Versa-Spray® IPS PRX® Automatic Electrostatic Powder Spray Gun

Part 108 385B

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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Safety

Section 1
Safety

1. Introduction

This section contains general safety instructions for using your Nordson equipment. Task- and equipment-specific warnings are included in other sections of this manual where appropriate. Note all warnings and follow all instructions carefully. Failure to do so may result in personal injury, death, or property damage.

To use this equipment safely,

- read and become familiar with the general safety instructions provided in this section of the manual before installing, operating, maintaining, or repairing this equipment.
- read and carefully follow the instructions given throughout this manual for performing specific tasks and working with specific equipment.
- store this manual within easy reach of personnel installing, operating, maintaining, or repairing this equipment.
- follow all applicable safety procedures required by your company, industry standards, and government or other regulatory agencies. Refer to the National Fire Protection Association (NFPA) standard 33 and to federal, state, regulatory agency, and local codes for rules and regulations covering installation and operation of powder spray systems.
- obtain and read Material Safety Data Sheets (MSDS) for all materials used.

2. Safety Symbols

Become familiar with the safety symbols presented in this section. These symbols will alert you to safety hazards and conditions that may result in personal injury, death, or property and equipment damage.

WARNING: Failure to observe this warning may result in personal injury, death, or equipment damage.

2. Safety Symbols (contd.)

WARNING: Risk of electrical shock. Failure to observe this warning may result in personal injury, death, or equipment damage.

WARNING: Disconnect equipment from line voltage. Failure to observe this warning may result in personal injury, death, or equipment damage.

WARNING: Risk of explosion or fire. Fire, open flames, and smoking prohibited.

WARNING: Wear protective clothing, safety goggles, and approved respiratory protection. Failure to observe may result in serious injury.

WARNING: System or material pressurized. Relieve pressure. Failure to observe this warning may result in serious injury or death.

CAUTION: Failure to observe may result in equipment damage.

3. Qualified Personnel

"Qualified personnel" is defined here as individuals who thoroughly understand the equipment and its safe operation, maintenance, and repair. Qualified personnel are physically capable of performing the required tasks, familiar with all relevant safety rules and regulations, and have been trained to safely install, operate, maintain, and repair the equipment. It is the responsibility of the company operating the equipment to see that its personnel meet these requirements.

4. Intended Use

WARNING: Use of this equipment in ways other than described in this manual may result in personal injury, death, or property and equipment damage. Use this equipment only as described in this manual.

Nordson Corporation cannot be responsible for injuries or damages resulting from nonstandard, unintended applications of its equipment. This equipment is designed and intended only for the purpose described in this manual. Uses not described in this manual are considered unintended uses and may result in serious personal injury, death, or property damage. Unintended uses may result from taking the following actions:

- making changes to equipment that have not been recommended or described in this manual or using parts that are not genuine Nordson replacement parts
- failing to make sure that auxiliary equipment complies with approval agency requirements, local codes, and all applicable safety standards
- using materials or auxiliary equipment that are inappropriate or incompatible with your Nordson equipment
- allowing unqualified personnel to perform any task

5. Installation

Read the installation section of all system component manuals before installing your equipment. A thorough understanding of system components and their requirements will help you install the system safely and efficiently.

- Allow only qualified personnel to install Nordson and auxiliary equipment.
- Use only approved equipment. Using unapproved equipment in an approved system may void agency approvals.
- Make sure all equipment is rated and approved for the environment in which you are using it.
- Follow all instructions for installing components and accessories.
- Install all electrical, pneumatic, gas, and hydraulic connections to local code.

5. Installation (contd.)

- Install locking, manual, shutoff valves in the air supply lines to the system. This allows you to relieve air pressure and lock out the pneumatic system before undertaking maintenance and repairs.
- Install a locking disconnect switch or breaker in the service line ahead of any electrical equipment.
- Use only electrical wire of sufficient gauge and insulation to handle the rated current demand. All wiring must meet local codes.
- Ground all electrically conductive equipment within 10 feet (3 meters) of the spray area. Ungrounded conductive equipment can store a static charge which could ignite a fire or cause an explosion if a hot spark is discharged.
- Route electrical wiring, electrostatic cables, and air hoses and tubing along a protected path. Make sure they will not be damaged by moving equipment. Do not bend electrostatic cables around a radius of less than 6 in. (152 mm).
- Install safety interlocks and approved, fast-acting fire detection systems. These shut down the spray system if the booth exhaust fan fails, a fire is detected, or other emergency situation develops.
- Make sure the spray area floor is conductive to ground and that the operator's platform is grounded.
- Use only designated lifting points or lugs to lift and move heavy equipment. Always balance and block loads when lifting to prevent shifting. Lifting devices must be inspected, certified, and rated for a greater weight than the equipment being lifted.
- Protect components from damage, wear, and harsh environmental conditions.
- Allow ample room for maintenance, material supply container drop-off and loading, panel accessibility, and cover removal.
- If safety devices must be removed for installation, install them immediately after the work is completed and check them for proper functioning.

6. Operation

Only qualified personnel, physically capable of operating the equipment and with no impairments to their judgement or reaction times, should operate this equipment.

Read all component manuals before operating a powder spray system. A thorough understanding of all components and their operation will help you operate the system safely and efficiently.

- Use this equipment only in the environments for which it is rated. Do not operate this equipment in humid, flammable, or explosive environments unless it has been rated for safe operation in these environments.

- Before starting this equipment, check all safety interlocks, fire-detection systems, and protective devices such as panels and covers. Make sure all devices are fully functional. Do not operate the system if these devices are not working properly. Do not deactivate or bypass automatic safety interlocks or locked-out electrical disconnects or pneumatic valves.

- Know where EMERGENCY STOP buttons, shutoff valves, and fire extinguishers are located. Make sure they work. If a component malfunctions, shut down and lock out the equipment immediately.

- Before operating, make sure all conductive equipment in the spray area is connected to a true earth ground.

- Never operate equipment with a known malfunction or leak.

- Do not attempt to operate electrical equipment if standing water is present.

- Never touch exposed electrical connections on equipment while the power is ON.

- Do not operate the equipment at pressures higher than the rated maximum working pressure of any component in the system.

- Know the pinch points, temperatures, and pressures for all equipment that you are working with. Recognize potential hazards associated with these and exercise appropriate caution.

- Wear shoes with conductive soles, such as leather, or use grounding straps to maintain a connection to ground when working with or around electrostatic equipment.

6. Operation (contd.)

- Do not wear or carry metallic objects (jewelry or tools) while working with or around electrostatic equipment. Ungrounded metal can store a static charge and cause harmful shocks.

- Maintain skin-to-metal contact between your hand and the gun handle to prevent shocks while operating manual electrostatic spray guns. If wearing gloves, cut away the palm or fingers.

- Keep parts of the body or loose clothing away from moving equipment or parts. Remove personal jewelry and cover or tie back long hair.

- Wear National Institute of Occupational Safety and Health (NIOSH) approved respirators, safety glasses or goggles, and gloves, and while handling powder containers, filling hoppers, operating spray equipment, and performing maintenance or cleaning tasks. Avoid getting powder coatings on your skin.

- Never point manual guns at yourself or other persons.

- Do not smoke in the spray area. A lit cigarette could ignite a fire or cause an explosion.

- If you notice electrical arcing in a spray area, shut down the system immediately. An arc can cause a fire or explosion.

- Shut off electrostatic power supplies and ground gun electrodes before making adjustments to powder spray guns.

- Shut off moving equipment before taking measurements or inspecting workpieces.

- Wash exposed skin frequently with soap and water, especially before eating or drinking. Do not use solvents to remove coating materials from your skin.

- Do not use high-pressure compressed air to blow powder off your skin or clothes. High-pressure compressed air can be injected under the skin and cause serious injury or death. Treat all high-pressure fittings and hoses as if they could leak and cause injury.

7. Less-obvious Dangers

Operators should also be aware of less-obvious dangers in the workplace that often cannot be completely eliminated:

- exposed surfaces on the equipment which may be hot or have sharp edges and cannot be practically safeguarded
- electrical equipment which may remain energized for a period of time after the equipment has been shut off
- vapors and materials which may cause allergic reactions or other health problems
- automatic hydraulic, pneumatic, or mechanical equipment or parts that may move without warning
- unguarded, moving mechanical assemblies

8. Action in the Event of a System or Component Malfunction

Do not operate a system that contains malfunctioning components. If a component malfunctions, turn the system OFF immediately.

- Disconnect and lock out electrical power. Close and lock out hydraulic and pneumatic shutoff valves and relieve pressures.
- Allow only qualified personnel to make repairs. Repair or replace the malfunctioning component.

9. Maintenance and Repair

Allow only qualified personnel to perform maintenance, troubleshooting, and repair tasks.

- Always wear appropriate protective devices and use safety devices when working on this equipment.
- Follow the recommended maintenance procedures in your equipment manuals.
- Do not service or adjust any equipment unless another person trained in first aid and CPR is present.
- Use only genuine Nordson replacement parts. Using unapproved parts or making unapproved modifications to equipment may void agency approvals and create safety hazards.

9. Maintenance and Repair (contd.)

- Disconnect, lock out, and tag electrical power at a disconnect or breaker in the service line ahead of electrical equipment before servicing.
- Do not attempt to service electrical equipment if there is standing water present. Do not service electrical equipment in a high-humidity environment.
- Use tools with insulated handles when working with electrical equipment.
- Do not attempt to service a moving piece of equipment. Shut off the equipment and lock out power. Secure equipment to prevent uncontrolled movement.
- Relieve air pressures before servicing equipment. Follow the specific instructions in this manual.
- Make sure that the room where you are working is sufficiently ventilated.
- If a “power on” test is required, perform the test carefully and then shut off and lock out power as soon as the test is over.
- Connect all disconnected equipment ground cables and wires after servicing the equipment. Ground all conductive equipment.
- Service lines connected to panel disconnect switches may still be energized unless they are disconnected. Make sure the power is off before servicing. Wait 5 minutes for capacitors to discharge after shutting off the electrical power.
- Turn off the electrostatic power supply and ground the gun electrode before adjusting or cleaning.
- Keep high-voltage connection points clean and insulated with dielectric grease or oil.
- Check all ground connections periodically with a megohm meter. Resistance to ground must not exceed one megohm. If arcing occurs, shut down the system immediately.

9. Maintenance and Repair (contd.)

- Check interlock systems periodically to ensure their effectiveness.

WARNING: Operating faulty electrostatic equipment is hazardous and can cause electrocution, fire, or explosion. Make resistance checks part of your periodic maintenance program.

- Do not store flammable materials in the spray area or room. Keep containers of flammable materials far enough away from spray booths to prevent their inclusion in a booth fire. If a fire or explosion occurs, flammable materials in the area will increase the chances and the extent of personal injuries and property damage.

- Practice good housekeeping procedures. Do not allow dust or powder coatings to accumulate in the spray area or booth or on electrical equipment. Read this information carefully and follow instructions.

10. Disposal

Dispose of equipment and materials used in operation and cleaning according to your local regulations.

11. Safety Labels

Table 1-1 contains the text of the safety label shipped with the Versa-Spray IPS manual gun. Place it on the powder spray booth next to the gun operator's station. Familiarize yourself with this label. It is provided to help you operate and maintain your equipment safely.

Table 1-1 Safety label

Item	Part	Description
	244 664	 **WARNING:** The following procedures MUST be followed when working with this electrostatic spray equipment. Failure to follow these instructions may 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). If you have any questions concerning this electrostatic spray equipment, call (216) 988–9411, and ask to speak with the Powder Systems Group Technical Service Department.

Section 2

Description

Section 2
Description

1. Introduction

The Nordson Versa-Spray Integral Power Supply (IPS) PRX automatic gun electrostatically charges and sprays organic powder coatings. It is used for coating parts with deep recesses at close ranges.

The gun is used with a Nordson Versa-Spray IPS control unit, which supplies a user-adjustable low-voltage DC voltage to the voltage multiplier in the gun. The multiplier generates the high electrostatic voltage needed for powder coating. This voltage generates an electrical field (corona) around the gun electrode. 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 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, the shape of the nozzle used, and air velocity. Powder is supplied to the 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 gun.

The gun can be ordered with either a negative or a positive voltage multiplier. The multiplier is replaceable. The powder inlet body, feed hose adapter, and nozzles are interchangeable with those used on Versa-Spray IPS manual guns.

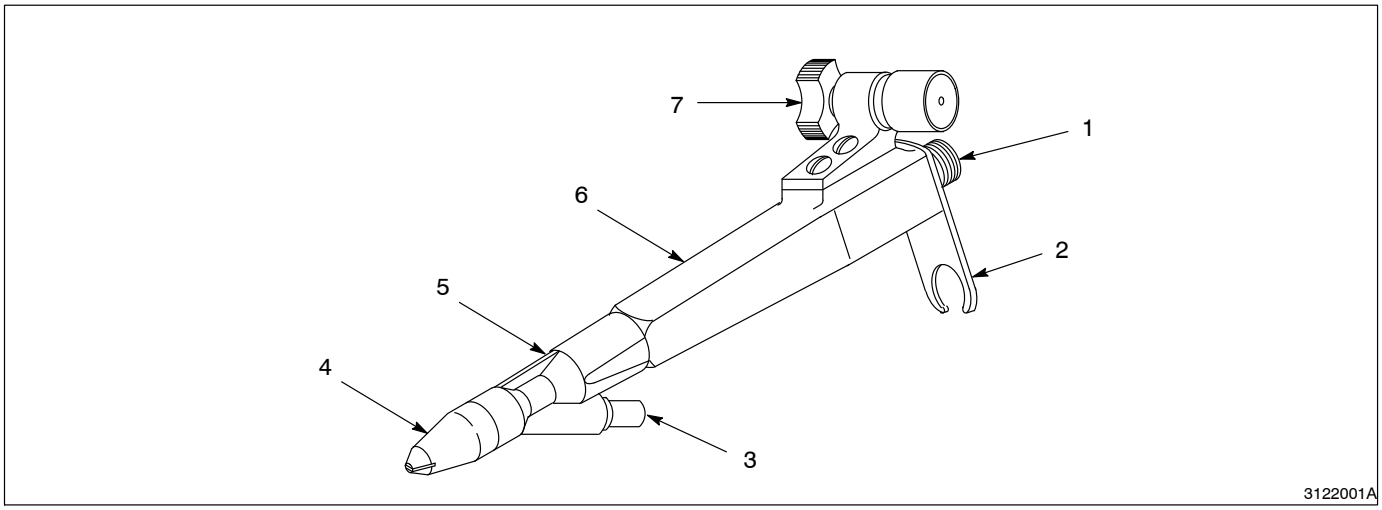

Fig. 2-1 Versa-Spray IPS automatic powder spray gun

1. *Gun cable connection*
2. *Feed hose bracket*
3. *Feed hose adapter*
4. *Flat spray nozzle*
5. *Powder inlet body*
6. *Multiplier*
7. *Gun mount*

2. Options

Options include three gun cable lengths, various nozzle types and sizes, a gun mounting bar, feed hoses, deflectors, hose adapters, and a purge adapter. Refer to *Section 7, Parts* for part numbers and illustrations. Contact your local Nordson representative if you need additional information about these options.

Cables

The gun cable carries +21VDC from the IPS control unit to the multiplier. Gun cables are available in 8-, 12-, and 16- meter lengths (25-, 38-, and 50-feet).

Nozzles

Nozzles are available in the following sizes and configurations:

- single-slot Tivar and GFT (Glass-Filled PTFE) flat spray nozzles with 2.5-, 3-, 4- (standard), and 6-mm slot widths
- Cross-Cut nozzles with two 4-mm slots at 60 or 90 degrees from each other
- castle nozzle with three slots at equal angles from each other
- conical nozzles with 32- or 45-mm diameters

The standard conical nozzle deflector is 26-mm in diameter. Optional deflectors with 14-, 16-, and 19-mm diameters are available.

Lance extensions

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

Feed Hoses and Adapters

The gun is equipped with a feed hose adapter for $^{1}/_{2}$- in. I.D. powder feed hose. A low-flow hose adapter can be ordered for use with low-flow hose ($^{3}/_{8}$- in. I.D.).

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.

3. Specifications

Maximum rated output voltage at the electrode	80,000 volts ±10%
Maximum rated output current at the electrode	.180 mA ±10%

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

Section 3

Installation

Section 3
Installation

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

1. Gun Mounting

Use the optional $^{5}/_{8}$-in. (16-mm) by 36-in. (91-cm) gun mounting bar listed in *Section 7, Parts* to mount the gun on a fixed gun stand, or on an oscillating or reciprocating gun mover arm.

1. See Figure 3-1. Install the mounting bar clamp (1) on a 1-in. (25.4-mm) diameter bar (2). Tighten handle B to clamp the mounting bar securely in place.

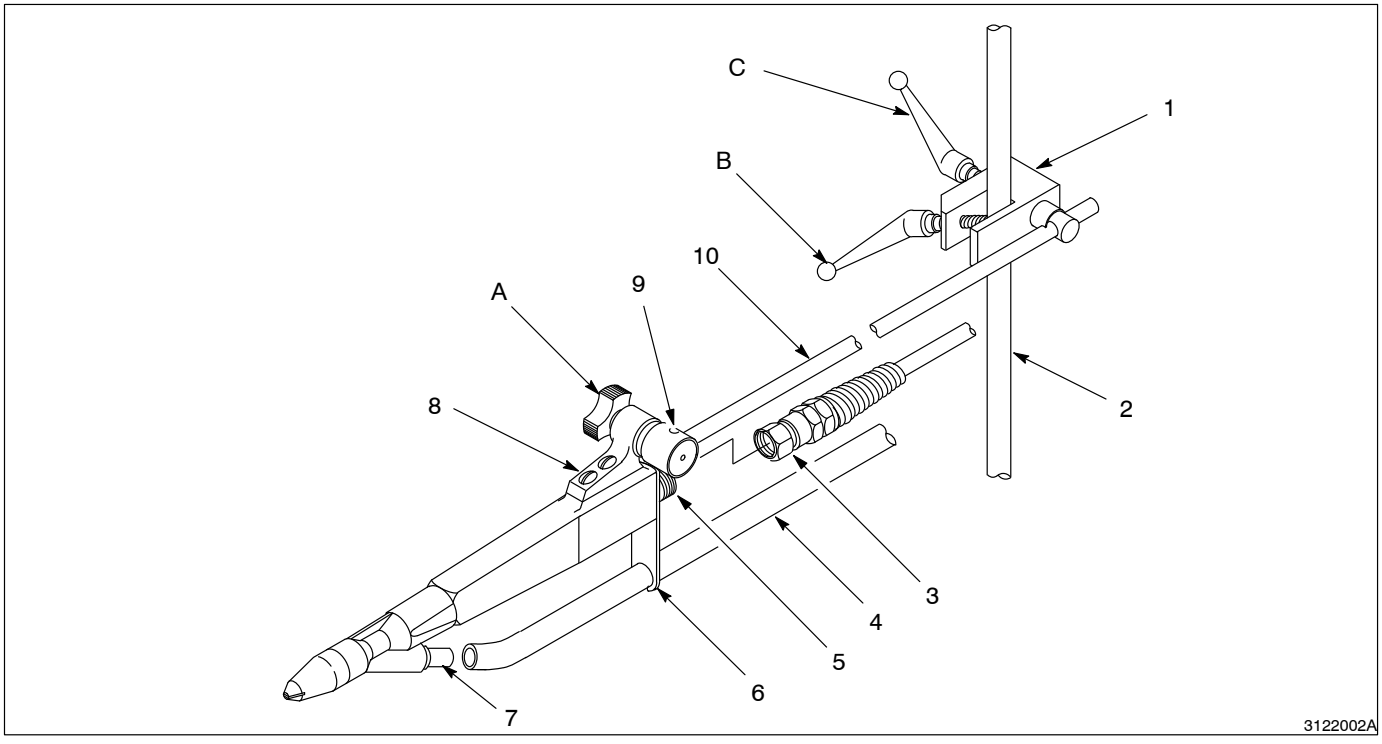

Fig. 3-1 Gun installation

1. *Mounting bar clamp*
2. *1-in. (25.4-mm) bar*
3. *Gun cable*
4. *Feed hose*
5. *Multiplier receptacle*
6. *Feed hose bracket*
7. *Hose adapter*
8. *Gun mount*
9. *Set screws*
10. *Gun mounting bar*

1. Gun Mounting (contd.)

2. Loosen the set screws (9) in the gun mount (8) with a hex key and insert the end of the mounting bar (10) in the mount. Tighten the set screws securely.

3. Use knob A to adjust the angle of the gun. Use handle B to adjust the position of the mounting bar (1) vertically or horizontally. Use handle C to adjust the angle and length of the mounting bar (10).

2. Gun Connections

Perform the following steps to install the gun cable and feed hose. Refer to Figure 3-1.

1. Plug the 3-socket end of the gun cable (3) into the multiplier receptacle (5). Plug the 6-pin end of the gun cable into the GUN OUTPUT receptacle on the rear panel of the IPS control unit. Thread the cable retaining nuts at each end of the cable onto the receptacles and tighten them securely.

2. Pinch the feed hose (4) and slide it into the hose bracket (6). Connect the feed hose to the hose adapter (7). Secure the hose to the adapter with a snap clamp.

3. Connect the other end of the feed hose to the powder pump outlet. Secure the hose to the outlet with a snap clamp. Install spiral-wrap around the hose wherever necessary to prevent the hose from kinking and cutting off the flow of powder.

NOTE: To increase powder flow and keep the distribution of powder in the air even, keep the feed hose as short as possible. The hose should not be more than 25-ft. (8-m) long.

4. Anchor the feed hose and gun cable to the gun mounting bar and stand or to the reciprocator arm with cable ties or spiral wrap. Make sure that the hose and cable cannot be abraded, cut, or run over by moving equipment.

5. Connect supply air tubing (5) from the air supply to the control unit, flow-rate tubing (6) and atomizing air tubing (7) from the control unit to the powder pump, and fluidizing air tubing (3) from the control unit to the feed hopper. Refer to the control unit, powder pump, and hopper manuals for more detained instructions.

6. Connect all conductive equipment to ground.

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.

3. Air Quality

Powder spray systems require clean, dry operating air. 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 38 °F (3.4 °C) or lower dewpoint at 100 psi (6.89 bar).

Section 4

Operation

Section 4
Operation

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

WARNING: 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.

1. Startup

Air pressure and the kV level adjustments (steps 5 through 8) are normally required only the first-time you use a new gun and control unit or when you change powders or parts.

Before turning on the IPS control unit, make sure that

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

Refer to the appropriate equipment manuals for startup procedures.

1. If the IPS control unit is controlled by a master control unit, turn on the master control unit power switch. Turn on the IPS control unit power switch.

1. Startup (contd.)

2. Adjust powder-pump air pressures with the regulators and gauges on the IPS control unit front panel. Flow-rate air pressure controls the volume and velocity of the powder-and-air mixture delivered to the gun, while atomizing air pressure controls the density (powder-to-air ratio) of the mixture.

Flow-rate	20 psi (1.4 bar)
Atomizing	30 psi (2.1 bar)

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

3. Spray powder and observe the spray pattern. Adjust the flow-rate and atomizing air pressures to obtain the desired pattern.

4. Turn on the high-voltage switch on the control unit and adjust the kV output to 100 %.

5. Coat a few parts and adjust the air pressures and kV output to obtain the desired film build and coverage.

WARNING: Turn off the electrostatic voltage and ground the gun electrode before making adjustments to the gun or nozzle.

NOTE: If the IPS control unit is controlled by a master control unit, the IPS control unit power switch, kV potentiometer, and air pressure regulators can be left on after the initial air pressure and kV settings are made. Electrostatic voltage, flow-rate air, and atomizing air will be turned on and off when the master control unit is turned on and off.

2. Shutdown

1. Turn off the master control unit power switch if the IPS control unit is controlled by a master control unit. If it is not, turn off the IPS control unit power switch.

2. Perform the daily maintenance procedures.

For information on the operation of other system components, refer to their respective manuals.

3. Maintenance

The following maintenance procedures are for the gun only. Add these procedures to your routine maintenance schedule. Maintenance procedures for other components of your system are in their manuals.

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

Clean the powder path, consisting of the nozzle, powder inlet body, wear sleeve, and hose adapter. See Figure 4-1.

1. Disconnect the powder feed hose from the powder pump outlet. Blow the powder out of the feed hose with compressed air.

2. Disconnect the feed hose from the gun. Remove the hose adapter (4) from the powder inlet body (2).

3. Loosen the set screw (5) in the underside of the powder inlet body. Remove the powder inlet body from the multiplier (7).

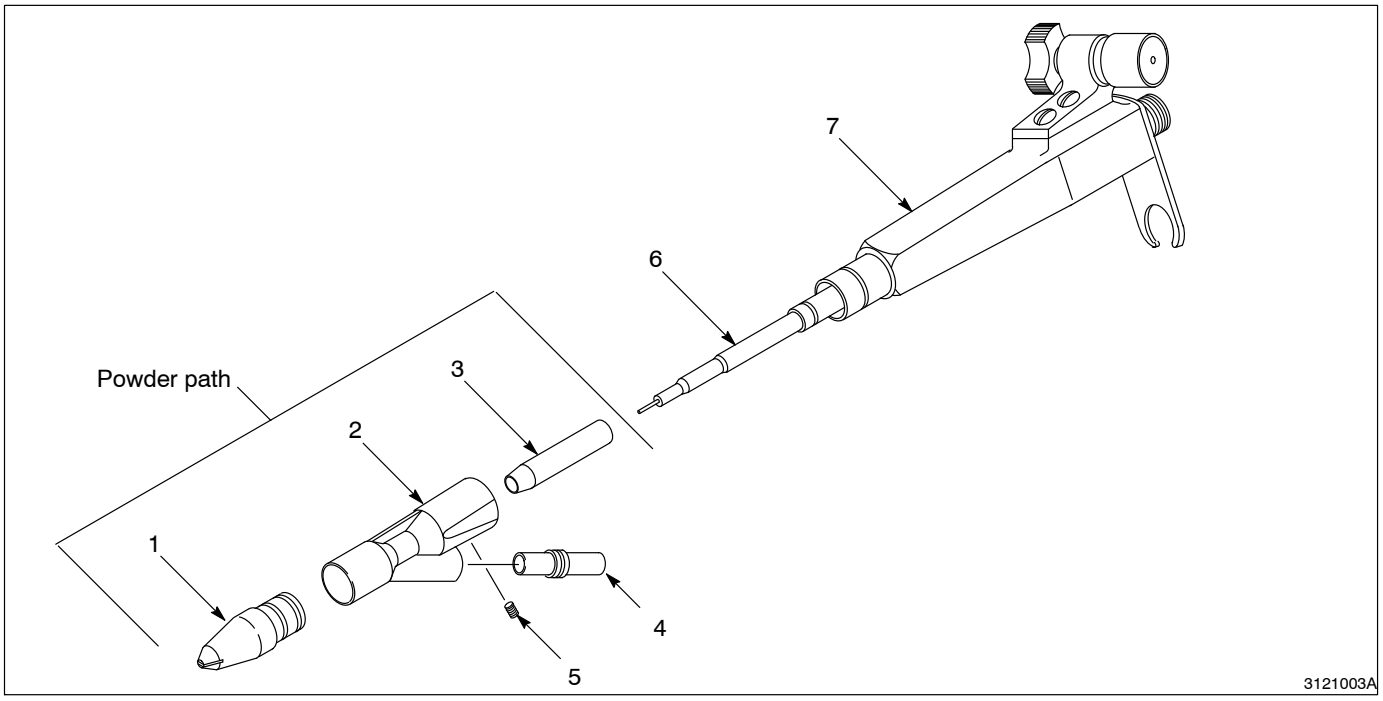

Fig. 4-1 Daily maintenance – clean parts shown

1. Flat spray nozzle
2. Powder inlet body
3. Wear sleeve
4. Hose adapter
5. Set screw
6. Resistor probe
7. Multiplier

3. Maintenance (contd.)

4. Slide the wear sleeve (3) off the resistor probe (6). Remove the nozzle (1) from the powder inlet body.

5. Blow powder off the powder path parts, the resistor probe, and the multiplier with an OSHA-approved low-pressure blow gun. Wipe the parts with a clean, lint-free cloth.

6. 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 gun in alcohol. Do not use any other solvents.

7. Inspect the powder path parts for wear. Replace worn parts.

Weekly

Check the resistance of the multiplier/resistor probe assembly with a megohmmeter, as described in *Section 5, Troubleshooting*. Replace the multiplier or resistor, or both, if the resistance readings do not fall within the specified ranges.

Section 5

Troubleshooting

Section 5
Troubleshooting

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

WARNING: 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.

1. Introduction

This section contains troubleshooting procedures for the Versa-Spray IPS PRX automatic electrostatic powder spray gun. These troubleshooting 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.

Continuity and Resistance Checks

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

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

2. Troubleshooting Charts

Problem	Possible Cause	Corrective Action	Refer to
1. Uneven pattern, unsteady or inadequate powder flow	Blockage in gun, feed hose, or pump	Remove the feed hose from the pump outlet. Blow the powder out of the hose and gun with compressed air. If necessary, disassemble and clean the gun and pump.	Fig. 5-1
	Deflector or nozzle worn, or impact-fusion affecting pattern	Remove the deflector and/or nozzle. Clean and inspect them. Replace worn parts. If the parts are wearing excessively or impact-fusion is a problem, reduce the air pressures.	Fig. 5-1 or Page 6-1
	Damp powder	Check the powder in feed hopper, air filters, and dryer. Correct the problem and replace the powder supply if it is contaminated.	Page 4-1
	Low atomizing or flow-rate air pressure	Increase the atomizing and/or flow-rate air pressure.	Page 4-2
	Improper fluidization of powder in feed hopper	Increase the fluidizing air pressure. Remove the powder from the hopper and clean or replace the fluidizing plate, if necessary.	Hopper manual
2. Voids in powder pattern	Worn nozzle or deflector	Remove the nozzle and deflector. Inspect and replace them if necessary.	Fig. 5-1 or Page 6-1
	Plugged powder path	Disassemble the powder path and clean all parts.	Fig. 5-1 or Page 6-1

2. Troubleshooting Charts
(contd.)

Problem	Possible Cause	Corrective Action	Refer to
3. Loss of wrap, poor transfer efficiency	Electrostatic voltage insufficient	Increase the electrostatic voltage.	IPS control unit manual
	Dirty or broken electrode	Clean or replace the electrode (contact tip)	Page 6-3
	Resistor, multiplier, or IPS control unit failure	Check the multiplier/resistor probe assembly with a shorting plug. If the reading obtained is out of the correct range, check the resistor separately.	Fig. 5-2, Fig. 5-3, or IPS control unit manual
	Poorly grounded parts, hangers, or conveyor	Check the conveyor chain, rollers and part hangers for powder buildup. Clean them and check for 1 MΩ or less resistance between the parts and ground. For best results, resistance should be no more than 200 Ω.	
4. No kV output from gun	Damaged gun cable	Check the continuity of the gun cable wires from pin to pin.	Fig. 5-4
	Malfunctioning voltage multiplier	Perform a continuity and resistance check.	Fig. 5-2
	Failed gun resistor	Perform a continuity and resistance check.	Fig. 5-3
	Malfunctioning IPS control unit	Repair or replace the control unit.	Control unit manual

3. Continuity and Resistance Checks

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.

Multiplier/Resistor Assembly Continuity and Resistance Check

1. See Figure 5-1. Disconnect the feed hose and gun cable from the gun. Remove the hose adapter (7) from the powder inlet body (2).
2. Loosen the set screw (8) in the underside of the powder inlet body. Remove the powder inlet body and nozzle (1). Slide the wear sleeve (3) off the resistor probe (5).
3. Wipe powder off the electrode (4), resistor probe (5), and multiplier (6). Inspect the exterior and interior surfaces. Replace any parts with burn holes or arc tracks.

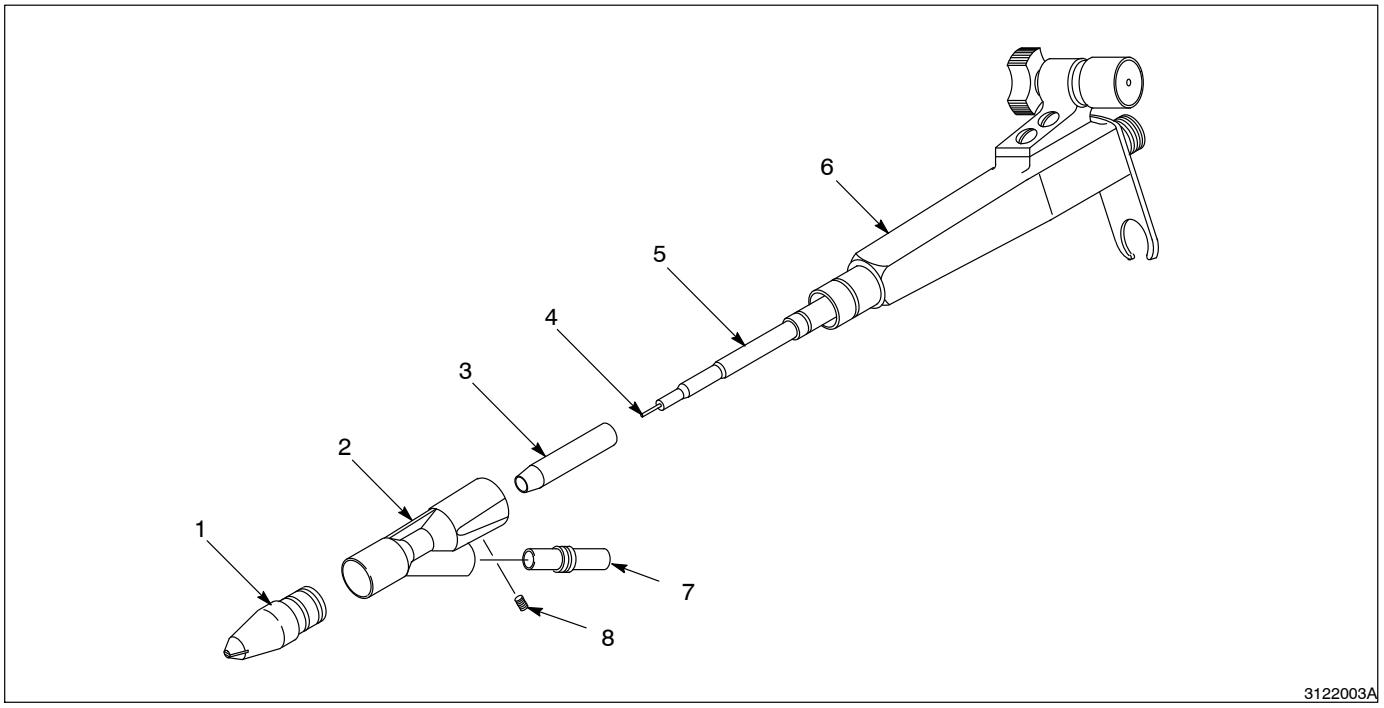

Fig. 5-1 Preparing for continuity and resistance checks

1. Flat spray nozzle
2. Powder inlet body
3. Wear sleeve
4. Electrode
5. Resistor probe
6. Multiplier
7. Feed hose adapter
8. Set screw

Multiplier/Resistor Assembly Continuity and Resistance Check *(contd.)*

4. See Figure 5-2. Connect the shorting plug (4) to the multiplier receptacle (3). Connect the megohmmeter probes to the shorting plug ring-tong terminal and electrode. To check negative multipliers, connect the negative probe to the electrode. To check positive multipliers, connect the positive probe to the electrode.

NOTE: This test can be made without a shorting plug. Connect together all three multiplier pins before taking a reading with a megohmmeter. Failure to do so could damage the multiplier. Contact your Nordson representative for more information.

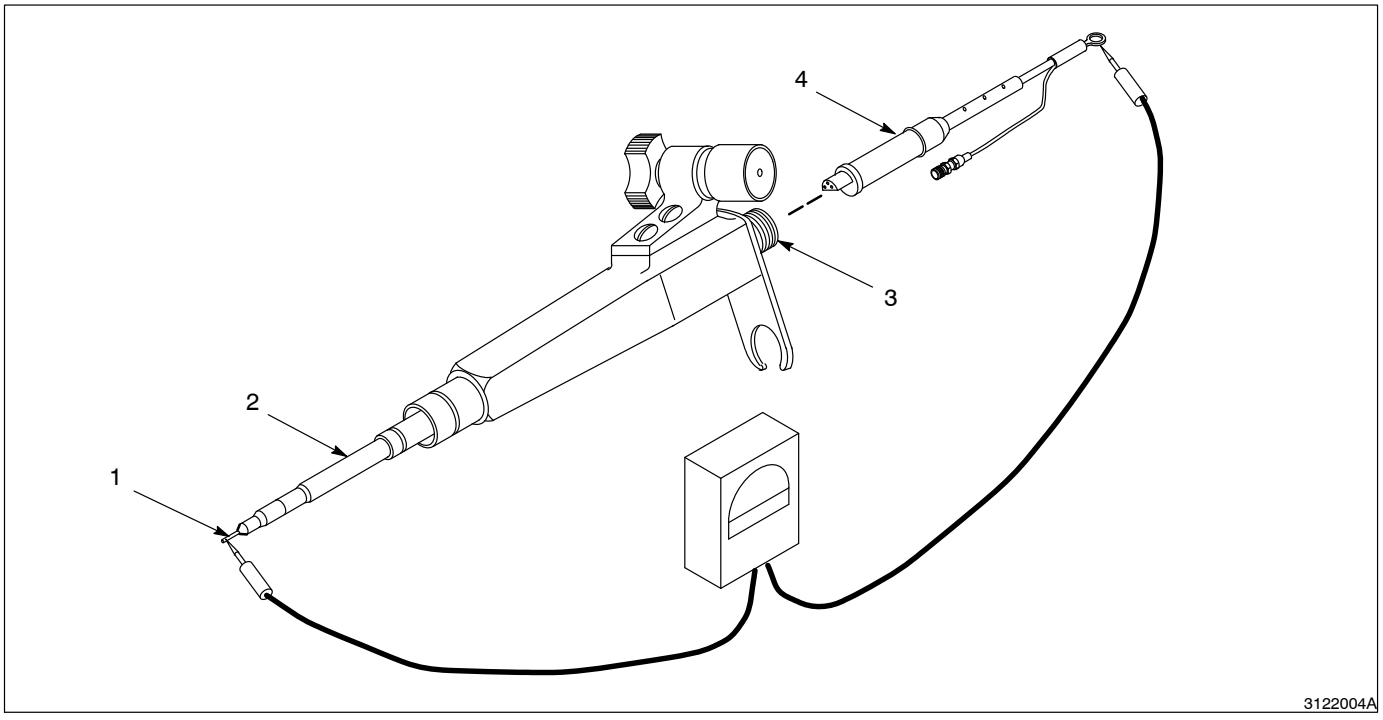

Fig. 5-2 Checking multiplier/resistor assembly

1. Electrode
2. Resistor probe
3. Multiplier receptacle
4. Shorting plug

5. The megohmmeter should read between 195 and 260 MΩ 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.

6. See Figure 5-4. Check for continuity between the bottom pin (5-VDC feedback) in the multiplier receptacle and the heatsink.

Resistor Continuity and Resistance Check

1. Perform steps 1 through 3 under *Multiplier/Resistor Assembly Continuity and Resistance Check.*
2. See Figure 5-3. Unscrew the resistor probe (2) from the multiplier (4).
3. Check the resistor with a megohmmeter. The megohmmeter should read between 153 and 187 MΩ at 500 volts. If the reading is out of this range, replace the resistor probe.

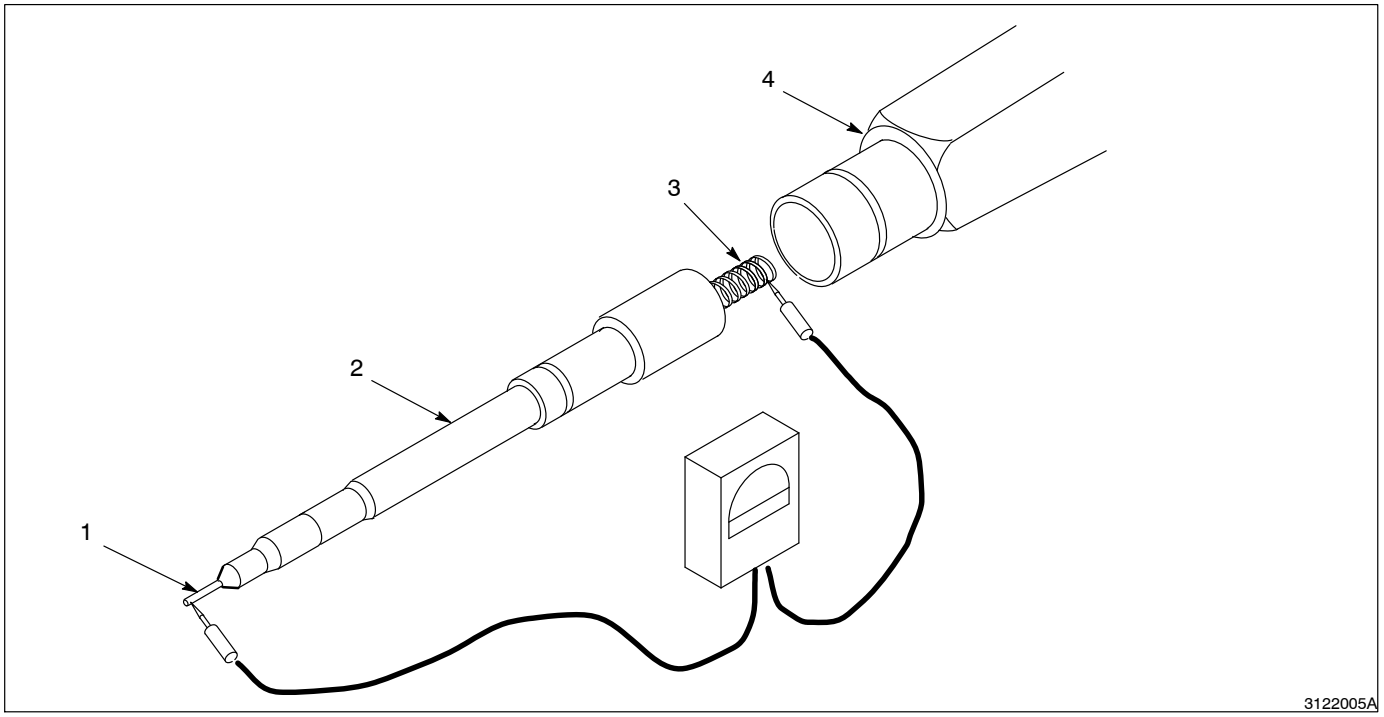

Fig. 5-3 Checking resistance

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

Gun Cable Continuity Check

Gun cable and multiplier pins, and their functions, are shown in Figure 5-4. Check the continuity of the cable leads from the pins in one end to the pins in the other with a standard ohmmeter. Check for continuity between the bottom pin (5-VDC feedback) in the multiplier receptacle and the multiplier heatsink.

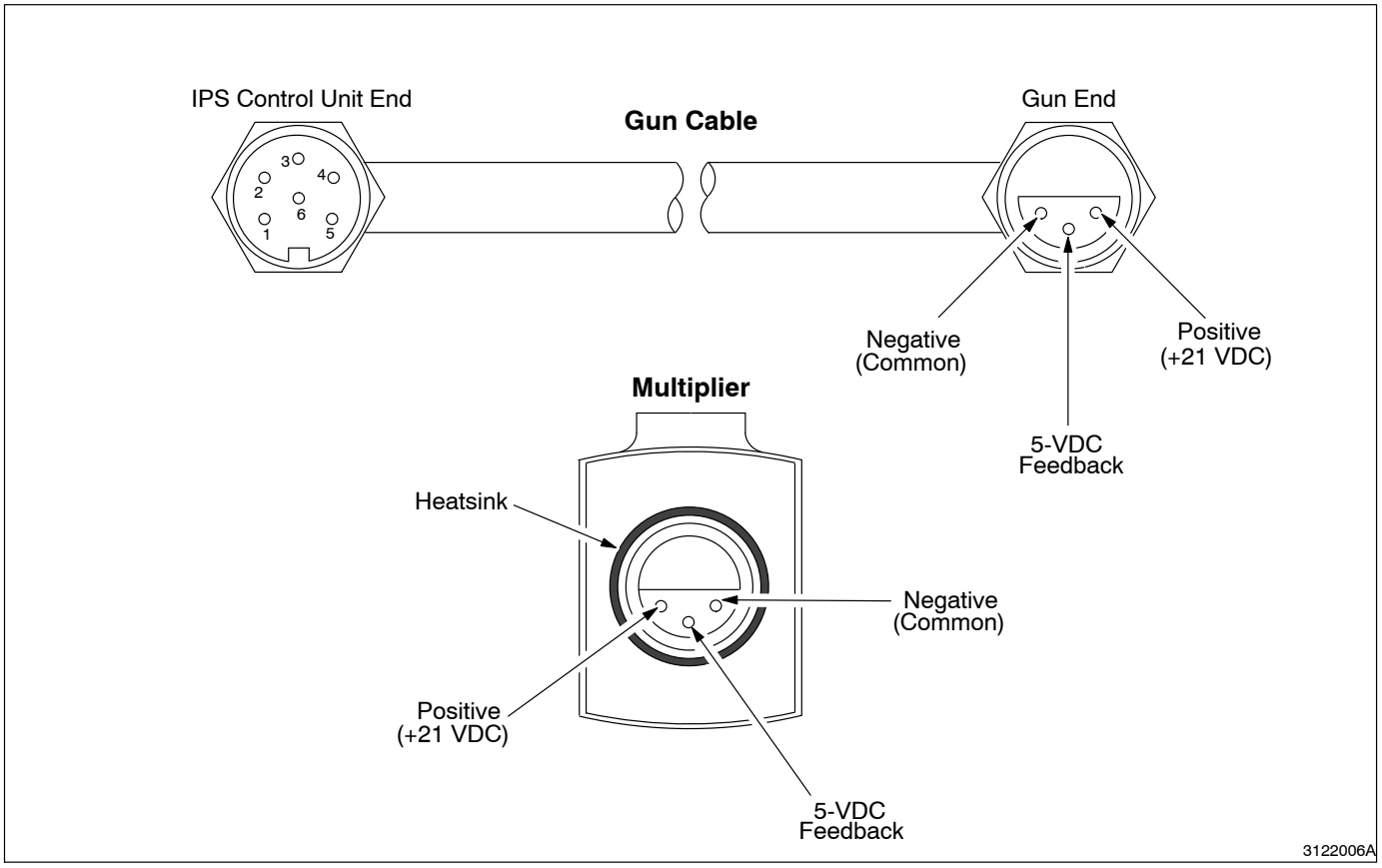

Fig. 5-4 Gun cable and multiplier pins

Table 5-1 Gun cable pin functions

Control Unit End Pins	Function
1	Open
2	Negative (Common)
3	Positive (+21 VDC)
4	5 VDC Feedback
5, 6	Jumpered

Section 6

Repair

Section 6
Repair

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

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

1. Powder Path Repair

1. See Figure 6-1. Disconnect the powder feed hose and gun cable from the gun. Remove the hose adapter (7) from the powder inlet body (2).

2. Loosen the setscrew (8) in the underside of the powder inlet body (2). Remove the powder inlet body and nozzle (1).

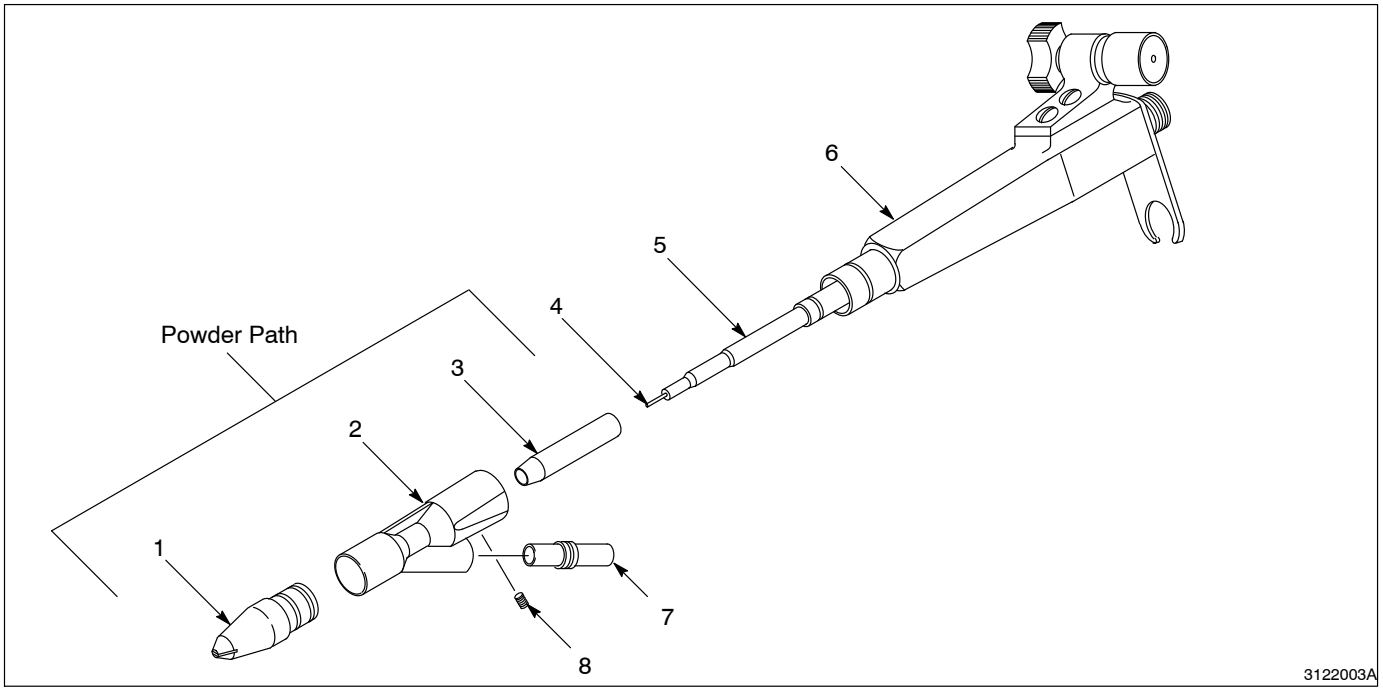

Fig. 6-1 Powder path repair

1. Flat spray nozzle
2. Powder inlet body
3. Wear sleeve
4. Electrode
5. Resistor probe
6. Multiplier
7. Feed hose adapter
8. Set screw

1. Powder Path Repair *(contd.)*

3. Slide the wear sleeve (3) off the resistor probe (5).

4. Wipe powder off the electrode (4), resistor probe (5), and multiplier (6). Inspect the exterior and interior surfaces of all parts. Replace any parts with burn holes or arc tracks.

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.

6. If necessary, remove the O-rings and wipe the parts with a cloth dampened with isopropyl or ethyl alcohol. Do not use any other solvent. Do not immerse the assembled gun or 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 reassemble the powder path.

2. Resistor Replacement

1. Perform steps 1 through 4 under *Powder Path Repair*.

2. See Figure 6-2. Unscrew the old resistor probe (2) from the multiplier (4). Clean the exposed threads in the end of the multiplier and wipe the multiplier well (5) with a clean, lint-free cloth.

3. Inject $^1/_2$- to $^3/_4$-cc dielectric grease into the well from the applicator shipped with the resistor kit.

4. Fill the new resistor spring (3) and resistor probe cavity (6) with $^1/_2$- to $^3/_4$-cc dielectric grease.

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

5. Unscrew the new contact tip (1) from the resistor probe.

6. Screw the new resistor probe onto the multiplier and tighten it securely.

2. Resistor Replacement *(contd.)*

7. Screw the contact tip into the resistor probe end and tighten it securely. Do not overtighten the tip or the threads will be stripped.
8. Wipe dielectric grease off the contact tip, resistor probe, and multiplier.
9. Install the wear sleeve over the resistor probe. Install the powder inlet body, nozzle, and hose adapter.

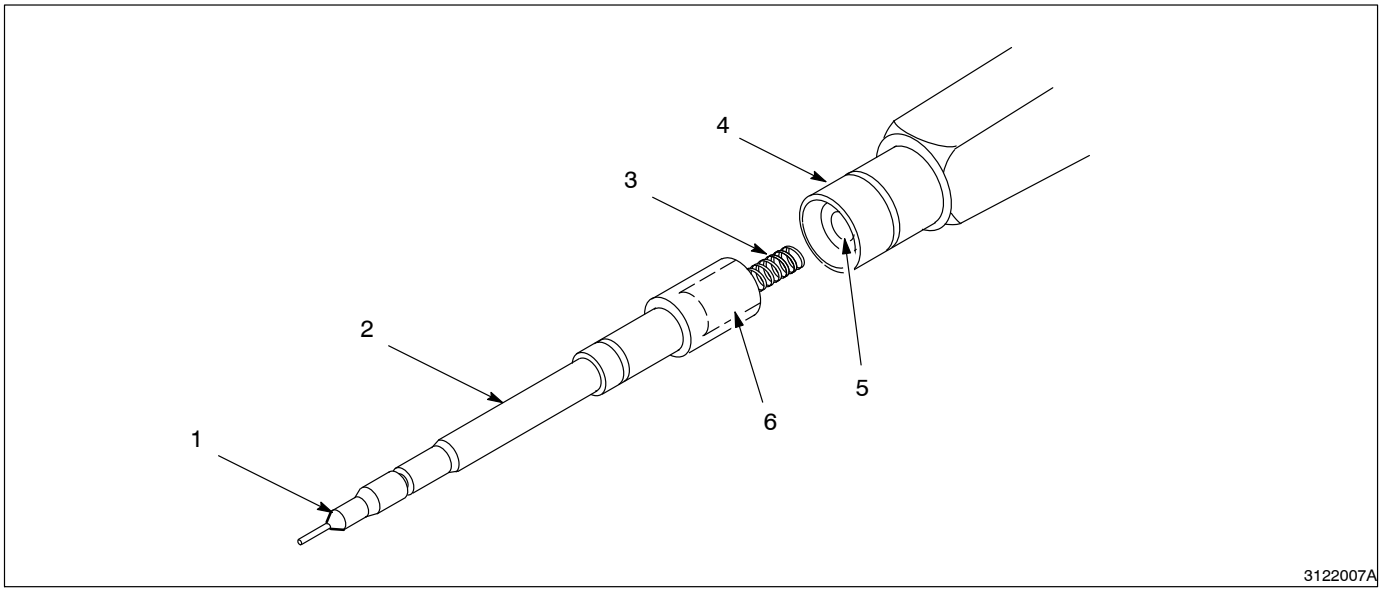

Fig. 6-2 Resistor replacement

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

Note: Clean and grease items 3, 5, and 6.

3. Contact Tip Replacement

1. Perform steps 1 through 4 under *Powder Path Repair*.
2. See Figure 6-2. Unscrew the old contact tip (1) from the resistor probe (2).
3. Apply dielectric grease to the threads of the new contact tip and in the end of the probe.
4. Screw the new contact tip into the resistor probe and tighten it securely. Wipe grease off the contact tip and probe.
5. Install the wear sleeve over the resistor probe. Install the powder inlet body, nozzle, and hose adapter.

4. Multiplier Replacement

The multiplier replacement kit consists of a new multiplier and a resistor probe with contact tip, filled with dielectric grease and assembled.

1. Disconnect the powder feed hose and gun cable from the gun.
2. See Figure 6-3. Loosen the set screws (1) in the gun mount (11). Remove the gun from the mounting bar.
3. Perform steps 1 through 4 under *Powder Path Repair*.
4. Remove the gun mount (10) and the hose bracket (2) from the old multiplier (10). Save the screws (3, 12) for reuse.

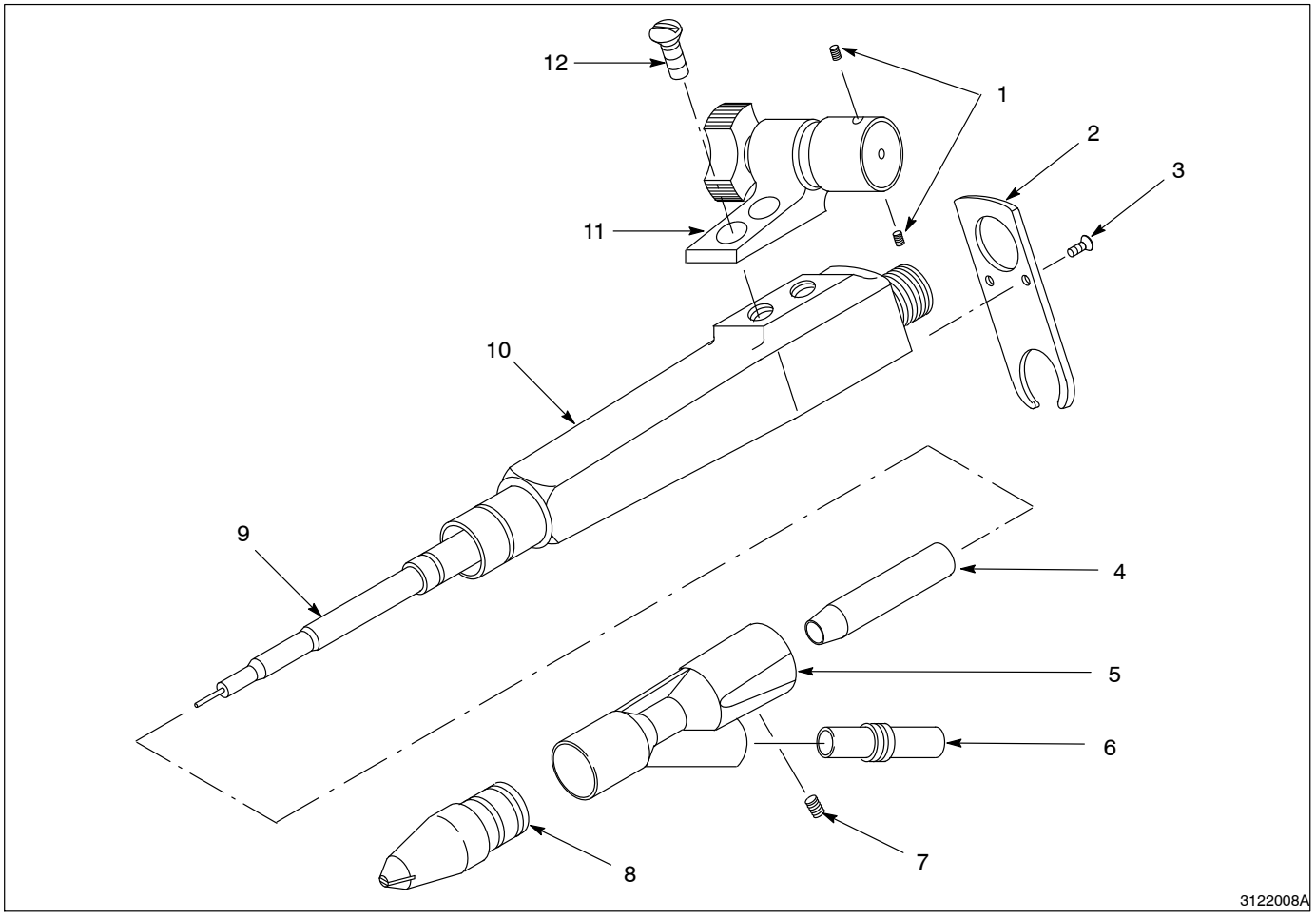

Fig. 6-3 Multiplier replacement

1. Set screws
2. Hose bracket
3. Screws
4. Wear sleeve
5. Powder inlet body
6. Hose adapter
7. Set screw
8. Flat spray nozzle
9. Resistor probe
10. Multiplier
11. Gun mount
12. Screws

4. Multiplier Replacement
(contd.)

5. Install the gun mount (11) and the hose bracket (2) on the new multiplier (10) with the screws (3, 12) removed from the old multiplier.

6. Install the wear sleeve (4) over the resistor probe (9). Install the powder inlet body (5), nozzle (8) , and hose adapter (6). Tighten the set screw (7) to secure the powder inlet body to the multiplier.

7. Install the gun on the mounting bar. Tighten the gun mount setscrews (1) securely with a 3 mm hex key.

8. Connect the gun cable and feed hose to the gun.

Section 7

Parts

Section 7
Parts

1. Introduction

To order parts, call the Nordson Customer Service Center at 800-241-8777 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 six-digit 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
–	000 000	Assembly	1	
1	000 000	• Subassembly	2	A
2	000 000	• • 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.

2. Gun Parts List

See Figure 7-1.

Item	Part	Description	Quantity	Note
–	149 673	Gun, Versa-Spray, PRX, negative, flat	1	
–	149 674	Gun, Versa-Spray, PRX, positive, flat	1	
1	141 044	• Service kit, nozzle, flat spray, 4 mm	1	
2	141 045	• • Nozzle, flat spray, 4 mm, w/O-rings, Tivar	1	
3	941 181	• • • O-ring, silicone, .875 x 1.063 x .094 in.	2	
4	134 385	• • Sleeve, wear, flat spray, w/O-ring	1	
5	125 612	• Body, inlet	1	
6	982 455	• Screw, set, M6 x 1.0 x 8 mm, nylon, black	1	
7	134 386	• Adapter, hose, w/O-ring	1	
8	940 163	• • O-ring, silicone, .625 x .750 x .063 in.	1	
9	133 409	• Mount, gun, w/pivot	1	
10	981 708	• • Screw, M8 x 1.25 x 20 mm, black	2	
11	982 067	• • Screw, set, cup, M5 x 5, black	2	
12	982 056	• Screw, flat head, M3 x 6	1	
13	140 562	• Bracket, tube	1	
14	146 330	• Service kit, PRX, negative	1	A
14	129 855	• Service kit, PRX, positive	1	A
15	940 243	• • O-ring, silicone, 1.125 x 1.250 x .062 in.	1	
16	134 376	• • Service kit, resistor	1	
17	940 117	• • • O-ring, silicone, .312 x .438 x .063 in.	1	
18	132 748	• • • Contact, cable	1	

NOTE A: Check part number on existing multiplier identification plate and note polarity before ordering service kit.

Gun Cables

Gun cables are not included with automatic guns. Order cables in the lengths desired.

Part	Description	Note
142 108	Cable, Versa-Spray, 100 kV, 8 m (25 ft.)	
168 448	Cable, Versa-Spray, 100 kV, 12 m (38 ft.)	
142 109	Cable, Versa-Spray, 100 kV, 16 m (50 ft.)	

Gun Parts List Illustration

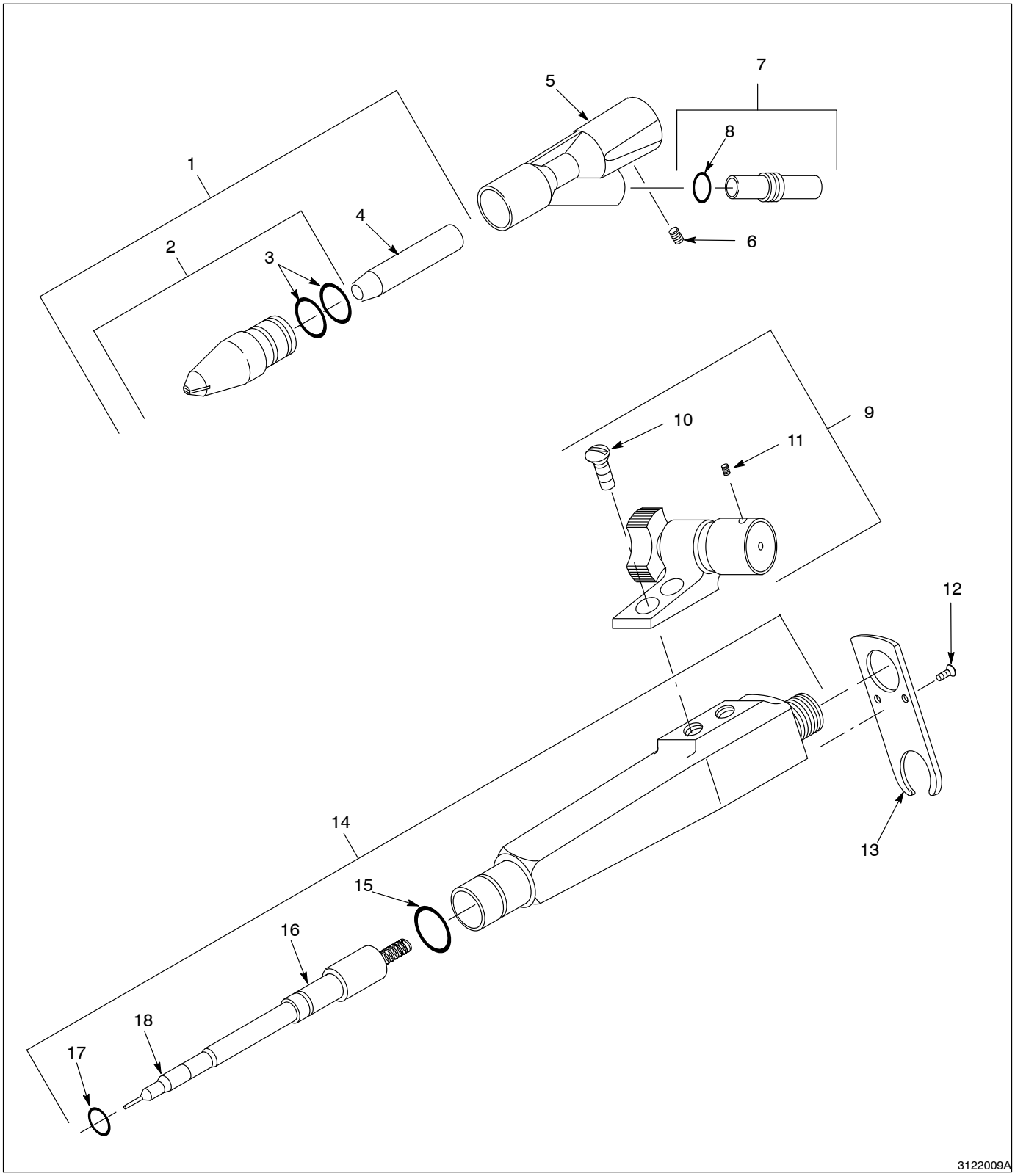

Fig. 7-1 Versa-Spray IPS PRX automatic powder spray gun

3. Options

Tivar Flat-Spray Nozzles

Figure 7-2 applies to the 2.5-, 3-, 4-, and 6-mm Tivar and GFT flat spray nozzles.

Item	Part	Description	Quantity	Note
–	134 380	Service kit, nozzle, flat spray, 2.5 mm	1	
1	134 384	• Nozzle, flat spray, 2.5 mm, w/O-rings, Tivar	1	A
2	941 181	• • O-ring, silicone, .875 x 1.062 x .093 in.	2	
3	134 385	• Sleeve, wear, flat spray, w/O-ring	1	
NOTE A: Nozzles without identification groove use part 940 212 O-ring. Nozzles with groove use part 941 181 O-ring.				

Item	Part	Description	Quantity	Note
–	139 935	Service kit, nozzle, flat spray, 3 mm	1	
1	139 902	• Nozzle, flat spray, 3 mm, w/O-rings, Tivar	1	A
2	941 181	• • O-ring, silicone, .875 x 1.062 x .093 in.	2	
3	134 385	• Sleeve, wear, flat spray, w/O-ring	1	A
NOTE A: Nozzles without identification groove use part 940 212 O-ring. Nozzles with groove use part 941 181 O-ring.				

Item	Part	Description	Quantity	Note
–	141 044	Service kit, nozzle, flat spray, 4 mm	1	
1	141 045	• Nozzle, flat spray, 4 mm, w/O-rings, Tivar	1	A
2	941 181	• • O-ring, silicone, .875 x 1.062 x .093 in.	2	
3	134 385	• Sleeve, wear, flat spray, w/O-ring	1	
NOTE A: Nozzles without identification groove use part 940 212 O-ring. Nozzles with groove use part 941 181 O-ring.				

Tivar Flat-Spray Nozzles *(contd.)*

Item	Part	Description	Quantity	Note
–	139 937	Service kit, nozzle, flat spray, 6 mm	1	
1	139 903	• Nozzle, flat spray, 6 mm, w/O-rings, Tivar	1	A
2	941 181	• • O-ring, silicone, .875 x 1.062 x .093 in.	2	
3	134 385	• Sleeve, wear, flat spray, w/O-ring	1	
NOTE A: Nozzles without identification groove use part 940 212 O-ring. Nozzles with groove use part 941 181 O-ring.				

Glass-Filled PTFE Flat-Spray Nozzles

See Figure 7-2. These nozzles are available with 2.5-, 3-, 4-, and 6-mm slot widths. They do not include a wear sleeve.

Item	Part	Description	Quantity	Note
1	174 223	Nozzle, flat spray, 2.5 mm, w/O-rings, G-F PTFE	1	
2	941 181	• O-ring, silicone, .875 x 1.062 x .093 in.	2	
1	174 225	Nozzle, flat spray, 3 mm, w/O-rings, G-F PTFE	1	
2	941 181	• O-ring, silicone, .875 x 1.062 x .093 in.	2	
1	174 227	Nozzle, flat spray, 4 mm, w/O-rings, G-F PTFE	1	
2	941 181	• O-ring, silicone, .875 x 1.062 x .093 in.	2	
1	174 229	Nozzle, flat spray, 6 mm, w/O-rings, G-F PTFE	1	
2	941 181	• O-ring, silicone, .875 x 1.062 x .093 in.	2	

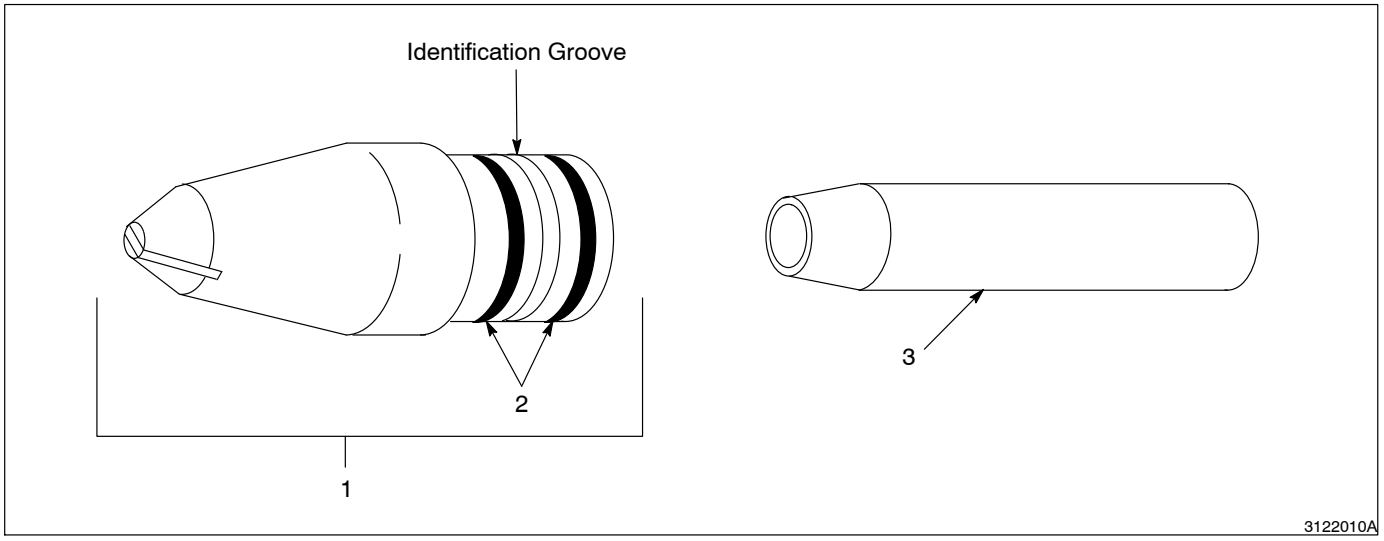

Fig. 7-2 Flat spray nozzles

3. Options (contd.)

Cross-Cut Nozzles

Figure 7-3 applies to 60- and 90-degree Cross-Cut nozzles.

Item	Part	Description	Quantity	Note
–	141 013	Service kit, nozzle, Cross-Cut, 60°	1	
1	141 017	• Nozzle, Cross-Cut, 60°, w/O-rings	1	A
2	941 181	• • O-ring, silicone, .875 x 1.062 x .093 in.	2	
3	134 385	• Sleeve, wear, flat spray, w/O-ring	1	
NOTE A: Nozzles without identification groove use part 940 212 O-ring. Nozzles with groove use part 941 181 O-ring.				

Item	Part	Description	Quantity	Note
–	141 014	Service kit, nozzle, Cross-Cut, 90°	1	
1	141 015	• Nozzle, Cross-Cut, 90°, w/O-rings	1	A
2	941 181	• • O-ring, silicone, .875 x 1.062 x .093 in.	2	
3	134 385	• Sleeve, wear, flat spray, w/O-ring	1	
NOTE A: Nozzles without identification groove use part 940 212 O-ring. Nozzles with groove use part 941 181 O-ring.				

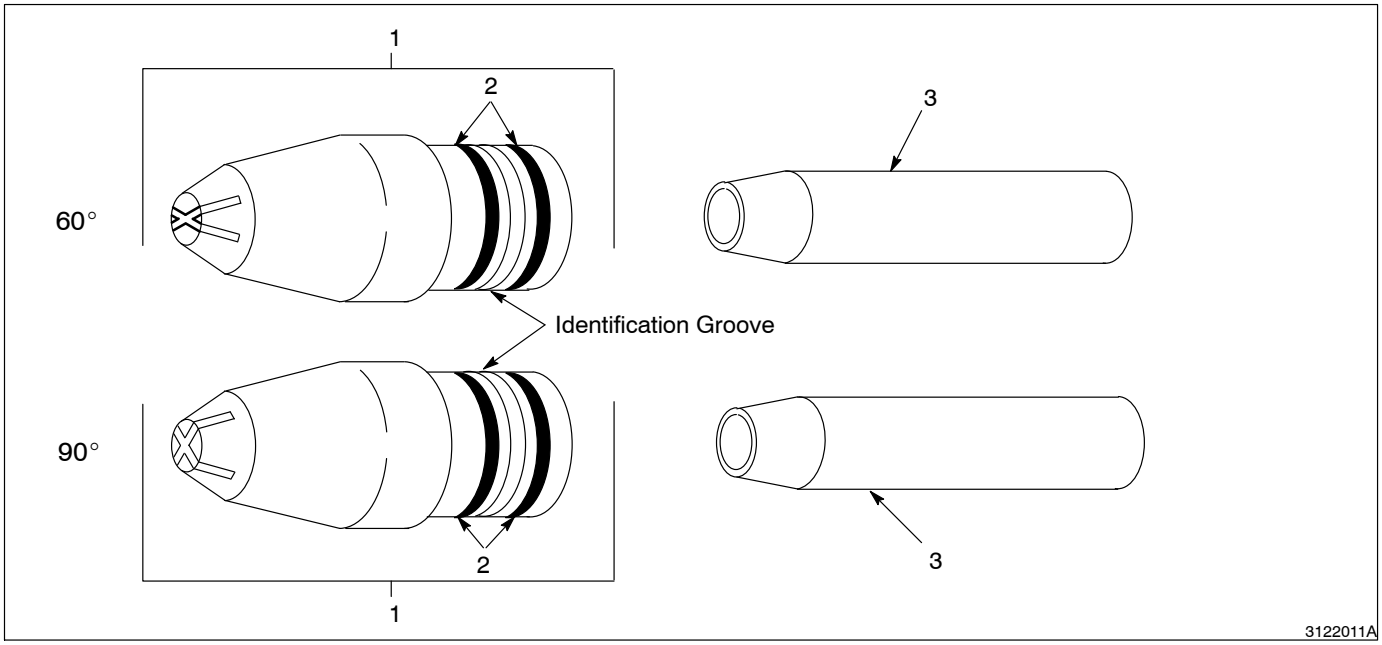

Fig. 7-3 Cross-cut nozzles

Castle Nozzle

See Figure 7-4.

Item	Part	Description	Quantity	Note
–	147 495	Service kit, nozzle, castle, .375	1	
1	147 877	• Nozzle, castle, .375, w/O-rings	1	
2	941 181	• • O-ring, silicone, .875 x 1.062 x .093 in.	2	
3	134 385	• Sleeve, wear, flat spray, w/O-ring	1	

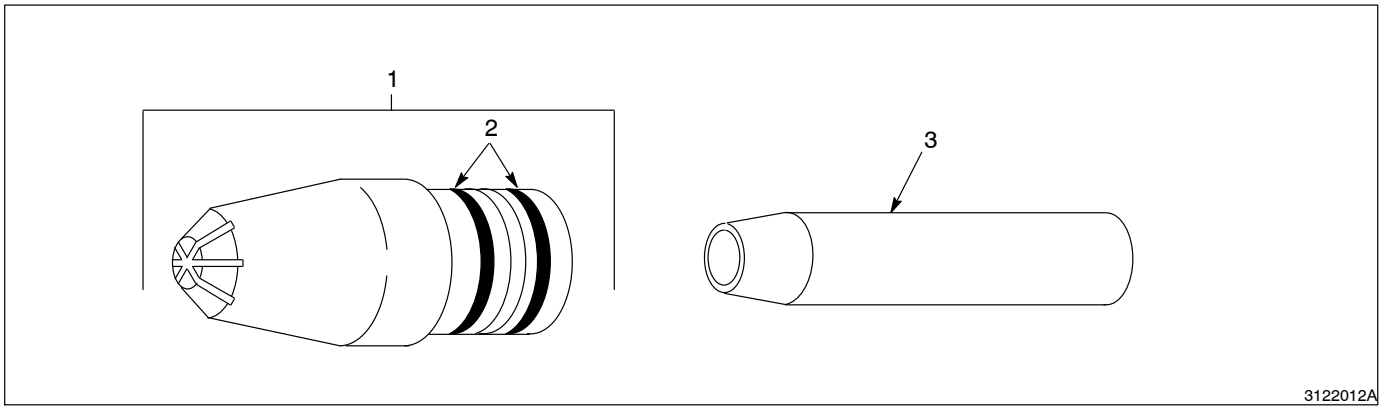

Fig. 7-4 Castle nozzle

3. Options *(contd.)*

32-mm Conical Nozzle

See Figure 7-5.

Item	Part	Description	Quantity	Note
–	145 559	Service kit, nozzle, 32 mm	1	
1	132 348	• Sleeve, wear, conical, Tivar	1	
2	145 558	• Nozzle, 32-mm dia., w/O-rings, Tivar	1	
3	941 181	• • O-ring, silicone, .875 x 1.062 x .093 in.	2	
4	941 215	• • O-ring, silicone, 1.062 x 1.250 x .093 in.	1	
5	144 759	• Adjuster, pattern, 32 mm	1	
6	133 734	• Deflector, 26-mm dia., w/O-ring, Tivar	1	

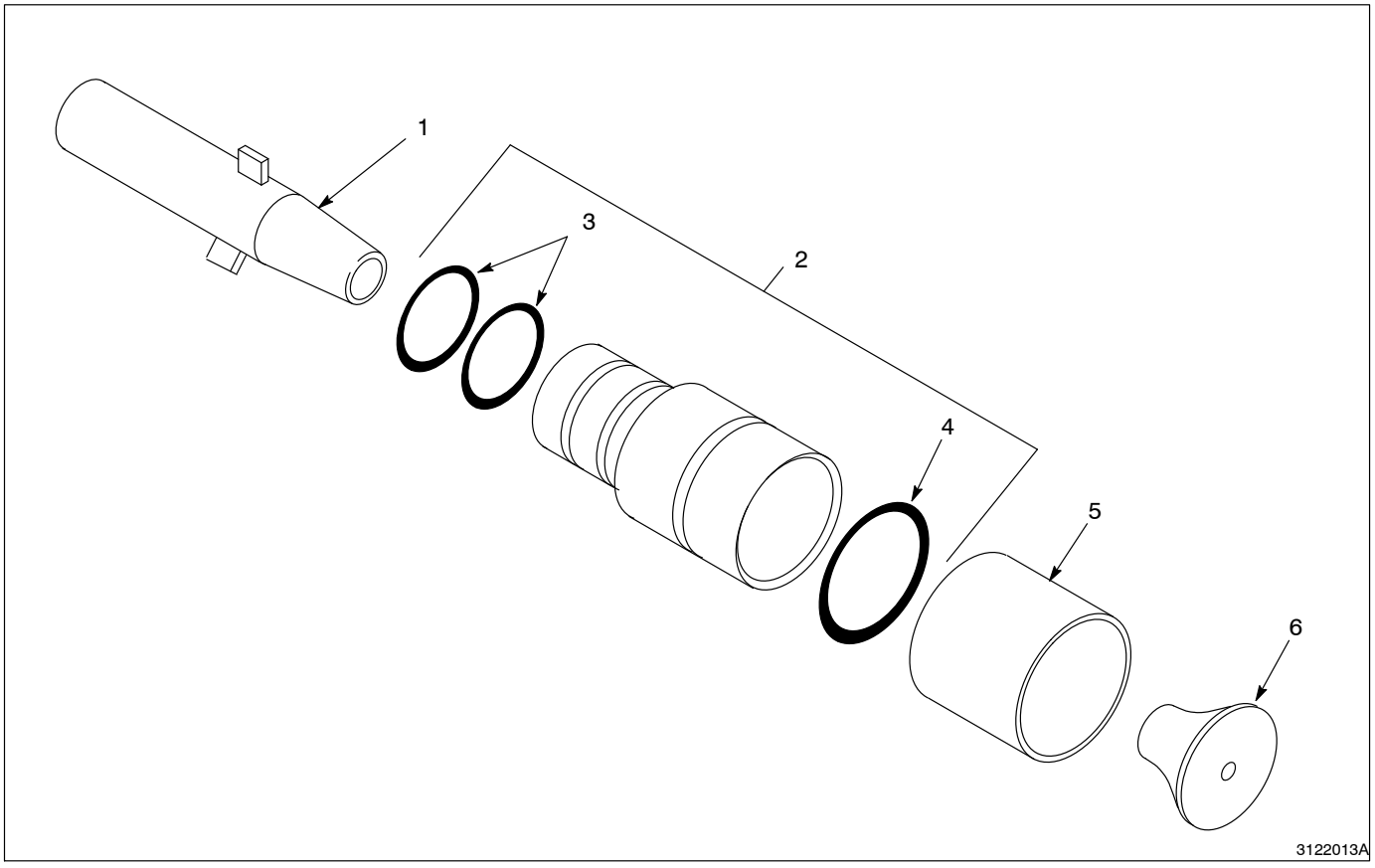

Fig. 7-5 32-mm conical nozzle

45-mm Conical Nozzle

See Figure 7-6.

Item	Part	Description	Quantity	Note
–	144 760	Service kit, nozzle, 45 mm	1	
1	132 348	• Sleeve, wear, conical, Tivar	1	
2	144 789	• Nozzle, 45-mm dia., w/O-rings	1	
3	941 181	• • O-ring, silicone, .875 x 1.062 x .093 in.	2	
4	249 233	• Deflector, Tivar, w/O-ring	1	

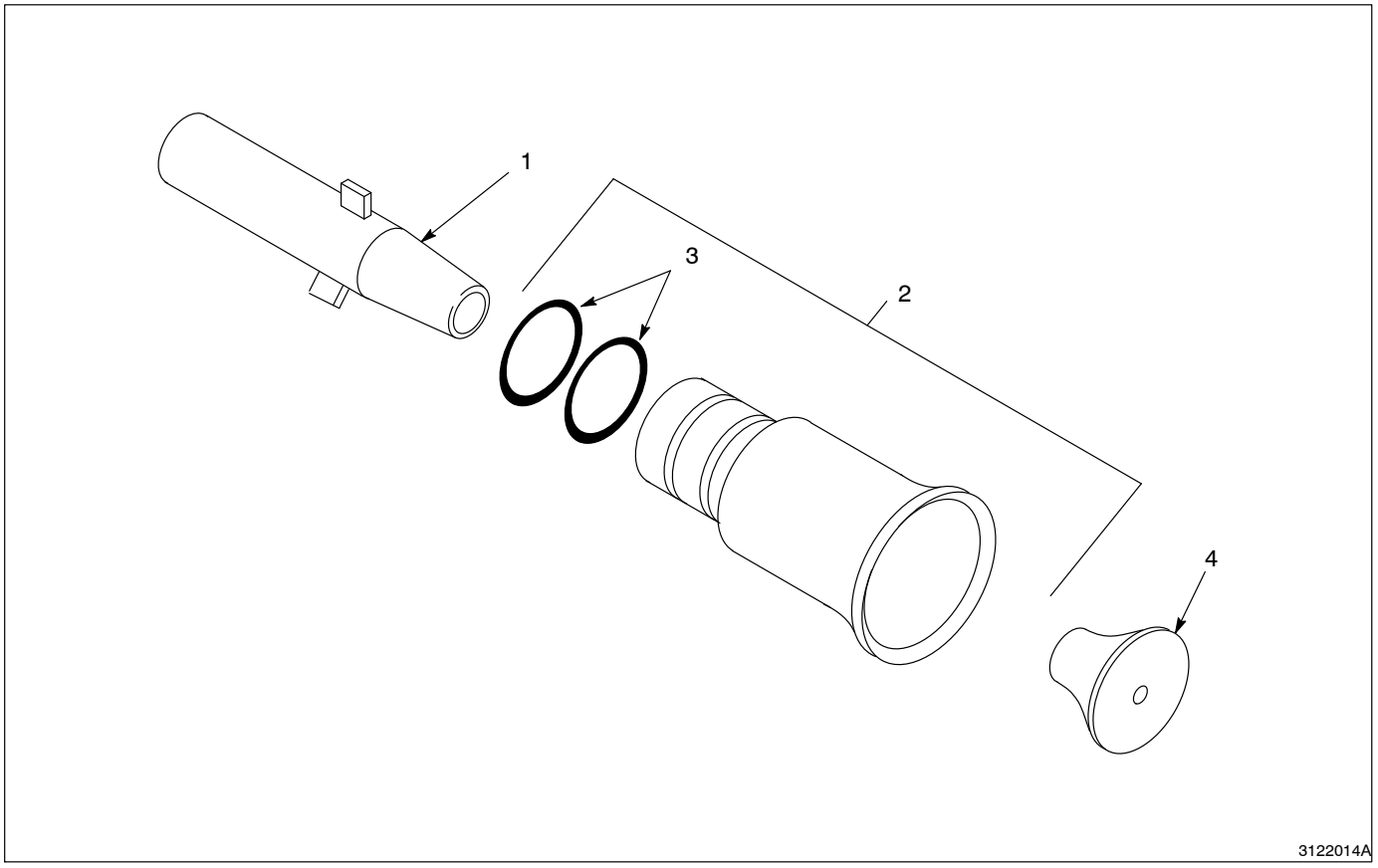

Fig. 7-6 45-mm conical nozzle

3. Options (contd.)

150- and 300-mm Lance Extensions Parts List

See Figure 7-7.

Item	Part	Description	Quantity	Note
–	133 730	Extension, lance, 150 mm	1	
–	133 731	Extension, lance, 300 mm	1	
1	940 212	• O-ring, silicone, .938 x 1.063 x 063 in.	1	
2	133 728	• Tube, extension, 150 mm	1	
2	133 729	• Tube, extension, 300 mm	1	
3	940 224	• O-ring, silicone, 1.00 x 1.125 x .063 in.	1	
4	160 066	• Electrode, lance, 150 mm	1	A
5	160 020	• Sleeving, contact	1	A
4	160 068	• Electrode, lance, 300 mm	1	A
5	160 020	• Sleeving, contact	1	A
6	160 021	• Link, adapter, 300 mm	1	
7	133 719	• Support, lance	1	
8	133 721	• Connector, nozzle	1	
9	249 194	• Support, cable	1	
–	- - - - - -	• Nozzle, 32 mm, w/O-rings	1	B
–	940 212	• • O-ring, silicone, .938 x 1.063 x .063 in.	1	B
–	- - - - - -	• Adjuster, pattern, w/O-ring	1	C
–	940 262	• • O-ring, silicone, 1.250 x 1.375 x .063 in.	1	C
10	145 558	• Nozzle, w/O-rings	1	
11	941 181	• • O-ring, silicone, .875 x 1.062 x .093 in.	2	
12	941 215	• • O-ring, silicone, 1.062 x 1.250 x .093 in.	1	
13	144 759	• Adjuster, pattern, 26 mm	1	
14	133 734	• Deflector, 26-mm dia., w/O-ring	1	

NOTE A: Replaces part 133 732 electrode (150 mm) and part 133 733 electrode (300 mm). Use part 130 727 contact sleeve with old-style electrodes.

B: Obsolete, replaced by part 145 558 nozzle, item 10.

C: Obsolete, replaced by part 144 759 pattern adjuster, item 13.

150- and 300-mm Lance Extensions Parts Illustration

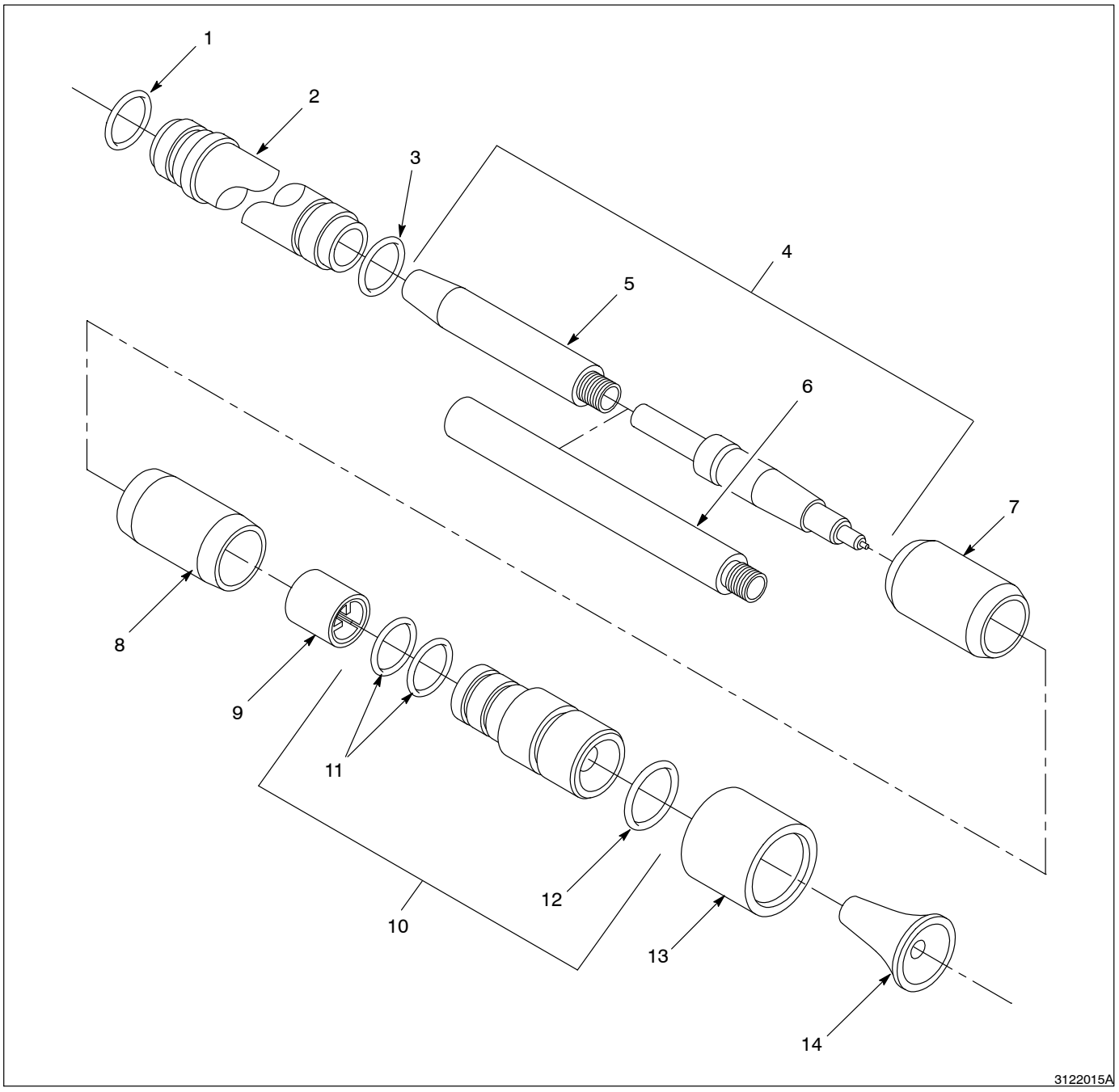

Fig. 7-7 150- and 300-mm lance extensions

3. Options *(contd.)*

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

See Figure 7-8.

Item	Part	Description	Quantity	Note
1	135 865	Deflector, 14-mm dia., Tivar, w/O-ring	1	
2	940 084	• O-ring, silicone, .188 x .312 x .062 in.	1	
3	147 880	Deflector, 16-mm dia., Tivar, w/O-ring	1	
4	940 084	• O-ring, silicone, .188 x .312 x .062 in.	1	
5	133 714	Deflector, 19-mm dia., Tivar, w/O-ring	1	
6	940 084	• O-ring, silicone, .188 x .312 x .062 in.	1	
7	135 896	Adapter, hose, low-flow, w/O-ring	1	
8	940 163	• O-ring, silicone, .625 x .750 x .063 in.	1	

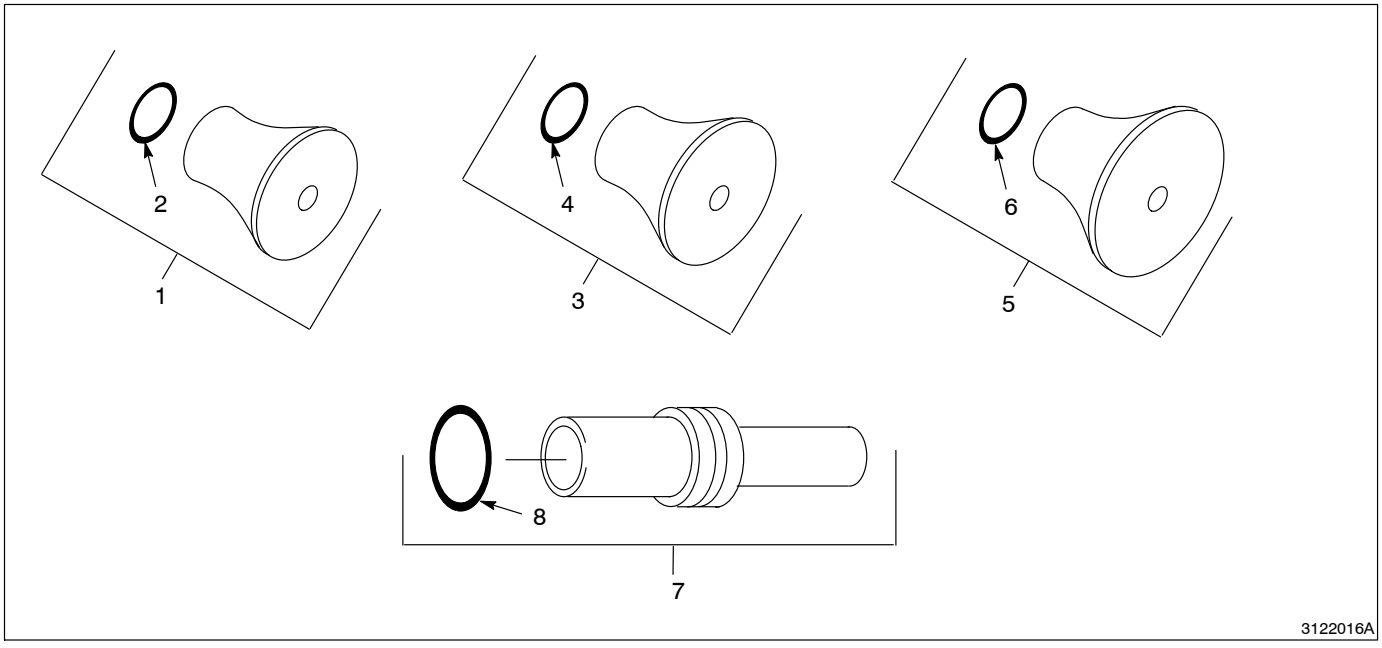

Fig. 7-8 Deflectors and low-flow hose adapters

Gun Mounting Bar

See Figure 7-9.

Item	Part	Description	Quantity	Note
1	133 403	Bar, gun, mounting	1	

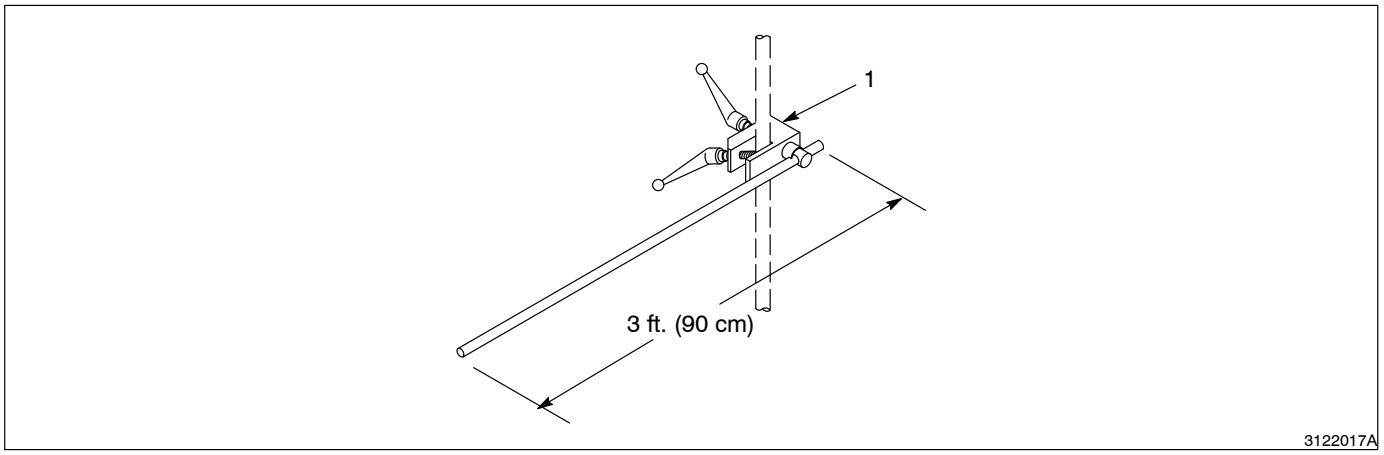

Fig. 7-9 Gun mounting bar

Shorting Plug

See Figure 7-10.

Item	Part	Description	Quantity	Note
1	161 411	Plug, shorting, IPS	1	

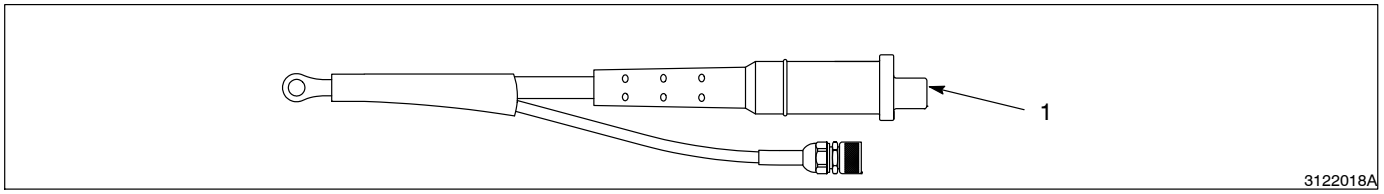

Fig. 7-10 Shorting plug

Powder Feed Hose

Part	Description	Note
900 550	Tubing, powder, high-flow ($^1/_2$-in. I.D.)	A
900 549	Tubing, powder, low-flow ($^3/_8$-in. I.D.)	A
NOTE A: Bulk part numbers. Order in one-foot increments.		

3. Options *(contd.)*

Purge Adapter Kit

See Figure 7-11. The purge adapter kit is installed in the powder inlet body in place of the hose adapter. It is used to clean accumulated powder from the powder inlet body and nozzle. Air flow controls and $^1/_4$-in. air tubing are not included. Refer to manual 34-28 *Versa-Spray Purge Adapter Kits*, shipped with the purge adapter, for installation and operation instructions.

Item	Part	Description	Quantity	Note
1	157 094	Adapter, purge, Versa-Spray	1	

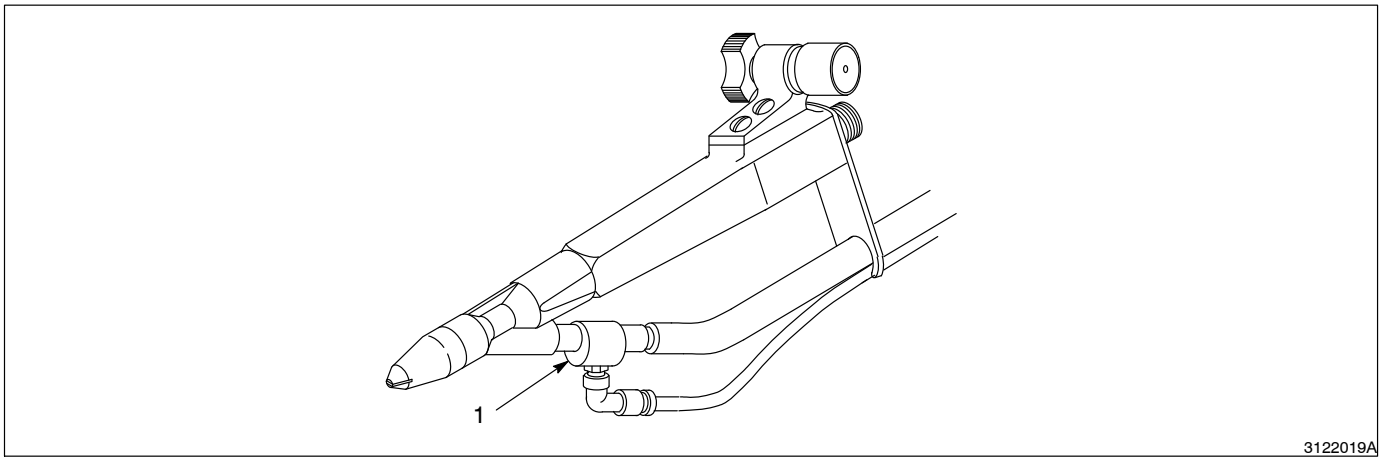

Fig. 7-11 Purge adapter

Low-Flow Hose Adapter for Purge Adapter

See Figure 7-12. This adapter replaces the standard ($^1/_2$-in. I.D.) hose adapter included with the purge adapter.

Item	Part	Description	Quantity	Note
1	163 917	Adapter, purge, inlet, low-flow	1	

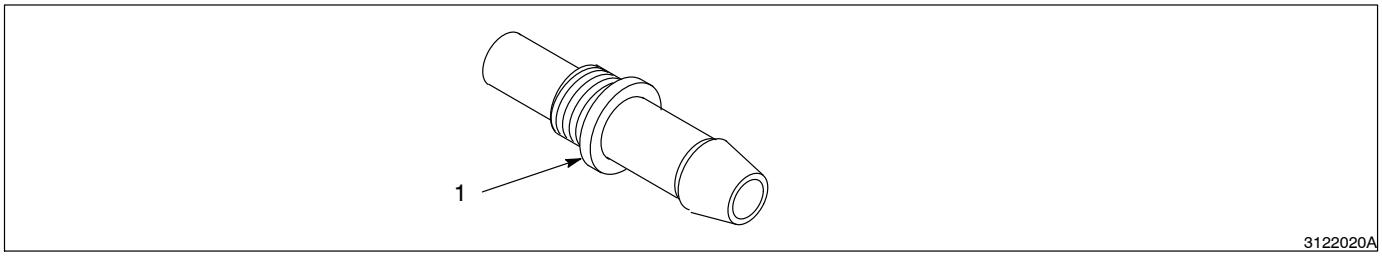

Fig. 7-12 Low-flow hose adapter for purge adapters