

TROUBLE SHOOTING		
SYMPTOM	POSSIBLE CAUSE	TREATMENT
* Restricted airflow and inhalation resistance through complete system.	<ol style="list-style-type: none"> 1. Cylinder valve not completely opened. 2. Cylinder valve requires service. 3. Cone filter(5) is contaminated. 	<ol style="list-style-type: none"> 1. Open valve completely. 2. Connect regulator to a different cylinder. 3. Replace with new and perform a complete service.
* Air leakage detected from Inlet openings of first stage.	<ol style="list-style-type: none"> 1. Piston head o-ring(33) is damaged or worn. 2. Piston shaft o-ring(29) is damaged or worn. 	<ol style="list-style-type: none"> 1. Replace with new. 2. Replace with new.
* Air leakage detected from between LP swivel and piston cap.	<ol style="list-style-type: none"> 1. Swivel o-ring(38) is damaged or worn. 	<ol style="list-style-type: none"> 1. Disassemble and replace retainer, o-ring, and washers with new.
* Air leakage detected from HP end plug of main body.	<ol style="list-style-type: none"> 1. HP seat o-ring(27) is damaged or worn. 2. End plug o-ring(25) is damaged or worn. 3. End plug loose. 	<ol style="list-style-type: none"> 1. Replace with new. 2. Replace with new. 3. Tighten end plug into main body.
* Insufficient intermediate pressure.	<ol style="list-style-type: none"> 1. End plug loose. 2. Piston cap loose. 3. Spring is weakened. 	<ol style="list-style-type: none"> 1. Tighten end plug into main body. 2. Tighten piston cap onto main body. 3. Replace with new valve spring.
* Excessive intermediate pressure.	<ol style="list-style-type: none"> 1. Contamination under spring isolator. 2. HP seat damaged or worn. 3. Knife-edge of piston shaft damaged. 4. Piston o-rings(33&29) are damaged or worn. 5. Internal damage to seating surface inside body. 	<ol style="list-style-type: none"> 1. Clean seating surface and replace isolator with new. 2. Replace with new. 3. Replace piston, HP-seat, and piston o-rings. 4. Replace with new. 5. Replace main body.
* Honking or squealing accompanies inhalation mode. (Harmonic Imbalance)	<ol style="list-style-type: none"> 1. Piston head o-ring(33) is incorrect size or durometer. 2. Spring is incorrectly seated. 3. Excessive silicone present on spring, piston o-rings, or spring isolators. 4. Faulty spring. 	<ol style="list-style-type: none"> 1. Replace with new factory supplied o-ring of 90 durometer. 2. Reverse spring. 3. Remove excessive silicone with clean cloth. 4. Replace with new. <p><i>NOTE: If regulator has sustained any amount of use with this condition, automatically replace spring with new.</i></p>

BALANCED FLOW-THROUGH PISTON FIRST STAGE

INITIAL INSPECTION PROCEDURE

1. While the customer is still present, gather the following information:
 - A. Original date of purchase. (Ask to see service record or original invoice.)
 - B. Date of last service, if over one year old. (Ask to see record of this service, to learn which parts were replaced and what previous problems were experienced.)
 - C. Is the regulator to receive annual service or specific repair?
 - D. What problems are being reported, if any. Probe to determine level of customer satisfaction with the product, and attempt to resolve any dissatisfaction by offering to instruct the customer how to better use and maintain the product. (Refer to the Recommended Maintenance Procedures outlined in this manual.)
 - E. How frequently has the regulator been used since the last service?
 - F. What types of diving conditions has it been exposed to? Ask the customer to describe the environments the regulator has been used in.
 - G. What level of maintenance the regulator has received. Ask the customer to demonstrate or describe their method of rinsing and storing the regulator, and describe how often they rinse it, both during and after a dive trip.
2. Determine whether the warranty is still active, based on Oceanic USA's warranty requirements.
 - A. The original warranty card must be filled out and mailed to Oceanic headquarters within 30 days of the original date of purchase.
 - B. A receipt or similar sales record must be provided to show the original date of purchase.

△ **NOTE:** *Oceanic's Limited Lifetime Warranty extends only to regulators purchased after May 1986 and before February 1993.*

 - C. The regulator must be serviced on an annual basis by an Authorized Oceanic service facility. If more than a year old, a receipt or similar document must be provided to verify that the regulator has been serviced annually.
 - D. Any signs of abuse, neglect, or unauthorized repair void the warranty for the repair or replacement of any damaged parts or components.
 - E. The warranty is extended only to the original purchaser of the product, and is not transferable. The customer must therefore be able to provide documentation showing that they are the original owner.
3. Provided that the above requirements are met and the warranty is still active, the customer may be entitled to the benefits of the Parts

BALANCED FLOW-THROUGH PISTON FIRST STAGE

Replacement Program, on the following conditions:

- A. The date of original purchase shown on the customer's sales receipt must be after January of 1989. (The Parts Replacement Program did not exist prior to 1989, and is not extended retroactively.)
- B. If the regulator was purchased prior to February, 1993, an official Oceanic Annual Service Record must be provided, showing that the regulator has received service on an annual basis by an Authorized Oceanic service facility, with a lapse of no more than 30 days.
- C. If the regulator was purchased after February, 1993, the Parts Replacement Program is valid for only two years (two servicings) after the original purchase date unless an official Oceanic Lifetime. An Annual Service Record has not been provided to the customer and is therefore not required, but their original warranty identification card and original receipt must be provided.
- D. The Parts Replacement Program provides free parts only once a year for each regulator covered under the program.
- E. The Parts Replacement Program does not extend to Alpha I or Alpha II regulators.
- F. The Parts Replacement Program does not extend to regulators purchased for rental use.

EXTERNAL INSPECTION

1. Visually inspect the cone filter for any visible residue present.
2. Remove the hose protectors, if present, to visually inspect the condition of the hoses along their length, as well as at their fittings.
3. Closely examine the chrome finish of the first stage to check for any flaking or chipping.

△ **NOTE: DO NOT clean any parts found to be chipping or flaking chrome in an ultrasonic cleaner.**

4. Closely examine all parts of the first stage for any other signs of external corrosion.

INTERMEDIATE PRESSURE TEST

1. Connect the first stage to a pure air source of 3,000 PSI, and connect a recently calibrated intermediate pressure test gauge to either the LP inflator hose, or a standard LP hose via an extra LP port.
2. Pressurize slowly, with the gauge held facing away from you until fully pressurized. Make a mental note of the intermediate pressure, and purge the second stage to ensure that the needle instantly returns to original pressure reading without "creeping" or fluctuating back and forth.
3. Allow to stabilize again, and make a note of the intermediate pressure. Correct intermediate pressure for the Balanced Flow-Through Piston first stage is **140PSI**, plus or minus **5PSI**, with a supply pressure of 3,000PSI. Remove the intermediate pressure gauge from the regulator.

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IMMERSION TEST

1. Connect the first stage to a pure air source of 3,000PSI. Open the cylinder valve to pressurize.
2. Immerse the first stage in fresh water to note any signs of air leakage from the following areas:
 - A. Swivel area, between swivel cap and piston cap. (See Fig. 1A.)
 - B. Beneath the saddle, from the main body.
 - C. Ambient pressure inlet ports of the main body.
 - D. End plug of main body.

HOSE IMMERSION TEST

1. While still pressurized, immerse all hoses in fresh water to check for any signs of leakage from along length or at fittings on both ends.

Refer to the troubleshooting chart to evaluate any of the above conditions that exist.

Before proceeding further, read ahead to determine that the service facility is equipped with the proper tools and parts needed to complete the service as specified by this manual.

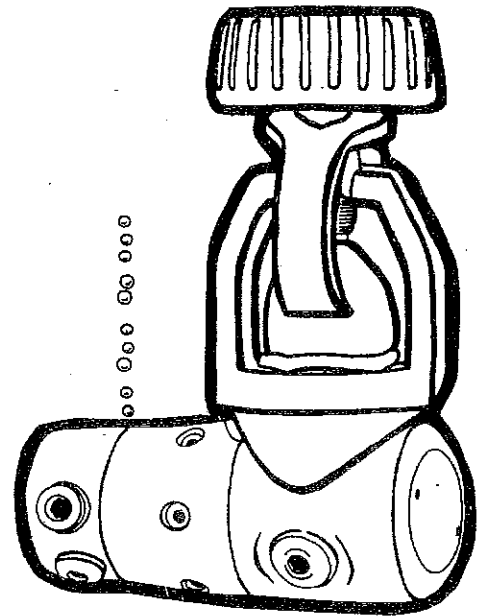


Fig. 1A

REGULATOR DISASSEMBLY - GENERAL

1. Refer to the replacement schedule given in the exploded drawing and parts listing before reusing or throwing away any parts. "Discard" is a term which designates parts that should not be reused, but not necessarily thrown away. To maintain higher credibility and trust with the customer, save all parts that were replaced to show the customer prior to disposing of them.
2. Inspection of reusable o-rings, diaphragms, and other parts that are not automatically discarded, should be performed after disassembly is completed to help avoid any confusion. Lay these parts out in the order in which they are removed, and compare with identical new parts to better discern their condition before reassembling the regulator. Inspect o-rings with the use of a magnifier to ensure they are supple, well rounded, and completely free of any scoring or corrosion that would impair proper sealing.
3. All o-rings are classified as being either dynamic or static. *Dynamic* o-rings are those which sustain friction and movement, as they are either mounted directly onto a moving part, or create a seal against a moving part. *Static* o-rings simply create a seal between two non-moving parts, and are therefore less subject to wear than *dynamic* o-rings. After passing close inspection, *static* o-rings may sometimes be reused, although this is not necessarily recommended.

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Dynamic o-rings are to be automatically discarded and replaced with every service, regardless of age or appearance.

4. Be certain to perform the initial inspection and troubleshooting procedures prior to beginning any disassembly. Doing so will provide clues to which internal parts may be worn, and therefore allow you to better advise the customer with an accurate estimate of the service that is needed.
5. Review the complete Dealer Service & Repair Guide prior to beginning any procedure, to ensure that the service facility is well equipped with all the tools and parts needed to perform a complete service from start to finish. DO NOT attempt to perform the service if not equipped with the proper tools.
6. Perform the outlined steps in the order given, without exception. The reassembly procedure has been outlined with the assumption that the service technician first followed the outlined disassembly procedure, in the order given for each step.

DISASSEMBLY PROCEDURE BALANCED FLOW-THROUGH PISTON FIRST STAGE WITH STANDARD YOKE CONNECTOR

NOTE: Be sure to check and record the intermediate pressure and perform the immersion test 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. Before disassembling the first stage, remove the low pressure second stage hoses with a 9/16" open end wrench, the high pressure hose(s) with a 5/8" open end wrench, and the low pressure inflator hose with either a 9/16" or 1/2" open end wrench. Remove all remaining port plugs with a 5/32" hex key.
2. Remove and inspect the o-rings now visible on all these items for any signs of decay. Discard if found.
3. Place the first stage on the repair bench, situated with the yoke screw(1) facing farthest away, vertically. Holding the yoke(3) firmly in place, use a genuine Oceanic Body Spanner to slightly loosen the piston cap(36) from the main body(28) in a counter clockwise direction by exerting opposing downward pressures (See fig. 2A.). DO NOT loosen beyond 1/4 turn.

NOTE: Be certain the spanner wrench is well seated in one of the inlet openings of the piston cap. Damage to the chrome finish will result if the wrench is allowed to slip.

4. Remove the yoke screw from the yoke, and remove the dust cap(2) from the yoke screw.
5. Secure the first stage body in a soft-jawed or well padded vise and apply a thin-wall, or modified, 1" box wrench to the yoke retainer(7). Using firm steady force, turn the yoke retainer counter-clockwise to remove. DO NOT use impact to loosen.

NOTE: It is important that the wrench is properly seated over the entire hex portion of the yoke retainer to prevent any damage to the part. (See fig. 3A.)

CAUTION: Tighten the vise only as snug as is needed to hold the first stage secure, and DO NOT overtighten. Doing so will result in permanent damage, rendering it inoperable.

6. After removing the yoke retainer, remove the yoke and saddle(19) and set these aside. Remove the saddle o-ring(18) from the yoke retainer and inspect for any signs of decay. Discard if found. Remove and discard the main seal o-ring(8), and DO NOT attempt to reuse.

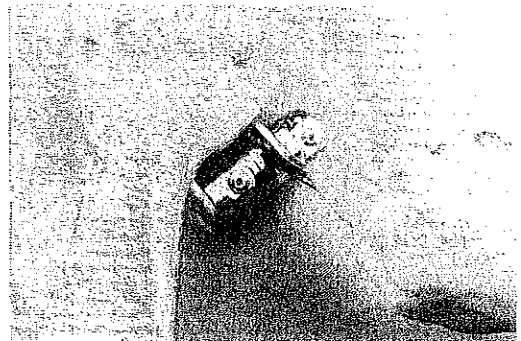


Fig. 2A

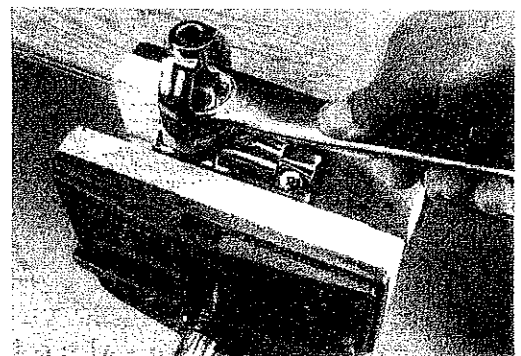


Fig. 3A

REGULATORS

BALANCED FLOW-THROUGH PISTON FIRST STAGE

7. Inspect the saddle, checking for any signs of stress cracks or other distortions. Discard if found.
 8. Using internal circlip pliers, remove the circlip(4) that retains the cone filter(5). The cone filter is now accessible, and should drop out freely in your hand. Discard, and DO NOT attempt to reuse. The filter o-ring(6) is now accessible. Remove and inspect for any signs of decay. Discard if found.
 9. Use a dental instrument to remove any Loctite residue found in threads of yoke retainer and main body. It is important to do this prior to cleaning.
 10. Rotate the main body and the piston cap in opposite directions to separate, with the main body facing up vertically. Lift the main body straight up and off the shaft of the piston(32) to avoid any angular pressure that might damage the delicate edge of the piston shaft. (See fig. 4A.) Set the piston cap aside, standing on the swivel, with the piston shaft exposed and facing up.
 11. Look for the colored spring isolator(30) found either inside the cavity of the main body, or on the end of the valve spring(31). Remove and inspect for signs of wear or distortion, and discard if found.
 12. Insert the prongs of a genuine Oceanic face spanner wrench into the two outer recessed holes of the valve seat end plug(24), found on the end of the main body. Use downward pressure to hold the tool seated securely, and rotate the end plug in a counterclockwise direction to remove. Remove and discard the valve seat o-ring(27). Remove and inspect the end plug o-ring(25) for any signs of decay. Discard if found.
 13. Remove the valve seat(26) from the end plug by directing short blasts of low pressure air through the small opening found directly in the center of the end plug(See fig. 5A.). First, wrap a cloth over the seat to prevent it from ejecting suddenly and becoming lost. Discard and DO NOT attempt to reuse.
- ⚠ **NOTE:** DO NOT attempt to insert a dental pick or other sharp instrument through the opening in the end plug. Doing so may cause damage that will require replacement of the part. Use only pneumatic pressure to push the seat out.
14. Viewing the main body through the internal cavity, you will find the recessed o-ring(29) through which the piston shaft moves. (See fig. 6A.)
- ⚠ **CAUTION:** This o-ring is very critical, and extreme care must be taken not to damage the seating surface inside the body when removing or installing. Carefully remove, using a brass or plastic dental instrument, and discard. DO NOT attempt to reuse.

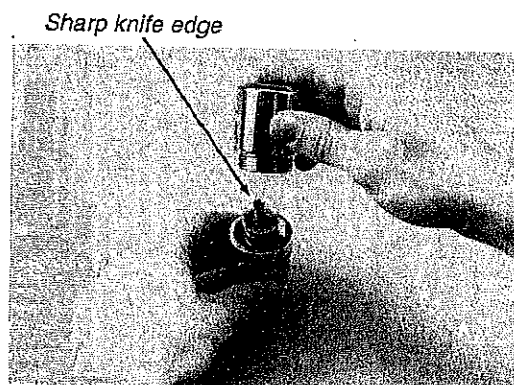


Fig. 4A

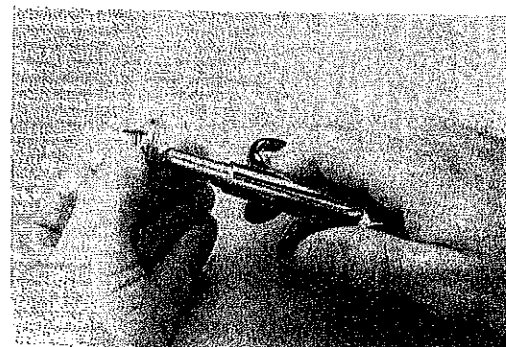


Fig. 5A

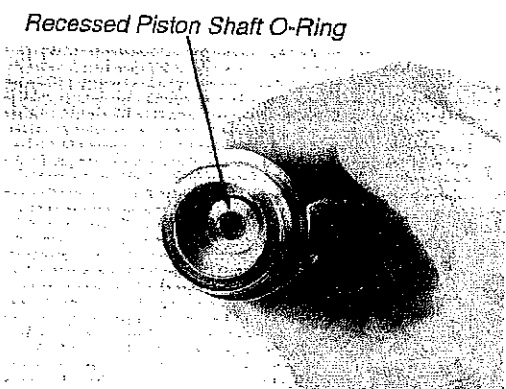


Fig. 6A

REGULATORS

BALANCED FLOW-THROUGH PISTON FIRST STAGE

15. Remove the spring from the piston, lifting it directly off to avoid damaging the edge of the piston shaft. Closely examine the spring with the use of a magnifier, checking for any signs of corrosion. Discard if found.

⚠ CAUTION: *If the initial intermediate pressure was lower than 135PSI, indicating that the valve spring has weakened, replace the spring and DO NOT attempt to reuse.*

16. Carefully lift out the piston from the cap by grasping the piston shaft between thumb and forefinger and pulling it straight up with slow, steady force. Closely examine the knife-edge of the piston shaft end with the use of a magnifier, checking for any signs of damage or wear. If found, replace with new and DO NOT attempt to reuse.

17. Remove the second colored spring isolator from the base of the piston, and inspect for signs of wear or distortion. Discard if found.

18. Remove the piston head o-ring(33) and discard.

19. Inspect the swivel assembly by turning it on the piston cap to ensure a smooth movement.

⚠ NOTE: *If a smooth movement is found, further disassembly is unnecessary and not recommended unless leakage was detected between the swivel and the piston cap during the immersion test or reported by the customer. If leakage was detected or reported, you are encouraged to send the complete assembly to Oceanic's Parts and Service Center for service.*

⚠ CAUTION: *If service is required for swivel assembly, DO NOT attempt to perform the following procedure unless you are properly equipped with a padded vise and an inch-pounds torque wrench. Adhere closely to the following instructions:*

- 19a. Secure the swivel in a padded vise, with the open end of the piston cap facing up. (See fig. 7A.) Examine the swivel retainer(34) to determine whether it requires the use of a 3/16" hex-drive socket or an 11/16" nut-drive socket. Install the appropriate tool onto a socket wrench.
- 19b. Apply firm steady force in a counter clockwise direction to loosen the swivel retainer with the appropriate socket. DO NOT use impact to loosen.
- 19c. Remove and discard the swivel retainer, o-ring(38), swivel washer(37), and retainer washer(35), and replace with new. DO NOT attempt to reuse.
- 19d. Use a dental instrument to remove any Loctite residue found inside threads of the swivel. It is important to do this prior to cleaning.

This concludes the disassembly of the Balanced Flow-Through Piston first stage with standard yoke connector. Proceed directly to the section titled: Cleaning & Lubrication.

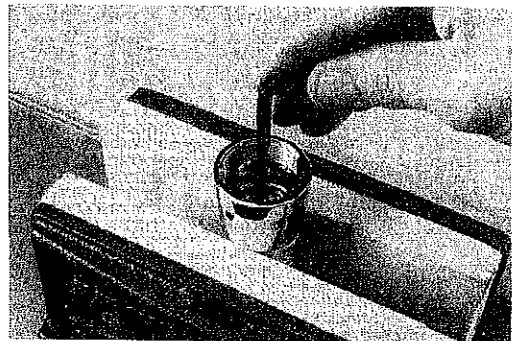


Fig. 7A

DISASSEMBLY PROCEDURE BALANCED FLOW-THROUGH PISTON FIRST STAGE WITH DIN CONNECTOR

△ **NOTE:** Be sure to check and record the intermediate pressure and perform the immersion test 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. Before disassembling the first stage, remove the low pressure second stage hoses from the swivel(39) with a 9/16" open end wrench, the high pressure hose(s) with a 5/8" open end wrench, and the low pressure inflator hose with either a 9/16" or 1/2" open end wrench. Remove all remaining port plugs with a 5/32" hex key.
2. Remove and inspect the o-rings now visible on all these items for any signs of decay. Discard if found.
3. Place the first stage on the repair bench, situated with the DIN connector facing farthest away, vertically. Holding the connector firmly in place, use a genuine Oceanic Body Spanner to loosen the piston cap(36) from the main body(28) in a counter clockwise direction by exerting opposing downward pressures. DO NOT loosen beyond 1/2 turn. (See fig. 8A.)

△ **NOTE:** Be certain the spanner wrench is well seated in one of the inlet openings of the piston cap. Damage to the chrome finish will result if the wrench is allowed to slip.

4. Secure the first stage in a soft-jawed or well padded vise, with the DIN connector facing up. Apply a 1/4" hex key to the filter retainer(11) and loosen in a counter clockwise direction to remove by lifting straight out. Remove and inspect o-rings(10 & 12) for any signs of decay. Discard if found.

△ **CAUTION:** Tighten the vise only as snug as is needed to hold the first stage secure, and DO NOT overtighten. Doing so will result in permanent damage, rendering it inoperable.

5. The coupler wheel(14) may now be lifted straight off the filter housing(16) and set aside. Apply a 1" open-end wrench to the flange at the base of the filter housing. Using firm, steady force, loosen in a counter clockwise direction to remove. DO NOT use impact to loosen. (See fig. 9A.)

△ **NOTE:** It is important that the wrench is deep enough to seat entirely over the flange to avoid any damage to the seating surface.

6. After removing the filter housing from the main body, turn it over and tap lightly to drop out the cone filter(13). Discard the cone filter, and DO NOT attempt to reuse. Remove and inspect the cone filter o-ring(15) and saddle o-ring(18) for any signs of decay. Discard if

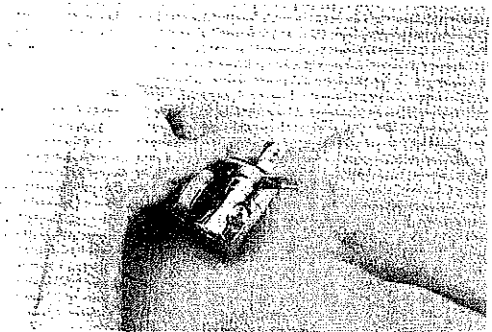


Fig. 8A

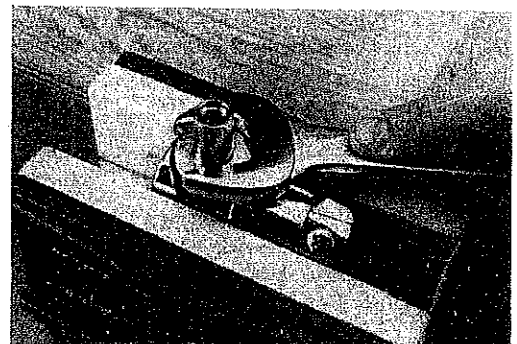


Fig. 9A

BALANCED FLOW-THROUGH PISTON FIRST STAGE

found. Remove and discard the main seal o-ring(17) and DO NOT attempt to reuse.

7. Inspect the saddle(19), checking for any signs of stress cracks or other distortions. Discard if found.
8. Use a dental instrument to remove any thread adhesive residue found in the threads of the filter housing and main body. It is important to do this prior to cleaning.

9. Rotate the main body and the piston cap in opposite directions to separate, with the main body facing up vertically. Lift the main body straight up and off the shaft of the piston(32) to avoid any angular pressure that might damage the delicate edge of the piston shaft(32). (See fig. 10A.) Set the piston cap aside, standing on the swivel, with the piston shaft exposed and facing up.

10. Look for the colored spring isolator(30) found either inside the cavity of the main body, or on the end of the valve spring(31). Remove and inspect for signs of wear or distortion, and discard if found.

11. Insert the prongs of a genuine Oceanic face spanner wrench into the two outer recessed holes of the valve seat end plug(24), found on the end of the main body. Use downward pressure to hold the tool seated securely, and rotate the end plug in a counterclockwise direction to remove. Remove and discard the valve seat o-ring(27). Remove and inspect the end plug o-ring(25) for any signs of decay. Discard if found.

12. Remove the valve seat(26) from the end plug by directing short blasts of low pressure air through the small opening found directly in the center of the end plug. (See fig. 11A.) First, wrap a cloth over the seat to prevent it from ejecting suddenly and becoming lost. Discard and DO NOT attempt to reuse.

NOTE: DO NOT attempt to insert a dental pick or other sharp instrument through the opening in the end plug. Doing so may cause damage that will require replacement of the part. Use only pneumatic pressure to push the seat out.

13. Viewing the main body through the internal cavity, you will find the recessed o-ring(29) through which the piston shaft moves. (See fig. 12A.)

CAUTION: This o-ring is very critical, and extreme care must be taken not to damage the seating surface inside the body when removing or installing. Carefully remove, using a brass or plastic dental instrument, and discard. DO NOT attempt to reuse.

14. Remove the spring from the piston, lifting it directly off to avoid damaging the edge of the piston shaft. Closely examine the spring with the use of a magnifier, checking for any signs of corrosion. Discard if found.

Sharp knife edge

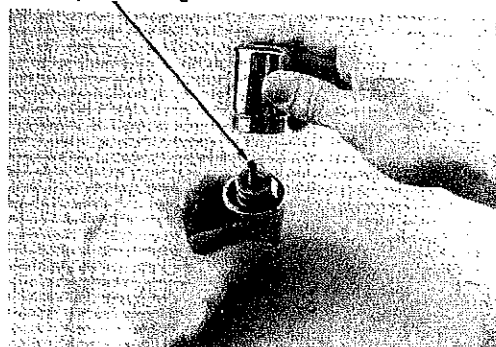


Fig. 10A

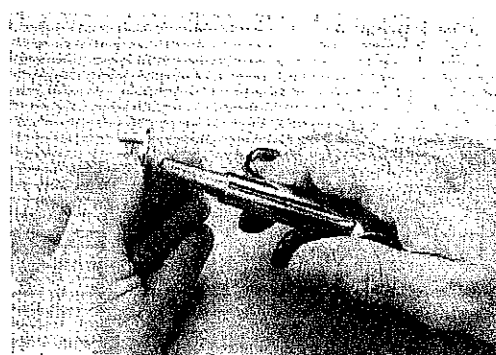


Fig. 11A

Recessed Piston Shaft O-Ring

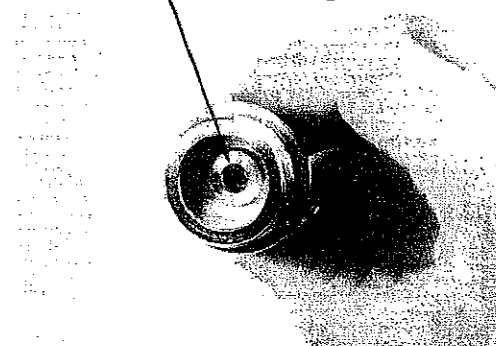


Fig. 12A

REGULATORS

BALANCED FLOW-THROUGH PISTON FIRST STAGE

⚠ CAUTION: If the initial intermediate pressure was lower than 135PSI, indicating that the valve spring has weakened, replace the spring and DO NOT attempt to reuse.

15. Carefully lift out the piston from the cap by grasping the piston shaft between thumb and forefinger and pulling it straight up with slow, steady force. Closely examine the knife-edge of the piston shaft end with the use of a magnifier, checking for any signs of damage or wear. If found, replace with new and DO NOT attempt to reuse.
16. Remove the second colored spring isolator from the base of the piston, and inspect for signs of wear or distortion. Discard if found.
17. Remove the piston head o-ring(33) and discard.

18. Inspect the swivel assembly by turning it on the piston cap to ensure a smooth movement.

⚠ NOTE: If a smooth movement is found, further disassembly is unnecessary and not recommended unless leakage was detected between the swivel and the piston cap during the immersion test or reported by the customer. If leakage was detected or reported, you are encouraged to send the complete assembly to Oceanic's Parts and Service Center for service.

⚠ CAUTION: If service is required for the swivel assembly, DO NOT attempt to perform the following procedure unless equipped with a padded vise and an inch-pounds torque wrench. Adhere closely to the following instructions:

- 18a. Secure the swivel in a padded vise, with the open end of the piston cap facing up. (See fig. 13A.) Examine the swivel retainer(34) to determine whether it requires the use of a 3/16" hex-drive socket or an 11/16" nut-drive socket. Install the appropriate tool onto a socket wrench.
- 18b. Apply firm steady force in a counter clockwise direction to loosen the swivel retainer with the appropriate socket. DO NOT use impact to loosen.
- 18c. Remove and discard the swivel retainer, o-ring(38), swivel washer(37), and retainer washer(35), and replace with new. DO NOT attempt to reuse.
- 18d. Use a dental instrument to remove any Loctite residue found inside threads of the swivel. It is important to do this prior to cleaning.

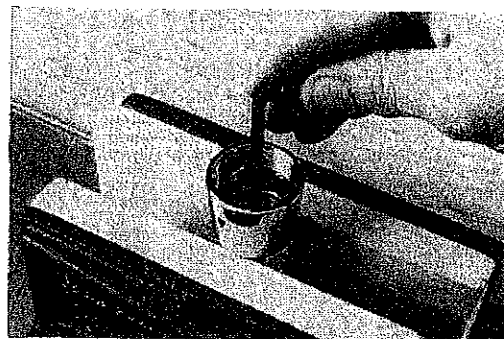


Fig. 13A

This concludes the disassembly of the Balanced Flow-Through Piston first stage with DIN connector. Proceed to the next section, titled: Cleaning & Lubrication.

CLEANING & LUBRICATION - GENERAL

- A. Cleaning of reusable metal parts is a three-step process which involves:

1. Acid Bath - Oceanic exclusively recommends VFC-23 regulator cleaner for cleaning all reusable metal parts, especially when bathing whole assemblies. VFC-23 is a specially formulated cleaner that does not harm rubber or teflon parts, yet effectively removes grease, corrosion, and grime from metal parts, leaving only a brilliant shine. For best results, soak parts in an ultrasonic cleaner for 5 to 7 minutes, unless the chrome finish is chipped or flaking. In this case, clean the chrome plated parts separately, avoiding severe agitation. Be certain to protect more delicate parts, such as orifice cones and piston shafts, when combining with other parts.

△ **NOTE:** *Ultrasonic cleaning times in excess of 10 minutes may damage the chrome finish of certain parts.*

△ **CAUTION:** *Harsh acids, such as muriatic acid, should be strictly avoided. White vinegar is one suitable substitute for VFC-23.*

2. Neutralizing Bath - Mix one part sodium bicarbonate to ten parts water. Remove parts from the acid bath and place directly into this rinse for 1-2 minutes.
3. Fresh Water Rinse - Use only distilled water, to prevent any mineral residue. Remove parts from the neutralizing bath and place directly into this rinse. Agitate lightly, and allow to soak for at least 30 minutes. Afterwards, remove and blow dry using a low pressure air source, and closely inspect to ensure proper cleaning and like-new condition.

- B. Reusable soft parts, such as yoke saddles and dust caps, may be soaked and cleaned in a solution of warm water mixed with mild dish soap. Use only a soft nylon toothbrush to scrub away any deposits. Thoroughly blow dry, using a low pressure air source.

△ **CAUTION:** *DO NOT use a steel wire brush.*

△ **NOTE:** *If salt or grit is found on any o-rings, discard and replace with new. DO NOT attempt to clean and reuse.*

CLEANING TIPS:

1. Remove any existing thread adhesive residue from the threads of the yoke retainer and main body prior to cleaning, using a brass or plastic dental instrument. The same applies to the swivel assembly.
2. The yoke screw threads may be dipped into the acid bath, holding the plastic portion out of the cleaner.
3. Be certain to isolate the piston to avoid contact with other metal parts which may damage the knife-edge seating surface on the end of the piston shaft.
4. If salt and corrosion buildup is severe, it is permissible to soak only the hose fittings in VFC-23 cleaner as needed, not allowing any solution to enter the hose. Rinse in fresh water and allow to dry with the cleaned ends hanging down. Blow filtered air through them prior to installing onto the regulator.

LUBRICATION AND DRESSING

O-rings are to be lubricated using silicone grease only. Dress the o-rings with a very light film of grease, and remove any visible excess by running the o-ring between thumb and forefinger. Avoid applying excessive amounts of silicone grease, as this will attract dirt that may cause damage to the o-ring.

⚠ CAUTION: *Aerosol spray silicone is to be strictly avoided. DO NOT attempt to use as a substitute for silicone grease.*

Hoses and other black rubber parts may be dressed and preserved using a clean cloth impregnated with a pump silicone milk.

⚠ CAUTION: *DO NOT apply any form of silicone to silicone rubber parts, as this will cause deterioration of these parts.*

REASSEMBLY PROCEDURE BALANCED FLOW-THROUGH PISTON FIRST STAGE WITH STANDARD YOKE CONNECTOR

NOTE: Prior to reassembly, it is necessary to inspect all parts, both new and those that are being reused. Check to ensure that o-rings are clean and supple, and that every part and component has been thoroughly cleaned.

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

1. Lubricate and install the piston shaft o-ring(29) into the main body(28), using a 3/16" wooden dowel and a smoothly polished blunt dental probe from opposite ends to guide it into place. (See fig. 1B.)

2. Lubricate and install the piston head o-ring(33) onto the head of the piston(32).

NOTE: Ensure that this o-ring is a genuine Oceanic part.

3. Apply a very light film of silicone grease to both sides of both spring isolators(30). Install one over the piston shaft onto the head of the piston, and the other into the main cavity of the main body.

NOTE: These isolators are color coded for thickness. When replacing, replace with same color to avoid changing the intermediate pressure, unless you are replacing the valve spring(31). In this case, it will be necessary to experiment, changing in and out of various colors to arrive at the correct combination of only two spring isolators that will deliver an intermediate pressure of 140psi, plus or minus 5psi. DO NOT attempt to "stack" these or use only one.

4. Apply a very light film of silicone grease to both ends of the spring and place onto the piston, over the piston shaft. Use caution to avoid damaging the delicate knife edge of the piston shaft as this is done.

5. Set the piston on its head with the shaft facing straight up, and fit a genuine Oceanic piston installation bullet onto the piston shaft.

CAUTION: Failure to use this bullet while performing the next step may result in damage to the piston shaft o-ring, main body, or the knife edge of the piston shaft.

6. Carefully lower the main body(28) onto the piston shaft until the bullet and shaft have passed through the piston shaft o-ring. The main body should now be resting on the spring, mated flush with the end. (See fig. 2B.)

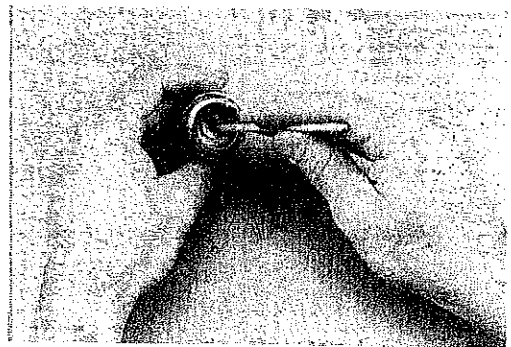


Fig. 1B

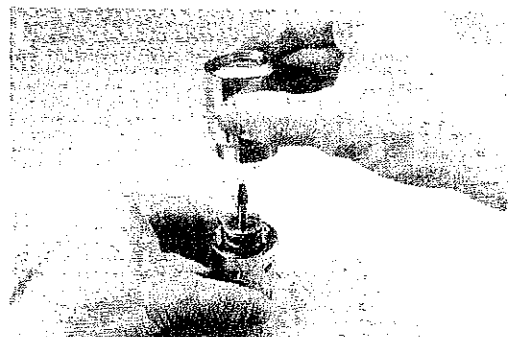


Fig. 2B

REGULATORS

BALANCED FLOW-THROUGH PISTON FIRST STAGE

7. Grasp the piston and body together to prevent the piston from sliding back out, and turn over to allow the installation bullet to drop out. (See fig. 3B.) Set the body on end, with the piston head facing straight up.

8.

△ **NOTE:** If the swivel has not been disassembled, proceed directly to step 9.

⚠ **CAUTION:** If the swivel has been disassembled, adhere closely to the following procedure, using only those tools that are recommended:

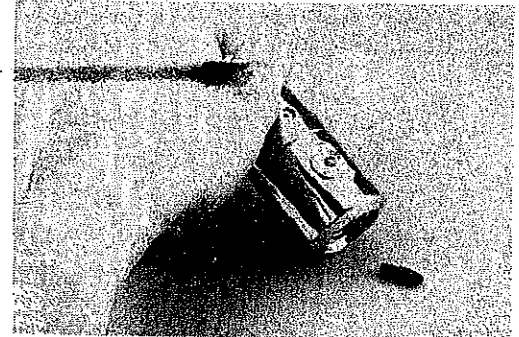


Fig. 3B

- 8a. Before proceeding, examine the new swivel retainer(34) to determine whether it requires the use of a 3/16" hex drive socket or an 11/16" nut drive socket. Install the appropriate socket onto a self limiting, inch-pounds, ratchet drive torque wrench. Preset the wrench to a torque of 96-120 inch-pounds (or 8-10 foot pounds), and keep it nearby at the ready as you perform the following steps:
- 8b. Lubricate and install the swivel o-ring(38) onto the swivel cap(39). Lay the swivel washer(37) flat onto the base of the swivel.
- 8c. Place the washer(35) onto the swivel retainer, and insert the threaded male end of the swivel retainer through the open cavity of the piston cap(36). Ensure that it seats flush, with the male end extruding through the head of the piston cap.
- 8d. Holding the swivel retainer and piston cap together between thumb and forefinger, apply one drop only of medium strength (blue) thread adhesive to the center threads of the swivel retainer. (See fig. 4B.) Very quickly, mate the piston cap and swivel retainer onto the swivel cap, so that the threads seat properly. Immediately hand tighten in a clockwise direction as snug as possible.
- 8e. Very quickly, secure the swivel cap in a padded vise with the open end of the piston cap facing up. Using the appropriate pre-selected socket, carefully tighten the swivel retainer into the swivel in a clockwise direction, only until it reaches the exact torque requirement.

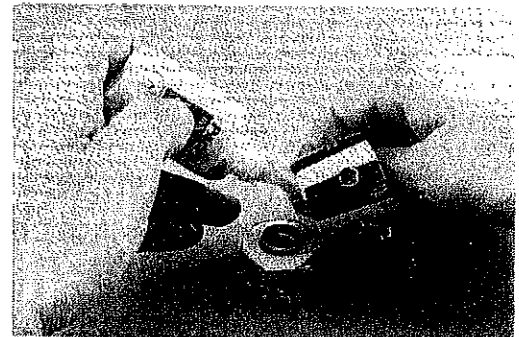





Fig. 4B

⚠ **CAUTION:** If the swivel retainer is somehow over-tightened, disassemble, discard, and replace with new after cleaning the Loctite residue out of the threads of the swivel.

9. Carefully lower the piston cap and swivel assembly over the head of the piston, and press straight down, causing the cap to seat upon the threads of the body. Grasp the body with one hand and turn the cap with the other in a clockwise direction until snug.
10. Lubricate and install the valve seat o-ring(27) into the base of the valve seat cavity, above the end of the piston shaft.
11. Lubricate and install the end plug o-ring(25) onto the end plug(24), around the base of the threads.
12. Install the valve seat(26) into the end plug, ensuring that it seats completely flush with the outer rim.

REGULATORS

BALANCED FLOW-THROUGH PISTON FIRST STAGE

13. Install the end plug into the main body, and tighten clockwise until snug, using a genuine Oceanic face spanner.
14. Lubricate and install the cone filter o-ring(6) into the yoke retainer(7), at the base of the cone filter cavity.
15. Install the cone filter(5) into the yoke retainer, and install the retaining clip(4) into the groove above it, using internal circlip pliers.
 **NOTE:** *Close examination of the retaining clip will show that one side is slightly rounded and the other is flat. Install with the flat side facing out of the yoke retainer to ensure greater holding strength.*
16. Lubricate and install the saddle o-ring(18) onto the yoke retainer, at the base of the threads, and the main seal o-ring(8) into the groove on the end.
17. Insert the male end of the yoke retainer through the yoke(3), facing opposite the end which holds the yoke screw(1). Place the saddle(19) onto the yoke retainer, with the flat side mating to the base of the yoke.
18. Holding the yoke retainer, yoke, and saddle together between thumb and forefinger, apply one drop only of medium strength (blue) thread adhesive to the middle threads of the yoke retainer. Very quickly, mate the yoke retainer into the main body, so that the threads seat properly. Immediately hand tighten in a clockwise direction as snug as possible. Using a thin-wall, or modified, 1" box wrench that is properly seated over the entire hex portion of the retainer, tighten further until completely snug.
19. Using a genuine Oceanic Body Spanner, fully tighten the piston cap onto the main body until completely snug.
 **NOTE:** *Be certain the spanner wrench is well seated in one of the inlet openings of the piston cap. Damage to the chrome finish will result if the wrench is allowed to slip.*
20. Lubricate and install all o-rings(21&23) onto all hoses and port plugs. Install all LP hoses and port plugs(22) into the swivel cap, and the HP hose(s) and port plug(20) into the main body, tightening clockwise until snug.
 **CAUTION:** *Be certain not to install any low pressure hose into the the high pressure port via an adaptor.*
21. Install the dust cap(2) onto the yoke screw and the yoke screw into the yoke.

This concludes the reassembly of the Balanced Flow-Through Piston first stage with standard yoke connector.

BALANCED FLOW-THROUGH PISTON FIRST STAGE

REASSEMBLY PROCEDURE BALANCED FLOW-THROUGH PISTON FIRST STAGE WITH DIN CONNECTOR

NOTE: Prior to reassembly, it is necessary to inspect all parts, both new and those that are being reused. Check to ensure that o-rings are clean and supple, and that every part and component has been thoroughly cleaned.

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

1. Lubricate and install the piston shaft o-ring(29) into the main body(28), using a 3/16" wooden dowel and a smoothly polished blunt dental probe from opposite ends to guide it into place. (See fig. 5B.)

2. Lubricate and install the piston head o-ring(33) onto the head of the piston(32).

NOTE: Ensure that this o-ring is a genuine Oceanic part.

3. Apply a very light film of silicone grease to both sides of both spring isolators(30). Install one over the piston shaft onto the head of the piston, and the other into the main cavity of the main body.

NOTE: These isolators are color coded for thickness. When replacing, replace with same color to avoid changing the intermediate pressure, unless you are replacing the valve spring(31). In this case, it will be necessary to experiment, changing in and out of various colors to arrive at the correct combination of only two spring isolators that will deliver an intermediate pressure of 140psi, plus or minus 5psi. DO NOT attempt to "stack" these or use only one.

4. Apply a very light film of silicone grease to both ends of the spring and place onto the piston, over the piston shaft. Use caution to avoid damaging the delicate knife edge of the piston shaft as this is done.

5. Set the piston on its head with the shaft facing straight up, and fit a genuine Oceanic piston installation bullet onto the piston shaft.

CAUTION: Failure to use this bullet while performing the next step may result in damage to the piston shaft o-ring, main body, or the knife edge of the piston shaft.

6. Carefully lower the main body(28) onto the piston shaft until the bullet and shaft have passed through the piston shaft o-ring. The main body should now be resting on the spring, mated flush with the end. (See fig. 6B.)

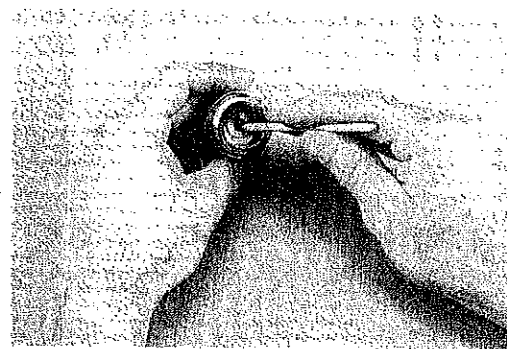


Fig. 5B

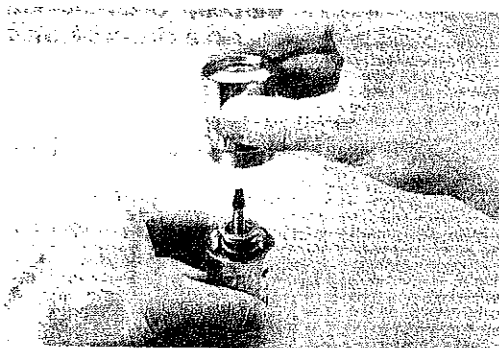


Fig. 6B

BALANCED FLOW-THROUGH PISTON FIRST STAGE

7. Grasp the piston and body together to prevent the piston from sliding back out, and turn over to allow the installation bullet to drop out. (See fig. 7B.) Set the body on end, with the piston head facing straight up.

8.

△ **NOTE:** If the swivel has not been disassembled, proceed directly to step 9.

⚠ **CAUTION:** If the swivel has been disassembled, adhere closely to the following procedure, using only those tools that are recommended:

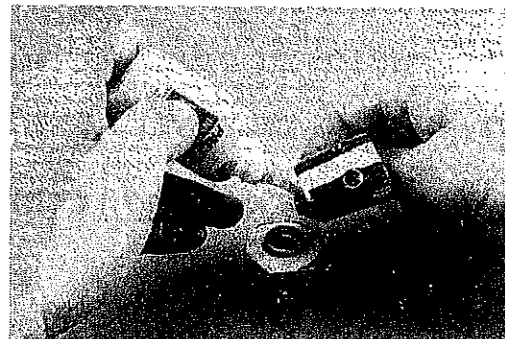


Fig. 7B

- 8a. Before proceeding, examine the new swivel retainer(34) to determine whether it requires the use of a 3/16" hex drive socket or an 11/16" nut drive socket. Install the appropriate socket onto a self limiting, inch-pounds, ratchet drive torque wrench. Preset the wrench to a torque of 96-120 inch-pounds (or 8-10 foot pounds), and keep it nearby at the ready as you perform the following steps:
- 8b. Lubricate and install the swivel o-ring(38) onto the swivel cap(39). Lay the swivel washer(37) flat onto the base of the swivel.
- 8c. Place the washer(35) onto the swivel retainer, and insert the threaded male end of the swivel retainer through the open cavity of the piston cap(36). Ensure that it seats flush, with the male end extruding through the head of the piston cap.
- 8d. Holding the swivel retainer and piston cap together between thumb and forefinger, apply one drop only of medium strength (blue) thread adhesive to the center threads of the swivel retainer. (See fig. 8B.) Very quickly, mate the piston cap and swivel retainer onto the swivel cap, so that the threads seat properly. Immediately hand tighten in a clockwise direction as snug as possible.
- 8e. Very quickly, secure the swivel cap in a padded vise with the open end of the piston cap facing up. Using the appropriate pre-selected socket, carefully tighten the swivel retainer into the swivel in a clockwise direction, only until it reaches the exact torque requirement.

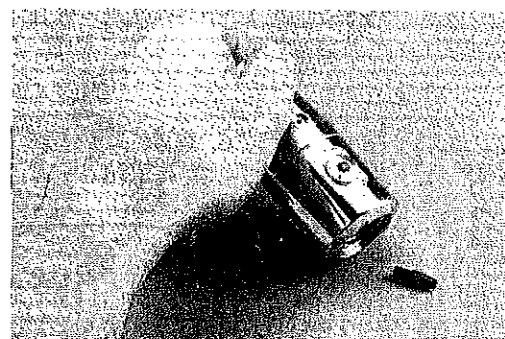




Fig. 8B

⚠ **CAUTION:** If the swivel retainer is somehow over-tightened, disassemble, discard, and replace with new after cleaning the Loctite residue out of the threads of the swivel.

9. Carefully lower the piston cap and swivel assembly over the head of the piston, and press straight down, causing the cap to seat upon the threads of the body. Grasp the body with one hand and turn the cap with the other in a clockwise direction until snug.
10. Lubricate and install the valve seat o-ring(27) into the base of the valve seat cavity, above the end of the piston shaft.
11. Lubricate and install the end plug o-ring(25) onto the end plug(24), around the base of the threads.
12. Install the valve seat(26) into the end plug, ensuring that it seats completely flush with the outer rim.

REGULATORS

BALANCED FLOW-THROUGH PISTON FIRST STAGE

13. Install the end plug into the main body, and tighten clockwise until snug, using a genuine Oceanic Face Spanner.
14. Lubricate and install the saddle o-ring(18) onto the filter housing, at the base of the threads, and the main seal o-ring(17) into the groove on the end.
15. Insert the male end of the filter housing through the flat side of the saddle(19). Hold together between thumb and forefinger, and apply one drop only of medium strength (blue) thread adhesive to the middle threads of the filter housing. Very quickly, mate the filter housing into the main body, so that the threads seat properly. Immediately hand tighten in a clockwise direction as snug as possible. Using a 1" box wrench that is properly seated over the entire seating surface of the filter housing flange, tighten further until completely snug.
16. Lubricate and install the cone filter o-ring(15) into the filter housing(16), at the base of the cone filter cavity. Install the cone filter(13) into the filter housing.
17. Install the coupler wheel(14) down over the stem of the filter housing, with the threaded male end facing up.
18. Lubricate and install o-rings(10&12) onto the filter retainer(11).
19. Mate the threaded male end of the filter retainer through the coupler wheel, into the filter housing, and hand tighten until snug. Apply a 1/4" hex key to tighten completely snug.
20. Using a genuine Oceanic Body Spanner, fully tighten the piston cap onto the main body until completely snug.
 **NOTE:** Be certain the spanner wrench is well seated in one of the inlet openings of the piston cap. Damage to the chrome finish will result if the wrench is allowed to slip.
21. Lubricate and install all o-rings(21&23) onto all hoses and port plugs. Install all LP hoses and port plugs(22) into the swivel cap, and the HP hose(s) and port plug(20) into the main body, tightening clockwise until snug.
 **CAUTION:** Be certain not to install any low pressure hose into the high pressure port via an adaptor.

This concludes the reassembly of the Balanced Flow-Through Piston first stage with DIN connector.

REGULATORS

PRE-1995 BALANCED PISTON FIRST STAGE

Dia. No.	Part #	Description
Yoke Version		
1c	6307.07	Knob Assembly
	6307.21	Knob Assembly (Nitrox - Yellow)
2c	3877	Cap - Protector
3c	6316.3	Yoke (satin finish)
4c	3530	Clip - Retaining
5a	3545	Filter - Conical
6a	2.013	O-ring - Conical Filter
	2.013V	O-ring - Filter Viton (Nitrox)
7c	3450	Retainer - Yoke
8a	2.011	O-ring - Yoke Retainer
	2.011V	O-ring - Retainer Viton (Nitrox)

DIN Version		
9c	4547.07	Cap - Protector (Black)
	4547.13	Cap - Protector (Nitrox - Yellow)
10a	6374	O-ring - DIN Face Urethane (Nitrox)
11c	4544	Retainer - DIN Filter
12a	2.012	O-ring - Filter Retainer
	2.012V	O-ring - Retainer Viton (Nitrox)
13a	4546	Filter - DIN Conical
14c	4545	Wheel - DIN Coupler
15a	2.011	O-ring - Filter
	2.011V	O-ring - Filter Viton (Nitrox)
16c	4543	Housing - DIN Filter
17a	2.011	O-ring - DIN Filter Housing
	2.011V	O-ring - Filter Hsg Viton (Nitrox)

Yoke & DIN Versions		
18b	2.115	O-ring - Saddle
19c	3454.07	Saddle - BK
	3454.21	Saddle - Nitrox
20c	3462	Plug - HP Port
21b	3.904	O-ring - HP Port Plug
	3.904V	O-ring - HP Plug Viton (Nitrox)
22c	3463	Plug - LP Port
23b	3.903	O-ring - LP Port Plug
	3.903V	O-ring - LP Plug Viton (Nitrox)
24c	3452	End Plug
	3452.3	End Plug (satin finish)
25b	2.015	O-ring - End Plug
	2.015V	O-ring - End Plug Viton (Nitrox)
26a	6509	Valve Seat
27a	2.013	O-ring - HP Seat
	2.013V	O-ring - HP Seat Viton (Nitrox)
28c	3445	Body
	3445.3	Body (satin finish)
29a	2.010	O-ring - Inner Body
	6499	O-ring - Inner Body Viton (Nitrox)
30b	3546	Isolator - Spring - White (10 psi)*
	3547.1	Isolator - Spring - Blue (2 psi)**
	3547.2	Isolator - Spring - Brown (4 psi)**
	3547.3	Isolator - Spring - Pink (6 psi)**
	3547.4	Isolator - Spring - Yellow (8 psi)**
31c	3464	Spring - Valve
32c	6162	Piston - Valve
33a	2.022	O-ring - Piston Head
	6373	O-ring - Piston Head Urethane (I
34b*	3453	Retainer - Swivel
35b	3456	Washer - Retainer
36c	3446	Cap - Piston
	3446.3	Cap - Piston (satin finish)
37b	3541	Washer - Swivel
38b	2.014	O-ring - Swivel

Dia. No.	Part #	Description
	2.014V	O-ring - Swivel Viton (Nitrox)
39c	3447	Swivel
	3447.3	Swivel (satin finish)
ANNUAL SERVICE PARTS KITS		
40.6102		Service Kit - Regulator (Includes all Bold items)
40.9335		Nitrox Conversion/Service Kit
40.6144		Service Kit - DIN assembly (Nitrox compatible) (Includes all • items)

*Note: Item 34b (P/N 3453) must be replaced whenever the swivel is disassembled.

