

# MENTOR

## TECHNICAL MANUAL



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## TRADEMARK NOTICE

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## Warnings, Cautions, & Notes

PAY SPECIAL ATTENTION TO INFORMATION PROVIDED IN WARNINGS, CAUTIONS AND NOTES THAT ARE ACCOMPANIED BY ONE OF THESE SYMBOLS:



A **WARNING** indicates a procedure or situation that, if not avoided, could result in serious injury or death to the user.



A **CAUTION** indicates any situation or technique that could cause damage to the product, and could subsequently result in injury to the user.



A **NOTE** is used to emphasize important points, tips and reminders.

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## Introduction

This manual provides factory prescribed procedures for the correct service and repair of the Aqua Lung or Apeks regulator products described in this manual. It is not intended to be used as an instructional manual for untrained personnel. The procedures outlined within this manual are to be performed only by personnel who have received Factory Authorized training through an Aqua Lung Service & Repair Seminar. If you do not completely understand all of the procedures outlined in this manual, contact Aqua Lung to speak directly with a Technical Advisor before proceeding any further.

## Scheduled Service

If the regulator is subjected to less than 50 dives per year, it is permissible to overhaul it every other year with an inspection procedure being performed on the "off" years. For example:

Year #1: Inspection

Year #2: Overhaul

Year #3: Inspection

Year #4: Overhaul, and so on.

Both Inspections and Overhauls need to be documented in the Annual Service & Inspection Record in the back of the Owner's Manual to keep the Limited Lifetime Warranty in effect. If a regulator is subjected to more than 50 dives per year, it should receive the complete overhaul.

## An Official Inspection consists of:

1. A pressurized immersion test of the entire unit to check for air leakage.
2. Checking for stable intermediate pressure that is within the acceptable range.
3. Checking for opening effort that is within the acceptable range.
4. A visual inspection of the filter for debris or discoloration.
5. A visual inspection of the exhaust valve to see that it is in good shape and that it's resting against a clean surface.
6. A visual inspection of the mouthpiece looking for tears or holes.
7. Checking that the hoses are secure in the hose clamps.

If a regulator fails item #1, 2, 3 or 4, the entire regulator should be overhauled. If a regulator fails 5, 6 or 7, it will be up to the technician's discretion whether or not a full overhaul is required.

## General Guidelines

1. In order to correctly perform the procedures outlined in this manual, it is important to follow each step exactly in the order given. Read over the entire manual to become familiar with all procedures before attempting to disassemble the product in this manual, and to learn which specialty tools and replacement parts will be required. Keep the manual open beside you for reference while performing each procedure. Do not rely on memory.
2. All service and repair should be carried out in a work area specifically set up and equipped for the task. Adequate lighting, cleanliness, and easy access to all required tools are essential for an efficient repair facility.
3. As the regulator is disassembled, reusable components should be segregated and not allowed to intermix with nonreusable parts or parts from other units. Delicate parts, including inlet fittings and crowns which contain critical sealing surfaces, must be protected and isolated from other parts to prevent damage during the cleaning procedure.

## General Guidelines (continued)

4. Use only genuine Aqua Lung parts provided in the overhaul parts kit for this product. DO NOT attempt to substitute an Aqua Lung part with another manufacturer's, regardless of any similarity in shape or size.
5. Do not attempt to reuse mandatory replacement parts under any circumstances, regardless of the amount of use the product has received since it was manufactured or last serviced.
6. When reassembling, it is important to follow every torque specification prescribed in this manual, using a calibrated torque wrench. Most parts are made of either marine brass or plastic, and can be permanently damaged by undue stress.

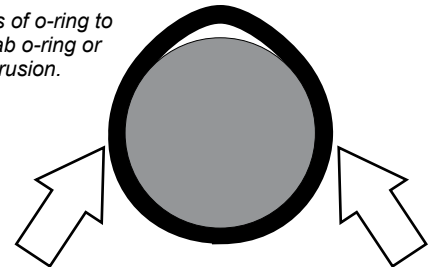
## General Conventions

Unless otherwise instructed, the following terminology and techniques are assumed:

1. When instructed to *remove*, *unscrew*, or *loosen* a threaded part, turn the part counterclockwise.
2. When instructed to *install*, *screw in*, or *tighten* a threaded part, turn the part clockwise.
3. When instructed to *remove* an o-ring, use the pinch method (see illustration below) if possible, or use a brass or plastic o-ring removal tool. Avoid using hardened steel picks, as they may damage the o-ring sealing surface. All o-rings that are removed are discarded and replaced with brand new o-rings.

### Pinch Method

*Press upwards on sides of o-ring to create a protrusion. Grab o-ring or insert o-ring tool at protrusion.*



4. The following acronyms are used throughout the manual: **MP** is Medium Pressure; **HP** is High Pressure; **LP** is Low Pressure.
5. Numbers in parentheses reference the key numbers on the exploded parts schematics. **For example**, in the statement, "...remove the o-ring (7) from the crown (8)...", the number 7 is the key number to the crown o-ring.

## DISASSEMBLY PROCEDURE



**NOTE:** Before performing any disassembly, refer to the exploded parts drawing, which references all mandatory replacement parts. These parts should be replaced with new, and must not be reused under any circumstances – regardless of the age of the regulator or how much use it has received since it was last serviced.



**CAUTION:** Use only a plastic or brass o-ring removal tool (p/n 944022) when removing o-rings to prevent damage to the sealing surface. Even a small scratch across an o-ring sealing surface could result in leakage. Once an o-ring sealing surface has been damaged, the part must be replaced with new. DO NOT use a dental pick or any other steel instrument.

### Breathing Hose Disassembly

1. Using a small slotted screwdriver and a 7/32" (5.5mm) open-end wrench, remove the two hose clamps (19). Next, remove the breathing hose assembly from the regulator housing.



2. Unscrew the connector ring (4) on each side of the mouthpiece and separate the mouthpiece body (8) from the hoses. With a small slotted screwdriver, remove each hose clamp (3). Remove the inlet connector (5) and outlet connector (11) from the hoses. Slide the connector rings (4) off the connectors.



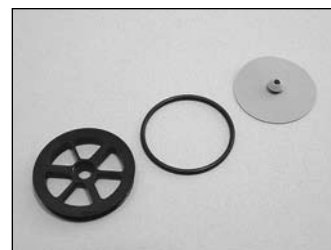
3. Remove the o-ring (6) from each connector. The preferred method is to pinch the o-ring between the thumb and forefinger to lift it off the connector then a pick can be slid underneath to remove it. Exercise caution not to scratch the o-ring groove. Both o-rings are replaced during a standard overhaul service.



4. Gently pull out the non return valve (7) from the inlet connector (5). This valve is replaced during a standard overhaul service.



5. Remove the exhalation valve support (9) from the outlet connector by prying it out with a fingernail or the edge of a credit card. Remove the outer o-ring (10) and the non return valve (7) from the exhalation valve support (9). Both the o-ring and the valve are replaced during a standard overhaul service.



6. With a pair of side cutters, cut the clamp (12) that holds the mouthpiece. Exercise caution not to cut the mouthpiece underneath. A new clamp comes in the overhaul service kit. Remove the mouthpiece assembly (13), lip cover (14) and strap (15) from the mouthpiece body (8).



### Regulator Housing Disassembly

1. With a medium flat blade screwdriver, remove the clamp screw (16). Gently stretch the clamp (17) open and remove it from the housing. Separate the inhalation box (25) and the exhalation box (20). Remove the large inhalation diaphragm (22). The diaphragm is normally replaced during standard overhaul service.



2. Remove the exhaust valve (21) from the exhalation box by folding it in half and gently pulling from its center stem. Carefully inspect the exhalation box for dents or excessive wear particularly on sealing/mating surfaces. Replace the box if found to have problems.



3. Place the nut spanner tool (p/n 7-0550) over the nut (23) that secures the Mentor body assembly to the inhalation box. Rotate the tool until the pins on the tool mate with the holes on the nut. Use a 3/4" wrench to turn the spanner tool counterclockwise to remove the nut. Remove the washer (24) located underneath the retaining nut.



4. Separate the regulator assembly from the inhalation box. Carefully inspect the inhalation box for dents or excessive wear particularly on sealing/mating surfaces. Replace the box if found to have problems.

5. Remove the large o-ring (42) from the underside of the body assembly (47).



6. Using a 4mm hex key, remove the two MP port plugs (45) and one HP port plug (43). Remove each of their associated o-rings (44 & 46).



7. Insert a vise mounting tool into the HP port. Securely mount the tool into a bench vise. Remove the yoke screw (52) and dust cap (51). Using the yoke nut socket (p/n 111001) and an extension, unscrew the yoke retaining nut (53). The yoke can now lift off.



**NOTE:** Never attach a CO<sub>2</sub> cartridge directly into a LP port. The neck of the CO<sub>2</sub> cartridge may break off, leaving the threads stuck in the regulator.

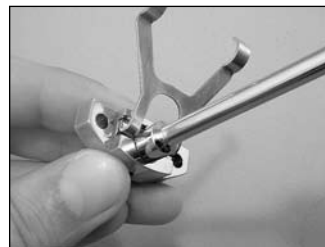
**WARNING:** DO NOT use a CO<sub>2</sub> cartridge which has not been discharged. Doing so may cause the cartridge to rupture, possibly resulting in serious personal injury.

### Second Stage Disassembly

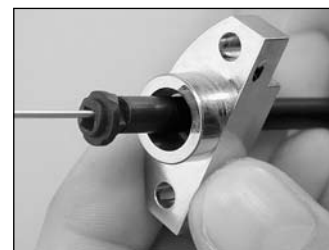
1. Turn the body assembly over. Using a 3mm hex key, remove the two screws (36) on either side of the lever. Remove the lever bracket assembly (37).



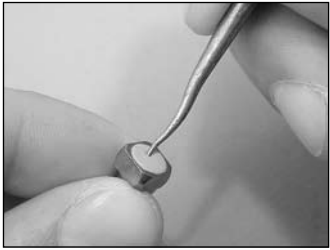
2. Using a 1/4" nut driver, remove the locknut (33). This will release a washer (34), lever (35), poppet (40) and spring (39).



3. Using the nylon dowel portion of the extraction tool, press the poppet bearing (38) out of the lever bracket.



4. Using a needle or sharp pick, pierce and remove the old LP seat (41) from the poppet.



5. Turn the body assembly over. Using a 4mm hex key, remove the adjustable nozzle (49). With the o-ring tool (pn 944022), carefully remove both of the o-rings (48) from the adjustable nozzle.



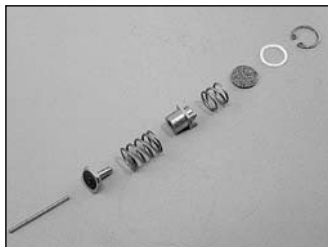
**CAUTION:** Care must be taken to protect the critical crown orifice machined into the end of the adjustable nozzle. Do not allow metal tools or other metal parts to come into contact with it.



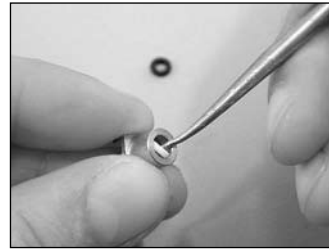
**WARNING:** To prevent eye injury and loss of parts, the circlip (65) must be removed carefully as the components beneath it are under spring tension. Place your thumb over the filter (63) while removing the circlip to keep the parts from forcefully ejecting.

### First Stage Disassembly

1. Using internal circlip pliers, carefully remove the circlip (64) from the inlet nozzle. Keep your thumb over the filter to prevent the parts from ejecting. Once the circlip is out, remove the filter washer (63), filter (62), short spring (58a), spring block (61), longer seat spring (58b), HP seat (57) and the pin (54).



2. Using a brass or plastic pick, remove the HP o-ring (59) and backup ring (60) from the spring block (61). Care must be exercised not to scratch the inside wall of the spring block. If a scratch does occur, the spring block must be replaced.



3. Attach the vise mounting tool into the HP port and mount the body into the vise with the adjusting screw (26) facing upward. Using a 8mm hex key, remove the adjustment screw. Lift out the antifriction washer (27) and main spring (28). Remove the spring retainer (29) with an adjustable or 28mm wrench. Lift out the spring pad (30).



4. Using a pick, remove the white thrust washer (31a).



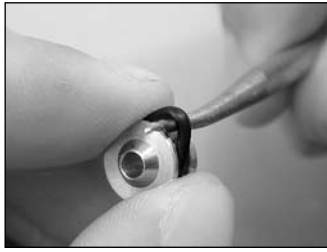
5. Using the extraction tool (PN 109437), insert the wire end through the crown orifice, engage the pin support (32) and push out the diaphragm (31b).



6. Insert the extraction tool diagonally through the center hole as shown in the picture and push out the crown orifice (55) into your hand or on to a soft mat. The critically machined crown surface must be protected at all times.



7. Using an o-ring pick, remove the o-ring (56) from the crown orifice.



## THIS ENDS DISASSEMBLY

Before starting reassembly, perform parts cleaning and lubrication in accordance with *Procedure A: Cleaning and Lubricating* (p. 17).

## REASSEMBLY PROCEDURE

### First Stage Reassembly

1. Install a new, lubricated o-ring (56) onto the crown orifice (55). Place the crown orifice on the seat extraction tool (pn 109437) with the conical sealing edge facing against the plastic part of the tool. Insert the crown orifice into the first stage inlet boss. Remove the tool, flip the first stage over, and use the plastic part of tool to press the crown all the way into place.



2. Install a new backup ring (60) into the HP spring block (61), followed by a new, lubricated o-ring (59).



3. Install the HP seat (57) into the first stage body, followed by the long seat spring (58b), HP spring block (61), and short spring (58a).



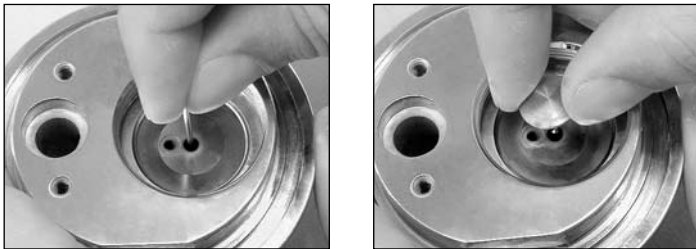
4. Place the Spring Block Assembly Guide (PN 111000), recessed side facing down, over the inlet boss. Place a new sintered filter (62), rough side facing upward, into the Spring Block Assembly Guide. Place the filter washer (63) over the filter. Place a new circlip (64), flat side facing upward, over the filter washer.



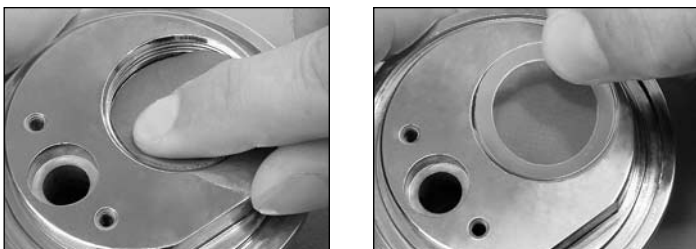
5. Using a 1/2" diameter dowel, apply downward force on the circlip until it locks into place. Slowly and carefully remove the Spring Block Assembly Guide and inspect the circlip to make sure it is properly secured and the filter washer is seated evenly under the circlip.



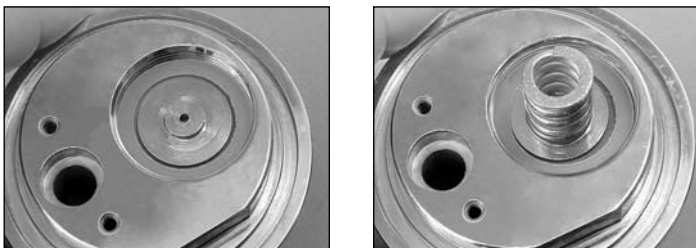
6. Turn the regulator over and drop the pin (54) through the center hole in the first-stage body. Make sure the pin is centered in the hole. Place the pin support (32) over the pin. Use your finger to compress the pin support a few times to ensure it has proper spring action.



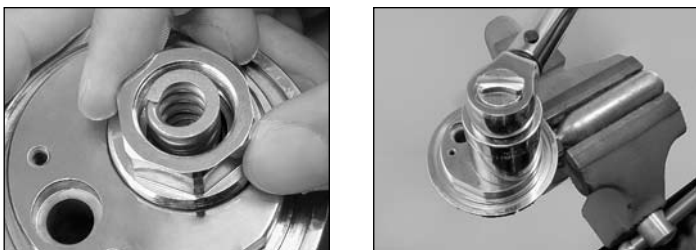
7. Press the diaphragm (31b) into place. Use your finger to ensure that the edges of the diaphragm are seated evenly. Place the thrust washer (31a) over the diaphragm, making sure it is seated flat against the diaphragm.



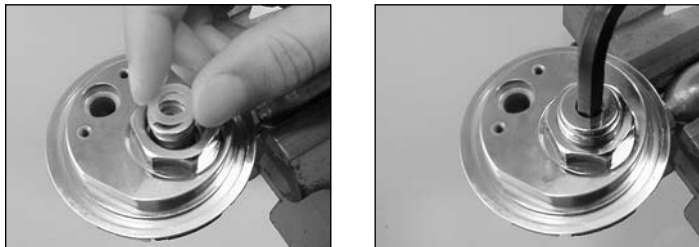
8. Place the spring pad (30) in the center of the diaphragm and place the main spring (28) onto the spring pad.



9. Thread the spring retainer (29) into the body. Secure the body in a vise using a vise mounting tool. Using a 28mm socket attached to a ft/lb torque wrench, tighten the spring retainer to  $25 \pm 2$  ft/lbs.



10. Place the friction washer (27) atop the spring. Thread the adjustment screw (26) into the spring retainer (29). Using an 8mm hex key, tighten the adjustment screw until no threads are visible.



## Second Stage Reassembly

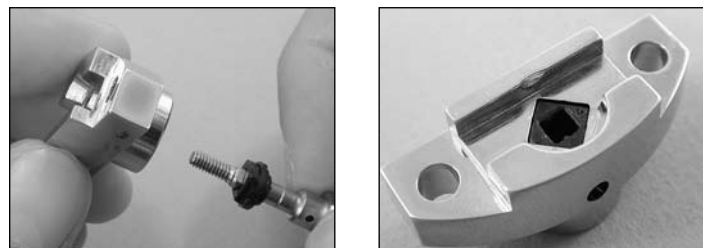
1. Place two new lubricated o-rings (48) onto the adjustable nozzle (49). Press the nozzle into the body. Using a 4mm hex key, tighten the nozzle until it is flush with the body.



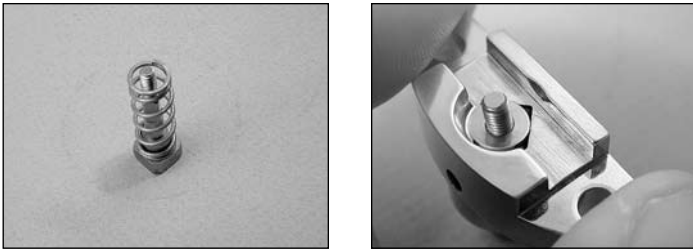
2. Press a new LP seat (41), smooth side facing outward, into the face of the poppet (40)



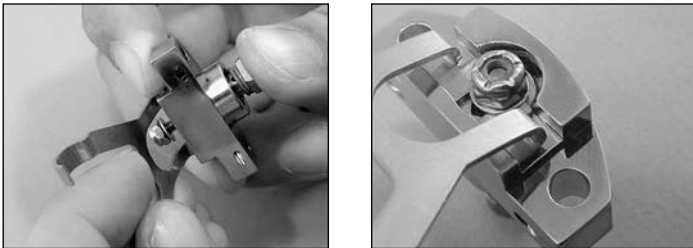
3. Place the poppet bearing (38), squared side facing upward, onto the poppet. Using the poppet as an installation tool, guide the poppet bearing into the lever bracket (37). Press the poppet bearing into place, making sure it is flush with the lever support. Remove the poppet.



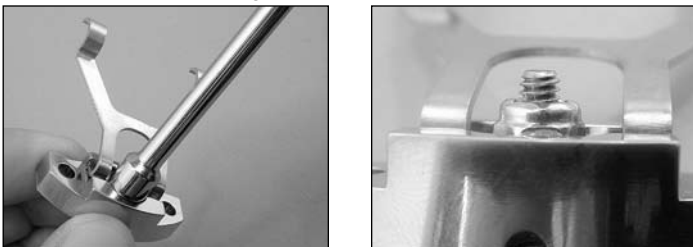
4. Place the spring (39) over the poppet shaft. Place the lever bracket over the poppet and compress the poppet spring to fully expose the poppet threads. Place the washer (34) over the poppet threads, then thread the locknut (33) onto the poppet until the first thread is engaged.



15. Using your thumb, compress the poppet. Tilt the lever assembly so the washer falls against the locknut. Place the feet of the lever into the lever support such that the lever legs are over the flat side of the lever support.



16. Using a 1/4" nutdriver, tighten the locknut until three full threads are showing.



17. Secure the lever support to the body with two screws (36). Tighten the screws using a 3mm hex key (exact torque of 12±2 in/lbs).



18. Place the yoke (50) over the first stage inlet boss. Thread the retaining nut (53), wrench flats facing upward, onto the inlet boss. Secure the first stage in a vise using the vise mounting tool (pn 5116230).



19. Place the retaining nut socket (PN 111001) over the retaining nut. Attach a socket extension to a ft/lb torque wrench. Pass extension through the top of the yoke and attach it to the socket. Tighten the retaining nut to 20±2 ft/lbs. Remove the first stage from the vise and remove the vise mounting tool.



20. Install the dust cap (51) onto the yoke screw (52) and thread the yoke screw into the yoke.



21. Install new, lubricated o-rings on all the port plugs. Install the HP port plug and only one of the LP port plugs, leaving one port open.



**! WARNING:** Before adjusting the MP in the next step, make sure your test pressure gauge is equipped with an overpressure relief valve. If the gauge does not have an overpressure relief, you will need to attach a second stage to the other low pressure port to act as a pressure relief in case of a high pressure failure. Failure to have an overpressure relief may lead to injury.

22. Attach a MP test gauge (PN 111610) to the open LP port. Attach the regulator to a fully charged cylinder (2500+ psi). Slowly open the cylinder valve to pressurize the regulator. Using an 8mm hex key, turn the adjustment screw to set the medium pressure to  $135\pm 5$  psi. Turn clockwise to increase pressure, counterclockwise to decrease pressure. With every quarter turn, cycle the regulator with the lever or bleed screw.



23. Using a 1/4" nutdriver, turn the locknut clockwise (tighten) until the regulator starts to leak air. Turn the locknut counterclockwise (loosen) just until the leak stops, then go an additional 1/4 turn counterclockwise.



24. Install the remaining port plug(s).



2. Place the washer (24) over the regulator body, against the inside of the inhalation box. Thread the retaining nut (23) onto the body. Place the nut spanner tool (PN 7-0550) over the retaining nut. Rotate the tool until the pins on the tool mate with the holes in the retaining nut. With a 3/4" socket attached to an in/lb torque wrench, tighten the retaining nut to  $40\pm 2$  in/lbs.



3. Pass the stem of a new exhaust valve (21) through the center hole located on the inside of exhalation box (20). Using your thumb, press on the center of the valve until the barb passes through the hole. Lift up on the edge of the valve to make sure the barb went all the way through and the valve is secure.



4. Install the demand diaphragm (22) into the inhalation box with the diaphragm strike plate facing the lever.



## Regulator Housing Reassembly

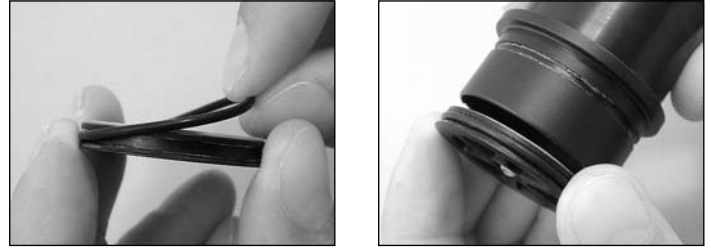
1. Install the large o-ring (42) into the regulator body (47). Pass the regulator body through the front of the inhalation box (25). The hole in the inhalation box is keyed, so the body will only go in one way.



5. Place the exhalation box onto the inhalation box such that the two hose attachments are 120° apart. While holding the boxes together with your hand, put the clamp (17) in place with the screw holes located at the top-center. Thread the screw (16) into the clamp ring and tighten with a medium blade screwdriver.



3. Install a new, lubricated o-ring (10) onto the valve support. With the non return valve facing inward, insert the valve support into the outlet connector (11). Install a new, lubricated o-ring (6) onto the outlet connector.



4. Pass the connector ring (4), threaded side first, over the open end of the inlet connector. Insert the inlet connector into the wide end of one of the rubber corrugated hoses (18) as far as it will go. Repeat this step for the other connector.



5. Place the small hex nut (2) into the hex shaped hole on the hose clamp (3). Wrap the clamp around the rubber hose and pull it together using the clamp installation tool (PN 7-0543) as shown in the picture. Note: This tool is not required, but it makes the job much easier. Insert the screw (1) and tighten with a medium blade screwdriver. Repeat this step for the other hose.

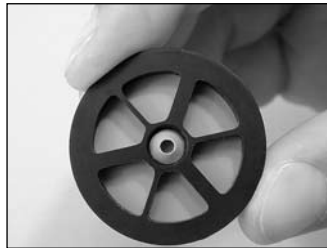


## Moupiece/Hose Reassembly

1. Insert non return valve (7) into the inlet connector (5). Press firmly on the center of the check valve so the barb goes through the hole. Look into the connector to ensure the barb is all the way through and the check valve is secure. Place a new, lubricated o-ring (6) on the connector.



2. Examining the valve support (9), you will notice that one side is flat, the other side is slightly concave. Insert the other non return valve into the valve support so the valve sits against the concave side. Firmly press on the center of the valve until the barb is all the way through the hole. Visually inspect the barb to make sure it is completely through the hole.



6. Attach the regulator to a charged cylinder with the hose outlets facing upward. Slide the rubber hoses onto the inhalation and exhalation outlets on the first stage body as shown in the picture. Install the hose clamps (19) into the grooves located at the end of the rubber hose.



7. Insert the screw (1) through the clamp holes. Thread the hex nut (2) onto the screw. While holding the hex nut with a 7/32" (5.5mm) wrench, tighten the screw with a small blade screwdriver.



8. Install the mouthpiece (13) onto the mouthpiece body (8). Secure the mouthpiece with a clamp (12). The locking tab of the tie wrap clamp should be position on the side of the mouthpiece. Trim the clamp with side cutters.



9. Squeeze the mouthpiece together and slide the lip shield (14) into place.



10. Install the neck strap (15) through the buckles on each side of the mouthpiece as shown in the picture.




11. Attach the regulator to a cylinder with the rubber hoses coming off the top of the regulator. Stand the cylinder upright. Attach the mouthpiece body to the two hoses with the mouthpiece facing upward. Tighten the two connectors to the body.



**THIS ENDS REASSEMBLY**

**Table 1: Troubleshooting Guide**

SYMPTOM	POSSIBLE CAUSE	TREATMENT
<b>High pressure creep (also called second stage leaks)</b>	1. The HP seat (57) is worn or damaged.	1. Replace HP seat
	2. The crown (55) is damaged.	2. Replace crown
	3. The spring block (61) internal wall is damaged.	3. Replace spring block
	4. The o-ring (59) is worn or damaged.	4. Replace o-ring
<b>External Air Leak (Immersion Test)</b>	1. The diaphragm (31) is worn or damaged.	1. Replace diaphragm
	2. Diaphragm sealing area is damaged.	2. Replace body
	3. Port plug o-rings (44 & 46) are worn or damaged.	3. Replace o-rings
<b>Second Stage Leaks</b>	1. HP leaks.	1. See High Pressure Creep Symptoms
	2. The o-rings (48) are worn or damaged.	2. Replace o-rings
	3. The o-ring (48) sealing surface is damaged.	3. Replace adjustable nozzle
	4. The adjustable nozzle (49) is damaged.	4. Replace adjustable nozzle
	5. LP seat (42) is worn or damage.	5. Replace LP seat
	6. MP is set incorrectly.	6. Set MP to 135 ±5 psi
	7. Locknut (33) is tightened too much.	7. Readjust locknut
	8. Nozzle is backed out too far.	8. Set nozzle flush with cone
<b>Significant Breathing Resistance</b>	1. Filter (62) is clogged	1. Replace filter
	2. Lever (35) is bent.	2. Replace lever
	3. Lever (35) is set too low.	3. Readjust locknut
	4. Insufficient MP.	4. Readjust MP
	5. Inhalation/exhalation valves are installed incorrectly or hoses are installed on wrong outlets.	5. Check valve/hose installation
	6. Nozzle (49) is in too far.	6. Set nozzle flush with cone
	7. Locknut (33) is backed out too far.	7. Readjust locknut

 **NOTE:** This is a partial list of possible problems and recommended treatments. For more information, refer to the second-stage troubleshooting guide, or contact Aqua Lung Technical Services Department for assistance with problems not described here.















 **CAUTION:** Recommended treatments which require disassembly of the regulator must be performed during a complete overhaul, according to the prescribed procedures for scheduled, annual service. Do not attempt to perform partial service.

Table 2: List of Tools and Service Kits

PART #	DESCRIPTION	APPLICATION
111610	MP Gauge 0-400 psi 	Checking medium pressure
N/A	Yoke Nut Socket 	Inlet fitting
N/A	3" Socket Extension 	Use with inlet fitting and spring retainer sockets to apply proper torque
111000	Spring Block Assembly Guide 	Assembly of HP components
N/A	1/2" Dowel 	Assembly of HP components
944022	O-ring Tool 	Removing and installation of o-rings
111100	Reversible Circlip Pliers 	Removing circlip (5)
109437	Seat Extraction Tool 	Crown (14) assembly/disassembly
5116230	Vise Mounting Tool 	For holding first stage in vise
9-45171	Side Cutters 	Mouthpiece clamp

**Table 2: List of Tools and Service Kits (cont.)**

PART #	DESCRIPTION	APPLICATION
N/A	1/4" Nutdriver 	Second Stage disassembly/reassembly/adjusting
N/A	Small/Medium Blade Screwdriver 	Various
N/A	Bottle Brush 2 3/4" Diameter 	Cleaning inside of corrugated hoses
7-0543	Clamp Installation Tool	Hose clamps
7-0550	Nut Spanner Tool	Body retaining nut
N/A	Torque Wrench ft/lbs and in/lbs	To apply torque to inlet fitting, retaining nut and spring retainer
9-43001	3/4" Socket	Used with nut spanner tool removal/installation
9-44584	3/4" Wrench	Used with nut spanner tool removal/installation
N/A	28mm Wrench (or 12" adjustable) & Socket	Spring retainer
9-47436	Phillips Screwdriver #2	Various
9-44363	3/8" Drive Flex Handle	Socket
N/A	7/32" (5.5mm) Wrench	Hose clamps
N/A	Hex Key (3mm, 4mm, 8mm)	Lever assembly, port plugs, adjustable crown, MP adjustment
108560	Mentor Service Kit	



**Table 3: Torque Specifications**

PART #	DESCRIPTION / KEY ITEM #	TORQUE
716021	Spring Retainer (29)	25±2 ft/lbs
716018	Retaining Nut (23)	40±2 in/lbs
124602	Yoke Nut (53)	20±2 ft/lbs
716038	Lever Support Screw (36)	12±2 in/lbs

**Table 4: Bench Test Specifications**

TEST	CONDITION	SPECIFICATION
Leak Test	Inlet 2,500-3,000 (±100) psi	No leaks allowed
MP	Inlet 2,500-3,000 (±100) psi	135±5 psi
MP creep	Inlet 2,500-3,000 (±100) psi	5 psi max between 5 to 15 seconds after cycling regulator (purge)
Opening Effort	Inlet 2,500-3,000 (±100) psi, MP 135±5 psi	±0.7 ±0.2 inch H <sub>2</sub> O

Table 5: Recommended Cleaners and Lubricants

LUBRICANT/CLEANER	APPLICATION	SOURCE
Christo-Lube MCG 111	All o-rings	Aqua Lung, PN 820466, or Lubrication Technologies 310 Morton Street Jackson, OH 45640 (800) 477-8704
 <b>CAUTION:</b> Silicone rubber requires no lubrication or preservative treatment. DO NOT apply grease or spray to silicone rubber parts. Doing so may cause a chemical breakdown and premature deterioration of the material.		
Oakite #31	Acid bath for reusable stainless steel and brass parts.	Oakite Products, Inc. 50 Valley Road Berkeley Heights, NJ 07922
 <b>CAUTION:</b> Do not use muriatic acid for the cleaning of any parts. Even if strongly diluted, muriatic acid can harm chrome plating and may leave a residue that is harmful to o-ring seals and other parts.		
White distilled vinegar	Acid bath for reusable stainless steel and brass parts.	"Household" grade
Liquid dishwashing detergent (diluted with warm water)	Degreaser for brass and stainless steel parts; general cleaning solution for plastic and rubber	"Household" grade

## Procedure A: Cleaning and Lubricating

### Cleaning Brass and Stainless Steel Parts

1. Preclean in warm, soapy water\* using a nylon bristle tooth brush.
2. Thoroughly clean parts in an ultrasonic cleaner filled with soapy water. If there are stubborn deposits, household white distilled vinegar (acetic acid) in an ultrasonic cleaner will work well. DO NOT place plastic, rubber, silicone or anodized aluminum parts in vinegar.
3. Remove parts from the ultrasonic cleaner and rinse with fresh water. If tap water is extremely “hard,” place the parts in a bath of distilled water to prevent any mineral residue. Agitate lightly, and allow to soak for 5-10 minutes. Remove and blow dry with low pressure (25 psi) filtered air, and inspect closely to ensure proper cleaning and like-new condition.

### Cleaning Anodized Aluminum, Plastic & Rubber Parts

Anodized aluminum parts and parts made of plastic or rubber, such as box bottoms, box tops, dust caps, etc., may be soaked and cleaned in a solution of warm water mixed with mild dish soap. Use only a soft nylon toothbrush to scrub away any deposits. Rinse in fresh water and thoroughly blow dry, using low pressure filtered air.



**CAUTION:** Do not place plastic and rubber parts in acid solutions. Doing so may alter the physical properties of the component, causing it to prematurely degrade and/or break.

### Cleaning Hoses

1. Hose fittings: Ultrasonically clean with soapy water\*; vinegar OK on tough corrosion
2. Run soapy water through hose if needed
3. Thoroughly rinse with fresh water
4. Blow out hose before installing

### Cleaning Corrugated Hoses

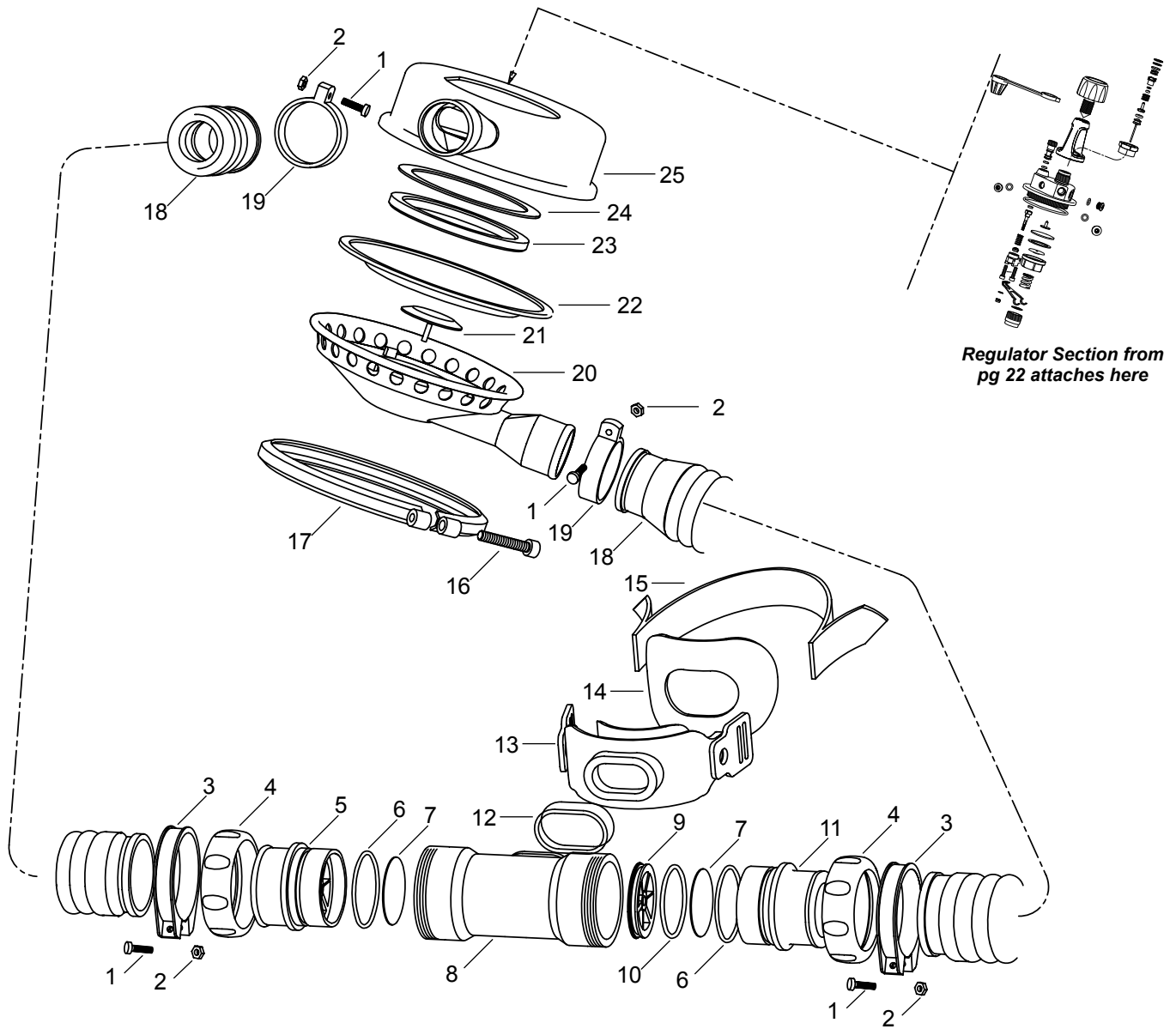
Clean using a mixture of liquid dishwashing detergent and hot water. Use a 2 3/4” diameter bottle-brush with nylon bristles to clean the inside of the hoses. Rinse in fresh water and hang to air dry completely.

### Lubrication and Dressing

All o-rings should be lubricated with Christo-Lube® MCG-111. Dress the o-rings with a very light film of grease, and remove any visible excess by running the o-ring between thumb and forefinger. Avoid applying excessive amounts of Christo-Lube grease, as this will attract particulate matter that may cause damage to the o-ring.

\*Soapy water is defined as “household” grade liquid dishwashing detergent diluted in warm water.

### Mentor Exploded View



**Key # .Part # Description**

**Key # .Part # Description**

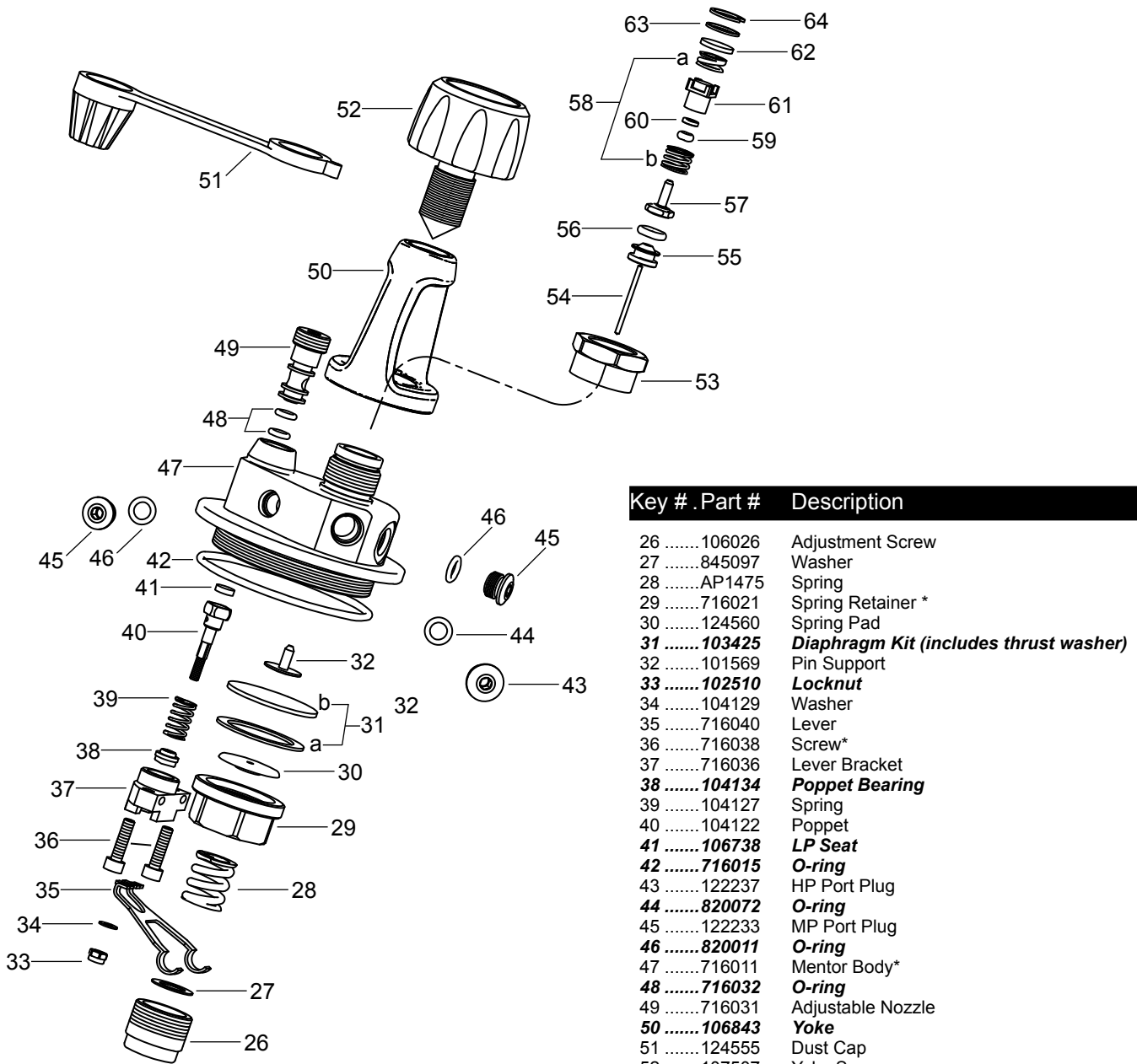
- .....108560 Standard Overhaul Kit
- .....108565 Shop Spares Kit
- 1 .....101093 Screw
- 2 .....101092 Nut
- 3 .....101036 Clamp
- 4 .....467508 Connector Ring
- 5 .....467506 Inlet Connector
- 6 .....820095 O-ring**
- 7 .....101031 Non Return Valve**
- 8 .....716051 Mouthpiece Body \*
- 9 .....467507 Valve Support
- 10 .....820065 O-ring**
- 11 .....467505 Outlet Connector
- 12 .....104913 Clamp**

- 13 .....101037 Mouthpiece Assembly
- 14 .....101034 Lip Cover
- 15 .....101245 Strap
- 16 .....716154 Screw
- 17 .....716151 Clamp
- 18 .....454089 Corrugated Hose
- 19 .....446440 Clamp
- 20 .....716101 Exhalation Box
- 21 .....107822 Exhaust Valve**
- 22 .....716060 Diaphragm**
- 23 .....716018 Nut \*
- 24 .....716016 Washer
- 25 .....716121 Inhalation Box

Part numbers in **BOLD ITALICS** indicate standard overhaul replacement part.

\* indicates limited part availability

### Mentor Exploded View



Key #	Part #	Description
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26	.....106026	Adjustment Screw
27	.....845097	Washer
28	.....AP1475	Spring
29	.....716021	Spring Retainer *
30	.....124560	Spring Pad
<b>31</b>	..... <b>103425</b>	<b>Diaphragm Kit (includes thrust washer)</b>
32	.....101569	Pin Support
<b>33</b>	..... <b>102510</b>	<b>Locknut</b>
34	.....104129	Washer
35	.....716040	Lever
36	.....716038	Screw*
37	.....716036	Lever Bracket
<b>38</b>	..... <b>104134</b>	<b>Poppet Bearing</b>
39	.....104127	Spring
40	.....104122	Poppet
<b>41</b>	..... <b>106738</b>	<b>LP Seat</b>
<b>42</b>	..... <b>716015</b>	<b>O-ring</b>
43	.....122237	HP Port Plug
<b>44</b>	..... <b>820072</b>	<b>O-ring</b>
45	.....122233	MP Port Plug
<b>46</b>	..... <b>820011</b>	<b>O-ring</b>
47	.....716011	Mentor Body*
<b>48</b>	..... <b>716032</b>	<b>O-ring</b>
49	.....716031	Adjustable Nozzle
<b>50</b>	..... <b>106843</b>	<b>Yoke</b>
51	.....124555	Dust Cap
52	.....107507	Yoke Screw
53	.....103162	Yoke Retaining Nut
54	.....102002	Pin
55	.....122224	HP Crown
<b>56</b>	..... <b>820038</b>	<b>O-ring</b>
<b>57</b>	..... <b>105940</b>	<b>Seat</b>
58	.....101509	Spring Kit (includes both springs 58a, 58b)
<b>59</b>	..... <b>820080</b>	<b>O-ring</b>
<b>60</b>	..... <b>828005</b>	<b>Backup Ring</b>
61	.....105324	Spring Block
<b>62</b>	..... <b>105106</b>	<b>Filter</b>
<b>63</b>	..... <b>845095</b>	<b>Washer</b>
64	.....863051	Circlip

Part numbers in **BOLD ITALICS** indicate standard overhaul replacement part.

\* indicates limited part availability



## WARRANTY INFORMATION

All warranty transactions must be accompanied by proof of original purchase from an Aqua Lung® authorized dealer/agent. Be sure to save your sales receipt and present it whenever returning your vest for warranty service.

### **The Aqua Lung One Year Limited Warranty™**

Aqua Lung America warrants to the original purchaser for a period of one year from the date of purchase that the product will be free from defects in material and workmanship; provided that it receives normal use, proper care and prescribed dealer service subject to those restrictions stated below. This limited warranty is extended only to the original purchaser for purchases made from an authorized Aqua Lung dealer and is not transferable. This warranty is limited to repair or replacement only at the discretion of Aqua Lung America, Inc.



**WARNING:** It is dangerous for untrained and uncertified persons to use the equipment covered by this warranty. Therefore, use of these products by an untrained person renders any and all warranties null and void. Use of SCUBA equipment by anyone who is not a certified diver or has not received training through a recognized certification agency, shall render void all warranties, expressed or implied.

**ALL WARRANTIES, INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED IN DURATION TO A PERIOD ENDING ONE YEAR FROM THE DATE OF PURCHASE.**

**AQUA LUNG AMERICA DISCLAIMS AND EXCLUDES ANY LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. SOME STATES DO NOT ALLOW EXCLUSIONS OF LIABILITY, SO THIS MAY NOT APPLY TO YOU.**

### ***Restrictions***

The following restrictions apply to this warranty:

- This warranty extends to inflator parts and to the seams of the CSAV bladder. Factory prescribed annual service by a trained technician is required.
- This warranty does not extend to abrasion, punctures, tears of the bladder or seam separation caused by chemical attack; including prolonged exposure to chlorine.
- This warranty does not extend to damages caused by improper use, improper maintenance, neglect, unauthorized repairs, modifications, accidents, fire or casualty.
- Cosmetic damage, such as scratches, fraying and nicks are not covered by this warranty.
- This warranty covers products purchased in the United States. For warranties that may apply elsewhere, please contact your local representative.
- Failure to meet any of the above requirements will render the warranty null and void.



# MENTOR

TECHNICAL MANUAL

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