Reverse Acting Pinch Valve

1. Description

See Figure 1. The Reverse Pinch Valve controls powder flow from a bulk powder supply to the powder pump. The assembly mounts to a powder hopper.

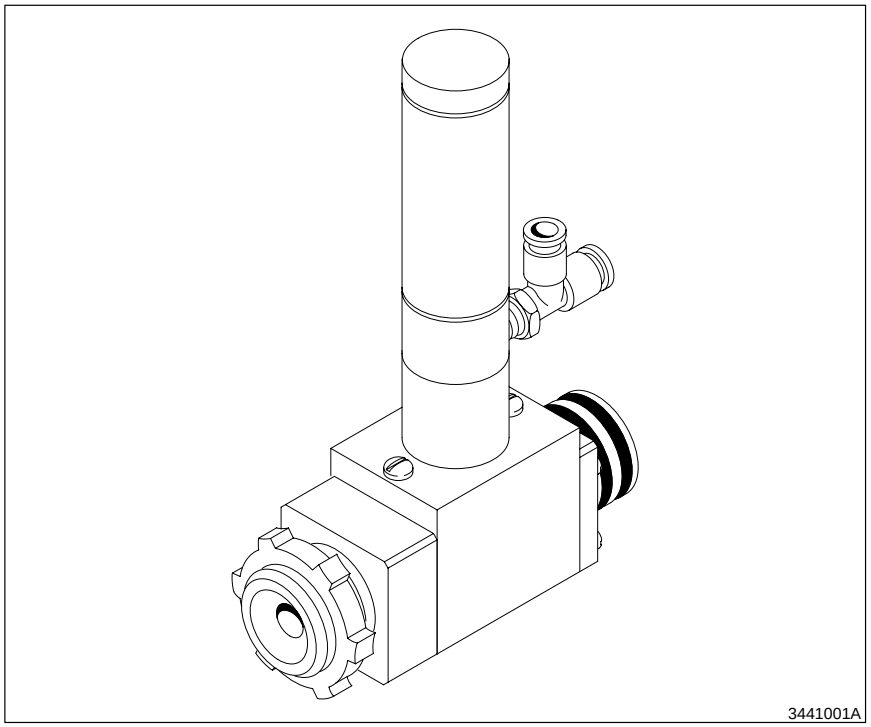

Fig. 1 Reverse pinch valve

2. Installation

WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

1. See Figure 2. Drill a 25.4-mm (1-in.) diameter hole into the side of the hopper (8) that is 89 mm–114 mm (3.5–4.5 in.) on center above the fluidizing plate (9).

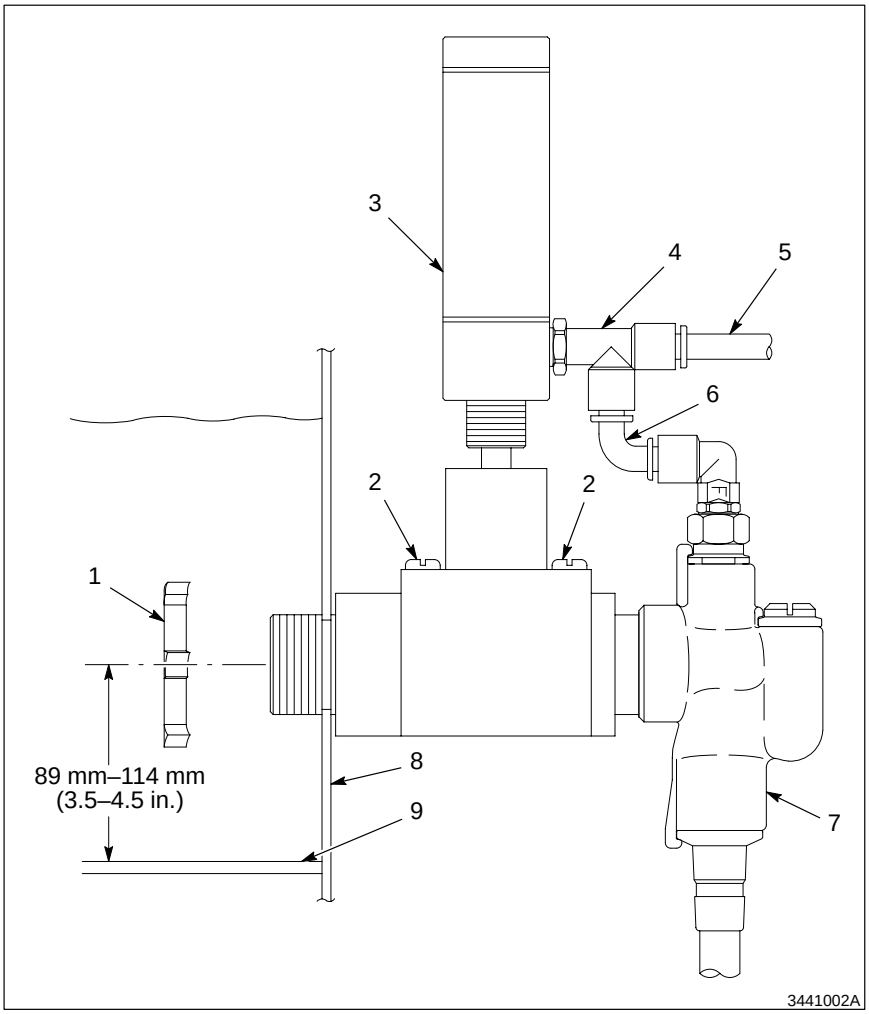

Fig. 2 Typical reverse pinch valve installation

1. Locknut
2. Screws
3. Cylinder
4. Tee
5. Tubing (flow rate air from the controller)
6. Tubing (flow rate air from the pump)
7. Powder pump
8. Hopper
9. Fluidizing plate

2. Use the locknut (1) to secure the reverse pinch valve to the hopper. Tighten the locknut securely.

3. If desired, change the position of the cylinder (3):

   a. Loosen the screws (2).
   b. Turn the cylinder. Tighten the screws securely.

4. Connect the powder pump (7) to the reverse pinch valve.

5. Connect the flow rate air tubing (5) from the controller to the tee (4).

6. Connect the flow rate air tubing (6) from the pump to the tee.

NOTE: As an alternative, the valve may be threaded into a $^{3}/_{4}$-in. NPT coupling welded to the side of the hopper. If this method is used, it may be necessary to reassemble the pump with the cylinder on top as it may not be possible to orient the valve otherwise.

3. Operation

The operating pressure must be at least 0.7 bar (10 psi).

4. Repair

WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

WARNING: Shut off and relieve air pressure before performing any maintenance on this equipment. Failure to observe may result in serious personal injury.

Disassembly

1. See Figure 2. Disconnect the flow rate tubing (5, 6) from the cylinder (3).

2. Disconnect the powder pump (7) from the reverse pinch valve.

3. See Figure 3. Remove the screws (13) securing the cylinder (1) to the pinch valve body (9).

4. Remove the screws (5) securing the pump adapter (6) to the pinch valve body. Discard the O-rings (3, 4).

5. Remove the hopper adapter (10) from the pinch valve body. Discard the O-ring (11).

6. Remove the hose (8) and O-rings (7) from the pinch valve body.

Assembly

See Figure 3.

WARNING: Do not replace conductive O-rings with non-conductive O-rings. Failure to observe may result in serious personal injury, fire or explosion.

1. Insert the hose (8) into the pinch valve body.
2. Insert new O-rings (7) into the pinch valve body (9).
3. Install new O-rings (3, 4) on the pump adapter (6) if required.
4. Install the pinch valve body to the pump adapter using the screws (5). Tighten the screws securely.
5. Install the cylinder (1) on the pinch valve body:
   a. Insert the screws (13) into the pinch valve body and hand-tighten.
   b. Rotate the cylinder to the desired position. Tighten the screws securely.
6. See Figure 2. Connect the powder pump (7) to the reverse pinch valve.
7. Connect the tubing (5, 6) to the tee (4).

Cylinder Tip Replacement

See Figure 3.

1. Remove the screws (13) securing the cylinder (1) to the pinch valve body (9).
2. Unscrew the cylinder tip (14) from the cylinder. Screw the new tip onto the cylinder.
3. Install the cylinder on the pinch valve body:
   a. Insert the screws into the pinch valve body and hand-tighten.
   b. Rotate the cylinder to the desired position. Tighten the screws securely.

Exploded Assembly of Valve

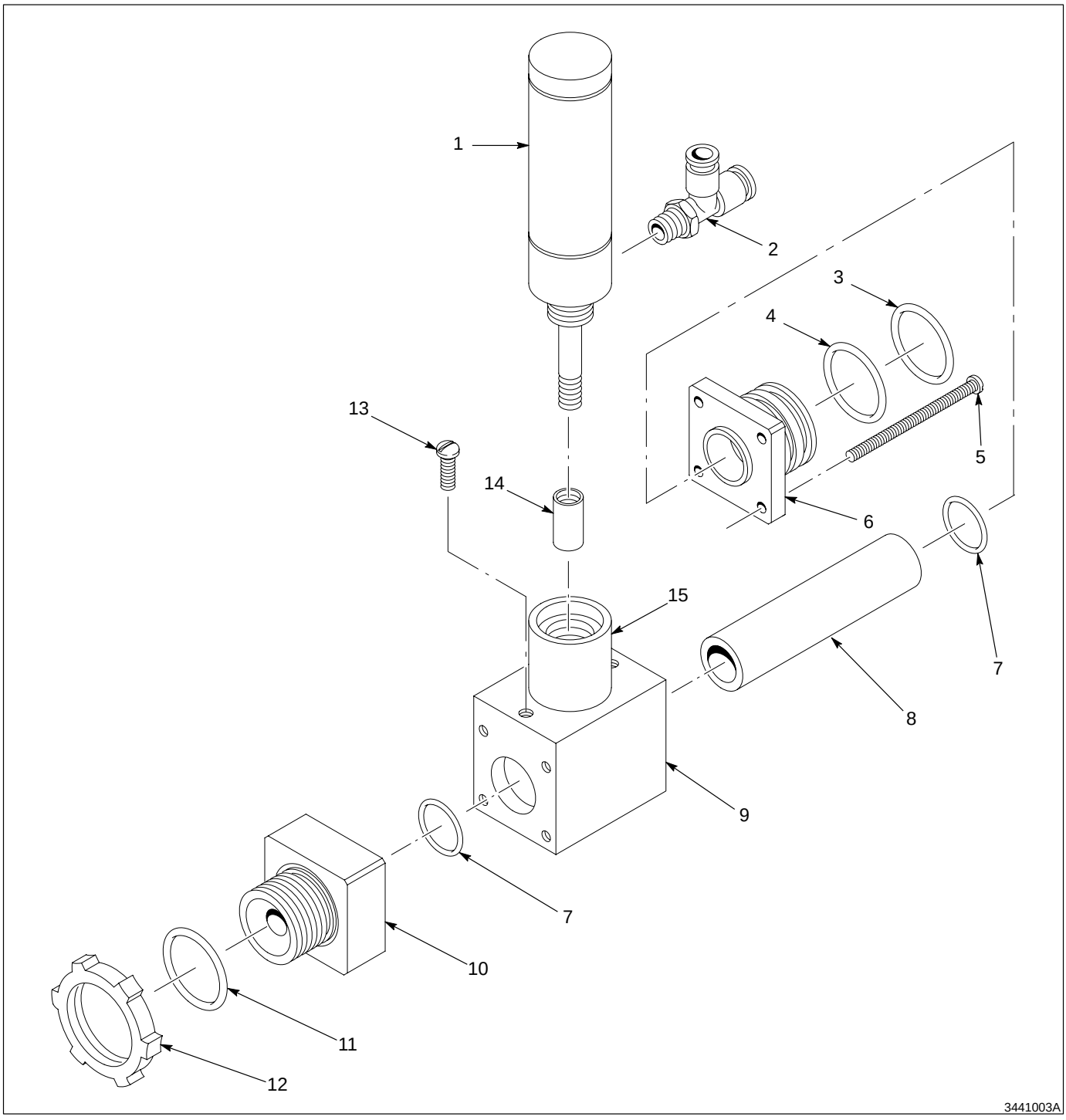

Fig. 3 Reverse pinch valve assembly

5. Parts

See Figure 3.

Item	Part	Description	Quantity	Note
—	307 420	Pinch valve assembly	1	
1	307 418	• Cylinder, reverse action	1	
2	971 124	• Tee, male, run, $^5/_{16}$ tube x $^1/_8$ NPT	1	
3	941 185	• O-ring, silicone, conductive, 0.875 x 1.062 x 0.093 in.	1	
4	940 186	• O-ring, polyurethane, 0.875 x 1.062 x 0.093 in.	1	
5	981 116	• Screw, fillister head, 10-32 x 2.5, sl, zn	4	
6	307 417	• Adapter, pump, pinch valve	1	
7	941 145	• O-ring, silicone, conductive, 0.625 x 0.812 in.	2	
8	307 413	• Hose, powder, 3.40–3.60 in., valve	1	
9	307 415	• Body, pinch valve	1	
10	307 414	• Adapter, hopper, pinch valve	1	
11	942 161	• O-ring, silicone, 1.125 x 1.375 x 0.125 in.	1	
12	939 613	• Locknut, conduit, $^3/_4$ NPS	1	
13	981 154	• Screw, pan head, 10-24 x 0.250, sl, zn	2	
14	307 419	• Tip, cylinder	1	
15	307 416	• Adapter, reverse cylinder	1	

6. Service Kit

See Figure 3.

Item	Part	Description	Quantity	Note
—	307 412	Service kit, hose, with O-rings	1	
7	941 145	• O-ring, silicone, conductive, 0.625 x 0.812 in.	2	
8	307 413	• Hose, powder, 3.40–3.60 in., valve	1	