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APPENDIX D-9 VALVES

- WILKINS Model 550 AND 575
- SHARPE Series 40276

FORM B646

WILKINS

MODEL 575

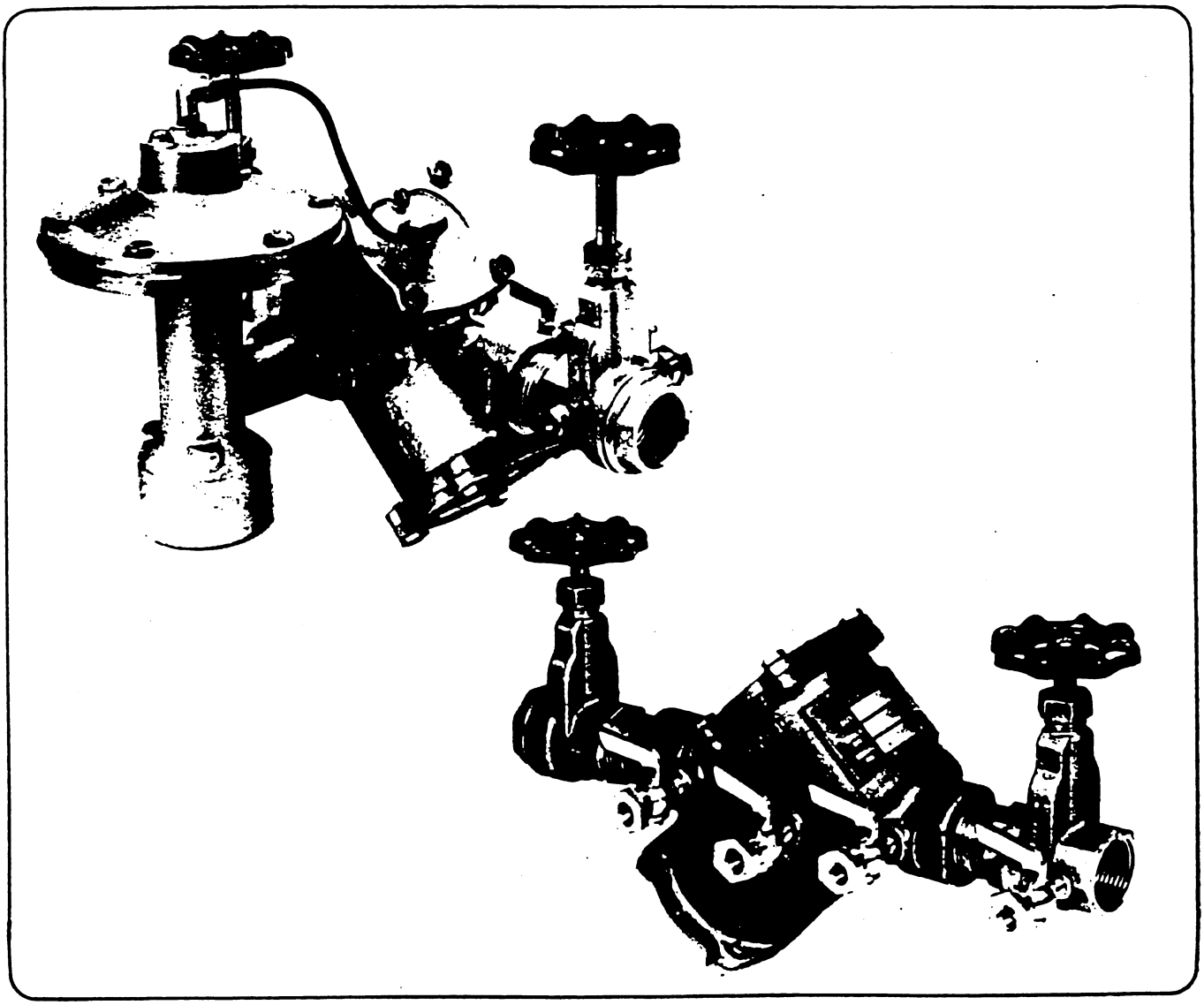
REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER

MODEL 550

DOUBLE CHECK VALVE ASSEMBLY

Sizes ¾" — 2"

INSTALLATION • TESTING • MAINTENANCE



BASIC INSTALLATION INSTRUCTIONS

CAUTION:

Installation of Backflow Preventers must be performed by qualified licensed personnel. Faulty installation could result in an improperly functioning device.

The installer, to be sure he has the up-to-date information, should read all Installation Instructions before attempting to install the device.

The installer should be sure the proper device has been selected for the particular installation.

WILKINS Model 575 Reduced Pressure Principle Backflow Preventers are for use on potable water lines where a health hazard could exist if a backflow or backsiphonage situation were to occur.

WILKINS Model 550 Double Check valve assemblies are for use on a potable water line where a health hazard does not exist in event of a backflow situation.

Proper performance is dependent upon following these Installation Instructions, and prevailing governmental and industry standards and codes. Failure to do so, according to the WILKINS Certificate of Limited Warranty, "releases WILKINS of any liability that it might otherwise have with respect to that device." Such failure could also result in an improperly functioning device.

Damage to the device could result wherever water hammer and/or water thermal expansion could cause excessive line pressure. Where this could occur, shock arrestors and/or pressure relief valves should be installed downstream of the device.

1. Before installing either a Model 575 Backflow Preventer or a Model 550 Double Check valve unit, flush the lines thoroughly to remove all debris, chips, and other foreign matter.
2. The Model 575 Backflow Preventer must be installed in a horizontal position (Fig. 1) to provide proper operation of the relief valve.

   The Model 550 Double Check unit is not position sensitive. It can be installed in positions other than horizontal.

   The cast arrow on the side of the unit must point in the direction of water flow (Fig. 1).
3. Provide adequate space around the installed unit so that the test cocks will be accessible for testing, servicing, and repair (Fig. 2).

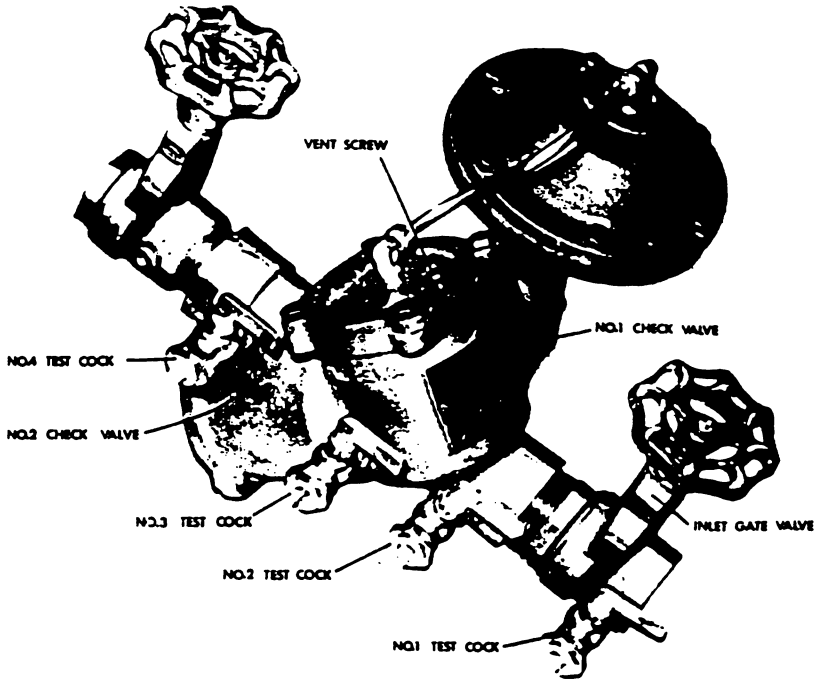


FIGURE 1. NOMENCLATURE

4. If installation of a Model 575 unit is in a building, provide a suitable drain arrangement to drain off spillage from the relief valve. An air gap of at least two times the pipe diameter must be provided between the relief valve and the drain piping to prevent a cross-connection (Fig. 2). Do not pipe the relief valve solidly to a floor drain, sewer or sump.
5. Always consult local codes for installation methods, approvals, and guidance.

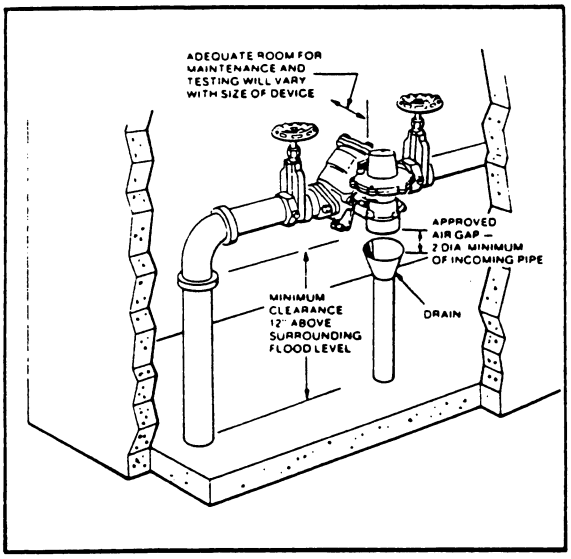


FIGURE 2. TYPICAL INSTALLATION IN BUILDING

OUTDOOR INSTALLATION

Model 575 Backflow Preventers and Model 550 Double Check valve units may be installed outdoors only if the device is protected against any freezing conditions.

Exposure to freezing conditions will result in improper functioning of the device. The installation location must be kept above 32° F. All the basic installation instructions apply.

If installation is above ground, install the unit at least 12 inches above surrounding flood level (Fig. 3).

If installation is in a pit or vault, observe the following additional precautions:

1. The installed backflow preventer must never be submerged in water because this could cause a cross-connection. Make sure that the pit or vault always remains dry by providing ample drainage.
2. If there is any possibility of freezing, protect the backflow preventer by providing heat or insulation sufficient to prevent unit from freezing.
3. Allow enough space in the pit or vault for testing and repair of the backflow preventer.

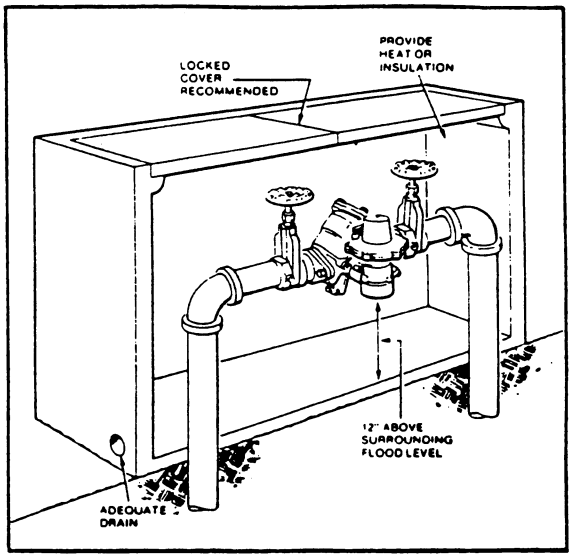


FIGURE 3. ABOVE GROUND OUTDOOR INSTALLATION

INDOOR INSTALLATION

Indoor installation is preferred in areas that are subject to freezing conditions. All the basic installation instructions apply to such installations.

PARALLEL INSTALLATION

Where uninterrupted service from a single meter connection must be maintained, two or more Model 575 Reduced Pressure Principle Backflow Preventers or Model 550 Double Check Valve assemblies may be connected in parallel (Fig. 4). Parallel installation permits testing of backflow preventers individually without interrupting service. When two backflow preventers are used in parallel, the total capacity of the device must equal or exceed the capacity of the main line. All the basic installation instructions apply to a parallel installation.

When paralleling devices, adequate room (6" or more) must be provided between units to allow for testing and repair.

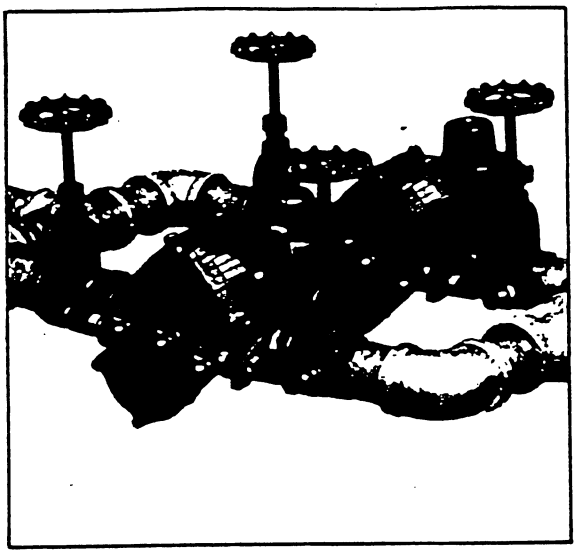


FIGURE 4. TYPICAL PARALLEL INSTALLATION

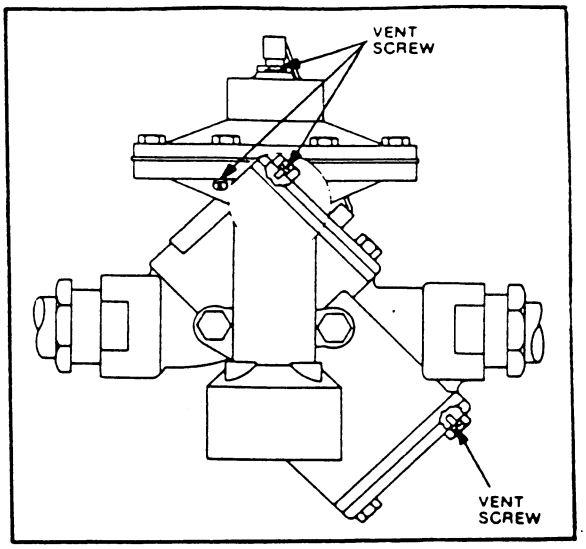


FIGURE 5. VENTING CHECK AND RELIEF VALVES

PLACING THE DEVICE IN SERVICE

After the installation of a Model 575 or Model 550 unit has been completed, place the unit in service as follows:

MODEL 575 REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTERS

1. Start with both gate valves closed. Slowly open the inlet gate valve until the backflow preventer is completely pressurized (Fig. 1).
2. A sizable, short discharge from the relief valve may occur while the device is pressurizing. The discharge should cease by the time the gate valve is fully open.

   If the discharge should continue, close the gate valve. Loosen the vent screws (2) on the relief valve and reopen the gate valve. Close the vent screw when water flow is noted.
3. If the discharge still does not stop refer to "Maintenance Instructions" for Repair Procedures.
4. Repressurize device as in Step 1. Device should function properly.
5. After the device has been pressurized, vent all trapped air from both check valves and the relief valve by opening each of the four vent screws two full turns (Fig. 5). When liquid appears at all the vents, close the four vent screws. Do not remove the vent screws to bleed air.
6. Slowly open the discharge gate valve. The Model 575 Reduced Pressure Principle Backflow Preventer is now in service (Fig. 1).
7. If "spitting" or intermittent discharges from the relief valve are noted "spitting" (drainage) from the relief valve could be a result of pressure fluctuations and/or water hammer condition in the system. If such condition exists, install water pressure reducing valves or water hammer shock arrestors in compliance with industry standards as needed.
8. After the backflow preventer has been properly installed, test the device (see "Testing the Model 575 Device"). If the device fails the test, remove the first and second check valves and thoroughly flush the device. If the relief valve fails to operate properly, inspect the sensing line for clogging (also see maintenance instructions). Clean rubber seats of all debris and place the unit back in service.

MODEL 550 DOUBLE CHECK VALVE ASSEMBLIES

1. Start with both gate valves closed. Slowly open the inlet gate valve until the backflow preventer is completely pressurized (Fig. 1).
2. When the unit has been pressurized, vent any trapped air by loosening the vent screws in the valve covers two full turns (Do not remove screws) (Fig. 5). Close the screws when water appears at the vents.

3. Slowly open the discharge gate. The double check valve assembly is now in service.
4. After the device has been placed in service, test the device (see "Testing The Model 550 Device").

TEST PROCEDURE

NOTE: The following test procedures conform to the recommendations of the "Foundation for Cross-Connection Control of the University of Southern California."

The test procedure for the Model 575 Reduced Pressure Backflow Preventer is based on use of the Midwest Model 830 Test Kit.

The test procedure for the Model 550 Double Check Valve Assembly is based on use of the Midwest Model 890 Test Kit.

TESTING THE MODEL 575 DEVICE WITH RP TEST KIT

1. **PRELIMINARY STEPS** (Fig. 6)
   a. Connect the HIGH (red) hose of the test kit to the No. 2 test cock of the backflow preventer.
   b. Connect the LOW (green) hose of the test kit to the No. 3 test cock of the backflow preventer.
   c. Open test cock No. 2 and test cock No. 3 on the backflow preventer.
   d. Open the VENT valve of the gauge (black).
   e. Open the HIGH (red) valve and bleed to atmosphere until all air has been expelled. Then, close the HIGH valve.
   f. Open the LOW (green) valve and bleed to atmosphere until all air has been expelled. Then, close the LOW valve.
   g. Close the VENT valve.
   h. Close the No. 2 gate valve on the backflow preventer.
   i. Proceed with the No. 1 check valve test.
   j. Be sure there are no leaks. This will distort testing results.
2. **NUMBER 1 CHECK VALVE TEST**

   Purpose: To determine the static pressure drop across check valve #1.

   Requirement: The static pressure drop across check valve #1 shall be at least 3 psi greater than the opening pressure of the differential relief valve.

   The PSID (differential pressure) reading on the kit gage is the normal static pressure with no flow for the #1 check valve. This value should be recorded for record purposes. The reading should hold steady and not decrease.

   If the reading decreases and continues to do so, the valve is leaking. Refer to "Maintenance Procedure" for correction steps.
3. **RELIEF VALVE OPENING PRESSURE TEST**

   Purpose: To test operation of pressure differential relief valve.

   Requirements: The pressure differential relief valve must open before the "line to zone differential pressure" reaches 2 psi.

   a. Open the HIGH (red) valve on the test kit a number of turns.
   b. Open the LOW (green) valve very slightly until the gage pointer begins to drop. This establishes a bypass, line to zone.
   c. Hold the LOW (green) valve at this position. Observing the PSID gage, place one hand beneath the relief valve drain to sense the first discharge.

      Record the gage reading of first discharge.

      If this value is less than 2 psi, the relief valve is malfunctioning. Repeat preliminary steps (1a thru 1i) and test steps 3a thru 3c. If results are repeated, refer to "Maintenance Procedure" for valve repair steps.
4. **NUMBER 2 CHECK VALVE TEST**

   Purpose: To test the #2 check valve for tightness against reverse flow.

   Requirements: The valve must be tight against reverse flow under all pressure differentials.

   a. Connect the VENT (black) hose of the test kit to the #4 test cock on the backflow preventer. Open the #4 test cock.
   b. Observe the differential pressure with all gauge valves closed.
   c. Open the HIGH (red) and VENT (black) valves on the test kit. This places line pressure on the downstream side of the #2 check valve.

      The PSID reading on the gage should hold steady with valves open.

      If the gage reading continues to decrease, the valve is leaking. Refer to "Maintenance Procedure" for correction steps.

MID-WEST Model 830
R P VALVE TEST KIT
Schematic Diagram

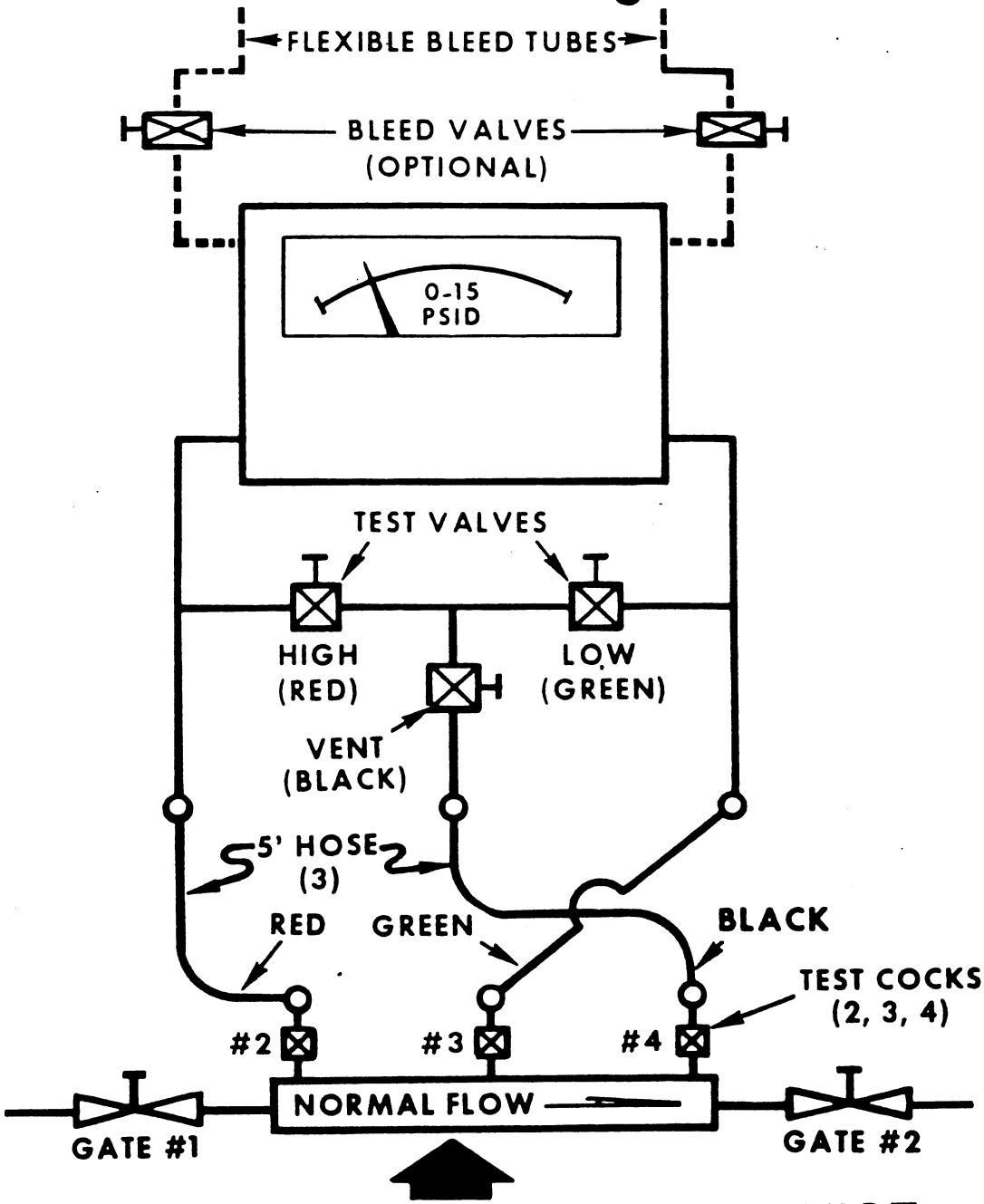


FIGURE 6. TYPICAL TEST SETUP, SCHEMATIC DIAGRAM — RP

MID-WEST MODEL 890 TEST KIT

Double Check Valve, Backflow Prevention Assembly Schematic Diagram

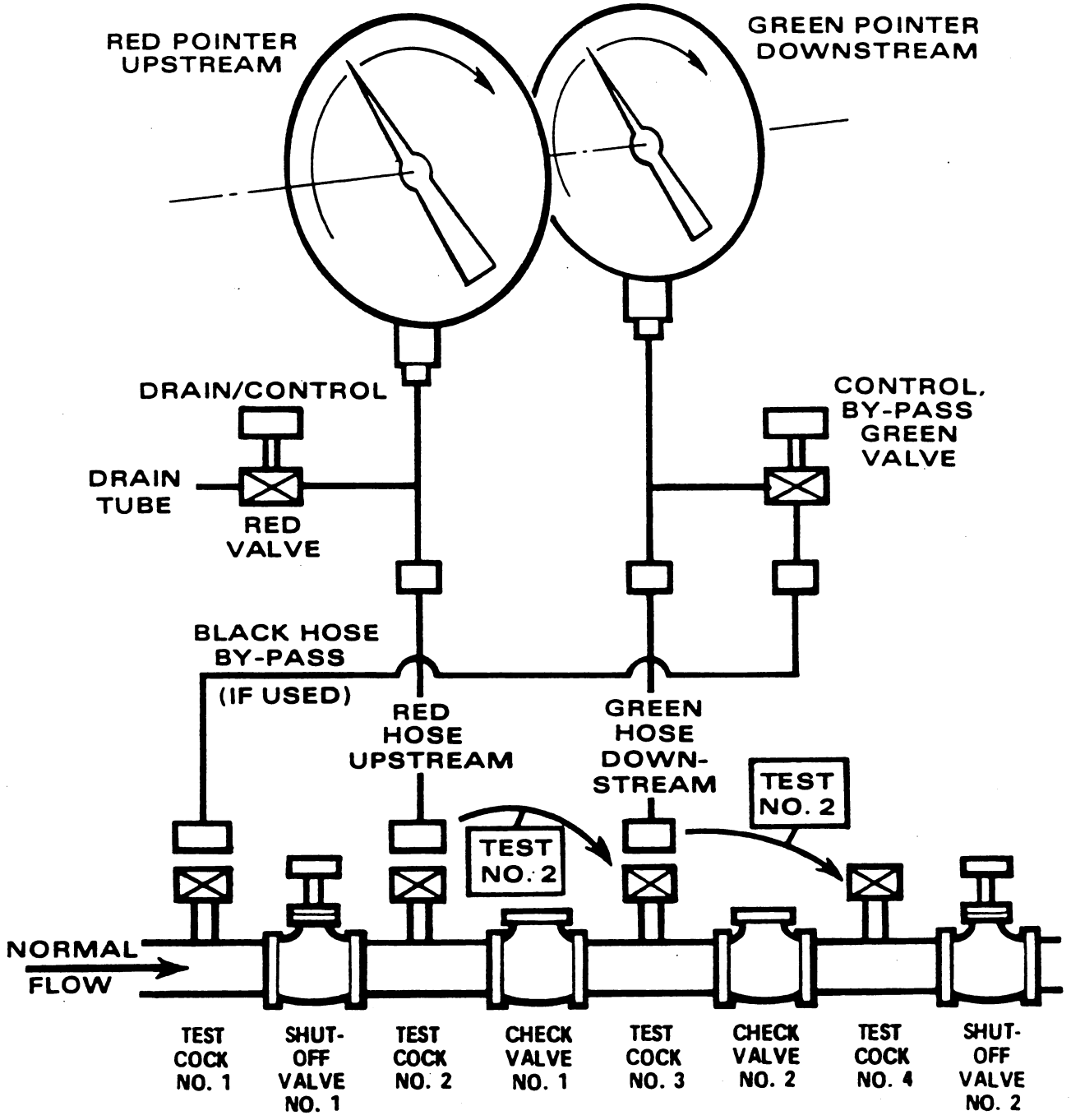


FIGURE 7. TYPICAL TEST SETUP, SCHEMATIC DIAGRAM — DC

TESTING THE MODEL 550 DEVICE WITH DC TEST KIT

1. **PRELIMINARY STEPS** (Fig. 7)

   a. Connect HIGH (red) hose to test cock #2 of the double check valve assembly.

   b. Connect LOW (green) hose to test cock #3.

   c. Open test cocks #2 and #3.

   d. Open HIGH (red) and LOW (green) valves on test kit to bleed air from lines and fill hoses.

   e. Close red and green valves.

   f. Close shutoff valve #2.

   g. Close shutoff valve #1.

2. **TESTING NUMBER 1 CHECK VALVE**

   Purpose: To test #1 check valve for tightness against reverse flow.

   Requirements: The valve must be tight against reverse flow under all pressure differentials.

   a. Bleed off upstream pressure by slowly opening HIGH (red) valve until red pointer on test kit reads about 2 psi less than downstream side as indicated by green pointer.

   b. Close red valve.

   c. Both pointers should hold steady and maintain 2 psi differential.

   d. If both pointers drop in (a.), check valve indicates leakage.

   e. To confirm if valve leaks:

      1. With #1 shutoff valve still closed, open green valve and bleed both pointers down about 10 psi.

      2. Close green valve.

      3. Connect bypass (black) hose to #1 test cock on device.

      4. Open test cock #1.

      5. Slowly open both red and green valves together, placing line pressure on downstream side of check valve and venting upstream side.

      6. Red pointer should decrease and green pointer increase.

      7. Close red valve.

      8. Red pointer should hold steady.

      9. If red pointer continues to increase, the check valve leaks. See "Maintenance Instructions" for correction steps.

   f. Close all kit valves, test cocks, and disconnect hoses from device.

3. **TESTING NUMBER 2 CHECK VALVE**

   Purpose: To test #2 check valve for tightness against reverse flow.

   Requirements: The valve must be tight against reverse flow under all pressure differentials.

   Repeat steps of test of #1 check valve except with hoses connected red to test cock #3 and green to test cock #4.

MAINTENANCE INSTRUCTIONS

CAUTION:

Proper performance is dependent upon licensed, qualified personnel performing regular, periodic testing according to WILKINS' specifications and prevailing governmental and industry standards and codes. Failure to do so could result in an improperly functioning device.

All Model 575 Backflow Preventers and Model 550 Double Check Valve units must be inspected and maintained by licensed personnel at least once a year or more frequently as specified by local codes. Replacement of worn or damaged parts must only be made with genuine "WILKINS" parts. The WILKINS Certificate of Limited Warranty provides that failure to do so "releases WILKINS of any Liability that it might otherwise have with respect to that device." Such failure could also result in an improperly functioning device.

Model 575 devices should be thoroughly flushed after backflow conditions occur to prevent any type of corrosive deterioration to its components. Failure to do so could result in malfunction of the device.

1. **GENERAL**

   Maintenance of either the Model 575 Backflow Preventer or the Model 550 Double Check Valve Unit can be performed without removing the device from the line. There are NO SPECIAL TOOLS required.

2. **CHECK VALVES**

   To service the Check Valves, proceed as follows: (refer to Page 2, Fig. 1).

   a. Shut off the No. 2 gate valve, then shut off the No. 1 gate valve.

   b. Open the No. 2, No. 3, and No. 4 test cocks to release pressure and drain water from the backflow preventer.

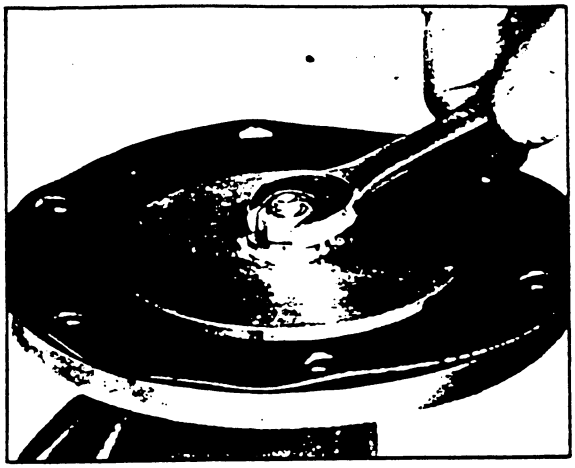


FIGURE 14. REMOVAL OF STEM NUT FROM ¾ OR 1 INCH RELIEF VALVE

e. Inspect the diaphragm for pinholes, tears, and frayed fabric edges. Replace the diaphragm if any damage is noted (Figs. 13 & 14).

f. On the 1¼", 1½" and 2" relief valves, remove the small bolt from the bottom of the stem, and remove the relief valve disc holder (Fig. 15). On the ¾" and 1" relief valves, remove the nut at the bottom of the stem, and remove the relief valve disc holder (Fig. 16).

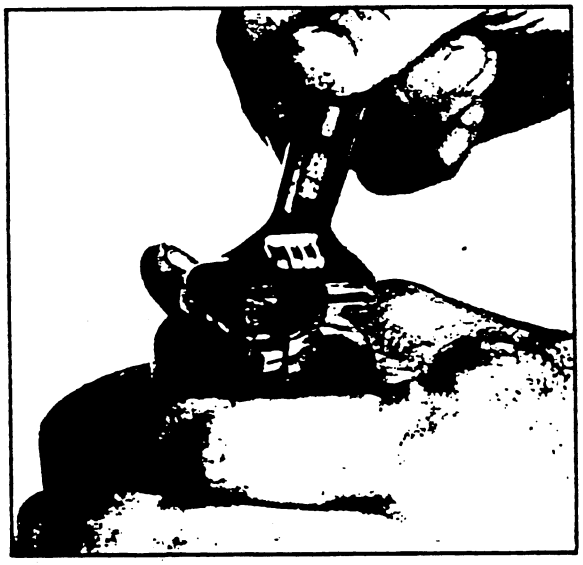


FIGURE 15. REMOVAL OF BOLT FROM BOTTOM OF 1¼, 1½ OR 1 INCH RELIEF VALVE STEM

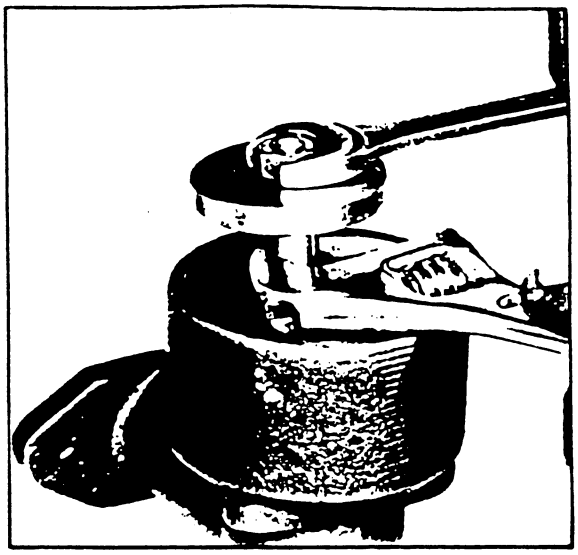


FIGURE 16. REMOVAL OF NUT FROM BOTTOM OF ¾ OR 1 INCH RELIEF VALVE STEM

g. Inspect the rubber seat for tears and embedded debris. If damage is noted, remove seat by easing knife blade between outside of rubber seat and brass housing. If reverse side is unused, invert and reassemble. Otherwise, replace with proper "WILKINS" part.

h. Remove the three screws that secure the seat, and remove the stem assembly (Fig. 17). Inspect the sealing surface on seat (Fig. 18). Slight nicks or dents may cause the relief valve to leak. If the sealing surface is damaged, replace the seat.

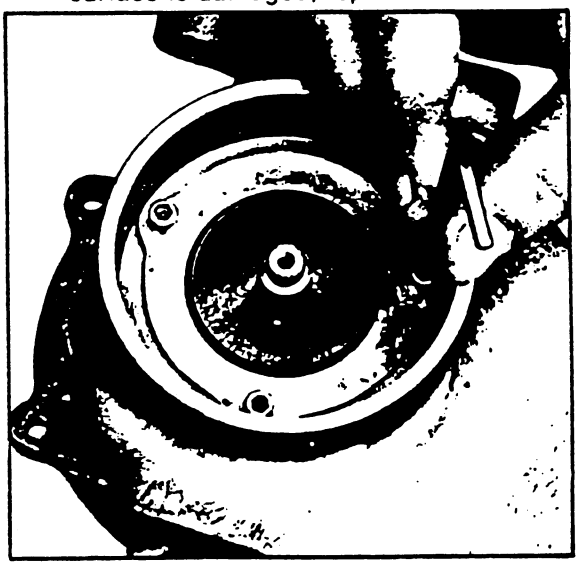


FIGURE 17. REMOVAL OF SEAT SCREWS FROM RELIEF VALVE

c. On the Model 575, loosen the sensing tube nuts and remove the sensing tube from the top of the check valve and the relief valve.

CAUTION: Take care in removing the cover in the following steps. The cover is spring loaded.

d. Holding the cover down firmly, loosen and remove the four (4) bolts which mount the cover of the check valve (Fig. 8).

e. Slowly ease the cover outward to relieve the spring tension.

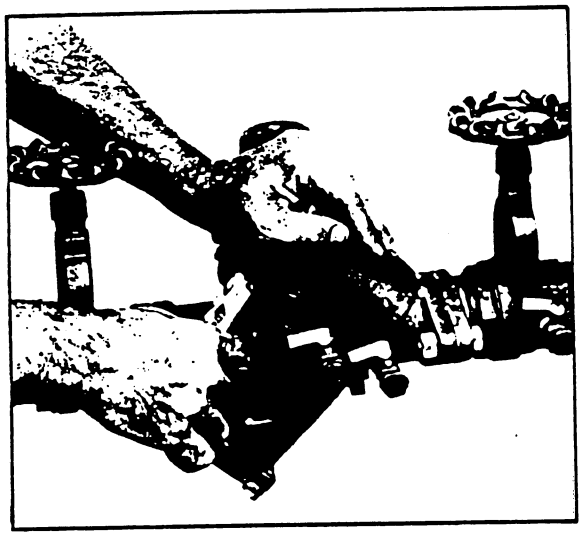


FIGURE 8. REMOVAL OF COVER BOLTS FROM NO. 1 CHECK VALVE

f. Remove the cover, spring and poppet assembly from the check valve (Fig. 9).

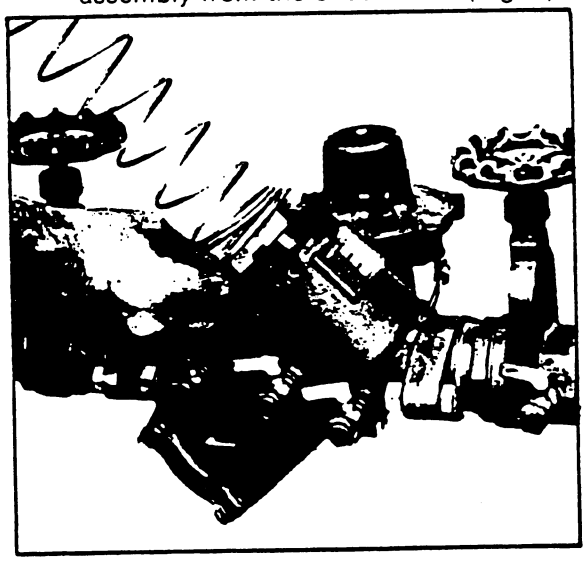


FIGURE 9. REMOVAL OF SPRING AND POPPET ASSEMBLY FROM NO. 1 CHECK VALVE

g. Inspect the rubber seat of the poppet assembly for cuts or embedded debris. (Fig. 10).

h. If damage is noted, loosen and remove the screw holding the retaining washer in place.

i. Remove washer by easing any slim device (screwdriver, etc.) between the outer edge of the seal and poppet and lifting seal.

j. If reverse side of seal is unused, invert seal and reassemble, otherwise replace with proper "WILKINS" seal. In reassembly, be sure seal is fully seated and "flat" in poppet.

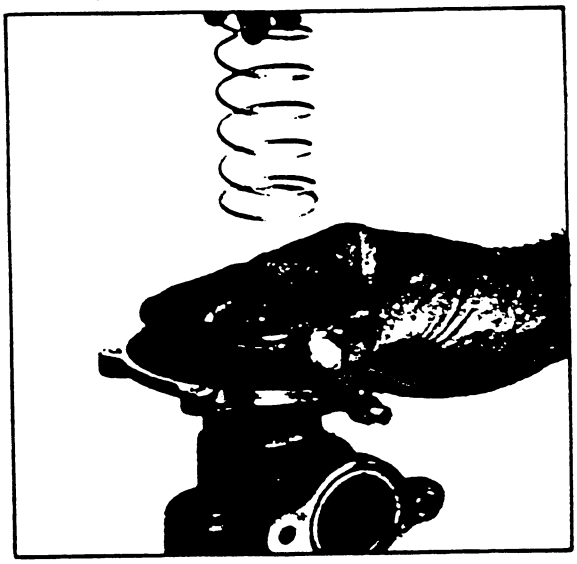


FIGURE 10. RUBBER SEATING DISC

k. Inspect valve cavity and seating area. Remove any debris. Check for possible damage to seat. If seat is damaged, body assembly should be replaced.

l. Inspect cover and cover sealing area. Replace O-ring seal with proper "WILKINS" part.

m. Reassemble the check valves. Install the covers with the bleed screws in the highest possible position.

n. Reassemble the sensing line removed in (c.). Be sure clamping collars are tight. (See "Relief Valve" before reassembling.)

o. Refer to "Placing Device in Service" section above to reuse device.

p. Inspect device after water is turned on and before testing to eliminate leaks.

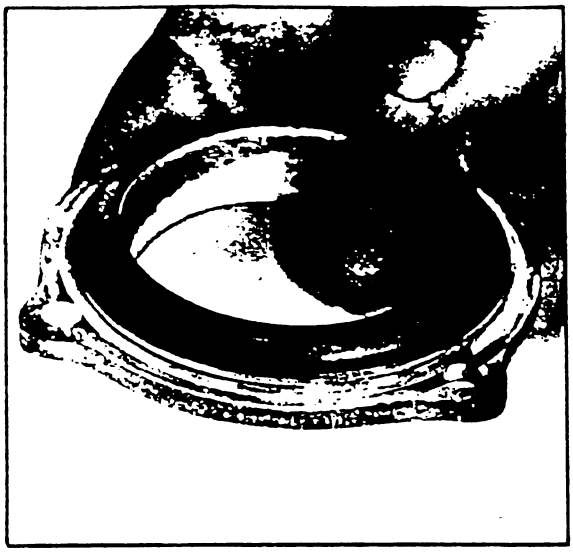


FIGURE 18. INSPECTING SEAT SEALING SURFACE OF RELIEF VALVE

i. Replace the seat O-ring with proper "WILKINS" part (Fig. 19).

j. Remove all stem O-rings (Fig. 20). Replace the O-rings with proper "WILKINS" parts.

NOTE: Use caution when reinserting the stem assembly to avoid damaging the stem O-rings. When replacing the spring retainer, make sure that the small point is centered over the stem (Fig. 21). This centering equalizes the spring force required for proper action of the relief valve.

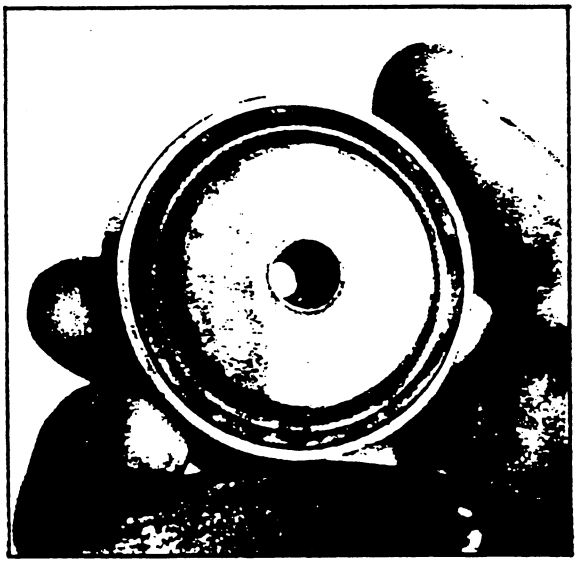


FIGURE 19. INSPECTING SEAT O-RING OF RELIEF VALVE

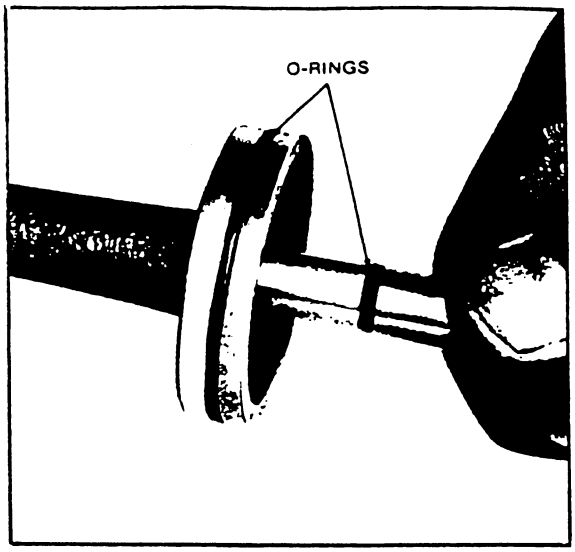


FIGURE 20. INSPECTING STEM O-RINGS OF RELIEF VALVE

k. Reassemble the relief valve following the steps (h) through (a) above, making sure that the bevelled end of the seat is exposed (Fig. 17). Tighten all bolts, but not excessively.

l. Before remounting the relief valve to the check valve body, replace the sealing gasket or O-ring with proper "WILKINS" part.

NOTE: The 1¼", 1½", and 2" devices utilize an outside sensing line for relief valve closure. The ¾" and 1" devices have an inside sensing line drilled into the body and relief valve (Fig. 22). Always check to make sure there is no foreign matter in the sensing line, removing it if there is.

m. Open gate valve No. 1 (refer to page 1, Fig. 1) and bleed any entrapped air through the bleed screws located above and below the diaphragm. Do not remove the vent screws when bleeding air.

n. Check complete unit for leaks, tighten as required.

o. After testing open gate valves and the device is in service.

SINCE 1904

WILKINS REGULATOR CO.

A Division of Zurn Industries, Inc.

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Paso Robles, CA 93446
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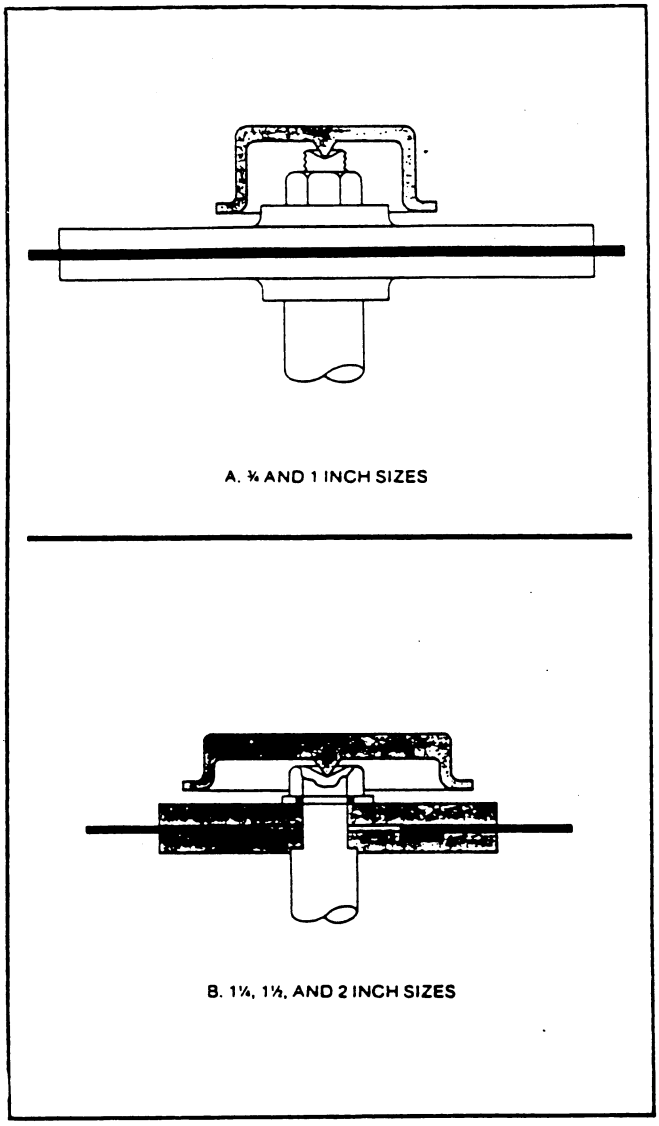

A. ¾ AND 1 INCH SIZES

B. 1¼, 1½, AND 2 INCH SIZES

FIGURE 21. PROPER CENTERING OF SPRING RETAINER POINT ON RELIEF VALVE

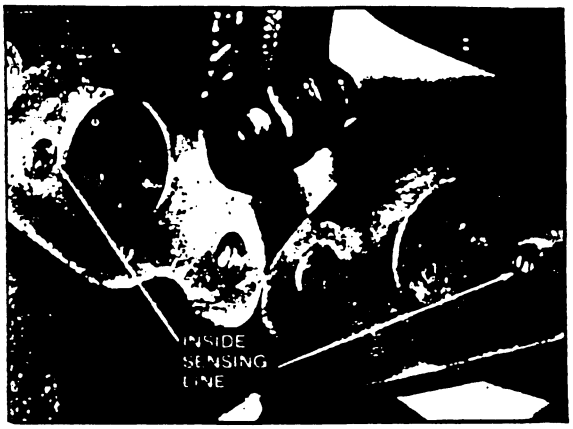

FIGURE 22. INSIDE SENSING LINE, ¾ OR 1 INCH RELIEF VALVE.

NOTE: If any questions concerning the installation, inspection, or maintenance instructions arise, contact the Manager of Consumer Relations at WILKINS' Home Office.

WILKINS

Series 40276

Globe Valve

Features

- 200 WOG @ 350 °F
- 316 stainless steel
- Screwed bonnet
- Non-rising stem
- Hydrostatic shell test at 300 psi
- Hydrostatic seat test at 220 psi

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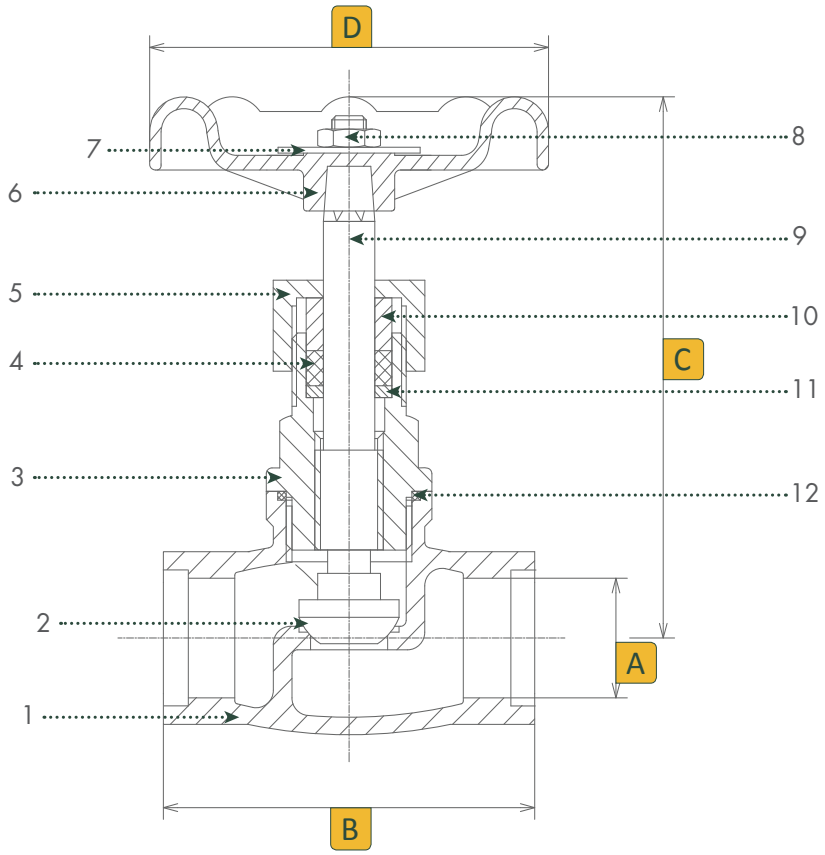


Dimensions (Inches)

Size	A	B	C	D
1/4	0.40	2.01	4.41	2.76
3/8	0.49	2.01	4.41	2.76
1/2	0.59	2.56	4.21	2.76
3/4	0.79	2.95	4.59	2.76
1	0.98	3.54	5.16	3.15
1-1/4	1.26	4.13	5.67	3.15
1-1/2	1.57	4.65	6.46	3.94
2	1.97	5.43	6.93	3.94

No.	Part Name	Qty	Material
1	Body	1	316 Stainless Steel
2	Core	1	316 Stainless Steel
3	Bonnet	1	316 Stainless Steel
4	Packing	1	PTFE
5	Gland Nut	1	304 Stainless Steel
6	Hand Wheel	1	Aluminum
7	Name Plate	1	Aluminum
8	Nut	1	304 Stainless Steel
9	Stem	1	316 Stainless Steel
10	Metal Padding	1	304 Stainless Steel
11	Washer	1	316 Stainless Steel
12	Seal	1	PTFE

Ordering

Fig: 1 - 40276 - SW
Description: 1" - Series 40276 - Socket Weld

Size	Series	Ends	
1/4 3/8 1/2 3/4 1 1-1/4 1-1/2 2	40276	TE SW	Threaded Socket Weld

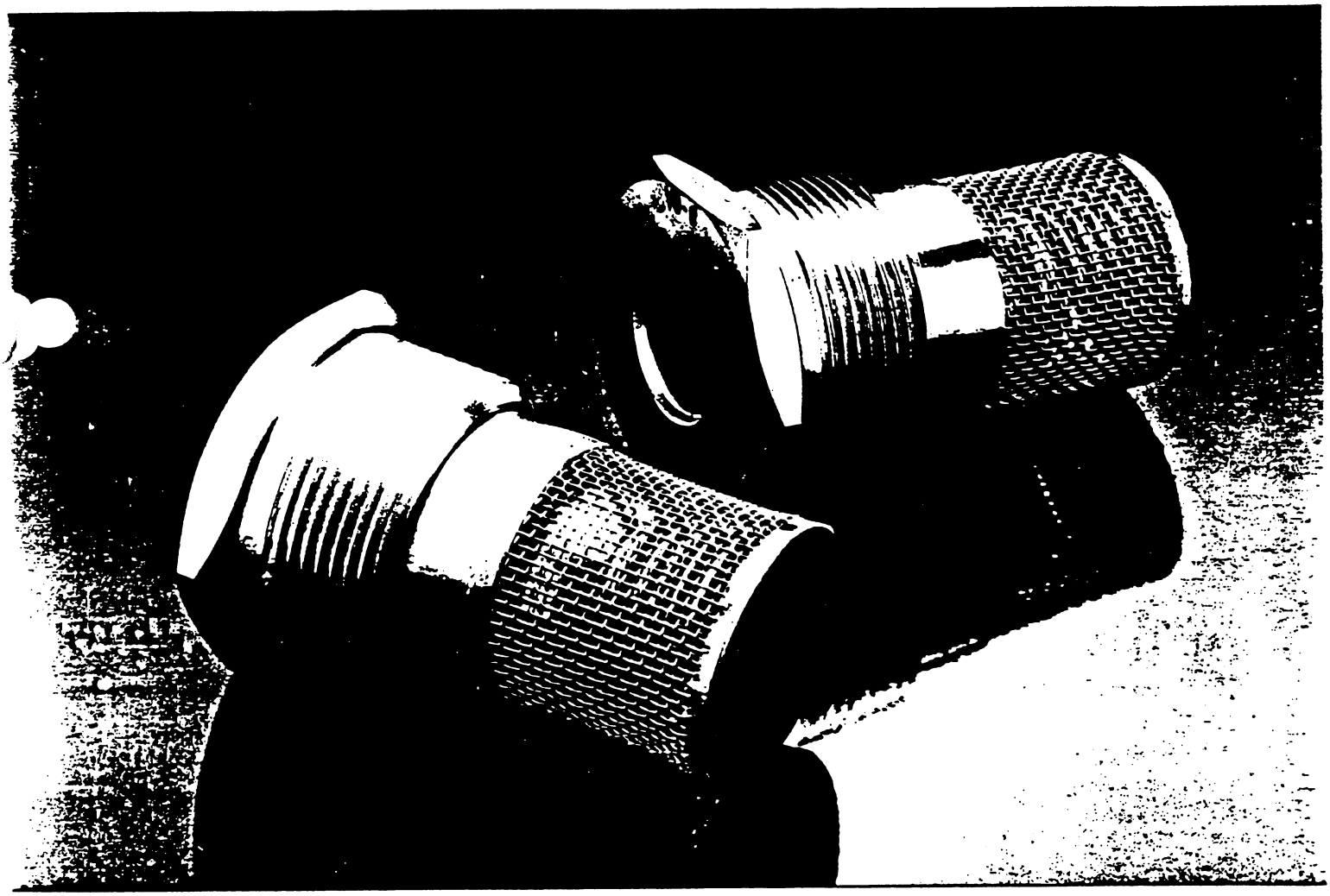
-

APPENDIX D-10 VACUUM BREAKERS

- Johnson Series 768

BULLETIN VB-1001

Vacuum Breakers



035224

Series 788 JOHNSON
VACUUM BREAKERS

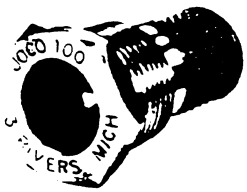


Fig. 1—Johnson Vacuum Breaker with plain outlet.

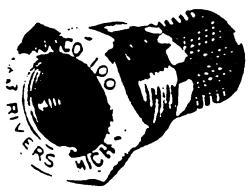


Fig. 2—Johnson Vacuum Breaker with outlet threaded for pipeaway.

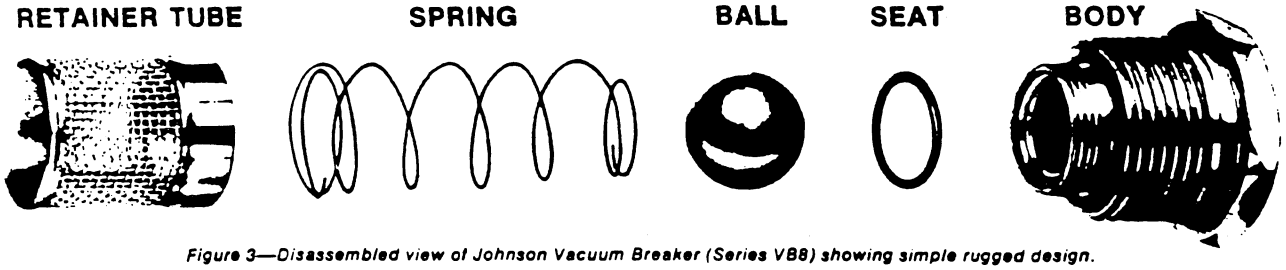


Figure 3—Disassembled view of Johnson Vacuum Breaker (Series VB8) showing simple rugged design.

Fast Acting, Tight Closing, High Capacity Thanks to the ROUND BALL, SOFT SEAT Principle

Johnson Vacuum Breakers provide a simple, dependable way to relieve any unwanted vacuum condition which may develop in a closed vessel or pipeline. They can be used to prevent contamination from back siphonage in fluid handling systems, and to protect equipment against collapse or implosion. They combine tight closing with instant response; provide large air venting capacity; are designed for easy installation and long service life.

Positive Closing — Low Breakaway

The successful combination of the spring action on a round ball and the soft resilient seat assures positive bubble-tight closing, even at very low differential pressures. And, of course, the higher the pressure the tighter the seal.

Since only slight spring pressure is needed for seating, the ball comes off the soft seat at a very low vacuum condition, providing almost instantaneous protection.

Sealing is accomplished by an EPR "O" Ring. The supporting seat, however, is designed to assume any pressure in excess of the small amount needed for sealing, thus preventing any excessive compression of the "O" Ring.

Quiet, Trouble-Free Operation

The soft resilient seat, combined with the gentle spring action, provides quiet opening and closing; chatter is completely eliminated. Corrosion-resistant seating surfaces leave little danger of any sticking or leaking. The simple design assures long and dependable service life, as proved both in the laboratory and on the job.

Easily Installed, Easily Maintained

Johnson Vacuum Breakers have hex heads and standard pipe threads on bodies, and are simply threaded into pipe fittings or available tank openings. Outlets can be threaded for pipeaway if desired.

Rigorously Tested

In exhaustive endurance tests Johnson Vacuum Breakers have been subjected alternately to 120 psig of steam and then vacuum, four times a minute, and still opened freely and closed bubble-tight after a million such test cycles. Every individual vacuum breaker is bubble-tested under water at both low and high pressure before it leaves the factory.

High Pressure and Temperature

Johnson Vacuum Breakers are very conservatively rated for use with pressures up to 300 psig, temperatures to 365°F. Higher operating pressures are possible, depending upon size, seal materials and temperatures. Under certain conditions the steel ball unit can be installed upright and spring removed altogther. The factory should always be consulted for any departure from standard ratings or constructions.

VB8 — 38 — BR — P — S — E

EXPLANATION OF CATALOG NUMBERS

The letter and numeral designations which make up the Johnson Vacuum Breaker Catalog Numbers identify details of construction. The explanation at right should prove helpful.

Series VB8 Vacuum Breakers	SIZE	BODY	OUTLET	BALL	SEAL
	38 = ⅜"	BR = Brass	P = Plain	S = Stainless Steel	E = EPR (Specify alternate by name)
	51 = ½"	SS = Stainless Steel	T = Threaded		
	76 = ¾"				
	101 = 1"				
	126 = 1¼"				
	151 = 1½"				

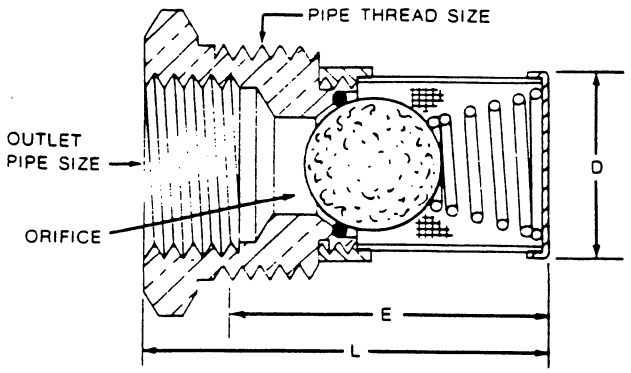


Figure 4—Dimension drawing, Johnson Vacuum Breakers (Series VB8).

MATERIALS OF CONSTRUCTION

Part Description	Standard Units	Also Available
Body	Brass	Stainless Steel (Type 303) (Specified by catalog number)
Retainer Tube	Screen — Type 304 Stainless Cap — Type 304 Stainless Threaded Collar — Type 416 Stainless	
Spring	Type 316 Stainless Steel	
Ball	Stainless Steel (Type 440) (Available 3/8" through 1 1/2" sizes)	
Seat	EPR "O" Ring	Silicone—Consult factory Buna-N—225° F. Maximum Must be specified by name)

...—Standard Sizes and Dimensions

Catalog Number	Maximum Pressure	Maximum Temp. °F.	Pipe Thread Size	Outlet Pipe Size	Total Length "L"	Engaged Length "E"	O.D. of Tube "D"	Hex Body Size	Diameter of Orifice	Diameter of Ball	Net Weight
VB8-38-BR-P-S-E VB8-38-BR-T-S-E VB8-38-SS-P-S-E VB8-38-SS-T-S-E	300	365	3/8"	1/4"	1 1/2"	1 1/8"	5/16"	3/4"	1/4"	3/8"	1 oz.
VB8-51-BR-P-S-E VB8-51-BR-T-S-E VB8-51-SS-P-S-E VB8-51-SS-T-S-E	300	365	1/2"	3/8"	1 3/4"	1 3/8"	11/16"	1"	1/32"	1/2"	2 oz.
VB8-76-BR-P-S-E VB8-76-BR-T-S-E VB8-76-SS-P-S-E VB8-76-SS-T-S-E	300	365	3/4"	1/2"	2 1/8"	1 5/8"	13/16"	1 1/4"	13/32"	5/8"	3 oz.
VB8-101-BR-P-S-E VB8-101-BR-T-S-E VB8-101-SS-P-S-E VB8-101-SS-T-S-E	300	365	1"	3/4"	2 3/8"	1 7/8"	1 1/16"	1 1/2"	19/32"	7/8"	6 1/2 oz.
VB8-126-BR-P-S-E VB8-126-BR-T-S-E VB8-126-SS-P-S-E VB8-126-SS-T-S-E	300	365	1 1/4"	1"	2 15/16"	2 5/16"	1 5/16"	1 3/4"	3/4"	1 1/16"	11 oz.
VB8-151-BR-P-S-E VB8-151-BR-T-S-E VB8-151-SS-P-S-E VB8-151-SS-T-S-E	300	365	1 1/2"	1 1/8"	3 1/16"	2 1/2"	1 5/8"	2"	7/8"	1 3/16"	13 oz.

NOTE: For higher pressure applications consult factory for recommendations. Specify size, type and temperature conditions. Certified dimensional drawings available upon request.

Simple Installation

The drawings at right show how the vacuum breaker can be installed in a threaded opening in either vertical or horizontal position. When installed in a pipeline fitting, use of a reducing bushing is required to make sure vacuum breaker does not intrude far enough to impede flow in the line or bind against any internal wall.

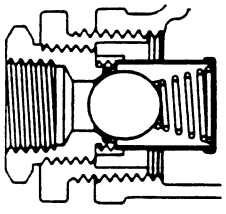


Figure 5 — Horizontal installation in either end or side outlet of tee, showing use of reducing bushing.

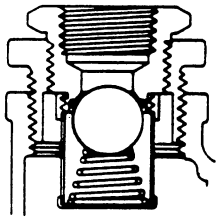


Figure 6 — Vertical installation in top outlet of tee, showing use of reducing bushing.

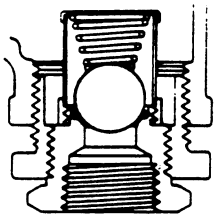


Figure 7 — Vertical installation in bottom outlet of tee, showing use of reducing bushing.

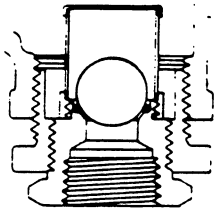
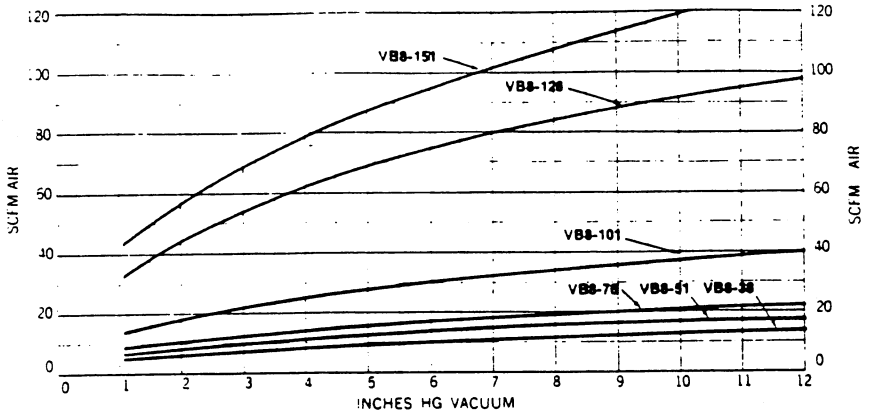


Figure 8 — Under certain conditions spring can be removed from steel ball unit installed in bottom outlet; consult factory please.

Approximate Series VBB Air Handling Capacities

The air handling capacity curves were plotted from calculations using the C_V factors of the vacuum breaker units. The C_V factor is a flow coefficient determined by actual test which mathematically gives the relationship between the rate of flow and the pressure drop. The flow formula used was recommended by the Fluid Controls Institute.



Note: Capacities will vary slightly due to position of installation or kind of ball.

The JOHNSON Guarantee

Johnson Products are built to a high standard of quality. Performance is what you desire—that is what we guarantee. Should any Johnson Product fail to function perfectly, because of defective material or workmanship within one year after the date of purchase, the product or its defective parts will be promptly replaced. It is expressly understood that our liability shall be limited to such replacement.

Vacuum Required to Open

			Vertical		
		Horizontal	Top Outlet	Bottom Outlet	No Spring
VB8-38 ⅜"	In. H_2O	7.0	4.3	10.5	3.5
	In. Hg	.51	.32	.77	.26
	Psi	.25	.16	.38	.13
VB8-51 ½"	In. H_2O	9.3	10.6	18.0	4.4
	In. Hg	.68	.78	1.32	.32
	Psi	.34	.38	.65	.16
VB8-76 ¾"	In. H_2O	15.3	15.0	25.0	5.1
	In. Hg	1.13	1.10	1.84	.37
	Psi	.55	.54	.90	.18
VB8-101 1"	In. H_2O	10.0	5.9	19.5	6.6
	In. Hg	.73	.43	1.43	.48
	Psi	.36	.21	.70	.24
VB8-126 1¼"	In. H_2O	10.5	7.1	21.0	6.9
	In. Hg	.77	.52	1.54	.51
	Psi	.38	.26	.76	.25
VB8-151 1½"	In. H_2O	10.0	4.9	20.3	7.9
	In. Hg	.73	.36	1.49	.58
	Psi	.36	.18	.73	.29

NOTE: Stainless Steel Ball used to arrive at all figures. Values given are averages of test results, and may vary slightly.

Typical Installations—JOHNSON VACUUM BREAKERS

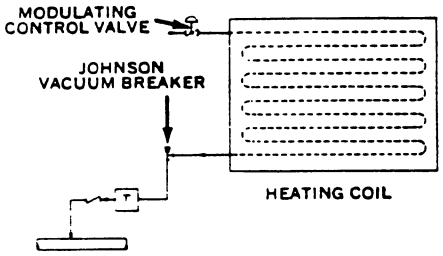


Figure 10 — Johnson Vacuum Breaker installed on heating coil. When the modulating control valve closes, the steam in the coil will condense. Actually, a vacuum can exist in the coil with the control valve partly open and positive pressure between the control valve and the coil.

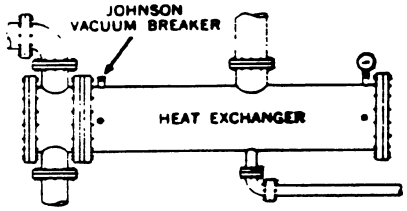


Figure 13—Typical installation of a Johnson Vacuum Breaker in a heat exchanger.

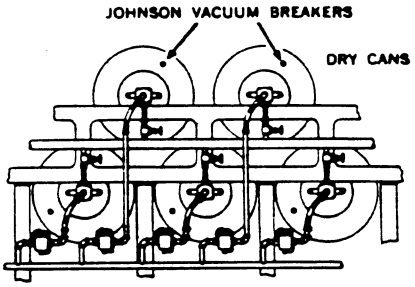


Figure 11—Textile dry cans, multiple slasher cylinders, print cans, etc., can be protected against collapse with Johnson Vacuum Breakers.

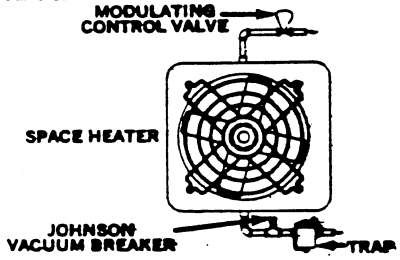


Figure 14—Typical space heater installation with Johnson Vacuum Breaker protection.

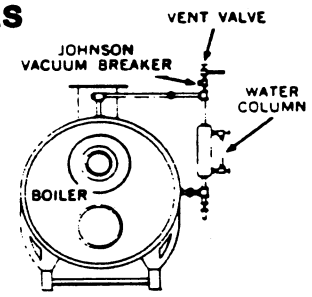


Figure 12—Typical application of a Johnson Vacuum Breaker as used on a steam boiler to break a vacuum imposed when a boiler is shut down, thereby condensing the steam in the boiler and creating a vacuum. This condition causes the boiler to be flooded by pulling in excess water from the return system. The vacuum breaker is normally installed at the top of the water column as illustrated.

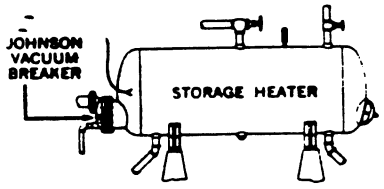


Figure 15—Horizontal storage heater with heating coils protected by a Johnson Vacuum Breaker.

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