

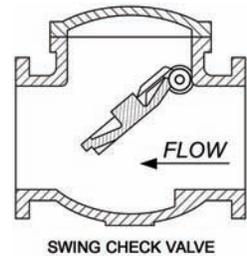
Test Drive a Check Valve Today

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Val-Matic Valve & Mfg. Corp.

Selecting a check valve is similar to buying a new car. There are many types of cars and buyers, each with an array of needs and wants. Similarly, there is a wide range of check valves that meet the varying requirements of pumping systems.

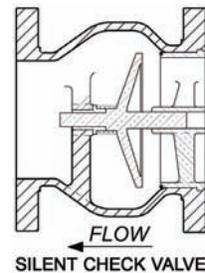
Swing Check Valve, the Sedan

For example, compare the age-old Swing Check Valve with the standard sedan. Both are classics and meet many buyers' needs. The swing check is a safe purchase and meets the American Water Works (AWWA) Standard C508 for check valves. The Swing Check Valve can be enhanced with many options such as a lever and weight, which is designed to make the valve close faster and prevent slamming. This is not unlike adding a turbocharger and rear spoiler to a sedan to improve performance. However, a lever and weight adds inertia to the valve closure assembly and in fact slows down the closure. The weight does help prevent slam, but it does so by limiting the opening of the valve and shortening the stroke and increasing headloss. Since the valve disc has a shorter travel, it will close in a shorter period of time, hopefully before flow reversal becomes significant. Unfortunately, a rear spoiler or a half open disc will create higher headloss—significantly higher than the published Cv. In this time of energy conservation and green systems, there are many other types of efficient valves and cars to consider.



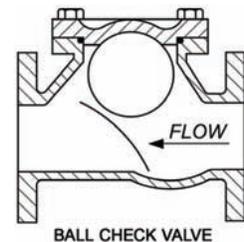
Silent Check Valve, the Sports Car

Another common check valve is the Silent Check Valve; consider this valve a sports car. It is fast, compact, but burns a lot of gas. However, a Silent Check Valve has its place: commonly used in short, high-head systems such as high-rise buildings where slamming is unacceptable. The Silent Check Valve is the fastest closing valve because of its short stroke and strong spring. Since high-rise buildings have high head regardless, specifiers of Silent Check Valves do not consider energy consumption a priority, not unlike the driver of a sports car.



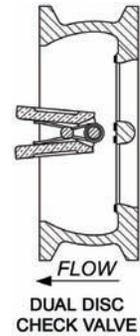
Ball Check Valve, the Off-Road Vehicle

Another option for buyers is the Jeep®, known for its on-road/off-road versatility. Similarly, the Ball Check Valve is one of the few check valves that works well in both water (on-road) and wastewater (off-road) applications. Ball Check Valves are simple in operation and commonly used on small pumps. However, you might consider adding an optional roll-bar to your piping system for safety because Ball Check Valves have the highest tendency to slam due to the ball's high inertia long stroke. They are typically used in low head systems. When Ball Check Valves encounter high pressures and dynamics, severe slamming may result.



Dual Disc Check Valve, the Sub-compact Car

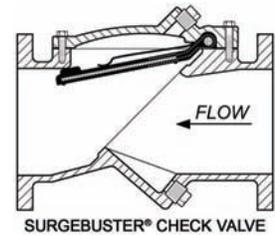
For the cost-conscious buyer, a sub-compact car or Dual Disc Check Valve will suffice. Dual Disc Check Valves are the most compact and lightest check valve in on the market. They can be used for both water and air service such as air blower service and many water systems where being compact is an asset. The Dual Disc has low inertia and a strong torsion spring to prevent slam. This valve is often used on well pumps, plant pumps, and various industrial water systems.



Resilient Hinge Check Valve, the SUV and the Crossover

One of the newer and more popular vehicles is the SUV. Nearly every manufacturer has released an SUV. Like the SUV, the Resilient Hinge Check Valve is becoming the new standard. It does everything that the conventional Swing Check does and much more. It features a 100% flow area port (generous head room), has a short stroke and favorable non-slam characteristics (safety). A few years ago, the resilient hinge check valve was added to AWWA C508 and is fast becoming the standard check valve of the industry. The valve is available as a stocked valve in ductile iron construction and coated with an intense blue fusion-bonded epoxy rated to 250 psig.

If an SUV isn't modern enough for the application, manufacturers are now selling Crossover vehicles with the features of an SUV and the performance of a sports car. Similarly, there is a new valve on the market comparable to the crossover. The Resilient Hinge Valve can be equipped with a disc accelerator or spring over the disc, giving the valve non-slam characteristics similar to a Silent Check Valve/sports car. This valve was first released as the Surgebuster[®] by Val-Matic Valve & Mfg. Corp. in 2005.

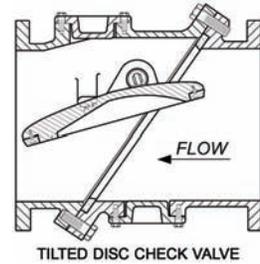


In the installation shown in the photo, a four-inch Surgebuster is being installed in an existing high-dynamic auxiliary water system to resolve serious slamming issues. The check valve is mounted in a vertical line upstream of a 70-psig hydro-pneumatic tank which caused swing check and dual disc check valves to slam. A Surgebuster was installed and monitored with a data acquisition system. The results found the Surgebuster closed in about 1/8 of a second with near silent closure.

Installation of a Surgebuster[®] in a Vertical Line.

Tilted Disc Check Valve, the Luxury Sedan

Finally, for the most demanding customers there is the luxury sedan, or the Tilted Disc Check Valve. Both are an investment, but guarantee quality. The Tilted Disc Check Valve features high-performance, metal-to-metal aluminum bronze seating and a flow port equal to 140% of the nominal size. The valve's oversized port and airfoil type disc provides the lowest headloss of check valves. Calculating headloss is important because it is directly related to pumping costs and in the current market fuel economy is a priority.



The Tilted Disc Check Valve can pay for itself in energy savings over its lifetime. Tilted Disc Check Valves can also be equipped with oil dashpots to control the speed of operation and hence, the surges in the pumping system. The top oil dashpot links the disc to a high-pressure oil cylinder and independently controls speed of opening and closing in the range of 5 to 30 seconds. The bottom oil dashpot is similar, but only controls the last 10% of disc closure in the range of 2-5 seconds to prevent check valve slam in the most demanding applications.

12 inch Valve Energy Costs			
TYPE OF VALVE	ΔK	H	40-Yr Energy Cost*
Swing Check & Weight	1.0	0.56	\$2,931
Silent Check	3.0	1.68	\$8,794
Ball Check	0.80	0.45	\$2,355
Dual Disc	1.1	0.64	\$3,350
Resilient Hinge	0.80	0.45	\$2,356
Tilted Disc	0.63	0.35	\$1,832

*Assumes 50% usage, \$0.06/kw-hr, 6 ft/sec velocity

Decide which valve fits the needs of the project by using these memorable comparisons and test drive one of these check valves today! The American valve industry has made amazing innovations over the years, and like the auto industry, continues to develop new technology to fit any imaginable application.

Jeep® is a registered trademark of Chrysler LLC.

About the Author

John V. Ballun, P.E. is Vice-President of Engineering at Val-Matic Valve & Mfg. Corp., 905 Riverside Dr., Elmhurst, IL 60126. He has a BSE degree from the Illinois Institute of Technology in Chicago and an MBA degree from Northern Illinois University in DeKalb. He has over 25 years of experience working with water system valves and valve standards.