Troubleshooting

Double Check (DC)

Problem	Possible Causes	Corrective Action	Additional Comments
Leaking check valve or doesn't hold above 1.0	1.Debris on seat, rubber disc. 2.Damaged, broken or cracked seat, damaged seat o-ring . 3.Damaged guide holding check open or not moving freely. 4.Weak or broken spring 5.Leaking shut off valve or not shut off completely.	1.Clean debris and rubber, replace if necessary. 2.Inspect seat and seat o-ring clean or replace as required. 3.Inspect check guide and all surfaces it touches and replace if necessary. 4.Inspect spring, replace if necessary. 5.Close #2 shut off valve, clean or replace as necessary.	If there is chattering look closer at the check guide. It may be bent, cracked, or damaged preventing it from moving freely.

Pressure Vacuum Breaker (PVB) / Spill Resistant Vacuum Breaker (SVB)

Problem	Possible Causes	Corrective Actions	Additional Comments
Air inlet doesn't open or below 1.0 PSIG	1.Debris restricting free operation or if model has a guide it could be bent, broken or has scale build up restricting movement. 2.Poppet seal adhering to bonnet. 3.Weak spring load.	Inspect, clean and replace parts as necessary.	
Air inlet valve does not open and differential on gauge will not drop	Leaking #1 shutoff	Inspect, ensure valve shuts off completely. Replace as necessary	
Check valve doesn't hold 1.0 PSID	1.Debris on sealing surface or damaged seat disc, or check poppet or possible friction on moving check components. 2.Check seat damaged. 3.Weak or broken spring.	1.Inspect, clean or replace parts as necessary. 2.Clean seat, replace if possible or necessary. 3.Replace spring if necessary.	
Leakage through air vent	1.Damaged poppet seal, poppet or bonnet, bent, broken or missing guide. 2.Insufficient inlet volume to operate assembly. 3.Not assembled correctly.	1.Inspect, clean or replace as necessary. 2.Inlet pressure needs to be increased or partially close #2 shutoff valve to create greater pressure on the poppet. 3.Inspect and reassemble.	
Chatter during flow conditions	Worn, damaged or defective check valve guide.	Inspect, clean, repair or replace as needed.	Could also be low flow condition

Reduced Pressure (RP)

I would recommend following these procedures whenever you come up to an RP assembly to test it and it is leaking out of the relief valve (RV). Before you even attach your gauge do the following:

Determine if there is something downstream that is always calling for water or in other words is water flowing through it to something open downstream. If so you know there is a problem with the RV assembly.

If there is not water being used downstream then see if you can establish a flow through the assembly by opening something downstream that will get a greater flow through the assembly than what is discharging through the RV. Sometimes it is possible to open the #4 test cock to accomplish this purpose if it is only a small discharge from the RV. You just have to get a greater flow going through the assembly than what is coming out of the RV.

If while you have the flow going through the assembly to something open downstream or out the #4 test cock and the discharge stops entirely then the cause of the discharge is in the number one check.

If the discharge out the RV doesn't change at all then the RV is the issue.

If the discharge out the RV lessens then you have a problem in both the #1 check and the RV assembly.

One last possibility is that you might have a bad #2 check with backpressure. To see if this is the issue shut the #2 shutoff valve. If it stops leaking then you know you have a bad #2 check.

To see what action to take once you know what the cause is see the corrective actions below. Remember, when determining the problem in either the #1 check or the RV assembly depending on the results of the troubleshooting, you must look at everything as suspect after resolving the basic issues of debris, bad rubber, broken poppet assembly, corrosion etc. Do not forget to look at seats either replaceable or not, at seat o-rings or possible cracks in the body if freezing is suspected.

Problem	**Possible Causes**	**Corrective Action**	**Additional Comments**
RV leaks continuously	1.#1 check issue 2.#2 check issue with backpressure 3.RV issue	1.See DC corrective action 2.See DC corrective action 3.Inspect, clean, repair as needed including RV seat	See the above trouble shooting tips
Continuous leaking from RV during flow or no flow condition	1.RV seat disc dislodged from holder due to pressure surges. 2.Debris fouling the RV seat 3.Debris plugging RV sensing line. 4.Debris, scale jamming stem. 5.Leaking at RV stem	1.Inspect RV disc and reposition or replace as necessary. Repressurize system slowly. 2.Inspect and clean. 3.Inspect and clean. 4.Inspect and clean or replace. 5.Inspect, clean or replace.	
RV only starts to leak when #2 shut off is turned off	This means water is flowing through the assembly to something open downstream. When #2 shut off is turned off the flow is stopped. This means #1 check has an issue.	See DC corrective actions	

Problem	Possible Causes	Corrective Action	Additional Comments
RV discharges intermittently Assembly is functioning as designed but there are possible solutions to prevent or lessen this.	1.Line fluctuations from inlet or outlet pressure 2.Low buffer between #1 check value and RV opening point 3.Water hammer	1.Install spring loaded , soft seated check valve before or after the device or both if needed 2. See DC corrective actions for check valve and corrective actions for faulty RV 3. Reduce causes of water hammer install water hammer arrestor	1. Other possible solution is to install pressure reducing valve before or after assembly depending on source of fluctuation.
RV does not open above 2.0 PSID during testing	1.#2 shutoff valve leaking or not closed tight. 2.Plugged sensing line. 3.Debris jamming movement swollen o-rings restricting movement or insufficient lubrication. 4.RV assembly not reassembled correctly or there is a reason causing resistance of movement.	1.Make sure #2 shutoff valve closes tight or inspect and clean or replace if necessary. 2.Inspect, clean or replace 3.Inspect, clean or lube as necessary. 4.Remove and reassemble, lubricate as required.	
#1 check pressure drop is low (less than 5 PSID) during field testing	1.#1 check issue. 2.#2 check issue with backpressure. 3.Inlet pressure variations causing inaccurate readings.	1.See DC corrective actions. 2.See DC corrective actions. 3.Eliminate pressure variations.	
RV will not open during test. Needle may drop but not close to where most RV's would open	1.Leaky #2 shutoff valve with excessive flow through the assembly	1.Inspect #2 shutoff valve. Make sure it is completely shut off. If possible inspect, clean repair or replace shutoff valve.	
RV will not open but gauge needle drops to zero	1.RV stuck shut due to corrosion, scale or debris, removed spring, or some item put in RV to keep RV closed 2. RV sensing line plugged	1.Inspect, clean, repair or replace parts as necessary 2.Inspect RV sensing line and if external especially on epoxy coated assemblies inspect and clean where it threads into the body	It is possible that the RV stem has broken resulting in loss of tension on the RV to open the RV. This depends on the model and size as this is not possible with all models.
#2 check valve fails to hold backpressure (check won't close tight)	1.Issue with #2 check valve 2.Leaky #2 shutoff valve	1. See DC corrective actions 2.Inspect #2 shutoff valve. Make sure it is completely shut off. If possible inspect, clean, repair or replace shutoff valve.	
Gauge doesn't come off of zero after bleeding high and low sides	High and low hoses connected incorrectly.	Make sure hoses attached to assembly and/or test kit correctly	Make sure test cocks are identified correctly. Sometimes it helps to start from #4 test cock and count back to the #1 test cock.

Additional tips on RP's. If after you repair the assembly and it is worse than when you started, troubleshoot the assembly again. For example when you came to the assembly and it was just dripping and you have taken the assembly apart to inspect and clean it to see if that would solve the problem so you could test it, and now it is dumping full force out the RV you can try these things.

1. Make sure that you put the #1 and #2 check springs in the right places. If the #2 spring is in the #1 check it will dump full force because the water will not be forced down to the RV first to close it.

2. Make sure you put it back together correctly. For example on RV diaphragms that have a hole for the sensing line to allow the water to the high side of the diaphragm did you line it up correctly so it corresponds with the opening on the body of the assembly so water can get to the high side of the diaphragm to pushed it closed?

3. Whether internal or external sensing line make sure it is not plugged or restricted at either end or in the line.

4. If it is still dripping and you had pulled debris out I would recommend determining if it is the #1 check that is the issue or the RV by doing what is suggested at the top of this RP section. If it is determined to be a number #1 check issue then take the #1 check apart again and look for more debris that may have washed through and with the #1 still out and the cover off flush the system for a minute. Reinstall and see if that solved the issue. If there is a lot of debris you may have to do this several times.

5. If you do find a lot of debris, rust or other items coming through the assembly you may want to install a wye strainer before the assembly or if it is something finer than what a wye strainer would catch you may want to install a filter.