®

OASIS 2®
(SRB3700)

CLASSIC®
(SRB0050)

BLIZZARD®
(SRB3900)



Assembly & Maintenance Guide

FIRST STAGE - BRUT™ SRB2100

ITEM #	CATALOG #	DESCRIPTION
	SRB3601	First Stage Complete
1	3701-12	Label for Handwheel
2	3701-70	Handwheel Assembly
3	3504-6	Star Washer
	J2790056B	Filter Retaining Ring
4	1390-7	Filter
5	29-3106-13A	Moving orifice
6	3601-20	Complete Moving Orifice Assembly
7	19-8010-8	Disc Spring
8	MS28774-007	Back-up Ring (for Moving Orifice)
9	G007A	O-ring (for Moving Orifice, 2 ea.)
10	3801-20	Dust Cap
11	1-1665-17	Yoke Nut
12	2-3801-4	Yoke
13	1-3105-6	L.P. Port Plug
14	G011B	O-ring (for L.P. Port Plugs)
15	3106-6	One Way Bleed Valve
16	J07-S1024-08DB	Locking Allen Screw
17	2-3601 -1 A	Main Body
18	G904A	O-ring (for H.P. Port Plug)
19	1-3405-4	H.P. Port Plug
20	G024A	O-ring (fits on large end of Body)
21	2-3601-7	Pressure Adjusting Ring
22	G025A	O-ring (fits on Pressure Adj. Ring)
23	3801-12B	Main Spring
24	G007A	O-ring (for small end of Piston)
25	3801-5	Piston Seat
26	3601-10	Piston Assembly
27	G022A	O-ring (for large end of Piston)
28	2-3601-8	Cap
29	3601-15	Cap Label



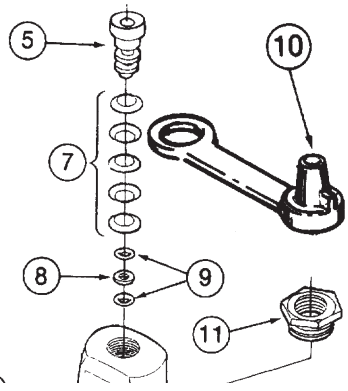


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IMPORTANT

Read all instructions and procedures in this manual carefully **before** servicing the regulator. The procedures in this manual apply to all Brut regulators. Parts have changed cosmetically over the years, but newer style parts can usually be used in place of older parts. The most current part numbers can be obtained by calling your Sherwood Distributor. If you have any questions, contact your Sherwood Sales Representative or Sherwood Distributor.

INTRODUCTION

This manual is written as a guide to the annual servicing and maintenance of the SHERWOOD Blizzard SRB3900 and Oasis 2 SRB3700 regulators. It gives breakdowns of regulator parts, equipment specifications, servicing instructions, trouble-shooting recommendations, and guidelines for proper care of these regulators. The manual is intended for use only by persons specially trained and authorized to service SHERWOOD SCUBA equipment.

Because of the many unique features found only in SHERWOOD regulators, SHERWOOD conducts seminars on a regular basis throughout North America to train technicians in proper service and repair procedures for all current SHERWOOD regulators. Those technicians servicing SHERWOOD regulators **must** attend the appropriate seminars to be authorized. All SHERWOOD dealers and their staffs are also encouraged to attend the seminars to gain an in-depth understanding of the construction, special features and operation of SHERWOOD regulators.

For information on the date and location of the next SHERWOOD service seminar in your area, contact your SHERWOOD Distributor or SHERWOOD Sales Representative.

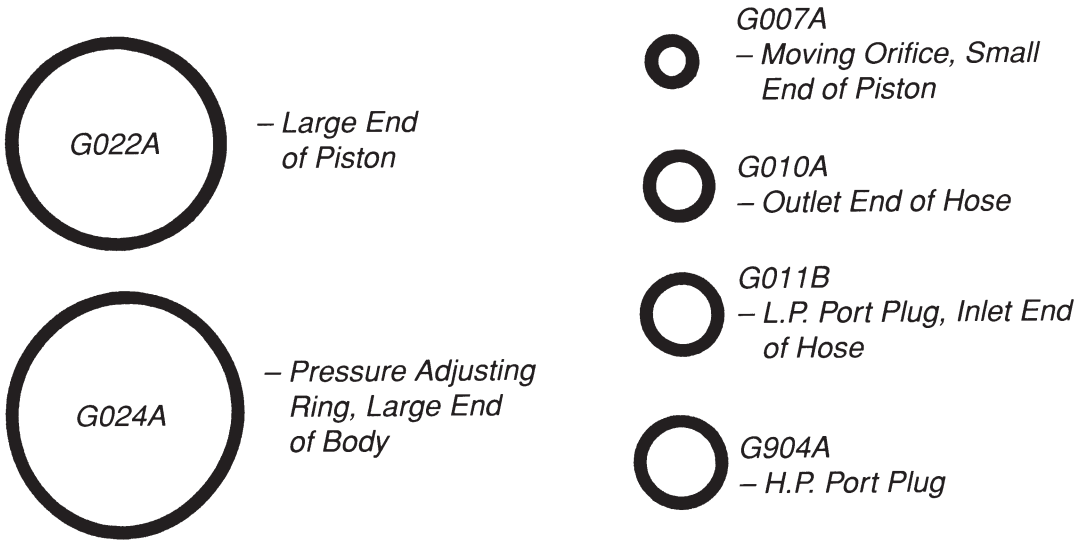
IMPORTANT: Anyone attempting to service or repair SCUBA regulators must have a thorough understanding of the principles of operation of SCUBA regulators and valves, as well as the appropriate mechanical ability. The technician must also be properly trained in the safe use of compressed air and the various tools and cleaning solutions involved in the procedures outlined in this manual.

SPECIFICATIONS

REGULATOR MODEL	SHERWOOD Oasis 2 SRB3700 SHERWOOD Blizzard SRB3900
AIR FLOW	32 cu. ft. / min. @ 1 atmosphere
INHALATION RESISTANCE	1. 1" w.c @ 1 atmosphere
EXHALATION RESISTANCE	0.5" w.c. max. @ 1 atm. (OASIS 2) 0.6" w.c. max. @ 1 atm. (BLIZZARD)
FIRST STAGE REGULATOR	SRB3601
TYPE	Externally adjustable, flow-by piston with moving orifice balancing, and Positive Air Purge (Dry Air Bleed) **U.S. Pat. 4,226,257**
WEIGHT	1 lb. 11oz.
INTERSTAGE PRESSURE	135-150 psi (OASIS 2) 120-135 psi (BLIZZARD)
MAXIMUM INLET PRESSURE	3600 psi (with DIN Adapter)
POSITIVE AIR PURGE FLOW RATE	13-25 cc/minute
# LOW PRESSURE PORTS	5 (3/8" - 24 UNF)
# HIGH PRESSURE PORTS	1 (7/16" - 20 UNF)
MATERIALS	Body -------- CDA-360 Brass O-rings -------- Buna-N® Bleed Valve -------- Ethylene Propylene Piston Seat -------- Teflon®

SECOND STAGE REGULATOR	SRB3702 (Oasis 2) SRB3902 (Blizzard) SRB0050 (Classic)
TYPE	Downstream, diaphragm
WEIGHT	7.6 oz. (w/o hose)
HOSE LENGTH	31 in.
MATERIALS	Cover -Thermoplastic Triax® Case -Thermoplastic Triax® Poppet Seat - Buna-N O-rings - Buna-N Diaphragm —Tufel® (Blue) Exhaust Valve -Thermoplastic Elastomer Mouthpiece - C-Flex®

O-RING REFERENCE CHART



NOTE: Before disassembly of the regulator begins, the first and second stages should be tested for output pressures and leakage. Pretesting in this way will help the technician to zero in on any specific problems requiring repair.

The work area must be clean and well lighted, with clean compressed air available to blow sand and dirt from parts.

TOOLS REQUIRED FOR FIRST STAGE SERVICING

— 15" Adjustable Wrench
— Bench Vise
— 3/32" Allen Wrench
— 5/32" Allen wrench
— #53 Drill

— Pocket Screwdriver
— Small Phillips Screwdriver
— 1/4" (approx.) Diameter Wooden or Plastic Probe to push out Orifices
— 25cc Graduated Cylinder
— SHERWOOD'S Regulator Support Handle p/n 4700-15
— SHERWOOD'S Intermediate Pressure Gauge p/n SYA 4700
— SHERWOOD O-ring Installation Cones
Brass Colored - p/n TL106 (for O-ring on piston tip)
Green Colored - p/n 38-TL107 (1 st O-ring onto orifice)
Black Colored - p/n 29-TL108 (2nd O-ring onto orifice)
— SHERWOOD Inlet Filter Screen Installation Tool p/n TL115

DISASSEMBLY OF FIRST STAGE

NOTE: To view the complete parts list of the first stage, fold out the front cover of this manual.

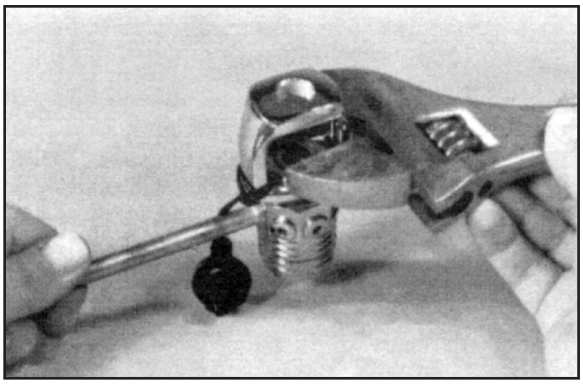
(1) Pull back hose protectors and disconnect all hoses from first stage. Inspect hoses for wear and replace if necessary.

(2) Unscrew and remove the Handwheel (item 2).

(3) Remove the Dust Cap (item 10).

(4) Install a SHERWOOD Regulator Support Handle p/n 4700-15 into one of the low pressure ports. Use the Support Handle, and a 15" adjustable wrench or bench vise to loosen the Yoke Nut (item 11) from the Body (see photo #1).

PHOTO #1



NOTE: If a SHERWOOD DIN Adapter p/n SAA5300 is installed in place of the normal yoke assembly, remove it at this time. (See SHERWOOD Technical Bulletin #104 for Servicing procedures for the SAA5300 DIN Adapter.)

(5) Remove the Yoke (item 12) and Yoke Nut from the Body.

(6) Use a 5/32" allen wrench to remove all remaining Port Plugs (items 13 & 19) from the Main Body (item 17).

(7) Use a 3/32" allen wrench to remove the Locking Allen Screw (item 16) from the Main Body (see photo #2).

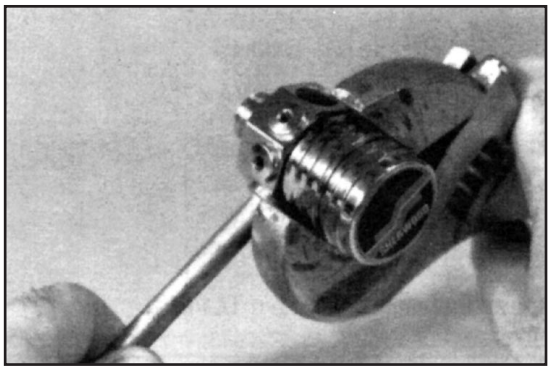
(8) Use a Regulator Support Handle and a 15" adjustable wrench or Bench Vise to remove the Cap



PHOTO #2

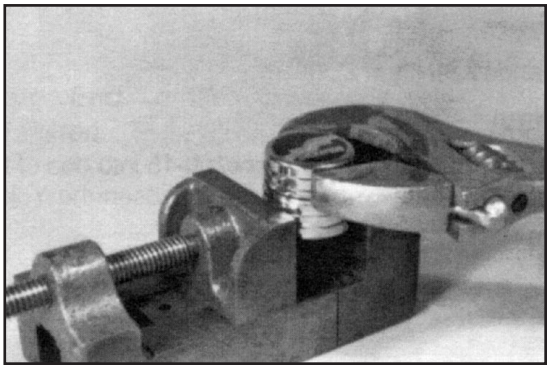
(item 28) / Pressure Adjusting Ring (item 21) as a unit from the Main Body. Keep the wrench on the Adjusting Ring flats, not on the Cap flats, for this operation. This will ensure that the two units do not separate. (see photo #3).

PHOTO #3



(9) Use a 15" adjustable wrench and a bench vise to separate the Cap from the Adjusting Ring (see photo #4).

PHOTO #4



(10) Remove the Piston (item 26) and Spring (item 23) from the Cap. Visually inspect the Piston O-rings. If any cuts, deformities, or abrasions are noted, replace the O-rings. Otherwise, the O-rings can be re-used. If the O-rings are in good condition, clean them with a clean dry rag, and lightly re-lubricate them with silicone grease (LT1 Christo-Lube MCG #111®, Dow-Corning 111®, Parker O-ring Lube®, or equivalent). Installation of the small O-ring (item 24) on the Piston is made much easier by using the **BRASS COLORED** SHERWOOD O-ring Installation Cone p/n TL106. Place this Cone over the tip of the Piston. Slide the lubricated 0-ring over the Cone until it slips into the Piston groove.

(11) Be sure the Piston Seat (item 25) is free of nicks, scratches, and imperfections. Any imperfection will increase the lock-up pressure above the desired setting, or the lock-up pressure will slowly creep to a higher pressure after the initial lock-up is obtained. If the Seat appears damaged, it can be removed by pushing through the stem with a #53 drill (.059") from the large end. The Seat will then pop out. Place the new Piston Seat on a clean piece of paper on a hard flat surface. Press the Piston tip firmly over the seat until it Is fully installed. The Piston is now rebuilt and ready for installation in the "FIRST STAGE ASSEMBLY" portion of this guide.

IMPORTANT: In the unlikely event that the Piston needs cleaning, it should be wiped with a clean dry cloth only. **DO NOT** put the Piston in a cleaning solution, or an ultrasonic cleaner because floating on the surface of the cleaning fluid there is often a layer of oils that will coat the Piston when it is removed from the fluid. This coating will interfere with the air flow through the Flow Control Element in the face of the Piston (see photo #5). This would cause the Positive Air

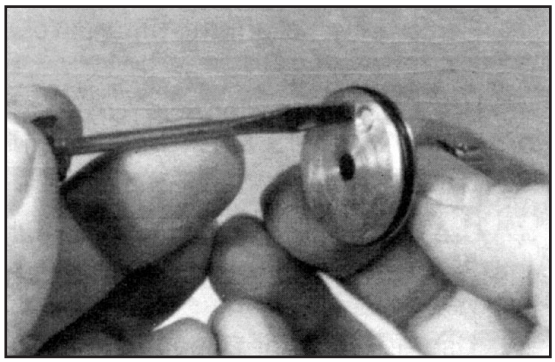


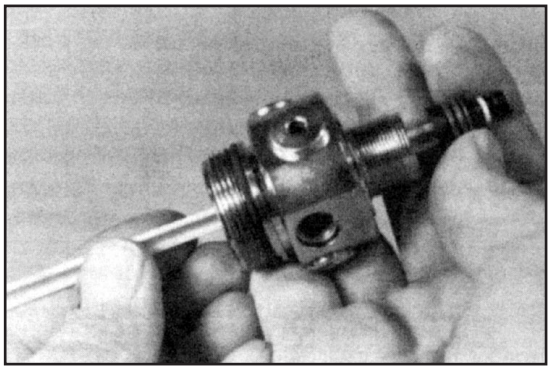
PHOTO #5

Purge System (Dry Air Bleed) to cease working. This condition is not dangerous to the diver, but would make the regulator somewhat harder to breath on as the diver descended. An indication that the Positive Air Purge System is not working, would be no air bubbling from the One Way Bleed Valve. For similar reasons, greasy finger tips should be kept away from the Flow Element during servicing.

(12) Use a pocket screwdriver to remove the star washer (item 3) that holds the filter (item 4) in place. Most units used a star washer (a flat disc washer with six outward facing legs). Units made after 1997 use a wire-retaining ring with a forward hook. The only first stage bodies that can use this reuseable ring, have a groove machined into the area above the filter for the ring to fit snugly into. Always discard the used filter and old style star washers, newer style retaining rings are saved for reuse.

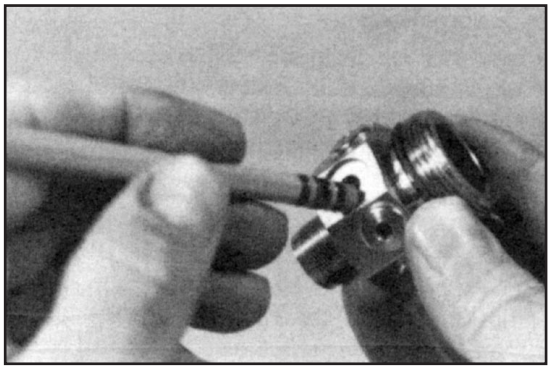
(13) Remove the Moving Orifice (item 6) from the Body by pushing it with a soft plastic probe from the large threaded end of the Body. Catch the Orifice Assembly in the hand as it comes out the Yoke Nut thread end of the Body (see photo # 6). Carefully inspect the Disc Springs (item 7) for any cracks. Replace all five Disc Springs if any cracks are found.

Photo #6



(14) Remove the One Way Bleed Valve (item 15) from the Body using the fingers or a soft plastic probe. **DO NOT** use a metal screwdriver or blade since this will scratch the sealing surface that the Bleed Valve seals against. This scratch may allow water to enter the first stage spring chamber during use. The sealing surface on the Body where the One-Way Valve seals must be totally clean of deposits. If any deposits remain on the sealing surface after initial cleaning, take a **fine** abrasive polishing stick, or a pencil with a new eraser and polish the surface to remove deposits (see photo # 7). Blow all residues from the body after polishing.

Photo #7



(15) Remove the large O-ring (item 20) from the Body and the large O-ring (item 22) from the Pressure Adjusting Ring.

(16) Inspect all O-rings. If any cuts, deformities, or abrasion are noted, replace the damaged O-rings. Otherwise, O-rings can be re-used in the first stage. The clean environment provided by the Positive Air Purge System (Dry Air Bleed) makes this re-use possible. Clean the O-rings carefully with a lint free rag, and re-lubricate lightly with LTI Christo-Lube MCG #111®, Dow-Corning 111® Silicone grease, Parker O-ring Lube®, or equivalent. The small Piston O-ring, and the Moving Orifice O-rings can be cleaned and re-lubricated while in place.

(17) **If necessary** all metal parts of the first stage **except the piston** can be cleaned in an ultrasonic cleaner or cleaning solution The O-rings must be removed before cleaning any metal parts because most cleaning solutions are damaging to the O-ring material. (See page **14** for recommendations on cleaning solutions.) Inspect the two O-rings on the Moving Orifice. If they have scratches on their surface, remove and discard them. The bare Moving Orifice can then be cleaned in a cleaning solution.

NOTE: It is quite difficult to remove the Moving Orifice O-rings without damaging them If the o-rings are in good condition with an unblemished surface it is better to leave them in place and then use a clean rag to clean the Moving Orifice.

(18) Remove the regulator parts from the cleaning solution. Blow all internal passageways dry with clean dry compressed air.

(19) Inspect the bores that the Piston O-rings and the Moving Orifice O-rings move in, for corrosion or wear. If worn to the point of air leakage, the parts must be replaced. If some corrosion deposits persist, they can be carefully wiped away with a plastic scrubbing cloth. Blow any resulting dust out of the regulator parts.

(20) Inspect the Moving Orifice's sealing surface located at the top edge of the orifice cone. Any nicks, scratches, or corrosion at the top of the cone can allow air to pass resulting in creeping hose pressures. The defects can be polished out using a fine abrasive polishing stick or pencil eraser. When polishing, apply a light pressure to prevent excessive wear on the cone. On the outer edge of the cone is a somewhat ragged edge left when a protective shroud was removed during production. This is not a sealing surface so it's condition can be ignored. Blow away any dust created by the polishing process using compressed air.

ASSEMBLY OF FIRST STAGE

(1) Insure that the Disc Springs (item 7) are in the proper orientation on the Moving Orifice Assembly (see item 6).

(2) **If** the O-rings on the Moving Orifice Assembly (item 6) are removed and discarded due to wear, new ones are installed at this point. Installation of these O-rings is made much easier using SHERWOOD's O-ring Installation Cones.

Place the clean Moving Orifice (item 5) with properly installed Disc Springs (item 7) on a clean flat surface, with the orifice tip facing up. To install the O-ring (item 9) in the lower groove, place the **GREEN** O-ring Installation Cone p/n 38-TL107 over the Orifice. Slide a lubricated O-ring (item 9) over the Cone until it rests in the lower groove. Install the white Teflon® Back-up Ring (item 8) into the groove **above** (towards the tip) the O-ring just installed. Use the **BLACK** O-ring Installation Cone p/n 29-TL108 to install a lubricated O-ring into the upper groove of the Moving Orifice.

(3) Using a greased soft probe, **lightly** lubricate the first 1/8" of the **small** bore in the Main Body (item 17) where the Moving Orifice O-rings seal.

(4) Install the Moving Orifice into the Main Body until it bottoms.

(5) Place the inlet Filter (item 4) into the Main Body on top of the Moving Orifice. Place the Star Washer (item 3) on top of the Filter screen.

NOTE: Replace domed screen P/N 3601-16 with filter P/N 1390-7. First stage bodies manufactured after 1997 have a groove machined in the inlet for a filter retaining ring P/N J2790056B. For first stage bodies without the groove use a star washer P/N 3504-6

(7) Place the Main ' Spring (item 23) over the Piston stem. Insert the Main Spring and Piston (with its clean, lubricated O-rings and new Seat) into the Pressure Adjusting Ring.

(8) Screw the Cap (item 28) onto the Pressure Adjusting Ring. Use a 15" Adjustable Wrench and Bench Vise to tighten the Cap to the Pressure Adjusting Ring **snugly** (see photo # 4). Do not over-tighten.

(9) Replace the lightly lubricated O-ring (item 20) onto the Main Body. Be sure to place the O-ring into the groove right next to the threads, **NOT** in the groove away from contact with the threads. Lightly lubricate the bore in the Pressure Adjusting Ring where the Body O-ring (item 20) will seal. With a greased soft probe, lightly lubricate the first 1/8" of the small bore in the Main Body where the small piston O-ring will seal.

(10) Install the Pressure Adjusting Ring/Cap Assembly onto the Main Body. Hand tighten the Assembly completely onto the Body until it bottoms on the thread.

(11) Lubricate the Locking Allen Screw (item 16) with silicone grease, and place a small dab of grease onto the hole in the Main Body that the Allen Screw goes into. Using a 3/32" alien wrench, screw the Locking Allen Screw into the Main Body until it lightly bottoms. **NOTE:** Do not tighten it at this point.

(12) Using the index finger, install the cleaned and dry one way bleed valve (item 15) into the main body.

NOTE: If you use the bleed valve with the Sherwood logo molded into it P/N 3106-6 you will notice a "dot" molded near the right side of the logo. Install the bleed valve with the "dot" oriented closest to the inlet of the regulator (towards the yoke).

(13) Lightly lubricate the Main Body Yoke Nut Threads with Silicone Grease and install the Yoke (item 12) and the Yoke Nut (item 11) onto the Main Body.

(14) Install the Regulator Support Handle p/n 4700-15 into one of the L. P. Pressure Ports of the Main Body. Use the Support Handle and a 15" Adjustable Wrench to tighten the Yoke Nut snugly (see photo # 1).

(15) Lightly lubricate the threads of the Handwheel (item 2) with silicone grease and install the Handwheel and Dust Cap (item 10) onto the Yoke.

(16) If the first stage has a SYA-5300 DIN Adapter installed instead of a standard yoke, see the installation instructions given in SHERWOOD TECHNICAL BULLETIN #104 for overhaul and installation instructions of the DIN ADAPTER.

TESTING OF FIRST STAGE

NOTE: For safety, always test the first stage regulator with SHERWOOD'S Test Gauge and Relief Valve p/n SYA-4700. (The demand valve on the unit acts as a relief valve in the event of a malfunction.)

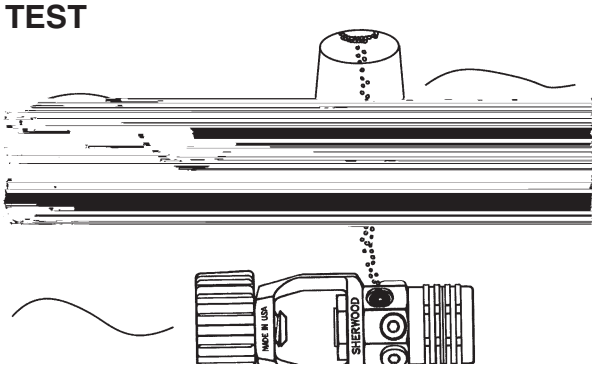
(1) Install Intermediate Pressure Test Gauge SYA-4700 into one of the low pressure ports of the first stage. Plug all other pressure outlet ports with suitable Port Plugs.

(2) Install First Stage onto a Tank Valve, and introduce 2700 - 3500 psig to the inlet of the Regulator. If a new Piston Seat (item 25) and/or new Moving Orifice (item 5) have been installed, the first stage may "POP" slightly during the seating in process. Flow air through the demand valve on the test gauge several times to get all parts properly seated.

DRY AIR BLEED FLOW TEST

(3) Submerge the first stage under several inches of water.

(4) A small stream of bubbles should be escaping from the One-Way Bleed Valve on the first stage and nowhere else on the Body. (see fig. 1) The number and size of the bubbles may vary from regulator to regulator, but the volume of air should be 13 - 25 cc per minute. To check this use the following steps:



(A) Invert a small (25 cc capacity) graduated cylinder filled with water, over the underwater flow of bubbles (see fig. 1). The air entering the cylinder will gradually empty the water out of the cylinder.

(B) After exactly one minute, remove the graduated cylinder from the air flow and raise the cylinder to the surface so that the air/water dividing line inside the cylinder matches the water level outside the cylinder. The measurement at this point should be between 13 and 25 cc.

(C) If the reading is significantly higher than 25 cc, check the O-rings and sealing surfaces mated to the Piston. If the reading is below 13 cc, check the Piston's flow element to determine if it has been clogged by grease or other foreign matter.

A grease clogged element in the Piston can sometimes be cleared by washing the grease off with an application of **fresh** soapy water or other food grade solvent in an ultrasonic cleaner. This is the only time the Piston should be cleaned in solvent since the clogging has already occurred. If this condition happens repeatedly to your customer's regulators, make sure that all technicians at your store are being extra careful during servicing not to use a spray lubricant on the Piston or in any other way over lubricate causing the flow control element in the Piston to be covered over with grease.

INTERMEDIATE PRESSURE TEST

NOTE: This test determines the regulator's LOCK-UP PRESSURE, that is, the pressure put out by the first stage during a no flow condition. Since the SRB3601 first stage will be used on either an OASIS 2, BLIZZARD or CLASSIC, the actual output pressure to which the technician sets the regulator depends on the type of diving the diver wants to use it for. (See the **FIRST STAGE FEATURES** section of this manual on page **14** for the uses of selected first stage output pressures.)

(5) Attach any SHERWOOD Second Stage to one of the low pressure ports and the SHERWOOD Intermediate Pressure Gauge SYA-4700 to another low pressure port. Plug all other ports with appropriate Port Plugs. Attach the regulator to a Tank Valve giving a source pressure of between 2700 and 3500 psig. Be sure that the Pressure Adjusting Ring is screwed down all the way on the Body before ANY air is turned on. Turn the supply air on SLOWLY while listening for any unusual air leaks. If any are heard, turn the air off immediately and determine the source of the leakage. While turning the air on SLOWLY, watch the pressure gauge reading rise. It should stop around 120 psig when the Pressure Adjusting Ring is screwed all the way in. If it does not stop and continues beyond 140 psig, turn the air supply off immediately and inspect the regulator to determine the cause. Once the air pressure stops rising, the internal parts should be worked into place by allowing air to escape from the second stage several times by pushing the purge button. To raise the pressure to the desired final setting, slowly turn the Pressure Adjusting Ring in a counterclockwise direction (as seen when looking down at the cap end of the regulator) in 1/8 turn stages. At the end of each 1/8 turn, push the Purge Button several times to let the internal parts work into place to give a true reading.

If the pressure goes beyond the desired reading, turn the Pressure Adjusting Ring clockwise in 1/8 turn increments. Between each 1/8 turn, the Purge Button of the second stage **MUST** be depressed to allow the pressure to drop.

After the desired pressure has been reached, let the regulator sit for several minutes and then depress the Purge Button again to see that the regulator returns to the proper pressure. Once the proper pressure has been set. Use the 3/32" allen wrench to tighten the Locking Allen Screw (item 16). Tighten the Screw in only tight enough to stop the Pressure Adjusting Ring from being moved by hand. **DO NOT OVER-TIGHTEN.** After tightening the Allen Screw, check the intermediate pressure one more time.

IMPORTANT: *NEVER SET THE OUTPUT PRESSURE OF THE FIRST STAGE ABOVE 150 PSIG.*

SRB3700 & SRB3900 - TOOLS REQUIRED FOR SECOND STAGE SERVICING

- 5/32" Nut Driver
  TIP: A 5/16-18 X 2" socket Set Screw will work well if a 5/32" Nut Driver is unavailable.
- 5/8" Wrench
- 3/4" Wrench
- 1/4" Nut Driver
- Slotted Screwdriver
- Phillips Screwdriver
- Side Cutting Pliers
- SHERWOOD Lever Height Adjusting Tool p/n 4005-16

DISASSEMBLY OF SECOND STAGE OF THE SRB3700 & SRB3900

NOTE: To view the complete parts list of the second stage, fold out the back cover of this manual.

NOTE: The second stages of the new (1991 and later) Oasis SR3702 and Blizzard SR3902 are identical **EXCEPT** for the hose Logo Sleeve that gives the model name and the Exhaust Heat Sink p/n 52-3902-22 which is found only on the Blizzard.

(1) Pull back the hose Logo Sleeve (item 26). Remove the Hose Assembly (item 27) from the Orifice housing (item 24). Inspect the Hose Assembly for any cuts or cracks. Replace if any are found.

(2) Examine the condition of the Mouthpiece (item 21). If it is in good condition and shows no cracks when stretched away from the mouth tube of the second stage Case, it can be left in place during the overhaul. If, however, the Mouthpiece is worn or cracked, it should be removed and discarded by cutting the Mouthpiece Tie (item 22) with side cutting pliers.

(3) Remove the two Exhaust Tee Retaining Screws (item 20) using a Phillips Screwdriver.

(4) Remove the Exhaust Tee (item 19) from the Case by sliding it downwards.

(5) Remove the front Cover (item 4) from the Case by pulling it straight out from the front of the Case.

PURGE BUTTON LOGO COLOR CHANGE:

NOTE: At this point **if desired**, the Purge Button Logo (item 1) can be changed to a different color. If this color change is to be made, follow the next sub-steps A to E. Otherwise, go on to step 6.

(A) Place the Cover Assembly with the Purge Button Logo face down on a clean flat surface.

(B) From the inside of the Cover Assembly, push the four barbed tabs holding the Purge Button Assembly in place in towards each other. This will release the Purge Button Assembly from the Cover. Take note of how the Purge Button Spring is oriented behind the Purge Button with the narrow end of the coil toward the Cover. Be sure to replace the Spring later with the narrow end facing the Cover.

(C) Place the removed Purge Button Assembly with the Logo facing downwards on a clean flat surface.

(D) Use fingernails to release the colored hooked tabs from the black Purge Button body. As you remove the colored Logo from the Purge Button, note that the Logo will only go on one way because of a channel in the Purge Button and matching tabs on the Logo. Be sure to install the new Logo in the same orientation.

(6) Using the thumbnail or a slotted screwdriver, gently pry the Diaphragm Retaining Ring (item 5) out of the Case (see photo # 8).

(7) Gently remove the Diaphragm (item 6) from the Case.

(8) Before removing the Fins (items 9 & 10) from the Case, look through the Mouthpiece, and note that the Fins rest against the **right** side of the tabs in the mouthpiece tube. This is, of course, the way they must be re-installed later on. Also note that one of the Fins has a spacing dimple in it, and that this Fin is the left one as you look into the mouthpiece tube. Replace the Fins later in this order.

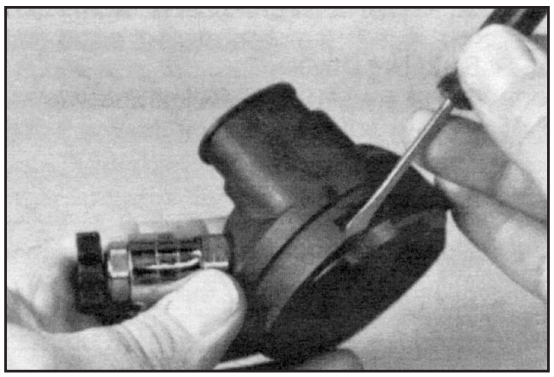


PHOTO #8

(9) Using a 5/32" nut driver, remove the fin Screws (item 8) from the Lever Support (item 14).

(10) Remove the Fins from the Case.

(11) Use a 3/4" wrench on the Orifice Housing (item 24) and a 3/4" wrench on the flats of the Lever Support (item 14) to loosen and remove the Orifice Housing.

(12) Remove the Lever Assembly (item 13) from the Case.

NOTE: At this point, if the regulator is a BLIZZARD, the Exhaust Heat Sink (item 7) would be removed since it fits under the Lever Assembly.

(13) Normally only the poppet Stem Seat Insert (item 17) will need- to be changed to restore the second stage to like new performance. To change the Stem Seat Insert (item 17) the lever assembly can be left together. First carefully remove the old Seat Insert using a pen knife or similar object. Put the new Seat Insert on a clean flat surface and lower the poppet cavity, from which the old Seat Insert was removed, over the new Seat Insert.

(14) In the unlikely event that parts of the lever assembly need to be replaced, (Stem, Spring, Lever, etc.), this can be done by removing the Locking Nut (item 11). All parts of the lever assembly will then be separable. The old part is removed, the new part installed, and the locking nut re-tightened.

(15) Grasp the oval Exhaust Valve (item 18) with your fingers and pull first one and then the other locking nipple out of the case.

(16) Rinse all plastic and silicone parts in clean fresh water, and then blow the parts with compressed air to dry and remove any sand and dust particles.

(17) Inspect the Case (item 23) for any cracks. Look particularly closely at the area where the Orifice Housing and the Lever Support clamp down. Replace the Case if any cracks are found.

(18) Inspect the Exhaust Valve and the Diaphragm for any tears or pin holes. Replace if any defects are found.

(19) The second stage orifice is permanently machined into the Orifice Housing (item 24). Inspect the orifice sealing cone (where the poppet seals) for any nicks, scratches, or corrosion. Corrosion or minor scratches can be polished out using a fine grit rubberized polishing stick or a clean new pencil eraser. Remember not to apply too much pressure when rotating the polishing stick. Check frequently to see when the corrosion or scratch is gone and stop at that point. Blow all dust and debris out of the Orifice Housing using clean compressed air.

NOTE: At this point it is assumed that all parts are cleaned and inspected.

ASSEMBLY OF SECOND STAGE OF THE SRB3700 & SRB3900

(20) Install the Exhaust Valve (item 18) into the Case by inserting the two nipples into the small holes from the outside of the Case. Reach inside the Case and pull each nipple firmly with the fingers until a " click " is heard. Inspect the Exhaust Valve to see that it is properly seated.

NOTE: At this point if the regulator is a BLIZZARD, the Exhaust Heat Sink (item 7) would be re-installed since it fits under the Lever Assembly.

(21) Install the Lever Assembly into the Case, setting it firmly between the guide ribs in the Case.

NOTE: A drop of mild thread locker, such as Locktite® 242 or equivalent should be applied to the threads of the lever support to prevent the Orifice Housing from loosening during use.

(22) Screw the Orifice Housing (item 24) onto the threads of the Lever Assembly. Using a 3/4" wrench on the Orifice Housing and a 3/4" wrench on the flats of the Lever Support (item 14) inside the Case, tighten them together snugly (70 in. lbs.).

(23) Install the Fins into the Case. Note that the dimple on the left Fin (item 10) goes between the Left and Right Fin (item 9) to keep them precisely separated. Use a 3/32" nut driver to install the Screws that hold the Fins onto the Lever Support. Note that you can also use a 5/16" - 18 X 2" socket set screw as a nut driver if the 3/32" nut driver is unavailable. Do not over-tighten.

NOTE: Do not at any time allow lubrication (grease on fingers, or silicone over-spray), to get on the Case (item 23), the Diaphragm (item 6), or the Diaphragm Retaining Ring (item 5) as it may cause slippage of these parts.

NOTE: The following steps 24 - 30 would be performed **after** the regulator second stage is adjusted (see SET UP OF SECOND STAGE Page 11) but are included here for continuity.

(24) Install the Tufel Diaphragm (item 6) into the Case so that it sits evenly on the ledge.

(25) Inspect the Diaphragm Retaining Ring (item 5). Notice that there is a long tab and a short tab on the Ring. The short tab lines up with the short notch in the Case when the Ring is installed.

(26) Install the Diaphragm Retaining Ring into the Case smoothly so that it correctly holds the Diaphragm in place.

(27) Before installing the Cover, notice that there are two alignment tabs on the bottom of the Case, over which two corresponding flanges on the Cover must be aligned. Install the Cover (item 4) onto the Case by sliding it carefully and firmly into place.

(28) Install the Exhaust Tee (item 19) onto the Cover and Case by sliding it up from the bottom. Be careful to engage the locking tabs on the Exhaust Tee and the Cover.

(29) Install the Retaining Screws (item 20) through the screw holes in the Exhaust Tee and into the holes in the Case using a #1 phillips screwdriver. **DO NOT OVER-TIGHTEN** since these Screws are threading into plastic which will hold well in service but is easily stripped if over-tightened.

(30) Install a new Mouthpiece (item 21) and Mouthpiece Tie (item 22) **if** the old Mouthpiece was removed due to deterioration.

SET UP OF SECOND STAGE OF THE SRB3700 & SRB3900

NOTE: For the following adjustments, the Exhaust Tee, Cover, and Diaphragm must be removed.

(1) Use a 1/4" nut driver to turn the Locking Nut (item 11) counterclockwise outward, until the Lever Assembly (item 13) is just loose enough so that the tip of the roller on the Lever Assembly will move loosely up and down about 1/16".

(2) Attach the second stage to the overhauled and properly adjusted first stage that it is going to be used with, mounted on a air tank filled to between 2700 and 3500 psig.

(3) **Slowly** turn on the tank valve. If any leaks are heard, notice where the air is leaking, shut the air off, and correct the problem.

(4) In 1/8 turn increments, turn the Adjusting Nut (item 11) clockwise until a slight hissing is heard. Then turn the Adjusting Nut 1/8 turn counterclockwise to just stop the hissing.

(5) Depress the Lever Assembly in the second stage five or six times to get the -internal parts seated in their proper positions.

(6) After setting the Adjusting Nut, the relationship between the diaphragm wear plate and the tip of the Lever Assembly must be checked. To do this, install the Diaphragm and Retaining Ring. The tip of the Lever should just barely touch the Diaphragm. If when touching the. Diaphragm lightly with the finger there seems to be a gap between the Lever tip and Diaphragm, remove the Diaphragm and bend the Lever slightly upwards using the fingers. If the regulator hisses slightly when the air is turned on, but stops hissing when the Diaphragm is removed, then the Lever is too high. Use SHERWOOD's Lever Bending Tool p/n 4005-16 to bend the Lever slightly downward. Replace the Diaphragm and test the gap between the Lever and the Diaphragm again after each bending.

TESTING OF SECOND STAGE OF THE SRB3700 & SRB3900

INHALATION EFFORT

- The inhalation effort of the second stage can be checked using a pan of water about five inches deep. Slowly immerse the second stage with the front Cover down and level. The regulator should flow as soon as the Diaphragm is a little deeper than level with surface of the water. If a water column or water manometer is used to check inhalation effort, it should not exceed 1 " w. c. at cracking. It should drop to about 3/4" w. c. at one atmosphere and a moderate flow rate. The technician can alter the inhalation effort within a certain range. The inhalation effort can be increased by turning the Adjusting Nut (item 11) counterclockwise. However, counterclockwise adjusting must stop when the Lever Assembly (item 13) becomes loose against the Lever Support (item 14). The inhalation effort can be decreased by turning the Adjusting Nut clockwise. However, clockwise adjusting must stop when air begins to hiss past the second stage Poppet.

EXHALATION EFFORT

- If the exhalation is checked with no instruments, it should feel smooth and unrestricted. If a water column is used, it should not exceed 1/2" w.c. at one atmosphere. Brand new Exhaust Valves will sometimes adhere slightly to the Case causing a slight increase in inhalation effort. This condition will disappear with use.

LEAK TEST

- With the air supply **disconnected** and the regulator purged of all positive air pressure, slowly immerse the second stage in a pan of water with the mouthpiece pointing straight up. Immerse the regulator until the water is 1/4" to 1/8" from the lip of the mouthpiece. Hold the regulator in this position for one minute and then slowly raise it out of the water. While watching the inside of the mouthpiece tube, tip the regulator mouthpiece downwards to see if any water comes out of the mouthpiece tube. If it does, check for source of leakage.

EXTERNAL AIR LEAKS

- Attach the regulator first stage to a tank short enough to totally submerge the first and second stage in your filling station cooling water. With the tank valve still turned off, flood the second stage completely with water, and then position it mouthpiece up. Turn the tank air valve on **slowly** and then watch for any leaks in the first or second stage (except for the normal flow of air from the one-way Bleed Valve on the first stage). Correct any unwanted leaks found. Check for the proper Positive Air Purge flow rate. See the first stage testing section (page 7) in this manual for the technique.

SRB0050 TOOLS REQUIRED FOR SECOND STAGE SERVICING

– Two good quality 6" or 8" (15 or 20 cm) adjustable wrenches

– #10 Torx screwdriver

– Small Phillips ACR Screwdriver

– Size 0 Square Drive (Robertson Head) screwdriver

– Side cutting pliers

– Sherwood In-line Adjusting Tool (p/n TL102)

– Sherwood Plastic Probe (p/n TL111) to push out orifice

– Sherwood Lever Height Adjusting Tool (p/n TL123)

DISASSEMBLY OF SECOND STAGE OF THE SRB0050

NEVER tighten the hose fitting to the first stage with more than 40 in. lbs. (4.5 joules) of torque. The inlet hose fitting can be weakened by overtightening.

To view the complete parts list of the second stage, fold out the back cover of this manual.

1. Pull back the hose protector (item 27) from the inlet end ferrule. Remove the hose assembly (item 26) from the orifice housing (item 22). Inspect the hose assembly for any cuts or cracks, especially on the hose at the metal ferrules. Replace the hose assembly if any cuts or cracks are found.

2. Remove the mouthpiece (item 18) by cutting the mouthpiece tie (item 19) with side cutting pliers. Discard the old mouthpiece tie. Examine the condition of the mouthpiece. Pay particular attention to the area on top just behind where the old tie tightened. This is a prime area for small holes to develop. If the mouthpiece is in good condition, it can be reused.

3. Remove the exhaust tee retaining screw (item 15) with a Phillips or Square Drive screwdriver.

4. Remove the exhaust tee (item 14) from the case by pulling it back and off the top edge.

5. Remove the front cover (item 5) from the case by turning the bezel ring by hand. Some older units (manufactured before 1986) have a metal bezel ring with a small metal locking tab in the mouthpiece area. Remove this ring with a small slotted screwdriver.

A. Purge Button Change:

NOTE: At this point, the purge button can be removed from the cover. This will be necessary only if the button travel is impeded by silt deposits, or if the logo (item 1) is to be changed to a different color. If it is necessary to remove the purge button, follow the next sub-steps A to E. Otherwise, go on to Step 6.

a. Place the cover assembly with the purge button logo face down on a clean flat surface.

b. From the inside of the cover assembly, push the four barbed tabs holding the purge button assembly in place in towards each other. This will release the purge button assembly from the cover.

NOTE: The purge button spring is located behind the purge button, with the wide end of the coil toward the cover. Be sure to replace the spring with the wide end facing the cover.

c. If only the label insert (item 1) was purchased for installation, carefully remove the old label insert from the purge button (item 2) with a thin flat-blade screwdriver, and install the new colored label insert in its place.

d. Reverse the disassembly procedure to reassemble the case assembly with the new color logo installed.

6. Gently remove the diaphragm (item 6) from the case. Hold the diaphragm up to a light source. Gently stretch the diaphragm and look for tears or pinholes. If any are found, replace the diaphragm. Otherwise, the diaphragm can be reused. If you are repeatedly tearing diaphragms during this visual inspection, you are using too much force. You cannot return diaphragms torn in this way for warranty credit.

7. Clamp the Sherwood modified 3/4" deep socket (p/n TL118) in a bench vise. Lower the lever (item 9) into the socket until the 3/4" hex of the lever support (item 10) is engaged in the socket. Use a 13/16" wrench to loosen and remove the orifice housing (item 22).

NOTE: Some regulators (Oasis, Blizzard, Classic) will have heat transfer fins (10B) attached to the lever support. The modified 3/4" socket will still fit onto the lever support with the fins attached. You can leave the fins attached throughout your servicing. If the fins are damaged and need to be replaced, use the Sherwood 5/32" drive socket to remove and replace the two 5/32" hex head screws (10A).

8. Use the Sherwood in-line adjusting tool (p/n TL102) to back the adjusting orifice out of the orifice housing until the threads disengage. Remove the in-line adjusting tool, and push the adjusting orifice the rest of the way out of the orifice housing with the Sherwood Plastic Probe (p/n TL111).

9. Remove the O-ring (item 23) from the adjustable orifice.

10. Before removing the exhaust valve (item 16) from the case, bend it over as far as it will go from the top, bottom, left, and right sides. If it fails to snap back quickly, and does not lie perfectly flat against the case, the valve should be replaced. If it does snap back satisfactorily, remove it and inspect the sealing edges. If they appear smooth, and the locking tab on the nipple is good, the valve can be reused.

11. Remove the spacing washer (item 21), and the O-ring (item 20) from the threads of the lever support (item 10). Remove the lever support from the inside of the case (item 17).

12. Normally, you will simply need to change the poppet stem seat insert (item 13) to restore the second stage to maximum performance. To change the stem seat insert (item 13), leave the lever assembly together. With a penknife or similar object, carefully remove the old seat insert. Put the new seat insert on a clean flat surface and lower the poppet cavity (from which the old seat insert was removed) over the new seat insert. The new style black molded seat (p/n 978-9BN) should be installed with the identifying Sherwood symbol facing outward.

13. If parts of the lever assembly (stem, spring, lever, etc.) need to be replaced, take apart the assembly with the Sherwood stem socket tool (p/n TL124) Clamp the stem socket tool in a bench vice. Insert the square head of the poppet stem into the tool. With a Phillips screwdriver, or preferably a size 0 Square Drive (Robertson Head) screwdriver, loosen the screw (item 7) that holds the assembly together.

NOTE: If only the lever (item 9) is to be replaced, do not totally remove the screw. You can remove the lever from under the washer (item 8) by pushing the poppet into the lever support when the screw is almost all the way out.

14. Rinse all plastic and silicone parts in clean fresh water, and then blow the parts dry with compressed air to remove any sand and dust particles.

15. **If necessary**, clean all metal parts of the second stage in an ultrasonic cleaner or cleaning solution. Remove the O-rings before cleaning any metal parts; most cleaning solutions are damaging to the O-ring material. See Section 6.3 for recommendations on cleaning solutions.

    NOTE: If you use an ultrasonic cleaner to clean the second stage adjustable orifice (item 22), use a plastic container to prevent the orifice from vibrating against other metal parts which could damage the orifice seal.

16. Inspect the case (item 17) for any cracks. Look particularly closely at the area where the orifice housing and the lever support clamp down. Replace the case if any cracks are found.

17. Inspect the orifice sealing cone (where the poppet insert seals) for any nicks, scratches, or corrosion. Corrosion or minor scratches can be polished out using a fine-grit rubberized polishing stick or a clean new pencil eraser. Do not apply heavy pressure when rotating the polishing stick. Stop polishing immediately after the corrosion or scratch disappears. An orifice will not be accepted for warranty replacement simply because it is dirty or corroded. The technician must clean the orifice sealing surface at every service interval.

18. Blow all dust and debris out of the orifice housing with clean compressed air.

    NOTE: Prior to this point, you should have cleaned and inspected all parts, following proper servicing procedures. Do not continue until this has been done.

ASSEMBLY OF SECOND STAGE OF THE SRB0050

1. Re-install the cleaned and lubricated O-ring (item 23) onto the adjustable orifice (item 24). Install the adjustable orifice back into the orifice housing. Push it in with your finger as far as it will go.

2. Install the exhaust valve (item 16) into the case by inserting the nipple into the small hole from the outside of the case. Reach inside the case and pull the nipple firmly with the fingers until you hear or feel it “click” into place. Inspect the exhaust valve to see that it is properly seated.

3. Install the lever assembly into the case.

4. Install the O-ring (item 20) on the threads of the orifice housing. Install the spacing washer (item 21) around the outside of the O-ring.

    NOTE: The spacing washer must be installed with the outer lip facing upward toward the orifice housing.

5. Screw the orifice housing (item 22) onto the threads of the lever assembly. With a 13/16” wrench on the orifice housing and a Sherwood modified 3/4” deep socket (clamped in a vise) on the hex of the lever support (item10) inside the case, tighten the orifice housing and the lever assembly together snugly (70 in. lbs. / 8 Nm).

    NOTE: Do not allow lubrication (grease on fingers, or silicone over-spray) to get on the case (Item 17), the diaphragm (item 6), or the exhaust valve (item 16). This may cause slippage or deterioration of these parts.

> **NOTE: THE FOLLOWING STEPS (6 - 10) ARE INCLUDED HERE FOR CONTINUITY. THEY MUST BE PERFORMED AFTER THE REGULATOR SECOND STAGE IS ADJUSTED (see 5.4 Setup of Second Stage).**

6. Install the diaphragm (item 6) into the case so that it sits evenly on the ledge.

7. Install the cover (item 5) onto the case by sliding it carefully and firmly into place. Keep the cover straight so that the cover vent holes and the purge button emblem are properly aligned. Install the bezel ring (item 4) over the cover and tighten it firmly by hand onto the case.

8. Install the exhaust tee (item 14) onto the case flange by sliding it up from the bottom.

9. Install the retaining screw (item 15) through the screw hole in the exhaust tee and into the hole in the case using a # 1 Phillips, or Size 0 Square Drive screwdriver.

   DO NOT OVER-TIGHTEN. This screw is threading into plastic, which will hold well in service but is easily stripped if over-tightened.

10. Install a new mouthpiece (item 18) and mouthpiece tie (item 19).

11. Install one end of the hose into a serviced first stage, tighten snugly.

NEVER tighten the hose with more than 40 in. lbs. (4.5 joules) of torque. The inlet hose fitting can be weakened by overtightening.

SET- UP OF SECOND STAGE OF THE SRB0050

For the following adjustments, remove the cover and diaphragm.

1. Install Sherwood's in-line adjusting tool (p/n TL102) between the orifice housing (item 22) and the hose assembly (item 26). Use the tool to screw the adjustable orifice (item 24) clockwise. Watch the end of the lever (item 9) as you do this. As soon as the tip of the lever begins to drop, stop turning the tool. The slight amount of friction this operation produces between the orifice and the stem seat will not harm the stem seat.

2. Attach the in-line tool and the second stage to its accompanying overhauled and properly adjusted first stage, and mount on an air tank filled to between 2700 and 3500 psig (186 and 240 bar).

3. **Slowly** turn on the tank valve. If you hear any leaks, determine the location of the leak, shut the air off, and repair the leak as necessary.

4. Turn on the air. Use the in-line adjusting tool to turn the adjusting orifice (item 24) counter-clockwise until you hear a slight hissing. Then turn the adjusting orifice clockwise just enough to stop the hissing. HINT: A slight clockwise turn past the point where the hissing just stops will reduce wear and tear on regulators used heavily in rental or training situations.

5. Depress the lever assembly in the second stage five or six times to get the internal parts seated in their proper positions. Listen for any hissing. Adjust if necessary.

6. After setting the adjusting orifice, check the relationship between the diaphragm wear plate and the tip of the lever assembly. To do this, use the Sherwood lever height gauge and adjusting tool (p/n TL123). Use the tool as a gauge by laying it across the top of the case as shown in Photo #4.

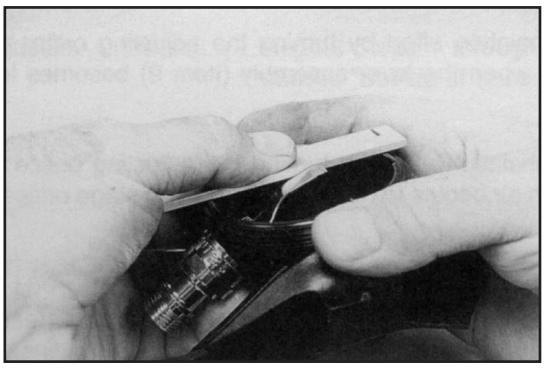
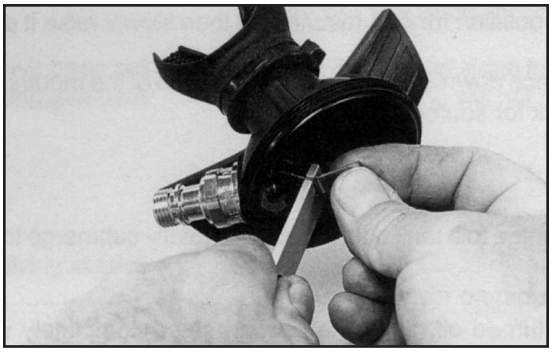


Photo #4.

7. Look across the case and gauge tool. The tip of the lever should be even with the bottom surface of the gauge. If you are re-using the same major parts of the regulator, this measurement will most likely be correct, and no adjustment will be needed. In fact bending the lever should be avoided unless necessary to get the tip of the lever in the proper position.

8. If you have installed a new lever, and the lever tip is noticeably high, bend it lower by installing the lever in the slot of the tool as shown in Photo #5.

Photo #5.



9. Holding the tool in one hand, with the tip of the lever toward the fingers, bend the lever carefully. Do not hold on to the case when making this adjustment, as this can result in the lever bending at the wrong area (near the lever support instead of at the mid-point of the lever). If necessary, bend the lever upward using the same holding method.

10. After the regulator is assembled, turn on the air. If the regulator hisses slightly, but stops hissing when the diaphragm is removed, the lever is too high. Use the lever bending tool to bend the lever slightly downward.
11. Replace the diaphragm. Continue to test the gap between the lever and the diaphragm after each bending until the lever is in the correct position.

12. Return to Assembly of Second Stage Section of this manual to complete assembly of the regulator.

TESTING OF SECOND STAGE OF THE SRB0050

INHALATION EFFORT

Check the inhalation effort of the second stage with a pan of water about five inches deep.

1. Slowly immerse the second stage with the front cover down and level. The regulator should flow as soon as the diaphragm is a little deeper than level with surface of the water.

2. If you use a water column or water manometer to check inhalation effort, it should not exceed 1” w.c. (2.5 cm) at cracking. It should drop to about 3/4” w.c. (1.9 cm) at one atmosphere and a moderate flow rate. You can alter the inhalation effort within a certain range.

3. You can increase the inhalation effort by turning the adjusting orifice (item 22) clockwise. However, discontinue clockwise adjusting when the lever (item 6) becomes loose against the lever support (item 7).

4. You can decrease the inhalation effort by turning the adjusting orifice counter-clockwise. Discontinue counter-clockwise adjusting when air begins to hiss past the second stage orifice.

5. Install the second stage on the end of the hose. Use two wrenches to tighten the hose fitting with 40 in. lbs. (4.5 Joules) of torque

EXHALATION EFFORT

1. If you do not use instruments to check the exhalation effort, the flow should feel smooth and unrestricted.

2. If you use a water column, it should not exceed 1/2" w.c.(.02 bar) at one atmosphere.

3. Brand new exhaust valves will sometimes adhere slightly to the case, causing a slight increase in inhalation effort. This condition will disappear with use.

LEAK TEST

1. Disconnect the air supply. Purge the regulator of all positive air pressure.

2. Slowly immerse the second stage in a pan of water with the mouthpiece pointing straight up.

3. Immerse the regulator until the water is 1/4" to 1/8"(.64 to .32 cm) from the lip of the mouthpiece.

4. Hold the regulator in this position for one minute and then slowly raise it out of the water.

5. Tip the regulator mouthpiece downward and watch the inside of the mouthpiece tube. If any water escapes from the mouthpiece tube, check for source of leakage.

EXTERNAL AIR LEAKS

1 Attach the regulator first stage to a tank short enough to totally submerge the first and second stage in your filling station cooling water.

2. With the tank valve still turned off, flood the second stage completely with water, and then position it mouthpiece up.

3. Turn the tank air valve on **slowly** and then watch for any leaks in the first or second stage (except for the normal flow of air from the one-way bleed valve on the first stage).

4. Repair any leaks.

5. Check for the proper Positive Air Purge flow rate. See the first stage testing section (page 7) in this manual for the technique.

TROUBLESHOOTING REGULATORS

POSSIBLE CAUSE	RECOMMENDED ACTION
HIGH INHALATION EFFORT AT DEPTH:	
1. Inlet Filter clogged	Clean Filter
2. No air flowing through Dry Air Bleed (Positive Air Purge) System	Check flow rate out of the Positive Air Purge System one-way Bleed Valve. If low air flow or no air flow is detected, clean the flow element in the piston face, or replace the piston.
3. H.P. Air supply insufficient	Verify supply air pressure. Make **SURE** customer had the tank valve turned **ALL** the way on.
4. Second Stage improperly adjusted	Repeat steps 1 through 5 in the section of this manual entitled "SET UP OF SECOND STAGE ".
FREE FLOWING:	
1. Intermediate pressure too high	Adjust First Stage below 150 psig.
2. Damaged or Worn H.P. Piston Seat . (Also gives High Intermediate Press.)	Replace Seat. p/n 3801-5
3. Damaged or Worn L.P. Poppet Stem Seat	Replace Seat. p/n 978-9C
4. Nicked or corroded Orifice Sealing surfaces in First or Second stage	Dress orifices with polishing stick, or replace orifices.
5. Demand Lever in second stage bent .	Replace.
6. Weak spring in second stage .	Replace.
7. Second Stage improperly adjusted	Repeat steps 1 through 5 in section of this manual entitled "SET UP OF SECOND STAGE".
8. Parts in second stage have been severely chilled due to too much purging and have shrunk, allowing air to leak	Allow the second stage to warm back up to room temperature. This chilling will not occur in normal diving.
WET BREATHING:	
1. Improper clearing, or diver diving in total head-down position	Instruct diver on proper clearing technique.
2. Diaphragm improperly installed	Check position of Diaphragm visually.
3. Hole in Mouthpiece at Tie area	Replace Mouthpiece.
4. Hole in Diaphragm	Replace Diaphragm.
5. Damaged Exhaust Valve, or edges of Exhaust Valve not firmly seated on case.	Replace Exhaust Valve.
6. Crack in Case .	Replace Case.
HUMMING OR BUZZING DURING INHALATION:	
1. Harmonic resonance between Springs and mass of Piston.	Disassemble first stage and flip Main Spring over. Change the position of Piston in bore. If that does not work, exchange Piston and Spring with different units.
2. Harmonic resonance between the 2nd stage lever assembly springs, and the mass of the diaphragm.	This “honking” effect in the second stage can be lessened by installing one of Sherwoods new denser black diaphragms shipped under the same 4006-13A part number as the older blue diaphragm (available since 1997).

PARTS CLEANING RECOMMENDATIONS

Regulators which see heavy use, particularly those used in salt water, often need extra effort to remove dirt and corrosion from the parts of the regulator. Some suggested cleaning solutions are listed at the end of this section, and there are probably many others being used successfully. Here are a few general suggestions we can make:

First, don't expect your cleaning solution to do all the work in a matter of seconds. If it does clean that fast, it is probably too strong and is etching the finish on the parts. Use a soft bristle brush to help get rid of the thickest deposits. Take special care not to damage orifice sealing areas. Dress the orifice sealing areas with a fine grit polishing stick or pencil eraser after drying the parts.

Only immerse those parts which really need cleaning. With SHERWOOD's Positive Air Purge system (Dry Air Bleed) the interior of the first stage is always clean and dry so the piston and spring should never need cleaning. In fact, immersing the clean SHERWOOD piston in contaminated cleaning solution can plug the Flow Control Orifice in the face of the Piston, which could slow or stop the flow through the Positive Air Purge system.

Many of the solutions used for cleaning metal parts are damaging to the nitrile compounds found in O-rings. For this reason, all O-rings must be removed from parts placed in a cleaning bath.

If the first stage Moving Orifice (item 29-3106-13A)is corroded due to salt water entry through the inlet filter, the first attempt to clean it should be made with a clean lint-free cloth or a soft brush in a fresh soapy water solution. If a cleaning solution in an ultrasonic cleaner must be used, the Orifice should be isolated from the side walls, and all other parts by placing it individually in a plastic cup in the cleaning hopper to prevent mechanical damage to the Orifice sealing surfaces.

Due to it's unique stainless mesh design, the inlet Filter of the SHERWOOD SR3601 first stage can be cleaned in the ultrasonic cleaner. Visually inspect the Filter before and after cleaning. Blow the Filter dry with clean compressed air.

Check the strength of any cleaning solution by placing a spare chrome plated part in the bath for a few minutes longer than the time you expect to leave the parts in. If visible damage to the chrome finish results, then the solution is too strong.

SOME EXAMPLES OF COMMONLY USED CLEANING SOLUTIONS

SOLUTION	COMMENTS
Soapy Water	Good for plastic & silicone parts.
Vinegar and Water - Equal part solution	Ingredients easily available, 15 minutes approx. cleaning time.
1000 cc Water 60 gr. Sulfuric Acid 60 gr. Potassium Dichromate	Fast acting solution that should be made and used with care. Use gloves and safety glasses.
Cleaning solutions recommended by Ultrasonic Cleaner Manufacturers.	Usually the best route to go. Check with the manufacturer for strengths and uses for their cleaners. Some brand names of cleaning solutions are Branasonic®, Micro®, Oakite 31®, and Brex®.

FEATURES

First Stage:

- External adjustability of the first stage allows the dive store technician to adjust regulator intermediate pressure to match the type of diving being done. Low outlet pressure (120 psi) helps the BLIZZARD regulator resist freezing in cold water diving. Medium outlet pressure (135 psi), combines good breathing effort and durability in both models. High outlet pressure (150 psi), maximizes flow rates on the OASIS 2 for high work efforts during dives.

- A high flow mesh Filter gives the regulator protection with low restriction. The Filter's dome shape provides a large surface area to maximize flow capabilities. The Filter can be cleaned by the service technician after accidental sea water contamination.

- Five low pressure ports give flexibility for any BCD / Dry Suit configuration.

- Positive Air Purge (Dry Air Bleed) keeps the interior of the first stage clean and dry including the main spring chamber. This feature gives the first stage superior durability, stable output pressure under all sport diving conditions, and outstanding resistance to cold water freezing effects.

Second Stage:

- The new Exhaust Tee reduces exhaust bubble pulsation, which in turn reduces mouth and jaw fatigue. The Exhaust Tee also directs the bubbles behind the mask, giving the diver unobstructed vision in most head attitudes.

- The large high-flow Mouthpiece and new oval Exhaust Valve give lower breathing resistance.

- A smooth hydro-dynamic shape gives low resistance to forward motion through water, thus lowering jaw fatigue.

- With low interstage hose pressure (120-135 psi.) the BLIZZARD's Heat Transfer Fins become warm and transfer heat to the Lever Support area, thus aiding in freeze resistance. At higher interstage hose pressures (135-145 psi.), the OASIS 2's heat transfer Fins become much colder, causing condensation and moisture retention to ease dry mouth.

- The Exhaust Heat Sink, exclusive to the SRB3900 Blizzard, captures the otherwise wasted heat from the diver's exhaled breath to further enhance the BLIZZARD's resistance to freeze-up.

CUSTOMER MAINTENANCE & HANDLING TIPS

How your customers treat their regulators will have a great deal to do with the unit's function and durability. The following are a few tips that you can pass on to your customer to help assure the durability

PRE-DIVE CHECKS

1. Before mounting the regulator on the tank valve, check the hoses and hose connections for cuts, abrasions or other signs of damage. Slide the hose protectors back to inspect the areas of the hose normally covered. Be sure all hose connections are tight.

2. Just before turning on the tank air valve, check to make sure that the yoke nut or DIN connection is tight and the regulator body is aligned properly, with no kinks in the hoses.

3. Turn the tank valve on **SLOWLY** and listen for leaks.

4 . **DO NOT** at any time lift the tank/BCD assembly by the regulator or hoses.

5. Surface test the regulator by breathing lightly through the mouthpiece. Depressing the purge button above the water's surface is not an appropriate method for testing the function of the regulator.

POST-DIVE CARE

1. After the dive, blow all water out of the dust cap with clean dry air and place the cap securely on the regulator inlet. On multiple tank dives, use great care to keep salt water out of the regulator inlet when tanks are changed. Neglecting these simple procedures is the greatest cause of corrosion and wear in SCUBA regulators. SHERWOOD's exclusive Dry Air Bleed System keeps all other water-borne contamination out of the first stage body.

   NOTE: A tiny stream of air bubbles escaping from a small black valve on the first stage indicates that the Dry Air Bleed System is working. The amount of air used is negligible (13-25 cc/min.). The system should be checked periodically, particularly after servicing, to ensure that there is some air escaping from the black oneway Bleed Valve. If no air is escaping from the valve when air pressure is applied to the first stage, you should have the regulator inspected by your Sherwood dealer.

2. With the dust cap securely in place, rinse the first and second stages in clean fresh water. DO NOT depress the purge button before or during rinsing since this may introduce water into the second stage and the low pressure hose. Shake or blow all excess water from the second stage and allow the entire regulator to air dry before storing.

3. Store the regulator in a clean bag or storage box, away from sunlight, excessive heat and humidity.

SCHEDULED MAINTENANCE

To keep the owner warranty in effect, your customers must have their regulators inspected and serviced annually, within 30 days before or after the anniversary of the date of purchase, by an authorized SHERWOOD dealer. Failure to do so invalidates the warranty. Even with infrequent use, the regulator must be serviced annually to ensure proper performance and satisfy warranty requirements.

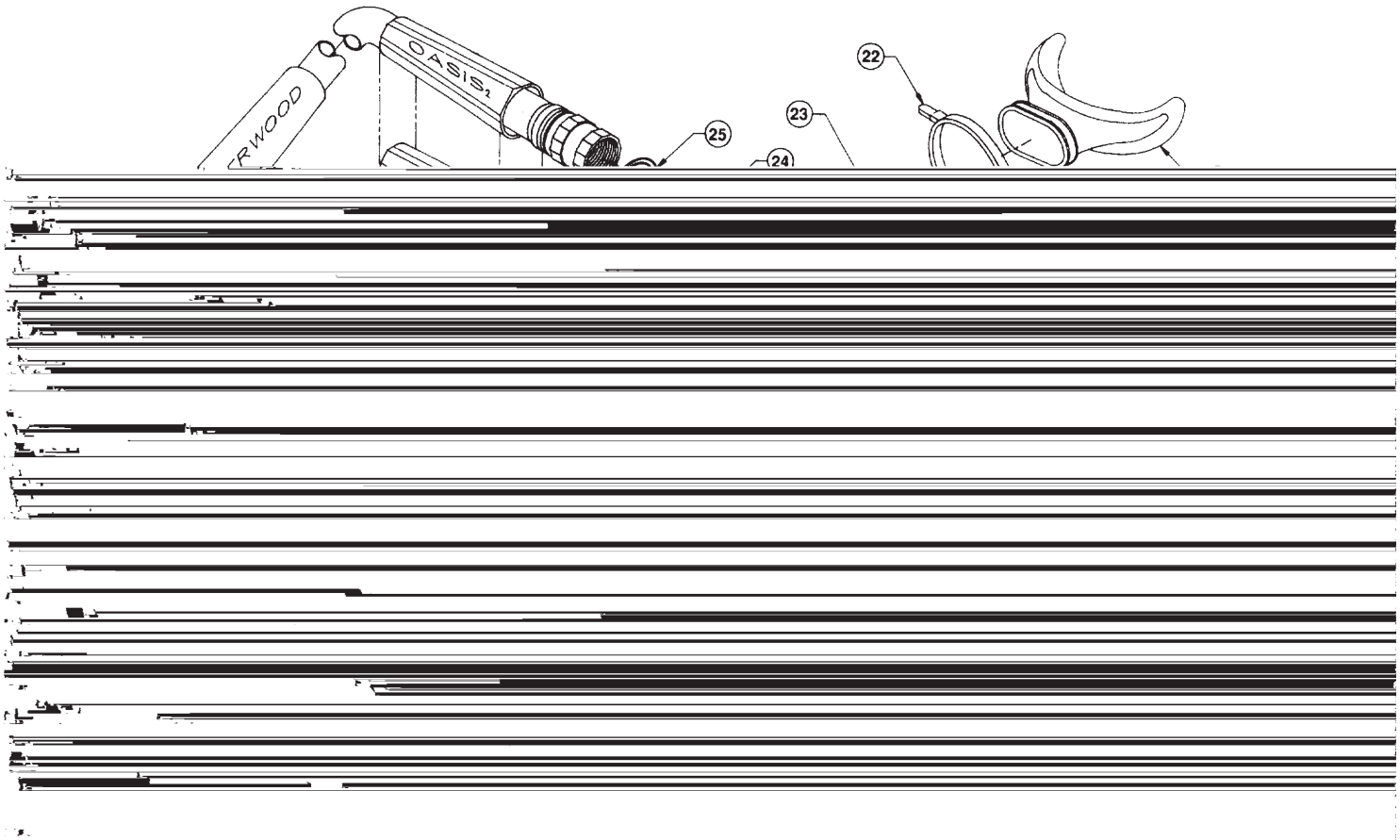
Companion Instructional VHS Video Tapes to this and other SHERWOOD Repair Manuals are available from your SHERWOOD Distributor at a nominal cost. Ask your SHERWOOD Sales Representative or SHERWOOD Distributor for details.

NOTE: Part numbers and specifications are subject to change without notice. Changes will be announced by technical bulletins. The repair technician should have ready access to these bulletins.

SECOND STAGE FOR THE OASIS 2 (SRB3700) & BLIZZARD (SRB3900)

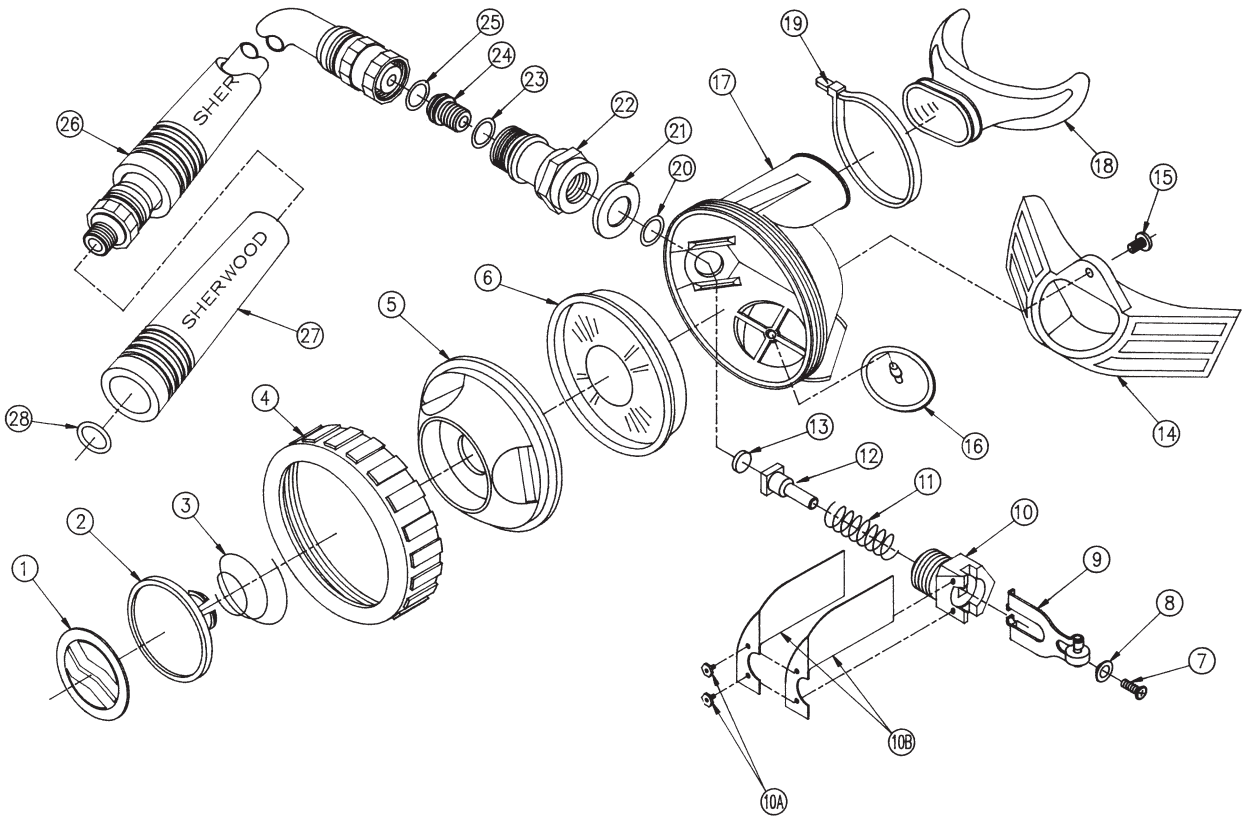
ITEM #	CATALOG #	DESCRIPTION´
	SR3701	OASIS 2, 2nd Stage Complete
	SR3902	BLIZZARD, 2nd Stage Complete
1	3702-8BU	Logo Insert (Blue)
1	3702-8PK	Logo Insert (Pink)
1	3702-8RD	Logo Insert (Red)
1	3702-8WH	Logo Insert (White)
1	3702-8Y	Logo Insert (Yellow)
1	3702-8NG	Logo Insert (Green)
2	3702-6	Purge Button
3	29-4006-12	Purge Button Spring (Black)
4	3702-3	Cover
5	3602-17	Retaining Ring
6	3602-4A	Diaphragm (Blue Tufel®)
7	25-3902-22	Exhaust Heat Sink
8	J11-348-38ET	Screw (for fins)
9	25-3602-21	Right Fin
10	25-3602-22	Left Fin (dimpled)
11	J11N0440BP	Adjusting Nut

ITEM #	CATALOG #	DESCRIPTION
12	3602-9A	Washer (for Stem)
13	3602-20A	Lever
14	9-3602-7	Lever Support
15	19-3602-29	Spring
16	29-3602-18	Stem
17	978-9S	Seat Insert (for Stem)
18	3602-6A	Exhaust Valve
19	3702-7A	Exhaust Tee
20	3702-5	Exhaust Tee Retaining Screw
21	3602-3	Mouthpiece
22	3786-9W	Mouthpiece Tie
23	3602-1D	Case
24	1-3702-4	Orifice Housing
25	G010A	O-ring (hose outlet end)
26	3702-9	OASIS 2 Logo Sleeve
26	3902-9	BLIZZARD Logo Sleeve
27	3406-20-31HF	Hose Assembly (31˝ High Flow)
28	G011B	O-ring (hose inlet end)



SECOND STAGE FOR THE CLASSIC (SRB0050)

ITEM #	CATALOG #	DESCRIPTION
1	3207-2	Label
2	3004-1	Purge Button (no label insert)
3	19-4006-12	Purge Button Spring
4	3302-7	Bezel Ring
5	3302-6BK	Cover
6	4006-13 A	Diaphragm (blue Tufel®)
7	J12-CO40-45B	Screw (combination Phillips/square drive)
8	19-4006-17	Washer
9	3302-20	Lever
10	1-3106-17R	Lever Support
10	J11-348-38ET	Screws (2 needed)
10B	25-3106-16	Fins (2 needed)
11	19-978-10	Spring
12	46-4006-18	Stem (no seat insert installed)
13	978-9B	Seat Insert (for Stem)
14	3302-2	Exhaust Tee
15	J12-C040-45B	Screw (combination phillips/square drive)
16	4006-15	Exhaust Valve
17	3302R-1	Case
18	3208-9S	Mouthpiece
19	3786-9W	Mouthpiece Tie
20	G097A	O-ring
21	1-3004-12	Spacing Washer
22	1-3004-4A	Orifice Housing
23	G010A	O-ring (for adjustable orifice)
24	43-40006-20	Adjustable Orifice (no O-ring)
25	G010A	O-ring (for hose outlet end)
26	3809-50-31	Hose Assembly (31") (includes hose protector)
27	3602-27	Hose Protector
28	G011B	O-ring (hose inlet end)





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