

RAP R11: Low Pressure Air Relay Valve Service and Adjustment
ARV-VA001-102-00
05/05/11

Low Pressure Diaphragm-Operated Air Relay Valve

Service and Adjustment for VA001-102-01 & VA001-102-02

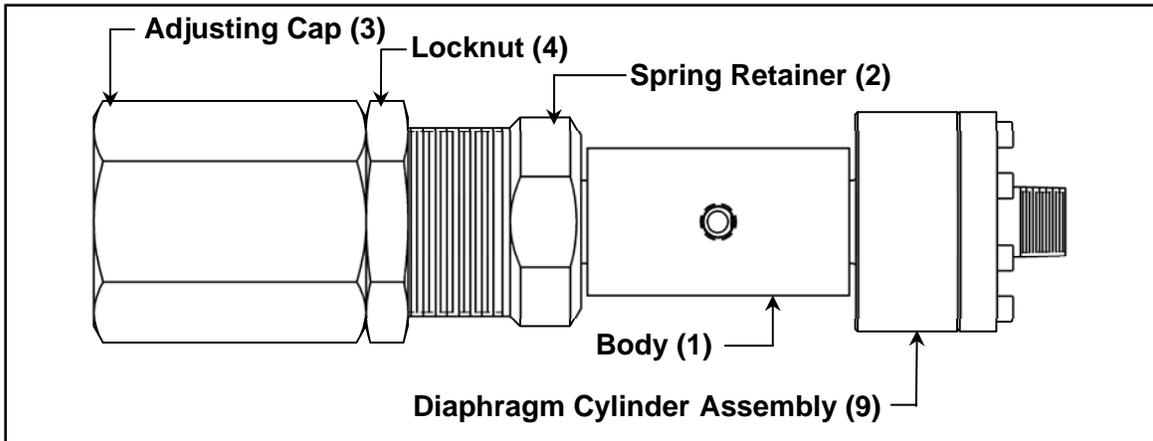


Figure 1: Air Relay Valve with 1-1/4 Diaphragm

A. Disassemble and Clean

Information enclosed in brackets (item 1 etc.) is in reference to the complete assembly drawings on page 6 and the illustrations throughout the document.

1. Remove spring retainer (item 2), adjusting cap (item 3) and locknut (item 4), by unscrewing as a unit, from the body (item 1) and set aside.
2. Remove diaphragm cylinder assembly (item 9), by unscrewing as a unit, from the body (item 1) and set aside.
3. Slowly pull valve stem (item 7) out of body (item 1) and set aside on a clean surface.
4. Carefully remove end valve sleeves (item 6) and center valve sleeve (item 5).

Note how they go together.

5. Clean stem (item 7) with a soft cloth, Do Not scratch the stem. Clean the end sleeves (item 6) and center sleeve (item 5).
6. Lubricate and install new outer o-ring (item 10) and install new inner o-ring (item 11), without lube, on one end sleeve (item 6). From the spring retainer end, fit the end sleeve into the bore of the body with the o-rings toward the spring retainer threads. Insert the sleeve until the outer o-ring is about to enter the bore. (See Figure 2.)

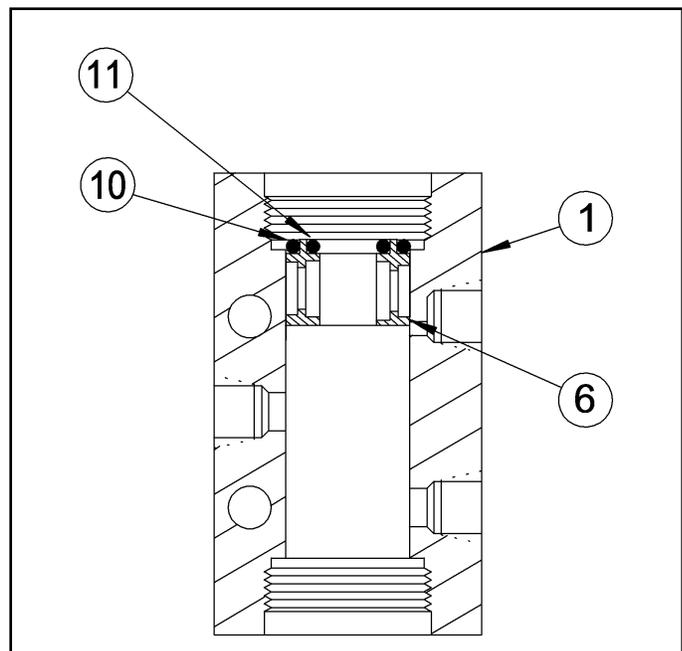


Figure 2: Placing End Sleeve Seals

7. Install the spring retainer (item 2), adjusting cap (item 3) and locknut (item 4), as a unit. As you thread the spring retainer in, it will push the o-ring and sleeve into the bore to the correct position. Tighten spring retainer hand tight. (See Figure 3)

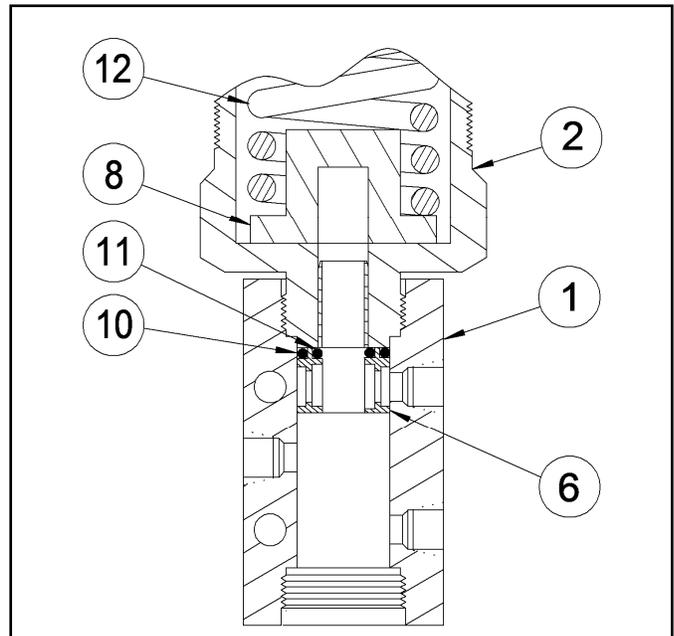


Figure 3: Installing Spring Retainer

8. Turn the valve body (item 1) so that the open end of the bore is up. Install new inner o-rings (item 11), without lube, in the center sleeve (item 5). Place new lubricated o-ring (item 10) in the bore of the body (item 1) on top of the end sleeve (item 6). (See Figure 4)
9. Carefully slide the center sleeve (item 5) into the bore in of the body. When it reaches the outer o-ring (item 10), lying on the end sleeve (item 6), press the center sleeve to seat the o-ring. (See Figure 5)

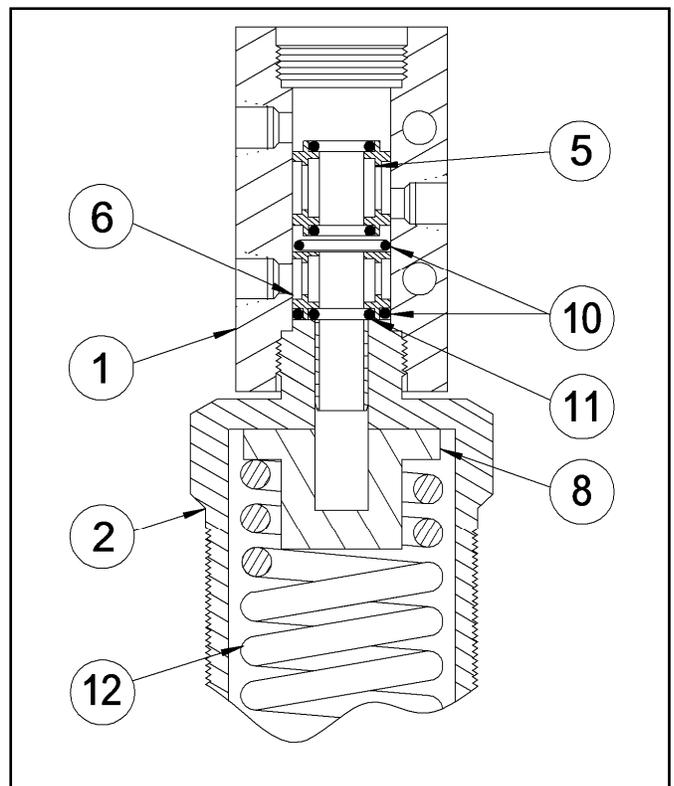


Figure 4: Placing Center Sleeve

10. Place a lubricated outer o-ring (item 10) in the bore of the body (item 1) on top of the center sleeve (item 5). Do not try to seat o-ring at this time. (See Figure 5)

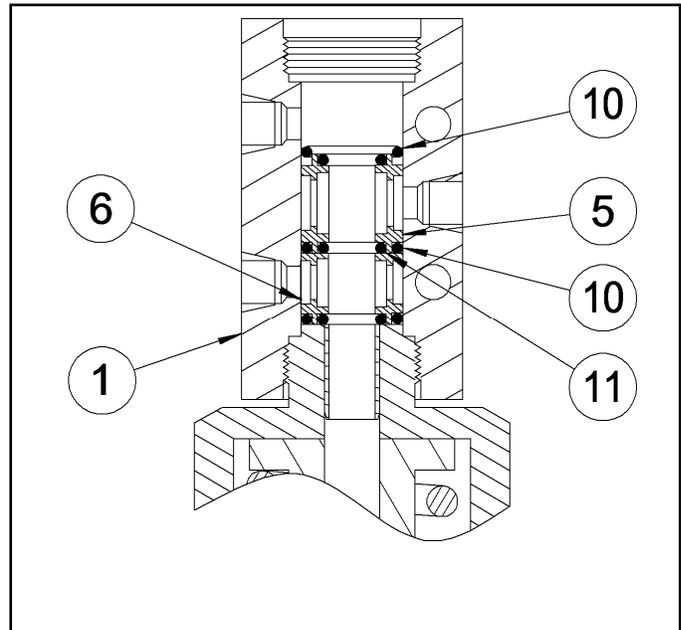


Figure 5: Center Sleeve Seated

11. Install new inner o-rings (item 11), without lube, and lubricated outer ring (14) in the second end sleeve (item 9). Slide the end sleeve into the bore of the body (item 1) with the o-ring grooves out toward the cylinder threads. Insert the sleeve until the outer o-ring is about to enter the bore. (See Figure 6)
12. Disassemble the diaphragm cylinder by removing the 10-32 x 3/4" socket head cap screws (items 9-8) retaining the end cap (item 9-7) and remove the diaphragm assembly (item 9-3) from the cylinder (item 9-1). Discard the old diaphragm assembly (item 9-3). (See Figure 8)

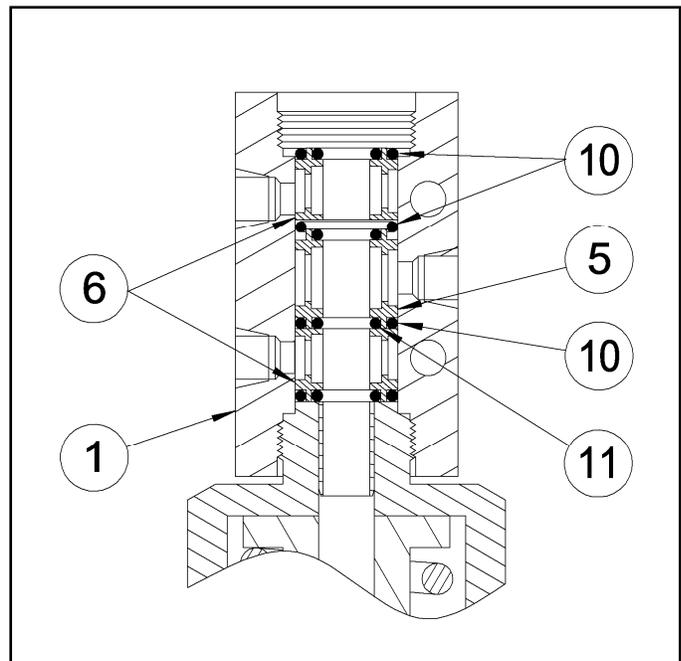


Figure 6: Placing Last End Sleeve

13. Clean the cylinder and end cap.
Check the breather (item 9-10) and clean if needed.
14. Install the cylinder (item 9-1). As you thread the cylinder in, it will push the o-ring and sleeve into the bore to the correct position. This action will also seat the o-ring in the center sleeve. Tighten cylinder (item 9-1) hand tight to the body (item 1).

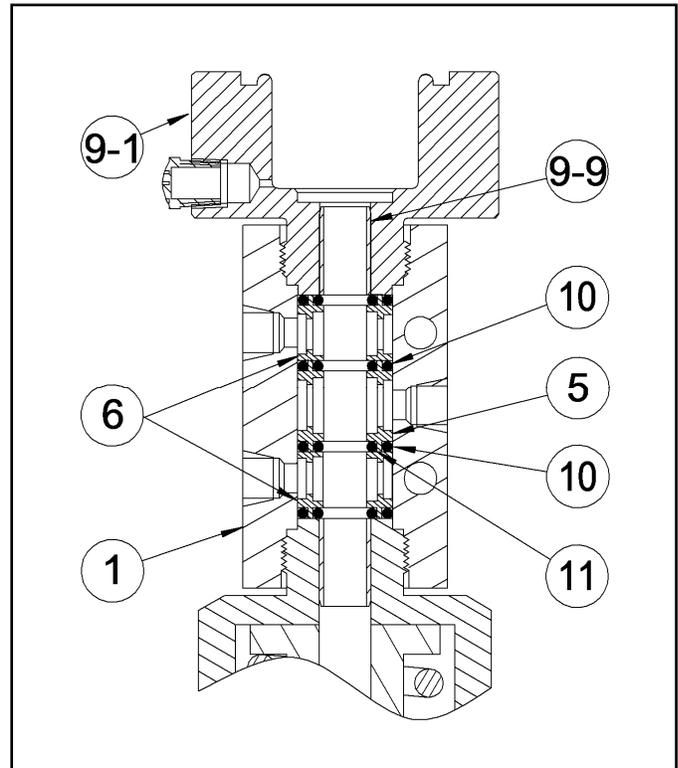


Figure 7: Installing Cylinder

15. Lubricate the tip of the stem (item 7), note taper, and carefully insert taper end first, pushing it through bearing (item 9-9) toward the spring end (item 3). (See Figure 8)

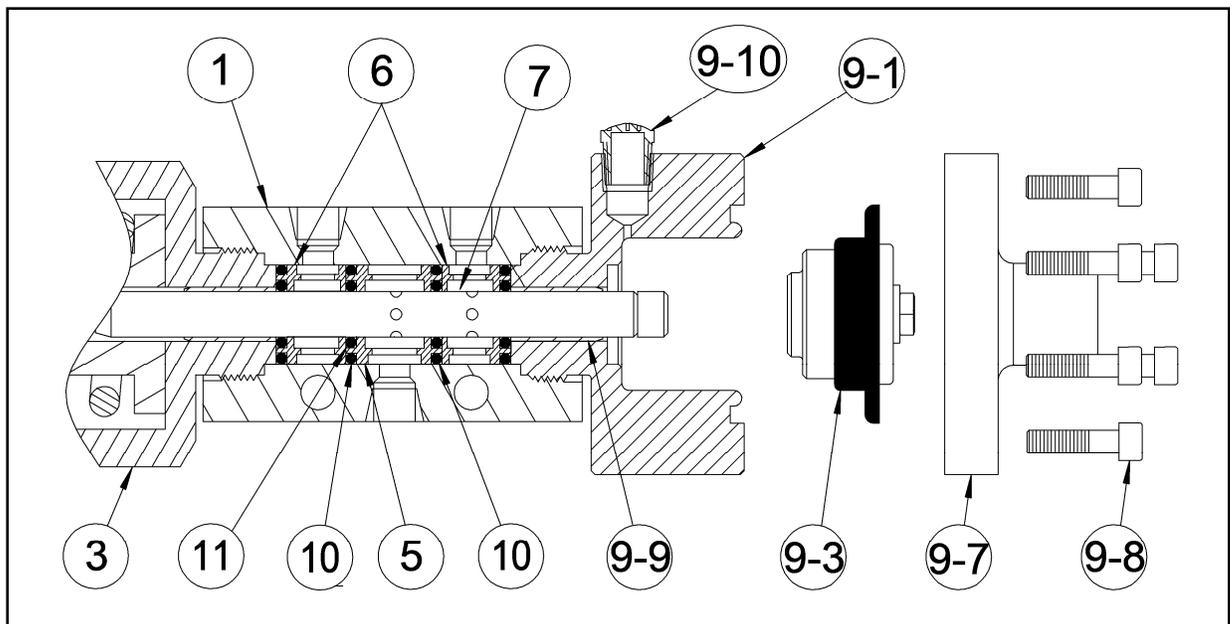


Figure 8: Completing Assembly

16. Lubricate the seal ring on the new diaphragm assembly and install it in the cylinder.
Note: The diaphragm assembly is not repairable and must be replaced in its entirety.
17. Place the end cap on the cylinder.
18. Lubricate the $\frac{3}{4}$ "x10-32 screws with Never-seeze® and torque to 20 In-Lbs max. in a criss-cross pattern.
19. Hold the assembly by gripping the diaphragm cylinder assembly, item 9, and using a wrench on the spring retainer flats (item 3) tighten the complete assembly. Torque to 120 inch pounds.

B. Valve Setting Procedure

1. Mount the air relay valve in a stand that has a 150-psi maximum supply with an adjustable self-venting regulator. Connect the adjustable supply to the pilot port in the end of the diaphragm cylinder (item 9).
2. Install a pressure gauge that reads up to 300-psi in the body cylinder port.
3. Install a 150-psi air supply in the normally open or normally close port.
4. Gradually increase or decrease the pressure, at the pilot port until the valve trips. When the valve trips read the pilot supply gage and make a note of the pressure.
5. To adjust the trip point, remove pressure on the pilot and rotate the adjusting cap (item 3) clockwise to increase or counter clockwise to decrease. Always remove pressure at the pilot before adjusting the adjusting cap.
6. Adjust the cap (item 3) and take pressure readings until the valve trips at the required pressure.
7. Tighten the locknut (item 4) to maintain the setting achieved.

If any further information is required, please feel free to contact:

Emerson Process Management
Valve Automation Inc.
2500 Park Avenue West
Mansfield, Ohio 44906

Phone: (419) 529-4311
Fax: (419) 529-3688

Please visit our website for up to date product data. www.shafervalue.com

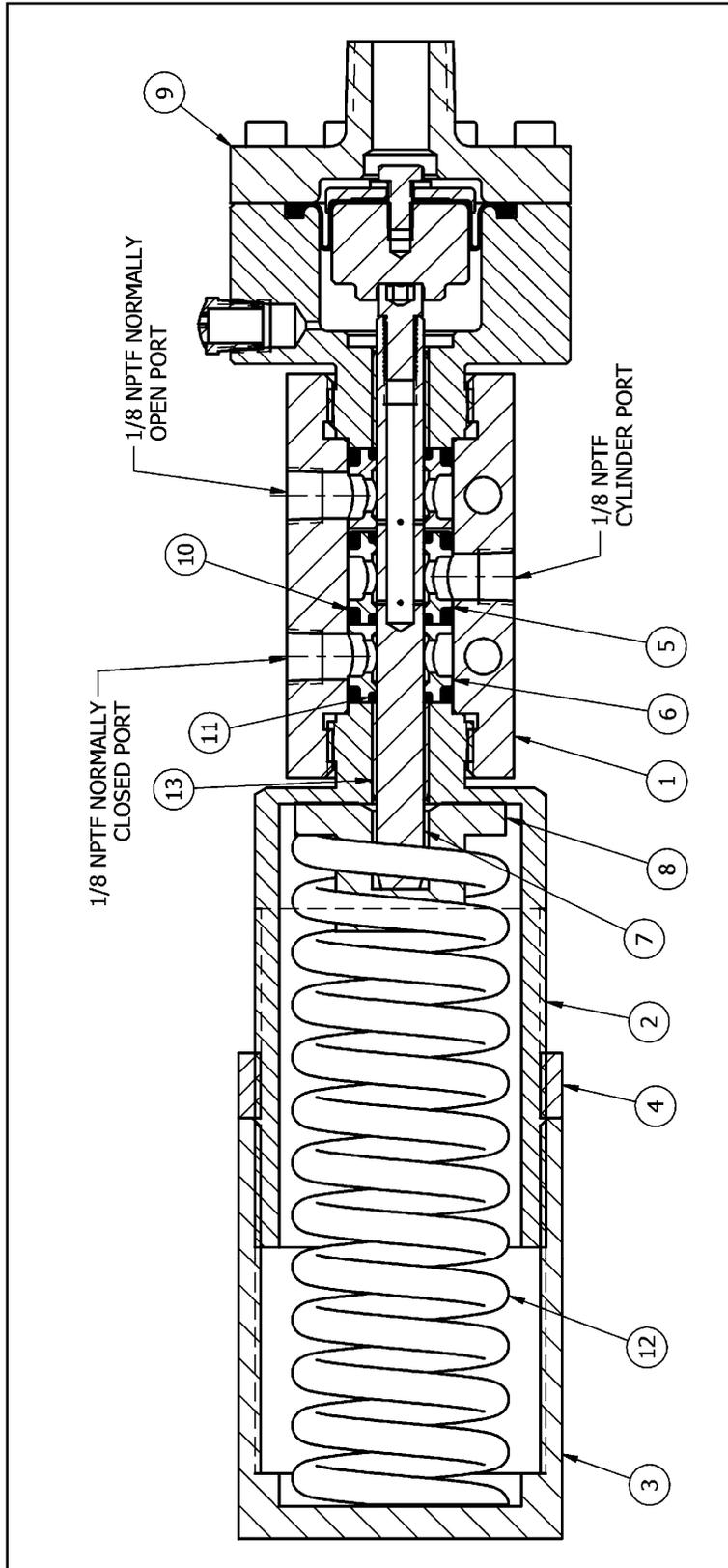
The contents of this publication are presented for informational purpose only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. We reserve the right to modify or improve the designs or specifications of such products at any time with out notice.

RAP R11: Low Pressure Air Relay Valve Service and Adjustment

ARV-VA001-102-00

05/05/11

Air Relay Valve



View from VA001-102-00 assembly drawing of valves VA001-102-01 (Buna-N seals) and VA001-102-02 (Fluorocarbon seals).