GMT 360 Rhino® Bulk Unloader Controls

Customer Product Manual
Part 303 864A

NORDSON CORPORATION • AMHERST, OHIO • USA

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Section 1

Safety

Section 1
Safety

1. 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.

2. 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.

3. 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

4. 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.

5. Personal Safety

To prevent injury follow these instructions.

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

High-Pressure Fluids

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

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

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

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

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

MEDICAL ALERT–AIRLESS SPRAY WOUNDS: NOTE TO PHYSICIAN

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

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

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

6. Fire Safety

To avoid a fire or explosion, follow these instructions.

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

Halogenated Hydrocarbon Solvent Hazards

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

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

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

7. 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.

8. Disposal

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

Section 2

Description

Section 2
Description

1. GMT 360 Dual Bulk Unloaders

See Figure 2-1.

Figure 2-1 shows both primary (A-Unit) and secondary (B-Unit) bulk unloaders as they are built for GMT 360 applications. GMT 360 unloaders are available with two unloaders (an A-Unit and a B-Unit) and a filter for use with adhesive materials (A); or two unloaders (an A-Unit and a B-Unit) with a stand for use with mastic materials (B). Operation switches between A- and B-Units automatically (via the controller program) or manually (via operator intervention).

Rhino bulk unloaders are available in a variety of configurations, with various hydraulic sections and controls. Rhino drum unloaders pump Nordson-approved adhesives and sealant materials at room temperature from 200-liter (55-gallon) containers.

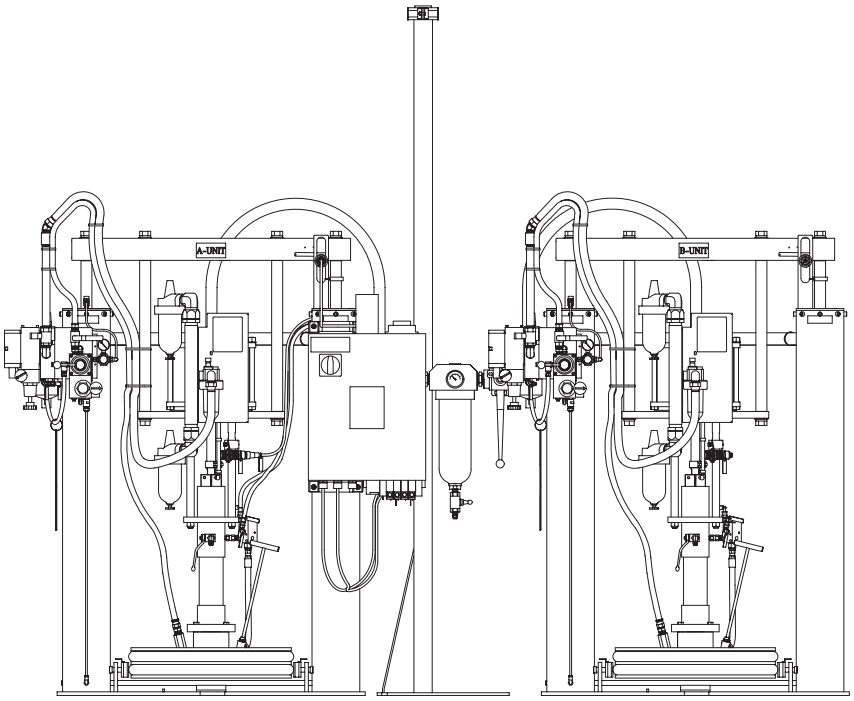
GMT 360 unloaders are shipped with a rotary elevator control for elevator operation, have a 65:1 air input to hydraulic output ratio pump with a 10-inch air motor, and have a drum (55-gallon) follower plate. A pail (5-gallon) follower plate is available as a replacement.

Contact your Nordson representative if

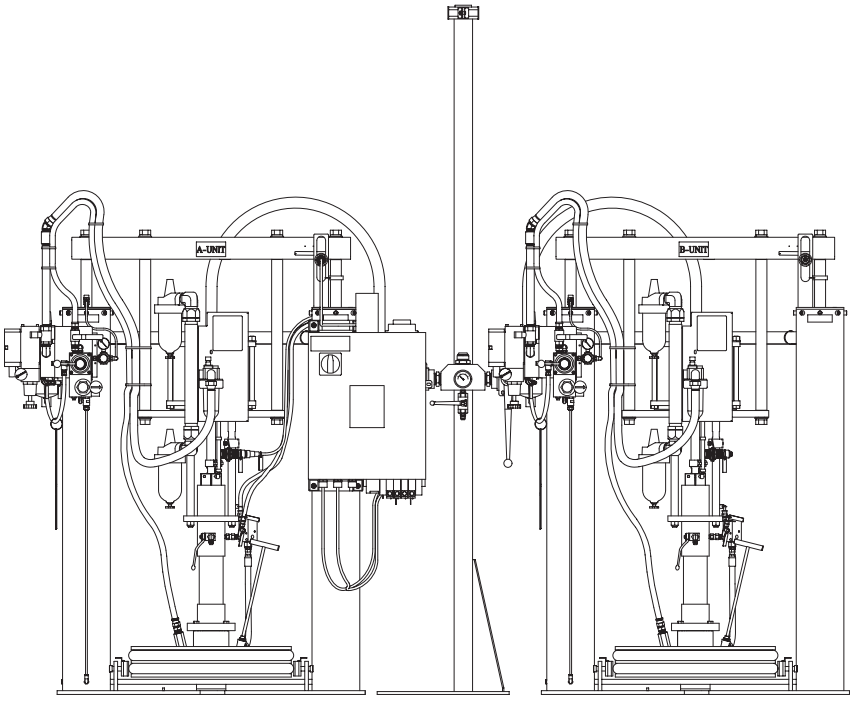
- you require more information about the other configurations available for Rhino bulk unloaders
- to verify that the material you wish to pump is compatible with your equipment and setup

WARNING: This manual is written to reflect the controls and components of the GMT 360 dual unloaders configuration only. The procedures included are specific to the product configuration. Use this manual to familiarize yourself with the safe and proper operation of GMT 360 unloaders. Do not use this manual when operating unloaders not built to GMT 360 specifications.

1. GMT 360 Dual Bulk Unloaders (contd)



A. Dual unloaders with filter



B. Dual unloaders with mastic stand

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Fig. 2-1 GMT 360 Rhino Bulk Unloaders, A- and B-Units

2. Theory of Operation

An unloader typically pumps a constant supply of material to dispensing guns or process applicators. The hydraulic section of the unloader is a dual-acting, positive-displacement, demand-type operation pump. The pump can handle high viscosity materials, some of which may be abrasive. It is often used in applications that require rapid delivery of material to dispensing guns.

CAUTION: If the material is too abrasive or generally not compatible, equipment may wear out prematurely and components may be damaged.

Hydraulic and Electrical Components

See Figure 2-2.

The operator places a full (open, non-tapered, undamaged) container of material under the unloader frame. When the unloader is pressurized and DOWN movement is initiated, the elevator lowers the follower plate (8) and hydraulic section (9) into the material. Once the pump strokes, the downward movement of the follower plate forces material into the hydraulic section. Material is pumped through the material output hoses and to the applicator or gun. The follower plate seals (7) create a sealed compartment below the follower plate and prevent material from leaking past the follower plate. A bleed valve (10) enables the operator to remove air from the pump body. A bleeder stem (6) enables the operator to remove air from beneath the follower plate to ensure proper contact with the material in the container. An output check valve (5) prevents backward material flow into the pump.

The operator interfaces with unloader operation via the GMT 360 pump controller (2) and keypad (3). Depressurization intervals and pump runaway parameters can be programmed into the pump controller. (Specific pump controller operation and programming information is located in the *Operation* section of this manual.) The runaway sensor (4) will stop pump operation when too many pump strokes occur within a set period of time.

Hydraulic and Electrical Components (contd)

See Figure 2-2.

When a material container is emptied during unloader operation,

- the empty drum sensor (11) causes the light (1) on the pump controller to go on, indicating that a material container change is necessary;
- the pump controller automatically switches operation to the inactive unloader; and
- the operator is able to change material containers at the inactive unloader by raising the follower plate, replacing the empty container with a full one, and lowering the follower plate into the new container.

The unloaders can be purged through the programmable logic controller (PLC). The PLC is pre-wired to provide the following output signals:

- dirty filter
- drum A empty
- drum B empty
- runaway A
- runaway B

Pneumatic Controls

The controls that initiate elevator movement and operate the unloaders are pneumatic. Because of the latent (potential) power in a pressurized unloader, an unloader under pressure from the air supply is considered active even if it is not pumping. Only a non-pressurized pump is considered inactive.

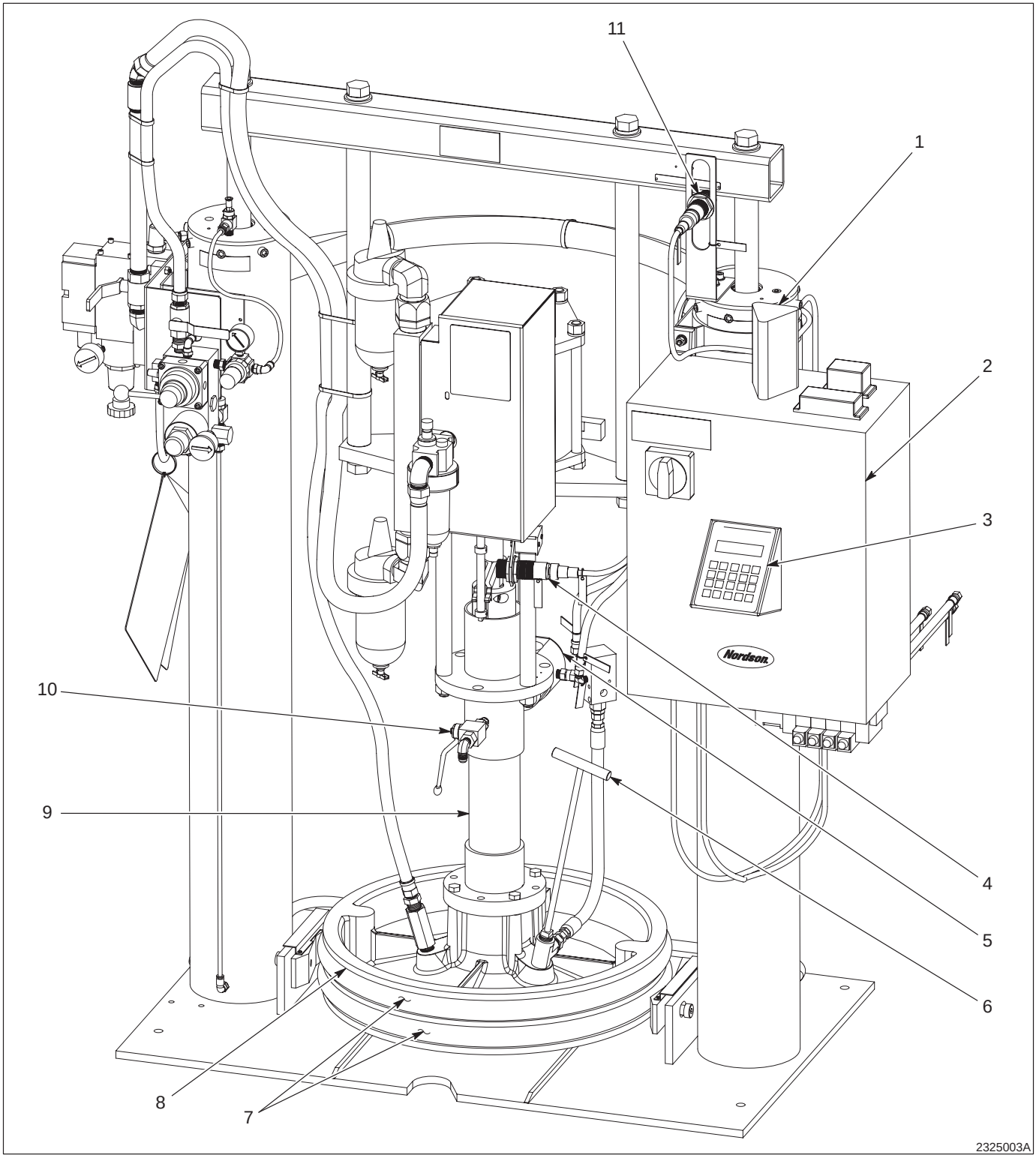


Fig. 2-2 Hydraulic and Electrical Components

1. Light
2. Pump controller
3. Keypad
4. Runaway sensor
5. Output check valve
6. Bleeder stem
7. Follower plate seals
8. Follower plate
9. Hydraulic section
10. Bleed valve
11. Empty drum sensor

Pneumatic Controls (contd)

Refer to Table 2-1.

The following describes the various components used in the pneumatic control of the GMT 360 unloaders.

See Figure 2-3.

Table 2-1 Pneumatic Controls Components

Item	Component	Function
1	Air motor	The power generated by the air motor cycles the pump. The air motor includes a lubricator that mixes the air with a small amount of vitalizer oil. This minimizes wear on the air motor and cylinder.
2	Depressurization module	The depressurization module circulates material from downstream of the pump to the output check valve and bleeds material under the follower into the container.
3	Elevator control regulator	This regulator is adjustable and is used to control elevator force in the DOWN position only.
4	Elevator control valve	GMT 360 unloaders have a rotary elevator control valve that initiates elevator movement. Placing the elevator control valve in the UP position raises the elevator and placing it in the DOWN position lowers the elevator and follower plate assembly into the container of coating material. Placing the elevator control valve in the NEUTRAL position halts elevator movement. Refer to the *Operation* section for specific operating instructions. The elevator control valve is mounted on the elevator/blow-off control module (6). The UP air pressure is preset, non-adjustable and the DOWN air is regulated by the elevator control regulator (3).
5	Air motor regulator	This is an adjustable pressure regulator used to control the amount of air pressure supplied to the air motor.
6	Elevator/blow-off control module	This is a non-adjustable blow-off system that regulates air to the blow-off valve (7) when the controls are in the UP position. The elevator/blow-off control module also incorporates a high-pressure, low-volume button stamped C/O (for clean out) that, when pressed, provides a blast of air to help remove clogged material from the material check valve (at the follower plate).
7	Blow-off valve	The blow-off valve is a shut off valve to the blow-off air. The blow-off circuit operates at a pressure range of 1.4–1.7 bar (20–25 psi). This valve is used to introduce air pressure under the follower plate when the elevator control valve is in the UP position and the follower plate is in a container of material. The blow-off valve lets air under the follower and helps the operator to remove the follower plate out of the container of material.
8	Air motor lockout valve	When this valve is open and the pump is active, air pressure to the air motor will cause the pump to stroke. When this valve is closed, it locks out pressure to the air motor, preventing pump operation.
9	Filter	Supply air passes through the filter, which removes contaminants and moisture.
10	Main air supply valve	The supply of air to the unloader is controlled by the main air supply valve. When the valve is open, standard shop air is supplied to the unloader(s). When the valve is closed, the only air in the unloader is the latent pressure built up during operation.
11	Elevator	When the elevator is pressurized and the elevator control valve is in the DOWN position, it exerts downward pressure on the follower plate. The elevator is connected to both cylinders by a crossover bar.

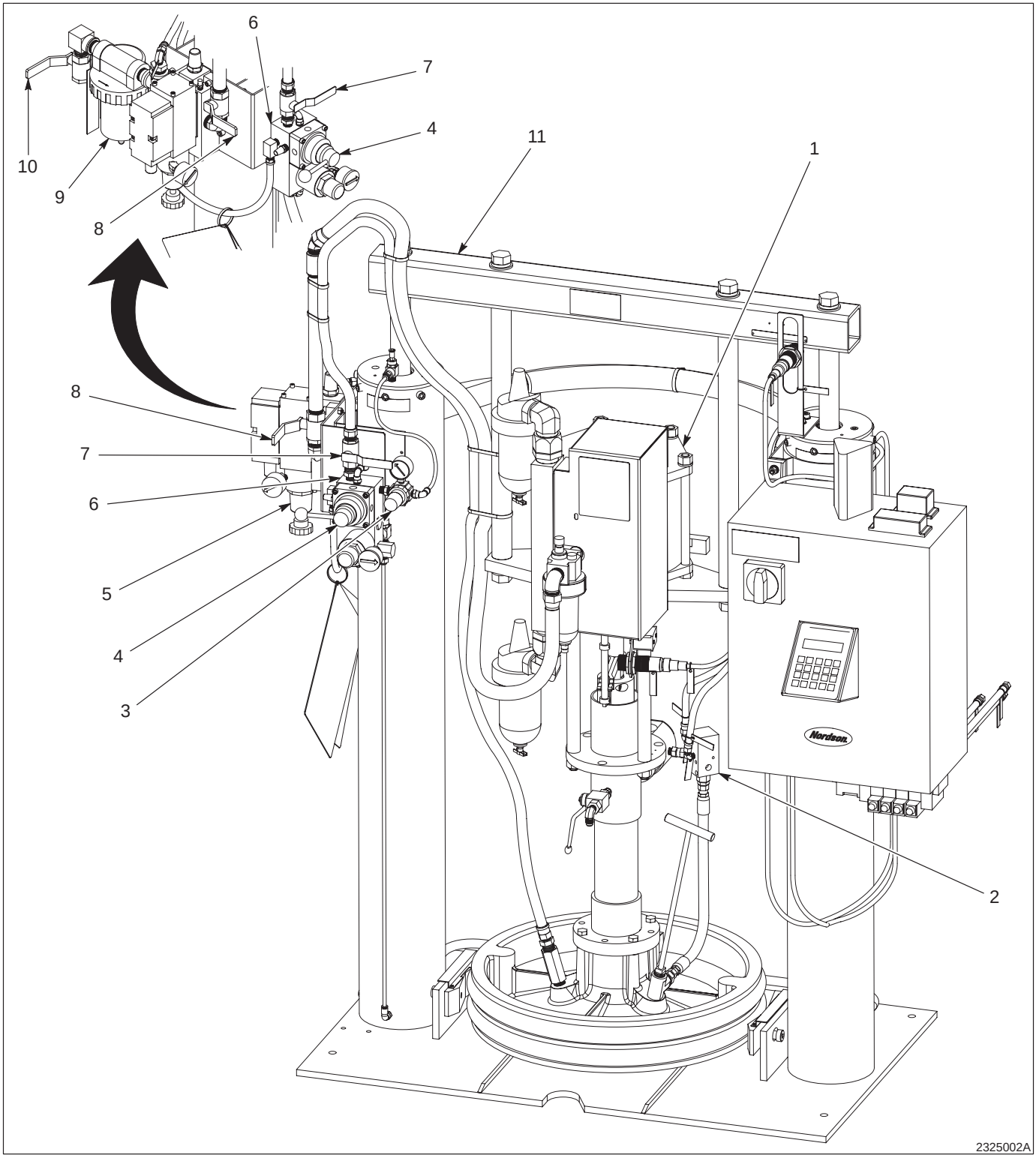


Fig. 2-3 Pneumatic Components

1. Air motor
2. Depressurization module
3. Elevator control regulator
4. Elevator control valve
5. Air motor regulator
6. Elevator/blow-off control module
7. Blow-off valve
8. Air motor lockout valve
9. Filter
10. Main air supply valve
11. Elevator

3. Specifications

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

Electrical Supply

120 Vac; 3.0 amps (normal operation)

Air Supply

The customer must supply a single source of 4.8–6.9 bar (70–100 psi) air pressure to power the unloader(s). Options may depend on customer requirements. Contact your Nordson representative for additional details.

Refer to the air consumption data in the *7- and 10-Inch Air Motors with Air Valve* manual for more information.

Overall Dimensions

Refer to the Tables 2-2 and 2-3 to determine the overall weight and dimensions for the unloader.

Table 2-2 Unloader Weights

Drum, per unloader		
Weight/Mass	**US (lb)**	**Metric (kg)**
Weight (approximate)	790	359

Table 2-3 Unloader Dimensions

Drum, per unloader		
Physical Dimensions	**US (in.)**	**Metric (cm)**
Height (elevator down)	94 with stand	157
Height (elevator up)	103	268
Depth	31	79
Width	56	142

Baseplate Mounting Holes

Refer to the Table 2-4 for the baseplate mounting holes.

Table 2-4 Baseplate Mounting Hole Dimensions

Drum		
Dimensions, on center	**US (in.)**	**Metric (cm)**
Width	39	99
Depth	20.5	52

Section 3

Installation

Section 3
Installation

1. General

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

See Figure 3-1.

Perform the following steps to install the unloader:

NOTE: If your floor is not level, be sure to level your unloaders before anchoring them to the floor. Operating your unloaders on a surface that is not level can affect elevator operation.

1. Position the unloaders to allow access to the controls and follower plate area. Make sure that the air hoses and electrical cables are protected and can reach between the A-Unit (primary) and the B-Unit (secondary). Refer to your system drawings for the layout patterns and dimensions of your dual unloaders.

2. Anchor the unloaders to the floor.

3. Set the elevator control regulator (7) and the air motor regulator (9) to 0 bar/psi. Make sure that the main air supply ball valve (12) is closed.

4. Connect the air supply lines to the $^{3}/_{4}$-in. NPT inlet valves at both the A-Unit and B-Unit. Maximum supply air pressure is 7 bar (100 psi). Refer to the air consumption data in the *7- and 10-Inch Air Motors with Air Valve* manual for more information.

CAUTION: Use a hose support to prevent hose damage in applications where the hose is suspended by an overhead tool balancer or similar device. Route the hose in a manner that prevents kinking and abrasion. Do not bend the hoses less than the minimum bend radius of the hoses.

5. The pump outlet fitting on the hydraulic section is a female $1^{1}/_{4}$ NPTF pipe threads. The check valve connects to this. The check valve has a $1^{1}/_{4}$ NPTF female to $1^{1}/_{2}$ JIC male connector. The material hose connects to the check valve. Unloaders are shipped with the hoses already connected to the pump outlets. You will need to attach your material hoses to the filter/mastic stand.

2. Automatic Changeover Installation

When two unloaders are used together with an automatic changeover feature, they must be connected together by several air lines and electrical cables. The main air supply is connected to the A-Unit and the B-Unit.

Pneumatic Connections

Refer to Table 3-1.

When making the pneumatic connections, match the labels on the air lines to the labels on the fittings.

NOTE: Pneumatic air lines are factory-installed on the A-Unit and must be connected to the B-Unit. All air lines and connectors are marked for ease of installation.

Table 3-1 Pneumatic Connections

Connect Air Line . . .	To Fitting . . .
B-Unit Pump Air	B-Unit Pump Air
B-Unit Open Depressurization	B-Unit Open Depressurization
B-Unit Close Depressurization	B-Unit Close Depressurization

Electrical Connections

Refer to Table 3-2.

When making the electrical connections, match the labels on the air lines to the labels on the fittings.

NOTE: Electrical cables are factory-installed on the A-Unit and must be connected to the A-Unit, B-Unit, or filter stand, as specified. All cables and connectors are marked for ease of installation.

Table 3-2 Electrical Connections

Connect Cable . . .	To Connector . . .
B-Unit Empty Sensor (4-pin)	B-Unit Empty Sensor (on B-Unit)
B-Unit Sensor Runaway (4-pin)	B-Unit Sensor Runaway (on B-Unit)
Filter Switch (5-pin)	Connector on Filter (on filter stand)
A-Unit Empty Sensor (4-pin)	A-Unit Empty Sensor (on A-Unit)
A-Unit Sensor Runaway (4-pin)	A-Unit Sensor Runaway (on A-Unit)

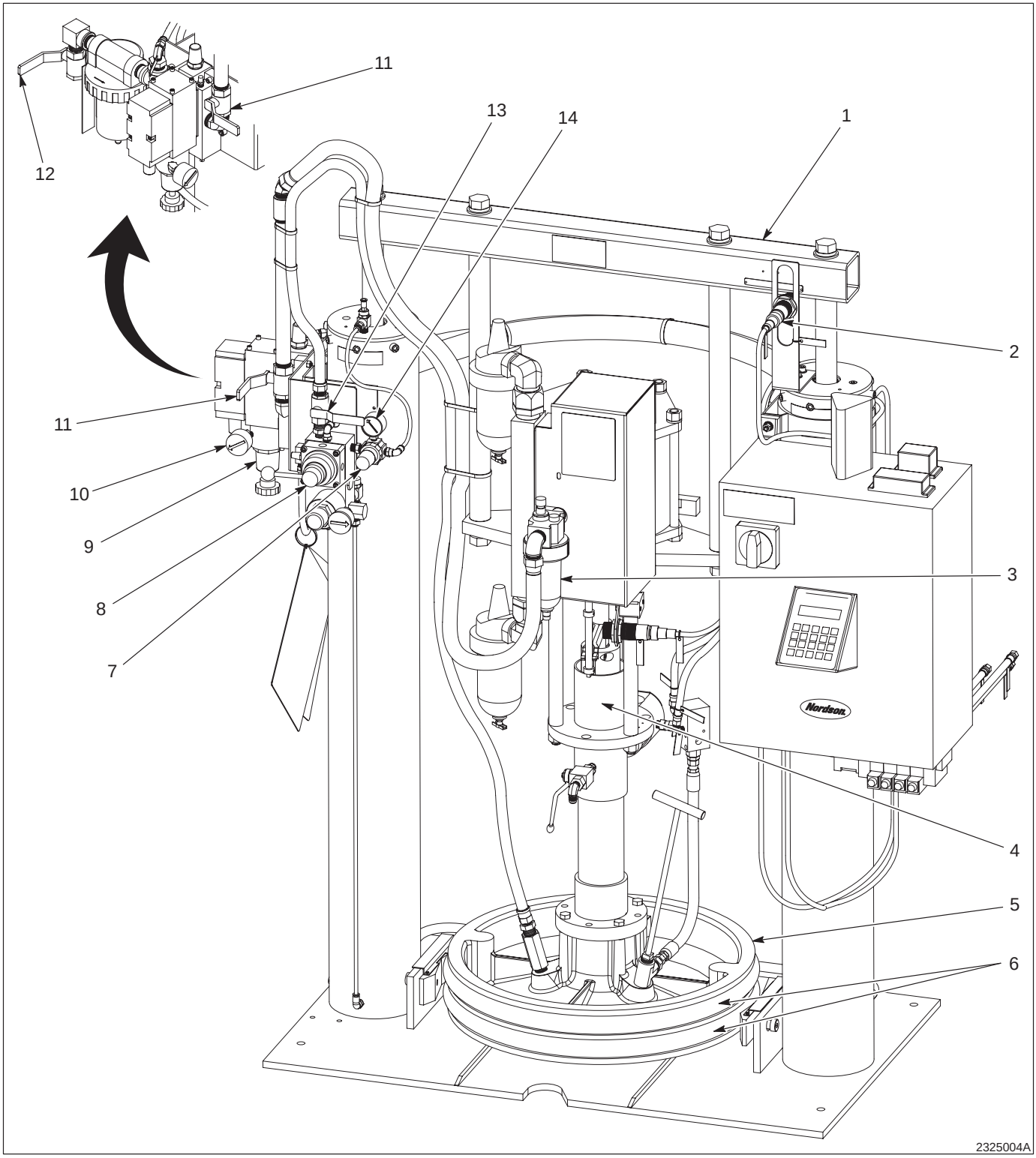


Fig. 3-1 Installation Components

1. Elevator
2. Empty drum sensor
3. Air motor lubricator
4. Solvent chamber
5. Follower plate
6. Follower plate seals
7. Elevator control regulator
8. Elevator control valve
9. Air motor regulator
10. Air motor pressure gauge
11. Air motor lockout valve
12. Main air supply valve
13. Blow-off valve
14. Elevator control gauge

3. New Equipment Installation

See Figure 3-1.

This procedure applies only to the first-time installation of a new system.

1. Refer to Table 3-1. Verify that all pneumatic connections have been made at the appropriate locations.

2. Refer to Table 3-2. Verify that all electrical connections have been made at the appropriate locations.

3. Connect the $1^1/_2$-in. hoses (factory-installed on the A- and B-Unit pump outlets) to the fittings on the manifold (located on the hose/filter stand).

4. Make sure that the fluid level in the pump solvent chamber (4) is 38 mm (1.5 in.) from the top of the chamber. Add fluid as necessary. Refer to the *Parts* section to order solvent chamber fluid.

5. Make sure that the air motor lubricator (3) is filled with vitalizer oil. Refer to the *Parts* section in your pump manual to order vitalizer oil.

6. Lubricate the follower plate seals (6) with a lubricant that is compatible both with the seals and with the material dispensed.

7. Verify that the air motor lockout valve (11) is closed.

8. Open the main air supply ball valve (12) to supply air to the elevator control valve.

9. Adjust the setting on the air motor regulator (9) until the air motor pressure gauge (10) reads 0 bar/psi.

10. Adjust the elevator controls regulator (7) setting until the elevator control gauge (14) reads 1.7–4.0 bar (25–60 psi).

    NOTE: You may need to increase this setting when using high-viscosity material. Apply sufficient down pressure to force material into the pump.

11. Place the blow-off valve (13) in the closed position.

12. Place the elevator control valve (8) in the UP position to raise the elevator (1) to the top of its travel range.

13. Open the blow-off ball valve. Listen for air to flow to make sure that the adapter tube and material check valve are not clogged. Close the ball valve.

14. Make sure that the air hoses and material delivery hose are not kinked or pinched.

15. Connect your pump/Pro-Flo interface cable from the A-Unit connector labeled Pro-Flo II Control to the Pro-Flo controller connector labeled Pump Stand.

4. Adjusting the Empty Drum Settings

Rhino bulk unloaders (with automatic changeover) are shipped with the empty drum setting already set. As a safety precaution, verify the empty drum setting before beginning normal operation of your unloader. For most applications, you should not have to adjust this setting. However, you can adjust the setting to stop the follower plate closer or farther from the bottom of the drum. Use extreme caution if you adjust the setting.

See Figure 3-1.

The empty drum sensor (2) is fastened to the elevator (1). The sensor sends a signal to the PLC which stops the follower plate (5) approximately $1^1/_2$ inches from the bottom of the drum. The sensor is adjusted within the slot it is mounted to.

Follow this procedure to adjust the empty drum setting of your unloader:

1. Remove the drum hold down brackets (shoes).
2. Lower the follower plate to the desired position. This is best done by using gauge blocks between the base and the bottom of the follower plate.
3. Once the follower plate is resting on the gauge blocks at the required height/position, adjust the empty drum sensor so that it is activated at this position:
   a. Loosen the sensor jam nuts on the sensor.
   b. Within the slot, raise the sensor to make the follower plate stop higher in the container. Within the slot, lower the sensor to make the follower plate stop lower in the container.
   c. Tighten the sensor jam nuts.
4. Reinstall the drum hold down brackets (shoes).

5. Adjusting the Runaway Sensor

If you have to remove and adjust the placement of the runaway sensor for any reason, be sure to return the sensor to its original position (in the middle of the pump stroke).

Section 4

Operation

Section 4
Operation

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

1. Introduction

This section describes new equipment startup, routine operating procedures, and procedures for changing to a different material.

Refer to Table 4-1.

This table gives a description of the various controllers involved in the operation of the GMT 360 dual unloader.

Table 4-1 Controller Operation and the GMT 360 Dual Unloaders

This Controller . . .	Does This . . .
Robot controller	• Communicates with the GMT 360 pump controller through a Pro-Flo controller • Provides operator access to pressurize and depressurize the pumps • Takes precedence over the **MANUAL** mode at the GMT 360 pump controller
Pro-Flo controller	• Receives signals from the robot controller; relays them to the GMT 360 pump controller • Does not allow pump operation or programming
GMT 360 pump controller (mounted on the A-Unit)	• Provides operator interface to perform pump purges, forced changeovers, and manually operate the pumps **NOTE**: If the pump controller is receiving any signals from the Pro-Flo controller, you cannot operate the pump controller in **MANUAL** mode. You must reset all of the outputs at the Pro-Flo controller.

2. New Equipment Startup

See Figure 4-1.

This procedure applies only to the first-time startup of operation of a new system.

1. Load a new container of material. Refer to the *Container Change* procedures in this section.

2. Ensure that the pump you are loading with material is active through the pump controller (5). Refer to *Controller Operation* for instructions on how to activate and purge pumps.

3. Adjust the air motor regulator (18) until the pump begins to operate. Do not increase the pressure beyond the minimum required to cycle the pump. Check the air motor pressure gauge (19) and note the minimum required pressure.

4. At low pressure, bleed the pump through the bleed valve (12) until all air has been removed from the pump. It will begin spitting. Follow the procedures in *Bleeding the Pump*, in this section.

5. Bleed all air from the system. Trigger the dispense gun(s) to allow air in the lines to bleed off.

NOTE: If air is not bled from the dispense gun, it may pop and spit when dispensing material.

6. After the system is purged the depressurization circuit must be purged with material. This can be accomplished by depressurizing the pump that has been purged through the pump controller. Refer to *Controller Operation* for instructions. Repeat the *Bleeding the Pump* procedures, as needed, to purge air that was introduced under the platen assembly while priming the depressurization circuit.

7. Raise pressure to operating levels. When you reach normal operating pressure, the gun dispenses material smoothly, continuously, and without air bubbles.

8. Check the air motor lubricator (6) for the desired flow rate:

NOTE: Two types of lubricators are used. Units shipped before October 1997 use the Watts brand lubricator. Units shipped after October 1997 use the Parker micro-mist lubricator.

- Set the Watts brand lubricator to dispense one drop of oil for every 15 pump strokes.

- Set the Parker brand lubricator to dispense one drop of oil for every other pump stroke, because most of the oil that drops in the sight glass returns to the reservoir.

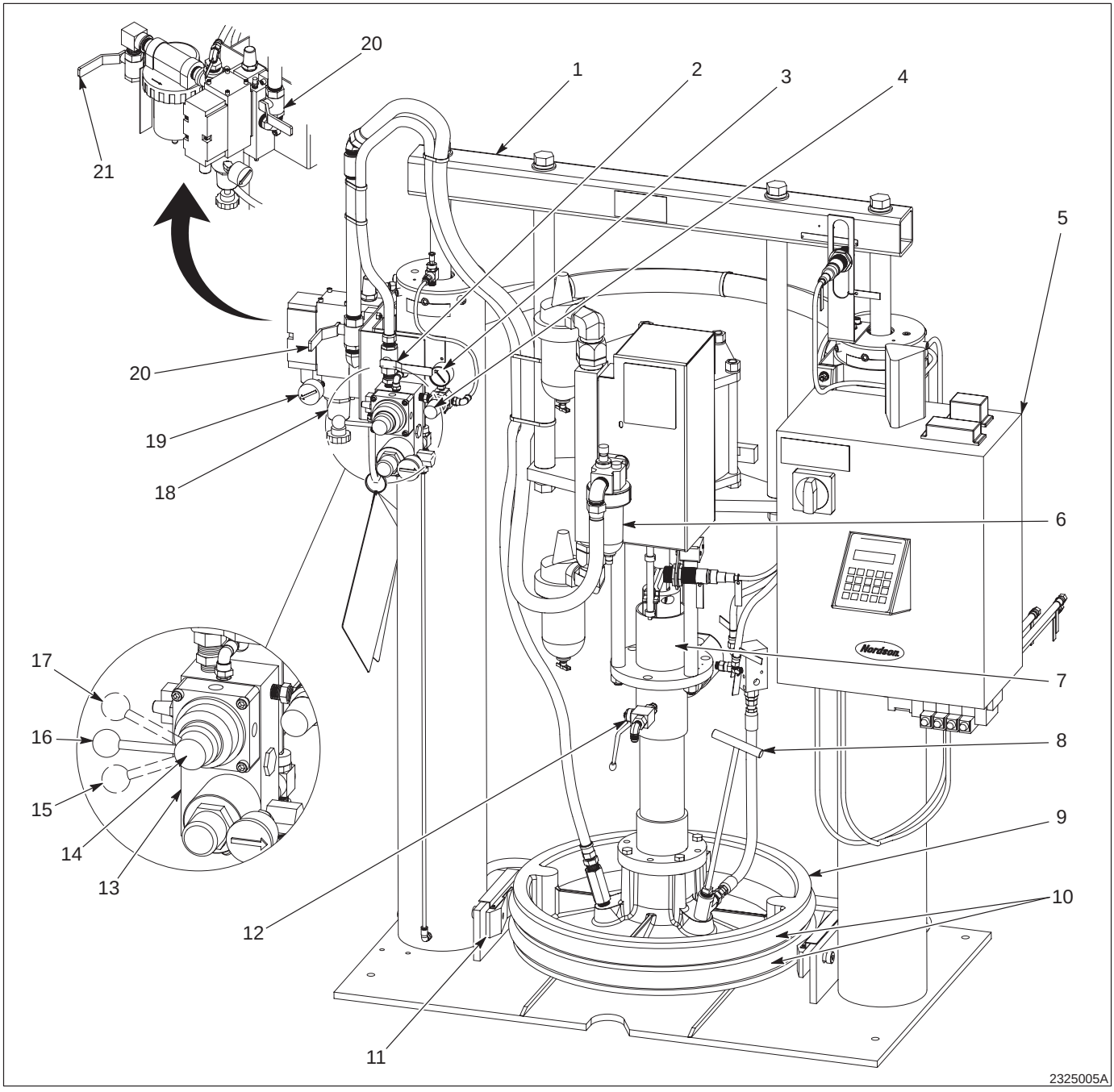


Fig. 4-1 GMT 360 Unloader Operation

1. Elevator
2. Blow-off valve
3. Elevator control pressure gauge
4. Elevator control regulator
5. Pump controller
6. Air motor lubricator
7. Solvent chamber
8. Bleeder stem
9. Follower plate
10. Follower plate seals
11. Hold down
12. Bleed valve
13. Elevator/blow-off control module
14. Elevator control valve
15. DOWN position
16. NEUTRAL position
17. UP position
18. Air motor regulator
19. Air motor pressure gauge
20. Air motor lockout valve
21. Main air supply valve

3. Routine Operating Procedures

The following paragraphs provide information about the various routine operating procedures for Rhino bulk unloaders. Routine operating procedures include

- elevator movement
- daily startup
- forced changeover
- container change
- bleeding the pump
- shutdown
- restart after shutdown

Elevator Movement

See Figure 4-1.

To operate your Rhino bulk unloader, you will initiate UP and DOWN elevator movement and place the elevator in the NEUTRAL position.

- To initiate UP elevator movement, place the elevator control valve (14) in the UP position (17).

- To initiate DOWN elevator movement, place the elevator control valve in the DOWN position (15).

WARNING: Do not treat the neutral position as a secure or locked position. Personal injury or equipment damage could result.

- To place the elevator in NEUTRAL, place the elevator control valve in the NEUTRAL position (16).

Daily Startup

See Figure 4-1.

1. Make sure that air pressure to the system is off. Make sure that the unloader is in the NEUTRAL position (16).

2. For most applications, check for material leaking past the follower plate seals (10). If you need to replace the seals, refer to the *Repair* section of this manual for instructions.

3. If the container is empty, refer to the *Container Change* procedure in this section.

4. Check the solvent chamber (7) fluid level. Refer to the *Installation* section for filling instructions.

5. Check the air motor lubricator (6) fluid levels. Turn on the main air supply ball valve (21) to the unloader.

6. Verify that the air motor lockout valve (20) is open.

7. Initiate DOWN elevator movement (15) at the designated unit.

8. Make sure that the hose and dispense gun are secured firmly and that the dispense gun is not pointing at any personnel in the area.

NOTE: If the pump does not pump, pressurize the pump via the robot controller. Remember that the robot always takes precedence. If you correct the problem at the robot, it will override any other commands from the other controllers. If the wrong pump is pumping, perform the *Forced Changeover* procedures from the **CHANGE** screen (at the GMT 360 pump controller) until the right pump is pumping.

9. Check the air motor lubricator for the desired flow rate (one drop of oil for every other pump stroke for Parker micro-mist lubricators and one drop of oil for every 15 pump strokes for Watts lubricators). Adjust the air motor lubricator, if necessary.

10. Check the unloader for proper pump operation. Adjust the air motor regulator (18) as necessary for the material you are pumping.

Container Change

Follow these procedures to change the container of material for your Rhino bulk unloader.

NOTE: You must bleed the pump every time that you change containers. This section includes procedures that detail how to bleed the pump.

Removing the Empty Container

See Figure 4-1.

Follow these steps to remove the empty container.

1. Place the unloader in the NEUTRAL (16) position.
2. Place the air motor lockout valve (20) in the OFF position.
3. Open the blow-off ball valve (2).
4. Press the C/O (clean out) button (on the bottom of the elevator/blow-off control module, (13)) 3–4 times before you raise the follower.
5. Initiate elevator UP movement (17).
6. Press the C/O button on the elevator/blow-off control module until the follower plate begins to move. Continue UP elevator movement until the follower plate is at the top of the container.

NOTE: If the container begins to rise off the unloader frame, press the C/O button on the elevator/blow-off control module to allow the container to return to the frame. Release the button and the elevator will continue upward movement on its own.

CAUTION: Be careful to watch for material spitting from the container when the follower plate is removed from the container. Failure to observe this precaution can result in personal injury.

7. Close the blow-off ball valve and the elevator (1) will continue to rise to its maximum height.
8. Disengage or unlatch the container hold down (11).
9. Remove the empty container from the unloader.
10. Inspect the blow-off port and clean as necessary.

Installing a Full Container of Material

See Figure 4-1.

Follow these steps to install a new, full container.

CAUTION: Do not use a damaged container. A damaged container can damage the follower plate, follower plate seals, or sealing device when the follower plate is lowered.

1. Carefully inspect the new container for dents or other damage. Do not use a damaged container.
2. To prepare the follower plate (9) for operation, coat the follower plate seals (10) with an O-ring lubricant that is compatible with the dispensing material and with the seals.

WARNING: Severe personal injury could result if your hands or fingers are caught between the follower plate and container. Keep your hands clear of this area.

3. Place the container of material on the base of the unloader and center it under the follower plate.
4. Adjust the elevator control regulator (4) until the elevator control pressure gauge (3) reads at least 2.1 bar (30 psi).
5. Engage or latch the container hold down, if applicable.
6. Make sure that the blow-off valve (2) is closed.
7. Unscrew the bleeder stem (8) from the follower plate to allow any air trapped under the follower plate to escape.

Installing a Full Container of Material (contd)

WARNING: Do not lower the follower plate into the container without wearing goggles, gloves, and long sleeved protective clothing. The air expelled when you bleed air from under the follower plate may contain material that could cause injury.

8. Place the elevator control valve (14) in the DOWN position (15) and slowly lower the follower plate into the open container of material. Continue lowering the follower plate until material begins to flow from the bleeder stem. Perform the following steps:

   a. When you see a continuous flow of material flowing from the bleeder stem fitting, stop DOWN movement of the elevator by placing the elevator in the NEUTRAL position (16).

   b. Tighten the bleeder stem securely.

9. Initiate DOWN elevator movement at the designated unit (A-Unit or B-Unit). DOWN elevator movement will force material into the pump section.

Bleeding the Pump

See Figure 4-1.

Perform these steps to bleed the pump:

1. Reduce pressure to 0 bar/psi.

2. Place a waste container beneath the bleed valve (12). Carefully open the bleed valve.

3. Purge the unloaders. Refer to *Controller Operation* for procedures on how to purge the pump.

4. Leave the bleed valve open until the material flows continuously.

5. Gradually increase the pressure to an acceptable stroke rate for the pump or acceptable material bleed volume.

6. Close the bleed valve. Remove the waste container. Further bleeding should not be necessary unless the hydraulic section is completely empty or until the next container change.

Shutdown

During shutdown, the active pump will automatically depressurize if no pump stroke is detected within a set time or if the depressurization signal is received from the Pro-Flo controller via the robot controller. Additionally, the operator can manually initiate depressurization at the keypad of the GMT 360 pump controller.

NOTE: If the pump controller is receiving any signals from the Pro-Flo controller, you cannot operate the pump controller in **MANUAL** mode. You must reset all of the outputs at the Pro-Flo controller.

WARNING: When you shut off the air supply ball valve the elevator is not in a locked state. The elevator and follower plate could drift downward and cause personal injury.

NOTE: When you shut off the air supply to the unloader, air pressure to the controls is vented to the atmosphere. The unloader remains in a neutral state until you turn on the air supply ball valve and initiate UP or DOWN elevator movement.

See Figure 4-1.

Follow the steps below to initiate a shutdown:

1. Place the unloader in the NEUTRAL position (16).
2. Shut off the main air supply ball valve (21).
3. Relieve material pressure through the bleed valve (12) or by triggering the gun(s).

Restart after Shutdown

To restart operation after a shutdown, perform the *Daily Startup* procedures in this section.

NOTE: When the pump controller is powered up, it will be in the state that it was left in during the last power down. All pumps will be depressurized. Pumps will have to be activated (pressurized) through the robot interface or from the pump controller in manual mode. Upon power up, the controller will read: `Pump “A” Active, Depressurized`.

4. Changing to a Different Material

Not all adhesives and sealants are compatible with each other. Consult the manufacturer of both the old and new materials to determine compatibility. If you are switching materials, make sure that the lubricant for the follower plate seals is compatible with the new material to be dispensed.

If the old and new materials are not compatible, clean the entire system before using the new material.

If the old and new materials are compatible, refer to the *Container Change* procedure in this section.

5. Controller Operation

The following paragraphs detail the operation of the GMT 360 pump controller. Read this entire section before performing any procedures.

Keypad

See Figure 4-2, which shows what each button on the keypad represents.

Refer to Table 4-2 for an explanation of the keypad functions.

The following provides information on how to use the controller keypad.

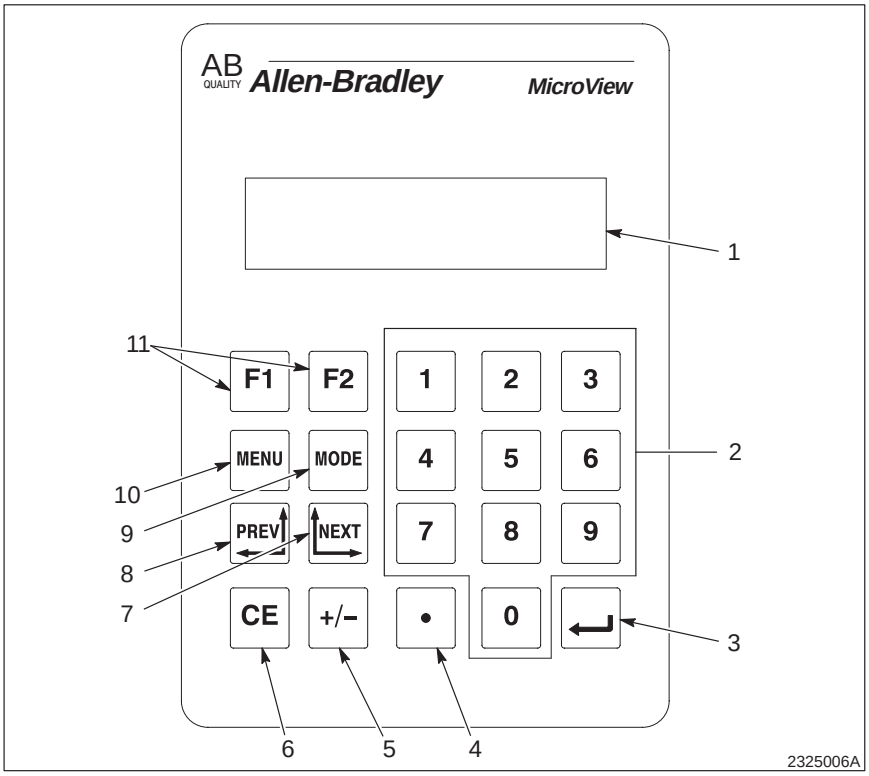


Fig. 4-2 Controller Keypad

1. Display panel
2. Number keys
3. [**ENTER**] key
4. Decimal key
5. Positive/negative toggle key
6. [**CLEAR ENTRY**] key
7. [**NEXT**] screen key
8. [**PREVIOUS**] screen key
9. [**MODE**] key
10. [**MENU**] key
11. Function keys

Table 4-2 Keypad Functions

Item	Key	Function
1	Display panel	Displays menu options and pump information readouts
2	[**0–9**]	Enters numbers **0–9** during data entry or selects a numbered item shown on the display
3	[↵]	The [**ENTER**] key, sends data to the controller. Data can be either default values or data entered at the keypad
4	[**.**]	Enters a decimal point
5	[**+/–**]	Toggles a data entry value between positive or negative
6	[**CE**]	Clears an entire value during data entry
7	[**NEXT**]	Steps forward through a series of linked screens
8	[**PREV**]	Steps back through a sequence of linked screens
9	[**MODE**]	Accesses special features and configuration of operating parameters
10	[**MENU**]	Returns to the main menu of an application
11	[**F1**] – [**F2**]	Displays any application screen assigned to the key

Controller Menu Options

See Figure 4-3.

This section details the various menu options and how to navigate within the **MAIN MENU**. When you turn the controller on, the **MAIN MENU** appears.

The four main menu selections are:

1. **PURGE**
2. **CHANGE**
3. **SETUP**
4. **MANUAL**

Controller Menu Options

(contd)

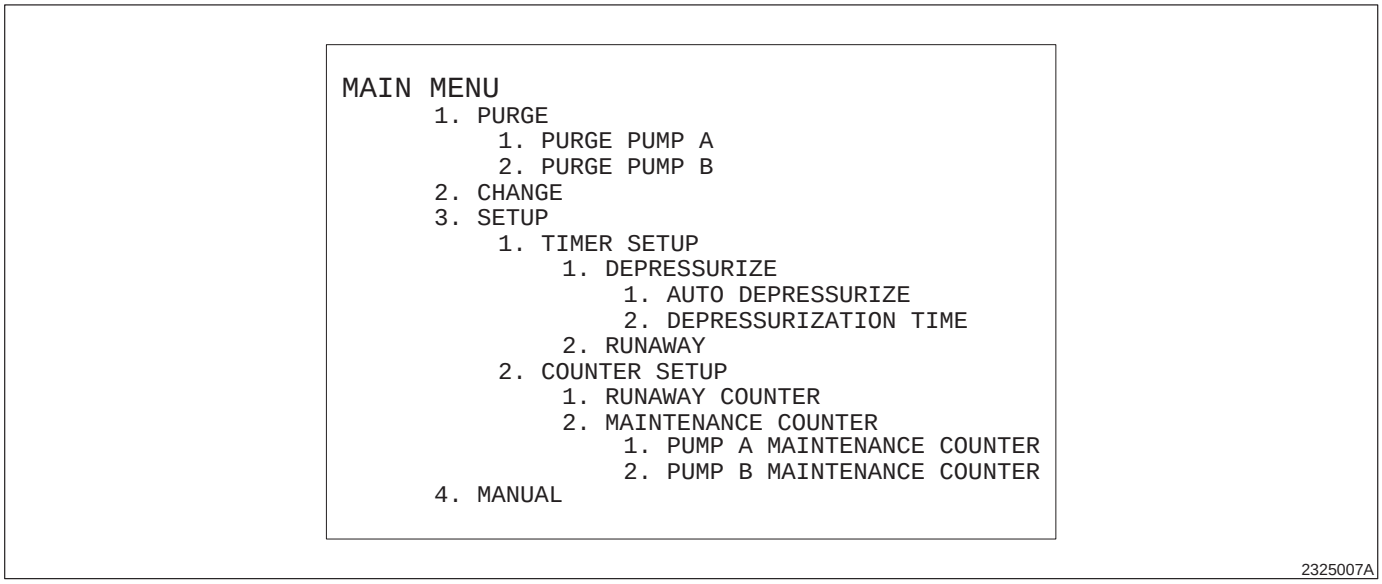


Fig. 4-3 GMT 360 Pump Controller Menu Tree

PURGE Screen

Refer to Table 4-3 for information to help you navigate in the **PURGE** screen.

Table 4-3 **PURGE** Screen Functions

Press	To
[**1**]	Access the **PURGE PUMP A** screen
[**2**]	Access the **PURGE PUMP B** screen
[**F1**]	Start purging at selected pump
[**F2**]	Stop purging at selected pump
[**MENU**]	Return to **MAIN MENU**

CHANGE Screen

Refer to Table 4-4 for information to help you navigate in the **CHANGE** screen.

To switch operation from the active unloader when the material container is not empty, perform a forced changeover to start the inactive unloader. Use the **CHANGE** screen to initiate a forced changeover.

Once *New Equipment Startup* has been performed, the inactive unloader must be ready for operation and the following conditions must be met at the inactive unloader. The follower plate must be

- in place,
- under downward pressure, and
- in any position other than the empty drum position.

NOTE: The inactive unloader will start if in any position other than empty drum.

Table 4-4 **CHANGE** Screen Functions

Press	To
[**F1**]	Change to pump A
[**F2**]	Change to pump B
[**PREV**]	Return to **CHANGE** screen
[**MENU**]	Return to **MAIN MENU**

SETUP Menu

Refer to Table 4-5 to navigate the **SETUP** menu.

Access the **SETUP** menu when you need to adjust the various operation settings of the GMT 360 pump controller.

Those settings include

- the number of strokes the counter must see in a certain period of time until it considers the pump in runaway mode
- the time elapsed until the pump will automatically depressurize if no pump strokes are detected
- the time allotted for the process of depressurization.

NOTE: To perform functions in the **SETUP** menu, you must enter an access code. Contact your Nordson Corporation representative if you do not have the proper access code.

NOTE: If you access a screen and the value shown is acceptable and you do not have to change it, press the [**ENTER**] key to go back to the**TIMER SETUP / COUNTER SETUP** menu.

NOTE: In Table 4-5, “X” indicates a variable number.

Table 4-5 SETUP Menu Navigation

When:	You Will See This Message:	Then:
You enter the **SETUP** menu	`LIMITED ACCESS CODE`	Enter your **access code** to continue.

Your access code is accepted	`Valid Code Access Permitted`
	Then, you will see this menu:
	`1. TIMER SETUP`
	`2. COUNTER SETUP`
		Access the menu you need to make adjustments.

You enter the **TIMER SETUP** menu	`1. DEPRESSURIZE` `2. RUNAWAY`	Access the menu you need to make adjustments.
You select **DEPRESSURIZE** from the **TIMER SETUP** menu	`1. AUTO DEPRESSUR` `2. DEPRESSUR TIME`	Access the menu you need to make adjustments.
You select **AUTO DEPRESSURIZE** from the **DEPRESSURIZE** menu	`AUTO DEPRESSURIZ` `XXX MIN NEW=`	Enter the new value (length of time until the pump auto depressurizes if no pump strokes are detected). The display returns to the **TIMER SETUP / COUNTER SETUP** menu.
You select **DEPRESSURIZATION TIME** from the **DEPRESSURIZE** menu	`DEPRESSURIZ TIME` `XXX MIN NEW=`	Enter the new value (length of time that the pump will depressurize). The display returns to the **TIMER SETUP / COUNTER SETUP** menu.
You select **RUNAWAY** from the **TIMER SETUP** menu	`RUNAWAY TIMER` `XX.XX SEC`	Enter the new value (length of time that the sensor will count pump strokes to determine runaway). The display returns to the **TIMER SETUP / COUNTER SETUP** menu.
You enter the **COUNTER SETUP** menu	`1. RUNAWAY COUNTER` `2. MAINTENANCE COUNTER`	Access the menu you need to make adjustments.
You select **RUNAWAY COUNTER** from the **COUNTER SETUP** menu	`RUNAWAY COUNTER` `XX COUNTS NEW=`	Enter the new value (number of pump strokes within the runaway timer parameters). The display returns to the **TIMER SETUP / COUNTER SETUP** menu.
You select **MAINTENANCE COUNTER** from the **COUNTER SETUP** menu	`MAINTENANCE CNTR` `XXXX * 1000`	The **MAINTENANCE COUNTER** counts the number of pump strokes (multiplied by 1000) until a preset alert indicates it is time to perform preventative maintenance. The number of pump strokes until the alert activates can be changed.

You enter the **MAINTENANCE COUNTER** sub menus	`PUMP A MAINT. CNTR`
	`X, XXX RESET`
	or
	`PUMP B MAINT. CNTR`
	`X, XXX RESET`
		Check the number of strokes that the pump (A or B) has stroked since the last time it was reset during routine preventative maintenance. Do not reset this value until you have actually performed the required maintenance on the pump.

MANUAL Screen

Refer to Table 4-6 for information that will help you to navigate in the **MANUAL** screen.

Table 4-6 **MANUAL** Screen Functions

Press	To
[**F1**]	Pressurize the active pump
[**F2**]	Depressurize the active pump
[**PREV**]	Return to **MANUAL** screen
[**MENU**]	Return to **MAIN MENU**

Section 5

Maintenance

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.

1. Introduction

This section details the recommended preventive maintenance procedures for the unloader. The frequency of periodic system cleaning depends on your facility's operating conditions and shop environment.

WARNING: Never use halogenated hydrocarbon solvents to clean aluminum parts or to flush any system. Cleaning agents, coatings, and paints or adhesives may contain halogenated hydrocarbon solvents. Obtain and read MSDS for each material and solvent being used.

WARNING: Relieve air and fluid pressures before servicing equipment. Follow the specific instructions in this manual.

2. Daily Maintenance

Perform these steps on a daily basis:

1. Check the pump controller light tower for proper bulb operation. The bulb should light when the empty drum sensor is tripped.
2. Visually inspect the unit. Check all hydraulic and pneumatic connections and tighten them if required. Inspect all pneumatic tubing for bends or kinks.
3. Drain the accumulated water from the filter/separator (near the air supply inlet) as required.
4. If you have a material filter installed in your system (filter stand), check and change the filter element, as needed. Refer to *Filter Element Changing* to replace the filter element.

Changing the Filter Element

See Figure 5-1.

Some unloaders are installed with a material filter mounted on a separate filter stand. The filter contains an element that must be changed periodically, as needed. Follow these procedures to change the filter element:

1. Place the unloader you are servicing in the NEUTRAL position. Refer to the *Operation* section if you require specific unloader operation information.
2. Locate and close the unloader main lockout valve.
3. Close the material supply valve(s), if applicable.
4. Place a one-gallon bucket beneath the pump bleed valve(s). Rotate the handle and bleed off the pressure. Close the valve.
5. Remove the cable from the electrical connector (10). The electrical connection provides information about filter status to the pump controller.
6. Place a five-gallon bucket beneath the filter bleed valve (4) located at the bottom of the filter bowl (5). Open the bleed valve to bleed off pressure. Close the bleed valve.
7. Support the filter bowl. Using a $^{1}/_{2}$-in. hex wrench, remove the four cap screws (1). Remove the filter bowl and filter bowl O-ring (2).
8. Remove the filter element (3) and filter O-ring (7).
9. Clean the filter bowl and filter head (6) components.
10. Install a new filter O-ring and filter element on the bottom of the filter head. Refer to the *Options* section for filter kit ordering information.
11. Support the filter bowl and filter bowl O-ring in place at the bottom of the filter head and install the four socket head cap screws. Using a torque wrench, hex driver socket, and bit, tighten the screws to 81 N•m (60 lb-ft).
12. Close the filter bleed valve.

13. To reset the dial,
    a. Remove the cover (8).
    b. Turn the dial (9) clockwise to the CLEAN position.
    c. Replace the cover.
14. Open the material supply ball valve(s), if applicable.
15. Reconnect the cable to the electrical connector.
16. Open the unloader main lockout valve.

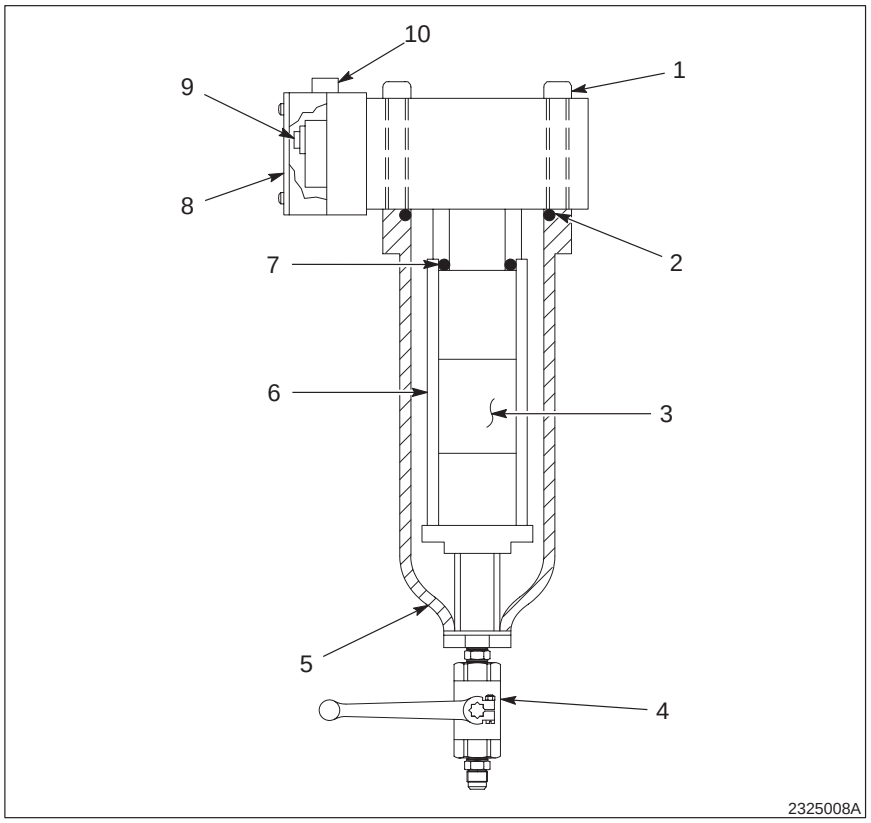


Fig. 5-1 Filter Assembly

1. Cap screws
2. Filter bowl O-ring
3. Filter element
4. Filter bleed valve
5. Filter bowl
6. Filter head
7. Filter O-ring
8. Cover
9. Dial
10. Connector

3. Weekly Maintenance

Perform these steps on a weekly basis:

1. Inspect the unloader.
2. Clean any materials from the top of the follower plate and around the follower plate seals.
3. Clean the top of each unloader air cylinder (on the frame).

Section 6

Troubleshooting

Section 6
Troubleshooting

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

1. Introduction

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

Troubleshooting Procedures

Verify all pneumatic operations through the pneumatic schematics and systems drawings provided in your system documentation. Contact your Nordson representative if you require replacement documentation or additional information.

Problem	Possible Cause	Corrective Action
1. Elevator not working	Malfunctioning elevator controls regulator, or damaged valves Elevator air cylinder seals worn or damaged, or piston binding in cylinder	Contact your Nordson representative for assistance. If you are unable to solve the problem via pneumatic troubleshooting, rebuild the air cylinders. Refer to the *Rhino Bulk Unloader Frames* manual for more information.
2. Blow-off assembly not working	No air supply present	Follow these procedures to check the blow-off assembly: 1. Check the air supply. Make sure that the blow-off ball valve is open. 2. Place the elevator control valve in the UP position. 3. Hold the clean out (C/O) button in. 4. If the container rises from the base, there is little or no air flow from the blow-off assembly. Proceed to the next possible cause and corrective action.

Continued on next page

Problem	Possible Cause	Corrective Action
2. Blow-off assembly not working *(contd)*	Clogged check valve, follower plate, or blow-off hose	Follow these procedures to check for material blockages: 1. Shut off air to the system. 2. Remove the blow-off hose and check valve. 3. Clean the follower hole, check valve, and blow-off hose.
3. Light tower does not illuminate (during Empty Drum)	Light burned out	Disconnect the leads and apply 24 V to the light. If the light is burned out, replace it.
	Faulty proximity switch	Verify proper operation of the proximity switch. Replace faulty switch.
	All other problems	Check to see if the empty drum sensor bracket is not broken, or out of adjustment. If the light is still not working, contact your Nordson representative.
4. Pump not delivering material	Insufficient air pressure to pump	Increase air pressure to the air motor so that it is within application range.
	Follower plate not in contact with material	Make sure you have placed the elevator control valve in the DOWN position. The unloader should begin to pump material. Make sure that the elevator control regulator is within its application range.
	Air pocket in pump	Carefully bleed pump as noted in *Operation* section of this manual.

Continued on next page

Problem	Possible Cause	Corrective Action
4. Pump not delivering material *(contd)*	Blocked hydraulic system or follower plate	Perform following steps: 1. Cycle pump. Slowly open the bleed valve $^1/_4$ turn. If material exits valve, close valve and go to step 2. If no material exits valve, close valve; shut down system; relieve system pressure. Remove and rebuild pump. 2. Shut down pump. Relieve system pressure. Disconnect hose from pump. Check hose for blockage. If hose is not blocked, go to step 3. If hose is blocked, clean or replace hose. 3. Remove gun from hose. Check gun for blockage. If gun is blocked, clean it. If gun is damaged, rebuild or replace gun as necessary.
5. Depressurization module not working	Pneumatic control valve not functioning	Verify that the control valve is getting electrical signal. Verify that the valve is functioning pneumatically.
	Auto-Flo valve not functioning or clogged	Disconnect discharge hose from the valve. Manually cycle the depressurization function and look for material flow from the valve discharge. If no flow is present, bleed system pressure and clean or replace the gun cartridge.
	Clogged discharge hose or follower port	Clean or replace discharge hose and follower port.

Section 7

Repair

Section 7
Repair

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

1. Repair Guidelines

NOTE: Specific operating instructions for the unloader controls are in the *Operation* section. This section covers basic repair guidelines for the GMT 360 Rhino unloaders as well as specific procedures for preparing Rhino unloaders for further repair. For dispensing gun, air valve, air motor, pump, and frame repair information, refer to the specific component manuals.

NOTE: Faulty hoses are not field-repairable. You must replace them if they are damaged.

WARNING: When performing repair or maintenance on the A-Unit, turn off the main material valve at the filter/mastic manifold stand and trigger the depressurization of the A-Unit at the pump controller keypad.

When performing repair or maintenance procedures on the B-Unit, turn off the main material valve at the filter/mastic manifold stand and trigger the depressurization fo the B-Unit at the pump controller keypad.

Otherwise, serious personal injury could result.

2. Service and Repair Guidelines

See Figure 7-1.

Refer to Table 7-1.

WARNING: GMT 360 Rhino unloaders operate in a dual unloader configuration. You must be aware of the air/hydraulic pressures in both unloaders when servicing. Shut off and lock out various components as directed. Failure to heed this warning may result in serious personal injury or death.

The table lists general guidelines that must be followed when servicing various components on the unloaders. It provides information about which controls and valves to shut off or be aware of so that you can safely service your dual unloaders.

Table 7-1 Service and Repair Guidelines

If You Need to Service This Component:	At This Location:	Follow This Safety Guideline:
Valves on the bottom of the pump controller (4)	A-Unit	Shut off main air supply valve (12) at the A-Unit before servicing. This will take the B-Unit out of production.
Depressurization module (3)	A-Unit	Shut off the main material valve at the filter/mastic filter manifold stand. Bleed the material pressure at the keypad or the robot controller. Shut off the main air supply valve (12) at the A-Unit before servicing. **NOTE**: There is always air pressure on one side of the lines in the depressurization module unless the main air supply valve on the A-Unit is off.
	B-Unit	Shut off the main material valve at the filter/mastic manifold stand. Bleed the material pressure at the keypad or the robot controller. Shut off the main air supply valves (12) at the A-Unit and the B-Unit before servicing. **NOTE**: There is always air pressure on one side of the lines in the depressurization module unless the main air supply valve on the A-Unit is off.
Blow-off check valves (on follower plate) (6)	A-Unit	Remove the follower plate (5) from the container. Do not perform service on these valves with a material container in place. Shut off the main air supply (12) and blow-off air valve (14) at the A-Unit before servicing.
	B-Unit	Remove the follower plate (5) from the container. Do not perform service on these valves with a material container in place. Shut off the main air supply (12) and blow-off air valve (14) at the B-Unit before servicing.
Elevator/blow-off control module (8)	A-Unit	Shut off the main air supply valve (12) on the A-Unit before servicing. **NOTE**: The B-Unit will go off-line, out of production because the pump controller will lose its source air.
	B-Unit	Shut off the main air supply valve (12) on the B-Unit before servicing.
Pneumatic solenoid (11)	A-Unit	Shut off the main air supply valve (12) on the A-Unit before servicing. **NOTE**: The B-Unit will go off-line, out of production because the pump controller will lose its source air.
	B-Unit	Shut off the main air supply valve (12) on the B-Unit before servicing.
Bleed valve (7)	A-Unit	If the bleed valve (7) on the pump body is plugged and won't bleed material, shut off the air motor supply valve (12) at the A-Unit. Trigger the depressurization module (3) via the pump controller keypad (2) to relieve system pressure at the A-Unit. Unscrew the bleed valve from the pump body and clean or replace the valve.
	B-Unit	If the bleed valve (7) on the pump body is plugged and won't bleed material, shut off the air motor supply valve at the B-Unit. Trigger the depressurization module (3) via the pump controller keypad (2) to relieve system pressure at the B-Unit. Unscrew the bleed valve from the pump body and clean or replace the valve.

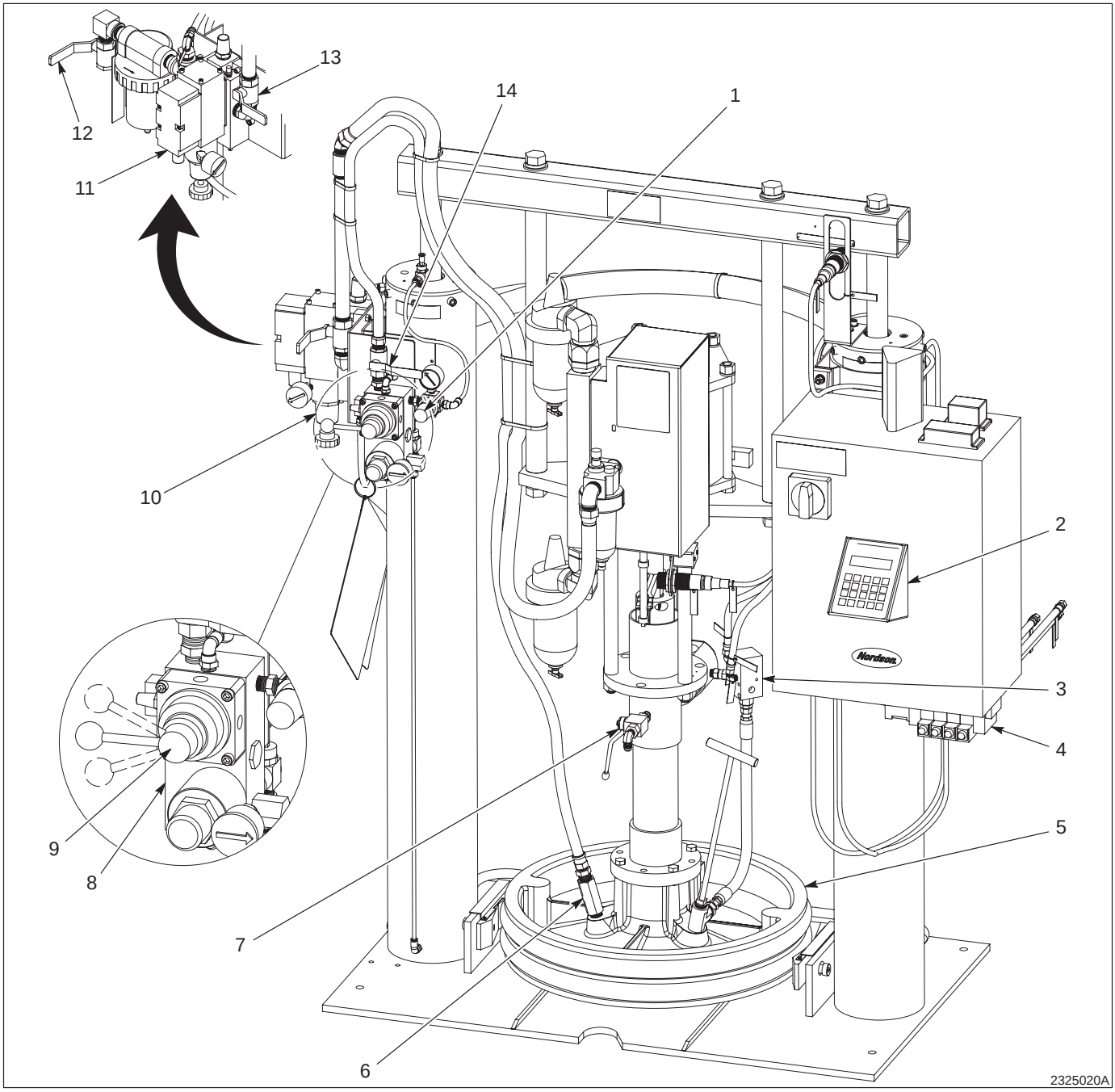


Fig. 7-1 GMT 360 Unloader Components

1. Elevator control regulator
2. Keypad
3. Depressurization module
4. Valves
5. Follower plate
6. Blow-off check valves
7. Bleed valve
8. Elevator/blow-off control module
9. Elevator control valve
10. Air motor regulator
11. Pneumatic solenoid
12. Main air supply valve
13. Air motor lockout valve
14. Blow-off valve

3. Preparing to Remove the Hydraulic Section

See Figure 7-1.

To perform pump repair procedures (located in the pump manual), you must remove the pump (hydraulic section) from the unloader frame.

Follow these procedures to prepare the system for pump removal:

NOTE: Follow the procedures in the pump manual to remove the follower and the hydraulic section from the air motor

1. Turn off the air motor lockout valve (13).
2. Turn off the material valve input to filter/mastic manifold stand.
3. Bleed the pump.

NOTE: The bleed stem must be in place when depressurizing the pump.

4. Depressurize the pump via the pump controller keypad (2).
5. Remove the container (UP elevator movement). Refer to the *Container Change* procedures in the *Operation* section.
6. Lower the follower plate (5) and block it.
7. Turn on low pressure at the air motor valve to stroke the pump and to gain access to the coupling. Turn off the valve when you can access the coupling.
8. Turn off the main air supply valve (12).
9. Place and leave the elevator in the NEUTRAL position.

4. Bleeding Air Pressure from the Air Cylinders

To prepare the air cylinders for the rebuild procedures located in the frame manual, you must relieve all the air pressure in the cylinders. Follow these procedures to isolate the drum frame air cylinders from all air pressure.

WARNING: The unloader frame can stay under pressure even when the unloader is disconnected. Be cautious and aware that air remains in the cylinders. Otherwise, serious personal injury can result.

See Figure 7-1.

1. Shut off the air motor lockout valve (13).

2. Remove the material container from beneath the raised follower plate (5). Refer to the *Container Change* procedures in the *Operation* section for more information.

3. Block the follower plate to prevent damage to the seals from the drum hold down shoes. To do this:

   a. Make sure that you have raised the follower plate and removed the material container.

   b. Place wooden blocks on the unloader frame. Make sure that the blocks won't tip over and are high enough to keep the follower plate from contacting the drum hold down shoes.

   c. Lower the follower plate until it is firmly settled on the wooden blocks.

4. Place the elevator control valve (9) in the NEUTRAL position.

5. Shut off the main air supply valve (12).

6. Shut off the main control cabinet.

See Figure 7-2.

7. Disconnect the push-lock air tubing (5) from the air fitting (RU) at the bottom of the left air cylinder (6). This will bleed the air pressure from below the piston.

8. Disconnect the push-lock air tubing (3) from the air fitting (RD) (2) at the top of the left air cylinder.

NOTE: Turn the fitting (2) away from you to prevent the escaping air from being aimed at your face in the next step.

9. Remove the tubing (4) from the pilot-operated check valve (1) at the top of the left air cylinder.

10. Apply shop air at the check valve to bleed residual air pressure from the air cylinder above the piston. Applying air opens the check valve and allows air to bleed through the air fitting.

5. Reinstating Air Pressure to the Cylinders

Follow these procedures to reinstate air pressure to the air cylinders and return your unloader to operation.

See Figure 7-1.

1. Place the elevator control valve (9) in the NEUTRAL position.

See Figure 7-2.

2. Connect the input air supply to the fittings (3, 4, 5).

See Figure 7-1.

3. Raise the follower plate (5) and remove the wood blocks from beneath the follower plate.

4. Replace the material container. Refer to the *Container Change* procedures in the *Operation* section for more information.

5. Turn the elevator controls regulator (1) and the air motor regulator (10) to their standard operating levels.

6. Turn on the air motor lockout valve (13).

6. Adjusting the Runaway Sensor

If you have to remove and adjust the placement of the runaway sensor for any reason, be sure to return the sensor to its original position in the middle of the pump stroke.

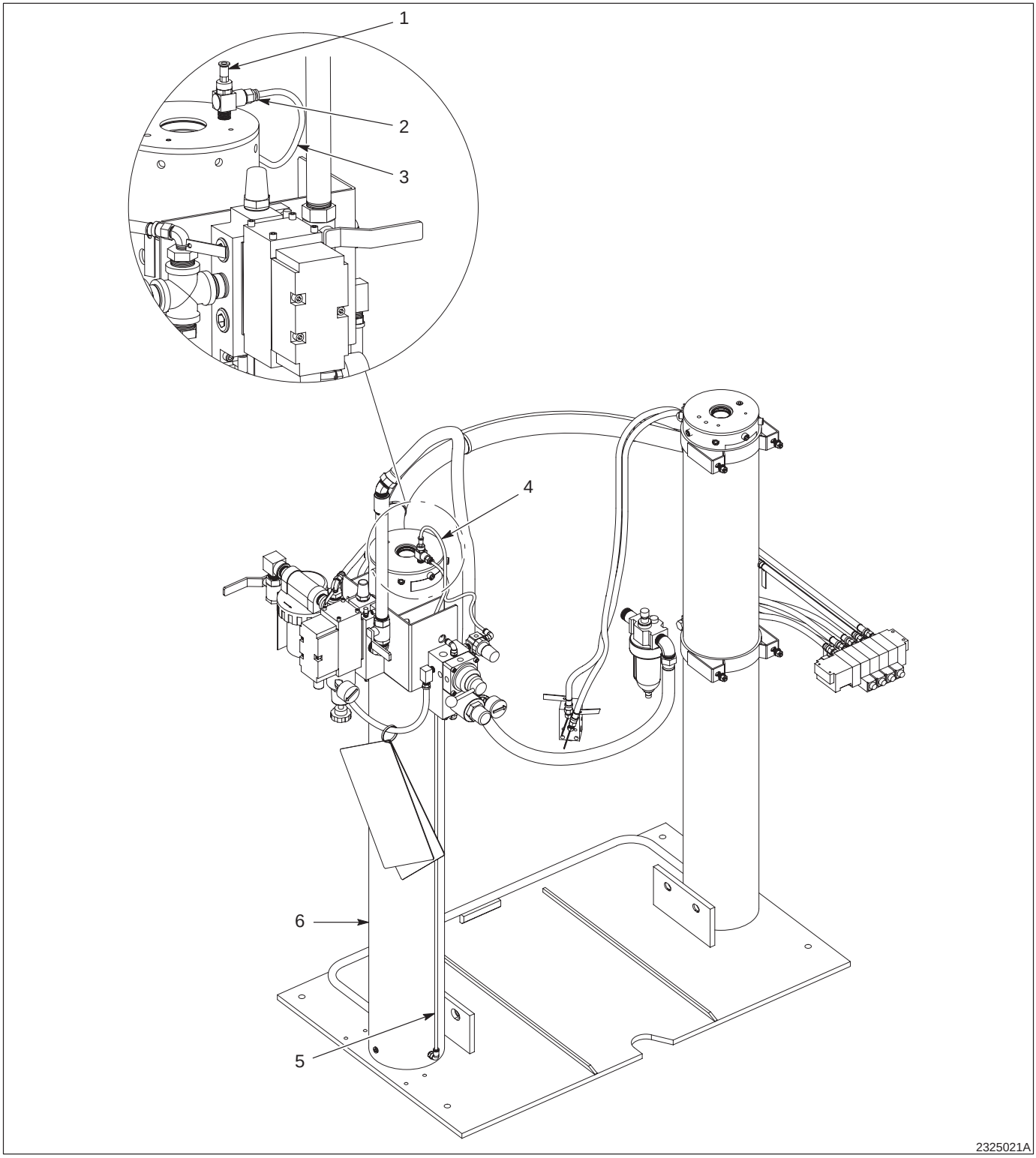


Fig. 7-2 Bleeding Residual Air from the Air Cylinders

1. Pilot-operated check valve
2. Air fitting
3. Air tubing
4. Air tubing
5. Air tubing
6. Air cylinder

Section 8

Parts

Section 8
Parts

1. Introduction

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

Using the Illustrated Parts List

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

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

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

Item	Part	Description	Quantity	Note
—	000 0000	Assembly	1	
1	000 000	• Subassembly	2	A
2	000 000	• • Part	1	

- 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.

2. Parts Lists

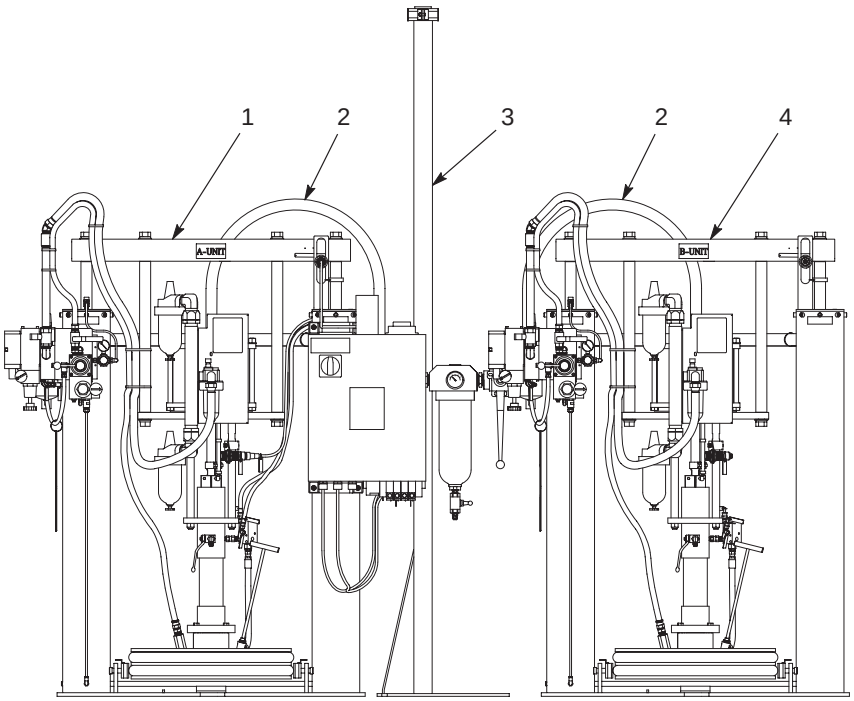
Parts lists pertain to both A- and B-Units unless otherwise noted.

GMT 360 Dual Unloader Parts

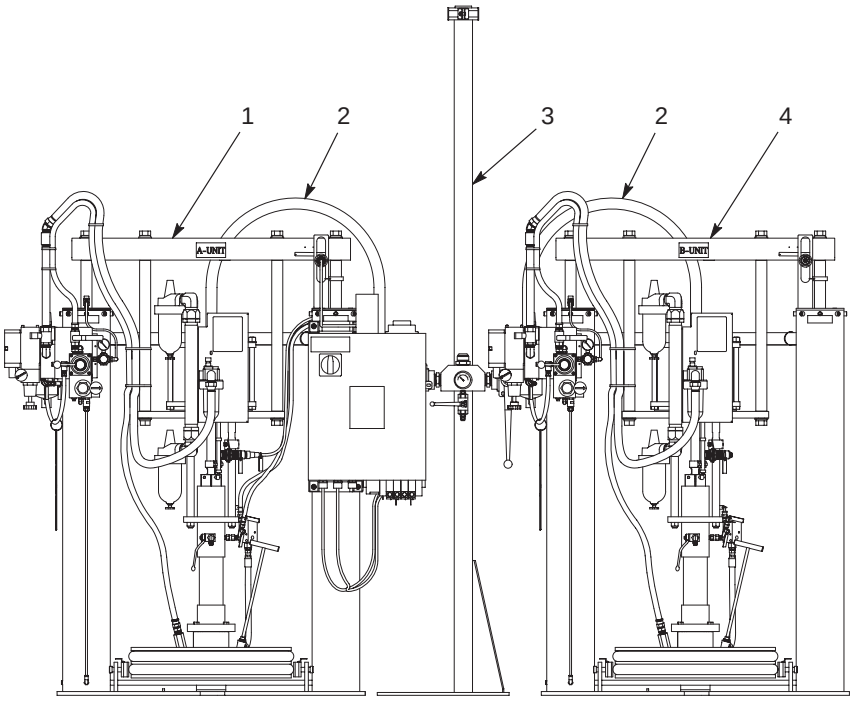
See Figure 8-1.

Item	Part	Part	Description	Quantity	Note
—	329 501		Dual unloaders, drum, GMT 360, 65:1, with filter	1	
—		329 502	Dual unloaders, drum, GMT 360, 65:1	1	
1	329 503		• Bulk unloader, 65:1 A-Unit, GMT 360 body with filter	1	
1		329 552	• Bulk unloader, 65:1 A-Unit, GMT 360 body	1	
2	329 584	329 584	• Hose, $1^{1}/_{2}$-in. x 6.00-in., 4000 psi, $1^{7}/_{8}$	2	
3	329 837		• Stand, hose, adhesive	1	
3		329 659	• Stand, hose, mastic	1	
4	329 504	329 504	• Bulk unloader, 65:1, B-Unit, GMT 360 body	1	
NS	329 765	329 765	• Tube fitting, male, 1.5 tube x 1.25 NPT	2	A
NS	900 481	900 481	• Adhesive,pipe/thread/hydraulic sealant	AR	B

NOTE A: This part connects to the output check valve on the rear view of each unloader.
B: Apply pipe/thread/hydraulic adhesive on all pipe threads.
AR: As Required
NS: Not Shown



A. Dual unloaders with filter



B. Dual unloaders with mastic stand

2325009A

Fig. 8-1 GMT 360 Dual Unloaders

Pneumatic Module Parts

See Figures 8-2 and 8-3.

This parts list details A- and B-Unit pneumatic module parts separately.

Item	Part	Part	Description	Quantity	Note
—	- - - - - -		Module, pneumatic, A-Unit	1	
—		- - - - - -	Module, pneumatic, B-Unit, GMT 360 body	1	
1	973 103	973 103	• Nipple, steel, sched 40, $^3/_4$, 1.37	3	
2	124 798	124 798	• Filter, $^3/_4$ NPT, 160 z, 250 psi	1	
3	973 262	973 262	• Bushing, pipe, hydraulic, $^3/_4$ x $^1/_4$, steel, zinc	2 or 1	A
4		973 442	• Plug, pipe, socket, flush, $^3/_4$, zinc	1	
5	329 830		• Connector, female, $^1/_4$ hose, $^1/_2$-20 barbed	6	
6	972 176		• Elbow, male, 37, $^1/_2$-20 x $^1/_4$, steel	1	
7	971 728	971 728	• Connector, male, $^1/_4$ tube x 10-32	1	B
8	335 498	335 498	• Valve, pilot operated check, $^1/_4$ NPT	1	
9	971 265	971 265	• Connector, male, $^1/_4$ tube x $^1/_4$ NPT	1	
10	900 730	900 730	• Tubing, polyurethane, 0.250 x 0.040	AR	
11	329 497	329 497	• Valve assembly, reg, manifold, valve	1	
12	- - - - - -	- - - - - -	• Connector, male sw, $^1/_4$ hose, $^1/_4$ NPT barbed	2	
13	973 002	973 002	• Nipple, steel, sched 40, $^1/_8$, 1.50	1	
14	805 652	805 652	• Hose, air $^1/_4$ ID	AR	
15	973 130	973 130	• Elbow, pipe, hydraulic, 90, $^1/_8$, steel, zinc	1	
16	972 215	972 215	• Connector, male, 37, $^7/_{16}$-20 x $^1/_8$ NPT, steel	1	
17	329 829		• Connector, female, $^1/_4$ hose, $^7/_{16}$-20 barbed	8	
18	973 969	973 969	• Cross, pipe, class 150, $^3/_4$, zinc	1	
19	- - - - - -	- - - - - -	• Coupling, pipe, class 150, $^3/_4$, ga	1	
20	973 140	973 140	• Elbow, male, 45 d, $^3/_4$ NPT x 1 1	1	

NOTE A: Order a quantity of 2 of this part for the A-Unit pneumatic components, part 329 555. Order a quantity of 1 of this item for the B-Unit pneumatic components, part 331 460.

B: Coat these parts with threadlocking adhesive, part 900 464.

AR: As Required

Continued on next page

Item	Part	Part	Description	Quantity	Note
21	124 795	124 795	• Fitting, hose, $^3/_4$ barb x $1^1/_{16}$	2	
22	124 792	124 792	• Hose, 0.75 ID, 200 psi	AR	
23	939 694	939 694	• Strap, cable, 0.06–4.00, natural	10	
24	320 792	320 792	• Label, cylinders energized	2	
25	973 411	973 411	• Plug, pipe, socket, flush, $^1/_4$, zinc	2	
26	972 583	972 583	• Elbow, male, 37, $1^1/_{16}$-12 x $^3/_4$, steel	1	
27	329 500		• Clamp, accumulator, 160–172 mm diameter	2	
28	981 353		• Screw, hex, $^5/_{16}$-18 x 1.250, cap, zinc	4	
29	983 051		• Washer,flat, e, 0.344 x 0.688 x 0.065, zinc	8	
30	983 150		• Washer, lock, e, split, $^5/_{16}$, steel, nickel	4	
31	984 140		• Nut, hex, reg, $^5/_{16}$-18, steel, zinc	4	
32	973 109	973 109	• Nipple, steel, sched 40, $^3/_4$, 2.00	1	
33	303 956	303 956	• Lubricator, micro mist, $^3/_4$ NPT	1	
34	971 266	971 266	• Elbow, male, 0.25 tube x 0.25 NPT	1	
35	329 498	329 498	• Valve, ball, lock, closed, exhaust	1	
36	- - - - - -	- - - - - -	• Nipple, pipe, $^3/_4$ NPT, 12.00 lg	1	
37	982 032	982 032	• Screw, socket, M6 x 30, black	2	B
38	124 851	124 851	• Muffler, $^3/_4$ NPT, 40 micron	1	
39	170 269	170 269	• Muffler, exhaust, $^1/_8$-in. NPT	1	
40	973 439	973 439	• Elbow, male, pipe, hydraulic, $^3/_4$ steel, zinc	1	
NS	900 464	900 464	• Adhesive, threadlocking	AR	
41	335 652		Valve, 4-way, $^1/_8$ NPT, DC	AR	C

NOTE A: Order a quantity of 2 of this part for the A-Unit pneumatic components, part 329 555. Order a quantity of 1 of this item for the B-Unit pneumatic components, part 331 460.

B: Coat these parts with threadlocking adhesive, part 900 464.

C: These valves are part of the GMT 360 pump controller. Order these valves as needed. Refer to the *GMT 360 Pump Controllers* parts list, in this section, for more information.

AR: As Required

NS: Not Shown

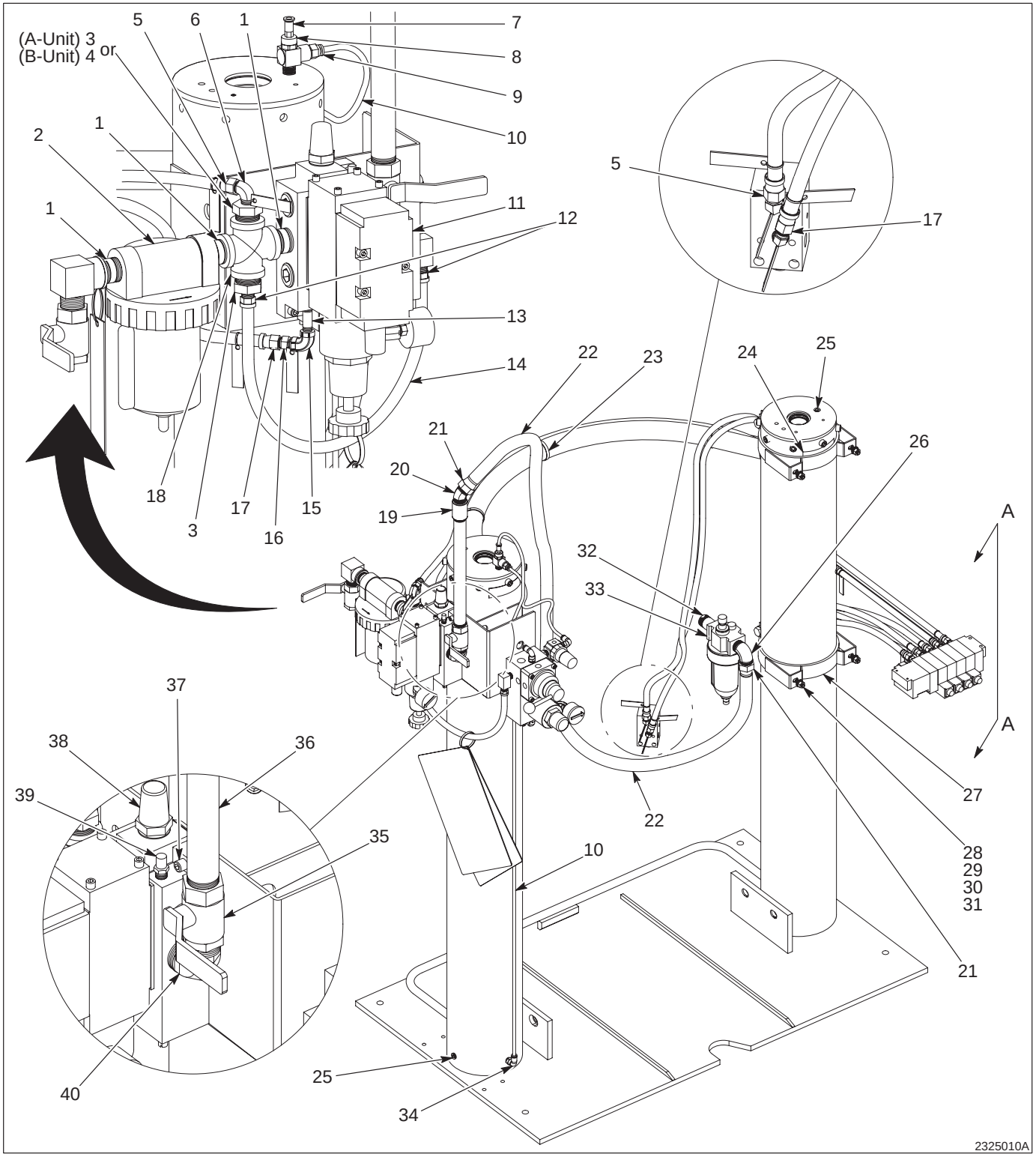


Fig. 8-2 Pneumatic Components

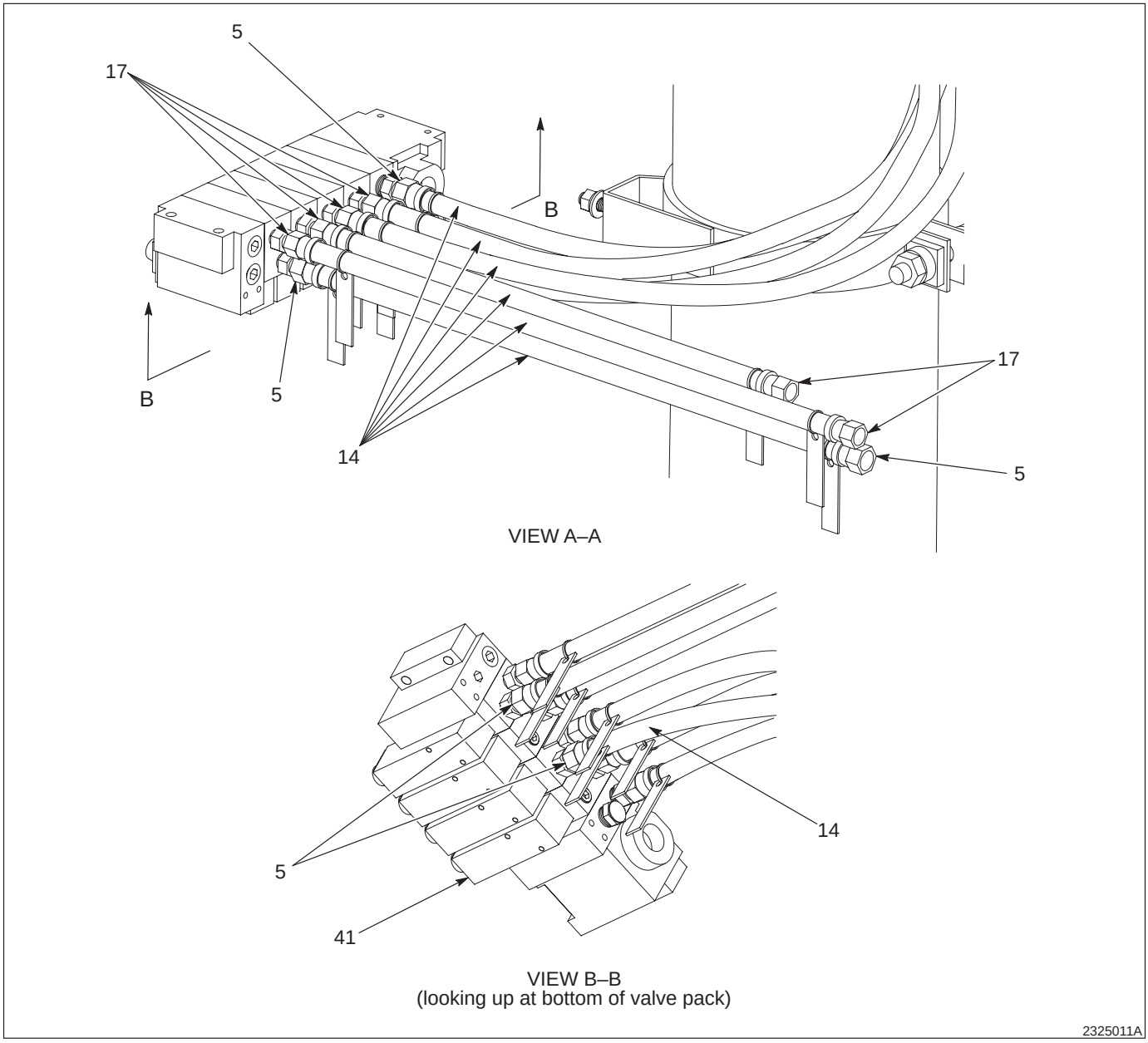


Fig. 8-3 Pneumatic Components

Manual Shut-Off Parts

See Figure 8-4.

Item	Part	Description	Quantity	Note
5	329 498	Valve, ball, lock, closed, exhaust	1	
6	973 226	Elbow, pipe, hydraulic, 90, $^{3}/_{4}$, steel, zinc	1	A
NS	900 481	Adhesive, pipe/thread/hydraulic sealant	AR	

NOTE A: Apply pipe/thread/hydraulic adhesive, part 900 481, to this part.
AR: As Required
NS: Not Shown

Empty/Limit Bracket Parts

See Figure 8-4.

Item	Part	Description	Quantity	Note
1	983 013	Washer, flat, M, reg, 8, steel, zinc	2	
2	982 035	Screw, socket, M8 x 16, black	2	A
3	329 508	Bracket, sensor proximity, GMT 360	1	
4	332 947	Switch, proximity, 4-pin Euro, PNP	1	
NS	900 439	Adhesive, threadlocking	AR	

NOTE A: Apply threadlocking adhesive, part 900 439, to this part.
AR: As Required
NS: Not Shown

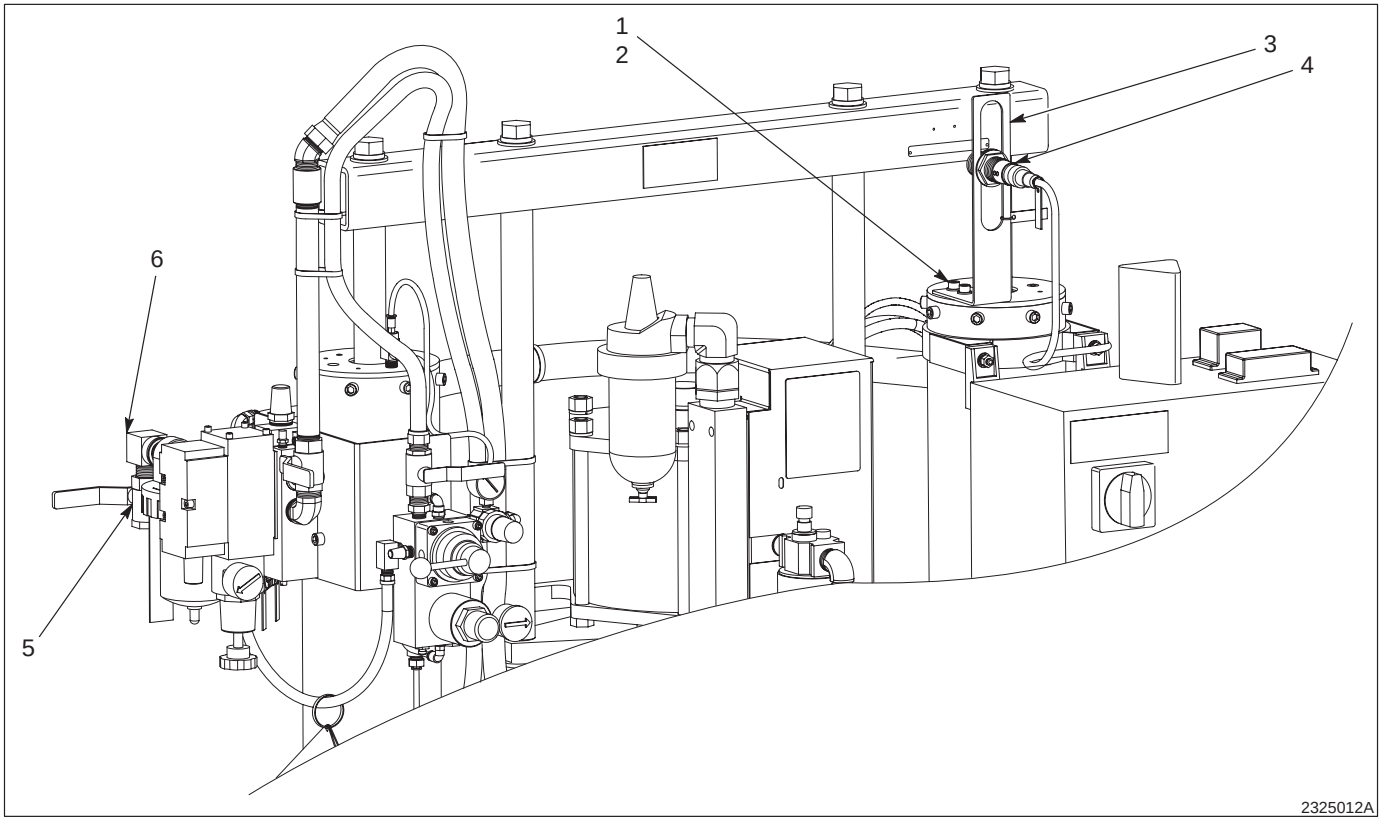


Fig. 8-4 Manual Shut-Off and Empty/Limit Bracket Components

Support Assembly Parts

See Figure 8-5.

Item	Part	Description	Quantity	Note
1	329 507	Bracket, valve assembly, GMT 360	1	
2	981 561	Screw, socket, $^3/_8$-16 x 1.000, zinc	4	A
NS	900 464	Adhesive, threadlocking, removable	AR	

NOTE A: Apply removable threadlocking adhesive, part 900 464, to this part.
AR: As Required
NS: Not Shown

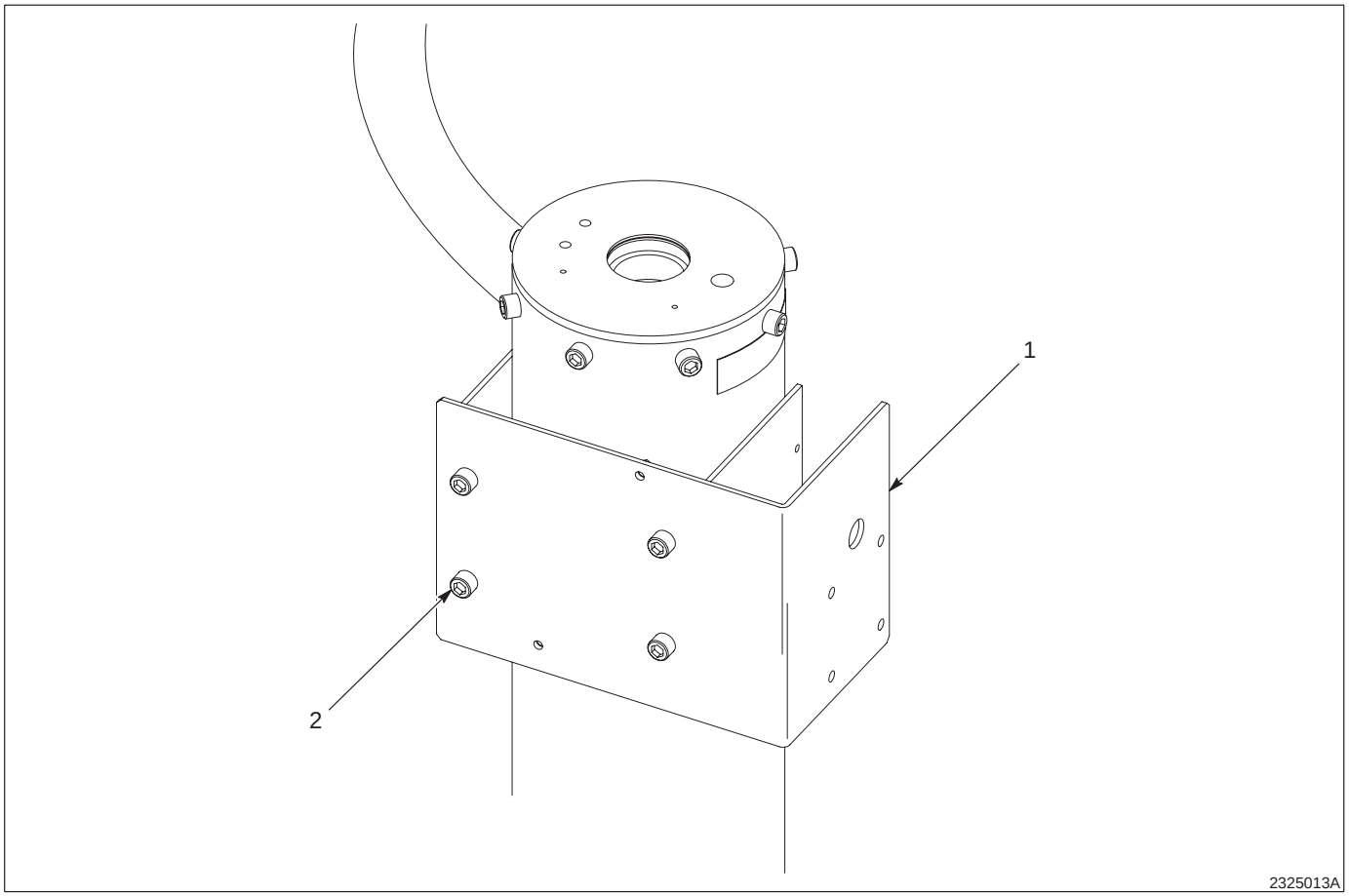


Fig. 8-5 Support Assembly

Elevator/Blow-off Control Module Parts

See Figures 8-6 and 8-7.

Item	Part	Description	Quantity	Note
—	- - - - - -	Module, elevator/blow-off control	1	
1	939 694	• Strap, cable, 0.06–4.00, natural	3	
2	939 171	• Strap, cable, 0.18–4.00, natural	2	
3	973 151	• Elbow, pipe, hydraulic, 90, $^1/_4$, steel, zinc	1	
4	973 973	• Nipple, hex, $^1/_2$ x $^3/_8$ x 1.625, brass	1	
5	901 151	• Valve, ball, $^1/_2$ NPT	1	
6	972 708	• Connector, male, $^1/_2$ hose, $^1/_2$ NPT, barbed	1	
7	805 652	• Hose, air, $^1/_4$ ID	AR	
8	124 790	• Gage, 0–160 psig, $^1/_8$ NPT	1	
9	126 767	• Regulator, air, 0–60, $^1/_4$ NPT	1	
10	972 119	• Elbow, male, $^1/_4$ tube x $^1/_8$ NPT	1	
11	320 821	• Control unit, pneumatic, elevator/blow-off	1	
12	972 903	• Muffler, exhaust, $^1/_4$ NPTF	1	
13	320 859	• Stem, bleeder, follower, long	1	
14	973 076	• Nipple, steel, sched 40, $^1/_2$, 1.12	1	
15	332 925	• Valve, check, 1.5 psi, $^1/_2$-in. NPT	1	
16	972 108	• Connector, male, 37, $^3/_4$-16 x $^1/_2$, steel	1	
17	972 024	• Connector, female, $^1/_2$ hose, $^3/_4$-16, barbed	1	
18	805 652	• Hose, air, $^1/_4$ ID	AR	
19	973 037	• Nipple, hex, $^1/_4$ x $^1/_4$ x 1.45, steel, zinc	1	
20	324 833	• Screw, hex, cap, M6 x 16, zinc	4	

Continued on next page

Item	Part	Description	Quantity	Note
21	983 409	• Washer, lock, m, split, M6, steel, zinc	4	
22	983 410	• Washer, flat, m, narrow, M6, steel, zinc	4	
23	971 728	• Connector, male, $^1/_4$ tube x 10-32	1	
24	320 790	• Valve, pilot, operated check, $^3/_8$ NPT	1	
25	973 520	• Coupling, pipe, hydraulic, $^3/_8$, steel, zinc	1	
26	971 672	• Connector, male, $^1/_4$ tube x $^3/_8$ NPT	1	
27	228 426	• Nipple, hex, $^3/_8$ x $^1/_4$ x 1.41, brass	1	
28	971 266	• Elbow, male, 0.25 tube x 0.25 NPT	2	
NS	900 481	• Adhesive, pipe/thread/hydraulic sealant	AR	A
NS	900 439	• Adhesive, threadlocking	AR	B

NOTE A: Apply pipe/thread/hydraulic sealant on the check valve (15) and all pipe threads during assembly.

B: Apply threadlocking adhesive the the follower when installing elevator/blow-off control module components.

AR: As Required

NS: Not Shown

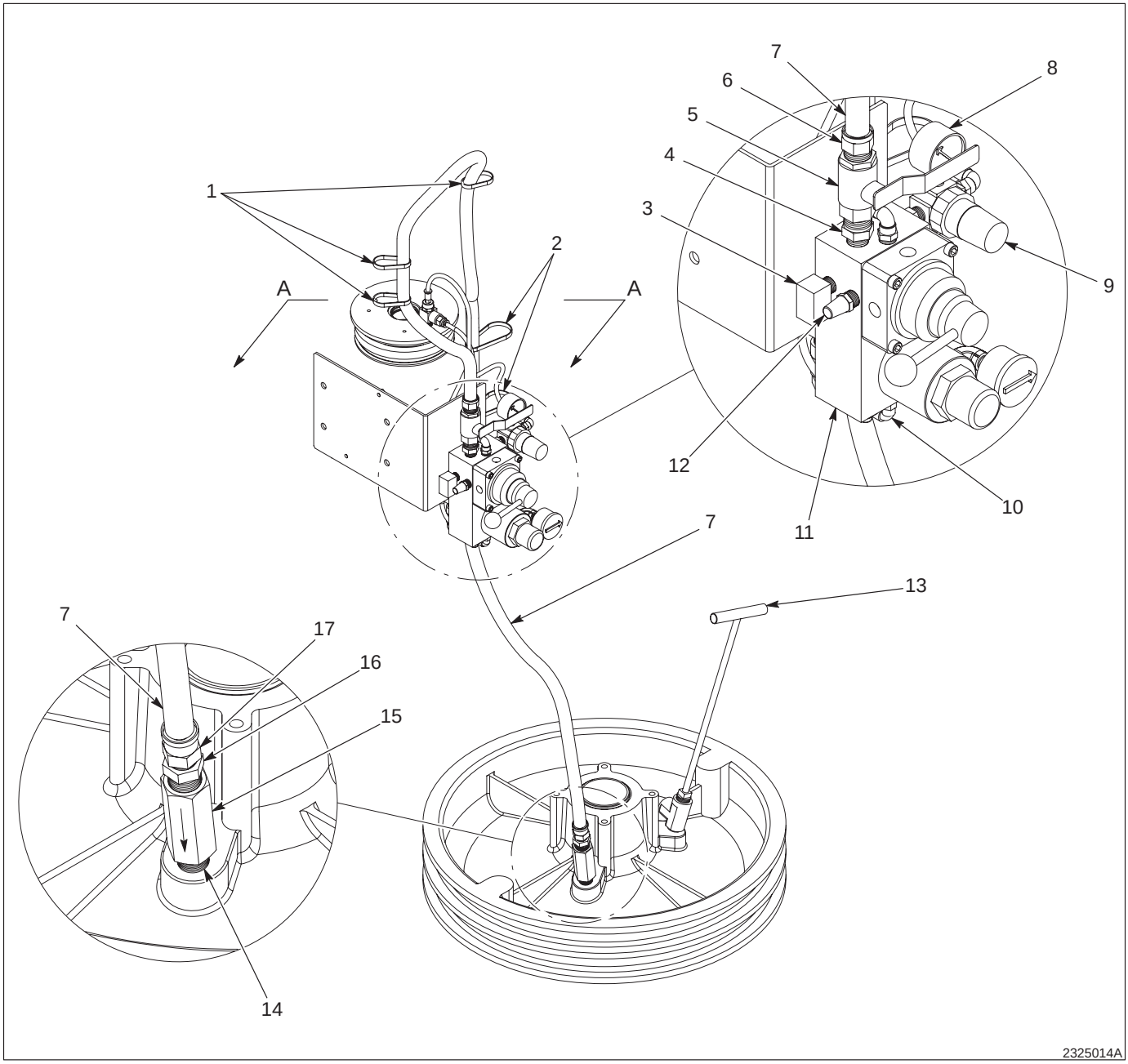


Fig. 8-6 Elevator/Blow-Off Control Module

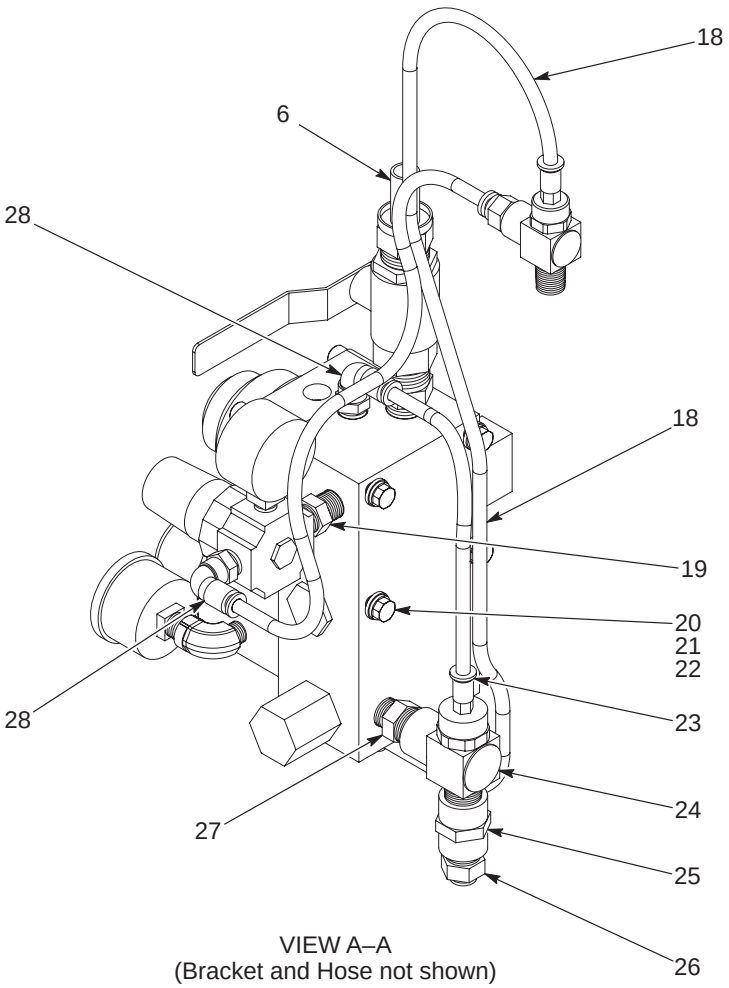


Fig. 8-7 Elevator/Blow-Off Control Module

GMT 360 Pump Controllers Parts

See Figure 8-8.

Most available replacement parts for the GMT 360 pump controllers are the same regardless of whether or not your pump controller has a filter.

Item	Part	Description	Quantity	Note
—	327 177	Controller, dual unloader, with filter	1	
—	327 345	Controller, dual unloader	1	
1	327 387	• Light source, amber LED light tower	1	
2	327 385	• Lens, amber for light tower	1	
3	335 503	• Base unit, mini direct panel mount	1	
4	341 371	• Display, Microview operator panel, with software	1	
5	341 377	• Sloped mounting bracket for display	1	
6	341 378	• Station 1–4, with terminal strip	1	
NS	335 652	• • Valve, 4-way, $^1/_8$ NPT, DC	4	A
7	341 374	• Cable, 4-pin micro, 6-m	3	
8	341 376	• Cable, 5-pin mini, 20-ft, filter	1	B
9	341 375	• Cable, 4-pin micro, 4-m	1	
10	341 385	• Fuse, time delay, 2 amp	1	
11	341 372	• Power supply, 24 Vdc at 2 amp	1	
12	341 384	• Fuse, class CC, time delay, 2 amp	1	
13	282 446	• Relay, DPDT 10A	3	
14	341 359	• Micrologix programmable control, with software	1	
15	235 935	• Cable, Microview to Micrologix	1	

NOTE A: This part is shown in Figure 8-3. You can order individual spare valves or the 4-valve assembly with the terminal strip.

B: This part is only used with the dual unloader pump controller with filter, part 327 177.

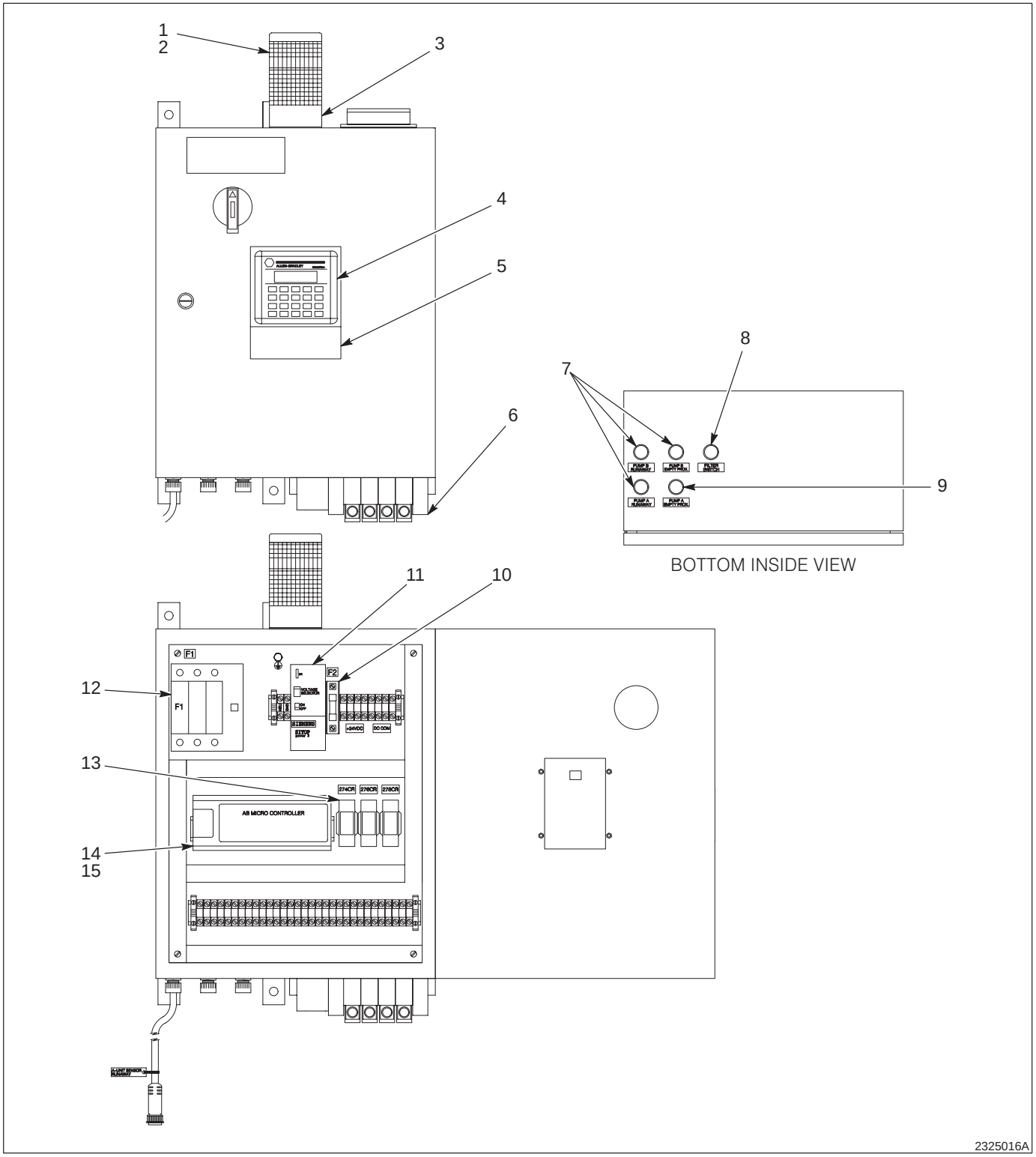


Fig. 8-8 GMT 360 Pump Controllers

Drum Hold Down Kit

See Figure 8-9.

Drum hold down brackets hold the material container in place during elevator UP movement.

Item	Part	Description	Quantity	Note
—	282 774	Kit, drum hold down	1	A
1	230 607	• Screw, socket head, shoulder	4	B
2	807 230	• Spring	4	
3	807 231	• Holder, drum	2	
4	807 232	• Cover	2	
5	981 014	• Screw, pan head, #4-40 x 0.250, steel, zinc	4	
NS	900 464	• Adhesive, threadlocking	AR	
6	- - - - - -	Flange, frame assembly	2	C

NOTE A: If your old drum hold down kit used washers, discard them before installing the new hold down kit.

B: Apply threadlocking adhesive to this part during reassembly.

C: The flanges are part of the frame assembly and are shown for reference purposes only. Only one flange is shown in the figure.

AR: As Required

NS: Not Shown

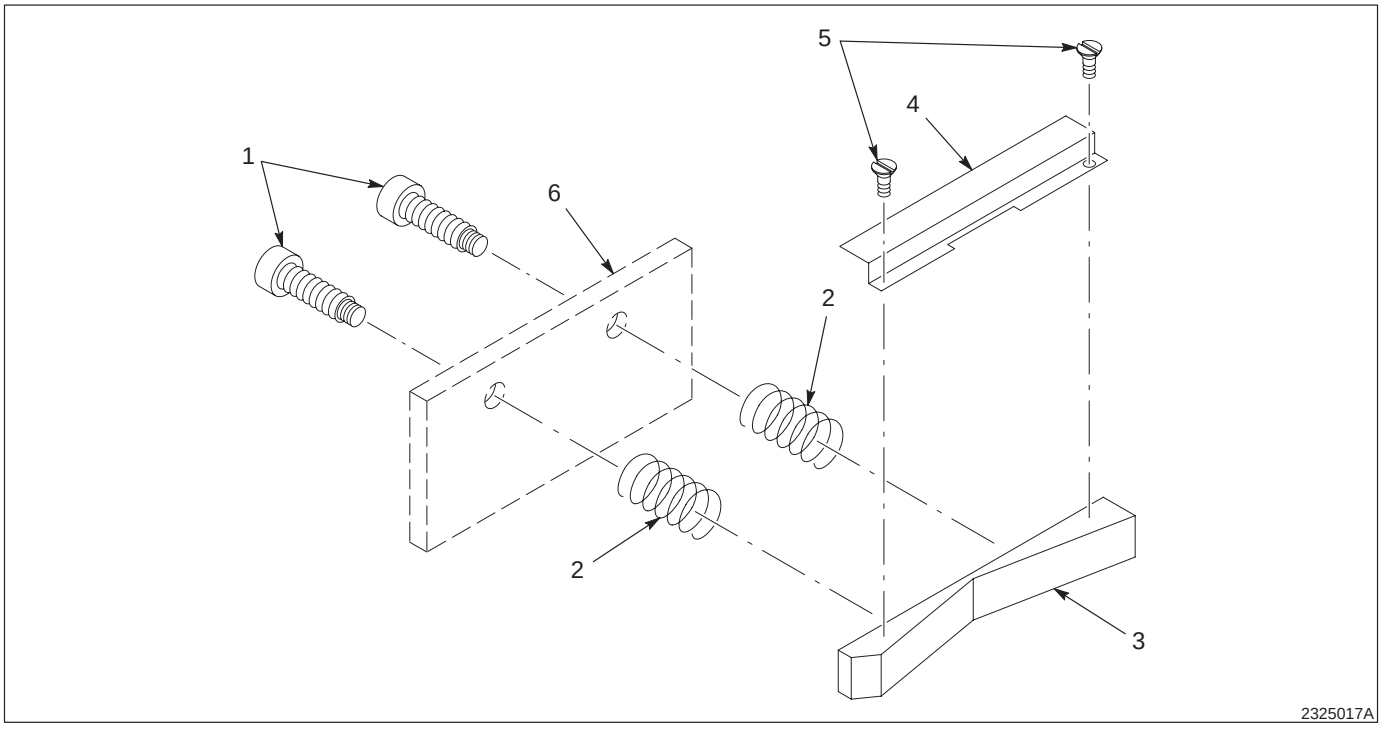


Fig. 8-9 Drum Hold Down Kit

Check Valve

See Figure 8-10.

Output check valves are used to make sure that the pump does not stroke without material present.

Item	Part	Description	Quantity	Note
—	221 941	Module, check valve, $1^1/_4$ NPT	1	
10	124 935	• Valve, check, ball, $1^1/_4$ NPTF	1	A
11	322 822	• Pipe fitting, $1^1/_4$ m x $1^1/_4$ f, steel, zinc	1	A
NS	900 481	• Adhesive, pipe/thread/hydraulic sealant	AR	

NOTE A: Coat these parts with pipe/thread/hydraulic sealant, part 900 481.
AR: As Required
NS: Not Shown

Depressurization Module Parts

See Figure 8-10.

Item	Part	Description	Quantity	Note
—	329 561	Module, depressurization	1	
1	972 151	• Elbow, male, 37, $^7/_{16}$-20 x $^1/_8$, steel	1	A
2	329 740	• Elbow, male, 37 degrees, $^1/_2$-20 x $^1/_8$ NPT, steel	1	A
3	238 418	• Gun, Auto-Flo, standalone, polymyte	1	B
4	281 334	• Adapter, $^9/_{16}$-18 JIC, $^3/_8$ NPSM	1	
5	329 565	• Hose, -6 JIC 37, $^3/_8$ x 18-in.	1	
6	972 771	• Connector, male, 37, $^9/_{16}$-18 x $^1/_2$, steel	1	A
7	973 547	• Tee, street, s, $^1/_2$ NPT	1	
8	329 588	• Connector, 45, hose, $^9/_{16}$-18 x $^9/_{16}$-18	1	
9	973 560	• Swivel, 37, $^9/_{16}$-18 x $^1/_4$, zinc	1	A
NS	900 439	• Adhesive, threadlocking	AR	C
NS	900 481	• Adhesive, pipe/thread/hydraulic sealant	AR	

NOTE A: Coat these parts with pipe/thread/hydraulic adhesive, part 900 481.
B: Order the packing cartridge rebuild kit, part 239 788, if you need to replace the packing cartridge instead of ordering a new gun.
C: Use this adhesive to coat the pipe thread that threads into the follower.
AR: As Required
NS: Not Shown

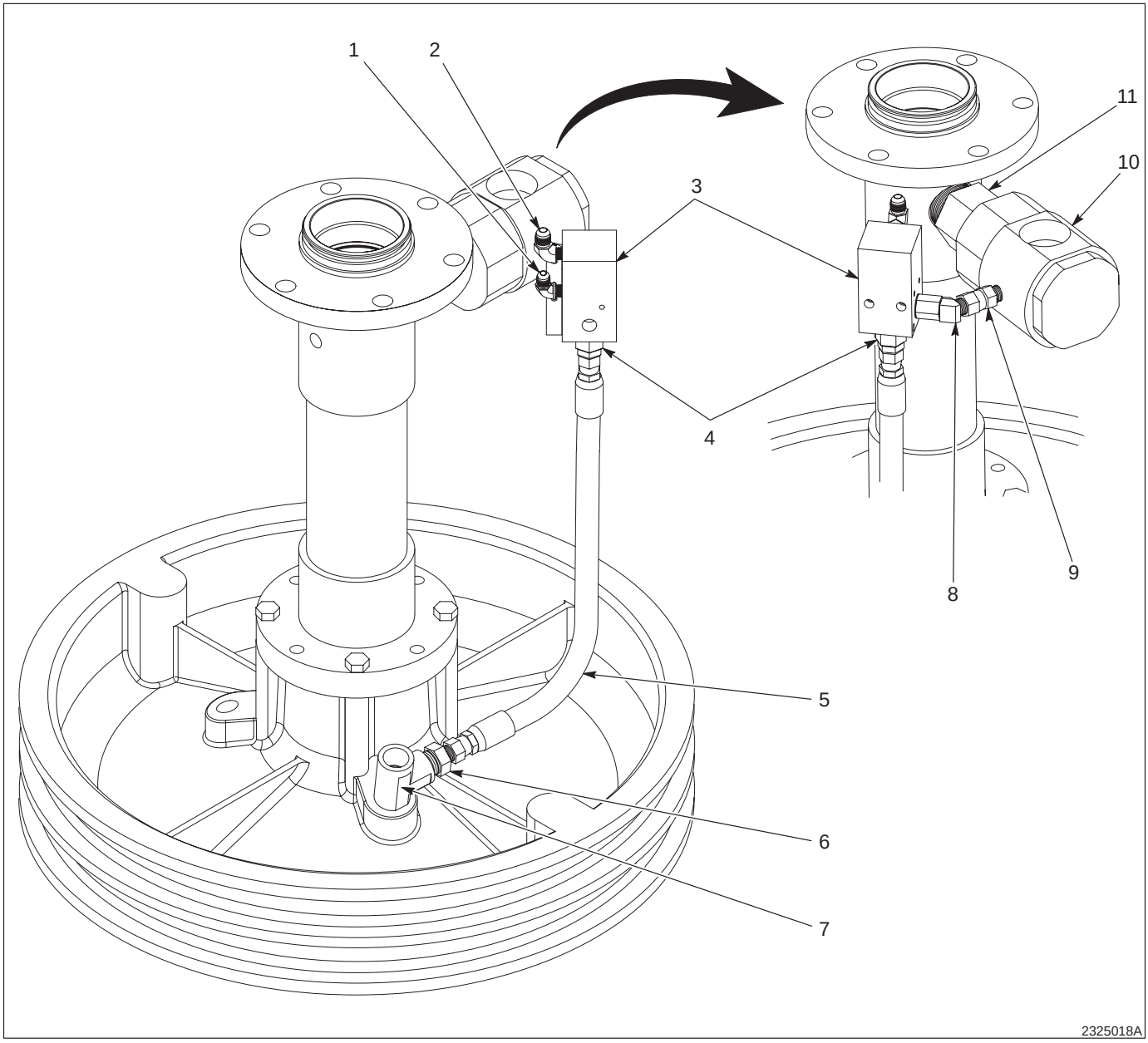


Fig. 8-10 Check Valve and Depressurization Components

Runaway Valve Parts

See Figure 8-11.

Item	Part	Description	Quantity	Note
—	329 557	Module, runaway	1	
4	239 729	• Bracket, sensor, runaway	1	
5	295 803	• Clamp, 1-in. tube, stauff, special	1	
6	332 947	• Switch, proximity, 4-pin, Euro, PNP	1	

Exhaust Module Parts

See Figure 8-11.

Item	Part	Description	Quantity	Note
—	295 788	Module, exhaust, reclassifier	1	
1	295 796	• Muffler, reclassifier, 1 NPT	1	
2	295 797	• Connector, swivel, $1^1/_4$ FJIC x $1^1/_4$ m	1	
3	295 798	• Elbow, male, 37, $1^5/_8$-12 x 1 NPTF-16	1	

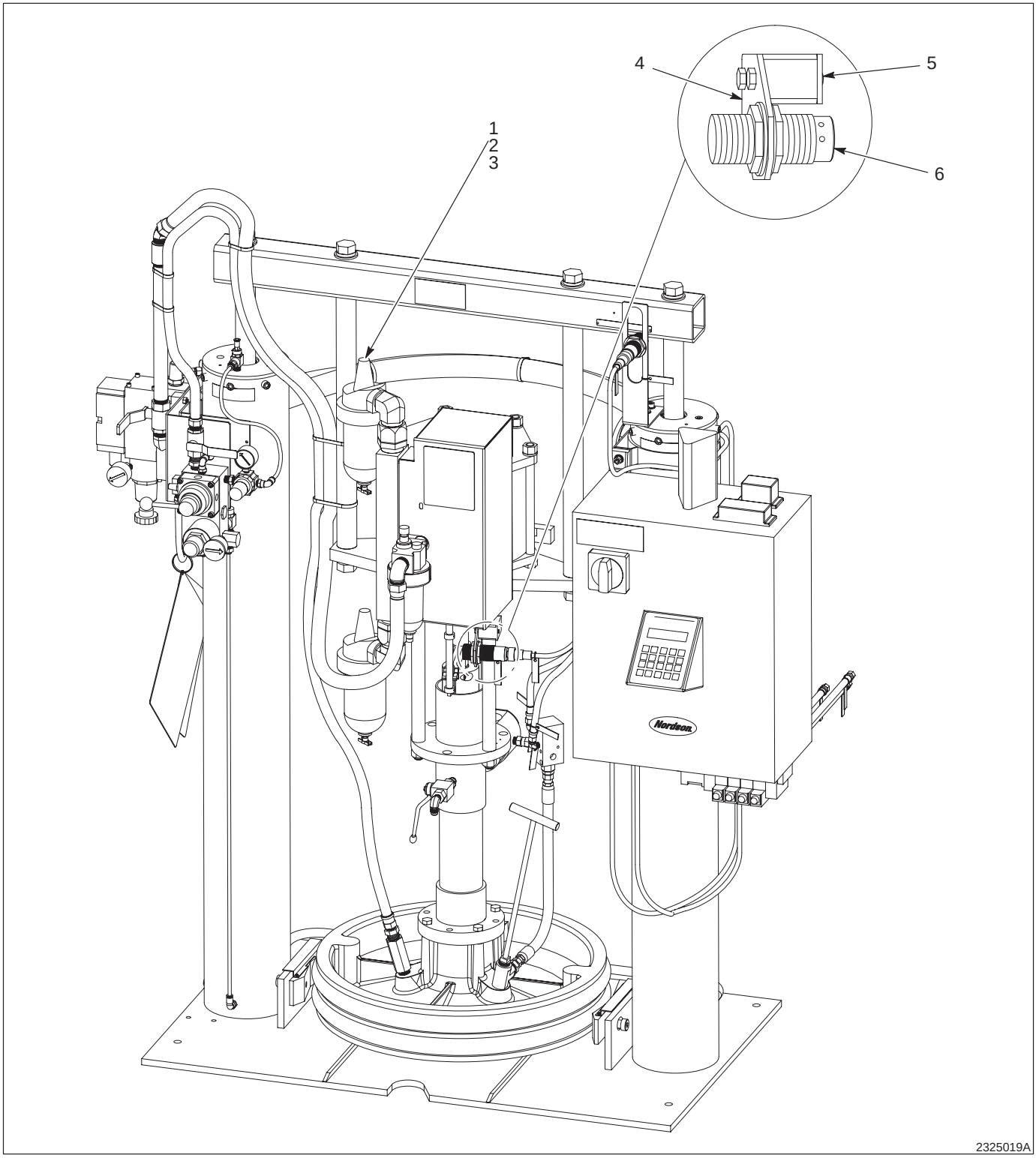


Fig. 8-11 Runaway Valve and Exhaust Components

Filter Kits

Certain Rhino unloaders are installed with a material filter mounted on a separate stand. This filter contains an element that must be changed periodically, as needed.

Part	Description	Note
178 491	Kit, element, with O-rings, 60 mesh	

Accessory Kit

This kit is shipped with the unloaders.

Item	Part	Description	Quantity	Note
—	124 747	Accessory group, ship with kit	1	
NS	900 216	• Oil, vitalizer, 1-gal	1	A
NS	900 256	• Fluid, type K, pump chamber, 1-gal	1	B
NS	900 302	• Grease, high temperature	1	
NS	900 215	Oil, vitalizer, 1-qt	AR	A
NS	900 255	Fluid, type K, pump chamber, 1-qt	AR	B

NOTE A: Vitalizer oil is used in the air motor lubricator. You can purchase vitalizer oil by the quart or the gallon.

B: Type K solvent chamber fluid is used in the solvent chamber of the pump. You can purchase Type K solvent chamber fluid by the quart or the gallon.

AR: As Required

NS: Not Shown