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

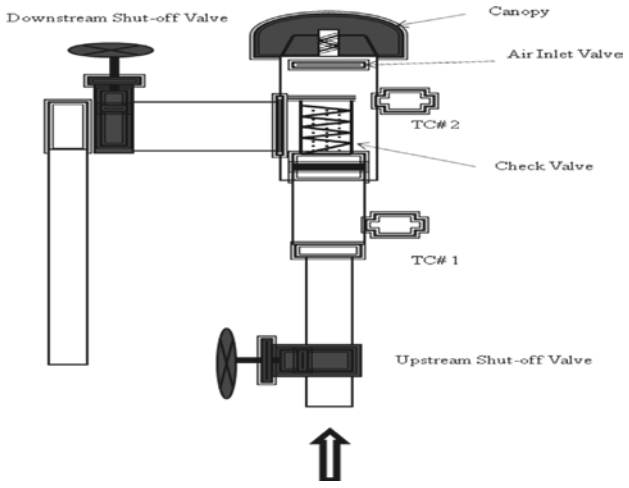
This field test procedure evaluates the operational performance characteristics as specified by nationally recognized industry standards of the independently-operating internal spring loaded check valve and air inlet valve while the assembly is in a no-flow condition. This field test procedure utilizes a three 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 three 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 hood 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 three valve differential pressure gauge with a range of 0 – 15 PSID.

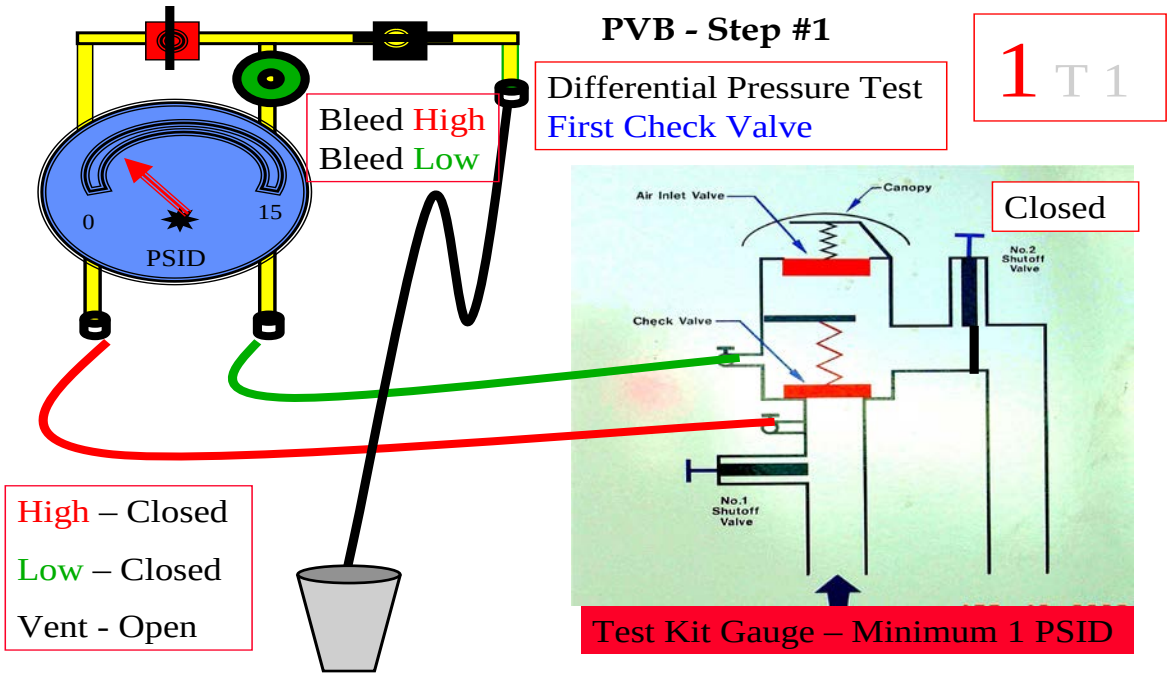
1. The check valve has a minimum differential pressure across it of 1 PSID.
2. The device is in a no-flow condition at the time of the test.
3. The air inlet valve opens at least 1 PSID above atmospheric pressure.
4. Optional – The downstream shut-off valve is tight.



PRESSURE VACUUM BREAKER 3 VALVE FIELD TEST PROCEDURE

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

1. Verify that upstream shut-off valve is open.
2. Close the downstream shut-off valve.
3. Orientate test kit. Close high and low control valves. Open vent control valve.
4. Connect the high pressure hose to test cock # 1.
5. Connect the low pressure hose to test cock # 2.
6. Place the vent hose into a bucket or suitable drainage area.
7. Open test cock # 1 and test cock # 2.
8. Open the high control valve; bleed water through the vent hose.
9. Close high control valve.
10. Open the low control valve; bleed water through the vent hose.
11. Close low control valve.
12. Observe needle on test kit is should be 1 PSID or greater. 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.
13. Shut off test cock # 1 and # 2.
14. Remove hoses from the device.
15. Proceed to **Step 2**.

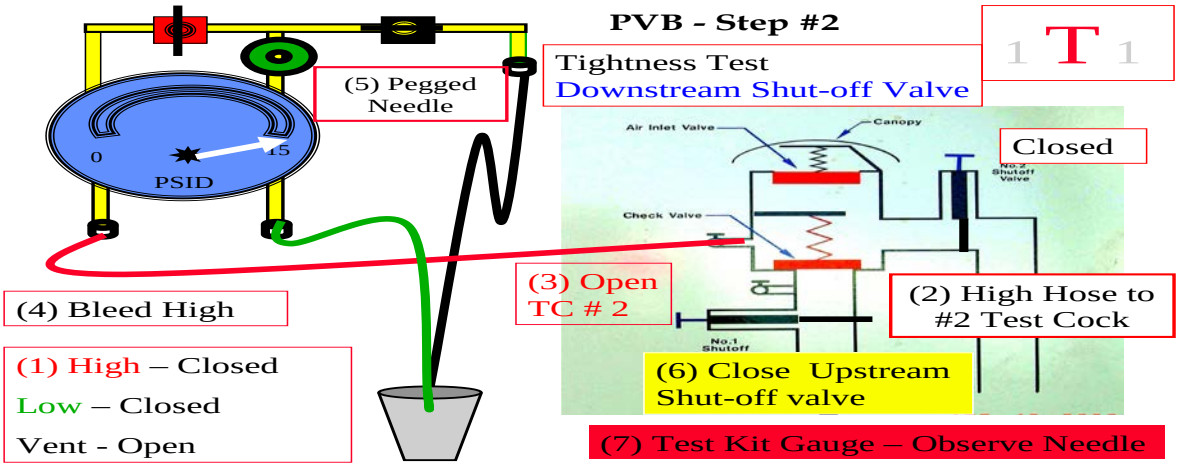


Step 2: Tightness Validation Test --- No-Flow Test to determine that the device is under a no-flow condition and validate differential pressure reading.

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

NOTE A: If the device is in a flow condition the differential reading taken is 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.

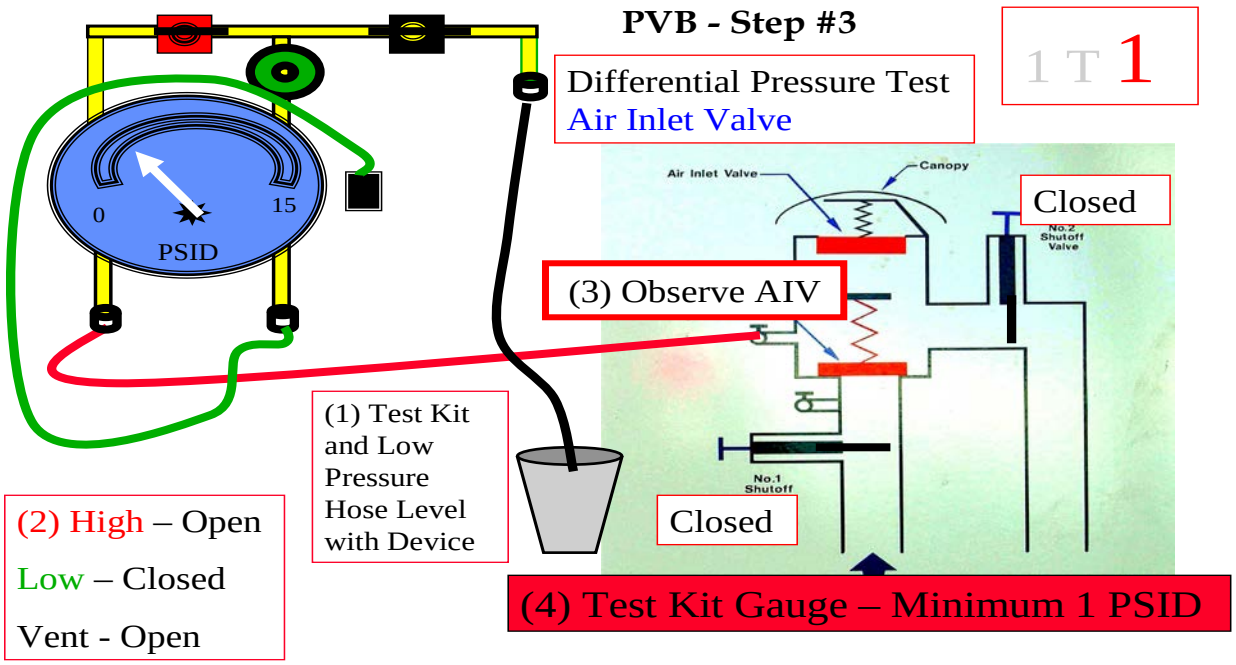
Downstream Shut-off Valve Tightness: To determine the tightness of the downstream shut-off valve, a demand downstream of the backflow prevention device assembly shall be created while performing the no-flow test. If the needle on the test kit remains steady during a demand condition, the downstream shut-off valve is considered holding tight. If under a demand condition the needle on the test kit drops to zero, the downstream shut-off valve is considered leaking. 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.



Numbers on illustration may not correlate with the step numbers above.

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

1. Both shut-off valves are still closed.
2. The high pressure hose is still connected to the open test cock # 2.
3. The low pressure and vent hoses are still in a bucket or suitable drainage area.
4. The test kit valves are positioned as follows: High and low control valve closed; Vent control valve is open.
5. Elevate the test kit and the end of low pressure hose to the same level as test cock # 2.
6. Slowly open the high control valve 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.)
7. Observe the test kit needle at the point where the air inlet valve opens (pops). The air inlet 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.
8. Observe that the air inlet valve to determine that it is open completely.



Numbers on illustration do not correlate with the step numbers above.

Concluding Procedures This completes the standard field test for a Pressure Vacuum Breaker. Before removal of the test equipment, the tester should ensure that the test cocks have been closed, and the downstream and upstream shut-off valves are open, thereby reestablishing flow. All test data should be recorded on appropriate forms.