

# Metric Porcelain Enamel Powder Pump

## 1. Introduction

This instruction sheet covers the Metric Porcelain Enamel Powder Pump.

The pump is a highly efficient venturi-type powder pump. It lifts fluidized porcelain enamel powder (frit) out of a feed hopper, atomizes the powder stream, and forces the powder and air mixture through a feed hose to a powder spray gun.

The venturi nozzles, throat, and holder are held in the body with interference fits provided by silicone O-rings.

The pump is sold without an adapter. Adapters are included with Nordson HR-X-X series hoppers and configured systems, or can be purchased separately. Contact your Nordson Corporation representative for information on adapters.

**NOTE:** Refer to *Pump Adapter Kits* for more information on what adapter and pick-up tubes are available.

## 2. Installation

See Figures 1 and 2.

1. Install the pump adapter (7) on the hopper lid or mounting bracket (6).



**WARNING:** The adapter O-rings are conductive silicone to maintain a ground connection between the pump body and the adapter. Do not replace these O-rings with O-rings made of a non-conductive material.

2. Make sure the O-rings on the pump adapter are correctly installed. Do not use lubricant on the adapter O-rings.
3. Install the pump (3) on the adapter (7) with a slight twisting motion.
4. Connect 6-mm or 8-mm OD flow-rate tubing (14) and atomizing air tubing (1) from the gun control unit to their respective pump fittings (13, 2). The fittings are labeled F for flow rate air, and A for atomizing air.

Air tubing color code:

Blue: Atomizing air  
Black: Flow rate air

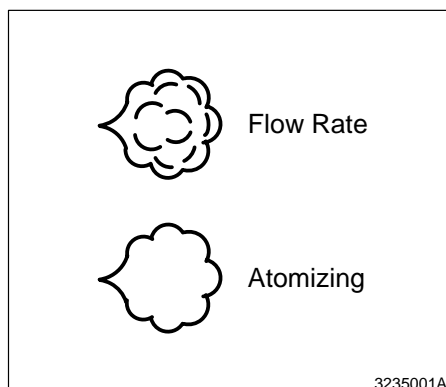
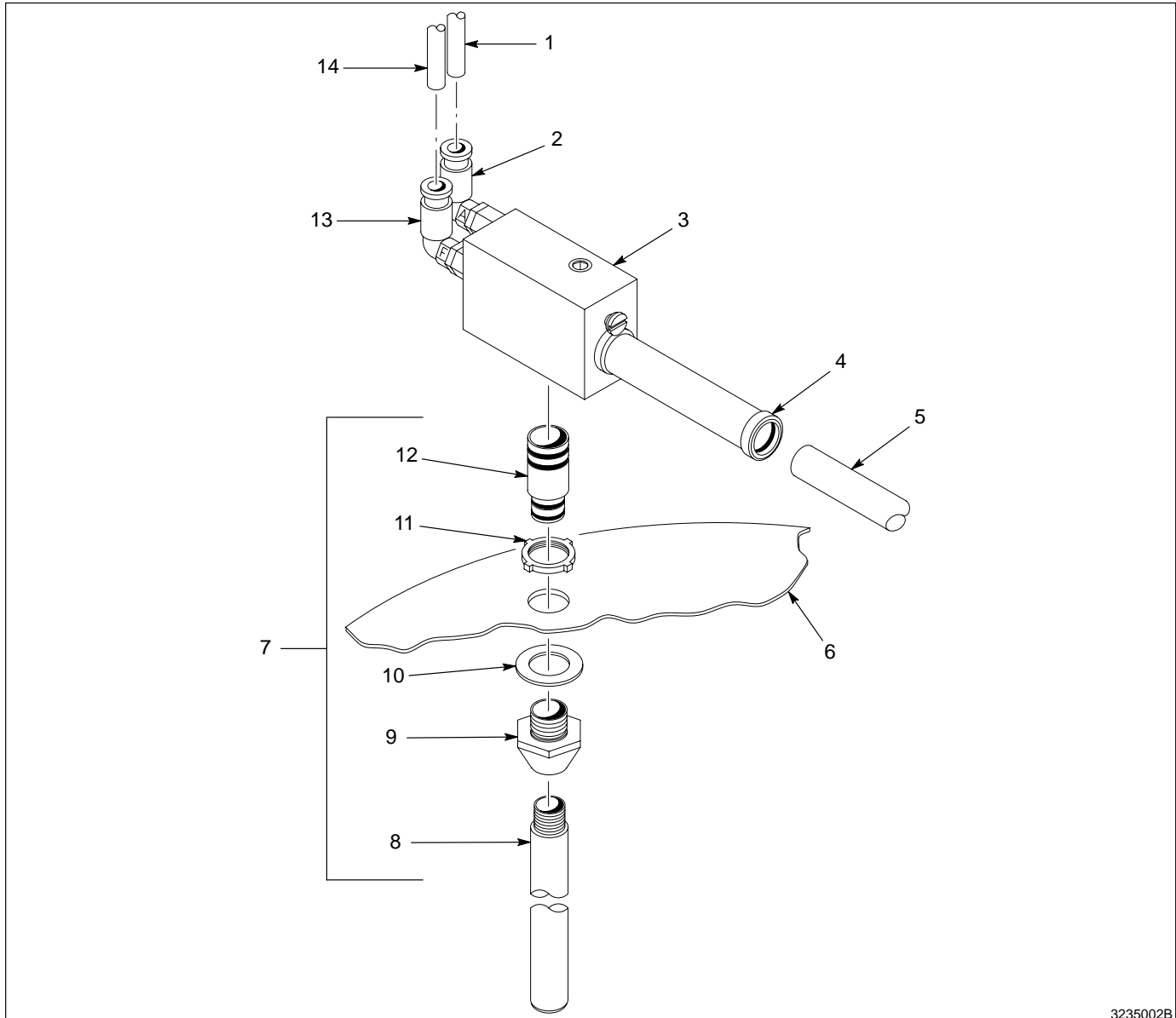


Fig. 1 Air Function Symbols

## 2. Installation (contd.)

5. Insert  $\frac{3}{4}$  in. OD polyurethane powder feed hose (5) into the throat holder (4) until it seats against the ceramic tube inside the holder. Cut the end of the hose square before installing. If necessary, install spiral wrap around the hose at the throat holder to prevent the hose from kinking and cutting off the flow of powder.



3235002B

Fig. 2 Installing a Metric Porcelain Enamel Powder Pump

- |                                |                                   |                              |
|--------------------------------|-----------------------------------|------------------------------|
| 1. Atomizing air tubing (blue) | 6. Hopper lid or mounting bracket | 11. Conduit nut              |
| 2. Atomizing air fitting       | 7. Pump adapter parts             | 12. Pump adapter             |
| 3. Pump                        | 8. Pickup tube                    | 13. Flow-rate air fitting    |
| 4. Throat holder               | 9. Pump mount                     | 14. Flow-rate tubing (black) |
| 5. Powder feed hose            | 10. Flat washer                   |                              |

6. Route the powder feed hose (5) to the gun and connect it to the gun inlet. Use spiral wrap to bundle together the hose and gun cable and protect them from damage.

**NOTE:** For best results, the powder feed hose should be no longer than 7.6 m (25 ft) and rise vertically over its length no more than 2.7 m (9 ft).

---

### 3. Operation

---

Typical operating pressures are:

Atomizing: 1.4 bar (20 psi)  
Flow: 2.1 bar (30 psi)

---

### 4. Preventive Maintenance

---

Follow these procedures to clean and maintain the pump.

#### Daily

**See Figure 2.** Disconnect the atomizing air (1) and flow-rate tubing (14), and blow out the pump (3) and powder feed hose (5). Always disconnect the feed hose and blow it out from the pump end into the booth, not from the gun into the pump.

#### Periodically



**WARNING:** Do not use high-pressure compressed air to blow powder off skin or clothing. Air can be injected under skin, causing serious injury or death.

1. Disassemble the pump (3) and clean the parts with the low-pressure compressed air and a clean, lint-free cloth. Remove the O-rings and wipe the parts clean with a non-toxic solvent such as alcohol. Do not use the solvent on the O-rings. Solvents can damage the O-rings.
2. Do not scrape the pump parts with sharp metal tools. Burrs or scratches on powder contact surfaces will contribute to powder buildup or impact fusion. Inspect the parts and replace them if worn or damaged.

**NOTE:** **See Figure 3.** When installing the throat (10) and throat holder (14) in the pump housing, use care to prevent damaging the ceramic throat.

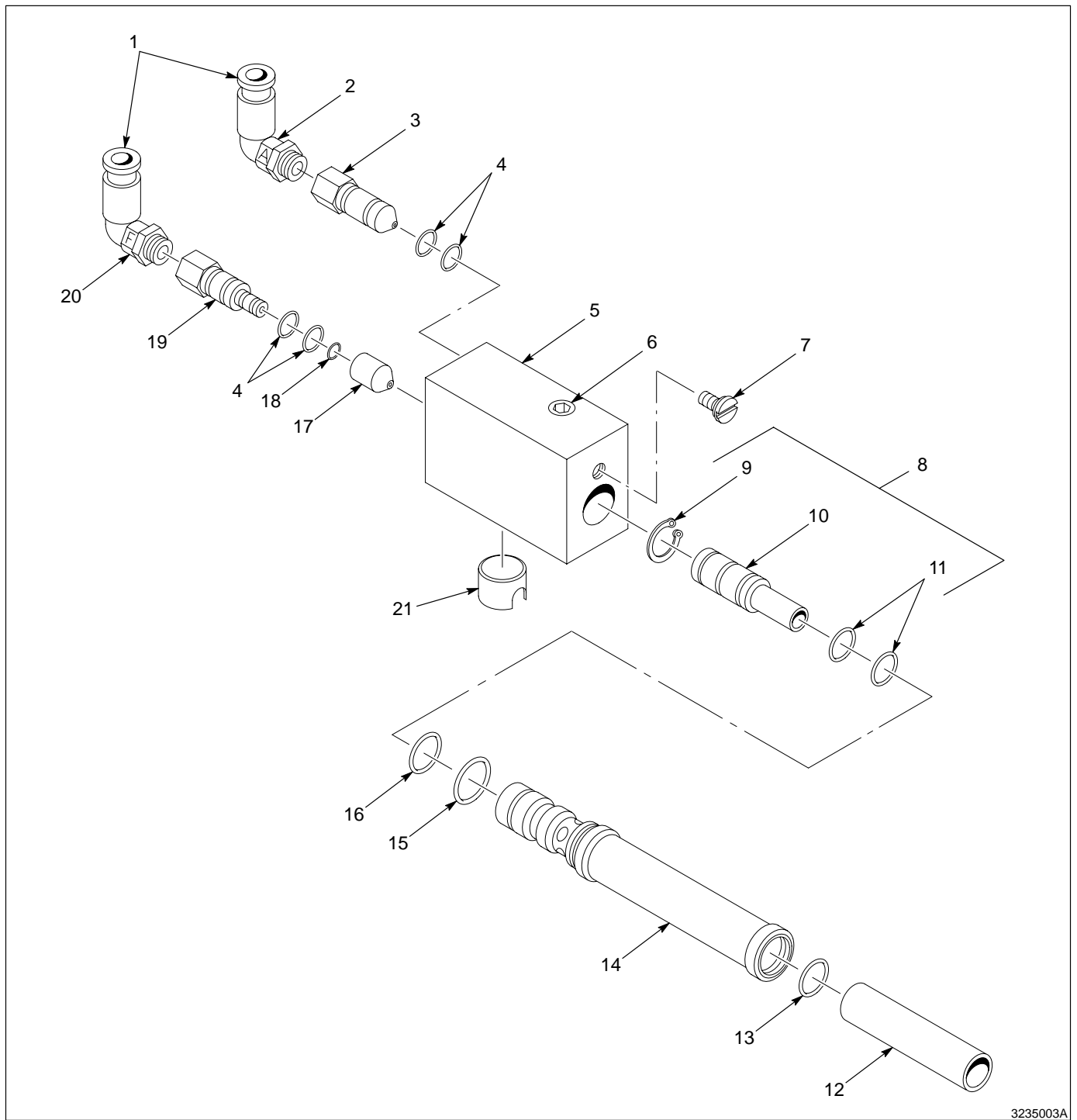
3. **See Figure 2.** Inspect the powder feed hose (5) and replace it if it is worn or damaged. If powder has impact-fused inside the hose, replace the hose.

## 5. Pump Parts

See Figure 3.

Item	Part	Description	Quantity	Note
—	168 551	Pump, porcelain, 6-mm	1	
—	307 441	Pump, porcelain, 8-mm	1	
1	972 126	• Elbow, male, M6 x 1/8 in., 6-mm	2	
1	972 276	• Elbow, male, M6 x 1/8 in., 8-mm	2	
2	939 108	• Marker, clip, A, 6-mm	1	
2	248 046	• Marker, clip, A, 8-mm	1	
3	107 240	• Nozzle, venturi, w/ check valve	1	
4	940 129	• O-ring, silicone, conductive, 0.375 x 0.500 in.	4	A
5	107 224	• Housing, pump, porcelain	1	
6	973 402	• Plug, pipe, socket, flush, 1/8 in.	1	
7	112 412	• Screw, lock, 5/16- 18 L5-1	1	
8	107 227	• Throat, venturi, porcelain	1	
9	986 100	• • Ring, retaining, external, 50, inverted	2	
10	-----	• • Throat, venturi	1	
11	940 126	• • O-ring, silicone, 0.375 x 0.500 x 0.063 in.	1	
12	107 230	• Tube, 0.500 x 0.750 x 4.00, ceramic	1	
13	942 105	• O-ring, polyurethane, 0.750 x 1.00 in.	1	
14	107 229	• Holder, throat	1	
15	940 184	• O-ring, silicone, conductive, 0.750 x 0.875 x 0.63 in.	1	A
16	940 163	• O-ring, silicone, 0.625 x 0.750 x 0.063 in.	1	
17	107 231	• Nozzle, ceramic	1	
18	940 084	• O-ring, silicone, 0.188 x 0.312 x 0.063 in.	1	
19	109 898	• Holder, nozzle, w/check valve	1	
20	939 109	• Marker, clip, F, 6-mm	1	
20	248 124	• Marker, clip, F, 8-mm	1	
21	107 225	• Cup, insert, ceramic	1	

NOTE A: Black silicone O-rings are electrically conductive. Do not replace with non-conductive O-rings.



3235003A

Fig. 3 Exploded View of Pump

**6. Pump Adapter Kits**

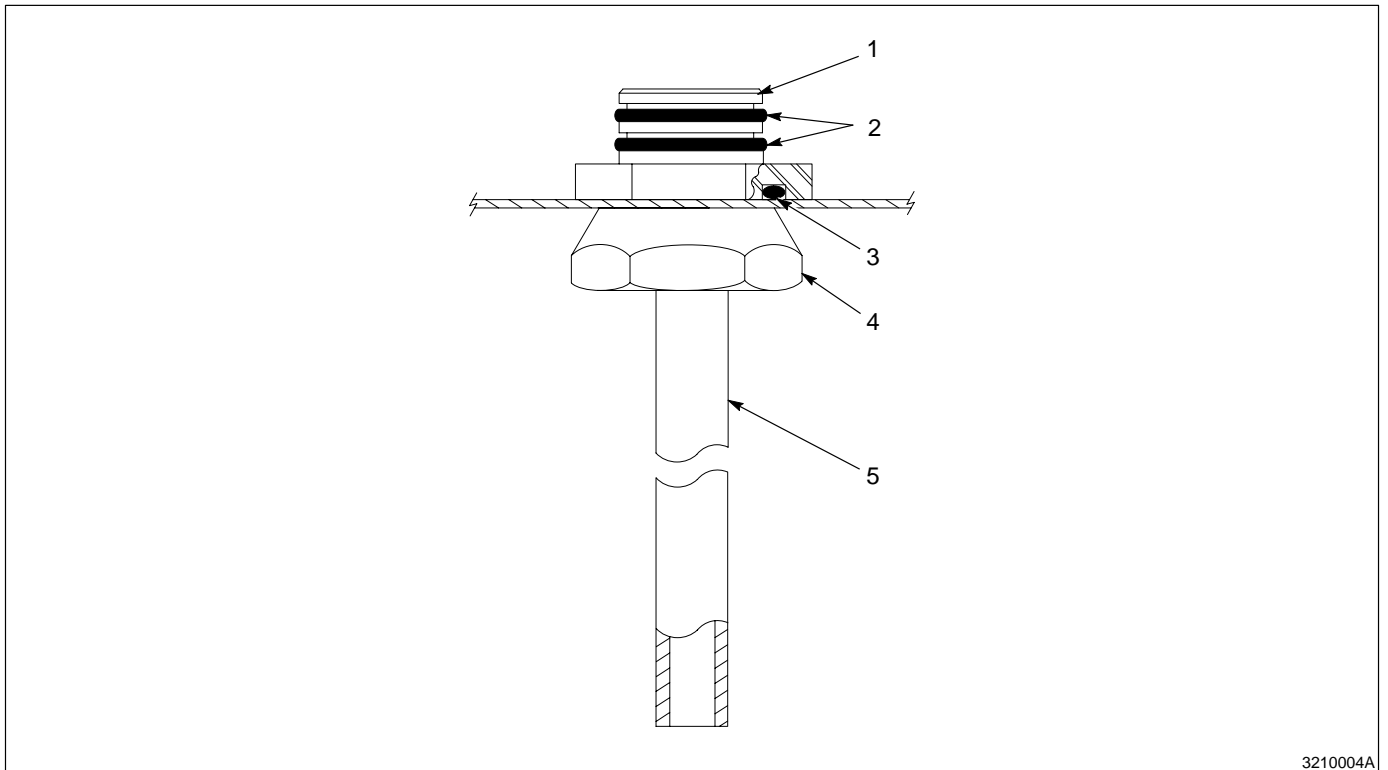
Use the following lists to order the appropriate adapter and pick-up tube for your application.

**Fixed Adapters**

See Figure 4.

Item	Part	Description	Quantity	Note
—	180 777	Mount, pump, w/pick-up tube, fixed, 18 in.	1	A
1	114 225	• Adapter, pump	1	
2	941 185	• O-ring, silicone, conductive, 0.875 x 1.062	2	
3	942 161	• O-ring, silicone, 1.125 x 1.375 x 0.125	1	
4	142 382	• Nut, ground, pump mount	1	
5	180 778	• Tube, pick-up, 0.490 ID x 18 in.	1	
NOTE A: Black silicone O-rings are electrically conductive. Do not substitute with non-conductive O-rings.				

Item	Part	Description	Quantity	Note
—	224 721	Mount, pump, w/pick-up tube, fixed, 24 in.	1	A
1	114 225	• Adapter, pump	1	
2	941 185	• O-ring, silicone, conductive, 0.875 x 1.062	2	
3	942 161	• O-ring, silicone, 1.125 x 1.375 x 0.125	1	
4	142 382	• Nut, ground, pump mount	1	
5	224 722	• Tube, pick-up, 0.490 ID x 24 in.	1	
NOTE A: Black silicone O-rings are electrically conductive. Do not substitute with non-conductive O-rings.				



3210004A

Fig. 4 Fixed Adapter with Pick-Up Tube

**Thru-Lid Adapters**

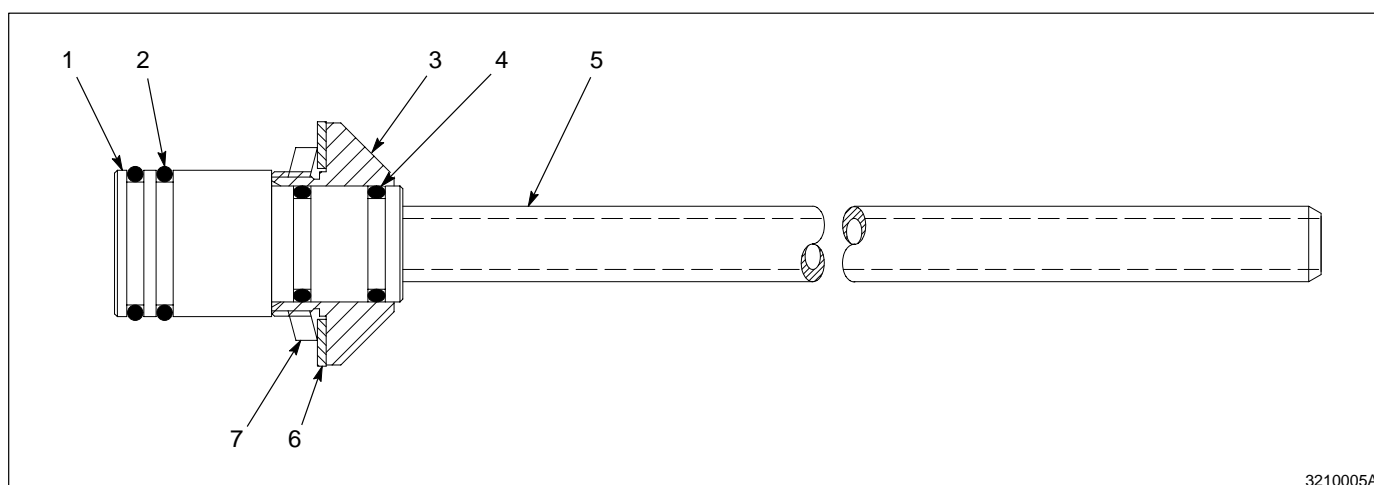
See Figure 5.

Item	Part	Description	Quantity	Note
—	309 476	Mount, pump, w/tube, fixed, 18 in., $\frac{3}{8}$ NPS	1	
1	309 471	• Adapter, pump, thru-lid	1	
2	941 185	• O-ring, silicone, conductive, 0.875 x 1.062	2	A
3	164 063	• Mount, pump	1	
4	941 145	• O-ring, silicone, 0.625 x 0.812	1	A
5	309 474	• Tube, pick-up, 0.490 ID x 18-in.	1	
6	983 055	• Washer, pump, mount	1	
7	939 613	• Locknut, conduit, $\frac{3}{4}$ NPS	1	

NOTE A: Black silicone O-rings are electrically conductive. Do not substitute with non-conductive O-rings.

Item	Part	Description	Quantity	Note
—	309 479	Mount, pump, w/tube, fixed, 24 in., $\frac{3}{8}$ NPS	1	
1	309 471	• Adapter, pump, thru-lid	1	
2	941 185	• O-ring, silicone, conductive, 0.875 x 1.062	2	A
3	164 063	• Mount, pump	1	
4	941 145	• O-ring, silicone, 0.625 x 0.812	1	A
5	309 477	• Tube, pick-up, 0.490 ID x 24-in.	1	
6	983 055	• Washer, pump, mount	1	
7	939 613	• Locknut, conduit, $\frac{3}{4}$ NPS	1	

NOTE A: Black silicone O-rings are electrically conductive. Do not substitute with non-conductive O-rings.



3210005A

Fig. 5 Thru-Lid Adapters with Pick-Up Tube

Original copyright date 1994. Nordson and the Nordson logo are registered trademarks of Nordson Corporation.