AMES FACTORY REPAIR INFORMATION

The following pages are excerpts from literature the manufacturers print to help repair their assemblies. This information is provided to assist in repairing their assemblies but should not be considered all the information needed to repair all situations.

MODELS FOR WHICH FACTORY REPAIR INFORMATION IS PROVIDED

PAGES 1-83 THROUGH 1-119 HAVE INTENTIONALLY BEEN OMITTED

BAVCO
BACKFLOW APPARATUS & VALVE CO.

MAINTENANCE INSTRUCTIONS:

Ames backflow prevention assemblies require minimum maintenance. Maintenance on all internal components can be performed without removal of the assembly from line service. All assemblies must be retested once maintenance has been performed.

Removing and Installing Knuckle Joint Assembly 2000 DCA & 3000 DCDA

1. Shut down water system and lockout system if possible.

2. Slowly open test cocks or air bleed screw to relieve pressure.

3. Remove all cover plate bolts, lid and cover plate gasket from valve body.

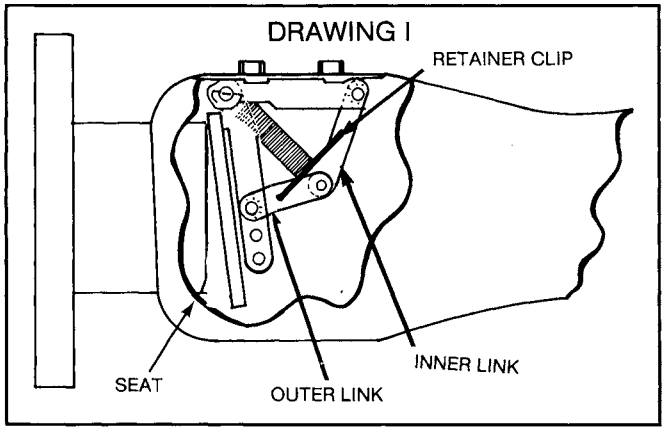
4. Push retainer clip into knuckle joint retention openings located on inner and outer linkages of knuckle joint assembly, until clapper opens slightly. (Drawing 1).

5. Carefully loosen and remove the two knuckle joint mounting bolts, located on exterior of valve body.

6. Remove knuckle joint assembly from body assuring retainer clip is not disturbed.

7. Bolt the knuckle joint assembly on the exterior of the body through the mounting link holes (Drawing II), or press on hard surface to remove retainer clip.

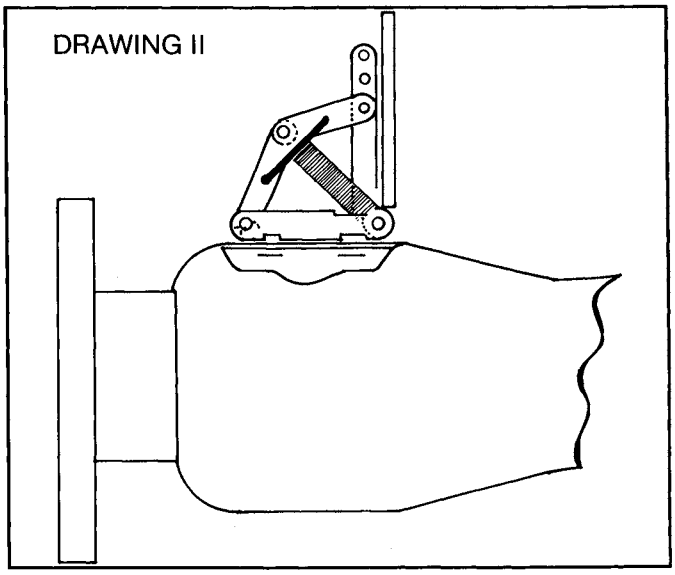
8. Push on clapper plate to release retainer clip, and remove clip. Slowly remove tension on clapper and unbolt knuckle joint assembly from mounting link holes.



9. Bolt replacement knuckle joint assembly as in step 7.

10. Push on clapper plate to extend springs and install retainer clip. Unbolt knuckle joint assembly from mounting link holes.

11. Insert two New ⅜ x 1" sealed mounting bolts through mounting holes in body. Position knuckle joint in place inside body, and finger tighten both bolts.



12. Torque knuckle joint mounting bolts to approximately 10 FT LBS.

13. Remove retainer clip.

14. Install new gasket with lid. Torque lid bolts to 120 FT LBS.

Removing And Installing Knuckle Joint Assembly (#1 check valve on 4000 RP, 1st and 2nd check on 10" 2000 DC & 3000 DCDC).

1. Depressurize assembly.

2. Remove all cover plate bolts, cover and gasket from #1 check.

3. Locate pivot arm of tong tool onto horizontal link pin of knuckle joint (Drawing III).

4. Locate pivot arm of tong tool into adjacent port flange hole.

5. Remove the two rear mounting **nuts** from exterior of body.

6. While depressing tong tool handle, work rear mounting link away from port tube. (Caution: considerable tension is on tong tool hold firmly).

7. Slowly release controlled pressure on tong tool handle until tension is relieved from springs.

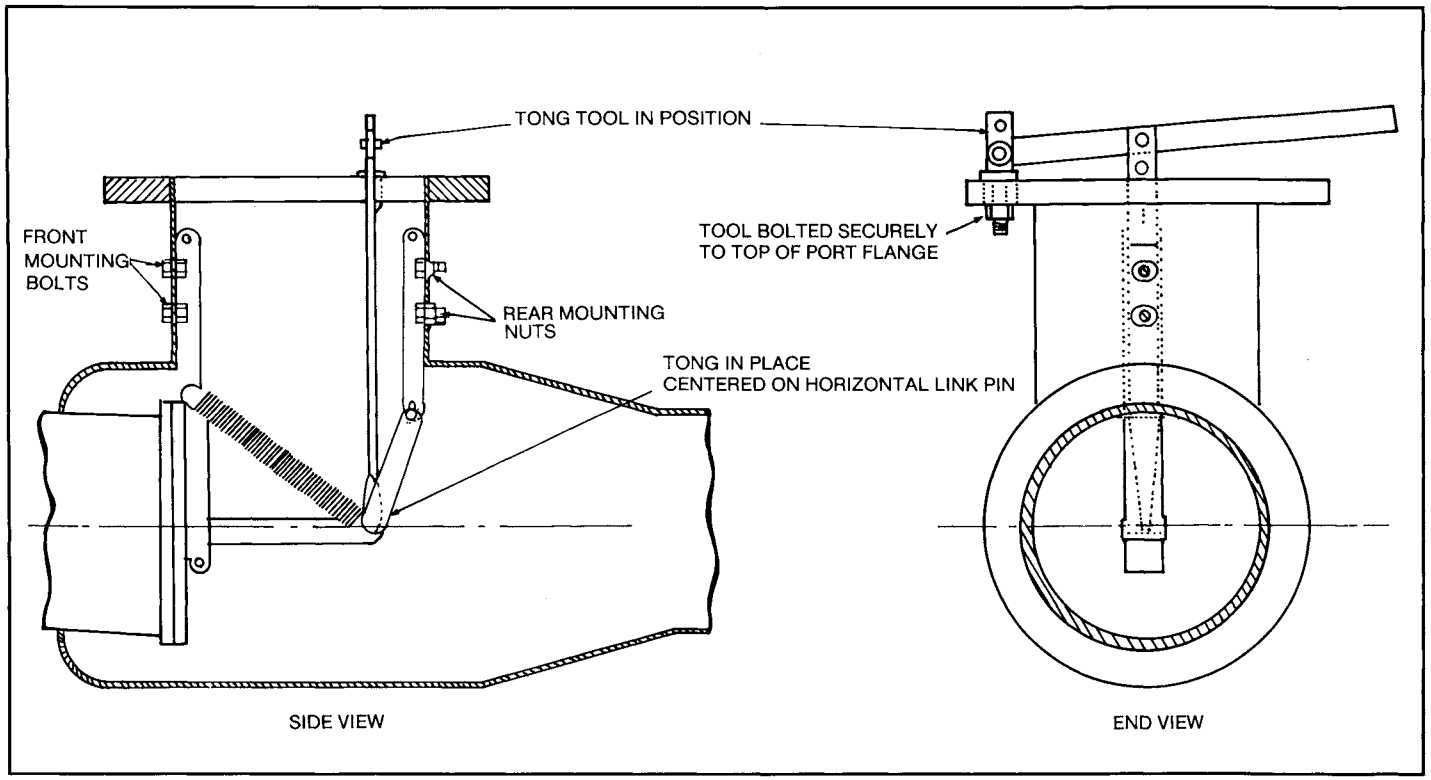
8. Remove tong tool from device.

9. Remove 2 - ⅜" mounting **bolts** from front of body.

10. Remove knuckle joint assembly from body.

11. Reinstall new knuckle joint assembly by reversing above procedure.

DRAWING III



REMOVAL AND REPAIR OF RELIEF VALVE 4000 / RP 5000

1. Depressurize assembly Disconnect hose and remove relief valve from elbow flange. Inspect rubber relief valve mounting seat gasket for debris, cutting or distortion of rubber. Remove 5/16" lid bolts.

2. Disassemble piston assembly by unscrewing top diaphragm plate from seat tube in counter clockwise direction. Remove o-ring from relief valve body. Clean and inspect all parts for damage, debris or buildup. Clean and inspect vent hole in seat tube and o-ring groove in body.

3. Place small amount of FDA approved lubricant on o-ring groove, seat tube OD, o-ring.guide pin and diaphgram plate threads. (Do not use petroleum or solvent based lubricant). Clean o-ring groove on top washer plate. Hold top washer plate with threaded side up. Set diaphragm on washer plate with side marked HIGH PRESSURE SIDE down, install bottom washer plate with spring guide shoulder away from diaphragm. Set seat tube on threaded stub of washer plate and slowly engage threads. **Hand tighten** seat tube in clockwise direction.

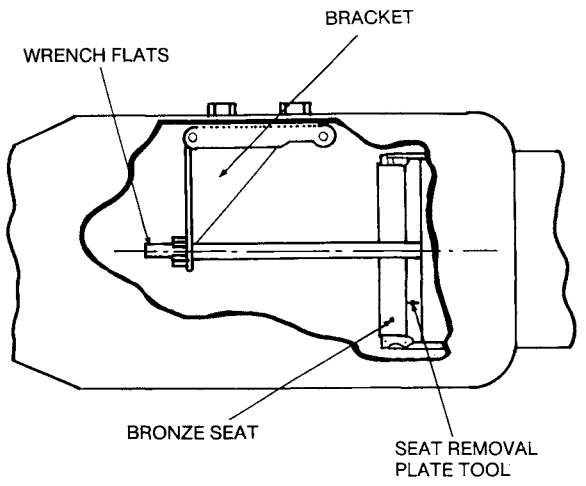
4. Stretch to 3" diameter and lubricate o-ring and place in o-ring groove. Place relief valve spring in body. Place lid with bolts on piston assembly and thread diaphragm over bolts. Insure that diaphragm is not pinched between lid and washer plate. Reassemble unit assuring spring is seated over guide and that tube is carefully pushed through o-ring in body. Hand tighten bolts. If o-ring has been pushed from groove, disassemble, inspect for damage, and repeat assembly.
Clean and place rubber seat mounting gasket in recess with raised o-ring side out. Before installing relief valve, slightly open #1 gate valve to insure hose is free of debris and debris is washed from main body. Bolt relief valve to mainline valve and install hose. Open #1 gate valve and bleed air from all test cocks and air vents on relief valve.

5. Test assembly.

MAINTENANCE INSTRUCTIONS: Check Seat Replacement

I. Removing Bronze Seat (all assemblies except #1 RP, 8" & 10" DC & DCDC)

DRAWING IV



1. Remove knuckle joint assembly.

2. Insert seat replacement bracket into interior of body and install where knuckle joint was located.

3. Place seat removal tool beyond seat into pulling position.

4. Install rod through bracket seat and thread into seat removal tool.

5. Thread nut and washer onto rod until contact with bracket.

6. Place wrench on rod flats, while using another wrench to tighten nut until seat dislodges from body.

7. Remove seat and all tooling except bracket from body.

Installing New Bronze Seat (Drawing V)

1. Clean debris from seat area.

2. Lubricate seat area with water soluble FDA approved lubricant.

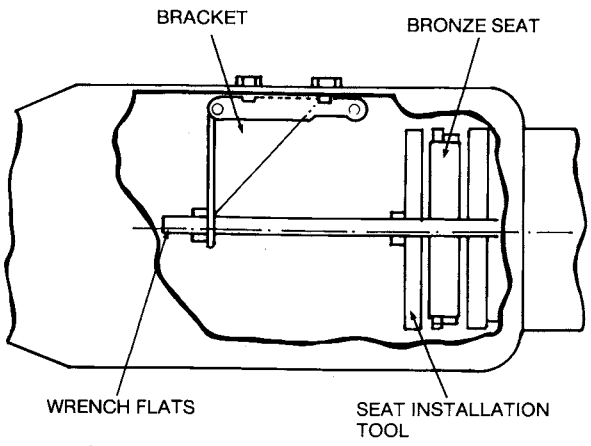
3. Install tooling as per Drawing V.

4. Using two crescent wrenches, tighten nuts on rod in opposite directions until seat, with o-ring, is securely into place. Visually inspect seat to insure contact with body.

5. Remove tooling.

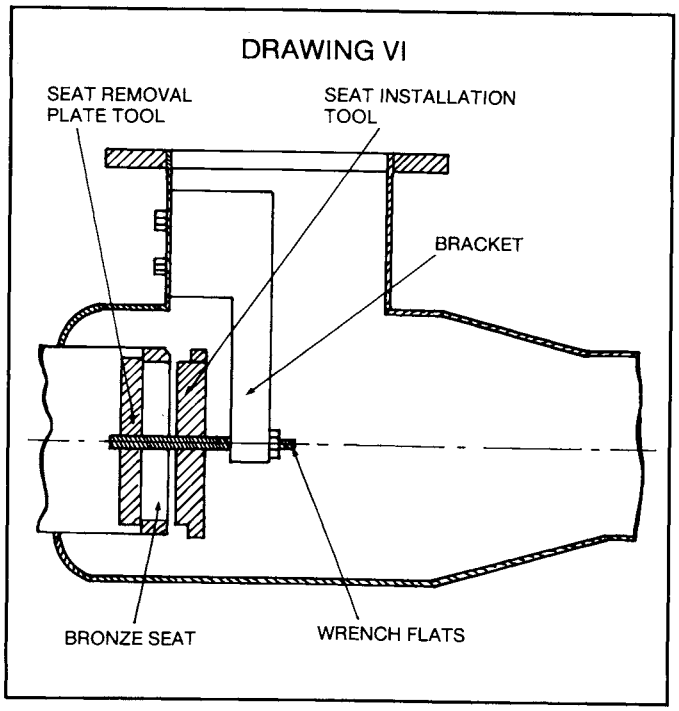
6. Install knuckle joint and lid.

DRAWING V



II. Removing and Installing bronze seat (1st check 4000 RP and 8" & 10" DC & DCDC) Drawing VI

Note: Procedure is identical to previous removal and installation of seat.



AIR GAP DRAIN 4000 5000

APPLICATION

The Air Gap Drain is designed to be installed under the relief valve on Ames RP and RPDA devices to catch minor relief valve discharges created by pressure fluctuations of the supply line. The Ames Air Gap Drain is approved by the USCFCCCHR.

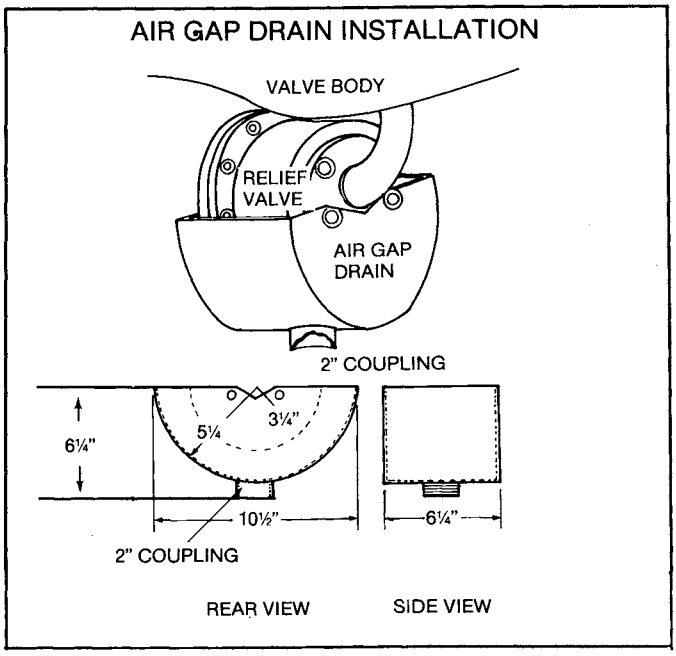
INSTALLATION INSTRUCTIONS:

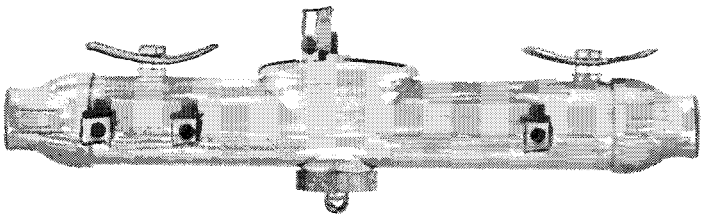
A. Before installation, check with local authorities as an air gap drain is not approved for all installations.

B. Remove lower two relief valve mounting bolts.

C. Align bolt holes on air gap drain with holes in relief vavle flange.

D. Insert the two bolts which were removed in Step B through air gap drain and relief valve flange, then tighten.





Ames Model 2000 SS Double Check Backflow Preventer

3/4"-2" Produced from 1990-1992

MAINTENANCE INSTRUCTIONS:

NOTE: Ames assemblies require minimum maintenance. All assemblies must be retested once maintenance has been performed. Before servicing be certain all water is turned off or shut off valves are closed.

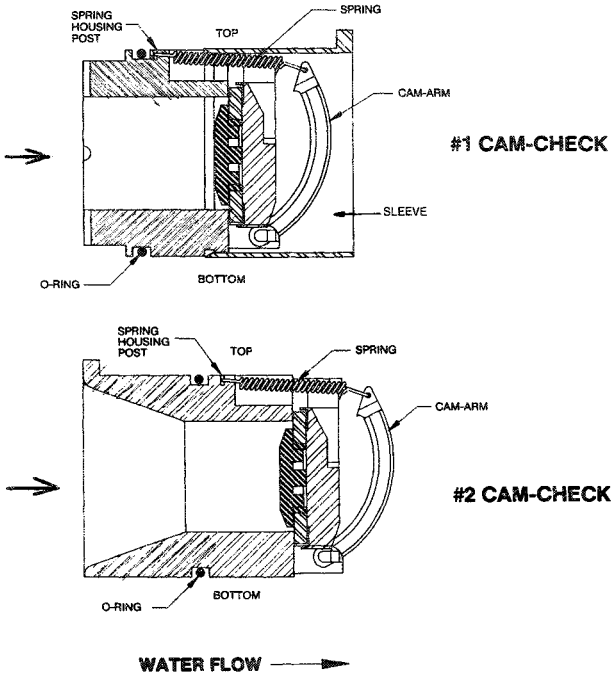
REMOVING AND INSTALLING CAM-CHECK ASSEMBLIES:

1. Shut down water system and lock out system if possible. Slowly open all test cocks to relieve air and water pressure. Loosen cover bolt, then remove bottom plug and bottom nut. Next remove lid assembly, leaving lid bolt in lid as part of assembly.

2. Remove #1 cam-check assembly by using your hand to slide the assembly downstream. Lift #1 cam-check through top access port. Remove #2 cam-check by using your hand to slide the assembly upstream. Lift #2 cam-check through top access port. (Note: #1 cam-check must be removed first in order to remove #2 cam-check. #2 cam-check may only be removed when #1 cam-check has been removed.) If the cam-check is tight and resistent to sliding to the access port, insert a straight blade screwdriver between the cam-check unit and the housing and gently pry it towards the access port.

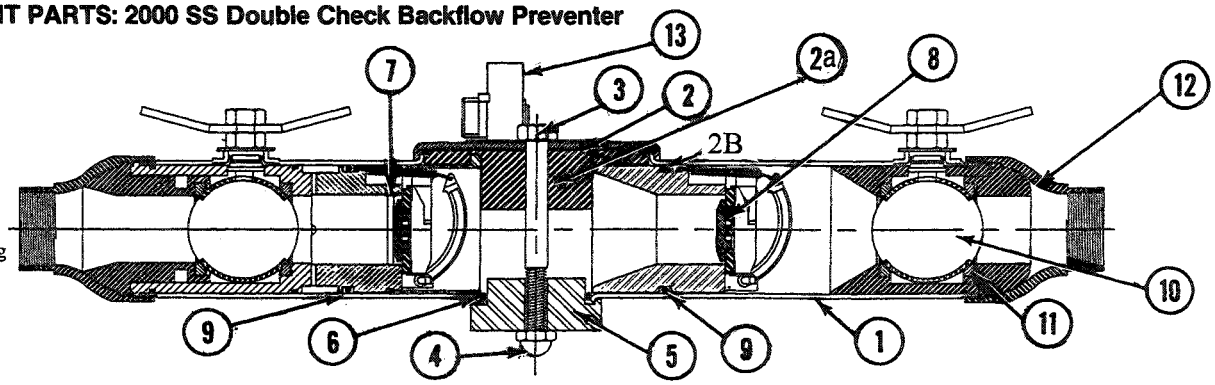
3. To clean check assembly, remove spring from check housing by lifting spring with a small screw driver from housing post. Rinse cam-check and o-rings thoroughly. Inspect clapper seats, housing, cam-arm, and o-ring for damage. If not damaged, return spring to housing post for re-assembly.

4. Re-assemble the cam-checks in the reverse order. #2 cam-check must be installed prior to installation of #1 cam-check. Be sure cam-checks are installed with cam-arm facing downstream in the body. When installing, use a FDA approved lubricant. Be sure o-rings are securely in place and have not fish-mouthed. Insert cover lid (making sure locating lip on checks mates with underside of lid), bottom plug (lubricated) and nut. Tighten securely. (Note: All test cocks must be in open position in order to install cam-checks.)



REPLACEMENT PARTS: 2000 SS Double Check Backflow Preventer

1 Body
2 Upper Cover
2 A Upr Cvr Ret
2B #2 Ck Assy
3 Bolt
4 Nut
5 Lower Cover
6 Lower Cover O'Rg
7 #1 Ck Assy
8 Ck Disc
9 Ck Assy O'Rg
10 Ball
11Ball Seal
12 Body End
13 Test Cock



Ames model 2000 SS Double Check Backflow Preventer (3/4" through 2")
General Installation, Maintenance, Testing, and Parts Information

MAINTENANCE INSTRUCTIONS

NOTE: Ames assemblies require minimum maintenance. All assemblies must be re-tested once maintenance has been performed. Before servicing be certain all water is turned off or shut off valves are closed.

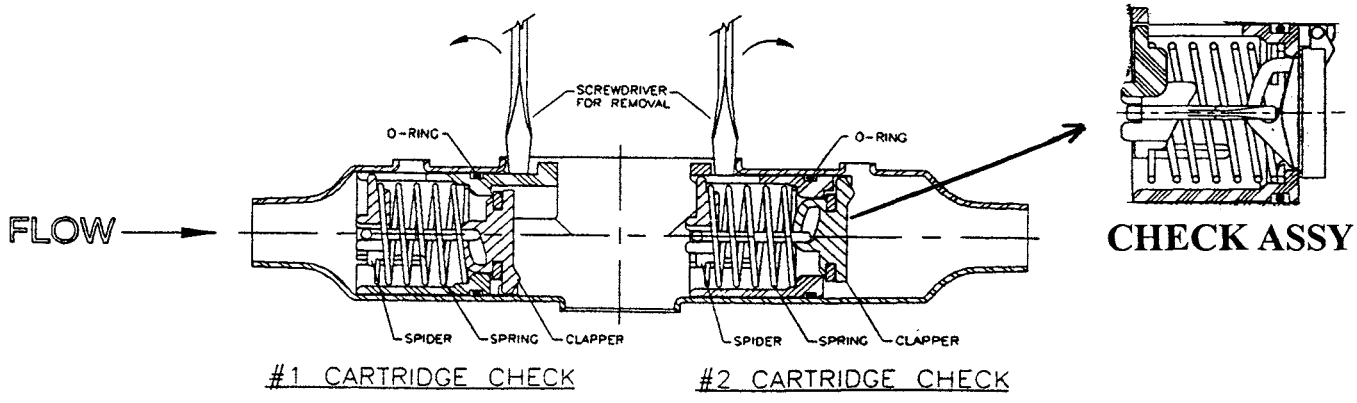
Removing and Installing Cartridge Check Assemblies Produced from 1992 – 1997

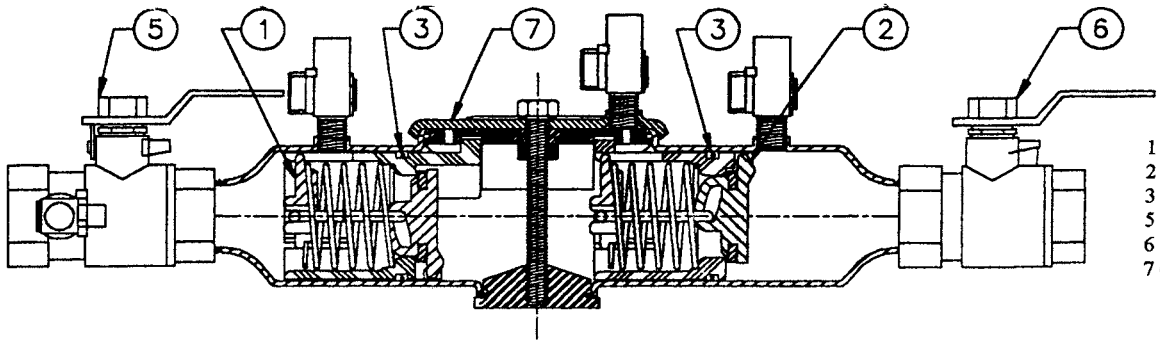
1. Shut down water system and lock out system if possible. Slowly open all test cocks to relieve air and water pressure. Loosen cover bolt, Next remove lid assembly.

2. Remove #2 cartridge check by using your hand to slide the assembly downstream and remove through the top access port. Remove #1 cartridge check by using your hand to slide the assembly upstream and remove through the top access port. **(Note: #2 cartridge check must be removed first in order to remove #1 cartridge check)** If the cartridge check is tight and resistant to sliding to the access port, insert a straight blade screwdriver (as shown below) between the cartridge check and the housing and gently pry it towards the access port.

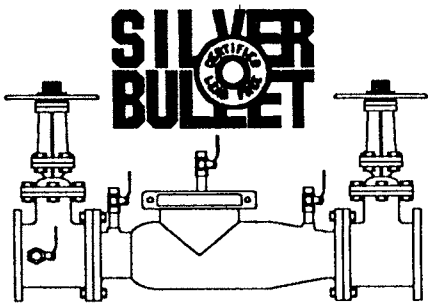
3. To clean cartridge check, push spider towards clapper and hold in open position. Rinse cartridge check and o-rings thoroughly. Inspect clapper seats, housing, and o-ring for damage. If not damaged, clean clapper face and o-ring groove prior to re-assembly. If damaged install new cartridge check.

4. Re-install the cartridge check in the reverse order. **#1 cartridge check must be installed prior to installation of #2 cartridge check.** Be sure cartridge checks are installed with clapper downstream in the body. When installing, use a FDA approved lubricant. Be sure o-rings are securely in place and have not fish-mouthed. Insert cover lid *(making sure locating lip on cartridge checks mate with underside of lid)*, Tighten securely (5-7 lbs). **(Note: All test cocks must be in open position in order to install cartridge checks.)**





1 #1 Ck Assy
2 #2 Ck Assy
3 Ck Assy O'Rg
5 #1 Ball Valve
6 #2 Ball Valve
7 Cover



Ames Model 2000 SS and 2000 SE Double Check and 3000 SS & 3000 SE Double Detector Check Backflow Preventer General Installation, Maintenance, and Parts Information 2 1/2" - 8"

MAINTENANCE INSTRUCTIONS

NOTE: Ames assemblies require minimum maintenance. All assemblies must be retested once maintenance has been performed. **Before servicing be certain shut off valves are closed.**

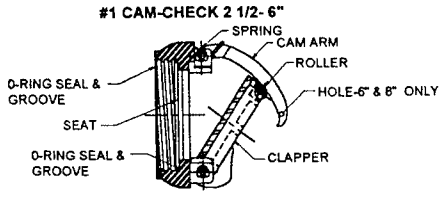
REMOVING CAM-CHECKS

1. Shut down water system and lock out system if possible. Slowly open all ball valves to relieve air and water pressure. Loosen bolts on groove coupler and remove groove couple and cover plate from valve body.

2. Remove #1 Cam-Check assembly by using your hands to unscrew (turn counter-clockwise) Cam-Check and remove through top access port. ***Do not use Cam Arm as a handle to unscrew Cam-Check.*** If Cam-Check cannot be loosened by hand, insert a long screwdriver between valve body and Cam-Check (see figure 2 Gently apply pressure against the Cam-Check until loosened. Finish unscrewing by hand. Unscrew #2 Cam-Check (turn counter clockwise) by placing a long screwdriver across lugs and applying pressure to loosen #2 Cam-Check. Finish unscrewing by hand.

3. To clean #1 Cam-Check (except 2 1/2" - 4" DC Check), locate the Cam Arm opening stud on the outlet flange of the valve assembly. Slide the Cam Arm over the stud with the check threads facing downward (figure 5A). Tighten 1/4" nut on stud to secure cam bar. Slowly pull the assembly outward to open check allowing exposure of the seat and clapper contact area for cleaning. To clean #2 Cam-Check, lift Cam Arm and hold in open position. Raise clapper so that the end of the Cam Arm rests between roller and clapper (figure 5B). Thoroughly clean the seat area and clapper sealing surfaces of both Cam-Checks. Rinse Cam-Checks and O-rings thoroughly. Inspect seats, clapper sealing surfaces, Cam Arms, and O-rings for damage, nicks, and debris. If not damaged, gently close the clapper. If damaged, install a new Cam-Check assembly and/or O-ring.

4. Before reinstallation of Cam-Checks, thoroughly clean O-ring groove and lubricate O-ring with FDA approved lubricant. Insert and thread #2 Cam-Check first and then #1 Cam-Check. #2 Cam-Check should be tightened by inserting a long screwdriver between lugs to tighten firmly (see figure 2). Do not over tighten. Tighten #1 Cam-Check firmly by hand only. Replace cover plate, clean groove coupler gasket and groove. Replace groove coupler. Close ball valves. Repressurize and bleed air from all test cocks.



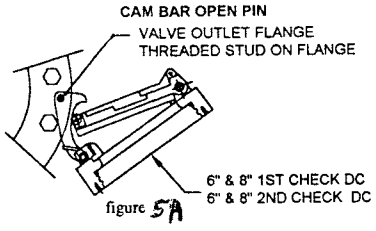


figure 5A

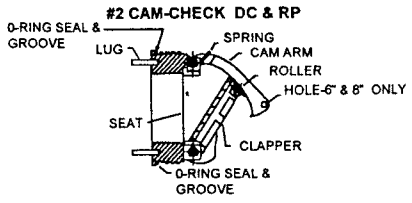
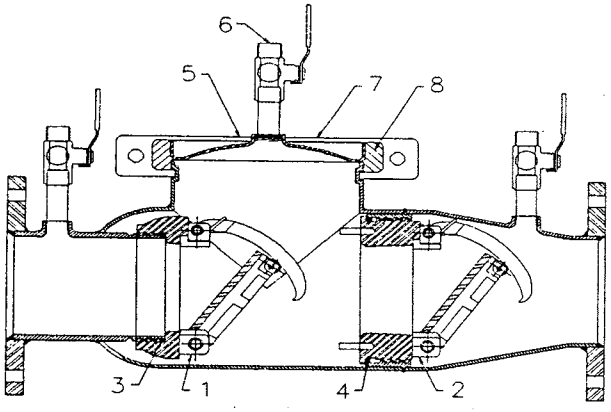


figure 5B



1 #1 Ck Assy
2 #2 Ck Assy
3 #1 Ck Assy O'Rg
4 #2 Ck Assy O'Rg
5 Cover
6 Test Cock
7 Groove Coupler
8 Groove Cplr Gskt

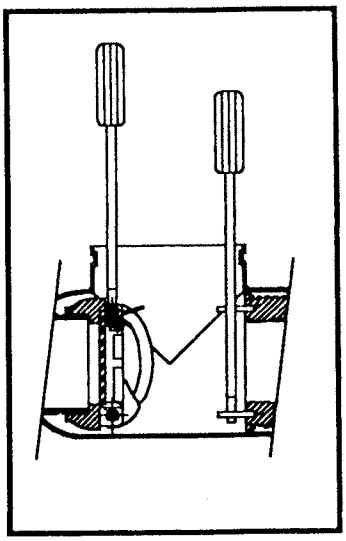
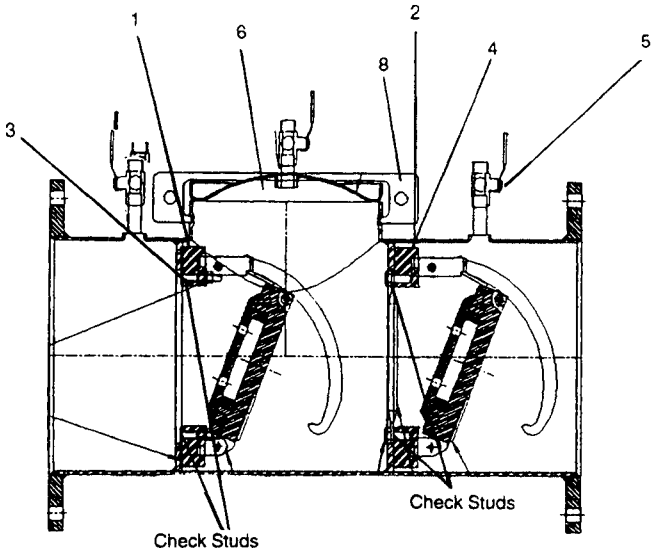


FIGURE 2

Ames Model 2000SS and 3000SS Double Check & Double Detector Check Backflow Preventer

8" - 12"

FIGURE 1



1 #1 Ck Assy
2 #2 Ck Assy
3 #1 Ck Assy O'Ring
4 #2 Ck Assy O'Ring
5 Test Cock
6 Cover
8 Groove Coupler

FIGURE 2
#1 CAM-CHECK

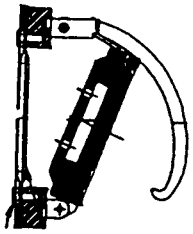


FIGURE 3
#2 CAM-CHECK DC

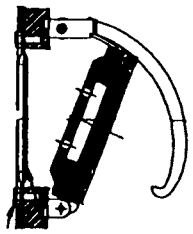
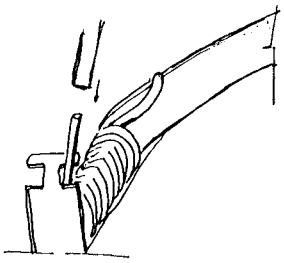


FIGURE 4



MAINTENANCE INSTRUCTIONS

NOTE: Ames assemblies require minimum maintenance. All assemblies must be retested once maintenance has been performed. ***Before servicing be certain shut off valves are closed.***

REMOVING CAM-CHECKS

1. Shut down water system and lock out system if possible. Slowly open all ball valves to relieve air and water pressure. Loosen bolts on groove coupler and remove groove couple and cover plate from valve body.

2. **#1 CHECK (Fig. 2)**
Using a 9/16" socket wrench or nut driver, remove the four nuts from the #1 check studs (See fig.1). Using two hands, place them at 12 o'clock and 6 o'clock, wiggle the check assembly free. Remove through access port with back of clapper first with spring end down. Pull check assembly out of main body.

#2 CHECK (Fig. 3)
After loosening bolts with a 9/16" socket, remove bolts completely. Using the centerline access bar, spin the cam assembly from the 9 o'clock position to the 12 o'clock position, then (without letting go of the access bar) push the cam assembly slightly downstream so that the clapper is now parallel to the valve body. Now bring the cam assembly through the check retaining wall. Leave the cam assembly clapper parallel to the valve body. Pull the cam assembly through the access port.

3. Using a 3/8" nut driver or a piece of small diameter pipe, place on the cam arm torsion spring and move away from and around the torsion spring retaining bracket so as to relieve the torsion spring tension. (See Figure 4.) This will allow the cam arm to move freely, enabling you to inspect the clapper face and cam seat. Thoroughly clean the seat area and clapper sealing surfaces, cam arms, and o-rings for damage, nicks, and debris. If damaged, install a new check assembly o'ring, or washer, shutoff disk.

4. Before reinstallation of check assembly, thoroughly clean O-ring groove and lubricate O-ring with F.D.A. approved lubricant.

Ames Model 4000 SS Reduced Pressure Backflow Preventer (¾" – 2")

MAINTENANCE INSTRUCTIONS

NOTE: Ames assemblies require minimum maintenance. All assemblies must be retested once maintenance has been performed. Before servicing be certain all water is turned off or shut off valves are closed.

Removing and Installing Cam-Check Assemblies Produced from 1990-1992

1. Shut down water system and lock out system if possible. Slowly open all test cocks to relieve air and water pressure. Loosen cover bolt, and relief valve tubing then remove the relief valve. Next remove lid assembly, leaving lid bolt in lid as part of assembly.

2. Remove #1 cam-check assembly by using your hand to slide the assembly downstream. Remove #1 cam-check through top access port. Remove #2 cam-check by using your hand to slide the assembly upstream. Remove #2 cam-check through top access port. (Note: #1 cam-check must be removed first in order to remove #2 cam-check.) If the cam-check is tight and resistant to sliding to the access port, insert a straight blade screwdriver between the cam-check unit and the housing and gently pry it towards the access port.

3. To clean check assembly, remove spring from check housing by lifting spring with a small screw driver from spring post. Rinse cam-check and o-rings thoroughly. Inspect clapper seats, housing, cam-arm, and o-ring for damage. If not damaged, clean thoroughly and return spring to spring post for re-assembly. If damaged install new cam-check assembly.

4. Re-install the cam-checks in the reverse order. #2 cam-check must be installed prior to installation of #1 cam-check. Be sure cam-checks are installed with cam-arm facing downstream in the body. When installing, use a FDA approved lubricant. Be sure o-rings are securely in place and have not fish-mouthed. Insert cover lid (making sure locating lip on checks mates with underside of lid), reattach relief valve and relief valve tube. Tighten securely. (Note: All test cocks must be in open position in order to install cam checks.)

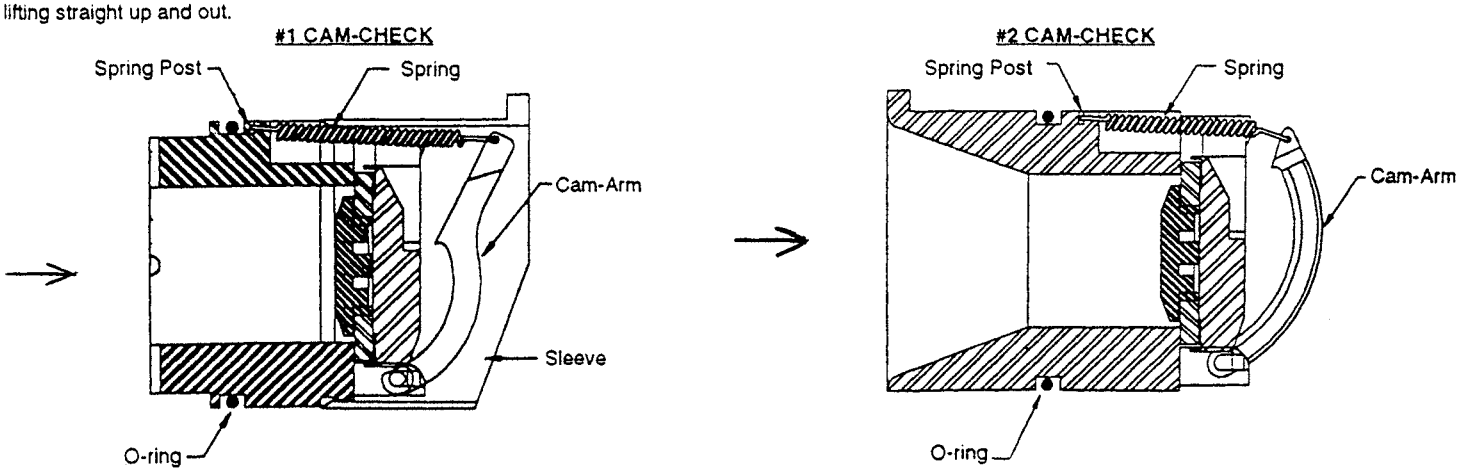
Removing, Repairing, and Installing the Relief Valve All Versions

1. Depressurize assembly and disconnect relief valve tubing from the relief valve body. Loosen and remove the relief valve bottom assembly (turn bottom assembly counter clockwise). Piston assembly will be attached to bottom assembly when bottom assembly is removed.

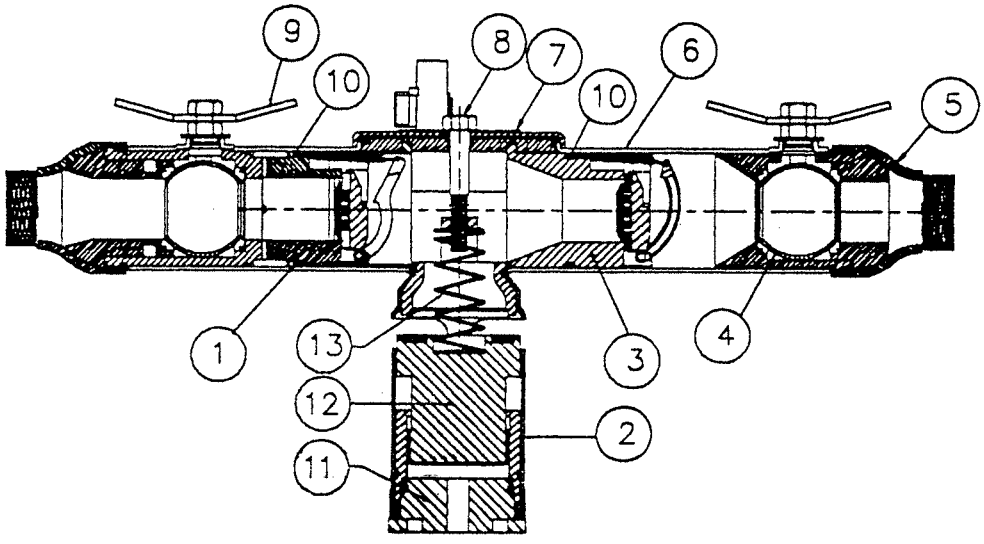
2. Separate the piston assembly from the relief valve bottom assembly by firmly lifting straight up and out.

3. Inspect bottom assembly, piston and seat for damage. If not damaged, clean thoroughly and reassemble.

4. Reassemble the relief valve in the reverse order. Be sure to utilize a FDA approved lubrication on all O-rings. Tighten bottom assembly by hand only. Reattach relief valve tubing.



1 #1 Ck Assy
2 RV Body
3 #2 Ck Assy
4 Ball Valve seat
5 Body End
6 Body
7 Cover
8 Bolt
9 Ball Valve Handle
10 Ck Assy O'ring
11 Bfrm Piston Assy
12 RV Sleeve
13 RV Spring



Ames model 4000 SS Reduced Pressure Backflow Preventer (¾" – 2")
General Installation, Maintenance, Testing, and Parts Information

MAINTENANCE INSTRUCTIONS

NOTE: Ames assemblies require minimum maintenance. All assemblies must be re-tested once maintenance has been performed prior to use. Before servicing be certain all water is turned off or shut off valves are closed.

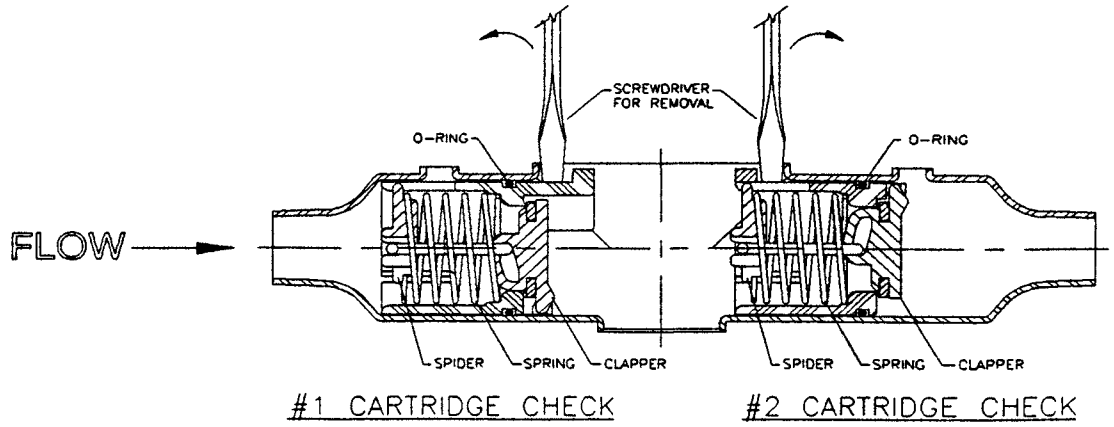
Removing and Installing Cartridge Check Assemblies Produced from 1992 – 1997

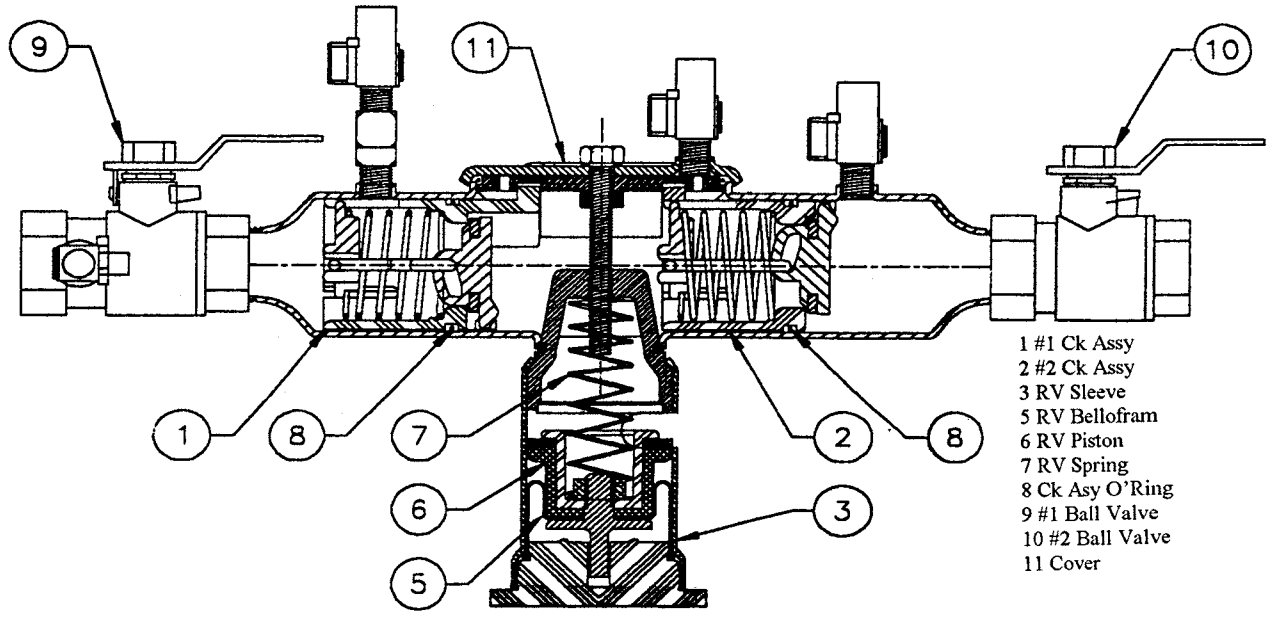
1. Shut down water system and lock out system if possible. Slowly open all test cocks to relieve air and water pressure. Loosen cover bolt, and relief valve tubing, then remove the relief valve. Next remove lid assembly.

2. Remove #2 cartridge check by using your hand to slide the assembly downstream and remove through the top access port. Remove #1 cartridge check by using your hand to slide the assembly upstream and remove through the top access port. **(Note: #2 cartridge check must be removed first in order to remove #1 cartridge check)** If the cartridge check is tight and resistant to sliding to the access port, insert a straight blade screwdriver (as shown below) between the cartridge check and the housing and gently pry it towards the access port.

3. To clean cartridge check, push spider towards clapper and hold in open position. Rinse cartridge check and o-rings thoroughly. Inspect clapper seats, housing, and o-ring for damage. If not damaged, clean clapper face and o-ring groove prior to re-assembly. If damaged install new cartridge check.

4. Re-install the cartridge check in the reverse order. **#1 cartridge check must be installed prior to installation of #2 cartridge check.** Be sure cartridge checks are installed with clapper downstream in the body. When installing, use a FDA approved lubricant. Be sure o-rings are securely in place and have not fish-mouthed. Insert cover lid *(making sure locating lip on cartridge checks mate with underside of lid)*, re-attach relief valve and relief valve tube. Tighten securely (5-7 lbs). **(Note: All test cocks must be in open position in order to install cartridge checks.)**





Ames Model 4000 SS and 5000 SS Reduced Pressure Backflow Preventer

2 1/2"-6"

1 #1 Ck Assy
2 #2 Ck Assy
3 #1 Ck Assy O'Rg
4 #2Ck Assy O'Rg
5 Cover
6 Test Cock
7 Groove Coupler
8 Groove Coupler Gasket
9 RV Assy
10 RV Sensing Line
11 RV Assy O'Rg

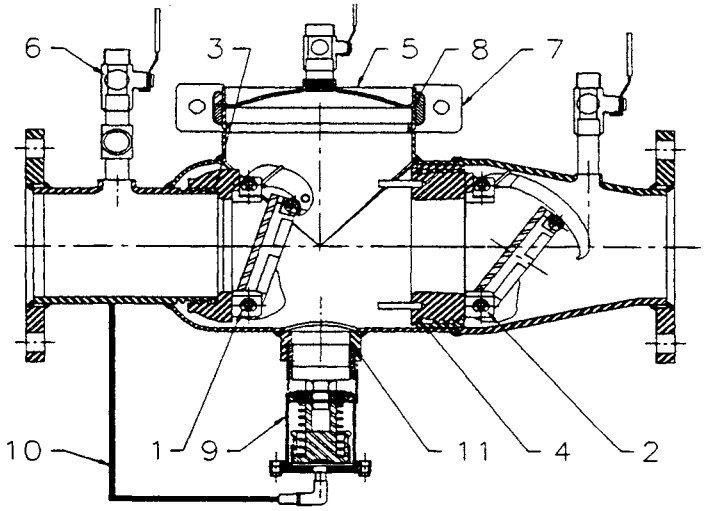


FIGURE 1

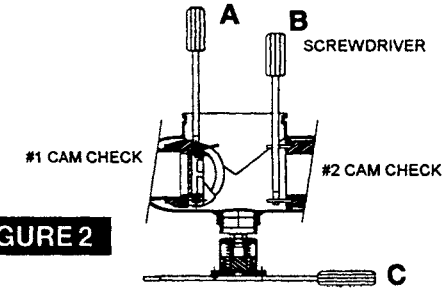


FIGURE 2

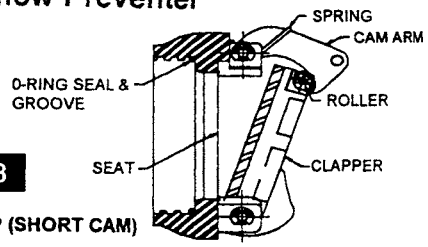


FIGURE 3

#1 CAM-CHECK 2 1/2- 6" RP (SHORT CAM)

FIGURE 4

#2 CAM-CHECK DC & RP

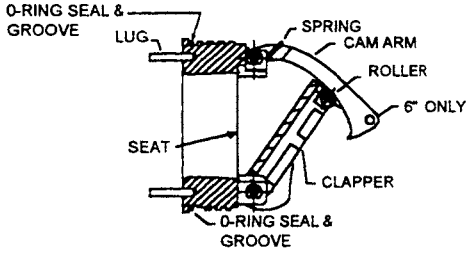


FIGURE 5A

CAM BAR OPEN PIN

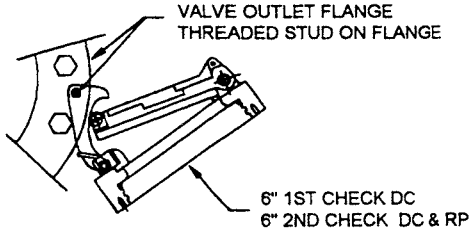
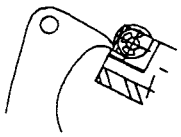


FIGURE 5B



CLEANING POSITION

MAINTENANCE INSTRUCTIONS

NOTE: Ames assemblies require minimum maintenance. All assemblies must be retested once maintenance has been performed. ***Before servicing be certain shut off valves are closed.***

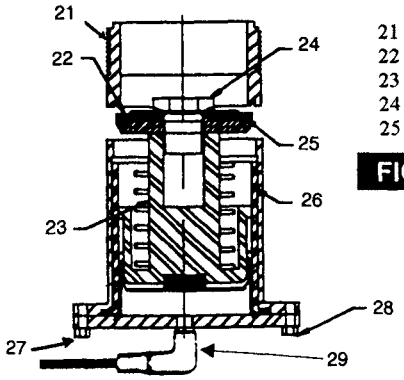
REMOVING CAM-CHECKS

1. Shut down water system and lock out system if possible. Slowly open all ball valves to relieve air and water pressure. Loosen bolts on groove coupler and remove groove couple and cover plate from valve body.

2. Remove #1 Cam-Check assembly by using your hands to unscrew (turn counter-clockwise) Cam-Check and remove through top access port. ***Do not use Cam Arm as a handle to unscrew Cam-Check.*** If Cam-Check cannot be loosened by hand, insert a long screwdriver between valve body and Cam-Check (see figure 2. Gently apply pressure against the Cam-Check until loosened. Finish unscrewing by hand. Unscrew #2 Cam-Check (turn counter-clockwise) by placing a long screwdriver across lugs and applying pressure to loosen #2 Cam-Check. Finish unscrewing by hand.

3. To clean #1 Cam-Check (except 2 1/2" - 4" DC Check), locate the Cam Arm opening stud on the outlet flange of the valve assembly. Slide the Cam Arm over the stud with the check threads facing downward (figure 5A). Tighten 1/4" nut on stud to secure cam bar. Slowly pull the assembly outward to open check allowing exposure of the seat and clapper contact area for cleaning. To clean #2 Cam-Check, lift Cam Arm and hold in open position. Raise clapper so that the end of the Cam Arm rests between roller and clapper (figure 5B). Thoroughly clean the seat area and clapper sealing surfaces of both Cam-Checks. Rinse Cam-Checks and O-rings thoroughly. Inspect seats, clapper sealing surfaces, Cam Arms, and O-rings for damage, nicks, and debris. If not damaged, gently close the clapper. If damaged, install a new Cam-Check assembly and/or O-ring.

4. Before reinstallation of Cam-Checks, thoroughly clean O-ring groove and lubricate O-ring with FDA approved lubricant. Insert and thread #2 Cam-Check first and then #1 Cam-Check. #2 Cam-Check should be tightened by inserting a long screwdriver between lugs to tighten firmly (see figure 2). Do not over tighten. Tighten #1 Cam-Check firmly by hand only. Replace cover plate, clean groove coupler gasket and groove. Replace groove coupler. Close ball valves. Repressurize and bleed air from all test cocks.



21 RV Body
22 RV Disc
23 Bfrm Piston Assy
24 RV Bolt
25 RV Disc Holder

FIGURE 6

26 RV Sleeve
27 RV Cover
28 Bolt
29 Fitting

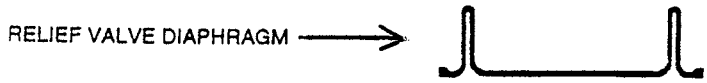


FIGURE 7

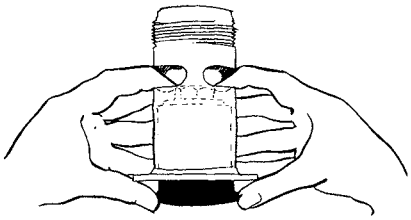


FIGURE 8

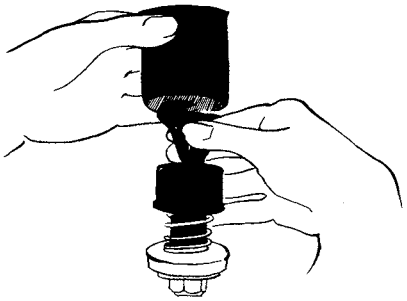
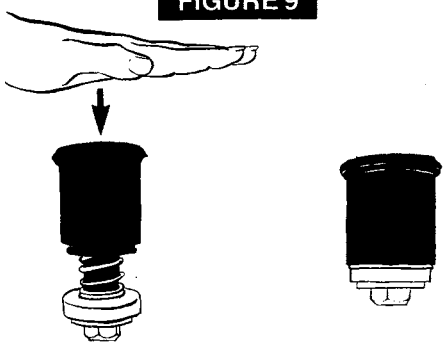


FIGURE 9



RELIEF VALVE SERVICE INSTRUCTIONS

1. The relief valve may be serviced while on or off the backflow preventer valve.

2. **NOTE: DO NOT USE A PIPE WRENCH TO REMOVE THE RELIEF VALVE ASSEMBLY FROM THE BACKFLOW PREVENTER.**

3. Shut down water system.

RELIEF VALVE DISASSEMBLY

1. Disconnect the relief valve hose from the elbow in the bottom flange cover at the swivel hose connection. Do not remove the elbow.

2. If the valve is to be removed from the backflow preventer for service, place a screw driver blade or flat bar across the edges of (2) of the hex head screws in the bottom flange cover and turn counter-clockwise to loosen the relief valve assembly. (See Figure 2.)

3. Remove the (4) bottom bolts from the bottom of the relief valve assembly with a 5/16" socket or open-end wrench. Remove the bottom flange cover.

4. Remove the piston assembly & sleeve from the relief valve body by placing your index fingers through the slots in the side of the body and pressing down on the top of the disc retainer in the top of the piston assembly. (See Figure 7.)

5. Pull the piston assembly free of the body by grasping the sleeve and pulling down.

6. Grip the sleeve and the piston assembly by the head of the hex head bolt. Pull up on the sleeve to extend the diaphragm. Slide the sleeve (Part #6-5222) completely off of the diaphragm and inspect the diaphragm for tears, holes or excessive wrinkles. If the diaphragm is damaged, order a new piston/diaphragm assembly.

RELIEF VALVE REASSEMBLY

1. Thoroughly clean all inside surfaces of the relief valve body.

2. Inspect the relief valve body seat surface located at the top edge of the (3) discharge slots near the top of the body by rubbing the end of the index finger around the entire seat surface; access the seat surface through the slots or the bottom of the body. The seat must be free of nicks. If nicks are discovered, remove the body & install a new relief valve assembly.

3. Position the diaphragm on the piston assembly so that it is facing up as shown in Figure 8.

4. Now fold the top (ribbed) edge of the diaphragm inward, grasp the sleeve with the ribbed edge up and slide the sleeve down over the piston assembly as shown in Figure 8.

5. While still holding the sleeve, slide it up over the diaphragm and, using your thumb & index finger, position the bead of the diaphragm so that it wraps over the outside of the rib on the top of the sleeve so that the sleeve is held by the diaphragm. Now place the piston assembly on a flat, firm surface with diaphragm facing up as shown in Figure 9.

6. Cup your hand slightly to form an air trap and force the sleeve down over the piston assembly with a rapid slap (hard) on the open end of the diaphragm with your cupped hand. The trapped air in the diaphragm will force the diaphragm between the inside of the sleeve and the outside of the piston. Ensure that the diaphragm is fully seated by running the end of a dull "butter" knife in the formed diaphragm. If diaphragm is wrinkled, repeat previous step.

7. Slide the piston assembly and sleeve into the relief valve body with the hex head bolt entering the flanged end of the body first. Slide the piston assembly in until the diaphragm lip is smoothly seated in the machined groove in the flanged end of the body. By running your index finger around the outside of the diaphragm bead, you will ensure it is seated smoothly.

8. Position the bottom flange cover on the bottom of the relief valve body and secure by hand tightening the (4) bottom bolts.

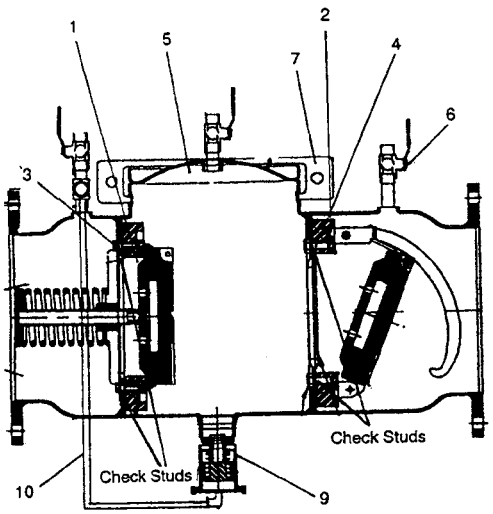
9. Now tighten the (4) bottom bolts to approximately 15 ft.-lbs. with a 5/16" socket or open-end wrench.

10. Reattach the relief valve hose to the elbow in the bottom flange cover.

Ames Model 4000SS and 5000SS
Reduced Pressure Backflow Preventer

8" - 10"

FIGURE 1



1 #1 Ck Assy
2 #2 Ck Assy
3 #1 Ck Assy O'rg
4 #2 Ck Assy O'rg
5 Cover
6 Test Cock
7 Groove Cplr
9 RV Assy
10 RV Sensing Line

MAINTENANCE INSTRUCTIONS

NOTE: Ames assemblies require minimum maintenance. All assemblies must be retested once maintenance has been performed. ***Before servicing be certain shut off valves are closed.***

REMOVING CAM-CHECKS

1. Shut down water system and lock out system if possible. Slowly open all ball valves to relieve air and water pressure. Loosen bolts on groove coupler and remove groove couple and cover plate from valve body.

2. **#1 CHECK**
Using a 9/16" socket wrench or nut driver, remove the four nuts from the #1 check studs (See fig.1). Using two hands, place them at 12 o'clock and 6 o'clock, wiggle the check assembly free. Remove through access port with back of clapper first with spring end down. Pull check assembly out of main body. To inspect 1st check gear or to free 1st check of debris,

#2 CHECK
After loosening bolts with a 9/16" socket, remove bolts completely. Using the centerline access bar, spin the cam assembly from the 9 o'clock position to the 12 o'clock position, then (without letting go of the access bar) push the cam assembly slightly downstream so that the clapper is now parallel to the valve body. Now bring the cam assembly through the check retaining wall. Leave the cam assembly clapper parallel to the valve body. Pull the cam assembly through the access port.

3. Using a 3/8" nut driver or a piece of small diameter pipe, place on the cam arm torsion spring and move away from and around the torsion spring retaining bracket so as to relieve the torsion spring tension. This will allow the cam arm to move freely, enabling you to inspect the clapper face and cam seat. Thoroughly clean the seat area and clapper sealing surfaces, cam arms, and o-rings for damage, nicks, and debris. If damaged, install a new check assembly and or O-ring.

4. Before reinstallation of check assembly, thoroughly clean O-ring groove and lubricate O-ring with F.D.A. approved lubricant.

FIGURE 2
#1 CAM-CHECK RP

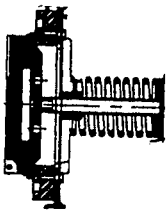


FIGURE 3
#2 CAM-CHECK DC & RP

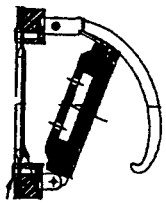
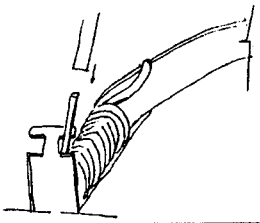


FIGURE 4



MAINTENANCE INSTRUCTIONS TO INSPECT SEAT & CLAPPER ON 1ST CHECK
8"-10" 4000SS and 5000SS

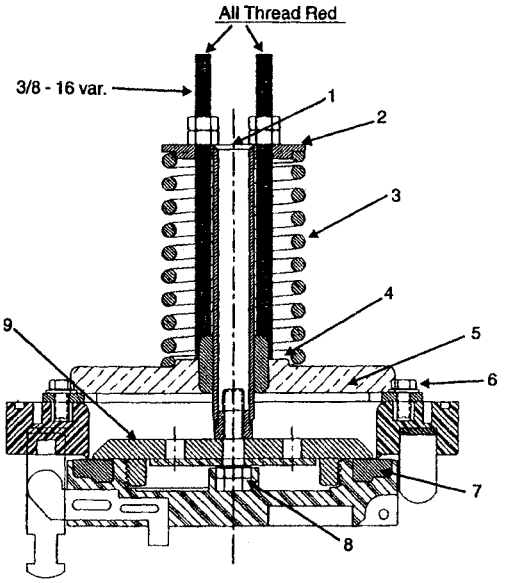
Please be advised, you must use extreme caution when servicing the first check.

To disassemble the first check, you will need the following:

- Two pieces of 3/8" all thread rod (approximately 14" long)
- Four 3/8" hex nuts
- Adjustable crescent wrench
- Pipe wrench or channel lock pliers

To inspect the seat and clean the seat and clapper washer:

1. After removing the first check from the backflow valve body, place on a flat surface with the coil spring facing up.
2. In order to gain access to the seat and clapper rubber ring, you must compress the spring (#3) that surrounds the clapper shaft (#1). To do so, you must place the 3/8" all thread rod through two holes of the spring retaining plate #2.
3. After placing the 3/8" all thread rod through the spring retaining plate, thread the all thread rod into the threaded holes (#4) at the base of spider (#5 next to shaft). Be sure to use two nuts on the all thread rod to tighten them into the thread holes. The depth of the threaded holes should be approximately 1/2". This operation will require you to use two pieces of all thread rod (see drawing on the right).
4. Compressing the spring. To do so you need to loosen the top 3/8" nut and back it off without unthreading the all thread rod from the spider. Place a box end wrench or crescent wrench on the 3/8" nut closest to the spring retaining plate and tighten (be sure to tighten both all thread and nut evenly; that is to say, put a few turns on one all thread rod nut and a few turns on the other).
5. During compression, the clapper will slowly move up, away from the seat. To examine the seat, continue spring compression until the clapper has moved approximately 1" from the seat. This should allow debris to be removed and or the seat to be examined.
6. To unload the spring compression, loosen the all thread and then double nut the all thread and unscrew the all thread rod from the spider and shaft base.



1. Shaft
2. Spring retaining plate
3. Spring
4. 3/8" threaded hole (maintenance)
5. Spider
6. Spider retaining bolt
7. Seat ring
8. Clapper to shaft bolt
9. Seat ring retainer

Model 2000B
Sizes: 1/2" - 2"

Double Check Backflow Prevention Assembly

(Before servicing be certain water is turned off or shut-off valves are closed)

Note: Ames assemblies require minimum maintenance. All assemblies must be retested once maintenance has been performed prior to use.

Servicing the First and Second Check Valves:

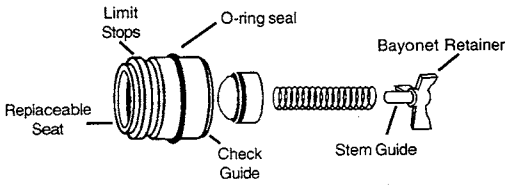
1. After removing the cover, remove the retainer for the body bore. The check valve cartridges can now be removed from the valve by hand or with a screwdriver. **Note:** For Model 2000B sizes 1/2" - 2", the seats and springs of the first and second check modules are **not** interchangeable. The heavier spring and smaller diameter seat belong with the first check module. Model 2000B sizes 3/4" - 1" have interchangeable seats and springs.

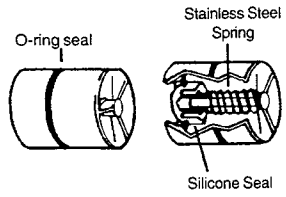
2. The check seats are attached to the cage with a bayonet type locking arrangement. Holding the cage in one hand, push the seat inward and rotate counterclockwise against the cage, for 3/4" Model 2000B pull apart seat and cage. The seat, cage, spring and disc assembly are now individual components.

3. The disc assembly may now be cleaned and reassembled or, depending on its condition, it may be discarded and replaced with a new assembly from the repair kit. O-rings should be cleaned or replaced as necessary.

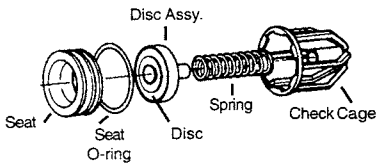
4. Reassemble the check valve cartridge in the reverse order. Check cartridges are installed in the valve body with the seats facing the valve inlet. The cartridges must be securely in place before the retainer can be replaced. On the 3/4" - 1" size, this retainer may have to be tilted slightly into place. Replace cover.

Check Assembly (3/4")

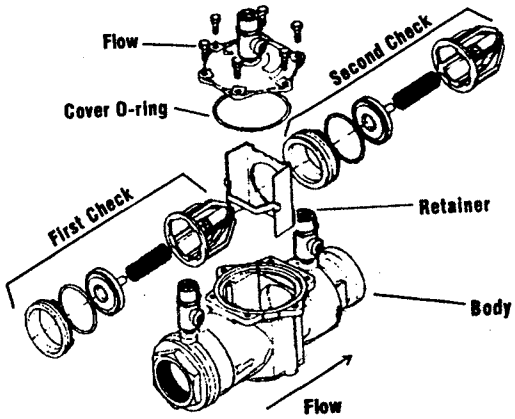




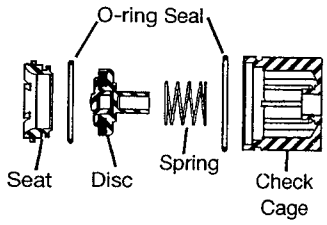
Check Assembly (1/2")

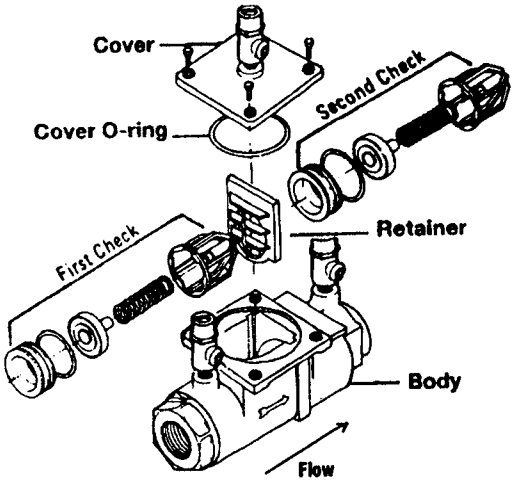


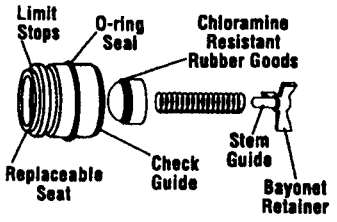
Check Assembly (1" to 2")

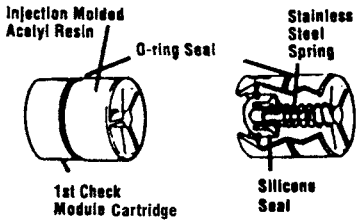


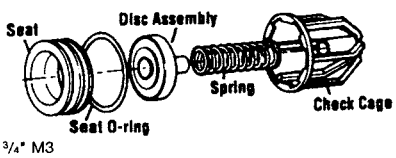
Check Assembly 3/4" M3





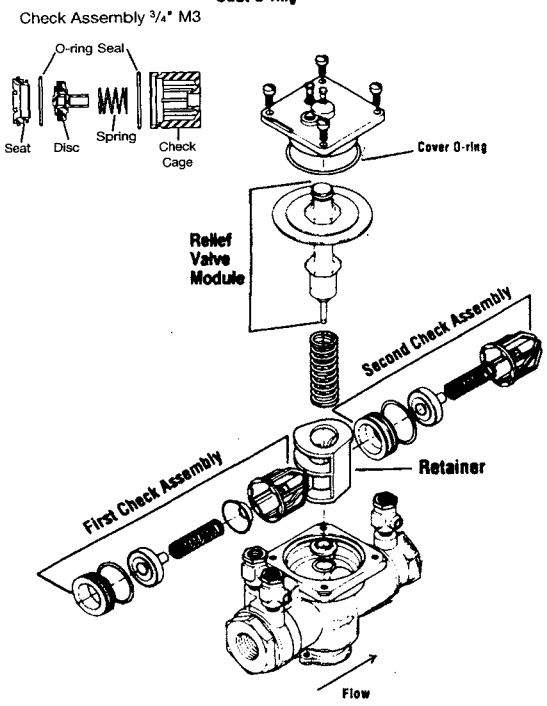






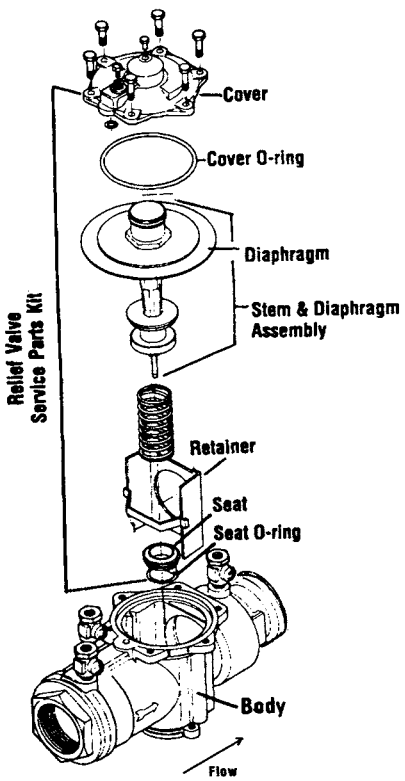
Removing and Installing Check Assemblies

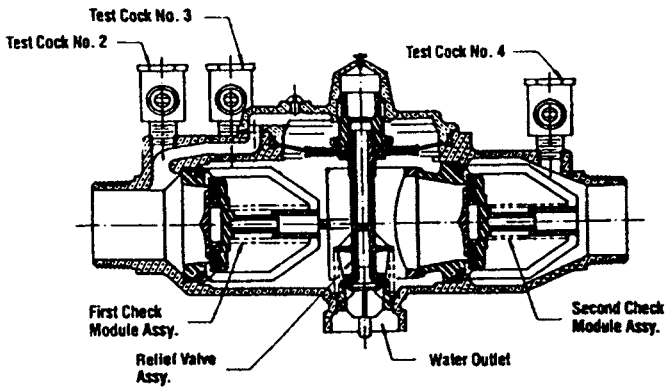
1. Remove the retainer from the body. The check valve cartridges can now be removed from the valve by hand or with a screwdriver. The first check cartridge must be removed before the second check cartridge can be removed. Note: The seats and springs of the first and second check cartridges are not interchangeable. The heavier spring and smaller diameter seat belong with the first check cartridge.
2. The check seats are attached to the cage with a bayonet type locking arrangement. Holding the cage in one hand, push the seat inward and rotate counter-clockwise against the cage. The seat, spring cage, spring and disc assembly are now individual components.
   Note: 3/4" cartridges snap apart.
3. The disc assembly may now be cleaned and re-assembled or, depending on its condition, may be discarded and replaced with a new assembly from the repair kit. O-rings should be cleaned or replaced as necessary and lightly greased with the FDA approved grease.
4. Re-assemble the check valve cartridge. Check cartridges are installed in the valve body with the seat facing the valve inlet. The cartridges must be securely in place before the retainer can be replaced. The 3/4" size retainer may have to be tilted slightly into place. Replace relief valve assembly.



Removal and Service of the Relief Valve

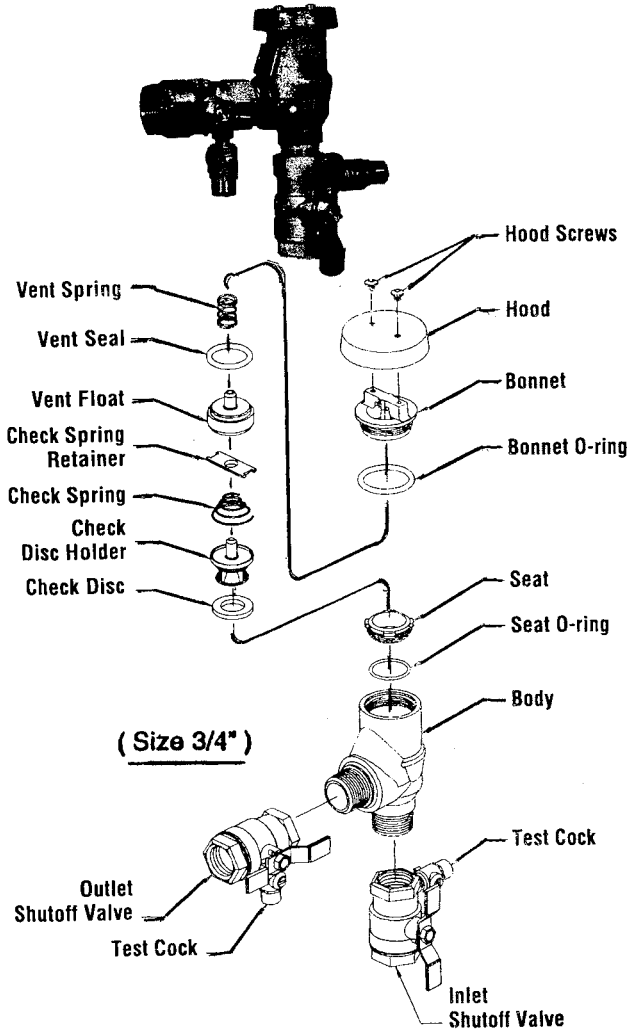
1. Remove the relief valve cover bolts while holding the cover down.
2. Lift the cover straight off. The stem and diaphragm assembly will normally remain with the cover as it is removed. The relief valve spring will be free inside the body at this point.
3. The relief valve seat is located at the bottom of the body bore, and can be removed, if necessary, for cleaning. The disc can be cleaned without disassembly of the relief valve. If it is determined that the relief valve diaphragm and/or disc should be replaced, the relief valve module can be readily disassembled without the use of special tools. **Note:** the disc rubber is molded into the disc holder and is supplied as a disc holder assembly.
4. To re-assemble the relief valve, press the seat firmly into place in the body, center the spring on the seat, and insert the cover and relief valve module as a unit straight into the bore. Press down on the cover to assure proper alignment. Insert and tighten bolts.
   Caution: If cover will not press flat against body, stem assembly is crooked and damage can result. Re-align stem and cover before bolts are inserted.

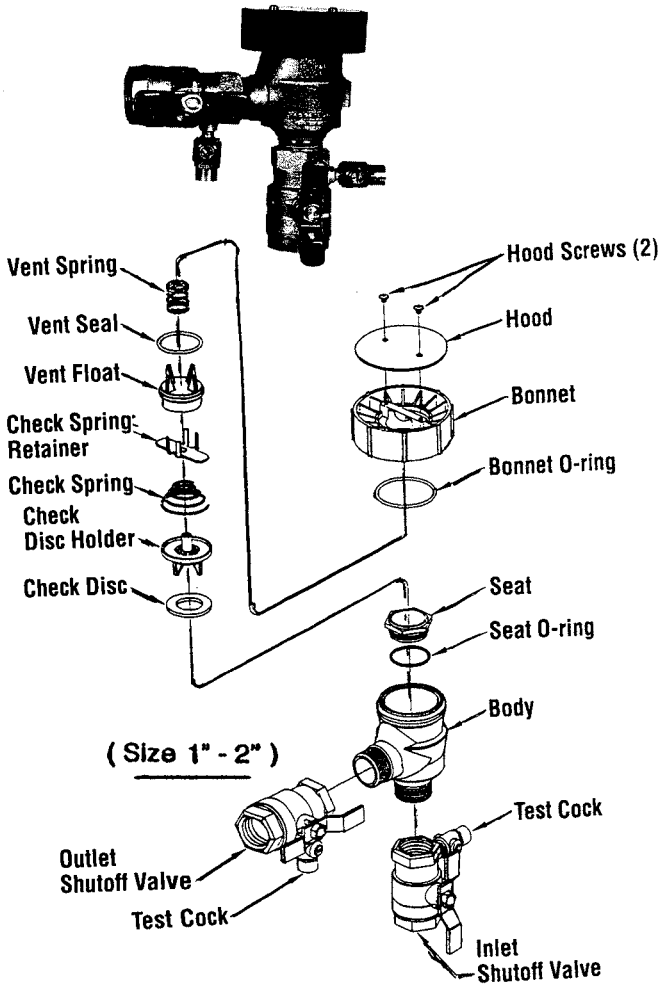




Model A200 PRESSURE VACUUM BREAKER

Sizes: 3/4" thru 2"





Internal parts can be removed, repaired or inspected without removing the valve from the piping.

Disassembly:

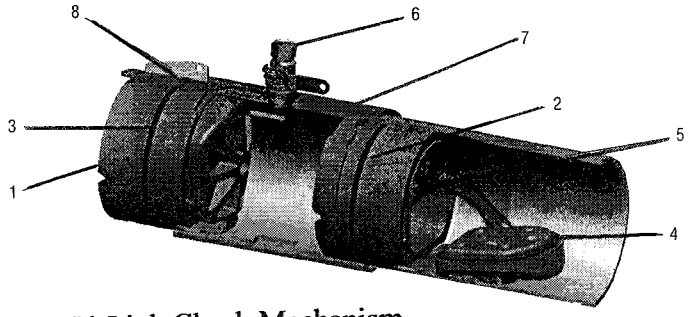
1. Shut off the supply pressure and drain the valve.
2. Remove the two hood screws and the hood.
3. Place a wrench on the parallel flats of bonnet and stem assembly. Turn counter clockwise and remove.
4. Remove the vent assembly.
5. Press down on the spring retainer and disengage it from the retaining lugs. Then turn 90° and remove.
6. Remove the spring retainer and spring. Note that the large diameter of the spring is down on the guide assembly.
7. Remove the check disc holder and guide assembly.
8. Disassemble the check disc holder assembly.

Reassembly:

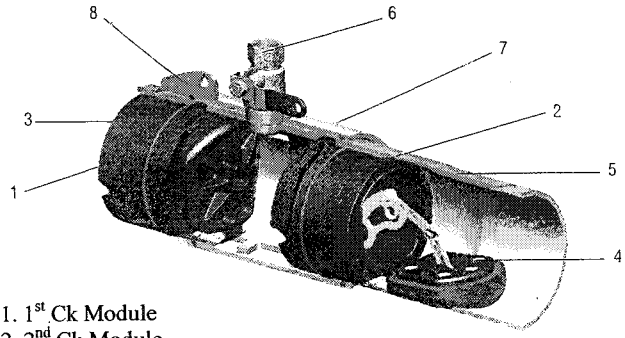
Reassemble in the reverse order utilizing the new parts from the repair kit.

Note: Ames assemblies require minimum maintenance. All assemblies must be retested once maintenance has been performed prior to use.

Check Maintenance Instructions
C200-C300-C400-C500 & C200A-C300A 2 ½-6"
M200-M300-M400-M500 & M200A-M300A 2 ½-4"



Bi-Link Check Mechanism



1. 1st Ck Module
2. 2nd Ck Module
3. Ck Module O'ring
4. Ck Disc
5. Clevis Pin Clip
6. Sleeve Test Cock
7. Sleeve
8. Sleeve O'ring

Tri-Link Check Mechanism

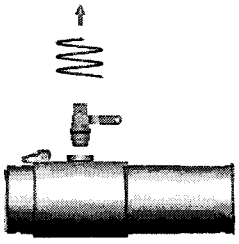


Figure A

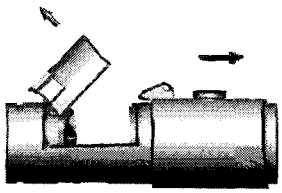


Figure B

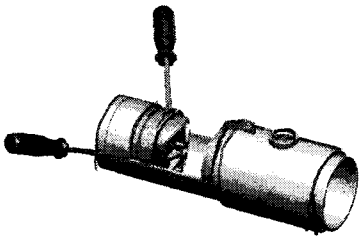


Figure C

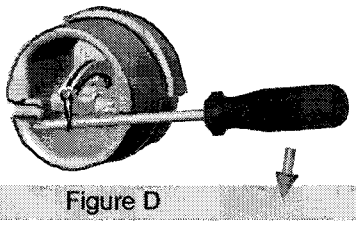


Figure D

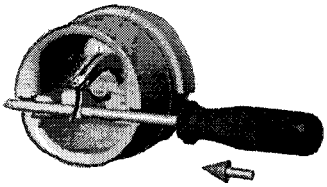


Figure E

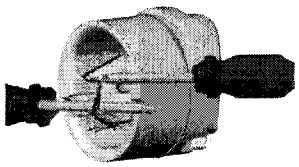


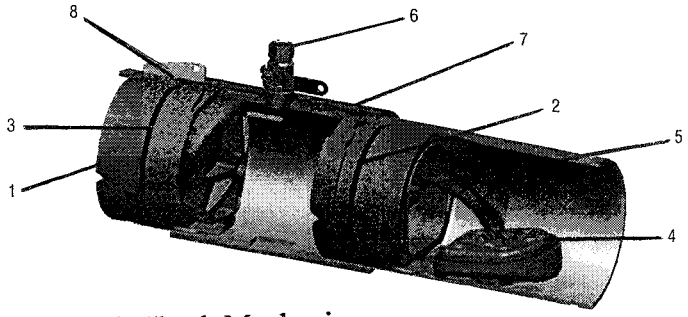
Figure F

Instructions

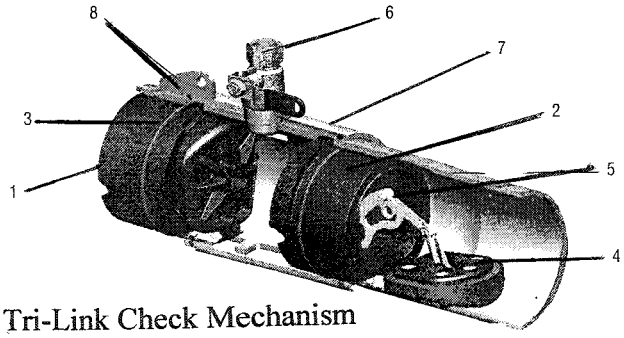
Prior to servicing any Ames valve, it is mandatory to shut down the water system by closing both the inlet and outlet shutoff valves. After shutoff valves are closed, open test cock #2, #3 & #4 to relieve pressure within the backflow assembly.

1. After #3 test cock has been opened to relieve pressure, remove #3 test cock from housing. (Figure A)
2. Slowly slide the cover sleeve to the downstream side of the housing. (Figure B)
3. Remove the stainless steel check retainer from the housing. (Figure B)
4. Remove the #1 check module (Figure C) by inserting two flat blade screwdrivers into the slots on either side of the check module and gently pry to check module toward the open zone.
5. Remove #2 check module with the same instructions as in #4 above.
6. To clean or inspect either check module, insert a #3 screwdriver through the downstream side of the check module as shown in Figure D & E. When the screwdriver is in place, remove the "E"-clip (Figure F) and pin connecting the structural members and the check clapper will open with no tension.
7. Thoroughly clean the seating area. The sealing disc may be removed, if necessary, by removing the screws connecting the keeper plate to the clapper. The sealing disc may be reversed and reinstalled if the elastomer is cut or damaged.
8. Wash check module and O-ring and inspect for any damage. If damaged, reinstall new parts.
9. After thorough cleaning, lubricate O-ring w/FDA approved lubricant, replace pin and "E"-clip in structural members, remove screw driver and reinstall check modules and assemble housing in reverse order of these instructions.

Check Maintenance Instructions
C200-C300-C400-C500 8-10"
M200-M300-M400-M500 6-10"



Bi-Link Check Mechanism



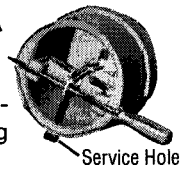
Tri-Link Check Mechanism

1. 1st Ck Module
2. 2nd Ck Module
3. Ck Module O'ring
4. Ck Disc
5. Clevis Pin Clip
6. Sleeve Test Cock
7. Sleeve
8. Sleeve O'ring

Material/Tool Requirements:

- #3 Phillips screwdriver or 5/16" diameter rod, length sufficient to span diameter of check, see Figures A and B.
- 1/2 – 13 x 5" fully threaded hex bolt (Service bolt).
- 3/4" open end or socket wrench.

Figure A



Instructions:

Prior to servicing any Ames valve, it is mandatory to shut down the water system by closing both the inlet and outlet shutoff valves. After shutoff valves are closed, open test cock #2, #3 & #4 to relieve pressure within the backflow assembly.

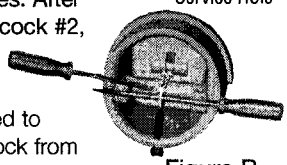


Figure B

1. After #3 test cock has been opened to relieve pressure, remove #3 test cock from housing.
   When repairing a 6," 8" or 10" (150, 200, 250mm) assembly, remove both Victaulic couplers from body. Slide the downstream Victaulic coupler gasket to the downstream side of the housing. The upstream Victaulic coupler gasket stays in place.
2. Remove check/s to be maintenanced.
3. Locate the service hole and thread in the service bolt by hand until it contacts the linkage. (Figure A)
4. Continue to thread in service bolt with the wrench until the service hole in the linkage is aligned with the service notches on the spring arbors. (Figure A)
5. Insert the Phillips screwdriver through the arbors and service hole of the linkage making sure that the tip of the screwdriver extends past the ends of the arbors by a minimum of 1/4" (6mm). (Figure B)
6. Back out the service bolt until load is transferred to the screwdriver. Continue to back out the service bolt until sufficient clearance is achieved to remove the complete spring mechanism.
7. To disconnect linkage, remove retaining clip and pin (store in a safe location for reinstallation).
8. To remove spring mechanism, grasp the screwdriver at the center and pull complete assembly straight out and store in a safe place.
9. Reinstall in reverse.

WARNING – While the spring mechanism is removed for check servicing; never pull the screwdriver out or off the support notches on the arbors. Doing so may cause bodily injuries.

Relief Valve Maintenance C400-C500-M400-M500 2 ½-10"

Servicing Relief Valve

Prior to servicing the relief valve, it is mandatory to shut down water system by closing both the inlet and outlet shutoff valves and relieving pressure within the assembly by opening the #2, #3 and #4 test cocks.

1. Disconnect the hose from the bottom cover plate to the relief valve.
2. An O-ring seals the relief valve body to the main housing. It is not necessary to tighten the connection beyond firm hand tightening. The relief valve should be able to be removed by hand untightening. Unscrew the relief valve from the housing.
3. Remove the cover plate of the relief valve by removing the four connecting screws.
4. Remove the rubber diaphragm from the relief valve. Be aware of how the diaphragm is configured so that it can be reinstalled in the same manner. The hard rubber tab in the diaphragm fits into a similar socket in the head of the piston. (Figure 1)
5. Hold the relief valve in both hands with the threaded end up and both thumbs on the head of the piston. Push up on the piston until the piston shaft with the attached E-clip is exposed. Remove the E-clip (Figure 2)
6. Remove the piston and spring from the relief valve housing and thoroughly clean all parts including the diaphragm. Inspect all rubber parts for damage and if damaged, replace them with new parts.
7. Reassemble the relief valve in the reverse order that it was disassembled.

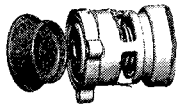
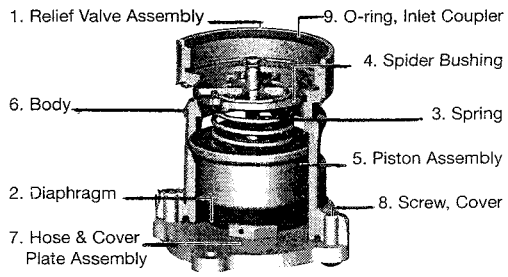


Figure 1

Figure 2



Relief Valve