

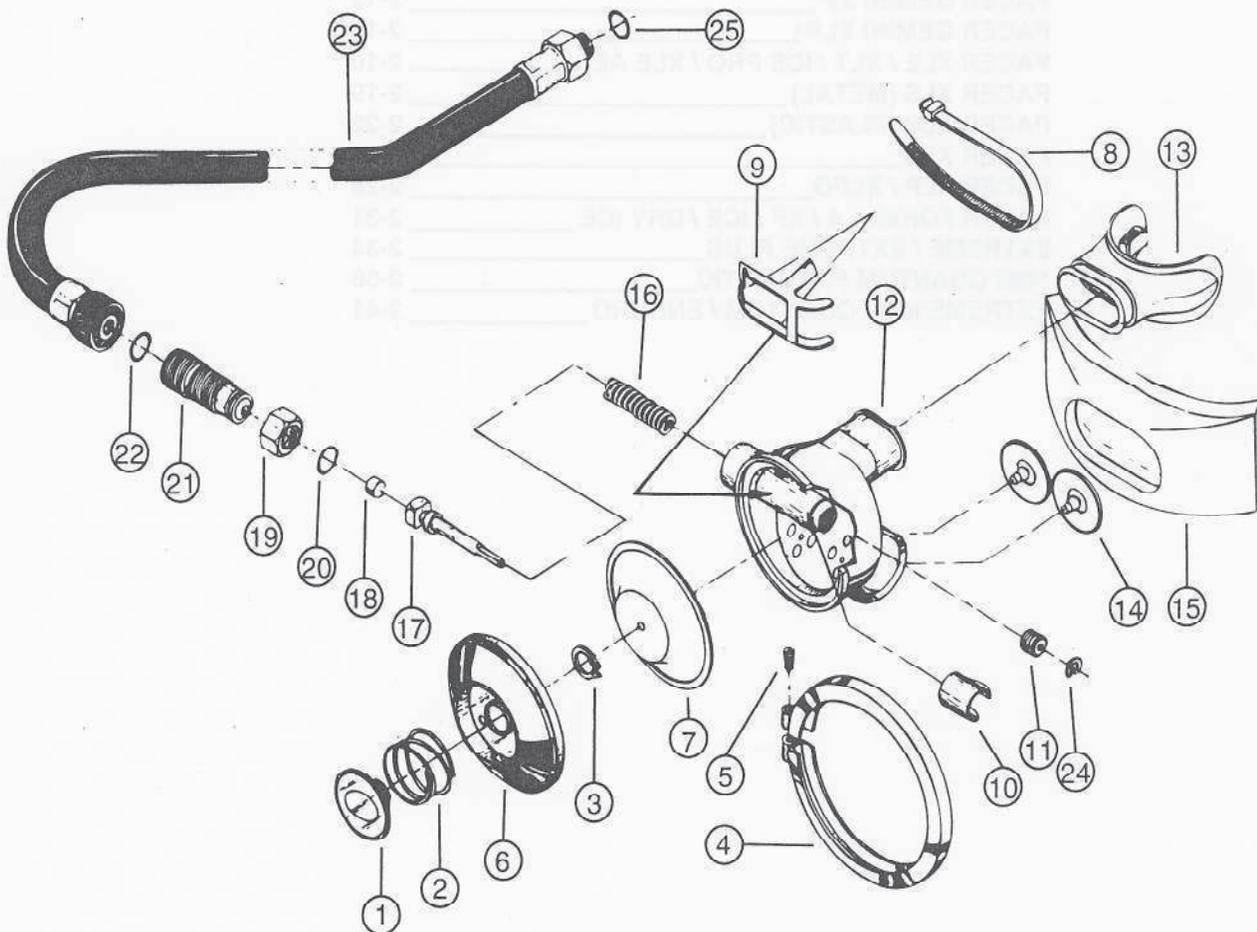
**DACOR REPAIR MANUAL**  
**VOLUME TWO**  
**9/93**  
**SECTION 2**

**SECOND STAGE REGULATORS**



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| #  | QTY | PART #  | KEY | DESCRIPTION                      |
|----|-----|---------|-----|----------------------------------|
| 1  | 1   | 0100-76 |     | PURGE BUTTON                     |
| 2  | 1   | 0040-15 |     | SPRING                           |
| 3  | 1   | 0250-05 |     | RETAINING RING                   |
| 4  | 1   | 0100-85 |     | CLAMP RING                       |
| 5  | 1   | 0130-13 |     | RING SCREW                       |
| 6  | 1   | 0170-39 |     | TOP COVER                        |
| 7  | 1   | 0050-09 |     | DIAPHRAGM ASSEMBLY               |
| 8  | 1   | 0310-09 |     | CLAMP                            |
| 9  | 1   | 0170-22 |     | VENTUREMATIC LEVER (SUB 0170-55) |
| 10 | 1   | 0250-07 |     | SPRING CLIP                      |
| 11 | 1   | 0200-05 |     | ADJUSTING SCREW (SUB 0200-12)    |
| 12 | 1   | 0103-19 |     | BOTTOM BOX                       |
| 13 | 1   | 1117-00 |     | MOUTHPIECE                       |
| 14 | 2   | 0240-02 |     | EXHAUST VALVE                    |
| 15 | 1   | 0512-25 |     | EXHAUST MANIFOLD                 |
| 16 | 1   | 0040-16 |     | VALVE SPRING                     |
| 17 | 1   | 0040-01 | ①   | VALVE SPRING TEFLON              |
| 18 | 1   | 0181-23 |     | VALVE SEAT CARRIER               |
| 19 | 1   | 0180-01 | ①   | VALVE SEAT RETAINER TEFLON       |
| 20 | 1   | 0070-01 |     | SEAT                             |
| 21 | 1   | 0150-29 |     | JAM NUT                          |
| 22 | 1   | 0060-01 |     | O-RING                           |
| 23 | 1   | 0180-85 |     | VALVE SEAT (SUB 0182-43)         |
| 24 | 1   | 0060-02 |     | O-RING                           |
| 25 | 1   | 1726-00 |     | L.P. HOSE ASSEMBLY               |
| 26 | 1   | 0250-04 |     | RETAINING RING                   |
| 27 | 1   | 0060-01 |     | O-RING                           |
| 28 | 1   | 1107-00 | ②   | REGULATOR LANYARD                |



**PACER  
SECOND STAGE**

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9/93      Second Stage  
Regulators

**PAGE**  
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**KEY**  
 ① Used on All Environment Regulators (AER).  
 ② Not shown.

**PACER SECOND STAGE**

**Tools Needed:**

1. 0980-11 Multi-Tool
2. 0980-61 O-ring Tool Kit
3. Screwdriver
4. External Retaining Ring Pliers
5. 11/16" Wrench

**Disassembly:**

**Step 1:** Remove hose (23) from second stage regulator assembly using 11/16" wrench. "O" ring (22) is now accessible.

**Step 2:** Remove exhaust manifold (15) by pulling sharply on one end. No tools are required for removal. Exhaust valves (14) are now accessible and are removed by gently pulling free from bottom box assembly (12).

**Step 3:** Remove mouthpiece (13) by removing mouthpiece clamp (8) and gently pulling free from mouthpiece sleeve. Have replacement clamps available because clamps have a one time use only and will be destroyed upon removal.

**Step 4:** Remove ring screw (5) and clamp ring (4).

**Step 5:** Remove top cover (6). Low pressure diaphragm (7) is now accessible.

**Step 6:** Remove purge button (1) and purge button spring (2) by releasing purge button retaining ring (3) using external spring clip pliers.

**Step 7:** Remove low pressure diaphragm (7).

**Step 8:** Loosen jam nut (19) with 11/16" wrench. Remove valve seat (21) by turning counter clockwise. "O" ring (20) is now accessible. CAUTION: Do not damage seat during this operation.

**Step 9:** Remove jam nut (19) from valve.

**Step 10:** Remove Venturamatic lever (9), valve seat carrier (17) and valve spring (16) as follows: Use multi-tool to depress valve seat carrier. The lever will now be loose. Remove lever by freeing one side at a time from the valve seat carrier housing. Release multi-tool slowly because of the spring tension released by removal of the lever.

**Step 11:** Remove adjusting screw (11) prior to removing valve seat carrier by turning the carrier counter clockwise until the adjusting crown, carrier, and carrier spring will fall free from the outside end of the valve seat carrier chamber. Be sure the square shaft of the carrier is firmly in the square broached hole of the adjusting crown during this operations. Low pressure seat (18) (black disc in valve seat carrier) is now accessible and can be removed by prying out with pick.

**Step 12:** Remove Venturamatic booster clip (10) by sliding it off the end of the valve seat carrier housing. Second stage is now completely disassembled. NOTE: Retaining clip (24) should be considered a permanent part and remain in place.

**Assembly:**

**Step 1:** Install exhaust valves (14) by pulling stem portion of the valve through center hole of exhaust port openings, from the outside into the inside of bottom box assembly (12). NOTE: Valves can be replaced without disassembly of second stage by pushing stem portion of valve through the center hole from the outside. Be sure shaft is firmly seated in place. Soap water will facilitate this operation.

**Step 2:** Install low pressure seat (18) in valve seat carrier (17), flat side out and indented side in.

**Step 3:** Install jam nut (19) on valve seat (21) carefully so as to avoid damage to the cone area. Unthreaded portion of nut should face the larger shoulder of valve seat.

**Step 4:** Install adjusting screw (11), valve seat carrier (17) and valve spring (16) as follows: Place spring on valve seat carrier. Place adjusting screw on square end of carrier and insert entire assembly, adjusting screw first, into carrier chamber. Using multi-tool, turn assembly clockwise until adjusting screw is stopped by retaining ring (24) on crimped end. For preliminary adjustment, turn assembly, including adjusting screw, counter clockwise 3.5 turns. This will minimize or eliminate further adjustment when assembly is complete. NOTE: Some early models of the PACER do not incorporate the retaining ring (24). On those models, the preliminary adjustment position of the adjusting screw should have the top surface of the adjusting screw level with the end of the carrier chamber.

**Step 5:** Replace Venturamatic lever (9) as follows: Hold the bottom box assembly (12) in the palm of the left hand, grasping the crossbar of the multi-tool with the

|                         |             |                               |      |   |
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index and middle fingers. Squeeze the bottom box and the multi-tool together as far as it will go. About 3/8" of the carrier shaft will protrude beyond the adjusting screw at this point. With the right hand insert the ends of the lever one at a time into the square broached holes on the side of the carrier chamber. Release the tool. Lever will now be in an up position.

**Step 6:** Replace "O" ring (20) on valve seat (21). Install valve seat (21) using care to avoid damage to the cone area. Turn valve seat clockwise until the top of the lever is even with the edge of the bottom box. This is not the final lever height adjustment.

**Step 7:** Install Venturamatic booster clip (10). Open end of clip on valve seat carrier body (17) and pushing down until it snaps into place. Slide clip toward valve seat side of carrier body until clip touches the Venturamatic lever (9). Depress lever completely. This will position the clip correctly.

**Step 8:** Install low pressure diaphragm (7). Stainless steel center plate should make contact with the top of the Venturamatic lever.

**Step 9:** Install purge button (1) and spring (2) in top cover (6) using external retaining ring (3) to hold in place.

**Step 10:** Install top cover (6).

**Step 11:** Install ring (4) and ring screw (5).

**Step 12:** Install exhaust manifold (15) by engaging one end of lip of exhaust tube, then stretching manifold over balance of exhaust tube lip. Lubricating with soap water will facilitate proper positioning. Do not use grease as lubricant, because the residual properties could cause loss of the manifold.

**Step 13:** Install mouthpiece (13) on mouthpiece tube. A new clamp (8) must be used, and can be tightened with pliers. Any excess material must be cut off.

**Step 14:** Install hose (23) and "O" ring (22).

**Step 15:** To adjust second stage lever height and attain proper air flow on demand, plus proper purge button action, proceed as follows:

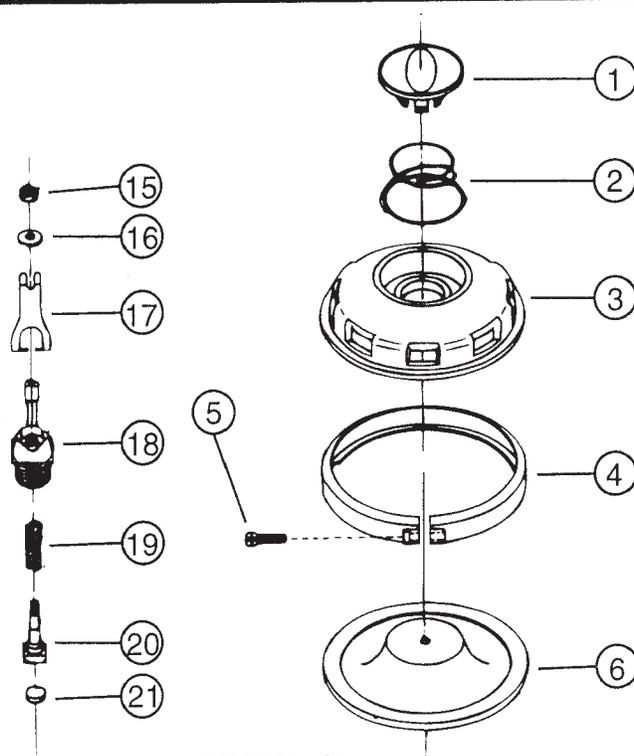
- A. Place regulator on air source, such as a diving cylinder.
- B. Open Cylinder valve.

- C. Be sure the intermediate pressure is correct for the regulator being adjusted.
- D. Hose nut and lock nut must be loosened approximately one turn.
- E. Grasp hose in left hand, as near to the second stage of the regulator as is comfortable. Grasp second stage in right hand.
- F. Rotate second stage toward you (counter clockwise) until heavy free-flow is attained.
- G. Rotate second stage away from you (clockwise) until free-flow stops. The closer to the cut-off point you stop this rotation, the better the performance of the regulator will be.

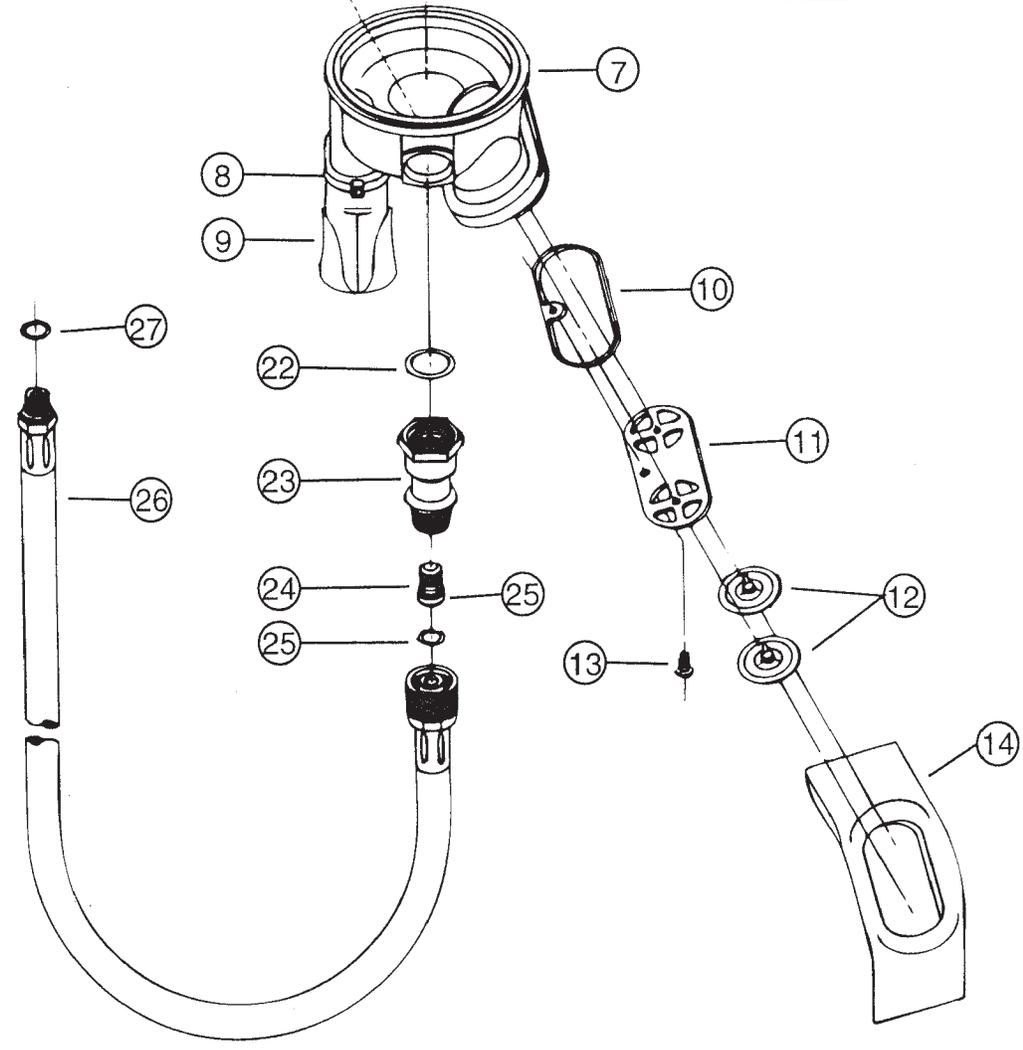
H. Tighten lock nut and the hose nut. Test by (A) breathing through the unit. Air must come easily and freely, but should have no free-flow. Test by (B) depressing purge button. A heavy flow of air should be attained. If unit fails A and /or B, loosen the hose and the lock nut; readjust unit.

NOTE: In the event that the valve seat carrier spring load is too low or too high, the spring load can be adjusted as follows: Loosen lock nut and hose nut. Remove valve seat. Insert multi-tool in chamber and seat on valve seat carrier. To increase spring load, turn tool counter clockwise. To decrease spring load, turn tool clockwise. One third of a turn is usually sufficient to change the spring load to a correct tension; however, further adjustment can be made if warranted.

|   |                               |                            |                        |                         |
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| #  | QTY | PART #  | KEY | DESCRIPTION                |
|----|-----|---------|-----|----------------------------|
| 1  | 1   | 0101-12 |     | PURGE BUTTON (SUB 0109-74) |
| 2  | 1   | 0040-38 |     | SPRING                     |
| 3  | 1   | 0610-40 |     | TOP COVER (SUB 0105-30)    |
| 4  | 1   | 0310-07 |     | CLAMP                      |
| 5  | 1   | 0130-13 |     | RING SCREW                 |
| 6  | 1   | 0050-09 |     | DIAPHRAGM ASSEMBLY         |
| 7  | 1   | 0610-59 |     | BOTTOM BOX                 |
| 8  | 1   | 0310-09 | ❶   | MOUTHPIECE CLAMP           |
| 9  | 1   | 1117-00 |     | MOUTHPIECE- CLEAR          |
| 10 | 1   | 0270-17 |     | GASKET                     |
| 11 | 1   | 0170-33 |     | RETAINER PLATE             |
| 12 | 2   | 0240-04 |     | EXHAUST VALVE              |
| 13 | 1   | 0130-32 |     | SCREW                      |
| 14 | 1   | 0512-25 |     | EXHAUST MANIFOLD           |
| 15 | 1   | 0150-37 |     | LOCK NUT                   |
| 16 | 1   | 0120-45 |     | WASHER                     |
| 17 | 1   | 0170-38 |     | LEVER                      |
| 18 | 1   | 0102-89 |     | VALVE CARRIER & TUBE ASSM. |
| 19 | 1   | 0040-44 |     | SPRING                     |
| 20 | 1   | 0181-35 |     | VALVE SEAT CARRIER         |
| 21 | 1   | 0070-01 | ❶   | SEAT                       |
| 22 | 1   | 0060-42 | ❶   | O-RING                     |
| 23 | 1   | 0181-26 |     | VALVE SEAT HOUSING         |
| 24 | 1   | 0181-25 |     | VALVE SEAT                 |
| 25 | 2   | 0060-02 | ❶   | O-RING                     |
| 26 | 1   | 1726-00 |     | L.P. HOSE ASSEMBLY         |
| 27 | 1   | 0060-51 |     | O-RING                     |



**PACER AERO  
SECOND STAGE**

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9/93      Second Stage  
Regulators

**PAGE**  
2-4

**KEY**  
❶ Included in annual service kit #9680-02

**PACER AERO SECOND STAGE**

**Tools Needed:**

1. 1/4" Nut Driver (may require modification by reducing the outside diameter of the socket to 3/8")
2. 3/4" Open End Wrench
3. 13/16" Open End or Deep Socket Wrench.  
An inch/pound torque wrench is preferred.
4. Thin Blade Screwdriver (Approx. 5/16" wide)
5. 5/8" Open End Wrench
6. 0980-20 Dacor Adjusting Tool NOTE: A screwdriver with a 1/4" wide blade can make a suitable substitute. When using a screwdriver to adjust regulator, exercise caution not to score or scratch the wall of the housing.
7. Phillips Screwdriver
8. Wooden Dowel Rod, 1/4" x 4" or equivalent.

**Disassembly:**

**Step 1:** Remove AERO second stage from hose (26) using 5/8" open end wrench. NOTE: Avoid using pliers on knurled area of hose connector, both in removing the hose from the second stage and replacing it. When removing the hose, hold the mating part (the housing) with the 13/16" open end or adjustable wrench to prevent damage to the plastic bottom box.

**Step 2:** Remove exhaust manifold (14) from second stage by pulling one end away from the regulator assembly. Considerable resistance may be experienced.

**Step 3:** Remove mouthpiece clamp (8) by cutting ratchet knob free of clamp. NOTE: This action will destroy the mouthpiece clamp. Be sure you have replacements available.

**Step 4:** Remove mouthpiece (9).

**Step 5:** Remove screw (5) from clamp (4) using thin bladed screwdriver. Remove clamp.

**Step 6:** Remove top cover (3) and diaphragm (6). NOTE: Purge button assembly is now exposed. However, unless the purge button (1) and/or the spring (2) are to be replaced, it is not recommended that this assembly be removed due to the possibility of damage to the lock-in area of the purge button.

**Step 7:** Remove air control system from bottom box (7) as follows: Place 3/4" open end wrench over hex flats of valve carrier and tube assembly (18) located on the

inside of the bottom box (7) between the inside wall and the base of the lever (17). While holding the valve carrier steady with the 3/4" wrench, use 13/16" open end wrench to turn the housing (23) counter clockwise until loose. Housing can now be removed by hand. "O" ring (22) is now accessible as is seat (21).

**Step 8:** Remove valve seat (24) from housing using the Dacor adjusting tool. Insert the tool into the smaller bore end of the housing. Turn counterclockwise until tool is engaged in slots on the valve seat. Continue turning counter clockwise until threaded parts are disengaged (approx. 7 to 9 full turns). Use 1/4" dowel rod inserted into large bore opening of housing to gently push valve seat out of housing. "O" ring (25) is now accessible for removal and inspection.

**Step 9:** Remove "O" ring (22) located on outside of bottom box on threaded part of valve carrier.

**Step 10:** Remove valve carrier assembly (18) from bottom box (7).

**Step 11:** Remove seat carrier (20) and spring (19) from valve carrier (18) as follows: Using 1/4" nut driver turn lock nut (15) counter clockwise until it separates from stem of seat carrier (20). Use caution for this operation because as soon as disengagement is complete the valve seat (24), the spring (19), the lever (17), the washer (16) and the nut will all fall free. Seat (21) may now be removed from valve seat carrier (20).

**Step 12:** Remove exhaust valve retainer plate (11) as follows: Remove screw (13) from bottom box using Phillips screwdriver by turning screw counter clockwise. Retainer plate (11) may now be removed as well as the gasket (10).

**Step 13:** Remove exhaust valves (12) from retainer plate.

**Assembly:**

**Step 1:** Install exhaust valves (12) on retainer plate (11) by inserting stem of valve in center holes then pulling stem from the reverse side of retainer plate until valve is firmly seated. NOTE: Close inspection of the retainer plate will reveal a slight bow. Valves should seal against bowed-in surface.

**Step 2:** Inspect and lightly lubricate the gasket (10) with silicone grease (Dacor 9506-00). Install gasket in groove in bottom box. NOTE: Be sure gasket is properly and firmly in place in insure a watertight seal

|                         |             |                                    |      |   |
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between retainer plate and bottom box.

**Step 3:** Insert the two lugs on bottom of the retainer plate into the two slots in bottom box. Press plate against gasket. Secure with screw (13) using Phillips screwdriver. Recommended torque is 10 inch/pounds. CAUTION: Do not over tighten.

**Step 4:** Preassemble air control system as follows:

- A. Insert seat (21) into seat carrier (20).
- B. Place spring (19) on shaft of seat carrier and insert both into valve carrier (18).
- C. Screw housing (23) onto valve carrier (18) to overcome the spring load. Turn by hand until tight. NOTE: The seat carrier stem has a square shaft that must fit in a square hole in the valve carrier. On occasion, the two parts will mate perfectly during this assembly procedure. If they do, the stem will protrude through the valve carrier approximately 3/16". If the parts do not match up at this time, the shaft will protrude approximately 1/4". Do not try to force the seat carrier farther at this time.
- D. Install the lever (17) and washer (16) on the seat carrier and secure with the lock nut (15) using the 1/4" nut driver. If the stem has mated perfectly with the valve carrier as explained above, tighten the nut until approximately two threads of the stem are visible above the nut. If, however, the two parts have not mated perfectly as explained above, then tighten nut only as far as it goes. Do not try to force it further or you may damage the parts.
- E. Remove housing. If the parts are in place, as indicated, by approximately two threads visible above the nut, this assembly is complete. If, however, the parts have not mated properly as explained above, proceed as follows: The square end of the seat carrier will be protruding approximately 1/4" from the valve carrier. Turn the seat carrier, pushing in at the same time, until you can feel the square shaft enter the square hole. (If the seat carrier will not turn, loosen the locknut 1/4 turn). Once the mating parts are lined up, tighten the locknut until approximately two threads are visible above the nut.

Install air control system as follows:

F. Insert threaded part of valve carrier assembly through the 9/16" hole in the side wall of the bottom box, so that the lever is angled up. Be sure the hex body of the valve carrier fits within the flats on the inside of the

bottom box.

G. Inspect and lightly grease "O" ring (22). Place on threaded portion of valve carrier (18) which is now protruding through bottom box wall. Push "O" ring down on threaded portion until it is firmly positioned against the outer wall of the bottom box.

H. Inspect and lightly grease "O" ring (25) and install "O" ring in groove on valve seat (24). Inspect sealing cone radius for nicks or other imperfections. Insert valve seat, cone end first, into smaller diameter opening in housing. Push in with adjusting tool or dowel rod or 1/4" screwdriver. The valve seat should go into housing 1/4".

I. Place less than one drop of Green Loc-Tite ® #290 on second thread of valve carrier (18). Care must be taken to avoid accidental application of Loc-Tite® to the rubber seat, "O" ring and/or bottom box. Install housing (23) on valve carrier and tighten using 13/16" wrench. The valve carrier (18) should be held steady using a 3/4" open end wrench on the inside of the bottom box during this procedure. Maximum tightness should be 70-75 inch/pounds.

J. Hold the regulator so the lever is visible. Using the adjusting tool (or 1/4" screwdriver) turn the valve seat clockwise into the housing until the lever starts to descend. Turn back 1/4 turn.

**Step 5:** If the purge button assembly is to be installed in the top cover, proceed as follows: Place the large end of the conical spring (2) into the purge button chamber located in the front center of the top cover. Then place the purge button shaft into the center of the spring. Push the purge button straight down. When you hear a "click", you will know the purge button is locked in place.

**Step 6:** Inspect and replace "O" rings (25 & 27) on hose assembly (26).

**Step 7:** Install hose assembly (26).

|   |                            |                            |                 |                  |
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**PACER AERO SECOND STAGE  
ADJUSTMENT**

**Purge Adjustments:**

**Step 1:**

- A) Place the demand diaphragm on top of the lever.
- B) Place top cover assembly on top of the diaphragm and hold firmly in place.
- C) Depress the purge button. You should have a strong purge without any freeflow. NOTE: On units without mouthpiece vane purge should be minimal. Installation of clamp ring will increase purge flow of air.

**Step 2:** If Purge is Too Weak:

- A) Check lever freeplay. If it is too excessive, adjust lever freeplay by turning the lock nut under the lever with a 1/4" nut driver.
  - a) To DECREASE freeplay (Clockwise)
  - b) To INCREASE freeplay (Counter Clockwise)

**Step 3:** If Purge is Too Strong or Regulator Freeflows:

- A) Insert the adjusting tool into the housing. Locate the slot in the valve seat and turn clockwise approximately 1/2 - 1 turn.
- B) Connect to first stage, pressurize the assembly and adjust the lever freeplay.
- C) Check the purge again.
- D) Install the diaphragm, the cover, the clamp and secure the assembly with a screw.

**Step 4:** To Check the Opening Effort:

With second stage pressurized, lower it slowly into the container with water as follows: Hold the regulator by the mouthpiece (not obstructing the mouthpiece opening) and with the diaphragm in a horizontal position below the mouthpiece, lower the assembly into the water until the water level reaches between the last digit of the serial number and the step in the regulator mouthpiece right above the number. NOTE: Diaphragm position must be parallel to water surface level. If your intermediate (in line)\* pressure gauge needle starts to move downward before the water level reaches the last digit of the serial number on the second stage, the effort is too low, and the following adjustment is needed:

**Step 5:** To Increase the Effort:

- A) Turn air "OFF".
- B) Disconnect the second stage.
- C) Remove the clamp, cover, and the diaphragm.
- D) Insert the adjusting tool (or screwdriver) into the housing. Find the slot in the valve seat and turn clockwise approximately 1/2 to 1 turn.
- E) Connect to first stage.
- F) Pressurize the assembly.
- G) Adjust lever freeplay.
- H) Install the diaphragm, cover, and the clamp.
- I) Repeat the water check.

\* If the intermediate pressure gauge shows pressure decrease after the water level reaches the step in the mouthpiece tube, regulator is adjusted too high and must be re-adjusted as follows:

**Step 6:** To Decrease the Effort:

- A) Turn air "OFF."
- B) Disconnect the second stage.
- C) Remove the clamp, cover, and the diaphragm.
- D) Insert the adjusting tool (or screwdriver) into the housing. Find the slot in the valve seat and turn counter clockwise approximately 1/2 to 1 turn.
- E) Back "OFF" the 1/4 lock nut (under the lever) approximately 1/2 turn.
- F) connect to the first stage assembly.
- G) Pressurize the assembly.
- H) Adjust lever freeplay.
- I) Install the diaphragm, cover, and the clamp.
- J) Repeat the water check.

\* If the pressure gauge is not available, simply listen to the air flow through the second stage (when it is being submerged in water). Raise your adjustment on the initial opening of the second stage.

**Step 7:** With the diaphragm and top cover in place on the bottom box, mount the clamp in position. The cut-out in the wall of the clamp must fit over the mouthpiece tube. Secure with screw (5) using small bladed screwdriver.

**Step 8:** Replace the exhaust manifold. To facilitate this installation, lubricate the inside of the manifold with soap water. Do not use any other type of lubricant. Seat one side of the manifold over the manifold sleeve, and gently work the balance of the manifold into place.

**Step 9:** Replace the mouthpiece on the mouthpiece

|                         |             |                                    |      |   |
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tube and secure it with a new mouthpiece clamp (8). Unit should now be totally reassembled.

**Flow Adjustment: On the Flow Board, if available:**

**Step 1:** Connect the second stage to the first stage (140 psi intermediate pressure) and pressurize the unit. Check the freeplay at the end of the lever (17). It should be approximately 1/64".

**Step 2:** If adjustment is needed, insert a 1/4" nut driver under the lever and turn the lock nut (15) on the end of the seat carrier clockwise. When the regulator starts to leak, turn the nut back slowly to stop the leak. You should now have a minimum play in the lever.

**Step 3:** Install the demand diaphragm (6) and the top cover (3). Do not clamp together with the ring at this time. Hold the assembly firmly in one hand and insert the mouthpiece into the vacuum tube on the test board. Turn on the vacuum and check the opening effort. It should read between 1.00 - 1.3 inch/water, and the effort at 10CFM should be under 1 inch/water.

**Flow Adjustment: Without the Flow Board:**

**Equipment Needed:**

- 1) Tank with at least 2,000 psi air pressure.
- 2) First stage regulator, with hose, set to 140 psi intermediate pressure.
- 3) \*In line intermediate pressure gauge (optional).
- 4) Dacor adjusting tool (0980-20, SSE-98-1) Optional), or screwdriver (small blade).
- 5) 1/4" modified nut driver.
- 6) Container with clean water approximately 6" or deeper.
  - a) Attach the second stage to the first stage. If in-line pressure gauge is available install it between the first and second stage.
  - b) Position the first stage on the tank and pressurize.

**Step 1:** To Adjust the Effort:

- A) Depressurize the unit.
- B) Disconnect from the hose.
- C) Insert the adjusting tool or a screwdriver and turn the valve seat 1.5 to 1 turn clockwise for increased effort or counter clockwise for less effort. This adjustment may require a re-adjustment of nut (15) as explained on step #2 under Flow Adjustment - Using Flow Board.
- D) Connect the hose.
- E) Pressurize the assembly.

|   |                                    |                            |             |                         |
|---|------------------------------------|----------------------------|-------------|-------------------------|
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**AERO TROUBLE SHOOTING: PROBLEM - MINOR AIR FREE FLOW THROUGH MOUTHPIECE:**

**Reason A:**

Lever set too high.  
Item 17.

**Solution:** Adjust lever height.

**See:** Disassembly of Pacer Aero Second Stage, steps 1,5 & 6  
--Pacer Aero Second Stage Purge Adjustment. Step 3.

**Reason B:**

Low pressure seat is worn or damaged.  
Item 21.

**Solution:** Replace low pressure seat.

--Pacer Aero Second Stage. Steps 5,6 & 7.  
--Assembly of Pacer Aero Second Stage. Steps 4A, 4F, 4G, & 4I.

**Reason C:**

Intermediate pressure is high.

**Solution:** Decrease intermediate pressure to 140 P.S.I.G. (See service instructions for Dacor First Stage being used.

**Reason D:**

Valve seat cone worn, damaged or corroded.  
Item 24.

**Solution:** If cone is slightly corroded or damaged, polish sealing cone with extra fine polishing stick. If damage is major, replace with new part.

**See:** Disassembly of Pacer Aero Second stage. Steps 1,5,6,7, & 8.  
--Assembly of Pacer Aero Second Stage. Steps 4H, 4I, & 4J.  
--Pacer Aero Second Stage Purge Adjustment. Steps 4J, 4I & 4H.

**AERO TROUBLE SHOOTING: PROBLEM - WATER ENTERING REGULATOR:**

**Reason A:**

Hole in mouthpiece.  
Item 9.

**Solution:** Check mouthpiece carefully for cuts, etc. If any are found replace mouthpiece.

**See:** Disassembly of Pacer Aero Second Stage

**Reason B:**

Foreign material trapped under exhaust valves.  
Item 12.

**Solution:** Clean thoroughly by running clean, fresh water into mouthpiece and out of exhaust ports. Inspect to be sure area is cleaned.

**See:** Disassembly of Pacer Aero Second Stage. Steps 2, 12 & 13.  
--Assembly of Pacer Aero Second Stage. Steps 1, 2 & 3 and Purge Adjustment, Step 8.

**Reason C:**

Exhaust valves not seated correctly.  
Items 11 & 12.

**Solution:** Be sure exhaust valves are seated flat against retainer plate.

**See:** Disassembly of Pacer Aero Second Stage Step 2.  
--Assembly of Pacer Aero Second Stage. Step 1 and Purge Adjustment, Step 8.

**Reason D:**

Exhaust valve material deteriorated.  
Item 12.

**Solution:** Replace valves.

**See:** Disassembly of Pacer Aero Second Stage. Steps 2 & 13.  
--Assembly of Pacer Aero Second Stage. Steps 1, 2 & 3 and Purge Adjustment, Step 8.

|                         |             |                                |      |   |
|-------------------------|-------------|--------------------------------|------|---|
| <b>REPAIR PROCEDURE</b> | <b>PAGE</b> | <b>PACER AERO SECOND STAGE</b> |      |  |
|                         | 2-9         | Second Stage Regulators        | 9/93 |   |

**AERO TROUBLE SHOOTING: PROBLEM- WATER ENTERING REGULATOR (CONT.)**

**Reason E:**  
**Exhaust valves missing.**  
**Item 12**

**Solution:** Replace valve(s).  
**See:** Disassembly of Pacer Aero Second Stage.  
 Steps 2 & 13  
 -- Assembly of Pacer Aero Second Stage.  
 Steps 1, 2 & 3.  
 -- Purge Adjustment.  
 Step 8.

**Reason F;**  
**Hole in Low Pressure Diaphragm.**  
**Item 6.**

**Solution:** Replace diaphragm.  
**See:** Disassembly of Pacer Aero Second Stage.  
 Steps 5 & 6.  
 -- Purge adjustment.  
 Step 3D.

**Reason G:**  
**Low pressure diaphragm not seated under top cover correctly.**  
**Item 6.**

**Solution:** Reset diaphragm. If diaphragm is damaged, replace.  
**See:** Disassembly of Pacer Aero Second Stage  
 Steps 5 & 6.  
 -- Purge Adjustment.  
 Step 3D.

**Reason H:**  
**Gasket not properly mounted.**  
**Item 10.**

**Solution:** Re-install gasket correctly.  
**See:** Disassembly of Pacer Aero Second Stage  
 Steps 2 & 12.  
 -- Assembly of Pacer Aero Second Stage.  
 Steps 2 & 3.  
 -- Purge adjustment.  
 Step 8.

**Reason I:**  
**Gasket damaged.**  
**Item 10.**

**Solution:** Replace gasket.  
**See:** Solution to reason D.

**AERO TROUBLE SHOOTING: PROBLEM- DIFFICULT INHALATION DURING BREATHING CYCLE**

**Reason A:**  
**Lever set too low.**  
**Item 17.**

**Solution:** Adjust lever height.  
**See:** Disassembly of Pacer Aero Second Stage.  
 Steps 1, 5 & 6.  
 --Lever height adjustment.  
 Step 1.  
 -- Purge adjustment.  
 Steps 2 & 3.

**Reason B:**  
**Corrosion or foreign matter in first stage filter. Difficult breathing becomes very pronounced at lower tank pressures.**

**Solution:** Check First Stage filter. If filter appears polluted, change. (see service instructions for first stage being used.)

**Reason C:**  
**Intermediate pressure is low.**

**Solution:** Increase intermediate pressure to 140 PSIG. (see service instructions for first stage being used.)

**Reason D:**  
**Low pressure diaphragm has lost resiliency.**

**Solution:** Replace low pressure diaphragm.  
**See:** Disassembly of Pacer Aero Second Stage.  
 Steps 5 & 6.  
 --Purge adjustment  
 Step 3D.

|   |                            |                            |                  |                  |
|---|----------------------------|----------------------------|------------------|------------------|
|  | PACER AERO<br>SECOND STAGE |                            | PAGE<br><br>2-10 | REPAIR PROCEDURE |
|   | 9/93                       | Second Stage<br>Regulators |                  |                  |

**AERO TROUBLE SHOOTING: PROBLEM- REGULATOR WILL NOT PURGE CORRECTLY:**

**Reason A:**  
Lever out of adjustment.  
Item 17.

**Reason B:**  
Intermediate pressure low.

**Solution:** Adjust lever.  
**See:** Disassembly of Pacer Aero Second Stage.  
Steps 1, 5 & 6.  
--Purge Adjustment.  
Step 3.

**Solution:** Adjust intermediate pressure to 140 PSIG.  
(see service instructions for first stage being used.)

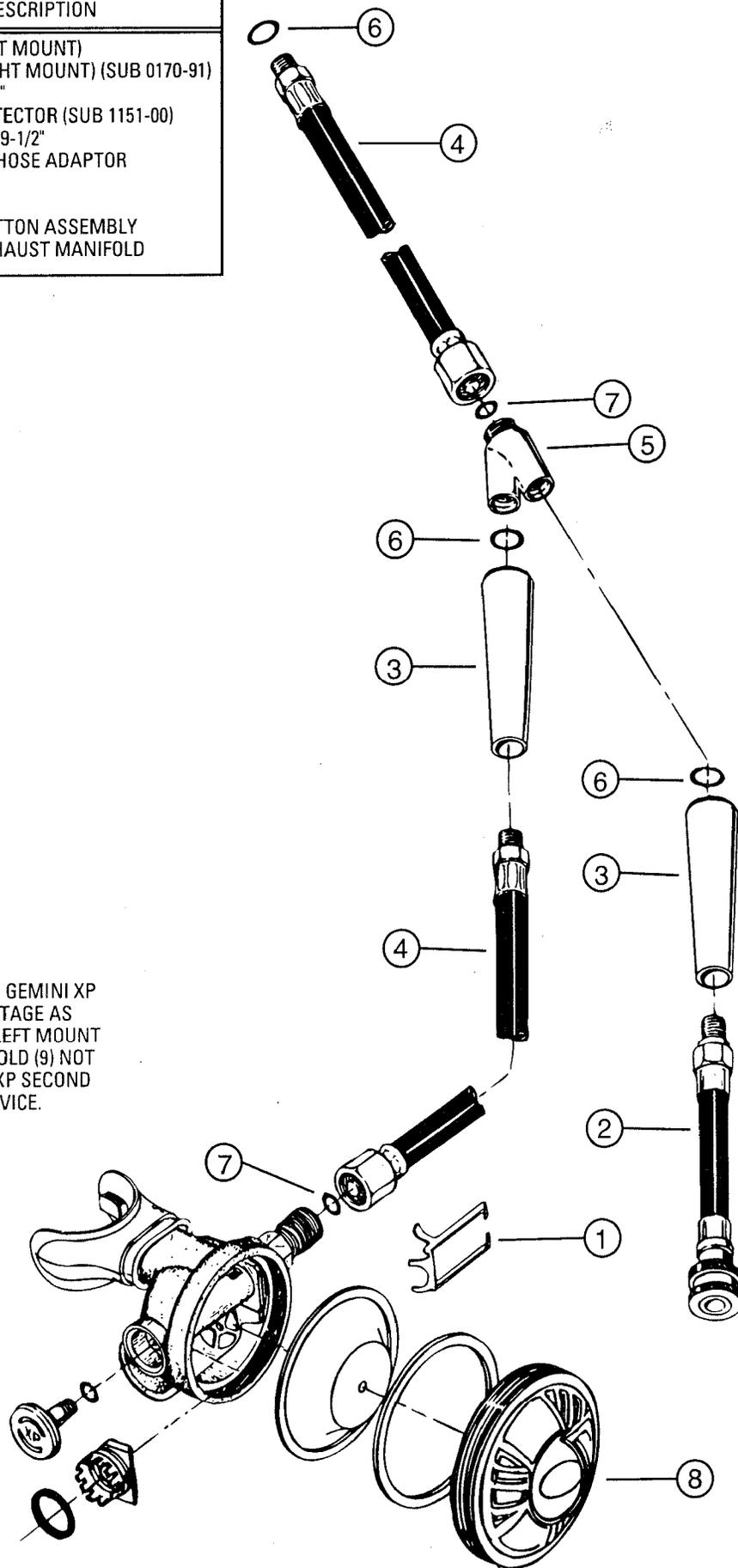
**AERO TROUBLE SHOOTING: PROBLEM- DIFFICULT OR NO EXHALATION THROUGH SECOND STAGE**

**Reason A:**  
Exhaust valves sticking to retainer plate.  
Item 12.

**Solution:** Free valves.  
**See:** Disassembly of Pacer Aero Second Stage.  
Step 2.  
-- Purge adjustment.  
Step 8.

|                         |             |                                    |      |   |
|-------------------------|-------------|------------------------------------|------|---|
| <b>REPAIR PROCEDURE</b> | <b>PAGE</b> | <b>PACER AERO<br/>SECOND STAGE</b> |      |  |
|                         | 2-11        | Second Stage<br>Regulators         | 9/93 |   |

| # | QTY | PART #  | KEY | DESCRIPTION                       |
|---|-----|---------|-----|-----------------------------------|
| 1 | 1   | 0170-58 |     | LEVER (LEFT MOUNT)                |
| 1 | 1   | 0170-55 | ❶   | LEVER (RIGHT MOUNT) (SUB 0170-91) |
| 2 | 1   | 1729-00 |     | L.P. HOSE 5"                      |
| 3 | 2   | 1111-00 |     | HOSE PROTECTOR (SUB 1151-00)      |
| 4 | 2   | 1728-00 |     | L.P. HOSE 19-1/2"                 |
| 5 | 1   | 0181-75 |     | INFLATOR HOSE ADAPTOR             |
| 6 | 3   | 0060-01 |     | O-RING                            |
| 7 | 2   | 0060-02 |     | O-RING                            |
| 8 | 1   | 0212-39 |     | PURGE BUTTON ASSEMBLY             |
| 9 | 1   | 0513-64 | ❶   | SMALL EXHAUST MANIFOLD            |



NOTE: THE SECOND STAGE UNIT OF THE GEMINI XP SYSTEM UTILIZES THE SAME SECOND STAGE AS THE PACER XP. THE EXCEPTION IS THE LEFT MOUNT LEVER (1) AND SMALL EXHAUST MANIFOLD (9) NOT SHOWN. PLEASE REFER TO THE PACER XP SECOND STAGE PAGE OF THIS MANUAL FOR SERVICE.



PACER GEMINI XP  
ALTERNATE AIR SOURCE

9/93

Second Stage  
Regulators

PAGE

2-12

KEY

❶ Not shown

**PACER GEMINI XP ALTERNATE AIR SOURCE**

**Disassembly:**

**Step 1:** Remove hose (4) from second stage.

**Step 2:** Proceed to disassemble regulator per Dacor PACER XP regulator disassembly procedure in this manual..

**Assembly:**

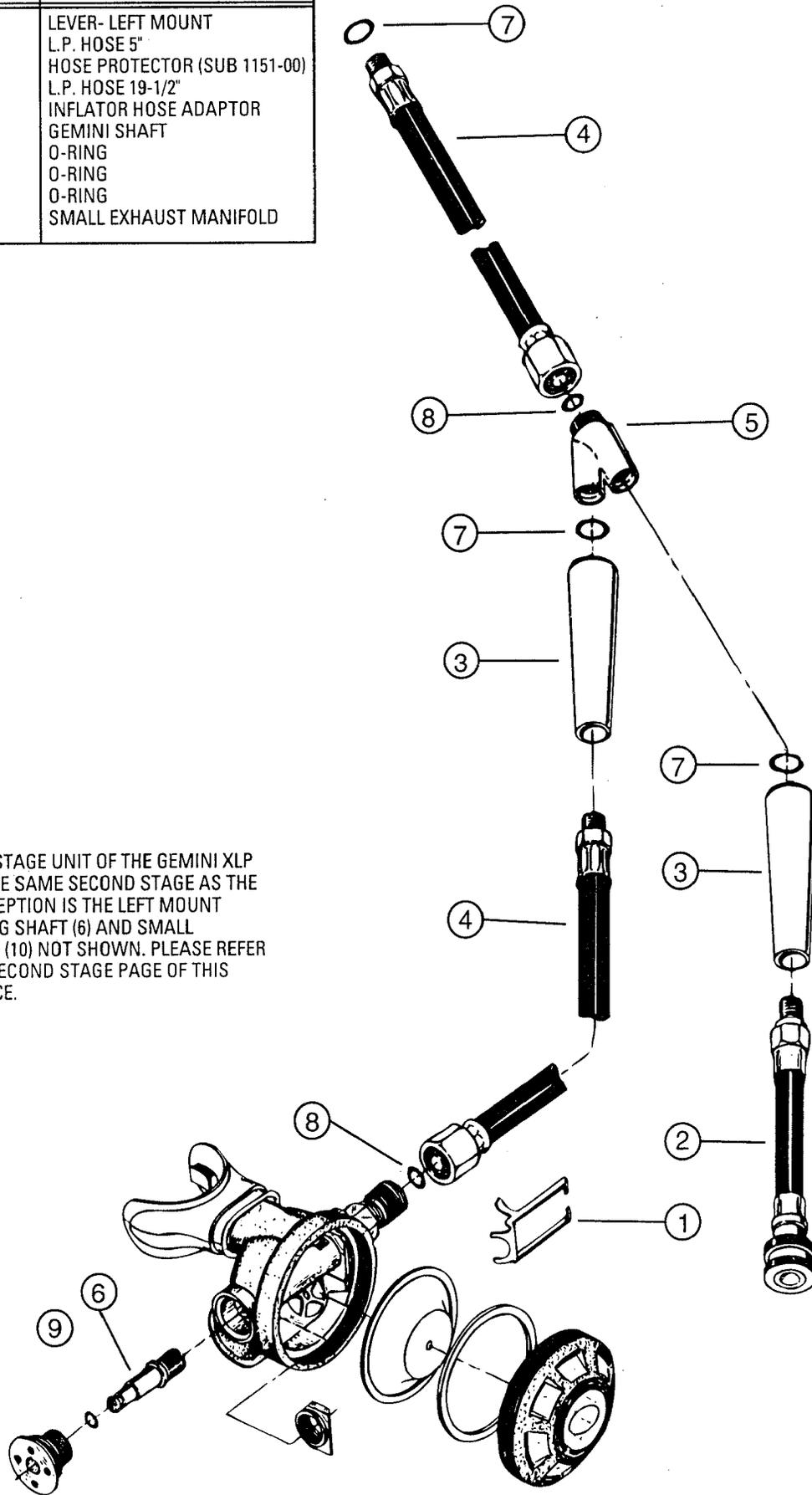
**Step 1:** Follow Pacer "XP" assembly procedure.

**Step 2:** Notice item No. 1 (lever left mount) is made uniquely for a second stage such as the Gemini that mounts over the diver's left shoulder. NOTE: "O" ring on hoses (2) and (4) should be inspected periodically and lubricated or replaced as required.

|                         |                                |   |             |   |
|-------------------------|--------------------------------|---|-------------|---|
| <b>REPAIR PROCEDURE</b> | <b>PAGE</b><br><br><b>2-13</b> | <b>PACER GEMINI XP<br/>ALTERNATE AIR SOURCE</b> |             |  |
|                         |                                | <b>Second Stage<br/>Regulators</b>              | <b>9/93</b> |   |

| #  | QTY | PART #  | KEY | DESCRIPTION                  |
|----|-----|---------|-----|------------------------------|
| 1  | 1   | 0170-58 |     | LEVER- LEFT MOUNT            |
| 2  | 1   | 1729-00 |     | L.P. HOSE 5"                 |
| 3  | 2   | 1111-00 |     | HOSE PROTECTOR (SUB 1151-00) |
| 4  | 2   | 1728-00 |     | L.P. HOSE 19-1/2"            |
| 5  | 1   | 0181-75 |     | INFLATOR HOSE ADAPTOR        |
| 6  | 1   | 0350-19 |     | GEMINI SHAFT                 |
| 7  | 3   | 0060-01 |     | O-RING                       |
| 8  | 2   | 0060-02 |     | O-RING                       |
| 9  | 1   | 0060-16 |     | O-RING                       |
| 10 | 1   | 0513-64 | ①   | SMALL EXHAUST MANIFOLD       |

NOTE: THE SECOND STAGE UNIT OF THE GEMINI XLP SYSTEM UTILIZES THE SAME SECOND STAGE AS THE PACER XLP. THE EXCEPTION IS THE LEFT MOUNT LEVER (1), ADJUSTING SHAFT (6) AND SMALL EXHAUST MANIFOLD (10) NOT SHOWN. PLEASE REFER TO THE PACER XLP SECOND STAGE PAGE OF THIS MANUAL FOR SERVICE.



PACER GEMINI XLP  
ALTERNATE AIR SOURCE

9/93

Second Stage  
Regulators

PAGE

2-14

KEY

① Not shown

**PACER GEMINI XLP ALTERNATE AIR SOURCE**

**Disassembly:**

**Step 1:** Remove hose (4) and "O" ring (8) from second stage.

**Step 2:** Proceed to disassemble regulator per PACER XLP regulator disassembly procedure steps 2 thru 8 in this manual.

**Step 3:** Remove lever (1) as follows: use multi-tool to depress seat assembly (12). (See Pacer XLP) drawing). The lever will now be loose. Remove lever by freeing one side at a time from the housing (22). Release multi-tool slowly because of the spring tension released by removal of the lever. Seat assembly (12) and spring (13) should now drop from the housing. "O" ring (15) and washer (14) are available for inspection/replacement.

**Step 4:** Remove (XLP) bushing (25) from (XLP) bushing retainer (23) by turning counter clockwise with #2 hex wrench. "O" ring (21) is now accessible.

**Step 5:** Remove shaft (6) by turning counter clockwise with screwdriver. Shaft and bushing retainer can now be removed from bottom box. "O" ring is now accessible for inspection/replacement.

**Step 6:** Follow steps 12, 13, and 14 of Pacer XLP procedure to complete disassembly.

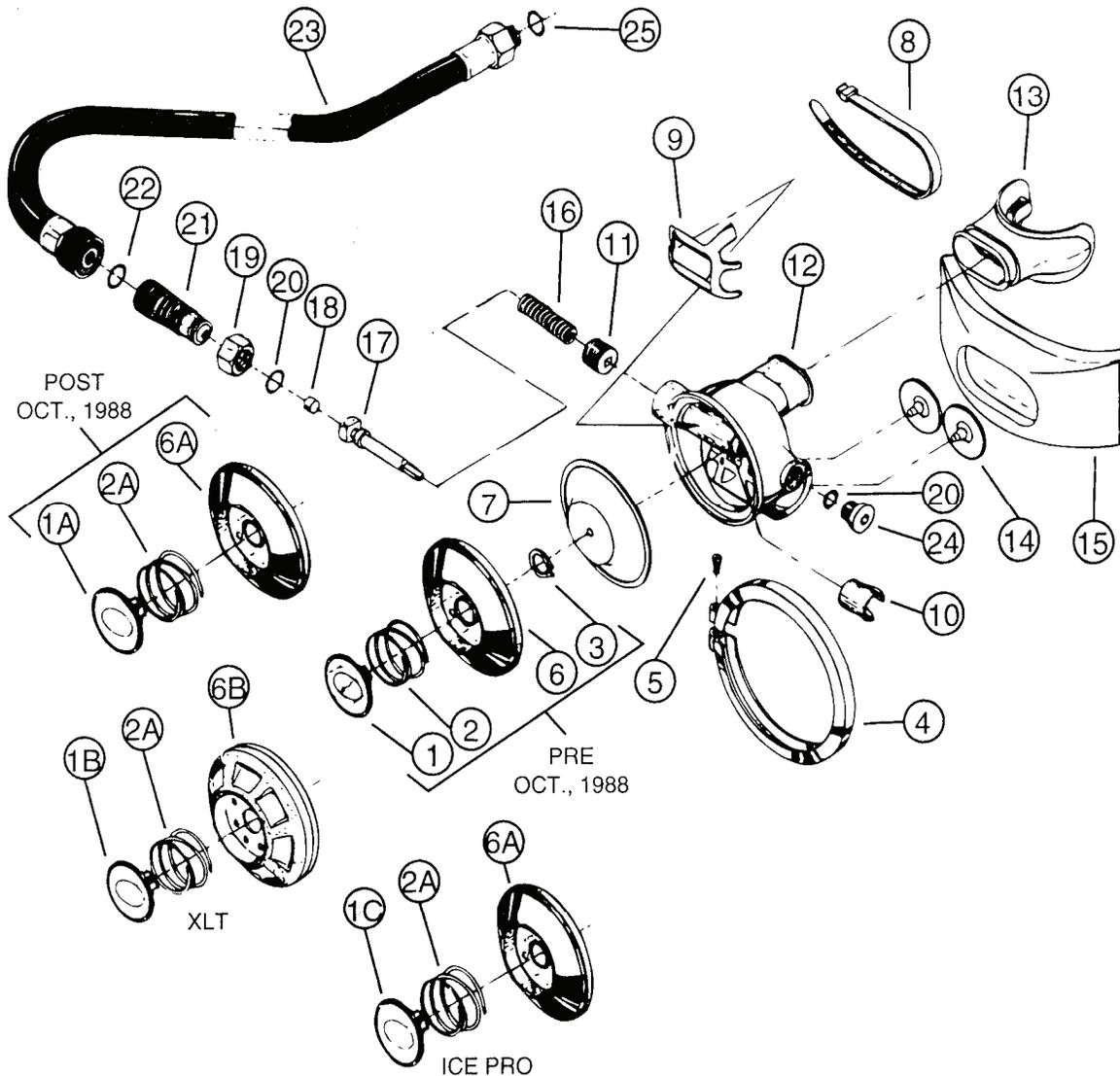
**Assembly:**

**Step 1:** Follow Pacer XLP assembly procedure with these exceptions: Substitute Gemini XLP shaft (6) for Pacer XLP shaft (16). There is no knob (26) and screw (27). Substitute Gemini XLP lever (1) (left mouth) for Pacer XLP lever (28). Make adjustment with screwdriver instead of knob.

NOTE: "O" rings on hoses (4) and (2) should be inspected periodically and lubricated or replaced as necessary.

|                         |             |  |      |   |
|-------------------------|-------------|--|------|---|
| <b>REPAIR PROCEDURE</b> | <b>PAGE</b> | <b>PACER GEMINI XLP<br/>ALTERNATE AIR SOURCE</b> |      |  |
|                         | 2-15        | Second Stage<br>Regulators                       | 9/93 |   |

| #  | QTY | PART #  | KEY | DESCRIPTION                | #  | QTY | PART #  | KEY | DESCRIPTION              |
|----|-----|---------|-----|----------------------------|----|-----|---------|-----|--------------------------|
| 1  | 1   | 0102-83 |     | PURGE BUTTON XLE PRE 1988  | 18 | 1   | 0070-01 | ①   | SEAT                     |
| 1A | 1   | 0110-06 |     | PURGE BUTTON XLE POST 1988 | 19 | 2   | 0150-29 |     | JAM NUT                  |
| 1B | 1   | 0210-28 |     | PURGE BUTTON XLE           | 20 | 1   | 0060-01 | ①   | O-RING                   |
| 1C | 1   | 0218-84 |     | PURGE BUTTON ICE PRO       | 21 | 1   | 0182-43 |     | VALVE SEAT               |
| 2  | 1   | 0040-15 |     | SPRING PRE 1988            | 22 | 1   | 0060-02 | ①   | O-RING                   |
| 2A | 1   | 0040-38 |     | SPRING                     | 23 | 1   | 0228-30 |     | 1/2" L.P. HOSE ASSM. 29" |
| 3  | 1   | 0250-05 |     | CLIP XLE PRE 1988          | 1  | 1   | 0228-31 |     | 1/2" L.P. HOSE ASSM. 39" |
| 4  | 1   | 0100-85 |     | CLAMP RING ASSM.           | 1  | 1   | 1726-00 |     | 3/8" L.P. HOSE ASSM. 26" |
| 5  | 1   | 0130-13 |     | RING SCREW                 | 24 | 1   | 0410-05 |     | PLUG                     |
| 6  | 1   | 0170-39 |     | TOP COVER XLE PRE 1988     | 25 | 1   | 0060-51 | ①   | O-RING                   |
| 6A | 1   | 0170-77 |     | TOP COVER XLE/ICE PRO      |    |     |         |     |                          |
| 6B | 1   | 0210-18 |     | TOP COVER XLT              |    |     |         |     |                          |
| 7  | 1   | 0050-09 |     | DIAPHRAGM ASSEMBLY         |    |     |         |     |                          |
| 8  | 1   | 0310-09 | ①   | CLAMP                      |    |     |         |     |                          |
| 9  | 1   | 0170-55 |     | LEVER (SUB 0170-91)        |    |     |         |     |                          |
| 10 | 1   | 0250-07 |     | BOOSTER CLIP               |    |     |         |     |                          |
| 11 | 1   | 0200-12 |     | ADJUSTING SCREW            |    |     |         |     |                          |
| 12 | 1   | 0103-20 |     | BOTTOM BOX                 |    |     |         |     |                          |
| 13 | 1   | 1117-00 |     | MOUTHPIECE CLEAR           |    |     |         |     |                          |
| 14 | 2   | 0240-04 |     | EXHAUST VALVE              |    |     |         |     |                          |
| 15 | 1   | 0512-25 |     | EXHAUST MANIFOLD           |    |     |         |     |                          |
| 16 | 1   | 0040-16 |     | SPRING                     |    |     |         |     |                          |
| 17 | 1   | 0040-01 | ②   | SPRING TEFLON              |    |     |         |     |                          |
| 18 | 1   | 0181-23 |     | VALVE SEAT CARRIER         |    |     |         |     |                          |
| 19 | 1   | 0180-01 | ②   | VALVE SEAT CARRIER TEFLON  |    |     |         |     |                          |



XLE / XLT / ICE PRO / XLE AER  
SECOND STAGES

9/93

Second Stage  
Regulators

PAGE

2-16

KEY

① Included in annual service kit #9680-02  
② Used on Ice Pro and AER second stages.

**XLE / XLT / ICE PRO / XLE AER SECOND STAGES**

**Tools Needed:**

1. 0980-11 Multi Tool
2. 0980-61 O-ring Tool Kit
3. External Retaining Ring Pliers
4. 11/16" Wrench

**Disassembly:**

**Step 1:** Remove hose (23) from second stage regulator assembly using 11/16" wrench. "O" ring (22) is now accessible.

**Step 2:** Remove exhaust manifold (15) by pulling sharply on one end. No tools are required for removal. Exhaust valves (14) are now accessible and are removed by gently pulling free from bottom box assembly.

**Step 3:** Remove mouthpiece (13) by removing mouthpiece clamp (8) and gently pulling free from mouthpiece sleeve. Have replacement clamps available because this piece has a one-time use only and will be destroyed upon removal.

**Step 4:** Remove ring screw (5) and ring (4).

**Step 5:** Remove top cover (6). Low pressure diaphragm (7) is now accessible.

**Step 6:** Remove purge button (1) and purge button spring (2) by releasing purge button spring clip (3) using external spring clip pliers. On later models, disengage plastic retaining tabs on purge button.

**Step 7:** Remove low pressure diaphragm (7).

**Step 8:** Loosen lock nut (19) with 11/16" wrench. Remove valve cone (21) by turning counter-clockwise. "O" ring (20) is now accessible. CAUTION: Do not damage seat during this operation.

**Step 9:** Remove lock nut (19) from valve.

**Step 10:** Remove Venturamatic lever (9), valve seat carrier (17) and valve seat carrier spring (16) as follows: Use multi-tool to depress valve seat carrier. The lever will now be loose. Remove lever by freeing one side at a time from the valve seat carrier housing. Release multi-tool slowly because of the spring tension released by removal of the lever.

**Step 11:** Remove adjusting screw (11) prior to removing valve seat carrier by turning the carrier counter clockwise until the adjusting screw, carrier, and carrier spring will fall free from the outside end of the valve seat carrier chamber. Be sure the square shaft of the carrier is firmly in the square broached hole of the adjusting screw during the operation. Low pressure seat (18) (black disc in valve seat carrier) is now accessible.

**Step 12:** Remove Venturamatic booster clip (10) by sliding it off the end of the valve seat carrier housing.

**Step 13:** Remove plug (24). "O" ring (20) is now accessible.

**Assembly:**

**Step 1:** Install exhaust valves (14) by pulling stem portion of the valve through center hole of exhaust port openings, from the outside into the inside of bottom can assembly (12). NOTE: Valves can be replaced without disassembly of second stage by pushing stem portion of valve through the center hole from the outside. Be sure shaft is firmly seated in place.

**Step 2:** Install low pressure seat (18) in valve seat carrier, flat side out, indented side in.

**Step 3:** Install lock nut (19) on valve seat carefully so as to avoid damage to the cone area. Unthreaded portion of nut should face the larger shoulder of the valve seat.

**Step 4:** Install adjusting screw (11), valve seat carrier (17), and valve seat carrier spring (16) as follows: Place spring on valve seat carrier (17). Place adjusting screw (11) on square end of carrier and insert entire assembly, adjusting crown first, into carrier chamber. Using multi-tool, turn assembly clockwise until adjusting crown bottoms. Do not force assembly past this point. For preliminary adjustment, turn assembly including adjusting crown counter clockwise 3-1/2 turns. This will minimize or eliminate further adjustment when assembly is complete.

**Step 5:** Install Venturamatic lever (9) as follows: Hold the bottom box assembly (12) in the palm of the left hand, grasping the crossbar of the multi-tool with the index and middle finger. Squeeze the bottom box and the multi-tool together as far as it will go. About 3/8" of the carrier shaft will protrude beyond the adjusting crown at this point. With the right hand insert the ends of the lever one at a time into the square broached holes on the side of the carrier chamber. Release the tool. Lever will now be in an up position.

|                         |             |  |      |   |
|-------------------------|-------------|--|------|---|
| <b>REPAIR PROCEDURE</b> | <b>PAGE</b> | <b>PACER XLE / XLT / ICE PRO / XLE AER<br/>SECOND STAGES</b> |      |  |
|                         | 2-17        | Second Stage<br>Regulators                                   | 9/93 |   |

**Step 6:** Install valve seat (18) again using care to avoid damage to the cone area. Turn valve seat clockwise until the top of the lever is even with the edge of the bottom box. This is not the final lever height adjustment.

**Step 7:** Install Venturamatic booster clip (10) placing open end of clip on valve seat carrier body and pushing down until it snaps into place. Slide clip toward valve seat side of carrier body until clip touches the Venturamatic lever (9). Depress lever completely. This will position the clip correctly.

**Step 8:** Install low pressure diaphragm (7). Stainless steel center plate should make contact with the top of the Venturamatic lever.

**Step 9:** Install purge button (1) and purge button spring (2) in top cover (6) using external spring clip (3) to hold in place.

**Step 10:** Install top cover (6).

**Step 11:** Install ring (4) and ring screw (5).

**Step 12:** Install exhaust manifold (15) by engaging one end of lip of exhaust tube, then stretching manifold over balance of exhaust tube lip. Lubricating with soap water will facilitate proper positioning. Do not use grease as lubricant, because the residual properties could cause loss of the manifold.

**Step 13:** Install mouthpiece (13) on mouthpiece tube. A new clamp (8) must be used, and can be tightened with pliers. Any excess material must be cut off.

**Step 14:** Install hose (23) and "O" ring (22).

**Step 15:** To adjust second stage lever height and attain proper air flow on demand, plus proper purge button action, proceed as follows:

- A. Place regulator on air source, such as a diving cylinder.
- B. Open Cylinder valve.
- C. Be sure the intermediate pressure is correct for the regulator being adjusted.
- D. Hose nut and lock nut must be loosened approximately one turn.
- E. Grasp hose in left hand, as near to the second stage of the regulator as is comfortable. Grasp second stage in right hand.
- F. Rotate second stage toward you (counter clockwise) until heavy free-flow is attained.
- G. Rotate second stage away from you

(clockwise) until free-flow stops. The closer to the cut-off point you stop this rotation, the better the performance of the regulator will be.

H. Tighten lock nut and the hose nut.

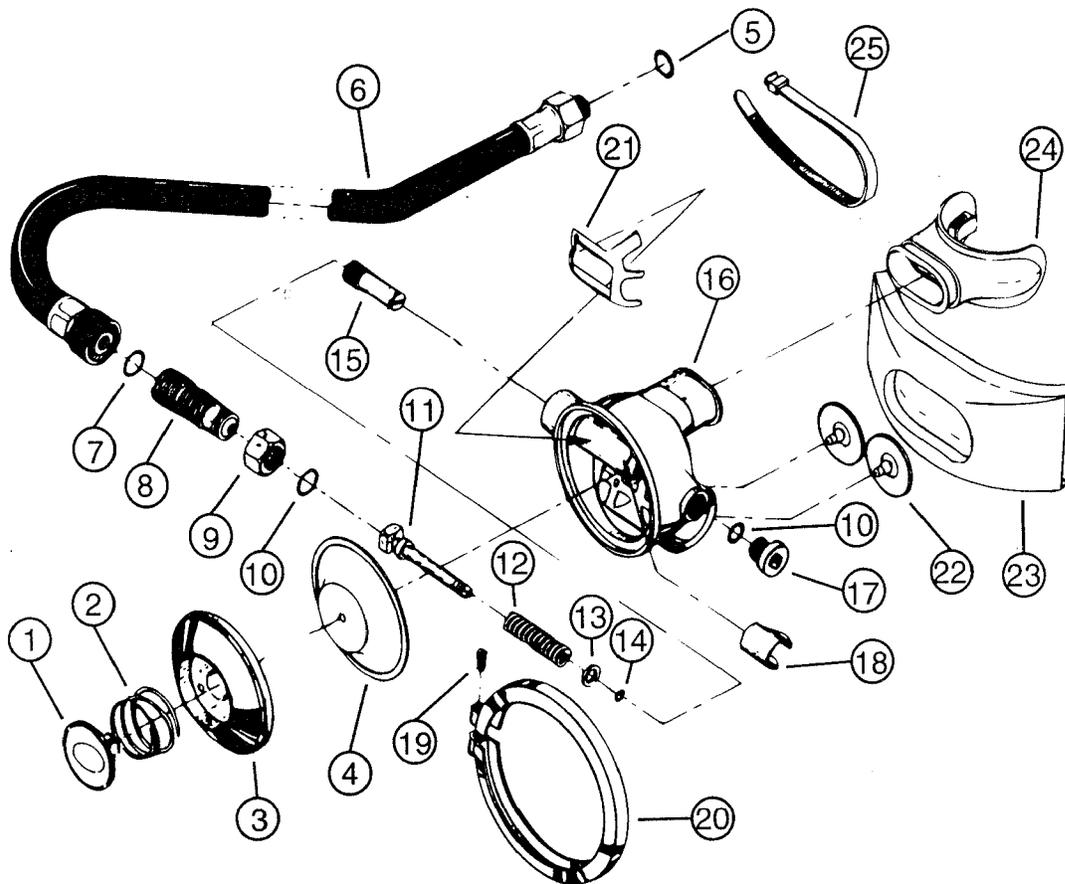
Test by (A) breathing through the unit. Air must come easily and freely, but should have no free-flow. Test by (B) depressing purge button. A heavy flow of air should be attained. If unit fails A and /or B, loosen the hose and the lock nut; readjust unit.

**Step 16:** To fine tune the Pacer XL, XLE, & XLT, proceed as follows:

- A. Set first stage pressure at 140 PSIG.
- B. Adjust lever height.
- C. Using screwdriver through plug opening now provided, turn valve seat carrier, as follows: Clockwise to increase valve seat carrier spring load (this increases opening and breathing effort); Counter clockwise to decrease valve seat carrier load (this decreases opening and breathing effort).
- D. Replace plug (24) with "O" ring (20) installed.

|   |  |                            |                  |                  |
|---|--|----------------------------|------------------|------------------|
|  | PACER XLE / XLT / ICE PRO / XLE AER<br>SECOND STAGES |                            | PAGE<br><br>2-18 | REPAIR PROCEDURE |
|   | 9/93   | Second Stage<br>Regulators |                  |                  |

| #  | QTY | PART #  | KEY | DESCRIPTION              |
|----|-----|---------|-----|--------------------------|
| 1  | 1   | 0220-59 |     | PURGE BUTTON ASSEMBLY    |
| 2  | 1   | 0040-38 |     | PURGE BUTTON SPRING      |
| 3  | 1   | 0170-77 |     | TOP COVER (SUB 0622-13)  |
| 4  | 1   | 0050-09 |     | DIAPHRAGM ASSEMBLY       |
| 5  | 1   | 0060-51 | ⓐ   | O-RING                   |
| 6  | 1   | 0228-30 |     | 29" L.P. HOSE ASSEMBLY   |
| 7  | 1   | 0060-02 | ⓐ   | O-RING                   |
| 8  | 1   | 0180-85 |     | VALVE SEAT (SUB 0182-43) |
| 9  | 1   | 0150-29 |     | JAM NUT                  |
| 10 | 1   | 0060-01 | ⓐ   | O-RING                   |
| 11 | 1   | 0107-98 | ⓐ   | L.P. SEAT ASSEMBLY       |
| 12 | 1   | 0040-72 |     | SPRING                   |
| 13 | 1   | 0120-95 |     | WASHER                   |
| 14 | 1   | 0060-61 | ⓐ   | O-RING                   |
| 15 | 1   | 0350-31 |     | BALANCE CHAMBER          |
| 16 | 1   | 0108-16 |     | BOTTOM BOX               |
| 17 | 1   | 0410-05 |     | PLUG                     |
| 18 | 1   | 0250-07 |     | SPRING CLIP              |
| 19 | 1   | 0130-13 |     | RING SCREW               |
| 20 | 1   | 0100-85 |     | CLAMP RING               |
| 21 | 1   | 0170-55 |     | LEVER (SUB 0170-91)      |
| 22 | 2   | 0240-04 |     | EXHAUST VALVE            |
| 23 | 1   | 0512-25 |     | EXHAUST MANIFOLD         |
| 24 | 1   | 1117-00 |     | MOUTHPIECE               |
| 25 | 1   | 0310-09 | ⓐ   | CLAMP                    |



PACER XLS (METAL)  
SECOND STAGE

9/93

Second Stage  
Regulators

PAGE

2-19

KEY

ⓐ Included in annual service kit #9680-03

**PACER XLS (METAL) SECOND STAGE**

**Tools Needed:**

1. 0980-38 Tool Kit
2. 0980-61 O-ring Tool Kit
3. 11/16" Open End Wrench
4. 5/8" Open End Wrench
5. 3/16" Allen Wrench

**Disassembly:**

**Step 1:** Remove hose (6) from second stage regulator assembly using an 11/16" and 5/8" wrench. "O" ring (7) is accessible.

**Step 2:** Remove exhaust manifold (23) by pulling sharply on one end. No tools are required for removal. Exhaust valves (22) are now accessible and are removed by gently pulling free from the bottom box assembly.

**Step 3:** Remove mouthpiece (24) by removing mouthpiece clamp (25) and gently pulling free from mouthpiece sleeve. Have replacement clamps available. This piece has a one time use only and will be destroyed upon removal.

**Step 4:** Remove ring screw (19) and ring (20).

**Step 5:** Remove top cover (3). Low pressure diaphragm (4) is now accessible.

**Step 6:** Remove purge button (1) and purge button spring (2).

**Step 7:** Remove low pressure diaphragm (4).

**Step 8:** Loosen lock nut (9) with 11/16" wrench. Remove valve seat (8) by turning counter clockwise. Use 3/16" allen wrench. "O" ring (10) is now accessible. CAUTION: Do not damage seat during this operation.

**Step 9:** Remove lock nut (9) from valve seat (8).

**Step 10:** Remove Venturamatic lever (21), valve seat carrier (11), spring (12) and washer (13) as follows: Use multi-tool to depress valve seat carrier. The lever will now be loose. Remove lever by freeing one side at a time from the valve seat carrier housing. Release multi-tool slowly because of the spring tension released by removal of the lever. "O" ring (14) may now be removed.

**Step 11:** Remove plug (17) and remove "O" ring (10) from plug.

**Step 12:** Balance chamber (15) may now be removed by fitting a screwdriver through the open port on the side of the bottom box (16). Turn the balance chamber (15) clockwise until it falls through the valve seat carrier housing in the bottom box (16).

**Step 13:** Remove Venturamatic booster clip (18) by sliding it off the end of the valve seat carrier housing.

**Assembly:**

**Step 1:** Install exhaust valves (22) by pulling stem portion of the valve through center hole of exhaust port openings from the outside into the inside of the bottom box assembly (16). NOTE: Valves can be replaced without disassembly of second stage by pushing stem portion of valve through the center hole from the outside. Be sure stem is firmly seated in place.

**Step 2:** Install spring (12) onto seat assembly (11). Install washer (13) and "O" ring (14) onto seat assembly.

**Step 3:** Install lock nut (9) on valve seat (8) carefully so as to avoid damage to the cone area. Unthreaded portion of nut should face the larger shoulder of valve seat.

**Step 4:** Install balance chamber (15) and valve seat carrier (15) as follows: Drop balance chamber (15) into seat carrier housing. Turn exposed end of balance chamber (15) counter clockwise until first thread is exposed. Then turn back 1.5 to 2 turns. Install seat carrier (11).

**Step 5:** Install Venturamatic lever (21) as follows: Hold the bottom box assembly (16) in the palm of the left hand grasping the crossbar of the multi-tool together as far as it will go. With the right hand insert the ends of the lever one at a time into the square broached holes on the side of the carrier chamber. Release the tool. Lever will now be in an up right position.

**Step 6:** Install valve seat (8) again using care to avoid damage to the cone area. Turn valve seat clockwise until the top of the lever is even with the edge of the bottom box. This is not the final lever height adjustment.

**Step 7:** Install Venturamatic booster clip (18) placing open end of clip on valve seat carrier body and pushing down until it snaps into place. Slide clip toward valve seat side of carrier body until clip touches the

|                         |             |   |      |   |
|-------------------------|-------------|---|------|---|
| <b>REPAIR PROCEDURE</b> | <b>PAGE</b> | <b>PACER XLS (METAL)<br/>SECOND STAGE</b> |      |  |
|                         | 2-20        | Second Stage<br>Regulators                | 9/93 |   |

Venturamatic lever (21). Depress lever completely. This will position the clip correctly.

**Step 8:** Install low pressure diaphragm (4).

**Step 9:** Install purge button (1) and purge button spring (2) in top cover (3).

**Step 10:** Install top cover (3).

**Step 11:** Install ring (20) and ring screw (19).

**Step 12:** Install exhaust manifold (23) by engaging one end in lip of exhaust tube then stretching manifold over balance of exhaust tube lip. Lubricating with soap water will facilitate proper positioning. Do not use grease as a lubricant because the residual properties could cause loss of the manifold.

**Step 13:** Install mouthpiece (24) on mouthpiece tube. A new mouthpiece clamp (25) must be used and can be tightened with pliers. Any excess material must be cut off.

**Step 14:** Install hose (6) and "O" ring (7).

**Step 15:** To adjust second stage lever height and attain proper air flow on demand plus proper purge button action, proceed as follows:

A. Place regulator on air source such as a diving cylinder.

B. Open cylinder valve.

C. Be sure the intermediate pressure is correct for the regulator being used.

D. Hose nut and lock nut must be loosened approximately one turn.

E. Grasp hose in left hand as near to the second stage of the regulator as is comfortable. Grasp second stage in right hand.

F. Rotate second stage toward you (counter clockwise) until heavy free flow is attained.

G. Rotate second stage away from you (clockwise) until free flow stops. The closer to the cut-off point you stop this rotation the better the performance of the regulator.

H. Tighten lock nut (9).

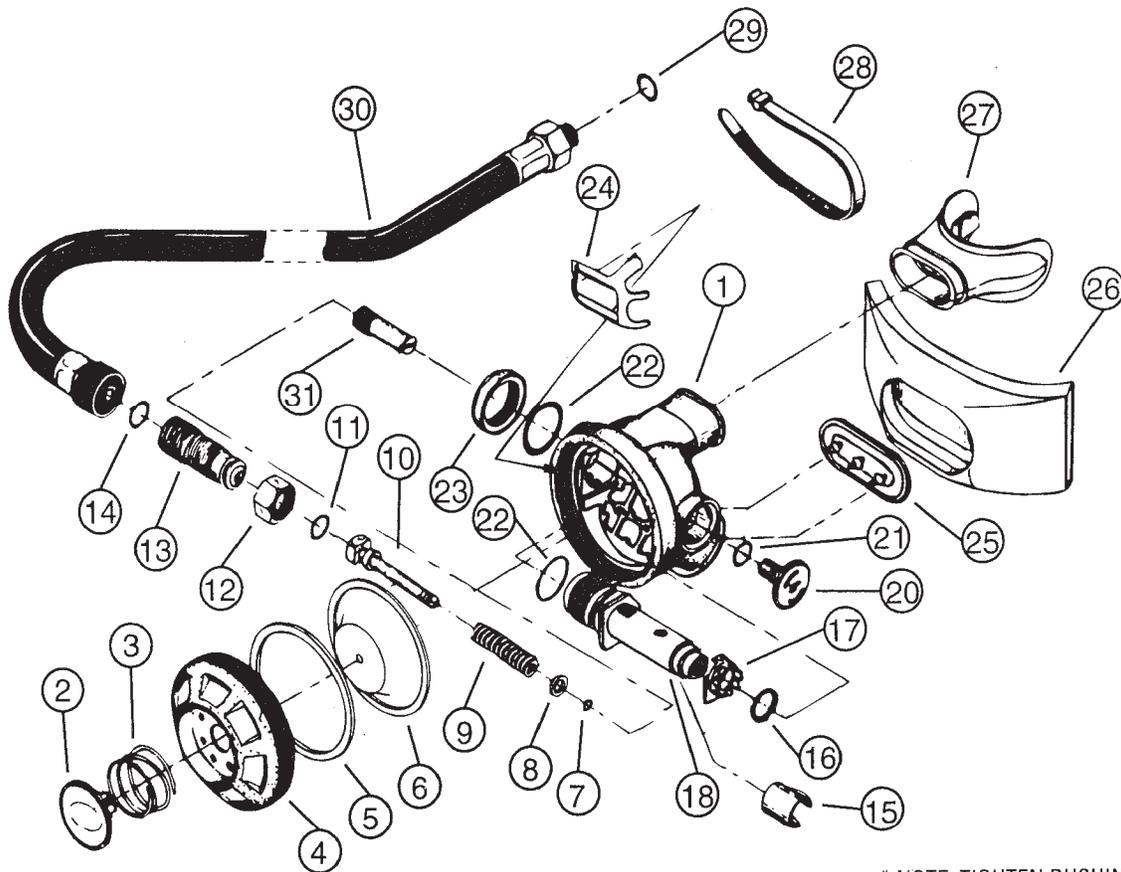
I. Tighten hose nut.

Test by (a) breathing through unit. Air must flow easily and freely, but should have no free flow. Test by (b) depressing purge bottom. A heavy flow of air should be attained. If unit fails a and/or b, turn off air at cylinder valve then loosen the hose and lock nut. Readjust unit. Following procedures in step 15 above.

**Step 16:** To fine tune the Pacer XLS, proceed as follows: Using screwdriver through plug opening now provided, turn balance chamber (15) clockwise to increase valve seat carrier spring load (this increases the opening and breathing effort) and counter clockwise to decrease valve seat carrier spring load (this decreases opening and breathing effort). Replace plug (17) with "O" ring (10) installed.

|   |                                   |                            |      |                  |
|---|-----------------------------------|----------------------------|------|------------------|
|  | PACER XLS (METAL)<br>SECOND STAGE |                            | PAGE | REPAIR PROCEDURE |
|   | 9/93                              | Second Stage<br>Regulators | 2-21 |                  |

| #  | QTY | PART #  | KEY | DESCRIPTION                 | #  | QTY | PART #  | KEY | DESCRIPTION                |
|----|-----|---------|-----|-----------------------------|----|-----|---------|-----|----------------------------|
| 1  | 1   | 0215-53 |     | BOTTOM BOX- DUAL EXHAUST    | 25 | 1   | 0240-10 | ⓐ   | EXHAUST VALVE - ROUND      |
| 2  | 1   | 0220-59 |     | PURGE BUTTON ASSEMBLY       | 2  | 1   | 0240-12 | ⓑ   | EXHAUST VALVE - ELLIPTICAL |
| 3  | 1   | 0040-38 |     | PURGE BUTTON SPRING         | 26 | 1   | 0512-25 |     | EXHAUST MANIFOLD           |
| 4  | 1   | 0210-10 |     | TOP COVER - BLACK           | 27 | 1   | 1117-00 |     | MOUTHPIECE                 |
| 5  | 1   | 0120-60 |     | FRICTION WASHER             | 28 | 1   | 0310-09 | ⓓ   | CLAMP                      |
| 6  | 1   | 0050-09 |     | DIAPHRAGM ASSEMBLY          | 29 | 1   | 0060-51 | ⓔ   | O-RING                     |
| 7  | 1   | 0060-61 | ⓓ   | O-RING                      | 30 | 1   | 0228-30 |     | L.P. HOSE ASSM. 29"        |
| 8  | 1   | 0120-97 |     | WASHER                      | 1  | 1   | 0228-31 |     | L.P. HOSE ASSM. 39"        |
| 9  | 1   | 0040-72 |     | SPRING                      | 31 | 1   | 0350-35 |     | BALANCE CHAMBER            |
| 10 | 1   | 0107-98 | ⓓ   | L.P. SEAT ASSEMBLY          |    |     |         |     |                            |
| 11 | 1   | 0060-01 | ⓓ   | O-RING                      |    |     |         |     |                            |
| 12 | 1   | 0150-29 |     | JAM NUT                     |    |     |         |     |                            |
| 13 | 1   | 0182-43 |     | VALVE SEAT                  |    |     |         |     |                            |
| 14 | 1   | 0060-02 | ⓓ   | O-RING                      |    |     |         |     |                            |
| 15 | 1   | 0250-07 |     | SPRING CLIP                 |    |     |         |     |                            |
| 16 | 1   | 0060-17 | ⓓ   | O-RING                      |    |     |         |     |                            |
| 17 | 1   | 0612-09 |     | SNAP IN BUSHING             |    |     |         |     |                            |
| 18 | 1   | 0030-95 |     | VALVE HOUSING               |    |     |         |     |                            |
| 19 | 1   | 0060-17 |     | O-RING                      |    |     |         |     |                            |
| 20 | 1   | 0410-35 |     | BUSHING PLUG*               |    |     |         |     |                            |
| 21 | 1   | 0060-02 | ⓓ   | O-RING                      |    |     |         |     |                            |
| 22 | 1   | 0060-54 | ⓓ   | O-RING                      |    |     |         |     |                            |
| 23 | 1   | 0181-92 |     | VALVE HOUSING NUT           |    |     |         |     |                            |
| 24 | 1   | 0170-55 |     | LEVER (RIGHT) (SUB 0170-91) |    |     |         |     |                            |
| 1  | 1   | 0170-58 | ⓐ   | LEVER (LEFT MOUNT)          |    |     |         |     |                            |



\* NOTE: TIGHTEN BUSHING PLUG (20) BY HAND USING HEX WRENCH #2. DO NOT OVER TIGHTEN OR USE ANY OTHER TOOLS



XLS (PLASTIC)  
SECOND STAGE

9/93

Second Stage  
Regulators

PAGE

2-22

KEY

- ⓓ Included in annual service kit #9680-03.
- ⓑ Used on 1991 models only.
- ⓐ Not shown.

**XLS (PLASTIC) SECOND STAGE**

**Tools Needed:**

1. 0980-38 Tool Kit
2. 0980-39 Top Cover Removal Tool XLP
3. 0980-61 O-ring Tool Kit
4. 11/16" Open End Wrench
5. 13/16" Open End Wrench

**Disassembly:**

**Step 1:** Remove hose (30) from second stage.

**Step 2:** Remove exhaust manifold (26) by pulling sharply on one end. No tools are required for removal. Exhaust valve(s) (25) are now accessible and are removed by gently pulling free from bottom box assembly. Note: 1991 models used an elliptical valve.

**Step 3:** Remove mouthpiece (27) by removing mouthpiece clamp (28) and gently pulling free from mouthpiece sleeve. Have replacement clamps available. This piece has a one time use only and will be destroyed upon removal.

**Step 4:** Unscrew top cover (4) counter-clockwise using top cover removal tool. Remove friction washer (5). Low pressure diaphragm is now accessible.

**Step 5:** Remove purge button (2) and purge button spring (3) by squeezing legs of purge button slightly.

**Step 6:** Remove low pressure diaphragm (6).

**Step 7:** Loosen jam nut (12) with 11/16" wrench. Remove valve seat (13) by turning counter clockwise. "O" ring (11) is now accessible. CAUTION: Do not damage seat during this operation.

**Step 8:** Remove jam nut (12) from valve seat (13).

**Step 9:** Remove lever (24) as follows: Use multi-tool to depress seat assembly (10). The lever will now be loose. Remove lever by freeing one side at a time from the housing (18). Release multi-tool slowly because of the spring tension released by removal of the lever. Seat assembly (10) and spring (9) should now drop from housing. "O" ring (7) and washer (8) are available for inspection/replacement.

**Step 10:** Remove bushing plug (20) from bushing retainer (17) by turning counter clockwise with #2 hex wrench. "O" ring (21) is now accessible. Remove

bushing retainer (17) from bottom box (1). "O" ring (16) is now accessible.

**Step 11:** Remove balance chamber (31) from valve housing (18) by turning clockwise with a narrow blade screwdriver. When threads are disengaged, the balance chamber will fall from housing on hose side.

**Step 12:** Remove spring clip (15).

**Step 13:** Remove valve housing nut (23) from housing (18) using 13/16" wrench. "O" ring (22) is now available for inspection.

**Step 14:** Remove housing (18) from bottom box (1). "O" ring (22) is now accessible.

**Assembly:**

**Step 1:** Install "O" ring (22) onto housing (18). Insert housing into bottom box (1).

**Step 2:** Install "O" ring (22) onto housing (18). Install valve housing nut (23) onto housing (18) and tighten clockwise using 13/16" open end wrench.

**Step 3:** Install spring clip (15) onto housing (18). Exact location is not important at this time so long as clip does not cover the square holes or the air-flow port.

**Step 4:** Install bushing retainer (17) and "O" ring (16) into bottom box (1).

**Step 5:** Insert slotted end of balance chamber (31) into valve housing (18). Screw the balance chamber (31) counterclockwise into housing (22) until all of the threads on the shaft are inside the housing. Caution: Do not cross thread shaft into valve housing.

**Step 6:** Inspect and install exhaust valve(s) (25). If valves are worn or damaged replace them with new valve(s).

**Step 7:** Install spring (9) onto the seat assembly (10) followed by the washer (8) and "O" ring (7). This entire sub-assembly should now be inserted into the valve housing (18). Using the multi-tool or any non-abrasive rod (pencil with eraser), push against the face of the seat and compress approximately 1/4". At the same time insert the lever (24) by opening the two "legs" and inserting the "legs" into the square holes in the side of the valve housing. Remove the compression tool and test the lever for proper engagement by compressing it a few times. Looking at the face of the black rubber seat

|                         |             |   |      |   |
|-------------------------|-------------|---|------|---|
| <b>REPAIR PROCEDURE</b> | <b>PAGE</b> | <b>PACER XLS (PLASTIC)<br/>SECOND STAGE</b> |      |  |
|                         | 2-23        | Second Stage<br>Regulators                  | 9/93 |   |

you should see a movement of the whole seat carrier assembly when the lever is depressed. Push spring clip (15) all the way against the lever (24) and press on the end of the lever approximately 1/4". The spring clip (15) will move away from the lever slightly and will now be in the correct position. Reinstall "O" ring (11), jam nut (12), and valve seat (13). Do not tighten the nut at this time.

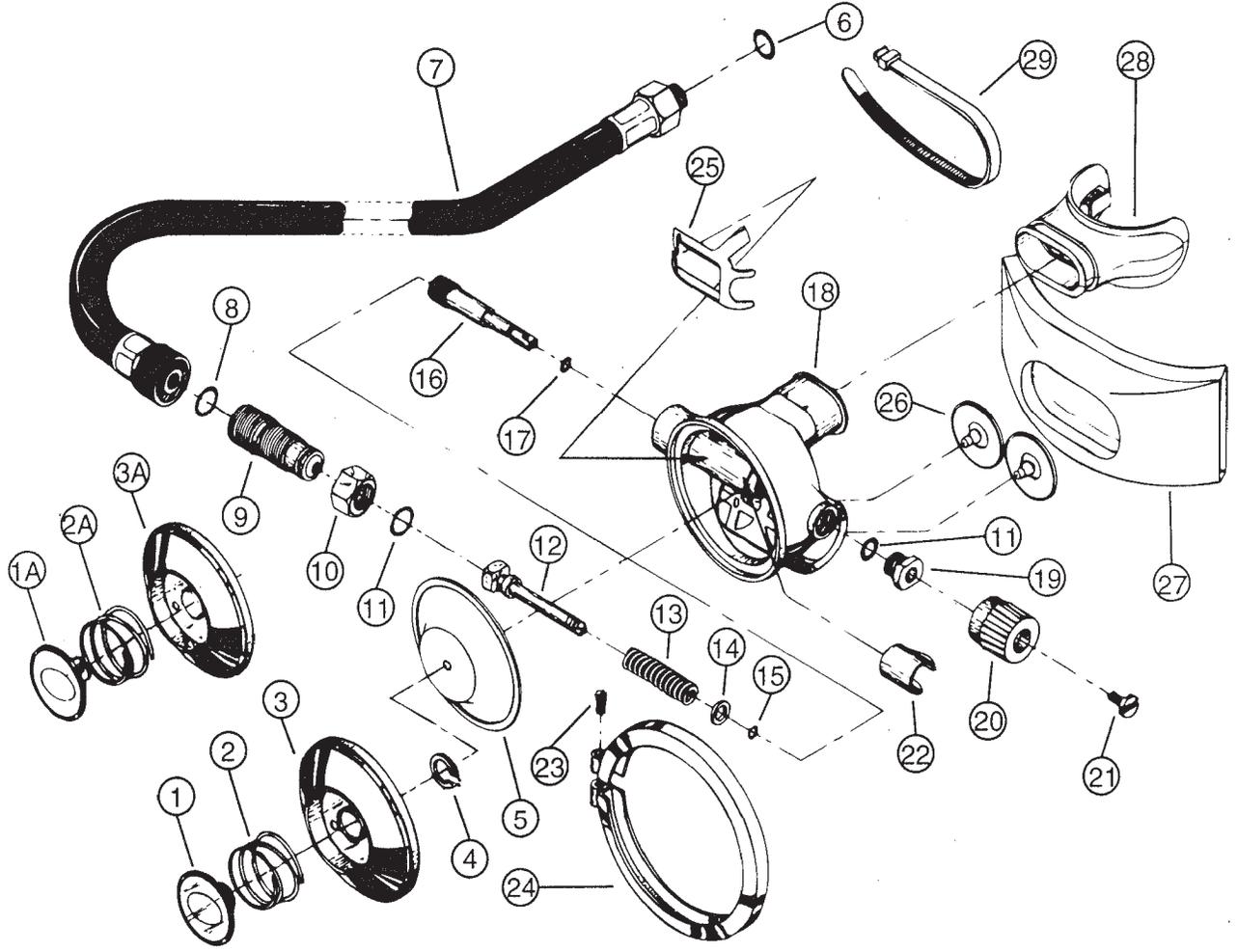
**Step 8:** Hold regulator at eye level focusing on the very top of the lever (24). With the free hand, turn the valve seat (13) clockwise until the lever starts descending. Stop turning and back off 1/4 turn. Tighten the jam nut (12). Install diaphragm (6), slip washer (5) and cover assembly (4).

**Step 9:** Turn the balance chamber (31) counter clockwise until it stops, then turn 3 full turns back. Turn the air on and depress purge button (2). You should have a strong purge without any free-flow. If purge is too weak, loosen the jam nut (12) and turn the valve seat (13) counter clockwise approximately 1/8 turn at a time until a strong purge is accomplished. If free flow occurs, loosen jam nut and turn valve seat clockwise until free flow stops. Re-check for strong purge. Tighten the nut (12). Make final adjustment by turning the balance chamber (31) clockwise for harder breathing or counter-clockwise for easier breathing. For optimum performance at any depth the regulator should be adjusted to open between .7-1.0 inch/water and should not exceed the 1.5 inch/water inhalation effort at 10CFM.

**Step 10:** Install "O" ring (21) on bushing plug (20). Hand tighten bushing plug using #2 hex wrench. Install mouthpiece (27) using a new mouthpiece clamp (28). Install exhaust manifold (26). If the regulator free-flows and can't be stopped by turning the balance chamber (31) check the intermediate pressure or replace the internal seals - seat assembly (10) and "O" ring (7). During the required annual inspection, the "O" ring (7) must be replaced.

|   |                                     |                            |      |                  |
|---|-------------------------------------|----------------------------|------|------------------|
|  | PACER XLS (PLASTIC)<br>SECOND STAGE |                            | PAGE | REPAIR PROCEDURE |
|   | 9/93                                | Second Stage<br>Regulators | 2-24 |                  |

| #  | QTY | PART #  | KEY | DESCRIPTION              | #  | QTY | PART #  | KEY | DESCRIPTION         |
|----|-----|---------|-----|--------------------------|----|-----|---------|-----|---------------------|
| 1  | 1   | 0106-58 |     | PURGE BUTTON ASSEMBLY    | 23 | 1   | 0130-13 |     | RING SCREW          |
| 1A | 1   | 0110-07 | ⊗   | PURGE BUTTON ASSEMBLY    | 24 | 1   | 0100-85 |     | CLAMP RING ASSM     |
| 2  | 1   | 0040-15 |     | SPRING                   | 25 | 1   | 0170-55 |     | LEVER (SUB 0170-91) |
| 2A | 1   | 0040-38 | ⊗   | SPRING                   | 26 | 2   | 0240-04 |     | EXHAUST VALVE       |
| 3  | 1   | 0170-39 |     | TOP COVER                | 27 | 1   | 0512-25 |     | EXHAUST MANIFOLD    |
| 3A | 1   | 0170-77 | ⊗   | TOP COVER (SUB 0622-13)  | 28 | 1   | 1117-00 |     | MOUTHPIECE          |
| 4  | 1   | 0250-05 |     | CLIP                     | 29 | 1   | 0310-09 | ●   | CLAMP               |
| 5  | 1   | 0050-09 |     | DIAPHRAGM ASSEMBLY       |    |     |         |     |                     |
| 6  | 1   | 0060-51 | ●   | O-RING                   |    |     |         |     |                     |
| 7  | 1   | 1726-00 |     | L.P. HOSE ASSEMBLY 26"   |    |     |         |     |                     |
| 8  | 1   | 0060-02 | ●   | O-RING                   |    |     |         |     |                     |
| 9  | 1   | 0180-85 |     | VALVE SEAT (SUB 0182-43) |    |     |         |     |                     |
| 10 | 1   | 0150-29 |     | JAM NUT                  |    |     |         |     |                     |
| 11 | 1   | 0060-01 | ●   | O-RING                   |    |     |         |     |                     |
| 12 | 1   | 0107-98 | ●   | L.P. SEAT ASSEMBLY       |    |     |         |     |                     |
| 13 | 1   | 0040-72 |     | SPRING                   |    |     |         |     |                     |
| 14 | 1   | 0120-95 |     | WASHER                   |    |     |         |     |                     |
| 15 | 1   | 0060-61 | ●   | O-RING                   |    |     |         |     |                     |
| 16 | 1   | 0350-16 |     | SHAFT                    |    |     |         |     |                     |
| 17 | 1   | 0060-16 | ●   | O-RING                   |    |     |         |     |                     |
| 18 | 1   | 0108-16 |     | BOTTOM BOX               |    |     |         |     |                     |
| 19 | 1   | 0410-28 |     | PLUG                     |    |     |         |     |                     |
| 20 | 1   | 0560-19 |     | KNOB                     |    |     |         |     |                     |
| 21 | 1   | 0130-47 |     | SCREW                    |    |     |         |     |                     |
| 22 | 1   | 0250-07 |     | SPRING CLIP              |    |     |         |     |                     |



**PACER XLB  
SECOND STAGE**

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9/93      Second Stage  
Regulators

**PAGE**  
2-25

**KEY**  
 ● Included in annual service kit #9680-03  
 ⊗ Oct. 1988 to present, Must be used together.

**PACER XLB SECOND STAGE**

**Tools Needed:**

1. 0980-38 Tool Kit
2. 0980-61 O-ring Tool Kit
3. 11/16" Open End Wrench
4. Screwdriver
5. External Retaining Ring Pliers

**Disassembly:**

**Step 1:** Remove hose from second stage.

**Step 2:** Remove exhaust manifold (27) by pulling sharply on one end. No tools are required for removal. Exhaust valves (26) are now accessible and are removed by gently pulling free from bottom box assembly.

**Step 3:** Remove mouthpiece (28) by removing mouthpiece clamp (29) and gently pulling free from mouthpiece sleeve. Have replacement clamps available because this piece has a one time use only and will be destroyed upon removal.

**Step 4:** Remove ring screw (23) and clamp ring (24).

**Step 5:** Remove top cover (3). Low pressure diaphragm (5) is now accessible.

**Step 6:** Remove purge button (1) and purge button spring (2) by releasing purge button retaining ring (4) using external spring clip pliers.

**Step 7:** Remove low pressure diaphragm (5).

**Step 8:** Loosen jam nut (10) with 11/16" wrench. Remove valve seat (9) by turning counter clockwise. "O" ring (11) is now accessible. CAUTION: Do not damage seat during this operation.

**Step 9:** Remove jam nut (10) from valve seat (9).

**Step 10:** Depress L.P. seat assembly (12) by inserting the multi-tool into the bushing and applying pressure until the lever (25) drops. Remove lever (25) from unit. Seat assembly (12) and spring (13) should now drop from housing. "O" ring (15) and washer (14) are available for inspection/replacement.

**Step 11:** Remove screw (21). Leave knob (20) on shaft (16). Turn knob clockwise until shaft falls from unit from hose connection side. "O" ring (17) is now available for

inspection/replacement. Knob is also free.

**Step 12:** Remove plug (19) using small crescent wrench. "O" ring (11) is now available for inspection/replacement.

**Step 13:** Remove spring clip (22).

**Assembly:**

**Step 1:** Install spring clip (22) onto regulator bushing. Exact locations is unimportant at this time, so long as clip does not cover the square holes or the air-flow port.

**Step 2:** Inspect and install exhaust valves (26). If valves are worn or damaged, replace with new valves.

**Step 3:** Insert "O" ring (11) and plug (19) into side port and tighten. Place "O" ring (17) into groove on shaft (16) and insert into regulator bushing and through the opening in plug (19). Pull on the flat end of the protruding shaft (16) and turn counter clockwise approximately three turns. Install the knob (20) and screw (21).

**Step 4:** At this point the spring (13) should be assembled onto the seat assembly (12) followed by the washer (14) and "O" ring (15). This entire sub-assembly should now be inserted into the regulator bushing. Using Dacor's multi-tool or any non-abrasive rod (pencil with eraser) push against the face of the seat and compress approximately 1/4". At the same time insert the lever (25) by opening the two "legs" and inserting the ends into the square holes in the side of the valve bushing. Remove the compression tool and test the lever for proper engagement by compressing it a few times. Looking at the face of the black rubber seat you should see a movement of the whole seat carrier assembly when the lever is pressed on.

**Step 5:** Push spring clip (22) all the way against the lever (25) and press on the end of the lever approximately 1/4". The spring clip (22) will move away from the lever slightly and will now be in the correct position. Reinstall "O" ring (11), jam nut (10), and valve seat (9). Do not tighten the nut at this time.

**Step 6:** Hold regulator at eye level focusing on the very top of the lever (25). With the free hand, turn the valve seat (9) clockwise until the lever starts descending. Stop turning an back off 1/4 turn. Tighten the jam nut (10). Install diaphragm (5), cover assembly (3), clamp (24) and screw (23).

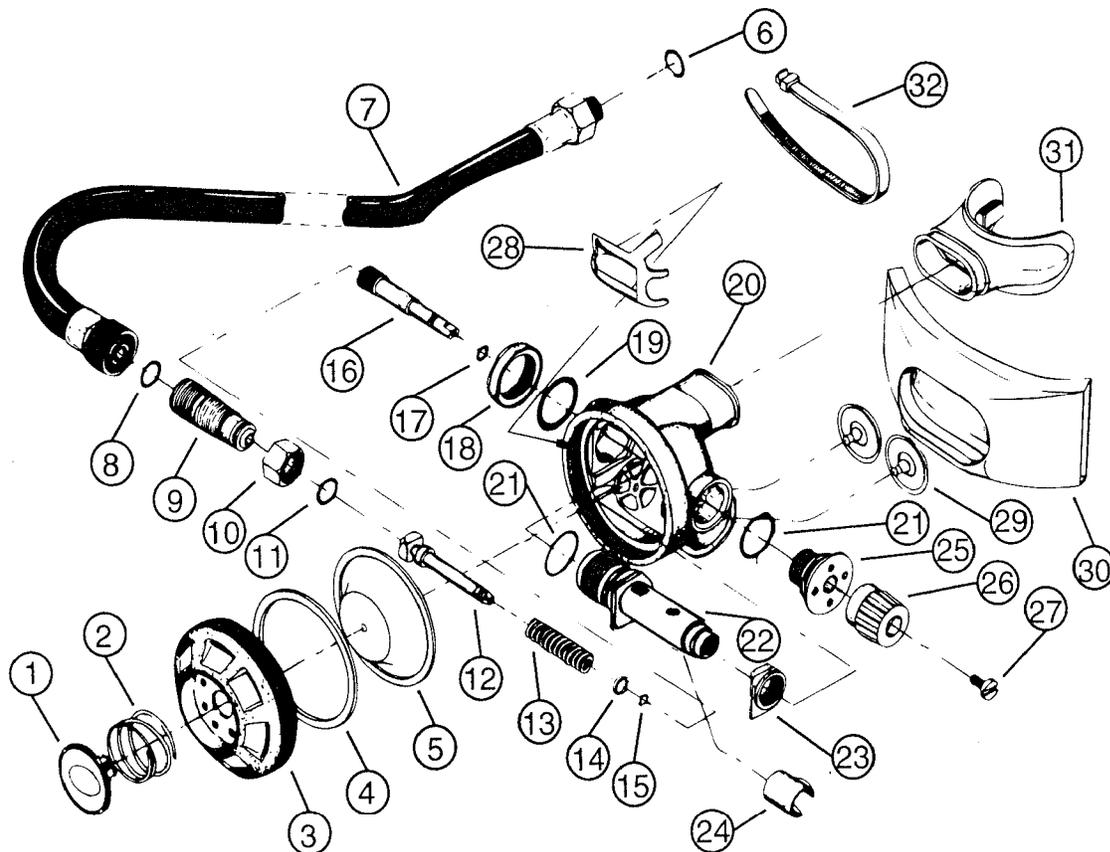
|                         |             |                                   |      |   |
|-------------------------|-------------|-----------------------------------|------|---|
| <b>REPAIR PROCEDURE</b> | <b>PAGE</b> | <b>PACER XLB<br/>SECOND STAGE</b> |      |  |
|                         | 2-26        | Second Stage<br>Regulators        | 9/93 |   |

**Step 7:** Turn the adjusting knob counter clockwise until it stops, then turn 3 full turns back. Turn the air on and depress purge button (1). You should have a strong purge without any free-flow. If purge is too weak, loosen the jam nut (10) and turn valve seat (9) counter clockwise approximately 1/8 turn at a time until a strong purge is accomplished. Tighten the nut (10). Make final adjustment by turning the knob (20) clockwise for harder breathing or opposite for easier breathing as indicated on the face of the knob. For optimum performance at any depth the regulator should be adjusted to open between .7-1.0 inch/water and should not exceed the 1.5 inch/water inhalation effort at 10CFM. If the test equipment is not available, adjust your regulator for desired effort without any free-flow after you enter the water to dive.

**Step 8:** Install mouthpiece (28) using new mouthpiece clamp (29). Install exhaust manifold (27). If the regulator free-flows and can't be stopped by turning the knob (20), check the intermediate pressure or replace the internal seals - seat assembly (12) and "O" ring (15). During the required annual inspection, the "O" ring (15) must be replaced.

|   |                           |                            |      |                  |
|---|---------------------------|----------------------------|------|------------------|
|  | PACER XLB<br>SECOND STAGE |                            | PAGE | REPAIR PROCEDURE |
|   | 9/93                      | Second Stage<br>Regulators | 2-27 |                  |

| #  | QTY | PART #  | KEY | DESCRIPTION              | #  | QTY | PART #  | KEY | DESCRIPTION                |
|----|-----|---------|-----|--------------------------|----|-----|---------|-----|----------------------------|
| 1  | 1   | 0210-29 |     | PURGE BUTTON ASSEMBLY    | 25 | 1   | 0181-90 |     | BUSHING                    |
| 2  | 1   | 0040-38 |     | PURGE BUTTON SPRING      | 26 | 1   | 0560-20 |     | KNOB                       |
| 3  | 1   | 0621-59 |     | TOP COVER BLACK XLP      | 27 | 1   | 0130-47 |     | SCREW                      |
|    | 1   | 0612-38 |     | TOP COVER GRAPHITE XLPG  | 28 | 1   | 0170-55 |     | LEVER (RIGHT MOUNT)        |
| 4  | 1   | 0120-60 |     | FRICTION WASHER          | 1  | 1   | 0170-58 |     | LEVER (LEFT MOUNT)         |
| 5  | 1   | 0050-09 |     | DIAPHRAGM ASSEMBLY       | 29 | 2   | 0240-10 |     | EXHAUST VALVE (ROUND)      |
| 6  | 1   | 0060-51 |     | O-RING                   | 1  | 1   | 0240-12 | ⊗   | EXHAUST VALVE (ELLIPTICAL) |
| 7  | 1   | 0228-30 |     | L.P. HOSE ASSEMBLY 29"   | 30 | 1   | 0512-25 |     | EXHAUST MANIFOLD           |
| 8  | 1   | 0060-02 | Ⓢ   | O-RING                   | 1  | 1   | 0513-29 |     | EXHAUST MANIFOLD (XLPG)    |
| 9  | 1   | 0180-85 |     | VALVE SEAT (SUB 0182-43) | 31 | 1   | 1115-00 |     | MOUTHPIECE BLACK           |
| 10 | 1   | 0150-29 |     | JAM NUT                  | 1  | 1   | 1117-00 |     | MOUTHPIECE CLEAR           |
| 11 | 1   | 0060-01 | Ⓢ   | O-RING                   | 32 | 1   | 0310-09 | Ⓢ   | CLAMP (WHITE)              |
| 12 | 1   | 0107-98 | Ⓢ   | SEAT ASSEMBLY            | 1  | 1   | 0310-04 | Ⓢ   | CLAMP (BLACK)              |
| 13 | 1   | 0040-72 |     | SPRING                   |    |     |         |     |                            |
| 14 | 1   | 0120-95 |     | WASHER                   |    |     |         |     |                            |
| 15 | 1   | 0060-61 | Ⓢ   | O-RING                   |    |     |         |     |                            |
| 16 | 1   | 0350-16 |     | SHAFT                    |    |     |         |     |                            |
| 17 | 1   | 0060-16 | Ⓢ   | O-RING                   |    |     |         |     |                            |
| 18 | 1   | 0181-92 |     | NUT, VALVE HOUSING       |    |     |         |     |                            |
| 19 | 1   | 0060-54 | Ⓢ   | O-RING                   |    |     |         |     |                            |
| 20 | 1   | 0215-53 |     | BOTTOM BOX- DUAL EXHAUST |    |     |         |     |                            |
| 21 | 2   | 0060-17 | Ⓢ   | O-RING                   |    |     |         |     |                            |
| 22 | 1   | 0030-95 |     | VALVE HOUSING            |    |     |         |     |                            |
| 23 | 1   | 0181-91 |     | BUSHING RETAINER         |    |     |         |     |                            |
| 24 | 1   | 0250-07 |     | SPRING CLIP              |    |     |         |     |                            |



PACER XLP & XLPG  
SECOND STAGE

9/93

Second Stage  
Regulators

PAGE

2-28

KEY

- Ⓢ Included in annual service kit #9680-03
- ⊗ Used on 1991 models only.

**PACER XLP & XLPG SECOND STAGE**

**Tools Needed:**

1. 0980-38 Tool Kit
2. 0980-39 Top Cover Removal Tool XLP
3. 0980-61 O-ring Tool Kit
4. 11/16" Open End Wrench

**Disassembly:**

**Step 1:** Remove hose (7) from second stage.

**Step 2:** Remove exhaust manifold (30) by pulling sharply on one end. No tools are required for removal. Exhaust valves (29) are now accessible and are removed by gently pulling free from bottom box assembly. Note: 1991 models used an elliptical valve.

**Step 3:** Remove mouthpiece (31) by removing mouthpiece clamp (32) and gently pulling free from mouthpiece sleeve. Have replacement clamps available because this piece has a one time use only and will be destroyed upon removal.

**Step 4:** Unscrew top cover (3) counter-clockwise using top cover removal tool. Remove friction washer (4). Low pressure diaphragm is now accessible.

**Step 5:** Remove purge button (1) and purge button spring (2) by squeezing legs of purge button slightly.

**Step 6:** Remove low pressure diaphragm (5).

**Step 7:** Loosen jam nut (10) with 11/16" wrench. Remove valve seat (9) by turning counter clockwise. "O" ring (11) is now accessible. CAUTION: Do not damage seat during this operation.

**Step 8:** Remove jam nut (10) from valve seat (9).

**Step 9:** Remove lever (28) as follows: Use multi-tool to depress seat assembly (12). The lever will now be loose. Remove lever by freeing one side at a time from the housing (22). Release multi-tool slowly because of the spring tension released by removal of the lever. Seat assembly (12) and spring (13) should now drop from housing. "O" ring (15) and washer (14) are available for inspection/replacement.

**Step 10:** Remove screw (27). Leave knob (26) on shaft (16). Turn knob clockwise until shaft falls from unit on hose connection side. "O" ring (17) is now available for

inspection/replacement. Knob is also free.

**Step 11:** Remove (XLP) bushing (25) from (XLP) bushing retainer (23) by turning counter clockwise with #2 hex wrench. "O" ring (21) is now accessible. Remove (XLP) bushing retainer (23) from bottom box (20).

**Step 12:** Remove spring clip (24).

**Step 13:** Remove (nut) valve housing (18) from housing (22). "O" ring (19) is now available for inspection.

**Step 14:** Remove housing (22) from bottom box (20). "O" ring (21) is now accessible.

**Assembly:**

**Step 1:** Install "O" ring (21) onto housing (22). Insert housing (22) into bottom box (20).

**Step 2:** Install "O" ring (19) onto housing (22). Install (nut) valve housing (18) onto housing (22) and tighten clockwise using 13/16" open end wrench.

**Step 3:** Install spring clip (24) onto housing (22). Exact location is not important at this time so long as clip does not cover the square holes or the air-flow port.

**Step 4:** Install (XLP) bushing retainer (23) into bottom box (20).

**Step 5:** Place "O" ring (17) into groove on shaft (16). Insert threaded end of shaft (16) through bottom box (20), into valve housing (22) and bushing retainer (23). Screw the shaft (16) clockwise into housing (22) until all of the threads on the shaft are inside the housing. Caution: Do not cross thread shaft into valve housing.

**Step 6:** Install "O" ring (21) onto (XLP) bushing (25). Install (XLP) bushing (25) over end of shaft (16) through bottom box (20) and into (XLP) bushing retainer (23). Tighten bushing (25) clockwise using #2 hex wrench.

**Step 7:** Install knob (26) and screw (27).

**Step 8:** Inspect and install exhaust valves (29). If valves are worn or damaged, replace them with new valve.

**Step 9:** Install spring (13) onto the seat assembly (12) followed by the washer (14) and "O" ring (15). This entire sub-assembly should now be inserted into the valve housing (22). Using the multi-tool or any

|                         |             |  |      |   |
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non-abrasive rod (pencil with eraser), push against the face of the seat and compress approximately 1/4". At the same time insert the lever (28) by opening the two "leg" and inserting the ends into the square holes in the side of the valve housing. Remove the compression tool and test the lever for proper engagement by compressing it a few times. Looking at the face of the black rubber seat you should see a movement of the whole seat carrier assembly when the lever is depressed. Push spring clip (24) all the way against the lever (28) and press on the end of the lever approximately 1/4". The spring clip (24) will move away from the lever slightly and will now be in the correct position. Reinstall "O" ring (11), jam nut (10), and valve seat (9). Do not tighten the nut at this time.

**Step 10:** Hold regulator at eye level focusing on the very top of the lever (28). With the free hand, turn the valve seat (9) clockwise until the lever starts descending. Stop turning and back off 1/4 turn. Tighten the jam nut (10). Install diaphragm (5), slip washer (4) and cover assembly (3).

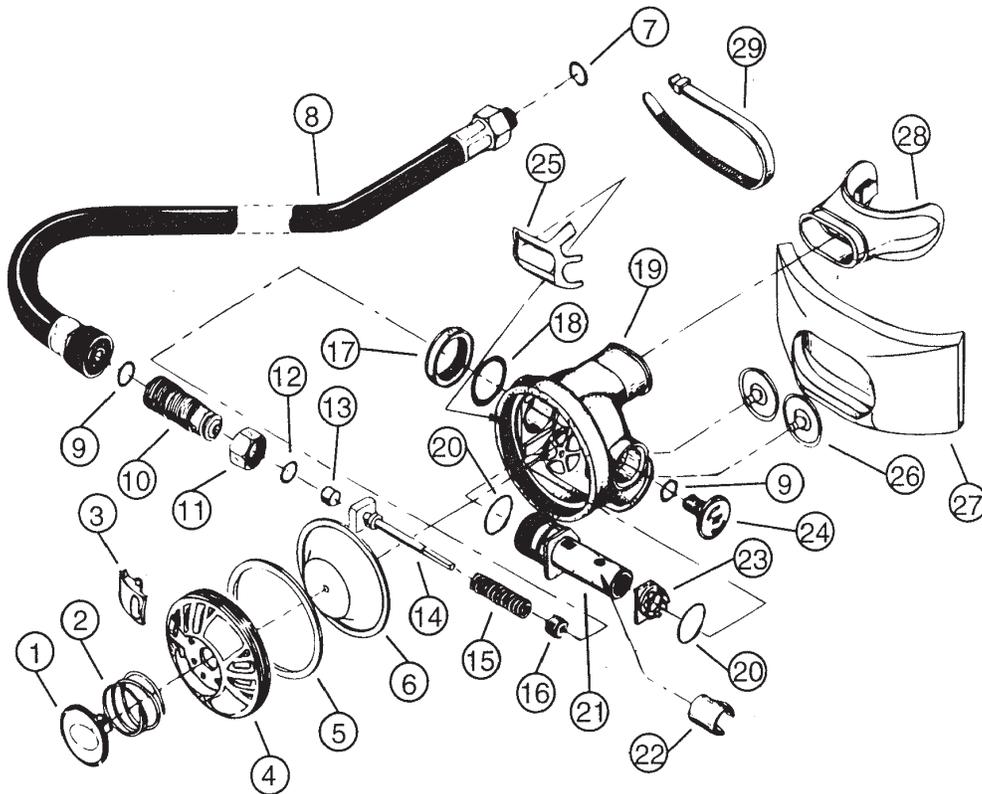
**Step 11:** Turn the adjusting knob counter clockwise until it stops, then turn 3 full turns back. Turn the air on and depress purge button (1). You should have a strong purge without any free-flow. If purge is too weak, loosen the jam nut (10) and turn the valve seat (9) counter clockwise approximately 1/8 turn at a time until a strong purge is accomplished. If free flow occurs, loosen jam nut and turn valve seat clockwise until free flow stops. Re-check for strong purge. Tighten the nut (10). Make final adjustment by turning the knob (26) clockwise for harder breathing or opposite for easier breathing as indicated on the face of the knob. For optimum performance at any depth the regulator should be adjusted to open between .7-1.0 inch/water and should not exceed the 1.5 inch/water inhalation effort at 10CFM. If the test equipment is not available adjust your regulator for desired effort without any free-flow after you enter the water to dive.

**Step 12:** Install mouthpiece (31) using a new mouthpiece clamp (32). Install exhaust manifold (30). If the regulator free-flows and can't be stopped by turning the knob (26) check the intermediate pressure or replace the internal seals - seat assembly (12) and "O" ring (15). During the required annual inspection, the "O" ring (15) must be replaced.

|   |                                  |                            |                  |                  |
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|  | PACER XLP & XLPG<br>SECOND STAGE |                            | PAGE<br><br>2-30 | REPAIR PROCEDURE |
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| #  | QTY | PART #  | KEY | DESCRIPTION                   | #  | QTY | PART #  | KEY | DESCRIPTION                 |
|----|-----|---------|-----|-------------------------------|----|-----|---------|-----|-----------------------------|
| 1  | 1   | 0213-52 |     | PURGE BUTTON (XP/XP AER)      | 19 | 1   | 0215-53 |     | BOTTOM BOX- DUAL EXHAUST    |
|    | 1   | 0217-02 |     | PURGE BUTTON (FORMULA)        | 20 | 2   | 0060-17 | ⓐ   | O-RING                      |
|    | 1   | 0218-82 |     | PURGE BUTTON (ICE)            | 21 | 1   | 0030-99 |     | VALVE HOUSING               |
| 2  | 1   | 0040-38 |     | SPRING                        | 22 | 1   | 0250-07 |     | BOOSTER CLIP                |
| 3  | 1   | 0612-08 |     | DEPRESSOR, TOP COVER          | 23 | 1   | 0612-09 |     | SNAP IN BUSHING             |
| 4  | 1   | 0612-07 |     | TOP COVER (XP/ XP AER)        | 24 | 1   | 0410-35 |     | BUSHING PLUG (SEE NOTE)     |
|    | 1   | 0612-59 |     | TOP COVER (FORMULA)           | 25 | 1   | 0170-55 |     | LEVER (RIGHT) (SUB 0170-91) |
|    | 1   | 0612-44 |     | TOP COVER (ICE)               |    | 1   | 0170-58 |     | LEVER (LEFT MOUNT)          |
| 5  | 1   | 0120-60 |     | FRICTION WASHER               | 26 | 2   | 0240-10 |     | EXHAUST VALVE (ROUND)       |
| 6  | 1   | 0050-09 |     | DIAPHRAGM ASSEMBLY            |    | 1   | 0240-12 |     | EXHAUST VALVE (ELLIPTICAL)  |
| 7  | 1   | 0060-51 | ⓐ   | O-RING                        | 27 | 1   | 0512-25 |     | EXHAUST MANIFOLD            |
| 8  | 1   | 0228-30 |     | 1/2" L.P. HOSE 29" W/O-RINGS  | 28 | 1   | 1117-00 |     | MOUTHPIECE (CLEAR)          |
|    | 1   | 0228-31 |     | 1/2" L.P. HOSE 39" W/ O-RINGS | 29 | 1   | 0310-09 | ⓐ   | CLAMP                       |
| 9  | 1   | 0060-02 | ⓐ   | O-RING                        |    |     |         |     |                             |
| 10 | 1   | 0182-43 |     | VALVE SEAT (CONE)             |    |     |         |     |                             |
| 11 | 1   | 0150-29 |     | JAM NUT                       |    |     |         |     |                             |
| 12 | 1   | 0060-01 | ⓐ   | O-RING                        |    |     |         |     |                             |
| 13 | 1   | 0070-01 | ⓐ   | L.P. SEAT                     |    |     |         |     |                             |
| 14 | 1   | 0181-23 |     | SEAT CARRIER                  |    |     |         |     |                             |
|    | 1   | 0180-01 | ⓐ   | SEAT CARRIER (ICE/XP AER)     |    |     |         |     |                             |
| 15 | 1   | 0040-16 |     | SPRING                        |    |     |         |     |                             |
|    | 1   | 0040-01 | ⓐ   | SPRING (ICE/XP AER)           |    |     |         |     |                             |
| 16 | 1   | 0200-12 |     | ADJUSTING SCREW               |    |     |         |     |                             |
| 17 | 1   | 0181-92 |     | NUT, VALVE HOUSING            |    |     |         |     |                             |
| 18 | 1   | 0060-54 | ⓐ   | O-RING                        |    |     |         |     |                             |

NOTE: Tighten bushing plug (24) by hand using #2 hex wrench. Do not overtighten or use any other tools.



FORMULA/XP/ICE/DRY ICE  
SECOND STAGE

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Second Stage  
Regulators

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KEY

- ⓐ Included in annual service kit #9680-02
- ⓑ Teflon coated, use on XP octo, & AER units.

**PACER FORMULA / XP / ICE / DRY ICE SECOND STAGE**

**Tools Needed:**

1. 0980-11 Multi-Tool
2. 0980-45 XP Top Cover Tool
3. 0980-29 #2 Hex Wrench
4. 0980-61 O-ring Tool Kit
5. 11/16" Wrench
6. 13/16" Wrench
7. 1/8" Flatblade Screwdriver

**Disassembly:**

**Step 1:** Remove hose (8) from second stage.

**Step 2:** Remove exhaust manifold (27) by pulling sharply on one end. No tools are required for removal. Exhaust valves (26) are now accessible and can be removed by gently pulling free from bottom box assembly. NOTE: 1991 models used a single elliptical exhaust valve.

**Step 3:** Remove mouthpiece (28) by removing mouthpiece clamp (29) and gently pulling mouthpiece free from mouthpiece sleeve. Have replacement clamps available because this piece has a one-time use only and will be destroyed when removed.

**Step 4:** Unscrew top cover (4) counter clockwise using top cover removal tool. Remove friction washer (5). Low pressure diaphragm is now accessible.

**Step 5:** Remove purge button (1) and purge button spring (2) by squeezing legs of purge button slightly. If purge button depressor (3) must be changed, slide forward until free and remove.

**Step 6:** Remove low pressure diaphragm (6).

**Step 7:** Loosen jam nut (11) with 11/16" wrench. Remove valve seat (10) by turning counter clockwise. "O" ring (12) is now accessible. CAUTION: Do not damage seat during this operation.

**Step 8:** Remove jam nut (11) from valve seat (10).

**Step 9:** Remove Venturamatic lever (25), valve seat carrier (14), and valve seat carrier spring (15) as follows: Use multi-tool to depress seat assembly. The lever will now be loose. Remove lever by freeing one side at a time from the housing (21). Release multi-tool slowly because of the spring tension released by removal of the

lever.

**Step 10:** Remove adjusting crown (16) prior to removing valve seat carrier. Turn the carrier counter clockwise until the adjusting crown carrier and carrier spring fall free from the outside end of the valve housing chamber. Be sure the square shaft end of the carrier is firmly in the square hole of the adjusting crown during the operation. Low pressure seat (13) (black disc in valve seat carrier) is now accessible.

**Step 11:** Remove spring clip (22).

**Step 12:** Remove valve housing nut (17) from bottom box (19) using 13/16" wrench. "O" ring (18) is now accessible for inspection.

**Step 13:** Remove valve housing (21) from bottom box (19). "O" ring (20) is now accessible.

**Assembly:**

**Step 1:** Install "O" ring (20) onto valve housing (21). Insert housing (21) into bottom box (19).

**Step 2:** Install "O" ring (18) onto housing (21). Install valve housing nut (17) onto housing (21) and tighten clockwise using 13/16" open end wrench.

**Step 3:** Install "O" ring (20) onto snap-in bushing (23). Install snap-in bushing into bottom box.

**Step 4:** Inspect and install exhaust valve(s) (26). If valves are worn or damaged, replace with new valve(s).

**Step 5:** Install low pressure seat (13) in valve seat carrier, flat side out, indented side in.

**Step 6:** Install adjusting crown (16) valve seat carrier (14) and valve seat carrier spring (15) as follows: Place spring on valve seat carrier (14). Place adjusting crown (16) on square end of carrier and insert entire assembly, adjusting crown first, into carrier chamber. Using multi-tool, turn assembly clockwise until adjusting crown bottoms. Do not force assembly past this point. For preliminary adjustment, turn assembly adjusting crown counter clockwise 3-1/2 turns. This will minimize or eliminate further adjustment when assembly is complete.

**Step 7:** Install Venturamatic lever (25) as follows: Hold the bottom box assembly in the palm of the left hand, grasping the crossbar of the multi-tool with the index and middle finger. Squeeze the bottom box and the multi-tool together as far as it will go. About 3/8" of the

|                         |             |  |      |   |
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carrier shaft will protrude beyond the adjustment crown at this point. With the right hand insert the ends of the lever one at a time into the square holes on the side of the carrier chamber. Release the tool. Lever will now be in an up position.

**Step 8:** Install jam nut (11) on valve seat carefully to avoid damage to the cone area. Unthreaded portion of nut should face the larger shoulder of the valve seat. Install "O" ring (12) onto valve seat. Install valve seat (10) using care to avoid damaging the cone area. Hold regulator at eye level focusing on the very top of the lever (25). With the free hand, turn the valve seat (10) clockwise until the lever starts descending. Stop turning and back-off 1/4 turn. Tighten jam nut (11).

**Step 9:** Install Venturamatic booster clip (22) placing open end of clip on valve seat carrier body (21) and pushing down until it snaps into place. Slide clip toward valve seat side of carrier body until clip touches the Venturamatic lever (25). Depress lever completely. This will position clip correctly.

**Step 10:** Install diaphragm (6), friction washer (5) and top cover assembly (4).

**Step 11:** Turn the air on and depress purge button (1). You should have a strong purge without any free flow. If purge is too weak, loosen the jam nut (11) and turn the valve seat (10) counter clockwise approximately 1/8 turn at a time until a strong purge is accomplished. Tighten the nut (11) and make final adjustment by inserting a 1/8" flat blade screwdriver through the snap-in bushing (20) opening and turning the adjusting screw (16) clockwise for harder breathing or opposite for easier breathing. For optimum performance at any depth the regulator should be adjusted to open between .7 - 1.0 inch/water and should not exceed the 1.5 inch/water inhalation effort at 10CFM. If the test equipment is not available, adjust your regulator for desired effort without any free-flow after you enter the water to dive.

**Step 12:** Install "O" ring (9) onto bushing plug (24). Install bushing plug into bottom box and into snap-in bushing (23). Tighten bushing plug clockwise using #2 hex wrench. CAUTION: When tightening bushing plug use the #2 hex wrench and tighten slightly by hand until plug bottoms out on bottom box. Do not over tighten or use any other tools.

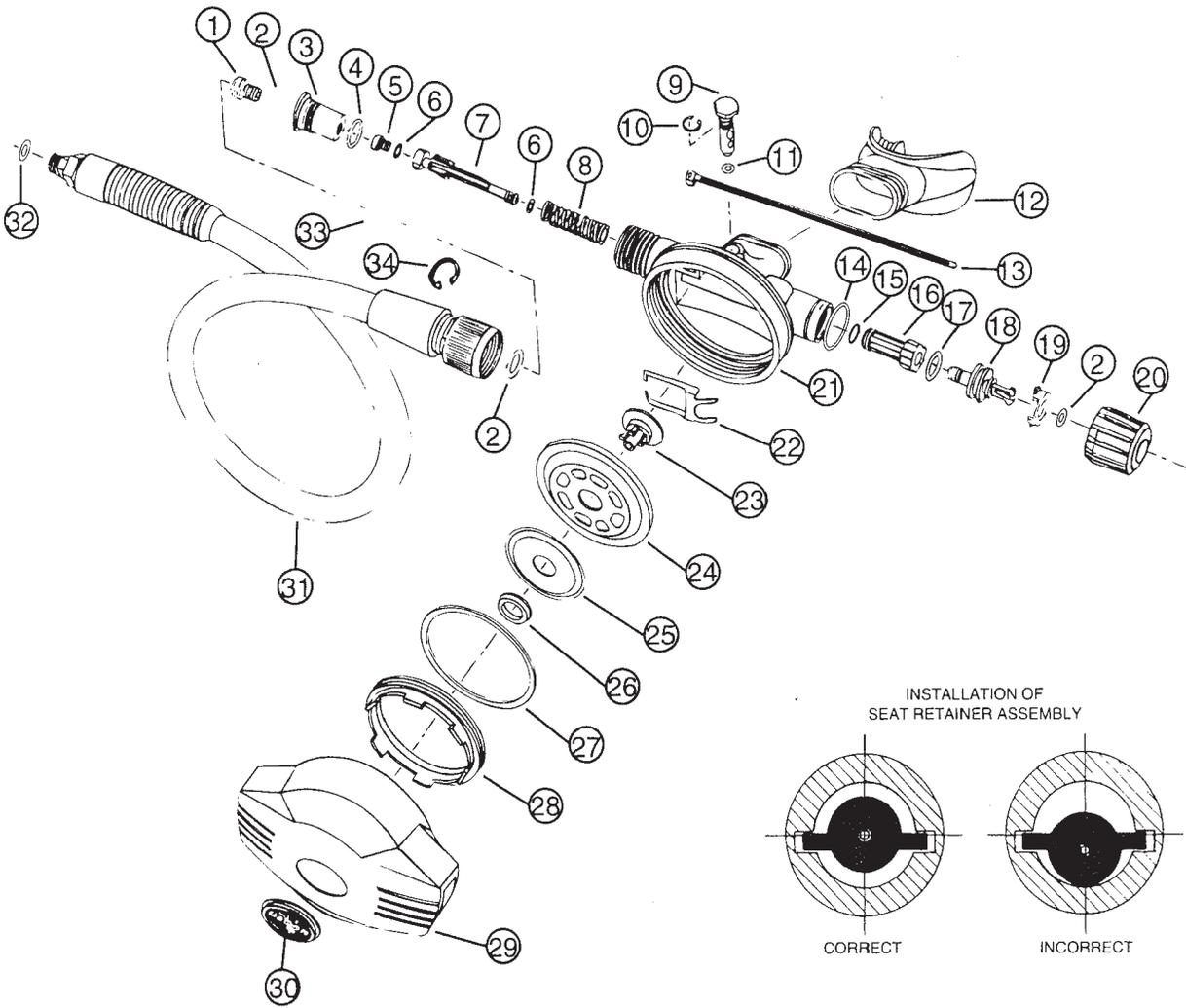
**Step 13:** Install mouthpiece (28) using new mouthpiece clamp (29). Install exhaust manifold (27). NOTE: This regulator is a downstream valve and will relieve pressure if the intermediate pressure from the first stage

increases beyond a certain limit. It will also relieve pressure if any of the internal seals are damaged. If the regulator free flows and can't be stopped by turning the adjusting screw (16), check the intermediate pressure or replace the internal seals, valve seat assembly (13), and "O" ring (12) during the required annual inspection.

|   |  |                            |      |                  |
|---|--|----------------------------|------|------------------|
|  | FORMULA/XP/ICE/DRY ICE<br>SECOND STAGE |                            | PAGE | REPAIR PROCEDURE |
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| #  | QTY | PART #  | KEY | DESCRIPTION              |
|----|-----|---------|-----|--------------------------|
| 1  | 1   | 0182-87 |     | VALVE SEAT               |
| 2  | 3   | 0060-02 | ⓪   | O-RING                   |
| 3  | 1   | 0182-88 |     | ADAPTOR, VALVE SEAT      |
| 4  | 1   | 0060-22 | ⓪   | O-RING                   |
| 5  | 1   | 0226-01 | ⓪   | L.P. SEAT                |
| 6  | 2   | 0060-61 | ⓪   | O-RING                   |
| 7  | 1   | 0624-97 |     | SEAT CARRIER             |
| 8  | 1   | 0040-77 |     | SPRING, PNEUMATIC        |
| 9  | 1   | 0624-98 |     | FLOW TUBE, ADJUSTABLE    |
|    | 1   | 0625-78 |     | FLOW TUBE, NON-ADJ. OCTO |
| 10 | 1   | 0250-22 | ⓪   | RETAINING RING           |
| 11 | 1   | 0060-16 | ⓪   | O-RING                   |
| 12 | 1   | 0300-67 |     | MOUTHPIECE               |
| 13 | 1   | 0310-11 | ⓪   | CLAMP                    |
| 14 | 1   | 0061-11 | ⓪   | O-RING                   |
| 15 | 1   | 0061-02 | ⓪   | O-RING                   |
| 16 | 1   | 0626-81 |     | BALANCE CHAMBER          |
| 17 | 1   | 0060-96 | ⓪   | O-RING                   |
| 18 | 1   | 0624-95 |     | SHAFT, ADJUSTING         |
| 19 | 1   | 0625-61 | ⓪   | CLIP, RETAINER           |
| 20 | 1   | 0624-99 |     | KNOB                     |
| 21 | 1   | 0614-59 |     | BOTTOM BOX               |
| 22 | 1   | 0170-91 |     | LEVER S.S.               |
| 23 | 1   | 0624-91 |     | CORE, DIAPHRAGM          |
| 24 | 1   | 0050-18 |     | DIAPHRAGM ASSM.          |

| #  | QTY | PART #  | KEY | DESCRIPTION                 |
|----|-----|---------|-----|-----------------------------|
| 25 | 1   | 0240-14 |     | EXHAUST VALVE               |
| 26 | 1   | 0624-92 |     | RETAINER, DIAPHRAGM CORE    |
| 27 | 1   | 0120-98 |     | FRICION WASHER              |
| 28 | 1   | 0624-93 |     | RETAINER, DIAPHRAGM         |
| 29 | 1   | 0513-65 |     | TOP COVER, EXTREME BLACK    |
|    | 1   | 0514-15 |     | TOP COVER, EXTREME NEON     |
| 30 | 1   | 0232-25 |     | DECAL/INSERT ASSM BLACK     |
|    | 1   | 0232-26 |     | DECAL/INSERT ASSM BLUE      |
| 31 | 1   | 0229-39 |     | HOSE ASSM. 29" IN-LINE ADJ. |
|    | 1   | 0229-40 |     | HOSE ASSM. 39" IN-LINE ADJ. |
| 32 | 1   | 0060-51 |     | O-RING                      |
| 33 | 1   | 0121-02 |     | FRICION WASHER              |
| 34 | 1   | 0250-24 |     | RETAINING RING, L.P. HOSE   |



EXTREME/EXTREME PLUS  
SECOND STAGE

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Second Stage  
Regulators

PAGE

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KEY

⓪ Included in annual service kit #9680-22

**EXTREME / EXTREME PLUS SECOND STAGE**

**Custom Tools Supplied by Dacor:**

1. 0980-20 Cone Adjusting Tool
2. 0980-54 In-Line Adjusting Tool
3. 0980-61 O-Ring Removal Tool
4. 0624-93 Diaphragm Retaining Ring
5. 9508-00 Polishing Stick

**Standard Tools Needed:**

1. Small Needle-Nose Pliers
2. Diagonal Cutters
3. 5/8" Open-End Wrench
4. Narrow-Blade Screwdriver
5. 1/4" Diameter Wood or Plastic Dowel (a 3" minimum length is required)

**Disassembly:**

**Step 1:** The disassembly process starts the same way for all models (note that the second stage is the same for both the Extreme and Extreme Plus). Remove the hose from the second stage using the 5/8" open-ended wrench. Remove the two o-rings from the hose. Remove the plastic washer (33) from the hose coupling. (early models did not have this washer, but it may be added).

**Step 2:** Peel off the flexible cover, and then remove the mouthpiece by cutting off the clamp with the small diagonal cutter, taking care to prevent damage to the mouthpiece. Then use the inverted diaphragm retainer as a tool to remove the diaphragm retainer (28).

**Step 3:** Next, remove the friction washer (27), diaphragm assembly and lever (22). To remove the lever, spread the engagement legs of the lever with your thumb and forefinger. Be careful not to over bend the lever. Inspect the lever for deformation.

**Step 4:** Remove the valve seat adaptor (3) by inserting a narrow blade screwdriver into the slot located on the main body and wedging the valve seat adaptor out. The valve seat (1) is now accessible. Remove it by using the cone adjusting tool. Turn the tool counter-clockwise until the threads disengage. The valve seat now can be pushed out of the adaptor with the 1/4" diameter dowel. Be careful to not damage the seat. Remove the o-rings from the adaptor and valve seat.

**Step 5:** Remove the seat carrier (7) and spring (8) Use a 1/16" Allen wrench to remove the seat (5) from the carrier. Then remove the o-rings (6) from the seat carrier and seat. Note how small the seat is in

comparison with other models.

**Step 6:** Remove the small retaining ring (10) from the flow tube (9) using the small needle-nose pliers. Push on the ends of the ring with the tips of the pliers. The flow tube can now be pulled out of the body. Remove the flow tube's o-ring (11).

**Step 7:** The Extreme has an adjustment knob (20) that should be removed using the needle-nose pliers. Squeeze the two plastic retainers together that are located within the knob's center. Remove the knob/body o-ring (14) from the body (not on 1992 models, but can be retrofitted).

**Step 8:** Remove the o-ring (2) and internal retaining clip (19) with a thin blade screwdriver. Insert the blade into one of the slots located on the body and push on the clip until the center of the clip bows out. Do not try to pry, you will damage the body. Insert the blade in the gap that now exists between the center of the clip and the body. As you wedge the clip out, don't worry if it gets damaged. It will be replaced.

**Step 9:** Remove the adjusting shaft (18) and the balance chamber (16). On the Extreme, pull on the shaft with your fingers to remove the parts.

**Step 10:** Separate the shaft and the balance chamber by turning the shaft clockwise. *Note: these are left handed threads.* Remove the shaft o-ring (17) and balance chamber o-ring. (Balance chamber o-ring is not on 1992 models. A new balance chamber and o-ring can be retrofitted). Be careful not to scratch or gouge the o-ring surface. Disassembly of the second stage is now complete.

**Cleaning:**

**Step 1:** Cleaning is the same as for the first stage parts. All metal parts should be cleaned using a solution made of 1 gallon of white vinegar (5% acid content) and a quart of any general purpose household cleaner. Soak parts no longer than 15 minutes or 5 minutes, if using an ultrasonic cleaner. All plastic and rubber items should be cleaned with fresh water only. Air dry all parts with an air gun, if possible.

**Step 2:** Replace all o-rings, the seat and the plastic and metal retaining clips. These parts are provided in the annual service kit. Do not re-use the old parts.

**Step 3:** Visually inspect the diaphragm-exhaust valve

|                         |             |   |      |   |
|-------------------------|-------------|---|------|---|
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assembly. Disassembly of these parts is not required unless they are damaged, in which case they should be replaced.

**Step 4:** Inspect the top surface of the valve seat's sealing area for nicks or scratches. Take care not to damage this delicate part. If scratches are present, they can be removed by polishing the cone surface with a polishing stick in a circular motion. Cleaning and inspection is now complete.

**Assembly:**

**Step 1:** Now you are ready to re-assemble the second stage. Install a new knob/body o-ring (14). Install the new large o-ring (17) onto the adjusting shaft (18). Thread the balance chamber (16) onto the shaft by turning the shaft counter-clockwise, using just light hand pressure, until the assembly is fully threaded. Install o-ring (15) on to balance chamber (if equipped).

**Step 2:** Insert the shaft and balance chamber assembly into the proper side of the body. A slight twisting action will ease the installation. Apply light pressure and twist until the assembly fully seats itself. The large flat surface of the shaft should be below the level of the retaining clip slots when the unit is properly seated.

**Step 3:** Install a new plastic retaining clip (19). Engage one of the clip's legs into its slot within the body. Flex and push the other leg into its slot, while holding the pre-installed end in position with your fingers, using light pressure. The ring will bow-out during installation, but should be pushed in flat when properly installed.

**Step 4:** Install the new small o-ring (2) onto the adjusting shaft. Then re-install the adjusting knob (20) onto the shaft, using light hand pressure to snap it in place. To avoid breakage, be sure the retaining tabs line up with the slot.

**Step 5:** Install the new o-ring (11) onto the flow tube. Insert the flow tube into the body. Ensure that the flow tube's end has fully engaged into the opening in the air chamber of the body. Lock the flow tube in place by installing the retaining ring (10), using the needle-nose pliers.

**Step 6:** Install the new seat (5), with its o-ring (6) into the seat carrier (7). Start threading by hand and lightly snug-up with the 1/16 " Allen wrench. Install the new o-ring (6) on the end of the seat carrier assembly.

**Step 7:** The next step can be tricky, so take particular care. Insert the spring and seat carrier assembly into the body's air chamber, following the diagram. Note the off-center "ears" on the front sides of the seat carrier. The seat carrier will go into the air chamber in any direction, but it must only be installed with the off center "ears" on the carrier matching the off center slots within the body's air chamber. When properly installed the seat face will be centered.

**Step 8:** Install the new o-rings on the valve seat (1) and valve adaptor (3). Using the cone adjusting tool, thread the valve seat into the adaptor until the cone surface is fully visible with about 1/2 thread exposed. Insert the assembly into the body's air chamber, using hand pressure only. If lubrication is necessary, wet the o-ring with water. Do not use silicone for this application. The two flats should align between the guides on the main body.

**Step 9:** Reinstall the plastic washer (33) onto the hose coupling and install the new hose o-rings. Install the in-line adjusting hose on the body, and tighten to 45-50 in. lbs. with an 5/8" crows foot on a torque wrench. Slide back the hose protector and remove the retaining ring (34). Early models did not have an in-line adjusting hose. In this case, install the regulator hose onto an in-line adjusting tool and tighten securely.

**Step 10:** Install the lever (22) into the assembly. Spread the legs apart and push the lever down. Ensure that it has properly engaged the seat carrier by manually testing for spring resistance. If the lever does not engage, turn the cone in clockwise until it does.

**Step 11:** Turn the knob counter-clockwise until it stops (do not over tighten) and turn the knob back clockwise 2-1/2 turns. Slowly introduce 140 PSI to the second stage. Engage the adjustment portion of the in-line adjusting hose (or tool). Turn counter-clockwise until the lever reaches its maximum height. Now turn the adjustment clockwise until a slight downward movement of the lever occurs. There should be some amount of play in the lever, but as little as possible.

**Step 12:** Now, install the diaphragm-exhaust valve assembly, the friction washer (27) and the diaphragm retainer (28). Using an inverted retainer, hand-tighten the diaphragm retainer until it's snug.

**Adjustment:**

To check the inhalation effort of the second stage, a test board with a manometer is preferred. If no test board is

|   |                                      |                            |      |                  |
|---|--------------------------------------|----------------------------|------|------------------|
|  | EXTREME/EXTREME PLUS<br>SECOND-STAGE |                            | PAGE | REPAIR PROCEDURE |
|   | 9/93                                 | Second Stage<br>Regulators | 2-36 |                  |

available, use a tray of water and lower the second stage, diaphragm down, into the water to the appropriate depth.

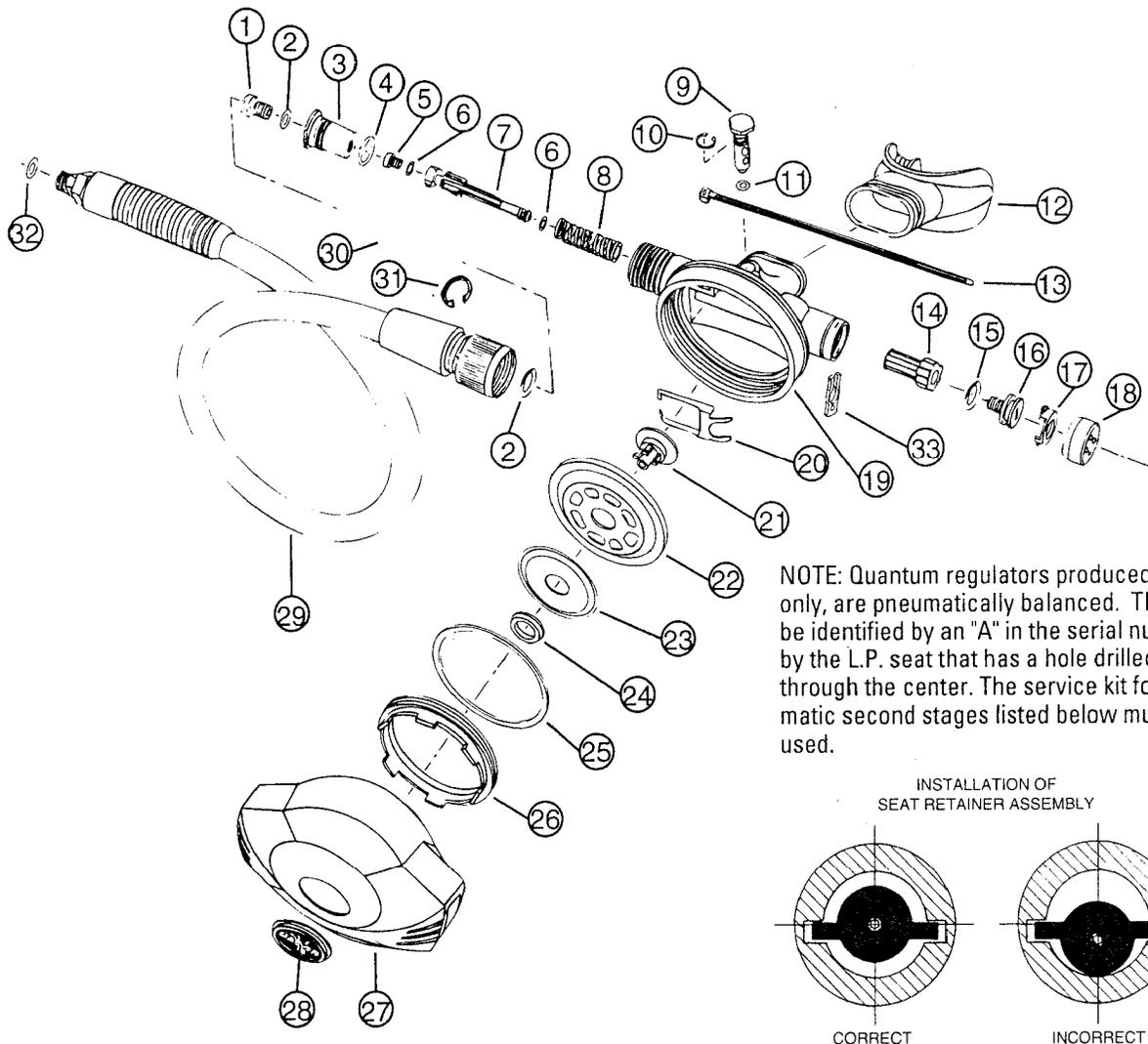
**Step 1:** Turn the knob clockwise until an initial opening effort of 1.0-1.1" of water is achieved. Remove supply pressure from second stage.

**Step 2:** Then, re-install the retaining ring (34) on the in-line adjusting hose or detach the in-line adjustment tool and connect the hose directly onto the second stage. Tighten the hose with the 5/8" wrench to a torque specification of 45-50 inch pounds.

**Step 3:** Finally, replace the flexible cover and the mouthpiece with a new clamp. Service of the second stage is now complete.

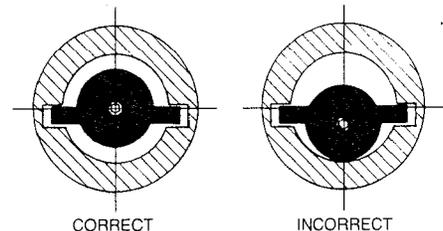
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| <b>REPAIR PROCEDURE</b> | <b>PAGE</b> | <b>EXTREME/EXTREMEPLUS<br/>SECOND STAGE</b> |      |  |
|                         | 2-37        | Second Stage<br>Regulators                  | 9/93 |   |

| #  | QTY | PART #  | KEY | DESCRIPTION              | #  | QTY | PART #  | KEY | DESCRIPTION                 |
|----|-----|---------|-----|--------------------------|----|-----|---------|-----|-----------------------------|
| 1  | 1   | 0182-87 |     | VALVE SEAT               | 25 | 1   | 0120-98 |     | WASHER                      |
| 2  | 2   | 0060-02 | ①   | O-RING                   | 26 | 1   | 0624-93 |     | RETAINER, DIAPHRAGM         |
| 3  | 1   | 0182-88 |     | ADAPTOR- VALVE SEAT      | 27 | 1   | 0513-94 |     | TOP COVER, QUANT. BLACK     |
| 4  | 1   | 0060-22 | ①   | O-RING                   | 1  | 1   | 0513-95 |     | TOP COVER, QUANT. YELLOW    |
| 5  | 1   | 0226-01 | ①   | L.P. SEAT                | 28 | 1   | 0232-26 |     | DECAL/INSERT ASSM BLUE      |
| 6  | 2   | 0060-61 | ①   | O-RING                   | 1  | 1   | 0232-25 |     | DECAL/INSERT ASSM. BLACK    |
| 7  | 1   | 0624-97 |     | SEAT CARRIER             | 29 | 1   | 0229-39 |     | HOSE ASSM. 29" IN-LINE ADJ. |
| 8  | 1   | 0040-77 |     | SPRING                   | 1  | 1   | 0229-40 |     | HOSE ASSM. 39" IN-LINE ADJ. |
| 9  | 1   | 0624-98 |     | FLOW TUBE                | 30 | 1   | 0121-02 |     | FRICTION WASHER             |
| 10 | 1   | 0625-78 |     | FLOW TUBE NON-ADJUSTABLE | 31 | 1   | 0250-24 |     | RETAINING RING L.P. HOSE    |
| 11 | 1   | 0250-22 | ①   | RETAINING RING           | 32 | 1   | 0060-51 |     | O-RING                      |
| 12 | 1   | 0060-95 |     | O-RING                   | 33 | 1   | 0628-02 | ②   | RETAINING CLIP              |
| 13 | 1   | 0300-67 |     | MOUTHPIECE               |    |     |         |     |                             |
| 14 | 1   | 0310-11 | ①   | CLAMP                    |    |     |         |     |                             |
| 15 | 1   | 0624-96 |     | BALANCE CHAMBER          |    |     |         |     |                             |
| 16 | 1   | 0060-96 | ①   | O-RING                   |    |     |         |     |                             |
| 17 | 1   | 0625-05 |     | SHAFT                    |    |     |         |     |                             |
| 18 | 1   | 0625-61 | ①②  | CLIP, RETAINER           |    |     |         |     |                             |
| 19 | 1   | 0625-04 |     | CAP                      |    |     |         |     |                             |
| 20 | 1   | 0612-80 |     | BOTTOM BOX               |    |     |         |     |                             |
| 21 | 1   | 0170-91 |     | LEVER S.S.               |    |     |         |     |                             |
| 22 | 1   | 0624-91 |     | CORE, DIAPHRAGM          |    |     |         |     |                             |
| 23 | 1   | 0050-18 |     | DIAPHRAGM ASSEMBLY       |    |     |         |     |                             |
| 24 | 1   | 0240-14 |     | EXHAUST VALVE            |    |     |         |     |                             |
| 25 | 1   | 0624-92 |     | RETAINER, DIAPHRAGM CORE |    |     |         |     |                             |



NOTE: Quantum regulators produced in 1992 only, are pneumatically balanced. They can be identified by an "A" in the serial number or by the L.P. seat that has a hole drilled through the center. The service kit for pneumatic second stages listed below must be used.

INSTALLATION OF SEAT RETAINER ASSEMBLY



1992 QUANTUM PNEUMATIC SECOND STAGE

9/93

Second Stage Regulators

PAGE

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KEY

① Included in annual service kit #9680-22  
 ② 0628-02 Clip retainer (33) replaces 0625-61 retainer, clip (17).

**1992 QUANTUM PNEUMATIC SECOND STAGE**

**Custom Tools Supplied by Dacor:**

1. 0980-20 Cone Adjusting Tool
2. 0980-54 In-Line Adjusting Tool
3. 0980-61 O-Ring Removal Tool
4. 0624-93 Diaphragm Retaining Ring
5. 9508-00 Polishing Stick

**Standard Tools Needed:**

1. Small Needle-Nose Pliers
2. Diagonal Cutters
3. 5/8" Open-End Wrench
4. Narrow-Blade Screwdriver
5. 1/4" Diameter Wood or Plastic Dowel (a 3" minimum length is required)

**Disassembly:**

**Step 1:** The disassembly process starts the same way for all models. Remove the hose from the second stage using the 5/8" open-ended wrench. Remove the two o-rings from the hose. Remove the plastic washer (30) from the hose coupling. (early models did not have this washer, but it may be added).

**Step 2:** Peel off the flexible cover, and then remove the mouthpiece by cutting off the clamp with the small diagonal cutter, taking care to prevent damage to the mouthpiece. Then use the inverted diaphragm retainer as a tool to remove the diaphragm retainer (26).

**Step 3:** Next, remove the friction washer (25), diaphragm assembly and lever (20). To remove the lever, spread the engagement legs of the lever with your thumb and forefinger. Be careful not to over bend the lever. Inspect the lever for deformation.

**Step 4:** Remove the valve seat adaptor (3) by inserting a narrow blade screwdriver into the slot located on the main body and wedging the valve seat adaptor out. The valve seat (1) is now accessible. Remove it by using the cone adjusting tool. Turn the tool counter-clockwise until the threads disengage. The valve seat can now be pushed out of the adaptor with the 1/4" diameter dowel. Be careful not to damage the seat. Remove the o-rings from the adaptor and valve seat.

**Step 5:** Remove the seat carrier (7) and spring (8). Use a 1/16" allen wrench to remove the seat (5) from the carrier. Then remove the o-rings (6) from the seat carrier and seat. Note how small the seat is in comparison with other models.

**Step 6:** Remove the small retaining ring (10) from the flow tube (9) using the small needle-nose pliers. Push on the ends of the ring with the tips of the pliers. The flow tube can now be pulled out of the body. Remove the flow tube's o-ring (11).

**Step 7:** Remove the end cap (18) and internal retaining clip (17) with a thin blade screwdriver. Insert the blade into one of the slots located on the body and push on the clip until the center of the clip bows out. Do not try to pry, you will damage the body. Insert the blade in the gap that now exists between the center of the clip and the body. As you wedge the clip out, don't worry if it gets damaged. It will be replaced. If the regulator is using a new style clip (33), it can be pushed out with a screwdriver and re-used.

**Step 8:** Remove the adjusting screw (16) and the balance chamber (14) with 3" wooden dowel.

**Step 9:** Separate the screw and the balance chamber by turning the screw clockwise. *Note these are left handed threads.* Remove the screw o-ring (15). Be careful not to scratch or gouge the o-ring surface. Disassembly of the second stage is now complete.

**Cleaning:**

**Step 1:** Cleaning is the same as for the first stage parts. All metal parts should be cleaned using a solution made of 1 gallon of white vinegar (5% acid content) and a quart of any general purpose household cleaner. Soak parts no longer than 15 minutes or 5 minutes, if using an ultrasonic cleaner. All plastic and rubber items should be cleaned with fresh water only. Air dry all parts with an air gun, if possible.

**Step 2:** Replace all o-rings, the seat and the plastic and metal retaining clips. These parts are provided in the annual service kit. Do not re-use the old parts.

**Step 3:** Visually inspect the diaphragm-exhaust valve assembly. Disassembly of these parts is not required unless they are damaged, in which case they should be replaced.

**Step 4:** Inspect the top surface of the valve seat's sealing area (cone) for nicks or scratches. Take care not to damage this delicate part. If scratches are present, they can be removed by polishing the cone surface with a polishing stick in a circular motion. Cleaning and inspection is now complete.

**Assembly:**

|                         |             |  |      |   |
|-------------------------|-------------|--|------|---|
| <b>REPAIR PROCEDURE</b> | <b>PAGE</b> | <b>1992 QUANTUM PNEUMATIC SECOND STAGE</b> |      |  |
|                         | 2-39        | Second Stage Regulators                    | 9/93 |   |

**Step 1:** Now you are ready to re-assemble the second stage. Install the new large o-ring (15) onto the adjusting screw (16). Thread the balance chamber (14) onto the screw by turning the shaft counter-clockwise, using just light hand pressure, until the assembly is fully threaded.

**Step 2:** Insert the screw and adjusting chamber assembly into the proper side of the body. A slight twisting action will ease the installation. Apply light pressure and twist until the assembly fully seats itself. The large flat surface of the screw should be below the level of the retaining clip slots when the unit is properly seated.

**Step 3:** Install a new plastic retaining clip (33). NOTE: Retaining clip (33) should be used to replace retaining clip (17). The clip should be carefully pushed through both slots and engage on the outside of the tube to retain it in place.

**Step 4:** Install the new o-ring (11) onto the flow tube. Insert the flow tube into the body. Ensure that the flow tube's end has fully engaged into the opening in the air chamber of the body. Lock the flow tube in place by installing the retaining ring (10), using the needle-nose pliers.

**Step 5:** Install the new seat (5), with its o-ring (6) into the seat carrier (7). Start threading by hand and lightly snug-up with the 1/16 " Allen wrench. Install the new o-ring (6) on the end of the seat carrier assembly.

**Step 6:** The next step can be tricky, so take particular care. Insert the spring and seat carrier assembly into the body's air chamber, following the diagram. Note the off-center "ears" on the front sides of the seat carrier. The seat carrier will go into the air chamber in any direction, but it must only be installed with the off center "ears" on the carrier matching the off center slots within the body's air chamber. When properly installed the seat face will be centered.

**Step 7:** Install the new o-rings on the valve seat (1) and valve adaptor (3). Using the cone adjusting tool, thread the valve seat into the adaptor until the cone surface is fully visible with about 1/2 thread exposed. Insert the assembly into the body's air chamber, using hand pressure only. If lubrication is necessary, wet the o-ring with water. Do not use silicone for this application. The two flats should align between the guides on the main body.

**Step 8:** Reinstall the plastic washer (30) onto the hose coupling and install the new hose o-rings. Install the in-line adjusting hose on the body, and tighten to 45-50 in. lbs. with an 11/16" crows foot on a torque wrench. Slide back the hose protector and remove the retaining ring (31). Early models did not have an in-line adjusting hose. In this case, install the regulator hose onto an in-line adjusting tool and tighten securely.

**Step 9:** Install the lever (20) into the assembly. Spread the legs apart and push the lever down. Ensure that it has properly engaged the seat carrier by manually testing for spring resistance. If the lever does not engage, turn the cone in clockwise until it does.

**Step 10:** Turn the adjusting screw counter-clockwise until it stops (do not over tighten) and turn the screw back clockwise 2-1/2 turns. To make adjustments with the new clip (33) in place, use a 1/8" screwdriver. Slowly introduce 140 PSI to the second stage. Engage the adjustment portion of the in-line adjusting hose (or tool). Turn counter-clockwise until the lever reaches its maximum height. Now turn the adjustment clockwise until a slight downward movement of the lever occurs. There should be some amount of play in the lever, but as little as possible.

**Step 11:** Now, install the diaphragm-exhaust valve assembly, the friction washer (25) and the diaphragm retainer (26). Using an inverted retainer, hand-tighten the diaphragm retainer until it's snug.

**Adjustment:**

To check the inhalation effort of the second stage, a test board with a manometer is preferred. If no test board is available, use a tray of water and lower the second stage, diaphragm down, into the water to the appropriate height.

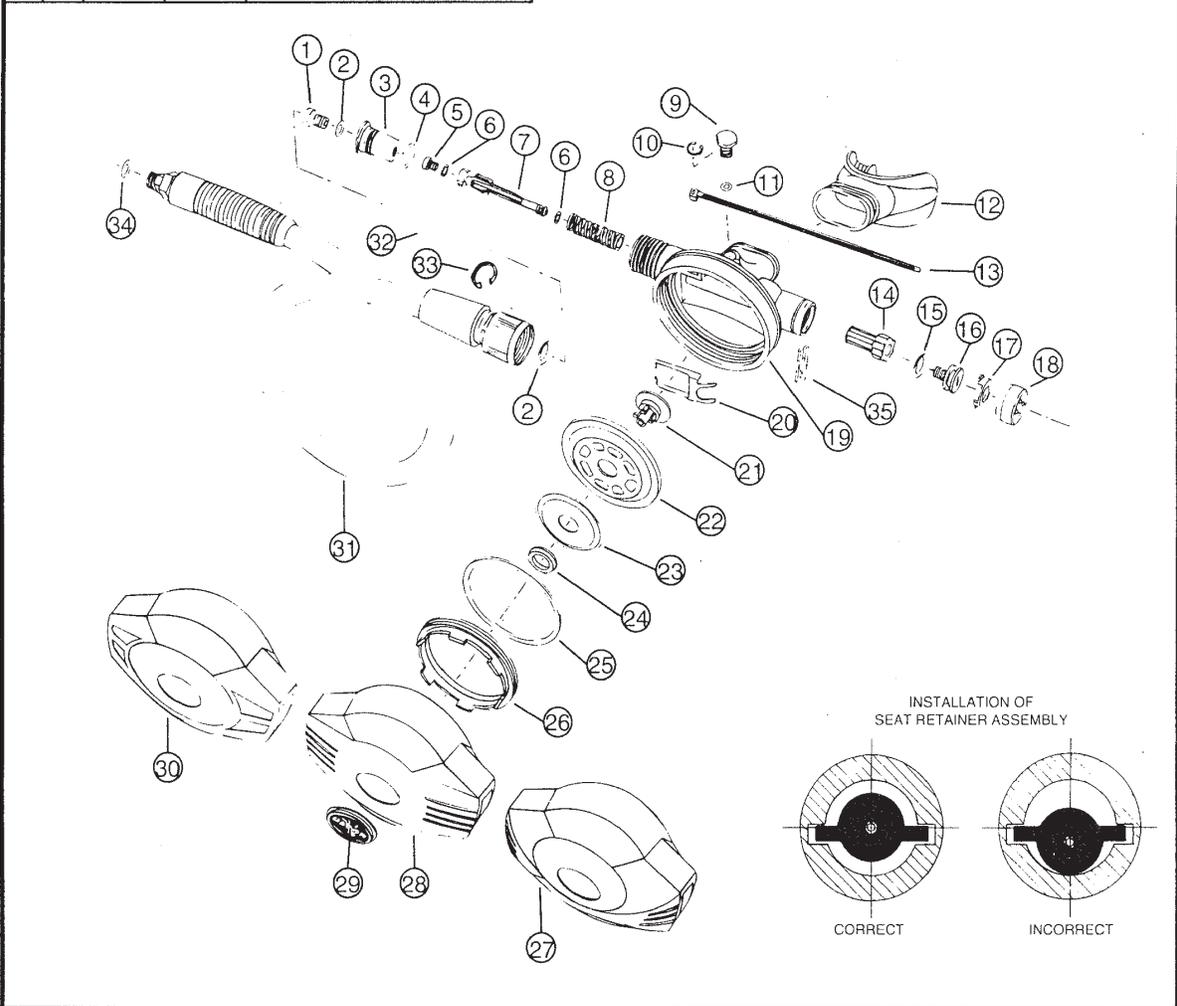
**Step 1:** Turn the adjusting screw clockwise until an initial opening effort of 1.0-1.1" of water is achieved. Remove supply pressure from second stage.

**Step 2:** Then, re-install the retaining ring (33) on the in-line adjusting hose or detach the in-line adjustment tool and connect the hose directly onto the second stage. Tighten the hose with the 5/8" wrench to a torque specification of 45-50 inch pounds.

**Step 3:** Finally, replace the flexible cover and the mouthpiece with a new clamp. Service of the second stage is now complete.

|   |  |                            |              |                  |
|---|--|----------------------------|--------------|------------------|
|  | 1992 QUANTUM PNEUMATIC<br>SECOND STAGE |                            | PAGE<br>2-40 | REPAIR PROCEDURE |
|   | 9/93                                   | Second Stage<br>Regulators |              |                  |

| #  | QTY | PART #  | KEY | DESCRIPTION               | #  | QTY | PART #  | KEY | DESCRIPTION                 |
|----|-----|---------|-----|---------------------------|----|-----|---------|-----|-----------------------------|
| 1  | 1   | 0182-87 |     | VALVE SEAT                | 26 | 1   | 0624-93 |     | RETAINER, DIAPHRAGM         |
| 2  | 2   | 0060-02 | ⓐ   | O-RING                    | 27 | 1   | 0513-94 |     | TOP COVER, QUANT. BLACK     |
| 3  | 1   | 0182-88 |     | ADAPTOR, VALVE SEAT       | 28 | 1   | 0514-18 |     | TOP COVER, EXT. ICE BLUE    |
| 4  | 1   | 0060-22 | ⓐ   | O-RING                    | 29 | 1   | 0232-25 |     | DECAL/INSERT ASSM BLACK     |
| 5  | 1   | 0232-07 | ⓐ   | L.P. SEAT, MECHANICAL     |    | 1   | 0232-26 |     | DECAL/INSERT ASSM BLUE      |
| 6  | 2   | 0060-61 | ⓐ   | O-RING                    |    | 1   | 0232-31 |     | DECAL/INSERT ASSM- ENDURO   |
| 7  | 1   | 0624-97 |     | SEAT RETAINER             | 30 | 1   | 0513-96 |     | TOP COVER, ENDURO BLACK     |
| 8  | 1   | 0040-85 |     | SPRING, MECHANICAL TEFLON |    | 1   | 0514-17 |     | TOP COVER, ENDURO NEON      |
| 9  | 1   | 0627-89 |     | FLOW TUBE PLUG, NON-ADJ.  | 31 | 1   | 0229-39 |     | HOSE ASSM. 29" IN-LINE ADJ. |
| 10 | 1   | 0250-22 |     | RETAINING RING            |    | 1   | 0229-40 |     | HOSE ASSM. 39" IN-LINE ADJ. |
| 11 | 1   | 0060-16 | ⓐ   | O-RING                    | 32 | 1   | 0121-02 |     | FRICTION WASHER             |
| 12 | 1   | 0300-67 |     | MOUTHPIECE                | 33 | 1   | 0250-24 |     | RETAINING RING, L.P. HOSE   |
| 13 | 1   | 0310-11 | ⓐ   | CLAMP                     | 34 | 1   | 0060-51 |     | O-RING                      |
| 14 | 1   | 0625-20 |     | ADJUSTING CHAMBER         | 35 | 1   | 0628-02 | ⓑ   | RETAINING CLIP              |
| 15 | 1   | 0060-96 | ⓐ   | O-RING                    |    |     |         |     |                             |
| 16 | 1   | 0625-05 |     | SHAFT, NON-ADJ.           |    |     |         |     |                             |
| 17 | 1   | 0625-61 | ⓑ   | CLIP, RETAINER            |    |     |         |     |                             |
| 18 | 1   | 0625-04 |     | END CAP                   |    |     |         |     |                             |
| 19 | 1   | 0614-59 |     | BOTTOM BOX                |    |     |         |     |                             |
| 20 | 1   | 0170-91 |     | LEVER S.S.                |    |     |         |     |                             |
| 21 | 1   | 0624-91 |     | CORE, DIAPHRAGM           |    |     |         |     |                             |
| 22 | 1   | 0050-18 |     | DIAPHRAGM ASSM.           |    |     |         |     |                             |
| 23 | 1   | 0240-14 |     | EXHAUST VALVE             |    |     |         |     |                             |
| 24 | 1   | 0624-92 |     | RETAINER, DIAPHRAGM CORE  |    |     |         |     |                             |
| 25 | 1   | 0120-98 |     | FRICTION WASHER           |    |     |         |     |                             |



|  |   |                            |              |  |
|--|---|----------------------------|--------------|--|
|  | EXTREME ICE / QUANTUM / ENDURO<br>MECHANICAL SECOND STAGE |                            | PAGE<br>2-41 | <b>KEY</b><br>ⓐ Included in annual service kit #9680-23<br>ⓑ 0628-02 Retaining clip (35) replaces 0625-61 retaining clip (17). |
|  | 9/93  | Second Stage<br>Regulators |              |  |

**EXTREME ICE / QUANTUM / ENDURO MECHANICAL  
SECOND STAGE**

**Custom Tools Supplied by Dacor:**

1. 0980-20 Cone Adjusting Tool
2. 0980-54 In-Line Adjusting Tool
3. 0980-61 O-Ring Removal Tool
4. 0624-93 Diaphragm Retaining Ring
5. 9508-00 Polishing Stick

**Standard Tools Needed:**

1. Small Needle-Nose Pliers
2. Diagonal Cutters
3. 5/8" Open-End Wrench
4. 1/8" Narrow-Blade Screwdriver
5. 1/4" Diameter Wood or Plastic Dowel 3"

**Disassembly:**

**Step 1:** The disassembly process starts the same way for all models. Remove the hose from the second stage using the 5/8" open-ended wrench. Remove the two o-rings from the hose. Remove the plastic washer (32) from the hose coupling. (early models did not have this washer, but it may be added).

**Step 2:** Peel off the flexible cover, and then remove the mouthpiece by cutting off the clamp with the small diagonal cutter, taking care to prevent damage to the mouthpiece. Then use the inverted diaphragm retainer as a tool to remove the diaphragm retainer (26).

**Step 3:** Next, remove the friction washer (25), diaphragm assembly and lever (20). To remove the lever, spread the engagement legs of the lever with your thumb and forefinger. Be careful not to over bend the lever. Inspect the lever for deformation.

**Step 4:** Remove the valve seat adaptor (3) by inserting a narrow blade screwdriver into the slot located on the main body and wedging the valve seat adaptor out. The valve seat (1) is now accessible. Remove it by using the cone adjusting tool. Turn the tool counter-clockwise until the threads disengage. The valve seat can now be pushed out of the adaptor with the 1/4" diameter dowel. Be careful to not damage the seat. Remove the o-rings from the adaptor and valve seat.

**Step 5:** Remove the seat carrier (7) and spring (8). Use a 1/16" allen wrench to remove the seat (5) from the carrier. Then remove the o-rings (6) from the seat carrier and seat. Note how small the seat is in comparison with other models.

**Step 6:** Remove the small retaining ring (10) from the flow tube (9) using the small needle-nose pliers. Push on the ends of the ring with the tips of the pliers. The flow tube can now be pulled out of the body. Remove the flow tube's o-ring (11).

**Step 7:** Remove the end cap (18) and internal retaining clip (17) with a thin blade screwdriver. Insert the blade into one of the slots located on the body and push on the clip until the center of the clip bows out. Do not try to pry, you will damage the body. Insert the blade in the gap that now exists between the center of the clip and the body. As you wedge the clip out, don't worry if it gets damaged. It will be replaced. If the regulator has a new style retaining clip (35), it can be pushed out with a screwdriver and re-used.

**Step 8:** Remove the adjusting screw (16) and the adjusting chamber (14) with the 3" wooden dowel.

**Step 9:** Separate the screw and the adjusting chamber by turning the screw clockwise. *Note: these are left handed threads.* Remove the screw o-ring (15). Be careful not to scratch or gouge the o-ring surface. Disassembly of the second stage is now complete.

**Cleaning:**

**Step 1:** Cleaning is the same as for the first stage parts. All metal parts should be cleaned using a solution made of 1 gallon of white vinegar (5% acid content) and a quart of any general purpose household cleaner. Soak parts no longer than 15 minutes or 5 minutes, if using an ultrasonic cleaner. All plastic and rubber items should be cleaned with fresh water only. Air dry all parts with an air gun, if possible.

**Step 2:** Replace all o-rings, the seat and the plastic and metal retaining clips. These parts are provided in the annual service kit. Do not re-use the old parts.

**Step 3:** Visually inspect the diaphragm-exhaust valve assembly. Disassembly of these parts is not required unless they are damaged, in which case they should be replaced.

**Step 4:** Inspect the top surface of the valve seat's sealing area (cone) for nicks or scratches. Take care not to damage this delicate part. If scratches are present, they can be removed by polishing the cone surface with a polishing stick in a circular motion. Cleaning and inspection is now complete.

|                         |             |   |      |   |
|-------------------------|-------------|---|------|---|
| <b>REPAIR PROCEDURE</b> | <b>PAGE</b> | <b>EXTREME ICE / QUANTUM / ENDURO<br/>MECHANICAL SECOND STAGE</b> |      |  |
|                         | 2-42        | Second Stage<br>Regulators  | 9/93 |   |

**Assembly:**

**Step 1:** Now you are ready to re-assemble the second stage. Install the new large o-ring (15) onto the adjusting screw (16). Thread the adjusting chamber (14) onto the screw by turning the shaft counter-clockwise, using just light hand pressure, until the assembly is fully threaded.

**Step 2:** Insert the screw and adjusting chamber assembly into the proper side of the body. A slight twisting action will ease the installation. Apply light pressure and twist until the assembly fully seats itself. The large flat surface of the screw should be below the level of the retaining clip slots when the unit is properly seated.

**Step 3:** Install a new plastic retaining clip (35). NOTE: retaining clip (35) should replace retaining clip (17). The clip should be carefully pushed through both slots and engage on the outside of the tube to retain it in place.

**Step 4:** Install the new o-ring (11) onto the flow tube. Insert the flow tube into the body. Ensure that the flow tube's end has fully engaged into the opening in the air chamber of the body. Lock the flow tube in place by installing the retaining ring (10), using the needle-nose pliers.

**Step 5:** Install the new seat (5), with its o-ring (6) into the seat carrier (7). Start threading by hand and lightly snug-up with the 1/16 " Allen wrench. Install the new o-ring (6) on the end of the seat carrier assembly.

**Step 6:** The next step can be tricky, so take particular care. Insert the spring and seat carrier assembly into the body's air chamber, following the diagram. Note the off-center "ears" on the front sides of the seat carrier. The seat carrier will go into the air chamber in any direction, but it must only be installed with the off center "ears" on the carrier matching the off center slots within the body's air chamber. When properly installed the seat face will be centered.

**Step 7:** Install the new o-rings on the valve seat (1) and valve adaptor (3). Using the cone adjusting tool, thread the valve seat into the adaptor until the cone surface is fully visible with about 1/2 thread exposed. Insert the assembly into the body's air chamber, using hand pressure only. If lubrication is necessary, wet the o-ring with water. Do not use silicone for this application. The two flats should align between the guides on the

main body.

**Step 8:** Reinstall the plastic washer (32) onto the hose coupling and install the new hose o-rings. Install the in-line adjusting hose on the body, and tighten to 45-50 in. lbs. with an 5/8" crows foot on a torque wrench. Slide back the hose protector and remove the retaining ring (33). Early models did not have an in-line adjusting hose. In this case, install the regulator hose onto an in-line adjusting tool and tighten securely.

**Step 9:** Install the lever (20) into the assembly. Spread the legs apart and push the lever down. Ensure that it has properly engaged the seat carrier by manually testing for spring resistance. If the lever does not engage, turn the cone in clockwise until it does.

**Step 10:** Turn the adjusting screw counter-clockwise until it stops (do not over tighten) and turn the screw back clockwise 2-1/2 turns. To make adjustments with the new clip (35) in place, use a 1/8" screwdriver. Slowly introduce 140 PSI to the second stage. Engage the adjustment portion of the in-line adjusting hose (or tool). Turn counter-clockwise until the lever reaches its maximum height. Now turn the adjustment clockwise until a slight downward movement of the lever occurs. There should be some amount of play in the lever, but as little as possible.

**Step 11:** Now, install the diaphragm-exhaust valve assembly, the friction washer (25) and the diaphragm retainer (26). Using an inverted retainer, hand-tighten the diaphragm retainer until it's snug.

**Adjustment:**

To check the inhalation effort of the second stage, a test board with a manometer is preferred. If no test board is available, use a tray of water and lower the second stage, diaphragm down, into the water to the appropriate depth.

**Step 1:** Turn the adjusting screw clockwise or counter-clockwise until an initial opening effort of 1.2-1.3" of water is achieved. Remove supply pressure from second stage.

**Step 2:** Then, re-install the retaining ring (33) on the in-line adjusting hose or detach the in-line adjustment tool and connect the hose directly onto the second stage. Tighten the hose with the 5/8" wrench to a torque specification of 45-50 inch pounds.

**Step 3:** Finally, replace the top cover & mouthpiece

|   |   |                            |      |                  |
|---|---|----------------------------|------|------------------|
|  | EXTREME ICE / QUANTUM / ENDURO<br>MECHANICAL SECOND STAGE |                            | PAGE | REPAIR PROCEDURE |
|   | 6/93  | Second Stage<br>Regulators | 2-43 |                  |

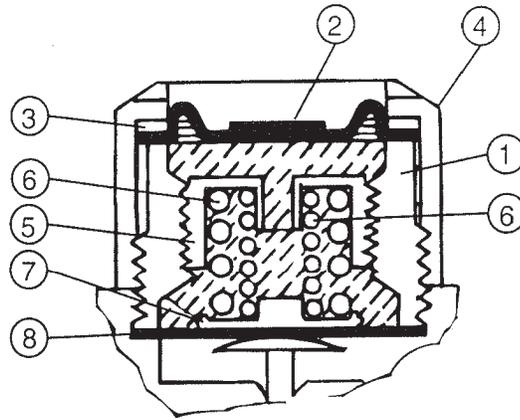
**DACOR REPAIR MANUAL**  
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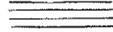
**DIN KITS & REGULATOR ACCESSORIES**

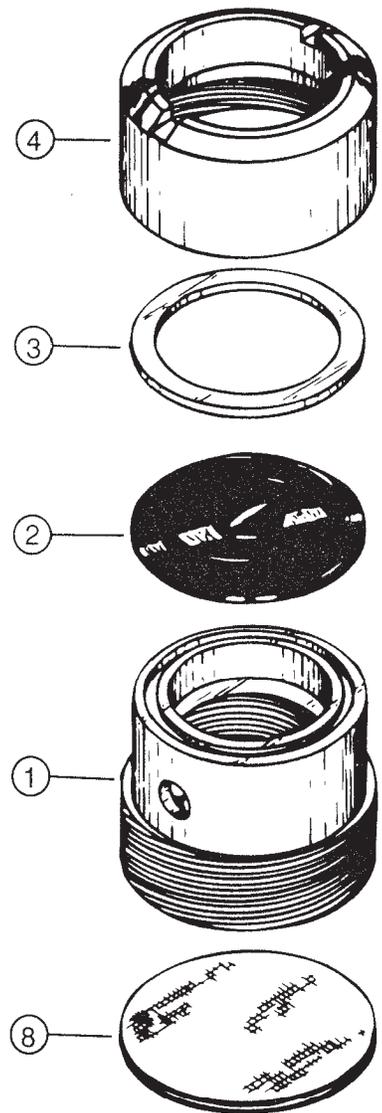


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| AER (ALL ENVIRONMENT REGULATOR) KIT _____                                  | 3-1  |
| DIN KIT (1123-00) FOR: PACER 600, 900, 650, 950 & 760 _____                | 3-3  |
| DIN KIT (1159-00) FOR: PACER 260, 300, 350, FORMULA & 360 (PRE 1991) _____ | 3-5  |
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| DIN KIT (1150-00) FOR: ALL MODULAR REGULATORS & ENDURO _____               | 3-13 |

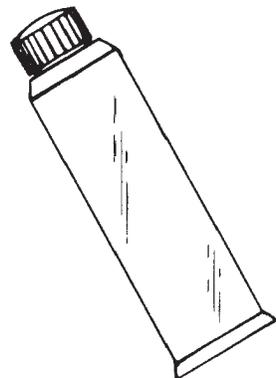
| #  | QTY | PART #  | KEY | DESCRIPTION                    |
|----|-----|---------|-----|--------------------------------|
| 1  | 1   | 0180-05 |     | RETAINER                       |
| 2  | 1   | 0050-01 |     | DIAPHRAGM                      |
| 3  | 1   | 0120-65 |     | WASHER                         |
| 4  | 1   | 0180-04 |     | AMBIENT CAP                    |
| 5  | 1   | 0020-03 |     | ADJUSTING SCREW                |
| 6  | 1   | 0040-06 | ①   | SPRING PRE 1987                |
|    | 1   | 0040-05 | ①   | SPRING PRE 1987                |
|    | 1   | 0040-53 | ②   | SPRING POST 1987 (SUB 0040-57) |
| 7  | 1   | 0160-00 |     | SPRING PAD (SUB 0622-14)       |
| 8  | 1   | 0050-12 |     | H.P. DIAPHRAGM                 |
| 9  | 1   | 0860-04 |     | SILICONE PASTE                 |
| 10 | 1   | 0108-09 |     | SILICONE LIQUID                |



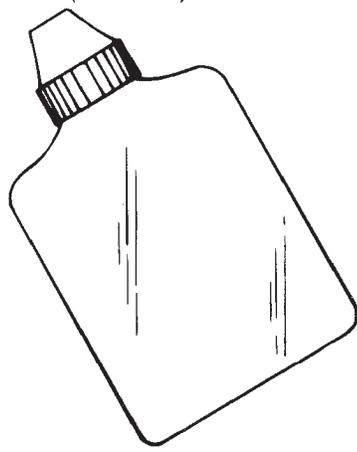
 SILICONE PASTE  
 SILICONE LIQUID



9. (0680-04) SILICONE PASTE



10. (0108-09) SILICONE LIQUID



AER (ALL ENVIRONMENT REGULATOR) KIT

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DIN Kits & Regulator Accessories

PAGE

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KEY

- ① Dual spring combination pre 1987
- ② Single spring post 1987

**AER (ALL ENVIRONMENT REGULATOR) KIT**

filled, the diaphragm (2) will contract inward and expand outward once repressurized.  
B) Check for leaks.

**Tools Needed:**

1. 0980-15 Spanner Wrench
2. 9935-00 Intermediate Pressure Gauge
3. Wide Blade Screwdriver

**Installation:**

Install thin H.P. diaphragm (8) and spring pad (7). Install pre 1987 dual springs or post 1987 single spring (6). Install retainer (1) using spanner wrench to ensure positive sealing against H.P. diaphragm (8). Install adjusting screw (5) making sure the screw is sitting properly on top of spring(s). Screw in adjusting screw approximately 2-1/2 turns using 3/4" blade screwdriver.

**Intermediate Pressure Adjust and Final Assembly:**

**Step 1:** Attach regulator to an air source with at least 1000 PSI supply pressure (dive tank or test board). Regulator should be mounted with the retainer (1) in the upright position.

**Step 2:** Connect intermediate pressure gauge to any low pressure port on the regulator.

**Step 3:** Pressurize regulator.

**Step 4:** Adjust intermediate pressure to 140 PSI by turning adjusting screw (5) clockwise to increase pressure, counterclockwise to decrease pressure.

**Step 5:** Fill chamber above H.P. diaphragm (8) with silicone liquid (10). Fill through adjusting screw (5) up to rim of retainer(1). (see illustration). Wait a few seconds for any air to be displaced and fill again.

**Step 6:** Fill convolution in diaphragm (2) with silicone paste (9) or silicone grease (9606-00).

**Step 7:** Place thick washer (3) (sharp side away from diaphragm) in the ambient cap (4).

**Step 8:** See illustration for replacement of diaphragm (2) in the cap (4). Install cap (4) on the retainer (1). Tighten with wide blade screwdriver.

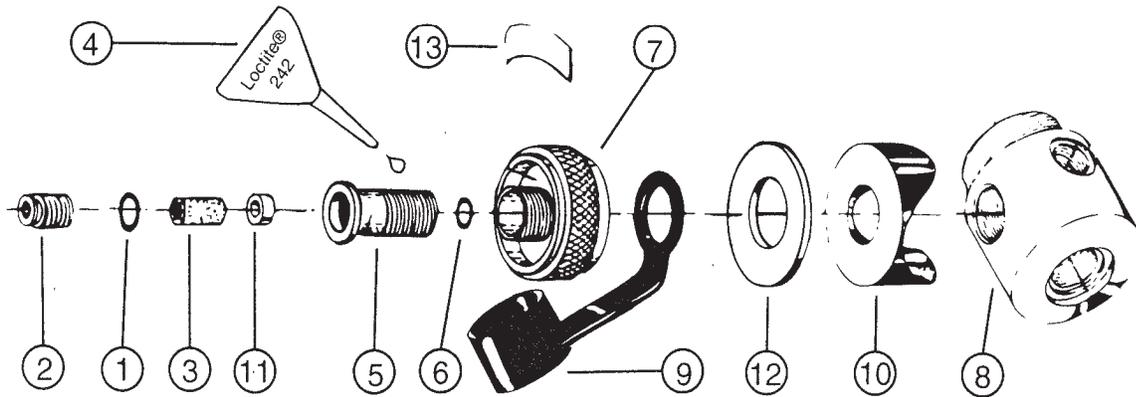
**Step 9:** Recheck intermediate pressure. It should be between 138-144 PSI.

**Step 10:** Final check:

A) Depressurize system. If chamber has been properly

|                         |             |  |      |   |
|-------------------------|-------------|--|------|---|
| <b>REPAIR PROCEDURE</b> | <b>PAGE</b> | <b>AER (ALL ENVIRONMENT REGULATOR) KIT</b> |      |  |
|                         | 3-2         | DIN Kits & Regulator Accessories           | 9/93 |   |

| #  | QTY | PART #  | KEY | DESCRIPTION        |
|----|-----|---------|-----|--------------------|
| 1  | 1   | 0060-21 |     | O-RING             |
| 2  | 1   | 0130-87 |     | RETAINING SCREW    |
| 3  | 1   | 0110-01 |     | FILTER             |
| 4  | 1   | 9803-00 |     | GREEN LOCTITE® 290 |
| 5  | 1   | 0182-10 |     | ADAPTOR            |
| 6  | 1   | 0060-01 |     | O-RING             |
| 7  | 1   | 0560-22 |     | KNOB               |
| 8  |     |         | ⊗   | REGULATOR BODY     |
| 9  | 1   | 0960-06 |     | DUST CAP           |
| 10 | 1   | 0621-13 | ⊗   | YOKE SUPPORT       |
| 11 | 1   | 0182-26 |     | SPACER             |
| 12 | 1   | 0623-36 | ①   | SPACER             |
| 13 | 1   | 0721-84 |     | DECAL              |



DIN CONVERSION KIT (P/N 1123-00)  
 FITS: 600, 900, 650, 950 & 760

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DIN Kits & Regulator  
 Accessories

PAGE

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KEY

- ① Used on 600, 650, 900 & 950 only.
- ⊗ Not included in kit

**DIN CONVERSION KIT (P/N 1123-00)**  
**FITS: 600, 900, 650, 950 & 760**

**Pre-Assembly:**

**Step 1:** Disassemble yoke assembly from regulator body (8). This is accomplished by unscrewing the nut from the main body. Removal of the yoke nut will completely detach yoke assembly.

**Step 2:** make certain the bottom surface of the threaded hole in the body (8) is perfectly clean and without any imperfections, nicks or scratches.

**Assembly:**

**Step 1:** Lubricate the o-ring (6) with silicone grease, and place it in the groove in the face of the adaptor (5).

**Step 2:** Place the knob (7) on the adaptor stem (5) as shown. Then, put the dust cap on the outside of the knob (7), also on the stem of the adaptor (5). The dust cap (9) should cover and protect the threaded portion of the knob when the regulator is not in use.

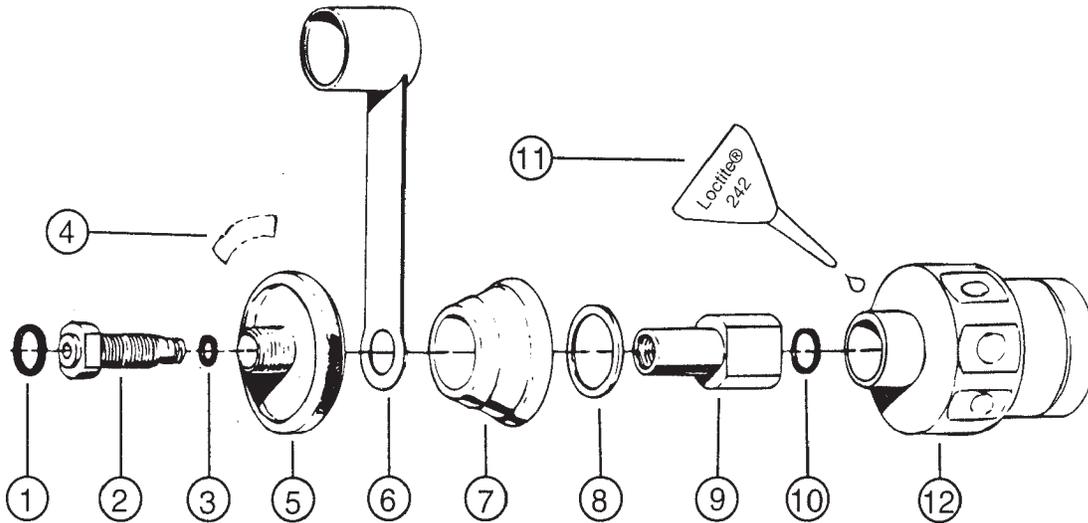
**Step 3:** Place yoke support (10) over adaptor stem, (on 760 model only). On models 600, 650, 900 and 950 place spacer (12) over adaptor.

**Step 4:** Place one drop Blue Loctite® 242 (4) on the threaded portion of the adaptor, approximately in the middle of the exposed thread length, as shown in the drawing.

**Step 5:** The DIN assembly is now ready to be fastened to the regulator body. Lock the assembly in by using a wrench to ensure a tight seal.

|                         |             |  |      |   |
|-------------------------|-------------|--|------|---|
| <b>REPAIR PROCEDURE</b> | <b>PAGE</b> | <b>DIN CONVERSION KIT (P/N 1123-00)</b><br><b>FITS: 600, 900, 650, 950 &amp; 760</b> |      |  |
|                         | 3-4         | DIN Kits & Regulator<br>Accessories  | 9/93 |   |

| #  | QTY | PART #  | KEY | DESCRIPTION           |
|----|-----|---------|-----|-----------------------|
| 1  | 1   | 0060-21 |     | O-RING                |
| 2  | 1   | 0182-30 |     | RETAINER              |
| 3  | 1   | 0060-55 |     | O-RING                |
| 4  | 1   | 0721-84 |     | DECAL                 |
| 5  | 1   | 0560-22 |     | KNOB                  |
| 6  | 1   | 0960-06 |     | DUST CAP              |
| 7  | 1   | 0612-65 |     | PLASTIC SPACER        |
| 8  | 1   | 0513-61 |     | RUBBER SPACER         |
| 9  | 1   | 0182-32 |     | ADAPTOR               |
| 10 | 1   | 0060-29 |     | O-RING                |
| 11 | 1   | 9803-00 |     | LOCTITE®              |
| 12 |     |         |     | BODY (REFERENCE ONLY) |



DIN CONVERSION KIT (P/N 1159-00)  
 FITS: 260, 300, 350, FORMULA & 360 (PRE 1991)

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PAGE

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KEY

**DIN CONVERSION KIT (P/N 1159-00)**

**FITS: 260, 300, 350, FORMULA & 360 (PRE 1991)**

**Pre Assembly:**

**Step 1:** Prior to installing the DIN adaptor, remove the regulator yoke assembly by removing the yoke nut and yoke.

**Assembly:**

**Step 1:** Inspect the cavity of the adaptor (9) to make sure the o-ring (10) is properly seated.

**Step 2:** Add one drop of Loctite® 290 (11) to the threads on the first stage body (12).

**Step 3:** Install adaptor (9) onto the first stage body using an adjustable wrench across the flats of the adaptor. Tighten in a clockwise direction to approximately 10 foot pounds torque. Do not over-tighten.

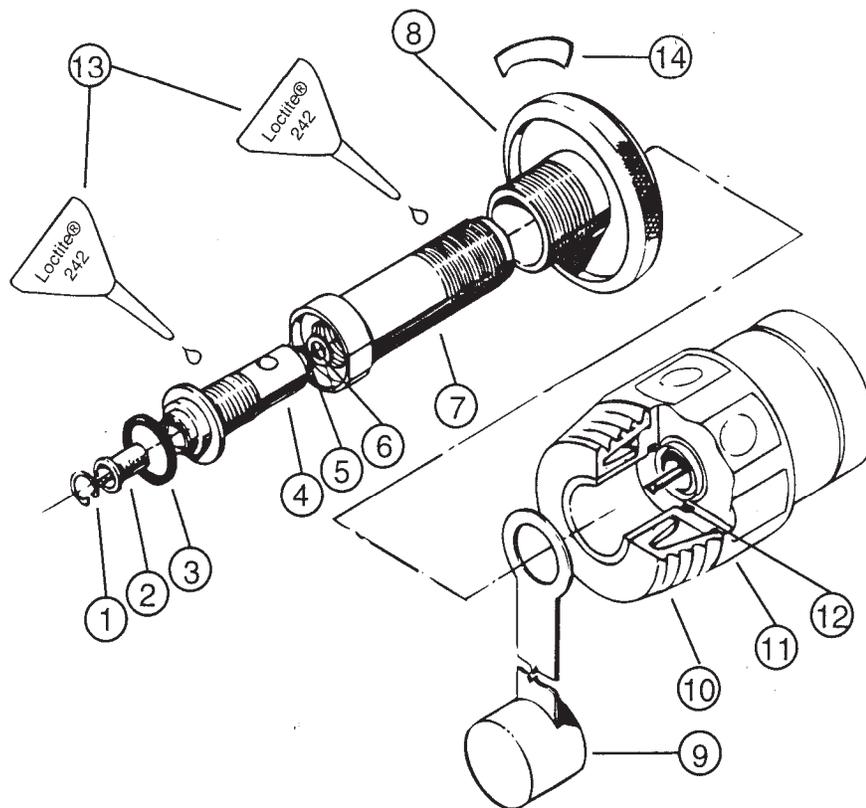
**Step 4:** Install the rubber spacer (8) and the plastic spacer (7) onto the adaptor (9).

**Step 5:** Inspect the o-rings (1 & 3) on the retainer (2) for proper seating.

**Step 6:** Install the dust cap (6), knob (5) and retainer (2). Apply one drop of Blue Loctite® 242 (11) to the threads of the retainer (2). Use an adjustable wrench or a 3/4" open end wrench to tighten the retainer. Tighten to 25 inch pounds torque. Do not over-tighten. Care should be taken not to damage the flats.

|                         |             |  |             |   |
|-------------------------|-------------|--|-------------|---|
| <b>REPAIR PROCEDURE</b> | <b>PAGE</b> | <b>DIN CONVERSION KIT (P/N 1159-00)<br/>FITS 260, 300, 350, FORMULA &amp; 360 (PRE 1991)</b> |             |  |
|                         | <b>3-6</b>  | <b>DIN Kits &amp; Regulator<br/>Accessories</b>  | <b>9/93</b> |   |

| #  | QTY | PART #  | KEY | DESCRIPTION                |
|----|-----|---------|-----|----------------------------|
| 1  | 1   | 0250-19 |     | RETAINING RING             |
| 2  | 1   | 0110-08 |     | FILTER                     |
| 3  | 1   | 0060-21 |     | O-RING                     |
| 4  | 1   | 0182-25 |     | RETAINER                   |
| 5  | 1   | 0060-85 |     | O-RING                     |
| 6  | 1   | 0120-10 |     | WASHER                     |
| 7  | 1   | 0182-24 |     | ADAPTOR                    |
| 8  | 1   | 0560-22 |     | KNOB                       |
| 9  | 1   | 0960-06 |     | DUST CAP (REF.)            |
| 10 | 1   | 0623-00 |     | PLASTIC SPACER (REF.)      |
| 11 | 1   | 0031-14 |     | 460 BODY (REF.)            |
| 12 | 1   | 0060-83 |     | YOKE SUPPORT O-RING (REF.) |
| 13 | 1   | 9803-00 |     | LOCTITE®                   |
| 14 | 1   | 0721-84 |     | DECAL                      |



DIN CONVERSION KIT (P/N 1122-00)  
FITS: 460; 360 (1991 & AFTER)

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Accessories

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KEY

**DIN CONVERSION KIT (P/N 1122-00)  
FITS: 460; 360 (1991 & AFTER)**

**Disassembly of Yoke Assembly:**

**Step 1:** Unscrew the yoke support (not shown) from the main body (11).

**Step 2:** Remove the high pressure seat (not shown) and spring (not shown).

**Step 3:** Remove the yoke support o-ring (12) from the main body (11).

**Step 4:** Discard existing retaining ring (not shown), filter (not shown), balance chamber (not shown), and yoke support o-ring (12). However, save the high pressure seat and spring unless damaged. If the high pressure seat and/or spring are damaged, replace with new item.

**Installation of DIN Kit:**

**Step 1:** Lubricate and install the new yoke support o-ring (12).

**Step 2:** Replace the inspected or new high pressure seat and spring (not shown). Make sure the push rod inserts itself into the high pressure seat's guide hole.

**Step 3:** Remove the red protective plug (not shown) and cap (not shown) from the assembled DIN kit. The DIN kit comes fully assembled. All that is required is a simple visual inspection of the assembly.

A. Verify that the retaining ring (1), filter (2) and high pressure o-ring (3) are in place.

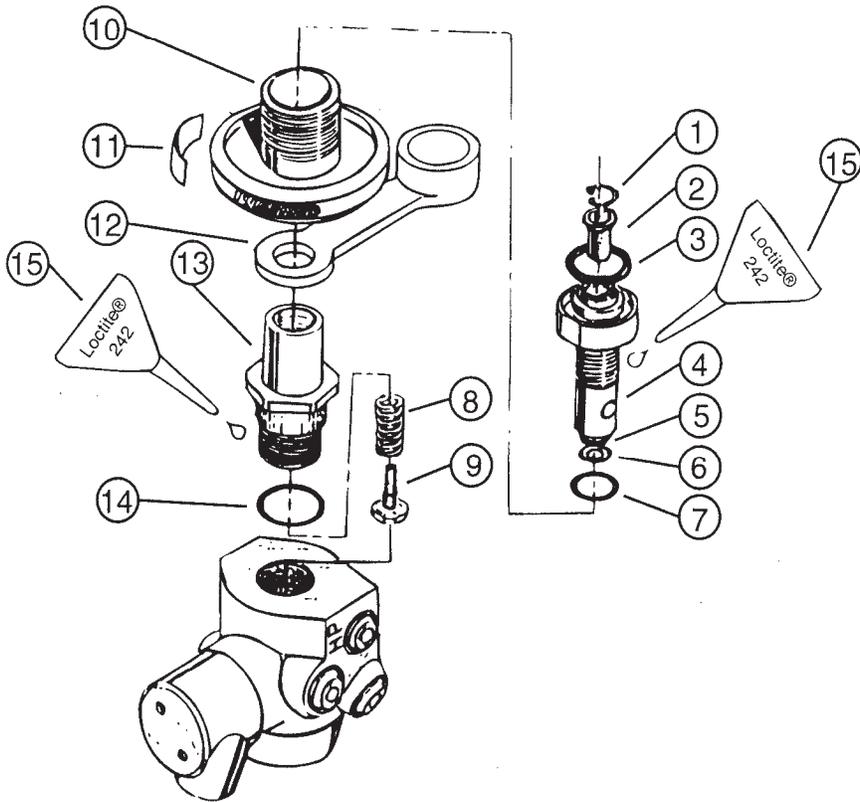
B. Verify that the balance chamber o-ring (5) and washer (6) are in place. If the washer (6) has fallen, simply wipe it with a clean lint free cloth and lubricate it lightly with silicone grease. (The grease helps retain the washer during installation). The washer can now be installed into the retainer (4).

**Step 4:** Screw in the inspected DIN assembly into the main body using an adjustable wrench across the flats on the adaptor. NOTE: Do not over tighten. (20 foot pounds max).

**Step 5:** First stage is now ready to be reset at 140 PSI. See the appropriate section in this repair manual for procedure.

|                         |             |   |      |   |
|-------------------------|-------------|---|------|---|
| <b>REPAIR PROCEDURE</b> | <b>PAGE</b> | <b>DIN CONVERSION KIT (P/N 1122-00)<br/>FITS: 460; 360 (1991 &amp; AFTER)</b> |      |  |
|                         | 3-8         | DIN Kits & Regulator<br>Accessories   | 9/93 |   |

| #  | QTY | PART #  | KEY | DESCRIPTION    |
|----|-----|---------|-----|----------------|
| 1  | 1   | 0250-19 |     | RETAINING RING |
| 2  | 1   | 0110-08 |     | FILTER         |
| 3  | 1   | 0060-21 |     | O-RING         |
| 4  | 1   | 0182-49 |     | RETAINER       |
| 5  | 1   | 0060-85 |     | O-RING         |
| 6  | 1   | 0120-10 |     | WASHER, BRASS  |
| 7  | 1   | 0060-43 |     | O-RING         |
| 8  | 1   | 0040-24 | ⓐ   | SPRING         |
| 9  | 1   | 0217-64 | ⓑ   | H.P. SEAT      |
| 10 | 1   | 0560-22 |     | KNOB           |
| 11 | 1   | 0721-84 |     | DECAL          |
| 12 | 1   | 0960-06 |     | DUST CAP       |
| 13 | 1   | 0182-47 |     | ADAPTOR        |
| 14 | 1   | 0060-53 |     | O-RING         |
| 15 | 1   | 9803-00 |     | LOCTITE®       |



DIN CONVERSION KIT (P/N 1140-00)  
 FITS: 960 (1991 & AFTER)

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KEY

ⓐ Not included in kit.

**DIN CONVERSION KIT (P/N 1140-00)  
FITS: 960 (1991 & AFTER)**

**Pre-Assembly:**

**Step 1:** Remove yoke nut assembly from regulator body using 1" open end wrench.

**Step 2:** Remove filter, balance chamber, H.P. spring and H.P. seat from yoke nut. Inspect the H.P. spring and seat for use in the DIN kit. Replace if necessary.

**Assembly:**

**Step 1:** Place H.P. seat (9) on push rod in first stage high pressure chamber. Place spring (8) on stem of H.P. seat.

**Step 2:** Place o-ring (14) on adaptor (13). Place one drop of Loctite® 242 on adaptor threads and screw into main body.

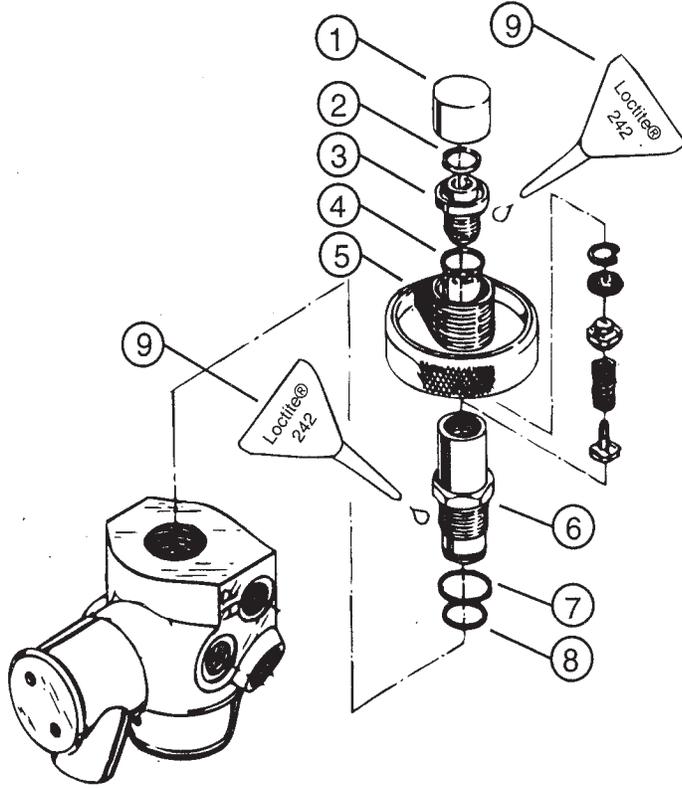
**Step 3:** Place dust cap (12) and knob (10) on extended surface of adaptor (13).

**Step 4:** Place o-ring (5) and washer (6) into retainer (4). Install o-ring (7) into bottom of retainer. o-ring (3), filter (2) and retaining ring (1) can be installed into face of retainer.

**Step 5:** Place one drop of Locktite® 242 on threads of retainer (4) and tighten into adaptor (13). Tighten securely with an adjustable wrench on flats of retainer.

|                         |             |   |      |   |
|-------------------------|-------------|---|------|---|
| <b>REPAIR PROCEDURE</b> | <b>PAGE</b> | <b>DIN CONVERSION KIT (P/N 1140-00)<br/>FITS 960 (1991 &amp; AFTER)</b> |      |  |
|                         | 3-10        | DIN Kits & Regulator<br>Accessories                                     | 9/93 |   |

| # | QTY | PART #  | KEY | DESCRIPTION  |
|---|-----|---------|-----|--------------|
| 1 | 1   | 0960-37 |     | DUST CAP     |
| 2 | 1   | 0060-07 |     | O-RING       |
| 3 | 1   | 0182-53 |     | RETAINER     |
| 4 | 1   | 0060-22 |     | O-RING       |
| 5 | 1   | 0560-28 |     | KNOB         |
| 6 | 1   | 0182-44 |     | ADAPTOR      |
| 7 | 1   | 0060-53 |     | O-RING       |
| 8 | 1   | 0060-10 |     | O-RING       |
| 9 | 1   | 9803-00 |     | LOCTITE® 290 |



DIN CONVERSION KIT (P/N 1125-00)  
FITS: 960 (PRE 1991)

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DIN Kits & Regulator  
Accessories

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KEY

**DIN CONVERSION KIT (P/N 1125-00)**  
**FITS: 960 (PRE 1991)**

**Pre-Assembly:**

**Step 1:** Remove yoke assembly from regulator first stage by removing yoke nut assembly. Hold regulator vertical so pin does not drop out of high pressure chamber.

**Step 2:** Remove retaining ring from yoke support. Remove filter, balance chamber assembly, spring and H.P. seat. Inspect for wear and replace if necessary. Set aside for assembly into DIN kit.

**Assembly:**

**Step 1:** Place H.P. seat, spring, balance chamber assembly, filter and retaining ring into adaptor (6).

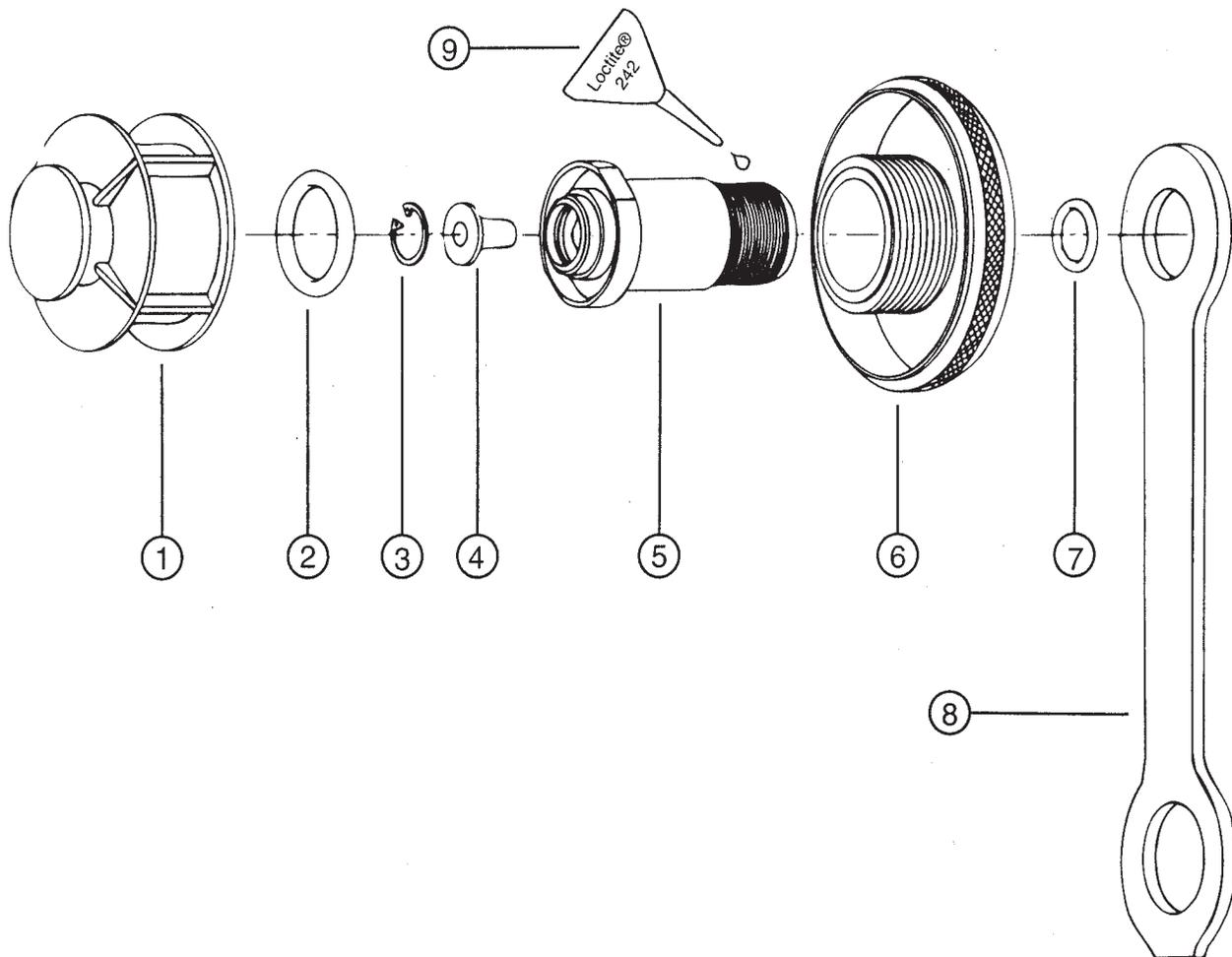
**Step 2:** Place o-rings (7 & 8) onto adaptor (6). Place one drop of Loctite® 242 on the threads of adaptor.

**Step 3:** Thread adaptor into regulator body. The push rod must seat itself into the face of the H.P. seat inside the adaptor. Tighten assembly.

**Step 4:** Place knob (5) on shaft of adaptor (6). Install o-rings (2 & 4) onto retainer (3). Place one small drop of Loctite® 242 on threads of retainer (3) and tighten into adaptor (6).

|                         |             |  |      |   |
|-------------------------|-------------|--|------|---|
| <b>REPAIR PROCEDURE</b> | <b>PAGE</b> | <b>DIN CONVERSION KIT (P/N 1125-00)</b><br><b>FITS: 960 (PRE 1991)</b> |      |  |
|                         | 3-12        | DIN Kits & Regulator<br>Accessories                                    | 9/93 |   |

| # | QTY | PART #  | KEY | DESCRIPTION    |
|---|-----|---------|-----|----------------|
| 1 | 1   | 0960-38 |     | DUST CAP       |
| 2 | 1   | 0060-21 |     | O-RING         |
| 3 | 1   | 0250-19 |     | RETAINING CLIP |
| 4 | 1   | 0110-08 |     | FILTER         |
| 5 | 1   | 0182-86 |     | ADAPTOR BODY   |
| 6 | 1   | 0560-22 |     | KNOB           |
| 7 | 1   | 0060-01 |     | O-RING         |
| 8 | 1   | 0513-97 |     | RETAINER       |
| 9 | 1   | 9803-00 |     | LOCTITE®       |



DIN CONVERSION KIT (P/N 1150-00)  
 FITS: ALL MODULAR REGULATORS & ENDURO

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DIN Kit & Regulator  
 Accessories

PAGE

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KEY

**DIN CONVERSION KIT (P/N 1150-00)  
FITS: ALL MODULAR REGULATORS & ENDURO**

**Step 1:** Remove regulator yoke assembly if necessary. Use 1" open end wrench to remove yoke nut assembly.

**Step 2:** DIN kit comes pre-assembled from Dacor. Make sure o-ring (2), retaining ring (3) & filter (4) are in face of adaptor body (5). Make sure o-ring (7) is seated in o-ring groove on internal end of adaptor body.

**Step 3:** Place knob (6) and retainer (8) over end of adaptor body (5) as shown.

**Step 4:** Place one small drop of Loctite® 242 on threads of adaptor body (5). Thread adaptor body into regulator body and tighten to a torque of 16-18 foot pounds using a 3/4" crows foot.

|                         |                                |   |             |   |
|-------------------------|--------------------------------|---|-------------|---|
| <b>REPAIR PROCEDURE</b> | <b>PAGE</b><br><br><b>3-14</b> | <b>DIN CONVERSION KIT (P/N 1150-00)<br/>FITS: ALL MODULAR REGULATORS &amp; ENDURO</b> |             |  |
|                         |                                | <b>DIN Kits &amp; Regulator<br/>Accessories</b>                                       | <b>9/93</b> |   |

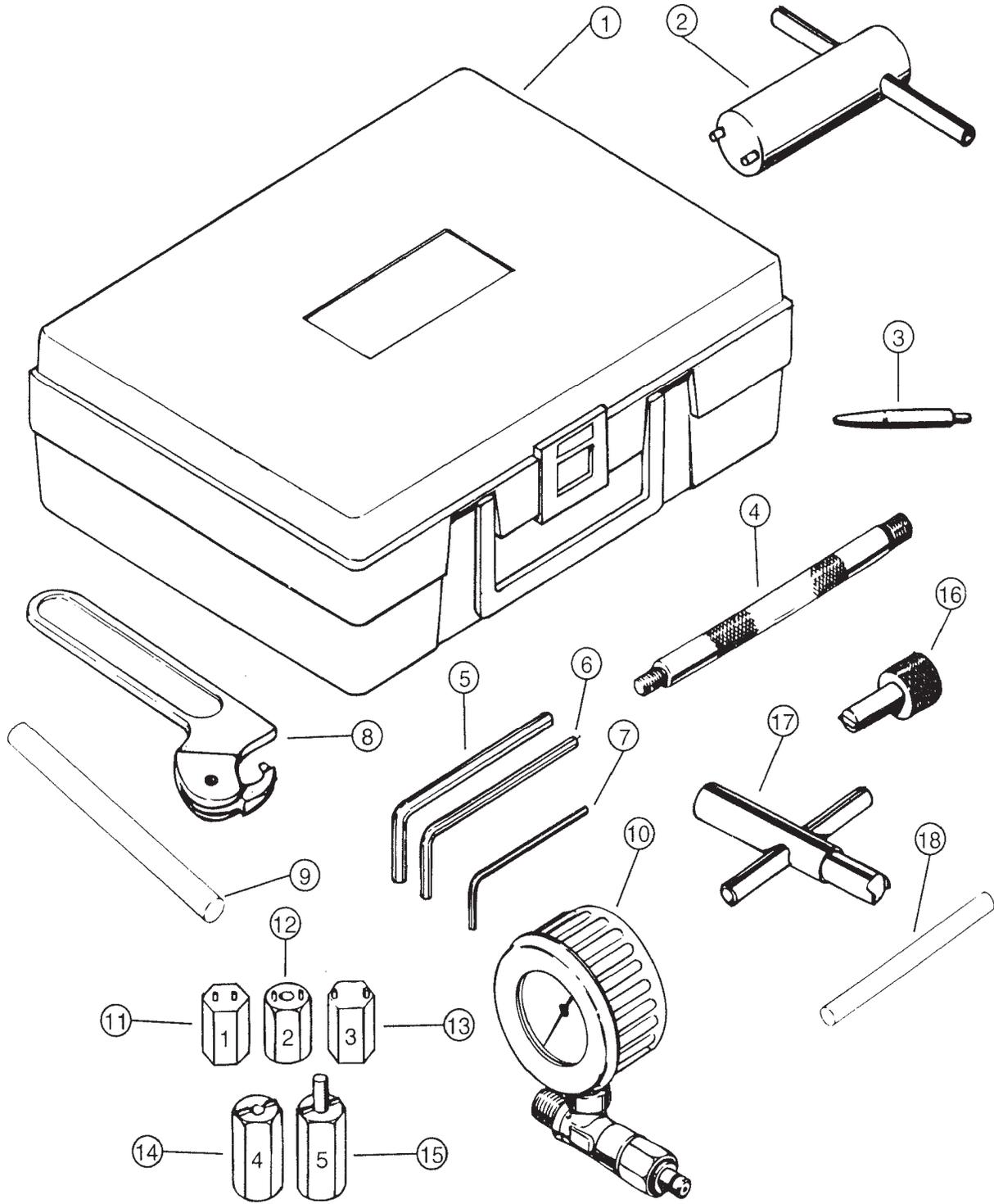
**DACOR REPAIR MANUAL**  
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**SECTION 12**

**SERVICE TOOLS & AIDS**



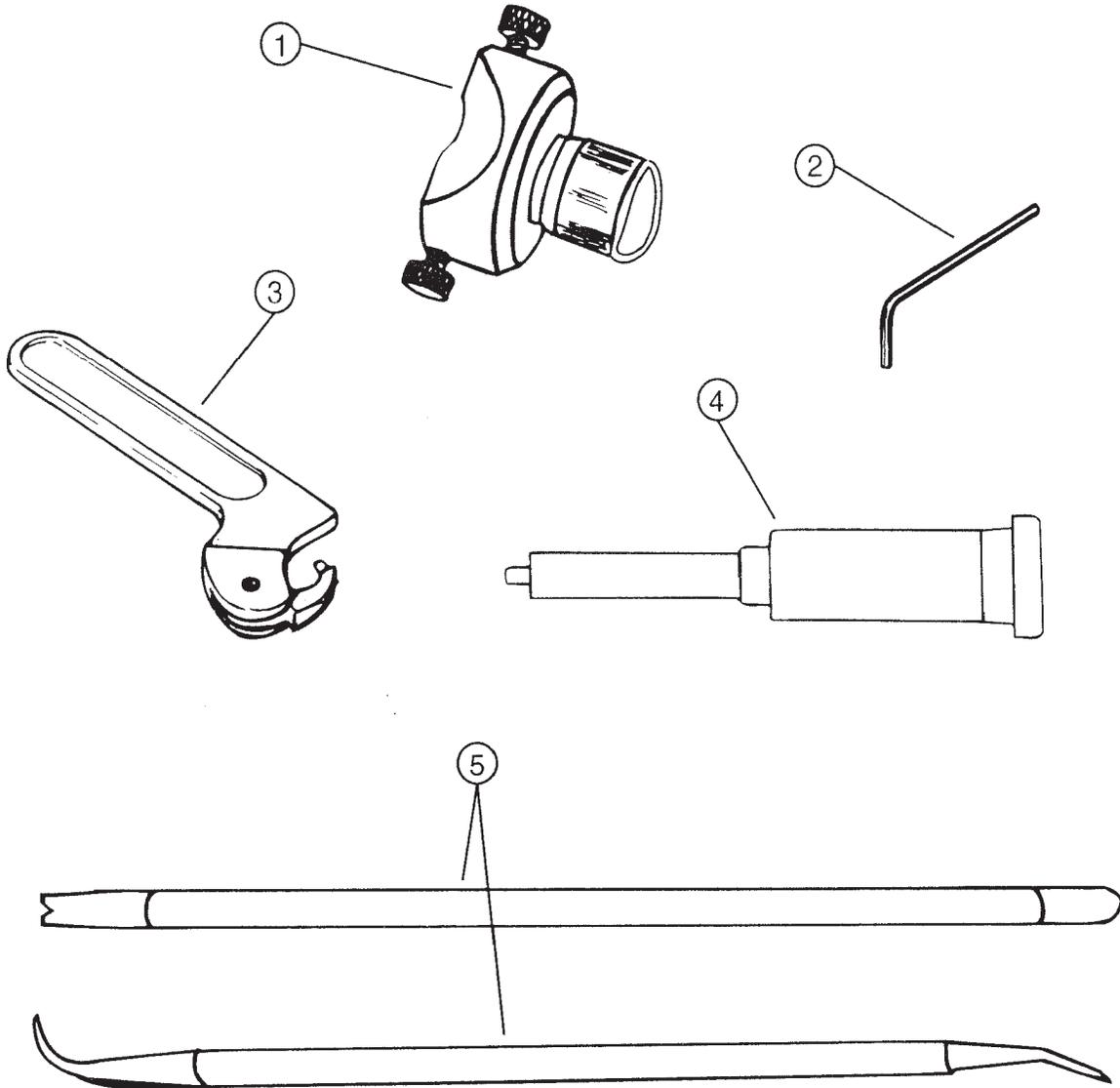
|  |      |
|--|------|
| 0980-38 PACER REGULATOR TOOL KIT _____   | 12-1 |
| 0980-67 MODULAR REGULATOR TOOL KIT _____ | 12-2 |
| MISCELLANEOUS TOOLS _____                | 12-3 |

| # | QTY | PART #  | KEY | DESCRIPTION        | #  | QTY | PART #  | KEY | DESCRIPTION            |
|---|-----|---------|-----|--------------------|----|-----|---------|-----|------------------------|
| 1 | 1   | 0800-14 |     | TOOL CASE          | 10 | 1   | 0212-05 |     | IN-LINE PRESSURE GAUGE |
| 2 | 1   | 0980-13 |     | CAP WRENCH         | 11 | 1   | 0980-28 |     | HEX WRENCH #1          |
| 3 | 1   | 0980-12 |     | O-RING BULLET      | 12 | 1   | 0980-29 |     | HEX WRENCH #2          |
| 4 | 1   | 0980-33 |     | THREADED ROD       | 13 | 1   | 0980-30 |     | HEX WRENCH #3          |
| 5 | 1   | 0980-19 |     | 5/32" ALLEN WRENCH | 14 | 1   | 0980-31 |     | HEX SCREWDRIVER #4     |
| 6 | 1   | 0980-17 |     | 3/16" ALLEN WRENCH | 15 | 1   | 0980-32 |     | HEX SCREWDRIVER #5     |
| 7 | 1   | 0980-16 |     | 1/8" ALLEN WRENCH  | 16 | 1   | 0980-20 |     | ADJUSTING TOOL         |
| 8 | 1   | 0980-15 |     | SPANNER WRENCH     | 17 | 1   | 0980-11 |     | MULTI-TOOL ADJ. WRENCH |
| 9 | 1   | 9508-00 |     | POLISHING STICK    | 18 | 1   | 0980-91 |     | 3" PLASTIC TUBE        |

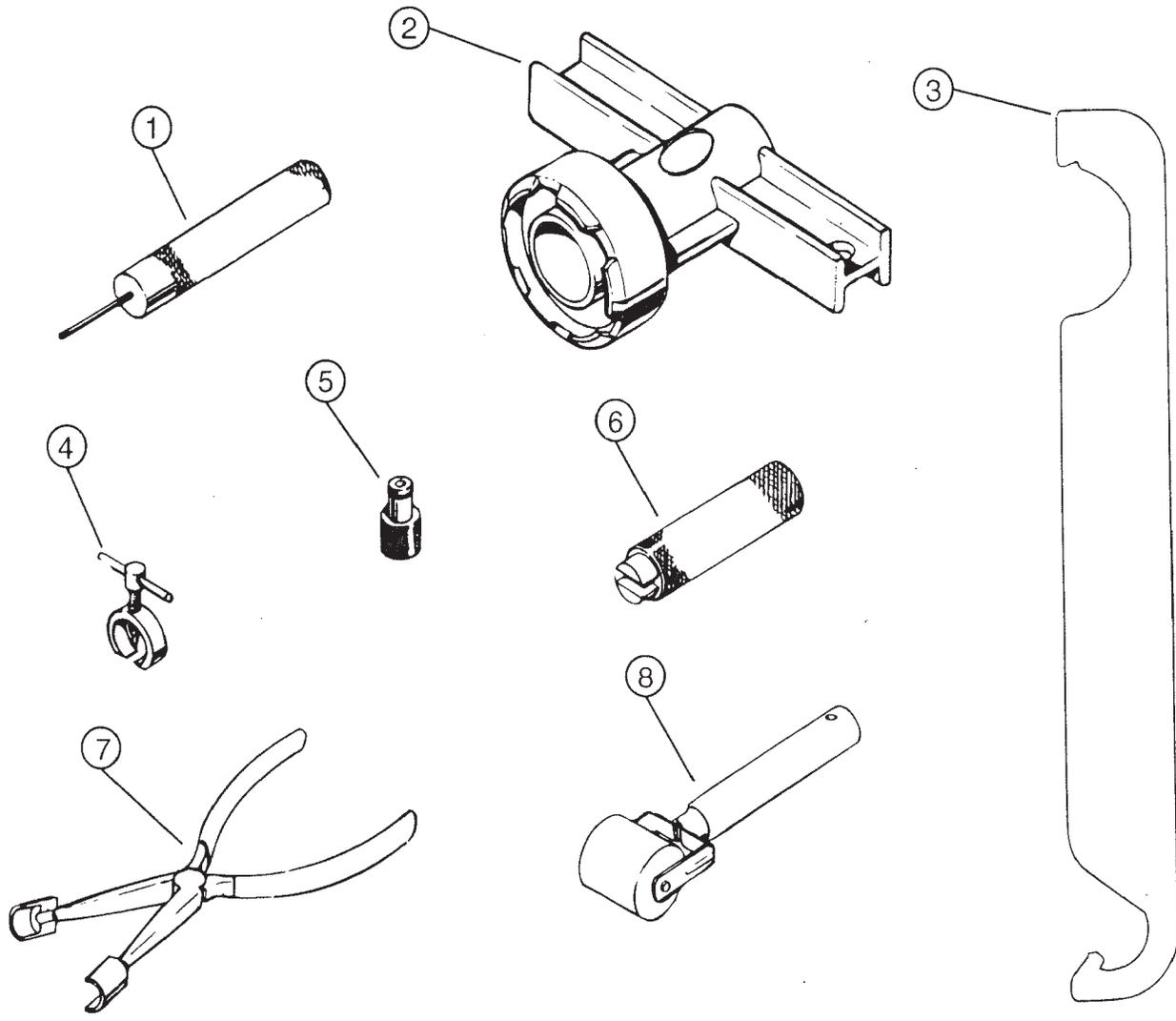


|   |                                  |                      |      |     |
|---|----------------------------------|----------------------|------|-----|
|  | 0980-38 PACER REGULATOR TOOL KIT |                      | PAGE | KEY |
|   | 9/93                             | Service Tools & Aids |      |     |

| # | QTY | PART #  | KEY | DESCRIPTION                   | WHERE USED                               |
|---|-----|---------|-----|-------------------------------|--|
| 1 | 1   | 0980-60 |     | BOOST TESTER                  | CHECK BOOST PISTON DIAPHRAGM SEALING     |
| 2 | 1   | 0980-58 |     | 1/16" ALLEN WRENCH            | INSTALL & REMOVE 2ND STAGE SEAT          |
| 3 | 1   | 0980-62 |     | 3/16" SPANNER WRENCH          | ASSEMBLE & DISASSEMBLE 1ST STAGE         |
| 4 | 1   | 0980-56 |     | CONE & PISTON TOOL            | INSTALL & REMOVE 1ST STAGE PISTON & CONE |
| 5 | 1   | 0980-61 |     | O-RING TOOL KIT (BRASS PICKS) | REMOVE O-RINGS                           |



| #  | QTY | PART #  | KEY | DESCRIPTION                | WHERE USED                            |
|----|-----|---------|-----|----------------------------|---------------------------------------|
| 1  | 1   | 0980-02 |     | CONE TOOL                  | 950 FIRST STAGE                       |
| 2  | 1   | 0980-39 |     | XLP TOP COVER TOOL         | REMOVE XLP TOP COVER                  |
|    | 1   | 0980-45 |     | XP TOP COVER TOOL          | REMOVE XP TOP COVER                   |
| 3  | 1   | 0980-37 |     | B.C. INFLATOR TOOL         | DISASSEMBLE B.C. POWER INFLATOR       |
| 4  | 1   | 0980-01 |     | NEEDLE PULLER              | REMOVE PRESSURE & DEPTH GAUGE NEEDLES |
| 5  | 1   | 9903-00 |     | I.P. ADAPTOR               | DOUBLE HOSE REGULATORS                |
| 6  | 1   | 0980-26 |     | B.C. THREADED FITTING TOOL | REMOVE THREADED FITTINGS FROM B.C.    |
| 7  | 1   | 0980-03 |     | TOGGLE SWITCH PLIERS       | UNDERWATER LIGHTS                     |
| 8  | 1   | 0980-25 |     | B.C. PATCH ROLLER          | TO APPLY PATCHES                      |
| 9  | 1   | 0217-66 | ①   | 460 CONE REMOVAL TOOL      | 460 FIRST STAGE                       |
| 10 | 1   | 0980-10 | ①   | ALLEN WRENCH               | OLYMPIC 800 SET SCREW                 |



MISCELLANEOUS  
TOOLS

9/93

Service Tools  
& Aids

PAGE

12-3

KEY

① Not shown.

# TECHNICAL BULLETIN



Post this bulletin in the service area of your store.

**SUBJECT:** Retaining Ring Replacement

**TB: 20**

**DATE:** 3/4/92

**Step 1:** Peel off the flexible top cover. Using an inverted diaphragm retainer as a tool or hand pressure, turn the diaphragm retainer in a counter-clockwise direction to remove.

**Step 2:** Remove the friction washer and diaphragm assembly.

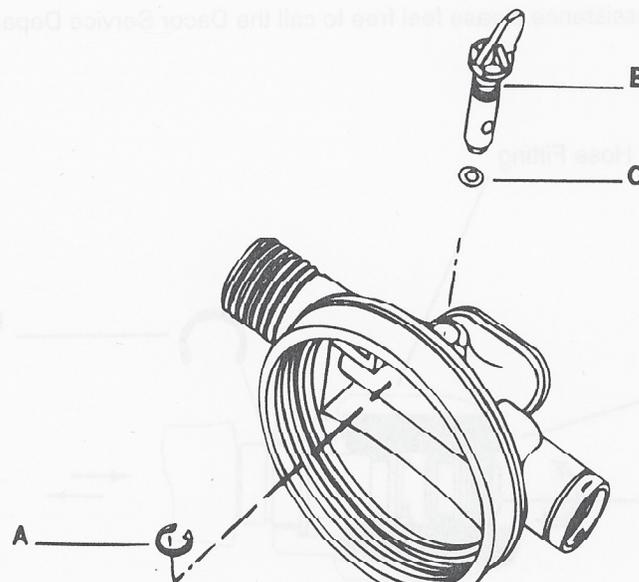
**Step 3:** Turn the injector tube (B) so the retaining ring (A) opening is visible. Remove the small retaining ring from the injector tube using small needle-nose pliers. Push on the ends of the ring with the tips of the pliers. The injector tube can now be pulled out of the body.

**Step 4:** Inspect the o-ring (C) and clean with water if necessary.

**Step 5:** Insert the injector tube into the body. Ensure that the injector's end has fully engaged into the opening in the air chamber of the body. Lock the injector in place by installing the new retaining ring, sharp end up, using the needle-nose pliers.

**Step 6:** Now, install the diaphragm-exhaust valve assembly, the friction washer and the diaphragm retainer. Using an inverted retainer or hand pressure, hand-tighten the diaphragm retainer until it's snug.

**Step 7:** Replace the flexible top cover.



# TECHNICAL BULLETIN



Post this bulletin in the service area of your store.

**SUBJECT:** IN-LINE ADJUSTING HOSE

**TB:** 21

**DATE:** 8/17/92

Dacor is producing a patent pending regulator hose that incorporates an in-line adjusting tool. The In-Line Adjusting Hose will enable your repair technician to adjust second stage lever height without the use of an additional In-Line Adjusting Tool. The In-Line Adjusting Hose will simplify lever adjustment and reduce the time required for adjustment.

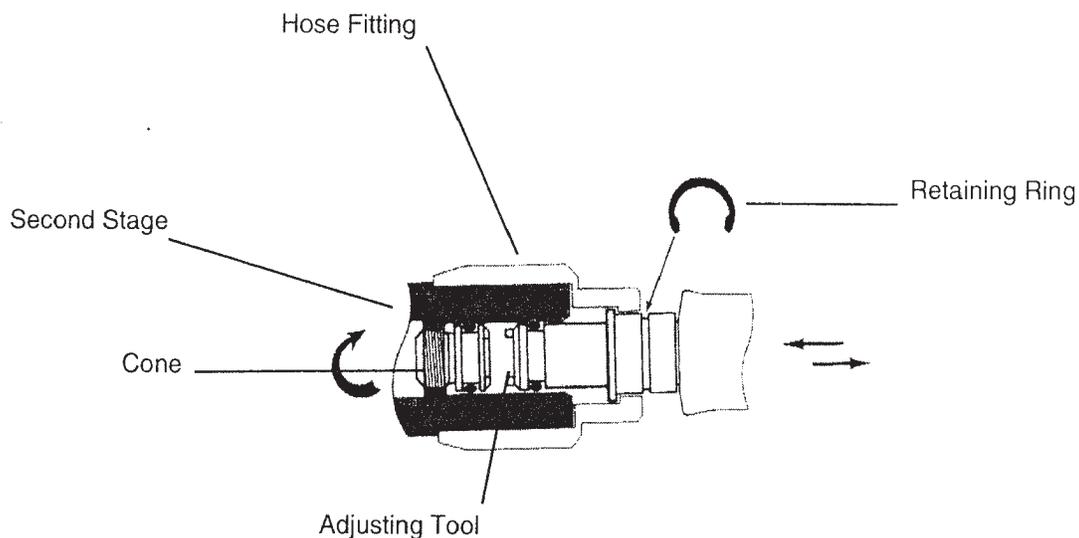
The new In-Line Adjusting Hose has been implemented as a running change beginning with Extreme™ and Quantum™ octopus second stages, and will be added to all 1992 modular regulators including the Enduro™.

To set the second stage lever height, follow the repair manual instructions and implement the procedures below in place of the In-Line Adjusting Tool instructions.

Bleed the system of air. Slide back the hose protector to expose the retaining ring (just beyond the 5/8" wrench flats). Remove the retaining ring with needle nose pliers or a screwdriver.

Push the hose fitting and second stage together and twist to engage the cone with the built in adjusting tool. For more lever play, rotate the second stage clockwise. For less lever play rotate the second stage counter clockwise. Re-introduce 140 PSI to recheck the setting. Repeat procedure until the lever is properly set. Pull the second stage from the hose fitting to expose the retaining ring groove. Re-install the retaining ring on the swivel fitting.

If you need additional assistance please feel free to call the Dacor Service Department.



# TECHNICAL BULLETIN



Post this bulletin in the service area of your store.

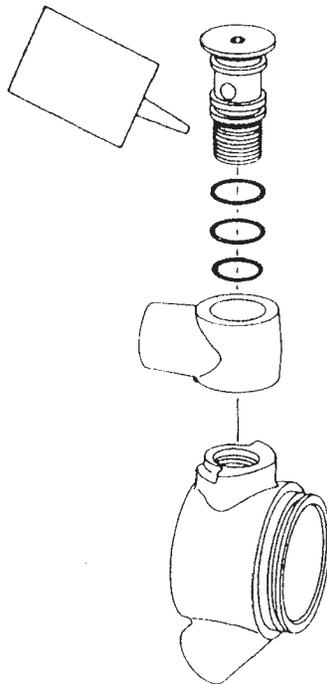
**SUBJECT:** Extreme Plus/Extreme Ice Swivel Posts

**TB24**

**DATE:** 3/11/93

To prevent loosening of Extreme Plus & Extreme Ice swivel posts, Dacor recommends using Loctite® #242 (Blue).

1. Remove the swivel post using a 5/32" allen wrench.
2. Apply one small drop of Loctite #242 to the swivel post threads only. Applying too much Loctite may cause difficulty removing the swivel post at a later date.
3. Re-install the swivel post and tighten to a torque specification of 8 Ft. Lbs.



# TECHNICAL BULLETIN



Post this bulletin in the service area of your store.

**SUBJECT:** Identification of Quantum Second Stages

**TB25**

**DATE:** 3/15/93

Beginning in 1993, Dacor changed the Quantum second stage regulator from pneumatically balanced to mechanically balanced. This change was made to better match the needs of divers who purchase the Quantum Regulator. Identification of these second stages is essential for proper servicing.

All Quantum Regulators manufactured in 1992 have a pneumatically balanced second stage. These regulators are identified with an "A" in the serial number. When performing annual maintenance, a pneumatic second stage annual service kit P/N 9680-22 must be used.

All Quantum regulators manufactured in 1993 have a mechanically balanced second stage. These regulators are identified with a "B" in the serial number. When performing annual maintenance, a mechanical second stage annual service kit P/N 9680-23 must be used.

Identification can also be made by inspecting the low pressure seat and seat carrier. A pneumatically balanced seat has a hole drilled through and air can be blown through the seat and seat carrier assembly. Air cannot be blown through a mechanically balanced seat and seat carrier assembly.

If you have any questions, please call Dacor Customer Service.

# TECHNICAL BULLETIN



Post this bulletin in the service area of your store.

**SUBJECT:** FLOW TUBE IDENTIFICATION

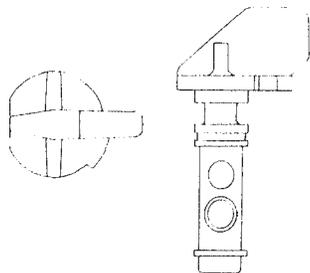
**TB 27**

**DATE:** 8/9/93

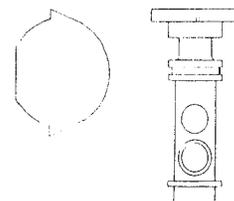
Part of Dacor's continuing research and development efforts over the past year, have been directed at regulator performance. The results of this research and development have incorporated several performance enhancing improvements in the line of modular regulators.

One of the key changes has been the modification of second stage flow tubes. Each flow tube variation will affect flow rate and degree of venturi in the second stage. Listed below is a reference chart of flow tubes currently used in production as of 7/12/93. The most recent change is the addition of the 0627-89 Non-Adjustable Plug, used on all primary mechanical second stages. This plug allows an improved flow rate with minimal venturi for stable breathing performance.

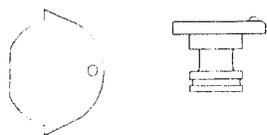
Please keep this bulletin handy when servicing regulators. All modular second stages can be retrofitted with the current flow tubes.



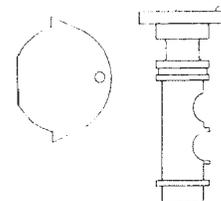
**0624-98**  
Adjustable Pneumatic Flow Tube  
Used on:  
Extreme Plus & Extreme  
'92 Quantum Pneumatic  
Primary Second Stages



**0625-78**  
Non-Adjustable Pneumatic Flow Tube  
Used On:  
Extreme Octo  
Quantum Octo  
Enduro Octo



**0627-89**  
Non-Adjustable Mechanical Plug  
Used On:  
Extreme Ice  
'93 Quantum Mechanical  
Enduro Primary  
Second Stages



**0626-98**  
Non-Adjustable Mechanical Flow Tube  
Previously Used On:  
All Primary Mechanical Second Stages  
Replaced by 0627-89