



MODEL SDX

SINGLE DISC EXTERNAL SPRING CHECK VALVE

APPLICATION AND OPERATION

The Champion Valves, Inc. ("CVI") SDX Check valve is a self-operating check valve designed to prevent the backflow of gas or liquid media. Initial opening of the valve's discs begins when the upstream pressure exceeds the downstream pressure and the effective torque of the spring. This pressure is called the "cracking" pressure. Once the SDX disc opens, flow velocity determines the position and stability of the disc.

If the flow velocity upstream of the valve decreases and/or stops, the spring forces the disc to a closed position. Ideally, the disc will be fully closed just prior to flow reversal, thus alleviating the potential for water hammer.

LIMITATIONS AND PRECAUTIONS

SDX check valves are not recommended for the following service conditions.

- Pulsating flows
- Installation directly to a butterfly valve or other piping accessory that may interfere with the opening or closing of the SDX disc
- Vertical Flow **DOWN** without prior Factory Approval

The following precautions should be taken to insure long service life of SDX Check valves.

- Accurate sizing of single disc check valves is crucial to ensure an acceptable pressure drop and a long service life.
- Flow velocities should be in the following ranges:

MEDIA	FLOW RATE
Liquid	3 to 11 feet/second
	.91 to 3.35 m/second
Gas	20 to 250 feet/second
	6.1 to 76.2 m/second



- A minimum of 5 (five) pipe diameters should be maintained between the valve and likely causes of turbulence (i.e. pump discharge, reducers, elbows, and tees, etc.).

UNPACKING AND INSPECTION

It is important to follow these instructions when unpacking and preparing to use this product:

Preparation for Shipment:

Product packaging and conservation for shipment must be sufficient to protect against deterioration and physical damage during shipment. CVI valves are normally shipped from the factory in boxes, crates or on skids. Protruding parts, such as the levers, weights and spring assemblies are sometimes removed from the valves and either attached to the box or crate or packaged separately. Special shipping conditions or packaging requirements must be defined in the Customer's Order and shall be appropriate to ensure safe transportation and conservation before installation.

Inspection of Packaged Product:

Inspect the product packaging for damage while the freight carrier is present. Any observed packaging damage should be reported to the carrier and a claim created.

Carefully open the shipping container, leaving it intact. Follow any instructions marked on the container. Carefully remove any packing material and lift the product from the container. The shipping container and packing material may be kept and reused for product storage or shipment.

Visually inspect the product for signs of possible damage, including missing, broken or loose parts, scratches, or other forms of damage that may have occurred during shipment. Items that are damaged during shipment are the responsibility of the purchaser. If damage is observed, file a claim with the freight carrier immediately. Refer to CVI Terms and Conditions for Sale for our full warranty policy.

Storage:

For short term storage, up to 3 months, keep the product indoors in in the original packaging in a temperature not below 32°F or exceeding 85°F. General guidelines for short and long term storage:

- Do not expose the valve to direct sunlight.
- Do not expose the valve to weather conditions.
- Do not expose the valve to temperature extremes.
- Do not stack the valves on top of each other.
- Keep endcaps on when applicable, and protect the valve against dust, dirt and damage.

For long term storage, the valve should be kept in a clean, heated, weather tight (dry), well-ventilated, fire-resistant storage facility with flooring that seals against dust and dirt and will not be subject to flooding.

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The valve should be securely held in place by banding or other means of support to prevent accidental damage due to movement of the valve.

For outdoor storage, special crating and valve preparation can be provided, at an additional charge, based upon specific requirements for each situation. Periodical checks at least every 6 months have to be carried out in the storage area to verify that the above mentioned conditions are maintained.

Handling:

Most valves are supplied with a removable lifting eye. Always lift the valve using this device, as damage to the valve body or threads (if applicable) could occur from improper lifting. Alignment and final installation should be done while the valve is being supported by the lifting eye.

The valve should never be used as an alignment point in the pipeline. Be sure the pipeline flanges on both sides of the valve are aligned with the proper spacing before the valve is installed into the system.

Never lift or move the valve assembly by using the body rim, external springs or levers (if supplied), valve disc or mounting holes.

Transport, unpack and store being careful not to scratch the surfaces of flanges or gaskets. Also, take steps that will prevent any foreign matter from getting into the valves. Wooden plate or plastic caps should not be removed until the valves are installed.

The transportation of all packed material must be carried out safely and following the local safety regulations.

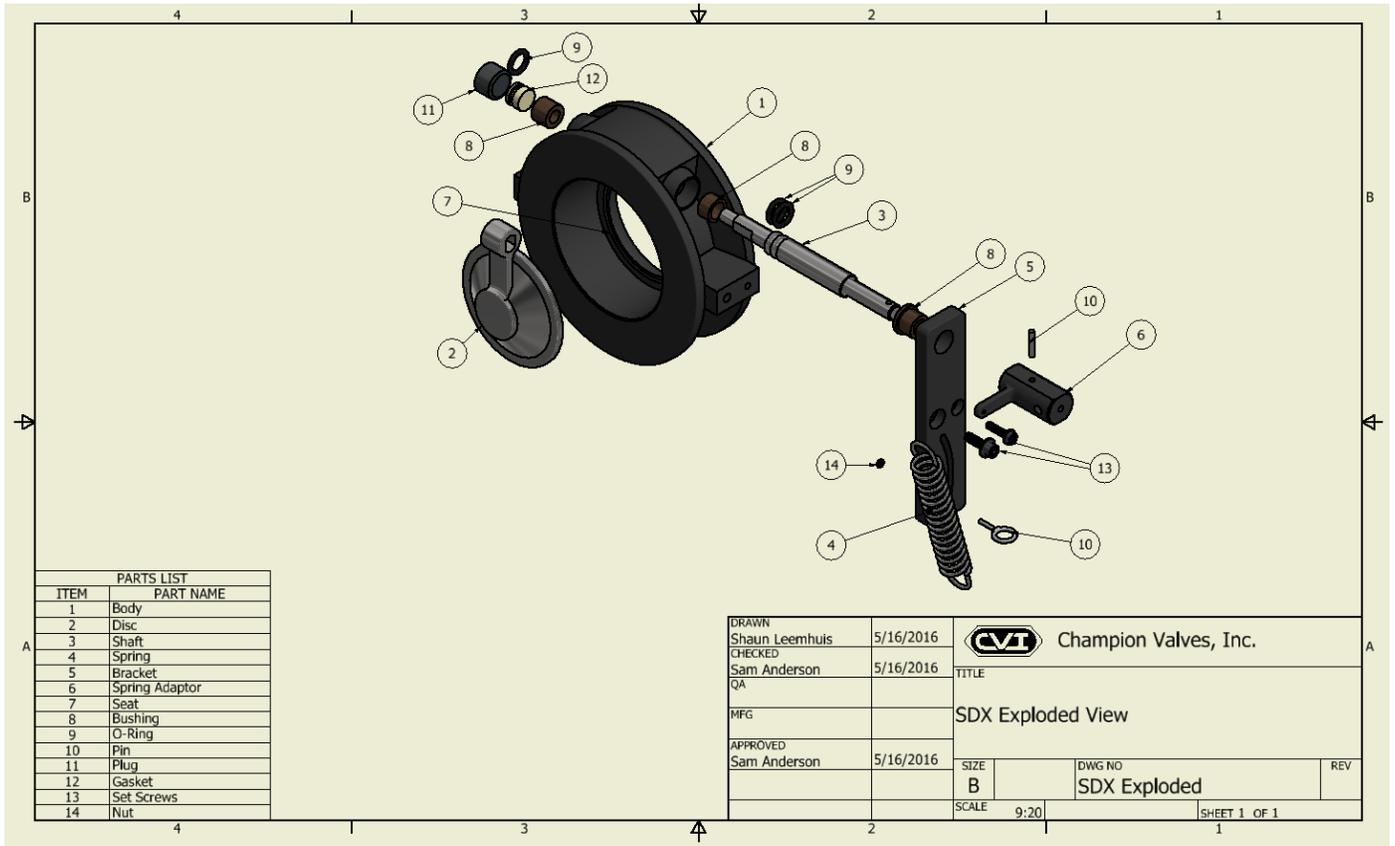
INSTALLATION

1. Remove the valve from carton or packing skid.
2. The protective rust proof coating on the internal parts of steel or cast iron valves should be removed by brushing out with any standard petroleum solvent (Varsol, Kerosene) and air dried. Insure internal parts operate freely.
3. Stainless Steel or Bronze valves need only to be wiped clean and installed.
4. In horizontal flow installation, the hinge shaft must be horizontal.
5. Insert the valve between two companion flanges of the same series as the valve and place gaskets on flange faces. The arrow on the valve or name plate indicating direction of flow should coincide with line flow. Install studs through companion flanges and tighten, using standard industry practice.
6. We recommend valve be installed at least five (5) pipe diameters downstream from a pump discharge and/or other pipe fittings for maximum service life.



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ASSEMBLY AND DISASSEMBLY



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NOTE: EYE PROTECTION IS RECOMMENDED WHEN DISASSEMBLING AND ASSEMBLING CHAMPION CHECK VALVES.

DISASSEMBLY

Disassembly and assembly of the SDX Check valve is moderately simple using a hammer, allen-wrench, bronze round nose punch and Loctite thread sealant and the following instructions:

Please use caution when removing/installing the external spring. Preset spring(s) may cause serious injury when tension is released.

1. Lay the body down with downstream side facing upward.
2. Using an allen-wrench, remove the plug on the opposite side of the body from the spring.
3. Remove set screws on the spring side of the valve holding the bracket to the valve body.
4. Carefully detach the spring from the spring adaptor and eye bolt by first removing loop through eye bolt and then by removing spring from spring adaptor arm. Spring may have tension so be careful in this step. Removing a loaded spring can cause serious injuries if done without caution.
5. Using a hammer, gently knock the pin out of the spring adaptor using a small punch and slide the spring adaptor off of the shaft.
6. Remove the bracket from the valve body. It should be easily pulled off but a hammer can be used to gently tap it off if it becomes stuck.
7. Using a hammer, gently tap out the shaft from the side opposite of the spring. This will allow the shaft with the o-rings installed to slide out and if done correctly shouldn't cause additional damage to any internal components.
8. After the shaft is removed, the disc and bushings can be lifted out of the valve from the outlet side and the valve should be completely disassembled.

ASSEMBLY

1. First lay the body down with downstream side facing upward.
2. Ensure that the seat is installed correctly in the body of the valve. Champion does not recommend performing a seat change, contact Champion if any concerns arise about the seat's viability before reassembling the valve.
3. Place the disc down inside the body with the flat face resting against the seat, about where it will be installed to have it ready for the shaft to be assembled.
4. Place new o-rings onto the shaft in the correct position, indicated in the assembly drawing above.
5. Insert the shaft from the spring side of the valve stopping when the shaft starts to protrude into the center of the valve where the disc is sitting.
6. Place the first bushing over the shaft on the spring side of the disc and then proceed to push shaft through the bore of the disc, stopping once it protrudes past the disc bore.

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7. Place second bushing on opposite side of the disc as the first and push shaft through this bushing and all the way through the remainder of the body of the valve.
8. Place new o-ring around gasket.
9. Position gasket up against the end of the shaft on the side opposite of the spring.
10. Wrap Teflon tape around the threads of the plug and install using an allen-wrench until the plug is sufficiently tight.
11. Place flanged bushing over the spring-side of the shaft.
12. Install the bracket by placing the bore of the bracket over the shaft and bushing. If this proves to be difficult, it may be necessary to first install the flanged bushing into the bore of the bracket before sliding the bracket over the shaft.
13. Insert set screws into bracket and screw them into the body of the valve using the appropriate allen-wrench.
14. Install eye bolt (part #10 in above drawing) into bracket and attach nut onto opposite side, as shown above. The position of this may need to be altered later to change the valve's cracking pressure. Make sure that this is installed very tight so that the spring doesn't cause the bolt to move (if using the slotted bracket design).
15. Place spring adaptor over the shaft on the spring side of the valve so that the spring adaptor arm extends in the down flow direction.
16. Line up the hole through the shaft with the hole through the spring adaptor, making sure that the arm on the spring adaptor is pointing in the downstream direction. Place pin into the hole on the spring adaptor, and gently hammer down into position until flush with the spring adaptor.
17. Carefully install spring by looping one of the looped ends through the eye bolt at the bottom of the bracket and then stretching the spring to loop the top loop through the arm of the spring adapter. If this is too difficult, try loosening the eye bolt and repositioning to make the spring length shorter. Be careful with the spring when it is loaded as releasing a loaded spring can cause serious injuries. Make sure that the eye bolt and nut are tightened sufficiently.
18. Once the spring is installed, sit the valve upright and test the cracking pressure of the valve by pushing against the disc in the downstream direction.
19. If the valve opens too easily, the spring needs to be stiffened. This can be done by detaching the spring, and detaching the eye bolt and moving it downwards away from the spring adapter. Re-tighten the eye bolt into place, and then reinstall the spring. Again be careful when installing the spring as releasing a loaded spring can cause serious injuries.
20. If the valve is too hard to open, and it is clear that it is due to the spring being too stiff, the spring needs to be loosened. This can be done by detaching the spring, and detaching the eye bolt and moving it upwards towards the spring adaptor. Re-tighten the eye bolt into place, and then reinstall the spring. Again be careful when installing the spring as releasing a loaded spring can cause serious injuries.



21. If there are any problems with the valve upon reassembly, or if difficulties arise in assembling with the proper spring torque, please contact Champion immediately and do not install a faulty valve into any application.

NOTE: EYE PROTECTION IS RECOMMENDED WHEN DISASSEMBLING AND ASSEMBLING CHAMPION CHECK VALVES.

Installation of Replacement Spring

1. Carefully detach the spring from the spring adaptor and eye bolt. Spring may have tension so be careful in this step. Removing a loaded spring can cause serious injuries if done without caution.
2. Install new or replacement spring by carefully looping one of the looped ends through the eye bolt at the bottom of the bracket and then stretching the spring to loop the top loop through the arm of the spring adapter. If this is too difficult, try loosening the eye bolt and repositioning to make the spring length shorter. Be careful with the spring when it is loaded as releasing a loaded spring can cause serious injuries.
3. Once the spring is installed, sit the valve upright and test the cracking pressure of the valve by pushing against the disc in the downstream direct.
4. If the valve opens too easily, the spring needs to be stiffened. This can be done by detaching the spring, and detaching the eye bolt and moving it downwards away from the spring adapter. Re-tighten the eye bolt into place, and then reinstall the spring. Again be careful when installing the spring as releasing a loaded spring can cause serious injuries.
5. If the valve is too hard to open, and it is clear that it is because the spring is too stiff, the spring needs to be loosened. This can be done by detaching the spring, and detaching the eye bolt and moving it upwards towards the spring adaptor. Re-tighten the eye bolt into place, and then reinstall the spring. Again be careful when installing the spring as releasing a loaded spring can cause serious injuries.
6. If there are any problems with the valve upon reassembly, or if difficulties arise in assembling with the proper spring torque, please contact Champion immediately and do not install a faulty valve into any application

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