

Kinetix[®] Electrostatic Spray Gun Automatic Air Spray and KVLP

Customer Product Manual

Part 334594G03

Issued 8/08

**For parts and technical support, call the Industrial Coating
Systems Customer Support Center at (800) 433-9319 or
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DECLARATION of CONFORMITY

Nordson Corporation

declare under our sole responsibility that the products

Kinetix High Pressure or Trilogy Low Pressure, automatic liquid electrostatic applicators including control cables used with the IPS-20 Automatic Controller

to which this declaration relates complies with the following Directives:

- **Machinery Directive 2006/142/EC**
- **EMC Directive 2004/108/EEC**
- **ATEX Directive 94/9/EC**

The conformity is under observance of the following standards or standards documents:

EN12100 (2003) EN60204 (2006)	EN60079-0 (2006) EN50050 (2006) EN50176 (2007)	EN61000-6-3 (2007) EN61000-6-2 (2005) EN55011 (2007)
		FM7260 (1996)

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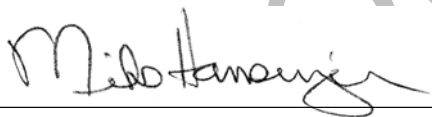
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Section 1

Safety

Introduction

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

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

Qualified Personnel

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

Intended Use

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

Some examples of unintended use of equipment include

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

Regulations and Approvals

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

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 debridement, and immediate antibiotic treatment.

Fire Safety

To avoid a fire or explosion, follow these instructions.

- Ground all conductive equipment. 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 when 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:

<u>Element</u>	<u>Symbol</u>	<u>Prefix</u>
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.

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.





Disposal

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

Safety Label

Table 1-1 contains the text of the safety label on this equipment. The safety label is provided to help you operate and maintain your equipment safely. See Figure 2-1 for the location of the safety label.

Table 1-1 Safety Label

Symbol	Description
	WARNING: Allow only qualified personnel to use this equipment. Observe and follow all safety instructions for this equipment.
	WARNING: Risk of explosion or fire. Fire, open flames, and smoking prohibited.
	WARNING: Do not point the spray gun at any part of your body or at anyone else. Do not operate the fluid delivery system if any component is leaking. Failure to observe this warning could result in an injection injury.
	WARNING: Risk of electrical shock. Disconnect and lockout input power to equipment before servicing. Failure to observe this warning may result in personal injury or death.

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Section 2

Description

Introduction

See Figure 2-1.

The Kinetix air spray and KVLP automatic electrostatic spray gun electrostatically charges and sprays liquid coatings. The spray gun is powered by a gun control unit and has a user-replaceable internal voltage multiplier.

The spray gun is non-circulating and can be used with heated and unheated non-circulating spray systems.

KVLP and air spray systems use low-pressure fluid sources, such as pressure pots, diaphragm pumps, or low-ratio piston pumps. They are commonly used to apply low to medium viscosity fluids to products requiring a high-quality finish.

NOTE: The fluid tip and air cap you choose will determine if you will be using air spray technology or KVLP technology.

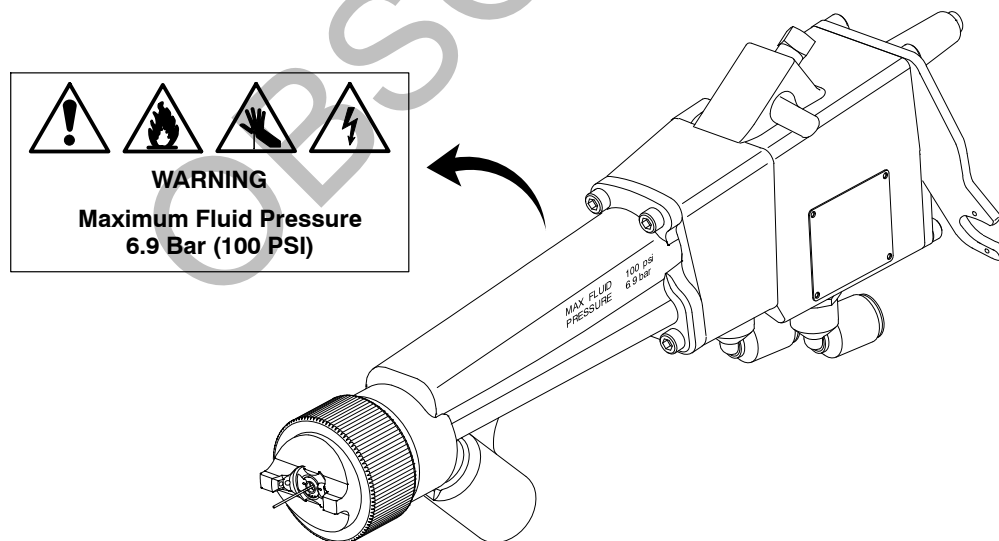


Figure 2-1 Kinetix Air Spray and KVLP Automatic Electrostatic Spray Gun

Note: Refer to *Safety Label* on page 1-5 for a description of the warning labels on the spray gun extension.

KVLP Description

KVLP technology creates a soft spray with high transfer efficiency, reducing emissions of volatile organic compounds (VOCs). KVLP spray guns use high volumes of very low pattern control (horn) and atomizing air pressures (less than 0.69 bar (10 psi)). The high volume of pattern control air provides sufficient energy to atomize sprayed fluids. The low atomizing air pressure reduces fluid bounceback and overspray which improves transfer efficiency.

KVLP atomization is typically coarser than air spray when used with high-viscosity fluids and high flow rates.

Air Spray Description

Air spray technology atomizes material at higher air pressures and lower air flows than KVLP spray guns. Air spray guns produce a very fine, atomized mist. This makes them useful for extremely fine finishing work.

Features

- adjustable pattern control (horn) air pressure and fluid flow rate
- large air passages for higher air energy
- easy disassembly for cleaning and repair
- self-adjusting packing cartridge

Options

Options include a variety of fluid tips; air caps; air and fluid hoses; fitting; and a quick-exhaust valve. KVLP compliance kits are available for each KVLP air cap.

NOTE: The fluid tip and air cap you choose will determine if you will be using air spray technology or KVLP technology.

Coating Materials

The spray guns are compatible with a wide variety of coating materials including

- general solvent-based
- metallics
- high-solids
- multi-component
- waterborne
- ultraviolet curing

NOTE: The seals in the spray gun are compatible with most coatings. If the coating material you use damages the seals, contact your Nordson Corporation representative for compatible replacements.

Theory of Operation

See Figure 2-2.

Electrostatic Charge

The Kinetix automatic gun power supply delivers low-voltage dc power through an electrostatic cable (1) to the multiplier (3), which is housed in the extension (4) of the spray gun. The multiplier then generates high-voltage for an electrostatic field. This electrostatic field produces a corona discharge around the gun electrode (6).

Resistors within the multiplier limit the output current at safe levels. High-voltage (93 kV) current passes through the gun's electrode to electrostatically charge the coating material. As the charged coating material is sprayed it is attracted to the grounded object to be coated.

Fluid Flow

Fluid enters the spray gun through fluid tubing (9) attached to the extension and flows to the fluid tip (7). The needle (5) controls fluid flow through the fluid tip. The fluid adjuster (14) controls the needle travel allowing adjustments to be made in fluid flow rates at the spray gun. The packing cartridge (8) prevents fluid from flowing out of the back of the extension. The fluid flow is dead-ended at the spray gun when the operation has stopped.

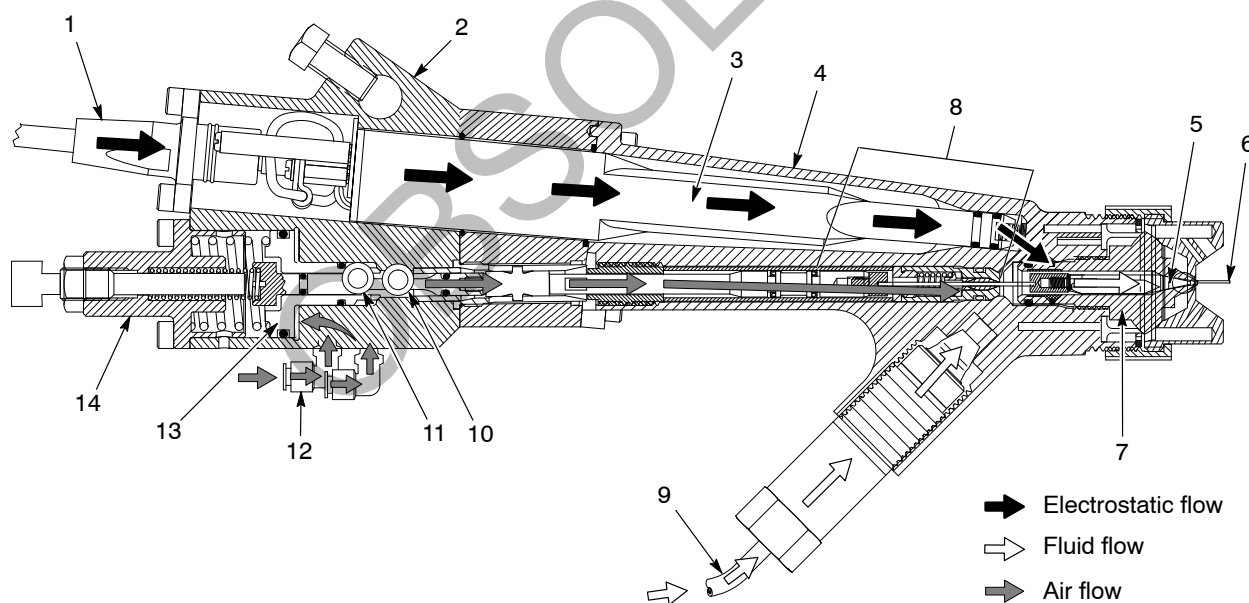


Figure 2-2 Spray Gun Components and Operation

- | | | |
|------------------------|------------------------|--------------------------------------------|
| 1. Electrostatic cable | 6. Electrode | 11. Horn air core |
| 2. Spray gun body | 7. Fluid tip | 12. Activation (trigger) air inlet fitting |
| 3. Multiplier | 8. Packing cartridge | 13. Air piston |
| 4. Extension | 9. Fluid tubing | 14. Fluid adjuster |
| 5. Needle | 10. Atomizing air core | |

Air Flow

Air enters the spray gun body at three fittings:

Activation (trigger) — Activation (trigger) air (12) moves the air piston (13) which opens the atomization air core (10) and develops full atomization air flow. The air piston then pulls on the connecting rod, opening the needle generating fluid flow. There is always maximum air flow prior to fluid flow thus eliminating fluid spitting and poor atomization of the initial fluid flow.

Horn — Horn air (11) flows directly to the air cap and shapes the spray pattern. The horn air flow is constant unless it is controlled by a separate solenoid valve.

Atomization — Atomization air (10) flows when the spray gun is activated or triggered. A small amount of atomization air continually flows through the spray gun body.

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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.

Preparation



CAUTION: Do not overtighten parts. Failure to observe this caution will result in equipment damage.

NOTE: Fluid tips, air caps, and hoses are not shipped with the spray gun. You must order them separately, based on your application. If you order an KVLP air cap, you may also want to order the appropriate compliance kit. You will need one compliance kit for each air cap size you use.

NOTE: Compliance caps are used to verify compliance of non-electrostatic KVLP systems. Electrostatic guns are by themselves compliant spray technologies, so it is not necessary to verify air cap compliance. Instead, you may want to use a compliance kit to make sure the air cap pressure is at optimum level.

Before installation,

- make sure you have the appropriate fluid tip and air cap for your application.
- make sure you have air and fluid hoses of the correct length, ID, and materials.



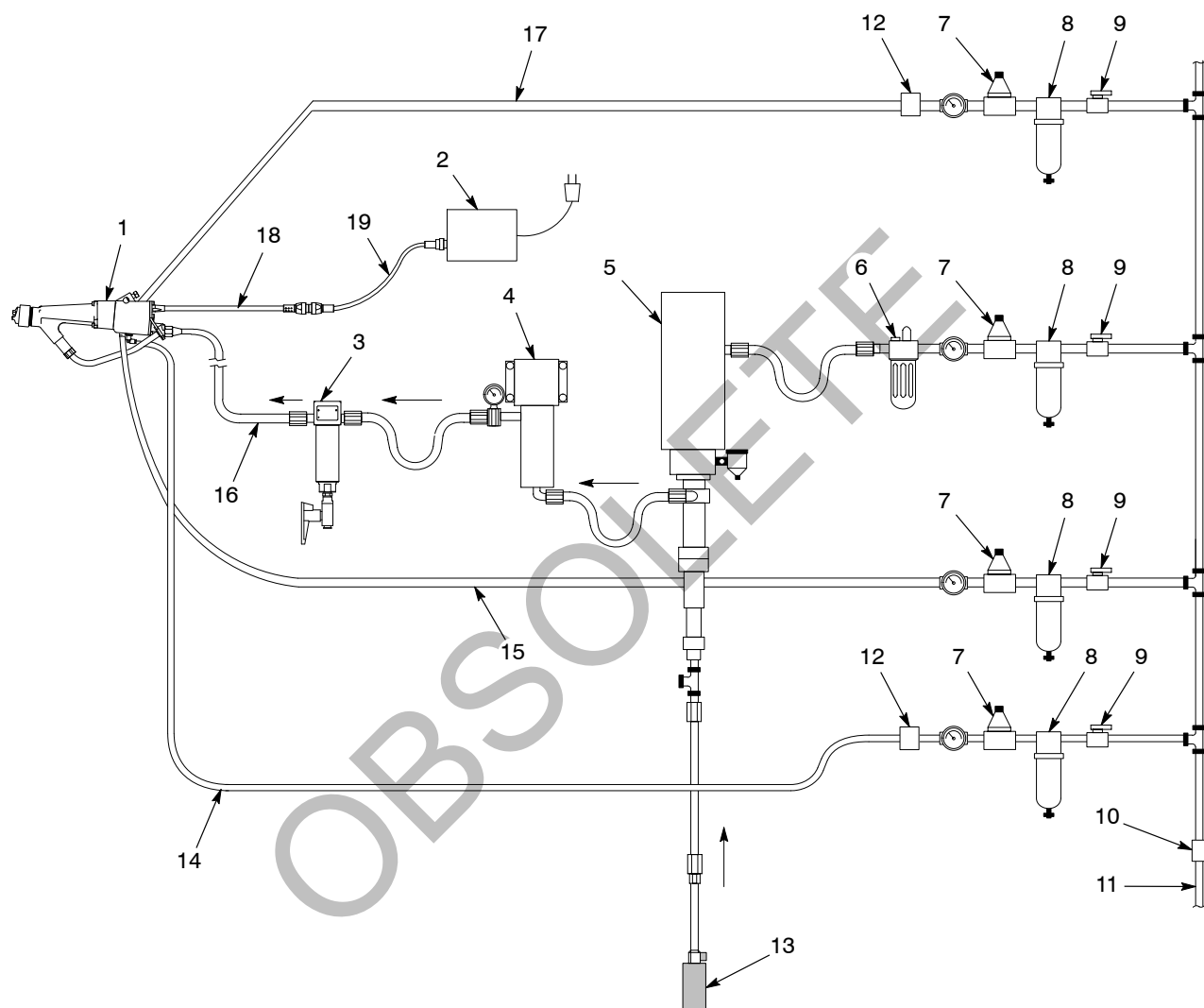
WARNING: Risk of fire and/or electrical shock if the spray gun and the system components are not properly grounded.

- make sure the system is properly grounded.

NOTE: Inadequately grounded parts will lose electrostatic attraction when sprayed.

- remove the spray gun, brushes, and combination tool from the box.

Some components shown are optional. Make sure your system contains self-relieving shutoff valves for both air and fluid supply.



1. Spray gun	8. Air filter	14. Activation (trigger) air
2. Control unit	9. Self-relieving shutoff valve	15. Horn air
3. Fluid filter	10. Drain valve	16. Fluid supply
4. Heater (as required)	11. Drain rod	17. Atomizing air
5. Pump	12. Solenoid	18. Gun cable
6. Air lubricator	13. Siphon screen	19. Extension cable
7. Air regulator		

Air and Fluid Hose Connections

Spray gun fittings accept standard Nordson fluid hoses.

Air Hose

The air hoses supplying air to the spray gun should be no longer than 7.62 m (25 ft).

Limit the number of restrictions in the air supply lines and hose to provide maximum air flow.

1. Clean the air hose fitting with a clean, dry cloth.
2. Connect the atomization air hose between the $\frac{3}{8}$ -in. tube fitting in the spray gun body and the air supply outlet.
3. Connect the trigger air hose between the $\frac{1}{4}$ -in. tube fitting in the spray gun body and the air supply outlet.

Fluid Tubing



WARNING: The spray gun body and all conductive parts must be grounded. Without a ground, a static charge could build up in the spray gun, resulting in shocks to the operator or sparking that could cause a fire. Resistance checks, from hose fitting to hose fitting, should be a part of your regular maintenance procedures.

The spray gun uses a ferrule and retaining nut to attach the customer-supplied fluid tubing. The spray gun includes a $\frac{1}{4}$ -in. and $\frac{3}{8}$ -in. ferrule and one retaining nut. Determine the fluid tubing size that is best for your application needs and then install the appropriate ferrule and retaining nut on the spray gun extension.

Fluid Tubing Selection

Consider the following when selecting the fluid hose/tubing:

- The longer the hose/tubing, the lower the current draw.
- The smaller the hose/tubing inside diameter, the lower the current draw.
- The pressure drop through the hose/tubing increases with length and as the inside diameter gets smaller.
- Both the length and inside diameter of the hose/tubing could affect flow rate requirements on your system.

Fluid Tubing Selection *(contd)*

Current draw levels through the fluid tubing of 20 μA or less should provide adequate charging of the coating material. Higher current draws may be acceptable if transfer efficiency levels are acceptable.

Refer to Table 3-1.

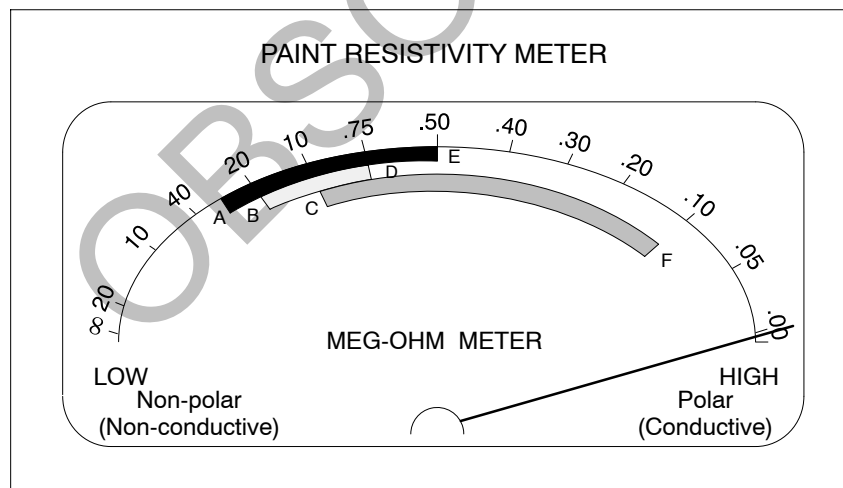
Figure 3-2 identifies the optimum coating resistivities for air spray electrostatics as 0.5–3.0 $\text{M}\Omega$.

Figure 3-3 plots the tubing length required to keep current draw below 20 μA for 0.25-, 0.170-, and 0.093-in. ID tubing for various coating resistivities.

Figure 3-4 plots the tubing length required to keep current draw below 10 μA for 0.25-, 0.170-, and 0.093-in. ID tubing for various coating resistivities.

Table 3-1 Tubing Lengths for a 20 μA Current Draw

Resistivity of Coating	Tubing		
	0.25-in. ID	0.170-in. ID	0.093-in. ID
0.025 $\text{M}\Omega$	21.0 ft	8.75 ft	3.5 ft
0.05 $\text{M}\Omega$	16.5 ft	5.5 ft	2.5 ft
0.10 $\text{M}\Omega$	3.5 ft	1.8 ft	1.0 ft
0.25 $\text{M}\Omega$	1.5 ft	1.0 ft	1.0 ft



Legend:

- Best range for airspray electrostatic 0.5–3.0 range — A to E scale.
- Best range for airless and air-assisted airless electrostatic 0.75–2.0 range — B to D scale.
- Best range for rotary 0.10–1.0 range — C to F scale.

NOTE: Readings outside these ranges are often acceptable.

Figure 3-2 Resistivity Range for Coatings

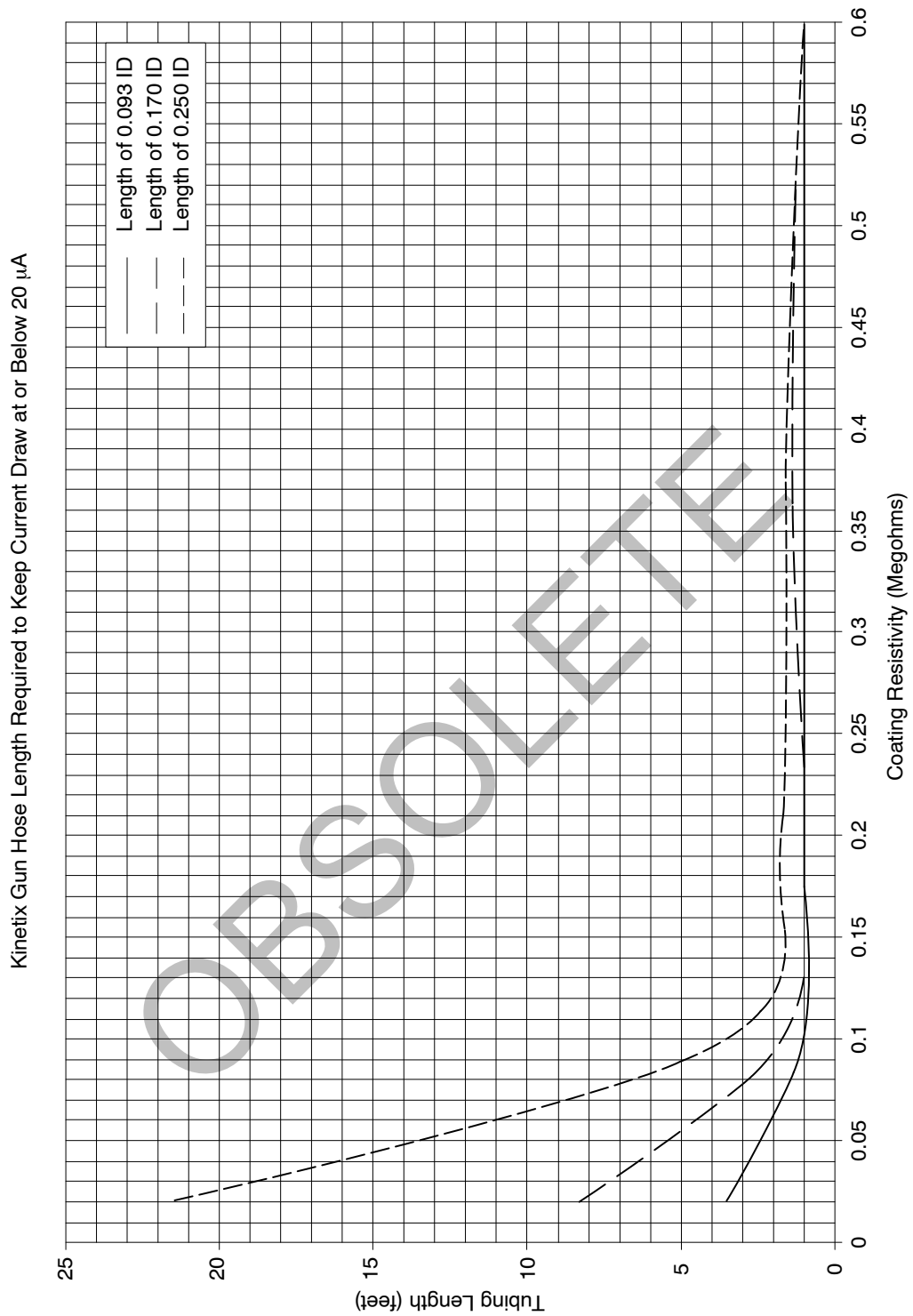


Figure 3-3 Tubing Length Required to Keep Current Draw at or Below 20 μ A

Fluid Tubing Selection *(contd)*

See Figure 3-4 for the plot of a 10 μA current draw if you feel that the transfer efficiency or wrap are compromised.

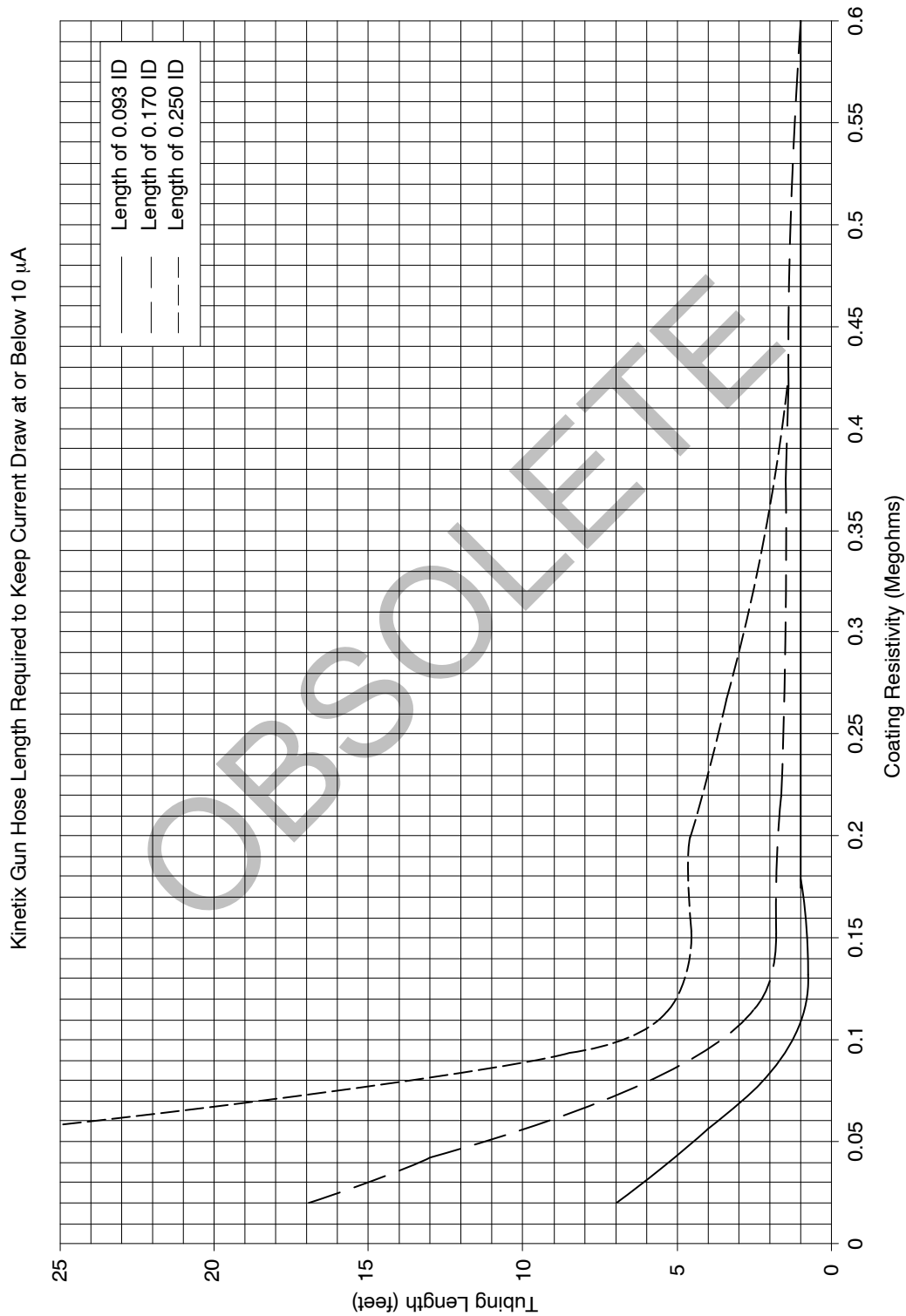


Figure 3-4 Tubing Length Required to Keep Current Draw at or Below 10 μA

Fluid Tubing Connections

See Figure 3-5.

1. Apply dielectric grease to the outside diameter of the customer-supplied fluid tubing.
2. Slide the retaining nut (3) over the the fluid tube.
3. Insert the fluid tubing through the ferrule (2) so that approximately 2.5 cm (1 in.) is out of the pointed end of the ferrule.
4. Apply dielectric grease to the threads of the retaining nut and slide it over the tube and onto the ferrule.
5. Push the ferrule into the gun extension inlet (1) so that the fluid tube is seated into the counterbore at the bottom of the fluid fitting boss.
6. Tighten the retaining nut hand tight then use a wrench to secure it by turning it $\frac{1}{4}$ – $\frac{3}{4}$ of a turn.
7. Connect the fluid tubing to the fluid-delivery system outlet.

NOTE: The effectiveness of the electrostatics may diminish when coating resistivities fall below 0.25 megohms.

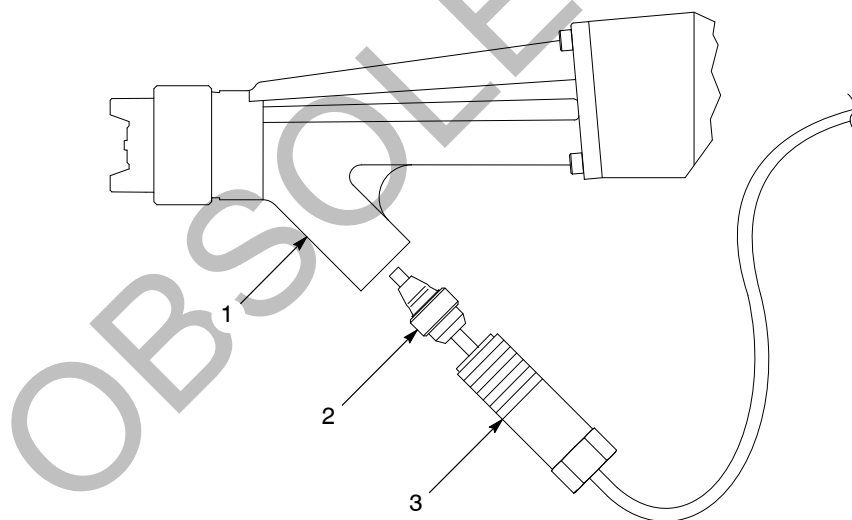


Figure 3-5 Connecting the Ferrule and Retaining Nut

- | | |
|-------------------------------|------------------|
| 1. Extension fluid inlet boss | 3. Retaining nut |
| 2. Ferrule | |

Gun Cable Connection



WARNING: Ground all electrically conductive equipment. Ungrounded conductive equipment can store a static charge, which could ignite a fire or cause an explosion if a hot spark is discharged. 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.

NOTE: Refer to the gun control unit manual for more information.

1. Insert the small threaded connector (8) of the gun cable through the ground bracket (7).
2. Install the lock washer (9) on the threaded connector and secure with the nut (10).
3. Connect the three-pin connector on the multiplier pigtail (11) to the small connector of the gun cable.
4. Carefully push the pigtail back into the the gun body and attach the ground bracket to the spray gun with the four screws (6).
5. Connect the large male connector (5) on the gun cable to the female connector of the extension cable (4).
6. Connect the male connector of the extension cable (3) to the POWER OUTPUT receptacle (2) on the rear panel of the control unit.

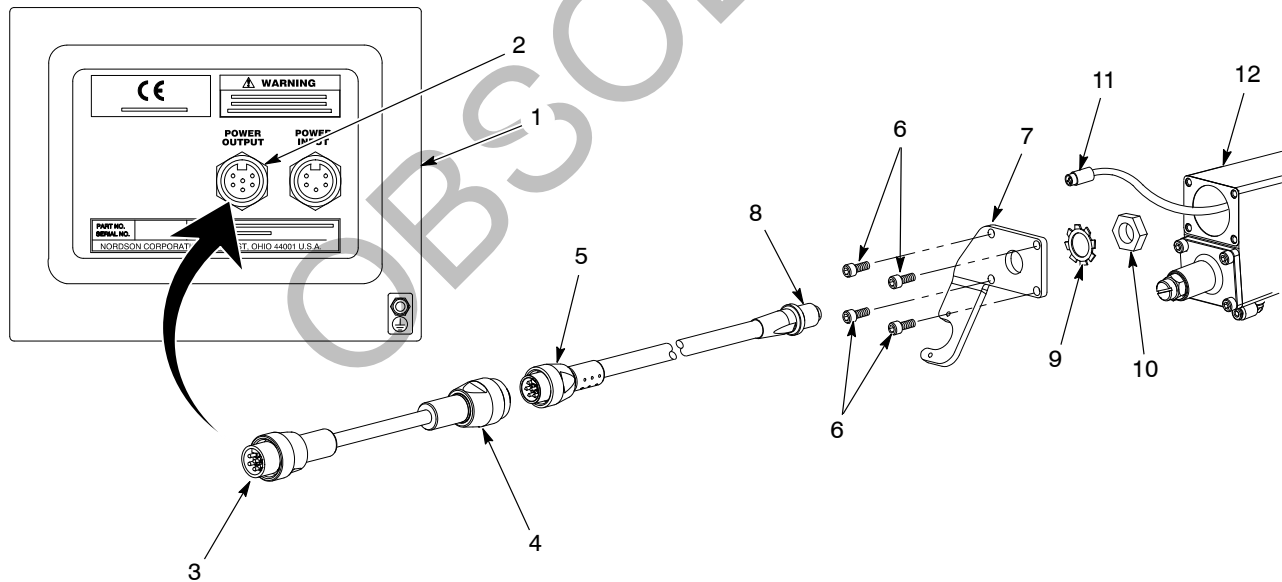


Figure 3-6 Gun Cable Installation

- | | | |
|-------------------------------|------------------------------|------------------------|
| 1. Control unit | 5. Gun cable large connector | 9. Lock washer |
| 2. POWER OUTPUT receptacle | 6. Screws | 10. Nut |
| 3. Extension cable male end | 7. Bracket | 11. Multiplier pigtail |
| 4. Extension cable female end | 8. Gun cable small connector | 12. Spray gun |

Securing the Hoses and Cables

Gun Cable

- Protect the ends of the gun cable so that no contaminants, oils, particles, or solvents are carried by it into the gun control unit receptacle or multiplier connector.
- Do not tie the cable to the machine members in areas where the cable must move or stretch.
- Do not bend the cable around a radius of less than 15.24 cm (6 in.) at stationary points and 20.3 cm (8 in.) at flexing points.
- Do not allow the cable to become abraded around sharp corners such as booth edges.
- Do not walk on the cable or run over it with heavy objects.
- Do not use cable ties. Use hook and loop tape to secure the cable.
- Bundle the gun cable with the air and fluid hoses.

Air and Fluid Hoses

- Bundle the air and fluid hose(s) together with hook and loop tape, spiral-cut tubing, or similar devices. If you secure the hoses to a stationary object at any point between the fluid-delivery system, make sure the hoses can flex without strain.
- If desired, cover the spray gun body, hoses, and other equipment in the spray area with a grounded, conductive wrapping to keep them clean.

Fluid Tip and Air Cap Installation



WARNING: Shut off the power supply. Ground the spray gun's electrode to remove any residual charge. Failure to observe this warning could result in personal injury.



WARNING: Before installing or changing fluid tips or air caps, shut off the fluid-delivery system and relieve the fluid pressure in the system. Failure to observe this warning could result in injury.

1. Turn off the gun control unit and ground the spray gun electrode to remove any residual charge
2. Point the spray gun into the booth or waste container and activate the spray gun to relieve residual pressure. Deactivate the trigger air to prevent inadvertent activation of the equipment.
3. See Figure 3-7. Unscrew the retaining ring (1). Remove the retaining ring and air cap (2) assembly.
4. Prepare the fluid tip (3) by installing the O-ring (5) in the groove on the fluid tip. Lubricate the O-ring with dielectric grease.
5. Make sure the conductive back-up ring (4) is installed on the fluid tip.



CAUTION: To prevent damage to the needle and fluid tip seat, activate the spray gun to pull the needle tip back before removing or installing a fluid tip.

6. Activate the spray gun to retract the needle (7). Screw the fluid tip into the threaded bore of the spray gun.



CAUTION: The spray gun fluid seal is an O-ring. The O-ring sealing capability is provided by radial squeeze. Tightening the fluid tip to beyond snug does not prevent or eliminate fluid leaks.

7. Tighten the fluid tip with the internal hex of the combination tool until it is snug. Do not overtighten the fluid tip.

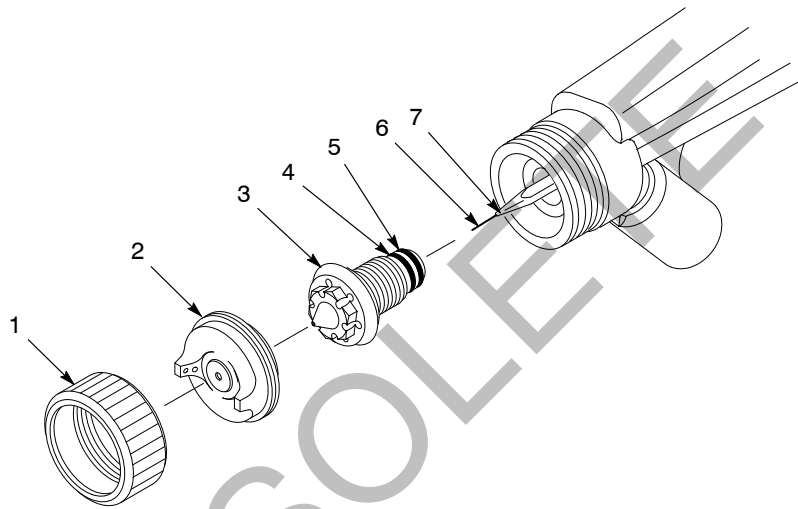


Figure 3-7 Fluid Tip and Air Cap Installation

- | | | |
|-------------------|----------------------------|--------------|
| 1. Retaining ring | 4. Conductive back-up ring | 6. Electrode |
| 2. Air cap | 5. O-ring | 7. Needle |
| 3. Fluid tip | | |

8. Make sure the air cap rests in the groove in the bottom of the retaining ring and that it rotates freely.

NOTE: If you are using a KVLP fluid tip and air cap, you may want to remove the air cap, install the appropriate KVLP compliance kit, and test for optimum performance. Refer to *KVLP Performance Testing* on page 4-5.

9. Screw the retaining ring and air cap assembly onto the extension. Hold the air cap in the desired position and tighten the retaining ring until it is snug.

NOTE: The air cap screws into the retaining ring and rests in a groove in the ring that lets it rotate freely. Do not overtighten the air cap.

Optional Quick-Exhaust Valve

See Figure 3-8.

A quick-exhaust valve is available for applications requiring a faster air piston response. Follow this procedure to install the quick exhaust valve.

1. Remove and save the elbow (2) supplied with the spray gun.
2. Apply PTFE tape to both ends of the nipple (1).
3. Install the nipple into the quick-exhaust valve (3).
4. Apply PTFE tape to the muffler (4) and install it into the quick-exhaust valve.
5. Apply pipe sealant adhesive to the threads of the elbow if not already applied. Install the elbow into the quick-exhaust valve.
6. Install the the quick-exhaust nipple in the spray gun body trigger port (5).

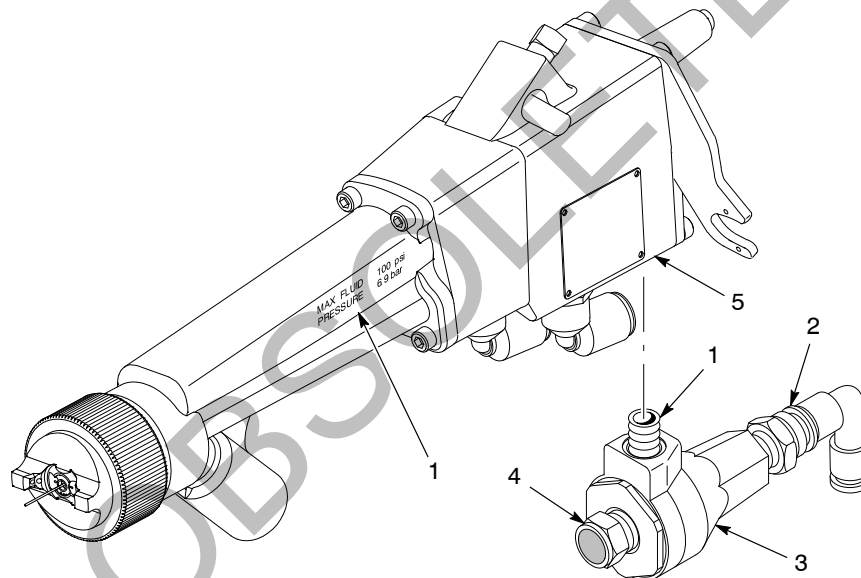


Figure 3-8 Optional Quick-Exhaust Valve

- | | | |
|---------------------------------------|------------------------|--------------------------|
| 1. 1/8-in. NPT x 1/8-in. NPT nipple | 3. Quick exhaust valve | 5. Gun body trigger port |
| 2. 1/8-in. in. NPT x 1/4-in. OD elbow | 4. Muffler | |

OBSOLETE

Section 4

Operation

Introduction



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



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



WARNING: Do not exceed the maximum fluid pressure rating of 6.9 bar (100 psi). Failure to follow this warning may result in death or personal injury.

NOTE: Read this entire section before performing any procedures.

Before operating the spray gun, make sure that

- the fluid tip is securely tightened and the air cap is correctly installed and secured with the retaining ring.
- all fluid and air connections are secure and leak-free. The fluid hose is grounded.
- air supply and fluid-delivery components are correctly installed. All conductive system components and flammable material containers are securely connected to a true earth ground.
- the operator station and spray area are clean and free of debris.

System Startup

NOTE: When starting a new spray system for the first time, flush the fluid-delivery system, hose, and spray gun with a solvent compatible with the coating material to be used. Remove the air cap from the spray gun before flushing solvent through the spray gun. Flushing will remove contaminants from the system.

1. Turn on the spray booth exhaust fans then turn on the air supply shutoff valve. Adjust the air pressure as required for your application. Do not exceed 6.9 bar (100 psi).
2. Pressurize the system with fluid. Do not exceed 6.9 bar (100 psi).
3. Turn on the fluid heater, if used. Do not exceed 82 °C (180 °F).
4. Check the fluid-delivery system for leaks.
5. Shut off the air supply to the spray gun and check the fluid flow rate.

NOTE: You may want to remove the air cap.

An appropriate fluid supply pressure should develop an unatomized fluid stream that breaks at a distance of 25.4–35.6 cm (10–14 in.). If the flow rate does not have an acceptable fluid stream, increase the fluid tip diameter and adjust the fluid pressure until a break of 25.4–35.6 cm (10–14 in.) is achieved at your required flow rate.

If the flow rate is too high, turn the fluid control knob clockwise in small increments. This will decrease needle travel and fluid flow. For more significant flow rate changes, adjust the fluid supply pressure or use the next smallest or largest fluid tip.

NOTE: For best results, leave the fluid control knob adjusted fully open. If you have to limit the stroke to less than half the needle travel, you are using too large a fluid tip.

6. Point the spray gun into the booth and activate the spray gun. Adjust the atomization air pressure, horn air pressure, and fluid pressure to obtain the desired atomization and spray pattern. Refer to *Spray Pattern and Atomization Adjustments* on page 4-3.
7. Turn on the gun control unit.
8. Use a Nordson kV meter to read the maximum kV output of the power supply. Use this information and the values from *Electrostatic Troubleshooting* on page 6-6 as a baseline when troubleshooting the electrostatic system.
9. **If you are using KVLP air caps and fluid tips:** Check the atomizing and horn air pressures are 0.69 bar (10 psi) or less. Refer to *KVLP Performance Testing* on page 4-5.

Spray Pattern and Atomization Adjustments

Obtaining the correct spray pattern, coating material atomization, and transfer efficiency for your application requires a combination of operator experience and experimentation. To obtain the best results, perform the following steps:



WARNING: Shut off the gun control unit and ground the spray gun electrode to remove any residual charge. Failure to observe this warning could result in personal injury.

1. Set the supply air pressures to the spray gun. Use the lowest possible air pressure to obtain proper atomization of the coating material. Increasing the air pressure provides finer atomization. Decreasing the air pressure provides coarser atomization.

If you are using KVLP air caps and fluid tips: Refer to *KVLP Performance Testing* on page 4-5 for suggested starting air pressures.

2. Point the spray gun into the booth and activate the spray gun.
3. Adjust the horn air supply pressure to achieve the desired spray pattern. Higher pressures will generate a wider fan pattern. Lowering the pressure will decrease the pattern width and create a rounder pattern.
4. Repeat steps 1, 2, and 3 until you achieve the desired spray pattern and atomization. If necessary, adjust the fluid and air pressure at the fluid and air delivery systems. Use the lowest atomizing air pressure possible along with the appropriate fluid flow rates to ensure maximum transfer rates and highest quality finishes.
5. **If you are using KVLP air caps and fluid tips:** Test for optimum performance. Both atomizing and horn air pressures should be 0.69 bar (10 psi) or less. Refer to *KVLP Performance Testing* on page 4-5.

Fluid Tips and Air Caps



WARNING: Turn off the gun control unit and ground the spray gun electrode to remove any residual charge. Failure to observe this warning could result in personal injury.

Different combinations of fluid tips and air caps can improve atomization and spray patterns with various coating materials and viscosities. If the fluid flow and air adjustments described previously do not produce the desired results, try a different combination of fluid tip and air cap.

A full range of air spray and KVLP fluid tips and air caps are available that can improve coating quality. Refer to the *Kinetix KVLP and Air Spray Fluid Tip and Air Cap Selection Charts* included with this manual for part numbers. Refer to *KVLP Performance Testing* on page 4-5 for information on optimum KVLP performance.

Shutdown



WARNING: Turn off the gun control unit and ground the spray gun electrode to remove any residual charge. Failure to observe this warning could result in personal injury.



WARNING: Shut off the fluid-delivery system and relieve the fluid pressure in the system before removing any spray gun components. Failure to observe this warning could result in personal injury.

Short-Term

For short-term breaks in production, no shutdown procedures are necessary. Deactivate the trigger air and wipe the cap and fluid tip with a clean cloth dampened with a compatible solvent.

Long-Term

1. Shut off the gun control unit.
2. Shut off the atomizing and horn air.
3. Flush the fluid-delivery system, fluid hose, and spray gun with a compatible solvent.

NOTE: Refer to the *Flush the System* on page 5-3 for recommended flushing and cleaning procedures.

4. Relieve system fluid pressure.
5. Activate the spray gun into a waste container.
6. Remove the air cap and fluid tip.

Multi-Component Coatings



CAUTION: Leaving the coating material in the spray gun longer than the indicated pot-life may clog the spray gun and require disassembly and replacement of major spray gun components.

Refer to the coating material pot-life information to determine the proper shutdown procedures.

KVLP Performance Testing

To maintain optimum KVLP performance, both atomizing and horn pressures should be 0.69 bar (10 psi) or less. Each KVLP air cap has a corresponding KVLP compliance kit that consists of a modified air cap, air tubing, and pressure gauges. Kits must be ordered separately for each type of air cap. Refer to the *Kinetix KVLP and Air Spray Fluid Tip and Air Cap Selection Charts* included with this manual for part numbers.

NOTE: The 0.69 bar (10 psi) limit is for reference only and is not required. Many coating materials can be atomized using less pressure. Lower pressures will result in a softer pattern which will lead to better transfer efficiency assuming that there is enough air to adequately atomize the coating material.

Table 4-1 shows the approximate static regulator setting (psig) and resulting airflow (scfm) at an atomizing air cap pressure of 10 psig. This data was generated using 25-ft of $\frac{3}{8}$ -in. OD (0.050-in.) wall tubing. Note that any restrictions in the line after the regulator, such as 90-degree fittings, quick disconnects, or valves, will affect the pressures at the air cap.

Table 4-2 shows the approximate static regulator setting (psig) and resulting airflow (scfm) at a horn air cap pressure of 0.69 bar (10 psig). This data was generated using 25 ft of $\frac{3}{8}$ -in. OD (0.050-in.) wall tubing.

The air pressure settings in Tables 4-1 and 4-2 do not guarantee optimum KVLP performance. After making an air pressure setting, perform an KVLP compliance test.

See Figure 4-1 and refer to *Checking Air Cap Performance* on page 4-7 for kit installation.

KVLP Performance Testing *(contd)*

Table 4-1 Air Cap Designations

Fluid Tip Orifice	Approximate Static Regulator Pressure Setting (psig) and Approximate Air Flow (scfm) at 10 psig Atomization Cap Pressure									
	Air Cap									
	325714		325715		325716		325717		325719	
	psig	scfm	psig	scfm	psig	scfm	psig	scfm	psig	scfm
0.030	19.5	4	22	5	26	6	30	7	39	9
0.035	20	4	23	5	26	6	31	7	39	9
0.040	20	4	22	5	25	6	30	7	38	9
0.050	17	3	19	4	21	5	26	6	33	8
0.060	14	2	16	3	19	4	23	5	31	7
0.070	X	X	X	X	17	3	21	4	28	7
0.080	X	X	X	X	17	3	21	4	28	7
0.100	X	X	X	X	X	X	15	2	21	5
Fluid Tip Orifice	Approximate Static Regulator Pressure Setting (psig) and Approximate Air Flow (scfm) at 10 psig Atomization Cap Pressure									
	Air Cap									
	325721		325723		325725		325727			
	psig	scfm	psig	scfm	psig	scfm	psig	scfm		
0.030	51	12	63	15	79	19	97	23		
0.035	51	12	62	15	77	19	97	23		
0.040	50	12	62	15	77	18	95	22		
0.050	43	11	55	13	68	17	82	20		
0.060	41	10	53	13	67	16	84	20		
0.070	38	9	49	12	64	15	79	19		
0.080	38	9	50	12	63	15	81	19		
0.100	30	7	40	10	54	13	70	17		
NOTE: X represents combinations that are not practical. Consult your Nordson Corporation representative if this combination is desired.										

Table 4-2 Approximate Static Regulator Setting and Horn Air Flow at 10 psig Horn Air Cap Pressure

Air Cap Designation	psig	scfm
714	50	12.8
715	50	12.8
716	50	12.8
717	50	12.8
719	50	12.8
721	50	12.8
723	65	16.3
725	65	16.3
727	65	16.3

NOTE: Horn air flow rates are not a function of the fluid tip used.

Checking Air Cap Performance



WARNING: Shut off the fluid-delivery system and relieve system fluid pressure before performing a compliance test. Failure to observe this warning could result in personal injury.

NOTE: This procedure is only necessary to achieve optimum air cap performance in order to achieve optimum transfer efficiencies. It is acceptable to exceed pressure limits. The lower the air pressure, the softer the spray.

See Figure 4-1.

1. Turn off the gun control unit and ground the electrode to remove any residual charge.
2. Shut off the fluid delivery system and relieve fluid pressure to prevent fluid from spraying while performing the compliance test.
3. Remove the production air cap and retaining ring and replace them with the air cap (4) and retaining ring (1) included with the KVLP compliance kit.
4. Activate the spray gun to fully open the air valve.

Checking Air Cap Performance *(contd)*

5. Check the air pressure gauges (2, 3). Both atomizing and horn pressures should be 0.69 bar (10 psi) or less.
 - If the atomization pressure exceeds 0.69 bar (10 psi), reduce the atomization air supply pressure and check atomization quality.
 - If the horn air pressure exceeds 0.69 bar (10 psi), reduce the horn air supply air pressure and check pattern size.
6. Install the production air cap and check the fluid atomization.

NOTE: You can check the atomization quality with the compliance cap installed. Simply make sure the tubing is not interfering with the spray pattern and is not crimped when held back.

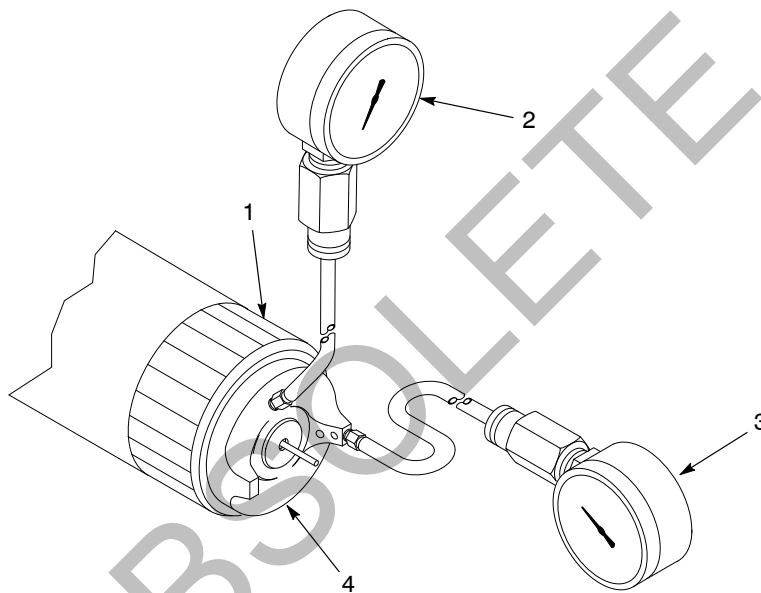


Figure 4-1 Checking Air Cap Performance

1. Retaining ring
2. Atomizing air gauge

3. Horn air gauge

4. Compliance air cap

Section 5

Maintenance

Introduction



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

The spray gun requires very little routine maintenance beyond cleaning. For best results, keep the spray gun as clean as practical.

NOTE: Three spray gun covers are provided with each spray gun. Keeping the spray gun clean can minimize wrapback and improve transfer efficiency.

Daily

Perform the following procedure at the end of each work shift:



WARNING: Shut off the gun control unit and ground the spray gun electrode to remove any residual charge. Failure to observe this warning could result in personal injury.



WARNING: Shut down the system and relieve all fluid and air pressures before performing these procedures. Failure to observe this warning could result in injury.

1. Turn off the gun control unit and ground the spray gun electrode to remove any residual charge
2. Shut down the atomization and horn air supply.
3. Flush the fluid-delivery system, fluid hose, and spray gun with a compatible solvent.
4. Relieve system fluid pressure.
5. Point the spray gun into the booth or grounded waste container and activate to relieve any residual pressure.

NOTE: Keep the spray gun activated when removing the fluid tip.

6. Remove the fluid tip and air cap.

Daily *(contd)*



CAUTION: Use a non-conductive solvent compatible with your coating material. Cleaning with conductive solvents can result in loss of kV, carbon tracking, and permanent damage to spray gun components.



CAUTION: Use only a Nordson cleaning brush to clean the fluid tip and air cap. Using metal tools will damage the fluid tip and air cap, causing faulty spray patterns.



CAUTION: Avoid cleaning the spray gun with pressurized solvents. Spraying with pressurized solvents can force the solvent into spray gun cavities, potentially damaging spray gun components.

7. Remove the O-ring and back-up ring from the fluid tip then soak the fluid tip and air cap in a suitable non-conductive solvent to dissolve any accumulated coatings, then use the brush included with the spray gun to clean them.
8. Clean the spray gun extension frequently with a clean cloth dampened with non-conductive solvent. Do not soak the spray gun in solvent.
9. Dry the fluid tip, air cap and spray gun with low-pressure air from an OSHA-approved blowgun.
10. Replace the O-ring and back-up ring on the fluid tip. Lubricate the O-ring with O-ring grease.

Periodically

Periodically flush the system and clean the spray gun components. The frequency of these procedures will vary depending on the application and coating material being used.



WARNING: Shut off the gun control unit and ground the spray gun electrode to remove any residual charge. Failure to observe this warning could result in personal injury.



WARNING: Shut down the system and relieve all fluid and air pressures before performing these procedures. Failure to observe this warning could result in injury.



CAUTION: Use a non-conductive solvent compatible with your coating material. Cleaning with conductive solvents can result in carbon tracking and loss of kV.



CAUTION: Avoid cleaning the spray gun with pressurized solvents. Spraying with pressurized solvents can force the solvent into spray gun cavities, potentially damaging spray gun components.

System Flushing

1. Relieve system air and fluid pressure and make sure the spray gun cannot be activated.
2. Turn off the gun control unit and ground the spray gun electrode to remove any residual charge.
3. Point the spray gun down into a grounded waste container. Activate the spray gun to drain the spray gun and hose(s).
4. Remove the retaining ring and air cap.
5. Turn on the solvent supply and adjust it to the lowest possible pressure.
6. Activate the spray gun into a suitably grounded container. Allow solvent to flow until it runs clear.
7. Turn off the solvent supply and relieve the pressure. Disconnect the fluid supply hose, atomizing air, and horn air hoses.

Spray Gun Cleaning



CAUTION: Do not clean the multiplier or the electrostatic cables with solvent. Failure to observe this caution could result in equipment damage.

NOTE: Activate the spray gun to pull the needle off of the seat before removing the fluid tip. This will prevent damage to the needle and or the seat.

Routine Cleaning

1. Remove the fluid tip.
2. Remove the trigger air hose.



CAUTION: Use a non-conductive solvent compatible with your coating material. Cleaning with conductive solvents can result in carbon tracking and loss of kV.



CAUTION: Use only a Nordson cleaning brush to clean the fluid tip and air cap. Using metal tools will damage the fluid tip and air cap, causing faulty spray patterns.

3. Point the spray gun down and clean the front of the spray gun with a soft-bristled brush dampened with a compatible cleaning solvent.

NOTE: Pointing the spray gun down at a slight angle will prevent solvents from entering the air passages and possibly damaging the air seals. Most air seals are not universally compatible with all solvents and can be damaged.

4. Dampen a soft cloth with a compatible cleaning solvent. Point the spray gun downward and clean the exterior.

NOTE: Take special care when cleaning the spray gun body with solvents. Excessive amounts of solvent can leak into the spray gun and damage the multiplier. If the spray gun requires extensive cleaning, remove the multiplier. Refer to the *Multiplier Replacement* on page 7-14 for the procedure to remove the multiplier.

5. Clean the fluid tip, air cap, and retaining ring with a soft-bristled brush and a compatible solvent. Remove the O-rings and back-up ring and soak the fluid tip in solvent if necessary.
6. Install the retaining ring, air cap, and fluid tip making sure the needle is retracted before installing the fluid tip.
7. Install all three air hoses.

Extensive Cleaning



CAUTION: Never soak or vigorously clean the spray gun with the multiplier installed.

For more extensive cleaning, disassemble the spray gun and clean each part. Once disassembled, the extension and body can be soaked in solvent and scrubbed. Remove O-rings before soaking any parts in solvent.

NOTE: Allow parts that have been soaked or heavily washed in solvent to dry thoroughly (overnight) before assembling and reusing the spray gun.

Electrostatic System Checks

Use a Nordson non-loading kV meter to perform checks on the electrostatic system, and a megohmmeter to check the resistance values on the spray gun. These checks ensure that the operator, electrostatic spray gun, electrostatic power supply, and all conductive material within the spray area are connected to a true earth ground. Proper grounding is essential for efficient operation and prevention of a buildup and subsequent discharge of an electrostatic charge that could ignite combustible material within the spray area.

Make sure the electrostatic equipment has and maintains the proper resistance values. Proper resistance values are important to maintain the equipment within designed current outputs. The resistance values may vary over a period of time due to several conditions; for example, a buildup of residue in the spray area and degradation of electrical components that have been exposed to high voltages may occur.

Section 6

Troubleshooting

Introduction



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



WARNING: Shut off the gun control unit and ground the spray gun electrode to remove any residual charge. Failure to observe this warning could result in personal injury.

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.

This section contains troubleshooting procedures for

- common spray gun problems,
- spray pattern and film-build faults, and
- electrostatics.

When multiple causes exist for a problem, they are listed in order of importance.

Common Problems

Problem	Possible Cause	Corrective Action
1. Spray gun spitting	Clogged or damaged needle or fluid tip	Clean or replace the needle and/or fluid tip.
	Partially plugged or dirty air cap	Clean the air cap.
	Air bubbles in fluid stream	Bleed air from the fluid-delivery system; check for leaks in the fluid-delivery system or excessive agitation in the fluid reservoir.
	Fluid pressure too low	Increase the fluid pressure.
2. Air leaks	Foreign matter on the air piston seal or seat	Remove and clean the air valve stem and seat.
	Worn or damaged air piston O-rings or other air seals	Replace the air piston O-rings or other seals, using the correct seals or the air seal kit.
3. Fluid leak from front of spray gun	Worn or damaged fluid tip O-ring	Replace the fluid tip O-ring.
	Worn or damaged needle or seat	Replace the fluid tip if needle seat damaged. Replace the needle if damaged.
4. Fluid leaking from rear of extension	Worn or damaged packing cartridge O-ring	Replace the O-ring and backup ring.
	Worn or damaged packing cartridge	Replace the packing cartridge (packing cartridge cannot be repaired).
5. Spray pattern not affected by air adjustments	No air to spray gun	Supply air to the spray gun. Check for blockage in the air spray line. Adjust the supply air regulator.
	Plugged holes in air cap	Clean the air cap.
6. Low or erratic fluid flow	Fluid-delivery system malfunction	Check the fluid-delivery system (air and fluid).
	Blockage within the spray gun, fluid hose, or fluid-delivery system	Flush the system. If necessary, repair or replace clogged or damaged components.
Continued...		

Problem	Possible Cause	Corrective Action
6. Low or erratic fluid flow (<i>contd</i>)	Low fluid pressure	WARNING: Do not exceed the maximum fluid pressure rating of 6.9 bar (100 psi). Slowly raise the fluid pressure until the the desired fluid flow is obtained.
	Fluid too viscous	Lower the viscosity by adding solvent or increasing the fluid temperature.
	Fluid needle has backed out of packing cartridge fitting	Screw the needle into the packing cartridge fitting. If the problem persists, make sure the operators are pulling the trigger before removing the fluid tip. A removable threadlocking compound can be applied to the threads of the needle to keep it in place.
7. Coarse spray	Air pressure too low for fluid flow rate	Decrease the fluid flow rate or increase the atomizing air pressure. Change the air cap and fluid tip.
	Fluid viscosity too high for atomizing air pressure	Increase the atomizing air pressure, use a larger air cap, or decrease fluid viscosity by either adding solvent or increasing fluid temperature.
	Obstructed atomizing air orifice	Clean the air cap and exterior surface of fluid tip.
	Damaged fluid tip or air cap	Inspect the fluid tip and air cap; replace them if they are damaged.
	Solvent evaporates too quickly	Use slower evaporating solvent. Contact your material supplier.
8. Excessive overspray	Atomization air pressure too high	Decrease the atomization air pressure.
	Fluid pressure is too high	Use a larger fluid tip and decrease the fluid pressure.
9. Excessive bounce back	Air and fluid pressures too high	Decrease the pressures.
	Horn air pressure too high	Decrease the horn air pressure.
10. Dry spray	Spray gun held too far away from substrate	Move the spray gun closer to the substrate.
	Horn air pressure too high or fluid pressure too low	Decrease the horn air pressure or increase fluid pressure. Change the air cap or fluid tip.
11. Paint or coating material is wrapped back	Spray gun needs to be cleaned	Clean the spray gun. Refer to <i>Spray Gun Cleaning</i> on page 5-3.
		Use a gun cover.

Spray Pattern/Film Build Troubleshooting

Figure 6-1 illustrates common spray pattern and film-build faults.

Problem	Possible Cause	Corrective Action
1. Blown pattern (1)	Horn air pressure too high	Decrease the horn air pressure.
	Fluid pressure too low	Increase the fluid pressure.
2. Heavy top (3), bottom (2), left (4) or right (5) pattern	Partially clogged air cap or fluid tip	Rotate the air cap and activate spray gun. If the problem persists, clean the air cap. If the problem still persists, clean the fluid tip or inspect the air cap and fluid tip for damage. Replace if necessary.
	Fluid viscosity incorrect	Change the fluid viscosity.
3. Heavy center (6)	Atomization or horn pressure too low	Increase the atomization and horn air pressure.
	Fluid pressure too high	Decrease the fluid pressure.
	Fluid viscosity too low	Increase the fluid viscosity.
4. Spitting (7)	Air in fluid line	Purge the air from the fluid-delivery system.
	Atomization or horn pressure too low	Increase the atomization air and fluid pressure and/or increase the horn air pressure.
	Fluid too viscous	Decrease the fluid viscosity.
5. Runs and sags	Air in fluid line	Purge air from the fluid-delivery system.
	Atomization air pressure too low	Increase the atomization air pressure and decrease fluid pressure.
	Fluid pressure too high	Increase the atomization air pressure and decrease fluid pressure.
	Spray gun too close to the substrate	Move the spray gun farther from the substrate.
	Horn air pressure is too low	Increase the horn air pressure.
	Fluid too viscous	Decrease the fluid viscosity.
Continued...		

Problem	Possible Cause	Corrective Action
6. Dry spray	Atomization air pressure too high	Decrease the atomization air pressure.
	Spray gun too far from the substrate	Move the spray gun closer to the substrate.
	Horn air pressure too high	Decrease the horn air pressure.
	Fluid viscosity incorrect	Change the fluid viscosity.
7. Poor coverage in recesses	Atomization air pressure too high	Decrease atomization air.
	Fluid pressure too low	Increase fluid pressure.
	Spray gun too far from the substrate	Move the spray gun closer to the substrate.

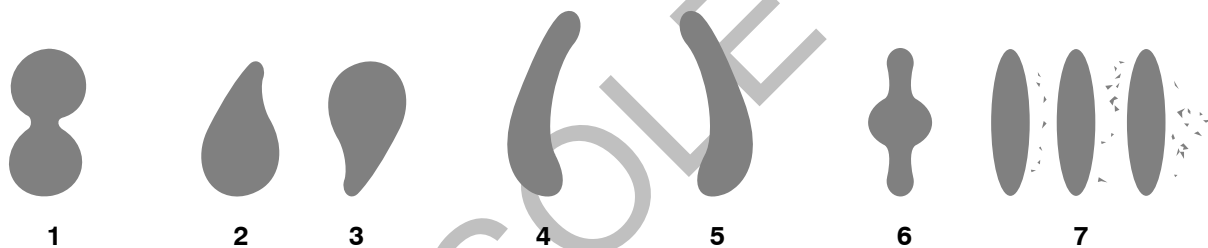


Figure 6-1 Common Spray Pattern Faults

- | | | |
|------------------|---------------------|-----------------|
| 1. Blown pattern | 4. Heavy left side | 6. Heavy center |
| 2. Heavy bottom | 5. Heavy right side | 7. Spitting |
| 3. Heavy top | | |

Electrostatic Troubleshooting

Problem	Possible Cause	Corrective Action
1. Loss of wrap, poor transfer efficiency	Low electrostatic voltage	Increase the voltage.
	Resistor or power supply failure	Check the multiplier/tip resistor assembly with a megohmmeter for 277–340 megohms at 500 volts. If the reading is out of range, check the resistor tip separately. Tip resistor should measure 19.8–20.2 megohms. Refer to <i>Multiplier Continuity and Resistance Check</i> on page 6-7.
	Poorly grounded parts	Check conveyor chain, rollers, and part hangers for paint buildup. The resistance between the parts and the ground must be 1 megohm or less. 500 ohms or less is recommended for best results.
	Leaking packing cartridge	Check packing cartridge for leaks. Clean packing cartridge bore and install new packing cartridge and dielectric grease.
2. No kV output from spray gun	Damaged gun cable	Check the continuity of the cable wires, from pin to pin. Replace the cable if any opens or shorts are found. Refer to <i>Gun Cable Continuity Checks</i> on page 6-8.
	Malfunctioning multiplier	Check the continuity and resistance of the multiplier/resistor assembly with a megohmmeter for 277–340 megohms at 500 volts. No burn throughs or arc tracks should be visible on any gun parts. Refer to <i>Multiplier Continuity and Resistance Check</i> on page 6-7.
	Failed needle resistor	Check the resistor with a megohmmeter for 19.8–20.2 megohms at 500 volts.
	Malfunctioning gun control unit	Check for 21 Vdc between cable end connectors. Refer to <i>Gun Cable Continuity Checks</i> on page 6-8.
	Leaking packing cartridge	Check packing cartridge for leaks. Clean packing cartridge bore and install new packing cartridge and dielectric grease.
3. %kV reading on power supply incorrect	Input voltage switch is not in correct position	If the input voltage is 120 V, the switch in the power supply must be set to the 120V position. Refer to the <i>Kinetix Automatic Gun Power Supply</i> manual for more information.

Multiplier Continuity and Resistance Check

See Figure 6-2.

Follow these steps to complete a multiplier continuity and resistance check. The multiplier should measure 277–340 megohms at 500 volts.

NOTE: The polarity of the multiplier requires that the megohmmeter be connected correctly in order to obtain a correct reading.

1. Connect the earth ground probe (common end) of the megohmmeter to the contact spring (2).
2. Connect the other megohmmeter probe to one of the three pins (1) on the end of the multiplier.

If the multiplier resistance is not correct, replace the multiplier. Refer to the *Multiplier Replacement* on page 7-14.



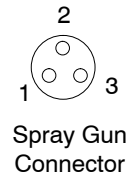
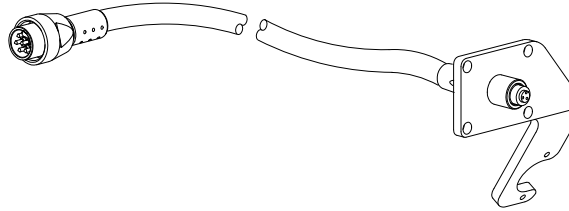
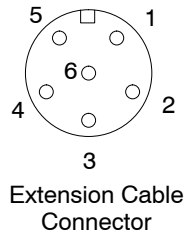
Figure 6-2 Multiplier Continuity and Resistance Check

1. Pins

2. Contact spring

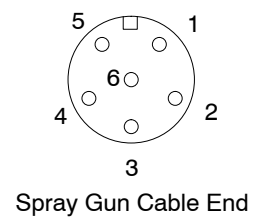
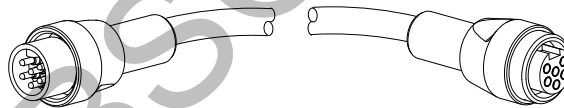
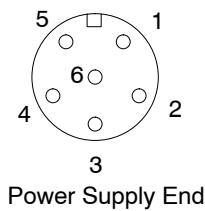
Gun Cable Continuity Checks

1. Use an ohmmeter to check the continuity of the armored electrostatic cable. Place the probes of the ohmmeter on the pins as listed.



Extension Cable Connector	Spray Gun Connector	Position
1	—	Open
2	3	Closed
3	1	Closed
4	2	Closed
5	Bracket	Closed
6	Bracket	Closed

2. Use an ohmmeter to check the continuity of the extension cable. Place the probes of the ohmmeter on the pins as listed.



Power Supply End Connector	Spray Gun End Connector	Position
1	1	Closed
2	2	Closed
3	3	Closed
4	4	Closed
5	5	Closed
6	6	Closed

Section 7

Repair



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



WARNING: Shut off the power supply. Ground the spray gun's electrode to remove any residual charge. Failure to observe this warning could result in personal injury.



WARNING: Shut off the fluid-delivery system. Relieve the fluid pressure in the system. Failure to observe this warning could result in an injection injury.



WARNING: Use only Nordson replacement parts to repair the spray gun. Deviating from the repair instructions, using unauthorized parts, or making unauthorized modifications can result in personal injury or death and/or the loss of approvals by agencies such as Factory Mutual Research Corporation (FM).



CAUTION: Do not overtighten threaded parts. Failure to observe this caution will result in equipment damage.

NOTE: Tighten all fittings until snug or to the specified torques. Because the spray gun uses O-ring seals, further tightening provides no benefit and could damage plastic threads.

NOTE: The numeric callouts in this section match the item numbers in the spray gun parts list. Refer to the *Parts* section for complete part descriptions and ordering information. Items in the repair section that are not called out in the spray gun parts list are identified with alphabetic callouts.

Tools/Supplies Required

Before beginning any of the repair tasks described in this section, make sure you have the following tools and supplies:

- See Figure 7-1: Combination tool provided with your spray gun
- Needle tool (provided with your spray gun)
- Needle nose pliers (provided with your spray gun)
- $\frac{5}{32}$ -in. hex wrench
- Flat-blade screwdriver
- Service kits and replacement parts
- Removeable threadlocking adhesive
- Dielectric grease
- PTFE grease lubricant (MagnaLube G) or equivalent PTFE-based lubricant
- Pipe/thread/hydraulic sealant adhesive

NOTE: Refer to the *Parts* section for service kits and individual part numbers.

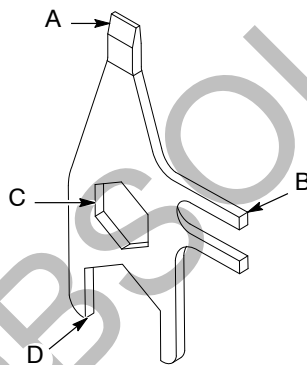


Figure 7-1 Combination Tool

- | | |
|---------------------------|-------------------|
| A. Screwdriver | C. Fluid tip tool |
| B. Packing cartridge tool | D. Hose tool |

Air Cap and Fluid Tip Replacement

See Figure 7-2.

1. Turn off the gun control unit and ground the spray gun electrode to remove any residual charge.
2. Flush the fluid-delivery system, hoses, and spray gun.
3. Turn off the fluid-delivery system. Relieve system fluid pressures. Point the spray gun into the booth or grounded container and activate it to relieve any residual pressure.

4. Disconnect the fluid hose from the spray gun and move the spray gun to a clean, dry, flat surface.
5. Unscrew the retaining ring (45) and air cap (A) assembly from the extension then unscrew the air cap from the retaining ring.



CAUTION: To prevent damage to the needle and fluid tip seat, activate the spray gun to pull the needle back before removing or installing a fluid tip.

6. Activate the spray gun to retract the needle (42). Place the hex on the combination tool over the hex on the fluid tip (B) and unscrew it from the extension.
7. Make sure the O-ring (D) is installed in the groove in the fluid tip. Lubricate the O-ring with dielectric grease.

NOTE: Place the O-ring in the groove closest to the rear of the fluid tip.

8. Make sure the conductive back-up ring (C) is installed on the fluid tip.



CAUTION: Do not overtighten threaded parts. Failure to observe this caution will result in equipment damage.



CAUTION: To prevent damage to the needle and fluid tip seat, activate the spray gun to pull the needle back before removing or installing a fluid tip.

9. Activate the gun to retract the needle. Screw the new fluid tip in the extension. Tighten the fluid tip snugly. Do not overtighten it or you could damage the extension threads.
10. Screw the new air cap into the retaining ring until it bottoms out in the groove and turns freely then screw the retaining ring onto the extension and tighten it securely by hand.

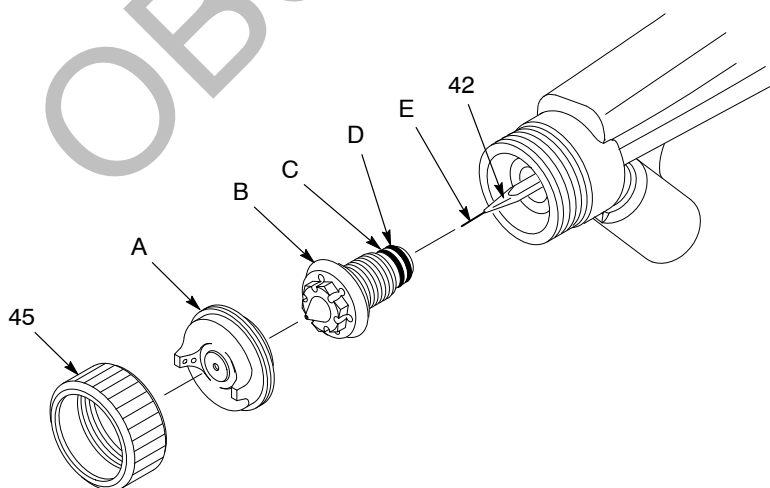


Figure 7-2 Air Cap and Fluid Tip Replacement

- | | | |
|--------------------|----------------------------|-------------------------------|
| 42. Needle | B. Fluid tip | D. O-ring |
| 45. Retaining ring | C. Conductive back-up ring | E. Electrode (part of needle) |
| A. Air cap | | |

Fluid Adjuster Replacement

See Figure 7-3.

1. Turn off the gun control unit and ground the spray gun electrode to remove any residual charge.
2. Flush the fluid-delivery system, hoses, and spray gun.
3. Turn off the fluid-delivery system. Relieve system fluid pressures. Point the spray gun into the booth or grounded container and activate it to relieve any residual pressure.
4. Disconnect the fluid hose from the spray gun and move the spray gun to a clean, dry, flat surface.

NOTE: Keep a firm grip on the fluid adjuster because the fluid return spring and a piston return spring will begin to push out the fluid adjuster as you loosen the socket screws.

5. Remove the four socket screws (12) with a $\frac{5}{32}$ -in. hex wrench to remove the fluid adjuster housing (15).
6. Remove and inspect the springs, replace if worn or damaged.
7. Generously lubricate the piston return spring (17), the fluid return spring (16), and the fluid adapter housing spring bores with MagnaLube G or an equivalent PTFE-based lubricant.
8. Place the piston return spring on the air piston.
9. Insert the fluid return spring inside the fluid adjuster housing.
10. Secure the fluid adjuster housing onto the piston block body by holding it firmly and securing the four socket screws. Tighten the socket screws to 2.27–2.83 N•m (20–25 in.-lb).

NOTE: The springs will provide some resistance as you tighten the socket screws.

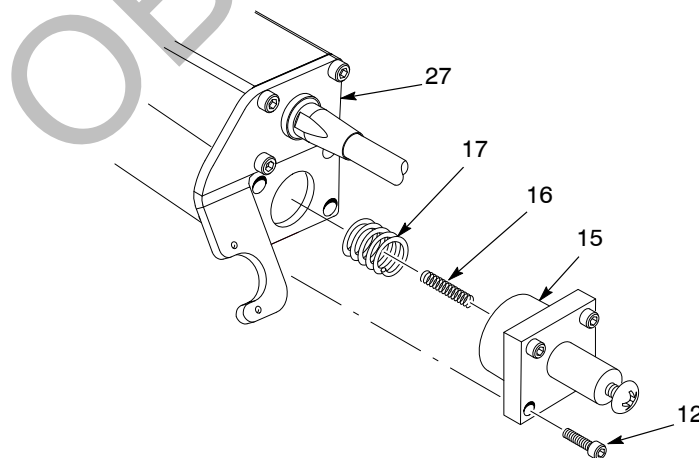


Figure 7-3 Fluid Adjuster Replacement

- | | |
|----------------------------|--------------------------|
| 12. #10-24 socket screws | 17. Piston return spring |
| 15. Fluid adjuster housing | 27. Piston block body |
| 16. Fluid return spring | |

Air Piston and Connecting Rod Replacement

Spray Gun Preparation

1. Turn off the gun control unit and ground the spray gun electrode to remove any residual charge.
2. Flush the fluid-delivery system, hoses, and spray gun.
3. Turn off the fluid-delivery system. Relieve system fluid pressures. Point the spray gun into the booth or grounded container and activate it to relieve any residual pressure.
4. Disconnect the fluid hose from the spray gun and move the spray gun to a clean, dry, flat surface.
5. Remove the air cap and fluid tip as described in *Air Cap and Fluid Tip Replacement* on page 7-2.
6. Remove the fluid adjuster as described in *Fluid Adjuster Replacement* on page 7-4.

Spray Gun Disassembly

See Figure 7-4.

1. Insert the flat-blade screwdriver of the combination tool into the end of the spray gun body to loosen the connecting rod (18) from the packing cartridge. The connecting rod will remain in the piston block body (27).
2. Remove the four socket-head screws (43 and 46) with a $\frac{5}{32}$ -in. hex wrench to remove the extension (44) and spacer block (30).

NOTE: A set of small face-seal O-rings is located on each side of the spacer block for the air cores. One large face-seal O-ring is located on each side of the spacer block that seal the multiplier.

3. Remove the extension and spacer block from the spray gun body. Do not lose the four face-seal O-rings (31) or the two large face-seal O-rings (29) that seal the multiplier.

NOTE: If the extension remains on piston block body, loosen the connecting rod from the packing cartridge again.

Air Piston and Connecting Rod Removal

See Figure 7-4.

1. Using the $\frac{5}{32}$ -in. hex wrench, push the connecting rod (18) out of the piston block body (27). Replace worn or damaged connecting rod O-rings (19).
2. Push the air piston (20) out of the piston block body. Inspect the air piston and replace if necessary. Generously lubricate the inside bore of the piston body with MagnaLube G or an equivalent PTFE-based lubricant.
3. Inspect the O-rings (21, 22) on the air piston and replace if necessary. Generously lubricate the O-rings with MagnaLube G or an equivalent PTFE-based lubricant and install in the piston block body.
4. Lubricate the O-rings (19) on the connecting rod with MagnaLube G or an equivalent PTFE-based lubricant and push it through the air piston.
5. Assemble the spray gun.

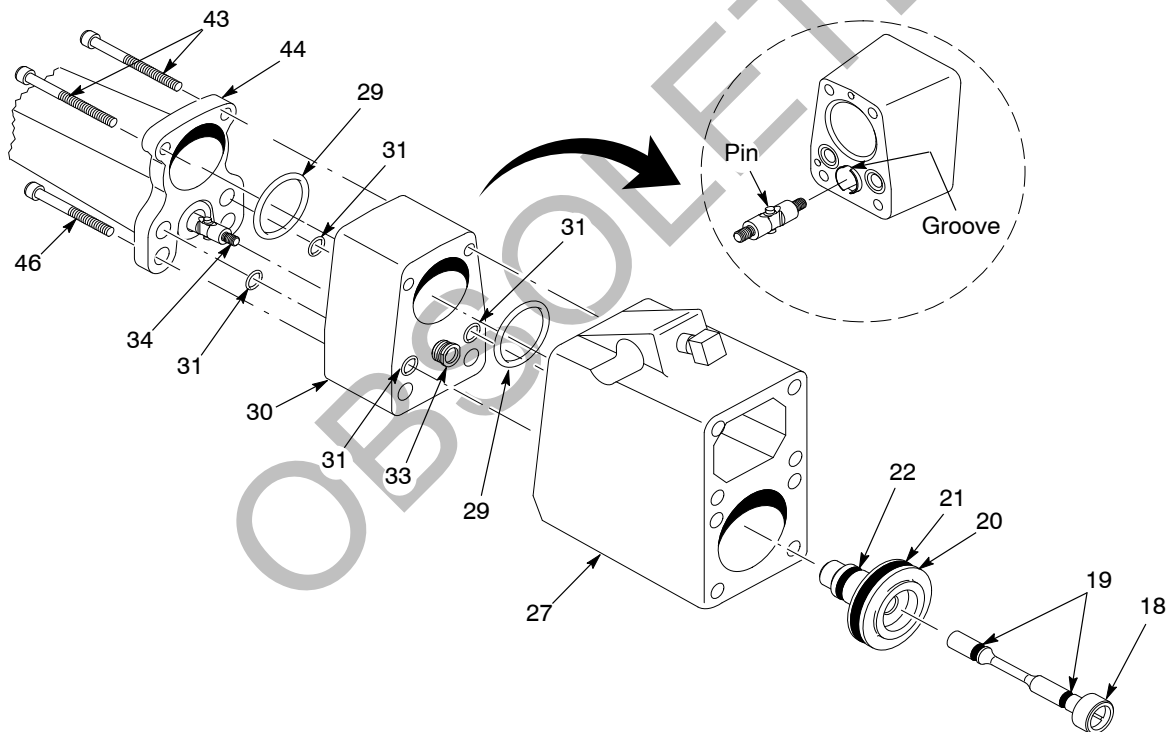


Figure 7-4 Air Piston and Connecting Rod Replacement

- | | | |
|--------------------|-----------------------------|------------------------|
| 18. Connecting rod | 27. Piston block body | 34. Puller link |
| 19. O-rings | 29. Large face-seal O-rings | 43. Socket-head screws |
| 20. Air piston | 30. Spacer block | 44. Extension |
| 21. O-ring | 31. Face-seal O-rings | 46. Socket-head screws |
| 22. O-ring | 33. Retainer bushing | |

Spray Gun Assembly

See Figure 7-4.

NOTE: A set of small face-seal O-rings is located on each side of the spacer block for the air cores. One large face-seal O-ring is located on each side of the spacer block to seal the multiplier.

1. Make sure the four face-seal O-rings (31) are correctly installed. Lubricate the O-rings with dielectric grease.
2. Make sure the two large face-seal O-rings (29) are correctly installed. Apply dielectric grease to these O-rings.
3. Grasp the puller link (34) and pull until the needle is fully retracted.

NOTE: It is critical that the pins on the puller link engage the grooves in the retainer bushing for the remainder of the assembly procedure. If not, the packing cartridge wire will bend and the spray gun will not trigger properly.

4. Generously lubricate the pins on the top and bottom of the puller link and the grooves on the end of the retainer bushing (33) with MagnaLube G or an equivalent PTFE-based lubricant.
5. Apply threadlocking adhesive to the threads of the puller link then align the pins in the link with the grooves on the retainer bushing. Push the extension against the spacer block.
6. Grasp the entire spray gun making sure to hold onto the piston block body, extension, and spacer block. Turn the spray gun so it is on its side. Attach the connecting rod by tightening it with the flat-blade screwdriver on the combination tool.

NOTE: The needle should not rotate during this procedure. If it does then the pins are not engaged in the retainer bushing grooves and step 3 should be repeated.

7. Secure the extension to the body with the four socket-head screws (43 and 46). Tighten the socket-head screws to 2.27–2.83 N•m (20–25 in.-lb).
8. Install the retaining ring, air cap, and fluid tip as described in *Air Cap and Fluid Tip Replacement* on page 7-2.
9. Install the piston return compression spring, fluid return spring, and fluid adjuster housing as described in *Fluid Adjuster Replacement* on page 7-4.
10. Turn on the gun control unit.

Needle Replacement

NOTE: You do not need to completely disassemble the spray gun for this procedure.

NOTE: To replace the entire packing cartridge and needle assembly, refer to *Packing Cartridge and Needle Replacement* on page 7-10.

Preparation

1. Turn off the gun control unit and ground the spray gun electrode to remove any residual charge.
2. Flush the fluid-delivery system, hoses, and spray gun.
3. Turn off the fluid-delivery system. Relieve system fluid pressures. Point the spray gun into the booth or grounded container and activate it to relieve any residual pressure.
4. Disconnect the fluid hose from the spray gun and move the spray gun to a clean, dry, flat surface.
5. Remove the air cap and fluid tip as described in *Air Cap and Fluid Tip Replacement* on page 7-2.

Needle Removal

See Figure 7-5.

NOTE: Be careful not to bend the connecting wire on the packing cartridge.

1. Insert the bent needle nose pliers into the gun body and grasp the square fitting on the end of the packing cartridge.
2. Line up the open end of the needle tool over the needle and slide it down over the needle.
3. Hold the pliers tightly then begin turning the needle tool to loosen the needle from the packing cartridge.

NOTE: If the needle does not break lose easily, make sure the pliers are preventing the square fitting from turning. If the needle still does not loosen, it may be necessary to remove the packing cartridge to replace the needle. Refer to *Packing Cartridge and Needle Replacement* on page 7-10.

4. Once it is loose, remove the needle.

NOTE: See Figure 7-6. The contact spring (41) may come out with the needle.

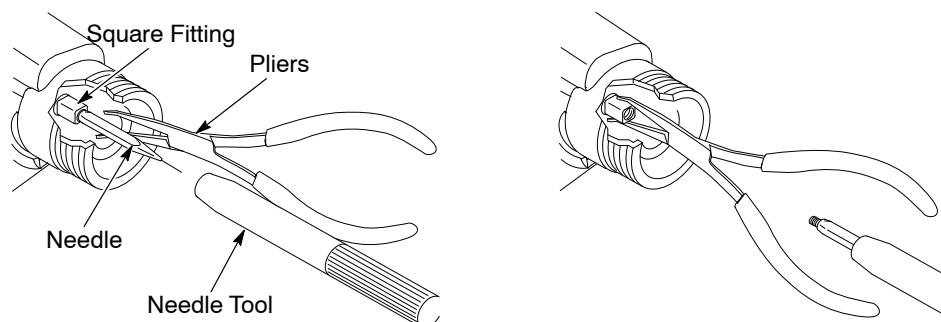


Figure 7-5 Needle Replacement

Note: The bent needle nose pliers and the needle tool are shipped with the spray gun.

Needle Installation

1. Inspect the extension bore and the threads of the packing cartridge fitting for residual material. If necessary, clean them using a squirt bottle filled with a compatible solvent.
2. See Figure 7-6. Inspect the contact spring (41) and replace if damaged.
3. Thread the contact spring onto the needle so the wide end is towards the packing cartridge.

NOTE: A removable threadlocking adhesive can be applied to the threads of the new needle if there are problems with the needle backing out.

4. Screw the new needle into the square needle fitting. Tighten the needle finger tight. Wipe off excess adhesive, if used.

NOTE: Be careful not to bend the packing cartridge wire.

5. See Figure 7-5. Insert the bent needle nose pliers into the gun body and grasp the square needle fitting on the end of the packing cartridge.
6. Line up the open end of the needle tool over the needle and slide it down over the needle.
7. Hold the pliers tight then turn the needle tool to tighten the needle into the packing cartridge.
8. Inspect the needle and packing cartridge fitting to make sure that the needle threads are completely engaged. If not, remove and install the needle again.
9. Install the retaining ring, air cap, and fluid tip as described in *Air Cap and Fluid Tip Replacement* on page 7-2.

Packing Cartridge and Needle Replacement



CAUTION: If the packing cartridge leaks, it is important to thoroughly clean the packing cartridge bore in the extension with a compatible non-conductive solvent to remove any residual coating material. Failure to do so may result in loss of kV.



CAUTION: Do not overtighten threaded parts. Failure to observe this caution will result in equipment damage.

The Kinetix spray gun is shipped with the standard gold packing cartridge. This durable packing cartridge is appropriate for most coating materials. Use the optional PTFE packing cartridge with harsh chemical solvents such as MEK.

The only serviceable parts of the packing cartridge are the external O-ring and back-up ring. If replacing the O-ring and back-up ring does not stop the packing cartridge from leaking, you must replace the packing cartridge.

The needle is not a component of the packing cartridge. To replace the needle only, refer to *Needle Replacement* on page 7-8. You must order the needle separately.

Preparation

1. Turn off the gun control unit and ground the spray gun electrode to remove any residual charge.
2. Flush the fluid-delivery system, hoses, and spray gun.
3. Turn off the fluid-delivery system. Relieve system fluid pressures. Point the spray gun into the booth or grounded container and activate it to relieve any residual pressure.
4. Disconnect the fluid hose from the spray gun and move the spray gun to a clean, dry, flat surface.
5. Remove the air cap and fluid tip as described in *Air Cap and Fluid Tip Replacement* on page 7-2.
6. Remove the fluid adjuster as described in *Fluid Adjuster Replacement* on page 7-4.

Spray Gun Disassembly

See Figure 7-4.

1. Insert the flat-blade screwdriver of the combination tool into the end of the piston block body (27) to loosen the connecting rod (18) from the packing cartridge. The connecting rod will remain in the piston block body.
2. Remove the four socket-head screws (43 and 46) with a $\frac{5}{32}$ -in. hex wrench to remove the extension (44) and spacer block (30).

NOTE: A set of small face-seal O-rings is located on each side of the spacer block for the air cores. One large face-seal O-ring is located on each side of the spacer block to seal the multiplier.

3. Remove the extension and spacer block from the piston block body. Do not lose the four face-seal O-rings (31) or the two large face-seal O-rings (29).

NOTE: If the extension remains on the piston block body, loosen the connecting rod from the packing cartridge again.

Packing Cartridge and Needle Removal

See Figure 7-6.

1. Holding onto the flats on the pull shaft (37), unscrew the puller link (34).
2. Push the pull shaft forward and unscrew the packing cartridge retainer (35) with the combination tool.
3. Pull the pull shaft out of the back of the extension to remove the pull shaft, packing cartridge (38), and sleeve retainer (36). Do not bend the packing cartridge wire (A).
4. Remove the sleeve retainer from the pull shaft and unscrew the pull shaft from the packing cartridge.
5. Clean the extension fluid bores with a round, soft-bristled brush and a compatible non-conductive solvent. For thorough cleaning, remove the fluid fittings from the extension.
6. Inspect the packing cartridge. Replace the O-ring (40) and back-up ring (39) if they are damaged. If the packing cartridge is damaged, replace it with a new one.
7. Lubricate the packing cartridge O-ring with MagnaLube G or an equivalent PTFE-based lubricant.
8. Generously lubricate both ends of the packing cartridge wire with MagnaLube G or an equivalent PTFE-based lubricant. Push and pull the wire 40–50 times to work the lubricant into the packing cartridge.

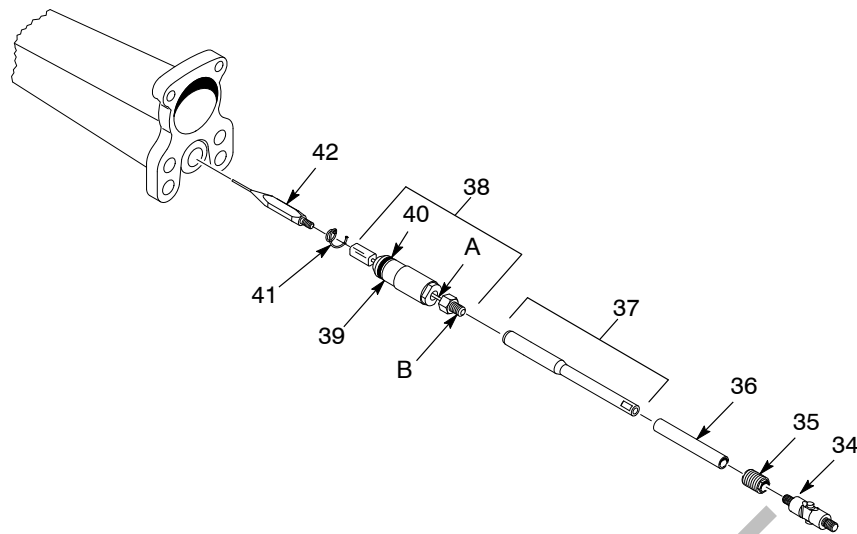


Figure 7-6 Packing Cartridge and Needle Replacement

- | | | |
|--------------------------------|-----------------------|---------------------------|
| 34. Puller link | 38. Packing cartridge | 42. Needle |
| 35. Packing cartridge retainer | 39. Back-up ring | A. Packing cartridge wire |
| 36. Sleeve retainer | 40. O-ring | B. Puller fitting |
| 37. Pull shaft | 41. Contact spring | |

9. If the needle (42) is damaged, replace it as follows:

- a. Hold the needle fitting on the end of the packing cartridge assembly with a wrench, slide the needle removal tool over the needle and unscrew the needle from the needle fitting.

NOTE: A removeable threadlocking adhesive can be applied to the threads of the new needle if there are problems with the needle backing out.

NOTE: Inspect the contact spring (41) and replace if damaged. Make sure the contact spring is installed on the needle with the wide end towards the packing cartridge.

- b. Screw the new needle into the needle fitting. Tighten the needle finger tight until it bottoms against the fitting. Wipe off excess adhesive, if used.

Packing Cartridge and Needle Installation

See Figure 7-6.

NOTE: Make sure all residual coating material has been removed from all of the parts before installing.

1. Apply a removeable thread-locking adhesive to the threads of the puller fitting (B).
2. Screw the pull shaft (37) onto the packing cartridge (38).



CAUTION: Apply dielectric grease as instructed in steps 3, 4, and 5. If it is not applied as instructed, damage to the spray gun is likely and spray gun performance and safety may be compromised.

3. Apply liberal amount of dielectric grease to the puller fitting and the pull shaft then insert the packing cartridge and pull shaft into the extension from the back.
4. Apply a thin coating of dielectric grease to the outside of the sleeve retainer (36) then slide the sleeve retainer over the pull shaft and push down over the fluid bore.
5. Generously lubricate the end of the pull shaft and the inside of the packing cartridge retainer (35) with MagnaLube G or an equivalent PTFE-based lubricant.
6. Apply a thin coating of dielectric grease to the threads of the packing cartridge retainer. Screw the packing cartridge retainer into the extension. Tighten the packing cartridge retainer hand-tight.
7. Push the pull shaft forward and tighten the packing cartridge retainer with the combination tool hand-tight.
8. Wipe off excess dielectric grease.
9. Apply a removeable thread-locking adhesive to the threads of the pull shaft (37) and screw the puller link onto the pull shaft.
10. Assemble the spray gun.

Spray Gun Assembly

See Figure 7-4.

NOTE: A set of small face-seal O-rings is located on each side of the spacer block for the air cores. One large face-seal O-ring is located on each side of the spacer block to seal the multiplier.

1. Make sure the four face-seal O-rings (31) are correctly installed. Lubricate the O-rings with dielectric grease.
2. Make sure the two large face-seal O-rings (29) are correctly installed. Apply dielectric grease to these O-rings.
3. Grasp the puller link (34) and pull until the ball tip is fully retracted.

NOTE: It is critical that the pins on the puller link engage the grooves in the retainer bushing for the remainder of the assembly procedure. If not, the packing cartridge connecting wire will bend and the spray gun will not trigger properly.

4. Generously lubricate the pins on the top and bottom of the puller link and the grooves on the end of the retainer bushing (33) with MagnaLube G or an equivalent PTFE-based lubricant.
5. Apply threadlocking adhesive to the threads of the puller link then align the pins in the link with the grooves on the retainer bushing. Push the extension against the spacer block.

6. Grasp the entire spray gun making sure to hold onto the piston block body, extension, and spacer block. Turn the spray gun so it is on its side. Attach the connecting rod by tightening it with the flat-blade screwdriver on the combination tool.

NOTE: The needle should not rotate during this procedure. If it does then the pins are not engaged in the retainer bushing grooves and step 3 should be repeated.

7. Secure the extension to the piston block body with the four socket-head screws (43 and 46). Tighten the screws to 2.27–2.83 N•m (20–25 in.-lb).
8. Install the retaining ring, air cap, and fluid tip as described in *Air Cap and Fluid Tip Replacement* on page 7-2.
9. Install the piston return compression spring, fluid return spring, and fluid adjuster housing as described in *Fluid Adjuster Replacement* on page 7-4.
10. Turn on the gun control unit.
11. Make sure the spray gun is working correctly and that atomization quality and spray pattern are at optimum conditions. Refer to *Spray Pattern and Atomization Adjustments* on page 4-3.

Multiplier Replacement

Multiplier Removal

1. Turn off the gun control unit and ground the spray gun electrode to remove any residual charge.
2. Turn off the fluid delivery system and relieve the fluid pressure.
3. See Figure 7-7. Remove the four socket screws (12) securing the bracket (51) to the piston block body.
4. Unplug the electrostatic cable (1) from the multiplier connector (C).
5. Remove the two upper screws (5), spacers (8), and lock washers (6) located inside the piston block body cavity.



CAUTION: Do not use the pigtail (B) to pull out the multiplier.

6. Install one of the upper screws into the standoff (7) and use it to pull the multiplier out of the spray gun.
7. Remove the following items from the old multiplier and install them on the new multiplier:
 - screw (2), flat washer (3), and cable clamp (4)
 - standoff (7)
 - heat sink plate (9)
8. Check the continuity of the new multiplier. Refer to *Multiplier Continuity and Resistance Check* on page 6-7.

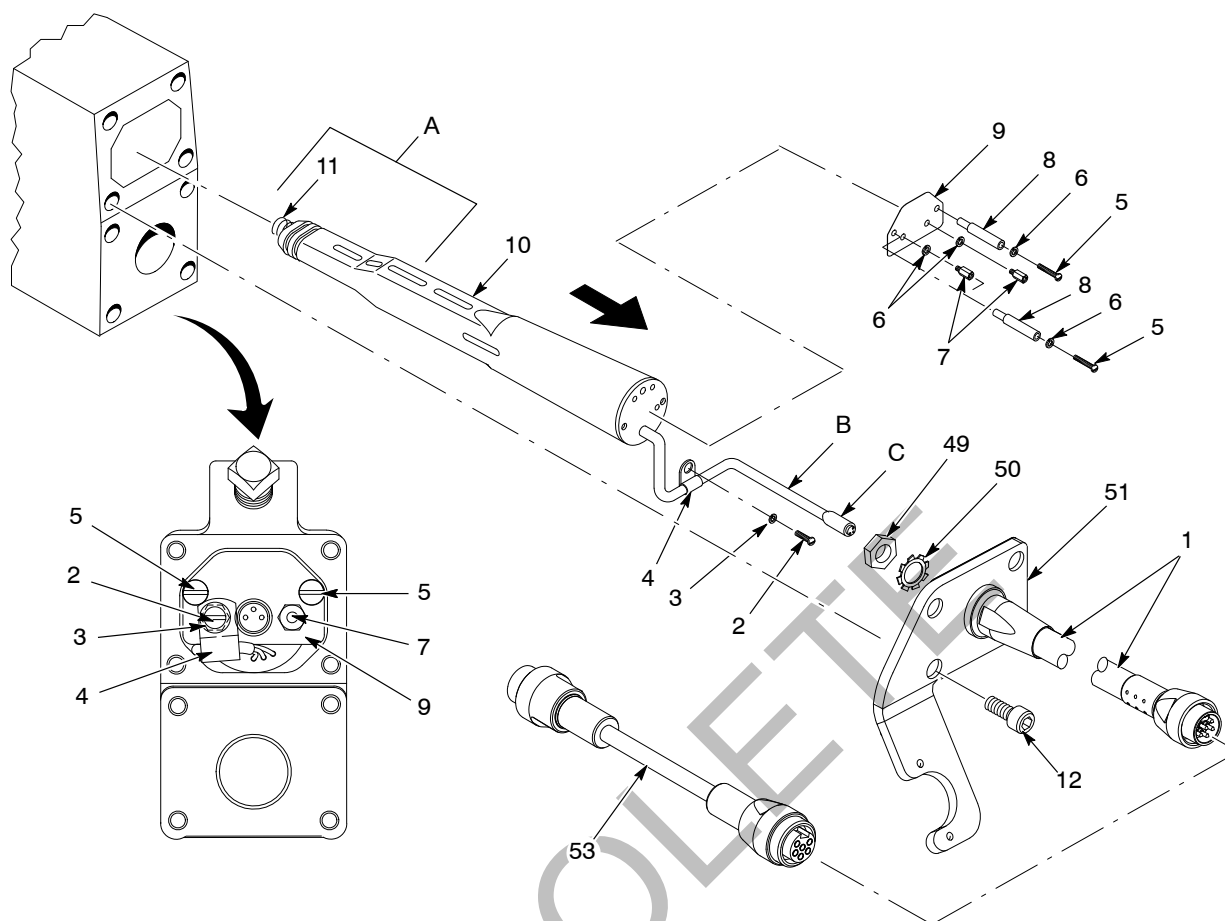


Figure 7-7 Multiplier and Electrostatic Cable Replacement

- | | | |
|------------------------|--------------------|-------------------------|
| 1. Electrostatic cable | 8. Spacers | 50. Lock washer |
| 2. Screw | 9. Heat sink plate | 51. Bracket |
| 3. Flat washer | 10. Multiplier | 53. Extension cable |
| 4. Cable clamp | 11. Contact spring | A. Dielectric grease |
| 5. Upper screws | 12. Socket screws | B. Pigtail |
| 6. Lock washers | 49. Nut | C. Multiplier connector |
| 7. Standoffs | | |

Multiplier Installation



CAUTION: Apply dielectric grease as instructed. If it is not applied as instructed, damage to the spray gun is likely and spray gun performance and safety may be compromised.

1. See Figure 7-7. Make sure that the contact spring (11) is in place. Apply a liberal coating of dielectric grease (A) to the contact spring and front $\frac{1}{3}$ of the multiplier.
2. Push the new multiplier through piston block body cavity and towards the extension.

NOTE: If it is difficult to seat the heat sink plate (9) on the spray gun body, loosen the four screws [See Figure 7-4 (43) and (46)] approximately one turn. This should relieve any residual air pockets and allow the heat sink plate to rest against the body. Once set, tighten the to 2.27–2.83 N•m (20–25 in.-lb).

3. Install the two upper screws (5), spacers (8), and lock washers (6) located inside the piston block body cavity.
4. Attach the electrostatic cable (1) to the spray gun.
5. Screw in the four socket screws (12) to secure the bracket (51) to the piston block body. Tighten the socket screws to 2.27–2.83 N•m (20–25 in.-lb).
6. Turn on the gun control unit.

Gun Cable Replacement

See Figure 7-7.

1. Turn off the gun control unit and ground the spray gun electrode to remove any residual charge.
2. Disconnect the fluid hose from the bracket (51). Refer to *Fluid Supply Hose Replacement*.
3. Disconnect the gun cable (1) from the extension cable (53).
4. Remove the screws (12) from the bracket on the spray gun.
5. Disconnect the gun cable from the multiplier connector (C).
6. Remove the nut (49) and lock washer (50) to remove the gun cable from the bracket.
7. Reverse these steps to install the new gun cable.

Fluid Supply Hose/Tubing Replacement

NOTE: See Figures 3-3 and 3-4 to choose the correct fluid hose/tube for your application. Additional hose/tube length will improve the electrostatic charge by isolating the fluid column.

Fluid Hose/Tubing Removal

1. Turn off the gun control unit and ground the spray gun electrode to remove any residual charge.
2. Turn off the fluid-delivery system and relieve the fluid pressure.
3. See Figure 7-8. Remove the screws (52) and optional fluid hose collar (C) from the bracket (51). Remove the collar from the tubing and save for the new tubing installation.
4. Loosen the retaining nut (48), which is located at the extension fluid inlet boss (A), and unscrew completely.
5. Pull the ferrule (47) and retaining nut assembly out of the spray gun extension inlet.

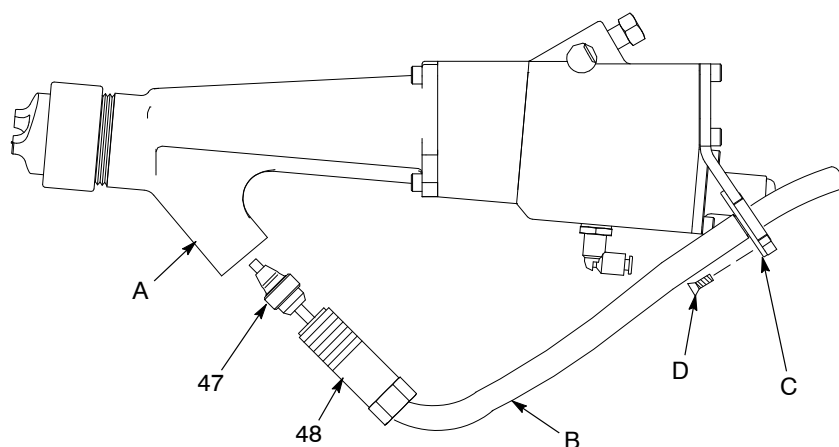


Figure 7-8 Fluid Supply Hose/Tubing Replacement

- | | | |
|-------------------|-------------|-------------------------------|
| 47. Ferrule | 51. Bracket | A. Extension fluid inlet boss |
| 48. Retaining nut | 52. Screws | B. Fluid tubing |
| | | C. Collar (optional) |

Fluid Hose/Tubing Installation

1. Slide the retaining nut onto the fluid tube.
2. Apply dielectric grease to the end of the customer supplied fluid tubing (B).
3. Insert the fluid tubing through the ferrule (47) so that approximately 2.5 cm (1 in.) is out of the pointed end of the ferrule.
4. Apply dielectric grease to the threads of the retaining nut (48) and slide it over the tube and onto the ferrule.
5. Push the ferrule into the spray gun's extension inlet so that the fluid tube is seated into the counterbore at the bottom of the extension fluid inlet boss (A).
6. Slide the optional collar onto the tubing and use the screws (52) to secure the collar to the bracket (51).

NOTE: The effectiveness of the electrostatics may diminish when coating resistivities fall below 0.25 megohms. Refer to page 3-3 and see Figure 3-3 to review the relationship between coating conductivity and fluid tube/hose length and ID.

7. Turn on the fluid-delivery system. Refer to the appropriate fluid-delivery system manual.
8. Turn on the gun control unit.

Service Illustration and Notes

Use Figure 7-9 and Table 7-1 to repair the spray gun.

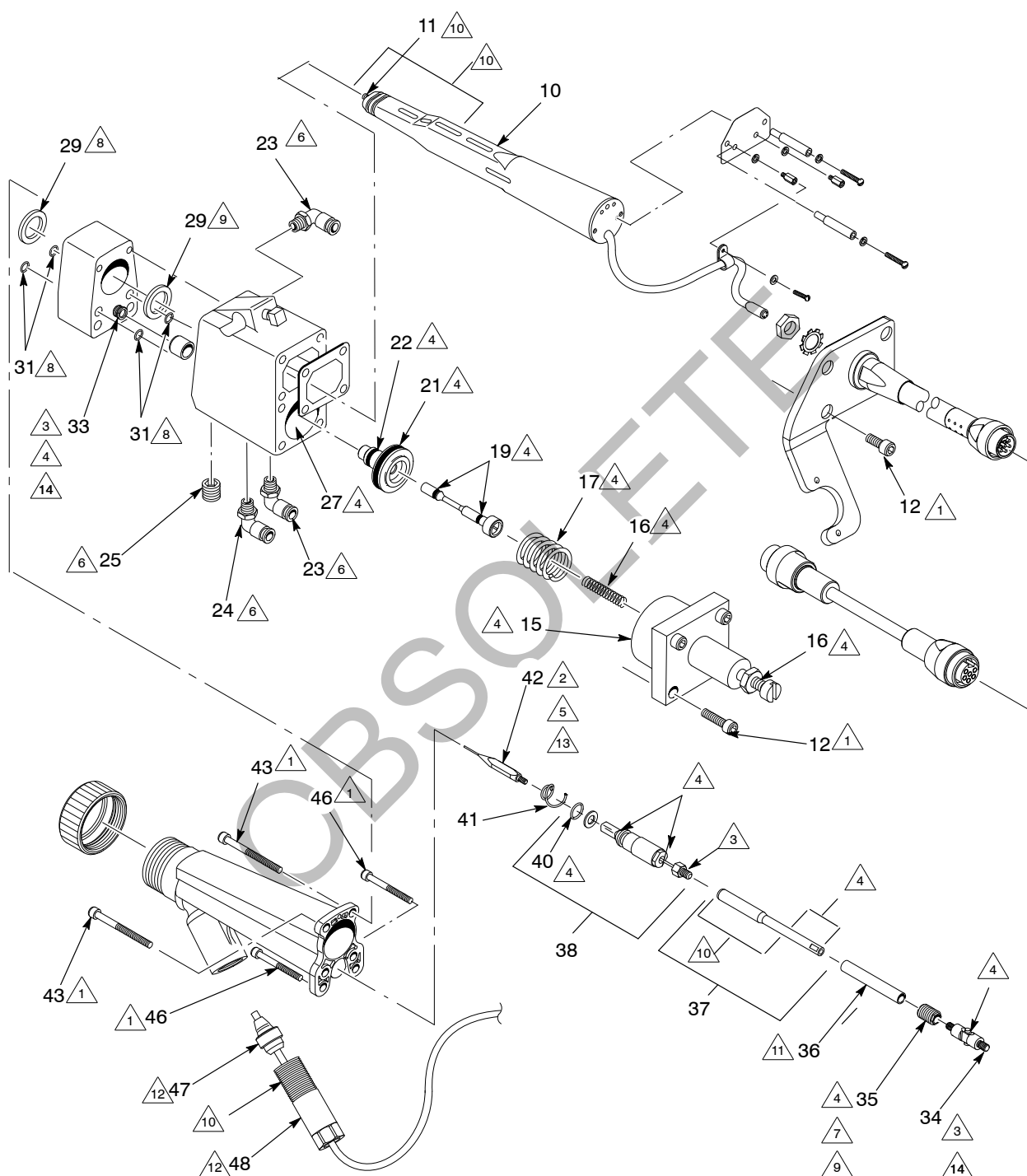
















Figure 7-9 Spray Gun Service Notes

Table 7-1 Spray Gun Service Notes

Note	Item	Description
	12, 43, 46	Tighten these items to 2.27–2.83 N•m (20–25 in.-lb).
	42	Tighten this item finger tight.
	33, 34, 37, 38	Apply threadlocking adhesive to the threads of these items.
	13, 14, 16, 17, 19, 21, 22, 40 15 (the housing bores where the springs rest) 27 (inside the piston bore), 33 (the grooves on the retainer bushing) 34 (the top and bottom pins of the adapter link) 35 (inside of packing cartridge retainer), 37 (end of pull shaft), 38 (wire at both ends)	Generously apply MagnaLube G (PTFE-filled lubricant) to these parts.
	42	Activate the spray gun to pull the needle tip back before removing or installing a fluid tip.
	23, 24, 25	Apply pipe sealant adhesive if fitting does not already have manufacturer's thread sealant applied.
	35	Tighten this item hand tight.
	29, 31	Apply dielectric grease to these O-rings.
	35	Apply a thin coat of dielectric grease to the threads of this item.
	10, 11, 37, 48	Apply a liberal coat of dielectric grease to these areas.
	36	Apply a thin coat of dielectric grease to the outside of this item.
	47, 48	Insert hose end into the extension until the ferrule is seated. Screw in the retaining nut then tighten $\frac{1}{4}$ turn past hand tight.
	42	A removeable thread-locking adhesive can be applied to the threads of the needle if there are problems with the needle backing out.
	33, 34	Make sure the pins on puller link engage in the grooves in the retainer bushing.

OBSOLETE

Section 8

Parts

Introduction

To order parts, call the Nordson Finishing Customer Support Center at (800) 433-9319 or your local Nordson representative. Use the parts lists and accompanying illustrations to located and describe parts correctly.

Using the Illustrated Parts List

Numbers in the Item column correspond to numbers that identify parts in illustrations following each parts list. The code NS (not shown) indicates that a listed part is not illustrated. A dash (—) is used when the part number applies to all parts in the illustration.

The number in the Part column is the Nordson Corporation part number. A series of dashes in this column (- - - - -) means the part cannot be ordered separately.

The Description column gives the part name, as well as its dimensions and other characteristics when appropriate. Indentions show the relationships between assemblies, subassemblies, and parts.

- 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.

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

Kinetix Air Spray and KVLP Automatic Electrostatic Spray Gun

NOTE: Before ordering parts for your spray gun, review the appropriate procedure in the *Repair or Installation* section to make sure you are ordering the correct parts, lubricant, and adhesives to complete the procedure.

See Figure 8-1.

Item	Part	Description	Quantity	Note
—	336681	SPRAY GUN, Kinetix, air spray/KVLP, low pressure, automatic, electrostatic	1	
1	1045531	• KIT, cordset, automatic gun, Kinetix	1	A
2	981496	• SCREW, pan head, #4–40 x 0.375 in., zinc, slotted	1	
3	983531	• WASHER, flat, English, 0.125 x 0.25 x 0.032 in., zinc	1	
4	336732	• CLAMP, cable, miniature, electrostatic, automatic	1	
5	336707	• SCREW, pan, #4–40, 1.75 in.	2	
6	983526	• LOCK WASHER, English, split, #4, steel, zinc	2	
7	336705	• STANDOFF, hex, male/female, #4–40 x 0.5 in.	2	
8	336706	• SPACER, round, clearance, #4	2	
9	336625	• PLATE, heat sink, electrostatic, automatic	1	
10	336505	• MULTIPLIER, 93 kV, Kinetix	1	
11	336383	• • SPRING ASSEMBLY, contact	1	
12	981104	• SCREW, socket, #10–24 x 0.5 in., zinc	8	
13	325692	• ADJUSTER, fluid, low pressure	1	
14	984156	• NUT, hex, jam, $\frac{3}{8}$ -24, brass	1	
15	336623	• HOUSING, adjuster, electrostatic, automatic	1	
16	325537	• SPRING, fluid return, high pressure	1	
17	241176	• SPRING, compression, 1.24 x 1.093 OD x 0.094 in.	1	
18	325693	• ROD, connecting, automatic	1	
19	940063	• O-RING, Viton, 0.125 x 0.25 x 0.063 in.	2	B
20	243975	• PISTON, air	1	
21	941210	• O-RING, Viton, 1.063 x 1.25 x 0.094 in.	1	B
22	940125	• O-RING, Viton, 0.375 x 0.50 x 0.063 in.	1	B
23	972183	• ELBOW, male $\frac{3}{8}$ -in. tube x $\frac{1}{4}$ -in. NPT	2	
24	972119	• ELBOW, male, $\frac{1}{4}$ -in. tube x $\frac{1}{8}$ -in. NPT	1	
25	973410	• PLUG, pipe, socket, standard, $\frac{1}{4}$ in., zinc	1	
26	336626	• GASKET, cable bracket, Kinetix, automatic	1	
27	336620	• BODY, piston, block, automatic	1	
28	981405	• SCREW, square, set, $\frac{3}{8}$ –16 x 0.75 in., cup, zinc	1	
29	336499	• O-RING, PTFE, 1.05 x 0.07 in.	2	B, C
30	336621	• SPACER, electrostatic, automatic	1	C

NOTE A: Included in the spray gun cordset kit(s). Refer to *Cordset Assemblies* on page 8-8.

B: Included in air seal service kit 336656. Refer to *Air Seal* on page 8-6.

C: Included in puller link upgrade kits. Refer to *Puller Link Upgrade Kits* on page 8-7. The kit parts can be ordered separately but you cannot use one part without the others.

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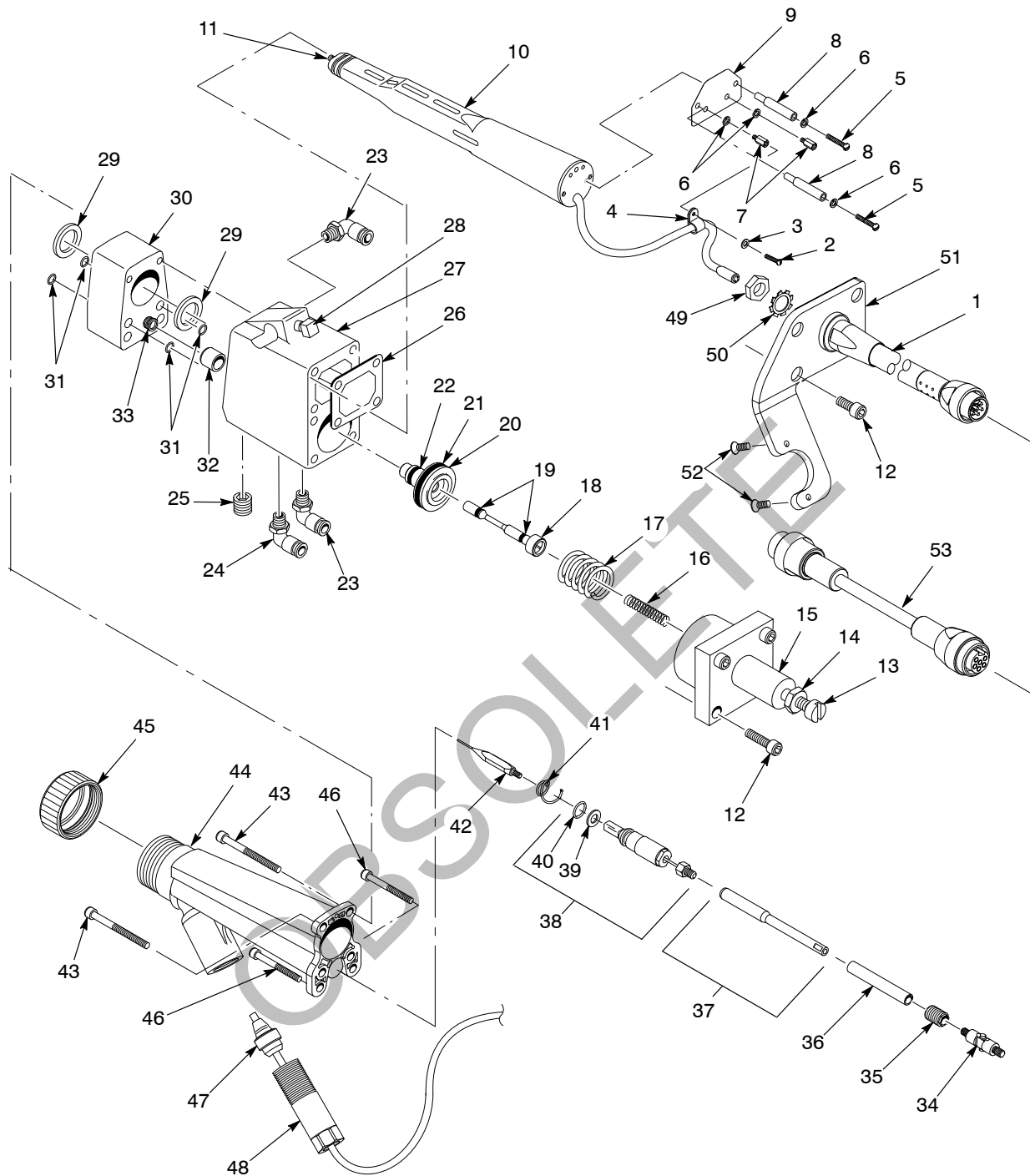


Figure 8-1 Kinetix Air Spray and KVLP Automatic Electrostatic Spray Gun

Kinetix Air Spray and KVLP Automatic Electrostatic Spray Gun *(contd)*

See Figure 8-1.

Item	Part	Description	Quantity	Note
31	940110	• O-RING, hotpaint, 0.313 x 0.438 x 0.063 in.	4	B, C
32	325694	• BUSHING, automatic	1	
33	1045778	• RETAINER, bushing, Kinetix	1	C
34	1045777	• ADAPTER, link-pin 8-32 UNC-2A Kinetix	1	C
35	325749	• RETAINER, packing cartridge, Kinetix	1	
36	325748	• RETAINER, sleeve, packing cartridge	1	
37	325747	• SHAFT, pull, packing cartridge, Kinetix	1	
38	-----	• CARTRIDGE ASSEMBLY, packing	1	D
39	105527	• SERVICE KIT, ring, backup, quantity 4	1	D
40	336677	• O-RING, Perlast, 0.25 x 0.375 x 0.063 in.	2	D, E
41	336549	• SPRING, contact, KVLP, Kinetix	1	F
42	-----	• NEEDLE, with resistor, machined	1	F
43	338909	• CAPSCREW, socket head, #10-24 x 2.25 in., stainless steel	2	
44	336644	• EXTENSION, low pressure, machined, electrostatic	1	
45	325547	• RING, retaining, air cap	1	
46	338910	• CAPSCREW, socket head, #10-24 x 2 in., stainless steel	2	
47	336751	• FERRULE, $\frac{1}{4}$ -in. tube, low pressure, hose, electrostatic	1	G
47	336752	• FERRULE, $\frac{3}{8}$ -in. tube, low pressure hose, electrostatic	1	G
48	336347	• RETAINER, fluid hose	1	
49	238331	• NUT, hex, jam, $\frac{9}{16}$ -18, steel	1	A
50	983513	• LOCK WASHER, E, external, $\frac{9}{16}$ -in., steel	1	A
51	1045076	• BRACKET, cable, automatic, long, Kinetix	1	A
52	346725	• MACHINE SCREW, flathead, recessed, 4-40, 0.25 in., stainless steel	2	A
53	336531	• CABLE, 50 ft, electrostatic, extension	1	A
NS	901905	• BRUSH (wooden toothbrush type)	1	
NS	247066	• BRUSH	1	
NS	336642	• WRENCH, Kinetix, combination tool	1	
NS	156098	• BAG, gun cover, polyethylene	3	H
NS	1028630	• PLIERS, needle nose bent, Kinetix	1	
NS	1028631	• TOOL, needle, Kinetix	1	

NOTE A: Included in automatic spray gun cordset kit(s). Refer to *Cordset Assemblies* on page 8-8.

B: Included in air seal service kit 336656. Refer to *Air Seal* on page 8-6.

C: Included in puller link upgrade kits. Refer to *Puller Link Upgrade Kits* on page 8-7.

D: Included in packing cartridge service kit 1089861. Refer to *Packing Cartridge* on page 8-7.

E: Included in Perlast fluid seal service kit 336679. Refer to *Perlast Fluid Seal* on page 8-6.

F: Included in needle service kit 336556. Refer to *Needle with Resistor* on page 8-7.

G: Refer to *Hoses, Tubing and Accessories* on page 8-9.

H: Order part 106403 for a quantity of 10 cover bags.

NS: Not Shown

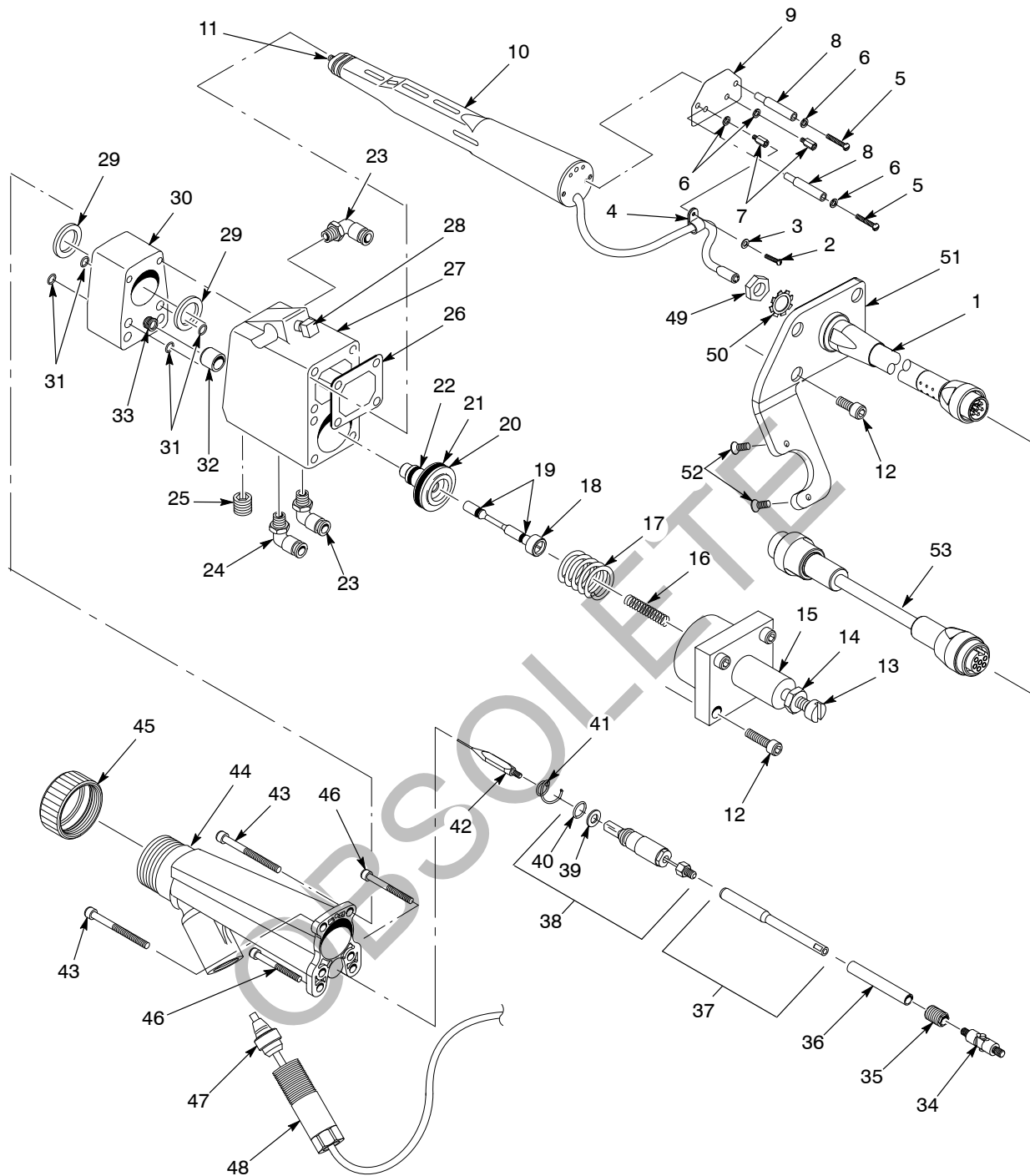


Figure 8-1 Kinetix Air Spray and KVLP Automatic Electrostatic Spray Gun

Adhesives, Sealants, and Lubricants

Use these adhesives, sealants, and lubricants when repairing your unit. Refer to the *Repair* or *Installation* sections in this manual for application instructions.

Part	Description	Quantity
900481	ADHESIVE, pipe/thread/hydraulic sealant (Loctite High Temp SS567 for stainless steel threads)	1
900464	THREADLOCKING ADHESIVE (Loctite Removable 242)	1
900349	PTFE-FILLED LUBRICANT, O-ring, (MagnaLube) , 0.75-oz tube	1
247658	DIELECTRIC GREASE, applicator, 10 cc, 12 count	1

Recommended Kits

See Figure 8-1.

Perlast Fluid Seal

Item	Part	Description	Quantity	Note
—	336679	PERLAST FLUID SEAL KIT, gun, Kinetix	1	
40	336677	• O-RING, Perlast, 0.25 x 0.375 x 0.063 in.	2	A
NS	336678	• O-RING, Perlast, 0.375 x 0.50 x 0.063 in.	1	B, C
NS	336569	• BACKUP RING, conductive, 0.39-in. ID x 0.045-in. thick, cut	1	B
NOTE A: Used on the packing cartridge and fluid hose. B: Used on the fluid tips. C: Lubricate with dielectric grease. NS: Not Shown				

Air Seal

Item	Part	Description	Quantity	Note
—	336656	AIR SEAL KIT, automatic	1	
19	940063	• O-RING, Viton, 0.125 x 0.25 x 0.063 in.	2	
21	941210	• O-RING, Viton, 1.063 x 1.25 x 0.094 in.	1	
22	940125	• O-RING, Viton, 0.375 x 0.50 x 0.063 in.	1	
29	336499	• O-RING, PTFE, 1.05 x 0.07 in.	2	
31	940110	• O-RING, hotpaint, 0.313 x 0.438 x 0.063 in.	4	

Packing Cartridge

NOTE: The Kinetix spray gun is shipped with the standard gold packing cartridge, which is appropriate for most coating materials. Use the optional PTFE packing cartridge 1089862 with harsh chemical solvents such as MEK.

Item	Part	Description	Quantity	Note
—	1089861	PACKING CARTRIDGE KIT, gold Kinetix	1	
38	-----	• CARTRIDGE ASSEMBLY, packing	1	
39	-----	• BACKUP RING, single, $\frac{1}{4} \times \frac{3}{8}$ in.	1	
40	336677	• O-RING, Perlast, 0.25 x 0.375 x 0.063 in.	1	

Needle with Resistor

Item	Part	Description	Quantity	Note
—	336556	NEEDLE WITH RESISTOR KIT, electrostatic	1	
41	336549	• SPRING, contact, KVLP, Kinetix	1	
42	-----	• NEEDLE WITH RESISTOR, machined	1	

Puller Link Upgrade Kits

Puller Link Upgrade with Spacer Block

Item	Part	Description	Quantity	Note
—	1045984	PULLER LINK KIT, with spacer block, Kinetix	1	
29	336499	• O-RING, PTFE, 1.051 x 0.07-in. wide	2	
30	336621	• SPACER, electrostatic, automatic	1	
31	940110	• O-RING, hotpaint, 0.313 x 0.438 x 0.063 in.	4	
33	1045778	• RETAINER, bushing, Kinetix	1	
34	1045777	• ADAPTER, link-pin 8-32 UNC-2A Kinetix	1	

Puller Link Upgrade

Item	Part	Description	Quantity	Note
—	1045981	PULLER LINK KIT, Kinetix	1	
33	1045778	• RETAINER, bushing, Kinetix	1	
34	1045777	• ADAPTER, link-pin 8-32 UNC-2A Kinetix	1	

Cordset Assemblies

Automatic Gun Cordset

Item	Part	Description	Quantity	Note
—	1045983	CORDSET KIT, automatic, Kinetix	1	
1	1045531	• CORDSET ASSEMBLY, Kinetix, automatic	1	
49	1046703	• LOCKNUT, bulkhead, $\frac{9}{16}$ -18, brass	1	
50	983513	• LOCK WASHER, E, external, $\frac{9}{16}$ -in., steel	1	
51	1045076	• BRACKET, cable, automatic, long, Kinetix	1	
52	346725	• MACHINE SCREW, flathead, recessed, 4-40, 0.25 in., stainless steel	2	

Automatic Gun Cordset with 50 ft Extension

Item	Part	Description	Quantity	Note
—	1046521	CORDSET KIT, automatic with 50 ft cable	1	
1	1045531	• CORDSET ASSEMBLY, Kinetix, automatic	1	
49	1046703	• LOCKNUT, bulkhead, $\frac{9}{16}$ -18, brass	1	
50	983513	• LOCK WASHER, E, external, $\frac{9}{16}$ -in., steel	1	
51	1045076	• BRACKET, cable, automatic, long, Kinetix	1	
52	346725	• MACHINE SCREW, flathead, recessed, 4-40, 0.25 in., stainless steel	2	
53	336531	• CABLE, 50 ft, electrostatic, extension	1	

Optional Fluid Hose Collar Kit

Part	Description	Quantity
1045985	FLUID HOSE COLLAR KIT, Kinetix	1
1045986	• COLLAR, low-pressure, automatic, Kinetix	1
346725	• MACHINE SCREW, flathead, recess, 4-40, 0.25 in., stainless steel	2

Optional Quick-Exhaust Valve

Part	Description	Quantity
325529	MUFFLER/EXHAUST VALVE KIT	1
973000	• NIPPLE, steel, sched 40, $\frac{1}{8}$ in., 0.75 in.	1
901262	• VALVE, exhaust	1
272556	• MUFFLER, low profile, $\frac{1}{4}$ -in. NPT	1

Optional Hotpaint Fluid Seal

The standard fluid seal O-rings for all Kinetix products provide solvent resistance. If a particular application does not require solvent resistance then the hotpaint seal kit can be used instead. These O-rings should not be used with highly polar solvents like Acetone and MEK, Chlorinated Hydrocarbons and Nitro Hydrocarbons unless they will be replaced regularly.

Part	Description	Quantity	Note
336633	HOTPAINT FLUID SEAL KIT, electrostatic	1	
940100	• O-RING, hotpaint, 0.250 x 0.375 x 0.063 in.	2	A
940120	• O-RING, hotpaint, 0.375 x 0.50 x 0.063 in.	1	B
336569	• BACKUP RING, conductive, 0.39-in ID x 0.045-in. thick, cut	1	B
NOTE A: Used on the packing cartridge and fluid hose. B: Used on the fluid tips.			

Optional PTFE Packing Cartridge

NOTE: Use the PTFE packing cartridge with harsh chemical solvents such as MEK.

Part	Description	Note
1089862	KIT, cartridge, packing, Kinetix, electrostatic, PTFE	
-----	• CARTRIDGE ASSEMBLY, packing, electrostatic	
-----	• BACKUP RING, single, $\frac{1}{4} \times \frac{3}{8}$ in.	
336677	• O-RING, Perlast, 0.25 x 0.375 x 0.063 in.	

Hoses, Tubing, and Accessories

Order hoses and tubing separately. Order tubing in 1-ft increments.

Part	Description	Quantity	Note
1074588	25-FT HOSE, Kinetix, solvent resistant, automatic	1	A
336659	25-FT HOSE KIT, Kinetix, low pressure, $\frac{1}{4}$ -in. ID, automatic	AR	
900589	FLUID TUBING, PTFE, 0.249-in., OD x 0.093-in. ID	AR	
900561	FLUID TUBING, PTFE, 0.375-in. OD x 0.188-in. ID	AR	
146132	FLUID TUBING, PTFE, 0.375-in. OD x 0.25-in. ID	AR	
900509	AIR TUBING, polyethylene, 0.25-in. OD x 0.04-in. wall	AR	
900511	AIR TUBING, polyethylene, 0.375-in. OD x 0.062-in. wall	AR	
900556	AIR TUBING, nylon, 0.25-in. OD x 0.035-in. wall	AR	
900557	AIR TUBING, nylon, 0.375-in. OD x 0.05-in. wall	AR	
336470	COUPLING, $\frac{3}{8}$ -in. NPSM x $\frac{3}{8}$ -in. NPSM, brass	1	
972637	COUPLING, $\frac{3}{8}$ -in. NPSM x $\frac{3}{8}$ -in. NPSM, brass, nickel plate	1	
336689	KIT, ferrule, $\frac{1}{4}$ in., low pressure	1	
336688	KIT, ferrule, $\frac{3}{8}$ in., low pressure	1	
336751	FERRULE, $\frac{1}{4}$ -in. tube, low pressure, hose	1	
336752	FERRULE, $\frac{3}{8}$ -in. tube, low pressure, hose	1	
NOTE A: This hose is optional and should be used only in applications in which M.E.K. or other harsh solvents are present. AR: As Required			

Recommended Spare Parts

Keep the following parts in inventory to avoid unplanned downtime. Quantities listed support a single spray gun. Adjust order quantities based on the number of spray guns in service.

Part	Description	Quantity	Note
336679	PERLAST FLUID SEAL KIT, gun, Kinetix	1	A
336633	HOTPAINT FLUID SEAL KIT, electrostatic	1	A
336656	AIR SEAL KIT, automatic	1	
1089861	PACKING CARTRIDGE KIT, gold, Kinetix	1	B
1089862	PACKING CARTRIDGE KIT, PTFE, Kinetix	1	B
336556	NEEDLE WITH RESISTOR KIT, electrostatic	1	
1046521	CORDSET KIT, automatic, gun, with 50-ft cable	1	
336531	CABLE, 50 ft, electrostatic extension	1	
1045983	CORDSET KIT, automatic extension	1	
336505	MULTIPLIER KIT, 93 kV, Kinetix	1	
336644	EXTENSION KIT, Kinetix, low pressure	1	
1045984	PULLER LINK KIT, with spacer block, Kinetix	1	
1045981	PULLER LINK KIT, Kinetix	1	
1045985	FLUID HOSE COLLAR KIT, Kinetix	1	
336642	WRENCH, Kinetix, combination tool	1	
156098	PROTECTIVE COVER, bag, Kinetix	6	C
900349	PTFE-FILLED LUBRICANT, O-ring, (MagnaLube) , 0.75-oz tube	1	
247658	DIELECTRIC GREASE, applicator, 10 cc, 12 count	1	
-----	FLUID TIP	1	D
-----	AIR CAP	1	D
336751	FERRULE, 1/4-in. tube, low pressure, hose	1	E
336752	FERRULE, 3/8-in. tube, low pressure, hose	1	E
1028630	PLIERS, needle nose bent, Kinetix	1	
1028631	TOOL, needle, Kinetix	1	
1043238	PARTS POSTER, Kinetix Automatic Air Spray and KVLP Electrostatic Spray Gun	1	

NOTE A: Fluid seal kit 336679 is standard, fluid seal kit 336633 is optional.

B: The Kinetix spray gun is shipped with the standard gold packing cartridge. This durable packing cartridge is appropriate for most coating materials. Use the optional PTFE packing cartridge with harsh chemical solvents such as MEK.

C: Order 106403 for a quantity of 10 protective cover bags.

D: Refer to the *Kinetix Air Spray Fluid Tip and Air Cap Selection Chart* and the *Kinetix KVLP Fluid Tip and Air Spray Selection Chart* included with this manual for available part numbers and descriptions.

E: Choose the correct ferrule for the tubing size used.

KVLP Compliance Kit

Refer to the *Kinetix KVLP Fluid Tip and Air Cap Selection Chart* foldout included with this manual for kit part numbers and the part numbers of the air caps included in the kits.

Item	Part	Description	Quantity	Note
—	-----	COMPLIANCE KIT	1	A
1	325643	• GAUGE, air, 1.5-in. diameter, 0–30 psi	2	
2	972937	• CONNECTOR, female, $\frac{1}{8}$ -in. tube x $\frac{1}{8}$ -in. NPT	2	
3	-----	• TUBING, $\frac{1}{8}$ -in. diameter, gray (18 in.)	3	B
4	-----	• CAP, compliance, KVLP	1	A, C
5	971620	• • CONNECTOR, barbed, #3–56 x $\frac{1}{8}$ in., brass	2	
6	325547	• RING, retaining, air cap	1	

NOTE A: Refer to the *Kinetix KVLP Fluid Tip and Air Cap Selection Chart* included with this manual for the correct part number.

B: Order tubing in one-foot increments. Two 18-in. sections are required.

C: Compliance caps can be ordered separately corresponding to different air caps used.

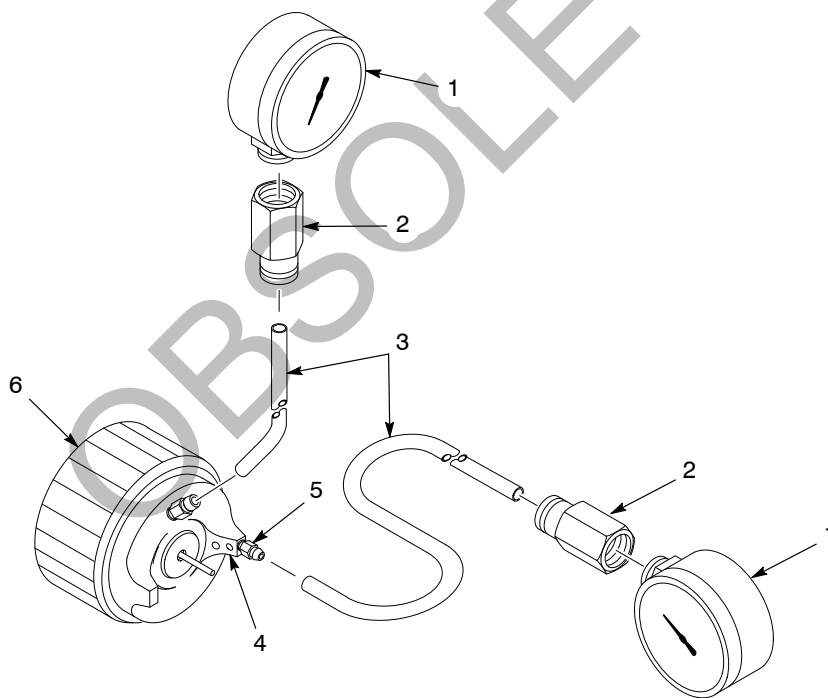


Figure 8-2 Compliance Kit

Air Spray Conical Nozzles

Part	Description	Quantity
336608	10-in. CONICAL NOZZLE KIT, low pressure, 25.4 cm	1
336610	• TIP, fluid conical, electrostatic	1
336581	• CAP, conical	1
-----	• NOZZLE, 10 in. with insert, electrostatic	1
336678	• O-RING, Perlast, 0.375 x 0.50 x 0.063 in.	1
336569	• BACKUP RING, conductive, 0.39-in. ID x 0.045-in. thick, cut	1
336609	13-in. CONICAL NOZZLE KIT, low pressure, 33.1 cm	1
336610	• TIP, fluid conical, electrostatic	1
336582	• CAP, conical	1
-----	• NOZZLE, 13 in. with insert, electrostatic	1
336678	• O-RING, Perlast, 0.375 x 0.50 x 0.063 in.	1
336569	• BACKUP RING, conductive, 0.39-in. ID x 0.045-in. thick, cut	1

Section 9

Specifications

Dimensions

Dimensions	Metric (cm)	English (in.)
Height	12.29	4.84
Length	35.4	13.92
Width	7.92	3.12
NOTE: The spray gun dimensions include the fluid and air fittings.		

Weight

Weight	Metric (g)	English (oz)
Air Spray/KVLP	1465	51.6
NOTE: The spray gun weight includes the fluid and air fittings.		

Operating Pressures

Operating Pressures	Metric	English
Maximum air input pressure	6.9 bar	100 psi
Maximum fluid input pressure	6.9 bar	100 psi
Maximum fluid temperature	82 °C	180 °F
NOTE: Supply air must be particulate free (5 microns maximum) and oil free. Use coalescing-type air filters.		

Air Hose Requirements

Air Hose	Metric	English
Length (optimum for KVLP)	7.62 m	25 ft
Minimum ID required for KVLP (horn and atomizing)	8 mm	⁵ / ₁₆ in.

Standard Fitting Sizes

Spray Gun Standard Fitting Sizes	
Atomization air	$\frac{3}{8}$ -in. tube
Horn air	$\frac{3}{8}$ -in. tube
Activation (trigger) air	$\frac{1}{4}$ -in. tube
Fluid fitting	$\frac{3}{8}$ -in. NPSM, female $\frac{1}{4}$ -in., ferrule $\frac{3}{8}$ -in., ferrule

Gun Electrostatics

Maximum voltage: 93 kV

Maximum output rating current: 122 microamps

NOTE: Current draw greater than 50 μ A may affect spray pattern, transfer efficiency and finish. If the conductivity of your material causes excessive current draw, changing to the longer hose may be necessary.

Conductivity Range

Material Resistivity	Tube Length
Greater than 25 megohms/cm	Refer to <i>Fluid Tubing Selection</i> on page 3-3
Less than 25 megohms/cm	

Approvals

This spray gun has met the requirements for ATEX, CE, and FM approval.

Special Conditions for Safe Use in the European Union

- This applicator must be installed according to the standard EN50176.
- The equipment is intended to be used in the ambient temperature range of 0–40 °C.
- This applicator must be used with the Kinetix Automatic Gun Power Supply.

DECLARATION of CONFORMITY

Nordson Corporation

declare under our sole responsibility that the products

Kinetix High Pressure or Trilogy Low Pressure, automatic liquid electrostatic applicators including control cables used with the IPS-20 Automatic Controller

to which this declaration relates complies with the following Directives:

- **Machinery Directive 2006/142/EC**
- **EMC Directive 2004/108/EEC**
- **ATEX Directive 94/9/EC**

The conformity is under observance of the following standards or standards documents:

EN12100 (2003) EN60204 (2006)	EN60079-0 (2006) EN50050 (2006) EN50176 (2007)	EN61000-6-3 (2007) EN61000-6-2 (2005) EN55011 (2007)
		FM7260 (1996)

Type of protection:

- **II 2 G, EEx 0.24 mJ (type A), Ambient temperature: 0 °C to +40 °C**

N ° of EC type Certificate:

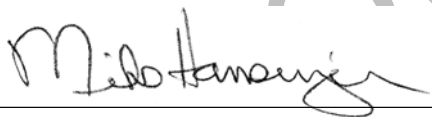
- **INERIS 05 ATEX 0069X**
- **Location: Verneuil en Halatte, FRANCE**

N ° of notified body (ATEX surveillance)

- **1180 (Baseefa) Buxton, Derbyshire, UK**

ISO9000 certificate

DNV



Mike Hansinger
ICS Manager Engineering Development

Date: 09 Sept 2010

Nordson Authorized Representative in the EU

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