# Model AN-8 Plus Manual
# Electrostatic Air Spray Gun

Customer Product Manual
Part 107 962H

NORDSON CORPORATION • AMHERST, OHIO • USA

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

Address all correspondence to:

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

**Notice**



**Trademarks**

# Table of Contents

## *Section 8 Parts*



## *Section 9 Specifications*

*Section 1*

# *Safety*

# Section 1
# Safety

## *1. Introduction*

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

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

## *2. Qualified Personnel*

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

## *3. Intended Use*

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

Some examples of unintended use of equipment include

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

## *4. Regulations and Approvals*

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

## *5. Personal Safety*

To prevent injury follow these instructions.

- Do not operate or service equipment unless you are qualified.
- Do not operate equipment unless safety guards, doors, or covers are intact and automatic interlocks are operating properly. Do not bypass or disarm any safety devices.
- Keep clear of moving equipment. Before adjusting or servicing moving equipment, shut off the power supply and wait until the equipment comes to a complete stop. Lock out power and secure the equipment to prevent unexpected movement.
- Relieve (bleed off) hydraulic and pneumatic pressure before adjusting or servicing pressurized systems or components. Disconnect, lock out, and tag switches before servicing electrical equipment.
- While operating manual 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. Do not wear or carry metallic objects such as jewelry or tools.
- If you receive even a slight electrical shock, shut down all electrical or electrostatic equipment immediately. Do not restart the equipment until the problem has been identified and corrected.
- Obtain and read Material Safety Data Sheets (MSDS) for all materials used. Follow the manufacturer's instructions for safe handling and use of materials, and use recommended personal protection devices.
- Make sure the spray area is adequately ventilated.
- To prevent injury, be aware of less-obvious dangers in the workplace that often cannot be completely eliminated, such as hot surfaces, sharp edges, energized electrical circuits, and moving parts that cannot be enclosed or otherwise guarded for practical reasons.

## *High-Pressure Fluids*

High-pressure fluids, unless they are safely contained, are extremely hazardous. Always relieve fluid pressure before adjusting or servicing high pressure equipment. A jet of high-pressure fluid can cut like a knife and cause serious bodily injury, amputation, or death. Fluids penetrating the skin can also cause toxic poisoning.

If you suffer a fluid injection injury, seek medical care immediately. If possible, provide a copy of the MSDS for the injected fluid to the health care provider.

The National Spray Equipment Manufacturers Association has created a wallet card that you should carry when you are operating high-pressure spray equipment. These cards are supplied with your equipment. The following is the text of this card:

**WARNING:** Any injury caused by high pressure liquid can be serious. If you are injured or even suspect an injury:

- Go to an emergency room immediately.
- Tell the doctor that you suspect an injection injury.
- Show him this card.
- Tell him what kind of material you were spraying.

MEDICAL ALERT–AIRLESS SPRAY WOUNDS: NOTE TO PHYSICIAN

Injection in the skin is a serious traumatic injury. It is important to treat the injury surgically as soon as possible. Do not delay treatment to research toxicity. Toxicity is a concern with some exotic coatings injected directly into the bloodstream.

Consultation with a plastic surgeon or a reconstructive hand surgeon may be advisable.

The seriousness of the wound depends on where the injury is on the body, whether the substance hit something on its way in and deflected causing more damage, and many other variables including skin microflora residing in the paint or gun which are blasted into the wound. If the injected paint contains acrylic latex and titanium dioxide that damage the tissue's resistance to infection, bacterial growth will flourish. The treatment that doctors recommend for an injection injury to the hand includes immediate decompression of the closed vascular compartments of the hand to release the underlying tissue distended by the injected paint, judicious wound depravement, and immediate antibiotic treatment.

## *6. Fire Safety*

To avoid a fire or explosion, follow these instructions.

- Ground all conductive equipment in the spray area. Use only grounded air and fluid hoses. Check equipment and workpiece grounding devices regularly. Resistance to ground must not exceed one megohm.
- Shut down all equipment immediately if you notice static sparking or arcing. Do not restart the equipment until the cause has been identified and corrected.
- Do not smoke, weld, grind, or use open flames where flammable materials are being used or stored.
- Do not heat materials to temperatures above those recommended by the manufacturer. Make sure heat monitoring and limiting devices are working properly.
- Provide adequate ventilation to prevent dangerous concentrations of volatile particles or vapors. Refer to local codes or your material MSDS for guidance.
- Do not disconnect live electrical circuits while working with flammable materials. Shut off power at a disconnect switch first to prevent sparking.
- Know where emergency stop buttons, shutoff valves, and fire extinguishers are located. If a fire starts in a spray booth, immediately shut off the spray system and exhaust fans.
- Shut off electrostatic power and ground the charging system before adjusting, cleaning, or repairing electrostatic equipment.
- Clean, maintain, test, and repair equipment according to the instructions in your equipment documentation.
- Use only replacement parts that are designed for use with original equipment. Contact your Nordson representative for parts information and advice.

### *Halogenated Hydrocarbon Solvent Hazards*

Do not use halogenated hydrocarbon solvents in a pressurized system that contains aluminum components. Under pressure, these solvents can react with aluminum and explode, causing injury, death, or property damage. Halogenated hydrocarbon solvents contain one or more of the following elements:

| Element | Symbol | Prefix |
|---|---|---|
| Fluorine | F | “Fluoro-” |
| Chlorine | Cl | “Chloro-” |
| Bromine | Br | “Bromo-” |
| Iodine | I | “Iodo-” |

Check your material MSDS or contact your material supplier for more information. If you must use halogenated hydrocarbon solvents, contact your Nordson representative for information about compatible Nordson components.

## *7. Action in the Event of a Malfunction*

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

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

## *8. Disposal*

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

## *9. Safety Labels*

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

Table 1-1 Safety Labels

| Item | Part | Description |
|---|---|---|
| 1. | 241 162 | **WARNING:** High voltage. Read manual before using. All conductive objects in area must be grounded. |
| — | 600 001 | **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.<br>1. NO SMOKING. Keep open flames, hot surfaces, and sparks from torches or grinding away from booth.<br>2. Turn the electrostatic power unit OFF when the spray gun is not in use.<br>3. Appropriate control interlocks and fire suppression apparatus must be installed and operative.<br>4. Ground the power unit, the spray booth, work hangers, conveyor rollers, channels, and all other conductive objects within approximately 3 m (10 ft) of the electrostatic spay gun. THE FLOOR MUST BE CONDUCTIVE AND GROUNDED.<br>5. Examine all equipment at the beginning of each work period and repair or replace any damaged, loose, or missing parts.<br>6. Maintain grounding of all work pieces. Work hangers, conveyor rollers, channels, etc. MUST BE CLEAN. Electrical sparks from discharge of static accumulation are capable of igniting fires. If any sparking is seen around the workpiece, conveyors, or other metal objects in the area, immediately shut down the process and correct grounding before continuing process.<br>7. 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.<br>8. Before cleaning the nozzle or performing any work on the electrostatic spray gun, turn off the power unit and ground the nozzle. The nozzle MUST BE REMOVED for cleaning. Use a non-flammable solvent in a non-conductive container, i.e. glass container. |

*Continued on next page*

## *9. Safety Labels (contd)*

| Item | Part | Description |
|---|---|---|
| | | 9. NEVER use or store flammable solvents in the spray area.<br>10. Make no modification to this electrostatic equipment or its fluid feed system without written permission from Nordson Corporation, 555 Jackson Street, Amherst, OH, 44001, U.S.A.<br>11. When providing an air supply to an electrostatic waterborne hand spray gun, the air hose must be electrically conductive in nature. Continuity between end fittings must be 1 megohm or less.<br>12. Refer to: Instruction manuals; appropriate federal, state, and local regulations; and to ANSI/NFPA 33 for further guidance and requirements for safe operations.<br>If you have questions concerning this electrostatic spray equipment, call (440) 988-9411, and ask to speak with the Liquid Systems Group Technical Service Department.<br>Nordson Corporation, Amherst, OH, 44001, U.S.A. |

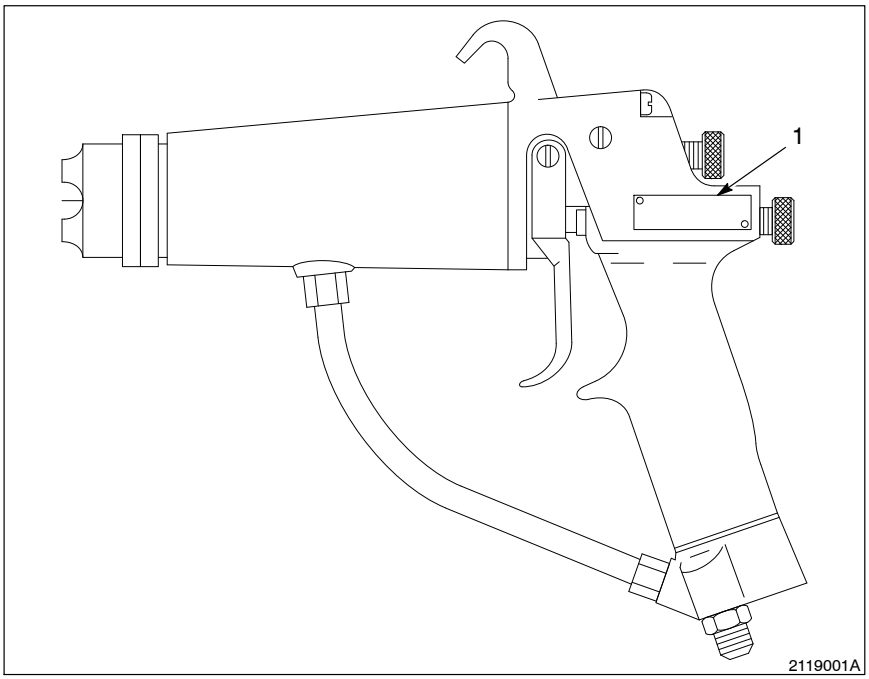


Fig. 1-1 AN-8 Plus Gun Safety Label Location

1. Safety Label

*Section 2*

# *Description*

# Section 2
# Description

## *1. Introduction*

See Figure 2-1. The Model AN-8 Plus is an air-atomizing, electrostatic, manual spray gun. This light-weight gun can spray a wide range of solvent-based coating materials. The AN-8 Plus gun is designed for use with a Nordson model EPS8 electrostatic power supply, which is equipped with an electro-pneumatic flow switch.

The AN-8 Plus gun is light weight and well balanced. You can adjust the horn air pressure and fluid flow rate of the AN-8 Plus gun, and easily disassemble the gun for cleaning and repair.

Optional equipment for the AN-8 Plus gun includes 8-, 12-, and 16-meter (25-, 37-, and 52-feet, respectively) electrostatic cables, a miniature Isocoil for highly conductive coating materials, a variety of fluid tips and air caps, an electro-pneumatic air flow switch for the EPS8 electrostatic power supply, and air and fluid hoses and fittings.

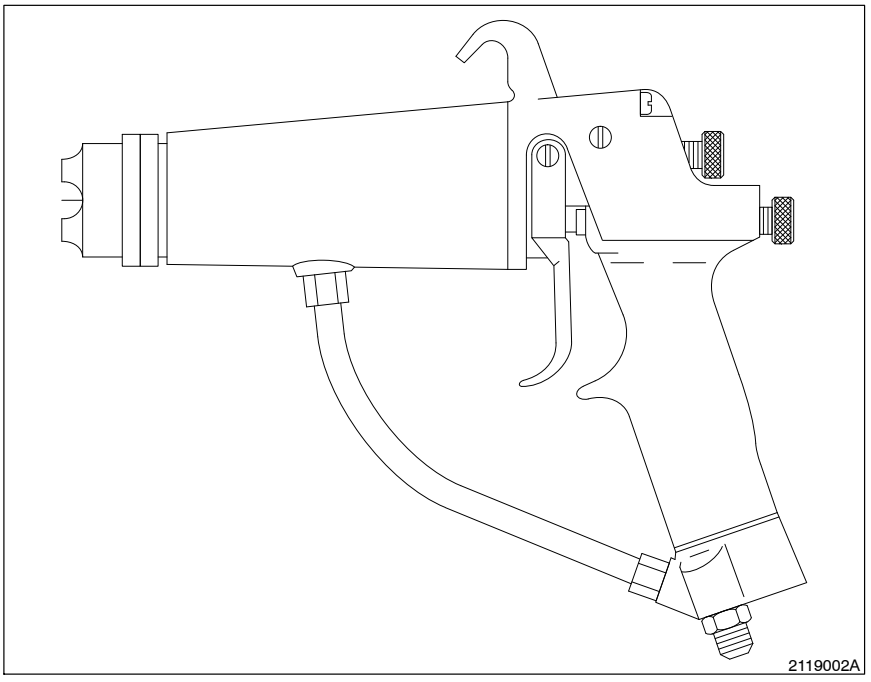


Fig. 2-1 AN-8 Plus Manual Electrostatic Air Spray Gun

## 1. Introduction *(contd)*

**NOTE:** Refer to the following documents for more information about AN-8 Plus gun parts:

- *Standard and Conical Air Spray Nozzles* and *Air Flow Switch* instruction sheets
- *Low Pressure Fluid Hose, Air Hose, High Dielectric Strength Fluid Connectors* instruction sheet
- *AN-8 Plus Air Spray Gun Solvent-Based to Waterborne Conversion Kit* instruction sheet
- *AN-8 Fluid Tubes and Isocoils* instruction sheet
- *Isocore Hose Connector Kit* instruction sheet
- *Electrostatic System Checks* instruction sheet

Refer to the *Parts* section of this manual for more information on the electrostatic cables and the Isocoil.

## 2. Options

**WARNING:** To prevent hazards that can cause personal injury or death, do not use unauthorized parts or modify any component of the gun, including parts of the fluid-feed system between the gun and the earth ground connection of the gun.

When you use highly conductive coating materials, you might need to install the optional Isocoil in place of the standard fluid tube. The Isocoil increases the length of the fluid tube and provides a greater resistance to the electrostatic charge, which prevents it from traveling back to the gun handle. Refer to the *Parts* section for ordering information for the Isocoil.

You can also convert the AN-8 Plus gun for use with waterborne materials. Refer to *AN-8 Plus Waterborne Conversion Kit* instructions for conversion data.

**WARNING:** To prevent a fire hazard, make sure that you effectively connect all electrically conductive objects near the spray operation to a true earth ground. Ungrounded conductive objects can accumulate an electrical charge great enough to cause a fire when they discharge.

When correctly installed and maintained, an AN-8 Plus gun will not discharge sparks capable of igniting any common solvent-based coating materials, and can be used at any distance from the workpiece.

## *3. Typical Heated Circulating System*

Figure 2-2 illustrates the AN-8 Plus gun in a typical heated, circulating system.

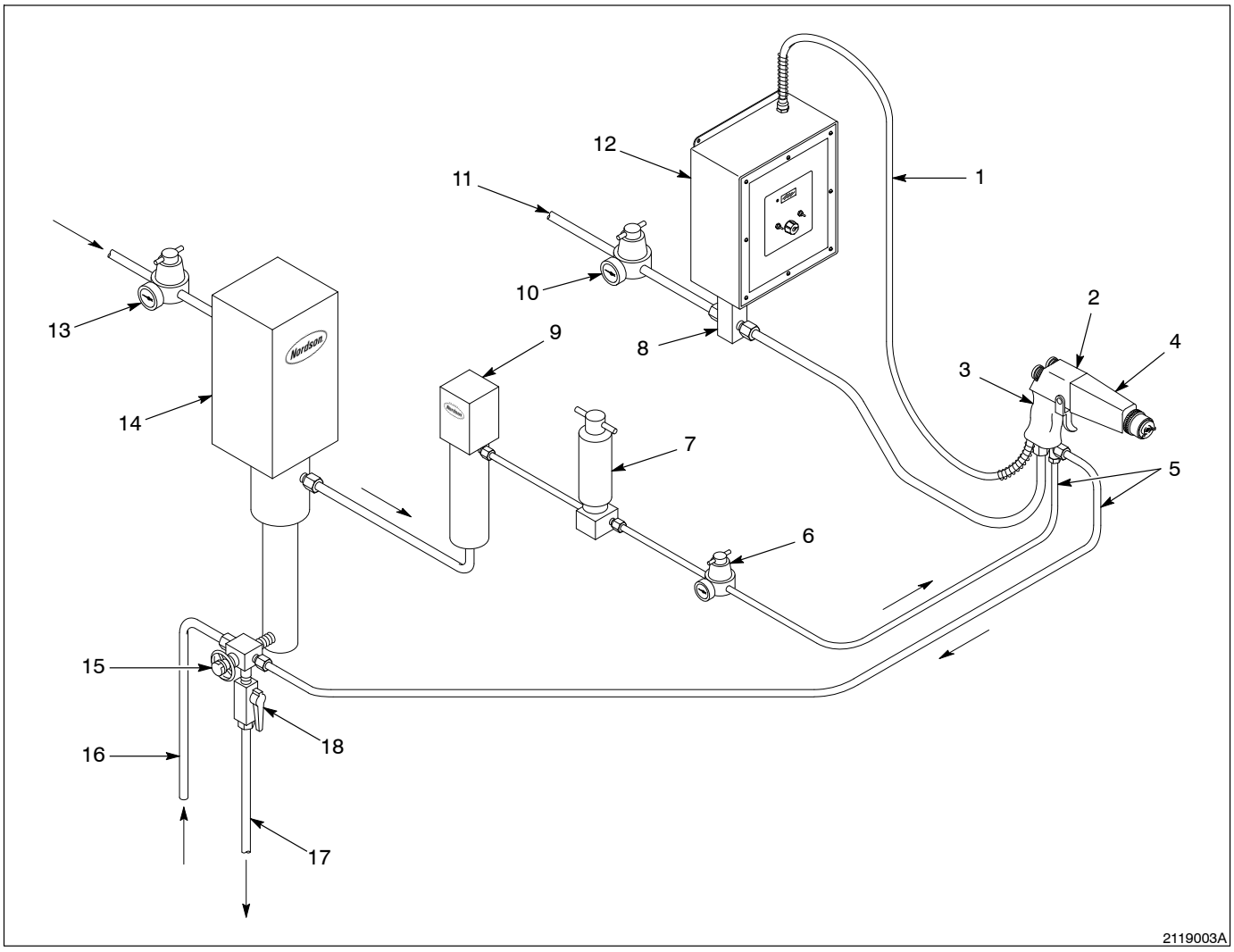


Fig. 2-2 AN-8 Plus Gun in a Typical Heated, Circulating System

1. Electrostatic cable
2. AN-8 Plus gun
3. Gun handle
4. Gun extension
5. Fluid hoses
6. Fluid pressure regulator
7. Fluid filter
8. Air flow switch
9. Heater
10. Air pressure regulator
11. Supply air
12. EPS8 electrostatic power supply
13. Air pressure regulator
14. Pump
15. Circulation valve
16. Tube to reservoir
17. Tube from drain
18. Two-way ball valve

## 4. Theory of Operation

To charge the coating particles as they leave the gun, the AN-8 Plus gun (2) uses a high-voltage electrostatic charge, generated in the EPS8 electrostatic power supply (12) and conducted to the gun through the electrostatic cable (1).

The fluid tube between the gun handle (3) and the gun extension (4) has a dielectric strength great enough to contain the electrostatic charge. Without this dielectric strength, the high voltage can burn through the fluid tubing or gun extension, creating a safety hazard. A path to ground exists at the gun handle through the electrostatic cable (1) and EPS8 power supply ground.

## 5. Equipment Certification

During disassembly or repair of the AN-8 Plus gun, use only Nordson replacement parts in accordance with the instructions and parts lists published in this and other Nordson equipment manuals. Do not deviate from these instructions. Deviation from the instructions or unauthorized modification of the equipment can cause loss of equipment approval from agencies such as Factory Mutual Research Corporation (FM), or the Canadian Standards Association (CSA).

Within the United States, federal regulations require that all electrostatic spray paint equipment used with flammable or combustible liquids be approved by Factory Mutual Research Corporation (FM) or Underwriter's Laboratories (UL). Use of unapproved configurations of equipment not only presents a fire hazard, but also constitutes a violation of federal law.

*Section 3*

# *Installation*

# Section 3
# Installation

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

## 1. Introduction

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

**WARNING:** Before you start the electrostatic system, ground all electrically conductive objects near the spray area to a true earth ground. If objects are not grounded, an electrical charge can accumulate and discharge a spark, creating a fire hazard.

**NOTE:** Inadequately grounded work pieces lose efficiency for electrostatic attraction when sprayed.

A properly maintained AN-8 Plus gun will not discharge sparks capable of igniting any common solventborne coating material. The AN-8 Plus gun operates at any reasonable working distance.

If you wish to use the AN-8 Plus gun to spray waterborne coating materials, convert the gun as described in *Converting the Gun for Waterborne Coatings*.

## 2. Installing the Electrostatic Cable

Perform the following procedures to install the electrostatic cable to the EPS8 electrostatic power supply and to the AN-8 Plus gun.

### Installing the Cable to the Power Supply

1. Use a clean, dry cloth to remove any contamination from the power supply end of the electrostatic cable.

   **NOTE:** Cable ends must be clean and dry before installation.

### *Installing the Cable to the Power Supply (contd)*

**CAUTION:** Fill the multiplier well with dielectric oil to keep out air and prevent arcing. Do not overfill the multiplier well with dielectric oil. Overfilling can cause excessive oil to leak from the well. Leaking oil and arcing can each cause equipment damage.

2. Fill the multiplier well with dielectric oil.
3. Locate the end of the high-voltage cable with the brass tag. Slowly install this end of the cable into the multiplier well and then wipe away any oil that overflows from the well.
4. Tighten the cable connecting nut.
5. Attach the cable to the strain relief on the side of the power supply cabinet.
6. Consult your electrostatic power supply manual for more information about the electrostatic connections.

### *Installing the Cable to the AN-8 Plus Gun*

**CAUTION:** Nordson Corporation uses dielectric grease as an insulator in the AN-8 Plus gun. When placed around the contact points in a high-voltage system, the dielectric grease eliminates corona discharge or arcing that can cause premature failure of parts. The grease must displace all the air from around the contact points to effectively prevent arcing.

A resistor, insulating tube, and dielectric grease are factory-installed in the AN-8 Plus gun. To install a replacement resistor kit and cable to a previously installed AN-8 Plus gun, refer to *Replacing the Extension Resistor Kit and Cable* in the *Repair* section.

Use the following procedure to install the electrostatic cable on a new AN-8 Plus gun.

**NOTE:** If you need to apply additional dielectric grease to the gun, warm the applicator of grease by holding it in your hands or running it under warm water before applying it to the gun. Warmed grease helps the cable install easier.

1. Use a clean, dry cloth to remove any contamination from the end of the electrostatic cable.

2. See Figure 3-1. Slowly push the cable into the electrostatic cable port (2) on the cable adapter (4). Continue to push the cable into the gun until it reaches the stop.

   **NOTE:** The end of the cable acts as a piston in the insulating tube, pushing the dielectric grease around the resistor and spring, and around the exterior of the tube. This totally covers the high-voltage contact points inside the gun with dielectric grease.

3. Install the retainer nut on the cable and into the cable adapter, and then tighten the nut.

4. Keep the resistor service kit shipped with the electrostatic cable as a spare.

5. Before using the AN-8 Plus gun:

   a. Refer to the *Electrostatic System Checks* instruction sheet and perform the *Installation Checks* and *Periodic Checks* procedures on the electrostatic system.

   b. Refer to the *Electrostatic Cable Care and Installation* manual for instructions on maintaining the cable and power supply well.

6. Operate the AN-8 Plus gun only from a primary voltage source with a grounded conductor connected to a true earth ground. Make a second ground connection at the external ground terminal on the power supply chassis.

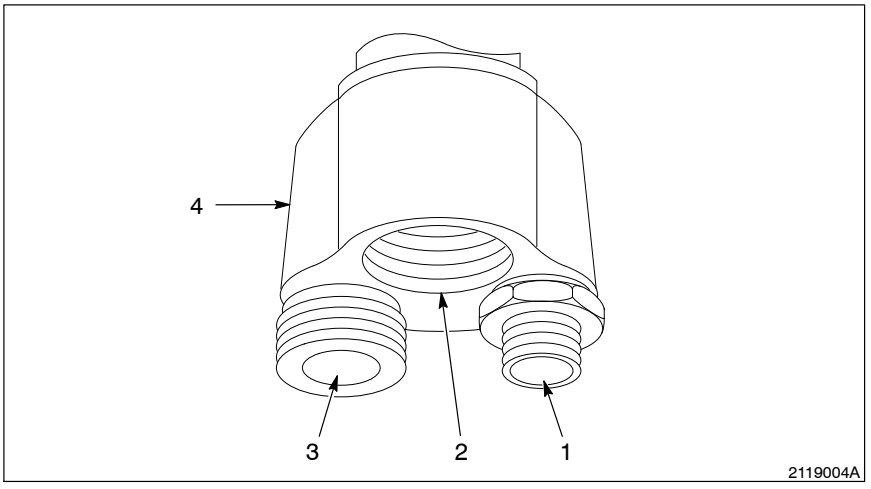


Fig. 3-1 Cable and Hose Connections

1. Air inlet port
2. Electrostatic cable port
3. Fluid inlet port
4. Cable adapter

## 3. Installing the Gun

See Figure 3-2. Use the following procedures to install the gun.

### Installing the Tip Resistor, Fluid Tip, and Air Cap

Use the following procedure to install the tip resistor, fluid tip, and air cap on the AN-8 Plus gun.

1. Install the tip resistor (4), spring-end first, into the end of the AN-8 Plus gun extension (5).
2. Install the fluid tip (3) over the tip resistor, and then thread it into the end of the gun extension.
3. Tighten the fluid tip with the Nordson wrench until it is snug. Do not overtighten the fluid tip.
4. Install the air cap (2) over the fluid tip, and then secure the air cap with the retaining ring (1).

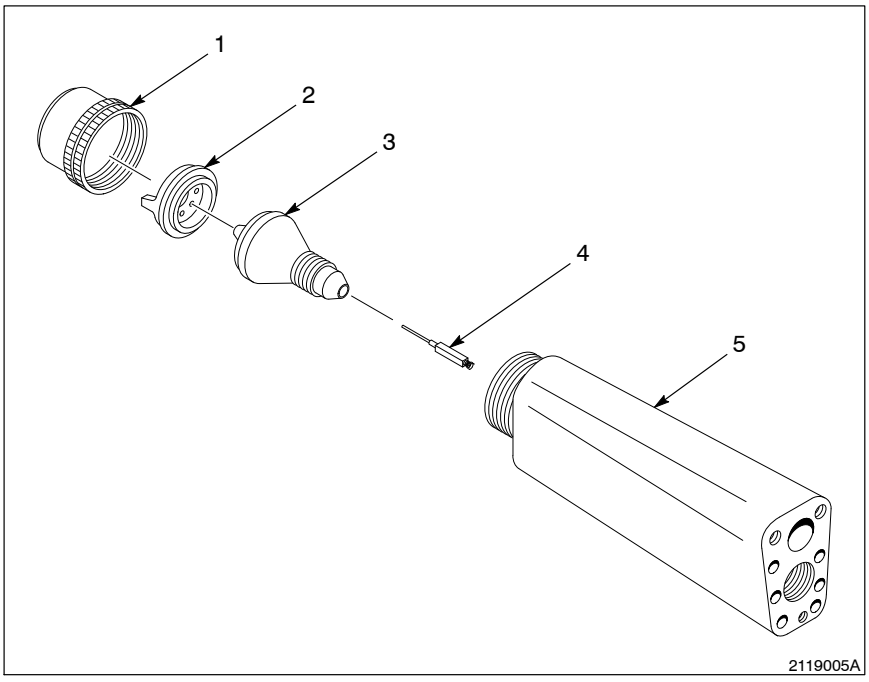


Fig. 3-2 Installing the AN-8 Plus Gun

1. Retaining ring
2. Air cap
3. Fluid tip
4. Tip resistor
5. Gun extension

### *Installing the Air Flow Switch, Hoses, and Fittings*

**WARNING:** Use of fluid conductors other than approved tubes and Isocoils, or use of approved tubes and Isocoils not connected to ground, can cause sparking and possible fire or explosion. Failure to observe this warning may result in equipment damage, personal injury, or death.

**WARNING:** Using fittings other than those recommended can void the AN-8 Plus gun's Factory Mutual (FM) certification and create a spark or ignition hazard.

**CAUTION:** Dirty, moist air can reduce the efficiency of the gun and can cause equipment damage. To prevent equipment damage, Nordson Corporation recommends the use of a refrigerated air drier. Refer to the *Specifications* section of this manual for air quality requirements. Also, note the following supply air requirements:

- If the air is commercially clean (sufficiently free of moisture and oil to prevent detrimental effects on an air electrostatic system), then additional air quality devices are not required in the air supply lines.
- If the air is not commercially clean, use an air dryer with a capacity of 11.8 liters per second (25 scfm) and capable of producing a dew point of 4.0 °C (39.0 °F). Also use coalescent air filters to ensure that the supply air is clean.

**CAUTION:** Failure to observe the information in this procedure can result in equipment damage.

1. Install the air flow switch on the EPS8 electrostatic power supply. Refer to the *Air Flow Switch* instruction sheet for installation information.
2. Install an air hose at least 2.4 cm (0.9 in.) in length at the air flow switch inlet port.
3. See Figure 3-1. Install the other end of the air hose at the $^1/_4$-in. NPS male fitting to the air inlet port (1) on the cable adapter (4).
4. Regulate the supply air for a maximum delivery of 7 bar (100 psi) or less.

### *Installing the Air Flow Switch, Hoses, and Fittings* *(contd)*

5. Use a clean, dry cloth to wipe any contamination from the fittings and threads before installing them on the gun. Cleaning the fittings and threads prevents an electrically conductive path to ground.

   **NOTE:** Conductive fluids used with the recommended fluid hoses and fittings must have a minimum resistivity of 4.5 megohm/cm; otherwise, the fluid can ground out the system.

   **NOTE:** All fluid connections that use a tapered thread must have three to four wraps of PTFE tape. Wrap the tape away from the end of the fitting. The tape will tighten as you install the fitting, providing additional electrical insulation.

6. See Figure 3-1. Install a fluid hose with a $^{3}/_{8}$-in. NPS female fitting between the fluid inlet port (3) on the cable adapter and the fluid supply.

7. Regulate the fluid supply pressure for a maximum delivery pressure of 5 bar (75 psi).

**WARNING:** To prevent a fire hazard, make sure that you effectively connect all electrically conductive objects near the spray operation to a true earth ground. Ungrounded conductive objects can accumulate an electrical charge great enough to cause a fire when they are discharged.

8. Place the warning tag in a prominent location on the spray booth.

## *4. Securing the Hoses and Gun*

**CAUTION:** Do not use a nylon tie wrap to bundle the electrostatic cable. Nylon tie wraps can cause the cable to flex incorrectly and cause mechanical cable damage.

Use the following steps to secure the hoses and gun.

1. Use hook and loop tape or similar tying device to secure the fluid hose, air hose, and electrostatic cable into a bundle, and then secure the bundle to a solid object near the gun. Allow the bundle to flex without pulling to minimize the strain on the hoses during gun movement.

2. Ground all metal fittings to a suitable earth ground and keep them as far away from the AN-8 Plus gun as possible.

3. To keep the gun, hoses, and other equipment in the spray area clean, cover them with the static dissipative wrap recommended by Nordson Corporation.

4. Establish a protected path for the cable between the gun and the power supply. Anchor the cable and the air and fluid hoses so any strain is applied only to the hoses. This makes sure that cable damage will not occur by striking other objects or by severe flexing.

   **NOTE:** Refer to the *Electrostatic Cable Care and Installation* manual for specific information concerning your electrostatic cable.

## 5. Checking the Gun After Installation

Before operating the AN-8 Plus gun, make sure that

- the operator has read and understands the safety precautions in this manual.
- you securely tightened the fluid tip and correctly installed the air cap. Verify that the air cap is securely held with the retaining ring.
- you tightly connected all the air and fluid connections.
- you correctly installed the pump, heater, fluid filters, power supply, and all accessories, and connected them to a true earth ground according to the instructions in their respective manuals.
- you correctly installed the electrostatic cable. Or, if you converted the gun for use with waterborne coatings, ensure that you correctly installed the conversion parts.
- you have cleaned the gun handle, and the operator is not wearing gloves that prevent good contact between skin and handle.

## 6. Converting the Gun for Waterborne Coatings

To convert the AN-8 Plus gun to use waterborne coating materials, consult your Nordson Corporation representative to order the conversion kit. When installing the waterborne conversion kit, refer to the *AN-8 Plus Air Spray Gun Solvent-Based to Waterborne Conversion Kit* instruction sheet for additional information.

## *7. Installing a New Extension Resistor Kit and Cable*

**CAUTION:** Apply dielectric grease to the cable bore of the gun. Without dielectric grease installed, the resistor cable or gun extension can fail due to arcing or high-voltage, corona burn-through.

**NOTE:** New AN-8 Plus guns are factory-assembled with the insulating tube, resistor, and dielectric grease installed in the gun. The resistor service kit includes dielectric grease.

If you are performing an initial installation of the AN-8 Plus gun, refer to *Installing the Electrostatic Cable* in this section.

If you are installing a new cable or a new resistor service kit into a previously installed AN-8 Plus gun, refer to *Replacing the Resistor Service Kit and Cable* in the *Repair* section of this manual.

## *8. Installing the Optional Miniature Isocoil*

When using highly conductive coating materials, install the optional Isocoil in place of the standard fluid tube. The Isocoil increases the length of the fluid tube and provides a greater resistance to the electrostatic charge, which prevents it from traveling back to the handle.

Use the following steps to install the optional miniature Isocoil on the AN-8 Plus gun.

**WARNING:** Before installing the miniature Isocoil, relieve all pressure and turn off electrical power to the system. Failure to observe this warning can result in serious personal injury or death.

1. Relieve the system fluid pressure.
2. See Figure 3-3. Remove the fluid tube (6) between the gun extension (1) and the gun handle (2).
3. Connect the Isocoil swivel fitting (5) to the fluid inlet port (7) on the gun extension.
4. Connect the Isocoil fluid tube (4) to the fluid port (3) on the gun handle.

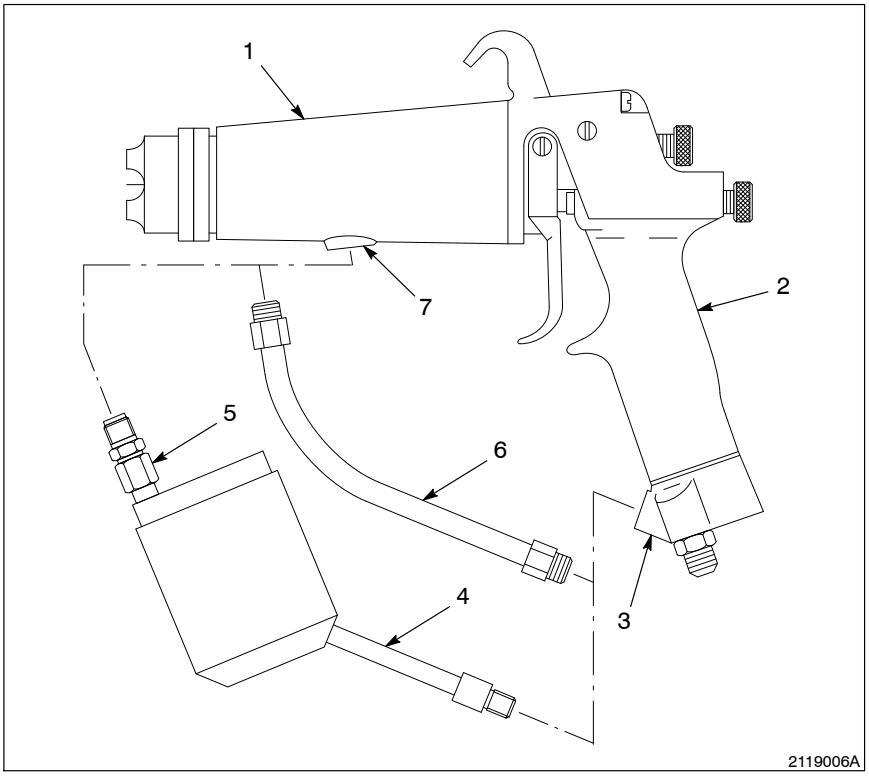


Fig. 3-3 Optional AN-8 Plus Isocoil

1. Gun extension
2. Gun handle
3. Fluid port—gun handle
4. Isocoil fluid tube
5. Isocoil swivel fitting
6. Fluid tube
7. Fluid inlet port—gun extension

*Section 4*

# *Operation*

# Section 4
# Operation

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

## *1. Daily*

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

The following steps describe daily operation of your AN-8 Plus gun.

1. Turn on the air supply.

2. Turn on the EPS8 electrostatic power supply.

3. Pressurize the system with fluid. Refer to the appropriate pump manual for startup and operating instructions.

4. Turn on the heater(s), if used. Refer to the heater manual(s) for operating instructions.

**NOTE:** On startup of a new spray system, flush the system (pump, heater, and fluid filter) with a solvent that is compatible with the coating material in use. Remove the air cap from the gun before flushing solvent through the gun.

5. Turn the gun air control knob counterclockwise until it stops.

6. Turn the trigger stop counterclockwise to allow the trigger to pull back as far as possible, and allow the needle to pull away from the seat as far as possible.

## *1. Daily (contd)*

7. With the booth exhaust power on, trigger the gun. Triggering the gun should produce atomized spray and start the power supply. The power supply indicator (red lamp) should illuminate.

8. Check the fluid-feed system for leaks.

9. Check the fluid flow rate per standard practice.

**NOTE:** When installing a new electrostatic power supply, cable and gun, record the power supply microammeter reading with the gun spraying and no target (no workpiece in front of gun), and with the gun electrode shorted to ground (dead short).

10. Use a Nordson kV meter to read the maximum kV output of the power supply. Use this information, and the resistance values given in the *Electrostatic System Checks* manual, as a baseline when troubleshooting the electrostatic system.

*Section 5*

# *Maintenance*

# Section 5
# Maintenance

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

## *1. Introduction*

**WARNING:** To prevent electrical shock that can cause personal injury or death due to accidental discharge of paint or solvent from the gun, perform the following tasks before performing any maintenance procedures:

- Turn off the fluid and air supplies.
- Relieve fluid and air pressure in the system.
- Turn off the power supply.
- Ground the gun electrode.

## *2. Cable and Electrostatic System Maintenance*

**WARNING:** If you remove the electrostatic cable during maintenance of the gun, refer to the *Installation* section for correct installation steps. If you incorrectly install the cable, or if you use electrostatic power systems or cables other than the EPS8 or the Nordson electrostatic cable, destruction of property, electrocution, explosion, fire, or death can occur.

**WARNING:** Early cable failure is usually due to the presence of air in the cable/resistor bore, which allows the presence of a corona when applying electrostatic power. This corona causes rapid degradation of cable and gun components that can result in a loss of operating safety by creating an ignition hazard.

The electrostatic cable is the high-voltage link between the power supply and the AN-8 Plus gun. Because the cable conducts high voltage, it is subject to electrical breakdown (burn-through or carbon tracking) if it is not correctly maintained.

## 2. Cable and Electrostatic System Maintenance *(contd)*

**CAUTION:** Do not soak or clean the outside of the cable with ketones or other active solvents, including lacquer thinner; they will damage the outer cover and cause electrical breakdown.

If you remove the cable from the gun, clean the end of the cable and cable guide hole with the cable cleaning service kit. Do not touch the cable ends after cleaning. Apply dielectric grease to the resistor before assembling. Refer to the *Parts* section for information on ordering the cleaning kit.

For complete information about the electrostatic power system, refer to the manual that accompanied your system. Also refer to the *Electrostatic System Checks* manual for more information about maintaining the electrostatic system.

## 3. Gun Maintenance

**CAUTION:** Do not allow coating material to build up around the gun extension or fluid tip. This type of buildup can cause an electrostatic charge, resulting in poor coating transfer and premature failure of the gun.

**CAUTION:** Use only a Nordson cleaning brush to clean the fluid tip and air cap. Use of metal objects and/or rough handling will damage these components, causing faulty spray patterns.

Keep the gun as clean as practical. At the end of each work shift, clean the fluid tip and air cap. Soak these parts in a suitable solvent to dissolve any accumulated coatings. Use a Nordson cleaning brush to clean the parts. Use low-pressure air to dry the air cap and fluid tip.

Clean the gun extension and handle regularly. A dirty or paint-coated extension can allow the electrostatic charge to bleed back to the handle, decreasing transfer efficiency and endangering the operator. To prevent coating materials from collecting on the gun extension, you can wrap the extension in the Nordson AN-8 Plus gun cover, or in a protective, non-conductive cloth or plastic and then secure it with non-conductive tape or rubber bands.

Keep the handle clean to ensure a good ground contact between the operator and the earth ground provided by the electrostatic cable.

*Section 6*

# *Troubleshooting*

# Section 6
# Troubleshooting

**WARNING:** Allow only qualified personnel to perform the following tasks. 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.

### Mechanical Problems



### Electrostatic Problems

## *2. Mechanical Problems*

The following chart provides troubleshooting procedures for correcting mechanical problems. If multiple causes exist, the chart lists those problems in the order of importance.

| Problem | Possible Cause | Corrective Action |
|---|---|---|
| **1. Gun spitting when triggered** | Improperly adjusted trigger puller (causes fluid valve to open before air valve) | Remove the trigger and adjust the trigger puller. Refer to the trigger adjustment instructions in the *Repair* section of this manual. |
| **2. Coarse spray** | Air pressure too low for fluid flow | Decrease fluid flow, increase air pressure, or use the correct air cap and fluid tip. |
| | Viscosity too high for atomizing air pressure | Reduce the viscosity by either adding solvent or increasing fluid temperature.<br>Increase the atomizing air pressure. |
| | Obstructed atomizing air orifice | Clean the air cap and exterior surface of the fluid tip. |
| | Damaged fluid tip or air cap | Inspect the fluid tip and air cap, and replace if necessary. |
| | Obstructed fluid tip | Remove and clean the fluid tip. |
| | Damaged electrode assembly | Repair or replace the electrode assembly. |
| | Solvent evaporates too quickly | Use slower evaporating solvent. Contact your material supplier. |
| **3. Excessive overspray** | Atomizing air pressure too high | Reduce the atomizing air pressure. |
| **4. Gun sputtering** | Air bubbles in coating material | Remove air from fluid system, tighten loose parts, and replace worn or damaged parts.<br>Check for excessive agitation in the reservoir.<br>Check for an air leak in the air purge valve or in the siphon line to pump. |
| **5. Fluid leaking near trigger** | Damaged packing cartridge gasket or shaft seal | Disassemble the gun and inspect the parts for damage or wear. Replace parts if required. |

## *3. Electrostatic Problems*

**CAUTION:** Perform all resistance readings with the electrical power source turned off. Using an ohmmeter with the power turned on can cause instrument damage.

The following chart provides steps for troubleshooting electrostatic problems. The baselines referred to in this chart are microammeter values that you establish when a new power supply and gun are first installed. For complete information about establishing baselines and about electrostatic problems, refer to the *Electrostatic System Checks* manual.

| Problem | Possible Cause | Corrective Action |
|---|---|---|
| **1. Open circuit with microamp reading more than 50 microamps above normal, or erratic microamp readings** | System shorted to ground through fluid circuit | 1. Drain the fluid circuit. If condition continues, go to step 2.<br>2. Check the electrostatic cable to between the gun and power supply using a Nordson kV meter (follow the instructions provided with the meter). |
| | Defective electrostatic cable | Replace the electrostatic cable. |
| | Power supply problem | Refer to the *Troubleshooting* section in your power supply manual. |
| **2. Open circuit with slightly elevated microamp reading (less than 50 microamps above normal)** | Change in fluid characteristics | If part coverage is correct, check the paint formulation. |
| | Power supply setting is higher than normal | Adjust the power supply setting. |
| **3. Microamp reading below normal** | Power supply setting lower than normal | Adjust the power supply setting. |
| | Open circuit | Check the electrostatic cable between the gun and power supply using a Nordson kV meter (follow the instructions provided with the meter). |

*Section 7*

# *Repair*

# Section 7
# 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*

**CAUTION:** Follow disassembly and assembly steps in order. Performing these steps out of sequence can cause damage to the internal parts of the gun.

**CAUTION:** Do not overtighten the hose fittings on the gun. Overtightening can damage or strip the threads in the nylon extension of the gun.

## *2. Applying Dielectric Grease*

Use these steps to apply dielectric grease to the gun.

**CAUTION:** After disassembling the gun or removing the cable from the gun, always apply dielectric grease to the gun. If you do not apply dielectric grease, the resistor cable or gun extension can prematurely fail due to arcing or high-voltage, corona burn-through. When correctly applied, dielectric grease prevents coronal discharge and arcing around the contact points of the resistor, spring, and cable end.

**NOTE:** Begin at step 2 if you completely disassembled the gun for repairs or cleaning.

1. After removing the electrostatic cable to test the voltage or resistance of the gun, perform the following steps:
   a. Do not disassemble the gun any further.
   b. Work through the cable adapter at the end of the gun.

## 2. Applying Dielectric Grease *(contd)*

2. See Figure 7-1. Clean as much dielectric grease (1) from the insulating tube (4) as possible. Use a round brush to clean the grease from the tube.

3. Warm a syringe (2) of dielectric grease to about 37–43 °C (98–110 °F) by holding it in your hands or running the syringe under warm water.

4. Insert the flexible tube (3) on the end of the syringe into the electrostatic cable port in the cable adapter.

**NOTE:** The end of the cable acts as a piston in the insulating tube, pushing the dielectric grease around the resistor and spring (5), and around the exterior of the tube. This totally covers the high-voltage contact points inside the gun with dielectric grease.

5. Apply approximately 1.5 cc of warmed grease into the electrostatic cable port.

6. Install the cable. If you apply too much grease in the cable bore, you will not be able to install the cable completely into the gun. If this happens, remove the cable and wipe some of the grease away with a clean, dry cloth, and then try to install the cable again.

7. Tighten the cable connecting nut.

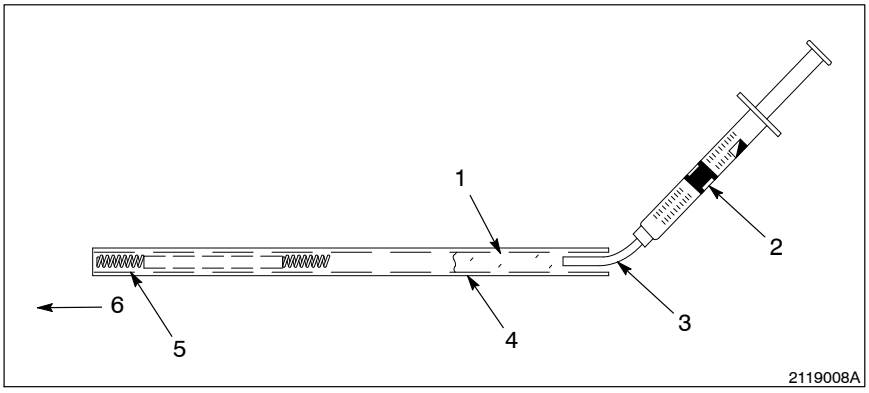


Fig. 7-1 Applying the Dielectric Grease to the AN-8 Plus Gun

1. Dielectric grease
2. Syringe
3. Flexible tube
4. Insulating tube
5. Resistor and spring
6. Resistor end

## *3. Disassembling the Gun*

**WARNING:** To prevent electrical hazards that can cause personal injury, perform the following steps before performing this procedure:

a. Turn the power to the electrostatic power supply off.

b. Ground the gun electrode.

c. Wait at least three minutes for residual voltage to bleed off before removing the electrostatic cable from the gun.

Follow these steps, in order, to disassemble the AN-8 Plus gun for cleaning or repairs. Refer to the *Parts* section to locate the part numbers of the parts referenced in this procedure.

### *Preparation*

1. Turn off all electrostatic power to the gun.

**WARNING:** Relieve all air and fluid pressure from the system before disconnecting the hoses from the gun; otherwise, paint or solvent can spray from the gun, causing personal injury to the operator.

2. Relieve all fluid and air pressure to the gun.
3. See Figure 7-2. Unscrew the cable adapter (20) from the gun handle (17) and carefully remove the electrostatic cable from the gun.
4. Ground the end of the electrostatic cable.

### *External Parts*

1. See Figure 7-2. Use the Nordson wrench provided with the gun to remove the fluid tube (31) from the gun extension (30), and from the gun handle.
2. Unscrew the retaining ring (3) and remove the air cap (1) from the gun extension.
3. Use the Nordson wrench to remove the fluid tip (2) from the gun extension.
4. Remove the tip resistor (35).
5. Remove the two pivot screws (11) that secure the trigger (25) to the gun handle, and then remove the trigger.
6. Use a $^{5}/_{16}$-in. open-ended wrench to remove the nut (26) and washer (27) from the set screw (28).
7. Remove the two set screws (not shown) from the upper back of the gun handle.

### *External Parts (contd)*

**CAUTION:** Do not allow any coating material or solvent from the coating passage to enter the electrical passage as you pull the extension away from the gun body. Coating material or solvent can cause the electrical components in the gun to fail prematurely. Hold the extension lower than the gun body when removing the extension to prevent coating material or solvent from entering the electrical passage.

**NOTE:** The compression spring (13) and O-ring (10) located between the trigger (25) and gun handle may fall out during step 12. Exercise care when performing step 12 so that you do not lose these parts.

8. Separate the gun extension from the gun handle.

### *Internal Parts*

1. Unscrew the trigger puller (12) from the threaded end of the packing cartridge/needle assembly (32).

2. Use the Nordson wrench shipped with your gun to unscrew and remove the seal retainer (8) from the gun extension.

3. Remove the spacer (7), gasket (6), and packing cartridge/needle assembly from the gun extension.

**NOTE:** The needle (33) in the packing cartridge/needle assembly and the valve seat (34) are matched parts and cannot be ordered or replaced separately. If you need to replace the needle or seat, order and replace the entire packing cartridge/needle assembly.

4. Remove the insulating tube (4), which contains the resistor (5), from the gun extension.

5. Now you can replace the resistor service kit or the electrostatic cable. Refer to the corresponding procedures in this section.

**NOTE:** If you are not replacing the resistor service kit or the electrostatic cable, continue disassembling the gun (steps 6–9).

6. Remove the valve seat and the shaft seal (23) from the gun handle (17).

7. Remove the cable adapter (20) from the gun handle. To remove the adapter, remove the screws (19) and pull the adapter from the gun handle.

8. Remove the air tubing (21) from the handle and the cable adapter. Remove the O-ring (18) from the cable adapter.

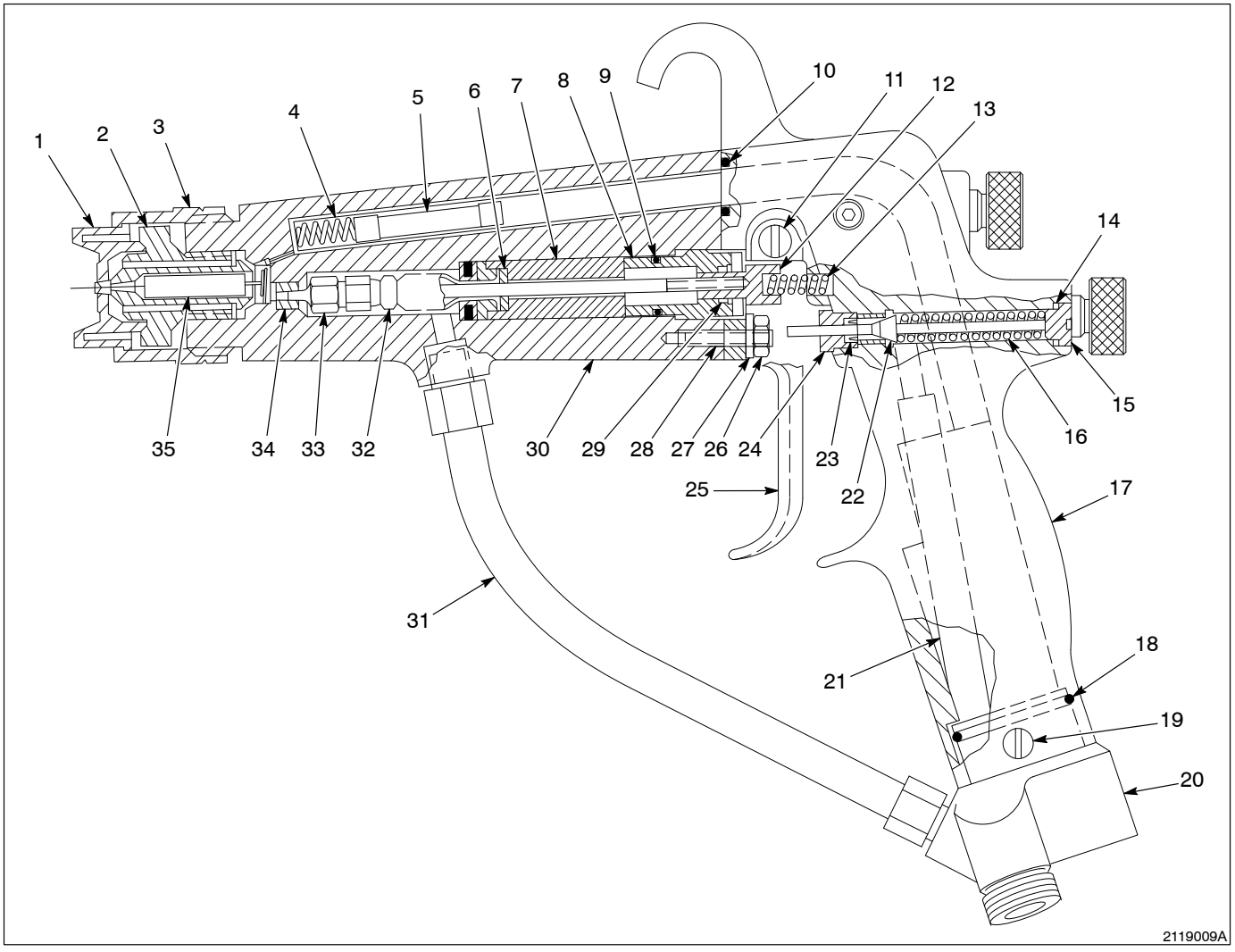


Fig. 7-2 AN-8 Plus Gun Parts

1. Air cap (typical)
2. Fluid tip (typical)
3. Retaining ring
4. Insulating tube
5. Gun resistor
6. Gasket
7. Spacer
8. Seal retainer
9. O-ring
10. O-ring
11. Pivot screws
12. Trigger puller
13. Compression spring
14. Retainer gasket
15. Air valve plug
16. Spring
17. Gun handle
18. O-ring
19. Screw
20. Cable adapter
21. Air tubing
22. Air valve needle
23. Shaft seal
24. Fluid tube
25. Trigger
26. Nut
27. Washer
28. Set screw
29. Shaft seal
30. Gun extension
31. Fluid tube
32. Packing cartridge/needle assembly
33. Needle
34. Valve seat
35. Tip resistor

***Internal Parts*** *(contd)*

9. See Figure 7-3. To remove the adjustment hardware from the gun handle, perform the following steps:

   a. Loosen the rearmost set screw (9) at the right-hand side of the gun handle (4).

   b. Rotate the air adjustment knob (3) counterclockwise until you can pull the air valve needle (2) from the gun handle. Remove the O-ring (1).

   c. Rotate the trigger stop knob (5) until you can pull the trigger stop needle (7) from the gun handle (4).

   d. Remove the spring (6).

   e. Remove the retaining ring (8) from the trigger stop needle (7).

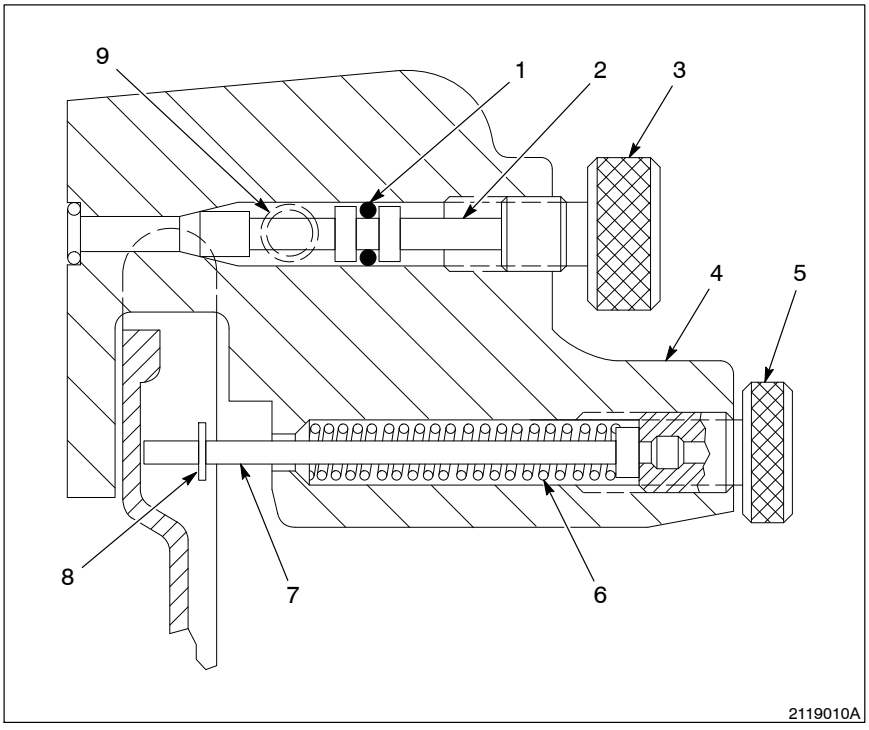


Fig. 7-3 Air Adjustment and Trigger Stop

1. O-ring
2. Air valve needle
3. Air adjustment knob
4. Gun handle
5. Trigger stop knob
6. Spring
7. Trigger stop needle
8. Retaining ring
9. Set screw

## *4. Replacing the Extension Resistor Service Kit and Cable*

See Figure 7-4. Use this procedure to install a new electrostatic cable and service resistor kit, or to replace the resistor kit and continue to use the existing electrostatic cable.

**NOTE:** The service resistor kit contains a new resistor (2) and insulating tube (4). A resistor kit is provided with each new cable. When replacing a cable, also replace the resistor kit since a damaged resistor often causes cable failure.

1. Disassemble the AN-8 Plus gun. Refer to *Disassembling the Gun* in this section.

2. Using a clean cloth and a round brush, clean as much of the old dielectric grease from the high-voltage bore as possible.

**NOTE:** The resistor service kit contains the resistor and dielectric grease (3) installed in the insulating tube(4). The resistor is factory-installed, spring-end (5) first, into the insulating tube.

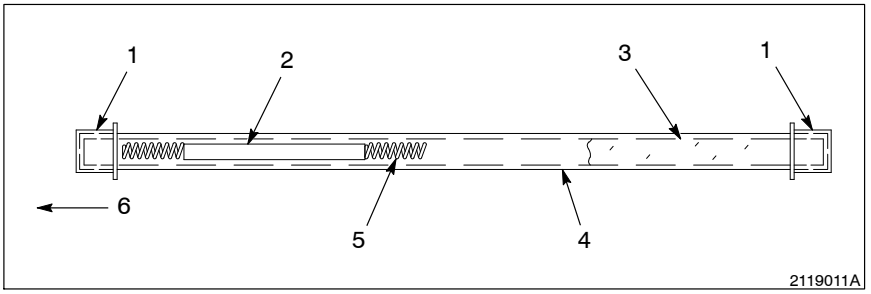


Fig. 7-4 Resistor Service Kit

1. Caps
2. Resistor
3. Dielectric grease
4. Insulating tube
5. Spring
6. End inserted into extension (high-voltage bore)

3. Perform the following steps to install the resistor service kit into the high-voltage bore of the gun:

   a. Remove the caps (1) from the ends of the insulating tube.

   b. Install the resistor end (6) of the insulating tube into the high-voltage bore of the extension. (The end of the insulating tube containing the dielectric grease should go into the bore last.)

4. Assemble the AN-8 Plus gun. Refer to *Assembling the Gun* in this section.

### 4. Replacing the Extension Resistor Service Kit and Cable *(contd)*

5. Install the electrostatic cable on the gun.

**NOTE:** The end of the cable acts as a piston in the insulating tube, pushing the dielectric grease around the resistor and spring, and around the exterior of the tube. This totally covers the high-voltage contact points inside the gun with dielectric grease.

6. Tighten the cable connecting nut.

### 5. Replacing the Resistor Only

See Figure 7-4. Use this procedure to install a new resistor only, and continue to use the existing electrostatic cable.

1. Disassemble the AN-8 Plus gun. Refer to *Disassembling the Gun* in this section.

2. Clean the old dielectric grease from the high-voltage bore with a clean cloth and a round brush. Clean as much grease out of the bore as possible.

**CAUTION:** Do not handle the resistor with your bare hands. Salts and oils from your skin can conduct electricity and can cause arcing along the resistor. Arcing can destroy the extension and the resistor. Handle the resistor using a piece of plastic or a clean, dry cloth.

3. Install the resistor (2), spring end first, into the insulating tube (4).

4. Install the greased insulating tube, resistor end (6) first, into the high-voltage bore. (The end of the insulating tube containing the dielectric grease (3) should go into the bore last.)

5. Assemble the gun. Refer to *Assembling the AN-8 Plus Gun* in this section.

6. Install the electrostatic cable on the gun.

**NOTE:** The end of the cable acts as a piston in the insulating tube, pushing the dielectric grease around the resistor and spring (5), and around the exterior of the tube. This totally covers the high-voltage contact points inside the gun with dielectric grease.

7. Tighten the cable connecting nut.

## *6. Replacing Parts and Cleaning the Gun*

See Figure 7-2 to locate the parts referenced in this procedure.

After disassembling the gun to replace the resistor service kit and electrostatic cable, continue with the steps provided here to clean the AN-8 Plus gun.

**CAUTION:** Keep the packing cartridge clean and free of burn holes or cracks; otherwise, high-voltage breakdown can occur and damage the equipment.

1. Inspect the packing cartridge/needle assembly (32) carefully for burn holes or cracks. Install a new packing cartridge/needle assembly if you see any signs of wear or damage.

2. Inspect all the gun parts, especially seals, gaskets, and O-rings, for signs of wear or damage, and replace parts as required.

3. Clean the AN-8 Plus gun and replace the O-rings as follows.

   a. Lubricate all new O-rings with O-ring lubricant before installing them into the gun.

**CAUTION:** Do not use metal tools to clean the air cap or fluid tip. Metal tools can damage the precisely drilled holes and distort the fan pattern.

   b. Clean the gun handle (17) and gun extension (30) with a compatible cleaning solution. Use a soft bristle brush that is compatible with the cleaning solution, or use a wooden toothpick to clean the fluid tip (2) and air cap (1).

   c. Thoroughly dry all the parts before assembling the gun.

4. Discard all damaged or worn parts. Do not attempt to re-use these parts.

**NOTE:** Always apply dielectric grease into the high-voltage bore of the gun after disassembling or repairing the gun, or after removing the cable from the gun. Refer to *Applying Dielectric Grease* in this section.

## 7. Assembling the Gun

After you replace any parts and perform the cleaning procedures for the AN-8 Plus gun, use this procedure to complete the assembly of the gun.

### Internal Parts

1. See Figure 7-2. Install the needle (33) on the replacement packing cartridge (32).
2. Gently pull on the ends of the packing cartridge to expand the bellows, and then slide the gasket (6) and spacer (7) over the cartridge/needle assembly.
3. Install the packing cartridge/needle assembly with the gasket and spacer into the threaded bore of the gun extension (30).
4. Make sure that the end of the needle is visible through the valve seat (34) orifice, and then perform the following steps:
   a. Install the seal retainer (8) over the packing cartridge/needle assembly shaft.
   b. Screw the seal retainer into the gun extension, and then tighten it with the special tool.
   c. Position the gun extension in the operating (upright) position, and make sure that the needle is still in place in its seat.
5. Thread the trigger puller (12) onto the shaft of the packing cartridge/needle assembly. Do not tighten it completely, allowing for adjustment later.
6. Install the compression spring (13) into the trigger puller (12).
7. Make sure that the cable bore of the gun is clean and dry. Clean the cable core and cable with the cable cleaning kit.
8. See Figure 7-1. If you have not replaced the insulating tube (4) and applied dielectric grease to the gun, perform the following steps:

**CAUTION:** After disassembling the gun or removing the cable from the gun, always apply dielectric grease to the gun. If you do not apply dielectric grease, the resistor cable or gun extension can prematurely fail due to arcing or high-voltage, corona burn-through. When correctly applied, dielectric grease prevents coronal discharge and arcing around the contact points of the resistor, spring, and cable end.

   a. Clean as much dielectric grease from the insulating tube as possible. Use a round brush to clean the grease from the tube.

b. Warm a syringe (2) of dielectric grease to about 37–43 °C (98–110 °F) by holding it in your hands or running the syringe under warm water.

c. Insert the flexible tube (3) of the syringe into the electrostatic cable port on the cable adapter.

**NOTE:** The end of the cable acts as a piston in the insulating tube (4), pushing the dielectric grease (1) around the resistor and spring (5), and around the exterior of the tube. This totally covers the high-voltage contact points inside the gun with dielectric grease.

d. Apply about 1.5 cc of warmed grease into the electrostatic cable port.

e. Install the insulating tube (4), resistor-end first (6), into the gun extension.

9. See Figure 7-3. Install the air valve needle (2) and the trigger stop needle (7).

10. See Figure 7-2. Install the valve seat (34), and then carefully install the air valve needle (22), the spring (16), and the retainer gasket (14).

### *External Parts*

1. See Figure 7-2. Carefully screw the air valve plug (15) into the gun handle (17).

2. See Figure 7-3. Install the retaining ring (8) on the trigger stop needle (7), and then tighten the rear-most set screw (9) on the right-hand side of the gun handle (4).

**CAUTION:** Securely tighten the fluid tip on the gun extension or it will leak fluid into the air passages, causing the charge to ground out through the gun body.

3. See Figure 7-2. Install the fluid tip (2) on the gun using the Nordson wrench. Tighten the fluid tip hand-tight, and then tighten further with $^{1}/_{4}$–$^{1}/_{2}$ turn of the wrench.

4. Install the air cap (1) and the retaining ring (3).

5. Lubricate the O-rings (10) and install them into the grooves around the horn and atomizing air passages in the gun handle (17).

### *External Parts (contd)*

**NOTE:** Do not kink the insulating tube (4) by pressing too hard when you replace the gun extension (30). Evenly applying pressure to the extension while you screw it onto the gun body will ease the insulating tube into the high-voltage bore without kinking it.

6. Hold the gun handle and gun extension (30) in their mated position, and then slide the trigger (25) over the trigger puller (12) to hold the handle and extension together.

7. Secure the gun extension onto the gun handle with the screws removed during disassembly.

8. Install the washer (27) and nut (26) on the socket head set screw (28).

### *Final Assembly and Adjustments*

1. Adjust the trigger puller, using the following steps:

   a. See Figure 7-5. Rotate the trigger puller (5) until the end of the air valve needle (2) aligns with the flange on the gun extension (4) side of the puller. This is the adjustment starting point (3).

   b. See Figure 7-2. Install the trigger (25) and secure it with the pivot screws (11).

   c. To check the adjustment, pull the trigger and make sure that the trigger depresses the air valve needle (22) before the trigger puller (12) begins its movement. When correctly adjusted, the trigger puller (12) allows atomizing or horn air to flow before the needle (33) on the packing cartridge (32) pulls away from its seat (34). This allows the fluid to flow into the fluid tip (2).

   d. If the adjustment is correct, go to step 2. If re-adjustment is necessary, remove the pivot screws (11) and trigger (25), and then repeat steps a–c.

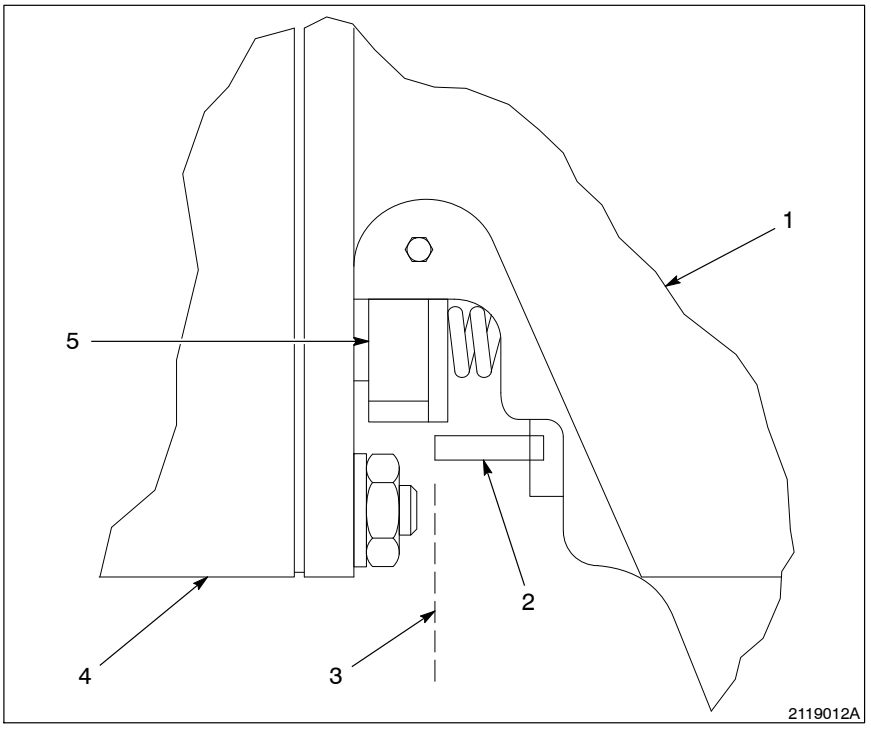


Fig. 7-5 Adjusting the Trigger Puller

1. Gun handle
2. Air valve needle
3. Adjustment starting point
4. Gun extension
5. Trigger puller

2. Install the air and fluid lines to the gun fittings.

3. Install the electrostatic cable into the high-voltage bore.

4. Tighten the cable connecting nut.

5. Restore the fluid and air pressures to operating levels.

6. With the electrostatic power supply turned off, test the spray for correct operation and for leaks. If necessary, correct any leaks.

7. Turn all power on and return the system to operation.

*Section 8*

# *Parts*

# Section 8
# 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. Gun Assembly*

See Figure 8-1.

| Item | Part | Description | Quantity | Note |
|---|---|---|---|---|
| — | 111 048 | Gun, electrostatic air spray, manual, AN-8 Plus | 1 | |
| 1 | 244 971 | • Ring, retaining | 1 | |
| 2 | 249 038 | • Resistor, tip with holder | 1 | |
| 3 | - - - - - - | • Extension, head | 1 | A |
| 4 | 935 025 | • Resistor, without leads, 1.5 W, 7.5 kV | 1 | B |
| 5 | - - - - - - | • Tube, insulating | 1 | B |
| 6 | 940 140 | • O-ring, hotpaint, 0.500 x 0.625 x 0.063 in. | 1 | C |
| 7 | 111 021 | • Puller, rod, packing | 1 | |
| 8 | 246 537 | • Seal, shaft, 0.250 x 0.375 in. | 1 | |
| 9 | 111 020 | • Retainer, cartridge | 1 | |
| 10 | 940 140 | • O-ring, hotpaint, 0.500 x 0.625 x 0.063 in. | 1 | |
| 11 | 111 019 | • Spacer, packing cartridge | 1 | |
| 12 | 244 748 | • Gasket, 0.28 x 0.47 x 0.062 in. | 1 | |
| 13 | 111 049 | • Service kit, packing cartridge | 1 | |
| 14 | 987 053 | • Spring, compression, 1.289 x 0.312 OD x 0.043 in. | 1 | |
| 15 | 940 080 | • O-ring, hotpaint, 0.188 x 0.313 x 0.063 in. | 2 | |
| 16 | - - - - - - | • Handle, gun, AN-8 Plus | 1 | C |
| 17 | 940 080 | • O-ring, hotpaint, 0.188 x 0.313 x 0.063 in. | 1 | C |
| 18 | 981 157 | • Screw, fillister head, #10-32 x 2.750 in., steel, zinc | 2 | |
| 19 | 111 029 | • Needle, air | 1 | C |
| 20 | 987 034 | • Spring, compression, 2.250 x 0.180 ID x 0.035 in. | 1 | C |
| 21 | - - - - - - | • Stop, trigger, adjuster | 1 | C, D |

NOTE A: The head extension includes the needle and seat. These parts are a matched set and cannot be ordered separately; they are included in the extension service kit, part 111 050.

B: These parts are included in the resistor replacement service kit, part 116 472.

C: This part is included in the handle replacement service kit, part 232 892.

D: This part is included in the replacement service kit, part 111 028.

*Continued on next page*

| Item | Part | Description | Quantity | Note |
|---|---|---|---|---|
| 22 | 111 024 | • Screw, pilot, stem, valve air | 1 | C |
| 23 | 246 517 | • Gasket, retainer | 1 | C |
| 24 | 987 065 | • Spring, compression | 1 | C |
| 25 | 125 140 | • Needle, valve, air | 1 | C |
| 26 | 986 002 | • Ring, retaining, external, 15, reinforced e-ring | 1 | C |
| 27 | 941 180 | • O-ring, hotpaint, 0.875 x 1.063 x 0.094 in. | 1 | C |
| 28 | 900 531 | • Tubing, nylon, 0.250 x 0.050 in. | 1 | C |
| 29 | 118 786 | • Adapter, cable | 1 | C |
| 30 | 940 130 | • O-ring, hotpaint, 0.43 x 0.563 x 0.063 in. | 1 | C |
| 31 | 937 505 | • Coupling, 0.250 x 0.250 in., brass | 1 | C |
| 32 | 111 046 | • Service kit, fluid tube, 0.188 in. ID | 1 | |
| 33 | 118 772 | • Trigger, AN-8 Plus | 1 | |
| 34 | 246 526 | • Screw, pivot, trigger/handle | 2 | |
| 35 | 982 076 | • Screw, oval head, slotted, M4 x 10, zinc | 2 | C |
| 36 | 246 521 | • Seal, shaft, SPR, 0.109 x 0.125 x 0.250 in., PTFE | 1 | C |
| 37 | 124 634 | • Retainer, air valve seat | 1 | C |
| 38 | 984 120 | • Nut, hex, #10-32, steel, zinc | 1 | |
| 39 | 983 121 | • Washer, lock, e external, #10, steel, zinc | 1 | |
| 40 | 981 345 | • Screw, socket set, $^{5}/_{16}$-18 x 0.312 in., HLFDG | 3 | C |
| 41 | 981 175 | • Screw, socket set, #10-32 x 1.00 in., cup, zinc | 1 | |
| NS | 244 752 | • Wrench, air spray, electrostatic | 1 | |
| NS | 901 905 | • Brush | 1 | |
| NS | 901 907 | • Brush, bristle, nylon | 1 | |
| NS | 227 583 | • Bag, cover, AN-8 Plus | 1 | |
| NS | 247 658 | Applicator, dielectric grease, 10 cc, carton of 12 | 1 | E |
| 42 | - - - - - - | Cap, air | 1 | E |
| 43 | - - - - - - | Tip, fluid | 1 | E |

NOTE C: This part is included in the handle replacement service kit, part 232 892.

E: These parts must be ordered separately. (Refer to the *Standard and Conical Air Spray Nozzles* instruction sheet for information on optional air caps and fluid tips; also refer to the *Air Flow Switch* instruction sheet.)

NS: Not Shown

## *2. Gun Assembly (contd)*

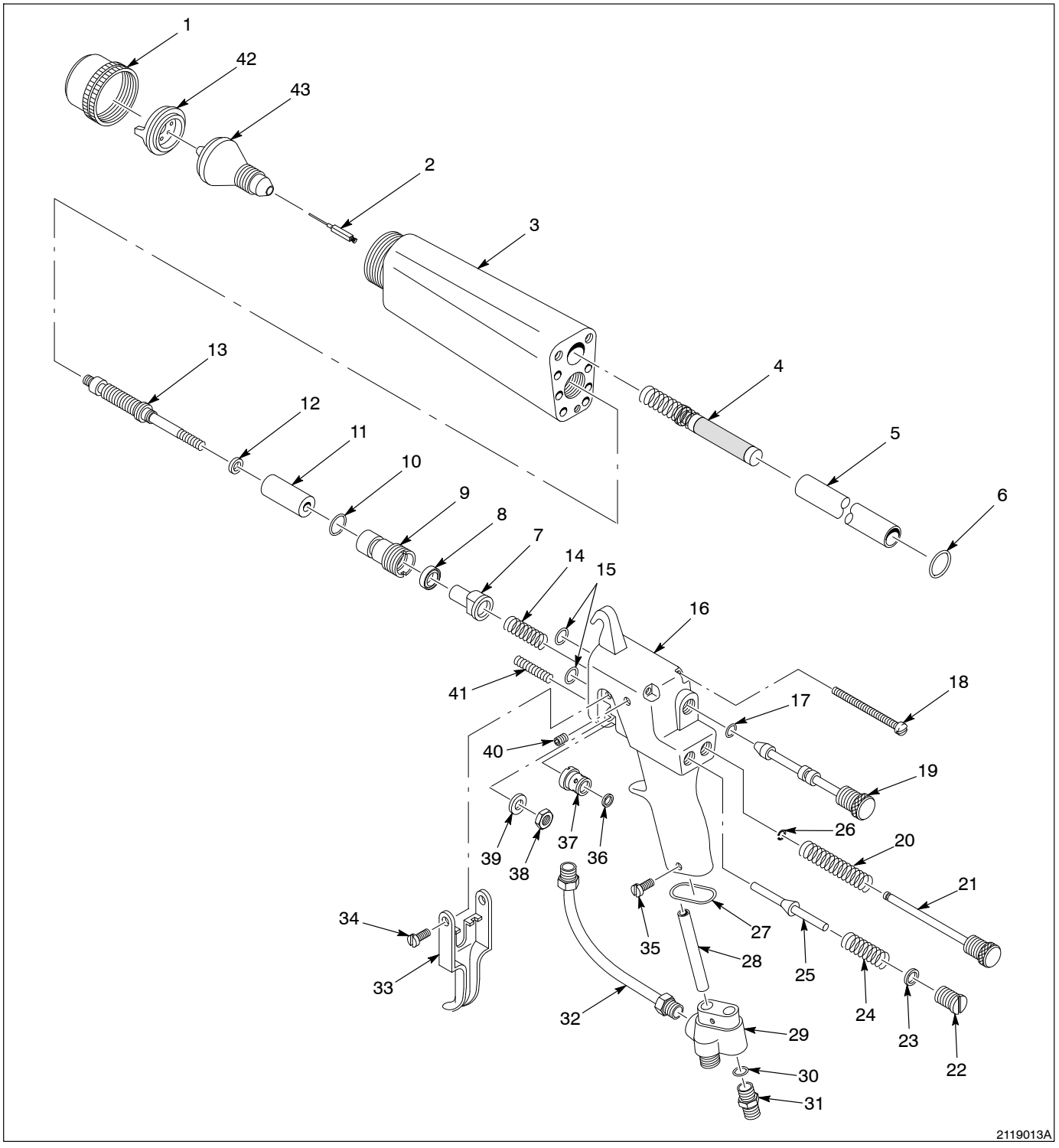


Fig. 8-1 AN-8 Plus Gun (Exploded View)

## 3. Recommended Spare Parts

See Figure 8-1.

| Item | Part | Description | Quantity | Note |
|---|---|---|---|---|
| 1 | 244 971 | Ring, retaining | 1 | |
| 2 | 249 038 | Resistor tip, with holder | 1 | |
| 8 | 246 537 | Seal, shaft, 0.250 x 0.375 in. | 1 | |
| 12 | 244 748 | Gasket, 0.28 x 0.47 x 0.062 in. | 1 | |
| NS | 247 658 | Applicator, dielectric grease, 12 count | 1 | |
| NS | 111 050 | Service kit, extension | 1 | |
| NS | 111 049 | Service kit, cartridge, packing | 1 | |
| NS | 116 472 | Service kit, tube with resistor | 1 | |
| NS | 115 505 | Service kit, air valve seat | 1 | |
| NS | 227 583 | Bag, cover, AN-8 Plus | 1 | |
| NS | 227 584 | Bag, cover, AN-8 Plus | 12 | |

NS: Not Shown

## 4. Service Kits

Use the following lists to order service kits for the AN-8 Plus gun.

### Resistor Service Kit

See Figure 8-1.

| Item | Part | Description | Quantity | Note |
|---|---|---|---|---|
| — | 116 472 | Service kit, resistor, AN-8 Plus | 1 | |
| 4 | 935 025 | • Resistor, without leads, 1.5 W, 7.5 kV | 1 | |
| 5 | - - - - - - | • Tube, insulating | 1 | |
| NS | - - - - - - | • Dielectric grease | AR | |

AR: As Required
NS: Not Shown

### *Air Valve Service Kit*

See Figure 8-1.

| Item | Part | Description | Quantity | Note |
|---|---|---|---|---|
| — | 115 505 | Service kit, air valve | 1 | |
| 25 | 125 140 | • Needle, valve, air | 1 | |
| 36 | 246 521 | • Seal, shaft, SPR, 0.109 x 0.125 x 0.250 in., PTFE | 1 | |
| 37 | 124 634 | • Retainer, air valve seat | 1 | |

### *Trigger Stop Adjustment Service Kit*

See Figure 8-1.

| Item | Part | Description | Quantity | Note |
|---|---|---|---|---|
| — | 111 028 | Service kit, trigger stop adjustment | 1 | |
| 21 | - - - - - - | • Adjuster, trigger stop | 1 | |
| NS | - - - - - - | • Needle, stop | 1 | |
| NS | 900 439 | • Adhesive, threadlocking | 1 | |
| NS: Not Shown | | | | |

### *Handle Replacement Kit*

See Figure 8-1.

| Item | Part | Description | Quantity | Note |
|---|---|---|---|---|
| — | 232 892 | Service kit, handle replacement | 1 | |
| 6 | 940 140 | • O-ring, hotpaint, 0.500 x 0.625 x 0.063 in. | 1 | |
| 16 | - - - - - - | • Handle, gun, AN-8 Plus | 1 | |
| 15 | 940 080 | • O-ring, hotpaint, 0.188 x 0.313 x 0.063 in. | 2 | |
| 17 | 940 080 | • O-ring, hotpaint, 0.188 x 0.313 x 0.063 in. | 1 | |
| 19 | 111 029 | • Needle, air | 1 | |
| 20 | 987 034 | • Spring, compression, 2.250 x 0.180 ID x 0.035 in. | 1 | |
| 21 | - - - - - - | • Adjuster, trigger stop | 1 | A |
| 22 | 111 024 | • Screw, pilot, stem, valve air | 1 | |
| 23 | 246 517 | • Gasket, retainer | 1 | |
| 24 | 987 065 | • Spring, compression, 1.500 x 0.210 OD x 0.022 in. | 1 | |
| 25 | 125 140 | • Needle, air valve | 1 | |
| 26 | 986 002 | • Retaining ring, external, 15, reinforced e-ring | 1 | |
| 27 | 941 180 | • O-ring, hotpaint, 0.875 x 1.063 x 0.094 in. | 1 | |
| 28 | 900 531 | • Tubing, nylon, 0.250 x 0.050 in. | 1 | |
| 29 | 118 786 | • Adapter, cable, AN-8 Plus | 1 | |
| 30 | 940 130 | • O-ring, hotpaint, 0.438 x 0.563 x 0.063 in. | 1 | |
| 31 | 973 505 | • Coupling, 0.250 x 0.250 in., brass | 1 | |
| 35 | 982 076 | • Screw, oval head, slotted, M4 x 10, zinc | 2 | |
| 36 | 246 521 | • Seal, shaft, SPR, 0.109 x 0.125 x 0.250 in., PTFE | 1 | |
| 37 | 124 634 | • Retainer, air valve seat | 1 | |
| 40 | 981 345 | • Screw, socket set, $^{5}/_{16}$-18 x 0.312 in., HLFDG | 3 | |
| NS | - - - - - - | • Needle, stop | 1 | A |
| NS | 900 223 | • Lubricant, O-ring, Parker, 4 oz | AR | |
| NS | 900 439 | • Adhesive, threadlocking | AR | A |
| NS | 900 424 | • Compound, threadlocking, VC-3 | AR | |
| NS | 900 419 | • Adhesive, retaining cylindrical | AR | |

NOTE A: These parts are included in the trigger stop adjustment service kit, part 111 028.
AR: As Required
NS: Not Shown

### *Extension Service Kit*

See Figure 8-1.

| Item | Part | Description | Quantity | Note |
|---|---|---|---|---|
| — | 111 050 | Service kit, extension | 1 | |
| 3 | - - - - - - | Extension, AN-8 Plus | 1 | |
| NS | - - - - - - | Needle and seat, A7A | 1 | |
| NS | - - - - - - | Conductor, pin | 1 | |
| NS: Not Shown | | | | |

### *AN-8 Plus Electrostatic Cables*

See Figure 8-1.

| Item | Part | Description | Quantity | Note |
|---|---|---|---|---|
| NS | 118 937 | Cable, high voltage, 8 m (25 ft) | 1 | |
| NS | 118 938 | Cable, high voltage, 12 m (37 ft) | 1 | |
| NS | 118 940 | Cable, high voltage, 16 m (52 ft) | 1 | |
| NS: Not Shown | | | | |

### *Cable Cleaning Service Kit*

See Figure 8-1.

| Item | Part | Description | Quantity | Note |
|---|---|---|---|---|
| — | 106 455 | Service kit, cable cleaning | 1 | |
| NS | - - - - - - | • Solvent, contact/circuit board | 1 | |
| NS | - - - - - - | • Brush | 1 | |
| NS: Not Shown | | | | |

## *5. Optional Isocoils*

Only use Nordson Corporation parts. The AN-8 Plus gun can use several optional parts.

### *AN-8 Plus Miniature Isocoils*

See Figure 8-2. The AN-8 Plus gun can use either of two miniature Isocoils listed below.

| Item | Part | Description | Quantity | Note |
|---|---|---|---|---|
| — | 115 451 | Tube, fluid, Isocoil, 0.23 cm (0.093 in.) | 1 | |
| 1 | 246 727 | • Adapter, extension, $^1/_2$-20 x 0.375 in. | 1 | |
| 2 | 940 112 | • O-ring, PTFE, 0.313 x 0.438 in. | 1 | |

| Item | Part | Description | Quantity | Note |
|---|---|---|---|---|
| — | 119 077 | Tube, fluid, Isocoil, 0.48 cm (0.188 in.) | 1 | |
| 1 | 246 727 | • Adapter, extension, $^1/_2$-20 x 0.375 in. | 1 | |
| 2 | 940 112 | • O-ring, PTFE, 0.313 x 0.438 in. | 1 | |

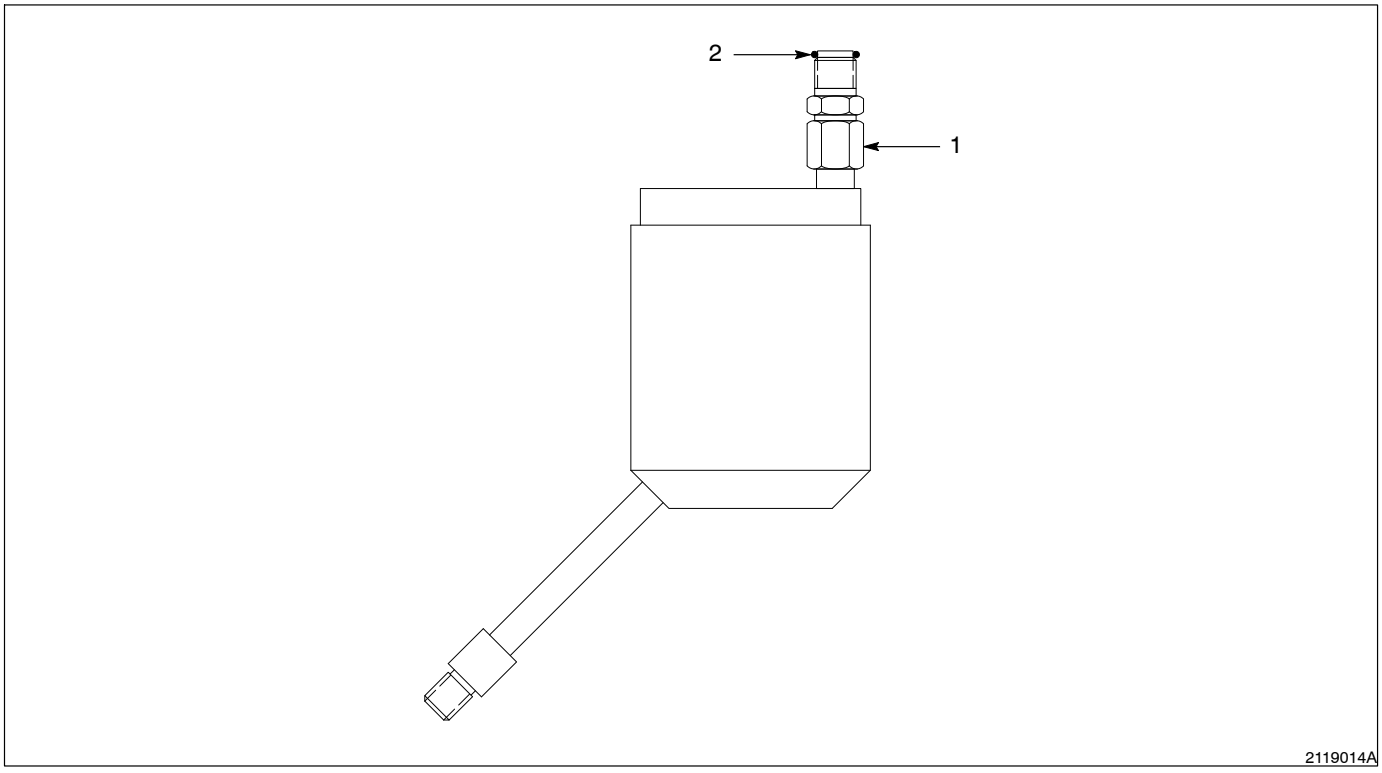


Fig. 8-2 AN-8 Plus Miniature Isocoil

### *High-Conductivity Isocoil*

See Figure 8-3. The Isocoil listed below, with the 0.23-cm (0.93-in.) ID or 0.48-cm (0.188-in.) ID tube listed previously, can spray highly conductive coating materials through the AN 8 Plus gun.

| Item | Part | Description | Quantity | Note |
|---|---|---|---|---|
| — | 133 680 | Isocoil, high conductivity | 1 | |
| 1 | 972 012 | • Plug, O-ring, boss, $^1/_2$-20 | 1 | |
| 2 | 246 638 | • Isocoil, offset | 1 | |
| 3 | 246 727 | • Adapter, extension, $^1/_2$-20 x 0.380 in. | 1 | |
| 4 | 940 112 | • O-ring, PTFE, 0.313 x 0.438 in. | 2 | |
| 5 | 245 308 | • Insert, tube | 2 | |
| 6 | 984 546 | • Nut, pipe, 0.380 in., NPS | 2 | |
| 7 | 246 632 | • Adapter, Isocoil, 0.380 in., NPS | 1 | |
| 8 | 133 679 | • Bracket, Isocoil, AN-8 Plus | 1 | |

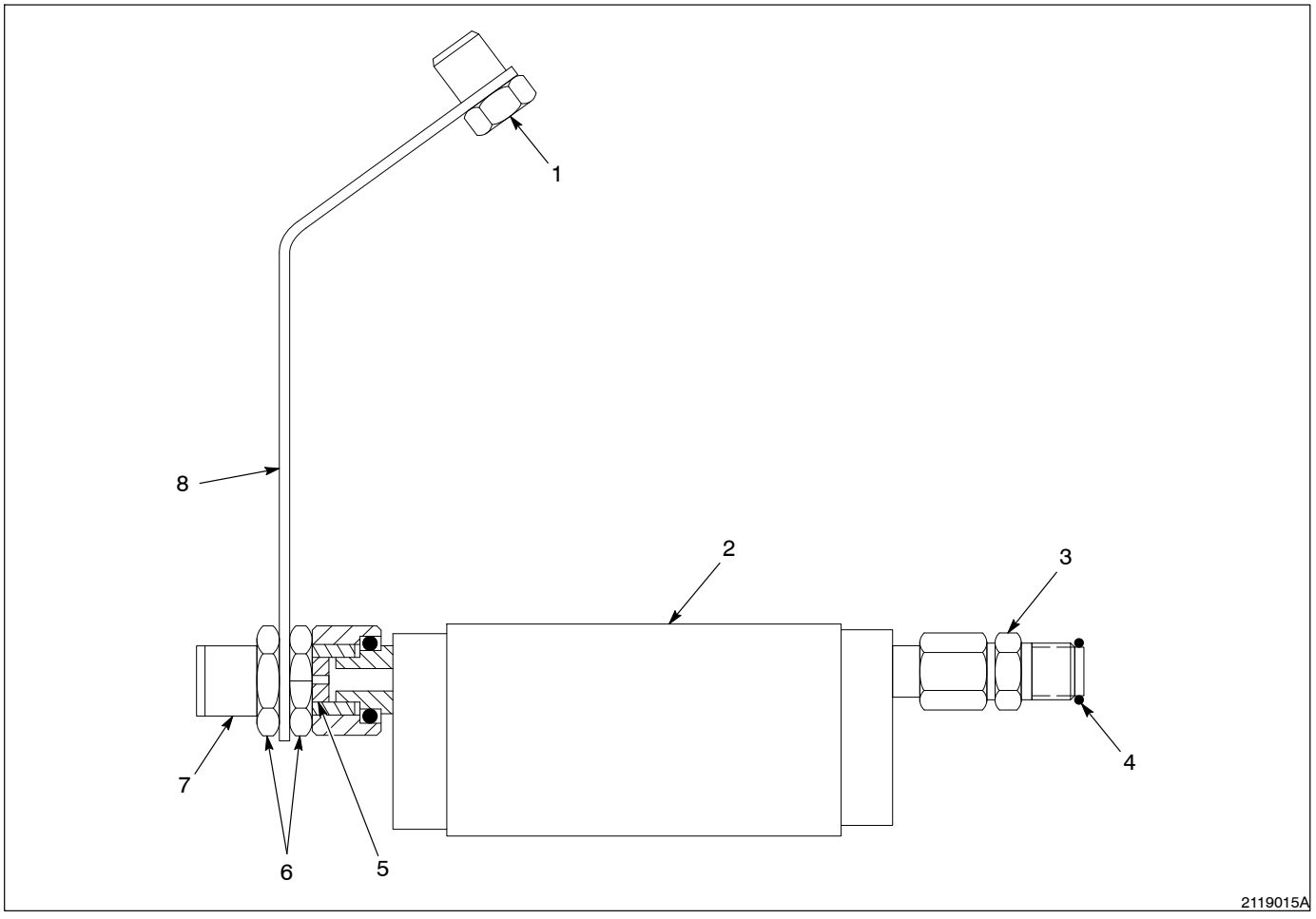


Fig. 8-3 High Conductivity Isocoil

*Section 9*

# *Specifications*

# Section 9
# Specifications

## 1. Introduction

This section provides the specifications for the AN-8 Plus gun.

### Dimensions

| Size | Metric (cm) | USA (in.) |
|---|---|---|
| Height: | 24.1 | 9.5 |
| Length: | 26.4 | 10.4 |
| Width: | 4.1 | 1.6 |

### Operating Pressures

| Pressure | Metric (bar) | USA (psi) |
|---|---|---|
| Air: | | |
| Maximum working pressure | 7.0 | 100 |
| Optimum pressure (at gun) | 1.4–2.1 | 20–30 |
| Average operating pressure | 1.1–2.8 | 15–40 |
| Working pressure | 0.0–7.0 | 0–100 |
| Fluid: | | |
| Maximum working pressure | 5.3 | 75 |
| Optimum pressure (at gun) | 1.1 | 10 |
| Maximum fluid flow | 900 cc/min | 30 fl oz/min |
| Optimum fluid flow | 45–350 cc/min | 1.5–12 fl oz/min |

### Electrical Ratings

Rated output voltage at gun tip: 76 kV

Rated output current at gun tip: 170 μA

| | | |
|---|---|---|
| ***Air Quality*** | Particulate free: | 5 microns maximum |
| | Oil free: | Coalescing filters |
| | Pressure dew point: | <4.45 °C at 7.0 bar<br><40 °F at 100 psi |
| ***Fittings*** | Air inlet: | $^1/_4$-in. NPS male |
| | Fluid inlet: | $^3/_8$-in. NPS male |
| ***Resistance Values*** | Power unit cable end to gun electrode: | 230–250 MΩ |
| | Cable, end-to-end: | 180–270 MΩ |
| | Gun resistor: | 88 MΩ ± 10% |
| | Tip resistor: | 12 MΩ ± 10% |