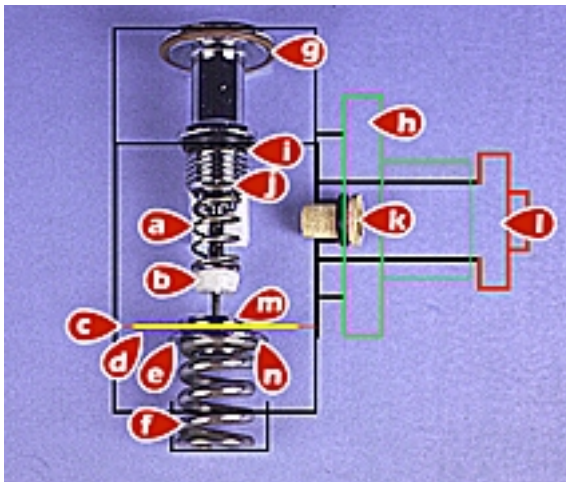
Text and Photography
by Pete Nawrocky

RG1200 Service and Repair Manual

WARNING

This manual is only to be used as a guide for trained regulator technician. Possession of this guide does not qualify any individual to service Dive Rite breathing systems. Only qualified Dive Rite dealers may service Dive Rite Products. Improper servicing can lead to **serious injury** or **death.**

First Stage Overview



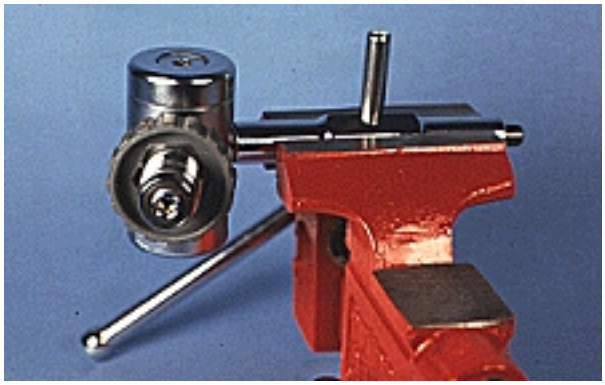
a Spring
b High-pressure valve
c Diaphragm
d Thrust washer
e Spring carrier
f Intermediate pressure spring
g 1231 O-ring
h Hand wheel
i 1232 O-ring
j 1233 O-ring
k Inlet filter
l DIN lockdown screw
m Valve lifter
n Plastic washer

First Stage Disassembly

Before you begin:

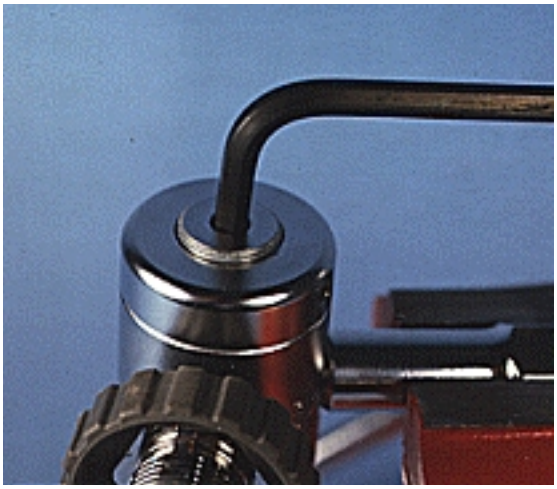
- Remove all low-pressure hoses.
- Remove high-pressure hoses and remaining port plugs.
- Note location of plugs and hoses.

Then perform the following steps, in order.



1 Screw port tool into high-pressure port. Take care not to damage threads.

2 Place port tool with first stage attached into vise, with the intermediate pressure spring on the upright position.



3 Using a 6mm hex wrench, loosen the adjustment screw enough to lessen the spring tension.

4 Place a spanner wrench into the holes of the diaphragm cap.

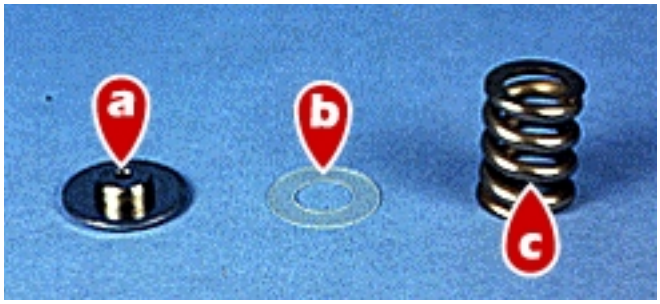
5 Loosen the cap by applying a firm steady pressure on the housing.

WARNING

Rapid jerking can cause the spanner wrench to slip and damage the cap

a Adjustment screw **b** Diaphragm cap

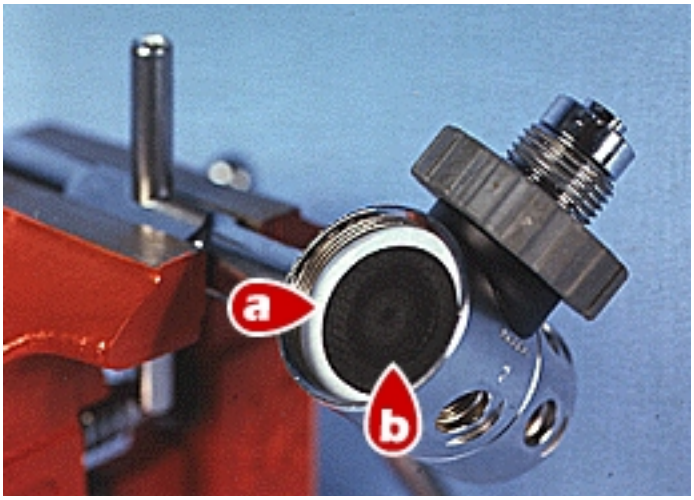
6 Unscrew the diaphragm cap and remove the adjustment screw from the housing.



a Spring carrier **b** Plastic washer **c** Intermediate pressure spring

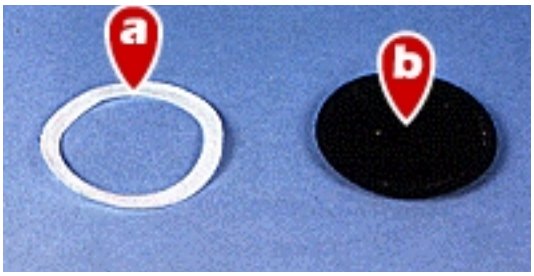
7 Remove the intermediate pressure spring.

8 Remove the spring carrier and the plastic washer.



a Thrust washer **b** Diaphragm

9 Remove the thrust washer.

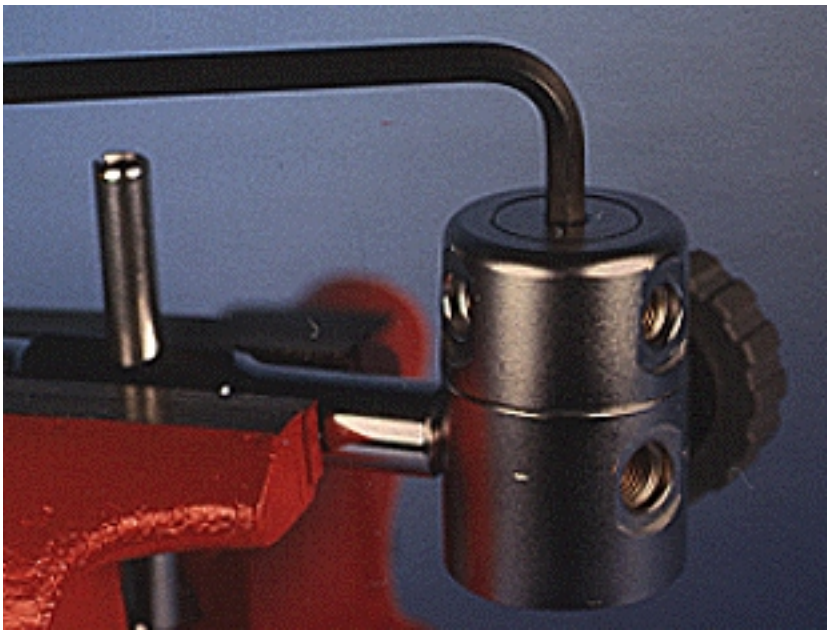


a Thrust washer **b** Diaphragm

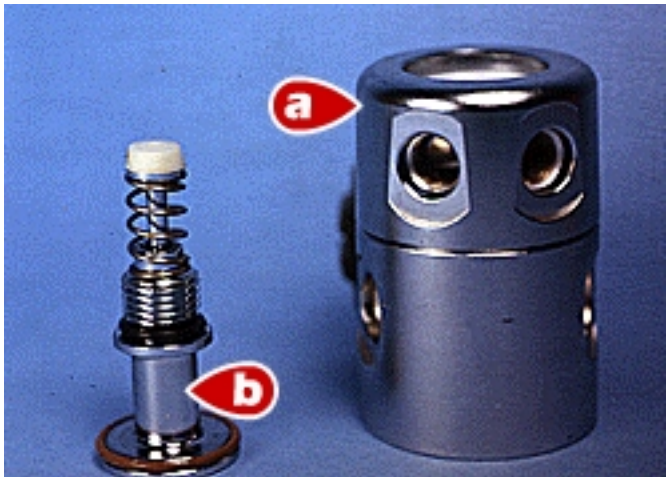
10 Remove the diaphragm.

11 Carefully remove the valve lifter.

12 Inspect parts for excessive wear.

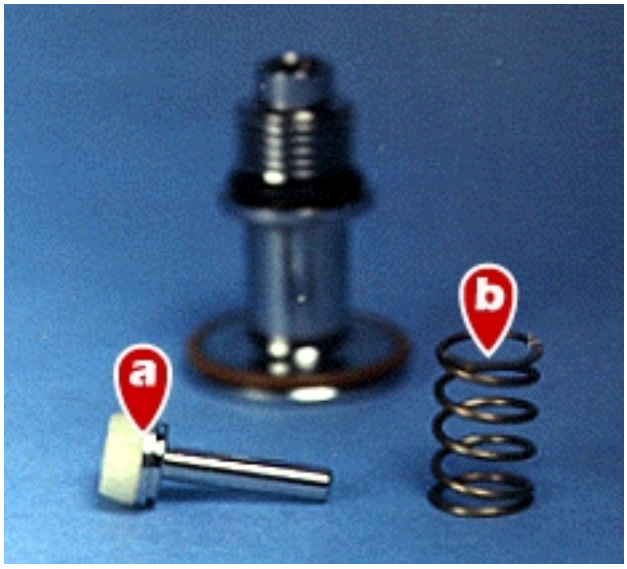


13 Remove the regulator from the vise and invert it so the 6mm hex opening is facing up.



a Turret **b** Turret retainer

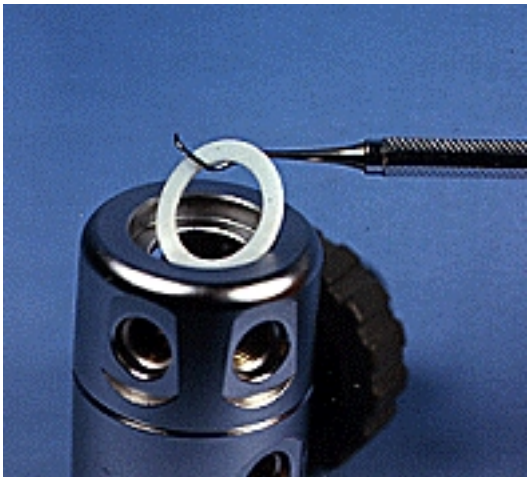
14 Insert a 6mm hex wrench and remove the turret retainer.



a High pressure valve **b** Spring

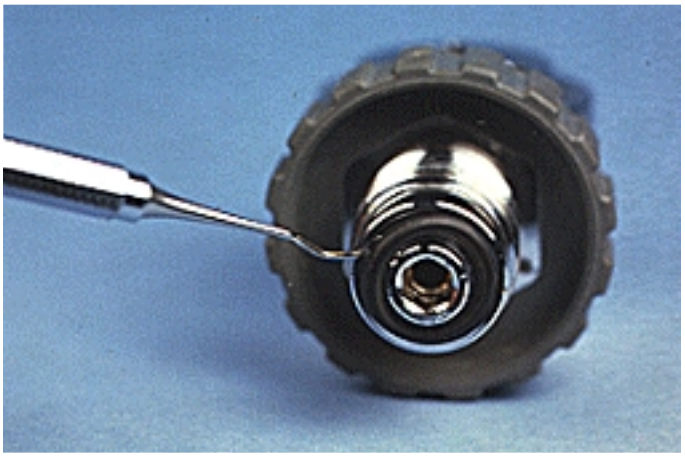
15 Remove the high pressure valve and spring.

16 Using a pick remove the three O-rings located in the module. (**Note:** Be careful not to scratch the sealing surfaces on the module.)

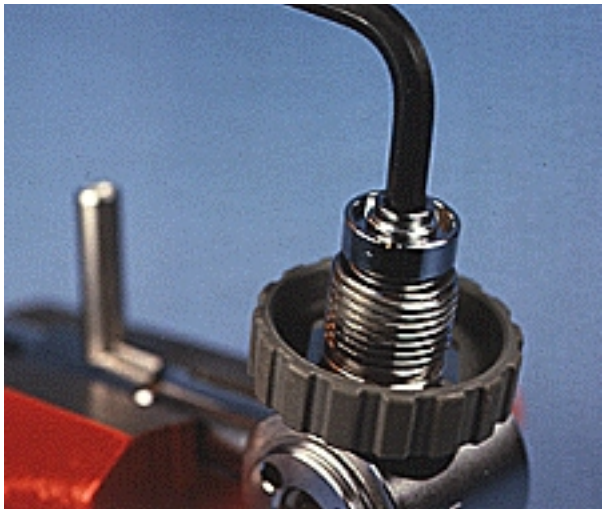


17 Remove the thrust washer from the top of the turret.

18 Remove the turret and the corresponding large O-ring.



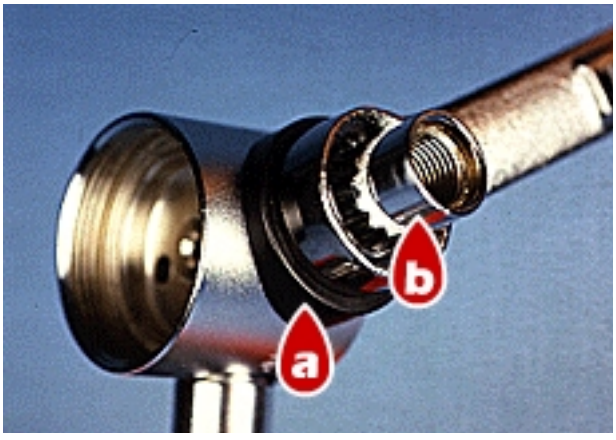
19 Using a pick remove the exterior O-ring from the DIN lockdown screw. (If the yoke adapter is attached, unscrew the yoke.) This O-ring is located in the track surrounding the high pressure inlet.



20 The DIN lockdown screw uses threadlock. If you find it difficult to remove, carefully heat the DIN lockdown screw to dissolve threadlock. Insert a 6mm hex wrench into the high pressure inlet. Loosen and remove the DIN lockdown screw.

21 Remove the O-ring from the DIN lockdown screw.

22 Remove the hand wheel.



a Saddle **b** DIN Connector

23 The DIN connector uses threadlock. If you find it difficult to remove, carefully heat the DIN connector to dissolve threadlock. Using a 19mm wrench, loosen and remove the DIN connector and saddle.

24 Remove the O-ring located on the DIN connector.

25 Carefully remove the cone shaped filter and O-ring from the interior of the DIN connector.

26 Change all the O-rings on the port plugs and all hoses.

The first stage is now ready for parts replacement, cleaning, reassembly and adjustment.

Servicing Disassembled First Stage Parts

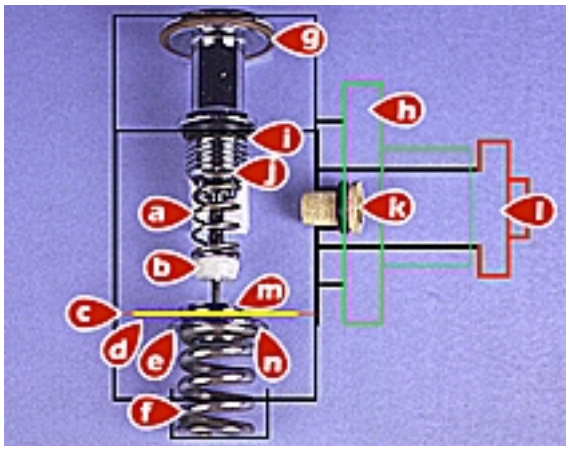
Dive Rite makes available all the items you should replace as part of a normal first-stage overhaul in kit form. This kit contains:

1230	Diaphragm	**1236**	O-ring	**1243**	O-ring
1231	O-ring	**1237**	Thrust washer	**1265**	Diaphragm thrust washer
1232	O-ring	**1238**	O-ring		
1233	O-ring	**1239**	O-ring		
1234	High pressure seat	**1240**	Inlet filter		
		1241	O-ring		
1235	O-ring	**1242**	O-ring		

1 From the collection of disassembled first stage parts, remove and package those items that will be replaced by items from the service kit.

2 Thoroughly clean the remaining items in a solution compatible with Nitrox service.

3 When lubricating O-rings, use only Nitrox-compatible lubricants, such as Techno Lube.



a Spring
b High-pressure valve
c Diaphragm
d Thrust washer
e Spring carrier
f Intermediate pressure spring
g 1231 O-ring
h Hand wheel
i 1232 O-ring
j 1233 O-ring
k Inlet filter
l DIN lockdown screw
m Valve lifter
n Plastic washer

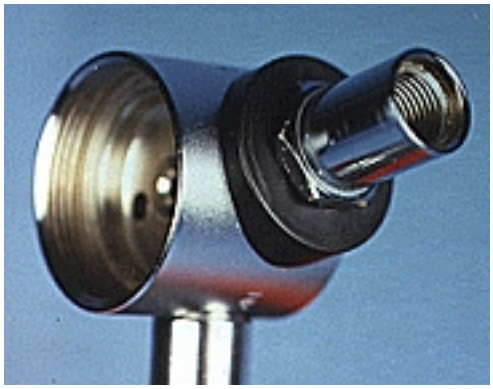
First Stage Reassembly

1 Screw the port tool into the high pressure port.

2 Place the tool in a vise with the turret side facing up.

3 After lubricating, place O-ring into the bottom of the DIN connector.

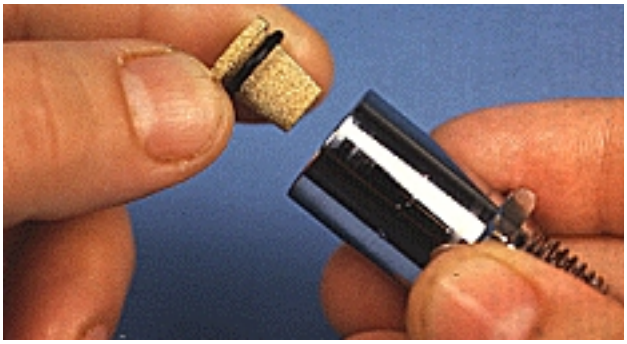
4 Place the saddle over the DIN connector. (Be careful to position the curved side so that it will contact the first stage block.)



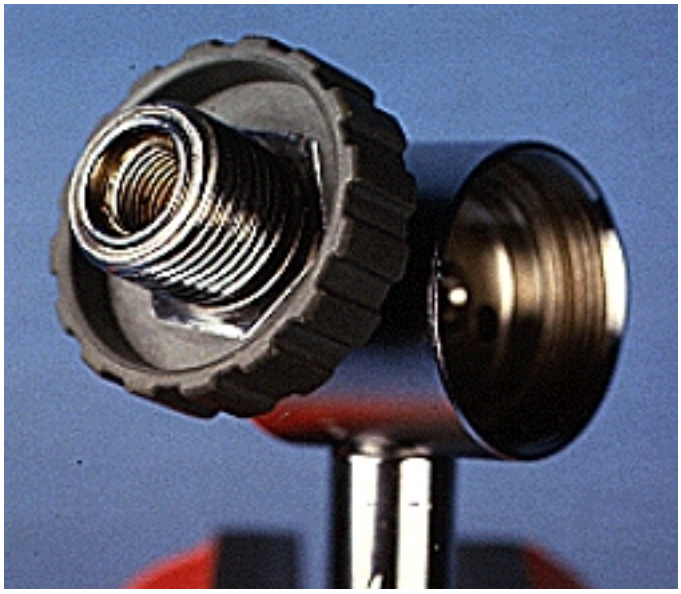
5 Reapply a *small amount* of threadlock, then screw the DIN connector into the first stage housing…

…and tighten with a 19mm wrench.

6 Install backing O-ring onto the inlet filter (no lubrication needed).



7 Place the inlet filter into the DIN connector (point down).

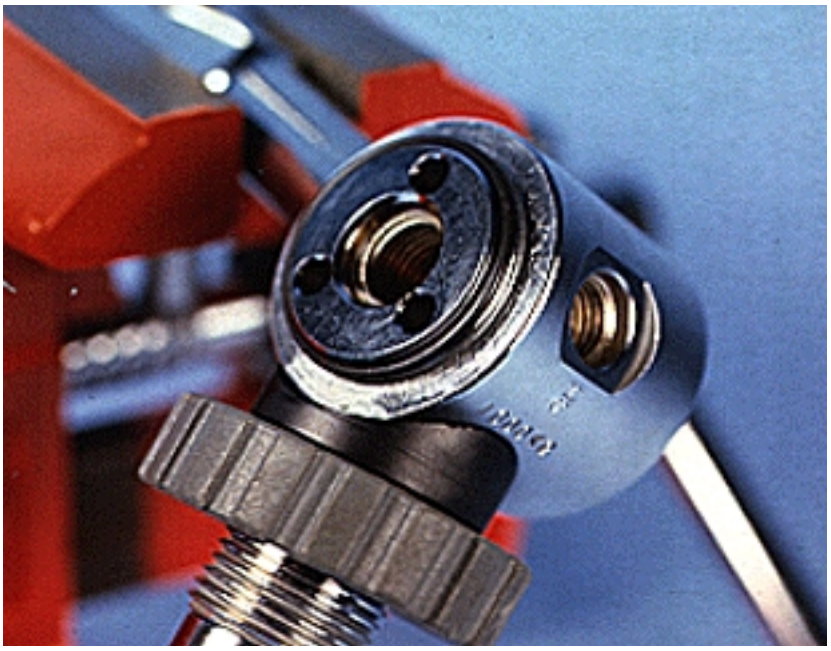


8 Place the DIN hand wheel over the DIN connector (the threads face away from the first stage block).

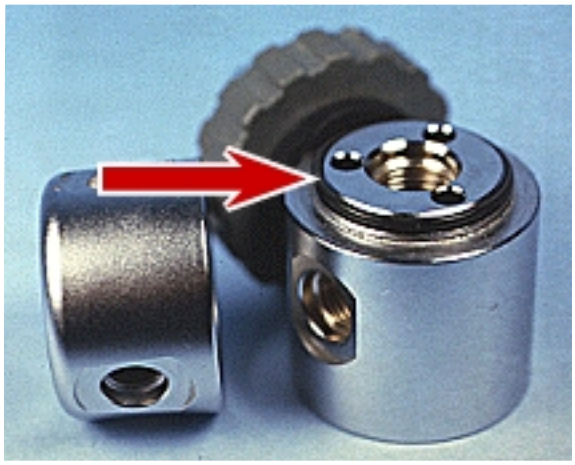
9a Lubricate and install an O-ring on the top of the DIN wheel lockdown screw.

9b Lubricate and install the O-ring for the bottom of the DIN wheel lockdown screw.

10 Reapply a *small amount* of threadlock, then install the DIN wheel lock-down screw into the DIN connector and tighten with a 6mm hex wrench.

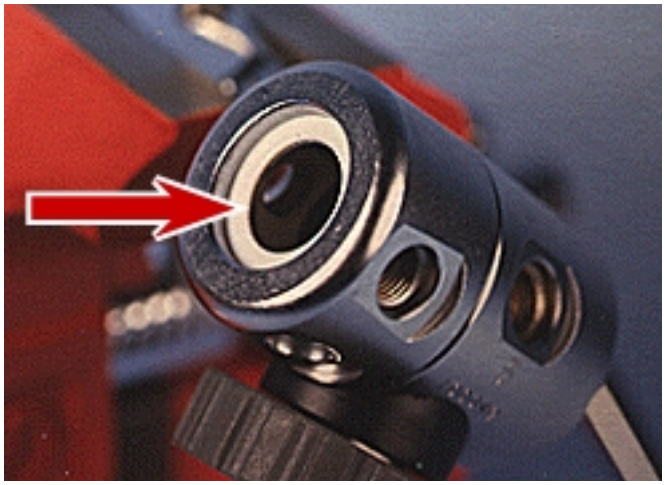


11 Turn the first stage so the turret side is up.



12 Lubricate and install the 1232 O-ring on the first stage housing, where it will contact the turret.

13 Install the turret on the first stage body.



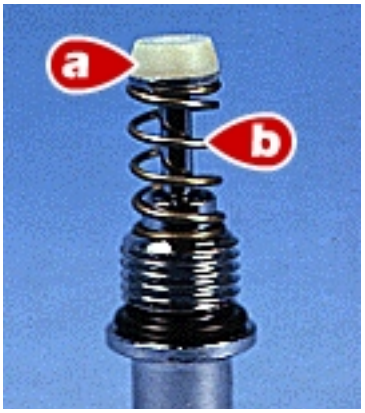
14 Place the 1237 thrust washer on the top of the turret.

To prepare the turret retainer/high-pressure module for installation:

15 Lubricate and install the 1235 O-ring inside the top of the turret retainer (a).

16 Lubricate and install 1236 O-ring on the surface just below the threads (b).

17 Lubricate and install 1238 O-ring on the base of the turret retainer (c).



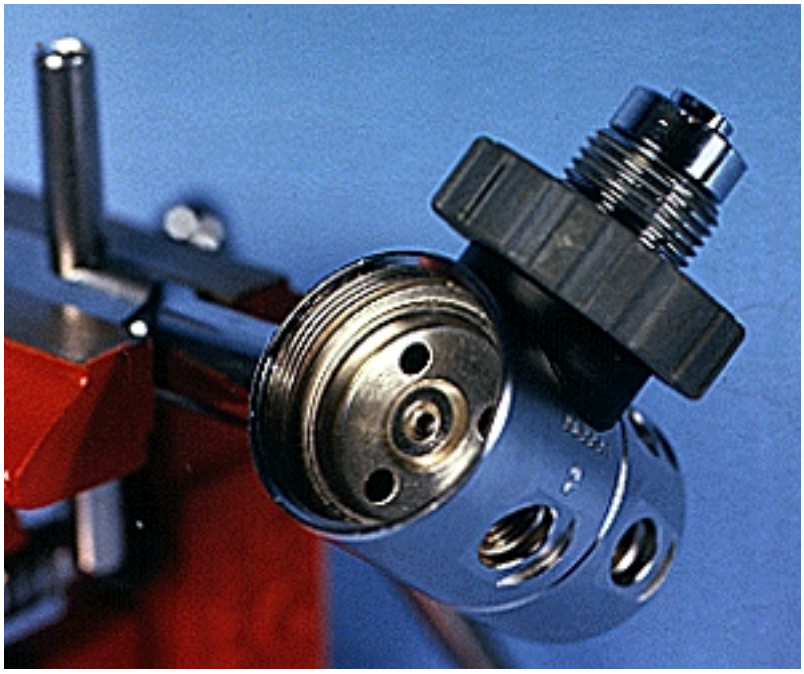
a High pressure valve **b** Spring

18 Place the return spring on the top of the turret retainer.

19 Install the new high-pressure valve. Allow the stem to pass through the center of the spring and through the 1235 O-ring.

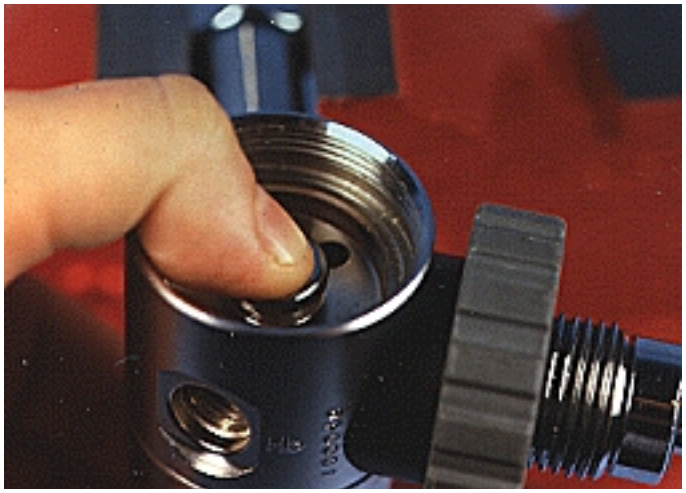
20 Install the completed turret retainer into the first stage by passing it through the turret.

21 Tighten with a 6mm hex wrench. (Be careful not to crimp the O-ring.)



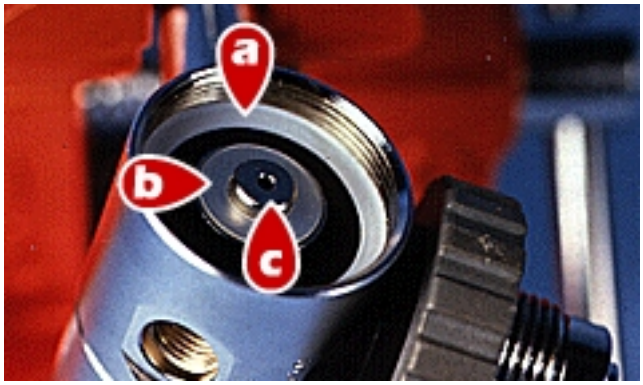
22 Turn the first stage over so that the balance chamber is facing up.

23 Install the valve lifter into the first stage block…



…press on the valve lifter to verify contact and spring resistance with the high pressure valve.

24 Install the diaphragm. (Make certain that the diaphragm is seated below the threads and is in contact with the seating surface.)



a Thrust washer **b** Plastic washer **c** Spring carrier

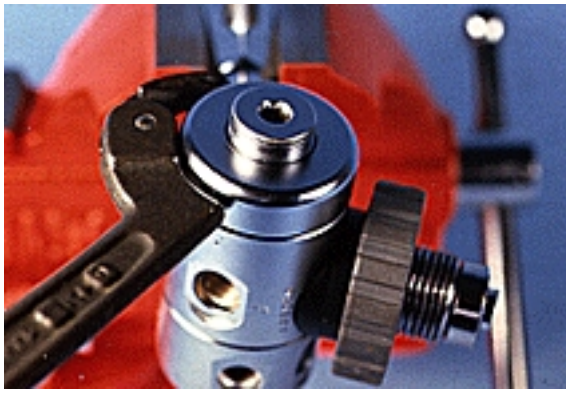
25 Install the thrust washer (a).

26 Place the spring carrier on the top center of the diaphragm (c).

27 Place the plastic washer on the spring carrier (b).

28 Install the adjusting screw two turns into the diaphragm cap.

29 Place the intermediate pressure spring onto the spring carrier.

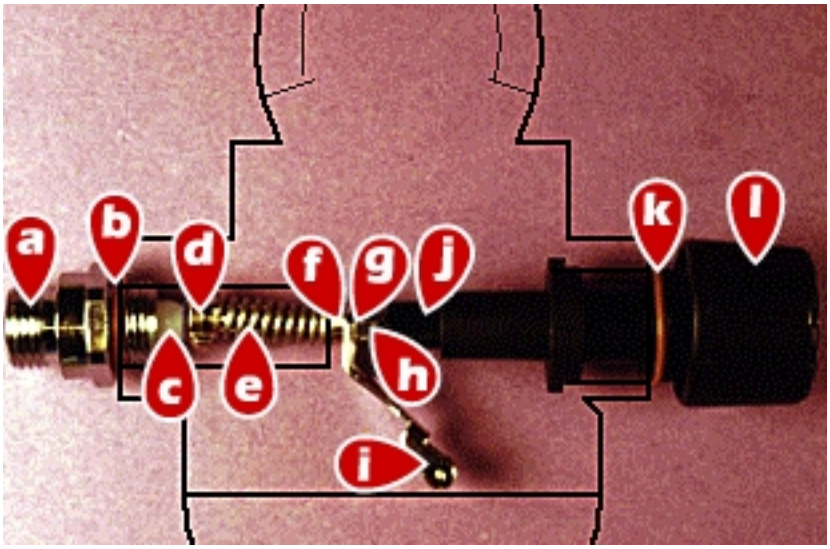


30 Place the diaphragm cap over the spring and screw the cap down completely.

31 Tighten the diaphragm cap firmly using the spanner wrench with steady even pressure.

The first stage is now reassembled and ready for adjustment.

Second Stage Overview



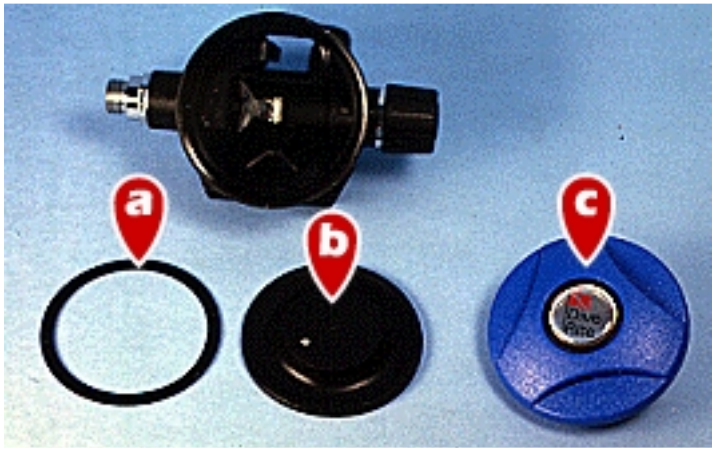
a Inlet nipple
b O-ring
c Inlet valve
d Piston
e Spring
f Spacing washer
g Spacing washer
h Packing nut
i Lever arm
j Adjustment shaft
k O-ring
l Adjustment knob

Adjustable Second Stage Disassembly

1 Remove the low-pressure hose from the second stage using 3/4-inch and 11/16-inch wrenches.

2 Remove the two O-rings from the low-pressure hose.

3 Use a 3/4-inch wrench to loosen and remove the inlet nipple.



a Retainer ring **b** Diaphragm **c** Front cover

4 Unscrew the front cover (no tools required).

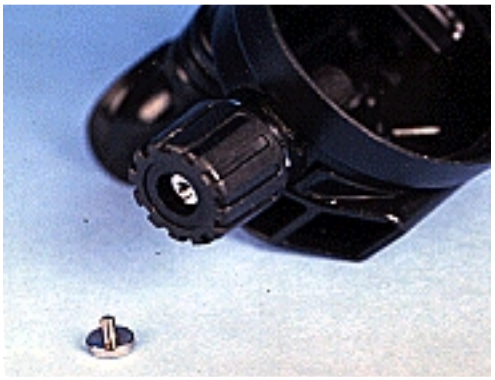
5 Remove the retainer ring.

Note: On second stages made from late 2000 on, the retainer ring, plastic second stage cover and purge button assembly are replaced by this soft rubber second stage cover and metal retainer ring.

6 Remove the diaphragm.

7 Turn the adjustment knob counter clockwise, as far as it will go.

8 Remove the decal from the adjustment knob.

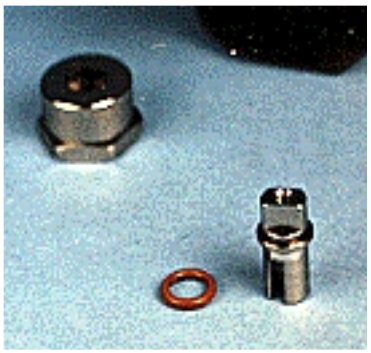


9 Using a flat tipped screwdriver remove the screw from the adjustment knob.

10 Remove the adjustment knob by pulling gently.

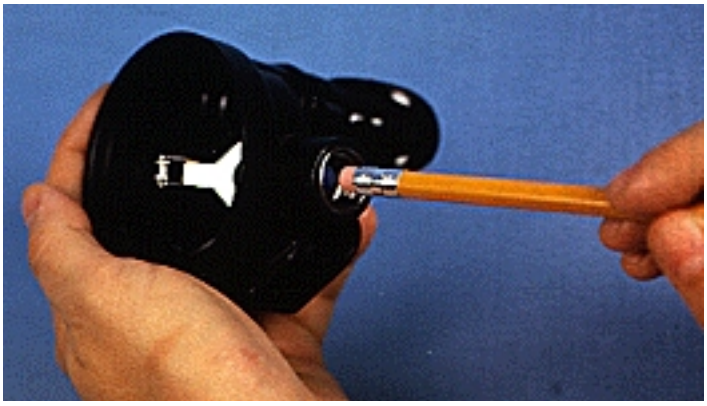
11 Using a 3/4-inch wrench remove the packing nut.

12 Remove the adjustment shaft that goes through the packing nut.

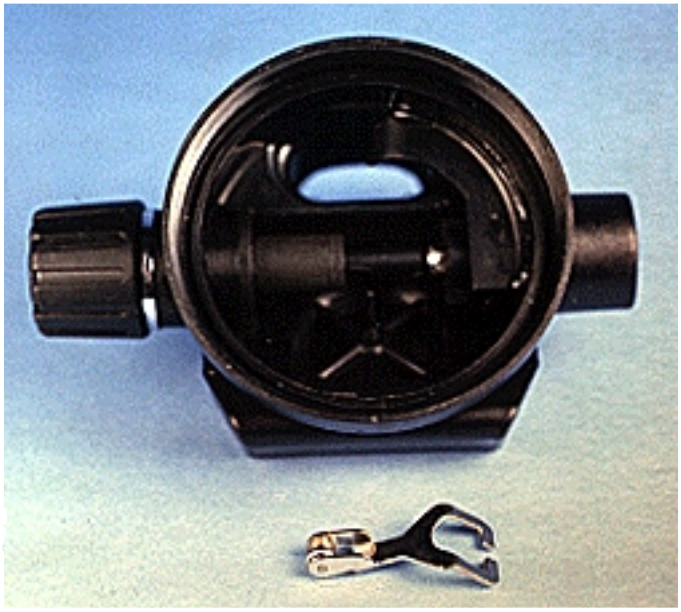


13 Remove the O-ring from the shaft.

14 Unscrew the interior adjustment screw with needle nose pliers and remove the entire assembly. Clean and lubricate all the adjustment assembly's interior parts.



15 Insert the **eraser** side of a number 2 pencil against the LP piston. (This will cause the piston to move into the housing. The lever arm will lower. Continue to press firmly until the lever arm can be removed.)



16 Remove the lever arm.

17 Remove the adjustment housing, remove the O-ring from the housing.

18 Using a 1/4-inch, open-end wrench, loosen and remove the stainless locking nut. It will be necessary to hold the piston with the tip of your index finger to keep it from rotating.

(Note: count the threads exposed before removing the nut.)

a Spacing washers **b** Spring **c** Piston

19 Remove the two spacing washers.

20 Remove the piston and spring.

21 Remove the seating surface from the piston using a pick.

22 Cut the tie-wrap that surrounds the mouthpiece.

23 Remove the mouthpiece (this also allows the exhaust tee to be removed).

24 Use a small, flat-tipped screwdriver to carefully pry the exhaust tee loose. (Use the small spaces provided under the inlet and adjustment tube ports.)

25 Remove the exhaust tee.

26 Remove the exhaust valve by pulling gently.

The second stage is now ready for parts replacement, cleaning, reassembly and adjustment.

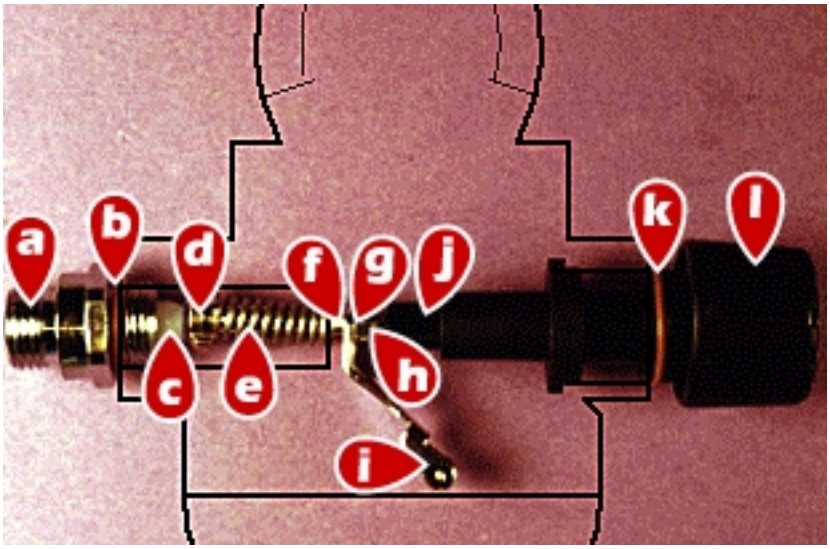
Servicing Disassembled Second Stage Parts

Dive Rite makes available all the items you should replace as part of a normal second-stage overhaul in kit form. This kit contains:

1264 LP seat
1255 O-ring
1257 O-ring
1258 O-ring
1263 Adjustable orifice
1266 Nylon insert nut
1267 Decal

1. From the collection of disassembled first stage parts, remove and package those items that will be replaced by items from the service kit.
2. Thoroughly clean the remaining items in a solution compatible with Nitrox service.
3. When lubricating O-rings, use only Nitrox-compatible lubricants, such as Techno Lube.

Second Stage Reassembly



a Inlet nipple
b O-ring
c Inlet valve
d Piston
e Spring
f Spacing washer
g Spacing washer
h Packing nut
i Lever arm
j Adjustment shaft
k O-ring
l Adjustment knob

1 Install the exhaust valve.

2 Lubricate and install the 1257 O-ring onto the adjustment tube.

3 Re-install the adjustment tube into the second stage (remember to align the collar properly).

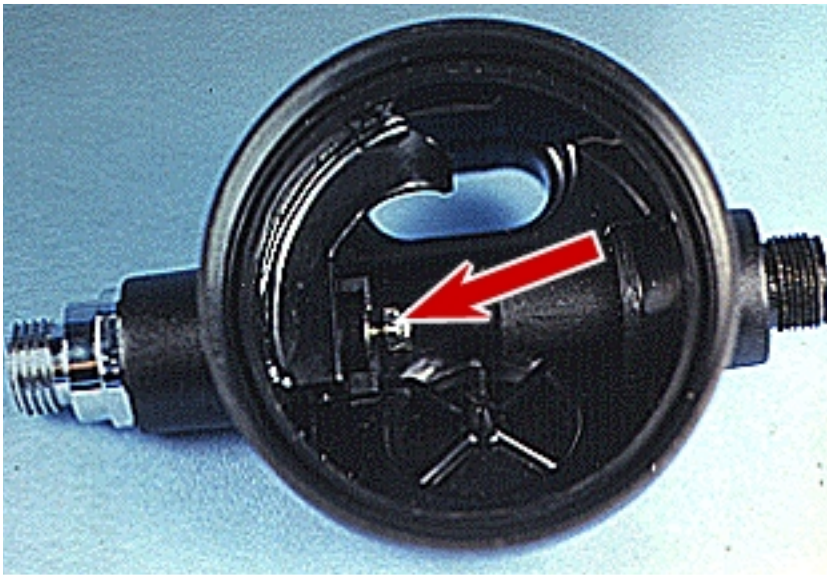
4 Install the valve seat into the piston.

5 Place the spring over the piston.

6 Install this assembly into the inlet nipple opening.

7 Temporarily install the inlet nipple (this will hold the piston in place and make the next step easier).

8 Install the thin spacing washer, followed by the fat spacing washer.

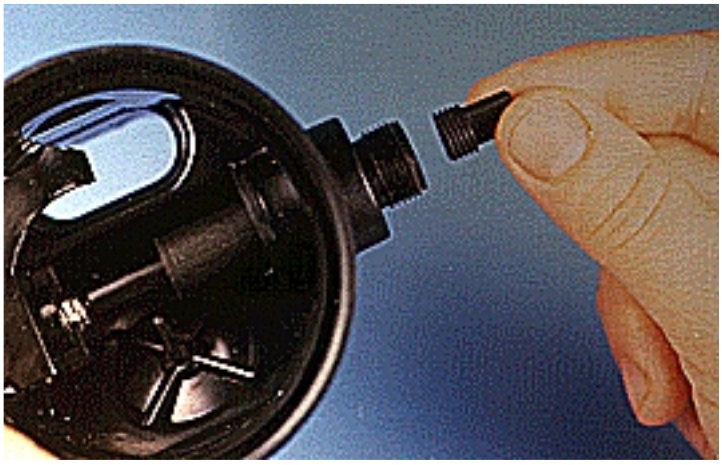


9 Install the nylon insert nut onto the piston finger tight.

10 Remove the inlet nipple.

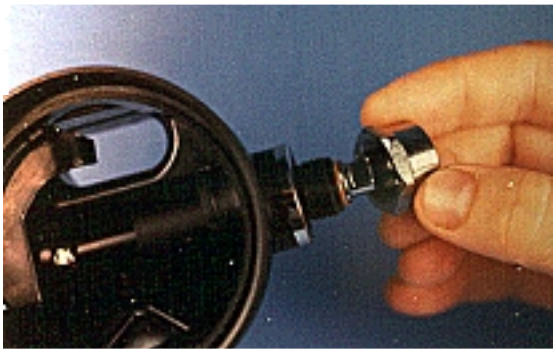
11 Using a 1/4-inch wrench, tighten the stainless nylon insert nut the same number of threads as you counted when disassembling the second stage.

12 Install the pushrod, spring and backing pad into the adjustment tube housing.



13 Screw the interior adjustment shaft into the adjustment tube housing.

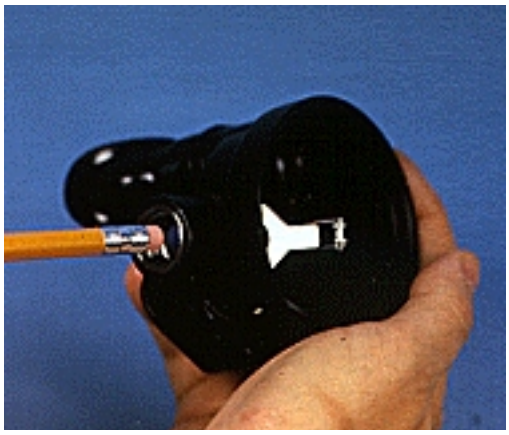
14 Install the O-ring on the adjustment shaft.



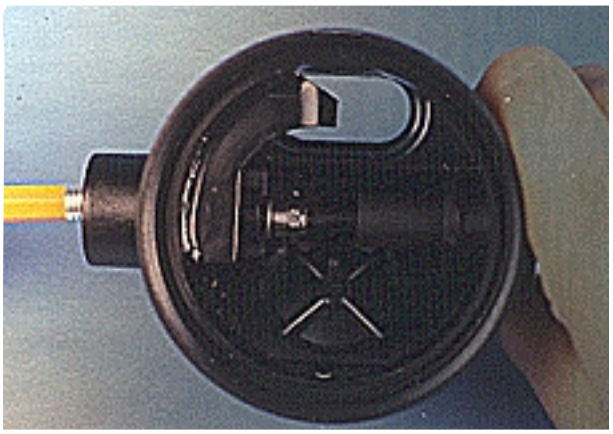
15 Install shaft into housing.

16 Install the packing nut and tighten with a 3/4-inch wrench.

17 Install the lockdown screw and tighten with a flat-tipped screwdriver.



18 Using the eraser of a number 2 pencil compress the piston to the point where the washers are exposed.

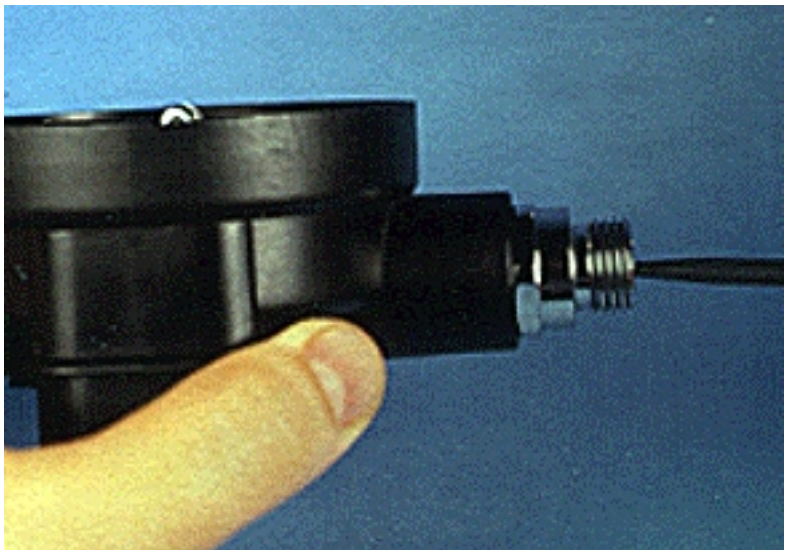


19 Install the lever arm **between** the two washers.

20 Lubricate and install the 1255 O-ring onto the inlet nipple. Install a new 1263 inlet orifice.

21 Install the inlet nipple into the second stage housing.

22 Tighten with a 3/4-inch wrench.



23 Using a flat-tipped screwdriver, tighten the inlet valve until the lever arm is just slightly above the second stage body threads.

24 Install the diaphragm.

25 Place the retainer ring over the diaphragm.

26 Install the second stage cover.

27 Install the exhaust tee (make certain the locking clips engage on both sides of the housing).

28 Install the mouthpiece and secure with a pull tie.

29 Lubricate and install new O-rings on the low-pressure hose. Attach hose to a first stage **low-pressure** port.

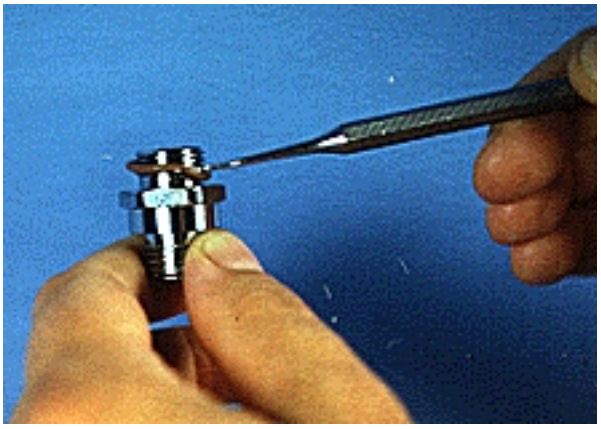
Non-Adjustable Second Stage Disassembly

1 Remove the low-pressure hose from the first stage using a 9/16-inch wrench.

2 Remove the low-pressure hose from the second stage using a 3/4-inch and 11/16-inch wrenches.

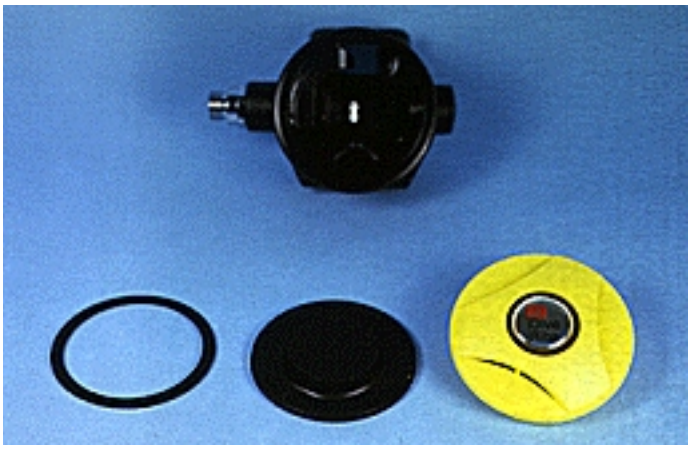
3 Remove the two O-rings from the low-pressure hose.

4a Use a 3/4-inch wrench to loosen and remove the inlet nipple.



4b Remove the O-ring from the inlet nipple.

5 Unscrew the front cover (no tools required).

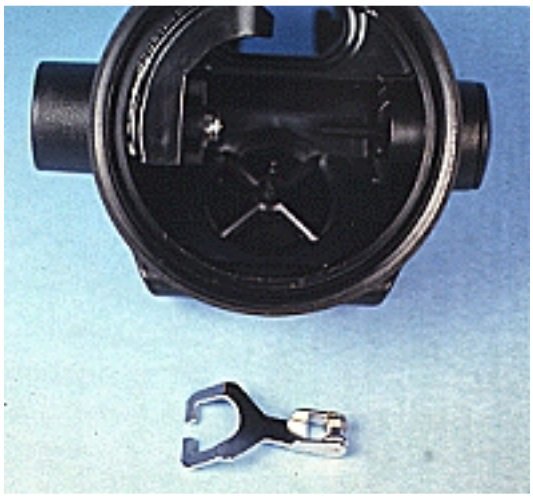


6 Remove the retainer ring and diaphragm.

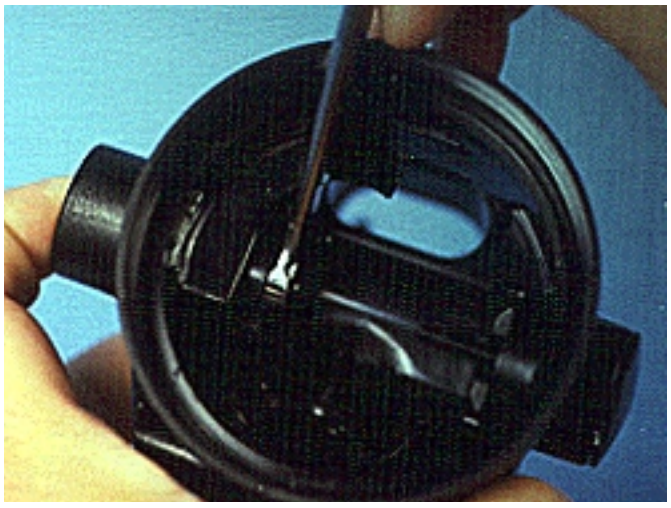
Note: On second stages made from late 2000 on, the retainer ring, plastic second stage cover and purge button assembly are replaced by this soft rubber second stage cover and metal retainer ring.

7 Insert the eraser end of a number 2 pencil and press against the low-

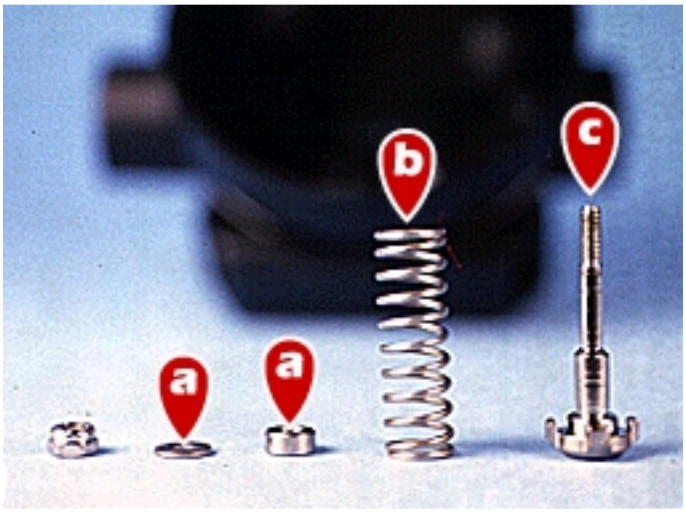
pressure piston. This will cause the piston to move into the housing. The lever arm will lower; continue pressing until you reach the point where the lever arm can be removed.



8 Remove the lever arm.



9 Using a 1/4-inch wrench loosen and remove the nylon insert nut. It will be necessary to hold the piston with the tip of your index finger to keep it from rotating. **Note:** count the number of threads exposed before removing the nut.



a Spacing washers **b** Spring **c** Piston

10 Remove the two spacing washers.

11 Remove the piston and the spring.

12 Remove the seating surface using a pick.

13 Cut the tie wrap that surrounds the mouthpiece and remove the mouthpiece.

14 Use a small, flat-tipped screw driver and Carefully pry the exhaust tee loose by using the spaces provided.

…the exhaust tee can now be removed.

15 Remove the exhaust valve by pulling gently.

The second stage is now ready for parts replacement, cleaning, reassembly and adjustment.

Servicing Disassembled Second Stage Parts

Dive Rite makes available all the items you should replace as part of a normal second-stage overhaul in kit form. This kit contains:

1264 Low-pressure seat
1255 O-ring
1263 Adjustable orifice
1266 Nylon insert nut
1260 O-ring

1. From the collection of disassembled first stage parts, remove and package those items that will be replaced by items from the service kit.
2. Thoroughly clean the remaining items in a solution compatible with Nitrox service.
3. When lubricating O-rings, use only Nitrox-compatible lubricants, such as Techno Lube.

Non-Adjustable Second Stage Reassembly

1. Install the exhaust valve.

2 Install the valve seat into the piston.

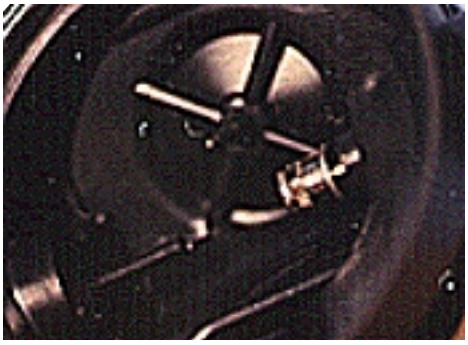
3 Place the spring over the piston.

4 Install this assembly into the inlet nipple opening.

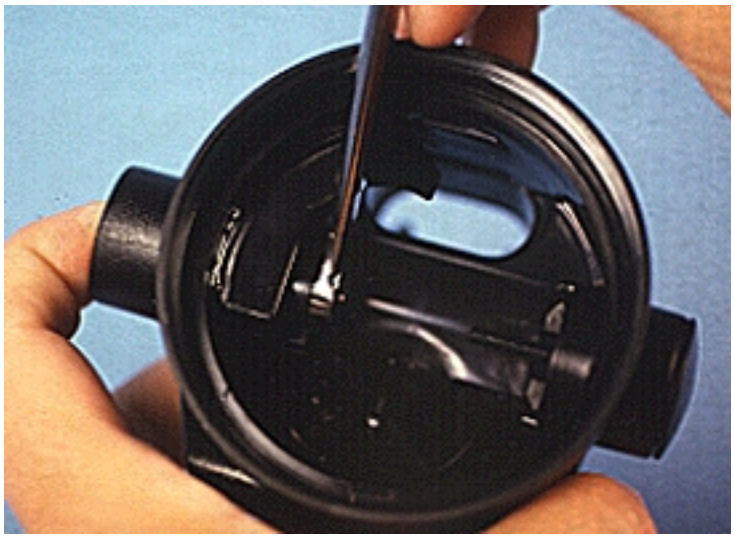
5 Temporarily install the inlet nipple (this will hold the piston in place

and make the next step easier).

6 Install the thin spacing washer, followed by the fat spacing washer.



7 Install the nylon insert nut onto the piston finger tight.

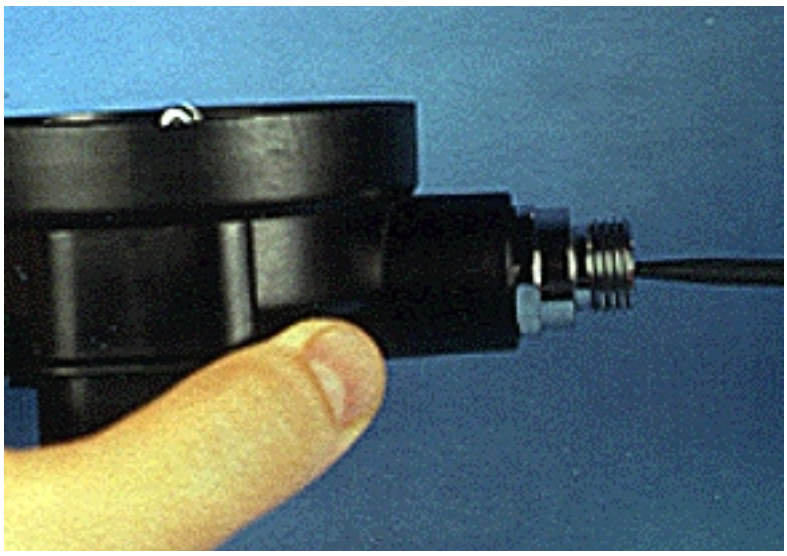


8 Remove the inlet nipple.

9 Using a 1/4-inch wrench, tighten the stainless nylon insert nut the same number of threads as you counted when disassembling the second stage.

10 Using the eraser of a number 2 pencil compress the piston to the point where the washers are exposed.

11 Install the lever arm **between** the two washers.



13 Using a flat-tipped screwdriver, tighten the inlet valve until the lever arm is just slightly above the second stage body threads.

14 Lubricate and install the 1255 O-ring onto the inlet nipple. Install a new 1263 inlet orifice.

15 Install the inlet nipple into the second stage housing.

16 Tighten with a 3/4-inch wrench.

17 Install the diaphragm.

18 Place the retainer ring over the diaphragm.

19 Install the second stage cover hand tight.

20 Install the exhaust tee (make certain the locking clips engage on both sides of the housing).

21 Install the mouthpiece and secure with a pull tie.

29 Lubricate and install new O-rings on the low-pressure hose. Attach hose to a first stage **low-pressure** port.

First Stage Adjustment

1 Connect first stage to a high-pressure (3,000 psi) source.

2 Open the supply pressure slowly.

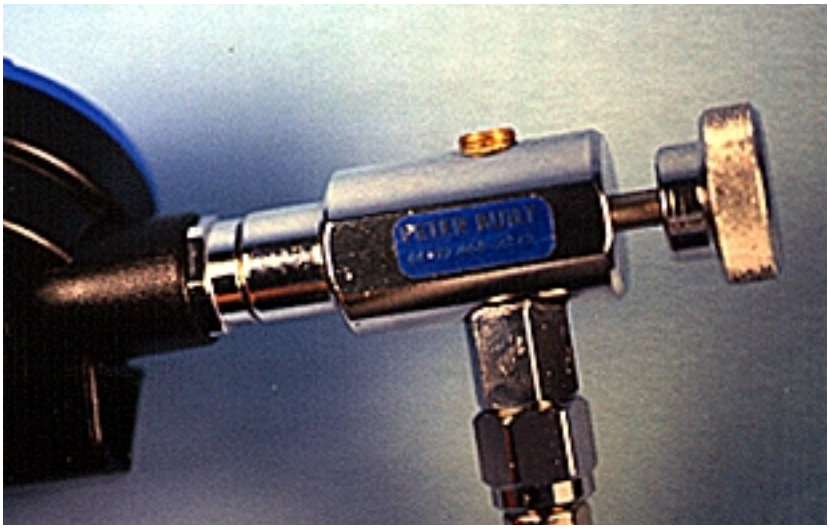
3 Adjust intermediate pressure by turning the adjusting screw to increase or decrease tension on the intermediate pressure spring. After each adjustment, purge the regulator.

4 Continue moving the adjusting screw until the intermediate pressure reaches 140 psi (±5 psi).

5 Reduce the supply pressure to between 300 and 500 psi. The intermediate pressure should remain within one to two psi of what it was at high pressure.

6 Reset the supply pressure to 3,000 psi. The intermediate pressure should return to its original setting. (**Note:** You may need to purge the regulator several times to enable the high-pressure seat to "break in" and hold pressure.)

Second Stage Adjustment



1 Install an in-line adjustment tool between the second stage and its low-pressure hose. Make certain all other first stage ports are sealed with hoses or port plugs.

2 On adjustable second stages, turn the adjustment knob counterclockwise until it stops. This will set the second stage for its lowest possible breathing resistance. (By doing so, users can use the knob in increase breathing resistance, if desired; however, they should not be able to turn the adjustment knob to the point where the regulator free flows.)

3 Using the in-line adjustment tool, set breathing resistance to between 0.6 and 0.8 inches of water.

4 Observe what happens to intermediate pressure when you purge the regulator. A drop of between two and eight psi is acceptable.

Troubleshooting

Problem	Cause/Solution
Freeflow	• Check intermediate pressure • Adjust second-stage inlet valve • Replace second-stage piston seat • Check first stage high-pressure seat; clean or replace, as needed

Problem	Cause/Solution
Intermediate Pressure "Creeps"	• Dirty or damaged first stage high-pressure set; clean or replace as needed

Problem	Cause/Solution
Hard Inhalation	• Check second stage adjustment knob • Check second stage demand lever height • Check "cracking" pressure • Intermediate pressure set too low

Problem	Cause/Solution
Regulator Free Flows When Adjustment Knob Set to Least Resistance	• Re-tune regulator

Problem	Cause/Solution
Second Stage Leaks Water	• Damaged exhaust valve or diaphragm; replace as needed • Tighten second stage cover • Defective mouthpiece; replace

Problem	Cause/Solution
Low Air Flow	• Cone-shaped filter clogged; replace • Intermediate pressure set too low

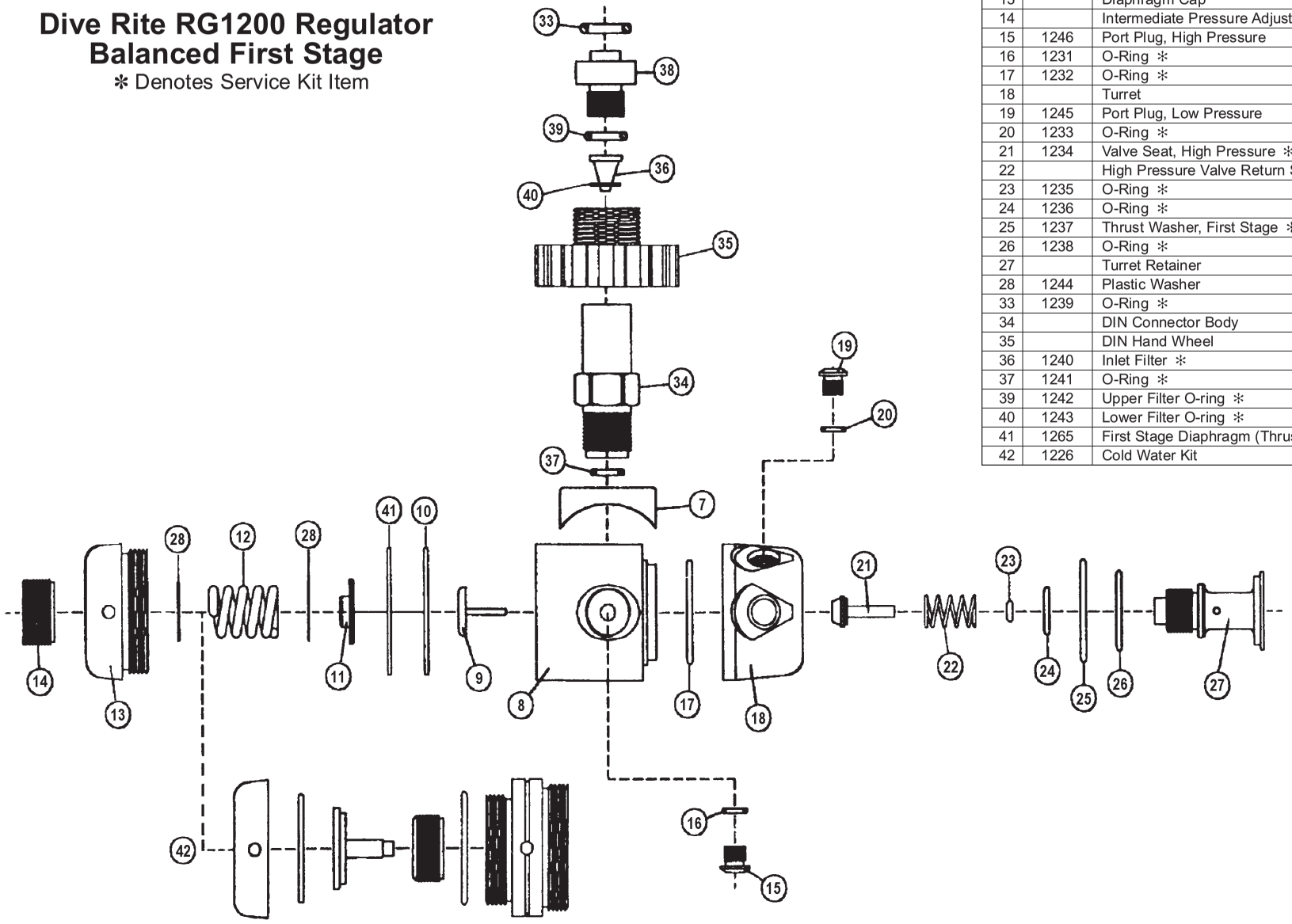
Problem	Cause/Solution
Regulator Purge Volume Low	• Inlet valve set too low • Demand lever height too low

Cold Water Kit Installation:

1. Remove Diaphragm Cap (diagram item number 13) from first stage.
2. Remove Intermediate Pressure Adjustment Screw (diagram item number 14) from Diaphragm Cap.
3. Install Intermediate Pressure Adjustment Screw into the Cold Water Diaphragm Cap.
4. Replace Diaphragm and thrust washer.
5. Install Cold Water Diaphragm Cap.
6. Adjust intermediate pressure to 140 psig.
7. Install plunger (black plastic piece) into Intermediate Pressure Adjustment Screw.
8. Install Insulator Cap.

Dive Rite RG1200 Regulator
Balanced First Stage

✻ Denotes Service Kit Item



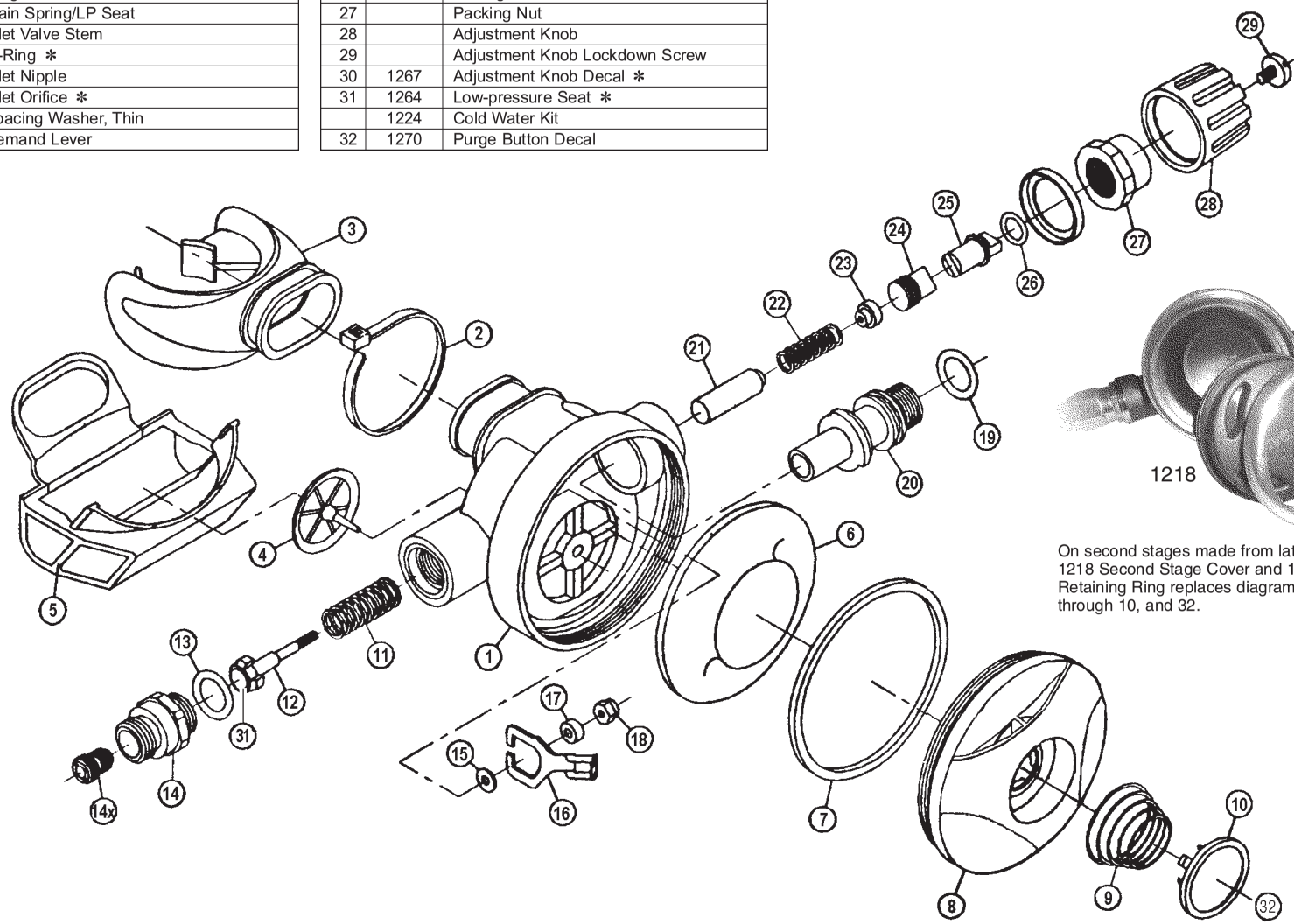
No.	Part No.	Description
7		DIN Connector Saddle
8		First Stage Body
9		Valve Lifter
10	1230	Diaphragm ✻
11		Spring Carrier
12		Intermediate Pressure Spring
13		Diaphragm Cap
14		Intermediate Pressure Adjustment Screw
15	1246	Port Plug, High Pressure
16	1231	O-Ring ✻
17	1232	O-Ring ✻
18		Turret
19	1245	Port Plug, Low Pressure
20	1233	O-Ring ✻
21	1234	Valve Seat, High Pressure ✻
22		High Pressure Valve Return Spring
23	1235	O-Ring ✻
24	1236	O-Ring ✻
25	1237	Thrust Washer, First Stage ✻
26	1238	O-Ring ✻
27		Turret Retainer
28	1244	Plastic Washer
33	1239	O-Ring ✻
34		DIN Connector Body
35		DIN Hand Wheel
36	1240	Inlet Filter ✻
37	1241	O-Ring ✻
39	1242	Upper Filter O-ring ✻
40	1243	Lower Filter O-ring ✻
41	1265	First Stage Diaphragm (Thrust) Washer ✻
42	1226	Cold Water Kit

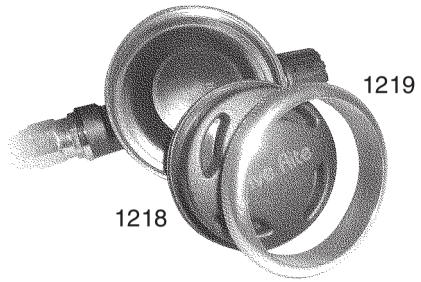
Dive Rite RG1200 Regulator
Adjustable Second Stage

✻ Denotes Service Kit Item

No.	Part No.	Description
1		Second Stage Body
2	9320	Pull Tie
3	1250	Mouthpiece
4	1251	Exhaust Valve
5		Exhaust Tee
6	1252	Diaphragm
7	1274	Diaphragm Retainer Ring
8	1227	Second Stage Cover
9	9804	Spring, Purge Button Return
10	9803	Purge Button
11	1253	Main Spring/LP Seat
12	1254	Inlet Valve Stem
13	1255	O-Ring ✻
14	1256	Inlet Nipple
14x	1263	Inlet Orifice ✻
15		Spacing Washer, Thin
16		Demand Lever

No.	Part No.	Description
17		Spacing Washer, Fat
18	1266	Nylon Insert Nut ✻
19	1257	O-Ring ✻
20		Adjustment Housing
21		Interior Adjustment Screw
22		Adjustment Screw Spring
23		Adjustment Screw Button
24		Adjustment Carrier
25		Adjustment Shaft
26	1258	O-Ring ✻
27		Packing Nut
28		Adjustment Knob
29		Adjustment Knob Lockdown Screw
30	1267	Adjustment Knob Decal ✻
31	1264	Low-pressure Seat ✻
	1224	Cold Water Kit
32	1270	Purge Button Decal

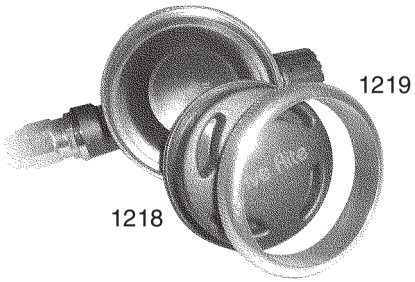




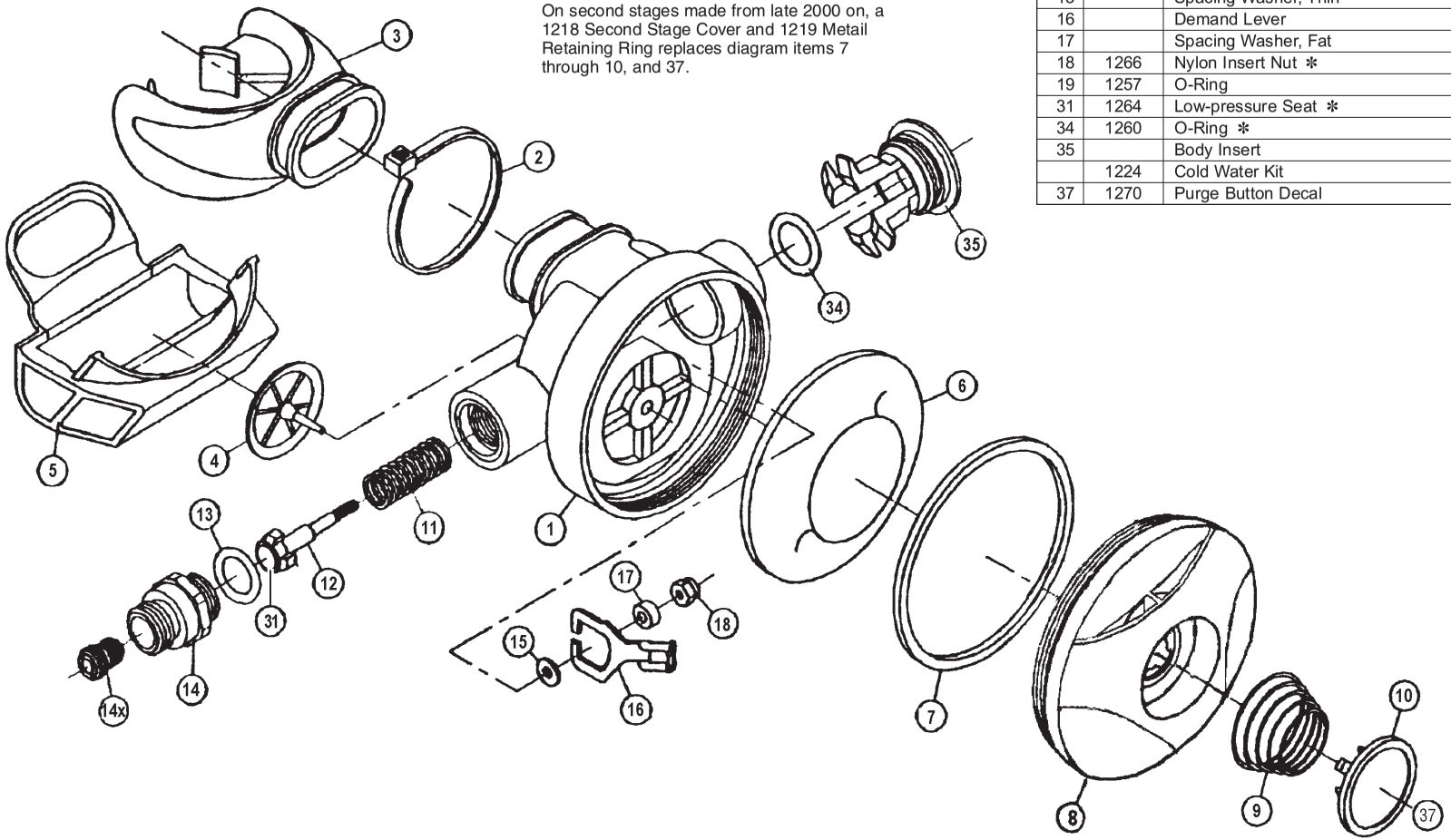
On second stages made from late 2000 on, a 1218 Second Stage Cover and 1219 Metail Retaining Ring replaces diagram items 7 through 10, and 32.

Dive Rite RG1200 Regulator
Non-Adjustable Second Stage

✻ Denotes Service Kit Item



On second stages made from late 2000 on, a 1218 Second Stage Cover and 1219 Metail Retaining Ring replaces diagram items 7 through 10, and 37.



No.	Part No.	Description
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3	1250	Mouthpiece
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11	1253	Main Spring/LP Seat
12	1254	Inlet Valve Stem
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14	1256	Inlet Nipple
14x	1263	Inlet Orifice ✻
15		Spacing Washer, Thin
16		Demand Lever
17		Spacing Washer, Fat
18	1266	Nylon Insert Nut ✻
19	1257	O-Ring
31	1264	Low-pressure Seat ✻
34	1260	O-Ring ✻
35		Body Insert
	1224	Cold Water Kit
37	1270	Purge Button Decal