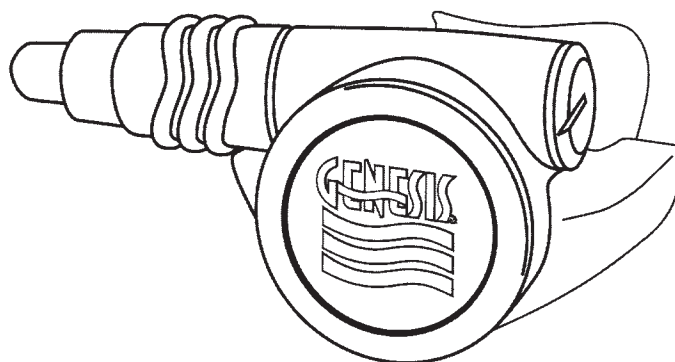




REPAIR & SERVICE MANUAL



VALOR GR230

VALOR OCTOPUS GS030

SECOND STAGE REGULATORS





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Procedural overview and illustrations provided by US Divers Co., Inc.

Technical assistance provided by Robert Ledbetter.

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I. Introduction

Genesis SCUBA regulator repair manuals are written and provided to Authorized Genesis Dealers for use as a guide to assist in the maintenance, overhaul and trouble-shooting of Genesis SCUBA Regulators. This manual should be used only by personnel that have attended a sanctioned Genesis Regulator Repair Seminar, given by a representative designated by the Liberty Group.

To receive information about repair seminars in your region, contact your Genesis Distributor or sales representative for the date of the next Regulator Repair Seminar in your area. All employees of current Genesis dealers are encouraged to attend.

ANYONE ATTEMPTING TO SERVICE OR REPAIR A GENESIS SCUBA REGULATOR MUST HAVE ATTENDED A SANCTIONED REPAIR CLINIC. THE TECHNICIAN SHOULD HAVE A THOROUGH UNDERSTANDING OF THE PRINCIPLES OF OPERATION OF SCUBA REGULATORS AND VALVES, AS WELL AS THE APPROPRIATE MECHANICAL ABILITY. THE TECHNICIAN MUST ALSO BE FAMILIAR WITH THE SAFE USE OF COMPRESSED AIR AND THE TOOLS AND CLEANING SOLUTIONS INVOLVED IN THE PROCEDURES OUTLINED IN THIS MANUAL. THIS MANUAL IS NOT INTENDED TO BE USED AS A SELF-TEACHING GUIDE.



NOTE: Remember that you are working on life support equipment. Good workmanship and cleanliness are extremely important. Do not attempt to substitute parts that look similar from other manufacturers into Genesis regulators. Substitute parts can lead to malfunction or reduced performance.

II. Safety Precautions

The following symbols are used throughout this manual to bring your attention to situations that require special consideration. Be sure to read and follow all instructions carefully.



A **WARNING** is used before a procedure that will result in serious injury or death if the procedure is not followed carefully.



A **CAUTION** is used before a maintenance technique that will result in damage to parts if that technique is not followed carefully.



A **NOTE** is used to emphasize an important maintenance technique.



III. General (User) Maintenance

Providing the best possible preventative and routine maintenance before, after and between dives will help to ensure the maximum life of a regulator, and more importantly, proper function between service intervals. To consistently achieve this goal, there are a number of simple, but important, routine maintenance procedures that should be followed by the customer after every use of the equipment. It is therefore important to advise the customer of the following recommended procedures:



NOTE: Refer the customer to the MAINTENANCE section of the GENESIS Regulator Owner's Manual.

POST-DIVE PROCEDURE

1. After each day of diving, the regulator must be cleaned, inspected and prepared for the next use, or for storage. As soon as the regulator is removed from the SCUBA cylinder, prepare the dust cap to be reinstalled over the regulator inlet port. Because the dust cap is normally attached to the regulator yoke, it has been underwater during the dive, so be sure to blow out all of the water in the dust cap before securing it over the inlet port. Failure to do this results in water or other contaminants entering the first stage, causing corrosion.
2. There are two methods of routinely cleaning regulators after each dive:

The Pressurized method

- a) Remove the dust cap. Attach the regulator to a charged SCUBA cylinder.
- b) Open the cylinder valve slowly to pressurize the regulator.
- c) Thoroughly soak both the first and second stage regulators in warm (not over 120°F) tap water to remove salt and mineral deposits. Direct water into the mainspring cavity of the first stage regulator, the second stage mouthpiece and the holes in the second stage front cover. Depress the purge button several times while the regulator is submerged in water. To remove excess water after soaking is complete, purge the second-stage a few more times.
- d) Close the cylinder valve and purge remaining air from the regulator. Remove the first stage from the cylinder.
- e) Dry the dust cap and place over the first stage inlet. Secure with the yoke screw.
- f) To air dry, lay the regulator on a clean towel, away from direct sunlight.

The Non-Pressurized method

The non-pressurized method can be performed if no charged cylinder is available.

- a) With the dust cap in place, thoroughly soak both the first and second stage regulators in warm (not over 120°F) tap water to remove salt and mineral deposits. After soaking, drain or blow all excess water out of the second stage.



NOTE: DO NOT DEPRESS THE PURGE BUTTON while soaking the second stage. Doing so will allow water to enter the hose and first stage.

- b) To air dry, lay the regulator on a clean towel, away from direct sunlight.
3. After drying, store the regulator as follows:
 - a) Store in a clean equipment box, or as an alternative, seal in a plastic bag
 - b) It is good practice to wipe rubber parts with a light application of silicone grease using an impregnated cloth if the regulator is to be stored for a long period of time.



GENERAL CAUTIONS AND WARNINGS - Whenever possible, be sure to advise your customers to take the following precautions while using or caring for their equipment.

CAUTION: First-stage regulators equipped with a DIN adapter must be cleaned with the pressurized method only, unless the inlet is covered with a threaded, o-ring sealed protective cap. Failure to adequately cover the DIN inlet will cause water to enter the first-stage, causing corrosion.

CAUTION: Do not expose any part of the regulator to silicone spray since some aerosol propellants attack, or degrade, rubber and plastic materials.

CAUTION: DO NOT use any type of solvent to clean any part of the regulator.

CAUTION: Never store the regulator while still connected to a SCUBA cylinder.

CAUTION: DO NOT carry the SCUBA cylinder by the regulator or hoses. Such abuse will eventually damage the regulator or the cylinder valve.

IV. Scheduled Dealer Service

1. Do not assume that a regulator is in good working condition because of storage or infrequent use. Remember that even prolonged or improper storage can result in internal corrosion and/or deterioration of o-ring seals and rubber components.
2. A regulator should be cleaned and adjusted frequently at a competent service facility (by a trained GENESIS repair technician). As an authorized GENESIS Scuba repair technician, it is your responsibility to inform your staff and customers that regulators require a complete servicing with scheduled parts replacement **at least** once a year in order to comply with the Limited Lifetime Warranty and 2 Year Parts Program for the regulator. **Failure to obtain service annually will void the warranty and parts program for the regulator.** The frequency of service should be appropriate for the frequency of use and the conditions under which the regulator is used. Use as rental or commercial equipment and/or use in salt, chlorinated (swimming pool) or polluted water might require cleaning and overhaul of the regulator more frequently. Chlorinated water is an especially bad environment for regulators since chlorine chemically deteriorates the neoprene rubber components.
3. Advise your customers to regularly inspect the filter in the inlet port of the first stage. If it is discolored or corroded, replacement by trained personnel is required. Also, the entire regulator may need a general overhaul with replacement of all soft seals and non-reusable components. Rust (red powder) or aluminum oxide (white/gray powder) deposits on the filter are usually an indication that water has entered the SCUBA cylinder and caused internal corrosion. The customer must be notified that their SCUBA cylinder(s) should be internally inspected and cleaned or hydrostatically tested as required.
4. When counseling your customers on preventative maintenance, inform them that no other adjustment or maintenance of their regulator is recommended by GENESIS Scuba. For adjustments such as intermediate pressure setting or proper lubrication, the regulator must be taken to an Authorized GENESIS Scuba Dealer.

V. Disassembly

GENERAL CONSIDERATIONS:

This section of the manual presents step-by-step disassembly procedures for the Valor second stage regulator. It is important that the sequence be followed exactly in the order given. Read over the entire manual prior to overhaul to become familiar with maintenance procedures. Take special note of all reference tables following these procedures.

Servicing of the second stage regulator should be carried out in a work area specifically set up and equipped for the task. Adequate lighting, cleanliness and easy access to all required tools are essential for an efficient repair facility. Special tools (see Table 7) are required for disassembly and subsequent assembly.

Before disassembling the second stage regulator, perform a pretest. By following the tests described in Section XI. J. and making reference to the Troubleshooting Guide, you will be able to determine the need for parts replacement.



NOTE: Fold out the exploded view of the Valor 2nd Stage from the back cover of this manual for easy reference during the service procedure.

1. Slide back the hose protectors from both ends of the hose. While holding the hex nut (item 24) with a $\frac{3}{4}$ " wrench, use a $\frac{11}{16}$ " wrench to unscrew the swivel end of the hose. Use a $\frac{9}{16}$ " wrench to unscrew the hose from the 1st stage body.
2. Remove and discard the o-rings (items 29 and 30) from both ends of the hose.
3. Remove the color ring (item 1) from the front cover by turning it counter clockwise by hand.
4. Place the two pins of cap wrench (G1001-88) into the slots of the retaining ring (item 2). Turn counter clockwise to remove.
5. Lift out the purge cover (item 3) and diaphragm (item 4).
6. Use a $\frac{3}{4}$ " wrench and remove the hex nut (item 24) by unscrewing it counter clockwise.
7. Remove the cap (item 13) by turning it counter clockwise using the screwdriver blade of the cover wrench (G1001-88).
8. Remove and discard the o-ring (item 12).
9. Remove the adjustment screw (item 11) with a $\frac{1}{8}$ " flat-blade screwdriver, turning counter clockwise.
10. Remove the small plastic washer (item 10) and the spring (item 9) from the stem of the adjustment screw.



CAUTION: The lever (item 5) must be pulled up and out of the way prior to sliding the valve body (item 16) over in the case. Failure to do this will cause the lever to become stuck in the exhaust port of the case. *Figure 1.*

11. Removal of the lever.
 - a) Rotate the lever (item 5) up against the side of the case. *Figure 1.*
 - b) Push the valve body (item 16) into the case from the hose side until the head of the pin (item 6) is exposed.
 - c) Turn the case vertical (mouthpiece up) and gently shake the case until the pin falls out. If the pin does not readily fall out, insert the Seat Extractor (G1094-36) through the mouthpiece and push the pin free.
 - d) Gently remove the lever.

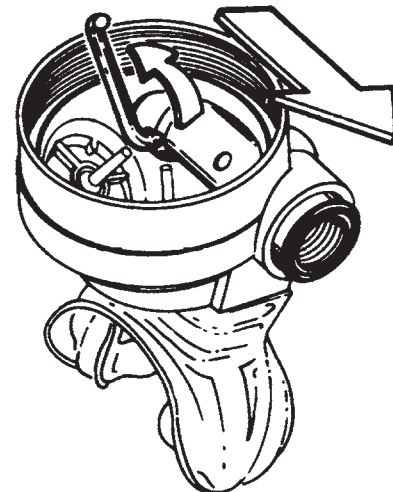


Figure 1

12. Slide the valve body completely out of the case.
13. Turn the valve body up, and the poppet and seat assembly (items 14 & 15) will fall out.
14. Remove and discard the seat (item 15).
15. Remove and discard the valve body o-ring (item 17).
16. Use a medium flat-blade screw driver, and turn the orifice (item 25) counter clockwise until the threads disengage.
17. Using a soft probe or the Seat Extractor Tool (G1094-36), push the orifice out of the valve body from the adjustment screw side. *Figure 2.*
18. Remove and discard the orifice o-ring (item 26).



Figure 2



19. Use pliers or diagonal cutters to cut the mouthpiece clamp, and then remove the mouthpiece.
20. Use the Pre-Adjustment Tool (G1001-68) to press the c-clip (item 18) off of the Vane Adjustment Switch (item 21). *Figure 3*.
21. Press the vane out with your finger tip, and pull the switch out of the case.
22. Remove and discard the o-ring (item 22).
23. Grasp the exhaust tee (item 8) and stretch it off of the case.
24. Remove and discard the exhaust valves (item 7).

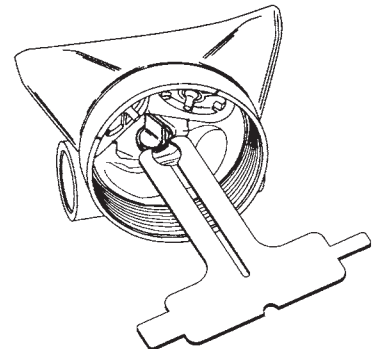


Figure 3

VI. Parts Cleaning



CAUTION: NEVER expose plastic or rubber parts to solvents, acidic, or caustic cleaning agents of any type. Never use aerosol silicone sprays to lubricate or clean plastic or rubber parts. The propellant or solvents may attack or weaken them.

1. All of the o-rings, seats and exhaust valves are routinely replaced during a general overhaul.
 - a) All of the parts in the repair kit should be installed in the Valor, and the used parts discarded.
 - b) A list of the parts to be replaced during routine maintenance is on page 6 of this manual.
2. All of the plastic and rubber parts (case, front cover, retaining ring, color ring, diaphragm, poppet, adjustment screw, vane adjustment switch, mouthpiece, exhaust tee, and access port cap) should be cleaned in fresh, warm (not over 120°F) water with a mild detergent. Use a soft nylon brush, if necessary.
 - a) Rinse in clean, fresh water.
 - b) Blow dry with low pressure air (less than 30 psi.)
 - c) Inspect the parts for cracks, burrs, distortion and solvent attack.
 - d) Hold the diaphragm up to the light and gently stretch it, looking for holes and tears and proper placement of the nylon plate.
 - e) Inspect the poppet for wear, and ensure that the relief hole is free of blockage.
3. Use a soft nylon brush to loosen and remove any loose or flaking material from all metal parts.



NOTE: The orifice (item 25) should be cleaned and rinsed separately to prevent any damage to the sealing surface that could be caused by contact with the other parts.

4. Place the metal parts in suitable cleaning solution (see list on page 12).
 - a) Genesis recommends the use of an ultrasonic cleaner, and mixing cleaning materials to manufacturer's specifications.
 - b) If a 50% vinegar/50% water solution is used, check parts frequently to avoid deterioration of the finish.
 - c) Always follow manufacturer's recommendations for dilution and soak times. The plating on interior bore surfaces is very thin and can easily be damaged. Subsequent corrosion of unprotected brass can lead to early performance deterioration.



CAUTION: Do not over use acid solutions, damage to plated surfaces may result. NEVER use a wire brush to remove mineral encrustation or corrosion. Damage to plated surfaces or orifice sealing surfaces may result.

- d) If no ultrasonic cleaning tank is available, use the cleaning solution mixed to manufacturer's specifications, or 50% water/50% white vinegar solution. Immerse metal parts and gently agitate for three to four minutes. Check frequently.
5. Thoroughly rinse the clean parts in fresh water, and blow dry with low pressure air (30 psi or less).



VII. Parts Inspection

1. All of the parts in the kit should be inspected before use. Look for contaminants and molding flaws before installation.
2. All reusable metal components must be inspected for burrs, scoring and corrosion. Genesis strongly recommends the use of a strong light and magnifying lens to aid inspection.
3. Replace components if you find:
 - a) blistered, peeling or cracked chrome;
 - b) damaged threads, cross-threaded or stripped threads;
 - c) scratches or damage to o-ring sealing surfaces;
 - d) nicks, burrs, scoring or scratches that could effect sliding or rotating parts;
 - e) solvent attack, deformation, cracking or distortion of plastic parts;
 - f) holes, tears or dislodged plate on the diaphragm.
4. Pay specific attention to the following parts and replace if necessary.
 - a) Inspect the poppet (item 14) for nicks, galling or wear of the lever groove. The hole under the seat must be clear of obstruction. Replace if necessary.
 - b) Examine the sealing surface of the orifice (item 25) for scratches, nicks, excessive wear or damage to the plating. Inspect the o-ring seating surface and threads. Replace if necessary.
 - c) Examine the valve body (item 16) for internal scratches or corrosion damage and inspect the threads and o-ring sealing surface. Replace if necessary.
 - d) Examine the Vane Adjustment Switch (item 21) for damage or solvent attack and inspect the o-ring groove for scratches or wear.
 - e) Check the demand lever (item 5) for bending, distortion or excessive wear. Replace if necessary.
 - f) Examine the back half of the case (item 23) for cracks, or damaged threads. Replace if necessary.
 - g) Inspect the diaphragm (item 4) for cuts, pinholes, or any other damage by gently stretching it while holding it to a light. The pressure plate in the center of the diaphragm is held in place by tension. Ensure the pressure plate is properly seated. Replace if necessary.
 - h) Inspect the hose for cuts, nicks, cracking, or hardening. Pay particular attention to the outer jacket at the hose ends. Look for damage around the crimped portion of the hose fittings. If the braided reinforcement is showing or there is evidence that the hose is pulling out of the fittings, replace the hose. Inspect the threads on the hose fittings and the o-ring seating surfaces. Replace if necessary.

Refer to TABLE 1 - Troubleshooting Guide for additional problem areas.

VIII. Routine Replacement Parts

These parts are included in Genesis Valor Parts Kit, PK030, and should be replaced during all routine maintenance.

Item Number	Part number	Description	Qty Needed
7	G1001-22	exhaust valve	2
12	R016B	o-ring	1
15	G1085-10	l.p. seat	1
17	R014B	o-ring	1
19	G1049-13	clamp	1
22, 26, 29	R010B	o-ring	3
30	R011B	o-ring	1



NOTE: Genesis recommends that all of the parts in the Routine Replacement Parts list be replaced every year for regulators used by recreational divers. Heavily used rental regulators and commercially used units should be serviced on more frequent intervals, based on their level of use and abuse. The second stage diaphragm need only be replaced if it shows signs of damage from age, deterioration or chemical attack.



IX. Reassembly Procedure

1. Lubricate the o-ring (item 22) and install it into the o-ring groove in the vane adjustment switch (item 21).
2. Install the Vane Adjustment Switch into the hole on the top of the mouth tube of the case (item 23). Make sure the pin on the switch is in the groove in the case. *Figure 4*.
3. While holding the vane adjustment switch in place with your finger, turn the case over as shown in *Figure 5*. Place the c-clip (item 18), with the flat side up, rounded side toward the case, into the groove below the vane. Using the Valor Pre-Adjustment Tool (G1001-68), push on the c-clip until it snaps in place. Make sure the c-clip is fully seated in the groove.
4. Install a new low pressure seat (item 15) into the poppet (item 14), and set it aside.
5. Lightly lubricate the o-ring (item 26), and install it into the groove in the orifice (item 25).
6. Push the orifice into the valve body (item 16) with your finger tip, and then press it into the valve body with the blunt end of the seat extractor tool (G1094-36). DO NOT thread the orifice in place at this time. *Figure 6*.
7. Hold the valve body (item 16) with the two large holes in the side facing up. *Figure 7*. Hold the poppet assembly (item 14) such that the rib with the hole in it is facing up. Slide the poppet into the valve body, seat end first.

N **NOTE:** The valve body has four flats on the threaded end that must be aligned properly in the case. To achieve proper orientation, ensure the large air supply holes are facing downward, toward the mouth tube.

8. Rotate the valve body so that the recessed hole for the pin is facing up. Hold the case with the diaphragm opening up, and slide the valve body, male threaded end first, into the case, until two male threads are showing on the outside of the case. Tip the case so that the male threads on the valve body are angled downward.
9. Insert the notched end of the lever (item 5) into the valve body with the lever up, and the flat of the notch toward the male threaded end.
10. Hold the pin (item 8) by its head, and insert it into the hole until the head is flush with the valve body. Gently tug on the lever to ensure that it is locked in place.
11. Push the valve body the rest of the way into the case. The o-ring (item 17) may need to be compressed as the valve body is seated. To do this, gently push down on the o-ring with a flat screwdriver blade, as you slide the valve body into place.
12. Insert the spring (item 9) into the valve body. Make sure the spring seats on the poppet between the three ribs. Place the small plastic washer (item 10) onto the stem of the adjusting screw (item 11). Next, using the Valor Pre-Adjustment Tool (G1001-68), thread the adjusting screw into the valve body until it is flush with the end of the valve body.

N **NOTE:** If the lever is properly installed, it will rise slightly in the case when you have tightened the adjusting screw flush with the valve body. If the lever does not rise, check to see if the lever has properly seated in the valve body.

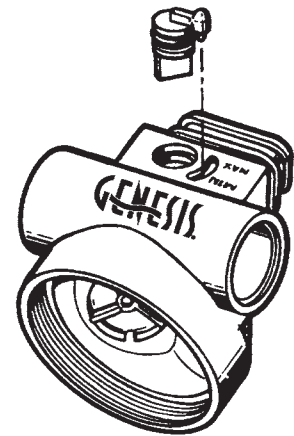


Figure 4

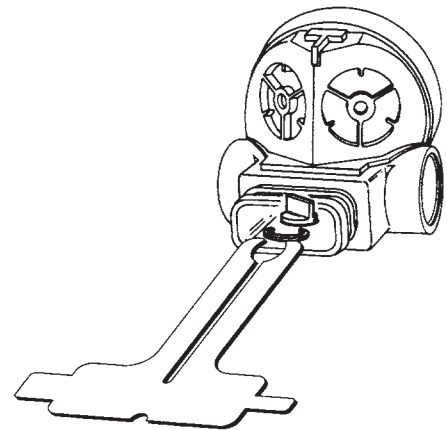


Figure 5



Figure 6

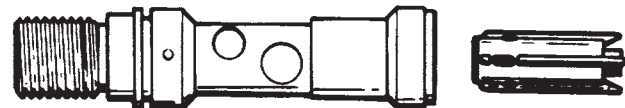


Figure 7



13. Thread the hex nut (item 24), shoulder side toward the case, clockwise on to the valve body assembly. Tighten to 45 to 55 inch pounds.



CAUTION: FAILURE TO DEPRESS THE LEVER (item 5) WHILE TURNING THE ORIFICE (item 25) WILL CAUSE DAMAGE TO THE SEAT (item 15), REQUIRING REPLACEMENT.

14. Using the small screwdriver end of the Valor Pre-Adjustment Tool(G1001-68), turn the adjusting screw (item 11) clockwise until the shoulder on the tool prevents further advancement. If the tool is not available, carefully turn the adjustment screw eight full 360 degree turns into the case with a 1/8" flat blade screwdriver.



NOTE: The Valor Pre-Adjustment Tool(G1001-68) makes adjustment of the Valor 2nd stage much easier, and will give repeatable results. Genesis strongly recommends the use of this tool on every repair.

15. While depressing the lever (item 5), turn the orifice (item 25) clockwise, using the large screwdriver on the Valor Pre-Adjustment Tool until the shoulder prevents the orifice from turning further. If you do not have a multi-tool, turn the orifice six full 360 degree turns into the valve body.
16. Install the exhaust valves (items 7) into the case (item 23) from the outside. Be sure the valve stems are properly seated. Carefully snip off the ends of the stems from inside the case with scissors or wire cutters.
17. Install the exhaust tee (item 8) onto the boss on the case by placing the tab on one side of the tee into the groove in the case, then stretching the tee in place. Press the center tab and then the opposite corner tab into place.
18. Install the mouthpiece (item 20) on to the mouth tube of the case. If using the stock mouthpiece, the bridge should face up. Fasten the mouthpiece in place with a new mouthpiece clamp (item 19). The locking tab on the clamp should be closest to the hose fitting. Trim the excess length closely with a knife after tightening the clamp tightly with pliers.
19. Place the diaphragm (item 4) over the lever with the plate facing the lever, and seat it into the case. Place the purge cover over the diaphragm, ensuring the logo and waves are horizontal.
20. Thread the retaining ring (item 2) clockwise over the purge cover, using the retaining ring and cap wrench (G1001-88). Snug the retainer hand tight.
21. Thread the color ring (item 1) clockwise into the case hand tight.



NOTE: O-ring (item 12) and cap (item 13) will not be installed until adjustments and testing procedures have been completed.

X. Authorized Adjustment and Testing



CAUTION: Prior to adjusting and testing of the Valor 2nd stage, you should first complete the adjusting and testing of the 1st stage regulator with which it will be used. Refer to the appropriate 1st stage manual, and complete all recommended tests before proceeding with this manual.

1. Attachment of the 1st stage to the 2nd stage.
 - a) Lightly lubricate and install the two o-rings (item 29 and item 30) on to the intermediate pressure hose (item 28).
 - b) Attach the hose to the primary low pressure port on the 1st stage body using a 9/16" wrench. Torque to 40 inch pounds. The primary port is identified by a ** stamp.
 - c) Connect the 1st stage to a source of low pressure (500 psig) breathing air. While firmly holding the free end of the 2nd stage hose, carefully open the valve and flush out any dirt or debris with a small quantity of air flow.
 - d) Thread the swivel end of the second stage hose on to the Valor In-Line Adjustment Tool (G1001-95) by turning the swivel nut clockwise, hand tight. Pull back the adjustment knob to retract the screwdriver end, and thread the second stage on to the adjustment tool hand tight. *Figure 8.*

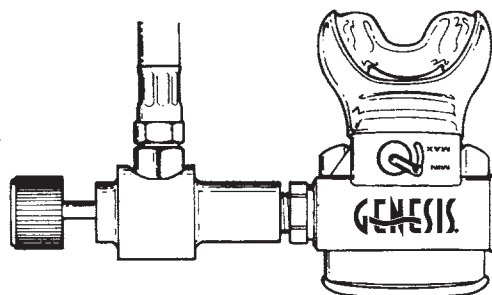


Figure 8



2. Valor 2nd stage adjusting and testing.



CAUTION: ALWAYS DEPRESS THE PURGE COVER WHEN ADJUSTING THE ORIFICE. FAILURE TO DEPRESS THE PURGE COVER WHILE ADJUSTING THE ORIFICE WILL CAUSE DAMAGE TO THE LOW PRESSURE SEAT (ITEM 15), REQUIRING ITS REPLACEMENT.

- Place the Vane Adjustment Switch (item 2) in the "MIN" position. *Figure 9.* Slowly pressurize the 1st Stage regulator to 3500 to 3000 psig. Verify a steady hose pressure of 135-150 psig.
- Depress the purge cover and adjust the orifice by pushing in on the adjustment knob of the In-Line Adjustment Tool and turning the knob ¼ turn counter clockwise. Release the purge cover and listen for a slight leak from the 2nd stage. If no leak is detected, repeat the procedure, pressing the cover and turning ¼ turn counter clockwise until a leak begins.
- Once the regulator 2nd stage is leaking as described above, hold the purge cover down and turn the adjusting knob clockwise in 1/8th turn increments until the leak stops when the purge cover is released.
- With a 1/8" screwdriver, loosen the adjusting screw (item 11) by turning the screwdriver counter clockwise until there is barely a leak. Next, turn the adjustment screw clockwise until the leak just stops.
- Purge the regulator several times and listen for leaks. Adjust as necessary to eliminate leaks.
- Turn off the air and depressurize the regulator.

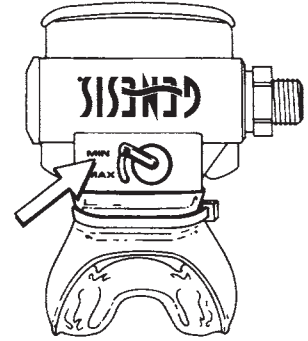


Figure 9



NOTE: Once the regulator has been depressurized, the adjusting knob must be retracted prior to removal of the tool from the 2nd stage inlet. Failure to retract the knob will cause the screwdriver blade of the tool to remain in engagement with the orifice, and inadvertent adjustment to occur. This will require readjustment of the 2nd stage, as outlined in Steps 2a - 2f above.

- With the adjustment knob fully retracted, turn the 2nd stage counter clockwise and remove it from the inline tool. Next, turn the swivel nut on the hose counter clockwise and remove it from the adjustment tool.
- Thread the swivel nut on the hose on to the inlet of the valve body until hand tight. Using a 11/16" wrench, tighten the hose to 40-inch pounds of torque.
- Lightly lubricate the o-ring (item 12), and install it on to the valve body assembly (item 16). Thread the access cap (item 13) clockwise into the valve body. Snug the plug hand tight with the screwdriver blade of the cap wrench (G1001-88). Slide the hose protector back into place over the hex retainer nut.



NOTE: Before placing the Valor regulator back in service, the following sequence of tests are necessary. A flow bench is the preferred device to ensure the quality of your adjustments. This will enable the service technician to check critical performance requirements of the regulator more precisely. If a flow bench is not available, testing with the use of a SCUBA cylinder (the less preferred testing procedure) will follow this section.

Second Stage Air Flow Test with Flow Bench

- With the regulator attached to the flow test bench, repressurize the regulator to 3500 to 3000 psig. Place the 2nd stage mouthpiece over the flow stand mouthpiece adapter. Slowly turn the flow meter control knob until flow reaches a minimum of 15 scfm (425 lpm). The reading on the Magnahelic gauge should indicate no more than 6.0" water column. If the reading is over 6.0 w.c., refer to Table 1 Troubleshooting Guide, for corrective procedures.
- Second Stage Opening Effort Test.** With the flow control knob turned off, gently inhale on the regulator. When the air starts to flow, the Magnahelic gauge should indicate an opening effort of +0.6" w.c., up to 1.5" w.c. for an octopus. If the opening effort is not within this range, refer to Table 1 Troubleshooting Guide, for corrective procedures.
- Second Stage Purge Flow Test.** With the flow control knob turned off, and the mouthpiece mounted on the adapter, fully depress the purge cover and watch the flow meter gauge. The flow meter must



indicate a minimum of +5.0 scfm (142 lpm.) If the purge flow is not correct, refer to Table 1 Troubleshooting Guide, for corrective procedures.

Second Stage Air Flow Test with a SCUBA Cylinder

1. Attach Hose Pressure Test Gauge (G1116-10) to the regulator 1st Stage.
2. Place the Vane Adjustment Switch in the "MIN" position.
3. With the regulator attached to a full SCUBA cylinder, repressurize the regulator to 3000 to 3500 psig. Hose pressure should be 135-150 psig.
4. *Second Stage Purge Flow Test.*
Fully depress the purge cover. There should be a moderate flow of air from the mouthpiece. If the purge flow is not correct, refer to Table 1 Troubleshooting Guide, for corrective procedures.
5. *Second Stage Opening Effort Test.*
 - a) Hold the second stage by the mouthpiece so that the diaphragm is horizontal.
 - b) Slowly lower the Valor into a pan of clean water. The regulator should start to free flow at about one inch of water depth on the diaphragm, indicating an approximate opening effort of one inch of water column.
 - c) If the opening effort is not correct, refer to Table 1 Troubleshooting Guide, for corrective procedures.

Final Tests to be performed on all regulators

1. *Second Stage Leak Test.* After final reassembly and adjustment of the Valor regulator, the following simple tests for external leaks are recommended.
 - a) With the air turned OFF, and the regulator still connected to the air source, inhale hard on the 2nd stage. If any air leaks into the regulator, inspect it for leaks. The seal of the diaphragm to the case, the exhaust valves and the condition of the mouthpiece should be suspect.
 - b) With the regulator connected to an air source, (a small pony bottle is ideal), submerge the entire system. Turn on the air supply. Observe the regulator 1st and 2nd stages for one minute. The one minute period will allow small leaks, if present, to form observable bubbles. Bubbles indicate a leak that might worsen, which means the regulator must be disassembled to check sealing surfaces.
 - c) Correct any problems and reassemble and readjust as required, following the procedures in this manual.
2. *Subjective Breathing Test.*
Breathe on the regulator slowly and deeply 4 or 5 times. It should deliver air without excessive effort, free flow or fluttering of the diaphragm. When exhaling there should be no fluttering or sticking of the exhalation valve. If you suspect problems, refer to Table 1 Troubleshooting Guide, for corrective procedures.



TABLE 1 Troubleshooting Guide

Valor 2nd Stage Regulator

PROBLEM	PROBABLE CAUSE	RECOMMENDATION
Leaking or hissing sound from second-stage (Vane in "MIN" position)	High intermediate-pressure	Set intermediate pressure to 135-150 psig. See Genesis 1 st Stage Manual Troubleshooting Guide.
	Lever (item 5) set too high	Adjust orifice (item 25) clockwise to lower lever. (See Section X, Adjustment and Testing)
	Adjustment screw (item 11) improperly adjusted	Turn adjustment screw (item 11) clockwise
	Lever (item 5) bent	Replace lever (item 5)
	O-ring (item 26) dirty, damaged or worn	Replace o-ring (item 26)
	Orifice (item 25) seating surface or o-ring groove dirty, damaged or worn	Clean and inspect orifice (item 25). Replace if damaged.
	Seat (item 15) dirty, damaged or worn	Replace seat (item 15)
	Poppet (item 14) dirty, damaged or worn	Clean or replace poppet (item 14)
	Valve body (item 16) o-ring (item 17) sealing surface dirty, damaged or worn	Clean or replace valve body (item 16)
	Spring (item 9) worn or weak	Replace spring (item 9)
Hard to breath	Intermediate pressure set too low	Set intermediate pressure to 135-150 psig. See Genesis 1 st Stage Manual Troubleshooting Guide.
	Lever (item 5) set too low	Orifice (item 25) too far in. Adjust orifice out counter-clockwise.
	Adjustment screw (item 11) improperly adjusted	Adjustment screw (item 11) too far in. Adjust screw counter-clockwise. (See Section X, Adjustment and Testing)
	Lever (item 5) bent	Replace lever (item 5)
	Spring (item 9) not properly seated on poppet (item 6)	Disassemble and reset spring (item 9) on poppet (item 14)
	First -stage sintered filter clogged	Inspect filter and replace if necessary.
	Intermediate-pressure hose (item 28) clogged	Clean or replace hose (Item 28)
Low purge flow	Lever (item 5) set too low	See adjusting procedures in Section X.
Water entering second-stage	Hole in mouthpiece (item 20)	Replace mouthpiece (item 20)
	Vane o-ring (item 22) dirty, damaged or worn	Examine and/or replace o-ring (item 22)
	Hole in diaphragm (item 4)	Replace diaphragm (item 4)
	Diaphragm (item 4) improperly seated between case and purge cover (Items 23 & 3)	Disassemble and properly reassemble
	Exhaust valve seating surface on case (item 23) dirty, damaged or worn	Clean and/or replace case (item 23)
	Damaged exhaust valve (item 7)	Replace exhaust valves(s) (item 7)
	O-rings (items 17 & 12) dirty, or damaged	Clean or replace o-rings (items 17 & 12)
	Cracked or damaged case (item 23)	Examine and/or replace case (item 23)
External air leaks NOTE: Immerse pressurized regulator in water to locate source of leak. Always depressurize system prior to tightening loose fittings, plugs or hoses.	Intermediate-pressure hose (item 28) loose	Tighten intermediate pressure hose
	O-rings (items 29 and/or 30) dirty, damaged or worn	Examine and/or replace o-rings (items 29 & 30)
	First-stage fittings too loose	See the Genesis 1 st Stage Service Manual



TABLE 2 Test Bench Specifications

Test	Condition	Acceptable Range
Leak Test	inlet pressure: 3000 - 3500 psi	no leaks allowed
Intermediate pressure	inlet pressure: 3000 - 3500 psi	hose pressure 135-150 psig
Intermediate pressure creep	inlet pressure: 3000 - 3500 psi	hose pressure should not change more than 5 psig within 15 seconds after purging regulator.
Opening effort	hose pressure: 135-150 psig	.6 - 1.5 inches water column
Flow effort	hose pressure: 135-150 psig flow rate: 15 SCFM	6 inches water column or less
Purge flow	hose pressure: 135-150 psig	5.0 SCFM flow rate minimum

TABLE 3 Torque Specifications

Part Number	Description / Item Number	Torque
1001-36	Hex Retaining Nut item 24	45 to 55 inch pounds
1022-36	Hose Assembly item 28	40 inch pounds



NOTE: All hoses attached to the regulator, including gauge and BC inflator hoses, should be installed to 40 inch pounds of torque before any leak tests are performed.

TABLE 4 Recommended Lubricants and Cleaners

Item	Application	Source(s)
Dow Corning DOW-111	For regulators in service with air only (21% oxygen max.). All o-rings and threaded metal parts.	Genesis distributor
Christo Lube 111	For regulators in service with air or enriched air mixtures. <i>See Note below.</i> All o-rings and threaded metal parts.	Genesis distributor, Lubrication Technology, Inc. 310 Morton Street Jackson, Ohio 45640
NOTE: Use only a light film of lubricant. Do not use silicone spray. Sprays leave very little lubricant after the propellant evaporates and the propellant in many sprays attacks plastic and rubber parts. NOTE: Use of regulators with enriched air mixtures (over 21% oxygen) requires special cleaning, handling, and maintenance techniques. The standard model Valor regulator is not intended for use with enriched air mixtures.		
Ultrasonic cleaner with ultrasonic detergent	Mixed according to manufacturer specifications. All metal regulator parts	Dental supply houses Ultrasonic manufacturers
Oakite #31	All metal regulator parts	Oakite Products, Inc 50 Valley Rd. Berkeley Heights, NJ 07922
Lawrence Factor LWF	All metal regulator parts	Lawrence Factor (305) 430-0550
White Distilled Vinegar	50/50 solution with fresh water. All metal regulator parts	Grocery Stores
Liquid dishwashing detergent	All reusable parts	Grocery Stores



TABLE 5 O-Ring Reference Chart

This chart is provided to help you identify the o-rings included in the parts kit. All sizes are approximate. DO NOT use this chart as a guide for selecting substitute o-rings.





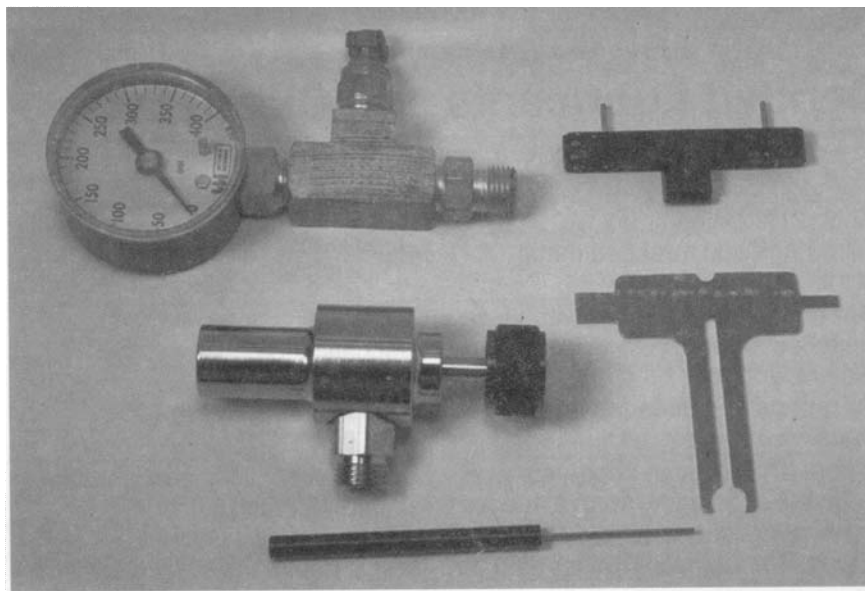
	R016B	Valve body / cap
	R014B	Valve body
	R010B	Vane Adjustment Switch Orifice Hose end, swivel
	R011B	Hose end, male

TABLE 6 Special Tools Required for proper maintenance of the Valor 2nd stage.



G1116-10 Hose Pressure Test Gauge,
0-400 psig

G1001-95 In-Line Adjustment Tool

G1001-88 Cap Wrench

G1001-68 Valor Pre-Adjustment Tool

G1094-36 Seat Extractor

Additionally, the technician should have a complete set of wrenches, adjustable wrenches, torque wrench (0-50 ft/lbs.), common tools, a source for high pressure and low pressure breathing air, and a clean well lighted work area. A professional flow bench is highly recommended for making accurate adjustments.



Limited Lifetime Warranty (as printed in the Genesis regulator Owner's Manual)

GENESIS regulators are warranted to be free of defects in materials and workmanship for as long as you own the regulator. This warranty originates at the date of consumer purchase from an authorized GENESIS retailer. The warranty is limited and subject to the restrictions listed below.

What is covered

All parts of your Genesis regulator are covered under this warranty. Should any part of your Genesis regulator be found *defective*, Genesis Scuba, at its discretion, will repair or replace the component at no charge to you.

What is not covered

Inspection, service, and/or labor charges will be paid by the regulator owner.

Some regulator parts are subject to wear even under normal or minimal use. O-rings, high pressure seats, low pressure seats, filters, star washers, diaphragms, exhaust valves, tie wraps, mouthpieces, and hoses should be inspected for excessive wear on a regular basis. Replacement of worn items constitutes normal maintenance, and is the responsibility of the owner. *See the GENESIS 2 Year Parts Program below.*

This warranty does not cover damage to the product resulting from the introduction of rust or other contaminants from the air supply, normal wear, improper usage, improper maintenance, neglect of care, alteration, or unauthorized repair. This warranty will automatically become void if proper preventative maintenance procedure have not been followed as outlined in this manual.

All repairs made, not covered under the terms of this warranty, will be made at the owner's expense.

What you need to do

Keep a copy of the original purchase receipt and subsequent inspections with this manual.

Your GENESIS regulator must be inspected and serviced by a qualified GENESIS repair facility within 6 weeks before or after the one year anniversary date of your purchase or last servicing. Service must take place at least annually, or more frequently with heavy use. See your authorized GENESIS retailer if you have questions regarding the recommended frequency of service. Failure to have your regulator inspected/serviced within the specified time will void the warranty.

The repair facility must sign your service registration log at each annual inspection. Failure to do so will void the warranty.

Put this manual, your original purchase receipt, and subsequent inspection receipts in a safe place for future reference.

This warranty is nontransferable from the original owner. No salesperson, dealer, or representative is authorized to make any modification to this warranty.

ALL IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED TO THE DURATION OF THIS WRITTEN WARRANTY. Some states do not allow limitations on the duration of implied warranties so this may not apply to you.

GENESIS SCUBA SHALL NOT BE LIABLE OR RESPONSIBLE IN ANY MANNER FOR LOSS OF USE OF THE PRODUCT OR ANY INCIDENTAL, CONSEQUENTIAL, OR INDIRECT COSTS, EXPENSES OR DAMAGES INCURRED WITH THE USE OF THE GENESIS REGULATOR. Some states do not allow this exclusion so this limitation may not apply to you.

This warranty gives you specific legal rights. You may have rights which will vary from state to state.

GENESIS 2 Year Parts Program

Genesis Scuba will provide the annual service kits for your Genesis regulator for your first two annual service/inspections. The service kits contain all the standard overhaul parts that Genesis recommends be replaced at least on an annual basis.

The GENESIS 2 Year Parts Program is automatic but you must adhere to the stipulations of the Limited Lifetime Warranty to keep it in effect.

- Your regulator must be inspected/serviced only by an qualified GENESIS repair facility.
- Your regulator must be inspected/serviced within 6 weeks before or after the one year anniversary date of your purchase or last servicing.
- Keep a copy of the original purchase receipt and subsequent inspections with this manual.
- Inspection, service, and/or labor charges will be paid by the regulator owner.

This program is nontransferable from the original owner.



Genesis Regulator Warranty - Dealer Procedure

At the time of sale:

1. Complete the Inspection Record on page 15 of the Regulator Owner's Manual. The purchase date, model of regulator, service technician's name and serial numbers of both first and second stages must be recorded on this page. The customer needs to keep this information and the transaction receipt as a record of the original purchase.
2. You also need to let your customer know that this record (the Regulator Owner's Manual and receipt) is important and must be presented to the service facility to take advantage of the 2 Year Parts Program and Limited Lifetime Warranty. Recommend the customer keep these items in a safe, accessible place - with his/her logbook for instance.

When it's time for service:

In order to keep the Limited Lifetime Warranty and 2 Year Parts Program in effect, the customer must provide: the regulator, the owner's manual, the original sales receipt, and receipts or records of any subsequent service.

You need to:

1. Verify ownership of the regulator. The warranty and parts program are only eligible to the original retail purchaser.
2. Verify warranty is in effect. Service must take place within one year of the original purchase date, ± 6 weeks; or within one year of the last service procedure, ± 6 weeks. Additional service procedures will not affect the warranty, however, exclusion of an annual service procedure within the specified time frame will void the warranty and parts program.
3. Determine if 2 Year Parts Program is in effect. The 2 Year Parts Program provides a free parts kit for each of the first two annual service procedures as long as the customer has kept the warranty in effect.
2 Year Parts Program in effect. Cut out the applicable coupon from the inside back cover of the Owner's Manual. Completely fill out all information on the coupon. ALL information must be provided to obtain parts kit replacement.
2 Year Parts Program expired or void. Notify the consumer of the warranty status of this regulator and estimate his/her parts costs before beginning the service procedure.
4. Service the regulator with appropriate parts kit. Each kit contains all the standard overhaul parts that Genesis recommends be replaced at least on an annual basis.
5. Record the service on page 15 of the regulator owner's manual. The repair facility must sign the Inspection Record at each annual service. Failure to do so will void the warranty.
6. Return the regulator and the owner's manual with all dated receipts and records to the customer. Again, stress to the owner the importance of keeping all receipts for verification of warranty status in the future. It is a good idea to staple the receipts inside the back cover of the regulator Owner's Manual.
7. Send the completed coupon to your Genesis Scuba distributor. Your distributor will replace the coupon with a new kit of the same parts.

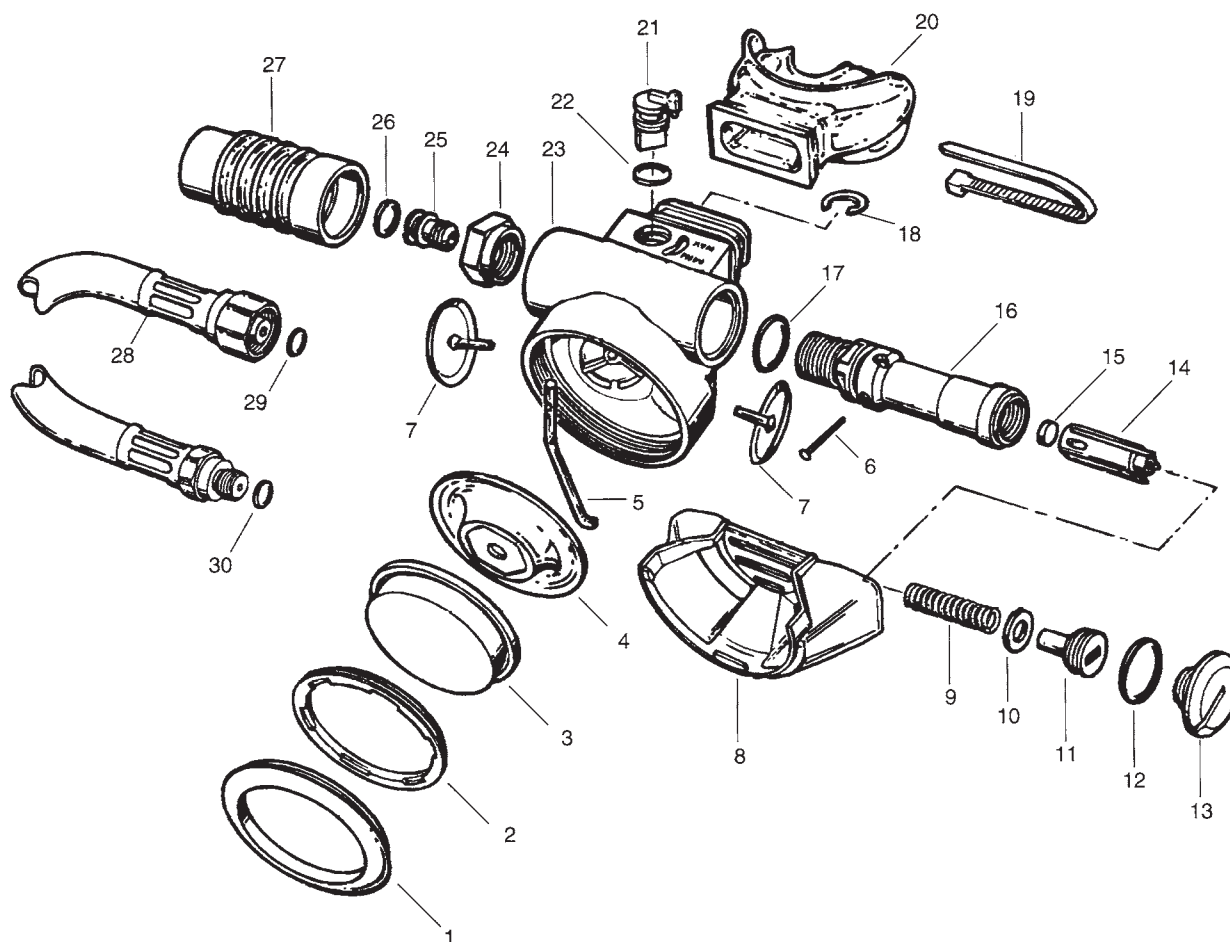
Defective Parts

Should any part of a Genesis regulator be found defective in materials or workmanship, Genesis Scuba, at its discretion, will repair or replace the component at no charge to the dealer. Please refer to the warranty statement on the previous page for explanations and examples of items that are, and are not, covered by this warranty. Defective parts should be sent to your Genesis distributor along with a completed Defective Parts Claim Form. (Forms are available from your Genesis distributor, or you may photocopy the form on the next page.) ALL information must be provided for the claim to be processed. Contact your Genesis distributor to obtain a Returned Goods Authorization number and other shipping instructions. Shipments without an RGA number visible will be refused and returned to sender.

This form is *not* to be used for normal, regular maintenance items, seats, o-rings, etc.

Rental

All regulators used in rental service have a Limited Lifetime Warranty to be free of defects in materials and workmanship as long as the dealer owns the regulator. The warranty is not transferable. All repairs on these regulators are to be maintained by the dealer. All defective parts will be evaluated by Genesis Scuba, and at their discretion, will repair or replace the component to the dealer. Defective parts need to be returned with a RGA number and a Limited Lifetime Warranty Defective Parts Claim Form. The form is not used for items replaced for annual maintenance.



Item	Part #	Description
1	G1001-52	Color ring, BK
	G1001-53	Color ring, YL
	G1001-54	Color ring, PK
	G1001-55	Color ring, BU
	G1001-56	Color ring, RD
	G1001-59	Color ring, TL
2	G1001-19	Retaining ring
3	G1079-32	Purge cover
4	G1001-81	Diaphragm
5	G1001-57	Lever
6	G1001-32	Pin
7	G1001-22	Exhaust valve, 2 required
8	G1079-33	Exhaust tee
9	G1001-34	Spring
10	G1001-73	Washer
11	G1001-23	Adjustment screw
12	R016B	O-ring
13	G1001-52	Cap, BK
	G1001-53	Cap, YL
	G1001-54	Cap, PK
	G1001-55	Cap, BU
	G1001-56	Cap, RD
	G1001-59	Cap, TL

Item	Part #	Description
14	G1001-27	Poppet
15	G1085-10	Seat
16	G1001-45	Valve body
17	R014E	O-ring
18	G8601	C-clip
19	G1049-10	Tie wrap
20	G1058-38	Mouthpiece, silicone
21	G1001-08	Vane adjustment switch
22	R010B	O-ring
23	G1079-34	Case
24	G1001-36	Hex nut, 3/4"
25	G1001-28	Orifice (crown)
26	R010B	O-ring
27	G1079-17	Hose protector
	G1079-18	Hose cover
28	LPH-30	Hose, 30"
29	R010B	O-ring
30	R011B	O-ring



Limited Lifetime Warranty - Regulators Defective Parts Claim Form

Use this form to submit parts that are defective in materials or workmanship to your Genesis distributor. Should any part of a Genesis regulator be found defective, Genesis Scuba will, at its discretion, repair or replace the component at no charge to the dealer. Contact your Genesis distributor to obtain a Returned Goods Authorization number and other shipping instructions. Shipments without an RGA number visible will be refused and returned to sender. ALL information must be provided and legible on this form for the claim to be processed.

This form is *not* to be used for normal, regular maintenance items, seats, o-rings, etc. Refer to the Genesis Limited Lifetime Warranty for further explanation of parts that are, and are not, covered under this warranty.

Warranty Verification (must meet both of the following)

- ☐ Original Owner verified by original bill of sale
- ☐ Annual service verified by receipt(s) for previous annual service(s)

Owner Information
Name
Regulator model
1 st Stage Serial number
2 nd Stage Serial Number
Original date of purchase
Date of this service

Dealer Information
Store name
Address
Phone
Technician name
Signature

Defective Part(s)		
Part number	Description	Nature of defect