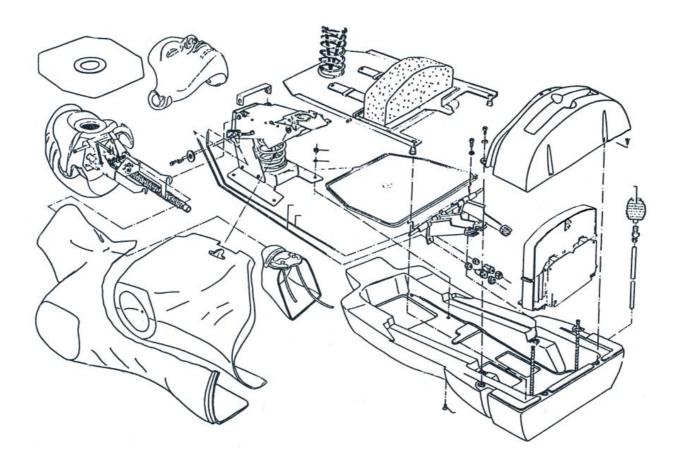




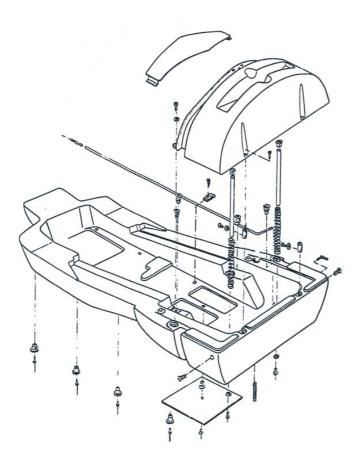


1.	234000703	Face Piece
2.	234000702	Head Bag
3.	234000789	Carrying Bag/Training Mat
4.	234000790	Jogging suit jacket
5.	234000792	Jogging suit trousers

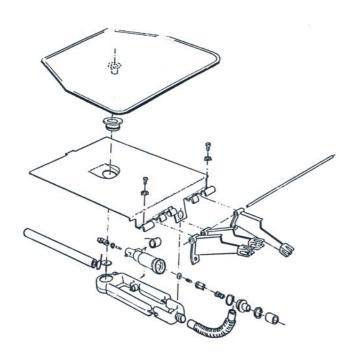
10.1 Drawing - Full manikin

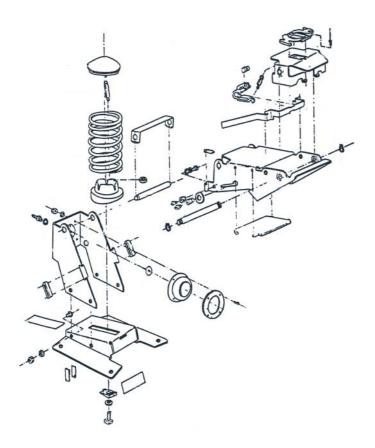


10.1-1 Drawing - Base

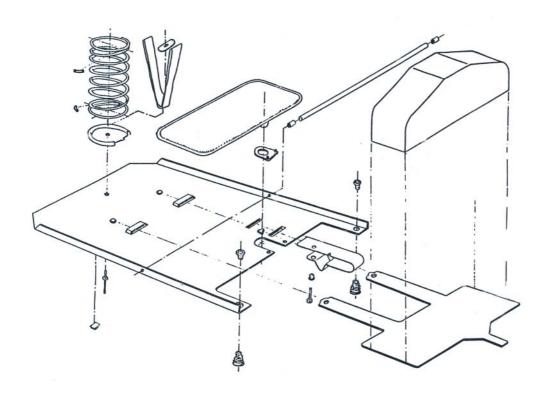


10.1-2 Drawing - Base and lung plate





10.1-4 Drawing - Lungplate and stomach plate



10.1-5 Drawing - Head

