OPERATING INSTRUCTIONS

MODEL PRH09i-THD

PRESSURE REDUCING VALVE

APPLICATIONS:

This valve is normally used for applications where our single piston model, PRH04 cannot regulate very accurately at lower outlet pressures.

Valve should only be used for non-corrosive fluids, or where the materials selected are compatible with the fluid or gas and will not cause corrosive buildup, which could keep the main valve from opening. When liquids contain debris or other solid matter, which might cause internal clogging or improper operation of the valve, a strainer with at least a #20 wire mesh or finer, should be installed before the inlet of the valve. In-line strainers can be purchased from STRAVAL to solve this problem. **Do not use this valve with a metal seat as a shutoff valve**, even though the valve, when new, may be able to do so. In time, as wear sets in, or if contamination is present, seat leakage may increase and result in an objectionable pressure rise at zero flow. As long as the flow through the valve is much greater than the seat leakage, the valve could still regulate.

PRINCIPLE OF OPERATION

Fluid passing through the valve is regulated by a poppet and piston assembly (7 & 10). Outlet pressure is sensed by the underside of the piston (7), which is able to move up and down with changes in outlet pressure. Pressure regulation is achieved when a force balance is maintained between the pressure acting on the underside of the piston and the spring force, which is adjusted to maintain a particular outlet pressure.

If the outlet pressure is below the set point, which is preset by the adjusting spring (4), the spring force overcomes the pressure force acting on the underside of the piston. This causes the poppet (10) to open, thereby admitting higher inlet pressure fluid or gas to raise the outlet pressure until the force balance is restored. As soon as the outlet pressure is restored, the piston/poppet assembly begins to close to limit the amount of higher inlet pressure fluid or gas passing through the valve .

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Adjust the spring compression by loosening the lock nut and turn the adjusting screw clockwise to increase the spring compression; this will increase the outlet pressure. Similarly, turning the screw counterclockwise will reduce the spring compression and correspondingly reduce the outlet pressure. A slow pressure build up will take place if the outlet is completely blocked off which may take place over a period of time depending on how effective the valve seat is performing and the volume of the discharge piping. For this reason **it is strongly recommended that a relief valve be installed on the outlet side of the valve to protect any equipment damage** that may take place because of this possible pressure build up in a shut off or blocked discharge condition. If the regulator fails to maintain the proper outlet pressure, it is very likely the piston/poppet assembly Is not free to move or is even frozen, as discussed previously. Also, internal clogging of foreign objects or material, sediment, rust, etc. could be in the valve seat area.

MAINTENANCE & REPAIR

If the valve is shipped preset to a particular pressure, the valve is ready to be installed and ready to operate after the protective shipping plugs are removed. If the valve is not preset, the adjusting screw may be strapped to the spring chamber, only if it is very long in order to conserve shipping space. All that needs to be done to get the valve ready for operation is to install the adjusting screw (1) and lock nut (2) and make the final pressure adjustment.

Check to make sure that the discharge piping is not blocked off and that the valve does not operate against a shut-off condition. When pressure is applied to the valve inlet, check to make sure there is no visible leakage coming from the spring chamber or from any other place of the valve. The only areas where leakage could come from the valve would be from the piston seals (8) and (9). If these are damaged or worn or if they are failing due to chemical incompatibility or deterioration, they must be replaced.

If after extensive use the valve begins to lose its ability to regulate, or if there is excessive pressure build up at very low flows or near shutoff, there probably is excessive seat leakage due to seat wear or seat contamination, which would cause an excessive pressure rise on the outlet of the valve. The other possibility could be if the pistons and mating body bores are worn or scored. If this condition is present, it needs to be corrected or the valve sent in for repair some parts replacement. Before removing the valve from service, **make sure that the valve is completely isolated from any piping under pressure in order avoid any personal injury.**

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If the valve needs to be opened and examined for any reason, it is best to have a replacement seal kit on hand, in case the seals are worn. With the valve removed from service, perform a simple test for mechanical operation is to see if the **poppet/piston assembly (8 & 10) is free to move by hand**. This is the only moving part within the valve. This should be done with the spring chamber removed and the spring decompressed. If this assembly is not free to move, or if is frozen in place, this assembly needs to be removed from the valve. Usually only the body bores and piston surfaces may just need to be cleaned and re-polished which will restore the valve to its normal operating condition and will prolong piston seal life.

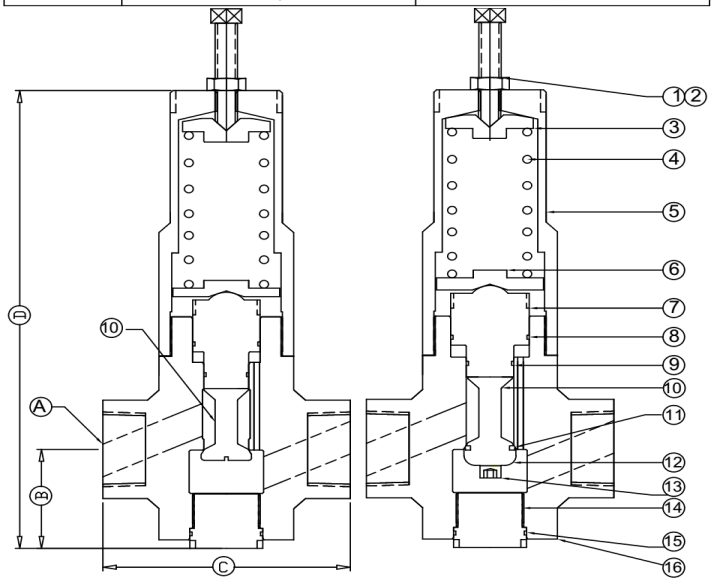
If severe wear or corrosion is evident, the piston assembly may need to be replaced. If the valve is able to regulate but only at higher capacities, but not at very low flows or at or near shut off, then seat leakage is suspect. Usually the seat only needs to be re-lapped, or with more severe wear, just a just a minor re-cutting of the seating surfaces needs to be performed on the poppet (10) and body (16) seat surfaces. If a soft, elastomeric replaceable seat was ordered and supplied with the valve, (not illustrated here) then the seat may just require replacement. These corrective measures should be performed by skilled valve personnel, or the valves can be shipped for repair to Straval.

DISASSEMBLY/ASSEMBLYINSTRUCTIONS

If disassembly is required **make sure the valve piping is not under pressure and sufficiently cooled off** for operating personnel to handle. If some light contamination is present and stuck in the valve seat, it may be possible to just blow out the contaminants with an air hose. To disassemble the valve, the **valve must be removed completely from the piping**. Unscrew the spring chamber (5) with a wrench in the area provided with wrench flats. Now remove the piston poppet assembly by placing a wrench against the wrench flats on the top piston (7) and placing an extra wide tipped screw driver or other tool into the slot machined into the bottom of the poppet (10). Unscrew the poppet/piston assembly which will allow these parts to be now removed from the body. Next inspect the seat in the body and poppet which is the area where sealing contact is made. It may be necessary to just re-lap these parts with a fine grit lapping compound such as a #600 grit. If there is more severe wear or damage that can't be corrected by lapping, then the parts need to be replaced or re-machined making sure that the parts remain concentric. Also, inspect the poppet and piston on the surfaces where they perform their sealing function. If the area is not too severely worn, the surface may be re-polished and restored to a smooth low friction surface finish. If this area is very rough or worn, the valve will not regulate properly and will stick because of excessive friction and wear. If in doubt, replace this entire assembly with seals (7, 8, 9, 10) from the factory.

If the poppet/piston assembly is purchased from the factory, it would need to be lapped into the body at final assembly for tight shut off and optimum regulating performance. This would not be necessary for a soft seated version. After the valve is properly assembled, reset the adjusting screw until the desired outlet pressure is achieved at the flow range the valve will be operating, then tighten the adjusting screw lock nut. Little or no adjustment is required to compensate for changes in inlet pressure, as this valve is a balanced design. Although this is a balanced inlet valve design, a zero outlet pressure is never really achievable and should not be expected as there is always a small unbalanced area in-

PRH09i-THD SERIES BOM		
#	Description	Available Materials
1	Screw	CS, 303SS, 316SS
2	Nut	CS, 304SS, 316SS
3	Pusher	CS, 304SS, 316SS
4	Spring	CRSi, 302SS, 316SS
5	Spring chamber/Housing	CS, 303SS, 316SS
6	Follower	CS, 303SS, 316SS
7	Piston	303SS, 316SS
8	Piston Seal (Large)	Viton, Buna, EPDM, Kalrez
9	Piston Seal (Small)	Viton, Buna, EPDM, Kalrez
10	Poppet (Soft or metal Seat)	303SS, 316SS
11	Seat Seal	Viton, Buna, EPDM, Kalrez
12	Seat Retainer (Soft seat Only)	303SS, 316SS
13	Seat Retaining bolt (Soft Seat Only)	304SS, 316SS
14	Plug	303SS, 316SS
15	Plug Seal	Viton, Buna, EPDM, Kalrez
16	Body	303SS, 316SS



Reference Dimension Chart			
"A"	"B"	"C"	"D"
1/2	2 1/8	3 1/2	10 1/2
3/4	2 1/8	3 1/2	11
1	2 1/4	3 1/2	11 1/2
1 1/4	2 1/4	5 1/2	12
1 1/2	2 1/4	5 1/2	12
2	3 1/2	6 1/4	13 1/4
2 1/2	3 1/2	6 1/4	13 1/4
3	3 1/2	10 1/4	17 1/2

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