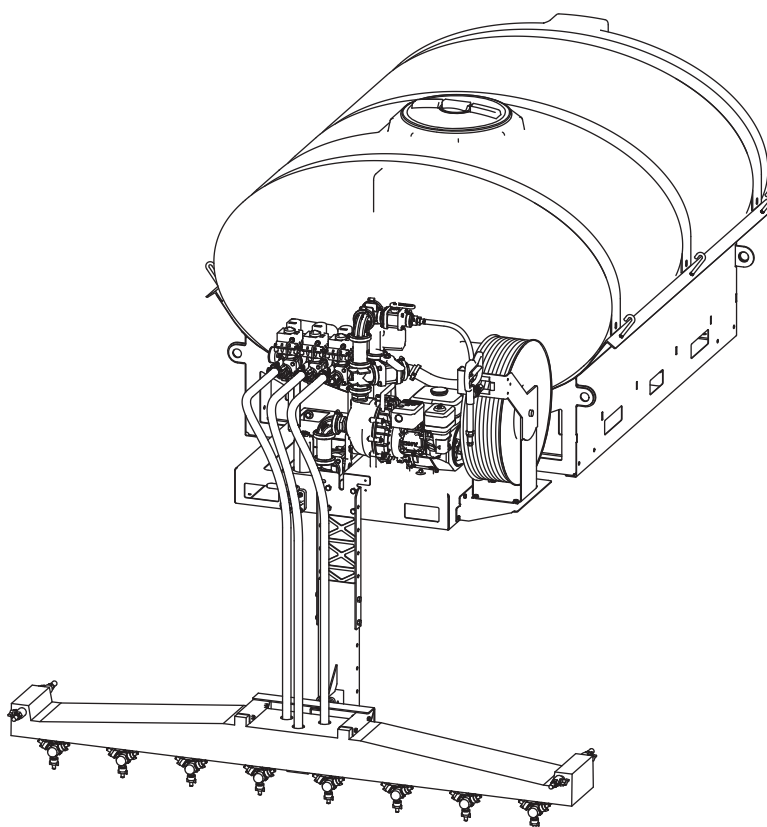




Liqui Maxx™ Sprayer Systems

Owner's Manual and Installation Instructions

Original Instructions



⚠ CAUTION

Read this document before operating
or servicing the equipment.

This manual and instructions are for Liqui Maxx Sprayer Systems
with serial numbers beginning with 141107–160208.

This document supersedes all editions with an earlier date.

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PREFACE

This manual has been prepared to acquaint you with the safety information, operation, and maintenance of your new equipment. Improper installation and operation could cause personal injury and/or equipment and property damage. Read and understand the Owner's Manual before installing, operating, or making adjustments. Keep this manual accessible.

When service is necessary, call SnowEx® Technical Service at 1-800-SALTERS (725-8377).

NOTE: This unit is designed to be used with salt brine; the use of additives may impact performance.

NOTE: Do not modify or alter the equipment. Altering the unit in any way will void the warranty.

The Liqui Maxx™ sprayer system is designed to apply brine to pre-treat, anti-ice, and post-treat parking lots and roadways. Each Liqui Maxx unit consists of a holding tank, pumping system and control, and a spray boom.

Standard Control – Texas Industrial Remcor, Inc.

The standard version of the control has the ability to turn the sprayers ON and OFF and increase or decrease the pressure of the system from the cabin.

Deluxe Control – Micro-Trak RoadMaster™

The deluxe version of the control unit has many features that include: push-button controls, application rate adjustment and selection, automatic and manual control modes, visual and audio alarms, and a blast function for spot applications.

A separate GPS unit is offered that incorporates the vehicle speed to automatically adjust the flow rate and maintain the desired application rate. The deluxe control is also compatible with some vehicle speed sensors that can replace the GPS unit. Consult your vehicle owner's manual for more information.

WARRANTY REGISTRATION

Warranty registration is available online at www.snowexproducts.com. Under "Support" click "Warranty Registration" and submit the form online.

OWNER'S INFORMATION

Owner's Name: _____

Date Purchased: _____

Outlet Name: _____ Phone: _____

Outlet Address: _____

Vehicle Model: _____ Year: _____

Equipment Model: _____ Serial #: _____

Length: _____ Weight: _____ lb/kg: _____

RoadMaster™ is an unregistered trademark of Micro-Trak Systems, Inc.

SAFETY

SAFETY DEFINITIONS

WARNING

Indicates a potentially hazardous situation that, if not avoided, could result in death or serious personal injury.

CAUTION

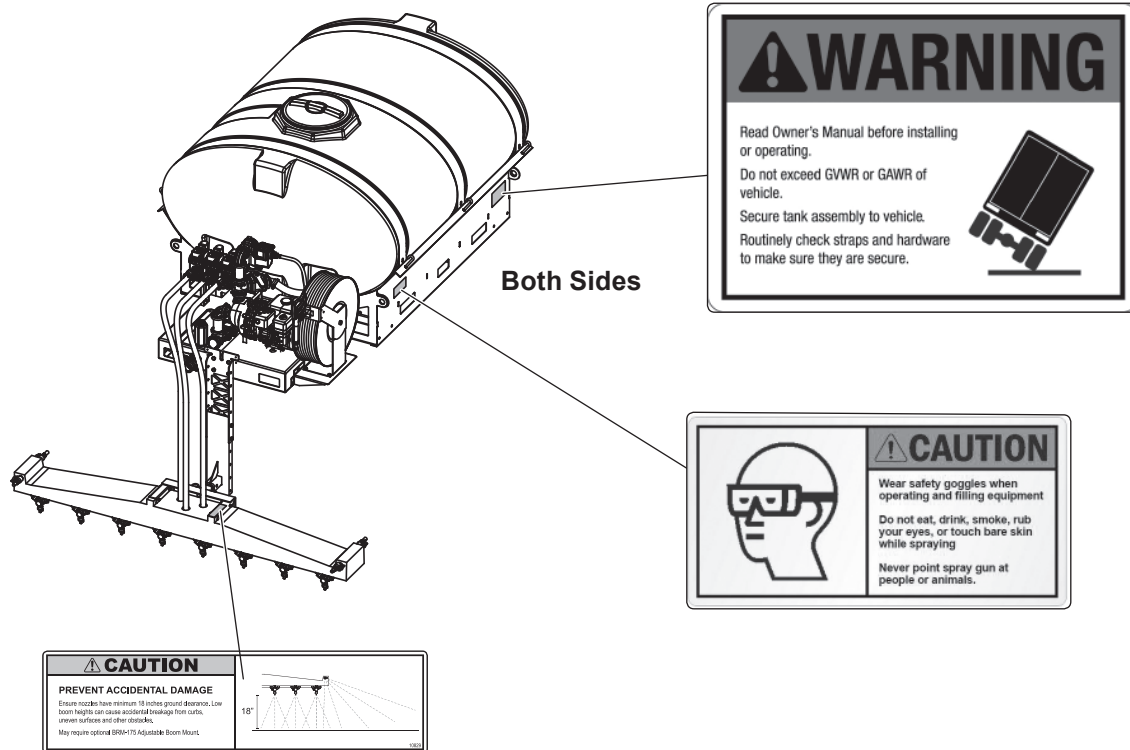
Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTE: Indicates a situation or action that can lead to damage to your sprayer and vehicle or other property. Other useful information can also be described.

WARNING/CAUTION LABELS

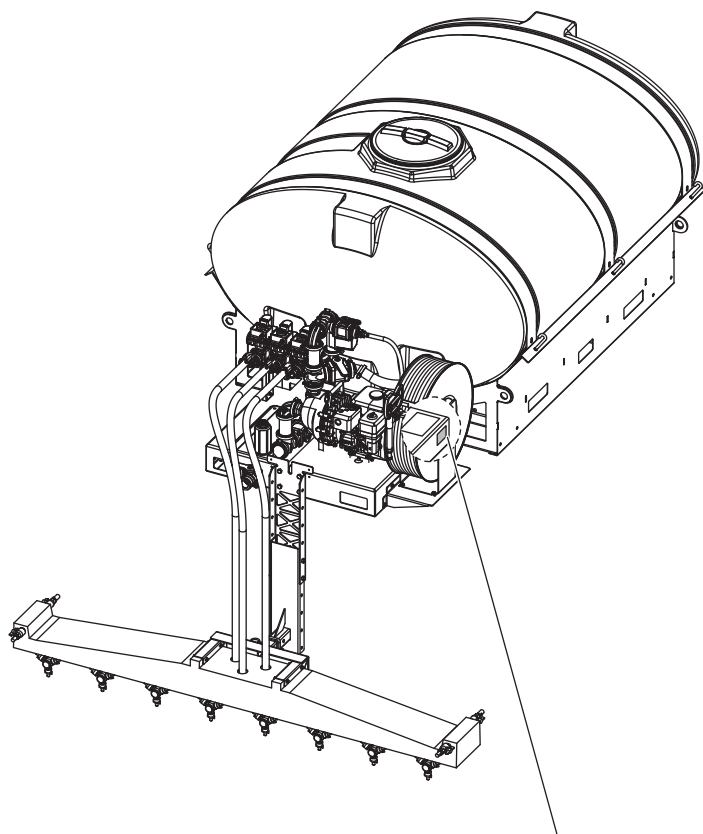
Become familiar with and inform users about the warning and caution labels on the equipment.

If labels are missing or cannot be read, call 1-800-SALTERS (725-8377).



SAFETY

SERIAL NUMBER LABEL



SnowEx TrynEx International
531 Ajax Drive
Madison Heights, MI 48071
www.snowexproducts.com

XXXXXXXXXXXXXXXXXXXXXXXXXXXX

YYMMDDLLXXXXZZZZZZ



Code	Definition
YY	2-Digit Year
MM	2-Digit Month
DD	2-Digit Day
LL	2-Digit Location Code
XXXX	4-Digit Sequential Number
ZZZZZZ	Model #

SAFETY PRECAUTIONS

Improper installation and operation could cause personal injury and/or equipment and property damage. Read and understand labels and the Owner's Manual before installing, operating, or making adjustments.

⚠ WARNING

- Before working with the equipment, secure all loose-fitting clothing and unrestrained hair.
- Before operating the sprayer system, verify that all safety guards are in place.
- Always shut OFF vehicle before attempting to attach, detach, or service sprayer system.
- Never attempt to take a unit off a truck with liquid in it.
- Do not climb into or ride on the equipment.

⚠ WARNING



Overloading could result in an accident or damage. Do not exceed GVWR or GAWR ratings as found on the driver-side vehicle door cornerpost. See Filling section to determine maximum volumes of spraying material.

⚠ WARNING

Securely bolt and strap unit into place on the vehicle bed using the optional UMK-200 bolt kit and ratchet straps or similar. Unit must be strapped down and bolted into position before operating or transporting.

⚠ WARNING

Vehicle handling and characteristics will change with the unit installed. Avoid any sudden steering maneuvers, starts, or stops that could create sloshing and instability.

⚠ WARNING

Always make sure personnel are clear of areas of danger when using equipment. Maintain 60' distance from all bystanders when operating the sprayer system.

SAFETY

⚠ WARNING

Do not install the control for this product in the deployment path of an air bag. Refer to vehicle manufacturer's manual for air bag deployment area(s).

⚠ WARNING

Inspect the unit periodically for defects. Parts that are broken, missing, or worn out must be replaced immediately. Do not alter any part of the unit without prior written permission from the manufacturer.

⚠ CAUTION

Brine is typically a clear to cloudy white liquid with no odor. It may be irritating to the eyes, skin, and respiratory system. For more safety information on brine and other de-icing materials, refer to the manufacturer's Safety Data Sheet (SDS).

⚠ CAUTION

During the sprayer system installation we recommend the addition of an OSHA compliant Backup Alarm. This alarm is required for OSHA governed employers.

⚠ CAUTION

- Do not operate a sprayer system in need of maintenance.
- Before operating the sprayer system, reassemble any parts or hardware removed for cleaning or adjusting.
- Before operating the sprayer system, remove materials such as cleaning rags, brushes, and hand tools from the unit.
- Before operating the sprayer system, read the engine owner's manual, if so equipped.
- While operating the unit, use auxiliary warning lights, except when prohibited by law.
- Tighten all fasteners according to the Torque Chart. Refer to Torque Chart for the recommended torque values.

⚠ CAUTION

Disconnect electric and/or hydraulic power and tag out if required before servicing or performing maintenance.

⚠ CAUTION

Do not leave material in the unit for long periods of time.

NOTE: Lubricate grease fittings after each use. Use a good quality multipurpose grease.

FUSES

The electrical system contains several automotive-style fuses. If a problem should occur and fuse replacement is necessary, the replacement fuse must be of the same type and amperage rating as the original. Installing a fuse with a higher rating can damage the system and could start a fire.

PERSONAL SAFETY

- Remove ignition key and put the vehicle in PARK or in gear to prevent others from starting the vehicle during installation or service.
- Wear only snug-fitting clothing while working on your vehicle or sprayer system.
- Do not wear jewelry or a necktie, and secure long hair.
- Wear safety goggles to protect your eyes from brine, battery acid, gasoline, dirt, and dust.
- Do not eat, drink, smoke, rub your eyes, or touch bare skin while spraying.
- Never point spray gun at people or animals.
- Avoid touching hot surfaces such as the engine, radiator, hoses, and exhaust pipes.
- Always have a fire extinguisher rated BC handy, for flammable liquids and electrical fires.

SAFETY

FIRE AND EXPLOSION

WARNING

Gasoline is highly flammable and gasoline vapor is explosive. Never smoke while working on vehicle. Keep all open flames away from gasoline tank and lines. Wipe up any spilled gasoline immediately.

Be careful when using gasoline. Do not use gasoline to clean parts. Store only in approved containers away from sources of heat or flame.

CELL PHONES

A driver's first responsibility is the safe operation of the vehicle. The most important thing you can do to prevent a crash is to avoid distractions and pay attention to the road. Wait until it is safe to operate Mobile Communication Equipment such as cell phones, text messaging devices, pagers, or two-way radios.

VENTILATION

WARNING

Vehicle exhaust contains lethal fumes. Breathing these fumes, even in low concentrations, can cause death. Never operate a vehicle in an enclosed area without venting exhaust to the outside.

BATTERY SAFETY

CAUTION

Batteries normally produce explosive gases which can cause personal injury. Therefore, do not allow flames, sparks, or lit tobacco to come near the battery. When charging or working near a battery, always cover your face and protect your eyes, and also provide ventilation.

- Batteries contain sulfuric acid, which burns skin, eyes, and clothing.
- Disconnect the battery before removing or replacing any electrical components.





TORQUE CHART

CAUTION





Read instructions before assembling. Fasteners should be finger tight until instructed to tighten according to the Torque Chart. Use standard methods and practices when installing equipment, including proper personal protective safety equipment.

Recommended Fastener Torque Chart

Inch Fasteners Grade 5 and Grade 8

Size	Torque (ft-lb)		Size	Torque (ft-lb)	
	 Grade 5	 Grade 8		 Grade 5	 Grade 8
1/4-20	8.4	11.9	9/16-12	109	154
1/4-28	9.7	13.7	9/16-18	121	171
5/16-18	17.4	24.6	5/8-11	150	212
5/16-24	19.2	27.3	5/8-18	170	240
3/8-16	30.8	43.6	3/4-10	269	376
3/8-24	35.0	49.4	3/4-16	297	420
7/16-14	49.4	69.8	7/8-9	429	606
7/16-20	55.2	77.9	7/8-14	474	669
1/2-13	75.3	106.4	1-8	644	909
1/2-20	85.0	120.0	1-12	704	995

Metric Fasteners Class 8.8 and 10.9

Size	Torque (ft-lb)		Size	Torque (ft-lb)	
	 Class 8.8	 Class 10.9		 Class 8.8	 Class 10.9
M6 x 1.00	7.7	11.1	M20 x 2.50	325	450
M8 x 1.25	19.5	26.9	M22 x 2.50	428	613
M10 x 1.50	38.5	53.3	M24 x 3.00	562	778
M12 x 1.75	67	93	M27 x 3.00	796	1139
M14 x 2.00	107	148	M30 x 3.50	1117	1545
M16 x 2.00	167	231	M33 x 3.50	1468	2101
M18 x 2.50	222	318	M36 x 4.00	1952	2701

These torque values apply to fasteners except those noted in the instructions.

SPECIFICATIONS

This Owner's Manual covers vehicles that have been recommended for carrying the sprayer system. Please see your local dealer for proper vehicle applications.

CERTIFICATION

WARNING

New untitled vehicle installation of a sprayer system requires National Highway Traffic Safety Administration altered vehicle certification labeling. Installer to verify that full sprayer does not exceed GVWR or GAWR rating label and complies with FMVSS.

WARNING

Overloading could result in an accident or damage. Do not exceed GVWR or GAWR as found on the driver-side cornerpost of vehicle.

CAUTION



Read and adhere to manufacturer's ice-control material package labeling, including Safety Data Sheet requirements.

SPECIFICATIONS

Liqui Maxx™ Sprayer System					
Tank Model		TSA-300	TSA-500	TSA-750	TSA-1250
Capacity (gal)		300	500	750	1250
Tank and Pump Dimensions (in)	Length	101	112	118	119
	Width	53	59	75	85
	Height	24	48	55	73
Empty Unit Weight (lb)		500	600	700	1000
Full Unit Weight (lb)		3500	5600	8200	13500
Suggested Gross Vehicle Weight Rating (GVWR) (lb)		8,500–10,000	14,000–16,000	16,000–19,500	19,500–26,000
Vehicle Class		Class 2B	Class 4	Class 5	Class 6

INSTALLATION INSTRUCTIONS

⚠ WARNING



Overloading could result in an accident or damage. Do not exceed GVWR or GAWR ratings as found on the driver-side vehicle door cornerpost. See specifications to determine maximum volumes of spraying material.

⚠ WARNING

New untitled vehicle installation of a sprayer system requires National Highway Traffic Safety Administration altered vehicle certification labeling. Installer to verify that full sprayer does not exceed GVWR or GAWR rating label and complies with FMVSS.

⚠ WARNING

Always shut OFF vehicle before attempting to attach, detach, or service spray system.

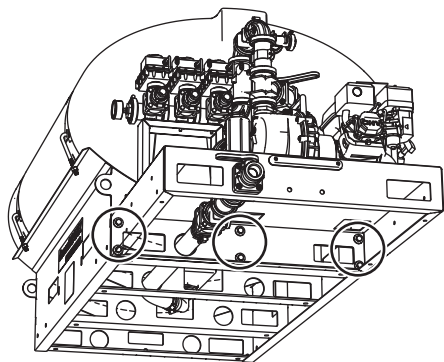
⚠ WARNING

Never attempt to take a unit off a truck with liquid in it.

INSTALLATION AND REMOVAL

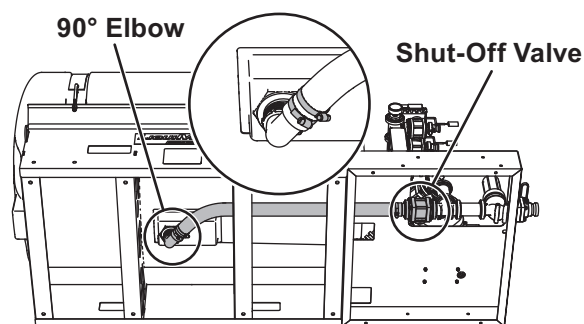
NOTE: To prevent leaks, use a thread sealing compound on all threaded connections. Do not use Teflon® tape, as fragments will clog the spray nozzles. Clamped connections may require periodic retightening.

1. Bolt the pump and tank platforms together (six places).

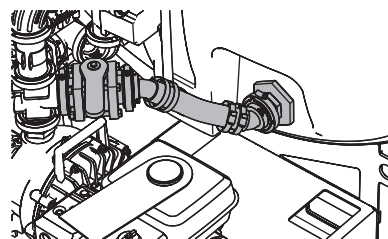


2. Connect the hose underneath the unit. Securely fasten the 90° elbow connection to the tank bulkhead fitting underneath the unit. Make sure that the bulkhead fitting is securely fastened to the tank to prevent leaks. Run the 2" hose from the elbow to the shut-off valve below the pump. Clock the 90° elbow so that the hose remains free of kinks; cut it to length. Clamp the hose using two clamps on each end to prevent leaks.

NOTE: In low temperatures, warming the hose may ease installation. Dip the hose in hot water or carefully use a heat gun for 20–40 seconds.



3. Connect the return valve to the 2" bulkhead connection on the pump side of the brine tank. Securely fasten the 45° connections to the tank bulkhead fitting and the return valve. Make sure that the bulkhead fitting is securely fastened to the tank to prevent leaks. Clock the 45° connections so that the hose remains free of kinks, and cut the 1-1/2" hose to length. Clamp the hose using two (2) clamps on each end to prevent leaks.

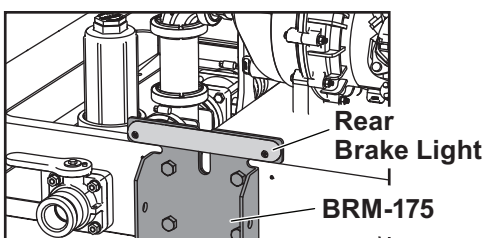


4. Connect the bypass line to the 3/4" bulkhead connection on the pump side of the brine tank. Securely fasten the 90° elbow to the tank bulkhead fitting. Make sure that the bulkhead fitting is securely fastened to the tank to prevent leaks. Clock the 90° elbow so that the hose remains free of kinks, and cut the 1/2" hose to length. Clamp the hose tightly to prevent leaks.

Teflon® is a registered trademark of E. I. du Pont de Nemours and Company.

INSTALLATION INSTRUCTIONS

5. Lift the main tank and pump assembly using the fork lift pockets. Use caution when inserting forks. Improper insertion may puncture or damage the brine tank and tubing routed underneath the unit. Center the tank and pumping system from driver to passenger side on top of the truck bed and lower into position.
6. Install any optional kits and equipment. To install the BRM-175 Adjustable Boom Receiver Mount, unfasten the rear brake light, install the kit, and re-install the light on the top rear face of the boom receiver mount bracket.

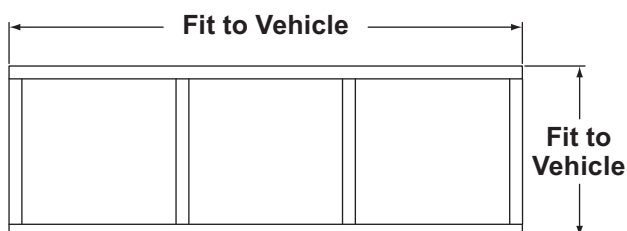


7. Securely bolt and strap unit into place on the vehicle bed using the optional UMK-200 Universal Mounting Kit, or similar brackets and ratchet straps. It is the end user's responsibility to provide the hardware for attaching the sprayer system to the vehicle.

NOTE: Pay special attention when drilling or clamping dissimilar metals to aluminum bodies. Galvanic corrosion can occur if not handled properly. Contact vehicle manufacturer for recommended attachment practices.

8. Measure the distance between front of the truck bed and the tank base. Make a wooden spacer to fill the area between the tank base and the front of the truck bed.

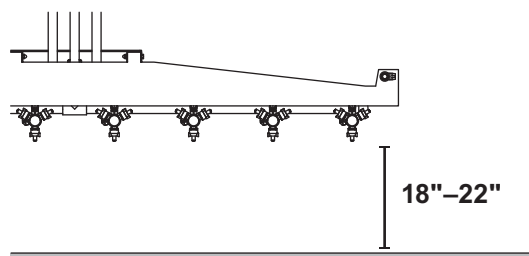
NOTE: Failure to install this spacer could result in damage to the sprayer and/or vehicle.



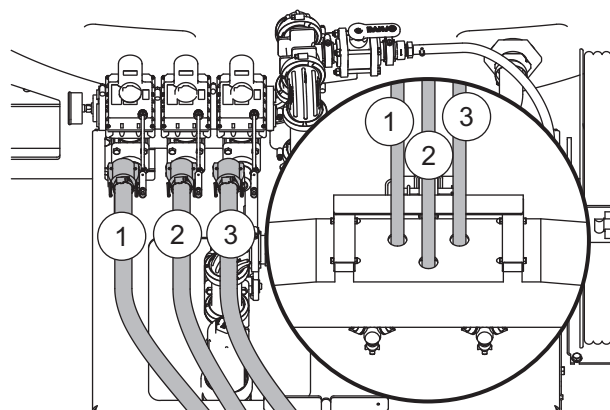
⚠ CAUTION

Ensure that nozzles have minimum 18 inches ground clearance. Low boom heights can cause accidental breakage from curbs, uneven surfaces, and other obstacles. Adjustment may require optional BRM-175 Adjustable Boom Mount.

9. Install the boom so the nozzles measure 18"-22" from ground to nozzle tip. This is to prevent damage and ensure optimal performance. Consider using the optional BRM-175 Adjustable Boom Receiver Mount if the tips of the nozzles lie outside this zone when using your stock receiver hitch.



10. Connect the boom to the pump. Clamp the quick disconnect attachments on the boom hoses to the manifold valves on the pumping unit. Route the hoses to the installed boom with adequate slack and cut the hoses to fit. Clamp the hose tightly to the boom to prevent leaks.



11. Fill the pump's antifreeze reservoir with a mixture of 50% ethylene-glycol and 50% water. The seal should be completely submerged. Check mixture every 8 hours of operation and each time the gasoline tank is filled. See filling instructions.

INSTALLATION INSTRUCTIONS

CONTROL BOX MOUNTING

NOTE: Use dielectric grease to prevent corrosion on all connections.

Before beginning the installation, remove all battery cables from the vehicle battery terminals.

1. Route the control box harness along the vehicle frame. Do not route it close to the exhaust system or engine, where extreme heat could melt the wiring insulation and short out the sprayer and vehicle electrical systems. Attach the harness to the frame holes and frame supports. Do not attach to fuel or brake lines. Use heavy duty cable ties or frame clamps to fasten the harness along the frame.
2. Lay out the control power cable along the fire wall and fender well. **Do not connect the power leads to the battery at this time.**

⚠ CAUTION

Before drilling holes, check to see that no vehicle wiring or other components could be damaged.

3. Route the control power cable and harness using an existing access hole through the fire wall into the vehicle cab. If adding an access hole is necessary, check the area on the other side of the fire wall to make sure you will not drill into vehicle wiring or other components.

⚠ WARNING

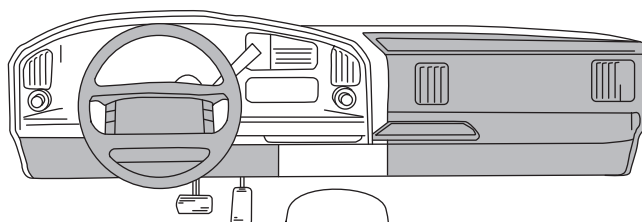
Do not install the control for this product in the deployment path of an air bag. Refer to vehicle manufacturer's manual for air bag deployment area(s).

⚠ CAUTION

Do not mount the control close to any heater vents or in areas prohibited by the vehicle manufacturer for crashworthiness. See the vehicle's body builder's book, owner's manual, or service manual for details.

⚠ CAUTION

Do not alter, modify, or install components in shaded areas shown below. Failure to comply may interfere with airbag deployment or cause injury to operator in an accident.



4. Connect the harness and the control power cable to the back of the control and mount the control in a suitable location within easy reach of the vehicle operator without restricting access to the vehicle controls and instruments.
5. Connect the harness to the battery. Refer to the wiring diagrams for battery connections.

WIRING DIAGRAMS

Standard RC-1B Control

For detailed information on wiring diagrams, refer to the installation instructions in the RC-1B Sprayer owner's operating manual. Refer to the previous section in this manual for control box placement guidelines.

Deluxe RoadMaster™ Control

For detailed information on wiring diagrams, refer to the installation instructions in the RoadMaster control system's reference manual. Refer to the previous section in this manual for control box placement guidelines.

The RoadMaster reference manual can be found online at www.micro-trak.com.

FILLING

⚠ WARNING

Overloading could result in an accident or damage. Do not exceed GVWR or GAWR as found on the driver-side cornerpost of vehicle.

⚠ WARNING

Always shut OFF vehicle before attempting to attach, detach, or service spray system.

⚠ CAUTION

Starting the motor with no antifreeze will damage the seal in the pump. Check antifreeze levels before starting.

Refer to the specifications section to determine sprayer weights and capacities.

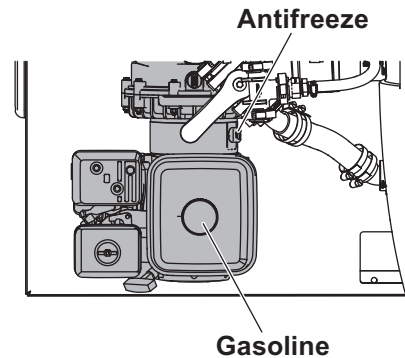
FIRST TIME FILLING

1. Install the sprayer and any optional equipment. See the installation section of this manual for details.
2. Install or attach any other equipment that will be on the vehicle while the sprayer will be in use (step bumper, trailer hitch, snowplows, etc.) and fill gas tanks.
3. Obtain the Gross Vehicle Weight Rating (GVWR), Front Gross Axle Weight Rating (FGAWR), and Rear Gross Axle Weight Rating (RGAWR) from the certification label typically located inside the driver-side door.
4. With the occupants in the truck for normal sprayer operation, weigh the vehicle to obtain gross vehicle weight (GVW).
5. Subtract the GVW from the GVWR to determine the available material payload. For reference, brine weighs approximately 10 lb/gal. For more weight information, see the Specifications section of this manual or the material manufacturer's specifications.

ROUTINE FILLING

Wet Seal Pump

Fill the pump's antifreeze reservoir with a mixture of 50% ethylene-glycol and 50% water. Check mixture every 8 hours of operation and when the gasoline tank is filled. The reservoir should be at least 75% full, with the seal completely submerged. See diagram.

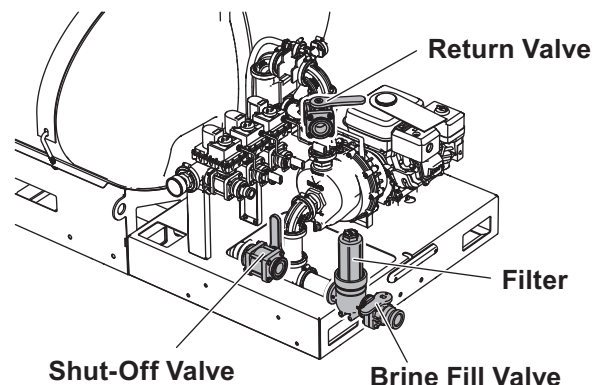


Gasoline

Fill the motor with gasoline as needed.

Adding Brine

Fill the brine tank to the desired level using the following steps. Use the markings on the tank for volume reference. If filling is slow, check the intake filter. For more info see the Maintenance and Troubleshooting sections of this manual.



FILLING

Filling with an External Pump

1. Connect fill hose to the brine fill valve. Opening the valves first will cause standing brine in the tank to flow out.
2. Once the hose is hooked up, open the brine fill and the shut-off valves.
3. Once the valves are open, begin pumping brine from the holding tank using the external pump.
4. Fill to the desired level.
5. Close the brine fill valve. The shut-off valve must be open for spraying.

Filling with the Liqui Maxx™ Sprayer's Pump

NOTE: This method only works when the brine reservoir level is above the tank level. The pump requires a gravity-fed start to remove standing air in the piping. Once the pump is primed it will function normally.

1. Connect fill hose to the brine intake valve. Opening the valve first will cause standing brine in the mixing tank to flow out.
2. Once the hose is hooked up, open the brine fill and return valves, and close the shut-off valve.
3. Once brine begins to flow in, start the motor.
4. Fill tank to the desired level.
5. Close the brine fill and return valves, and open the shut-off valve.

OPERATING AND CALIBRATION INSTRUCTIONS

⚠ WARNING

Always make sure that personnel are clear of areas of danger when using equipment. Maintain 60' distance from all bystanders when operating the spray system.

⚠ WARNING

Vehicle handling and characteristics will change with the unit installed. Avoid any sudden steering maneuvers, starts, or stops that could create sloshing and instability.

⚠ WARNING

Before operating the sprayer, verify that all safety guards are in place.

⚠ WARNING

Unit must be strapped down and locked into position before operating or transporting.

⚠ CAUTION

Starting the motor with no antifreeze will damage the seal in the pump. Check antifreeze levels before starting.

CONTROL OPERATION

Deluxe RoadMaster™ Control

Follow the steps below to get started using your deluxe control. See the Operation section of the RoadMaster operator's manual for complete details and instructions.

1. Before spraying, consider what speed range you wish to operate in and select and install the appropriate nozzles using the Application Rate charts in this manual. Note that the unit will not function as intended outside these ranges.

2. Turn the power switch ON. The unit will display the software version and the total hours of operation for 1.5 seconds each. Be sure the control is set to HOLD or the boom switches are set to OFF before starting the Liqui Maxx™ sprayer's motor to prevent unintentional spraying.

The RUN/HOLD button is the master switch to turn all sections ON and OFF. For example, instead of using the individual section switches, simply use the RUN/HOLD switch.

3. Set the valves to the spray configuration. Start the Liqui Maxx sprayer's motor by turning the motor ON, setting the appropriate choke, and pulling the recoil start handle.

Spray configuration:

- Brine Fill Valve: Closed
- Shut-off Valve: Open

4. Select the spray mode by pressing the AUTO/MAN button on the bottom left of the control until the desired mode is displayed on the top right of the control display. Select Automatic Mode if you wish to have the control automatically hold a target application rate and your unit has a compatible speed sensor installed. If you are doing driveways or other applications where it is difficult to stay within a target speed range, it may be desirable to use Manual Mode. If speeds of 4–6 mph are desired, Manual Mode is recommended.

OPERATING AND CALIBRATION INSTRUCTIONS

Automatic Mode

1. During normal operation, set the rotary switch to RATE to see the actual application rate per acre. The unit will automatically adjust to the target application rate which can be seen and adjusted using the Up (+) and Down (–) arrow buttons on the control. Use the RUN/HOLD button and the boom switches to control the boom as desired. The factory defaults below can be adjusted as desired. See the Entering Calibration Values section of the RoadMaster™ operator's manual.

Factory Defaults:

- Target Application Rate: 30
- Rate Increment: ± 5
- Units: Gallons/Acre

The Automatic Mode has a BLAST function intended for spot application that requires a higher application rate like bridges or intersections. This can be changed to any value and it is not associated with the standard application rate. See the Entering Calibration Values section of the RoadMaster operator's manual.

Factory Defaults:

- Blast Target Rate: 35
- Blast Duration: 5 seconds
- Units: Gallons/Acre

The control is also equipped with visual and audio alarms. The alarms will trigger if the actual application rate is above or below 10% of the target rate. For more information on the alarms and other control features see the Console Functions section of the RoadMaster operator's manual.

2. To avoid draining the vehicle battery, turn the control OFF when not in use.
3. When finished turn the motor OFF.

NOTE: The unit cannot automatically adjust the application rate unless there is a compatible speed sensor installed.

Manual Mode

NOTE: In this mode the control will not compensate for speed.

1. During normal operation, set the rotary switch to VOLUME/MINUTE to see the flow rate. This value can be adjusted using the Up (+) and Down (–) arrow buttons on the control. Use the RUN/HOLD button and the boom switches to control the boom as desired.

Factory Defaults

- Units: gallons/acre
2. To avoid draining the vehicle battery, turn the control OFF when not in use.
 3. When finished turn the motor OFF.

For detailed information on operating instructions, refer to the Calibration and Operation sections in the RoadMaster control system's reference manual.

The RoadMaster reference manual can be found online at www.micro-trak.com.

OPERATING AND CALIBRATION INSTRUCTIONS

Standard RC-1B Control

Follow the steps below to get started using your standard control. See the RC-1B owner's operating manual for complete details and instructions.

1. Before spraying, consider what speed range you wish to operate in and select and install the appropriate nozzles using the Application Rates tables in this manual. Note that the unit will not function as intended outside these ranges.
2. Set the master switch to OFF and turn the power switch ON.
3. Set the valves to the spray configuration. Start the Liqui Maxx™ sprayer's motor by turning the motor ON, setting the appropriate choke, and pulling the recoil start handle.

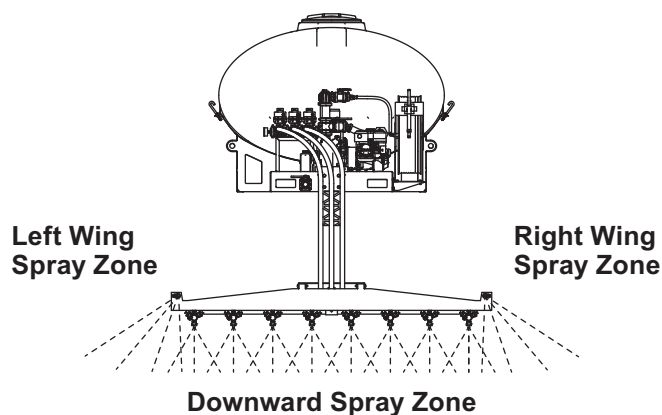
Spray Configuration:

- Brine Fill Valve: Closed
- Shut-off Valve: Open
- Return Valve: Set pressure to 40 psi by opening and adjusting return valve.

4. During normal operation, use the master switch and boom switches to control the boom as desired. Increase or decrease the pressure of the system as desired using the pressure switch.
5. To avoid draining the vehicle battery, turn the control OFF when not in use.
6. When finished turn the motor OFF.

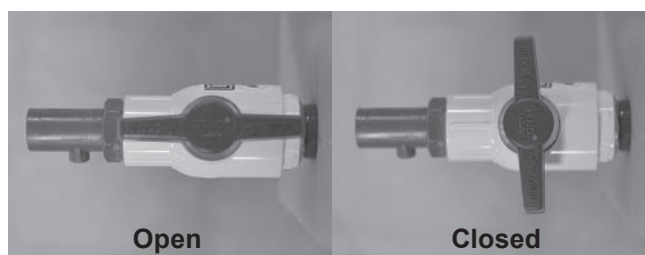
For detailed information on operating instructions, refer to the Operating section in the RC-1B sprayer owner's operating manual.

SPRAY BOOM OPERATION



Wing Spray Nozzle Selection

Select the nozzles to use by referring to the Application Rates tables. Open the desired nozzles on the wing by turning the valve handle so that it is parallel to the nozzle. Close the nozzles not being used by turning the valve handle perpendicular to the nozzle.



In some cases it is beneficial to increase or decrease the distance covered by the wing nozzles by rotating the nozzle(s) on the wing. Note that this will also affect the application rate for the spray zone. For details on how the distance affects the application rate of the nozzles, see the Operation and Calibration – Calculations section of this manual.

OPERATING AND CALIBRATION INSTRUCTIONS

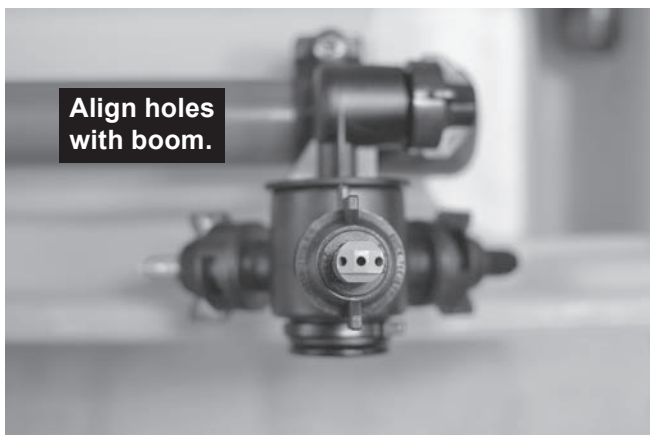
Downward Spray Nozzle Selection PBA-300

Select the nozzles to use by referring to the Application Rates tables. Rotate the selection wheels so that the desired nozzle faces downward.



Nozzle Alignment

For consistent brine application, make sure the holes in the nozzles are aligned with the boom.



DEFAULT CONTROL SETTINGS

Deluxe Control

The values for the deluxe control unit below have been factory calibrated for the Liqui Maxx™ sprayer system and can be changed at any time through typical control calibration procedures. For more information on how to calibrate the control, refer to the RoadMaster™ reference manual.

Factory Settings — Deluxe Control	
	ENGLISH
Tank Set Point	OFF
Fill Tank Size	OFF
Control Speed	-1
Vehicle Number	1
Blast Target Rate	35
Blast Duration	5
Start Time	0(OFF)
Auto Delay Time	1 sec
Valve Polarity	Bypass
Auto Shut-off	ON
Minimum Alarm Speed	0 MPH
Manual Control Enable	ON
Alarm Enable	ON
Default Calibration Values	English
Mode	Acres
Speed Cal	0.189
Flow Cal	148
Min Flow	0.0
Target Rate	30.0
Adjust Rate	5.0
Section 1 Width	96.0
Section 2 Width	96.0
Section 3 Width	96.0

OPERATING AND CALIBRATION INSTRUCTIONS

APPLICATION RATES

Application rates are to be selected and adjusted by the user according to ground conditions and temperatures. Initial market research suggests an application rate of approximately 30 gallons/acre for use in de-icing and anti-icing. Application rates in the charts below are based on manufacturer's numbers. If your flow is uncharacteristically slow, see the Troubleshooting and Maintenance sections of this manual.

Nozzle Selection

Suggested Operating Range 30–40 psi

Boom Nozzle†	Width (ft)	gal/min @30psi‡	Total gal/min†	gal/min @40psi‡	Total gal/min‡
Brown (<i>std</i>)	8	0.38	3.0	0.42	3.4
Gray (<i>acc</i>)	8	0.45	3.6	0.50	4.0
White (<i>std</i>)	8	0.61	4.9	0.67	5.4
Lt Blue (<i>acc</i>)	8	0.76	6.1	0.84	6.7
Lt Green (<i>std</i>)	8	1.04	8.3	1.26	10.1
Black (<i>acc</i>)	8	1.47	11.8	1.68	13.4

Side Nozzle†	Width (ft)	gal/min @30psi‡	Total gal/min†	gal/min @40psi‡	Total gal/min‡
Red (<i>std</i>)	8	0.37	3.0	0.42	3.4
White (<i>std</i>)	8	0.72	5.8	0.84	6.7

† Application calculations assume boom set @ 18" from ground

‡ Application calculations adjusted with a factor of specific gravity for brine solution of 1.189

Manual Mode

Standard & Deluxe Control

Use the charts below to select the appropriate nozzles for your route when using the standard control or the Manual Mode on the deluxe control. These values are approximations based on manufacturer's data and should be replaced with actual tested values whenever possible.

Suggested Nozzle Configuration

Desired Speed (mph)	Center Nozzles	Boom Nozzles	Gallons Per Acre	Gallons Per Lane Mile
5–7	Brown	Red	25–40	35–60
8–11	White	White		
12–20	Green	Red & White		

Application Rate Table

Desired Application Rate*	Gallons Per Acre	Gallons Per Lane Mile
50	22	32
60	26	38
70	31	44
80	35	51
90	39	57

* lb of NaCl Active Ingredient Per Acre @ 23.3% Solution

OPERATING AND CALIBRATION INSTRUCTIONS

CALCULATIONS

Nozzle Flow Rates (gal/min)			
Wing Nozzles	Min	Max	Center Nozzles
Red	2.9	4	
White	5.2	8	Blue
Red & White	7.9	12	Green
	11.3	16	Black

Equations

$$S \left(\frac{\text{Miles}}{\text{Hour}} \right) = G \left(\frac{\text{Gallons}}{\text{Minute}} \right) \times \left(\frac{1}{A \left(\frac{\text{Gallons}}{\text{Acre}} \right)} \right) \times \left(\frac{1}{B \left(8 \text{ Feet}^* \right)} \right) \times \left\{ \frac{60 \text{ Minutes}}{1 \text{ Hour}} \times \frac{1 \text{ Mile}}{5280 \text{ Feet}} \times \frac{43560 \text{ Square Feet}}{1 \text{ Acre}} \right\}$$

$$S \left(\frac{\text{Miles}}{\text{Hour}} \right) = G \left(\frac{\text{Gallons}}{\text{Minute}} \right) \times \left(\frac{1}{A \left(\frac{\text{Gallons}}{\text{Lane Mile}} \right)} \right) \times \left(\frac{1}{B \left(8 \text{ Feet}^* \right)} \right) \times \left\{ \frac{60 \text{ Minutes}}{1 \text{ Hour}} \times \frac{1 \text{ Mile}}{5280 \text{ Feet}} \times \frac{63360 \text{ Square Feet}}{1 \text{ Lane Mile}} \right\}$$

A = Application rate in gallons per acre or gallons per lane mile

S = speed in miles per hour

G = flow rate of the nozzles in gal/min
(See chart above for min and max values)

B = Spray width in feet
(* 8 feet is the default width)

Conversions

1 lane mile = 1.45 acres

1 acre = 43560 square feet

1 lane mile = 63360 square feet

OPERATING AND CALIBRATION INSTRUCTIONS

Example Calculation

What is the fastest I can travel if both the wing nozzles are adjusted to cover 5 feet instead of 8 feet, with an application rate of 30 gallons per acre? (Note that the boom application rate will not change.)

Using the equation to solve for speed, the variables are as follows:

S_{\max} = Unknown

A = 30 gal/acre

B = 5 feet

G = 12 gal/min (from chart*)

*The deluxe control will display the actual flow rate for your specific unit. For a more accurate max speed, use the flow rate from your control in this equation.

Here is the equation with these numbers:

$$S_{Max} \left(\frac{\text{Miles}}{\text{Hour}} \right) = 12 \left(\frac{\text{Gallons}}{\text{Minute}} \right) \times \left(\frac{1}{30 \left(\frac{\text{Gallons}}{\text{Acre}} \right)} \right) \times \left(\frac{1}{5 \left(\text{Feet} \right)} \right) \times \left\{ \frac{60 \text{ Minutes}}{1 \text{ Hour}} \times \frac{1 \text{ Mile}}{5280 \text{ Feet}} \times \frac{43560 \text{ Square Feet}}{1 \text{ Acre}} \right\}$$

$$S_{Max} \left(\frac{\text{Miles}}{\text{Hour}} \right) = \frac{12}{30 \times 5} \times 495 \approx 40 \text{ Miles per hour}$$

MAINTENANCE

⚠ WARNING

Inspect the unit periodically for defects. Parts that are broken, missing, or worn out must be replaced immediately. Do not alter any part of the unit without prior written permission from the manufacturer.

⚠ WARNING

Always shut OFF vehicle before attempting to attach, detach, or service spray system.

⚠ WARNING

Do not operate equipment in need of maintenance.

NOTE: To prevent leaks, use a thread-sealing compound on all threaded connections. Do not use Teflon® tape, as fragments will clog the spray nozzles. Clamped connections may require periodic retightening.

PERIODIC MAINTENANCE

- When servicing, you may need to close the shut-off valve and/or the return valve, to prevent stored brine from exiting the holding tank.
- Wash unit after each use to prevent material build-up and corrosion.
- Use dielectric grease on all electrical connections to prevent corrosion each time power or signal plugs are disconnected.
- Paint or oil all bare metal surfaces as needed.
- Inspect unit for defects: broken, worn, or bent parts and similar.
- Inspect all tubing, hoses, and harnesses for cracks and leaks.
- Clean the brine filter as needed. Close the shut-off valve and access the filter by unscrewing the top cap, then unscrewing the filter cover.
- Retighten bolts, screws, and other connections after first use and as needed.

CLEANING

- Clean the unit as desired. When power washing, keep spray away from electronics.
- Use caution if you are flushing the pumping system with water as it will accumulate in the valves and can cause damage if the water inside freezes. Use antifreeze if unit is to be stored in freezing temperatures.

END OF SEASON AND STORAGE

- Before long periods of storage, flush out the tank, pumping system, and boom to remove salt build-up and prevent corrosion.
- Do not leave unused material in the unit for a prolonged period of time.

NOZZLE MAINTENANCE

Remove nozzles by pushing in and rotating the nozzle cap counterclockwise and clean as necessary.

When reassembling nozzles, make sure that the nozzle holes are in line with the boom. Failure to align the nozzle holes will result in inconsistent brine application.



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TROUBLESHOOTING

WARNING

Always shut OFF vehicle before attempting to attach, detach, or service spray system.

WARNING

Do not operate equipment in need of maintenance.

NOTE: To prevent leaks, use a thread-sealing compound on all threaded connections. Do not use Teflon® tape, as fragments will clog the spray nozzles. Clamped connections may require periodic retightening.

Problem	Possible Cause	Suggested Solution
Brine pumps in slowly or not at all	1. Valve(s) are in closed position.	1. Rotate handle to open the valve.
	2. Brine filter is clogged.	2. Remove and clean the brine filter.
No power to cab control (ignition and control switches ON; no illumination of control indicator lights)	1. Control connector plug is loose.	1. Check plug connection at cab control.
	2. Switched accessory connection is poor.	2. Check accessory connection.
	3. Faulty battery.	3. Check for low battery.
	4. Vehicle control harness is damaged.	4. Replace or repair damaged wires or harness as required.
Control malfunction	1. Refer to the troubleshooting section of the control's operating manual.	1. Refer to the troubleshooting section of the control's operating manual.
Brine spray is inconsistent or no spraying occurs	1. Nozzles have become clogged.	1. Remove and clean the affected nozzles.
	2. Control connection is loose.	2. Check harness connections.
	3. Brine tank empty.	3. Check brine tank level.
Unit is leaking	1. Hose connections are loose.	1. Retighten all hose connections; add thread-sealing compound.



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