Rhino® SD2/XD2 Type-H Follower Modules

Customer Product Manual
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For parts and technical support, call the Industrial Coating Systems Customer Support Center at (800) 433-9319 or contact your local Nordson representative.

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Contact Us

Nordson Corporation welcomes requests for information, comments, and inquiries about its products. General information about Nordson can be found on the Internet using the following address: http://www.nordson.com.

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Nordson Corporation
Attn: Customer Service
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Amherst, OH 44001

Rhino® SD2/XD2 Type-H Follower Modules

Safety

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.

Fire Safety *(contd)*

- 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.

Water Requirements for Temperature Conditioning

The temperature conditioning section is constructed of the following materials. Always refer to this list if different water, corrosion inhibitors or biocides other than those listed in the following sections are used.

Black Iron Pipe	Stainless Steel	Nylon
Brass	PVC Plastic	Copper
Buna Rubber	Aluminum	Polyurethane
Steel	Viton®	PTFE

Water Types

Refer to Table 1. To minimize the introduction of contaminants that may degrade system components, review these guidelines before selecting the type of water to use.

NOTE: Water types are listed in order of preference.

Corrosion Levels

To maintain proper performance, minimum levels of corrosion to aluminum and copper must be maintained. To maintain safe operation keep the corrosion levels of

- aluminum at or below 3 mil/year (0.003 in./yr).
- copper at or below 1 mil/year (0.001 in./yr).

When adding water to the system, corrosion inhibitor must be added. CorrShield MD405 corrosion inhibitor is shipped with temperature-conditioned systems. This is a Molybdate-based corrosion inhibitor that contains an Azole additive to protect copper and is used in the concentration of 1.5 ounces per gallon of water to maintain a concentration of 250–350 ppm.

The Ford Tox number for CorrShield MD 405 is 149163.

The GM FID number for CorrShield MD 405 is 225484.

Refer to the *Parts* section to order CorrShield MD 405.

Biocide Water Treatment

Do not use the following Biocides:

- oxidizers, such as chlorine, bromine, hydrogen peroxide, iodine, ozone, etc.
- cationic, or positively charged biocides.

Biocides for use with CorrShield MD405 are BetzDearborn Spectrus NX114. The recommended concentration of Spectrus NX114 is 150–PPM which is 0.017 oz./gal (0.5 ml/gal).

The Ford Tox Number for Spectrus NX114 is 148270.

Table 1 Water Types

Water	Description
1. **Distilled**	No minerals and chemicals Lacks the nutrients necessary to support biological growth and the minerals that wear away at system components Neutral nature reduces interaction with additives used to protect the system **NOTE** Distilled water is the best choice for use in the temperature conditioning section.
2. **Well**	Contains an abundance of minerals that can support plant and animal life Contains minerals like calcium and iron that are abrasive; accelerates wear and tear on components **NOTE** If well water is the only option available, it must be softened to reduce the mineral content.
3. **City**	Contains chlorine that can degrade all metals including stainless steel Hard on most non−metals Usually contains an abundance of minerals that are capable of supporting plant and animal life; accelerates wear on components
4. **Weld (Tower)**	Often heavily treated both for bacterial suppression and to make it more compatible with the welding and cooling tower processes Treatment process usually involves some aggressive chemicals that can degrade metals, plastics and other materials Usually contains an abundance of metals and other contaminants picked up from the welding and cooling tower processes that can interfere with the components of the temperature control system
5. **DI**	**! CAUTION !** Do not use DI water in this system. DI water draws free electrons from metal to normalize ion levels. This process causes degradation of metals.

Description

See Figure 1. The Rhino® SD2/XD2 Type-H follower module attaches onto the hydraulic section of the pump (5) and is designed to force material out of straight-sided containers. Standard (A), temperature-conditioned (B), and PTFE-coated steel ring (C) modules are available.

The standard and temperature-conditioned follower plates (3) have two rubber seals. When the follower plate is lowered into a container, the rubber seals cause the material to pressurize by creating a tight seal around the ID of the container. When the pump cycles, the follower plate forces the material out of the container and into the pump hydraulic section. The rubber seals also protect the material from moisture and contamination.

The temperature-conditioned follower module has inlet and outlet water ports (6) for temperature control unit connections. Refer to the *Water Requirements for Temperature Conditioning* section on page 5 for information about the types of water to use with this follower module.

The PTFE-coated steel ring follower module does not use rubber seals. A PTFE-coated steel ring (7) is used for pumping high-viscosity urethane materials that are shipped in foil bags. It is sized for a close-tolerance fit to the ID of the container. The ring collapses the foil bag to prevent it from getting wedged between the follower plate module and the container wall.

Lowering the follower plate module into a container will cause air buildup between the bottom of the follower plate (3) and the material. Removing the bleeder stem (2) from the adapter (4) before lowering the follower plate provides a path for the air to vent.

The blow-off tube (1) allows air to enter the area below the follower plate. The blow-off air hose from the bulk unloader connects to the blow-off tube fitting. When the elevator is in the *Up* position and the blow-off valve is triggered, air flows under the follower plate. This pressure forces the container off of the follower plate.

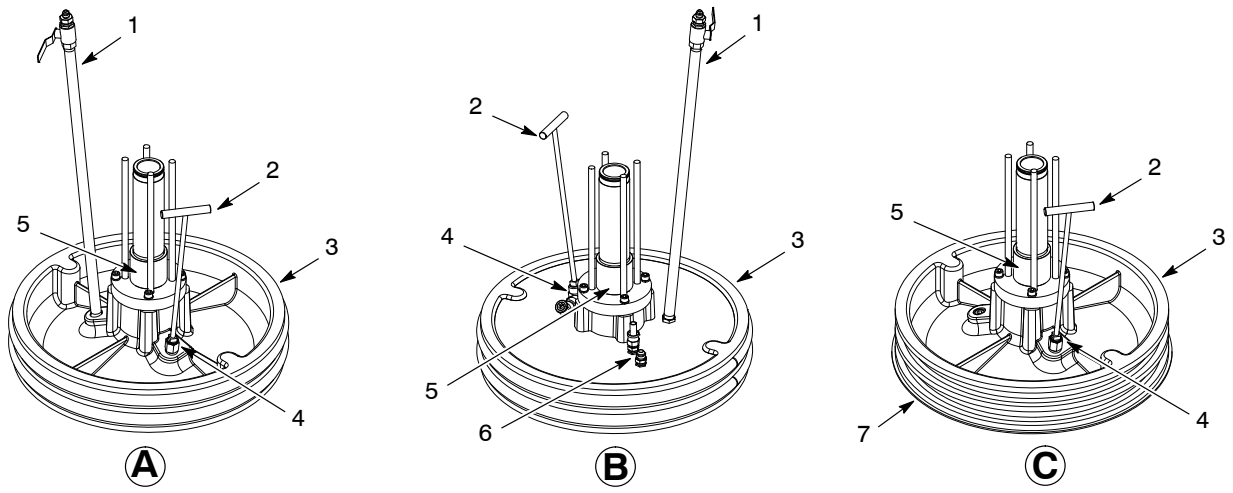

Figure 1 Type-H 55-Gallon Follower Modules

1. Blow-off tube
2. Bleeder stem
3. Follower plate
4. Bleeder stem adapter
5. Pump
6. Temperature-conditioned inlet/outlet port
7. PTFE-coated steel ring

Replacing the Follower Plate Seals

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

NOTE: If the material container needs to be removed from the unloader, it is important to remember that the *Neutral* setting on the elevator control valve is not a locked and secured position.

Refer to Table 2 for the required items to perform the repair procedure.

Table 2 Required Items

Item	Use
Support blocks	Prevents air cylinder pistons from drifting downward during repairs
Two large screwdrivers or tire irons	Pries follower plate seals off the follower plate **NOTE:** Follower plate seals are removed in the same manner as a tire from a rim
O-ring grease	Lubricates new follower plate seals **NOTE:** O-ring grease must be compatible with material being pumped and the new follower plate seals

See Figure 2.

1. If installed, remove the material container from the unloader.
2. Insert support blocks (2) between the frame cross bar (1) and the top of both air cylinders (3).
3. Use either large screwdrivers or tire irons to pry the follower plate seals (5) off of the follower plate grooves (4).
4. Inspect the neoprene bands (6) on the follower plate (4) for damage and replace if necessary.
5. Install the new follower plate seals (5) using either large screwdrivers or tire irons.
6. Apply a compatible O-ring grease to the follower plate seals (5).
7. Remove the support blocks (2) from the unloader. Put the unloader back into service if desired.

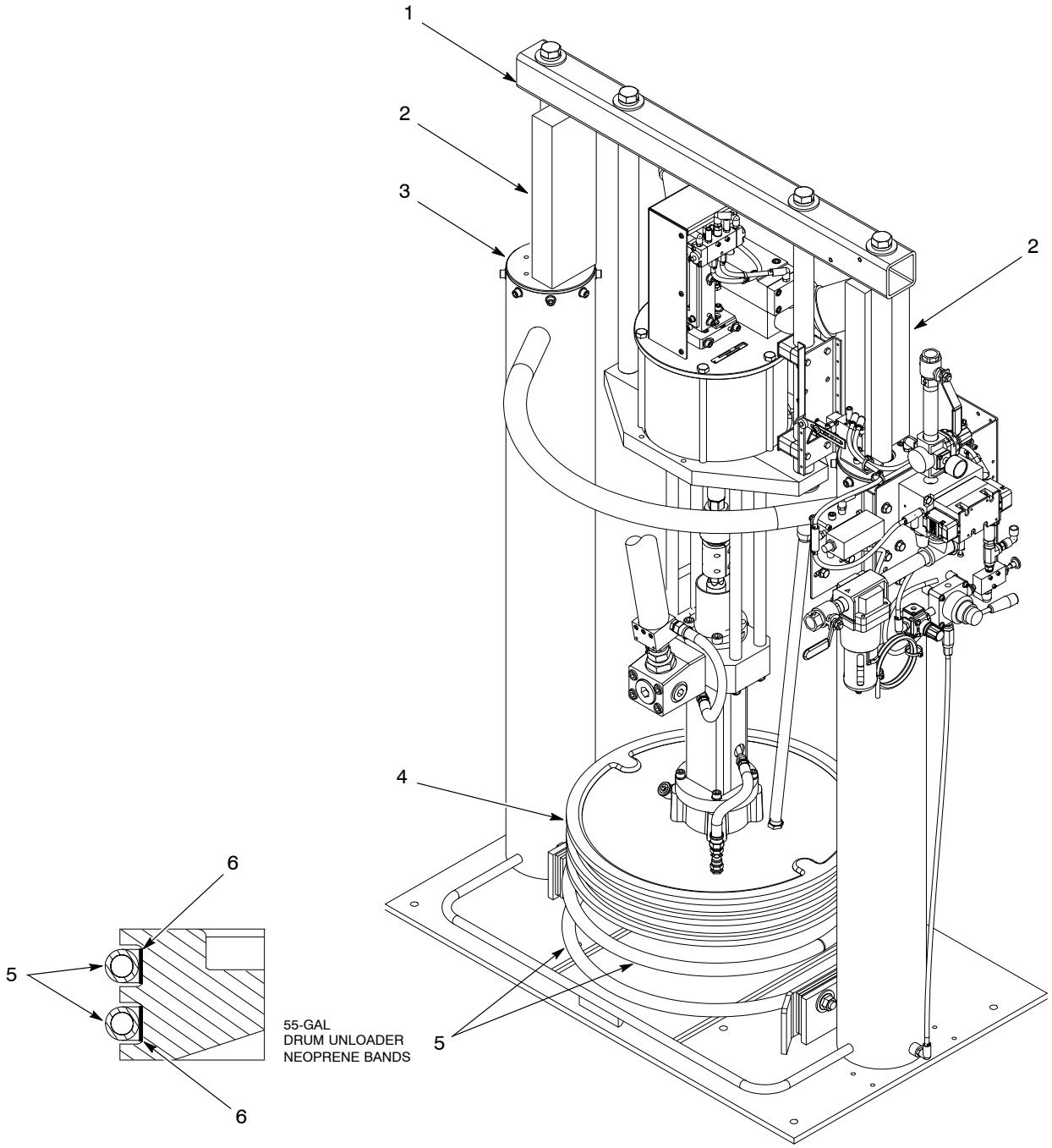

Figure 2 Replacing the Seals

Parts

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

55-Gal Standard Follower Module

See Figure 3 and refer to the following parts list.

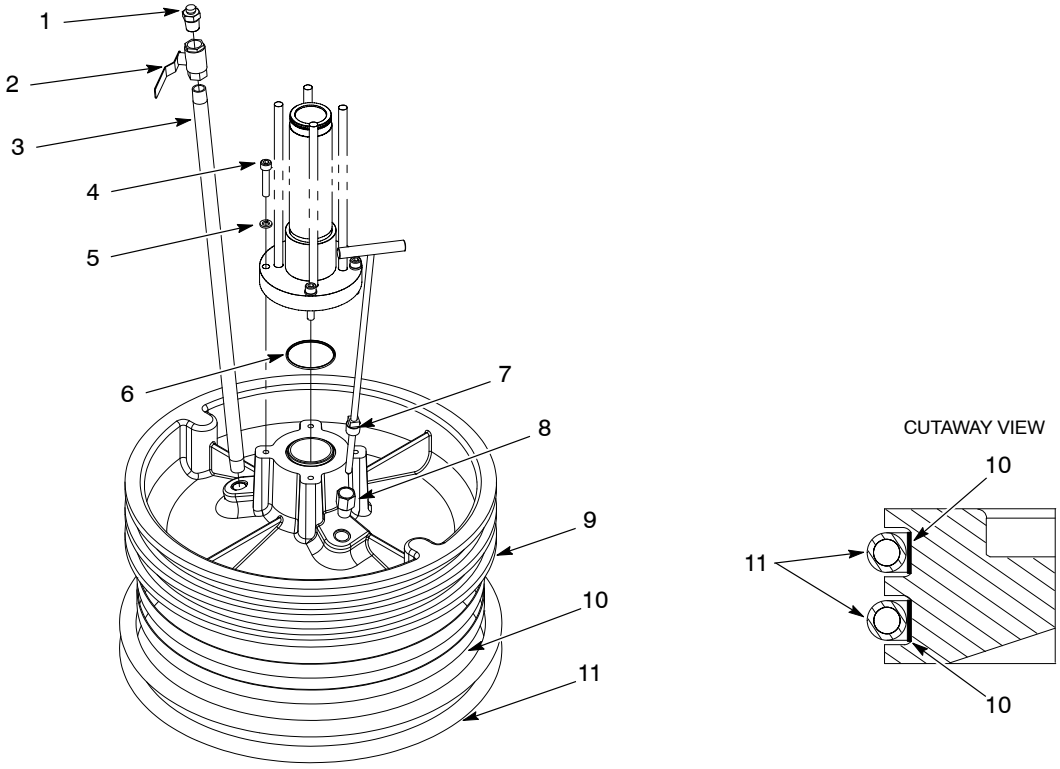

Figure 3 55-Gal Standard Follower Module

Item	Part	Description	Qty	Note
—	1610993	FOLLOWER PLATE MODULE, 2.375 throat, SD2	1	
1	------	• CONNECTOR, male, 37 degrees, 9/16-18 x ½	1	
2	901151	• VALVE, ball, ½ NPT	1	
3	1043271	• NIPPLE, pipe, Schedule 40, ½ NPT, 24-in. galvanized	1	
4	------	• SCREW, socket, M10 x 50 black, Class 12.9, per ISO 4762	4	
5	------	• WASHER, lock, M10, per ISO 7089	4	
6	941480	• O-RING, Viton™, 2.75 x 2.938 x 0.094	1	
7	1001827	• STEM, bleeder	4	
8	------	• ADAPTER, female, ½ x ½ NPT, steel, zinc	1	
9	------	• PLATE, follower	1	
10	308796	• RING, neoprene	2	
11	124706	• SEAL, follower	2	
NS	900439	• ADHESIVE, Loctite® Threadlocker Red 271™, high strength, 50 mL	AR	
NS	900344	• LUBRICANT, Never-Seez®	AR	
NS	900223	• LUBRICANT, O-ring, Parker	AR	
NS	900481	• ADHESIVE, sealant	AR	

AR: As Required
NS: Not Shown

55-Gal Temperature-Conditioned Follower Module

See Figure 4 and refer to the following parts list.

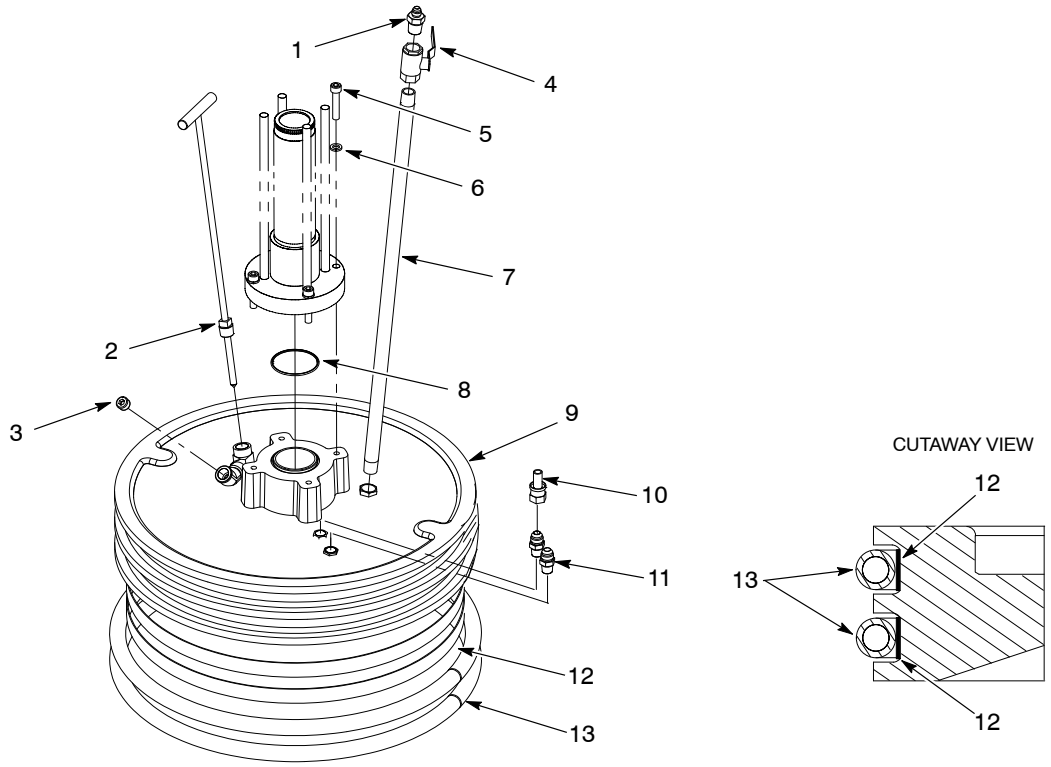

Figure 4 55-Gal Temperature-Conditioned Follower Module

Item	Part	Description	Qty	Note
—	1611005	FOLLOWER PLATE MODULE, 55-gal, 2.375 throat, SD2, temperature-conditioned	1	
1	------	• CONNECTOR, male, 37 degrees, 9/16-18 x ½	1	
2	124786	• STEM, bleeder, follower	1	
3	973431	• PLUG, pipe, socket, ½	1	
4	901151	• VALVE, ball, ½ NPT	1	
5	------	• SCREW, socket, M10 x 50, black, Class 12.9, per ISO 4762	4	
6	------	• WASHER, lock, M, SPT, M10, per ISO 7089	4	
7	1043271	• NIPPLE, pipe, Schedule 40, ½ NPT, 24–in, galvanized	1	
8	941480	• O-RING, Viton, 2.750 x 2.938 x 0.094	1	
9	------	• PLATE, follower, 55-gal, 2.375 in. throat, SD2, temperature-conditioned	1	
10	------	• CONNECTOR, female, ½ hose, ¾ –16, barbed	1	
11	------	• TUBE FITTING, 37 deg, ½ T x ⅜ NPT, brass	2	
12	308796	• RING, neoprene follower	2	
13	124706	• SEAL, follower, 55 gal	2	
NS	900481	• ADHESIVE, sealant	AR	
NS	900344	• LUBRICANT, Never-Seez	AR	
NS	900223	• LUBRICANT, O-ring, Parker	AR	

AR: As Required
NS: Not Shown

55-Gal PTFE-Coated Steel Ring Follower Module

See Figure 5 and refer to the following parts list.

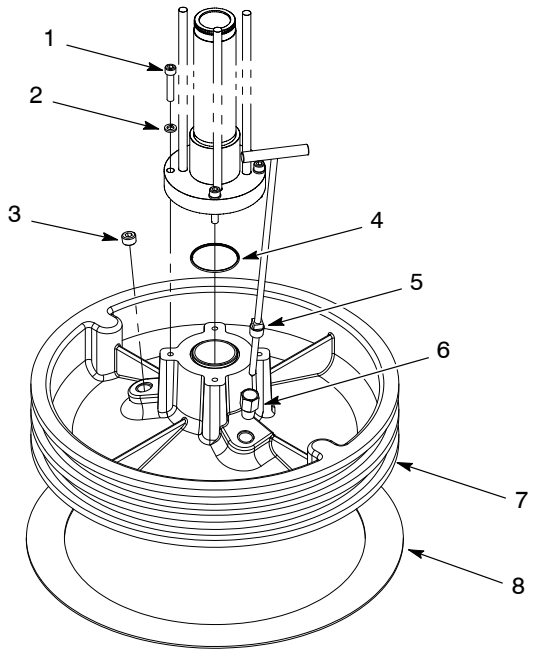

Figure 5 55-Gal PTFE-Coated Steel Ring Follower Module

Item	Part	Description	Qty	Note
—	1611002	FOLLOWER PLATE MODULE, 55-gal, 2.375 throat, SD2, green	1	
1	------	• SCREW, socket, M10 x 50, black, Class 12.9, per ISO 4762	4	
2	------	• WASHER, lock, SPT M10, per ISO 7089	4	
3	------	• PLUG, pipe, socket, ½	1	
4	941480	• O-RING, Viton, 2.75 x 2.938 x 0.094	1	
5	1001827	• STEM, bleeder	1	
6	1073298	• ADAPTER, female, ½ x ½ NPT, steel, zinc	1	
7	------	• PLATE, follower	1	
8	282846	• RING, follower, 571-mm drum	1	
NS	900439	• ADHESIVE, Loctite Threadlocker Red 271, high strength, 50 mL	AR	
NS	900481	• ADHESIVE, sealant	AR	
NS	900344	• LUBRICANT, Never-Seez	AR	
NS	900223	• LUBRICANT, O-ring, Parker	AR	

AR: As Required
NS: Not Shown