

TECHNICAL MAINTENANCE MANUAL



HOSE INSPECTION & CLEANING

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Hose Inspection & Cleaning

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.

WARNINGS, CAUTIONS, & NOTES

Pay special attention to information provided in warnings, cautions and notes that are accompanied by one of these symbols:

 **WARNINGS** indicate a procedure or situation that may result in serious injury or death if instructions are not followed correctly.

 **CAUTIONS** indicate any situation or technique that will result in potential damage to the product, or render the product unsafe if instructions are not followed correctly.

 **NOTES** are used to emphasize important points, tips and reminders.

GENERAL CONVENTIONS

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

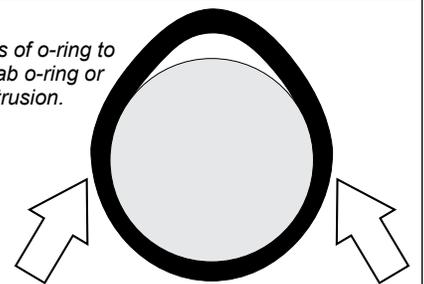
1. When instructed to **remove**, **unscrew**, or **loosen** a threaded part, turn the part counterclockwise.
2. When instructed to **install**, **screw in**, or **tighten** a threaded part, turn the part clockwise.
3. When instructed to **remove** an o-ring, use the pinch method (see illustration below) 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.

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.
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.
7. In order to make the regulator compatible with nitrox up to 40% O₂ (EAN40), the regulator must be properly cleaned lubricated and assembled using genuine Aqua Lung® or Apeks replacement parts. In addition, assembly must be carried out in a clean environment using powderless, latex gloves or equivalent. For more detailed information, be sure to read: **Procedure A: Cleaning and Lubrication** at the back of this manual.

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.

INSPECTION PROCEDURE

WARNING: All flexible hoses currently produced are perishable over time. While hoses are very durable, they can be damaged and do wear out. During the service or annual inspection of the regulator, all hoses must be thoroughly inspected and maintained following the recommendations listed here. **HOSE INSPECTION "MUST" BE PERFORMED** at least once a year during annual inspection or maintenance under normal operating conditions.

AN OFFICIAL HOSE INSPECTION CONSISTS OF THE FOLLOWING:

1 Pull back the hose protectors and look for corrosion or dents on the ferrule, crimp on the ferrule should look clean and precise. The external hose liner diameter shall not protrude past the ferrule.



2 Examine the length of the hose looking for blisters, hernias, heavy abrasion or cuts, excessive scratching, broken or frayed nylon braiding.



CAUTION: If an MP or HP hose displays any of the above issues, Aqua Lung and Apeks recommend the hose be exchanged for a new hose during the service.

CLEANING PROCEDURE

NOTE: All the O-rings (O-rings of the hose ends, and O-rings of the HP Spool for high pressure hose) must be changed during the routine maintenance every 2 years OR when leaks appear between the regulator and hose.

NOTE: Before performing any disassembly, confirm you have the necessary required service parts. These parts must not be reused under any circumstances - regardless of the age of the hose or how much use it has received since it was last serviced.

CAUTION: Use only a plastic or brass o-ring removal tool 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.

1 Remove the o-ring from inside the hose swivel. Exercise caution not to scratch the o-ring groove. Remove the o-ring from the male end of the hose.



2 To perform complete cleaning, you will need to use brushes and swabs: soft bristles (nylon bristle brush) and stiff bristles (brass) for when corrosion is evident. Also, a soapy hot water bath is necessary to remove any traces of grease.

CAUTION: Tools and basin used must be clean before performing the cleaning.



WARNING: Nitrox/O2 high pressure hoses "MUST NOT BE CLEANED". The flow restricting nozzle on the male end of the hose can't be cleaned and won't allow a good rinsing of the hose. If the high pressure hose is dirty, it must be replaced with a new one.

3 Brush the outside of both hose ends.



4 Brush the inside of both hose ends with a swab.



5 Clean the ends of the hose with hot soapy water in order to remove dirt residues and grease. Rinse the ends of the hose under running water. Rinse the inside of the hose by circulating tap water through it.



WARNING: Nitrox/O₂ medium pressure hose cleaning:
 – The soapy water **“MUST”** be replaced by an oxygen cleaner solution.
 – The rinse water **“MUST”** be demineralized water.

WARNING: Nitrox/O₂ after brushing/cleaning – If any damage to the plating on the fittings is found; the hose **“MUST BE REPLACED”**.

6 Dry the inside and the outside of the hose using an air blower.



WARNING: Nitrox/O₂ medium pressure hose cleaning:
 – The air supply for the air blower **“MUST be CLEAN AIR”** (oxygen compatible air).

7 Follow *Table 1: Recommended Cleaners & Lubricants* and *Table 2: Lubrication Procedures*. Install O-rings at the ends of the hose.

THIS CONCLUDES THE INSPECTION & CLEANING

TABLE 1: RECOMMENDED CLEANERS & LUBRICANTS

LUBRICANT/CLEANER	APPLICATION	SOURCE
Christolube MCG 111	All O-rings	Lubrication Technologies 310 Morton Street Jackson, OH 45640, USA (800) 477-8704
PerfluoroLube 20/1		Performance Fluids Ste 101 Lomeshaye Business Park Turner rd. Nelson Lancashire BBP 7DR
<p>CAUTION: 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.</p>		
Oxygen Compatible Solution	Nitrox/ O ₂ Cleaning	As per Training
Promoclean TP108		INVENTEC PERFORMANCE CHEMICALS SA. 20, Rue de bourgogne BP 211 69802 SAINT-PRIEST cedex
Janitol Plus		JOHN LAWSON DIST. SCOTSHAW BROOK HOUSE BRANCH ROAD LOWER DARWEN LANCASHIRE BB3 0PR
Liquid Dishwashing Detergent (diluted w/warm water)	Degreaser for brass & stainless, General cleaning for plastic & rubber	“Household” grade

CAUTION: Do not place complete hose length in contact with any acidic cleaning solutions. This could alter their physical properties and cause degradation and premature breakdown.

TABLE 2: LUBRICATION PROCEDURES

When the regulator is being prepared for Nitrox use: When handling O-rings wear unpowdered latex gloves. It is important not to allow contact between the internal components and the skin or any other source of contamination.

All seals should be lubricated with one of the lubricants designated in *Table 1*. Cover the seals with a light film of grease and remove any excess by rolling the seal between finger and thumb. Do not use an excess of grease; this can have the effect of accumulating particles that could damage the O-rings.

**AUTHORIZED TECHNICIAN
TECHNICAL MAINTENANCE MANUAL
HOSE INSPECTION & CLEANING PROCEDURE**



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