



**LX SERIES
SERVICE
PROCEDURE
DOC. HO-O1-02-003**

**100LX, 150LX AND 200LX
REGULATORS**

This LX Series Regulator Service Procedures conveys a list of components and service procedures that reflect the LX Series Regulators as they were configured at the time of this writing.

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

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

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PATENT NOTICE

U.S. Patents have been issued to protect the following design features: Orthodontic Mouthpiece (U.S. Patent No. 4,466,434) and Second Stage Regulator Depth Compensating Adjustment Mechanism (U.S. Patent No. 5,660,502).

EC TYPE EXAMINATION CONDUCTED BY:

Products carrying the mark 0120 have the EC Type Examination conducted by:
SGS United Kingdom Ltd, Inward Way, Rossmore Business Park, Ellesmere Port, Cheshire, CH65 3EN, United Kingdom:
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All products sold by Hollis in the EU (European Union) meet the following requirements where applicable. Compliance with the following where applicable.

EN 250:2014: This standard describes certain minimum performance requirements for SCUBA regulators sold in the EU (European Union). Testing identifies regulators that should not be used in water colder than 50 °F/ 10 °C, these regulators are marked >10 °C.

EN ISO 12209: This regulator's thread and yoke connection conforms to ISO 12209. Maximum working pressure: 232 bar (3500 PSI).

Normative references:

- EN ISO 12209-1, Gas cylinders — Outlet connections for gas cylinder valves for compressed breathable air
Part 1: Yoke type connections (ISO 12209-1)
- EN ISO 12209-2, Gas cylinders — Outlet connections for gas cylinder valves for compressed breathable air
Part 2: Threaded connections (ISO 12209-2)
- EN ISO 12209-3, Gas cylinders — Outlet connections for gas cylinder valves for compressed breathable air
Part 3: Adaptor for 230 bar valves (ISO 12209-3)

EN13949:2003: This standard describes special qualification testing for regulators that are to be used with gases whose oxygen content is greater than 22%. Regulators that have passed testing are marked NITROX/O₂.

EN144-3: This standard describes the M26 regulator inlet fitting and M26 valve that must be used with gases containing over 22% oxygen sold in the EU (European Union). These inlet fittings and valves are marked with the maximum rated working pressure.

EN12021: This standard specifies the allowable contaminants and component gases that make up compressed air. This standard is the equivalent of the USA Compressed Gas Association's Grade E air. Both standards allow very small amounts of contaminants that are not harmful to breathe, but can cause a problem if present in systems using gases with a high percentage of oxygen.

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WARNINGS, CAUTIONS AND NOTES

Pay attention to the following symbols when they appear throughout this document. They denote important information and tips.



WARNING: are indicators of important information that if ignored would lead to severe injury or death.



CAUTION: are indicators of information that if ignored may lead to minor to moderate injury.



NOTES: indicate tips and advice that can inform of features, aid assembly, or prevent damage to the product.

GENERAL PROCEDURES

REFER TO "HOLLIS GENERAL SERVICE PROCEDURES".....DOC. 12-4025

SPECIFICATIONS

TORQUES

Screw (35) - 3 to 4 in-lbs (0.34-0.45 N-m)
Packing (33) or Spacer (9/8) nut - 11 to 13 in-lbs (1.2-1.5 N-m)
LP Hose - 50 to 60 in-lbs (5.6-6.8 N-m)

Opening Effort {IP @ 138 psi (9.9 bar), Venturi Switch set negative}

1. No leak with Adjustment Knob turned fully out counterclockwise.
2. Inhalation Effort not to exceed 1.4 IWC. With the adjustment knob turned fully out - counter clockwise.
3. No free flow allowed when Venturi Switch set negative (switch forward).
4. Free flow allowed when Venturi Switch set positive (switch backward).
5. No over purge allowed.

TOOLS REQUIRED

STANDARD TOOLS

Inch Pounds Torque Wrench	Cotton Swab
5/8" Open End Wrench	Wooden or Plastic Dowel
11/16" Open End Wrench	Magnifying Light
13/16" Open End Wrench	Small Pin Punch
3/32" Hex Key	Magnehelic® Gauge
5/8" Socket	Magnifying Lens
3/32" Hex Driver	Soft Probe (Wooden Dowel)
Small Flat Blade Screwdriver	Needle Nose Pliers
(or in-line adjustment tool)	Adjustable Wrench
	Crows Foot Wrench

(Magnehelic® is a registered trademark of Dwyer Instruments)

SPECIALTY TOOLS

PN 220.9102	Tribolube 71
or	
PN 220.9101	Cristo-Lube MCG111 (2oz)
PN 40.9315	IP Gauge
PN 40.9520	O-Ring Tool Set
PN 240.9107	Inline Adjustment Tool (Non-Swivel Version)

TROUBLESHOOTING

SYMPTOMS	POSSIBLE CAUSE	TREATMENT
Free flow or leak present with KNOB ADJUSTMENT (38) turned fully out counterclockwise.	<ol style="list-style-type: none"> 1. LEVER (5) bent. 2. Excessive intermediate pressure. 3. Damaged or worn POPPET SEAT (6). 4. Damaged ORIFICE SEAT (4). 5. ORIFICE SEAT (4) incorrectly adjusted. 6. LP Hose to INLET CHAMBER (2) connection loose. 7. Trapped sand or debris. 8. Score inside sealing surface of ADJUSTMENT TUBE (27, 31). 9. Weak or damaged POPPET SPRING (13). 	<ol style="list-style-type: none"> 1. Replace LEVER (5). 2. Readjust IP of 1st stage to specification. 3. Replace POPPET SEAT (6). 4. Replace ORIFICE SEAT (4). 5. Readjust ORIFICE SEAT (4) (refer to Final Adjustment section). 6. Torque LP Hose to specification. 7. Remove sand or debris and clean. 8. Replace ADJUSTMENT TUBE (27, 31). 9. Replace POPPET SPRING (13).
Excessive inhalation effort with KNOB ADJUSTMENT (38) turned fully out counterclockwise.	<ol style="list-style-type: none"> 1. LEVER (5) bent. 2. ORIFICE SEAT (4) incorrectly adjusted. 3. Insufficient Intermediate Pressure from 1st stage. 	<ol style="list-style-type: none"> 1. Replace LEVER (5). 2. Readjust ORIFICE SEAT (14) (refer to Final Adjustment section). 3. Readjust IP of 1st stage to specification.
Rattle noise heard inside second stage.	<ol style="list-style-type: none"> 1. Gravel or sand trapped inside LX HOUSING ASSY (1). 2. Excessive LEVER (5) slack. 	<ol style="list-style-type: none"> 1. Remove and clean. 2. Readjust ORIFICE SEAT (4) (refer to Final Adjustment section).
Little or no airflow when purge is depressed	<ol style="list-style-type: none"> 1. DIAPHRAGM RETAINING RING (45, 46) not tightened correctly. 2. Excessive LEVER (5) slack. 3. ORIFICE SEAT (4) incorrectly adjusted. 	<ol style="list-style-type: none"> 1. Tighten DIAPHRAGM RETAINING RING (45, 46) until secure. 2. Readjust ORIFICE SEAT (4) (refer to Final Adjustment section) or replace LEVER (5) if bent. 3. Readjust ORIFICE SEAT (4) (refer to Final Adjustment section)
KNOB ADJUSTMENT (38) difficult to turn.	<ol style="list-style-type: none"> 1. Debris or corrosion present on ADJUSTMENT SHAFT (34). 2. Debris present inside KNOB ADJUSTMENT (38). 3. SPRING FOLLOWER (32) damaged or cross-threaded. 4. POPPET SPRING (13) damaged or corrosion present. 	<ol style="list-style-type: none"> 1. Disassemble and clean. 2. Flush out or disassemble to clean. 3. Replace SPRING FOLLOWER (32). 4. Clean or replace POPPET SPRING (13).

DISASSEMBLY PROCEDURE



NOTE: Be sure to perform the steps outlined in the Initial Inspection Procedures prior to disassembling the regulator. Review the troubleshooting section to gain a better idea of which internal parts may be worn, and to better advise your customer of the service that is needed.

1. Pull mouthpiece down, up and side to side looking for holes or tears. Dispose after step 2 if any damage is present.
2. Snip the plastic **TY-STRAP (21)** that holds the **MOUTHPIECE (39, 40, 41)**, and remove the **MOUTHPIECE (39, 40, 41)**. Inspect the condition of the **MOUTHPIECE (39, 40, 41)** to ensure that it is supple and in good working condition. Discard if any wear or damage is present.



NOTE: Refer to the Leak Detection section of General Procedures to perform the immersion test before proceeding any further, if you have not already done so.

3. Remove the LP Hose from the **INLET CHAMBER (2)** using 2 wrenches. Use an 11/16ths wrench on the **INLET CHAMBER (2)** and an adjustable wrench (or another 11/16ths wrench) on the hose.
4. Using your hands, turn the **TOP COVER RING (47, 48)** counterclockwise to remove it from the **LX HOUSING ASSY (1)**. If the **TOP COVER RING (47, 48)** has been over-tightened onto the **LX HOUSING ASSY (1)** and cannot be loosened by hand, you may use a small strap wrench to loosen it while holding the second stage firmly in place.
5. Remove the **TOP COVER AND DISK ASSEMBLY (42, 43, 44)**.
6. Using your hands, unscrew the **DIAPHRAGM RETAINING RING (45, 46)**. (Fig. 1)
7. Remove the **DIAPHRAGM WASHER (23)** by carefully pulling on its inside edges. You may need to "walk it out" by gently pulling on opposing sides until it comes out. DO NOT forcefully pull on the **DIAPHRAGM WASHER (23)**.
8. Carefully remove the **DIAPHRAM ASSEMBLY (22)** by pulling on its raised center edges. DO NOT stress the material if it appears stuck onto the **LX HOUSING ASSY (1)**. If the **DIAPHRAGM ASSEMBLY (22)** is stuck, soak the **LX HOUSING ASSY (1)** in warm fresh water for 20 minutes and try again. (Fig. 2)

Inspect diaphragm while backlit by stretching from center out to edge. Look for small pin holes or tears.



Fig. 1



Fig. 2



CAUTION: Proper disassembly of the main valve is crucial. Failure to correctly perform the following procedure will result in damage to either the DIAPHRAGM (22), the ORIFICE SEAT (4), the POPPET SEAT (6), or all of these parts, requiring replacement. Hollis USA strictly recommends avoiding the use of a sharp metal instrument and closely adhering to the valve removal method outlined in the following steps.

9. Remove the **NUT RETAINER (17, 47)** by unscrewing it counter-clockwise. Remove the **O-RING (15)** and discard. (Fig. 3)
10. Carefully push the valve body approximately 1/2 inch toward the opposite side (Toward the **PREDIVE LEVER (50, 51, 52)**). This will allow access to the **RETAINING CLIP (16)**. (Fig. 4 & 5)
11. Remove the **RETAINING CLIP (16)** by gently pulling on the RETAINING CLIP (16) with your finger or needle nose pliers. (Fig. 5 & 6)
12. Rotate the **PRE-DIVE LEVER (50, 51, 52)** so the deflector is facing up. (Fig. 6)

Rotate the deflector so the lever cut out is facing up. (Fig. 6)

13. Gently depress the **LEVER (5)** so the arms fall between the cut outs on the deflector and pull the entire valve body assembly out of the **LX HOUSING ASSEMBLY (1)**. (Fig. 7 & 8)



CAUTION: DO NOT apply excessive pressure onto the LEVER (5).



CAUTION: DO NOT force the LEVER (5) through the LX HOUSING ASSEMBLY. It should slide easily through if you have depressed the VALVE (5) before attempting to remove the valve body. (Fig. 8)

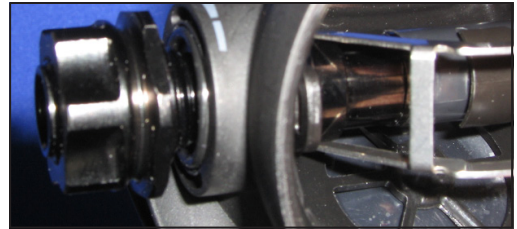


Fig. 3

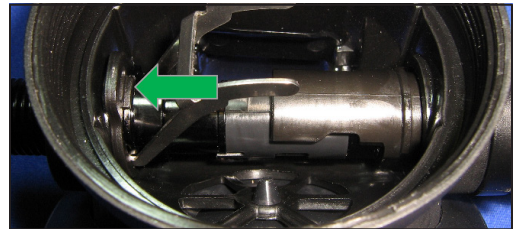


Fig. 4



Fig. 5

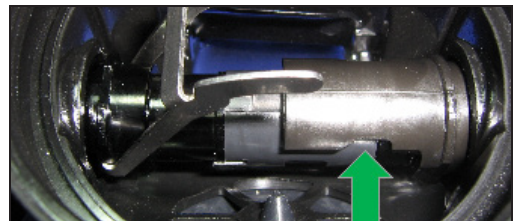


Fig. 6



Fig. 7

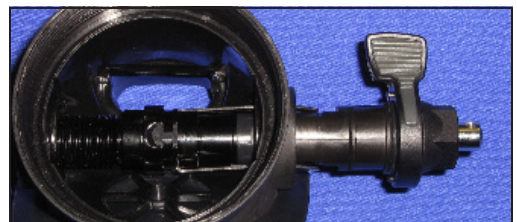




Fig. 8


14A. **200LX Only:** Turn the **ADJUSTMENT KNOB (38)** out completely counter clockwise. Remove the **CAP SCREW (37)** with a 3/32 inch hex key and remove the Adjustment Knob (38) from the **ADJUSTMENT SHAFT (34)**. (Fig. 9)

14B. Remove **CAP 221 (26)** from **LX HOUSING ASSY (1)** by unscrewing it. Unscrew **ADJUSTMENT SCREW (25)** **BY ROTATING COUNTER-CLOCKWISE**. Remove **O-RING (28)** from **ADJUSTMENT SCREW (25)** and dispose of it. (Fig. 9)

15. **200LX Only:** Remove the **PACKING NUT (36)** by turning clockwise from the **ADJUSTMENT TUBE (31, 27)** with a 5/8 inch open-end or adjustable wrench, being careful not to lose the **WASHER (35)**. (Fig. 10)

 **NOTE:** The packing nut is reverse threaded. (Fig. 10)

 **NOTE:** The **ADJUSTMENT SHAFT (34)** sub-assembly is under spring load and may pop out when the **PACKING NUT (33)** is removed; be careful not to lose any components during disassembly. (Fig. 11)


 **NOTE:** During disassembly, if you are to discover a white washer between the Blue Spring and the Spring Follower, please discard prior to replacing with Red Spring provided with your service kit.

16. **200LX Only:** Remove the **WASHER (35)** from the **ADJUSTMENT SHAFT (31)**; if missing; it may be stuck on the face of the **PACKING NUT (36)**.

17. **200LX Only:** Grasp the **ADJUSTMENT SHAFT (34)** and pull it straight out of the **ADJUSTMENT TUBE (31)**.

18. Remove the **POPPET SPRING (13)** and **BALANCE SHAFT (12)**. If the **BALANCE SHAFT (12)** does not come out, gently tap the **ADJUSTMENT TUBE (31, 27)** into your hand to remove it. Examine the **BALANCE SHAFT (12)** and check that it is not bent or deformed; replace if damaged. (Fig. 11)

19. **200LX Only:** Do not remove the **O-RING (33)** from the **ADJUSTMENT SHAFT (34)** unless it is damaged and requires replacement.

 **NOTE: 200LX Only:** Do not remove the **SPRING FOLLOWER (32)** from the **ADJUSTMENT SHAFT (34)** unless it is damaged and needs replacing, or debris needs to be removed to clean it. In this case, remove by turning the **SPRING FOLLOWER (32)** clockwise while holding the **ADJUSTMENT SHAFT (34)** in your other hand.

 **NOTE: 200LX Only:** The thread on the **SPRING FOLLOWER (32)** is left-handed. (Fig. 11)



Fig. 9



Fig. 10



Fig. 11

20. Remove the **ADJUSTMENT TUBE (31, 27)** from the **INLET CHAMBER (2, 30)** by using an adjustable wrench on the **INLET CHAMBER (2, 30)**. Turn clockwise to loosen while holding the **ADJUSTMENT TUBE (31, 27)** or secure with another adjustable wrench. (Fig. 12)



NOTE: The threads on the **ADJUSTMENT TUBE (31, 27)** and **INLET CHAMBER (2, 30)** are reversed. (Fig. 12)

21. Remove the **PREDIVE DEFLECTOR (14)** and **PREDIVE LEVER** from the **INLET CHAMBER** (Fig. 13)



NOTE: Do not remove the **FLOW DEFLECTOR** from the **INLET CHAMBER** unless damaged.

22. Separate the **PREDIVE DEFLECTOR** and **PREDIVE LEVER** (Fig. 14, 15)

23. Pull the **POPPET** out of the **INLET CHAMBER**

24. Remove **O-RING (10)** from inside **ADJUSTMENT TUBE (27, 31)** using a dull punch or blunt plastic pick, and discard. (Fig. 16)

25. Remove the **POPPET SEAT (6)** from the **POPPET (7)** and discard. DO NOT attempt to reuse it. (Fig. 17)



Fig. 12



Fig. 13



Fig. 14



Fig. 15



Fig. 16

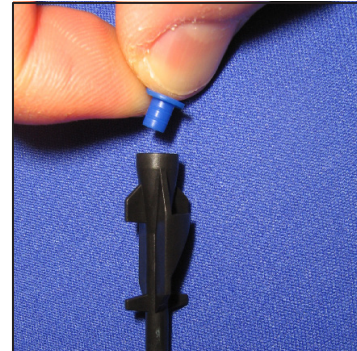


Fig. 17

26. Remove the **2 O-RINGS (8)** from the shaft of the **POPPET (7)** by squeezing them with your fingers and working them off the end of the shaft. Discard both O-Rings. (Fig. 18)
27. Examine the **LEVER (5) without** removing it from the **INLET CHAMBER (2)**. Make sure it is not bent or distorted in any way. If the **LEVER (5)** is damaged in any way, it must be replaced. DO NOT attempt to re-use it.
28. Using a narrow slotted screwdriver or in-line adjustment tool, remove the **ORIFICE SEAT (4)** from the **INLET CHAMBER (2)** by unscrewing it counter-clockwise. Use a cotton swab to push the **ORIFICE SEAT (4)** out of the **INLET CHAMBER (2)** once it is fully unscrewed.
29. Inspect the **ORIFICE SEAT (4)** with a magnifier. Pay close attention to the knife edge to make sure it is free of damage. DO NOT attempt to reuse if any damage is found. (Fig. 19)
30. Remove and discard the **ORIFICE SEAT O-RING (3)**.
31. Only remove the **EXHAUST COVER (20)** if the exhaust valve requires replacement. Pull it straight back and downwards, disengaging it from the housing lip.
32. Examine the overall condition of the **LX HOUSING ASSY (1)** and **EXHAUST COVER (20)** to insure there are no stress fractures or deformation. Insure that all threading on the **LX HOUSING ASSY (1)** is in good condition and free from sand or debris. Discard either if any damage is found.
33. Examine the **EXHAUST VALVE (19)** with a soft probe to insure that it is resilient and no holes or tears are present; discard if any found. Inspect the sealing surface under the **EXHAUST VALVE (19)** on the **LX Housing ASSY(1)** to insure there is no debris or scores.



NOTE: It is not necessary to remove the **EXHAUST VALVE (19)** if it is in good condition; the **LX HOUSING ASSY (1)** may be cleaned without removing it.

34. If the **EXHAUST VALVE (19)** requires replacement, remove by grasping it with your fingers and pull straight out from the **LX HOUSING ASSY (1)**, snipping the stem if necessary and discard. (Fig. 20)



NOTE: Prior to Reassembly, it is important to inspect all parts, both new and those being reused, for defects and damage. Inspect to insure that all o-rings are clean and supple, and all parts and components have been thoroughly cleaned and dried in accordance to the General Service Procedure (Doc. No. 12-4025). Inspect all critical sealing surfaces for scratches or imperfections.



WARNING: Use only genuine Hollis parts, subassemblies and components whenever assembling Hollis products. DO NOT substitute any Hollis part with a part from another manufacturer, regardless of any similarity in shape, size or appearance. Doing so may render the product unsafe, and could result in serious injury or death to the user.

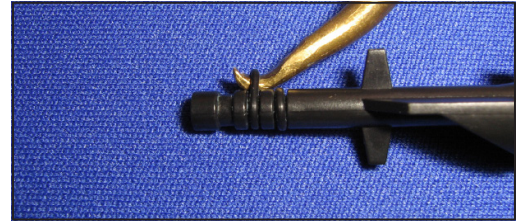


Fig. 18



Fig. 19



Fig. 20

REASSEMBLY PROCEDURE

1. If it was removed, install a new **EXHAUST VALVE (19)** into the **LX HOUSING ASSY (1)** by gently pulling the valve stem through the **LX HOUSING ASSY (1)** with needle nose pliers, insuring that the retaining nipple is pulled inside the **LX HOUSING ASSY (1)** and properly seated.

WARNING: DO NOT use any lubricant on the **EXHAUST VALVE (19)** to install; doing so may result in the **EXHAUST VALVE (19)** slipping from the **LX HOUSING ASSY (1)** rendering the product unsafe, and could lead to serious injury or death.

2. Reinstall the **EXHAUST COVER (20)** by pressing it firmly over the **LX HOUSING ASSY (1)** lip. Be certain to fully seat the **EXHAUST COVER (20)**. Installation may be aided with the use of warm to hot water.
3. Inspect and install a new **POPPET SEAT (6)** onto the **POPPET (7)**, large flat end facing out until it is fully seated and flush with the edge of the **POPPET (7)**. Examine the hole in the center of the **POPPET SEAT (6)** to insure that it is clear and not plugged. Do not use any adhesive or lubricant. (Fig. 21)
4. Lightly lubricate and install both **POPPET O-RINGS (8)** into the first two narrow grooves of the shaft of the **POPPET (7)**. (Fig. 22)

CAUTION: Make sure the 2 **POPPET O-RINGS (8)** are placed on the proper grooves of the **POPPET (7)**. DO NOT place an o-ring on the groove closest to the Poppet shaft end of the **POPPET (7)**. (Fig. 22)

5. Carefully examine the knife sealing edge of the **ORIFICE SEAT (4)** for nicks or imperfections. Lightly lubricate and install the **ORIFICE O-RING (3)** onto the groove of the **ORIFICE SEAT (4)**. (Fig. 23)
6. Insert the **ORIFICE SEAT (4)** into the **INLET CHAMBER (2)** knife-edge first. (Fig. 24)

CAUTION: Be careful to protect the knife edge sealing surface of the **ORIFICE SEAT (4)** during installation.

7. Using a In-Line Adjustment Tool or narrow flat blade screwdriver, engage the slotted head of the **ORIFICE SEAT (4)** and slowly turn in clockwise into the **INLET CHAMBER (2)** until the knife-edge of the **ORIFICE SEAT (4)** barely makes contact with the **POPPET SEAT (6)**. This will be indicated by the slight drop of the **LEVER (5)**; when this occurs depress the **LEVER (5)** and slightly turn the **ORIFICE SEAT (4)** out counter clockwise, bringing the **LEVER (5)** upright.

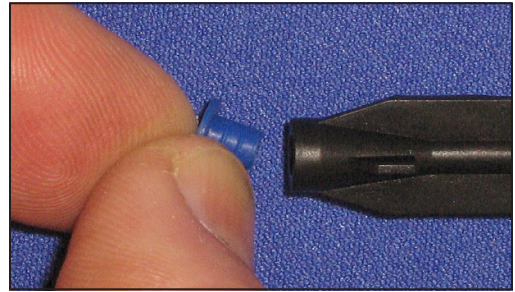


Fig. 21



Fig. 22



Fig. 23

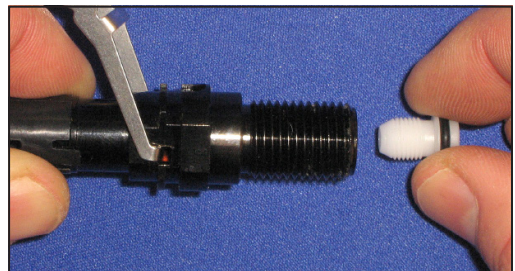


Fig. 24



CAUTION: Continuing to turn the **ORIFICE SEAT (4)** inward any further may result in damage to the **POPPET SEAT (6)**, requiring its replacement.

8. Lightly lubricate and install the **ADJUSTMENT TUBE O-RING (11)** onto the narrow groove on the outer threaded end of the **ADJUSTMENT TUBE (27, 31)**. (Fig. 25)
9. Lightly lubricate and install the **BALANCE SHAFT O-RING (10)** into the small opening of the **ADJUSTMENT TUBE (27, 31)** by pressing it into place with the stem of the **POPPET (7)**. Look into the small opening of the **ADJUSTMENT TUBE (27, 31)**; you should be able to see clear through. If not, remove o-ring and reinstall until correctly seated. (Fig. 26)



CAUTION: Be sure to remove the poppet from the balance chamber after installing the o-ring. (Fig. 27)

10. Lightly lubricate and install the **O-RING (15)** onto the **PREDIVE DEFLECTOR (14)**.
11. Install the **PREDIVE LEVER (50)** onto the **PREDIVE DEFLECTOR (14)**. (Fig. 28)



Fig. 25

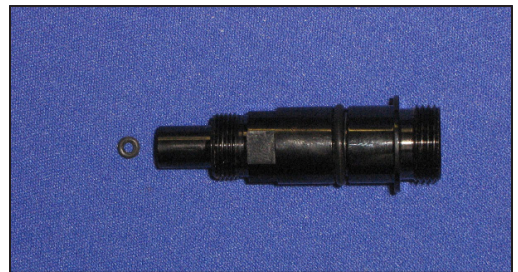


Fig. 26

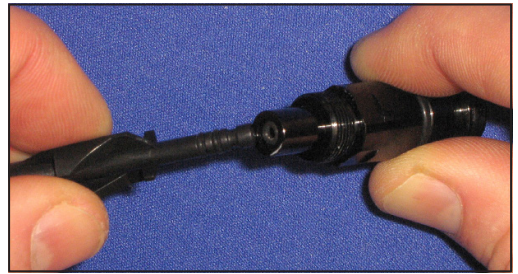


Fig. 27

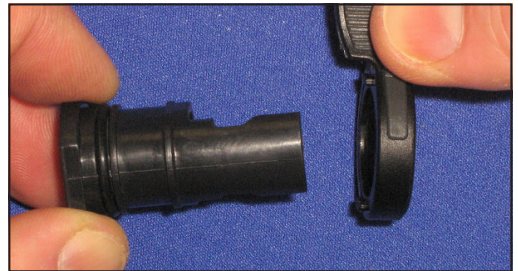


Fig. 28

12. Install the **PREDIVE ASSEMBLY (50, 14)** onto the **ADJUSTMENT TUBE (31)**. (Fig. 29)
13. Install (drop) the **POPPET (7)** into the **INLET CHAMBER (2)** making sure the side with only 2 fins is directly facing the **LEVER (5)**. (Fig. 30 & 31)



CAUTION: Failure to align the components precisely as described may prevent the **POPPET (7)** from engaging the legs of the **LEVER (5)**, rendering the unit inoperable.

14. Install the **ADJUSTMENT TUBE (27, 31)** into the **INLET CHAMBER (2)** tightening counterclockwise (Left-Handed threads) to a torque of 11 to 13 in-lbs (1.2-1.5 N-m) using a torque wrench with 5/16 in driver and an adjustable wrench. If the **INLET CHAMBER (2)** is held vertically with the threads pointing down, the **LEVER (5)** will keep the **POPPET (7)** from turning inside the **INLET CHAMBER (2)** (Fig. 32)



NOTE: The threads on the **ADJUSTMENT TUBE (31, 27)** and **INLET CHAMBER (2, 30)** are left-handed.

15. If the Spring Follower was removed during disassembly, Install the **SPRING FOLLOWER (32)** flat side first onto the **ADJUSTMENT SHAFT (34)**, screwing by hand counter clockwise until it stops; do not tighten with a wrench or any tool. Insure that you do not cross thread during assembly. (Fig. 33)

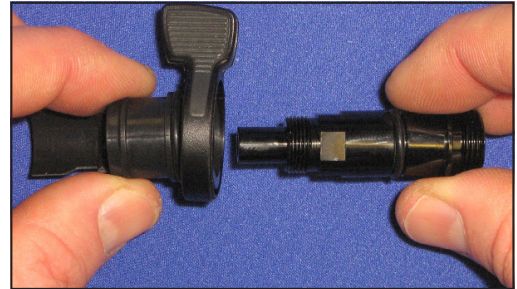


Fig. 29



Fig. 30

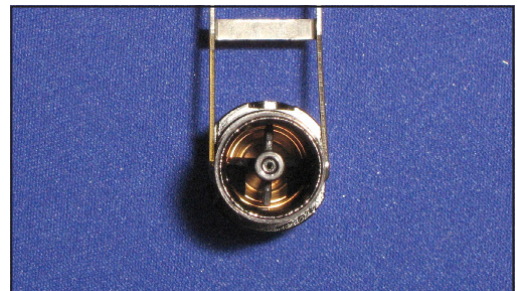


Fig. 31

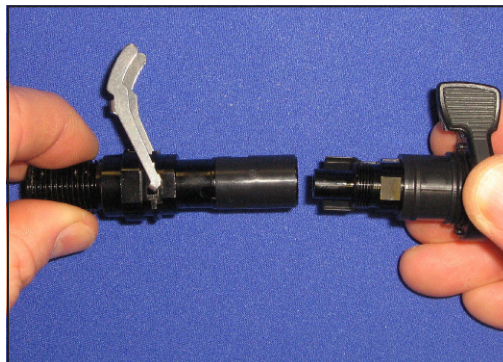


Fig. 32

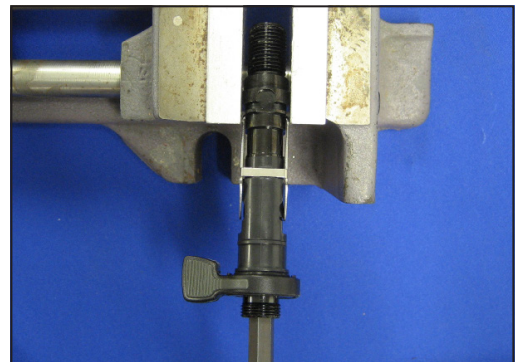


Fig. 33

16. Lightly lubricate and install the **ADJUSTMENT SHAFT O-RING (33)** onto the groove on the **ADJUSTMENT SHAFT (34)**. (Fig. 34)
17. Install the **BALANCE SHAFT (12) POPPET SPRING (13) SPRING FOLLOWER (32) O-RING (33)** and **ADJUSTMENT SHAFT (34)** into the **ADJUSTMENT TUBE (31)**. (Fig. 35)
18. Install the **WASHER (35)** over the end of the **ADJUSTMENT SHAFT (34)**. (Fig. 36)
19. Thread the **PACKING NUT (36)** onto the **ADJUSTMENT TUBE (27, 31)** by turning counterclockwise. Tighten the **PACKING NUT (36)** with a 5/8 inch socket, and torque to 11-13 in/lbs (1.2-1.5 N-m). (Fig. 37)
20. Tighten the **PACKING NUT (36)** with a 5/8 inch socket, and torque to 11-13 in/lbs (1.2-1.5 N-m). (Fig. 38)



CAUTION: Over-tightening the **PACKING NUT (36)** and/or **NUT RETAINER (17, 49)** may result in the failure of the fastener or body, rendering them unusable and requiring replacement.

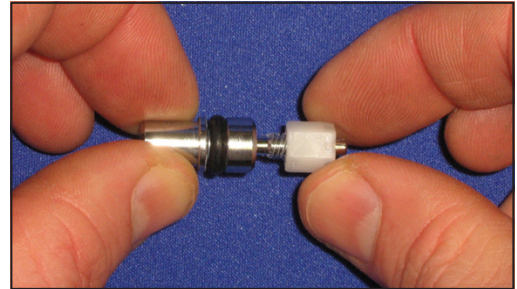


Fig. 34

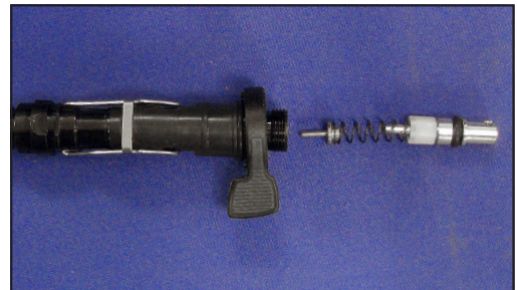


Fig. 35



Fig. 36

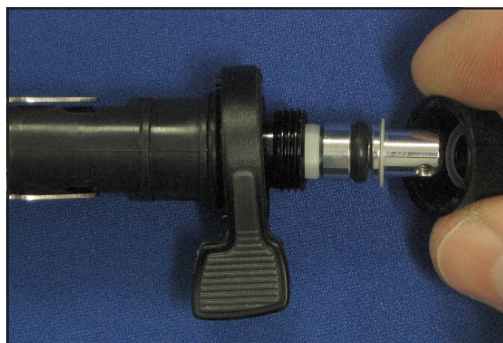


Fig. 37

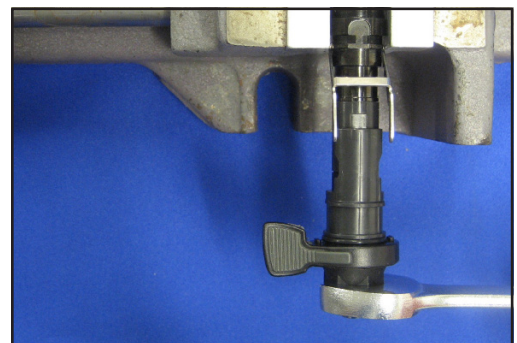


Fig. 38

21. Install the **ADJUSTMENT KNOB (38)** onto the **ADJUSTMENT SHAFT (34)**. (Fig. 39)
22. Insert the **CAP SCREW (37)** and tighten clockwise using a 3/32 inch hex driver. Torque to 3-4 in/ lbs (0.34-0.45 N-m). (Fig. 40)
23. Regardless if the regulator is assembled for right hand or left hand operation rotate the **FLOW DEFLECTOR (9)** so the Venturi opening is facing up in relation to the lever. (Fig. 41)
24. Position the **PREDIVE DEFLECTOR (14)** so the deflector sits between the **LEVER (5)** arms and **PREDIVE LEVER (50, 51, 52)** is facing the **EXHAUST VALVE COVER (20)** (Fig. 42).
25. Install the combined **INLET CHAMBER (2) / ADJUSTMENT TUBE (27, 31)** assembly into the **LX HOUSING ASSY (1)**. Make sure the **PREDIVE LEVER (50, 51, 52)** is facing the purge opening (facing downward when assembled into LX Housing Assy. (Fig. 43)

⚠ WARNING: DO NOT force the LEVER (5) through the LX HOUSING ASSEMBLY. It should slide easily through if you have depressed the VALVE (5) before attempting to install the valve body.

26. Push **INLET CHAMBER (2) / ADJUSTMENT TUBE (27, 31)** assembly into **LX HOUSING ASSY (1)** until **RETAINING CLIP (16)** groove is approximately 1/2 inch from the edge of the **LX HOUSING ASSY (1)**. With the open side of the **RETAINING CLIP (16)** facing the **INLET CHAMBER (2) / ADJUSTMENT TUBE (27, 31)** assembly, push **RETAINING CLIP (16)** firmly into the groove. (Fig. 44)

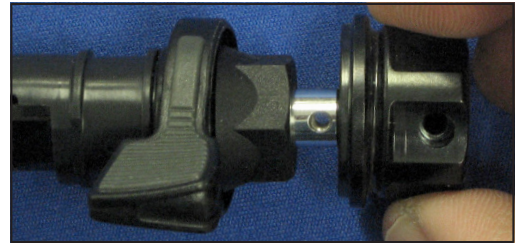


Fig. 39



Fig. 40

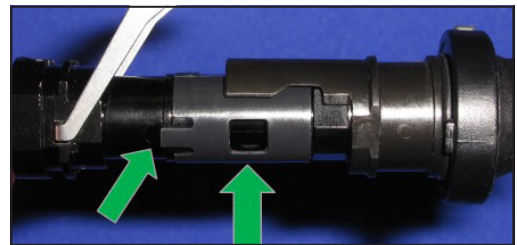


Fig. 41



Fig. 42

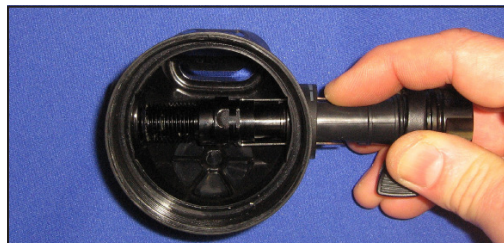


Fig. 43

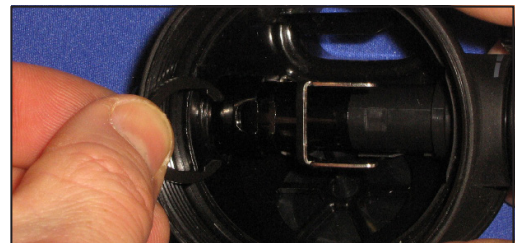


Fig. 44

27. Pull the **INLET CHAMBER (2) / ADJUSTMENT TUBE (27, 31)** assembly into **LX HOUSING ASSY (1)** until **RETAINING CLIP (16)** is fully seated in the **LX HOUSING ASSY (1)**. (Fig. 45)

⚠ WARNING: Failure to fully seat **INLET CHAMBER (2) / ADJUSTMENT TUBE (27, 31)** assembly into **LX HOUSING ASSY (1)** prior to continuing can damage the **LX HOUSING ASSY (1)**, **RETAINING CLIP (16)** and **INLET CHAMBER (2) / ADJUSTMENT TUBE (27, 31)** assembly, requiring replacement of damaged parts.

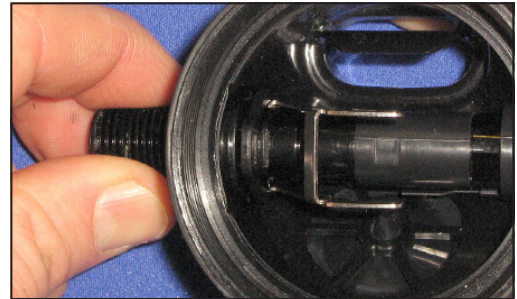


Fig. 45

28. Place the **O-RING (15)** onto the **INLET CHAMBER (2)**. (Fig. 46)
29. Thread the **NUT RETAINER (17)** onto the threaded **INLET CHAMBER (2)** end, and tighten the **NUT RETAINER (17, 49)** clockwise to 11-13 in/lbs (1.2-1.5 N-m) onto the **INLET CHAMBER (2)**. (Fig. 47)

✉ Note: The **NUT RETAINER (17)** will automatically seat the **O-RING (15)** into the proper position.

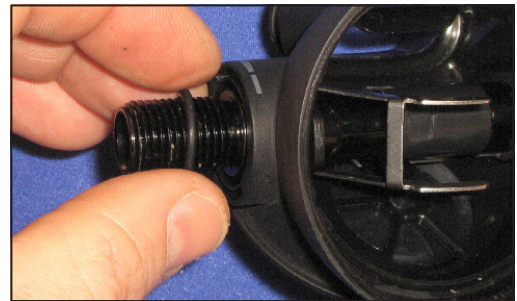


Fig. 46

30. Install the **DIAPHRAGM ASSY (22)** into the **LX HOUSING ASSY (1)** with the raised center facing up and the smooth strike plate facing the **LEVER (5)**. Examine the raised lip of the **DIAPHRAGM ASSY (22)** edge to insure it is fully seated into the groove at the base of the threads of the **LX HOUSING ASSY (1)**. (Fig. 48)

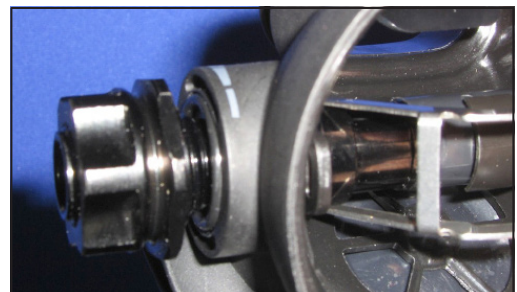


Fig. 47



Fig. 48

31. Place the **DIAPHRAGM WASHER (23)** over the **DIAPHRAGM ASSY (5)**. (Fig. 49)
32. Screw in the **DIAPHRAGM RETAINING RING (45, 46)** on top of the **DIAPHRAGM WASHER (23)**. (Fig. 50)
33. Place the **TOP COVER AND DISK ASSY (42, 43, 44)** onto the **LX HOUSING ASSY (1)**. It is designed to fit in only one orientation inside the **TOP COVER RING ASSY (47, 48)**. (Fig. 51)
34. Place the **TOP COVER RING ASSY (47, 48)** onto the **LX HOUSING ASSY (1)**. Match each tab on the **TOP COVER AND DISK ASSY (43, 44, 45)** with the same sized slot in the **TOP COVER RING ASSY (47, 48)**. Tighten the **TOP COVER RING ASSY (47, 48)** by threading it clockwise onto the **LX HOUSING ASSY (1)**, being careful not to cross thread or over tighten.



Fig. 49



Fig. 50



Fig. 51

FINAL ADJUSTMENT AND TESTING



NOTE: Adjustment and testing of the LX Series second stages are done with an inlet Intermediate Pressure of 144 psi (+/- 2 psi) [9.9 Bar (+/- 0.14 Bar)] and supply pressure of 3000 psi (207 Bar).

1. Connect the second stage LP Hose to a LP Port of a properly adjusted first stage; connect an LP QD Inflator Hose to another LP port. Install port plugs to seal all other ports of the first stage.
2. Connect the first stage to a SCUBA-rated air source supply of 3000 psi (207 BAR). Connect a calibrated Intermediate Pressure Gauge to the LP QD Inflator hose (make sure that there is an overpressure relief device connected to the IP Gauge to relieve pressure in excess of 175 psi). Slowly open the supply valve to pressurize the regulator, purging the second stage several times to cycle the first stage to stabilize the IP. Check the IP Gauge to insure that the intermediate pressure is 144 psi (+/- 2 psi) [9.9 Bar (+/- 0.14 Bar)].



NOTE: If the Intermediate Pressure is other than recommended, readjust the first stage IP to specification. If necessary, refer to the Trouble Shooting section of the first stage to determine possible cause and resolution.

3. Prior to adjusting the second stage, check the following items: the **TOP COVER AND DISK ASSY (42, 43, 44)** is on tight and secure; the **KNOB ADJUSTMENT (38)** is turned out fully counter clockwise; the **PREDIVE LEVER (50, 51, 52)** is set negative (switch up); **THE MOUTHPIECE (39, 40, 41)** has been removed.
4. Lever Height Adjustment: If available, attach an Inline Adjustment Tool between the second stage and the LP Hose to adjust the **LEVER (5)** height. Pressurize the regulator and listen to determine that no air flow is present; if none present, engage the slotted head of the **ORIFICE SEAT (4)** with the Inline Adjustment Tool and turn the **ORIFICE SEAT (4)** counterclockwise in small increments until a slight leak is present. Now turn the Inline Adjustment Tool clockwise until the leak just stops, then turn in an additional 1/12 turn more. Make sure to depress the **TOP COVER AND DISK ASSY (42, 43, 44)** while turning the **ORIFICE SEAT (4)** to prevent damaging the **POPPET SEAT (6)**. If a leak was present upon initial pressurization, turn the Inline Adjustment Tool clockwise in small increments until the leak just stops, then turn in an additional 1/12 turn more.
5. If no Inline Adjustment Tool is available, fully depressurize the regulator and remove the LP Hose from the second stage. Use a narrow flat blade screwdriver and adjust the **ORIFICE SEAT (4)** as outlined in step 4 above.



NOTE: Turning the **ORIFICE SEAT (4)** clockwise in further than necessary to stop airflow will result in excessive **LEVER (5)** slack and excessive **POPPET SPRING (13)** tension, preventing peak performance.



CAUTION: To avoid cutting the **POPPET SEAT (6)** with the knife edge of the Orifice Seat (4), always depress the **TOP COVER AND DISK ASSY (42, 43, 44)** while adjusting the **ORIFICE SEAT (4)**; failure to do so will result in damaging the **POPPET SEAT (6)**, requiring its replacement.

6. After attaining correct lever height, install the LP Hose by turning clockwise and torque to 50-60 in/lbs using a torque wrench and crows foot.
7. Pressurize the regulator again and listen for leaks or airflow; none should be present. If a leak is present, repeat steps 3 through 5.
8. Hold the second stage with the **TOP COVER AND DISK ASSY (42, 43, 44)** facing downwards; gently shake up and down, listening for any rattle sound indicating excessive lever slack. If a rattle sound is found, readjust the **ORIFICE SEAT (4)** as outlined in steps 4 and 5.
9. Inhalation Effort Test: Attach the correctly adjusted second stage to a Magnehelic® Gauge via the mouthpiece adapter; slowly inhale on the mouthpiece while watching the IP Gauge. The moment the needle of the IP Gauge moves left from 140 psi indicating the precise moment the first stage has opened, look at the Magnehelic Gauge and record the Inhalation Effort in Inches Water Column (IWC); this is also referred to as Cracking Effort. Inhalation Effort is not to exceed 1.4 IWC. If available, attach the correctly adjusted second stage to a flow meter that is connected to a Magnehelic® Gauge via the mouthpiece adapter. Initiate airflow through the flow meter with the needle valve while watching the IP Gauge. The moment the IP Gauge needle moves left from 140 psi indicating the precise moment the first stage has opened, look at the Magnehelic® Gauge and record the Inhalation Effort in IWC. Inhalation effort is not to exceed 1.4 IWC.



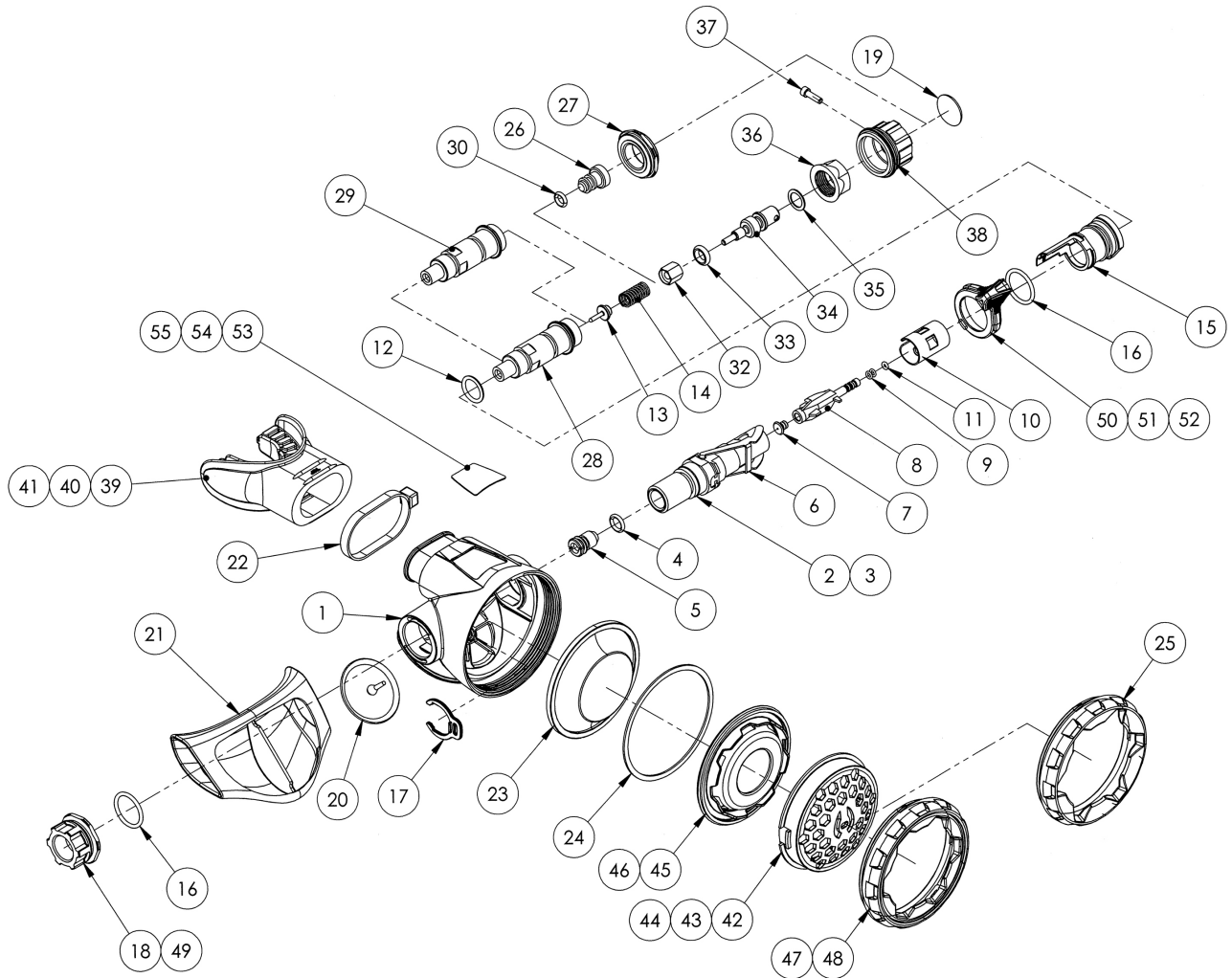
NOTE: If the inhalation effort is greater or less than specification, refer to the Troubleshooting section on page 5 to determine the possible cause and resolution.

10. Depressurize and remove the second stage from the Magnehelic® Gauge. Attach a clean **MOUTHPIECE (39, 40, 41)** to the mouthpiece tube and secure with a **TY-STRAP (21)**.

11. Install the protector cap on the first stage yoke retainer and tighten down with the yoke screw. If using a DIN model 1st stage for testing, make sure to seal the opening in the DIN Filter Retainer. Making sure that all other ports on the first stage are sealed closed, lightly inhale on the second stage to determine vacuum integrity; you should not be able to draw air through the second stage. If you can, refer to the Troubleshooting section on page 5 to determine the possible cause and resolution.
12. Check all fittings to insure none are loose and are correctly torqued before returning the regulator to the customer.



WARNING: DO NOT return any regulator to the customer if it has known defects without first explaining to the customer that diving a regulator with known defects can lead to their INJURY OR DEATH.



LX SERIES REGULATOR PARTS LIST

ITEM NO.	PART NUMBER	DESCRIPTION	LX200	LX200 OCTO	LX150	LX150 OCTO	LX150 GRN	LX100	LX100 OCTO	LX100 GRN
			7500.1.07 QTY.	7500.1.94 QTY.	7500.2.07 QTY.	7500.2.94 QTY.	7500.2.95 QTY.	7500.3.07 QTY.	7500.3.94 QTY.	7500.3.95 QTY.
1	9807-07	LX HOUSING ASSY	1	1	1	1	1	1	1	1
2	9552-8	INLET CHAMBER	1	1	-	-	-	-	-	-
3	9552	INLET CHAMBER	-	-	1	1	1	1	1	1
4	2-010	O-RING	1	1	1	1	1	1	1	1
5	6621	ORIFICE SEAT	1	1	1	1	1	1	1	1
6	5463	LEVER	1	1	1	1	1	1	1	1
7	5465	POPPET SEAT	1	1	1	1	1	1	1	1
8	5464	POPPET	1	1	1	1	1	1	1	1
9	5474	O-RING 091X.036	2	2	2	2	2	2	2	2
10	9558	FLOW DEFLECTOR	1	1	1	1	1	1	1	1
11	5473	O-RING 070 X 047	1	1	1	1	1	1	1	1
12	2-013	O-RING	1	1	1	1	1	1	1	1
13	5468	BALANCE SHAFT	1	1	1	1	1	1	1	1
14	7822	POPPET SPRING	1	1	1	1	1	1	1	1
15	9556	PREDIVE DEFLECTOR	1	1	1	1	1	1	1	1
16	2-016	O-RING	2	2	2	2	2	2	2	2
17	9559	RETAINING CLIP	1	1	1	1	1	1	1	1
18	9554-2	NUT RETAINER	-	-	1	1	1	1	1	1
19	9803	DECAL KNOB ADJUSTMENT	1	1	1	1	1	1	1	1
20	6326	EXHAUST VALVE	1	1	1	1	1	1	1	1
21	7050	EXHAUST COVER	1	1	1	1	1	1	1	1
22	1978-07	TY-STRAP	1	1	1	1	1	1	1	1
23	5236	DIAPHRAGM ASSY	1	1	1	1	1	1	1	1
24	7045	DIAPHRAGM WASHER	1	1	1	1	1	1	1	1
25	7514-07	TOP COVER RING	-	-	-	-	-	1	1	1
26	9632	ADJUSTMENT SCREW	-	-	1	1	1	1	1	1
27	9633	CAP 221	-	-	1	1	1	1	1	1
28	9553-8	ADJUSTMENT TUBE	1	1	-	-	-	-	-	-
29	9631	ADJUSTMENT TUBE	-	-	1	1	1	1	1	1
30	2-008	O-RING	-	-	1	1	1	1	1	1
31	6946	BAR CODE LABEL	1	1	1	1	1	1	1	1
32	5475	SPRING FOLLOWER	1	1	-	-	-	-	-	-
33	2-107	O RING	1	1	-	-	-	-	-	-
34	9555	ADJUSTMENT SHAFT	1	1	-	-	-	-	-	-
35	5054	WASHER	1	1	-	-	-	-	-	-
36	7515	PACKING NUT	1	1	-	-	-	-	-	-
37	4787-2	CAP SCREW 4-40 X .375	1	1	-	-	-	-	-	-
38	7507-8	KNOB ADJUSTMENT	1	1	-	-	-	-	-	-
39	7031-04	MOUTHPIECE	1	-	1	-	-	1	-	-
40	7031-18	MOUTHPIECE	-	1	-	1	-	-	1	-
41	7031-19	MOUTHPIECE	-	-	-	-	1	-	-	1
42	7506-07-2	TOP COVER AND DISK ASSEMBLY	1	-	1	-	-	1	-	-
43	7506-94-8	TOP COVER AND DISK ASSEMBLY	-	1	-	1	-	-	1	-
44	7506-95-8	TOP COVER AND DISK ASSEMBLY	-	-	-	-	1	-	-	1
45	7509-07	DIAPHRAGM RETAINING RING	-	1	-	1	1	-	1	1
46	7509-04	DIAPHRAGM RETAINING RING	1	-	1	-	-	1	-	-
47	9661-07-8	TOP COVER RING ASSY	1	1	-	-	-	-	-	-
48	9661-07-2	TOP COVER RING ASSY	-	-	1	1	1	-	-	-
49	9554-8	NUT RETAINER	1	1	-	-	-	-	-	-
50	9557-29	PREDIVE LEVER	1	-	1	-	-	1	-	-
51	9557-94	PREDIVE LEVER	-	1	-	1	-	-	1	-
52	9557-95	PREDIVE LEVER	-	-	-	-	1	-	-	1
53	9663-200	LABEL REGULATOR	1	1	-	-	-	-	-	-
54	9663-150	LABEL REGULATOR	-	-	1	1	1	-	-	-
55	9663-100	LABEL REGULATOR	-	-	-	-	-	1	1	1