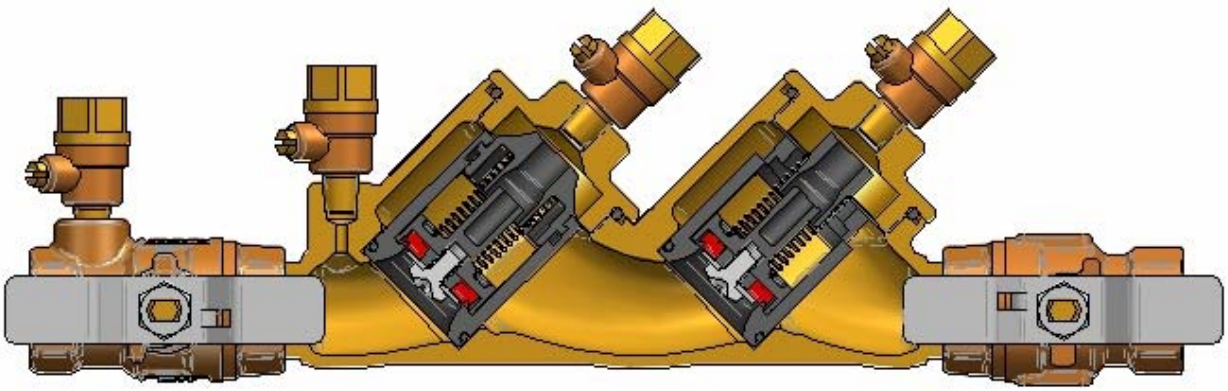
"Apollo" Valves

Made In The USA

DC4A Series

Installation, Operation, and Maintenance Manual



Double Check Valve (DC)
Backflow Preventers
1/2” – 2”

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Double Check Valve Backflow Preventer ½" – 2"

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I. DESCRIPTION AND OPERATION

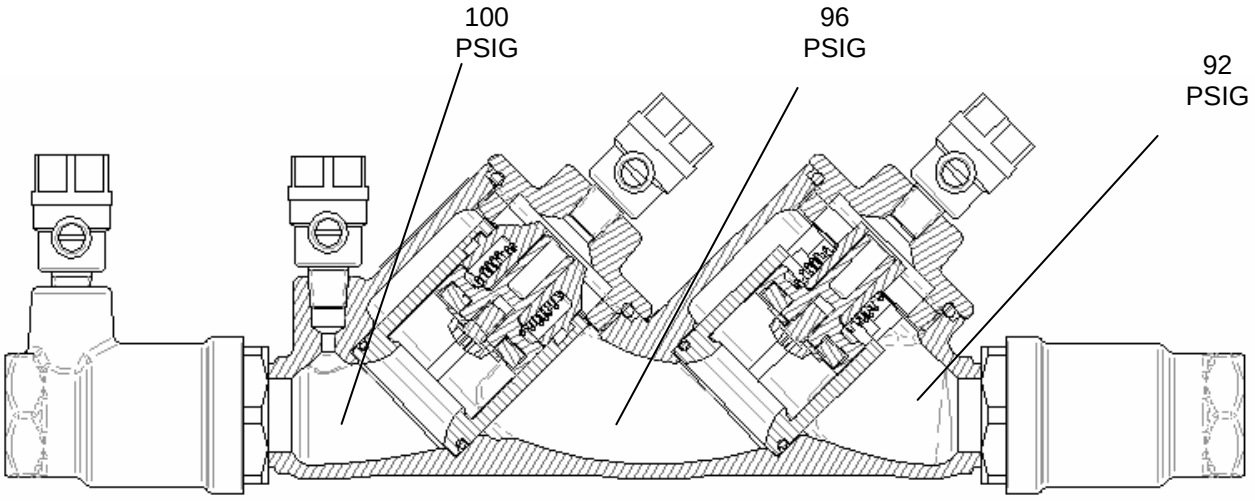
The Double Check Valve (DC) device consists of two independently acting, spring-loaded check valves. Two resilient seated shut-off valves and four test cocks complete the assembly.

Each check is designed to maintain a minimum of 1 psi across the valve during normal operation. If at any time the pressure downstream of the device increases above the supply pressure, both check valves will close to prevent any backflow from occurring.

The flowing and no flow conditions are illustrated in figures 1 and 2. To initiate flow, supply pressure must be sufficient to open both checks and overcome friction, normally a minimum of 3 to 5 psi above the downstream pressure.

II. INSTALLATION

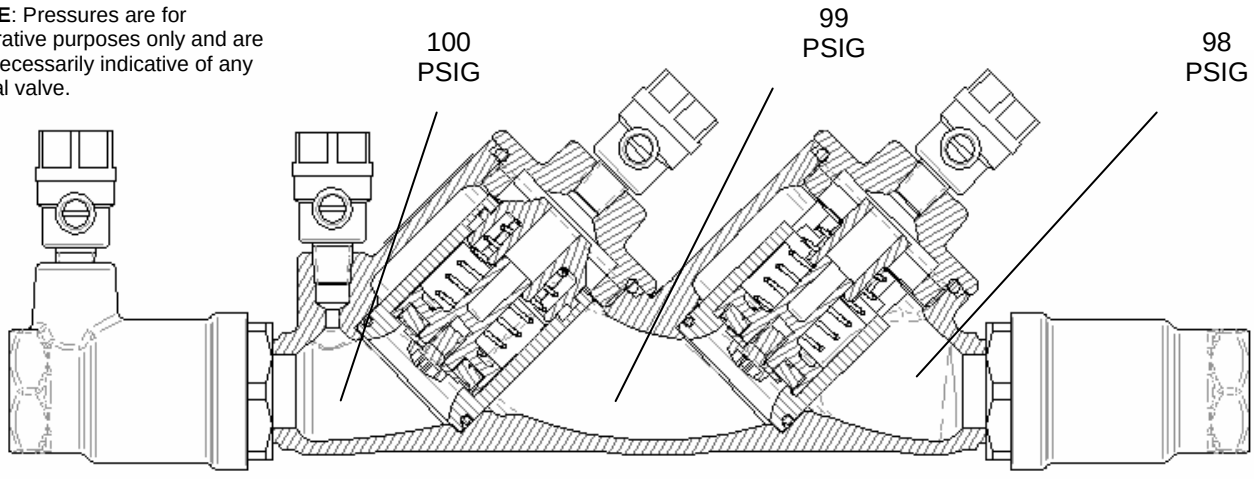
A. The DC must be installed in an accessible location to facilitate periodic field testing and maintenance.
B. Flush all upstream piping thoroughly to remove foreign matter prior to installing the device.
C. The device should be installed either horizontally or vertical up for ease of maintenance and testing. A clearance between the lower most portion of the device and flood grade or floor should be provided for ease of maintenance.
D. When shut-off valves are provided separately, they should be installed with a test cock on the upstream side of the inlet shut-off valve.
E. After installing the assembly and with downstream or #2 shut-off valve closed, pressurize the device and bleed air through test cock #4. Then open #2 shut-off valve.



(FLOWING CONDITION)

FIGURE 1

NOTE: Pressures are for illustrative purposes only and are not necessarily indicative of any actual valve.



(NO FLOW CONDITION)

FIGURE 2

III. TROUBLE SHOOTING GUIDE

SYMPTOM	CAUSE	CORRECTIVE ACTION
1. Check valve fails to hold 1 psid.	a. Shut-off valve not closed completely.	a. Close #2 shut-off valve or inspect for possible through leakage.
	b. Check valve fouled with debris.	b. Inspect and clean seat disc and seat.
	c. Check poppet stem not moving freely in guide.	c. Inspect for debris or deposit on poppet stem or guide.

IV. MAINTENANCE INSTRUCTIONS 1/2" – 2"

A. Disassembly – Check Valves

1. Close #2 shut-off valve, then close #1 shut-off valve.
2. Bleed pressure from the assembly by opening #2, #3, and #4 test cocks.
3. Unscrew cap using hex head provided.
4. Push down and turn the spring retainer 90 degrees to remove. Remove the spring. Remove the poppet from the check seat.
5. Normally, the check seat need not be removed. If removal is required, rock it back and forth while pulling outward.

B. Disassembly – Check Valve Poppet

CAUTION: Do not use pliers or other tools, which may damage or scratch the plastic stem.

1. Holding the poppet assembly in one hand, remove screw and retaining washer.
2. Remove the seat disc.
3. All parts should be carefully inspected for any damage or excessive wear and thoroughly rinsed in clean water prior to reassembly. Replace worn parts as necessary.

C. Assembly – Check Valve Poppet

1. Install new disc in poppet and secure with washer and screw.

D. Assembly – Check Valve

1. If the check seat was removed, install the new o-ring and lubricate. Line up the seat with the bore and push it firmly into place.
2. Place and center the poppet assembly in the check seat.
3. Install the spring onto the poppet.
4. Install the spring retainer onto the spring by pushing down into the grooves of the check seat and turning 90 degrees. Ensure spring retainer pops up about .1" and locks into the lugs. **CAUTION: Ensure the spring retainer orientation matches that in the parts list drawing or the device's flow will be significantly restricted.**
5. Apply a thin coat of Apollo supplied lubricant or DOW 111 or equal on cap o-ring.
6. Install cap.

V. TESTING PROCEDURES

This test is performed with the Differential Pressure Gauge Test Kit. The Differential Pressure Gauge simply measures the pressure drop across the check valve. This pressure drop is normally the same as the strength of the check valve spring. In using the Differential Pressure Gauge to test the Double Check assembly, a minimum of 1.0 psid is required for each check valve in order for that check valve to pass the test. Such a small reading is often difficult to read on most test kits. This is one of the drawbacks of this test. However, since the first shut-off valve is left in the open position for this test, it is possible to use this test when the first shut-off valve is leaking badly.

NOTE: This 3 valve test kit procedure and may or may not be approved in all jurisdictions. Consult your local water purveyor for acceptable test procedures.

TEST SETUP:

1. Notify customer that the water service will be off. Identify the make, model, and serial number on the backflow device. Inspect that this is an approved assembly – two check valves, two, shut-off valves & four test cocks. Observe the area to make sure there are no leaks.
2. Flush test cocks (1, 2, 3 & 4), then close all test cocks.
3. Install brass fittings in the test cocks.
4. Close shut-off valve #2.

CHECK VALVE #1:

1. Close all valves on test kit.
2. Connect the high side hose to test cock #2 and the low side hose to test cock #3. Open test cock #2 and test cock #3.
3. Open vent valve “C” and high “A” on the test kit to bleed air from the high side of the kit. Close high “A” valve and then open low “B” valve to bleed the low side. Close low “B” valve.
4. Record the gauge reading. It must be a minimum of 1.0 psid in order to pass. Close test cock #2 and test cock #3.

CHECK VALVE #2:

1. Move the high side hose to test cock #3 and the low side hose to test cock #4. Open test cock #3 and test cock #4.
2. Open vent “C” valve. Then open high “A” and bleed air from the high side of the kit. Close high “A” valve, and then open low “B” valve and bleed the low side of the kit. Close low “B” valve.
3. Record the gauge reading. It must be a minimum of 1.0 psid in order to pass. Close test cock #3 and test cock #4. Remove hoses and test kit. Slowly open shut-off valve #2 in order to restore water flow to the facility, placing the DC back into service.

LEAKING #2 SHUT-OFF VALVE:

As previously mentioned, the above test is not accurate when the second shut-off valve is leaking. The following test will expose a leaking shut-off valve.

1. Both shut-off valves should be open. Make sure all valves on test kit are closed. Connect the high “A” hose to test cock #2 and the low “B” hose to test cock #3. Open test cock #2 and test cock #3.
2. Open the high “A” valve and vent “C” valve to bleed air from high side of gauge. Open low “B” valve to bleed air from low side of gauge. Close valves “A”, “B” and “C” on test kit.
3. Connect the vent hose to test cock #4. Open test cock #4.
4. Close shut-off valve #2. The differential gauge needle should read at least 1.0 psid in order to pass.
5. Open the high “A” valve and vent “C” valve. This will put back pressure on check valve #2.
6. Close test cock #2.

NOTES:

If gauge is steady, then shut-off valve #2 is holding tight. However, if gauge drops to zero psid, then shut-off valve #2 is leaking.

If the gauge rises then the #2 shut-off valve is still leaking, but is under backpressure from the facility.

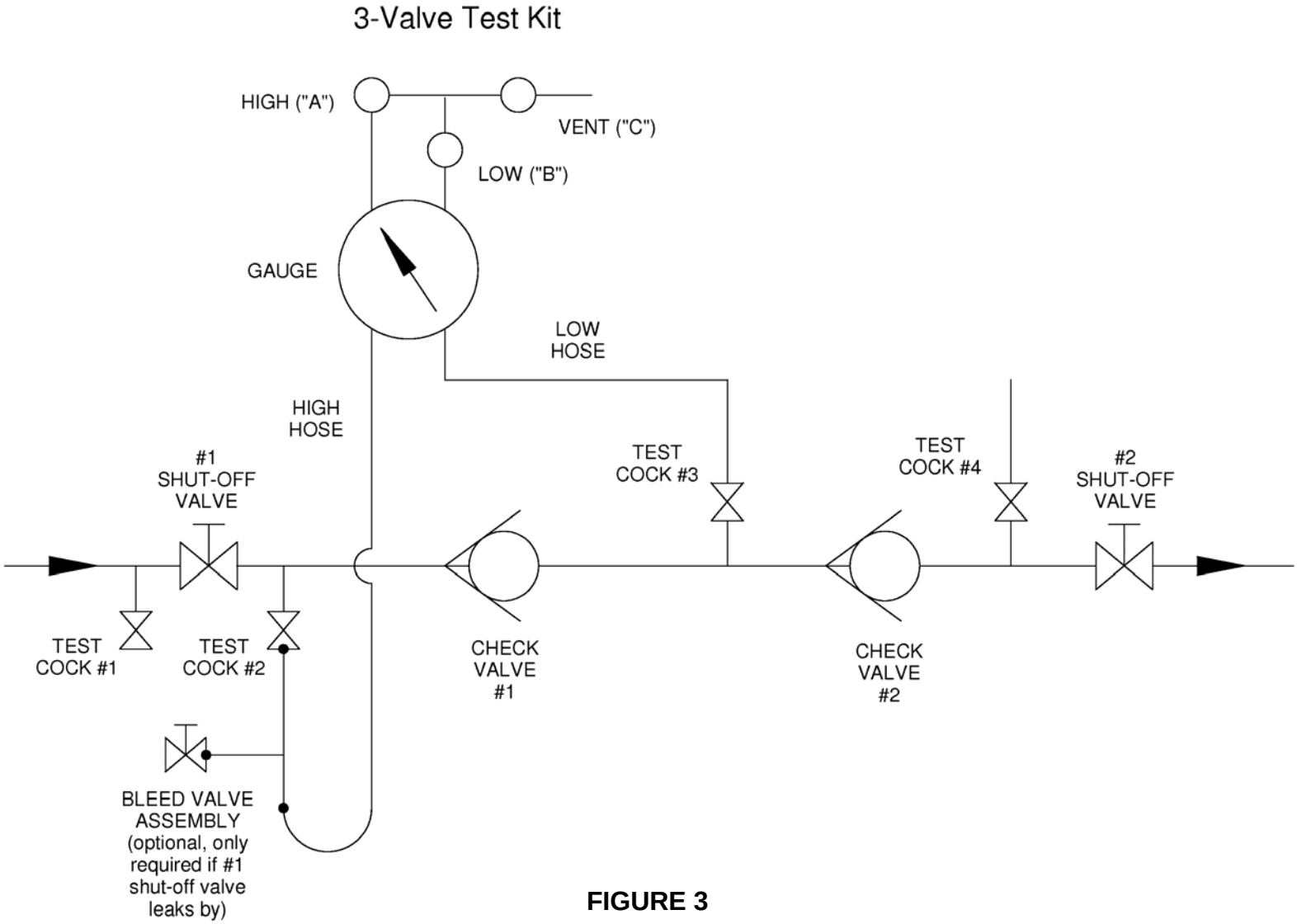

3-Valve Test Kit
HIGH ("A")
VENT ("C")
LOW ("B")
GAUGE
LOW
HOSE
HIGH
HOSE
#1
SHUT-OFF
VALVE
TEST
COCK #3
TEST
COCK #4
#2
SHUT-OFF
VALVE
TEST
COCK #1
TEST
COCK #2
CHECK
VALVE
#1
CHECK
VALVE
#2
BLEED VALVE
ASSEMBLY
(optional, only
required if #1
shut-off valve
leaks by)

FIGURE 3

VI. PARTS LIST 1/2” – 2”

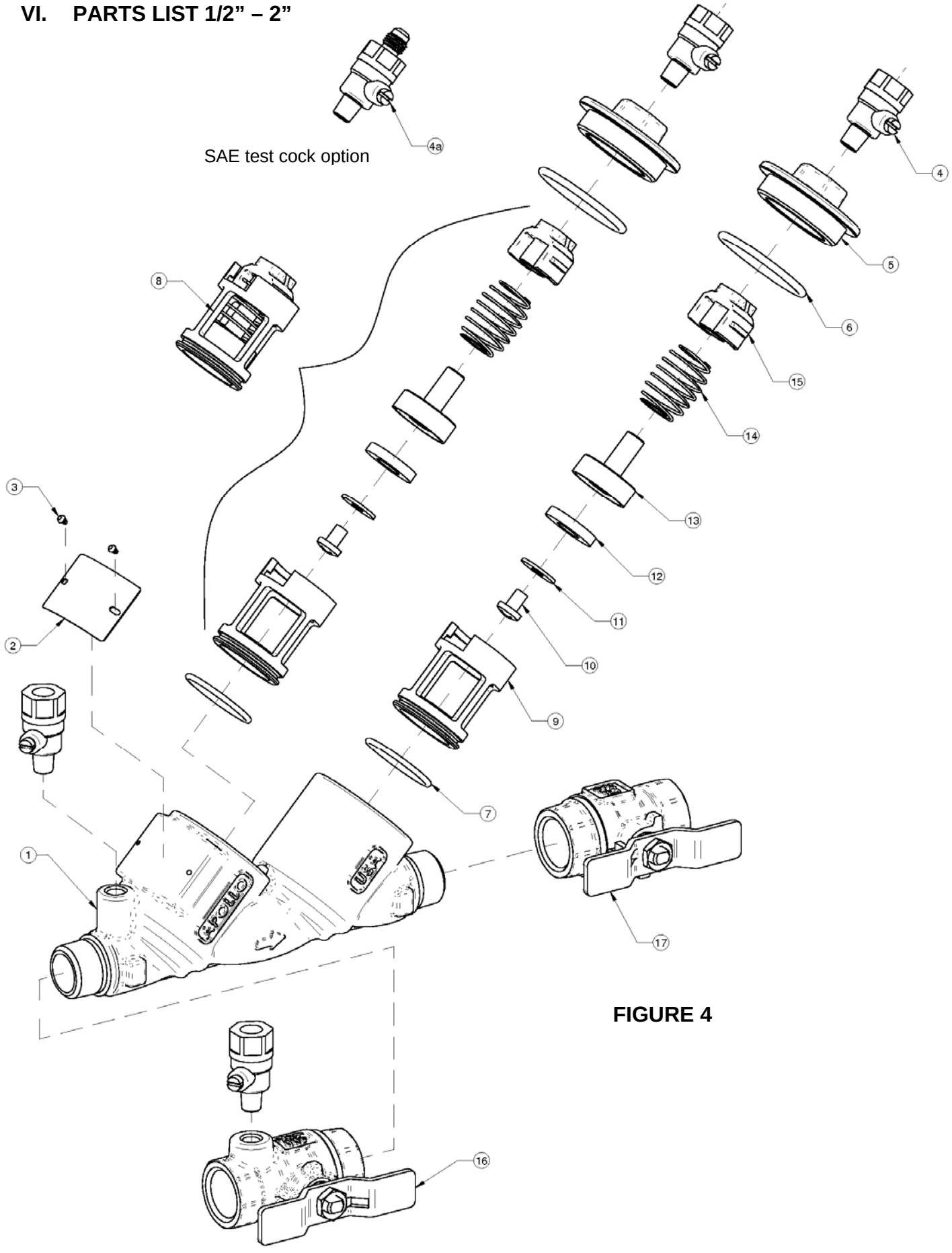


FIGURE 4

DC4A PARTS LIST

ITEM #	DESCRIPTION	QTY.	PART #					
			1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
1	Body	1	Q-6868-05	Q-6792-05	Q-6872-05	Q-6882-05	Q-6884-05	Q-6870-05
2	Label Plate	1	I-9024-00					
3	Label Plate Tack	2	I-2614-00					
4	Test Cock (Standard)	4	78-290-01			78-291-01		
4a	SAE Test Cock (T2F option)	4	78-292-01			78-293-01		
5	Cap	2	F-3846-05	F-3822-05	F-3848-05	F-3850-05		F-3854-05
6	Cap O-Ring	2	D-4881-00	D-4812-00	D-4884-00	D-4885-00		D-4888-00
7	Check O-Ring	2	D-4880-00	D-4744-00	D-4882-00	D-4884-00		D-4885-00
8	Check Module S-Assy (see table below)	2	W-9075-05	W-9003-05	W-9074-05	W-9159-05		W-9204-05

CHECK MODULE SUB-ASSEMBLY PARTS LIST

ITEM #	DESCRIPTION	QTY.	PART #					
			1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
9	Check Seat	1	L-7815-00	L-7727-00	L-7813-00	L-7979-00		L-7983-00
10	Screw	1	B-3279-00	B-1750-00				
11	Disc Retaining Washer	1	E-2372-00	E-2841-00	E-2933-00	E-2860-00		E-2876-00
12	Seat Disc	1	D-4771-00	D-4743-00	D-4770-00	D-4853-00		D-4873-00
13	Poppet	1	K-4491-00	K-4471-00	K-4483-00	K-4511-00		K-4512-00
14	Spring	1	A-2505-00	A-2503-00	A-2510-00	A-2511-00		A-2512-00
15	Spring Retainer	1	L-7814-00	L-7726-00	L-7812-00	L-7980-00		L-7984-00

INLET AND OUTLET SHUT-OFF VALVES

ITEM #	DESCRIPTION		PART #					
			1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
16	T2 standard	Inlet Shut-Off Valve	77B-103-85	77B-104-83	77B-105-83	77B-106-84	77B-107-84	77B-108-84
	T4 option	Inlet Shut-Off Valve w/Union	77B-303-85	77B-304-83	77B-305-83	77B-306-84	77B-307-84	77B-308-84
17	T2 standard	Outlet Shut-Off Valve	77C-103-A4	77C-104-83	77C-105-83	77C-106-84	77C-107-84	77C-108-84
	T4 option	Outlet Shut-Off Valve w/Union	77C-303-85	77C-304-83	77C-305-83	77C-306-84	77C-307-84	77C-308-84
	Replacement Handles for Shut-Off Valves		H-3821-00	H-3818-00		W-9366-00		
4	Standard	Test Cock (MNPT X FNPT)	78-290-01			78-291-01		
4a	T2F option	SAE Flare Test Cock (MNPT X SAE Flare)	78-292-01			78-293-01		

REPAIR KITS

CM is Check Module **C is Complete subassembly(s)** **R is Rubber only**

		DC Checks Rubber Only Kit (One kit repairs one check)				
		Size				
		1/2"	**3/4"**	**1"**	**1-1/4" - 1-1/2"**	**2"**
ITEM #	Repair Kit Model Number	**RK4A12CMR**	**RK4A34CMR**	**RK4A1CMR**	**RK4A112CMR**	**RK4A2CMR**
	Ordering Code	4A-003-01	4A-004-01	4A-005-01	4A-007-01	4A-008-01
not shown	O-Ring Lubricant	I-9016-00				
12	Check Module Seat Disc	D-4771-00	D-4743-00	D-4770-00	D-4853-00	D-4873-00
7	Check Module O-Ring	D-4880-00	D-4744-00	D-4882-00	D-4884-00	D-4885-00
6	Cap O-Ring (for DC)	D-4881-00	D-4812-00	D-4884-00	D-4885-00	D-4888-00

		DC Checks Complete Kit (One kit repairs one check)				
		Size				
		1/2"	**3/4"**	**1"**	**1-1/4" - 1-1/2"**	**2"**
ITEM #	Repair Kit Model Number	**RK4A12CMC**	**RK4A34CMC**	**RK4A1CMC**	**RK4A112CMC**	**RK4A2CMC**
	Ordering Code	4A-003-02	4A-004-02	4A-005-02	4A-007-02	4A-008-02
not shown	O-Ring Lubricant	I-9016-00				
8	Check Module S-ASSY	W-9075-05	W-9003-05	W-9074-05	W-9159-05	W-9204-05
7	Check Module O-Ring	D-4880-00	D-4744-00	D-4882-00	D-4884-00	D-4885-00
6	Cap O-Ring (for DC)	D-4881-00	D-4812-00	D-4884-00	D-4885-00	D-4888-00
extra part*	Bonnet O-Ring (for PVB)	D-4812-00	D-4883-00	D-4887-00	D-4858-00	

*Extra part not needed for DC4A