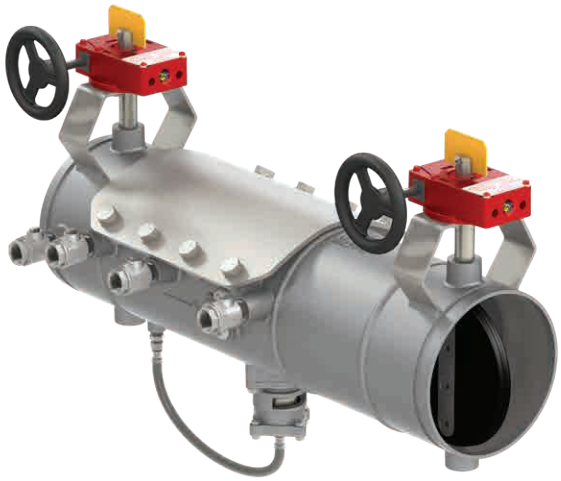
Installation, Operation and Maintenance Manual

Deringer™ 40/40X/50/50X

Reduced Pressure Zone/ Reduced Pressure Detector Assemblies

Size: 40/50: 6"&8"
40X/50X: 4"&6"



⚠ WARNING

THINK SAFETY FIRST

Read this manual BEFORE using this equipment.

Failure to read and follow all safety and use information can result in death, serious personal injury, property damage, or damage to the equipment.

Keep this manual for future reference.

⚠ WARNING

You are required to consult the local building and plumbing codes prior to installation. If the information in this manual is not consistent with local building or plumbing codes, the local codes should be followed. Inquire with governing authorities for additional local requirements.

AMES® FIRE & WATERWORKS
A WATTS Brand

Tools Required

This list is the recommended tools for installation. Other versions of the same tool can be used. For example, allen wrenches instead of allen drive sockets.

#2 Phillips Head Screwdriver

#2 Flathead Screwdriver

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

Adjustable Wrench

Deringer Test Cock Wrench

Slip-joint Pliers

1 5/16" Socket
1 1/8" Socket

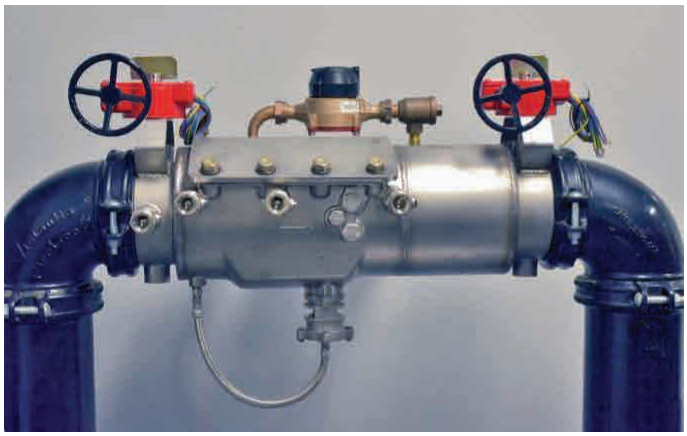
Wood Block 2" x 4" x 5"
Wood Block 1" x 2" x 16"

Toothbrush

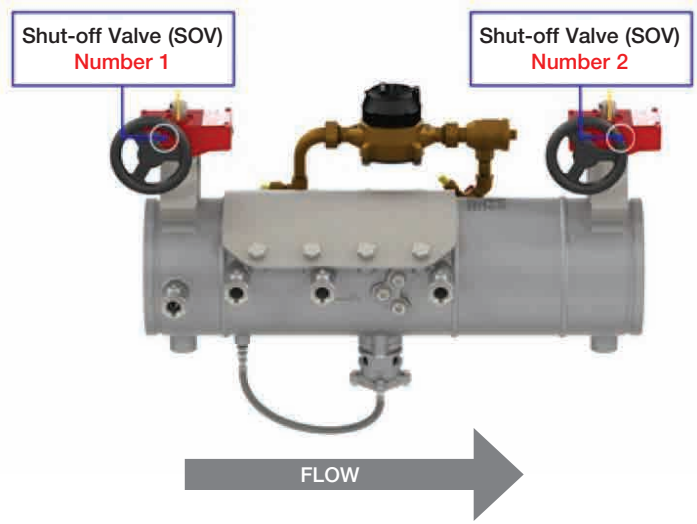
Closing Shutoff Valves Prior to Maintenance

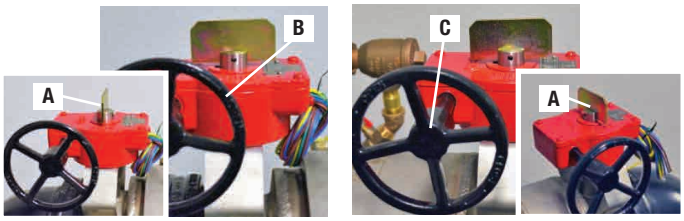
NOTICE

When yellow/orange position indicator flags are parallel with the flow of water the shutoff 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 shutoff valves are in the closed position (A).



FLOW



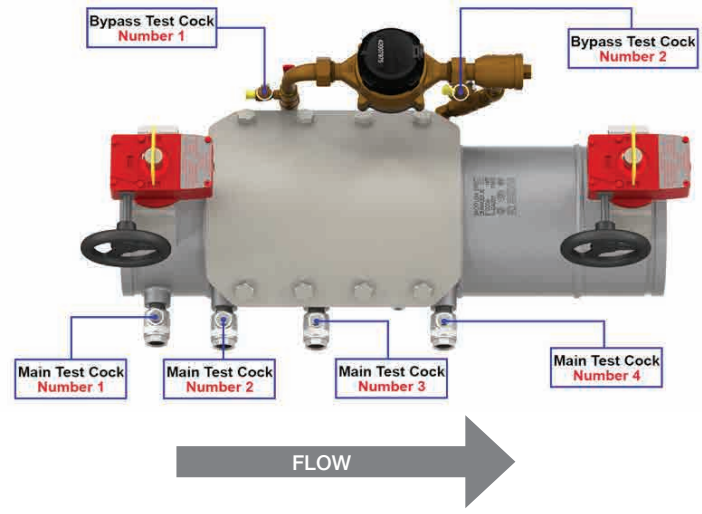


1. Slowly rotate shutoff valve #2 handle (C) clockwise to the closed position. Flag perpendicular to flow (A).
2. Slowly rotate shutoff valve #1 handle (B) clockwise to the closed position. Flag perpendicular to flow (A).

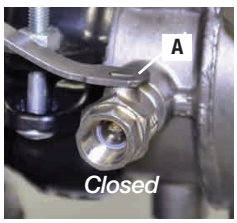
Opening Test Cocks and Bleeding All Pressure from the Line Before Maintenance

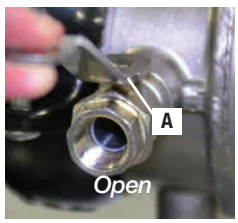
NOTE: valve is still under pressure. When opening test cocks, water will be released. Take precautions to ensure discharging water does not damage the surrounding area/equipment or create an unsafe condition.

1. **DO NOT OPEN** Main test cock number 1, as it is still subject to line pressure.
2. Using the Deringer™ 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. Deringer 50/50X only: using a #2 flathead screwdriver open bypass test cock number 2. (Test cock is open when screw-driver slot is parallel to water flow through test cock (B)).
4. Using the Deringer test cock wrench or a small adjustable wrench open main test cock number 3.
5. Deringer 50/50X only: using a #2 flathead screwdriver open bypass test cock number 1.
6. Using the Deringer test cock wrench or a small adjustable wrench open main test cock number 2.

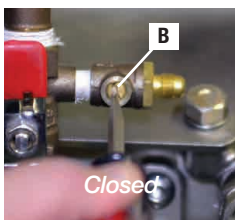


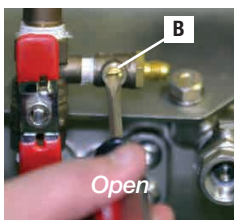
Main Test Cock





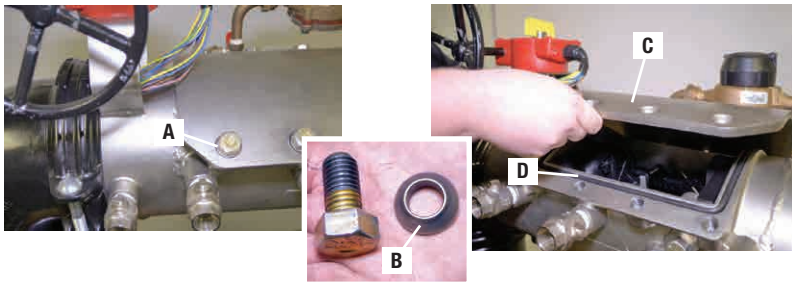
Bypass Test Cock





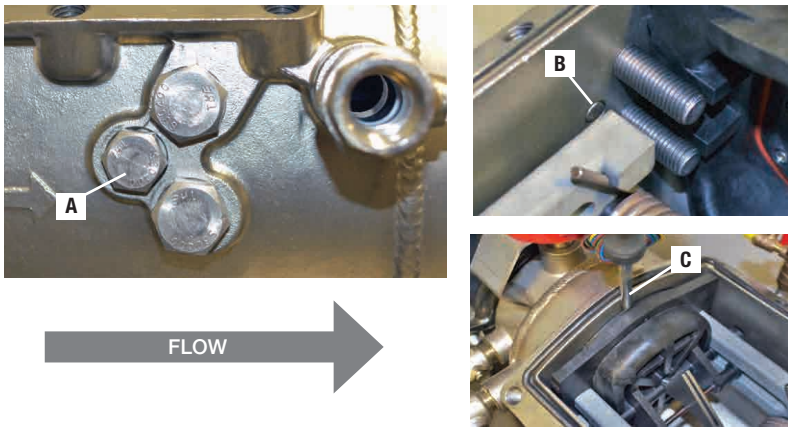
Removing Access Port Cover Plate

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).



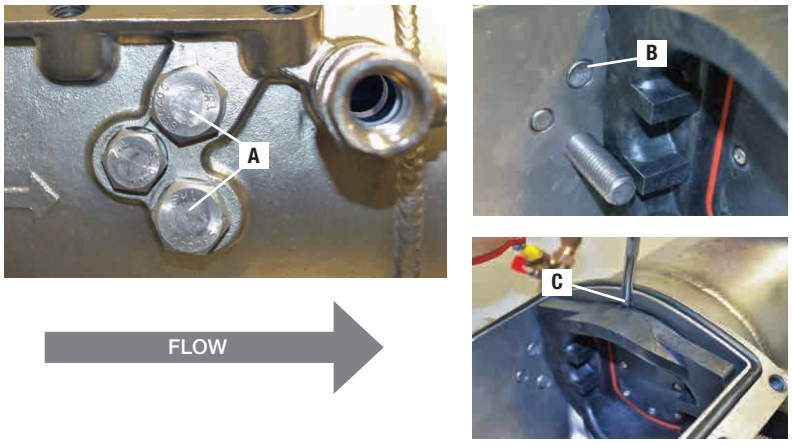
Removing the First Dual-action™ Check Module

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. 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 first check module flange (C), gently push the first check module in the downstream direction until the first check module can easily be removed from the access port by hand.



Removing the Second Dual-action Check Module

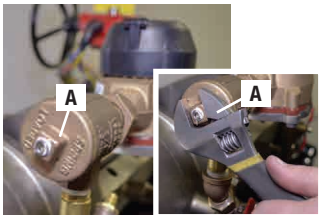
1. Use a 1 1/8" socket wrench to loosen the check retainer bolts on each side of the valve body (A). Do not completely remove check retainer bolts from valve body. Loosen the bolts until the ends of the bolts are flush with the inner wall of the valve body (B).
2. Insert a flathead screwdriver between the inner valve body and the second check module flange (C), gently push the second check module in the upstream direction until the second check module can easily be removed from the access port by hand.

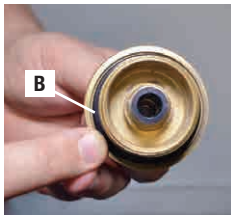


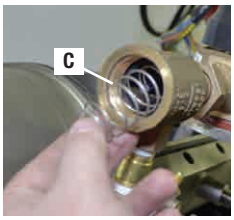
Deringer 50/50X: Disassembly and Maintenance of Bypass Check Valve

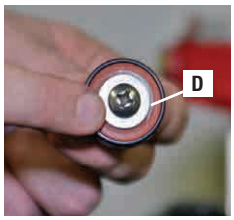
Part 1

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, located inside the bypass check valve body, 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 bypass check valve.



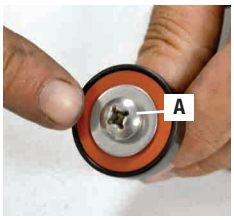


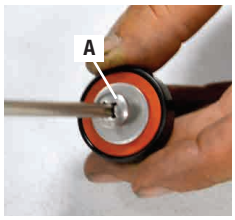


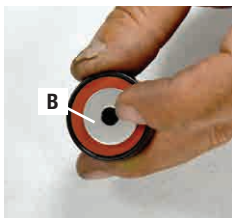


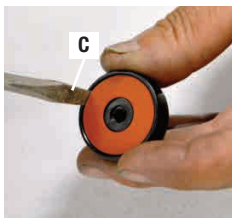
Part 2

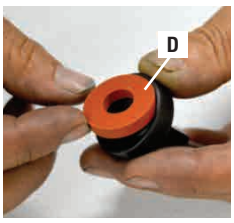
1. To replace a damaged red silicone poppet disk, use a #2 phillips head screwdriver to remove the disk retaining screw (A).
2. Remove disk retaining washer (B).
3. Use a flathead screwdriver to remove the gasket from poppet cavity (C).
4. Install new red silicone poppet disk (D).
5. Reverse the order 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.





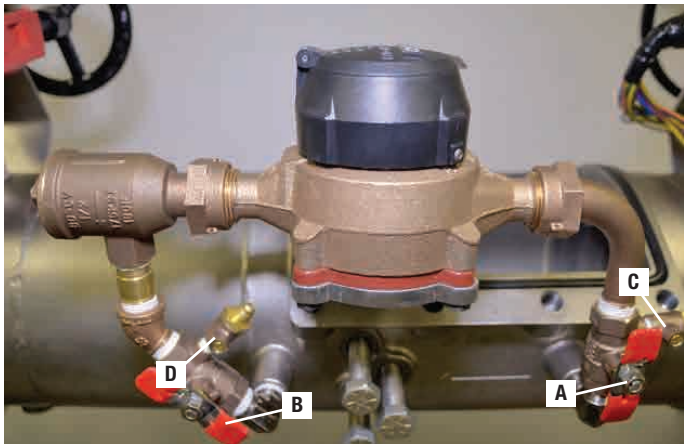


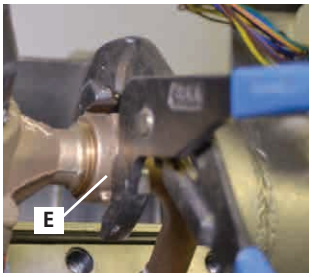


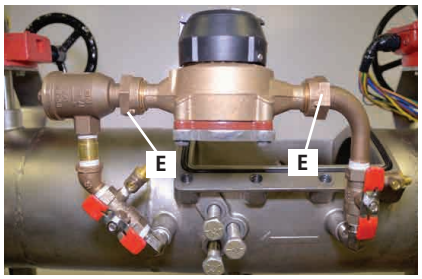


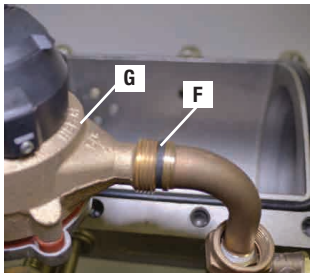
Deringer 50/50X: Removing Bypass Meter

1. Using the ball valve handles close the #2 bypass ball valve (B) and then #1 bypass ball valve (A). (Ball valve is closed when “T” handle is perpendicular to water flow through ball valve).
2. Using a #2 flathead screwdriver open bypass test cock #2 (D) and then open bypass test cock #1 (C). (Test cock is open when screwdriver slot is parallel to water flow through test cock).
3. Using large adjustable pliers or a 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 to install gaskets (F) before threading meter coupling nuts into place.



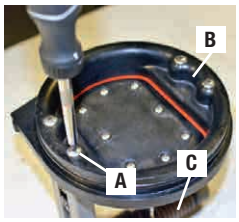


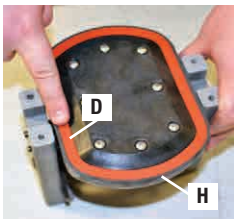


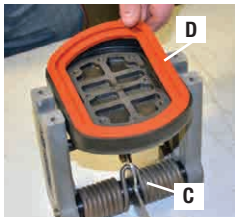


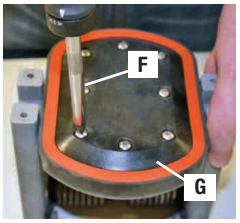
Maintenance of First True Seal Check Module

1. Use a #2 phillips 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.



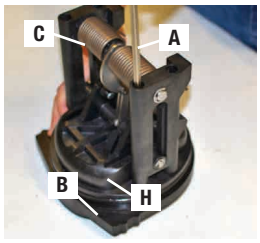


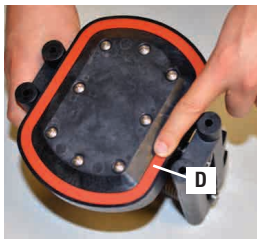


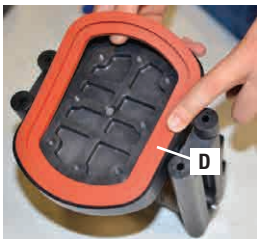


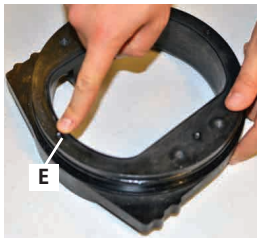
Maintenance of Second Dual-action Check Module

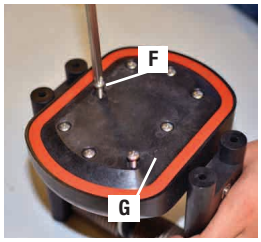
1. Use a #2 phillips head screwdriver to remove tower screws (A) from the second check seat (B) the double torsion spring is captured (C) and does not to be retained during maintenance.
2. After removing the tower screws (A) examine the elastomer disk (D) and check seat (E) for fouling or damage.
3. 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).







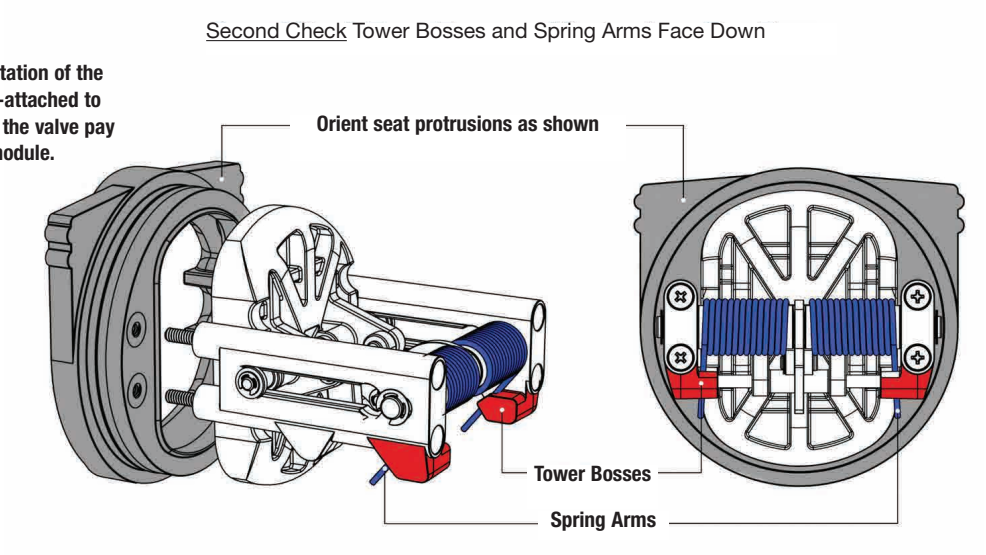




NOTICE

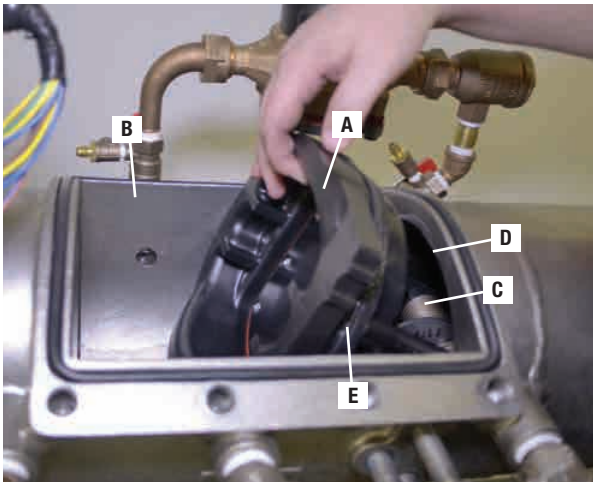
The diagram on the right shows the correct orientation of the second dual-action check module when being re-attached to the seat. In order to maintain the performance of the valve pay attention to the proper orientation of the check module.

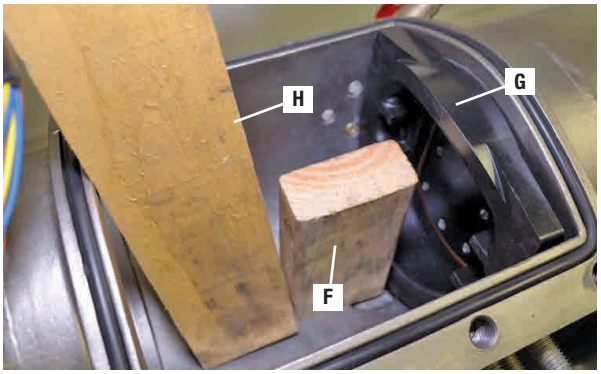
Second Check Tower Bosses and Spring Arms Face Down



Installing Second Dual-action Check Module

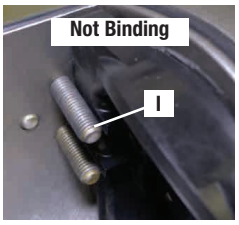
1. Insert second check module (A) into access port (B) with second check towers (C) pointing downstream. Push second check module (A) downstream into valve sealing ring (D) until check O-ring (E) rests against valve sealing ring (D). Push second check module (A) into its fully seated position by hand.
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 move 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.





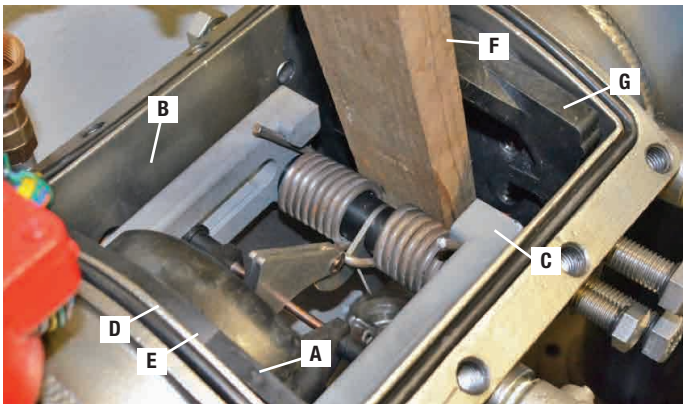
⚠ WARNING

The second check module must be fully seated to ensure retainer screws do not bind against check seat. Binding retainer screws against check seat will result in permanent damage to second check modules.



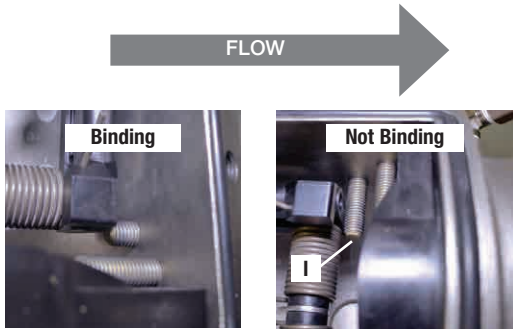
Installing First Dual-action Check Module

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). Push 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), push 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

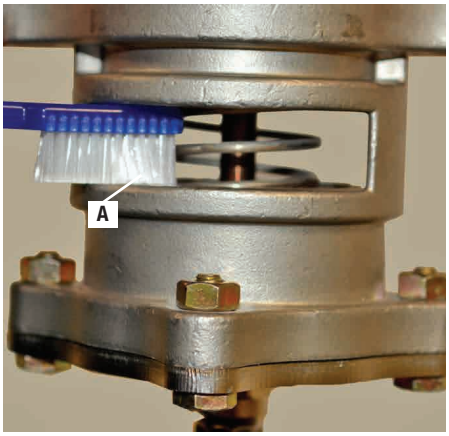
The first check module must be fully seated to ensure retainer screws do not bind against check towers. Binding retainer screws against check towers will result in permanent damage to first check modules.

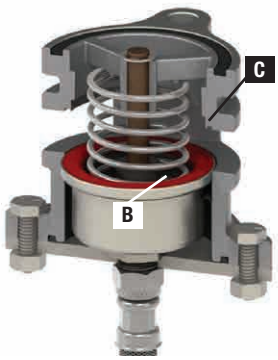


Maintenance of Relief Valve

NOTICE

Typically, 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.



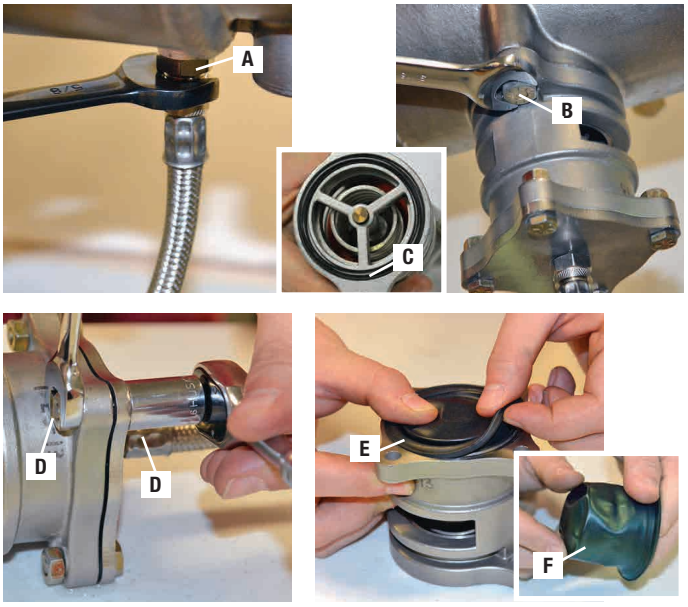


Maintenance of Relief Valve

NOTICE

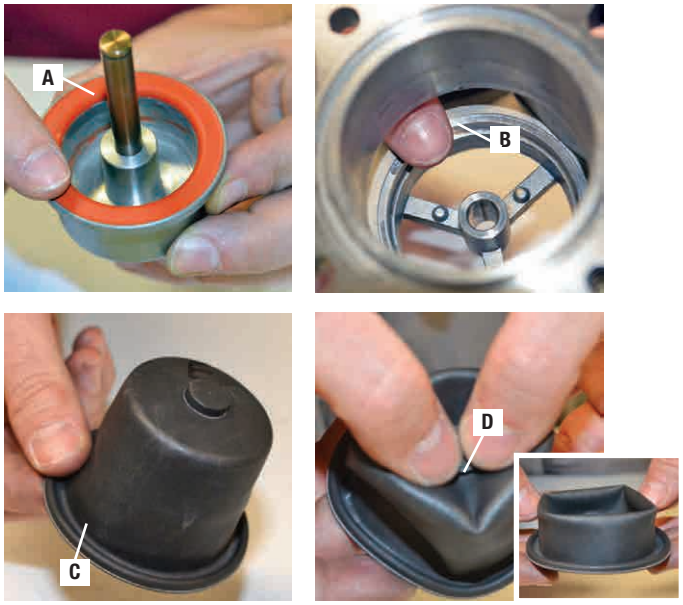
If one is certain that the relief valve requires maintenance proceed as follows.

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).



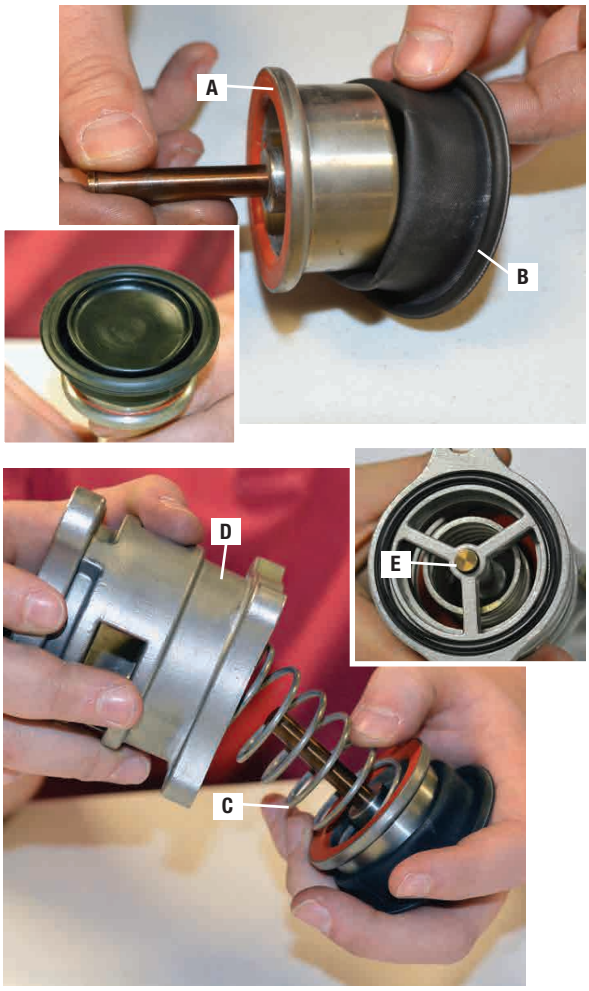
Maintenance of Relief Valve (continued)

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.



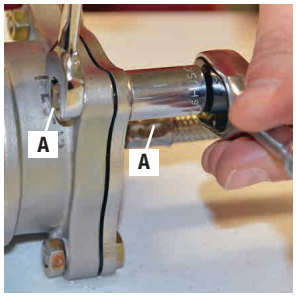
Maintenance of Relief Valve (continued)

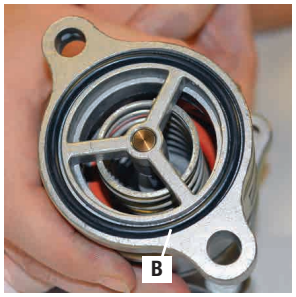
1. Place the piston assembly (A) into the diaphragm (B), making sure the diaphragm lays flush on the bottom of the piston assembly with no wrinkles or tears in the diaphragm.
2. Place the relief valve spring (C) back onto the relief valve assembly (A) and slide the valve assembly back into the relief valve body (D). Make sure the piston assembly lines up to penetrate hole (E) in top side of relief valve.

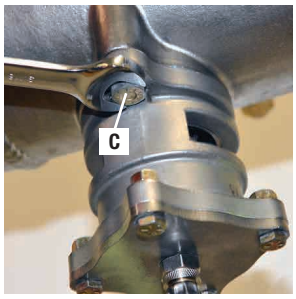


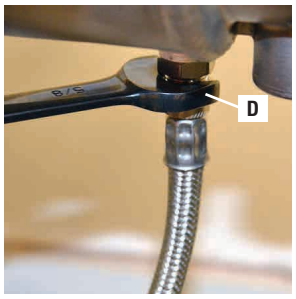
Maintenance of Relief Valve (continued)

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).



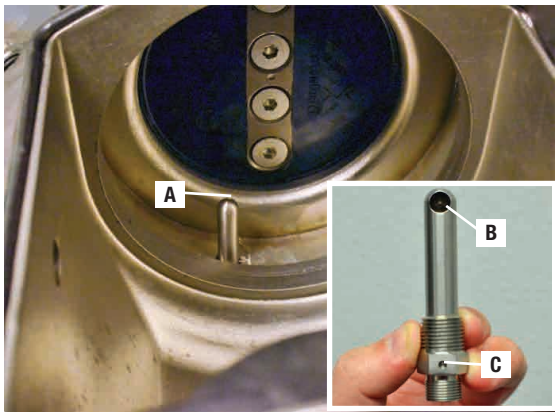


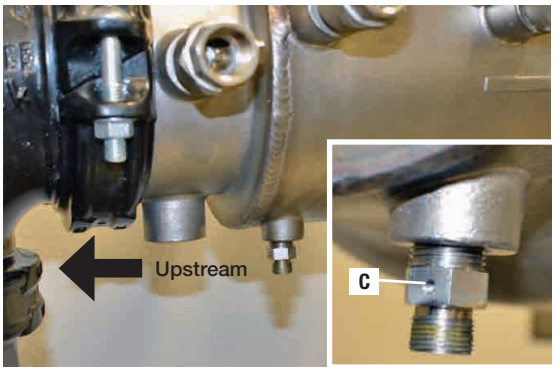




Pitot Tube Orientation

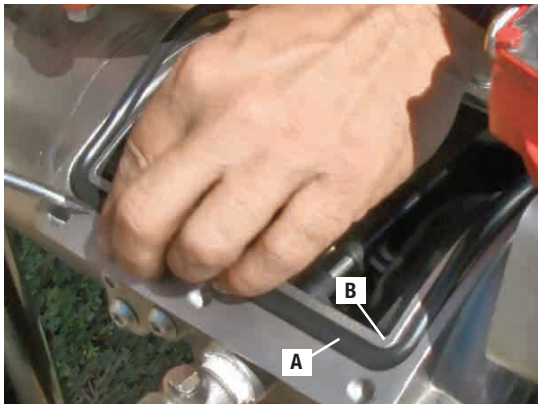
1. Before reinstalling the relief valve after maintenance, check to make sure the pitot tube (A) is in the proper orientation. If the pitot tube is **NOT** in the proper orientation the relief valve **WILL LEAK OR DUMP** during flow conditions.
2. The inlet port of the pitot tube (B) at the top of the pitot tube must face directly UPSTREAM toward the #1 shutoff 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 shutoff 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 right). 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 shutoff 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

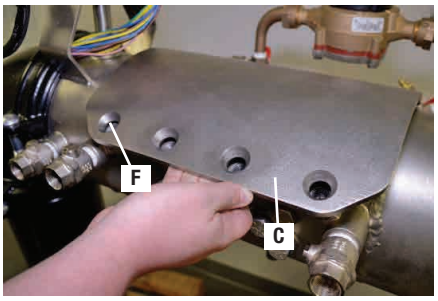


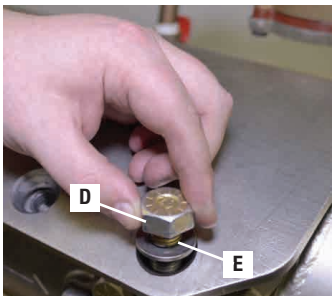


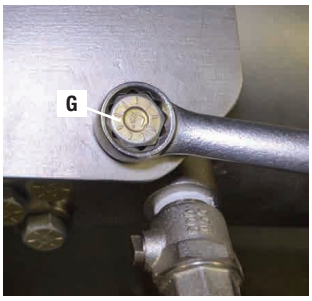
Installing Access Port Cover

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), flat side facing up, 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.



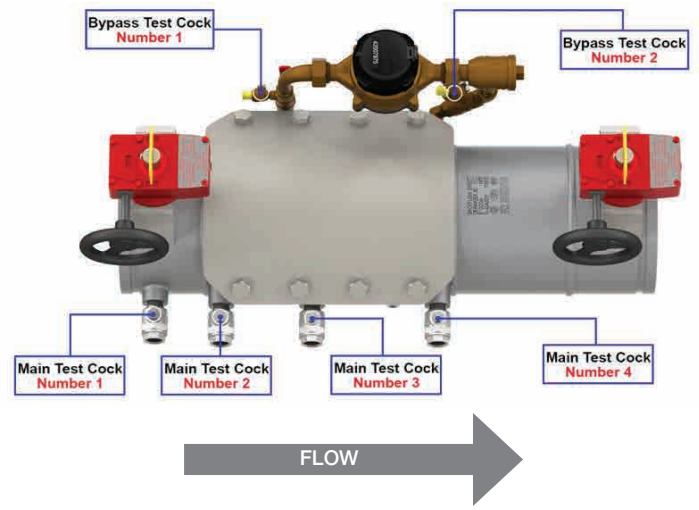


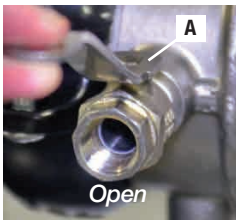


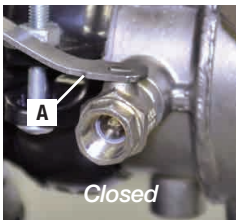


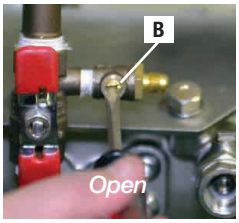
Close Test Cocks and Double Check All Closing/Sealing Mechanisms

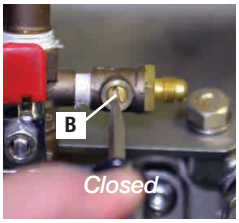
1. Using the Deringer test cock wrench or a small adjustable wrench close main test cocks number 1, 2 and 3 (A). (Test cock is closed when wrench flats on stem are perpendicular to water flow through test cock)
2. Deringer 50/50X: Using a #2 flathead screwdriver close bypass test cock number 1 and 2 (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 (D) and then open bypass ball Valve number 2 (C). (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)
   - Deringer 50/50X: Bypass check valve cover is tightened (F)
   - Deringer 50/50X: Bypass meter coupling nuts are tightened (G)

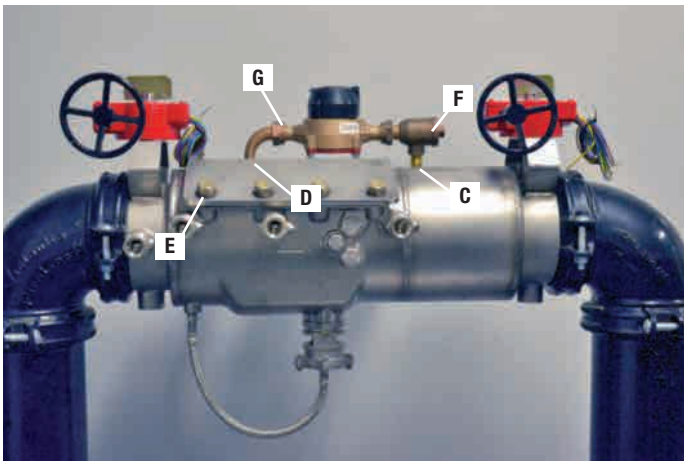










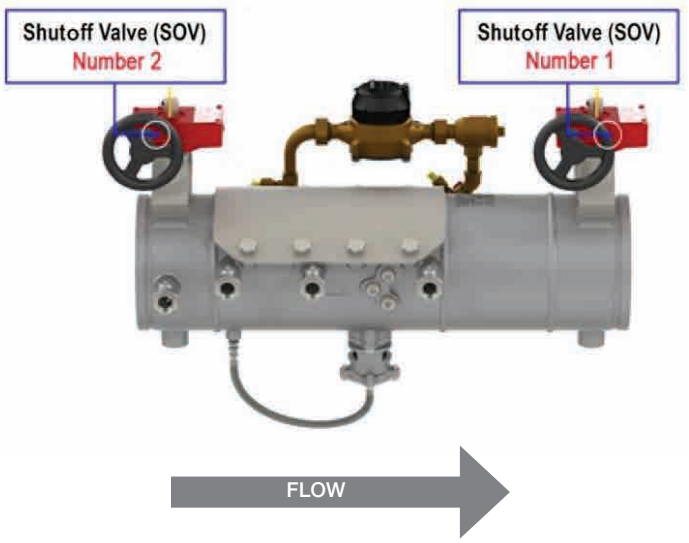


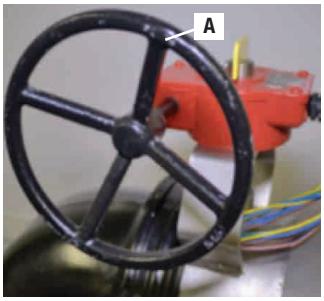
Open Shutoff Valves to Make Backflow Preventer Functional

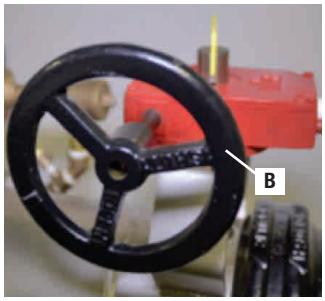
1. Slowly rotate the number 1 shutoff valve operation handle (A) counterclockwise to the open position. (Shutoff valve is open when yellow/orange position indicator flags are parallel to the mainline water flow).
2. Slowly rotate the number 2 shutoff valve operation handle (B) counterclockwise to the open position.

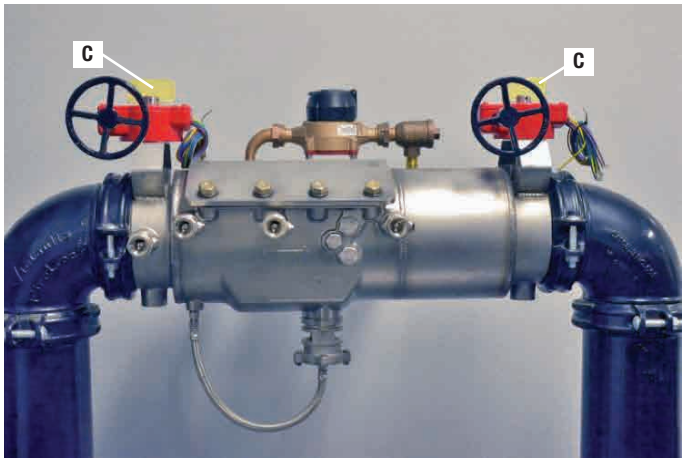
NOTICE

Yellow/orange position indicator flags must be parallel to mainline water flow for backflow valve to be functional (C).









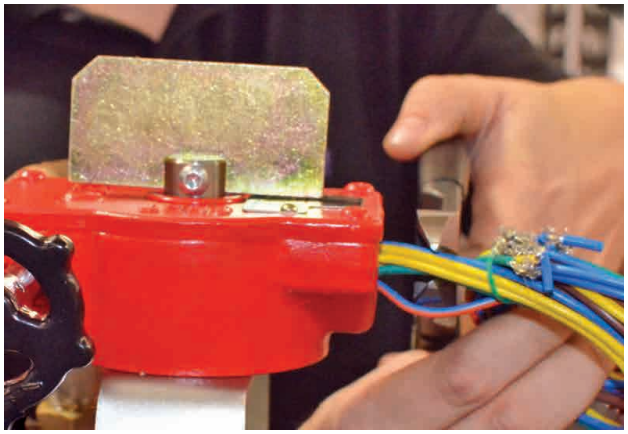
NOTICE

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 gearbox.

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 a 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.



Limited Warranty: Ames Fire & Waterworks (the "Company") warrants each product to be free from defects in material and workmanship under normal usage for a period of one year from the date of original shipment. In the event of such defects within the warranty period, the Company will, at its option, replace or recondition the product without charge.
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The remedy described in the first paragraph of this warranty shall constitute the sole and exclusive remedy for breach of warranty, and the Company shall not be responsible for any incidental, special or consequential damages, including without limitation, lost profits or the cost of repairing or replacing other property which is damaged if this product does not work properly, other costs resulting from labor charges, delays, vandalism, negligence, fouling caused by foreign material, damage from adverse water conditions, chemical, or any other circumstances over which the Company has no control. This warranty shall be invalidated by any abuse, misuse, misapplication, improper installation or improper maintenance or alteration of the product.
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