FT1 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***

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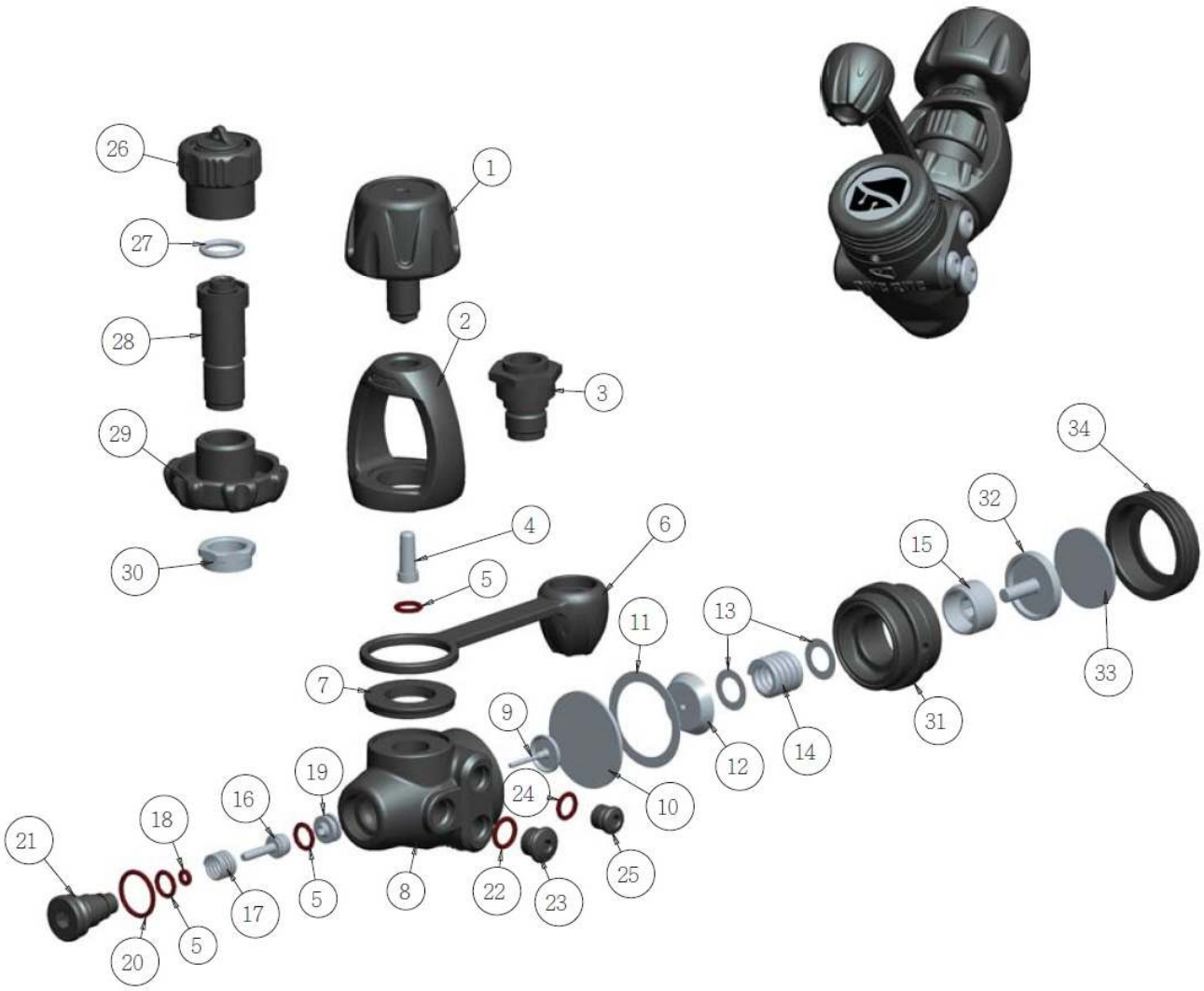
Required Tools

- Torque wrench 1/4” or 3/8” drive up to 250 in/lb
- Spanner wrench (RG1271-PL)
- 6mm hex wrench
- 5mm hex wrench
- 2mm hex wrench
- ¼ inch hex wrench
- ¼ inch nut driver
- 1” socket wrench
- 1st Stage Vise Tool
- Bench Vise
- Tribolube 71 or similar oxygen compatible grease



*Highlighted items are included in service kit.

#	Part Number	Description
1	RG5101	YOKE KNOB
2	RG5102	232 BAR YOKE
3	RG5103	YOKE RETAINER
4	RG5104	FILTER
5	RG1241	ORING
6	RG5106	DUST CAP
7	RG5707	STYLE DISK
8	RG5708	MAIN HOUSING
9.1	RG5709	VALVE LIFTER (Before June 2020)
9.2	RG5146	VALVE LIFTER (After June 2020)
10	RG1230-08	DIAPHRAGM
11	RG5111	DIAPHRAGM WASHER
12	RG5112	SPRING SEAT
13	RG5113	SPRING WASHER
14	RG5114	MAIN SPRING
15	RG5115	ADJUST SCREW
16	RG5121	HP SEAT
17	RG5122	BALANCE SPRING
18	RG1235	ORING
19.1	RG5140	HP ORIFICE (Before June 2020)
19.2	RG5145	HP THREADED ORIFICE (After June 2020)
20	RG5720	ORING
21	RG5721	BALANCE PLUG
22	RG1231	ORING
23	RG5127	HP PLUG
24	RG1233	ORING
25	RG5129	LP PLUG
26	RG5106-DIN	DIN CAP
27	RG1239-P	ORING
28	RG5133	DIN BOLT
29	RG5131	DIN HANDWHEEL
30	RG5130	DIN BOLT BUSHING
31	RG5135	DIAPHRAGM CAP
32	RG5136	TRANS PISTON
33	RG5733	ENVIRONMENTAL SEAL
34	RG5138	ENVIRONMENTAL CAP

Disassembling the FT1 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 (#34 – RG5138), it may be necessary to use a Spanner wrench

3) Remove the Silicone Disc (#33 – RG5733) and the Transition Piston (#32 – RG5136)

*Take care to not damage the Silicone Disk

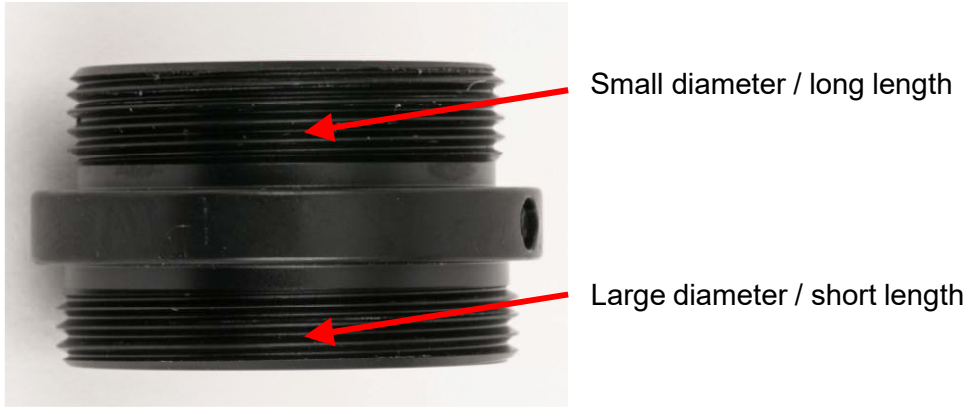
4) Use a 6mm Hex wrench to loosen the Adjustment Screw (#15 – RG5115) until spring tension is relieved

5) Use the spanner wrench to loosen the Diaphragm Cap (#31 – RG5135)

6) Remove the Diaphragm Cap (#31 – 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 (#31 – RG5135). The larger diameter thread installs to the Main Housing (#8 – RG5708)



7) Remove the Diaphragm Washer (#11 – RG5111), Diaphragm (#10 – RG1230-08), and Valve Lifter (#9.1 – RG5709 for push-in orifice models or #9.2 – RG5146 for threaded orifice models)

*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 a 6mm hex wrench to loosen and remove the Balance Plug (#21 – RG5721)

9) Remove the HP Seat (#16 – RG5121), Balance Spring (#17 – RG5122), and O-rings (#18 – RG1235, #5 – RG1241, #20 – RG5720)

*For yoke regulators skip to page 16

10a) Use a ¼ **inch hex wrench** to loosen and remove the DIN Bolt (#28 – RG5133). This will allow removal of the DIN assembly

11a) Remove the DIN Handwheel (#29 – RG5131), DIN Bolt Bushing (#30 – RG5130), and Style Disk (#7 – RG5707)

12a) Remove the O-ring (#27 – RG1239-P) from the Din Bolt (#28 – RG5133) and use a dowel to push out the Filter (#4 – RG5104) and O-ring (#5 – RG1241)

*Skip to page 18

10b) 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

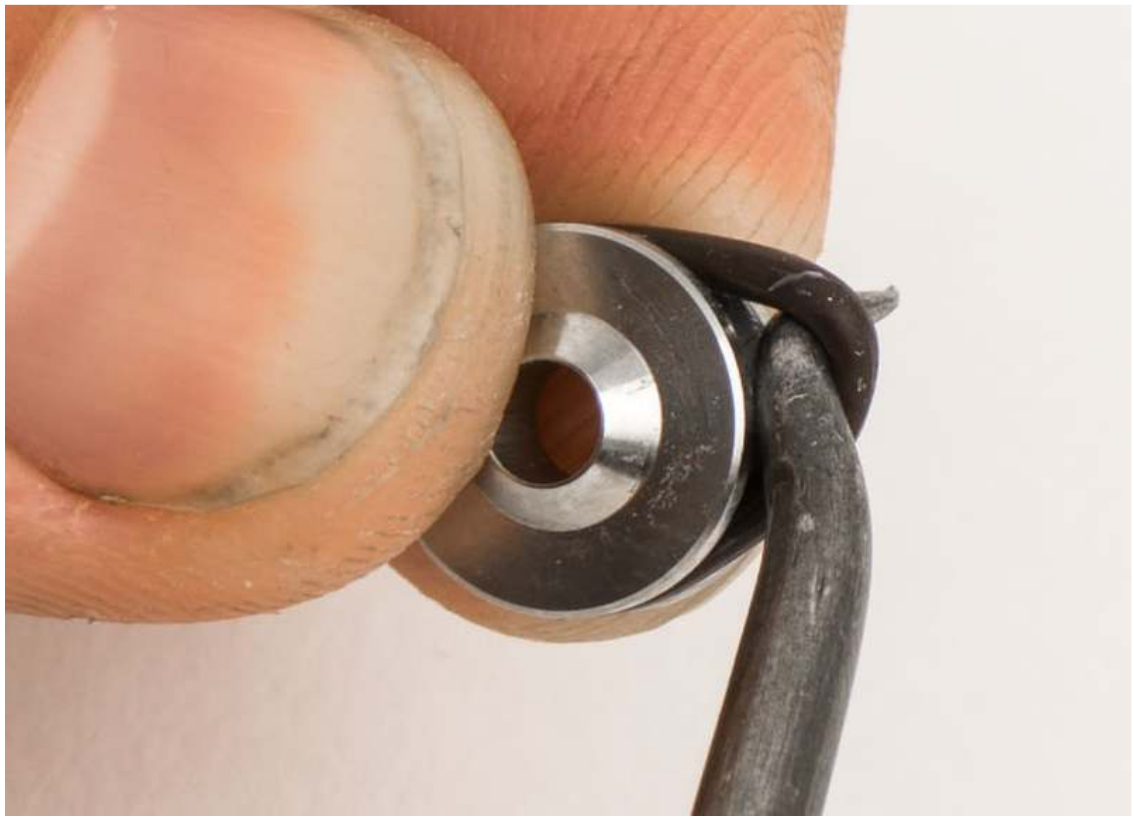
11b) Remove the Style Disk (#7 – RG5707), Dust Cap (#6 – RG5106), and 232 Bar Yoke (#2 – RG5102)

12b) Use a dowel to push out the Filter (#4 – RG5104) and O-ring (#5 – RG1241)

13) If the regulator was produced before June 2020, use a 2mm hex wrench push out the HP Orifice (#19.1 – RG5140)

If the regulator was produced after June 2020 (Serial # begins with “K”), use a 5mm hex wrench to loosen and remove the threaded HP orifice (#19.2 – RG5145)

14) Remove the O-ring (#5 – RG1241)



This completes disassembly of the FT1 First Stage

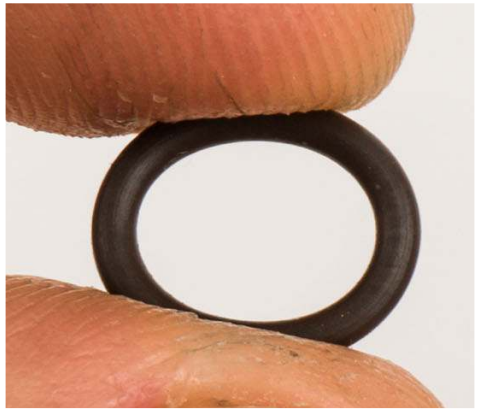
Warning!!! Only original Dive Rite parts are to be used

- 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 FT1 First Stage

1) Install O-ring (#5 – RG1241) onto the HP Orifice (#19.1 – RG5140 or #19.2 – RG5145) and install into the Main Housing (#8 – RG5708)

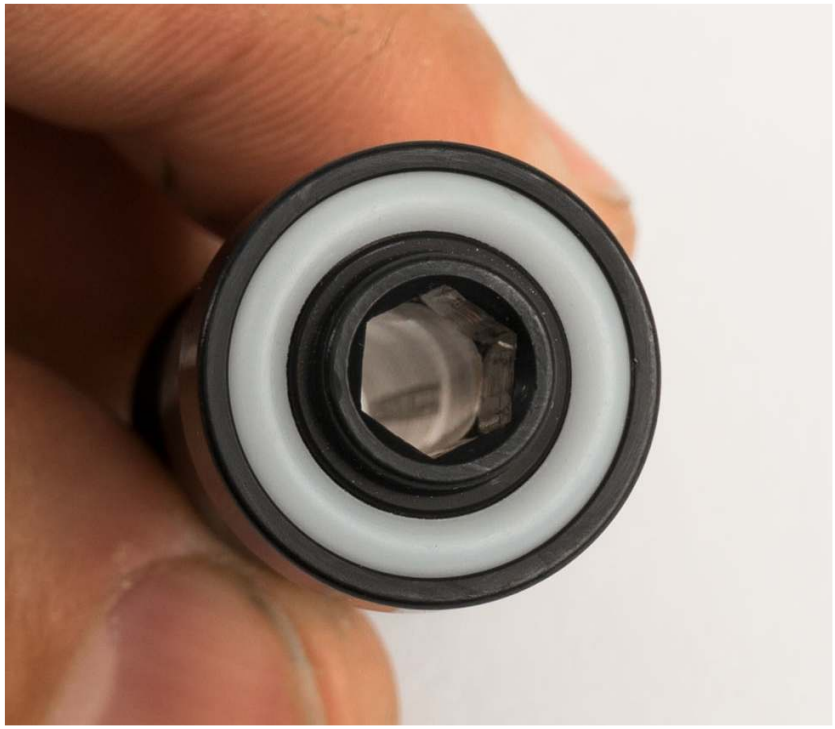
*This is a 90 durometer o-ring. To differentiate between 70 durometer o-rings, gently squeeze from the sides. 90 durometer o-rings are noticeably firmer.



2) If press in orifice style (RG5140), use the ¼ inch nut driver to push the Orifice into place. Do not push on the knife edge of the orifice.

If thread in orifice style (RG5145) (Serial # begins with “K”), use a 5mm allen wrench to install the orifice.

*Confirm that the Orifice is fully seated



*For yoke regulators skip to page 26

3a) Install O-ring (#27 – RG1239-P) onto DIN Bolt (#28 – RG5133) *Do not lubricate this O-ring.

4a) Install O-ring (#5 – RG1241) and Filter (#4 – RG5104) into DIN Bolt (#28 – RG5133). *Do not lubricate this O-ring.

*This is a 90 durometer o-ring

5a) Install the Style Disk (#7 – RG5707), Din Bolt Bushing (#30 – RG5130), and DIN Handwheel (#29 – RG5131)

6a) Install the Din Bolt (#28 - RG5133) and tighten with a ¼ inch hex wrench to 250 in-lb (28 N-m)

*Skip to page 29

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

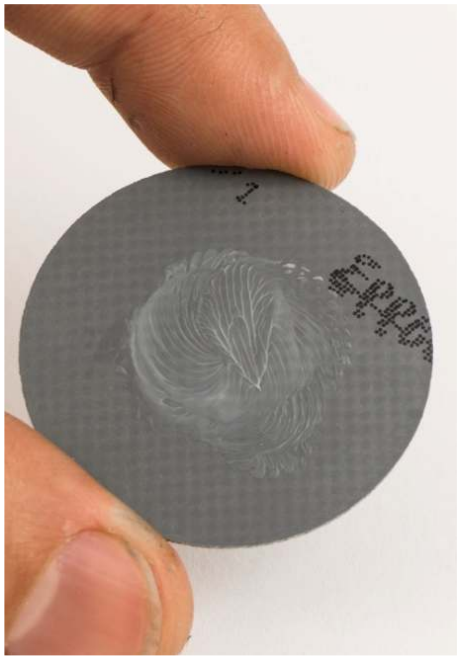
4b) Install Filter (#4 – RG5104) into Yoke Retainer (#3 – RG5103)

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

5b) Install Dust Cap (#6 – RG5106) onto Main Housing (#8 – RG5708). Install 232 Bar Yoke (#2 – RG5102) and Style Disk (#7 – RG5707) onto Yoke Retainer (#3 – RG5103) and install onto Main Housing (#8 – RG5708)

6b) Tighten Yoke Retainer (#3 – RG5103) with a 1” socket wrench to 250 in-lb (28 N-m) and install Yoke Knob (#1 – RG5101)

7) Install the Valve Lifter (#9.1 – RG5709 for push-in orifice models or #9.2 – RG5146 for threaded orifice models)



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

9) Install Teflon Washer (#11 – RG5111)

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

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

(12) Install the Adjustment Screw (#15 – RG5115) into the Diaphragm Cap (#35)

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

13) Install the Diaphragm Cap (#31 – RG5135). Install and tighten with the spanner wrench

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

14) Lubricate and install the O-rings (#18 – RG1235, #5 – RG1241, #20 – RG5720) onto the Balance Plug (#21 – RG5721)

15) Install the Balance Spring (#17 – RG5122). Lubricate stem of the HP Seat (#16 – RG5121) and install

*Compress the HP seat to ensure proper, smooth movement

16) Install Balance Plug assembly and tighten with a 6mm hex wrench to 106 in-lb (12 N-m)

17) Install HP O-rings (#22 - RG1231) and LP O-rings (#24 – RG1233) onto HP Port Plugs (#23 – RG5127) and LP Port Plugs (#25 - RG5129) respectively.

Install the port plugs into the Body and tighten using an appropriate allen wrench.

The first stage needs to be pressurized for the following steps

IP Adjustments should be completed prior to the following steps

18) Install the Transition Piston (#32 – RG5136)

19) Install the Silicone Disk (#33 – RG5733)

20) Install the Environmental Cap (#34 – RG5138) hand tight

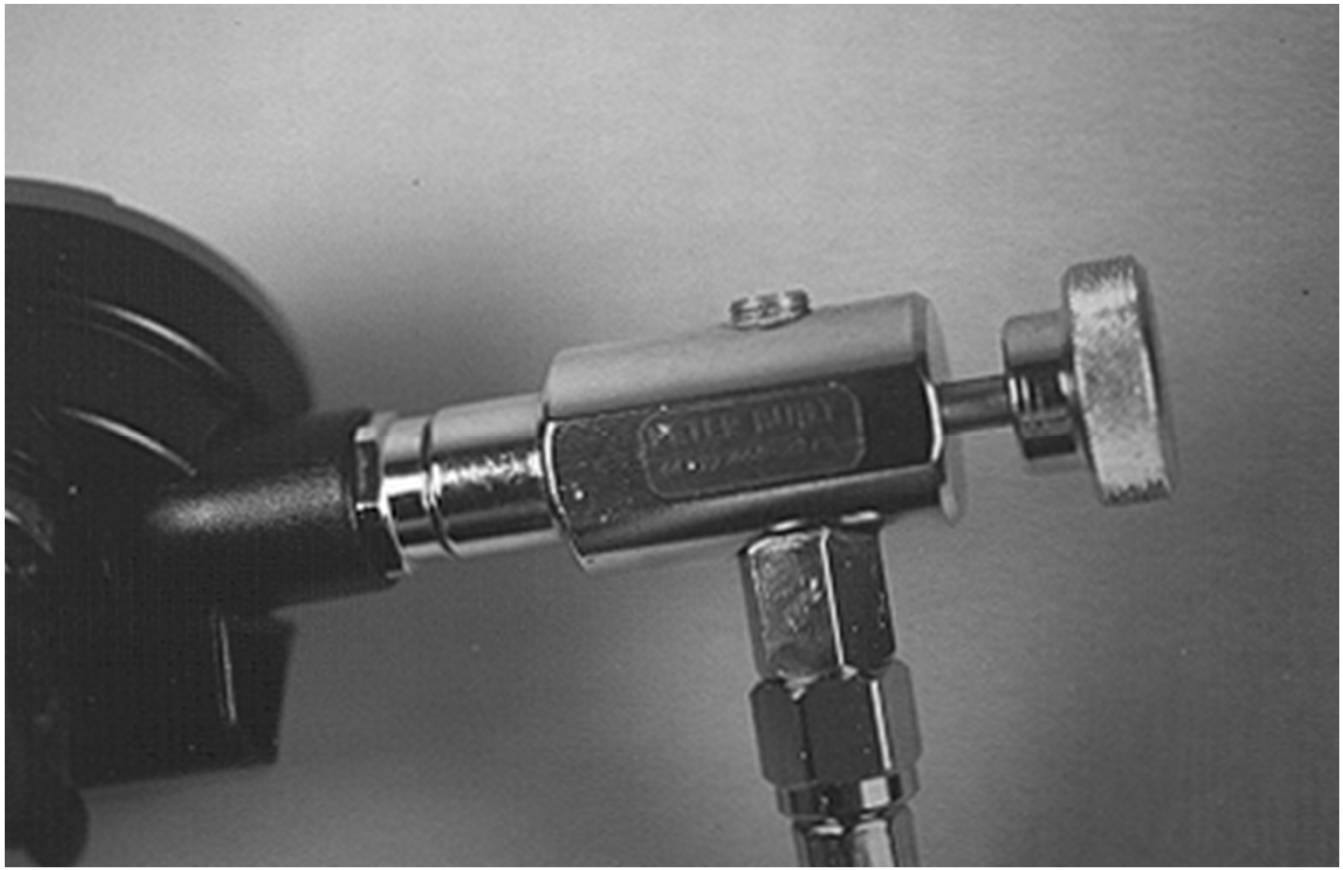
*Press down lightly on the Silicon Disk while tightening the Environmental Cap.

This completes assembly of the FT1 First Stage

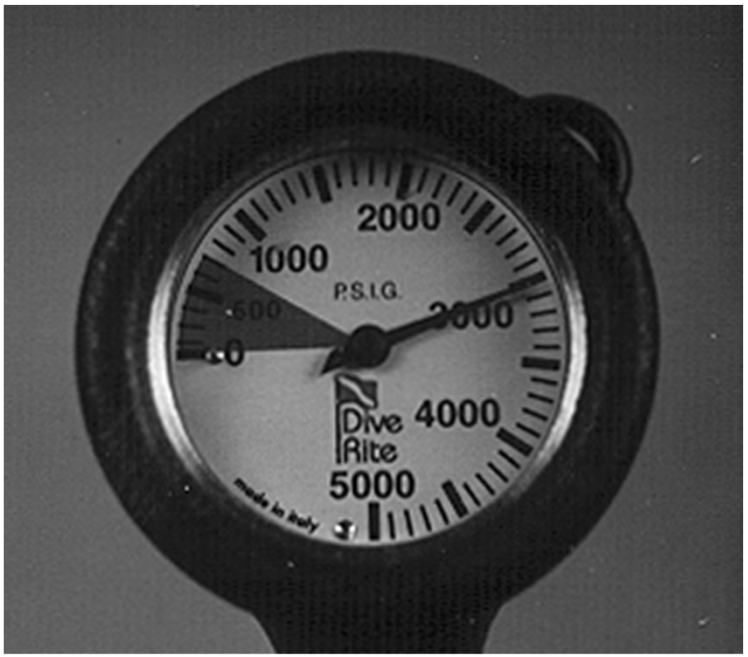
DIVE RITE®

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

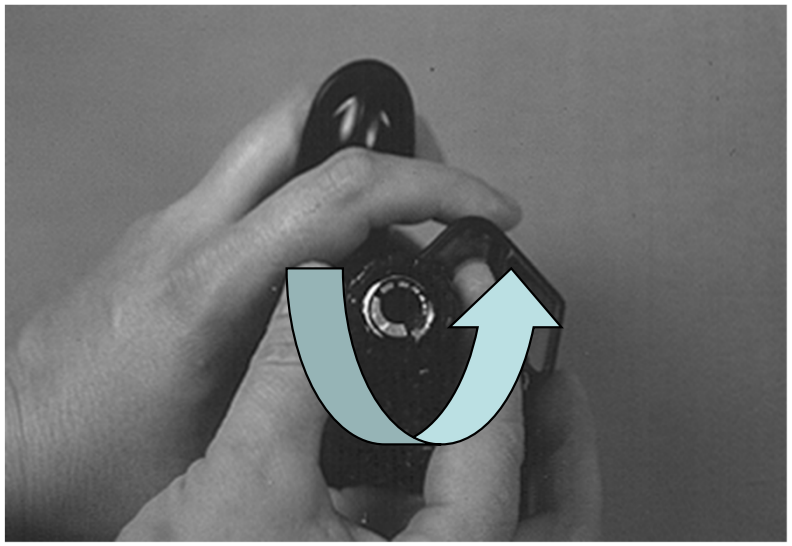
Intermediate Pressure

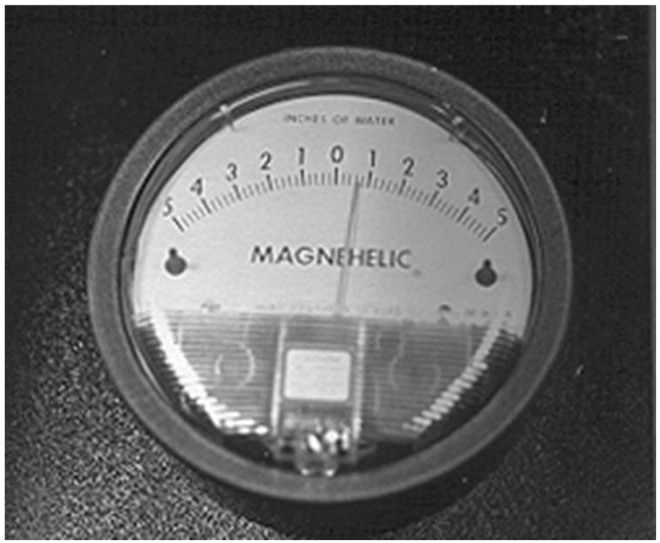
Note: it may be necessary to purge the regulator several times to allow the HP seat to “break in” and hold pressure.

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 .8-1.0 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.