

APPLICATIONS:

This valve is used for back pressure control applications such as maintaining constant pump discharge pressures, bypassing excessive pressures from various types of process equipment, and where ever a constant pressure must be maintained in a process or piping system. Valve can be used for - corrosive or mildly corrosive fluids, when the proper corrosion resistant materials are selected. When liquids or gases contain debris or other solid matter, which might cause internal clogging or improper operation of the valve, a strainer with a fine wire mesh should be installed before the inlet of the valve. In-line strainer fittings or basket strainers can be purchased from STRA-VAL.

PRINCIPLE OF OPERATION

This is a direct acting valve with an adjustable spring operating against a diaphragm subjected to the inlet pressure of the valve. The pressure which acts on the underside of the diaphragm can come from the inlet port directly with an internally drilled sensing hole, or from an external source with a separate port, which is shown in the attached illustration. When the sensing is from an external source, there is an additional piston seal (12) to isolate the external sensing pressure from the inlet pressure. Increasing the spring compression will increase the system or line pressure to be maintained. Reducing the spring compression will reduce the system or line pressure to be maintained. An increase in system pressure beyond the set point will cause the main valve to open and relieve the excess pressure through the outlet port

OPERATING INSTRUCTIONS MODEL BPS-09 THD BACK PRESSURE CONTROL VALVE

MAINTENANCE & REPAIR

The valve should be periodically checked for proper operation. This can be easily done by reducing the spring compression from its current pressure setting. Eventually the poppet should open and begin to discharge liquid or gas under pressure. **Make sure that the discharge is properly piped to a safe area in order avoid any personal injury.**

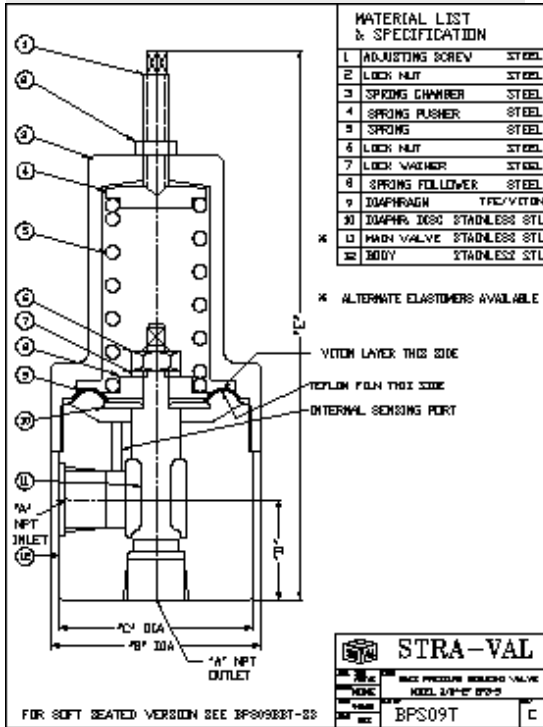
If the poppet fails to open with the adjusting screw sufficiently backed out and the valve is under pressure, the poppet is probably frozen or corroded in place. If this condition exists, the valve must be **immediately removed from service** and replaced or repaired.

Another reason for replacing or repairing a valve is if there is excessive leakage from the valve seat. If this happens even with the spring compressed to the maximum (this should only be temporarily done for test purposes), this is an indication the poppet and or valve seat on the body is worn, damaged, corroded, or a particle lodged in the seat causing the valve to constantly leak. If leakage is observed through the spring adjusting screw, this indicates there is leakage through the diaphragm, which requires replacement..

PROCEDURE FOR DISASSEMBLY

Make sure the valve is isolated and is not under pressure. Next remove the valve from the system. Unlock the lock nut (2). Back out the spring adjusting screw (1) until there is no longer any spring compression. Unscrew the spring chamber (3) using the flats provided on top of the spring chamber. Now the top of the diaphragm (10) is exposed. While still assembled, test to see if the diaphragm is free to move by hand. There should only be a slight resistance to movement resulting from the O-ring (12) friction between the piston (13) and the body (15). The diaphragm (10) and piston assembly (13) can now be pulled out through the top of the body. Next, remove the diaphragm lock nut (7) by placing a wrench on the two flats on top of the lock bolt (6) Then remove the diaphragm (10) and observe if there any tears, cuts, or
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delaminations in the convoluted area or on any of the sealing areas between the body and spring chamber, and between the diaphragm plates (9) & (11). Replace the diaphragm (10) if there are any defects including any deterioration due to chemical attack. Next, examine the O-ring seal (12) to see if any deterioration has taken place and replace if necessary.

Next, observe if the seat (14) is damaged or worn, and replace with a new one.

Examine the body bore where the piston or poppet is housed. If the surface is not smooth, the bore should be polished with a very fine abrasive paper or fine scotch brite. The same should be done with the piston or poppet outside diameter. These operations can be done in a small lathe. Use extreme caution when polishing the body so as not to get a finger caught in the inlet port if the body is rotating in a lathe while polishing. If the valve body and poppet require re-machining from extreme wear or corrosion, use only an experienced tool room machinist to perform this operation on a precision lathe, as the parts must be completely concentric to within .001 TIR. If this is not done properly, the valve will not seat properly. If the bore requires re-machining, there is a risk that too much clearance will result in the seat not closing properly because of excessive side movement. Ordinarily the side clearance between the piston and body bore should

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only be about 0.001 to 0.0025 in depending on the size. Consult factory for proper clearances for your specific valve. If the valve is severely damaged and if it is not practical to re-machine because side clearances would be excessive, then a new valve should be purchased, or the valve shipped to STRA-VAL for a repair evaluation and possible repair or replacement.

Don't forget to examine the adjusting spring to look for signs of corrosion or outright failure. Replace if necessary. Springs are usually always in stock at STRA-VAL and can be shipped readily.

REASSEMBLY & TEST

When all the valve parts are cleaned and inspected, the valve can be reassembled in reverse order.

Make sure the diaphragm is installed properly with the convoluted facing upward as illustrated. For stainless steel or Hastelloy valves, the diaphragm will be supplied with a molded in film of Teflon, and it must face downward towards the body. Use a valve seal lubricant is used to lubricate the seal and is compatible with the elastomer used.

Make sure no dirt or foreign particles are embedded in the valve seat, which might cause the valve seat to stay partially open and cause unwanted leakage.

When the spring and spring hardware is assembled and the spring chamber threaded on to the body tight enough so that there is no leakage at the interface between the spring chamber and the body. Also make sure the Lock nut (7) together with the lock washer (8), which clamps the diaphragm plates (9) & (11) to the diaphragm (10), is tight. The valve is ready for final installation and test.

Testing should be done with the valve completely piped up with the discharged piped safely away or on a test bench. At the proper system pressure, turn the adjusting screw until the valve begins to open. Next reduce the system pressure below the normal operating pressure and check to see if the valve reseats properly and shuts off.