Tribomatic® II Automatic Purgeable Powder Spray Gun

Customer Product Manual
Part 303 815A

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

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Table of Contents

Troubleshooting

Repair

Parts

Options

Section 1

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.

- While operating manual electrostatic spray guns, make sure you are grounded. Wear electrically conductive gloves or a grounding strap connected to the gun handle or other true earth ground.

- 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 standard ohmmeter. 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 Tribomatic II automatic 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).

Continued on next page

11. Safety Labels (contd.)

Item	Part	Description
		 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 1.7 bar (25 psig). If you have any questions concerning this electrostatic spray equipment, call (800) 433-9319, and ask to speak with the Powder Systems Group Technical Service Department.

Section 2

Description

Section 2
Description

1. Introduction

The Nordson Tribomatic II automatic purgeable powder spray gun uses friction (the tribo effect) to electrostatically charge powder coating particles as they are forced through the gun by compressed air. The gun is used with a Tribomatic II controller and powder pump.

See FIgure 2-1. The gun consists of a charge module (3), diffuser (1), in-line gun mount (2), and various optional sprayheads (4). The standard gun has a PTFE charge module used with organic powder coatings. The gun mount is used with a $^{5}/_{8}$-in. diameter mounting bar to mount the gun to a reciprocator or oscillator, or to a fixed gun stand. An optional gun holder adapter allows existing Tribomatic gun holders to be used with gun mounting bars.

The gun uses the same wide variety of optional nozzles and sprayheads available for use with the original Tribomatic automatic gun. Options are listed in Table 2-1.

Table 2-2 describes the characteristics of materials used in the Tribomatic II guns: PTFE, nylon, and Tivar. Use this table to identify the materials used in your gun.

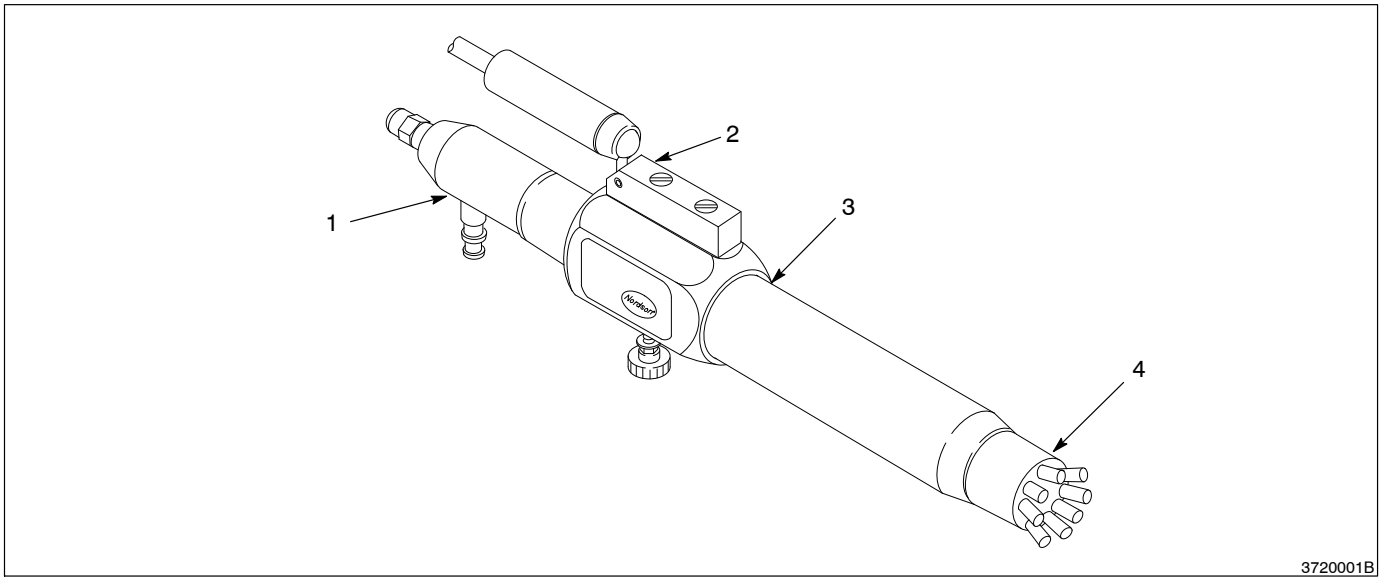

Fig. 2-1 Tribomatic II automatic gun

1. Diffuser
2. In-line gun mount
3. Charge module
4. Sprayhead

2. Operation

WARNING: Make sure the gun is grounded before spraying powder or cleaning the gun with compressed air. Without a ground connection the gun will become electrostatically charged. Personnel touching the gun could receive a shock.

Flow-rate air pumps powder out of the feed hopper and forces it through the feed hose to the diffuser. Diffuser air mixes with the powder and increases its speed. The powder and air mixture then passes between the inner and outer wear sleeves inside the charge module. The collision of the powder particles with the walls of the sleeves electrostatically charges both the powder particles and the sleeves.

The sleeves are grounded through the gun body, ground wire, and control unit. The charge picked up by the sleeves is displayed in microamperes at the control unit. The display indicates how well the powder is charging (the higher the number, the stronger the charge the powder is receiving). The strength of the charge the powder receives will vary depending on many factors, including the powder type and its speed through the gun.

3. Options

The options listed in Table 2-1 are available for use with the Tribomatic II automatic gun. Refer to the *Options* section for part numbers and descriptions.

Table 2-1 Options

Options	Description
Tribomatic sprayheads and nozzles	Available in PTFE. Connect directly to the charge module.
Sprayhead repair kit	Use to repair 630 006 adjustable 8-nozzle sprayhead.
Gun mounting bar	Use to mount an automatic gun on a 1-in. round or square fixed gun stand or gun mover arm.
Gun holder adapter	Allows old style Tribomatic gun holders to be used with gun mounting bars and the Tribomatic II automatic gun.
Lance extensions	Use to spray powder into recesses. Available in 100-, 150-, or 300-mm lengths.
Deflectors for lance extensions	Available in Tivar, with and without holes.
Versa-Spray nozzles	Refer to the Versa-Spray automatic gun manual for descriptions and part numbers. Must be used with one of the optional lance extensions described above.
Powder feed hose, air tubing, spiral-cut tubing, and hose clamps	Available in both metric and English ID and OD sizes and in bulk lengths.

4. Material Descriptions

Table 2-2 contains descriptions of the three types of plastics used in the Tribomatic II guns and the powder compatible with each type. Use this table to determine the types of plastics used in your gun.

Table 2-2 Material Description and Usage

Material	Appearance	Usage
PTFE	Opaque white	Standard material for inlet and outlet distributors and wear sleeves in automatic guns. Optional for manual guns. Shorter wear-life than Tivar, but reduces or eliminates impact-fusion.
Tivar	Greyish, translucent white	Longer wear-life than PTFE, but some powders may impact-fuse to Tivar. Switch to PTFE if impact-fusion is a problem.
Nylon	Yellowish white	Standard material for nylon guns. Use for spraying PTFE powders. Most organic powders will impact-fuse to nylon.

Section 3

Installation

Section 3
Installation

1. Mounting

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. See Figure 3-1. Install the gun mounting bar (2) on a fixed gun stand or gun mover arm (1).
2. Unscrew the adjuster (4) from the ball mount cap (7). Slide it over the end of the mounting bar (3).
3. Loosen the two set screws (6) in the ball mount flange (5). Slide the end of the mounting bar into the flange. Tighten the set screws.
4. Slide the adjuster down the mounting bar. Thread it onto the ball mount cap.
5. Make sure the M6 x 8 set screw (8) is tightened.
6. Rotate the gun to the desired position, then tighten the adjuster to lock the gun into position.

1. Mounting (contd.)

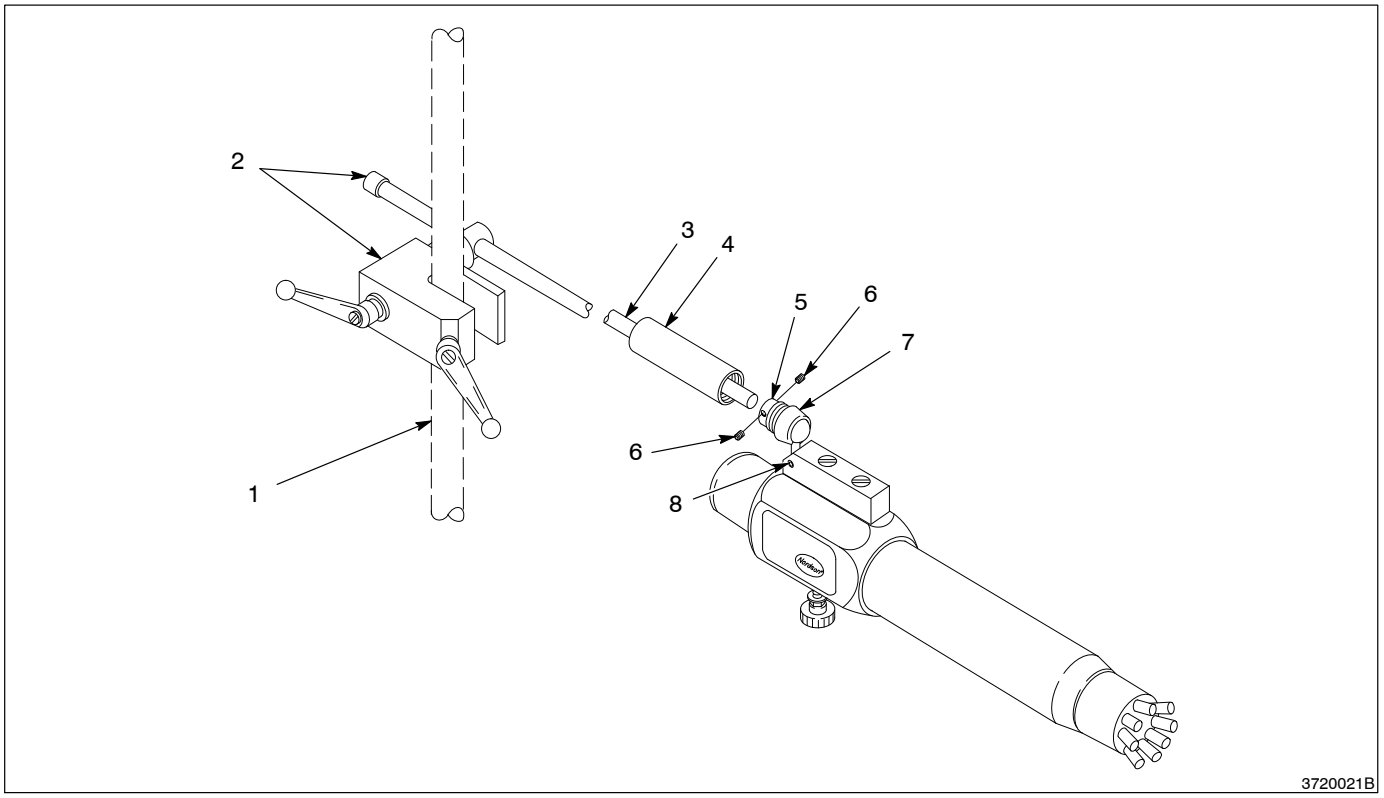

Fig. 3-1 Mounting the Tribomatic II automatic gun

1. Fixed gun stand or gun mover arm
2. Gun mounting bar assembly
3. Gun mounting bar
4. Adjuster
5. Ball mount flange
6. Set screws
7. Ball mount cap
8. M6 x 8 set screw

2. Feed Hose, Air Tubing and Ground Wire Connections

1. See Figure 3-2. Install the diffuser (1) into the charge module body (2).

2. Install 6-mm blue air tubing (7) between the diffuser and the control unit and 6-mm black flow-rate air tubing between the control unit and the powder pump.

3. Connect powder feed hose (5) to the barbed diffuser fitting, route the hose to the powder pump, and connect it the pump outlet connector. Use snap clamps to secure the hose to the diffuser and pump adapters. Wrap spiral-cut tubing around the hose where necessary to prevent it from kinking and cutting off the flow of powder.

2. *Feed Hose, Air Tubing and Ground Wire Connections* *(contd.)*

4. Attach a ground wire (6) to the ground stud (4). Tighten the knurled knob to secure the wire.

5. Route the ground wire to the control unit and connect it to the correct terminal in the rear panel.

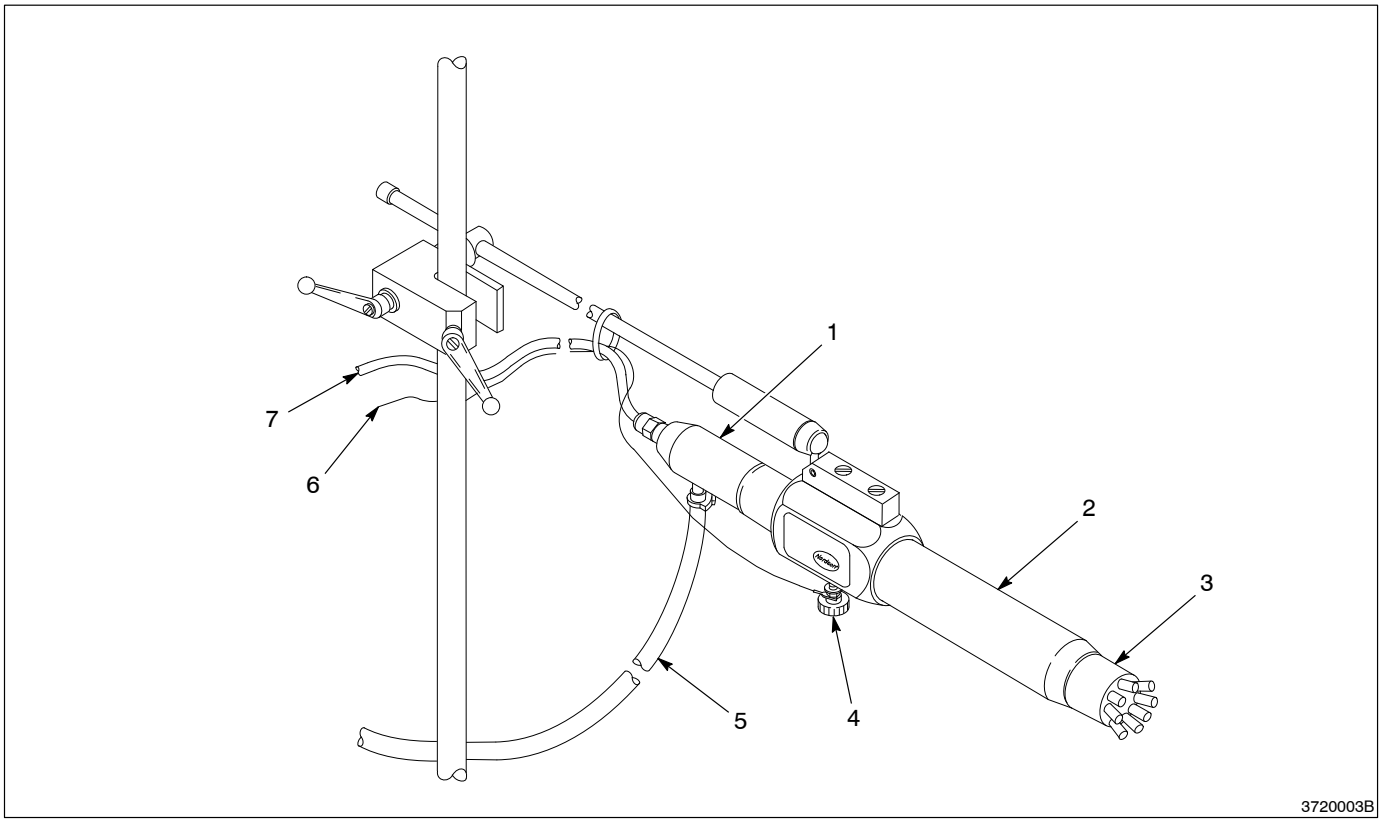

Fig. 3-2 Connecting feed hose, air tubing and ground wire

1. Diffuser
2. Charge module body
3. Sprayhead
4. Ground stud
5. Feed hose
6. Ground wire
7. Air tubing

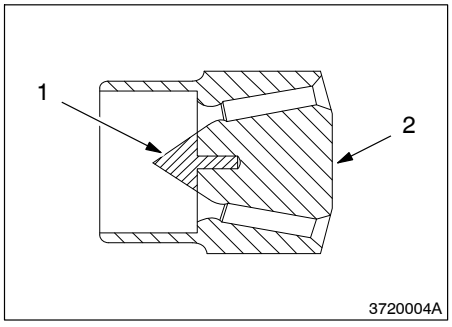

Fig. 3-3 Removing nozzle cone

1. Nozzle cone
2. Sprayhead base

6. See Figure 3-3. Before installing a sprayhead on the gun, remove the nozzle cone (1) from the interior of the sprayhead base (2) with a pair of pliers. (The cone is only used with the original Tribomatic gun.)

7. See Figure 3-2. Install the sprayhead (3) on the end of the charge module (2) with a twisting motion.

8. Adjust the gun-to-workpiece distance and position.

3. Installing Nozzles on Sprayheads

Sprayheads are available in many configurations. Standard sprayheads can be modified for your application using optional nozzles. Figure 3-4 illustrates the various ways in which these nozzles can be installed. The following optional nozzles are available:

Threaded nozzles—Use to modify standard sprayheads. They are threaded on one end to screw into the sprayhead base.

Angled nozzles—Install on existing sprayhead nozzles, using cylindrical nozzles as connectors. These nozzles are not threaded.

Pinpoint, flat, cylindrical, and 8-orifice nozzles—Install on sprayhead tubing ends or on threaded or angled nozzles. The 8-orifice nozzle must be installed on a cylindrical nozzle. Cylindrical nozzles are also used as connectors.

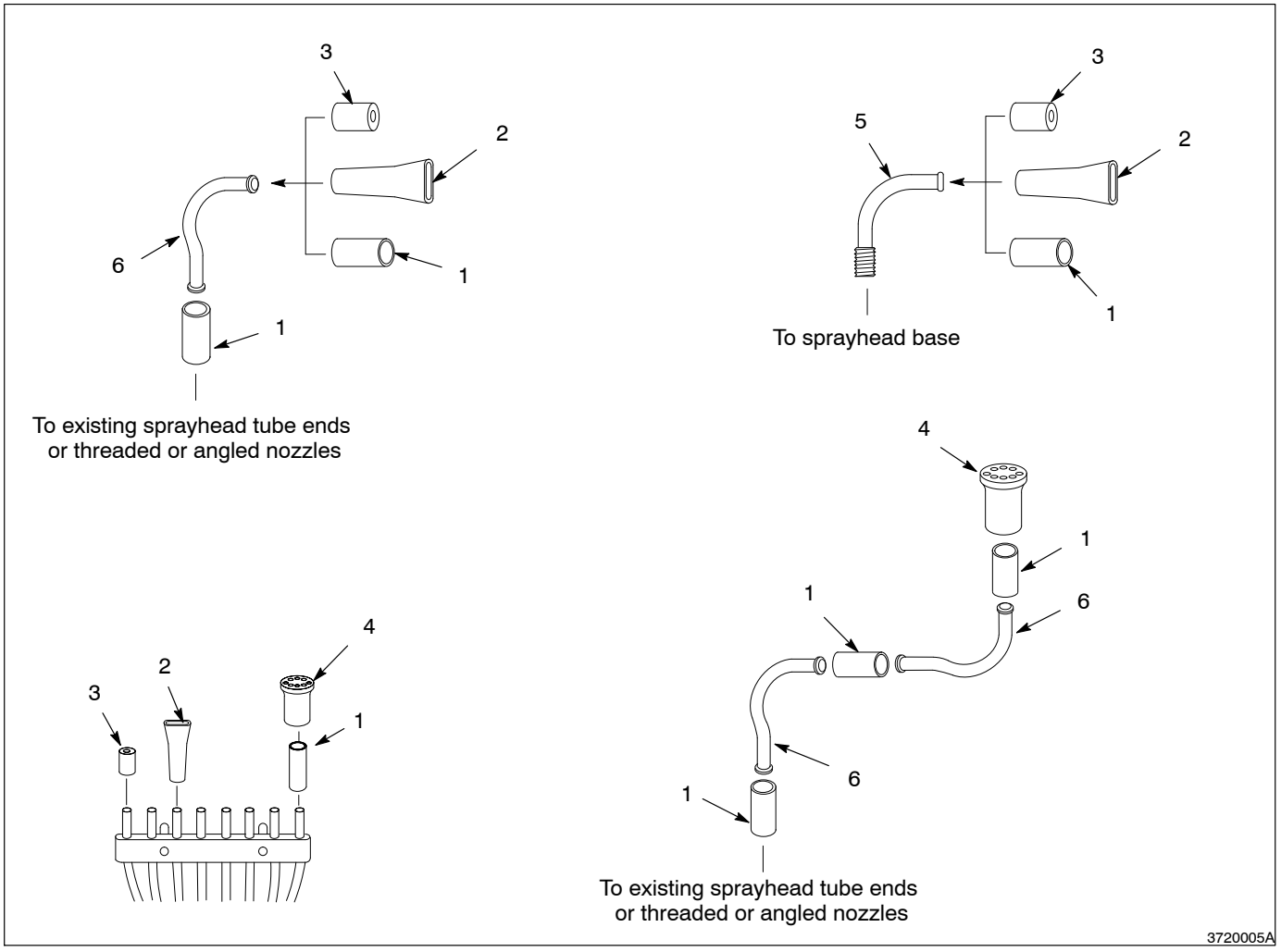

Fig. 3-4 Connecting feed hose, air tubing and ground wire

1. Cylindrical nozzles
2. Flat nozzles
3. Pinpoint nozzles
4. 8-orifice nozzles
5. Threaded nozzles
6. Angled nozzles w/o threads

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.

1. Introduction

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.

WARNING: Make sure the gun is grounded before spraying powder or cleaning the gun with compressed air. Without a ground connection the gun will become electrostatically charged. Personnel touching the gun could receive a shock.

Each automatic gun is controlled by one gun control unit which houses electrical controls, a digital display, and regulators and gauges for flow-rate and diffuser air. Refer to the control unit manual for operation instructions.

2. Operation

Powder volume, velocity, and atomization are controlled by the flow rate and diffuser air pressure settings. As a starting point, set air pressures to:

Flow-rate (ejector) air pressure	1.8 bar (26 psi)
Diffuser (atomizing) air pressure	2.5 bar (36 psi)

Keep the flow-rate air pressure as low as possible. Maintain the same ratio of diffuser air-to-flow-rate air without reducing the charging level. Reduce the diffuser air pressure if powder is being blown out of recesses. Build coating thicknesses slowly. Reduce air pressures to keep overspray to a minimum.

Experiment with the part hanger configuration and part density. Reduce the space between parts to keep overspray to a minimum. Keep the air velocity through the booth as close to the minimum required by law as practical without violating safety.

2. Operation *(contd.)*

Use different sprayheads for different part shapes. Select the appropriate nozzle for the parts being coated.

- Pinpoint nozzles for penetration
- 8-orifice nozzles for flat surfaces
- Cylindrical nozzles for general purpose coating

Angle the nozzles to meet and follow the parts as they move through the booth. Typical nozzle-to-part distance is 20–25 cm (8–10 in.). Coat the inside surfaces and recessed areas first, then coat the outside surfaces and open areas.

3. Maintenance

Perform the following maintenance procedures daily.

WARNING: Make sure the gun is grounded before spraying powder or cleaning the gun with compressed air. Without a ground connection the gun will become electrostatically charged. Personnel touching the gun could receive a shock.

1. Remove the powder feed hose from the pump and the air tubing from the pump and diffuser. Use an OSHA-approved air gun to clean the hose, diffuser, and charge module with compressed air.

2. Remove the diffuser from the gun body. Disassemble the diffuser and clean the parts with compressed air and a clean, soft cloth. Check the powder contact parts for wear and replace worn parts.

   NOTE: Never use a knife or other sharp objects to clean plastic parts. Powder will build up on scratches on the powder contact surfaces. The powder particles can fuse on impact and clog the gun.

3. Blow out the charge module and sprayheads. Disassemble and clean the charge module. Check the powder contact parts for wear and replace worn parts.

   NOTE: Never blow powder through the feed hose back into the pump. Turn on the booth exhaust fan, disconnect the hose from the pump, and blow out the hose from the pump end into the booth.

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.

4. Make sure all conductive equipment in the spray area, including the guns, are connected to a true earth ground. The resistance from part to ground, through the hangers and conveyor, must not exceed one megohm. For best results, the resistance should be less than 500 Ω.

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.

1. Introduction

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.

2. Troubleshooting Charts

Problem	Possible Cause	Corrective Action
1. Powder does not flow when control unit turned on	No supply air or pressure set too low	Make sure control unit is getting air. Check supply air pressure.
	Blockage in system	Shut down and clean system starting with pump. Check air dryer for proper operation. Drain air filters and inspect filter elements. Make sure powder supply in feed hopper is dry.
	Control unit malfunction. Solenoid valve is not opening	Repair or replace control unit.
	Flow-rate (ejector) air pressure too low	Increase flow-rate air pressure.

2. Troubleshooting Charts
(contd.)

Problem	Possible Cause	Corrective Action
2. Powder puffing from gun	Blockage in system	Shut down system. Clean system starting with pump.
	Pump venturi throat worn out	Change venturi throat.
	Diffuser (atomizing) air pressure too high or incorrect ratio of diffuser to flow-rate air pressure	Decrease diffuser air pressure or increase flow-rate air pressure.
	Powder feed hose ID too large or hose too short	Change to smaller ID hose or change hose length. Best results are obtained when hose is 4–6 m (13–20 ft) long.
3. Poor powder charging—no electrostatic wrap or adhesion	Flow-rate air pressure too high or diffuser air pressure too low	Decrease flow-rate air pressure or increase diffuser air pressure.
	Parts not properly grounded	Check conveyor and hangers with standard ohmmeter for coating buildup that could affect ground. Resistance between parts and ground must not exceed 1 megohm. For best results resistance should not exceed 500 ohms.
	Too much moisture in compressed air supply	Check air dryer for proper operation. Use a refrigerated or regenerative desiccant air dryer that can produce a 3.4 °C (38 °F) or lower dew point at 7 bar (100 psi). Drain air filter and check filter element.
	Inner and outer wear sleeves worn	Disassemble gun. Reverse inner and outer wear sleeves (turn end-for-end). Replace sleeves if necessary.
	Too many fine particles in powder supply	Replace powder supply with virgin powder. Consult with powder manufacturer.
	Powder not suitable for tribo-charging	Consult with powder manufacturer.
4. Inadequate powder flow	Flow-rate air pressure too low	Increase flow-rate air pressure.
	Wet powder clogging system	Check air filters, dryer, and powder supply. Service filters and/or dryer and change powder supply.

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.

1. Introduction

See Figure 6-1. This illustration shows how the parts of the charge module fit together. Refer to this drawing when assembling the charge module.

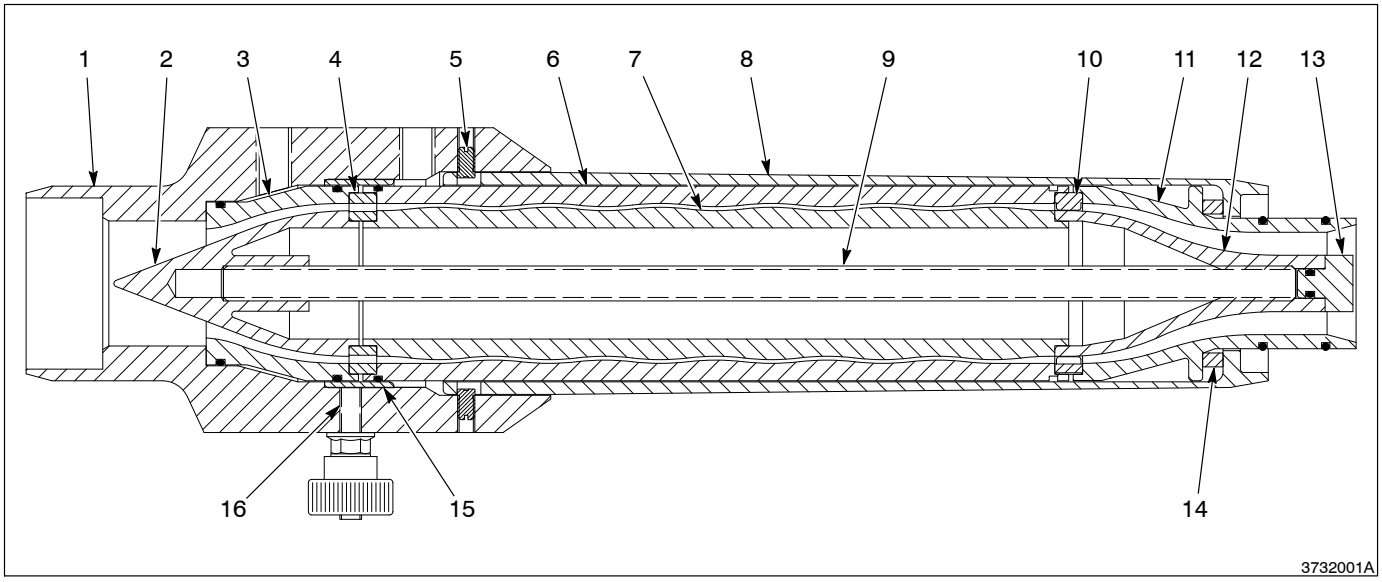

Fig. 6-1 Charge module

1. Body
2. Inlet distributor
3. Inlet wear sleeve
4. Positioning ring
5. Body pins
6. Outer wear sleeve
7. Inner wear sleeve
8. Extension
9. Threaded rod
10. Spacing ring
11. Outlet wear sleeve
12. Outlet distributor
13. Outlet distributor plug
14. Spring
15. Grounding ring
16. Ground stud

2. Cleaning

Before disassembling the gun perform the following steps:

1. Shut off the flow-rate and diffuser air.
2. Disconnect the powder feed hose from the pump and the diffuser air tubing from the diffuser.
3. Leave the ground wire attached to the gun. Make sure the booth exhaust fan is running.
4. Blow out the feed tubing, diffuser, and charge module.
5. Pull the diffuser from the gun body and blow out the charge module again.
6. Remove the sprayhead.

3. Inlet and Outlet Wear Sleeve Assemblies

The following paragraphs provide repair procedures for the inlet and outlet wear sleeve assemblies.

Removal

1. See Figure 6-2. Push the extension (3) toward the body (1) and twist it counterclockwise to release it from the body pins. Pull the extension out of the body, and slide it off the inner and outer wear sleeve assembly (2). The outlet wear sleeve assembly (4) will remain inside the extension.
2. Pull the inner and outer wear sleeve assembly from the body. The inlet wear sleeve assembly will stay in the body.

NOTE: The body pins are replaceable. If you break or bend them, unscrew them from the body and install new ones.

3. See Figure 6-3. Push the inlet wear sleeve assembly (2) out of the body (1) with a wooden dowel or piece of $^{3}/_{4}$-in. OD schedule 40 PVC pipe. Discard the O-rings (3, 5).
4. Remove the outlet wear sleeve assembly (7) from the extension (6). Clean the body and extension with a clean, lint-free cloth.

Removal *(contd.)*

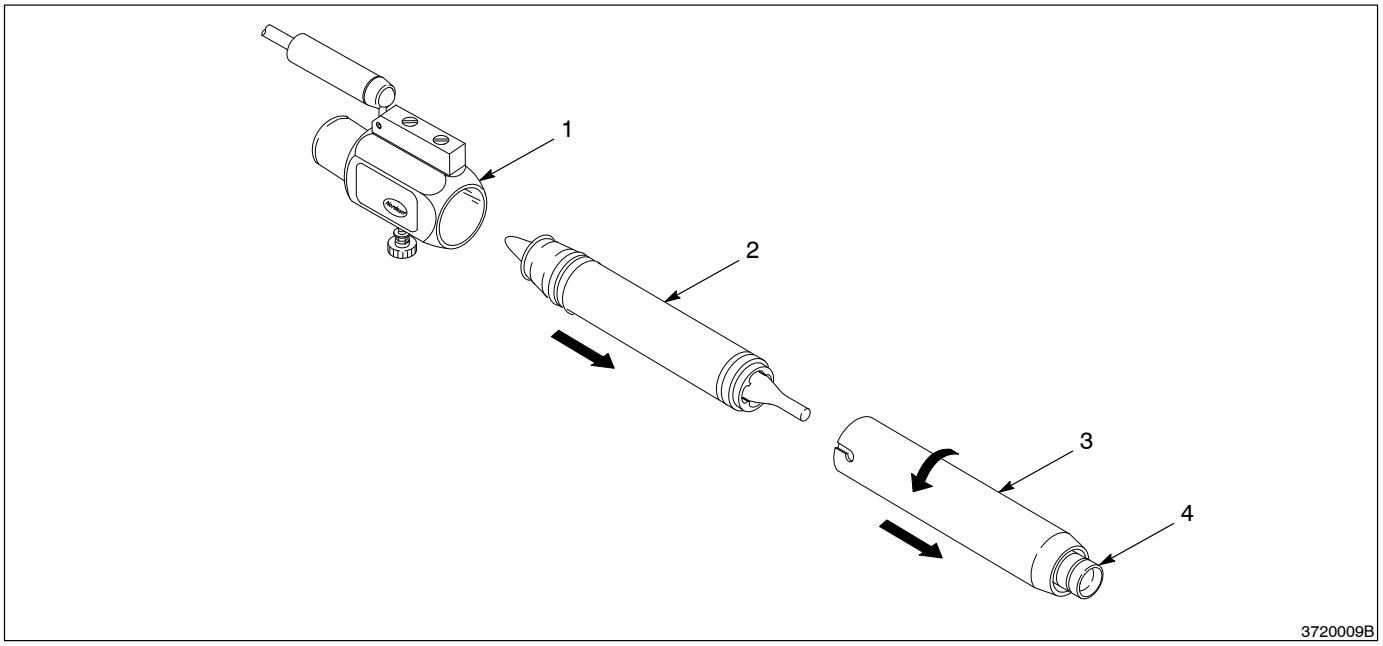

Fig. 6-2 Removing the inner and outer wear sleeve assembly

1. Body
2. Inner and outer wear sleeve assembly
3. Extension
4. Outlet wear sleeve assembly

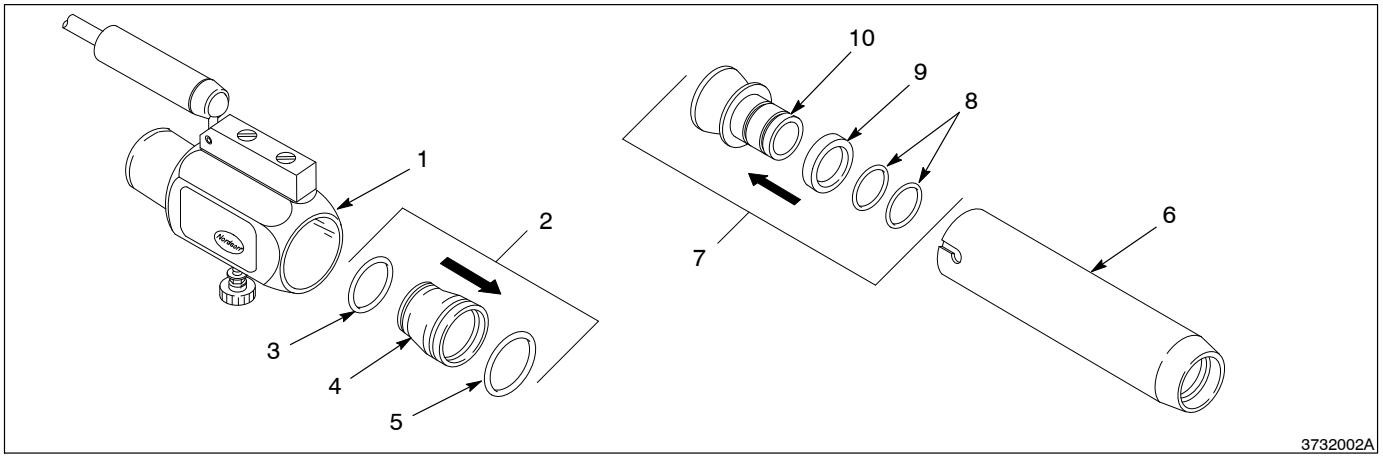

Fig. 6-3 Removing the inlet and outlet wear sleeve assemblies

1. Body
2. Inlet wear sleeve assembly
3. O-ring
4. Inlet wear sleeve
5. O-ring
6. Extension
7. Outlet wear sleeve assembly
8. O-ring
9. Spring
10. Outlet wear sleeve

Installation

1. See Figure 6-3. Install the O-rings (3, 5) on the inlet wear sleeve (4).
2. Install the spring (9) and O-rings (8) on the outlet wear sleeve (10).
3. See Figure 6-4. Insert the inlet wear sleeve assembly (1) into the body (3).
4. Insert the outlet wear sleeve assembly (2) into the extension (4).

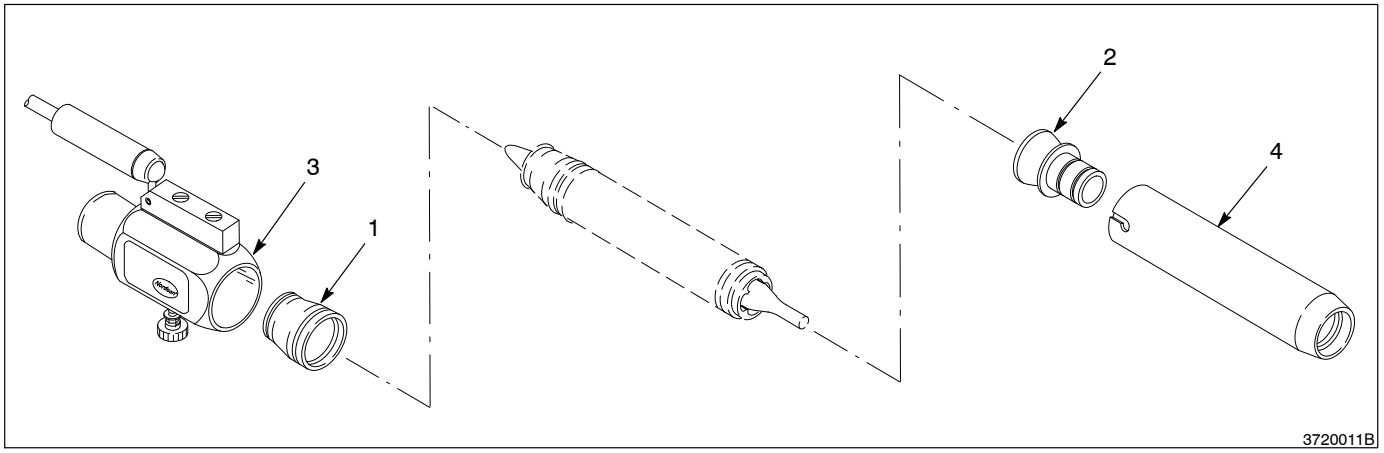

Fig. 6-4 Installing the inlet and outlet wear sleeve assemblies

1. Inlet wear sleeve assembly
2. Outlet wear sleeve assembly
3. Body
4. Extension

5. See Figure 6-5. Insert the inner and outer wear sleeve assembly (2) into the body (1) with the inlet distributor (cone-shaped end) first. Make sure the positioning ring (3) fits into the groove in the ID of the inlet wear sleeve.
6. Make sure the spacing ring (4) is in place in the end of the outer wear sleeve. Slide the extension (5) over the inner and outer wear sleeve assembly. Engage the slots in the extension with the pins in the body. Push the extension in and rotate it clockwise to lock it to the body.
7. Install the sprayhead and diffuser. Connect the powder feed tubing and diffuser air line.

Installation *(contd.)*

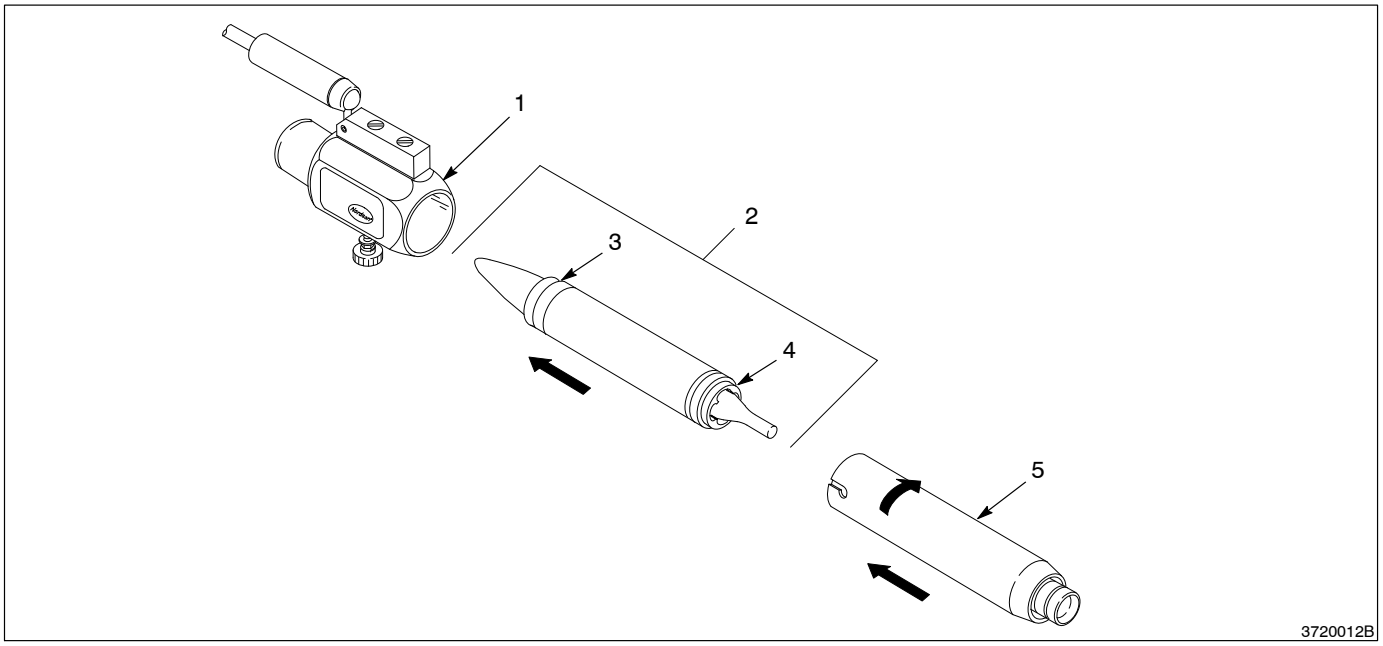

Fig. 6-5 Installing the inner and outer wear sleeve assembly

1. Body
2. Inner and outer wear sleeve assembly
3. Positioning ring
4. Spacing ring
5. Extension

4. Inner and Outer Wear Sleeves

The following paragraphs provide repair procedures for the inner and outer wear sleeves.

Removal

1. See Figure 6-2. Push the extension (3) toward the body (1) and twist it counterclockwise to release it from the body pins. Pull the extension out of the body, and slide it off the inner and outer wear sleeve assembly (2). The outlet wear sleeve assembly (4) will remain inside the extension.

2. Pull the inner and outer wear sleeve assembly from the body. The inlet wear sleeve assembly will stay in the body.

3. See Figure 6-6. Hold the outer wear sleeve (3) in your hand and push on the outlet distributor (2). Discard the outer wear sleeve and spacing ring (4).

4. See Figure 6-7. Unscrew the inlet distributor (1) or outlet distributor (5) from the threaded rod (2) and remove the distributors and threaded rod from the inner wear sleeve (4). Discard the inner wear sleeve and positioning ring (3).

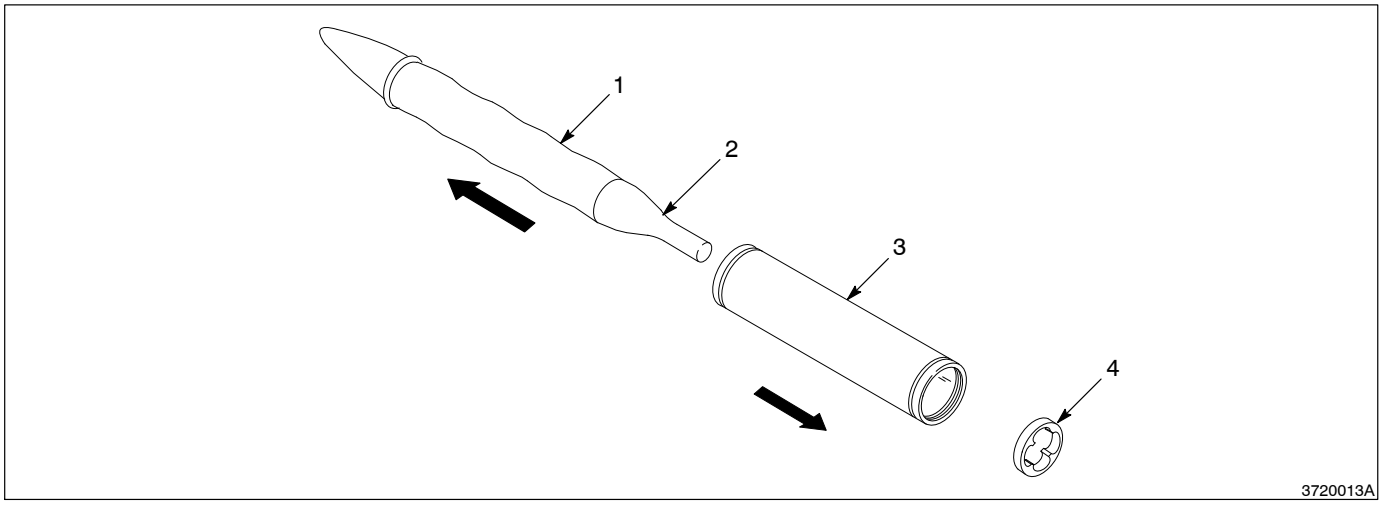

Fig. 6-6 Inner and outer wear sleeve

1. Inner wear sleeve
2. Outlet distributor
3. Outer wear sleeve
4. Spacing ring

Installation

1. See Figure 6-7. Slide the new positioning ring (3) onto one end of the new inner wear sleeve (4).

NOTE: The spacing and positioning rings, as well as the inner and outer wear sleeves, are reversible.

2. Screw the inlet distributor (1) onto one end of the threaded rod (2). Insert the threaded rod into the positioning ring end of the inner wear sleeve. Screw the outlet distributor (5) onto the threaded rod and tighten it securely by hand.

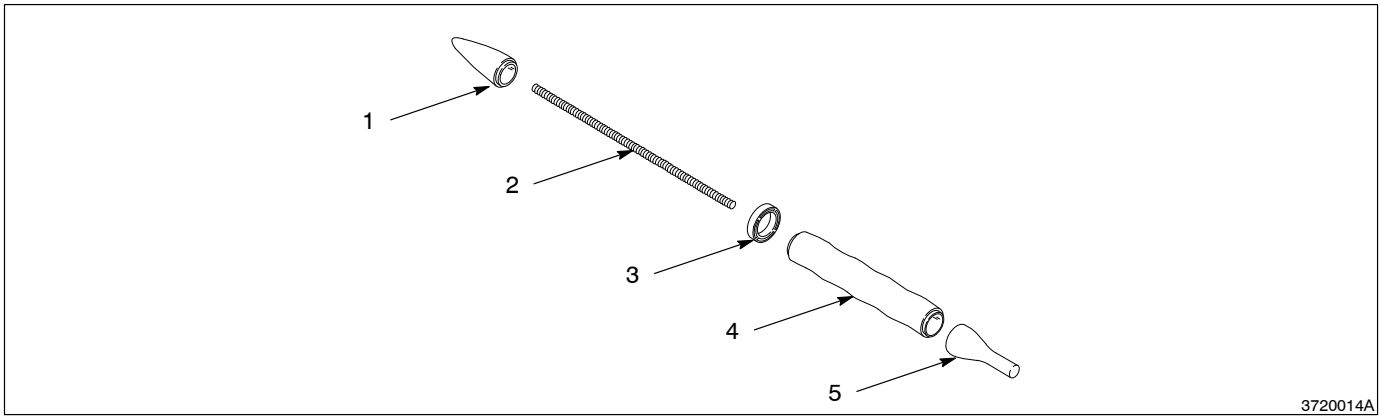

Fig. 6-7 Inner wear sleeve assembly

1. Inlet distributor
2. Threaded rod
3. Positioning ring
4. Inner wear sleeve
5. Outlet distributor

3. See Figure 6-8. Push the inner wear sleeve assembly (1) into the outer wear sleeve (3) until the positioning ring (2) seats properly into the outer wear sleeve.

4. Install the new spacing ring (4) over the inner wear sleeve assembly. Seat it in the end of the outer wear sleeve.

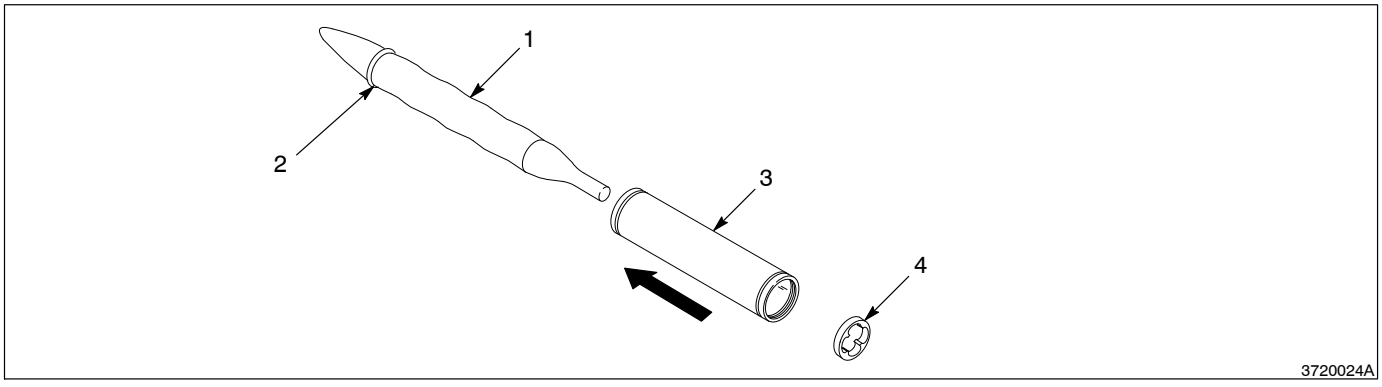

Fig. 6-8 Installing the inner wear sleeve into the outer wear sleeve

1. Inner wear sleeve assembly
2. Positioning ring
3. Outer wear sleeve
4. Spacing ring

***Installation** (contd.)*

5. See Figure 6-5. Insert the inner and outer wear sleeve assembly (2) into the body (1) with the inlet distributor (cone-shaped end) first. Make sure the positioning ring (3) fits into the groove in the ID of the inlet wear sleeve.

6. Make sure the spacing ring (4) is in place in the end of the outer wear sleeve. Slide the extension (5) over the inner and outer wear sleeve assembly. Engage the slots in the extension with the pins in the body. Push the extension in and rotate it clockwise to lock it to the body.

7. Install the sprayhead and diffuser. Connect the powder feed tubing and diffuser air line.

Section 7

Parts

Section 7
Parts

1. 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 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. PTFE Charge Module Parts

See Figure 7-1.

Item	Part	Description	Quantity	Note
—	304 376	Charge module, w/ball mount, PTFE	1	
1	631 225	• Extension, complete	1	
2	304 385	• Sleeve, wear, outlet, PTFE, assy purge	1	
3	941 193	• • O-ring, silicone, 0.937 x 1.125 x 0.093 in.	2	
4	304 379	• • Spring, silicone, 1.25 x 1.63 in.	1	
5	631 220	• Ring, spacing	1	A
6	631 212	• Sleeve, wear, outer, PTFE	1	
7	940 284	• O-ring, silicone, 1.375 x 1.500 x 0.063 in.	1	
8	631 237	• Plug, distributor, outlet, Tivar	1	
9	940 066	• O-ring, silicone, 0.125 x 0.250 x 0.063 in.	1	
10	631 236	• Distributor, outlet, PTFE	1	
11	631 216	• Sleeve, wear, inner, PTFE	1	
12	631 210	• Ring, positioning	1	A
13	631 211	• Stud, M8 x 9.65 long	1	
14	631 234	• Distributor, inlet, PTFE	1	
15	631 232	• Sleeve, wear, inlet, PTFE	1	
16	940 284	• • O-ring, silicone, 1.375 x 1.500 x 0.063 in.	1	
17	940 243	• • O-ring, silicone, 1.125 x 1.250 x 0.063 in.	1	
18	631 235	• Pin, quick connect	2	
19	630 073	• Knob, M5 x .08	1	
20	630 088	• Stud, ground, w/nut	1	
21	631 228	• Body, autogun, assy	1	B

NOTE A: Refer to *Positioning and Spacing Ring Service Kit* for ordering information.
B: Please supply gun part number and serial number when ordering replacement body assembly.

2. PTFE Charge Module Parts (contd.)

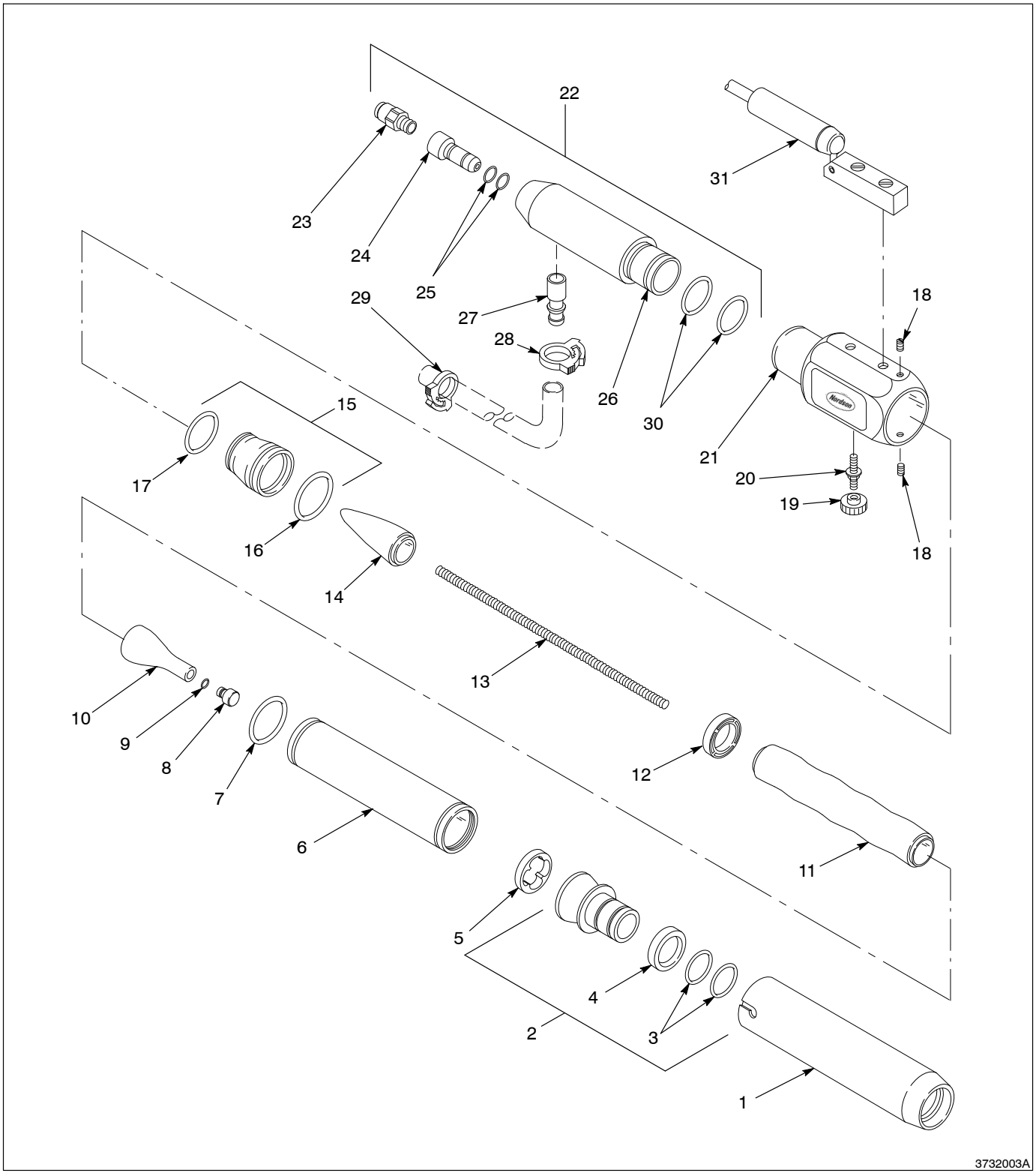

Fig. 7-1 Charge module

2. PTFE Charge Module Parts *(contd.)*

Item	Part	Description	Quantity	Note
22	304 383	• Diffuser, Tribomatic II, purge, single	1	
23	972 080	• • Connector, male, $^1/_8$ in. NPTF x $^1/_4$ in. tube	1	
24	635 007	• • Nozzle, diffuser	1	
25	940 117	• • O-ring, silicone, 0.312 x 0.438 x 0.063 in.	2	
26	635 008	• • Housing, diffuser, purge	1	
27	631 275	• • Connector, diffuser	1	
28	939 247	• • Clamp, hose	1	
29	247 006	• • Clamp, hose, 0.673–0.786 OD	1	
30	941 193	• • O-ring, silicone, 0.937 x 1.125 x 0.093 in.	2	
31	183 539	In-line ball mount	1	C
NOTE C: Refer to *In-Line Ball Mount Kit Parts* list in this section for ordering information.				

3. Positioning and Spacing Ring Service Kit

See Figure 7-2.

Item	Part	Description	Quantity	Note
—	631 209	Service kit, positioning and spacing rings	1	
1	631 210	• Ring, positioning	1	
2	631 220	• Ring, spacing	1	

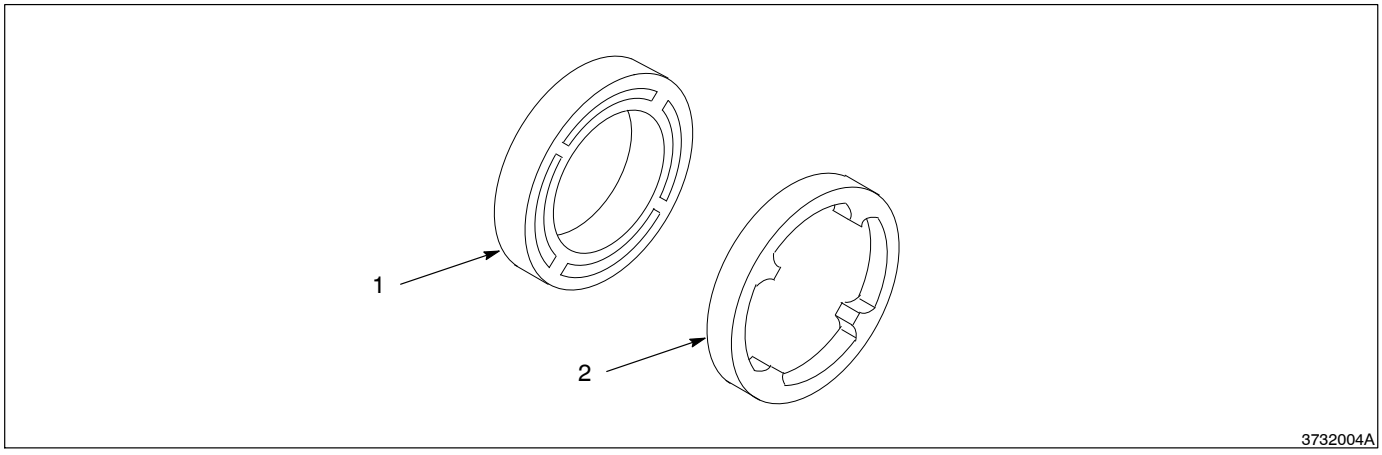

Fig. 7-2 Positioning and spacing ring service kit

4. In-Line Ball Mount Kit Parts

See Figure 7-3.

Item	Part	Description	Quantity	Note
—	183 539	Kit, VS2 in-line ball mount	1	
—	- - - - - -	• Mount, VS2, in-line ball	1	
1	941 143	• • O-ring, silicone, 0.625 x 0.813 x 0.094 in.	1	
2	183 547	• • Adjuster, hand, ball mount	1	
3	183 546	• • Flange, bar, ball mount	1	
4	982 067	• • Screw, set, cup, M5 x 5, black	2	
5	941 176	• • O-ring, silicone, 0.813 x 1.00 x 0.094 in.	1	
6	183 818	• • Ball, pivot, VS2 gun mount	1	
7	183 549	• • Cap, ball mount	1	
8	982 595	• • Screw, set, cone, M6 x 8, stainless steel	1	
9	183 548	• • Plate, adapting, ball mount	1	
10	982 186	• Screw, flat head, M8 x 20	2	
11	129 592	Knob, clamping, M6 x 12	1	A
NOTE A: Optional equipment, replaces item 8.				

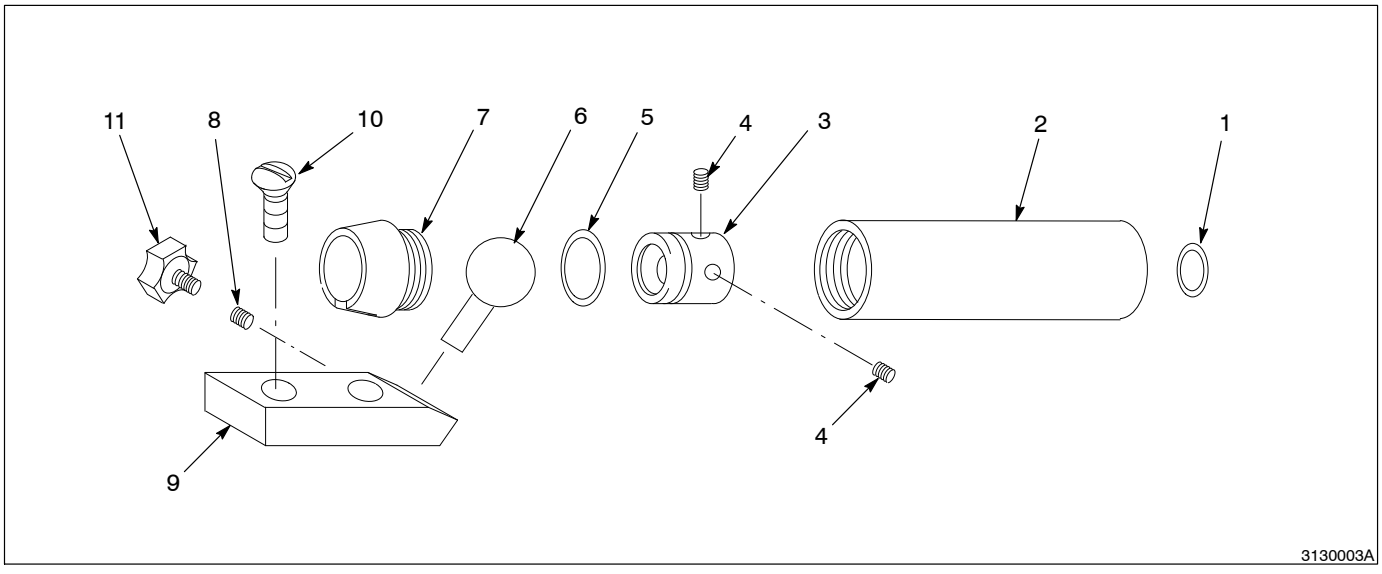

Fig. 7-3 In-line ball mount kit

Section 8

Options

Section 8
Options

1. Shur-Lok Gun Mount

See Figure 8-1. The Shur-Lok gun mount can be used as an alternative to the in-line ball mount. The Shur-Lok uses the same size mounting rod as the in-line ball mount.

Item	Part	Description	Quantity	Note
—	133 409	Mount, gun, w/pivot	1	
1	982 067	• Screw, set, cup, M5 x 5, black	2	
2	983 527	• Washer, flt, 0.344 x 1.125 x 0.063	1	
3	981 708	• Screw, set, cup, M5 x 5, black	2	

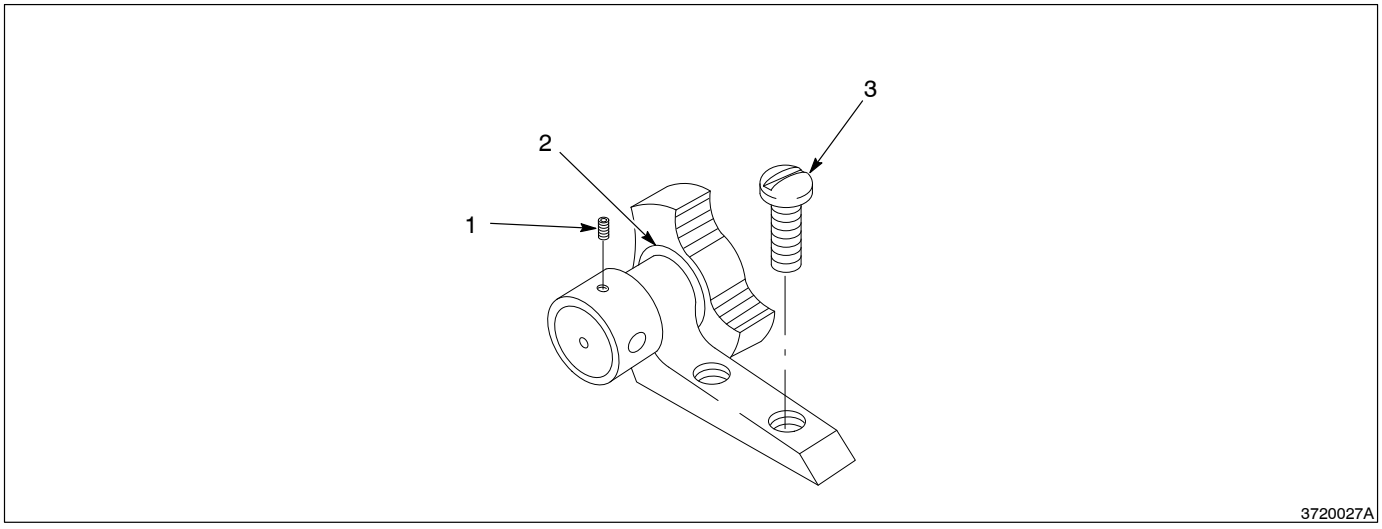

Fig. 8-1 Shur-Lok gun mount

2. Sprayheads

See Figures 8-2, 8-3, and 8-4. Special sprayhead designs can be requested. Contact Nordson Sverige AB, ICAB Division.

Item	Part	Description	Note
1	630 006	Sprayhead, adjustable	A
2	630 009	Sprayhead, expandable	A
3	630 010	Sprayhead, short	
4	630 330	Sprayhead, fixed, 105 mm	A
4	630 209	Sprayhead, fixed, 130 mm	A
4	630 169	Sprayhead, fixed, 165 mm	A
4	630 201	Sprayhead, fixed, 200 mm	A
4	630 322	Sprayhead, fixed, 235 mm	A
4	630 008	Sprayhead, fixed, 270 mm	A
4	630 184	Sprayhead, fixed, 305 mm	A
4	630 171	Sprayhead, fixed, 360 mm	A
4	630 208	Sprayhead, fixed, 425 mm	A
4	630 323	Sprayhead, fixed, 460 mm	A
4	630 172	Sprayhead, fixed, 515 mm	A
5	630 200	Sprayhead, graduated, 90 deg	A
6	630 178	Sprayhead, round, 100 mm dia	A

NOTE A: Noted sprayheads include 630 017 cylindrical nozzles.

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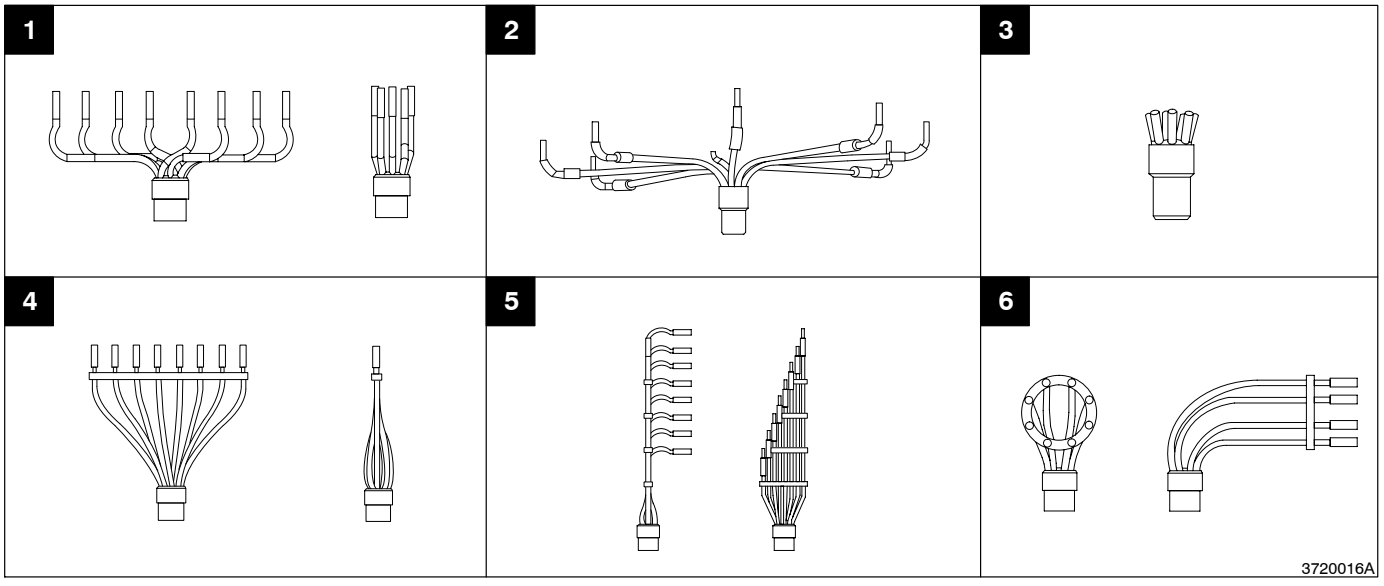

Fig. 8-2 Sprayheads (drawings not to scale)

2. Sprayheads (contd.)

Item	Part	Description	Note
7	630 186	Sprayhead, 2 row, 80 mm	A
7	630 174	Sprayhead, 2 row, 100 mm	A
7	630 180	Sprayhead, 2 row, 130 mm	A
7	630 328	Sprayhead, 2 row, 165 mm	A
7	630 337	Sprayhead, 2 row, 185 mm	A
8	630 374	Sprayhead, fixed, 4 row, 120 mm	B
9	630 206	Sprayhead, fixed, 15 deg, 270 mm	A
9	630 187	Sprayhead, fixed, 30 deg, 270 mm	A
9	630 188	Sprayhead, fixed, 45 deg, 270 mm	A
10	630 338	Sprayhead, graduated, 90 deg, 200 mm	A
10	630 327	Sprayhead, graduated, 90 deg, 235 mm	A
10	630 332	Sprayhead, graduated, 90 deg, 315 mm	A
10	630 333	Sprayhead, graduated, 90 deg, 375 mm	A
10	630 358	Sprayhead, graduated, 90 deg, 420 mm	A
11	630 326	Sprayhead, fixed, 230 mm, 16 tubes	B
11	630 336	Sprayhead, fixed, 260 mm, 16 tubes	B
11	630 363	Sprayhead, fixed, 365 mm, 16 tubes	B
11	630 369	Sprayhead, fixed, 425 mm, 16 tubes	B
11	630 366	Sprayhead, fixed, 515 mm, 16 tubes	B
12	630 325	Sprayhead, 2 row, 140 mm, 16 tubes	B
12	630 349	Sprayhead, 2 row, 260 mm, 16 tubes	B

NOTE A: Noted sprayheads include 630 017 cylindrical nozzles.

B: Noted sprayheads include 630 340 cylindrical nozzles.

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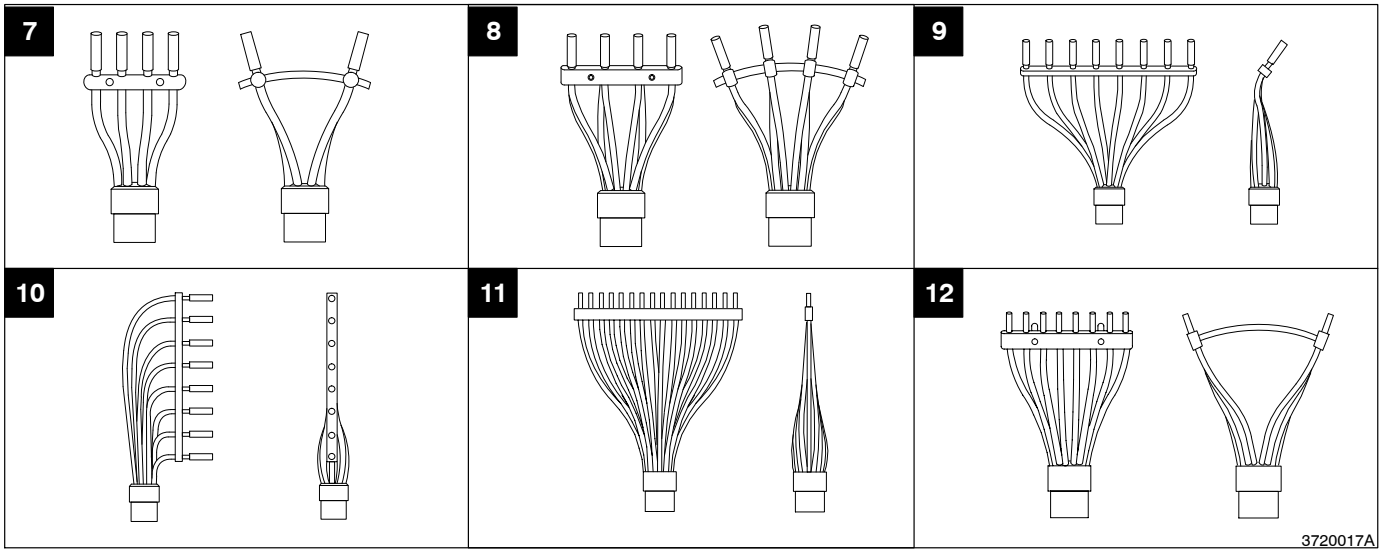

Fig. 8-3 Sprayheads (drawings not to scale)

2. Sprayheads (contd.)

Item	Part	Description	Note
13	630 321	Sprayhead, graduated, 30 deg, 270 mm	A
13	630 320	Sprayhead, graduated, 45 deg, 270 mm	A
14	630 361	Sprayhead, fixed, 30 deg, 260 mm, 16 tubes	B
14	630 341	Sprayhead, fixed, 45 deg, 260 mm, 16 tubes	B
15	630 344	Sprayhead, graduated, 45 deg, 230 mm, 16 tubes	B
16	630 368	Sprayhead, graduated, 90 deg, 235 mm, 16 tubes	B
16	630 367	Sprayhead, graduated, 90 deg, 390 mm, 16 tubes	B
17	630 359	Sprayhead, cross, 45 deg, 230 mm	B
17	630 362	Sprayhead, cross, 30 deg, 260 mm	B
17	630 360	Sprayhead, cross, 45 deg, 260 mm	B
17	630 371	Sprayhead, cross, 45 deg, 395 mm	B
17	630 373	Sprayhead, cross, 45 deg, 460 mm	B
17	630 370	Sprayhead, cross, 45 deg, 500 mm	B

NOTE A: Noted sprayheads include 630 017 cylindrical nozzles.
B: Noted sprayheads include 630 340 cylindrical nozzles.

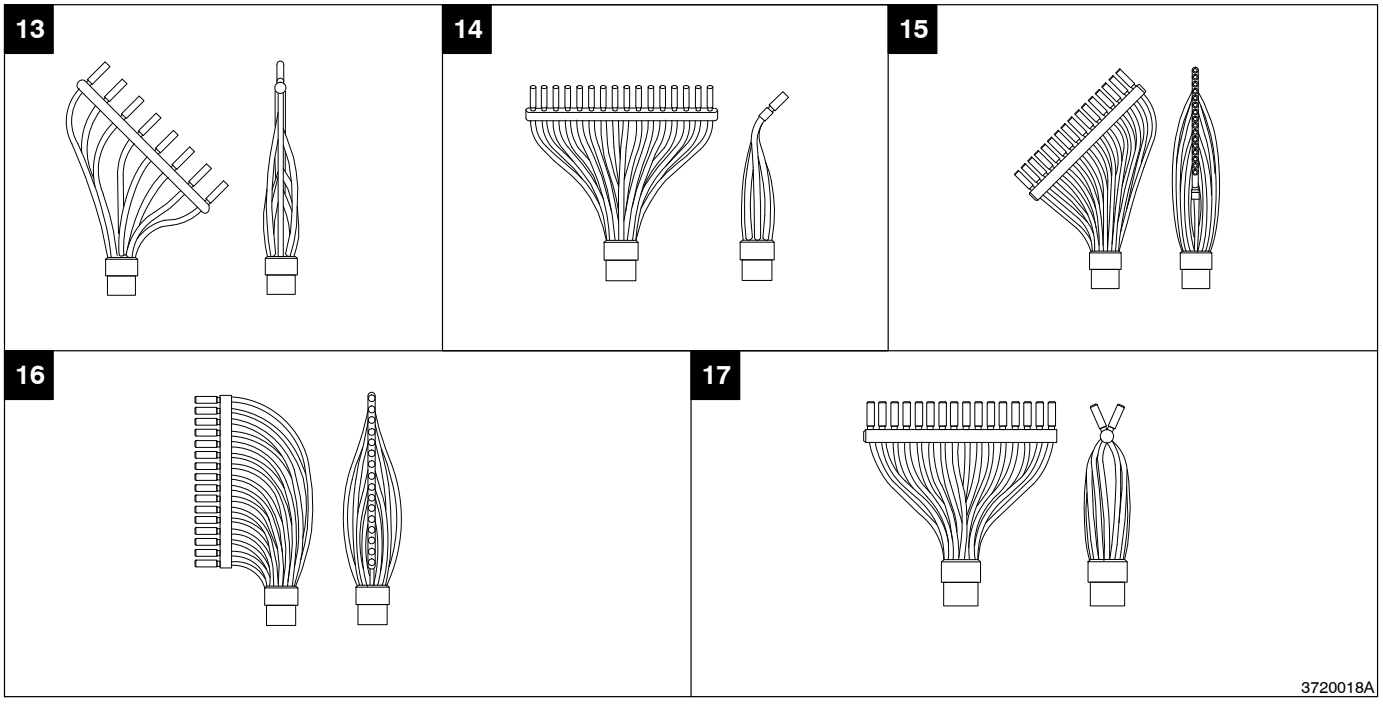

Fig. 8-4 Sprayheads (drawings not to scale)

3. 8-Tube Sprayhead Nozzles

See Figure 8-5. Refer to the *Installation* section for examples of nozzle usage.

Item	Part	Description	Note
1	630 017	Nozzle, cylindrical	
2	630 018	Nozzle, flat	
3	630 019	Nozzle, 8 orifice	
4	630 166	Nozzle, pinpoint	
5	630 092	Nozzle, threaded, A	
6	630 093	Nozzle, threaded, D	
7	630 094	Nozzle, threaded, C	
8	630 095	Nozzle, threaded, B	
9	630 182	Nozzle, 15 deg	
10	630 096	Nozzle, 45 deg	
11	630 097	Nozzle, 90 deg	
12	630 098	Nozzle, 30 deg	
13	630 181	Nozzle, 135 deg	

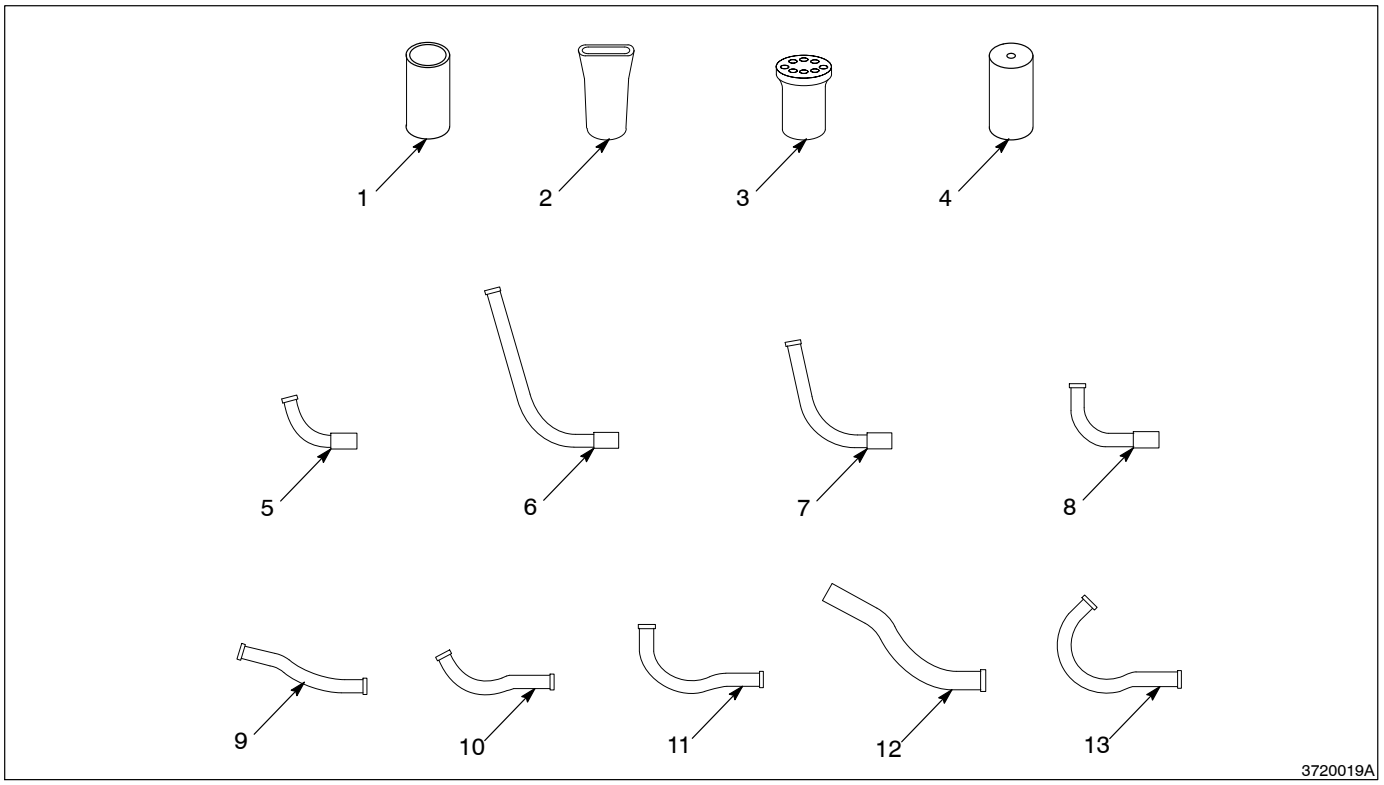

Fig. 8-5 Eight-tube sprayhead nozzles (drawings not to scale)

4. 16-Tube Sprayhead Nozzles

See Figure 8-6.

Item	Part	Description	Note
1	630 340	Nozzle, cylindrical, 16-tube	A
2	630 391	Nozzle, flat, 16-tube	
3	630 390	Nozzle, 8 orifice, 16-tube	
4	630 392	Nozzle, pinpoint, 16-tube	
5	630 386	Nozzle, 15 deg, 16-tube	
6	630 387	Nozzle, 30 deg, 16-tube	
7	630 388	Nozzle, 45 deg, 16-tube	
8	630 389	Nozzle, 90 deg, 16-tube	

NOTE A: Noted nozzle is included on all 16-tube sprayheads.

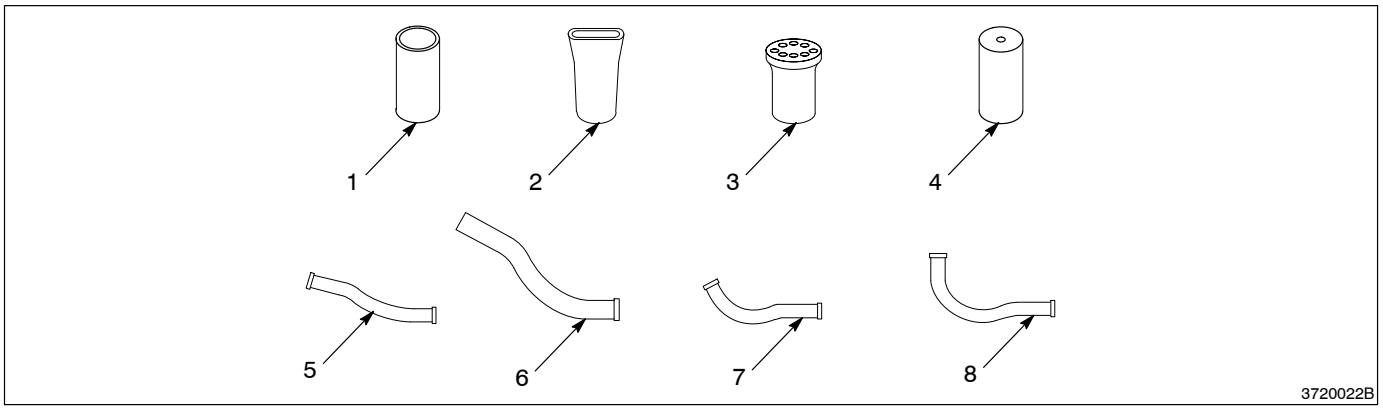

Fig. 8-6 Sixteen-tube sprayhead nozzles (drawings not to scale)

5. Sprayhead Repair Kit

This kit includes all the necessary parts to repair one 630 006 adjustable 8-nozzle sprayhead.

Part	Description	Quantity
630 063	Kit, repair, sprayhead, 8 nozzle, adjustable	1
630 017	• Nozzle, cylindrical	16
630 092	• Nozzle, threaded, A	2
630 093	• Nozzle, threaded, D	2
630 094	• Nozzle, threaded, C	2
630 095	• Nozzle, threaded, B	2
630 096	• Nozzle, 45 deg	2
630 097	• Nozzle, 90 deg	6

6. Lance Extensions

See Figure 8-7. Lance extensions are used to spray powder into recesses. Versa-Spray electrostatic gun nozzles can be installed on a lance extension.

Item	Part	Description	Quantity	Note
—	631 385	Extension, lance, 100 mm	1	
—	631 386	Extension, lance, 150 mm	1	
—	631 387	Extension, lance, 300 mm	1	
1	631 395	• Adapter, 100 mm	1	A
1	631 396	• Adapter, 150 mm	1	A
1	631 397	• Adapter, 300 mm	1	A
2	941 181	• O-ring, silicone, 0.875 x 1.063 x 0.093 in.	2	
3	144 758	• Nozzle, 32 mm	1	
4	941 205	• O-ring, silicone, 1.00 x 1.18 x 0.093 in.	1	
5	144 759	• Adjuster, pattern, 26 mm	1	
6	631 390	• Support, deflector	1	
—	631 392	• Deflector assembly, 26 mm, holes	1	B
7	940 084	• • O-ring, silicone, 0.187 x 0.312 x 0.063 in.	1	
8	- - - - - -	• • Deflector, 26 mm, holes	1	
—	631 394	• Distributor assembly, cone, Tribomatic II	1	C
9	940 066	• • O-ring, silicone, 0.125 x 0.250 x 0.063 in.	1	
10	- - - - - -	• • Distributor, cone	1	

NOTE A: Select length desired when ordering replacement parts.
B: A Tivar deflector with no holes is available. Order part 133 734.
C: This part replaces the plug in the end of the outlet distributor.

6. Lance Extensions (contd.)

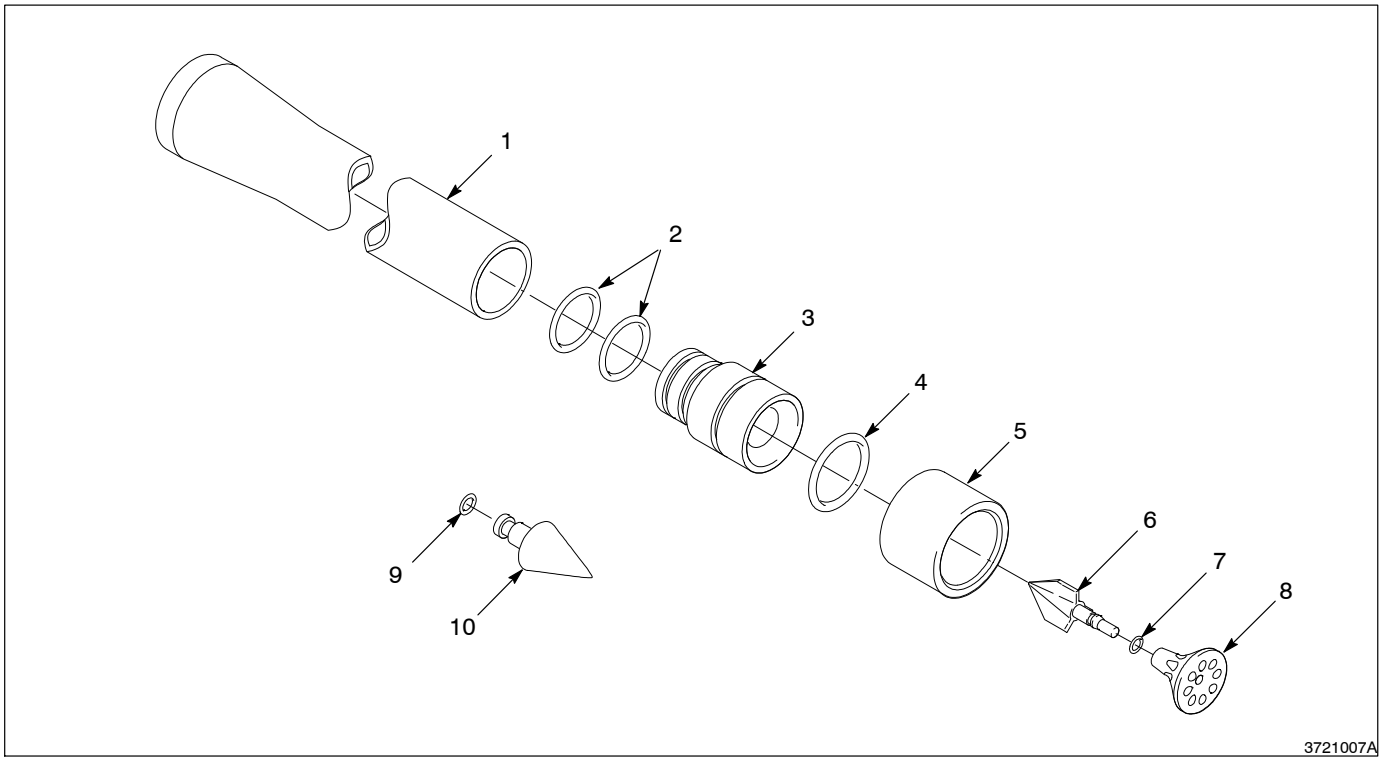

Fig. 8-7 Lance extensions

7. Gun Mounting Bar

See Figure 8-8. This mounting bar clamps onto a oscillator, reciprocator or fixed gun stand arm. The bar is 90-cm (36-in.) long. The length and angle of the bar can be adjusted. The mounting bar clamp is designed for 1-inch round or square tubing.

Part	Description	Quantity
133 403	Bar, gun, Versa-Spray	1

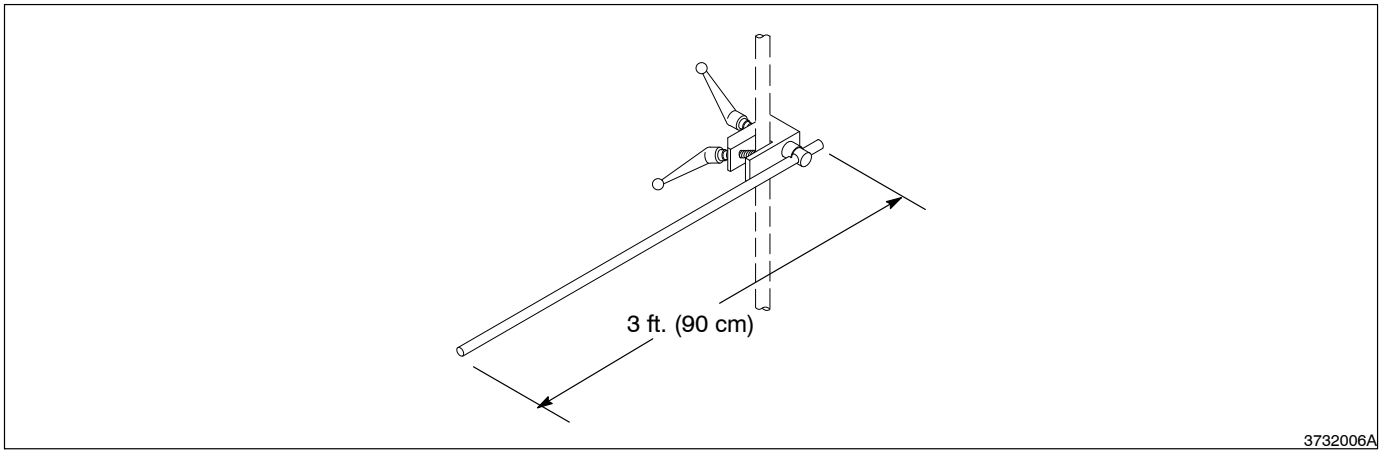

Fig. 8-8 Gun mounting bar

8. Gun Holder Adapter Kit

See Figure 8-9. This kit allows you to use old style Tribomatic gun holders with the Tribomatic II charge module. Cut the ground wire to length, crimp ring-tong terminals to the ends of the wire, and attach the wire to the ground clips.

WARNING: The adjusting rod must be grounded to prevent electrical shock. Dangerous electrostatic charges can accumulate on ungrounded conductive parts in the spray booth.

Item	Part	Description	Quantity	Note
—	631 451	Kit, adapter, holder to gun bar	1	
1	631 450	• Adapter, gun holder to gun bar	1	
2	248 964	• Rod, adjusting, 3 ft	1	
3	931 191	• Wire, vinyl, 14, green w/yellow	AR	
4	939 458	• Clip, ground	2	
5	933 054	• Terminal, ring-tong, INS, 16-14, 10	2	
6	133 404	• Cap, plug, rubber	1	
AR: As Required				

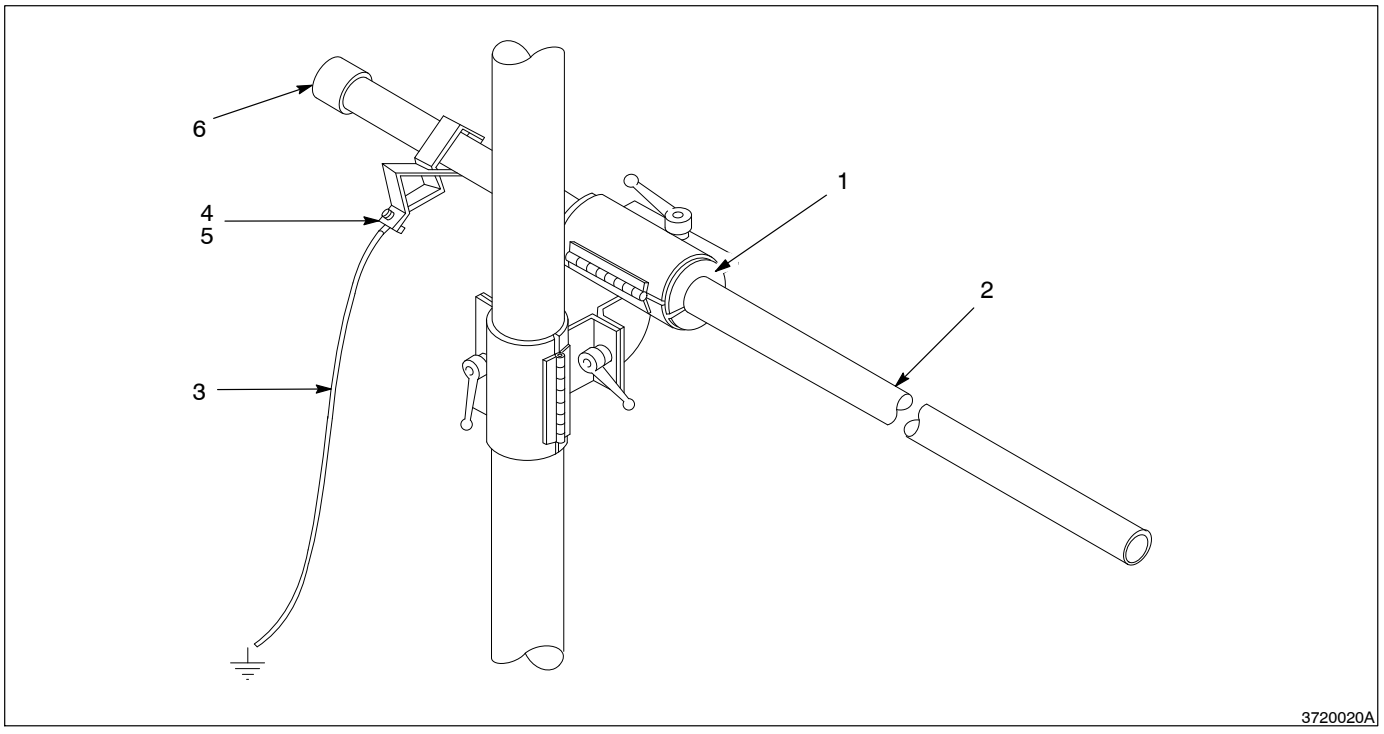

Fig. 8-9 Gun holder adapter

9. Powder Feed Hose and Air Tubing

Part	Description	Note
630 061	Hose, powder feed, 12 mm (PVC)	A
630 237	Hose, powder feed, 10 mm (PVC)	A
900 549	Hose, powder feed, $^3/_8$ in. ID (black rubber)	B
900 550	Hose, powder feed, $^1/_2$ in. ID (black rubber)	B
900 649	Hose, powder feed, 9.5 mm (.37 in.) ID (blue rubber)	B, C
900 648	Hose, powder feed, 11 mm (.44 in.) ID (blue rubber)	B, C
900 650	Hose, powder feed, 12.7 mm (.5 in.) ID (blue rubber)	B, C
900 509	Tubing, polyethylene, $^1/_4$ in. OD, black	B
900 730	Tubing, polyurethane, $^1/_4$ in. OD, blue	B
900 741	Tubing, polyurethane, 6 mm OD, black	B
900 742	Tubing, polyurethane, 6 mm OD, blue	B
630 597	Tubing, PVC, 6 mm OD, blue	A
630 598	Tubing, PVC, 6 mm OD, black	A

NOTE A: Order in 1-meter increments from Nordson Sverige AB, ICAB Division.
B: Order in 1-ft increments from Nordson Corporation, Amherst, Ohio.
C: New and improved, for more uniform flow and less impact fusion.

10. Miscellaneous Options

Part	Description	Note
939 247	Hose clamp, small (for $^3/_8$ and $^1/_2$ in. hose)	
900 517	Tubing, spiral-cut	A
931 191	Wire, vinyl, 14-gauge, green w/yellow	A

NOTE A: Order in 1-ft increments.

11. Versa-Spray Nozzles

Nordson Versa-Spray gun nozzles can be used on the Tribomatic II guns. They must be installed on one of the optional lance extensions listed in this section. For more information, contact your Nordson representative, or refer to one of the following manuals for descriptions and part numbers.

Manual No.	Description
31-13	Versa-Spray cable-fed automatic gun
31-16	Versa-Spray cable-fed manual gun
31-27	Versa-Spray II IPS manual gun
31-26	Versa-Spray II IPS automatic gun

12. Material Descriptions

Table 8-1 contains descriptions of the three type of plastics used in the Tribomatic II manual guns and the powder compatible with each type. Use this table to determine the types of plastics used in your gun.

Table 8-1 Material Description and Usage

Material	Appearance	Usage
PTFE	Opaque white	Standard material for inlet and outlet distributors and wear sleeves in automatic guns. Optional for manual guns. Shorter wear-life than Tivar, but reduces or eliminates impact-fusion.
Tivar	Greyish, translucent white	Longer wear-life than PTFE, but some powders may impact-fuse to Tivar. Switch to PTFE if impact-fusion is a problem.
Nylon	Yellowish white	Standard material for nylon guns. Use only for spraying PTFE powders. Most organic powders will impact-fuse to nylon.