Interflow and Non-Interflow in Barksdale Valves

Interflow in a Barksdale Shear-Seal® valve is a small amount of fluid flow from the Pressure A and B ports to the return port through the clearance between the rotor and the body. This interflow occurs whenever the valve is shifted from one position to another or when the valve is being used for throttling. This is due to the Shear-Seal® in the valve being only partially covered by the rotor. Interflow is not leakage and does not occur when the valve is fully engaged.

The interflow in a Shear-Seal® valve is beneficial in that it reduces the hydraulic shock or "water hammer" that can occur when a valve is closed rapidly. The small amount of interflow between ports acts as a cushion as the fluid flow is stopped in the system.

Non-interflow valves are constructed with Shear-Seal®s using a much smaller flow passage than a comparably sized interflow valve. By doing this, the orifice in the pressure seal and rotor are completely covered during transition thus preventing interflow. Non-interflow valves may be required when precise control of a cylinder is needed and the small settling associated with interflow valves can not be tolerated. Non-interflow valves have a much lower flow rate than interflow valves with the same port size. Mandatory higher force is required to actuate them.

Barksdale Shear-Seal® Valves are available with many standard options as well as special order features. Many of the options available are listed below. Consult Factory for additional details and availability for a particular valve model. Don't see what you need here? Call us - we're only a phone call away.

Seal Material	Std. P/N Suffix
Butyl	-Z10
Neoprene	-Z12
Viton®	-Z13
EPR	-Z15
Silicone	-Z16
FSR	-Z17
Thiokol	-Z18
Teflon (PTFE)	-Z19
Disogrin	-Z21

Modification	Std. P/N Suffix
2-Position 45° CW detent	-Z30
2-Position 45° CCW detent	-Z31
2-Position 90° detent	-Z32
No valve detent	-Z33
No valve handle	-Z34
Valve with actuator mounting Hardware only (no actuator)	-Z35

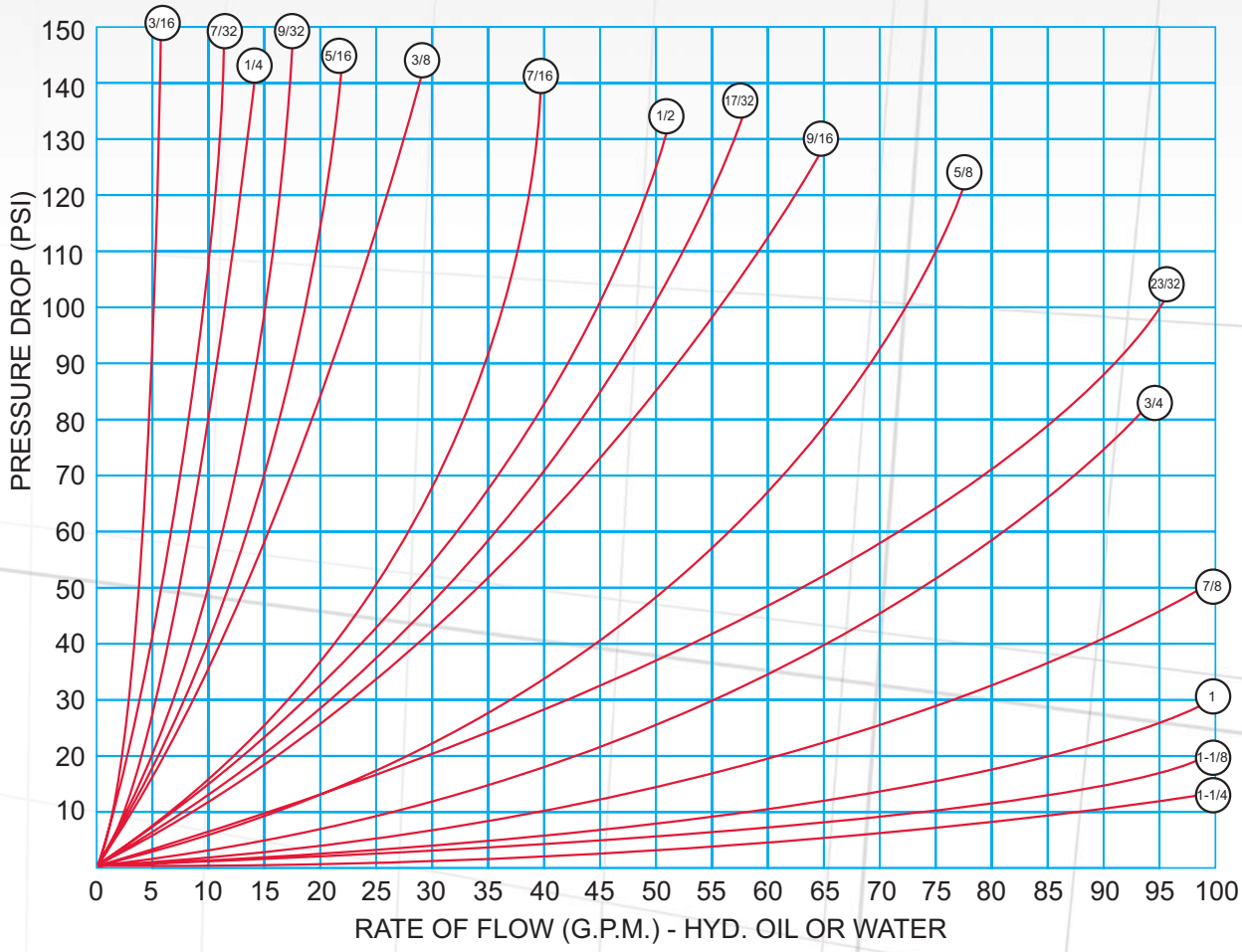
Maintenance

1. Disassemble and inspect. Replace or repair damaged or worn parts and "O" rings; clean all parts including solenoid and plunger. Grease valve parts before assembly. The solenoid should be cleaned at least every 1,000,000 cycles or every six months. The valve should be checked every 2,000,000 or once a year.
2. All Barksdale manual selector valves for water service are equipped with a grease fitting in the housing. On untreated water, valve should be lubricated through this fitting. Frequency of lubrication depends entirely on duty cycle of valve. An increase in handle load will indicate exactly what lubrication schedule should be followed. Use water resistant lubricant such as Socony-Vacuum "Sovarex 2W", Shell "Alvania" or equivalent. Preceding operation may be disregarded if valve is used on water treated with soluble oil.
3. At the first sign of excessive internal leakage the valve should be disassembled and the source of leakage repaired. Allowing valve to continue in operation may cause damage to other components, as the escaping fluid is generally in the form of a jet stream.

WARNING: Reverse assembly of any valve parts may result in high case pressure and possible injury. Assembly drawings, sales drawings and parts lists MUST be consulted.

Pressure Drop Curves

(Theoretical)



Pressure Drop

Barksdale's Shear-Seal® Valves have a much lower pressure drop than other valve technologies. This is possibly due to smooth internal passages and transitions within the valves which keep turbulent fluid flow to a minimum. This translates to less heat build-up and higher pressures available to perform the required work.

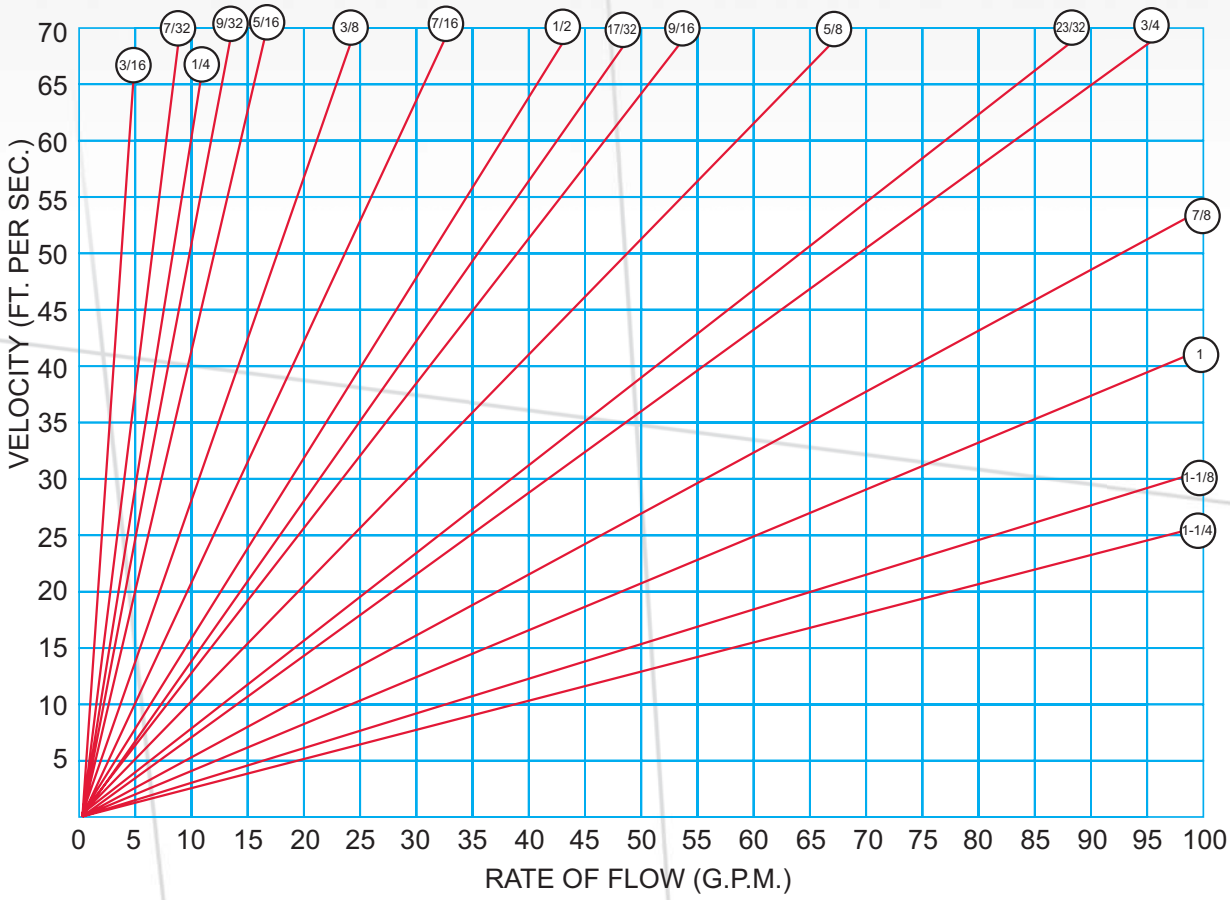
Determine Pressure Drop for Barksdale Shear-Seal Valves

1. Determine the Rate of Flow in G.P.M. or L.P.M. for fluid being controlled.
2. Determine minimum flow passage for valve from vale data sheet or sales drawing.
3. Locate the Pressure Drop Curve from the chart above for the appropriate minimum flow passage (indicated by the small circles at each curve).
4. Read the Pressure Drop from the vertical axis at the point where the flow rate (horizontal axis) intersects the appropriate pressure drop curve.

Note: The Pressure Drop is about the same in all flow directions.

Velocity Curves

(Theoretical)



Fluid Velocity

Barksdale's Shear-Seal® Valves control fluid at a much higher velocity than other types of valve technologies. This means that a smaller valve can be used to do the same types of job, saving you space and component costs. The recommended velocity for Barksdale valves is about 30 ft/sec (9.1 m.sec) for continuous operation. However, the valve can easily handle higher velocities up to 60 ft/sec (19.3 m/sec) for intermittent duty.

Determining Fluid Velocity in a Shear-Seal Valve for a known Rate of Flow

1. Determine the Rate of Flow in G.P.M. or L.P.M. for fluid being controlled.
2. Determine minimum flow passage for valve from valve data sheet or sales drawing.
3. Locate the Velocity curve from the chart above for the appropriate minimum flow passage (indicated by the small circles at each curve).
4. Read the Velocity from the vertical axis at the point where the flow rate (horizontal axis) intersects the appropriate Velocity curve.

Trouble-Shooting Pointers

Barksdale Manual Directional Control Valves

SUSPECTED TROUBLE	SOLUTION
High force required to shift valve	
Possible Cause	
1 Restriction or blockage in "return" port causing back pressure in excess of maximum allowable for valve style	1 Remove restriction
2 Valve installed in system incorrectly allowing pressure to be applied to return port	2 Install valve correctly
3 Bent detent disk rubbing valve housing	3 Repair or replace detent disk
4 Dirt or debris under trust washer causing tipping of rotor	4 Disassemble and clean valve
5 Worn or missing pin rotor pin on shaft which allows rotor to rub on housing	5 Disassemble and replace shaft pin
6 Worn or scored thrust washers causing bearings to bind	6 Replace thrust washers and bearings. If balls run on top of rotor inspect this area for damage as well.
7 Pressure in excess of valve rating	7 Reduce working pressure of valve in system with regulator, relief valve or other means.
8 Lip worn off of Shear-Seal®	8 Replace Shear-Seals®
9 Galling between Shear-Seal® and rotor	9 This is typically an affect of rotor tipping. Replace Shear-Seal®. If possible grind and lap rotor and use shim on top of rotor to make up difference that is ground off. Otherwise replace rotor.

SUSPECTED TROUBLE	SOLUTION
Symptom: Leakage around shaft	
1 Worn shaft O-ring	1 Replace shaft O-ring
2 Enlarged shaft hole in housing caused by side load on shaft. Typically only found when valve is actuated by some mechanical means which is misaligned	2 Replace housing. Inspect shaft for wear and replace if necessary. Correct side loading condition.

SUSPECTED TROUBLE	SOLUTION
Internal Leakage around Shear-Seal	
1 Worn Shear-Seal O-ring	1 Replace O-ring

SUSPECTED TROUBLE	SOLUTION
Internal Leakage Across Face of Shear-Seal®	
1 Scratch or other damage to face of Shear-Seal®	1 Replace Shear-Seal®. Field dressing can be performed on the face of Shear-Seal® by lapping with 600 grit paper. Paper should be held securely on a surface plate for best results.
2 Scratch or other damage to rotor	2 Lap rotor with 600 grit paper as described above. Replace rotor if leakage continues
3 Incorrect position of rotor in relation to Shear-Seals®. This can be caused by worn rotor shaft pins or worn detent disk	3 Replace detent disk or shaft pins
4 Wear on surface of Shear-Seal® after millions of cycles. This can reduce spring tension on Shear-Seal® due to material loss on seal face.	4 Replace Shear-Seal®s
5 Shear-Seal® spring fails due to breakage or taking permanent set.	5 Replace springs

SUSPECTED TROUBLE	SOLUTION
External Leakage Between Body and Housing	
1 Improperly installed body O-ring	1 Replace body O-ring and install completely in O-ring groove
2 Excessive back pressure in housing caused by restriction or blockage in return port. Back pressure can cause body bolts to stretch and allow leakage at body O-ring	2 Check pressure at return port with pressure gauge and insure it is below maximum rating for valve. Replace body O-ring
3 Body bolts not tightened to specification on assembly drawing.	3 Replace body O-ring and tighten bolts as per assembly drawing