TROUBLE SHOOTING							
SYMPTOM	POSSIBLE CAUSE	TREATMENT					
* Freeflow	Incorrectly positioned during water entry. Second stage adjusted too sensitively. Excessive intermediate pressure from first stage. Debris trapped in orifice of main valve diaphragm(6). Bent control valve lever(12). Control valve lever(12) seat damaged or worn. Main valve diaphragm installed incorrectly.	1. Hold exhaust end of second stage facing up when entering water. 2. Readjust. (Refer to tuning section.) 3. Refer to first stage troubleshooting chart. 4. Replace with new. 5. Replace lever, pin, and spring with new and readjust second stage. 6. Replace lever, pin, and spring with new and readjust second stage. 7. Reverse to face larger opening of orifice towards hose.					
* Air leakage detected from control valve orifice.	1. Control valve lever(12) seat damaged or worn. 2. Control valve spring(13) damaged or obstructed. 3. Control valve lever(12) bent. 4. Excessive intermediate pressure.	1. Replace lever with new and readjust second stage. 2. Clean or replace with new as needed. 3. Replace with new. 4. Refer to first stage troubleshooting chart.					
* Air leakage detected from control valve flange.	Control valve screw(7) loose. Control valve o-ring(10) worn or damaged. Control valve screw(7) damaged.	Tighten. Replace with new. Replace with new.					
* Air leakage detected from ports of inlet chamber.	Main valve diaphragm(6) worn or misseated. Main valve seat(5) damaged. Main valve seat o-ring(4) damaged or worn. Slight obstruction of main valve diaphragm orifice. Excessive intermediate pressure.	Reseat or replace with new as needed. Replace with new. Replace with new. Clean or replace with new as needed. Refer to first stage troubleshooting chart.					
* Excessive inhalation resistance.	1. Debris or corrosion present, prohibiting main valve(6) or control valve(15) operation. 2. Second stage incorrectly adjusted. 3. Bent control valve lever(12). 4. End cap(1) loose, prohibiting contact between lever arm and adjustment screw(20). 5. Exhaust cover(18) loose, prohibiting contact between lever arm and adjustment screw. 6. Purge relief spring(19) incorrectly installed.	1. Disassemble and clean. 2. Readjust. (Refer to tuning section.) 3. Replace with new and readjust second stage. 4. Tighten until perfectly snug. 5. Tighten until perfectly snug. 6. Reassemble according to procedure.					
* Inconsistent performance - Freeflow/ Excessive inhalation re- sistance.	Indexed retainer of housing(24) damaged or distorted. End cap(1) loose, prohibiting contact between control valve lever(12) and adjustment screw(20).	Replace with new. Tighten until perfectly snug.					
* Servo lag - Delay in opening of main valve when control valve is actuated.	Main valve seat(5) damaged or worn. Debris trapped in orifice of main valve diaphragm(6).	Replace with new. Replace with new.					
* Excessive water entering second stage.	Exhaust valve diaphragm(21) distorted or damaged. Tear in mouthpiece. Debris trapped beneath exhaust valve diaphragm(21). Improperly installed or damaged bi-radial diaphragm assembly. Cracked or damaged housing. Control piston o-ring(25) worn or missing.	1. Replace with new. 2. Replace with new. 3. Clean and remove. 4. Disassemble, clean or replace parts with new as needed. 5. Replace with new. 6. Replace with new.					

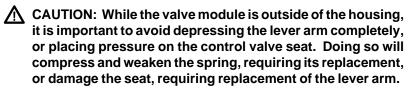
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DISASSEMBLY PROCEDURE

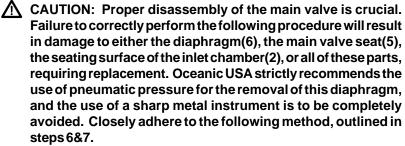
NOTE: Be sure to perform the steps outlined in the Initial Inspection Procedures prior to disassembling the regulator. Review the troubleshooting section to gain a better idea of which internal parts may be worn, and to better advise your customer of the service that is needed.

- 1. Locate the serial number stamped on the housing above the mouthpiece. Record this number and compare it to the customer's invoice or service record to determine warranty status.
- 2. Turn the end cap(1) counter clockwise to remove from the plastic housing(24), avoiding the use of tools. If the end cap(1) has been over tightened onto the housing assembly and cannot be loosened by hand, you may use a small strap wrench to loosen it while holding the second stage firmly in place, flat on its side on the repair bench.
- 3. Firmly grasp the low pressure hose at the fitting with one hand, and pull the housing assembly straight away with the other. Ensure that the valve module does not exit at an angle to the housing, as this may bend the control valve lever arm. (Fig. 1)





- 4. To remove the hose, apply an 11/16" open end wrench to the hex portion of the fitting, and turn counter-clockwise while holding the inlet chamber(2) secure with a 15/16" open end wrench. (Fig. 2) Remove and inspect the o-ring found inside the hose fitting for any signs of decay. Discard if found.
- Continue to hold the inlet chamber flange secure, and remove the control valve flange(9) complete with the control valve assembly(15), using a 9/16" open end wrench. (Fig. 3) Remove and inspect the inlet chamber o-ring(3) for any signs of decay. Discard if found.



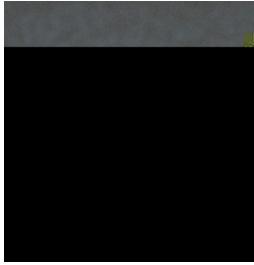


Fig. 1



Fig. 2



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- 6. Connect the inlet chamber(2) to an air source, via a standard low pressure hose with an intermediate pressure of no more than 145 psi. Wrap a cloth around the open end of the inlet chamber to prevent the main valve diaphragm(6) from exiting, and gradually pressurize, allowing the pressure to increase until the diaphragm is unseated. (Fig. 4)
- 7. If the diaphragm has not exited entirely beyond the threaded portion of the inlet chamber cavity, extreme care must be taken to avoid damaging the inlet chamber(2). Using your fingertips, remove the main valve diaphragm(6) from the inlet chamber(2). Discard and DO NOT attempt to reuse.
 - 8. Remove the inlet chamber(2) from the LP hose, and insert a 5/16" wooden dowel through the small threaded opening to dislodge the main valve seat(5), causing it to exit entirely. (Fig. 5) Compare with new and closely inspect for any signs of pitting or distortion that would prevent proper seating with the main valve diaphragm. Discard if found.
 - Locate the main valve seat o-ring(4) by viewing through the main cavity of the inlet chamber(2). Carefully remove, using a brass or plastic dental pick to avoid damaging the brass seating surface, and discard.
 - 10. While holding the control valve flange(9) secure with a 9/16" open end wrench, slightly loosen the control valve screw(7) with just one turn, using a 1/4" Deep Wall nut drive socket. (Fig. 6)
 - ↑ CAUTION: DO NOT apply a slotted blade screwdriver to the head of the screw. Doing so will result in damage to the screw, requiring replacement.
 - 11. Hold the control valve body(11) secure between thumb and forefinger, on either side of the control valve lever(12).
 - CAUTION: DO NOT apply direct pressure onto the control valve lever seat. Continue loosening the screw with the use of the deep wall socket to remove the control valve assembly (15). Remove the control valve flange o-ring(8) and inspect for any signs of decay. Discard if found. Remove and discard the control valve block o-ring(10).
 - 12. Closely inspect the control valve screw(7) with the use of a magnifier, checking for any signs of stress damage caused by unauthorized repair, either at the slotted head or just above the threads. Discard if found, and DO NOT attempt to reuse.



Fig. 4

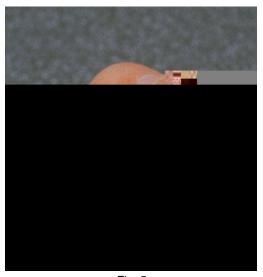


Fig. 5



Fig. 6

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NOTE: If leakage from the control valve was detected during the immersion test performed during the Initial Inspection Procedures, it is important to proceed directly to step 13. If no leakage from the control valve was detected during the immersion test, perform the following inspection of the control valve assembly to determine whether further disassembly may be necessary. If the assembly passes this inspection after passing the immersion test, Oceanic advises that it be cleaned fully assembled, as one part.

- A. Inspect the control valve spring(13) to ensure that it is present and securely in place, without any grit or debris inside it.
- B. Examine the control valve pin(14) to ensure that the slotted portion is visible and facing directly up, and that it is not flared or distorted in any way.
- C. Closely examine the lever arm and compare with new to ensure it is not bent.
- 13. In the event that disassembly of the control valve assembly(15) is needed, strictly adhere to the following procedure:
 - A. Place the control valve assembly(15) on top of a vise. Open the jaws of the vise slightly, and position the control valve body(11) on its side so that the pin(14) is centered between the opening. (Fig. 7)
 - B. Using a drift pin punch with a point diameter of 1/16", gently drive out the pin(14) with a small ball peen hammer, rapping lightly on the punch until the pin has exited. If the pin(14) will not exit completely, grasp the portion extruding, using needle nose pliers, and pull it straight out. (Fig. 8) Discard, and DO NOT attempt to reuse.
 - C. Remove the lever(12) and spring(13), which can now drop out freely. Discard them, and DO NOT attempt to reuse.
- 14. Inspect the condition of the housing assembly:
 - A. The mouthpiece should be supple and free of any tears or corrosion.
 - B. The plastic body should be free of any stress cracks, and the threads should be clean and free of any signs of damage or distortion.
 - C. The indexed valve retainer inside the inlet portion of the housing should be intact, and free of any signs of damage or distortion caused by improper removal of the LP hose. (Fig. 9)
- 15. Remove the exhaust cover(18) by turning it in a counterclockwise direction, avoiding the use of tools. Inspect the threads of the cover and the housing to ensure they are in good condition, without any signs of distortion. Squeeze the tabs found on the underside of the purge button(16) inward, and simultaneously press the others, causing the purge button to exit the exhaust cover. Inspect the purge spring(17) for any signs of corrosion that might impair its performance.

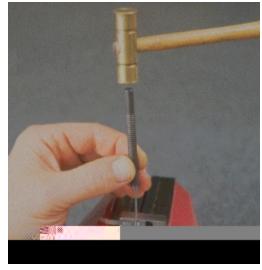


Fig. 7

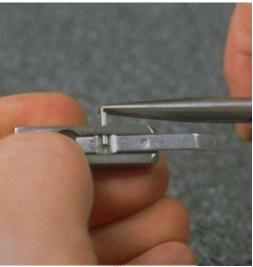


Fig. 8

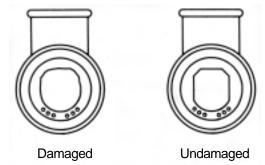


Fig. 9

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- 16. Remove the bi-radial diaphragm assembly, which includes: the control diaphragm(23), control piston(22), exhaust valve diaphragm(21), adjustment screw(20), and purge relief spring(19). (Fig. 10) Inspect the following to determine whether further disassembly is necessary. If the assembly passes this inspection, it may be cleaned fully assembled, as one part. Disassembly, if needed, may be performed without the use of tools.
 - A. Inspect the condition of the control diaphragm (23) and exhaust valve diaphragm (21) to ensure the silicone rubber is supple and free of any tears or corrosion. Ensure that the exhaust valve diaphragm seals completely over the surface of the control piston (22).
 - B. Inspect the condition of the control piston(22) to ensure it is free of any stress cracks, warping, or other signs of distortion.
 - C. Inspect the adjustment screw(20) to ensure the threads are in good condition, without any signs of distortion.
 - D. Inspect the spring(19) to ensure that it is correctly seated over the adjustment screw(20), and free of any signs of corrosion that might impair its performance. Removal and close inspection of the spring should reveal that it is bent inward at the base to cause a better seating onto the screw. (Fig. 11)



NOTE: DO NOT replace the spring with the end that is bent facing up. This will impair the performance of the second stage.





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 thorougly cleaned and dried.



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.



NOTE: If the control valve assembly has not been disassembled, proceed directly to step 5.

 Lay the control valve body(11) on a flat surface, with the orifice and grooved side facing farthest away and the roll pin hole facing up. Grasp the control valve pin(14) firmly without squeezing it, using a pair of tweezers, and closely examine it in good lighting to find the slot that runs lengthwise down its center. (Fig. 12)



Fig. 10



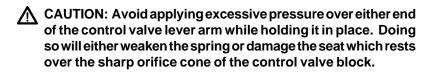
Fig. 11



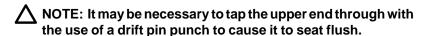
Fig. 12

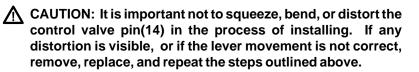
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- Continue to hold the pin(14) with the tweezers, and apply a very small amount of lubricant to the end. Position the lubricated end of the pin(14) directly onto the hole in the body(11), with the slot facing directly out of the grooved side of the body(11). Using a small ballpeen hammer, gently tap the pin into the hole just until it is well seated, without causing it to protrude into the groove.
- 3. Turn the control valve body(11) towards you, so that the grooved side is facing up. Place the control valve spring(13) into the recessed hole inside the groove, standing on end. Examine the control valve lever(12) to find the spring retaining tab on its underside (Fig. 13), and lower the lever directly onto the body(11), mating this tab into the spring and positioning the seat over the orifice cone. Press the lever into the groove, slightly compressing the spring, and place your forefinger over the tab to hold it there.

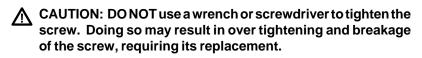


4. While continuing to hold the lever(12) in place, turn the control valve body(11) over to its original position so that the control valve pin(14) faces straight up. Using the ball peen hammer, gently tap the pin(14) completely through the groove and into the hole on the opposite side until seated flush on both sides. (Fig. 14) Ensure that the slot is visible and facing directly up, and depress the lever repeatedly to ensure a smooth movement.





- Insert the threaded end of the control valve screw(7) through the open end of the control valve flange(9), until the screw protrudes out the other end. Lubricate and install the control valve o-ring(10) onto the threaded end of the screw.
- R 6. Examine the outer side of the control valve flange(9) to find three flat surfaces and a fourth, which is rounded. Align the control valve flange(9) with the control valve assembly(15) so that this rounded surface faces down and opposite the control valve lever(12), which should face up. (Fig. 15) Mate the two parts, and hold together while turning the control valve screw(7) in a clockwise direction, using a 1/4" Deep Wall socket mounted on a hand driver. Tighten to a torque of 20-24 in-lbs



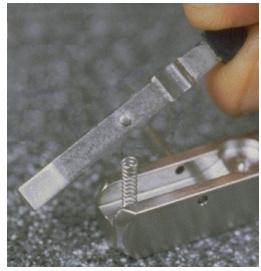


Fig. 13

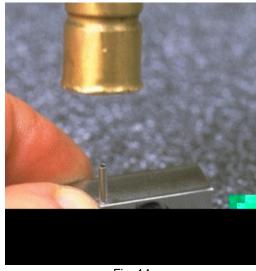


Fig. 14

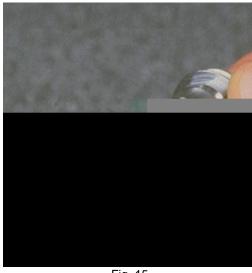
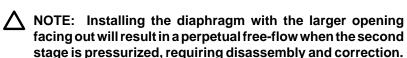


Fig. 15

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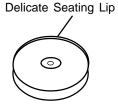
- 7. Lubricate and install the control valve flange o-ring(8) onto the control valve flange.
- 8. Lubricate and install the main valve seat o-ring(4) into the inlet chamber(2), using a 5/16" wooden dowel and a smoothly polished blunt dental probe from opposite ends to guide it into place.
- 9. Install the main valve seat(5) into the inlet chamber(2), pressing the inlet stem through the o-ring until seated.(Fig. 16)
- 10. Lubricate and install the inlet chamber o-ring(3) onto the inlet chamber(2).
- 11. Close examination of the main valve diaphragm(6) will show that the orifice in the center is much larger on one side than the other. Position the diaphragm flat, directly over the large opening of the inlet chamber(2) with the smaller opening of the orifice facing out. (Fig. 17)



- 12. Using a wooden dowel, gently tamp the edges of the diaphragm(6) down inside the internal threads of the inlet chamber(2), one thread at a time. Rotate the inlet chamber while doing this, to facilitate an even seating of the diaphragm, and closely inspect to ensure it is well seated at the base of the threads.
- CAUTION: DO NOT force the diaphragm into the inlet chamber in a manner which will damage either the lip of the inside edge, or the threads of the inlet chamber. The use of a sharp instrument, such as a screwdriver, is to be strictly avoided.
- 13. Hold the inlet chamber flange(2) secure, using a 15/16" open end wrench, and install the control valve flange(9), complete with the control valve assembly(15), using a 9/16" open end wrench. Tighten clockwise until the control valve flange is completely secure, and flush against the inlet chamber.
- 14. Lubricate and install the o-ring inside the hose fitting. Ensure that the end cap(1) is on the hose, and hold the inlet chamber flange(2) secure once again, using a 15/16" open-end wrench. Install the hose onto the inlet chamber, using an 11/16" open end wrench. Tighten clockwise until competely secure. (Fig. 18)
- 15. **IMPORTANT:** Before performing the next step, it is important to pressurize the second stage and perform the immersion test which is outlined in the Leak Test section of General Procedures. This will help determine whether the main valve and control valve have been properly reassembled. If any leakage is found, refer to the troubleshooting chart and perform the needed remedy before proceeding further.



Fig. 16





Upstream Surface

Downstream Surface

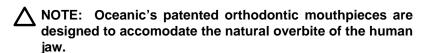
Fig. 17



Fia. 18

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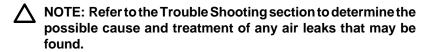
- 16. Align the rounded surface of the control valve flange(9) with the indexed retainer inside the housing(24), and insert the valve module completely into the housing, causing it to "snap" into place. Check to ensure that the control valve lever(12) is now facing up inside the housing. (Fig. 19)
- 17. Carefully seat the end cap(1) onto the threads of the housing(24) and slowly turn clockwise, ensuring that it is threading properly. Hand-tighten until completely secure.
- CAUTION: Forceful cross threading of the end cap onto the housing will seriously impair the performance of the second stage, and require replacement of the housing.
- 18. Install the bi-radial diaphragm assembly into the housing, and tamp down the edges to ensure it is well seated. (Fig. 20)
- 19. Install a holed purge button into the exhaust cover(18), and hand-tighten the cover onto the housing until secure. (Fig. 21)
- 20. Secure the mouthpiece onto the housing with an all plastic, noncorrosive tie-wrap, positioning the locking tab of the tie-wrap towards the retaining ring.





FIRST STAGE TESTING

 Perform the Leak Detection Test specified in the Initial Inspection procedure for the first stage.



- Connect the low pressure hose of the Omega second stage to a low pressure port of the first stage. Ensure that all other ports are sealed with port plugs, with the exception of an additional low pressure quick disconnect hose.
- 3. Connect a recently calibrated low pressure test gauge to the additional low pressure hose, and connect the first stage to a pure breathing gas source of 3,000PSI.
- Slowly open the valve to pressurize the regulator, and check the test gauge to ensure that the intermediate pressure is set as recommended in the specifications for the first stage being used.

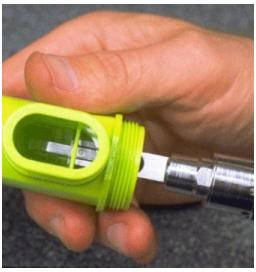


Fig. 19



Fig. 20

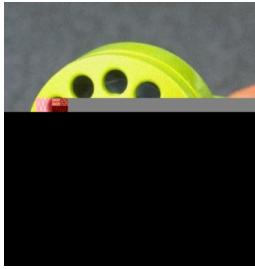


Fig. 15

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NOTE: If the intermediate pressure is found to be other than recommended, refer to that regulator's troubleshooting section to determine possible cause and treatment.

TUNING

- 1. Prior to tuning the Omega regulator, check the following items:
 - A. The metal end cap(1) should be tightened completely secure onto the housing(24).
 - B. A holed purge button, if available, should be installed into the exhaust cover(18).
 - C. The adjustment screw(20) inside the bi-radial diaphragm assembly should be turned out counter clockwise as needed to avoid making contact with the control valve lever arm(12).
 - D. The exhaust cover (18) should be tightened completely secure into the housing.
 - E. The mouthpiece should be cleaned and disinfected with warm, soapy water.



NOTE: Steps A&D are essential to ensure correct contact between the adjustment screw and control valve lever arm.

- If a holed purge button is being used, it will be possible to adjust the regulator while it is pressurized. Use a small slotted blade screwdriver to turn the adjustment screw(20) in clockwise only until a slight flow of air is audible from the main valve after the screwdriver has been removed.
- Turn the adjustment screw(20) out counter clockwise in increments no greater than 1/8 turn just until airflow is no longer present, and pause to listen carefully for airflow or leakage after each adjustment.
- 4. When airflow is no longer heard, purge the second stage repeatedly and/or inhale sharply through the mouthpiece. Again, listen carefully to check for any airflow that may have returned, and repeat steps 2&3 if found.
- 5. When the second stage no longer flows or "leaks" air in its static mode, turn the adjustment screw(20) out counter clockwise an additional 1/4 turn, if it is designated as a primary air source, and 1/2 turn if it is designated as an alternate air source, or octopus.



NOTE: Slight variances to the recommended adjustment may be made upon the customer's request.

- Remove exhaust cover(18) to replace the holed purge button with original. Replace the exhaust cover, ensuring that it is tightened completely secure onto the housing, and repeat step 4 to make subjective test of airflow.
- 7. Fully depress purge button to initiate a healthy airflow.

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NOTE: If not present, disassemble and inspect the exhaust cover(18) and bi-radial diaphragm assembly. Refer to the troubleshooting section if the cause is not apparent.

8. Clean and disinfect the mouthpiece in warm, soapy water before returning to the customer.

SPECIFICATIONS

Torques

R 3845

LP Hose 50 to 60 in-lbs Control valve screw 20 to 24 in-lbs

Opening Effort (IP = 140 psi)

Prefered Primary Set-up
Acceptable (Primary)
Prefered Octopus Set-up
Acceptable (Octopus)

1.1 to 1.4 inches of H₂O
1.0 to 1.6 inches of H₂O
1.5 to 2.0 inches of H₂O
1.5 to 2.2 inches of H₂O

Specialty Tools

P/N 40.6125 Exhaust Cover Tool

P/N 40.2302 Christo-Lube MCG111 - 2 oz P/N 40.9410 Purge Button Tool

P/N 40.9410 Purge Button Tool
P/N 40.9411 Deep Wall Socket (1/4")
P/N 40.9412 Drift Pin Punch (1/16")

P/N 40.9520 O-ring Tool Kit

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REGULATORS

OMEGA II SECOND STAGE

Dia. No.	Part #	Description	Dia. No.	Part #	Description
INO.	rail#	Description	<u>INU.</u>	rail#	Description
	0004	0 5 1		0704.00	Have an Assessible (OD)
1c	3801	Cap - End		3784.03	Housing Assembly (OR)
2c	3787	Chamber - Inlet		3784.07	Housing Assembly (BK)
3b	2.018	O-ring – Inlet Chamber		3784.10	Housing Assembly (CL)
4a	2.011	O-ring – Valve Seat		3784.18	Housing Assembly (NY)
5b	5508	Seat - Main Valve		3784.19	Housing Assembly (NG)
6a	3799	Diaphragm - Main Valve	051	3784.20	Housing Assembly (NP)
7c	3845	Screw - Control Valve	25b	2.007	O-ring - Control Piston
8b	2.016	O-ring – Valve Flange	n/sa	1978.10	Wrap - Tie
9c	3846	Flange - Control Valve	n/s	40.2100.033	MaxFlo hose - 33"
10a	2.008	O-ring – Control Valve	n/s	40.2100.036	MaxFlo hose - 36"
11c	3964	Body - Control Valve	n/s	4485.10	Mouthpiece - Orthodontic (Clear)
12b	3847	Lever - Control Valve	n/s	40.4200.01	Omega Color (BL)
13b	3849	Spring - Control Valve	n/s	40.4200.07	Omega Color (BK)
14b	3856	Pin - Control Valve	n/s	40.4200.10	Omega Color (CL)
15c	40.9400	Assy Control Valve	n/s	40.4200.18	Omega Color (NY)
16c	3786.01	Button - Purge (BL)	n/s	40.4200.19	Omega Color (NG)
	3786.07	Button - Purge (BK)	n/s	40.4200.20	Omega Color (NP)
17c	3797	Spring - Purge			
18c	3785.01	Cover - Exhaust (BL)	ANN	UAL SERVICE	PARTS KIT
	3785.03	Cover - Exhaust (OR)	40.61	04	Service Kit
	3785.07	Cover - Exhaust (BK)			(Includes all Bold items)
	3785.10	Cover - Exhaust (CL)			
	3785.18	Cover - Exhaust (NY)			
	3785.19	Cover - Exhaust (NG)			
	3785.20	Cover - Exhaust (NP)			
19c	3921	Spring - Purge Relief			
20c	3802	Screw - Adjustment			
21b	3798	Valve - Exhaust			
22c	3779	Piston - Control			
23b	3776	Diaphragm - Control			
24c	3784.01	Housing Assembly (BL)			
					10

