

**DELTA 3 SECOND STAGE**

<b>TROUBLE SHOOTING</b>		
<b>SYMPTOM</b>	<b>POSSIBLE CAUSE</b>	<b>TREATMENT</b>
* <b>Freeflow or leakage present. (ADJUSTMENT KNOB (33) turned in)</b>	<ol style="list-style-type: none"> <li>1. LEVER ARM (17) bent.</li> <li>2. Excessive intermediate pressure.</li> <li>3. Damaged or worn POPPET SEAT (14).</li> <li>4. Damaged MOLDED ORIFICE (11).</li> <li>5. NYLON LOCK NUT (20) overtightened onto POPPET (15) shaft.</li> <li>6. WASHER (18) bent or distorted.</li> <li>7. MOLDED ORIFICE (11) incorrectly adjusted.</li> <li>8. POPPET SPRING (16) worn or weakened.</li> <li>9. INLET COUPLING (12) not sufficiently tightened into HOUSING (4) Inlet Tube.</li> <li>10. Trapped debris.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace with new.</li> <li>2. Refer to First Stage Troubleshooting Chart.</li> <li>3. Replace with new.</li> <li>4. Replace with new.</li> <li>5. Replace with new and readjust. (Refer to tuning section.)</li> <li>6. Replace WASHER (18), SPACER (19), and LOCK NUT (20) with new.</li> <li>7. Turn in clockwise to adjust. (Refer to tuning section.)</li> <li>8. Replace with new.</li> <li>9. Follow correct procedure given in Reassembly Section to tighten.</li> <li>10. Remove and clean.</li> </ol>
* <b>Excessive inhalation resistance. (ADJUSTMENT KNOB (33) turned out)</b>	<ol style="list-style-type: none"> <li>1. LOCK NUT (20) overtightened onto POPPET (15) shaft, causing excessive POPPET SPRING (16) tension.</li> <li>2. LOCK NUT (20) insufficiently tightened onto POPPET (15) shaft, causing LEVER ARM (17) slack.</li> <li>3. LEVER ARM (17) bent.</li> <li>4. MOLDED ORIFICE (11) incorrectly adjusted.</li> <li>5. Insufficient intermediate pressure from First Stage.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace with new and readjust. (Refer to tuning section.)</li> <li>2. Tighten to correct Spring load and Lever height. (Refer to tuning section.)</li> <li>3. Replace with new.</li> <li>4. Adjust to correct contact. (Refer to tuning.)</li> <li>5. Refer to First Stage Troubleshooting Chart.</li> </ol>
* <b>Rattle heard inside Second Stage.</b>	<ol style="list-style-type: none"> <li>1. Gravel or sand trapped inside HOUSING ASSEMBLY (4).</li> <li>2. LEVER ARM (17) slack present.</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove and clean.</li> <li>2. Tighten LOCK NUT (20) onto POPPET (15) shaft. (Refer to tuning section.)</li> </ol>
* <b>Little or no airflow when Purge Button is depressed.</b>	<ol style="list-style-type: none"> <li>1. FRONT COVER (2) not sufficiently tightened into HOUSING (4).</li> <li>2. Lever slack present.</li> <li>3. MOLDED ORIFICE (11) incorrectly adjusted.</li> </ol>	<ol style="list-style-type: none"> <li>1. Tighten COVER RING (1) until secure.</li> <li>2. Tighten LOCK NUT (20) onto POPPET (15) shaft. (Refer to tuning section.)</li> <li>3. Adjust MOLDED ORIFICE (11) to correct contact. (Refer to tuning section.)</li> </ol>
* <b>ADJUSTMENT KNOB (33) difficult to turn.</b>	<ol style="list-style-type: none"> <li>1. Debris or corrosion present on ADJUSTMENT SHAFT (29).</li> <li>2. Debris present inside ADJUSTMENT KNOB (33).</li> <li>3. Debris or corrosion present on or inside ADJUSTMENT SPRING (27).</li> </ol>	<ol style="list-style-type: none"> <li>1. Disassemble and clean.</li> <li>2. Flush out or disassemble if necessary to clean.</li> <li>3. Disassemble to clean or replace with new as needed.</li> </ol>
* <b>Water entering Second Stage.</b>	<ol style="list-style-type: none"> <li>1. Tear in MOUTHPIECE(8).</li> <li>2. EXHAUST VALVE (6) distorted or damaged.</li> <li>3. DIAPHRAGM (3) distorted or damaged.</li> <li>4. Debris trapped beneath EXHAUST VALVE (6).</li> <li>5. FRONT COVER (2) insufficiently tightened onto HOUSING (4).</li> <li>6. Cracked or damaged HOUSING (4).</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace with new.</li> <li>2. Replace with new.</li> <li>3. Replace with new.</li> <li>4. Remove and clean.</li> <li>5. Tighten until secure and properly aligned.</li> <li>6. Replace with new.</li> </ol>

## DISASSEMBLY PROCEDURE

**△ NOTE:** Be sure to perform the steps outlined in the Initial Inspection Procedures (Doc. 12-2202) prior to disassembling the regulator. Review the Troubleshooting Section to gain a better idea of which internal parts may be worn, and to better advise your customer of the service that is needed.

1. Snip the plastic TIE WRAP (7) that holds the MOUTHPIECE (8), and remove the MOUTHPIECE. Inspect the condition of the MOUTHPIECE to ensure that it is supple and free of any tears or corrosion. Discard if found.
2. Remove the Hose from the Second Stage, using an 11/16" open end wrench, while holding the hex portion of the INLET COUPLING (12) secure with a 3/4" open end wrench.
3. Remove the COVER RING (1) using a universal Front Cover tool if necessary, and remove the FRONT COVER (2) to expose the DIAPHRAGM (3).
4. Grasp the DIAPHRAGM (3) by the raised edges of the center, and lift with a slight upward twist to remove. Inspect the DIAPHRAGM to ensure it is supple and free of any tears, corrosion, or other distortion. Discard if found.
5. Depress and hold the LEVER ARM (17) to remove the INLET COUPLING (12) in a counter clockwise direction, using a 3/4" open end wrench (Fig. 1).
6. Remove the COUPLING O-RING (13) from the INLET COUPLING (12) and inspect for any signs of decay. Discard if found.
7. Using a narrow slotted blade screwdriver, remove the MOLDED ORIFICE (11) by turning it counter clockwise inside the INLET COUPLING (12). When it has disengaged completely from the threads, press it out with the use of a cotton swab (Fig. 2). Use caution to avoid nicking or scratching the delicate knife edge of the ORIFICE as this is done. Remove and discard the ORIFICE O-RING (10). Inspect the ORIFICE carefully with the use of a magnifier to ensure that it is perfectly free of any scoring or nicks. If found, discard and DO NOT attempt to reuse.
8. Using a Poppet installation tool, push the POPPET (15) inward in the Inlet Tube of the HOUSING (4), compressing the POPPET SPRING (16), and carefully remove the LEVER ARM (17) (Fig. 3).
9. Turn the ADJUSTMENT KNOB (33) out completely until resistance is felt. Remove the ADJUSTMENT KNOB SCREW (34) using a 5/32" hex key and slide the KNOB off the ADJUSTMENT SHAFT (29).



Fig. 1

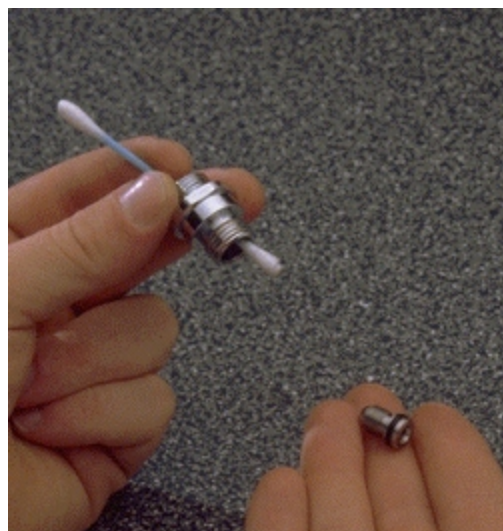


Fig. 2

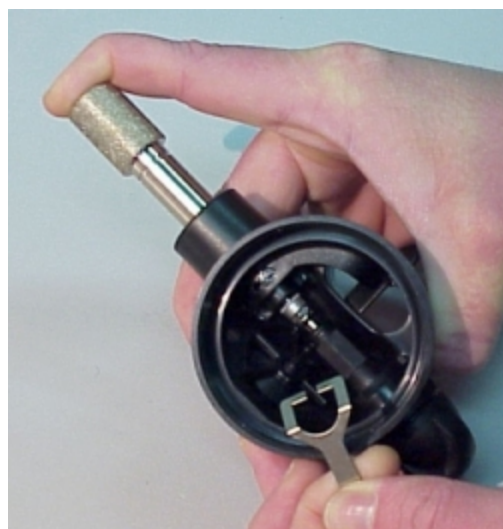


Fig. 3

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10. Remove the PACKING NUT (32) by turning it counterclockwise using a 5/8" open end wrench. Remove the THRUST WASHER (31) from the ADJUSTMENT SHAFT (29).
11. Using the Poppet installation tool, push the POPPET (15) inward in the Inlet Tube of the HOUSING (4), which will push the SPRING PAD (26), ADJUSTMENT SPRING (27), and ADJUSTMENT SHAFT (29) with PISTON SPRING FOLLOWER (28) through the outer end of the ADJUSTMENT TUBE (24) (Fig. 4). If the SPRING PAD does not come out, gently tap the HOUSING in your hand to remove it.
12. Remove the STEM O-RING (30) from the ADJUSTMENT SHAFT (29) and examine for signs of decay or distortion. Discard if found.

**NOTE:** Removal of the PISTON SPRING FOLLOWER (28) from the ADJUSTMENT SHAFT (29) should not be necessary unless it is broken or needs to be replaced. In this case remove it by holding the ADJUSTMENT SHAFT in one hand and turning the PISTON SPRING FOLLOWER clockwise with your other hand. Note the thread is left handed.

13. Examine the ADJUSTMENT SPRING (27) with a magnifier and compare with new to ensure correct tension and length. Discard if found to be distorted, weakened, or corroded.
14. Using your finger, push the ADJUSTMENT TUBE (24) into the HOUSING (4) and remove by tilting and lifting out (Fig. 5). The BALANCE SHAFT (21) will retract into the TUBE during removal.
15. Remove the ADJUSTMENT TUBE O-RING (25) from the ADJUSTMENT TUBE (24) and inspect for any signs of decay. Discard if found.
16. Remove the BALANCE SHAFT (21) by pushing it out of the ADJUSTMENT TUBE (24) using a cotton swab. Examine the SHAFT and compare with new to ensure that it is not bent or distorted in any way. Discard if distortion is found. Remove the SNAP WASHER (22) by gently inserting a small screwdriver through one of the slots in the ADJUSTMENT TUBE. Examine the SNAP WASHER for deterioration. Discard if found. Remove the BALANCE SHAFT O-RING (23) (Fig. 6). Discard the O-RING and DO NOT attempt to reuse.
17. Remove the POPPET (15), POPPET SPRING (16), WASHER (18), SPACER (19), and LOCK NUT (20) by holding the POPPET with the Poppet installation tool while turning the LOCK NUT counterclockwise using a 1/4" nut driver. To avoid a sudden ejection as they are disengaged, continuously apply a slight amount of inward pressure to the POPPET and the LOCK NUT.
18. Examine the SPACER (19) for deterioration. Discard if found. Discard the LOCK NUT (20) and WASHER (18), and DO NOT attempt to reuse.



Fig. 4



Fig. 5

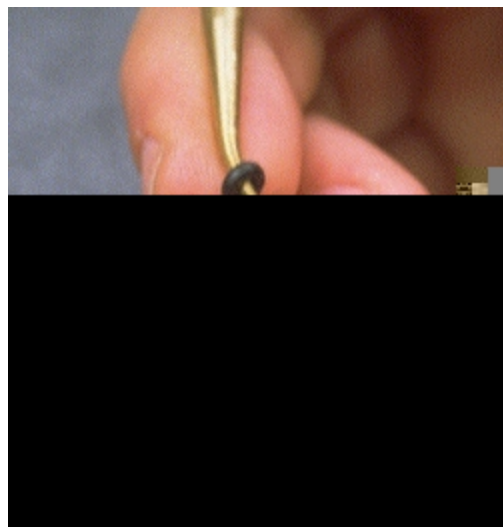


Fig. 6

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19. Examine the LEVER ARM (17) and compare with new to ensure that it is not bent or distorted in any way. Discard if distortion is found.
20. Examine the POPPET SPRING (16) with a magnifier and compare with new to ensure correct tension and length. Discard if found to be weakened or corroded.
21. Remove the POPPET SEAT (14) from the POPPET (15) with the use of a dental pick. Discard, and DO NOT attempt to reuse.
22. Using the flat end of a brass o-ring tool or a thin plastic probe, carefully lift the retaining tab slats of the EXHAUST COVER (5) from the retaining tabs located on the base of the HOUSING (4) (Fig. 7). Once the EXHAUST COVER is disengaged from the retaining tabs, push straight down on the exhaust porting of the EXHAUST COVER to remove it from the HOUSING.
23. Inspect the overall condition of the HOUSING (4), and the EXHAUST COVER (5) to ensure they are free of any stress cracks or other distortions. Ensure that all threading on the HOUSING is in good condition. Discard either if any distortion or damage is found.
24. Using a soft probe, inspect the condition of the EXHAUST VALVE (6) to ensure that it is supple and free of any tears or corrosion, and that it seals completely around the seating surface of the HOUSING (4).

**△ NOTE: Provided that the EXHAUST VALVE (6) is in good condition, removal of the EXHAUST VALVE is not necessary. The HOUSING (4) may be cleaned with the EXHAUST VALVE attached. (Refer to the Cleaning Section of this manual.)**

25. If the EXHAUST VALVE (6) requires replacement, it may be removed by grasping it at the flange and pulling it straight out, snipping the retainer stem if necessary. Discard.
26. Inspect the VENTURI SWITCH (35) for smooth even operation, ensuring there is no resistance throughout its range of movement. Inspect for signs of debris trapped within the VENTURI SWITCH Mechanism, and ensure there is no corrosion or rust on the VENTURI SWITCH Retaining Ring.

**△ NOTE: Provided that the VENTURI SWITCH Mechanism is in good condition, removal of the VENTURI SWITCH is not necessary. The HOUSING (4) may be cleaned with the VENTURI SWITCH attached. (Refer to the Cleaning Section of this manual.)**

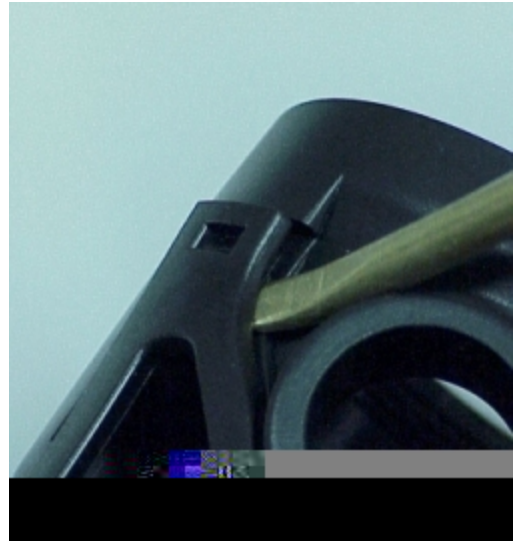


Fig. 7



## DELTA 3 SECOND STAGE

27. If disassembly of the VENTURI SWITCH Assembly is needed, proceed by closely adhering to the following steps:

A. Remove the SWITCH RETAINING RING (37) by pushing on the exposed tip of the RETAINING RING with a brass O-ring tool until the body of the RETAINING RING is no longer seated in the groove on the VENTURI SWITCH (35) (Fig. 8).

B. Place the end of the brass O-ring tool through the Mouthpiece opening in the HOUSING (4), and into the space between the Body of the RETAINING RING (37) and the VENTURI SWITCH (35). Using caution not to damage the HOUSING, slowly pull the RETAINING RING away from the VENTURI SWITCH to remove it (Fig. 9).

C. Grasp the VENTURI SWITCH (35) by the Adjustment Tab and pull it straight up and out of the HOUSING (4) to remove. Remove and discard the VENTURI SWITCH O-RING (36), and DO NOT reuse.

D. Closely examine the VENTURI SWITCH (35) and the VENTURI SWITCH RETAINING RING (37) for signs of distortion, cracks, corrosion, rust, or other damage. Discard if found.

## REASSEMBLY PROCEDURE

**NOTE:** Prior to reassembly, it is necessary to inspect all parts, both new and those that are being reused. Check to ensure that o-rings are clean and supple, and that every part and component has been thoroughly cleaned and dried.

**WARNING:** Use only genuine Oceanic parts, subassemblies, and components whenever assembling Oceanic products. DO NOT attempt to substitute an Oceanic part with another manufacturer's, regardless of any similarity in shape, size, or appearance. Doing so may render the product unsafe, and could result in serious injury or death of the user.

1. Replace the EXHAUST VALVE (6), if removed, into the HOUSING (4) by gently pulling the Retainer Stem through the HOUSING until the Retaining Flange is inside the HOUSING and properly seated.
2. Replace the EXHAUST COVER (5) onto the Exhaust Tee portion of the HOUSING (4) by holding the COVER at a slight angle to the HOUSING with the Bottom raised and mating the Top of it with the Hinge Tabs on the HOUSING. Ensure that the Top is aligned, then press the COVER in toward the HOUSING until it snaps into place. (Fig. 10)



Fig. 8



Fig. 9

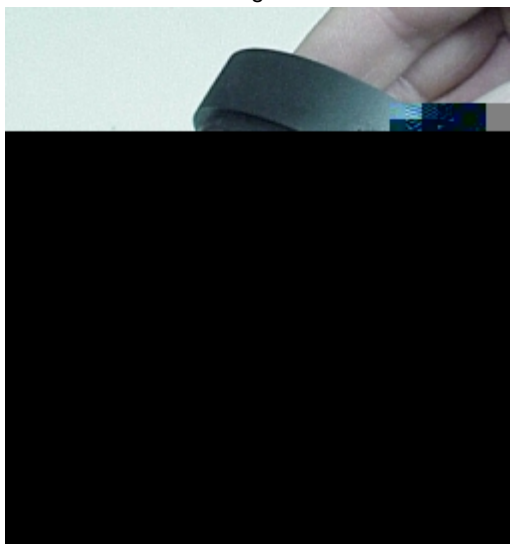


Fig. 10

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3. Replace the VENTURI SWITCH ASSEMBLY if removed by closely adhering to the following steps:

A. Lightly lubricate and install the VENTURI SWITCH O-RING (36) onto the VENTURI SWITCH (35), ensuring the O-RING is properly seated in the Groove.

B. Holding the ASSEMBLY by the Adjustment Tab, lower the VENTURI SWITCH (35) into the HOUSING (4), ensuring that the Adjustment Stop Post is seated in the Adjustment Groove located on the HOUSING. Ensure the Retaining Ring Groove on the VENTURI SWITCH is visible when looking into the HOUSING through the Mouthpiece opening.

C. Load the SWITCH RETAINING RING (37) into the Retaining Ring tool so that the rounded side of the RETAINING RING is against the Cradle of the tool, and the flat side is facing up and out (Fig. 11).

D. Insert the Retaining Ring Tool with the RETAINING RING (37) into the HOUSING (4) through the Mouthpiece opening. Press the RETAINING RING into the VENTURI SWITCH (35) Groove until completely seated, ensuring that the flat side of the RETAINING RING is against the HOUSING (4). Remove the tool (Fig. 12).

E. Turn the VENTURI SWITCH (35) back and forth through its complete range of motion ensuring smooth movement without any restriction. Verify that the RETAINING RING (37) is completely seated into the Groove on the VENTURI SWITCH, and does not rotate.

4. Replace the POPPET SEAT (14) into the POPPET (15), with the side that is perfectly smooth facing out. Ensure that it is completely seated, flush with the Rim of the POPPET. DO NOT use adhesive.
5. Apply a light film of lubricant to each end of the POPPET SPRING (16) and place it onto the POPPET (15). Fit the POPPET into the Pronged End of the Poppet installation tool and insert the POPPET Shaft completely through the Inlet Tube of the HOUSING (4) compressing the SPRING until the threaded portion of the Shaft is completely visible inside the HOUSING. Hold in position by grasping the tool with the fingers and the outer rim of the HOUSING with the thumb.
6. Place the WASHER (18) over the threads of the POPPET (15) and onto the Shaft. Place the SPACER (19) onto the POPPET Shaft. Turn the LOCK NUT (20) clockwise onto the POPPET threads with your finger tips until threading is started (Fig. 13). Then, while still compressing the SPRING (16) with the Poppet installation tool, insert a 1/4" nut driver through the open Adjustment Port of the HOUSING (4) and turn the LOCK NUT further onto the POPPET until 3 threads are showing beyond the outer surface of the LOCK NUT (Fig. 13 - insert). Remove the tools.

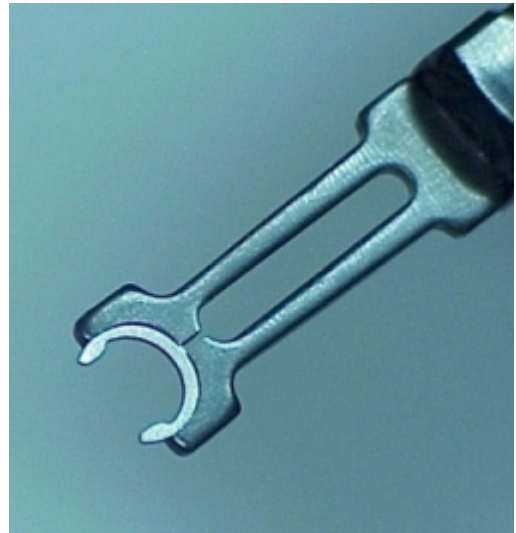


Fig. 11



Fig. 12

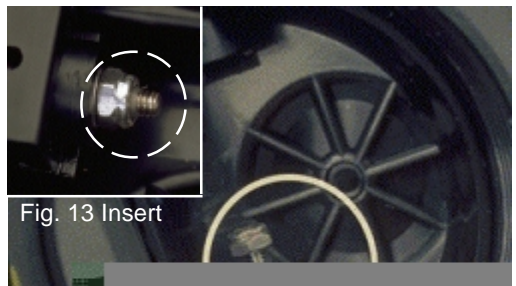


Fig. 13 Insert

Fig. 13

## DELTA 3 SECOND STAGE

**⚠ CAUTION:** It is very important that a minimum of 2-3 threads of the POPPET (15) Shaft are adjusted outside the LOCK NUT (20). The LEVER ARM (17) may otherwise become caught on the end of the POPPET Shaft, resulting in an uncontrolled free flow.

7. Lubricate and install the BALANCE SHAFT O-RING (23) into the small opening end of the ADJUSTMENT TUBE (24). Install the SNAP WASHER (22), smooth end down, into the ADJUSTMENT TUBE directly over the BALANCE SHAFT O-RING, causing the WASHER to "snap" securely into position. Insert the BALANCE SHAFT (21) into the small opening end of the ADJUSTMENT TUBE through the SNAP WASHER and BALANCE SHAFT O-RING (Fig. 14).
8. Lubricate and install the ADJUSTMENT TUBE O-RING (25) onto the ADJUSTMENT TUBE (24). Holding the smaller end of the ADJUSTMENT TUBE, insert it, threaded end first, down into the HOUSING (4) and angle it into the ADJUSTMENT TUBE Opening in the side of the HOUSING. Ensure that the ADJUSTMENT TUBE Flange mates flat against the inner wall of the opening. If necessary, grasp the outer threads and rotate the TUBE until the surfaces mate.
9. If previously removed, install the PISTON SPRING FOLLOWER (28) on the ADJUSTMENT SHAFT (29). Screw it on counter clockwise, flat side first. DO NOT tighten with a wrench.
10. Lubricate and install the STEM O-RING (30) onto the ADJUSTMENT SHAFT (29).
11. Holding the ADJUSTMENT SHAFT (29) vertically, install the ADJUSTMENT SPRING (27) over the Stem so it rests in the concave end of the PISTON SPRING FOLLOWER (28), then place the SPRING PAD (26) on top with the small rounded end in the SPRING (Fig. 15).
12. Holding the HOUSING (4) with the ADJUSTMENT TUBE (24) facing down and your index finger inside pressing the TUBE against the inner wall of the HOUSING, insert the ADJUSTMENT SHAFT (29), ADJUSTMENT SPRING (27) and SPRING PAD (26) up into the TUBE (Fig. 16). This will push the BALANCE SHAFT (21) partially out the other end of the TUBE and up against the POPPET (15). Ensure that the BALANCE SHAFT is properly aligned with the POPPET. Spring tension will hold the parts in place.
13. Install the THRUST WASHER (31) onto the ADJUSTMENT STEM (29), then slide the PACKING NUT (32) over the STEM and thread it onto the ADJUSTMENT TUBE (24) until secure. Tighten with a 5/8" open end wrench to a torque of 12 in/lbs.

**⚠ CAUTION:** DO NOT over tighten! Doing so will damage the HOUSING or other parts, requiring their replacement.

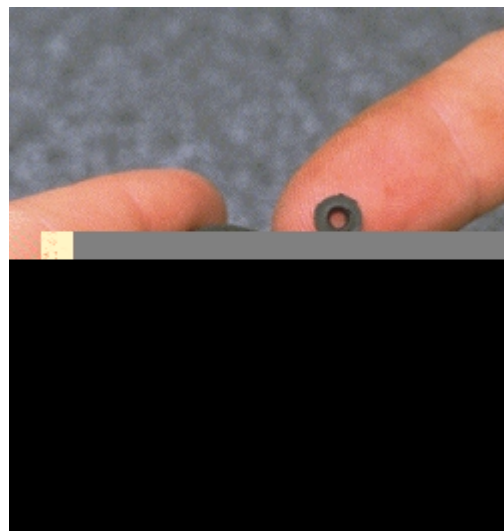


Fig. 14



Fig. 15

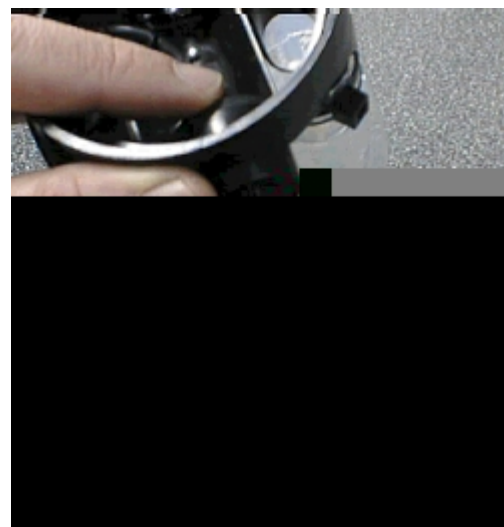


Fig. 16



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14. Install the ADJUSTMENT KNOB (33) over the ADJUSTMENT SHAFT (29) and PACKING NUT (32). Insert the ADJUSTMENT KNOB SCREW (34) and tighten with a 3/32" hex key **to a torque of 4 in/lbs.**

15. Using a Poppet installation tool, push the POPPET (15) into the HOUSING (4) to expose the WASHER (18) and SPACER (19) inside the HOUSING. Place the Forks of the LEVER ARM (17) over the POPPET shaft between the WASHER and the SPACER. Relax the POPPET and watch to ensure that the LEVER ARM stands upright.

16. Lubricate and install the INLET COUPLING O-RING (13) onto the INLET COUPLING (12). Install the INLET COUPLING into the Inlet Tube of the HOUSING (4) with the smaller opening facing in. Tighten clockwise with a 3/4" open end wrench **to a torque of 110 in/lbs.**

17. Lubricate and install the ORIFICE O-RING (10) onto the MOLDED ORIFICE (11). Lubricate the threads of the ORIFICE with a very thin film of lubricant and insert the ORIFICE into the INLET COUPLING (12) with the knife edge facing in (Fig. 17).

**CAUTION:** Be careful to protect the delicate knife edge as this is done.

**NOTE:** For best sensitivity of touch during Step #18, place your forefinger gently on the LOCK NUT (20) while slowly turning the MOLDED ORIFICE (11). As soon as contact is made, you will feel the LOCK NUT begin to turn. Hold the screwdriver by the shaft rather than the handle.

18. Using a narrow shafted, slotted blade screwdriver, gently turn the MOLDED ORIFICE (11) clockwise into the INLET COUPLING (12) until the knife edge is barely contacting the POPPET SEAT (14). DO NOT continue to turn the ORIFICE any further beyond this point, which will cause the LEVER ARM (17) to drop. Doing so will damage the POPPET SEAT, requiring its replacement (Fig. 18).

19. Place the DIAPHRAGM (3) inside the HOUSING (4) with the raised center facing up, and ensure that it seats flush at the base of the inner threads.

20. Place the FRONT COVER (2) directly over the DIAPHRAGM (3), and ensure that it seats flush. Position the COVER RING (1) onto the HOUSING (4), taking care to ensure that it is correctly seated on the threads. Hand tighten until secure and ensure the FRONT COVER is properly aligned, with the logo right side up (Fig. 19). Use the universal front cover tool, if necessary. DO NOT over tighten.



Fig. 17

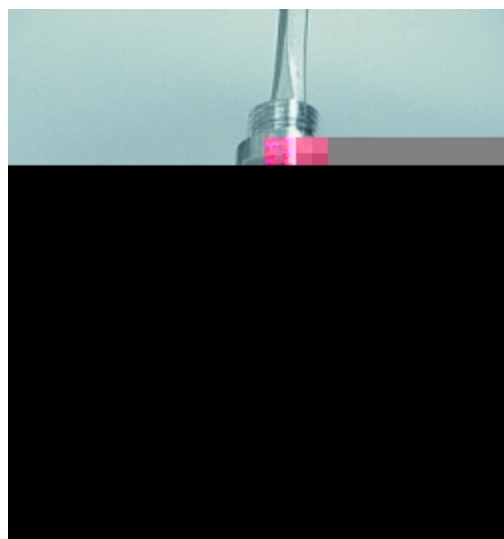


Fig. 18



Fig. 19



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21. Secure the MOUTHPIECE (9) onto the HOUSING (4) with an all plastic, noncorrosive TIE WRAP (8), positioning the Locking Tab of the TIE WRAP towards the Hose (Fig. 20).

**△ NOTE:** Oceanic's patented Orthodontic Mouthpieces are designed to accommodate the natural overbite of the human jaw. Ensure that it is properly positioned.

22. Lubricate and replace the O-ring inside the Second Stage Coupling End of the LP Hose. Install the Hose onto the Second Stage, and tighten to a torque of 55 in/lbs with an 11/16" crows foot wrench, while holding the hex portion of the INLET COUPLING (12) secure with a 3/4" crows foot wrench (Fig. 21).

## FINAL TUNING AND TESTING

### FIRST STAGE TESTING

1. Perform the Leak Detection Test specified in the Initial Inspection procedure.

**△ NOTE:** Refer to the Trouble Shooting Section to determine the possible cause and treatment of any gas leaks that may be found.

2. Connect the Delta 3 Second Stage LP Hose to a low pressure port of the First Stage. Ensure that all other Ports are sealed with Port Plugs, with the exception of an additional low pressure quick disconnect Hose.
3. Connect a recently calibrated low pressure test gauge to the additional low pressure Hose, and connect the First Stage to a pure breathing gas source of 3,000PSI.
4. Slowly open the valve to pressurize the Regulator, and check the test gauge to ensure that the intermediate pressure is set as recommended in the Specifications for the First Stage being used.

**△ NOTE:** If the intermediate pressure is found to be other than recommended, refer to that Regulator's Trouble Shooting Section to determine possible cause and treatment.

### TUNING

1. Prior to tuning the Delta 3, check the following items:
  - A. 2 to 3 threads on the Shaft of the POPPET (15) should extend past the outer surface of the LOCK NUT (20) inside the HOUSING (4).
  - B. The FRONT COVER (2) should be secure and properly aligned.
  - C. The ADJUSTMENT KNOB (33) should be turned counter clockwise 1-1/2 turns from fully open (or out).

(Continued on Page 10)

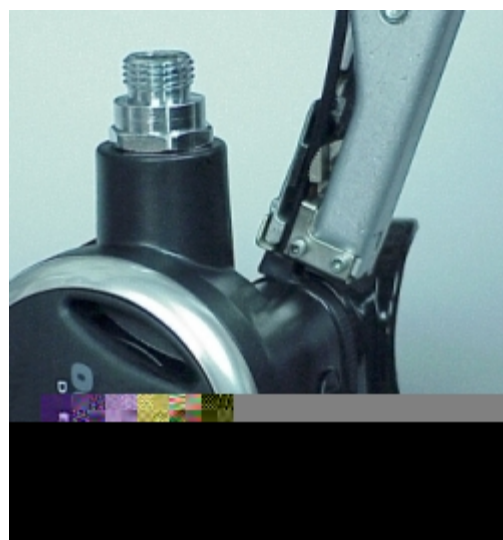


Fig. 20




Fig. 21


## DELTA 3 SECOND STAGE


- D. Connect an In-Line Adjustment tool between the low pressure Hose and INLET COUPLING (12).
- E. The MOUTHPIECE (8) should be cleaned and disinfected with warm, soapy water.

- 2. Pressurize the regulator with a pure breathing gas source of 3,000PSI, and listen to determine that a slight airflow is initially present. If necessary, use the In-Line Adjustment tool to turn the MOLDED ORIFICE (11) counter clockwise, slightly out, to initiate this airflow.


 **NOTE:** While pressurized, the slotted blade of the In-Line Adjustment tool will be held away from the MOLDED ORIFICE (11), and will therefore needs to be pushed inward and held while turning in either direction. Locate the slotted head of the ORIFICE by touch before attempting any adjustment.


- 3. Use the In-Line Adjustment tool to turn the MOLDED ORIFICE (11) in clockwise using small fractions of a turn just until airflow is no longer present. Pause to listen carefully for airflow or leakage after each adjustment.

 **NOTE:** Turning the MOLDED ORIFICE (11) in further than necessary to stop airflow will result in lever slack and excessive Spring load tension, prohibiting peak performance.

 **CAUTION:** To avoid cutting the POPPET SEAT (14) with the knife edge of the ORIFICE (11), depress the Purge Button while turning the ORIFICE in or out.

- 4. Hold the Second Stage with the MOUTHPIECE (8) facing directly down, and gently shake up and down. Listen carefully for any rattle that may be present, indicating LEVER ARM (17) slack. If found, perform the following procedure:
  - A. Remove the COVER RING (1), FRONT COVER (2), and DIAPHRAGM (3) to gain access to the Valve Assembly.
  - B. Purge the Regulator of air.
  - C. Depress the LEVER ARM and hold to remove the INLET COUPLING (12) from the Inlet Tube of the HOUSING (4), using a 3/4" open end wrench.
  - D. Turn the LOCK NUT (20) further clockwise onto the POPPET (15) Shaft with small fractions of a turn, using the Poppet Installation tool and 1/4" open end wrench. Use the correct method given in step 15 of the Reassembly Procedure to replace the INLET COUPLING after each adjustment, and again determine whether slack is eliminated.

 **NOTE:** Avoid tightening the LOCK NUT (20) any further than is necessary to eliminate LEVER ARM (17) slack. It may be necessary to repeat step 4D several times to arrive at the correct setting.

 **CAUTION:** Be careful to avoid over adjusting! If airflow returns, replace the LOCK NUT and POPPET SEAT (14) with new, and start over after rereading the above procedures.

## DELTA 3 SECOND STAGE

5. Replace the DIAPHRAGM (3), FRONT COVER (2), and COVER RING (1) if removed, and pressurize the Regulator again with a pure breathing gas source of 3,000PSI. Determine the range of adjustment by performing the following procedure:
  - A. Turn the ADJUSTMENT KNOB (33) completely out counter clockwise. A slight to moderate airflow should be present.
  - B. Turn the ADJUSTMENT KNOB completely in clockwise and fully depress the Purge Button. This should initiate a slight airflow.

**△ NOTE: If airflow is greater or less than specified for each adjustment, refer to the Trouble Shooting Section to determine possible cause and treatment.**

6. Purge the Regulator of air, remove the In-Line Adjustment tool and connect the LP Hose directly onto the INLET COUPLING (12), using two wrenches as prescribed in step 22 of the Reassembly procedure.
7. Pressurize the Regulator again with a pure air source of 3,000PSI. Return the ADJUSTMENT KNOB (33) to its mid range position. Inhale lightly through the MOUTHPIECE (8) to determine that air flows easily and smoothly, without any hesitation or lag.

**△ NOTE: If hesitation or lag is detected, refer to the Trouble Shooting Section to determine possible cause and treatment.**

8. Clean and disinfect the MOUTHPIECE (8) in warm, soapy water before returning the Delta 3 to the customer.

## SPECIFICATIONS

**Torques**

P/N 4330	Coupling	100 to 120 in-lbs
P/N 4787	Screw	4 to 5 in-lbs
P/N 6332	Packing Nut	11 to 13 in-lbs
LP Hose		50 to 60 in-lbs

**Opening Effort (IP = 140 psi)**

1. Leak with ADJUSTMENT KNOB turned fully out, clockwise.
2. No leak with knob turned in, counter clockwise, 1.5 turns.
3. Minimum effort with no leak = 1.2 inches of H<sub>2</sub>O, or less.

**Specialty Tools**

P/N 40.9510	In-line Adjustment Tool
P/N 40.3362	Poppet Installation and Removal Tool
P/N 40.4400	Retaining Ring Installation Tool
P/N 40.9315	Intermediate Press. Gauge
P/N 40.9520	O-ring Tool Kit
P/N 40.9650	Universal FRONT COVER Tool
P/N 40.2302	Christo-Lube MCG111 - 2 oz

**Standard Tools**

P/N	N/A	Inch pounds Torque Wrench
P/N	N/A	3/32" Hex Key Socket
P/N	N/A	5/8" Crows Foot Wrench
P/N	N/A	3/4" Crows Foot Wrench
P/N	N/A	11/16" Crows Foot Wrench
P/N	N/A	Standard Screwdriver - small
P/N	N/A	1/4" Nut Driver
P/N	N/A	Allen Key - 3/32"
P/N	N/A	Cotton Swab (Q-Tip)



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