

## VP525A,C Pneumatic Radiator Valves

### SERVICE DATA

### GENERAL

#### Description

The VP525A,C Pneumatic Radiator Valves are normally open, single-seated valves with straight-through or angle-body construction. The VP525A rating is 180°F (82°C) maximum and the VP525C rating is 240°F (116°C).

NOTE: Solder-body VP525A Valves are obsolete (superseded by VP531 Valves).

### APPLICATION

These valves typically provide control of two-pipe water or steam systems.

### OPERATION

An increase in branchline pressure from a thermostat causes the valve to close proportionally, modulating the flow through the valve (Fig. 1). The valve is fully open when the branchline pressure is at or below the actuator range low end and is fully closed when the branchline pressure is at the high end.

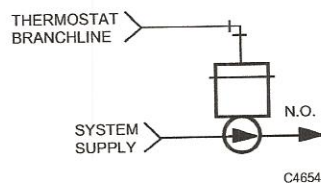


Fig. 1. Typical valve operation.

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### SPECIFICATIONS

**Action:** Normally open, air pressure to close.

**Capacity Index:** See Table 1.

**Operating Range:** See Table 1.

**Close-Off Rating:** See Fig. 2 and 3.

#### Construction:

Body: Cast bronze.

Stem: Stainless steel, 3/16 in. (5 mm) diameter.

Packing: Teflon, spring loaded, self adjusting.

Seats:

Solder body: Integral only.

Threaded body: Integral on 3.0 and 3.5 Cv, 1/2 in. valves.  
(removable on all others).

**Flow Characteristics:** Modified linear.

#### Body Pressure Rating (Nominal):

Solder body: 250 psi (1724 kPa).

Threaded Body: 150 psi (1034 kPa).

#### Controlled Medium Temperature:

VP525A: 180°F (82°C) maximum.

VP525C: 240°F (116°C) maximum.

Maximum allowable difference for alternating hot and cold water: 140°F (78K).

#### Maximum Pressure Differential for Quiet Service and Normal Life of Disc and Seat:

Water: 20 psi (138 kPa).

Steam: 10 psi (69 kPa).

**Actuator:** Rolling diaphragm type.

**Air Connection:** Integral, for 1/4 in. (6 mm) O.D. plastic tubing.

**Maximum Safe Air Pressure:** 30 psi (207 kPa).

**Maximum Safe Diaphragm Temperature:** 230°F (110°C).

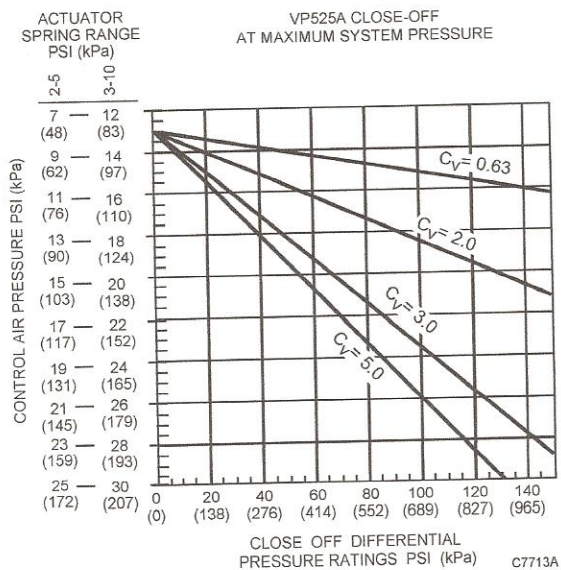


**Table 1. VP525 Capacity Index, Pressure Range, and Fitting Sizes.**

Body Type	Fitting Size O.D. in in.	C <sub>v</sub>	Pressure Range in psi (kPa)
Solder <sup>a</sup>	5/8	1.6	2-5 (14-34)
			3-10 (21-69)
			8-11 (55-76)
	7/8	2.5	2-5 (14-34)
			3-10 (21-69)
			8-11 (55-76)
Threaded	1/2 NPT	0.4 <sup>a</sup>	3-10 (21-69)
		0.63	3-10 (21-69)
		2.0	2-5 (14-34)
			3-10 (21-69)
		3.0	2-5 (14-34)
			3-10 (21-69)
	3/4 NPT	3.5 <sup>a,b</sup>	8-11 (55-76)
		3.0	3-10 (21-69)
			2-5 (14-34)
			3-10 (21-69)

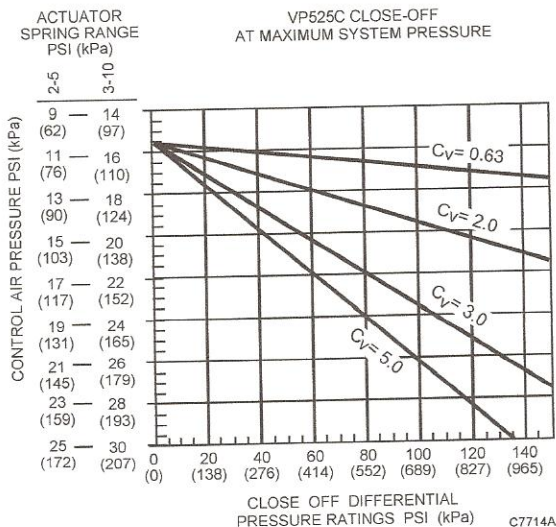
<sup>a</sup> Obsolete.

<sup>b</sup> Quick-opening flow characteristic.



**Fig. 2. VP525A close-off ratings at various control air pressures.**

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**Fig. 3. VP525C close-off ratings at various control air pressures.**

## MAINTENANCE

### Inspection and Cleaning

1. Inspect valve for leaks around the packing. If repacking is necessary, see Packing Replacement section.
2. Check for secure: pneumatic lines and connection to the valve.

### **WARNING**

**Personal Injury Hazard.**

Careless handling of solvents can permanently injure the respiratory system and skin tissue.

Use solvents in a well ventilated area. Avoid prolonged inhalation of solvents and/or contact with the skin.

3. Use commercial cleaning solvent to remove all dirt and grease accumulation from around the valve assembly.

### Operational Check

1. Set thermostat above present space temperature. Valve should open and space temperature gradually rise.
2. Set thermostat below present space temperature. Valve should close and space temperature gradually drop.
3. Return thermostat to desired setting.

## TROUBLESHOOTING

### Equipment Required

The following are available from Honeywell Direct:

- 305923 Gage, 0 to 30 psi (0 to 207 kPa).
- CCT852 Pressure Bulb.
- CCT853 Plastic Tubing, 5/32 in. (4 mm) O. D.
- CCT1614B T-Fitting, 1/4 x 1/4 x 1/8 in. NPT.

### Underheating

If room temperature is lower than the thermostat setting, check branchline pressure at the valve:

1. No branchline pressure at valve:
  - a. If heat is present in piping to valve, the valve (or steam trap) is stuck closed. If valve is stuck, free it by removing top and operating valve stem manually.
  - b. If evidence exists of leakage around valve stem, repack valve (see Packing Replacement section).
  - c. If stem binding or sticky operation persists, replace the top and insert assembly (or entire valve).
2. Branchline pressure present: Valve opens when the branchline is removed. Cap line and check thermostat operation and calibration. If the valve does not open, return to step 1.

### Overheating

If room temperature is higher than thermostat setting, check branchline pressure at valve:

1. No or low branchline pressure at valve:
  - a. Check for air leaks in thermostat branchline.
  - b. If branchline is OK, cap line and check thermostat operation and calibration.
2. Branchline pressure present:
  - a. If branchline pressure decreases when fed to the actuator, the diaphragm is defective. Replace top (see Diaphragm Replacement section).
  - b. Check the Troubleshooting Flowchart (Fig. 4) to determine that branchline pressure is sufficient for tight close-off and system pressure is not excessive.
    - (1) If air pressure is maintained and heating medium still flows through the valve, the problem is either a stuck valve stem, or defective seat/molded plug.
    - (2) Disassemble the valve to replace these parts (See Stem and Disc Holder Assembly and/or Valve Seat Replacement section).

NOTE: Some models do not include a removable valve seat. Defective seats in these valves require complete valve replacement.

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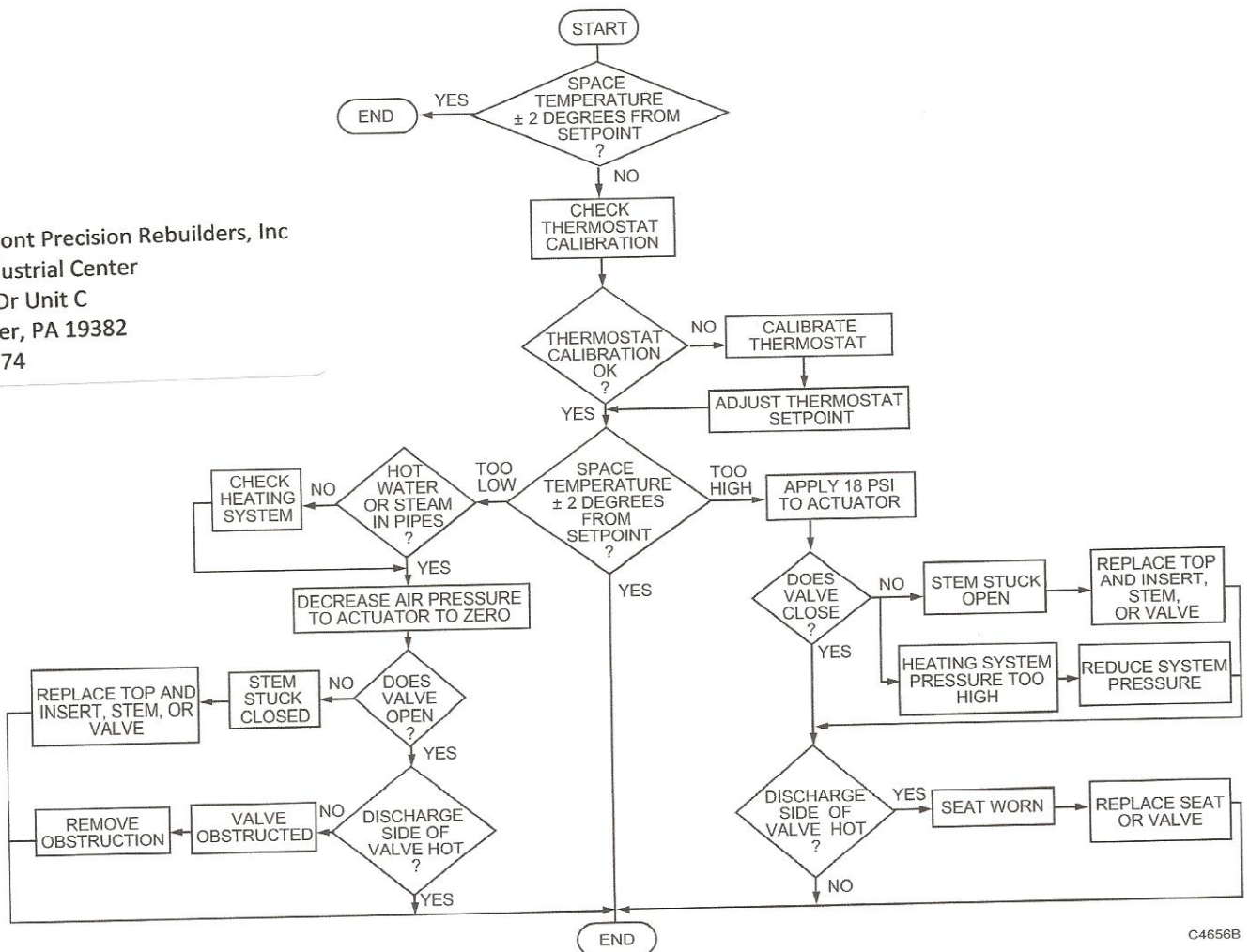


Fig. 4. VP525A,C troubleshooting flowchart.

## REPAIR

### Equipment Required

- Thin, open-end wrench:
  - For solder body valves: 1-1/4 in. wrench.
  - For 1/2 in. valves: 1-1/2 in. wrench.
  - For 3/4 in. valves: 1-1/4 in. wrench.
- Commercial cleaning solvent.

### **!** WARNING

**Personal Injury Hazard.**  
**Careless handling of solvents can permanently injure the respiratory system and skin tissue.**  
 Use solvents in a well ventilated area. Avoid prolonged inhalation of solvents and/or contact with the skin.

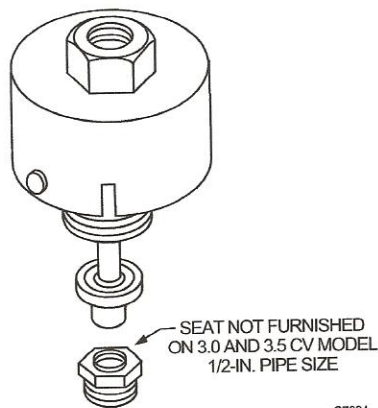


Fig. 5. Top and insert assembly (see Table 2).

### Diaphragm Replacement

For faulty diaphragm, replace top (14003102-001, plastic construction; or 14003648-001, metal construction). The top consists of cover, connector, and diaphragm. See Fig. 7.

NOTE: Use 14003648-001 Top (metal) on steam when air inlet is piped with copper tubing, or on jobs requiring rugged installation such as exposed radiation.

1. Remove branchline tubing at actuator fitting.
2. Remove cover locking fastener.
3. Push down and turn cover counterclockwise to disengage bonnet locking tabs.
4. Lift top off.
5. Install replacement top in reverse manner.

### Packing Replacement

Repack valves without system shutdown:

1. Remove top (see Diaphragm Replacement section).
2. Disengage spring retaining cup and remove coil spring.
3. While holding stem in upper position, remove: packing nut, packing, packing cup, and packing spring.
4. Clean all parts with commercial cleaning solvent.
5. Inspect valve stem for worn or scored areas. If replacement is necessary, see Stem and Disc Holder Assembly and/or Valve Seat Replacement section.
6. Reassemble components, including new packing, in reverse manner.
7. Replace top.

### Stem and Disc Holder Assembly and/or Valve Seat Replacement

Shut down and remove pressure from the system before disassembling valve:

1. Remove top (see Diaphragm Replacement section).
2. Disengage spring retaining cup and remove coil spring.
3. Remove packing nut and packing components.
4. Remove bonnet from valve body for access to the stem, disc, and seat.
5. Inspect valve seat and replace if necessary.
6. Install new stem and disc assembly or top.
7. Insert assembly.
8. Reassemble all parts, connect actuator to branchline, and turn on system.

## PARTS AND ACCESSORIES

### Parts List

Table 2. Serviceline Kits—Replacement Top and Insert Assemblies (See Fig. 5).

Body Type	Part Number	Use With
Solder	14003299-001	VP525A1002, 1010, and 1028 (5/8 in. O.D. body, 1.6 C <sub>v</sub> ).
	14003300-001	VP525A1036, 1044, and 1051 (7/8 in. O.D. body, 2.5 C <sub>v</sub> ).
Threaded	14003115-001	VP525A1069, 1077, 1085, 1390 <sup>a</sup> , 1408 <sup>a</sup> , and 1416 (1/2 in. valves, 2.0 C <sub>v</sub> or less).
	14003117-001	VP525A1143, 1150, and 1168 (3/4 in. valves, 3.0 C <sub>v</sub> ).
	14003118-001	VP525A1184, 1192, 1200, 1218, and 1226 (3/4 in. valves, 5.0 C <sub>v</sub> ).
	14003119-001	VP525A1093, 1101, 1127, 1119, and 1135 (1/2 in. valves, 3.0 C <sub>v</sub> ). VP525A1176: Field to replace stem and plug on 14003119-001 with 14004553-003
	14004897-001	VP525C1008 (1/2 in. valve, 0.63 C <sub>v</sub> ).
	14004897-002	VP525C1016, 1040 (1/2 in. valve, 2.0 C <sub>v</sub> ).
	14004897-003	VP525C1024, 1057 (3/4 in. valve, 3.0 C <sub>v</sub> ).
	14004897-004	VP525C1032, 1065 (3/4 in. valve, 5.0 C <sub>v</sub> ).
	14004897-005	VP525C1073, 1081 (1/2 in. valve, 3.0 C <sub>v</sub> ).

<sup>a</sup> Replacement Top and Insert Assembly increases C<sub>v</sub> to 1.6.

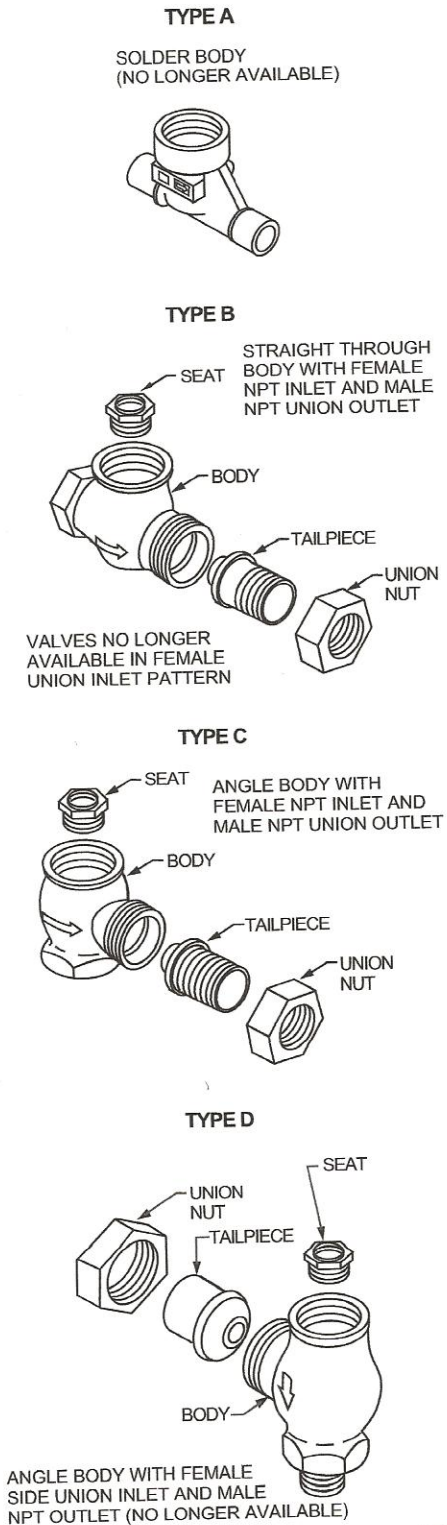
NOTE: All Serviceline Kits include three color-coded springs of ranges: 2-5, 3-10, and 8-11 psi (14-34, 21-69, and 55-76 kPa) as shown in Fig. 6, and replacement seats where applicable (see Fig. 6 and Table 3).

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Table 3. Body Type, Nuts, and Seats (See Fig. 6).

OS Number		Body Type	C <sub>v</sub>	Connection Size (in.)	Part Number	
Series 2 VP525C	VP525A				Seat	Nut
—	1002 <sup>a</sup>	A	1.6	5/8 O.D.	—	—
—	1010 <sup>a</sup>	A	2.5	7/8 O.D.	—	—
—	1028 <sup>a</sup>					
—	1036 <sup>a</sup>					
—	1044 <sup>a</sup>	D	2.0	1/2	308062	313052
—	1051 <sup>a</sup>					
1016	1077	B	2.0	1/2	308062	313051
1040	1085	C				
—	1093 <sup>a</sup>	D	3.0	1/2	Integral	—
1073	1101	B	3.0	1/2		
—	1119	C	3.0	1/2	Integral	—
1081	1127					
—	1135					
—	1143 <sup>a</sup>	D	3.0	3/4	309807	313053
1024	1150	B	3.0	3/4	309807	313052
1057	1168	C				
—	1176 <sup>a</sup>	B	3.5	1/2	Integral	313051
—	1184 <sup>a</sup>	D	5.0	3/4	310648	313053
1032	1192	B	5.0	3/4	310648	313052
—	1200					
1065	1218	C			310648	313052
—	1226					
—	1390	B	0.4	1/2	308064	313051
1008	1408		0.63		308064	313051
1016	1416		2.0			

<sup>a</sup> Obsolete.



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Fig. 6. Body types (see Table 3).

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Table 4. VP525 Replacement Parts (See Fig. 7).

Key	Part Number	Description
1	14003102-001	Top. Available for direct replacement on newer valves.
	14003648-001	Top. For valves with copper tube air supply, exposed valves, or valves in high ambient temperature areas. Interchangeable with 14003102-001.
2	310208	Packing (3)
3	14002560-005	Stem and Disc Holder Assembly: 0.4 C <sub>v</sub>
For VP525A <sup>a</sup>	14002560-006	Stem and Disc Holder Assembly: 0.63 C <sub>v</sub>
	14004553-003	Stem with molded plug: 1.6 and 2.0 C <sub>v</sub>
	14004554-003	Stem with molded plug: 2.5 and 3.0 C <sub>v</sub>
	14004555-003	Stem with molded plug: 4.7 and 5.0 C <sub>v</sub>
For VP525C	14002560-013	Stem and Disc Holder Assembly: 0.63 C <sub>v</sub>
	14002560-007	Stem and Disc Holder Assembly: 1.6 and 2.0 C <sub>v</sub>
	14002560-008	Stem and Disc Holder Assembly: 2.5 and 3.0 C <sub>v</sub>
	14002560-009	Stem and Disc Holder Assembly: 4.7 and 5.0 C <sub>v</sub>

<sup>a</sup> For quick-opening VP525A1176, use stem with molded plug (part number 14004553-003).

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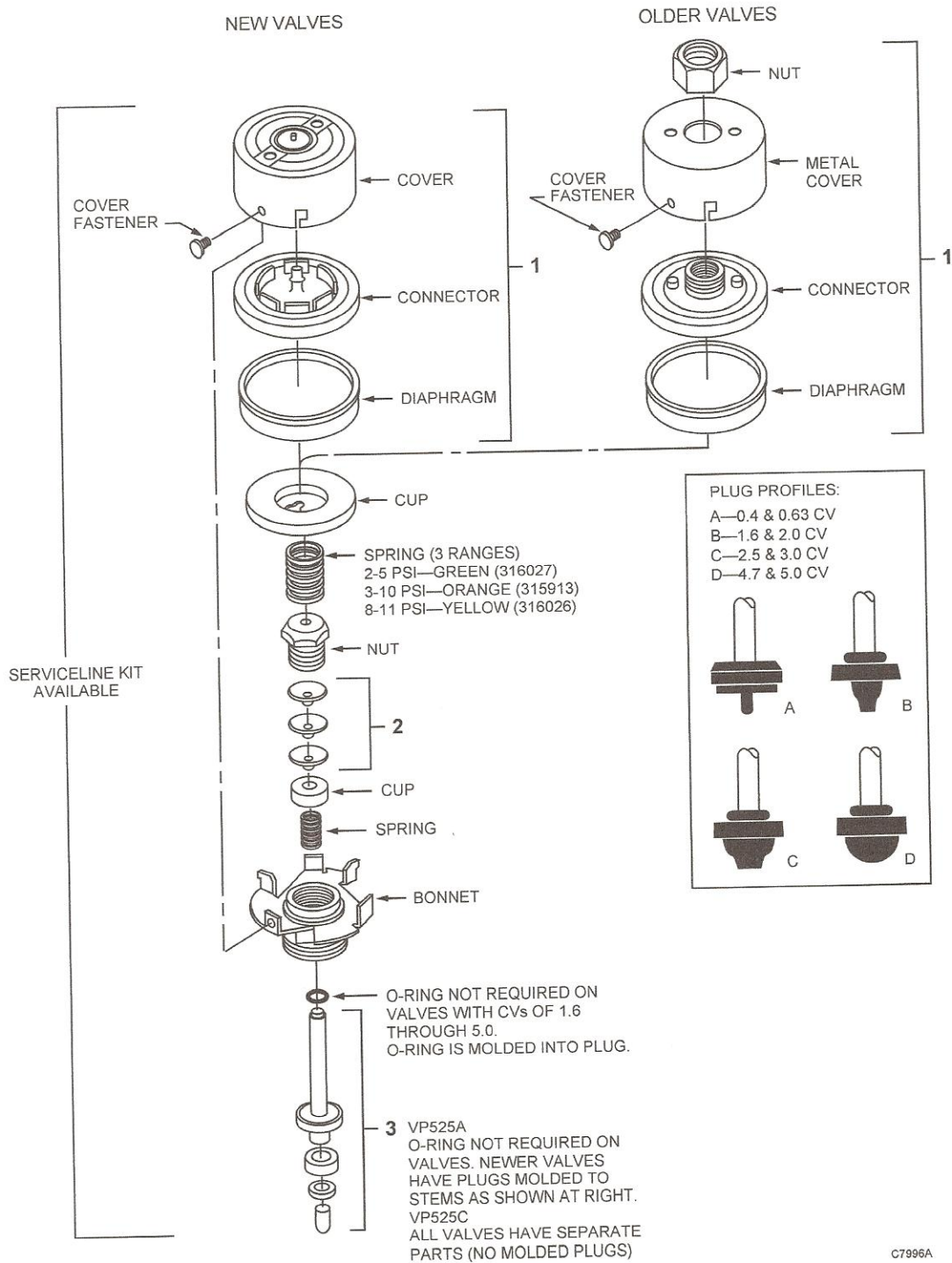


Fig. 7. Exploded view of top and insert assemblies (see Table 4).

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## VP525A High Temperature Conversion

VP525A rebuilding for higher temperature service is possible using either a Replacement Top and Insert Assembly or a Stem and Disc Holder Assembly (See Table 5).

NOTE: When rebuilding using a Stem and Disc Holder Assembly, Honeywell recommends marking the valve actuator cover accordingly and repacking the valve.

Table 5. VP525A High Temperature Conversion.

VP525A	C <sub>v</sub>	High Temperature Top and Insert Assembly	High Temperature Stem and Disc Holder
1077	2.0	14004897-002	14002560-007
1085			
1101	3.0	14004897-005	14002560-008
1119			
1127			
1135			
1150	3.0	14004897-003	14002560-009
1168			
1192	5.0	14004897-004	14002560-009
1200			
1218			
1226			
1408	0.63	14004897-001	14002560-013
1416	2.0	14004897-002	14002560-007

### Accessories

- 14002734-001 Lubricant.
- 14003648-001 Vandalism Shield Top with 1/8 in. NPT air connection.
- 311057 Plastilube.

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