XT1 First Stage Service Manual

Warning

- *This manual is only to be used as a guide for trained regulator technicians. Possession of this guide does not qualify any individual in the service of Dive Rite Breathing Systems. Only qualified Dive Rite dealers can service Dive Rite Products. Improper servicing can lead to serious injury or death.*
- ***Only Original Parts ordered from Dive Rite are to be used***

Table of Contents

Required Tools

- Torque wrench 1/4” or 3/8” drive up to 250 in/lb
- Spanner wrench (RG1271-PL)
- 5th port tool (RG1281-5PTOOL)
- 6mm hex wrench
- 5mm hex wrench (for removable orifice models)
- 2mm hex wrench
- ¼ inch hex wrench
- ¼ inch nut driver
- 1” socket wrench

#	Part Number	Description
1	RG5101	XT1 - FS - YOKE KNOB
2	RG5102	XT1 - FS - 232 BAR YOKE
3	RG5103	XT1 - FS - YOKE RETAINER
4	RG5104	XT1 - FS - FILTER
5	RG1241	XT1 - FS - ORING
6	RG5106	XT1 - FS - DUST CAP
7	RG5107	XT1 - FS - SADDLE
8	RG5108	XT1 - FS - MAIN HOUSING
9	RG5109	XT1 - FS - VALVE LIFTER
10	RG1230-08	XT1 - FS - DIAPHRAGM
11	RG5111	XT1 - FS - DIAPHRAGM WASHER
12	RG5112	XT1 - FS - SPRING SEAT
13	RG5113	XT1 - FS - SPRING WASHER
14	RG5114	XT1 - FS - MAIN SPRING
15	RG5115	XT1 - FS - ADJUST SCREW
16	RG5116	XT1 - FS - STYLE RING
17	RG1232	XT1 - FS - ORING
18	RG5118	XT1 - FS - TURRET
19	RG5119	XT1 - FS - THRUST WASHER
20	RG1238	XT1 - FS - ORING
21	RG5121	XT1 - FS - HP SEAT
22	RG5122	XT1 - FS - BALANCE SPRING
23	RG1235	XT1 - FS - ORING
24	RG1236	XT1 - FS - ORING
25	RG5125	XT1 - FS - TURRET BOLT W/ 5TH PORT
26	RG1231	XT1 - FS - ORING
27	RG5127	XT1 - FS - HP PLUG
28	RG1233	XT1 - FS - ORING
29	RG5129	XT1 - FS - LP PLUG
30	RG5130	XT1 - FS - DIN BOLT BUSHING
31	RG5131	XT1 - FS - DIN HANDWHEEL
33	RG5133	XT1 - FS - DIN BOLT
34	RG1239-P	XT1 - FS - ORING
35	RG5135	XT1 - FS - DIAPHRAGM CAP
36	RG5136	XT1 - FS - TRANS PISTON
37	RG5733	XT1 - FS - ENVIRONMENTAL SEAL
38	RG5138	XT1 - FS - ENVIRONMENTAL CAP
39	RG1241	XT1 - FS - ORING
40	RG5140	XT1 - FS - HP ORIFICE

Disassembling the XT1 First Stage

1) Remove all port plugs and secure the first stage in a vise using an appropriate tool

2) Loosen and remove the Environmental Cap (#38 – RG5138), it may be necessary to use a Spanner wrench

3) Remove the Silicone Disc (#37 – RG5733) and the Transition Piston (#36 – RG5136)

*Take care to not damage the Silicone Disk

4) Use a **6mm** Hex wrench to loosen the Adjustment Screw (#15 – RG5115) until spring tension is relieved

5) Use the spanner wrench to loosen the Diaphragm Cap (#35 – RG5135)

6) Remove the Diaphragm Cap (#35 – RG5135), Main Spring (#14 – RG5114), Spring Seat (#12 – RG5112), and Adjustment Screw (#15 – RG5115)

*The two Spring Washers (#13 – RG5113) will be reused

*Note the difference in the threaded ends of the Diaphragm Cap (#35 – RG5135). The larger diameter thread installs to the Main Housing (#8 – RG5108)

7) Remove the Diaphragm Washer (#11 – RG5111), Diaphragm (#10 – RG1230-08), and Valve Lifter (#9 – RG5109)

*Use a Pick to puncture and remove the diaphragm. *DO NOT pry the Diaphragm up from the edge. This Will damage the seating surface!*

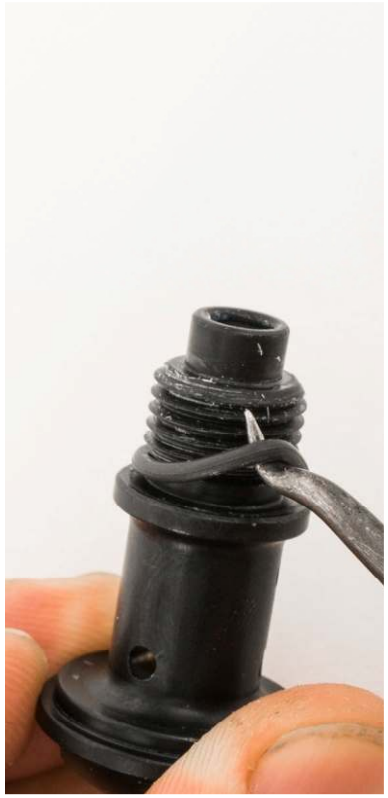
8) Use the 5th port tool to loosen the Turret Bolt (#25 – RG5125).

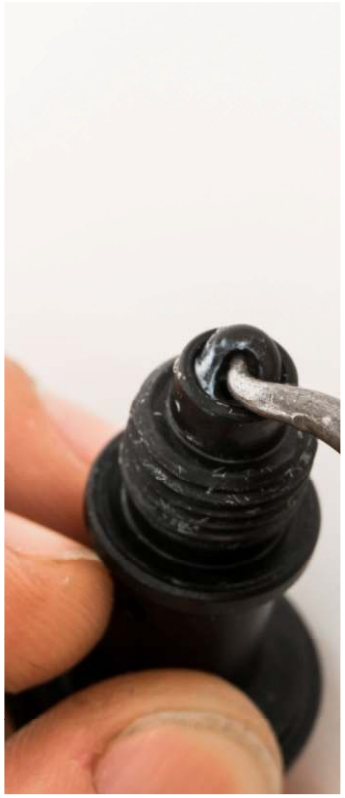
*The 5th port tool can be inserted into a 1” socket for use with a ratchet or breaker bar.

9) Remove the Turret Bolt (#25 – RG5125)

10) Remove the O-ring (#20 – RG1238) and Thrust Washer (#19 – RG5119)

11) Remove the Turret (#18 – RG5118),
Logo Ring (#16 – RG5116),
and O-ring (#17 – RG1232)





12) Remove the HP Seat (#21 – RG5121), Balance Spring (#22 – RG5122), and O-rings (#23 – RG1235, #24 – RG1236)

*For yoke regulators skip to page 18

13a) Use a ¼ **inch** hex wrench to loosen and remove the DIN Bolt (#33 – RG5133). This will allow removal of the DIN assembly.

14a) Remove the Saddle (#7 – RG5107), DIN Bolt Bushing (#30 – RG5130), and Din Handwheel (#31 – RG5131)

15a) Remove the O-ring (#34 – RG1239-P) from the DIN Bolt (#33 – RG5133) and use a dowel to push out the Filter (#4 – RG5104) and O-ring (#5 – RG1241)

*Skip to page 20

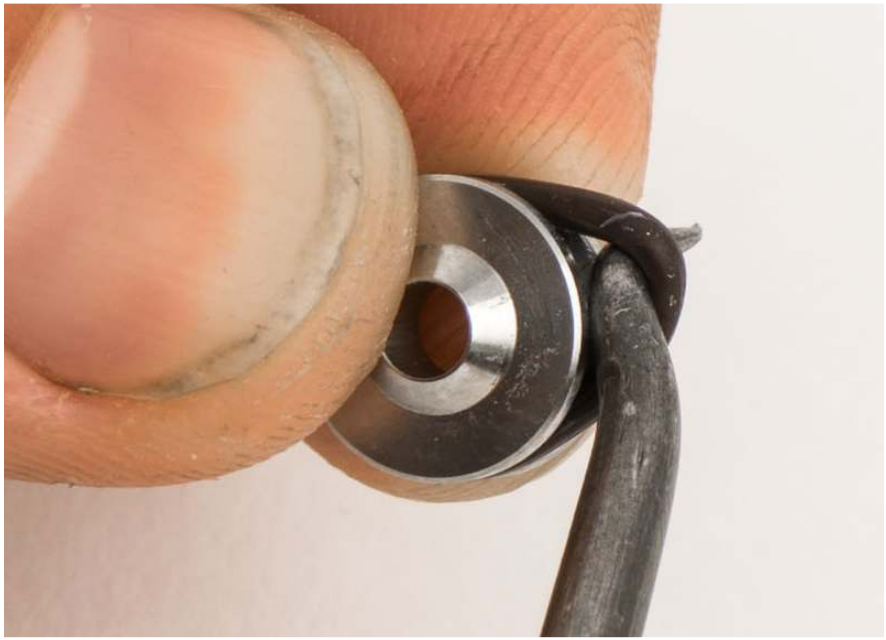
13b) Remove the Yoke Knob (#1 – RG5101) and use the 1” socket wrench to loosen and remove the Yoke Retainer (#3 – RG5103). This will allow removal of the yoke assembly

14b) Remove the Saddle (#7 – RG5107), Dust Cap (#6 – RG5106), and 232 Bar Yoke (#2 – RG5102)

15b) Use a dowel to push out the Filter (#4 – RG5104) and O-ring (#5 – RG1241)

16) Use a 2mm hex wrench push out the HP Orifice (#40 – RG5140)

*6/2020 Updated to screw in orifice (RG5145.D). Use a 5mm hex wrench to remove.



17) Remove the O-ring (#39 – RG1241)

This completes disassembly of the XT1 First Stage

Warning!!! Only original Dive Rite parts are to be used

- Parts should be cleaned in a solution compatible with Oxygen use.
- All points of lubrication (O-rings, Etc.) require the use of an Oxygen compatible lubricant. I.E. Tribolube 71

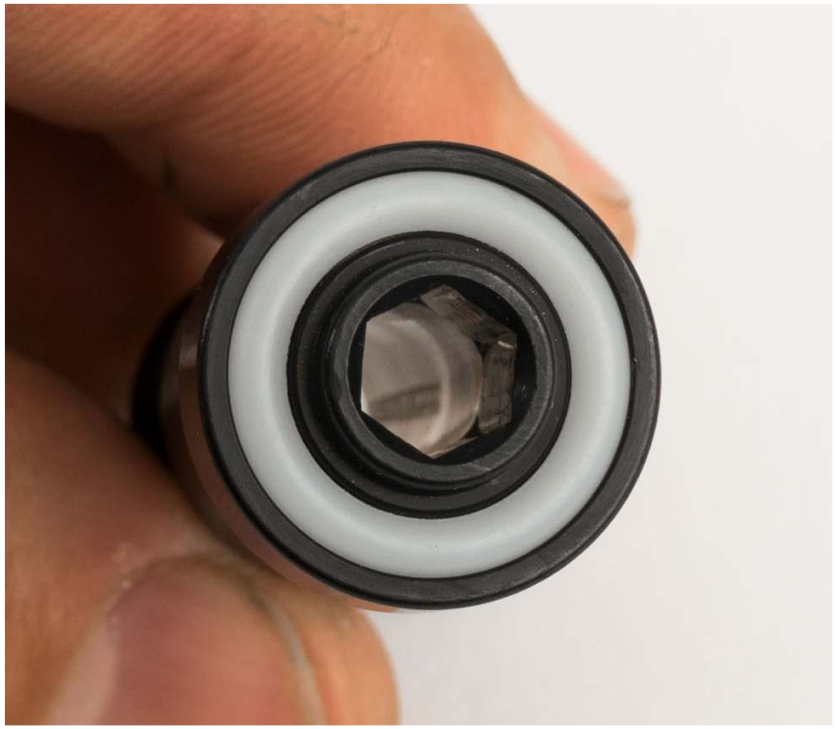
Assembling the XT1 First Stage

1) Install O-ring (#39 – RG1241) onto the HP Orifice (#40 – RG5140) and install into the Main Housing (#8 – RG5108/RG5108.1)

*This is a **90 durometer** o-ring. To differentiate between 70 durometer o-rings, gently squeeze from the sides. 90 durometer o-rings are noticeably firmer.

*Use the ¼ inch nut driver to push the Orifice into place. For threaded in orifice, use 5mm hex wrench.

*Confirm that the Orifice is fully seated



*For yoke regulators skip to page 26

2a) Install O-ring (#34 – RG1239-P) onto DIN Bolt (#33 – RG5133). Do not lubricate this O-ring.

3a) Install O-ring* (#5 – RG1241) and Filter (#4 – RG5104) into DIN Bolt (#33 – RG5133)

*This is a 90 durometer O-ring. Do not lubricate this O-ring.

4a) Install the DIN Handwheel (#31 – RG5131), DIN Bolt Bushing (#30 – RG5130), and Saddle (#7 – RG5107)

5a) Install the Din Bolt and tighten with a ¼ inch hex wrench to 250 in-lb (28 N-m)

*Skip to page 29

2b) Install O-ring (#5 – RG1241) into
Yoke Retainer (#3 – RG5103)

*This is a 90 durometer O-ring. Do not lubricate this O-ring.

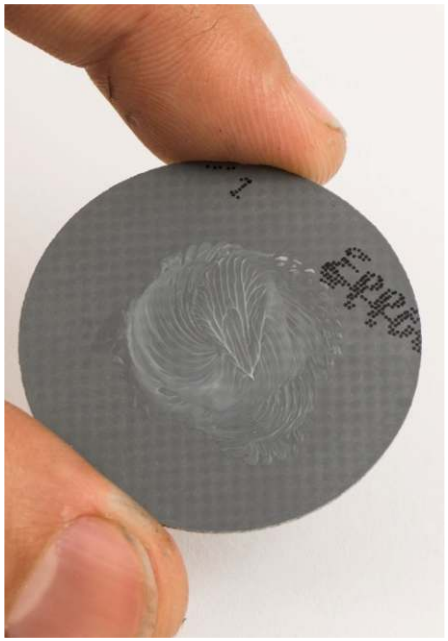
3b) Install Filter (#4 – RG5104) into Yoke Retainer (#3 – RG5103)

4b) install 232 Bar Yoke (#2 – RG5102) and Saddle (#7 – RG5107) onto Yoke Retainer (#3 – RG5103). Install yoke assembly into Main Housing (#8 – RG5108) and tighten with a 1” socket wrench to 250 in-lb (28 N-m)

5b) Install Dust Cap (#6 – RG5106) by stretching it over the yoke assembly and install the Yoke Knob (#1 – RG5101)

6) Install the Valve Lifter (#9 RG5109)

*Valve lifter for threaded orifice models is different (RG5146)



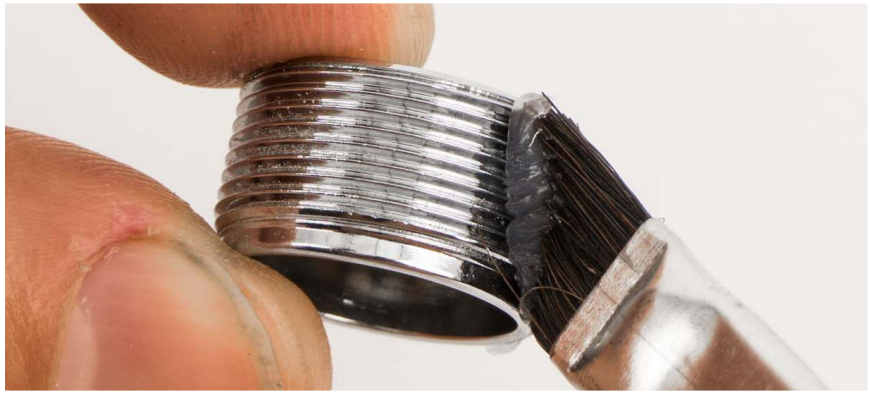
7) Lubricate the center of both sides of the Diaphragm (#10 – RG1230-08) and install

8) Install Teflon Washer (#11 – RG5111)

30

9) Place Spring Seat (#12 – RG5112) with Spring Washer (#13 – RG5113) onto Diaphragm (#10 – RG1230-08)

10) Place the Main Spring (#14 – RG5114) onto the Spring Seat (#12 – RG5112)



11) Lubricate the Adjustment Screw (#15 – RG5115) with grease and install into the Diaphragm Cap (#35 – RG5135)

*Ensure that Spring Washer (#13 – RG5113) is in place on the Adjustment Screw (#15 – RG5115)

12) Lubricate the threads on the Diaphragm Cap (#35 – RG5135). Install and tighten with the spanner wrench

*The cap should be tightened until the cap flange bottoms out on the Main Housing

13) Lubricate and install the O-rings (#23 – RG1235, #24 – RG1236) onto the Turret Bolt (#25 – RG5125)

14) Install the Balance Spring (#22 – RG5122). Lubricate stem of the HP Seat (#21 – RG5121) and install

*Compress the HP seat to ensure proper movement

15) Lubricate and install O-ring (#17 – RG1232) and Turret (#18 – RG5118)

16) Install Thrust Washer (#19 – RG5119) into turret, lubricate and install O-ring (#20 – RG1238) on top of the washer

17) Install the Turret Bolt assembly

18) Tighten Turret Bolt with the 5th port tool to 150 in-lbs (17 N-m)

19) Install the Style Ring (#16 – RG5116) by stretching it over the turret

The first stage needs to be pressurized for the following steps

IP Adjustments should be completed prior to the following steps

20) Install the Transition Piston (#36 – RG5136)

21) Install the Silicone Disk (#37 – RG5733)

22) Install the Environmental Cap (#38 – RG5138) hand tight

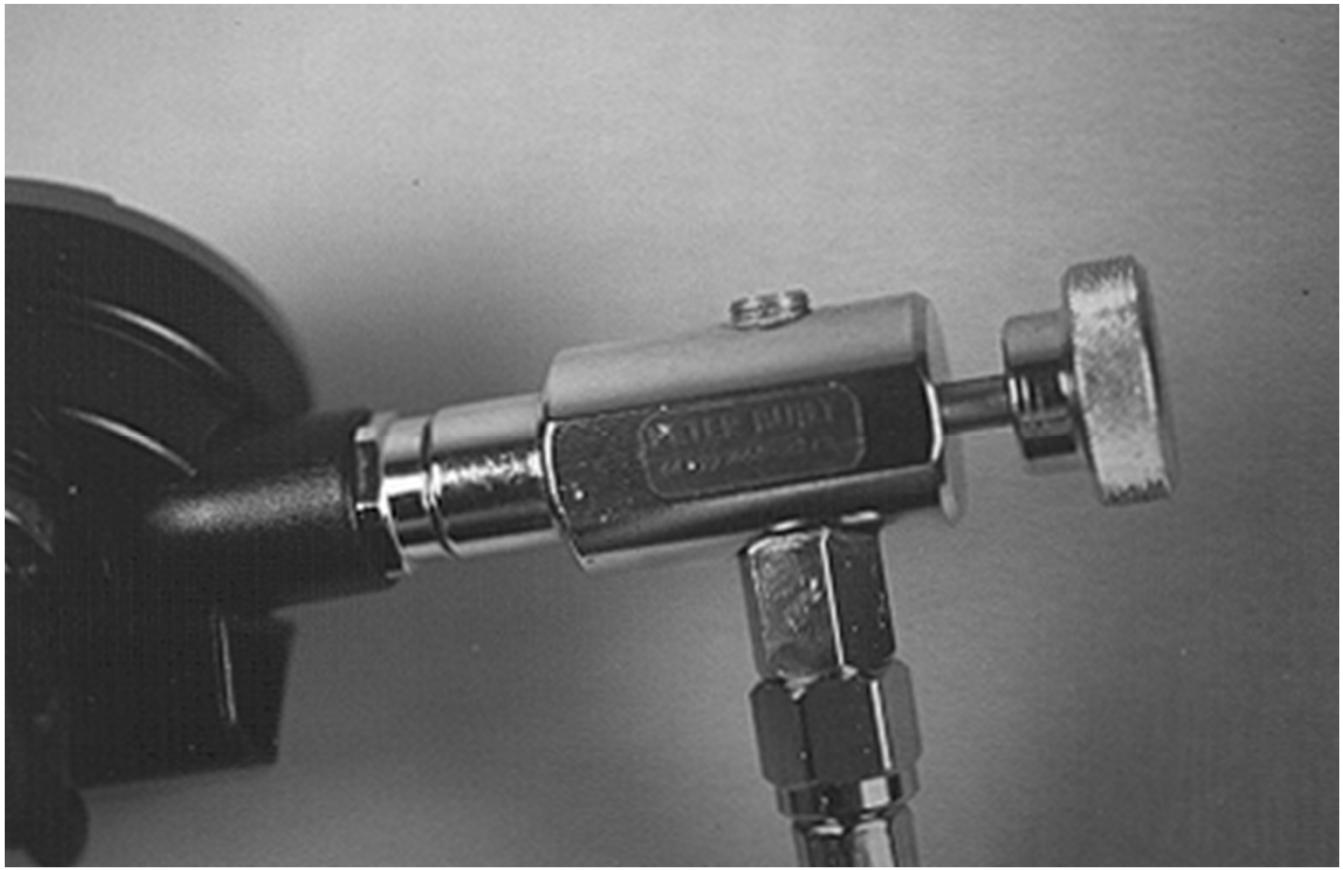
*Press down lightly on the Silicon Disk while tightening the Environmental Cap.

This completes assembly of the XT1 First Stage

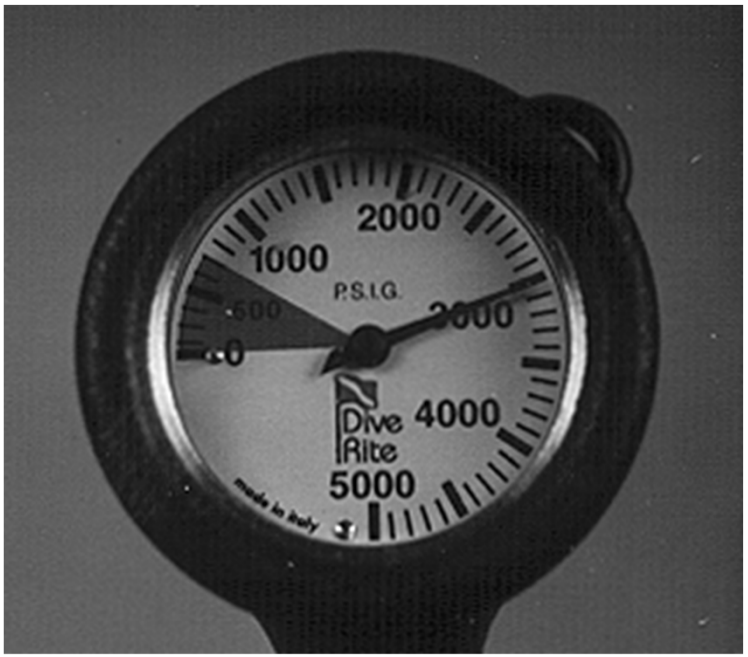
DIVE RITE®

Tuning and Adjusting Dive Rite Regulators

1) Attach a second stage adjusting tool between the second stage and the low pressure hose.
The first stage can also be connected to a overpressure valve
2) Close all other open ports with the appropriate plugs.



3) Connect to a high pressure (3000 psi) gas source.
4) Open the supply pressure slowly.
5) Adjust the intermediate pressure by moving the adjusting screw to increase or decrease tension on the intermediate pressure spring. (Purge the second stage after each adjustment.)
6) The Intermediate pressure should be adjusted to 140 psi +/- 2psi.



Supply Pressure

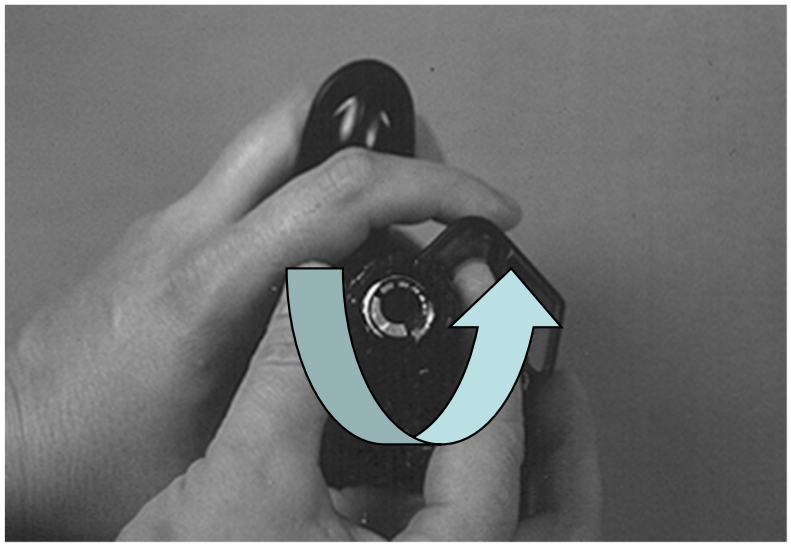
Intermediate Pressure

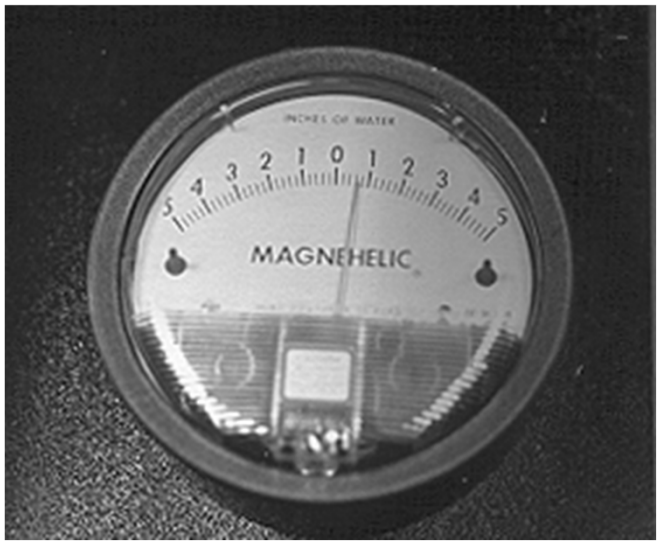
Note: it may be necessary to purge the regulator several times to allow the HP seat to “break in” and hold pressure.

Tuning the Second Stages

1) Turn the adjustment knob counterclockwise until it stops; this will set the second stage for the least resistance.
2) Using the second stage adjusting tool set the resistance to 1.0-1.2 inches of water.
3) Purge the regulator and observe the intermediate pressure.

An intermediate pressure drop of 2-8 psi is considered acceptable





Note: By setting the adjustment knob to the easiest setting, the diver can increase breathing resistance to his/her preference. The regulator should NOT be set to FREEFLOW.