6” – 8” Deringer 40/50 Maintenance Instructions

READ INSTRUCTIONS IN FULL BEFORE INSTALLATION.

QUESTIONS? CALL 916-760-4524 M-F 8:00 AM – 4:30 PM PST

At Backflow Direct we are committed to making our products as easy to install as possible. We design for most contingencies, but installation may be different based on your regional regulations or system design. We are continually improving our products and instructions – please help us by providing recommendations as to how we can improve or products or instructions.

If you have any difficulties at all, please give us a call. Thank you for purchasing our product!

IMPORTANT NOTE: We use Stainless Steel Hardware where possible. Therefore, it is best to have Silver Anti-seize available to use on all non-wetted bolts—only a small amount is needed.

WARRANTY INFORMATION: Please visit our website for our official warranty www.backflowdirectwarranty.com

NEVER INSTALL AN RP OR RPDA IN A LOCATION WHERE WATER DISCHARGE CAN CAUSE PROPERTY DAMAGE

Reduced Pressure Principle Backflow Preventers (RP or RPDA) can and WILL discharge water. The Relief Valve of an RP or RPDA is specifically designed to discharge high volumes of water during conditions of valve or system failure. NEVER install an RP or RPDA in a location where any amount of discharge from the Relief Valve will cause property damage. For an indoor, pit, vault, mechanical room or enclosure installation of an RP or RPDA an auxiliary drain (separate and independent of the Air Gap Assembly) is REQUIRED and MUST be properly sized for the Maximum Relief Valve Discharge Rate corresponding to the system/supply pressure (see chart below). Backflow Direct shall not be responsible for any damage caused by lack of auxiliary drain, location of auxiliary drain or undersized auxiliary drain. If installer does not understand or does not wish to meet these requirements DO NOT install the RP/RPDA, simply return the RP/RPDA to Backflow Direct for a full refund.

Visit our downloads page at backflowdirect.com for more information

REV: A | 04/21/2016 | BD-INST-04050

6”- 8” Deringer 40/50 Maintenance Instructions

Tools Required: This list is the recommended tools for ease of installation. Other versions of the same tool can be used. For example, Allen Wrenches instead of Allen Drive Sockets.

#2 Philips Head Screwdriver

Adjustable Wrench

#2 Flathead Screwdriver

Backflow Direct Test Cock Wrench

Ratchet

Expanding Pipe Pliers

15/16” Socket
1 1/8” Socket

Wood Block - 2” x 4” x 5”
Wood Block – 1” x 2” x 16”

Toothbrush

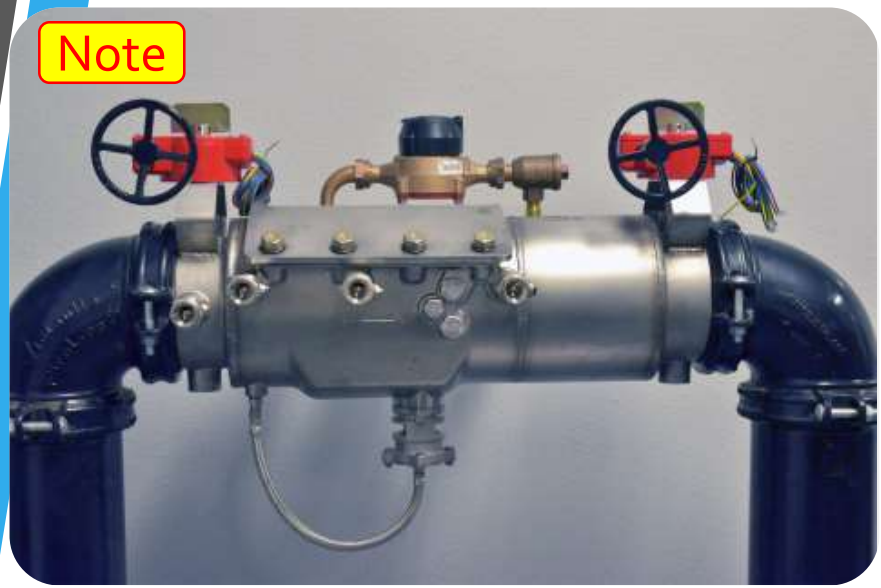
5/8” Ratchet Wrench
7/16” Ratchet Wrench (x2)
9/16” Ratchet Wrench

QUESTIONS: Please call us at 916-760-4524 M-F 8:00 AM – 4:30 PM PST or email us at techhelp@backflowdirect.com

6”- 8” Deringer 40/50 Maintenance Instructions

Closing Shut-Off Valves Prior to Maintenance

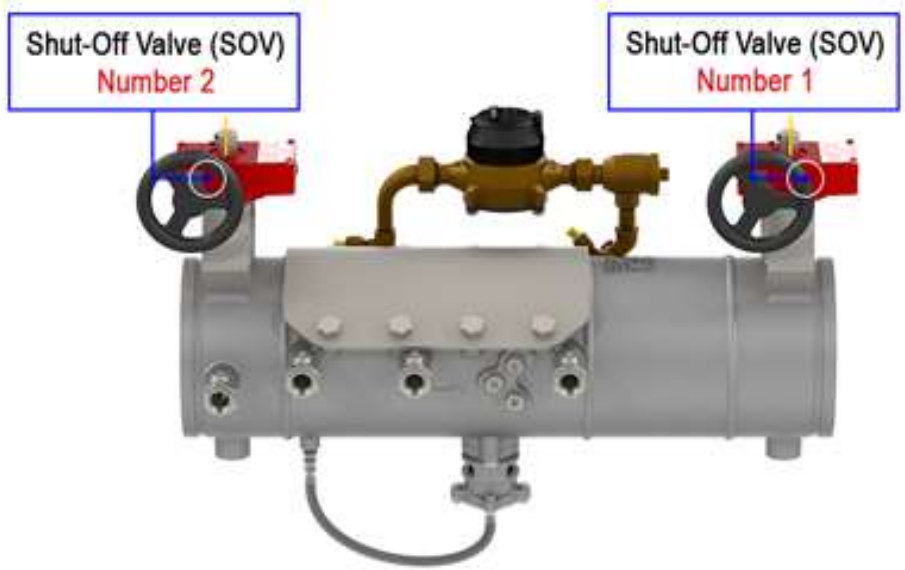
Note: *When yellow/orange position indicator flags are parallel with the flow of water the shut-off valves are in the open position. Before doing any maintenance be sure the yellow or orange flow indicators (flags) are perpendicular to the flow of water valve body indicating shut-off valves are in the closed position (A).*



FLOW

1. Slowly rotate Shut-Off Valve #2 Handle (B) clockwise to the closed position. Flag perpendicular to flow (A).

2. Slowly rotate Shut-Off Valve #1 Handle (C) clockwise to the closed position. Flag perpendicular to flow (A).



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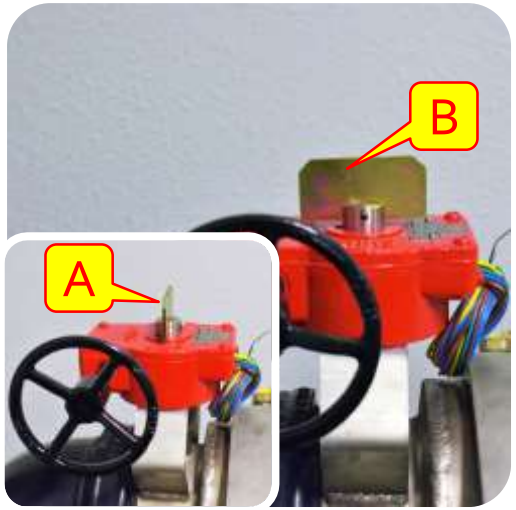
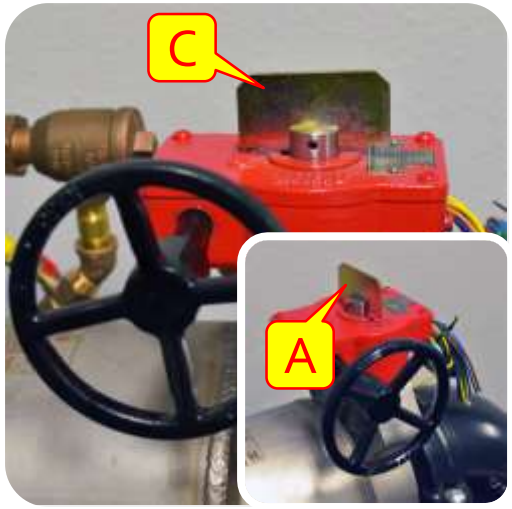
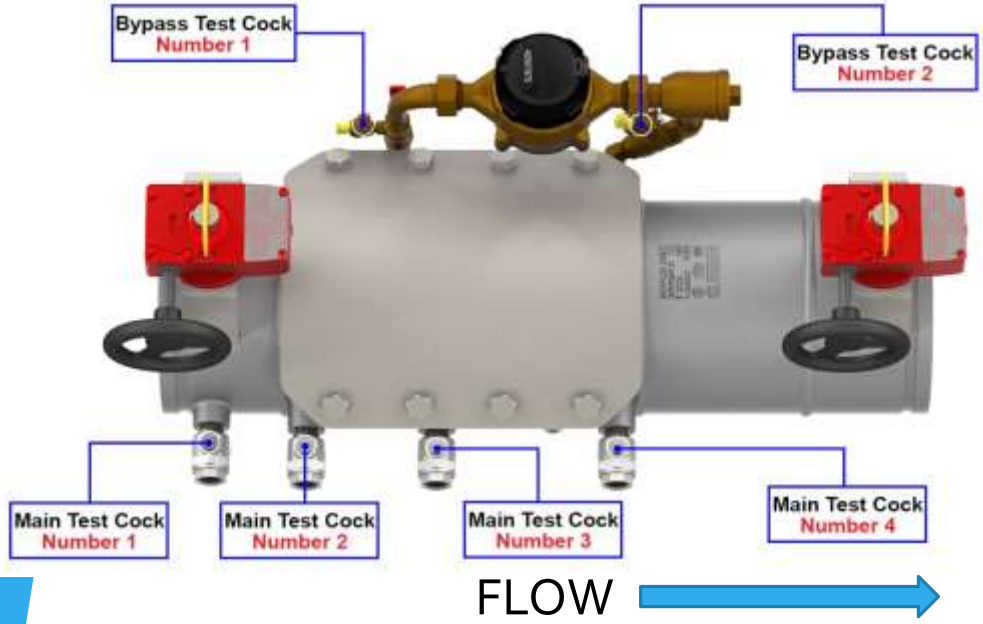
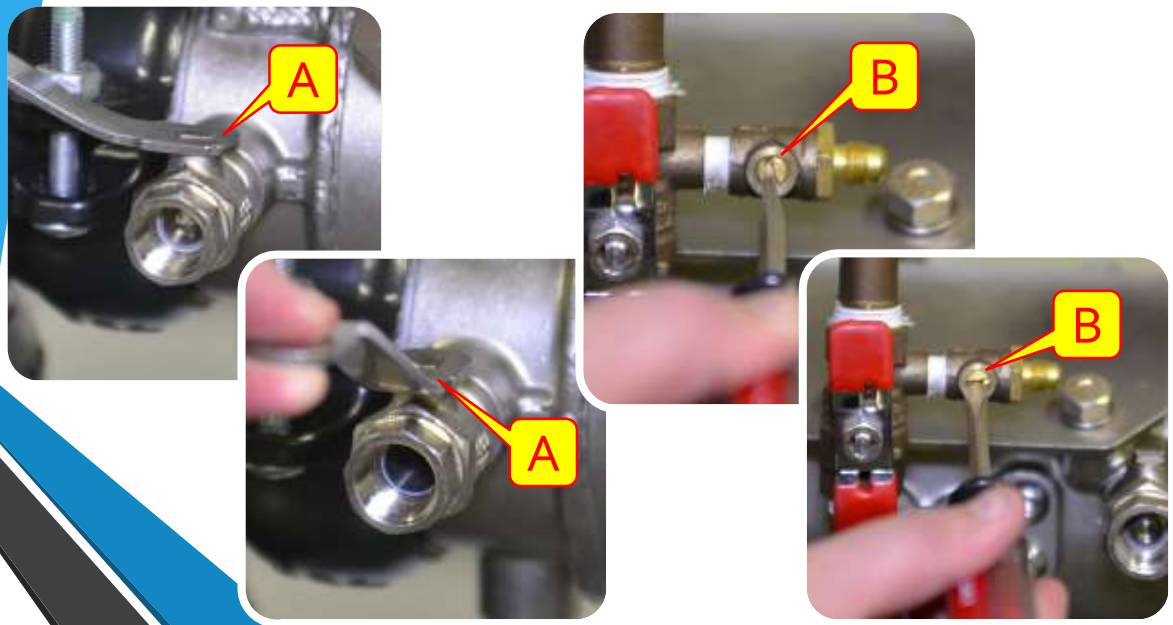




6”- 8” Deringer 40/50 Maintenance Instructions

Opening Test Cocks and Bleeding All Pressure from the Line Before Maintenance





1. DO NOT OPEN Main Test Cock Number 1, as it is still subject to line pressure.
2. Using the Backflow Direct test cock wrench or a small adjustable wrench open (A) Main Test Cock Number 4. (Test Cock is open when wrench flats are parallel to water flow through test cock)
3. Using a #2 Flathead Screwdriver open Bypass Test Cock Number 2. (Test Cock is open when screwdriver slot is parallel to water flow through test cock (B))
4. Using the Backflow Direct test cock wrench or a small adjustable wrench open Main Test Cock Number 3.
5. Using a #2 Flathead Screwdriver open Bypass Test Cock Number 1.
6. Using the Backflow Direct test cock wrench or a small adjustable wrench open Main Test Cock Number 2.

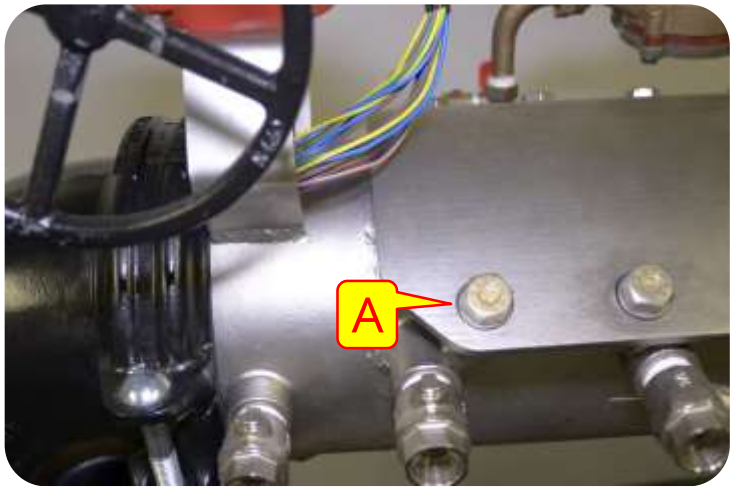
6”- 8” Deringer 40/50 Maintenance Instructions

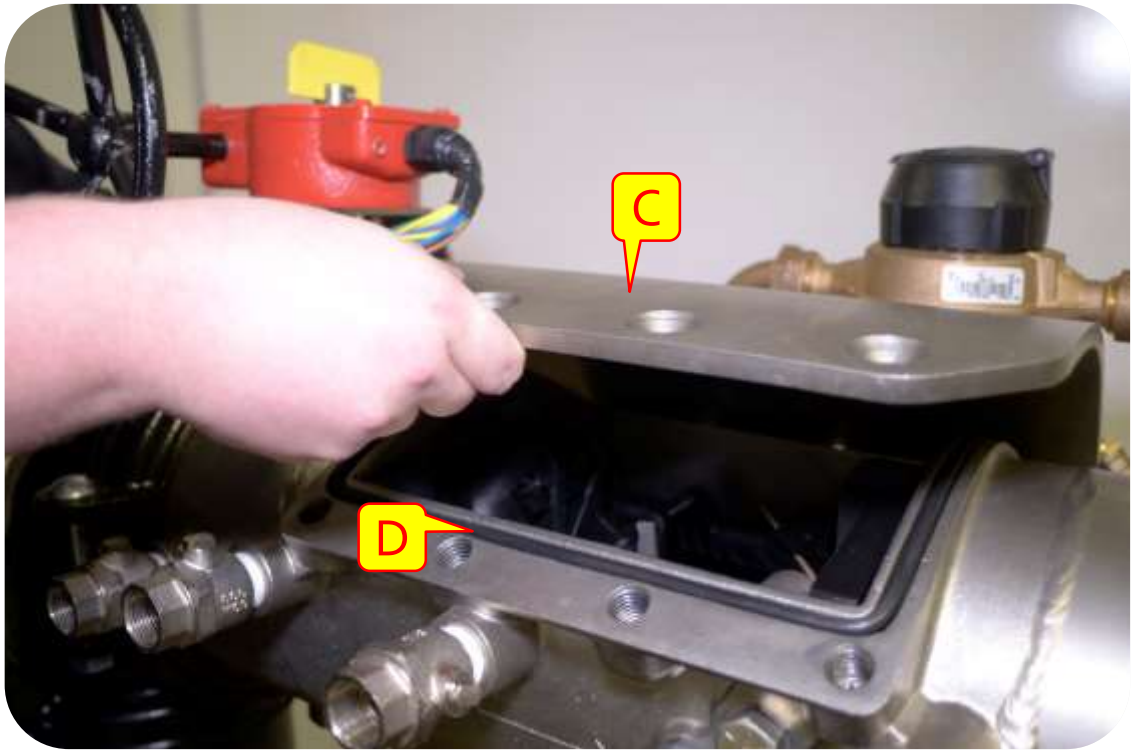
Removing Access Port Cover Plate

1. Using a 15/16” socket wrench loosen all eight bolts on the access port cover plate (A).

2. Remove bolts and tapered washers (B) and store in a safe place. Be careful not to lose tapered washers as the access cover will not seal properly without the tapered washers.

3. Remove access port cover plate (C). Do not remove Access Port O-ring (D).

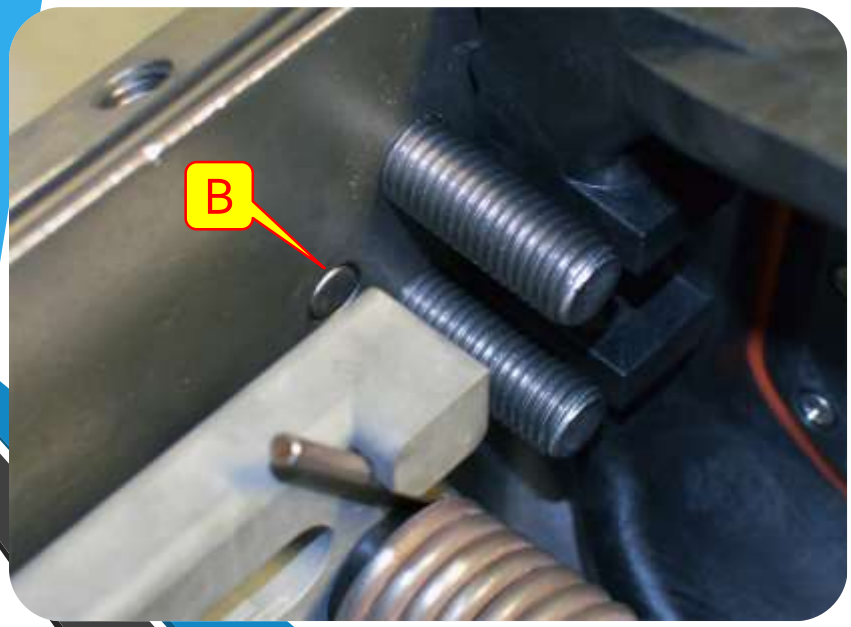




6”- 8” Deringer 40/50 Maintenance Instructions

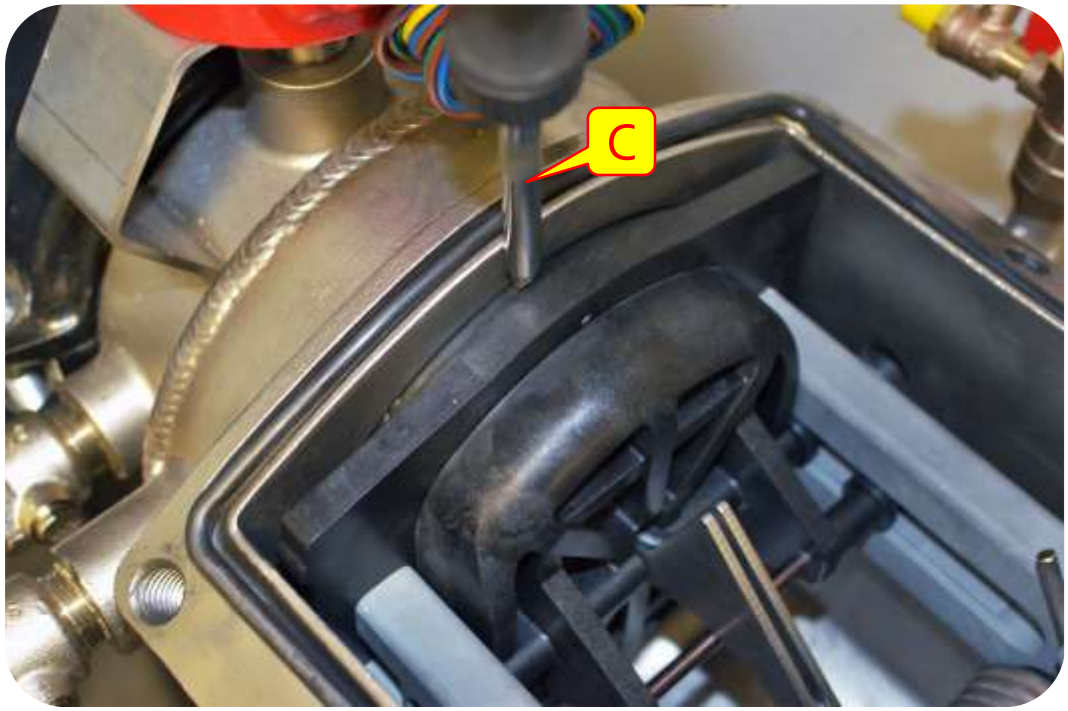
Removing the First Dual-Action Check Module

FLOW



1. Use a 15/16” Socket Wrench to loosen the check retainer bolts on both sides of the valve body (A). Do not completely remove check retainer bolts from valve body. Merely loosen the bolts until the ends of the bolts are flush with the inner wall of the valve body(B). Allow easy removal of Check Modules

2. Insert a flathead screwdriver between the inner valve body and the First Check Module Flange (C), gently coax the First Check Module in the downstream direction until the First Check Module can easily be removed from the access port by hand.



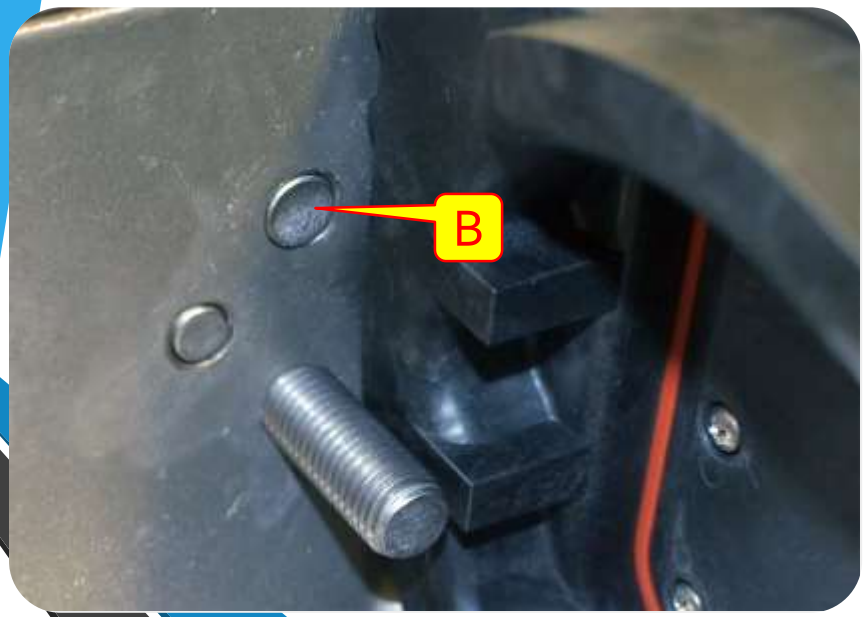
6”- 8” Deringer 40/50 Maintenance Instructions

Removing the Second Dual-Action Check Module

1. Use a 1 1/8” Socket Wrench to loosen the Check Retainer Bolts on each side of the valve body (A). Do not completely remove check retainer bolts from valve body. Merely loosen the bolts until the ends of the bolts are flush with the inner wall of the valve body(B).

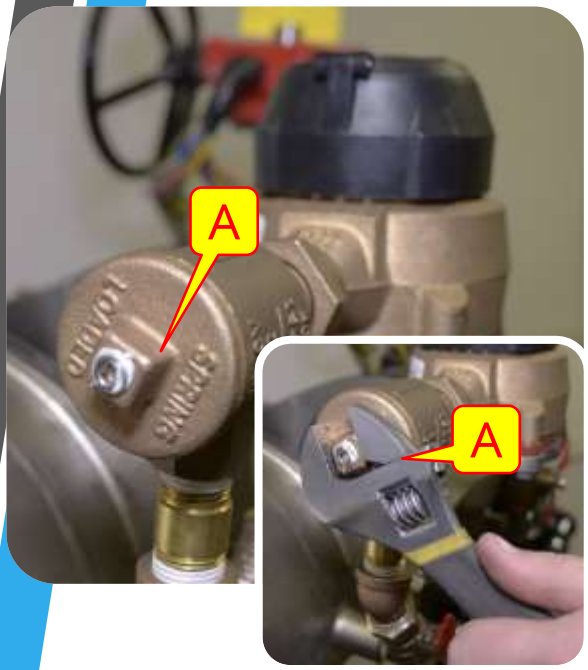
2. Insert a flathead screwdriver between the inner valve body and the Second Check Module Flange (C), gently coax the Second Check Module in the upstream direction until the Second Check Module can easily be removed from the access port by hand.

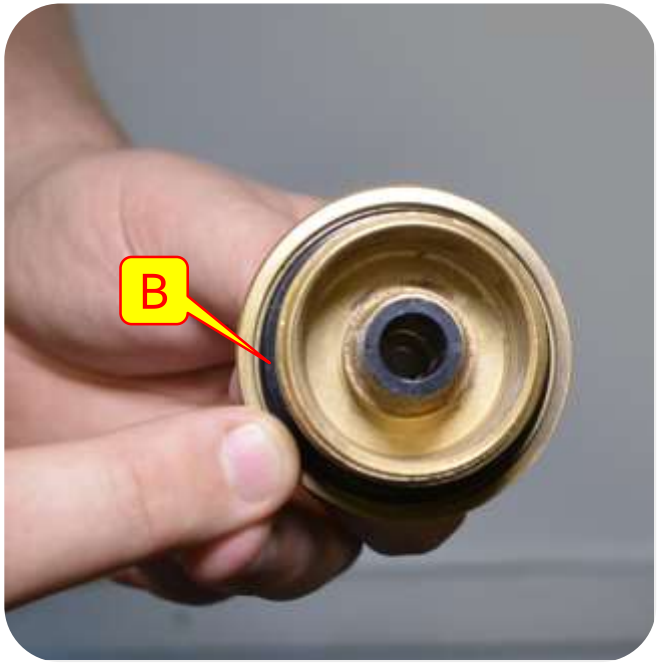
FLOW

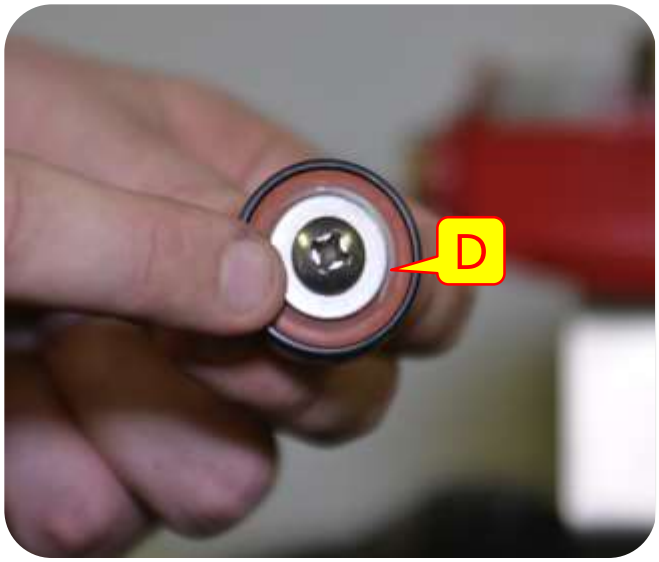


6”- 8” Deringer 40/50 Maintenance Instructions

Disassembly and Maintenance of By-Pass Check Valve



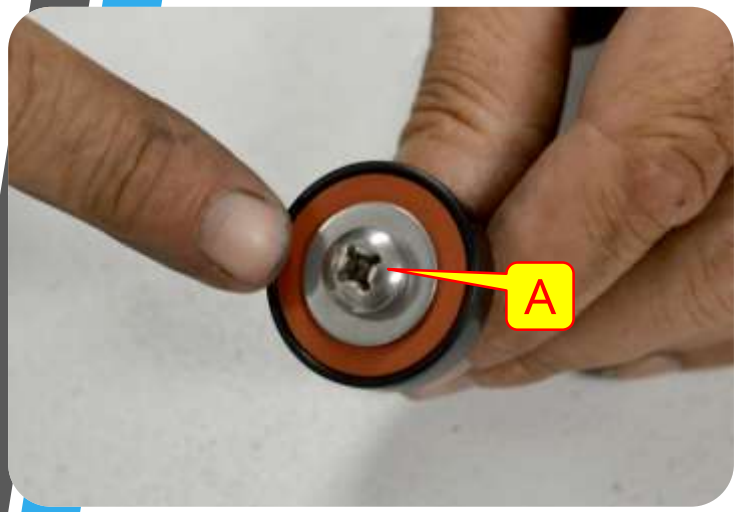




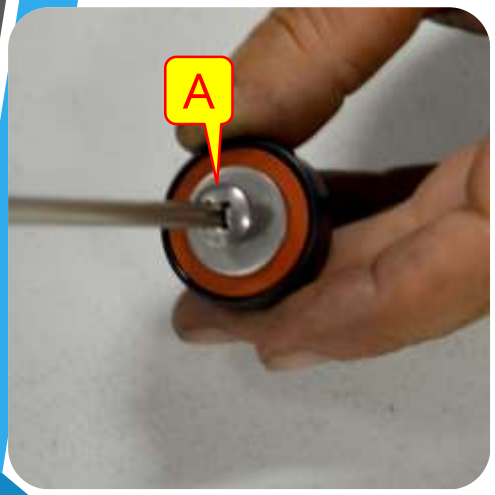
1. Use an adjustable wrench to rotate Check Cover (A) counterclockwise to remove.
2. Examine Cover Plate O-ring (B) for damage or fouling.
3. Remove Spring (C).
4. Remove Check Poppet Assembly (D) and examine for damage or fouling.
5. Examine seat cage for Seat Cage and examine for damage or fouling to the Sealing Seat. Do not remove unless the seat cage is being replaced.
6. Reverse the order of above instructions to reassemble By-Pass Check Valve.

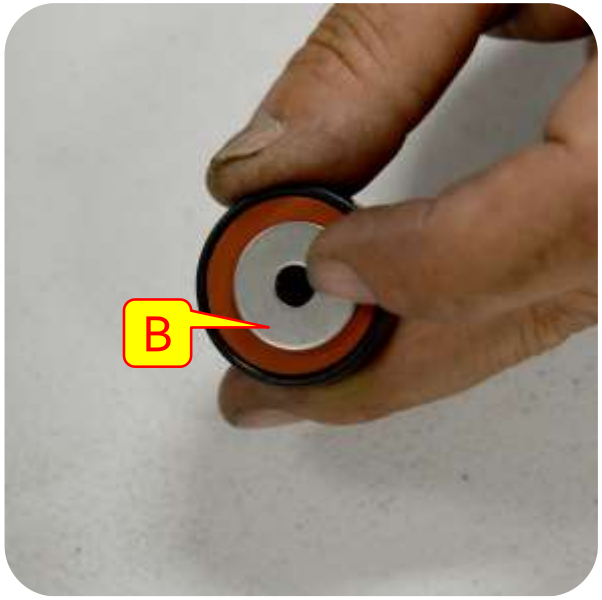
6”- 8” Deringer 40/50 Maintenance Instructions

Disassembly and Maintenance of By-Pass Check Valve (continued)



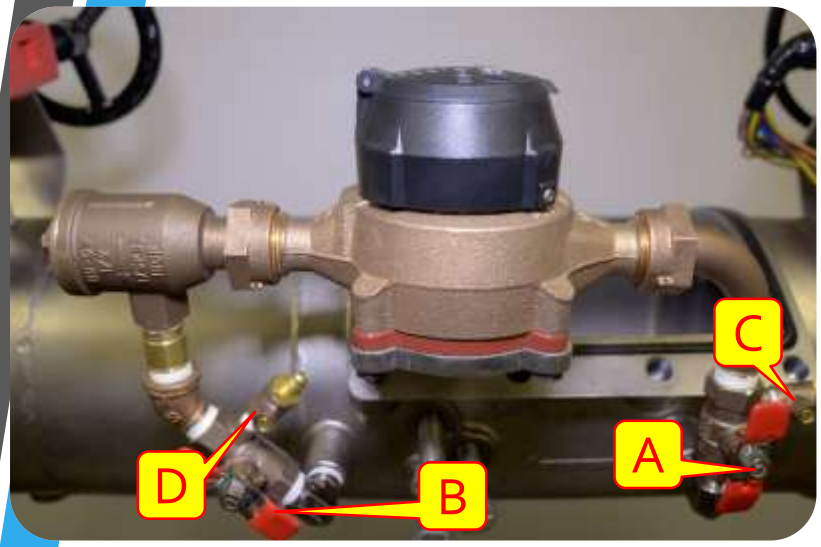
1. To replace a damaged Red Silicone Poppet Disk, use a #2 Philips Head Screwdriver to remove the Disk Retaining Screw (A).
2. Remove Disk Retaining Washer (B).
3. Use a Flathead Screwdriver to remove the gasket from Poppet Cavity (C).
4. Install new Red Silicone Poppet Disk (D).
5. Reverse the order of the above instructions to reassemble Check Poppet Assembly.
6. Reverse the order of the instructions on the previous page to reassemble Bypass Check Assembly.





6”- 8” Deringer 40/50 Maintenance Instructions

Removing Bypass Meter



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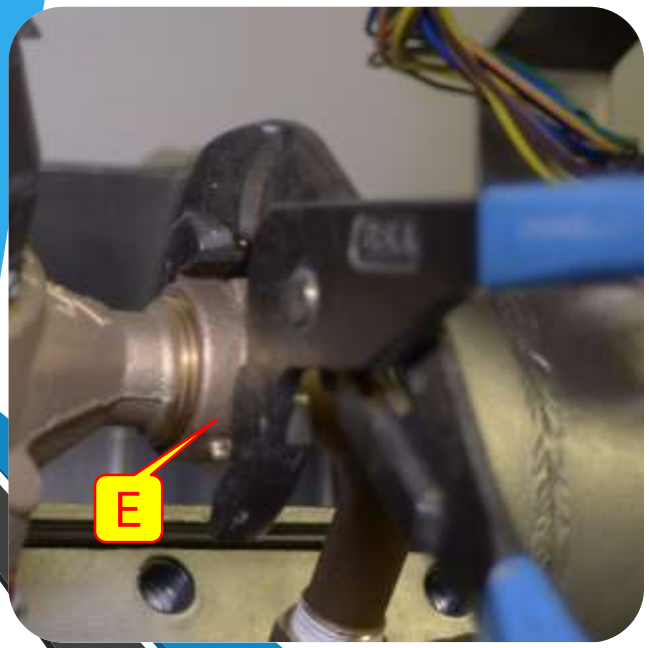


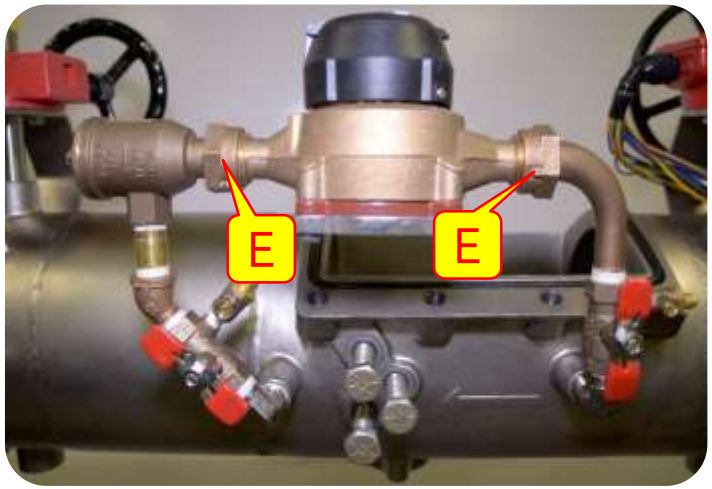
1. Using the Ball Valve Handles close the #2 Bypass Ball Valve (A) and then #1 Bypass Ball Valve (B). (Ball Valve is closed when “T” handle is perpendicular to water flow through Ball Valve).

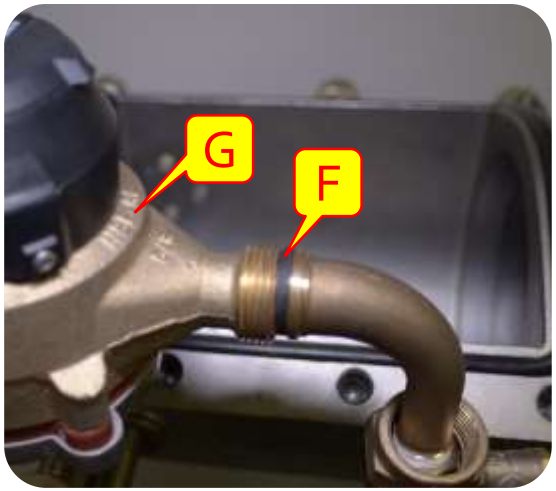
2. Using a #2 Flat Head Screw Driver open Bypass Test Cock #2 (C) and then open Bypass Test Cock #1 (D). (Test Cock is open when screw driver slot is parallel to water flow through Test Cock).

3. Using a large adjustable pliers or wrench unscrew and retract Bypass Meter Coupling Nuts (E) . Remove the Gaskets (F) on both sides of Bypass Meter.

4. Gently remove Bypass Meter (G) from line. It is OK if the bypass fittings move slightly during the removal process.

5. Reverse order of above instructions to reinstall Bypass Meter. Remember install Gaskets (F) before threading Meter Coupling Nuts into place.

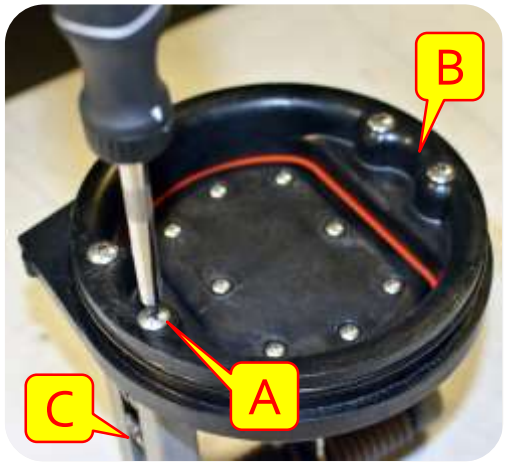


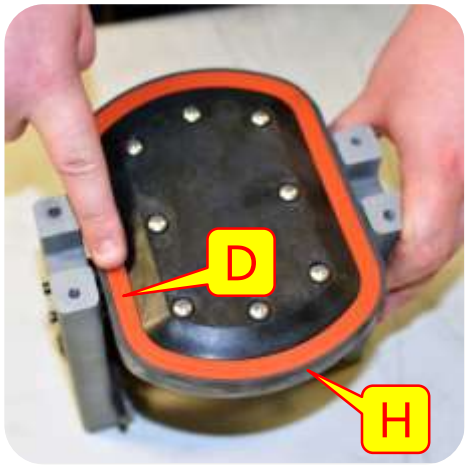


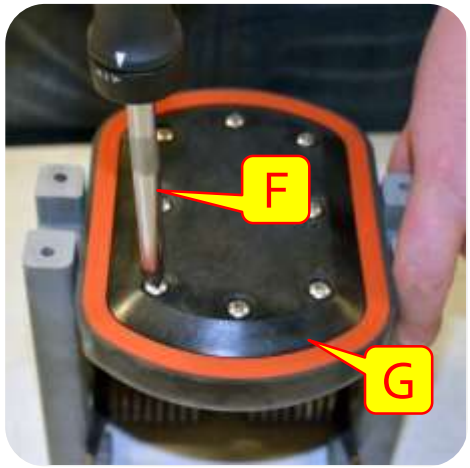
6”- 8” Deringer 40/50 Maintenance Instructions

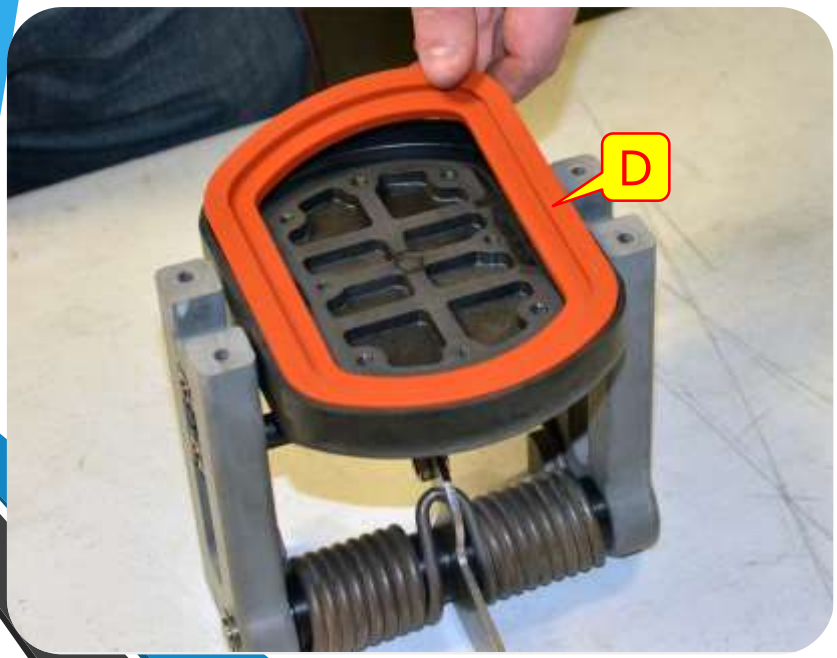
Maintenance of First True Seal Check Module

1. Use a #2 Philips Head Screwdriver to remove Tower Screws (A) from the First Check Seat (B) The Double Torsion Spring is captured (C) and does not need to be retained during maintenance.
2. After removing the Tower Screws (A) Examine the Elastomer Disk (D) and Check Seat (E) for fouling or damage.
3. Should Elastomer Disk (D) need replacement unscrew Disk Retainer Screws (F) and remove Disk Retainer (G). Carefully remove and replace Elastomer Disk (D). When replacing Elastomer Disk (D) be certain that no air, water or debris is trapped in the Clapper (H) cavity behind the Elastomer Disk (D).







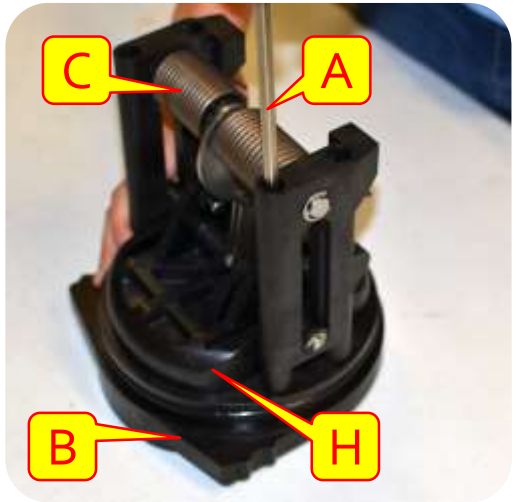


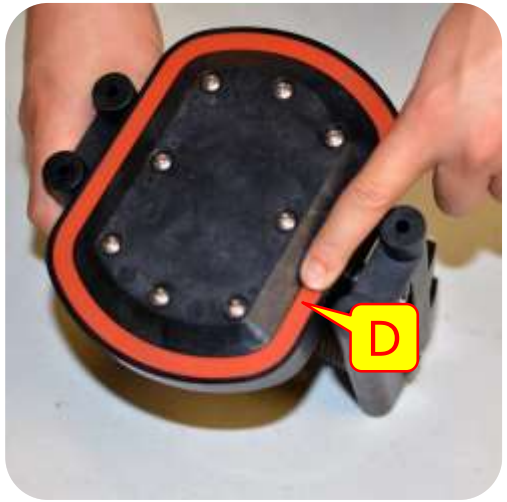
4. Reverse the order of the above instructions to reassemble check.
   - Elastomer Disk must be flat in Clapper (H) cavity before tightening Disk Retainer Screws (F).
   - Do not cross thread Disk Retaining Screws (F).
   - Check Orientation is not important when reattaching the check to the first check seat

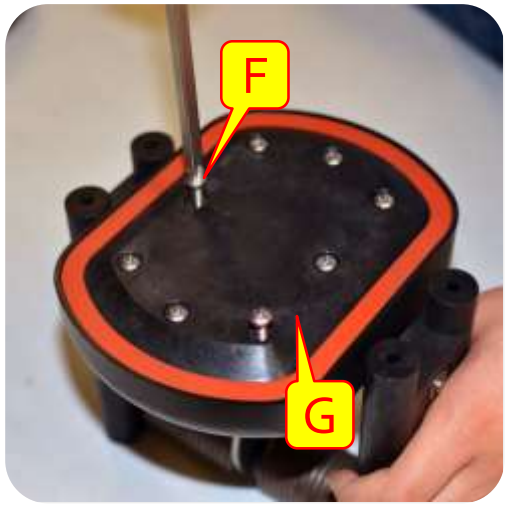
6”- 8” Deringer 40/50 Maintenance Instructions

Maintenance of Second Dual-Action Check Module

1. Use a #2 Philips Head Screwdriver to remove Tower Screws (A) from the Second Check Seat (B) The Double Torsion Spring is captured (C) and does not to be retained during maintenance.
2. After removing the Tower Screws (A) Examine the Elastomer Disk (D) and Check Seat (E) for fouling or damage.
3. Should Elastomer Disk (D) need replacement unscrew Disk Retainer Screws (F) and remove Disk Retainer (G). Carefully remove and replace Elastomer Disk (D). When replacing Elastomer Disk (D) be certain that no air, water or debris is trapped in the Clapper (H) cavity behind the Elastomer Disk (D).





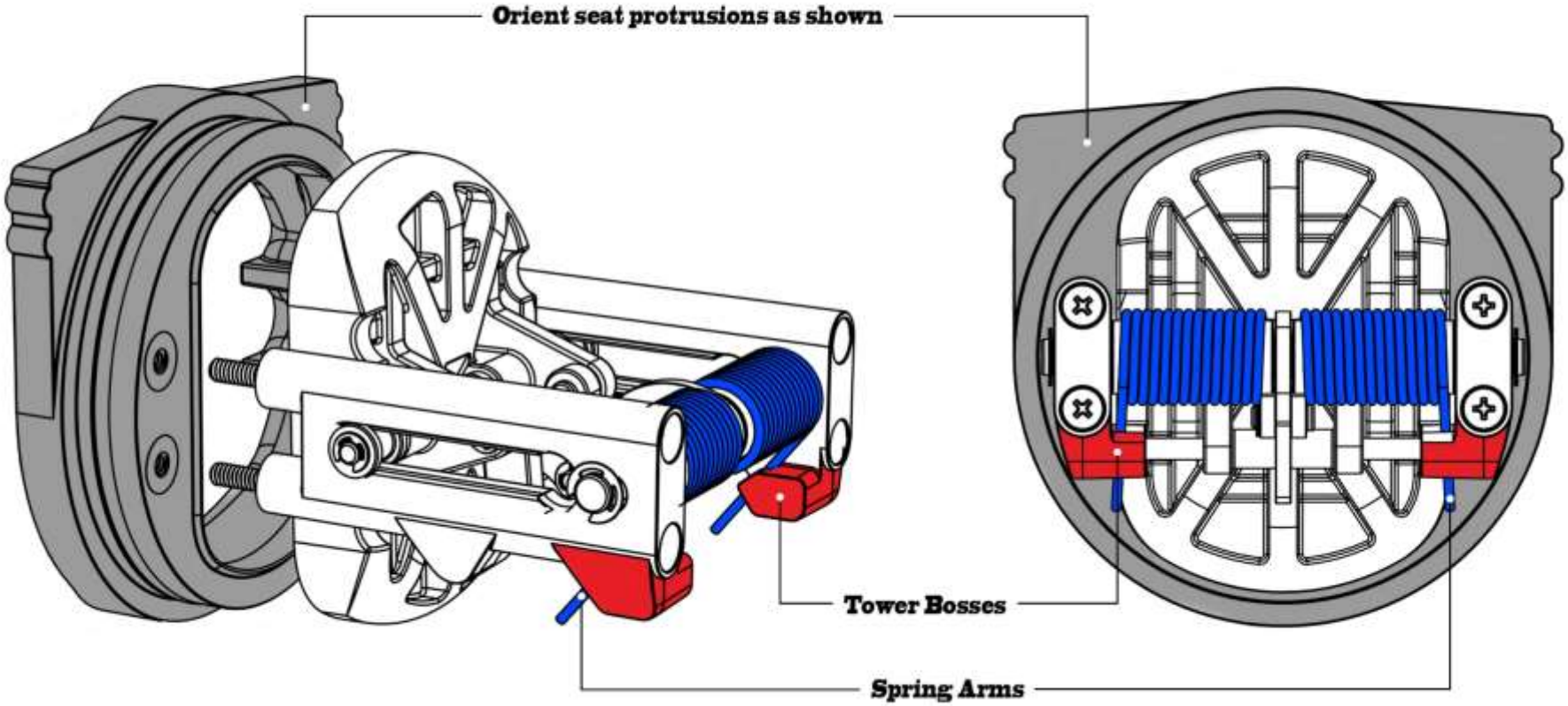


4. Reverse the order of the above instructions to reassemble check.
   - Elastomer Disk must be flat in Clapper (H) cavity before tightening Disk Retainer Screws (F).
   - Do not cross thread Disk Retaining Screws (F).

Maintenance of Second Dual-Action Check Module

Note: The diagram below shows the correct orientation of the Second Dual-Action Check Module when being re-attached to the seat. In order to maintain the performance of the valve pay attention to the proper orientation of the check module.

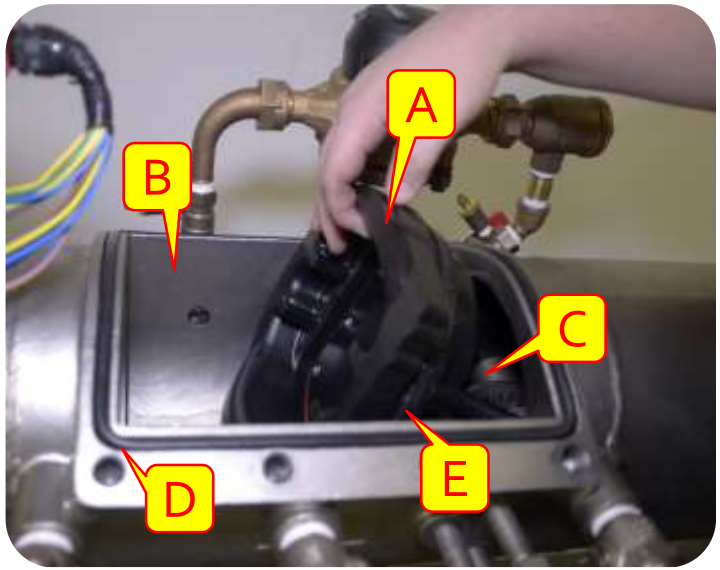
Second Check Tower Bosses and Spring Arms Face Down.



6”- 8” Deringer 40/50 Maintenance Instructions

Installing Second Dual Action Check Module

1. Insert Second Check Module (A) into Access Port (B) with Second Check Towers (C) pointing downstream. Push Second Check Module (A) downstream into Valve Sealing Ring (D) until Check O-ring (E) rests against Valve Sealing Ring (D). Coax Second Check Module (A) into its fully seated position by hand.
2. Alternatively place 2”x4” piece of wood cut to 5” length (F) against the backside of the Second Check Seat Ring (G). Using a 1”x4” piece of wood cut to 16” length (H) as a lever between Access Port Wall the 2”x4” (F) gently coax the Second Check Module (A) into its fully seated position.
3. Be certain Second Check Module (A) is fully seated and Check O-ring (E) is NOT “fish mouthed” or damaged.
4. Tighten the Second Check Retaining Screws (I) **ONLY AFTER** the First Check Module (A) as been installed.



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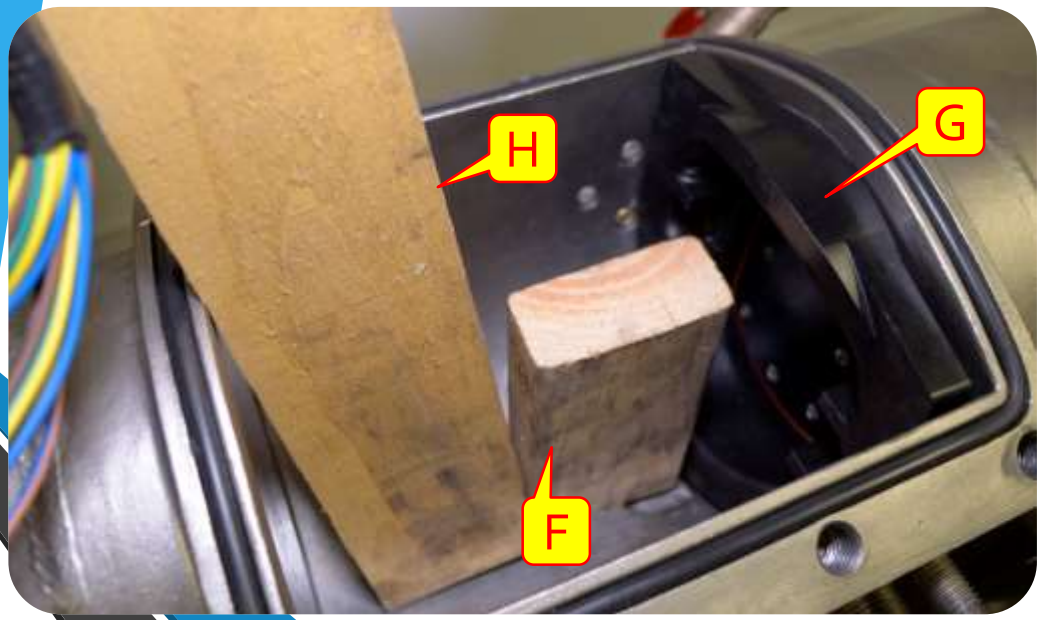


WARNING: *The Second Check Module must be fully seated to insure Retainer Screws do not bind against Check Seat. Binding Retainer Screws against Check Seat will result in permanent damage to Second Check Modules.*

6”- 8” Deringer 40/50 Maintenance Instructions

Installing First Dual-Action Check Module

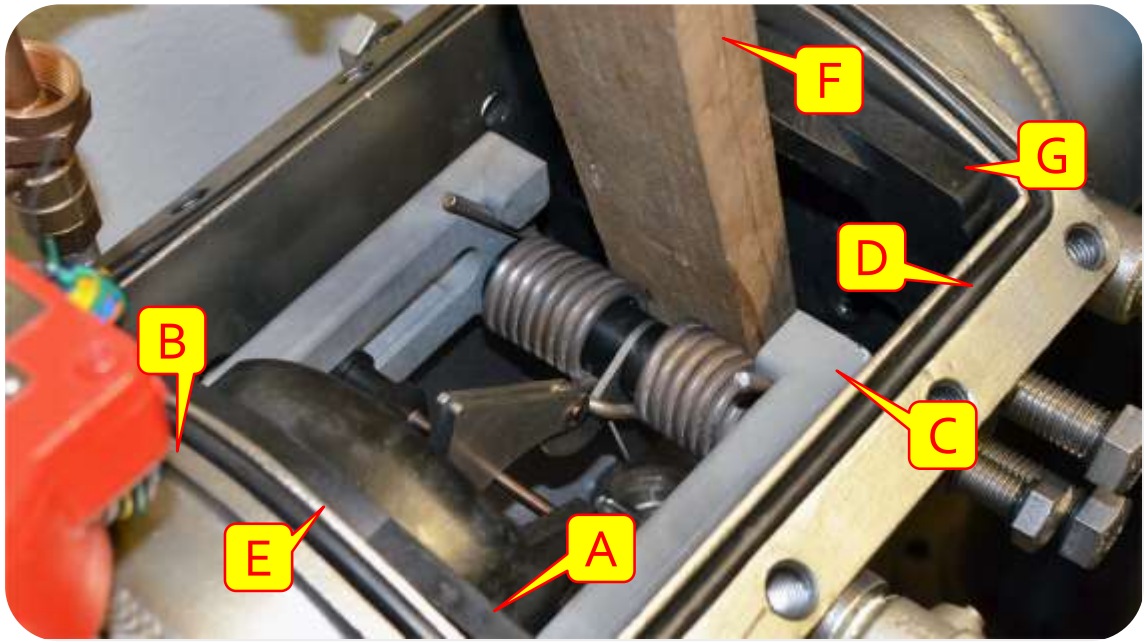
1. Insert First Check Module (A) into Access Port (B) with First Check Towers (C) pointing downstream. Push First Check Module (A) upstream into Valve Sealing Ring (D) until Check O-ring (E) is resting against Valve Sealing Ring (D). Coax First Check Module (A) into its fully seated position by hand.

2. Alternatively, using a piece of 1”x4” wood cut to 16” length (F) as a lever between the Second Check Seat (G) and the First Check Towers (C), coax the First Check Module (A) into its fully seated position.

3. Be certain First Check Module (A) is fully seated and Check O-ring (E) is NOT “fish mouthed” or damaged.

4. Now fully tighten the First and Second Check Retaining Screws (I) .

WARNING: *The First Check Module must be fully seated to insure Retainer Screws do not bind against Check Towers. Binding Retainer Screws against Check Towers will result in permanent damage to First Check Modules.*



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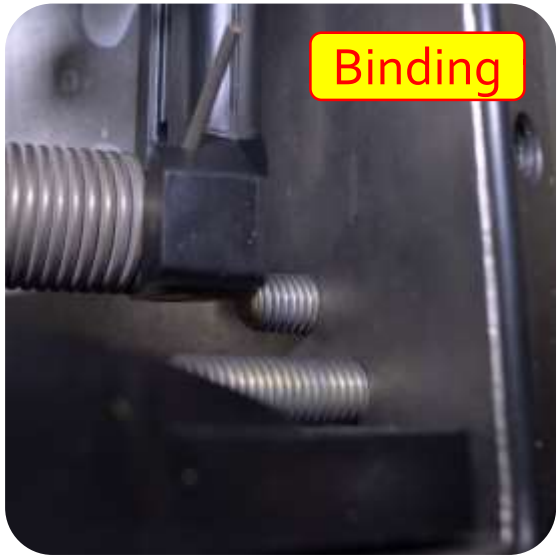
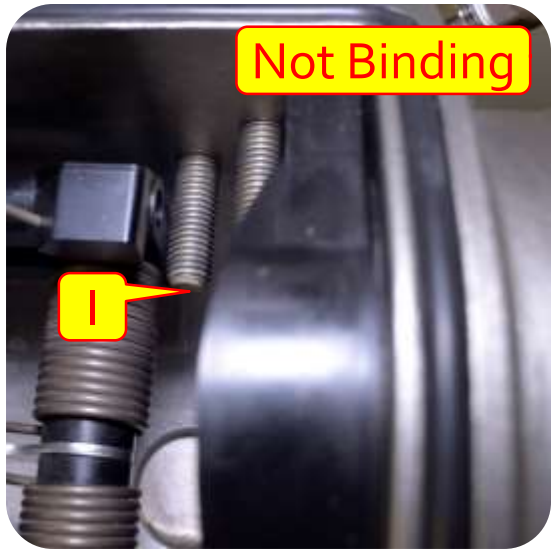
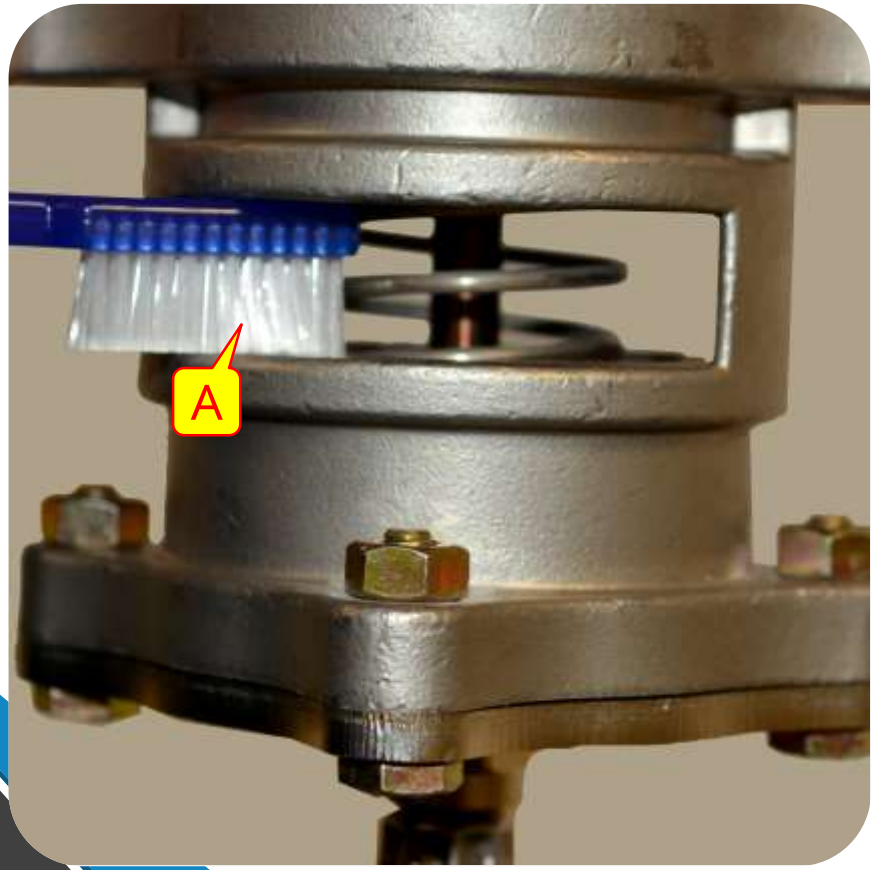


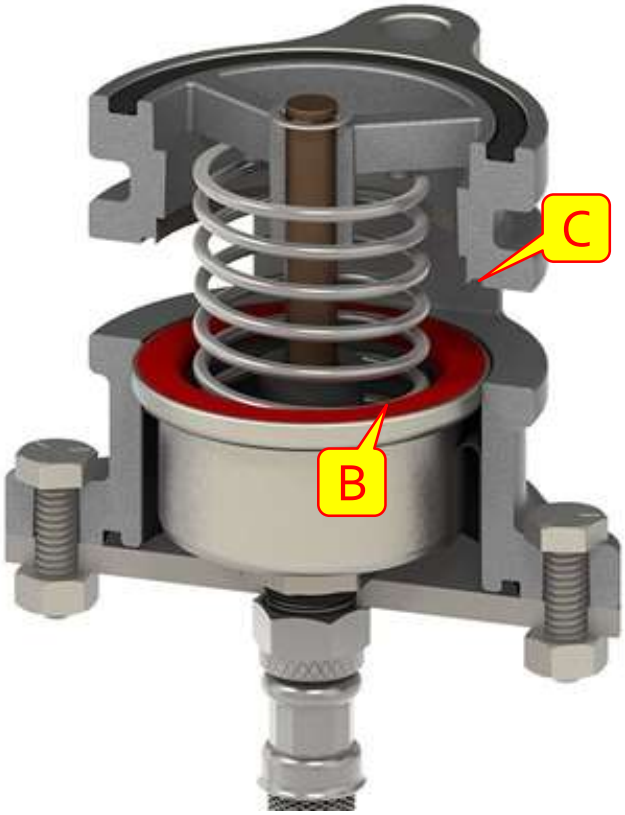


6”- 8” Deringer 40/50 Maintenance Instructions

Maintenance of Relief Valve

Note: *Almost always, when a RP device is leaking from the relief valve, a fouled or damaged first check valve is the cause. Make sure the first check valve is functioning properly before assuming there is a problem with the relief valve. If the first check is found to be functioning properly, we recommend cleaning the relief valve piston (B) and seat (C). Use a toothbrush (A) to gently brush away any debris on the relief valve piston (B) or seat (C) that may be preventing the piston (B) from sealing properly against the seat (C). This should return the relief valve to proper working order without disassembly or the use of a repair kit.*





6”- 8” Deringer 40/50 Maintenance Instructions

Maintenance of Relief Valve

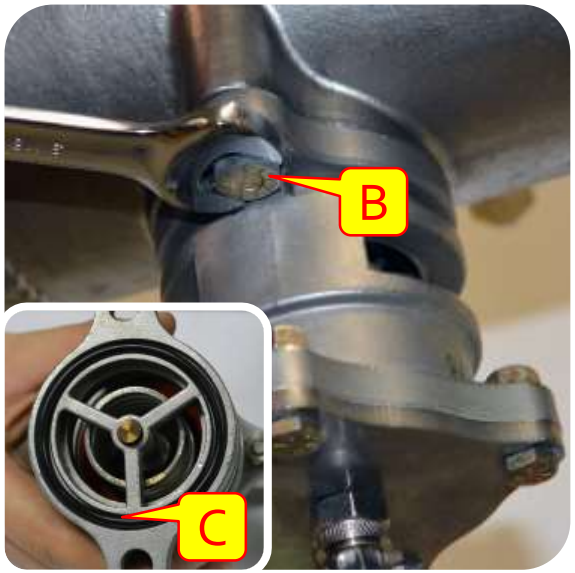
Note: *If one is certain that the Relief Valve requires maintenance proceed as follows.*

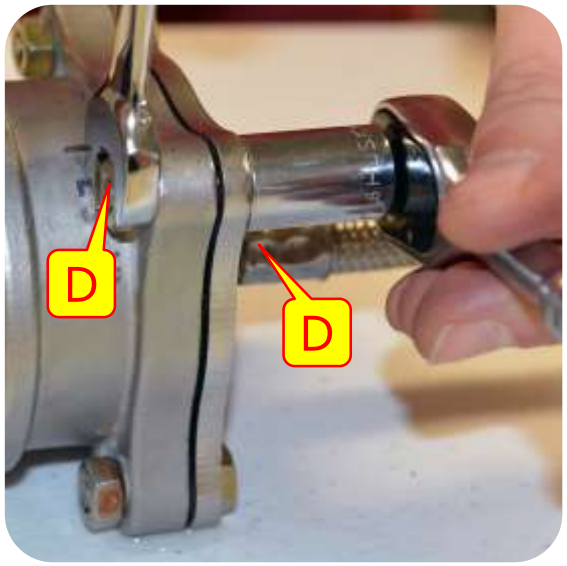
1. Using a 5/8” Box Wrench disconnect the Relief Valve Sensing Line from the Valve Body (A).

2. To remove the Relief Valve from the valve body disconnect the two Relief Valve Mounting Bolts (B) using a 9/16” wrench. When removing the Relief Valve be sure not to drop the top O-ring (C) as the Relief Valve Body uses this O-ring to seal against the valve body.

3. To access the relief valve remove the relief valve cover using two 7/16” wrenches to remove cover bolts (D).

4. Remove the Relief Valve Diaphragm (E) and check the diaphragm for tears, holes or debris (F).





6”- 8” Deringer 40/50 Maintenance Instructions

Maintenance of Relief Valve (continued)

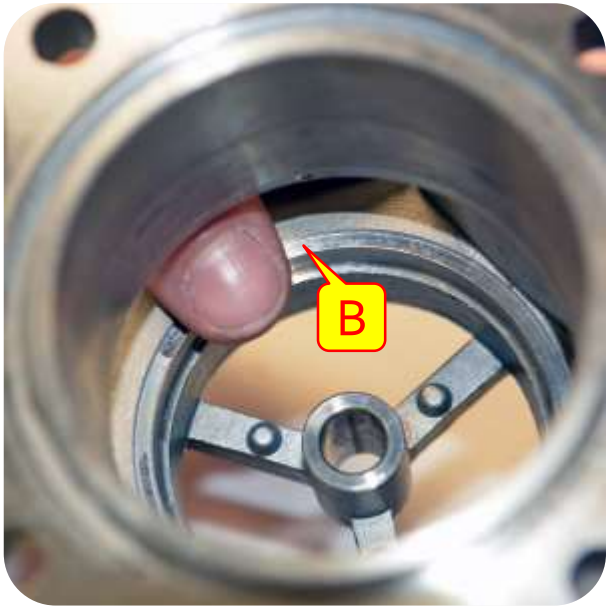
1. Check the rubber seal on the Relief Valve Piston Assembly (A) for fouling or damage by making sure the indentation of the seat in the rubber seal is present all the way around. (Confirm the Relief Valve Piston Assembly (A) sets flush on Relief Valve Seat (B).

2. Check Relief Valve Seat (B) for Fouling or damage before reinstalling the Relief Valve Piston Assembly (A).

3. Once the Relief Valve is ready to be reassembled, the first step is to reform and reattach the diaphragm to the piston.

4. Move the Diagram (C) to the fully open position making sure the embossed center is facing up.

5. While holding the diaphragm (C) with both hands, use your thumbs to gently push down on embossed center (D) so the diaphragm collapses into itself and forms a circle so that the bottom of the piston assembly can be inserted into the diaphragm and the embossed center can be pushed into the piston assembly groove.

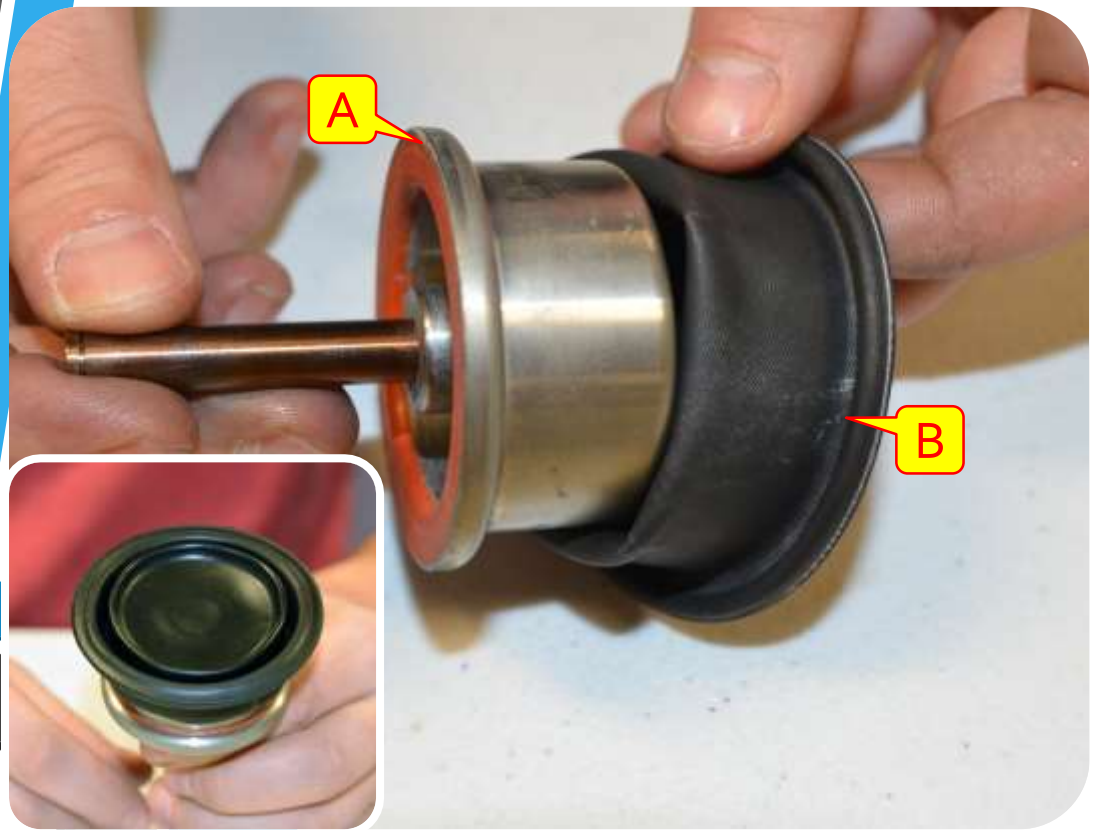


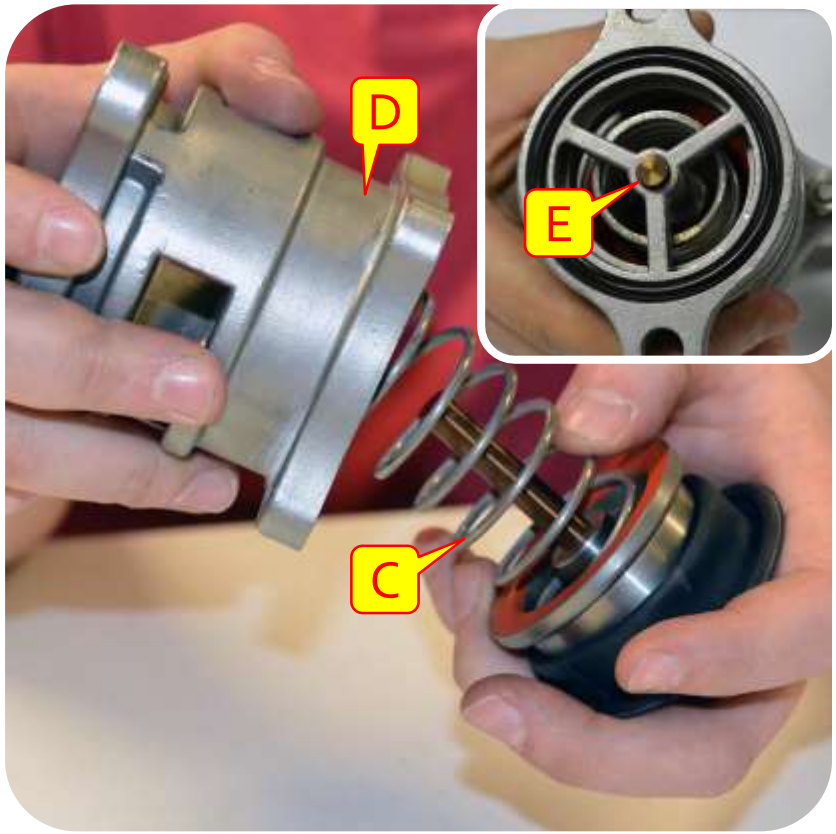
6”- 8” Deringer 40/50 Maintenance Instructions

Maintenance of Relief Valve (continued)

1. Place the Piston Assembly (A) into the Diaphragm (B), Making sure the Diaphragm lays flush on the bottom of the Piston Assembly with no wrinkles or tears in the diaphragm.

2. Place the Relief Valve Spring (C) back onto the Relief Valve Assembly (A) and slide the Valve Assembly back into the Relief Valve Body (D). Make sure the Piston Assembly lines up to penetrate hole (E) in top side of Relief Valve.

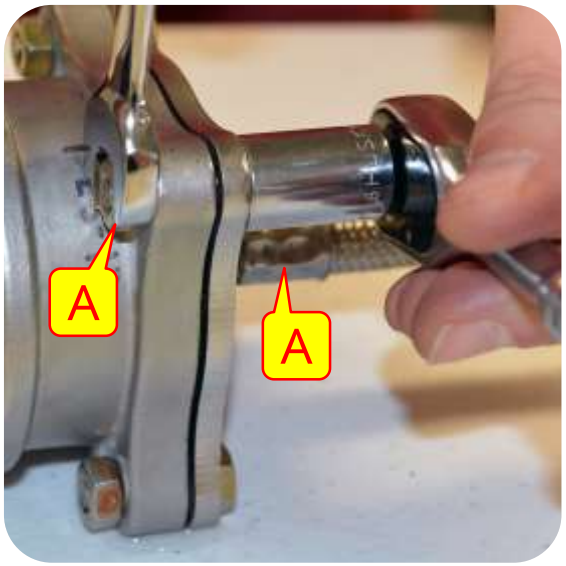


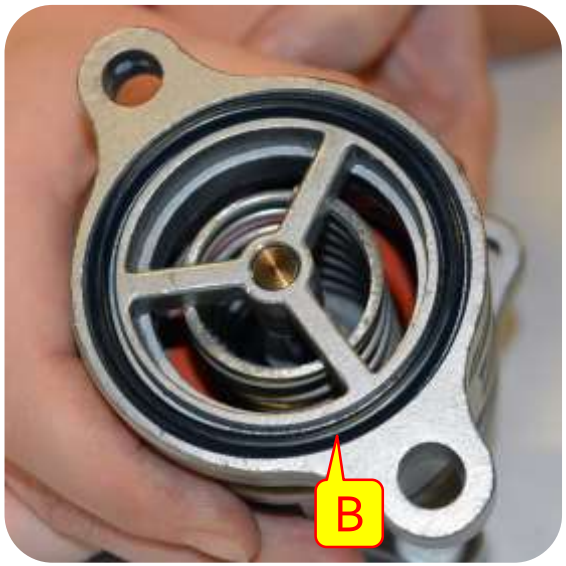


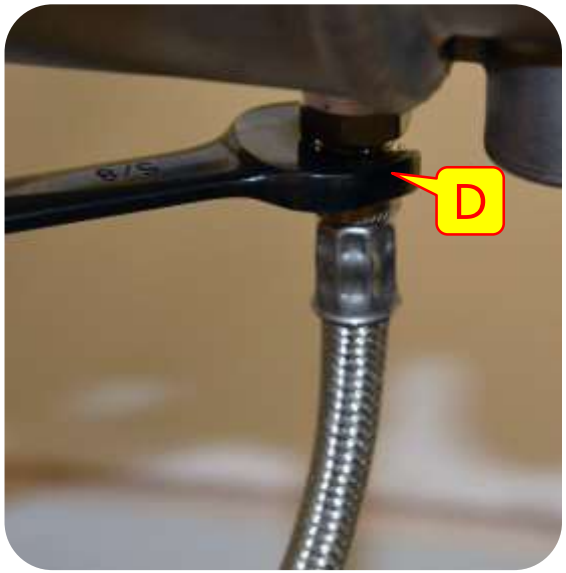
6”- 8” Deringer 40/50 Maintenance Instructions

Maintenance of Relief Valve (continued)

1. Using two 7/16” wrenches (A) re-attach the relief valve cover.
2. Making sure the Relief Valve O-ring (B) is in the groove on the top of the Relief valve use a 9/16” wrench to re-attach the two Relief Valve Mounting Bolts (C).
3. Use a 5/8” Box Wrench re-connect the Relief Valve Sensing Line to the Valve (D).







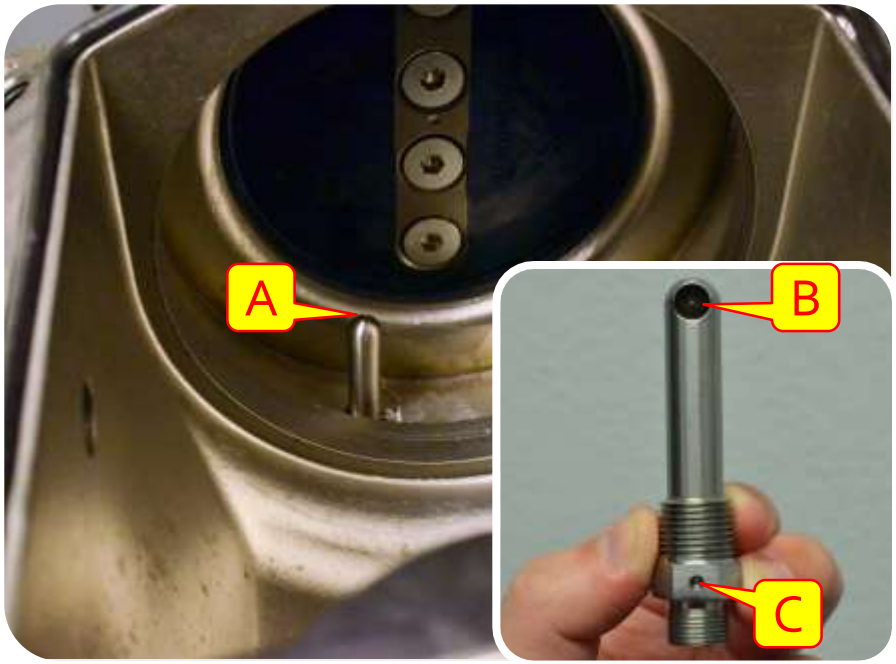
6”- 8” Deringer 40/50 Maintenance Instructions

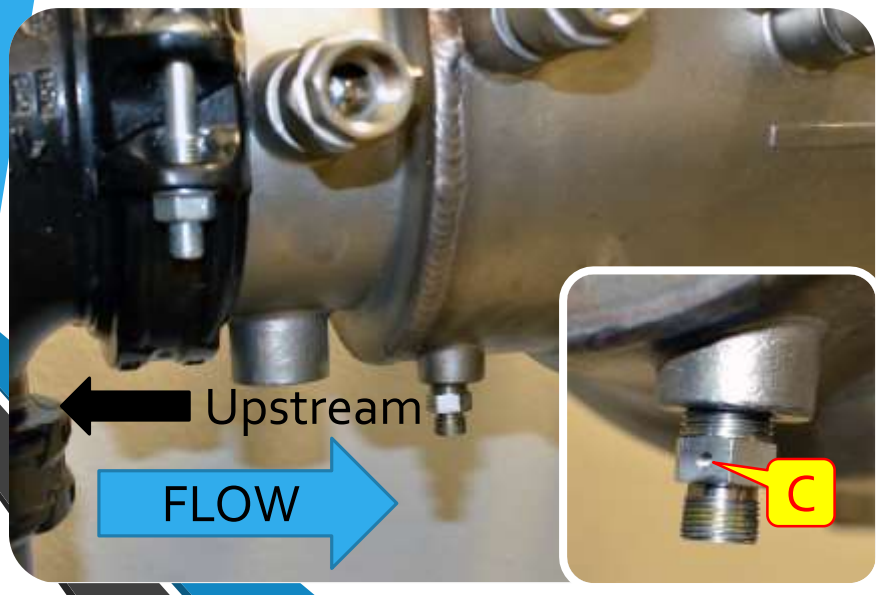
Pitot Tube Orientation

1. Before reinstalling the relief valve after maintenance, check to make sure the Pitot Tube (A) is in the proper orientation. If the Pitot Tube is **NOT** in the proper orientation the Relief Valve **WILL LEAK OR DUMP** during flow conditions.

2. The Inlet Port of the Pitot Tube (B) at the top of the Pitot Tube must face directly UPSTREAM toward the #1 shut off valve. Proper orientation can be confirmed visually by removing the Main Line Valve Cover and First Check Valve (see right).

3. Note that the Inlet Port of the Pitot Tube (B) is not visible because it is facing directly upstream toward the #1 Shut Off Valve.





4. A Dimple (C) has been provided on the Hex Wrench portion of the Pitot Tube in order to visually confirm the proper orientation of the Pitot Tube from the OUTSIDE of the valve (see left). Note that the Dimple (C) is on the same side of the Pitot Tube as the Inlet Port of the Pitot Tube (B). (see above)

5. From the OUTSIDE of the valve the Dimple (C) must face directly UPSTREAM toward the #1 shut off valve. If the Dimple (C) of the Pitot Tube is **NOT** in the oriented UPSTREAM the Relief Valve **WILL LEAK OR DUMP** during flow conditions.

6”- 8” Deringer 40/50 Maintenance Instructions

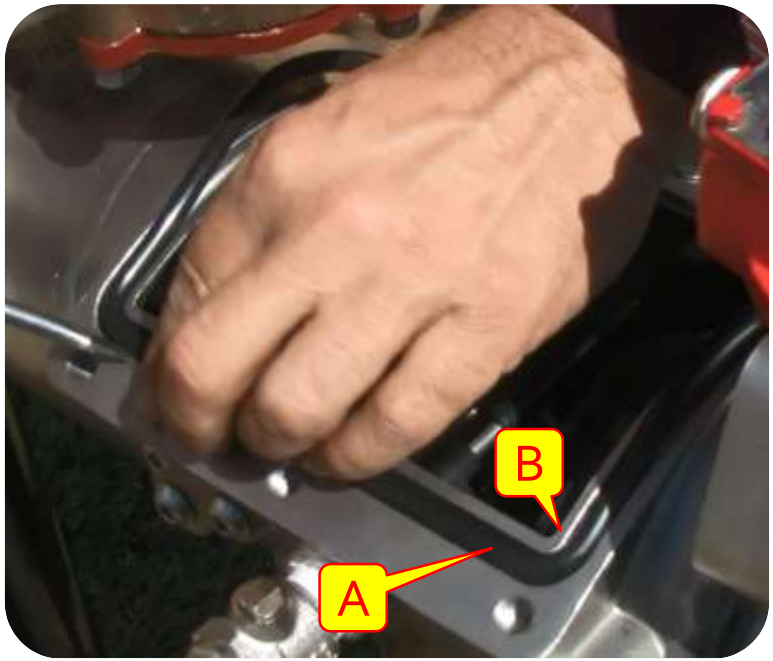
Installing Access Port Cover

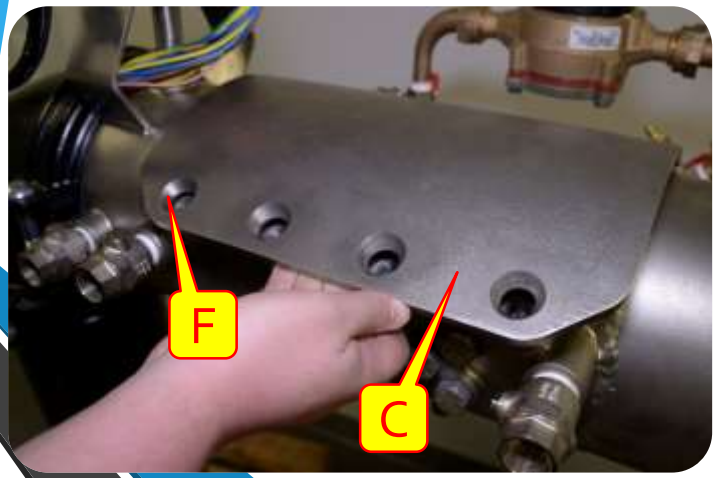
1. It is best to never remove the Access Port O-ring (A). Should the Access Port O-ring (A) become dislodged, simply insert it back into Access Port Groove (B).

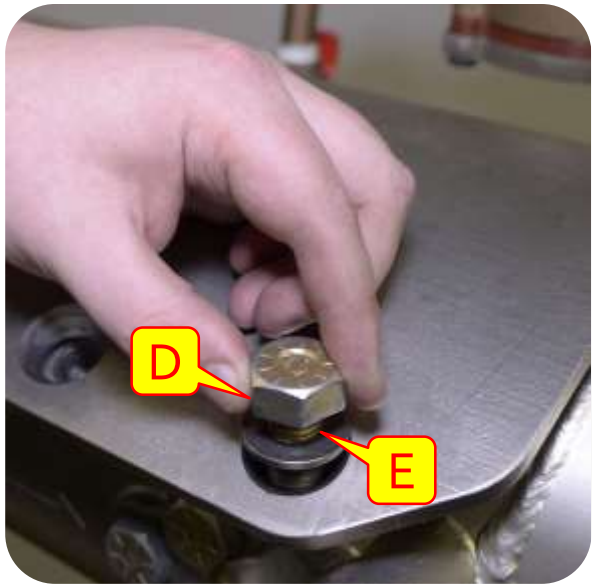
2. Slide the Access Port Cover (C) into place being certain that Access Port O-ring (A) does not become dislodged during the process.

3. Insert Cover Bolts (D) and Tapered Washers (E) into Tapered Cover Holes (F). Tapered Washers (E) must be properly installed or the Access Port Cover (C) will not seal under pressure.

4. Use 15/16” Socket Wrench (G) to tighten the 4 center Cover Bolts (D) alternating from one side of the valve to the other. Then Tighten the four corner bolts alternating from one side of the valve to the other.

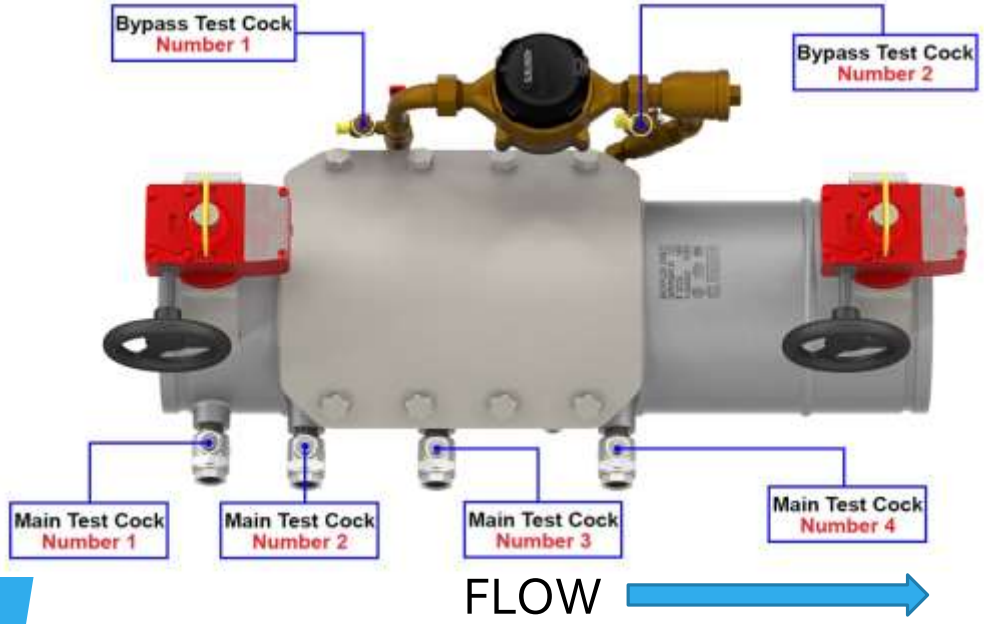






6”- 8” Deringer 40/50 Maintenance Instructions

Close Test Cocks and Double Check all Closing/Sealing Mechanisms

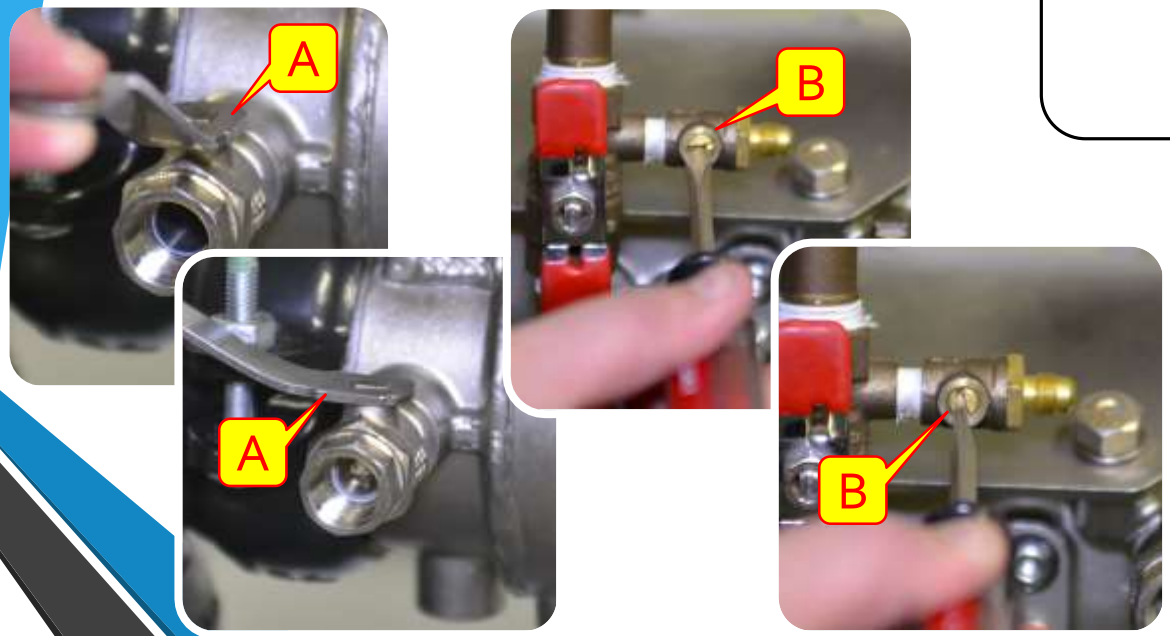


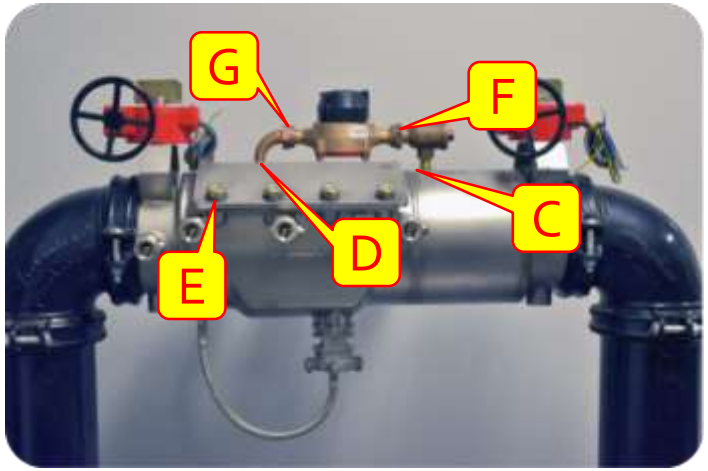
1. Using the Backflow Direct Test Cock Wrench or a small adjustable wrench close Main Test Cocks Number 1, 2 and 3 (A). (Test Cock is closed when wrench flats on stem are perpendicular to water flow through Test Cock)

2. Using a #2 Flathead Screwdriver Close Bypass Test Cock Number 1 and 2 (B). (Test Cock is closed when screwdriver slot on stem is perpendicular to water flow through Test Cock)

3. Use the “T” handles to open bypass Ball Valve Number 1 (C) and then open bypass Ball Valve Number 2 (D). (Ball Valve is open when “T” handle is parallel to water flow through Ball Valve)

4. Double check to be certain of the following:
   - All Cover Bolts are Tightened (E)
   - Bypass Check Valve Cover is Tightened (F)
   - Bypass Meter Coupling Nuts are Tightened (G)





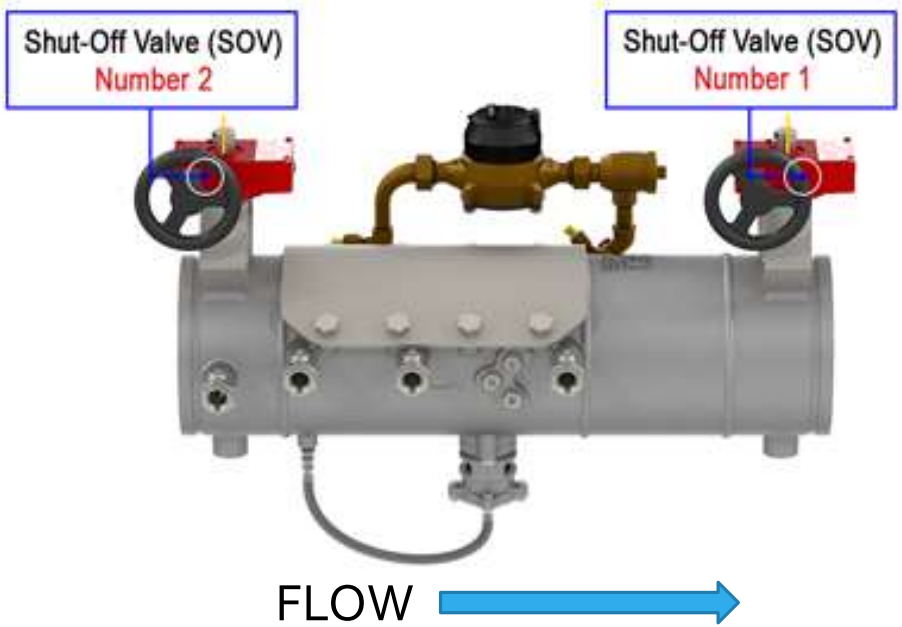
6”- 8” Deringer 40/50 Maintenance Instructions

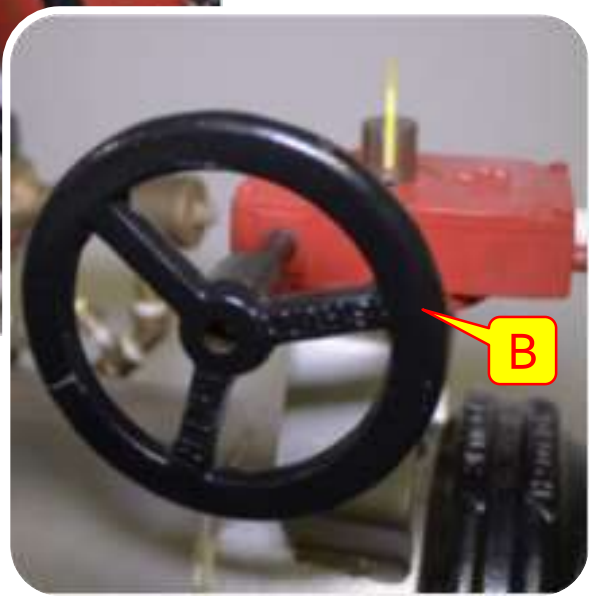
Open Shut-Off Valves to make Backflow Preventer Functional

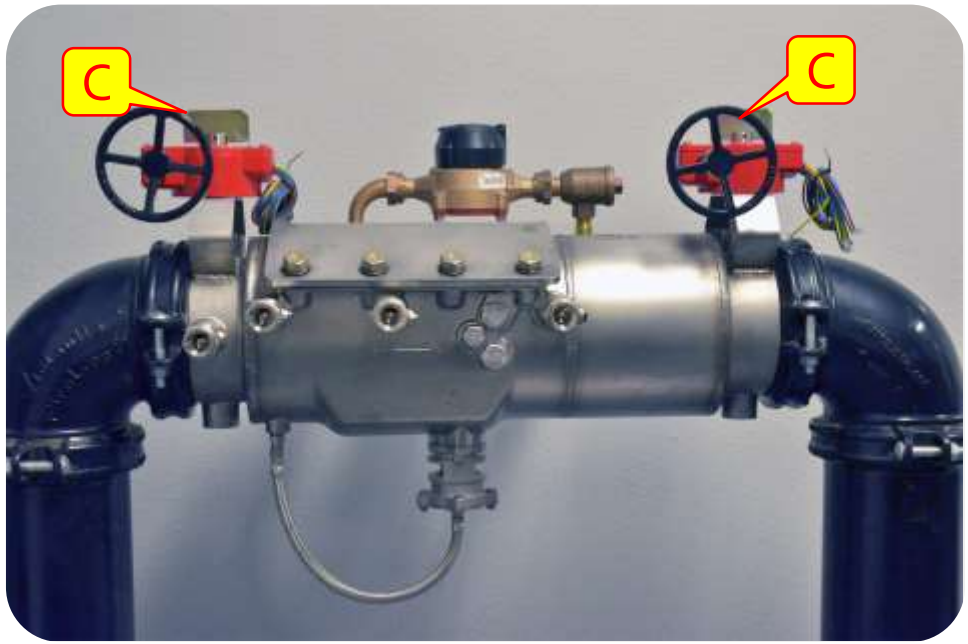
1. Slowly rotate the Number 1 Shut-Off Valve Operation Handle (A) counter clockwise to the open position. (Shut-Off Valve is open when yellow/orange position indicator flags are parallel to the mainline water flow)

2. Slowly rotate the Number 2 Shut-Off Valve Operation Handle (B) counter clockwise to the open position.

Note: Yellow/Orange Position Indicator Flags must be parallel to mainline water flow for Backflow Valve to be functional (C).



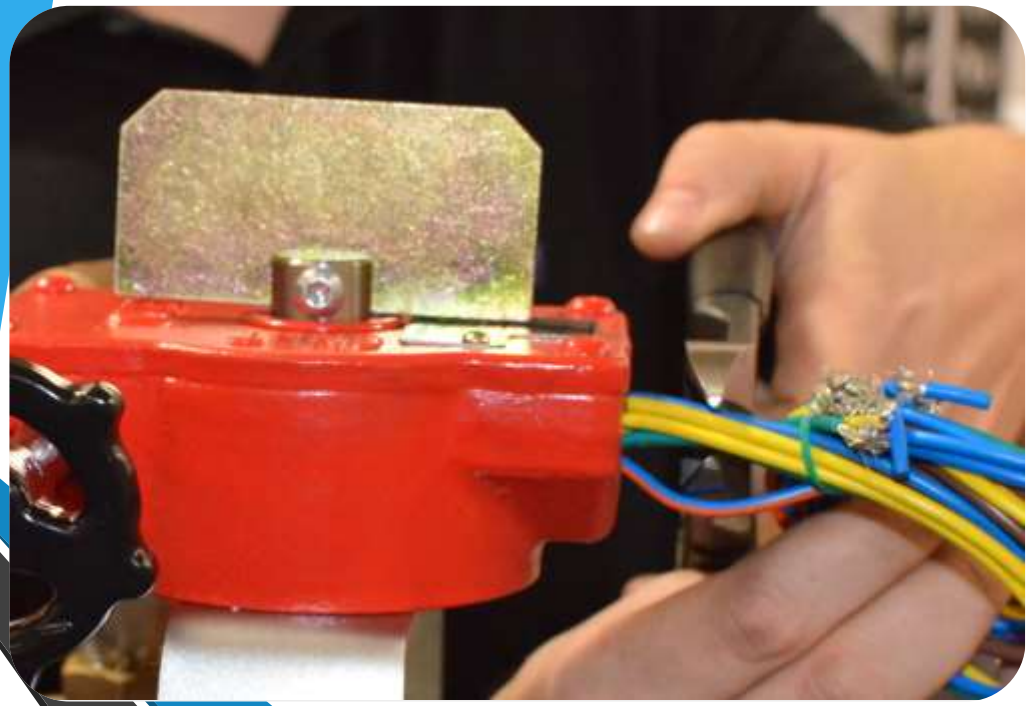
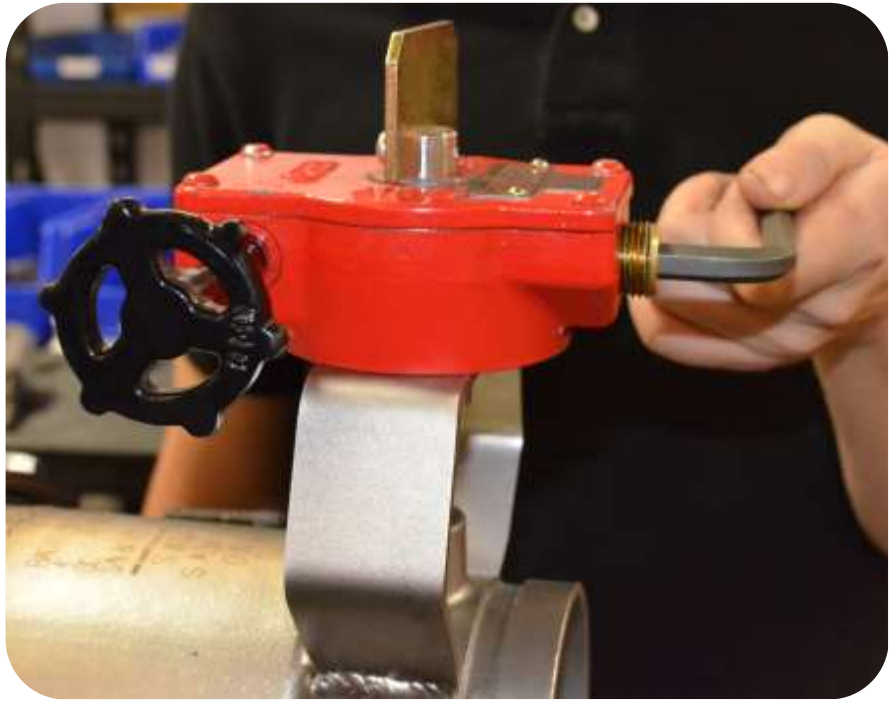




IMPORTANT NOTE

Important Note: If a Deringer is going to be installed outdoors and the tamper switches will not be wired into the fire alarm system, the wires will need to be cut and a plug will need to be installed to protect the internal components of the gear box.

Step 1: Using wire cutters, cut the wires coming out of the gearbox as close to the gearbox as possible.

Step 2: Use a piece of thread seal tape to seal the threads on the ½” NPT plug

Step 3: Using an Allen wrench, install and tighten the ½” NPT plug into the same threaded hole where the wires were previously cut.