

# CROSSTALK

Spring 2017

Ensuring backflow prevention assemblies continue to provide adequate protection may require repair from time to time. But, assemblies found on the *USC List of Approved Backflow Prevention Assemblies* must meet certain requirements to remain USC approved.

ated as provided by the manufacturer with original parts, the Foundation cannot validate the effectiveness of the product with non-OEM parts. So, when assemblies that appear on the USC List need repair, they must be repaired with original replacement parts produced by the manufacturer. Using non-OEM parts to repair USC approved assemblies invalidates the approval.

## REPAIRING



## USC APPROVED ASSEMBLIES

With the availability of non-original equipment manufacturer (non-OEM) replacement parts and recent requirements for lead-free parts it is important to understand what steps need to be taken to ensure assemblies, after a repair, maintain USC approval.

All assemblies on the USC List go through a thorough laboratory and field evaluation. After an assembly successfully completes both phases of the approval program it is placed on the USC List. Since the assemblies are evalu-

ated as provided by the manufacturer with original parts, the Foundation cannot validate the effectiveness of the product with non-OEM parts. So, when assemblies that appear on the USC List need repair, they must be repaired with original replacement parts produced by the manufacturer. Using non-OEM parts to repair USC approved assemblies invalidates the approval.

If repair technicians have suspicions about a replacement part they may try to compare the damaged part with the new part. If comparing

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# New Members

Below is a list of those who have become members of the USC Foundation since the last *Cross Talk*.

**Bayfront Plumbing Inc.**

Brown and Caldwell

**Coal Creek Utility District**

Dan Maloy

**Matt Buckman**

McPhee Plumbing and Heating

**Minuteman Plumbing**

Olague Plumbing Services

**Old Guard Inc.**

Philip Clements

**ProActive Water Solutions Inc.**

Raleigh Backflow Services

**Roto-Rooter (Rancho Cucamonga)**

Susan Clough

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# USC Foundation Membership Benefits



John McKay Center

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## Additional Benefits



*Cross Talk* quarterly subscription



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Free copy of each new edition of the  
*Manual of Cross-Connection Control*



2017 *USC List of Approved Backflow Prevention Assemblies* book (At member's request)



Email notifications of new updates to the  
*USC List of Approved Backflow Prevention Assemblies*



*Special Notices* mailed exclusively to members  
as published

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# READINGS FOR A PASSING RELIEF VALVE

Backflow prevention assembly testers use the field test procedures from the *Manual of Cross-Connection Control, Tenth Edition* daily. The field test was developed as a means to ensure that backflow prevention assemblies are functioning properly. In most cases the step-by-step instructions found in the field test are self-explanatory. But, there are cases where more explanation is needed to understand the requirements better. One such case involves the reading for the relief valve of a Reduced Pressure Principle Assembly (RP) during the field test.

The RP's field test begins with finding the relief valve opening point. The Tenth Edition States:

*The differential pressure relief valve must operate to maintain the zone between the two check valves at least 2 psi less than the supply pressure.*

Some testers have found this wording confusing. A tester may be looking for a minimum reading requirement but instead finds the statement above which does not clearly state a minimum requirement for the relief valve opening point.

To clarify, the tester needs to understand that the field test kit, when testing the RP, is always reading the difference between the supply pressure (the pressure at the No. 2 test cock) and the pressure present between the two check valves (pressure at the No. 3 test cock). So, with the high side hose of the field test kit attached to the No. 2 test cock and the low side attached to the No. 3 test cock, the field test kit is always reading the difference in pressure between "the supply pressure" and the pressure in "the zone between the two check valves." The requirement for the field test is that this reading on the field test kit must be at 2.0 psid or greater when the relief valve discharges. When the relief valve discharges, it drops the pressure in "the zone between the

two check valves," maintaining "the zone between the two check valves at least 2 psi less than the supply line."

In other words, *the reading on the field test kit must be 2.0 psid or greater when the relief valve opens.*

While the statement in the Manual describing the requirement for the relief valve opening point is technically correct it can be confusing. For better comprehension, instructors may just train students to require a minimum of 2.0 psid for the relief valve opening point for a passing field test, which is correct. But, understanding the

concept of what is occurring inside the assembly can aid a tester with future troubleshooting. ■



# DOES A **FAILED ASSEMBLY** SUGGEST THAT BACKFLOW OCCURED?

When backflow prevention assemblies are described as having “failed” or “have failure rates of such and such,” it may be misunderstood. The general public may understand such statements to mean that backflow can or has occurred, which is not accurate and may create misconceptions. So, it is important to clarify what these types of statements mean when discussing assemblies.

While some in the industry may understand the statements to mean that the assemblies did not meet the minimum accepted values needed to pass the field test; the general public does not. Assemblies that fail the field test can still be protecting against backflow. But, anyone who hears the words “the assembly failed” immediately interprets that to mean that the assembly is no longer protecting against backflow.

For example, when a double check valve backflow prevention assembly (DC) gives the results of 2.4 psid for the first check and 0.8 psid for the second check, the assembly fails the field test, but it cannot be said that the assembly leaks or fails to prevent backflow. Since the reading for the check valve is greater than 0.0 psid the check valve is still protecting against backflow. The check valve may only leak when the value is 0.0 psid. To pass the field test the minimum acceptable values for a DC are 1.0 psid for each of the check valves.

So, the readings of 2.4 psid and 0.8 psid indicate that the first check is holding at an acceptable value and the second check (while not holding a value of 1.0 psi or higher) is not leaking but holding at a low value. The assembly would not pass the field test, however,

since each check valve is required to hold at 1.0 psid or greater.

In this case when one states, “the assembly failed,” it would mean the check valves failed to hold at the values required to pass the field test, or the assembly failed the field test. To



say, “the assembly failed to prevent backflow,” would be incorrect. The assembly is still preventing backflow. In fact, each of the check valves is preventing backflow even though the assembly failed the field test. It would not be appropriate to state that the assembly failed to hold (or leaked) because each of the check

valves did hold, even though they did not hold at the required value of 1.0 psid or greater.

When field test results are compiled in a specific region or in a specific jurisdiction, it is important to report the final results accurately.

As an example, 100 reduced pressure principle assemblies (RPs) are tested.

# of Assemblies	Reason for failure
10	1st check valve holds < 5.0 psid
3	2nd check valve leaks
2	Relief valve < 2.0 psid

### 15 Assemblies Failed = 15% Failure Rate

One could state that there is a failure rate of fifteen percent. This is accurate; however, it is important to understand that this means fifteen percent of the RPs failed the field test.

None of the backflow preventers, in this example, would allow backflow to occur.

For a DC: only in the situation where both check valves leaked, with a reading of 0.0 psid each, could it be said that the assembly is failing to the point of allowing backflow to occur. Even this doesn't mean backflow is occurring. The hydraulics (backsiphonage or backpressure) needed to create backflow would also

need to be present. One should not jump to the conclusion that backflow is occurring or could occur when one hears of backflow preventers failing.

For the reduced pressure principle assembly, both check valves would need to be leaking



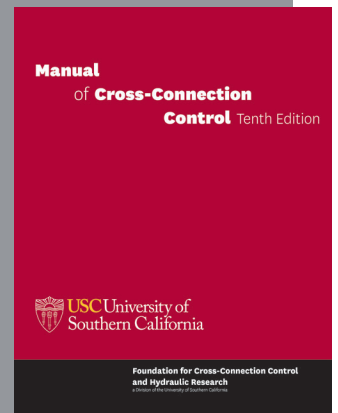
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# TENTH EDITION PRICE CHANGE

With the continued success of the *Manual of Cross-Connection Control, Tenth Edition* the USC Foundation will soon be receiving shipments of the fourth printing of the book. With an array of information like explanation of hydraulics, elements for a cross-connection control program and the field test procedures for backflow prevention assemblies; the Tenth Edition remains an essential tool for anyone involved in backflow prevention and cross-connection control.

With the fourth printing of the manual the Foundation has found it necessary to implement a small increase in the price of the book. Soon, the price of the Manual will be \$90 for members. For those who are not members the price of the Manual will be \$125.

The Foundation will post a document on its website detailing the minor typographical errors that were corrected in the fourth printing. You may view the document by visiting the Foundation's "Frequently Requested Documents" section of its website ([fcccr.usc.edu/frd](http://fcccr.usc.edu/frd)). The Foundation is dedicated to increasing the value of its membership program and will continue to provide substantial discounts for the Manual. ■



# MINIMUM CLEARANCE RECOMMENDATION

Installing backflow prevention assemblies can be challenging. Factors like accessibility and space availability can limit where assemblies can

be installed. In many cases the space allotted may be tight and difficult for field testing and maintenance of the assemblies. But, allowing adequate clearance ensures assemblies are accessible by testers and, in turn, are functioning properly.

The *Manual of Cross-Connection Control, Tenth Edition* recommends that all assemblies be installed at least 12-inches above grade from the lowest portion of the assembly. The Foundation's minimum clearance recommendation is meant to provide accessibility for field testing and maintenance of the assemblies. In some cases, assemblies that are installed less than 12-inches above grade become nearly impossible to field test or repair.

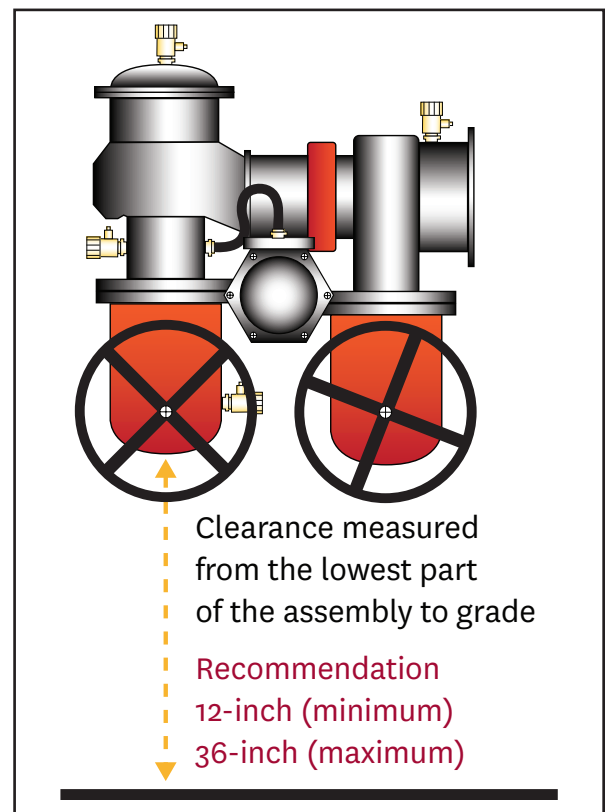
In chapter 8, where the clearance recommendation is mentioned, all the illustrations depict assemblies installed horizontally and measuring their clearance from the bottom of the assemblies.

For example, a Reduced Pressure Principle Assembly's (RP) lowest portion, when installed horizontally is usually the relief valve; since the relief valve is typically located at the bottom of the assembly. So, an RP installed horizontally is measured from the bottom of the relief valve. But, with alternate orientations of assemblies the relief valve, in the case of an RP, may not necessarily be at the assembly's lowest point.

With more assemblies on the *USC List of Approved Backflow Prevention Assemblies* approved to be installed in different orientations like vertical up (VU) or vertical up inlet, vertical down outlet (VUVD); the lowest point of the assembly changes. And, in many cases, the shutoff valves become the lowest point of the assembly.

In the case of an RP installed in the VUVD orientation the bottom of the shutoff valves may be the bottom of the assembly. So, the clearance recommendation is measured from lowest part of the shutoff valves to the grade instead of the relief valve. If the distance was measured from the relief valve to the grade for a VUVD assembly that assembly may have its shutoff valves below grade.

The minimum clearance recommendation is meant to always keep the assemblies fully accessible for field testing and maintenance. But, installations may not be able to meet the recommendation based on accessibility or space and may be granted a minor variance from the local administrative authorities. Remember, all installations of backflow prevention assemblies must follow state and local requirements. Contact the local administrative authority for detailed requirements. ■



RP installed in VUVD orientation

## repairing usc approved assemblies: continued

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the damaged and new part does not help, a call to the manufacturer to validate the replacement product may be necessary.

With recent requirements at the federal and state level requiring lead-free parts be used on systems delivering potable water for human consumption, the Foundation worked with manufacturers to provide lead-free replacement parts that would meet the requirements and still maintain USC approval even though the lead-free replacement parts were not originally approved with the assembly.

For six years, the Foundation worked with willing manufacturers to ease any transition from leaded to lead-free parts. In that time frame the Foundation evaluated existing USC approved assemblies with new lead-free parts to ensure the assembly continued to meet Foundation standards as well as lead-free requirements.

So, when USC approved assemblies need to be repaired, but are required by the administrative authority to use lead-free parts, the Foundation provides a set of documents for various backflow prevention assemblies detailing the lead-free repair/replacement parts available for leaded assemblies which maintain the assemblies' USC approval. Foundation members may find the documents by visiting the Foundation's website at [fccchr.usc.edu/leadfree](http://fccchr.usc.edu/leadfree).

Always use original replacement parts from the manufacturer to make certain an assembly maintains USC approval after a repair. And, in those instances where lead-free spare parts are required please reference the documents provided by the Foundation for existing USC approved leaded assemblies. In any case, contact the local administrative authorities first before beginning a repair. Depending upon local requirements, repair technicians may be allowed to maintain backflow prevention assemblies with either Foundation approved leaded and/or lead-free replacement parts. ■

## does a failed assembly suggest backflow occurred: continued

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Additionally, the differential pressure relief valve would need to be stuck in the closed position AND backflow would need to be occurring at the backflow preventer.

In most cases when a backflow prevention assembly "fails;" the assembly is only failing the annual field test. It is not failing to hold. It is not failing to prevent backflow. This terminology becomes especially important when discussing backflow prevention with those that don't understand the field test. By those not involved in backflow prevention, the term, "the assembly failed," could be taken to mean that the assembly failed to do its job and prevent backflow. In other words, there was a failure to the point of backflow occurring. There

have been news reports when a backflow incident occurred in which a backflow prevention assembly tester stated that about twenty percent of the assemblies in their area fail each year. In the context of the report, it seemed that every year twenty percent of backflow preventers fail to the point of allowing backflow to occur. This was probably not the case. An estimated twenty percent of the backflow preventers this tester tested failed to pass the field test during the annual test.

Terminology is important when discussing field test results. One needs to differentiate between failing a field test and failing to prevent backflow. This is especially pertinent when discussing failure rates of backflow preventers. ■

# Upcoming **Training** Courses

all courses in Los Angeles, CA unless noted

## Tester

10-14 July 2017

16-20 October 2017

## Specialist

24-28 July 2017

30 Oct. - 3 Nov. 2017

## Webinars

10 August 2017

Irrigation Systems and Winterizing

14 November 2017

Cross-Connection Control Surveys

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## Upcoming **Events**

**33rd Annual  
Tri-State Seminar**  
Las Vegas, NV  
26-28 September 2017

**CA-NV Section AWWA  
Fall Conference**  
Reno, NV  
23-26 October 2017

**Nebraska Section AWWA**  
Kearney, NE  
7-8 November 2017

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