

Scubagaskets SGT2



Second Stage Service & Repair Manual

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Record of Revisions

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INTRODUCTION

This manual is intended only to describe to experienced maintenance personnel the procedures for the proper service and repair of the Scubagaskets regulator products described in this manual. It should not be used as an instruction manual for regulator repair by untrained personnel or consumers. If you do not fully understand all of the procedures listed in this manual, do not attempt service.. The availability of replacement parts and Service Kits from Scubagaskets does not imply qualification to service scuba equipment. If you have questions about a listed procedure, please contact the Scubagaskets technical department at info@scubagaskets.com.

SAFETY PRECAUTIONS

This manual provides step-by-step instructions for the inspection, cleaning, reassembly and testing of the Scubagaskets SGT2 primary and auxiliary second stage regulators. It is recommended that the technician performs all steps in the order given, without skipping steps or taking shortcuts. Please read this manual in its entirety before starting service. Pay close attention to all WARNINGS, CAUTIONS, SPECIFICATIONS and NOTES that are intended to draw your attention to steps, techniques or procedures that may damage the equipment, or be dangerous to the technician or the diver, if not followed correctly.

Definition of Warnings, Cautions, Notes and Specifications:



A WARNING indicates a procedure or situation that may result in serious injury or death for either the technician or the diver if not performed correctly.



A CAUTION indicates a situation or technique that may result in potential damage to the product, or render the performance of the regulator outside of its specification limits.



A Note is used to emphasize an important point or tip that may improve the effectiveness of service.

SPECIFICATION

A Specification is a limiting torque or pressure range limit that MUST be adhered to for safe function of the regulator. Deviation may result in damage to the equipment, serious injury to the technician or diver, or death.

DIVING CONDITIONS:



This Scubagaskets regulator is designed for use in water temperatures above 50°F (10°C). Cooler water may cause the regulator to be more sensitive to freeflow or freezing. Users of Scubagaskets regulators in conditions outside of those in which the regulator was certified are advised to obtain specific training in cold water diving to avoid serious injury or death.

MAINTENANCE SCHEDULE:

Regulators are subject to a variety of environmental factors that may affect product performance over time. A complete regulator service is required every two years, or every 100 dives, whichever comes first. An inspection is required annually, or every 50 dives, whichever comes first.

Inspections and overhauls must be documented in the Service and Inspection Record at the end of this Manual to maintain the product warranty.

PRE-SERVICE INSPECTION:

Pressurize the regulator set and immerse it in water. Document the absence of leaks from any regulator, hose or connection. If a leak is noted, perform the appropriate service (which may include a complete service).

Occlude the first stage gas inlet (or the hose connection if the second stage is disconnected) and gently inhale from the second stage mouthpiece. It should not be possible to draw air. Any leak must be investigated during service. While an exhaust valve fault or mouthpiece tear are most common, there are numerous other case seals which must be evaluated via a full service.

Visually inspect the mouthpiece for distortion, cracks or holes. Replace the mouthpiece as necessary.

Confirm that second stage opening force (cracking effort) is within specification. In the absence of a leak from the second stage, only retuning is required if opening force is outside specification, unless the service interval has passed.

Check that the Adjustment Knob and Venturi Lever both operate smoothly. Any grittiness or sticking during operation should prompt disassembly and cleaning, and may warrant a full service.

Visually inspect the second stage exhaust valve to see whether it is in good condition and whether the sealing surface is clean.

The infrequently used regulator:

Do not assume that a regulator is in good condition because it is not often used, or just because it has been well stored. Corrosion can occur from moisture present during storage, and o-rings naturally become distorted over time, which may result in a loss of seal. The second stage is particularly susceptible to loss of tune during storage, due to spring pressure on the low pressure seat.

WORK AREA AND TOOLS:

Regulators should be serviced and repaired in a clean, well-lit work area. As each regulator is disassembled, its parts should be separated from those of the other regulators. Proper disassembly and reassembly requires several specialty tools. For a complete list of tools required for service, see Table 2 (page 18).

O-RING REMOVAL:

Whenever removing an o-ring, care must be taken not to damage the surfaces of adjacent sealing lands. Tools used to remove o-rings must not have sharp edges that could scratch the metal sealing surface. Insertion of the point of an o-ring pick should always be performed nearly parallel to the o-ring. Scubagaskets strongly recommends that all o-ring removal tools be made of brass or plastic, except when otherwise specified.



Even a small scratch on the surface of an o-ring land can cause a leak. Once the land is damaged, the part must be replaced.

LUBRICATION:

This regulator is delivered cleaned for use with Nitrox up to EAN40. Scubagaskets recommends the use of only [Crystal Lube®](#), Tribolube 71, [Christo Lube MCG-111](#) or equivalent. Liquid or spray lubricants are not authorized, and silicone-based lubricants are specifically prohibited. Use of an incompatible lubricant will void the use of this regulator with any diving gas other than air. Do not lubricate threads unless specifically indicated.



WARNING

Torque values for this regulator have been engineered for DRY threads, except where noted. Lubricating a thread engineered for dry torque application will increase the load on the part. This may cause part failure during a dive, which may be fatal!

DISASSEMBLY:



CAUTION

Before disassembly, refer to the schematic on page 19, which shows all parts that are normally replaced during service. The specified parts should be replaced with new items and should not be reused, regardless of the age of the regulator or how many times it has been used since the last service.

1. Using a thin-profile 11/16 open end wrench, secure the heat exchanger (1) and remove the hose with a second wrench of appropriate size.



2. Using a thin brass or plastic pick, or a [double-hook pick](#), remove the o-rings (27, 29) from inside the hose swivel and at the first stage end, being careful not to scratch the o-ring lands.

3. Inspect the hose crimps. The crimps should be free from damage and the hose should not rotate in the crimp. If it does, the hose must be replaced.

4. Unscrew the Retaining Ring (26) and lift out the Purge Cover (25). To avoid tearing the thin skirt of the diaphragm, use a blunt plastic pick or brass spade to gently break any seal between the case and the rim of the diaphragm (24), and then lift it out. Inspect the diaphragm by holding it up to a bright light and gently stretching it in segments. The diaphragm should be soft and undamaged, with no holes or tears. Replace the diaphragm if there are any signs of damage.



5. Secure the valve barrel (3) with a 13mm open end wrench to prevent rotation inside the case. Loosen the heat exchanger (1) with an 11/16" open end wrench, and unscrew it **only approximately 3mm**. Do not completely remove the heat exchanger in this step.



CAUTION

Directly unscrewing the heat exchanger without fixing the barrel in place may allow rotation of the barrel if the heat exchanger is tight. This rotation will permanently damage the case, and necessitate its replacement.

6. Holding the regulator firmly in one hand, strike the heat exchanger with the palm of your hand to break the valve barrel free of any verdigris corrosion or salt crystals binding it to the case.



Failure to take this simple step, and instead completely removing the heat exchanger, may cause sudden loosening of the valve barrel in step 9 below. This may damage the lever tips as they strike the opposite side of the case.

7. Now completely remove the Heat Exchanger (1), and if accessible, remove o-ring (2) from the threaded end of the valve barrel. If it cannot be easily retrieved, it can be retrieved from the case after step 9 below.



8. Before removing the valve barrel, turn the Adjuster Knob (13) counterclockwise until it stops. This locks the Knob Retention Pin (22) in place and prevents its unexpected loss when the Venturi Sleeve (11) is removed in a later step.

9. Depress the Lever (23) against the Valve Barrel (3). Grasping the Venturi Sleeve (11) or its lever, gently pull the entire assembly out of the case. Do not let the Lever strike the side of the case. Avoid pulling on the Knob Adjuster, as the Venturi Sleeve may remain in the case, potentially allowing the Knob Retention Pin to fall out and become lost. Retrieve o-ring (2) at this point if it has not yet been removed.



10. Slide the Venturi sleeve 1cm toward the lever. While depressing the Lever, rotate the Venturi Sleeve (11) 180° until its broad flange covers the lever, and slide it over the lever and off the Valve Barrel. Remove its o-ring (10).



11A. It is generally not necessary to remove the lever for service. Doing so risks bending the delicate legs and cracking a leg as the lever is reshaped. Instead, consider skipping to step 12 below.

11B. If removal of the lever is desired, carefully pull one leg from the square hole in the Valve Barrel. Now lift the lever past the vertical position, and gently slide that leg up and over the barrel, until the other leg can be pulled free.

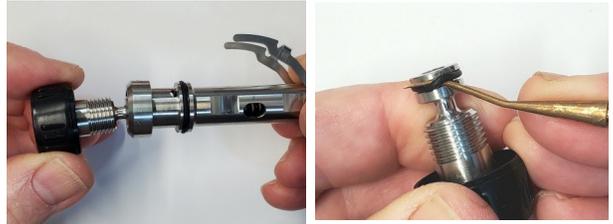


The Lever (23) is extremely delicate. Deforming the lever may create a stress fracture in the metal if it is reshaped for reassembly. This may cause lever failure and valve shutoff during a dive, which may be fatal. Do not remove the lever unless you can do so without permanently deforming the legs. Do not reshape a bent lever.

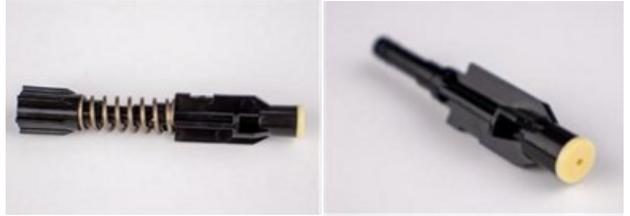
12. Rotate the Adjuster Knob (13) one-half turn clockwise, and push the Knob Retention Pin (22) out of the Valve barrel with a thin tool. It may be necessary to soak this end of the valve barrel in warm diluted vinegar for 10 minutes to remove salt crystals if the pin is stuck.



13. Unscrew the Adjuster Knob completely, gently pulling it past the internal threads in the Valve Barrel. Remove o-ring (13) with a thin pick.



14. Turning your attention to the Valve Barrel, tilt it threaded end up, and the Balance Chamber (21) and Spring (20) may fall out. If not, handle the barrel carefully during poppet removal to avoid losing parts.



15A. If the lever has been removed, push a thin dowel through the hole in Orifice (14) inside the threaded end of the Valve Barrel, and gently push out the poppet assembly (parts 16-21). If the Balance Chamber and Spring have already fallen out, simply push out the poppet.

15B. If the lever has not been removed, take a common zip-tie or other thin shim, and insert it between the Valve Barrel and one leg of the lever. Now loop the zip tie over the top of the barrel, and insert it (or a second thin shim) between the Valve Barrel and the other leg of the poppet. This will gently spread the legs of the lever approximately 1mm on each side, allowing the poppet to slide past. Now **gently** push a 3mm dowel through the hole in Orifice (14) and see if the poppet assembly (parts 16-21) falls free. If the poppet assembly does not push out, the lever must be removed.



16. Using a fingernail, remove the LP seat (16) from the Poppet (17). With a thin pick, carefully remove o-ring (18) before o-ring (19). Set the component parts aside.



17. Insert an [orifice tool](#), or the slotted end of an [Inline Adjuster](#) into the threaded end of the Valve Barrel, engage it in the Orifice (14) slot, and unscrew the Orifice at least seven full turns. Using a Scubagaskets [Seat Extraction Tool](#) or a 4-5mm wooden dowel, insert it in the Valve Barrel from the knob end until it catches on the knife edge. Gently push the Orifice from the Valve Barrel.



Failure to fully unscrew the threaded Orifice will make it impossible to push the Orifice from the Valve Barrel without tearing an orifice thread and damaging the knife edge.



Use of a metal tool to push out the Orifice may damage the knife edge and raise minimum cracking effort above specification, or make subsequent tuning impossible. If the knife edge is damaged, the Orifice must be replaced.

18. Remove o-ring (15) with a thin pick. Set the Orifice aside and store it protected from contact with metal parts or tools which may damage the knife edge.



18. Now carefully slide o-ring (4) (over the lever if necessary) and off the threaded end of the Valve Barrel.

19. Using a flat bladed tool (a stubby screwdriver is best), push in **no more than 1mm** on the small tab inside the right-hand exhaust port in the Case (5), and disengage the Exhaust Cover (7). The stubby screwdriver has the advantage of allowing you to brace your fingers against the case, to prevent excessive pressure on the exhaust cover locking tab. Lift the Exhaust Cover free and set it aside.



The locking tab on the Exhaust Cover is quite stiff. It will not flex more than 2mm without breaking, requiring replacement of the cover.

20. Inspect the exhaust valve leaflets for damage. Clean the case where the leaflets seal. It is not necessary to remove the exhaust valve for service unless it is damaged.



21. (Optional) If it is necessary to remove the Exhaust Valve (6), cut the center barb on the inside of the case with side-biting snips. Do not attempt to pull the barb through the case from the outside, as that may break one or more spokes in the case.



22. Open the Mouthpiece Clamp (8). Slide the Mouthpiece (9) off the mouthtube on the case. Inspect for tears or holes, and set it aside.



***The disassembly process is now complete.
Clean all parts before starting reassembly.***

CLEANING:

All components should be washed first in a warm (<120°F/50°C) mild liquid detergent and water solution. Use a soft nylon brush to help remove any debris or loose corrosion. After initial washing with warm water and detergent, all components should be thoroughly rinsed in clean fresh water.



Make sure all o-rings and other rubber or plastic parts are removed before cleaning with an ultrasonic cleaner or chemical bath.



A scented detergent may leave undesirable odors for an extended period after service. Always use a hypoallergenic or scent-free liquid detergent.

If Nitrox use is anticipated, o-rings and service kit parts should also be gently washed with a mild detergent solution and rinsed well with clean water.

After initial cleaning in warm liquid detergent and water, metal parts should be cleaned in ultrasonic cleaners using appropriate ultrasonic cleaning solutions.

If you don't have an ultrasonic cleaner, soak the metal parts in Chromesafe solution, stirring gently for 3-4 minutes. Metal parts can also be cleaned by soaking in a mild acetic acid solution (distilled household white vinegar diluted 1:1 with warm water) for 10-15 minutes at a time and reinspecting.



Exceeding the recommended cleaning time may damage plated parts. Do not clean parts longer than the time specified by the manufacturer of the solution used. After cleaning, rinse the parts thoroughly with clean water and allow to air dry, or blow dry with low pressure (30 psi) air. Only brass, brass plated and stainless steel parts should be immersed in an acid cleaning solution.



Protect hands and eyes when handling chemical cleaning solutions.

After cleaning, all parts should be thoroughly rinsed in fresh water and allowed to air dry, or dried with filtered low pressure (30 psi) air. Do not use a hardware store compressor for drying air!



In order to maintain this regulator suitable for use with oxygen concentrations above 21%, it is critical that drying air be free of hydrocarbons. Presence of an oil mist in pressurized drying air may create a fire hazard after reassembly and pressurization with Nitrox.

POST-CLEANING INSPECTION:

All parts should be carefully checked for damage. Strong magnification under bright light is best.

Check the Orifice (14) knife edge for nicks, scratches or pitting. Inspect the Spring (20) for rust, cracks or pitting.

Examine the square lever foot broaches in the valve barrel for irregularities.

Examine the Case (5) for cracks or damage to the alignment bosses where the Valve Barrel's threaded end is captured. Damage to these bosses from previous over-torquing will change lever alignment and may require Case replacement.

Examine the sealing surface of every o-ring land for scratches or damage.

If any parts are visibly damaged, they must be replaced.

SERVICE KIT PARTS:



WARNING

Only official Scubagaskets parts are permitted when reassembling any Scubagaskets product. Substitutions are not authorized and may void the warranty. Scubagaskets specifications may not match an aftermarket part, regardless of any similarity in size, shape or appearance. Using substitute parts may make the product unsafe and may result in serious injury or death.

In addition to all o-rings, the LP Seat (23) is replaced at every complete service:

The diaphragm (24), Poppet (17), Balance Chamber (21), Mouthpiece (9) and Mouthpiece Clamp (8) may be reused.

To confirm the correct o-ring for replacement, match each service kit o-ring to the sizer on page 20.

REASSEMBLY:



WARNING

In order to maintain this regulator suitable for use with oxygen concentrations above 21%, **ONLY** approved oxygen-compatible lubricants are permitted. Use of an unapproved lubricant may pose a hazard after reassembly and pressurization.



CAUTION

Do not use any petroleum based lubricants or products, or any aerosol silicone sprays on any part of Scubagaskets regulators. The petroleum base or propellant gas may attack or weaken plastic or rubber parts.



NOTE

All o-rings should be replaced at every service. New o-rings should be checked for contamination and/or defects. O-rings should be coated with a thin film of approved lubricant prior to installation. Except where indicated, do not heavily lubricate any o-ring, as it serves only to attract dust and lint, and the lubricant will not be retained over time.



NOTE

Before reassembly, it is important to check all parts (both new and reused) to ensure that every part is clean and free of any dust, corrosion or defects. Before applying lubricant to an o-ring, check to make sure it is clean, soft, and free of imperfections.

1. If the exhaust valve diaphragm (6) is being replaced, pass the tail of the center axle through the spoked hole in the outside of the case until the barb pops fully through to the inside. Use side cutting snips to trim the excess stem, leaving about 2 mm of tail beyond the cone of the barb.

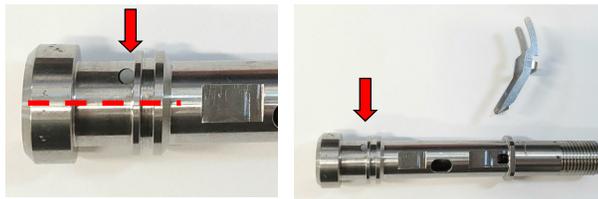


2. Install the Exhaust Cover by inserting **BOTH** tabs on the left side of the cover into their notches in the case. Press on the right side of the cover directly above the locking tab until you hear it click into place. Confirm that the cover is flush with the case, with no sharp raised edge.



3. Add a lightly lubricated o-ring (4) by sliding it from the threaded end of the barrel (up over the lever, if present) until it is seated at the Knob End in its land.

4A. (Optional) If the Lever (23) has been removed from the Valve Barrel (3), replace it now by holding the Valve Barrel with the hole for Pin (22) on the **upper** side of the barrel.



If the Valve Barrel is held with the pin hole on the **lower** side of the Valve Barrel, the Lever (23) will be installed on the wrong side!

4B. (Optional) Place one foot of the new Lever (23) in the square broach on the threaded end of the Valve Barrel, with the crossbar uppermost. Lift the lever vertical and gently spread the other leg until its foot can be dropped into the square broach on the opposite side of the barrel.



Do not twist the lever legs on insertion. If the lever legs are no longer parallel, do not re-bend the legs to straighten them. The part must be replaced.

4C. (Optional) Confirm that the lever drops easily flat against the Valve Barrel with no restriction.

5. Add a lightly lubricated o-ring (15) to the Orifice (14). While avoiding any contact of the knife edge with the Valve Barrel, insert the Orifice carefully into the threaded end.

6. Initially UNScrew the Orifice in a counterclockwise direction with an [Orifice Tool](#) or the slotted end of an [Inline Adjuster](#) until you can feel the slight click as the first thread drops off the threads inside the barrel. This will prevent cross-threading.



A cross-threaded Orifice is irreparably damaged and must be replaced.

7. Now screw the Orifice in five full turns.

8. Add a lightly lubricated o-ring (12) to the Adjustment Knob (13). Heavily lubricate the threads of the knob.



9. Install lightly lubricated o-rings (19) and (18) onto the shaft of the Poppet (17). Press a new LP Seat (16) in the end of the Poppet, ensuring that its sides are flush with the poppet body, with no gaps.



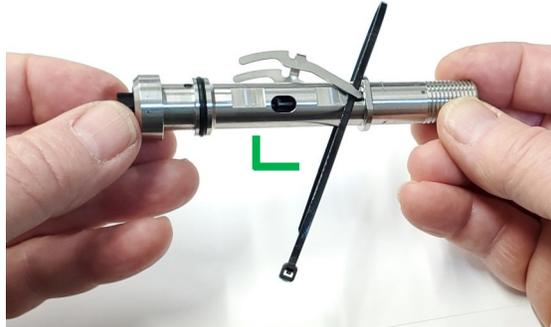
10. Add a thin line of lubricant between o-rings (18) and (19). This will serve as a lubricant reservoir for the poppet.



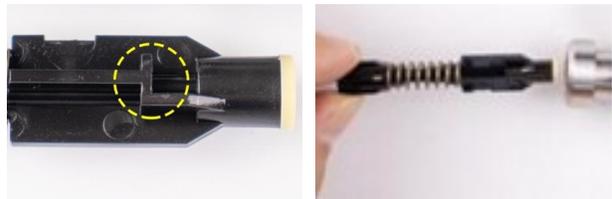
11. Add the Spring (20) and Balance Chamber (21), and set the poppet assembly nearby, handling it carefully to avoid dropping parts.



12. Thread a common Zip Tie between the lever leg adjacent to the square broach in the Valve Barrel. Now loop the Zip Tie up over the barrel, and down between the barrel and the other leg of the lever. Alternatively, use two thin 1mm shims between the lever legs and the Valve Barrel. This will gently spread the lever legs enough to allow insertion of the poppet assembly.



13. Orient the poppet assembly so the "L" in the poppet is oriented as shown. Holding the Valve Barrel by its threaded end in your **RIGHT** hand, and looking through the oval opening in the barrel, slide the poppet assembly into the Valve Barrel with your left hand. As you slide it into the barrel, watch the base of the "L" pass just across the top of the oval larger opening.



14. Push the poppet assembly until the "L" of the poppet reaches the oval hole. Confirm proper alignment. With a dowel, continue pushing approximately one inch until the "L" comes to rest against the lever feet. You may feel slight resistance as the poppet seat passes the feet.

15. Remove the Zip Tie. Press lightly on the end of the Balance Chamber with the dowel inserted into the Valve Barrel, and the lever should spring up. You should feel pressure against the dowel when you depress the lever.



WARNING If the Lever does not spring up with pressure on the Balance Chamber, or if you do not feel spring pressure against the dowel when you depress the Lever, the Poppet is not properly engaged with the lever feet. Remove the assembly and reinstall. Failure of the lever during a dive may be fatal.

16. Carefully push the Adjuster Knob (13) into the Valve Barrel and begin screwing it in. The Lever should rise. The end of the Adjuster will occlude the hole for the Knob Retention Pin (22). Continue screwing in the knob until you can see through the hole.



18. Insert the Knob Retention Pin (22) and center it in the barrel. Unscrew the knob until the pin is trapped in place. Confirm that it remains centered in the barrel.



19. Add a lightly lubricated o-ring (10) to the Venturi Sleeve (11). Slide the assembly over the threaded end of the Valve Barrel, with the flange of the Venturi Sleeve covering the lever. Slide it as far as it will go, and then rotate the sleeve 180° and allow the lever to rise. Now fully seat the Venturi Sleeve against the knob end, where it traps the Knob Retention Pin in place.



If you cannot fully seat the sleeve, it is probably caught on one end of an uncentered Pin (22). Slide the Venturi Sleeve to one side. Loosen the knob clockwise a fraction of a turn, recenter the Pin, and unscrew the knob. Now reseal the Venturi Sleeve.

20. Grasping the entire valve assembly by the Adjuster Knob, slide it into the case. Depress the lever as it passes the case rim, and take care to not let the lever spring up uncontrolled as the lever tips clear the case. Continue inserting the valve assembly, adjusting the Venturi Sleeve Lever so that it passes into the notch in the case. Next, ensure that the flats near the threaded end pass cleanly between the plastic bosses in the case, locking the assembly with the lever upmost.



21. Add a lightly lubricated o-ring (2) to the threaded end of the Valve Barrel, outside the case. Slide it down against the case.



22. Lightly lubricate the barrel threads, add the Heat Exchanger (1) to the barrel and spin it down finger tight.

23. Sight carefully along the rim of the case and confirm that the lever tips are parallel to the rim. If not, gently rotate the barrel assembly with a wrench until the lever is perfectly vertical.



24. Hold the valve assembly in this position with a 13mm wrench as you tighten the Heat Exchanger with a torque of 3 Nm. Do not overtighten.



Rotation of the valve assembly so that lever tips are no longer vertical will degrade lever contact with the diaphragm and increase friction. This may dangerously alter second stage performance. Ensure that the lever tips are parallel to the case rim after tightening the Heat Exchanger or changing hoses.



Overtightening the Heat Exchanger may permanently damage the case and necessitate replacement.

25. Using an [orifice tool](#), or an [Inline adjuster](#) threaded onto the Valve Barrel, screw in the Orifice until the Lever **just begins to drop**, and then **unscrew** the Orifice 1/8 turn.



26. Add the Diaphragm (24) to the case, confirming that it completely fills the rim with no gap. Confirm that the diaphragm does not "hang" from the lever tips. If the diaphragm edge does not reach the rim around its full perimeter, lower the lever 1-2mm by screwing in the orifice slightly.



A replacement diaphragm which has been in storage may shrink slightly due to the natural elasticity of the material. If the diaphragm does not fill the rim completely, gently stretch it in segments, reinserting it into the case to check, until it perfectly fills the internal diameter of the case. A diaphragm whose edge does not meet the rim perfectly may become dislodged during Purge Cover and Retaining Ring assembly.



Confirm that your hands or gloves are not greasy when handling the diaphragm.

27. Confirm even and complete seating of the Diaphragm by gently tamping around its entire rim with a thin dowel.



28. Orient the Purge Cover (25) using the logo, and press it into place. Lightly lubricating the threads, screw on the Retaining Ring (26) hand tight. Use a long pin face spanner to reorient the purge cover slightly as the retaining ring is screwed down.



29. Covering the threaded end of the Valve Barrel with your fingertip, gently inhale from the mouthtube to confirm a case seal. If any air can be inhaled, consult Table 1 - Troubleshooting Guide on page 17.

30. Fully unscrew the Adjuster Knob and set the Venturi Sleeve lever in the "+" position.

31. Add new o-rings (27) and (29) to your LP hose, using a [Scubagaskets O-ring Installation Tool](#) to prevent thread damage.

***This Concludes Reassembly
Adjustment and Final Testing Follows***

ADJUSTMENT:

1. Before proceeding with second stage adjustment, confirm that you have a first stage with a stable Intermediate Pressure. It is best to adjust your second stage with the first stage to which it will be connected. If adjusting a second stage for an unknown first stage, tune the test first stage to an Intermediate Pressure of 10 bar. Leave the Intermediate Pressure gauge attached.

2. Connect a LP hose on the first stage to an [Inline Adjuster](#) with a slotted end.

3. Connect the Inline Adjuster to the threaded end of the second stage.



4. Fully unscrew the Adjuster Knob and set the Venturi Sleeve lever in the "+" position.

5A. Carefully open the tank valve and pressurize the first stage. If the second stage freeflows, engage the inline adjuster in the orifice and screw the Orifice in clockwise until the leak just stops. **Then add 1/12 clockwise turn (5 minutes on a clockface, or 30°) to the Orifice.**

5B. Carefully open the tank valve and pressurize the first stage. If the second stage does NOT freeflow, engage the inline adjuster in the orifice and unscrew the Orifice counterclockwise until the valve leaks. Now screw the Orifice in clockwise until the leak just stops. **Then add 1/12 clockwise turn (5 minutes on a clockface, or 30°) to the Orifice.**

NOTE Always adjust the Orifice with the valve open.

6. Connect the mouthtube to a magnehelic and measure opening effort ("cracking effort") when the Intermediate Pressure first starts to drop.

SPECIFICATION Specification opening effort for the SGT2 Second Stage is between 1.0" and 1.4" WC.

7. If the opening effort is over 1.4" with the Adjuster fully unscrewed, the Spring (20) has likely caught on the neck of the Balance Chamber (21). Disassemble the regulator, remove the Adjuster Knob and reinsert the Balance Chamber. Complete reassembly and retest. If the problem persists, please contact the Scubagaskets technical department at info@scubagaskets.com.

8. If the opening effort is below 1.0", then you may add **ONLY ONE MORE** 1/12 turn (30°) to the Orifice.

WARNING Adding more than 1/6 total turn to the Orifice after valve sealing will lower the Lever. A low lever impairs valve opening. At depth, with increased gas density, impaired valve opening may be fatal. Adjusting opening effort with the orifice turned more than 1/6 turn clockwise after valve sealing is **specifically prohibited**.

8. Recheck opening effort and if below 1.0", turn the Adjuster Knob (13) until opening effort is 1.0". Make a note of this Adjuster Knob position, and always dive the regulator with no less than this amount of turn to the knob. If more than 3/4 turn is required to reach 1.0" opening effort, contact Scubagaskets for a replacement Spring (20).

NOTE Diving the SGT2 below 1.0" of opening effort may result in slight freeflow in the face down position.

9. Set opening effort as desired within specification by additional turns of the Adjuster Knob.

The adjustment process is now complete.

FINAL INSTALLATION:

1. Slide the Mouthpiece onto the mouthtube of the Case (5) with the "bridge" of the Mouthpiece facing up. The neck of the Mouthpiece has a shallow groove for the Mouthpiece Clamp. Place the Mouthpiece Clamp (8) loosely around the Mouthpiece (9). Orient the clamp so that the buckle is on the hose side, and on the underside of the mouthtube. Engage and tighten the Mouthpiece Clamp. Confirm that it is centered in the mouthpiece groove.
2. Disconnect the Inline Adjuster and occlude the hose inlet of the regulator with your finger. Inhale gently via the Mouthpiece and confirm that no air is admitted. If air inflow occurs, consult Table 1: Troubleshooting Guide on page 19.
3. Using an [o-ring installation bullet](#) to protect against thread damage, add the O-ring (27) to the first stage end of the hose. Add O-ring (29) to the spindle in the second stage end of the hose swivel with the use of the [Scubagaskets LP female hose tool](#). Now the attach the hose finger tight.
4. Attach a thin profile 11/16" wrench to the flats on the Heat Exchanger (1). Attach a second wrench to the hose nut. While ensuring that the Heat Exchanger does not rotate, tighten the hose nut to 5 Nm. If possible barrel rotation is suspected, remove the faceplate assembly and diaphragm, and confirm that the lever tips are parallel to the case rim. Adjust barrel position with a 13 mm wrench.



Failure to hold the Heat Exchanger in position may allow rotation of the barrel as described in Step 23, page 15 above. This will cause degraded function of the lever, which may be dangerous.

IMMERSION TEST:

With the regulator set pressurized, completely submerge both the first and second stages and check for leaks. There should be no leaks, once trapped gas in the regulator has escaped. Some second stage leaks are extremely small, and prolonged immersion is recommended to see the late appearance of small bubbles.



Do not confuse bubbles from trapped air with a true leak. If there is an air leak, bubbles will continue to appear as long as the regulator is pressurized.

SUBJECTIVE TESTING:

Purge the second stage. There should be a brisk and vigorous flow of air with the Venturi lever in the "+" position. Inhale from the regulator. There should be an easy flow of air, and no resistance to exhalation. The regulator may make a honking noise on the surface, but this is merely due to fluttering of the diaphragm in air which will not occur when submerged.

At this point, close the cylinder valve and depressurize the regulator. Remove the first stage from the tank and secure the dust cap in place.

This Completes Regulator Service

Table 1: Troubleshooting Guide

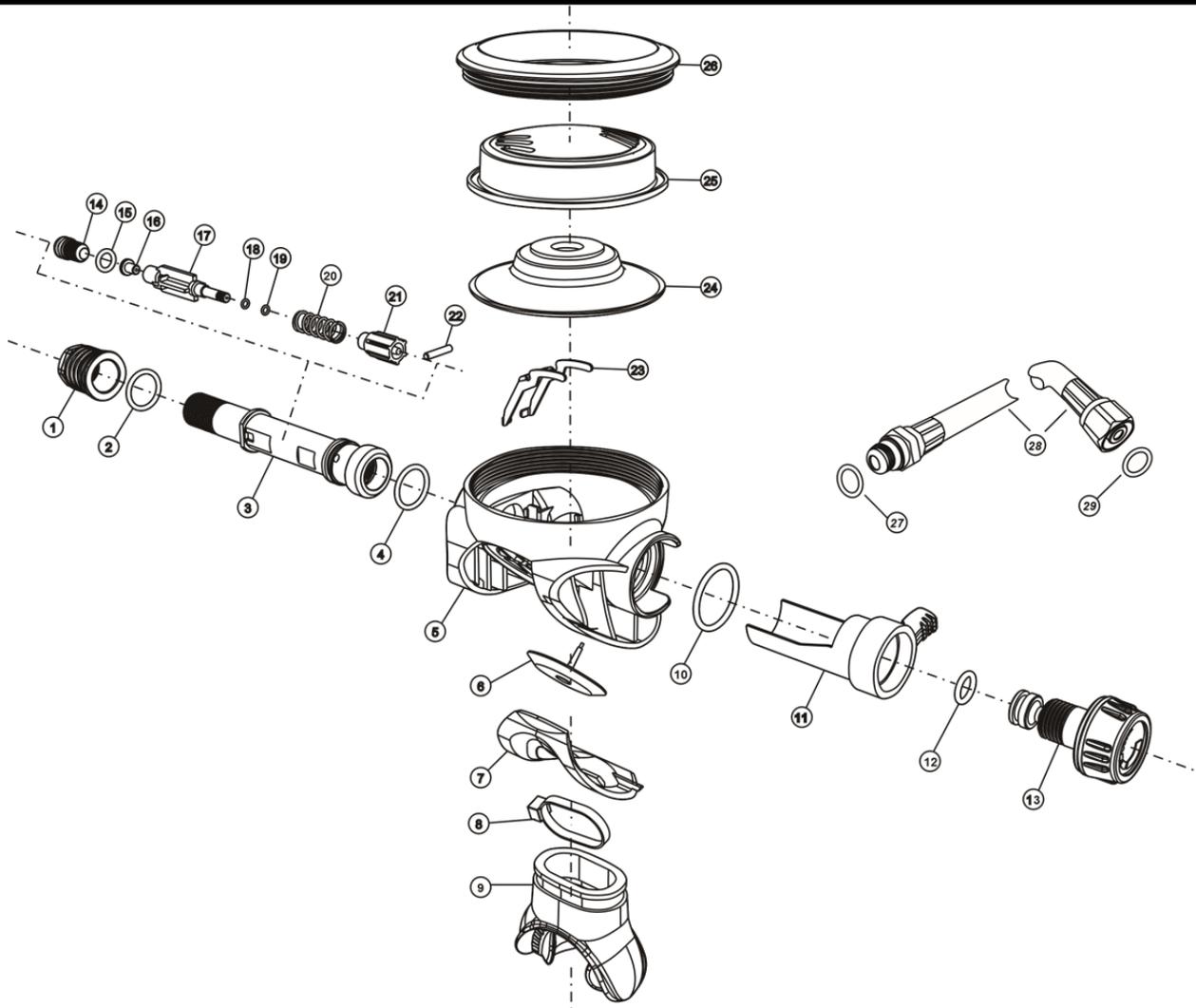
SYMPTOM	POSSIBLE CAUSE	TREATMENT
Opening Effort Below 1.0" With Knob Unscrewed	1. Orifice incorrectly adjusted	1. Readjust regulator as on page 15
	2. Spring (20) has weakened	2. Replace Spring (20)
Opening Effort Above 1.4" With Knob Unscrewed	1. Spring (20) caught on neck of Balance Chamber	1. Reassemble regulator
	2. Orifice knife edge damaged	2. Replace Orifice (14) and LP Seat (16)
Second Stage Air Leak or Free Flow	1. Extremely high IP from first stage.	1. Refer to First Stage Troubleshooting Guide
	2. The LP Seat (16) is damaged.	2. Replace LP Seat (16)
	3. The LP Seat (16) was adjusted incorrectly or the lever (23) was set too high.	3. Readjust regulator as on page 15
	4. The Orifice (14) is damaged.	4. Replace Orifice (14)
	5. The lever (23) is bent.	5. Replace Lever
	6. The Diaphragm (24) is improperly seated in the Case (5).	6. Remove cover and re-seat diaphragm
	7. The Orifice (16) sealing surface is damaged.	7. Replace Orifice (14)
	8. The Spring (20) is damaged.	8. Replace Spring (20)
	9. The shuttle valve o-ring (18,19) is damaged.	9. Replace o-ring
	10. The Balance Chamber (21) bore is damaged.	10. Replace Balance Chamber (21)
	11. The venturi lever o-ring (10) is damaged.	11. Replace o-ring
Low Purge or Labored Breathing on full cylinder	1. The first stage has low IP.	1. Refer to First Stage Troubleshooting Guide
	2. The Orifice (14) was adjusted incorrectly or the Lever (23) was set too low.	2. Readjust regulator as on page 15
	3. The LP hose is clogged or obstructed.	3. Clean or replace the LP hose
	4. The Lever (23) is bent or catching on the Valve Barrel (3).	4. Replace Lever
Water Entering Second Stage	1. The Mouthpiece (9) is incorrectly fitted or damaged.	1. Refit or replace mouthpiece
	2. The Diaphragm (24) is damaged.	2. Replace diaphragm
	3. The Diaphragm (24) is improperly seated in the Case (5).	3. Remove front cover (14) and diaphragm cover (5), check for any distortions, then properly reassemble diaphragm
	4. The Exhaust Valve (6) is damaged.	4. Replace exhaust valve
	5. The Case (5) is damaged.	5. Check exhaust valve seating surface. Disassemble and replace case
	6. The Heat Exchanger o-ring (2) is damaged.	6. Replace o-ring
	7. The Venturi Sleeve (11), its o-ring (10), Valve Barrel o-ring (4) or Adjuster Knob (13) is damaged.	7. Replace part



This table does not list all possible problems. Please contact the Scubagaskets technical department at info@scubagaskets.com for assistance with issues not mentioned here.

Table 2: Recommended Tool List

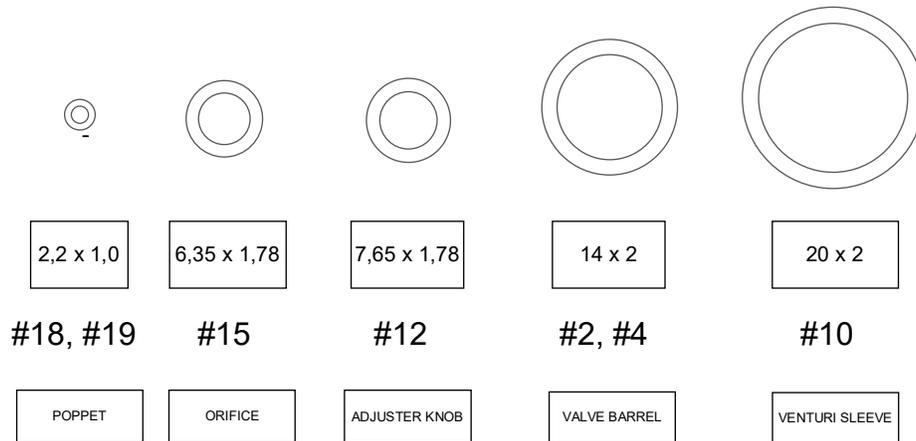
TOOL	DESCRIPTION	APPLICATION
	Medium Pressure Gauge (IP test gauge) (Scubagaskets Digital IP Regulator Tester Gauge)	Checking opening effort
	Thin brass or plastic picks	Removal and installation of o-rings
	Inline Adjuster (Scubagaskets 2SSHT-80000)	Orifice Adjustment under pressure
	Orifice Adjuster (Scubagaskets SCU-SLO-3000)	Orifice installation and preliminary adjustment
	Rubberized Jar Grip	Removal of Retaining Ring
	Zip Tie	Poppet Removal without removing Lever
	Ultrasonic Cleaner	Brass & stainless steel parts cleaning
	Stubby Screwdriver	Removal of Exhaust Cover
	Side Cutting Snips	Removal and replacement of Exhaust Valve
	Blunt Brass or Plastic Spade or Pick	Stuck Diaphragm Removal
	Thin Wooden Dowels 3 - 6 mm diameter	Lever Engagement Testing Diaphragm Seating
	Seat Extraction Tool (Scubagaskets universal orifice seat tool)	Orifice Removal
	Open End Wrenches Thin Profile 11/16" wrench 13 mm Open End Wrench	Attach and remove hoses Attach Heat Exchanger Stabilize Barrel
	Poppet Insertion Tool (Scubagaskets Scuba Tool for second stage poppet installation - Uni 2nd pop ins 3500)	Insert poppet Preserve alignment with lever feet
	LP Oring Installation Tool - (Scubagaskets HP and LP Oring Installation Tool Set)	Prevent thread damage to hose and port o-rings
	Bullet O-ring Installation Tool - (Scubagaskets Bullet O-ring Installation Tool for LP Femal Hose End)	To easily place the o-ring on the swivel end of the second stage hose.



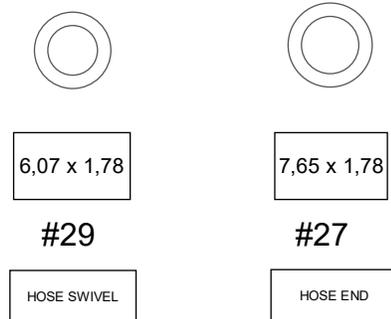
Ref #	Part #	Qty	Description	Ref #	Part #	Qty	Description
1	T2-01	1	Heat Exchanger	15*	T2-15	1	<i>O-ring: 6,35x1,78mm</i>
2*	T2-02	1	<i>O-ring: 14x2mm</i>	16*	T2-16	1	<i>LP Seat</i>
3	T2-03	1	Valve Barrel	17	T2-17	1	Poppet
4*	T2-04	1	<i>O-ring: 14x2mm</i>	18*	T2-18	1	<i>O-ring: 2,2x1mm</i>
5	T2-05	1	Case	19*	T2-19	1	<i>O-ring: 2,2x1mm</i>
6	T2-06	1	Exhaust Valve	20	T2-20	1	Spring
7	T2-07	1	Exhaust Cover	21	T2-21	1	Balance Chamber
8	T2-08	1	Mouthpiece Retainer	22	T2-22	1	Knob Retention Pin
9	T2-09	1	Mouthpiece	23	T2-23	1	Lever
10*	T2-10	1	<i>O-ring: 20x2mm</i>	24	T2-24	1	Diaphragm
11	T2-11	1	Venturi Sleeve	25	T2-25	1	Purge Cover / Yellow Cover
12*	T2-12	1	<i>O-ring: 7,65x1,78</i>	26	T2-26	1	Retaining Ring
13	T2-13	1	Adjuster Knob	27*	T2-27	1	<i>O-ring: 7,65x1,78</i>
14	T2-14	1	Orifice	28	T2-28	1	LP Hose
Service Kits: Standard Kit (EPDM) ; Viton Service Kit				29*	T2-29	1	<i>O-ring: 6,07x1,78mm</i>

**Italic items with an asterisk are in the Service Kit*

Second Stage



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Inspection and Service Record

Scubagaskets SGS2, Ser # _____ Purchase Date ____ / ____ / ____
Scubagaskets SGT2, Ser # _____
Scubagaskets SGT2, Ser # _____

Date/ Dive Count	Technician	Inspection (I) Service (S)	Comments

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