Model B1 Accelerator with Integral Accelo-Check



PRODUCT DESCRIPTION

The Reliable Model B1 Accelerator with integral Accelo-Check (anti-flooding device) is used to speed the operation of both dry pipe valves (in dry-type automatic sprinkler systems) and deluge valves (in preaction sprinkler systems). Both of these systems utilize pressurized air or nitrogen in the piping, instead of water, to prevent freezing or to prevent the accidental release of water.

The accelerated operation of the dry pipe valve permits an increase in both the number of sprinklers that can be controlled by one dry pipe valve and the volume of the dry system that can be installed.

PRODUCT FEATURES

- Quickens the operation of dry pipe valves.
- Can potentially increase the number of automatic sprinklers controlled by one dry pipe valve.
- Equalizes rapidly as dry system is being filled with air to required pressure.
- Self-adjusts for small fluctuations in system air pressure.
- Compact and light-weight construction.
- Accelo-Check prevents water and debris from entering critical areas.
- Tested and approved for use with Reliable dry pipe and preaction systems.
- UL Listed, FM Approved.

APPROVALS

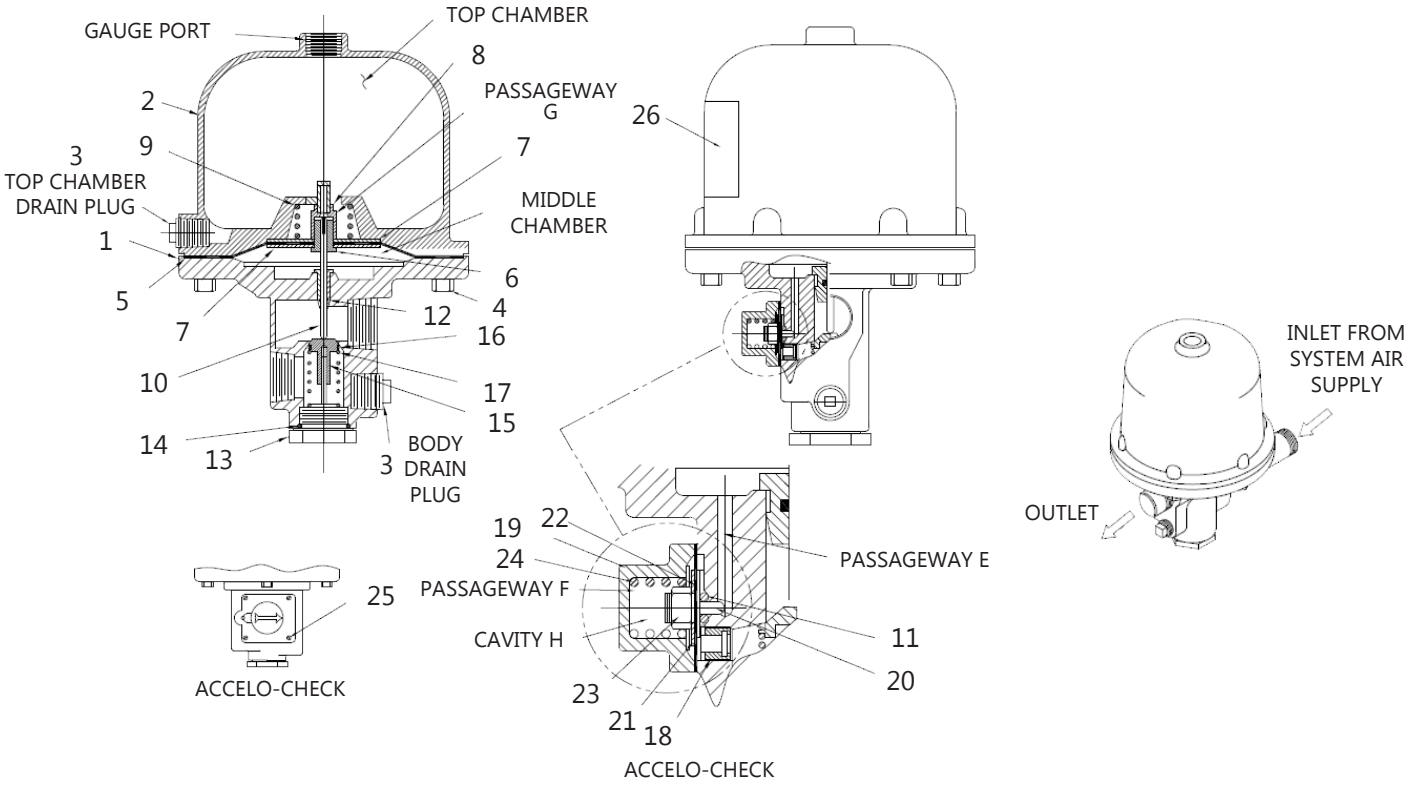
1. Listed by Underwriters Laboratories, Inc.
2. Underwriters Laboratories of Canada for up to 5678 liters (1500 gal.) systems.
3. Approved by Factory Mutual Research Corporation.
4. Loss Prevention Council.

PRODUCT FEATURES

The Model B1 Accelerator is a normally-closed valve with 1/2" NPT inlet and outlet ports, that is highly sensitive to the rate of air pressure change in a dry pipe sprinkler system. This device retains normal dry system air pressure in the top chamber even though pressure in the system may be dropping as a direct result from one or more sprinklers opening.

When a pressure difference of approximately 21 to 28 kPa (3 to 4 psi) occurs between the top and middle chambers, the Model B1 Accelerator opens and vents system pressure, thereby hastening the operation of the dry-pipe or preaction system.

FIGURE 1. Model B1 Accelerator Internal Components



REF: VSRACEB1_072024_REV1

Item Nº.	Description	Nº. Req'd
1	Body push rod guide S/A	1
2	Dome, top chamber	1
3	Drain plug 1/4" NPT	2
4	Top chamber bolt	6
5*	Sensing Diaphragm	1
6	Diaphragm retainer	1
7	Diaphragm washer	2
8*	Diaphragm nut/filter S/A	1
9	Diaphragm Spring	1
10*	Push rod/flow element assy	1
11*	O-ring, accelo - check	1
12*	O-ring, push rod guide	1
13	Valve plug assembly	1
14*	O-ring valve plug	1

Item Nº.	Description	Nº. Req'd
15	Poppet	1
16*	O-ring poppet	1
17	Poppet spring	1
18*	Filter assembly	1
19	Acello - check body	1
20	Acello - check poppet	1
21	Acello - check washer	1
22*	Acello - check diaphragm	1
23	Acello - check nut	1
24	Acello - check spring	1
25	Acello - check screw	4
26	Label, resetting	1
27	Grease, GPL - 201	A/R

* These items are contained in replacement parts kit.
Should replacement parts be needed, use only genuine reliable made parts. When ordering, specify part name and number. Also, name, size, model and serial number of the unit.

Fig. 1 Illustrates a cross-section of the Model B1 Accelerator in the "closed" position while being pressurized. Upon initial setup, the Accelerator is filled by air from the dry pipe system via a 1/2" NPT connection. Air passes through its filter assembly (*item #18*) and *passageway E* to the device's *middle chamber*. This air pressure also lifts the diaphragm assembly (*Items #5 through #8*) off of the push rod (*item #10*) thereby opening up *passageway G*. The air then completely fills the *top chamber* to the match the system pressure. When filled, the diaphragm assembly rests on the end of the push rod closing *passageway G* to all but very small amounts of air movement, thereby allowing slow changes in pressure between the top and middle chambers due to temperature change or small leaks.

Upon a significant air-pressure decay of the sprinkler system piping (such as sprinkler activation), the retained air pressure in the Accelerator *top chamber* exerts a net-downward force across the diaphragm assembly and pushrod (*items 5-8 & 10*). This forces the poppet (*item #15)* to open thereby allowing system air pressure to pass out of the Accelerator 1/2" outlet port and into the intermediate chamber of the dry pipe valve (or to atmosphere depending on the type of system to which it is installed). This in turn will activate the dry pipe valve. Simultaneously, pressurized air also passes through the Accelerator and closes the integral *Accelo-Check* (*items #11, #19 through #25*) by pressurizing *cavity H*, thereby preventing water and waterborne debris from entering the internal restriction area in *passageway E*. This increases the reliability of the Accelerator.

INSTALLATION

The Reliable Model B1 Accelerator is quickly attached to various valves and systems manufactured by Reliable. Table 1 lists the appropriate part numbers as well as technical bulletins which include installation details.

When installed into the basic trim of a Reliable Model D or Model FX Dry Pipe Valve, the Accelerator 1/2" outlet port should be directly connected to the intermediate chamber of the dry pipe valve. In this application, the Model B1 Accelerator directly assists the clapper of the dry pipe valve to open.

For installations into all other Reliable-manufactured dry systems such as Models DDX, DDX-LP & EX, the Accelerator 1/2" outlet port should be vented to the atmosphere. These types of systems do not utilize differential-type clappers that require additional air pressure to operate. Instead, these systems utilize a pneumatic actuator to seal a push rod chamber and mechanically latch a valve closed. In this instance, the Model B1 Accelerator speeds up the purging of the air side of the Model LP Actuator which in turn vents the push-rod chamber pressure of the main fire control valve causing its clapper to open and fill the system piping with water.

Note: The Model B1 Accelerator may be capable of hastening the operation of non-Reliable manufactured valves, however, it has only been tested and approved with Reliable valves.

SYSTEM REQUIREMENTS

NFPA (National Fire Protection Association) 13 titled "Installation of Sprinkler Systems", specifies that Accelerators (quick-opening devices) are required on dry systems having capacities of more than 500 gallons. However, exceptions permit the omission of quick-opening devices for larger systems when water can be delivered to the inspector's test connection in less than 60 seconds.

- Reliable's Accelerator is UL Listed for system volumes to 1500 gallons. This capability is also approved by FM.
- System pneumatic pressure must be maintained at a minimum of 15 psi in order for the Accelerator to operate.

It must be cautioned that accelerator operation and water delivery at the inspector's test connection does not occur at the same time. There is a delay while the air is being expelled through the inspector's test connection ahead of the water. This time delay depends on the piping configuration system size, available water supply and other factors which are beyond the control of the accelerator.

Figure 2 provides a graph of approximate Accelerator operating time versus system size when one sprinkler head opens. The time of operation of the Accelerator is relatively unaffected by inlet pressures so the graph applies for all normal dry system pressures from 25 psi to 50 psi (1.7 bar to 3.4 bar). As described above, water delivery time will significantly exceed the accelerator operating times shown in *Figure 2*.

FIGURE 2. Model B-1 Accelerator Operating Time

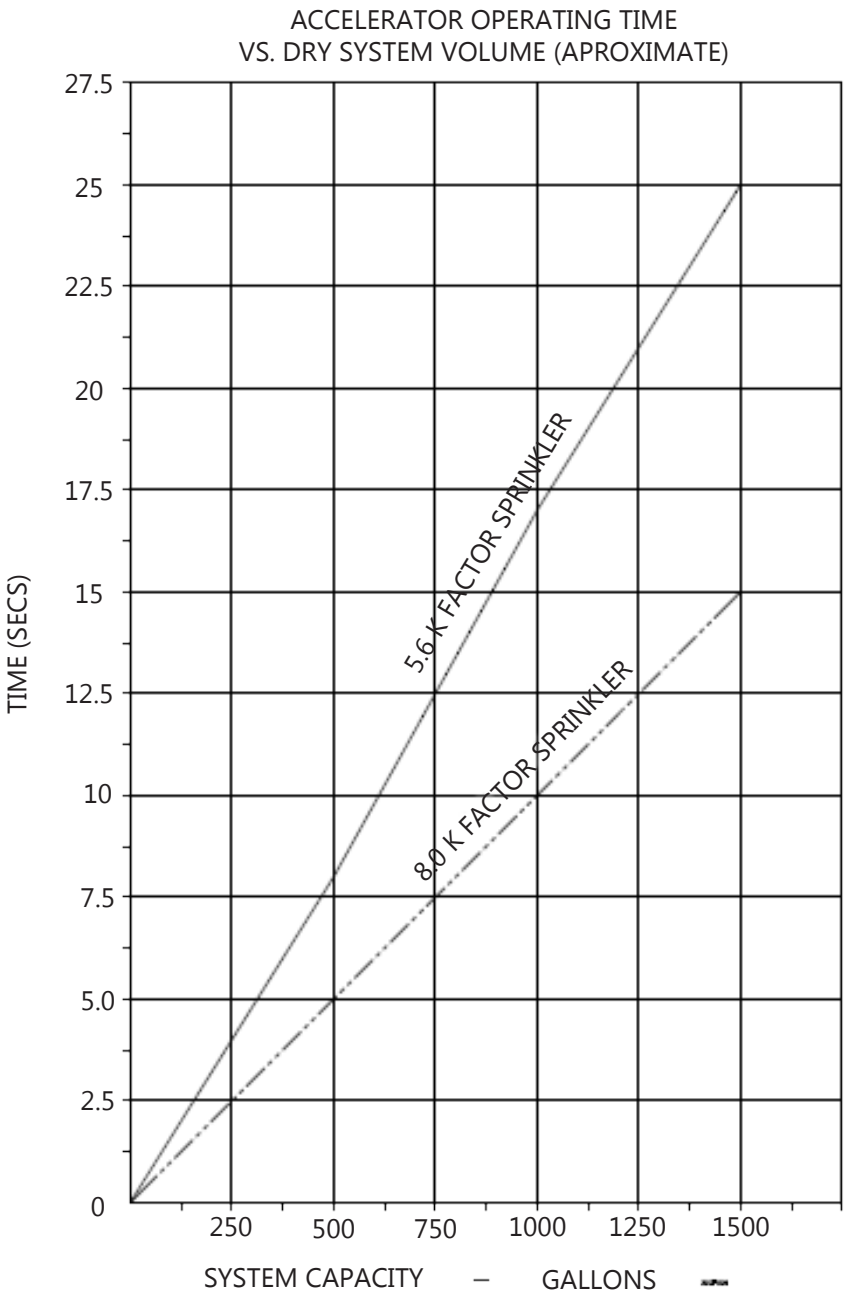


TABLE A: Accelerator Compatibility

Valve	System type	Trim kit
Model D	Dry pipe	Not included
Model EX	Dry pipe	Included
Model DDX-LP	Dry pipe	Included
Model DDX Type F	Double Interlock Preaction	Included
Model DDX Type PL	Double Interlock Preaction	Included
Model FX	Dry pipe	Included

RESETTING PROCEDURE FOR MODEL D DRY PIPE VALVE SYSTEMS

Note: These steps must be followed each and every time the system has operated or is tested.

1. Isolate the Accelerator by closing the inlet and outlet valves.

2. Close the air supply and main water supply valves to the dry pipe valve. Drain and fully reset the dry pipe valve in accordance with the manufacturer's instructions.

3. Close the main water supply control valve and open the system main drain. This step serves to prevent accidental operation of the system while resetting the Accelerator.

4. Remove the 1/2" drain plugs on the inlet and outlet piping.

5. Remove the 1/4" body drain plug from the lower section of the Accelerator.

6. Remove the 1/4" top chamber drain plug. If water is present in the top chamber, disassemble the Accelerator, clean and dry the top and middle chambers and diaphragm assembly using a clean lint free cloth. Reassemble the Accelerator. Replace the top chamber drain plug using new thread sealant.

7. Carefully remove the Accelo-Check Body and gently lift the Accelo-Check Diaphragm Assembly to verify venting of the middle chamber. Carefully reinstall these parts.

8. Partially open the Accelerator inlet valve, gently purging any water which may be in the trim lines. Close the inlet valve.

9. Replace the 1/2" drain plugs on the inlet and outlet piping.

10. Partially open Valve A and gently purge the Accelerator. Close Valve A and replace the 1/4" body drain plug on the lower section of the Accelerator.

11. Open the Accelerator outlet valve.

12. Pressurize the Accelerator by opening the inlet valve. When properly set, the top chamber pressure of the Accelerator should equal the system pressure.

13. Slightly open the main water supply control valve. Slowly close the main drain valve when water flows, then fully open the main supply valve. The system is now ready for service.

RESETTING PROCEDURE FOR MODEL FX DRY PIPE VALVE SYSTEMS

Note: These steps must be followed each and every time the system has operated or is tested.

1. Isolate the Accelerator by closing the inlet and outlet valves.

2. Close the air supply and main water supply valves to the dry pipe valve. Drain and fully reset the dry pipe valve in accordance with the manufacturer's instructions.

3. Close the main water supply control valve and open the system main drain. This step serves to prevent accidental operation of the system while resetting the Accelerator.

4. Remove the 1/4" body drain plug from the lower section of the Accelerator.

5. Remove the 1/4" top chamber drain plug. If water is present in the top chamber, disassemble the Accelerator, clean and dry the top and middle chambers and diaphragm assembly using a clean lint free cloth. Reassemble the Accelerator. Replace the top chamber drain plug using new thread sealant.

6. Carefully remove the Accelo-Check Body and gently lift the Accelo-Check Diaphragm Assembly to verify venting of the middle chamber.

7. Partially open inlet valve and gently purge the Accelerator. Close inlet valve and replace the 1/4" body drain plug on the lower section of the Accelerator.

8. Reopen inlet valve to purge the inlet filter assembly. Close the inlet valve.

9. Reinstall the Accelo-Check assembly to the accelerator.

10. Open the Accelerator outlet valve.

11. Pressurize the Accelerator by opening the inlet valve. When properly set, the top chamber pressure of the Accelerator should equal the system pressure.

12. Slightly open the main water supply control valve. Slowly close the main drain valve when water flows, then fully open the main supply valve. The system is now ready for service.

Note: These steps must be followed each and every time the system has operated or is tested.

1. Isolate the Accelerator by closing the inlet valve.

2. Close the air and water supply valves to the deluge valve. Drain and reset the system in accordance with the manufacturer's instructions.

3. Close the main water supply control valve and open the system main drain. This step serves to prevent accidental operation of the system while resetting the Accelerator.

4. Remove the 1/4" body drain plug from the lower section of the Accelerator.

5. Remove the 1/4" top chamber drain plug. If water is present in the top chamber, disassemble the Accelerator, clean and dry the top and middle chambers and diaphragm assembly using a clean lint free cloth. Reassemble the Accelerator. Replace the top chamber drain plug using new thread sealant.

6. Carefully remove the Accelo-Check Body, and gently lift the Accelo-Check Diaphragm Assembly to verify venting of the middle chamber.

7. Partially open inlet valve and gently purge the Accelerator. Close inlet valve and replace the 1/4" body drain plug on the lower section of the Accelerator.

8. Reopen inlet valve to purge the inlet filter assembly. Close the inlet valve.

9. Reinstall the Accelo-Check assembly to the accelerator.

10. Pressurize the Accelerator by opening the inlet valve. The top chamber pressure of the Accelerator of the Accelerator should equal the system pressure.

9. Slightly open the main water supply control valve. Close the main drain valve when water flows, then fully open the main supply valve.

RECOMMENDED PERIODIC INSPECTIONS

The following inspections should be performed on the Model B1 Accelerator on a weekly basis.

1. Check that the correct system air pressure is being maintained.
2. Verify that Accelerator top chamber pressure and system air pressure are equal.
3. Verify that the valves located on both the Accelerator's inlet and outlet lines are in the open position. A valve located on the Accelerator outlet port should only be present if the Accelerator is connected into a dry pipe valve intermediate chamber. Otherwise, the Accelerator outlet port should vent to the atmosphere.
4. Check that the prime water level is correct (if applicable).

TEST

The following Accelerator tests should be performed semiannually or whenever the Accelerator has been disassembled.

A) <u>Accelerator test without operating the dry pipe valve.</u>

1. Isolate the Accelerator by closing the valves located on its inlet and/or outlet ports.
2. Loosen the 1/4" (lower) body drain plug in order to decay the pressure at the inlet of the Accelerator. This will simulate a system decay as when one or more sprinklers open. The Accelerator should operate.
3. Reset the Accelerator following the instructions described in the "Resetting Procedure" sections of this bulletin.

B) <u>Sensitivity Test (Model D Dry Pipe Valves only).</u>

1. Close the main water supply control valve.
2. Bleed the system air pressure at a rate of 1 psi per minute.
3. After ten minutes (the air pressure should have decayed 10 psi) the Accelerator should not have tripped.
4. Restore the system air pressure and reopen the main water supply control valve.

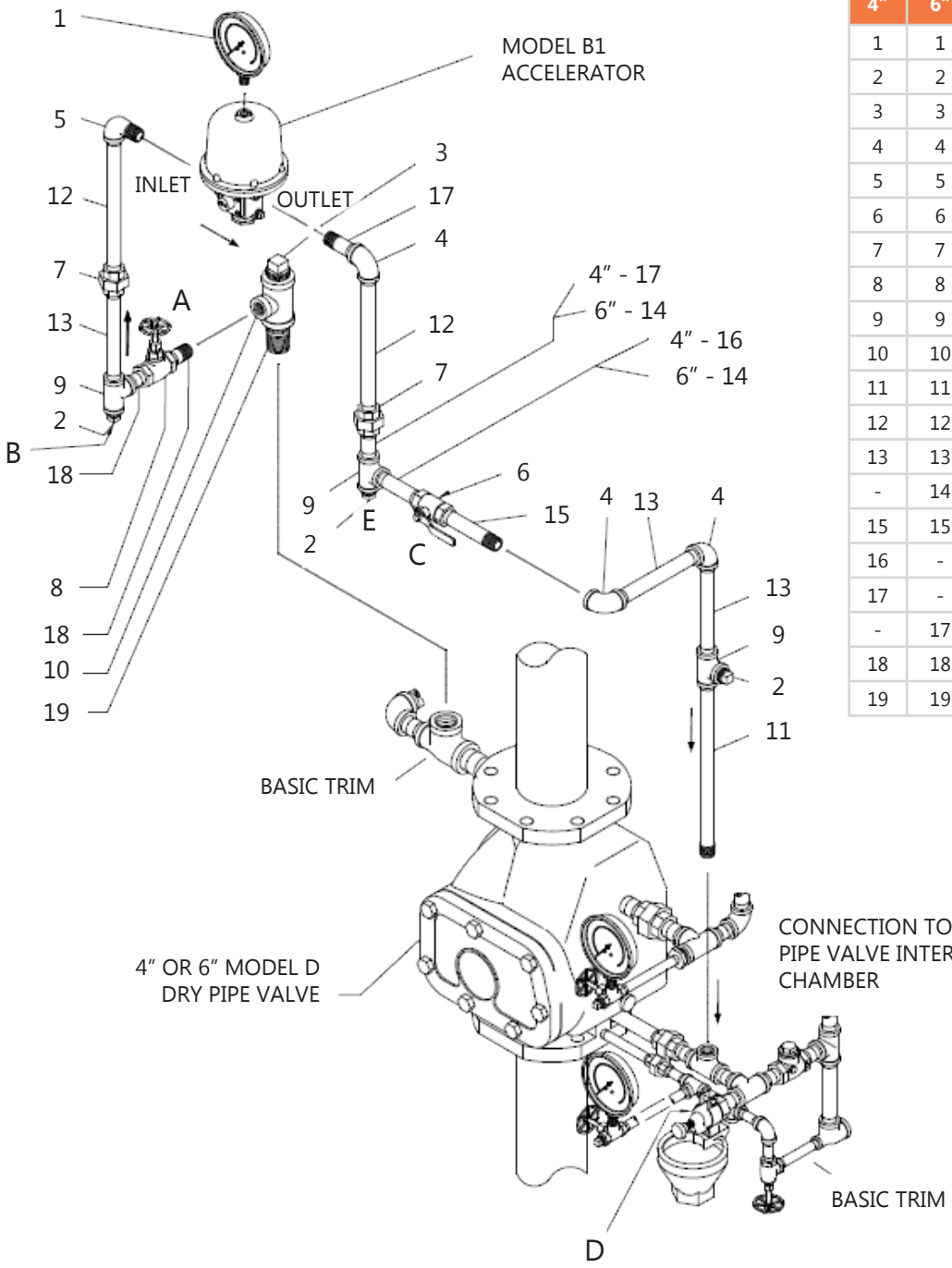
MAINTENANCE & TROUBLE SHOOTING (REFER TO FIG. 1)

The following table provides a simplified, trouble-shooting guide which indicates the necessary corrective maintenance for the more common problems, which may occur.

Symptom	Probable Cause	Correction
Air flows rapidly through the Accelerator and into the outlet port when resetting.	The Push-Rod is in the held down position by contamination, the Push-Rod is bent or the Push-Rod guide is too tight.	Clean or replace as needed.
Minor air flow or leakage through the Accelerator.	1. Contamination in the poppet area. 2. The Poppet "O"-Ring has blown off the Poppet, or is cut. 3. The Accelo-Check diaphragm has a hole or rip allowing air to reach the outlet through passageway (F). 4. Leakage past the Push-Rod Guide "O"-Ring. 5. The Push Rod or Push-Rod Guides damaged causing leakage.	1. Clean. 2. Install new "O"-Ring. 3. Replace. 4. Replace. 5. Replace.
No or low air pressure in the top chamber (gauge pressure does not increase, and no air pressure in the outlet).	1. Filter assembly is clogged. 2. Restriction area (Passageway G) is clogged or the filter on the diaphragm nut is clogged.	1. Replace 2. Replace.
Accelerator will not trip during a system test.	1. The top chamber air pressure is bleeding back to the system too fast through restriction area. 2. The top chamber air pressure is bleeding back to the system through the ripped diaphragm. 3. External leak in top chamber. 4. Filter assembly restricted.	1. Clean the top of the Push-Rod and mating surface in diaphragm nut, or replace. 2. Replace 3. Check the gauge and the drain plug for tightness-use new PTFE tape on the plug after each resetting. 4. Replace.
Accelerator floods with water.	1. Inspect check valve for leakage when system is filled with water. 2. The Accelo-Check "O"-Ring is missing or cut. 3. Leakage past the Push-Rod Guide "O"-Ring. 4. Push rod or Push-Rod Guide is damaged allowing leakage. 5. Condensate from the compressor has not been drained.	1. Wipe off the clapper facing and seat clean. 2. Replace if necessary. 3. Replace. 4. Replace. 5. Drain water from compressor and air supply line.
Accelerator operates prematurely.	1. Water or dirt in the restriction area. 2. Air is not bleeding back through the restriction area to compensate for minor pressure fluctuations. 3. Dry pipe valve is operating prematurely - not the accelerator. 4. On-Off is setting of the compressor's pressure switch allowing the system pressure to decay too far.	1. Clean top of the Push-Rod and mating surface-perform sensitivity test. 2. Replace Push-Rod and / or diaphragm nut. In "Test" section of this Technical Bulletin - perform sensitivity test. 3. Review the correct pressure settings from the corresponding system's technical bulletin. 4. Readjust the differential of pressure switch to minimum (6-8 psi) when using an accelerator.

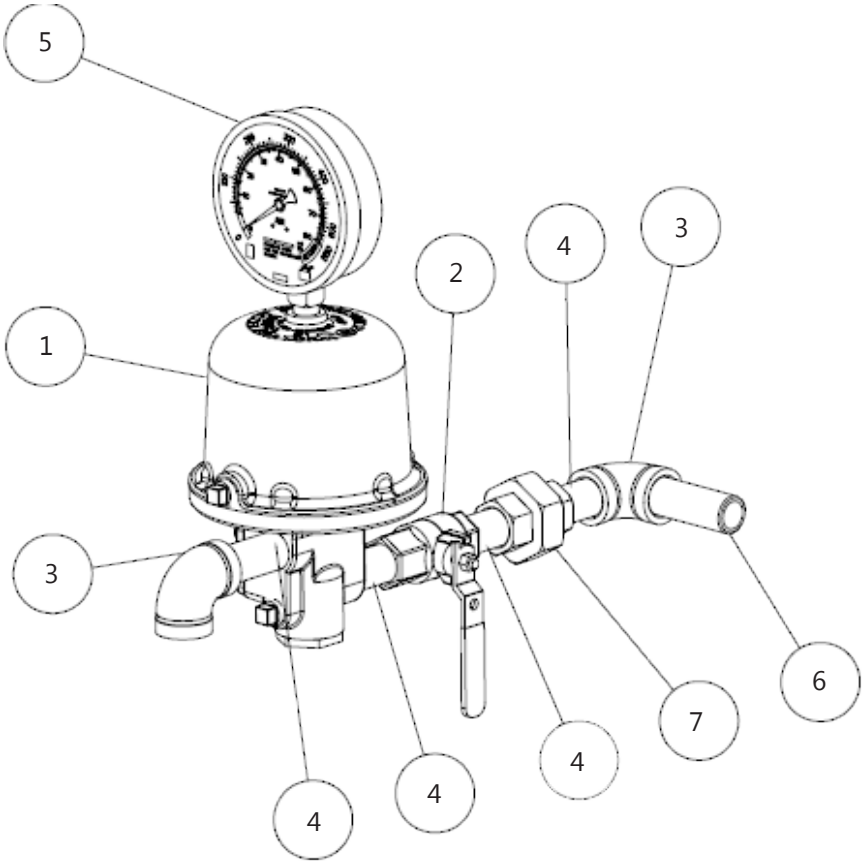
FIGURE 3. Model B1 Accelerator on Model D 4" & 6" Dry Pipe Systems

Model B1 accelerator and Trim kit.
Note: trim kit doesn't include accelerator.



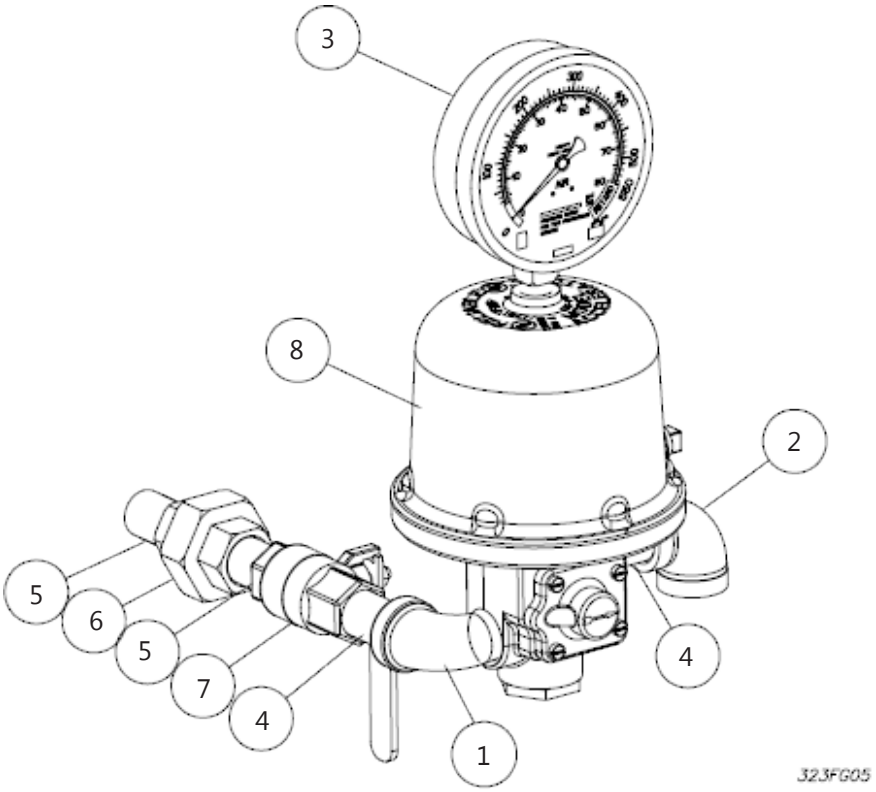
Valve size			Qty.
4"	6"	Description	
1	1	Gauge, pressure-air	1
2	2	Plug, 1/2"	3
3	3	Plug 1"	1
4	4	Elbow, 1/2"	3
5	5	Elbow, street, 1/2"	1
6	6	Ball valve. 1/2"	1
7	7	Union, 1/2"	2
8	8	Valve globe, bronze 1/2"	1
9	9	Tee, 1/2" x 1/2" x 1/2"	3
10	10	Tee, 1" x 1" x 1/2"	1
11	11	Nipple, 1/2" x 10 1/2"	2
12	12	Nipple, 1/2" x 8 1/2"	2
13	13	Nipple, 1/2" x 6"	3
-	14	Nipple, 1/2" x 5 1/2"	2
15	15	Nipple, 1/2" x 4"	1
16	-	Nipple, 1/2" x 3 1/2"	1
17	-	Nipple, 1/2" x 2 1/2"	2
-	17	Nipple, 1/2" x 2 1/2"	1
18	18	Nipple, 1/2" x 2"	2
19	19	Nipple, 1" x CLOSE	1

FIGURE 4. Model B1 Accelerator on Model EX Systems



Item	Description
1	Accelerator, Model B1
2	Valve, ball, 1/2"
3	Elbow, 1/2", mall iron, galv.
4	Nipple, steel, galv. ,1/2" x 2"
5	Gauge, air pressure (0-80PSI)
6	Nipple, steel, galv., 1/2" x 2 1/2"
7	Union, 1/2", G.J., Galv.

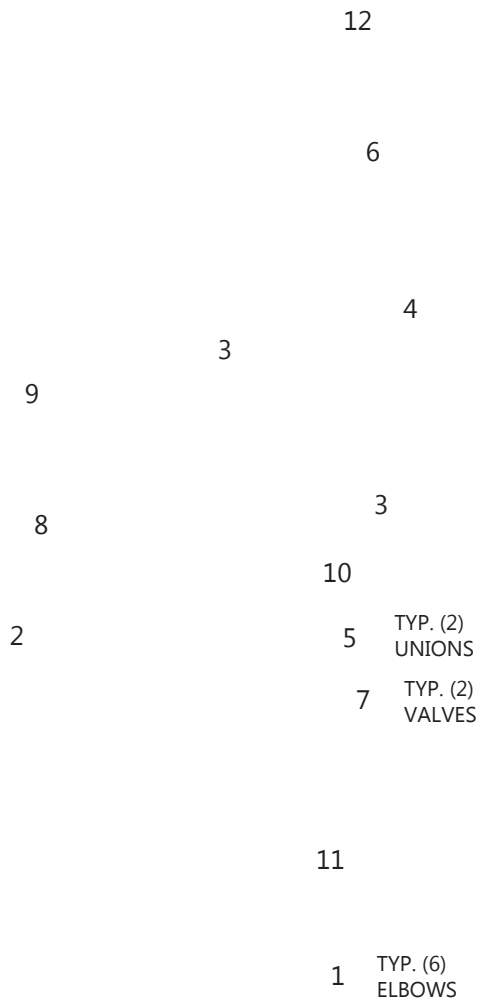
FIGURE 5. Model B1 Accelerator on Model DDX Systems



Item	Description
1	Elbow, street, 1/2", galv.
2	Elbow, 1/2", mall iron, galv.
3	Gauge, aire pressure (0-80PSI)
4	Nipple, steel, galv., 1/2" x 2"
5	Nipple, steel, galv., 1/2" x 1 1/2"
6	Union, "O" Ring seal, galv., 1/2"
7	Valve, ball, 1/2"
8	Accelerator, model B1

FIGURE 6. Model B1 Accelerator on Model FX Systems

1	Elbow, 1/2", Mall Iron, Galv.	6
2	Nipple, Steel, Galv., 1/2" x 5-1/2"	1
3	Nipple, Steel, Galv., 1/2" x 2-1/2"	4
4	Nipple, Steel, Galv., 1/2" x 9"	1
5	UNION, 1/2", IRON, G.J., GALV	2
6	ACCELERATOR, MODEL B1	1
7	Valve, Ball, 1/2" NPTF x 1/2" NPTM	2



Item	Description	Remarks	QTY.
8	Nipple, Steel, Galv., 1/2" x 5"	2", 2 1/2", 3", 4" & 76mm valves	1
	Nipple, Steel, Galv., 1/2" x 4"	6" & 165mm valves	
9	Nipple, Steel, Galv., 1/2" x 9 1/2"	2 1/2", 3" & 76mm valves	1
	Nipple, Steel, Galv., 1/2" x 9"	2", 4, 6" & 165mm valves	
10	Nipple, Steel, Galv., 1/2" x 1 1/2"	2" valve	1
	Nipple, Steel, Galv., 1/2" x 4"	2 1/2", 3", 4" & 76mm valves	
	Nipple, Steel, Galv., 1/2" x 5"	6" & 165mm valves	
11	Nipple, Steel, Galv., 1/2" x 9"	2 1/2", 3" & 76mm valves	1
	Nipple, Steel, Galv., 1/2" x 9 1/2"	2", 4, 6" & 165mm valves	
12	Gauge, Air Pressure (0 - 80psi)		1