PRODUCT OPERATION MANUAL
AIRLESS PAINT PUMP

<BASIC TYPE>

DST PUMP OPERATION MANUAL

Read the Manual Before Operation

Before using the equipment, please make sure to thoroughly read and understand all warnings and instructions in the manual.CAUTION

The following warning statements provide important safety information regarding the setup, operation, grounding, maintenance, and repair of this equipment. ⚠ **The exclamation mark** icon indicates general cautions, while the hazard symbol highlights specific dangers that may occur during certain procedures. Whenever these symbols appear in the manual or on warning labels, be sure to review the related instructions carefully. any product-specific hazard symbols or warnings not included in this section may be found elsewhere in the manual as needed.

⚠ CAUTION

Fire and Explosion Hazard

Flammable vapors such as solvents and paint fumes in the work area can cause fire or explosion. Additionally, the flow of paint and solvent through the equipment may generate static electricity, resulting in sparks.

⚠ **To prevent fire and explosion, please follow these precautions:**

✓ **Work Environment Management**

- Operate the equipment in a well-ventilated area.
- Remove all ignition sources such as pilot flames, cigarettes, portable electric lamps, and plastic mats.
- Keep the work area free from flammable materials like solvent-soaked rags and gasoline.

✓ **Equipment and Operator Protection**

- Properly ground all equipment. (Refer to grounding instructions.)
- Always use grounded hoses.
- Do not spray or clean with solvents under high pressure.
- Do not plug in or unplug power cords or turn lights on or off in areas with flammable vapors.

✓ **Prevention of Static Electricity and Electric Shock**

- Hold the spray gun firmly against the side of a grounded metal container while triggering.
- Do not use non-conductive liners in containers unless they are specifically designed to prevent static build-up.
- If you notice static sparking or feel a shock, stop operating the equipment immediately and do not resume use until the issue is resolved.

⚠ **Injection Hazard**

- High-pressure fluid can penetrate the skin through leaks in the gun, hose, or damaged components.
- While it may appear as a simple cut, it can cause severe internal injuries and requires immediate medical attention.

✓ **To prevent injury from high-pressure fluid, please follow these precautions:**

- Never spray without a Tip Guard and Trigger Guard installed on the spray gun.
- Always engage the trigger lock when the gun is not in use.
- Never point the spray gun at people or any part of the body. Do not place your hand or body near the spray tip.
- Do not attempt to stop or wipe fluid leaks using your hand, gloves, or cloth.

✓ **Safety Procedures During Inspection and Maintenance**

- Always perform pressure relief procedures before inspecting, cleaning, or servicing the equipment.
- Before operating the equipment, ensure all fluid connections are securely tightened and leak-free.
- Check hoses and couplings daily; replace any worn or damaged parts immediately.

⚠ **If high-pressure fluid is injected into the skin, seek medical attention immediately.**

Injection injuries may appear minor but can lead to serious damage.

⚠ CAUTION

⚠ **Moving Parts Hazard**

- Moving parts in the equipment can catch or sever fingers or other body parts.
- Extra caution is required as the machine may operate unexpectedly.

✓ **Safety Guidelines to Prevent Injury**

- Keep hands and body parts away from moving parts during operation.
- Do not operate the equipment with guards or covers removed.

✓ **Safety Procedures During Inspection and Maintenance**

- Equipment under pressure may start automatically without warning.
- Before inspection, moving, or servicing, always perform the **Pressure Release Procedure** and shut off all power sources.

⚠ **Operating equipment without proper protection can lead to serious injury. Always follow safety guidelines to prevent accidents.**

✓ **To prevent accidents caused by toxic substances, please follow these guidelines:**

- **Review Fluid Safety Information:** Check the **SDS (Safety Data Sheet)** to understand the specific hazards of the fluid you are using.
- Familiarize yourself in advance with the fluid's toxicity, chemical reactivity, handling procedures, and emergency response methods.

✓ **Handling and Storage of Toxic Fluids:**

- Always store hazardous materials in **approved containers**, tightly sealed to prevent leaks.
- Dispose of the fluids properly in accordance with **relevant laws and regulations** to avoid harm to the environment and human health.

⚠ **Always wear protective gear** (such as gloves, masks, and safety goggles) when handling toxic substances, and work in well-ventilated areas.

If you experience any symptoms of exposure, **seek emergency care immediately**.

✓ **Key Safety Guidelines to Prevent Equipment Misuse**

- **Before Operation:**
  - Do not operate the equipment if you are tired, or under the influence of drugs or alcohol.
  - Do not exceed the maximum operating pressure or temperature of the system's lowest-rated component.
  - Use only fluids and solvents that are compatible with the wetted parts of the equipment.

✓ **During Operation:**

- Never leave the equipment unattended while powered or under pressure.
- When not in use, always turn off the power and follow the pressure relief procedure.
- Keep children and animals away from the work area.

✓ **Maintenance and Inspection:**

- Inspect the equipment daily. Replace any worn or damaged parts immediately.
- Do not modify or alter the equipment.

✓ **Hose and Cable Management:**

- Route hoses and cables away from walkways, sharp edges, moving parts, and hot surfaces.
- Do not kink or excessively bend hoses. Never pull equipment by the hose.

⚠ **Use the equipment only for its intended purpose.** If the purpose is unclear or if you need more information, please contact your distributor or the manufacturer.

MAIN COMPONENTS OF PUMP

⚠ Risk of Trapped Air

If **trapped air** remains inside the pump, it may operate unexpectedly or jerk suddenly, potentially causing serious injury due to moving parts.

✓ To prevent this risk:

ν Always perform the pressure release procedure to eliminate trapped air.

ν Before inspecting or moving the equipment, make sure the pressure release has been completed.

ν Wear protective gear when working near the equipment and stay alert for unexpected movement.

⚠ Operating the equipment without releasing pressure can lead to accidents. Always follow the safety procedures.

Main Components

Master Air Valve

Valve Location and Operation

Valve Location:
The valve should be easily accessible from the pump and is typically located beneath the air regulator.
It is designed for quick operation during maintenance or emergency pressure relief.

✓ Function of the Valve
When Closing the Valve:
It discharges trapped air between the system and the air motor. This safely removes residual air in the motor when the system is stopped.

When Opening the Valve:
It supplies air to the motor, enabling normal operation. A stable air pressure must be maintained for smooth performance.

⚠ If air supply to the motor must be cut off during operation, always close the valve first and release all trapped air.
Follow proper procedures to maintain pump performance and prevent unexpected movement.

Air Pressure Relief Valve

- Automatically reduces the air pressure when the supplied pressure exceeds a pre-set limit, protecting the equipment from damage.

Air Filter

- Removes impurities and contaminants from the compressed air supply to protect the system.
- Filters out fine particles present in the air, ensuring clean air is delivered to the equipment.

Air Regulator

- Controls the air pressure supplied to the motor and adjusts the fluid outlet pressure of the pump.
- Should be installed close to the pump, and the air pressure can be monitored via the pressure gauge (E).

Fluid Discharge / Purge Valve

- Opens during pump cleaning or priming to release pressure and discharge fluid.
- Must be closed during spraying operations.

Anti-Icing Control

- Opening the Bleed Air Knob helps reduce icing, allowing smooth operation.

⚠ All valves and control devices must be properly set for safe equipment use.
Always refer to the manual before adjusting settings, and make adjustments suitable for your working environment.

GROUNDING

⚡ Electricity Prevention and Grounding

This equipment **must be grounded** to prevent fire and explosion risks caused by static electricity sparks.

✓ **Risks of Static Sparks**

- Static electricity can ignite flammable fumes or vapors, leading to **fires or explosions**.
- Proper grounding safely discharges accumulated static electricity and **prevents sparks**.

✓ **Role of Grounding**

- Provides a path for electrical current to safely discharge.
- Prevents static buildup, protects the working environment, and ensures **stable operation** of the equipment.

⚠ If grounding is not properly installed, the risk of fire or explosion **significantly increases**.
Always follow all relevant **safety regulations** and check that grounding is properly connected before starting work.

⚡ Grounding Methods

To prevent static electricity buildup and reduce the risk of fire or explosion, this equipment must be properly grounded. Follow the instructions below for grounding each component:

Pump Grounding

Use the supplied **ground wire and clamp**.
Connect the ground wire to the **grounding stud** on the air motor.
Attach the grounding clamp securely to a **true ground surface** (e.g., earth, metal structure).

Air and Fluid Hose Grounding

Use **only electrically conductive hoses** to ensure continuous grounding.
Keep the total combined hose length **under 150 meters (500 feet)**.
Regularly check the electrical resistance of the hose.
If the total resistance to ground exceeds **29 megohms (MΩ)**, replace the hose immediately.
(Verification may be required.)

Spray Gun and Dispensing Valve Grounding

Ensure they are connected to a properly grounded **fluid hose and pump** to maintain grounding.

Fluid Supply Container Grounding

Check the **material and grounding requirements** of the fluid supply container.

⚡ Grounding Objects During Spraying

Follow all applicable regulations for grounding the object being sprayed.

Do not ground through the dispensing valve.

🔧 Grounding Solvent Containers (for cleaning)

Ensure the container is placed on a **grounded surface** in accordance with local regulations.

Use **only conductive metal pails** that are properly grounded.

Do not place containers on non-conductive surfaces such as **paper or cardboard**, as these disrupt grounding continuity.

🔧 Grounding During Cleaning and Pressure Relief

Always press the trigger of the spray gun or dispensing valve **while its metal part is in contact with a grounded metal container**.

Check regularly to ensure grounding continuity is maintained—failure to do so may result in static discharge.

Improper grounding can lead to fire or explosion hazards due to static sparks. Always follow correct grounding procedures and perform regular inspections to maintain a safe working environment.

Grounding Installation Instrictions

✓ **Step-by-Step Grounding Procedure**

1. **Connect the Grounding Wire**
   - Attach the grounding wire to the **grounding stud on the air motor**.
2. **Secure the Grounding Wire to Ground Point**
   - Firmly fasten the other end of the grounding wire to an actual ground, such as the **earth or a metal structure**.
3. **Ground All Equipment in the Work Area**
   3-1) Ground the **object being sprayed**, **fluid supply containers**, and **all other equipment**.
   3-2) Follow **local electrical safety regulations** when performing grounding work.
   3-3) Use **only electrically conductive air and fluid hoses** verified for conductivity.
4. **Ground Solvent Containers (Cleaning Use)**
   4-1) **Solvent containers must be grounded.**
   - Only use **metal containers** placed on a **properly grounded surface**.
   4-2) **Do not** place containers on non-conductive surfaces like **paper or cardboard**.

Non-conductive surfaces can block static discharge paths and pose a serious hazard.

⚠ **Improper grounding significantly increases the risk of fire and explosion due to static electricity.**
Regularly inspect all equipment and containers to ensure they are safely and correctly grounded.

SET-UP

⚠ Preventing Cart Tipping During Set-up

✓ To ensure a safe setup, **place the cart on a flat and level surface**.

- **Do not use** the equipment on **sloped or uneven flooring**.

⚠ If the cart tips over, it may result in **serious injury** or **equipment damage**.
Always operate in a **stable environment** to maintain safety.

1. **Ground the Equipment**:
   Before using the equipment, make sure it is properly grounded.

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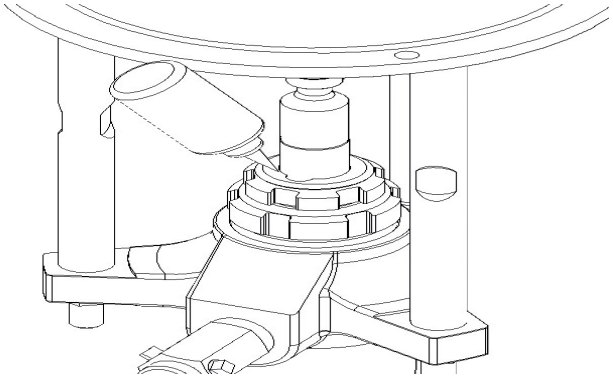
2. **Check and Adjust Packing Nut**:
   Remove the packing nut cover and fill the Throat Seal Liquid (TSL). Tighten the packing nut (F) using a torque wrench, then reattach the cover.



3. **Flush and Remove Air Before Use**:
   Clean the system and remove any trapped air before operation.

4. **Connect Suction Hose**:
   Attach the suction hose to the pump and tighten securely to prevent leaks.

5. **Connect Fluid Discharge Hose**:
   Attach an electrically conductive fluid hose to the pump outlet and tighten firmly.

6. **Connect Spray Gun and Air Hose**:
   Connect the conductive fluid hose (and the air hose, if using an air-assisted gun) to the spray gun, and tighten securely. Check all pressure connections to ensure they are properly secured.

7. **Adjust the Maser Air Valve:**

   Close the master air valve. Purge the air supply hose, then attach the whip check cable to the air hose. Connect the hose to the air inlet and ensure the whip check cable is tightly secured.

PRESSURE RELIEF

⚠ Importance of the Pressure Relief Procedure

This equipment remains pressurized until the pressure is manually relieved. Therefore, the **pressure relief procedure must be performed before stopping spraying, cleaning, inspecting, or servicing** the equipment.

✓ **Why You Must Perform the Pressure Relief Procedure**

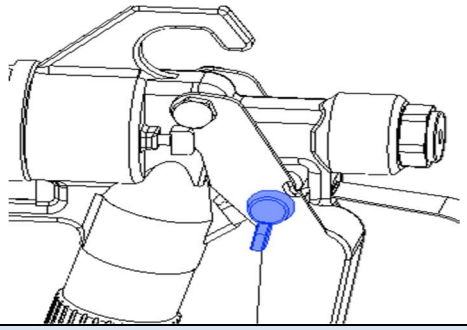
- 🛡 **Prevents injection injuries** to the skin
- 💧 **Avoids fluid ejection** from high-pressure lines
- ⚙ **Minimizes injury risks** from moving components

⚠ *Operating the equipment without performing the pressure relief procedure may lead to serious injury.* Always complete the pressure relief process **before handling or maintaining the equipment** to ensure a safe working environment. 🚨

Pressure Relief Procedure

Lock the Gun Trigger

Secure the trigger lock on the spray gun to prevent accidental spraying.



Close the Master Air Valve

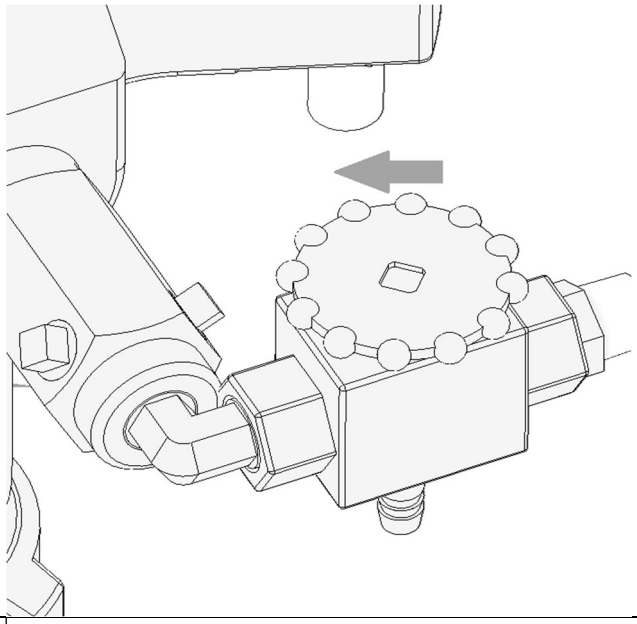
Shut off the air supply to reduce internal system pressure.

Fluid Drain

Slowly open the **Fluid Drain/Purge Valve (J)** and any other fluid drain valves to release pressure.

If a return tube is installed, open the return line ball valve to drain any remaining fluid.

Once draining is complete, **close all valves**..



Release Gun Trigger & Relock

Unlock the gun trigger.
(If using an air-assisted gun, turn the gun air regulator counterclockwise to release air pressure.)

Firmly press the metal part of the gun against a grounded metal container and **squeeze the trigger until all pressure is released**.
(If no fluid is ejected, refer to the clogged tip cleaning procedure.)

Re-engage the trigger lock to ensure safety.

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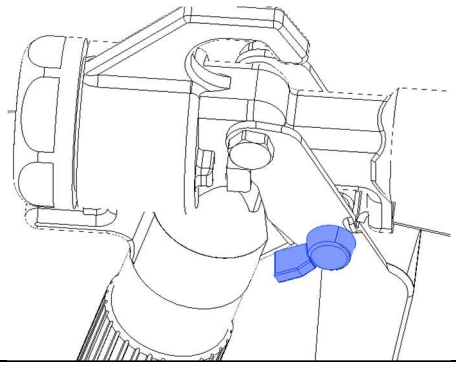


CLEANING

⚠ Cleaning Precations

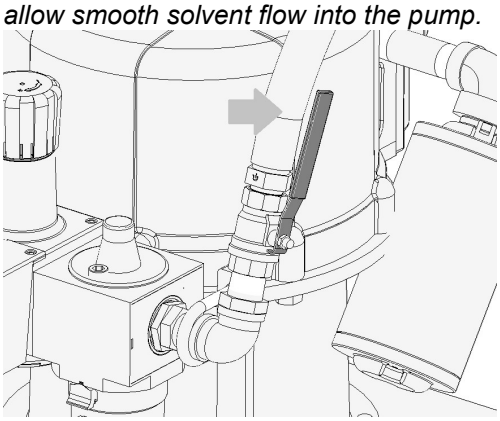
⚠ Ensure cleaning is performed at the **lowest possible pressure**, using a solvent compatible with the fluid and wetted parts of the system.

✓ When Cleaning Is Required

- Before first use *(cleaning new equipment)*
- When changing fluids *(to prevent cross-contamination)*
- Before servicing the equipment *(to protect components)*
- Before fluid dries or solidifies
- At the end of the workday *(daily maintenance)*
- Before long-term storage *(to remove residuals)*

✓ Cleaning Procedure

1. Perform the **pressure relief procedure** before cleaning.
2. Remove the spray tip and tip guard. If necessary, remove the fluid filter. After removing the filter, reinstall the filter cap.
3. Submerge the **suction tube** into a compatible solvent.
⚠ *Do not pull the hose tightly. Keep it relaxed to allow smooth solvent flow into the pump.*



4. Turn the **air regulator knob** counterclockwise until the **air pressure gauge** reads **0**.
5. Open the **master air valve (B)**.

✓ Hose and Gun Cleaning

a. Unlock the gun trigger and secure the gun to a grounded metal container.

b. While pulling the trigger, slowly turn the **air regulator knob (G)** clockwise until the **pump starts circulating**.

- During initial setup, trigger the gun for **10–15 seconds**.
- Continue triggering until **clean solvent** flows out.
  📌 *If using an air-assisted gun, increase air pressure using the gun regulator (clockwise).*

c. Once cleaning is complete, turn the **regulator knob (G)** counterclockwise to lower pressure to **0**.

- Let the **pump stop**, wait until **fluid stops flowing**, release the trigger, and engage the **trigger lock**.
  📌 *If not using the equipment for the day, stop the pump with solvent still in the system (wet with cleaner).*

d. Close the **bleed-type master air valve**.

⚠ Regular cleaning ensures system longevity and prevents clogs, corrosion, and damage.

PRIMING

⚠ Priming Safety Warming

⚠ Do NOT perform priming through the discharge/purge valve when using two-component materials.

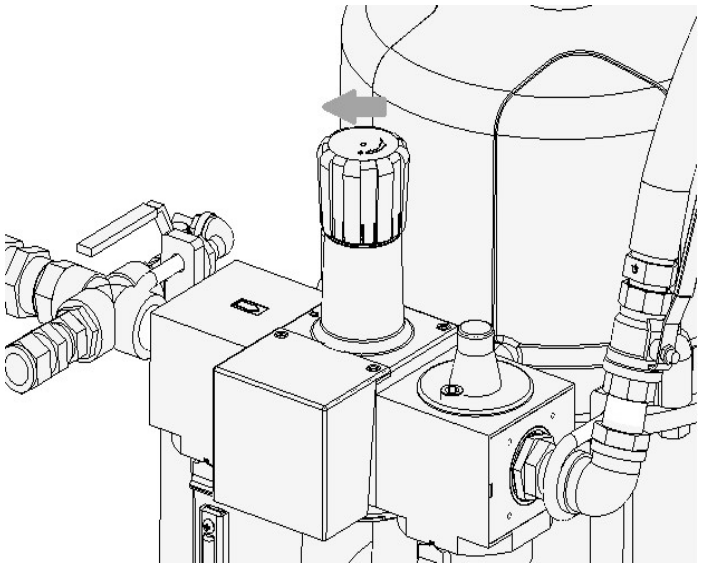
Two-component materials may chemically react and **harden (cure)** upon mixing. If the material cures inside the valve, it may cause clogging, equipment damage, and work interruption.

✓ Priming Procedure

1. Perform the **pressure relief procedure** before starting. Ensure all internal pressure in the equipment is fully released.

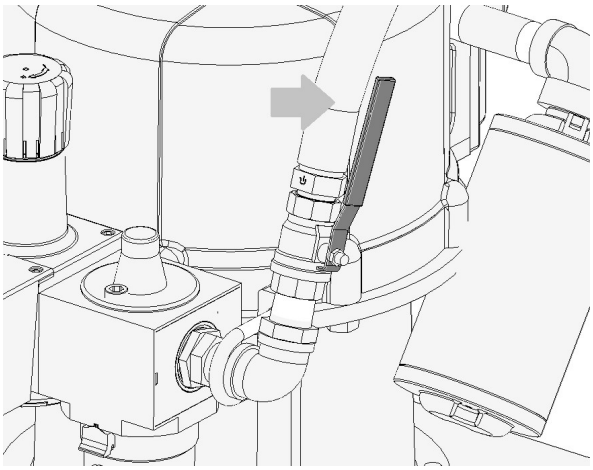
2. Lock the spray gun trigger and **remove the spray tip**.

3. Submerge the suction tube fully into the material to be sprayed.
Place it to the **bottom of the container** to prevent air intake.
📌 *Ensure the hose is positioned to allow smooth fluid flow.*



4. Turn the **air regulator knob** counterclockwise until the **air pressure gauge** shows **zero**.

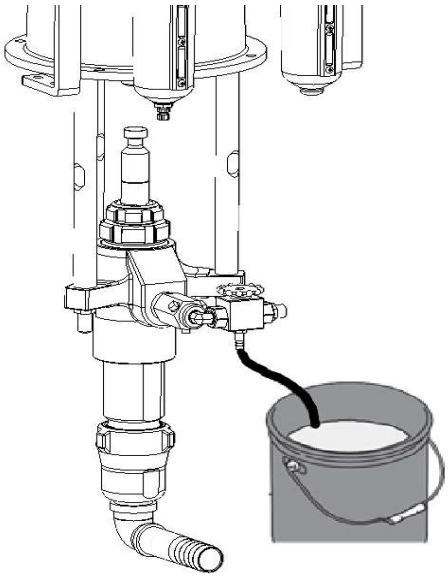
5. Open the **master air valve**.



❗ **For high-viscosity materials**, release air via the **drain valve**:

a. Position the discharge tube correctly into a grounded waste container.

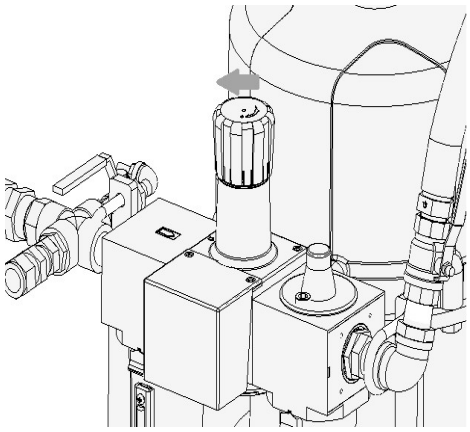
📌 Use **only grounded metal containers** to prevent static discharge.



b. Slowly turn the **pump discharge/purge valve** counterclockwise to open it slightly—do **not fully open**.

✓ Adjust the valve so that fluid flows steadily.

⚠ Opening the valve too quickly can cause fluid splashing or disrupt internal pressure balance. Always open gradually while monitoring the flow.



🔄 Remove Air from Hose and Gun

a. Unlock the spray gun trigger.
Secure the **metal part of the gun** against a **grounded metal container**.

⚠ This helps prevent static discharge and ensures a safe fluid flow.

b. Operate the gun while slowly turning the **air regulator knob** clockwise until the **pump begins circulating** again.
Continue triggering for **10–15 seconds** to remove any trapped air.

📌 *If using an air-assisted gun, adjust the gun air regulator clockwise to increase air pressure.*

c. After air removal, **lock the trigger** again to prevent unintended spraying.

✓ After priming is complete, the equipment is ready for spraying. Always verify that all connections are secure and no leaks are present before proceeding.

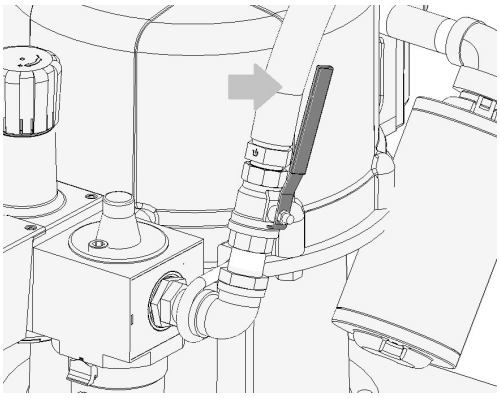
SPRAYING

⚠ Priming Safety Warning

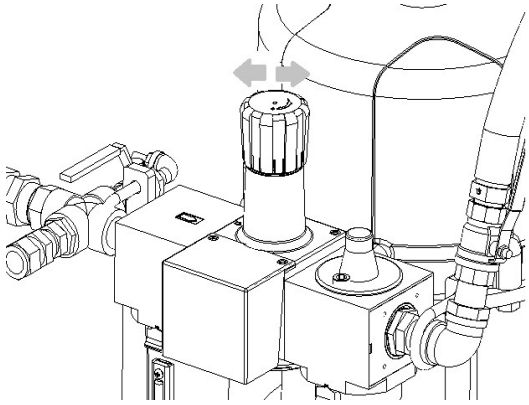
⚠ Operating the pump **while dry** can cause **internal components to accelerate rapidly without lubrication**, leading to severe damage.

✓ Final Priming and Setup Procedure

1. **Perform the priming procedure.**
2. **Perform the pressure relief procedure.**
3. **Install the spray tip and tip guard** onto the gun.
4. Turn the **air regulator knob** counterclockwise to reduce pressure to **zero**.
5. Open the **master air valve**.



6. Use the **air regulator knob** to adjust to the desired **working pressure**.



7. ✓ **All setup procedures are now complete.**
➞ Please refer to the **next section** for detailed spraying instructions.

◆ Fluid Spray Test & Adjustments

- Perform a **test spray** and **adjust pressure** as needed.
- If using an **air-assisted gun**, increase the air pressure during testing to optimize the **spray pattern**.

◆ Final Step – Cleaning Procedure

- **Always perform the cleaning procedure after use.**
- Storing the unit without cleaning may cause the **fluid to harden**, leading to equipment damage.
  📌 Regular cleaning ensures long-term performance and prevents clogs or internal wear.

SHUTDOWN

CAUTION

✓ **To ensure the longevity of the pump**, please make sure to clean it **before the fluid dries on the lower pump rod**.
If the fluid dries, it may lead to **seal damage and internal corrosion**, reducing the pump's lifespan.

💡 Prompt cleaning after each use is the most effective way to maintain the pump's performance and durability.

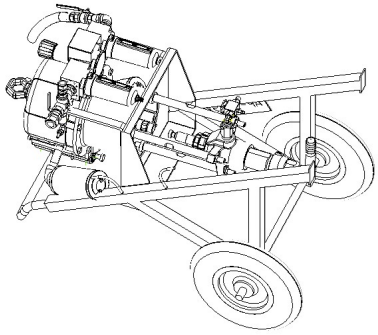
SOLUTION BY SITUATION

ISSUE	CAUSE	SOLUTION
Pump not operating	*Valve is closed or clogged*	Check air line and adjust supply pressure. Ensure valve is properly opened.
	Hose or gun is clogged	Clean the hose and gun to maintain smooth fluid flow.
	Fluid dried on displacement rod	Clean the rod. Always stop the pump at the bottom of stroke and fill the wet cup with compatible solvent for storage.
	Air motor components are dirty or worn	Disassemble and clean the motor, or repair as needed. Refer to the motor manual for detailed procedures.
Low output	*Air line is blocked or air pressure is insufficient*	Service the air line and adjust supply pressure. Check if the valve is functioning properly.
	Hose/gun is clogged or hose ID is too small	Clean the hose or replace with one that has a larger inner diameter.
	Air motor freezing	Activate the de-icing system and take necessary measures.
Low output during downstroke	*Inlet valve is clogged or worn*	Inspect and clean or replace the inlet valve as needed.
	Fluid viscosity is too high	Adjust the suction line to ensure smooth fluid flow.
Low output during upstroke	*Piston valve or packing is worn*	Clean the piston valve or replace the packing.
Unstable acceleration	*Insufficient fluid supply or clogged inlet*	Refill the supply unit and re-prime the pump. Check and clean the suction tube if necessary.
	High fluid viscosity	Reduce viscosity and adjust the suction line for better flow.
	Piston valve or packing is worn	Clean the piston valve and replace the packing.
	Inlet valve is clogged or worn	Clean and replace the inlet valve as needed.
Pump operates too slowly	*Possible freezing*	Stop the pump and check the de-icing system.
Pressure not maintained or pump keeps cycling	*Check valve or packing is worn*	Inspect and replace valves or seals. Refer to the component manual.
Bubbles in the fluid	*Inlet line is loose*	Tighten the connections and use proper thread sealant to ensure airtightness.
Irregular spray pattern	*Fluid pressure in the gun is incorrect*	Refer to the gun manual and set the correct pressure. Follow the fluid manufacturer's guidelines.
	Fluid viscosity is too low or high	Adjust the fluid viscosity according to the manufacturer's recommendations.

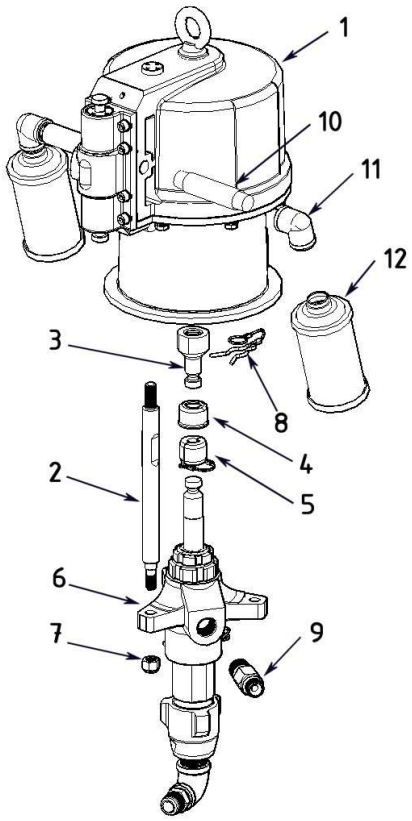
LOWER PUMP DISASSEMBLY

Lower Pump Disassembly and Reassembly

1. Stop the pump at the lowest stroke position and clean the internal fluid thoroughly. (Refer to the previous cleaning procedure)
2. Release all internal pressure in the pump to ensure a safe working environment. (Refer to the previous priming procedure)
3. Shut off the air supply and disconnect the air hose.
4. While disconnecting the hose, hold the pump outlet fitting firmly to prevent it from loosening.
5. Tilt the equipment backward to allow easier handling of the cart and pump.



6. Loosen the tie rod nuts to prepare for removing the lower pump.
7. Hold the lower pump and push it off the tie rods to remove it.
8. Reassemble the lower pump by reversing the disassembly steps. Then, refill the packing nut with fluid to complete the process.



⚠ NOTICE

FLUSH THE PUMP BEFORE FIRST USE

This pump may still have some liquid left from testing.
To avoid contaminating the paint or fluid you are using, make sure to clean the pump with a suitable solvent before using it.

Standard Warranty

Warrants all equipment referenced in this document which is manufactured by and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by, will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with written recommendations.

This warranty does not cover, and shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non–component parts. Nor shall be liable for malfunction, damage or wear caused by the incompatibility of equipment with structures, accessories, equipment or materials not supplied by, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized distributor for verification of the claimed defect. If the claimed defect is verified, will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT
NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within one (1) years of the date of sale.

MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR
A PARTICULAR PURPOSE, IN CONNECTION WITH ACCESSORIES, EQUIPMENT, MATERIALS OR COMPONENTS SOLD
BUT NOT MANUFACTURED BY. These items sold, but not manufactured by (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. will provide purchaser with reasonable assistance in making any claim for breach of these warranties.
In no event will be liable for indirect, incidental, special or consequential damages resulting from supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of or otherwise.