

Complaint—Origin

- b. Tilt valve bent or displaced.
- c. Stiff demand diaphragm due to poor care or improper storage.

Hose fitting leaks air.

Demand "O" ring seals—repeated removal without lubrication.

Repair Method

Inspect valve. Rotate hose at swivel to change position of tilt valve stem lever.

Check diaphragm and replace as needed.

Install new "O" rings, lubricate with silicone grease and carefully start thread. Fitting does not require extreme tightening to form seal.

Note: Refer to Table 3-20, Hydro-Lung Supreme, for additional details on first stage malfunctions.

Aqua-Matic (1957, 1958, 1959, 1960, 1961)

Single Hose; Two Stage: High Pressure Stage—Downstream Push-Pull Spring Biased Diaphragm; Demand Stage—Downstream Push-Pull Type.

The AM Aqua-Matic was the first single hose unit marketed by U.S. Divers. The basic standard model (AM) later evolved into the Deluxe version (similar, but with a built-in snorkel) and the Professional Aqua-Matic which had the AM first stage and a preliminary type Calypso demand stage.¹ The operation of all first stages were alike. Refer to Figure 3-32.

The first stage of the unit was of unusual design employing a horizontal lever system operating a downstream push-pull seat. The lever system was operated by the conventional spring biased diaphragm.

The demand stage also employed a *downstream* push-pull seat system employing another unusual mechanical system. With the concept that the best shape for a mouth mounted single hose demand regulator was a cylinder—like the regular mouthpiece of a two hose unit—the AM Aqua-Matic stage was devised. A unique demand diaphragm driven wedge spread two levers, with tremendous mechanical advantages, lifting the demand stem. Exhalation was directed out the demand diaphragm mounted exhaust valve and out

¹ Refer to first edition BASIC SCUBA (1960) for complete mechanical description of the AM Aqua-Matic.

AM "AQUA-MATIC" REGULATOR

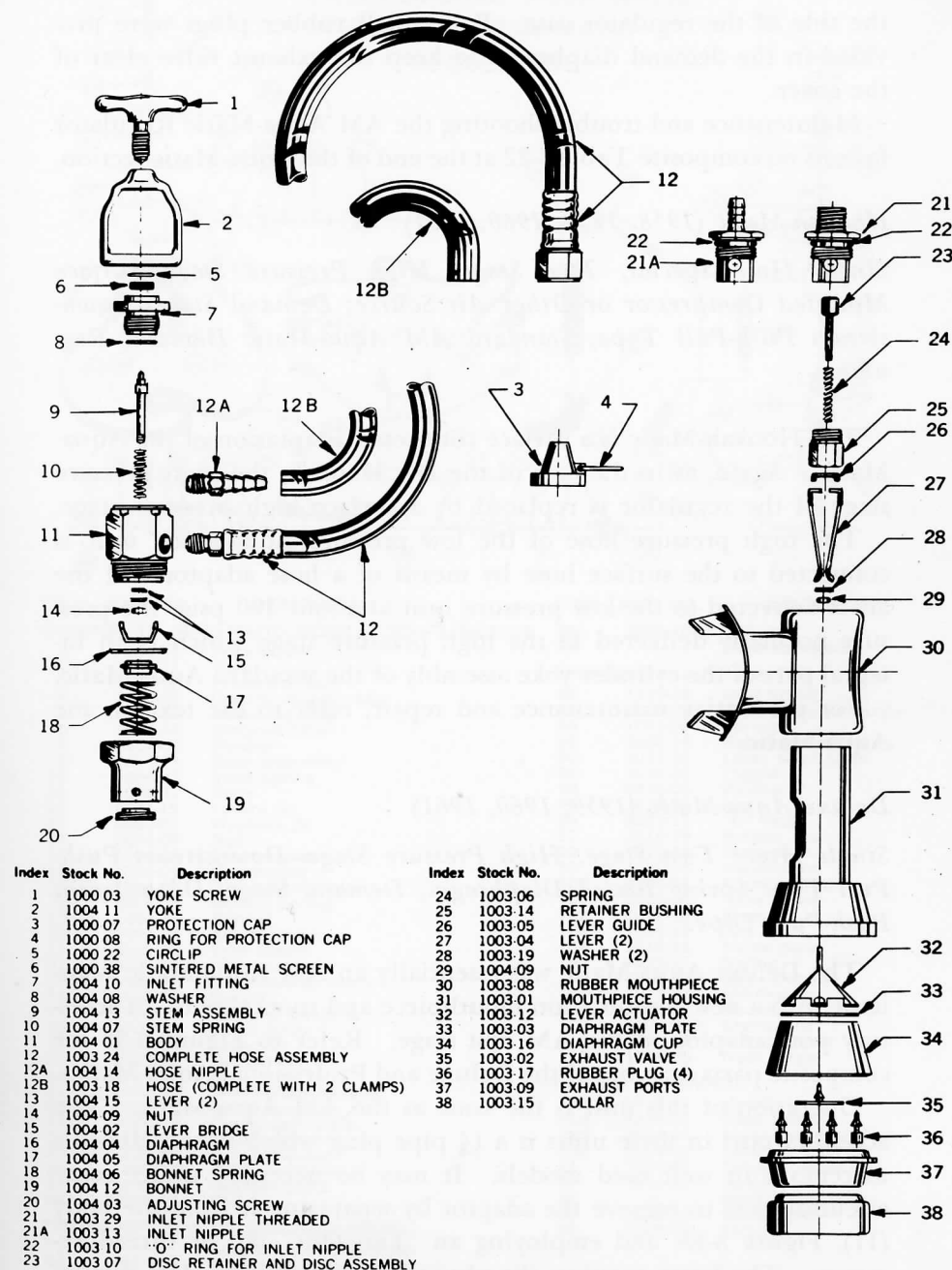


Figure 3-32. Exploded view of AM Aqua-Matic regulator and parts list. Courtesy U.S. Divers Company

the side of the regulator case. Four small rubber plugs were provided in the demand diaphragm to keep the exhaust valve clear of the cover.

Maintenance and trouble shooting the AM Aqua-Matic Regulator follows on composite Table 3-22 at the end of the Aqua-Matic section.

Hookah-Matic (1958, 1959, 1960, 1961)

Single Hose Special; Two Stage: High Pressure Stage—Surface Mounted Compressor or Other Air Source; Demand Stage—Downstream Push-Pull Type, Standard AM Aqua-Matic Demand Regulator.

The Hookah-Matic is a surface connected adaptation of the Aqua-Matic. Again, as in the case of the DA Hookah, the high pressure stage of the regulator is replaced by a surface high pressure stage.

The high pressure hose of the low pressure Aqua-Matic unit is connected to the surface hose by means of a hose adaptor and the air is delivered to the low pressure unit at about 100 psig, the pressure normally delivered to the high pressure stage which is an integral part of the cylinder yoke assembly of the standard Aqua-Matic.

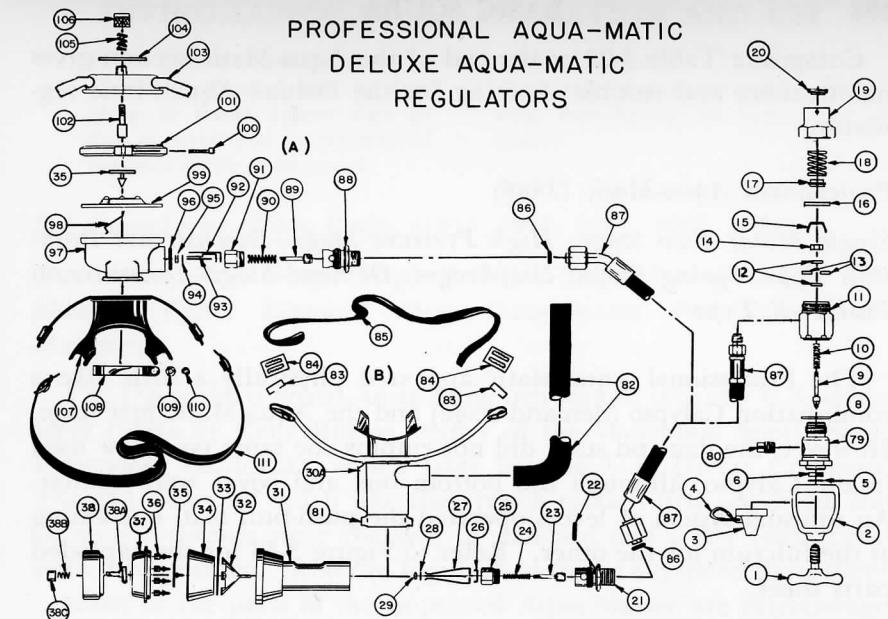
For preventive maintenance and repair, refer to the text on the Aqua-Matic.

Deluxe Aqua-Matic (1959, 1960, 1961)

Single Hose; Two Stage: High Pressure Stage—Downstream Push-Pull Type Spring Biased Diaphragm; Demand Stage—Downstream Push-Pull Type.

The Deluxe Aqua-Matic was essentially an AM Aqua-Matic regulator with a new combination mouthpiece and snorkel with an accessory port adaptor in the AM first stage. Refer to Figure 3-33 for composite parts drawing of the Deluxe and Professional Aqua-Matics.

Operation of this unit is the same as the AM Aqua-Matic. The accessory port in these units is a 1/8 pipe plug which is very difficult to remove in well used models. It may be necessary under some circumstances to remove the adaptor by separating it from the body (11), Figure 3-33, and employing an "Easy-Out" tap or thread remover. The latter requires the plug to be drilled out. Use care in the procedure as you could easily ruin the threads of the adaptor.



ITEM	PART NO.	DESCRIPTION	ITEM	PART NO.	DESCRIPTION
COMMON TO AQUA-MATIC REGULATORS—3 MODELS					
1	1000-03	Yoke screw	86	8200-10	"O" ring
2	1004-11	Yoke	87	—	Hose complete
3	1000-07	Protection cap	PROFESSIONAL AQUA-MATIC		
4	1000-08	Cord or ring for cap	88	1019-36	Inlet fitting
5	1000-22	Retaining ring	89	1003-07	Disc & retainer ass'y
6	1000-38	Sintered filter	90	1003-06	Spring
8	1004-08	Washer	91	1003-14	Retainer bushing
9	1004-13	Stem assembly	92	1019-21	Lever pivot plate
10	1004-07	Stem spring	93	1019-22	Toggle
11	1004-01	Body	94	8450-03	Washer
12	1004-15	Levers (2)	95	1019-44	Nut
13	8450-03	Washers (3)	96	8201-13	"O" ring
14	1004-09	Nut	97	1019-19	Bottom box
15	1004-02	Lever bridge	98	1019-18	Horseshoe
16	1004-04	Diaphragm	99	1019-16	Diaphragm
17	1004-05	Diaphragm plate	100	8340-04	Clamp screw
18	1004-06	Bonnet spring	101	1019-14	Case clamp
19	1004-12	Bonnet	102	1019-28	Stem
20	1004-03	Adjusting screw	103	1019-39	Top box
21	1003-29	Inlet nipple	104	1019-38	Name plate
22	8201-13	"O" ring	105	1019-27	Spring
23	1003-07	Disc retainer ass'y	106	1019-26	Clear button
24	1003-06	Spring	107	1019-07	Mouthpiece
25	1003-14	Retainer bushing	108	1019-02	Mouthpiece clamp
26	1003-05	Lever guide	109	8500-02	Clamp nut
27	1003-04	Lever (2)	110	8340-06	Clamp screw
28	1003-19	Washer (2)	111	1019-08	Neck strap
29	1004-09	Nut	DELUXE AQUA-MATIC		
31	1003-01	Mouthpiece housing	30A	1018-01	Mouthpiece
32	1003-12	Lever actuator	38A	1018-09	Clear button
33	1003-03	Diaphragm plate	38B	1018-07	Clear button spring
34	1003-16	Diaphragm cup	38C	1018-08	Locking cap
35	1003-02	Exhaust valve	81	1018-03	Selector valve
36	1003-17	Rubber plug (4)	82	1018-05	Snorkel
37	1003-09	Exhaust ports	83	—	Buckle wire loop
38	1003-15	Collar	84	1018-10	Buckle grip
PROFESSIONAL & DELUXE AQUA-MATIC			85	1018-06	Strap
79	—	Accessory adaptor body			
80	0514-01	Accessory plug, 1/8 pipe			

Figure 3-33. Exploded view and parts list Professional Aqua-Matic and Deluxe Aqua-Matic regulators. Item numbers keyed to Figure 3-32. (A) Demand stage Professional Aqua-Matic. (B) Demand stage Deluxe Aqua-Matic. Composite by author, no part sheets available from manufacturer at this printing.

Composite Table 3-22 at the end of the Aqua-Matic section gives maintenance and trouble shooting for the Deluxe Aqua-Matic regulator.

Professional Aqua-Matic (1960)

Single Hose; Two Stage: High Pressure Stage—Downstream Push-Pull Type, Spring Biased Diaphragm; Demand Stage—Downstream Push-Pull Type.

The Professional Aqua-Matic appeared physically a little like a combination Calypso (demand stage) and the Aqua-Matic first stage. However, the demand stage did not employ the same type now used in the Calypso, although the bottom box and cover were similar. An unusual system of levers operated the push-pull seat, one acting as the fulcrum for the other. Refer to Figure 3-33 for the exploded parts sheet.

TABLE 3-22. TROUBLE SHOOTING THE AM AQUA-MATIC (1957, 1958, 1959, 1960, 1961), DELUXE AQUA-MATIC (1959, 1960, 1961) AND PROFESSIONAL AQUA-MATIC (1960)

Complaint—Origin	Repair Method
Hard to breathe.	
a. The actuator point is not between the levers.	Take the diaphragm assembly off and put the actuator in the right position.
b. The levers (27) are not well fixed.	Fix them as mentioned above.
c. The adjusting screw (20) is not well fixed.	Fix it per above instructions.
Regulator leaks air.	
a. After inhaling the hissing of air starts after a short, but noticeable time. The high pressure valve leaks.	Fix the adjusting screws or the levers (14).
b. After inhaling the hissing starts immediately. The low pressure valve leaks.	If necessary, change the stem as in (9). Clean or change the disc as (23).
Regulator leaks water.	
a. The inlet nipple (22) is not well fixed.	Fix it. Eventually change the "O" ring gasket.
b. The diaphragm is not well fixed.	Fix it, or change the diaphragm.
c. The exhaust valve is leaking.	Clean or change the exhaling valve.
d. Snorkel valve open or loose.	Close valve.

- e. Loose grip on mouthpiece.
- f. Regulator flooded due to dangling in water before dive or due to accidental or intentional removal while submerged.

Tighten grip.
Push clear button or exhale sharply into mouthpiece to clear case of water.

DA Aqua-Lung (Navy Unit), (1953, 1954, 1955, 1956, 1957)

Two Hose; Two Stage: High Pressure Stage—Spring Biased Diaphragm Type; Demand Stage—Downstream Push-Pull Lever Mounted.

The DA is the original Aqua-Lung introduced into the U.S. in the early 1950's by Renè Bussoz, owner of the Westwood Sports Shop, Westwood, California, which later became U.S. Divers Company. The DA was very much like the French models first imported, but all metric threads were changed to standard and a few refinements were incorporated. Refer to Figure 3-34 for an exploded parts sheet.

Many of the parts of the improved Aqua-Master are interchangeable with the old DA as the latter is the first generation model of the former. Figure 3-1 at the beginning of this chapter is a cross section of the DA Aqua-Lung.

Maintenance and Repair, DA Aqua-Lung (1953 to 1957)

See the corresponding section under Aqua-Master and the following:

Maintenance and Servicing of the DA Regulator—Manufacturer's Recommendations

We cannot assume responsibility for repairs made by others. The following instructions are for divers who (at their own risk) wish to reset their Aqua-Lung themselves because of special circumstances. Success will depend on personal mechanical qualifications.

When ordering parts, indicate the serial number of your regulator. No repairs should be necessary unless the unit is not kept clean or is abused.

Instructions for Disassembling and Reassembling the Aqua-Lung DA Regulator

Snap off the box clips (24) using a screw driver as a wedge. Watch their position so that you will be able to put them back on the same