

# the Repair Guys

*In our line of work, we field questions from contractors and technicians concerning repairs, installations, and general backflow prevention practices. We'd like to share some questions we receive and our answers. Everyone has different opinions on these subjects and we would like to hear yours. Contact us with your questions and ideas via email at: [imark@backflowparts.com](mailto:imark@backflowparts.com) or mail us at American Backflow Products Co., P.O. Box 37025, Tallahassee, FL 32315.*

## QUESTION —

I have a few failures from time to time due to worn check valve discs. I know this is common, but instead of failing the device only to have to come back later with a new rubber kit, I flip the disc over and move on to the next unit. I feel that this will save the customer money and another service call. How much life should I expect to get from a check valve disc? Is turning the disc over a common practice?

## MARK -

Well first, I think you should be applauded for looking out for the customers' best interests, especially when it comes to their wallet. I believe that is our responsibility, as backflow technicians, to make repairs as cost effective as possible. It is also the responsibility of the technician to repair an assembly back to the original manufacturers specifications. Sometimes there is a fine line between being cost effective and repairing an assembly correctly. This basically means it is up to the technician to make that decision as he sees fit for each situation. Flipping a check valve disc over and reusing it permanently is one of those things that you should look at carefully as you make this type of repair. The best thing to do in this situation is refer to the manufacturers specifications or maintenance manual for that assembly.



*Some discs may not easily 'flip.'*



*Note uneven grooves or wear patterns.*

- JASON

Most manufacturers consider flipping or inverting a check valve disc only as a temporary fix, not as a repair. The condition of the check valve disc is very important. If the disc is in relatively good condition it can be inverted with no problem. If the disc has a deep indentation on one side and looks fine on the other side, it will need to be replaced. A lot of times flipping a disc will get you out of a tight spot in the field, but you should return as soon as possible to replace with a new parts. Now, you will have a few cases where a new device has some trash lodged in the check valve, and after cleaning the device some chose to invert the new disc out of good practice to ensure that we're beginning again with a new surface. However, this should only be done when you are dealing with a new device or the check valve disc is in relatively in good condition.

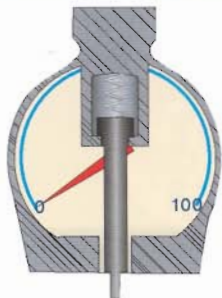
## MARK -

The thing that can be deceiving is that the check valve disc can be distorted or damaged on one side and looks so nice and smooth on the other. One thing to remember is that check valve discs are designed as a whole, not by each side. If one side is damaged then the disc may not have the size or durometer that it originally was designed to have. This can change surface of the disc and how it sets down on the seat. Even the nice smooth side of a damaged check disc will eventually weaken and affect how the check valve holds.

- JASON

The life expectancy for a check valve disc is hard to judge. How a disc wears is dependent on many different factors. The type of water running through the unit can have an affect, and the amount of water running through the unit. Water that is relatively free of debris will obviously increase the life of the check valve disc. The amount of backpressure the assembly is subject to can affect the check valve disc also. Sometimes you may find a second check valve disc wears more than the first in a particular assembly. This is due to excessive backpressure against the second check valve. Under the best conditions a check valve disc can give many years of good service. In the real world we know that the best conditions are rarely available, so try to be ready for anything.

## WHAT IS A DUROMETER AND HOW DOES IT WORK?



The operation of a durometer is based on the penetration of an 'indenter' into the material being tested under specific conditions.

The material is generally termed 'rubber or rubber-like.' Specifically, the American Society of Testing and Materials standard ASTM D2240 durometer hardness testing is restricted to thermoplastic elastomers, vulcanized (thermoset) rubber, elastomeric materials, cellular materials, and some plastics as defined by the ASTM committee on terminology.

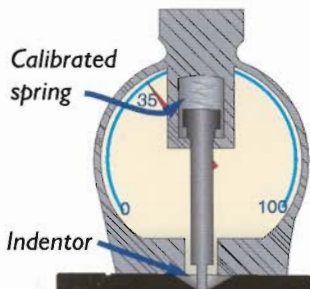
The 'indenter' has a specific geometry and resistance to movement. The resistance to movement of the indenter is accomplished through a calibrated spring.

The conditions are defined in ASTM D2240. In general terms, it outlines the preparation and configuration of the test specimen as well as the details of performing the durometer hardness test.

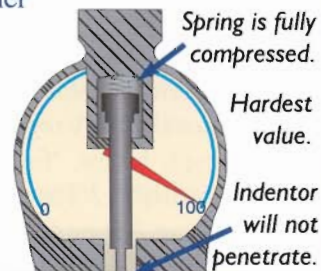
The ASTM D2240 standard may be found in Volume 09.01 of the American Society for Testing and Materials *Annual Book of ASTM Standards*.

The *movement* of the indenter is related to the durometer hardness of the material. For example, the more the indenter moves the higher the indicated durometer value of the material.

The *penetration* of the indenter into the test specimen is inversely proportional to the durometer hardness value of the test specimen. For example, the more indenter penetration into the test specimen (check valve disc), the lower the durometer hardness value.



Check Valve Disc Material



Hardest rubber or rubber-like material will have a rating of 100.



The Foundation for Cross-Connection Control and Hydraulic Research's *Manual of Cross-Connection Control* specifies that check valve discs have a durometer rating between 35 and 45, relief valve discs have a rating between 55 and 65, and air-inlet discs will have a rating between 65 and 75.

dw&bp



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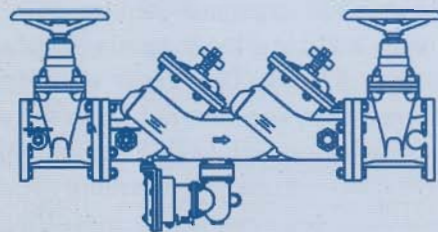
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