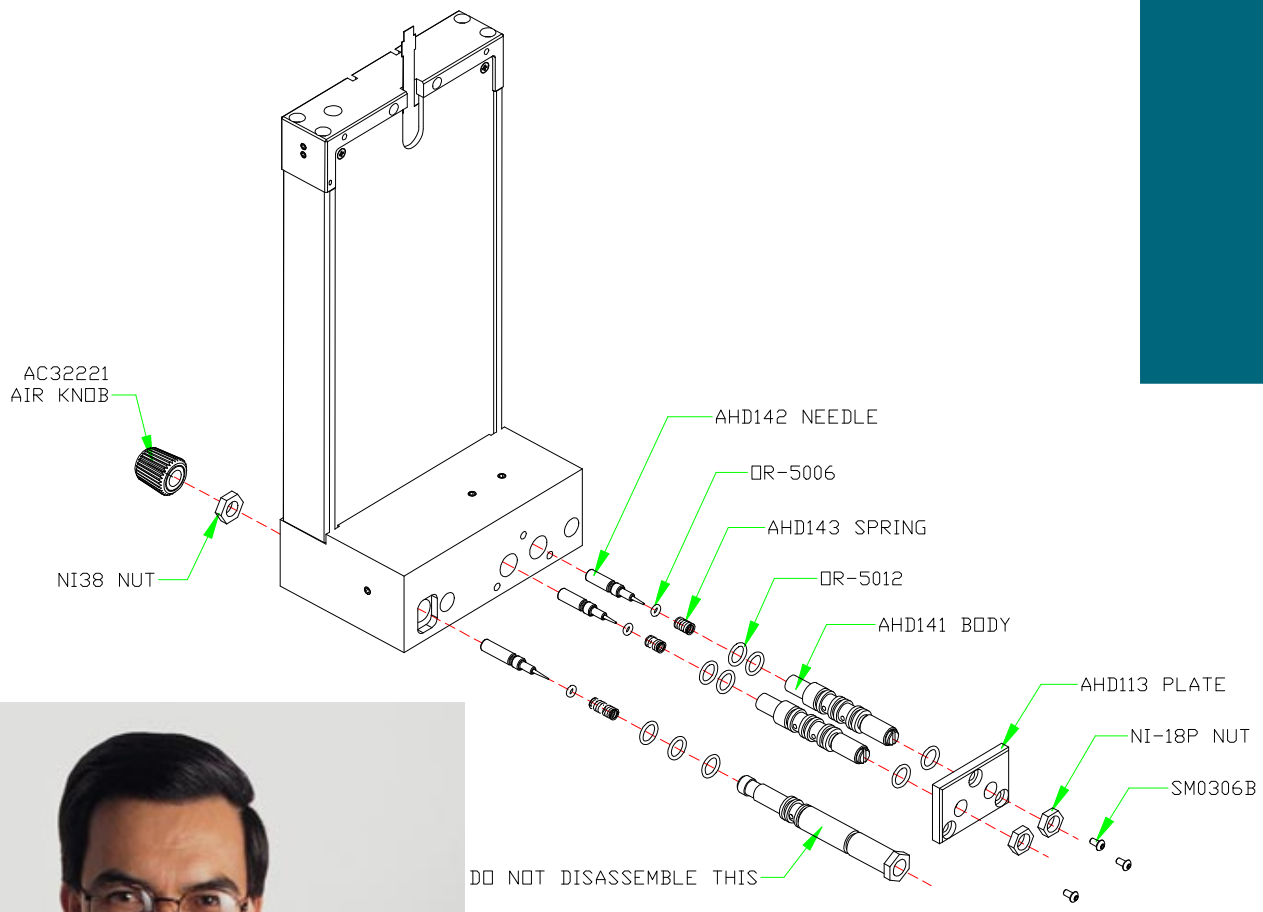
ulco medical



SERVICE KITS AND CALIBRATION NOTES

All Ulco products are subject to a program of continuous development and the manufacturer reserves the right to make alterations in design and equipment without prior notice.

Document Number: TRA-UM-001
Version: 1.0

CE 0123

TABLE OF CONTENTS

ANAESTHETIC MACHINE ACCEPTANCE PROTOCOL

MAKE: _____
MODEL: _____
SERIAL NO.: _____

BOTTLE SUPPLY

Install O_2 reserve cylinder supply only.

a. Check O_2 pressure gauges for reading. ☐
b. Check O_2 warning device is green. ☐
c. Check O_2 reserve regulator pressure (350-360kPa). Static_____kPa
adjust if necessary. Dynamic_____kPa
d. Check other outlets for pressure (cross connection). ☐
e. Check rotameter banks for correct gas deliveries. ☐
f. Check for leaks (no more than 1 division/minute on the Pressure gauge) ☐
g. When draining system ensure O_2 alarm activates. ☐

Install Medical Air reserve cylinder supply only.

a. Check pressure gauges for correct reading. ☐
b. Check Medical Air reserve regulator pressure (350-360kPa). Static_____kPa
Adjust if necessary. Dynamic_____kPa
c. Check other outlets for pressure (cross connection). ☐
d. Check rotameter banks for correct gas deliveries.
e. Check for leaks (no more than 1 division / minute on the pressure gauge). ☐
f. Check O_2 warning light is correct (should be green when O_2 connected, ☐
otherwise red). Check O2 warning device is red. ☐

Install N_2O reserve cylinder supply only.

a. Check pressure gauges for correct reading. ☐
b. Check N_2O reserve regulator pressure (350-360 kPa). Static_____kPa
Adjust if necessary. Dynamic_____kPa
c. Check other outlets for pressure (cross connection). ☐
d. Check rotameter banks for correct gas deliveries. ☐
e. Check for leaks (no more than 1 division / minute on the pressure gauge). ☐
f. Check O_2 warning device is red. ☐

Install O_2 and N_2O cylinder supplies.

a. Check pressure gauges for correct reading. ☐
b. Check other outlets for pressure (cross connection). ☐
c. Check the operation of the rotameter banks. ☐
d. Check rotameter banks for correct gas deliveries. ☐
e. Check for leaks (no more than 1 needle width). ☐
f. When draining system ensure O_2 alarm activates. ☐

ROTAMETER TEST

Install all reserve cylinder supplies.

a) Connect Oximeter to Fresh Gas Outlet (FGO). ☐

b) Open O_2 valve to 1 l/min, should read 100%. ☐

c) Open N_2O valve fully should read no less than 23%. N_2O should read 3l/min. (Check for accuracy of blends through full range of delivered mixes). ☐

d. Shut O_2. Should be no flow. Check using manometer. Check by occluding manometer at FGO. ☐

e. Open air should read 21%. ☐

f. Shut N_2O and should read 21%. ☐

OXYGEN FAILURE WARNING

a. Connect pressure gauge to O_2 outlet. ☐

b. Set oxygen flow to 2 l/min. ☐

c. N_2O should read 6 l/min. ☐

d. Turn off O_2 supply. ☐

e. Press emergency O_2 button to release oxygen pressure and monitor gauge until 240 kPa is reached in machine. ☐

An audible warning device should operate between 200-220 kPa. _____*kPa* ☐

f. N_2O supply must be interrupted within 2 seconds from the start of the alarm. _____secs ☐

g. O_2 supply should be present for approximately 30-45 seconds. ☐

h. Restore oxygen supply to machine, warning device will cease and oxygen and nitrous oxide flow restored to original flows. ☐

PIPELINE SUPPLY

Check all inlets for correct indexing. ☐

Connect O_2 pipeline supply only. ☐

a. Check O_2 supply gauge reading pressure 415 kPa. ☐

b. Check rotameter banks for correct gas delivery (O_2 only). ☐

c. Check for leaks, e.g. yokes, outlets etc. ☐

d. Check other outlets / inlets for pressure. ☐

Connect Air pipeline supply only.

a. Check Air supply gauge reading pressure 415 kPa. ☐

b. Check rotameter banks for correct gas delivery (Air only). ☐

c. Check for leaks, e.g. yokes, outlets etc. ☐

d. Check other outlets / inlets for pressure. ☐

Connect N2O pipeline only.

a. Check N_2O supply gauge reading pressure 415 kPa. ☐

b. Check rotameter banks for correct gas delivery (No reading). ☐

c. Check for leaks, e.g. yokes, outlets etc. ☐

d. Check other outlets / inlets for pressure. ☐

Connect all gases on pipeline supply.

a. Connect Oximeter to FGO. ☐

b. Open O_2 valve to 1 Lpm, should read 100%. ☐

c. Open N_2O valve fully should read no less than 22%. ☐

d. Check for correct reading through full range of delivered gases, ~25% O_2. ☐

e. Shut O_2 all flow should cease. ☐

f. Open AIR, should read 21%. ☐

g. Shut N_2O and should read 21%. ☐

FLOWMETERS

a. Ensure flowmeter controls move freely with full range of flows achievable as per increments on flowmeter tubes. ☐

b. Check that rotameter bobbins spin throughout range of flows. (take particular notice at low flows). ☐

c. Turn off flowmeter controls and check that the position of the bobbin in the rotameter tube is at zero and not spinning. ☐

d. Place a manometer gauge at fresh gas outlet. Occlude manometer. Ensure gauge reads zero. If gauge indicates flow, identify gas using O_2 analyser. ☐

VENTILATOR CUT OFF

a. Place pressure gauge on ventilator outlet. ☐

b. Turn off O_2 supply. ☐

c. All pressure should cease to ventilator outlet at 200 kPa. ☐

SAFETY RELIEF VALVE

a. Place manometer on FGO. ☐

b. Set O_2 to L/min. ☐

c. Occlude manometer. Safety valve should blow off at 50+ 2cm H_2O. ☐

d. Set O_2 at 100ml. Should obtain a reading greater than 40cm H_2O. ☐

EMERGENCY OXYGEN VALVE

a. Attach spirometer to FGO. ☐

b. Press emergency flush button for 15 seconds. ☐

c. Valve should read 35-75 L/min. ☐

ABSORBER

a. Connect breathing tube Y-piece to bag outlet. (Closed system). ☐

b. Place manometer in series with expiratory tube and expiratory outlet. ☐

c. Turn O_2 rotameter on to achieve manometer reading greater than 40cm H_2O. ☐

d. Reduce flow to 100ml of O_2. Maximum allowable pressure drop of 13cm H_2O in 30 seconds is allowable. ☐

e. Increase pressure above 40cm H_2O. ☐

f. Open 'spill valve', pressure should reduce to 0cm H_2O quickly. ☐

g. Check inspiratory and expiratory valves. ☐

h. Connect a 2L bag to Y-piece and a 2L bag to the reservoir outlet. ☐

i. Pressurise system using flush valve. ☐

j. Squeeze bag alternatively. ☐

k. Ensure valve works in sequence and each bag is inflated alternately. ☐

SCAVENGE

a. Connect scavenge circuit. ☐

b. Close spill valve. ☐

c. Inflate both bags using O_2 flush. ☐

d. Turn suction on and increase until scavenge indicator line sits in the centre of the ball bearing or a reading of a greater than –15kPa is read. ☐

e. Test lungs do not deflate completely when the spill valve is open.

AB800 ABSORBER TEST AND CALIBRATION CHECK LIST

METHOD 1

1. CONNECT 400 kPa AIR LINE INTO THE TESTING ANAESTHETIC MACHINE. ☐
2. SET 1.0 LITRE OXYGEN ON THE FLOWMETER. ☐
3. MAKE SURE THE MANOMETER 100CM IS ON ZERO. ☐
4. CONNECT A 'U' HOSE (22mm) TO INSP/EXP CONNECTORS. ☐
5. PLUG THE BAG ARM WITH A RUBBER PLUG. ☐
6. CONNECT AIR INTO THE ABSORBER FRESH GAS INLET.
7. TURN ON THE AIR FROM THE PATIENT BLOCK. ☐
8. SELECT KNOB TO MANUAL BAG. ☐
9. POSITION THE SPOOL LEVER TO THE ON POSITION.
10. OPEN THE APL VALVE FULLY. ☐
11. SET THE INTERNAL PLUNGER (SCREW) TO 2cm ON THE MANOMETER. ☐
12. CLOSE DOWN THE APL VALVE. ☐
13. THE PRESSURE MUST READ 75 cm H_2O ON THE METER.
14. FILL UP THE CANISTERS WITH AIR (5 SECONDS). ☐
15. SHUT OFF THE AIR SUPPLY. ☐
16. CHECK FOR ANY LEAKS ON THE MANOMETER.
    (NOTE: IF ANY LEAKS OCCUR, SPRAY WATER ON ALL PLUGS. CHECK O-RINGS ON SPOOL/HEAD ASSEMBLY. ☐
17. TURN ON THE AIR SUPPLY AGAIN. ☐
18. SET FLOW TO O.3 L/MIN ☐
19. POSITION LEVER TO OFF. ☐
20. RELEASE THE LEVER ON THE CANISTER. ☐
21. CHECK FOR LEAKS. ☐
22. IT MUST HOLD ITS PRESSURE ON 40 cm H_2O ☐
    (NOTE: IF THERE IS A LEAK, THE SPOOL IS TOO LOOSE, IT MUST BE FIRM FIT AND CHANGED).
23. CONNECT THE ABSORBER TO A VENTILATOR, AND WHILE VENTILATING, OBSERVE ☐
    THE OPENING OF THE INSPIRITORY SILICON SHUTTER VALVE DURING INSPIRATION, AND CLOSING DURING EXPIRATION.

METHOD 2: INTERFACE CONNECTION

1. SWITCH THE KNOB TO OBSERVE POSITION (CLOSEPOSITION). ☐
2. CONNECT AIR LINE PRESSURE ON TO THE M4 PUSH-IN FITTING. ☐
3. TURN ON THE AIR. ☐
4. THE MANOMETER SHOULD READ 60cm. ☐
5. TURN OFF THE AIR SUPPLY AND CHECK FOR LEAKS. ☐
6. THERE SHOULD BE NO LEAK, IF THERE IS A LEAK, CHECK THE RUBBER INSERT. ☐
7. SWITCH TO THE VENTILATOR POSITION, THE MANOMETER MUST LEAK (ON POSITION). ☐

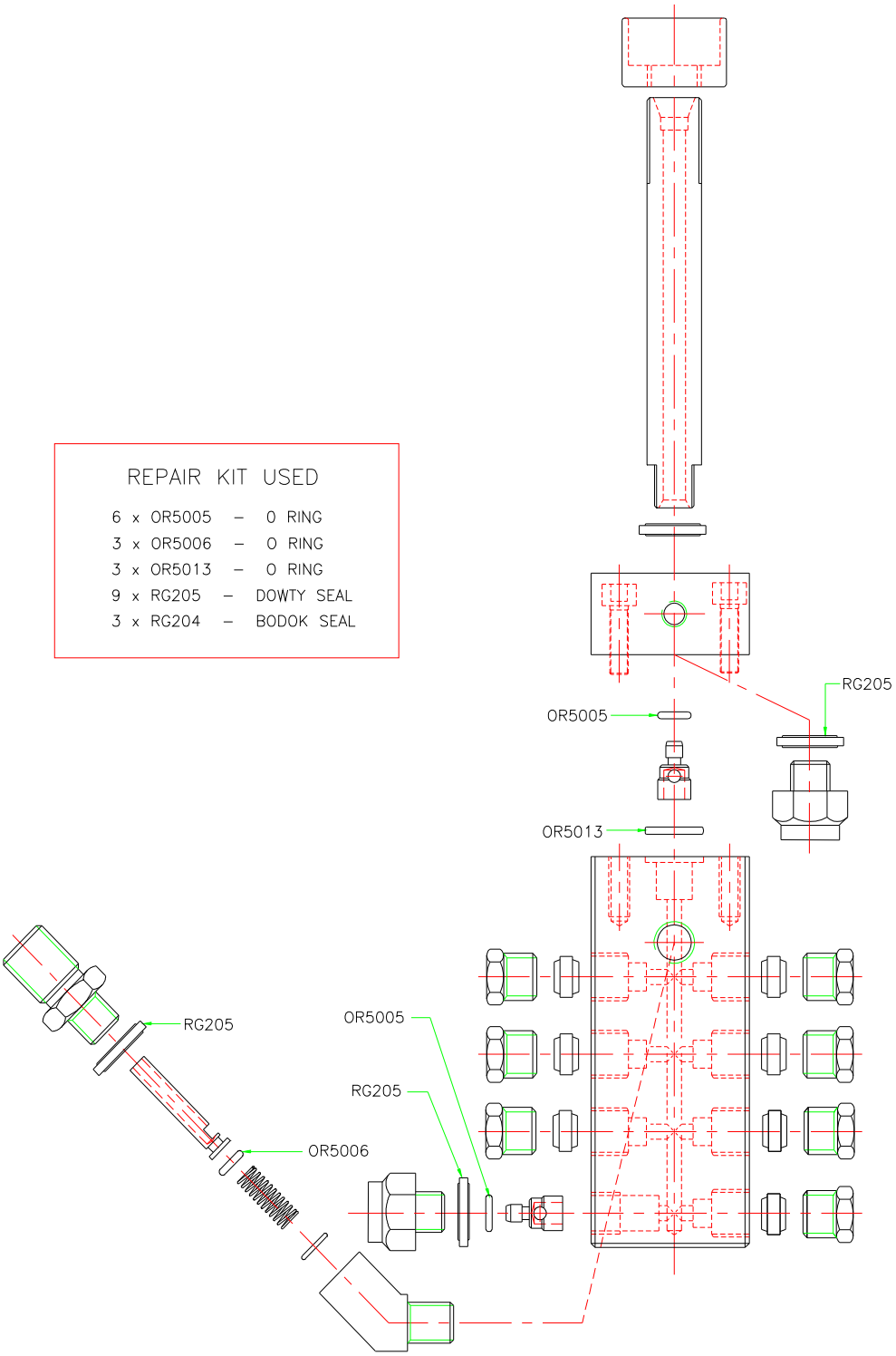
ANTI-HYPOXIC DEVICE – CALIBRATION

1. Unscrew both needle valves fully (rear of the AHD).
2. Open oxygen knob fully.
3. Close nitrous oxide fully.
4. Adjust Nitrous Oxide's 2nd stage regulator to maximum pressure.
5. Adjust Oxygen's 2nd stage regulator to zero (no flow).
6. Screw in N_2O needle valve until bobbin drop (check with circuit pressure manometer for leak... connect to patient outlet)
7. Open nitrous Oxide knob fully.
8. Close Oxygen knob fully.
9. Adjust Nitrous Oxide's 2nd stage regulator to zero (no flow).
10. Adjust Oxygen's 2nd stage regulator to maximum pressure.
11. Screw in Oxy needle valve until bobbin drop (check with circuit pressure manometer for leak... connect to patient outlet).
12. Open Oxy flow control knob 3 full turn...adjust flow with 2nd stage regulator **to 10 l/min (lock regulator after).**
13. Set Oxy flow to 2 l/min. – with control knob.
14. Set N_2O flow to 6 l/min. – with 2nd stage regulator (control knob must be fully open).
15. Check for 1 to 3 ratio, if not correct screw in gently N_2O seat and increase Pressure with 2nd stage N_2O regulator, till correct flow is achieved on whole scale.

Note: For correct ratio read manufacturer's specification and use oxygen analyser for final calibration...must read > 22% oxygen.

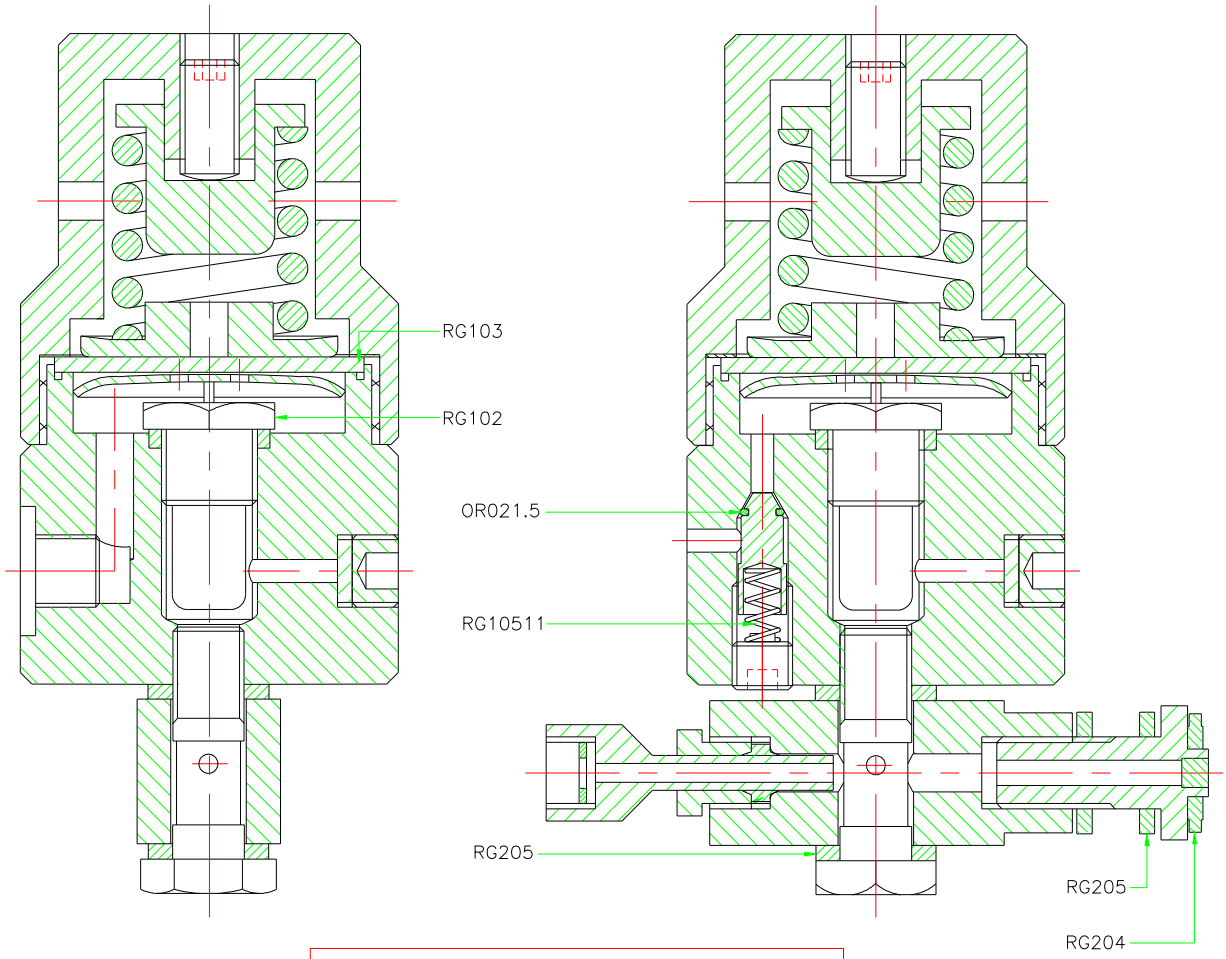
SERVICE KIT DRAWINGS

❖ MANIFOLD SERVICE KIT (A3057-99)



MANIFOLD REPAIR KIT
A3057–99 / A

❖ REGULATOR SERVICE KIT (RG1-99)

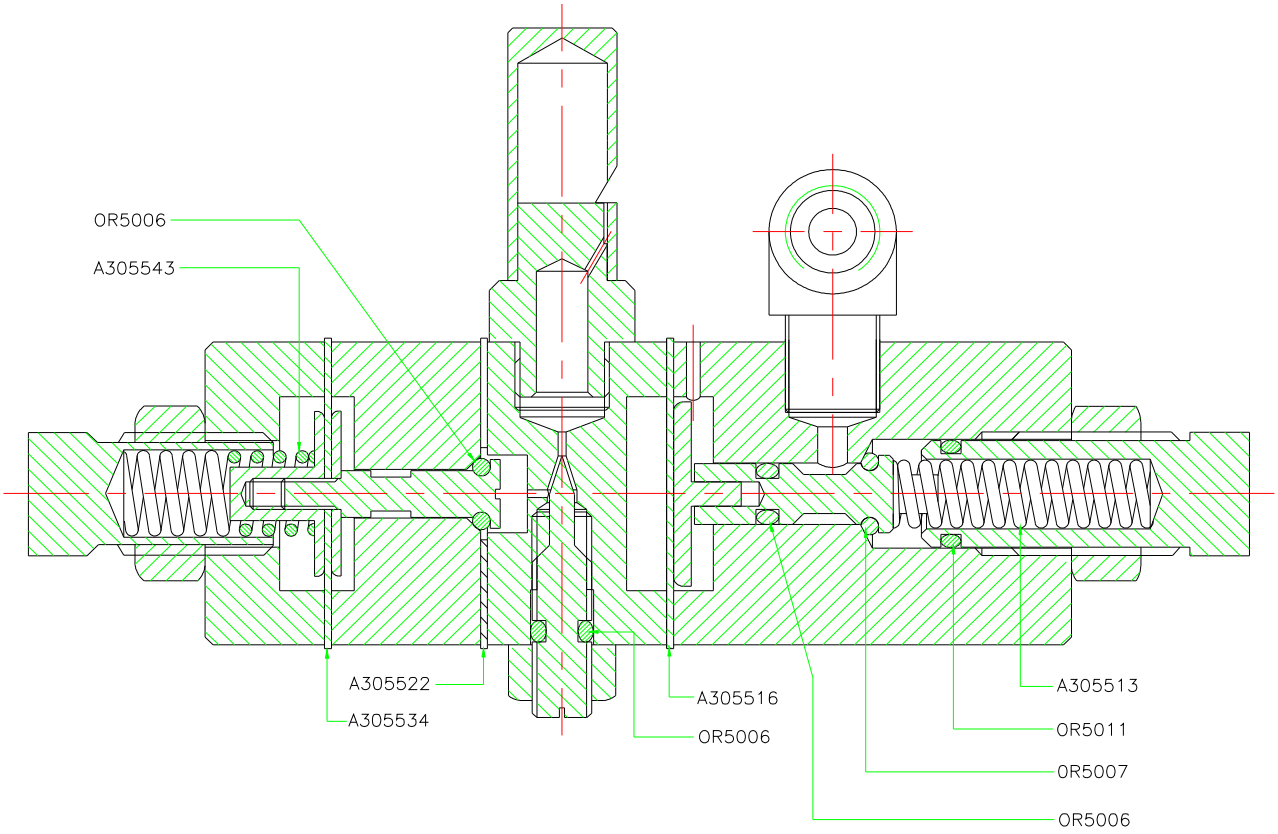


REPAIR KIT USED

1 x RG102 – CARTHRIDGE & WASHER
1 x RG10511 – SPRING
1 x OR021.5 – O RING
1 x RG103 – DIAPHRAGM
4 x RG205 – DOWTY SEAL
1 x RG204 – BODOK SEAL

REGULATOR REPAIR KIT
RG1–99 / A

❖ OXYGEN FAILURE ALARM SERVICE KIT (A3055-99)

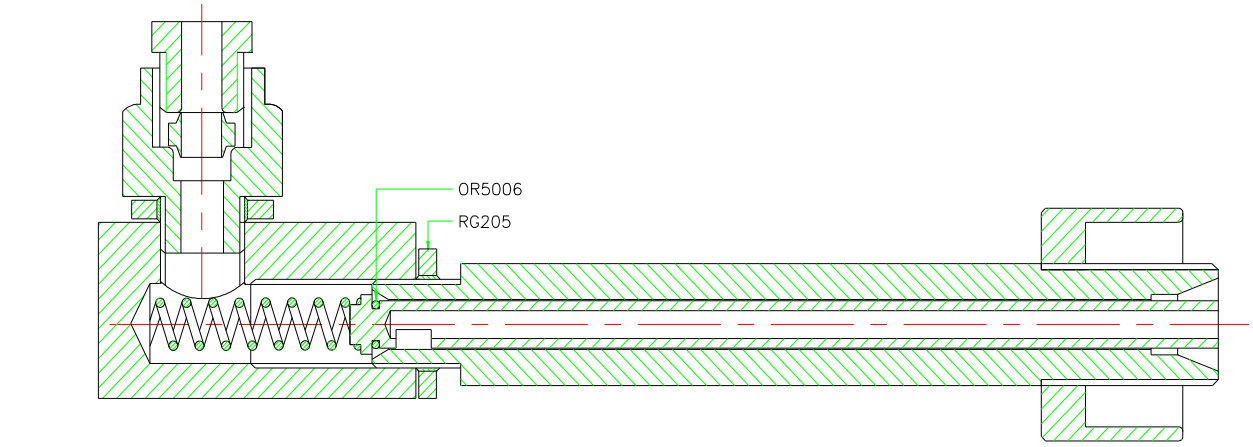


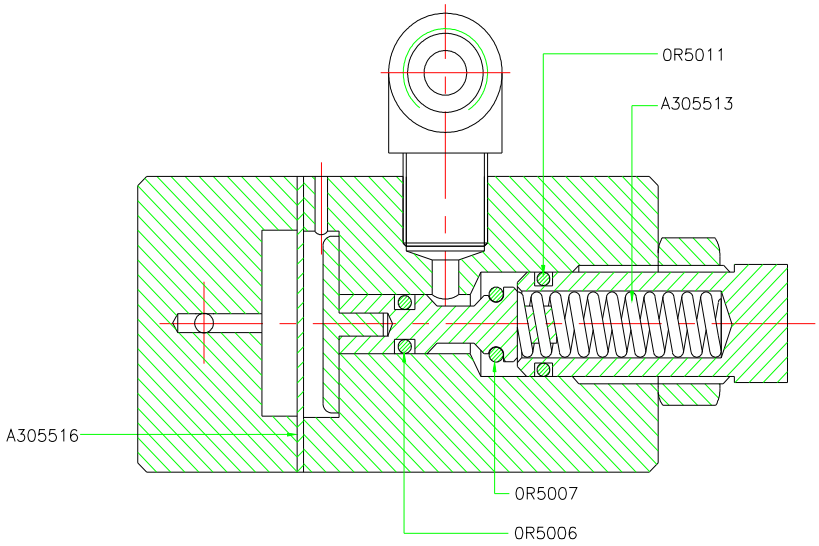
REPAIR KIT USED

1 x A305516	–	DIAPHRAGM
1 x A305522	–	DIAPHRAGM
1 x A305534	–	DIAPHRAGM
1 x A305513	–	SPRING
1 x A305543	–	SPRING
3 x OR5006	–	O RING
1 x OR5011	–	O RING
1 x OR5007	–	O RING

OXY–FAILURE ALARM REPAIR KIT
A3055–99 / A

❖ VENTILATOR DRIVE SERVICE KIT (A3056-99)



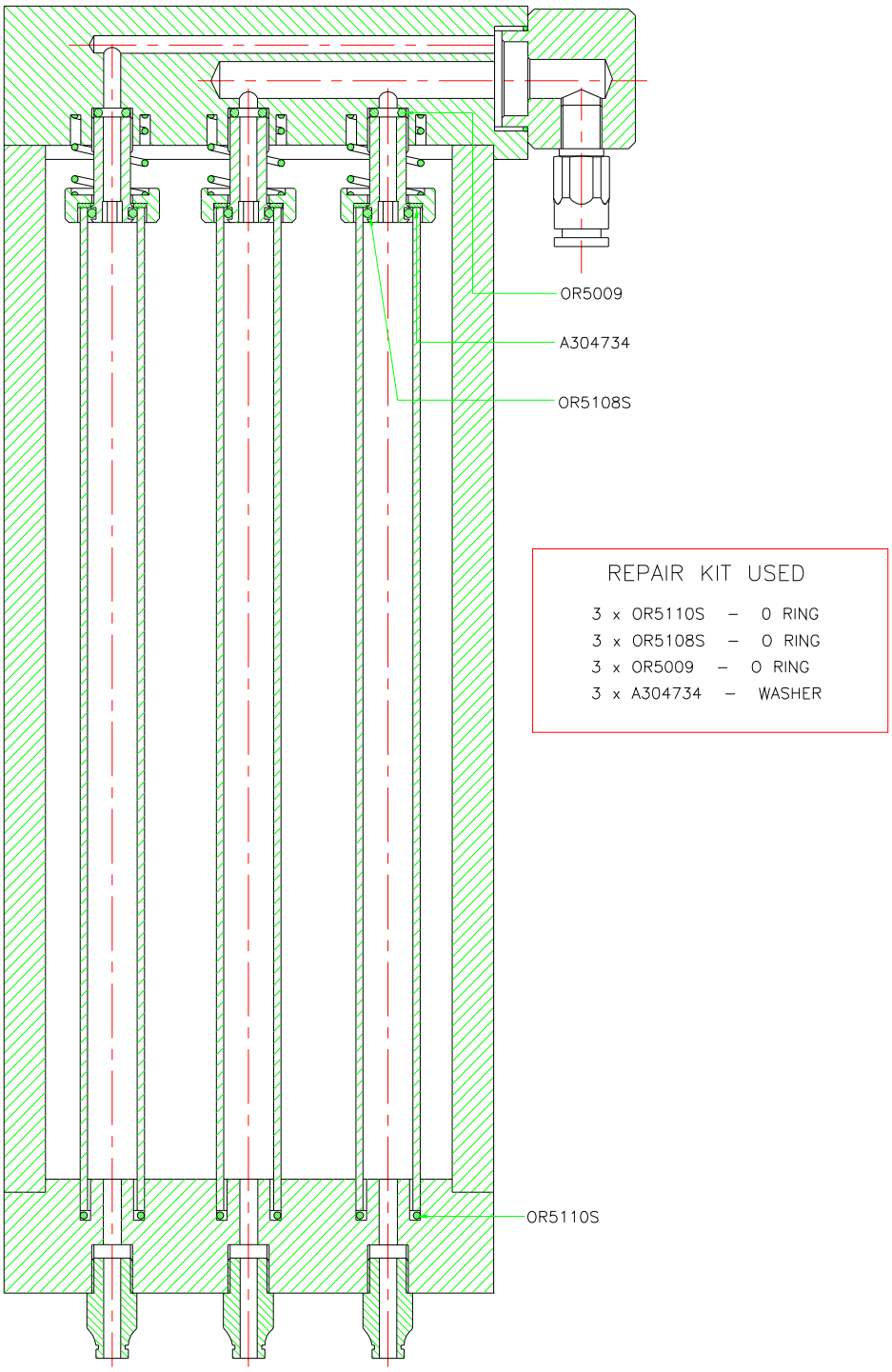


REPAIR KIT USED

2 x OR5006 – O RING
1 x OR5007 – O RING
1 x OR5011 – O RING
1 x RG205 – DOWTY SEAL
1 x A305516 – DIAPHRAGM
1 x A305513 – SPRING

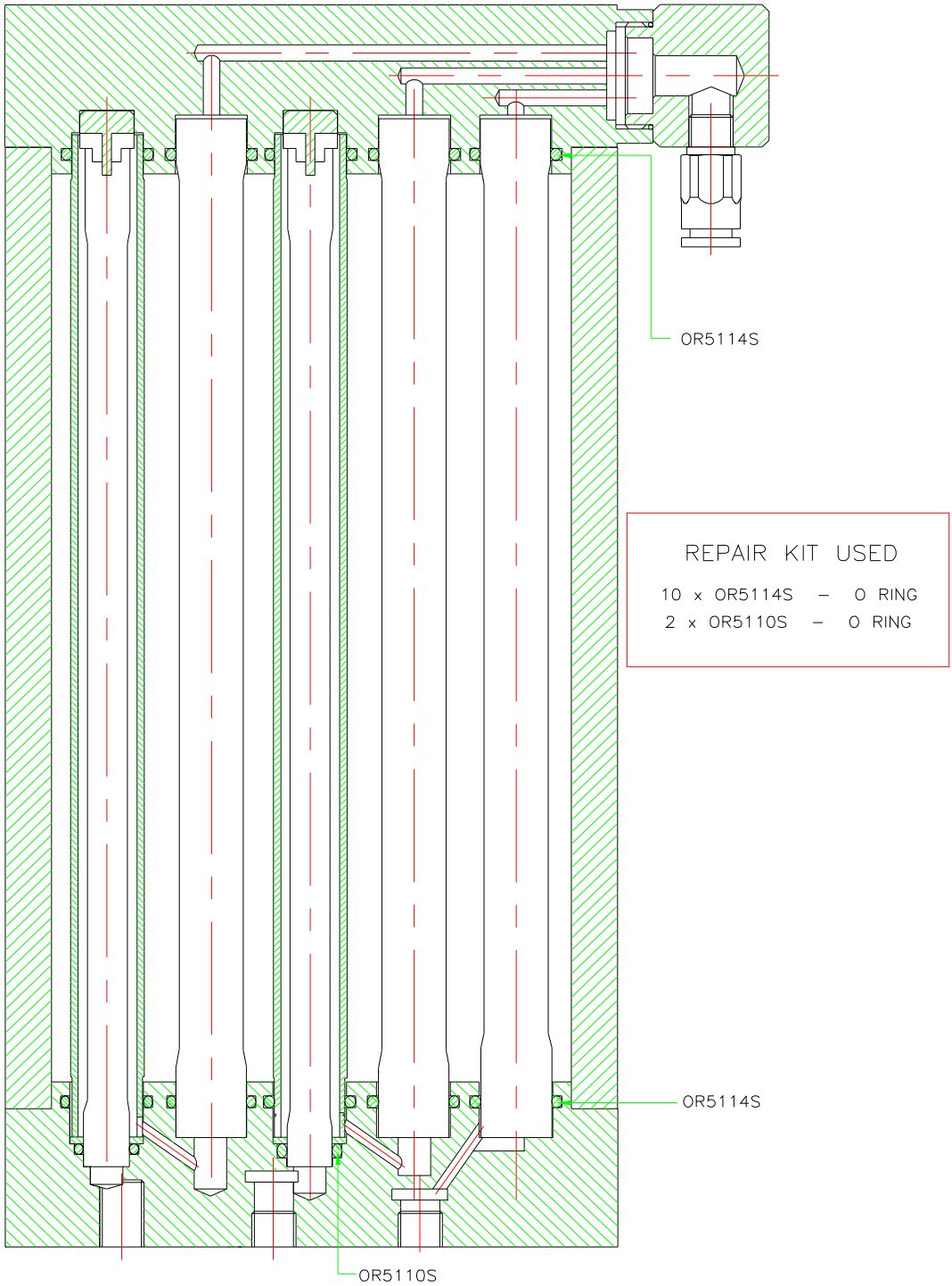
VENTILATOR DRIVE REPAIR KIT
A3056–99 / A

❖ ROTAMETER 3-TUBE SERVICE KIT (A3047-99)



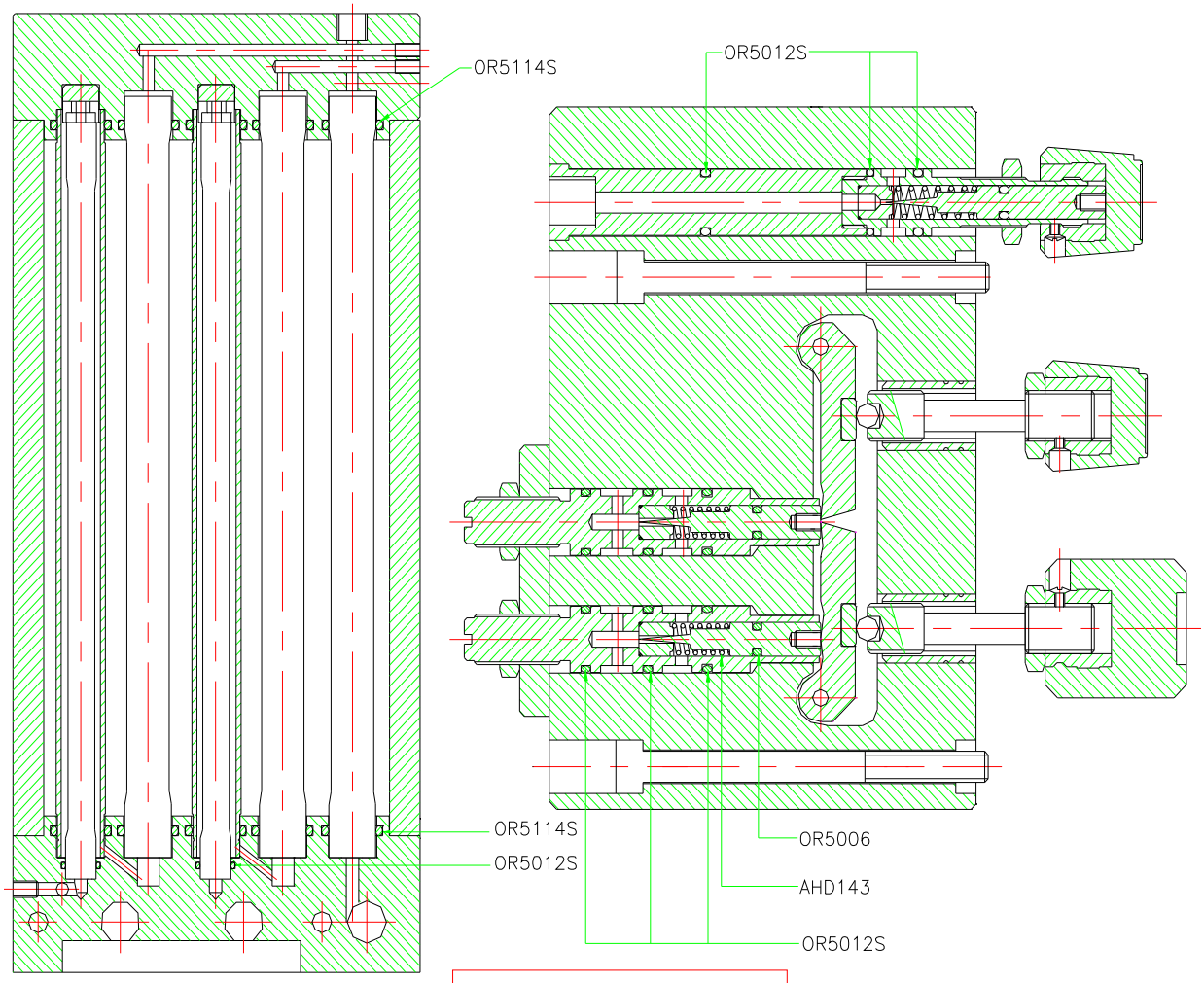
ROTAMETER 3–TUBE REPAIR KIT
A3047–99 / A

❖ ROTAMETER 5-TUBE SERVICE KIT (A5047-99)



ROTAMETER 5 TUBE REPAIR KIT
A5047–99 / B

❖ AHD60 SERVICE KIT (AHD60-99)

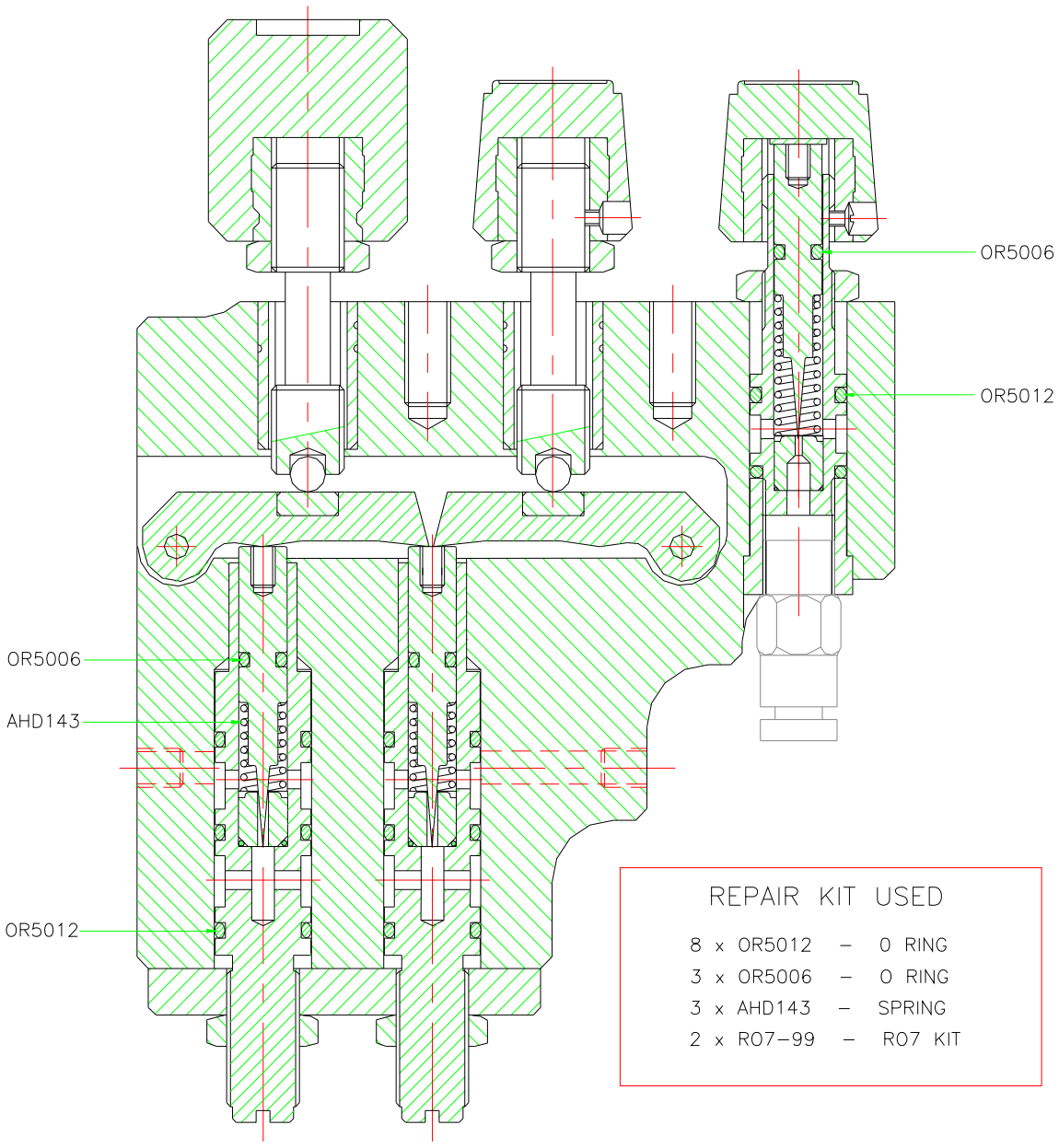


AHD REPAIR KIT
AHD60-99 / A

REPAIR KIT USED

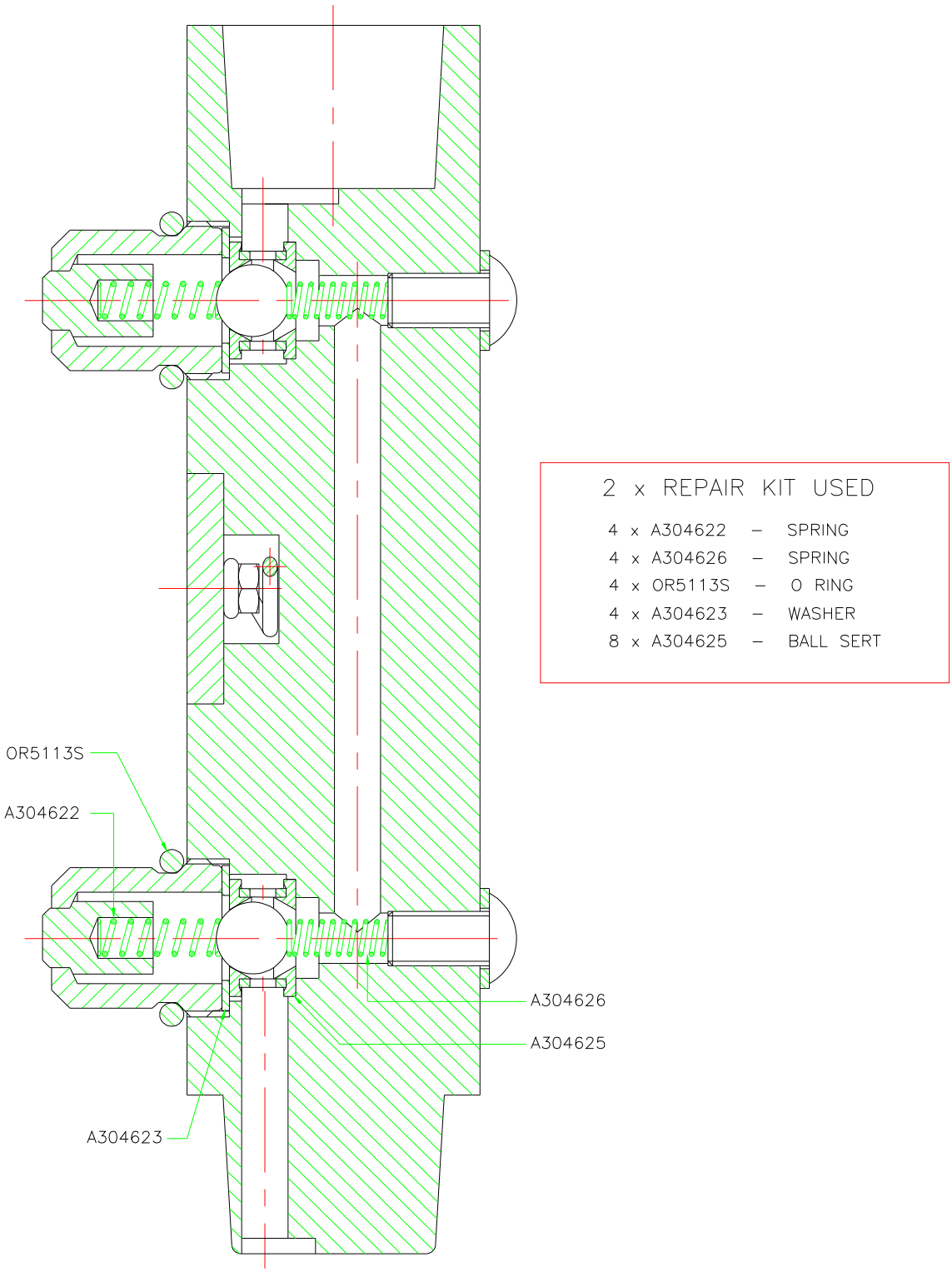
11 x	OR5012S	– O RING
3 x	OR5006	– O RING
3 x	AHD143	– SPRING
2 x	RO7-99	– RO7 KIT
10 x	OR5114S	– O RING

❖ AHD SERVICE KIT (AHD10-99)



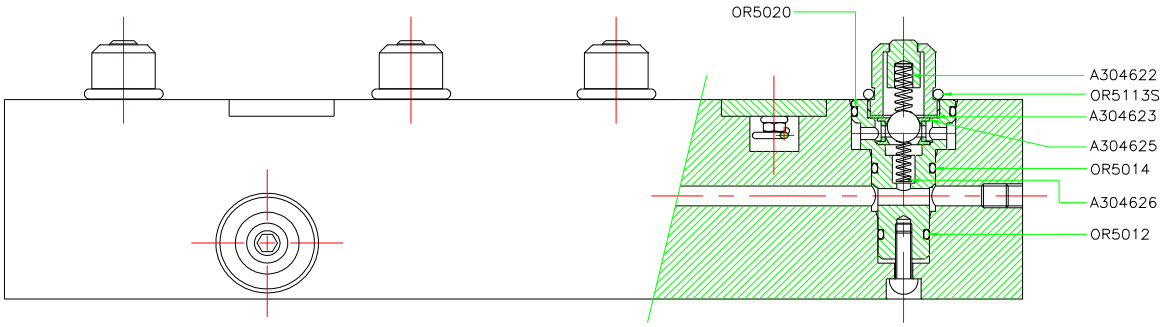
AHD REPAIR KIT
AHD10-99 / B

❖ 2 x SELECTATEC BLOCK SERVICE KIT (A3046-99)



SELECTATEC BLOCK REPAIR KIT
A3046–99 / A

❖ SELECTATEC BLOCK SERVICE KIT (A605-99)



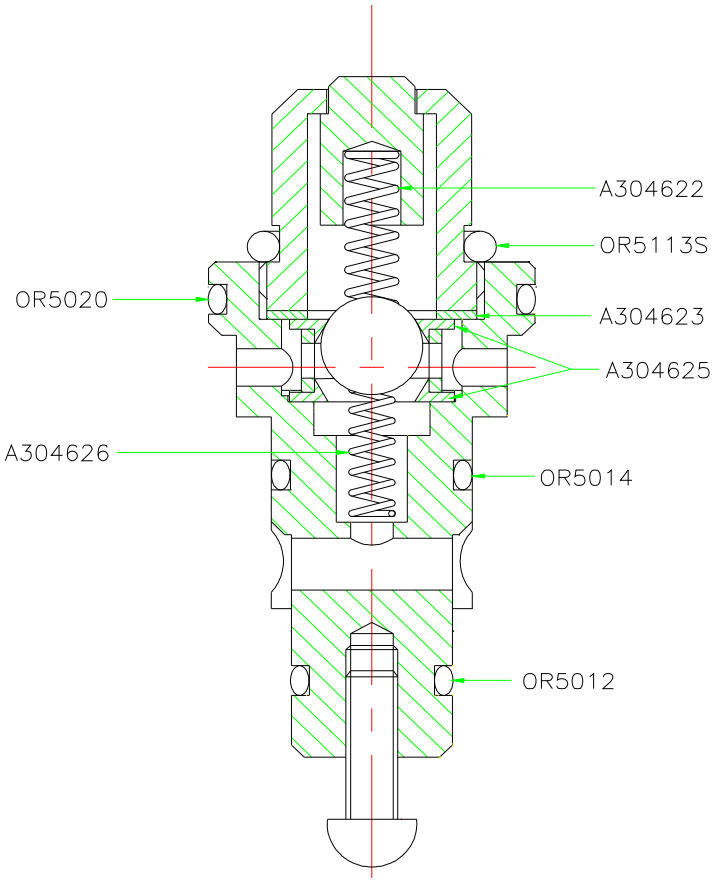
REPAIR KIT USED

4 x A304622	–	SPRING
4 x A304626	–	SPRING
4 x OR5113S	–	O RING
4 x A304623	–	WASHER
8 x A304625	–	BALLSERT
4 x OR5020	–	O RING
4 x OR5014	–	O RING
4 x OR5012	–	O RING

SELECTATEC BLOCK REPAIR KIT

A605–99 / A

❖ SINGLE SELECTATEC BLOCK SERVICE KIT (A605-9)



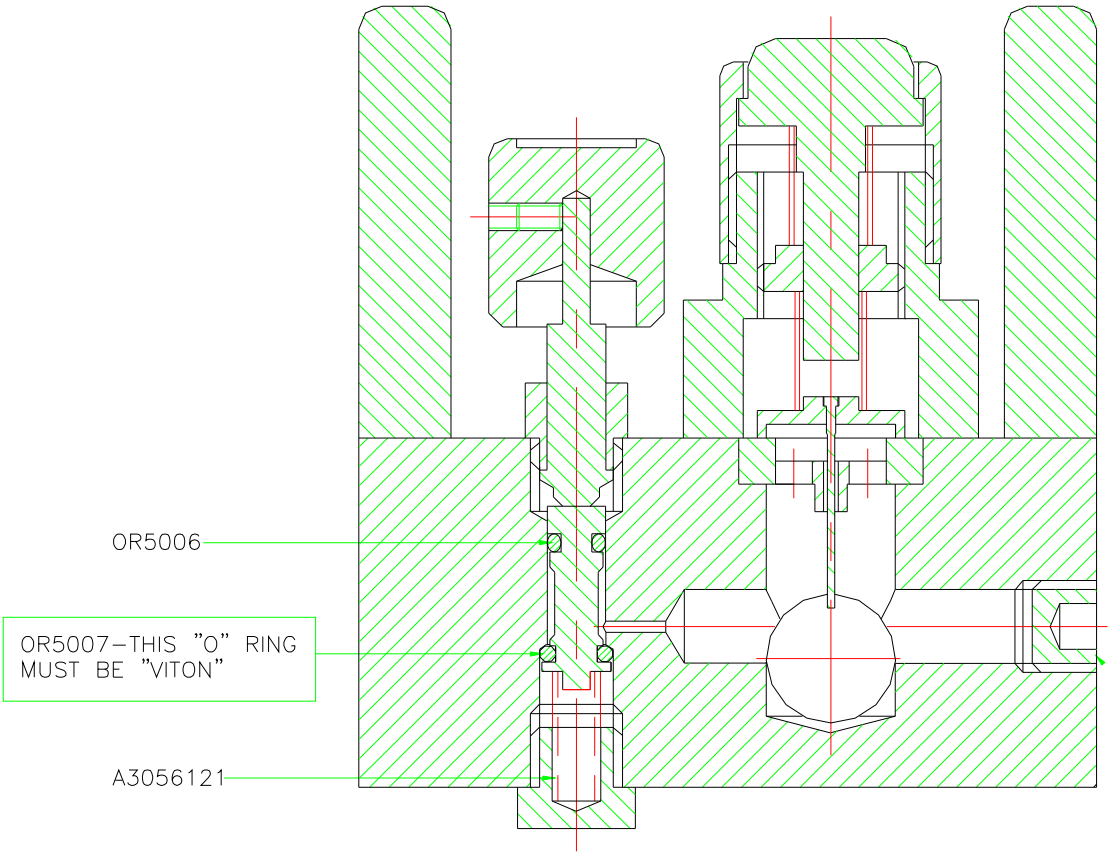
REPAIR KIT USED

1 x A304622	–	SPRING
1 x A304626	–	SPRING
1 x OR5113S	–	O RING
1 x A304623	–	WASHER
2 x A304625	–	BALLSERT
1 x OR5020	–	O RING
1 x OR5014	–	O RING
1 x OR5012	–	O RING

SELECTATEC BLOCK REPAIR KIT

A605–9 / A

❖ PATIENT BLOCK SERVICE KIT (A307-99)

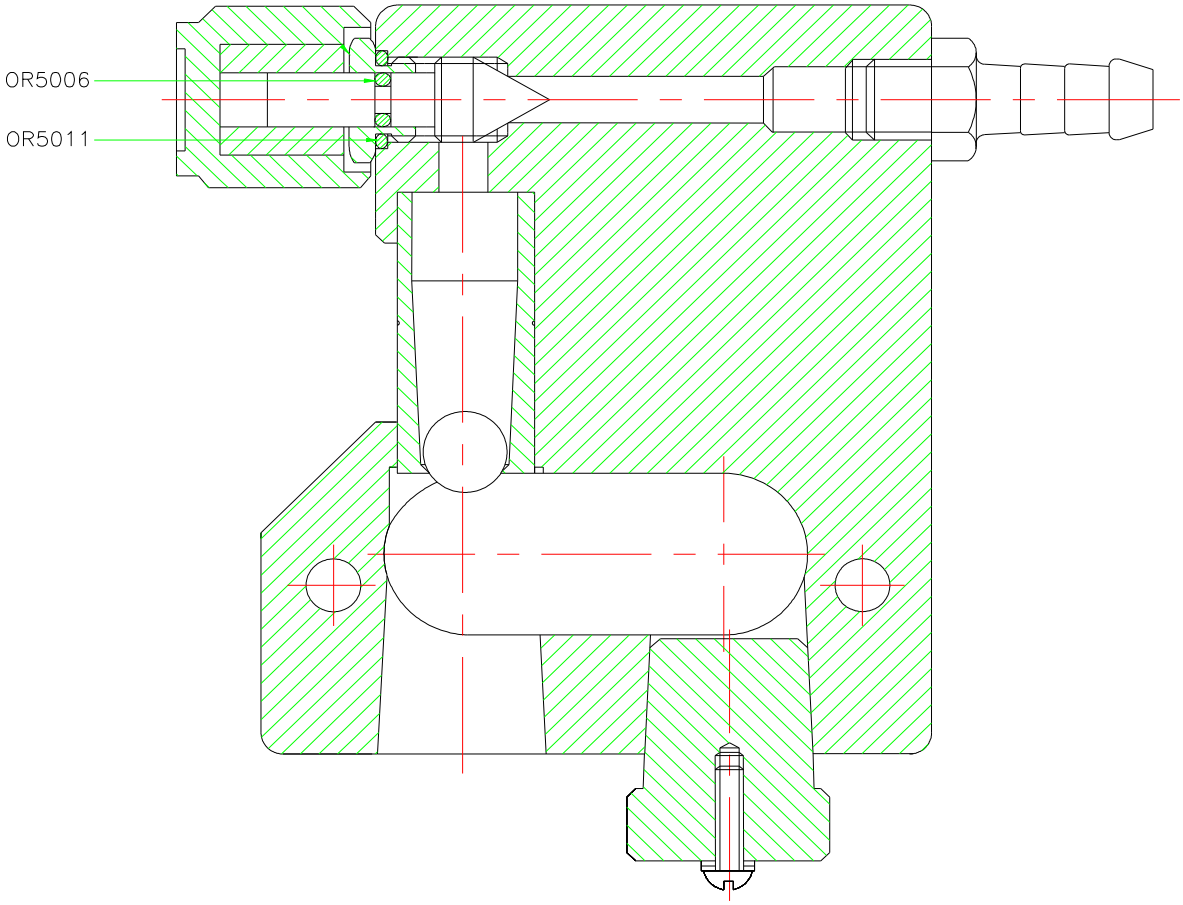


REPAIR KIT USED

1 x OR5006 – O RING
1 x OR5007V – O RING (VITON)
1 x A3056121 – SPRING

PATIENT BLOCK REPAIR KIT
A307–99 / A

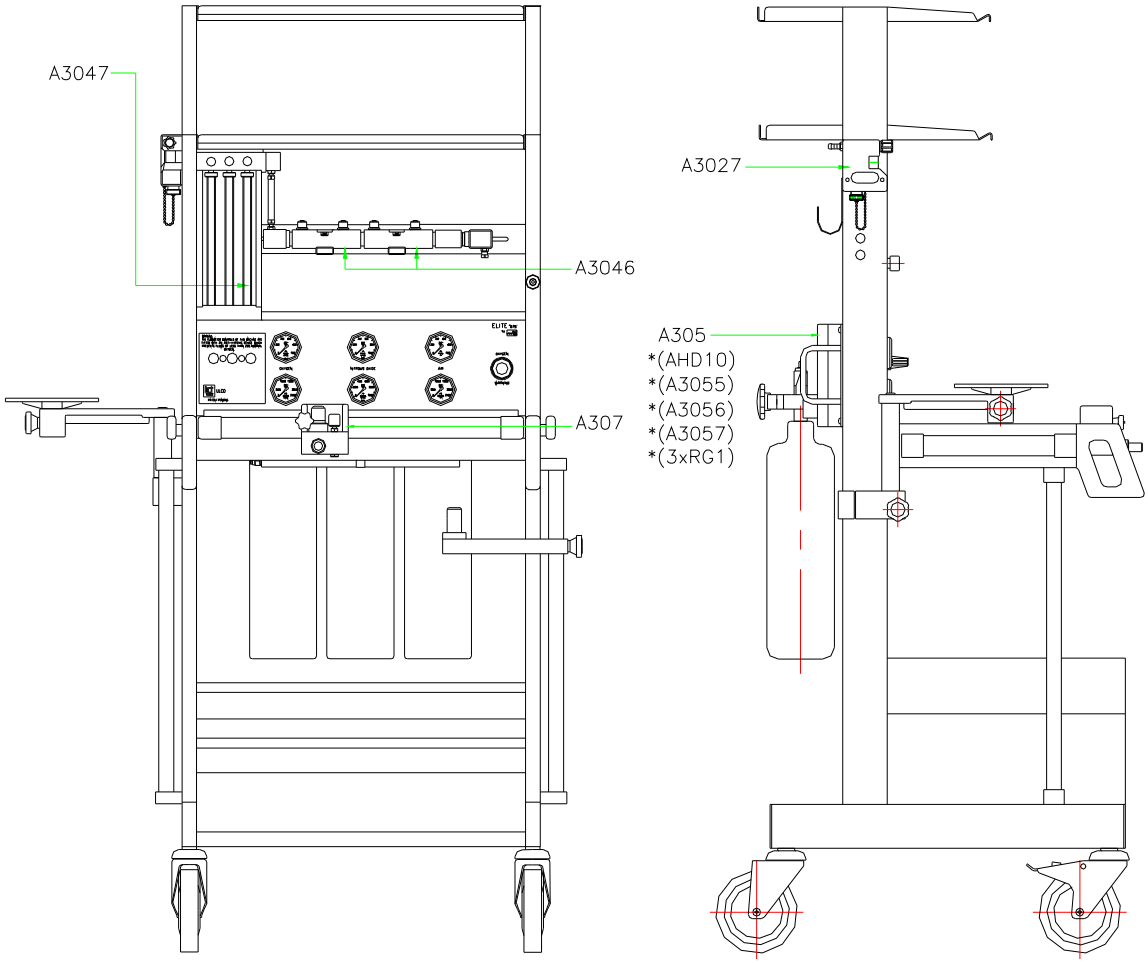
❖ SCAVENGER BLOCK SERVICE KIT (A3027-99)



REPAIR KIT USED

1 x OR5006 – O RING
1 x OR5011 – O RING

❖ ELITE 615 – 3 TUBE SERVICE KIT (A300-99)



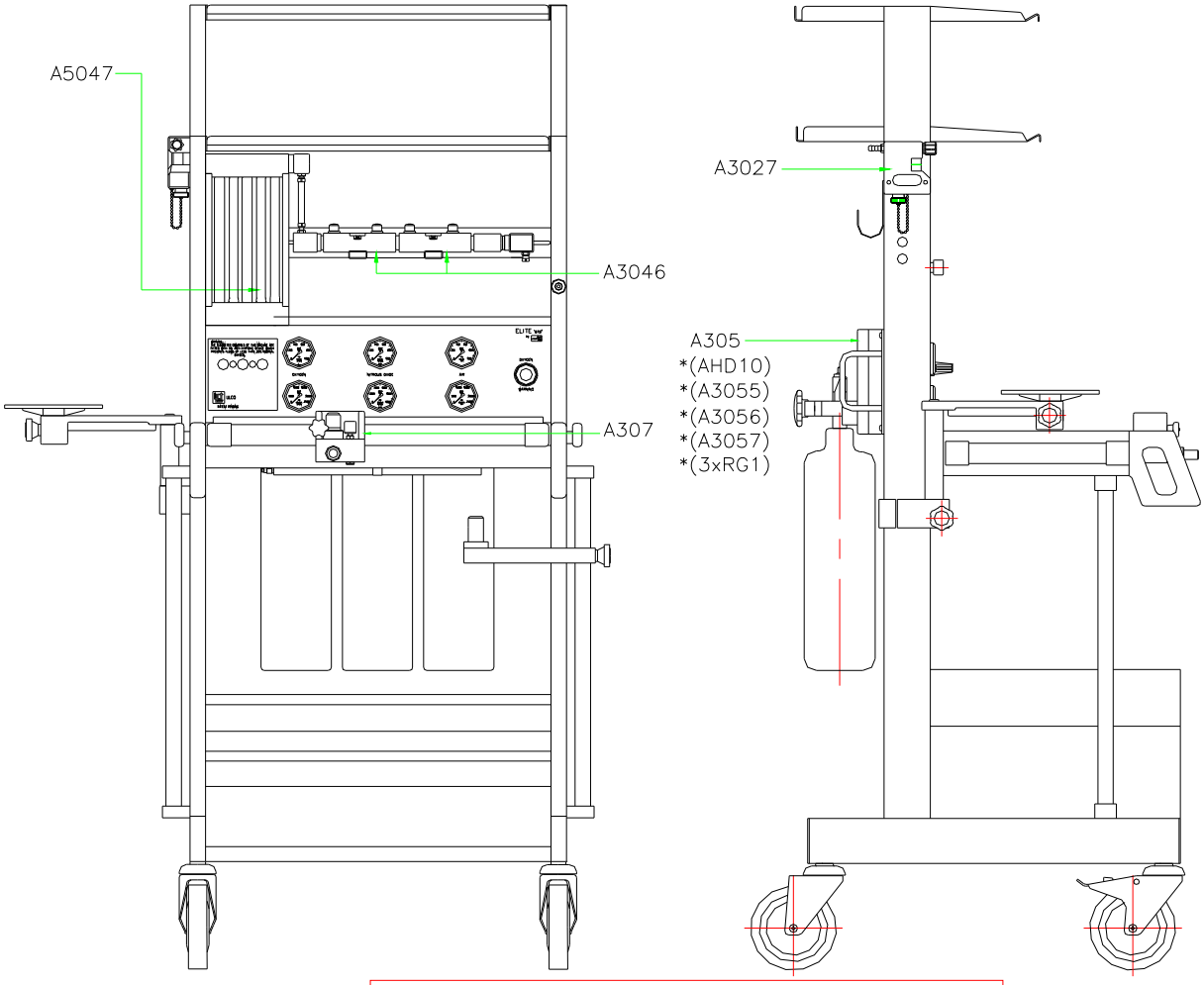
REPAIR KIT USED

1 x A3027–99	–	SCAVENGER BLOCK REPAIR KIT
1 x A3046–99	–	2xSELECTATEC BLOCK REPAIR KIT
1 x A3047–99	–	ROTAMETER 3 TUBE REPAIR KIT
1 x AHD10–99	–	AHD REPAIR KIT
1 x A3055–99	–	OXYGEN FAILURE REPAIR KIT
1 x A3056–99	–	VENTILATOR DRIVE REPAIR KIT
1 x A3057–99	–	MANIFOLD REPAIR KIT
1 x A307–99	–	PATIENT BLOCK REPAIR KIT
3 x RG1–99	–	REGULATOR REPAIR KIT

ELITE 615–3 TUBE REPAIR KIT

A300–99 / A

❖ ELITE 615 – 5 TUBE SERVICE KIT (A500-99)



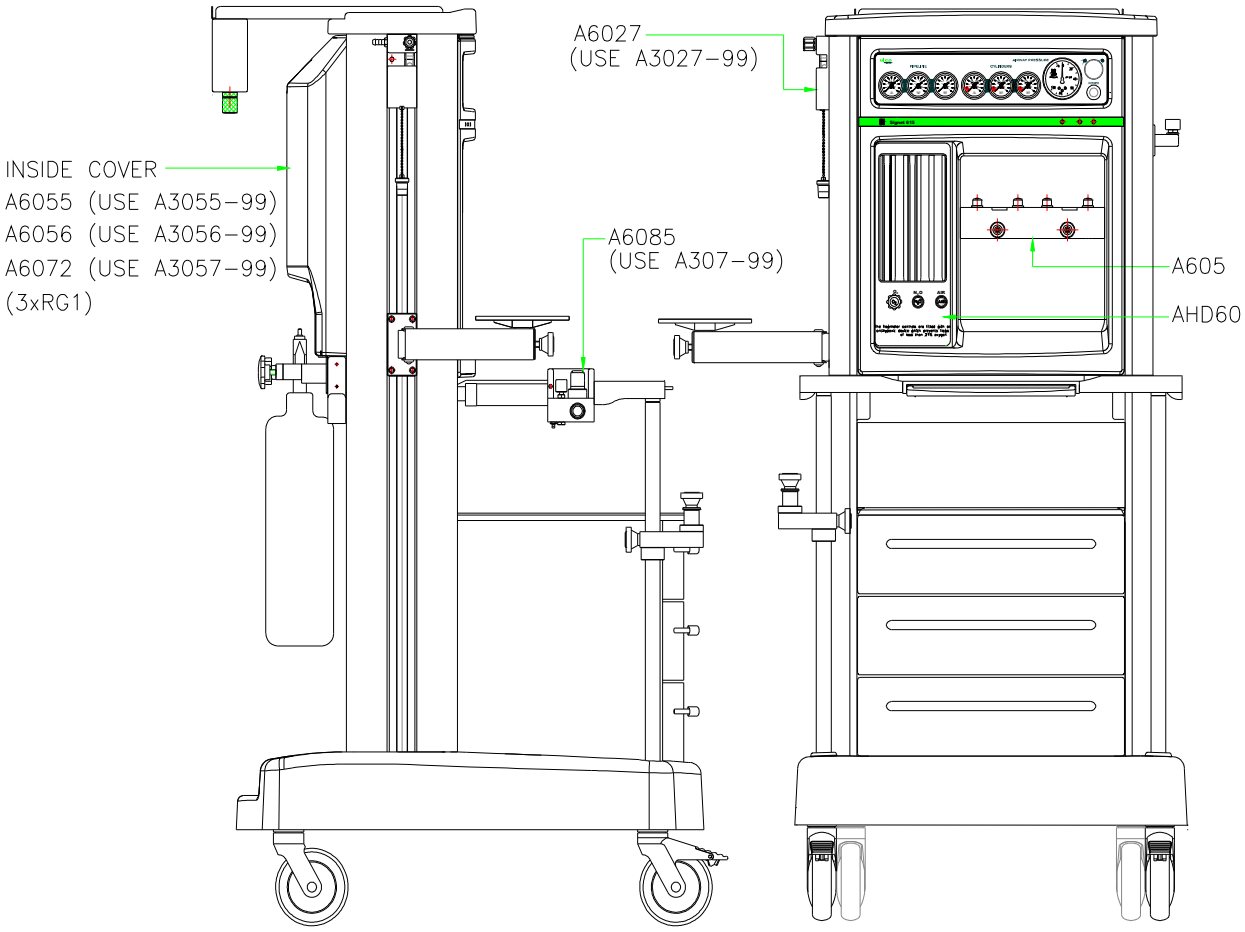
REPAIR KIT USED

1 x A3027–99	–	SCAVENGER BLOCK REPAIR KIT
1 x A3046–99	–	2xSELECTATEC BLOCK REPAIR KIT
1 x A5047–99	–	ROTAMETER 5 TUBE REPAIR KIT
1 x AHD10–99	–	AHD REPAIR KIT
1 x A3055–99	–	OXYGEN FAILURE REPAIR KIT
1 x A3056–99	–	VENTILATOR DRIVE REPAIR KIT
1 x A3057–99	–	MANIFOLD REPAIR KIT
1 x A307–99	–	PATIENT BLOCK REPAIR KIT
3 x RG1–99	–	REGULATOR REPAIR KIT

ELITE 615–5 TUBE REPAIR KIT

A500–99 / A

❖ SIGNET A.M. SERVICE KIT (A600-99)

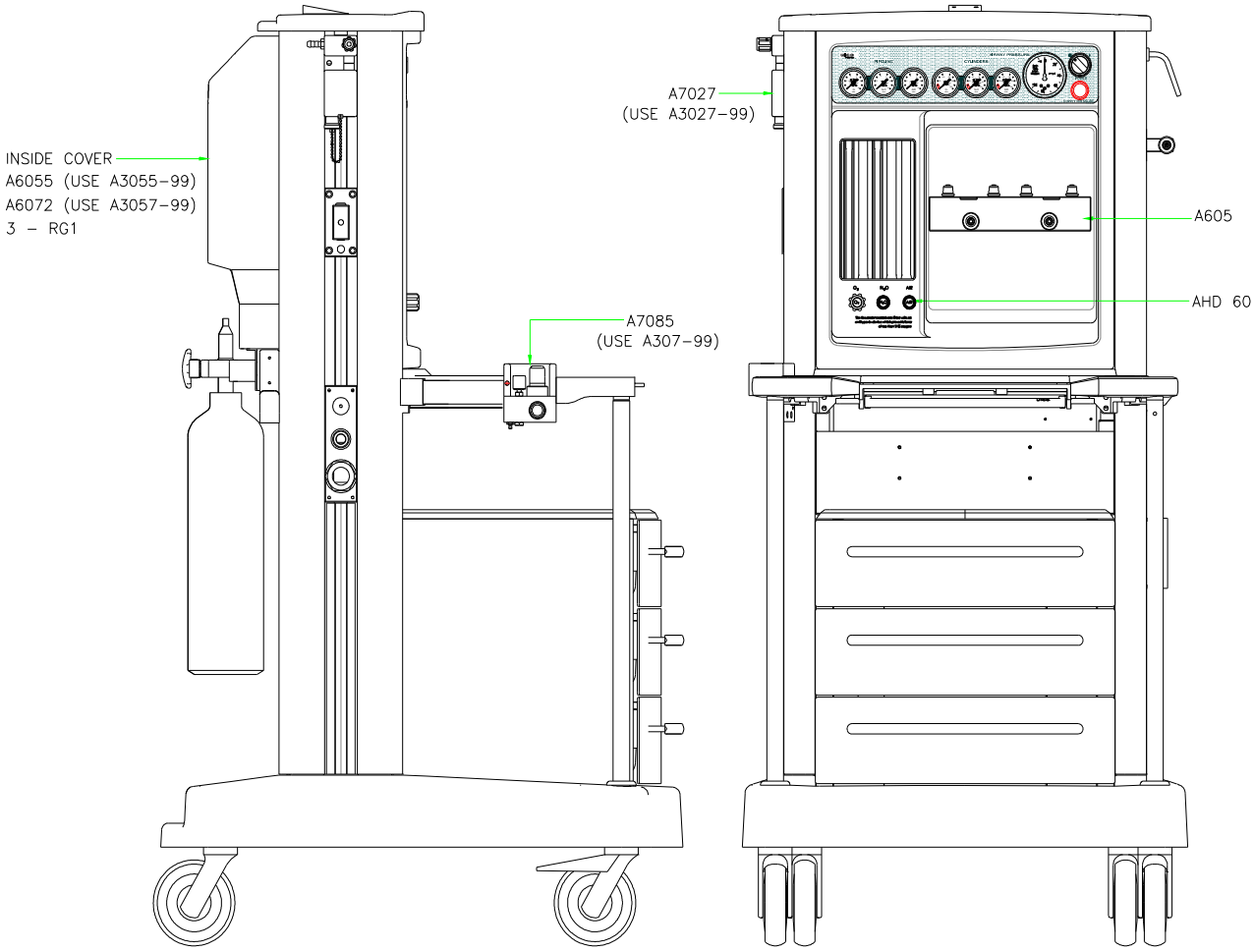


REPAIR KIT USED

1 x A3027-99	–	SCAVENGER BLOCK REPAIR KIT
1 x A605-99	–	SELECTATEC BLOCK REPAIR KIT
1 x AHD60-99	–	AHD60 REPAIR KIT
1 x A3055-99	–	OXYGEN FAILURE REPAIR KIT
1 x A3056-99	–	VENTILATOR DRIVE REPAIR KIT
1 x A3057-99	–	MANIFOLD REPAIR KIT
1 x A307-99	–	PATIENT BLOCK REPAIR KIT
3 x RG1-99	–	REGULATOR REPAIR KIT

SIGNET A.M. REPAIR KIT
A600-99 / A

❖ INTEGRUS PSV A.M. SERVICE KIT (A800-99)

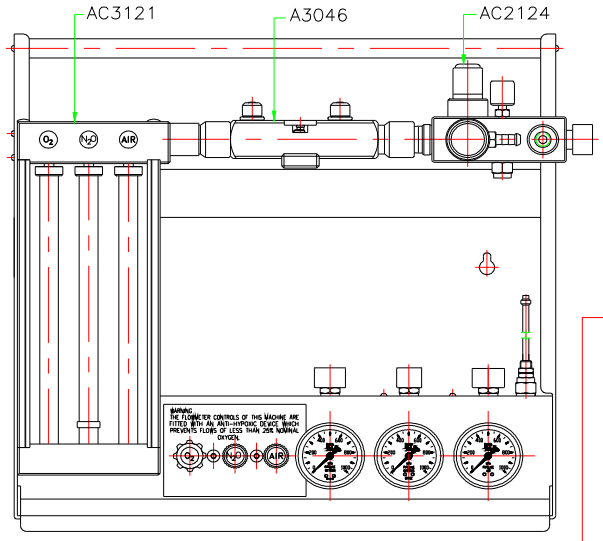


REPAIR KIT USED

1 x A3027-99 – SCAVENGER BLOCK REPAIR KIT
1 x A605-99 – SELECTATEC BLOCK REPAIR KIT
1 x AHD60-99 – AHD60 REPAIR KIT
1 x A3055-99 – OXYGEN FAILURE REPAIR KIT
1 x A3057-99 – MANIFOLD REPAIR KIT
1 x A307-99 – PATIENT BLOCK REPAIR KIT
3 x RG1-99 – REGULATOR REPAIR KIT

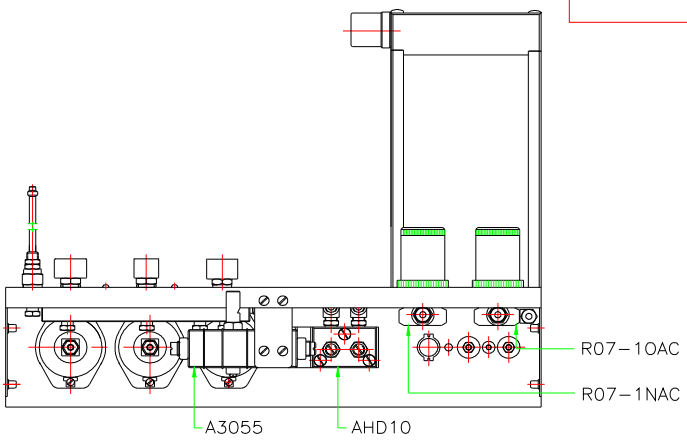
INTEGRUS PSV A.M. REPAIR KIT
A800-99 / A

❖ COMPACT ANAESTHETIC MACHINE – 3 TUBE (AC30-99)



REPAIR KIT USED

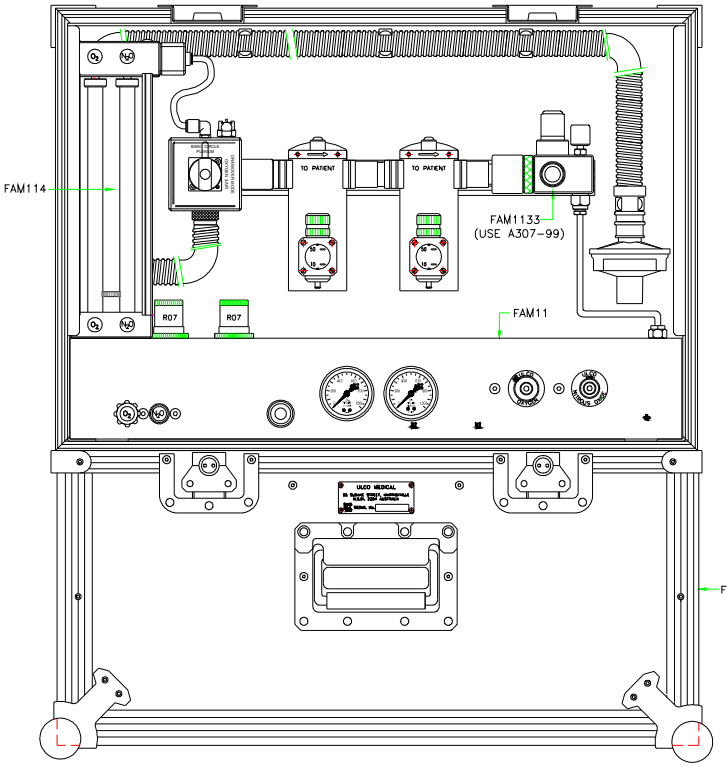
1 x A3047–99	–	3 TUBE ROTAMETER REPAIR KIT
1 x A3046–99	–	SELECTATEC BLOCK REPAIR KIT
1 x A307–99	–	PATIENT BLOCK REPAIR KIT
1 x AHD10–99	–	AHD REPAIR KIT
1 x A3055–99	–	OXYGEN FAILURE REPAIR KIT
5 x RG205	–	DOWTY SEALS
5 x RG204	–	BODOK SEALS



3 GAS COMPACT A.M. REPAIR KIT

AC30–99 / A

❖ FIELD ANAESTHETIC MACHINE SERVICE KIT (FAM100-99)



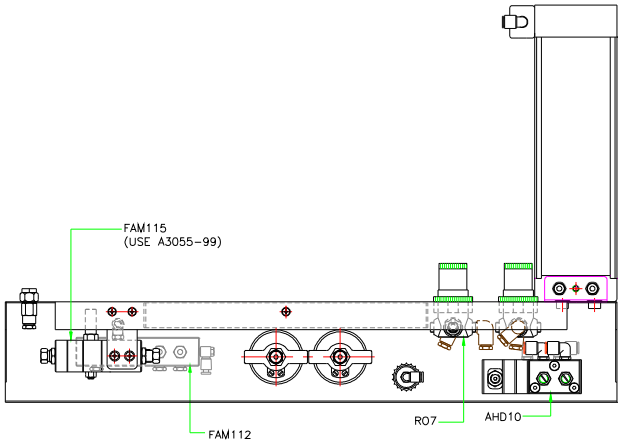
FRONT VIEW WITH LID OPEN

REPAIR KIT USED

1 x FAM114-99	–	2 TUBE ROTAMETER REPAIR KIT
1 x FAM112-99	–	MANIFOLD REPAIR KIT
1 x A307-99	–	PATIENT BLOCK REPAIR KIT
1 x AHD10-99	–	AHD REPAIR KIT
1 x A3055-99	–	OXYGEN FAILURE REPAIR KIT

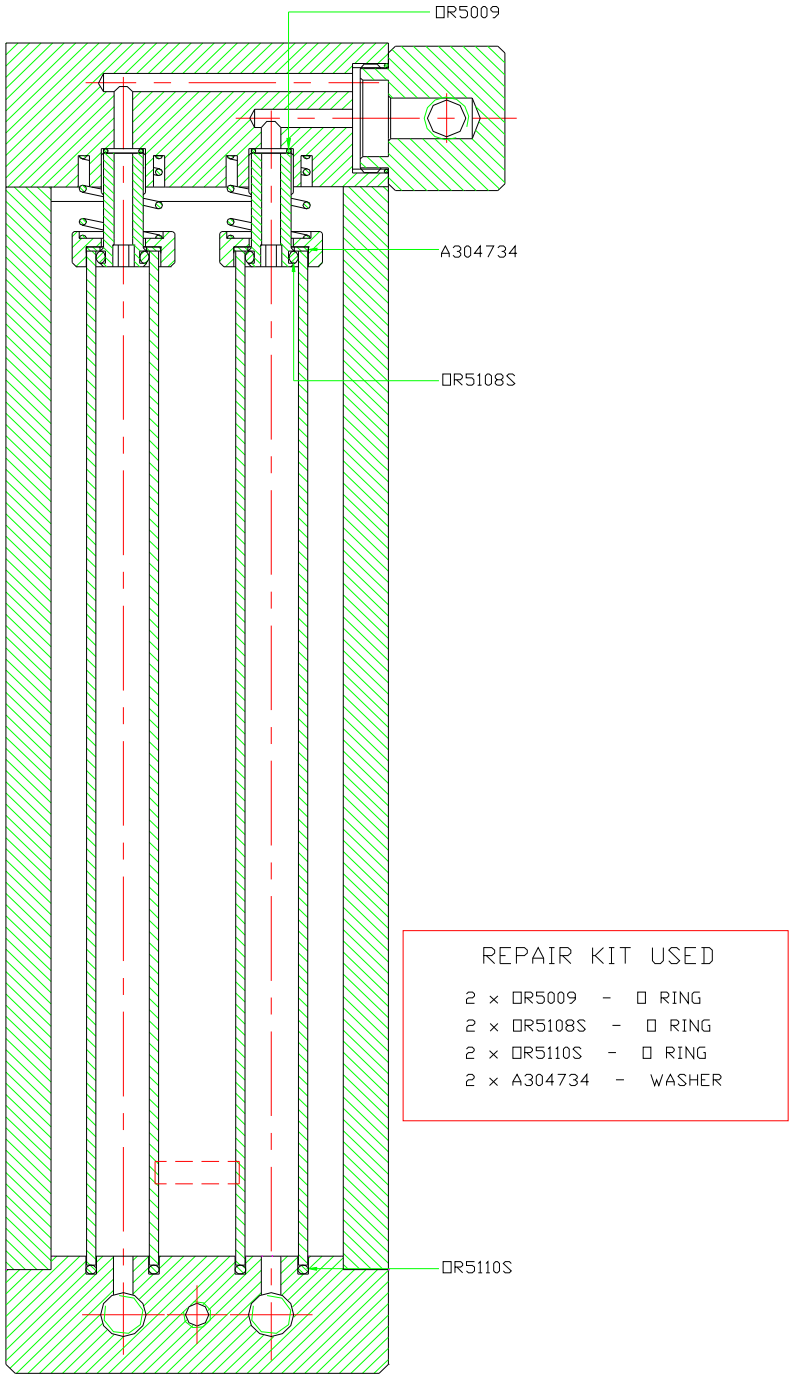
FIELD ANAESTHETIC MACHINE REPAIR KIT

FAM100-99 / A



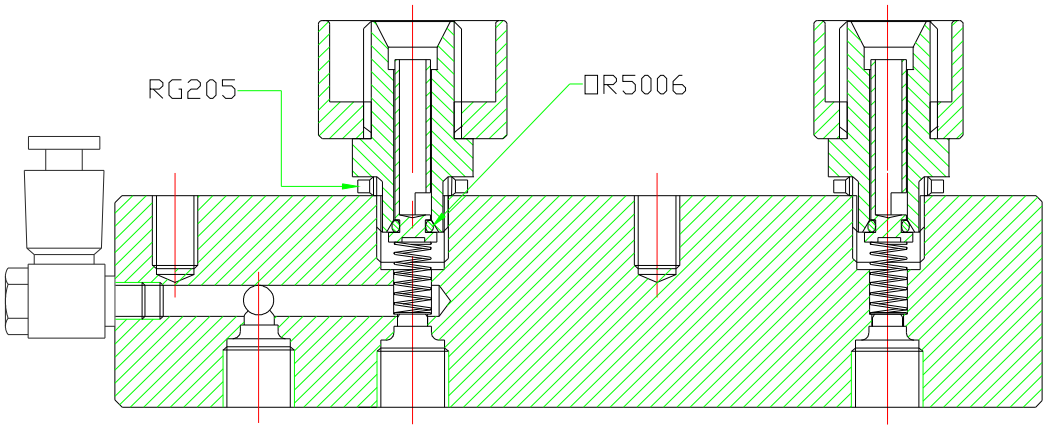
REAR VIEW OF FAM11

❖ FAM100 ROTAMETER 2 TUBE SERVICE KIT (FAM114-99)



2-TUBE ROTAMETER REPAIR KIT
FAM114-99 / A

❖ FAM100 MANIFOLD SERVICE KIT (FAM112-99)



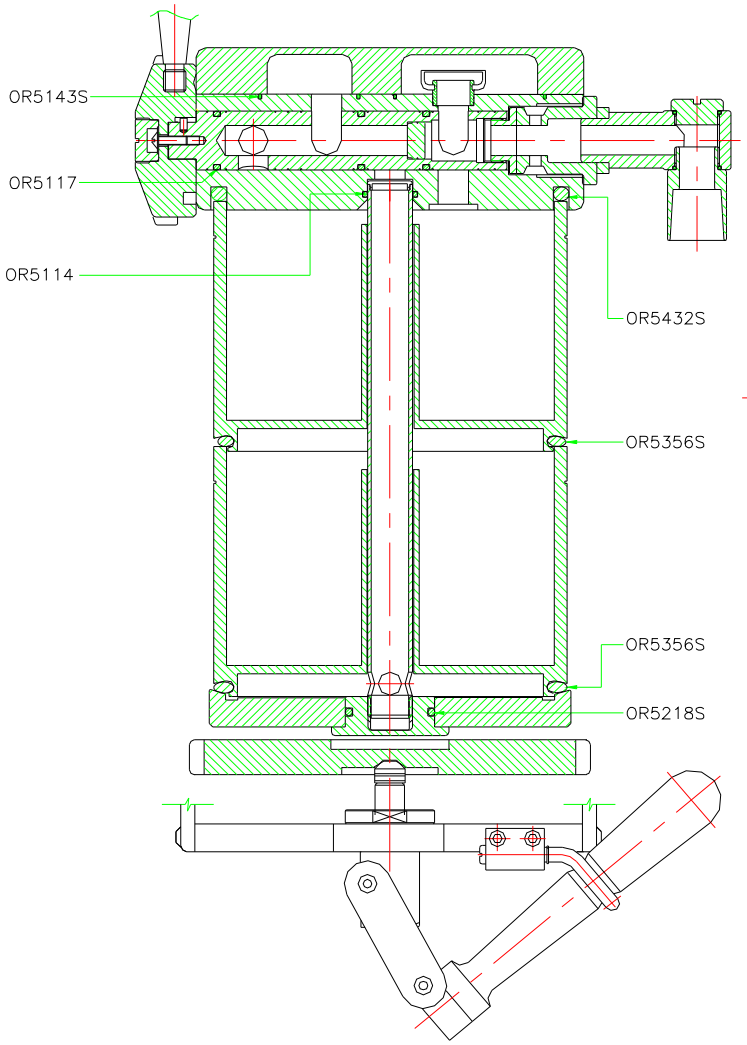
REPAIR KIT USED

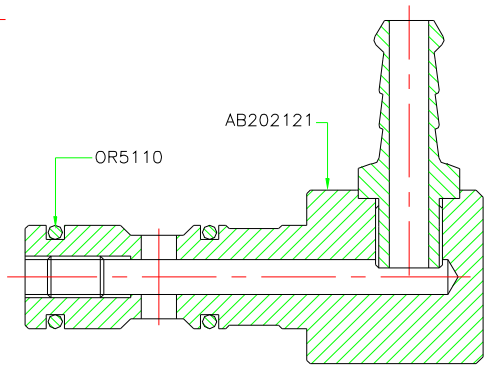
2 x OR5006 - O RING
2 x RG205 - DOWTY SEAL

MANIFOLD REPAIR KIT

FAM112-99 / A

❖ ABSORBER SERVICE KIT (AB200-99)





CONNECTOR ASSY/FRESH GAS

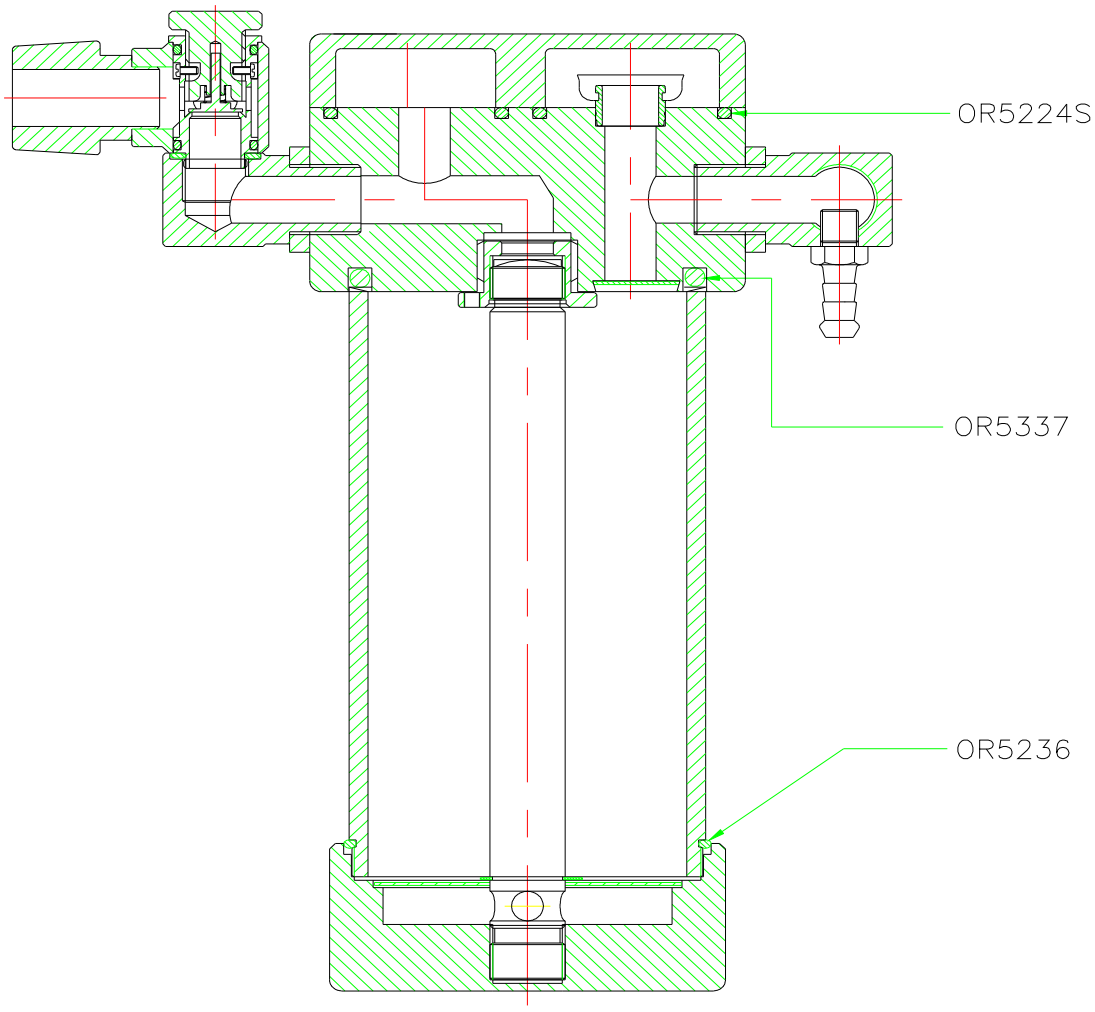
REPAIR KIT USED

1 x	OR5218S	– O RING
2 x	OR5356S	– O RING
1 x	OR5432S	– O RING
2 x	OR5143S	– O RING
3 x	OR5117	– O RING
2 x	OR5110	– O RING
1 x	OR5114	– O RING

AB200 REPAIR KIT

AB200–99 / B

- ABSORBER SERVICE KIT (AB300-99)



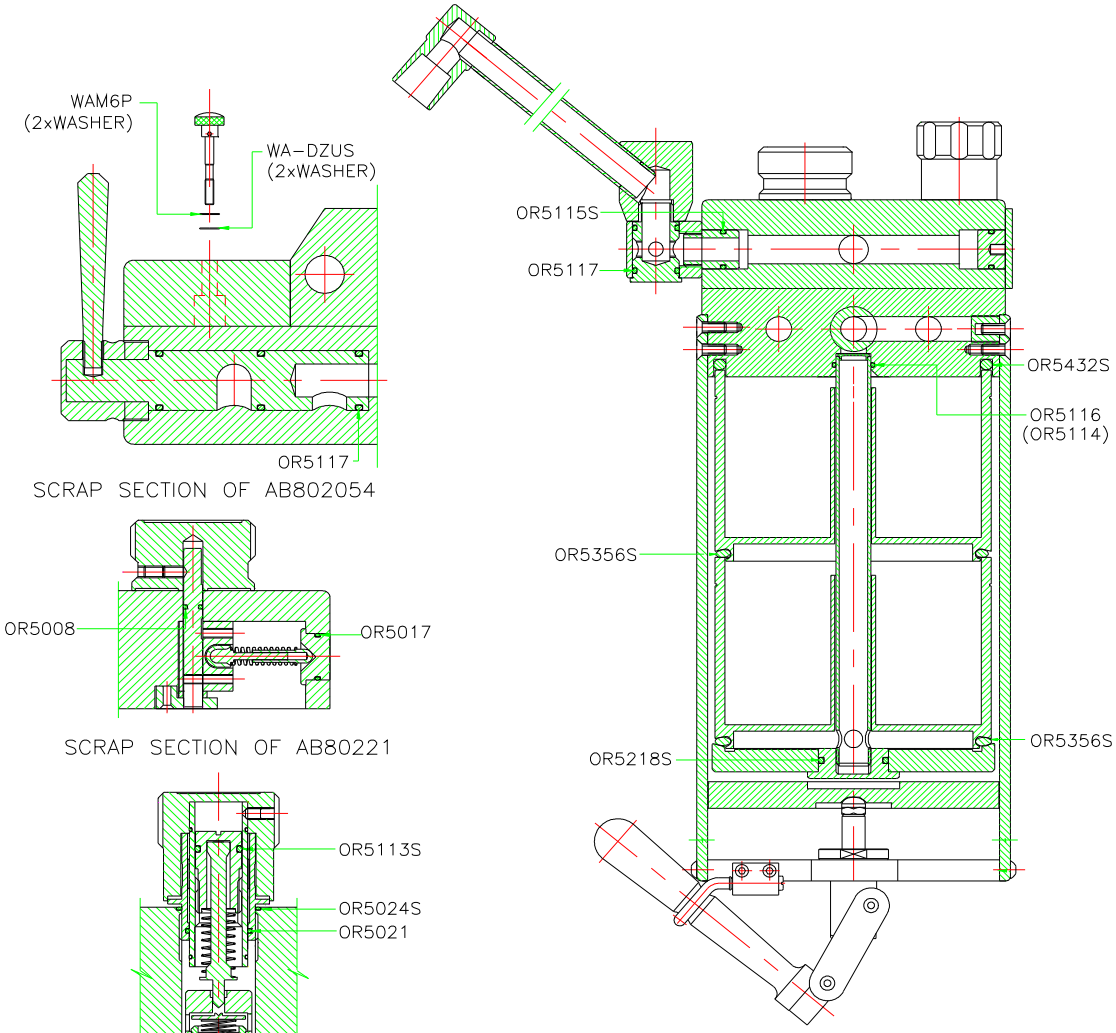
REPAIR KIT USED

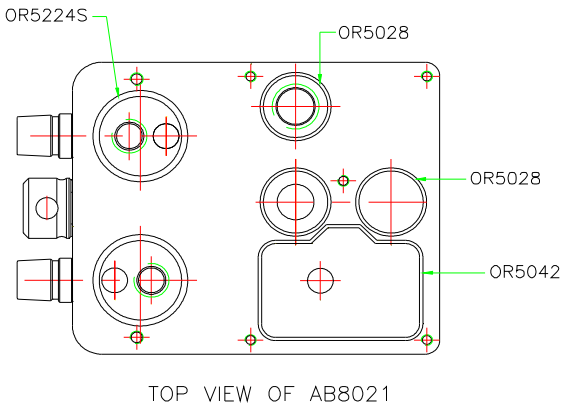
2 x OR5224S – O RING
1 x OR5337 – O RING
1 x OR5236 – O RING

AB300 REPAIR KIT

AB300–99 / A

❖ ABSORBER SERVICE KIT (AB800-99)



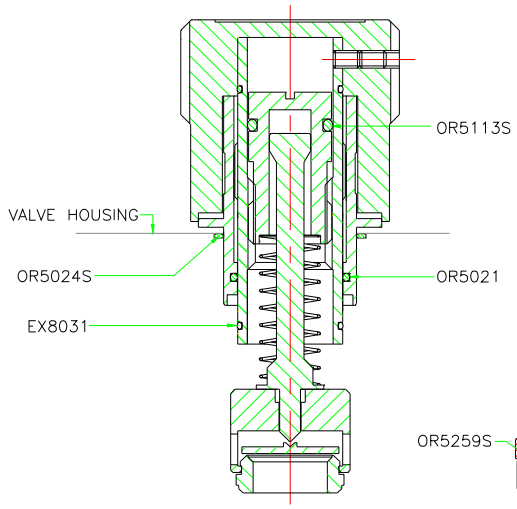


REPAIR KIT USED

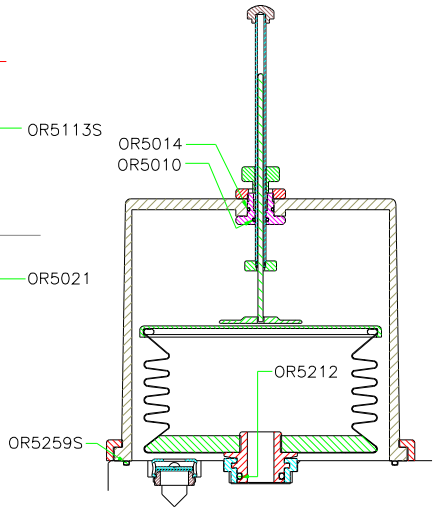
1 x	OR5008	– O RING
5 x	OR5117	– O RING
1 x	OR5021	– O RING
1 x	OR5024S	– O RING
1 x	OR5113S	– O RING
1 x	OR5115S	– O RING
2 x	OR5356S	– O RING
1 x	OR5218S	– O RING
2 x	OR5014	– O RING
1 x	OR5432S	– O RING
1 x	OR5114	– O RING
1 x	OR5116	– O RING
3 x	OR5028	– O RING
1 x	OR5042	– O RING
1 x	OR5017	– O RING
2 x	OR5224S	– O RING
2 x	AB802262	– 'U' CUP SEAL
2 x	WAM6P	– WASHER
2 x	WA-DZUS	– WASHER

ABSORBER REPAIR KIT
AB800-99 / C

❖ AB800C ABSORBER SERVICE KIR (AB800C-99)



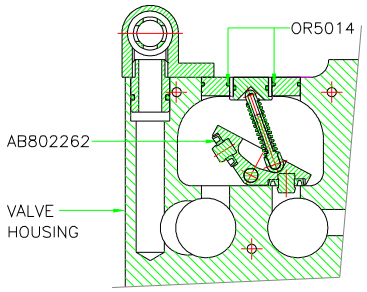
SECTION OF APL VALVE (EX800)

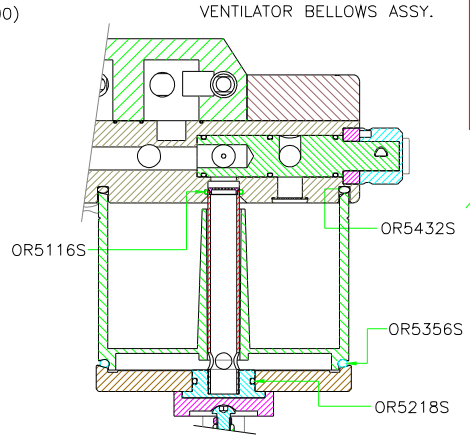


VENTILATOR BELLOWS ASSY.

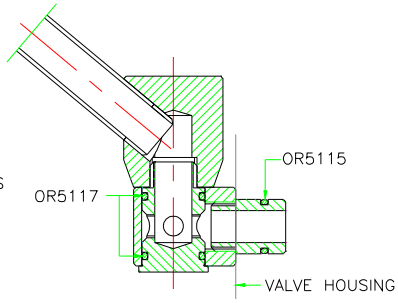
REPAIR KIT USED

1 x	OR5008	– O RING
5 x	OR5117	– O RING
1 x	OR5021	– O RING
1 x	OR5024S	– O RING
1 x	OR5113S	– O RING
1 x	OR5115	– O RING
1 x	OR5356S	– O RING
1 x	OR5218S	– O RING
3 x	OR5014	– O RING
1 x	OR5432S	– O RING
1 x	OR5116S	– O RING
3 x	OR5028	– O RING
1 x	OR5042	– O RING
1 x	OR5017	– O RING
2 x	OR5224S	– O RING
2 x	AB802262	– 'U' CUP SEAL
2 x	WAM6P	– WASHER
2 x	WA–DZUS	– WASHER
1 x	OR5010	– O RING
1 x	OR5212	– O RING
1 x	OR5259S	– O RING

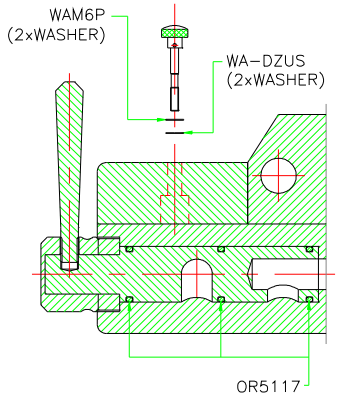




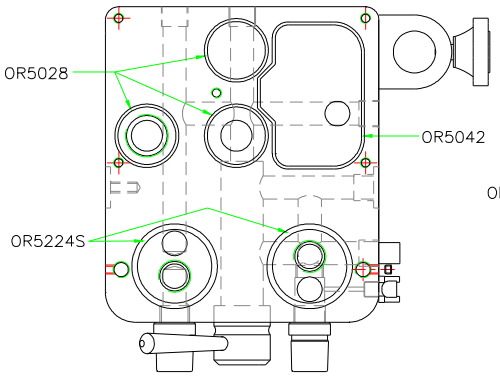
SECTION OF ABSORBER CANISTER (AB204)



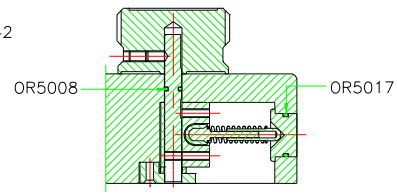
SECTION OF MANUAL BAG ASSY. (AB8023)



SCRAP SECTION OF AB802054



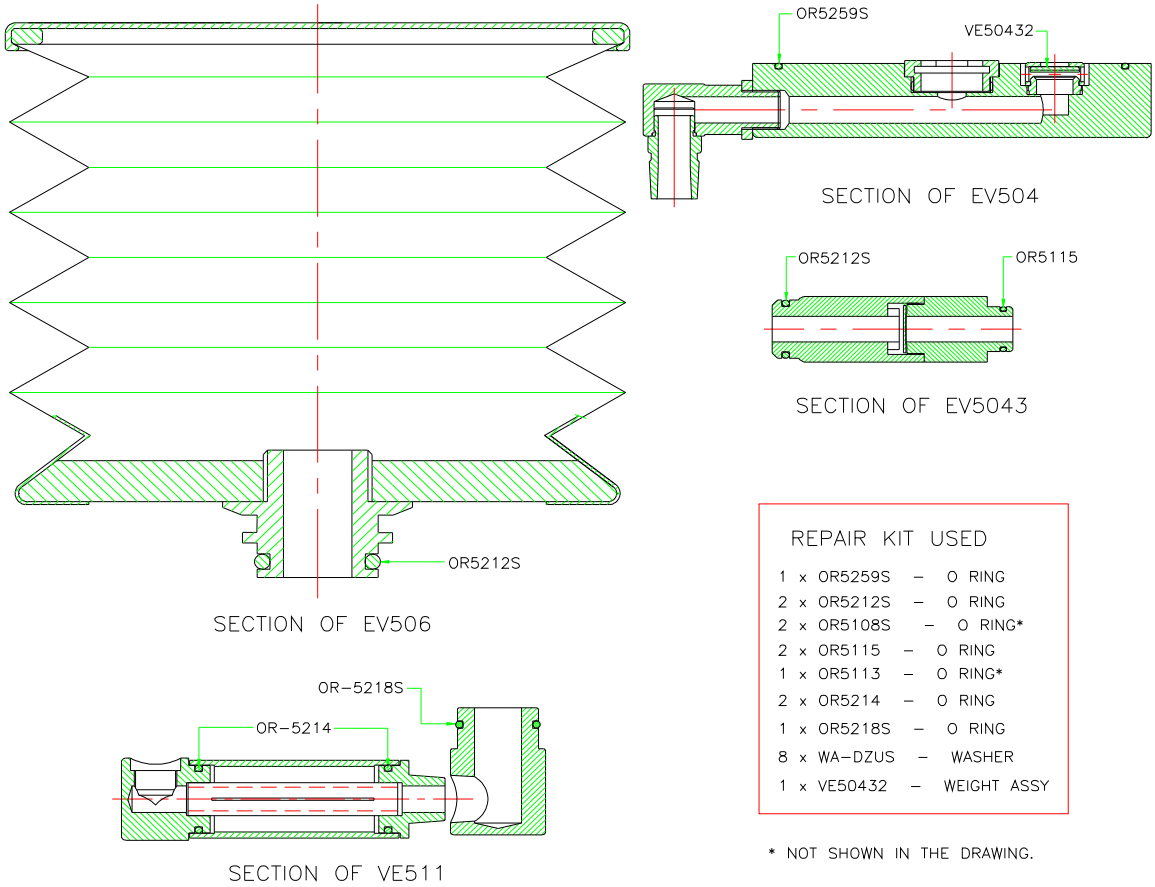
TOP VIEW OF ABSORBER HEAD (AB8021B)



SCRAP SECTION OF AB80221

AB800C REPAIR KIT
AB800C–99 / A

❖ EV500 O-RING KIT (VE506-99)



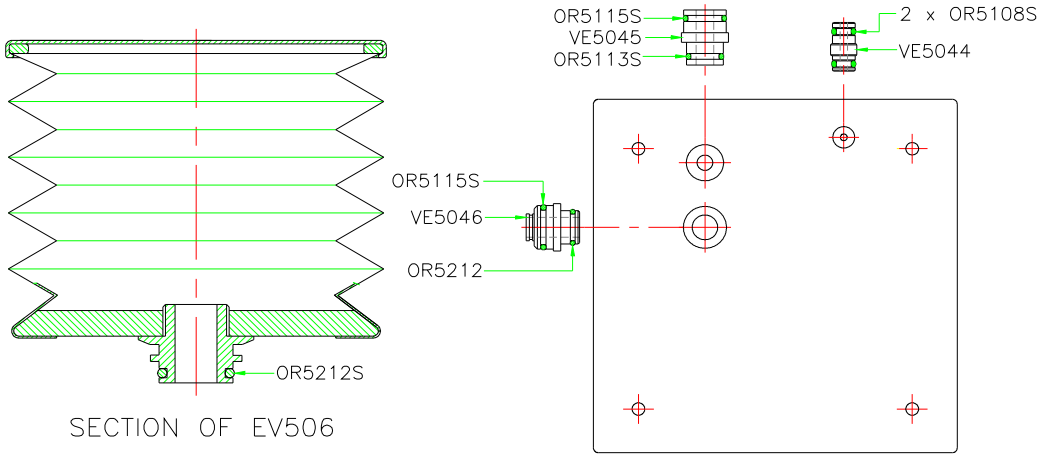
REPAIR KIT USED

1 x	OR5259S	– O RING
2 x	OR5212S	– O RING
2 x	OR5108S	– O RING*
2 x	OR5115	– O RING
1 x	OR5113	– O RING*
2 x	OR5214	– O RING
1 x	OR5218S	– O RING
8 x	WA-DZUS	– WASHER
1 x	VE50432	– WEIGHT ASSY

* NOT SHOWN IN THE DRAWING.

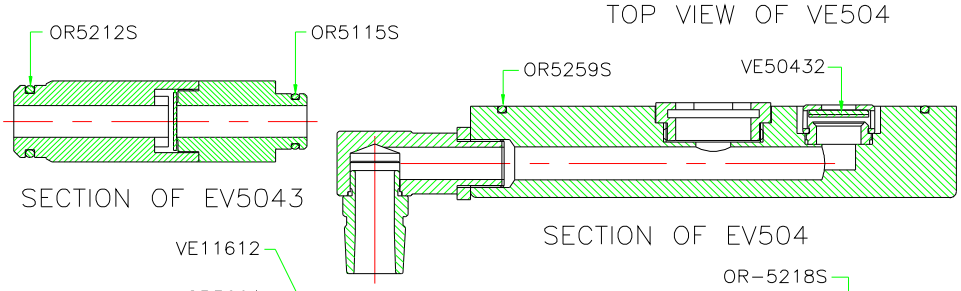
EV500 O-RING KIT
VE506-99 / B

- VENTILATOR SERVICE KIT – COMPLETE (VE500-99)



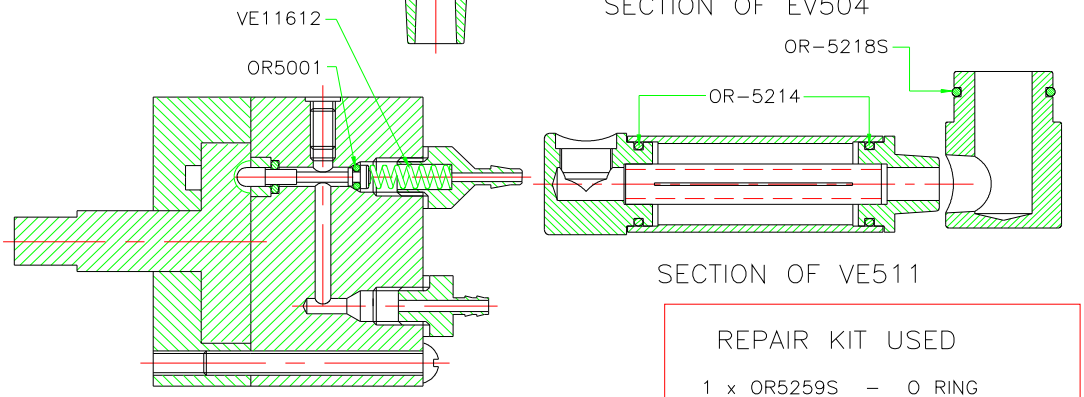
SECTION OF EV506

TOP VIEW OF VE504



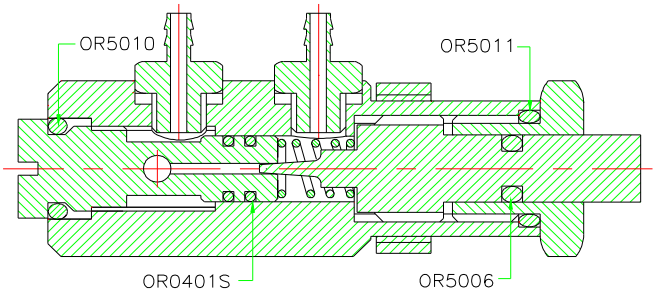
SECTION OF EV5043

SECTION OF EV504



SECTION OF VE116

SECTION OF VE511



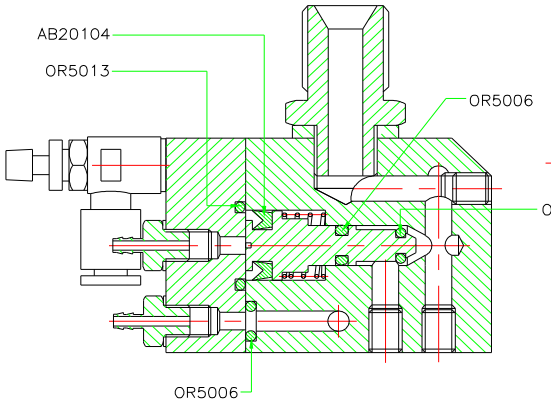
SECTION OF VE319

REPAIR KIT USED

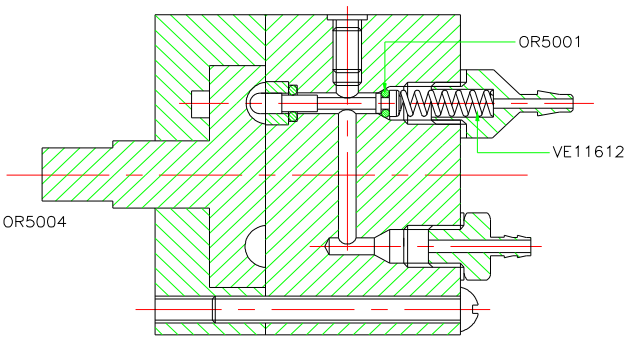
1 x	OR5259S	– O RING
2 x	OR5212S	– O RING
2 x	OR5108S	– O RING
2 x	OR5115S	– O RING
1 x	OR5113S	– O RING
3 x	OR5001	– O RING
3 x	VE11612	– SPRING
2 x	OR5006	– O RING
2 x	OR5011	– O RING
2 x	OR5010	– O RING
4 x	OR0401S	– O RING
2 x	OR5214	– O RING
1 x	OR5218	– O RING
8 x	WA-DZUS	– WASHER
1 x	VE50432	– WEIGHT ASSY

VENTILATOR ASSEMBLY
VE500-99 / C

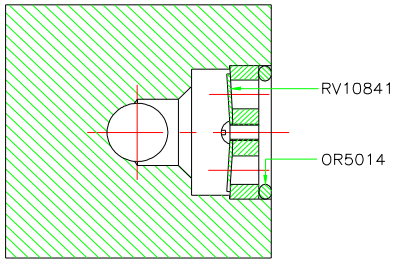
❖ **RESCU VENTILATOR SERVICE KIT (ER100-99)**



SECTION OF ER106



SECTION OF RV116



SECTION OF RV108

REPAIR KIT USED

6 x OR5006	–	O RING
2 x OR5004	–	O RING
1 x OR5012	–	O RING*
2 x OR5013	–	O RING
1 x OR5014	–	O RING
3 x OR5001	–	O RING
2 x AB20104	–	U CUP
1 x RV10841	–	DIAPHRAGM
3 x VE11612	–	SPRING

* NOT SHOWN IN THE DRAWING.

ER100 O–RING KIT

ER100–99 / A

1. CARE AND CLEANING OF THE WORKSTATION

For the workstation to work safely and reliably, it must have on-going, planned maintenance and cleaning.
The workstation itself requires little cleaning but the actions described in Section 1.1 should be performed at least daily or preferably after each procedure. Only **those** components in direct contact with expired patient gases, such as breathing circuits and breathing system components like absorbers, ventilator bellows and canisters will require regular disinfection. See the user manual for the particular accessory in order to determine how it should be disinfected. The workstation will require disinfection only if the exterior surfaces become directly contaminated; disinfection in such cases is described in Section 1.2.

WARNING: Always disconnect the workstation from the mains supply prior to carrying out maintenance and cleaning.

1.1 Cleaning

The machine must be disconnected from the mains before cleaning or disinfecting. The workstation's outer surfaces can be cleaned using a soft cloth and mild soap solution such as Lemex. Clean the following surfaces:

- Frame uprights and side panels
- Plastic surfaces (skirt, front panel, top)
- Metal work table
- Absorber mounting posts and side rails

Do not use ammonia, phenol or acetone based cleaners.
After washing, wipe with clean water and allow to dry. Do not allow fluids to penetrate the housing or any of the external connectors.

1.2 Disinfecting

Anaesthetic workstations need not be disinfected unless directly contaminated.

If the equipment has become contaminated and the affected part is removable, it may be cleaned using a washer (Meile or similar).

Chemical disinfecting:

- Wash with a soft cloth and soap solution and then dry
- Wipe again with 2% glutaraldehyde (pH 6.5) solution
- Allow to stand for 20 minutes
- Rinse and dry thoroughly.

1.3 Steam Autoclaving

Normally this is not required for anaesthesia equipment and accessories. There are no components of the Signet workstation which can be autoclaved.

1.4 Filters

Always fit a new single use bacterial filter to the patient "Y" piece connection of the patient circuit. This will minimise or prevent contamination.

2. CLEANING THE EV500 VENTILATOR

2.1. Cleaning intervals

The ventilator is an automatic bag squeezer, and the bellows within the ventilator takes the place of a normal rebreathing bag. Therefore, the bellows should be cleaned as often as a rebreathing bag, usually after any infected case or at the end of the day. If an inline bacterial filter is fitted on the breathing hose to the ventilator, cleaning will only be needed once every one or two months.

Note:	The filter should be replaced in accordance with the manufacturer's recommendations.

2.2. Method for cleaning ventilator

2.2.1 The machine must be disconnected from the mains before cleaning or disinfecting. The ventilator's outer surfaces can be cleaned using a soft cloth and mild soap solution. After washing, wipe with clean water and allow to dry. Do not allow fluids to penetrate the housing or any of the external connectors. In all cases, care must be taken in order to prevent liquids from entering the electronics situated in the base of the ventilator.

2.2.2 Dismantle the ventilator

1. Loosen the four knurled screws (labelled (1) in Figure 1) and remove the bellows canister

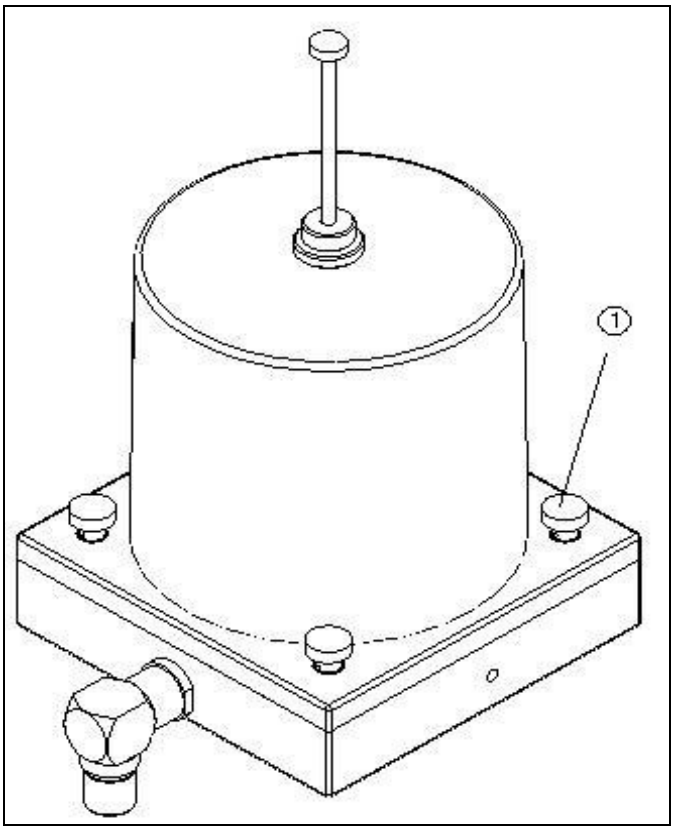


Figure 1: Location of knurled screws

2. Remove the ventilator head assembly from the ventilator by pulling upward on the delrin block.

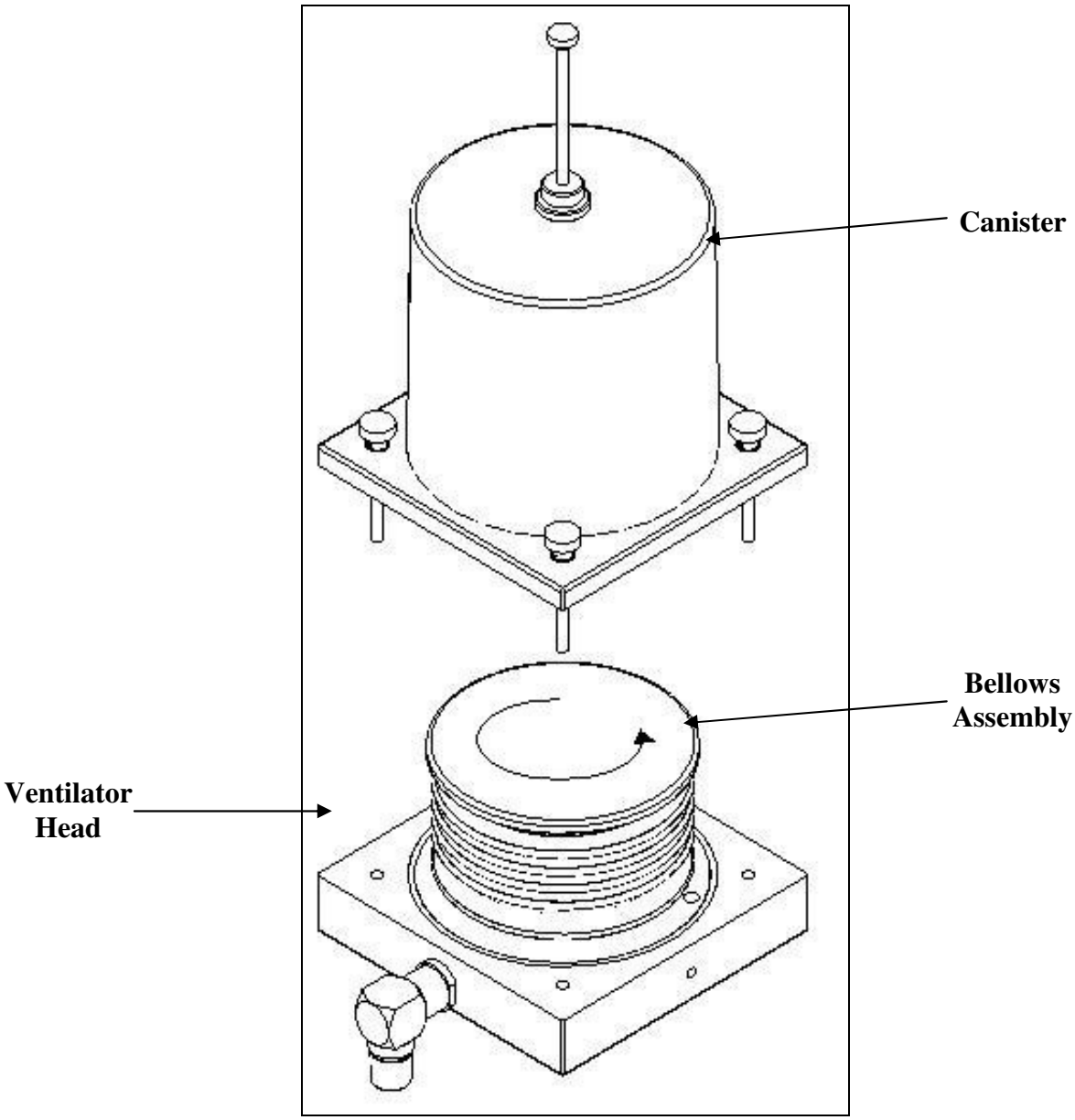


Figure 2: Removal of bellows canister and bellows bag assembly

3. Remove the ventilator head assembly from the ventilator by pulling upward on the delrin block.

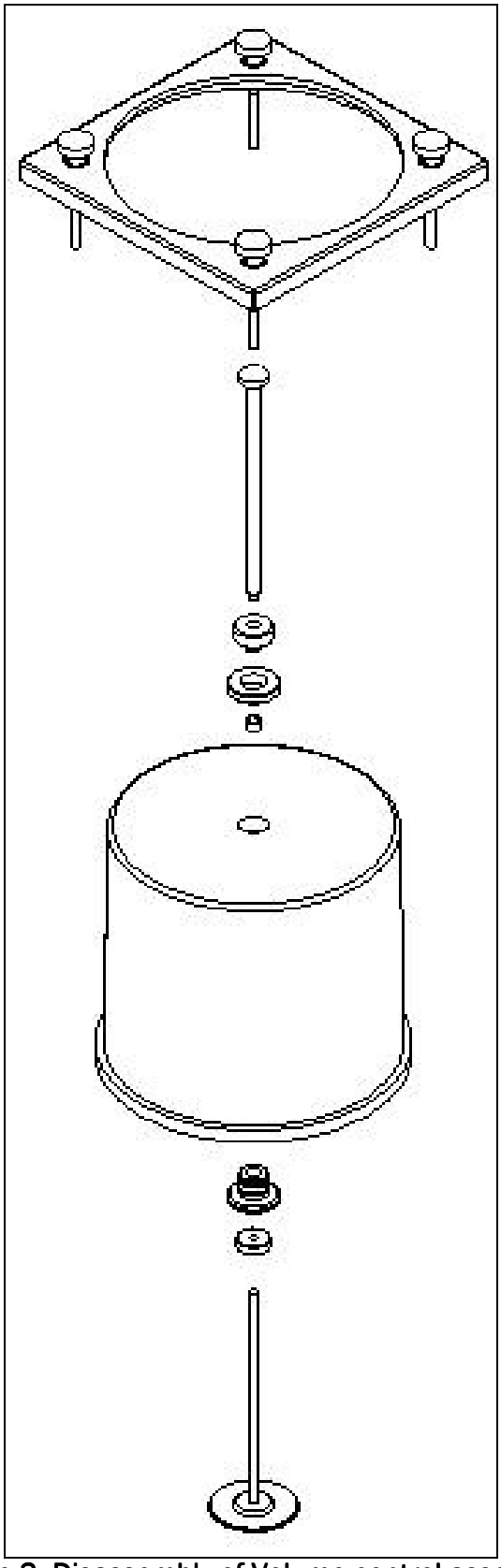


Figure 3: Disassembly of Volume control assembly

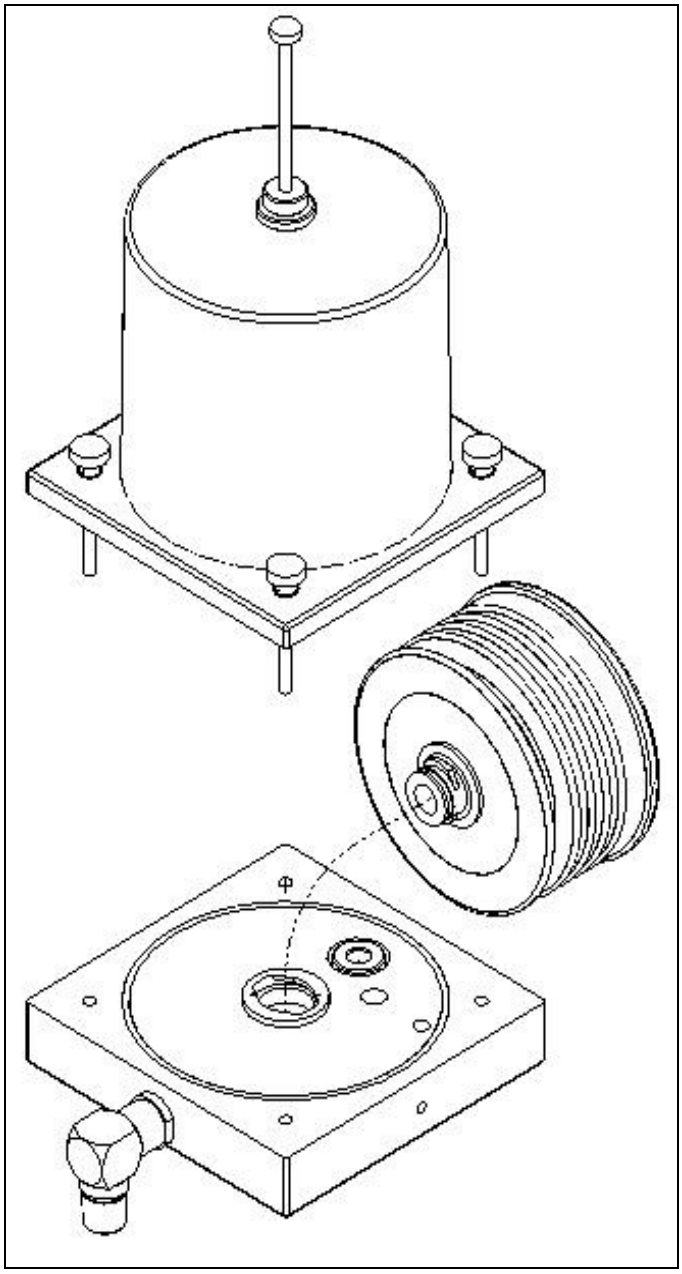


Figure 4: Bellows assembly removed from ventilator head

4. The ventilator head can be put through a washer at 80°C.
5. The bellows canister may be washed or autoclaved (volume control must be removed as shown in figure 3.
6. The base disk (mushroom) should be removed from the bellows assembly before washing. Pull the rubber bag from the delrin base disk as shown in figure 5. The bellows may be washed or autoclaved. The base component (mushroom) should not be autoclaved but can be put through a washer at 80°C.

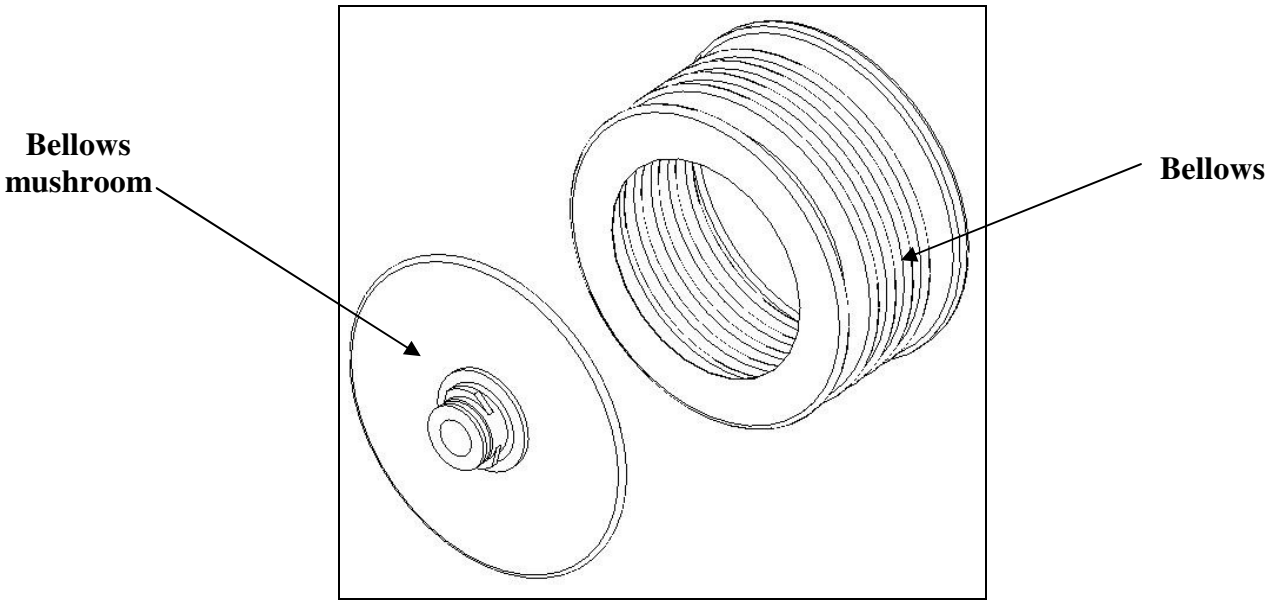


Figure 5: Bellows assembly with mushroom removed

7. Dry all components thoroughly before re-assembly. Low pressure warm air should be passed through the ventilator head by attaching a hose to the scavenge port.

2.3 Disinfection

If the unit has been contaminated, the whole ventilator may be gas sterilised. Do not sterilise the ventilator using radiation sterilisation techniques.
A disinfectant may also be used when cleaning the ventilator, if diluted with water. First wipe the whole ventilator with a damp sponge containing disinfectant, then remove the canister, bellows and head assembly as described above and wipe the inside of the ventilator (chamber).
Individual components may be cleaned using a washer (Meile or similar).
Breathing circuits and components such as ventilator bellows, canisters and head should be washed at approximately 80°C with a slightly alkaline detergent solution (pH 10-11).
Chemical disinfecting:

- Wash in soap solution and then dry
- Soak in 2% glutaraldehyde (pH 6.5) for 19-20 minutes. Rinse and dry thoroughly.

2.3.1 Steam Autoclaving components

Normally this is not required for anaesthesia equipment and accessories. If autoclaving is needed, use the glove cycle. Do not autoclave the head assembly or the base disk of the bellows bag assembly.

2.3.2 Gas sterilising

ETO gas sterilising can be carried out on all removable components after washing or on the entire ventilator. Aerate thoroughly after gassing.

2.4 Care and Maintenance of Bellows

Reversion and loss of strength is usually the result of exposure to high temperatures or excessive age. Some other factors, which cause degradation of natural rubber, are copper and manganese containing materials, which can include some water supply systems. The copper acts as a catalyst to degrade the rubber and surprisingly small amounts can lead to very rapid aging of the rubber, causing loss of strength.

Contact with solvents or oils can also damage rubber and can lead to tackiness and loss of strength, but will usually swell the rubber while it is still present. The rubber is compounded with antioxidants which are intended to preserve it against oxidation and aging, but if very powerful detergents or soaps are used to clean the bellows, these may leak out leaving the rubber largely unprotected.

Other agents, which will attack rubber, Reversion and loss of strength is usually the result of exposure to high temperatures or excessive age. Some other factors, which cause degradation of natural rubber are materials containing copper and manganese, SUNLIGHT, ULTRA VIOLET light and OZONE. Temperatures in excess of 80°C will cause reversion and at 100°C this occurs quite rapidly.

SUGGESTED PROTECTIVE METHODS

- Keep spare bellows in boxes and away from fluorescent (in the dark)
- Use only mild soaps and warm water to clean the bellows.
- The bellows should be dried while fully expanded.

3 CARE AND CLEANING OF ABSORBERS

3.1 Cleaning intervals

The absorber should be cleaned on a regular basis and in accordance with Hospital Infection Control guidelines, usually after an infected case, or at the end of each day.

If an inline bacterial filter is fitted to the expiratory port of the absorber, cleaning will only be needed once a month.

Note: The filter should be replaced in accordance with the manufacturer's recommendations.

3.2 Method for cleaning the AB800 Absorber:

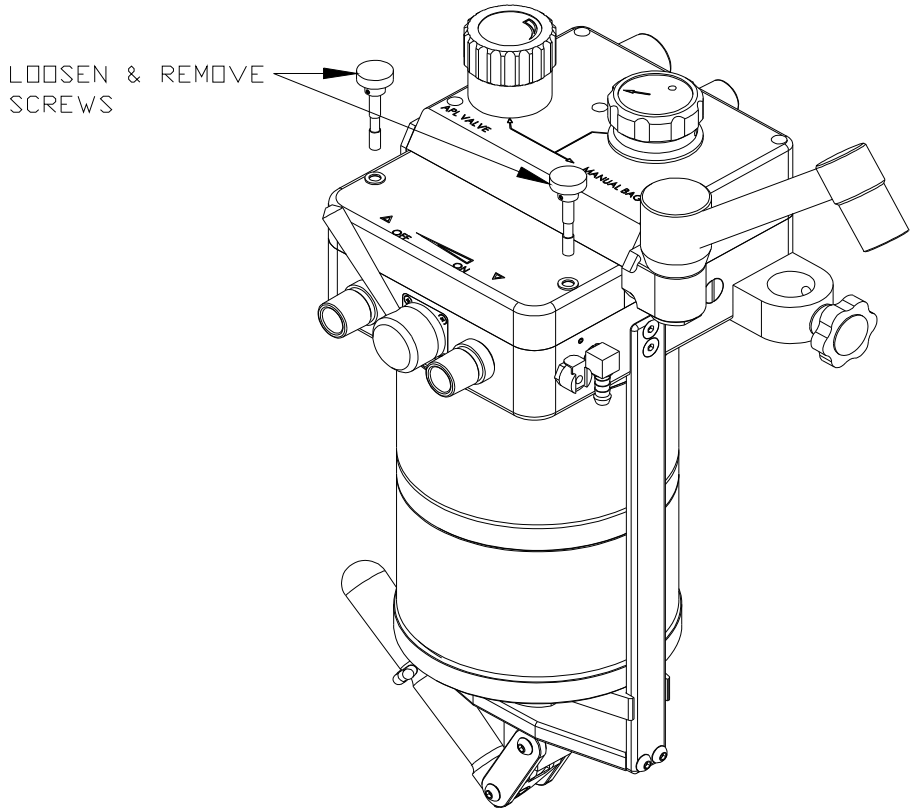
3.2.1 Method A.

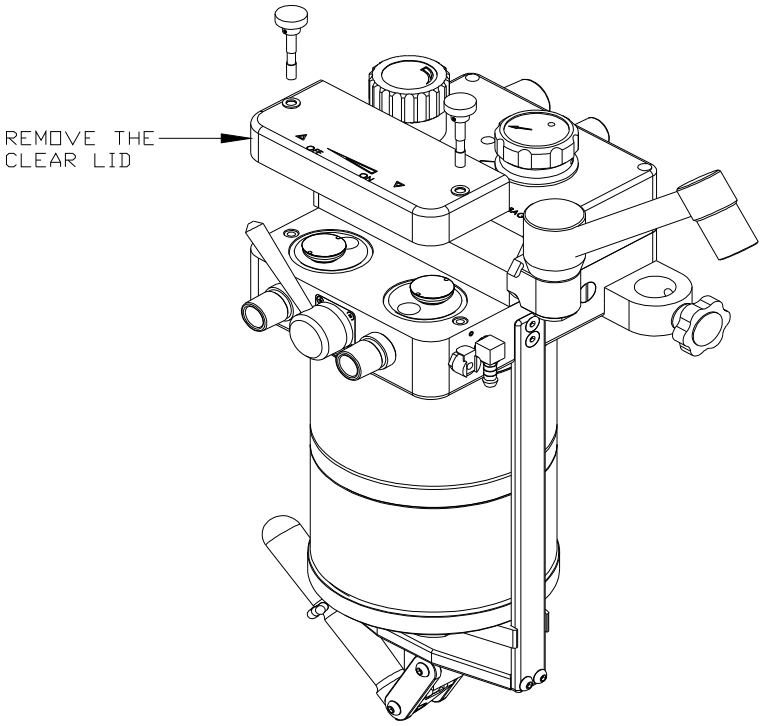
Wash with mild soap and warm water, or if contaminated the whole absorber may be gas sterilised. A disinfectant may be diluted with the water. First wipe the whole absorber with a damp sponge containing disinfectant, then remove the lid and shutter valves and wipe down.

3.2.2 Method B.

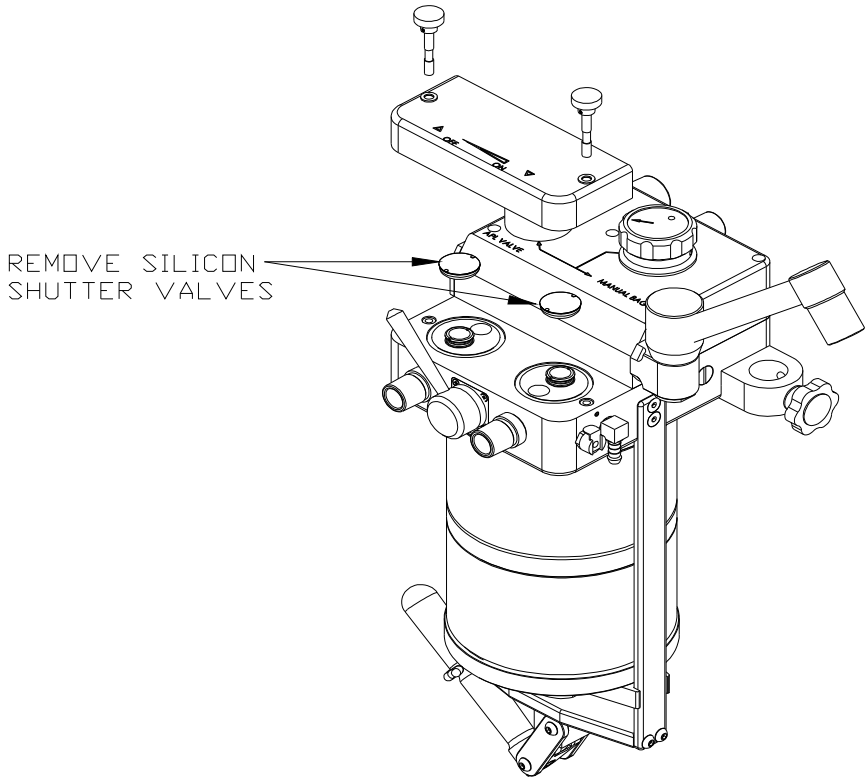
Dismantle the absorber.

1. Loosen the knurled screws and remove the clear lid.

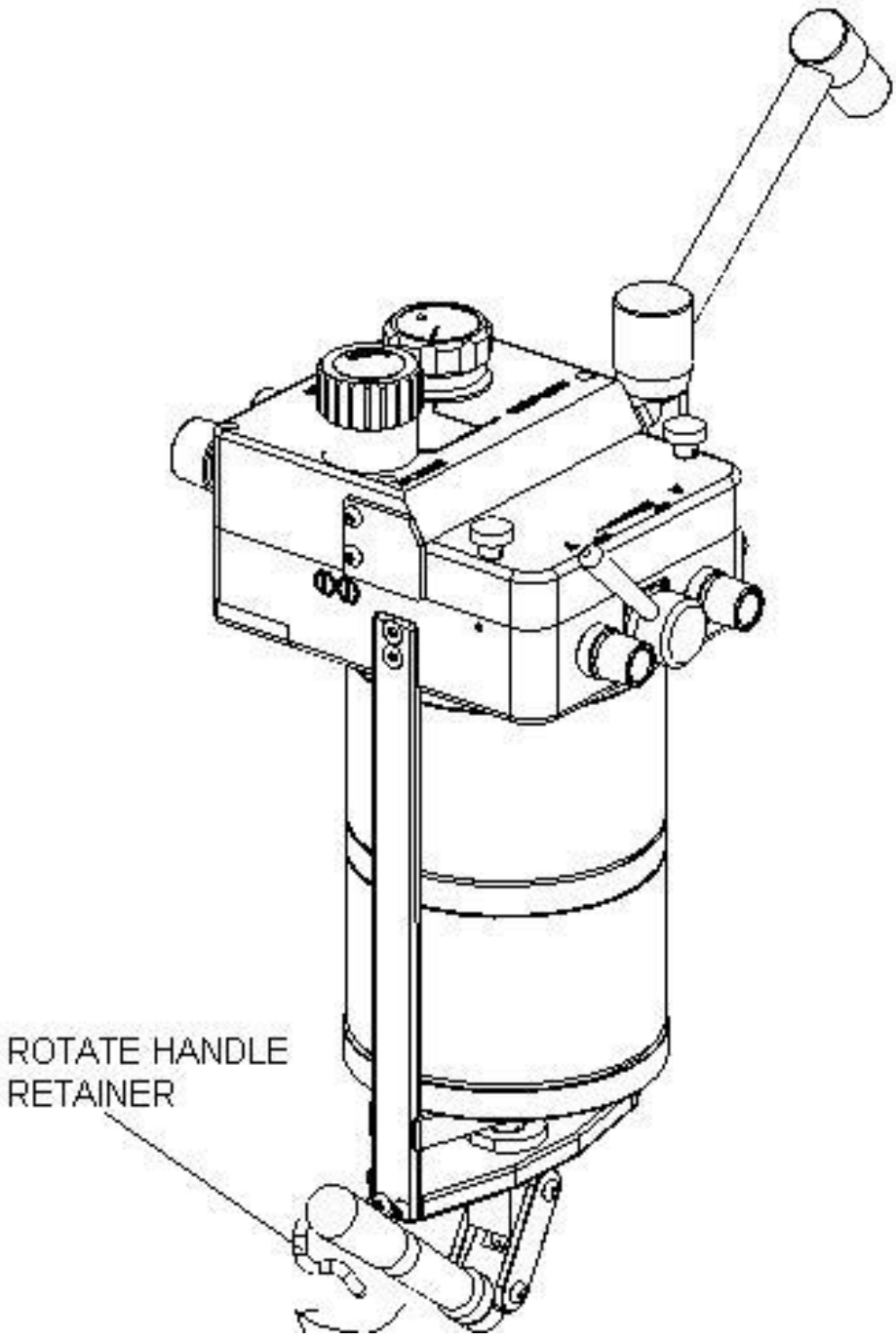




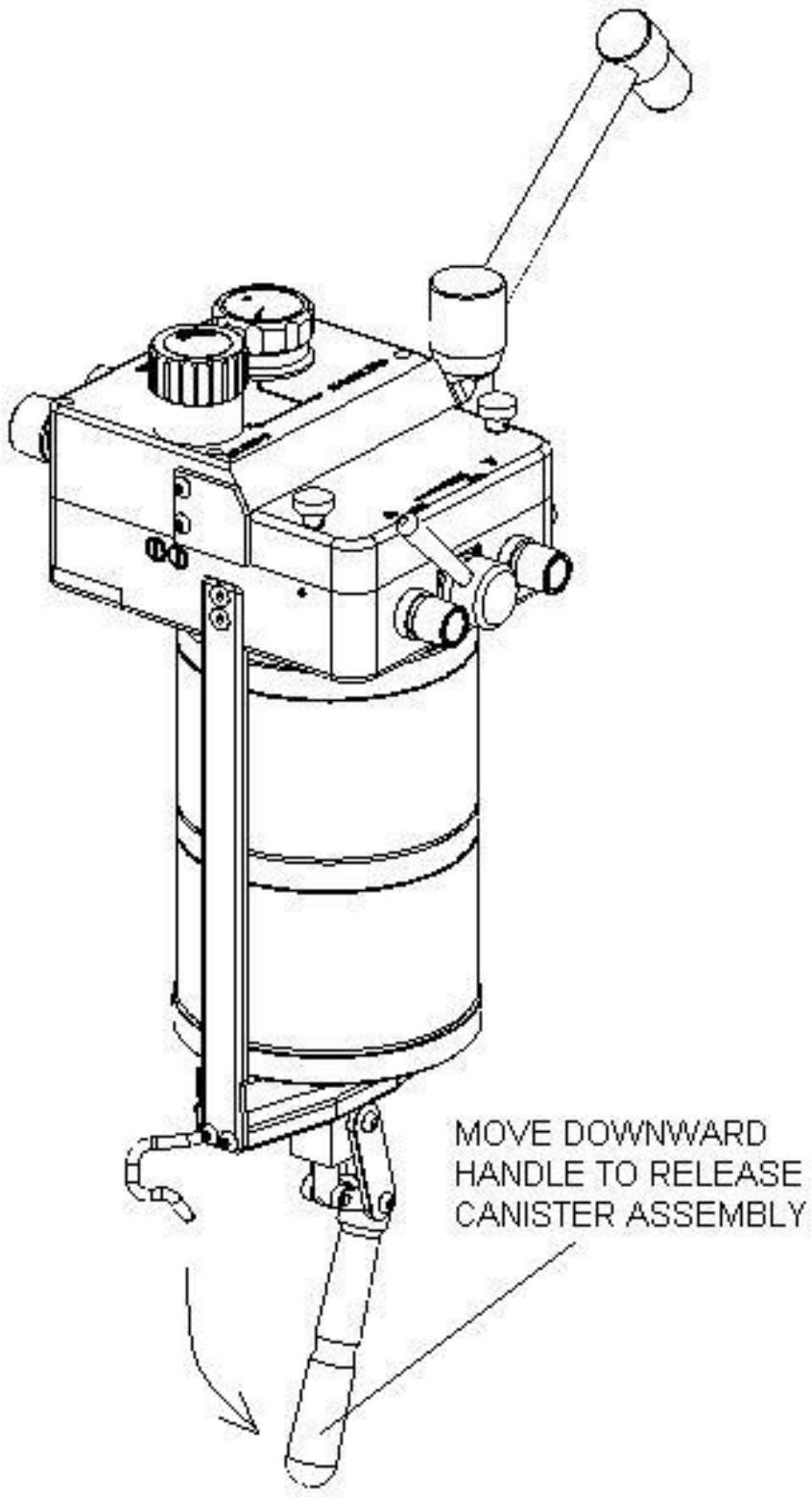
2. Remove the silicone shutters by gently lifting from the base NOT from the flaps.



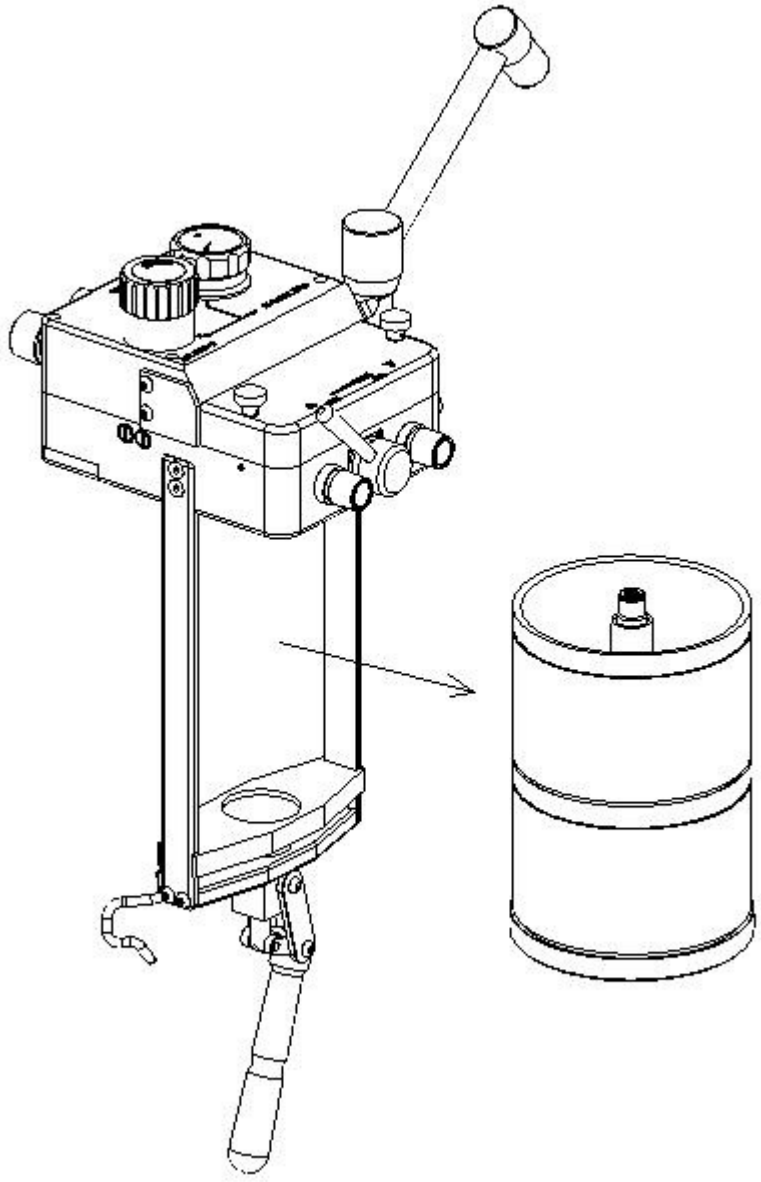
3. To release and remove the canister(s), undo the handle latch by turning side ways.



4. Push the release handle down to vertical until canisters are free.



5. Push canister(s) down then out of the cradle. Then dispose used soda lime (see Suppliers recommended procedure for disposal of soda lime).



6. Wash all the absorber components. Do **NOT** use caustic cleaning fluids.
7. The Canister(s) and silicone shutter can be autoclaved.
8. The Absorber head can be put through a washer at 80^{O}
9. Dry thoroughly before assembly, low pressure warm air should be passed trough the head by attaching a hose to the expiratory port of the absorber.