Prodigy® High-Capacity HDLV® Powder Transfer Pump

Customer Product Manual
Part 1053991C04

Issued 6/08

For parts and technical support, call the Industrial Coating Systems Customer Support Center at (800) 433-9319 or contact your local Nordson representative.

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Table of Contents

Contact Us

Nordson Corporation welcomes requests for information, comments, and inquiries about its products. General information about Nordson can be found on the Internet using the following address: http://www.nordson.com.

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Amherst, OH 44001

Prodigy High-Capacity HDLV Pump

Safety

Read and follow these safety instructions. Task- and equipment-specific warnings, cautions, and instructions are included in equipment documentation where appropriate.

Make sure all equipment documentation, including these instructions, is accessible to all persons operating or servicing equipment.

Qualified Personnel

Equipment owners are responsible for making sure that Nordson equipment is installed, operated, and serviced by qualified personnel. Qualified personnel are those employees or contractors who are trained to safely perform their assigned tasks. They are familiar with all relevant safety rules and regulations and are physically capable of performing their assigned tasks.

Intended Use

Use of Nordson equipment in ways other than those described in the documentation supplied with the equipment may result in injury to persons or damage to property.

Some examples of unintended use of equipment include

- using incompatible materials
- making unauthorized modifications
- removing or bypassing safety guards or interlocks
- using incompatible or damaged parts
- using unapproved auxiliary equipment
- operating equipment in excess of maximum ratings

Regulations and Approvals

Make sure all equipment is rated and approved for the environment in which it is used. Any approvals obtained for Nordson equipment will be voided if instructions for installation, operation, and service are not followed.

All phases of equipment installation must comply with all federal, state, and local codes.

Personal Safety

To prevent injury follow these instructions.

- Do not operate or service equipment unless you are qualified.
- Do not operate equipment unless safety guards, doors, or covers are intact and automatic interlocks are operating properly. Do not bypass or disarm any safety devices.
- Keep clear of moving equipment. Before adjusting or servicing any moving equipment, shut off the power supply and wait until the equipment comes to a complete stop. Lock out power and secure the equipment to prevent unexpected movement.
- Relieve (bleed off) hydraulic and pneumatic pressure before adjusting or servicing pressurized systems or components. Disconnect, lock out, and tag switches before servicing electrical equipment.

- Obtain and read Material Safety Data Sheets (MSDS) for all materials used. Follow the manufacturer's instructions for safe handling and use of materials, and use recommended personal protection devices.
- To prevent injury, be aware of less-obvious dangers in the workplace that often cannot be completely eliminated, such as hot surfaces, sharp edges, energized electrical circuits, and moving parts that cannot be enclosed or otherwise guarded for practical reasons.

Fire Safety

To avoid a fire or explosion, follow these instructions.

- Do not smoke, weld, grind, or use open flames where flammable materials are being used or stored.
- Provide adequate ventilation to prevent dangerous concentrations of volatile materials or vapors. Refer to local codes or your material MSDS for guidance.
- Do not disconnect live electrical circuits while working with flammable materials. Shut off power at a disconnect switch first to prevent sparking.
- Know where emergency stop buttons, shutoff valves, and fire extinguishers are located. If a fire starts in a spray booth, immediately shut off the spray system and exhaust fans.
- Clean, maintain, test, and repair equipment according to the instructions in your equipment documentation.
- Use only replacement parts that are designed for use with original equipment. Contact your Nordson representative for parts information and advice.

Grounding

WARNING: Operating faulty electrostatic equipment is hazardous and can cause electrocution, fire, or explosion. Make resistance checks part of your periodic maintenance program. If you receive even a slight electrical shock or notice static sparking or arcing, shut down all electrical or electrostatic equipment immediately. Do not restart the equipment until the problem has been identified and corrected.

Grounding inside and around the booth openings must comply with NFPA requirements for Class 2, Division 1 or 2 Hazardous Locations. Refer to NFPA 33, NFPA 70 (NEC articles 500, 502, and 516), and NFPA 77, latest conditions.

- All electrically conductive objects in the spray areas shall be electrically connected to ground with a resistance of not more than 1 megohm as measured with an instrument that applies at least 500 volts to the circuit being evaluated.
- Equipment to be grounded includes, but is not limited to, the floor of the spray area, operator platforms, hoppers, photoeye supports, and blow-off nozzles. Personnel working in the spray area must be grounded.
- There is a possible ignition potential from the charged human body. Personnel standing on a painted surface, such as an operator platform, or wearing non-conductive shoes, are not grounded. Personnel must wear shoes with conductive soles or use a ground strap to maintain a connection to ground when working with or around electrostatic equipment.
- Operators must maintain skin-to-handle contact between their hand and the gun handle to prevent shocks while operating manual electrostatic spray guns. If gloves must be worn, cut away the palm or fingers, wear electrically conductive gloves, or wear a grounding strap connected to the gun handle or other true earth ground.
- Shut off electrostatic power supplies and ground gun electrodes before making adjustments or cleaning powder spray guns.
- Connect all disconnected equipment, ground cables, and wires after servicing equipment.

Action in the Event of a Malfunction

If a system or any equipment in a system malfunctions, shut off the system immediately and perform the following steps:

- Disconnect and lock out electrical power. Close pneumatic shutoff valves and relieve pressures.
- Identify the reason for the malfunction and correct it before restarting the equipment.

Disposal

Dispose of equipment and materials used in operation and servicing according to local codes.

Description

See Figure 1. The Prodigy High-Capacity HDLV (High-Density powder, Low-Volume air) powder pump transports large amounts of powder from one location to another.

The pump design and the small diameter suction and delivery tubing used with the pump allow it to be purged quickly and thoroughly.

The pump is more efficient than traditional venturi-style pumps in that very little of the air that is used to operate the pump is mixed into the powder stream. Only the air that is used to move the powder out of the pump and into the delivery tubing enters the powder stream.

Figure 1 Prodigy High-Capacity HDLV Pump

High-Capacity HDLV Pump Components

See Figure 2.

Item	Description	Function
1	Vacuum Air Solenoid Valve	Cycles back and forth to alternate positive and negative air pressure to the fluidizing tubes.
2	Pinch Valve Solenoid Valve	Cycles back and forth to switch the pinch pressure between the pump halves.
3	Conveying Air Regulator and Gauge	Regulates the positive and negative air pressure being applied to the fluidizing tubes. Typically set to 0.7–1.0 bar (10–15 psi).
4	Exhaust Muffler	Allows the pump's operating air to silently exit the pump.
5	Input Air Fitting	Connects the high-capacity HDLV pump to a 4.8 bar (70 psi) air source.
6	Pinch Pressure Regulator and Gauge	Regulates the air pressure being applied to the pinch valves. Typically set to 2.4–2.75 bar (35–40 psi).
7	Vacuum Generator	Works on the venturi principle to generate the negative air pressure required to draw powder into the fluidizing tubes.
8	Timing Sequence Valve	Controls the timing of vacuum air and pinch valve solenoid valves, which alternate to allow the pump halves to draw powder in and force powder out.
9	Pump Assembly	Transports powder from powder source to powder destination.
10	Purge Air Fittings	Send line air pressure through the pump assembly during the purge process.
11	Fluidizing Tubes	Porous cylinders that alternately draw powder in and force powder out, depending on the state of the vacuum air solenoid valve.
12	Powder Delivery Tube Fitting	Connects 16-mm OD polyethylene tubing to the powder's destination.
13	Powder Suction Tube Fitting	Connects 16-mm OD polyethylene tubing from the powder's source.
14	Lower Wear Block	Connect the inlet and outlet fittings to the pinch valves on either half of the pump.
15	Pinch Valves	Open and close to allow powder to be drawn in or forced out of the fluidizing tubes.
16	Upper Y-Manifold	Interface between the pinch valves and the porous tubes; consists of two Y-shaped passages that join the inlet and outlet branches of either half of the pump.

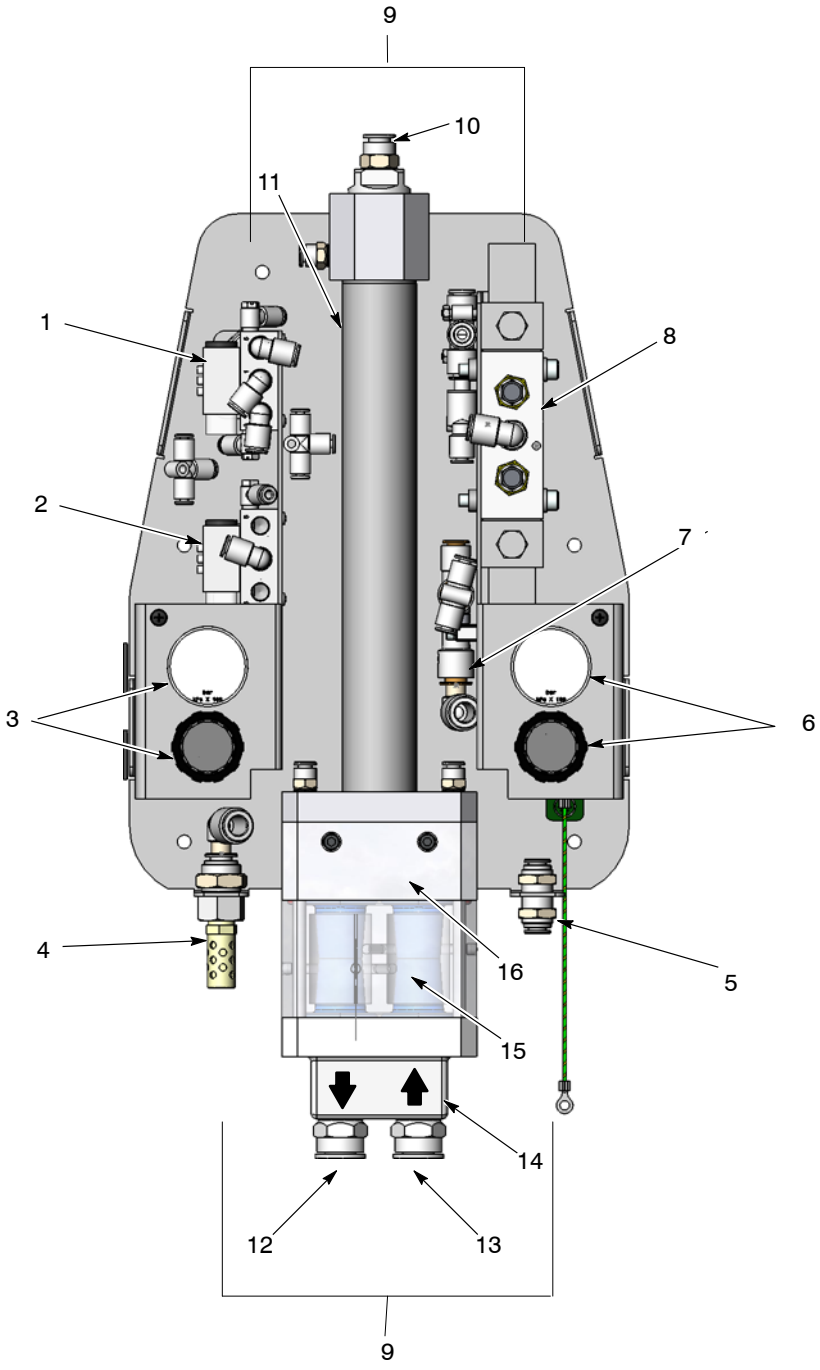


Figure 2 Prodigy High-Capacity HDLV Pump Components

Note: Shown with cover removed.

Theory of Operation

Pumping

See Figure 3. The Prodigy high-capacity HDLV pump consists of two halves that function identically. The halves alternately draw powder in and force powder out of the pump; while one half is drawing powder in, the other half is forcing powder out.

Front Half Drawing Powder In
The front suction pinch valve is open, while the front delivery pinch valve is closed. Negative air pressure is applied to the front porous fluidizing tube, which draws powder in the inlet fitting, up the inlet lower wear block, through the front suction pinch valve, and into the front fluidizing tube. After the negative air pressure has been on for the specified time, the fluidizing tube's negative air pressure shuts off and the front suction pinch valve closes.

Rear Half Forcing Powder Out
The rear suction pinch valve is closed, while the rear delivery pinch valve is open. Positive air pressure is applied to the rear porous fluidizing tube, which forces the powder out of the fluidizing tube, down the rear delivery pinch valve, down the lower wear block, out the delivery fitting, and out to the tubing that leads to the powder destination.

As the sides complete these processes, they alternate. In the example explained above, the front half would now force powder out while the rear half would draw powder in.

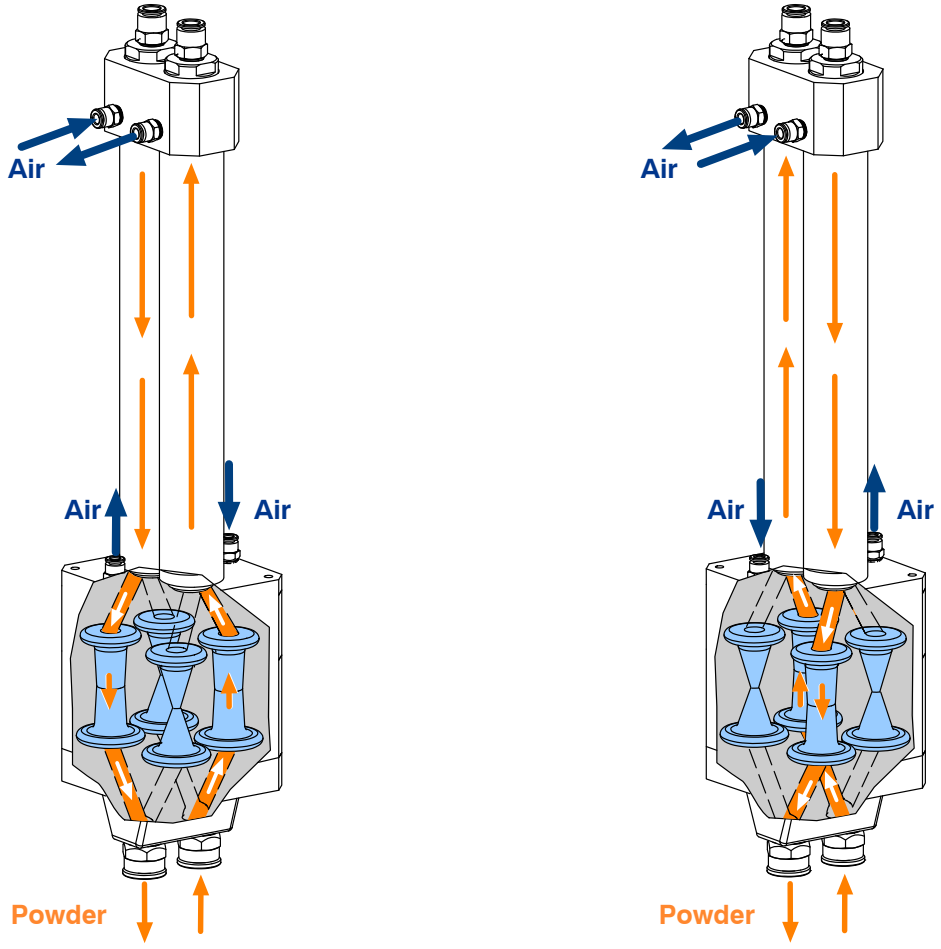


Figure 3 Theory of Operation — Pumping

Purging

NOTE: The pump purge process is dependant on how the pump is integrated into a powder coating system.

See Figure 4. While the pump is operating, pulses of line air pressure are sent down the purge air fittings at the top of the pump. Purge air pulses are typically 250 milliseconds on and 250 milliseconds off.

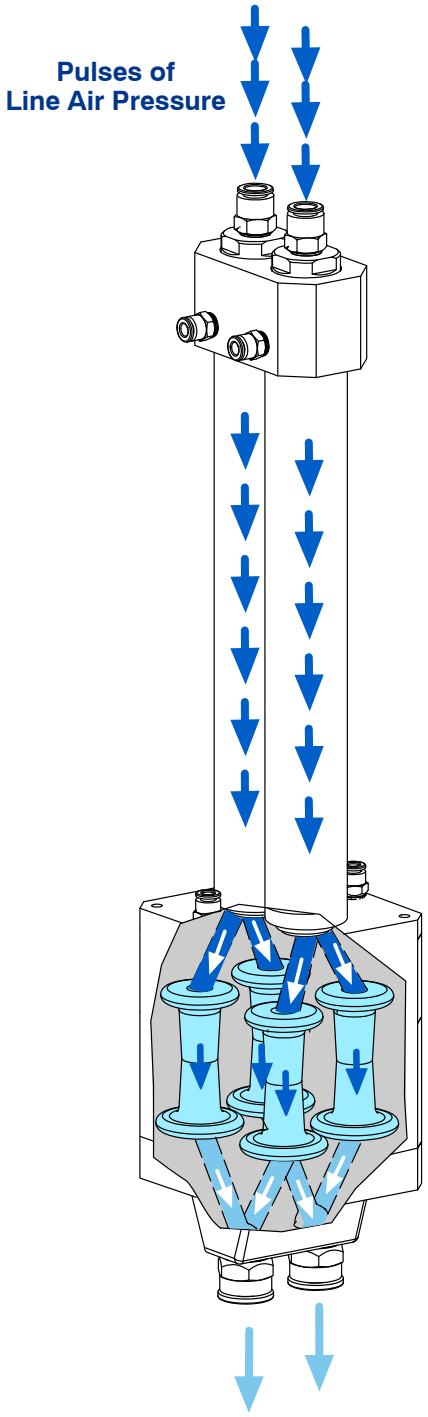


Figure 4 Theory of Operation — Purging

Specifications

Output (Maximum)	4 kg (9 lb) per minute
Input Air	4.8 bar (70 psi)
Purge Air	Line Air Pressure (7 bar (100 psi) maximum)
Operating Air Pressures Pinch Valves Conveying Air	 2.4–2.75 bar (35–40 psi) 0.7–1.0 bar (10–15 psi)
Air Consumption Conveying Air Total Consumption	 28–56 l/min (1–2 cfm) 198–255 l/min (7–9 cfm)
Tubing Size Air Input Powder Suction Powder Delivery	 8-mm OD polyurethane 16-mm OD polyethylene, 3.65-m (12-ft) long max 16-mm OD polyethylene, 30.5-m (100-ft) long max **NOTE:** For best results, keep the powder suction and delivery tubing as short as possible.
Dimensions	See Figure 5.

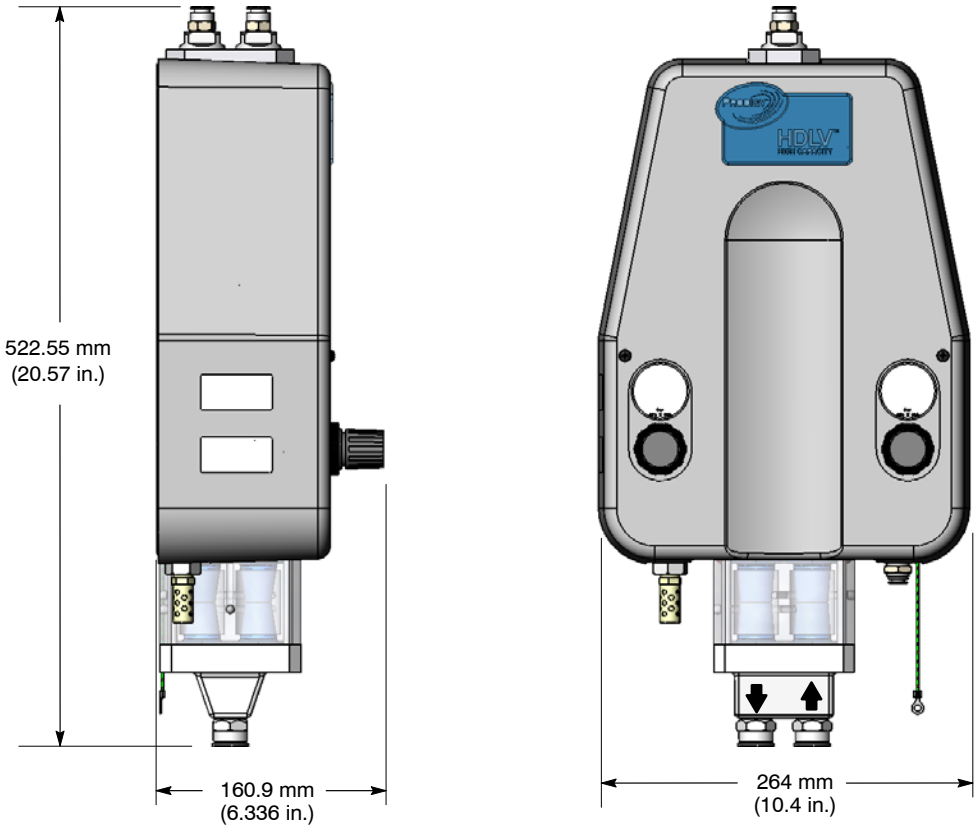
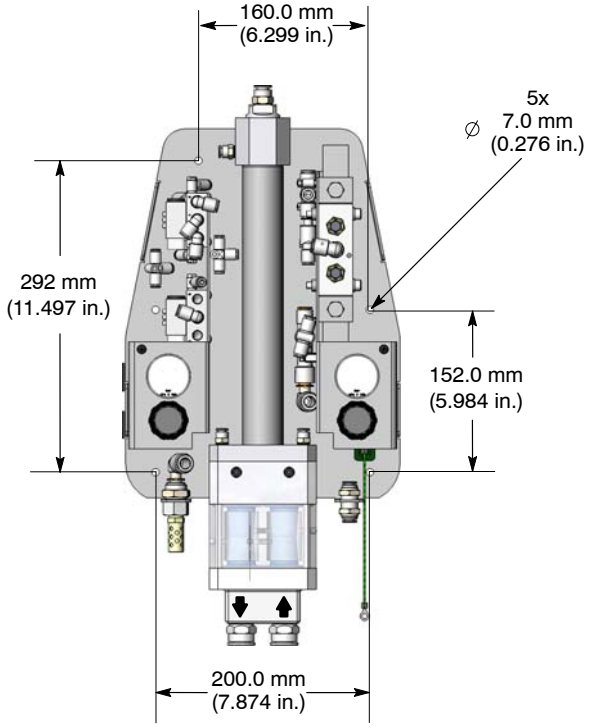


Figure 5 Prodigy High-Capacity HDLV Pump Dimensions

Installation

WARNING: The pump must be securely connected to a true earth ground. Failure to ground the pump could result in a fire or explosion.

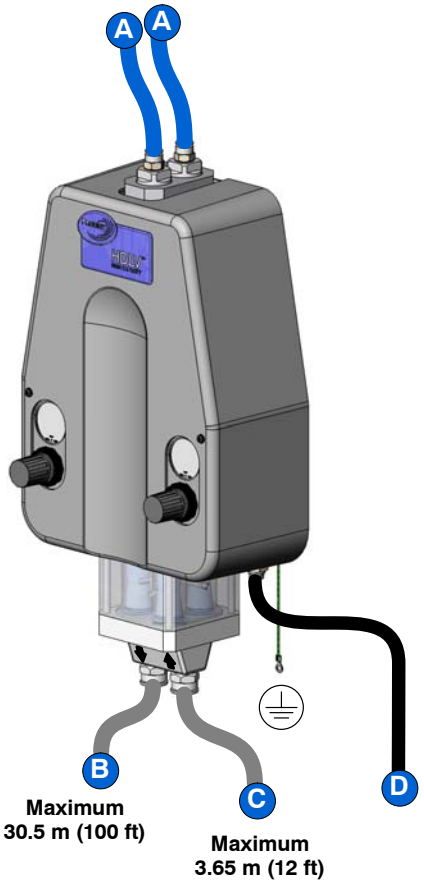
NOTE: The pump is normally mounted on a panel that includes an operating air regulator, and a manual pushbutton and piloted-operated air valve for manual purging. The panel may also include an auxiliary regulator for fluidizing the powder source.



Panel Mounting Dimensions

Use the supplied M6 screws, washers, and nuts to mount the pump.

NOTE: Five mounting holes and four sets of M6 fasteners are included. Use the four mounting holes that best match your mounting surface.



Tubing Connections

NOTE: For best results, keep the powder suction and delivery tubing as short as possible.

CONNECTION	TYPE	FUNCTION
A	10 mm blue polyurethane tubing	From customer-supplied purge air source (7 bar (100 psi) max)
B	16 mm clear polyethylene tubing	To powder destination
C	16 mm clear polyethylene tubing	From powder source
D	8 mm black polyurethane tubing	From input air source 4.8 bar (70 psi)
⏚	Pump ground wire	To earth ground

Figure 6 High-Capacity HDLV Pump Installation

Pickup Tube Adapter Assembly

The pickup tube adapter assembly easily adapts the 16-mm suction tubing to a standard pump pickup tube.

NOTE: Pickup tube adapter assemblies are available for pickup tubes with or without an external O-ring. Figure 7 shows a pickup tube with an external O-ring.

1. See Figure 7. Cut the end of the suction tubing (1) square with a tubing cutter.
2. Insert approximately 2 inches of the suction tubing through the retaining nut (2).
3. Install the O-ring (3) onto the suction tubing.
4. Insert the suction tubing into the pump adapter (4) until it bottoms out.
5. Slide the O-ring down the suction tubing until it bottoms out against the pump adapter.
6. Tighten the retaining nut onto the pump adapter.
7. Install the adapter assembly onto the pickup tube (5) using a twisting motion.

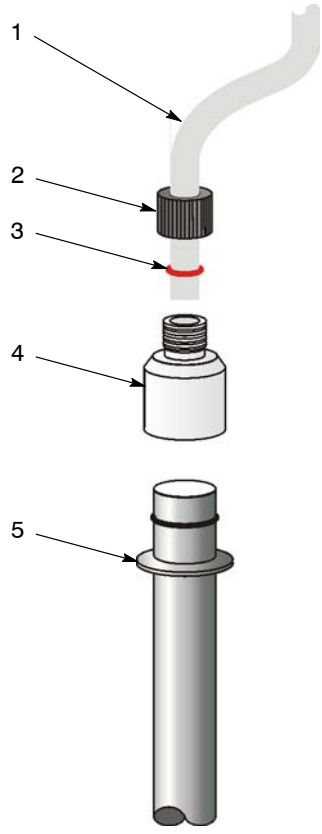


Figure 7 Pickup Tube Adapter Assembly

Operation

See Figure 8. After making the initial pump assist and pinch air pressure settings, you should not have to adjust them again.

- To start the pump, turn on the operating air supply. Regulate the air pressure to 4.8-bar (70-psi).
- To stop the pump, turn off the operating air supply.

Operating the pump at the recommended 4.8-bar (70-psi) pressure produces an approximately 500-millisecond cycle rate.

- Increasing the pressure slows down the pump.
- Decreasing the pressure speeds up the pump.

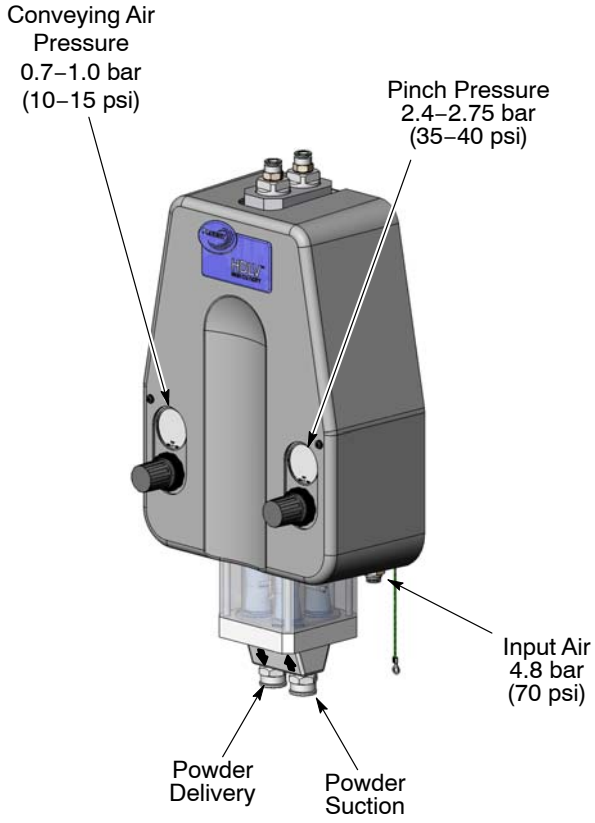


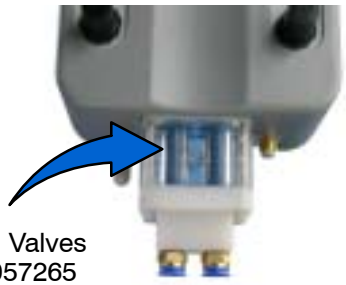
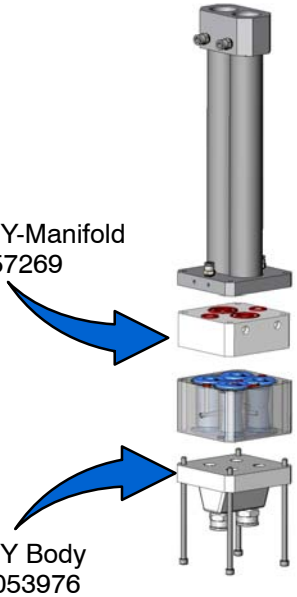
Figure 8 Operating the High-Capacity HDLV Pump

Maintenance

Perform these maintenance procedures to keep your pump operating at peak efficiency.

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

NOTE: You may have to perform these procedures more or less frequently, depending on factors such as operator experience and type of powder used.

Frequency	Part	Procedure
Daily	 Pinch Valves Kit 1057265	Inspect the pinch valve body for signs of powder leakage. If you see powder in the pinch valve body or stress cracks in the pinch valves, replace the pinch valves.
Every Six Months or Each Time You Disassemble the Pump	 Upper Y-Manifold Kit 1057269 Lower Y Body Part 1053976	Disassemble the pump assembly and inspect the lower Y body and upper Y-manifold for signs of wear or impact fusion. Clean these parts in an ultrasonic cleaner if necessary. **NOTE:** To reduce downtime, keep a spare upper Y-manifold and lower Y body in stock to install while you are cleaning the other set.

Troubleshooting

Problem	Possible Cause	Corrective Action
1. Reduced powder output (pinch valves are opening and closing)	Blockage in the powder tubing to the destination	Check the tubing for blockages. Purge the pump.
	Conveying air is set too high	Decrease the conveying air pressure.
	Conveying air is set too low	Increase the conveying air pressure.
	Defective pinch valve	Replace the pinch valves.
	Fluidizing tubes clogged	Replace the fluidizing tubes.
	Conveying air solenoid valve not actuating	Refer to the *Tubing Diagrams* on pages 20 and and 21. Turn off the pump and disconnect tubes J and K from the top of the pump. Turn the pump on and check the tubes for alternating positive and negative air pressure. If there is no pressure, replace the valve. If the valve is actuating, but you cannot feel positive or negative air pressure at the tubes, check for obstructions in the air lines leading in and out of the valve.
	Timing valve not actuating	Replace the timing valve.
2. Reduced powder output (pinch valves are not opening and closing)	Defective pinch valve	Replace the pinch valves.
	Defective check valve	Replace the check valves.
	Pinch pressure solenoid valve not actuating	Refer to the *Tubing Diagrams* on pages 20 and and 21. Turn off the pump and disconnect tubes H and G from the pump. Turn the pump on and check the tubes for alternating positive air pressure. If there is no pressure, replace the valve. If the valve is actuating, but you cannot feel air pressure at the tubes, check for obstructions in the air lines leading in and out of the valve.
	Timing valve not actuating	Replace the timing valve.
3. Reduced powder input (loss of suction from powder source)	Blockage in the powder tubing from the feed source	Check the tubing for blockages. Purge the pump.
	Loss of vacuum at the vacuum generator	Check the vacuum generator for contamination. Check the exhaust muffler. If the exhaust muffler appears to be plugged, replace it.
	Damaged O-rings in powder path	Check all powder path O-rings. Replace any worn or damaged O-rings.
4. Pinch valves failing rapidly, cracking around the flange	Powder is tribo-charging in the pump and grounding through the pinch valves	Replace the standard blue pinch valves with black non-conductive pinch valves. Refer to *Parts* for the non-conductive pinch valve kit.

Repair

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

WARNING: Shut off and relieve system air pressure before performing the following tasks. Failure to relieve air pressure may result in personal injury.

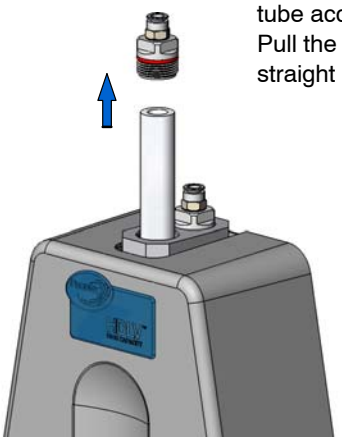
Fluidizing Tube Replacement

NOTE: Four O-rings are included in the fluidizing tube kit. Replace the O-rings if they are worn. It is not necessary to replace the O-rings each time you replace the fluidizing tubes.

1

Shut off and relieve purge air pressure.
Disconnect the purge air tubing.

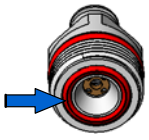
2



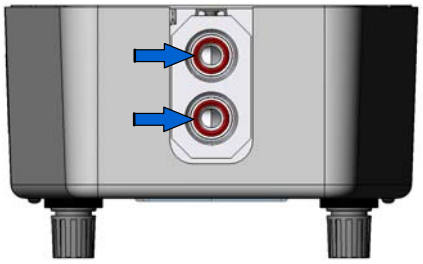
Remove the fluidizing tube access plugs
Pull the fluidizing tubes straight out of the pump.

3

Check the O-rings in the inside diameter of the access plugs. Replace them if necessary.

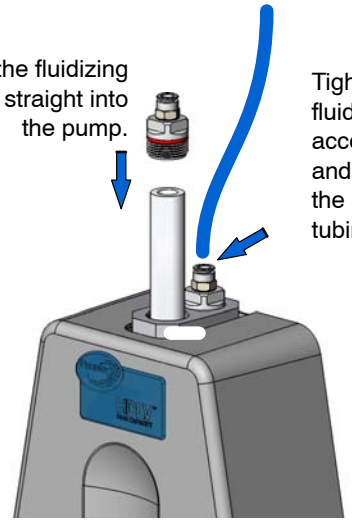


Look down into the pump to make sure the O-rings are seated in the upper-Y manifold. If they are not seated, use the fluidizing tubes to seat them.



4

Insert the fluidizing tubes straight into the pump.



Tighten the fluidizing tube access plugs and connect the purge air tubing.

Pump Disassembly

WARNING: Shut off and relieve system air pressure before performing the following tasks. Failure to relieve air pressure may result in personal injury.

NOTE: Tag all air and powder tubing before disconnecting from the pump.

1. See Figure 9. Disconnect the purge air lines from the top of the pump.
2. Disconnect the inlet and outlet powder tubing from the bottom of the pump.
3. Remove the two screws (A) and the cover from the pump.
4. See Figure 10. Disconnect one end of each of the seven air tubes indicated.

   NOTE: The letters in Figure 10 correspond to the letters in the *Tubing Diagram* on page 20.
5. See Figure 9. Remove the two screws (B) securing the pump assembly to the base. Remove the pump assembly and take it to a clean work surface.
6. See Figure 11. Starting with the fluidizing tubes, disassemble the pump as shown.

NOTE: Refer to *Pinch Valve Replacement* on page 18 for instructions on pulling the pinch valves out of the pinch valve body.

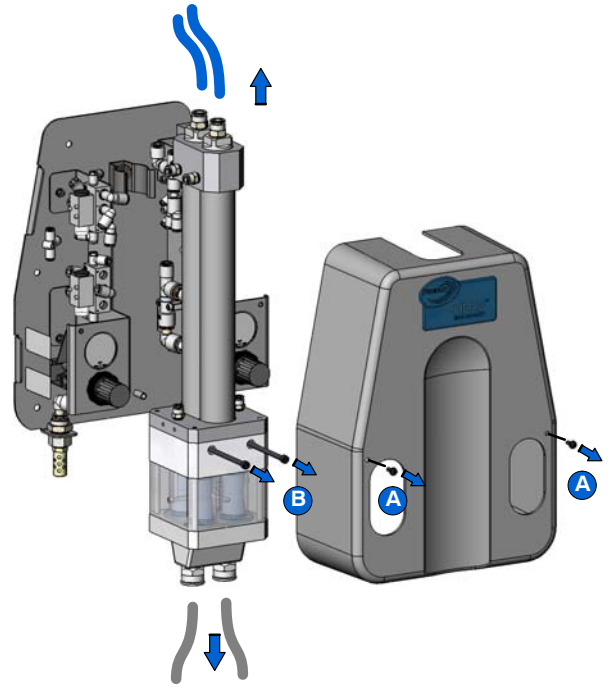


Figure 9 Disconnecting Tubing and Removing the Cover

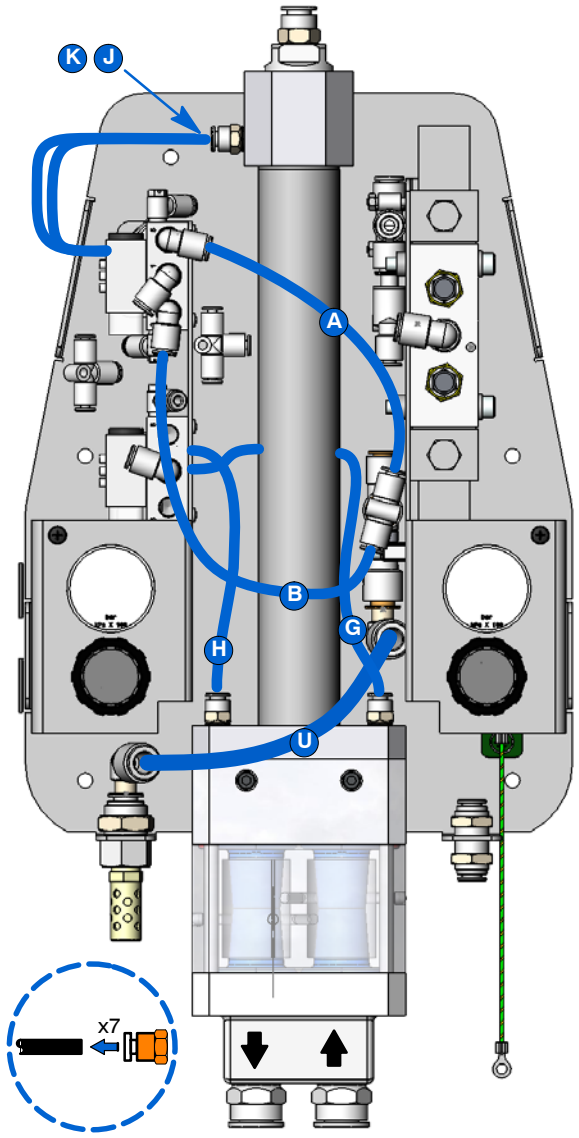


Figure 10 Disconnecting Air Tubing

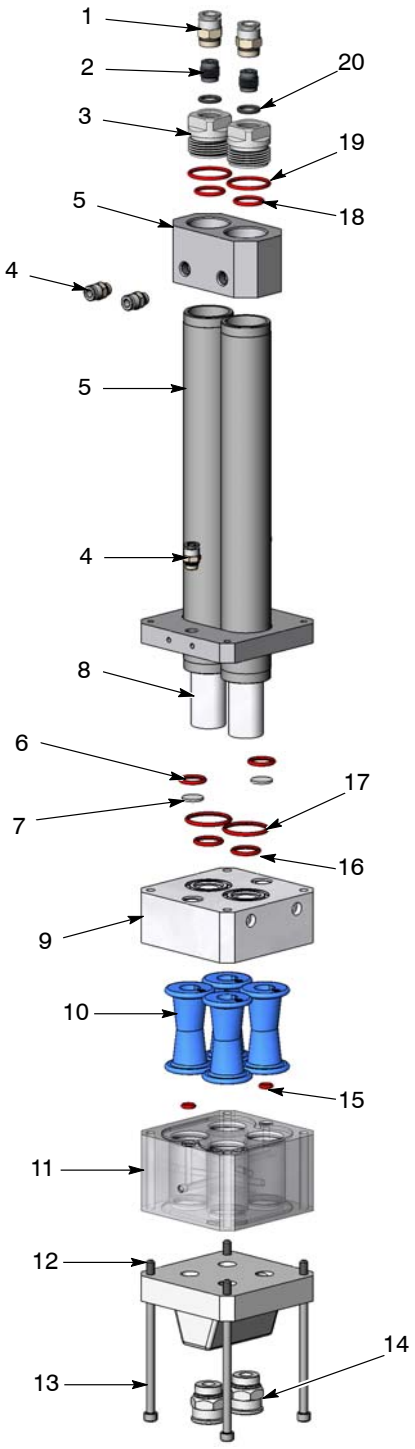


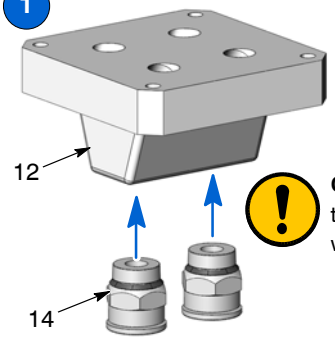
Figure 11 Pump Disassembly and Assembly

1. 10-mm tube connectors (2)
2. Check valves (2)
3. Fluidizing tube access plugs (2)
4. 6-mm tube connectors (4)
5. Outer fluidizing tube assembly
6. O-rings (2)
7. Filter discs (2)
8. Fluidizing tubes (2)
9. Upper-Y manifold
10. Pinch valves (4)
11. Pinch valve body
12. Lower-Y body
13. 120-mm screws (4)
14. 16-mm tube connectors (2)
15. O-rings (2)
16. O-rings (2)
17. O-rings (2)
18. O-rings (2)
19. O-rings (2)
20. O-rings (2)

Pump Assembly

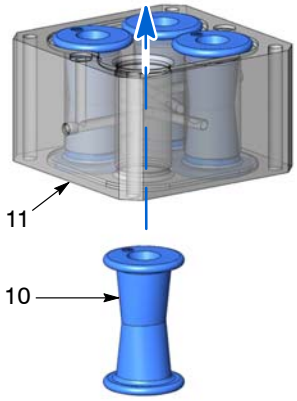
CAUTION: Follow the assembly order and specifications shown. Pump damage may occur if you do not carefully follow the assembly instructions.

1

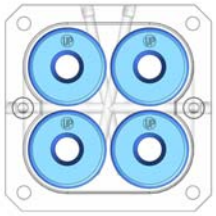


CAUTION: Do not over-tighten the fittings. You will strip the threads.

2



Refer to *Pinch Valve Replacement* on page 18 for specific instructions.



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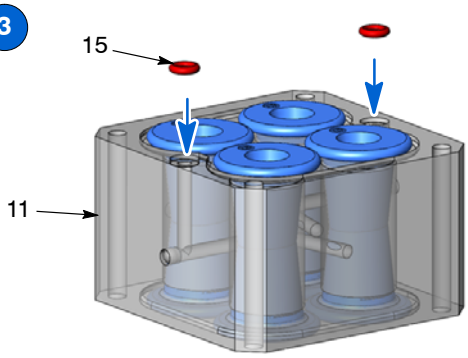

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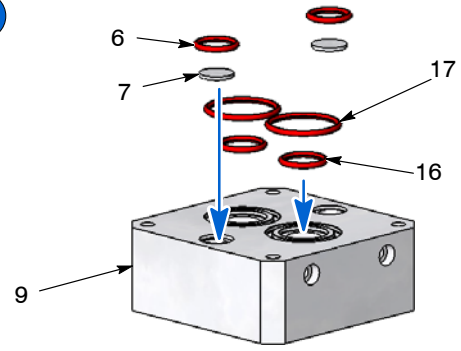

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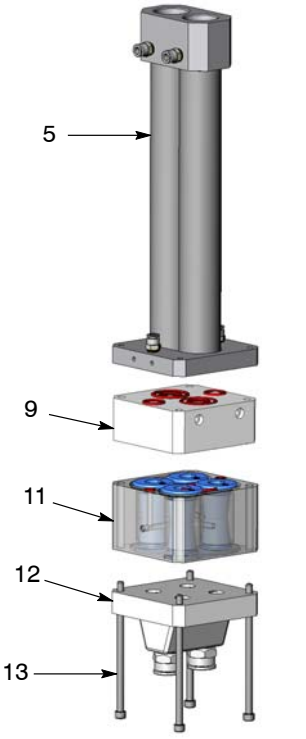
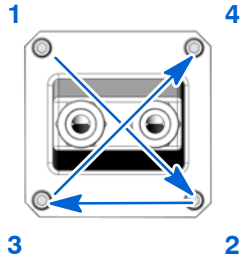
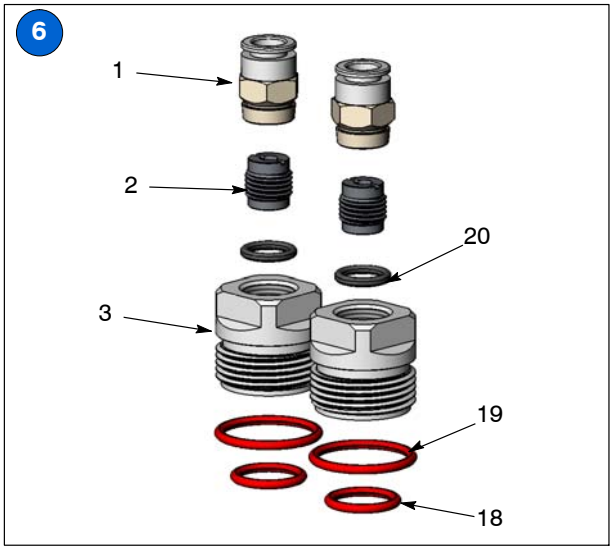
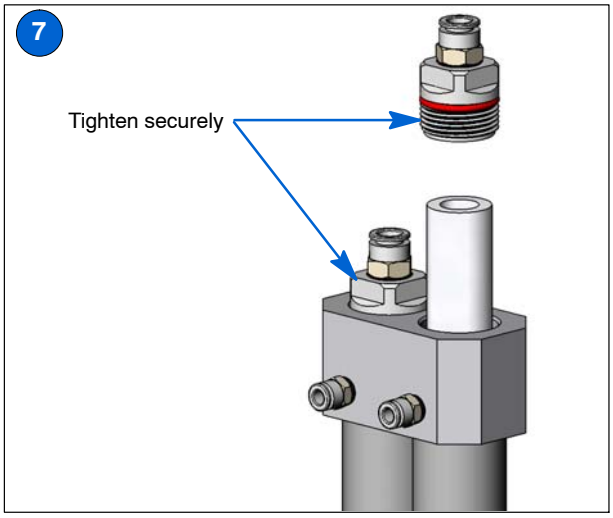
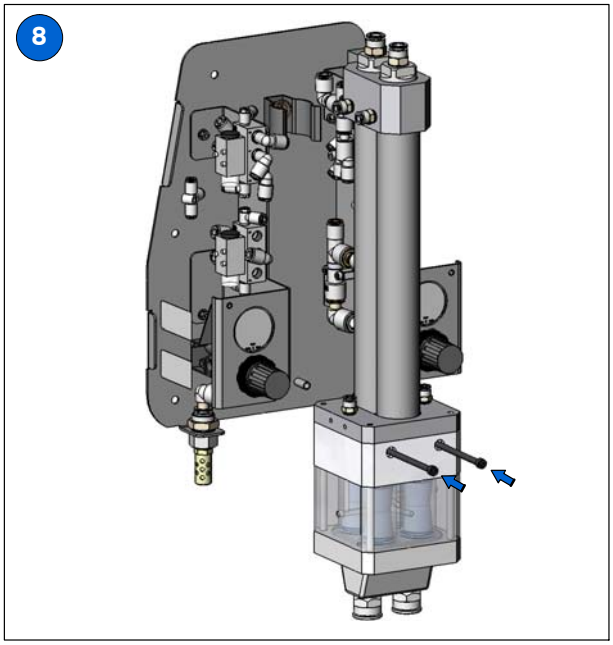


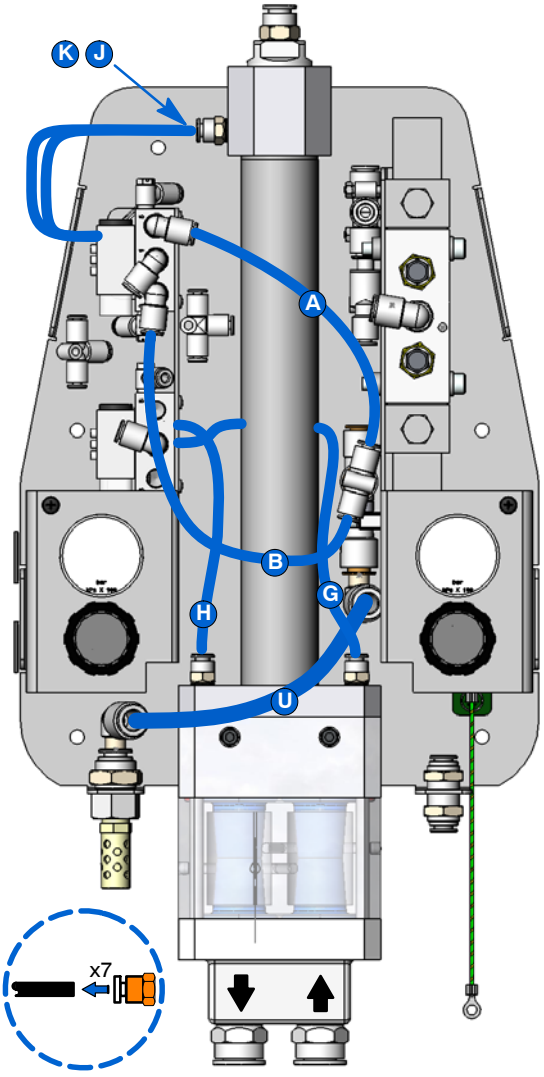


Tighten screws two turns at a time to 7–10 in. lb using an alternating pattern.

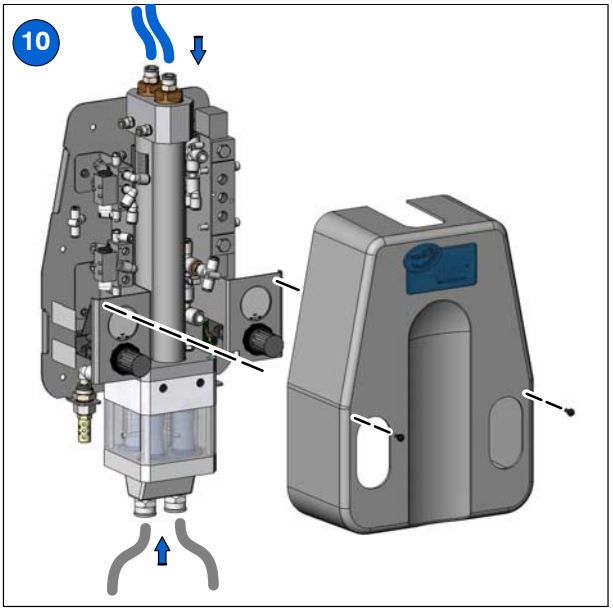








Refer to the tubing diagrams on pages 20 and 21.



Pinch Valve Replacement

WARNING: Wear eye protection while performing this procedure. The pinch valves will quickly snap back to their normal shape when you pull them out of the pinch valve body.

Pinch Valve Removal

1

Place the pinch valve body in a padded vise with the bottom end facing you. Grasp and pull the bottom end of the pinch valve with one hand.

2

Use your other hand to pinch the flange on the opposite end of the pinch valve.

3

Pull the pinch valve firmly until it comes out of the pinch valve body.

Pinch Valve Installation

1

Turn the pinch valve body around so that the top end faces you. Insert the pinch valve insertion tool through the pinch valve body.

NOTE: After you put the pinch valve into the insertion tool, pinch flat the flange on the UP end of the valve.

2

Insert the UP end of the pinch valve into the pinch valve insertion tool. Pinch the UP end flange flat and feed the small end of the flattened flange into the pinch valve body.

3

While keeping the UP end flange pinched flat, pull on the the insertion tool.

4

Pull the insertion tool through the valve body until the UP end of the pinch valve and the insertion tool comes out the top of the pinch valve body.

Tubing Diagrams

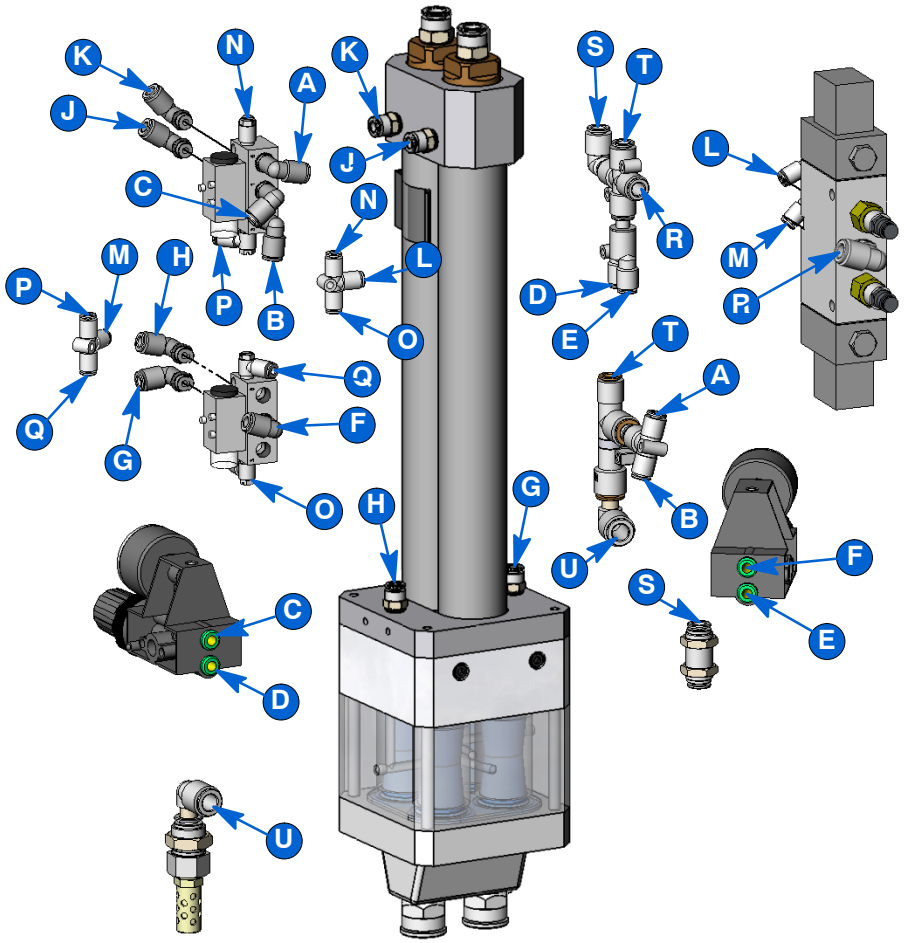


Figure 12 Tubing Diagram — 1 of 2

Note: Regulators shown rotated out of position to show fittings.

	OD	Color	Length mm (in.)
A — A	6 mm	Blue	213 (8.37)
B — B	6 mm	Blue	213 (8.37)
C — C	6 mm	Blue	273 (10.74)
D — D	6 mm	Blue	238 (9.36)
E — E	6 mm	Blue	383 (15.07)
F — F	6 mm	Blue	383 (15.07)
G — G	6 mm	Blue	278 (10.93)
H — H	6 mm	Blue	213 (8.37)
J — J	6 mm	Blue	153 (6.01)
K — K	6 mm	Blue	118 (4.63)

	OD	Color	Length mm (in.)
L — L	4 mm	Clear	243 (9.56)
M — M	4 mm	Clear	243 (9.56)
N — N	4 mm	Clear	123 (4.83)
O — O	4 mm	Clear	123 (4.83)
P — P	4 mm	Clear	88 (3.45)
Q — Q	4 mm	Clear	88 (3.45)
R — R	8 mm	Blue	103 (4.04)
S — S	8 mm	Blue	433 (17.04)
T — T	8 mm	Blue	238 (9.36)
U — U	10 mm	Blue	223 (8.77)

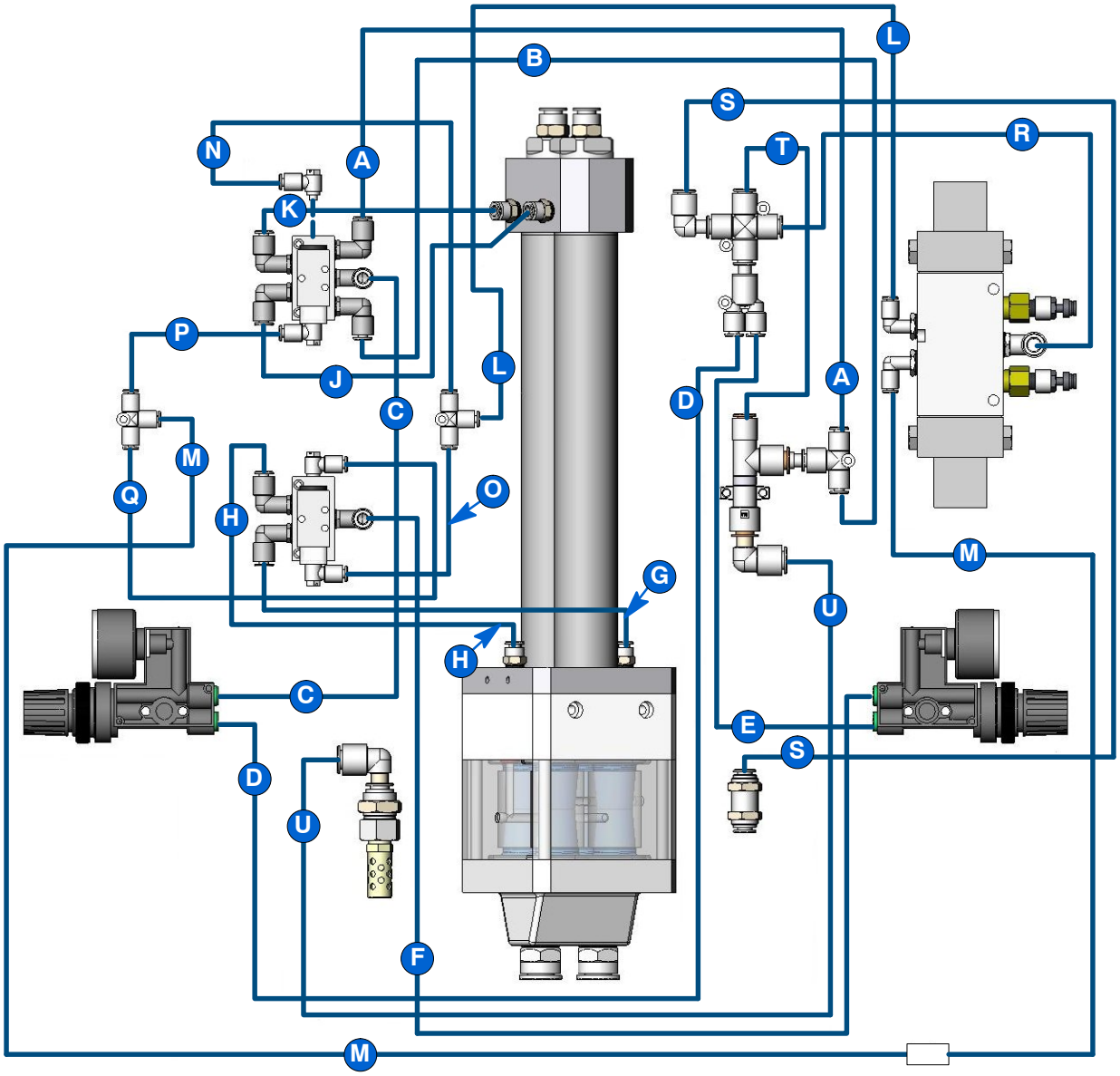


Figure 13 Tubing Diagram — 2 of 2

Parts

To order parts, call the Nordson Customer Service Center or your local Nordson representative. Use this five-column parts list, and the accompanying illustration, to describe and locate parts correctly.

Using the Illustrated Parts List

Numbers in the Item column correspond to numbers that identify parts in illustrations following each parts list. The code NS (not shown) indicates that a listed part is not illustrated. A dash (—) is used when the part number applies to all parts in the illustration.

The number in the Part column is the Nordson Corporation part number. A series of dashes in this column (- - - - - -) means the part cannot be ordered separately.

The Description column gives the part name, as well as its dimensions and other characteristics when appropriate. Indentions show the relationships between assemblies, subassemblies, and parts.

- If you order the assembly, items 1 and 2 will be included.
- If you order item 1, item 2 will be included.
- If you order item 2, you will receive item 2 only.

The number in the Quantity column is the quantity required per unit, assembly, or subassembly. The code AR (As Required) is used if the part number is a bulk item ordered in quantities or if the quantity per assembly depends on the product version or model.

Letters in the Note column refer to notes at the end of each parts list. Notes contain important information about usage and ordering. Special attention should be given to notes.

Item	Part	Description	Quantity	Note
—	0000000	Assembly	1	
1	000000	• Subassembly	2	A
2	000000	• • Part	1	

Pump Assembly Parts

See Figure 14.

Item	Part	Description	Quantity	Note
—	1081246	PUMP ASSEMBLY, high capacity HDLV, packaged	1	
1	- - - - - -	• PNEUMATIC ASSEMBLY	1	A
2	1087221	• PUMP ASSY, HDLV, high capacity, w/o controls	1	B
3	345537	• SCREW, socket, M5 x 90, black	2	
4	1054586	• COVER, high capacity HDLV pump	1	
5	982825	• SCREW, pan head, recessed, M4 x 12, with integral lockwasher bezel	2	
NS	981830	• SCREW, socket, M6 x 25, zinc	4	C
NS	984703	• NUT, hex, M6, steel, zinc	4	C
NS	983029	• WASHER, flat, M, regular, M6, steel, zinc	8	C
NS	983409	• WASHER, lock, M, split, M6, steel, zinc	4	C

NOTE A: Refer to *Pneumatic Assembly* on page 26 for a breakdown of the parts included in this assembly.

B: Refer to *Pump Parts* on page 24 for a breakdown of the parts included in this assembly.

C: Use these fasteners to mount the pump.

NS: Not Shown

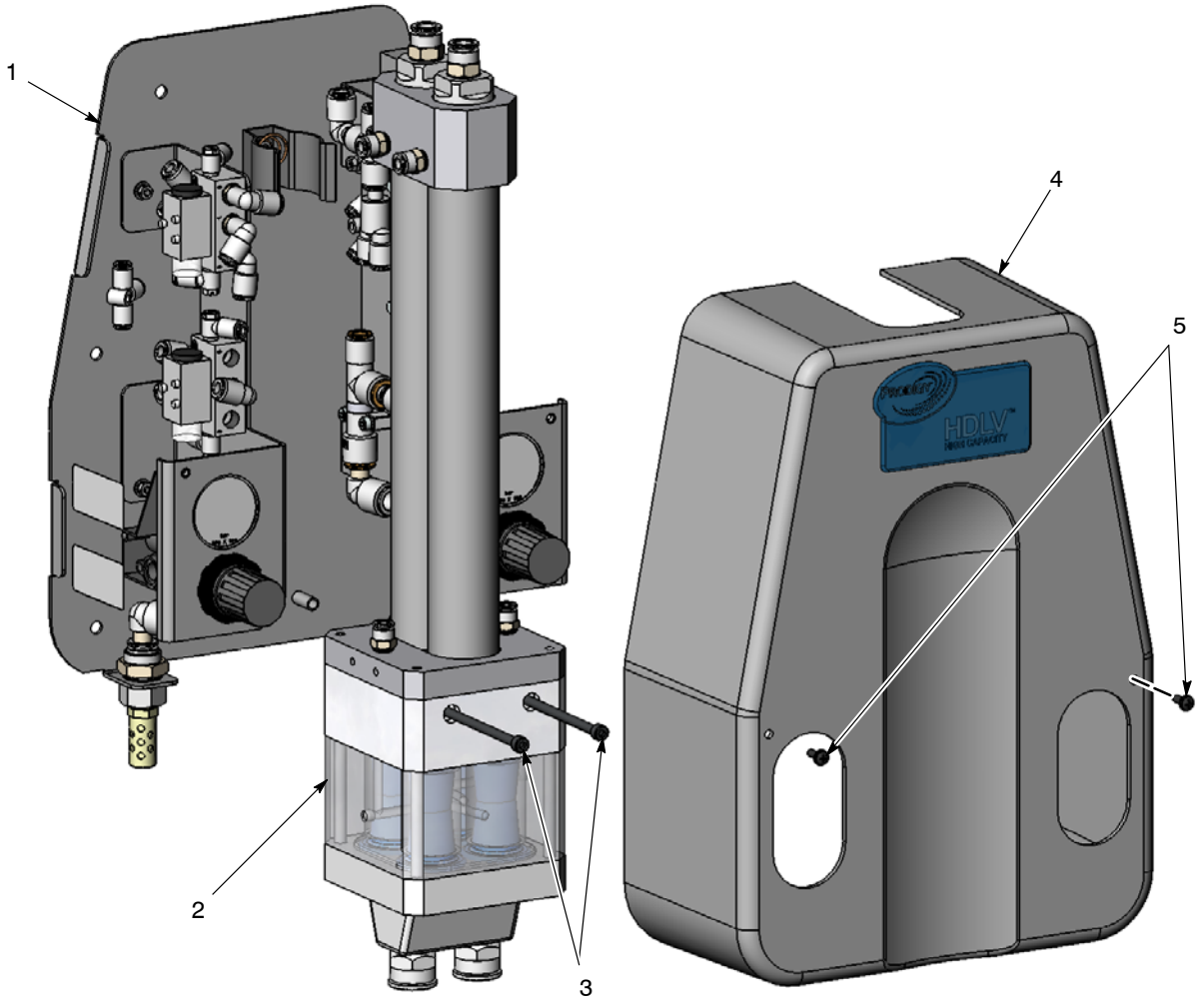


Figure 14 Prodigy High-Capacity HDLV Pump Parts

Pump Parts

See Figure 15.

Item	Part	Description	Quantity	Note
–	1087221	PUMP ASSY, HDLV, high capacity, w/o controls	1	
1	971102	• CONNECTOR, male, 10 mm tube x $^{3}/_{8}$ unithread	2	D
2	- - - - - -	• CHECK VALVE assembly, pump, Prodigy	2	D, E
3	- - - - - -	• PLUG, fluidizing tube, high capacity HDLV pump	2	D
4	972141	• CONNECTOR, male, 6 mm tube x $^{1}/_{8}$ universal	4	
5	- - - - - -	• TUBE, outer fluid assembly, high capacity HDLV pump	1	
6	941143	• O-RING, silicone, 0.625 x 0.813 x 0.094 in.	2	
7	- - - - - -	• DISC, filter, Prodigy HDLV pump	2	A
8	- - - - - -	• TUBE, fluidizing, high capacity HDLV pump	2	B
9	1057269	• KIT, upper Y manifold, high capacity HDLV pump	1	
10	- - - - - -	• VALVE, pinch, high capacity HDLV pump	4	A, C
11	1063272	• BODY, pinch valve, high capacity HDLV pump	1	
12	1053976	• BODY, lower Y, high capacity HDLV pump	1	
13	1054518	• SCREW, socket, M6 x 120, stainless steel	4	
14	1051108	• CONNECTOR, male, 16 mm tube x $^{1}/_{2}$ universal	2	
15	1053292	• O-RING, silicone, 0.219 x 0.406 x 0.094 in.	2	
16	941231	• O-RING, silicone, 1.188 x 1.375 x 0.094 in.	2	
17	941153	• O-RING, silicone, 0.688 x 0.875 x 0.094 in.	4	B, D
18	941215	• O-RING, silicone, 1.250 x 1.063 x 0.094 in.	2	D
19	941113	• O-RING, silicone, 0.438 x 0.625 x 0.094 in.	2	D

NOTE A: These parts are included in the Pinch Valve Service Kit, part 1057265.

B: These parts are included in the Fluidizing Tube Service Kit, part 1057266.

C: To replace standard blue pinch valves with non-conductive black pinch valves, order kit 1074620.

D: To upgrade older pumps to the new style check valves pictured in Figure 15, order the Check Valve Upgrade Kit, part 1080160. Noted parts are included in the kit.

E: To replace both check valves, order the Check Valve Service Kit, part 1078161.

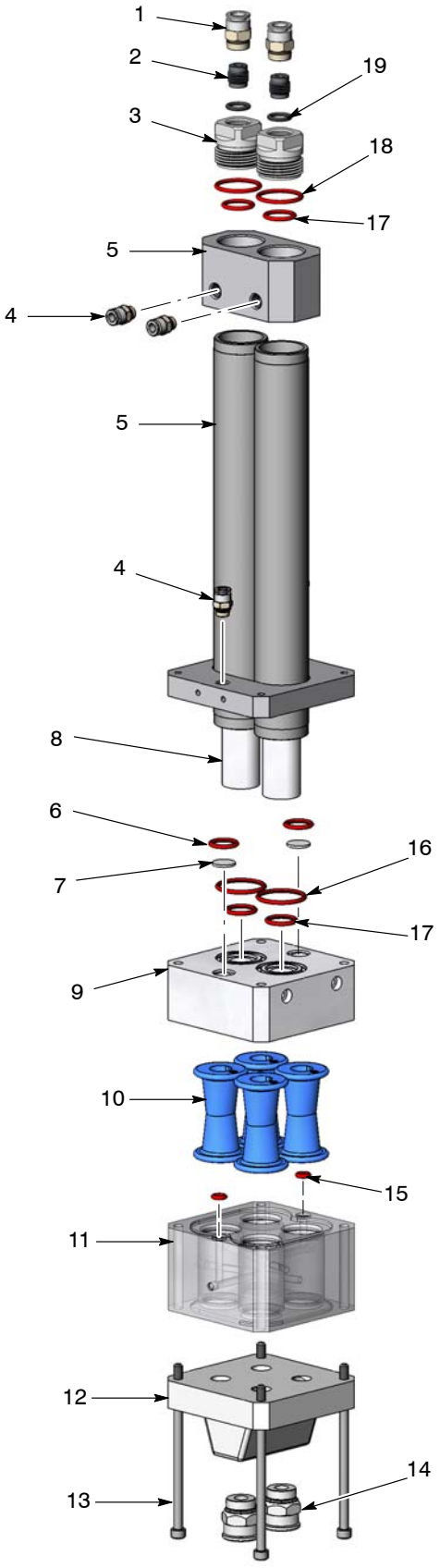


Figure 15 Pump Parts

Pneumatic Assembly

Left Side

See Figure 16.

Item	Part	Description	Quantity	Note
1	1056480	UNION, tee, 4 mm tube x 4 mm tube x 4 mm tube	2	
2	1054534	CONNECTOR, male, universal elbow, 4 mm tube x M5	4	
3	972126	CONNECTOR, male, elbow, 6 mm tube x $^{1}/_{8}$ universal	8	
4	982650	SCREW, socket, M3 x 20 long, black	4	
5	983400	WASHER, lock, M, split, steel, zinc	4	
6	1054519	VALVE, miniature, double air piloted, 5 port	2	
7	1018157	REGULATOR ASSEMBLY, 0–25 psi, 0–1.7 bar, vertical	1	

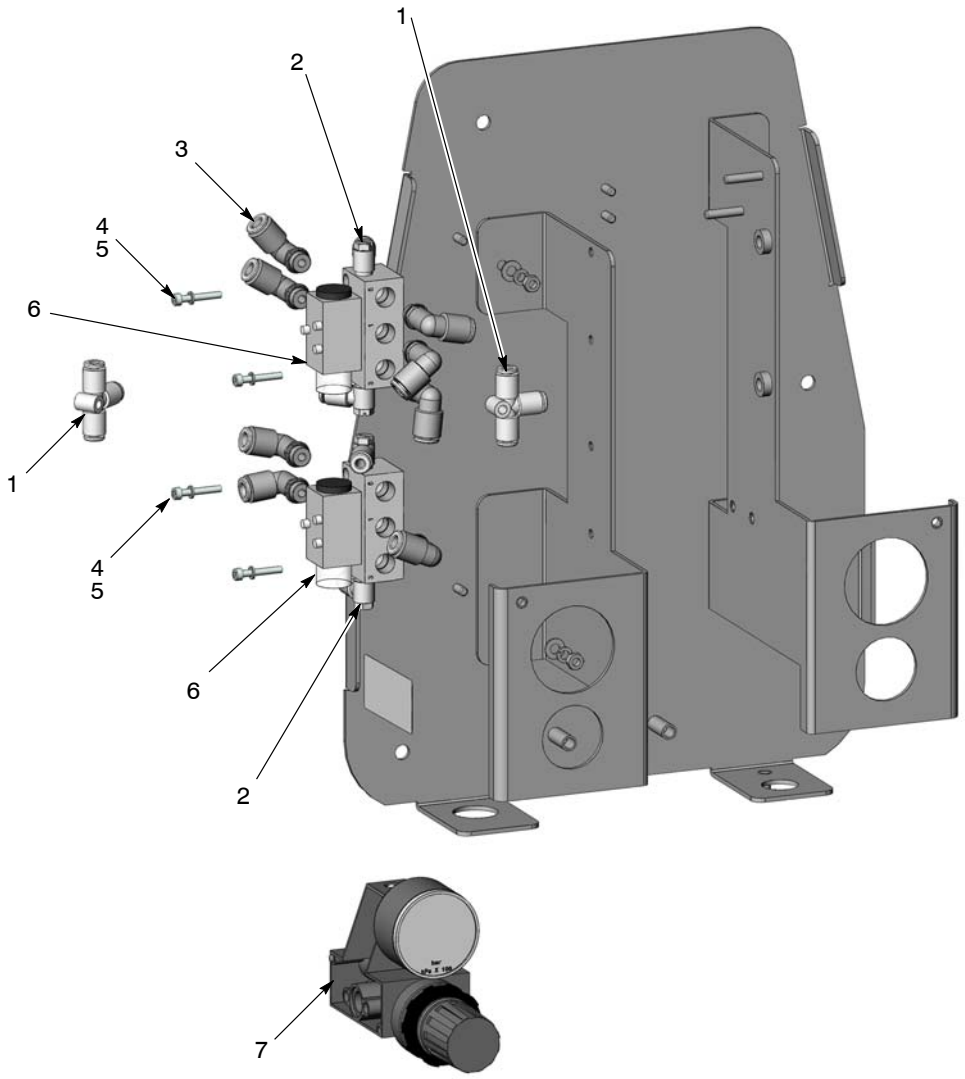


Figure 16 Pneumatic Assembly — Left Side

Right Side

See Figure 17.

Item	Part	Description	Quantity	Note
8	1034396	MUFFLER, exhaust, PE, 0.656 x 1.5 x $^1/_4$ NPT	1	
9	1005068	UNION, female bulkhead, 10 mm tube x $^1/_4$ RPT	1	
10	1052893	ELBOW, plug in, 10 mm tube x 10 mm stem, plastic	2	
11	982517	SCREW, socket, M4 x 20, zinc	2	
12	983403	WASHER, lock, M, split, M4, steel, zinc	8	
13	1052920	PUMP, vacuum generator	1	
14	1019093	CONNECTOR, plug in Y, 8 mm stem x 6 mm tube	1	
15	984715	NUT, hex, M4, steel, zinc	6	
16	1056465	ELBOW, plug in, 8 mm tube x 8 mm stem, plastic	1	
17	1054619	UNION, cross, 4 mm tube x 8 mm tube	1	
18	1054592	VALVE, timing, high capacity HDLV pump	1	
19	972277	• CONNECTOR, male, elbow, 8 mm tube x $^1/_4$ universal	1	
20	1054530	CONNECTOR, male, elbow, 4 mm tube x $^1/_4$ universal	2	
21	1054593	SCREW, socket, M6 x 45, zinc	2	
22	983409	WASHER, lock, M, split, M6, steel, zinc	2	
23	- - - - - -	HOLDER, clamping, spring action	1	
24	1063245	SPRING, tapered, 0.312 x 0.750 in., pump grounding	1	
25	983402	WASHER, flat, M, narrow, M4, steel, zinc	4	
26	1054617	NIPPLE, reducing, 10 mm tube x 8 mm tube, plastic	1	
27	1054616	UNION, tee, 8 mm tube x 6 mm tube x 6 mm tube	1	
28	984706	NUT, hex, M5, steel, zinc	1	
29	983401	WASHER, lock, M, split, M5, steel, zinc	1	
30	983021	WASHER, flat, E, 0.203 x 0.406 x 0.040 in., brass	1	
31	138142	WIRE, ground, power distribution	1	
32	240674	TAG, ground	1	
33	1002711	UNION, bulkhead, 8 mm tube x 8 mm tube	1	
34	288821	REGULATOR ASSEMBLY, 0–60 psi, 0–4 bar	1	

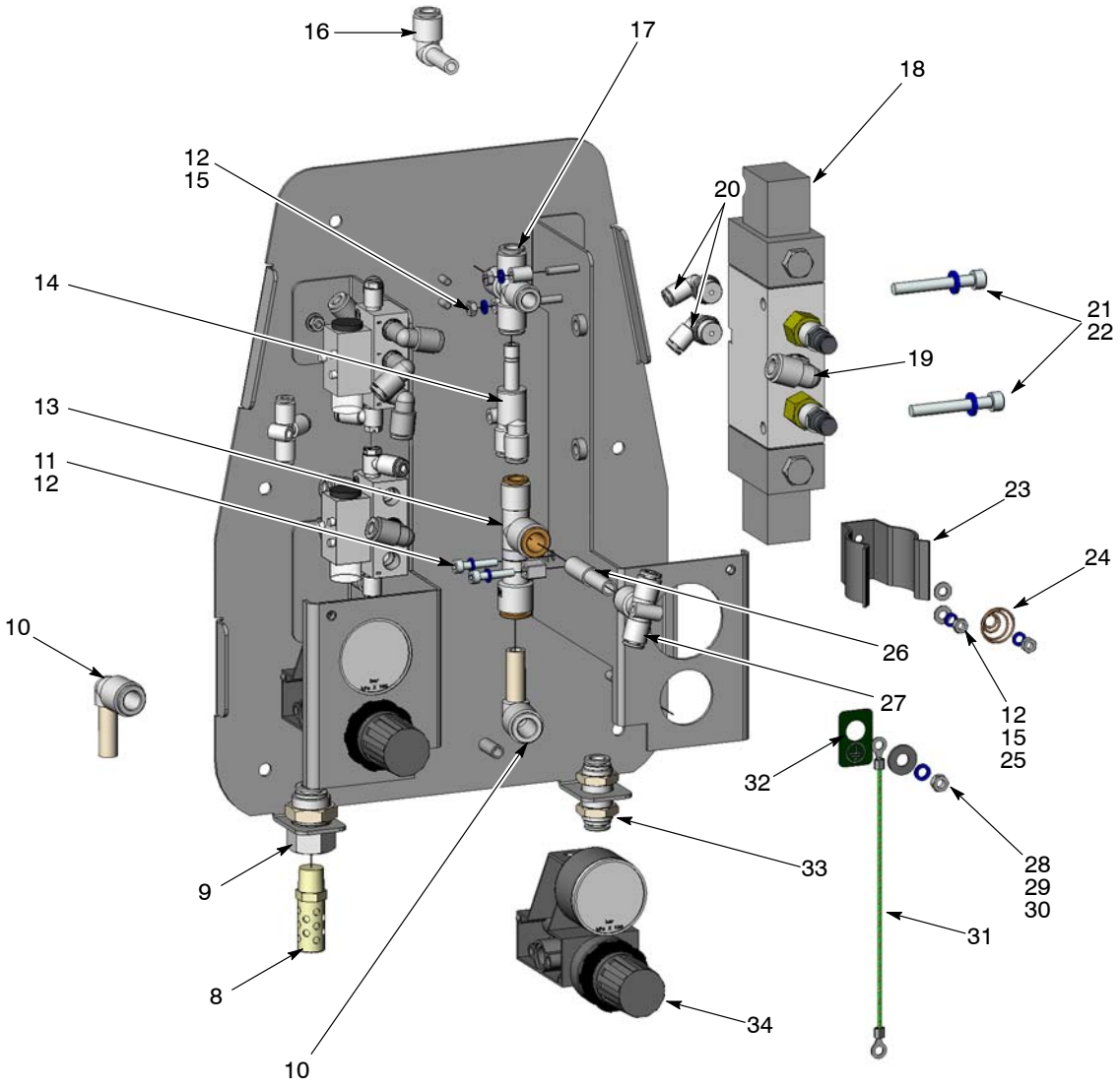


Figure 17 Pneumatic Assembly — Right Side

Powder and Air Tubing

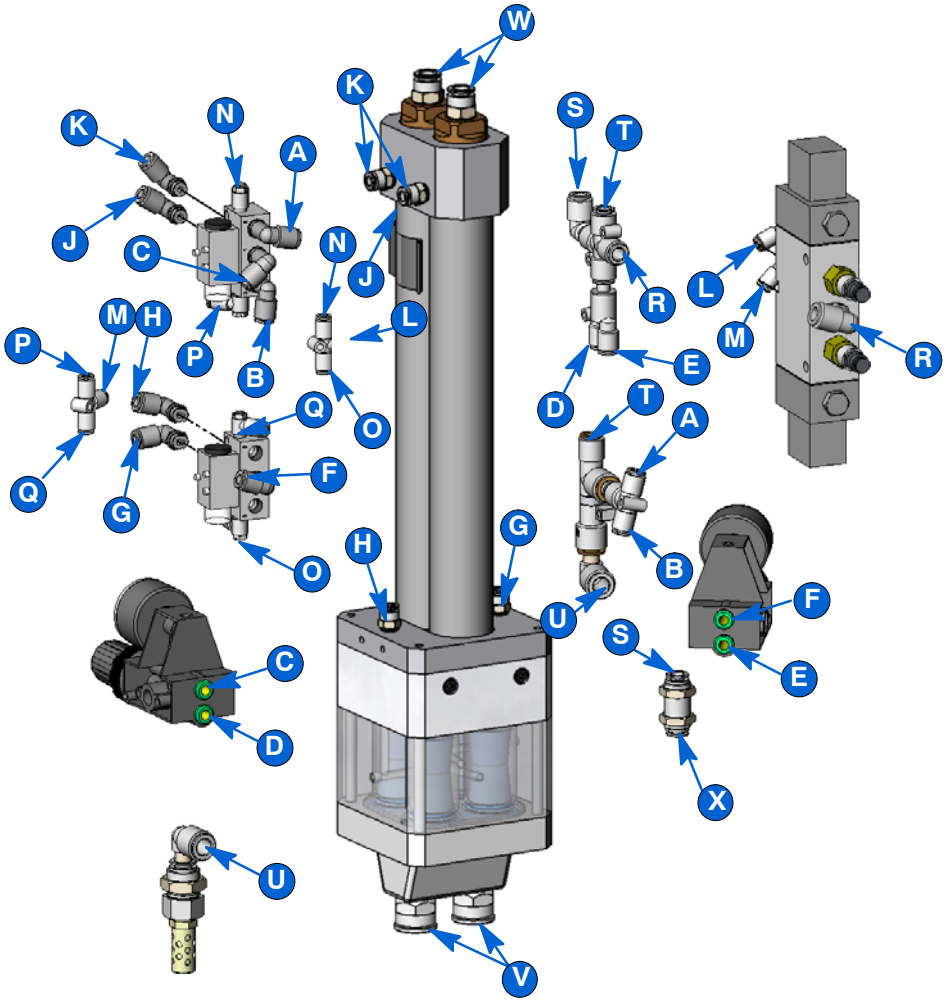


Figure 18 Powder and Air Tubing

	Part	Description
A — A	900742	6-mm OD, blue
B — B	900742	6-mm OD, blue
C — C	900742	6-mm OD, blue
D — D	900742	6-mm OD, blue
E — E	900742	6-mm OD, blue
F — F	900742	6-mm OD, blue
G — G	900742	6-mm OD, blue
H — H	900742	6-mm OD, blue
J — J	900742	6-mm OD, blue
K — K	900742	6-mm OD, blue
L — L	900617	4-mm OD, clear
M — M	900617	4-mm OD, clear

	Part	Description
N — N	900617	4-mm OD, clear
O — O	900617	4-mm OD, clear
P — P	900617	4-mm OD, clear
Q — Q	900617	4-mm OD, clear
R — R	900618	8-mm OD, blue
S — S	900618	8-mm OD, blue
T — T	900618	8-mm OD, blue
U — U	900740	10-mm OD, blue
V — V	1063654	16-mm OD, clear
W — W	900740	10-mm OD, blue
X — X	900619	8-mm OD, black

Pickup Tube Adapters

The pickup tube adapter assembly easily adapts the high-capacity HDLV pump's suction tubing onto a standard pump pickup tube. The adapter is available for pickup tubes with or without an external O-ring.

Adapter with Pump Mount O-Ring

See Figure 19. Use this adapter with pickup tubes that do not have an external pump mount O-ring.

Item	Part	Description	Quantity	Note
—	1068408	DISCONNECTOR, high-capacity HDLV pump, with pump mount O-ring	1	
1	1068402	• NUT, tube retaining, high-capacity HDLV pump	1	
2	941143	• O-RING, silicone, 0.625 x 0.813 x 0.094 in.	1	
3	1068379	• MOUNT, pump adapter, with O-ring gland	1	
4	942143	• O-RING, silicone, 1.00 x 1.250 x 0.125 in.	1	

Adapter without Pump Mount O-Ring

See Figure 19. Use this adapter with pickup tubes that have an external pump mount O-ring.

Item	Part	Description	Quantity	Note
—	1068409	DISCONNECTOR, high-capacity HDLV pump, without pump mount O-ring	1	
1	1068402	• NUT, tube retaining, high-capacity HDLV pump	1	
2	941143	• O-RING, silicone, 0.625 x 0.813 x 0.094 in.	1	
3	1068400	• MOUNT, pump adapter, without O-ring gland	1	

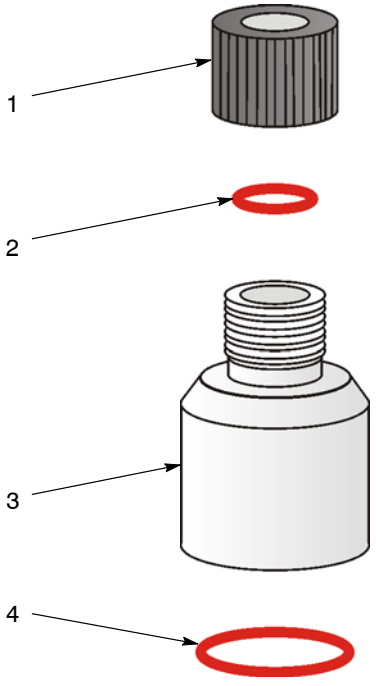
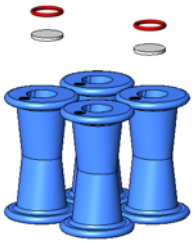


Figure 19 Pickup Tube Adapter Parts

Spare Parts

Keep one of each of these assemblies in stock for each pump in your system.

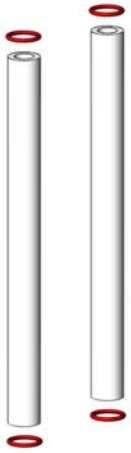


Pinch Valve
Kit 1057265
(Includes
4 pinch valves,
2 filter discs,
2 O-rings,
and 1 insertion tool)

Instructions on page 18

Non-conductive Pinch Valve
Kit 1074620
(Includes
4 pinch valves,
2 filter discs,
2 O-rings,
and 1 insertion tool)

Instructions on page 18

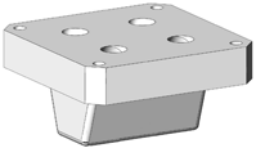


Fluidizing Tube
Kit 1057266
(Includes
2 fluidizing tubes
and 4 O-rings)

Instructions on page 13

Upper Y Manifold
Kit 1057269
(Includes
1 manifold
and 2 O-rings)

Instructions on page 14



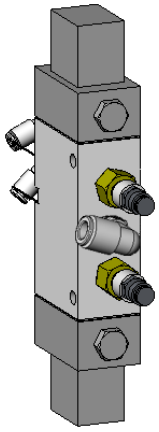
Lower Y Body
Part 1053976
(Quantity of 1)

Instructions on page 14

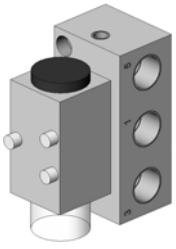
Check Valve Service
Kit 1078161
(Quantity of 2)

Check Valve Upgrade
Kit 1080160
(Includes
2 connectors,
2 check valves,
2 plugs,
6 O-rings)

Use to upgrade older
pumps to new style
check valves



Timing Valve
Part 1054592
(Quantity of 1)



Miniature Valve
Part 1054519
(Quantity of 1)