Nordson® NHC-8 Powder Coating System Manual

Part 108 186A

NORDSON CORPORATION • AMHERST, OHIO • USA

Nordson Corporation welcomes requests for information, comments and inquiries about its products.

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Notice

Trademarks

Nordson's Support System

Customer Support

For more than 25 years, Nordson has offered unparalleled field service to its customers before, during, and after a sale. Nordson representatives will work with you to decide the best system for the application. Nordson will be there to help you during start up, training your employees to maintain and run your equipment, and we're only a phone call away at any time thereafter.

Parts and Accessories

Besides standard replacement parts, many accessories are available to help improve productivity and reduce downtime. Contact your Nordson representative for further information.

System Engineering

Custom design and modifications to standard equipment are available through Nordson's Powder Systems Group. Your representative will have complete details.

RBX

Nordson has developed a "Rebuilt Exchange" program which can save you up to 50% of the cost of a new component while also eliminating downtime and costly in-plant repairs. Old, worn-out components may be traded for rebuilt Nordson equipment which has the same warranty as new equipment.

Package of Values

Specification assistance to post-installation troubleshooting, Nordsons package of values is designed to keep you productive and profitable. We provide:

- carefully engineered, high quality products;
- strong service support;
- backing of a financially and technically strong, well-established company; and
- field service representatives who believe in delivering to our customers the benefits for which you have paid - all of which is backed by a corporate commitment to deliver the product specified.

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Section 1
Safety Summary

Included in this summary are safety guidelines for the use of the NORDSON® NHC-8 Powder Coating System.

Other warnings and cautions specific to a particular piece of equipment or procedure are included in the manual text where appropriate.

General Safety Precautions

Introduction

Failure to follow these recommendations may result in personal injury or property damage from electrocution, fire or explosion.

It is important to understand that these warnings and cautions are not exhaustive but are developed to assist the installer and operator in safely installing or operating the equipment. NORDSON® Corporation could not possibly know, evaluate and advise of all conceivable ways in which installation or service might be done and of the possible hazards related to each. Anyone who undertakes to install or service this equipment must first ensure that the method to be used is safe and also conforms to all local, state and federal code requirements.

Refer to the National Fire Protection Association publication NFPA 33 for standards on the installation and operation of powder spray systems, and to federal, state, regulatory agency, and local codes for laws governing installation and operation of these systems.

Terms And Symbols

The following safety symbols and terms are used throughout this manual to alert the reader to safety hazards and to conditions that may result in personal injury or damage to equipment or property.

WARNING: General warning. Failure to observe may result in personal injury or death from fire or explosion.

WARNING: Risk of electrical shock. Failure to observe may result in personal injury or death.

CAUTION: Failure to observe may result in minor personal injury or property damage.

NOTE: Important information. Failure to observe may result in property damage.

Personal Safety

- Wear a filter-type respirator whenever handling powder containers, filling hoppers, operating spray equipment or performing maintenance or cleaning operations. Always wear safety glasses.

- Wash skin frequently with soap and water, especially before eating or drinking. Do not use solvents to remove powder from skin. Do not use high pressure compressed air to blow powder off skin or clothes. Compressed air injected under skin can cause serious injury or death.

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General Safety Precautions, cont.

Personal Safety, cont.

- Gloves should be worn whenever handling powder to minimize skin reactions. Obtain and read Material Data Safety Sheets for all powders used.
- Do not allow unqualified personnel to service electrical equipment.
- Lock out and tag external power sources at a disconnect switch or breaker in service line ahead of electrical equipment before servicing.
- Never touch exposed electrical connections or equipment while the power is on.
- Do not operate equipment at a pneumatic pressure higher than the rated maximum working pressure of any component in the system. OSHA rules require installation of manual shut-off valves, with lockout capability, in all air supply lines to pneumatic equipment, so that pressure can be relieved for maintenance or repairs.
- Do not operate equipment with covers, panels, or safety guards removed.
- Lift equipment using only designated lifting points or lugs. Do not attempt to lift using covers, doors, panels, or cable or hose connections. Always balance load when lifting and never put stress on flat sheet metal panels.
- Remove all jewelry (rings, watches, etc.) before operating or servicing equipment.
- Do not attempt to service equipment when standing water is present. Work on a rubber mat, if possible. Avoid servicing electrical equipment in a high humidity environment.
- Do not perform internal service or adjustment on any equipment unless another person capable of rendering first aid and CPR is present.
- Whenever undertaking maintenance or repairs on equipment, make sure that all moving equipment (robots, reciprocators, conveyors, etc.) that could endanger service personnel are shut down and locked out.

Electrical and Fire Safety

- All electrically conductive equipment in spray area must be grounded. Ungrounded conductors can store a charge which could cause a spark hot enough to cause ignition if a grounded object comes near enough to attract that charge. Sparks in a powder spray area are a fire hazard. If sparking is noticed, **SHUT DOWN SPRAY SYSTEM IMMEDIATELY.**

General Safety Precautions, cont.

Electrical and Fire Safety, cont.

- Do not smoke in the spray area. A fire could be ignited by a lit cigarette or cigar.
- Safety interlocks and approved, fast acting fire detection systems should always be installed to shut down the spray system in the event the booth ventilation system shuts down, a fire is detected, or a grounded workpiece comes too close to the gun electrode, causing sparking.
- Interlock systems should be checked periodically to ensure their effectiveness. Optical fire detector lenses should be cleaned daily. Do not operate spray system with fire detection system in by-pass mode. Detection system will then be inoperative and if a fire occurs it will be fed by powder spray system.
- Do not keep containers of flammables in the spray area or room. An accidental spark could ignite them and if a fire or explosion occurs the presence of flammable materials will increase the chances of personal injury and property damage.
- Know where "EMERGENCY STOP" buttons are located.
- Know where the nearest fire extinguisher is located. Make sure extinguishers are fully charged.
- Check cartridge filters daily. Reductions in air flow can diminish the ability of the booth to capture overspray powder.
- Practice good housekeeping procedures. Clean booth daily with squeegee or non-sparking device. Do not allow dirt or powder to build up on electrostatic system gun cables or power units, or on any electrical equipment.
- Power supply wire gauge and insulation must be sufficient to meet the temperature and power requirements. Only fuses of the correct type, voltage and current rating should be used. Using incorrect fuses or wire gauge is a dangerous practice.
- Use only approved replacement parts. Use of unapproved parts or unapproved modifications to equipment may void any agency approvals and create safety hazards.
- A disconnect switch or breaker with lockout capability must be installed in the service line ahead of any electrical equipment.
- Establish and maintain a protected path for power cables and electrostatic cables, if used, that will prevent their being abraded, cut, run over by heavy equipment, or bent around an extremely small radius.

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General Safety Precautions, cont.

Electrical and Fire Safety, cont.

- Do not operate equipment in a flammable environment unless equipment is rated and approved for such use.

Electrostatic Systems

- Wear shoes with conductive soles, such as leather, to maintain a connection to ground and prevent shocks. Grounding straps must be used if rubber soled shoes are worn to prevent potentially harmful shocks. The spray area floor must be conductive to ground and the operator's platform, if used, must be grounded.

- Personnel in spray area must not wear or carry metallic objects on their person. Ungrounded metal can store a static charge and cause harmful shocks.

- Do not make gun adjustments without turning off the high voltage output at the power unit or master control console. Ground tip of gun before cleaning or changing nozzles.

- If using hand gun, operator must maintain skin-to-metal contact between his hand and gun handle to prevent shocks and spark hazards. If wearing gloves, cut away palm or fingers.

- Turn OFF power and ground tip of gun before cleaning or changing nozzles. When handgun is not in use, hang so nozzle is within 4 inches (100mm) of a grounded conductor.

- Do not jerk, whip or snap electrostatic cable. Do not bend in a radius of less than 6 inches (152mm). Check cable condition daily. Always keep electrostatic cable ends, power unit wells, and gun resistors clean. Use approved dielectric grease and insulating oil in appropriate locations. Make resistance checks on gun resistor and electrostatic cable part of a periodic maintenance program. Operating with damaged electrostatic equipment is hazardous to the operator and can cause a fire to occur.

- Powder feed, application and recovery equipment and conveyors, hangers, and workpieces (all conductive equipment in spray area) should be grounded with a resistance to ground not exceeding 1 megohm. Check all ground connections, including workpiece to ground, periodically with a megohm meter. Keep conveyors, chains, rollers and hangers clean. If sparking is noticed, **SHUT DOWN SYSTEM IMMEDIATELY.**

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Section 2
Equipment Familiarization

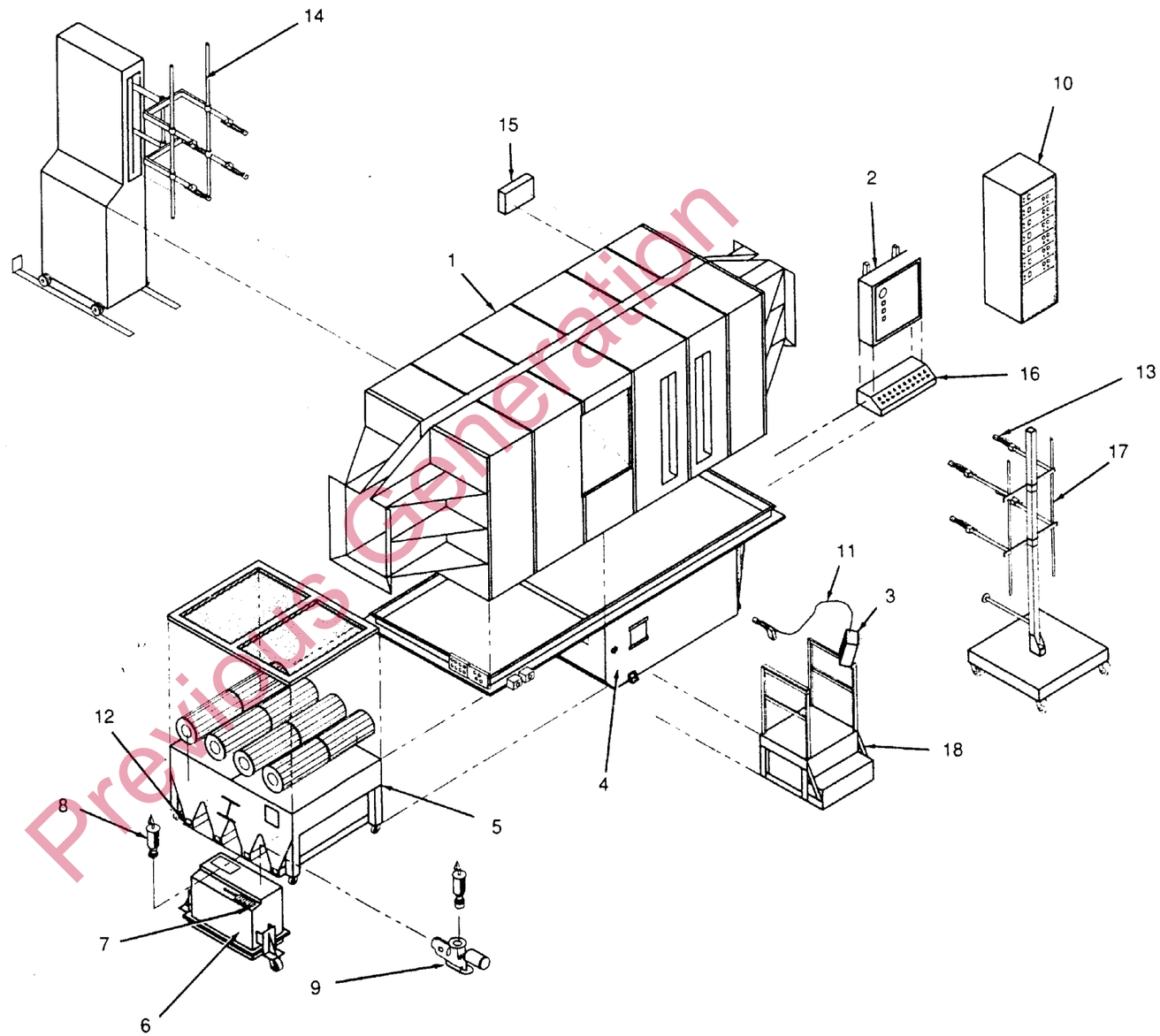
The Nordson® NHC-8 Powder Coating System is a working assemblage of modular components tailored to each application.

The system is a closed-loop powder delivery and recovery arrangement. The sprayed powder materials are contained within the system, allowing high material utilization rates, minimizing powder contamination, and providing a safe and clean working environment.

Basic Components and Functions

Figure 2.1

Refer to page 2.3 for detailed information corresponding to this drawing.



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Basic Components and Functions, cont.

Nordson® NHC-8 System Familiarization

Reference Figure 2.1 on opposite page.

Figure 2.1 is an exploded view of the Nordson® NHC-8 Powder Coating System. This drawing will assist the user in identifying the primary and optional components of the system and their relative positions.

System components shown include:

1. **Booth Enclosure (Canopy)**
2. **Electrical Control Panel**
3. **Manual Gun Control Console(s)**
4. **Booth Base**
5. **Collector Module**
6. **Feed Hopper**
7. **Powder Pumps**
8. **Vibratory Sieve (Option)**
9. **Rotary Sieve (Option)**
10. **Automatic Gun Control Console**
11. **Manual Powder Gun**
12. **Transfer Pumps**
13. **Automatic Powder Guns**
14. **Gun Movers (Reciprocators or Oscillators)**
15. **Fire Detection System**
16. **Pneumatic Control Panel**
17. **Moveable Automatic Gun Stand**
18. **Operator Platform**

Basic Components and Functions, cont.

Powder Delivery Equipment

For the preparation and application of powder to the parts.

1. **Feed Hopper**—with level control. Stores and conditions the powder.
2. **Powder Pumps**—draw powder from the feed hopper and convey it through hoses to guns.
3. **Guns**—electrostatically charge powder particles and spray them towards the target parts.

Powder Recovery and Recycle Equipment

For containment of powder during spraying; for collection of overspray; for recycling of powder to feed hopper.

1. **Collector Module**—with eight cartridge filters. Accumulates oversprayed powder which is then transferred via pumps back to the feed hopper.
2. **Booth Enclosure**—engineered to each individual application. Parts are powder coated as they pass through the booth enclosure. Negative air pressure inside booth, generated by the exhaust fan, confines the powder within the booth.
3. **Booth Base**—complete with recirculating fan and motor; collector module attachment; high efficiency final air filters which return clean air to room.

Control Equipment

For the safe and optimum operation of system and component parts.

1. **Gun Control Consoles**—regulate powder feed to the guns and provide control of electrostatic kilovoltage. One gun control console is needed for each gun.
2. **Pneumatic Control Panel**—provides regulation of hopper and collector powder fluidization, recycle transfer pump air pressure, and other pneumatic functions.
3. **Master Electrical Control Panel**—for system power distribution and control. Houses system motor starters, safety interlocks, operating pushbuttons, indicator lights and gauges.

NOTE: If your system includes the Nordson® Powder Booth Controller, the master electrical control panel is replaced by the booth controller. Refer to Manual No. 35-4 for Powder Booth Controller description.

4. **Fire Detection and Control Equipment**—for systems with automatic guns. This is a safety feature provided to shut down all powder flow, the booth exhaust fan, and system electrical power and compressed air within .5 seconds after detection of a flame within the booth.

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Basic Components and Functions, cont.

Optional Components

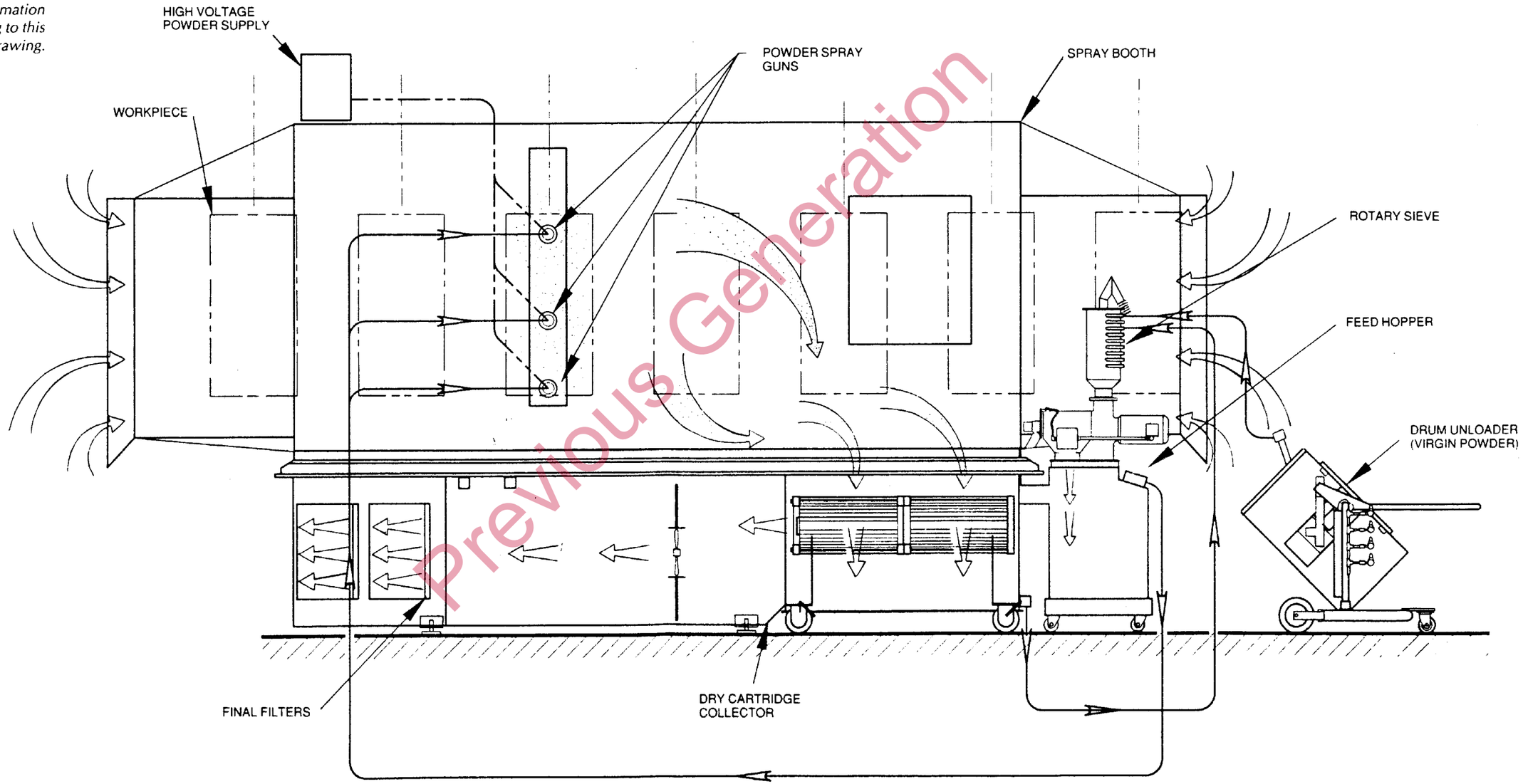
Available options may include those listed as well as other components. Please contact your Nordson representative for further information.

1. **Collector Modules**—one or more for additional powder colors.
2. **Feed Hoppers**—one or more for additional powder colors.
3. **Vibratory Sieves or Electrically-driven Rotary Powder Sieves**—mounted on feed hoppers. Sieves screen out undesirable particulates from recycled powder.
4. **Gun Movers**—oscillators or reciprocators. Move automatic guns in a repetitious pattern for better part coverage.
5. **Regenerative or Refrigerant Compressed Air Dryer**—removes moisture and contaminants from the system air supply.
6. **Powder Drum Unloaders**—transfer powder from drums to feed hoppers.
7. **Booth Controller**—provides microprocessor-based control of the booth system.

System Operation

Figure 2.2

Refer to page 2.7 for detailed information corresponding to this drawing.



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System Operation, cont.

Nordson® NHC-8 Powder Coating System Operation

Reference Figure 2.2 on opposite page.

The powder supply is fluidized in the feed hopper. Powder pumps mounted on the feed hopper entrain the fluidized powder in a high velocity stream of clean, dry air. The powder and air mixture is delivered to the powder spray guns through flexible hoses. At the guns, the powder particles receive an electrostatic charge as they are sprayed toward the grounded parts moving through the booth enclosure.

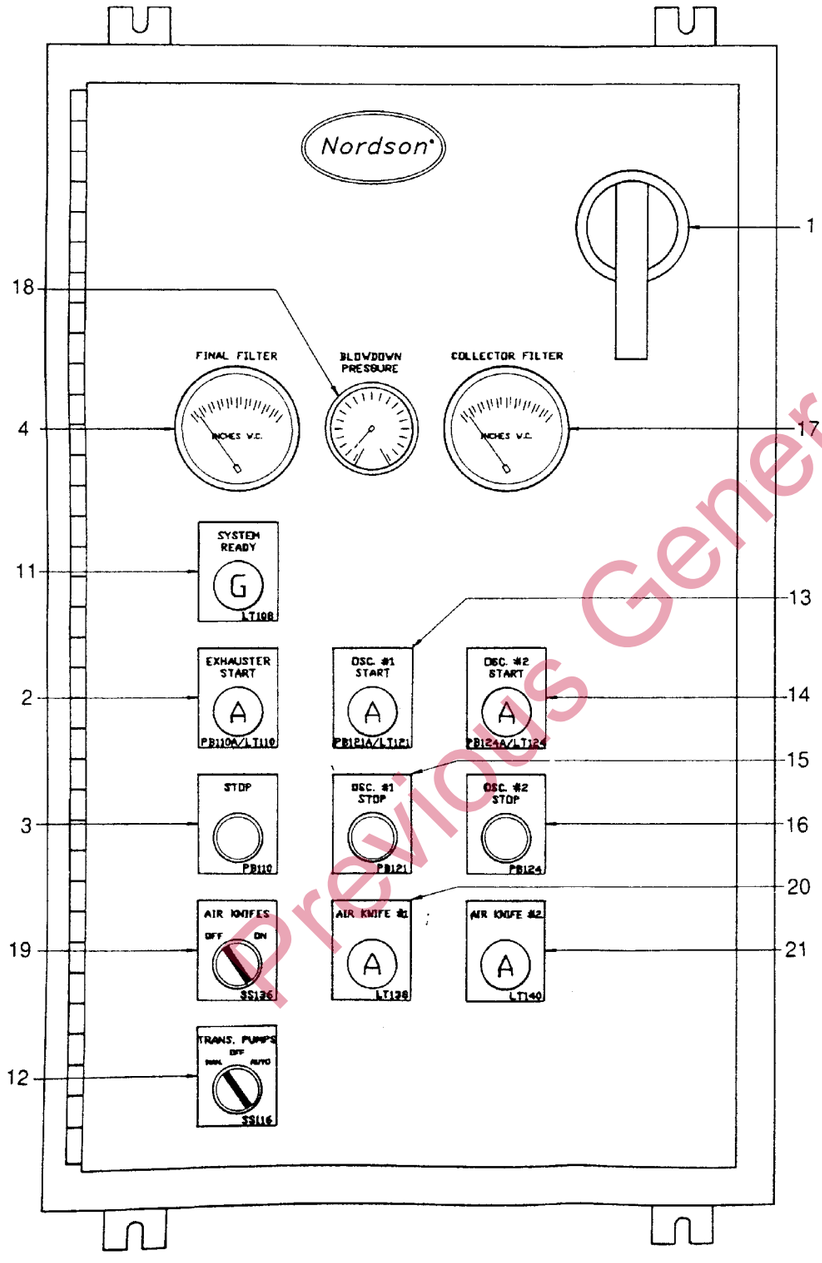
The exhaust fan pulls air through the booth enclosure openings downward into the collector module, and through the cartridge filters. This air is then returned to the room through the final filters. The powder not deposited on the parts (overspray) is carried by this air flow into the collector module, where it accumulates on the outside surface of the cartridge filters.

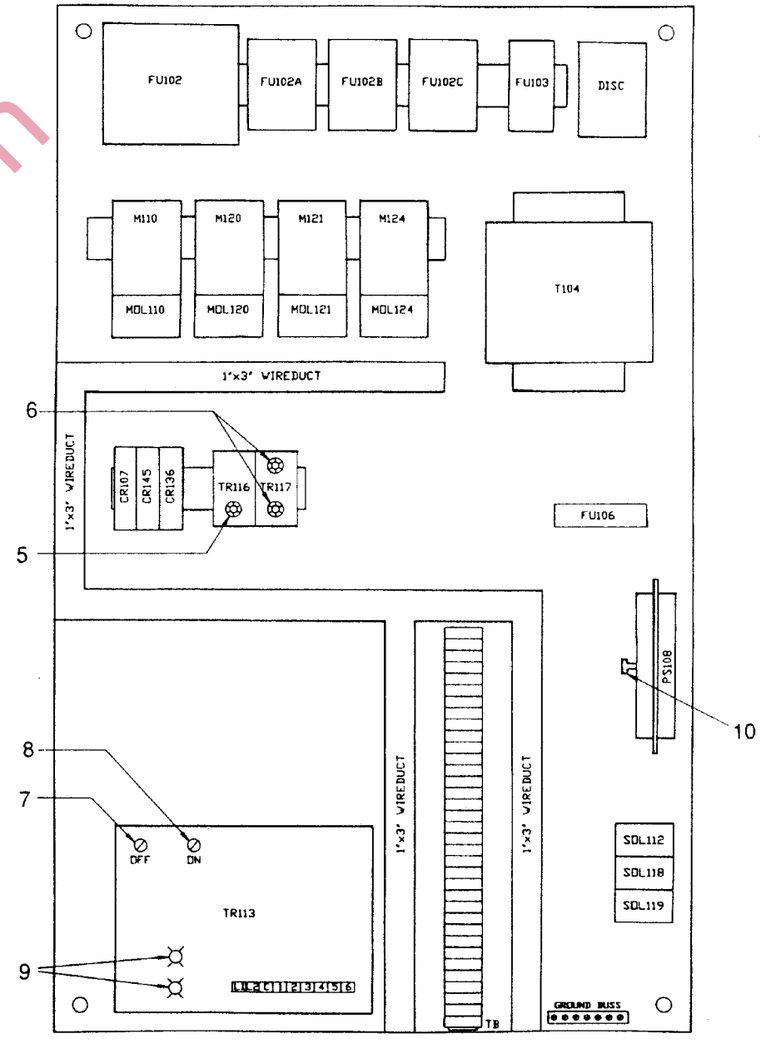
At timed intervals, pulses of air are directed into the cartridge filters, blowing the accumulated powder off the outside surfaces of the filters. The powder falls to the bottom of the collector module, where it is fluidized, and then pumped by the transfer pumps back to the feed hopper. At the feed hopper, the recycled powder is normally screened by a rotary or vibratory sieve before it is mixed with virgin powder.

Operating Controls and Indicators

Figure 2.3

The chart on the opposite page explains the operating controls and indicators illustrated in this figure. Callouts refer to item numbers in the chart.





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Operating Controls and Indicators, cont.

Master Electrical Control Panel

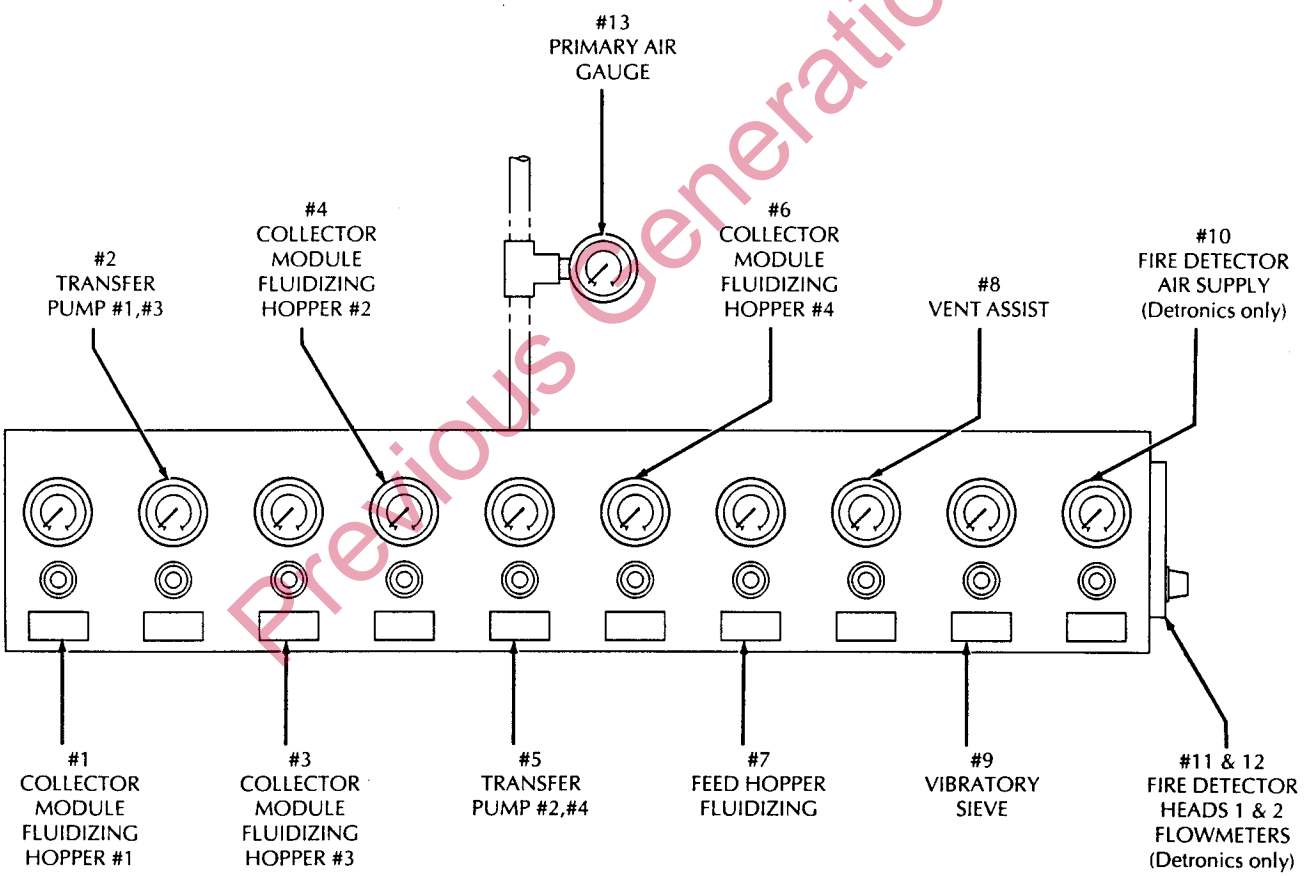
See Figure 2.3 on opposite page.

Item	Description of Purpose or Function
1. **Main Disconnect Switch**	Removes or applies power to the system (230/460/575V).
2. **Exhaust Fan Start Pushbutton & Light** (Amber)	Starts exhaust fan and energizes system electrical controls. Lit when energized.
3. **Exhaust Fan Stop Pushbutton**	Stops fan and de-energizes electrical controls. Amber light goes out.
4. **Differential Pressure Gauge**	Indicates in inches of water (w.c.) the pressure drop across the final filters.
5. **Adjustable Time Delay Relay** (TR116)	Activates the collector module transfer pumps. Delays action of level control to minimize frequency of pump "ON/OFF chatter."
6. **Dual Adjustable Time Delay Relay** (TR117)	Sets transfer pump(s) ON time. Automatically switches level control back and forthe between two transfer pumps.
7. **Pulse Valve Timer "OFF" Timer** (Adj. 8-180 secs.)	Sets time between air pulses for cartridge filter blowdown.
8. **Pulse Valve "ON" Timer** (Adj. 0.05 - .5 secs.)	Sets duration of air pulses for cartridge filter blowdown.
9. **RED LEDs** (Pulse Time Board)	Indicates which air pulse valve is activated.
10. **Differential Pressure Switch Adjusting Screw**	Changes sensitivity to pressure drop across final filters.
11. **"SYSTEM READY" Light** (Green)	Indicates that all system and safety interlocks are in place.
12. **3-Position Selector Switch** (MAN - OFF - AUTO)	Selects powder transfer pump operation: "OFF"—no transfer. "MAN"—continuous transfer. (non-reclaim). "AUTO"—powder transfer controlled by feed hopper level sensor.
13. **Oscillator #1 Start Pushbutton & Light** (Amber)	Starts electrically-driven Oscillator #1. Lit when operating.
14. **Oscillator #2 Start Pushbutton & Light** (Amber)	Starts electrically-driven Oscillator #2. Lit when operating.
15. **Oscillator #1 Stop Pushbutton**	Stops oscillator #1.
16. **Oscillator #2 Stop Pushbutton**	Stops oscillator #2.
17. **Differential Pressure Gauge**	Indicates in inches of water (w.c.) pressure drop across cartridge filters.
18. **Pressure Gauge**	Indicates in pounds per square inch (PSI) pulse pressure used to clean (blowdown) cartridge filters.
19. **Selector Switch ON/OFF**	Selects air knife operation ON or OFF.
20. **Air Knife #1 Light**	Indicates operation of air knife #1.
21. **Air Knife #2 Light**	Indicates operation of air knife #2.

Operating Controls and Indicators, cont.

Figure 2.4

The chart on the opposite page explains the operating controls and indicators illustrated in this figure. Callouts refer to item numbers in the charts.



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Operating Controls and Indicators, cont.

Pneumatic Control Panel

See Figure 2.4 on opposite page.

Item	Description of Purpose or Function
1. **Pressure Regulator and Gauge—Collector Module Fluidize #1**	Regulates and indicates air pressure delivered to collector module plenum #1.
2. **Pressure Regulator and Gauge—Transfer Pumps #1 & 3**	Regulates and indicates air pressure delivered to collector module transfer pumps #1 & 3, to increase or decrease powder transfer rate.
3. **Pressure Regulator and Gauge—Collector Module Fluidize #3**	Regulates and indicates air pressure delivered to collector module plenum #3.
4. **Pressure Regulator and Gauge—Collector Module Fluidize #2**	Regulates and indicates air pressure delivered to collector module plenum #2.
5. **Pressure Regulator and Gauge—Transfer Pumps #2 & 4**	Regulates and indicates air pressure delivered to collector module transfer pumps #2 & 4, to increase or decrease powder transfer rate.
6. **Pressure Regulator and Gauge—Collector Module Fluidize #4**	Regulates and indicates air pressure delivered to collector module plenum #4.
7. **Pressure Regulator and Gauge—Feed Hopper Fluidizing Air**	Regulates and indicates air pressure delivered to feed hopper plenum.
8. **Pressure Regulator and Gauge—Vent Assist**	Regulates and indicates air pressure delivered to the vent assist on the collector module, to decrease the internal pressure of the accumulator located on top of the feed hopper.
9. **Pressure Regulator and Gauge—Vibratory Sieve**	Regulates and indicates air pressure delivered to the pneumatic vibratory motor, to increase or decrease the flow rate of powder through the sieve.
10. **Pressure Regulator and Gauge—Fire Detection System**	Regulates and indicates the air pressure delivered to the fire detector heads for lens cleaning (Detronics option only).
11. **Flowmeter**	Sets and indicates air flow (SCFH) delivered to the fire detector heads for lens cleaning (Detronics option only).
12. **Flowmeter**	Sets and indicates air flow (SCFH) delivered to the fire detector heads for lens cleaning (Detronics option only).
13. **Primary Air Pressure Gauge**	Indicates incoming air pressure.
14. **Air Volume Control***	Regulates and indicates air pressure delivered to the cartridge filter blowdown valves.

* Not shown in Figure 2.4. Located inside fan compartment.

General

Suggested Review of Drawings

In addition to the "Controls and Indicators", the user should review the following drawings, to become familiar with the location of components and connection points:

Operating Environment

The Nordson® NHC-8 Powder Coating System will give the user the best performance when operated in a proper environment and within design conditions. The user should plan to locate the system in an area which maintains:

temperature range of 70 - 80° F; and
humidity range of 45 - 55% RH.

Temperature and humidity ranges exceeding the above indicate the need for climate conditioning of the installation area. Consult your powder supplier for optimum powder performance conditions.

Normal Design Conditions for the NHC-8 System Include:

NOTE: Special design conditions may exist for certain applications.

1. **End Opening Silhouettes**—allowing 6" clearance around all four sides of largest part.

2. **Part Hanger Keyhole Slot**—18" in height.

3. **Cross Drafts**—not exceeding 60 FPM.

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General, cont.

Normal Design Conditions, cont.

4. **Average Face Velocity**—100 FPM (minimum) through all openings in the booth enclosure.

5. **Entering Part Temperature**—not exceeding 120° F.

6. **Total Area of Booth Enclosure Openings**—not to exceed 40 square feet for automatic systems, 45 square feet for manual systems.

7. **Powder**—Nordson® Powder Coating Systems are designed to operate with commercially available powders.

   NOTE: The characteristics and properties of a powder coating material can affect system operation. Powder coatings generally have an average particle size of 25 - 35 microns, with no more than 8% of the total being less than 10 microns. When the percentage of fines (particles less than 10 microns) reaches 8% of the total, blinding or plugging of the filter media can occur.

8. **Cartridge Filters**—8 cartridge filters are provided with each system.

   NOTE: Cartridge filters are considered a wear item. Life expectancy of a cartridge filter depends on many variables including: type of coating material; particle size distribution; humidity and temperature in the spray area; number of hours of operation; dew point and cleanliness of the compressed air used to clean the cartridges; and the pressure and frequency of blowdown air pulses.

9. **Compressed Air**—supplied by a dedicated air dryer at 80 to 100 psi with a maximum pressure dewpoint of 38° F.

Prior to installation of a NHC-8 Powder Coating System, the above environmental and operating conditions should be verified. Please check with your Nordson representative if conditions exceed these guidelines.

General, cont.

Utilities Provided By User

1. **Primary Electrical Service**—(230/460/575VAC) should include a fused disconnect switch with lock-out capability, wired in accordance with the National Electic Code, NFPA70.

2. **Compressed Air Lines to the System**—should be a minimum of 1" NPT. Supply pressure must be 80 - 100 psi. Air must be clean and dry. OSHA rules require that the supply line include a manual shut-off valve with lockout capability.

System Manuals

Before attempting to install the components which make up a NHC-8 System, the user should become familiar with the contents of this manual. Identifying the components in the Parts Lists in Section 8 and reviewing the Operating Controls and Indicators in Section 2 should be done before installation and start up. The user should also carefully review other drawings and manuals supplied as parts of this manual. These will typically include:

1. **Booth Enclosure (Canopy) Drawing**
2. **System Layout Drawing**
3. **Pneumatic Diagram**
4. **Electrical Schematic**
3. **Powder Gun and Control Console Manuals**
4. **Electrostatic Cable Care and Installation Manual**
5. **Gun Mover (Oscillators and Reciprocators) Manual**
6. **Air Dryer Manual**
7. **Fire Detection System Manual**
8. **Rotary Sieve Manual**

Refer to the checklist at beginning of Section 10—Optional Parts and Equipment to identify included manuals and drawings.

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Section 3
Installation Procedures

Installation of the Nordson® NHC-8 Powder Coating System should be carried out in accordance with local, state and national codes, including NFPA Bulletin 33.

The following procedures are provided as guidelines to assist the user in installing the system in a timely and economical manner.

Safety • Unloading • Preparation

Safety Precautions

Observe all safety precautions during and after installation of the Nordson® NHC-8 Powder Coating System.

Read and observe the warnings and cautions in Section 1 of this manual before installing your Nordson® NHC-8 Powder Coating System. Observe the specific warnings and cautions included with the installation procedures in this section.

Unloading, Unpacking, and Storage

The Nordson® NHC-8 Powder Coating System will be shipped partially assembled, wired, and piped—usually via truck. The user is cautioned to use care in unloading components and assemblies to avoid damage to the equipment. Typically, it will be necessary to utilize fork lift trucks (or other rigging equipment) to unload the equipment from the carrier.

CAUTION! Lift equipment using only designated lifting points and lugs. Do not attempt to lift using covers, doors, panels, cable or hose connections. Always balance load when lifting. Never put stress on flat sheet panels.

NOTE: *Equipment stored outside and/or not protected from inclement weather can be damaged, voiding the warranty. Equipment should be stored indoors and protected from damage.*

A shipment packing list will be found taped inside the master electrical panel. It will identify quantity and numbers of skids, numbered boxes (such as M-1, M-2, etc.), and parts contained in each box. When the shipment is unloaded, an inventory of skids and boxes (only) should be made comparing actual count against the packing list. Please report discrepancies to your Nordson representative immediately.

All equipment should be removed to an **indoor** storage area at or adjacent to the installation site. **Unpacking and uncrating should be delayed until YOUR Nordson representative arrives and can oversee this activity.**

Inspection

NOTE: *Upon arrival, your Nordson representative will guide you in the unpacking of crates and boxes; examination of components for damage; and completion of an inventory.*

1. Upon unloading from the carrier, inspect the components and assemblies for obvious damage such as: scratches, dents, tears, or other physical damage; corrosion, or other water damage; and/or loose fasteners.

2. Remove the motor access cover from the booth base and inspect the fan compartment for hidden damage.

3. Inspect pulse blowdown valves and compartment for hidden damage.

4. Report any observed damages to the carrier. Retain a copy of this report for your Nordson representative. Take pictures of any damage. *SEE NOTE.*

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Safety • Unloading • Preparation

Tools

The availability of proper hand and/or power tools will expedite and enhance installation of the Nordson® NHC-8 Powder Coating System and its components. Following is a list of required and recommended tools:

- ❑ C-clamps (and/or welder's clamps)
- ❑ Caulking Gun
- ❑ Chalk Line
- ❑ Electrical Tools
- ❑ Electrical Multi-meter
- ❑ Material Handling Equipment
- ❑ Pipe Wrenches
- ❑ Pliers (including vise-grip)
- ❑ Plumb-bob and Line
- ❑ Portable Air or Electric Drills Wrenches
- ❑ Razor Knife
- ❑ Screw Driver Sets (straight blade and Phillips head)
- ❑ Spirit Levels (minimum 3 ft.)
- ❑ Torque Wrench
- ❑ Tubing Cutter
- ❑ Wrench Sets (including socket, open-end, Allen, and adjustable)

A medium-capacity forklift truck is required for movement of the booth base and other system components.

Foundation/Floor

The Nordson® NHC-8 Powder Coating System does not normally require any special foundations. However, a smooth and level concrete floor (no more than 1/8" in 3') will minimize time and effort associated with installation of the booth base and all other components of the system.

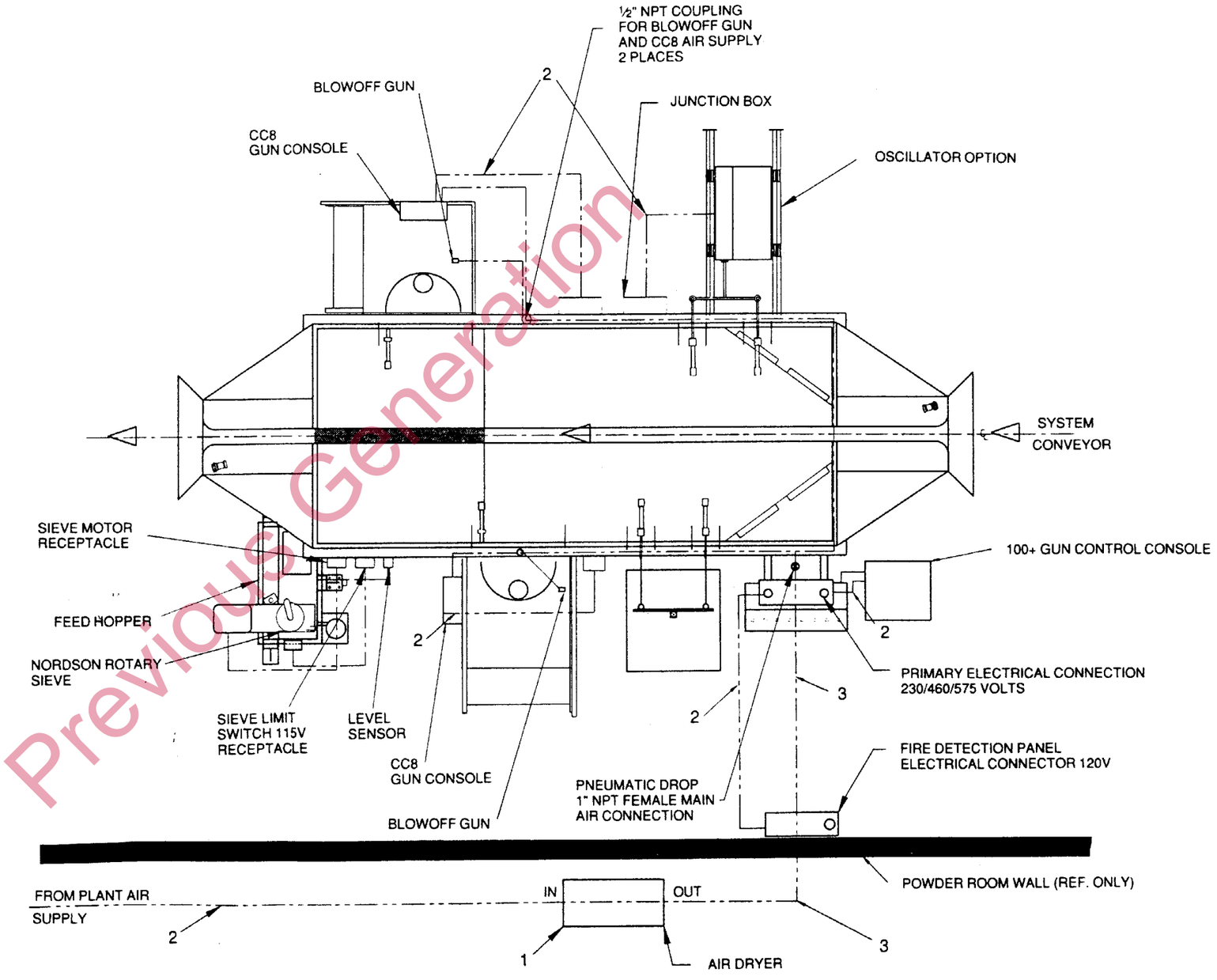
Location and Connections

Figure 3.1 shows the relationship of components, pneumatic connection points, and electrical service connections for the typical NHC-8 system. Please check Section 10—Optional Components and Equipment, for possible alternative layouts specific to your system.

Main System Assembly Procedures

Figure 3.1

Refer to Section 10 for possible alternative layouts.



Location and Connections

1. Recommended dryer should be located in an adjacent room and/or not greater than 20 feet from the booth.
2. Field electrical connections made by purchaser.
3. Field piping made by purchaser.

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Main System Assembly Procedures

Reference Figures 3.1 and 3.2.

Fixed Booth Base

The booth base consists of a single welded structure which encloses the exhaust fan, motor, and blowdown valves, and serves as a base pan for the booth enclosure. Electrical and pneumatic connections will be pre-wired and piped before shipment. Assembly procedures follow for installing a fixed booth base system.

CAUTION! Lift equipment using only designated lifting points and lugs. Do not attempt to lift using covers, doors, panels, cable or hose connections. Always balance load when lifting. Never put stress on flat sheet panels.

1. Locate and mark center line of booth base assembly at floor level on both ends (fan section and collector).

2. Locate the center line of the conveyor using plumb-bobs from existing conveyor (If the conveyor has not been installed, locate its future center line, using layout drawings) and snap a chalk line on the floor for reference.

3. Position and align booth base over the chalk line and/or under the plumb-bobs. Match center line markers established in Steps 1 and 2.

NOTE: *Leveling pads must be raised off the floor prior to aligning the base.* ***Do not*** *attempt to move the base with the leveling pads in contact with the floor.*

4. Four threaded leveling pads (Item 19, Figure 8.1), located in the base corner brackets, are provided for leveling the base. When the base is shipped, these pads are inverted. Remove the pads and reassemble to the base with the pads on the bottom. Leveling is accomplished by raising and lowering the pads.

5. Level the booth base, using spirit levels, from side-to-side and end-to-end, to ± 1/16 inch. Refer to Figure 3.2.

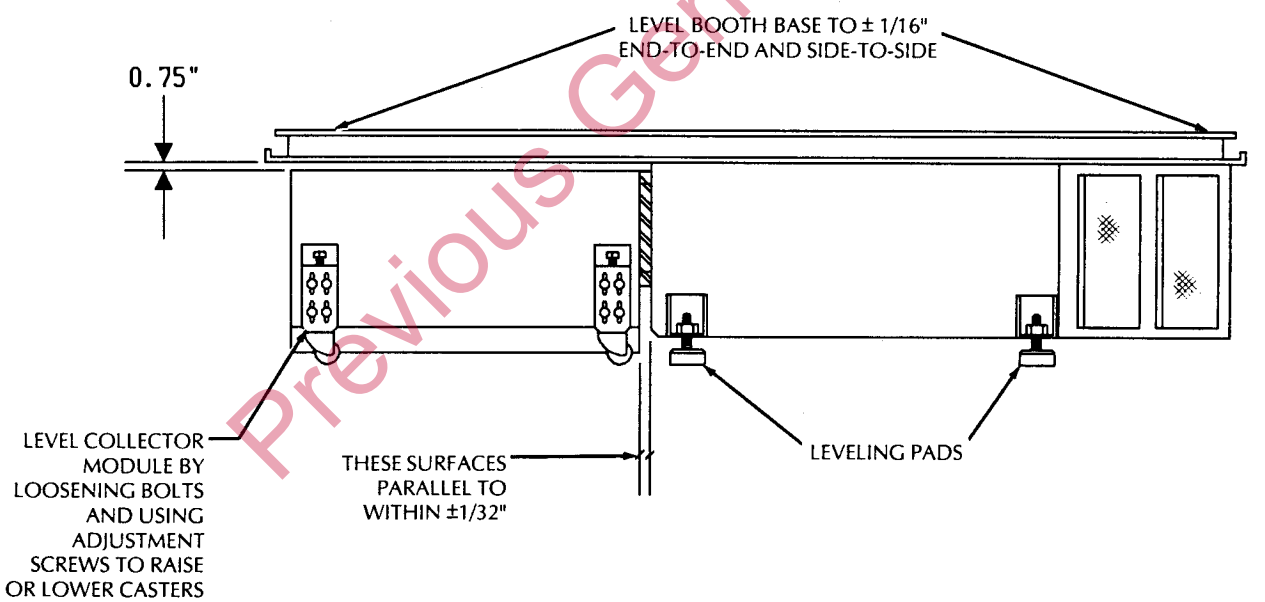
NOTE: *Proper positioning of blowdown valves is critical to powder recovery. Complete all steps detailed in Step 6.*

6. Verify and correct, if necessary, the position of the four air pulse blowdown valves (Item 24, Figure 8.1) in the base. Valve nozzles center-to-center distance must be 17". Center of left and right nozzles to side walls should be 10-7/8". Correct the centerline spacing by adjusting the position of the valve on the 1" NPT nipple. Verify that the distance from the end of the nozzle to the outside edge of the compartment is 18-1/4". To correct, loosen 2 bolts on air manifold brackets (Item 32, Figure 8.1). Make sure that the centerline of the blowdown valve nozzle is perpendicular with the front panel of the fan section which seals to the collector module. If necessary, shim below the square pulse manifold. Adjust to the proper distance and re-tighten.

Main System Assembly Procedures, cont.

Fixed Booth Base and Collector Leveling

Figure 3.2



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Main System Assembly Procedures, cont.

Reference Figures 3.1 and 3.3.

Booth Base - Roll On/Off

The roll on/off base incorporates four caster mounting wells, four V-groove casters, and two tracks positioned below the casters, to carry the booth on and off line. Additional casters are used below the operator, gun stand, and control console platforms. The track is secured to the floor by use of expansion bolts after the booth is centered on-line. Assembly procedures follow for installing the booth base configured as a roll on/off line system.

1. Follow Steps 1 through 3 for the Fixed Booth system.

2. Using a lift truck or hydraulic jack, lift the booth base 4" off the floor and block in position. Using a straight edge, check the alignment of the casters in the direction of travel and correct if necessary.

3. Position the triangular tracks under the V-groove casters.

4. Raise the booth base and remove blocks, then lower the base onto the tracks.

5. Check to make sure the booth base contacts the stop on the end of the tracks when the base is on-line. Reposition as necessary.

6. Once the base and tracks are positioned correctly, drill through the holes provided in the mounting tabs of the tracks and anchor the tracks into position. Maintain track straightness.

7. Roll the booth base off-line to ensure proper clearances and freedom of motion. If binding occurs check track straightness and caster alignment.

8. Level the booth base using spirit levels from side to side and end to end, to ± 1/16 inch. Leveling is accomplished by inserting shims on top of the caster mounting flanges. Seal slots in caster wells with tape after shimming.

   a. Using a hydraulic jack or lift truck, raise the booth base off the floor. Loosen the caster mounting bolts to provide sufficient clearance to insert the required thickness of shims between the caster mounting wells and caster mounting flanges.

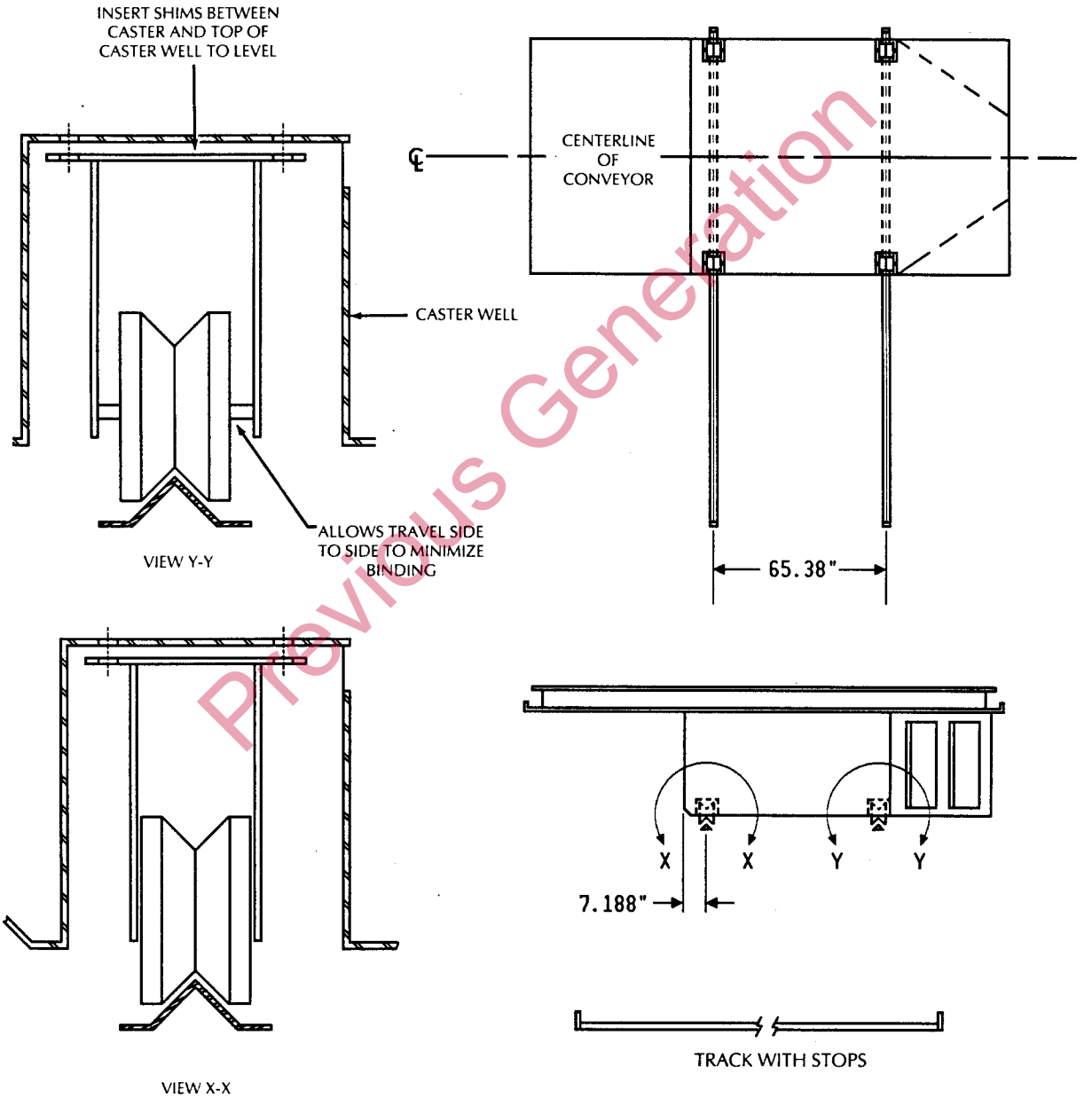
   b. Lower the booth base back on to the track and floor. Make sure base is level, correct if necessary.

9. Check positioning of blowdown valves and correct if necessary. Perform the procedures described in Step 6 under the heading "Fixed Booth Base".

Main System Assembly Procedures, cont.

Roll On/Off Booth Leveling

Figure 3.3



Main System Assembly Procedures, cont.

Booth Enclosure (Canopy)

CAUTION! Lift equipment using only designated lifting points and lugs. Do not attempt to lift using covers, doors, panels, cable or hose connections. Always balance load when lifting. Never put stress on flat sheet panels.

The booth enclosure may be shipped as a series of flanged panels of sheet polypropylene, sheet steel, or a combination of both, i.e., roof panels of polypropylene, side walls of sheet steel.

1. Locate and become familiar with Nordson supplied booth enclosure drawing(s).

2. Lay out the panels in a clean area, taking care to avoid scratching or other damage. Identify the match marks, i.e., the panels will assemble "A" to "A," "B" to "B," etc.

3. Locate and identify fasteners (bolts) to be used in the assembly of the enclosure. Fasteners will be used as follows:

   a. Nylon cap screws and nuts (5/16-18 x 1-1/4") for polypropylene to polypropylene panels.

   b. Nylon flat head screws and nuts (5/16-18 x 1-1/4") for polypropylene baffles to polypropylene panels. (Flat head screws fit countersunk holes.)

   c. Steel cap screws (5/16-18 x 1-1/4") nuts and washers for polypropylene panels to steel, or steel to steel. Always use steel washers under the screw heads when used with polypropylene panels.

   d. C-section clamping channels, with 2 steel cap screws, for joining booth enclosure flanges to base angle.

*NOTE: The availability and use of C-clamps, vise-grip pliers, or welder's clamps will aid in assembly of the booth enclosure. **Do not** allow flanges to be stressed. Use bracing and **do not** over-tighten bolts.*

The following procedures are for a typical fixed booth system.

4. Locate sidewall vertical panels and gun opening baffles. Install baffles in gun openings and tighten fasteners to 15 inch-pounds.

5. Assemble sidewall panels with cap screws and nuts. Finger tighten.

6. Place sidewall panel assemblies on booth base and temporarily clamp in place. Brace sidewalls to relieve stress on bottom flanges.

7. Locate four (4) vertical end panels (each with half vestibules) and place on end base angle. Temporarily clamp in place and brace. Assemble to sidewall panels and fasten with cap screws and nuts. Finger tighten.

Main System Assembly Procedures, cont.

Booth Enclosure (Canopy), cont.

8. Locate and assemble four (4) roof panels with conveyor slot baffles. Tighten fasteners to 15 inch-pounds. Assemble roof panels, with baffles, to side wall and end vestibule panels using cap screws and bolts. Finger tighten.

9. Install roof supports as shown in Figure 8-3. Level roof panels and plumb side panels, using vertical and horizontal adjustment screws (Item 6, Figure 8.3). Remove bracing installed in Step 6.

10. Verify that bottom gussets of half vestibules butt together and drill 3/8" diameter holes through both gussets. Draw gussets tightly together using steel cap screws, washers, and bolts.

11. Drill several 3/8" diameter holes between steel bolt locations. Insert nylon cap screws and nuts. Tighten to 15 inch-pounds. (The number of bolts used will vary with the length and depth of gussets.)

12. Remove steel cap screws, nuts, and washers. Replace with nylon bolts. Tighten to 15 inch-pounds. (This step will not be required for steel enclosures.)

13. Remove temporary clamps holding bottom flange of booth enclosure to base.

14. Carefully align booth enclosure on base mounting flange so that interior of enclosure is flush with, or evenly spaced around, the interior perimeter of the base angle. Temporarily re-clamp.

15. Locate C-section clamping channels (Item 47, Fig. 8.1, approximately 6" long) and evenly distribute around exterior of enclosure bottom flange and base angle. Channel cap screws engage bottom of base mounting flange.

16. Securely tighten C-section clamping channel cap screws while maintaining the alignment achieved in Step 15 above.

17. Measure roof conveyor slot and adjust, if necessary, to provide a width of approximately 5-1/2".

18. Tighten all panel fasteners to 15 inch-pounds while maintaining interior joints as flush as possible.

19. Using RTV sealant (provided), run a smooth bead around interior perimeter of booth enclosure/base joint. Allow sealant to cure for approximately 24 hours before disturbing joints.

NOTE: *Your Nordson representative will heat-gun weld all remaining interior joints prior to start up. Do not spray powder until joints are welded.*

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Main System Assembly Procedures, cont.

Refer to Figure 8.2.

Collector Module

The collector module will be shipped assembled, including 8 cartridge filters. The user is cautioned to remove, carefully inspect, and re-install the cartridge filters to assure that no damage has occurred and that shipping has not disturbed the filter seals.

1. Remove the 8 cartridge filters in strict accordance with procedures in Section 7—Disassembly and Repair.

NOTE: *Do not use damaged filters—replace with new filters.*

2. Thoroughly inspect each cartridge for damage including:
   a. Nicks or cuts in rubber gaskets.
   b. Bent or dented steel end caps.
   c. Dents in screens which have gouged pleated filter media.
   d. Tears, separations, or holes in pleated filter media.
3. Re-install the cartridge filters in strict accordance with procedures in Section 7—Disassembly and Repair.

NOTE: *Exceeding torque values given can cause damage to fluidizing plate.*

4. Check and tighten fluidizing plate C-section clamp cap screws (Items 16 & 22, Figure 8-2) to 25 inch-pounds maximum using a torque wrench.
5. Install 4 powder transfer pumps (Item 14, Figure 8-2) on the lower outboard end of the collector module. (See Section 7—Disassembly and Repair.)
6. Connect flexible tubing between fittings on collector module and quick-disconnect plate by referring to the Pneumatic Schematic in Section 6—Troubleshooting.
7. Level module to provide ¾" clearance between the booth base and the top of the collector module. Level module by raising or lowering the adjustable caster brackets (Item 17, Figure 8-2). Lock in place by tightening the bracket screws (Item 19, Figure 8-2).
8. Roll collector module aside to temporary storage with quick disconnect plate in storage bracket (Item 23, Figure 8-2).

Main System Assembly Procedures, cont.

Refer to Figure 8.4.

Feed Hopper

The feed hopper will be shipped assembled, but without powder pumps or connecting tubing with disconnect plate.

NOTE: *Exceeding torque values given can cause damage to fluidizing plate.*

1. Tighten fluidizing plate C-section clamping cap screws (Item 19, Figure 8.4) to 25 inch-pounds maximum.

2. Locate, assemble, and install 100 PLUS powder pumps (Item 14, Figure 8.4). One pump for each manual or automatic powder gun is included. Follow installation procedures in Manual No. 32-8, noting that the feed hopper will have mounting kits and powder suction (pick up) tubes already installed on hopper. Referring to Figure 4 in Manual No. 32-8: inspect O-rings [Ref. 3] on adapter [Ref. 1]. Replace if damaged. Take care when pressing pump down over O-rings to avoid causing damage.

3. Install sieve on feed hopper if removed for shipping. (Refer to Figures 8.5 or 8.6 for installing the Nordson Rotary or Vibratory Sieves.)

4. Locate and install accumulator on top of sieve if removed for shipping.

5. Locate and install vent assist plate (Item 12, Fig. 8-2) on collector module, if removed for shipping.

6. Connect flexible plastic tubing between fittings on feed hopper and quick-disconnect plate by referring to Pneumatic Diagram in Section 6.

7. Connect feed hopper to collector module by aligning direct vent openings.

8. Level hopper by raising or lowering the three caster brackets with hopper vent hole loosely mated to collector module direct vent plate.

9. Tighten the ¼-20 thumbscrews (Item 12, Figure 8.4) to secure feed hopper to collector module.

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Main System Assembly Procedures, cont.

Fire Detection and Control System

Used on systems with automatic powder guns.

Refer to the manual for the Detronics Model 801 Ultraviolet Fire Detection System, or the Nordson NFS-1000 system, provided in Section 10—Optional Parts and Equipment, for installation and start up procedures.

The fire detection system must be interlocked with the master electrical panel, so that the entire system will be shut down if a fire is detected within the booth.

Main System Assembly Procedures, cont.

Gun Control Consoles

The gun control consoles should be positioned as close to the booth as possible to accommodate the available lengths of electrostatic cables and to minimize lengths of flexible air tubing from console to pumps. Refer to the following manuals for installation procedures:

Console	Manual No.
100 PLUS® Power Unit	33-6
100 PLUS Master Control	33-5
NPE-CC8	33-2
NPE-CC2	33-3
Versa-Spray™ IPS Control Console	33-9

The automatic control consoles are most conveniently located at the fan compartment end of the booth, adjacent to the vestibule, on the same side as the master electrical control panel, with the control side (or front) positioned to allow the operator to view the automatic guns when adjusting the settings. Refer to Figure 3.1.

Refer to Figure 8.10 for handgun control console mounting.

The handgun control consoles are designed for wall or stand mounting and should be located close to the operator(s). This location should accommodate the length of electrostatic cable or low voltage cable supplied and also minimize air tubing lengths to the gun and pump. If an operator platform is included, the console is usually mounted on it, using the bracket provided.

1. Position the automatic gun control console(s). Install the handgun console(s) on the operator's platform rail with the hardware provided (refer to Fig. 8.10).

WARNING! Do not locate the electrostatic power supply within the Class 2 Div. 1 area, as defined in the National Electric Code, NFPA70, Article 500.

WARNING! Do not operate equipment at a pneumatic pressure higher than the rated maximum working pressure of any component in the system. Manual shut off valves should be installed in the air supply lines to pneumatic equipment so that pressure can be relieved before undertaking maintenance or repairs.

2. Connect air tubing provided from manifold behind the pneumatic panel to the inlet port of the console(s) by referring to console manuals and system pneumatic diagram in Section 6.

3. Complete electrical wiring connections. (See "Electrical Installation" in this section.)

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Powder Guns • Mounts • Gun Movers

Powder Guns

The Nordson® NHC-8 Powder Coating System may use manual (hand) or automatic powder guns or both. **DO NOT** attach cables or powder feed tubing to guns at this stage of the installation. Refer to the appropriate manuals in Section 10—Optional Parts and Equipment, when installing both automatic and manual powder spray guns.

Moveable Automatic Gun Stands

Refer to Figure 8.9 for automatic gun mounting.

1. Locate moveable automatic gun stands.
2. Set the vertical aluminum gun mounting bars at 21.75" centers.
3. Mount the gun mounting bars [P/N 249 160 (100 PLUS automatic guns), P/N 133 403 (Versa-Spray automatic guns)] to the 1" diameter bar with the adjustable handles mounted to the outside of the stand.
4. Position the knurled mounting pin to the inside of the stand and mount the powder spray gun.
5. Align the moveable automatic gun stand so that the guns are centered in the automatic gun openings in the canopy. Adjust the 21.75" gun bar spacing set in Step 2 if required.
6. Lock the moveable fixed gun stand in position by using the step lock caster.
7. If the system is configured to roll on/off line, a mounting bracket will be provided on the fixed gun stand to attach the stand to the booth base. The mounting bracket is attached to the booth base by four 5/16-18 x 1-1/4" bolts. The mounting holes in the booth base must be drilled when the system is installed.
8. After attaching the mounting bracket to the booth base check make sure the automatic guns are positioned in the center of the gun openings.

Powder Guns • Mounts • Gun Movers, cont.

Gun Movers (Oscillators • Reciprocators)

A system with automatic powder guns may incorporate one or more vertical gun movers. The user should first identify the type of gun mover supplied and study the appropriate manual and/or drawings provided in Section 10—Optional Parts and Equipment before installing the gun mover in the system.

1. Locate and align oscillator(s) at gun opening(s), allowing for the offset of the gun mounts.

2. Mount and position gun mounts and guns as previously described under the heading "Moveable Automatic Gun Stands".

3. Reposition oscillator(s) so that guns are centered in the opening.

4. Bolt or lag oscillator(s) to floor if required.

WARNING! Do not operate equipment at a pneumatic pressure higher than the rated maximum working pressure of any component in the system. Manual shut off valves should be installed in the air supply lines to pneumatic equipment so that pressure can be relieved before undertaking maintenance or repairs.

5. Connect compressed air to oscillator (if air powered) according to the oscillator manual.

6. Complete electrical wiring connections as required. (See "Electrical Installation" in this section, and electrical schematic in Section 10.

WARNING! The Nordson® NHC-8 Powder Coating System contains energized electrical components that could be fatal. Disconnect and lock out input electrical power to the system **before** removing any panels or performing maintenance procedures.

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Air Dryer

Air Dryer

NOTE: User's compressed air supply (80 psi minimum) should be clean and dry. The system must never be operated without a dedicated air dryer or with air that is not free of particulate matter, aerosols, oil, condensate, etc., or with a pressure dewpoint higher than 38° F.

A refrigerant or regenerative desiccant compressed air dryer may be supplied with the system. Each is a packaged assembly ready for connection to the user's compressed air supply (and electrical service in the case of the refrigerant type). Install as follows:

1. Locate the manufacturer's instruction manual included in Section 10—Optional Parts and Equipment, and become familiar with installation and operation.

2. Position the dryer according to the layout drawings or, if not specified, within 20 feet of the booth.

3. Bolt or lag dryer to floor if necessary.

WARNING! Do not operate equipment at a pneumatic pressure higher than the rated maximum working pressure of any component in the system. Manual shut off valves should be installed in the air supply lines to pneumatic equipment so that pressure can be relieved before undertaking maintenance or repairs.

4. Install 1" black piping to dryer inlet from plant compressed air supply. A manual shut-off valve should be installed in the air supply line ahead of the air dryer.

5. Install and connect pipe from dryer outlet to connection above electrical control panel. (Refer to pneumatic diagram in Section 6.)

Electrical Installation

System Wiring

All electrical wiring should be completed in accordance with the National Electric Code, NFPA70, and state and local codes, and should be performed by qualified electricians only.

WARNING! The Nordson® NHC-8 Powder Coating System incorporates electrical wiring and devices which, when activated, can cause personal injury or death. Always disconnect and lock out power to the system at a breaker or disconnect switch in the service line ahead of the system before performing any installation or service procedures.

1. Install 30 ampere primary electrical service from plant source (230/460/575 volts, 3-phase, 60 Hz) to vicinity of system. Terminate with fused disconnect switch and lock out.

2. Locate and review the electrical schematics and wiring diagrams in Section 10.

3. Provide stranded wire of the proper size and insulation to the following recommendations:

Color	Function
Red	AC Control
White	Common
Blue	DC
Black	Power
Green (or Green with Yellow stripe)	Ground
Yellow	Outside Source (interlocks)
Shielded Cable*	Fire Detector

*Refer to Fire Detector manual for type (2- or 3-conductor).

Verify each ground connection by the use of an ohmmeter. Paint, steel scale, or corrosion can prevent proper grounding and should be removed to bare metal at each grounding point.

4. Provide and use wire number labels (markers) consistent with the wiring schematic.

5. Install an earth ground to all components of the system including:
   - ❑ Booth base;
   - ❑ Gun consoles;
   - ❑ Oscillators;
   - ❑ Feed hopper and accumulator;
   - ❑ Collector module;
   - ❑ Fire detection control panel and detector heads; and
   - ❑ All other system components which are not directly grounded to the above.

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Electrical Installation, cont.

System Wiring, cont.

WARNING! Always disconnect and lock out power to the system at a breaker or disconnect switch in the service line ahead of the system before performing any installation or service procedures. Failure to observe this warning may result in personal injury or death.

6. Install wiring interconnections between system components as shown in the schematics and wiring diagrams and reconnect any wiring removed for shipping purposes. Code approved practices require use of metal conduit and liquid-tight flexible conduit. Interconnections will include, but may not be limited to:

   a. Primary (230/460/575 volt, 3-phase, 60 Hz) 30 ampere service from lock out disconnect to the master electrical control panel.

   b. 120 volt, single-phase, from dedicated and protected plant source to the fire detection system control panel.

   c. Fire detection control panel to detector head(s) and test source(s) (if used). Refer to Fire Detection System manual. This connection requires a shielded cable and ground strap.

   d. Master electrical control panel to the fire detection control panel.

   e. Conveyor interlock to fire detection control panel and to the master control panel.

   f. Master electrical control panel to gun console(s).

DO NOT apply power to the system until all installation and assembly procedures are complete and checked out.

7. Verify by continuity tests all wiring and connections. Correct as necessary. Tighten all terminals, including those factory-wired.

Completing the Installation

Final System Assembly

WARNING! Connect all ground wires and straps when installation is complete. Ungrounded equipment in the spray area can accumulate an electrical potential strong enough to cause a fire or explosion when discharged.

1. Check and adjust alignment of booth base with conveyor center line. Relevel if necessary.

2. Inspect sponge gaskets on the collector module. Replace if damaged.

3. Position proximity switch (Item 30, Figure 8.1) at the mouth opening of the pulse blowdown compartment to bring target face 7/32" maximum outside of the compartment. Tighten locknuts. The switch is not positioned prior to shipping to prevent damage; it must be positioned so that it will be activated when the collector module is properly sealed against the gasket.

4. Roll in and position collector module against the booth base. Align with the sides of the booth base, taking care not to damage any flexible tubing.

5. Level collector module by loosening the four bolts in the adjustable caster legs and raising or lowering the legs. Maintain ¾" between the top of the module and the bottom of the base. The module must be able to clear the base when removed.

6. Connect one clamping strap from the booth base to the collector module. Do not tighten.

7. Connect opposite clamping strap and snug up.

8. Snug up first clamping strap. Tighten both clamping straps to compress the sponge gasket between the collector module and the booth base.

9. Inspect the magnetized seal skirt (Item 21, Figure 8.2) for holes or other damage.

10. Lay out the skirt on top of the collector module with the smooth side facing inward and the corners positioned. Smooth the skirt into contact with the base pan frame and top frame of the collector module.

11. Connect and bolt up the collector module quick disconnect plate to the base plate (Item 2, Figure 8.7).

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Completing the Installation

Final System Assembly, cont.

12. Roll the feed hopper into position at the end of the collector module. Inspect gasket (Item 10, Figure 8.2).

13. Shift hopper to the right just enough to clear the module clamping guide, shift toward the collector module, then shift to the left and seat. Take precautions to ensure that the gasket is kept clear of the collector module.

14. Level hopper by loosening the four bolts on the caster brackets (Item 21, Figure 8.4) and raising and lowering the brackets.

15. Tighten 2 thumbscrews (Item 12, Figure 8.4) on the 2 clamping guides to compress the vent gasket.

16. Connect and bolt hopper quick disconnect plate to base plate (Item 1, Figure 8.7).

17. Connect 2" flexible vent hose between the sieve accumulator and the vent assist (Item 12, Figure 8.2) on the side of the collector module. Install and tighten hose clamps.

18. If system is equipped with an electrically powered rotary sieve, plug power cords into receptacles on the end of the base. (Refer to Figure 8.5.)

19. Attach electrical grounding straps between collector module and base, and between the feed hopper and collector module.

20. If system is "non-reclaim", round portable feed hoppers are used. (Refer to Color Changing, Non-reclaim, in Section 4—Operating Instructions.)

21. Insert the level control sensor (Item 3, Figure 8.4) into the plastic well on the side of the feed hopper. Lock sensor into place. Refer to Section 4 for setup and calibration procedures.

22. Complete all other (air and air/powder) flexible tubing connections. Assure that all cut ends are clean, square cuts. The use of properly sized tubing cutters will speed this process. Tubing must be clean and dry. Refer to the pneumatic diagram in Section 6, Figure 8.7, gun control console and gun manuals, and labels on pneumatic control panels. Connections may include:

Completing the Installation, cont.

Final System Assembly, cont.

a. Transfer pumps on the collector module to the accumulator on the feed hopper. Insert plugs provided to be inserted in unused accumulator inlet tubes.

b. Gun consoles to powder pumps on feed hoppers (2 lines per pump).

c. Booth base to control panel.

d. Quick-disconnect plate to feed hopper.

e. Quick-disconnect plate to collector module.

f. Quick-disconnect plate to pneumatic control panel.

g. Powder pumps on feed hopper to guns.

h. Factory installed connections removed for shipment.

23. Connect electrostatic cables between gun consoles and guns in *strict* accordance with gun and cable installation instructions in appropriate manuals.

Final Inspection

Thoroughly inspect all parts of the system to insure that all equipment is properly installed in accordance with instructions in all applicable manuals. DO NOT start up the equipment until this inspection is complete.

It is recommended that the user do not proceed with start up until your Nordson representative has checked out the system installation and has completed the training of your personnel.

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Section 4
Operating Instructions

Before commencing the operation of the Nordson® NHC-8 Powder Coating System, the user should review safety precautions, new equipment start-up, routine operating procedures, and the color change procedures.

Do not attempt to operate the NHC-8 Powder Coating System before your Nordson representative has completed the instruction and training of your personnel and you have read Section 2—Equipment Familiarization.

New Equipment Start Up

Safety Precautions

Observe all safety precautions when operating the Nordson® NHC-8 Powder Coating System.

Read and observe the warnings and cautions in Section 1 of this manual before operating your Nordson® NHC-8 Powder Coating System. Observe the specific warnings and cautions included with the procedures in this section.

Pre-start Up Procedures

The following procedures describe the steps necessary to bring a new Nordson® NHC-8 Powder Coating System to the pre-production trial state.

WARNING! The Nordson® NHC-8 system contains energized electrical components with potentials that could be fatal. Only qualified personnel should perform the following procedures.

WARNING! Remove all jewelry (rings, watches, etc.) before operating or servicing this equipment.

WARNING! Disconnect and lock out primary electrical source. Turn OFF and lock out conveyor system and, if so equipped, oscillators, reciprocators or gun movers.

WARNING! Never operate equipment at pneumatic pressures higher than the maximum rating of the components.

WARNING! Do not smoke in the spray area.

Initial Start Up

NOTE: The following procedures are based on the assumption that the installation is complete and that all electrical and pneumatic connections have been verified as correct.

1. Turn OFF system compressed air supply and electrostatic power at all individual power units.
2. Remove motor access cover (Item 43, Fig. 8.1) to expose the fan, motor, and V-belt drive.
3. Remove the 4 final filters (Item 38, Fig. 8.1).
4. Open door of master electrical control cabinet.
5. Verify continuity and size of all fuses. Replace any blown fuses.

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New Equipment Start Up, cont.

Initial Start Up, cont.

6. Set pulse valve timer (TR113):

Timer	Location
OFF Time—45 secs.	Item 7, Fig. 2.3
ON Time—.07 secs.	Item 8, Fig. 2.3

7. Set transfer pump time delay relays TR116 and TR117 (Items 5 & 6, Fig. 2.3).

Time delay to pump start (TR116) . . . . . 60 seconds
Pump ON Time (TR117) . . . . . 80 seconds (both settings)

8. Close the electrical control cabinet door.

9. Turn on electrical supply (230/460/575 volt, 3-phase, 60 Hz) at the service disconnect and on the master electrical control panel door.

10. Jog fan motor by depressing "Exhauster Start" pushbutton, and then by depressing "Stop" pushbutton.

11. Observe direction of fan rotation with respect to the yellow arrow. If direction is o.k., proceed to Step 16. If the rotation is backward, proceed to Step 12. (Rotation of fan shaft is clockwise when viewed from the sheave or pulley end.) If you are equipped with an electrically driven rotary sieve, observe the direction of fan rotation at the motor end. Motor shaft should be rotating clockwise. If the rotation is backward, proceed to Step 14.

WARNING! Disconnect and lock out primary electrical source before performing the following procedures.

12. Shut off and lock out power at the service disconnect ahead of the master electrical control cabinet and open cabinet door.

13. Change fan rotation by reversing any 2 wires of (230/460/575 VAC) L1, L2, or L3, coming into the fan motor starter M110 (Figure 2.3). Proceed to Step 16.

14. Change rotary sieve rotation by reversing any 2 wires (230/460 volt) coming into the motor starter M120 (Figure 2.3).

15. Close door of electrical cabinet.

New Equipment Start Up, cont.

Initial Start Up, cont.

WARNING! Do not operate equipment with covers, panels, or safety guards removed.

16. Replace fan compartment side cover.

17. Restore electrical power.

18. Set all air pressure regulators to "0" by turning handles fully counter-clockwise.

19. Turn ON compressed air supply to the system.

20. Adjust primary service air regulator (user-supplied) to 80 psi.

*NOTE: If the system utilizes automatic powder guns a fire detection system **MUST** be utilized.*

21. Fire Detection System—Adjust detector head pressure regulator (Item 10, Fig. 2.4) to 12 psi and the flowmeters (Items 11 & 12, Fig. 2.4) to 60 SCFH.

22. Adjust vent assist pressure regulator (Item 8, Fig. 2.4) to 20 psi.

23. Season new cartridges by using the procedures listed in "New Cartridge Seasoning" on following page.

Feed Hopper Level Sensor Calibration

The feed hopper level sensor (Nordson P/N 601 367) must be calibrated before beginning operations. When used in recycle systems, the level sensor is used as a normally closed (NC) switch. When used as such, cut the bridge jumper on the sensor circuit.

1. Fill the feed hopper with virgin powder to a level above the switch. Reduce the level below the switch so powder clings to the mounting well. If the switch LED is on, slowly turn the switch potentiometer counterclockwise (CCW) until it goes off. If the LED is off, turn the potentiometer clockwise (CW) until it turns on, then back off (CCW) slowly until it goes off.

2. Bring the powder level back above the switch. The LED should turn on. Turn the switch potentiometer CCW and count the number of turns it takes to turn the LED off.

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New Equipment Start Up, cont.

Feed Hopper Level Sensor Calibration, cont.

3. Turn the potentiometer CW for 1/2 the number of turns counted in Step 2. For example, if it took four turns in Step 2 to make the LED go off, rotate the potentiometer two turns CW. The switch will now be set in the midpoint of its sensitivity range for maximum stability.

New Cartridge Seasoning

NOTE: At this point in new system start up, user MUST season new cartridges. *This procedure may require 2 to 8 hours and should not be hurried.*

The following steps describe procedures for seasoning new cartridge filters. These steps **must** be followed whenever new cartridges are installed. Failure to properly season new cartridges can result in early clogging of filter media and loss of use.

WARNING! Wear a filter-type respirator whenever coming into contact with powders. Always wear safety glasses. Wear gloves to minimize contact with powders. Obtain and read Material Safety Data Sheets for each powder used.

WARNING! Wash skin frequently with soap and water, especially before eating and drinking. Do not use solvents to remove powder from skin. Do not use high pressure compressed air to blow powder off skin or clothing. (Compressed air injected under skin can cause serious injury or death.)

WARNING! Never spray powder anywhere except into the spray booth, with the fan, filters, and flame detection system fully operational.

1. Open seasoning slide dampers on both sides of the fan compartment (Item 2, Fig. 8.1). Insure that the final filters are removed.

2. Start exhaust fan. Take initial readings of the face velocity in the entrance and exit vestibules with a hand-held velocimeter. Record readings.

3. Load virgin powder into feed hopper, if not done during level sensor calibration.

4. Turn ON and adjust feed hopper fluidizing air regulator (Item 7, Fig. 2.4) to approximately 8 psi. Allow adequate time for the powder to become uniformly fluidized. Look for slight bubbling at the surface. Adjust regulators to achieve adequate fluidization without geysering (erupting clouds of powder) or having a "dead bed" (no evidence of fluidization).

5. Remove powder feed hoses from powder guns and point hose ends into booth enclosure, making sure that hoses are not pointed directly at cartridge filters. Lightly fasten hoses to enclosure so that they are restrained, but not crimped.

New Equipment Start Up, cont.

New Cartridge Seasoning, cont.

6. Turn ON power at the gun control consoles. **DO NOT** turn on electrostatic power to guns.

7. Start a light flow of powder through the feed hoses by adjusting the flow rate and atomizing air regulators on each console. Suggested initial pressure settings are 20 psi for both atomizing and flow rate air. Raise or lower both pressures to establish a light flow.

8. Turn ON and adjust four collector module (fluidizing) air regulators (Items 1, 3, 4, and 6, Fig. 2.4) to 10 psi. Allow powder to accumulate to a few inches depth. Readjust the regulator to give a slight bubbling of powder surface while noting that fluidization will only be seen in four narrow bands beneath the cartridges.

9. Start sieves.

   a. Vibratory—Adjust the sieve air regulator (Item 9, Fig. 2.4) to 50 psi to start the pneumatic vibrator motor. Raise or lower regulator pressure as necessary to just maintain the flow of powder through the screen into the feed hopper.

   b. Rotary—Refer to and follow the instructions given in the appropriate sieve manual. See also the suggested initial air pressure settings for AZO sieves, if used, given in the checklist at the end of this section.

10. Adjust two powder transfer pump air regulators (Items 2, and 5, Fig. 2.4) to 25 psi.

11. Take continuing readings with a hand-held velocimeter until the face velocity through the openings reaches ½ of the initial values recorded in Step 2.

12. Adjust pulse valve air pressure regulator (located inside fan compartment) to 25 psi on the gauge. Pulsed blowdown of the cartridges will become audible about every 45 seconds.

13. Continue to take velocimeter readings until the face velocity through openings again reaches ½ of the recorded initial values.

14. Adjust pulse valve air pressure regulator to 40 psi.

15. Repeat Step 13.

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New Equipment Start Up, cont.

New Cartridge Seasoning, cont.

16. Adjust pulse valve air pressure regulator to 55 psi. Start closing gate valve until the pressure gauge falls to 20 psi during a pulse and reaches 55 psi just prior to the next pulse. (This will prevent starving the powder pumps of air during pulses.)

17. Close seasoning slide dampers. Face velocity should rise to 100 FPM or greater and remain steady.

NOTE: Correct any powder leaks before proceeding further. Refer to Section 6—Troubleshooting for corrective measures.

18. Check for any powder leaks by observing if traces of powder are spitting out or by stopping fan (and powder flow) and by looking for any accumulation on the fan blades.

19. Reinstall the four final filters if no leaks are apparent.

20. Using a velocimeter, verify that the full velocity at openings is 100 FPM or greater. If the face velocity is below this requirement, contact your Nordson representative immediately.

21. Turn off all flow of powder through hoses.

22. Reconnect powder feed hoses to all guns.

At this point in the start up procedure, the user should have the Nordson representative work directly with him to complete settings of guns, pressures, and electrostatic voltages, for the initial powder coating trials.

Gun Activation

Manual Guns (Handguns)

The following steps cover the procedures for using electrostatic powder spray handguns. Refer to the gun manual for troubleshooting procedures.

WARNING! Never operate the equipment if it is not properly connected to a true earth ground. If sparking is noticed between the gun and workpiece, or between the workpiece and any other object, shut down the system immediately to prevent possible fire. Do not restart the system until the fault has been corrected.

WARNING! Wear shoes with conductive soles, e.g., leather. Rubber soles are not conductive. The operator's platform must be grounded. The operator must maintain skin-to-metal contact between his hand and the gun handle to prevent shocks and spark hazards. If the operator must wear gloves, cut away palm or fingers.

WARNING! Remove all jewelry (rings, watches, etc.) before operating or servicing this equipment.

WARNING! Do not make gun adjustments without turning OFF the high voltage output at the power unit or master control console. Turn OFF power and ground the tip before cleaning or changing nozzles on a gun. When a hand gun is not in use, hang the gun so that the nozzle is within 4" (100mm) of a grounded connector.

1. Thoroughly review the handgun and electrostatic power unit manuals, to assure that all components are properly installed, and to become familiar with operating instructions.

2. Verify that the handguns are positioned to spray powder only into the booth enclosure and that the high voltage output switch on the gun control console is OFF.

3. Restore electrical power and compressed air to the system. Verify that the booth exhaust fan is operating and that the powder in the feed hopper and collector module is properly fluidized.

4. Proceed with the steps given in the "Operation" section of the gun control console manual. Observe all safety precautions.

5. Power up conveyor and move parts into the booth enclosure.

6. Test spray items to be coated.

Gun Activation

Automatic Guns

The following steps cover the procedure for activating and spraying powder using automatic electrostatic powder spray guns.

WARNING! Review all safety precautions given at the beginning of this section.

WARNING! Before operating automatic powder guns, make sure that the fire detection system is fully operational.

WARNING! Never operate system equipment unless it is properly connected to a true earth ground. If sparking is noticed between the gun and workpiece, or between the workpiece and any other object, shut down the system immediately to prevent a possible fire or explosion. Do not restart the system until the fault has been corrected.

WARNING! Do not make gun adjustments without turning OFF the high voltage output at the power unit or master control console. Turn OFF power and ground the electrode before cleaning or changing nozzles on a gun.

1. Thoroughly review the gun manual to ensure that all components are properly installed and to become familiar with operating instructions.

2. Verify that the automatic guns are positioned to spray powder only into the booth enclosure and that all high voltage switches are turned OFF.

3. Restore electrical power and compressed air to the system. Verify that the booth exhaust fan is operating and that powder in the feed hopper and collector module are properly fluidized.

4. Power up conveyor and move parts into the booth enclosure.

5. Proceed with the operating instructions in the electrostatic power unit and master control module manuals. Observe all safety precautions. Test spray items to be coated.

6. Refer to Section 6—Troubleshooting, in this manual and in the automatic gun manuals as required.

7. Record all final air pressure and KV settings and post in a visible area on your system for continued reference.

Daily Start-up and Shut-down Procedures

Shutdown

1. Allow powder from collector module to pump back into feed hopper, if possible.
2. Turn OFF power at the electrostatic power units, and/or master control modules.
3. Turn OFF booth fan with the "Exhauster Stop" pushbutton. Turn disconnect switch handle to "OFF."
4. Perform daily preventive maintenance procedures as listed in Section 5—Preventive Maintenance.

Daily Start Up

WARNING! Never operate the equipment if it is not properly connected to a true earth ground. If sparking is noticed between the gun and workpiece, or between the workpiece and any other object, shut down the system immediately to prevent possible fire. Do not restart the system until the fault has been corrected.

1. Perform daily preventive maintenance procedures as listed in Section 5—Preventive Maintenance.
2. Turn disconnect switch handle to "ON."
3. Turn ON exhaust fan.
4. Turn ON power at the master control consoles and/or gun control consoles.
5. Adjust all air pressure and KV settings, as necessary, and/or as recorded.
6. Verify operation of fire detection system.

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Changing Powder Color

Booth Enclosure and Gun Cleaning

Booth enclosure and gun cleaning is necessary to remove all powder residue from those parts of the system that will be exposed to the next color.

Observe the following safety precautions while cleaning the booth and guns.

CAUTION! Wear a filter-type respirator while exposed to dusty conditions. Gloves should be worn whenever handling powder to minimize skin reaction. Obtain and read Material Safety Data Sheets for all powders used.

WARNING! Remove powder from skin with soap and water. Washing in solvents can cause a reaction with components in the powder, resulting in allergies and skin disorders. Wash hands before eating and smoking. Do not use compressed air to blow powder off hands or clothing. This practice may result in damage to eardrums or eyes. Compressed air injected under skin may cause serious injury or even death.

1. Turn ON fan (EXHAUSTER START).
2. Turn OFF all electrical power at the master control modules and/or gun control consoles.
3. Clean guns in accordance with gun manuals included in Section 10—Optional Parts and Equipment.
4. Clean entire interior of booth enclosure using a rubber (non-conductive or non-sparking) squeegee, drawing all powder toward the collector module opening. (The collector module is not normally cleaned for color changes.)
5. Remove the remaining powder residue using an air-powered vacuum equipped with a soft brush. Follow-up by wiping down the booth with a damp, lint-free cloth. After removal of the collector module, a second cleaning of the base pan may be required.
6. Turn OFF exhaust fan.

Changing Powder Color, cont.

Color Change • Non-Reclaim

1. Turn OFF all electrical power and compressed air supply to the system.

WARNING! Bleed off all air pressure from the entire system. Removal of quick-disconnects or hoses while under pressure could result in serious injury.

NOTE: Steps 2 through 9 are necessary only for reclaim to non-reclaim color change.

2. Unbolt and remove feed hopper quick-disconnect plate (with tubing).
3. Store and tie tubing and quick-disconnect plate on the feed hopper. Make sure that tubing clears the floor.
4. Remove ground strap.
5. Unplug rotary electric sieve, if so equipped.
6. Remove flexible vent hose from the side of the collector module and four powder transfer hoses at the transfer pumps. Store with the feed hopper.
7. Unlock and remove the level control sensor (Item 3, Fig. 8.4) from the side of the feed hopper. Store the sensor behind the base leg.
8. Loosen four thumbscrews on the feed hopper clamping guides and back out about 1/4" to disengage the vent gasket between the feed hopper and the collector module.
9. Pull the feed hopper away from the collector module and roll to the right to clear clamping guides. Move to temporary storage.
10. Unbolt and remove collector module quick disconnect plate (Item 2, Fig. 8.7) with tubing. Store quick disconnect on bracket (Item 23, Fig. 8.2).
11. Carefully remove magnetized fabric gasketing skirt (Item 21, Fig. 8.2) joining the base and collector module. Store with collector module for re-use.
12. Release ratchets and disconnect the two clamping straps securing the collector module to the booth base.
13. Roll collector module straight out, taking care to keep hoses and tubing clear. Move to temporary storage. Place storage cover (Item 26, Fig. 8.2) over collector module.

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Changing Powder Color, cont.

Color Change • Non-Reclaim, cont.

NOTE: The presence of excessive amounts of powder in the fan and blowdown compartments indicates cartridge filter leakage. Take corrective action by referring to Section 6—Troubleshooting, before proceeding further.

14. Inspect fan and blowdown valve compartments for accumulation of powder. Vacuum out compartments if necessary.

15. Inspect gaskets of new (alternate color) collector module and replace if damaged.

16. Roll in and position new collector module. Take care not to damage tubing.

17. Level module if necessary. Maintain ¾" between top of the module and the base. (Module must clear base for removal.)

18. Connect one clamping strap. DO NOT tighten.

19. Connect clamping strap on opposite side and snug up.

20. Snug up first clamping strap. Tighten both clamping straps to compress the gasket between the collector module and the blowdown valve compartment, and to activate the limit switch.

21. Inspect the new (alternate color) magnetized gasketing skirt for holes or other damage. Replace if damaged.

NOTE: Be sure that the top edge of the skirt does not extend above the base pan.

22. Lay skirt out on top of the collector module grating with the smooth side facing inward and corners positioned properly. Smooth the skirt into contact with the base frame and top frame of the collector module. Insert the rubber fingers of the skirt ends into the corners between the base floor and the top of the collector module.

23. Connect and bolt up the collector module quick disconnect plate.

24. Position non-reclaim portable feed hopper(s), with powder pumps mounted, adjacent to the booth enclosure.

25. Connect and bolt up feed hopper quick disconnect plate, with tubing, to the base plate.

26. Connect the tubing between guns and powder pumps and between powder pumps and gun control consoles.

27. Connect flexible vent hose from feed hopper to vent connection on the side of the collector module.

Changing Powder Colors, cont.

Color Change • Non-Reclaim, cont.

28. Install a scrap drum lid on top of (user-supplied, fibre, 21-1/2" dia.) 55 gallon drum. Connect four hoses between the transfer pumps on the collector module and the inlets on the drum lid. Plug unused inlets.

29. Clean powder spray guns. Install (alternate color) powder feed tubing between pumps and guns.

30. Install all ground connections.

Color Change • Reclaim

NOTE: If the cartridge filters in the new collector module have not been previously seasoned, perform the seasoning procedures described in previously in this section before proceeding.

1. Follow Steps 1 through 23 for non-reclaim color change.

2. Roll in and position new alternate color feed hopper with powder pumps, tubing and quick disconnect plate. Follow, in reverse order, Steps 2 through 8 for non-reclaim color change.

3. Clean powder spray guns. Install new (alternate color) powder feed tubing between pumps and guns.

4. Connect all ground straps.

Preparation

Before commencing spray operations, complete the color equipment changes as described previously under "Non-reclaim" or "Reclaim".

1. Restore electrical power and compressed air to the system.

2. Start exhaust fan.

3. Fill feed hopper with powder.

4. Verify all functions and settings for air and electrostatic voltage. (Different colors or powders may require adjustment of these settings for optimum coating results.)

5. Color change is complete. Part spraying can begin.

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System Settings

	Initial Set-up	Final Set-up	Subsequent Settings
Primary Air Pressure (plant supply)	80 - 100 psi		
Collector Module			
#1 Fluidizing	10 psi		
#2 Fluidizing	10 psi		
#3 Fluidizing	10 psi		
#4 Fluidizing	10 psi		
#1 & 3 Transfer Pump	25 psi		
#2 & 4 Transfer Pump	25 psi		
Feed Hopper • Reclaim			
Fluidizing	8 psi		
Vent Assist	20 psi		
Feed Hopper • Non-reclaim			
#1 Fluidizing	8 psi		
#2 Fluidizing	8 psi		
#3 Fluidizing	8 psi		
Vent Assist	40 psi		
Pulse Manifold			
After Gate Valve	55 psi		
Fire Detector			
Pressure	12 psi		
Flow #1	60 SCFH		
Flow #2	60 SCFH		
AZO Rotary Sieve			
#1 Flow	100 SCFH		
#2 Flow	100 SCFH		
#3 Pressure	25 psi		
#4 Pressure (vent assist)	20 psi		
Vibratory Sieve			
Pressure	50 psi		
Pulse Timer (TR113)			
OFF Time	45.0 secs.		
ON Time	0.07 secs.		

System Settings, cont.

	Initial Set-up	Final Set-up	Subsequent Settings
Transfer Pump Timers			
TR116 Delay-to-start	60 secs.		
TR117 ON Time (2 settings)	80 secs. (50%)		
	Start / Max.		
Filter Pressure Drop Readings			
Cartridge Filters (in. w.c.)	4.0 / 6.0		
Final Filters (in. w.c.)	1.0 / 3.0		
Guns			
#1 Flow Rate	30 psi		
Atomizing	20 psi		
KV	90/100		
#2 Flow Rate	30 psi		
Atomizing	20 psi		
KV	90/100		
#3 Flow Rate	30 psi		
Atomizing	20 psi		
KV	90/100		
#4 Flow Rate	30 psi		
Atomizing	20 psi		
KV	90/100		
#5 Flow Rate	30 psi		
Atomizing	20 psi		
KV	90/100		
#6 Flow Rate	30 psi		
Atomizing	20 psi		
KV	90/100		
#7 Flow Rate	30 psi		
Atomizing	20 psi		
KV	90/100		
#8 Flow Rate	30 psi		
Atomizing	20 psi		
KV	90/100		

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System Settings, cont.

	Initial Set-up	Final Set-up	Subsequent Settings
Guns, cont.			
#9 Flow Rate	30 psi		
Atomizing	20 psi		
KV	90/100		
#10 Flow Rate	30 psi		
Atomizing	20 psi		
KV	90/100		

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Section 5
Preventive Maintenance

Recommended preventive maintenance guidelines are designed to achieve the best performance and the longest life for the Nordson® NHC-8 Powder Coating System.

These procedures are organized according to the recommended frequency of performance, i.e., daily, weekly, and periodically (those procedures depending upon varying factors, such as operating conditions and the environment).

Regular and thorough maintenance provides better and more cost-effective operation.

Safety Precautions

Observe all safety precautions when performing maintenance procedures for the Nordson® NHC-8 Powder Coating System.

Read and observe the warnings and cautions in Section 1 of this manual before performing the following procedures. Observe the warnings and cautions included with the procedures in this section.

WARNING! Wear a filter-type respirator whenever handling powder containers, filling hoppers, operating spray equipment, or performing maintenance or cleaning operations. Always wear safety glasses. Wear gloves to minimize skin contact with powders. Obtain and read Material Safety Data Sheets for all powders used.

WARNING! Wash skin frequently with soap and water, especially before eating and drinking. Do not use solvents to remove powder from skin. Do not use high pressure compressed air to blow powder off skin or clothes. Compressed air injected under skin can cause serious injury or death.

WARNING! Lock out and tag external power sources at a disconnect switch or breaker in the service line ahead of the electrical equipment before performing maintenance procedures.

WARNING! Whenever undertaking maintenance, or repairs on equipment, make sure that all moving equipment (robots, reciprocators, conveyors, etc.) that could endanger service personnel are shut down and locked out.

WARNING! Reconnect all ground wires and straps when repair is complete.

WARNING! Do not smoke in the spray area.

WARNING! Do not make gun adjustments without turning OFF the high voltage output at the power unit or master control console. Ground tip of gun before changing or cleaning nozzles.

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Daily Maintenance

Booth Enclosure

NOTE: Do not use any type of tack cloths to clean booth.

With the fan ON, clean the booth interior with a rubber squeegee (or other grounded, non-sparking device), pulling the powder to the collector module opening. Wipe down with lint-free cloths.

Vibratory Sieve

Remove the screen basket from the interior of the feed hopper and vacuum out contaminants. Inspect screen and replace if damaged; reconnect ground clip.

Rotary Sieve

Refer to the appropriate manual in Section 10—Optional Parts and Equipment. Empty contaminants from scrap pail on a daily basis and with a soft brush clean out any contaminants from the inside of the screen. Replace the screen if damaged.

Transfer Pumps

1. Remove pumps from the collector module while using a small container to catch the powder. Remove the hoses (to the accumulator) and blow out with a safety-type compressed air gun.

2. Disassemble pump and clean all parts with an air gun and a soft, clean cloth. Replace worn or damaged parts.

Booth Base

NOTE: If significant amounts of powder have accumulated in either compartment, the cartridge filters may be leaking. Correct by referring to Section 6—Troubleshooting.

1. Open and inspect the fan/motor/drive compartment. Vacuum out any powder.

2. Inspect blowdown valve compartment. Vacuum out any powder.

Powder Guns

1. Clean guns in accordance with appropriate manuals included in Section 10—Optional Parts and Equipment.

2. Check cables and gun resistors as described in gun manuals.

Daily Maintenance, cont.

Powder Pumps

Clean pumps as described in pump manuals.

Fire Protection System

Clean detector head lenses every 4 hours. Verify that detector is operating. Check flowmeter for signs of oil or water each day. Correct problem if it occurs.

NOTE: Dryer should remain ON at all times to prevent moisture from accumulating in the system components.

Compressed Air Supply

Open drip leg. Use a clean, white cloth to check for water, oil, or other contaminants. Correct as necessary. Check and correct all regulator settings.

Gun Movers (Oscillators and Reciprocators)

On each shift, check for smooth stroking and proper speed. Correct and adjust if necessary.

Accumulator • Vent Hoses

Vacuum out accumulator and blow out vent hoses.

Air Dryers

Clean and drain filters. See dryer manual included in Section 10—Optional Parts and Equipment.

Part Clearance

Continually check clearance of parts through the booth. Part sizes may change, causing damage to booth and guns.

Grounding

Continually check for grounding of parts to hangers. Resistance between parts and hangers, and hangers and ground, should be no more than one megohm. Clean/strip hangers regularly.

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Weekly Maintenance

Booth Enclosure

Thoroughly clean the booth interior and surrounding area with the exhaust fan ON. Squeegee all powder to the collector module. Vacuum using a soft brush. Wipe down with damp, lint-free cloths.

Guns • Pumps • Hoses

Clean all parts per manuals. Replace worn parts.

Feed Hopper

Remove all powder, squeegee, and vacuum clean.

Collector Module

Remove all powder and vacuum clean. **DO NOT VACUUM CARTRIDGES**. Remove and clean the transfer pumps. Inspect cartridge filters for damage and replace if necessary. Season new cartridges.

Periodic Maintenance

Electrical Connections

Tighten electrical connections and inspect for loose or broken wires.

Guns and Cables

Check gun resistor and electrostatic cable resistance with a megohm meter on a regular basis, as decribed in gun manuals.

Dryer

Check the operation of the air dryer. Refer to manual in Section 10—Optional Parts and Equipment.

Gaskets

Inspect all foam gaskets for damage. Replace using rubber contact cement.

V-belts

Every 6 months, check tension of V-belt drive. Belt deflection should be no more than ½".

Bearings

Every 6 months, lubricate the 2 fan shaft bearings and 2 motor bearings with grease.

a. Shaft bearings . . . . . 2 shots of polyurea or lithium grease
b. Motor bearings . . . . . 2 shots of polyurea or lithium grease

Rotary Sieve (AZO)

Every 3 months, lubricate lip seals of the AZO rotary sieve, if used, per the manual in Section 10—Optional Parts and Equipment.

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Periodic Maintenance, cont.

Filter Gauges

Observe and record readings of differential pressure gauges. Readings should not exceed:

a. Across cartridge filters . . . . . 4.5" - 6" w.c.
b. Across final filters . . . . . 3.0" w.c.

Readings in excess of the above indicate clogging of the filters. Correct problem and replace with new filters. (See Section 6—Troubleshooting.)

Powder Tubing

Check all flexible tubing carrying powder. Blow out tubing ONLY when it is disconnected from guns and pumps. Where powder may have impact-fused inside the tubing, replace tubing.

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Maintenance Check List

Activity	Each Shift	Daily	Weekly	6 Mos.	Color Change
Cleaning					
Booth Enclosure		❑	❑		❑
Collector Module			❑		❑
Accumulator		❑			
Fan/Pulse Valve Compart.			❑		❑
Gun Pumps	❑	❑	❑		
Guns	❑		❑		
Part Grounding	❑				❑
Rotary Sieve		❑			
Transfer Pumps	❑	❑			
Fire Detector Head Lens *	❑				❑
Vent Hoses		❑			
Vibratory Sieve	❑				
Visual Checks					
Air Drip Leg		❑			
Air Dryer Drain		❑			
Cartridge Filter Gauge	❑				
Electrical Connections			❑		
Final Filter Gauge	❑				
Gaskets			❑		
Gun Movers	❑				
Gun Resistors and Cable Resistance			❑		
Part Clearance**	❑				
Powder Levels	❑				❑
Fire Detector Head Lens	❑				❑
V-belts				❑	

Maintenance Check List, cont.

Activity	Daily	Weekly	Monthly	Color Change
Lubrication				
Fan Bearings			❑	
Motor Bearings			❑	
Rotary Sieve ***			❑	

* Every 4 hours.
** Continuously.
*** Every 3 months. (AZO Rotary Sieve.)

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Section 6
Troubleshooting

Troubleshooting guides are provided in chart form to assist the user in finding possible causes of abnormal conditions and to provide suggested corrective measures.

Obvious causes of problems (such as broken wires, disconnected tubes, etc.) are not included in this guide.

Call your Nordson representative if difficulty arises in using a troubleshooting procedure, or if a condition is encountered which is not included here.

How To Use The Troubleshooting Procedures

This section is compiled in chart form to assist you in finding a probable cause to an abnormal condition. Where repair or replacement of components is necessary, refer to Section 7—Disassembly and Repair, and Section 8—Parts Lists.

Charts*

Charts are broken down into the following:

Obvious causes of conditions (such as broken wires, disconnected tubes, etc.) are not included in this guide.

NOTE: *In addition to the troubleshooting procedures in this section, review the troubleshooting procedures in the component manuals included in Section 10—Optional Parts and Equipment.*

If any difficulty should arise using this guide, or a condition is encountered which has not been covered, please contact your Nordson representative for assistance. He will be glad to help you.

*Included in this section is Figure 6.1—Pneumatic Diagram. Refer to the drawing package in Section 10 for electrical schematics.

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Condition A

Powder feed to gun(s) experiencing:
- *Inadequate flow*
- *Surging*
- *Intermittent flow*
- *Spitting*

Probable Cause	Suggested Correction
1. Unsuitable fluidization of feed hopper.	a. Adjust (increase or decrease) fluidizing pressure. b. Proceed to Condition D—Improper Fluidization.
2. Low powder level in feed hopper.	a. Refer to Condition C—Powder Not Transferring.
3. Powder gun pump.	a. Inspect or clean venturi nozzles. Replace if worn. b. Inspect or clean venturi throat. Replace if worn. c. Verify sealing of pick-up tube O-rings. d. Clear obstructions from pick-up tube or hoses. Look for large contaminants floating in powder bed near inlet.
4. Obstruction in tube to gun.	a. Remove feed tube at gun. Look for smooth powder outflow. Remove tube at pump and blow out. b. Eliminate kinks, severe bends, pinching, or any cause of impact fusion. c. Reduce length of hose to 25' maximum and vertical rise of 9' maximum.
5. Severe tribo-charging in feed tube to gun.	a. Contact Nordson representative for alternate tubing material. b. Review problem with powder supplier.
6. Obstruction in gun (flat spray).	a. Refer to appropriate gun manual. Clean nozzle, electrode, and internal passages. b. Replace worn parts.

Condition A, cont.

Powder feed to gun(s) is resulting in: • *Inadequate flow* • *Surging* • *Intermittent flow* *Spitting*	Probable Cause	Suggested Correction
	7. Obstruction in gun (conical spray).	a. Refer to appropriate gun manual. Clean nozzle, electrode, and internal passages. b. Verify that gap between deflector and nozzle is approximately 1/8" all around. c. Replace worn parts.
	8. Flow rate or atomizing pressure.	a. Adjust settings in accordance with appropriate gun control console manual.
	9. Low electrostatic voltage (KV).	a. Increase KV at electrostatic power unit, check KV at gun with KV meter.

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Condition B

Problems with the following when powder coating parts:

- *Uniformity*
- *Edge coverage*
- *Film build*
- *Wrap around*
- *Penetration into recess or corners (Faraday Cage Effect)*

Probable Cause	Suggested Correction
1. Poor part ground (less than 1 megohm to ground).	a. Clean hangers, fixtures, and hooks. b. Assure conveyor grounding.
2. Gun placement.	a. Position guns 10 - 14" from part. b. Stagger guns 24" vertically and 21" horizontally to avoid overlap of spray fan pattern and electrostatic fields. c. Contact Nordson representative and/or powder supplier.
3. Gun pump pressure settings.	a. Change flow rate pressure for more or less powder. b. Change atomizing pressure to alter spray fan pattern and distribution of powder.
4. Electrostatic voltage.	a. Adjust KV settings to: 90 - 100 KV for a large flat surface; 60 - 75 KV for recesses. (Never set below 60 KV.)
5. Gun nozzle selection.	a. Normally use flat spray for large regular-shaped parts. b. Conical spray for deep recesses and most hand touch-up.
6. Powder feed.	a. Refer to Condition A—Powder Feed to Guns.

Condition C

Powder not transferring from collector module to feed hopper.

Probable Cause	Suggested Correction
1. Transfer pump air pressure too low.	a. Increase pressure.
2. Transfer pump clogged.	a. Clean pump.
3. Transfer pump worn.	a. Replace worn parts.
4. Transfer hose clogged.	a. Clean out hose.
5. Sieve screens clogged.	a. Clean out sieves.
6. Accumulator plugged.	a. Clean out inlet ports. b. Clean inside of cyclone.
7. Excessive accumulator venting.	a. Reduce vent-assist air pressure.
8. Feed hopper level control system.	a. Decrease time delay to transfer pump start. b. Increase transfer pump "ON" Time. c. Adjust sensitivity of level control sensor. d. Replace level sensor.
9. Powder "rat-holing" in collector module.	a. Refer to Condition D, Probable Cause No. 1. b. Increase fluidizing pressure.
10. Damp or contaminated powder.	a. Refer to Condition D, Probable Cause No. 2.

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Condition D

Improper fluidization (geysering or dead-bed) in:
- *Collector module*
- *Feed Hopper*

Probable Cause	Suggested Correction
1. Powder level not maintained 6" to 8" in collector module, or at level sensor in feed hopper.	a. Add powder. b. Refer to Condition C—Powder not transferring.
2. Moist or contaminated powder.	a. Check incoming air for water, oil, etc., at drip legs. Correct problem. b. Check for contaminants dripping from the conveyor. c. Replace powder.
3. Fluidizing pressure too high/low.	a. Adjust pressure(s) for slight percolation at surface.
4. Plugged/worn transfer pumps or hose. (Geysering in collector module.)	a. Clean pumps. Replace worn parts. b. Clean hose.
5. Fluidizing plate(s).	a. Inspect for air leakage around flanges of plate. Correct if detected. b. Observe feed hopper fluidizing air gauge pressure for sharp increase or decrease. Replace plate if necessary. c. If no variation in gauge pressure, inspect plate for severe scratches, cracks, polished surface, or discolorization. Replace plate if damaged.

Condition D, cont.

	Probable Cause	Suggested Correction
Improper fluidization (geysering or dead-bed) in: • *Collector module* • *Feed Hopper*	6. Blend of reclaimed and virgin powder.	a. Complete "Daily Maintenance" of booth enclosure. b. Increase or decrease rate of powder transfer from collector module to feed hopper. c. Adjust system so that blend is 3 parts reclaim to 1 part virgin powder.
	7. Non-uniform distribution of powder in bed, i.e., stratification.	a. Increase fluidizing pressure. b. Refer to No. 2 above. c. Refer to No. 5 above.

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Condition E

Final filters:
- *Clogged*
- *Powder in fan compartment*

Probable Cause	Suggested Correction
1. Leaking cartridge filter gaskets.	a. Remove cartridges, clean gaskets, and reinstall.
2. Damaged cartridge filter gaskets.	a. Replace cartridges. (Season new cartridges before use.)
3. Leak (crack or hole) in mouth area of collector module around the cartridge opening.	a. Locate and seal any crack or hole with RTV sealant.

Condition F

Cartridge filters:
- *Clogged (Observe differential pressure gauge)*

Probable Cause	Suggested Correction
1. Inadequate blowdown pulse.	a. Increase pulse pressure. b. Decrease "OFF TIME" of pulse timers.
2. Powder too fine or contaminated.	a. Reduce ratio of reclaim-to-virgin powder. b. Check particle size of powder. c. Replace contaminated powder.
3. Blowdown valves out of position.	a. Position valves according to procedures given in Section 3—Installation.
4. Cartridge seasoning inadequate.	a. Replace cartridges. Season new cartridges properly.

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Condition G

System:
- *Shuts down.*
- *Won't start.*

Probable Cause	Suggested Correction
1. Fire Detection System	a. Follow troubleshooting procedures in fire detection system manual. b. Check grounding of parts.
2. Final filters clogged.	a. Locate source of powder leakage and correct problem. Refer to Condition E—Final Filters Clogged.
3. Collector module not activating limit switch.	a. Tighten collector clamping straps. b. Reposition limit switch. c. Replace limit switch if not functioning.
4. Final filter pressure switch failed.	a. Replace switch.
5. Fuse(s) blown.	a. Replace fuse(s).
6. Electrical failure.	a. Trace circuits and correct problem.

Condition H

Powder:
- *Escaping from booth openings.*

Probable Cause	Suggested Correction
1. Cartridge filters clogged.	a. Observe differential pressure gauge. If gauge reading exceeds 4-1/2" w.c., proceed to Condition F.
2. Cross drafts.	a. Check air conditioning system intake/discharge or other sources.
3. Parts entering booth are too hot.	a. Cool parts before moving into booth.
4. Powder flow exceeds design criteria.	a. Reduce powder flow and/or number of guns.
5. Booth openings exceed design criteria.	a. Close off or decrease size of openings.
6. Seasoning slide dampers open.	a. Close dampers.
7. Parts larger than design specifications.	a. Contact Nordson representative.
8. Guns too close to vestibules or openings.	a. Reposition guns.
9. Fan rotation backwards.	a. Reverse rotation of motor.
10. Air leaks around collector module.	a. Tighten strap clamps between the module and fan section to compress gaskets. b. Inspect gaskets. Replace if damaged. c. Inspect magnetic seal skirt between base pan and module. Assure integrity of seal. Replace if damaged.

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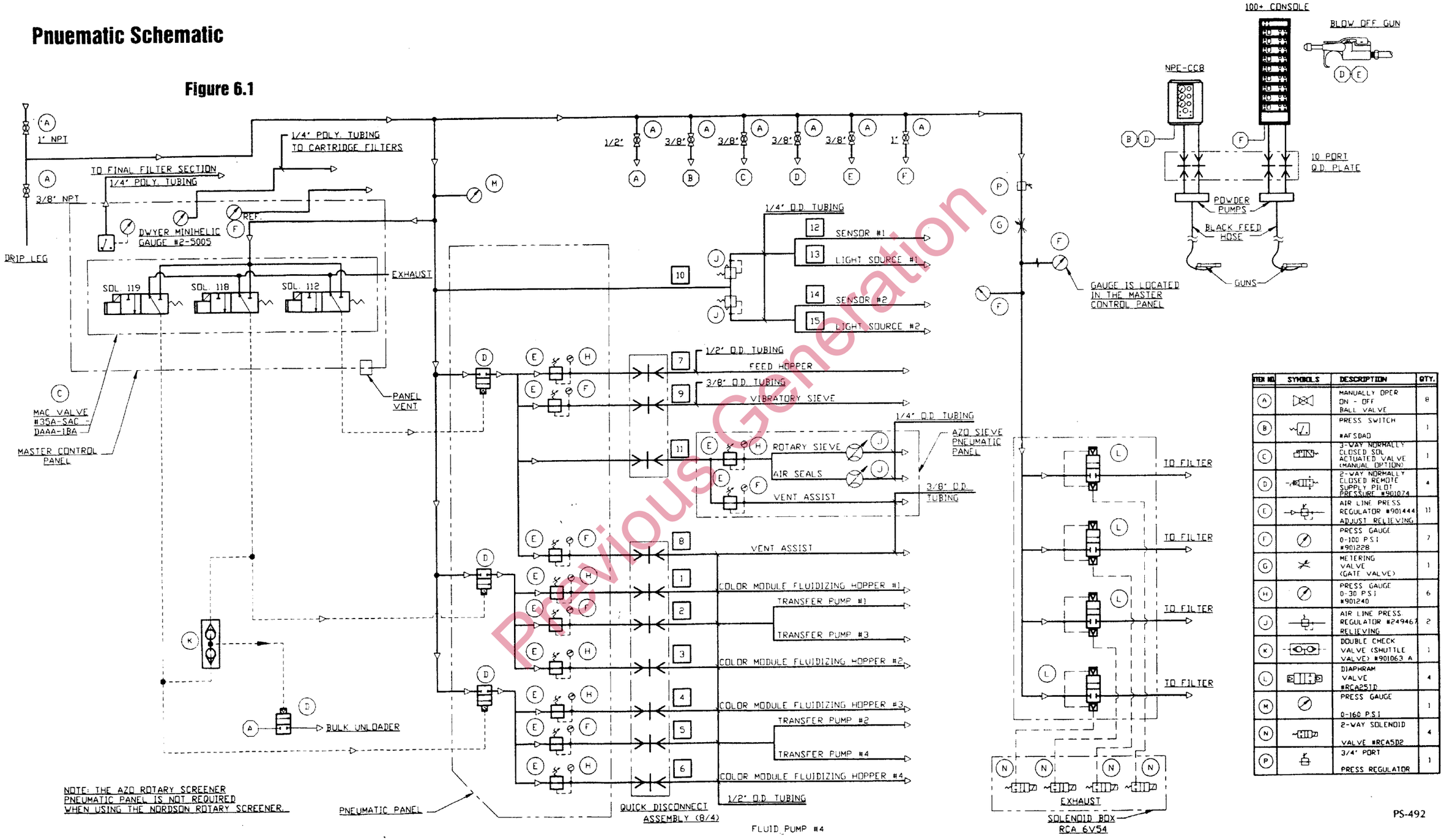
Pnuematic Schematic

Figure 6.1



ITEM NO.	SYMBOLS	DESCRIPTION	QTY.
A		MANUALLY OPER ON - OFF BALL VALVE	8
B		PRESS SWITCH #AFSDAD	1
C		3-WAY NORMALLY CLOSED SOL ACTUATED VALVE (MANUAL OPTION)	1
D		2-WAY NORMALLY CLOSED REMOTE SUPPLY PILOT PRESSURE #901074	4
E		AIR LINE PRESS REGULATOR #901444 ADJUST RELIEVING	11
F		PRESS GAUGE 0-100 P.S.I #901228	7
G		METERING VALVE (GATE VALVE)	1
H		PRESS GAUGE 0-30 P.S.I #901240	6
J		AIR LINE PRESS REGULATOR #249467 RELIEVING	2
K		DOUBLE CHECK VALVE (SHUTTLE VALVE) #901063 A	1
L		DIAPHRAM VALVE #RCA251D	4
M		PRESS GAUGE 0-160 P.S.I	1
N		2-WAY SOLENOID VALVE #RCA5D2	4
P		3/4" PORT PRESS REGULATOR	1

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Section 7
Disassembly and Repair

This section contains instructions for repair and replacement of various parts of the Nordson® NHC-8 Powder Coating System. Instructions describe the process of taking components apart, repair or replacement of key parts, and putting the assemblies together again.

Those sub-assemblies which are discussed in standard manuals provided in Section 10—Optional Parts and Equipment are not covered here. Refer to the Checklist in that section for a listing of provided manuals.

Safety Precautions

General Safety Guidelines

Observe all safety precautions when servicing the Nordson® NHC-8 Powder Coating System.

Read and observe the warnings and cautions in this section as well as those in Section 1 of this manual when servicing your Nordson® NHC-8 Powder Coating System.

WARNING! Do not allow unqualified personnel to service electrical equipment.

WARNING! Whenever handling powders, wash skin frequently with soap and water, especially before eating or drinking. Do not use solvents to remove powder from skin.

WARNING! Do not use high pressure compressed air to blow powder off skin or clothes. Compressed air injected under skin can cause serious injury or death.

WARNING! Remove all jewelry (rings, watches, etc.) before operating or servicing equipment.

WARNING! Whenever undertaking maintenance or repairs on equipment, make sure that all moving equipment (robots, reciprocators, conveyors, etc.) that could endanger service personnel are shut down and locked out.

WARNING! Reconnect all ground wires and straps when repair is complete.

WARNING! Use approved replacement parts only. The use of unapproved parts may void any agency approvals.

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Cartridge Filters

Removal and Replacement

Refer to Figure 8.2. (Collector Module)

The following steps cover the removal of spent cartridge filters and their replacement with new filters.

WARNING! Wear a filter-type respirator whenever handling powder containers, filling hoppers, operating spray equipment, or performing maintenance or cleaning operations. Always wear safety glasses.

WARNING! Shut off compressed air supply, and disconnect and lock out primary electrical service to the system, before performing the following procedures.

1. Bleed off all air pressure from the system.
2. Unbolt and remove quick disconnect plates (with tubing) at booth base.
3. Remove feed hopper in accordance with Section 3—Installation Procedures. Roll aside.
4. Remove collector module from beneath the booth base in accordance with Section 3—Installation Procedures. Roll aside to suitable working area. (If necessary, remove excess powder from the module so that the cartridge filter support rods are above the powder level.)
5. Remove protective expanded metal grating from the top of the collector module.
6. Back out four end plate torque screws (Item 8) to relieve all pressure on the cartridges and allow clearance for removal.
7. Unscrew four cap screws with washers (Items 28 & 29) from the tension rods on the closed end. Save for reuse.
8. Unscrew bolts with washers on opposite end, while holding the tension rods. Save rods, screws, and washers for reuse. Cartridges will now rest on the module support rods.
9. Push cartridges toward the closed end of the module and remove. Remove the four cartridges at the open end of the module first.
10. Carefully pry end plates (Item 6) from closed end cartridges. Clean RTV sealant from end plates.

Cartridge Filters, cont.

Removal and Replacement, cont.

*NOTE: New cartridges must always be seasoned in accordance with the procedures in Section 4—Operation, under "New Equipment Start Up." **Do not** use any cartridge filters other than those approved by Nordson. The use of cartridges not specifically designed to Nordson standards could seriously affect the operation and performance of your system.*

11. Locate eight new cartridge filters: four with open ends (P/N 101413), and four with one closed end (P/N 101414).

12. Remove cartridges from cartons and carefully inspect for damage. **DO NOT** use damaged cartridges.

13. Apply a few short beads of RTV sealant around the recessed diameter of the concave closed ends of the four cartridges. Place a clean end plate in the closed end recess of each cartridge. The sealant will hold the plate in place for reassembly, after it has been allowed to cure for about 60 minutes.

14. Install the four closed end cartridges, with the end plate, in the collector module. Make sure they are resting on the support rods. Push the cartridges to the end so that the end plate engages the torque screw. Note that the end plate is counter-bored for the torque screw.

15. Install the four open end cartridges with the bare steel ends engaging the rubber gaskets on the previously installed cartridges. The gaskets on the opposite ends will compress against the collector module front wall plate, around the four large openings.

16. Install the tension rods removed in Steps 7 and 8. Install cap screws and washers and tighten.

NOTE: Tightening in excess of this torque specification can cause damage to cartridges.

17. Tighten torque screws to 120-144 inch-pounds maximum, using a torque wrench. Inspect the cartridges for alignment and gasket sealing, using a feeler gauge.

18. Replace the protective expended metal grating removed in Step 5.

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Final Filters

Replacement

Refer to Figure 8.1.

Follow these procedures if it becomes necessary to replace the final filters.

WARNING! The interior of the fan compartment contains moving parts which can cause serious personal injury. Never put hands inside when power is available to the fan. Disconnect and lock out primary electrical service before performing the following procedures.

1. Turn OFF exhaust fan. Disconnect and lock out power to system at service disconnect ahead of electrical control cabinet.
2. Back out the capscrews (Item 40) securing the filter brackets to the base. The brackets will spring away from the filter. Remove the top bracket.
3. Remove and discard the filters.
4. Remove new final filters from carton and inspect for damage. Do not use damaged filters.
5. Insert new filters between the brackets and align so the filters overlap the opening equally on all four sides. Install the top bracket.
6. Loosely tighten capscrews on top and bottom brackets, to hold filters in place. Check filter alignment to ensure sealing around all four sides.
7. Tighten capscrews, so that gaskets are compressed. **DO NOT** overtighten or filter may be crushed.
8. Restart exhaust fan.

Transfer Pumps

Clean or Repair

Refer to Figure 8.8.

The following procedures should be used to clean or repair the transfer pumps.

WARNING! Wear a filter-type respirator whenever handling powder containers, filling hoppers, operating spray equipment, or performing maintenance or cleaning operations. Always wear safety glasses.

1. Remove powder from the collector module, or place a container under the pumps to catch powder.
2. Remove both incoming air tubing and outgoing powder hose from the pump.
3. Gently work the pump body from the mounting fitting welded to the collector module. Care should be taken that the internal O-ring (Item 6) is not damaged.
4. Gently work out the venturi throat (Item 1) and air nozzle (Item 4).
5. Unscrew the elbow fitting (Item 5).
6. Clean all parts using an OSHA approved air gun, and a clean, soft, and lint-free cloth.
7. Inspect all parts for wear or damage. Replace worn or damaged parts.

NOTE: *Do not use any lubricant on O-rings.*

8. Reassemble the pump. Press the pump back into the mounting fitting on the collector module and reconnect air and powder tubing.

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Collector Module Fluidizing Plates

Replacement

Refer to Figure 8.2.

Replacement of the fluidizing plates will be a rare and unusual occurrence resulting from either physical damage or contamination of the air supply or powder. If replacement is necessary, it is very important that these instructions be carefully followed.

WARNING! Wear a filter-type respirator whenever handling powder containers, filling hoppers, operating spray equipment, or performing maintenance or cleaning operations. Always wear safety glasses.

WARNING! Shut off compressed air supply and bleed off pressure before performing the following procedures.

1. Pump powder from the collector module (if reclaim system). Remove the feed hopper from the collector module, and remove the collector module from the booth base. Move the collector module to a suitable work area. Refer to the procedures in Section 4 under the heading "Color Change".

2. Remove cartridge filters as described in this section under the heading "Cartridge Filters—Removal and Replacement."

3. Remove powder from the collector module. Vacuum module and wipe clean with damp, lint-free cloths.

4. Remove flexible tubing, vent assist, and transfer pumps from the collector module.

WARNING! Use proper equipment and keep personnel clear when handling heavy structures.

5. Turn collector module over so that the bottom, or plenum, is on top.

6. Loosen cap screws from the clamping channels (Items 16 & 22). Back out cap screws about ¼-⅜" to clear the gaskets. Remove channels with screws and save for reuse.

7. Remove four plenums (Item 18) from the module. Thoroughly clean the plenums. If water or oil contamination is evident, the source of the contamination must be found and eliminated before the system is put back into service.

8. Remove four fluidizing plates (Items 15) with gasket and discard.

Collector Module Fluidizing Plates, cont.

Replacement, cont.

9. Verify fit of new fluidizing plates to plenums and module. Clean new fluidizing plates, using a dry brush and lint-free cloth. Clean module and plenum mating surfaces.

10. Position fluidizing plates and gaskets on module and carefully align with the flanges on all four sides. Position plenums on top of the fluidizing plates and align on all four sides.

11. Install clamping channels over the plates, gaskets, and flanges.

12. Tighten the clamping channel capscrews in a criss-crossing pattern to prevent flange distortion and plate damage. Use a torque wrench and tighten to 25 inch-pounds.

13. Using the proper handling equipment, turn collector module right side up.

14. Inspect cartridge filters for damage, and replace if necessary. (New cartridges **MUST** be seasoned before use—refer to seasoning procedure in Section 4.)

15. Replace protective grating, vent assist, transfer pumps, and tubing.

16. Install collector to booth base and resume operations.

*NOTE: **Do not** use any cartridge filters other than those approved by Nordson. The use of cartridges not specifically designed to Nordson standards could seriously affect the operation and performance of your system.*

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Feed Hopper

Disassembly and Repair

Refer to Figures 8.4.

Disassembly and repair of the feed hopper is broken down into sections. The first sections (removal of rotary sieve or vibratory sieve, and powder pumps) are necessary to prepare for replacement of the feed hopper fluidizing plate.

WARNING! Wear a filter-type respirator whenever handling powder containers, filling hoppers, operating spray equipment, or performing maintenance or cleaning operations. Always wear safety glasses.

WARNING! Shut off compressed air supply, and disconnect and lock out primary electrical service to the system, before performing the following procedures.

1. Relieve system air pressure. Remove all flexible hoses and tubing from feed hopper, powder pumps and sieve, if used.
2. Disconnect and lock out system electrical power. Unplug electrical connections to feed hopper and rotary sieve, if used.
3. Remove the feed hopper level sensor.
4. Remove the feed hopper to a suitable work area.
5. Remove powder pumps.
6. Remove powder, and thoroughly clean hopper and sieve.

Removing Nordson Rotary Sieves

Refer to Figure 8.5.

Rotary Sieves may be disassembled while mounted on the feed hopper. Refer to the appropriate manual in Section 10—Optional Parts and Equipment.

1. Remove vent hose from accumulator. Unbolt and remove accumulator from rotary sieve. Save gasket, nuts, bolts, and washers for reuse.
2. Remove hose clamps, discharge hose, pail, and shelf (Items 8, 13, 16, & 17). Save all parts removed for reassembly.

NOTE: *Sieve is heavy. Get help when removing.*

3. Remove nuts, bolts, and washers securing pedestal (Item 18) to feed hopper. Lift sieve and pedestal off hopper. Refer to sieve manual for further disassembly of sieve, if necessary. Clean sieve and accumulator before reinstalling.

Feed Hopper, cont.

Removing AZO Rotary Sieve

1. Remove vent hose from accumulator. Unbolt and remove accumulator from rotary sieve. Save gasket, nuts, bolts, and washers for reuse.

2. Remove bolts, nuts, and washers holding sieve to pedestal.

3. Lift sieve off pedestal and set aside. Remove bolts, nuts and washers holding pedestal to hopper cover. Remove pedestal and set aside.

4. Refer to sieve manual for further disassembly of sieve, if necessary. Clean accumulator before reinstalling.

Removing Vibratory Sieves

Refer to Figure 8.6.

1. Reach inside the hopper and disconnect the ground wire clip.

2. Remove bolts and washers from the hopper cover.

3. Lift the cover (with accumulator and sieve) straight up and out of the hopper. Remove to a work bench for further disassembly. Place blocks under the cover to prevent damage to the screen assembly.

4. Remove sieve basket by unfastening the retaining spring. Discard powder residue and vacuum out sieve. Reattach basket if no further disassembly is necessary. Replace basket if damaged. If no further disassembly is necessary, disregard Steps 5 through 7.

5. To remove vibrator motor, remove 2 flexible tubes, 1 bolt, and 1 spacer.

6. Remove accumulator from sieve and disassemble rest of sieve. Note position of screws, washers, nuts, rubber grommets (or washers), and gaskets for later reassembly.

7. Clean accumulator and sieve parts to remove powder residue.

8. Reassemble in reverse order. Replace caps over unused accumulator inlet tubes.

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Feed Hopper, cont.

Powder Pumps

Refer to Manual No. 32-8.

1. Gently work the pump housings off the adapters (Ref. No. 1, Figure 4). Do not damage O-rings.
2. Remove powder feed tubes (Ref. No. 6) inside the hopper.
3. Remove retainer plates (Ref. No. 8) from inside the hopper and disassemble pump retainers (Ref. No. 7) and pickup tubes (Ref. No. 2).
4. Clean all parts of the pump. Inspect all O-rings. Replace if necessary.
5. Reassemble pumps for later mounting on the hopper.

Fluidizing Plate

NOTE: *Sieve (if used), pumps, and cover must be removed prior to replacement of the fluidizing plate.*

1. Remove all powder and vacuum interior.
2. Turn over feed hopper so that the bottom, or plenum, is now on top.
3. Follow Steps 6 through 12 in "Collector Module Fluidizing Plates Replacement" in this section.
4. Turn the feed hopper back over to the normal position on casters.
5. Reassemble pumps, sieve, and cover. Reconnect flexible tubing and vent hose.
6. Reinstall the feed hopper to the booth base.

Blowdown Pulse Valves

Access and Replacement

Refer to Figure 8.1.

The 4 pulse valves are located in the booth base fan compartment. Access to the valves is through a large opening underneath the booth base pan.

WARNING! Shut off compressed air supply, bleed off air pressure, and disconnect and lock out primary electrical service to the system before performing the following procedures.

1. Verify that electrical power and compressed air are shut down and locked out. Bleed off all air pressure from the system.
2. Remove feed hopper and collector module.
3. Disconnect rubber hose (Item 20) at square manifold (Item 22).
4. Remove bolts, flat washers, and lockwashers (Items 27, 28 & 29) from the adjustable mounting brackets and lay square manifold, with pulse valves, on floor.
5. Disconnect four 1/4" tubing lines from the pulse valves.
6. Unscrew pulse valve(s) from the pipe nipple on the pulse manifold.
7. Unscrew tube fitting (Item 25) from the top of the valve(s) (24).
8. Wrap Teflon tape around threads of tube fitting and screw fitting into top of new valve(s).
9. Wrap Teflon tape around threads of pipe nipples (23). Screw new valves onto pipe nipples. Position valves so that the final positioning of the valves will tighten on the threads and form an air-tight seal.
10. Reconnect the four 1/4" tubing lines.
11. Position manifold with valves on brackets and secure with bolts, flat washers, and lock washers. Do not tighten bolts.
12. Adjust the manifold IN or OUT to give 18-1/4" from the end of the nozzles to the fan compartment opening. Tighten the bolts.

NOTE: *Removal of the limit switch will permit better access to the valves. If the limit switch is removed, refer to the adjustment procedures in Section 3, under the heading "Final System Assembly" when reinstalling.*

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Blowdown Pulse Valves, cont.

Access and Replacement, cont.

13. Position and tighten valves on the pipe nipples so that nozzles are 17" apart center-to-center and 10-3/8" from the center of the nozzles to the side walls.

14. Reconnect the rubber air supply hose to the manifold.

15. Reinstall the limit switch (if removed), and verify that the switch is operating normally.

Fan • Motor • V-Belt Drive

Refer to Figure 8.1.

V-belt Replacement

WARNING! The interior of the fan compartment contains moving parts and electrical potentials which can cause serious personal injury. Never put hands inside when power is available to the fan. Disconnect and lock out primary electrical service before performing the following procedures.

1. Remove motor access panel (Item 43). Locate the motor sliding base hex head locking screws.
2. Loosen the screws until the V-belts (Item 11) are loose enough to be rolled off the sheaves (pulleys).
3. If the V-belts are to be replaced, use only properly sized, matched belts. Roll the belts onto the sheaves, making sure that the V-sections are seated in the appropriate grooves.
4. Turn the sliding base locking screws until the belts are tightened. Depress belts midway between the sheaves; when properly tightened, the belts should not deflect more than ¼ to ½".

Motor Replacement

WARNING! The interior of the fan compartment contains moving parts and electrical potentials which can cause serious personal injury. Never put hands inside when power is available to the fan. Disconnect and lock out primary electrical service before performing the following procedures.

1. Remove V-belts as described previously.
2. Remove four nuts holding the motor feet to the sliding base and pull the motor from the compartment.
3. Remove the flexible conduit and disconnect the three wires from the motor leads.
4. Remove the taper-lock sheave (Item 14) from the motor by loosening three capscrews and pulling the sheave off the shaft. Save the capscrews, sheave and key for reuse.
5. Follow Steps 1 through 5 in reverse to replace the motor and V-belt drive. Tighten V-belts as described previously. Restore electrical power and start fan. Check for proper fan rotation direction.

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Fan • Motor • V-Belt Drive, cont.

Refer to Figure 8.1.

Fan Removal

WARNING! The interior of the fan compartment contains moving parts and electrical potentials which can cause serious personal injury. Never put hands inside when power is available to the fan. Disconnect and lock out primary electrical service before performing the following procedures.

1. Remove V-belts and motor as described previously.

2. Remove four bolts attaching fan assembly to the booth base structure. Remove the two bottom bolts. Block under the assembly. Remove the two top bolts.

3. Pull the assembly straight towards the end of the compartment. Do not damage the inlet cone (Item 34) or the fan wheel (Item 35). Remove the fan drive assembly through the motor access panel.

4. The fan wheel (Item 35) is removed from the shaft (17) by loosening two square head set screws and then pulling the wheel off the end of the shaft. Save shaft key for reuse.

5. If the bearings (18) or shaft must be replaced, the shaft must be removed first. Loosen the shaft locking collar set screws and pull the shaft out of the bearings, towards the sheave end.

6. If replacing the shaft, remove the taper-lock sheave (10) and key and install on the new shaft.

7. If replacing the bearings, remove the four bolts from the bearing and frame. Save the locking collar(s) for reuse. Use only specified bearings as replacements.

8. Follow Steps 1 through 7 in reverse to reassemble and reinstall the fan in the compartment.

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Section 8
NHC-8 Powder Coating System Parts Lists

This section includes illustrated parts lists for the Nordson® NHC-8 Powder Coating System.

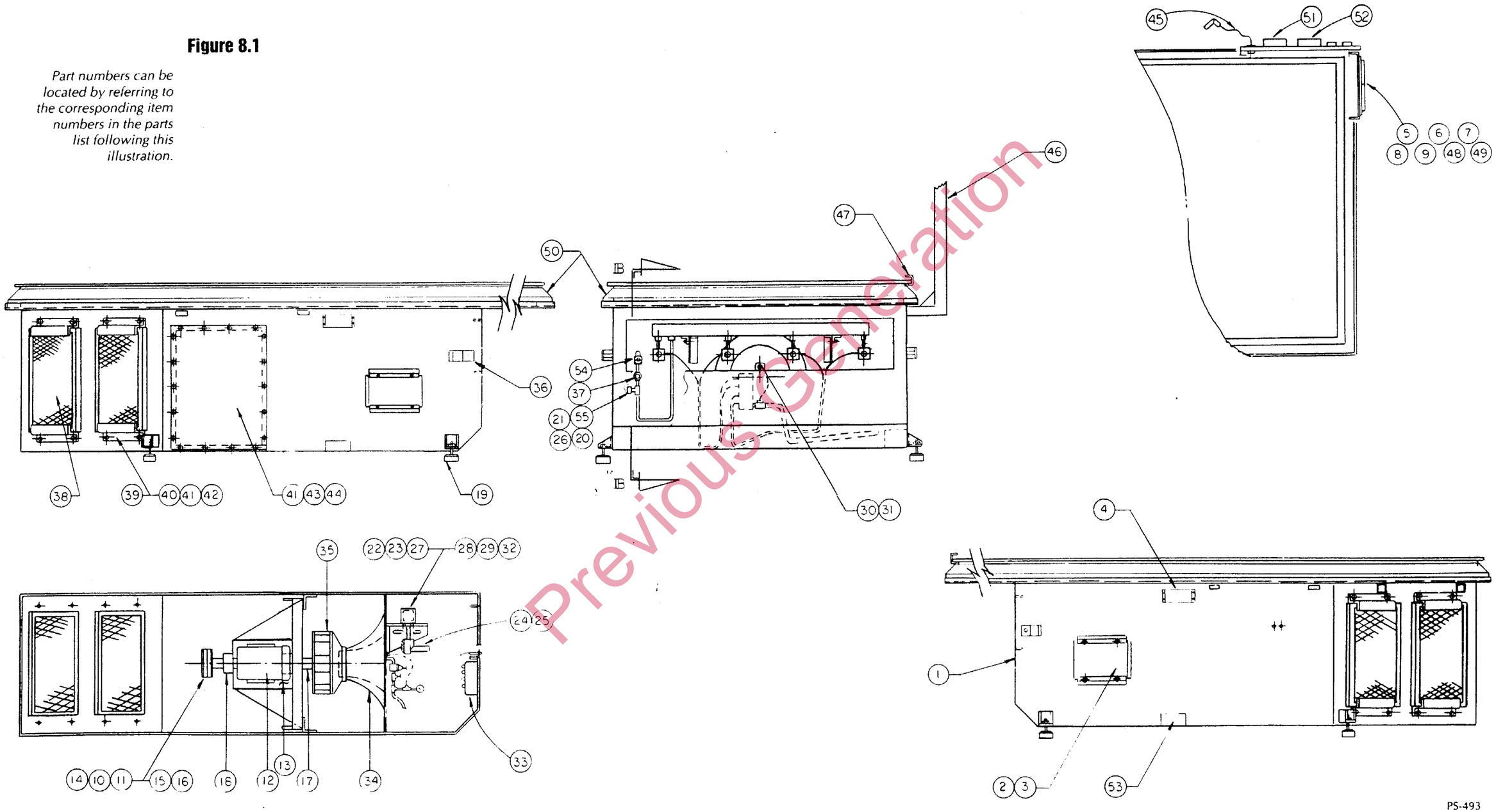
Various assemblies and components are shown and referenced by item number where appropriate.

Item numbers can be identified by studying the appropriate illustration.

Fixed Booth Base

Figure 8.1

Part numbers can be located by referring to the corresponding item numbers in the parts list following this illustration.



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Booth Base Parts List

Item #	Part #	Description	Qty.
1.		Booth Base, NHC-8	Ref.
2.		Slide Damper	2
3.		Thumbscrews, 1/4-20 x 1-1/4"	8
4.		Junction Box, Electrical	2
5.		Base Plate, Quick-disconnect	1
6.		Cap Screw, 1/4-20 x 1-1/4"	4
7.		Nut, Hex, 1/4-20	4
8.		Washer, Flat, 1/4"	4
9.		Washer, Lock, 1/4"	4
10.		Sheave, Fan, 2B54Q (Browning)	1
11.		V-belt, B-52, Matched	2
12.		Motor, 10hp, 1725RPM, 215T Frame	1
13.		Frame, Fan/Motor Support	1
14.		Sheave, Motor, 2TB48 (Browning)	1
15.		Bushing, Fan, Q1 (Browning)	1
16.		Bushing, Motor, P1 (Browning)	1
17.		Shaft, Fan, 1-15/16" x 35-1/2"	1
18.		Bearing, 1-15/16" I.D.	2
19.		Pad, Leveling	4
20.		Hose, Rubber, 3/4" I.D.	1
21.		Clamp, Hose	2
22.		Manifold, Blowdown	1
23.		Nipple, 1", Close	4
24.		Valve, Goyen, RCA25TD (T513)	4
25.		Elbow, Male, 1/4"T x 1/4"NPT	4
26.		Fitting, Barbed, 3/4"NPT x 3/4"	1
27.		Screw, Cap, 3/8-16 x 1-1/2"	2
28.		Washer, Flat, 3/8"	2
29.		Washer, Lock, 3/8"	2
30.		Sensor, Proximity, Inductive, 2mm Range	1
31.		Bracket, Mounting, Sensor	1
32.		Bracket, Mounting, Manifold	2
33.		Enclosure, Solenoid Valves, RCA6V54	1
34.		Cone, Inlet, Aluminum	1
35.		Fan, Airfoil, SQA Plug Fan, w/Drive Panel & Adjust. Motor Base	1
36.		Attachment, Bracket, Racket Strap	2
37.		Valve, Gate, 3/4"NPT	1
38.	101 432	Filter, Final	4
39.		Bracket, Mounting (898973)	8
40.		Screw, Cap, 5/6-18 x 1-1/4"	16
41.		Washer, Flat, 5/16"	29
42.		Spring, Compression	16
43.		Cover, Motor Access	1
44.		Screw, Cap, 5/16-18 x 3/4"	21
45.	601 367	Sensor, Level Control	1

Parts list continued on following page.

Booth Base Parts List, cont.

Item #	Part #	Description	Qty.
46.		Bracket, Mounting, Control Panel	2
47.		Clamp, C-section, Booth Enclosure	20
48.	972 192	Elbow, Male, 1/2"T x 1/4"NPT	16
49.	971 299	Connector, Male, 1/2"T x 1/4"NPT	4
50.		Panel, Cover	10
51.		Receptacle, Sieve Motor	1
52.		Receptacle, Limit Switch	1
53.		Trough, Powder Feed Hose	1
54,		Regulator, Air Pressure, 3/4" NPT	1
55		Gauge, Air Pressure, 0-100 psi	1

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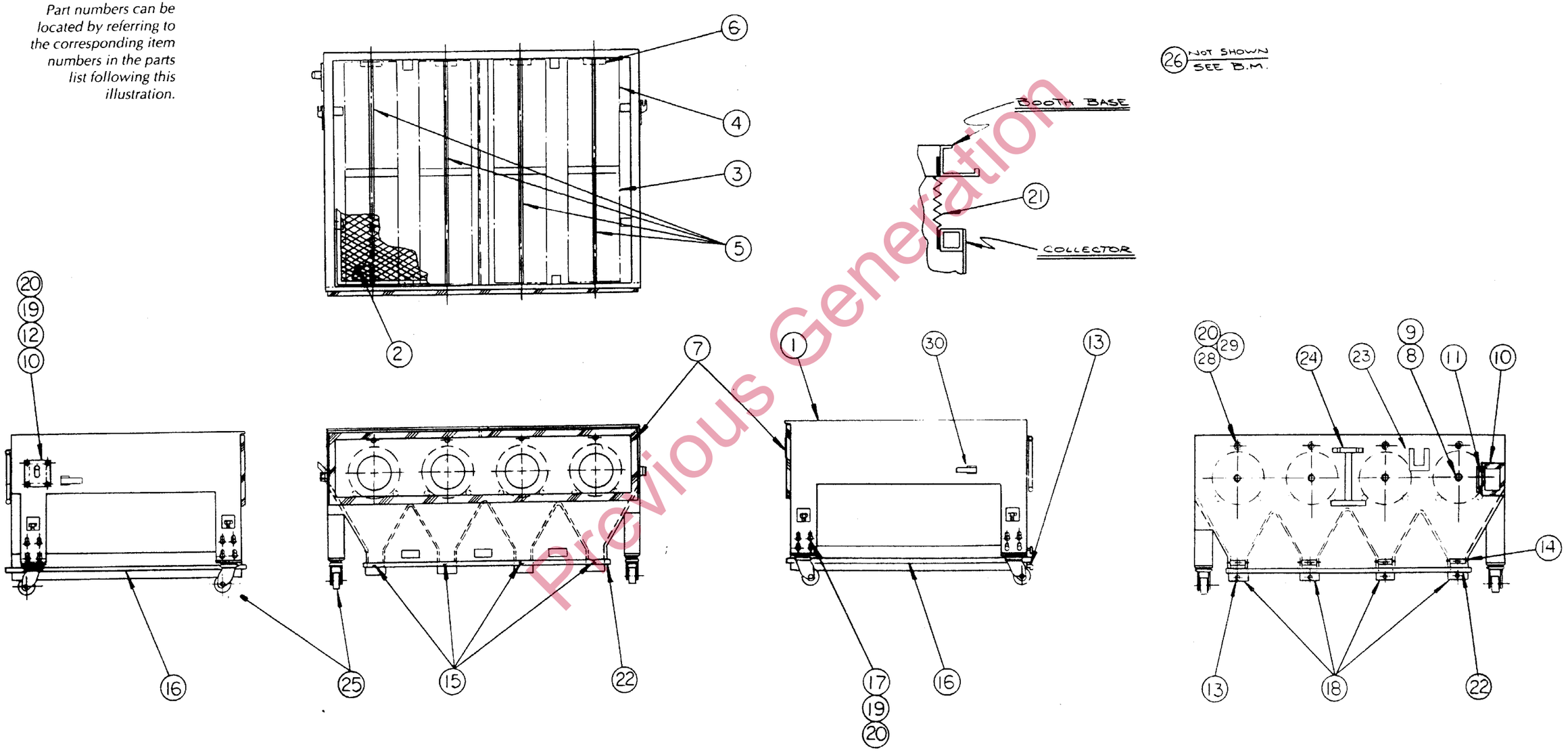
Collector Module

Figure 8.2

Part numbers can be located by referring to the corresponding item numbers in the parts list following this illustration.



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Collector Module Parts List

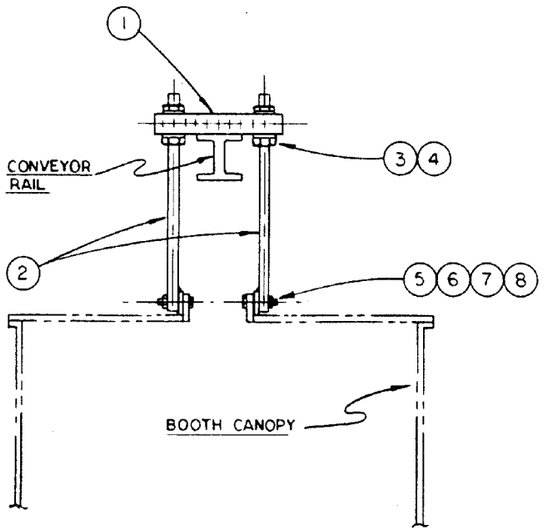
Item #	Part #	Description	Qty.
1.		Hopper, Collector	1
2.		Grating, Removable	1
3.	101 413	Cartridge Filter, HFT	4
4.	101 414	Cartridge Filter, HCE	2
5.		Rod, Tension	4
6.		End Plate, Cartridge	4
7.		Gasket, Mouth, 1" x 1-1/4"	ASR
8.		Screw, Torque, 1/2-13 x 3/4"	4
9.		Nut, 1/2-13	4
10.		Gasket, Vent, 1/2" x 1"	ASR
11.		Thumbscrew, 1/4-20 x 1"	2
12.		Vent Assist, 2"	1
13.		Elbow, Male, 1/2"T x 1/2"NPT	4
14.	244 721	Pump, transfer	4
15.		Plate, Fluidizing, w/Gasket	4
16.		Clamp, C-section, w/Screws	8
17.		Bracket, Caster, Adjustable	4
18.		Plenum, Fluidizing, Collector	4
19.		Screw, Cap, 3/8-16 x 3/4"	16
20.		Washer, Flat, 3/8"	16
21.		Skirt, Seal, Magnetic	1
22.		Clamp, C-section, w/Screws	2
23.		Bracket, Quick-disconnect	1
24.		Handle	1
25.		Caster, Swivel, 4"	4
26.	134 692	Cover, Storage	1
27.	900 551	Hose, Transfer, 3/4 I.D.	ASR
28.		Screw, Cap, Hex Hd, 7/16-14	8
29.		Washer, Flat, 7/16"	8

Note: ASR - As Required. Order quantity required for replacement. Flexible tubing and hose should be ordered in increments of one foot.

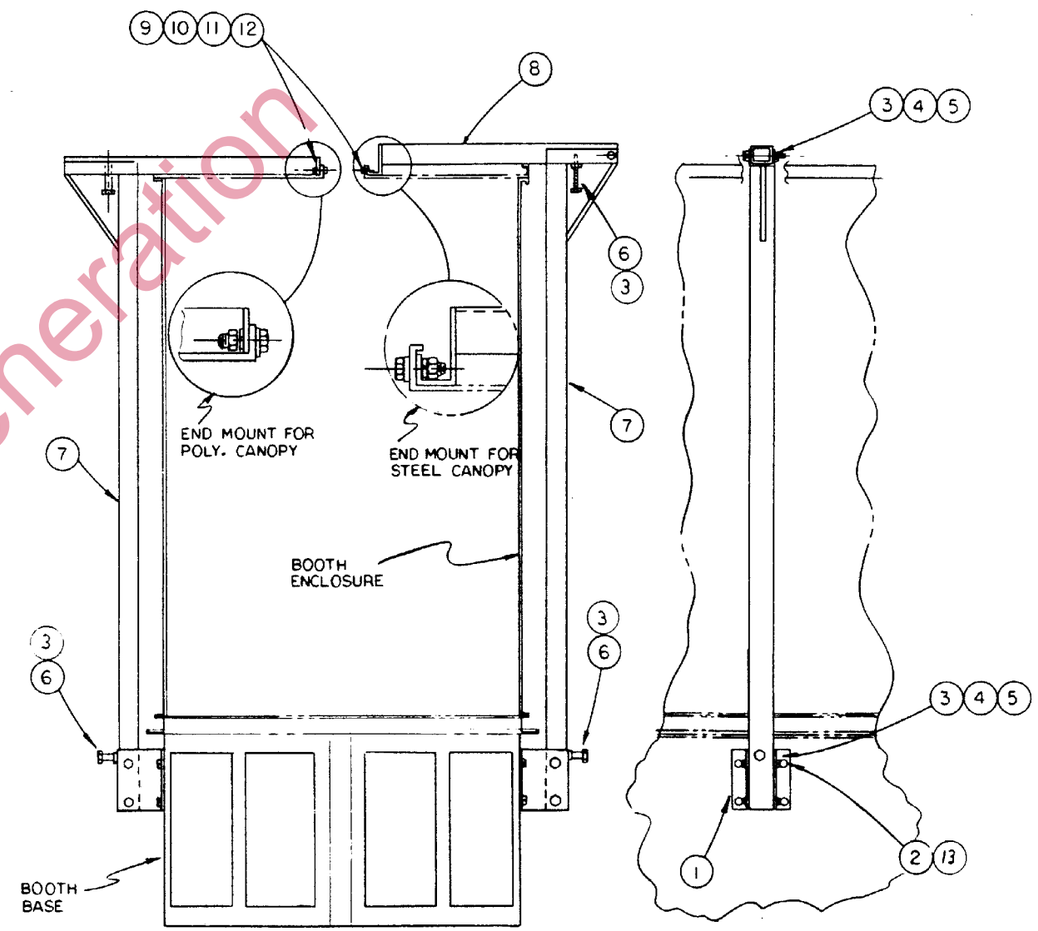
Roof Supports

Figure 8.3

Part numbers can be located by referring to the corresponding item numbers in the parts list following this illustration.



CONVEYOR MOUNT



BASE MOUNTED

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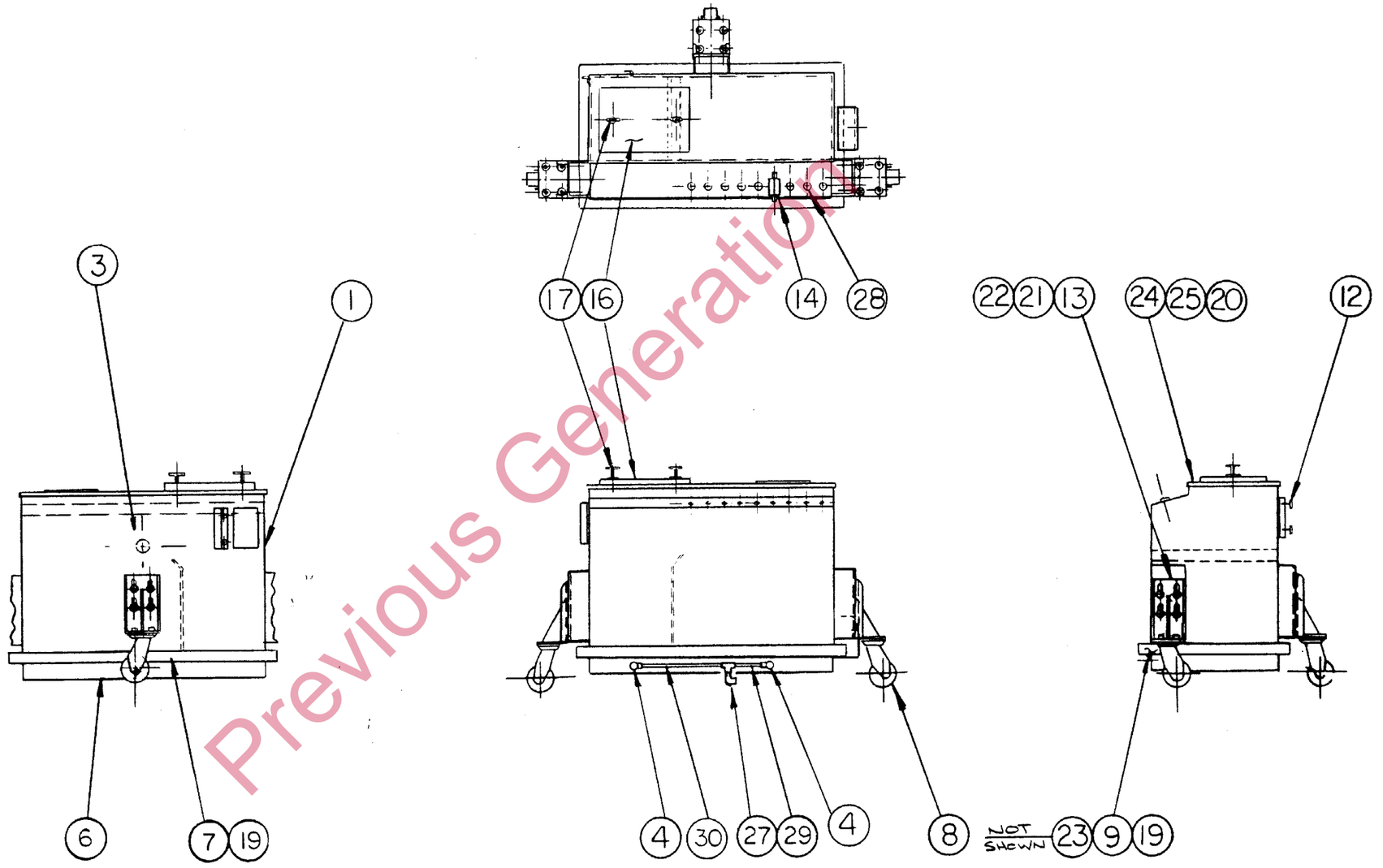
Roof Supports Parts List

Item #	Part #	Description	Qty.
A. Base Mounted			
1.		Bracket, Base Mount	1
2.		Screw, Cap, 3/8-16 x 1-1/2"	4
3.		Nut, Hex, 1/2-13	5
4.		Washer, Steel, 1/2"	6
5.		Screw, Cap, 1/2-13 x 3-1/2"	3
6.		Bolt, Vertical Adjusting, 1/2-13 x 6"	2
7.		Column, Vertical Support	1
8.		Beam, Horizontal Roof Support	1
9.		Bolt, Carriage, 5/16-18 x 1-1/4"	2
10.		Nut, Hex, 5/16-18	2
11.		Washer, Steel, 5/16"	2
12.		Washer, Lock, 5/16"	2
13.		Washer, Flat, 3/8"	4
B. Conveyor Mounted			
1.		Bracket, Beam	1
2.		Rod, Threaded, w/Roof Bracket	2
3.		Nut, Hex, 3/8-16	2
4.		Washer, Steel, 3/8"	2
5.		Bolt, Carriage, 5/16-18 x 1-1/4"	2
6.		Nut, Hex, 5/16-18	2
7.		Washer, Steel, 5/16"	2
8.		Washer, Lock, 5/16"	2

Feed Hopper

Figure 8.4

Part numbers can be located by referring to the corresponding item numbers in the parts list following this illustration.



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Feed Hopper Parts List

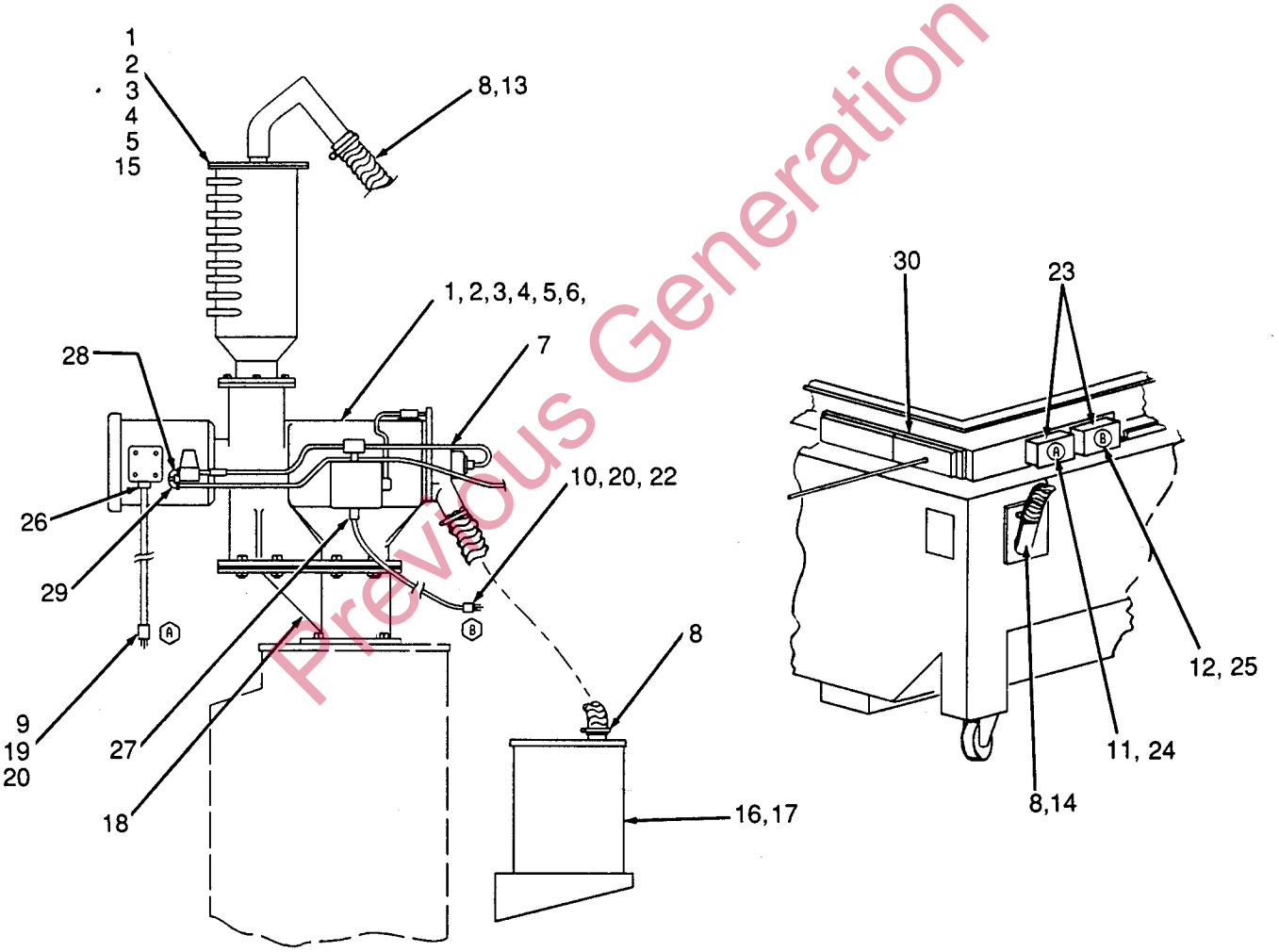
Item #	Part #	Description	Qty.
1.		Hopper, Feed	1
2.		Not Used	
3.		Kit, Mounting, Level Sensor (898942)	1
4.	972 184	Elbow, 90°, 1/2" O.D. Tube x 1/2"NPT	1
5.		Not Used	
6.		Plenum, Feed Hopper	1
7.		Clamp, C-section, Fluid. Plt., 39"	2
8.		Caster, Swivel, 4" (Colson, med. hvy. duty)	3
9.		Clamp, C-section, Fluid. Plt., 20-3/4"	2
10.		Not Used	
11.		Not Used	
12.		Thumbscrew, 1/4-20 x 1"	2
13.		Bracket, Caster, Adjustable	3
14.		Pump, Powder	Ref.
15.		Not Used	
16.		Lid, Removable, Loading	1
17.		Clamp, Removable Lid	2
18.		Not Used	
19.		Screw, Cap, 5/16-18 x 1"	.24
20.		Washer, 5/16"	.26
21.		Screw, Cap, 3/8-16 x 1"	.24
22.		Washer, 3/8"	.24
23.		Plate, Fluidizing, w/Gasket (898944)	1
24.		Cover, Feed Hopper	1
25.		Screw, Cap, 5/16-18 x 3/4"	.24
26.		Not Used	
27.		Tee, Union, KQT13-99	1
28.		Plug, Pump Hole	ASR
29.		Elbow, Plug-In, KQL13-99	1
30.	900 513	Tubing, 1/2" O.D. Poly (Black)	ASR

Note: ASR - As Required. Order quantity required for replacement. Flexible tubing and hose should be ordered in increments of one foot.

Nordson Rotary Sieve Mounting (Optional)

Figure 8.5

Part numbers can be located by referring to the corresponding item numbers in the parts list following this illustration.



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Nordson Rotary Sieve Mounting Parts List (Optional)

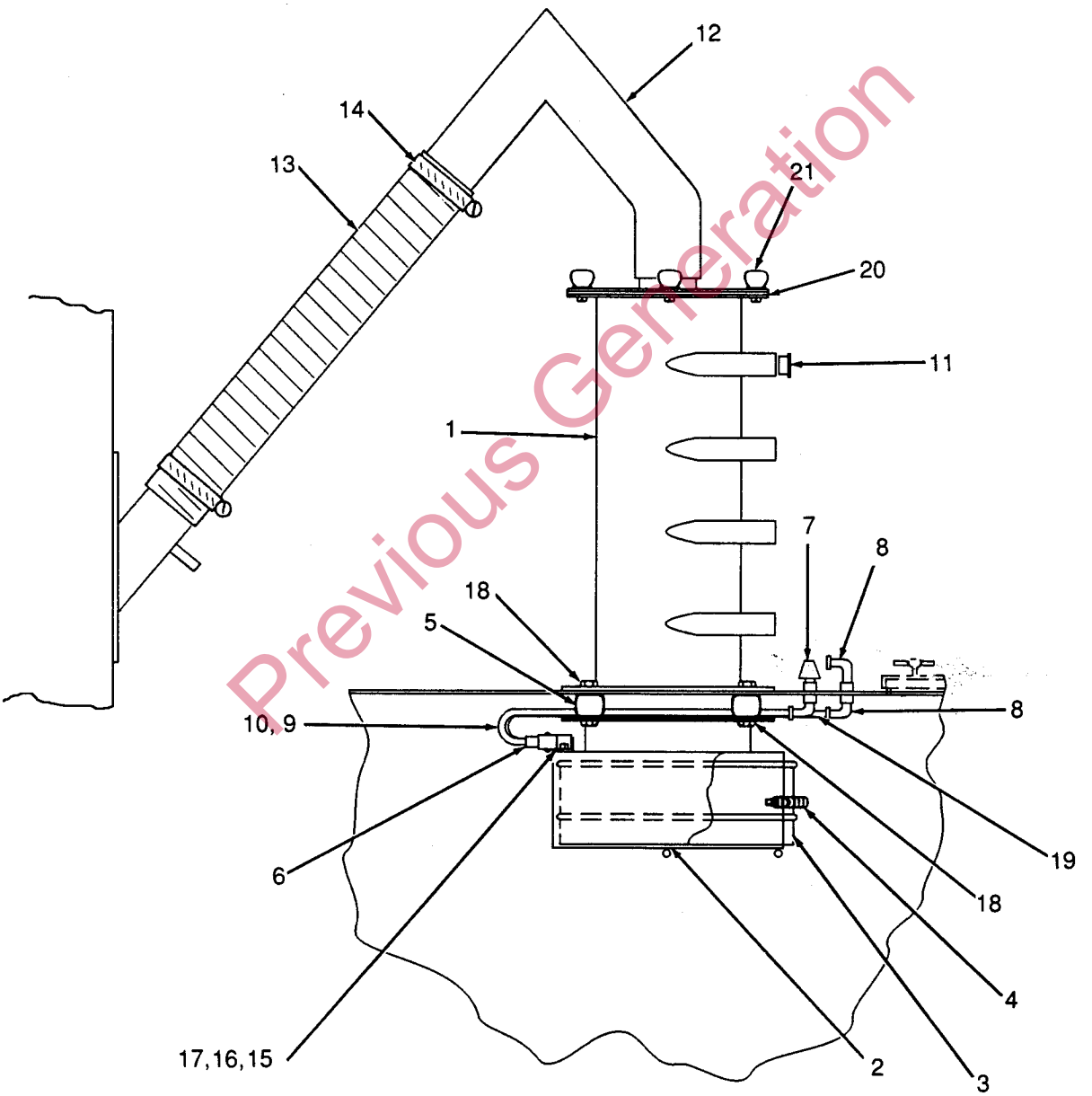
Item #	Part #	Description	Qty.
1.		Kit, Accumulator, Rotary Sieve (898913)	1
2.		Screw, Cap 5/16-18 x 1-1/4"	12
3.		Washer, Flat	24
4.		Washer, Lock	12
5.		Nut, 5/16-18	12
6.	249 450	Sieve, Rotary, Nordson	1
7.	900513	Tubing, 1/2" O.D.	ASR
8.	970966	Clamp, Hose	4
9.		Cordset, Motor, 14/4 S.O. Type	ASR
10.		Cordset, Limit Switch, 14/3 S.O. Type	ASR
11.		Receptacle, 230/460 Volt #20403	1
12.		Receptacle, 115 Volt #4710	1
13.	242402	Hose, Flexible, 2" O.D.	ASR
14.		Vent Assist	Ref.
15.	900754	Cap, Accumulator Port	9
16.		Container, Scrap, 5 Gallon (898921)	1
17.		Bracket, Scrap Container	1
18.		Pedestal, Nordson, Rotary Sieve	1
19.		Plug, 460V 14/4 #21415	1
20.		Plug, 115V 14/3 #4720	1
21.		Boot, Dust Tight, 20425B	1
22.		Boot, Dust Tight, 6023	1
23.		Box, Deep Bell 890-L	2
24.		Plate, Cover, 460V #20405	1
25.		Plate, Cover, 115V, #7423WL	1
26.		Cordgrip, 14/4	1
27.		Cordgrip, 14/3	1
28.	972 192	Elbow, Male, 1/2"T x 1/4"NPT	1
29.		Elbow, Plug-In, KQ13-99	1
30.		Assembly, Quick-disconnect	1

Note: ASR - As Required. Order quantity required for replacement. Flexible tubing and hose should be ordered in increments of one foot.

Vibratory Sieve

Figure 8.6

Part numbers can be located by referring to the corresponding item numbers in the parts list following this illustration.



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Vibratory Sieve Parts List

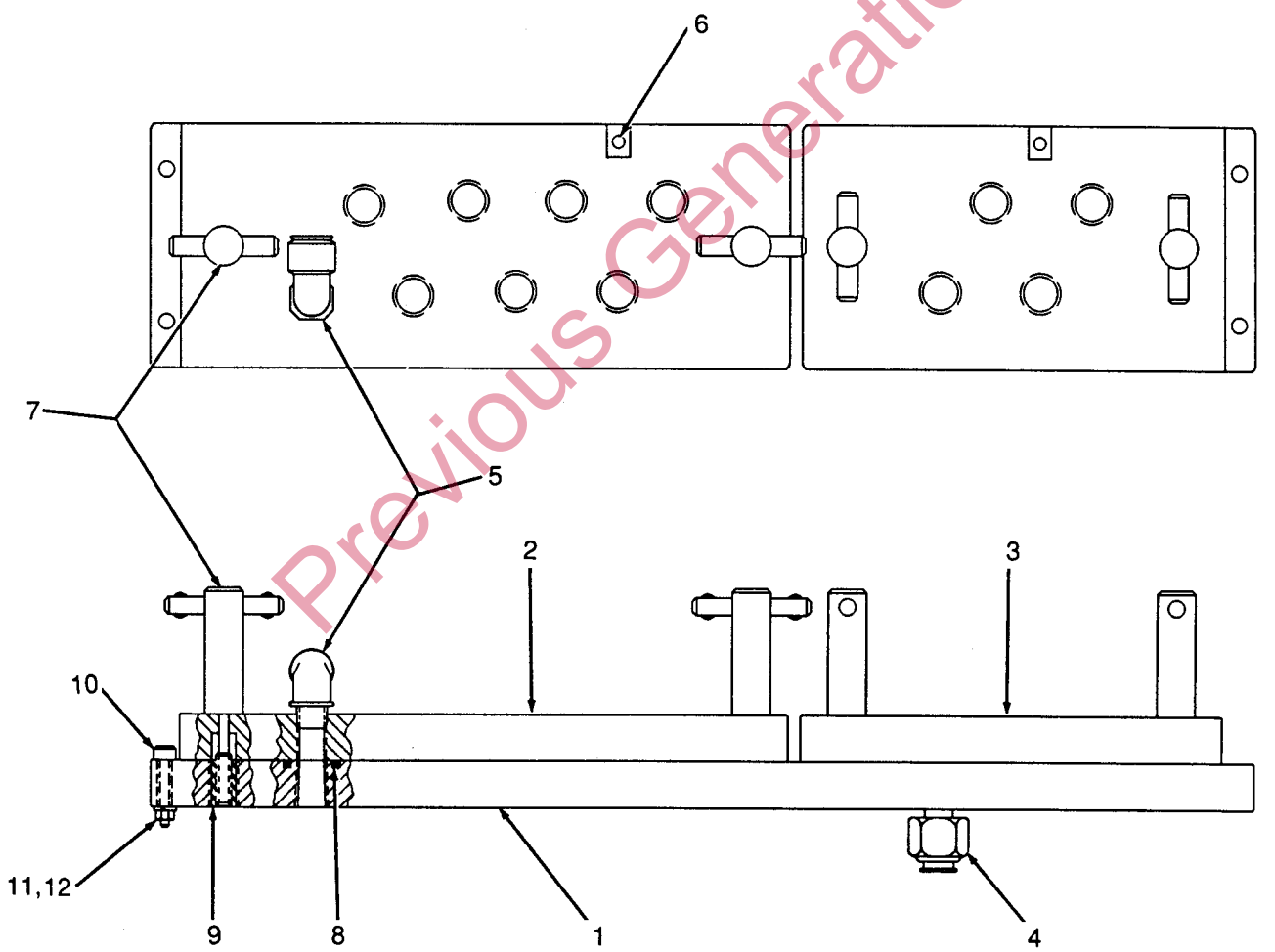
Item #	Part #	Description	Qty.
1.		Accumulator, 5" (898987)	1
2.		Bracket, Screen Holder	1
3.		Screen, Sieve, 8"	1
4.		Spring, Retainer	1
5.		Mount, Vibration, 1/4-20 x 5/8"	4
6.	246 656	Turbine, Vibrator, 1/4NPT	1
7.	972 615	Muffler, Filter, 1/4 NPT	1
8.		Elbow, Male, 1/4"T x 1/4"NPT	3
9.	900 511	Tubing, 3/8" O.D., Poly	ASR
10.	900 509	Tubing, 1/4" O.D., Poly	ASR
11.	900 754	Cap, Accumulator Port	ASR
12.		Tube, Vent, Upper (898984)	1
13.	242 402	Hose, Flexible, 2" O.D.	ASR
14.	970 966	Clamp, Hose	2
15.		Bolt, Hex Head, 3/8-16 x 1"	1
16.		Nut, Hex, Nylock, 3/8-16	1
17.		Washer, Flat, 3/8"	1
18.		Nut, Hex, Nylock, 1/4-20	8
19.		Elbow, Male, 3/8"T x 1/4"NPT	2
20.		Gasket	1
21.		Screw, Thumb, 1/4-20 x 3/4"	6

Note: ASR - As Required. Order quantity required for replacement. Flexible tubing and hose should be ordered in increments of one foot.

Quick Disconnect Plate

Figure 8.7

Part numbers can be located by referring to the corresponding item numbers in the parts list following this illustration



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Quick Disconnect Plate Parts List

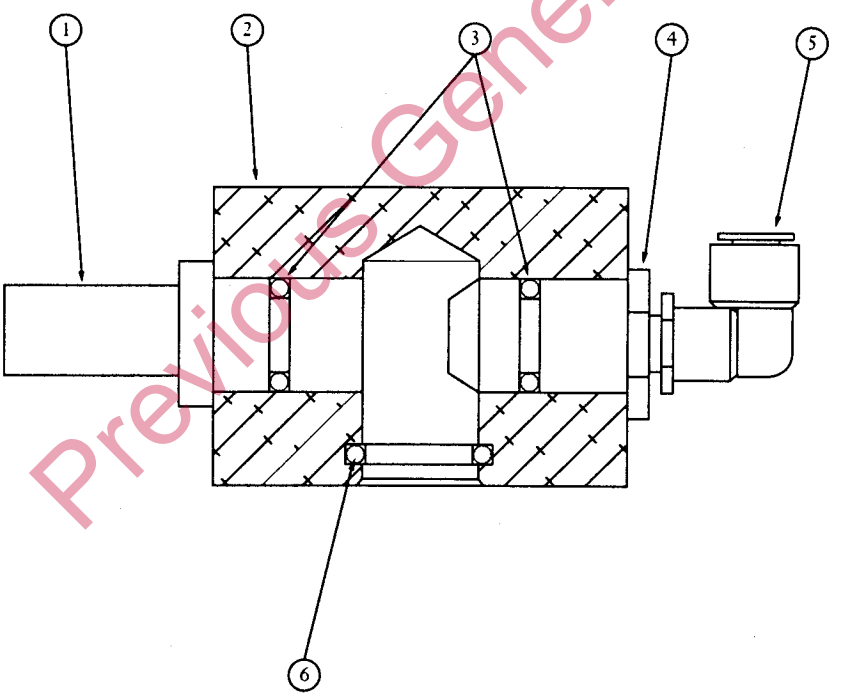
Parts:

Item #	Part #	Description	Qty.
1.		Base Plate, Fixed	1
2.		Face Plate, Removable, Collector Module	1
3.		Face Plate, Removable, Feed Hopper	1
4.	971 299	Connector Male, 1/2"T x 1/4"NPT	4
5.	972 192	Elbow, Male, 1/2"T x 1/4"NPT	20
6.		Dowel, locating	2
7.		Thumbscrew, T-Handle	4
8.	941 143	O-Ring, Silicone	12
9.		Insert, 1/4-28 x 7/16"	4
10.		Cap Screw, 1/4-20 x 1-1/2"	4
11.		Lock Washer, 1/4"	4
12.		Nut, Hex, 1/4-20	4

Transfer Pump

Figure 8.8

Part numbers can be located by referring to the corresponding item numbers in the parts list following this illustration



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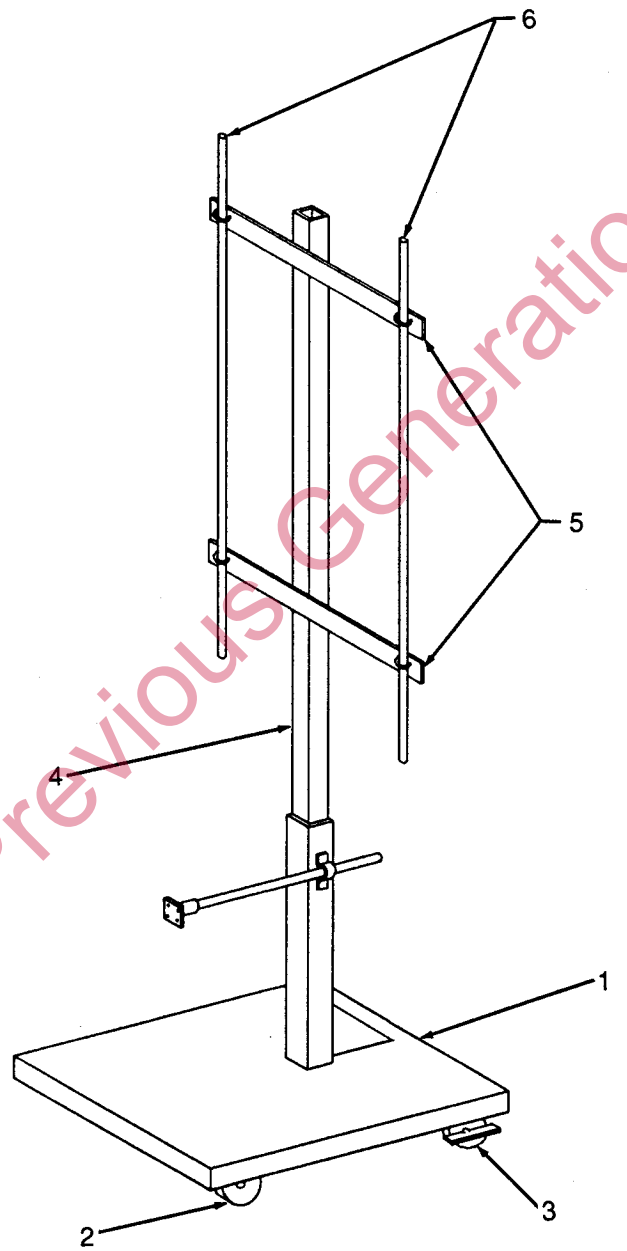
Transfer Pump Parts List

Item #	Part #	Description	Qty.
-	244 721	Pump, Powder Transfer	1
1.	244 642	• Throat, Venturi	1
2.	244 641	• Pump, Body	1
3.	942 101	• O-ring, Silicone	2
4.	244 643	• Nozzle, Air	1
5.	972 192	• Elbow, Conn. 1/4 NPT x 1/2" O.D. Tube	1
6.	942 143	• O-ring, Silicone	1

Moveable Gun Mounting

Figure 8.9

Part numbers can be located by referring to the corresponding item numbers in the parts list following this illustration



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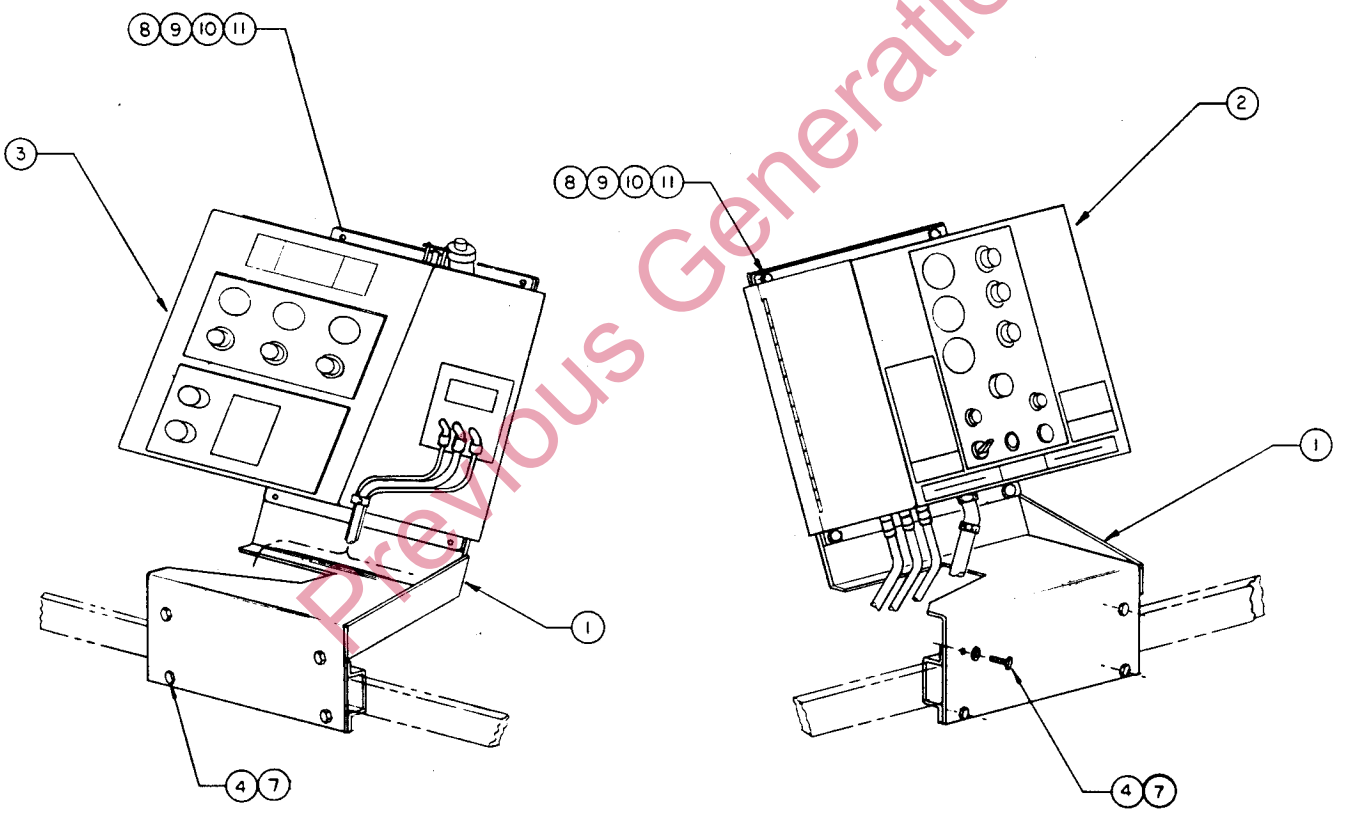
Moveable Gun Mounting Parts List

Item #	Part #	Description	Qty.
1.		Base, Moveable	1
2.		Caster, 4" Dia., Ridged	3
3.		Caster, 4" Dia., Swivel Lock	1
4.		Mast, 2-3/16" Unistrut Tube	1
5.		Bracket, Mounting Bars	2
6.		Bars, Bun Mounting, Aluminum	2

Gun Control Console Mounting

Figure 8.10

Part numbers can be located by referring to the corresponding item numbers in the parts list following this illustration



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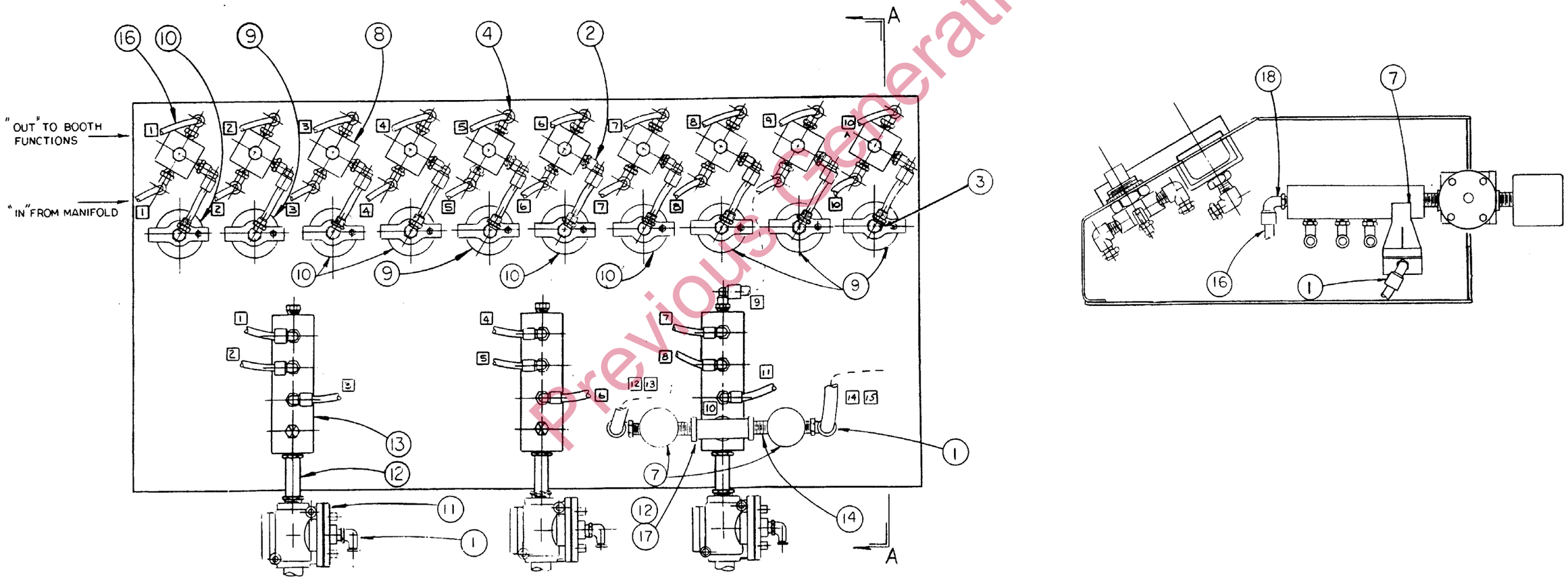
Gun Control Console Mounting Parts List

Item #	Part #	Description	Qty.
1.		Bracket, Mounting	1
2.	246 152	NPE-CC8 Control Console	1
3.	134 270	System, Versa-Spray™	1
4.		Screw, Hex Head, 5/16-18 x 1"	4
5.		Not Used	
6.		Not Used	
7.		Washer, Lock, 5/16"	4
8.		Screw, Hex Head, 1/4-20	4
9.		Nut, Hex, 1/4-20	4
10.		Washer, Flat, 1/4"	4
11.		Washer, Lock, 1/4"	4

Pneumatic Panel

Figure 8.11

Part numbers can be located by referring to the corresponding item numbers in the parts list following this illustration.



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Pneumatic Panel Parts List

Item #	Part #	Description	Qty.
Parts:			
1.	971 266	Elbow, 90°, 1/4" Tube x 1/4" NPT, Male	5
2.	972 119	Elbow, 90°, 1/4" Tube x 1/8" NPT, Male	10
3.	971 621	Elbow, 90°, 1/4" Tube x 1/8" NPT, Female	10
4.	972 192	Elbow, 90°, 1/2" Tube x 1/4" NPT, Male	31
5.		Not Used	
6.		Not Used	
7.	249 467	Regulator, Preset (Fire Sentry)	2
8.	901 444	Regulator, Pressure	10
9.	901 228	Gauge, Pressure, 0-100 psi	5
10.	901 240	Gauge, Pressure, 0-30 psi	5
11.	901 074	Valve, Pilot, 2-way	3
12.		Nipple, Pipe, 1/2 NPT x 3"	4
13.		Manifold, 6 Port	3
14.		Nipple, Pipe, 1/4 NPT x 1"	2
15.		Tubing, Flexible, 1/4" O.D.	ASR
16.		Tubing, Flexible, 1/2" O.D.	ASR
17.		Tee, 1/4 NPT	1

Note: ASR - As Required. Order quantity required for replacement. Order flexible tubing and hose in increments of one foot.

***Connections (ref. Pneumatic Diagram, Figure 6.2):**

1.	Collector Module Fluidizing #1
2.	Transfer Pumps #1 & #3
3.	Collector Module Fluidizing #3
4.	Collector Module Fluidizing #2
5.	Transfer Pumps #2 & #4
6.	Collector Module Fluidizing #4
7.	Feed Hopper Fluidizing
8.	Vent Assist
9.	Vibratory Sieve (Optional)
10.	Fire Detector Air Supply
11.	Rotary Sieve (Optional)
12.	Detector Head Air Shroud #1
13.	Light Test Source #1
14.	Detector Head Air Shroud #2
15.	Light Test Source #2

Electrical Panel Parts List

NHC-8 Electrical Panel Basic Parts List

(Refer to Figure 2.3)

Item	Qty.	Description	Part No.	Manufacturer
	1	Enclosure	A362408LP	Hoffman
	1	Panel	A36P24	Hoffman
Disc	1	Disconnect Switch	OETLNF60	Stromberg
	1	Handle	OETLZX47	Stromberg
M110	1	Motor Starter	CR7CCA	GE
MOL110	1	Overload Relay	See Chart	GE
	1	Aux. Contact	CR7XA11B	GE
FU102	1	Fuse Block	60308J	Gould
FU103	1	Fuse Block	L60030C2C	Littlefuse
FU106	1	Fuse Block	L60030M1C	Littlefuse
FU102	3	Fuses	See Chart	Gould
FU103	2	Fuses	See Chart	Gould
FU106	1	Fuse	FLM6	Littlefuse
T104	1	Transformer	See Chart	GE
CR107, CR145	2	Relay	RY2S-U-AC120V	IDEC
CR107, CR145	2	Socket	SY2S-05	IDEC
TR116	1	Time Delay Relay	5X829E	Dayton
TR117	1	Repeat Cycle Relay	1A368E	Dayton
TR116,117	2	Socket	5X852E	Dayton
PS108	1	Pressure Switch	AFSDAO	Cleve. Controls
SOL112, 118, 119	3	Solenoids	35ASACDAAAIBA	MAC
	1	End Kit	M35001-01	MAC
TR113	1	Blowdown Timer	DNCT2006A10	NCC
LT108	1	Pilot Light	CR304ALG3A2G	GE
PB110A/LT110	1	Push-to-test Pilot Light	CR304ABT11AE32	GE
PB110	1	Push Button	CR304ABGO1AR	GE
*TB	ASR	Control Terminal Blocks	1492F1	A.B.
*TB	ASR	Motor Terminal Blocks	1492-CA1	A.B.
GA1	1	Final Filter Gauge	2-5005	Dwyer
GA2	1	Collector Gauge	2-5010	Dwyer
GA3	1	Blowdown Gauge	901 228	Nordson
	3	Male Connectors	KQHO7-34S	SMC
	1	Male Elbow	KQLO7-35S	SMC
	1	Branch Tee	KQTO7-35S	SMC
	6	Bulkhead Union	KQEO7-00	SMC
	1	Vent		
	1	Male Elbow	KQLO7-34S	SMC

Note: Terminal blocks added as required per options selected.

Parts list continued on following page.

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Electrical Panel Parts List, cont.

NHC-8 Electrical Panel 3 Phase Sieve Parts List

(Refer to Figure 2.3)

Item	Qty.	Description	Part No.	Manufacturer
M120	1	Motor Starter	CR7CAA	GE
MOL120	1	Overload Relay	See Chart	GE
FU102A	1	Fuse Block	L60030C3	Littlefuse
FU102A	3	Fuses	See Chart	Littlefuse
	3	Terminal Blocks - Motor	1492-CA1	A.B.
	2	Terminal Blocks	1492F1	A.B.

NHC-8 ELectrical Panel 3 Phase Oscillator Parts List

Item	Qty.	Description	Part No.	Manufacturer
M121, M124	2	Motor Starter	*CR7CAA	GE
MOL121, 124	2	Overload Relay	See Chart	GE
FU102B, 102C	2	Fuse Block	L60030C3	Littlefuse
FU102B, 102C	6	Fuses	See Chart	Gould
	6	Terminal BLocks - Motor	1492-CA1	A.B.
	4	Terminal Blocks	1492F1	A.B.
PB121, 124	2	Push Button	CR304ABGO1AR	GE
PB121A/LT121, PB124A/LT124	2	Push-to-test Light	CR304ABT11AE32	GE

Note: Items and quantities shown are for two oscillators. For one oscillator use M121, FU102B, PB121, PB121A/LT121, 3 motor terminal blocks and 2 terminal blocks. * Only up to 2HP, 3 phase Osc.

NHC-8 Electrical Panel 120V Radial Oscillator Parts List

Item	Qty.	Description	Part No.	Manufacturer
PB121, 124	2	Push Button	CR304ABGO1AR	GE
PB121A/LT121, PB124A/LT124	2	Push-to-test Light	CR304ABT11AE32	GE
CR121, 124	2	Relay	RH2B-U-AC120V	IDEC
CR121, 124	2	Socket	SH2B-05	IDEC
	6	Terminal Blocks	1492F1	A.B.

Note: Quantities shown are for two radial oscillators. For one radial oscillator use PB121, PB121/LT121, CR121, and 3 terminal blocks.

Parts list continued on following page.

Electrical Panel Parts List, cont.

NHC-8 Electrical Panel 120V Air Knife Parts List

(Refer to Figure 2.3)

Item	Qty.	Description	Part No.	Manufacturer
CR136	1	Relay	RH2B-U-AC120V	IDEC
CR136	1	Socket	SH2B-05	IDEC
LT136, LT140	2	Pilot Light	CR304ALG3AE	GE
SS136	1	Selector Switch, 2 Position	CR304ASG21B11	GE

Note: LT140 is used only if 2 air knifes are used.

NHC-8 Electrical Panel Miscellaneous Parts List

Item	Qty.	Description	Part No.	Manufacturer
SS116	1	Selector Switch, 3 Pos.	CR304ASG34B22	GE
SS129	1	Selector Switch, 2 Pos.	CR304ASG21B11	GE

Note: SS116 used for manual transfer pump, SS129 used for conveyor interlock bypass.

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Section 9
Specification Summary

Because of possible technological or quality improvements, equipment specifications are subject to change without notice.

Equipment Specifications

Because of possible technological or quality improvements, equipment specifications are subject to change without notice.

Physical Dimensions

Booth Enclosure

Width . . . . . .6' 0"
Length . . . . . .14'0" (21'6" incl. vestibule)
Height . . . . . .Part height + 6'6" to floor

Overall System

Width . . . . . .9'4" (15'6" w/platforms)
Length . . . . . .21' 6" w/3' vestibules

Circulating Fan

10 hp AC, TEFC, 1725 rpm, with V-belt drive

Number of Guns

Manual (hand) 2
Automatic 8
Manual and Automatic . . . . . .2 and 8

Compressed Air Requirements (6 Guns)

Minimum . . . . . .75 SCFM
Maximum . . . . . .175 SCFM
Working pressure . . . . . .80 to 100 PSI

Electrical Data

Approximate system current draw, with 10 guns and rotary sieve, no oscillator:
208V-3Ø-60Hz . . . . . .38 amps
230V-3Ø-60Hz . . . . . .35 amps
380V-3Ø-60Hz . . . . . .21 amps
460V-3Ø-60Hz . . . . . .18 amps
575V-3Ø-60Hz . . . . . .14 amps

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Section 10
Optional Parts and Equipment

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Customer _____

Date _____

System No. _____

The following checklist details all drawings and manuals which are included with your Nordson® NHC-8 Powder Coating System.

	Manual No.	Description
☐	0-8	Electrostatic System Periodic Checks
☐	0-9	Electrostatic Cable Installation and Care
☐	31-3	NPE-2A Automatic Gun
☐	31-4	NPE-2M Manual Gun
☐	31-11	100 PLUS® Automatic Series II Gun
☐	31-13	Versa-Spray™ Automatic Cable-Fed Gun
☐	31-16	Versa-Spray Cable-Fed Handgun
☐	31-17	Versa-Spray Integral Power Supply Handgun
☐	31-12	100 PLUS Series II Cable Installation and Troubleshooting
☐	32-6	HR3 Powder Feed Hopper
☐	32-8	100 PLUS Powder Pump
☐	32-16	HRS-1 Feed Hopper (Portable, 50lb.)
☐	32-17	Powder Transfer Pump
☐	32-19	Versa-Spray Dolly System (Ref. 33-9, 31-17, 32-20, & 32-8)
☐	32-20	HVS-1 Hopper (25lb.)
☐	32-21	Versa-Spray Mobile System (Ref. 33-6, 32-16, 32-8, & 31-16)
☐	33-2	NPE-CC8 Control Console
☐	33-3	NPE-CC2 Control Console
☐	33-6	100 PLUS Electrostatic Power Unit
☐	33-5	100 PLUS Master Control Unit
☐	33-9	Versa-Spray Integral Power Supply Control Module

☐	34-13	Panel Mounted Air Manifold (Pneumatic 5-Function Box)
☐	34-15	Lance Extension
☐	34-16	Flat Spray Nozzle
☐	34-21	Nordson Rotary Sieve (230VAC)
☐	34-22	NFS-1000 Fire Detection System
☐	34-23	Nordson Rotary Sieve (110VAC)
☐	34-24	Versa-Spray Gun Mounting Bar
☐	35-4	Nordson Powder Booth Controller
☐	35-13	Cartridge Filter Installation Instructions
☐	37-1	TRIBOMATIC® Automatic Powder Spray Gun and Diffuser
☐	37-3	TRIBOMATIC Hoppers
☐	37-6	TRIBOMATIC Powder Spray Handgun and Diffuser
☐	37-7	TRIBOMATIC Powder Pump
☐	37-8	TRIBOMATIC 19-inch Control Module
☐	37-9	TRIBOMATIC Master Control Module
☐	37-12	TRIBOMATIC 14 Gun Master Control Module
☐	37-13	TRIBOMATIC Single Gun System
☐	37-16	TRIBOMATIC Generation 3 Powder Pump
☐	37-17	TRIBOMATIC Generation 3 Automatic Gun Diffuser

Other Equipment

	Manual No.	Description
☐	E240	Rotary Screener (AZO)
☐	801	Detector Electronics
☐		Deimco Reciprocator
☐		Nutro Oscillator
☐	LSM 1700	Endress & Hauser Level Control
☐		Efector Proximity Switch and/or Level Control
☐	_____	_____

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☐ _____ _____

☐ _____ _____

☐ _____ _____

Special Drawings

☐ _____ Booth Enclosure (Canopy)

☐ _____ System Layout

☐ _____ Utility Drops

☐ _____ Electrical Schematic

☐ _____ Pneumatic Diagram

☐ _____ _____

☐ _____ _____

☐ _____ _____

☐ _____ _____

☐ _____ _____