New England Water Works Association

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New England Water Works Association

Backflow Prevention Device Assembly Field Test Procedures Utilizing a 5 Valve Test Kit

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NEW ENGLAND WATER WORKS ASSOCIATION
5 VALVE TEST KIT FIELD TESTING PROCEDURE
DOUBLE CHECK VALVE ASSEMBLY

This field test procedure evaluates the operational performance characteristics as specified by nationally recognized industry standards of the independently-operating internal spring loaded check valves while the assembly is in a no-flow condition. This field test procedure utilizes a five valve differential pressure test kit to measure the static differential pressure across the check valves. This field test procedure will reliably detect weak or broken check valve springs and validate the test results by determining that a no-flow condition exists while not closing the upstream shut-off valve. This test procedure will work with all five valve differential pressure test kits.

Prior to initiating the test, the following preliminary testing procedures shall be followed:

1. The device has been identified.
2. The direction of flow has been determined.
3. The test cocks have been numbered and adapters have been installed.
4. The test cocks have been flushed.
5. Permission to shut-down the water supply has been obtained.
6. The downstream shut-off valve has been closed. (See NOTE A)
7. The upstream shut-off valve is verified as open.
8. The device is inspected and evaluated for a backpressure condition.

The double check valve assembly field test procedure will be performed in the following sequence to evaluate that:

1. The first check valve has a minimum differential pressure across it of 1 PSID.
2. The second valve has a minimum differential pressure across it of 1 PSID.
3. The downstream shut-off valve is tight and/or that there is no-flow condition through the assembly (including backflow) or demand downstream.

<u>NOTE A:</u> Prior to closing the downstream shut-off valve, if it is determined that the device may be prone to backpressure, as in a fire protection system, a standard PSI calibrated pressure gauge should be connected to test cock #2 and test cock #4. The pressure readings (PSI) should be noted.

a. If the pressure (PSI) reading at test cock #2 is higher than the pressure (PSI) reading at test cock #4, close the downstream shut-off valve and proceed to Step 1, number 3.

b. If the pressure (PSI) reading at test cock #2 is lower than the reading at test cock #4, the device is under backpressure and the downstream shut-off valve shall be closed prior to performing the test of the device.
    i. After closing the downstream-shut off valve, test cock #4 should be bleed and the pressure readings at test cock #2 and #4 should be noted again. If the pressure reading at test cock #2 is higher than the reading at test cock #4, proceed to Step 1, number 3. If the pressure reading at test cock #2 is lower than the reading at test cock #4, the downstream shut-off valve is considered leaking and a backpressure condition still exists. The downstream shut-off valve must be reclosed, repaired or a no-flow condition must be established before testing the device. The device cannot be tested in a backpressure condition.

DOUBLE CHECK VALVE ASSEMBLY 5 VALVE FIELD TEST PROCEDURE

Step 1: Test the first check valve to determine that it has a minimum differential pressure across it of 1 PSID. (Figure 1)

1. Close the downstream shut-off valve. (If it is determined that the device is prone to backpressure, see NOTE A prior to closing the downstream shut-off valve.)
2. Close all test kit valves and place the bleed tube in a bucket or suitable drain area.
3. Connect the high pressure hose to test cock # 2 and open test cock #2.
4. Connect the low pressure hose to test cock # 3 and open test cock #3.
5. Open the high bleed valve on the test kit to bleed the air from the high pressure hose. (Water will discharge through the clear bleed tube) Close the high bleed valve.
6. Open the low bleed valve on the test kit to bleed the air from the low pressure hose. (Water will discharge through the clear bleed tube) Close the low bleed valve.
7. The differential pressure gauge reading should be a minimum of 1 PSID. This differential pressure gauge reading is the apparent reading. This gauge reading cannot be validated or recorded until it is confirmed that the device is in a no-flow condition. (See NOTE B)
8. Close test cocks # 2 and # 3 and disconnect the hoses.

NOTE B: If the differential pressure is 0 PSID, the first check valve is leaking and the downstream shut-off valve cannot be tested for tightness using the procedure outlined in Step 3. However, an affirmation can be made that since the first check valve differential pressure is 0 PSID, the device is in a no-flow condition. The differential pressure would be positive in a flow condition. The second check valve can and should be tested to determine if the device is providing protection.

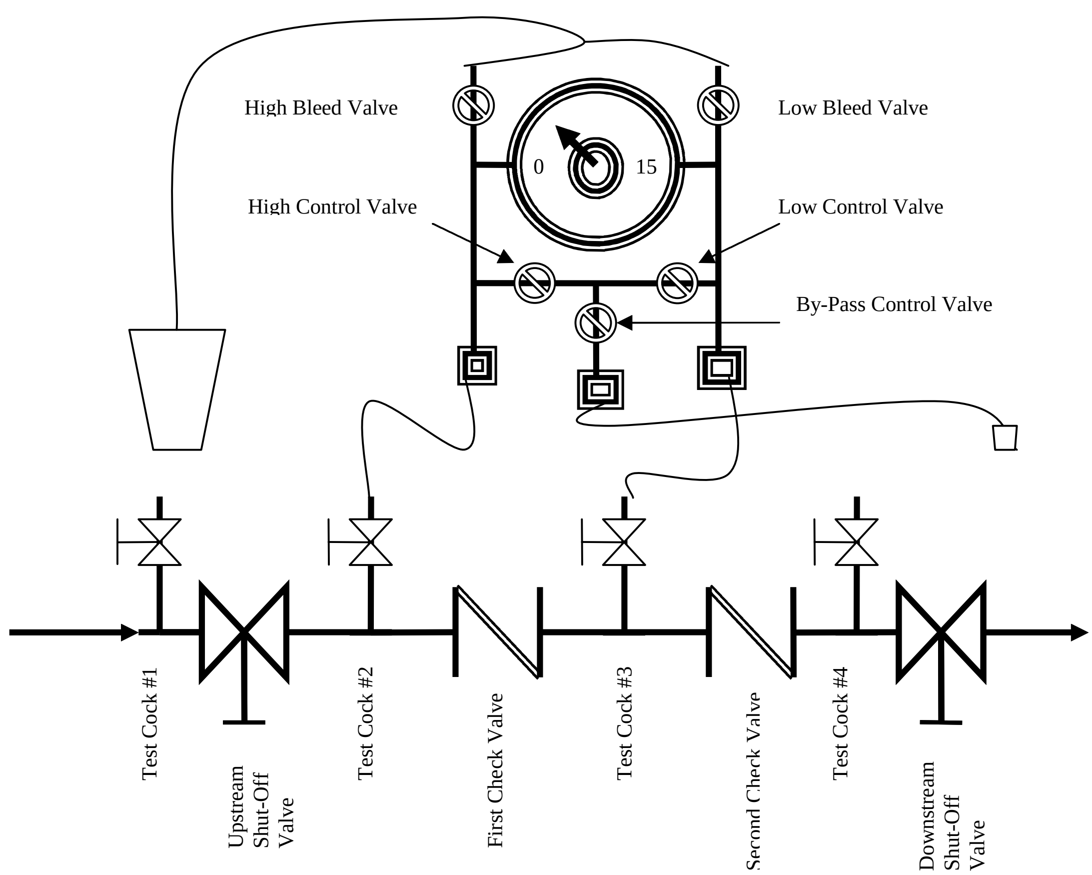

Figure 1

Step 2: Test the second check valve to determine that it has a minimum differential pressure differential across it of 1 PSID. (Figure 2)

1. Close downstream shut-off valve and verify that upstream shut-off valve is open.
2. Close all test kit valves and place the bleed tube in a bucket or suitable drain area.
3. Connect the high pressure hose to test cock # 3 and open test cock #3.
4. Connect the low pressure hose to test cock # 4 and open test cock #4.
5. Open the high bleed valve on the test kit to bleed the air from the high pressure hose. (Water will discharge through the clear bleed tube) Close the high bleed valve.
6. Open the low bleed valve on the test kit to bleeding the air from the low pressure hose. (Water will discharge through the clear bleed tube) Close the low bleed valve.
7. The differential pressure gauge reading should be a minimum of 1 PSID. This differential pressure gauge reading is the apparent reading. This gauge reading cannot be validated until it is confirmed that the device is in a no-flow condition. (See NOTE C)
8. Close test cocks # 3 and # 4 and disconnect the hoses.

NOTE C: If the differential pressure is 0 PSID, the second check valve is leaking and the downstream shut-off valve cannot be tested for tightness using the procedure outlined in Step 3. To validate that the second check valve is leaking and the downstream shut-off valve is tight, the device should be tested for backpressure, since a 0 PSID reading across the second check valve may be an indication that the downstream shut-off valve is leaking and the device is in a backflow condition.

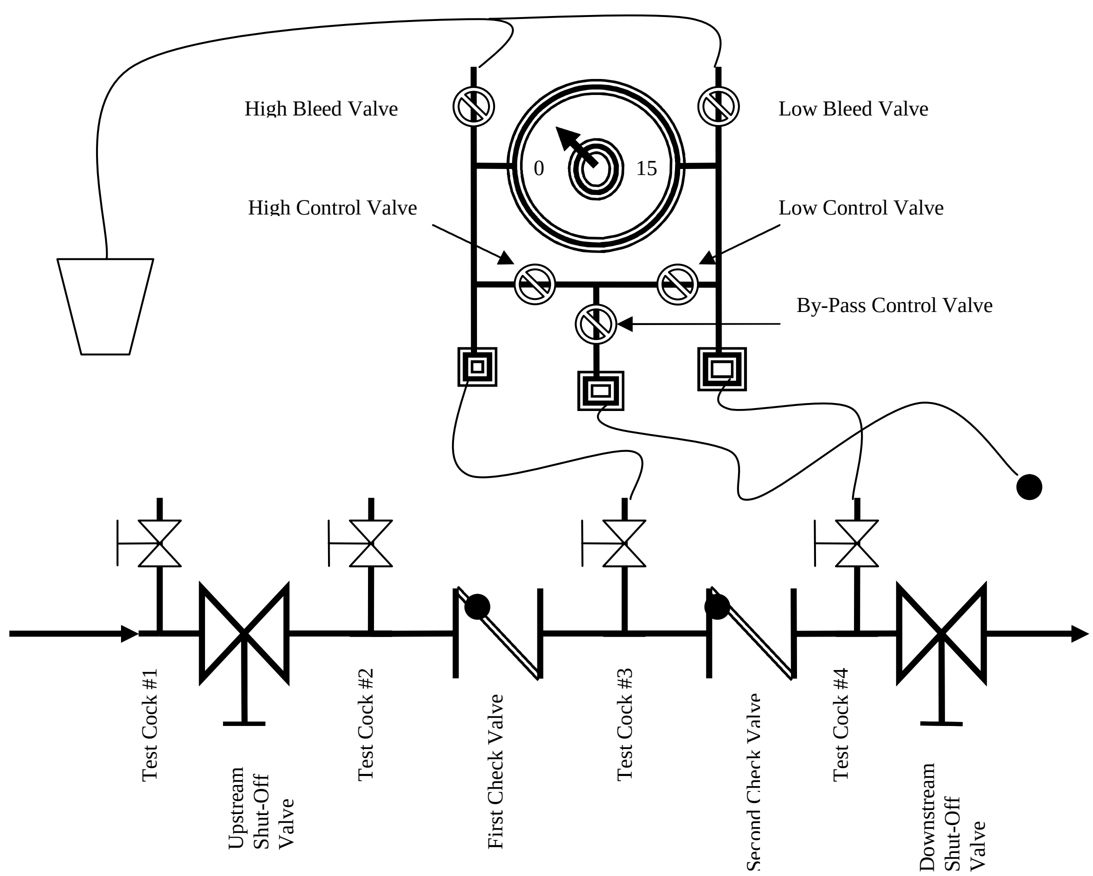

Figure 2

Step 3: Test the Downstream Shut-off Valve For Tightness (Figure 3)

To test the downstream shut-off valve for tightness, both check valves must be tight and holding a minimum differential pressure of 1 PSID, there must be little or no fluctuation of inlet supply pressure and the backpressure situation should be determined. The upstream shut-off valve is open and the downstream shut-off valve is closed.

1. Close all test kit valves and place the bleed tube in a bucket or suitable drain area.
2. Connect the high-side pressure hose to test cock # 2 and open test cock #2.
3. Connect the low-side pressure hose to test cock # 3 and open test cock #3.
4. Open the high control valve. With the by-pass hose elevated, open the by-pass control valve to bleed air from the by-pass hose and fill it with water. Close the by-pass control valve.
5. Connect the water filled by-pass hose to test cock # 4 and open test cock # 4.
6. Open the high bleed valve on the test kit to bleed the air from the high-side pressure hose. (Water will discharge through the clear bleed tube) Close the high bleed valve.
7. Open the low bleed valve on the test kit to bleeding the air from the low-side pressure hose. (Water will discharge through the clear bleed tube) Close the low bleed valve.
8. The differential pressure gauge reading should be a minimum of 1 PSID.
9. Open the by-pass control valve on the test kit. (This supplies high pressure water downstream of check valve number two.) If the differential pressure rises, close test cock #4 immediately. (See NOTE D)
10. Close test cock # 2. (This stops the supply of high pressure water downstream of check valve number 2.)
11. Observe test kit needle. If the differential pressure gauge reading holds steady, the downstream shut-off valve is recorded as being tight. (See NOTE E) If the differential pressure gauge reading drops to zero, the downstream shut-off valve is recorded as leaking. (see NOTE F)

NOTE D: If a backpressure condition is present with a leaking downstream shut-off valve and with the high and by-pass control valves open, non-potable water will pass through the test kit and be introduced into the potable water supply. If this occurs, test cock #4 should be closed immediately, the test should be discontinued and the test kit should be removed flushed-out with potable water. The assembly should be tested for backpressure as stated above and retested making sure that the downstream shut-off valves is closed tight or no-flow can be achieved and validated.

NOTE E: If there is no water demand downstream of the backflow prevention device assembly, the tightness validation of the downstream shut-off valve may not be possible, since a leaking downstream shut-off valve with a no-flow condition will emulate a tight downstream shut-off valve. To validate the condition of the downstream shut-off valve, a demand downstream of the backflow prevention device assembly should be created.

NOTE F: With a leaking downstream shut-off valve, the device is in a flow condition and the previous readings taken are invalid. The device does not fail the test, since it cannot be tested in a flow condition. To proceed with the test of the device, a non-flow condition shall be achieved, either through the repair of the downstream shut-off valve, the operation of an additional shut-off valve downstream or by another means of validating that the device is in a no-flow condition

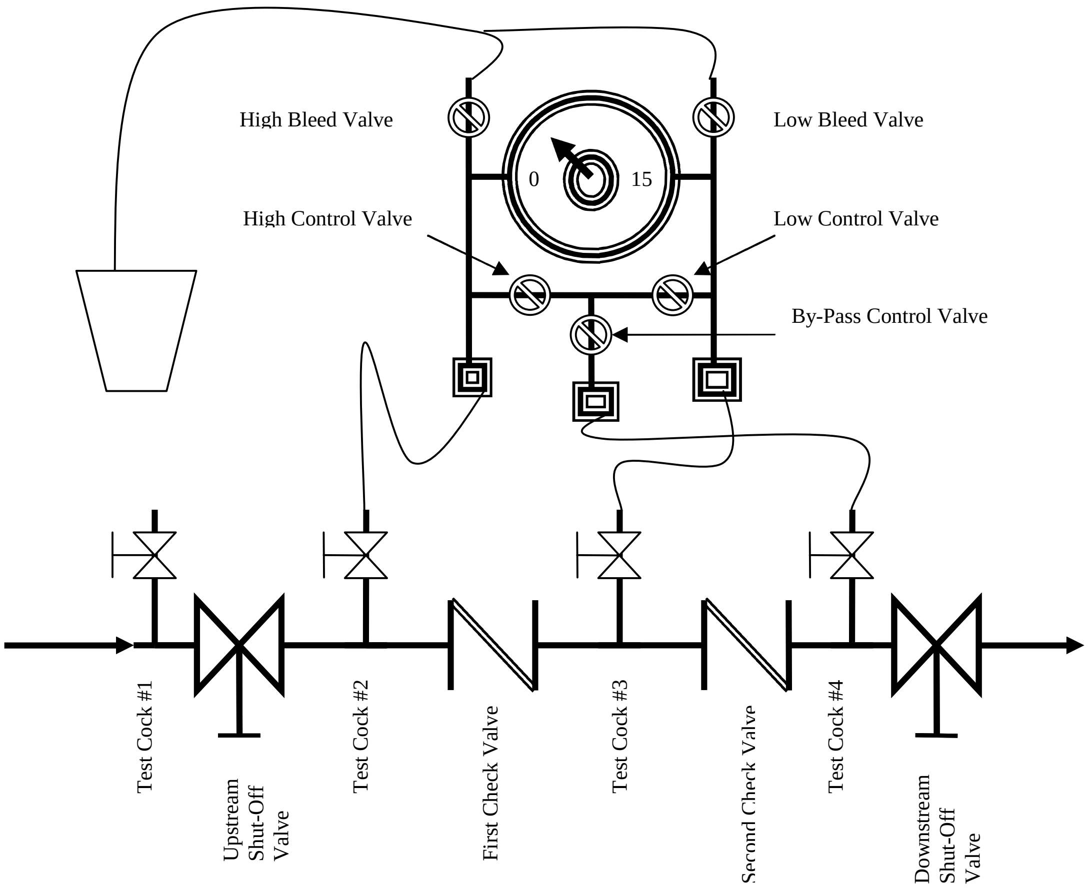

Figure 3

Concluding Procedures This completes the standard field test for a double check valve assembly. Before removing the test equipment, the tester should ensure that all test cocks have been closed and the No.2 shut-off valve is open, thereby reestablishing flow. All test data should be recorded on appropriate forms.

NEW ENGLAND WATER WORKS ASSOCIATION
5 VALVE DIFFERENTIAL TEST KIT
FIELD TESTING PROCEDURE
REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION DEVICE ASSEMBLY (RPZ)

The following field testing procedure is currently being taught by NEWWA instructors. It is based upon a proven method of testing that obtains an accurate assessment of the performance of the device based upon nationally accepted performance criteria, and at the same time, accomplishes the testing with a minimum of complication, and in a logical work saving sequence. This test procedure will work for all current production 5 Valve Differential Pressure Test Kits.

Prior to initiating the test, the following preliminary testing procedures shall be followed:

1. Identify the type of device to be tested.
2. The direction of flow has been determined.
3. The test cocks have been numbered.
4. Test adapters have been installed and "blown-out". (See Note A)
5. Permission to shut down the water supply has been obtained.
6. The downstream shut-off valve has been shut off.
7. No water is discharging from the relief valve opening.

This test procedure will examine the reduced pressure principle backflow prevention device for the following performance characteristics:

1. The first check valve will be tested to determine tightness and a minimum differential pressure across the first valve of 5 PSID.

2. The second check valve will be tested to determine tightness against backpressure and a minimum pressure across the second check valve 1 PSID.

3. The downstream shut-off valve will be testes for tightness and/or the device is in a no-flow condition at the time of the test.

4. The relief valve will be tested to determine if the relief valve opens at a minimum differential pressure of 2 PSID below the inlet supply pressure.

<u>NOTE A:</u> When flushing the test cocks on a reduced pressure principle assembly, test cock #4 should be flushed first and left open while flushing test cock #1, #2, and #3. Once test cocks #1, #2, and #3 have been flushed, close test cock #4. This prevents the premature opening of the relief valve prior to performing the test.

Reduced Pressure Principle Backflow Prevention Assembly Five Valve Field Test Procedure

Step 1: Test the first check valve to determine if it is tight and has a minimum differential pressure across it of 5 PSID. (Figure 1)

1. Verify that the upstream shut-off valve is open.
2. Close the downstream shut-off valve. If no water discharges from the relief valve, the first check valve is considered tight, proceed with the test. If water discharges from the relief valves, the first check valve is considered leaking and it must be repaired prior to completing the test.
3. Close all test kit valves and place the bleed tube in a bucket or suitable drain area.
4. Connect the high pressure hose to test cock # 2 and open test cock # 2.
5. Connect the low pressure hose to test cock # 3 and open test cock # 3.
6. Open the high bleed valve on the test kit to bleed the air from the high pressure hose. (Water will discharge through the clear bleed tube.) Close the high bleed valve
7. Open the low bleed valve on the test kit to bleeding the air from the low pressure hose. (Water will discharge through the clear bleed tube.) Close the low bleed valve
8. The differential pressure gauge reading should be a minimum of 5 PSID. This differential pressure gauge reading is the apparent reading. This gauge reading cannot be validated until it is confirmed that the device is in a no-flow condition.

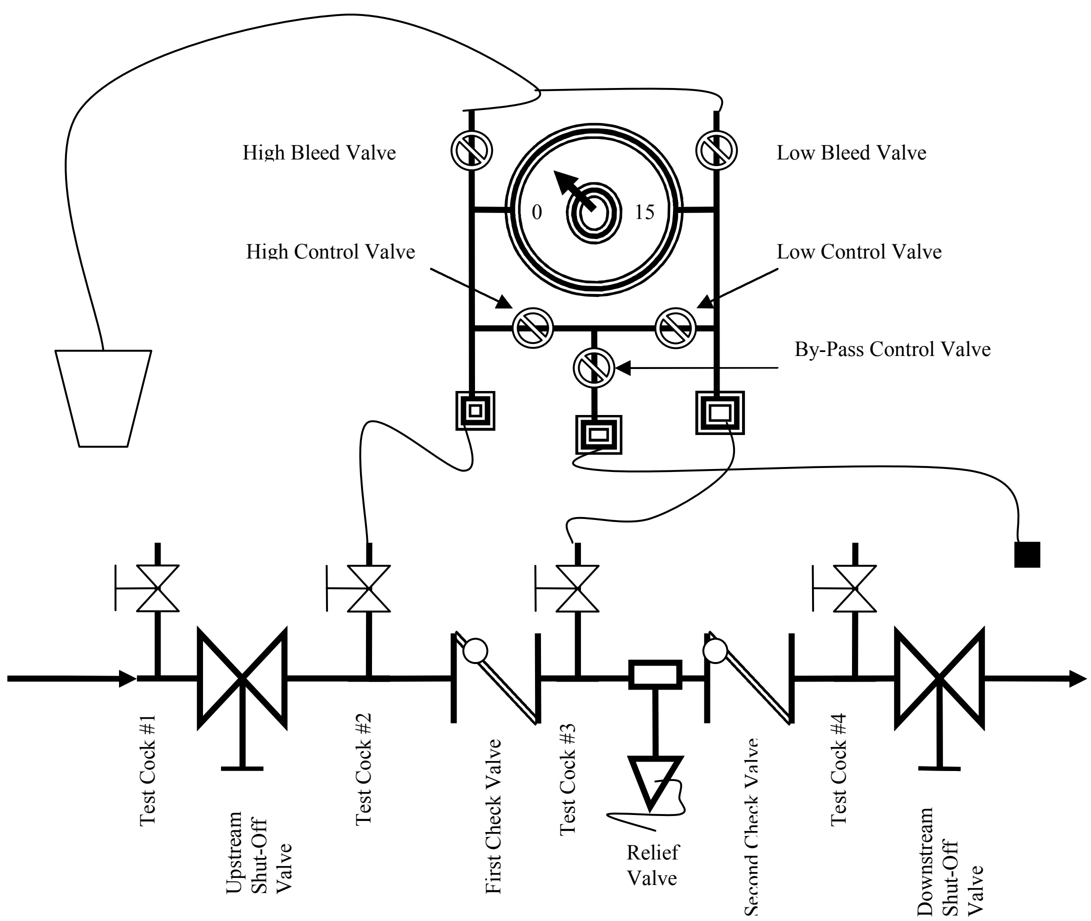

Figure 1

Step 2: Test the tightness of the second check valve against backpressure. (Figure 2)

1. The test kit valves and hoses are positioned as at the conclusion of Step 1.
2. Open the high control valve. With the by-pass hose elevated, open the by-pass control valve to bleed air from the by-pass hose and fill it with water. Close the by-pass control valve.
3. Connect the water filled by-pass hose to test cock # 4 and open test cock # 4.
4. Open the high bleed valve on the test kit to bleed the air from the high pressure hose. (Water will discharge through the clear bleed tube.) Close the high bleed valve
5. Open the low bleed valve on the test kit to bleeding the air from the low pressure hose. (Water will discharge through the clear bleed tube.) Close the low bleed valve
6. The differential pressure on the test kit should be a minimum of 5 PSID
7. Open the by-pass control valve on the test kit. (This supplies high pressure water downstream of the second check valve.) If the differential pressure gauge reading remains steady and no water discharges from the relief valve, the second check valve is considered tight. If the differential pressure gauge reading drops and water discharges from the relief valve, the second check is recorded as leaking (See NOTE B). If the differential pressure rises, close test cock # 4 immediately. (See NOTE C)

NOTE B: With the second check valve leaking, the downstream shut-off valve and/or the no-flow test (Step 3) cannot be performed. However, an affirmation can be made, that since water is discharging from the relief valve, the downstream shut-off valve is considered tight or the device is under a no-flow condition. The results of the deferential pressure test across the second check valve (Step 5) would be 0 PSID. The relief valve can and should be tested. To test the relief valve with a failed second check valve, close test cock # 4 and proceed to Step 4: number 2.

NOTE C: If the differential pressure reading on the test kit increases when the high control test kit vales is opened, (See Step 2, number 4) a backpressure situation may exists and the downstream shut-off valve is not closed tight. The device may be under a backflow situation. If a backpressure condition is present with a leaking downstream shut-off valve and with the high and by-pass control valves open, non-potable water will pass through the test kit and be introduced into the potable water supply. If this occurs, test cock #4 should be closed immediately, the test should be discontinued and the test kit should be removed flushed-out with potable water. The assembly should be tested for backpressure (see double check valve field test procedure) and retested making sure that the downstream shut-off valves is closed tight or no-flow can be achieved and validated.

Step 3: Test the downstream shut-off valve for tightness to determine that the device is in a no-flow condition and validate differential pressure readings. (See Figure 2 for hose connections)

1. The test kit valves and hoses are positioned as at the conclusion of Step 2.
2. Close test cock No. 2. (This stops the supply of high pressure water downstream of check valve number 2.) Observe the test kit needle. If the differential pressure gauge reading holds steady, the downstream shut-off valve is recorded as being tight and/or the device is under a no-flow condition. If the differential pressure gauge drops to zero, the downstream shut-off valve is recording as leaking. (See NOTE D)
3. Open test cock # 2

<u>NOTE D:</u> If the device is in a flow condition, the PSID readings previously taken are invalid and the device must be retested once a no-flow condition can be achieved. The device does not fail the test, since it cannot be tested in a flow condition. A no-flow condition shall be achieved, either through the repair of the downstream shut-off valve, the operation of an additional shut-off valve downstream or by another means of validating that the device is under a no-flow condition. A compensating temporary by-pass hose may be used in some cases. (See By-Pass Hose In Reduced Pressure Principle Backflow Prevention Device Testing. AWWA M14, Third Edition)

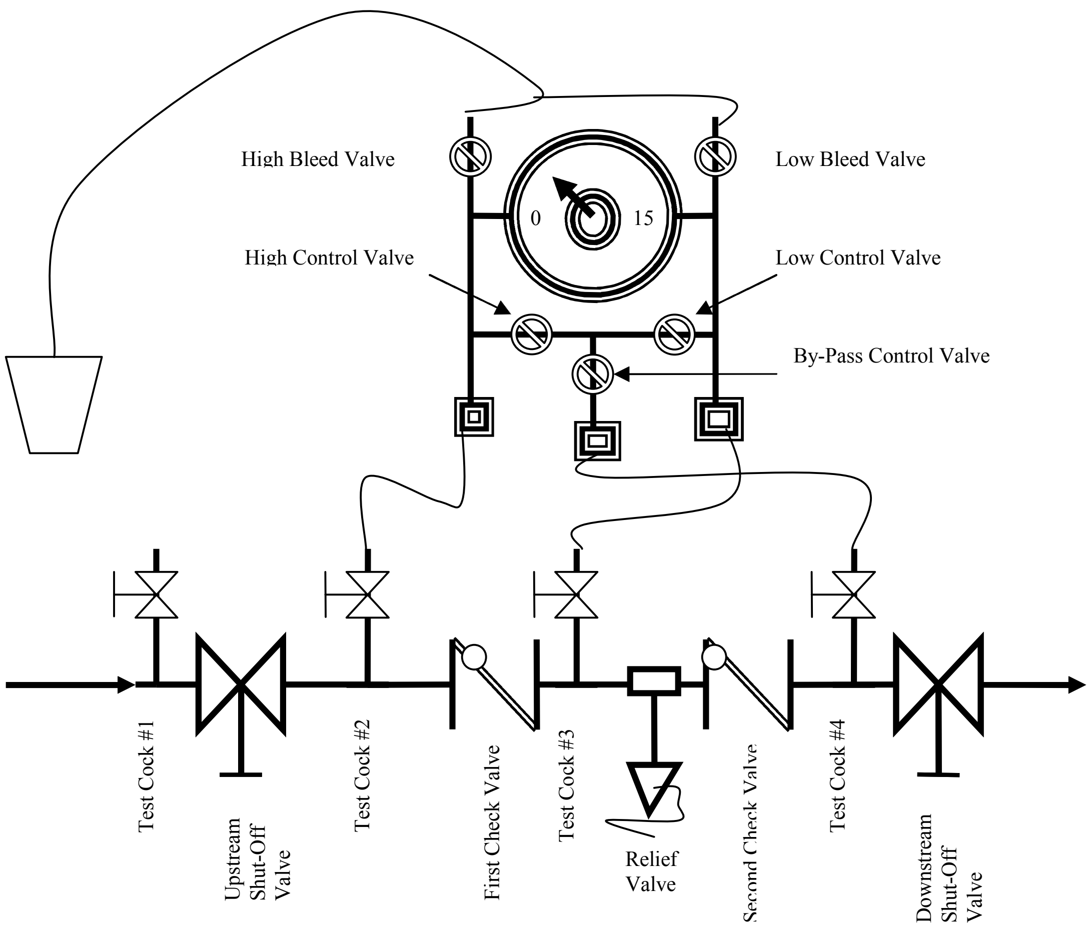

Figure 2

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<u>Step 4: Test the relief valve to determine that it opens at a minimum differential pressure of 2 PSID below the inlet supply pressure. (See Figure 2 for hose connections)</u>

1. The test kit valves and hoses are positioned as at the conclusion of Step 3. Test cock # 2 should be open.
2. <u>Slowly</u> open the test kit low control valve ¼ turn.
3. Record the differential pressure gauge reading at the point when water initially drips from the relief valve opening. The differential pressure gauge reading should be a minimum of 2 PSID. If water does not discharge from the relief valve, it may be jammed (intentionally), the sensing line may be clogged, or the diaphragm cannot open due to mechanical wear.

Step 5 : Test the Second Check Valve Differential Pressure - Optional (Figure 3)

1. Close all valves on test kit and place the bleed tube in a bucket or suitable drain area.
2. Connect the high pressure hose to test cock # 3 and open test cock # 3.
3. Connect the low pressure hose to test cock # 4 and open test cock # 4.
4. Open the high bleed valve on the test kit to bleed the air from the high pressure hose. (Water will discharge through the clear bleed tube) Close the high control valve.
5. Open the low bleed valve on the test kit to bleed the air from the low pressure hose. (Water will discharge through the clear bleed tube.) Close the low control valve.
6. The differential pressure gauge reading should be a minimum of 1 PSID. If the reading is 0 PSID and the second check was confirmed tight in Step 2, (See NOTE E)
7.

NOTE E: If the downstream shut-of valve is leaking and the device is in a flow condition, the differential test across the second check valve would record a positive PSID. If the downstream shut-off valve was leaking and the device was in a backflow condition with the second check valve held tight against backpressure, the differential pressure across the second check valve would record a 0 PSID. This is an indication that the downstream shut-off valve is leaking and the device is under a backpressure condition.

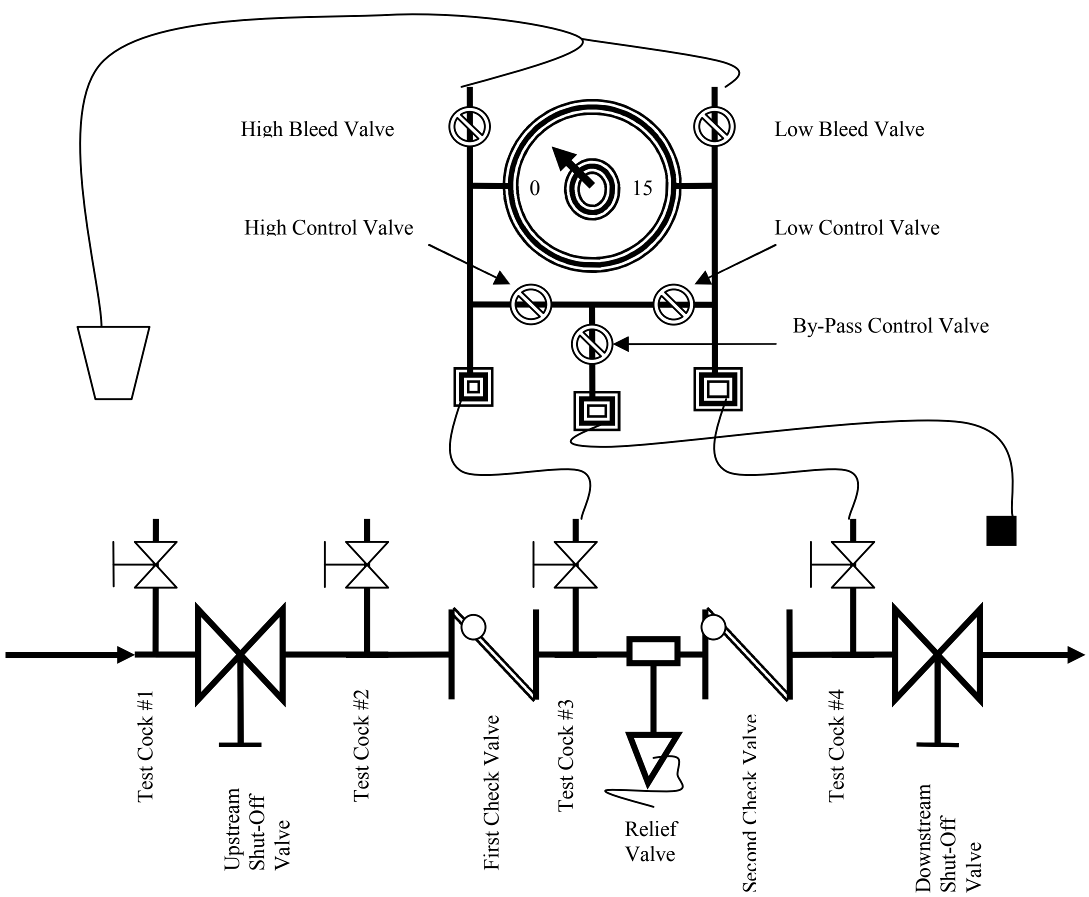

Figure 3

Concluding Procedures This completes the standard field test for a reduced pressure principle backflow prevention device. Before removal of the test equipment, the tester should ensure that the test cocks have been closed, and the downstream shut-off valve is open, thereby reestablishing flow. All test data should be recorded on appropriate forms.

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NEW ENGLAND WATER WORKS ASSOCIATION
5 VALVE TEST KIT FIELD TESTING PROCEDURE
PRESSURE VACUUM BREAKER

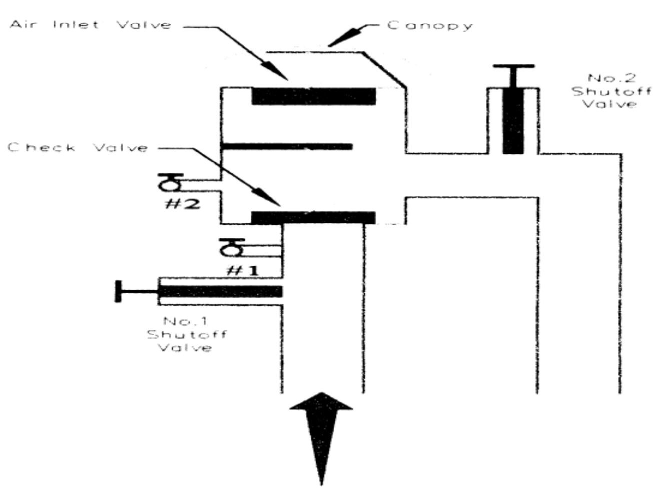
This field test procedure evaluates the operational performance characteristics as specified by nationally recognized industry standards of the independently-operating internal spring loaded check valve and air inlet valve while the assembly is in a no-flow condition. This field test procedure utilizes a five valve differential pressure test kit to measure the static differential pressure across the check valve and determine the opening point of the air inlet valve. This field test procedure will reliably detect weak or broken check valve springs and validate the test results by determining that a no-flow condition exists. This test procedure will work with all five valve differential pressure test kits.

Prior to initiating the test, the following preliminary testing procedures shall be followed:

1. The device has been identified.
2. The direction of flow has been determined.
3. The test cocks have been numbered and the canopy is removed.
4. Test adapters have been installed and "blown-out".
5. Permission to shut down the water supply has been obtained.
6. The downstream shut-off valve has been closed.

This test procedure will examine the pressure vacuum breaker assembly for the following performance characteristics using a five valve differential pressure gauge with a range of 0 – 15 PSID.

1. The check valve has a minimum differential pressure across it of 1 PSID.
2. The downstream shut-off valve is closed tight and/or a no-flow condition exists.
3. The air inlet valve opens at least 1 PSID above atmospheric pressure.



PRESSURE VACUUM BREAKER 5 VALVE FIELD TEST PROCEDURE

Step 1: Test the check valve to determine that it has a minimum differential pressure across it of 1 PSID (Figure 1)

1. Verify that upstream shut-off valve is open.
2. Close the downstream shut-off valve.
3. Close all test kit valves and place the bleed tube in a bucket or suitable drain area.
4. Connect the high pressure hose to test cock # 1 open test cock #1.
5. Connect the low pressure hose to test cock # 2 open test cock # 2.
6. Open the high bleed valve on the test kit to bleed the air from the high pressure hose. (Water will discharge through the clear bleed tube) Close the high bleed valve.
7. Open the low bleed valve on the test kit to bleed the air from the low pressure hose. (Water will discharge through the clear bleed tube) Close the low bleed valve.
8. The differential pressure gauge reading should be a minimum of 1 PSID. This differential pressure gauge reading is the apparent reading. This gauge reading cannot be validated or recorded until it is confirmed that the device is in a no-flow condition.
9. Close test cocks # 2 and # 3 and disconnect the hoses.
10. Proceed to **Step 2**.

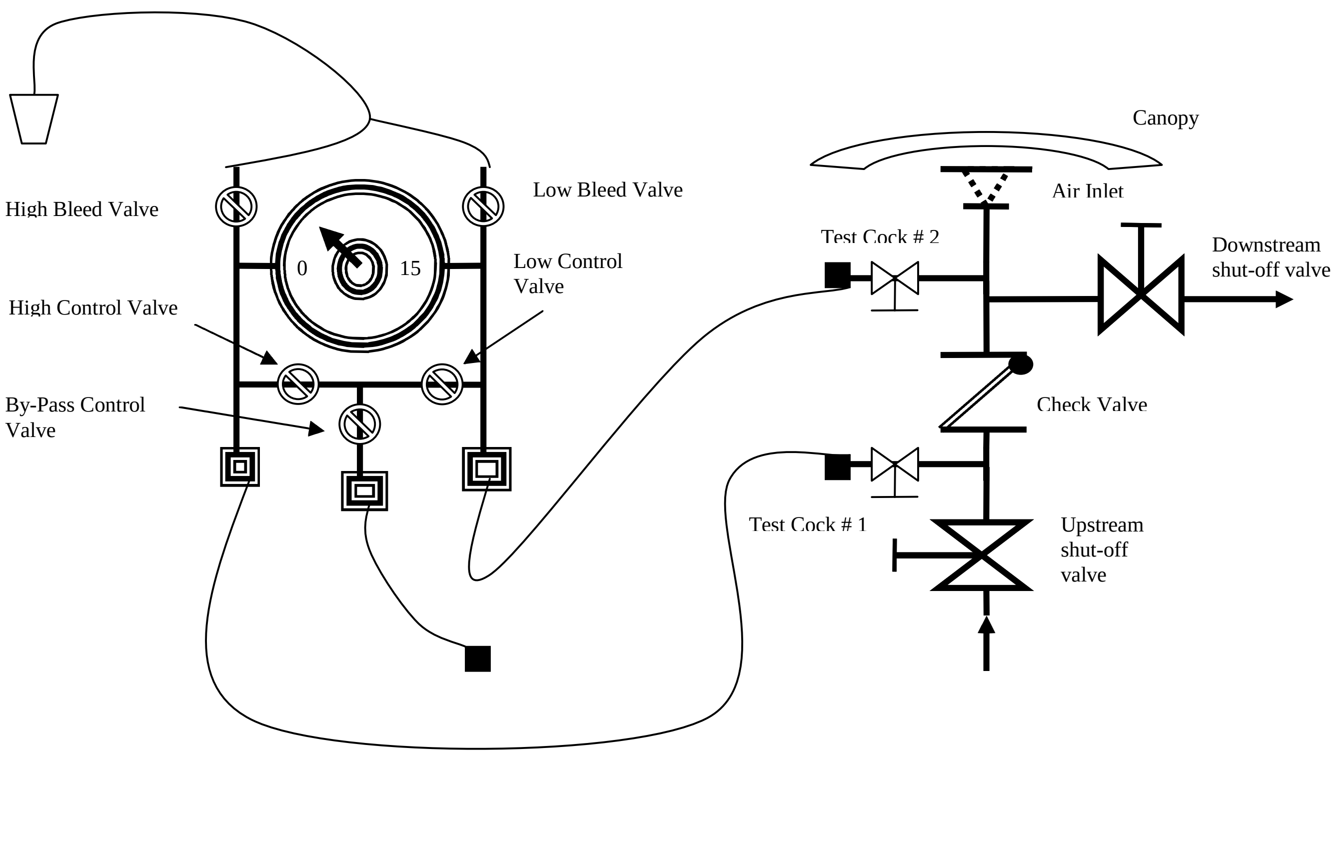


Figure 1

<u>Step 2: Test the downstream shut-off valve for tightness to determine that the device is under a no-flow condition and validate differential pressure reading. (Figure 2)</u>

1. The Downstream shut-off valve remains closed and upstream shut-off valve remains open. Place low pressure and vent hoses in a bucket or suitable drainage area.
2. Close all test kit valves and place the bleed tube in a bucket or suitable drain area.
3. Connect high pressure hose to test cock # 2 and open test cock # 2.
4. Open the high bleed valve to bleed air.
5. The test kit needle should "peg' to the extreme right of the gauge.
6. Close high bleed valve.
7. Close the upstream shut-off valve. (This stops the supply of high pressure water to the device)
8. Observe needle on test kit. If the needle remains steady, the downstream shut-off valve is holding tight and/or the device is in a no-flow condition. If needle starts to descend to zero, the downstream shut-off valve is considered leaking (see NOTE A).
9. Proceed to **Step 3** if a no-flow condition exists**.**

<u>NOTE A:</u> If the device is in a flow condition the differential readings taken are invalid. The device does not fail the test; it cannot be tested since it is in a flow condition. To perform the test of the device, a non-flow condition shall be achieved, either through the repair of the downstream shut-off valve, the operation of an additional shut-off valve downstream or by another means of validating that the device is under a no-flow condition.

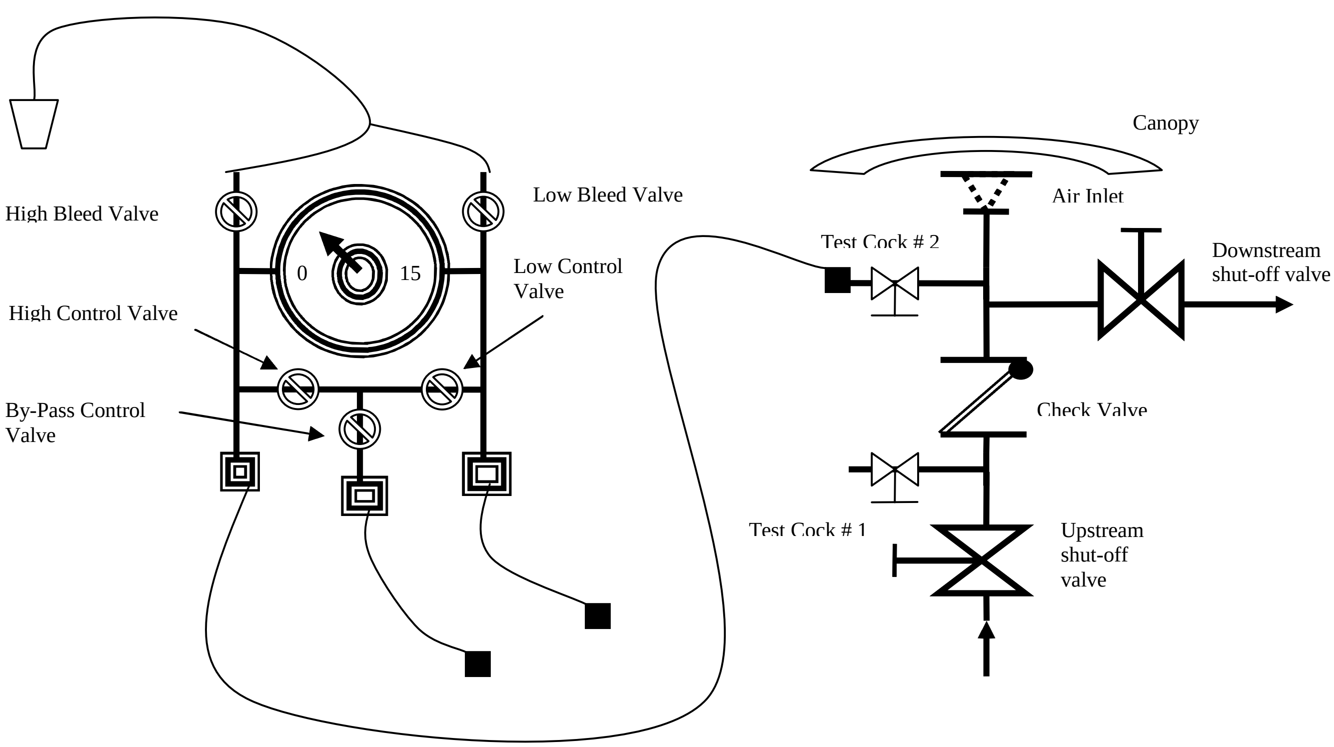


Figure 2

<u>Step 3: To determine if the opening point of the air inlet valve is at least 1 PSID above atmospheric pressure. For this test procedure the test kit *MUST* be held at the same level as the device being tested. (See Figure 2 for hose connections)</u>

1. The downstream shut-off valve and the upstream shut-off valve remain closed.
2. The test kit valves, test cocks and the high pressure hose remain as at the conclusion of Step 2. The bleed tube remains in a bucket or suitable drain area.
3. The test kit needle should be "pegged' to the extreme right of the gauge face.
4. Raise and hold the test kit as well as the end of low pressure hose to the same level as the center of the device.
5. <u>Slowly</u> open the high bleed valve ¼ turn while simultaneously observing the air inlet valve. (Lightly placing an object on top of the air inlet may be helpful in determine the opening point.)
6. Observe the test kit needle at the point where the air inlet valve opens (pops). It should open at a minimum of 1 PSID or greater. If the air inlet valve does not open, the upstream shut-off valve may be leaking.
7. Observe the air inlet valve to determine that it is open completely.

<u>Concluding Procedures:</u> This completes the standard field test for a double check valve assembly. Before removing the test equipment, the tester should ensure that all test cocks have been closed and the No.2 shut-off valve is open, thereby reestablishing flow. All test data should be recorded on appropriate forms.

NEW ENGLAND WATER WORKS ASSOCIATION
5 VALVE DIFFERENTIAL TEST KIT
FIELD TESTING PROCEDURE
SPILL-RESISTANT PRESSURE VACUUM BREAKER

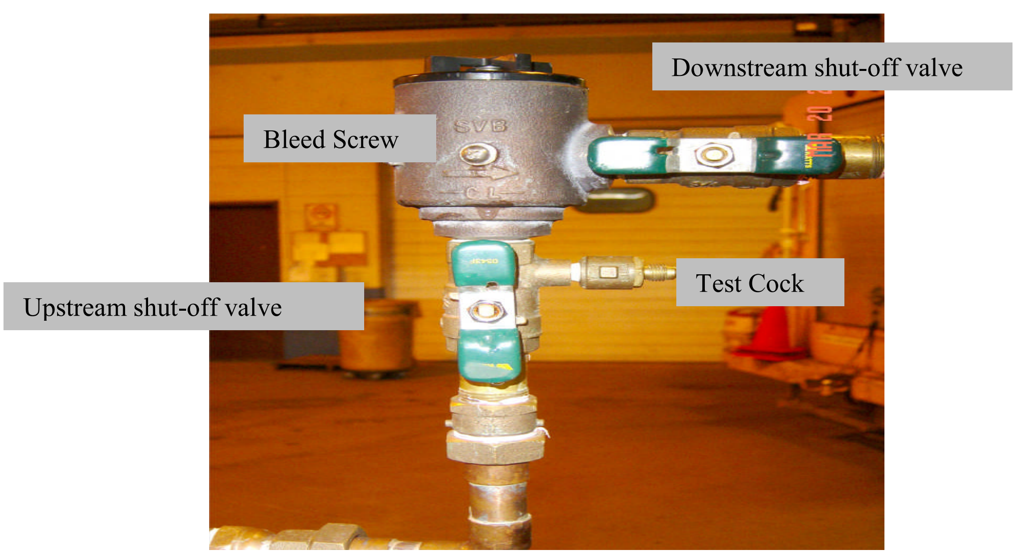
This field test procedure evaluates the operational performance characteristics as specified by nationally recognized industry standards of the independently-operating internal spring loaded check valve and air inlet valve while the assembly is in a no-flow condition. This field test procedure utilizes a five valve differential pressure test kit to measure the static differential pressure across the check valve and determine the opening point of the air inlet valve. This field test procedure will reliably detect weak or broken check valve springs and validate the test results by determining that a no-flow condition exists. This test procedure will work with all five valve differential pressure test kits.

Prior to initiating the test, the following preliminary testing procedures shall be followed:

1. The device has been identified.
2. The direction of flow has been determined.
3. The test cocks have been numbered and the canopy is removed.
4. Test adapters have been installed and “blown-out”.
5. Permission to shut down the water supply has been obtained.
6. The downstream shut-off valve has been closed.

This test procedure will examine the pressure vacuum breaker assembly for the following performance characteristics using a five valve differential pressure gauge with a range of 0 – 15 PSID.

1. The check valve has a minimum differential pressure across it of 1 PSID.
2. The downstream shut-off valve is closed tight and/or a no-flow condition exists.
3. The air inlet valve opens at least 1 PSID above atmospheric pressure.



SPILL RESISTANT PRESSURE VACUUM BREAKER
5 VALVE FIELD TEST PROCEDURE

Step 1: Test the check valve to determine that it has a minimum differential pressure across it of 1 PSID. (Figure 1)

1. Verify that upstream shut-off valve is open.
2. Close the downstream shut-off valve.
3. Close all test kit valves and place the bleed tube in a bucket or suitable drain area.
4. Connect the high hose to the test cock.
5. Open the test cock. The test kit needle should peg to the extreme right of the gauge.
6. Open high bleed valve to bleed air from the hose. (Water will discharge through the clear bleed tube) Close the high bleed valve.
7. Close the upstream shut-off valve.
8. Raise the test kit and end of the low pressure hose to the elevation of the center of the assembly.
9. Slowly unscrew the bleed screw until it starts to drip.
10. When dripping from the bleed screw stops, and the needle on the test kit stabilizes, the differential pressure reading should be a minimum of 1 PSID. If water continues to flow from the bleed screw, the upstream shut-off valve may be leaking. The differential pressure gauge reading is the apparent reading. This gauge reading cannot be validated until it is confirmed that the device is under a no-flow condition.
11. Close the bleed screw.

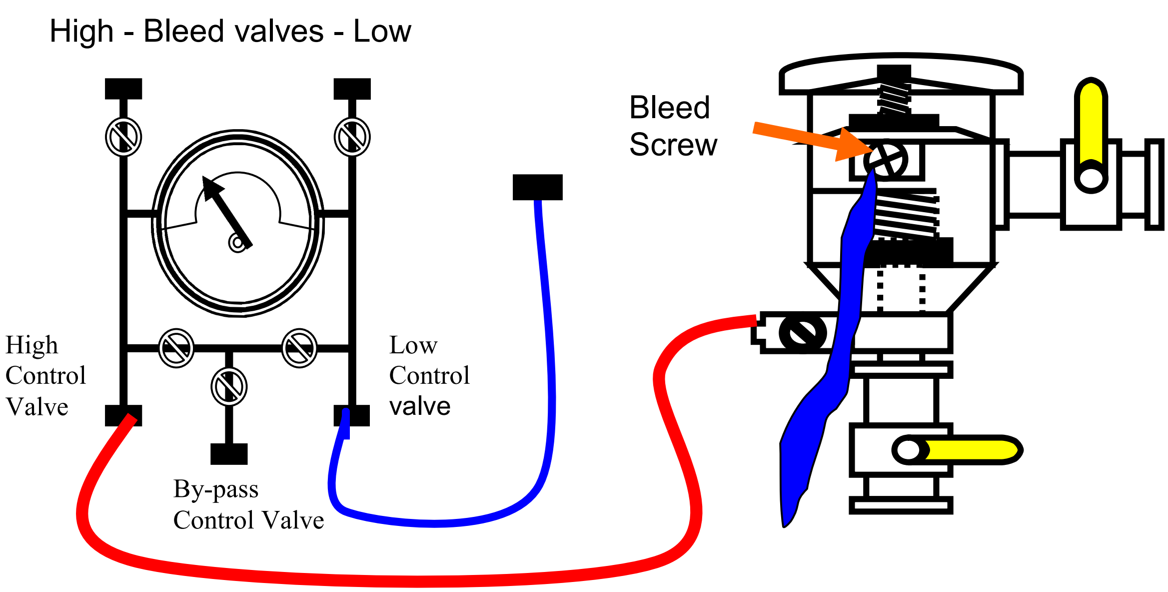


Figure 1

<u>Step 2: Test the downstream shut-off valve for tightness to determine that the device is under a no-flow condition and validate differential pressure reading. (Figure 2)</u>

1. With the high pressure hose still connected to the test cock, open the upstream shut-off valve to pressurize device. The test kit needle should peg to the extreme right of the gauge. The downstream shut-off valve is still closed.
2. Open high bleed valve to bleed air; water will discharge out of the bleed tube.
3. Close high bleed valve.
4. Close the upstream shut-off.
5. Observe the needle on test kit. If the needle remains steady the downstream shut-off valve holding tight and/or the device is in a no-flow condition. If needle starts to descend, the downstream shut-off valve is considered leaking. (See NOTE A)
6. Proceed to Step 3 if a no-flow condition exists.

NOTE A: If the device is in a flow condition the differential reading taken are invalid. The device does not fail the test, since it cannot be tested in a flow condition. To perform the test of the device, a non-flow condition shall be achieved, either through the repair of the downstream shut-off valve, the operation of an additional shut-off valve downstream or by another means of validating that the device is under a no-flow condition.

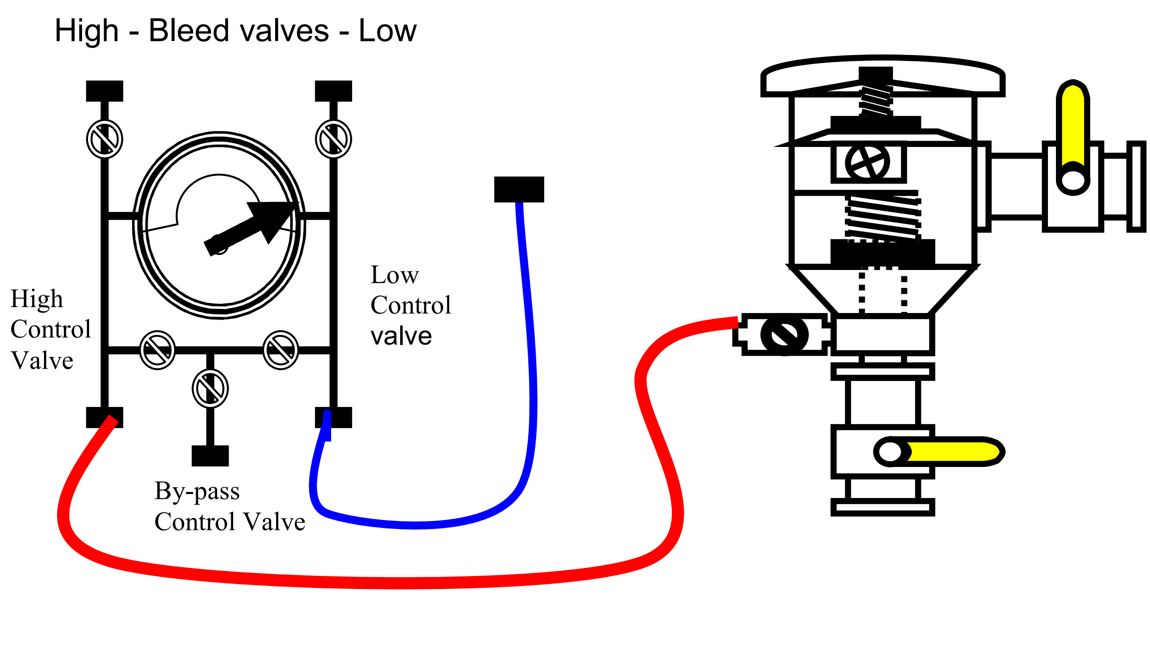


Figure 2

Step 3: Determine if the air inlet valve opens at least 1 PSID above atmospheric pressure. (Figure 3)

1. Both shut-off valves are still closed and the canopy is removed.
2. The high pressure hose is still connected to the open test cock.
3. Hold the test kit and end of low pressure hose to the same level as the center of the assembly.
4. Slowly unscrew the bleed screw until it starts to drip.
5. Slowly open the high bleed valve on top of test kit ¼ turn while simultaneously observing the air inlet valve. (Lightly placing an object on top of the air inlet may be helpful in determine the opening point.)
6. Read the test kit needle at the point when the air inlet valve opens (pops). It should be equal to or greater than 1 PSID. A reading of less than 1 PSID is cause for failure.
7. Observe that the air inlet valve to determine that it is open completely.

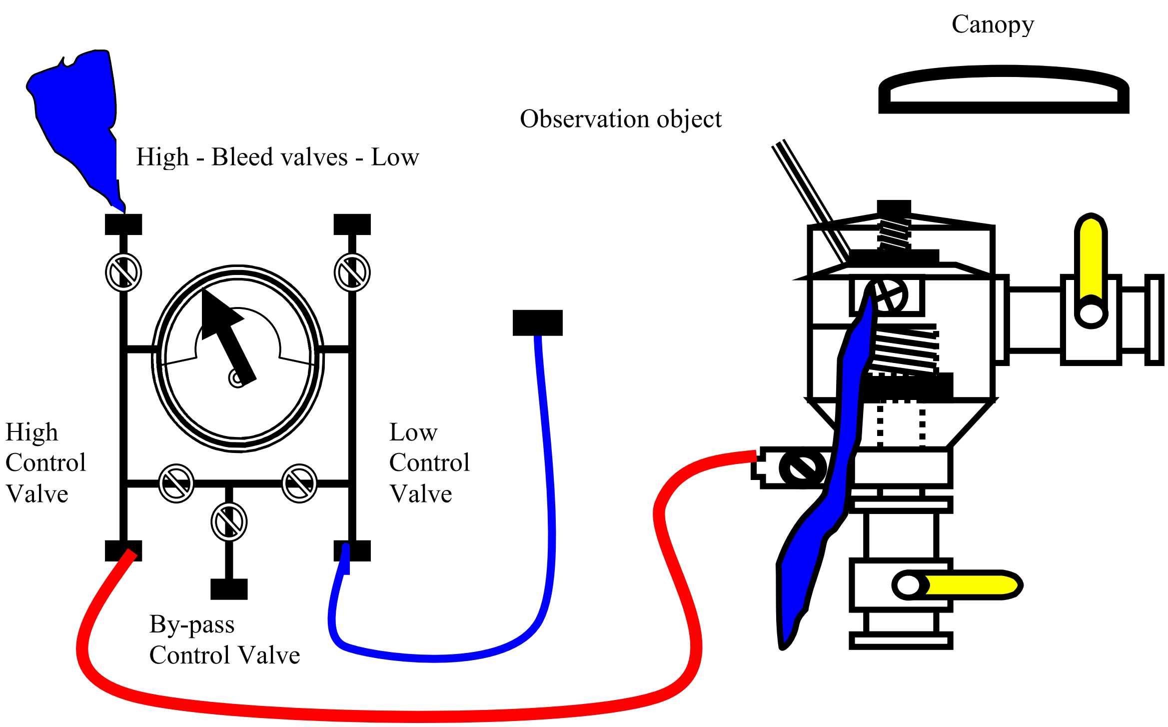


Figure 3

Concluding Procedures This completes the standard field test for a Spill-Resistant Pressure Vacuum Breaker. Before removal of the test equipment, the tester should ensure that the bleed screw and test cock are closed, and the downstream and upstream shut-off valves are open, thereby reestablishing flow. All test data should be recorded on appropriate forms and submitted to the appropriate parties.