Versa-Spray® IPS Manual
Electrostatic Powder Spray Gun

Customer Product Manual
Part 108132K
Issued 5/06

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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Notice

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Table of Contents

Section 1
Safety

Introduction

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.

All work conducted inside the spray booth or within 1 m (3 ft) of booth openings is considered within a Class 2, Division 1 or 2 Hazardous location and must comply with 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.

Safety Label

Table 1-1 contains the text of the safety label on this equipment. The safety label is provided to help you operate and maintain your equipment safely.

Table 1-1 Safety Label

Item	Part	Description
	244664	 **WARNING:** The following procedures MUST be followed when working w this electrostatic spray equipment. Failure to follow these instructions ma result in a fire and/or serious personal injury. Display this warning on the spray booth.  1. NO SMOKING. Keep open flames, hot surfaces, and sparks from torches or grinding away from booth. 2. Turn the electrostatic power unit off when the spray gun is not in use. 3. Shut down immediately in event of fire. 4. Maintain ground circuit on all conductive objects below 1 meg ohm to prevent sparking. (ANSI/NFPA 33, Chapter 9, or local codes) 5. Shut down operation and correct grounds if sparking occurs. 6. Install fixed fire suppression system in accordance with ANSI/NFPA 33, Chapter 7 (or local codes), before operating with combustible powder. 7. Install automatic flame detectors in accordance with ANSI/NFPA 33, Chapter 7 (or local codes), before operating automatic guns. 8. Examine all equipment at the beginning of each work period and repair or replace any damaged, loose, or missing parts. 9. Before cleaning or performing any maintenance on the electrostatic spray gun, turn off the power unit and ground the nozzle. Maintain electrostatic spray equipment in accordance with instruction manual. Do not deviate. Do not substitute parts from other manufacturers.  10. Operator must be grounded to prevent shocks from static electricity. Floor surface must be conductive. Footwear and gloves must be static dissipative in accordance with ANSI Z41-1991 (or local codes). 11. Air velocity through all booth openings must meet local requirements and contain powder within the booth. If powder escapes from the booth, shut down operation and correct the malfunction.  12. Powder may be toxic or be a nuisance dust hazard. Refer to supplier's MSDS. If exposed to dust during operation, maintenance, or clean up, operators must use appropriate personal protective equipment. 13. Do not use compressed air or organic solvents for removal of powder from skin or clothing. Do use soap and water. Wash hands before eating or smoking. 14. Guns, feeders, booths, etc., may be cleaned with clean dry air at 25 psig (1.7 bar).

Section 2
Description

Introduction

See Figure 2-1.

The Versa-Spray integral power supply (IPS) manual electrostatic powder spray gun electrostatically charges and sprays organic powder coatings. The integral power supply (multiplier) is user-replaceable. The spray gun is used with a Versa-Spray three-gauge IPS control unit and a standard or low-flow powder pump.

The spray gun is available with a negative or positive multiplier and either 4-, 8-, or 12-m low-voltage power and control cables. It is supplied with a standard 32-mm conical nozzle for organic powders. For quick color changes, the entire powder path is removable. Most of the powder path components are common to all Versa-Spray guns.

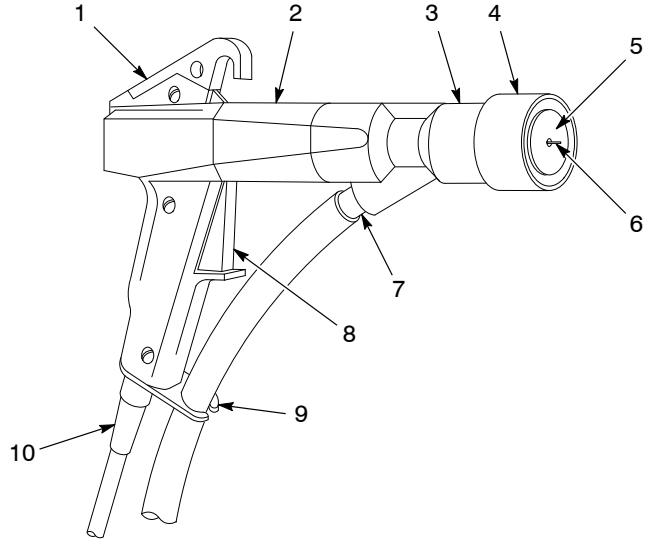

Figure 2-1 Versa-Spray IPS Manual Powder Spray Gun

1. Hanger
2. Extension
3. Powder inlet body
4. Pattern adjust sleeve
5. Deflector
6. Electrode
7. Feed hose adapter
8. Trigger
9. Hose bracket
10. Cable

Introduction *(contd)*

See Figure 2-1.

The spray gun is used with a Nordson Versa-Spray IPS control unit, which supplies low-voltage dc power to the voltage multiplier in the spray gun. The multiplier generates the high electrostatic voltage needed for powder coating. The operator adjusts the electrostatic voltage at the control unit. This voltage generates an electrical field (corona) around the gun electrode (6) . As the powder particles are sprayed through this field they pick up an electrical charge and are attracted to the grounded parts in front of the spray gun. The current at the electrode is limited to safe levels by a resistor installed between the multiplier and the electrode.

The spray pattern is controlled by the electrostatic field, shape of the nozzle used, and air velocity. Powder is supplied to the spray gun by a powder pump. The pump uses compressed air to draw the powder from a feed hopper, atomize it, and force it through feed hose to the spray gun.

There are no controls on the spray gun except the trigger (8) and the pattern adjust sleeve (4). Voltage controls and powder pump air pressure regulators are housed in the IPS control unit.

Options

Refer to the *Parts* section for part numbers and illustrations of the options listed below. Contact your Nordson representative for more information about these options.

Cables

The cable supplies 6.3–21 Vdc from the control unit to the multiplier and includes the trigger circuit. Cables are available in 4-, 8-, and 12-m lengths.

Nozzles

Nozzles are available in the following sizes and configurations:

- 45-mm conical nozzle
- 2.5-, 3-, 4-, and 6-mm flat spray nozzles for organic powders
- 60° and 90° Cross-Cut nozzles
- castle nozzle (six radial slots)
- 14-, 16-, 19-, and 26-mm deflectors for conical nozzles

Lance Extensions

Lance extensions are used to spray powder into recesses and interior corners. The extensions are equipped with 26-mm conical nozzles and are available in 150-, 300-, and 450-mm (6-, 12-, and 18-in.) lengths.

Feed Hoses and Adapters

The spray gun is equipped with a universal feed hose adapter for use with $^{3}/_{8}$- through $^{1}/_{2}$-in. ID powder feed hose.

Purge Adapter

The purge adapter is used to clean accumulated powder from the powder inlet body and nozzle. It is installed in the powder inlet body in place of the hose adapter. The feed hose then connects directly to the purge adapter.

Specifications

Maximum rated output voltage at the electrode	80,000 volts ±10 %
Maximum rated output current at the electrode	0.180 mA ±10 %

This equipment is rated for use in an explosive environment (Class II, Division I).

Section 3
Installation

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

Feed Hose, Air Tubing, and Cable Connections

WARNING: All electrically conductive equipment in the spray area must be grounded. Ungrounded or poorly grounded equipment can store an electrostatic charge which can give personnel a severe shock or arc and cause a fire or explosion.

See Figure 3-1.

1. Connect the feed hose (1) from the powder pump (2) outlet to the hose adapter on the underside of the powder inlet body. Pinch the hose and snap it into the hose bracket at the base of the gun handle.

NOTE: Keep the powder feed hose as short as possible. The hose should not be more than 12-m (39-ft) long if using $^{1}/_{2}$-in. ID hose, or 8-m (26-ft) long if using $^{3}/_{8}$-in. ID hose. Longer lengths may cause uneven powder flow.

2. Wrap spiral-cut tubing around the feed hose at the pump outlet and where necessary to prevent the hose from kinking and blocking the flow of powder.
3. Connect the gun cable (8) to the GUN OUTPUT receptacle at the rear of the IPS control unit (9). Secure the cable to the control unit with the retaining nut on the cable end.
4. Refer to Table 3-1 to connect tubing to the control unit, powder pump, hopper, and air supply.
5. Establish a path for the feed hose and gun cable. Make sure the hose and cable cannot be abraded, cut, or run over by heavy equipment.

Feed Hose, Air Tubing, and Cable Connections *(contd)*

Table 3-1 Air Tubing Connections

Item in Figure 3-1	Tubing Size (mm)	Controller Connection	Other Connection
3	10	AUX port	Feed hopper plenum/fluidizing air
5	10	IN port/supply air	System air supply
6	6	Flow rate port	Connector F (flow rate air) on powder pump
7	6	Atomizing port	Connector A (atomizing air) on powder pump

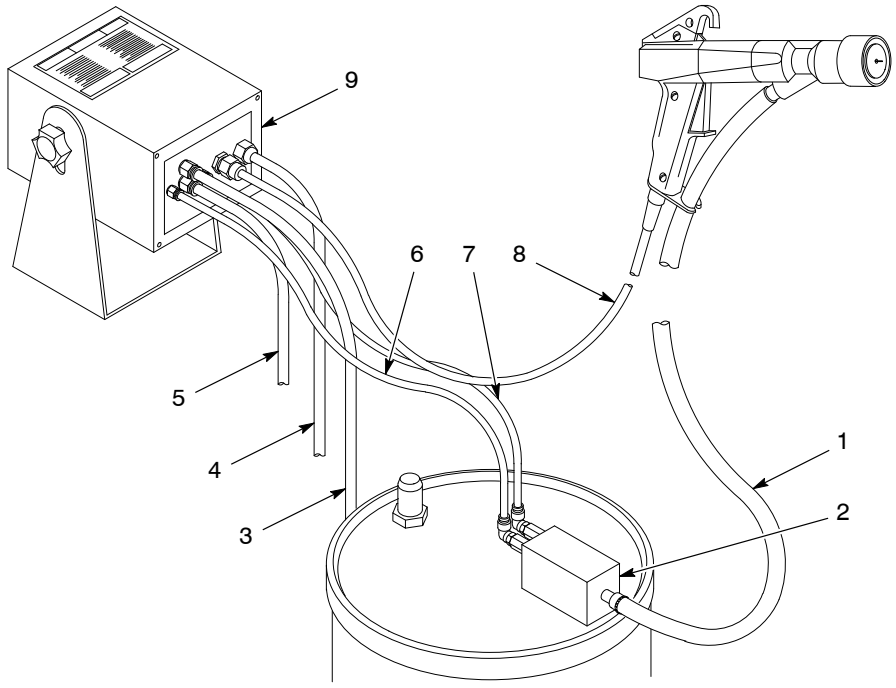

Figure 3-1 Feed Hose, Air Tubing, and Cable Connections

1. Feed hose
2. Powder pump
3. Fluidizing air tubing
4. Control unit power
5. Air supply tubing
6. Flow rate air tubing
7. Atomizing air tubing
8. Gun cable
9. IPS control unit

Air Quality

Powder spray systems require clean, dry operating air. Moist or otherwise contaminated air can cause the powder to clog in the pump venturi throat, feed hose, or gun passages. Moist air can also cause grounding or arcing.

Use 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 7 bar (100 psi).

Optional Flat-Spray Nozzle Installation

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

See Figure 3-2.

1. Remove the deflector (5), pattern adjust sleeve (6), and nozzle (4) from the powder inlet body (1). Slide the wear sleeve (3) off the resistor probe (2).
2. Clean powder from the powder inlet body and resistor probe. If necessary, disconnect the powder feed hose, loosen the set screw in the underside of the powder inlet body, and remove the powder inlet body from the extension.
3. Install the optional wear sleeve (7) over the end of the resistor probe. Be careful not to bend the end of the electrode. Do not use the optional flat-spray nozzle without the optional wear sleeve.
4. Push the optional flat-spray nozzle (8) into the powder inlet body until it bottoms out.

Optional Flat-Spray Nozzle Installation *(contd)*

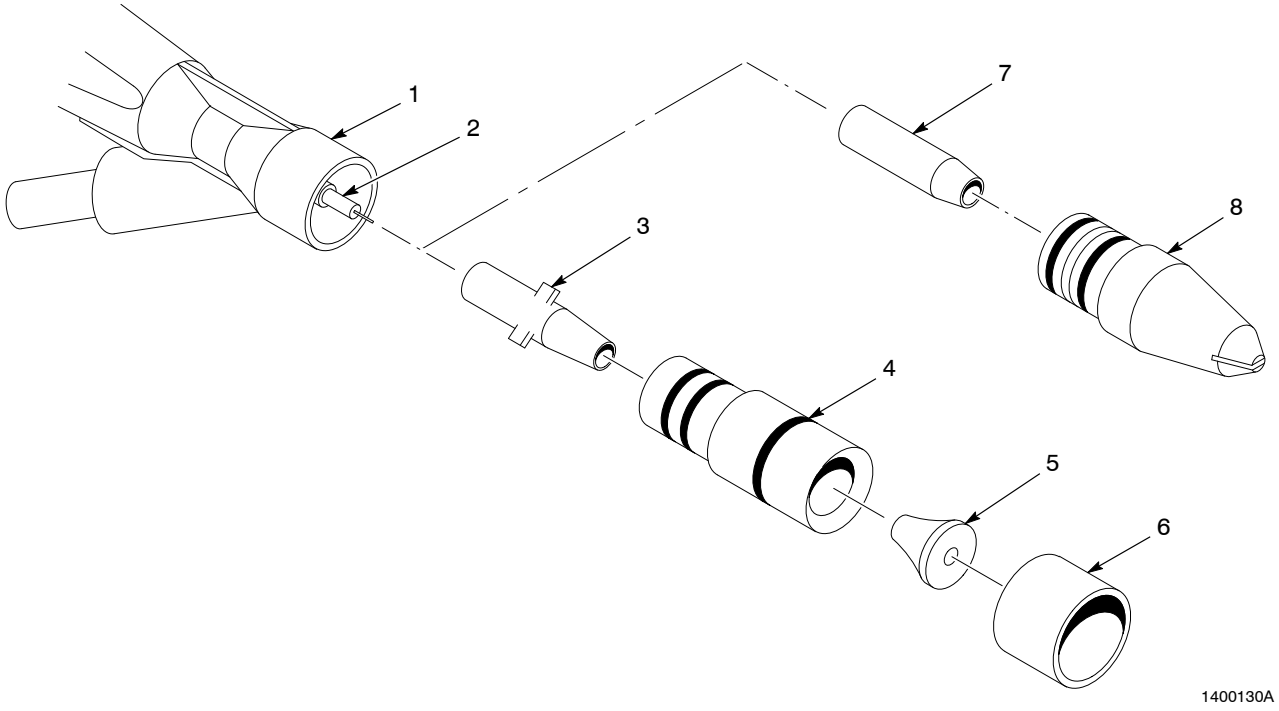

Figure 3-2 Optional Flat-Spray Nozzle Installation

1. Powder inlet body
2. Resistor probe
3. Wear sleeve
4. Nozzle
5. Deflector
6. Pattern adjust sleeve
7. Optional wear sleeve
8. Optional flat-spray nozzle

Optional Lance Extension Installation

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

NOTE: Before removing the nozzle parts, disconnect the powder feed hose from the pump. Blow out the feed hose, powder inlet body, and nozzle with low-pressure compressed air. Use a clean, dry cloth to wipe off the remaining powder after removing the nozzle parts.

See Figure 3-3.

1. Remove the pattern adjust sleeve (7), deflector (6) and conical nozzle (5) from the powder inlet body (1).
2. Remove the wear sleeve (4) from the resistor probe (2).
3. Install the lance extension (8) into the end of the powder inlet body, guiding the resistor probe into the lance extension contact sleeve (9). Be careful not to damage the electrode (3).
4. If desired, the nozzle, deflector, and pattern adjust sleeve that come with the lance extension can be removed and replaced with the nozzle adapter and nozzle parts that you removed in step 1.

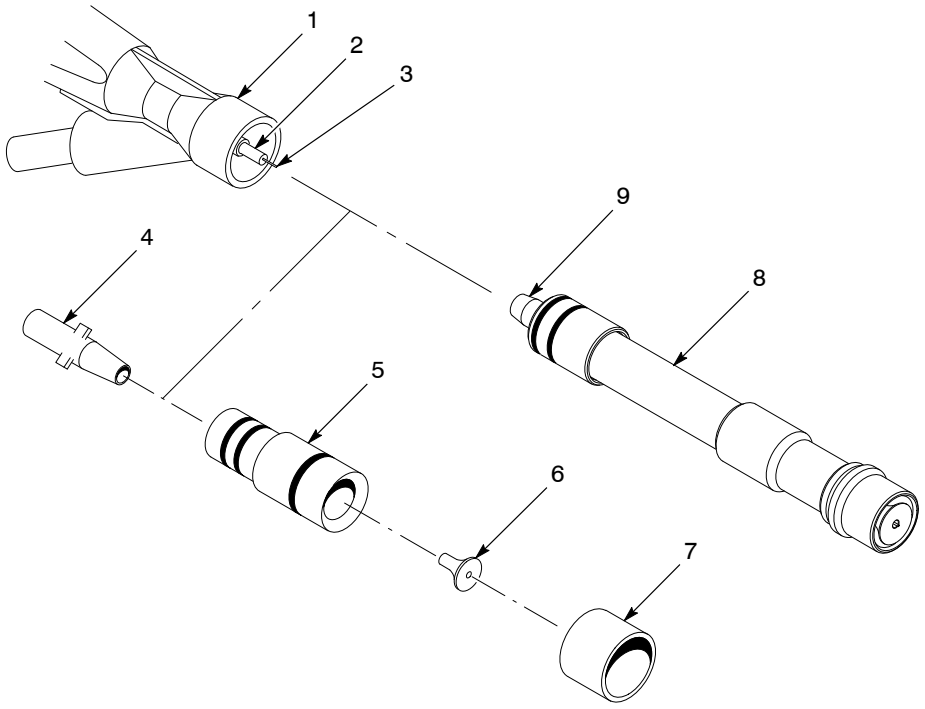

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Figure 3-3 Optional Lance Extension Installation

1. Powder inlet body
2. Resistor probe
3. Electrode
4. Wear sleeve
5. Conical nozzle
6. Deflector
7. Pattern adjust sleeve
8. Lance extension
9. Contact sleeve

Section 4
Operation

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

Startup

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

WARNING: Do not operate the spray gun if the resistor and multiplier resistances are not within the ranges specified in this manual. Failure to observe this warning may result in personal injury, fire, and property damage.

Before turning on the IPS control unit, make sure that the

- booth exhaust fan is on,
- powder recovery system is operating, and
- powder supply in the feed hopper is adequately fluidized.

Refer to the appropriate equipment manuals for startup procedures.

1. Make sure the cable, feed hose, and air tubing are correctly connected to the spray gun, powder pump, and IPS control unit.
2. Turn the IPS control unit main power switch to the on position.
3. Adjust the control unit air pressure regulators:

   NOTE: The pressures given are average starting points. Pressures will vary according to required film build, line speed, and part configuration. Adjust the pressures to obtain the desired results.

Air Pressure	Typical Setting	Description
Flow rate	1.4 bar (20 psi)	Controls the volume of the powder delivered to the spray gun.
Atomizing	2.1 bar (30 psi)	Controls the velocity and density (powder-to-air ratio) of the powder.

Startup *(contd)*

WARNING: The operator must maintain skin contact with the the gun handle. If wearing gloves, cut away the palm. Failure to observe this warning could result in a shock.

4. Point the spray gun into the booth, pull the trigger, and test the spray pattern. Adjust the flow rate and atomizing air pressures, or pattern adjust sleeve, until you obtain the desired pattern.
5. Turn the kV potentiometer clockwise until it stops.
6. Coat a few parts and adjust the kV potentiometer until you obtain the desired results.

Shutdown

1. Turn the kV potentiometer counterclockwise until it stops and turn the main power switch to the off position.
2. Ground the gun electrode to dissipate any residual voltage.
3. Perform the *Daily Maintenance* procedure.

For information on the operation of other components of your powder spray system, refer to their manuals.

Maintenance

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

Daily Maintenance

1. Disconnect the powder feed hose from the pump. Point the spray gun into the booth and blow the powder out of the hose and spray gun with low-pressure compressed air. Never blow air through the powder feed hose from the spray gun into the pump.
2. See Figure 4-1.

   Remove the nozzle parts (4 through 7) and powder inlet body (3) from the spray gun. Clean them with an OSHA-approved, low-pressure air gun. Wipe the parts with a clean, dry cloth.
3. Blow powder off the resistor probe (2) and extension (1). Wipe them with a clean, dry cloth.
4. Carefully remove fused powder from the parts with a wooden or plastic dowel or similar tool. Do not use tools that will scratch the plastic. Powder will build up and impact-fuse on scratches.

   NOTE: If necessary, use a cloth dampened with isopropyl or ethyl alcohol to clean the powder path parts. Remove the O-rings first. Do not immerse the spray gun in alcohol. Do not use any other solvents.
5. Inspect the powder path parts for wear. Replace worn parts.
6. Assemble the spray gun. Rotate the nozzle parts at least 30° from their previous position to prevent uneven wear and lopsided patterns.

Daily Maintenance *(contd)*

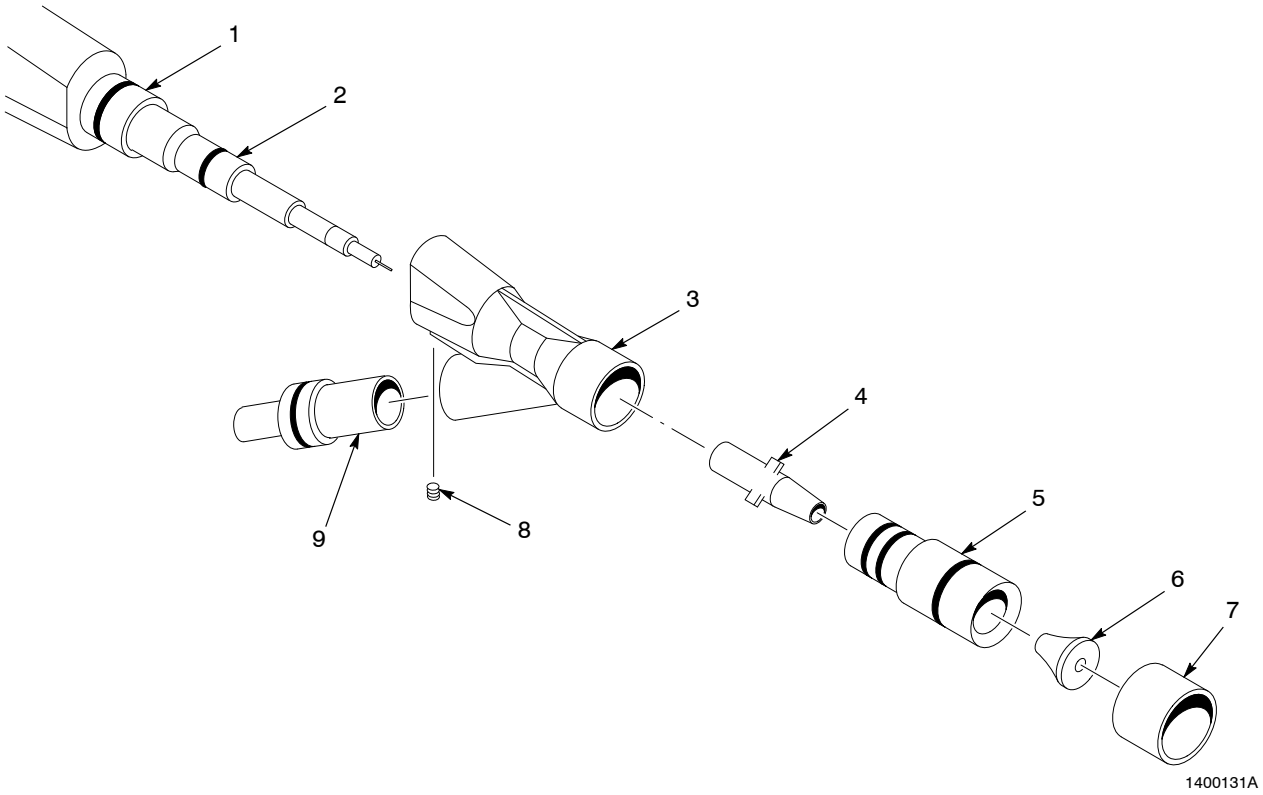


Figure 4-1 Daily Maintenance

1. Extension
2. Resistor probe
3. Powder inlet body
4. Wear sleeve
5. Nozzle
6. Deflector
7. Pattern adjust sleeve
8. Set screw
9. Hose adapter

Weekly Maintenance

Check the resistance of the multiplier/resistor probe assembly with a megohmmeter, as described in the *Troubleshooting* section. Replace the multiplier, resistor, or both, if the resistance readings do not fall within the specified ranges.

Section 5
Troubleshooting

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

This section contains troubleshooting procedures. 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 for help.

Perform continuity and resistance checks if you are having problems with the electrostatic components of the spray gun. Use the procedures at the end of this section to perform the following checks:

- multiplier/resistor assembly continuity and resistance
- resistor continuity and resistance
- gun cable continuity

Troubleshooting Charts

Troubleshooting Charts *(contd)*

Problem	Possible Cause	Corrective Action
1. Uneven pattern, unsteady or inadequate powder flow	Blockage in spray gun, feed hose, or pump	Disconnect the feed hose from the pump. Blow out the hose with compressed air. Disassemble the spray gun and pump and clean them. Replace the hose if it is clogged with fused powder.
	Deflector or nozzle worn, affecting pattern	Remove the deflector and nozzle. Clean and inspect them. Replace worn parts. If excessive wear or impact-fusion is a problem, reduce the flow rate and atomizing air pressures.
	Damp powder	Check the powder supply, air filters, and dryer. Replace the powder supply if it is contaminated.
	Low atomizing or flow rate air pressure	Increase the atomizing and/or flow rate air pressures.
	Improper fluidization of powder in hopper	Increase the fluidizing air pressure. Remove the powder from hopper and clean or replace the fluidizing plate, if contaminated.
2. Voids in powder pattern	Worn nozzle or deflector	Remove the deflector and nozzle. Inspect and replace them if worn.
	Plugged powder path	Remove the nozzle parts and powder path from the spray gun and clean them.
3. Loss of wrap, poor transfer efficiency	Low electrostatic voltage	Increase the electrostatic voltage.
	Resistor or IPS control unit failure	Check the multiplier/resistor probe assembly with a megohmmeter for 195–260 megohms at 500 volts. If the reading is out of this range, check the resistor probe separately.
	Poorly grounded parts	Check the conveyor chain, rollers, and part hangers for powder buildup. Clean them and check the resistance between the parts and a true earth ground. The resistance must be 1 megohm or less. For best results, 500 ohms or less is recommended.

Continued...

Problem	Possible Cause	Corrective Action
4. No kV output from spray gun	Malfunctioning trigger switch	Check for continuity between pins 1 and 2 (control unit end of cable) with the switch actuated. If no continuity is found, replace the cable.
	Damaged gun cable	Check the continuity of the cable wires, from pin to pin. Replace the cable if any opens or shorts are found.
	Malfunctioning voltage multiplier	Use the optional shorting plug and a megohmmeter to check the continuity and resistance of the multiplier/resistor assembly for 195–260 megohms at 500 volts. No burn-throughs or arc tracks should be visible on any spray gun parts.
	Failed spray gun resistor	Check the resistor with a megohmmeter for 153–187 megohms at 500 volts.
	Malfunctioning IPS control unit	Check for 21 Vdc between pins 2 and 3 (gun end of cable) with the trigger depressed. Refer to the IPS control unit manual if this voltage is not present.

Continuity and Resistance Checks

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

Resistor/Multiplier Assembly Continuity and Resistance Check

NOTE: All three pins on the input side of multiplier must be shorted together when you check continuity. Failure to do so could damage multiplier.

See Figure 5-1.

1. Connect the shorting plug (2) to the multiplier connector (1).
2. Connect the megohmmeter probes to the shorting plug ring-tong terminal and electrode (4). If you get an infinite reading, reverse the probes.
3. The megohmmeter should read between 195 and 260 megohms at 500 volts. If the reading is out of this range, unscrew the resistor probe from the multiplier and check the resistor separately (refer to *Resistor Continuity and Resistance Check*). If the resistor reading is within the range specified, replace the multiplier.

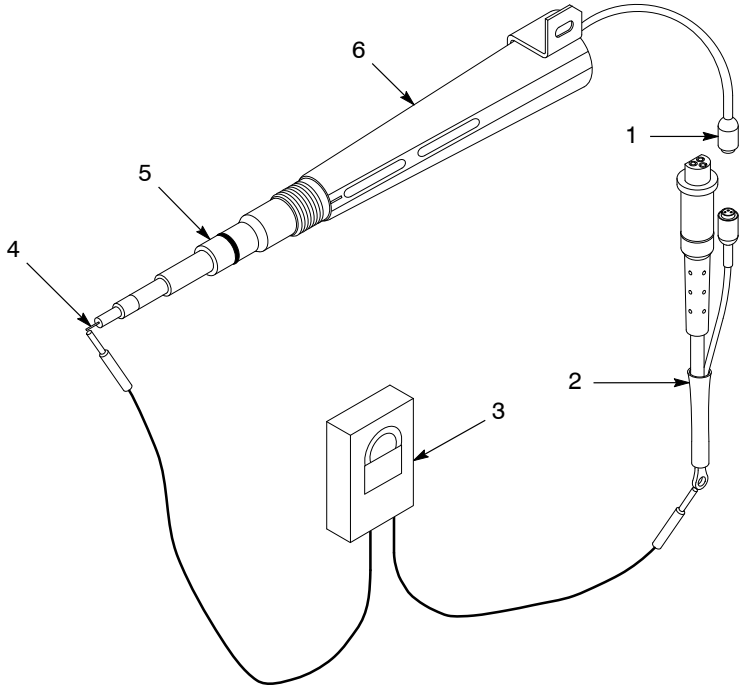


Figure 5-1 Resistor/Multiplier Assembly Continuity and Resistance Check

1. Multiplier connector
2. Shorting plug
3. Megohmmeter
4. Electrode
5. Resistor probe
6. Multiplier

Resistor Continuity and Resistance Check

1. Perform steps 1 through 3 of the *Resistor/Multiplier Assembly Continuity and Resistance Check.*
2. See Figure 5-2.

   Unscrew the resistor probe (2) from the multiplier (4).
3. Check the resistor with a megohmmeter. The megohmmeter should read between 153 and 187 megohms at 500 volts. If the reading is out of this range, replace the resistor probe.

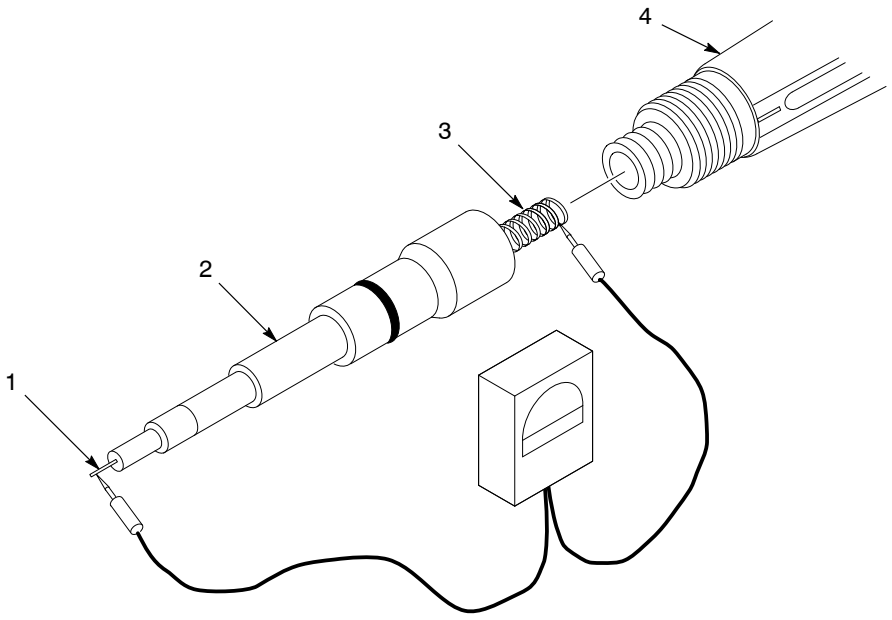


Figure 5-2 Resistor Continuity and Resistance Check

1. Electrode
2. Resistor probe
3. Resistor spring
4. Multiplier

Gun Cable Continuity Check

Cable pins and wire colors are shown in Figure 5-3. To make sure the cable is not damaged, check for continuity with a standard ohmmeter.

Table 5-1 Gun Cable Pin Functions

Controller End Pins	Function
1	Trigger
2	Negative (Common)
3	Positive (+21 Vdc)
4	μA Feedback
5	Open
6	Ground

Table 5-2 Gun Cable Continuity Checks

Control Unit End Pins	Gun End Pins and Terminals
1 and 2	Close trigger switch
2	2
3	3
4	1
5	No connection
6	Ring-tong terminal

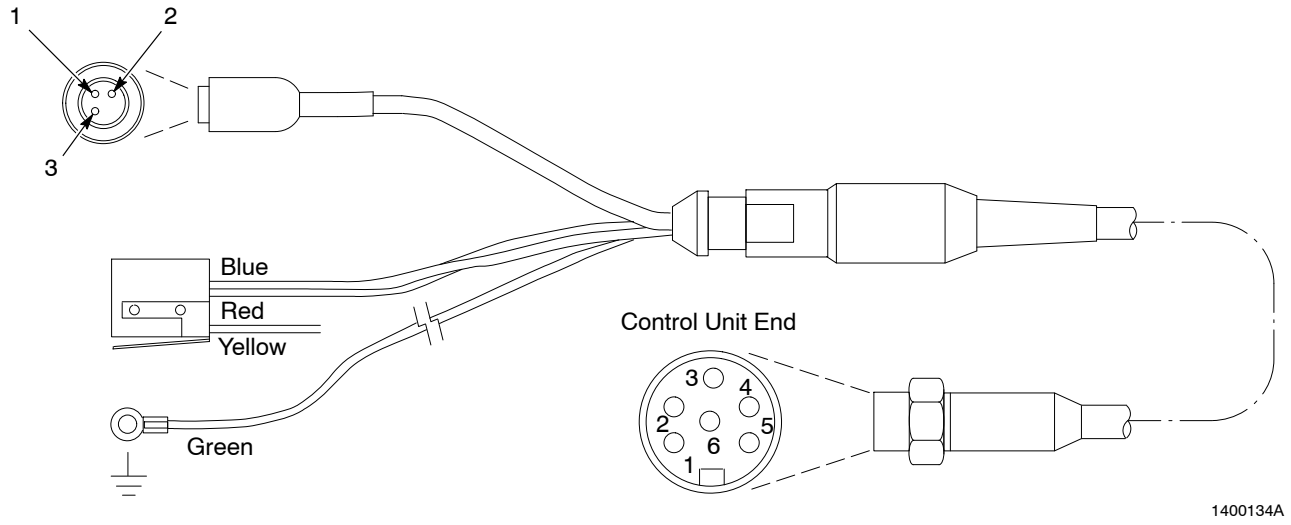


Figure 5-3 Gun Cable Continuity Check

Section 6
Repair

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

Powder Path Repair

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

See Figure 6-1.

1. Remove the pattern adjust sleeve (7), deflector (6), and nozzle (5). If you are using a flat spray nozzle, remove the nozzle.
2. Remove the wear sleeve (4) from the resistor probe (2).
3. Disconnect the powder feed hose from the hose adapter (9). Squeeze the powder feed hose to remove it from the hose bracket.
4. Loosen the set screw (8) and pull the powder inlet body (3) off the extension (1).
5. Clean the powder path parts with an OSHA-approved low-pressure air gun and a clean cloth. Carefully remove fused powder from the parts with a wooden or plastic dowel or similar tool. Do not use tools that will scratch the plastic. Powder will build up and impact-fuse on scratches.

Powder Path Repair *(contd)*

6. If necessary, wipe the parts with a cloth dampened with isopropyl or ethyl alcohol. Do not use any other solvent. Do not immerse the assembled spray gun or any parts in alcohol.
7. Inspect all O-rings and replace them if damaged.
8. Inspect the powder path parts. Replace worn parts as necessary.
9. Reverse the disassembly procedure to assemble the powder path.

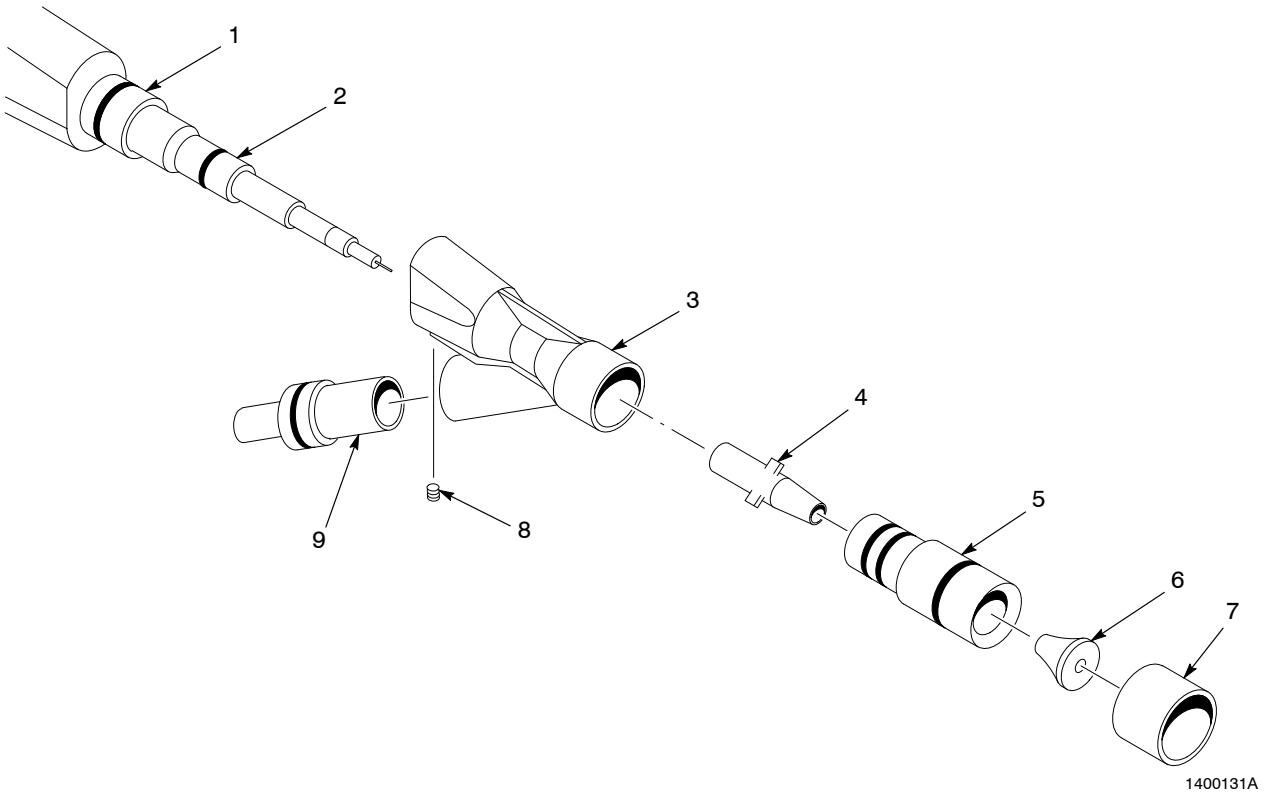


Figure 6-1 Powder Path Repair

1. Extension
2. Resistor probe
3. Powder inlet body
4. Wear sleeve
5. Nozzle
6. Deflector
7. Pattern adjust sleeve
8. Set screw
9. Hose adapter

Multiplier Replacement

Multiplier service kits contain a new multiplier/resistor probe assembly and extension. Follow the steps below to replace your old multiplier with a new multiplier/resistor probe assembly.

See Figure 6-2.

1. Remove the powder path parts as described in *Powder Path Repair*.
2. Loosen the three captive screws (8) in the cover (7). The O-rings (6) hold the screws in the cover. Lift the cover off the handle (1).
3. Remove the screw (15) securing the multiplier heat sink bracket to the hanger (17). Remove the cable ground wire (later versions only).
4. Loosen the connector swivel nut and disconnect the cable (13) from the multiplier connector (14).
5. Remove the extension (3) and multiplier (16) from the handle.
6. Loosen and remove the cable nut (4). Use a wrench if necessary.
7. Remove the multiplier from the extension.
8. If you are replacing the old extension with the new one included in the kit, remove the two screws (5) that secure the hanger (17) to the extension and remove the hanger. Install the hanger on the new extension.
9. Perform the disassembly steps in reverse to install the new multiplier/resistor assembly into your spray gun.

Multiplier Replacement *(contd)*

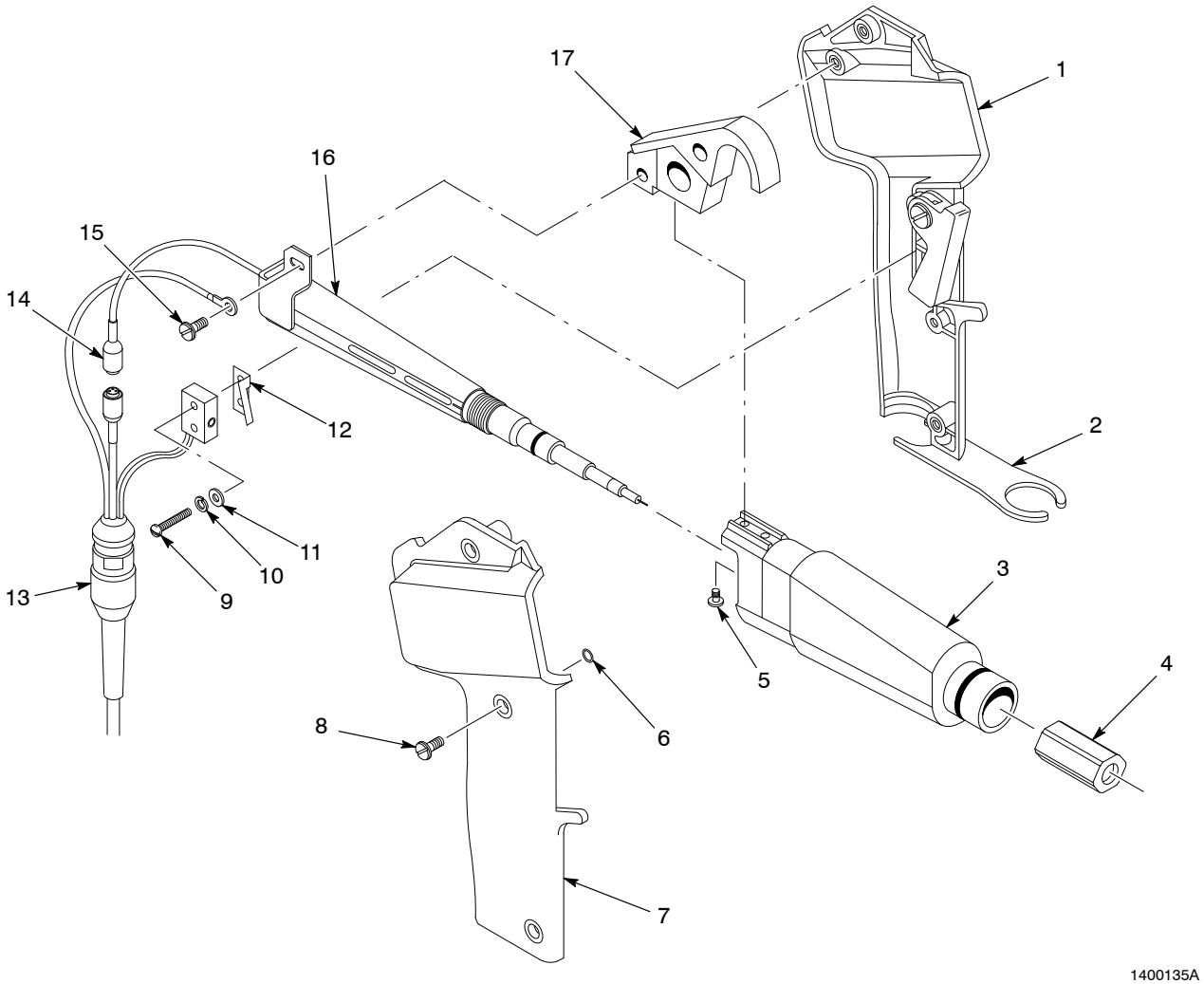


Figure 6-2 Multiplier and Cable Replacement

1. Handle
2. Hose bracket
3. Extension
4. Cable nut
5. Screws (2)
6. O-rings (3)
7. Cover
8. Captive screws (3)
9. Screws (2)
10. Lock washers (2)
11. Flat washers (2)
12. Switch actuator
13. Cable
14. Multiplier connector
15. Screw (1)
16. Multiplier
17. Hanger

Cable Replacement

See Figure 6-2.

1. Remove the cover from the handle and disconnect the cable from the multiplier as described in *Multiplier Replacement*.
2. Remove the two screws (9), lock washers (10) and flat washers (11). Remove the trigger switch and actuator (12) from the handle (1).
3. Rotate the hose bracket (2) slightly and release the cable. Note how the cable fits into the hose bracket.
4. Fit the new cable into the hose bracket and route the ground wire around the end of the multiplier. Secure the ground wire to the hanger (17) with the screw (15).
5. Connect the cable to the multiplier connector (14) and arrange the wiring so that it will not be pinched between the handle and the cover when the cover is installed.
6. The cable service kit includes new screws (9), washers (10, 11), and a switch actuator (12). Install the actuator on the trigger switch and secure both to the two threaded inserts in the handle with the screws and washers.
7. Install the cover (7) on the handle.

Resistor Replacement

See Figure 6-3.

1. Remove the multiplier and resistor probe from the extension as described in *Multiplier Replacement*.
2. Unscrew the old resistor probe (2) from the multiplier (4). Clean the multiplier well (5).
3. Remove the shipping container and protective caps from the new probe.

WARNING: All air in the multiplier well, resistor holder, and contact tip must be replaced by dielectric grease. High voltage can arc through air pockets, affect electrostatic performance, possibly burn through the spray gun, and create a fire or explosion hazard.

4. Inject dielectric grease into the multiplier well until it is completely full. Use the 3-cc applicator supplied with the kit.
5. Fill the new resistor spring (3) and the resistor probe cavity (6) completely with dielectric grease.
6. Unscrew the contact tip (1) from the resistor probe (2).

Resistor Replacement *(contd)*

7. Screw the new resistor probe onto the multiplier. Do not overtighten.
8. Screw the contact tip into the resistor probe. Do not overtighten. Wipe excess grease off the contact tip and multiplier.
9. Install the probe and multiplier into the extension and secure them with the cable nut. Connect the cable to the multiplier and assemble the spray gun.

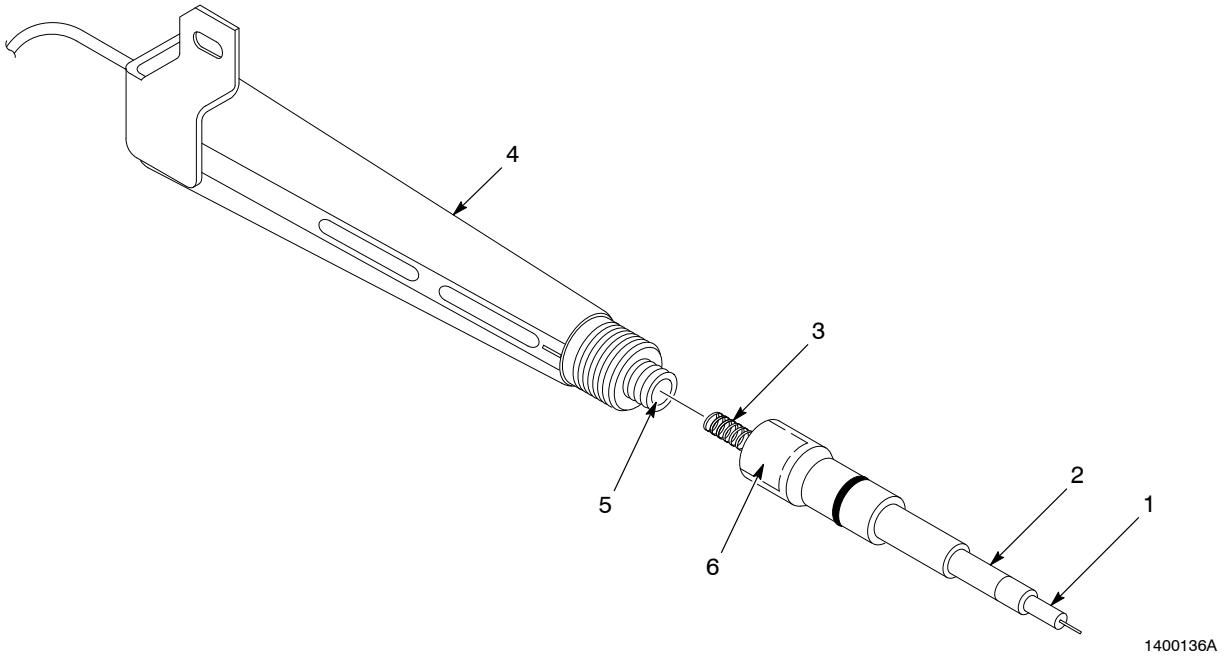


Figure 6-3 Resistor and Contact Tip Replacement

1. Contact tip
2. Resistor probe
3. Resistor spring
4. Multiplier
5. Multiplier well
6. Resistor probe cavity

Note: Clean item 5. Grease items 3, 5, and 6.

Contact Tip Replacement

See Figure 6-3.

1. Remove the nozzle parts and powder inlet body from the spray gun as described in *Powder Path Repair*. Wipe powder off the resistor probe.
2. Unscrew the damaged contact tip (1) from the end of the resistor probe (2).
3. Apply dielectric grease to the threads of the new contact tip and into the end of the probe.
4. Screw the new contact tip into the resistor probe. Do not overtighten.

Section 7
Parts

Introduction

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.

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

- 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.

Spray Gun Assembly

See Figure 7-1.

Item	Part	Description	Quantity	Note
—	132738	Hand gun, IPS Versa-Spray, 4-m cable, negative	1	
—	132749	Hand gun, IPS, Versa-Spray, 8-m cable, negative	1	
—	- - - - - -	Hand gun, IPS, Versa-Spray, 12-m cable, negative	1	A
—	- - - - - -	Hand gun, IPS, Versa-Spray, 4-m cable, positive	1	A
—	- - - - - -	Hand gun, IPS, Versa-Spray, 8-m cable, positive	1	A
—	- - - - - -	Hand gun, IPS, Versa-Spray, 12-m cable, positive	1	A
1	- - - - - -	• Service kit, 32-mm conical nozzle	1	B
2	125612	• Body, inlet, powder	1	
3	982455	• Screw, set, M6 x 1 x 8, nylon, black	1	
4	134386	• Adapter, hose	1	
5	940163	• • O-ring, silicone, 0.625 x 0.75 x 0.063 in.	1	
6	984165	• Nut, cable retainer	1	
7	940243	• O-ring, silicone, 1.125 x 1.25 x 0.063 in.	1	
8	125613	• Extension	1	
9	982098	• Screw, fillister head, slotted, M4 x 6, zinc	3	
10	132345	• Bracket, cable/tube, retaining	1	
11	160104	• Service kit, trigger, Versa-Spray	1	
12	125616	• Hanger, hand gun, modular	1	
13	- - - - - -	• Service kit, multiplier, 80 kV, with probe	1	C
14	982327	• Screw, chez head, slotted, M4 x 12, zinc	1	
15	- - - - - -	• Service kit, cable	1	D
16	160103	• Service kit, handle, Versa-Spray	1	

NOTE A: These spray gun assemblies are no longer available, but replacement parts may be ordered. Order replacement parts as necessary using the parts lists in this section.

B: Order a nozzle kit from lists on following pages.

C: Order a positive or negative multiplier kit from *Multiplier Service Kits*.

D: Order the appropriate cable service kit from *Cable Service Kits*.

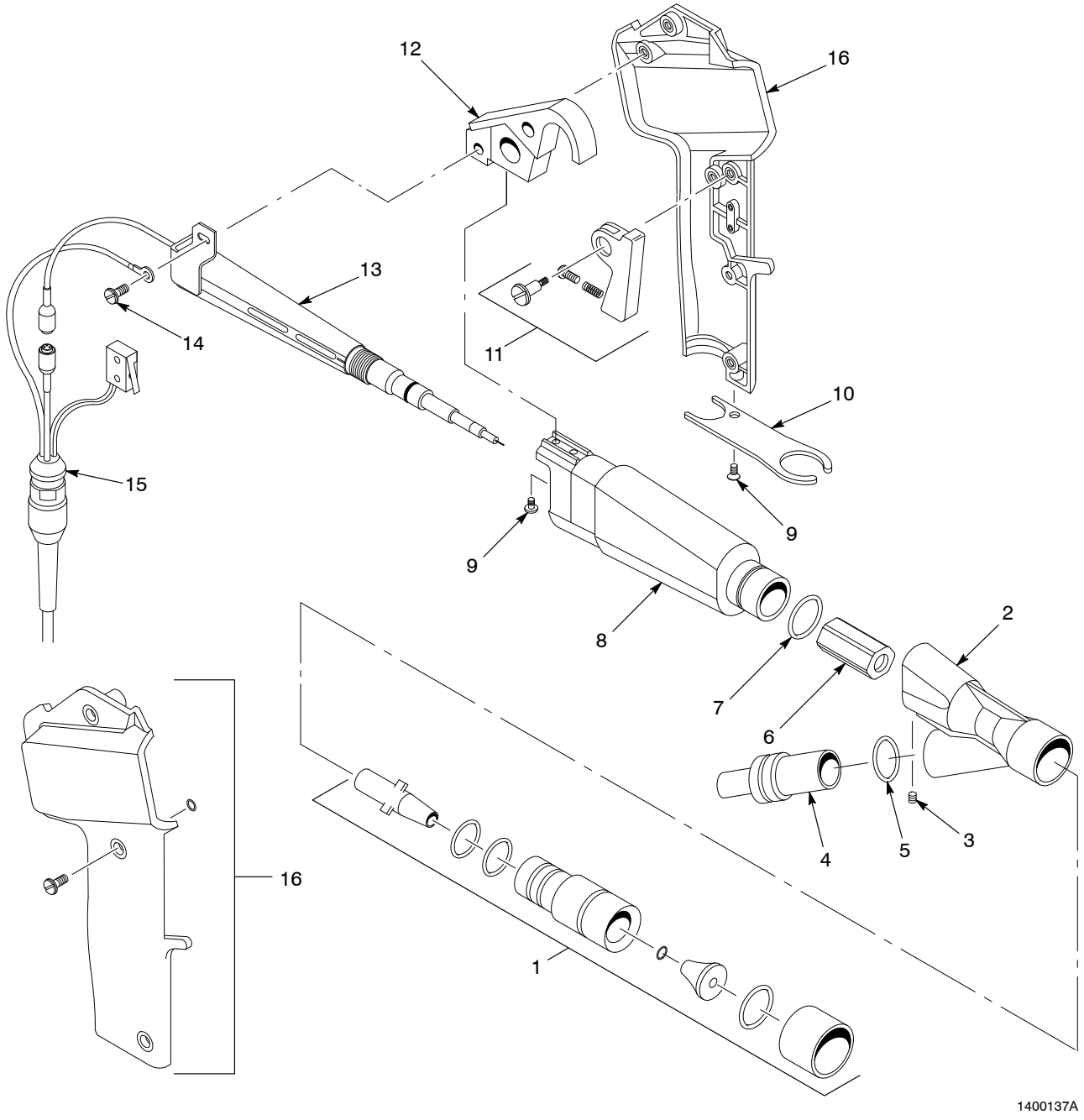


Figure 7-1 Versa-Spray IPS Manual Powder Spray Gun Assembly

Service Kits

Use the following charts to order service kits for the Versa-Spray IPS spray gun.

Service Kit Reference Chart

Part	Description	Note
133716	Service kit, cable, IPS, 4 meter	A
133715	Service kit, cable, IPS, 8 meter	A
163408	Service kit, cable, IPS, 12 meter	A
1014038	Service kit, multiplier, 80 kV, negative, with probe	B
1014039	Service kit, multiplier, 80 kV, positive, with probe	B
134376	Service kit, holder, resistor	C
160103	Service kit, handle, Versa-Spray	
160104	Service kit, trigger, Versa-Spray	
145559	Service kit, nozzle, 32 mm	D

NOTE A: Order cable service kit according to the length of cable desired.

B: Check multiplier polarity before ordering. Compare the part number on the gun label with the part number description in the *Spray Gun Assembly* chart in this section.

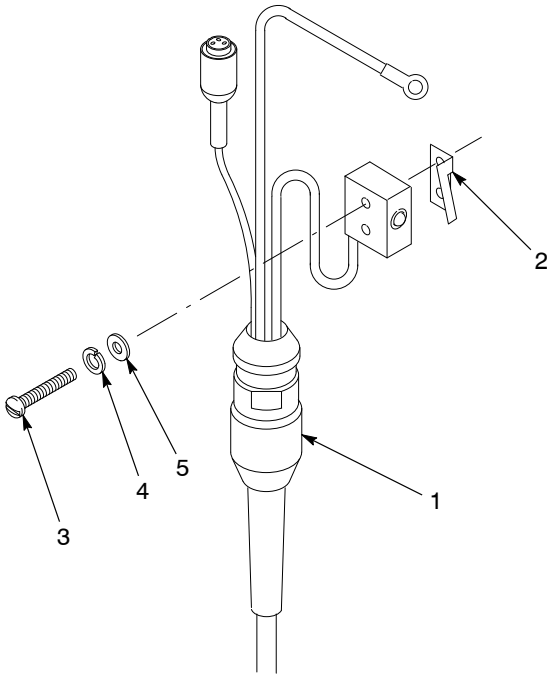
C: This kit replaces the resistor connected to the multiplier.

D: This is the new-style conical nozzle kit. The new-style kit has an O-ring installed on the outside diameter of the nozzle.

Cable Service Kits

See Figure 7-2.

Item	Part	Description	Quantity	Note
—	133716	Service kit, cable, IPS 4 meter	1	
—	133715	Service kit, cable, IPS 8 meter	1	
—	163408	Service kit, cable, IPS 12 meter	1	
1	- - - - - -	• Cable	1	
2	132336	• Actuator, switch	1	
3	1070246	• Screw, pan head, #2-56 x 0.437, slotted, zinc	2	
4	983113	• Washer, lock, e, split, 2, steel, zinc	2	
5	983510	• Washer, flat, e, 0.094 x 0.188 x 0.025 in., brown	2	



1400138A

Figure 7-2 Cable Service Kit

Multiplier Service Kits

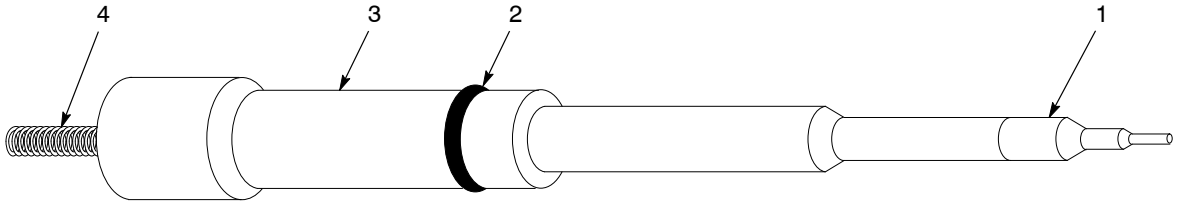
Multiplier kits include the resistor, multiplier, and extension. If replacing just the resistor, use the resistor kit shown below.

Part	Description	Note
1014038	Service kit, multiplier, 80 kV, with resistor probe, negative	
1014039	Service kit, multiplier, 80 kV, with resistor probe, positive	
125613	• Extension	
134376	• Service kit, holder, resistor	
- - - - - -	• Multiplier, 80 kV, Versa-Spray	

Resistor Service Kit

See Figure 7-3.

Item	Part	Description	Quantity	Note
1	134376	Service kit, holder, resistor	1	
2	132748	• Contact, cable	1	
3	940117	• O-ring, silicone, 0.312 x 0.438 x 0.063 in.	1	
4	- - - - - -	• Holder, resistor	1	
5	- - - - - -	• Resistor	1	
NS	245733	• Grease, dielectric, 3-cc applicator	1	
NS: Not Shown				



1400139A

Figure 7-3 Resistor Service Kit

Handle Service Kit

See Figure 7-4.

Item	Part	Description	Quantity	Note
1	160103	Service kit, handle, Versa-Spray	1	A
2	- - - - - -	• Handle, gun	1	
3	- - - - - -	• Handle, cover	1	
4	940060	• O-ring, Viton, 0.125 x 0.25 x 0.063 in.	3	
5	981626	• Screw, captive, slotted, M4 x 12, black	3	
NOTE A: Customer must provide gun part number and serial number when ordering.				

Trigger Service Kit

See Figure 7-4.

Item	Part	Description	Quantity	Note
6	160104	Service kit, trigger, Versa-Spray	1	
7	132334	• Pivot, trigger	1	
8	125617	• Trigger, hand gun, modular	1	
9	133783	• Spring, trigger, return	1	
10	982370	• Screw, pan head, slotted, M2 x 5, zinc	1	

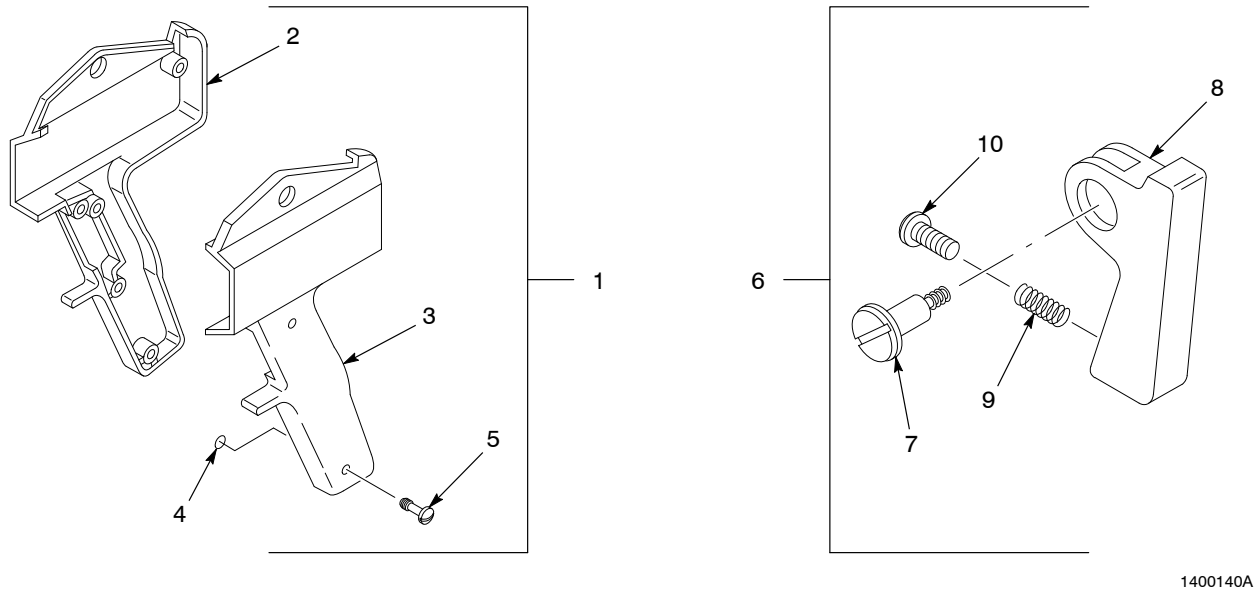


Figure 7-4 Handle and Trigger Service Kits

32-mm Conical Nozzle Service Kit (Old Style)

See Figure 7-5.

The old-style 32-mm conical nozzle's pattern adjust sleeve (4) has an O-ring (5) installed in the inside diameter. The new-style conical nozzle has an O-ring installed in the large OD of the nozzle (2). Part numbers listed in the following chart are available to repair old-style nozzles.

Item	Part	Description	Quantity	Note
—	- - - - - -	Service kit, nozzle, 32 mm, auto	1	
1	132348	• Sleeve, wear, conical, Tivar	1	
2	- - - - - -	• Nozzle, 32-mm diameter, with O-rings, Tivar	1	A
3	940212	• • O-ring, silicone, 0.938 x 1.063 x 0.063 in.	2	
4	- - - - - -	• Sleeve, pattern, Versa-Spray	1	A
5	940262	• • O-ring, silicone, 1.25 x 1.375 x 0.063 in.	1	
6	133734	• Deflector, 26-mm diameter	1	
NS	940084	• • O-ring, silicone, 0.188 x 0.312 x 0.063 in.	1	

NOTE A: These parts are no longer available. If you need to order a new nozzle or pattern adjust sleeve, order a new style conical nozzle kit, part 145559.

NS: Not Shown

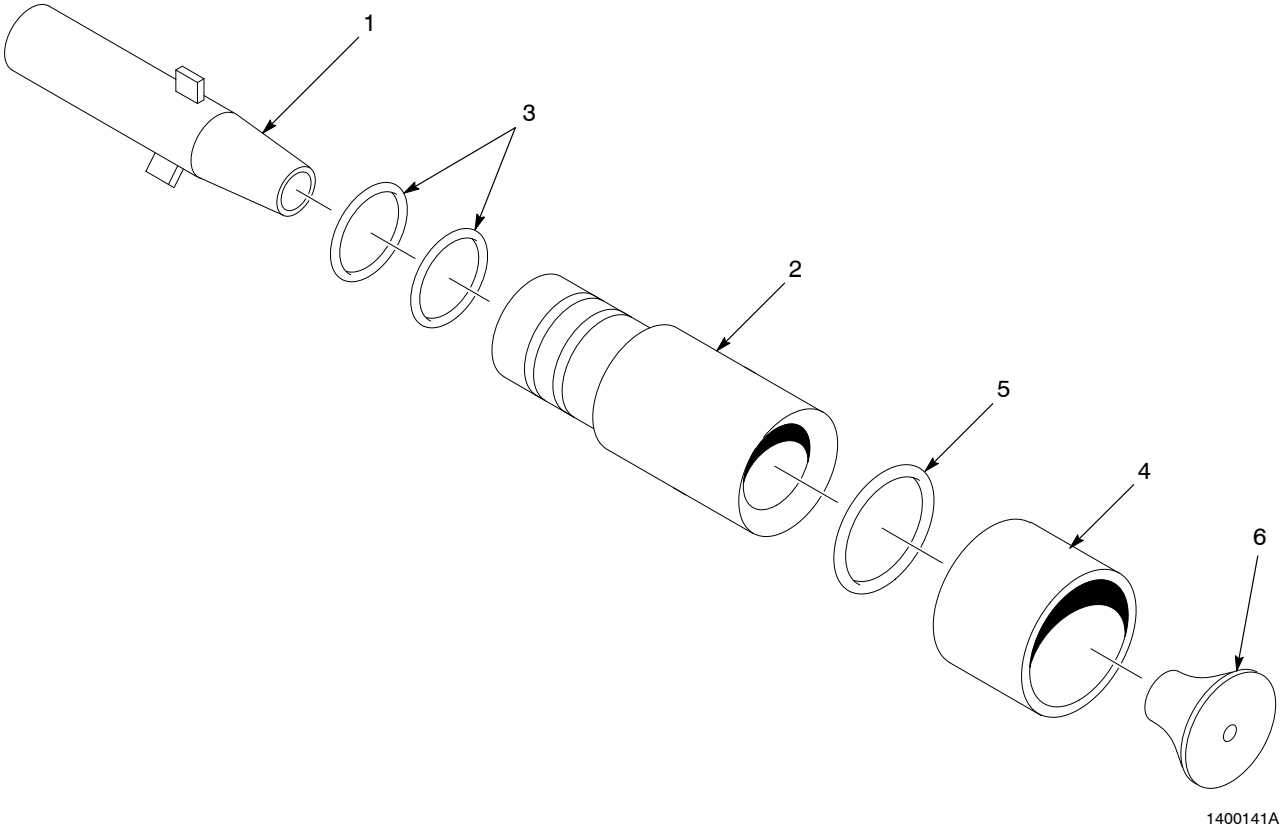


Figure 7-5 32-mm Conical Nozzle Service Kit (Old Style)

32-mm Conical Nozzle Service Kit (New Style)

See Figure 7-6.

Item	Part	Description	Quantity	Note
—	145559	Service kit, nozzle, 32 mm	1	
1	132348	• Sleeve, wear, conical, Tivar	1	
2	145558	• Nozzle, 32-mm diameter, with O-ring, Tivar	1	
3	941181	• • O-ring, silicone, 0.875 x 1.063 x 0.094 in.	2	
4	941205	• • O-ring, silicone, 1.00 x 1.188 x 0.094 in.	1	
5	144759	• Adjuster, pattern, 32 mm	1	
6	133734	• Deflector, 26-mm diameter, with O-ring, Tivar	1	
NS	940084	• • O-ring, silicone, 0.188 x 0.312 x 0.063 in.	1	
NS: Not Shown				

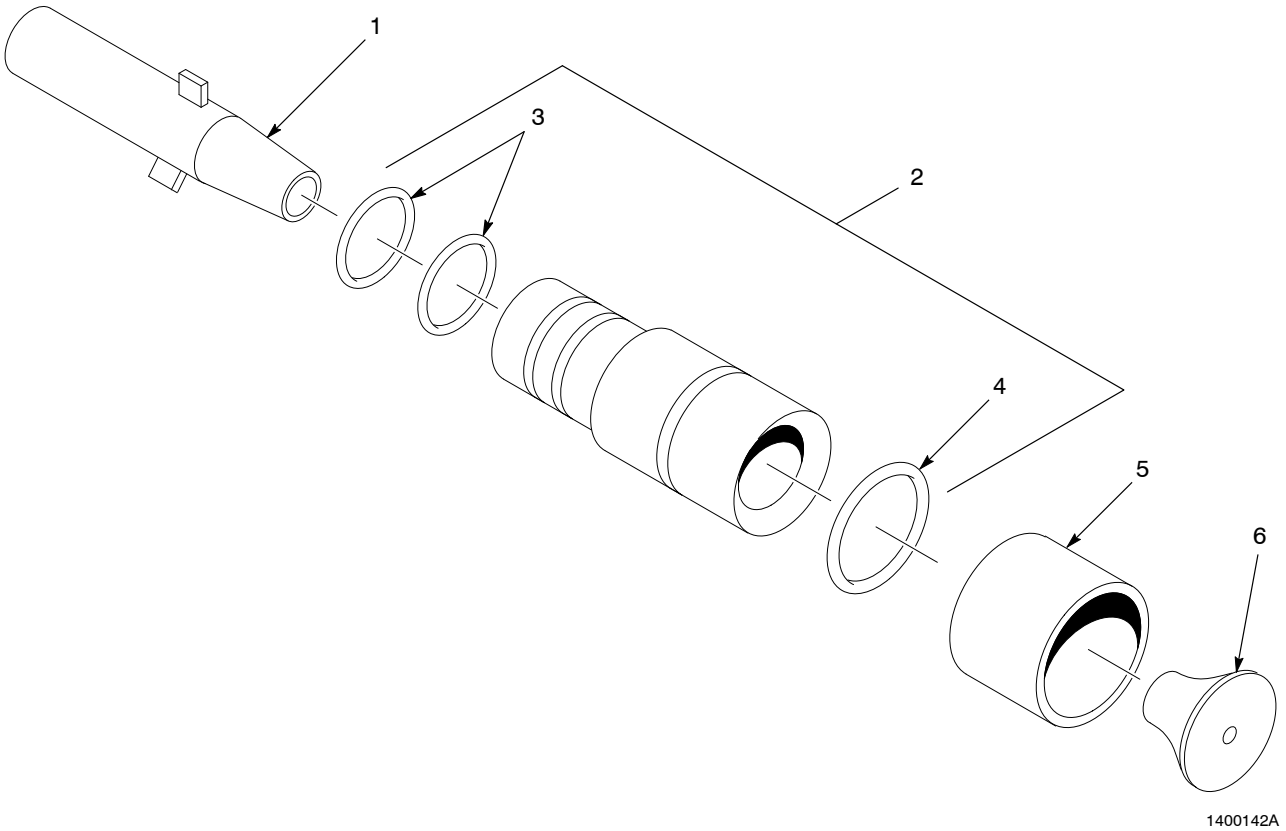


Figure 7-6 32-mm Conical Nozzle Service Kit (New Style)

Recommended Spare Parts

Shorting Plug

See Figure 7-7.

Item	Part	Description	Quantity	Note
1	161411	Plug, shorting, IPS	1	

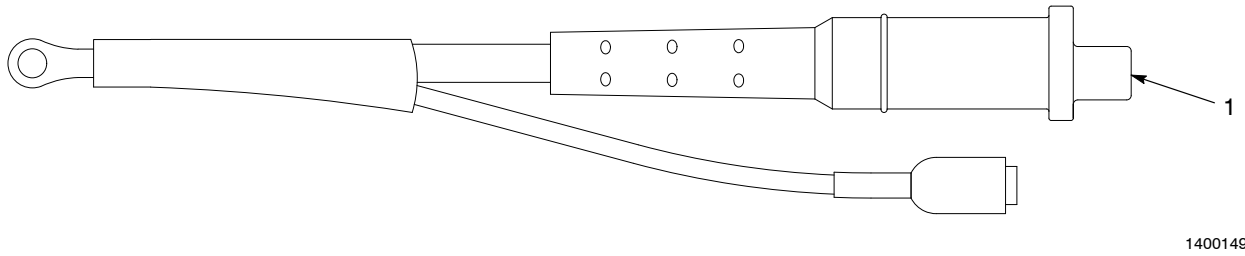


Figure 7-7 Shorting Plug

Powder Feed Hose

These are bulk part numbers. Order in one-foot increments.

Part	Description	Note
900550	Tubing, Isoprene, 0.469 x 0.208 in.	
900549	Tubing, Isoprene, 0.348 x 0.208 in.	

Section 8
Options

Options Reference Chart

Refer to the following chart for a list of options available for the Versa-Spray IPS manual powder spray gun.

Part	Description	Note
144760	Service kit, nozzle, conical, 45 mm, with O-rings, Tivar	A
134380	Service kit, nozzle, flat spray, 2.5-mm slot, with O-rings, Tivar	A
139935	Service kit, nozzle, flat spray, 3-mm slot, with O-rings, Tivar	A
141044	Service kit, nozzle, flat spray, 4-mm slot, with O-rings, Tivar	A
139937	Service kit, nozzle, flat spray, 6-mm slot, with O-rings, Tivar	A
174223	Service kit, nozzle, flat spray, 2.5-mm slot, with O-rings, glass-filled PTFE	B
174225	Service kit, nozzle, flat spray, 3-mm slot, with O-rings, glass-filled PTFE	B
174227	Service kit, nozzle, flat spray, 4-mm slot, with O-rings, glass-filled PTFE	B
174229	Service kit, nozzle, flat spray, 6-mm slot, with O-rings, glass-filled PTFE	B
141013	Service kit, nozzle, Cross-Cut, 60°, Tivar	A
141014	Service kit, nozzle, Cross-Cut, 90°, Tivar	A
147495	Service kit, nozzle, castle	A
233469	Lance extension, 150 mm	
233468	Lance extension, 300 mm	
233455	Lance extension, 450 mm	
135865	Deflector, 14-mm diameter, with O-ring, Tivar	C
147880	Deflector, 16-mm diameter, with O-ring, Tivar	C
133714	Deflector, 19-mm diameter, with O-ring, Tivar	C
157085	Service kit, manual gun, purge (non metallic powders)	
153832	Conversion kit, manual gun, conductive, purge (metallic powders)	

NOTE A: Nozzle kits include wear sleeves.
B: Wear sleeves are not included with these nozzles.
C: These deflectors can be used on all conical nozzles except the 45-mm conical nozzle.

45-mm Conical Nozzle

See Figure 8-1.

Item	Part	Description	Quantity	Note
—	144760	Service kit, nozzle, 45 mm	1	
1	132348	• Sleeve, wear, conical, Tivar	1	
2	144789	• Nozzle, 45-mm diameter, with O-rings	1	
3	941181	• • O-ring, silicone, 0.875 x 1.063 x 0.094 in.	2	
4	249233	• Deflector, with O-ring, Tivar	1	
NS	940084	• • O-ring, silicone, 0.188 x 0.312 x 0.063 in.	1	
NS: Not Shown				

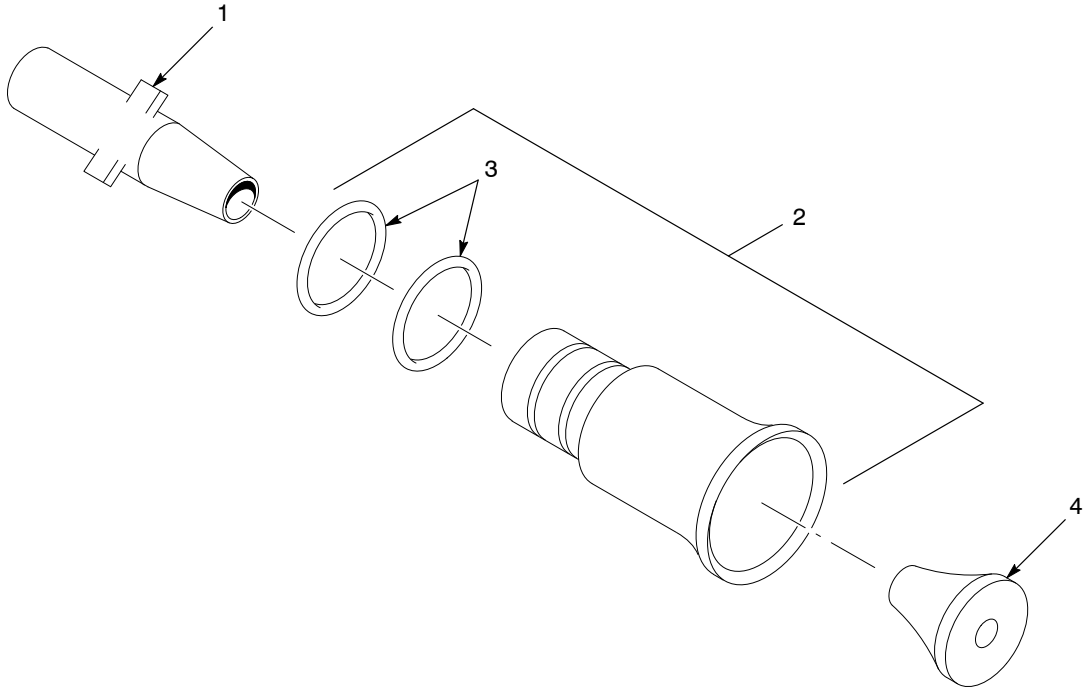


Figure 8-1 45-mm Conical Nozzle

Tivar Flat-Spray Nozzles

Figure 8-2 applies to the 2.5-, 3-, 4-, and 6-mm Tivar and glass-filled PTFE flat-spray nozzles.

2.5-mm Tivar Flat-Spray Nozzle

See Figure 8-2.

Item	Part	Description	Quantity	Note
—	134380	Service kit, nozzle, flat spray, 2.5 mm	1	
1	134384	• Nozzle, flat spray, 2.5 mm, with O-rings, Tivar	1	A
2	941181	• • O-ring, silicone, 0.875 x 1.063 x 0.094 in.	2	
3	134385	• Sleeve, wear, flat spray, with O-ring	1	
NS	940084	• • O-ring, silicone, 0.188 x 0.312 x 0.063 in.	1	

NOTE A: Nozzles without identification groove use O-ring, part 940212. Nozzles with groove use O-ring, part 941181.

NS: Not Shown

3-mm Tivar Flat-Spray Nozzle

See Figure 8-2.

Item	Part	Description	Quantity	Note
—	139935	Service kit, nozzle, flat spray, 3 mm	1	
1	139902	• Nozzle, flat spray, 3 mm, with O-rings, Tivar	1	A
2	941181	• • O-ring, silicone, 0.875 x 1.063 x 0.094 in.	2	
3	134385	• Sleeve, wear, flat spray, with O-ring	1	A
NS	940084	• • O-ring, silicone, 0.188 x 0.312 x 0.063 in.	1	

NOTE A: Nozzles without identification groove use O-ring, part 940212. Nozzles with groove use O-ring, part 941181.

NS: Not Shown

4-mm Tivar Flat-Spray Nozzle

See Figure 8-2.

Item	Part	Description	Quantity	Note
—	141044	Service kit, nozzle, flat spray, 4 mm	1	
1	141045	• Nozzle, flat spray, 4 mm, with O-rings, Tivar	1	A
2	941181	• • O-ring, silicone, 0.875 x 1.063 x 0.094 in.	2	
3	134385	• Sleeve, wear, flat spray, with O-ring	1	
NS	940084	• • O-ring, silicone, 0.188 x 0.312 x 0.063 in.	1	

NOTE A: Nozzles without identification groove use O-ring, part 940212. Nozzles with groove use O-ring, part 941181.

NS: Not Shown

6-mm Tivar Flat-Spray Nozzle

See Figure 8-2.

Item	Part	Description	Quantity	Note
—	139937	Service kit, nozzle, flat spray, 6 mm	1	
1	139903	• Nozzle, flat spray, 6 mm, with O-rings, Tivar	1	A
2	941181	• • O-ring, silicone, 0.875 x 1.063 x 0.094 in.	2	
3	134385	• Sleeve, wear, flat spray, with O-ring	1	
NS	940084	• • O-ring, silicone, 0.188 x 0.312 x 0.063 in.	1	

NOTE A: Nozzles without identification groove use O-ring, part 940212. Nozzles with groove use O-ring, part 941181.

NS: Not Shown

Glass-Filled PTFE Flat-Spray Nozzles

These nozzles are available with slot widths of 2.5-, 3-, 4-, and 6-mm. They do not include a wear sleeve.

See Figure 8-2.

Item	Part	Description	Quantity	Note
1	174223	Nozzle, flat spray, with O-rings, GFT, 2.5 mm	1	
2	941181	• O-ring, silicone, 0.875 x 1.063 x 0.094 in.	2	
1	174225	Nozzle, flat spray, with O-rings, GFT, 3 mm	1	
2	941181	• O-ring, silicone, 0.875 x 1.063 x 0.094 in.	2	
1	174227	Nozzle, flat spray, with O-rings, GFT, 4 mm	1	
2	941181	• O-ring, silicone, 0.875 x 1.063 x 0.094 in.	2	
1	174229	Nozzle, flat spray, with O-rings, GFT, 6 mm	1	
2	941181	• O-ring, silicone, 0.875 x 1.063 x 0.094 in.	2	

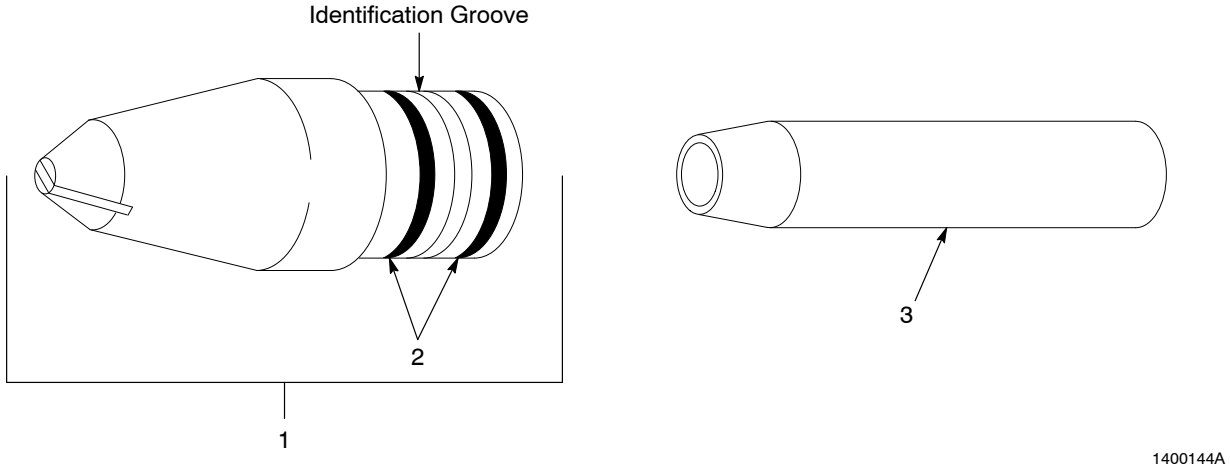


Figure 8-2 Flat Spray Nozzles

Cross-Cut Nozzles

Figure 8-3 applies to 60° and 90° Cross-Cut nozzles.

60 ° Cross-Cut Nozzle

See Figure 8-3.

Item	Part	Description	Quantity	Note
—	141013	Service kit, nozzle, Cross-Cut, 2.5 mm, 60°	1	
1	141017	• Nozzle, Cross-Cut, 2.5 mm, 60°, with O-rings	1	A
2	941181	• • O-ring, silicone, 0.875 x 1.063 x 0.094 in.	2	
3	134385	• Sleeve, wear, flat spray, with O-ring	1	
NS	940084	• • O-ring, silicone, 0.188 x 0.312 x 0.063 in.	1	

NOTE A: Nozzles without identification groove use O-ring, part 940212. Nozzles with groove use O-ring, part 941181.

NS: Not Shown

90 ° Cross-Cut Nozzle

See Figure 8-3.

Item	Part	Description	Quantity	Note
—	141014	Service kit, nozzle, Cross-Cut, 2.5 mm, 90°	1	
1	141015	• Nozzle, Cross-Cut, 2.5 mm, 90°, with O-rings	1	A
2	941181	• • O-ring, silicone, 0.875 x 1.063 x 0.094 in.	2	
3	134385	• Sleeve, wear, flat spray, with O-ring	1	
NS	940084	• • O-ring, silicone, 0.188 x 0.312 x 0.063 in.	1	

NOTE A: Nozzles without identification groove use O-ring, part 940212. Nozzles with groove use O-ring, part 941181.

NS: Not Shown

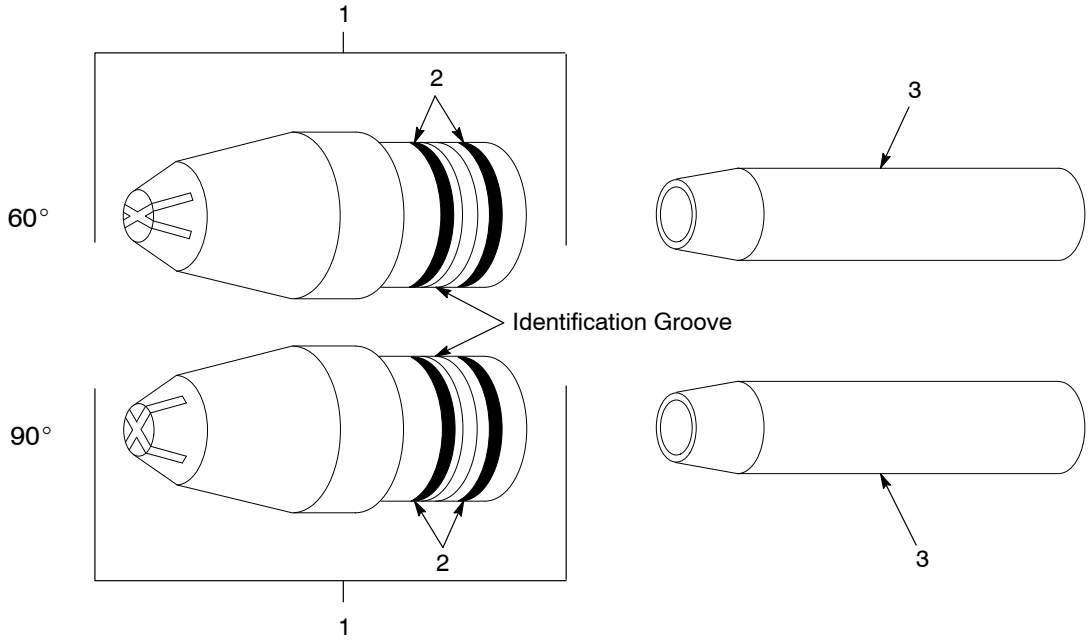


Figure 8-3 Cross-Cut Nozzles

Castle Nozzle

See Figure 8-4.

Item	Part	Description	Quantity	Note
—	147495	Service kit, nozzle, castle, 0.375 in.	1	
1	147877	• Nozzle, castle, 0.375 in., with O-rings	1	
2	941181	• • O-ring, silicone, 0.875 x 1.063 x 0.094 in.	2	
3	134385	• Sleeve, wear, flat spray, with O-ring	1	
NS	940084	• • O-ring, silicone, 0.188 x 0.312 x 0.063 in.	1	
NS: Not Shown				

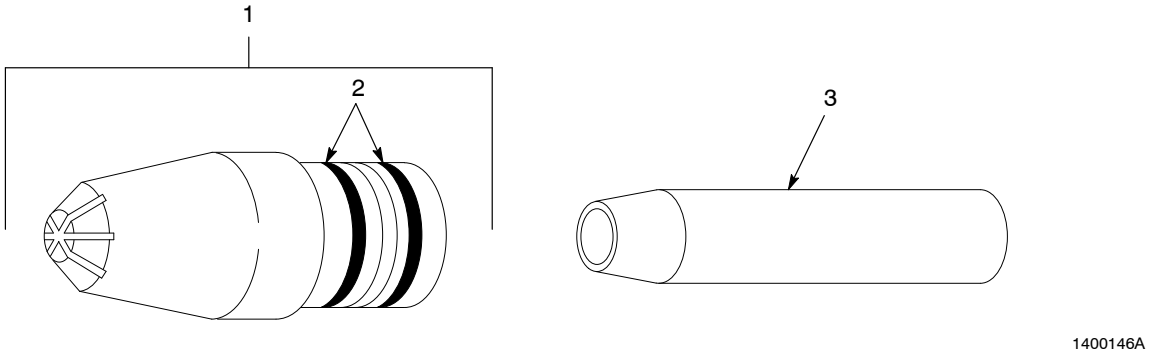


Figure 8-4 Castle Nozzle

14-, 16-, and 19-mm Deflectors and Low-Flow Hose Adapter

See Figure 8-5.

Item	Part	Description	Quantity	Note
1	135865	Deflector, 14-mm diameter, Tivar, with O-ring	1	
2	940084	• O-ring, silicone, 0.188 x 0.312 x 0.063 in.	1	
3	147880	Deflector, 16-mm diameter, Tivar, with O-ring	1	
4	940084	• O-ring, silicone, 0.188 x 0.312 x 0.063 in.	1	
5	133714	Deflector, 19-mm diameter, Tivar, with O-ring	1	
6	940084	• O-ring, silicone, 0.188 x 0.312 x 0.063 in.	1	
7	135896	Adapter, hose, low flow, with O-ring	1	
8	940163	• O-ring, silicone, 0.625 x 0.75 x 0.063 in.	1	

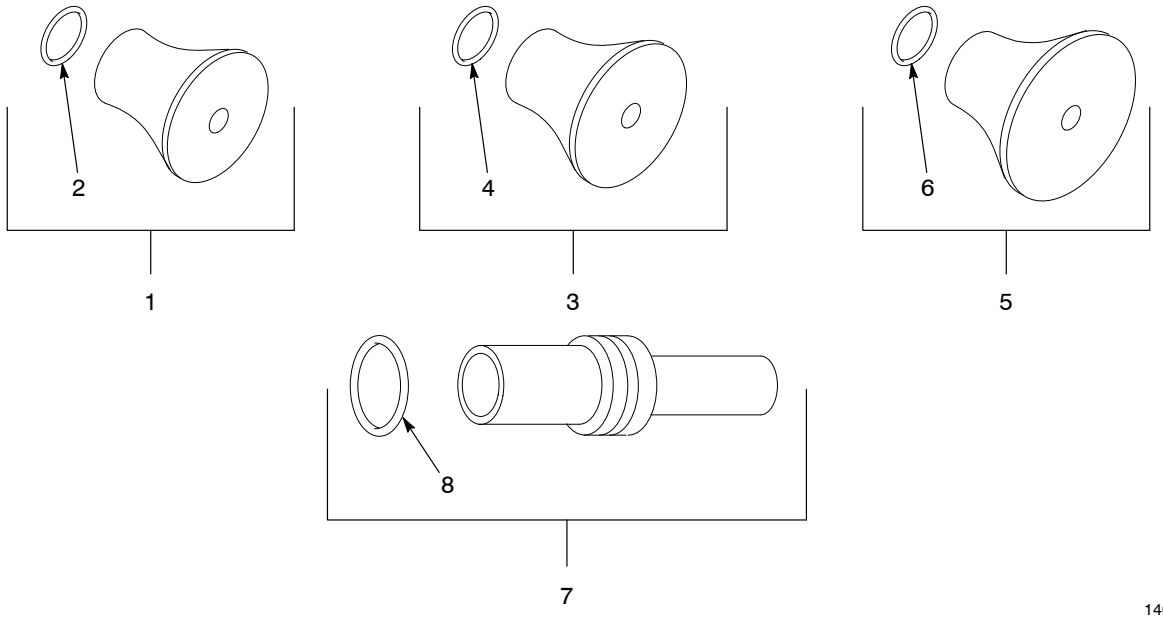


Figure 8-5 Deflectors and Low-Flow Hose Adapters

Lance Extensions

See Figure 8-6.

Item	Part	Description	Quantity	Note
—	233469	Lance extension, 150 mm	1	
—	233468	Lance extension, 300 mm	1	
—	233455	Lance extension, 450 mm	1	
1	233467	• Tube, 150 mm, gun, extension	1	
1	233466	• Tube, 300 mm, gun, extension	1	
1	233454	• Tube, 450 mm, gun, extension	1	
2	941181	• • O-ring, silicone, 0.875 x 1.063 x 0.094 in.	2	
3	160066	• Electrode assembly, lance, 150 mm	1	
3	160068	• Electrode assembly, lance, 300 mm	1	
3	233451	• Electrode assembly, lance, 450 mm	1	
4	170277	• • Service kit, lance resistor and electrode support	1	
5	160020	• • Sleeving, contact	1	
6	160021	• • Link, adapter	AR	A
7	233462	• Support, cable well	1	
8	233461	• Adapter, nozzle, light weight, with O-rings	1	
9	940203	• • O-ring, silicone, 0.875 x 1.000 x 0.063 in.	2	
10	233459	• Adjuster, pattern, lance, with O-ring	1	
11	941193	• • O-ring, silicone, 0.937 x 1.125 x 0.094 in.	1	
12	173138	• Deflector, 19 mm, flat, VS2, Tivar, with O-ring	1	
13	940084	• • O-ring, silicone, 0.188 x 0.312 x 0.063 in.	1	
14	233456	• Adapter, nozzle, flat spray, with O-rings	1	
15	940203	• • O-ring, silicone, 0.875 x 1.00 x 0.063 in.	2	

NOTE A: Not used on 150-mm lance extensions. Use one on 300-mm lance extensions. Use two on 450-mm lance extensions.

AR: As Required

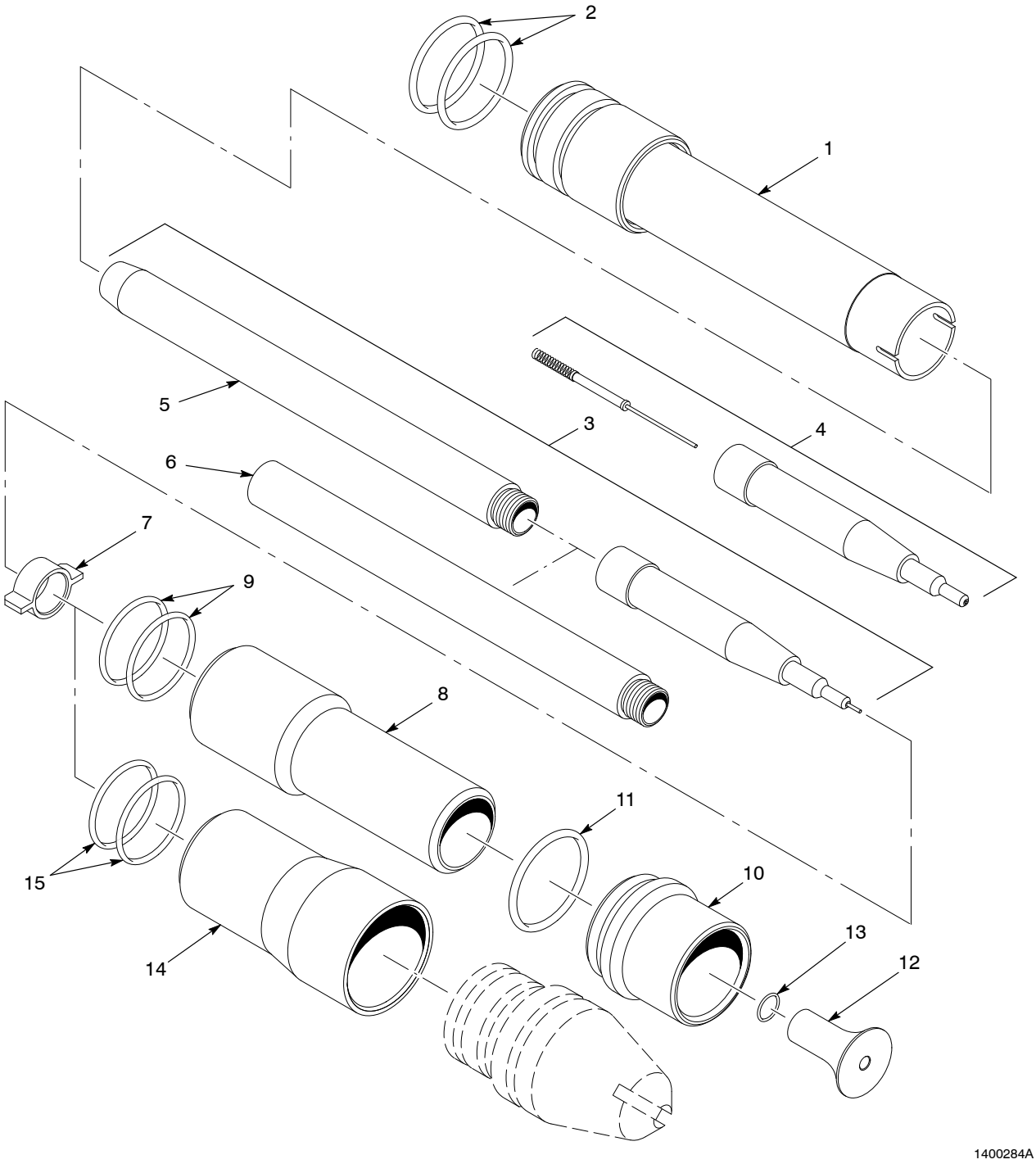


Figure 8-6 150- and 300-mm Lance Extensions

Purge Adapter Kits

Purge Adapter Kit for Use with Non-Metallic Powder Coatings

See Figure 8-7.

Item	Part	Description	Quantity	Note
—	157085	Service kit, hand gun, purge	1	
1	153830	• Panel, control, purge	1	
2	- - - - - -	• Adapter, purge, hose, Versa-Spray	1	

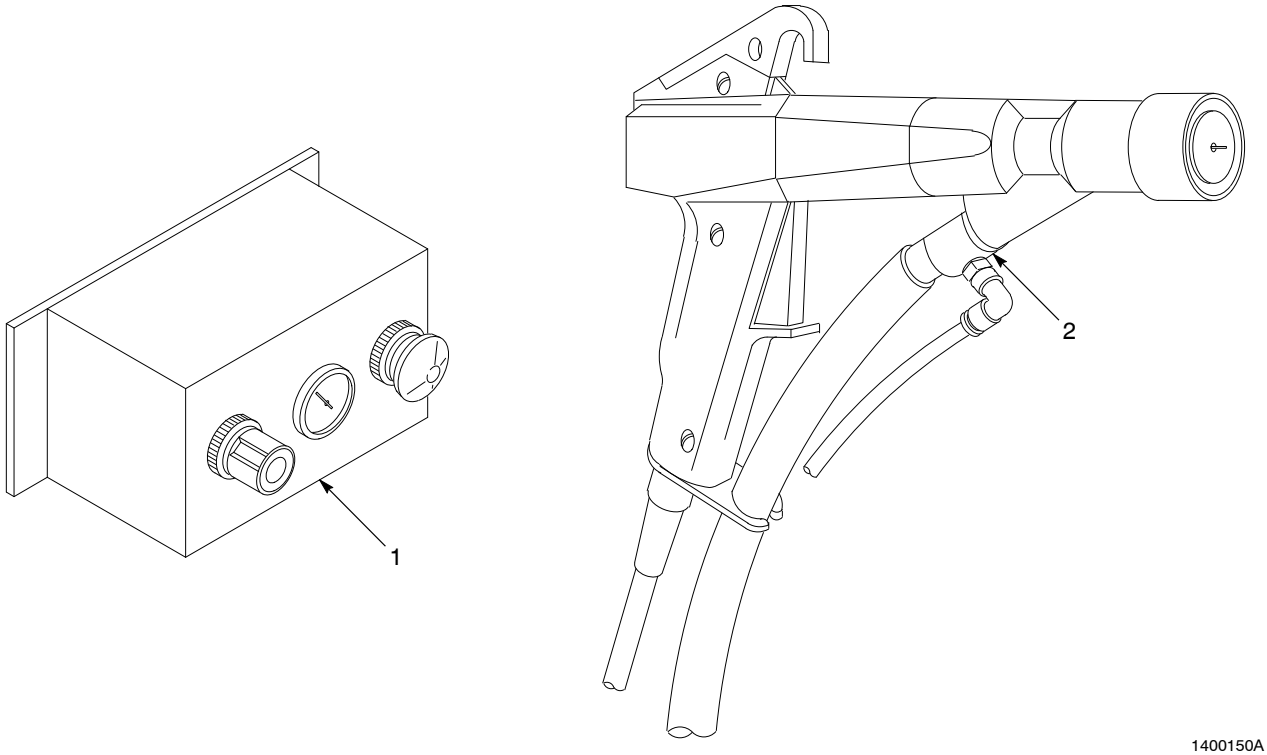


Figure 8-7 Purge Adapter Kit for Use with Non-Metallic Powder Coatings

Purge Adapter Kit for Use with Metallic Powder Coatings

See Figure 8-8.

Item	Part	Description	Quantity	Note
—	153832	Conversion kit, hand gun, conductive	1	
1	153830	• Panel, control, purge	1	
2	- - - - - -	• Adapter, purge, hose, Versa-Spray	1	

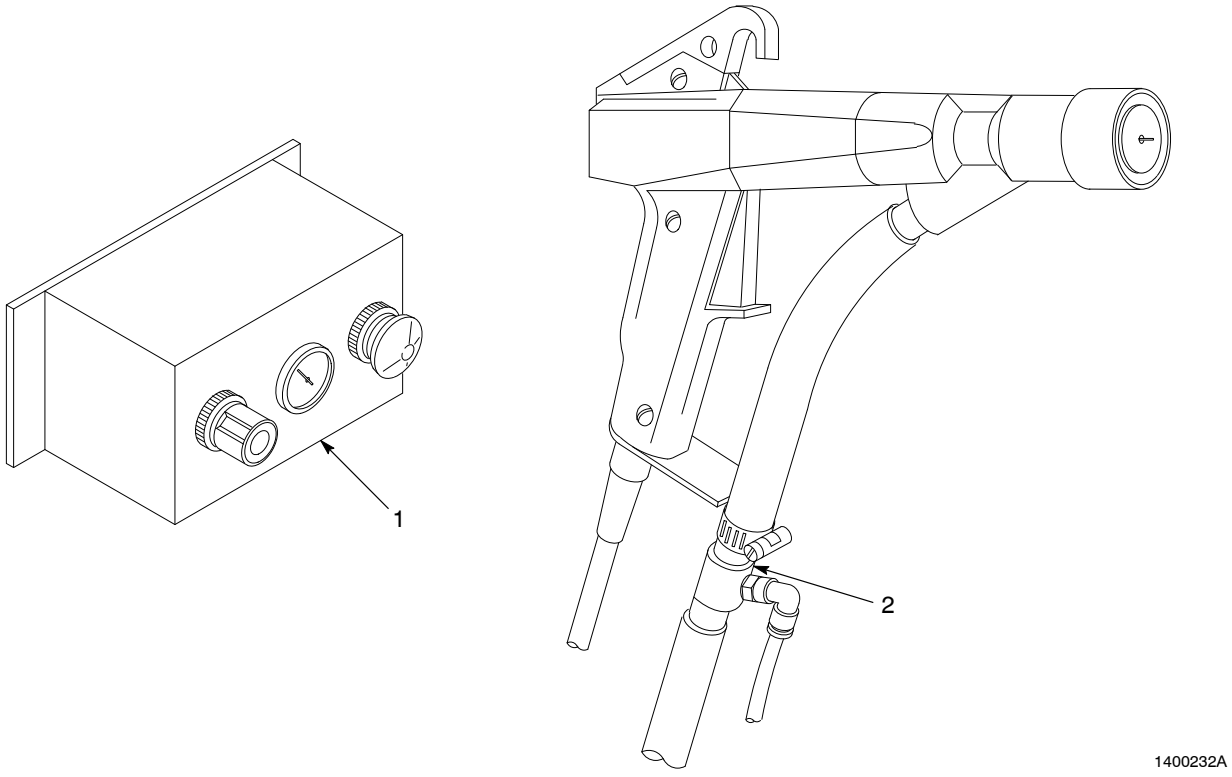


Figure 8-8 Purge Adapter Kit for Use with Metallic Powder Coatings