Prodigy® Automatic Powder Spray Guns

Customer Product Manual
Part 1054075-09

Issued 8/18

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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and available local languages.

NORDSON CORPORATION • AMHERST, OHIO • USA

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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.

Address all correspondence to:

Nordson Corporation
Attn: Customer Service
555 Jackson Street
Amherst, OH 44001

Change Record

Revision	Date	Change
08	5/17	Added air cap assembly kit.
09	8/18	Added nozzle kit.

Prodigy® Automatic Powder Spray Guns

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 Safety Data Sheets (SDS) 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 SDS 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

The Prodigy Automatic Powder Spray Guns use specially designed flat-spray and conical nozzles to atomize, shape, and spray dense-phase powder delivered by Nordson HDLV® (high-density powder, low-volume air) pumps.

There are two versions of the spray gun:

- Tube-mount gun
- Bar-mount gun

A flat spray nozzle with two 1-mm slots is shipped with each gun. Other nozzles are available, refer to pages 30 and 32 for part numbers.

Features

- Standard 8-mm poly tubing for powder delivery
- Nozzle and internal powder tube are the only wear parts.
- Separate high voltage and powder paths.
- Uses same nozzles as Prodigy manual powder spray gun.
- Unique low-surface-area profile sheds powder for fast cleaning.
- Ion collector included with tube-mount guns; optional with bar-mount guns.

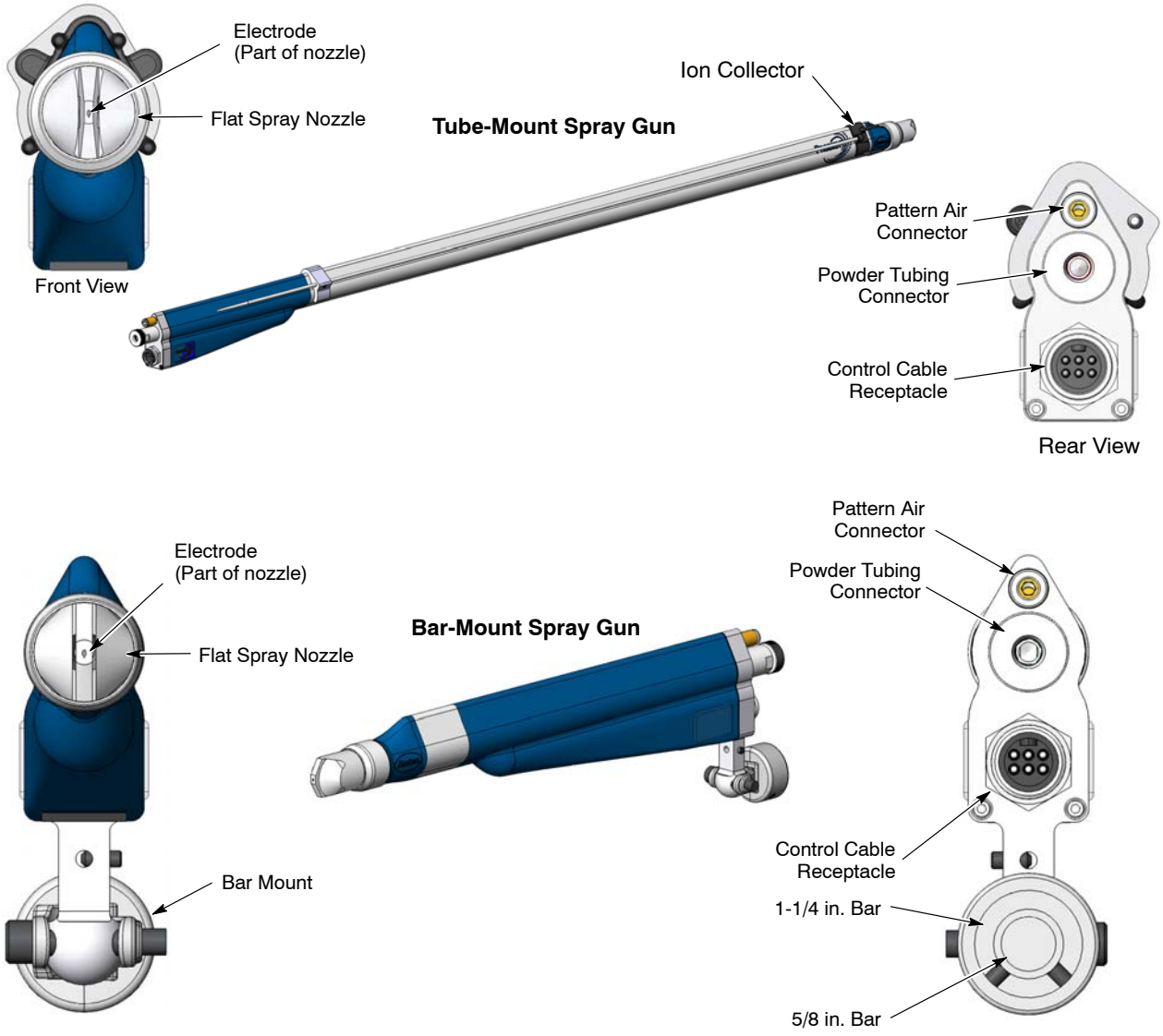

Figure 1 Prodigy Automatic Powder Spray Guns

Tube-Mount Gun Components

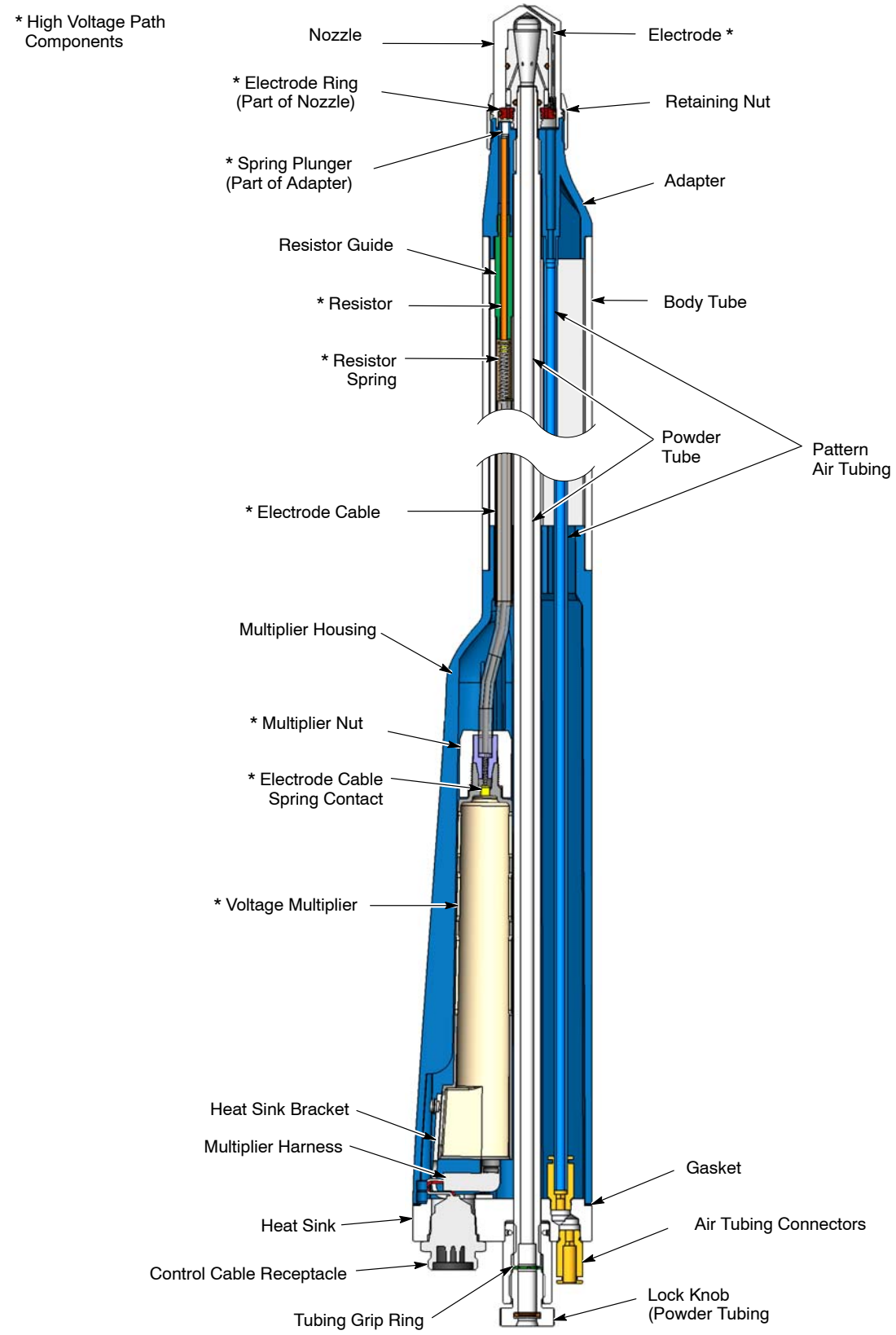

Figure 2 Section View – Tube Mount Gun Components and Assembly

Bar-Mount Gun Components

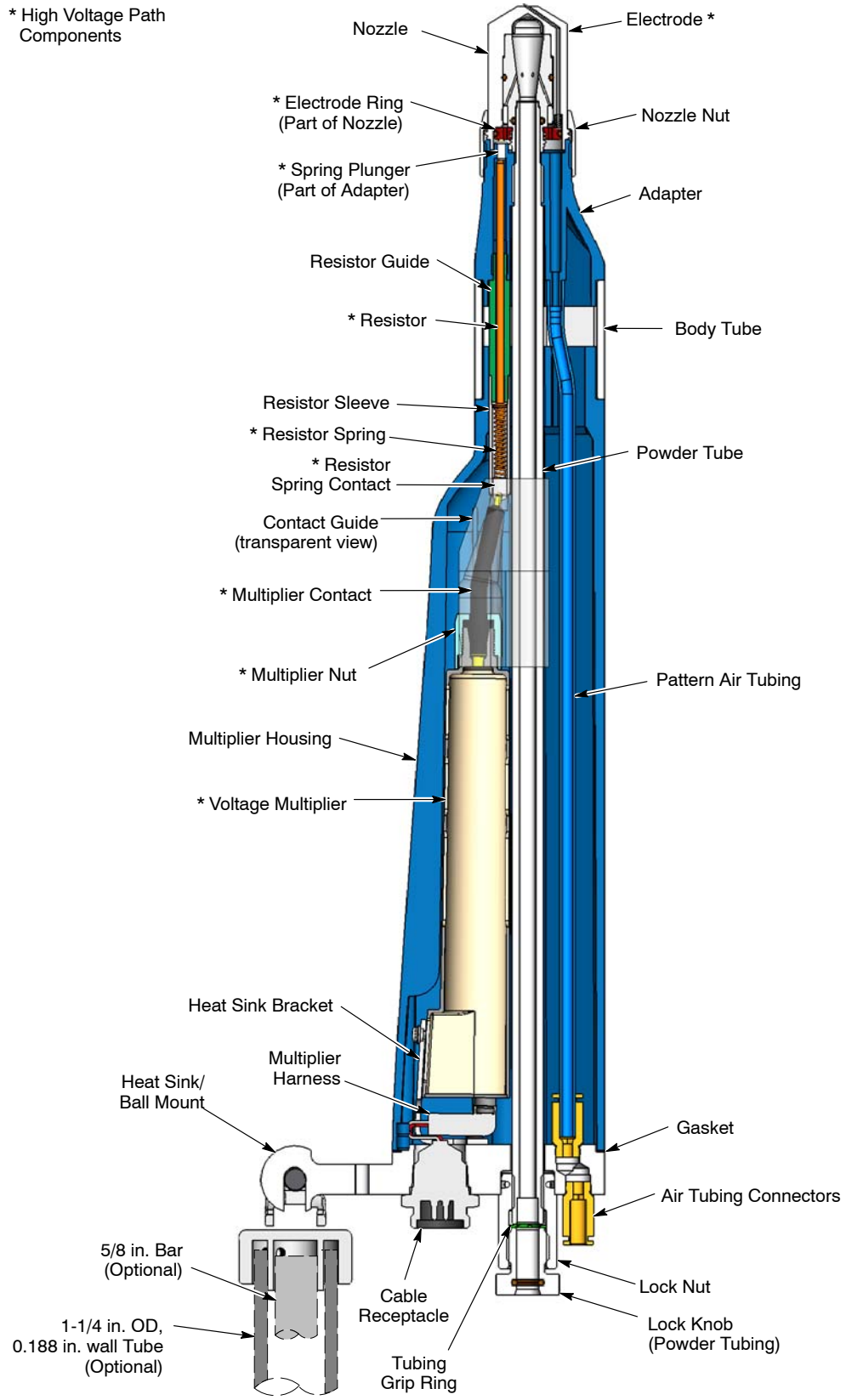

Figure 3 Section View – Bar-Mount Gun Components and Assembly

Specifications

Specifications are subject to change without notice.

Electrical Output	
Maximum rated output voltage at the electrode	95 kV ± 10%
Maximum rated output current at the electrode	100 μA ± 10%
Air Pressure and Flow Requirements	
Minimum input air	4 bar (60 psi)
Maximum input air	6.9 bar (100 psi)
Pattern air	5.9 bar (85 psi), 6–57 l/min. (0.2–2.0 scfm)
Temperature Requirement	
Maximum ambient temperature	40 °C (104 °F)

Air Quality Requirements

Powder spray systems require clean, dry, oil-free compressed air. Moist or oil-contaminated air can cause the powder to clog in the pump, powder feed tubing, or spray gun.

Use 3-micron filter/separators with automatic drains and a refrigerated or regenerative desiccant-type air dryer that can produce a 3.4 °C (38 °F) or lower dewpoint at 6.9 bar (100 psi).

Equipment Rating

This applicator is rated for use in a potentially explosive environment (Class II, Division I Group F & G or Zone 21).

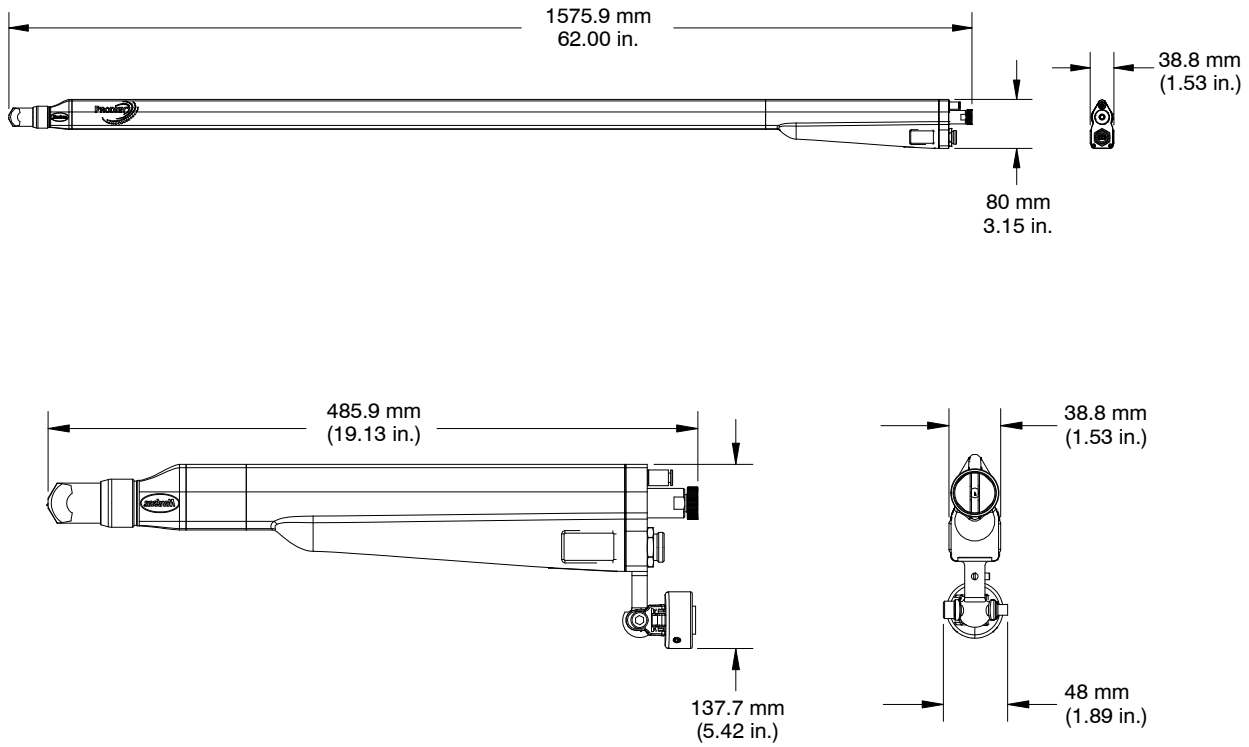

Figure 4 Gun Dimensions

Installation

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

NOTE: Control cables, powder and air tubing, and tube-mount gun clamps are optional and must be ordered separately. Refer to *Options* starting on page 26 for part numbers.

Tube-Mount Gun Mounting

1. Install the fixed jaw on the bar clamp as desired for either vertical or horizontal mounting bars, for left or right-hand use.
2. Assemble the rest of the clamp assembly as shown.
3. Install the nylon screw in the unused insert in the probe clip.
4. Thread the ion collector rod onto the probe clip, and then slide the rod through the rod support and into the fixed jaw, while sliding the probe clip onto the gun.
5. Position the rod support as desired and tighten the set screw.

NOTE: Refer to *Adjusting Ion Collector Position* on page 8 to obtain the best results.

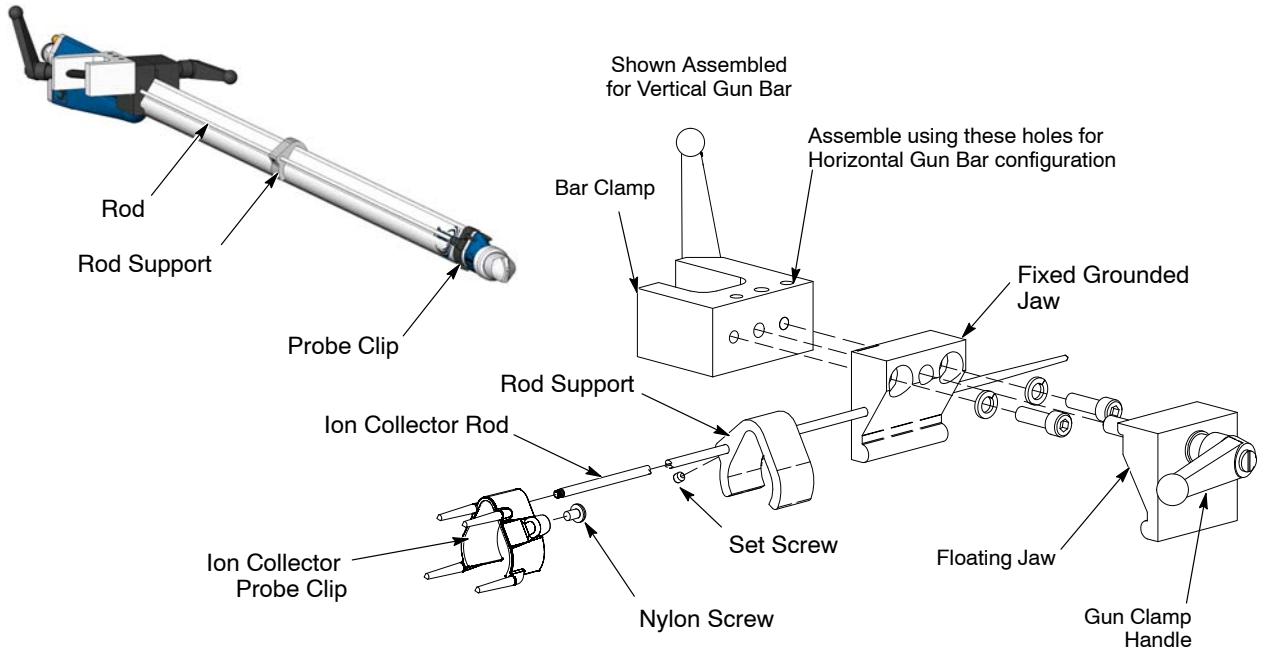

Figure 5 Tube-Mount Gun Mounting

Bar-Mount Gun Mounting

See Figures 3 and 6. The bar mount gun accommodates either 5/8 in. round bars or 1-1/4 in. OD, 0.188 in. wall tubes. The optional three- and four-foot gun bar assemblies have 1.25-in. O.D. tubes

Refer to page 29 for the gun bar assemblies. Also available for the bar-mount gun is an ion collector.

1. Install the gun bar clamp on a 25.4-mm (1-in.) round bar and tighten the clamp handle.
2. insert the tube end into the fixed clamp and tighten the set screws.
3. To pivot the gun vertically on the clamp, loosen the socket screw.

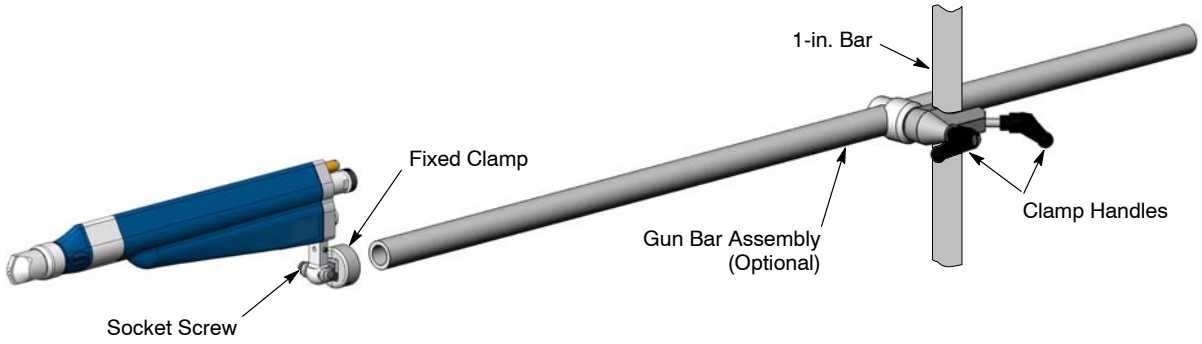

Figure 6 Bar Mount Gun Mounting

Optional Ion Collector for Bar-Mount Guns

The ion collector can only be installed on the left side of the gun.

1. Install the bracket on the clamp with the lock washer and pan-head screw.
2. Thread the ion collector rod into the left insert in the probe clip.
3. Install the nylon screw into the right insert in the probe clip.
4. Slide the end of the rod into the hole in the bracket while sliding the probe clip on the end of the gun.

NOTE: Refer to *Adjusting Ion Collector Position* on page 8 to obtain the best results.

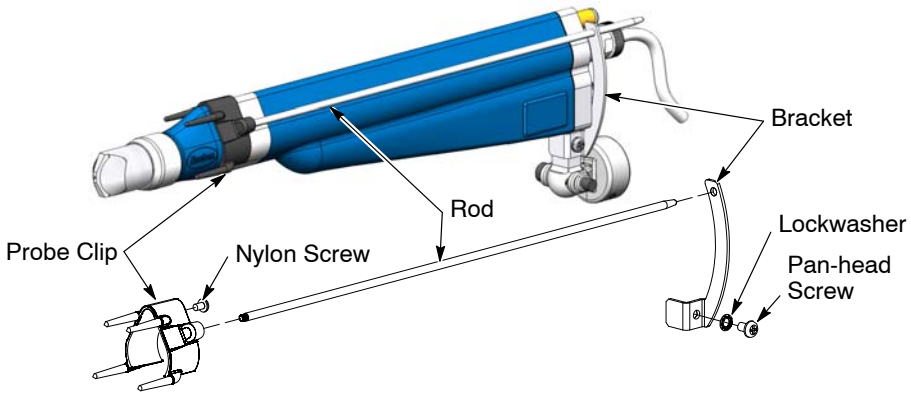

Figure 7 Optional Ion Collector for Bar Mount Gun

Adjusting Ion Collector Position

1. Note the current draw while coating parts before you install the ion collector kit.>>> 1 <<< Stop the line and turn off the spray guns.
2. Install the ion collectors.
3. Start coating parts again. Slide the collector rod forward until the current draw is 5 to 7 μA higher than without the kit.
4. Cure the coating on the new parts. Compare the surface finish on these parts with the finish on the parts you coated before installing the kit.
5. If you did not obtain the desired improvement in the surface finish, slide the probe forward approximately 25 mm (1-in.) and test again.

Tubing and Cable Connections

1. See Figure 8. Connect the control cable to the gun and the appropriate receptacle on the iControl cabinet. Tighten the cable nuts securely.
2. Connect blue 6-mm pattern air tubing to the gun and the appropriate outlet fitting on the pump panel.

NOTE: Use 8-mm polyethylene tubing for powder delivery, at least 10 meters long. Cut the end of the tubing square. Refer to page 27 for tubing cutter and tubing part numbers.

3. Install the lock knob and grip ring on the powder tubing, positioning the grip ring 6.35-mm ($^1/_4$-in.) from the end of the tubing.
4. Push the powder tubing into the lock nut at the back of the gun until it bottoms out, then screw the lock knob into the lock nut and tighten until snug.
5. Route the powder tubing to the pump cabinet and connect it to the appropriate powder pump outlet fitting (rear fitting).
6. Use spiral wrap, Velcro straps, or clamps to dress out the control cables and tubing, prevent kinking, and protect them from damage. **Do not use cable ties to bundle powder tubing**.

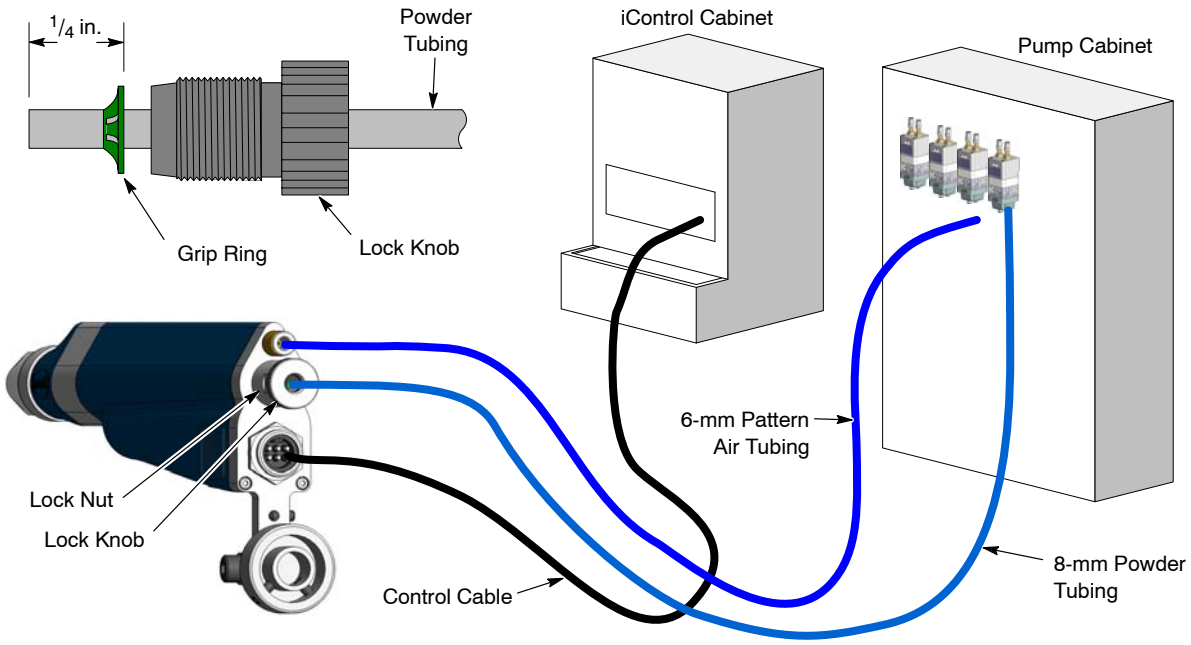

Figure 8 Tubing and Cable Connections

Operation

All automatic gun functions are set and controlled by the Prodigy iControl Integrated Control System. Refer to the iControl Operator Interface manual 1056418 for instructions on making spray settings.

WARNING: This equipment can be dangerous unless it is used in accordance with the rules laid down in this manual.

Maintenance

Daily: Blow off the gun exterior and wipe it clean with a soft cloth. Inspect the nozzle and electrode for damage or wear. Replace any worn parts.

Periodically: Check the resistance of the voltage multiplier and resistor with a 500-volt megohm meter as described on page 13. Replace any components that do not meet the specifications.

As Required: Disassemble the nozzle and clean the internal parts. Replace any worn parts. Refer to *Nozzle Disassembly and Cleaning* on the following page for instructions.

Nozzle Disassembly and Cleaning

Requirements: Nozzle Tool 1073682

1. Hold the nozzle firmly in one hand. Thread the tool onto the threaded end of the insert until it bottoms out on the electrode ring.

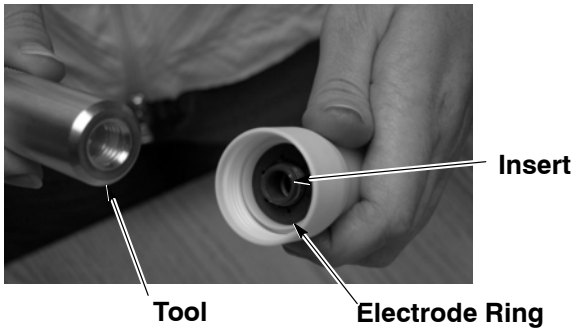

Figure 9 Nozzle Disassembly Step 1 (Shown with Nut Installed)

2. Turn the tool clockwise while pulling on it until the electrode ring/insert assembly comes out of the nozzle.

NOTE: If the electrode is pulled out of the nozzle shell, be careful to not lose it. The dual slot nozzle has the electrode glued in.

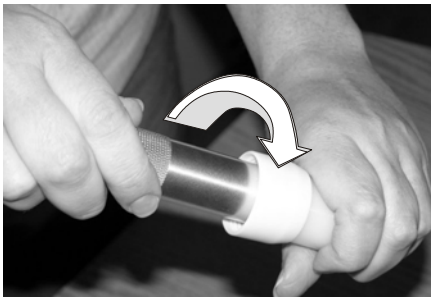

Figure 10 Nozzle Disassembly Step 2A

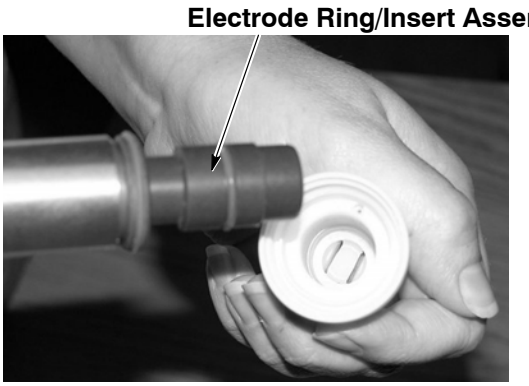

Figure 11 Nozzle Disassembly Step 2B (New Style Assembly Shown)

3. Unscrew the tool from the electrode ring/insert assembly and blow off the assembly with compressed air.

Figure 12 Nozzle Disassembly Step 2B (New Style Nozzle Shown)

4. To remove any impact fusion, place the nozzle and nozzle nut in an ultrasonic cleaner. Use $^{1}/_{2}$ cup of liquid Mr. Clean or equivalent per gallon of water as a cleaning solution. Rinse and blow off with compressed air. If desired, remove the nozzle nut from the nozzle by sliding the nut forward then turning it clockwise to unscrew it.

NOTE: See Figure 14. Old style nozzles have a disk-shaped filter (3) installed on the outside of the insert (6) and held on by the electrode ring (2). New style nozzles have a conical filter that is installed inside the front end of the insert. The old style filter and insert are obsolete. If you are replacing the filter on an old style nozzle, you must also order a new insert. The new filters are available in quantities of 10.

5. Blow off the insert and filter. If the filter is clogged with powder, remove it and replace it with a new one. When removing the new style filter from the insert, be careful not to scratch the inside surface of the insert.

To re-assemble the nozzle:

1. Make sure the electrode ring is threaded all the way onto the insert.
2. Thread the tool onto the threaded end of the insert.
3. Turn the tool counterclockwise to remove it from the insert. Check the nozzle. The electrode ring should be approximately $^1/_4$ inch inside the nozzle lip.

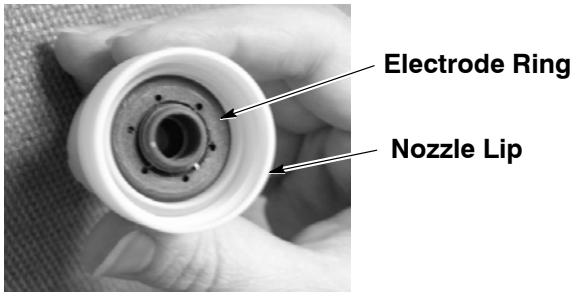

Figure 13 Nozzle Re-assembly

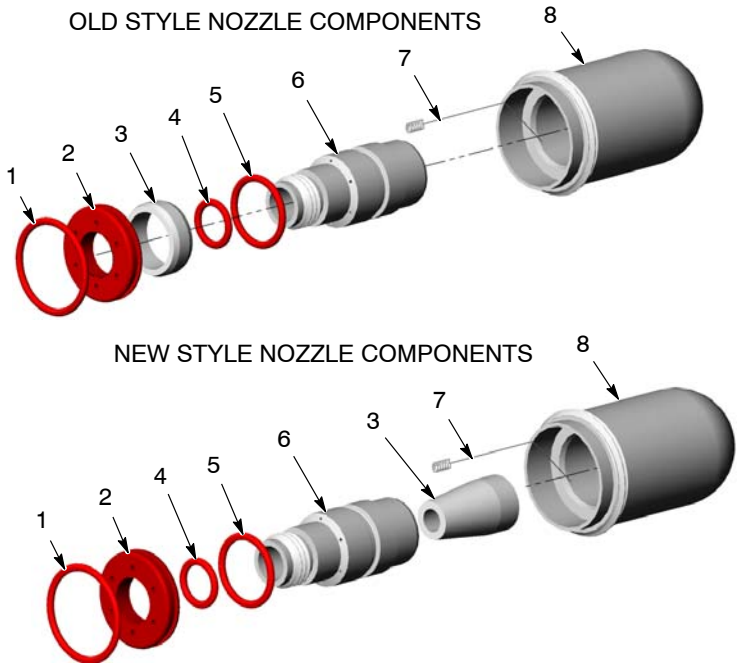

Figure 14 Internal Components of Nozzle Assemblies

1. O-ring
2. Electrode ring
3. Filter
4. O-ring
5. O-ring
6. Insert
7. Electrode
8. Nozzle shell

Note: All internal components, except the electrodes, are the same for all nozzles. For flat-spray, cross, and pinpoint nozzles, the electrode is glued into the nozzle shell with epoxy and cannot be replaced separately.

Troubleshooting

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

These procedures cover only the most common problems that you may encounter. If you cannot solve the problem with the information given here, contact your local Nordson representative or the Nordson Finishing Customer Support Center at (800) 433–9319 for help.

Problem	Possible Cause	Corrective Action
1. Unsteady or inadequate powder flow	Fault in pump, pump manifold, or pump control card	Refer to HDLV pump manual for troubleshooting.
	Blockage in gun powder tube or in 8-mm powder tubing	Purge gun and powder tubing. Replace powder tube or tubing if necessary.
	Damp or contaminated powder supply, powder supply not properly fluidized	Check powder supply, make sure powder is being fluidized properly.
2. Uneven pattern	Insufficient pattern air flow	Increase pattern air flow.
	Blocked nozzle	Clean or replace nozzle.
	Worn powder tube	Purge gun, disconnect powder tubing and examine powder tube ID.
3. Loss of wrap, poor transfer efficiency	Low electrostatic voltage	Increase electrostatic voltage.
	Poorly grounded parts	Check the conveyor chain, rollers, and part hangers for powder buildup. The resistance between the parts and ground must be 1 megohm or less. For best results, 500 ohms or less is recommended.
	Poor connection in high voltage path inside spray gun	Perform the *Multiplier and Resistor Assembly Resistance Tests* on page 13.
	Fault in gun control card	Refer to the iControl control system manual for troubleshooting.
4. No kV output	Damaged control cable	Perform the cable continuity tests on page 15. If an open or short is found, replace the cable.
	Fault in gun control card	Refer to the iControl control system manual for troubleshooting.
	Faulty voltage multiplier or poor connection in high voltage path	Perform the resistance checks on page 13. Check all high voltage path connections. See Figures 2 and 3.
5. No powder output	Blockage in powder tubing	Check powder tubing.
	Fault in gun control card	Refer to the Prodigy iControl hardware manual for troubleshooting.
	Fault in pump control card or pump	Refer to HDLV pump manuals for troubleshooting.

Continuity and Resistance Tests

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

WARNING: Turn off the electrostatic voltage and ground the spray gun electrode before performing the following tasks. Failure to observe this warning could result in a severe shock.

Resistance Tests

Use a 500 volt megohm meter to make these tests.>>> 2 <<<

Multiplier/Resistor Test – All Versions

1. See Figure 15. Remove the retaining nut (1) and nozzle (2).
2. Disconnect the control cable.
3. Short together receptacle pins 2, 3, and 4 and connect them to the positive megohm meter probe.

CAUTION: You must short multiplier receptacle pins 2, 3, and 4 together before performing this test to avoid damaging the multiplier.

4. Connect the negative megohm meter probe to the adapter spring plunger.

The megohm meter reading should be

- Tube Mount Gun: 420–510 megohms
- Bar Mount Gun: 400–510 megohms

. If the reading is out of this range, test the components of the high voltage path separately as described in the following tests. Replace any components that test out of range.

If the reading is infinite, there is no continuity through the high voltage path. Check the high voltage path connections (see Figures 2 and 3). If you have a tube-mount gun, test the electrode cable for continuity.

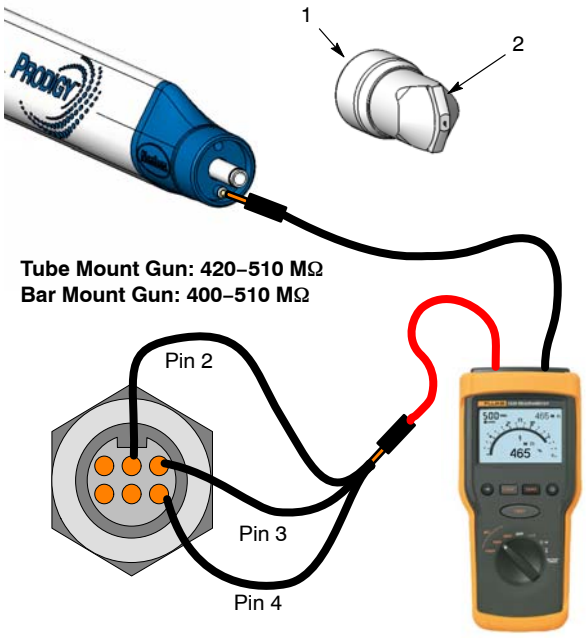

Figure 15 Multiplier/Resistor Test

Resistor Test – All Versions

Remove the resistor as described in *Resistor Replacement* on page 16.>>> 3 <<<

Resistor reading should be 153–187 megohms.

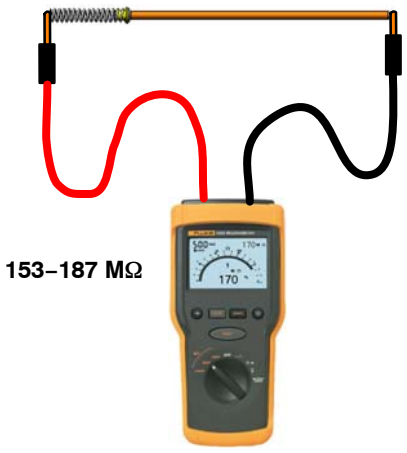

Figure 16 Resistor Test

Multiplier/Contact Test – Bar-Mount Only

Remove the multiplier as described in *Multiplier Replacement* on page .

Connect the optional shorting plug (refer to *Options* for the part number) to the multiplier receptacle or short together the three receptacle pins.

CAUTION: The multiplier receptacle pins must be shorted together before performing this test to avoid damaging the multiplier.

The resistance of the multiplier/contact assembly should be 150–220 megohms. If the reading is out of this range, test the contact tip and multiplier separately.

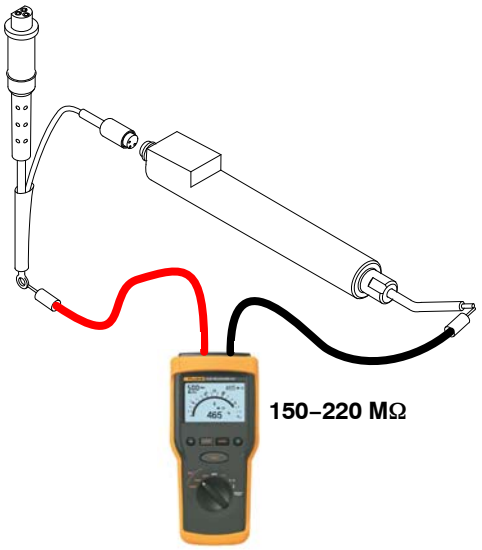

Figure 17 Multiplier/Contact Test – Bar-Mount Only

Multiplier Test – All Versions

Connect the optional shorting plug (refer to Options for part number) to the multiplier receptacle or short together the three receptacle pins.

CAUTION: The multiplier receptacle pins must be shorted together before performing this test to avoid damaging the multiplier.

Test from the shorting plug or shorted pins to the brass contact inside the multiplier well. Resistance should read 140–200 megohms.

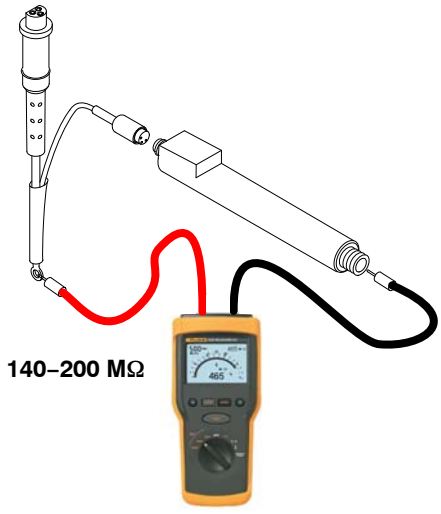

Figure 18 All Versions – Multiplier Test

Contact Test – Bar-Mount Only

Contact resistance should be 15–24 megohms.

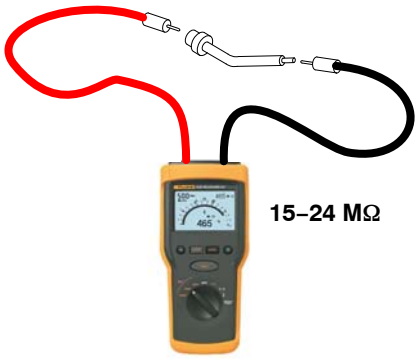

Figure 19 Contact Test – Bar Mount Only

Control Cable Continuity Test

Disconnect the control cable at both ends. Use Figure 20 and a standard ohmmeter to check the control cable from pin to pin.>>> 4 <<<

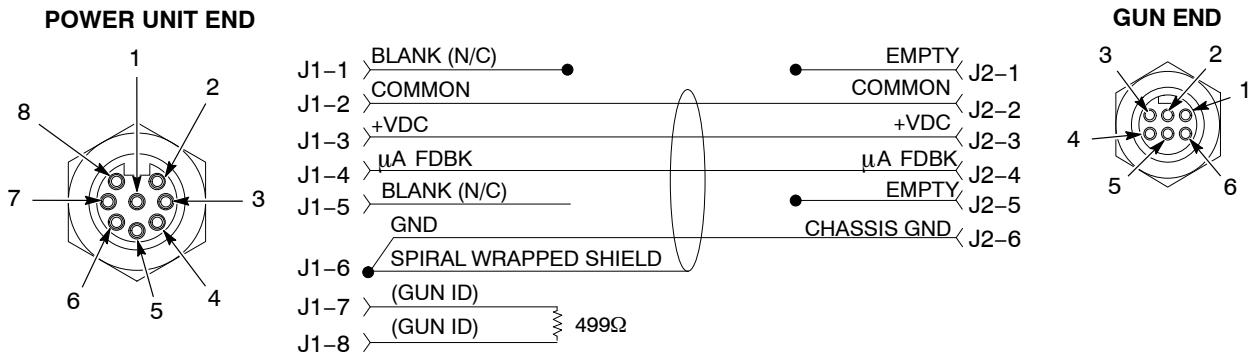

Figure 20 Control Cable Continuity Tests

Repair

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

WARNING: Turn off the electrostatic voltage and ground the spray gun electrode before performing the following tasks. Failure to observe this warning could result in a severe shock.

Nozzle Replacement

1. See Figure 21. Remove the retaining nut (1) and nozzle (2).

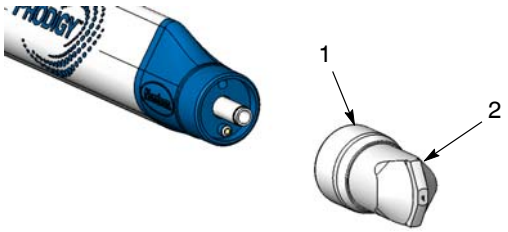

Figure 21 Removing Nozzle

2. See Figure 22. Unscrew the nozzle (2) from the retaining nut (1).

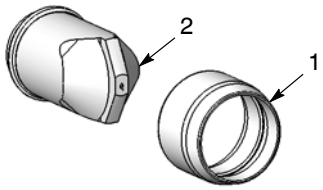

Figure 22 Nozzle and Retaining Nut

3. Screw a new nozzle into the retaining nut, then screw the retaining nut back onto the adapter.

Resistor Replacement

Resistor Removal

1. Disconnect the air tubing and control cable.>>> 5 <<<
2. See Figure 23. Unscrew the lock knob (20) and pull the powder tubing out of the lock nut (18).

Figure 23 Disconnecting Powder Tubing

3. Remove the spray gun from the gun mount and move it to a clean work area.
4. See Figure 21. Remove the nozzle from the spray gun to prevent damaging it while you are working.
5. See Figure 24. Remove the two screws (22) with a 2.5 mm hex wrench, then unscrew the lock nut (18).

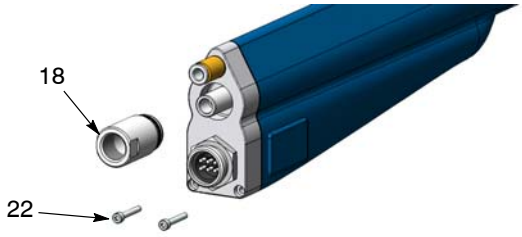

Figure 24 Removing Heat Sink Screws and Lock Nut

6. See Figure 25. Pull the heat sink (16) away from the housing (11) and disconnect the air tubing (4) from the connector (14).

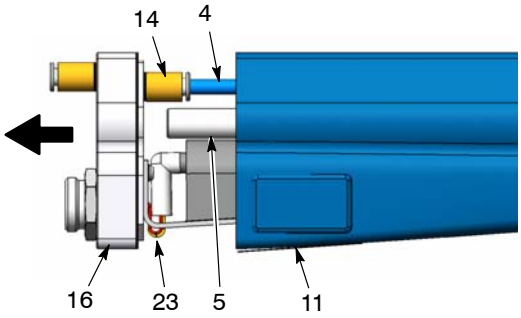

Figure 25 Pulling the Heat Sink away from the Housing

Tube-Mount Guns: See Figure 26. Pull the adapter (3) away from the body tube (9) far enough to access the cable guide (8) and resistor guide (6).

Slide the cable guide off the resistor guide, then pull the resistor (7) out of the resistor guide.

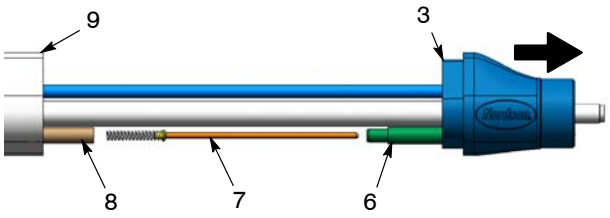

Figure 26 Removing the Resistor – Tube-Mount Guns

Bar-Mount Guns: See Figure 27. Pull the adapter (3) away from the body tube (9) far enough to access the sleeve (8) and resistor guide (6).

Remove the contact (8A), then slide the sleeve off the resistor guide and resistor (7). Pull the resistor out of the resistor guide.

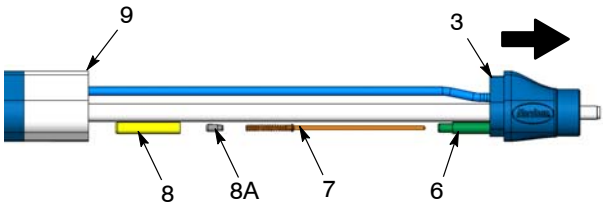

Figure 27 Removing the Resistor – Bar-Mount Guns

Resistor Installation

1. See Figure 26 or 27. Inject 0.6 cc of dielectric grease into the resistor guide (6).
2. Bar-Mount Guns Only: Install the contact (8A) into the new resistor spring.
3. Insert the new resistor into the resistor guide, rotating the resistor while pushing it in until it bottoms out. Rotating the resistor helps release trapped air pockets from the grease. Clean off any excess grease.
4. Tube-Mount Guns: Slide the cable guide (8) over the end of the resistor guide, then push together the adapter (3) and body tube (9).

   Bar-Mount Guns: Install the sleeve (8) over the contact and resistor spring and onto the resistor guide, then push together the adapter (3) and body tube (9).

   Bar-Mount Guns: See Figure 35. From the open end of the multiplier housing, install the contact guide on the powder tube. Push the contact guide into the housing until it seats on the sleeve (8). The contact should be visible in the open end of the contact guide when properly installed.
5. See Figure 25. Connect the air tubing (4) to the connector (14), then push the heat sink (16) back up against the housing while fitting the powder tube (5) through the heat sink. Make sure the harness wires (23) are not pinched between the housing (11) and the heat sink.
6. See Figure 24. Screw the lock nut (18) onto the powder tube and tighten it securely. Do not overtighten it or you will strip the plastic threads on the powder tube.
7. Install the two socket-head screws (22) in the heat sink and tighten them securely.
8. Perform the *Multiplier and Resistor Resistance Test* on page 13 to make sure the high voltage path is continuous and all connections are sound. If you do not get the proper reading, check all connections in the high voltage path (see Figures 2 and 3).
9. See Figure 21. Install the nozzle (2) and tighten the retaining nut (1).
10. Install the gun on its gun mount.
11. See Figure 23. Push the powder tubing into the lock nut (18) until it bottoms out, then tighten the lock knob (20).
12. Reconnect the air tubing and control cable.

Multiplier Replacement

Multiplier Removal – Tube-Mount Guns

1. Perform Steps 1–6 of the *Resistor Removal* procedure.
2. See Figure 28. Pull the heat sink (16), with multiplier (13) attached, out of the housing. Continue pulling until you can grasp the multiplier nut (12).>>> 6 <<<

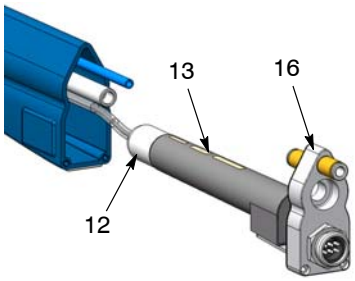

Figure 28 Removing the Multiplier from the Housing

3. See Figure 29. Unscrew the multiplier nut (12) and disconnect the electrode cable (10) from the multiplier (13).

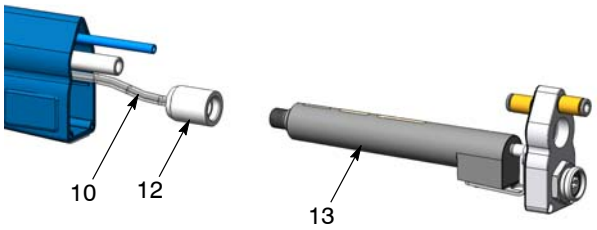

Figure 29 Disconnecting the Electrode Cable

4. See Figure 30. Remove the screw (26) and lockwasher (25), then remove the multiplier (13) from the bracket (24C).
5. Disconnect the harness plug (23) from the multiplier.

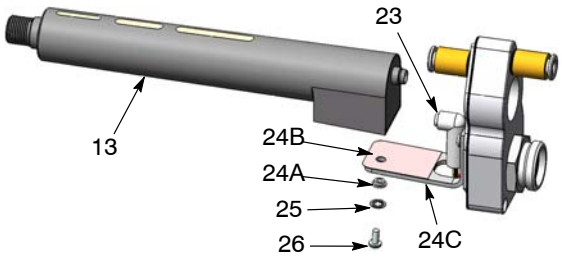

Figure 30 Replacing the Multiplier

6. Make sure the thermally conductive pad (24B) and nylon shoulder washer (24A) are intact. If not, install a new heat sink bracket kit, which includes a new bracket (24C), pad, and washer.

Multiplier Removal – Bar Mount Guns

1. Perform Steps 1–6 of the *Resistor Removal* procedure.
2. See Figure 31. Pull the heat sink (16), with multiplier (13) attached, out of the housing.

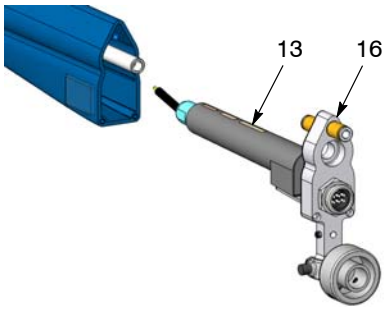

Figure 31 Removing the Multiplier from the Housing

3. See Figure 32. Unscrew the multiplier nut (12). Remove the multiplier contact (12A) from the nut and replace it if it is damaged.

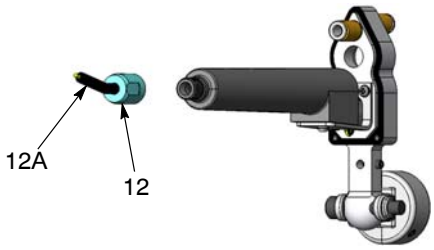

Figure 32 Removing the Multiplier from the Housing

4. See Figure 33. Remove the screw (26) and lockwasher (25), then remove the multiplier (13) from the bracket (24C).
5. Disconnect the harness plug (23) from the multiplier.

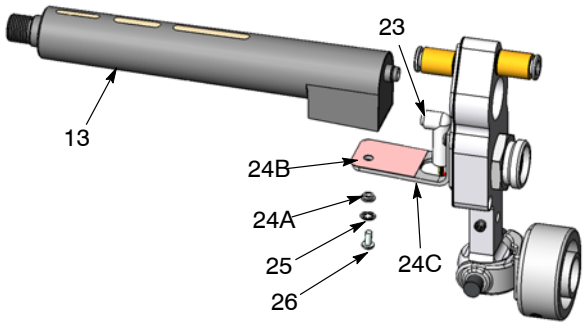

Figure 33 Replacing the Multiplier

6. Make sure the thermally conductive pad (24B) and nylon shoulder washer (24A) are intact. If not, install a new heat sink bracket kit, which includes a new bracket (24C), pad, and washer.

Multiplier Installation

1. See Figure 30. Connect the harness plug (23) to the multiplier (13).
2. Make sure the nylon shoulder washer (24A) is correctly installed into the bracket (24C). Install the multiplier on the bracket, tucking the harness wiring into the slot in the bracket.
3. Secure the multiplier to the bracket with the screw (26) and lockwasher (25).
4. Tube-Mount Gun Only: See Figure 34. Inject approximately 0.3 cc of dielectric grease into the multiplier well, so that it is about 75% full.

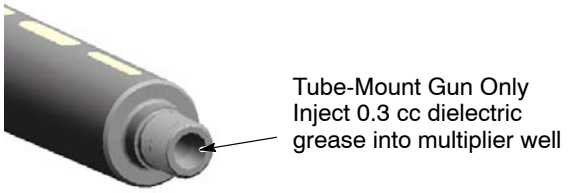

Figure 34 Multiplier Well Greasing – Tube-Mount Gun

5. Tube-Mount Guns: See Figure 29. Insert the spring end of the electrode cable (10) into the multiplier well until it bottoms out, then screw the multiplier nut (12) down tight.

   Bar-Mount Guns: See Figure 32. Install the contact in the multiplier well and secure it with the multiplier nut.
6. Perform Steps 5–12 of the *Resistor Installation* procedure to complete the installation.

   Tube-Mount Guns: See Figure 35. When mating the heat sink/multiplier assembly to the housing, make sure the electrode cable (10) slides freely through the cable guide.

   Bar-Mount Guns: See Figure 35. Make sure the tip of the multiplier contact (12A) slides into the contact guide (10) inside the housing.

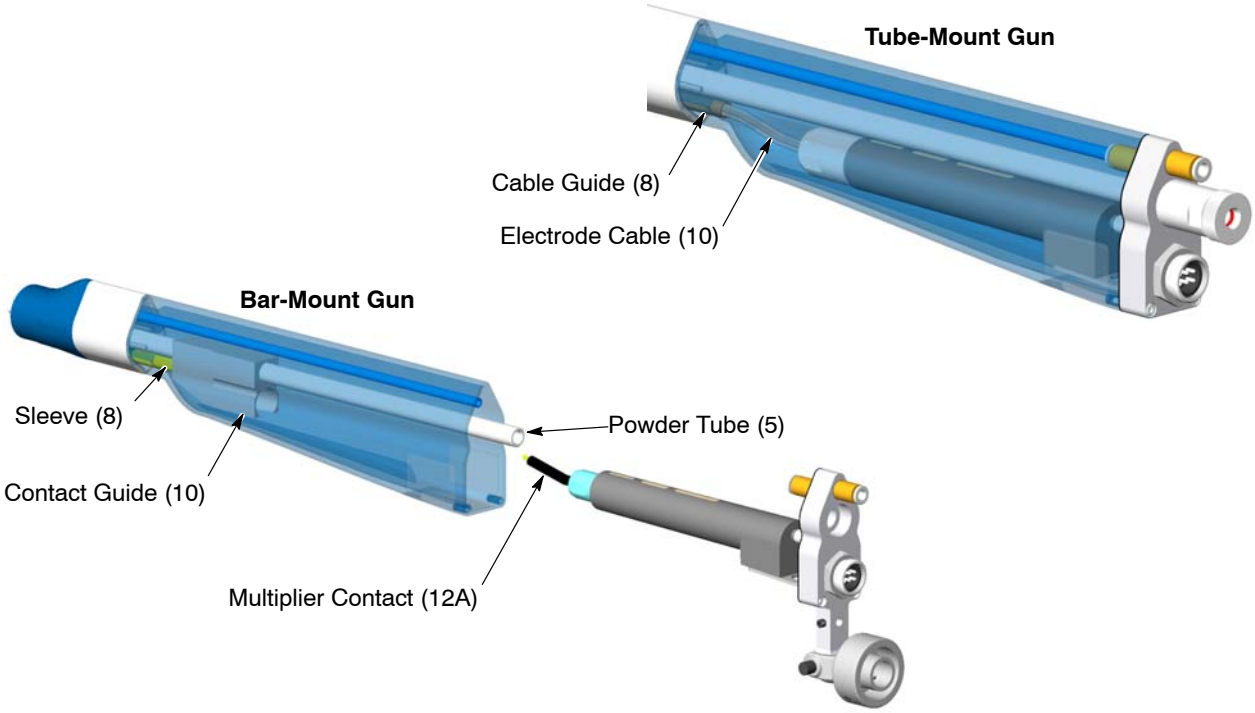

Figure 35 Multiplier Installation: Step 6

Electrode Cable Replacement – Tube-Mount Guns Only

Cable Removal

1. Disconnect the air tubing and control cable.
2. See Figure 36. Unscrew the lock knob (20) and pull the powder tubing from the lock nut (18).

Figure 36 Disconnecting Powder Tubing

3. Remove the spray gun from the gun mount and move it to a clean work area.
4. See Figure 21. Remove the nozzle from the spray gun to prevent damaging it while you are working.
5. See Figure 37. Remove the two screws (22) with a 2.5 mm hex wrench, then unscrew the lock nut (18) from the powder tube.

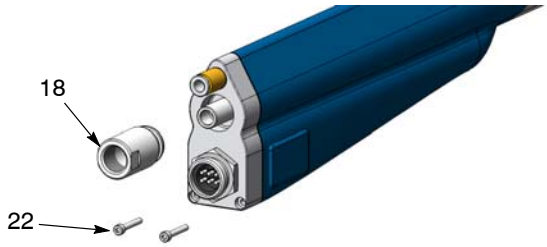

Figure 37 Removing Heat Sink Screws and Lock Nut

6. See Figure 38. Pull the heat sink (16) away from the housing (11) and disconnect the air tubing (4) from the connector (14).

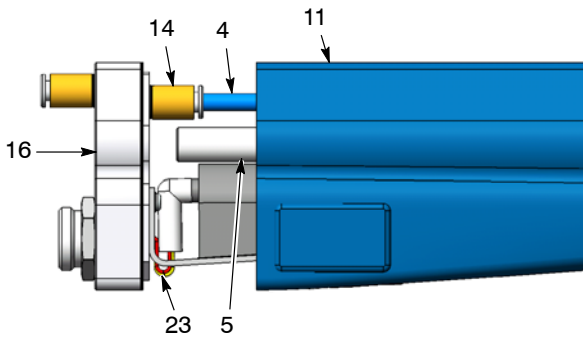

Figure 38 Pulling Heat Sink away from Housing

7. See Figure 39. Pull the heat sink (16), with multiplier (13) attached, out of the housing, until you can grasp the multiplier nut (12).

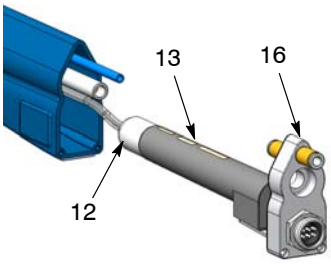

Figure 39 Pulling Multiplier out of Housing

8. See Figure 40. Unscrew the multiplier nut (12) from the multiplier (13).

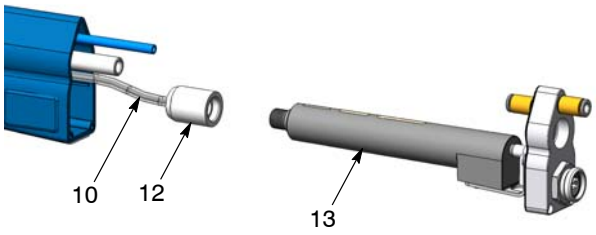

Figure 40 Disconnecting Electrode Cable

9. Pull the electrode cable (10) out of the gun.
10. Slide the multiplier nut up the cable and off the pin/washer end.

Cable Installation

1. Install the multiplier nut on the new cable and slide it down to the spring end.
2. See Figure 34. Inject approximately 0.3 cc of dielectric grease into the multiplier well, so that it is about 75% full.
3. See Figure 40. Insert the spring end of the electrode cable (10) into the multiplier well until it bottoms out, then screw the multiplier nut (12) onto the multiplier until tight.
4. See Figure 41. Pull the housing (11) off the body tube (9) to expose the cable guide (8).

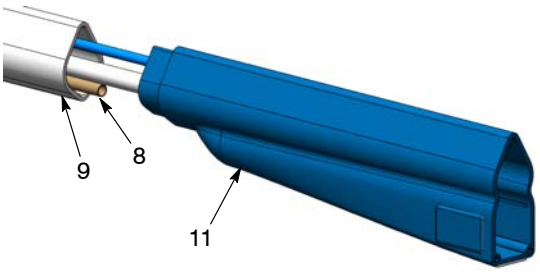

Figure 41 Pulling Housing Off Body Tube

5. See Figure 42. Route the new electrode cable through the housing as shown, while guiding the multiplier into the housing, until the heatsink is about 1 inch from the end of the housing.

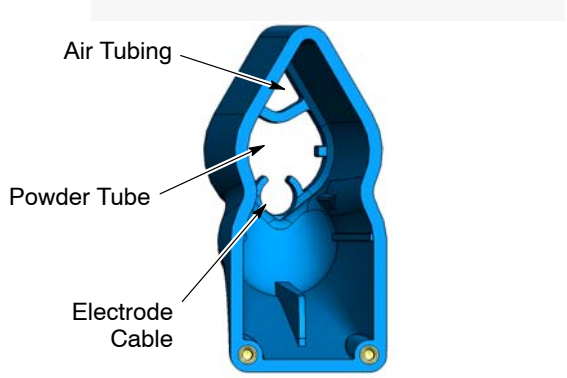

Figure 42 Air, Powder, and Electrode Cable Routing Through Housing

6. See Figure 41. Insert the end of the cable into the cable guide (8) and push it through while routing the powder tube and air tubing through the housing as shown in Figure 42.
7. Connect the housing to the body tube.
8. See Figure 38. Connect the air tubing (4) to the internal connector (14).
9. Push the heat sink (16) back up against the housing while guiding the powder tube (5) through the heat sink. Make sure the harness wires (23) are not pinched between the housing and the heat sink.
10. See Figure 37. Screw the lock nut (18) onto the powder tube and tighten it securely. Do not overtighten it or you may damage the plastic threads on the powder tube.
11. Install the two socket-head screws (22) in the heat sink and tighten them securely.
12. Perform the *Multiplier/Resistor Resistance Test* on page 13 to make sure the high voltage path is continuous and all connections are sound. See Figure 2 on page 4 for the high voltage path.
13. See Figure 21. Install the nozzle (2) and tighten the retaining nut (1).
14. Install the gun into the gun clamp.
15. See Figure 36. Push the powder tubing into the lock nut (18) until it bottoms out, then thread the lock knob (20) into the lock nut and tighten snugly.
16. Reconnect the air tubing and control cable.

Parts

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

Parts lists start on the following page.

Tube-Mount Gun Parts List

See Figure 43.

Item	Part	Description	Quantity	Note
—	1101743	GUN, automatic, 95 kV, Prodigy	1	A, I
1	1078850	• NUT, retaining	1	
2	1073706	• KIT, nozzle, flat spray, dual slot, converging angle, 1 mm	1	F, H
3	1054529	• KIT, adapter, Prodigy, spring, auto	1	
4	1101268	• CLIP, ion collector, 4-probe, Prodigy, packaged	1	G
4A	1101304	• • SCREW, pan, recessed, M4 x 6, nylon, black	1	
5	1101269	• ROD, tube mount ion collector, Prodigy	1	G
6	1101296	• SUPPORT, ion collector, Prodigy	1	G
6A	982067	• • SCREW, set, cup, M5 x 5, black	1	
7	900742	• TUBING, polyurethane, 6/4 mm, blue	4.7 ft.	B
8	1047793	• POWDER TUBE, 1500 mm	1	
9	1047933	• GUIDE, resistor	1	
10	1053912	• KIT, resistor, cable, series	1	C
11	1047935	• GUIDE, cable core	1	
12	1047512	• TUBE, body, 1500 mm, Prodigy, auto	1	
13	1054599	• KIT, cable, Prodigy, auto	1	
14	1047501	• HOUSING, 95 kV, Prodigy, auto	1	
15	1103950	• NUT, multiplier, auto gun, tube-mount, Prodigy	1	
16	288552	• POWER SUPPLY, 95 kV, negative	1	
17	972399	• CONNECTOR, male, w/integral hex, 6 mm tube x $^{1}/_{8}$ in. unithread	2	
18	1047510	• GASKET, heatsink	1	
19	1047931	• HEATSINK, Prodigy, auto	1	
20	945127	• O-RING, Viton, 13.4 x 2.1 mm	1	
21	1047932	• NUT, lock, Prodigy, auto	1	
22	1047796	• GRIP RING, 8mm TE	1	D
23	1047934	• KNOB, lock, powder tube	1	
24	940117	• O-RING, silicone, 0.312 x 0.438 x 0.063 in.	1	
25	1054073	• SCREW, socket head, M3 x 20 mm, steel, zinc	2	
26	1050007	• HARNESS, gun, Prodigy, auto	1	
27	1054590	• KIT, heat sink, Prodigy, auto	1	E
28	983520	• WASHER, lock, internal, M3, steel, zinc	3	
29	1054074	• SCREW, pan head, recessed, 4–40, 0.25 in. steel, zinc	1	
30	982341	• SCREW, pan head, recessed, M3 x 10, zinc	2	

NOTE
A: Control cables are optional. Refer to *Options* for part numbers.
B: Bulk part number, order in increments of 1 foot, cut to required length.
C: Kit includes one applicator with 3-cc of dielectric grease.
D: Also available in packages of 10. Order part 1053911.
E: Kit includes heat sink bracket, thermally conductive pad, and M4 nylon shoulder washer.
F: Optional nozzles available. Refer to pages 30 and 32.
G: If you have an older gun without an ion collector, refer to page 28 for the Retrofit Kit.
H: Part not included in gun body kit PN 1611772.
I: Part is obsolete.

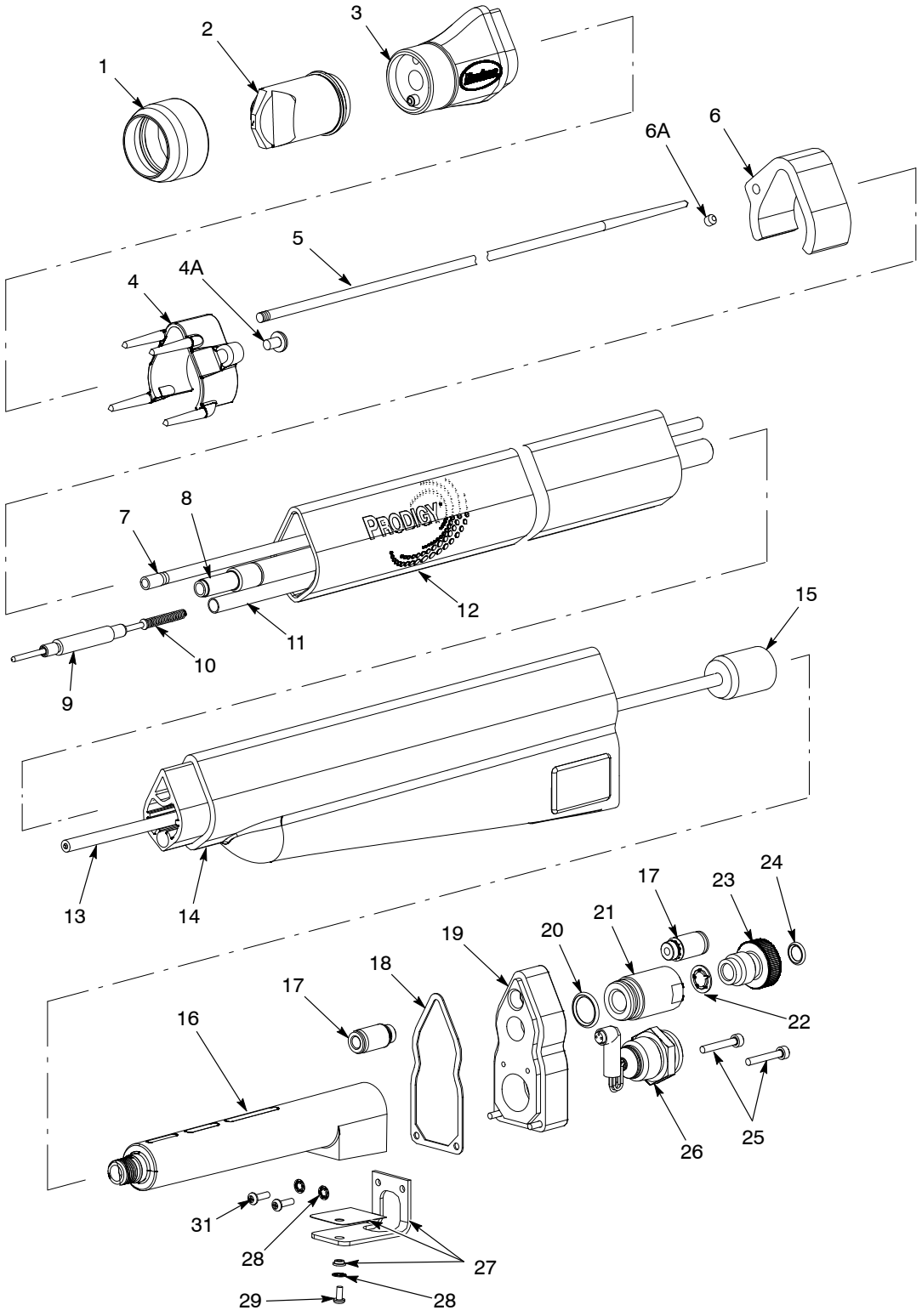

Figure 43 Tube-Mount Gun Parts

Bar-Mount Gun Parts List

See Figure 44.

Item	Part	Description	Quantity	Note
—	1070497	GUN, auto, 95 kV, Prodigy, bar mount	1	A, H
1	1078850	• NUT, retaining	1	
2	1073706	• KIT, nozzle, flat spray, dual slot, converging angle, 1 mm	1	F, G
3	1054529	• KIT, adapter, Prodigy, spring, auto	1	
4	900742	• TUBING, polyurethane, 6/4 mm, blue	1.1 ft	B
5	1071237	• TUBE, powder, short, Prodigy auto	1	
6	1047933	• GUIDE, resistor	1	
7	1053912	• KIT, resistor, cable, series	1	C
8	1070028	• SLEEVE, Prodigy	1	
8A	1070029	• CONTACT, Prodigy	1	
9	1070027	• TUBE, body, short, Prodigy, auto	1	
10	1070040	• GUIDE, contact, Prodigy bar mount	1	
11	1047501	• HOUSING, 95 kV, Prodigy, auto	1	
12	327706	• NUT, Sure Coat multiplier, outlet	1	
12A	1006352	• CONTACT, multiplier, packaged	1	
13	288552	• POWER SUPPLY, 95 kV, negative	1	
14	972399	• CONNECTOR, male, w/integral hex, 6 mm tube x $^{1}/_{8}$ in. unithread	2	
15	1047510	• GASKET, heatsink	1	
16	1070026	• HEATSINK, Prodigy auto gun, ball mount	1	
17	945127	• O-RING, Viton, 13.4 x 2.1 mm	1	
18	1047932	• NUT, lock, Prodigy, auto	1	
19	1047796	• GRIP RING, 8mm TE	1	D
20	1047934	• KNOB, lock, powder tube	1	
21	940117	• O-RING, silicone, 0.312 x 0.438 x 0.063 in.	1	
22	1054073	• SCREW, socket head, M3 x 20 mm, steel, zinc	2	
23	1050007	• HARNESS, gun, Prodigy, auto	1	
24	1054590	• KIT, heat sink, Prodigy, auto	1	E
25	983520	• WASHER, lock, internal, M3, steel, zinc	3	
26	1054074	• SCREW, pan head, recessed, 4–40, 0.25 in. steel, zinc	1	
27	982341	• SCREW, pan head, recessed, M3 x 10, zinc	2	
28	982501	• SCREW, socket, M8 x 40, black	1	
29	327730	• CLAMP, pivot	1	
30	982067	• SCREW, set, cup, M5 x 5 black	3	
31	327721	• CLAMP, fixed	1	

NOTE A: Control cables are optional. Refer to *Miscellaneous Options* for part numbers.
B: Bulk part number, order in increments of 1 foot, cut to required length.
C: Kit includes one applicator with 3-cc of dielectric grease.
D: Also available in packages of 10. Order part 1053911.
E: Kit includes heat sink bracket, thermally conductive pad, and M4 nylon shoulder washer.
F: Optional nozzles available. Refer to pages 30 and 32.
G: Part not included in gun body kit PN 1611773.
H: Part is obsolete.

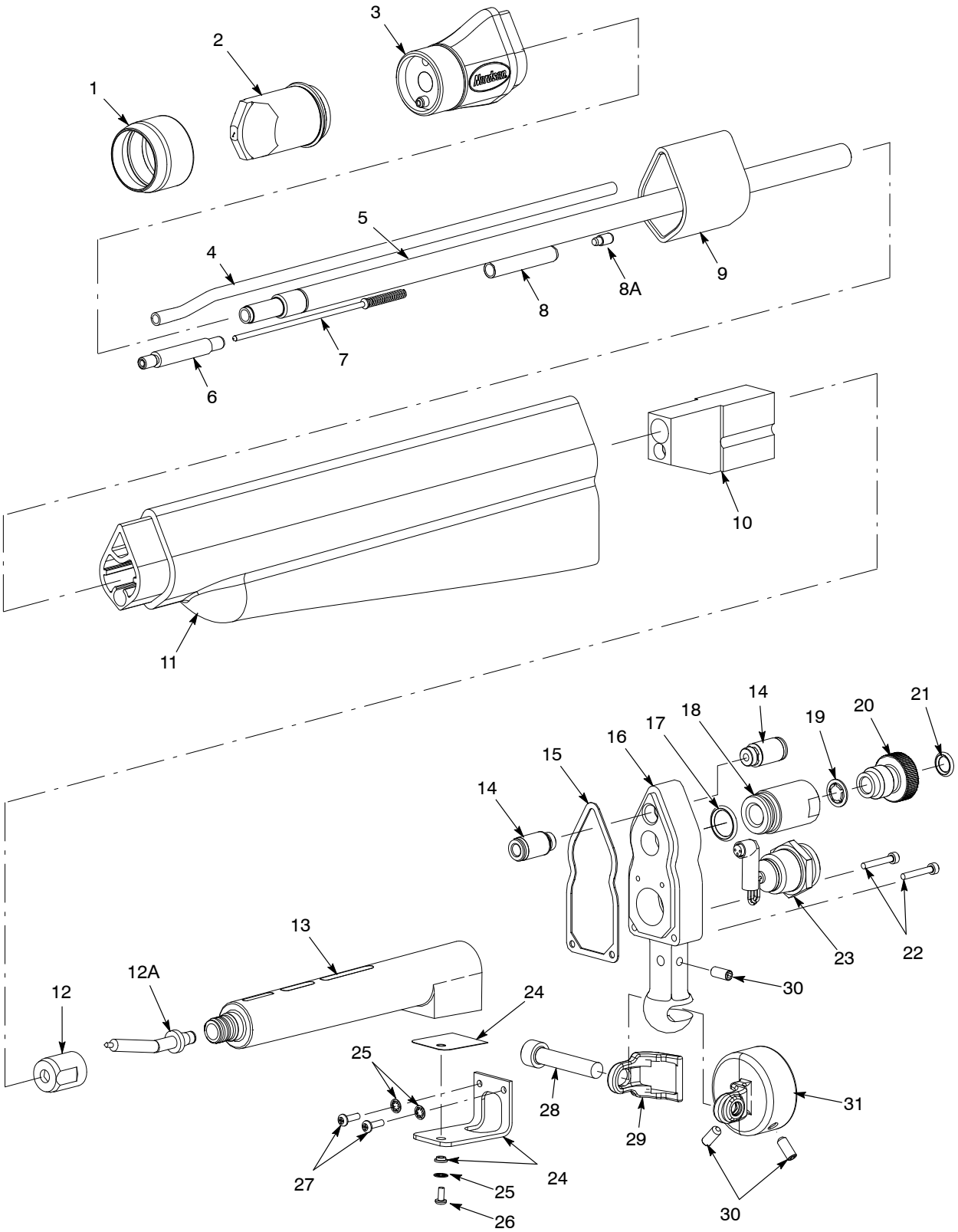

Figure 44 Bar-Mount Gun Parts

Service Kits

Part	Description	Note
1053911	KIT, grip ring, 8 mm TE, 10-pack	
1054599	KIT, cable, Prodigy, auto	A
1054590	KIT, heat sink, Prodigy, auto	A
1054529	KIT, adapter, Prodigy, spring, auto	A
NOTE A: Refer to the spray gun parts list and notes for contents.		

Spray Gun Body Service Kit

Part	Description	Note
1611772	KIT, repair, gun body, Prodigy, tube-mount, auto	A
1611773	KIT, repair, gun body, Prodigy, bar-mount, auto	A
NOTE A: Refer to the spray gun parts list and notes for contents.		

Options

Miscellaneous Options

Part	Description	Note
1073682	KIT, tool, insertion/extraction, nozzle	
1050040	CABLE, Prodigy, auto, 8 meter>>> 7 <<<	
1050043	CABLE, Prodigy, auto, 12 meter	
1069306	CABLE, Prodigy, auto,16 meter	
302112	POWER SUPPLY, 95 kV, positive	
245733	APPLICATOR, dielectric grease	A
161411	PLUG, shorting, IPS	B
1101301	KIT, ion collector retrofit, bar mount, Prodigy	C
NOTE A: Carton of 12 3-cc dielectric grease applicators. B: Use for testing voltage multiplier/resistor/electrode resistance. C: Refer to page 27 for repair parts for this kit.		

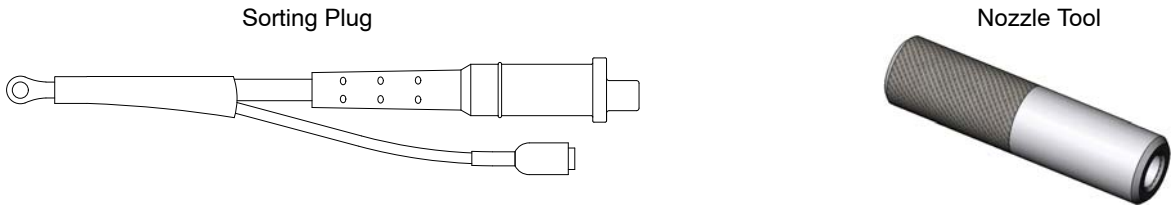

Figure 45 Optional Shorting Plug and Nozzle Tool

Powder and Air Tubing

Powder and air tubing are not supplied with the spray gun.>>> 8 <<<

Part	Description	Note
173101	TUBING, polyethylene, 8 mm x 6 mm, natural (Powder)	
900742	TUBING, polyurethane, 6/4 mm, blue (Air)	
1062178	TUBING CUTTER, 12 mm or less	

Optional Ion Collector for Bar-Mount Gun

Item	Part	Description	Quantity	Note
–	1101301	KIT, ion collector retrofit, bar mount, Prodigy	1	
1	1101291	• BRACKET, ion collector rod, bar mount, Prodigy>>> 9 <<<	1	
2	983127	• WASHER, lock, internal, M5, zinc	1	
3	326507	• SCREW, pan head, cross-recessed, M5 x 8	1	
4	1101290	• ROD, bar mount ion collector, Prodigy	1	
5	1101268	• CLIP, ion collector, 4-probe, Prodigy, packaged	1	
6	1101304	• • SCREW, pan, recessed, M4 x 6, nylon, black	1	

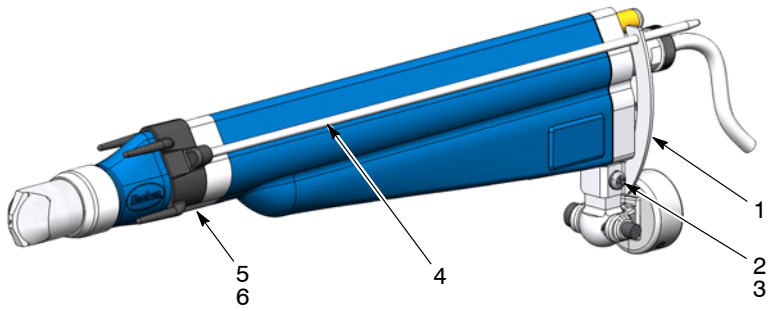

Figure 46 Optional Ion Collector for Bar-Mount Gun

Ion Collector Retrofit Kit for Tube-Mount Gun

The ion collector rods for the tube-mount retrofit kits must be ordered and shipped separately. This is because they are normally ordered in quantity, depending on the number of guns in the system.

Item	Part	Description	Quantity	Note
–	1101300	KIT, ion collector retrofit, tube mount, Prodigy	1	
1	- - - - - -	• JAW ASSEMBLY, fixed, clamp with ground, Prodigy automatic>>> 10 <<<	1	
2	1101296	• SUPPORT, ion collector, Prodigy, packaged	1	
2A	982067	• • SCREW, set, cup, M5 x 5, black	1	
4	1101268	• CLIP, ion collector, 4-probe, Prodigy, packaged	1	
4A	1101304	• • SCREW, pan, recessed, M4 x 6, nylon, black	1	

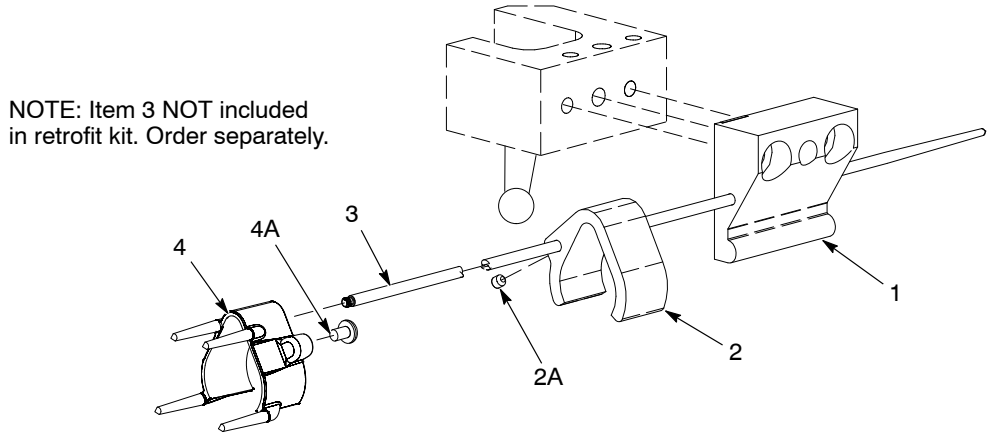

Figure 47 Optional Ion Collector Retrofit Kit for Tube-Mount Gun

Ion Collector Rods for Tube-Mount Gun

Item	Part	Description	Quantity	Note
3	1101269	ROD, tube mount ion collector, Prodigy	1	

Tube-Mount Gun Clamp

See Figure 48.

Item	Part	Description	Quantity	Note
—	1101298	GUN CLAMP, Prodigy auto	1	
1	- - - - - -	• CLAMP, bar, universal	1	
2	- - - - - -	• JAW, fixed clamp with ground, Prodigy auto	1	A
3	- - - - - -	• JAW, floating clamp, Prodigy auto	1	
4	249074	• HANDLE, adjustable, $^3/_8$–16 x 2.75 in.	1	
5	248957	• HANDLE, adjustable, $^3/_8$–16 x 1.77 in.	1	
6	983061	• WASHER, flat, 0.406 x 0.812 x 0.065 in., zinc	1	
7	982160	• SCREW, socket, M8 x 25, zinc	2	
8	- - - - - -	• WASHER, lock, split, M8, steel, zinc	2	

NOTE A: If you have older tube mount gun clamps and want to install ion collectors on your guns, refer to page 28 for the Ion Collector Retrofit Kit.

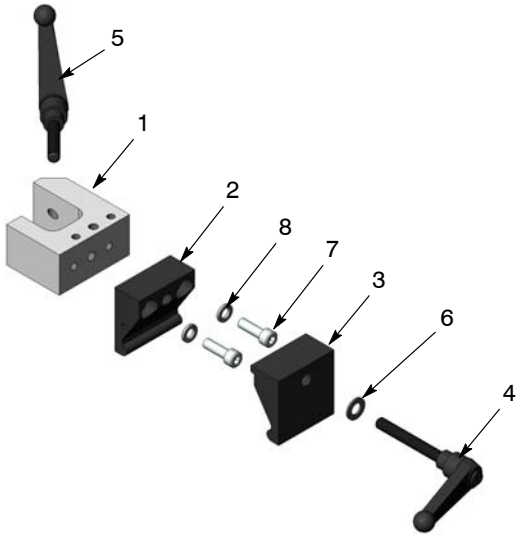

Figure 48 Optional Tube-Mount Gun Clamp

Optional 3 Foot Gun Bar Assembly for Bar-Mount Guns

See Figure 49.

Item	Part	Description	Quantity	Note
—	341726	3-ft GUN BAR, aluminum, 1.25-in. OD, assembly	1	
1	248669	• BODY, adjustable mounting>>> 11 <<<	1	
2	327733	• SLEEVE, locking, 1.25 in. diameter	1	
3	- - - - - -	• CAP, plug	1	
4	327732	• BODY, locking, 1.25 in. diameter	1	
5	327703	• ROD, adjusting, aluminum, 1.25 in. OD x 3 ft	1	
6	248957	• HANDLE, adjustment, $^3/_8$–6 x 1.77 in.	1	
7	983061	• WASHER, flat, 0.406 x 0.812 x 0.065 in., zinc	1	
8	249074	• HANDLE, adjustment, $^3/_8$–16 x 2.75 in.	1	

Optional 4 Foot Gun Bar Assembly for Bar-Mount Guns

See Figure 49.

Item	Part	Description	Quantity	Note
—	341727	4-ft GUN BAR, aluminum, 1.25 in. OD, assembly	1	
1	248669	• BODY, adjustable mounting	1	
2	327733	• SLEEVE, locking, 1.25 in. diameter	1	
3	- - - - - -	• CAP, plug	1	
4	327732	• BODY, locking, 1.25 in. diameter	1	
5	327704	• ROD, adjusting, aluminum, 1.25 in. OD x 4 ft	1	
6	248957	• HANDLE, adjustment, $^{3}/_{8}$–16 x 1.77 in.	1	
7	983061	• WASHER, flat, 0.406 x 0.812 x 0.065 in., zinc	1	
8	249074	• HANDLE, adjustment, $^{3}/_{8}$–16 x 2.75 in.	1	

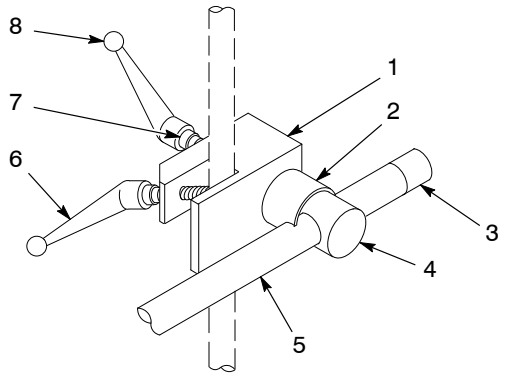

Figure 49 Optional Gun Bar Assemblies

Nozzles

Conical Nozzles

Part	Description	Effective Pattern Size	Usage	Note
1062223	KIT, nozzle, 70 degree, conical>>> 12 <<<	4–6 inches (101–152 mm)	General use on manual or automatic guns	A
1062160	• NOZZLE, 70 degree, conical (shell)			C
1062166	KIT, nozzle, 100 degree, conical	6–8 inches (152–230 mm)	General use on manual or automatic guns	B
1062161	• NOZZLE, 100 degree, conical (shell)			C
1073819	KIT, nozzle, conical, 40 degree, conical	2–4 inches (51–102 mm)	Manual coating and touch-up	B
1073818	• NOZZLE, 40 degree, conical (shell)			C

NOTE A: One of each supplied with spray gun.
B: Optional nozzles, not included with spray gun.
C: Nozzle shell only. Does not include internal components.

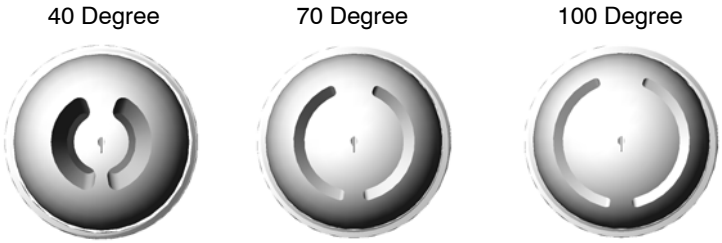

Figure 50 Conical Nozzles

Conical Nozzle Components

Refer to Options on page 26 for nozzle tool used to disassemble nozzles.

Item	Part	Description	Quantity	Note
1	940203	O-RING, silicone, 0.875 x 1.00 x 0.063 in.	1	
2	1047537	ELECTRODE ring	1	
3	940126	O-RING, silicone, 0.375 x 0.50 x 0.063 in.	1	
4	940163	O-RING, silicone, 0.625 x 0.75 x 0.063 in.	1	
5	1073625	INSERT, metric, conical/flat nozzles	1	
6	1073624	CONE, porous, nozzle	1	A
7	1062177	ELECTRODE, spring contact, 0.094 dia, Prodigy	1	
NOTE A: Also available in quantities of 10. Order kit 1073707.				

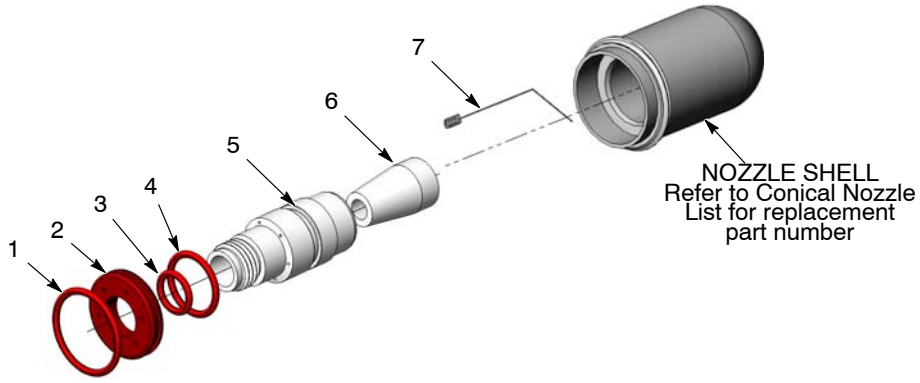

Figure 51 Conical Nozzle Components

Flat Spray, Cross, and Pinpoint Nozzles

Refer to Figure 53 and parts list for nozzle internal components.

Part	Description	Effective Pattern Size	Usage	Note
1073706	KIT, nozzle, flat spray, dual slot, converging angle, 1 mm>>> 13 <<<	8–10 inches (203–254 mm)	General use on manual or automatic guns	
1073726	• KIT, nozzle, dual converging slots, shell with electrode			C
1077385	KIT, nozzle, flat spray, Prodigy, 75 degree	6–8 inches (152–230 mm)	General use on manual or automatic guns	A
1077395	• NOZZLE, shell with electrode, flat spray, Prodigy, 75 degrees			C
1077382	KIT, nozzle, flat spray, Prodigy, 90 degree	2–4 inches (51–102 mm)	Manual coating and touch-up	A
1077394	• NOZZLE, shell with electrode, flat spray, Prodigy, 90 degree			C
1077388	KIT, nozzle, flat spray, Prodigy, 115 degree	9–11 inches (229–279 mm)	General use on manual or automatic guns	A
1077396	• NOZZLE, shell with electrode, flat spray, Prodigy, 115 degree			C
1077392	KIT, nozzle, flat spray, Prodigy, 140 degree	11–13 inches (279–330 mm)	Large flat surfaces	A
1077397	• NOZZLE, shell with electrode, flat spray, Prodigy, 140 degree			C
1073911	KIT, nozzle, flat spray, Prodigy, 180 degree	13–15 inches (330–381 mm)	Large flat surfaces	A
1077393	• NOZZLE, shell with electrode, flat spray, Prodigy, 180 degree			C
1077584	NOZZLE assembly, cross, Prodigy, 4 slot, 60 degree	3–5 inches (76–127 mm)	Manual coating and touch-up	B
1077893	• NOZZLE, shell with electrode, cross, Prodigy, 4 slot, 60 degree			C
1077585	NOZZLE assembly, cross, Prodigy, 4 slot, 90 degree	2–4 inches (51–102 mm)	Manual coating and touch-up	B
1077894	• NOZZLE, shell with electrode, cross, Prodigy, 4 slot, 90 degree			C
1077586	NOZZLE assembly, cross, Prodigy, 6 slot, 60 degree	2–3 inches (51–76 mm)	Manual coating – deep recesses	B
1077895	• NOZZLE, shell with electrode, cross, Prodigy, 6 slot, 60 degree			C
1077587	NOZZLE assembly, pinpoint, Prodigy, 10 hole	Pinpoint	Manual coating – touch-up and deep recesses	B
1077896	• NOZZLE, shell with electrode, pinpoint, Prodigy, 10 hole			C

NOTE A: These kits include spare nozzle shell with electrode.
B: Complete nozzle assembly with shell.
C: Nozzle shell with electrode only.

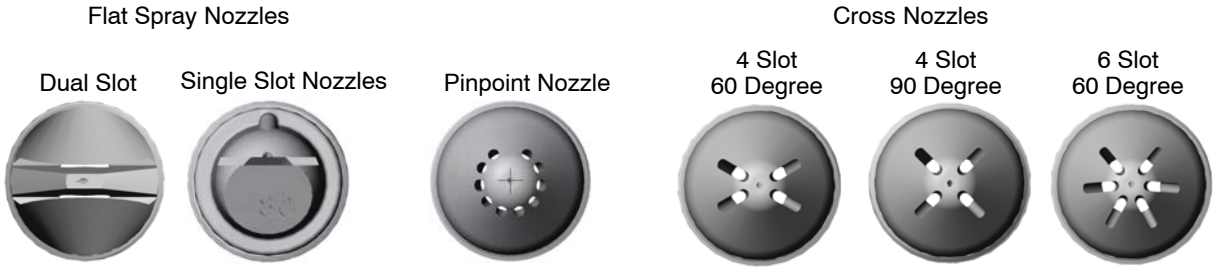

Figure 52 Flat Spray, Cross, and Pinpoint Nozzles

Flat Spray, Cross, and Pinpoint Nozzle Components

Refer to Miscellaneous Options on page 26 for nozzle tool used to disassemble nozzles.

Item	Part	Description	Quantity	Note
–	—	• NOZZLE ASSEMBLIES>>> 14 <<<	1	A
1	940203	• O-RING, silicone, 0.875 x 1.00 x 0.063 in.	1	
2	1047537	• ELECTRODE ring	1	
3	940126	• O-RING, silicone, 0.375 x 0.50 x 0.063 in.	1	
4	940163	• O-RING, silicone, 0.625 x 0.75 x 0.063 in.	1	
5	1073625	• INSERT, metric, conical/flat nozzles	1	
6	1073624	• CONE, porous, nozzle	1	B
7	—	• NOZZLE shell with electrode	1	A
NOTE A: Refer to Nozzle parts list on previous page for part numbers. B: Also available in quantities of 10. Order kit 1073707.				

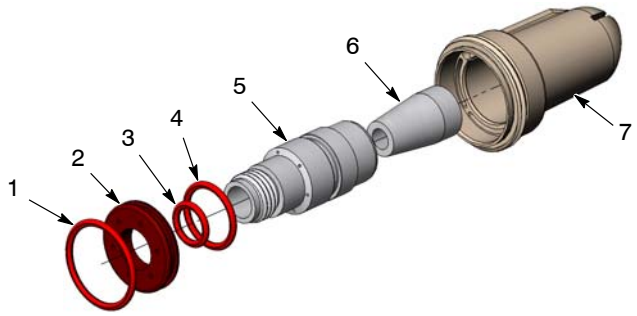

Figure 53 Flat Spray, Cross, and Pinpoint Nozzle Components

Air Cap Kit

Item	Part	Description	Quantity	Note
–	1605690	KIT, air cap assembly	1	
1	- - - - - -	• CAP, air, machined	1	
2	1605685	• KIT, air cap insert assembly	1	
3	- - - - - -	• ELECTRODE, ring	1	
4	- - - - - -	• O-RING, silicone, 0.875 x 1.000 x 0.063 in.	1	

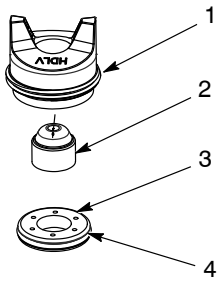

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Figure 54 Air Cap Kit