Scubagaskets SGS2

First 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 SGS2 first stage regulator. It is recommended that the technician perform 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 highlight 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 an action or situation that may result in serious injury or death for either the technician or the diver if not performed correctly.

A CAUTION highlights any action 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 50ºF (10ºC). 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 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).

Confirm that first stage Intermediate Pressure is within specification, without drift prior to lockup of more than 0.5 bar (7 psi). Any drift exceeding this amount, or continuous Intermediate Pressure creep, requires a complete service.

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 second stage control knob and venturi switch both operate smoothly. Any grittiness or sticking during operation should prompt disassembly and cleaning, and may warrant a full service.

Visually inspect the first stage filter for debris, discoloration or verdigris corrosion. Evidence of corrosion or obstruction warrants a full service, as corrosion or damage downstream from the filter may have occurred.

Visually inspect the second stage exhaust valve to see whether it is in good condition and whether the sealing surface is clean. Disconnect the hose and perform a gentle inhalation with the hose intake occluded, to confirm that there is no leak of air into the second stage case. Any leak requires a full second stage service.

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

Slide back the hose protector and confirm that the hose is not cracked or loose in the end crimp.

The infrequently used regulator:

Do not assume that the 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 other regulators. Proper disassembly and reassembly requires several specialty tools. For a complete list of tools required for service, see Table 2 (page 16).

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 a land is damaged, the part must be replaced. The only authorized steel o-ring pick is a double-hook pick, which is used only in a specific instance as described below.

LUBRICATION:

This regulator is delivered cleaned for use with Nitrox up to EAN40. Scubagaskets recommends the use of only Crystal Lube®, Tribolube 71, Christolube MCG-111 or equivalent. Liquid or spray lubricants are not authorized, and silicone-based lubricants are specifically prohibited. Use of an incompatible lubricant will restrict the use of this regulator to no other diving gas 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 parts list on page 17, 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. Before disassembling the first stage, remove all hoses using an appropriate wrench. Consider padding the wrench or isolating the wrench from the regulator body with a piece of paper to protect the finish.

2A. **Yoke disassembly**: Unscrew and remove the Yoke Knob (37) by hand, and set it and the dust cap (30) aside. Remove the Circlip (28) using angled internal circlip pliers, invert the regulator and let the filter (27) fall into your hand. If the filter is corroded in place, soak this portion of the regulator in warm Chromesafe or 50% distilled white vinegar for 10-20 minutes. Then use a sharp pick to loosen the filter until it can be removed.

3A. With the regulator body held in place with a vice handle, use a 6mm hex wrench to unscrew the Inlet Fitting (26) and remove the Yoke (29) and Inlet Fitting from the regulator body. Remove o-ring (25) and set it aside.

2B. **DIN Disassembly:** Remove the dust cap (36), and insert a 6mm hex wrench into the inlet fitting (34). **Do not use a ball-end hex key.** With the regulator body held in place, remove the Inlet Fitting. Remove both o-rings (25, 35) from the fitting, push out the filter (32) and DIN O-ring Shield (31), and remove the DIN handwheel (33).

CAUTION It is important that the hex wrench be placed fully into the broach of the Inlet Fitting to prevent any damage to the part. Do not use impact to force release of the Inlet Fitting.

3B. If the DIN Inlet Fitting (26) is frozen in place due to salt crystals or previous over-torquing, use a DIN Retainer Tool to grasp the upper flange of the fitting and unscrew it with gradually increasing force.

4. Using a 4mm hex wrench, unscrew remaining HP (19, 19) and LP (1, 5, 6) port plugs.

5. Remove o-rings (2, 4, 7, 20) from each port plug.

6. Using a 6mm hex wrench, unscrew the HP Seat Carrier (24). Separate the Bonnet Spacer Ring (21) from the Regulator Body (18). Remove o-ring (22). Remove the old HP Seat (23) by placing the rubber tip of an air gun against the small hole inside the hex broach and delivering a brief pulse of air.

7. Using a #3 (33 mm diameter) hook spanner with 0.240" (6mm) pin, and a vise tool screwed into a HP port, fix the Regulator Body in place and unscrew the Turret Cap (9) from the Regulator Body with the hook spanner. Maintain pressure on the spanner pin to avoid damage to the finish.

8. Carefully insert the bottom end of a piston bullet into the piston shaft. While carefully maintaining the alignment of the piston with the regulator body, push on the tip of the piston bullet and slide the piston assembly (14) and spring (16) out of the bore in the regulator body. Carefully remove the spring **without scuffing the piston knife edge**.

CAUTION Any rocking of the piston shaft as it leaves the bore in the regulator body may severely damage the sealing knife edge of the piston, and require part replacement.

NOTE Damage to the piston knife edge is the **single most common cause** of Intermediate Pressure Creep during reassembly and tuning. Protect the knife edge with a piston bullet whenever removing the piston, and wrap the piston in protective cloth and set it aside while completing disassembly.

9. Remove the o-ring (13) from the piston head. Remove the shim from the piston head, and the second shim from inside the regulator body. A pulse of compressed air from an air gun may free a stuck shim. Do not use a metal pick to remove this shim. Note the thickness and position of each shim in preparation for reassembly.

10. Using a double-hook pick, **carefully** retrieve o-ring (15) from the bore of the Body (18). Do not allow the point of the pick to scratch the o-ring land deep inside the regulator body! "Spearing" the o-ring with a straight or curved pick will likely damage the land!

CAUTION

Pick damage to the land for o-ring (15) will cause leakage of high pressure gas past the piston shaft and out of the ambient holes. This will result in visible bubbling during the Immersion Test, and will require replacement of the Main Body (18). **It cannot be repaired.**

11. Remove o-ring (10) from inside the Turret Cap (9).

12. Fix the swivel turret (3) in place with a vice tool screwed into a low pressure port. Unscrew the Retaining Screw (12) with a 6mm hex wrench, and separate the Swivel Turret from the Turret Cap (9). Do not lose Washer (11), which may remain inside the Turret Cap. Remove o-ring (8) from the neck of the Turret Cap.

13. Slide the Trim Ring (17) off the regulator body 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 solution of warm (not over 120°F/50°C) water and mild detergent. Use a soft nylon brush to help remove any debris or loose corrosion. After initial washing with warm water and soap, all components should be thoroughly rinsed in clean fresh water.

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

If Nitrox use is anticipated, o-rings and service kit parts should be gently washed with a mild detergent solution and rinsed well with clean water. Nitrile gloves are appropriate for cleaning and reassembly.

After initial cleaning in warm soap and water, metal parts can be cleaned in ultrasonic cleaners using appropriate ultrasonic solutions. However, coated metal main springs (16) should only be washed in warm detergent solution, and not ultrasonically cleaned.

CAUTION Ultrasonic cleaning will degrade the protective coating of the main spring (16). This may necessitate part replacement to avoid internal corrosion.

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.

NOTE 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 with any solution, rinse the parts thoroughly with clean water and air dry or blow dry with low pressure (30 psi) air. Only metallic parts should be immersed in a chemical cleaning solution.

WARNING 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!

WARNING 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 all cavities for nicks, scratches or pitting. Pay special attention to the knife edge of the piston, the piston shaft and the piston head sealing land in the Body (18).

Examine the Spring (16) for signs of corrosion, including breaks in the coating, or pitting or cracks in the metal coils.

Examine the HP Seat Carrier (24) for thread defects.

Examine the inner cavity of the Body (18) for scratches, pitting or any defects. Closely examine the Body (18) at the threads for the DIN or Yoke Inlet Fitting (26, 34) for cracking.

Examine the DIN or Yoke Inlet Fittings (34 or 26) for thread damage or evidence of cross-threading. Check the o-ring land at the Inlet Fitting end for any scratch, which may result in a HP leak.

Examine the DIN handwheel (33) threads for damage.

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:

- In addition to all o-rings, the HP seat (23) and filter (27 or 32) are replaced at every complete service:

> **WARNING** A filter whose pores are blocked by contaminants may provide inadequate gas flow with higher gas density at depth, which may be fatal!

- In addition to the parts mentioned above, the presence of the following o-rings should be confirmed in the overhaul service kit:

  o-ring #'s 2, 4, 7 (5), 8, 10, 13, 15, 20(2), 22, 25, 35.

- To confirm the correct o-ring for replacement, match each service kit o-ring to the sizer on page 18.

REASSEMBLY:

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.

WARNING In order to maintain this regulator suitable for use with oxygen concentrations above 21%, ONLY oxygen-compatible lubricants are permitted. Use of an inappropriate 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.

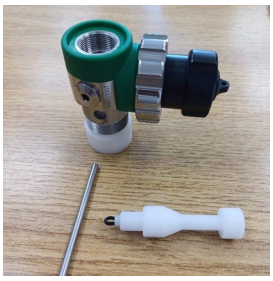
NOTE All o-rings should be replaced at every service. New o-rings should be checked for contamination and/or defects. O-rings should generally be coated with a thin film of approved lubricant prior to installation. Except where indicated, do not heavily lubricate any o-ring, as it serves only to attract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

NOTE Wear nitrile gloves for reassembly when Nitrox will be used.

1. Install a new, lubricated o-ring (13) in the land in the Piston (14) head. Protect the piston knife edge from damage during and after handling.

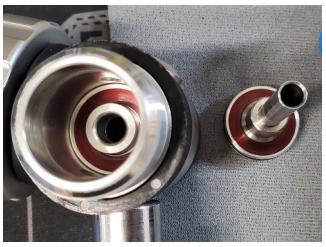
2. Insert the lower half of the Valve Body Installation Tool as a floor for the insertion of o-ring (15).



3. Push a **heavily lubricated** o-ring (15) into the bore of the top half of the tool and place the tool in the body. Use the rod to guide the o-ring to the depth of its land, and carefully push it into place.

4. Remove the tool and use a thin dowel to finish seating the o-ring. Push a lubricated Piston Bullet through the bore to ensure that this critical o-ring is fully seated in its land.

3. Add one shim to the piston head. Carefully add the Main Spring (16) without scuffing the knife edge. Insert a piston bullet into the end of the piston (14) shaft, again taking care to not damage the knife edge. Wipe a film of lubricant onto the Piston shaft and bullet. Place a second shim inside the regulator body, holding it in place with a tiny dot of lubricant under the shim.




4. Wipe a thin film of lubricant on the land for the Piston Head o-ring inside the Main Body (18). Raise the Piston/Spring/Bullet assembly into the bore of the Main Body from below, and carefully push the piston knife edge past o-ring (15). Remove the piston bullet. Once the piston is fully seated, invert the Main Body to retain all parts as shown.

5. Place a line of lubricant in the o-ring land in the neck of the Turret Cap (9). Now add a lubricated o-ring (8) to that land. Place a lightly lubricated o-ring (10) in its recess inside the Turret Cap.

6. Press the Swivel Turret (3) onto the Turret Cap (9). Wipe off any excess lubricant. Drop the washer (11) into the recess in the Turret Cap, and thread the Retaining Screw (12) finger tight. Do not lubricate the Retaining Screw threads.

7. Bracing the Swivel Turret with a vice handle screwed into a LP port, use a 6mm Hex Socket on a torque wrench to tighten the Retaining Screw to 15 Nm.


SPECIFICATION The specification torque for the Retaining Screw (12) is 15 Nm.

WARNING Overtightening the Retaining Screw (12) risks fracturing the screw. Separation of the Swivel Turret during a dive will result in rapid and catastrophic gas loss, and may be fatal. Do not "guess" at the torque for this fitting.

8. Slide the Trim Ring (17) onto the Main Body (18), aligning the flats in the trim ring with the matching flats in the Main Body. To ensure proper alignment of the ambient holes, confirm that the letters "HP" are adjacent to the corresponding high pressure port.

9. Moderately lubricate the threads on the Main Body where the Turret Cap will attach.

10. Screw the turret assembly onto the Main Body (18) and tighten it by hand. Use a #3 (33 mm) hook spanner with 0.240" (6 mm) pin (or a captive pin spanner), and while holding the pin of the hook spanner firmly in place, tighten the Turret cap clockwise until it meets the Main Body (18). Brace the Main Body with a vice handle screwed into a HP port, and torque the turret assembly to 15 Nm.

SPECIFICATION The specification torque for the turret assembly is 15 Nm.

11. Press a new HP Seat (23) into the cup of the HP Seat Carrier (24), with the central depression in the seat visible and the flat side down in the cup. Add a lightly lubricated o-ring (22) to the HP seat, forming a collar around the center cone.

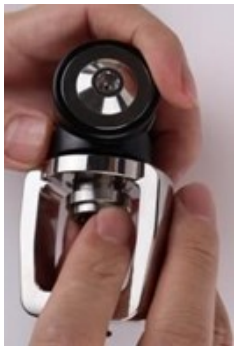
12. Add the Bonnet Spacer Ring to the Main Body, with the hole for the Inlet Fitting oriented over the threaded inlet fitting port in the Main Body. Screw the HP Seat Carrier UP into the Main Body from below, finger tight. This will prevent dislodging o-ring (22).

13. Mount or hold the assembled regulator with a vice handle screwed into a HP port.

14. Using a 6mm hex socket attached to a torque wrench, tighten the HP Seat Carrier to 15 Nm. Do not use a ball-end hex key.

SPECIFICATION The Specification torque for the HP Seat Carrier is 15 Nm.

15A. **Yoke Installation:** Insert the Filter (27) into the Yoke Inlet Fitting (26). Add the Circlip with the smooth, slightly curved edge against the filter. Now insert an unlubricated o-ring (25) into the opposite end. Slide the Inlet Fitting inside the Yoke (29). Holding the regulator with the port for the inlet fitting facing down, screw the Yoke Inlet Fitting (26) UP into the Main Body finger tight, to prevent displacement of o-ring (25). Now mount the Main Body in a vice with a vice handle screwed into a HP port.



16A. Tighten the Yoke Inlet Fitting to the Main Body with a torque wrench and a 6mm hex socket. Torque the Inlet Fitting to 25 Nm.

SPECIFICATION The specification torque for the Yoke Inlet fitting is 25 Nm.

17A. Install the dust cap on the shaft of the Yoke knob (37) and thread the Yoke knob into the Yoke.

15B. **DIN Installation:** Using clean hands or fresh gloves, drop the filter (32) into the center of the DIN Inlet, narrow end first. Add the O-ring Shield (31) and then press an unlubricated o-ring (25) into the recess at the end.

NOTE Do not lubricate the o-ring, nor use greasy gloves for filter insertion, as it risks clogging the filter with lubricant.

WARNING A filter whose pores are blocked by contaminants may provide inadequate gas flow with higher gas density at depth, which may be fatal!

16B. Set the DIN Handwheel (33) on the DIN Inlet Fitting, threads AWAY from the filter. Grasping the assembly, screw the DIN Inlet Fitting and Handwheel UP into the regulator body until it is finger tight, to prevent displacement of o-ring (32).

17B. Now tighten the DIN Inlet Fitting to 25 Nm with a 6mm hex socket and a torque wrench. Do not use a ball-end hex key. Before tightening, ensure that the hex key is fully inserted into the broach.

SPECIFICATION The specification torque for the DIN Inlet fitting is 25 Nm.

WARNING Overtightening the Inlet Fitting risks fracturing the Main Body of the regulator. Under-tightening may result in o-ring (25) extrusion and HP gas loss, which may be fatal. Do not "guess" at the torque for this fitting.

18. Based upon your desired hose routing, add lightly lubricated o-rings (20) to one or more HP port plugs, and lightly lubricated o-rings (2, 4, 7) to desired LP port plugs, using an o-ring bullet to protect the o-ring against damage from the threads. Use remaining o-rings for hose reassembly. Using a 4mm hex key, tighten port plugs in the locations not used by hoses. A torque of 5 Nm is recommended to tighten port plugs and hoses.

19. Similarly, hoses should be tightened to the first stage in the desired locations with a torque of 5 Nm.

This Concludes Reassembly
Final Testing Follows

FINAL TESTING AND TUNING:

1. Connect an Intermediate Pressure Gauge (IP Gauge) with an over-pressure relief valve (OPV) on a hose to a low pressure port. If your gauge does not have an OPV, add a working second stage on a hose to a second low pressure port as a safety relief valve.

2. Attach the first stage to a tank filled to 206 bar (3000 psi). With one finger pressing the second stage purge button, slowly open the tank valve. If the Intermediate Pressure does not exceed 10 Bar, slowly release the purge button and carefully observe Intermediate Pressure. If the gauge rapidly exceeds 145psi (10bar), there is a high pressure leak. Quickly depress the purge button to protect the hoses, and immediately close the cylinder valve. Refer to Table 1, Troubleshooting Guide on page 15 to find the possible cause of the HP leakage.

WARNING Failure to purge while shutting off the tank may result in LP hose and/or LP pressure gauge rupture, which could result in personal injury.

3. Using your gauge's OPV or your second stage, cycle the first stage under pressure several dozen times. The Intermediate Pressure should quickly rise to a consistent level **and stop**. If you observe a small and slow Intermediate Pressure increase which stops within specification, this is normal, and typical of a new HP seat. As the seat conforms to the piston knife edge, valve lockup should become crisp. This IP "drift" is limited to 0,5 bar.

4. If you observe a **continuous** slow (or rapid) rise in Intermediate Pressure, turn off the tank and consult the Troubleshooting Section. Your regulator will likely need disassembly and inspection to find and solve the HP leak.

5. After multiple cycles with the OPV or second stage, Intermediate Pressure should stabilize between 9 and 10 Bar (130-145 psi) at 206 bar (3000 psi) tank pressure.

SPECIFICATION The static Intermediate Pressure for the SGS2 First Stage with the second stage valve closed shall be between 9 and 10 Bar at 3000 psi tank pressure.

6. If the **stable** Intermediate Pressure is below specification, you must disassemble the Turret Assembly (see page 6, step 6). After carefully removing the piston, add one or more shims to the piston base before replacing the spring and reinserting the piston with the aid of a piston bullet to protect the HP piston shaft o-ring (15) (see page 11, step 3). Then return to page 14, step 1 above. Up to three shims at the piston base and one shim inside the regulator body are permitted. Alternatively, contact info@scubagaskets.com for a new spring. The thin brown shim will raise IP by 2-5 psi (0.15-0.35 bar) per shim, and the thicker shim may raise IP by 5-12 psi (0.35-0.8 bar) or more, depending upon thickness.

7. If the **stable** Intermediate Pressure is above specification (but not continuing to creep), you must disassemble the Turret Assembly (see page 6, step 6). After carefully removing the piston, remove one or more shims from the piston base. Having no shims between parts increases the chance of corrosion. Replace the spring and reinsert the piston with the aid of a piston bullet to protect the HP piston shaft o-ring (15) (see page 11, step 3). Alternatively, contact info@scubagaskets.com for a new spring. Now return to page 14, step 1 above.

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 second stage regulator case has escaped.

NOTE NOTE: 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.

If there are no leaks, close the cylinder valve and depressurize the regulator. Remove the first stage from the tank and secure the dust cap in place. If a leak is detected, note the source of the leak and refer to Table 1, Troubleshooting Guide for possible causes and corrective actions. If you have questions, please contact the Scubagaskets technical department at info@scubagaskets.com.

This Completes Regulator Service

Table 1: Troubleshooting Guide

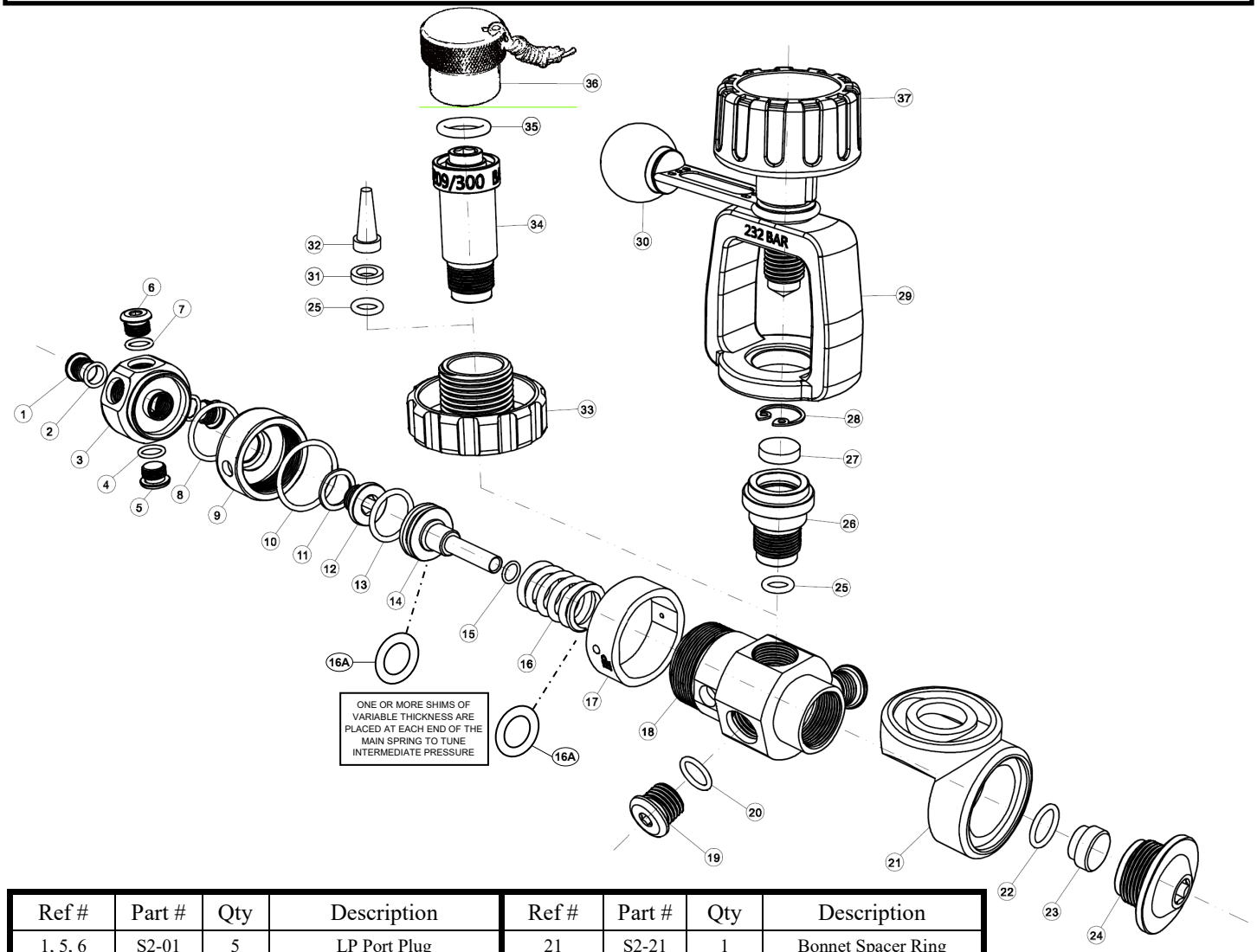
SYMPTOM	POSSIBLE CAUSE	TREATMENT
Restricted airflow/high inhalation resistance through entire system	1. Cylinder valve not completely open	1. Open valve and check fill pressure
	2. Cylinder valve requires service	2. Connect to a different cylinder
	3. Filter (27,32) clogged	3. Replace filter (27) or (32)
	4. Insufficient Intermediate Pressure	4. See below
Low Intermediate Pressure outside specification	1. Low inlet pressure	1. Refill test cylinder
	2. Main spring (16) weakened	2A. Add spring shim(s) (16A)
		2B. Replace main spring (16)
High, creeping Intermediate Pressure (including 2nd stage leakage or freeflow)	1. Debris caught between knife edge and HP seat	1. Clean and reassemble
	2. HP seat (23) damaged or worn	2. Replace HP seat (23)
	3. Damaged piston (14) knife edge	3. Replace piston (14)
Stable high Intermediate Pressure outside specification	1. HP Seat wear	1. Replace HP seat (23)
	2. Main spring (16) stiffening	2A. Remove spring shim (16A)
		2B. Replace main spring (16)
Leakage of air from ambient ports of Turret Cap	1. Piston shaft o-ring (15) damaged	1. Replace o-ring (15)
	2. Piston shaft scratched	2. Replace piston (14)
	3. Piston head o-ring (13) damaged	3. Replace o-ring (13)
Leakage of air from inlet fitting	1. Inlet fitting o-ring (25) damaged	1. Replace o-ring (25)
Leakage of air from the HP Seat Carrier	1. HP Seat Carrier (24) is loose	1. Torque HP Seat Carrier (24) to 15 Nm
	2. Valve seat sealing ring (22) is damaged or worn	2. Replace o-ring (22)
Drop of dynamic Intermediate Pressure during a second stage purge of >25psi	1. Tank valve is not fully open	1. Fully open tank valve
	2. Tank pressure is below 3000 psi	2. Attach full tank
	3. Filter (27) or (32) is clogged	3. Replace filter (27) or (32)

This table only lists some possible problems and recommended action. For more information, please contact the Scubagaskets technical department at info@scubagaskets.com for assistance with issues not mentioned here. Most of the symptoms in this list are cause for complete overhaul. Partial service should not generally be attempted, as few of the problems above are found in isolation.

Table 2: Recommended Tool List

TOOL	DESCRIPTION	APPLICATION
	Intermediate Pressure Gauge (IP test gauge)	Checking Intermediate Pressure (Medium Pressure) NOTE: needs an OPV if used without a second stage as a pressure relief
	Thin brass or plastic picks	Removal and installation of o-rings
	Steel Double-Hook Pick (Scubagaskets DHP-1000)	Removal of Valve Body O-ring (15) without damaging the HP o-ring land inside the bore of the regulator body
	Hex Keys (4mm & 6mm) (Straight shaft, NOT ball-end) (Scubagaskets HOTMH345-5900)	Remove and replace Port Plugs, Retaining Screw, HP Seat Carrier and DIN Inlet Fitting
	Hex Socket (6mm) (Straight shaft, NOT ball-end) (Included with Scubagaskets HOTP-58400 below)	Tighten Turret Retaining Screw, HP Seat Carrier and DIN Inlet Fitting to specification torques
	Ultrasonic Cleaner	Metal parts cleaning/corrosion removal
	Piston bullet (Scubagaskets BTS3D-1000)	Seat Valve Body O-ring (15) Protect o-ring (15) from damage during Piston (14) insertion
	Valve body (18) O-ring installation tool (Scubagaskets SGT2PT-8000)	Prevents the Valve Body O-ring (15) from sliding past its land on insertion. Improves reliability of seating without damaging the o-ring land.
	Angled Internal Circlip Pliers with 0.040" (1mm) tips (Yoke models only) (Scubagaskets HOTP-4860)	Removal and installation of Yoke Filter retaining Circlip (28) (Yoke models only)
	Torque Wrench (0-30 Nm) 3/8" socket tip (Scubagaskets HOTP-58400 - includes 6mm hex socket)	For accurate tightening of Inlet Fitting, Retaining Screw and HP Seat Carrier
	Vice handle (Scubagaskets UN1H-7000)	To mount regulator in stable position for application of torque
	Open End Wrenches	To attach and remove hoses
	Universal Captive Pin Scuba Tool (Scubagaskets SPCH 26000)	To remove/replace Turret Cap (9)
	Universal DIN Retainer Tool (Scubagaskets TU Ω 8000)	Removal of stuck DIN connector

SGS2 1st Stage Schematic



Ref #	Part #	Qty	Description
1, 5, 6	S2-01	5	LP Port Plug
2, 4*, 7**	*S2-02*	*5*	*O-ring: AS568 2-011*
3	S2-03	1	Swivel Turret
*8**	*S2-08*	*1*	*O-ring: 20x2mm*
9	S2-09	1	Turret Cap
*10**	*S2-10*	*1*	*O-ring: 24x2mm*
11	S2-11	1	Washer
12	S2-12	1	Retaining Screw
*13**	*S2-13*	*1*	*O-ring: 16x2mm*
14	S2-14	1	Piston
*15**	*S2-15*	*1*	*O-ring: 6x1,8mm*
16	S2-16	1	Main Spring
16A	S2-16A	2	Spring Shim (Thin and/or Thick)
17	S2-17	1	Trim Ring
18	S2-18	1	Main Body
19	S2-19	2	HP Port Plug
*20**	*S2-20*	*2*	*O-ring: AS568 2-012*
Standard Service Kit			

Ref #	Part #	Qty	Description
21	S2-21	1	Bonnet Spacer Ring
*22**	*S2-22*	*1*	*O-ring: 10x1,5mm*
*23**	*S2-23*	*1*	*HP Seat*
24	S2-24	1	HP Seat Carrier
*25**	*S2-25*	*1*	*O-ring: 6x1,8mm*
26	S2-26	1	Yoke Inlet Fitting
*27**	*S2-27*	1	*Yoke Filter*
*28**	*S2-28*	*1*	*Circlip*
29	S2-29	1	Yoke
30	S2-30	1	Dust Cap, Yoke
31	S1-31	*1*	DIN O-ring Shield
*32**	*S2-32*	*1*	*DIN Filter*
33	S2-33	1	DIN Handwheel
34	S2-34	1	DIN Inlet Fitting
*35**	*S2-35*	*1*	*O-ring: 11x2,5mm*
36	S2-36	1	Dust Cap, DIN
37	S2-37	1	Yoke Knob
Viton Service Kit			

* - Parts in *Italics* and marked with an asterisk are included in the Service Kit and must be replaced at each Complete Service.

SGS2 O-ring Sizer

First Stage

YOKE/DIN INLET

6,0 x 1,8

#25

PISTON SHAFT

6,0 x 1,8

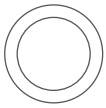
#15

DIN INLET
LP PORTS

7,65 x 1,78

#2, #4, #7 (5)

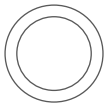
HP PORTS



9,25 x 1,78

#20 (2)

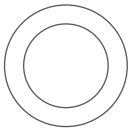
HP SEAT SEAL



10.0 x 1.5

#22

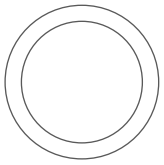
DIN TANK CONN



11.0 x 2.5

#35

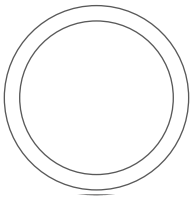
PISTON HEAD



16.0 x 2.0

#13

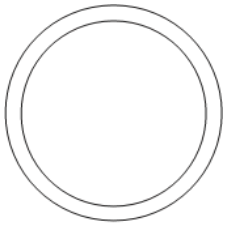
TURRET CAP NECK



20.0 x 2.0

#8

TURRET CAP



24.0 x 2.0

#10

Reproduce this page so this line is exactly 100mm long

Inspection and Service Record

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

Scubagaskets SGT2, Ser #_____

Scubagaskets SGT2, Ser #_____

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

Reproduce this page as needed for additional inspections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