

SPRAY RIG

MARSH MASTER®

OPERATING & MAINTENANCE MANUAL



COAST MACHINERY, LLC

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Table of Contents

FORWARD3

MANUFACTURER’S LIMITED WARRANTY4

SAFETY.....5

 OPERATOR QUALIFICATIONS5

 SAFETY WARNINGS5

LOAD CAPACITY.....8

SPRAY RIG.....9

 SPRAY RIG SYSTEM DESCRIPTION10

 SPRAY RIG CAPACITY10

 OPERATING SPEEDS10

 INSTALLING AND REMOVING.....10

 SPRAY RIG PRE-OPERATION12

 CONTROLS13

SPRAY RIG MAINTENANCE16

TROUBLESHOOTING17

PARTS ORDERING18

FORWARD

The spray rig was designed with safety as a priority. The spray rig is a hydraulically or gas engine driven pump that supplies flow and pressure to a spray boom or a spray gun such that the operator may apply herbicides, pesticides, or other product accordingly. This manual outlines the safety features and warns of hazards and unsafe practices one may encounter when operating the Marsh Master® when equipped with the spray Rig.

The spray rig was designed for controlling invasive species of vegetation or unwanted weeds and insects in various landscapes within an amphibious environment. When used properly, the spray rig can be an effective tool in keeping various landscapes controlled and well maintained safely and cost effectively.

To keep the spray rig operating efficiently, familiarize yourself with the contents of this manual and the Marsh Master® manual that applies to your machine. Doing so will provide the operator with instructions for the safe operation, use, and servicing of the equipment.

Thank you for the confidence you have placed in the spray rig. Care for it properly, and it will give you many years of dependable service.

MANUFACTURER'S LIMITED WARRANTY

MACHINE WARRANTY

Coast Machinery, LLC warrants to the original purchaser, for a period of one (1) full year from date of delivery, that goods manufactured by Coast Machinery, LLC will be free from defects of workmanship and materials, provided such goods are operated and maintained in accordance with Coast Machinery, LLC's written manuals or other instructions. No warranty is made with respect to items supplied by Coast Machinery, LLC on special order of purchaser. Coast Machinery, LLC's sole obligation is to repair or replace, at Coast Machinery, LLC's option, parts that do not conform to this warranty.

LABOR WARRANTY

For one (1) full year from date of delivery, Coast Machinery, LLC, at its option, will repair, pay for outside service, or pay the customer straight time for the particular warranted repairs.

REPLACEMENT PARTS WARRANTY

Repair parts supplied by Coast Machinery, LLC are warranted for a period of ninety (90) days from installation. Coast Machinery, LLC's sole obligation is limited to the replacement of the warranted part with no obligation to provide labor in installing such part. No warranty is given for electrical parts.

ALL ABOVE WARRANTIES DO NOT COVER THE FOLLOWING:

- Maintenance items, adjustments, or required maintenance as per written manuals or other instruction.
- Transportation cost of machine for necessary repairs.
- Repairs required as a result of failure due to normal wear, accidents, misuse, abuse, negligence, or improperly installed repair parts.
- Products altered or modified in a manner not authorized by Coast Machinery, LLC in writing.
- Provision of substitute equipment or service during periods of malfunctions or non-use.
- Electrical parts.

This warranty is expressly in lieu of all other stated or implied warranties and of all other obligations and liabilities on the part of Coast Machinery, LLC, including liabilities for direct, indirect, immediate, special, or consequential damages arising out of the failure of any machine or part of it to operate properly; including the cost of expense of providing substitute equipment or service during periods of malfunctions or non-use.

NOTE: This warranty cannot be expanded, changed, or modified by any representative of Coast Machinery, LLC without written approval from the President of Coast Machinery, LLC.

SAFETY

The spray rig is specifically designed and manufactured primarily for use on the rear deck of a Marsh Master® amphibious track vehicle. The spray rig should not be used in areas or applications where the Marsh Master® is not designed to operate (see your Marsh Master® manual). The spray rig is an attachment that should be operated and maintained with respect and caution. Misuse or carelessness can result in serious personal injury or death, damage to the machine, or both. Safety precautions must be observed at all times.

OPERATOR QUALIFICATIONS



Inexperienced personnel should not operate the spray rig. It is important that qualified personnel study and understand this manual along with the Marsh Master® manual specific to your machine, before attempting to operate the machine with the spray rig attached.






SAFETY WARNINGS




The following symbol is used throughout this manual as indicated to warn of hazards or unsafe practices that could result in property damage, personal injury, or death.



The table below lists warnings that must be read, understood, and followed prior to and during any activity that involves direct or indirect use and/or interaction with the spray rig. Many of these warnings are shown both here in this table and in the applicable sections throughout this manual.

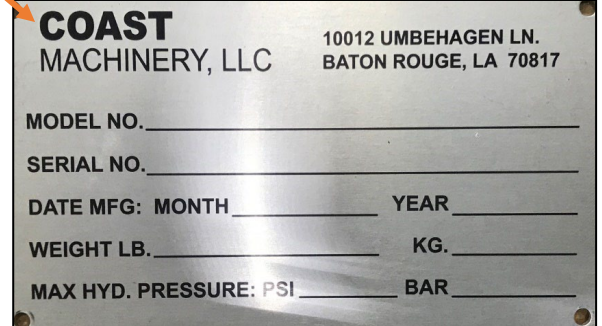
	<p style="text-align: center;">WARNING SERIOUS INJURY OR DEATH CAN OCCUR!</p>	<p style="text-align: center;">WHAT CAN HAPPEN</p>	<p style="text-align: center;">HOW TO AVOID</p>
	<p>READ AND UNDERSTAND THIS MANUAL AND THE MARSH MASTER® MANUAL (SPECIFIC TO YOUR MACHINE) PRIOR TO OPERATING THE MARSH MASTER® WITH THE SPRAY RIG ATTACHED</p>	<p>The risk of accident, injury, and equipment damage is greatly increased if the operator does not fully understand how to properly operate the spray rig in different situations.</p>	<p>New or inexperienced operators should read and understand this manual, and then regularly practice the operating techniques described in this manual.</p>

	READ, UNDERSTAND, AND FOLLOW ALL DECALS AND PLACARDS AFFIXED TO THE SPRAY RIG	Failure to obey all warnings affixed to the spray rig could increase the risk of injury, property damage, or death.	Ensure that all warnings affixed to the spray rig are visible to all surrounding personnel.
	PERFORM A PRE-TRIP ASSESSMENT OF THE AREA IN WHICH THE SPRAY RIG IS TO BE OPERATED AND IDENTIFY ALL POTENTIAL HAZARDS (OBSTACLES, IMPEDIMENTS, DEBRIS, MANWAY COVERS, HIGH WATER, STRONG CURRENTS, SUBMERGED OBJECTS, STEEP BANKS, ETC...)	Not fully understanding the operating environment greatly increases the risk of accident, injury, and equipment damage AND increases the chance of leaving the operator and personnel stranded in a remote location.	When performing a pre-trip assessment, consult weather resources, people familiar with the area that you are operating the machine in, and when possible, practice with an experienced operator in similar environments prior to embarkment.
	VISUALLY INSPECT THE CONDITION OF THE SPRAY RIG, LOOKING FOR LOOSE FITTINGS, LEAKS, ABNORMAL WEAR, ETC....	A damaged spray rig could lead to malfunction of the spray rig and Marsh Master® resulting in an increased risk of injury, death, or further property damage.	Prior to starting the machine, visually confirm that there are no noticeable mechanical concerns associated with the spray rig. Resolve any issues found.
	WEAR PERSONAL PROTECTIVE EQUIPMENT SUCH AS, BUT NOT LIMITED TO, SAFETY GLASSES, GLOVES, HEARING PROTECTION, STEEL TOE BOOTS, ETC.... WHEN OPERATING OR SERVICING THE SPRAY RIG	Failure to do so may put personnel in an adverse situation increasing the risk of injury or death.	It is the operator's or maintenance personnel's responsibility to ensure that all people interacting with or around the spray rig are properly fitted with the correct personal protective equipment.
	ENSURE THAT THE MARSH MASTER'S® ENGINE IS OFF, WHEN PERFORMING MAINTENANCE OR ADJUSTMENTS TO THE SPRAY RIG	Failure to do so could result in personnel being at risk if the spray rig were to be engaged increasing the risk of injury.	It is the operator and/or maintenance personnel's responsibility to ensure that the engine is turned off and the machine is in a stable environment prior to working on the spray rig.

	<p>NEVER ALLOW PASSENGERS TO RIDE IN THE REAR OF THE MARSH MASTER® WITH THE SPRAY RIG ATTACHED TO THE MACHINE</p>	<p>The addition of rear passengers creates the following issues: 1) puts passengers in harm's way of chemical overspray 2) it could imbalance the machine when entering water causing a risky operating condition. Failure to adhere to this warning increases risk of injury and death.</p>	<p>It is the operator's responsibility to visually ensure that no personnel are allowed to ride in the rear of the Marsh Master® when the spray rig is attached.</p>
	<p>WHEN SWIMMING THE MACHINE WITH THE SPRAY RIG ATTACHED ALWAYS FOLLOW THE BEST PRACTICES FROM YOUR SPECIFIC MARSH MASTER® MANUAL.</p>	<p>Failure to follow the recommended best practices could result in putting the machine in an adverse operating condition increasing the risk of property damage, injury, or death</p>	<p>It is the operator's responsibility to evaluate the situation at hand and to follow the recommended operations from the specific machine's manual with regards to swimming the machine with the spray rig attached. When in doubt, err on the side of safety.</p>
	<p>KEEP HANDS CLEAR OF THE SPRAY RIG PUMP AND MOTOR COUPLING</p>	<p>Rotating machinery can pull fingers or clothing articles into area resulting in an increased risk of injury.</p>	<p>Always use extreme caution when maneuvering around the spray rig pump and motor area.</p>

LOAD CAPACITY

The spray rig is stamped with a data plate that clearly displays the empty weight of the unit. The Marsh Master®, when attached with the spray rig is considered an amphibious package **AS LONG AS** the load capacity of the Marsh Master® itself is not exceeded. See your Marsh Master® manual along with the placarding on your machine to determine the load capacity of your package and how to calculate your loaded weight. It is the operator's responsibility to determine the weight of the spray rig and all other attachments, accessories, gear, personnel, etc.... to ensure that the Marsh Master's® stamped load capacity is not exceeded. If there are any questions regarding load limits, contact Coast Machinery, LLC.



$$\boxed{\text{SPRAY RIG TOTAL WEIGHT}} = \boxed{\text{STAMPED WEIGHT (EMPTY WEIGHT) [LBS]}} + \boxed{\text{WEIGHT OF CHEMICAL [LB/GAL]}} \times \boxed{\text{AMOUNT OF CHEMICAL IN TANK [GAL]}}$$

EXAMPLE: (SPRAY RIG STAMPED WEIGHTS AND AMOUNTS VARY DEPENDING ON THE SPRAY RIG MODEL)

$$\boxed{\text{SPRAY RIG TOTAL WEIGHT}} = \boxed{260 \text{ LBS}} + \boxed{8.34 \text{ LB/GAL}} \times \boxed{85 \text{ GAL}} = \boxed{969 \text{ LBS}}$$

SPRAY RIG



Shown: 85 GAL ELLIPTICAL TANK – SPRAY RIG

1. SPRAY RIG SKID FRAME WELDMENT
2. HOSE REEL & GUN (**some spray rigs don't include hose reels**)
3. HYDRAULIC DRIVEN MOTOR
4. SPRAY RIG PUMP
5. PUMP PRESSURE REGULATOR (BALE HOOK STYLE)
6. SPRAY RIG TANK (**may vary among models**)

7. HYDRAULIC QUICK CONNECT HOSES
8. SPRAY BOOM REGULATOR (**if equipped with boom**)
9. DRAFT HOSE
10. CONTROL VALVES AND FILTER

SPRAY RIG SYSTEM DESCRIPTION

The spray rig is a tank, pump, motor, draft hose, spray gun, and all associated plumbing mounted to an aluminum skid that is easily installed or removed from the Marsh Master®. The spray rig pump is driven by either a hydraulic motor or a gasoline engine. The hydraulic motor driven pump uses the Low-Flow circuit via quick connect fittings on the Marsh Master. The flow and pressure of the hydraulic fluid supplied to the spray rig motor is controlled by the low flow circuit pump and relief valve setting specific to each Marsh Master®. This provides for a smooth-running system that is hydraulically protected from abrupt overloads when operating the spray rig. The spray rig is typically supported by the deck and bed area of the Marsh Master®.



WARNING!
SERIOUS INJURY OR DEATH CAN OCCUR!

ROTATING EQUIPMENT AT THE PUMP & MOTOR COUPLING INCREASE THE RISK OF INJURY. USE CAUTION WHEN IN THE AREA.

SPRAY RIG CAPACITY

The spray rig is designed to supply flow and pressure for agricultural chemical application to either a spray gun or a spray boom. The spray rig “time to empty tank” depends on the model of spray rig, the type of spray tip on the gun and the pressure setting of the pump relief valve. In general, the “time to empty tank” for most spray rigs when using the gun is between 30 and 40 minutes, the “time to empty tank” for the boom is between 20 and 30 min.



WARNING!
SERIOUS INJURY OR DEATH CAN OCCUR!

ALWAYS WEAR PROPER CLOTHING AND GEAR WHILE SPRAYING AGRICULTURAL CHEMICALS, FAILURE TO DO SO MAY EXPOSE PERSONNEL TO HARMFUL CHEMICALS INCREASING THE RISK INJURY.

OPERATING SPEEDS

The spray rig is designed to operate with the Marsh Master’s® Engine rpms between 1200 and 1800 (depending on engine - see your specific Marsh Master® manual). Do not exceed 2200 rpms when spraying. The ground speed will vary depending upon the terrain conditions; however, the Marsh Master’s® drive system allows for creeping very slowly where necessary to full stroke which is usually around 8 mph. It is the operator’s responsibility to gauge the optimal spraying speed for the environment in which they are operating.



WARNING!
SERIOUS INJURY OR DEATH CAN OCCUR!

OPERATING ABOVE THE RECOMMENDED RPMS INCREASES THE RISK OF PROPERTY DAMAGE, EQUIPMENT MALFUNCTION LEADING TO SHORTENED EQUIPMENT LIFE.

INSTALLING AND REMOVING

The spray rig is typically installed laterally on the rear deck of the Marsh Master® where it is bolted to the deck sitting above the bed of the Marsh Master® with the pump & motor mounted on the passenger side of machine and the control valves facing the rear of the machine. If the spray rig is equipped with a hydraulic motor to drive the pump, then the spray rig will require use of the Marsh Master's® low flow tool circuit via quick connects. The spray rig is a modular design, such that all components are connected to the frame where the entire spray rig can be installed or removed by simply bolting to and un-bolting from the deck. Typically, the drain hose for the spray rig is such that the tank can be drained either through the drain plug in the bed of the Marsh Master® or off the rear transom. The following general practices should be followed when installing or removing the spray rig from the Marsh Master®:



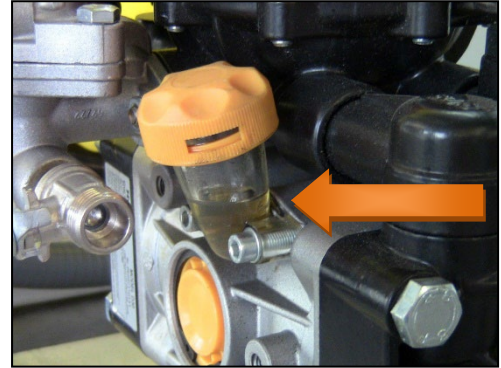
Shown: 85 - GAL ELLIPTICAL SPRAY RIG

1. ENSURE THAT THE SPRAY RIG IS FULLY DRAINED PRIOR TO INSTALLING ON THE MARSH MASTER®. BEFORE REMOVING THE SPRAY RIG FROM THE MARSH MASTER, ALWAYS FULLY DRAIN THE CHEMICAL AND FLUSH THE PUMP WITH CLEAN WATER.
2. BOLT/UN-BOLT THE SPRAY RIG FRAME FROM THE DECK OF THE MARSH MASTER®.
3. DISCONNECT OR CONNECT THE HYDRAULIC HOSES CONNECTING THE SPRAY RIG TO THE MARSH MASTER®. VARIOUS MODELS OF THE MARSH MASTER® HAVE DIFFERENT LOCATIONS OF QUICK CONNECTS.
4. USING FORKS OR STRAPS AND RIGGING, CAREFULLY LIFT THE SPRAY RIG OFF OF OR ONTO THE REAR DECK OF THE MARSH MASTER®.

SPRAY RIG PRE-OPERATION

Prior to operating the spray rig, the following best practices are recommended such that the performance and life of the equipment are not jeopardized during operation:

- Ensure that the oil level in the sight glass on the spray rig pump is approximately halfway full.



- Ensure that the air pressure on the pulsation dampener is approximately 20% of the pump discharge pressure which is controlled by the bale handle.
 - Typically 40 psi
 - Pump discharge pressure typically 200 psi



- For hydraulic model spray rigs, connect the hydraulic lines from the motor on the skid to the Marsh Master® low flow quick connect ports and engage the low flow circuit. See your specific model Marsh Master® for how to engage the low flow circuit.
- For the gas model spray rigs, check the fuel level and the oil level, turn the ignition switch on, choke as needed, and pull-start the engine.



- Warm up the pump:
 - Start the motor or engine as described above, this will immediately begin turning the pump as they are directly connected.
 - Let the pump run for approximately 1 minute.
 - Turn the motor off or kill the engine and then check the oil level in the sight glass of the pump to ensure that it is close to the halfway mark.

CONTROLS

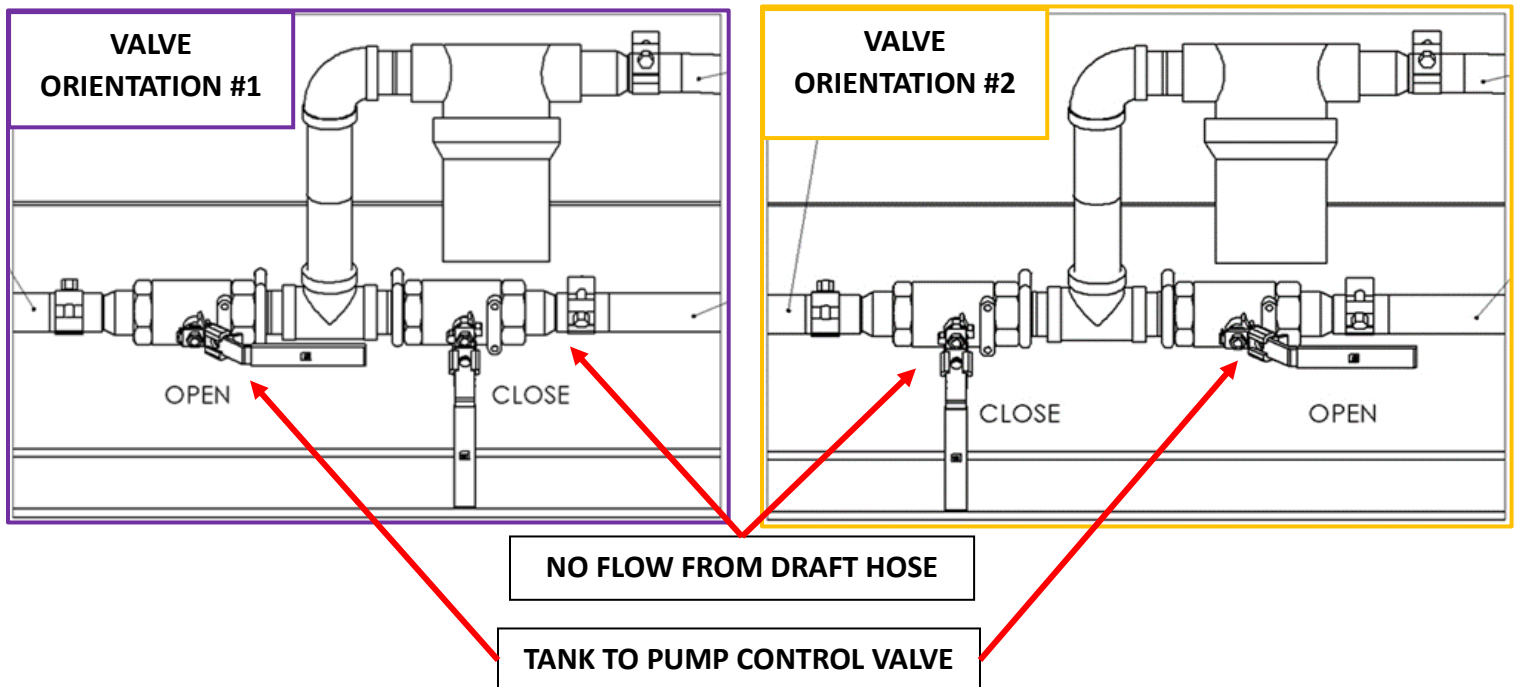
The spray rig pump is turned on and off by either activating the low flow circuit on the Marsh Master® or by starting the gasoline engine. The methodology by which the low flow tool circuit is engaged and disengaged depends on your make and model of Marsh Master®. **Generally**, the low flow tool circuit is engaged and disengaged via a push pull switch in the cab or by opening and closing a manual valve located in the cab.

Once the pump is turning, the control valves on the spray rig must be manipulated to achieve the desired function. There are two recommended operations for control valve configurations that perform two different functions by directing water/product to or from the spray tank. These two operations are as follows:

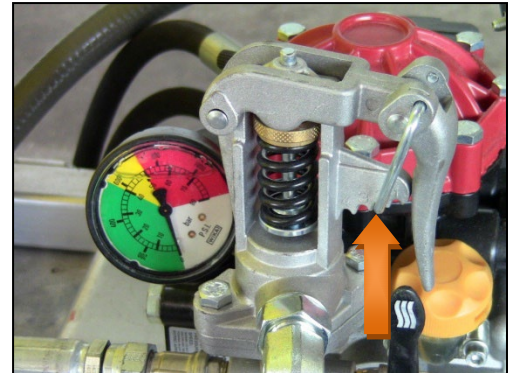
Spraying

1. Open the valve coming from the tank to the control valve & filter portion of the spray rig. This will typically be a hose that connects the tank to the valve. An open valve is such that the valve handle is parallel to the hose.
2. Close the valve that leads to the draft hose. This will typically be a hose that connects the valve to a suction strainer. A closed valve is such that the valve handle is perpendicular to the hose.

****DEPENDING ON YOUR SPRAY RIG MODEL, THE CONTROL VALVE ORIENTATION MIGHT VARY; THEREFORE, ALWAYS FOLLOW THE HOSES TO ENSURE CORRECT VALVE OPERATION. TWO OF THE COMMON ORIENTATIONS ARE SHOWN BELOW WHERE THE VALVE TO BE OPEN IS ON DIFFERENT SIDES DEPENDING ON THE SPECIFIC SPRAY RIG MODEL****



3. Set the pump operating pressure by setting the bale hook on the desired level. The recommended setting is level 2 which controls the pressure to 200 psi.
 - a. Level 1 \approx 100 psi
 - b. Level 2 \approx 200 psi
 - c. Level 3 \approx 300 psi (Not recommended for our system)
 - d. Level 4 \approx 400 psi (Not recommended for our system)

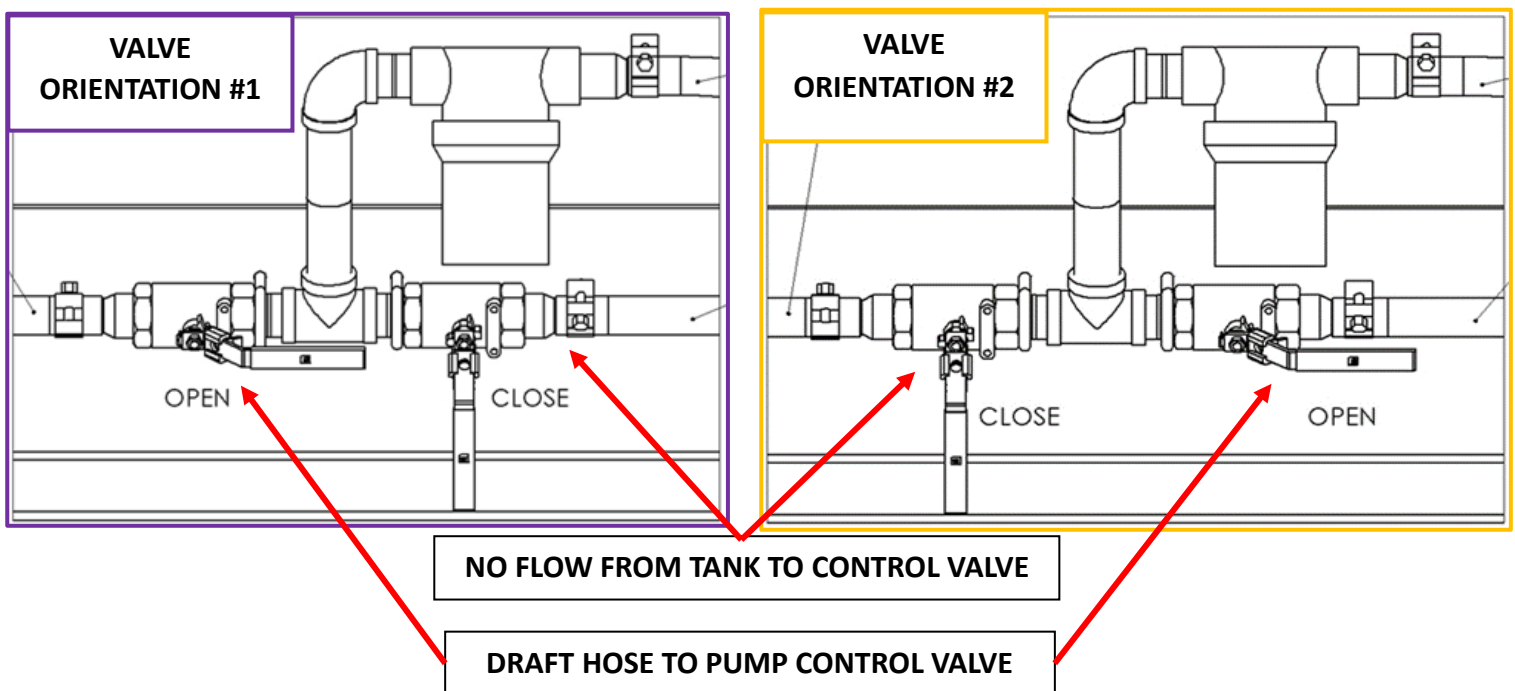


4. Ensure that the valve from the pump to the spray gun is in the open position (handle parallel to the hose)
5. Begin spraying!

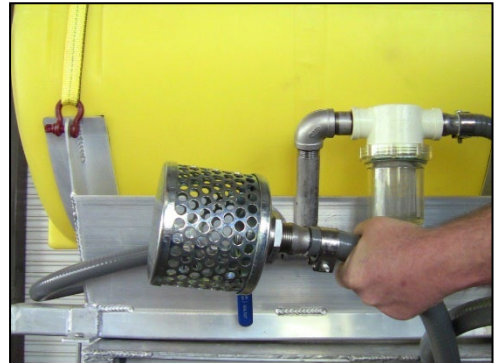
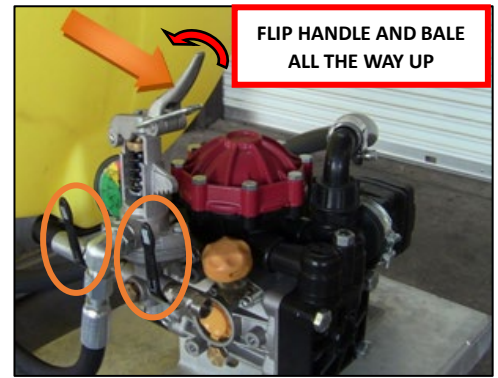


Refilling the Tank

1. Close the valve on the hose that comes from the tank to control valve & filter portion.
2. Open the valve on the draft hose that will be used to pump water into the tank.



3. Fully disengage the bale hook on the relief valve on the pump by flipping the handle and bale all the way up. **Water will not flow into the tank if the bale hook is not released such that there is zero spring pressure on the relief valve.**
4. Close both spray gun valves.
5. Submerge the metal strainer on the draft hose into the external water source. Try to keep the suction area of the strainer in areas where there is minimal debris if possible.



PRO-TIPS

- Most spray guns have a nut behind the spray lever which allows the spray stream to be adjusted depending on the required application:
 - Clockwise nut rotation = narrow & far stream
 - Counter-Clockwise nut rotation = wide, close stream
- Most spray rigs have a dual-gun option where two spray guns can be used simultaneously. For best results when spraying with two guns, a 0.090" orifice in spray gun tip is recommended.
- Most spray rigs can be equipped with an adjustable spray boom such that product can be applied when operating from the cab. If your spray rig is equipped with a spray boom, ensure that the spray boom regulator is set to 40 psi, anything higher will likely lead to loss of spray nozzles on the boom.



SPRAY RIG MAINTENANCE

- Prior to shelving the spray rig after use, the tank and the pump need to be flushed with clean water. Then run a 50/50 mixture of antifreeze and water through the system to prevent icing of components.
- Change the pump oil after 40 hours of break-in, and every 3 months or 500 hours, whichever comes first.
- Change the pump diaphragm every 3 months or 500 hours, whichever comes first.
- Cleaning the strainer:
 - Unscrew the plastic base.
 - Remove the metal screen and rinse.
 - Put the screen back and screw the base back on.



TROUBLESHOOTING

- **The pump does not draw water:**
 - Possible Cause - One or more valves are seating improperly.
 - Corrective Action - Remove valve and check for debris. Remove any debris found. Examine the valve seats and clean them.

- **The pump does not draw water:**
 - Possible Cause - Suction line is plugged or collapsed. Clogged strainer.
 - Corrective Action - Examine and clean the suction line. Clean the strainer.

- **The liquid flow is irregular (pulsation in the gun or discharge line):**
 - Possible Cause - The charge in the pulsation dampener is incorrect.
 - Corrective Action - Check the pressure in the pulsation dampener. (It should be 20% of your spray pressure.)

- **The liquid flow is irregular (pulsation in the gun or discharge line):**
 - Possible Cause - One or more valves are seating improperly.
 - Corrective Action - Remove the valve and check for debris. Remove any debris found. Examine the valve seats and clean them.

- **Output drops and the pump is noisy:**
 - Possible Cause - The oil level is too low.
 - Corrective Action - Add oil to the correct level (halfway up the sight glass).

- **Oil comes out of the discharge port or oil is a milky color:**
 - Possible Cause - One or more diaphragms have split.
 - Corrective Action - Remove the manifold and heads. Drain the oil and clean the crankcase of water. Replace the diaphragms, heads, and manifold. Refill with SAE 30 oil.

PARTS ORDERING

(1-800-827-5320)

The components used on the spray rig have been carefully selected for performance, reliability, and safety. Use only genuine Marsh Master® replacement parts.

WHEN ORDERING PARTS PLEASE FURNISH ALL OF THE FOLLOWING:

- Spray rig model → See data plate attached to the spray rig
- Spray rig Generic Description → Round vs. Square vs. Elliptical Tank & Capacity
- Your company name
- Shipping address
- Billing address
- Name of person ordering
- Telephone number
- Purchase order number
- Part description and quantity of each item

Thank you for choosing Coast Machinery, LLC, and the spray rig. If you have any questions regarding the spray rig please call Coast Machinery, LLC at 1-800-827-5320.