Modular Electric Gun

Model E-200

Part 106 645C

NORDSON CORPORATION • AMHERST, OHIO • USA

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Section 1

Safety

Section 1
Safety

1. Operate Safely

Safety instructions contained in this section and throughout this document apply to tasks that may be performed with or on the unit. Warnings related to specific safety concerns are included within the text as appropriate. It is very important that these safety instructions are always followed. Failure to do so could result in personal injury and/or damage to the unit or other equipment.

With this in mind, here are some basic safety recommendations:

- Read and become familiar with this *Safety* section prior to installing, operating, maintaining, or repairing the unit.
- Read and follow the warnings which appear within the text and are related to specific tasks.
- Store this document within easy reach of personnel operating or maintaining the unit.
- Wear personal protective equipment and clothing such as safety goggles and gloves.
- Familiarize yourself with and follow all safety instructions prescribed by your company, general accident-prevention regulations, and government safety regulations.

2. Safety Symbols

The following symbols are used to warn against dangers or possible sources of danger. Become familiar with them! Failure to heed a warning could lead to personal injury and/or damage to the unit or other equipment.

WARNING: Failure to observe may result in personal injury, death, or equipment damage.

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

WARNING: Disconnect equipment from the line voltage.

WARNING: Hot! Risk of burns. Wear heat-protective clothing, safety goggles, and/or heat-protective gloves depending on the symbols shown.

WARNING: Risk of explosion or fire. Fire, open flames, and smoking prohibited.

WARNING: System or material pressurized. Relieve pressure. Failure to observe may result in serious burns.

CAUTION: Failure to observe may result in equipment damage.

CAUTION: Hot surface. Failure to observe may result in burns.

3. Qualified Personnel

"Qualified personnel" is defined here as individuals who thoroughly understand the equipment and its safe operation, maintenance, and repair. Qualified personnel are physically capable of performing the required tasks, familiar with all relevant safety rules and regulations, and have been trained to safely install, operate, maintain, and/or repair the equipment. It is the responsibility of the company operating the equipment to see that its personnel meet these requirements.

4. Intended Use

The unit is designed and intended to be used only for the purpose described in the *Description* section. Uses not in accordance with that section or as described in this document are considered unintended uses and not in accordance with governing regulations.

WARNING: Use of this equipment in ways other than described in this document may result in personal injury, death, or equipment damage.

The following actions of the owner or operator of the unit are some, but not all, examples of unintended use which would permit Nordson to claim it is not responsible for personal injury or property damage arising from such unintended use:

- Unapproved modifications or changes to the unit
- Failure to comply with the safety instructions
- Failure to comply with instructions concerning installation, use, operation, maintenance, or repair, or when these tasks are carried out by unqualified personnel
- Use of inappropriate or incompatible foreign materials or auxiliary equipment
- Failure to observe workplace safety rules or regulations issued by government authorities or safety councils

5. Installation and Electrical Connections

WARNING: Failure to follow the safety procedures can result in injury or death.

- All electrical, pneumatic, gas, and hydraulic connections and installations of hot melt equipment may only be carried out by qualified personnel. Be sure to observe installation instructions for components and accessories.
- Equipment must be properly grounded and fused according to its rated current consumption (see ID plate).
- Cables which run outside the unit must regularly be checked for wear or damage.
- Power supply wire gauge and insulation must be sufficient to handle rated current consumption.
- Cables must never be squeezed or pinched. Do not locate cables or hoses in high traffic areas.

6. Operation

The unit should be operated by qualified personnel in accordance with the instructions presented in this document.

WARNING: Failure to follow the safety procedures can result in injury or death.

- Never allow the unit to be operated by personnel under the influence of substances which reduce their reaction times, or who are not able to operate the equipment for physical reasons.
- Prior to each start-up of the unit, check protection and warning devices and make sure they are fully functional. Do not operate the unit if these devices are not functioning properly.
- When the removal of safety equipment is required for installation, maintenance, or repair of the unit, it must be re-connected immediately upon completion of the work.
- Prior to start-up of the unit, check to make sure all safety guards and safety equipment are in place and functioning properly.

6. Operation (contd.)

- In a humid environment, only equipment featuring a corresponding class of protection may be operated.
- Do not operate the unit in an explosive environment.
- Keep parts of the body or clothing away from rotating parts. Do not wear loose articles of clothing when operating or servicing units with rotating parts. Take off wrist watches, rings, necklaces, or similar pieces of jewelry and pin up or cover long hair before performing any work on or with the unit.
- To carry out measurements on work pieces, switch off the unit and wait until it comes to a standstill.
- Never point hand guns or applicator nozzles at yourself or other persons.

Less-obvious Dangers

WARNING: An operator or service technician working with the unit should be aware of less-obvious dangers that often cannot be completely minimized at production sites:

- Exposed surfaces of the unit which cannot be practically safeguarded. They may be hot and take time to cool after the unit has been operating.
- The possibility that electrical potentials may remain in the unit after the unit was de-energized
- Hot melt material and vapors
- Hydraulically or pneumatically operated parts of the unit
- Parts winding something up or down which are not covered

Action in the Event of Unit Malfunction

If the unit malfunctions, switch it off immediately.

- Turn the circuit breaker or main power switch OFF.
- Have the unit repaired by qualified personnel only.

Danger of Burns

Contact with hot melt materials or hot areas of the unit may produce a severe skin burn.

WARNING: Hot! Risk of burns. Wear heat-protective clothing, safety goggles, and/or heat-protective gloves depending on the symbols shown.

- Be extremely careful when using hot melt material. Even solidified material may still be very hot.
- Always wear protective clothing which safely covers all exposed parts of the body.

In case of burns:

- Immediately cool affected skin areas using cold, clean water.
- Do not forcefully remove hot melt material from the skin.
- Immediately seek medical attention.

7. Maintenance/Repair

Allow only qualified personnel to perform the procedures described in this document. When performing such tasks, wear protective clothing, and equipment.

WARNING: Even when the circuit breaker or main power switch is OFF, the unit is still electrically energized. Complete the following steps prior to maintenance or repair:

- Disconnect, lock out, and tag external power supply.
- To ensure the external power supply is disconnected, attempt to operate the unit. If the unit does not energize, proceed with maintenance or repair work.
- If the unit energizes, repeat the disconnect, lock out, and tag procedure. Re-test the unit.

7. Maintenance/Repair (contd.)

- Follow the specific instructions provided in this manual to relieve the system pressure in the entire unit.
- Secure pneumatically- or hydraulically-operated equipment against uncontrolled movement.
- Only use parts which do not compromise the safety of the unit. Only use genuine Nordson parts.
- Always use tools with insulated handles when removing or installing components.

8. Cleaning

NOTE: Always refer to the material manufacturer's Material Safety Data Sheet (MSDS) or material information sheet before working with any material.

WARNING: Never clean any aluminum part or flush any system using halogenated hydrocarbon fluids. Examples of common halogenated hydrocarbons are: dichloromethylene, 1,1,1-trichloroethylene, and perchloroethylene. Halogenated hydrocarbons may react violently with aluminum parts.

WARNING: Fire, open flame, and smoking are prohibited when cleaning fluids are used. Observe all explosion prevention regulations. Cleaning fluids may only be heated using temperature-controlled and explosion-protected heaters.

- Never use an open flame to clean the unit or components of the unit.
- Use only cleaning fluids designed or intended to be used with the hot melt material being used in the unit. Never use paint fluids under any circumstances.
- Note the flash point of the cleaning fluid used. Only use a controlled heating method to heat fluids.
- Ensure sufficient room ventilation to draw off generated vapors. Avoid prolonged breathing of vapors.

9. Thermoplastic Hot Melt Material

NOTE: Always refer to the material manufacturer's Material Safety Data Sheet (MSDS) or material information sheet before working with any hot melt material.

- Ensure the work area is adequately ventilated.
- Do not exceed recommended processing temperatures. Doing so creates a danger to personnel due to decomposition of the material.

10. Equipment and Material Disposal

Dispose of equipment and materials used in operation and cleaning according to local regulations.

Section 2

Description

Section 2
Description

1. Overview

The Nordson E-200 Modular Electric Gun dispenses thermoplastic adhesives. It is sold with an optional electric gun driver that translates the timer signal into a pulsed wave form that optimizes gun performance.

NOTE: This Modular Electric Gun is designed to operate from the Nordson Model E-28 Driver (P/N 167 853) or the Nordson driver (P/N 101 084) used with the E-700 Electric Gun. Performance varies depending which power source is specified. Consult your Nordson representative.

The Series E-200 gun is comprised of the components shown in Figure 2-1.

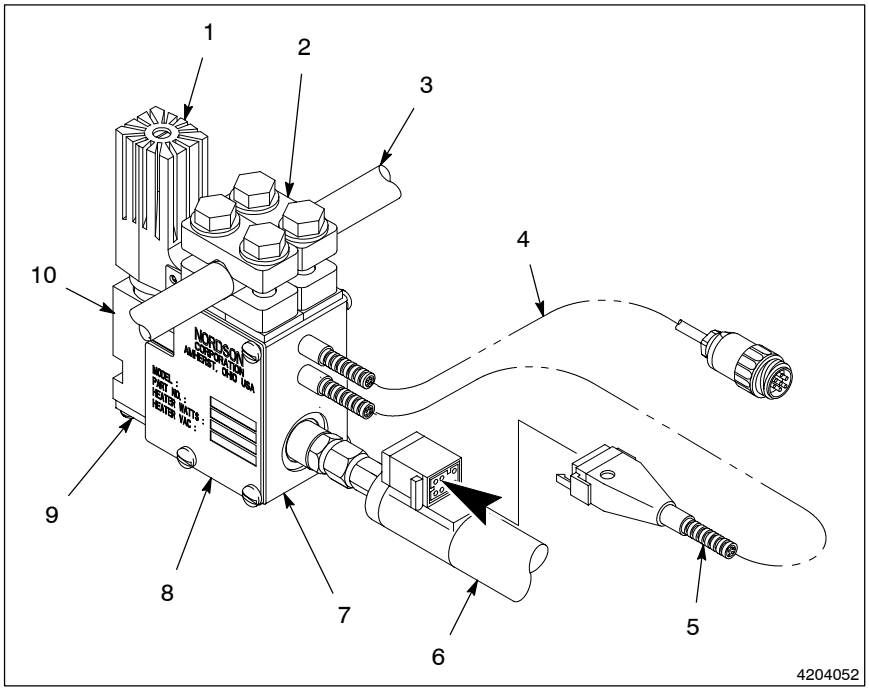


Fig. 2-1 E-200 Modular Electric Gun

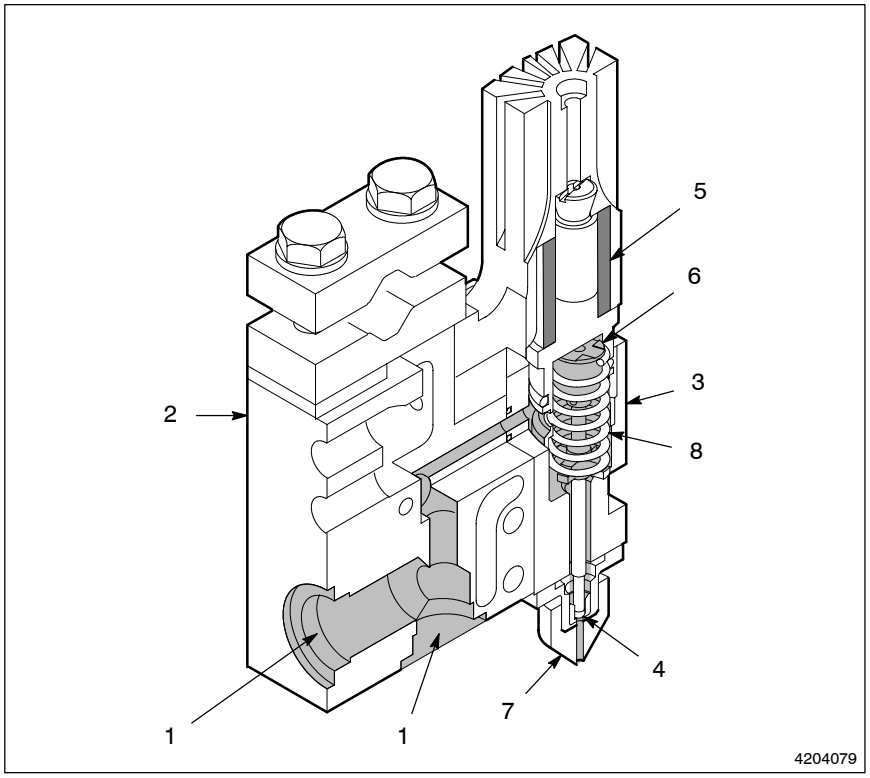
1. *Coil*
2. *Retainer*
3. *Mounting bar*
4. *Driver cordset*
5. *Hose cordset*
6. *Adhesive hose*
7. *Manifold*
8. *Cover*
9. *Nozzle seat*
10. *Dispensing Module*

Design Flexibility

The Series E-200 includes a variety of standard gun configurations to meet most application needs. Besides single-module guns, standard guns are available in two- and four-module configurations. Modules can be positioned close together in two- and four-module versions. Or, the modules can be spaced further apart in two- or four-module expanded versions. Low profile guns, designed especially for packaging case sealers with short compression sections, will also be available in single and two- or four-module configurations. The bead pattern of these standard guns can be modified by substituting one or more blank modules for operating modules.

2. Functional Description

During operation (see Figure 2-2), molten adhesive is supplied to the E-200 gun by the pump in the applicator. The material enters the inlet port (1) located on the rear or bottom of the gun and is directed through the manifold (2) and module (3) to the ball and seat (4). When the coil (5) is energized, the plunger (6) lifts the ball off the seat. The hydraulically pressurized adhesive material is extruded through the nozzle (7) while the ball is held off its seat by magnetic attraction on the plunger. When the timer de-energizes the driver, the coil looses its magnetic attraction and the plunger return spring (8) forces the ball against its seat, stopping material flow.



1. Inlet port
2. Manifold
3. Module
4. Ball and seat
5. Coil
6. Plunger
7. Nozzle
8. Spring

Fig. 2-2 E-200 Modular Electric Gun Operation

3. Specifications

Table 2-1 lists specifications for the E-200 modular electric gun.

Table 2-1 Series E-200 Modular Electric Gun Specifications
(When used with Nordson E 28 Driver and 1000 cps packaging grade adhesive)

Parameter	Value
Operating Temperature	425 °F (190 °C) maximum
Operating Hydraulic Pressure	900 psi (4.1 MPa) maximum
Operating Speed	1000 continuous/ 4000 instantaneous (short burst) cycles per minute
Nozzle Series (1)	237XXX
Electrical Requirements, Heaters	220/240 VAC or 180/220 VAC
Gun Heating Method	RTD Controlled Cartridge Heater
Minimum Pattern (@ 1000 cps)	4.0 ms ±0.5 ms
Maximum Viscosity	2000 cps
(1) Nozzles must be specified and purchased separately.	

4. Electric Gun Driver

The optional Nordson E-28 driver increases the E-200 gun performance envelope by providing a high energy initial pulse. Furthermore, since the driver delivers a low holding current, the heat generation in the coil is minimized. The driver specifications are listed in Table 2-2.

Table 2-2 Series E-28 Electric Gun Driver Specifications

Maximum Cycle @ Full Load with 4 modules connected to each group output	3000 cycles/minute @ 50% duty cycle
E-28 Electric Gun Driver Power Requirement	100/115/120/200/230/240 VAC (± 10%) 50/60 Hz, 1-Phase, 6 Amp
Maximum Input Power @ Full Load	350 W
Trigger Input	10-24VDC (± 10%) 115 VAC (± 10%), 50/60 Hz
Pull-in time duration	5 ms maximum
Output Specification: 1 Gun 2 Guns 3 Guns 4 Guns	Current: 1.4A pull-in., 200 mA holding 2.8A pull-in., 400 mA holding 4.2A pull-in., 600 mA holding 5.6A pull-in., 800 mA holding
Fault Relay Contact Rating	125VAC, 6 Amps; 30 VDC, 6 Amps
Input Terminal block wire	#14 - 18 AWG
Ambient Temperature Range	0-50 °C (32-120 °F)
Dimensions (L x W x H)	242 x 192 x 132 mm (9.50 x 7.55 x 5.20 inches)
Weight	2.5 kg (5.5 pounds)
Enclosure Class	NEMA 12 when installed according to the instructions described in the *Installation* Section.

Section 3

Installation

Section 3
Installation

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

1. Introduction

This section provides unpacking and installation instructions for the Nordson Series E-200 Modular Electric Guns.

The E-200 modular electric gun is shipped assembled in the configuration specified on the purchase order. Hoses are also shipped separately. This section gives detailed information on how to install guns and hoses; refer to the *E-28 Electric Gun Driver Manual* for details on installing and using the gun driver.

2. Unpacking

No special instructions are necessary to unpack the guns. Exercise normal care not to damage the equipment during unpacking. Be sure to refer to your hose operator card for hose unpacking instructions.

3. Inspection

After unpacking the guns and hoses, perform the following inspections:

1. Inspect gun and hose surfaces for evidence of dents, scratches, corrosion, and other physical damage. Contact your Nordson representative if there is any physical damage.

2. Inspect manifold for loose electrical connections and contaminants, and the fluid ports for foreign material. Remove all foreign material.

3. Inspect hose for frayed connections, rips in the outer braid and evidence of kinks.

4. Inspect all fasteners for tightness. Tighten any loose fasteners.

4. Preparing the System for Installation

Items Needed

- applicator and associated equipment technical manuals
- driver and associated technical manual
- safety goggles
- safety gloves
- long-sleeve protective clothing
- flat blade screwdriver
- bar stock, $^{1}/_{2}$ in. (13 mm) diameter
- Nordson automatic gun hose (one per gun)
- Never Seez or equivalent
- drain pan
- wrenches; refer to Table 3-1 for the required wrench sizes

Table 3-1 Wrench Sizes Needed to Install Guns

Component	Item	Wrench Size
Gun	Clamp Hex Nut	13 mm
	Male Gun Fitting (to hose)	$^{11}/_{16}$ in. (18 mm)
Hose I.D. $^{5}/_{16}$ in. (8 mm)	Hose Fitting	$^{11}/_{16}$ in. (16 mm)
Hose, I.D. $^{5}/_{8}$ in. (16 mm)	Hose Fitting	1 $^{1}/_{4}$ in. (32 mm)
	Connector, Hose to Gun Fitting	1 $^{1}/_{4}$ in. (32 mm)

Gun Installation Tips

The following tips are recommended by Nordson to give you the best and most consistent gun performance.

- Wherever possible, mount the gun so the nozzle is approximately $^1/_2$ in. or less (13 mm) from the substrate. This gives the best control of adhesive bead position, the best response time, and the minimum amount of adhesive heat loss.
- Protect the gun retainer from vibration and secure it so the gun will not change position during application.
- Install a heated or unheated in-line filter between the gun and hose.
- Install insulation over the hose-to-gun fittings.
- In drafty areas keep the guns shielded from the draft. Rapid heat dissipation due to air movement across the guns may cause operational problems.

Hose Installation Tips

The hose may be connected to the gun either by simply attaching the hose to the male hose connection on the rear of the gun, or by moving the fitting to the bottom of the manifold before attaching the hose.

WARNING: This equipment contains energized electrical components that could be fatal. Do not electrically connect the hose to the applicator at this time. Always make the tank and gun hydraulic connections before making the electrical connections. Connect input power at the appropriate point as described in the applicator service manual.

CAUTION: Avoid having large areas of hose in contact with a cold floor, cold supports or other such surfaces. Cold points along the hose restrict the flow of adhesive inside the hose and can create potential problems during operations.

NOTE: Nordson Corporation recommends insulation on the fittings that connect the hose to the gun. The gun installation kit has a cuff included in the kit; see Section 7 for the kit part number.

Hose Installation Tips *(contd.)*

If connecting the hose other than straight (horizontally) into the manifold, do the following steps to replace the straight connection fitting with a 45° or 90° elbow:

1. Remove the straight fitting from the rear of the gun manifold.

   NOTE: Do not use extra fittings or nipples to connect the gun to the hose. A cold connection may result.

2. Lubricate the elbow fitting threads and o-ring with a small amount of PTFE paste, making sure first that the o-ring and threads are free of dirt and other foreign particles.

3. Thread the fitting by hand into the threaded port in the gun.

4. Tighten the fitting only enough to seat. It should seat when the body of the metal fitting contacts the gun body surface. Between 7 and 10 ft-lb (9.49 and 13.56 Nm) of torque is required to create an effective seal.

CAUTION: Do not place adhesive hoses inside any closed cover where hose heat cannot dissipate. Hose failure may result.

NOTE: Do not secure or support adhesive hoses so that the hose has a large surface area in contact with a cold floor, cold steel, angle iron, or other cold material. Poor hose performance could occur.

5. Electrically connect the hose to the gun by connecting the plug on the gun to the hose receptacle.

6. Mechanically connect the hose to the applicator according to instructions in the applicator service manual.

System Power Removal

Prior to installing or removing any items or equipment from the system, be sure to remove all power as described below.

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

1. Set the applicator circuit breaker to the OFF position.

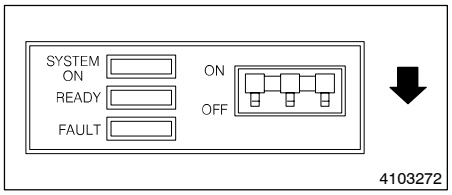


Fig. 3-1 Turning Off Applicator Circuit Breaker

2. Disconnect and lock out the input power line to the applicator main circuit breaker.

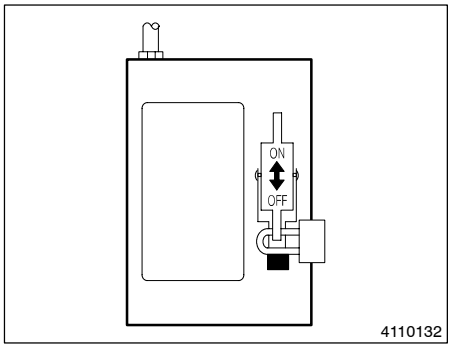


Fig. 3-2 Locking Out Input Power

5. Installing a New Gun

NOTE: Use this procedure to install a new gun on a new applicator (in which no adhesive has been melted). If you are replacing an existing gun, go to *Replacing an Existing Gun* in this section.

Mounting the Gun

The E-200 modular electric gun may be mounted to dispense material in any direction necessary for the application. The gun may be mounted directly to the parent machine using the two M8 tapped holes located on the top of the manifold. The gun may also be used with the retainer secured to the manifold. An insulator, located between the retainer and manifold, thermally insulates the gun from the mounting bars. Proceed as follows:

1. Make sure that you remove power as described earlier in this section under *System Power Removal*.

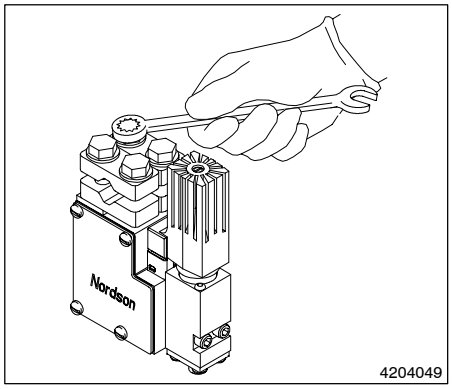


Fig. 3-3 Loosening the Gun Retainer

2. Use a $^1/_2$ in. (13 mm) wrench to loosen the four hex bolts on the gun retainer.

   NOTE: As an alternative, you can secure the gun to the parent machine using the two holes located on top of the manifold. Be sure to protect the gun from vibration by securing it so that the gun will not change position during application. When mounting the gun directly to the parent machine, be sure to place the insulator between the gun manifold and the parent machine.

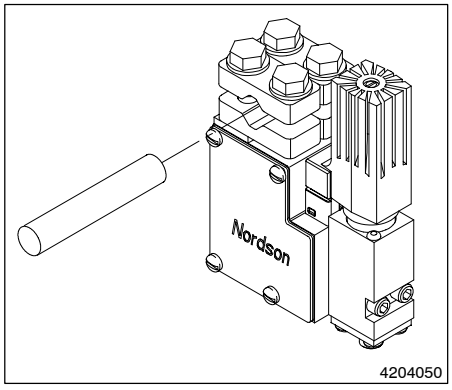


Fig. 3-4 Installing the Gun on the Mounting Bar

3. Slide a $^1/_2$ in. (13 mm) diameter mounting bar through the retainer. At this time just finger tighten the hex bolts on the retainer.

Mounting the Gun *(contd.)*

4. Attach the bar securely to its mount so there will be no gun movement.

   NOTE: Position the gun as close to the substrate as the application will allow. Accuracy in placement and reduced tailing will result.

5. Slightly loosen the gun retainer hex bolts and move the gun along the mounting bar to the desired position.

6. Use the wrench to securely tighten the hex bolts on the retainer.

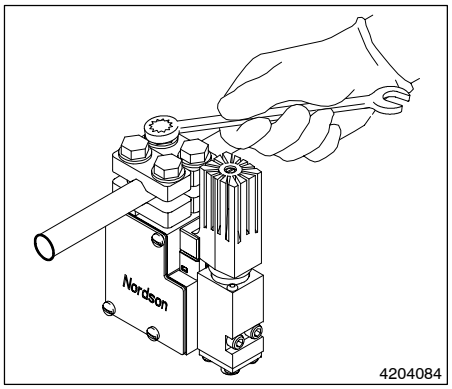


Fig. 3-5 Tightening the Gun Retainer to the Mounting Bar

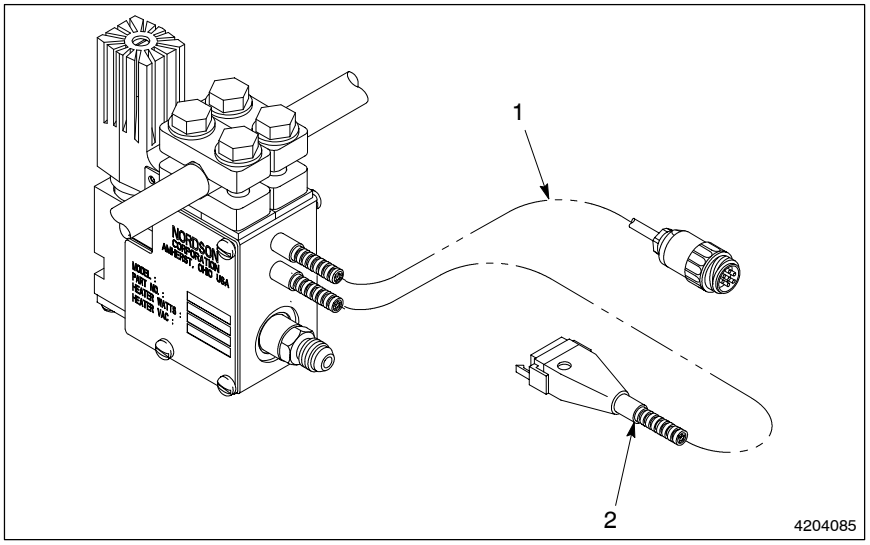


Fig. 3-6 Connecting the Coil Cordset to the Gun Driver

1. Coil cordset *2. Hose cordset*

7. Attach the coil cordset connector (the upper cordset at the rear of the manifold) to the mating connector coming from the gun driver.

Mounting the Gun *(contd.)*

8. Refer to the wiring diagram here for your specific E-200 gun and the gun driver manual, then complete the interconnect cordset wiring connections at the gun driver.

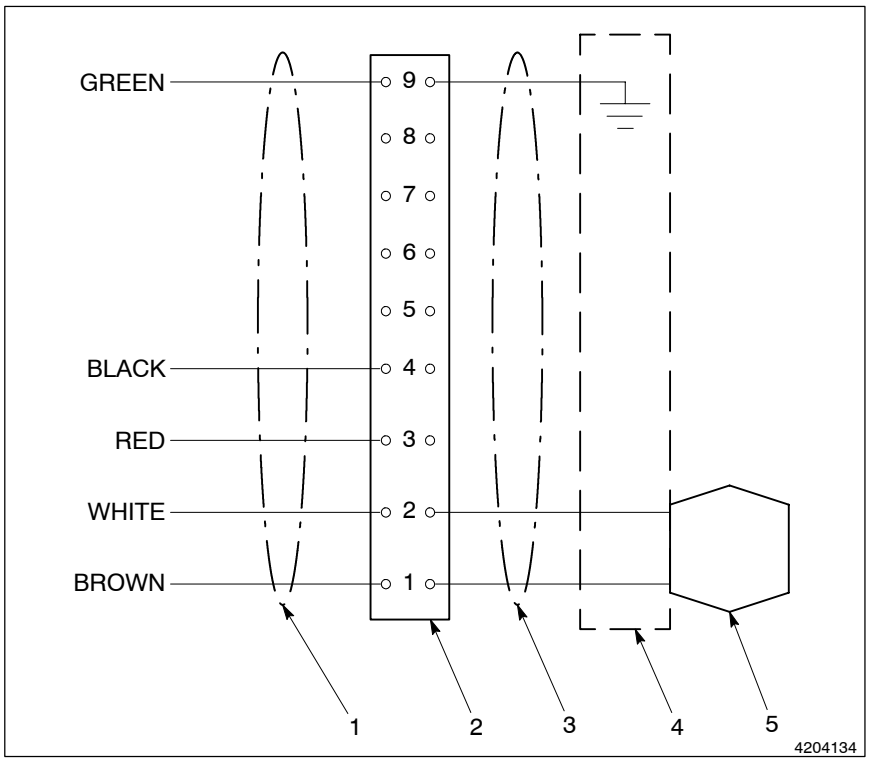


Fig. 3-7 Wiring Diagram for Interconnect Cordset and Single-Module Gun

1. *Interconnect cordset*
2. *Circular connectors for interconnect cordset and coil cordset*
3. *Coil cordset*
4. *E-200 gun manifold*
5. *E-200 gun module*

Mounting the Gun *(contd.)*

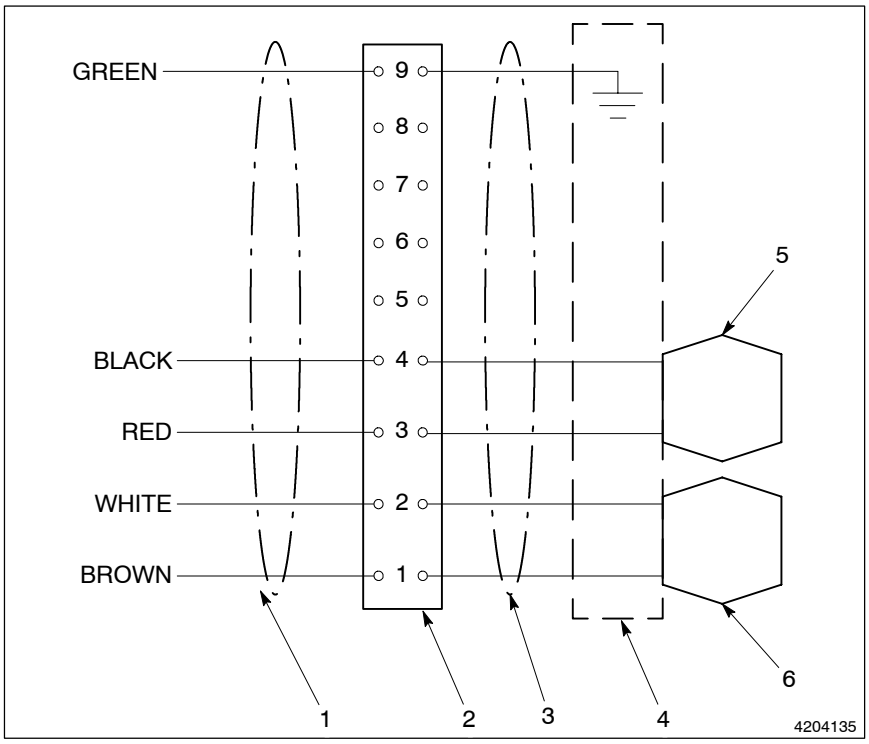


Fig. 3-8 Wiring Diagram for Interconnect Cordset and Two-Module Gun

1. *Interconnect cordset*
2. *Circular connectors for interconnect cordset and coil cordset*
3. *Coil cordset*
4. *E-200 gun manifold*
5. *E-200 gun right module*
6. *E-200 gun left module*

Mounting the Gun *(contd.)*

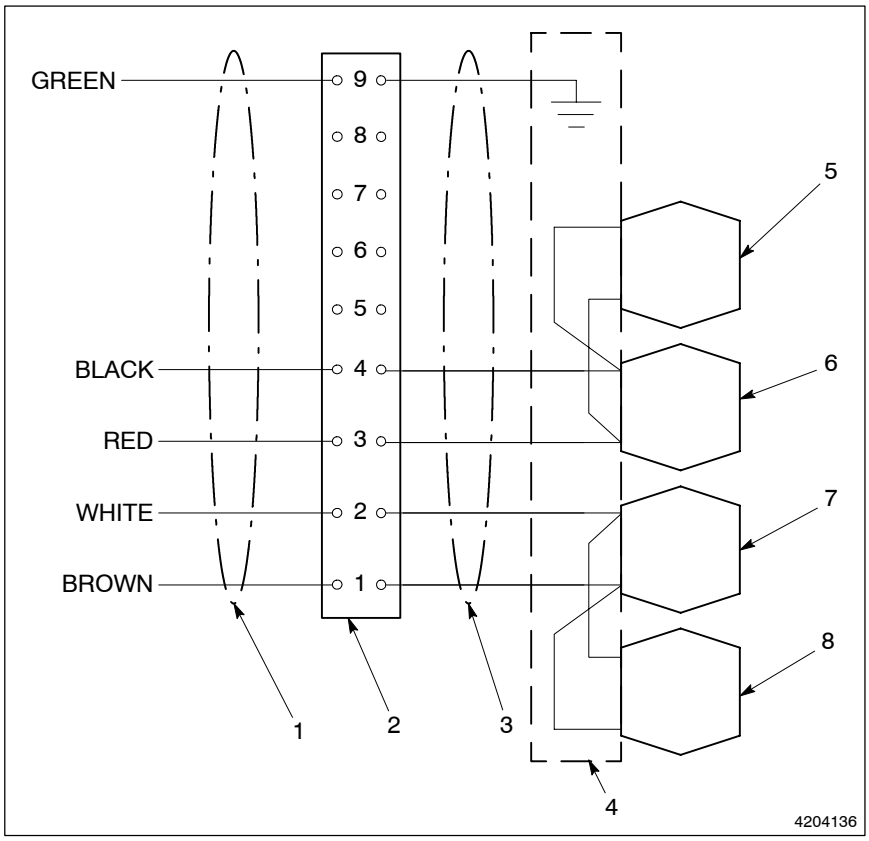


Fig. 3-9 Wiring Diagram for Interconnect Cordset and Four-Module Gun

1. *Interconnect cordset*
2. *Circular connectors for interconnect cordset and coil cordset*
3. *Coil cordset*
4. *E-200 gun manifold*
5. *E-200 gun module 1*
6. *E-200 gun module 2*
7. *E-200 gun module 3*
8. *E-200 gun module 4*

NOTE: Review the *Hose Installation Tips*, previously given, before completing the next step.

Mounting the Gun *(contd.)*

9. Thread the hose swivel fitting onto the gun male fitting until the connection is finger tight.

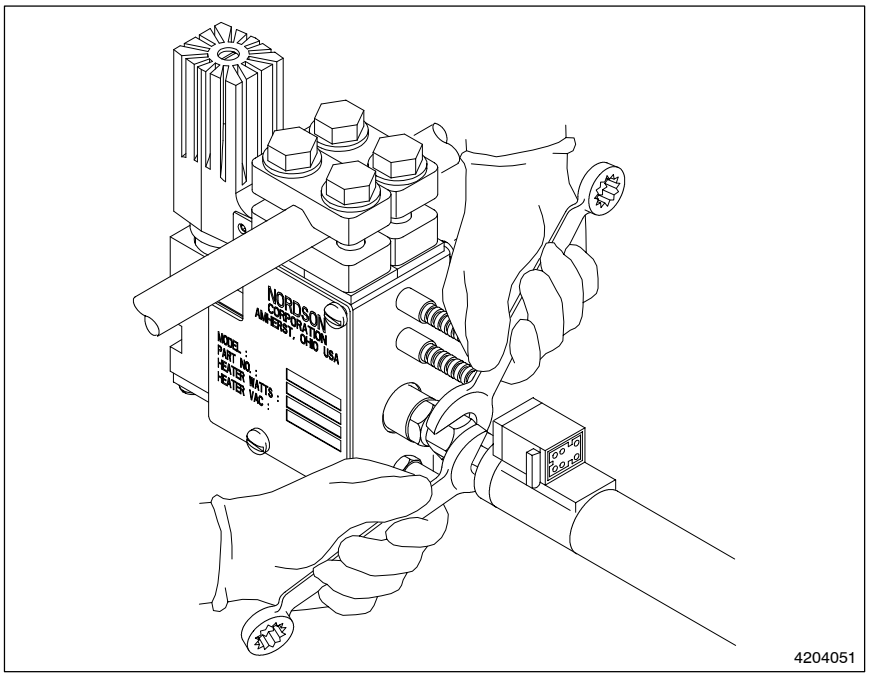


Fig. 3-10 Attaching the Hose to the Gun Manifold

10. Use two wrenches (refer to Table 3-1) to attach the hose swivel fitting to the gun manifold fitting. Do not overtighten.

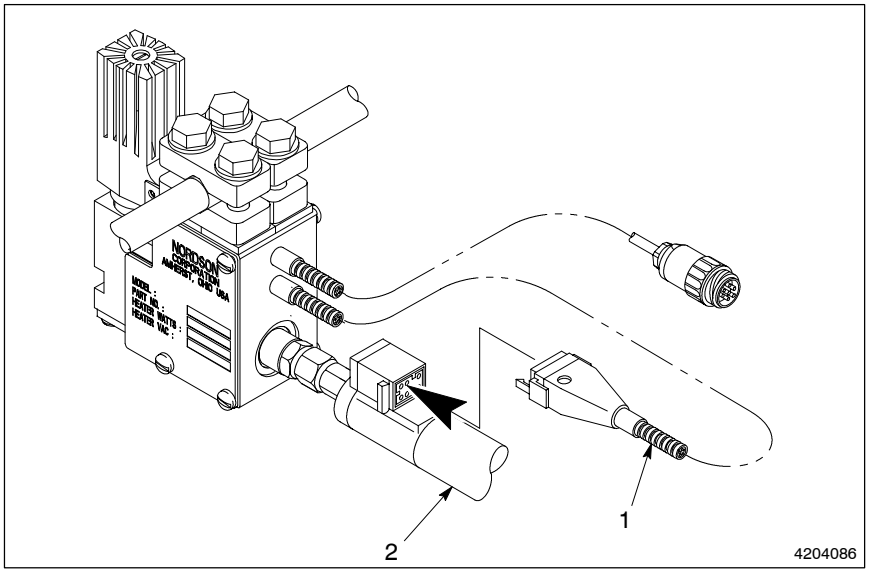


Fig. 3-11 Connecting the Gun Cordset to the Hose

1. Hose cordset *2. Adhesive hose*

11. Plug the gun electrical cordset connector (coming from the bottom cordset at the rear of the manifold) into the hose plug receptacle.

12. This completes the gun installation; continue with *Flushing the Gun* procedure described below.

Flushing the Gun

CAUTION: Risk of module failure. Machined parts in the applicator, hose, or gun manifold may contain small metallic particles that can clog the module. Follow the instructions below to flush the gun with adhesive.

1. Refer to the applicator technical manual for the procedure to connect the adhesive hose to the applicator.
2. Flush the gun by performing the following steps:
   a. Wear safety gloves.
   b. Place a collecting pan under the nozzle.
   c. Use a $^1/_2$ in. (13 mm) wrench to loosen the nozzle.
   d. Remove the nozzle.
   e. Flush the system by following the instructions given in your applicator technical manual.
   f. Reassemble the nozzle onto the gun.

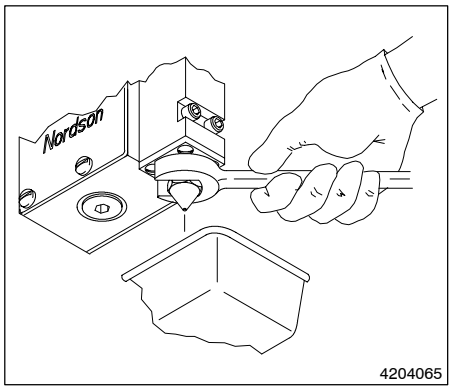


Fig. 3-12 Removing Gun Nozzle

Checking for Leaks

1. Restore electrical power to the applicator.
2. Set the applicator circuit breaker to the ON position.
3. Let the unit and hose reach operating temperature.
4. Check for low pressure leaks between the hose fitting and the gun fitting.
5. While slowly restoring air pressure to the applicator to 40 psi (0.28 MPa), check for leakage. (For gear pump units, increase motor speed to normal operating speed.) Retighten the fittings as necessary.

Restarting the System

1. Follow the start up procedures in your applicator technical manual.
2. Trigger the gun until all cleaning fluid is flushed out.
3. Resume normal operation.

6. Replacing an Existing Gun

CAUTION: The Nordson gun sensor and cordset are not compatible with similar components of other brands; therefore, to prevent a possible hazard when replacing an existing non-Nordson gun with any Nordson RTD-type gun, you will need to obtain and install a cordset conversion kit. See your Nordson representative. Possible hazards include runaway temperature and failure to obtain an adequate ground.

Replacing an existing gun with a new one involves seven operations:

- relieving hydraulic pressure
- removing the old gun
- mounting the replacement gun
- purging the hose
- checking for leaks
- restarting the system

Procedures for each of the above operations are given in the following paragraphs.

Relieving Hydraulic Pressure

WARNING: Risk of burns. Failure to relieve system pressure can result in hot material spraying from a connecting point, possibly causing serious burns. Before removing a hose, a gun, or any other part of the pressurized system, you must first relieve system pressure.

1. Heat the system to operating temperature.
2. Turn the applicator pumps off.
3. Place collecting pans under the applicator's filter drain valve.

WARNING: Hot! Risk of burns. Hot applicator parts, splashed adhesive, and hot gun surfaces can cause severe burns. Wear long-sleeved, heat-protective clothing, safety goggles (ANSI Z87.1-1-989 or equal), and heat-protective gloves.

Relieving Hydraulic Pressure
(contd.)

4. Follow instructions provided in your applicator's technical manual for relieving system hydraulic pressure.

WARNING: Risk of burns. Shield the area and operator. The gun modules must be triggered from the gun driver. Failure to do so can result in hot material spraying from a connecting point downstream of the applicator pump.

5. Trigger the gun module(s) from the gun driver to relieve pressure downstream of the pump. This step is especially important because this the only way to assure that the pressure has been relieved downstream of the pump.

6. Wipe any adhesive from the gun fittings.

7. Turn off the electric gun driver.

8. Place a drain pan under the applicator's drain valve.

NOTE: Figure 3-13 shows a typical arrangement. Details may vary depending on the applicator model.

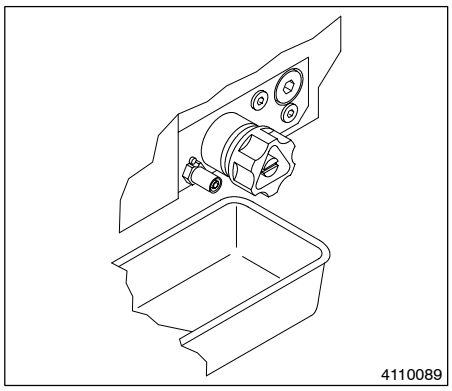


Fig. 3-13 Typical Drain Pan Placement

Relieving Hydraulic Pressure
(contd.)

CAUTION: In the following steps, do not turn the applicator valves with anything but a flat-blade screwdriver. Failure to follow these instructions may result in damage to the equipment.

9. Wear safety gloves.

10. Use a screwdriver to open the applicator's drain valve.

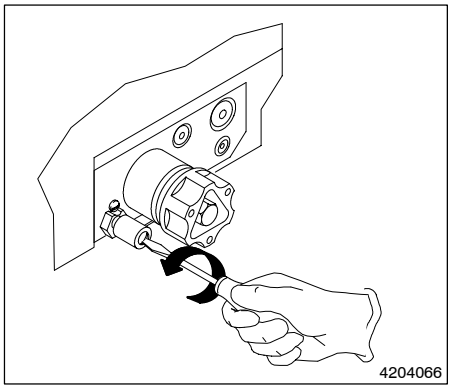


Fig. 3-14 Opening Applicator Drain Valve

11. Allow the applicator manifold to drain as completely as possible.

12. Use a screwdriver to close the drain valve.

13. Properly dispose of the drained adhesive.

Removing the Existing Gun

CAUTION: The Nordson gun sensor and cordset are not compatible with similar components of other brands; therefore, to prevent a possible hazard when replacing an existing non-Nordson gun with any Nordson RTD-type gun, you will need to obtain and install a cordset conversion kit. See your Nordson representative. Possible hazards include runaway temperature and failure to obtain an adequate ground.

Two procedures are given in the following sections: one covers pneumatic guns and the other covers electric guns. Perform the procedure applicable to your configuration.

NOTE: The illustrations referenced in the following procedures are not intended to represent a particular pneumatic or electric gun, but rather describe removal of any gun type.

Pneumatic-Type Gun

1. Make sure that you have followed the procedure above to relieve hydraulic pressure.

2. Make sure that you have removed power as described earlier in this section under *System Power Removal*.

3. Unplug the hose electrical connections from the gun.

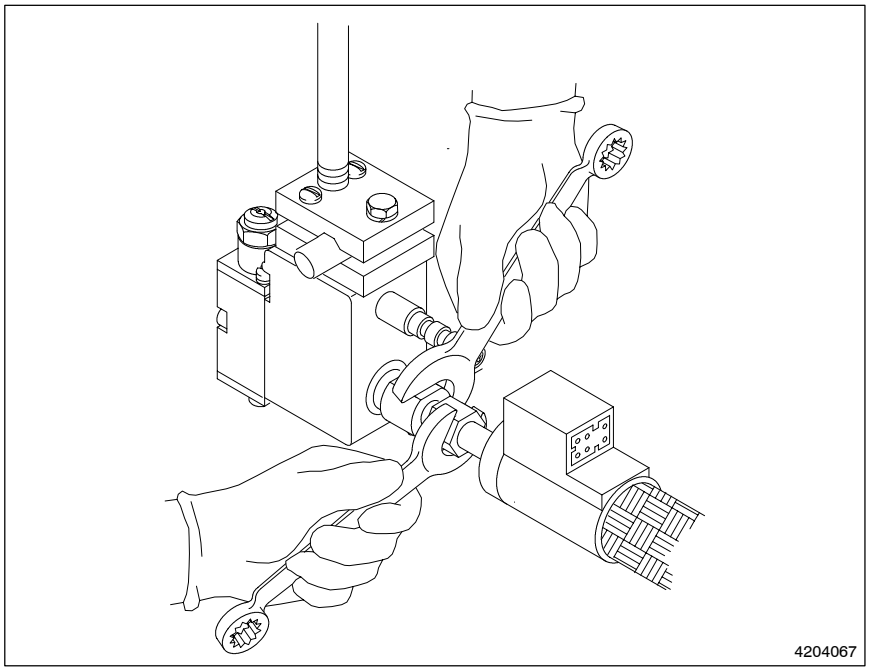


Fig. 3-15 Removing the Hose from the Gun Manifold

4. Use two wrenches to remove the hose swivel fitting from the gun manifold fitting. Place one wrench on the gun manifold fitting and the other wrench on the hose fitting.

5. Disconnect the solenoid from the air supply and shut off the air supply.

Pneumatic-Type Gun *(contd.)*

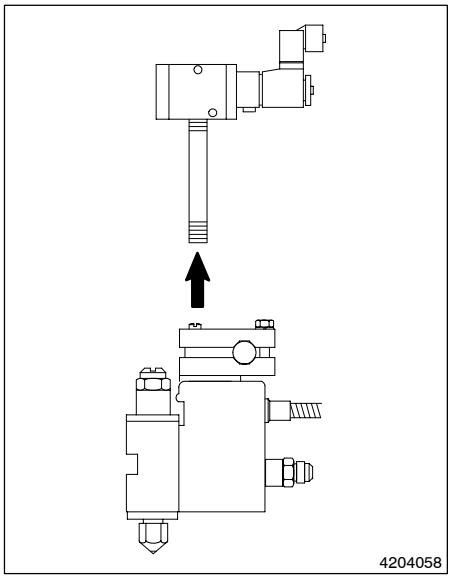


Fig. 3-16 Removing Solenoid from the Gun Manifold

6. Disconnect the gun-end of the solenoid valve pipe nipple from the gun manifold air inlet, and properly dispose of the old solenoid.

7. Remove the mounting bar from its mount.

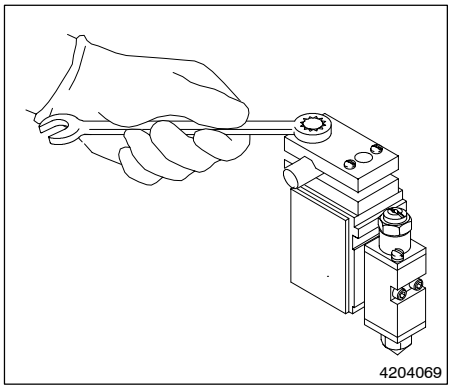


Fig. 3-17 Loosening the Gun Retainer Hex Bolts

8. Use a $^1/_2$ in. (13 mm) wrench to loosen the hex bolts on the gun retainer.

Pneumatic-Type Gun *(contd.)*

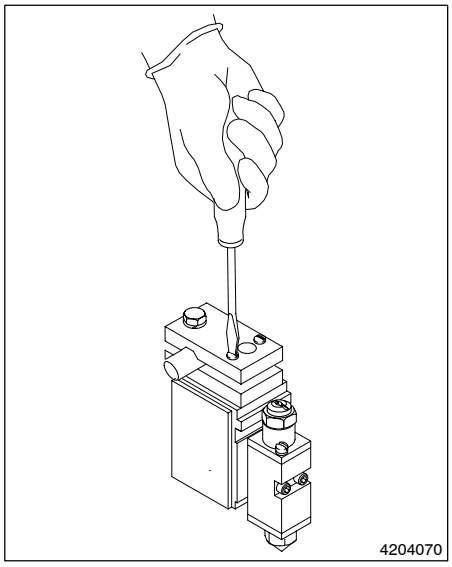


Fig. 3-18 Loosening the Gun Retainer Screws

9. Use a flat blade screwdriver to loosen the two screws on the clamp.

10. Slide the gun off the bar.

11. Properly dispose of the gun and solenoid.

12. Continue by going to the *Mounting the Replacement Modular Electric Gun* procedure later in this section.

Electric-Type Gun

1. Make sure that you have followed the procedure to relieve system pressure (refer to *Relieving Hydraulic Pressure* given earlier in this section).

2. Make sure that you have removed power as described earlier in this section under *System Power Removal*.

3. Unplug the hose electrical connections from the gun:

   a. Disconnect and lock out the input power to the electric gun driver.
   b. Remove power from or turn off the electric gun driver.
   c. Unplug the driver cordset from the gun.

Electric-Type Gun *(contd.)*

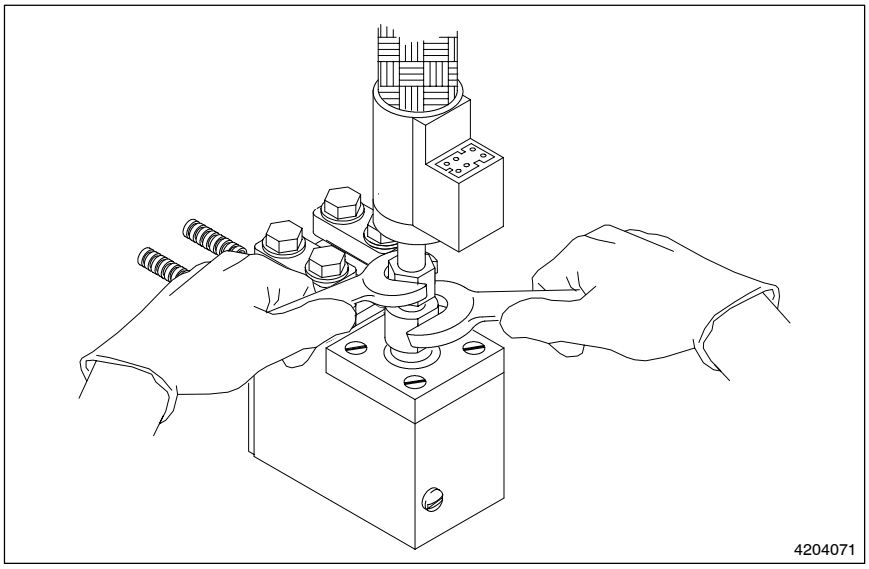


Fig. 3-19 Removing the Hose from the Gun Manifold

4. Use two wrenches to remove the hose swivel fitting from the gun fitting. Place one wrench on the gun fitting and the other wrench on the hose fitting.

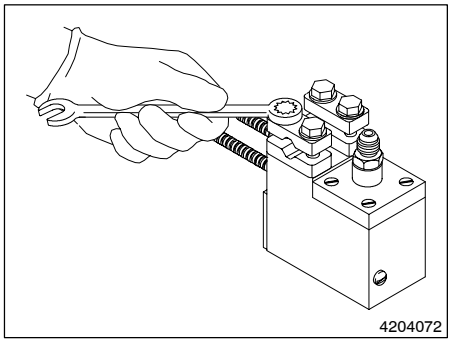


Fig. 3-20 Loosening the Gun Retainer

5. Remove the mounting bar from its mount.

6. Use a $^1/_2$ in. (13 mm) wrench to loosen the hex bolts on the gun retainer.

7. Slide the gun off the bar.

8. Properly dispose of the gun.

9. Continue by going to the *Mounting the Replacement Modular Electric Gun* procedure below.

Mounting the Replacement Modular Electric Gun

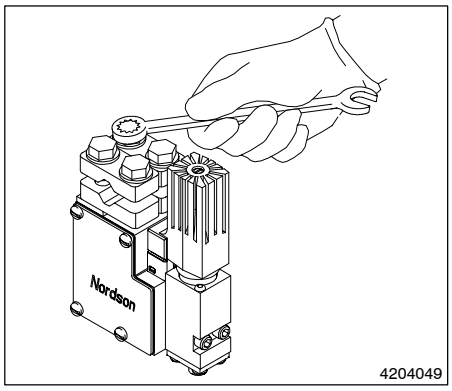


Fig. 3-21 Loosening the Gun Retainer

1. Use a $^1/_2$ in. (13 mm) wrench to loosen the four hex bolts on the gun retainer.

   NOTE: As an alternative, you can secure the gun to the parent machine using the two holes located on top of the manifold. Be sure to protect the gun from vibration by securing it so that the gun will not change position during application. When mounting the gun directly to the parent machine, be sure to place the insulator between the gun manifold and the parent machine.

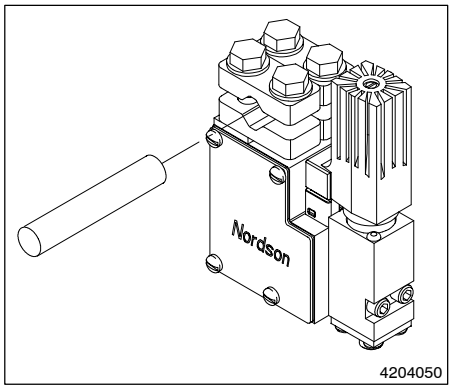


Fig. 3-22 Installing the Gun on the Mounting Bar

2. Slide a $^1/_2$ in. (13 mm) diameter bar through the retainer. At this time just finger-tighten the hex bolts.

3. Attach the bar securely to its mount so there will be no gun movement.

   NOTE: Position the gun as close to the substrate as the application will allow. This will result in accuracy in adhesive placement and reduced tailing.

Mounting the Replacement Modular Electric Gun *(contd.)*

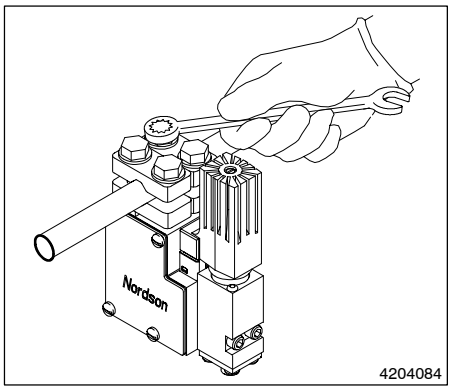


Fig. 3-23 Tightening the Gun Retainer to the Mounting Bar

4. Slightly loosen the gun retainer hex bolts and move the gun along the mounting bar to the desired position.

5. Use the wrench to securely tighten the hex bolts on the retainer.

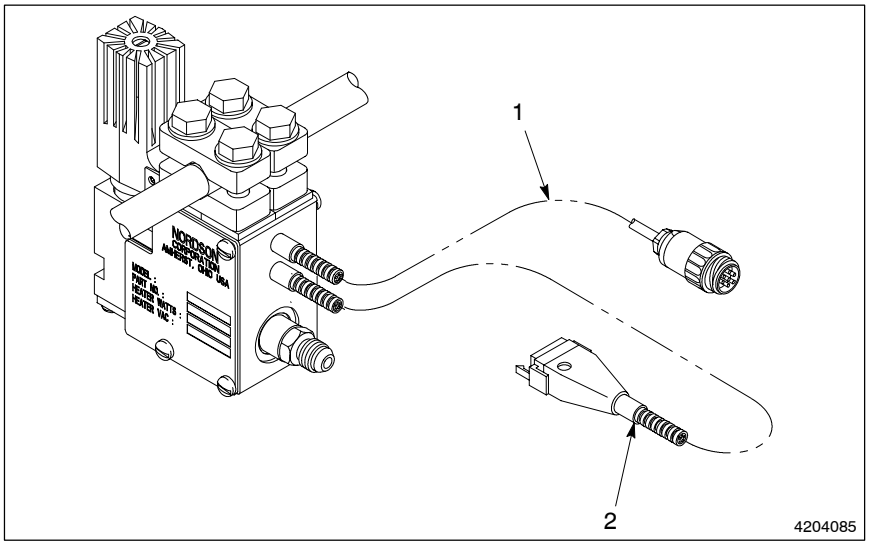


Fig. 3-24 Connecting the Coil Cordset to the Gun Driver

1. Coil cordset *2. Hose cordset*

6. Attach the coil cordset connector (the upper cordset at the rear of the manifold) to the mating connector on the interconnect cordset from the gun driver.

Flushing the Hose

WARNING: Trapped air and char may still be in the hoses. Shield the area and operator from splashing adhesive. Failure to use caution may result in serious injury of burns.

1. Reduce the pump air pressure to 0 psi or turn off the pump.
2. Trigger the guns to relieve any remaining system pressure.
3. Disconnect all hoses from their guns, and referring to Figure 3-25, place the end of these hoses in a bucket or similar container. However, be careful that you secure and position the ends of the hoses so that they will not be covered with adhesive during the flushing operation.

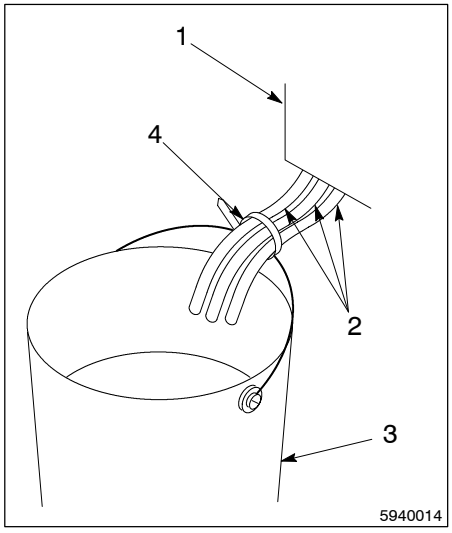


Fig. 3-25 Hose Drain Bucket

1. Applicator
2. Hoses
3. Bucket
4. Tie down to bucket handle

4. To remove air and char trapped in the hoses, perform the following appropriate step:

   - For piston pump applicators, gradually increase the pump air pressure until a clean, steady flow of adhesive flows from the drain.

     or

   - For gear pump applicators with motor control, turn the pump on. Then gradually increase the motor speed until a clean, steady flow of adhesive flows from the drain.

5. Reduce the pump air pressure to 0 psi or turn off the motor.

Flushing the Hose *(contd.)*

6. Thread the hose swivel fitting onto the gun male fitting until the connection is finger tight.

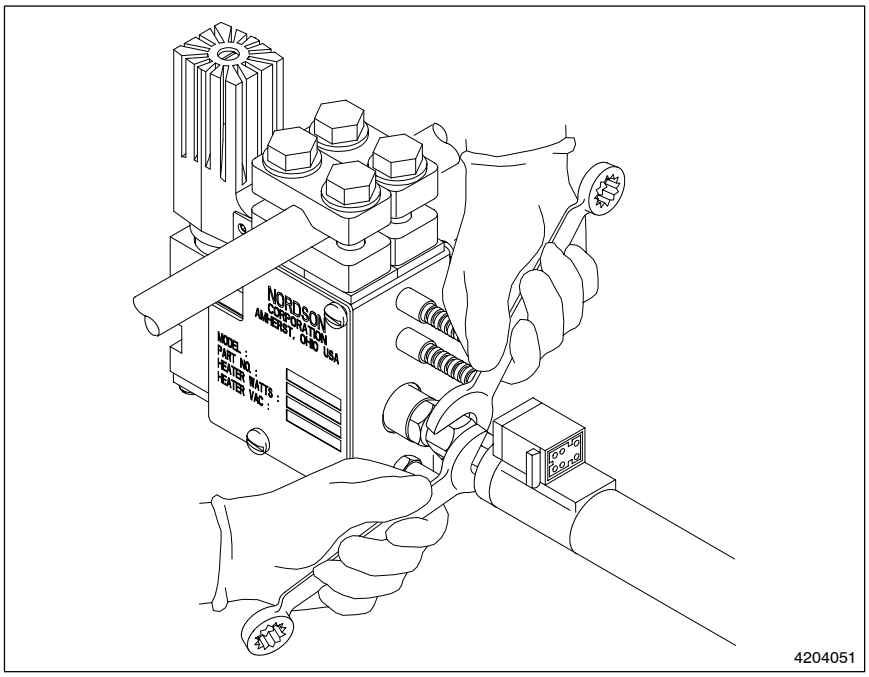


Fig. 3-26 Attaching the Hose to the Gun Manifold

7. Without overtightening, use two wrenches (refer to Table 3-1) to attach the hose swivel fitting to the gun fitting.

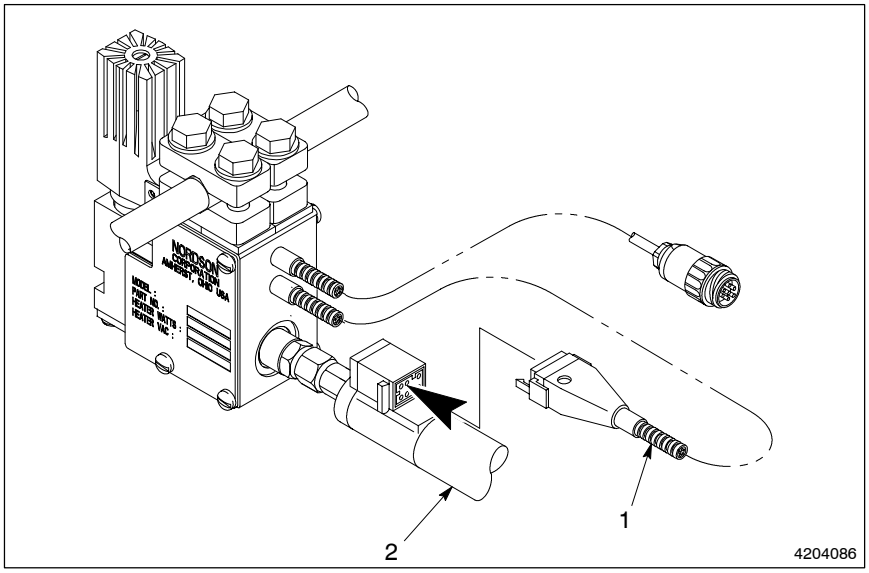


Fig. 3-27 Connecting the Gun Cordset to the Hose

1. Hose cordset *2. Adhesive hose*

8. Plug the gun electrical connection into the hose plug receptacle.

Checking for Leaks

1. Restore electrical power to the applicator.
2. Move the applicator circuit breaker to the ON position.
3. Let the unit and hose reach operating temperature.
4. Check for low pressure leaks between the hose fitting and the gun fitting.
5. While slowly restoring air pressure to the applicator to 40 psi (0.28 MPa), check for leakage. (For gear pump units, increase motor speed to normal operating speed.) Retighten the fittings as necessary.

Restarting the System

1. Follow the start up procedures in your applicator technical manual.
2. Trigger the gun until clean adhesive flows.
3. Resume normal operation.

Section 4

Troubleshooting

Section 4
Troubleshooting

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

1. Introduction

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

Obvious causes of malfunction, such as broken or missing electrical pins or wires, damaged hose plugs, etc. should be noted during daily visual inspection and corrected immediately during cleaning and inspection, unless the failure presents an immediate hazard to the equipment or personnel.

2. Quick Check of Module Operation

NOTE: If the Nordson driver (PN 101084) is being used, gun test triggering should be done at the timer, PLC (Programmable Logic Controller) or other triggering source.

A quick check for proper module operation involves pressing the STOP button on the driver, then pressing the TEST button for each channel on the driver.

Adhesive should flow from those modules connected to the channel whose TEST button is being pressed. If not, refer to the Troubleshooting Guide Table in this section.

3. Troubleshooting

Adhesive Application Problems

Since the plunger in each module is immersed in the adhesive, the viscosity affects the lead, lag, and sometimes the quality of the bead. The first areas you should check are the tank, hose, and gun temperatures. Table 4-1 lists the viscosity versus temperature for several common adhesives used with many Nordson applicators. The table reflects data from the MSDS sheets on file with Nordson. Contact your local representative for current data sheets and recommended operating temperatures. The recommended operating temperature for the adhesives listed is 350 °F (176 °C).

Table 4-1 Representative Adhesives Viscosity Versus Temperature

Manufacturer	Adhesive	Viscosity CPS Brookfield				
		300 °F (148 °C)	325 °F (162 °C)	350 °F (176 °C)	375 °F (184 °C)	400 °F (204 °C)
H.B. Fuller	2055	2200	—	1000	—	520
	1183	2300	—	970	—	550
	1662	2063	—	960	—	—
	2048	2500	—	1015	—	550
	2155	2200	—	1000	—	525
National	34-2876	2800	1800	1200	—	—
	34-2950	2450	1750	1250	—	—
	34-2849	2500	1650	1100	—	—
	34-2952	1500	1000	700	—	—
	34-2883	3000	1900	250	850	—
Swift	80625	2975	2036	1300	1050	740
	84021	960	830	570	—	—
	84116	—	1000	700	—	—
Eastman	A-3	4100	2800	2000	1400	NM-

The Troubleshooting Guide lists typical gun faults, their probable causes, and suggested corrective action.

Adhesive Application Problems *(contd.)*

Problem	Possible Cause	Corrective Action	Refer to
No adhesive flow from any modules of multi-module gun or from a single module gun.	Adhesive level low.	Check level. Tank level should be high enough to feed pump. Add adhesive if needed.	Applicator technical manual
	No applicator input power.	Make sure that all circuit breakers are switched ON. Connect power to applicator and associated equipment. Turn on power to applicator and allow system to heat.	Applicator technical manual
	Applicator temperature setting too low.	Adjust setting	Applicator technical manual
	Hose temperature controller setting too low.	Check hose and gun temperature settings on the applicator. Adjust setting	Applicator technical manual
	Gun temperature controller setting too low.	Adjust setting	Applicator technical manual
	System not at operating temperature.	Verify if READY light is on and adhesive or sealant is molten. If not, allow unit to reach operating temperature.	Applicator technical manual
	Insufficient air pressure to applicator, piston pump model.	Air pressure to pump should be on. Apply air pressure to system.	Applicator technical manual
	Applicator motor not operating.	Switch to motor should be on. Turn on and verify motor operation.	Applicator technical manual
	Heater failure.	Replace heater	Section 6, *Repair*
	Hose clogged.	Remove nozzle and actuate gun to verify flow without nozzle. Clean or replace hose.	Hose technical manual
	Faulty triggering device, driver.	Power indicator lamp should be on. Turn on power to driver.	Driver manual

Adhesive Application Problems *(contd.)*

Problem	Possible Cause	Corrective Action	Refer to
No adhesive flow from any modules of multi-module gun or from a single module gun. *(contd.)*	No timer input to driver.	Trigger indicator lamp on driver should light when timer/trigger is actuated. Turn on timer/trigger source or check troubleshooting guide for timer/trigger source. Replace driver.	Applicable technical manual
	Faulty encoder (if used).	Test encoder. Replace if defective.	Applicable technical manual
No adhesive flow from some modules in multi-module gun or from a single module gun.	Nozzle clogged.	Check nozzle, clean if necessary.	*Nozzle Operational Check* in this section
	Jammed plunger	Remove nozzle and verify flow. Replace or disassemble and clean module.	Section 6, *Repair*
	No stroke on plunger.	Verify gauge plate is in place. Insert gauge plate between seat and module body.	Section 6, *Repair*
	No stroke on plunger with gauge plate.	Repeat module assembly procedure.	Section 6, *Repair*
	Failed module.	Rebuild or replace module.	Section 6, *Repair*
	Heater Failure.	Replace heater	Section 6, *Repair*
	Coil failure.	Test coil. Replace coil if defective. Driver problem	*Coil Electrical Check* in this section Section 6, *Repair* Refer to driver technical manual

Adhesive Application Problems *(contd.)*

Problem	Possible Cause	Corrective Action	Refer to
Adhesive will not stop flowing from some modules in multi-module gun.	Jammed plunger.	Replace or disassemble and clean module.	Section 6, *Repair*
	Loose spring retainer	Replace plunger.	Section 6, *Repair*
	Improper driver wiring.	Check driver wiring diagram.	Driver manual
Gap between beads is missed regularly.	Off time is insufficient for material being used.	Increase temperature or off time, verify gun cuts off. Use an adhesive with lower viscosity.	Applicator technical manual
Beads missed intermittently or continuously.	On time is insufficient or operating pressure is too high for adhesive being used.	Increase on time or temperature or reduce pressure. Verify gun opens consistently. Use an adhesive with lower viscosity or reduce operating pressure.	Applicator technical manual
	Magnetic gap is too large.	Inspect gauge plate to be sure proper size is in place. Replace gauge plate with proper size.	Section 6, *Repair*
	Magnetic gap is too large with proper gauge plate.	Repeat module assembly procedure.	Section 6, *Repair*
Module leaks between manifold and module body.	O-ring between module body and manifold is missing or damaged.	Remove module from manifold following the module replacement procedure and inspect o-ring. Replace or install o-ring.	Section 6, *Repair*
	Seal screw is missing or damaged.	Remove module from manifold following the module replacement procedure and inspect seal screw. Replace or install seal screw.	Section 6, *Repair*
Module leaks between adapter/pole assembly and module body.	Adapter/pole o-ring damaged or missing.	Remove adapter/pole o-ring following adapter/pole o-ring replacement procedure and inspect o-ring. Replace or install o-ring.	Section 6, *Repair*

Adhesive Application Problems *(contd.)*

Problem	Possible Cause	Corrective Action	Refer to
Module leaks between seat adapter and module body.	O-ring between seat adapter and module body missing or damaged.	Remove seat adapter and inspect o-ring. Replace or install o-ring.	Section 6, *Repair*
Modules not triggering at the same time.	Failed module.	Rebuild or replace	Section 6, *Repair*
	Incorrect gauge plate installed.	Check gauge plate and install correct size.	Section 6, *Repair*
Gun fails to heat or underheats.	No power.	Make sure that input power is connected and all circuit breakers are switched ON.	Applicator technical manual
	Temperature setting too low.	Adjust setting.	Applicator technical manual
Gun fails to heat or underheats. *(contd.)*	Failed heater cartridge (open or short).	Heater indicator lamp should be cycling after ample time for warm up is given and no fault lights should be on. Test heater resistance. Replace the heater if it is defective	Section 6, *Repair*
	Failed RTD (open or short).	Check continuity. If continuity exists, check resistance. Replace RTD if defective	See Figure 4-2 for resistance range information. Section 6, *Repair*
Gun overheats.	Gun temperature controller setting too high.	Adjust setting	Applicator technical manual
	Shorted RTD (unit should shut down).	Test RTD using Nordson Hose/Gun Diagnostic Device. Replace the RTD if it is defective	Section 6, *Repair*

Resistance Temperature Detector (RTD) Problems

To identify problems with an RTD circuit, perform the following steps:

NOTE: The Nordson Hose/Gun Diagnostic Device enables you to quickly troubleshoot the gun RTD and heater without removing the guns from the hoses. Contact your Nordson representative for further information.

1. Measure the resistance and temperature of the RTD.

2. Compare the resistance measurement to the resistance graphs shown in Figures 4-1 and 4-2.

3. If the resistance measured is at or close to the correct value, test the continuity at each connection and wire in the RTD circuit. If no problem is observed and the fault still exists, refer to your applicator technical manual for instructions on replacing the applicator's control board.

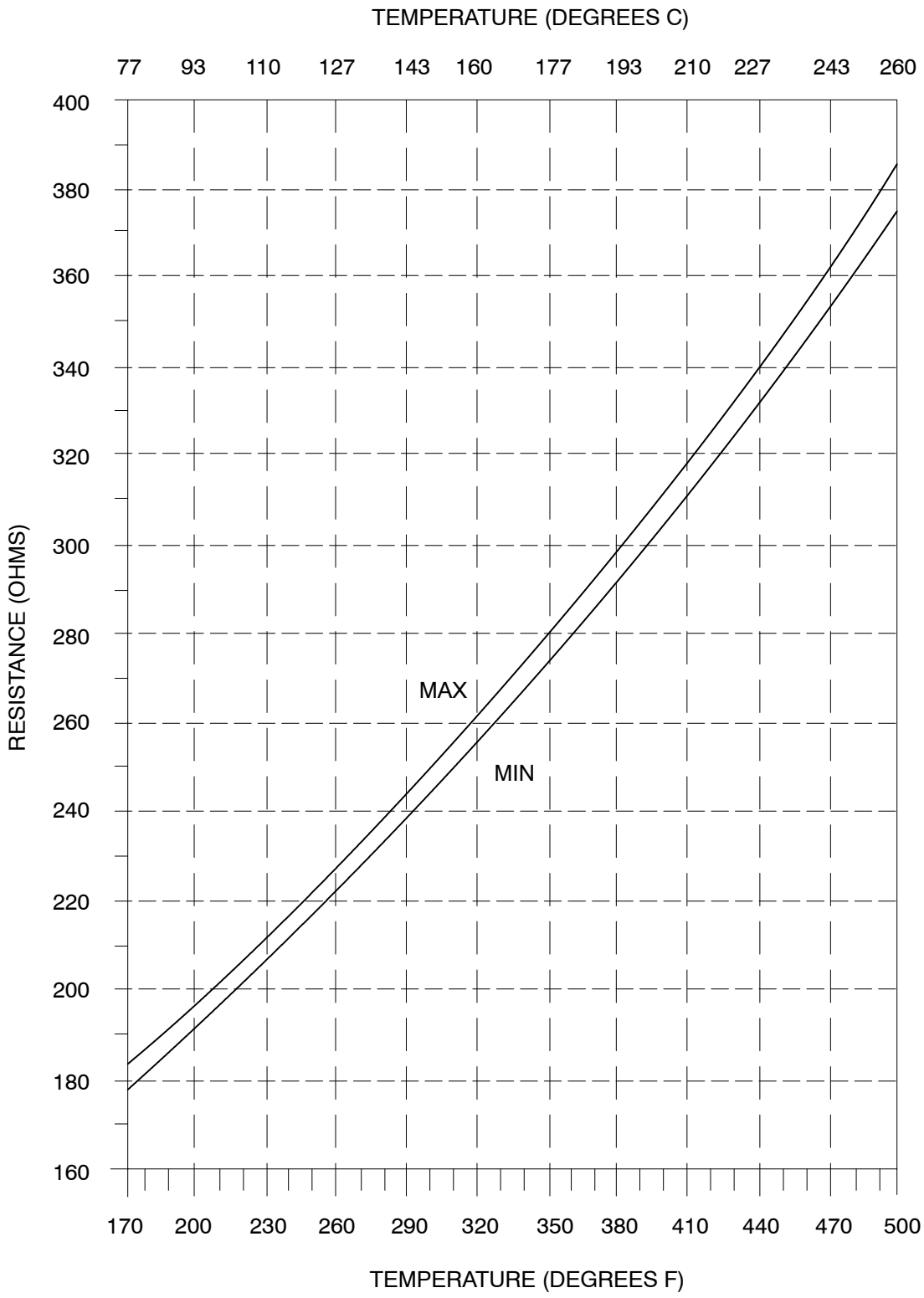


Fig. 4-1 Tank and Gun RTD Resistance Versus Temperature

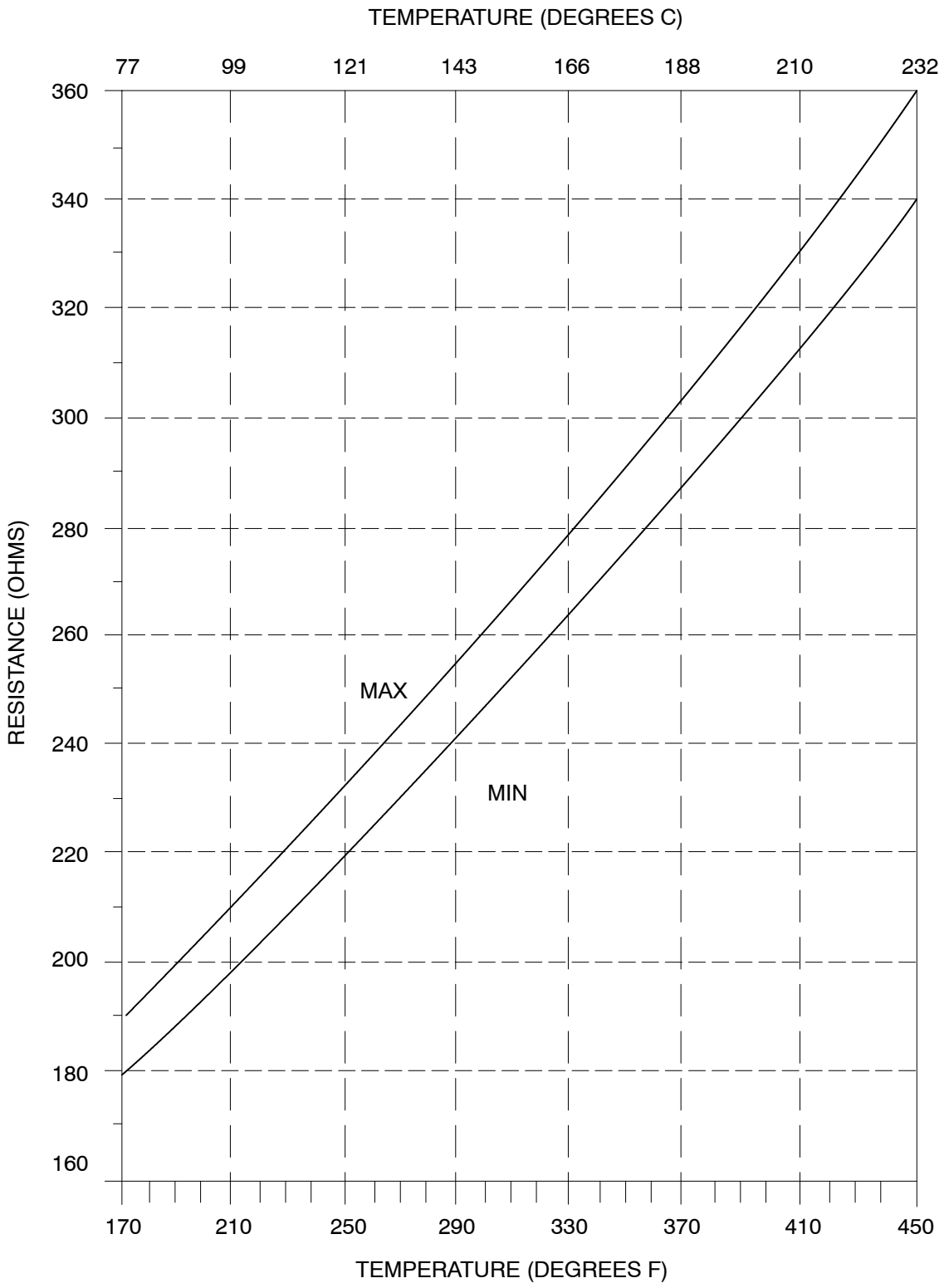


Fig. 4-2 Hose RTD Resistance Versus Temperature

4. Diagnostic Operational Checks

Relieving Hydraulic Pressure

Hydraulic pressure must be properly relieved before you can safely complete many of the diagnostic operational checks.

WARNING: Risk of burns. Failure to relieve system pressure can result in hot material spraying from a connecting point, possibly causing serious burns. Before removing a hose, a gun, or any other part of the pressurized system, you must first relieve system pressure.

1. Heat the system to operating temperature.
2. Turn the applicator pumps off.
3. Place collecting pans under the applicator's filter drain valve.

WARNING: Hot! Risk of burns. Hot applicator parts, splashed adhesive, and hot gun surfaces can cause severe burns. Wear long-sleeved, heat-protective clothing, safety goggles, and heat-protective gloves.

4. Follow instructions provided in your applicator's technical manual for relieving system hydraulic pressure.

WARNING: Risk of burns. Shield the area and operator. The gun modules must be triggered from the gun driver. Failure to do so can result in hot material spraying from a connecting point downstream of the applicator pump.

5. Trigger the gun module(s) from the gun driver to relieve pressure downstream of the pump. This step is especially important because this the only way to relieve pressure downstream of the pump.

Relieving Hydraulic Pressure
(contd.)

6. Wipe off any adhesive on the gun fittings.

7. Turn off the electric gun driver.

8. Place a drain pan under the applicator's drain valve.

NOTE: Figure 4-3 shows a typical arrangement. Details may vary depending on the applicator model.

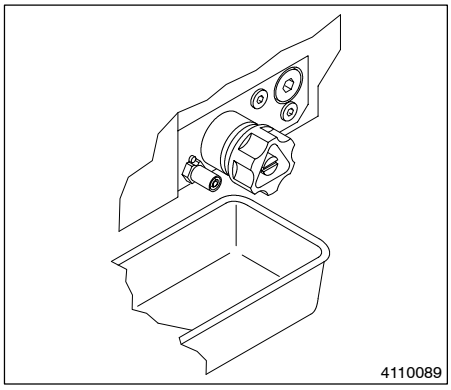


Fig. 4-3 Typical Drain Pan Placement

CAUTION: In the following steps, do not turn the applicator valves with anything but a flat-blade screwdriver. Failure to follow these instructions may result in damage to the equipment.

9. Wear safety gloves.

10. Use a screwdriver to open the applicator's drain valve.

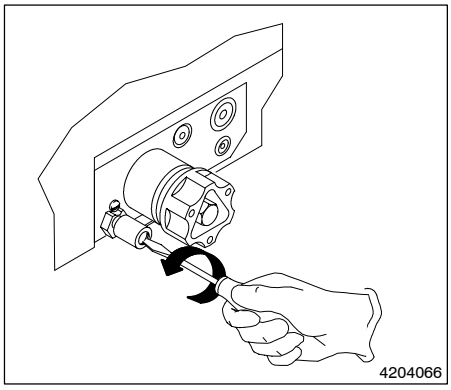


Fig. 4-4 Opening Applicator Drain Valve

11. Allow the applicator manifold to drain as completely as possible.

12. Use a screwdriver to close the drain valve.

13. Properly dispose of the drained adhesive.

Checking Coil and Coil Cordset

1. Disconnect the coil from gun, refer to coil removal procedure in Section 6.

2. Allow coil to cool.

3. Check coil for resistance using a standard ohm meter. Measurement should be 64 ohms ±1 ohm. Replace coil as required.

   NOTE: The above measurement should be performed at normal room ambient temperature (approximately 68 °F, ± 5 °F). The coil resistance will be different if measured outside this temperature range.

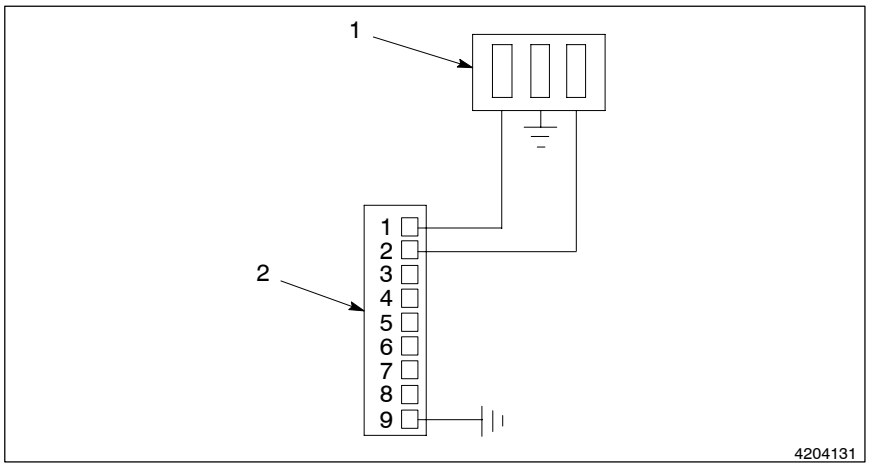


Fig. 4-5 Coil Actuator Socket Wiring Diagram for Single-Module Gun

1. Coil actuator socket on gun

2. Circular connector at end of coil cordset

4. Check coil cordset for continuity. Figures 4-5, 4-6, and 4-7 show the wiring diagrams for the coil actuator sockets on single-module, dual-module, and four-module guns.

Checking Coil and Coil Cordset *(contd.)*

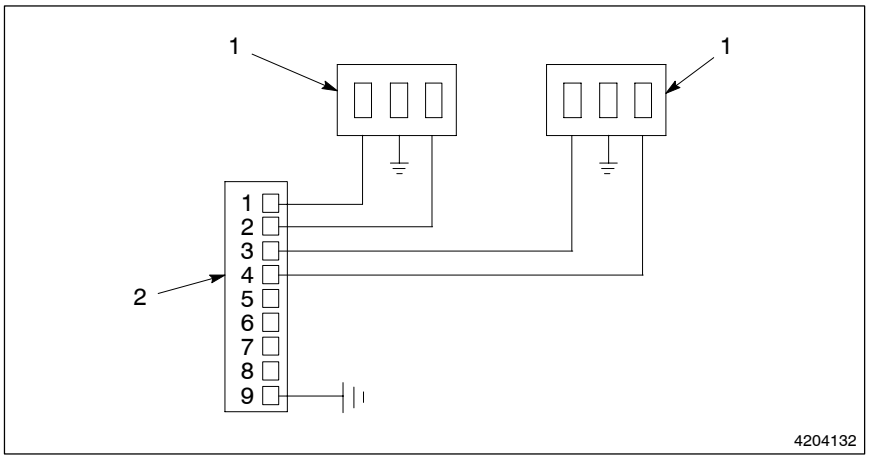


Fig. 4-6 Coil Actuator Socket Wiring Diagram for Dual-Module Gun

1. *Coil actuator sockets on gun*
2. *Circular connector at end of coil cordset*

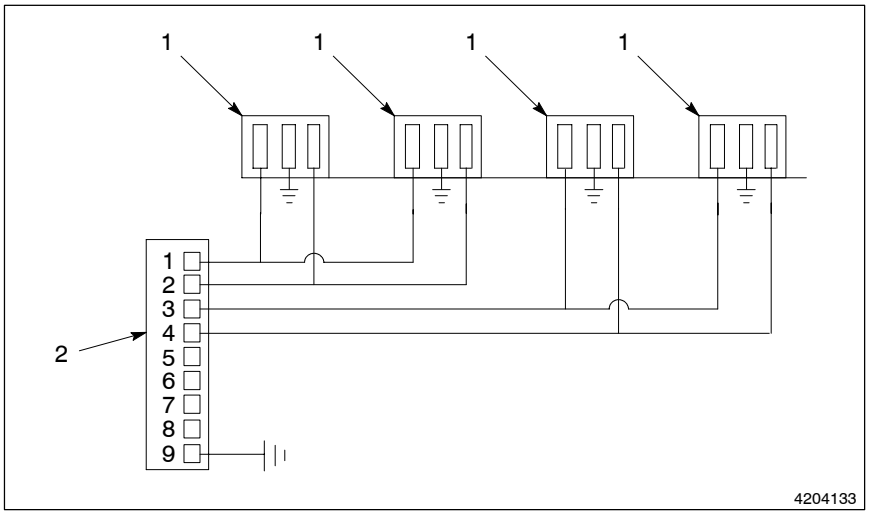


Fig. 4-7 Coil Actuator Socket Wiring Diagram for Four-Module Gun

1. *Coil actuator sockets on gun*
2. *Circular connector at end of coil cordset*

Checking Nozzle Operation

1. Wear safety gloves.
2. Relieve hydraulic pressure (refer to *Relieving Hydraulic Pressure* in this section).
3. Place a drain pan under the gun nozzle.
4. Use a $^1/_2$ in. (13 mm) wrench to remove the nozzle from the module.

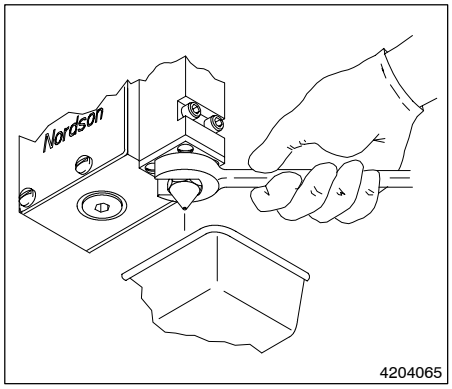


Fig. 4-8 Removing Gun Nozzle

5. Trigger the gun:
   a. Adhesive flows: normal indication. Return to the Troubleshooting Guide.
   b. No adhesive flows: nozzle seat clogged. Clean (refer to Section 5) or replace (refer to Section 6).

Section 5

Maintenance

Section 5
Maintenance

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

1. Introduction

Preventive maintenance procedures for Nordson Series E-200 guns consist of periodic inspections, cleaning, and material changeover. Service kits are available to aid in replacing many parts. These kits are listed in Section 7.

WARNING: Attempting any other repair procedure can result in damage to the gun, improper system operation, or personal injury.

2. Daily Maintenance

NOTE: Accumulated adhesive can char and cause erratic gun operation.

1. Make sure that you wear safety gloves. Wipe any adhesive off all exterior surfaces of the guns.

2. Clean any dust and debris from the work area.

3. Weekly Maintenance

Clean all nozzles weekly (as described below) unless operational history suggests more or less frequent cleaning is required. Nordson offers a complete line of nozzle cleaning kits. The kits and their part numbers are listed in Section 7.

WARNING: Wear safety glasses, safety gloves, and protective clothing to prevent injury from hot applicator parts, splashed adhesive, and hot gun surfaces.

WARNING: When using Type R fluid, do not heat above 475 °F (246 °C). Do not heat Type R fluid with an open flame or in an unregulated heating device (for example, a small pan on an unregulated hot plate). A fire hazard exists if an open flame or unregulated hot plate is used to heat Type R fluid. A controlled heating device (such as a small deep fat fryer or thermostatically controlled hot plate) must be used to heat the cleaning fluid above the melting temperature of the adhesive.

Relieving Hydraulic Pressure

WARNING: Risk of burns. Failure to relieve system pressure can result in hot material spraying from a connecting point, possibly causing serious burns. Before removing a hose, a gun module, or any other part of the pressurized system, you must first relieve system pressure.

1. Heat the system to operating temperature.
2. Turn the applicator pumps off.
3. Place collecting pans under the applicator's filter drain valve.

WARNING: Hot! Risk of burns. Hot applicator parts, splashed adhesive, and hot gun surfaces can cause severe burns. Wear long-sleeved, heat-protective clothing, safety goggles (ANSI Z87.1-1-989 or equal), and heat-protective gloves.

Relieving Hydraulic Pressure
(contd.)

4. Follow instructions provided in your applicator's technical manual for relieving system hydraulic pressure.

WARNING: Risk of burns. Shield the area and operator. The gun modules must be triggered from the gun driver. Failure to do so can result in hot material spraying from a connecting point downstream of the applicator pump.

5. Trigger the gun module(s) from the gun driver to relieve pressure downstream of the pump. This step is especially important because this the only way to relieve pressure downstream of the pump.

6. Wipe off any adhesive on the gun fittings.

7. Turn off the electric gun driver.

8. Place a drain pan under the applicator's drain valve.

NOTE: Figure 5-1 shows a typical arrangement. Details may vary depending on the applicator model.

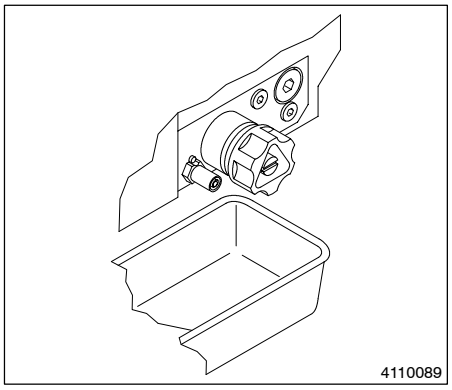


Fig. 5-1 Typical Drain Pan Placement

CAUTION: In the following steps, do not turn the applicator valves with anything but a flat-blade screwdriver. Failure to follow these instructions may result in damage to the equipment.

Relieving Hydraulic Pressure *(contd.)*

9. Wear safety gloves.

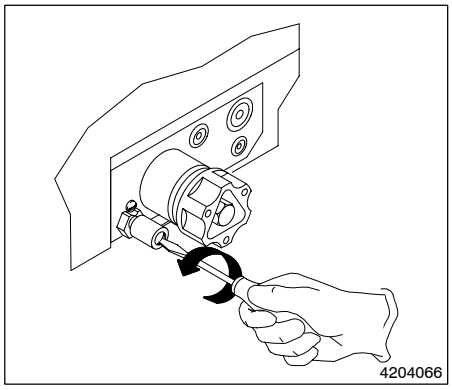


Fig. 5-2 Opening Applicator Drain Valve

10. Use a screwdriver to open the applicator's drain valve.

11. Allow the applicator manifold to drain as completely as possible.

12. Use a screwdriver to close the drain valve.

13. Properly dispose of the drained adhesive.

Cleaning the Nozzle

Nozzle clogging occurs when a filter screen is damaged or when there is charred material in the hose or gun. Charring can occur when an adhesive is heated above the application temperature recommended by the adhesive manufacturer. If charring does occur, it may be necessary to replace the gun.

Perform the following steps to clean gun nozzles:

WARNING: Relieve system pressure before breaking any mechanical connections (for example, the gun-to-hose connection or the filter-to-manifold connection) in the following manner:

1. Relieve system hydraulic pressure as described earlier in this section.

2. Set the applicator circuit breaker to the OFF position.

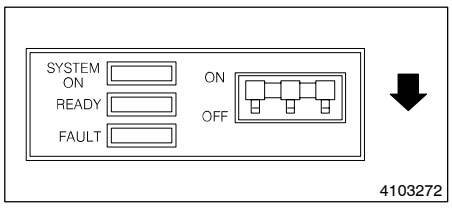


Fig. 5-3 Turning Off Applicator Circuit Breaker

Cleaning the Nozzle *(contd.)*

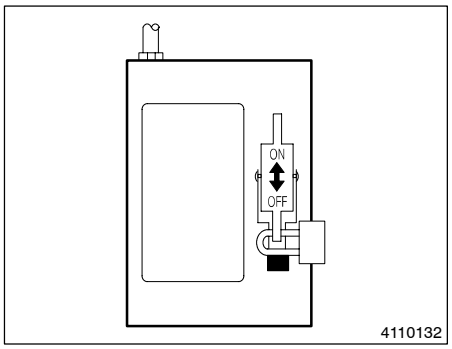


Fig. 5-4 Locking Out Input Power

3. Disconnect and lock out power to the main circuit breaker for the applicator input power line.

4. Disconnect the coil from the driver.

5. Wear safety gloves and continue.

6. Place a drain pan under the gun nozzle.

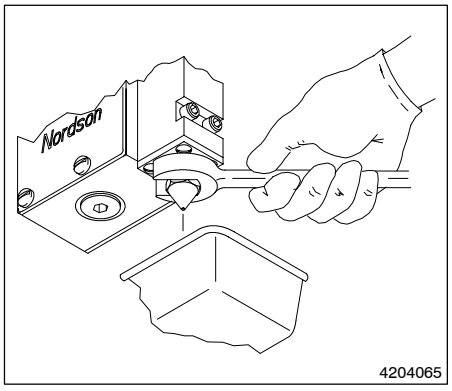


Fig. 5-5 Removing Gun Nozzle

7. Use a $^1/_2$ in. (13 mm) wrench to remove the nozzle from the module.

WARNING: Cleaning fluids may present a toxic or fire hazard, even at room temperature. Use extreme care in selecting a cleaning fluid other than Type R fluid.

NOTE: Some cleaning fluids may not be compatible with the adhesive. Sludge formation can further compound the problem. Test the cleaning fluid with a small sample of adhesive before using the cleaning fluid in the system.

Cleaning the Nozzle *(contd.)*

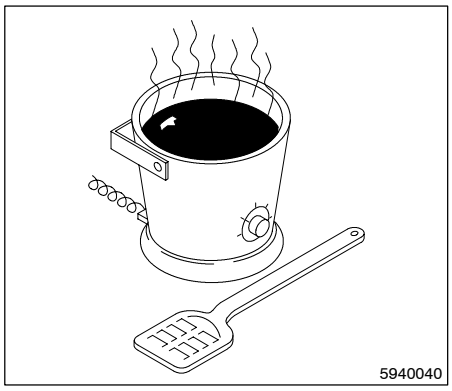


Fig. 5-6 Heated Cleaning Pot Filled with Cleaning Fluid

8. Place the nozzle in a container of Type R fluid. Use a controlled heating device (such as a small, deep-fat fryer or thermostatically-controlled hot plate) to heat the Type R fluid above the melting temperature of the adhesive.

CAUTION: Do not use an open torch, drill, or broach to clean a nozzle. Damage may result.

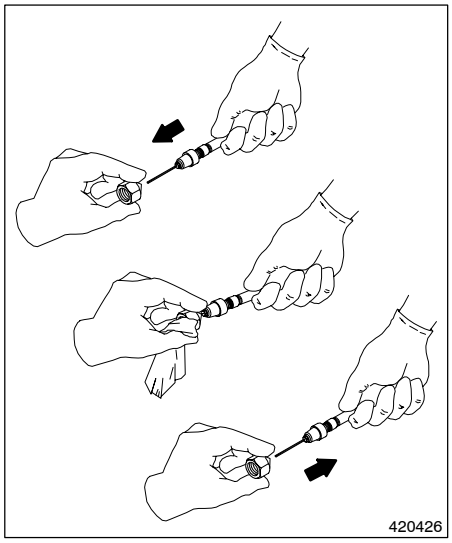


Fig. 5-7 Cleaning Nozzle with Probe

9. Clean the nozzle bore with a pin-type probe inserted into the nozzle in the opposite direction as the flow of adhesive. See Section 7 for specific information on nozzle cleaning kits. The Nordson nozzle cleaning kit includes the holder and a variety of probes.

10. Reassemble the nozzle into the gun.

11. Reconnect the coil to the driver.

12. Restore the system to normal operation in accordance with the applicator service manual.

4. Semi-Annual Maintenance

Inspecting the Gun

WARNING: This equipment contains energized electrical components with potentials that could be fatal. Disconnect and lock out input electrical power before installing or servicing this equipment.

1. Wear safety gloves.

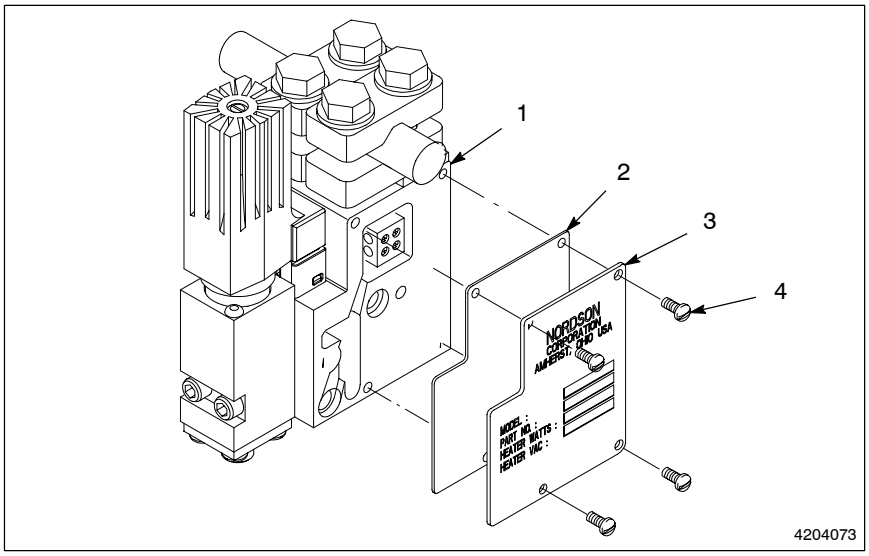


Fig. 5-8 Removing or Installing Manifold Cover Plates and Insulators

1. Manifold
2. Insulator
3. Cover plate
4. Screws

2. Remove the cover plates and insulators from each side of the manifold.

3. Inspect all wiring for signs of wear or other damage to the insulation.

4. Check all electrical connections for tightness.

WARNING: Vibration and heating/cooling cycles may loosen connections. This can result in electric shock or equipment damage.

5. Clean the plunger and spring assembly in each module. Replace as required. See Section 7 for disassembly instructions.

6. Reinstall all parts removed and restore the system to normal operation in accordance with the applicator service manual.

Cleaning the System

The entire adhesive application system, including the guns, must be flushed periodically. Flushing removes excess dirt and charred material. Also, clean the system if the adhesive in the system is changed, and if the old and new adhesives are incompatible.

Refer to your applicator technical manual for specific system cleaning procedures.

Section 6

Repair

Section 6
Repair

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

1. Introduction

This section contains instructions for removing and replacing the following E-200 gun components:

- gun assembly
- module
- coil
- RTD
- heater cartridge
- module disassembly/assembly
- seat adapter o-ring
- adapter/pole o-ring
- gun cordset

These are the only components that can be replaced. Gun modules can be rebuilt, refer to the parts list in Section 7.

Most of the procedures given in this section are independent and can thus be performed individually. Before performing any of the procedures in this section, prepare the unit by Relieving Hydraulic Pressure and Removing System Power as described below.

2. Preparing the Unit for Service

Relieving Hydraulic Pressure

Perform the following steps to relieve hydraulic pressure before disassembling and replacing any gun component:

WARNING: Risk of burns. Failure to relieve system pressure can result in hot material spraying from a connecting point, possibly causing serious burns. Before removing a hose, a gun module, or any other part of the pressurized system, you must first relieve system pressure.

1. Heat the system to operating temperature.
2. Turn the applicator pumps off.
3. Place collecting pans under the applicator's filter drain valve.

NOTE: Figure 6-1 shows a typical drain pan placement. Details may vary depending on the applicator model.

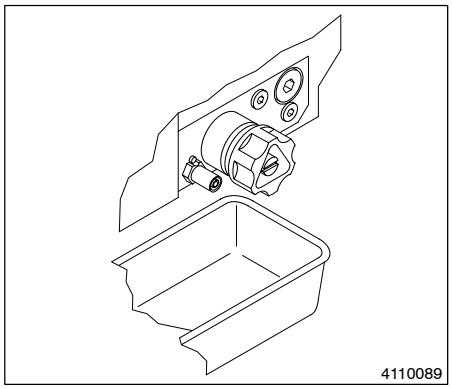


Fig. 6-1 Typical Drain Pan Placement

WARNING: Hot! Risk of burns. Hot applicator parts, splashed adhesive, and hot gun surfaces can cause severe burns. Wear long-sleeved, heat-protective clothing, safety goggles, and heat-protective gloves.

Relieving Hydraulic Pressure
(contd.)

4. Follow instructions provided in your applicator's technical manual for relieving system hydraulic pressure.

WARNING: Risk of burns. Shield the area and operator. The gun modules must be triggered from the gun driver. Failure to do so can result in hot material spraying from a connecting point downstream of the applicator pump.

5. Trigger the gun module(s) from the gun driver to relieve pressure downstream of the pump. This step is especially important because this the only way to relieve pressure downstream of the pump.

6. Wipe off any adhesive on the gun fittings.

7. Turn off the electric gun driver.

8. Place a drain pan under the applicator's drain valve.

CAUTION: In the following steps, do not turn the applicator valves with anything but a flat-blade screwdriver. Failure to follow these instructions may result in damage to the equipment.

9. Wear safety gloves.

10. Use a screwdriver to open the applicator's drain valve.

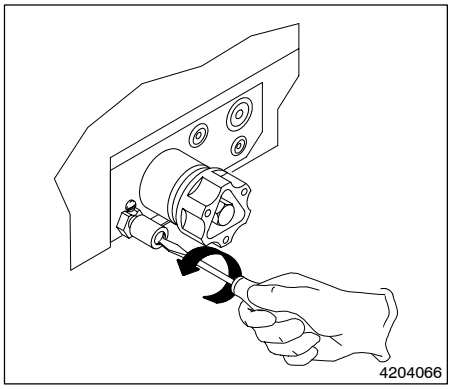


Fig. 6-2 Opening Applicator Drain Valve

11. Allow some adhesive to drain from the applicator until there appears to be no pressure forcing the adhesive.

12. Use a screwdriver to close the drain valve.

13. Properly dispose of the drained adhesive.

Removing System Power

Prior to installing or removing any items or equipment from the system, be sure to remove all power as described below.

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

1. Set the applicator circuit breaker to the OFF position.

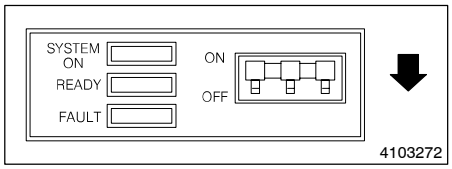


Fig. 6-3 Turning Off Applicator Circuit Breaker

2. Disconnect and lock out the input power line to the applicator main circuit breaker.

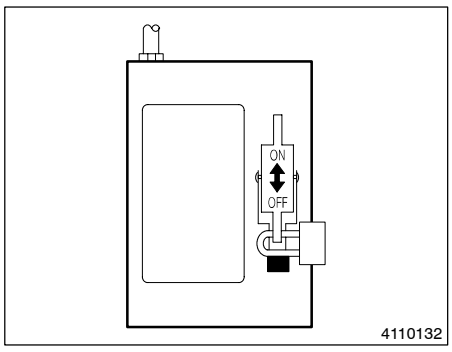


Fig. 6-4 Locking Out Input Power

3. Gun Assembly Removal and Replacement

Removing the Gun

1. First, perform the *Relieving Hydraulic Pressure* procedure given at the beginning of this section.

WARNING: Hot! Risk of burns. Hot applicator parts, splashed adhesive, and hot gun surfaces can cause severe burns. Wear long-sleeved, heat-protective clothing, safety goggles, and heat-protective gloves.

Removing the Gun *(contd.)*

2. Trigger the gun to relieve any remaining hydraulic pressure.

3. Make sure that you remove power as described earlier in this section under *Removing System* Power.

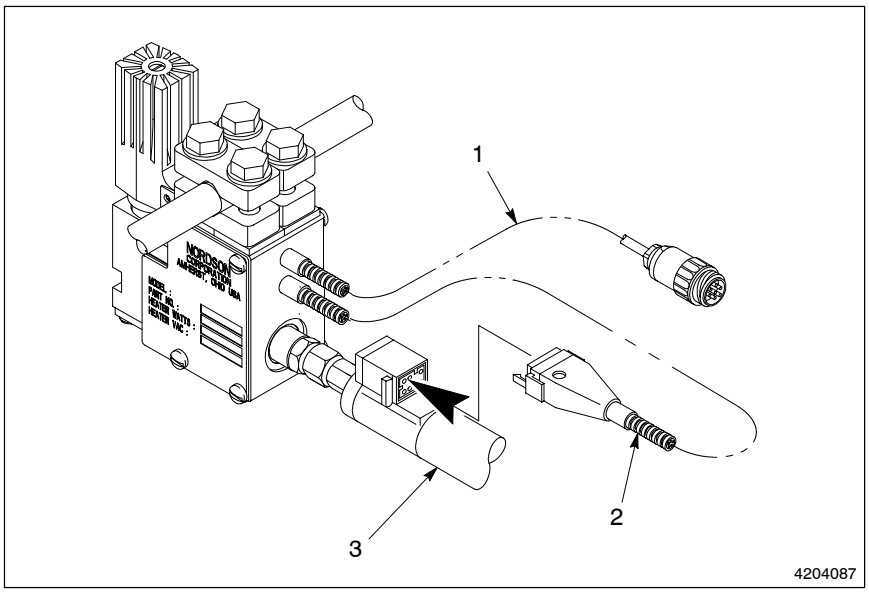


Fig. 6-5 Removing the Gun Cordsets from the Hose and Driver

1. Coil cordset
2. Hose cordset
3. Adhesive hose

4. Unplug the gun's hose and coil cordsets from their mating connector.

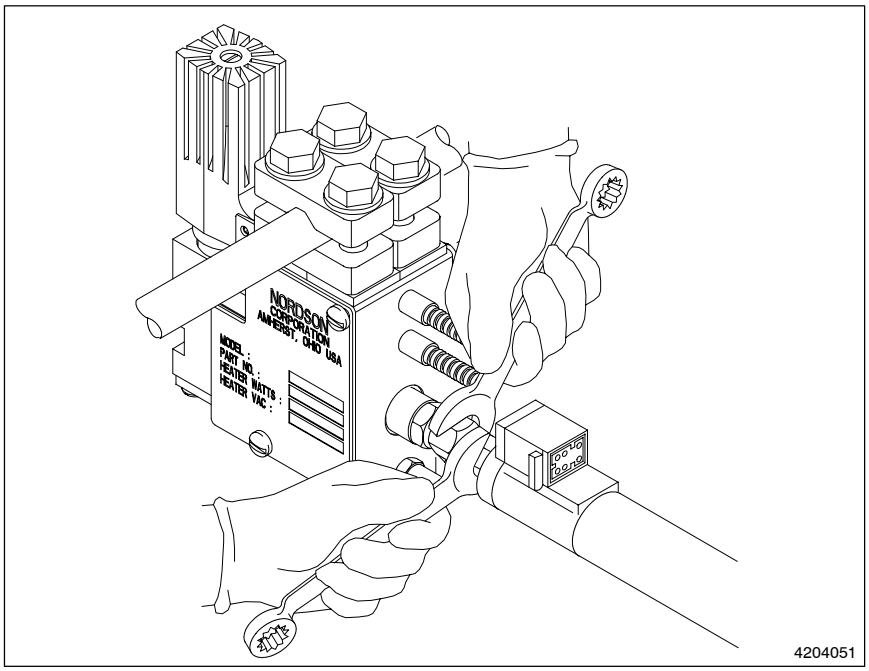


Fig. 6-6 Removing the Hose from the Gun Manifold

5. Use two wrenches to remove the hose swivel fitting from the gun. Place one wrench on the gun fitting and the other wrench on the hose fitting.

Removing the Gun *(contd.)*

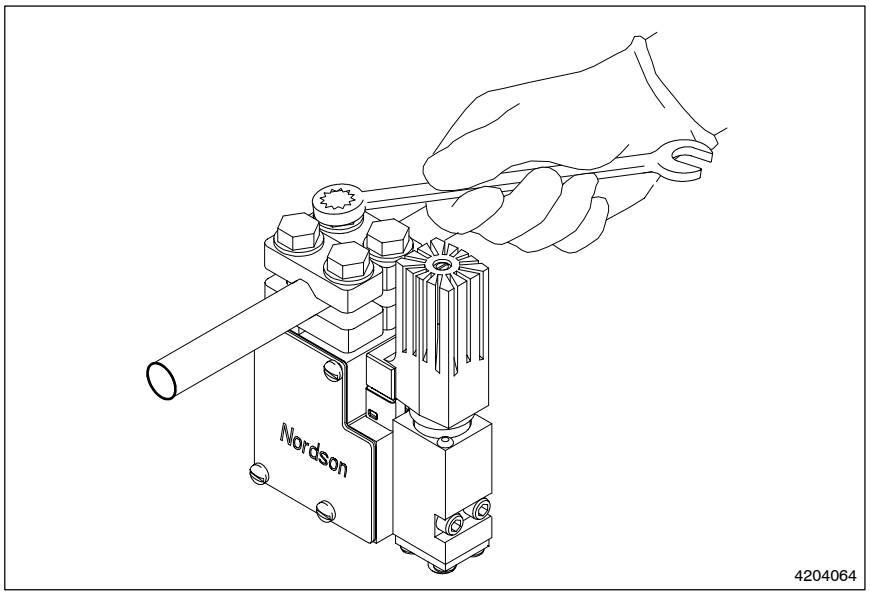


Fig. 6-7 Loosening the Gun Retainer

6. Use a 1/2 in. (13 mm) wrench to loosen the hex bolts on the gun retainer.

7. Slide the gun assembly off the mounting bar.

8. Properly dispose of the old gun and drained adhesive.

Replacing the Gun

1. Replace the gun assembly by following steps 4 through 9 in the above procedure in reverse.

2. Restore the system to normal operation by following the start up procedures in the applicator technical manual.

4. Module Removal and Replacement

Use the procedure below to replace E-200 gun modules. To rebuild the modules, follow the instructions provided with the Module Rebuilding Kits (refer to the parts lists in Section 7).

1. First, perform the *Relieving Hydraulic Pressure* procedure given at the beginning of this section.

WARNING: Hot! Risk of burns. Hot applicator parts, splashed adhesive, and hot gun surfaces can cause severe burns. Wear long-sleeved, heat-protective clothing, safety goggles, and heat-protective gloves.

2. Trigger the gun to relieve any remaining hydraulic pressure.

3. Make sure that you remove power as described earlier in this section under *Removing System* Power.

4. Then turn off power to the driver.

   NOTE: To remove the coil and module assembly as described next (with the gun installed at the station) you need a minimum of 3 inches above the coil in order to completely remove the coil from the adapter/pole assembly. If you do not have this minimum clearance, perform the alternate method of removing or installing the module described at the end of this section. For this procedure you will need only 1 inch clearance above the coil as the coil and module are removed as an assembled unit.

5. Remove the screw from the top of the module coil (item 1). The module retaining screws (item 2) will be removed later in this procedure.

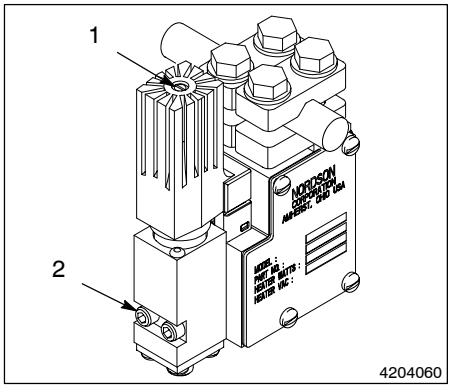


Fig. 6-8 Location of Module and Coil Retaining Screws

1. Coil retaining screw

2. Module retaining screws

4. Module Removal and Replacement (contd.)

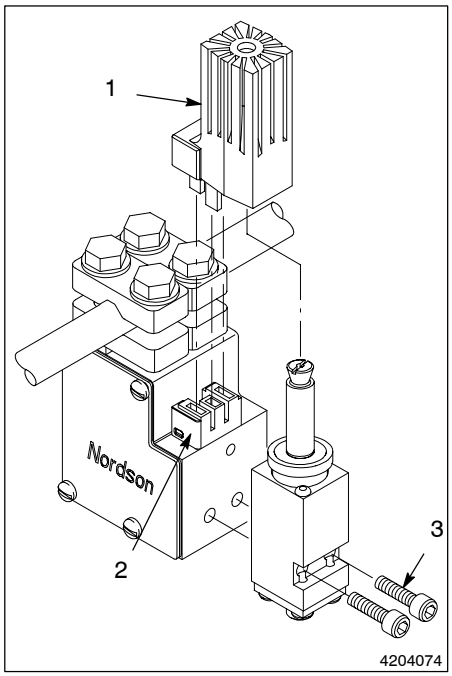


Fig. 6-9 Removing the Gun Module and Coil from the Manifold

1. *Coil*
2. *Coil connector*
3. *Module retaining screws*

6. Lift the coil off of the module (item 1) by carefully unplugging it from the manifold connector (item 2).

7. Use a hex head wrench to remove the two socket head screws from the front of the module (item 3).

8. Remove the module from the gun manifold.

9. Wipe off any adhesive left on the manifold, especially around the adhesive passage.

10. Coat the new o-ring with lubricant.

4. Module Removal and Replacement (contd.)

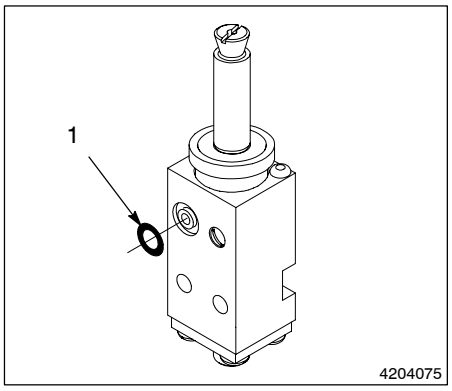


Fig. 6-10 Rear View of Module Showing O-Ring Location

1. O-ring

11. Install the o-ring in the groove in the back of the new module body. Then position the module on the gun manifold.

12. Apply PTFE paste to the two socket-head screws.

13. Replace and finger-tighten the two socket head screws that secure the module to the manifold.

14. Install the coil on top of the module, carefully connecting its plug to the mating connector on the manifold. Then reinstall the screw on the top of the coil.

CAUTION: Do not overtighten the screws. Overtightening can cause the head of the screw to break off.

15. Tighten the two socket head screws on the front of the module.

NOTE: For best results, tighten the screws again after the applicator reaches operating temperature.

16. Restore the system to normal operation according to instructions in the applicator service manual.

Alternate Module Removal and Replacement Procedure

NOTE: When there is insufficient clearance above the gun's coil for removal from the module at the station, use the following alternate method of removing or installing the module and coil as an assembled unit:

CAUTION: During module/coil removal, do not rock the module from side to side. This may result in damage to the plastic electrical connector.

1. Remove the two screws in the front of the module that secure it to the manifold. The coil must still be securely attached to the module by the screw in the top of the coil.
2. Remove the module/coil as an assembled unit from the manifold by carefully pushing up on the assembly and unplugging the prongs of the coil electrical connection from the plastic connector on the manifold.
3. Remove the screw from the top of the coil.
4. Remove the coil from top of module. Be sure to pull the coil straight off of the adapter/pole assembly.
5. Install coil on top of the replacement module. Be sure coil is aligned with the back of the module body.
6. Install the screw on top of the coil to secure it to the module.

CAUTION: During module/coil installation, do not rock the module from side to side. This may result in damage to the plastic electrical connector.

7. Install the o-ring in the grove in the back of the new module body, see Figure 6-10.
8. Install the module/coil assembly onto the manifold by inserting the prongs for the coil electrical connection into the plastic connector on the manifold.
9. Apply PTFE paste to the two socket-head screws that secure the module to the manifold, then Install them and tighten.
10. Restore the system to normal operation according to instructions in the applicator service manual.

5. Coil Removal and Replacement

1. First, perform the *Relieving Hydraulic Pressure* procedure given at the beginning of this section.

WARNING: Hot! Risk of burns. Hot applicator parts, splashed adhesive, and hot gun surfaces can cause severe burns. Wear long-sleeved, heat-protective clothing, safety goggles, and heat-protective gloves.

2. Trigger the gun to relieve any remaining hydraulic pressure.

3. Make sure that you remove power as described earlier in this section under *Removing System* Power.

4. Then turn off power to the driver.

   NOTE: To remove the coil as described next (with the gun installed at the station) you need a minimum of 3 inches above the coil in order to completely remove the coil from the adapter/pole assembly. If you do not have this minimum clearance, refer to the *Alternate Module Removal and Replacement Procedure* described at the end of the previous section as a guide. For this procedure you will need only 1 inch clearance above the coil as the coil and module are removed as an assembled unit.

5. Remove the screw on top of the module coil (item 1).

   NOTE: Do not loosen the module retaining screws (2), as only the coil is being replaced.

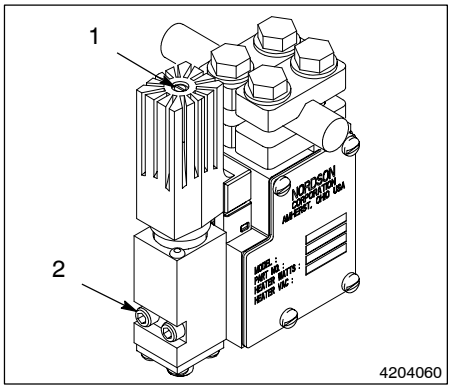


Fig. 6-11 Location of Module Coil Retaining Screw

1. Coil retaining screw
2. Module retaining screws

5. Coil Removal and Replacement (contd.)

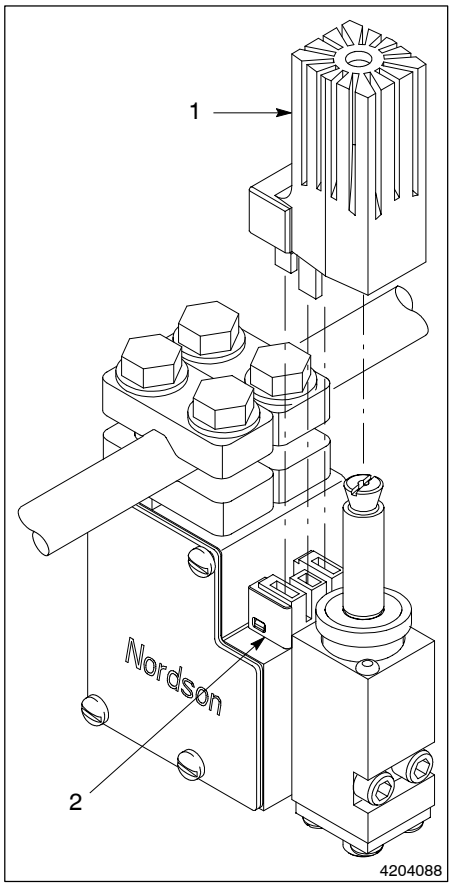


Fig. 6-12 Removing the Gun Module Coil from the Manifold

1. *Coil*
2. *Coil connector*

6. Lift the coil off of the module (item 1) by carefully unplugging it from the manifold connector (item 2).

7. Install the new coil on top of the module, carefully connecting its plug to the mating connector on the manifold. Then reinstall the screw on the top of the coil.

8. Restore power to the driver and applicator, then resume normal operation.

6. RTD Removal and Replacement

1. First, perform the *Relieving Hydraulic Pressure* procedure given at the beginning of this section.

WARNING: Hot! Risk of burns. Hot applicator parts, splashed adhesive, and hot gun surfaces can cause severe burns. Wear long-sleeved, heat-protective clothing, safety goggles, and heat-protective gloves.

2. Trigger the gun to relieve any remaining hydraulic pressure.

3. Make sure that you remove power as described earlier in this section under *Removing System* Power.

4. Then turn off power to the driver.

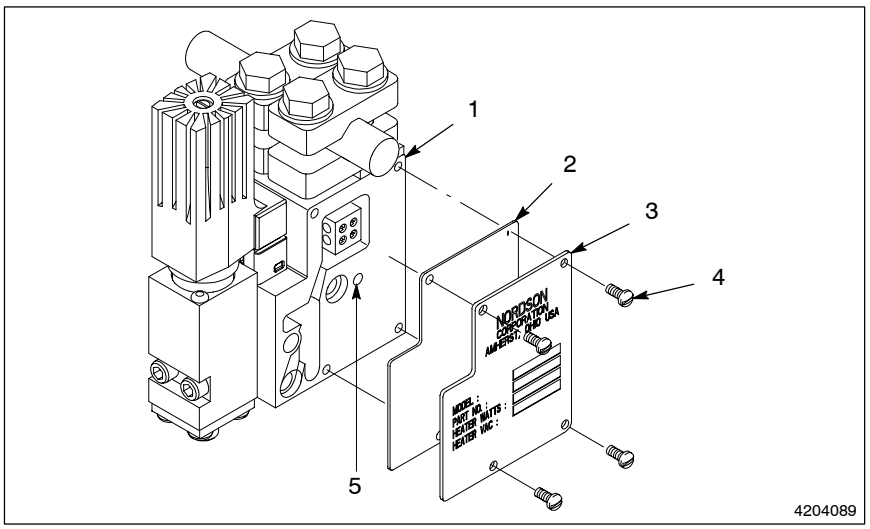


Fig. 6-13 Removing or Installing the Manifold Cover Plates, Insulators, and RTD

1. Manifold
2. Insulator
3. Cover plate
4. Screws
5. RTD

5. Use a screwdriver and remove the four screws (item 4) that secure the cover plate (item 3) and insulator (item 2) to the manifold (item 1). Then remove the cover plate and insulator from the other side of the manifold.

6. Remove the cylindrical RTD (item 5) from its mounting hole in the manifold.

6. RTD Removal and Replacement (contd.)

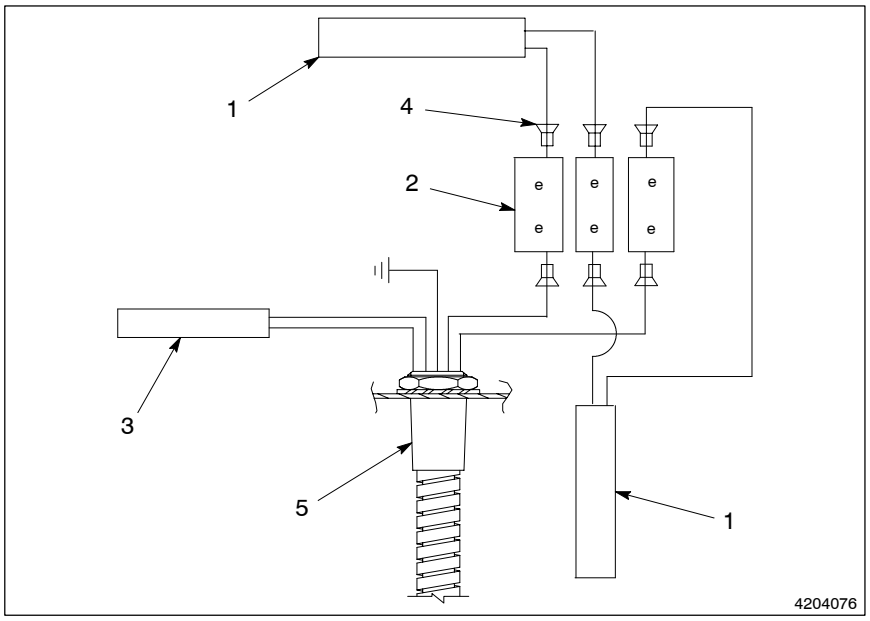


Fig. 6-14 Heater and RTD Cordset Wiring

1. Heaters
2. Terminal block
3. RTD
4. Screws
5. Cordset

7. Cut the two RTD leads approximately $^1/_2$ in. (13 mm) from the defective RTD. Discard the RTD.

8. Strip about 0.25 in. (7 mm) of insulation from the cut wires.

NOTE: RTDs are sold as a kit, see Section 7 for part number.

CAUTION: Do not use tinned wire leads with ceramic wire nuts. Tinned leads may corrode or melt at elevated temperatures resulting in shorted components or inaccurate temperature control.

NOTE: It does not matter which RTD lead is connected to which cut wire because the RTD is not polarity sensitive.

9. Use a ceramic wire nut to secure one lead of a new RTD and one of the cut wires together. Repeat the step for the other RTD lead and cut wire.

6. RTD Removal and Replacement (contd.)

10. Slide the RTD into its mounting hole in the manifold, and position the two ceramic wire nuts inside the cavity of the manifold along side of the terminal block.

11. Replace the manifold cover plates and insulators on each side of the manifold. Then secure them with the four cover screws.

12. Restore the system to normal operation according to instructions in the applicator service manual.

7. Heater Cartridge Removal and Replacement

1. First, perform the *Relieving Hydraulic Pressure* procedure given at the beginning of this section.

WARNING: Hot! Risk of burns. Hot applicator parts, splashed adhesive, and hot gun surfaces can cause severe burns. Wear long-sleeved, heat-protective clothing, safety goggles, and heat-protective gloves.

2. Trigger the gun to relieve any remaining hydraulic pressure.

3. Make sure that you remove power as described earlier in this section under *Removing System Power*.

4. Then turn off power to the driver.

7. Heater Cartridge Removal and Replacement (contd.)

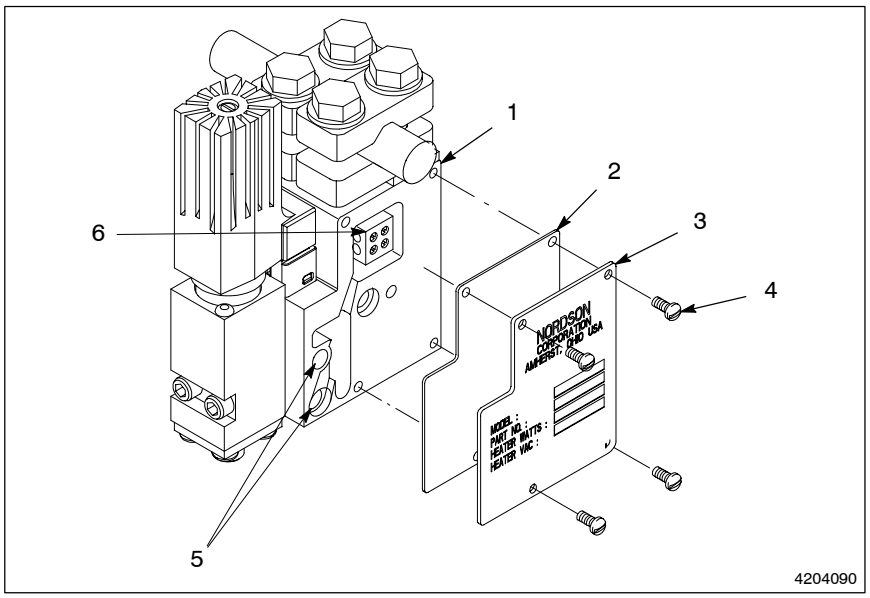


Fig. 6-15 Removing or Installing the Manifold Cover Plates, Insulators, and Heaters

1. Manifold
2. Insulator
3. Cover plate
4. Screws
5. Heaters
6. Terminal block

5. Use a screwdriver and remove the four screws (item 4) that secure the cover plate (item 3) and insulator (item 2) to the manifold (item 1). Then remove the cover plate and insulator from the other side of the manifold.

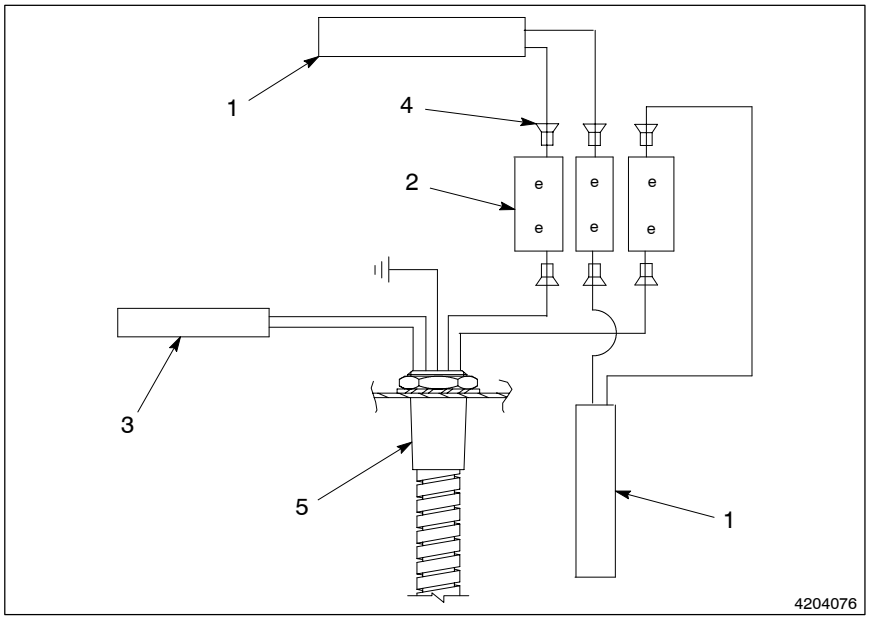


Fig. 6-16 Heater and RTD Cordset Wiring

1. Heaters
2. Terminal block
3. RTD
4. Screws
5. Cordset

6. Disconnect the wires from the heaters (1) from the terminal block (2) located inside of the manifold.

7. Check heater continuity from lead to lead to determine which heater needs replacement.

8. Slide the faulty heater cartridge out of the manifold. Then insert the new heater into the manifold.

9. Attach wires to the terminal block as shown.

7. Heater Cartridge Removal and Replacement (contd.)

10. Replace the manifold cover plates and insulators on each side of the manifold. Then secure them with the four cover screws.

11. Restore the system to normal operation according to instructions in the applicator service manual.

8. Module Disassembly/Assembly Procedure

To disassemble or reassemble the module it must first be removed from the manifold. This procedure is therefore presented in three parts; first, Removing the Module; second, Disassembling the Module; and third, Assembling the Module.

Removing the Module

1. First, perform the *Relieving Hydraulic Pressure* procedure given at the beginning of this section.

WARNING: Hot! Risk of burns. Hot applicator parts, splashed adhesive, and hot gun surfaces can cause severe burns. Wear long-sleeved, heat-protective clothing, safety goggles, and heat-protective gloves.

2. Trigger the gun to relieve any remaining hydraulic pressure.

3. Make sure that you remove power as described earlier in this section under *Removing System* Power.

4. Then turn off power to the driver.

5. Remove the module from the manifold as follows:

   a. Remove the screw from the top of the module coil (item 1). The module retaining screws (item 2) will be removed later in this procedure.

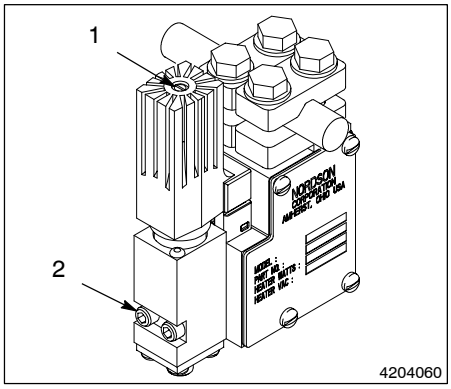


Fig. 6-17 Location of Module and Coil Retaining Screws

1. Coil retaining screw
2. Module retaining screws

Removing the Module *(contd.)*

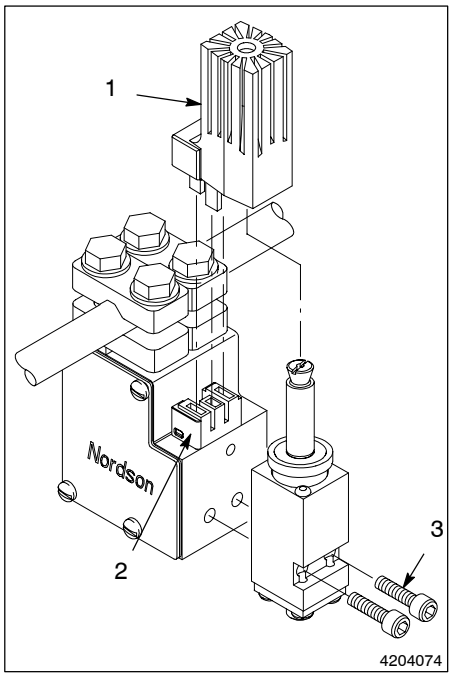


Fig. 6-18 Removing the Gun Module and Coil from the Manifold

1. Coil
2. Coil connector
3. Module retaining screws

b. Lift the coil (item 1) off of the module by carefully unplugging it from the manifold connector (item 2).

c. Use a hex head wrench and remove the two socket head screws (item 3) from the front of the module.

d. Remove the module from the gun manifold.

e. Wipe off any adhesive left on the manifold, especially around the adhesive passage.

f. Continue disassembly of the module as described below.

Disassembling the Module

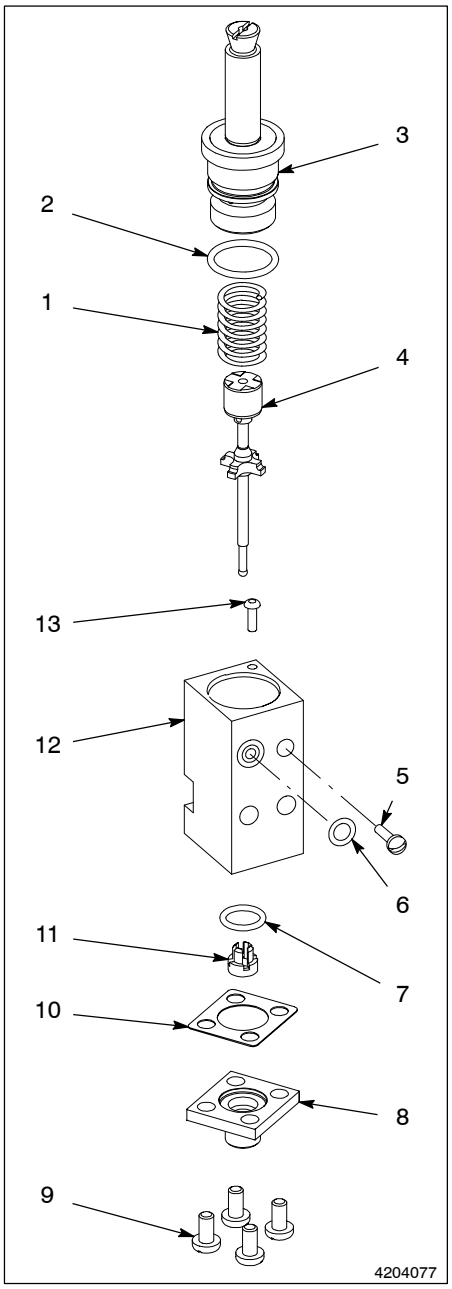


Fig. 6-19 Exploded View of Module Assembly

1. *Spring*
2. *O-ring*
3. *Adapter/pole assembly*
4. *Plunger*
5. *Seal screw*
6. *O-ring*
7. *O-ring*
8. *Seat*
9. *Screws*
10. *Gauge plate*
11. *Seat guide*
12. *Module*
13. *Screw*

NOTE: Refer to Figure 6-19 while performing the following steps.

1. Using a flat-blade screwdriver, remove the seal screw with attached o-ring (item 5) from the rear of module assembly.

2. Remove the o-ring (item 6) from the rear of the module. Discard the used o-ring.

3. Using a 2 mm hex wrench, turn round hex-head screw (item 13) clockwise until it no longer contacts the tapered edge of the adapter/pole assembly (item 3).

   NOTE: The adapter pole assembly is under spring tension as well as friction from the o-ring seal. Thus there will be some resistance when removing it during the next step.

4. Using a flat-blade screwdriver, unscrew the adapter pole assembly (item 3) and remove it from the module body (item 12).

5. Remove the plunger/spring (items 4 and 1) from the module body (item 12).

6. Remove the spring (item 1) from the plunger (item 4).

7. Remove the four screws (item 9) holding the seat (item 8) to the module body (item 12), then remove the seat, the gauge plate (item 10), the seat guide (item 11), and o-ring (item 7) from the module body (item 12).

8. The module is now completely disassembled so that any damaged or worn parts can be replaced. Reassembly according to the *Assembling the Module* procedure described next.

Assembling the Module

NOTE: Refer to Figure 6-19 while performing the following steps.

1. Assemble seat (item 8), o-ring (item 7), and seat guide (item 11) to the module body (item 12).

   NOTE: Do not install the gauge plate (item 10) between the adapter assembly and module body at this time; this will be done at step 11 below.

2. Install four screws (item 9) through the seat (item 8) into module body (item 12), and tighten securely to retain seat adapter.

3. Install round hex-head screw (item 13) into the top of the module body (item 12). Turn screw fully clockwise until just snug, but do not tighten.

4. Install a new o-ring (item 2) into the groove of the adapter/pole assembly (item 3).

5. Assemble spring (item 1) onto plunger (item 4).

6. Insert plunger/spring assembly (items 4 and 1) into adapter/pole assembly (item 3).

CAUTION: Perform the following step while the module is inverted. Otherwise, binding and improper stroke setting may occur.

7. Install plunger/spring (items 4 and 1) and adapter/pole assembly (item 3) into the assembled module body and seat (items 12 and 8).

8. Compress the adapter pole (item 3) assembly down over compression spring (item 1) and screw into module body (item 12) until fully seated.

9. Turn round hex-head screw (item 13) counterclockwise until it just contacts the tapered edge of the adapter/pole assembly (item 3). Then tighten against the adapter/pole assembly by turning counterclockwise to 5 to 7 in-lb.

   NOTE: Performing the following step while the module is inverted may aid in preventing the seat guide from falling out of place and causing improper gun operation.

Assembling the Module *(contd.)*

10. Remove the four screws (item 9) holding the seat (item 8) to the module body (item 12). Remove seat adapter.

11. Install gauge plate (item 10) between the seat (item 8) and the module body (item 12).

    NOTE: The seat (item 8) will be under spring pressure during the next step. Therefore, alternately tighten each screw only one turn at a time so that you apply even pressure during assembly. After fully seated against the module body, tighten the four screws securely.

12. Using the four screws (item 9), reinstall the seat (item 8) along with seat guide (item 11) onto the module body (item 12), and tighten the four screws.

13. Install seal screw (item 5) and the o-ring (item 6) in rear of module assembly.

14. Reinstall assembled module onto manifold by following the steps given at the beginning of this procedure in reverse.

9. Seat Adapter O-ring Removal and Replacement

1. First, perform the *Relieving Hydraulic Pressure* procedure given at the beginning of this section.

WARNING: Hot! Risk of burns. Hot applicator parts, splashed adhesive, and hot gun surfaces can cause severe burns. Wear long-sleeved, heat-protective clothing, safety goggles, and heat-protective gloves.

9. Seat Adapter O-ring Removal and Replacement (contd.)

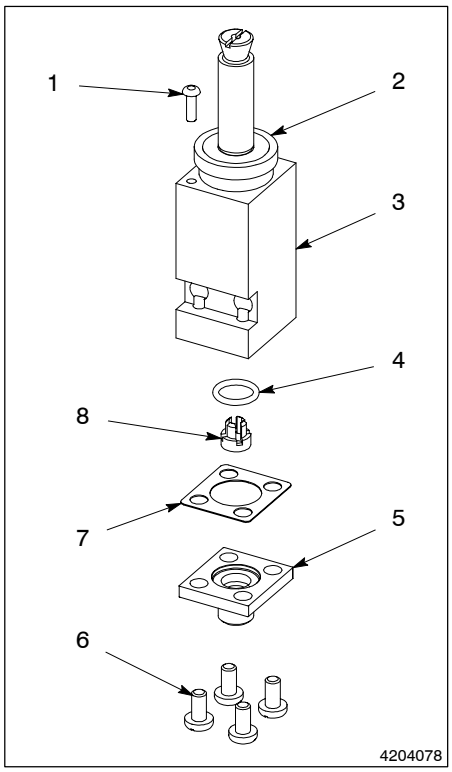


Fig. 6-20 Removing the Seat Adapter and O-ring

1. *Screw*
2. *Adapter/pole assembly*
3. *Module*
4. *O-ring*
5. *Seat*
6. *Screws*
7. *Gauge plate*
8. *Seat guide*

2. Trigger the gun to relieve any remaining hydraulic pressure.

3. Make sure that you remove power as described earlier in this section under *Removing System Power*.

4. Refer to Figure 6-20 while performing the following steps.

   NOTE: If access to the seat is possible without removing the module, perform steps 6 through 10 below, otherwise first perform the procedure for *Module Removal and Replacement* given earlier in this section.

CAUTION: Do not alter the adapter/pole (item 2) position during this procedure. If the position is moved, it must be reset by performing step 8 of the *Assembling the Module* procedure given earlier in this section.

5. Remove the four screws (item 6) that hold the seat (item 5) to the module body (item 3).

6. Remove the seat (item 5), seat guide (item 8), o-ring (item 4), and the gauge plate (item 7).

7. Replace the damaged o-ring (item 4).

8. Install gauge plate (item 7) between the seat (item 5) and the module body (item 3).

   NOTE: The seat (item 5) will be under spring pressure during the next step. Therefore, alternately tighten each screw only one half turn at a time so that you apply even pressure during assembly. After fully seated against the module body, tighten the four screws securely.

9. Using the four screws (item 6), reinstall the seat (item 5) along with seat guide (item 8) onto the module body (item 3), and tighten the four screws.

10. Adapter/Pole O-Ring Removal and Replacement

1. First, perform the *Relieving Hydraulic Pressure* procedure given at the beginning of this section.

WARNING: Hot! Risk of burns. Hot applicator parts, splashed adhesive, and hot gun surfaces can cause severe burns. Wear long-sleeved, heat-protective clothing, safety goggles, and heat-protective gloves.

2. Trigger the gun to relieve any remaining hydraulic pressure.

3. Make sure that you remove power as described earlier in this section under *Removing System Power*.

4. Remove screw from top of module coil (item 1). The module retaining screws (item 2) will be removed later in this procedure.

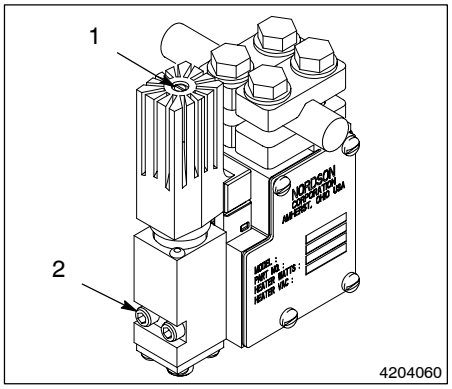


Fig. 6-21 Location of Module and Coil Retaining Screws

1. Coil retaining screw
2. Module retaining screws

10. Adapter/Pole O-Ring Removal and Replacement (contd.)

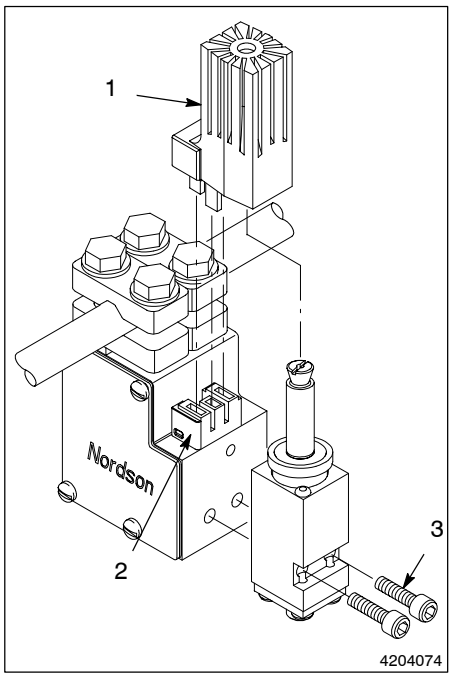


Fig. 6-22 Removing the Gun Module and Coil from the Manifold

1. *Coil*
2. *Coil connector*
3. *Module retaining screws*

5. Lift coil off of module (item 1) by carefully unplugging it from the manifold connector (item 2).

6. Use a hex head wrench and remove two socket head screws (item 3) from the front of module.

7. Remove module from gun manifold.

8. Wipe off any adhesive left on the manifold, especially around the adhesive passage.

10. Adapter/Pole O-Ring Removal and Replacement (contd.)

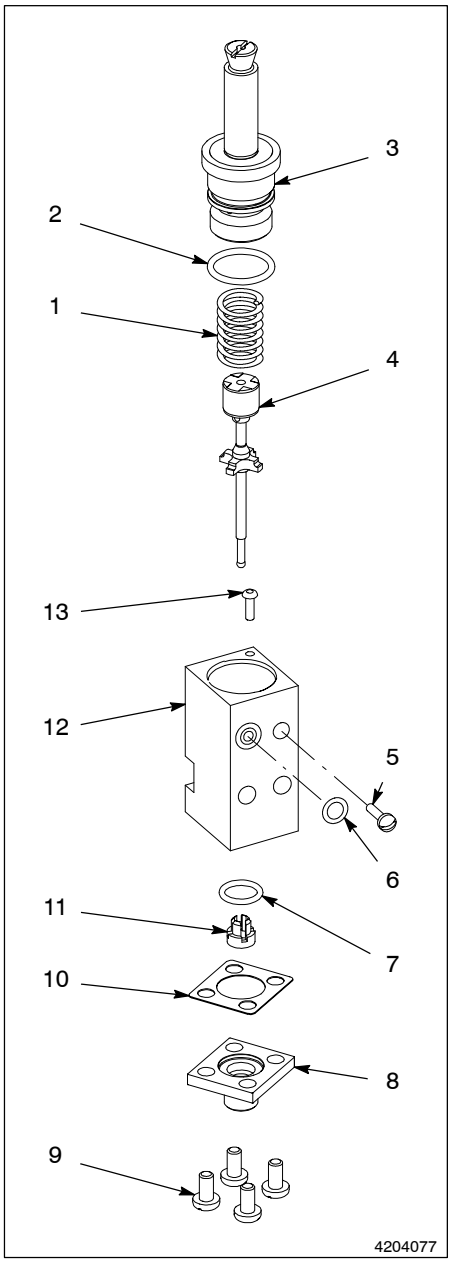


Fig. 6-23 Exploded View of Module Assembly

1. *Spring*
2. *O-ring*
3. *Adapter/pole assembly*
4. *Plunger*
5. *Seal screw*
6. *O-ring*
7. *O-ring*
8. *Seat*
9. *Screws*
10. *Gauge plate*
11. *Seat guide*
12. *Module*
13. *Screw*

9. Remove the o-ring (item 6) from the back of the module. Discard the used o-ring.

10. Using a flat-blade screwdriver, remove the seal screw with attached o-ring (item 5) from the rear of module the assembly.

11. Using a 2 mm hex wrench, turn round hex-head screw (item 13) clockwise until it no longer contacts the tapered edge of adapter/pole (item 3).

12. Turn adapter/pole (item 3) counterclockwise to remove adapter/pole from module (item 12).

13. Replace damaged adapter/pole o-ring (item 2).

14. Remove plunger and spring assembly (items 4 and 1) from module. Then insert plunger and spring assembly into adapter/pole (item 3).

15. Remove four screws (item 9) that hold the seat (item 8) to the module body (item 12).

16. Remove seat (item 9), o-ring (item 7), seat guide (item 11), and gauge plate (item 10).

CAUTION: The seat was removed as described above because complete reassembly of the module must be performed as referenced below to ensure correct alignment and proper magnetic gap spacing.

17. Refer to the *Assembling the Module* procedure given under the Module Disassembly/Assembly Procedure earlier in this section. After you have reassembled the module, reinstall it onto the manifold according to the instructions given at the end of the above referenced procedure.

NOTE: See alternate method of installing module on manifold under *Module Removal and Replacement* given earlier in this section.

18. Reconnect power to the gun driver and applicator, then resume normal operation.

Section 7

Parts

Section 7
Parts

1. Introduction

To order parts, call the Nordson Customer Service Center at 800-241-8777 or your local Nordson representative. Use this five-column parts list and the accompanying illustration to describe and locate parts correctly.

This section contains:

- selected service kits and recommended spare parts for standard guns
- standard gun cordset assemblies and temperature sensor parts list
- standard E-200 module parts list
- standard E-201, E-202, and E-204 gun parts list
- E-200 gun dimensions
- custom gun assembly drawing, if applicable

2. Service Parts

Selected Service Kits and Recommended Spare Parts for Standard Guns

Table 7-1 E-200 Gun Service Kits

Part Number	Description
124 044	Heater, 100 V 1.281 lg
114 692	Heater, 100 V 3.188 lg
124 046	Heater, 100 V 4.188 lg
161 999	Heater, 115 V 1.281 lg
162 008	Heater, 115 V 3.188 lg
162 007	Heater, 115 V 4.188 lg
184 671	Coil Kit
161 571	Seat E-200 Std
161 576	Module, E-200 Std
161 570	Plunger W/Ball Assy
161 568	E-200 O-rings
901 915	Nozzle Cleaning Kit
274 783	RTD Replacement Service Kit
270 763	Gun Installation Kit

Service Parts *(contd.)*

Table 7-2 Standard Gun Cordset Assemblies and Temperature Sensor Parts List

Description	Cordset P/N	Sensor P/N
RTD-Style Applicators	274 685 *	274 731
Coil Actuator, Single-Module	181 950	N/A
Coil Actuator, Multi-Module	168 729	N/A
Interconnect Cordset	183 542	N/A
* Includes temperature sensor		

3. Using the Module Parts List

The module and gun parts lists on the following pages are organized as follows:

- The Item column gives the number associated with the referenced figure.
- The Part column gives the Nordson part number. A dash indicates that the item is not for sale or is a subassembly of a saleable assembly.
- The Description column provides the part's name, dimensions and the physical properties. A part preceded by one bullet (●) is a component of the assembly above it.
- The Quantity column indicates the quantity requirements per unit or assembly. If the item is listed for reference only, "Ref" appears in the column.
- The Note column refers to the note (if any) placed at the bottom of the table.

4. E-200 Module Parts List

Item	Part	Description	Quantity	Note
–	–	Module Assembly, E-200 Standard	Ref	
1	139 049	• Screw, Panhd, M3 x 6 mm, O-Ring	1	
2	154 739	• Spring, Comp, 0.505 Dia. x 0.758 in. Lg. SS	1	
3	154 742	• Module Body, E-200	1	
4	159 725	• Adapter/Pole Assy	1	
5	184 671	• Coil Bobbin Assy	1	
6	159 766	• Seat Guide, E-200 Std	1	
7	159 987	• Seat, E-200, Plated Assy	1	
8	160 004	• Plunger Ball Assy	1	
9	168 442	• Plate, Gauge, E-200	1	
10	900 349	• Sealant, TFE	–	A
11	900 493	• Lubricant, O-Ring, High-temp	–	A
12	940 121	• O-Ring, Viton, 0.375 x 0.500 x 0.063 in.	1	
13	940 161	• O-Ring, Viton, 0.625 x 0.750 x 0.063 in.	1	
14	982 263	• Screw, Panhd, Slt, M3 x 25 mm	1	
15	982 454	• Screw, Btn, Skt, M3 x 0.5 x 10 mm	1	
16	982 096	• Screw, Pan, Slt, M4 x 8 mm	4	

NOTE A: Not shown in referenced figure.

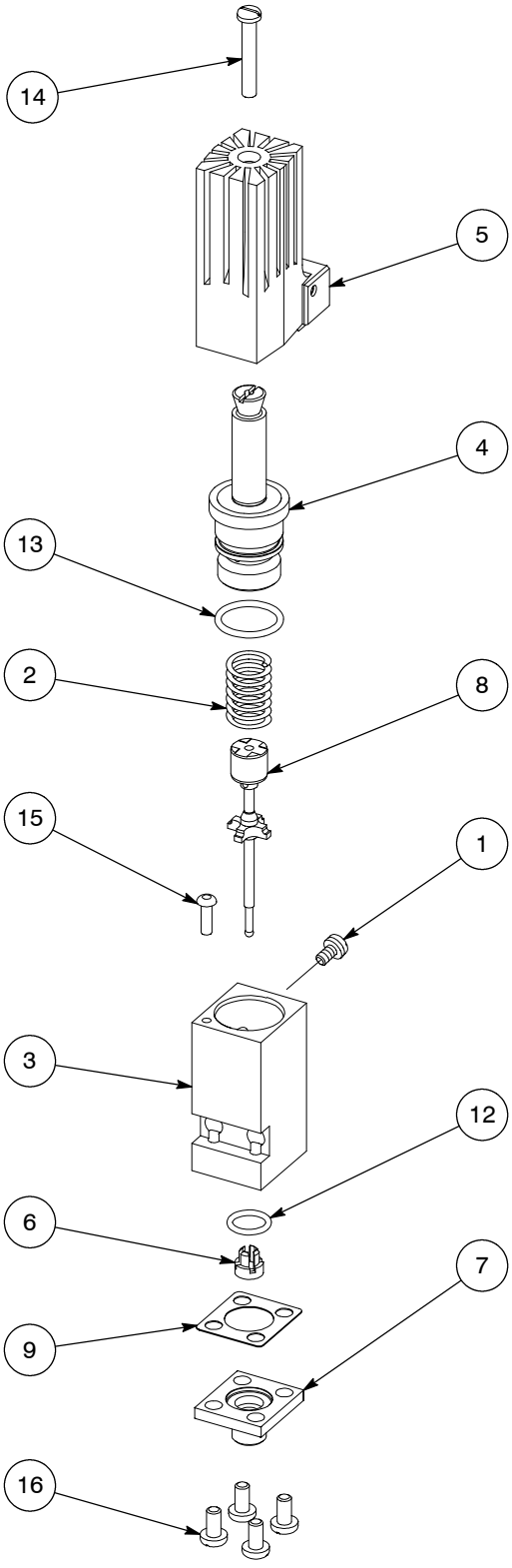


Fig. 7-1 E-200 Module Assembly

5. E-201, 200/230 V Gun Parts List

Item	Part	Description	Quantity	Note
–	174 858	Gun Assembly E-201, 200V	Ref	
–	174 856	Gun Assembly E-201, 230V	Ref	
1	–	Not Used	–	
2	154 744	• Cover, Electrical, E-200	2	
3	154 754	• Manifold, E-201	1	
4	–	• Heater, 100V, 90W, 0.2500 x 1.281 in. (200V gun)	2	B
4	–	• Heater, 115V, 90W, 0.2500 x 1.281 in. (230V gun)	2	B
5	168 732	• Gasket, Cover, Electrical, E-200	2	
6	170 299	• Connector, E-200	1	
7	–	Not Used	–	
8	–	Not Used	–	
9	939 994	• Connector, Ryton, 1-station	3	
10	972 657	• Connector Assy, Gun	1	
11	973 574	• Plug, O-Ring, Str Thd, $^{9}/_{16}$-18	1	
12	–	• Scr. Sochd, M5 x 30 mm	2	C
13	982 557	• Scr, Panhd, Slt, M4 x 8 mm	8	
14	–	• Module, E-200	1	C
15	170 311	• Retainer Assy	2	
16	–	Tag Set, Gun	1	A
17	274 685	• Cordset, Gun	1	
18	181 950	• Cordset, Coil Actuation	1	
19	940 111	• O-Ring, Viton, 0.313 x 0.438 x 0.063 in.	1	
20	973 576	• Plug, O-Ring, Str	2	
21	982 091	• Screw, Panhd, M3	2	
22	101 184	• Insulator, Mtg	2	

NOTE A: Not shown in referenced figure.
B: Included with heater service kit.
C: Included with module service kit.

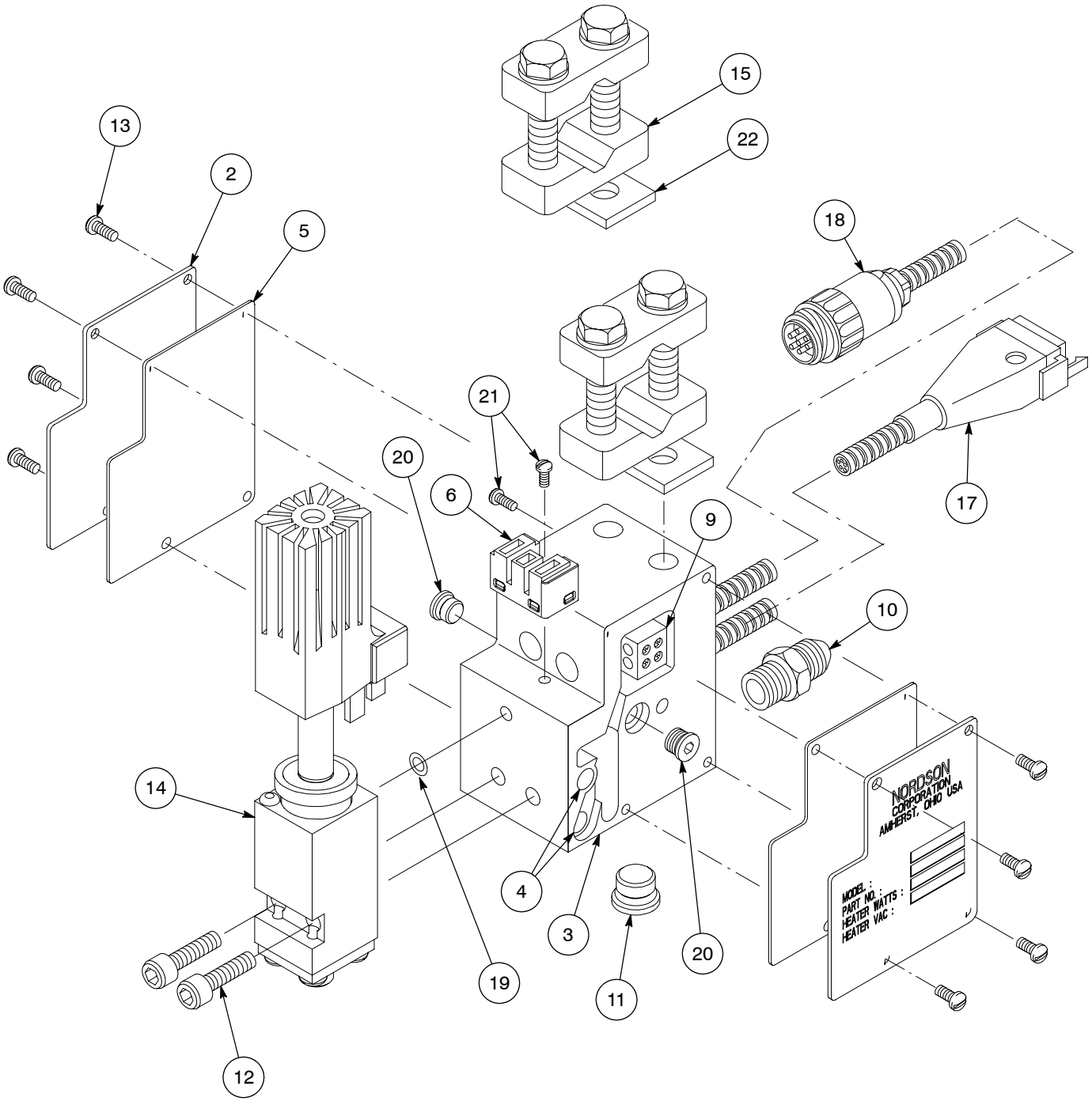


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Fig. 7-2 Series E-200 Gun Assembly

Note: Single module version shown, other models use wider manifold, see Figure 7-3

6. E-202, 200/230 V Gun (2.31 Ctr.) Parts List

See Figures 7-2 and 7-3.

Item	Part	Description	Quantity	Note
–	174 870	Gun Assembly E-202, 200V (2.31 in. Ctr)	Ref	
–	174 868	Gun Assembly E-202, 230V (2.31 in. Ctr)	Ref	
1	–	Not Used	–	
2	154 744	• Cover, Electrical, E-200	2	
3	158 342	• Manifold, E-202, 2.31 in. Ctr	1	D
4	–	• Heater, 115V, 100W, 0.2500 x 3.188 in. (200V gun)	2	B
4	–	• Heater, 100V, 100W, 0.2500 x 1.281 in. (230V gun)	2	B
5	168 732	• Gasket, Cover, Electrical, E-200	2	
6	170 299	• Connector, E-200	2	
7	170 306	• • Gasket, Insulator, Rear, Manifold	1	D
8	170 307	• • Plate, Manifold, Rear	1	D
9	939 994	• Connector, Ryton, 1-station	3	
10	972 657	• Connector Assy, Gun	2	
11	973 574	• Plug, O-Ring, Str Thd, 9/16-18	1	
12	–	• Scr. Sochd, M5 x 30 mm	4	C
13	982 557	• Scr, Panhd, Slt, M4 x 8 mm	10	
14	–	• Module, E-200	2	C
15	170 311	• Retainer Assy	2	
16	–	Tag Set, Gun	1	A
17	274 685	• Cordset, Gun	1	
18	168 729	• Cordset, Coil Actuation	1	
19	940 111	• O-Ring, Viton, 0.313 x 0.438 x 0.063 in.	2	
20	973 576	• Plug, O-Ring, Str	2	
21	982 091	• Screw, Panhd, M3	3	
22	101 184	• Insulator, Mtg	2	

NOTE A: Not shown in referenced figure.
B: Included with heater service kit.
C: Included with module service kit.
D: See Figure 7-3 for this item.

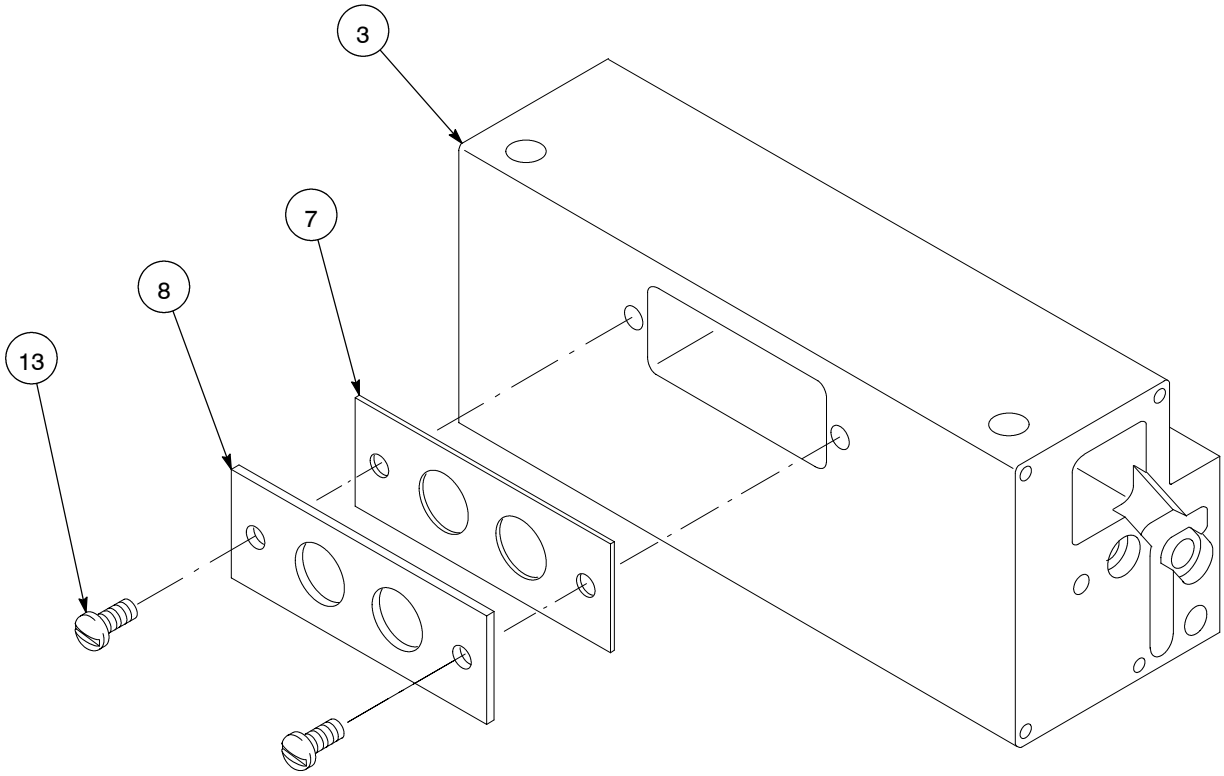

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Fig. 7-3 Manifold Assembly for Models E-202 and E-204

7. E-204, 200/230 V Gun (0.88, 1.5, 0.88) Parts List

See Figures 7-2 and 7-3.

Item	Part	Description	Quantity	Note
–	174 874	Gun Assembly E-204, 200V (0.88, 1.5, 0.88 in.)	Ref	
–	174 872	Gun Assembly E-204, 230V (0.88, 1.5, 0.88 in.)	Ref	
1	–	Not Used	–	
2	154 744	• Cover, Electrical, E-200	2	
3	158 343	• Manifold, E-204 (0.88, 1.5, 0.88 in.)	1	D
4	–	• Heater, 100V, 150W, 0.2500 x 4.188 in. (200V gun)	2	B
4	–	• Heater, 115V, 150W, 0.2500 x 4.181 in. (230V gun)	2	B
5	168 732	• Gasket, Cover, Electrical, E-200	2	
6	170 299	• Connector, E-200	4	
7	170 306	• • Gasket, Insulator, Rear, Manifold	1	D
8	170 307	• • Plate, Manifold, Rear	1	D
9	939 994	• Connector, Ryton, 1-station	3	
10	972 657	• Connector Assy, Gun	1	
11	973 574	• Plug, O-Ring, Str Thd, 9/16-18	1	
12	–	• Scr. Sochd, M5 x 30 mm	8	C
13	982 557	• Scr, Panhd, Slt, M4 x 8 mm	10	
14	–	• Module, E-200	4	C
15	170 311	• Retainer Assy	2	
16	–	Tag Set, Gun	1	A
17	274 685	• Cordset, Gun	1	
18	168 729	• Cordset, Coil Actuation	1	
19	940 111	• O-Ring, Viton, 0.313 x 0.438 x 0.063 in.	4	
20	973 576	• Plug, O-Ring, Str	2	
21	982 091	• Screw, Panhd, M3	5	
22	101 184	• Insulator, Mtg	2	

NOTE A: Not shown in referenced figure.
B: Included with heater service kit.
C: Included with module service kit.
D: See Figure 7-3 for this item.

8. Gun Dimensions

NOTE: The side-view profile shown below is typical for Nordson Extrusion standard E-200-series guns. The overall width can be estimated by adding 1.0 in. (2.54 cm) to the sum of the module centerline spacings. If you need design assistance consult your Nordson representative.

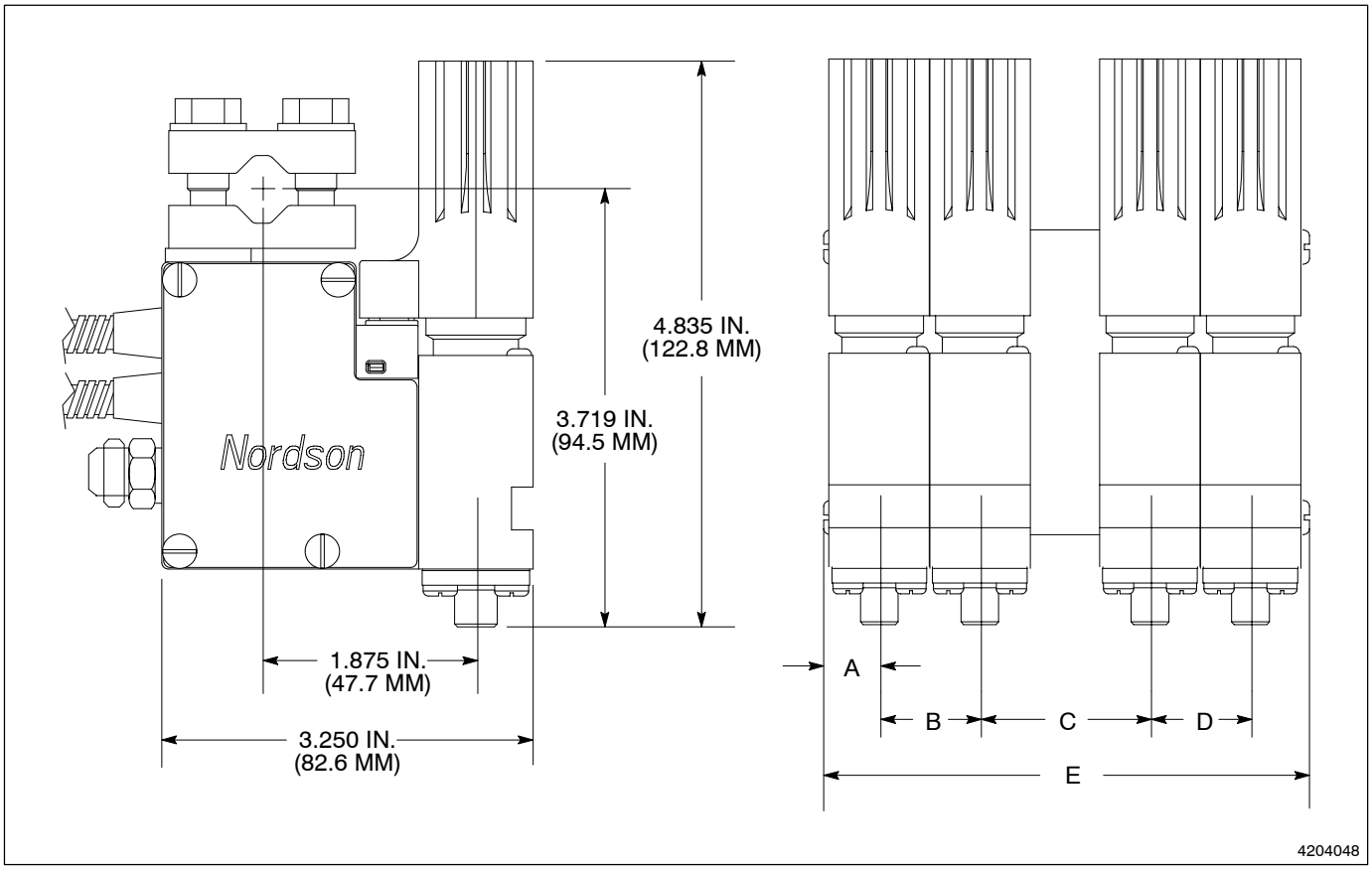

Fig. 7-4 Series E-200 Modular Electric Gun Side View Profile and Width Dimensions

Table 7-3 E-200 Series Modular Electric Gun Width Dimensions (see Figure 7-4)

Model	Dimension in inches (mm)				
	A	**B**	**C**	**D**	**E**
E-201	0.91 (23.0)	N/A	N/A	N/A	1.812 (46.0)
E-202	0.50 (12.7)	2.31 (58.7)	N/A	N/A	3.312 (84.1)
E-204	0.50 (12.7)	0.88 (22.4)	1.50 (38.1)	0.88 (22.4)	4.250 (108)

9. Custom Gun Assembly Drawing

If you ordered a custom gun, the gun assembly drawing should accompany this manual.

If you did not receive the drawing, have your Nordson representative contact the Nordson Applications Custom Engineering Group.