OT-4X SERVICE MANUAL

ScubaMax

Regulator Service Manual

Professional SCUBA Diving Equipment

SCUBA MAX

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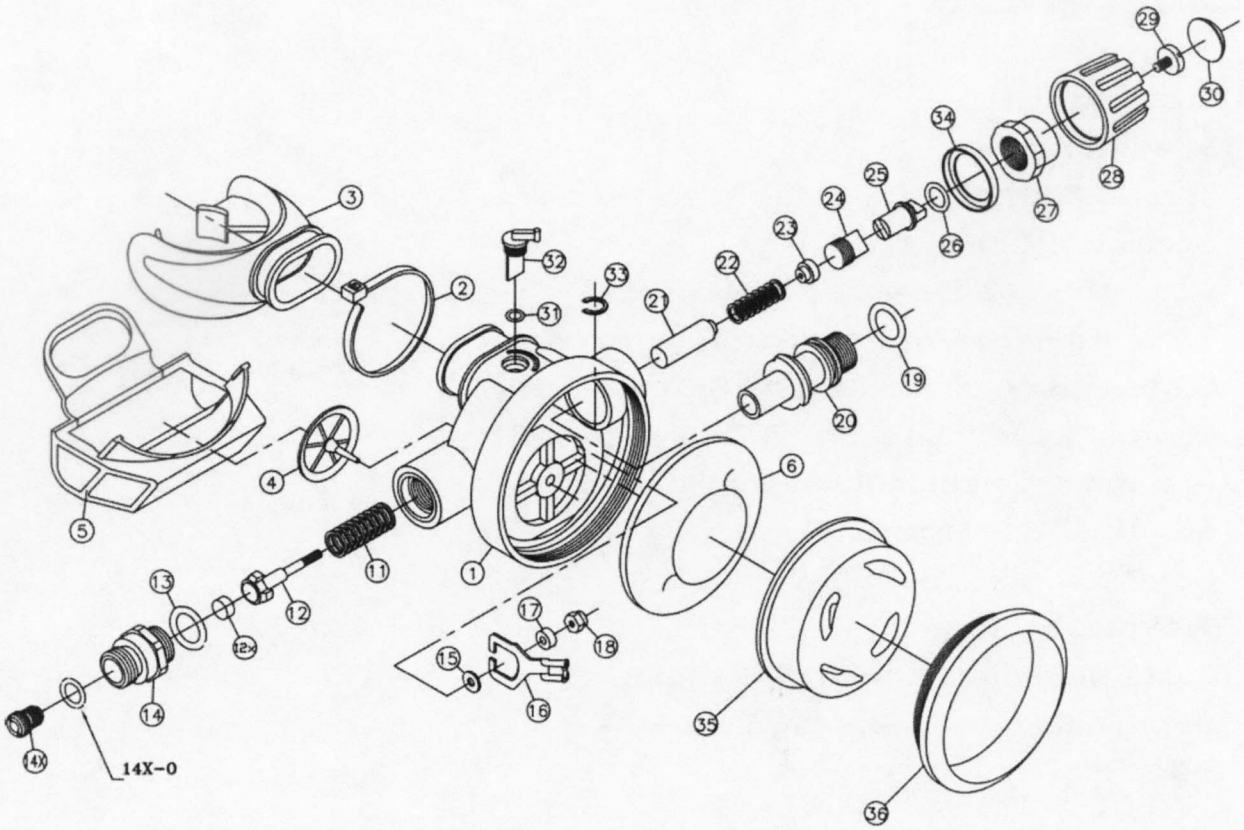

NO	P/N	DESCRIPTION	NO	P/N	DESCRIPTION
1	9301	MAIN HOUSING	20	9320	ADJUSTMENT TUBE
2	9302	NYLON TIE	21	9321	PISTON
3	9303	MOUTHPIECE	22	9322	ADJUSTMENT SPRING
4	9304	EXHAUST VALVE	23	9323	SPRING FOLLOWER
5	9305	EXHAUST TEE	24	9324	ADJUSTMENT SHAFT
6	9306	DIAPHRAGM	25	9325	SHAFT HANDLE
7	9307	RETAINER RING	26	9326	O-RING-010
8	9308	FRONT COVER	27	9327	PACKING NUT
9	9309	PURGE SPRING	28	9328	ADJUSTMENT KNOB
10	9310	PURGE BUTTON	29	9329	SCREW
11	9311	MAIN SPRING	30	9330	DECAL
12	9312	INLET VALVE	31	9331	O-RING-010
12X	9312X	LP SEAT	32	9332	DEFLECTOR
13	9313	O-RING-014	33	9333	SS CLIP
14	9314	INLET NIPPLE	34	9334	BRASS RING
15	9315	SPACER	14X	9314X	ORIFICE
16	9316	LEVER ARM	14X-O	9314-O	ORIFICE O-RING-010
17	9317	SPACER	35	9337	PU COVER
18	9318	STAINLESS NYLON NUT	36	9338	ALUMINUM RING
19	9319	O-RING-015			

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Before You Begin .....

Read these instructions completely before you begin servicing the regulator or filling whip. These instructions are intended for people who have been AUTHORIZED by SCUBAMAX to repair SCUBAMAX Scuba equipment. If you are not so authorized - STOP.

1.0 INTRODUCTION

1.0.1 The procedures in this manual apply to the SCUBAMAX the OT-4X type 2ND stage. Refer to the exploded views as you read the service section of the manual. The Item Numbers referred to in the service section are those seen in the corresponding exploded view

! WARNING !

NEVER tighten the hose fitting to the first stage with more than 40 in. lbs. (4.5 Nm) of torque. The inlet hose fitting will be weakened by over tightening. Failure to heed this warning may result in serious injury or death.

NOTE:

All SCUBAMAX Scuba Regulators have service kits available which contain the parts which must be changed at every annual service no matter what their condition. The standard annual service kit part numbers are shown in the parts list. All other parts not contained in these kits must be inspected by the technician and changed if necessary. Parts will be handled under warranty, only if they have failed due to problems with material or workmanship.

! WARNING !

SCUBAMAX Scuba Regulators are manufactured using materials suitable for use with oxygen enriched gases (i.e. Nitrox, etc.) providing the oxygen content does not exceed 40%. Equipment intended for enriched air (Nitrox) use, must not be used with regular compressed breathing air or other gases. Regulators intended for enriched air use, can be serviced only by technicians trained by one of the major oxygen enriched air training agencies. Failure to heed this warning may result in serious injury or death.

1.0.2 This manual gives breakdowns of regulator parts, equipment specifications, servicing instructions, troubleshooting recommendations, and guidelines for proper care of SCUBAMAX regulators. This manual is intended for use only by persons specially trained and authorized to service SCUBAMAX Scuba equipment.

1.0.3 Anyone attempting to service or repair SCUBAMAX Scuba regulators must have a thorough understanding of the principles of operation of scuba regulators and valves, as well as the appropriate mechanical ability. The technician must be properly trained in the safe use of compressed air and the various tools and cleaning solutions involved in the procedures outlined in this manual.

1.0.4 The best source for current part numbers for any of the parts listed in this manual is your current parts and price list from SCUBAMAX.

1.0.5 If you have any questions, or need more information, contact your

SCUBAMAX Scuba Sales Representative or SCUBAMAX Customer Service. You can e-mail you technical questions to SCUBAMAX'S mail box.

2.0 SPECIFICATIONS

PROBLUE OT-4X SECOND STAGE REGULATOR

AIR FLOW ..... 33 cu. ft. (935 liters/min). @ 1 atmosphere
INHALATION RESISTANCE .. 0.9" -2.0" (2.3 - 5.08 cm) w.c. @ 1 atmosphere
EXHALATION RESISTANCE .. 0.6" (1.52 cm) w.c. max. @ 1 atm.

RECOMMENDED LUBRICANT LTI Christo-Lube 111®

A. OT-4X SECOND STAGE REGULATOR

TYPE .....POPPET VALVE , BALANCE DIAPHRAGM
WEIGHT.....5 lb. (w/o hose)
MATERIALS .....COVER ---------- PU
HOUSING ---------- ABS HI-IMPACT
LP SEAT ----- SLICONE
O-RING ---------- Buna-N
DIAPHRAGM ------ SILICONE
EXHAUST VALVE----- SILICONE
MOUTHPIECE ------ SILICONE

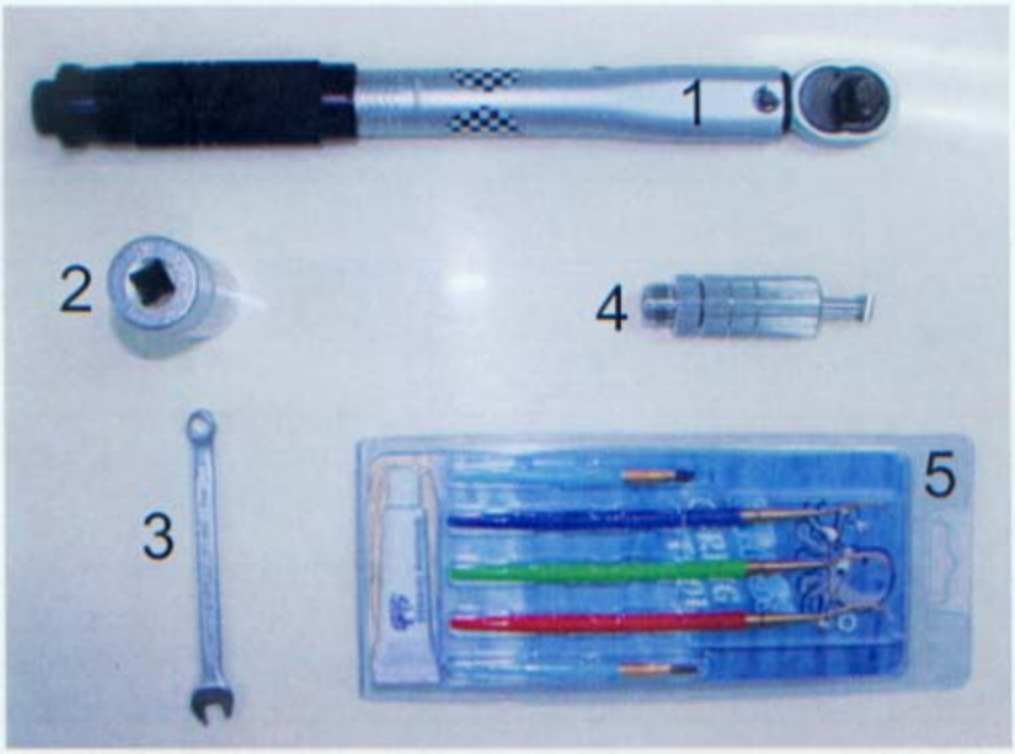
2.1 Torque Specifications:

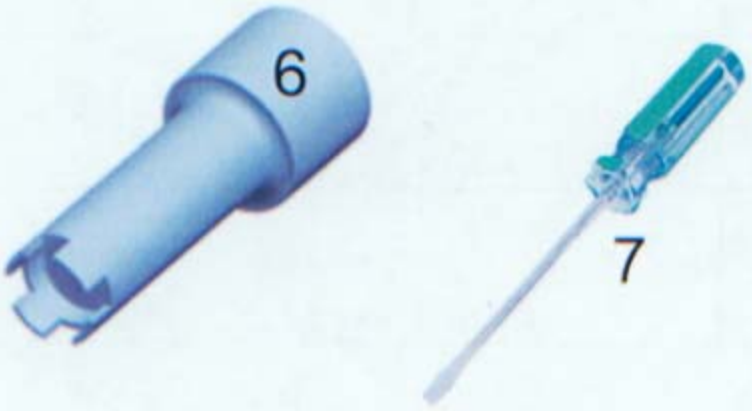
Description	Item #	Torque
INLET NIPPLE	14	85-95 in/lbs (9.6-10.7 Nm)
PACKING NUT	27	1-2 ft/lb (2-3 Nm)
Hose inlet end		2-3 ft/lb (3-4 Nm)
Hose outlet end		2-3 ft/lb (3-4 Nm)

3.0 SERVICE KIT LIST

DRAWING	NO	PART NO	DESCRIPTION	Q'TY
	12X	9312X	LP SEAT	1
	13	9313	O-RING	1
	19	9319	O-RING	1
	26	9326	O-RING	1
	31	9331	O-RING	1
	14X-O	9314-O	O-RING	1

3.1 SERVICE TOOL LIST





1	TORQUE WRENCH 5-25 N.M	2	19MM HEX SOCKET
3	6MM COMBINATION WRENCH	4	ADJUST TOOL
5	O-RING TOOL SET	6	4H POPPET TOOL
7	" — " SCREWDRIVER		

4.0 SERVICE PROCEDURES FOR THE SCUBAMAX OT-4X

4.0.1 Before you begin disassembly of the regulator, test the first and second stages for output pressures and leakage. Pre-testing in this way will help the technician to pinpoint any specific problems requiring repair.

4.0.2 The work area must be clean and well lighted, with clean compressed air available to blow sand and dirt from parts.

4.0.3 The procedures covered in this manual section apply to the OT-4X second stage. To access the exploded view of this model open the front cover of this manual.

4.1 TOOLS REQUIRED (or suggested) FOR SECOND STAGE SERVICING

- 19MM HEX SOCKET
- 4H POPPET TOOL
- 6MM COMBINATION WRENCH
- Adjust tool for second stage
- OT-4X 2nd Stage Annual Service Kit
- Clean Shop Rags
- Dow-Corning Compound 111
- Silicone Grease or LTI Christo-Lube 111® (p/n 347-0111)

4.2 DISASSEMBLY OF THE SECOND STAGE

! WARNING !

NEVER tighten the hose fitting to the first stage with more than 40 in. lbs. (4.5 Nm) of torque. The inlet hose fitting can be weakened by over tightening. To view the complete parts list of the second stage, open the front cover of this manual.

4.2.1

Use the 6" and 8" adjustable wrenches to loosen the hose nut from the INLET NIPPLE (14). Remove the hose assembly from the second stage. Inspect the hose assembly for any cuts or cracks, especially on the hose at the metal ferrules. Blow the interior bores of the hoses.

Replace the hose assembly if any cuts or cracks are found. Remove and discard the O-rings from each end of the hose. Clean, rinse, and blow-dry the interior bores of the hoses. Replace the hoses if necessary.

4.2.2

If the mouthpiece is in good condition, you can don't remove and be reused. If not good to remove the mouthpiece (3) by cutting the mouthpiece tie (2) with side cutting pliers. Discard the old mouthpiece tie. Examine the condition of the mouthpiece.

4.2.3

Remove the exhaust cover (5) from the case by pulling it back.

4.2.4

Before removing the exhaust valve (4) from the housing (1), bend the valve over as far as it will go from the top, bottom, left, and right sides. If it fails to snap back quickly, and does not lie perfectly flat against the housing exhaust grid, the valve should be replaced. If it does snap back satisfactorily, remove it by pulling it out with your fingers. Inspect the sealing edges. If they appear smooth, and the locking tab on the nipple is good, the valve can be reused.

4.2.5

Unscrew the cover ring (36) from the housing (1).
If the cover is difficult to remove you can try several methods to loosen it;

Heat the 2nd stage body surrounding the Ring by running hot water from a tap over it. When the plastic is hot, it will expand and loosen the threads.

Rubber pads are available to use in the hand to loosen tight jar lids. These pads will allow you to get a better grip on the Cover Ring (8)

4.2.6

Remove the pu cover (35) and the diaphragm (6) from the housing (1).

4.2.7

Remove the decal (30). Unscrew the screw (29) from the adjustment knob (28) with screwdriver. Remove the adjustment knob (28).

4.2.8

Only loosen and remove the packing nut (27) with 19MM HEX SOCKET from housing(1). Remove and discard the O-ring (26).

4.2.9

Unscrew the shaft handle (25) by hand. The adjustment shaft (24), spring follower (23), spring (22) and piston (21) will fall when the shaft handle (25) removed.

4.2.10

Remove the adjustment tube. Remove and discard the O-ring (19).

4.2.11

Remove the ss clip (33) with screwdriver. Remove the deflator (32). Remove and discard the O-ring (31).

4.2.12

Loosen and remove the inlet nipple (14) with 19MM HEX SOCKET from housing(1). Use a ADJUST TOOL to turn left the orifice (14x) until remove it. Remove and discard all o-ring (13,14X-O) from inlet nipple and orifice.

4.2.13

Before remove the poppet (12) must be check and record the poppet thread length that over the nut screw (18). Use the 6MM COMBINATION WRENCH hold the nut screw (18) and use the 4H POPPET TOOL turn left the poppet (12) until remove it. The spring (11), lever arm(16), thick washer spacer(17), thin washer spacer(15) and nut screw will fall when the poppet(12) removed. Remove the lp seat (12X) from the poppet(12).

4.3 CLEANING AND INSPECTION OF THE 2nd STAGE

4.3.1

Rinse all plastic and silicone parts in fresh warm soapy water solution. Rinse with clean warm water and then blow the parts dry with compressed air to remove any sand and dust particles.

! WARNING !

DO NOT use vinegar or other acid solutions on the plastic parts since this will cause the plastic to become brittle!

4.3.2

If necessary because of deposits or corrosion, clean all metal parts of the second stage in an ultrasonic cleaner or cleaning solution. See Section 5.3 for recommendations on cleaning solutions.

4.3.3

Inspect the housing (1) for any cracks or nicks. Look particularly closely at the area where the exhaust valve (4) seals and where the o-ring (19,13) place. Replace the housing if any cracks are found.

4.3.4

Inspect the sealing surface on the orifice (14X) (where the seating seal (12X) seals) for any nicks or scratches. Replace the orifice (14X) if any serious defects are found at the sealing area, or if the threads appear worn out.