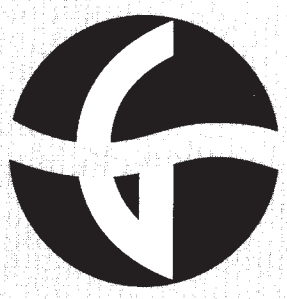
GENESIS®
SCUBA

REPAIR & SERVICE MANUAL



GF100 UNBALANCED

GF200 BALANCED

FIRST STAGE REGULATORS

Technical assistance provided by Robert Ledbetter.

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.

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

[redacted]

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.

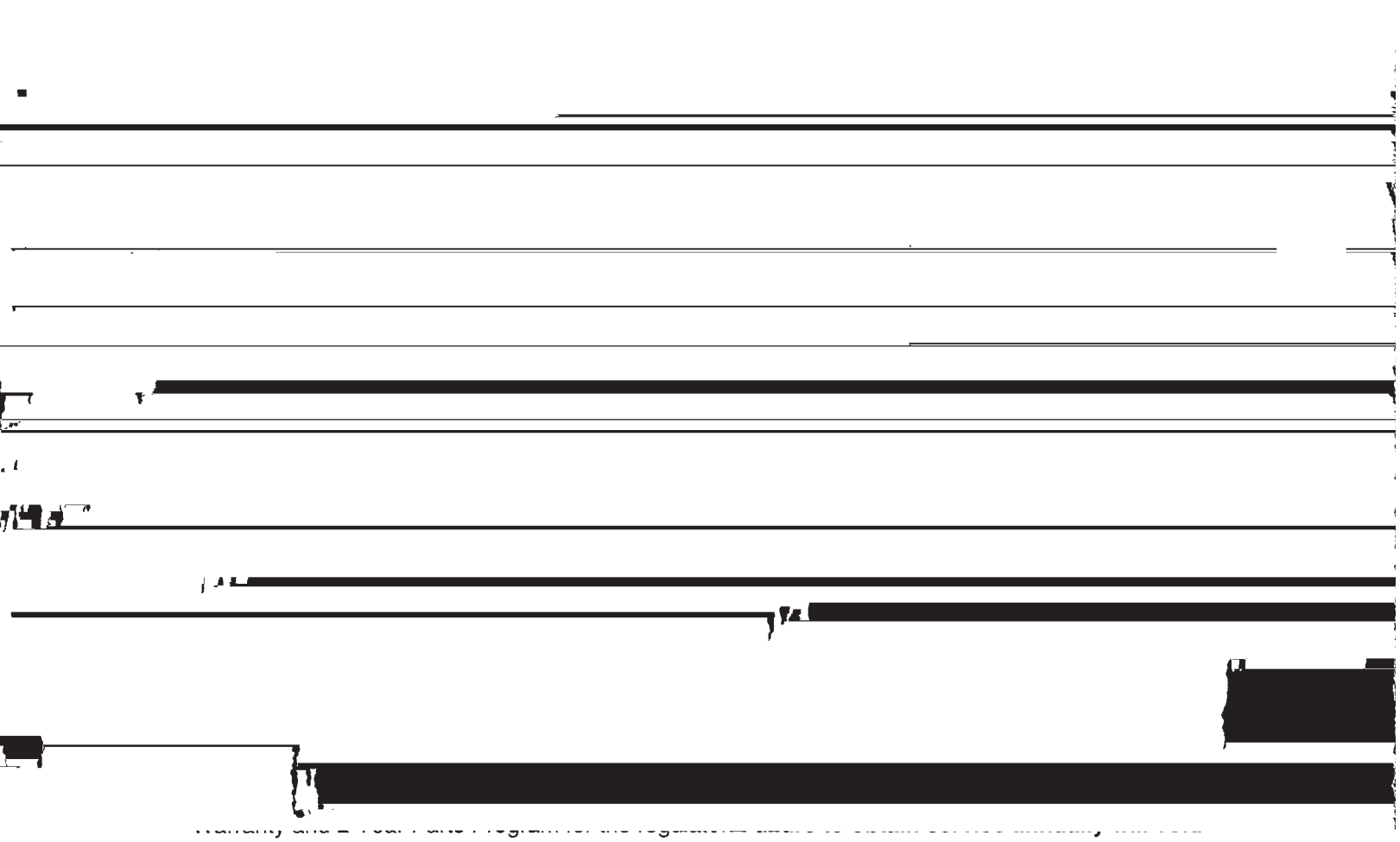
NOTE: DO NOT DEPRESS THE PURGE BUTTON while soaking the second stage. Doing so will allow water to enter the hose and first stage.

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.



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 GF100 and GF200 first stage regulators. 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 first 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 6) are required for disassembly and subsequent assembly.

Before disassembling the first stage regulator, perform a pretest. By following the tests described on pages 8 and 9 and making reference to the Troubleshooting Guide, you will be able to determine the need for parts replacement.

9. Using a small screwdriver, remove the tension clip (item 6) from the inlet (yoke end) of the regulator body

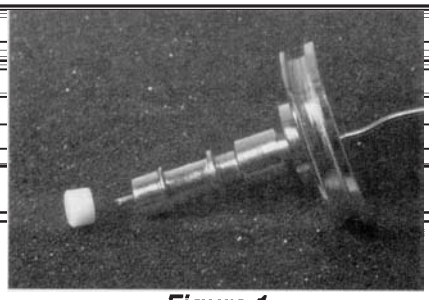


Figure 1

10. Remove the inlet filter (item 7).

    a. Inspect the filter for evidence of aluminum oxide (white), rust (red/brown), or other contamination. If contaminants are visible in the filter, make a note on the repair documents to notify the customer that an inspection of his/her cylinder(s) is recommended.

    b. Discard the filter after inspection.

NOTE: Regulators that experience excessive service should have the inlet filter replaced more frequently to maintain adequate performance.

11. Insert the **blunt end** of the H.P. seat tool (G1094-36) into the end cap side of the regulator body. Gently push the orifice assembly out the inlet side of the regulator body. *Figure 2.*

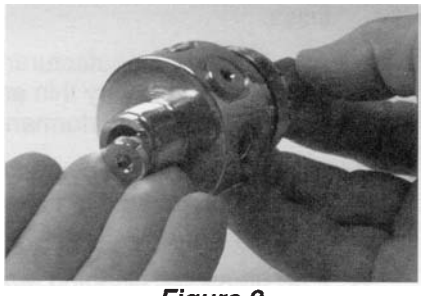


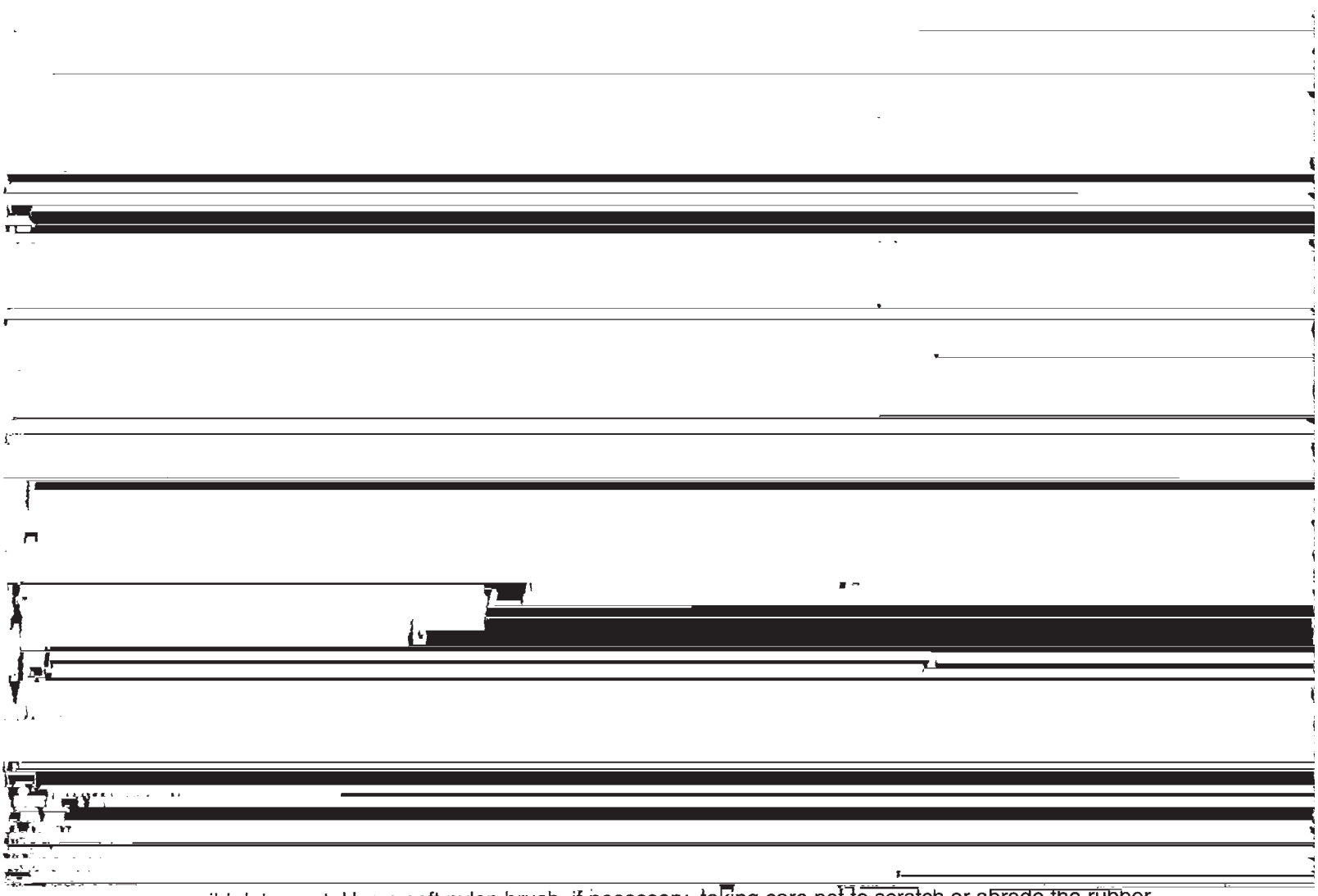
Figure 2

CAUTION: Use care when handling the orifice assembly to prevent damage to the delicate sealing surface. Even minor damage can cause pressure creep and decreased performance.

    a. Note the orientation of the spring washers (items 10), then remove by sliding them off the orifice stem.

    b. Remove and discard the o-ring (item 11).

    c. Remove the backup ring (item 12) and set aside.



mild detergent. Use a soft nylon brush, if necessary, taking care not to scratch or abrade the rubber or plastic parts..

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.

3. Use a soft nylon brush to loosen and remove any loose or flaking material from all metal parts.

CAUTION: The orifice (item 8) should be cleaned and rinsed separately to prevent damage to the sealing surface. Avoid contact with other parts, tools, or hard surfaces.

4. Place metal parts in suitable cleaning solution (see list on page 11).

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.)

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;

4. Pay specific attention to the following parts and replace if necessary.

   a. Examine the orifice (item 8) for scratches, nicks, excessive wear or damage to the plating. Inspect the o-ring groove.

   b. Examine the regulator body (item 13) for internal scratches or corrosion damage, and damage caused by excessive use of acid cleaning solutions that could cause o-ring sealing problems.

   c. Examine the end cap (item 26) for internal scratches or corrosion damage, and damage caused by excessive use of acid cleaning solutions that could cause o-ring sealing problems.

   d. Examine the threads on the regulator body, end cap (item 26), and yoke nut (item 5).

   e. Examine the o-ring grooves in the piston (item 24) for scratches and nicks.

   f. 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 First Stage Parts Kit PK100 and should be replaced during all routine maintenance.

Item Number	Part number	Description	Qty Needed
7	GF1-07	inlet filter	1
11 & 22	RM214E	o-ring	2
18	RM048E	o-ring	1
21	GF1-21	H.P.seat	1
25	RM139E	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.

IX. Reassembly Procedure

1. Lay out all parts on a clean working surface.
2. Reassemble the Orifice
   a. Once again inspect the cone of the orifice (item 8) for dings, scratches or corrosion. If necessary, use a pencil eraser to gently polish the cone surface. Defects will show as dark areas. A strong light and magnifying lens will make inspection easier.
   b. Lightly lubricate the o-ring (item 11) and roll it into the o-ring groove on the orifice.
   c. Gently stretch the backup ring (item 12) onto the end of the orifice and back into the o-ring groove.
   d. Determine if orifice is one that requires spring washers.
      i. The orifice assembly for an *unbalanced* (Origin) first stage should appear like *Figure 3a.*, and is ready to install.
      ii. The orifice assembly for a *balanced* first stage should appear like *Figure 3b.*, and must have the spring washers (items 10) installed. Verify the correct spring washer orientation as shown.

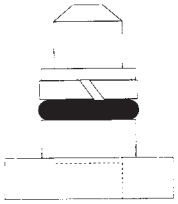


Figure 3a

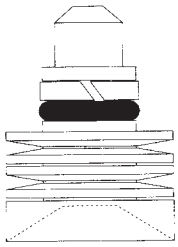


Figure 3b

NOTE: Genesis 1st Stages can be either balanced or unbalanced. The orifices are interchangeable and an Origin can be upgraded to balanced performance with a simple and inexpensive orifice change.

3. Press the orifice assembly into the regulator inlet with the tip of your finger.
4. Place a new filter on top of orifice; smoothest side toward the orifice.
5. Push the tension clip into the regulator inlet until it touches the filter.
6. Reassemble the piston
   a. Gently stretch the backup ring (item 23) and place into the groove on the stem of the piston.
   b. Lightly lubricate the o-ring (item 22) and roll it into the groove on the stem of the piston.
   c. Lightly lubricate the large piston o-ring (item 25) and roll into the groove in the flange of the piston.
   d. Place a new H.P. seat (item 21) on a clean pad on your work surface.
   e. Orient the piston such that the seat cavity is directly over the new seat. Gently push the piston down onto the seat. *Figure 4.*

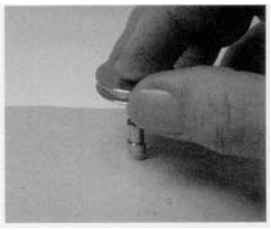
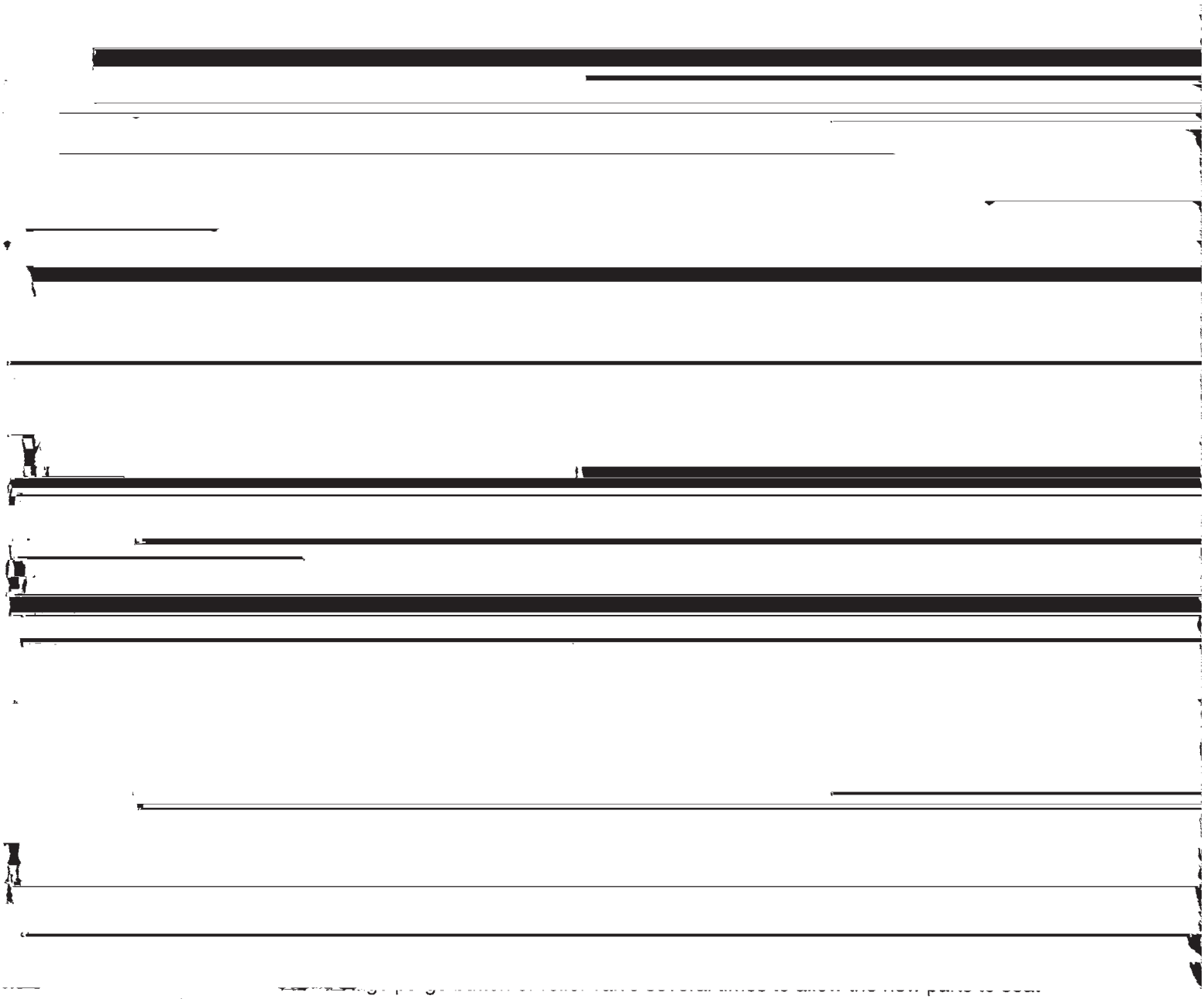


Figure 4

7. Replace all shims (item 20) that were removed during disassembly into the regulator body (item 13) from the end cap side.

NOTE: Use no more than 3 shims in a Genesis first stage. Refer to Troubleshooting for additional information about adjusting hose pressure.



themselves.

c. The pressure should rapidly rise and remain steady between 135 and 150 psig.

   i. There should be no more than 5 psig of creep within 15 seconds of cycling the regulator.

   ii. It is normal for piston regulators of this design to experience a slight drop in pressure after lockup, due to the superior efficiency of design.

   iii. If the pressure continues to rise above 150 psig, turn off the air and disassemble the first stage to find and correct the problem. Refer to Troubleshooting for additional information.

   - A simple removal of shims (item 20) may be all that is required.
   - Inspect the H.P. seat (item 21) and orifice (item 8) for defects.
   - Correct the problem and begin again with step 5.

   iv. If the pressure is below 135 psig, add shims in the main spring area to raise pressure. Use no more than 3 shims in a Genesis first stage. If the maximum number of shims is already present, replace the main spring, reassemble, and retest.

d. Slowly release a small amount of air from the gauge or second stage.

   i. Hose pressure should not drop more than 5 psi.

   ii. When the air flow is stopped, the pressure should immediately return to 135 - 150 psig and remain steady

6. Place the regulator on a cylinder or test bench with supply pressure of 300 - 500 psig.
7. SLOWLY turn on the air and watch the gauge.

   a. Origin first stage: Hose pressure should drop no more than 20 psi from the initial reading at high source pressure.

   b. Axis & Valor first stages: Hose pressure should drop no more than 5 psi from the initial reading at high source pressure.

   c. Greater pressure drops indicate a sealing problem between the piston seat (item 21) and the orifice (item 8).

      i. Remove the regulator from the air source.

      ii. Remove the end cap and piston.

      iii. Examine the high pressure seat for damage or foreign particles. Clean or replace as necessary

      iv. Remove the retainer ring and filter from the regulator inlet.

      v. Insert the **blunt end** of the H.P. seat tool (G1094-36) into the end cap side of the regulator body. Gently push the orifice assembly out the inlet side of the regulator body.

      vi. Examine the sealing surface of the orifice for damage. Clean or replace as necessary.

      vii. Reassemble and retest (Step 5 above).

8. Install the first stage assembly on a full SCUBA cylinder.
9. SLOWLY turn on the air supply.
10. Submerge the entire first stage assembly in water and gently agitate to dislodge any bubbles. There should be no bubbles leaking from the assembly. If bubbles appear, determine the source of the leak, disassemble to replace any worn parts, reassemble and retest (Step 5).

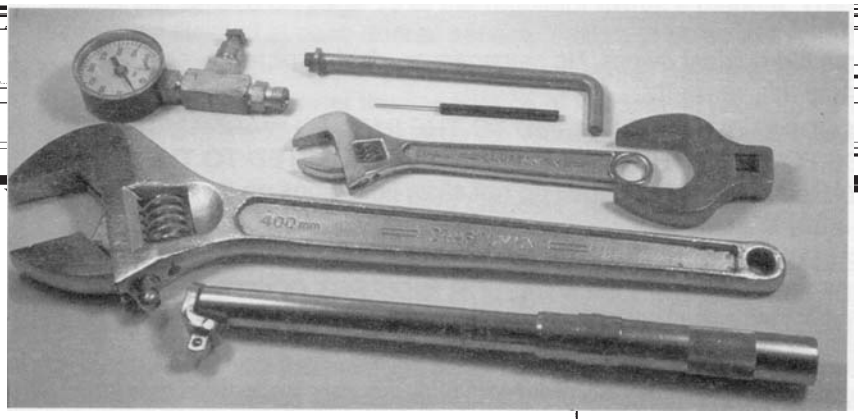
Creeping (slowly rising) hose pressure.	Damage to the orifice (item 8).	Inspect the orifice with a high powered light and magnifying lens. Replace if necessary.
	Corrosion on orifice (item 8).	Try polishing the orifice with a pencil or typewriter eraser using light pressure. Replace if necessary.
	Contamination on piston seat (item 21).	Inspect indentation for rust, aluminum oxide, sand, or other contamination. Replace if necessary.
	Defect in piston seat (item 21).	Inspect the seat with a high powered light and magnifying lens. Replace if necessary.
Hose pressure above 150 psig., and steady.	Too many shims (item 20) in spring chamber.	Remove one or more shims.
	Improper spring (item 19).	Replace.
	Defect in piston seat (item 21).	Inspect the seat with a high powered light and magnifying lens. Replace if necessary.
	Damage or corrosion on sealing surface of orifice (item 8).	Inspect the orifice with a high powered light and magnifying lens. Replace if necessary.
	Wrong orifice (item 8) used with spring washers (item 10).	Only orifice GF2-08 may be used with spring washers. See Figure 3b, for visual reference of orifice GF2-08.
Hose pressure below 135 psig., and steady.	Adjustment required	Add shims (item 20) under spring, up to 3 maximum.
	Wrong or weak spring (item 19)	Replace.
	Balanced orifice assembly missing one or more spring washers (item 10).	See Figures 3a & 3b for visual references of unbalanced and balanced orifice assemblies.
Noise on inhalation	Harmonic vibration of spring and/or piston.	Confirm backup rings and o-rings are properly installed on piston. Distribute shims on both ends of spring, turn the spring over, or replace spring.

TABLE 2 Test Bench Specifications

Test	Condition	Acceptable Range
Leak Test	inlet pressure: 3000 - 3500 psig	No leaks allowed
Intermediate pressure	inlet pressure: 3000 - 3500 psig	hose pressure: 143 ± 7 psig
Intermediate pressure creep	inlet pressure: 3000 - 3500 psig	hose pressure should not change more than 5 psig within 15 seconds after purging regulator

[redacted]

		Loctite (http://www.loctite.com)
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. *See Note below.* 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 Genesis regulators are 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



G1116-10	Hose Pressure Test Gauge,
	Small adjustable wrench
	Large adjustable wrench
	Torque wrench with crow's foot
	Regulator support (or spent CO2 cartridge)
G1094-36	Seat tool

Additionally, the technician should have a complete set of wrenches, 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.

[redacted]

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 INCURED WITH THE USE OF THE GENESIS REGUALTOR. 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.

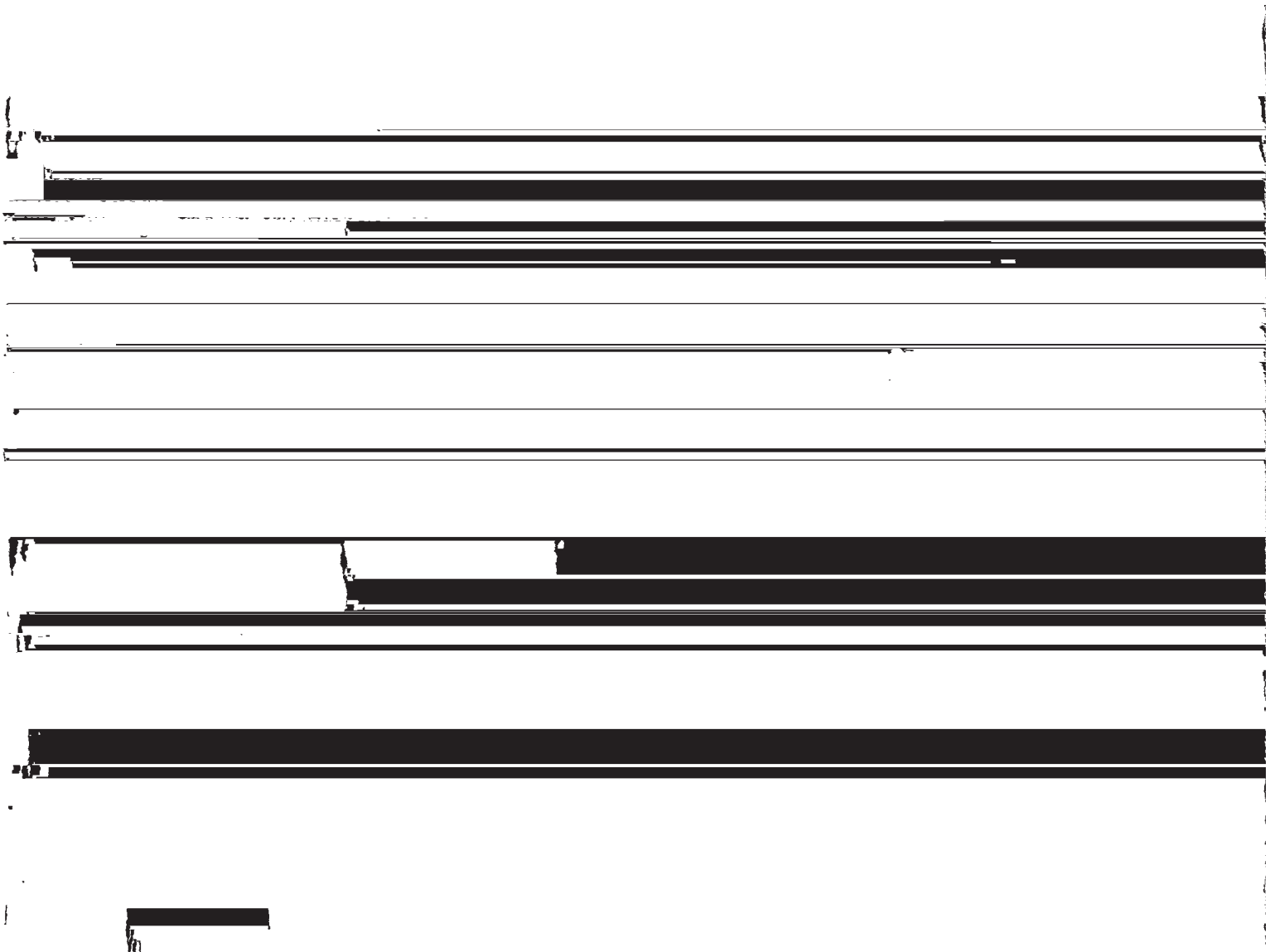
GENESIS 2 Year Parts Program

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.



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

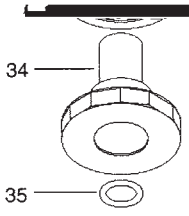
Should any part of a Genesis regulator be found defective in materials or workmanship, Genesis Scuba, at its discretion, will repair or replace the component at no charge to the dealer. Please refer to the warranty statement on the previous page for explanations and examples of items that are, and are 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.

34	GFT-34	body
35	R014E	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
1st Stage Serial number
2nd 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