Kinetix® Electrostatic Spray Gun
Automatic Version (without Fluid Hose)
60 kV Air Spray and KVLP™ Waterborne

Customer Product Manual
Part 1072645A02
Issued 06/07

For parts and technical support, call the Finishing Customer Support Center at (800) 433-9319.

This document is available on the Internet at http://emanuals.nordson.com/finishing

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Contact Us

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Notice

Trademarks

Part 1072645A02

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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:

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

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

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.

Section 2
Description

Introduction

See Figure 2-1.

The Kinetix 60 kV air spray and KVLP automatic electrostatic waterborne spray gun is used with the Nordson Iso-Flo system. Iso-Flo is an isolated fluid-delivery system which provides a direct charge to your waterborne coating.

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

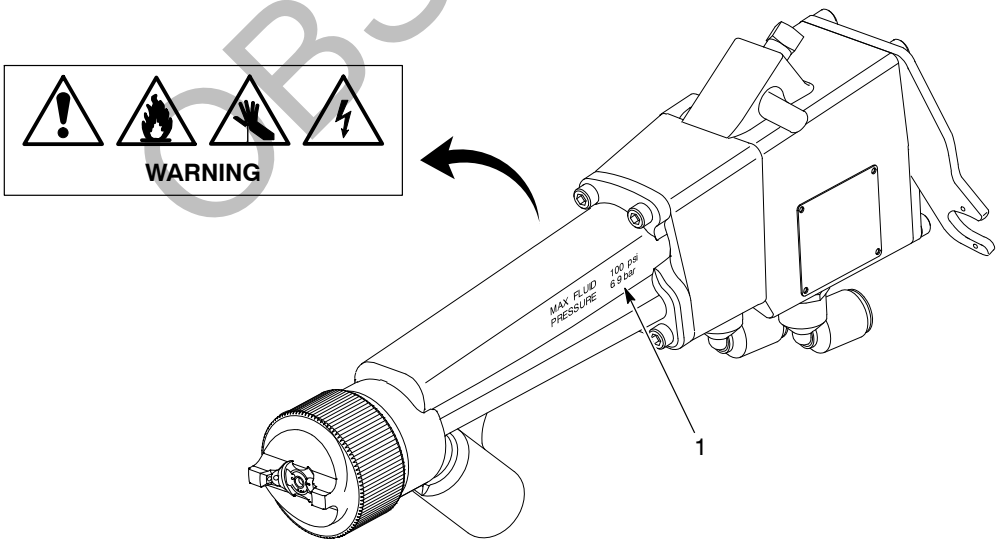

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Figure 2-1 Kinetix 60 kV Air Spray and KVLP Automatic Electrostatic Spray Gun

1. Maximum fluid pressure 6.9 bar (100 psi)

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
- separate horn and atomizing air for superior spray control
- easy disassembly for cleaning and repair
- self-adjusting packing cartridge

Options

Options include a variety of fluid tips; air caps; air hoses; air pressure regulators and gauges; fittings; 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 gun is compatible with a wide variety of waterborne coating materials.

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

An electrostatic charge is delivered by an automatic Iso-Flo voltage block system. The system delivers pressurized coating material to the spray gun on demand and electrically isolates the charged spray gun and fluid path from the grounded coating material supply.

The charged coating material flows through a special fluid supply hose (6) to the gun extension (2). As the charged coating material is sprayed it is attracted to the grounded object to be coated.

NOTE: The fluid supply hose is not supplied with the spray gun. It must be ordered separately.

Fluid Flow

Fluid enters the spray gun through a fluid hose (6) attached to the extension and flows to the fluid tip (4). The needle (3) controls fluid flow through the fluid tip. The packing cartridge (5) prevents fluid from flowing past it into the back of the spray gun extension. The fluid adjuster (11) controls the needle travel allowing adjustments to be made in fluid flow rates at the spray gun. The fluid flow is dead-ended at the spray gun when the operation has stopped.

NOTE: The fluid supply hose is not supplied with the spray gun. It must be ordered separately.

Theory of Operation *(contd)*

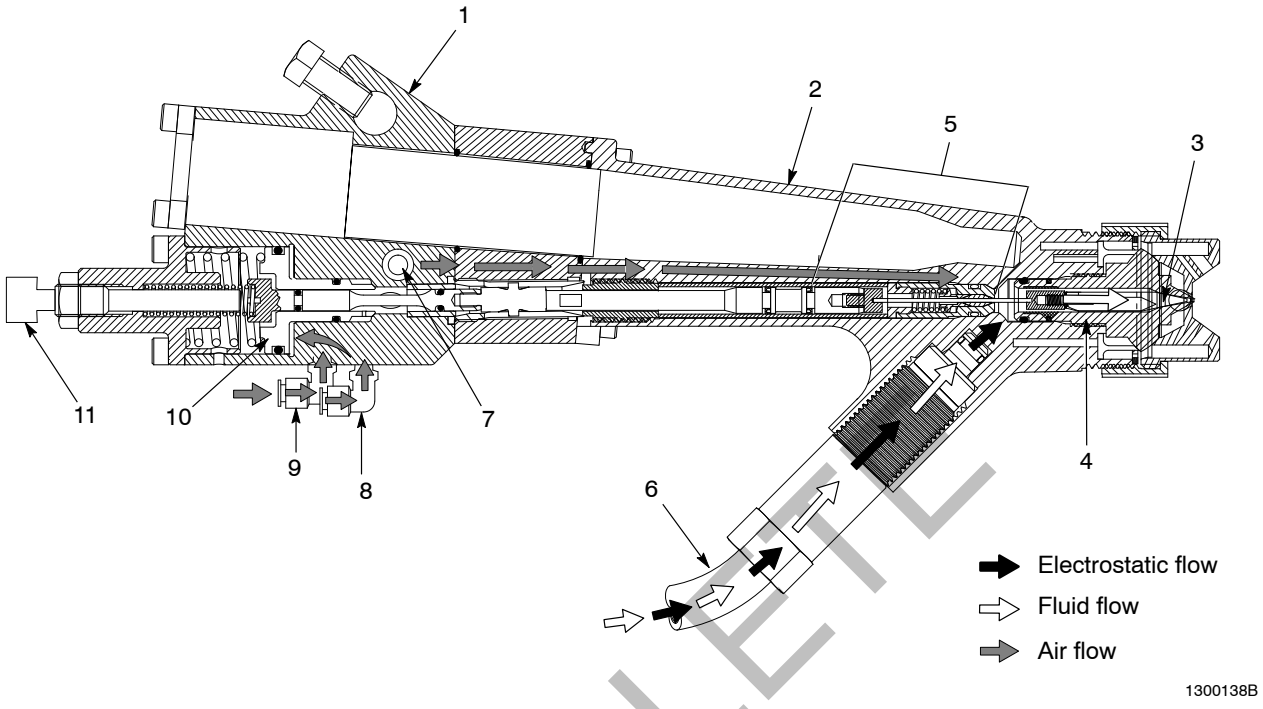

Figure 2-2 Spray Gun Components and Operation

1. Spray gun body
2. Extension
3. Needle
4. Fluid tip
5. Packing cartridge
6. Fluid hose (sold separately)
7. Atomization air core
8. Horn air core
9. Actuating (trigger) air inlet fitting
10. Air piston
11. Fluid adjuster

Air Flow

Air enters the spray gun body at three fittings:

Actuating (trigger) — Actuating (trigger) air (9) moves the air piston (10), which then opens the atomization air valve and develops full atomization air flow. The air piston then pulls on the connecting rod, opening the needle and generating fluid flow. There is always maximum air flow before fluid flow, thus eliminating fluid spitting and poor atomization of the initial fluid flow.

Horn — Horn air (8) flows directly to the air cap and is responsible for shaping the spray pattern. Horn air flow is constant unless it is controlled by a separate solenoid valve.

Atomization — Atomization air (7) flows when the spray gun is activated. A small amount of atomization air continually flows through the spray gun body.

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 air hoses are not shipped with the spray gun. You must order them separately, based on your application. If you order a 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 spray 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.

Typical 60 kV Air Spray and KVLP Waterborne System

Figure 3-1 shows a typical system's components.

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

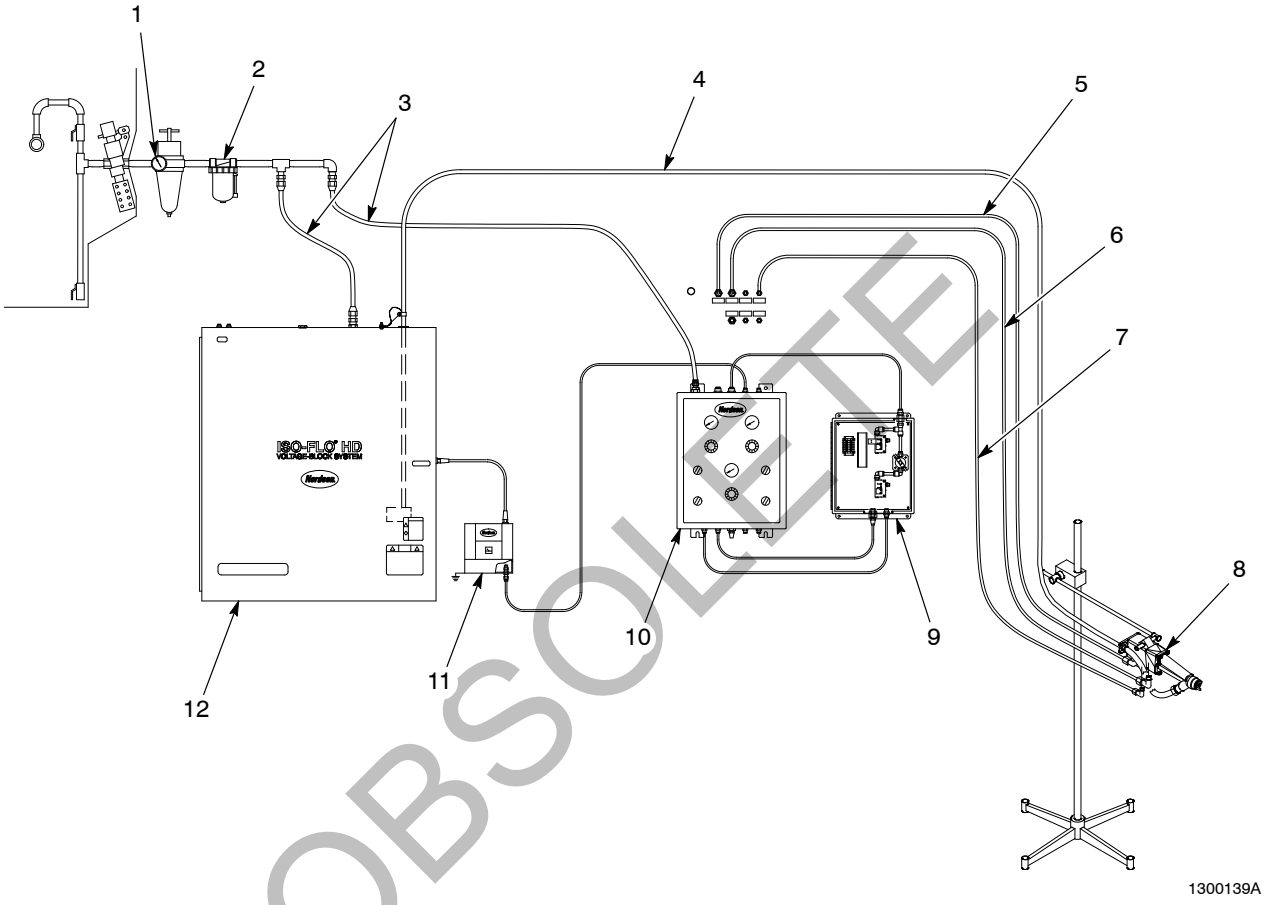

Figure 3-1 Typical 60 kV Air Spray and KVLP System

1. Air regulator
2. Air filter
3. Main air lines
4. Fluid supply line
5. Atomizing air
6. Horn air
7. Activation (trigger) air
8. Spray gun
9. Electro-pneumatic trigger panel
10. Gun panel
11. EPS-6 power unit
12. Iso-Flo automatic voltage block system

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) and have a minimum 8-mm ($^5/_{16}$-in.) inside diameter (ID).

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 $^3/_8$-in. tube fitting in the spray gun body and the air supply outlet.
3. Connect the trigger air hose between the $^1/_4$-in. tube fitting in the spray gun body and the air supply outlet.

Fluid Hose

WARNING: The fluid hose must be a grounding-type hose, with continuity between the spray gun and the ground strap. Use only the Nordson-approved fluid hose with this system. 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 grounding cable, should be a part of your regular maintenance procedures.

1. Clean the fluid hose fittings with a clean, dry cloth.
2. Connect the fluid hose between the fluid delivery system outlet and the fluid hose fitting on the spray gun extension.

Securing the Air and Fluid Hoses

- Bundle the air and fluid hoses 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

See Figure 3-2.

WARNING: Shut off the electrostatics. Ground the spray gun 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. Failure to observe this warning could result in an injection injury.

1. Shut down the Iso-Flo power supply. Refer to the appropriate Iso-Flo automatic power supply manual.
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. Unscrew the retaining ring (1). Remove the retaining ring and air cap (2) assembly.

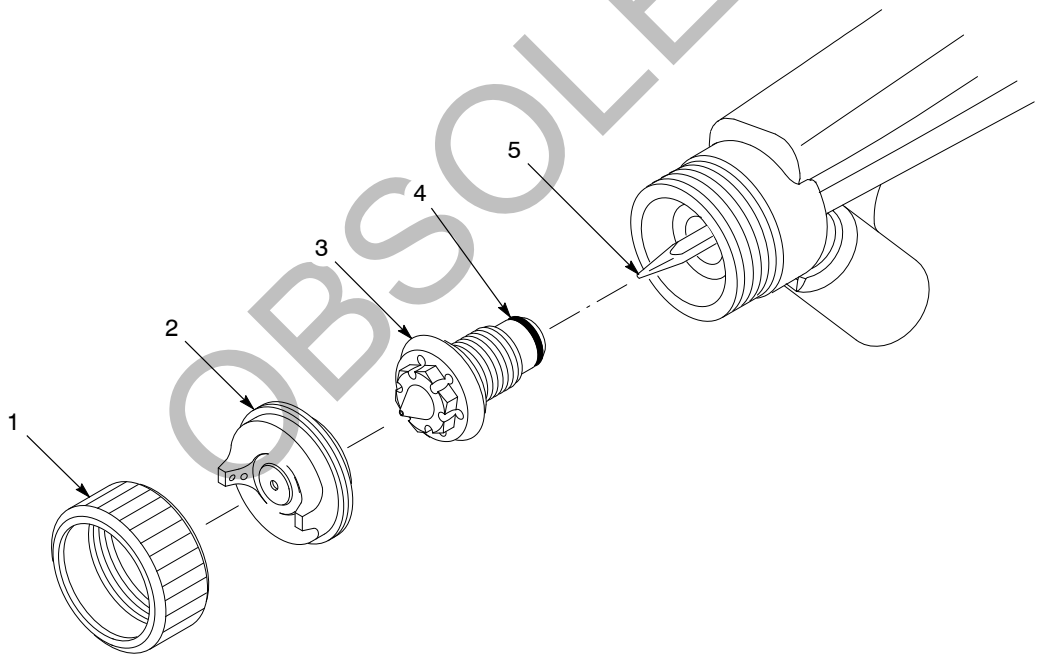

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Figure 3-2 Fluid Tip and Air Cap Installation

1. Retaining ring
2. Air cap
3. Fluid tip
4. O-ring
5. Needle

4. Install the O-ring (4) in the groove in the fluid tip (3). Lubricate the O-ring with dielectric grease.

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.

5. Activate the spray gun to retract the needle (5). Screw the fluid tip into the threaded bore of the spray gun.

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

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

8. 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 3-3.

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 quick-exhaust nipple into the spray gun body trigger port (5).

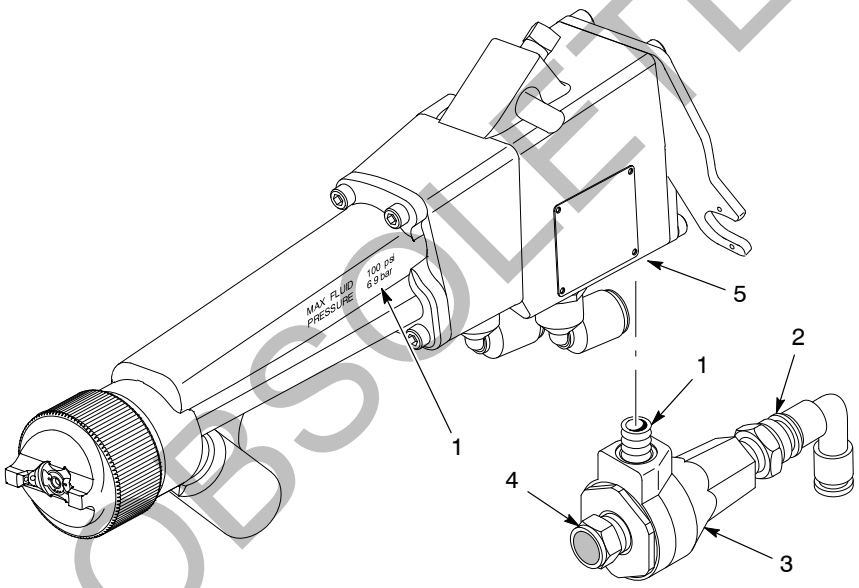

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Figure 3-3 Optional Quick-Exhaust Valve

1. $^1/_8$-in. NPT x $^1/_8$-in. NPT nipple
2. $^1/_8$-in. NPT x $^1/_4$-in. OD elbow
3. Quick exhaust valve
4. Muffler
5. Gun body trigger port

Section 4
Operation

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

Introduction

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

   NOTE: You may want to remove the air cap.

   An appropriate fluid supply pressure for optimum atomization 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 adjuster 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.
7. 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 Adjustment*s on page 4-3.
8. Turn on the Iso-Flo system. Refer to the appropriate automatic Iso-Flo system manual for more information.

NOTE: For best results, leave the fluid adjuster 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.

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 power supply. 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 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 a KVLP air cap and fluid tip:** 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

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 airspray 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: Shut off the power supply. Failure to observe this warning could result in personal injury.

WARNING: Shut off the fluid-delivery system and relieve system pressure 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 air cap and fluid tip with a clean cloth dampened with a compatible solvent.

Long-Term

For long-term shutdowns, follow this procedure:

1. Shut off the power supply.
2. Relieve air pressures for 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. Shut off the Iso-Flo fluid-delivery system.
5. Relieve system fluid pressures.
6. Activate the spray gun into a waste container.
7. 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 air 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* 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 $^{3}/_{8}$-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 $^{3}/_{8}$-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 a non-practical combination. 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 power supply.
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.
5. Check the air pressure gauges (2, 3). Both atomizing and horn pressures should be 0.69 bar (10 psi) or less.

Checking Air Cap Performance *(contd)*

6. If the atomization pressure exceeds 0.69 bar (10 psi), reduce the atomization air supply pressure and check atomization quality.
7. If the horn air pressure exceeds 0.69 bar (10 psi), reduce the horn air supply air pressure and check pattern size.
8. 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.

9. If atomization quality is unacceptable, install the next size larger air cap or increase the air pressure above optimum level.

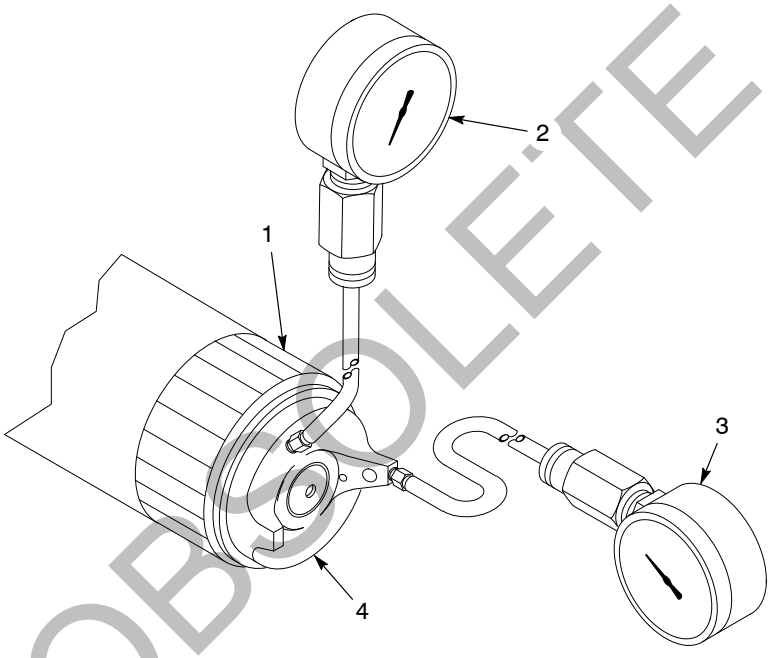

Figure 4-1 Checking Air Cap Performance

1. Retaining ring
2. Atomizing air gauge
3. Horn air gauge
4. Performance air cap

Section 5
Maintenance

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

Introduction

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 power supply. 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 power supply. Refer to the appropriate Iso-Flo automatic power supply manual.
2. Shut down the atomizing and horn air pressures.
3. Flush the fluid-delivery system, fluid hose, and spray gun with a compatible solvent.
4. Shut down the fluid-delivery system and air supply.
5. Point the spray gun into the booth or grounded waste container and activate it to relieve any residual pressure.

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. 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 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 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 power supply. 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. Failure to observe this warning could result in an injection 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.

Flush the System

1. Relieve system air and fluid pressure and make sure the spray gun can not be activated.
2. Turn off the power supply. Refer to the appropriate Iso-Flo automatic power supply manual.
3. Point the spray gun down into a grounded waste container. Activate the spray gun to drain the spray gun and hose.
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.

Clean the Spray Gun Components

CAUTION: Activate the spray gun to pull the needle out of the seat before removing the fluid tip. This will prevent damage to the needle and 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 them, 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.
4. Dampen a soft cloth with a compatible cleaning non-conductive solvent. Point the spray gun downward and clean the exterior.
5. Clean the fluid tip, air cap, and retaining ring as described in the *Daily* maintenance procedure on page 5-1.
6. Install the retaining ring, air cap, and fluid tip making sure the needle is retracted before installing the fluid tip.
7. Install the air and fluid hoses.

Extensive Cleaning

For more extensive cleaning, disassemble the spray gun and clean each part. Once disassembled, the extension and handle 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.

Section 6
Troubleshooting

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

Introduction

WARNING: Shut off the power supply. Failure to observe this warning could result in personal injury.

This section contains troubleshooting procedures. These procedures cover only the most common problems that you may encounter. If you cannot solve the problem with the information given here, contact your local Nordson representative for help.

This section contains troubleshooting procedures for

- common spray gun problems;
- spray pattern and film-build faults; and
- electrostatic.

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 the 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 fluid delivery system (air and fluid).
	Blockage within the spray gun, fluid hose, or fluid system	Flush the system. If necessary, repair or replace clogged or damaged components.
	Low fluid pressure	**WARNING:** Do not exceed the maximum fluid pressure rating of 6.9 bar (100 psi). If within the fluid pressure limit of the spray gun, slowly raise fluid pressure.
	Fluid too viscous	Lower the viscosity by adding solvent or increasing 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.

Problem	Possible Cause	Corrective Action
7. Coarse spray	Air pressure too low for fluid flow rate	Decrease the fluid flow rate or increase 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 the 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 too high	Use a larger fluid tip and decrease 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 *Clean the Spray Gun Components* 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 the 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	Decease 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 low	Increase the atomization air pressure and decrease the 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.
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 the atomization air.
	Fluid pressure too low	Increase the fluid pressure.
	Spray gun too far from the substrate	Move the spray gun closer to the substrate.

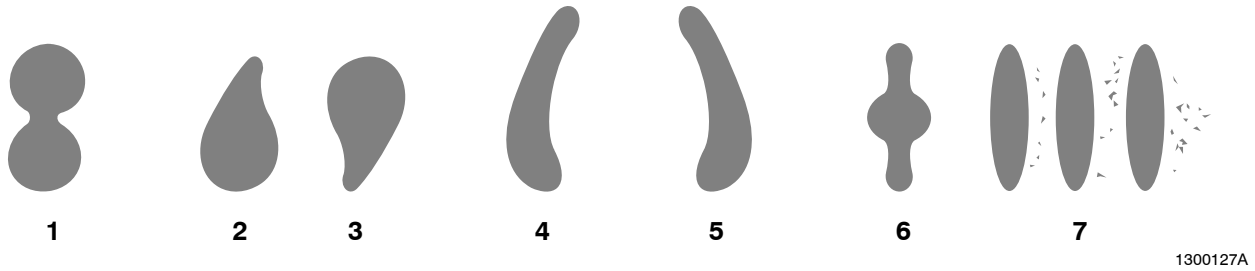

Figure 6-1 Common Spray Pattern Faults

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

Electrostatic Troubleshooting

Problem	Possible Cause	Corrective Action
1. No electrostatic voltage, or the electrostatic voltage is low or erratic	Coating material is grounding out	Inspect the hose and repair or replace it as necessary.
	Defective electrostatic power supply, electrostatic cable, cable connection, or control circuit	Check the electrostatic equipment and repair or replace as necessary. Refer to the appropriate automatic Iso-Flo system manual.
	Leaking packing cartridge	Check the packing cartridge for leaks. Clean the packing cartridge bore and install a new packing cartridge and dielectric grease.
2. Supply system malfunction	Supply system grounding out	Check the supply system.

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. 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 unathorized 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's main parts list. Refer to the *Parts* section starting on page 8-1 for complete part descriptions and ordering information. Items in the repair section that are not included with the main spray gun assembly 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)
- $^{5}/_{32}$-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 starting on page 8-1 for service kits and individual part numbers.

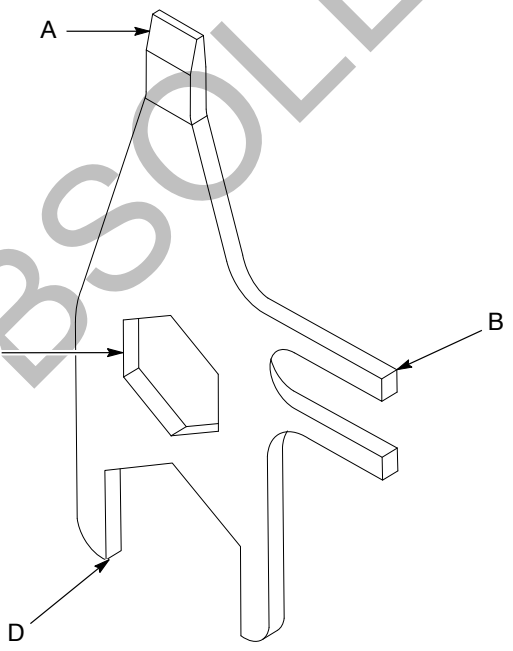

Figure 7-1 Combination Tool

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

Air Cap and Fluid Tip Replacement

See Figure 7-2.

1. Turn off the power supply. Refer to the appropriate Iso-Flo automatic power supply manual.
2. Flush the fluid-delivery system, hose, and spray gun.
3. Turn off the fluid-delivery system. Relieve the 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 (35) and air cap (A) assembly from the extension and 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 (32). 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 (C) is installed on the new fluid tip, with the O-ring toward the rear of the fluid tip. Lubricate the O-ring with dielectric grease.

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.

8. Activate the spray 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.
9. 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.

Air Cap and Fluid Tip Replacement *(contd)*

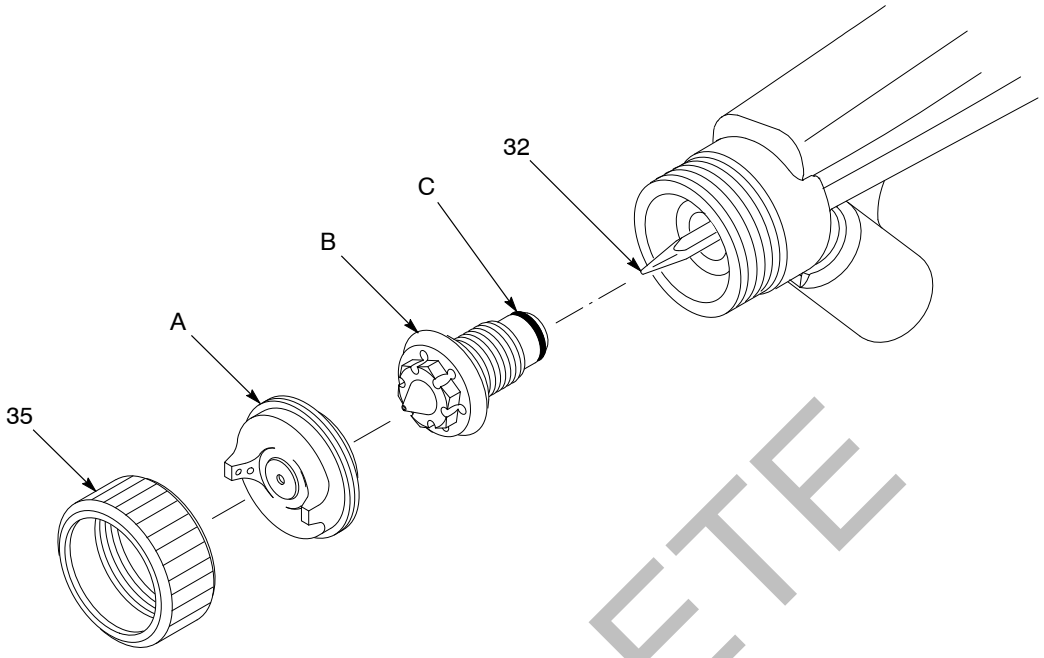

Figure 7-2 Air Cap and Fluid Tip Replacement

32. Needle
35. Retaining ring

A. Air cap
B. Fluid tip
C. O-ring

Fluid Adjuster Replacement

See Figure 7-3.

1. Turn off the power supply. Refer to the appropriate Iso-Flo automatic power supply manual.
2. Flush the fluid-delivery system, hose, and spray gun.
3. Turn off the fluid-delivery system. Relieve the 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 housing because the fluid return spring and piston return compression spring will begin to push the fluid adjuster housing out as you loosen the socket screws.

5. Remove the four socket screws (1) with a $^{5}/_{32}$-in. hex wrench to remove the fluid adjuster housing (5).
6. Remove and inspect the springs. Replace them if they are worn or damaged.
7. Generously lubricate the piston return compression spring (7), the fluid return spring (6), and the fluid adapter housing bores where the springs will rest inside the fluid adjuster with MagnaLube G or an equivalent PTFE-based lubricant
8. Place the piston return compression 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 (14) by holding it firmly and securing with 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.

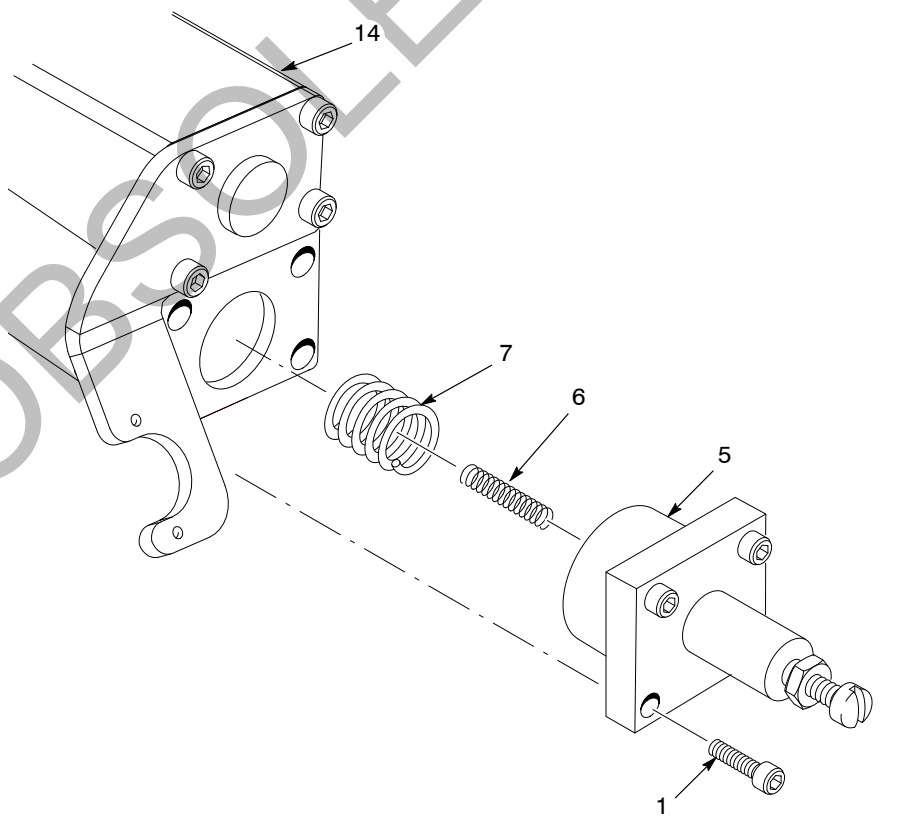

Figure 7-3 Replacing the Fluid Adjuster

1. #10-24 socket screws
5. Fluid adjuster housing
6. Fluid return spring
7. Piston return compression spring
14. Piston block body

Air Piston and Connecting Rod Replacement

Prepare the Spray Gun

1. Turn off the power supply. Refer to the appropriate Iso-Flo automatic power supply manual.
2. Flush the fluid-delivery system, hose, and spray gun.
3. Turn off the fluid-delivery system. Relieve the 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 7-3.
6. Remove the fluid adjuster as described in *Fluid Adjuster Replacement* on page 7-4.

Disassemble the Spray Gun

See Figure 7-4.

1. Insert the flat-blade screwdriver of the combination tool into the end of the piston block body (14) to loosen the connecting rod (8) from the packing cartridge. The connecting rod will remain in the piston block body.
2. Remove the four socket-head screws (33 and 36) with a $^{5}/_{32}$-in. hex wrench to remove the extension (34) and spacer block (18).

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.

3. Remove the extension and spacer block from the piston block body. Do not lose the four face-seal O-rings (21) or the two large face-seal O-rings (17) around the spacer block.

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

Remove the Air Piston and Connecting Rod

See Figure 7-4.

1. Using the $^{5}/_{32}$-in. hex wrench, push the connecting rod (8) out of the piston block body. Replace worn or damaged O-rings (9) on the connecting rod.
2. Push the air piston (10) out of the piston block body (14). 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 (11, 12) on the air piston and replace them 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 (9) on the connecting rod (8) with MagnaLube G or an equivalent PTFE-based lubricant and push it through the air piston.
5. Assemble the spray gun. Refer to *Assemble the Spray Gun* on page 7-8.

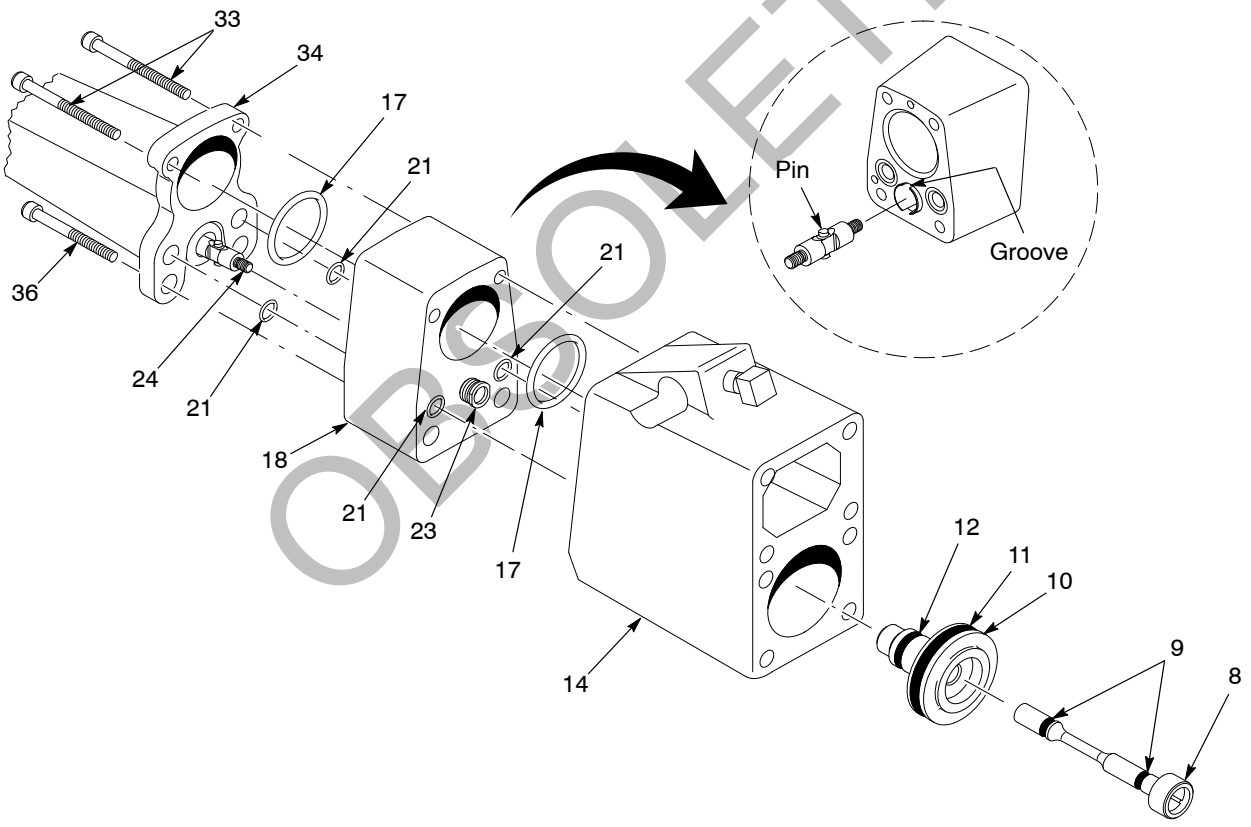

Figure 7-4 Replacing the Air Piston and Connecting Rod

8. Connecting rod
9. O-rings
10. Air piston
11. O-ring
12. O-ring
14. Piston block body
17. Large face-seal O-ring
18. Spacer block
21. Face-seal O-rings
23. Retainer bushing
24. Puller link
33. Socket-head screws
34. Extension
36. Socket-head screws

Assemble the Spray Gun

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.

1. Make sure the four face-seal O-rings (21) are correctly installed. Lubricate the O-rings with dielectric grease.
2. Make sure the two large face-seal O-rings (17) are correctly installed. Apply dielectric grease to these O-rings.
3. Grasp the puller link (24) 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 (31) 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 (33 and 36). 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 7-3.
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. Attach the fluid hose to the bracket.
11. Turn on the power supply. Refer to the appropriate Iso-Flo automatic power supply manual.

Needle Replacement

NOTE: You do not need to completely disassembly 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 7-11.

Prepare the Spray Gun

1. Turn off the power supply. Refer to the appropriate Iso-Flo automatic power supply manual.
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 7-3.

Remove the Needle

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 needle 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 removing 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 7-11.

4. Once it is loose, remove the needle.

   NOTE: See Figure 7-6. The washer (31) may come out with the needle.

Remove the Needle *(contd)*

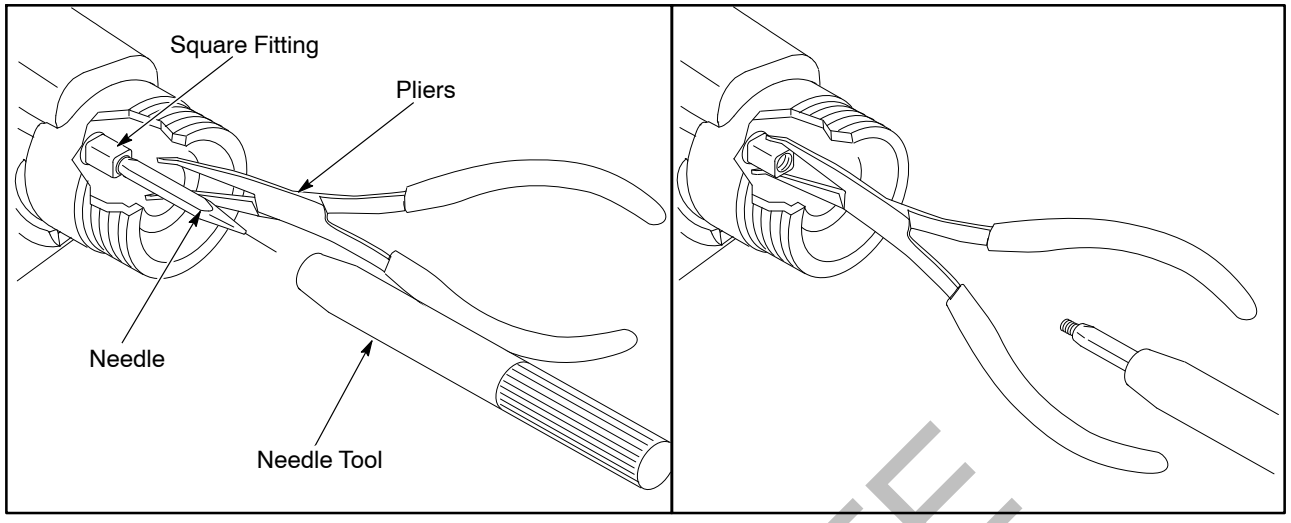

Figure 7-5 Needle Replacement

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

Install the Needle

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 washer (31) and replace if damaged.

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

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

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

4. 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.
5. Line up the open end of the needle tool over the needle and slide it down over the needle.
6. Hold the pliers tight then begin turning the needle tool to tighten the needle into the packing cartridge.
7. 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.
8. Install the retaining ring, air cap, and fluid tip as described in *Air Cap and Fluid Tip Replacement* on page 7-3.

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.

NOTE: The Kinetix spray gun is shipped standard with the gold packing cartridge, part 1050238. This durable packing cartridge is appropriate for most coating materials. An optional PTFE packing cartridge, part 1052118, is available if you are spraying harsh chemical solvents such as MEK.

NOTE: The needle is not a component of the packing cartridge. You must replace it separately. 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.

NOTE: To replace the needle only, refer to *Needle Replacement* on page 7-9.

Prepare the Spray Gun

1. Turn off the power supply. Refer to the appropriate Iso-Flo automatic power supply manual.
2. Flush the fluid-delivery system, hose, and spray gun.
3. Turn off the fluid-delivery system. Relieve the 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 7-3.
6. Remove the fluid adjuster as described in *Fluid Adjuster Replacement* on page 7-4.

Disassemble the Spray Gun

See Figure 7-4.

1. Insert the flat-blade screwdriver of the combination tool into the end of the piston block body (14) to loosen the connecting rod (8) from the packing cartridge. The connecting rod will remain in the piston block body.
2. Remove the four socket-head screws (33 and 36) with a $^{5}/_{32}$-in. hex wrench to remove the extension (34) and spacer block (18).

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.

3. Remove the extension and spacer block from the piston block body. Do not lose the four face-seal O-rings (21) or the two large face-seal O-rings (17) around the spacer block.

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

Remove the Packing Cartridge and Needle

See Figure 7-6.

1. Holding the flats on the pull shaft (27), unscrew the puller link (24).
2. Push the pull shaft forward and unscrew the packing cartridge retainer (25) with the combination tool.
3. Pull the pull shaft out of the back of the extension to remove the pull shaft, packing cartridge (28), and sleeve retainer (26). 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 (30) and back-up ring (29) 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.

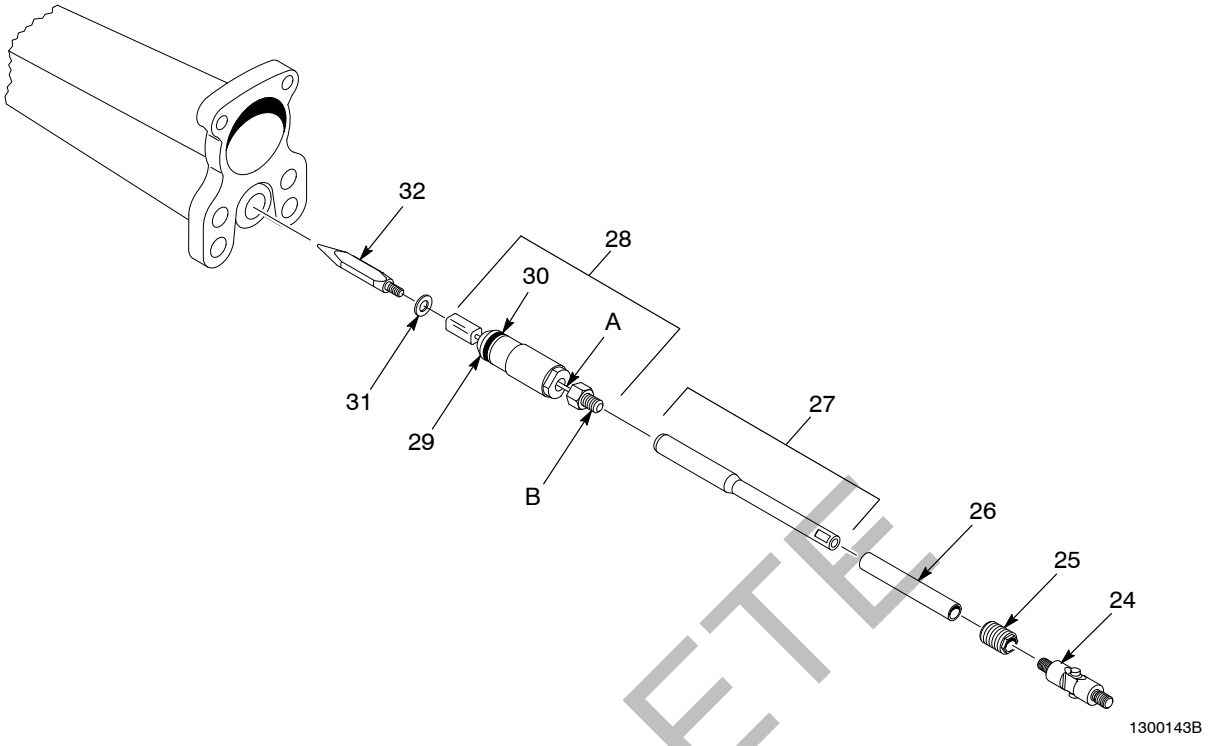

Figure 7-6 Packing Cartridge and Needle Replacement

24. Puller link
25. Packing cartridge retainer
26. Sleeve retainer
27. Pull shaft
28. Packing cartridge
29. Back-up ring
30. O-ring
31. Washer
32. Needle
A. Packing cartridge wire
B. Puller fitting

9. If the needle (32) 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.

b. Apply a removeable threadlocking adhesive to the threads of the new needle if there are problems with the needle backing out.

NOTE: Make sure the washer (31) is installed on the end of the needle.

c. 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.

Install the Packing Cartridge and Needle

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 threadlocking adhesive to the threads of the packing cartridge puller fitting (B).
2. Screw the pull shaft (27) into the packing cartridge (28).

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 liberal amount of dielectric grease to the outside of the sleeve retainer then slide the sleeve retainer (26) 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 (25) 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 threadlocking adhesive to the threads of the puller link (24) and then screw the puller link onto the pull shaft (27).
10. Assemble the spray gun. Refer to *Assemble the Spray Gun* on page 7-15.

Assemble the Spray Gun

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.

1. Make sure the four face-seal O-rings (21) are correctly installed. Lubricate the O-rings with dielectric grease.
2. Make sure the two large face-seal O-rings (17) are correctly installed. Apply dielectric grease to these O-rings.
3. Grasp the puller link (24) and pull it until the needle 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 (31) 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 (33 and 36). 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 7-3.
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. Attach the fluid hose to the bracket.
11. Turn on the power supply. Refer to the appropriate Iso-Flo automatic power supply manual.
12. 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.

Fluid Supply Hose Replacement

See Figure 7-7.

NOTE: The fluid supply hose is not supplied with the spray gun. It must be ordered separately.

Remove the Fluid Hose

1. Turn off the power supply. Refer to the appropriate Iso-Flo automatic power supply manual.
2. Turn off the fluid-delivery system and relieve the fluid pressure.
3. Remove the screws (D) to remove the fluid hose collar (C) and fluid hose from the bracket (2).
4. Loosen the retaining nut (B), which is located at the extension fluid inlet boss (A), and unscrew completely.
5. Pull the hose assembly out of the spray gun extension.

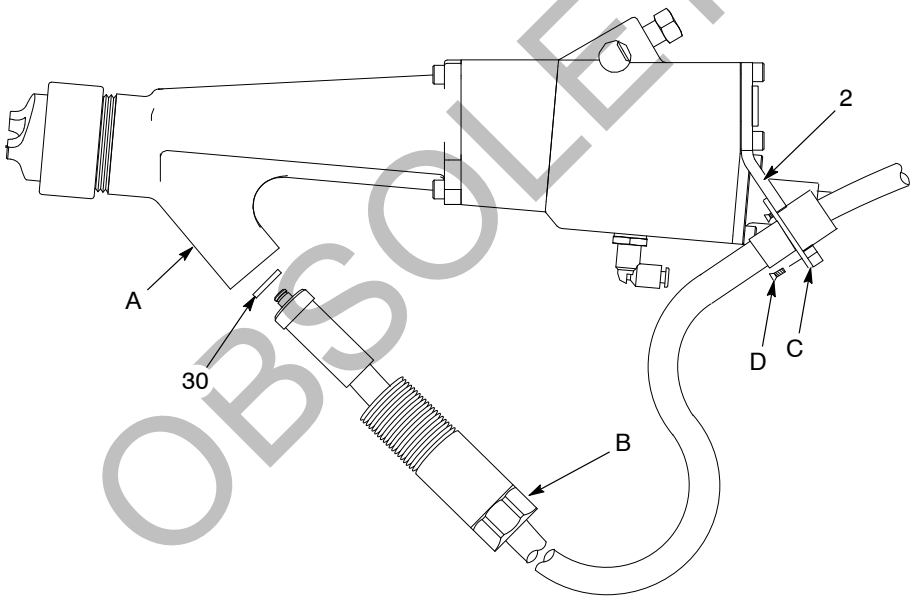

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Figure 7-7 Fluid Supply Hose Replacement

2. Bracket
30. O-ring
A. Extension fluid inlet boss
B. Retaining nut
C. Collar
D. Screws

Install the Fluid Hose

See Figure 7-7.

1. Clean the end fittings of the hose.
2. Inspect the O-ring (30) on the end fitting. Replace if necessary.
3. Lubricate the O-ring with dielectric grease.
4. Push the end fitting into the extension fluid inlet boss (A).
5. Screw the retaining nut (B) into the extension. Do not overtighten.
6. Secure the fluid hose collar (C) to the bracket (2) with the screws (D).
7. Turn on the fluid-delivery system. Refer to the appropriate fluid-delivery system manual.

NOTE: Attach a ground strap to the Iso-Flo power supply unit.

8. Turn on the power supply. Refer to the appropriate Iso-Flo automatic power supply manual.

Service Illustration and Notes

Use Figure 7-8 and Table 7-1 as a quick reference for the service notes to assemble the spray gun.

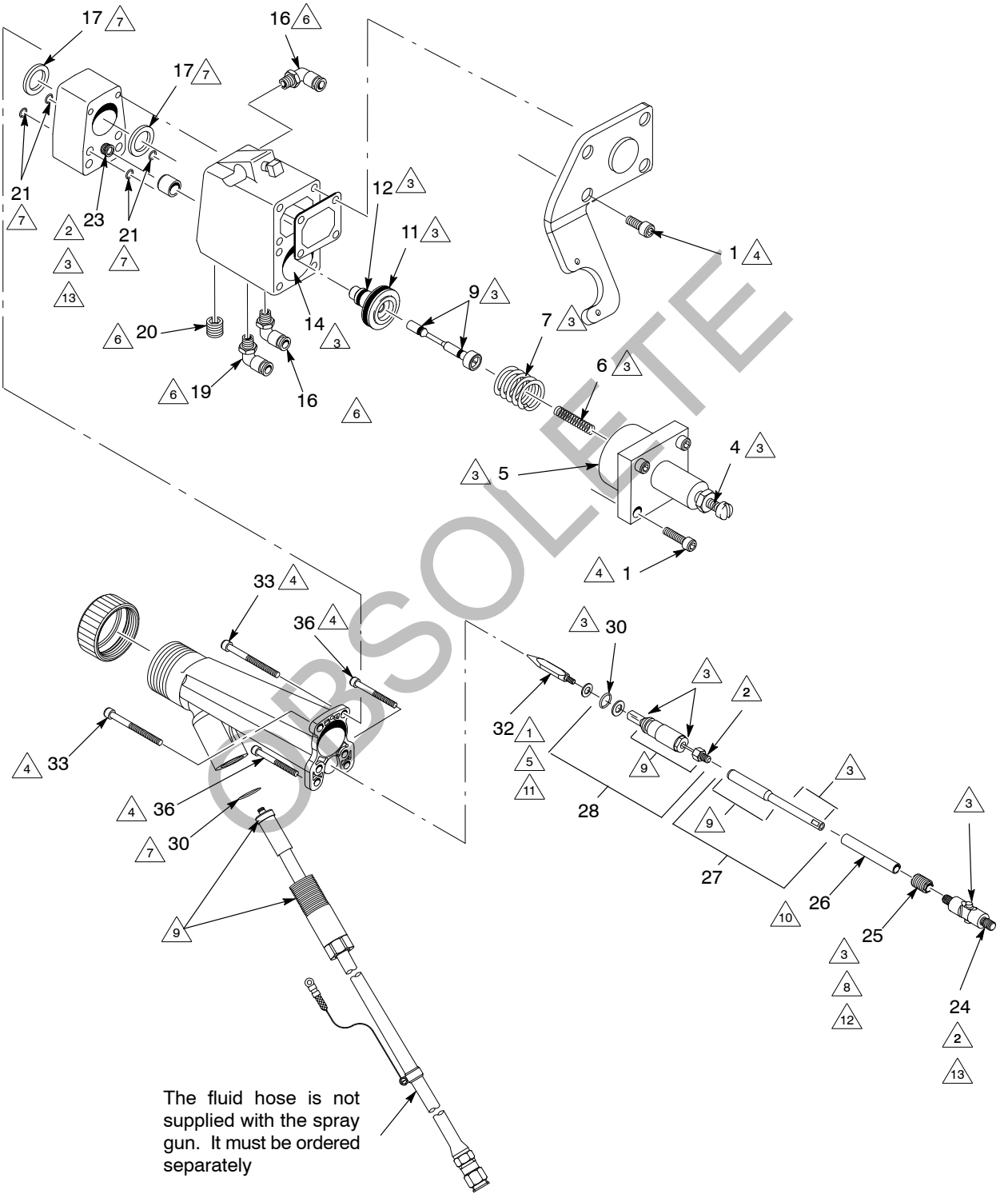


Figure 7-8 Spray Gun Service Notes

Table 7-1 Spray Gun Service Notes

Note	Item	Description
1	32	Tighten this item finger tight.
2	23, 24, 27, 28	Apply threadlocking adhesive to the threads of these items.
3	5 (the housing bores where the springs rest) 4, 6, 7, 9, 11, 12, 30 14 (inside the piston bore), 23 (the grooves on the retainer bushing) 24 (the top and bottom pins of the adapter link) 25 (inside of packing cartridge retainer), 27 (end of pull shaft), 28 (wire at both ends)	Generously apply MagnaLube G (PTFE-filled lubricant) to these parts.
4	1, 33, 36	Tighten these items to 2.27–2.83 N•m (20–25 in.-lb).
5	32	Activate the spray gun to pull the needle back before removing or installing a fluid tip.
6	16, 19, 20	Apply pipe sealant adhesive if fitting do not already have manufacturer's thread sealant applied.
7	17, 21	Apply dielectric grease to these O-rings.
8	25	Apply a thin coat of dielectric grease to the threads of this item.
9	27, 28, fluid hose O-rings	Apply a liberal coat of dielectric grease to these areas.
10	26	Apply a thin coat of dielectric grease to the outside of this item.
11	32	A removeable threadlocking adhesive can be applied to the threads of the needle if there are problems with the needle backing out.
12	25	Tighten this item hand tight.
13	23, 24	Make sure the pins on puller link engage in the grooves in the retainer bushing.

Section 8
Parts

Introduction

To order parts, call the Nordson Customer Service Center or your local Nordson representative. Use this five-column parts list, and the accompanying illustration, to describe and locate parts correctly.

Using the Illustrated Parts List

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

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

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

- 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 60 kV Air Spray and KVLP Automatic Electrostatic Spray Gun – without Fluid Hose

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
—	1072644	SPRAY GUN, Kinetix, air spray/KVLP, 60 kV, Watermark, automatic, electrostatic, w/o fluid hose	1	
1	981104	• SCREW, socket, #10-24 x 0.5 in., zinc	8	
2	1046550	• BRACKET, automatic, 60 kV	1	
3	325692	• ADJUSTER, fluid, low pressure	1	
4	984156	• NUT, hex, jam, $^3/_8$-24, brass	1	
5	336623	• HOUSING ADJUSTER, electrostatic, automatic	1	
6	325537	• SPRING, fluid return, high pressure	1	
7	241176	• SPRING, comp., 1.240 x 1.093 OD x 0.094 in.	1	
8	325693	• ROD, connecting, automatic	1	
9	940063	• O-RING, Viton, 0.125 x 0.250 x 0.063 in.	2	A
10	243975	• PISTON, air	1	
11	941210	• O-RING, Viton, 1.063 x 1.250 x 0.094 in.	1	A
12	940125	• O-RING, Viton, 0.375 x 0.500 x 0.063 in.	1	A
13	336626	• GASKET, cable bracket, Kinetix, automatic	1	
14	336620	• BODY, piston block, automatic	1	
15	981405	• SCREW, square set, $^3/_8$-16 x 0.75 in., cup, zinc	1	
16	972183	• ELBOW, male, $^3/_8$-in. tube x $^1/_4$-in. NPT	2	
17	336499	• O-RING, PTFE, 1.05 x 0.070 in.	2	A, B
18	336621	• SPACER, electrostatic, automatic	1	B
19	972119	• ELBOW, male, $^1/_4$-in. tube x $^1/_8$-in. NPT	1	
20	973410	• PLUG, pipe, socket, standard, $^1/_4$ in., zinc	1	
21	940110	• O-RING, hotpaint, 0.313 x 0.438 x 0.063 in.	4	A, B
22	325694	• BUSHING, automatic	1	
23	1045778	• RETAINER, bushing, Kinetix	1	B
24	1045777	• ADAPTER, link-pin 8-32 UNC-2A Kinetix	1	B
25	325749	• RETAINER, packing cartridge, electrostatic	1	
26	325748	• RETAINER, sleeve, packing cartridge	1	
27	325747	• SHAFT, packing cartridge, Kinetix	1	
28	- - - - - -	• CARTRIDGE ASSMBLY, packing, electrostatic	1	C
29	954036	• BACKUP RING, single, $^1/_4$ x $^3/_8$ in.	1	C
30	940100	• O-RING, hotpaint, 0.250 x 0.375 x 0.063 in.	2	C
31	336396	• WASHER, flat, nylon, 0.141 x 0.187 x 0.015 in.	1	
32	336640	• NEEDLE, electrostatic Kinetix, 60 kV	1	
33	338909	• CAPSCREW, socket hd, #10-24 x 2.25 in.,SS	2	

NOTE A: Part is included in air seal service kit, part 336656. Refer to *Air Seal* on page 8-6.

B: Part is 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.

C: Part is included in packing cartridge service kit, part 1050238. Refer to *Packing Cartridge* on page 8-6.

Item	Part	Description	Quantity	Note
34	336648	• EXTENSION, machined, 60 kV, Watermark	1	
35	325547	• RING, retaining, air cap	1	
36	338910	• CAPSCREW, socket head, #10-24 x 2 in., SS	2	
NS	901905	• BRUSH (wooden toothbrush type)	1	
NS	247066	• BRUSH	1	
NS	336642	• WRENCH, Kinetix, combination tool	1	
NS	1028630	• PLIERS, needle nose bent, Kinetix	1	
NS	1028631	• TOOL, needle, Kinetix	1	
NS: Not Shown				

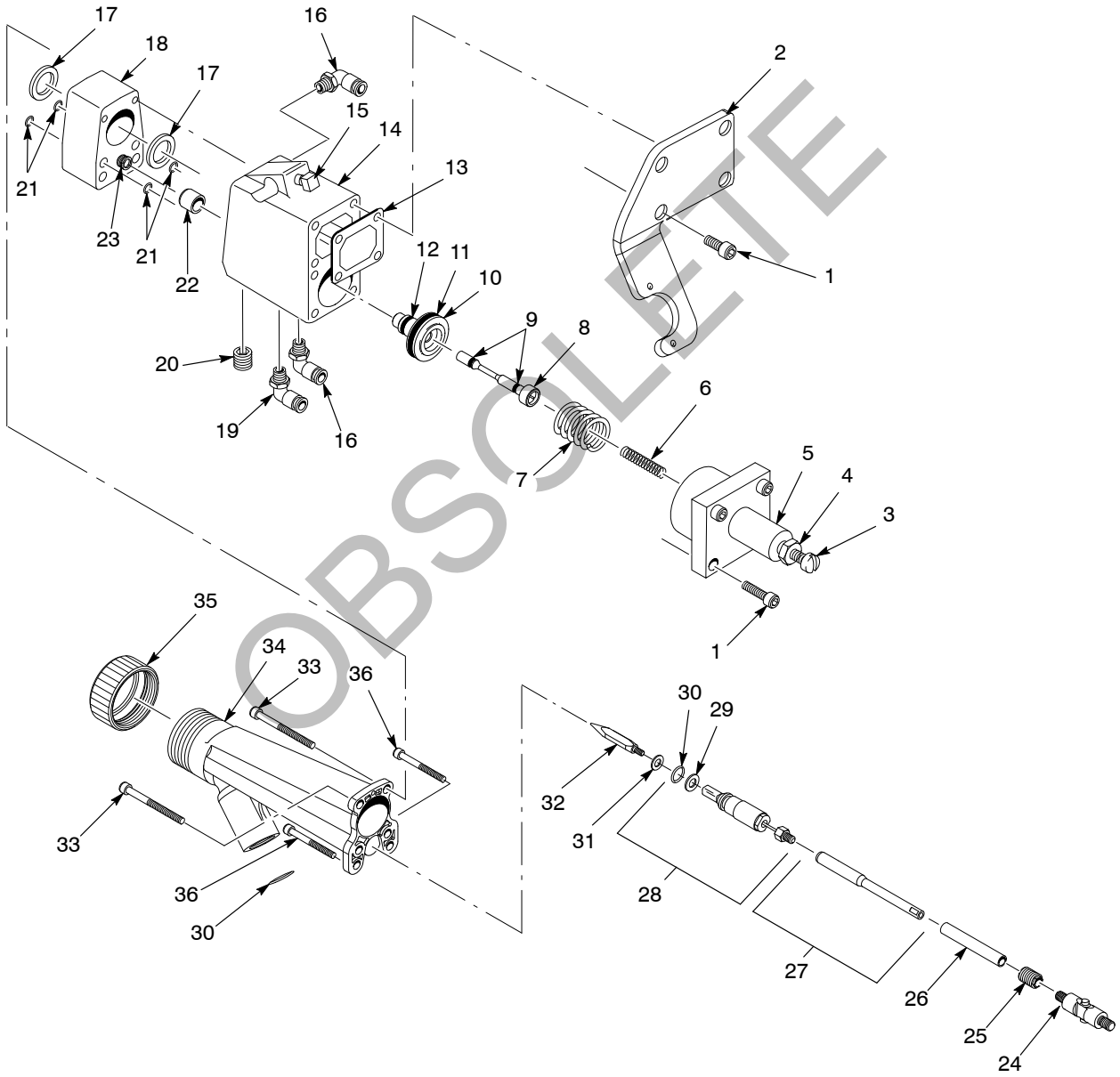


Figure 8-1 Kinetix 60 kV Air Spray and KVLP Automatic Electrostatic Spray Gun

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 G) , 0.75-oz tube	1
247658	DIELECTRIC GREASE, applicator, 10 cc, 12 count	1

Fluid and Air Hoses

See Figure 8-2.

Item	Part	Description	Quantity	Note
1	336723	HOSE KIT, Kinetix, low pressure, 60 kV, $^{1}/_{4}$-in. ID, 25 ft	1	
1	900561	FLUID TUBE, TFE, 0.375 in	AR	
1	900596	FLUID TUBING, $^{3}/_{8}$-in. OD x $^{1}/_{4}$-in. ID	AR	
1	900601	FLUID TUBING, PTFE, 0.562 x 0.093 in.	AR	
2	900511	AIR TUBING, polyethylene, 0.375 x 0.062 in.	AR	
3	900511	AIR TUBING, polyethylene, 0.375 x 0.062 in.	AR	
4	900509	AIR TUBING, polyethelene, 0.250 x 0.040 in.	AR	
5	900509	AIR TUBING, polyethelene, 0.250 x 0.040 in.	AR	

NOTE A: Order tubing in one-foot increments. Maxmum length is 30 ft.

AR: As Required

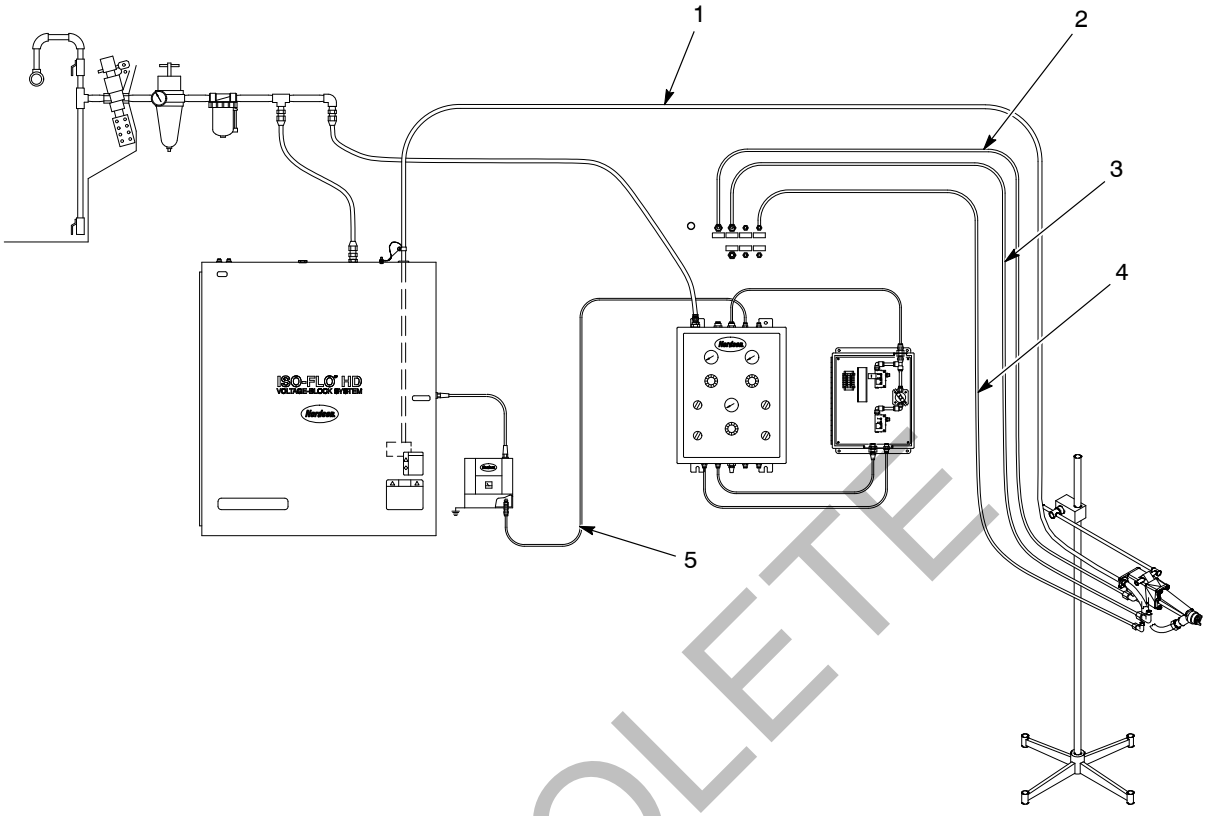


Figure 8-2 Fluid and Air Hoses for a Typical 60 kV Air Spray and KVLP System

Recommended Kits

Air Seal

See Figure 8-1.

Item	Part	Description	Quantity	Note
—	336656	AIR SEAL KIT, automatic	1	
9	940063	• O-RING, Viton, 0.125 x 0.250 x 0.063 in.	2	
11	941210	• O-RING, Viton, 1.063 x 1.250x 0.094 in.	1	
12	940125	• O-RING, Viton, 0.375 x 0.500 x 0.063 in.	1	
17	336499	• O-RING, PTFE, 1.05 x 0.070 in.	2	
21	940110	• O-RING, hotpaint, 0.313 x 0.438 x 0.063 in.	4	

Packing Cartridge

See Figure 8-1.

NOTE: The Kinetix spray gun is shipped standard with the gold packing cartridge, which is appropriate for most coating materials. An optional PTFE packing cartridge, part 1052118, is available if you are spraying harsh chemical solvents such as MEK.

Item	Part	Description	Quantity	Note
—	1050238	PACKING CARTRIDGE KIT, gold, Kinetix	1	
28	- - - - - -	• CARTRIDGE ASSEMBLY, packing, electrostatic	1	
29	954036	• BACKUP RING, single, $^1/_4$ x $^3/_8$ in.	1	
30	336677	• O-RING, Perlast, 0.250 x 0.375 x 0.063 in.	1	

Optional Quick-Exhaust Valve

Part	Description	Quantity
325529	MUFFLER/EXHAUST VALVE KIT	1
973000	• NIPPLE, steel, sched 40, $^1/_8$ in., 0.75 in.	1
901262	• VALVE, exhaust	1
272556	• MUFFLER, low profile, $^1/_4$-in. NPT	1

Puller Kink Upgrade Kits

See Figure 8-1.

Puller Link Upgrade with Spacer Block

Item	Part	Description	Quantity	Note
—	1045984	PULLER LINK KIT, with spacer block, Kinetix	1	
17	336499	• O-RING, PTFE, 1.051 x 0.070-in. wide	2	
18	336621	• SPACER, electrostatic , automatic	1	
21	940110	• O-RING, hotpaint, 0.313 x 0.438 x 0.063 in.	4	
23	1045778	• RETAINER, bushing, Kinetix	1	
24	1045777	• ADAPTER, link-pin 8-32 UNC-2A Kinetix	1	

Puller Link Upgrade

Item	Part	Description	Quantity	Note
—	1045981	PULLER LINK KIT, Kinetix	1	
23	1045778	• RETAINER, bushing, Kinetix	1	
24	1045777	• ADAPTER, link-pin 8-32 UNC-2A Kinetix	1	

Hotpaint Fluid Seal

NOTE: Hotpaint 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 0.500 x 0.063 in.	1	B
336569	• BACKUP RING, conductive, 0.390-in. ID x 0.045-in. thick, cut	1	B, C

NOTE A: Used on the packing cartridge and fluid hose.
B: Used on the fluid tips.
C: This part is not required for 60 kV spray guns.

Optional PTFE Packing Cartridge

NOTE: The PTFE packing cartridge is available if you are spraying harsh chemical solvents such as MEK.

Part	Description	Note
1052118	KIT, cartridge, packing, Kinetix, electrostatic, PTFE	
- - - - - -	• CARTRIDGE ASSEMBLY, packing, electrostatic	
- - - - - -	• BACKUP RING, single, $^{1}/_{4}$ x $^{3}/_{8}$ in.	
336677	• O-RING, Perlast, 0.250 x 0.375 x 0.063 in.	

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
336633	HOTPAINT FLUID SEAL KIT, electrostatic	1	
336656	AIR SEAL KIT, automatic	1	
1050238	PACKING CARTRIDGE KIT, gold Kinetix	1	A
1052118	PACKING CARTRIDGE KIT, PTFE, Kinetix	1	A
336640	NEEDLE, electrostatic, Kinetix, 60 kV	1	
336648	EXTENSION KIT, Kinetix, watermark	1	
1045984	PULLER LINK KIT, with spacer block, Kinetix	1	
1045981	PULLER LINK KIT, Kinetix	1	
336642	WRENCH, Kinetix, combination tool	1	
156098	BAG, gun cover, polyethelene	6	B
247658	DIELECTRIC GREASE APPLICATORS, 10 cc, 12 count	1	
900349	PTFE-FILLED LUBRICANT, O-ring, (Magna Lube G) , 0.75-oz tube		
- - - - - -	FLUID TIP	1	C
- - - - - -	AIR CAP	1	C
1028630	PLIERS, needle nose bent, Kinetix	1	
1028631	TOOL, needle, Kinetix	1	
1043235	PARTS POSTER, Kinetix Automatic 60 kV Air Spray and KVLP Electrostaic Spray Gun	1	

NOTE A: The Kinetix spray gun is shipped standard with the gold packing cartridge, part 1050238. This durable packing cartridge is appropriate for most coating materials. An optional PTFE packing cartridge, part 1052118, is available if you are spraying harsh chemical solvents such as MEK.

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

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

KVLP Compliance Kit

See Figure 8-2.

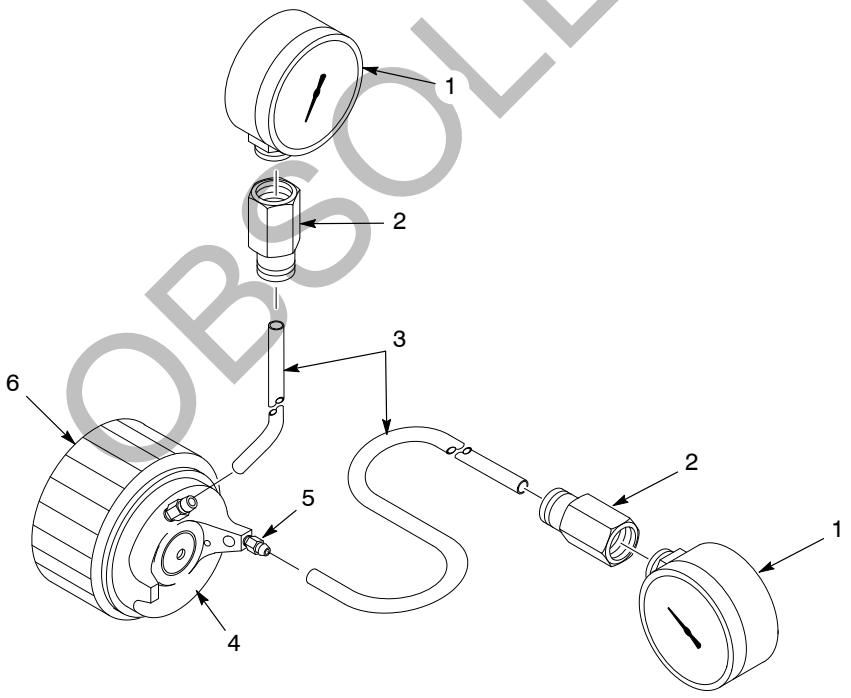
Refer to the *Kinetix KVLP Fluid Tip and Air Cap Selection Chart* included with this manual for available part numbers and descriptions.

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, $^1/_8$-in. tube x $^1/_8$-in. NPT	2	
3	- - - - - -	• TUBING, $^1/_8$-in. diameter, gray (18 in.)	3	B
4	- - - - - -	• CAP, compliance, KVLP	1	A, C
5	971620	• • CONNECTOR, barbed, #3-56 x $^1/_8$ in., brass	2	
6	325547	• RING, retaining, air cap	1	

NOTE A: Refer to *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.



1300449A

Figure 8-2 Compliance Kit Parts

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)
60 kV automatic spray gun	1129	39.7
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	$^3/_8$-in. tube
Horn air	$^3/_8$-in. tube
Activation (trigger) air	$^1/_4$-in. tube
Fluid fitting	$^3/_8$-in. NPSM, Female

Gun Electrostatics

Maximum voltage	60 kV
Maximum output rating current	150 microamps

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 used with the EPS6 power supply and the HD Iso-Flo unit.
- This equipment is intended to be used in the ambient temperature range from 0–40 °C.
- This applicator shall be used only for the spraying of waterborne paints.

DECLARATION of CONFORMITY

Nordson Corporation
declare under our sole responsibility that the products

Kinetix or Trilogy, automatic liquid waterborne applicator used with the following:
HD Automatic ISO-FLO and EPS6 Power Supply

This system is for use with water-base paints only.

to which this declaration relates complies with the following Directives:
- **Machinery Directive 89/37/EEC**
- **EMC Directive 2004/108/EEC**
- **ATEX Directive 94/9/EC**

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

EN12100	EN50348	EN61000-6-3
EN1127-1	EN50059	EN61000-6-2
IEC 60417	FM7260	EN55011
EN60204		

Type of protection:
- **Ex II 2 G, 93.24 mJ, Ambient temperature: 0 °C to +40 °C**

N ° of EC type Certificate:
- **INERIS 05 ATEX 0068X**
- **Location: Verneuil en Halatte, FRANCE**

N ° of notified body (ATEX surveillance)
- **1180 (Baseefa) Buxton, Derbyshire, UK**

ISO9000 certificate
DNV

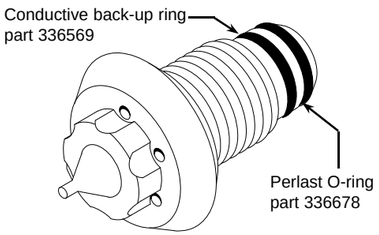
Date: 23 June 2009

Mike Hansinger
ICA, Manager Engineering and Development

Kinetix® Air Spray Fluid Tip and Air Cap Selection Chart

FLUID TIPS

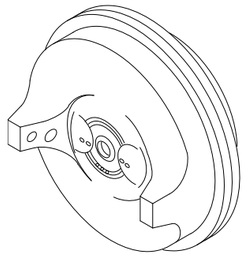
- Understand flow rate required for application. Flow rate is a function of film build, pattern width, line speed, coating material solids, and gun travel speed.
- After making your initial ID choice, have the next size lower and higher on hand as well.
- Flow rate nozzle with coating material.
- Make sure that un-atomized fluid stream breaks between 10 and 14 inches. Adjust fluid tip ID to get correct flow rate and fluid stream break instead of increasing or decreasing fluid pressure.
- All fluid tips come standard with a Perlast O-ring, part 336678 and a conductive back-up ring, part 336569.



Air Spray Fluid Tip

PART	HOLE DIAMETER (in.)
1075449	0.012
1068759	0.020
336593	0.030
336594	0.040
336595	0.046
336596	0.059
336597	0.070
336598	0.080 (Note A)
336599	0.090 (Note A)
336600	0.100 (Note A)
Note A: Must use air cap part 325617	

AIR CAPS



Air Spray Air Cap

AIR CAP	AIR CAP DESCRIPTION	ATOMIZATION AIR PRESSURE	SCFM	FLOW RATE	FAN WIDTH PATTERN	USAGE
325615	985	Less than 2.41 bar (35 psi)	8.2 @ 20 psi	0.059–0.295 l/min (2–10 oz/min)	15.24–30.48 cm (6–12 in.)	Universal air cap; low flow rates
325616	986	2.07–4.14 bar (30–60 psi)	12 @ 40 psi	0.236–0.355 l/min (8–12 oz/min)	30.48–45.72 cm (12–18 in.)	Medium flow rates
325617	987	1.38–4.14 bar (20–60 psi)	16 @ 40 psi	0.296–0.592 l/min (10–20 oz/min)	30.48–45.72 cm (12–18 in.)	High flow rates, must use for fluid tips 0.80 in. and larger
325618	988	Less than 2.41 bar (35 psi)	12 @ 40 psi	0.059–0.326 l/min (2–11 oz/min)	30.48–45.72 cm (12–18 in.)	Low flow rates, high solids or metallics
325611	991	Less than 2.76 bar (40 psi)	8 @ 15 psi	0.059–0.326 l/min (2–11 oz/min)	Less than or equal to 40.64 cm (16 in.)	Low flow rates, high viscosities
325612	992	Less than 2.76 bar (40 psi)	8 @ 15 psi	0.059–0.326 l/min (2–11 oz/min)	Less than or equal to 40.64 cm (16 in.)	Low flow rates, high solids or metallics

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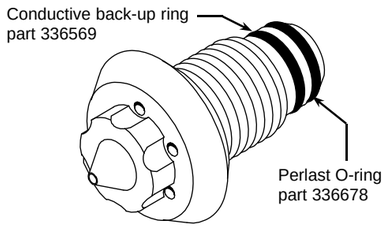
Kinetix® Air Spray Fluid Tip and Air Cap Selection Chart

Refer to the appropriate Kinetix Spray Gun manual for other parts.

Kinetix® KVLP™ Fluid Tip and Air Cap Selection Chart

FLUID TIPS

- Understand flow rate required for application. Flow rate is a function of film build, pattern width, line speed, coating material solids, and gun travel speed.
- After making your initial ID choice, Nordson recommends having the next size lower and higher on hand as well.
- Flow rate gun using coating material.
- Make sure that un-atomized fluid stream breaks between 10 and 14 inches. Adjust fluid tip ID to get correct flow rate and fluid stream break instead of increasing or decreasing fluid pressure.
- All fluid tips come standard with a Perlast O-ring, part 336678 and a conductive back-up ring, part 336569.

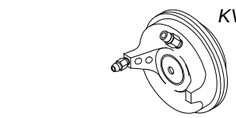


KVLP Fluid Tip

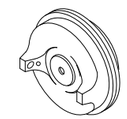
PART	HOLE DIAMETER (in.)
336573	0.030
336574	0.035
336575	0.040
336576	0.050
336577	0.060
336578	0.070
336579	0.080
336580	0.100

AIR CAPS

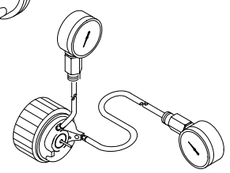
- A larger air cap will provide lower cap pressures and higher air flow, but may yield coarser atomization.
- Lower air cap pressures produce a softer spray and theoretically, improved transfer efficiency.
- Smaller air caps will produce finer atomization.
- Smaller air caps will require higher air cap pressures to atomize.
- Smaller fluid tips will work best with smaller air caps.
- Larger fluid tips will work best with larger air caps.
- As the fluid tip ID increases, the airflow through the atomizing section of the air cap decreases, as a result, there is less air available for atomization.
- Higher viscosity coatings and higher flow rates require more airflow for atomization.
- Atomizing air and horn air are completely independent in automatic spray guns.



KVLP Compliance Air Cap



KVLP Production Air Cap



Compliance Kit

DESCRIPTION	PART
General purpose air caps	325717
	325719
	325721
Very light viscosity, low solids air caps	325714
	325715
	325716
Heavy viscosity, high solids, high flow	325723
	325725
	325727

AIR CAP LOCATER	COATING CHARACTERISTICS	MAXIMUM AIRFLOW (SCFM)	TYPICAL COATINGS
A	Very light viscosity, very low solids, (<25%) Low flow (<5 oz/min)	10–12	Stains, wash primers, bleaches, fine finish
B	Light viscosity, low solids (25–30%) Low flow (<5 oz/min) to medium flow (5–10 oz/min)	13–15	Stains, wash primers, ADPRO, lacquer clear coat, fine finish
C	Light viscosity, low solids (25–30%) Medium flow (5–10 oz/min)	17–20	Primers, ADPRO, lacquer clear coat, metallics, solid colors, enamels, urethanes, waterbornes
	Medium viscosity, medium solids (30–50%) Low flow (<5 oz/min)		
D	Medium viscosity, medium solids (30–50%) Medium flow (5–10 oz/min) to high flow (10–20 oz/min)	22–25	Metallics, solid colors, enamels, urethanes, waterbornes, plural component, corrosion protection
	Heavy viscosity, high solids (>75%) Low flow (<5 oz/min)		
E	Medium viscosity, medium solids (30–50%) High flow (10–20 oz/min) to very high flow (>20 oz/min)	28–34	High solids enamels and urethanes, high solids waterbornes, plural component, corrosion protection
	Heavy viscosity, high solids (>75%) Medium flow (5–10 oz/min) to high flow (10–20 oz/min)		
X	Not recommended		

AIR CAP PART NUMBER (Atomizing Air Hole Diameter in inches)									
Tip Orifice (inches)	**325714 (0.140)**	**325715 (0.150)**	**325716 (0.160)**	**325717 (0.170)**	**325719 (0.190)**	**325721 (0.210)**	**325723 (0.230)**	**325725 (0.250)**	**325727 (0.270)**
0.030	A	A	B	B	C	D	E	X	X
0.035	A	A	B	B	C	D	E	E	X
0.040	A	A	B	B	C	D	E	E	E
0.050	A	A	A	B	C	C	D	E	E
0.060	X	A	A	A	B	C	D	E	E
0.070	X	X	A	A	B	C	D	E	E
0.080	X	X	X	A	B	C	D	E	E
0.100	X	X	X	X	X	B	C	D	E
Compliance Air Cap	325624	325625	325626	325627	325628	325629	325630	325631	325632
NOTE: Compliance air caps are modified caps for testing air pressure ONLY.									
Compliance Kits	325633	325634	325635	325636	325637	325638	325639	325640	325641
NOTE: Compliance kits include caps, gauges, and air tubing. Compliance kits are modified for testing ONLY.									

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Kinetix® KVLP™ Fluid Tip and Air Cap Selection Chart

Refer to the appropriate Kinetix Spray Gun manual for other parts.