25B 16:1 Stainless Steel Pump

Customer Product Manual
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– English –
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– Original document –

Change Record

Revision	Date	Change
01	01/04	Initial Release
02	05/07	Release of type F packings in 64B pumps; inclusion of type U packings; released top level and hydraulic section part numbers for 25B pumps with type F packings.
03	01/13	DOC and ATEX Compliance updates.
04	03/19	Updated parts tables and lubricant part numbers.
05	03/19	Added UKCA Certification.
06	10/21	Updated quantity of 3/8-16 nut (PN 984163); images updated.
07	02/24	Updated parts Section 8, *Motor and Air Valve Parts* (Figure 8-1 and 8-2).
08	10/24	Adminstrative updates made to parts Sections 8 and 9.
09	10/24	Address change affecting manual title page and UKCA.

Section 1
Safety

Introduction

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

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

Qualified Personnel

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

Intended Use

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

Some examples of unintended use of equipment include:

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

Regulations and Approvals

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

Personal Safety

To prevent injury follow these instructions.

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

High-Pressure Fluids

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

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

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

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

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

MEDICAL ALERT — AIRLESS SPRAY WOUNDS: NOTE TO PHYSICIAN

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

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

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

Fire Safety

To avoid a fire or explosion, follow these instructions.

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

Halogenated Hydrocarbon Solvent Hazards

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

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

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

Action in the Event of a Malfunction

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

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

Disposal

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

Safety Labels

Table B 1-1 contains the text of the safety labels on the pump. The safety labels are provided to help you operate and maintain your pump safely. See Figure B 1-1 for the location of the safety labels

NOTE: Item 3 is included with aluminum pumps only.

Table B 1-1 Safety Labels

Item	Part	Description
1	181119	 WARNING •  HIGH PRESSURE DEVICE Read instruction manual before operation and observe all warnings. •  INJECTION HAZARD Airless spray painting equipment can cause serious injury if the spray penetrates the skin. Do not point the gun at anyone or any part of the body. In case of penetration, adequate medical aid must be immediately obtained. •  COMPONENT RUPTURE This system is capable of producing bar (psi) pressure. To avoid rupture and injury, do not operate this pump at a pressure higher than the rated maximum working pressure of any component in the system (including but not limited to spray guns, hose, hose connections and heaters). •  FIRE Static voltage is developed by airless spraying. The pump, associated system, and object being sprayed must be grounded to prevent static discharge sparks which could start a fire. • SERVICING Before servicing, cleaning, or removal of any part, set trigger lock on gun, and always shut off power source; then carefully release pressure in fluid portions of the system.
2	181147	MAXIMUM INPUT 6.9 BAR (100 PSI)
3	246890 (Aluminum pumps only)	 WARNING  Do not use halogenated hydrocarbon solvents in this system, it contains aluminum parts and may explode. Cleaning agents, coatings, paints or adhesives may contain halogenated hydrocarbon solvents. Don’t take chances, consult your material supplier to be sure

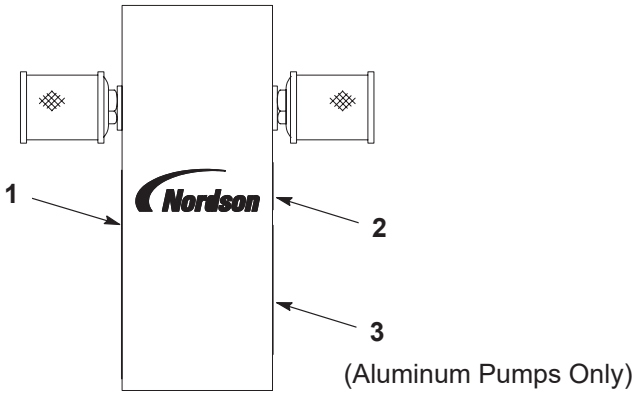


Figure 1 Safety Labels

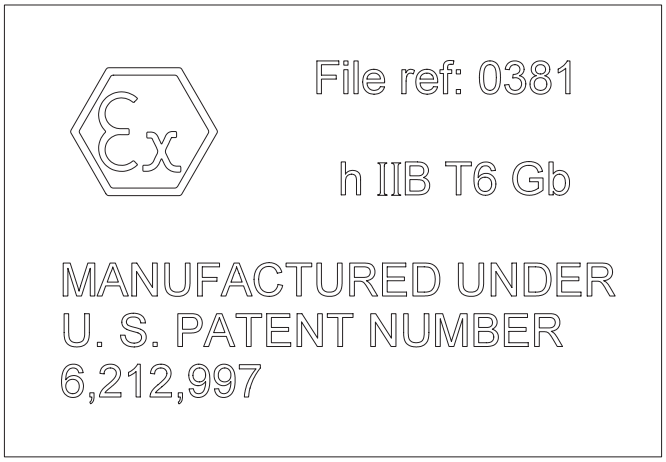


Figure 2 ATEX/Ex Label

Section 2
Description

Introduction

This section provides you with a brief overview of 25B pump versions and applications, options, and pump operation.

NOTE: The information in this section is common for all versions of the 25B pump.

Pump Versions

The 25B pump is available in the following versions.

Problem	Possible Cause	Corrective Action
2:1	Corrosive-resistant plated steel	General finishing, low-pressure, high-volume applications, including air-atomized coating systems.
4:1	Corrosive-resistant plated steel	
16:1	Aluminum	General finishing, medium-to-high pressures. Do not use with halogenated hydrocarbon solvents.
27:1	Aluminum	
16:1	Stainless steel	Materials such as halogenated hydrocarbon and chlorinated solvents, corrosives, waterbornes, non-paint applications, cold glues and adhesives, medium-to-high pressures.
27:1	Stainless steel	

WARNING: Do not use aluminum pumps with coating materials containing halogenated hydrocarbon solvents. Under pressure, these solvents can react with aluminum and cause an explosion. Refer to the Safety section for more information on halogenated hydrocarbon solvents.

Packings

Pumps are sold with Type-U (Ultra-high molecular weight polyethylene or UHMWPE) or Type-F (PTFE/leather) packings. Optional packings are available for use with other coating materials and solvents. Refer to the *Pump Packing and Solvent Chamber Fluid Guide* included with this manual for application information, and 25B 16:1 Stainless Steel Pump Quick Reference Guide and 25B 16:1 Stainless Steel Hydraulic Section Parts for packing gland and solvent chamber fluid part numbers..

Pump Operation

Suction Stroke

See Figure 2-1 The main components of the pump are the air valve (1), air motor (2), and hydraulic section (3).

Supply air enters the pump through the air valve. The air valve directs air through the connecting tube (6) to the underside of the piston (5), forcing the piston up. Air above the piston exhausts through the air valve and muffler. The piston pulls the plunger (7) up with it..

The pressure ball check (10) closes and the siphon ball check (11) opens. The material above the pressure ball check is forced out high-pressure port

(13) while new material is pulled in through the siphon port (12). The packing glands (9) prevent pressurized coating material from leaking past the plunger.

As the piston reaches the top of its stroke, the shifting mechanism (4) shifts the air valve spool, directing supply air to the top of the piston and exhausting the air below the piston.

Pressure Stroke

Air above the piston pushes the piston and plunger down. The siphon ball check closes and the pressure ball check opens. Material below the pressure ball check is forced up through the plunger and out the high pressure port. When the piston reaches the bottom of its stroke, the shifting mechanism shifts the air valve spool and the suction stroke begins again.

Plunger Lubrication

The solvent chamber (8) contains solvent chamber fluid that lubricates the upper part of the plunger and prevents the upper packings from wearing excessively. The coating material being pumped lubricates the lower packings.

NOTE: Coating material leaking past the upper packing gland will discolor the solvent chamber fluid and cause its level to rise. A small amount of leakage is normal. If the solvent cup fills quickly and overflows the packings need to be replaced. Both upper and lower packings should be replaced at the same time.

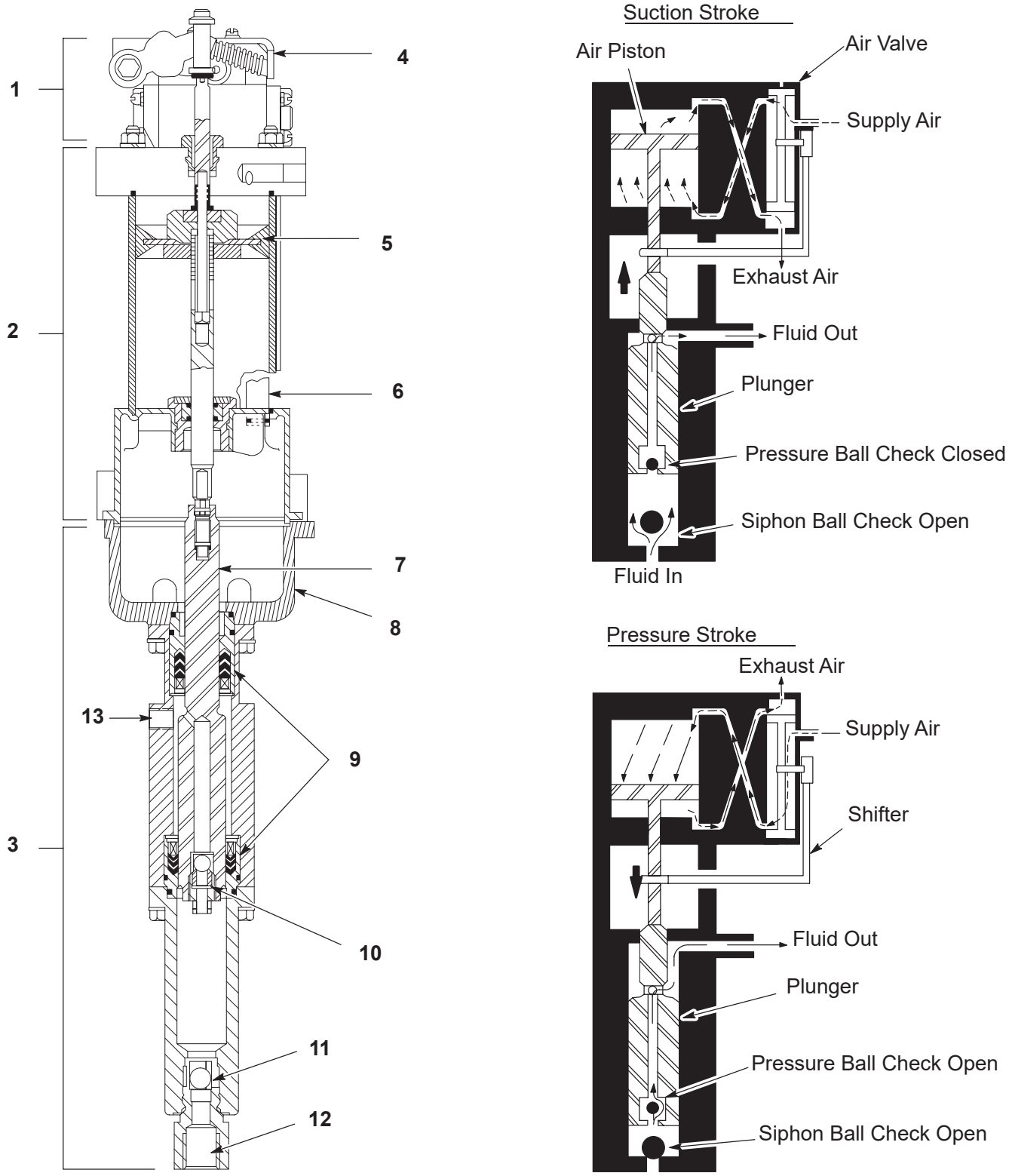


Figure 2-1 Pump Operation (16:1 amd 27:1 configuration shown in cutaway)

1. Air Valve
2. Air Motor
3. Hydraulic section
4. Shifting mechanism
5. Piston
6. Connecting tube
7. Plunger
8. Solvent chamber
12. Diaphragm
13. Upper and lower packings
10. Pressure ball check
11. Siphon ball check
12. Siphon port
13. High-pressure port

Dead-End and Circulating System Operation

In a dead-end system, the pump starts when air pressure is applied. It continues to operate until the fluid pressure in the system equals the pressure the pump can produce with the available air pressure. The pump then stalls until the fluid pressure drops, such as when a spray gun is triggered.

In a circulating system, the pump operates continuously at a rate set by a circulation valve. Opening the valve causes the pump to operate faster; closing the valve slows the pump. The normal operating rate is 8 to 10 strokes per minute.

Options

Refer to Options in *25B 16:1 Stainless Steel Pump Quick Reference Guide* or 25B Air Motor and Air Valve Parts and 25B 16:1 and 27:1 Hydraulic Section Repair for information on the following options:

- Air Motor Accessory Kit, consisting of an air filter, regulator, gauge, and lubricator, along with fittings, mounting brackets, fasteners, and lubricating oil.
- Mounting/Siphon Accessory Kits include the parts needed to mount the pumps on a wall, stand, or dolly. For 16:1 and 27:1 aluminum versions 5-gallon bucket or 55-gallon drum mounting kits are available. Wall mount kits include a siphon hose, rod, and strainer and fittings. Bucket and drum mounting kits include covers, siphon strainer, fittings, and mounting hardware.
- Single or Dual Circulation Kits, consisting of one or two circulation valves, drain valves, drain hose, drain rod, and fittings.
- In-Line Check Valves, installed in the high pressure fluid line from the pump to prevent a reverse flow of fluid when the pump shifts direction, which could cause pump motoring.

Section 3
Installation

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

NOTE: The information in this section is common for all versions of the 25B Pump. All illustrations in this section show the 2:1 version of the pump, but installation procedures are same for all versions.

Suitable for installation in Zone 1, Zone 2, or normal usage areas.

Mounting and Connections

See Figures B 3-1 through B 3-5. Follow all safety instructions.

WARNING: Install the pump according to all local codes and ordinances. Failure to do so is dangerous and could result in loss of agency approvals and voiding of Nordson warranties.

WARNING: If any component of the high pressure fluid system has a maximum working pressure less than the pump's, install a pressure relief valve in the hydraulic system set to open at that component's maximum working pressure. This will protect against equipment rupture and personal injury.

Mounting

Optional mounting kits are available as follows:

All versions: Wall mount kits

16:1 and 27:1 pumps Bucket (5 gal) and Drum 55 (gal) mount kits

Bucket and Drum mount kit installation are not covered in this manual.

See Figure 3-1.

1. Install the wall mount bracket (6) on a wall, stand, or wheeled dolly. Make sure there will be enough clearance under the pump for a siphon hose, pressure feed system plumbing, or circulation kit.
2. Install the pump into the bracket, fitting the projecting end of the screws into the holes in the top of the bracket. Thread the long hex nuts (7) included in the kit onto the front screws. Use 3/8−16 nuts on rear screws.
3. Install the solvent filler cup (8) on the solvent chamber. A through hole is provided in the mounting bracket.

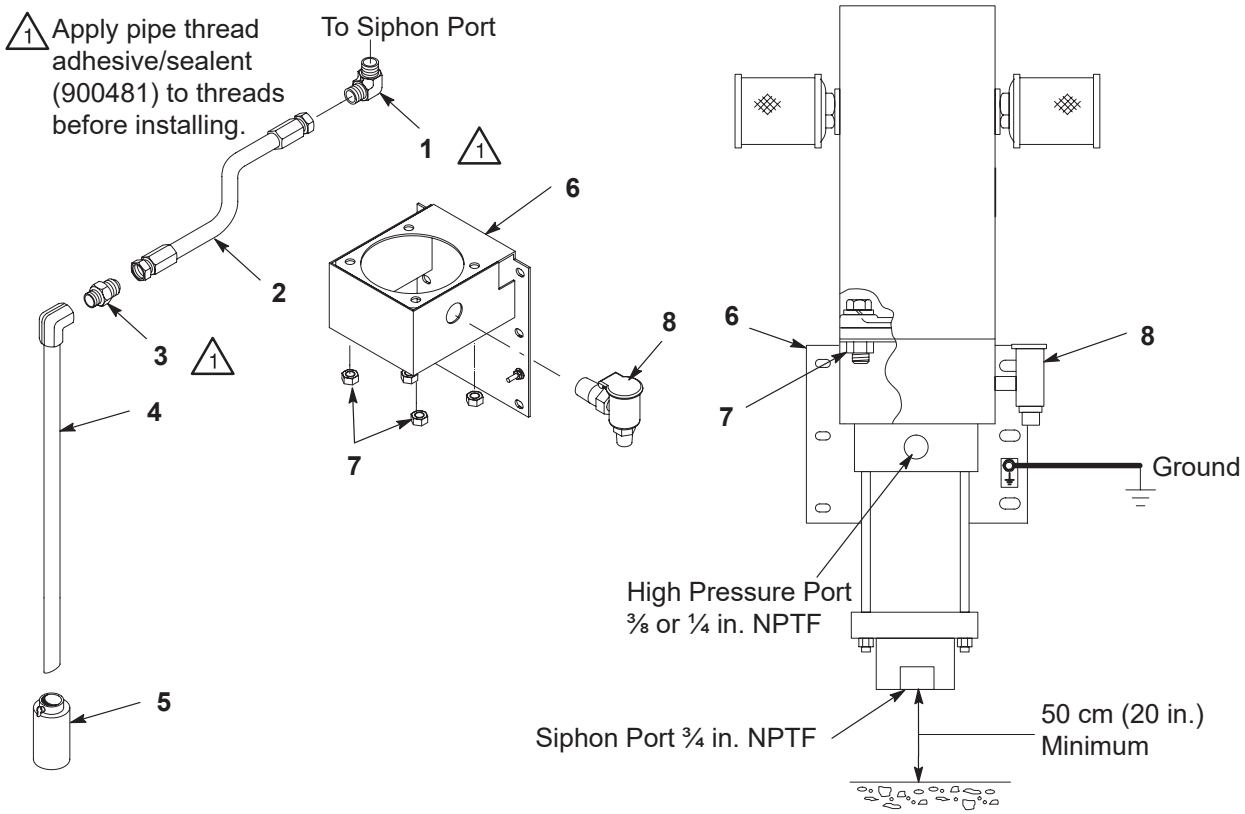


Figure 3-1 Pump Operation (16:1 amd 27:1 configuration shown in cutaway)

1. Elbow
2. Siphon hose
3. Male connector
4. Siphon rod
5. Strainer
6. Mounting bracket
7. ⅜−16 hex nuts
8. Solvent filler cup

Grounding

WARNING: The pump must be connected to a true earth ground. An ungrounded or poorly grounded pump can store an electrostatic charge that can give personnel a severe shock, or arc and cause a fire or explosion.

See Figure 3-1. Connect a ground wire or cable to the mounting bracket ground stud and to a true earth ground. The resistance to ground should not exceed 20 ohms.

Siphon and High Pressure Fluid Connections

WARNING: Static electricity is created by the flow of high pressure fluids. Use only grounded fluid hoses with continuity between fittings. Failure to use grounded hoses could result in a fire or explosion.

Refer to *25B 16:1 Stainless Steel Pump Quick Reference Guide* for optional siphon accessory and circulation kit part numbers. Use flexible hoses for both siphon and high pressure connections to act as a vibration damper.

See Figure 3-1.

High Pressure Port:

2:1, 4:1 pumps: ⅜-in. NPTF

16:1, 27:1 pumps: ¼-in. NPTF

Siphon Port: ¾ in. NPT. The siphon hose must be at least ¾-in. ID.

- **Dead-end Systems:** Assemble and connect the siphon hose, rod, and strainer to the siphon port.
- **Circulating Systems:** See Figure 3-2. Install an optional Single or Dual Circulation Kit as shown. Place the drain rod in a **grounded** waster container. Connect the siphon hose, rod, and strainer as shown.
- **Pressure Feed Systems:** Connect the siphon hose or an equivalent ¾-in. ID hose to the pressure feed system.

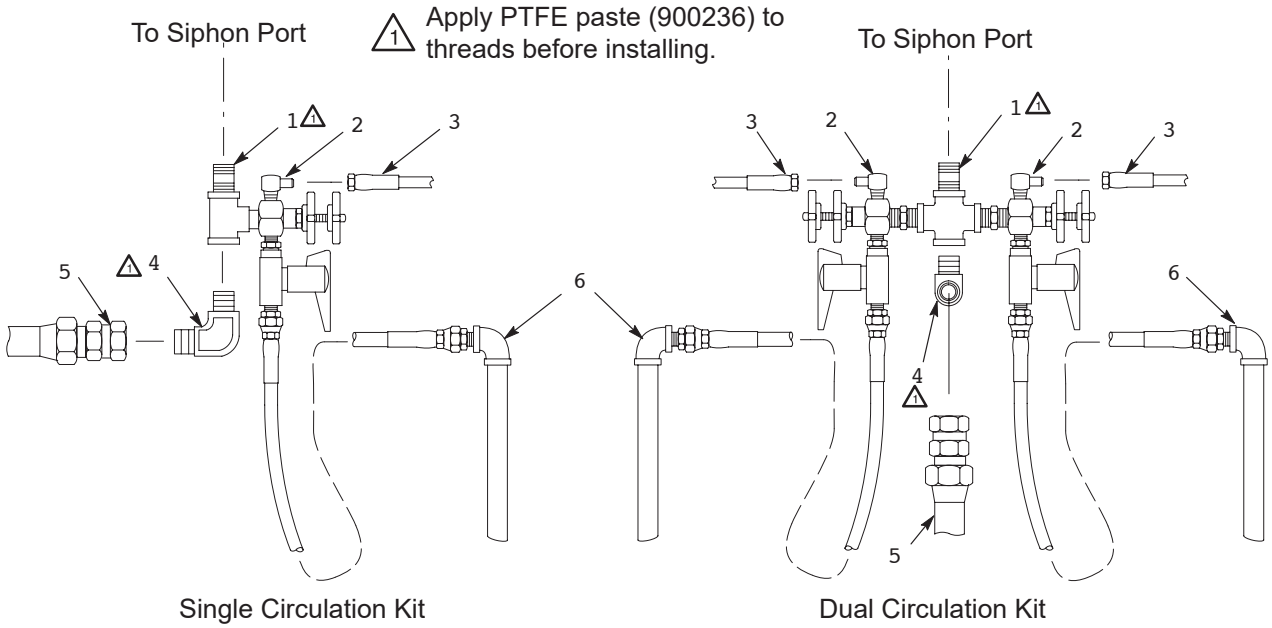


Figure 3-2 Single or Dual Circulation Kit Installation

1. ¾ in. NPT Nipple (part of circ. kit)
2. ½–20 JIC x ¼ in. NPT elbow
3. Return hose (customer-supplied)
4. ⅞–14 x ¾ in. NPT elbow
5. Siphon hose
6. Drain hose and rod

NOTE: Items 4 and 5 are included in the optional Wall Mounting kit.

Compressed Air Connection

Air Inlet Port: ⅜ in. NPT. Use a flexible air hose to supply air to the pump and act as a vibration damper. Minimum hose ID is 10-mm (⅜-in.). Refer to *25B 16:1 Stainless Steel Pump Quick Reference Guide* for the kit part number.

Figure 3-3 shows the installation of the optional Air Motor Accessory kit. If using your own air preparation components and fittings, connect them to the air inlet port with a ⅜ in. NPT nipple. You must use an air lubricator and Nordson-approved lubricating oil.

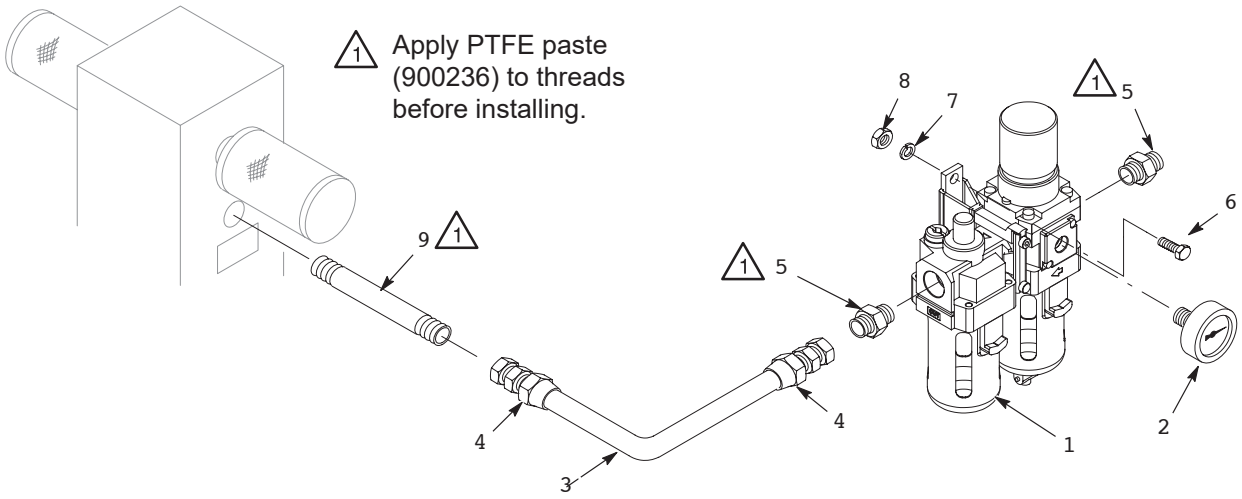


Figure 3-3 Siphon and High Pressure Connections (Optional Siphon Accessory Kit shown)

1. Elbow
2. Siphon hose
3. Male connector
4. Siphon rod
5. Strainer
6. Mounting bracket
7. ⅜–16 hex nuts
8. Solvent filler cup

NOTE: The parts listed are included in the Air Motor Accessory kit. Refer to 25B Air Motor and Air Valve Parts, for kit parts list. The filter/regulator/lubricator assembly is a generic representation. The actual assembly may look different.

Installation Guidelines

Figure 3-4 and Figure 3-5 show typical dead-end and circulating systems. When installing your pump, follow these guidelines:

- The compressed air supply should be clean and dry. Moisture-laden air can cause icing in the air valve or mufflers, resulting in poor performance and stalling. Use an air dryer to remove moisture from the air supply. Filter the air to 40 microns or better.
- The air drop to the pump should be plumbed from the top of the plant air line to prevent moisture from entering the pump air supply line. Install a drop leg and drain valve at the bottom of the drop.
- Install a self-relieving shutoff valve in the air supply line to the pump.
- Install the optional air filter/regulator/lubricator assembly so that the air supply enters the assembly at the filter and exits from the lubricator.
- The air and fluid hoses connected to the pump must be electrically conductive. Do not use rigid plumbing, which conducts vibration.
- Make sure the siphon connections are secure and leak-free. A leaking siphon connection will allow air to be drawn into the pump, causing cavitation and poor performance. Use PTFE paste on siphon fitting threads.
- High-pressure fluid connections must be tight and leak-free. Refer to Safety for information on high pressure fluid hazards. Check all connections for leaks before beginning production.
- Ground all system components, waste containers, and coating supplies. The only exception to this rule is electrostatic systems where the coating supply is charged at the supply rather than at the spray device.

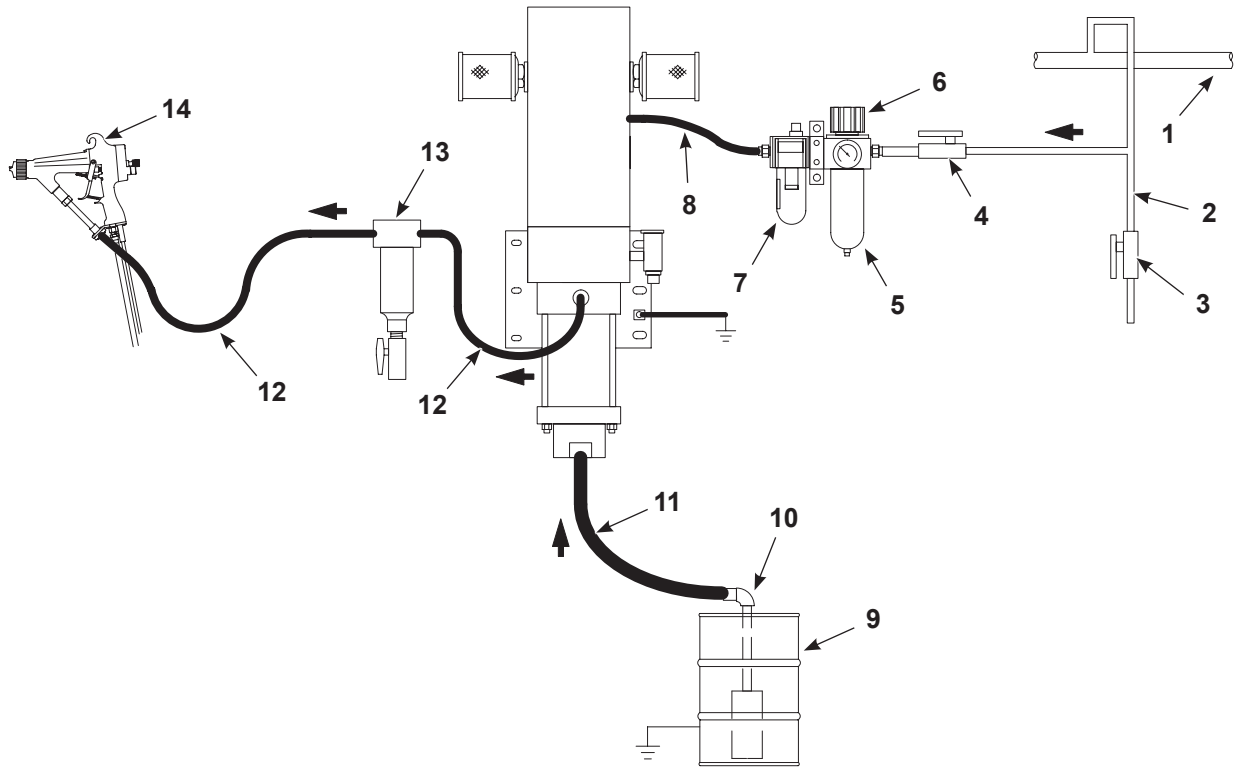


Figure 3-4 Typical Dead-End System Connections and Components

1. Plant air line
2. Drop leg
3. Drain valve
4. Air shut off valve (self-relieving)
5. Air filter
6. Regulator and gauge
7. Lubricator
8. Air hose
9. Coating supply
10. Siphon rod and strainer
11. Siphon hose
12. High-pressure fluid hoses
13. Fluid filter
14. Spray gun

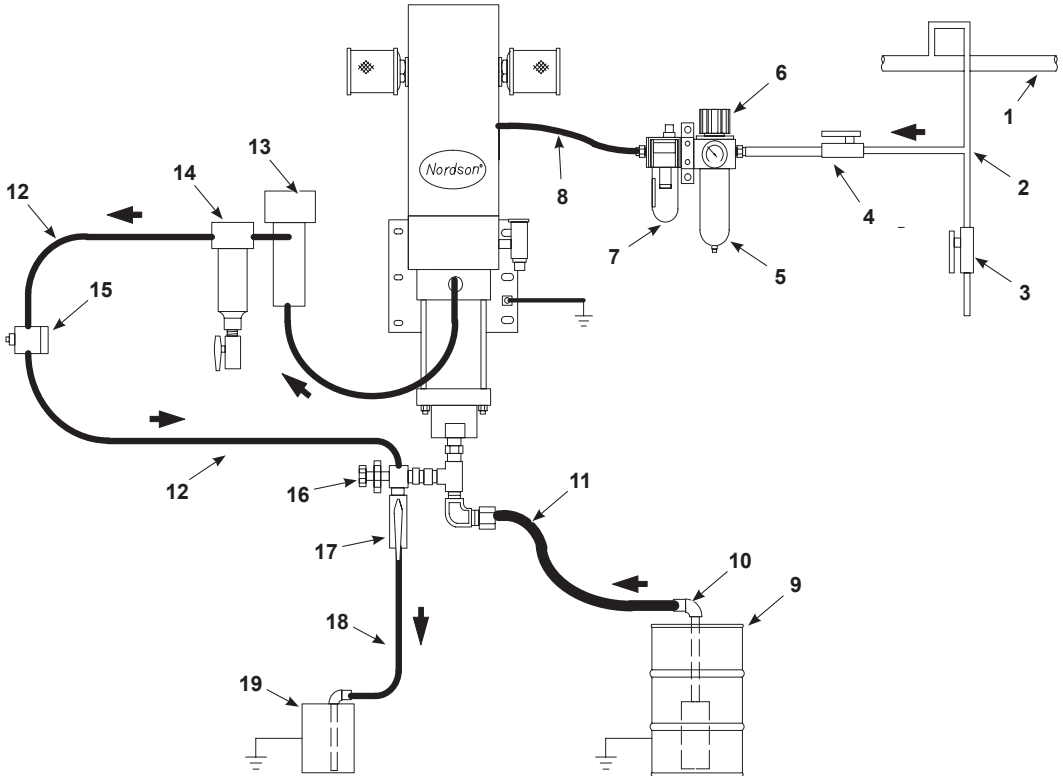


Figure 3-5 Typical Dead-End System Connections and Components

1. Plant air line
2. Drop leg
3. Drain valve
4. Air shut off valve (self-relieving)
5. Air filter
6. Regulator and gauge
7. Lubricator
8. Air hose
9. Coating supply
10. Siphon rod and strainer
11. Siphon hose
12. High-pressure fluid hoses
13. Fluid filter
14. Spray gun
15. Spray device
16. Circulation valve
17. Drain valve
18. Drain hose ad rod
19. Waste container

Section 4

Operation and Maintenance

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

WARNING: High-pressure fluids are extremely hazardous. Do not place any part of your body in front of a spray device, drain, or leak in high-pressure system. A jet of high-pressure fluid can cause a serious injury, toxic poisoning, or death. Relieve fluid pressure before removing nozzles, disconnecting hoses, or performing any maintenance or repair procedures.

WARNING: Do not remove any sheet-metal covers from the pump while it is operating. Moving parts under the covers could cause an injury.

Introduction

This section covers the following procedures:

- system check
- solvent chamber fill
- pump flushing
- routine startup
- coating material change
- routine shutdown
- maintenance

NOTE: The information in this section is common for both the aluminum and stainless steel versions of the 25B Pump. All illustrations in this manual show the aluminum version of the pump. The stainless steel versions look different, but operate in the same way.

System Check

Before starting the pump, make sure

- all fittings and connections are tightened securely.
- the air shutoff valve and the circulation and drain valves (if used) are closed and the air regulator is set to zero pressure.
- the air lubricator is full of lubricating oil.
- the system components (such as the heater and filter) have been installed according to the instructions in their manuals.

Solvent Chamber Fill

Open the top of the solvent chamber filler cup. Slowly pour solvent chamber fluid into the cup until the level rises to the fill line. Refer to the *Pump Packing and Solvent Chamber Fluid Guide* included with this manual for solvent chamber fluid applications and part

numbers. Use a solvent chamber fluid that is compatible with the coating material being pumped.

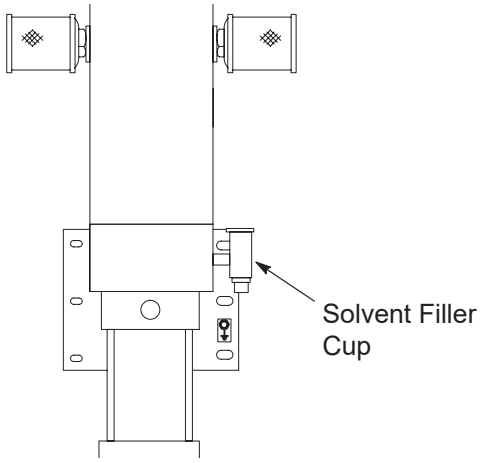


Figure 4-1 Solvent Chamber Fill

Flushing

Frequency

Flush the pump or system:

- before putting it into service for the first time
- before and after rebuilding the hydraulic section
- when changing coating material
- before a long term shutdown

Cleaning Solution for Flushing

WARNING: Do not use halogenated hydrocarbon solvents in pressurized systems that contain aluminum components. Refer to Safety for more information.

When flushing the pump or system, use a cleaning solution or solvent compatible with the pump construction, packing gland type, other system components, and the coating material used.

System Flushing

See Figure 4-2.

WARNING: High-Pressure Fluid Injection Hazard: Always relieve system pressure before removing or installing spray device nozzles, disconnecting hoses, or making any repairs or adjustments to system components. Shut off the pump air supply and relieve the air pressure to the pump, then trigger the spray devices or open the circulation kit drain valve.

1. Remove the siphon rod (6) from the coating material (5) and run the pump until it starts to run away, then stop it by shutting off the air supply.
2. Relieve the system fluid pressure by opening the drain valve (11) or triggering the spray devices.
3. Remove the spray device nozzles.
4. Set up a drain arrangement:

Dead-end system: Remove the fluid hose (14) from the spray device (8). Put the hose in a grounded waste container (13).

Circulating system: Put the drain rod (12) in a grounded waste container (13), close the circulation valve (10), and open the drain valve (11).

5. Put the siphon rod in the cleaning solution. Run the pump until no traces of the old coating material can be seen in the cleaning solution. Stop the pump.
6. Flush the spray guns:

Dead-end system: Connect the fluid hose (14) to the spray device (8).

Circulating system: Open the circulation valve (10) and close the drain valve (11).

Start the pump and trigger the spray devices to flush them clean.

7. Remove the siphon rod from the cleaning solution and run the pump until it starts to run away, then stop it.
8. Place the siphon rod in the new coating material, then start the pump and run it until the new material has flushed out all of the cleaning solution and air.
9. Trigger the spray devices to flush out the cleaning solution and air.
10. Stop the pump, relieve the system pressure, and install the spray device nozzles.
11. Start the pump and trigger the spray devices. When the spray devices stop spitting air, you can resume production.

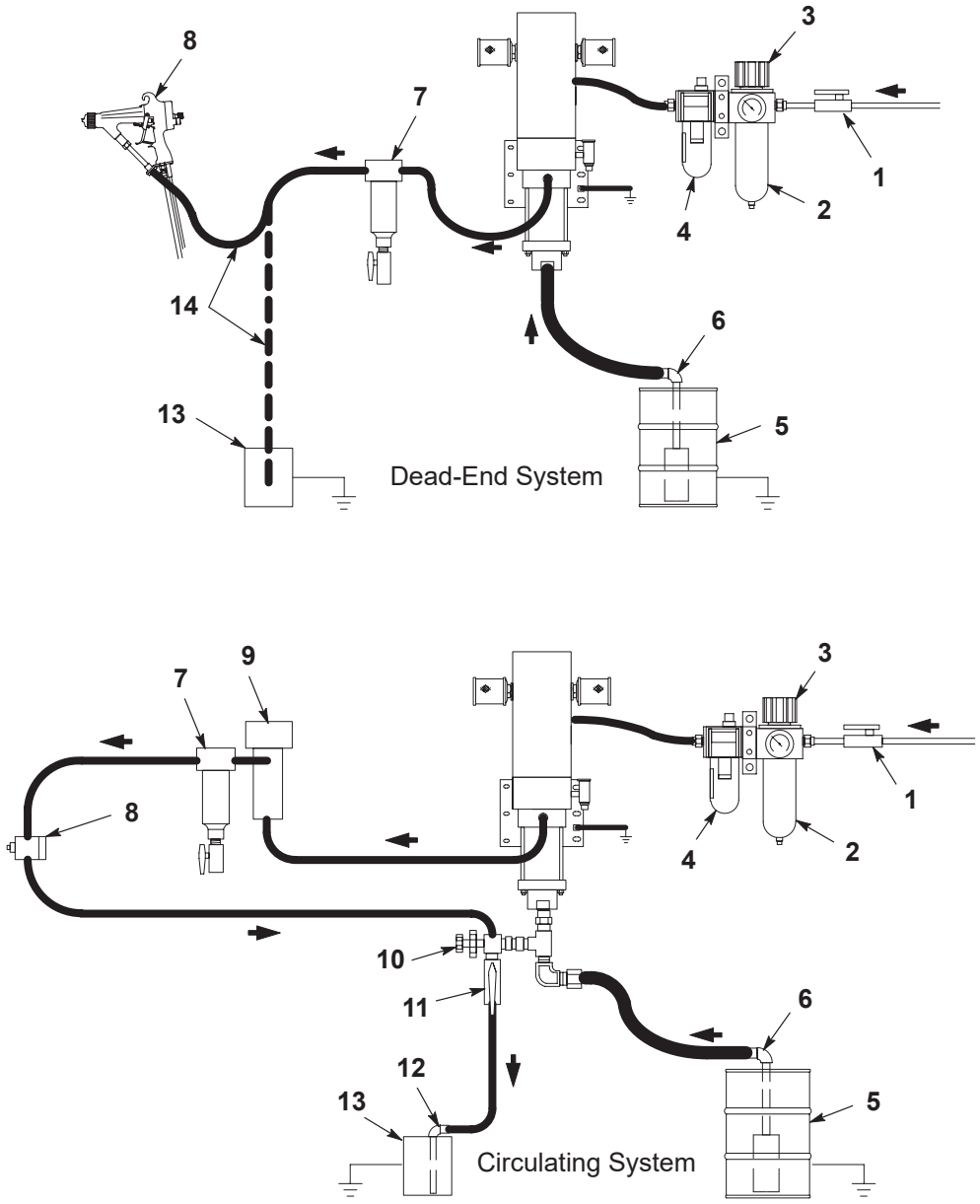


Figure 4-2 System Flushing and Operation

1. Air shutoff valve
2. Air filter
3. Air pressure regulator and gauge
4. Lubricator
5. Coating or cleaning solution supply
6. Siphon rod and strainer
7. Fluid filter
8. Spray device
9. Fluid heater
10. Circulation valve
11. Drain valve
12. Drain rod
13. Waste container
14. High-pressure fluid hose

Routine Startup

See Figure 4-2

Preparation

Check the levels of the:

- coating material supply (5)
- solvent chamber fluid (see Figure B 4-1)
- air lubricator (4)

Make sure that the

- siphon rod and strainer (6) are submerged in coating material, or pressure-feed system is operating
- fluid and air connections are tight
- air filter (2) has been drained
- compressed air is available to run the pump
- drain rod (12) is in a waste container (13) (circulating systems only)
- pump, coating material supply, and waste container are grounded

Startup

1. Use the following formula to calculate the air pressure required to produce the desired output pressure:

output pressure --- pump ratio = air pressure required

WARNING: Maximum air pressure for all versions of the 25B pump is 7 bar (100 psi). Do not exceed this pressure.

Calculate the required air pressure for desired output pressure as shown in the following examples:

2:1 pump: 100 psi desired --- 2 = 50 psi air pressure

4:1 pump: 200 psi desired --- 4 = 50 psi air pressure

16:1 pump: 1200 psi desired --- 16 = 75 psi air pressure required.

27:1 pump: 2000 psi desired --- 27 = 74 psi air pressure required.

NOTE: These calculations provide only the output pressure at the pump. The fluid pressure at the spray device will vary, depending on many factors, including material viscosity and temperature, the number of filters and heaters, and fluid hose ID and length. To determine the pressure available to the spray device, install a fluid pressure gauge at the spray device inlet or as close to the inlet as practical.

2. Start the pump by opening the air shutoff valve (1) and adjusting the air pressure regulator (3) to the air pressure that will produce the desired output pressure.
3. Purge air from the system:

- Dead-end system: Trigger the spray devices and watch for spitting as air is purged. Stop when the spray pattern is continuous and even.
- Circulating system: Close the circulation valve (10) and open the drain valve (11). Watch the flow from the drain rod. When no more air bubbles are seen, shut the drain valve and slowly open the circulation valve until the pump is stroking 8−10 times a

minute running at the desired number of cycles per minute. Trigger the spray device(s) to purge air from them.

NOTE: The more the circulation valve is opened, the more potential there is for fan pattern collapse or “wink” at the spray device when the pump shifts direction. Open the circulation valve just enough to maintain the required fluid temperature and agitation in the circulation loop.

4. Adjust the air lubricator so it delivers one drop every 17−25 strokes.
5. Turn on the fluid heaters (9), if used, and watch the thermometer at the heater outlet. Circulate coating material through the heater until it is at desired temperature before spraying parts.

NOTE: Overheating coating materials can cause cavitation in the pump if the heat allows the solvents in the coating material to boil out in the vacuum created during the siphon cycle. If this happens, lower the heater thermostat setting. Refer to Operation and Maintenance for more information.

6. Circulating systems: Adjust the circulation valve until the pump is supplying the required volume of coating material to the spray devices and circulating material back to the pump. The normal stroke rate is 8−10 times a minute, but high-volume systems may require faster rates.

Routine Shutdown

See Figure 4-2.

1. If fluid heaters (9) are used, turn them off and continue to circulate coating material through the system for 10 to 15 minutes before shutting down the pump. This will cool down the coating material and heaters and prevent the coating material from curing inside them.
2. Stop the pump by closing the air shutoff valve (1) or adjusting the air pressure regulator (3) to zero.
3. Relieve the system hydraulic pressure by triggering the spray devices or opening the drain valve (11).

NOTE: Normally, you can leave the system filled with coating material overnight. Circulate material through the system for several minutes before beginning production the next day. Do not leave the system open to air as the coating material could cure and clog the system. If the system will be shut down for more than a few days, flush it and leave it filled with cleaning solution.

4. Perform daily maintenance as described in Operation and Maintenance in this section.

Maintenance

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

WARNING: Stop the pump and relieve air and hydraulic pressures before disconnecting air or fluid hoses, or before disassembling any equipment.

Daily

See Figure 4-1 and Figure 4-2 Do the following daily:

1. Make sure that all conductive equipment in the spray area, including the pump and waste container, are securely connected to a true earth ground.
2. Drain the air filter (2). Check the filter element and replace it if necessary. Open the

drop leg drain valve and drain collected moisture.

3. Clean the fluid filter (7) screens. Replace them as necessary.
4. Check the air lubricator oil level. Adjust the oil delivery rate to one drop every 17−25 strokes.
5. Check the level of solvent chamber fluid in the solvent filler cup. Add more solvent chamber fluid as needed to bring the level up to the fill line.

NOTE: Coating material leaking past the upper packing gland will discolor the solvent chamber fluid and cause its level to rise. A small amount of leakage is normal. If the solvent filler cup fills quickly and overflows, the packings are worn and need to be replaced. Both upper and lower packings should be replaced at the same time.

Weekly

See Figure 4-3.

Remove the rear safety cover. Lubricate the snapper pivot points (1) and the end of the ball stem (2) with molybdenum-disulfide grease.

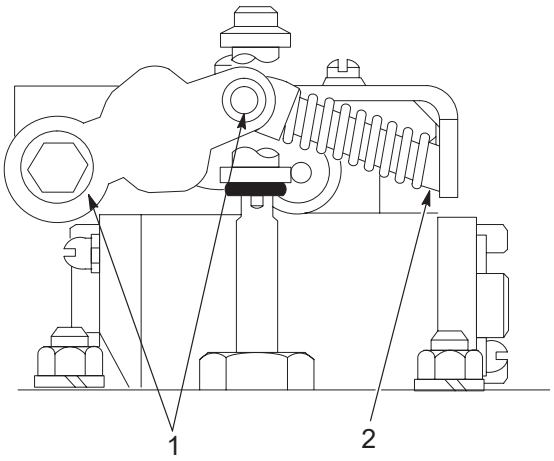


Figure 4-3 Air Valve Shifter Mechanism Lubrication (Front View)

1. Snapper pivot points
2. Ball stem

Every Four to Six Months

Rebuild the air valve. Refer to 25B Air Valve and Air Motor Repair.

As Needed

Flush the pump and system with a compatible cleaning solution.

Change the solvent chamber fluid regularly. Remove the drain plug from the bottom of the solvent filler cup to drain the old fluid.

Clean the exterior of the pump.

Section 5
Maintenance

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

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.

Common Problems

Problem	Possible Cause	Corrective
1. Pump fails to start or stops while operating and fails to restart	No compressed air supply, or air pressure too low	Check the air supply at the drop-leg drain valve. Make sure the air regulator is working correctly
	Blockage in fluid system	Check for flow from each component and hose, working from the spray device to the pump, as follows: 1. Shut off the air to the pump and relieve the hydraulic pressure. 2. Break the connection. 3. Turn on the air to the pump. If the pump starts, the blockage is in the component or hose downstream from the broken connection.
	Air valve spool stuck in middle position, or shifter mechanism damaged	Use a screwdriver to carefully move the shifter push rod up or down. If the pump fails to start, shut off the compressed air, relieve the fluid pressure, and remove the safety covers from around the air motor. Inspect the shifter mechanism and repair or replace any damaged or bent parts. If the shifter mechanism is not damaged, rebuild the air valve. Check the air supply for contamination. Rebuild the air valve if necessary.
	Air valve seals worn	Remove and rebuild the air valve.

Continued...

Problem	Possible Cause	Corrective
2. Excessive or constant air leakage from air motor or air valve	Worn seal in the upper or lower cylinder head	Remove the safety covers from around the air motor. Check for air leaking around the connecting rod or around the push rod. Replace any leaking seals.
	Worn O-rings on the air valve crankshaft or crankshaft end bushing	Remove the safety covers from around the air motor. Check for air leaking around the crankshaft or end bushing. Replace the leaking O-ring.
	Ice forming in valve	Remove the safety covers from around the air motor. Check for air leaking from the valve exhaust ports or ice on the valve body and mufflers. Allow the pump to idle as it warms. If the leaking stops, refer to Preventing Air Valve and Muffler Freezing in this section.
	Air valve poppet-seal washers, or piston worn or damaged	Remove the safety covers from around the air motor. Remove the muffler block. Make sure ice is not preventing the valve spool from moving. If air is flowing from both ends of the air valve, the washers sealing the poppet or the piston seal are leaking. Replace the washers around the poppets. If the problem continues, inspect the piston. Replace the piston if the seal is worn or damaged. Refer to 25B Air Valve and Air Motor Repair.
	Damaged gaskets between the air valve and the upper cylinder head	Remove the safety covers from around the air motor. If air leaks from between the air valve and the upper cylinder head, remove the air valve and replace the gaskets.

Continued...

Problem	Possible Cause	Corrective
3. Pump strokes irregularly when spray device is triggered	Air in hydraulic system	Purge the air from the hydraulic system. Refer to Flushing in Operation and Maintenance. Add defoaming agents to coating material.
	Coating material temperature too high, causing cavitation	As coating material temperature is increased, vacuum created by pump siphon can cause solvents to boil and cause cavitation. Lower heater thermostat setting.
	Worn or clogged ball check valve in hydraulic section	Flush the pump and system with a compatible cleaning solution. If the problem continues, rebuild the ball check valves.
	Worn packings	Replace the packings.
4. Pump operates but flow is restricted, or pump surges	Air motor or air valve leak	Refer to problem 2.
	Volume of supply air is inadequate	Check for a restriction in the air lines, regulator or filter. Make sure the air lines are the correct size.
	Blockage in hydraulic system	Refer to problem 1.
	Coating material too viscous	Check the material viscosity. Add solvent to the material to lower the viscosity.
	Drain valve (circulation kit) leaking	Check for flow from the valve when it is closed.
	Output from spray devices exceeds pump capacity	Reduce the spray device nozzle or fluid tip size. Reduce the number of spray devices connected to the pump. Reduce the circulation rate.

Continued...

Problem	Possible Cause	Corrective
5. Pump fails to siphon coating material	Blocked siphon strainer screen, rod, or hose	Check and clean the hose, rod, and strainer.
	Air leak in siphon system	Check the siphon hose for leaks. Break apart all connections in the siphon system. Remove old sealant from the fitting threads and wrap them with PTFE tape before reconnecting them.
	Coating material too viscous	Check the material viscosity. Add solvent to the material to lower the viscosity.
	Siphon hose too long, hose ID too small, or strainer screen too fine for coating material	Use a correctly sized siphon hose. Check the strainer screen. If the strainer screen is clogged with pigment, use a coarser mesh screen or a strainer without a screen. Contact your Nordson representative for advice.
6. Pump continues to operate even after drain and circulation valves are closed and spray devices are turned off	Coating material supply low, pump siphoning air	Fill the supply container.
	Leaking drain valve	Rebuild or replace the drain valve.
	Leaking circulation valve	Check for a damaged or worn circulation valve as follows: 1. Shut off the pump air supply. 2. Open the drain valve to relieve the hydraulic pressure. 3. Close the drain valve. 4. Immerse the siphon rod in coating material. 5. Disconnect the return hose from the circulation valve. 6. Connect an air hose to the circulation valve in place of the return hose. 7. Apply compressed air to the circulation valve. If air bubbles from the siphon rod, replace the circulation valve needle and seat.
	Leaking ball check valve	Rebuild the ball check valves.

Continued...

Problem	Possible Cause	Corrective
7. Pump does not stroke when circulation valve is opened	Clogged circulation valve, or blockage in system	Open the circulation valve fully, then close it partially. If the problem continues, flush the system with a compatible cleaning solution. Refer to problem 1.
	No compressed air supply, or air pressure is too low	Check the air supply at the drop-leg drain valve. Make sure the regulator is working correctly.
8. Solvent chamber overflows often	Upper packings worn	Replace the packings. Upper and lower packings should be replaced at the same time.
9. Spray pattern fades or narrows	Compressed air pressure is too low	Make sure the air pressure regulator is working correctly. The pump air motor requires at least 1.38 bar (20 psi) air pressure to operate. Increase the air pressure. Check for a restriction in the air supply line.
	Blockage in hydraulic system	Refer to problem 1.
	Nozzles or fluid tips too large, or too many spray devices connected to system	Reduce the nozzle or fluid tip size, or the number of spray devices connected to the pump.
	Spray device nozzle plugging	Remove the fluid filter screen and inspect it. If the screen is damaged, replace it. If the screen is undamaged, replace it with one with a smaller mesh size. Clean the spray device nozzle.
	Circulation valve opened too far	Close the circulation valve completely, then reopen until pump is stroking 5 to 10 strokes per minute with guns turned off.
10. Spray pattern has tails of unatomized coating material at the outer edges	Low hydraulic pressure or partial blockage in system	Increase the air pressure. Flush the system with a compatible cleaning solution. Refer to problem 1.
	Material too viscous	Add solvent or heat to the coating material to lower the viscosity.
	Damaged nozzle or fluid tip	Replace the nozzle or fluid tip.

Minimizing Pressure Deviations

Use the following guidelines to minimize pressure deviations.

Air Supply

Correct sizing and installation of the pump air supply system will reduce pressure deviation problems. One indication of an inadequate air supply is excessive needle deflections on the air line gauge as the pump strokes.

Fluctuations of 0.35 bar (5 psi) or less are normal. Fluctuations above 0.35 bar (5 psi) indicate a restricted air supply.

If it is inconvenient or expensive to install a larger air supply line, an air accumulator can be installed at the pump. This will minimize the air pressure drop that occurs when the pump reverses at the end of each stroke and ensure an adequate air volume during pump changeover.

Air Exhaust

Restricted exhaust air can have the same effect as a restricted air supply. The restriction can be caused by ice build-up, wrong size or design of mufflers, or contamination. Icing can be caused by high cycle rates at high air pressures, by a moisture laden supply air, or by restricted mufflers.

If the pump needs to be operated at high cycle rates and air pressures to maintain the desired fluid pressure and flow rate, a larger pump may be needed. The air supply must be clean and dry. Use of a refrigerated air drier and air filter/separators is recommended. Another way to reduce ice build-up and exhaust noise is to exhaust the air into a large common pipe manifold fabricated from 3- to 4-inch PVC pipe.

Correcting Siphon Problems

Use the following guidelines to isolate and correct siphon problems.

Cavitation

A large percentage of pump problems are the result of siphoning problems or cavitation. Pressure variations can be caused by restricting the suction or siphon side of the pump. When the pump does not fully prime on the up stroke, the pump will race or dive on the early portion of the down stroke. When the plunger contacts the fluid, a hydraulic shock and pressure spike is created. This hydraulic hammer also reduces packing, plunger, and siphon check valve life.

In higher viscosity and/or flow applications, the chances of cavitation increase. The simplest way to avoid cavitation problems is to provide a positive pressure at the pump inlet. This can be accomplished by one of the following methods.

- Elevate the material supply, above the pump if possible.
- Immerse the pump inlet (use bucket or drum mount kits).
- Use a positive pressure supply system to feed the pump. Normal supply pressures are 0.35−1.03 bar (5−15 psi).
- Use ram (elevator) mounted pumps, inductor plates, or follower plates.

Priming Problems

Priming problems can be caused by restrictions in the siphon filter, hoses, or rod, as well as by suction lift losses due to the pump being elevated above the material supply. The easiest way to solve these problems is by immersing the pump intake in the material supply, or by using a pressurized supply system. Other methods of minimizing restrictions

on the suction side of a pump include:

- Use as large an ID siphon hose as practical.
- Use the shortest siphon hose as practical.
- Keep the siphon strainer clean, or remove it when using very viscous materials.
- Elevate the material supply, above the pump if possible.
- Immerse the pump inlet (use a bucket or drum mount kits).
- Use ram (elevator) mounted pumps, inductor plates, or follower plates.

Preventing Air Valve and Muffler Freezing

As compressed air is exhausted from the air valve, it expands rapidly, and cools the air valve. The valve can get cold enough for water vapor to condense and freeze on or in the mufflers and interfere with the operation of the valve. If this happens, try one of the following actions:

- Run the pump at no more than 8−10 strokes per minute.
- If you are operating the pump at high speed in a humid environment, lubricate the compressed air with a glycol-based antifreeze fluid. Do not use an antileak-type antifreeze fluid.
- Install an air dryer to remove moisture from the air supply.
- Install larger mufflers.
- Remove the mufflers and install plumbing to exhaust the air to the outside of the building.

Section 6

25B Air Valve and Air Motor Repair

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

WARNING: Shut off and lock out the compressed air supply to the pump and relieve system fluid pressure before servicing the pump or other system components. Failure to observe this warning may result in serious personal injury.

Introduction

This section contains procedures for:

- Air valve repair
- Air motor repair

NOTE: Item numbers in illustrations match the item numbers in 25B Air Motor and Air Valve Parts. Lettered parts are parts of the hydraulic section, assemblies not called out in parts lists, or included only in optional kits.

Air Valve Repair

The air valve can be removed and repaired without removing the pump from its mounting. When repairing the valve, replace all gaskets and O-rings.

Refer to 25B Air Motor and Air Valve Parts, for information on old style air valves with poppet spacers.

Tools and Materials Required

The following tools and materials are needed to repair the air valve:

- small and large adjustable wrenches
- English hex wrench set
- flat-bladed screwdrivers
- molybdenum disulfide grease (Nordson part 900252)
- O-ring lubricant (Parker O-Lube or equivalent) (Nordson part 1612251)
- replacement parts or kits (refer to 25B Air Motor and Air Valve Parts)

Air Valve Removal

Shut off the air supply to the pump and relieve the air and fluid pressure.

1. Remove the mufflers and muffler adapters.
2. Disconnect the air supply hose and remove the air inlet nipple from the air motor.
3. Remove the two screws and the cover from the air motor.
4. Loosen but do not remove the screws securing the air valve assembly to the air motor.
5. Lift the entire air valve assembly off the air motor.

Air Valve Disassembly

See Air Valve Disability. Remove parts from the valve body (41) in the following order:

1. Gaskets (51) and O-ring (47).
2. Screws (36), lock washers (37), snapper assembly (A), and gasket (40).
3. Screws (54) and lock washers (37).
4. End plates (53) and end plate washers (52).

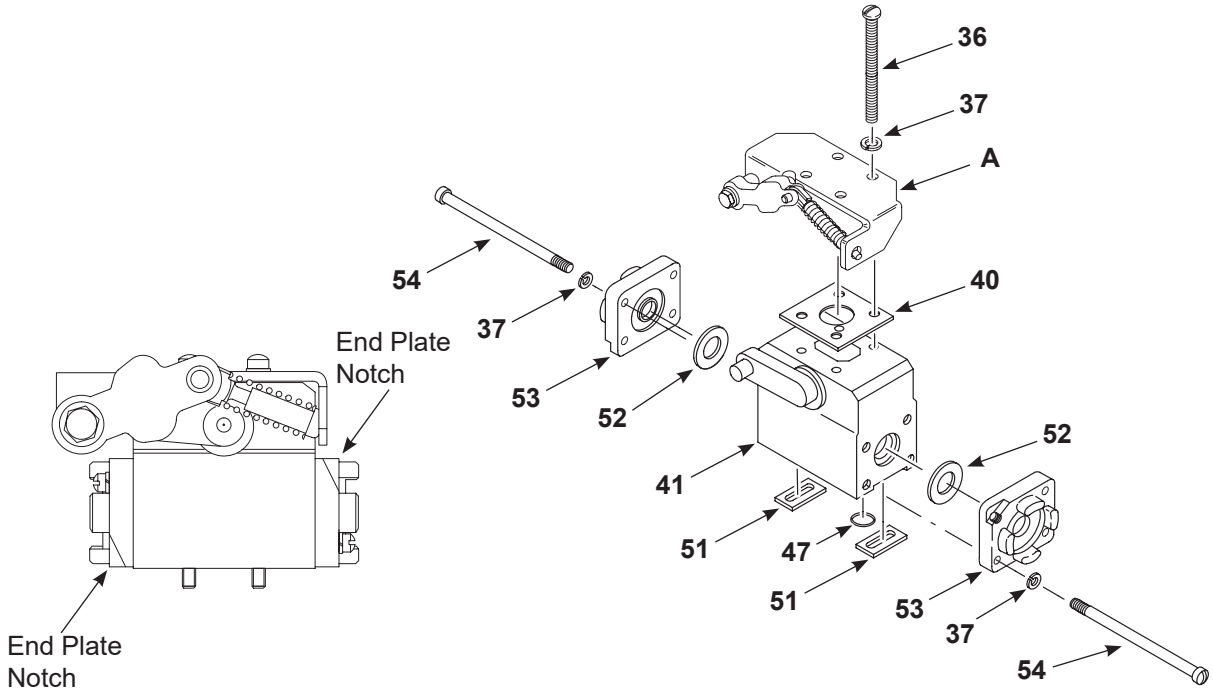


Figure 6-1 Air Valve Disability

36. Screws (4)
37. Lock Washers (4)
40. Gasket
41. Valve body
47. O-ring
51. Gaskets (2)
52. End plate washers (2)
53. End plates (2)
54. Screws (4)
A. Snapper assembly

See Figure 6-2. Finish removing parts from the air valve in the following order:

5. One screw (45) and poppet (50) from one side of poppet guide (49).
6. Screw (45) and end bushing (44).
7. Crankshaft (46).

NOTE: If the crankshaft will not disengage from the arm easily, thread one of the screws (45) into the end of the crankshaft and tap on the screw to push the crankshaft out of the arm.

8. Arm (39).
9. Poppet guide (49) (you do not need to remove the other poppet from the guide unless both are damaged).
10. O-rings (48) from valve body.

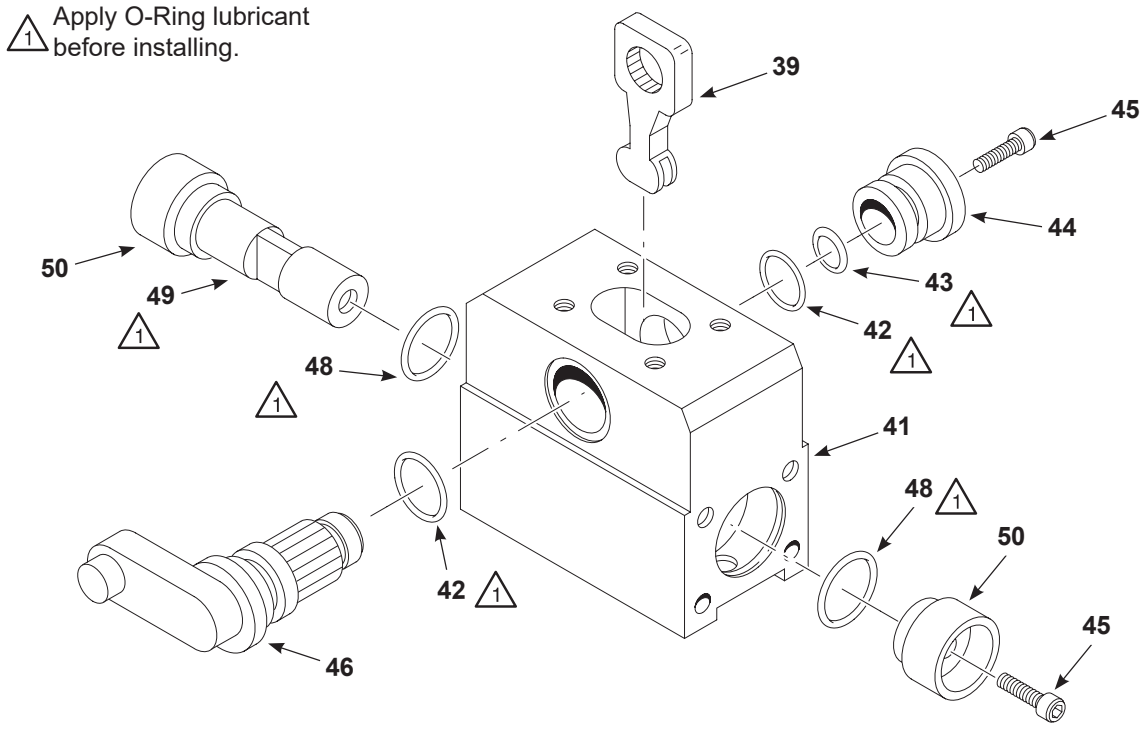


Figure 6-2 Air Valve Repair (2 of 2)

39. Arm
41. Valve body
42. O-rings (2)
43. O-ring
44. End bushing
45. Screws (3)
46. Crankshaft
48. O-rings (2)
49. Poppet guide
50. Poppets (2)

Snapper Rebuild

See Figure 6-3. Disassemble the snapper only to replace worn parts

CAUTION: The ball stem (32) and fork (31) are under spring tension. Remove the screw (55) carefully.

1. Remove the nut (35), lock washer (34), and screw (55).
2. Clean the snapper parts and inspect them for damage. Replace any damaged or worn parts.
3. Lubricate the snapper pin, fork, and ball stem with molybdenum disulfide grease, then re-assemble the snapper. Tighten the screw and nut securely.

1 Apply molybdenum disulfied grease before installing.

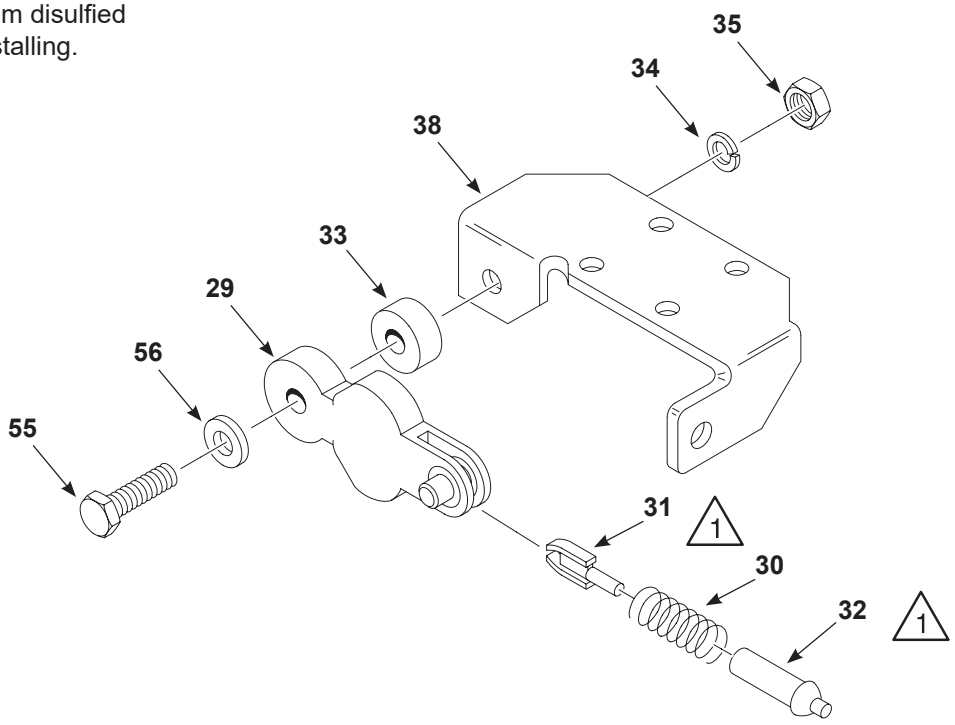


Figure 6-3 Snapper Repair

29. Snapper
30. Spring
31. Fork
32. Ball Stem
33. Spacer
34. Lock washer
35. Nut
38. Bracket
55. Screw
56. Washer

Air Valve Assembly

Follow these guidelines when reassembling the air valve:

- Remove and replace all O-rings and seals
- Lubricate all O-rings with O-ring lubricant before installation
- Lubricate the poppet guide with a thin film of O-ring lubricant
- Tighten the screws securely

See Figure 6-2 on page 6-11. Reassemble the air valve in the following order:

1. O-rings (48) in valve body bore.
2. Poppet guide (49), with one poppet (50) and screw (45) installed, in valve body (41).
3. Arm (39) into valve body and over poppet guide flats.
4. O-ring (42) on crankshaft (46), crankshaft into body and through arm.
5. O-rings (42, 43) on end bushing (44). O-ring (43) goes inside end bushing. End bushing into body, secure with screw (45).
6. Remaining poppet (50) on poppet guide, secure with screw (45).

See Figure 6-1 on page 6-10. Complete the air valve assembly by installing these parts in the following order. Tighten all fasteners securely.

7. End plate washers (52) in end plates (53).
8. End plates on valve body, with notches oriented as shown in the front view. Secure with screws (54) and lock washers (37).

NOTE: Before installing the snapper assembly, lubricate the crankshaft pin with molybdenum disulfide grease.

9. Gasket (40) and snapper assembly (A) on valve body, fitting the crankshaft pin into the slot in the snapper. Install the screws and lock washers (36, 37) through the bracket and valve body.
10. Gaskets (51) and O-ring (47) in valve body.

If you are not rebuilding the air motor, re-install the air valve.

Air Valve Installation

Install parts as follows, tightening all threaded parts and fasteners securely.

1. Air valve on air motor. Make sure the snapper pin fits between the shoulders of the spool.
2. Cover on air motor.
3. PTFE paste on muffler adapter threads, then screw adapters into air valve end plates.
4. Mufflers on adapters.
5. PTFE paste on air inlet nipple, screw nipple into air motor head.

Air Motor Repair

To repair the air motor, you must remove the pump from its mounting and separate the air motor and hydraulic section.

Tools and Materials Required

The following tools and materials are needed to repair the air motor:

- small and large adjustable wrenches
- English hex wrenches
- soft-faced mallet
- retaining ring pliers
- large, clean work surface
- container for solvent chamber fluid
- O-ring lubricant (Parker O-Lube or equivalent) (Nordson part 1612251)
- replacement parts or kits (refer to 25B Air Motor and Air Valve Parts)

Preparation

1. If you are also going to repair the hydraulic section, flush the pump with a compatible cleaning solution. Refer to Flushing in Operation and Maintenance.
2. When flushing is complete, run the pump with very low air pressure. Remove the siphon rod from the cleaning solution and let the pump run dry. Turn off the air supply when the pump starts to run away.
3. Perform steps 2 through 6 in “Air Valve Repair” on page 6-9 to remove the air valve.
4. Remove the drain plug from the filler cup and drain the solvent chamber. Remove the filler cup from the solvent chamber.
5. Disconnect the siphon and high-pressure fluid hoses, and the circulation valve, if used.
6. Remove the fasteners securing the pump to the mounting bracket.
7. Lift the pump out of the bracket and move it to a clean work area.

8. Remove the two screws and rear cover from the air motor.

Separating the Air Motor and Hydraulic Section

1. See Figure 6-4. Remove the four screws (27) and lock washers (28).
2. Pull the hydraulic section away from the air motor.
3. Use two wrenches to unscrew the connecting rod (22) from the plunger (A).

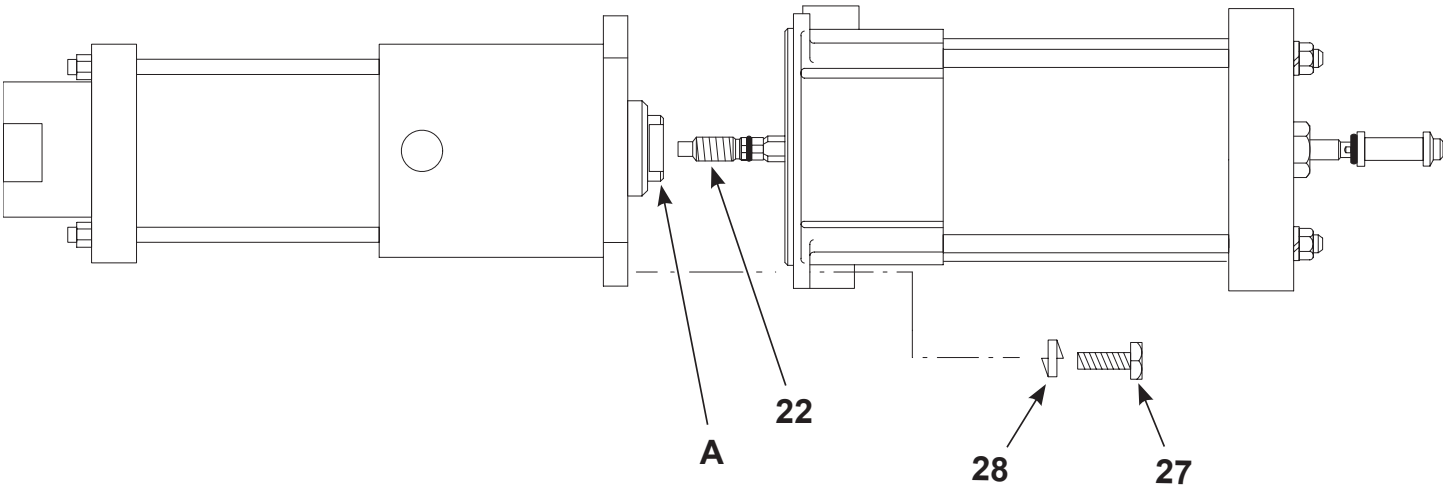


Figure 6-4 Separating the Air Motor and Hydraulic Section

22. Connecting rod
27. Screws (4)
28. Lock Washers (4)
A. Plunger

Air Motor Disassembly

See Figure 6-5. Disassemble the air motor by removing parts in the following order:

1. Socket head screw (1), lockwasher (2), and spool (3) from spool rod (5).
2. Nuts (8) and lockwashers (9) from tie rods (16).
3. Air motor head (10) from cylinder (21).
4. Spool carrier guide (6), U-cup (7), and square O-ring (20) from air motor head.
5. Connecting tube (13) and O-rings (12) from upper base (26).
6. Cylinder from upper base.
7. Piston assembly (A) from upper base.
8. One tie rod (16) from the upper base.
9. Packing gland (24) and square O-ring (20) from upper base.

Air Motor Disassembly (con't)

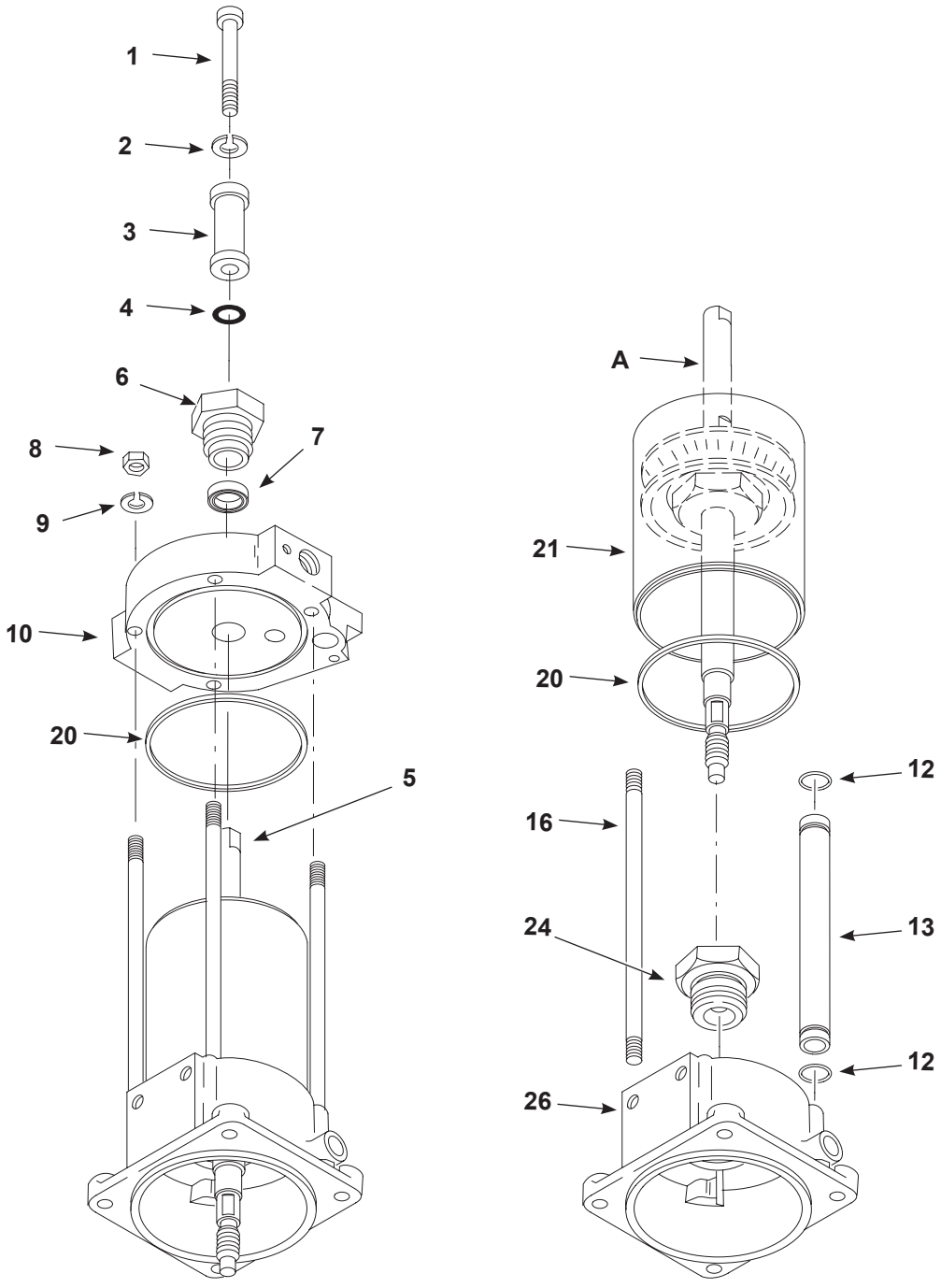


Figure 6-5 Separating the Air Motor and Hydraulic Section

1. Screw
2. Lock washer
3. Spool
4. O-ring
5. Spool rod
6. Spool carrier guide
7. U-cup
8. Nuts (3)
9. Lock washers (3)
10. Air motor head
11. O-rings (2)
13. Connecting tube
16. Tie rods (3)
20. Square O-rings (2)
21. Cylinder
24. Packing gland
26. Upper base
A. Piston assembly

Piston Repair

Piston Disassembly

CAUTION: Do not score the spool rod (5) or connecting rod (22). Any burrs will damage the seals and cause them to leak.

1. Put the piston assembly, connecting rod (22) up, in a vise with the upper jam nut (15) between the vise jaws. Turn the lower jam nut (19) counterclockwise (threads are right-handed) to the end of the connecting rod threads.
2. Turn the connecting rod counter-clockwise to unscrew it from the upper jam nut. Remove the piston (18).
3. Remove the remaining assembly from the vise. The upper jam nut will slide down the telescoping screw (17). To replace the O-ring (4), spool rod (5), upper jam nut (15), special nut (14), or telescoping screw:
   a. Place one wrench on the spool rod flats. Thread the special nut down the telescoping screw, away from the spool rod.
   b. Unscrew the telescoping screw from the spool rod. Remove the O-ring, special nut, and upper jam nut.
4. Remove the O-ring (23) from the connecting rod.

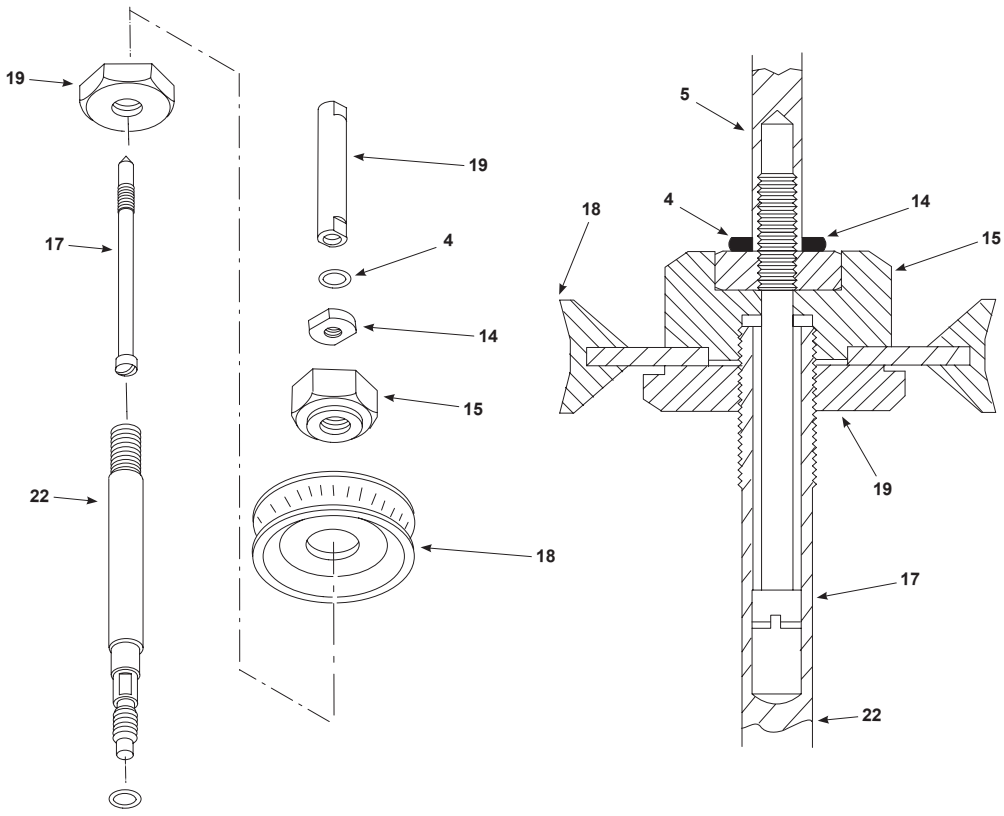


Figure 6-6 Piston Assembly Repair

4. O-ring
5. Spool rod
14. Special nut
15. Upper jam nut
17. Telescoping screw
18. Piston
19. Lower jam nut
22. Connecting rod
23. O-ring

Piston Assembly

See Figure 6-6.

1. Install the upper jam nut (15) onto the telescoping screw (17), with the recess for the special nut facing away from the slotted head of the telescoping screw. Thread the special nut (14) all the way onto the telescoping screw.
2. Install the O-ring (4) onto the spool rod (5). Thread the telescoping screw into the spool rod.
3. Place the upper jam nut into a vise with the slotted head of the telescoping screw up. Install the piston (18) onto the upper jam nut.
4. If removed, thread the lower jam nut (19) onto the connecting rod (22).
5. Thread the connecting rod into the upper jam nut until it bottoms out. Screw the lower jam nut down until it contacts the piston and tighten it securely.
6. Install a new O-ring (23) onto the end of the connecting rod.

Air Motor Assembly

NOTE: Lubricate all O-rings and seals with O-ring grease before installation. O-rings and U-cup are included in the air motor seal kit. The packing gland (24) must be ordered separately.

See Figure 6-5 on page 6-15 Assemble the air motor in the following order:

1. New packing gland (24) into the upper base (26). Tighten securely.
2. New square O-ring (20) into the upper base groove.
3. Tie rod(s) (16) into the upper base. Tighten securely.
4. Piston assembly into the cylinder (21), then both on the upper base:
   a. Lubricate the piston seal and inner cylinder wall. Insert the piston assembly into the cylinder at an angle until the piston seal is completely inside the cylinder, then straighten the piston assembly so it is parallel to the cylinder walls.
   b. Lubricate the connecting rod. Hold the cylinder and the piston assembly and insert the connecting rod through the packing gland. Insert the lip of the cylinder into the O-ring groove in the upper base.
5. New O-rings (12) onto the connecting tube (13), then connecting tube into upper base.
6. New square O-ring (20) in the air motor head (10) groove.
7. Air motor head on cylinder, making sure the:

- lip of the cylinder fits into the O-ring groove.
- connecting tube fits into the air port.
- spool rod fits through the center bore.
- tie rods fit through the four holes in the head.

8. U-cup (7) and spool carrier guide (6) in upper cylinder head.

NOTE: Install the U-cup with the lip facing down. Seat the U-cup in the bore before installing the spool guide.

9. O-ring (4), spool (3), lockwasher (2), and screw (1) on spool rod.
10. Lock washers (9) and nuts (8) on tie rods.

NOTE: Tighten the nuts in a criss-cross pattern, evenly and securely.

Connecting the Air Motor and Hydraulic Section

See Figure 6-4 on page 6-14.

1. Screw the connecting rod (22) into the plunger (A) and tighten securely.
2. Push the air motor and hydraulic section together. Install the four lock washers (27) and screws (28) and tighten them securely.
3. Perform the steps in “Air Valve Removal” on page 6-9 in reverse to install the air valve, covers, and mufflers.

Returning the Pump to Service

1. Install the pump on the wall mounting bracket.
2. Apply pipe thread adhesive/sealant to the siphon and high-pressure fitting threads and to the solvent filler cup threads. Install the fittings and filler cup on the pump.
3. Install the circulation kit, if used, and connect the siphon and high-pressure fluid hoses. Connect the air supply hose to the air motor. Refer to Installation, for connections and circulation valve installation.
4. Fill the solvent chamber with the appropriate solvent chamber fluid. Refer to Operation and Maintenance.
5. Flush the pump with a compatible cleaning solution or solvent.
6. Refer to Routine Startup in Operation and Maintenance to resume coating operations.

Section 7

25B 16:1 and 27:1 Hydraulic Section Repair

Introduction

The repair procedures in this section apply to both the 16:1 and 27:1 aluminum and stainless steel hydraulic sections. Although the aluminum and stainless steel pressure and siphon housings have different shapes, each version has the same internal components, except for their dimensions, and are repaired using the same procedures.

NOTE: Item numbers in illustrations match the item numbers in Section D2 Hydraulic Section Parts. Lettered parts are parts of the air motor, or assemblies not called out in parts lists, or included only in optional kits.

Tools and Materials Required

The following tools and materials are needed to repair the hydraulic section:

- small and large adjustable wrenches
- soft-faced mallet (rubber or brass)
- long brass drift or rod
- hardwood dowel (3/4-in.)
- retaining ring and needle nose pliers
- large, clean work surface resistant to solvents
- container for solvent chamber fluid
- O-ring lubricant (Parker O-Lube or equivalent) (Nordson part 1612251)
- pipe thread adhesive/sealant (Nordson part 900481)
- threadlocking adhesive (Loctite High Temp 271) (Nordson part 900439)
- replacement parts and kits (refer to 25B 16:1 and 27:1 Hydraulic Section Repair)

Preparation

Dismounting the Pump

1. Flush the pump with a compatible cleaning solution. Refer to Flushing in Operation and Maintenance.
2. Run the pump with very low air pressure. Remove the siphon rod from the cleaning solution and let the pump run dry. Turn off the air supply when the pump starts to run away.
3. Perform steps 2 through 4 under “Air Valve Removal” on page 6-9.
4. Remove the drain plug from the filler cup and drain the solvent chamber. Unscrew the solvent filler cup from the solvent chamber.
5. Disconnect the siphon and high-pressure fluid hoses, and the circulation valve, if used.
6. Remove the long nuts securing the pump to the mounting bracket.

7. Lift the pump out of the bracket and move it to a clean work area.

Separating the Air Motor and Hydraulic Section

1. See Figure 7-1. Remove the four screws (A) and lockwashers (B).
2. Pull the hydraulic section away from the air motor.
3. Use two wrenches to unscrew the connecting rod (C) from the plunger (3).

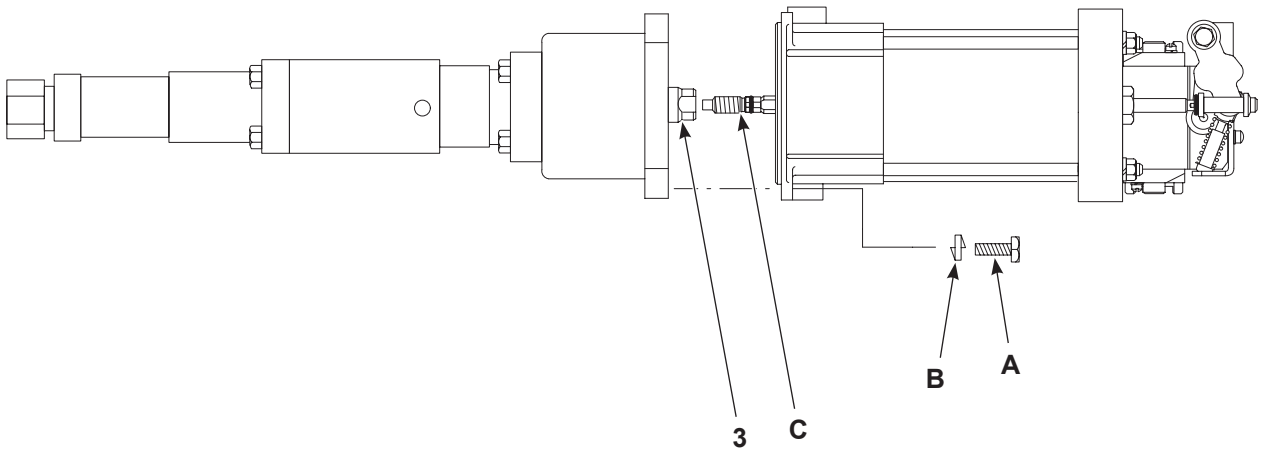


Figure 7-1 Separating the Air Motor and Hydraulic Section (Aluminum Hydraulic Section Shown)

3. Plunger
A. Screws (4)
B. Lock washers (4)
C. Connecting rod

Disassembly

See Figure 7-2.

1. Remove the hex head screws (15) and lock washers (14). Lift the solvent chamber (1) from the high pressure sleeve (8).
2. Unscrew the siphon check seat (13) from the siphon housing (10). Remove the ball (12) and cage (11) from the siphon housing with needle-nose pliers if necessary.
3. Remove the four hex head screws (16) and lockwashers (14). Pull the siphon housing away from the high pressure sleeve.
4. Place the high pressure sleeve (8) into a vise. Drive the plunger assembly (3) out of the sleeve with a soft-faced mallet and 3/4-in. hardwood dowel.

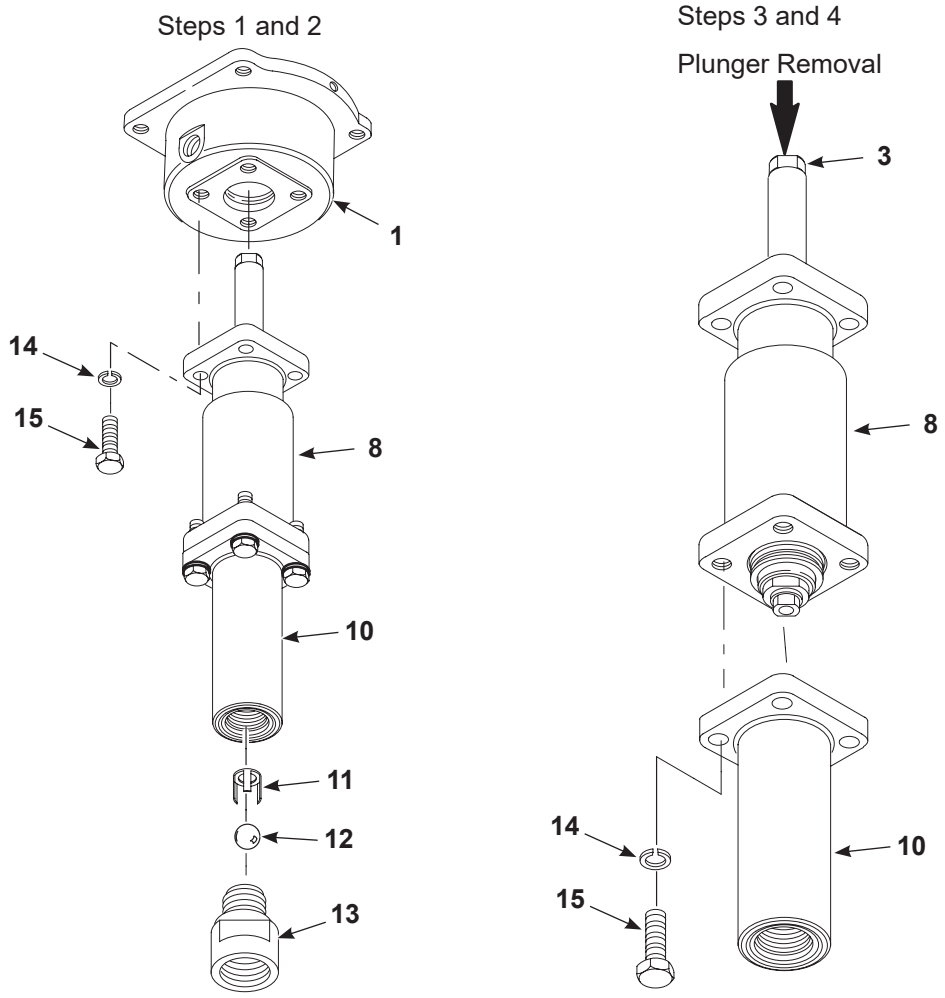


Figure 7-2 Hydraulic Section Disassembly−Steps 1, 2, and 3

1. Solvent chamber
3. Plunger assembly
8. High pressure sleeve
10. Siphon housing
11. Cage
12. Ball
13. Siphon check seat
14. Lock washers (4)
15. Screws (4, 1-in. long)
16. Screws (4, 1.25 in. long)

Disassembly (con't)

5. See Figure 7-3. Place the high pressure sleeve (8) upside down on two wood blocks so that the upper flange is resting on the blocks and the projecting portion of the upper packing gland (2) is between the blocks.
6. Insert a long brass rod through the center of the lower packing gland (9) until it contacts the lip of the upper packing gland. Drive the upper packing gland out of the sleeve.
7. Place the sleeve right side up on the wood blocks. Drive the lower packing gland out of the sleeve.

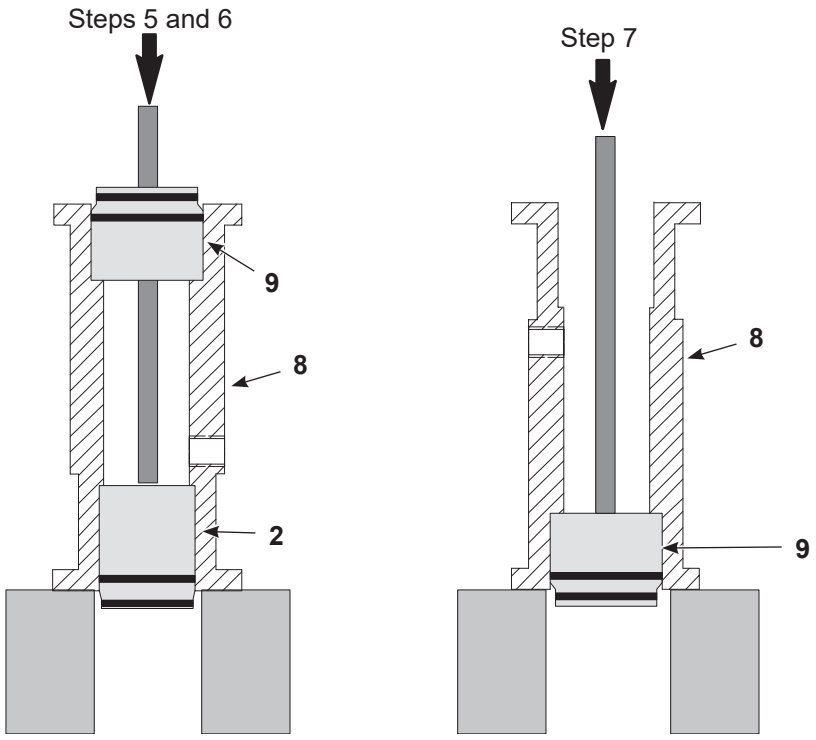


Figure 7-3 Hydraulic Section Disassembly−Steps 5, 6, and 7

2. Upper packing gland
8. High pressure sleeve
9. Lower packing gland

8. See Figure 7-4. Place a wrench on the flats at the top of the plunger. Unscrew the pressure check seat (7) from the bottom of the plunger. Remove the ball (6) and cage (5) from the plunger with needle nose pliers, if necessary.

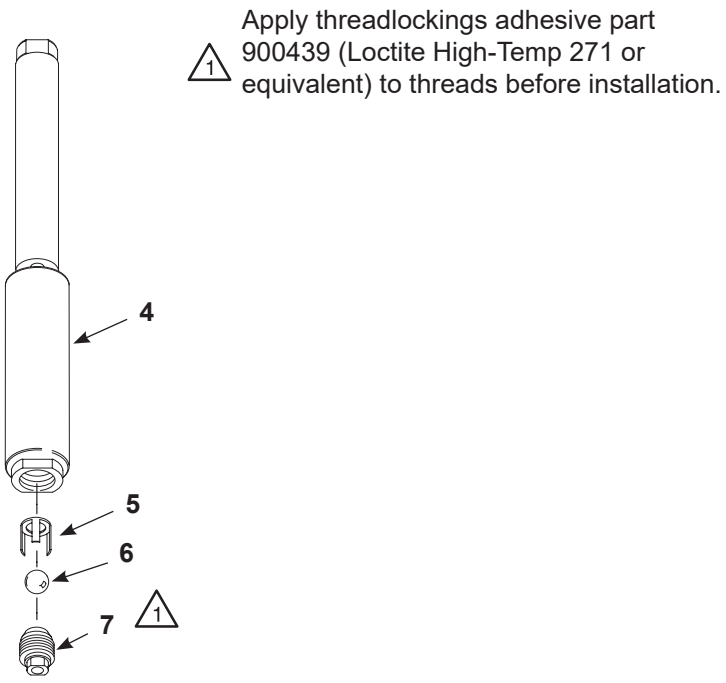


Figure 7-4 Plunger Disassembly (Step 8) and Assembly

4. Plunger
5. Cage
6. Ball
7. Pressure check seat

Cleaning, Inspection, and Parts Replacement

Clean and inspect the siphon housing, high pressure sleeve, plunger, and solvent chamber for cracks or scoring. Replace any cracked, deeply scored, or pitted parts. O-ring sealing surfaces must be smooth and clean with no pitting.

Lubricate the packing gland external O-rings with lubricant before installation.

Ball Check Test

Test the pressure and siphon ball checks for leaks by placing the seats on top of the balls and pouring a small quantity of solvent into each seat. If the solvent does not leak from the seats, you do not need to replace the seats or balls.

NOTE: Over time, the balls and seats wear into each other, so keep them together as matched sets if you are not replacing them.

Packing Gland Replacement

NOTE: Always lubricate the packing gland exterior O-rings with O-ring lubricant before installation.

Upper and lower packing glands can be ordered separately or together in a service kit. Except for Type G packings, the packing glands are shipped completely assembled. You should replace both upper and lower packings at the same time.

Type G Packing Gland Rebuild

Use the Type G service kit to rebuild Type G packing glands as shown in Figure 7-5. The Type G hydraulic service kit does not include the gland housing or retaining ring (2E, 9F). Reuse your existing housings and retaining rings.

Lubricate the U-cup with O-ring lubricant before installing it.

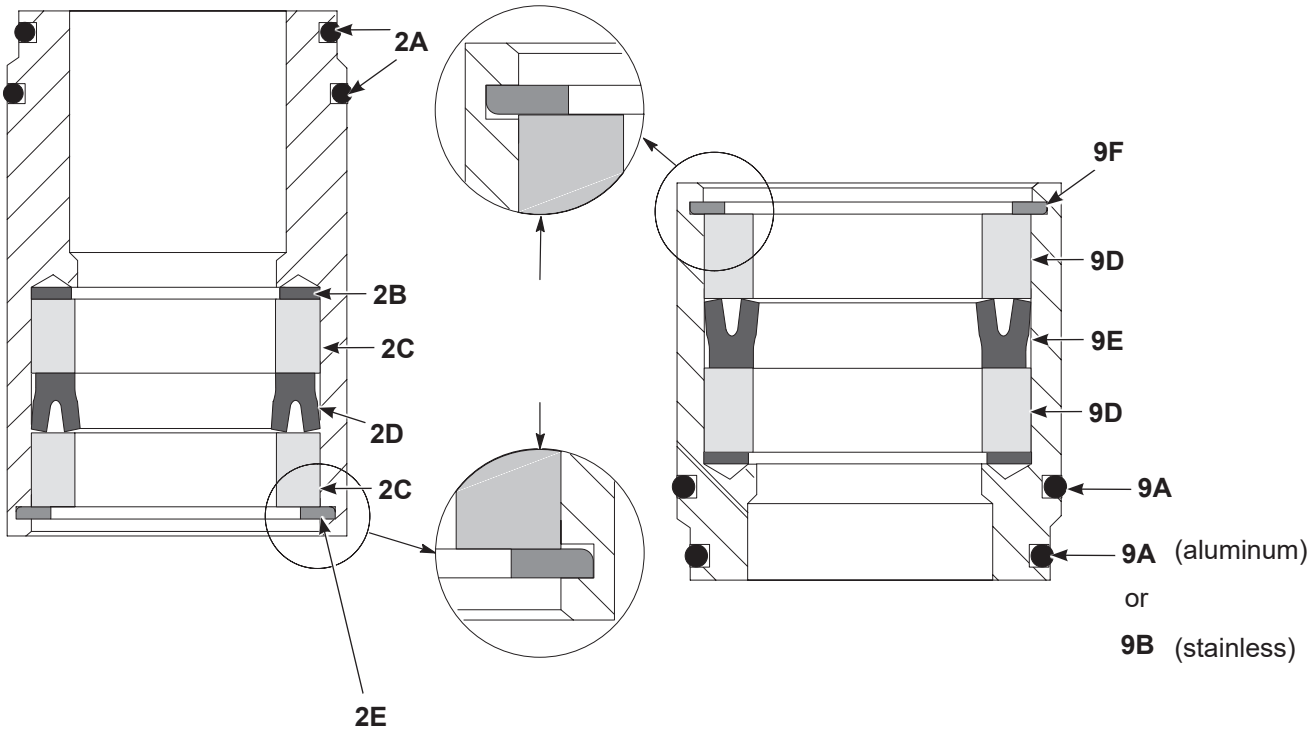


Figure 7-5 Type G Upper Packing Gland Rebuild

2A. O-rings
2B. Washer
2C. Spacers
2D. U-cup
2E. Retaining ring
9A. O-ring(s)
9B. O-ring
9C. Washer
9D. Spacers
9E. U-cup
9F. Retaining ring

Assembly

NOTE: Lubricate the packing gland external O-rings with O-ring lubricant before installing the glands. Tighten all threaded parts securely.

See Figure 7-4 on page 7-5.

1. Install the pressure ball (6) on the pressure seat (7), then install the cage (5) on the seat.
2. Apply threadlocking adhesive to the pressure seat threads, then thread the seat into the plunger (4) and tighten it securely.

See Figure 7-6 on page 7-8

3. Install the siphon ball (12) on the siphon seat (13), then install the cage (11) on the seat. Thread the seat into the siphon housing (10) and tighten it securely.
4. Install the lower packing gland (9) into the siphon housing.
5. Install the high pressure sleeve (8) over the lower packing gland. Install the hex head screws (16) and lockwashers (14) through the siphon housing and sleeve flanges and tighten them securely.
6. Lubricate the plunger (3) with O-ring lubricant.
7. Insert the plunger into the high pressure sleeve and into the lower packing gland. Use a rubber mallet to drive the plunger through the packing gland.
8. Install the upper packing gland (2) on the plunger. Use a rubber mallet to drive the packing gland down the plunger and into the high pressure sleeve.
9. Install the solvent chamber (1) over the upper packing gland, oriented so that the filler cup port in the solvent chamber is 90 degrees to the right of the high pressure outlet port in the high pressure sleeve.
10. Install the hex head screws (15) and lockwashers (14) through the high pressure sleeve flange and into the solvent chamber and tighten them securely.

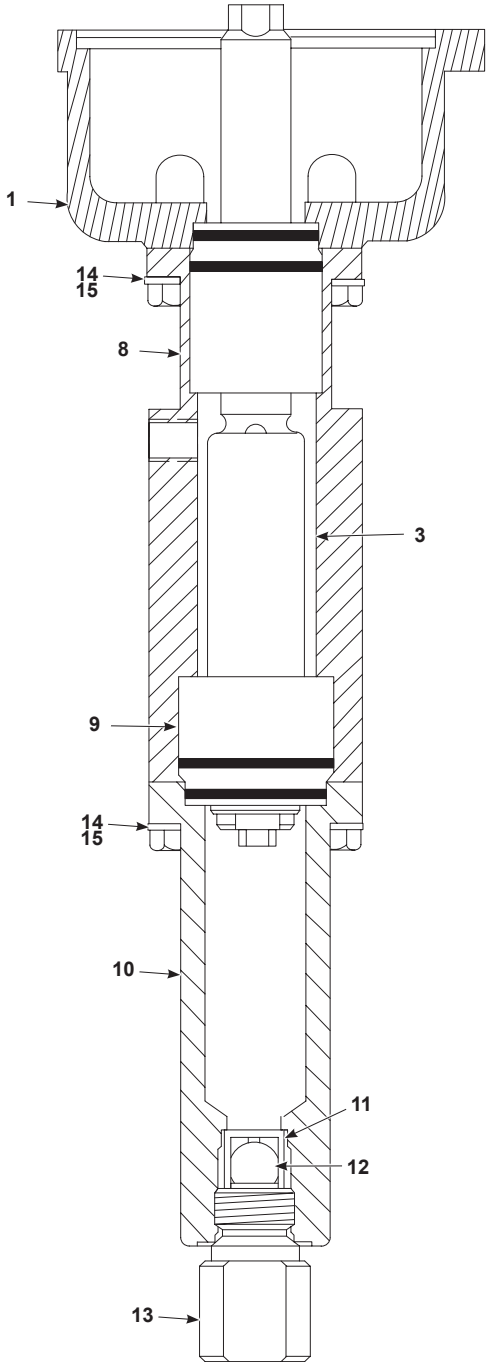


Figure 7-6 Hydraulic Section Assembly Cutaway View

1. Solvent chamber
2. Upper packing gland
3. Plunger assembly
8. High pressure sleeve
9. Lower packing gland
10. Siphon housing
11. Cage
12. Ball
13. Siphon check seat
14. Lock washer (8)
15. Screws (4, 1-in. long)
16. (4, 1.25-in. long)

Connecting the Air Motor and Hydraulic Section

See Figure 7-1 on page 7-2.

1. Screw the connecting rod (C) into the plunger (3) and tighten securely.
2. Push the air motor and hydraulic section together. Install the four lock washers (B) and screws (A) and tighten them securely.

Returning the Pump to Service

1. Apply PTFE paste to the air inlet nipple threads and muffler adapter threads. Install the cover, muffler adapters, mufflers, and air inlet nipple.
2. Connect the air supply hose to the air motor.
3. Install the pump on the mounting bracket.
4. Apply pipe thread adhesive/sealant to the siphon and high-pressure fitting threads and to the solvent filler cup threads. Install the fittings and filler cup on the pump.
5. Install the circulation kit, if used, and connect the siphon and high-pressure fluid hoses. Apply pipe thread adhesive/sealant to all fitting threads. Refer to Installation, for connections and circulation valve installation.
6. Fill the solvent chamber with the appropriate solvent chamber fluid. Refer to Solvent Chamber Fill in Operation and Maintenance.
7. Flush the pump with a compatible cleaning solution.
8. Refer to Routine Startup in Operation and Maintenance to resume coating operations.

Section 8

25B Air Motor and Air Valve Parts

Parts

To order parts, call the Nordson Industrial Coating Solutions Customer Support Center at (800) 433-9319 or contact your local Nordson representative.

Using the Illustrated Parts List

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

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

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

- If you order the assembly, items 1 and 2 will be included.
- If you order item 1, item 2 will be included.
- If you order item 2, you will receive item 2 only.

The number in the Quantity column is the quantity required per unit, assembly, or subassembly. The code AR (As Required) is used if the part number is a bulk item ordered in quantities or if the quantity per assembly depends on the product version or model.

Letters in the Note column refer to notes at the end of each parts list. Notes contain important information about usage and ordering. Special attention should be given to notes.

Item	Part	Part	Part	Description	Quantity	Note
—	- - - - - -	—	—		—	
1	- - - - - -					
2						

Continued...

NOTE: A.

B.

NS: Not Shown

AR: As Required

Air Motor Parts

See Figure 8-1.

Item	Part	Description	Quantity	Note
—	245546	MOTOR, air, 25B	1	
1	981182	• SCREW, socket head, #12−28 x 1.75 in., steel	1	
2	983131	• WASHER, lock, split, #12, steel, zinc	1	
3	323068	• SPOOL	1	
4	941101	• O-RING, Buna-N, 0.375 x 0.563 x 0.094 in.	2	
5	323067	• ROD, spool	1	
6	323073	• GUIDE, spool carrier	1	
7	952450	• U-CUP	1	B
8	984140	• NUT, hex, regular, 5/16−18, steel, zinc	4	
9	983150	• WASHER, lock, split, 5/16 in., steel, nickel	4	
10	245502	• HEAD, air motor	1	
11	973402	• PLUG, pipe, socket, flush, 1/8 in. NPTF, zinc	1	
12	940130	• O-RING, hotpaint, 0.438 x 0.563 x 0.063 in.	2	B
13	323051	• TUBE, connecting	1	
14	323064	• NUT, special, #12−28	1	
15	244578	• NUT, jam, piston, upper	1	
16	323052	• ROD, tie	4	
17	323066	• SCREW, telescoping	1	
18	1625751	• PISTON, air, 3.25 OD, SS	1	
19	323814	• NUT, jam, piston, lower	1	
20	323061	• O-RING, Buna-N, square, 3.25 x 0.068 in.	2	B
21	323060	• CYLINDER, air	1	
22	323063	• ROD, connecting	1	
23	945006	• O-RING, hotpaint, 0.30 x 0.40 x 0.05 in.	1	B
24	323053	• GLAND, air motor	1	
25	940241	• O-RING, Viton, 1.125 x 1.25 x 0.063 in.	1	B
26	323050	• BASE, upper	1	
27	981426	• SCREW, hex, 3/8−16, x 1.50 in., cap, zinc	4	
28	983160	• WASHER, lock, split, 3/8 in., steel, zinc	4	
NS	323001	• VALVE, air, 4-way	1	A

NOTE: A. Refer to *Air Valve Parts* list for additional information..

B. Noted parts are included in Service Kit, Seal, Air Motor, part 106274.

NS: Not Shown

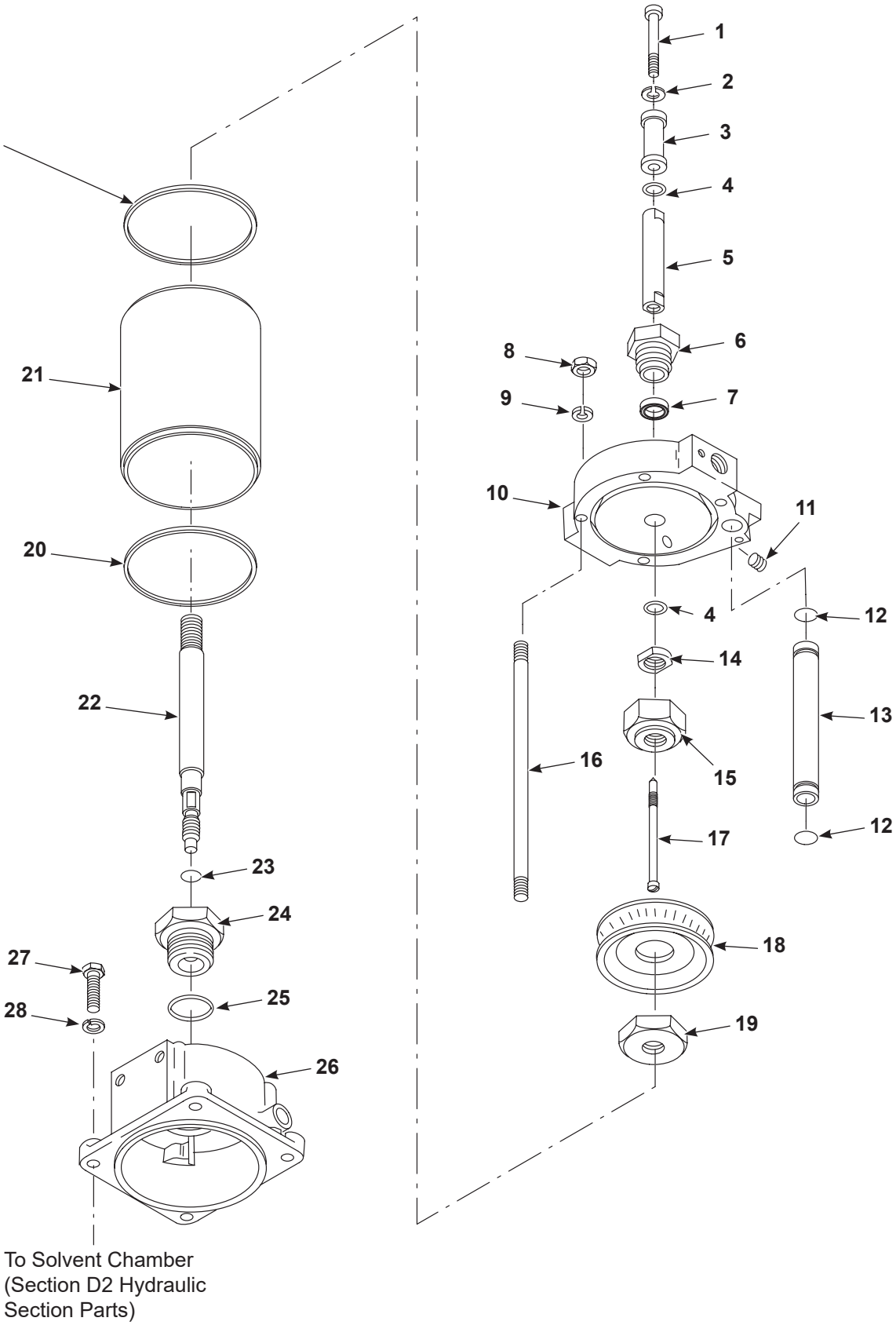


Figure 8-1 Air Valve Parts

Air Valve Parts

See Figure 8-2.

Item	Part	Description	Quantity	Note
—	323001	VALVE, air, 4-way	1	A
29	323020	• SNAPPER	1	
30	323023	• SPRING, compression, 1.625 x 0.453 OD x 0.071 in.	1	
31	323021	• FORK	1	
32	323022	• STEM, ball	1	
33	323017	• SPACER	1	
34	983140	• WASHER, lock, split, 1/4 in., steel, nickel	1	
35	984130	• NUT, hex, heavy, 1/4−20, steel, zinc	1	
36	981107	• SCREW, fillister head, #10−32 x 3.00 in., steel, zinc	4	
37	983120	• WASHER, lock, split, #10, steel, nickel	8	
38	323016	• BRACKET, valve	1	
39	246468	• ARM	1	C
40	323013	• GASKET, valve, air	1	B
41	127352	• BODY, center, valve, 4-way	1	D
42	940154	• O-RING, Buna-N, 0.563 x 0.688 x 0.063 in.	2	B
43	941080	• O-RING, Buna-N, 0.250 x 0.438 x 0.094 in.	1	B, C
44	323012	• BUSHING, end	1	
45	981109	• SCREW, socket head, #10−32 x 0.50 in., zinc, Nylok	3	
46	246467	• SHAFT, crank	1	C
47	940115	• O-RING, Buna-N, 0.312 x 0.438 x 0.063 in.	1	B, D
48	940164	• O-RING, Buna-N, 0.625 x 0.75 x 0.063 in.	2	B
49	323008	• GUIDE, poppet	1	
50	323024	• POPPET	2	
51	245789	• GASKET, poppet spacer	2	B, D
52	323030	• WASHER, plate, end	2	B
53	323029	• PLATE, end	2	
54	981108	• SCREW, fillister head, #10−32 x 3.375 in., steel, zinc	4	
55	981203	• SCREW, hex head, 1/4−20 x 1.25 in., cap, zinc	1	
56	983040	• WASHER, flat, 0.266 x 0.625 x 0.049 in., zinc	1	

NOTE: A. Component of 25B air motor, part 245546.

B. Noted parts are included in Service Kit, Seal, Air Valve, part 106103. Refer to 25B Air Valve and Air Motor Repair for kit parts list.

C. Noted parts are included in Service Kit, Crankshaft and Arm, part 106314. Refer to 25B Air Valve and Air Motor Repair for kit parts list.

D. Parts shown are for the new version of the air valve. The old version used a different valve body, three O-rings, part 940115, and two poppet spacers part 323006. Replacement poppet spacers can be ordered. If the valve body must be replaced, order the valve conversion kit, part 323014.

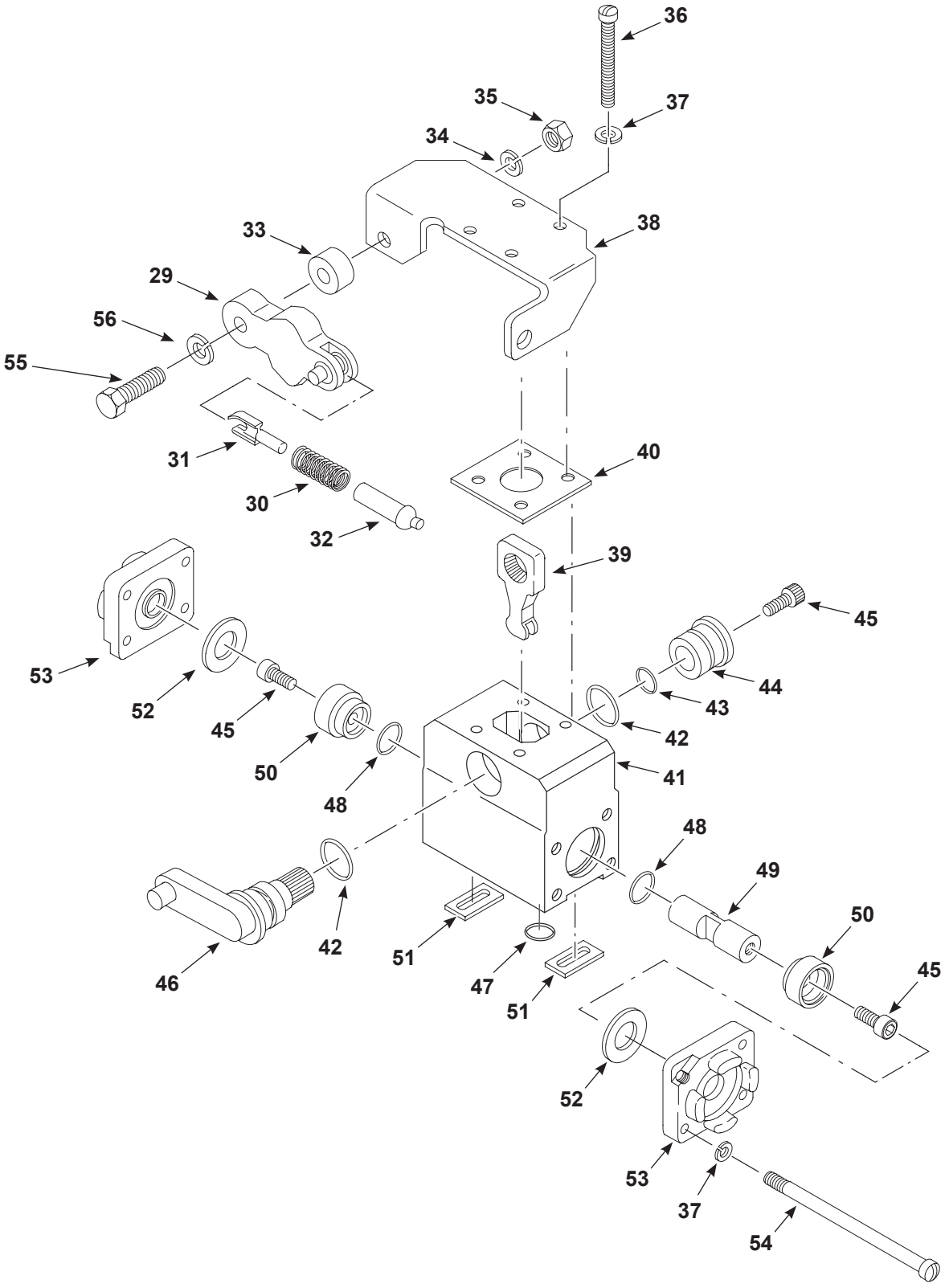


Figure 8-2 Air Valve Parts

Mufflers and Covers

See Figure 8-3. These parts are installed on the air motor.

Item	Part	Description	Quantity	Note
57	245491	COVER, air motor, MDL 25B	1	
58	245493	PANEL, back, MDL 25B	1	
59	902509	MUFFLER	2	A
60	323097	ADAPTER, muffler, right	1	A
61	323098	ADAPTER, muffler, left	1	A
62	981271	SCREW, hex sem, ext, 1/4−28 x 0.625 in.	2	
63	981166	SCREW, trs sems, ext, #10−24 x 0.375 in., zinc	2	
NOTE: A. Noted parts are included in Muffler kit, part 323099.				

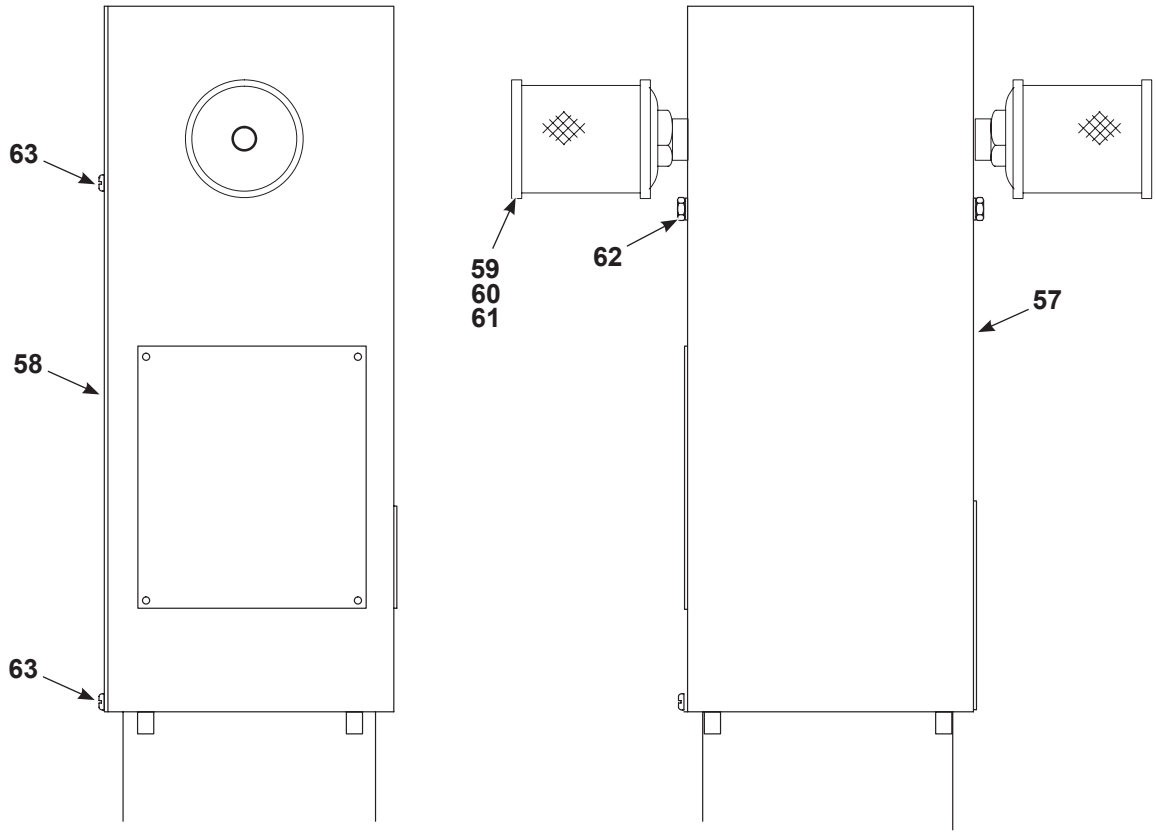


Figure 8-3 Mufflers and Covers

Air Motor and Air Valve Service Kits

Mufflers Kit

Refer to Figure 8-3 for muffler kit parts.

Item	Part	Description	Quantity	Note
—	323099	MUFFLER assembly	1	
59	902509	• MUFFLER	2	
60	323097	• ADAPTER, muffler, right	1	
61	323098	• ADAPTER, muffler, left	1	

Air Motor Seal Kit

Refer to Figure 8-1 for air motor parts.

Item	Part	Description	Quantity	Note
—	106274	SERVICE KIT, seal, air motor, 25B	1	
7	952450	• U-CUP	1	
12	940130	• O-RING, hotpaint, 0.438 x 0.563 x 0.063 in.	2	
20	323061	• O-RING, Buna-N, square, 3.25 x 0.068 in.	2	
23	945006	• O-RING, hotpaint, 0.30 x 0.40 x 0.05 in.	1	
25	940241	• O-RING, Viton, 1.125 x 1.25 x 0.063 in.	1	

Air Valve Seal Kit

Refer to Figure 8-2 for air valve parts.

Item	Part	Description	Quantity	Note
—	106103	SERVICE KIT, seal, air valve	1	
40	323013	• GASKET, valve, air	1	
42	940154	• O-RING, Buna-N, 0.563 x 0.688 x 0.063 in.	2	
43	941080	• O-RING, Buna-N, 0.250 x 0.438 x 0.094 in.	1	
47	940115	• O-RING, Buna-N, 0.312 x 0.438 x 0.063 in.	3	
48	940164	• O-RING, Buna-N, 0.625 x 0.75 x 0.063 in.	2	
51	245789	• GASKET, poppet spacer	2	A
52	323030	• WASHER, plate, end	2	
NS	940170	• O-RING, hot paint, 0.688 x 0.813 x 0.063 in.		B

NOTE: A. Used with new air valve center block.

B. Not used on 25B pump; for 64B pump only

NS: Not Shown

Air Valve Crankshaft and Arm Kit

Refer to Figure 8-2 for air valve parts.

Item	Part	Description	Quantity	Note
−	106314	SERVICE KIT, crankshaft and arm	1	
39	246468	• ARM	1	
43	941080	• O-RING, Buna-N, 0.25 x 0.438 x 0.094 in.	1	
46	246467	• SHAFT, crank	1	

Options

Air Motor Accessory Group

See Figure 8-4.

Item	Part	Description	Quantity	Note
−	1024722	ACCESSORY GROUP, air motor, 3/8 inch	1	
1	1024723	• FILTER, regulator, lubricator, 3/8 in. NPT, assembly	1	
2	901236	• GAUGE, air, 0−100 psi, 0−7 kg/cm2	1	
3	800000	• HOSE, rubber, bulk, 3/8 in. ID (3 ft)	AR	A
4	971766	• CONNECTOR, female, 3/8 in. hose x 3/8 in. NPSM, brass	2	
5	972550	• CONNECTOR, hose	2	
6	981208	• SCREW, hex head, 1/4−20 x 0.625 in. cap, zinc	2	
7	983140	• WASHER, lock, split, 1/4 in. steel, nickel	2	
8	984130	• NUT, hex, heavy, 1/4−20, steel, zinc	2	
9	973118	• NIPPLE, extra heavy, 3/8 in. NPT x 4.50 in. long, steel	1	
9	973067	• NIPPLE, extra heavy, 3/8 in. NPT x 2.00 in. long, steel	1	
NS	900215	• OIL, Vitalizer, 1 quart	1	

NOTE: A. Order in one-foot increments.

AR: As Required

NS: Not Shown

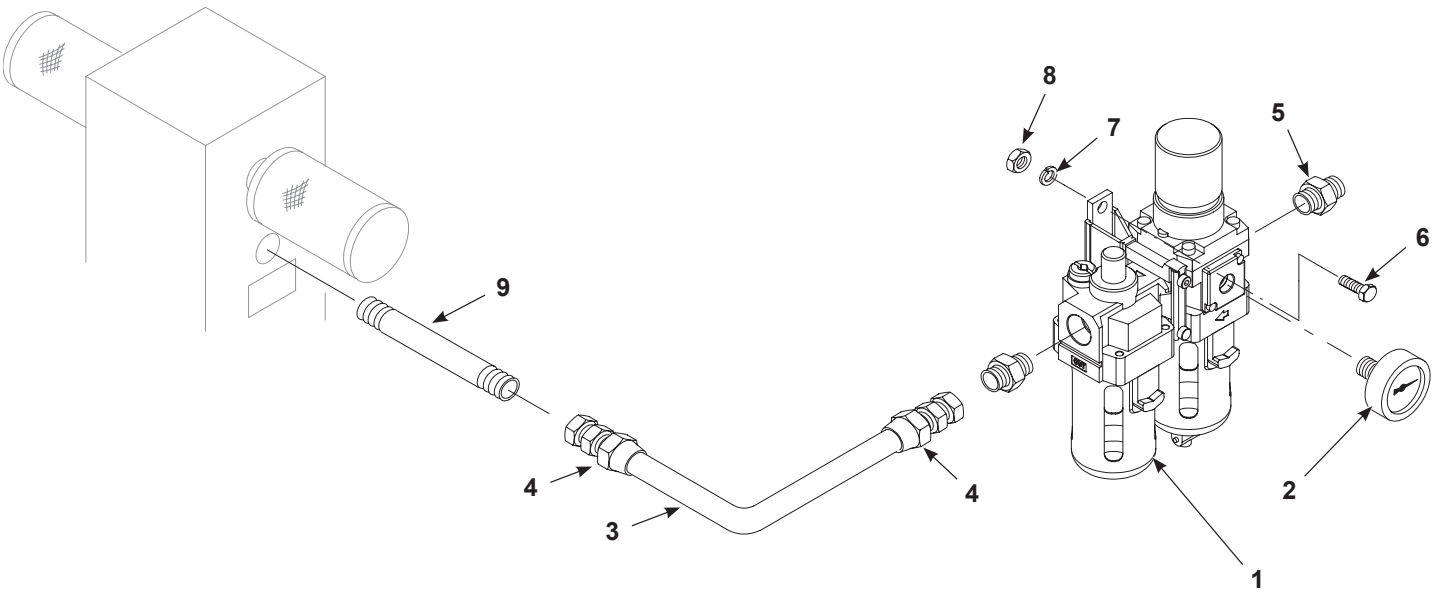


Figure 8-4 Air Motor Accessory Group

Adhesives, Sealents, and Lubricants

Use these adhesives, sealants, and lubricants when servicing your air motor. Refer to 25B Air Valve and Air Motor Repair for application instructions.

Part	Description	Quantity
1612251	LUBRICANT, O-ring, Parker (Parker O-Lube), 2 oz	1
900252	LUBRICANT, molybdenum disulfide, CP-28 (tube)	1
900236	SEALANT, paste, PTFE, 1 pint	1
900214	OIL, Vitalizer, 1 pint (air lubricator)	1
900215	OIL, Vitalizer, 1 quart	1
900216	OIL, Vitalizer, 1 gallon	1
900217	OIL, Vitalizer, 5 gallons	1

Section 9

25B 16:1 Stainless Steel Hydraulic Section Parts

Parts

To order parts, call the Nordson Industrial Coating Solutions Customer Support Center at (800) 433-9319 or contact your local Nordson representative.

Using the Illustrated Parts List

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

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

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

- If you order the assembly, items 1 and 2 will be included.
- If you order item 1, item 2 will be included.
- If you order item 2, you will receive item 2 only.

The number in the Quantity column is the quantity required per unit, assembly, or subassembly. The code AR (As Required) is used if the part number is a bulk item ordered in quantities or if the quantity per assembly depends on the product version or model.

Letters in the Note column refer to notes at the end of each parts list. Notes contain important information about usage and ordering. Special attention should be given to notes.

Item	Part	Part	Part	Description	Quantity	Note
—	- - - - - -	—	—		—	
1	- - - - - -					
2						

Continued...

NOTE: A.

B.

NS: Not Shown

AR: As Required

Hydraulic Section Parts

General Finishing pump, with Type U Packings

See Figure 9-1.

Item	Part	Description	Quantity	Note
−	247239	PUMP, hydraulic, 25B, 16:1,stainless steel, Type U	1	
1	245504	• CHAMBER, solvent	1	
2	335382	• SERVICE KIT, Type U, 25B, 16:1, stainless steel	1	A
2A	940274	• • O-RING, Viton, black, 1.313 x 1.438 x 0.063 in.	2	A
3	503395	• PLUNGER, hydraulic, assembly, 25B, 16:1	1	
4	503396	• • PLUNGER, hydraulic, 25B, 16:1	1	
5	503134	• • CAGE, ball, pressure	1	
6	900017	• • BALL, ceramic, 0.375, 25	1	B
7	503382	• • SEAT, ball, pressure	1	B
8	247240	• SLEEVE, high pressure	1	
9	335382	• SERVICE KIT, Type U, 25B, 16:1, stainless steel	1	A
9A	940304	• • O-RING, Viton, black, 1.625 x 1.75 x 0.063 in.	1	A
9B	940294	• • O-RING, Viton, black, 1.50 x 1.625 in.		A
10	247241	• HOUSING, siphon	1	
11	503123	• CAGE, ball, siphon	1	
12	900018	• BALL, ceramic, 0.500, 25	1	C
13	244824	• SEAT, ball, siphon, 316 stainless steel	1	C
14	983160	• WASHER, lock, split, 3/8 in., steel, nickel	8	
15	981402	• SCREW, hex head, 3/8−16 x 1.00 in., cap, zinc	4	
16	981408	• SCREW, hex head, 3/8-16 x 1.25 in., cap, zinc	4	

NOTE: A. Service kit consists of upper and lower packing glands, O-rings, and connecting rod O-ring. Refer to page 9-6 for other packing types.

B. Noted parts included in Ball and Seat Kit, part 503385.

C. Noted parts included in Ball and Seat Kit, part 244823.

NS: Not Shown

AR: As Required

General Finishing Pump, with Type F Packings

See Figure 9-1.

Item	Part	Description	Quantity	Note
−	1077607	PUMP, hydraulic, 25B, 16:1,stainless steel, Type F	1	
1	245504	• CHAMBER, solvent	1	
2	1602416	• SERVICE KIT, Type F, 25B, 16:1, stainless steel	1	A
2A	940274	• • O-RING, Viton, black, 1.313 x 1.438 x 0.063 in.	2	
3	503395	• PLUNGER, hydraulic, assembly, 25B, 16:1	1	
4	503396	• • PLUNGER, hydraulic, 25B, 16:1	1	
5	503134	• • CAGE, ball, pressure	1	
6	900017	• • BALL, ceramic, 0.375, 25	1	B
7	503382	• • SEAT, ball, pressure	1	B
8	247240	• SLEEVE, high pressure	1	
9	1602416	• SERVICE KIT, Type F, 25B, 16:1, stainless steel	1	A
9A	940304	• • O-RING, Viton, black, 1.625 x 1.75 x 0.063 in.	1	A
9B	940294	• • O-RING, Viton, black, 1.50 x 1.625 in.		A
10	247241	• HOUSING, siphon	1	
11	503123	• CAGE, ball, siphon	1	
12	900018	• BALL, ceramic, 0.500, 25	1	C
13	244824	• SEAT, ball, siphon, 316 stainless steel	1	C
14	983160	• WASHER, lock, split, 3/8 in., steel, nickel	8	
15	981402	• SCREW, hex head, 3/8−16 x 1.00 in., cap, zinc	4	
16	981408	• SCREW, hex head, 3/8-16 x 1.25 in., cap, zinc	4	

NOTE: A. Service kit consists of upper and lower packing glands, O-rings, and connecting rod O-ring. Refer to page 9-6 for other packing types

B. Noted parts included in Ball and Seat Kit, part 503385.

C. Noted parts included in Ball and Seat Kit, part 244823.

NS: Not Shown

AR: As Required

CleanSpray Pump, with Type G Packings

See Figure 9-1.

Item	Part	Description	Quantity	Note
−	149568	PUMP, hydraulic, 25B, 16:1,stainless steel, G packings	1	
1	245504	• CHAMBER, solvent	1	
2	248050	• GLAND, packing, 25B, 16:1, upper, poly	1	A
2A	940274	• • O-RING, Viton, black, 1.313 x 1.438 x 0.063 in.	2	A
4	503396	• PLUNGER, hydraulic, 25B, 16:1	1	
5	503134	• CAGE, ball, pressure	1	
6	900047	• BALL, 302/316 stainless steel, 0.375, 100	2	B
7	- - - - - -	• SEAT, ball, pressure	1	B
8	247240	• SLEEVE, high pressure	1	
9	248051	• GLAND, packing, 25B, 16:1, lower, poly	1	A
9A	940304	• O-RING, Viton, black, 1.625 x 1.75 x 0.063 in.	1	A
9B	940294	• • O-RING, Viton, black, 1.50 x 1.625 in.		
10	247241	• • HOUSING, siphon	1	
11	503123	• CAGE, ball, siphon	1	
12	900018	• BALL, ceramic, 0.500, 25	1	C
13	244824	• SEAT, ball, siphon, 316 stainless steel	1	C
14	983160	• WASHER, lock, split, 3/8 in., steel, nickel	8	
15	981402	• SCREW, hex head, 3/8−16 x 1.00 in., cap, zinc	4	
16	981408	• SCREW, hex head, 3/8-16 x 1.25 in., cap, zinc	4	
16	981408	• SCREW, hex head, 3/8-16 x 1.25 in., cap, zinc	4	

NOTE: A. Noted parts included in Type G Service Kit, part 106392. Refer to page 9-6 for other packing types

B. Noted parts included in Service kit, seat, ball, part 1047077

C. Noted parts included in Ball and Seat Kit, part 244823.

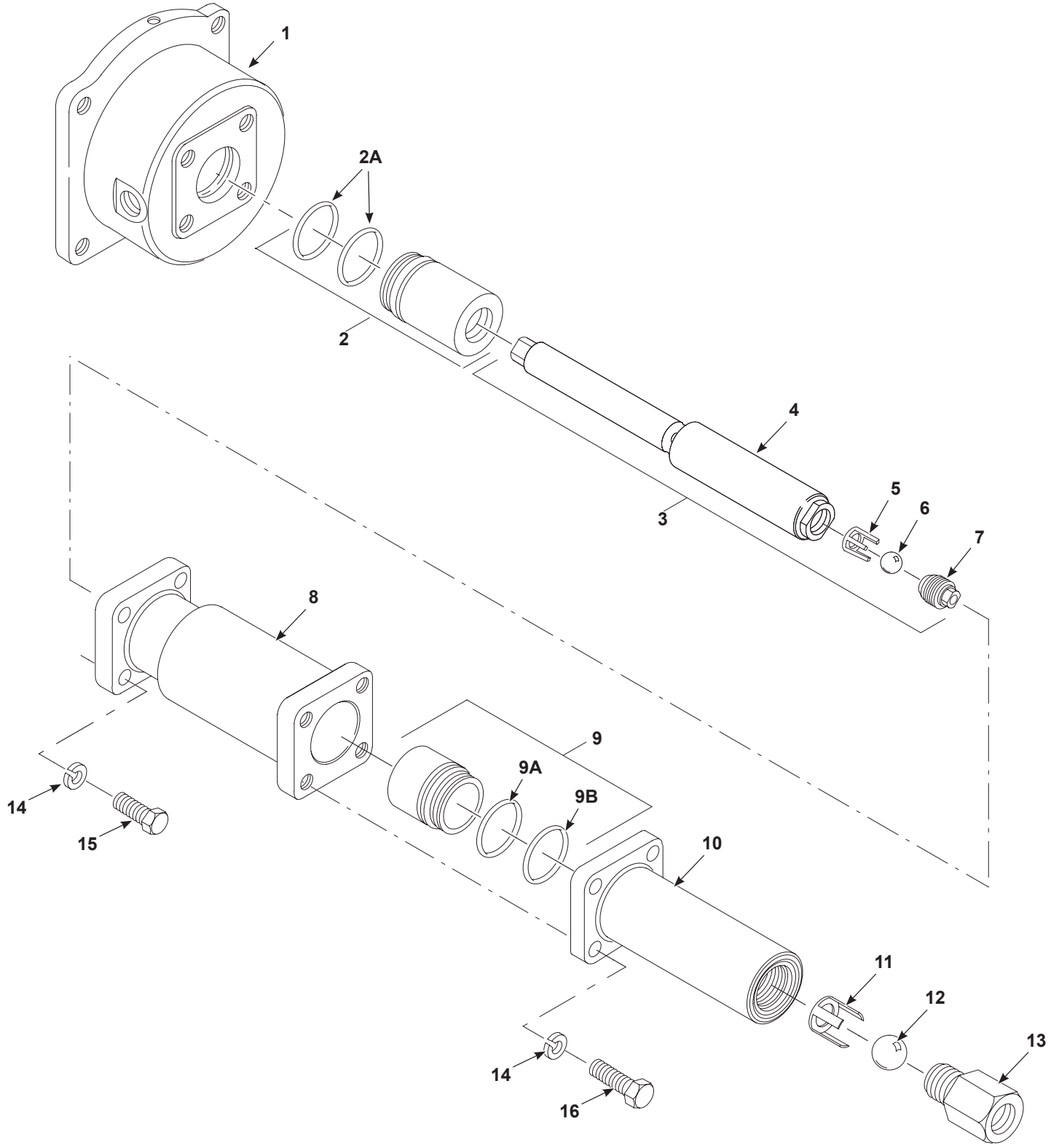


Figure 1-1 16:1 Stainless Steel Hydraulic Section Parts

Replacement Packing Glands

Packing Glands for 16:1 Stainless Steel 25B Pumps					
Packing Glands	**Type A**	**Type D**	**Type F**	**Type G**	**Type U (std)**
UPPER	—	—	—	248050 (A)	—
LOWER	—	—	—	248051 (A)	—
SERVICE KIT	1602414 (B)	1602415 (B)	1602416 (B)	106392 (C)	335382 (B)

NOTE: A. Complete packing glands with housings and external O-ring.

B. Service kits include upper and lower packing glands, O-rings, and connecting rod O-ring.

C. Type G packing gland kit includes parts to rebuild the upper and lower packing glands. It does not include the metal gland housings or internal retaining rings. Re-use your existing housing and retaining ring. Refer to Type G Packing Gland Service Kit for the kit parts list.

Replacement Packing Glands

Type	Material	Applications
A	Cotton duck saturated with buna-nitrile and coated with graphite	Good for less abrasive applications where strong solvents are not used. Contains graphite coating to reduce friction.
B	Cotton duck and synthetic fabric saturated with buna-nitrile and PTFE	Good for less abrasive applications where strong solvents are not used. Contains PTFE to reduce friction.
F	PTFE V-rings stacked with leather V-rings	Most commonly used packing in the finishing industry. Use for strong solvents and abrasive materials.
G	Polyurethane U-cups	Frequently used with waterborne materials. Not compatible with some solvents. Do not use with aromatic hydrocarbon solvents or Type K solvent chamber fluid.
U	Ultra-high molecular weight polyethylene (UHMWPE)	Good for highly abrasive materials. Compatible with waterbornes and most solventbornes. Slight swelling may occur when exposed to aromatic hydrocarbon solvents.

Hydraulic Section Service Kits

Pressure Ball and Seat Kit (General Finishing Pump)

Refer to Figure 9-1 for parts locations.

Item	Part	Description	Quality	Note
–	503385	SEAT, BALL	1	
6	900017	• BALL, ceramic, 0.375 in., 25	1	
7	503382	• SEAT, ball, pressure	1	

Pressure Ball and Seat Kit (CleanSpray Pump)

Refer to Figure 9-1 for parts locations.

Item	Part	Description	Quality	Note
–	1047077	SERVICE KIT, seat, ball	1	
6	900047	• BALL, 302/316 stainless steel, 0.375, 100	1	
7	- - - - - -	• SEAT, ball, pressure	1	

Siphon Ball and Seat Kit

Refer to Figure 9-1 for parts locations.

Item	Part	Description	Quality	Note
–	244823	SEAT, BALL	1	
12	900018	• BALL, ceramic, 0.50 in., 25	1	
13	244824	• SEAT, ball, siphon, 316 stainless steel	1	

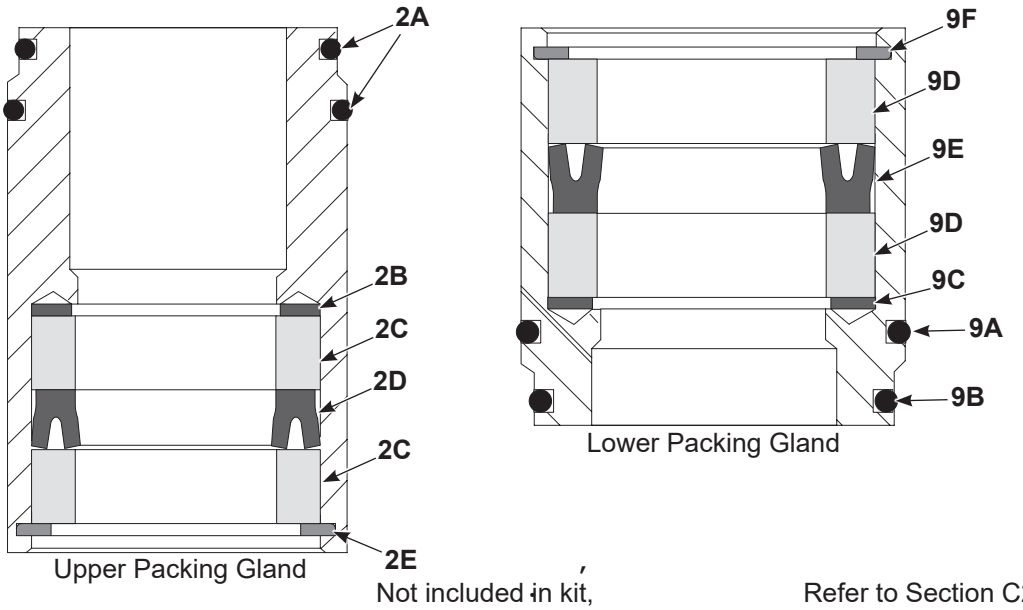
Type G Packing Gland Service Kit

Use this kit to rebuild Type G packings or convert other packing types to Type G.

See Figure 9-2.

Item	Part	Description	Quality	Note
–	106392	SERVICE KIT, Type G, 25B, 16:1, stainless steel	1	A
2A	940274	• O-RING, Viton, black, 1.313 x 1.438 in.	2	
2B	983212	• WASHER, 0.882 x 1.275 x 0.035 in.	1	
2C	- - - - - -	• SPACER, U-cup	2	
2D	952171	• U-CUP, polyurethane, 0.812 x 1.312 in.	1	
9A	940304	• O-RING, Viton, black, 1.625 x 1.75 in.	1	
9B	940294	• O-RING, Viton, black, 1.50 x 1.625 in.	1	
9C	983213	• WASHER, 1.195 x 1.585 x 0.035 in.	1	
9D	- - - - - -	• SPACER, U-cup	2	
9E	952221	• U-CUP, polyurethane, 1.125 x 1.625 in.	1	

NOTE: A. This kit does not include the packing gland housings or internal retaining rings. Housings are not sold separately; if you cannot reuse your existing housings, order a new Type G upper packing gland from the “Replacement Packing Glands” on page 9-6. If you need new retaining rings, order 986707 for the upper gland (2E); 986802 for the lower gland (9F).



Not included in kit, order 986707.

Refer to Section C2, Hydraulic Section Repair, for rebuild instructions.

Figure 1-2 Type G Packing Gland Service Kit

Options

Wall Mounting Kit

See Figure 9-3.

Item	Part	Description	Quality	Note
–	245554	KIT, wall mount/siphon accessory, 25B, 16:1, 27:1, stainless steel		
1	972599	• CONNECTOR, elbow, male, 3/4 x 7/8 in.	1	
2	827060	• HOSE, siphon, 1/2 in. ID, stainless steel, 5 ft	1	
3	972102	• CONNECTOR, male, 37, 7/8−14 x 1/2 in. NPT, stainless steel	1	
4	750256	• ROD, siphon, 55 gal	1	
5	247234	• STRAINER, siphon, stainless steel, 0.062 in. diameter	1	
NS	UA	• SCREW, thumb, 1/4−20 x 1.00 in., stainless steel	1	
6	UA	• NUT, hex, machine, 3/8−16, steel, zinc	4	
7	700037	• FILLER, solvent	1	
NS	UA	• • PLUG, pipe, square, 1/4 in. NPT, Delrin	1	
–	245543	• BRACKET, wall mounting, MDL 25B	1	
8	245495	• • BRACKET, mounting, MDL 25B	1	
9	UA	• • TAG, ground	1	
10	UA	• • WASHER, flat, 0.203 x 0.406 x 0.040 in.	1	
11	UA	• • WASHER, lock, split, #10, steel, nickel	1	
12	UA	• • NUT, hex, machine, #10−32, brass	1	

NS: Not Shown

UA: Unavailable for purchase through Nordson. Contact local distributor or local source.

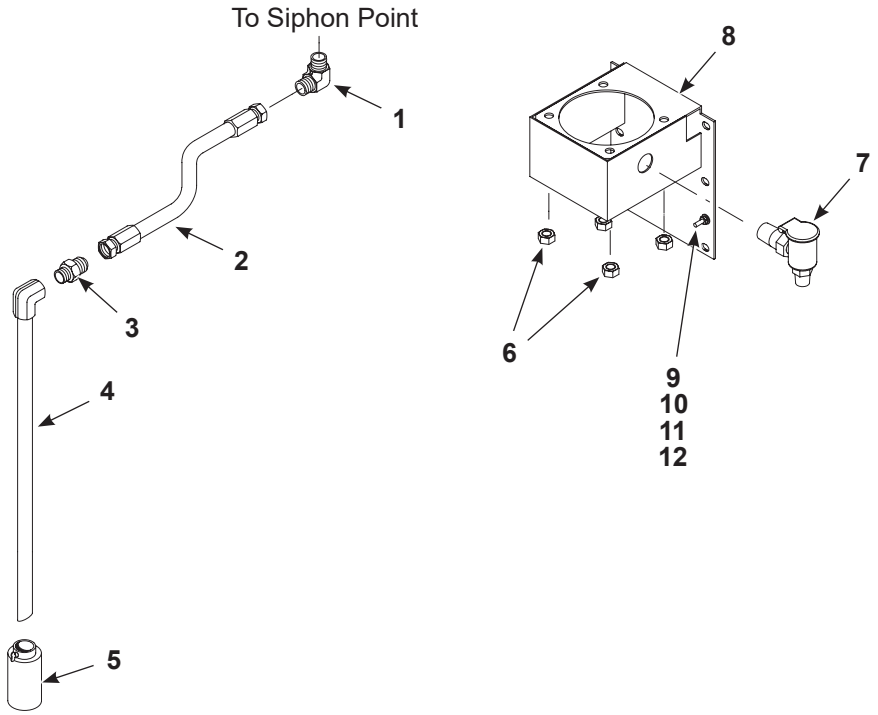


Figure 1-3 Wall Mount/Siphon Accessory Kit

Adhesives, Sealants, and Lubricants

Part	Description	Quality	Note
900439	ADHESIVE, threadlocking (Loctite High Temp 271)	1	
1612251	LUBRICANT, O-ring, Parker (Parker O-Lube), 2 oz	1	
900481	ADHESIVE, pipe/thread/hydraulic sealant (Loctite High Temp SS567)	1	

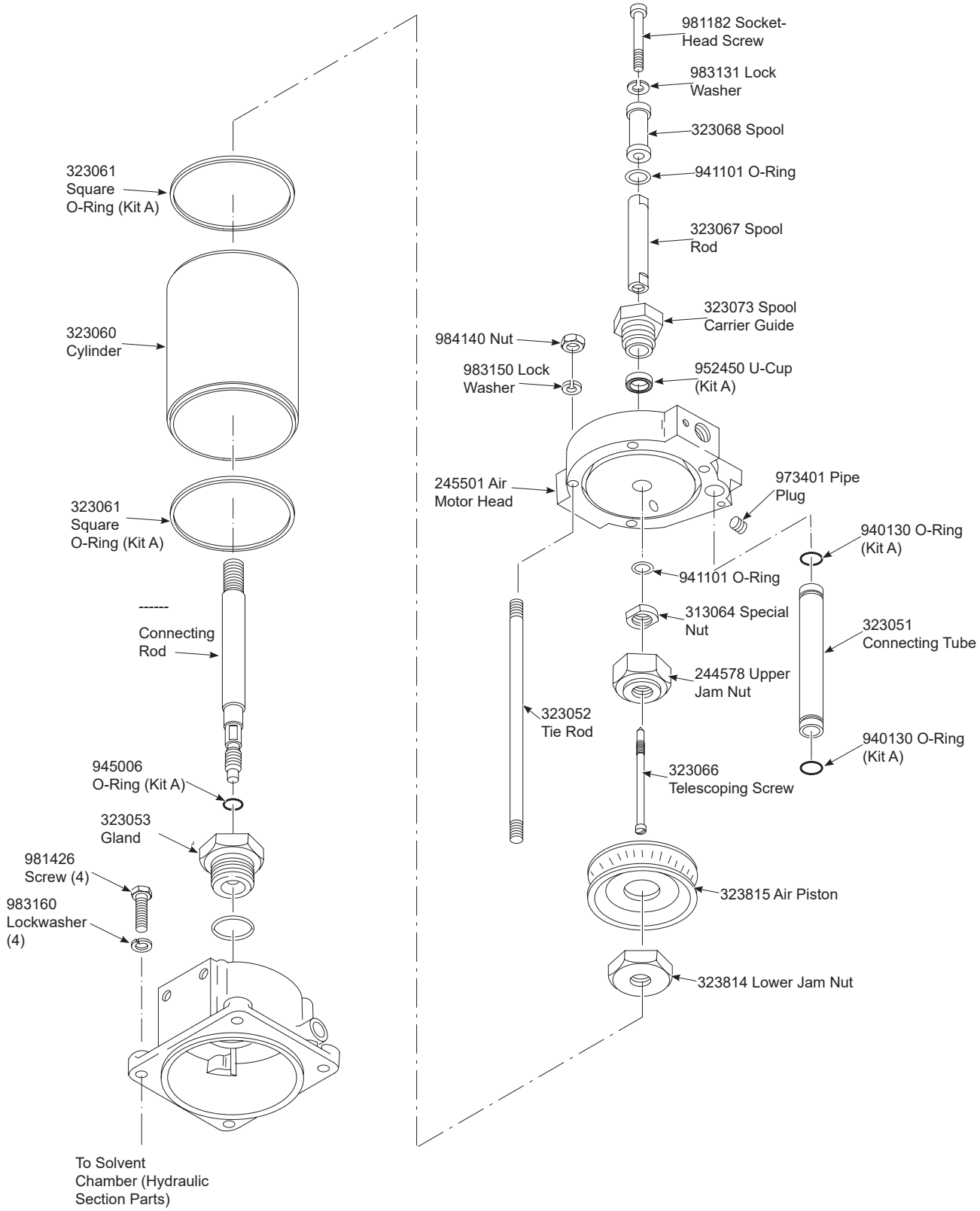
Section 10

Drawings

25B Air Motor Parts

Nordson Customer Service: (800) 433-9319

245546 Air Motor



Service Kits:

Kit A: 106274 Air Motor Seal Kit

Parts Not Shown:

902509 Muffler Adapter

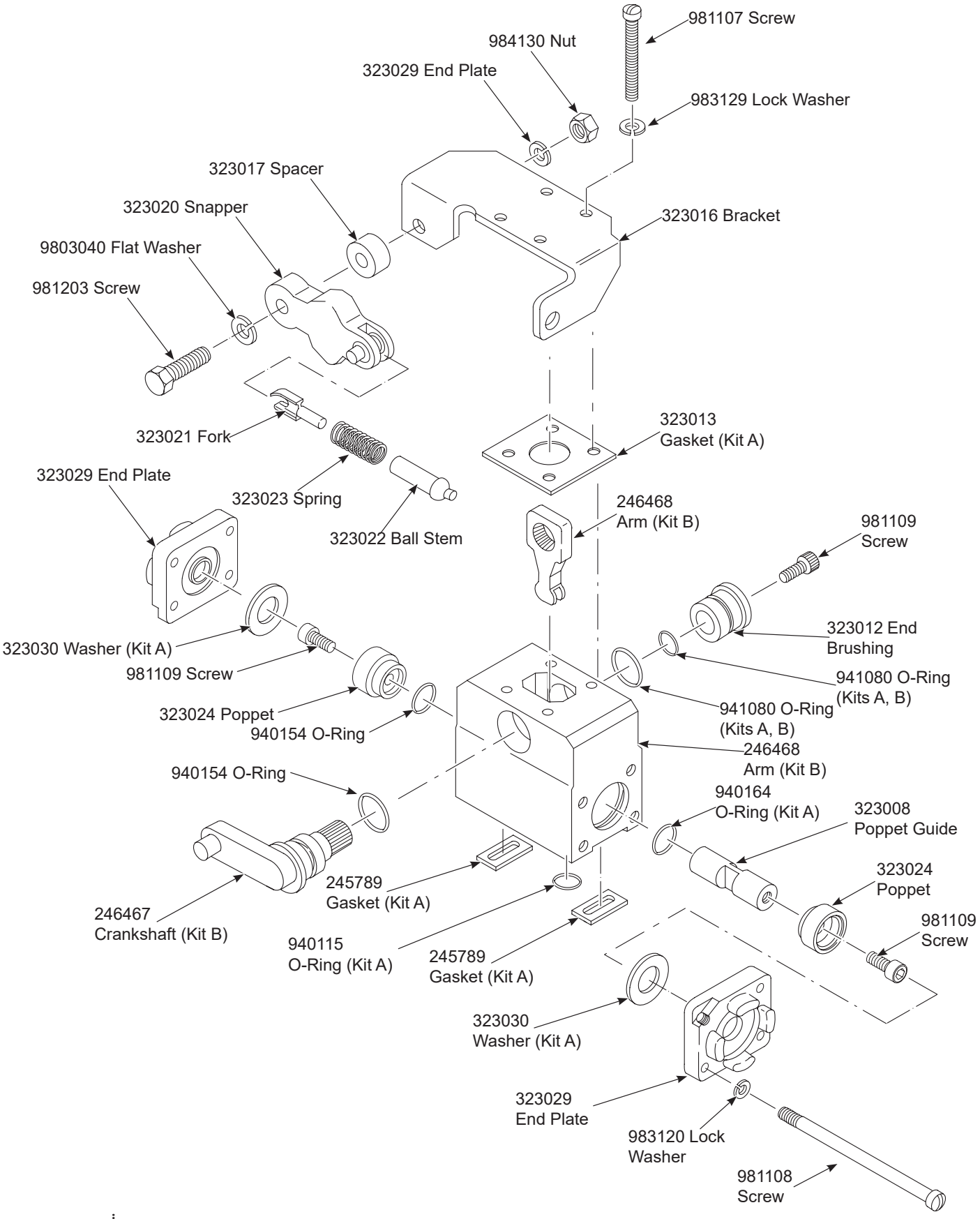
323097 Right Muffler Adapter

323098 Left Muffler Adapter

25B Pump Air Valve Parts

Nordson Customer Service: (800) 433-9319

323001 Air Valve



Pump Packing and Solvent Chamber Fluid Guide

This guide covers the following:

- Packing and Solvent Chamber Fluid Compatibility
- Packing Material and Application
- Solvent Chamber Fluid Composition and Application
- Solvent Chamber Fluid Parts List
- Type Q Concentrate Mixing Instructions

Packing and Solvent Chamber Fluid Compatibility

MATERIAL TYPE	SOLVENT FAMILY	ABRASIVE QUALITY	PACKING TYPE	SOLVENT FLUID
Waterborne	Water	Mild	D	T, Q
		Medium	G	T, Q
		High	U	T, Q
	Alcohols	Mild	D	T, Q
		Medium	G	T, Q
		High	U	T, Q
Solventborne	Ketones (e.g., acetone, MEK, MAK, etc.)	Mild	F	K, S
		Medium	F	K, S
		High	U	K, S
	Aromatic Hydrocarbons (e.g., xylene, toluene, etc.)	Mild	F	K, S
		Medium	F	K, S
		High	F, U(1)	K, S
	Alcohols	Mild	D	K, Q
		Medium	G	T, Q
		High	U	K, Q
	Aliphatic Petroleum Naphthas	Mild	D	K, S
		Medium	D	K, S
		High	G	T, Q
	Chlorinated Solvents	Mild	F	K, S
		Medium	F	K, S
		High	F	K, S

Note 1: Type U packings may swell slightly when exposed to aromatic hydrocarbon solvents.

Packing Material and Application

Packing Type	Material	Application
A	Cotton duck saturated with buna-nitrile and coated with graphite	Good for less abrasive applications where strong solvents are not used. Contains graphite coating to reduce friction.
D	Cotton duck and synthetic fabric saturated with buna-nitrile and PTFE	Good for less abrasive applications where strong solvents are not used. Contains PTFE to reduce friction.
F	PTFE V-rings stacked with leather V-rings	Most commonly used packing in the finishing industry. Use for strong solvents and abrasive materials.
G(1)	Polyurethane U-cups	Frequently used with waterborne materials. Not compatible with some solvents.(1)
U(2)	Ultra-high molecular weight polyethylene (UHMWPE)	Good for highly abrasive materials. Compatible with waterborne and most solventbornes.(2)
NOTE 1: Do not use Type G packing glands with aromatic hydrocarbon solvents or with Type K or S solvent chamber fluids. **NOTE 2:** Type U packings may swell slightly when exposed to aromatic hydrocarbon solvents.		

Solvent Chamber Fluid Composition and Application

Solvent Type	Material	Application
T	Mixed propylene glycol	Use for waterborne systems. (Thinner than Type-Q and best used on smaller pump models.)
Q	Liquid anionic flocculant mixed with distilled water.	Use for waterborne systems. (Thicker than Type-T and best used on larger pump models.)
K	Epoxidized soybean oil	Use for solventborne applications. Do not use for waterborne and catalyzed alkyd urea applications.
S	Mixed aliphatic dimethyl esters	Use for solventborne applications.
NOTE: Type K solvent is highly viscous. At room temperature, it is not appropriate for use in Model 25B or 64B pumps where the solvent must flow through a filler cup and small ID passage into the solvent chamber.		

Solvent Chamber Fluid Parts List

Part	Description
248831	FLUID, type-S, pump chamber, one quart
900255	FLUID, type-K, pump chamber, one quart
140029	FLUID, type-T, pump chamber, one quart
244854	FLUID, type-Q concentrate (2.6 fluid ounce, makes one gallon)

Type Q Concentrate Mixing Instructions

WARNING: Do not take internally. For industrial use only. Avoid direct contact. Eye and skin irritant. Refer to the MSDS shipped with the solvent chamber fluid for more information.

Mix one gallon of distilled water with 2.6 fluid ounces of Type Q concentrate as follows:

1. Fill a 1-gallon-(3.8-liter) round container $^3/_4$ full of distilled water at 70–100 °F.
2. Use a rotating agitator to mix the water until it forms a whirlpool at the container's center.
3. Slowly pour one full bottle (2.6 oz.) of Type Q concentrate into the whirlpool.
4. Add the remaining distilled water to make one gallon, and mix for an additional 15 minutes.

NOTE: The mixture may separate after prolonged shelf time. If it does, mix again before using.

Issued 10/03

Air Lubricator Adjustments and Oils

Adjustments

Air lubricators are shipped with Nordson pumps or are optional equipment. Refer to your pump manual for lubricator installation instructions.

Lubricators are not pre-adjusted at the factory. To properly adjust the lubricator, follow the instructions below:

1. Fill the lubricator bowl with Nordson Vitalizer oil.

   NOTE: Use only Nordson Vitalizer oil or an oil recommended by your Nordson representative. Disregard any oil recommendations in the OEM instruction sheet shipped with the air lubricator.

2. Start the pump and run it at the desired operating speed.
3. Adjust the lubricator to deliver oil at the rate given for your pump in the following table.

Pump Model	Strokes per drop of oil
180D	10–15
360D	10–15
25B	17–25
64B	15–20
32/64	17–25
CP	15–20
JP	5–10

Ordering Nordson Vitalizer Oil

To order parts, call the Nordson Finishing Customer Support Center at (800) 433–9319 or your local Nordson representative.

Quantity	Part Number
1 Pint (0.47 liters)	900214
1 Quart (0.95 liters)	900215
1 Gallon (3.79 liters)	900216
5 Gallons (18.93 liters)	900217

Vitalizer Oil Specifications

API Gravity:	31.7
Pour Point:	25 °F (-3.9 °C)
Flash Point 1:	430 °F (221 °C) (See Note 1)
Viscosity @ 100 °F (38 °C):	153
Viscosity @ 210 °F (99 °C):	43
Viscosity Index:	95
Neutralization No.	0.12
Toxicity (Refer to Notes 2 and 3)	

Specification Notes

1. As oil is heated various fractions will boil off in succession, starting at 430 °F (221 °C).
2. The toxicity of this oil is not classified as a hazardous material by the U.S. Department of Labor Health and Safety Regulations. There is a possibility of dermatitis. Effects of overexposure are presently unknown.
3. Antidote: If eyes are exposed to this oil, flush with plain water. Skin that has been exposed to this oil should be washed with soap and water, as with any lubricating oil.

Issued 1/04

UK DECLARATION of Conformity

Product: **Piston Pump**

Models: 25B Series Pumps

This Declaration is issued under the sole responsibility of the manufacture.

Description: This is an air operated, vertically mounted, piston pump for liquid materials.

Applicable UK Regulations:
Supply Machinery Safety Regulation 2008
Equipment & Protective Systems Intended for use in Potentially Explosive Atmosphere Regulation 2016

Standards Used for Compliance:
EN/ISO12100 (2010)
EN/ISO80079-36 (2016)
EN/ISO80079-37 (2016)
EN1127-1 (2019)
EN809 : 1998+A1:2009

Flammable Atmosphere Marking: Ex h IIB T6 Gb
Tech File: Sira / CSA Group, NB 0518 (Hawarden, UK)
DNV - ISO9001
Quality Notification – SGS Baseefa, NB 1180 (Buxton, Derbyshire, UK)

Quality System DNV – ISO9001 Certified

Date: 22Jan2024

Jeremy Krone
Engineering Manager
Industrial Coating Systems
Amherst, Ohio, USA

Nordson Authorized Representative in the UK
Contact: Technical Support Engineer
Nordson UK Ltd.; Unit 10 Longstone Road
Heald Green; Manchester, M22 5LB.
England

EU DECLARATION of Conformity

Product: **Piston Pump**

Models: 25B Series Pumps

This Declaration is issued under the sole responsibility of the manufacture.

Description: This is an air operated, vertically mounted, piston pump for liquid materials.

Applicable Directives:
2006/42/EC - Machinery Directive
2014/34/EU - ATEX Directive

Standards Used for Compliance:
EN/ISO12100 (2010)
EN/ISO80079-36 (2016)
EN/ISO80079-37 (2016)
EN1127-1 (2019)
EN809 : 1998+A1:2009

Flammable Atmosphere Marking: Ex h IIB T6 Gb
Tech File: Sira / CSA Group, NB 2813 (Arnhem, Netherlands)
DNV - ISO9001
ATEX Quality Notification – SGS Fimko Oy, NB 0598 (Helsinki Finland)

Quality System DNV – ISO9001 Certified

Date:22Jan2024

Jeremy Krone
Engineering Manager
Industrial Coating Systems
Amherst, Ohio, USA

Nordson Authorized Representative in the EU
Person authorized to compile the relevant technical data.
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