splash®

Service Technician Seminar 2011

SHERWOOD SCUBA®

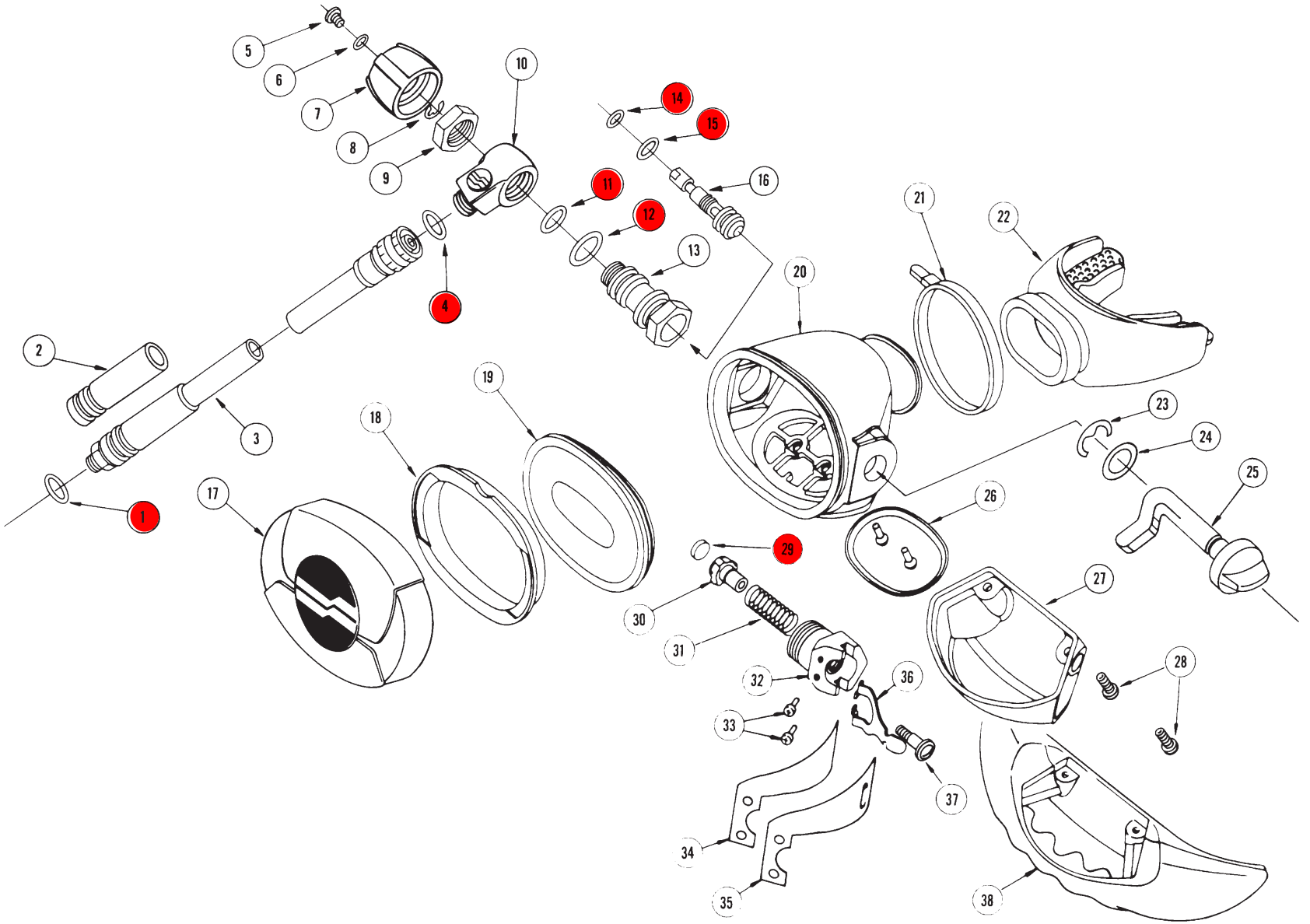
MAXIMUS SRB5600 2nd STAGE

SPECIFICATIONS FOR THE SRB5600 MAXIMUS

REGULATOR MODEL:	Sherwood SRB5600 Maximus
AIR FLOW:	33 cu. ft. (935 liters)/min. @ 1 atmosphere
INHALATION RESISTANCE:	.9" - 1.5" (2.3 - 3.8 cm) w.c @ 1 atmosphere (adjustable)
EXHALATION RESISTANCE:	0.7" (1.8 cm) w.c. max. @ 1 atm.
RECOMMENDED LUBRICANT:	Christo-Lube® MCG111 (Sherwood p/n SW-MS150)

Second Stage Regulator:

TYPE:	Downstream valve, diaphragm, Variable Fulcrum – **U.S. Pat.#3,991,785** other Pat. pending
WEIGHT:	7.1 oz. (.22 kg) (w/o hose)
HOSE LENGTH:	41 in. (1.04 m)
MATERIALS :	Cover –Thermoplastic vinyl Case –Thermoplastic Triax® Poppet Seat – Buna-N O-Rings – Buna-N Diaphragm – Tufel® (clear blue) Exhaust Valve – Thermoplastic elastomer (blue) Mouthpiece – Liquid Silicone



● ANNUAL SERVICE REPLACEMENT PARTS:

1	161500	O-ring (hose inlet end)
4	161499	O-ring (for hose outlet end)
11	451170	O-ring (smaller o-ring for orifice housing)
12	161520	O-ring (larger o-ring for orifice housing)
14	161495	O-ring (smaller o-ring for orifice)
15	161500	O-ring (larger o-ring for orifice)
29	451120	Seat Insert (for Stem)

ITEM	PINNACLE #	DESCRIPTION
1	161500	O-ring (hose inlet end)
2	390100	Hose Protector
3	390011	Hose Assembly (41"-84cm), includes hose protector & o-rings
4	161499	O-ring (for hose outlet end)
5	451250	Screw (for adjuster knob)
6	450290	Washer (for adjuster knob)
7	450890	Adjuster Knob
8	450630	Retaining Ring
9	180000	Nut
10	451037	Swivel Fitting
11	451170	O-ring (smaller o-ring for orifice housing)
12	161520	O-ring (larger o-ring for orifice housing)
13	451036	Orifice Housing
14	161495	O-ring (smaller o-ring for orifice)
15	161500	O-ring (larger o-ring for orifice)
16	450427	Orifice
17a	451054	Cover Assembly
18	450780	Retainer Ring
19	450460	Diaphragm (blue Tufel®)
20	450899	Case
21	450660	Mouthpiece Tie
22	390022	Mouthpiece (special Wisdom® style mouthpiece for Maximus only)
23	450900	Retainer Clip (for adjusting lever)
24	451210	O-ring
25	450910	Adjusting Lever
26	450640	Exhaust Valve
27	450820	Exhaust Tee (black)
28	450650	Screw (for exhaust tee, combination #10 Torx/ slot drive)
29	451120	Seat Insert (for Stem)
30	450430	Stem (no seat insert installed)
31	450760	Spring
32	451110	Lever Support
33	451240	Screws (for Heat Transfer Fins)
34	450395	Heat Transfer Fin (flat end)
35	450396	Heat Transfer Fin (dimpled end)
36	450410	Lever (black Teflon® coated)
37	451050	Screw (green color Teflon® coated, with friction adhesive on threads)
38	450960	Exhaust Tee (long)

TOOLS REQUIRED FOR SECOND STAGE SERVICING

6" or 8" adjustable wrenches

3/4" thin blade ring spanner. Remove retaining nut

#10 Torx screwdriver

Side cutting pliers

Plastic probe to push out orifice

Sherwood lever height adjusting tool (p/n TL123)

Small phillips screwdriver

Small slotted screwdriver

Locktite 242 (mild thread locking adhesive)

Size 'O' square drive screwdriver (e.g. channel lock p/n SL-O)

Christo-Lube®, 2 oz. tube of oxygen compatible lubricant

O-ring picks

Magnehelic gauge and in-line adjustment tool

In-line pressure gauge

TORQUE SETTINGS

Hose fittings, 40 in. lbs. (4.5 nm).

Never overtighten.

Orifice housing to lever assembly is 70 in. lbs. (7.8 nm).

Tighten the retainer nut to 70 in. lbs. (7.8 nm).

SRB5600 SECOND STAGE

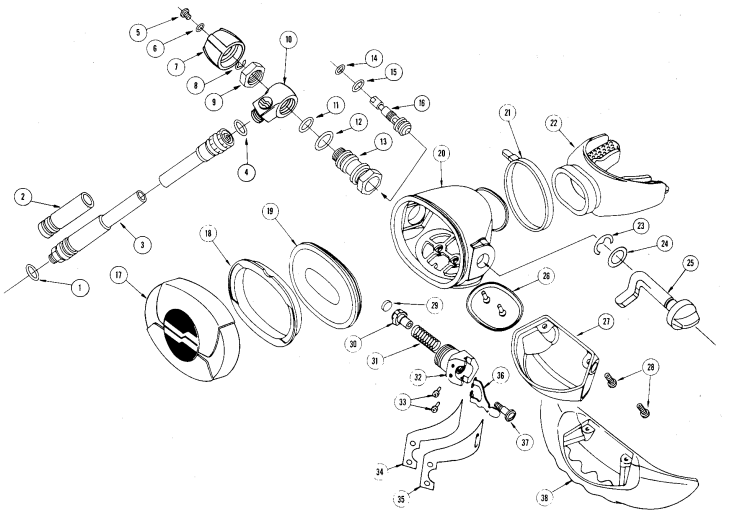
DISASSEMBLY

Pre-test regulator and one-way bleed valve prior to dissasembly. Check intermediate pressure (135-150psi - 9-10 bar). Check work of breathing. 1 to 1.5' of water - perform dry air bleed flow test (13-27 cc per minute).

SECOND STAGE REGULATOR - MAXIMUS™ SRB5600

NOTE: Labels (Item 1 below) in white, purple, pink, green, blue and yellow are available.

ITEM #	CATALOG #	DESCRIPTION
1	G011B	O-ring (hose inlet end)
2	.5100-27	Hose Protector
3	.5016-20-41A	Hose Assembly (41"-84cm), includes hose protector & o-rings
4	G010A	O-ring (for hose outlet end)
5	J12C04045B	Screw (for adjuster knob)
6	.19-4600-17	Washer (for adjuster knob)
7	.5602-16	Adjuster Knob
8	.3602-35	Retaining Ring
9	1-3602-15	Nut
10	.70-5602-14	Swivel Fitting
11	G014C	O-ring (smaller o-ring for orifice housing)
12	G015C	O-ring (larger o-ring for orifice housing)
13	.71-5602-13	Orifice Housing
14	G006B	O-ring (smaller o-ring for orifice)
15	G011B	O-ring (larger o-ring for orifice)
16	.29-5602-12	Orifice
17	.5602-80	Cover Assembly
18	.5100-6	Retainer Ring
19	.3108-13	Diaphragm (blue Tufel®)
20	.5602-1	Case
21	.3786-9W	Mouthpiece Tie
22	.5602-3LS	Mouthpiece (special Wisdom® style mouthpiece for Maximus only)
23	.5602-3	Retainer Clip (for adjusting lever)
24	G106B	O-ring
25	.5602-5	Adjusting Lever
26	.3602-6A	Exhaust Valve
27	.5700-9	Exhaust Tee (black)
28	.3702-5	Screw (for exhaust tee, combination #10 Torx/slot drive)
29	.978-9BN	Seat Insert (for Stem)
30	.29-5700-1	Stem (no seat insert installed)
31	.5100-29	Spring
32	9-5100-3A	Lever Support
33	J113481874BACR	Screws (for Heat Transfer Fins)
34	.25-5700-21	Heat Transfer Fin (flat end)
35	.25-5700-22	Heat Transfer Fin (dimpled end)
36	.29-3108-3	Lever (black Teflon® coated)
37	G010A	Screw (green color Teflon® coated, with friction adhesive on threads)
38	.5700-9BK	Exhaust Tee (black)



REMOVE AND INSPECT HOSE

Remember to inspect and replace if necessary the hose o-rings.

REMOVE THE MOUTHPIECE

The mouthpiece is the most common cause of a wet breathing regulator.

Pay particular attention to the tie strap area of the mouthpiece when inspecting it.

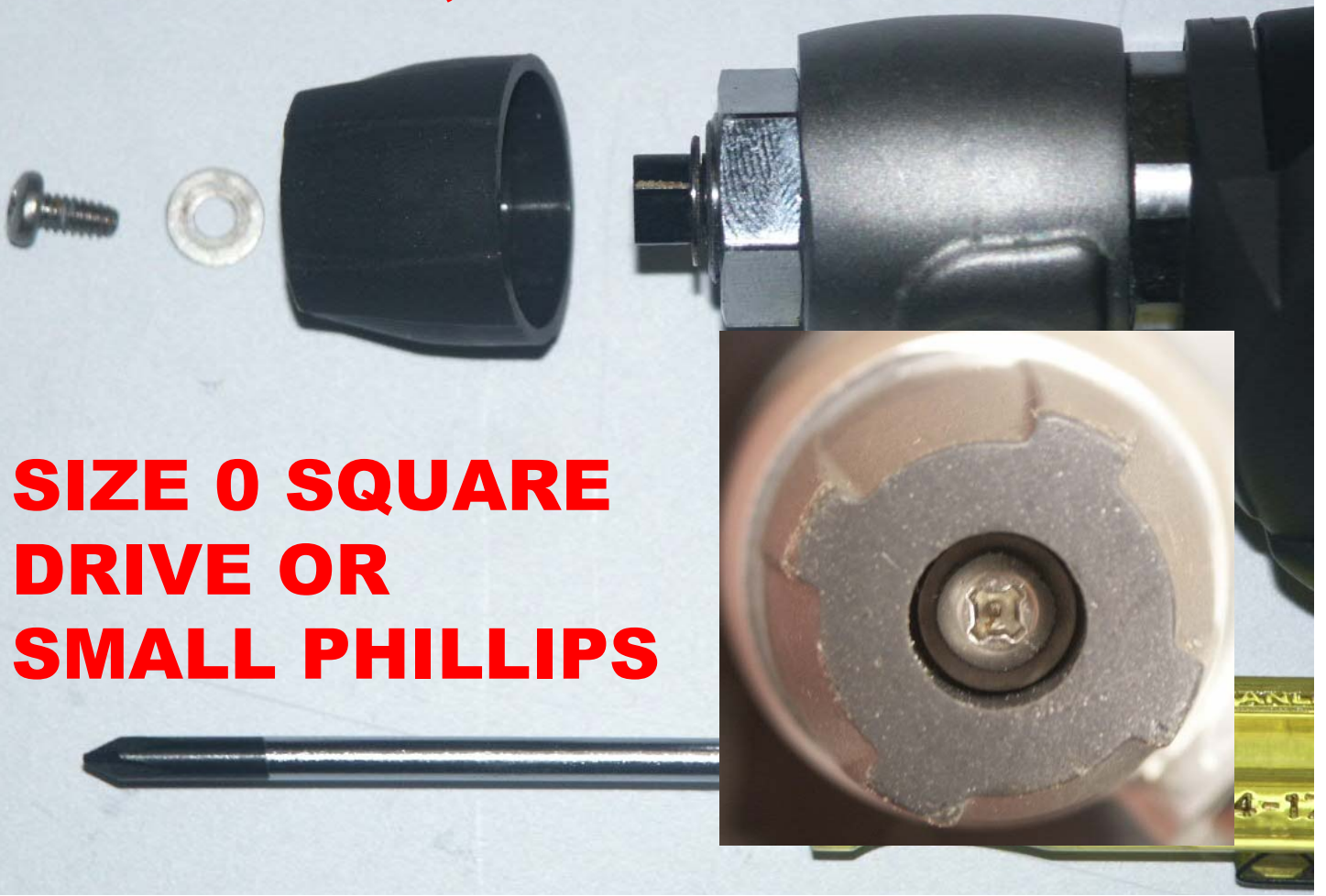
This is a stress point that can develop holes and leaks.


REMOVE THE EXHAUST
TEE #10 TORX SCREWS

REMOVE THE EXHAUST TEE

If the customer prefers, you can change this exhaust tee to the short exhaust tee part number 5100-9.

REMOVE THE ADJUSTMENT KNOB SCREW, WASHER & KNOB



SIZE 0 SQUARE DRIVE OR SMALL PHILLIPS

Orifice Recall

- A black washer is present under the adjustment knob screw indicates that this regulator has been serviced in accordance with technical bulletin number SRB56-01 and had the new orifice installed.
- Be sure to reinstall this black washer during reassembly
- A copy of this technical bulletin can be obtained at: www.splash.co.nz in the dealer zone

REMOVE THE ADJUSTABLE ORIFICE C-CLIP

REMOVE THE RETAINER NUT

Two wrenches are recommended to prevent damage to the housing.

Thin 3/4" & 5/8" ring spanner.

REMOVE AND INSPECT THE SWIVEL FITTING

Inspect the internal bore of the swivel for damage or scoring that could cause a leakage problem.

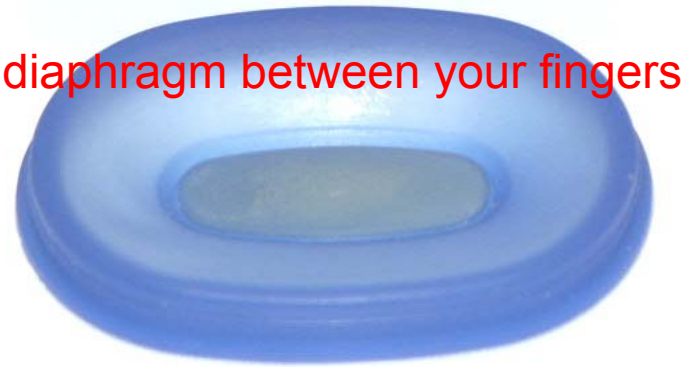
REMOVE THE FRONT COVER

Pinching the sides of the front cover will allow
you to get a grasp of the edge and peel off the cover.

REMOVE THE DIAPHRAGM RETAINING RING

REMOVE AND INSPECT THE DIAPHRAGM

Lightly stretch the diaphragm between your fingers to inspect for holes.



2nd Stage DIAPHRAGM

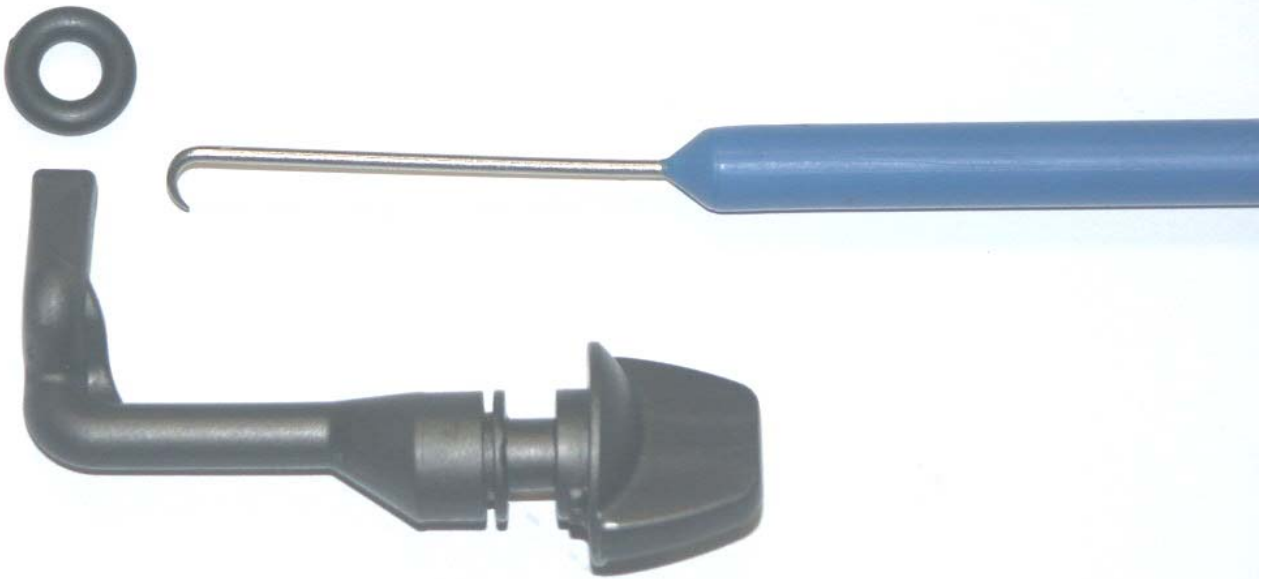
- The new blue diaphragms are made of a Tufel material.
- This material resists tearing and runs much better that the old black diaphragms.
- We have had hardly any returns of these new diaphragms. Any replacement diaphragms will be of the blue Tufel material.
- The black diaphragms are no longer available.

REMOVE THE ADJUSTING LEVER AND C-CLIP

ONLY IF NEEDED

REMOVE THE ADJUSTING LEVER O-RING

It is not necessary to remove the o-ring during an annual service.
It can be cleaned, inspected and relubricated while still on the adjusting lever.



REMOVE THE ORIFICE HOUSING

Loctite

- The orifice housing has Loctite applied to it during assembly
- If too much Loctite was previously applied, you could damage the second stage case and heat retention fins by twisting the demand lever support inside of the case
- If you encounter this problem, you can use a ¾ inch open end wrench to hold the demand lever support while you unscrew the orifice housing
- Be sure to clean off all of the old Loctite and only apply a small drop during reassembly.

REMOVE THE LEVER ASSEMBLY

Be sure to closely inspect the second stage case around the lever support area for cracks. This is a high stress area and can be damaged if the regulator becomes snagged during entry or exit from the water.

REMOVE THE LP SEAT

LP Seat

- During a normal annual service you do not need to completely disassemble the demand lever assembly
- If cleaning is needed, you can clean the demand lever assembly while it is still assembled, less the seat of course.
- Inspect the end of the poppet where the seat is positioned. There is a small hole designed to release any pressure from behind the seat should air become trapped during a dive. Make sure that this hole is not plugged and clean if necessary.

ONLY IF NEEDED

DISASSEMBLE THE DEMAND LEVER HOUSING ASSEMBLY

Should you need to disassemble the demand lever assembly,

this can be done with the use of the orifice housing.

Be sure that the OLD LP seat is still in the poppet and the orifice is in the housing.

ONLY IF NEEDED

REMOVE THE POPPET SCREW

If the poppet and spring need to be removed, unscrew the poppet screw with a number 10 torx. Once this screw is removed the manufacturer recommends replacing it with a new one.

ONLY IF NEEDED

REMOVE THE ORIFICE HOUSING, POPPET & SPRING

The poppet spring should last the life of the regulator and never need changing.

ONLY IF NEEDED

DISASSEMBLE THE HEAT / MOISTURE RETENTION FINS

The moisture retention fins should last the life of the regulator and never need to be replaced. If they do become damaged, they can be removed with a phillips head screw driver.

ONLY IF NEEDED

USING THE OLD LP SEAT, REVERSE THE PROCEEDURE TO REASSEMBLE. REPLACE THE POPPET SCREW, P/N 73-5602-4, WITH A NEW ONE.

REINSTALL THE ADJUSTER KNOB AND TURN THE ORIFICE IN CLOCKWISE UNTIL THE THREADS DISENGAGE COMPLETELY.

PUSH THE ORIFICE OUT OF THE HOUSING. USE A SOFT INSTRUMENT IF NECESSARY.

(Rough to smooth)

REMOVE AND DISCARD THE O-RINGS

These o-rings are all included in the annual service kit.

INSPECT & POLISH THE ORIFICE


INSPECT THE EXHAUST VALVE SEAL

REMOVE AND INSPECT THE EXHAUST VALVE

INSPECT THE CASE

Pay particular attention to the demand lever support area as this is a high stress area.

INSPECTION & CLEANING

Only if necessary, clean all metal parts of the second stage in an ultrasonic cleaner or cleaning solution.

Clean the orifice separately from other parts.

Inspect the second stage case for any cracks. Pay particular attention to the lever support area.

Clean all plastic parts in warm soapy water.

Inspect all bores and parts for damage, corrosion, or wear and replace if necessary.

Replace all parts provided in the annual service kit.

SRB5600 SECOND STAGE

ASSEMBLY

INSTALL THE EXHAUST VALVE

INSTALL THE NEW LP SEAT WITH THE LOGO FACING OUT

The 978-9BN LP seat replaces all previous seats.

Unlike the older seats, which were cookie cut out of a sheet, these seats are injection molded to maintain consistency.


INSTALL THE NEW LP SEAT
WITH THE LOGO FACING OUT

INSTALL THE LEVER SUPPORT ASSEMBLY

LUBRICATE AND INSTALL NEW ORIFICE O-RINGS

INSTALL THE ORIFICE INTO IT'S HOUSING

Use your finger tip to install the orifice into the housing to prevent damage to the knife edge.

ADJUST THE ORIFICE OUT COUNTER-CLOCKWISE UNTIL IT STOPS

This will completely engage the threads of the orifice into the orifice housing.

INSTALL THE ORIFICE ASSEMBLY. USE A SMALL DROP OF LOCTITE 242 ON THE ORIFICE HOUSING THREADS.

Torque to 70 in. lbs. (7.8 nm).

LUBRICATE AND INSTALL NEW ORIFICE HOUSING O-RINGS

INSTALL THE COVER ONTO THE CASE AND ROTATE IT OUT OF THE WAY

LUBRICATE AND INSTALL THE SWIVEL FITTING

Inspect and lubricate the internal sealing surface of the swivel before installation.

INSTALL THE RETAINER NUT

The use of two wrenches is recommended to prevent damage to the housing.

Torque to 70 in. lbs. (7.8 nm).


INSTALL THE C-CLIP

INSTALL THE ADJUSTING KNOB

INSTALL THE WASHER & SCREW AND USE A SMALL SMALL DROP OF LOCTITE 242 ON THE SCREW THREADS

If the regulator had a black washer under the screw be sure to reinstall it.

INSTALL THE ADJUSTING LEVER INTO THE CASE


INSTALL THE C-CLIP

CYCLE THE ADJUSTING LEVER AND CHECK IT'S MOVEMENT OF THE FINS

The fins should move freely from side to side when the lever is turned.

If the fins are hanging up on the bore of the mouth tube,

remove the demand lever support

and bend the fins sufficiently in the proper direction to correct the problem.

INSTALL THE DIAPHRAGM

INSTALL THE RETAINING RING

Check for proper seating of the diaphragm.
There should be no ripples in the diaphragm when properly installed.

MOVE THE COVER INTO PLACE

INSTALL THE EXHAUST TEE

Do not over tighten these screws.

These stainless steel screws can easily strip the thermoplastic second stage case.

INSTALL THE MOUTHPIECE

Maximus Mouthpiece

- The unique shape of the 5602-3LS mouthpiece bore works in conjunction with the adjusting lever to control the flow of air
- The diver can use another mouthpiece on the Maximus, but they must understand that the adjusting lever will no longer provide a minus function
- It will be as if the adjusting lever is always in the plus position.

CONNECT THE HOSE

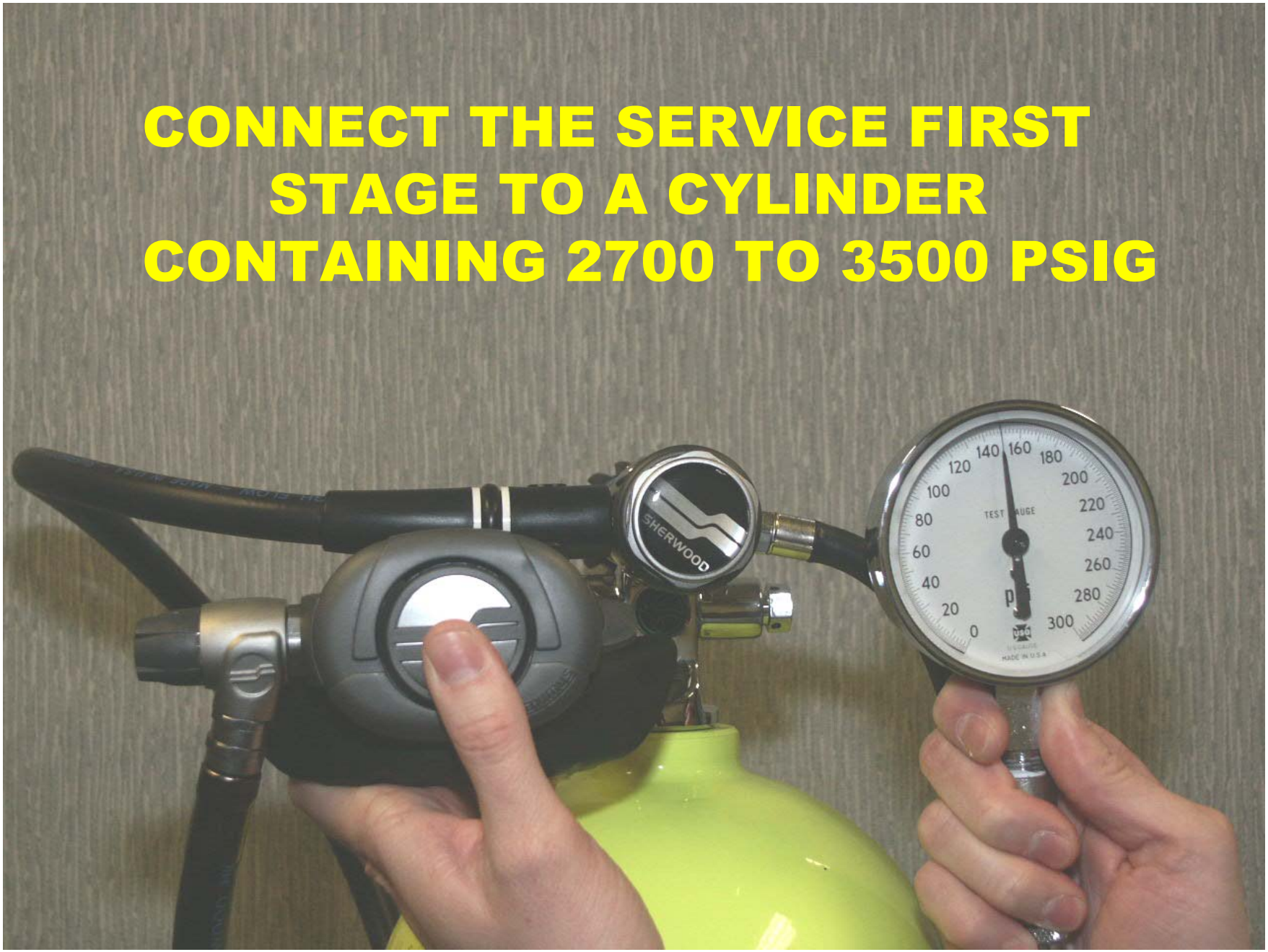
SET-UP OF SRB5600 SECOND STAGE

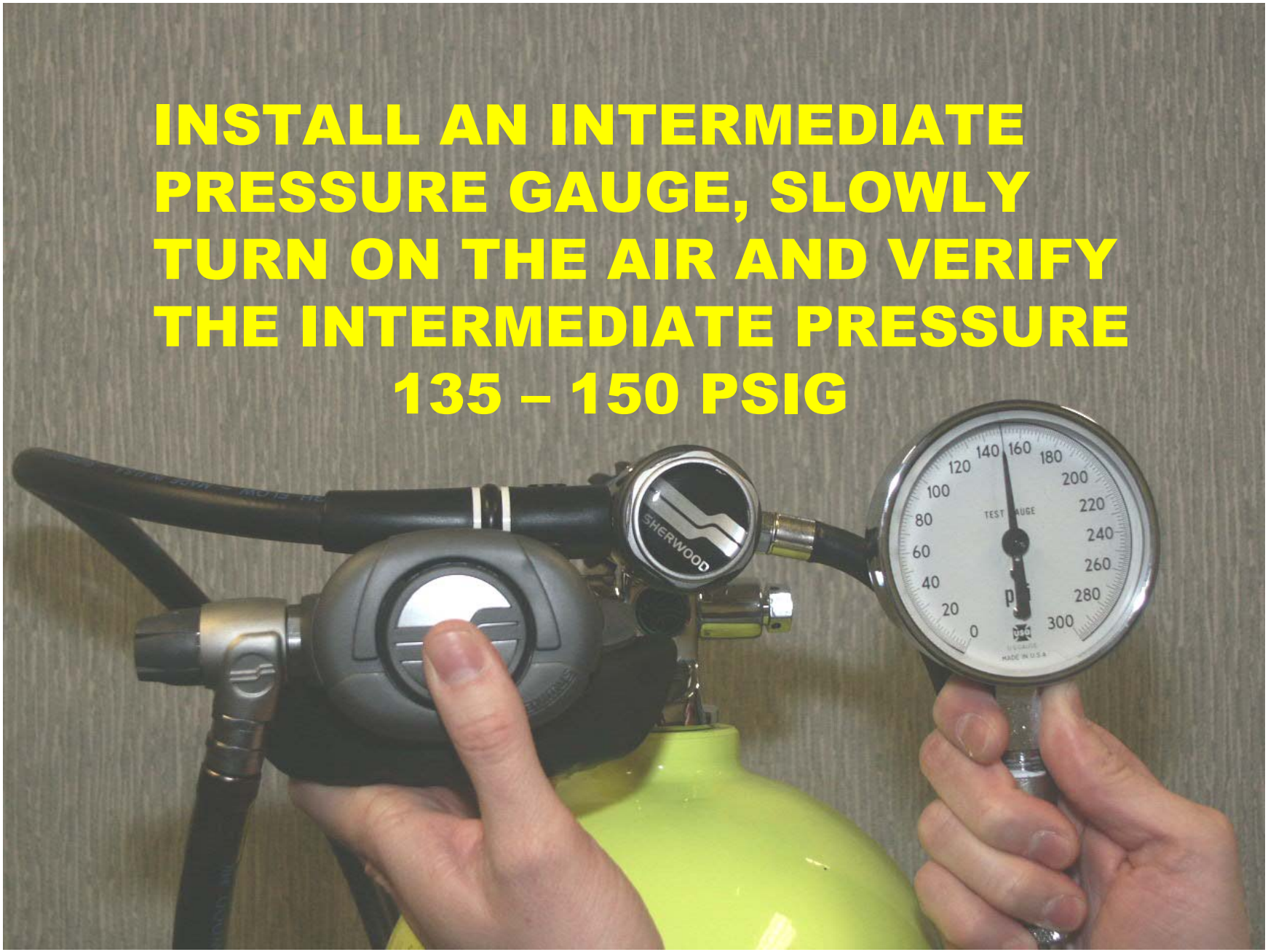
TURN THE ADJUSTER KNOB OUT COUNTER-CLOCKWISE ALL THE WAY

You need to have the orifice in this position to properly adjust the poppet screw.

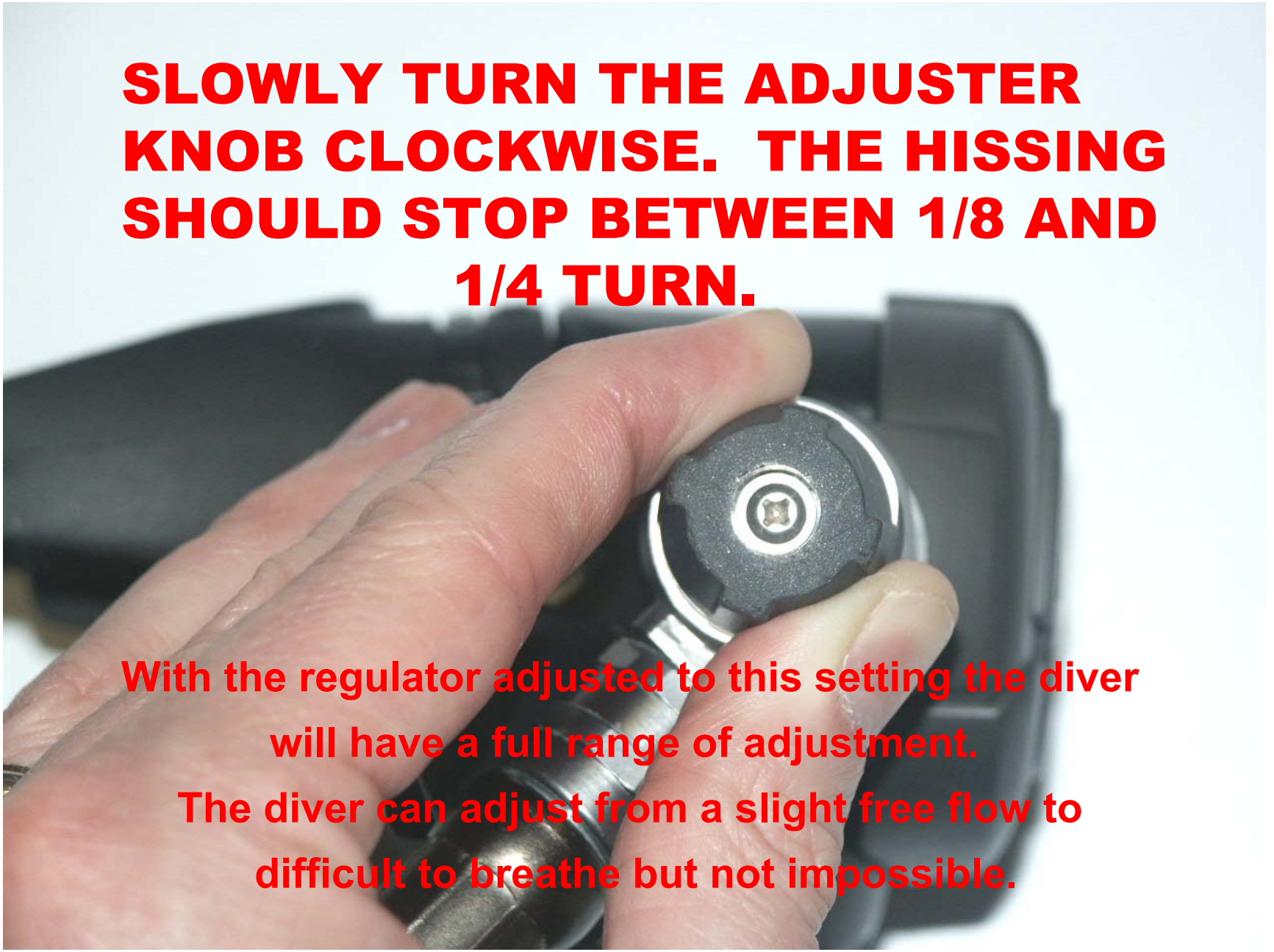

LOOSEN THE POPPET SCREW
UNTIL THE DEMAND LEVER HAS
1/16” OF FREE MOVEMENT
1/16” of free movement of the demand lever means
that the poppet seat is fully against the orifice.
This way when the air is turned on there will not be an instant free flow.

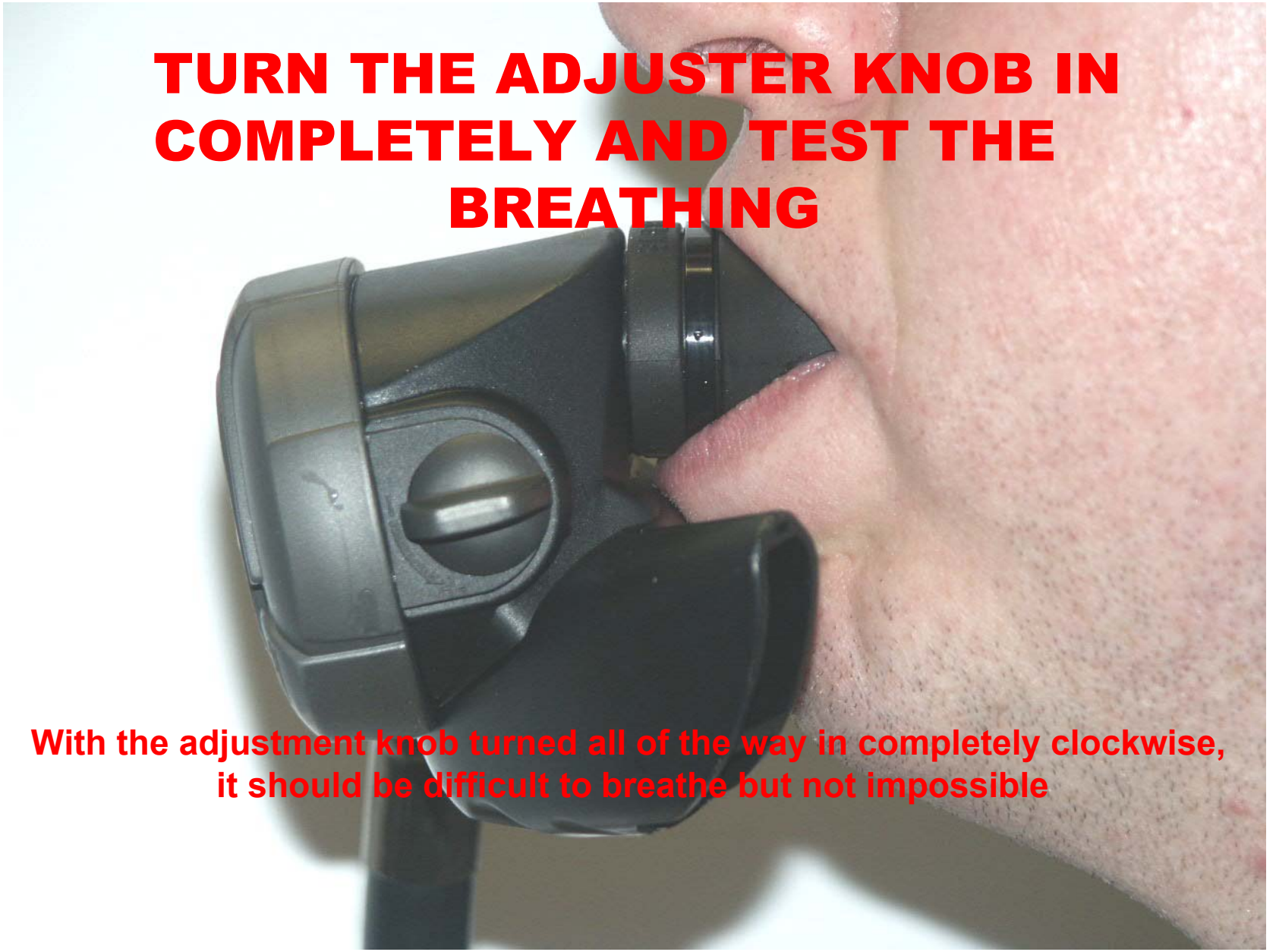
CONNECT THE SERVICE FIRST STAGE TO A CYLINDER CONTAINING 2700 TO 3500 PSIG




INSTALL AN INTERMEDIATE PRESSURE GAUGE, SLOWLY TURN ON THE AIR AND VERIFY THE INTERMEDIATE PRESSURE 135 – 150 PSIG
SHERWOOD
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300


ADJUST THE POPPET SCREW IN
UNTIL A SLIGHT LEAK IS HEARD
By turning the poppet screw in you are removing the play in the demand lever
and pulling the poppet seat off of the orifice slightly.
You want to have a slight leak when this adjustment is complete.


SLOWLY TURN THE ADJUSTER KNOB CLOCKWISE. THE HISSING SHOULD STOP BETWEEN 1/8 AND 1/4 TURN.
With the regulator adjusted to this setting the diver will have a full range of adjustment.
The diver can adjust from a slight free flow to difficult to breathe but not impossible.


TURN THE ADJUSTER KNOB IN COMPLETELY AND TEST THE BREATHING
With the adjustment knob turned all of the way in completely clockwise, it should be difficult to breathe but not impossible


TEST THE PURGE AND
LEVER HEIGHT

Purge and Lever Height

- Using the diaphragm as the measurement tool, there should be a slight gap between the lever and the diaphragm
- If you install the diaphragm after the initial set up and the regulator begins to free flow, the lever is too high
- If the gap is too big, you hear a clicking when you breathe on the regulator, and there is little or no purge, the lever is too low


IF LEVER BENDING IS
NEEDED, USE THE LEVER
BENDING TOOL, P/N TL123

Bending the Lever

- It is important the you hold the mid-section of the lever when bending to prevent damage to the lever feet
- If the feet are bent the lever should be changed because this affects the variable fulcrum
- The proper bending point is at the two indentations just below the lever tip

2.0 SPECIFICATIONS

2.1 SPECIFICATIONS FOR THE SRB5600 MAXIMUS

BENCH TEST THE SECOND STAGE AND / OR RETEST THE BREATHING

REGULATOR MODEL:	Sherwood SRB5600 Maximus
AIR FLOW:	33 cu. ft. (935 liters)/min. @ 1 atmosphere
INHALATION RESISTANCE:	.9" - 1.5" (2.3 - 3.8 cm) w.c. @ 1 atmosphere (adjustable)
EXHALATION RESISTANCE:	0.7" (1.8 cm) w.c. max. @ 1 atm.
RECOMMENDED LUBRICANT:	Christo-Lube™ MCG111 (Sherwood p/n SW-MS150)

A. First Stage Regulator:

TYPE:	Flow-by piston with Moving Orifice Balancing, Dry Air Bleed, and Air Sensing Channel Boost – **U.S. Pat. # 4,226,257, U.S. Pat. #5,662,100**
WEIGHT:	1 lb. 11 oz. (.77kg)
INTERSTAGE PRESSURE:	135 -150 psi (9-10 bar)
MAXIMUM INLET PRESSURE:	300 bar (with 300 bar DIN adapter)
POSITIVE AIR PURGE	
FLOW RATE:	13-27 cc/minute
# LOW PRESSURE PORTS:	5 (3/8"-24 UNF)
# HIGH PRESSURE PORTS:	2 (7/16"-20 UNF)
MATERIALS:	Body – CDA-36000 Brass O-rings – Buna-N (Viton Nitrox o-ring kit available) Bleed Valve – Ethylene Propylene Piston Seat – Teflon®

B. Second Stage Regulator:

SEE PAGE 3 OF THE REPAIR MANUAL FOR SPECIFICATIONS

TYPE:	Downstream valve diaphragm, balanced [illegible] **U.S. Pat. #3,[illegible]** Thermal Patent Pending
WEIGHT:	7.1 oz. (.22 kg) (w/o hose)
HOSE LENGTH:	Standard 72"
MATERIALS:	Case – Thermoplastic elastomer Case –Thermoplastic Triax® Poppet Seat – Buna-N O-Rings – Buna-N Diaphragm – Tufel® (clear blue) Exhaust Valve – Thermoplastic elastomer (blue) Mouthpiece – Liquid Silicone

FINALLY, ATTACH A SMALL PONY BOTTLE OR WHIP WITH A SCUBA BLOCK TO THE REGULATOR AND TEST FOR LEAKS