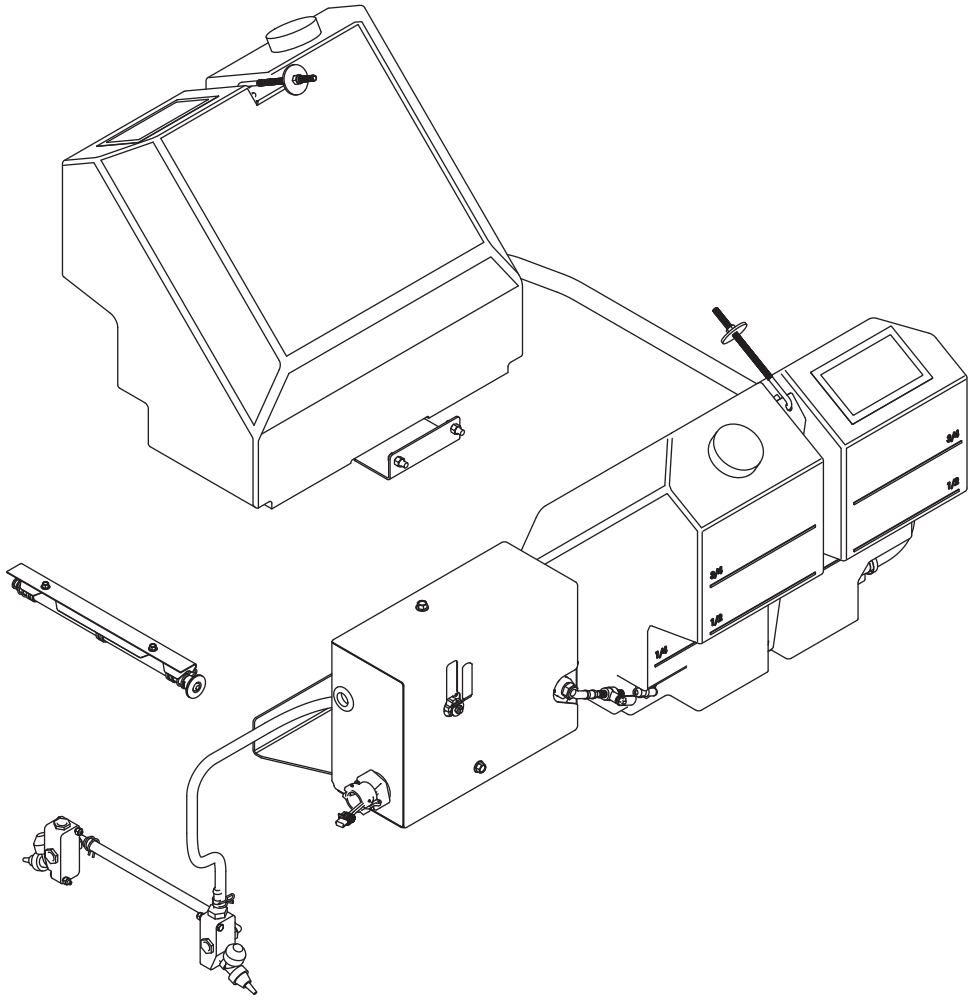
September 15, 2020
Lit. No. 74226, Rev. 00

0.7 yd^3 Hopper Spreader Liquid Kit (ON/OFF System)

#85695

Owner's Manual / Installation Instructions / Parts List



⚠ CAUTION

Read this manual before installing or operating the liquid kit.

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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.

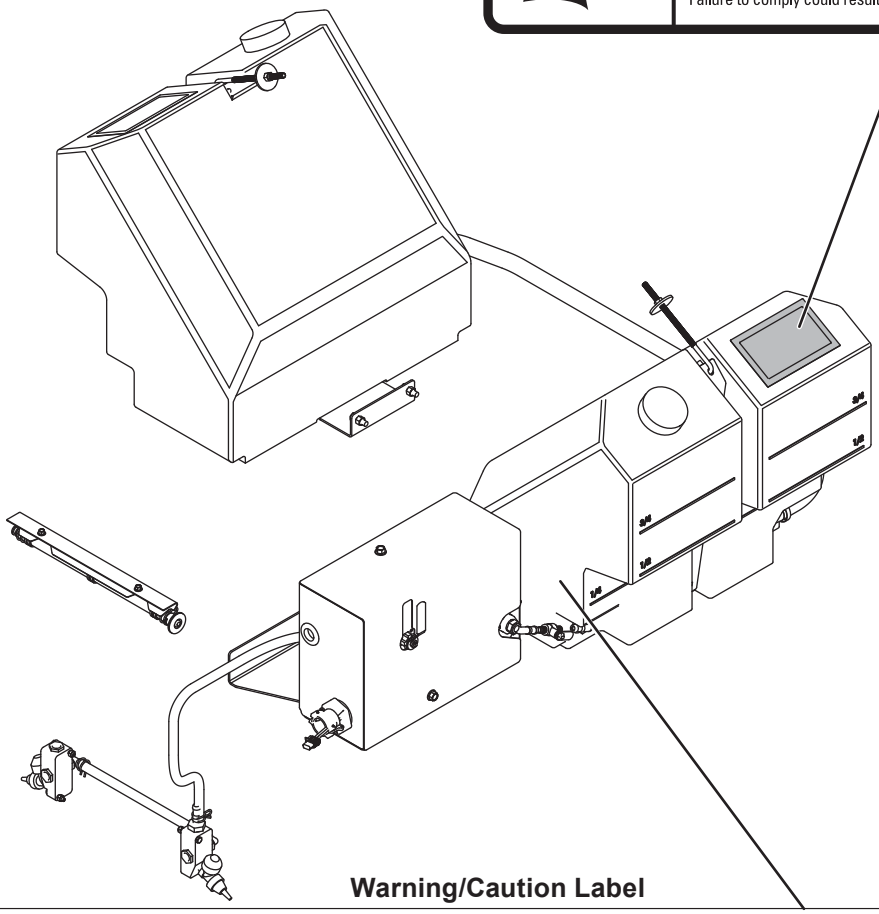
NOTE: Indicates a situation or action that can lead to damage to your liquid system and vehicle or other property. Other useful information can also be described.

WARNING/CAUTION LABELS

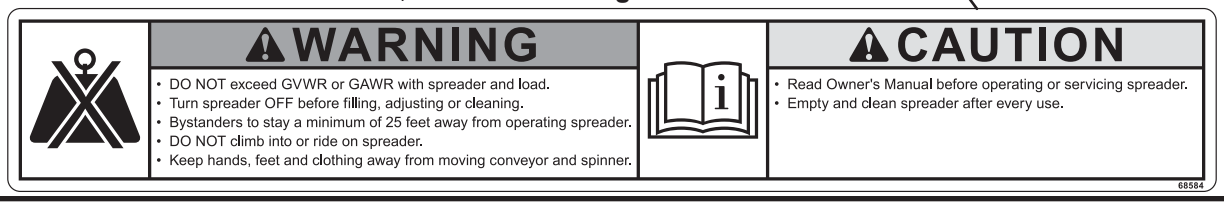
Please become familiar with the warning and caution labels on the liquid system.

NOTE: If labels are missing or cannot be read, see your sales outlet.

Warning Label – Corrosivity Hazard



Warning/Caution Label



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

- **Driver to keep bystanders a minimum of 25 feet away from operating liquid system.**
- **Before working with the liquid system, secure all loose-fitting clothing and unrestrained hair.**
- **Before operating the liquid system, verify that all safety guards are in place.**
- **Before servicing the liquid system, wait for conveyor and spinner to stop.**
- **Do not climb into or ride on liquid system.**

⚠ WARNING

Overloading could result in an accident or damage. Do not exceed GVWR or GAWR ratings as found on the driver-side door cornerpost of the vehicle. See Loading section of your spreader Owner's Manual to determine maximum volumes of spreading material.

⚠ WARNING

- **The drive shafts, conveyor, and spinner assemblies transmit great amounts of power and, accordingly, are hazardous when in operation. All maintenance, inspections, or operator adjustments must be made with all source power OFF.**
- **Keep liquid system and surrounding area clear of personnel and property when operating.**
- **When traveling, especially fully loaded, this machine may have a high center of gravity, and care should be exercised when turning or driving on banked surfaces.**
- **Unauthorized modifications to the liquid system and related components may impair the function and/or safety.**

⚠ CAUTION

- **Do not operate a liquid system in need of maintenance.**
- **Before operating the liquid system, reassemble any parts or hardware removed for cleaning or adjusting.**
- **Before operating the liquid system, remove materials such as cleaning rags, brushes, and hand tools from the liquid system.**
- **While operating the liquid system, 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 unused material in hopper. Material can freeze or solidify, causing unit to not work properly. Empty and clean after each use.

PERSONAL SAFETY

- Remove the 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 liquid system.
- Do not wear jewelry or a necktie, and secure long hair.
- Wear safety goggles to protect your eyes from battery acid, gasoline, dirt, dust, and brine.
- 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.

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.**

NOISE

Airborne noise emission during use is below 70 dB(A) for the liquid system operator.

VIBRATION

Operating liquid system vibration does not exceed 2.5 m/s^2 to the hand-arm or 0.5 m/s^2 to the whole body.

TORQUE CHART

⚠ CAUTION

Read instructions before assembling. Fasteners should be finger tight until instructed to tighten according to torque chart. Use standard methods and practices when attaching liquid system, including proper personal protective safety equipment.

Recommended Fastener Torque Chart

Inch Fasteners Grade 5 and Grade 8

Size	Torque (ft-lb) Grade 5	Torque (ft-lb) Grade 8	Size	Torque (ft-lb) Grade 5	Torque (ft-lb) 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

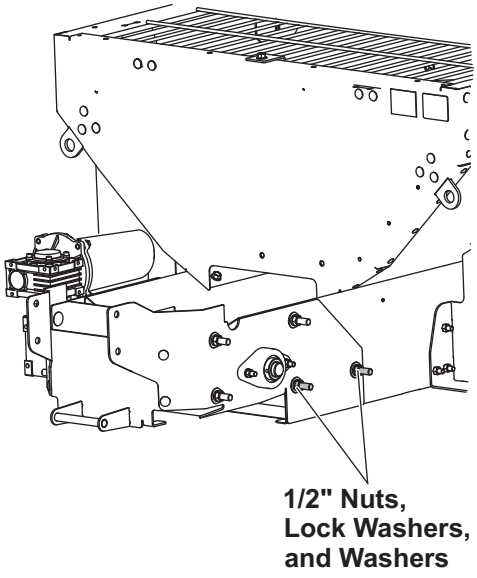
Size	Torque (ft-lb) Class 8.8	Torque (ft-lb) Class 10.9	Size	Torque (ft-lb) Class 8.8	Torque (ft-lb) Class 10.9
M6 x 1.00	7.7	11.1	M20 x 2.50	325	450
M8 x 1.25	19.5	26.9	M22 x 2.50	428	613
M10 x 1.50	38.5	53.3	M24 x 3.00	562	778
M12 x 1.75	67	93	M27 x 3.00	796	1139
M14 x 2.00	107	148	M30 x 3.50	1117	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.

MOUNTING THE PUMP BOX

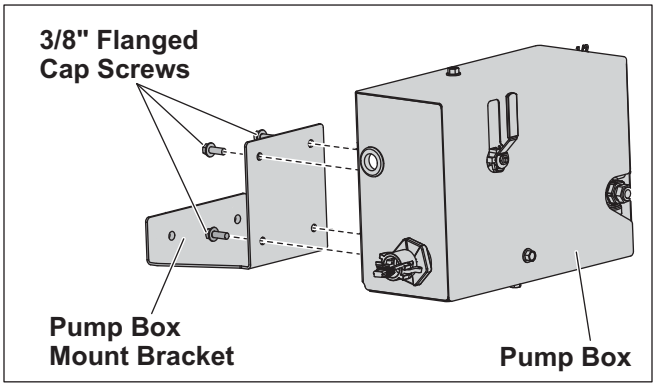
1. Remove all packing material from the liquid kit before installation.

2. From the passenger's side of the spreader, remove the two lower 1/2" nuts, lock washers, and washers.

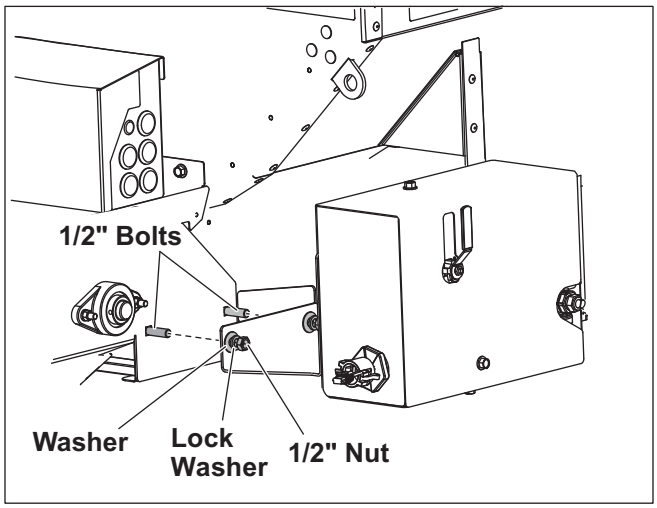


3. Replace sill extension cover and fasten with the five 3/8" flanged cap screws previously removed.

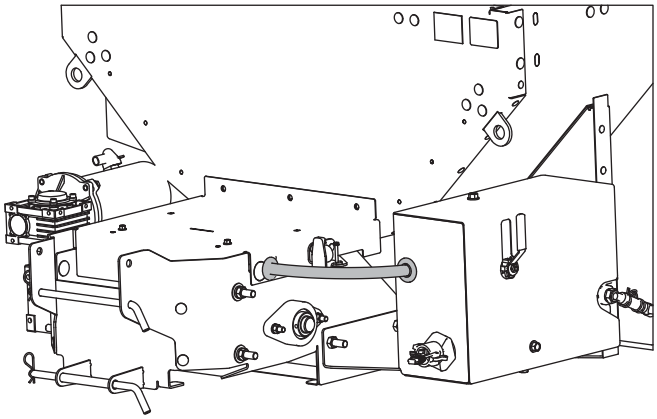
4. Fasten the pump box mount bracket to the pump box using four 3/8" flanged cap screws.



5. Slide the pump box mount bracket assembly onto the two 1/2" bolts, replace washers and lock washers and tighten the nuts.



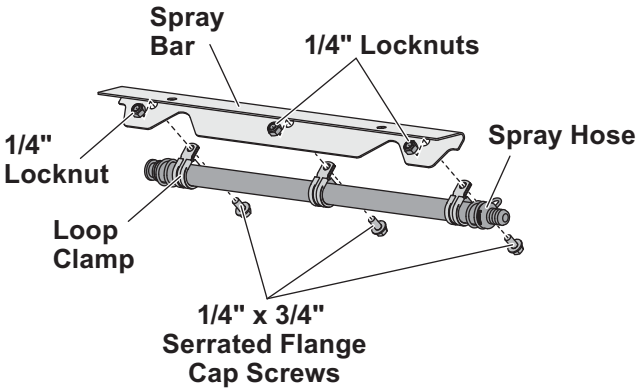
6. Connect the spray bar hose to the hose that exits through the rear face of the pump box. Position spring clamps at each end of the hose.



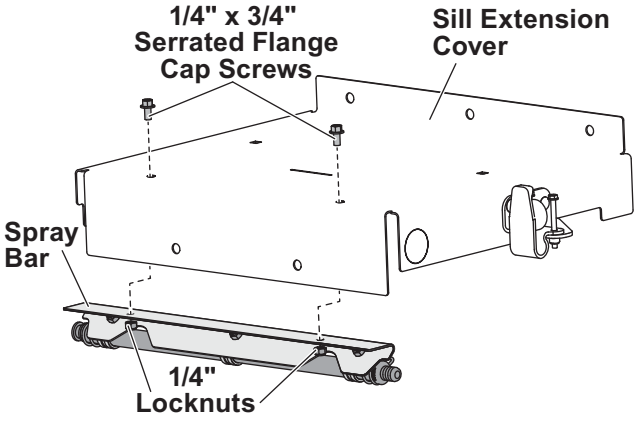
MOUNT THE SPRAY BRACKET

1. Remove the knockout on the passenger's side of the sill extension cover and install a hose grommet.

2. Use three loop clamps and 1/4" x 3/4" serrated flange cap screws with 1/4" locknuts to attach the spray hose to the spray bar. Verify that the slits in the spray hose face the sill bed when installed. The slits will be along the pink line.



3. Use two 1/4" x 3/4" serrated flange cap screws with 1/4" locknuts to fasten the spray bar assembly to the sill extension cover as shown.



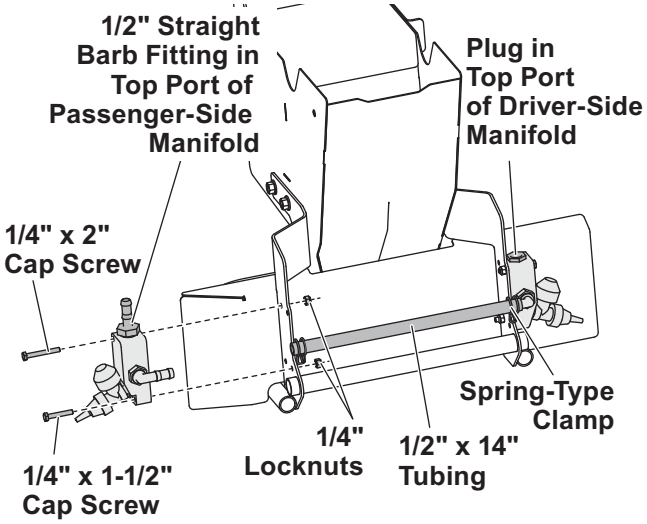
MOUNTING MANIFOLDS & NOZZLES

1. Position a manifold assembly with fittings to each side of the chute frame and align the mounting holes.

NOTE: The driver-side manifold top port is plugged. The passenger-side manifold top port has a 1/2" straight barb fitting.

2. Install the assembly using a 1/4" x 2" cap screw in the top hole and a 1/4" x 1-1/2" cap screw in the bottom hole. Secure the cap screws with 1/4" locknuts.

3. Connect the manifolds with a 14" long length of 1/2" tubing between the 90° elbow fittings. Secure the tubing with spring-type clamps.



MOUNTING THE TANKS

NOTE: While handling the hopper, ensure that the hopper mounting bolts do not damage the liquid tanks.

If this is a new hopper spreader installation, follow the installation steps as outlined in the hopper spreader Installation Instructions. Once the spreader has been located in the vehicle and the mounting holes have been made, remove the spreader from the vehicle. Ensure that the mounting bolts are in the mounting bar holes before installing the liquid tanks to the hopper.

If this spreader has been previously installed in the vehicle, remove the spreader from the vehicle. Ensure that the spreader mounting bolts are in the mounting bar holes before installing the liquid tanks to the hopper.

Once the tanks have been installed onto the hopper, place the spreader back into the vehicle and mount the spreader to the vehicle as described in the hopper spreader Installation Instructions.

INSTALLING TANKS & STRAPS

1. Use the stainless steel 3/8" cap screws and 3/8" locknuts to install the tank trays to the sill.

2. Insert a 3/8" x 1" carriage bolt into the tank tray so that the button head is facing the tank.

3. Place the tank on the tank tray. Verify that the recess in the bottom of the tank is seated into the tray.

4. Use the 3/8" x 1" carriage bolt and 3/8" hardware to install the tank support strap.

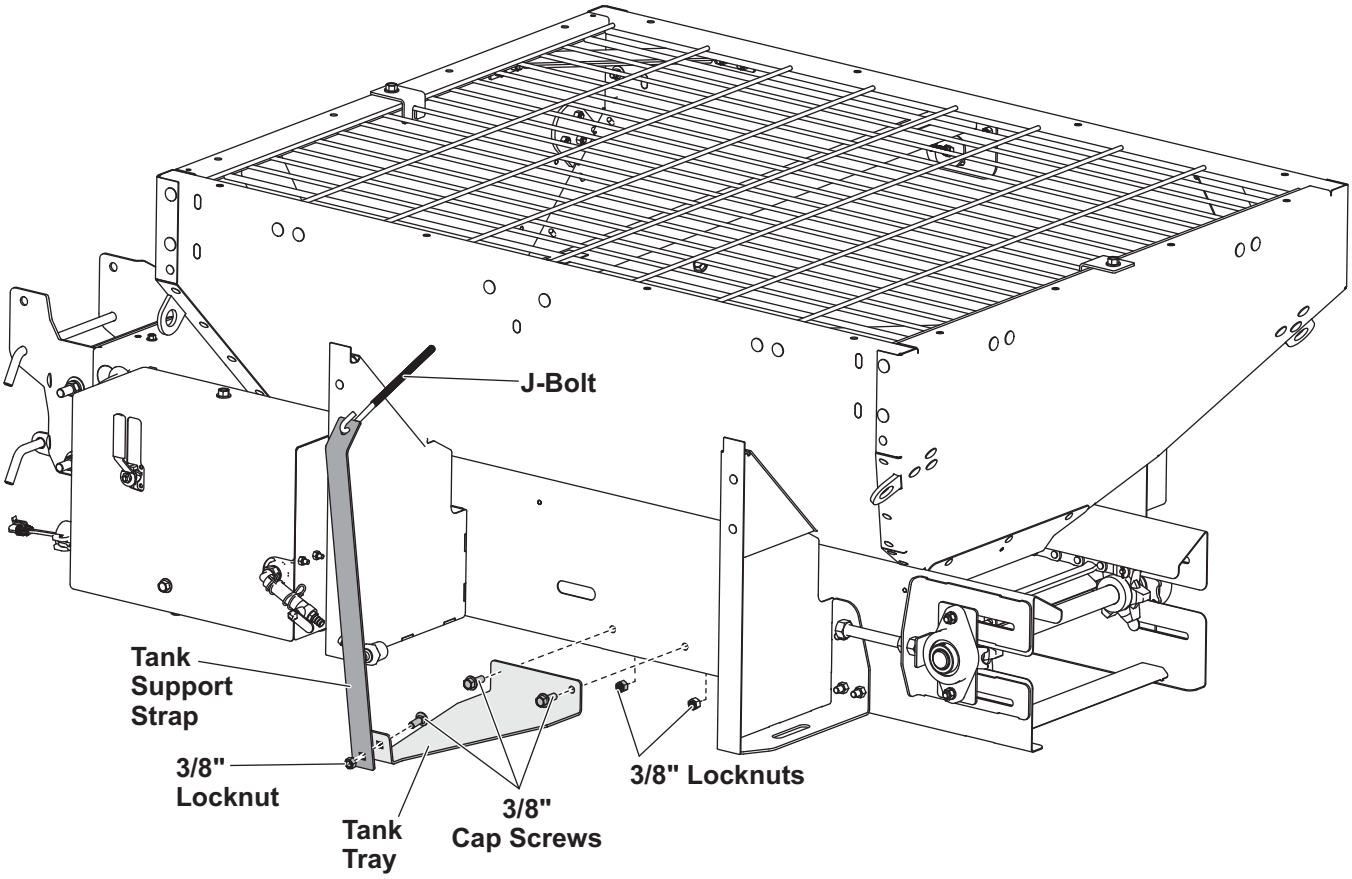
5. Loop the 3/8" x 8" J-bolt through the tank support strap and insert it through the knock-out hole in the hopper body. Loop the J-bolt so that the hook is facing upward.

6. For the J-bolt, place one 2" fender washer and locknut on the inside of the hopper with the locknut facing toward the chain. Tighten the nut toward the hopper body.

NOTE: Do not use power tools to tighten the J-bolts; use hand tools only. Overtightening can cause galling of the stainless steel threads.

7. Cut the excess bolt length from the J-bolt if desired.

8. Repeat Steps 1–7 for the remaining tank.



Secure all connections using hose clamps.

- **1/2" Hoses:** Use spring-type clamps.
- **1" Hoses:** Use stainless band clamps.

Use the provided pipe sealant on all NPT fittings.

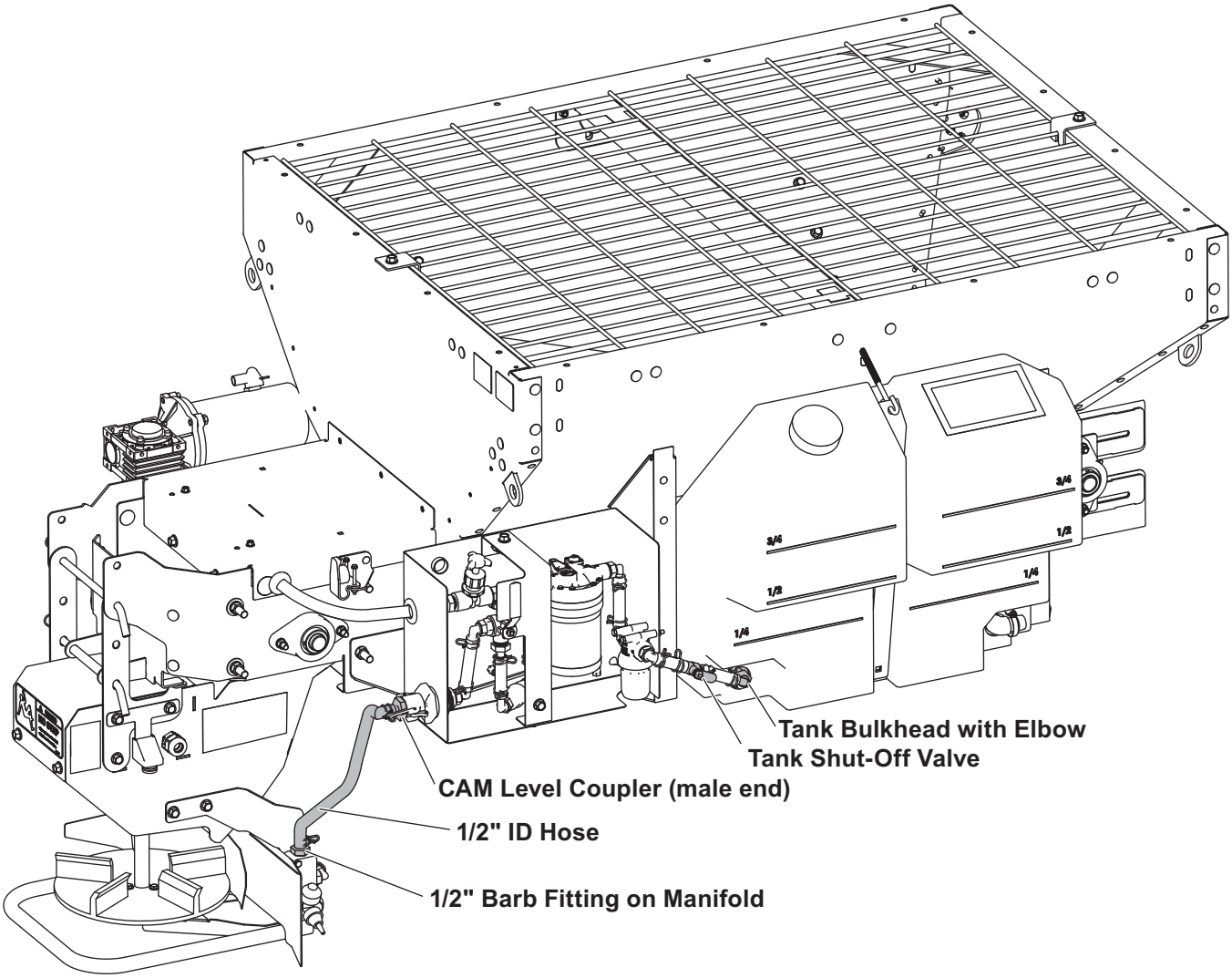
PLUMBING THE OUTPUT SIDE

1. Connect a 1/2" hose to the 1/2" barb fitting on top of the passenger-side manifold. Secure with a clamp.

2. Cut the hose to a suitable length to reach the quick coupler on the pump box. Install the cam lever coupler (male end) and connect it to the pump box.

PLUMBING THE INPUT SIDE

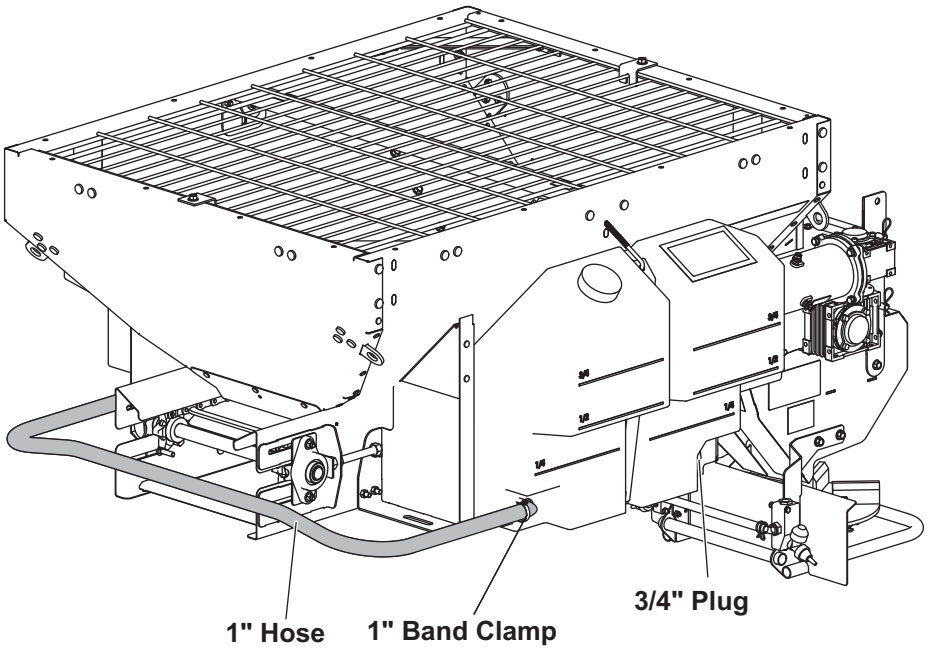
1. Use the 1/2" ID hose to connect the tank shut-off valve to the closest tank using a 1/2" barb elbow fitting.



2. To connect additional tanks, install a 1" barb elbow into the bulkhead and use a 1" hose to connect the tanks in series. Install the 3/4" plug in the final tank.

3. On the cab side of the spreader, route the hose behind the sill.

4. Verify that all bulkhead fittings are tightened to 20 ft-lb.



INSTALLING THE PUMP KIT

NOTE: The liquid accessory harness kit provides an ON/OFF switch to activate the liquid system from inside the vehicle.

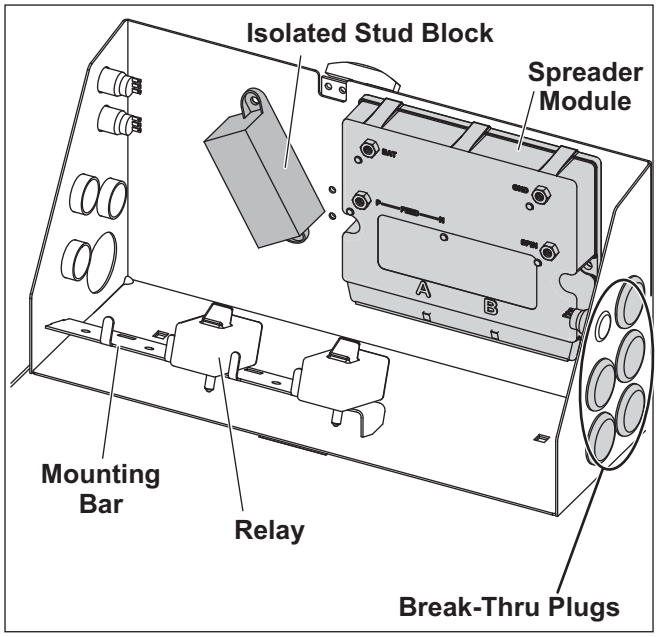
To properly wire the ON/OFF pump kit, follow these instructions and refer to the Liquid Kit Harness Wiring Diagram on page 14.

1. Install the ON/OFF pump kit.
2. Remove the chute from the spreader.

⚠ CAUTION

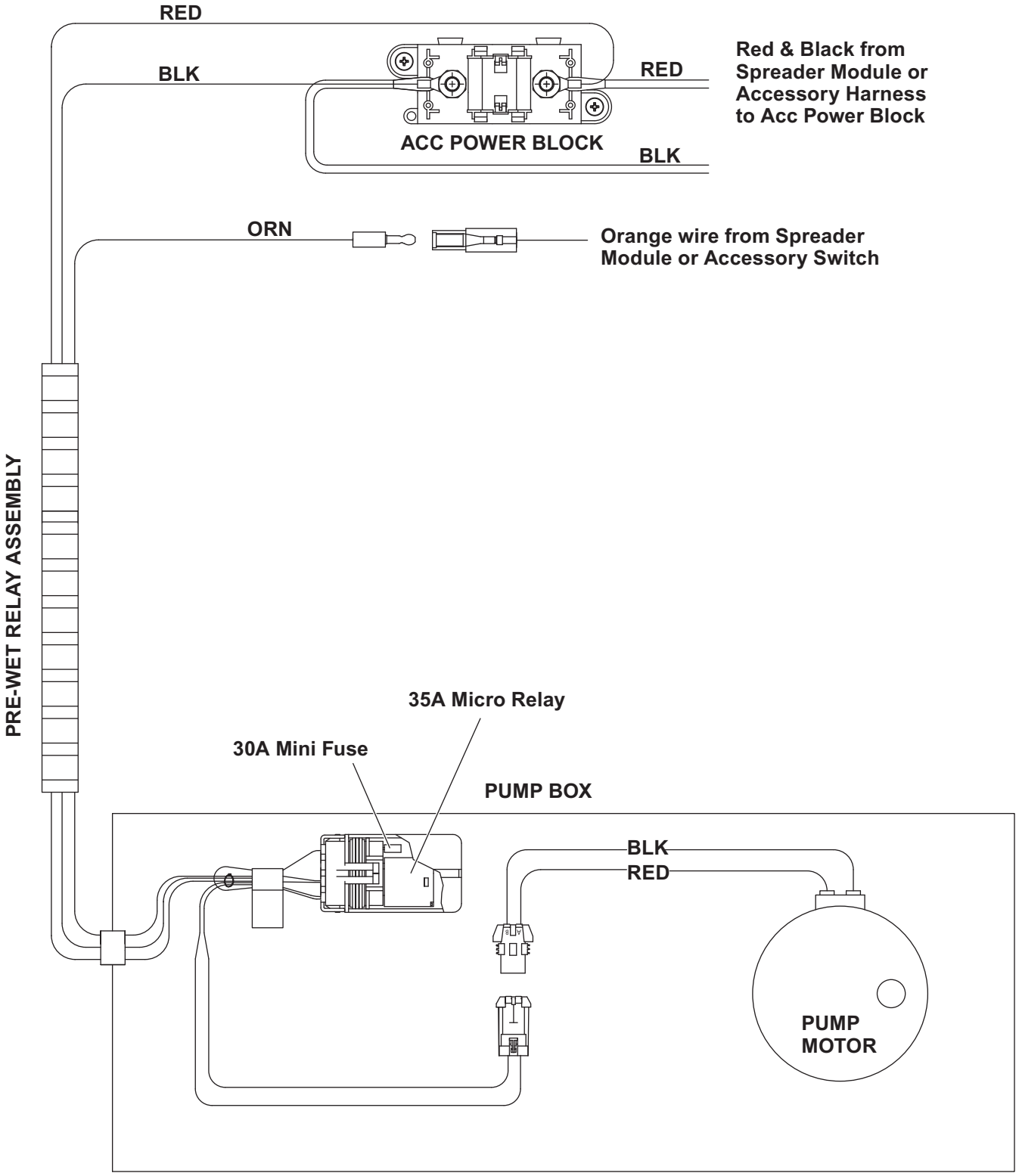
Before drilling any holes, check both sides of the material for any wires, fuel lines, fuel tanks, etc., that may be damaged by drilling.

3. Remove the cover from the hopper electrical enclosure located on the top of the sill extension cover.
4. Find the break-thru plug on the passenger's side of the electrical enclosure and use a tool to cut an "X" in the center of the plug. Route the liquid kit relay assembly harness through the cut break-thru plug.



5. Find the break-thru plug on the inside face of the pump box and use a tool to cut an "X" in the center of the plug. Route the harness from the passenger's side of the electrical box into the break-thru plug on the inside face of the pump box.
6. Remove the cover from the isolated stud block.
7. Attach the ring terminal connected to the red wire of the liquid kit harness to the POSITIVE (+) terminal of the isolated stud block.
8. Attach the ring terminal connected to the black wire of the liquid kit harness to the NEGATIVE (–) terminal of the isolated stud block.
9. Connect the male bullet terminal of the liquid kit wire assembly harness to the orange wire coming from the spreader module.
10. Reinstall the covers onto the isolated stud block and electrical enclosure.
11. Secure all harnessing to prevent damage to the wires and mount relay to mounting bar.

LIQUID KIT HARNESS WIRING DIAGRAM



ADJUSTING THE FLOW

To adjust the flow between direct application on the chute and direct application to the material, rotate the valve on the front of the pump box.

The following table shows the flow rates for the ON/OFF system. These values are approximate and can vary based on system configuration, age of components, brine composition, and other factors.

The flow of the system is controlled by a needle valve inside the pump box. Follow the instructions below to adjust the flow.

1. Remove the pump box cover.

2. Turn the white plastic handle to the left of the pump. Clockwise will reduce the flow and counter-clockwise will increase the flow.

NOTE: Do not overtighten the handle. Overtightening may damage the valve.

3. With the pump running, turn the valve clockwise until the flow stops. This is the "zero flow" point. **Do not** turn the valve further.

4. Mark the valve handle and body to indicate the "zero flow" point for future reference.

5. Turn the valve counter-clockwise a number of complete turns as indicated by the "ON/OFF Flow Rates" table below.

ON/OFF Flow Rates	
Number of Turns from Zero Flow Position	**gal/min**
0	0
1/4	0.22
1/2	0.46
3/4	0.66
1	0.80
2	1.13
3	1.40
3-1/2+	1.60
No Valve	2.00

NOTE: If higher flow rates are required, bypass the needle valve to increase the flow. Refer to Bypassing the Needle Valve.

BYPASSING THE NEEDLE VALVE

1. Remove the needle valve and install the 1/2" hose barb directly into the street elbow.

2. Replace the hose with the 1/2" hose kit. The new flow rate will be approximately 2.63 gal/min.

MANUALLY CALIBRATING THE FLOW

To obtain a more precise measurement of the flow rate, follow the steps below.

1. Adjust the liquid system to the desired setting.

2. Disconnect the 1/2" hose connected to the spray hose and place it in a 5-gallon bucket.

3. Turn on the liquid system and time how long it takes (in seconds) for the system to fill the 5-gallon bucket.

4. Determine the flow in gal/min by dividing 300 by the results from Step 3 (in seconds).

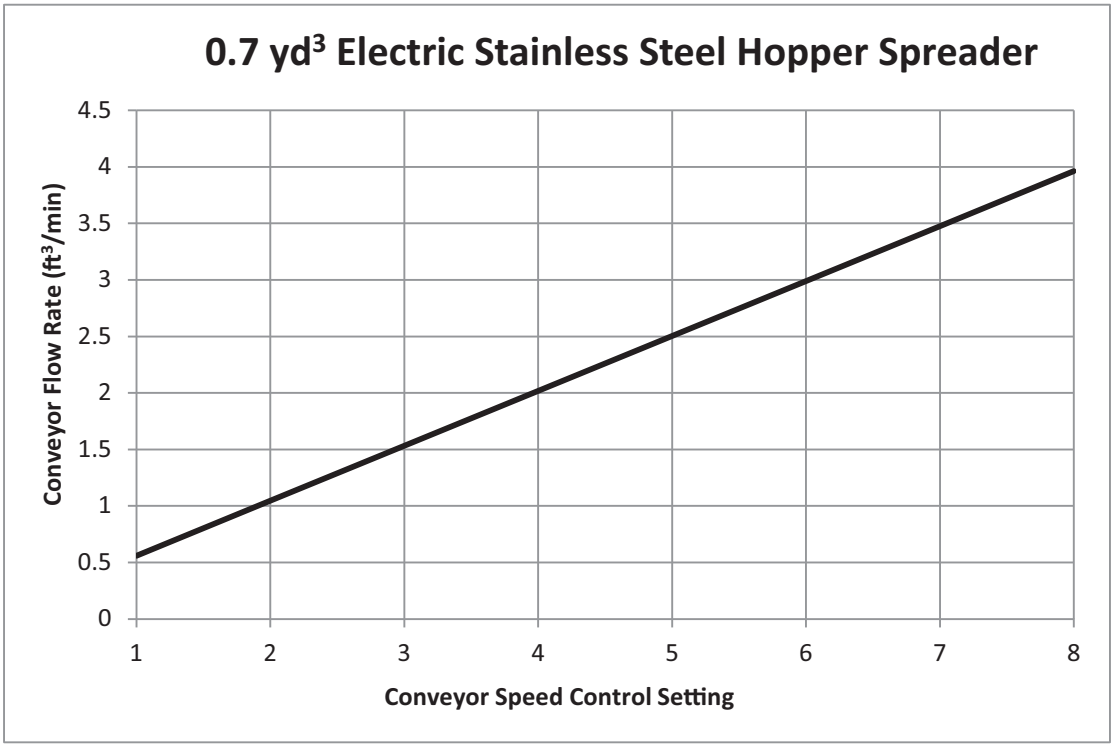
   Example:

   It took 165 seconds to fill the bucket.

   $$\frac{300}{165} = 1.82 \text{ gal/min}$$

APPLICATION RATE

The following application chart shows the approximate material delivery rate for chain hopper spreaders. Use these charts to determine the delivery rate of de-icing salt, which is based on the conveyor speed.



After the chain delivery rate has been determined, use the following table to determine the optimal flow rate for the liquid system.

NOTE: This value may vary depending on de-icing chemicals used and weather conditions. Consult the material manufacturer's recommended application rates. Gallons per ton refers to the amount of pre-wetting agent applied per ton of de-icing salt.

Optimal Flow Rate

	Gallons per Ton			
Delivery Flow Rate (ft^3/min)	**6**	**8**	**10**	**12**
0.5	0.11	0.15	0.19	0.22
1	0.22	0.30	0.37	0.44
1.5	0.33	0.44	0.56	0.67
2	0.44	0.59	0.74	0.89
2.5	0.56	0.74	0.93	1.11
3	0.67	0.89	1.11	1.33
3.5	0.78	1.04	1.30	1.56
4	0.89	1.19	1.48	1.78
4.5	1.00	1.33	1.67	2.00
5	1.11	1.48	1.85	2.22
5.5	1.22	1.63	2.04	2.44
6	1.33	1.78	2.22	2.67
7	1.56	2.07	2.59	–
8	1.78	2.37	–	–
9	2.00	2.67	–	–
10	2.22	–	–	–
11	2.44	–	–	–
12	2.67	–	–	–

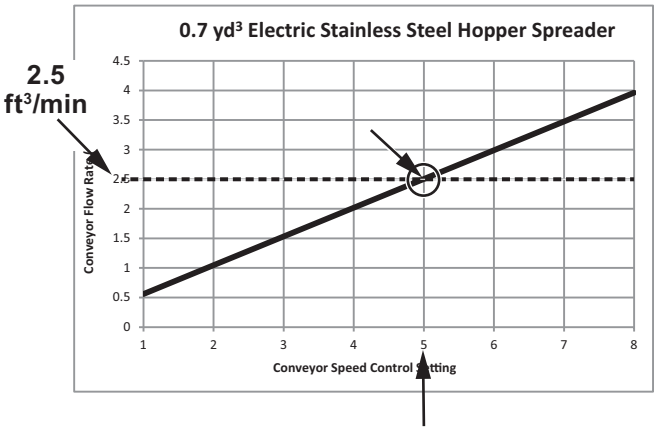
Material Application Example:

A hopper spreader is running at conveyor speed 5. The desired liquid rate is 8 gallons per ton.

Use the following procedure to determine the optimal flow rate in gal/min.

1. On the Application Rate chart on page 16, find the point on the graph where the 5 on the Conveyor Speed axis and the line intersect.

2. Follow from the point of intersection across to the Conveyor Flow Rate axis, as shown below. The delivery flow rate for this example is 2.5 ft³/min.



3. On the Optimal Flow Rate table on page 17, find the Delivery Flow Rate value (previously determined in Step 2 (2.5 ft³/min) and the Application Rate (8 gal/ton).

4. Find the point at which these two values meet on the table (see example below). This box shows the Optimal Flow Rate for this liquid application (0.74 gal/min).

	Gallons per Ton			
Delivery Flow Rate (ft³/min)	**6**	**8**	**10**	**12**
0.5	0.11	0.15	0.19	0.22
1	0.22	0.30	0.37	0.44
1.5	0.33	0.44	0.56	0.67
2	0.44	0.59	0.74	0.89
2.5	0.56	0.74	0.93	1.11
3	0.67	0.89	1.11	1.33
3.5	0.78	1.04	1.30	1.56
4	0.89	1.19	1.48	1.78
4.5	1.00	1.33	1.67	2.00

5. To achieve the desired liquid rate in this example, you would adjust the system to 0.74 gal/min. For details, refer to "Adjusting the Flow" on page 15.

PERIODIC MAINTENANCE

- 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.
- Inspect unit for damage, such as broken, worn, or bent parts.
- 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 pressure washing motor enclosure area, keep spray at least 36" away from motor enclosures.
- 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.

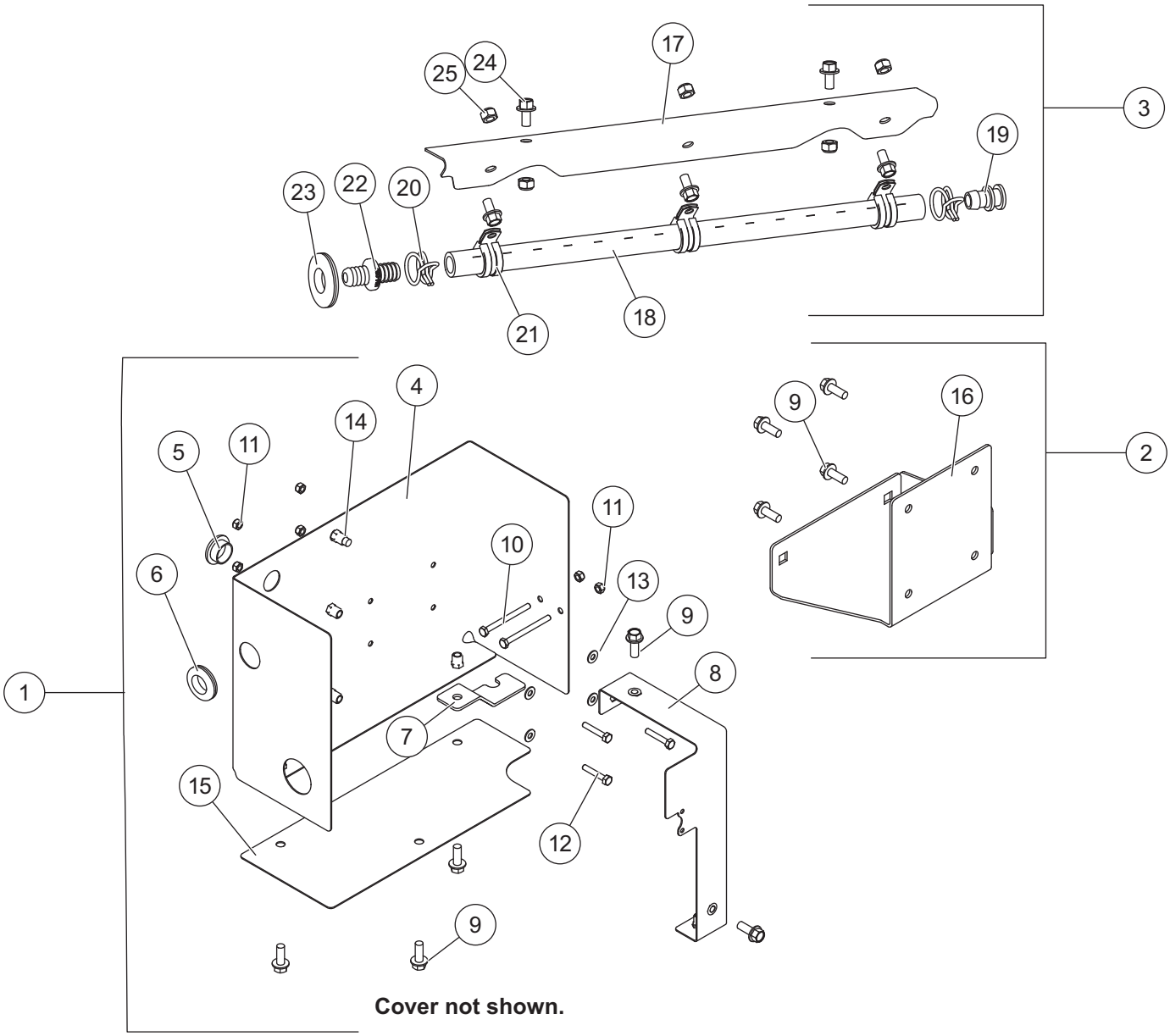
END OF SEASON AND STORAGE

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

TROUBLESHOOTING GUIDE

Problem	Possible Cause	Suggested Solution
Pump is not operating.	1. Loose electrical connection.	1. Check all electrical connections for corrosion.
	2. Blown fuse.	2. Replace the fuse.
	3. Pump seized.	3. Replace the pump.
Control shut down.	1. Loose electrical connection.	1. Check all electrical connections for corrosion.
	2. Electrical short.	2. Check for bare or burned wires.
	3. Control failure.	3. Replace the control.
	4. Blown fuse.	4. Replace the fuse.
Material being spread is not wet.	1. Liquid system is not running.	1. See Troubleshooting – Pump is not operating.
	2. Spray hose is misaligned.	2. See "Mount the Spray Bracket" on page 8.
	3. Flow rate is set too low.	3. See "Adjusting the Flow" on page 15.
Spray is uneven.	1. Spray hose is clogged.	1. Clean spray hose with fresh water.
	2. Spray hose is damaged.	2. Replace the spray hose.
Pump is leaking.	1. O-ring fittings are loose.	1. Verify that O-ring fittings are fully installed.
	2. O-rings are damaged or worn.	2. Replace the O-rings.
	3. Pump housing is damaged.	3. Replace the pump.

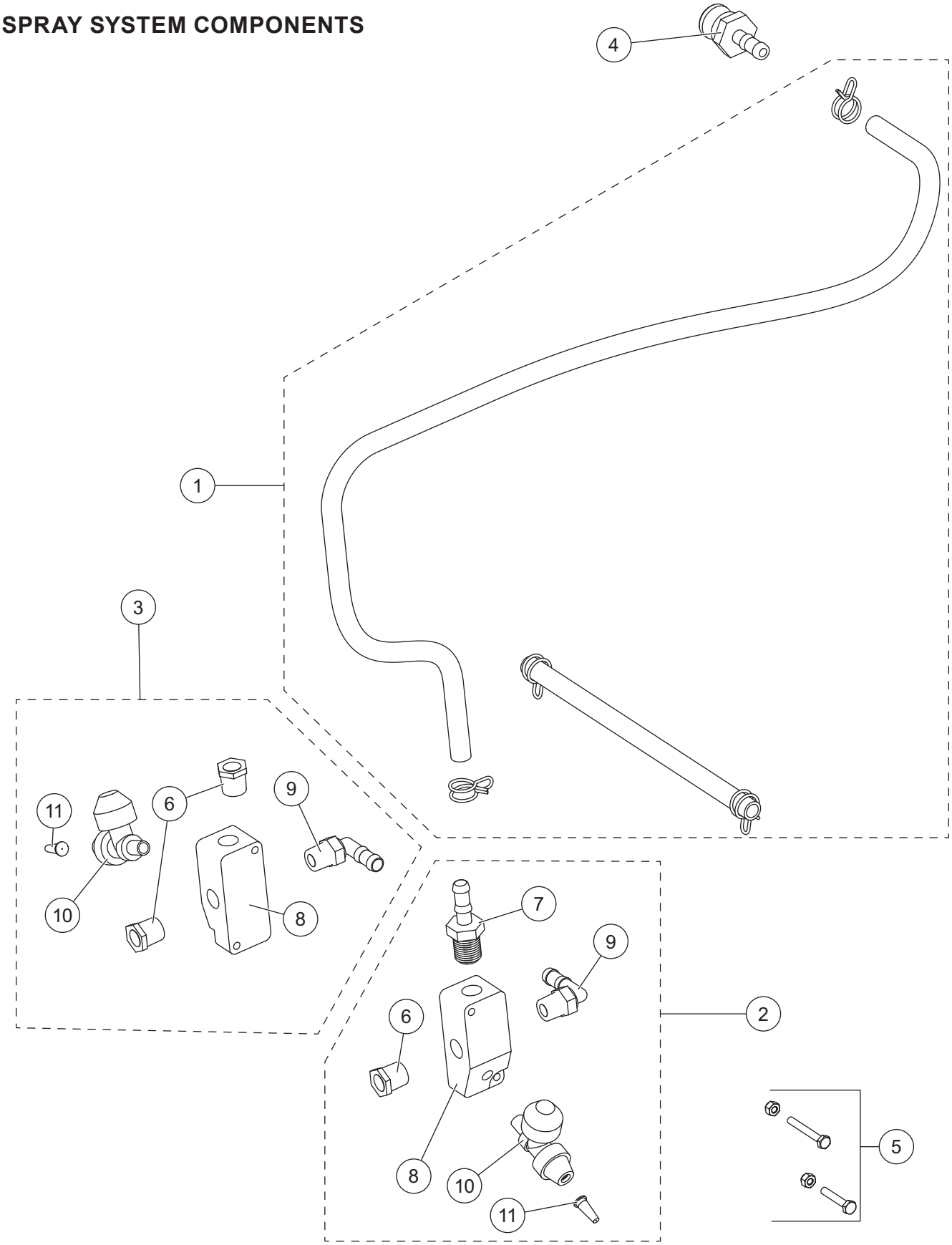
PUMP BOX COMPONENTS



Cover not shown.

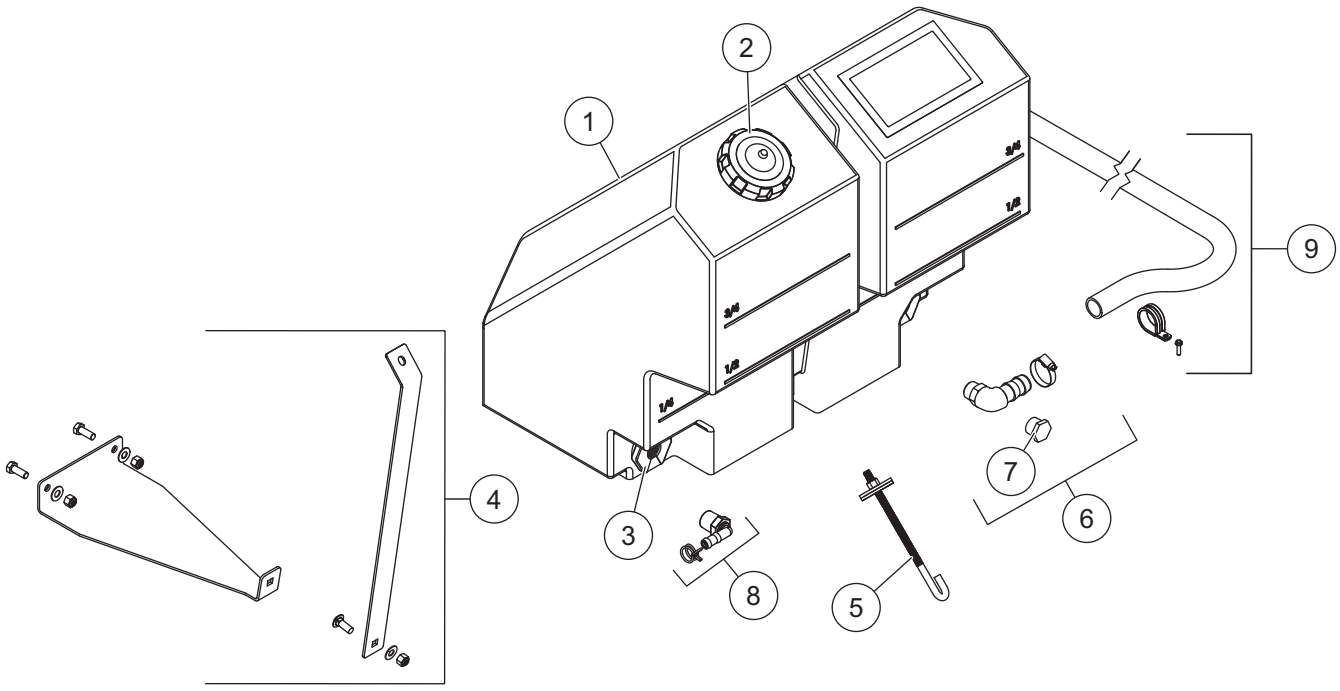
Pump Box Components							
Item	**Part**	**Qty**	**Description**	**Item**	**Part**	**Qty**	**Description**
1	91500	1	Pump Box Enclosure	3	91505	1	Liquid Spray Bar Kit
2	91510	1	Pump Box Mount Kit				
Item 1			**91500 Pump Box Enclosure**				
4		1	Pre-Wet Box – 0.7 yd^3	11		6	1/4-20 Hex Locknut
5		1	Break-Thru Plug	12		4	1/4-20 x 1-1/2 Hex Cap Screw SS
6		1	Hose Grommet	13		4	1/4 Flat Washer Type A Narrow
7		1	Pre-Wet Foot	14		10	3/8-16 Rivnut
8		1	Pre-Wet Valve Bracket	15		1	Pre-Wet Box Bottom
9		6	3/8-16 x 1 Flanged Cap Screw SS	ns		1	Pre-Wet Box Cover – 0.7 yd^3
10		2	1/4-20 x 3 Hex Cap Screw				
Item 2			**91510 Pump Box Mount Kit**				
9		4	3/8-16 x 1 Serrated Flange Cap Screw SS	16	91534	1	Pre-Wet Box Bracket
Item 3			**91505 Liquid Spray Bar Kit**				
17		1	Hose Bracket	22		1	Hose Mender Barb
18		1	Slit Rubber Tubing, 15-1/2	23		1	Grommet
19		1	1/2 Barb Plug	24		5	1/4-20 x 1/2 Serrated Flange Hex Cap Screw SS
20		2	Double Spring Clamp, 1/2				
21		3	7/8 ID Loop Clamp SS	25		5	1/4-20 Locknut SS
ns = not shown			G = Grade				SS = Stainless Steel

SPRAY SYSTEM COMPONENTS



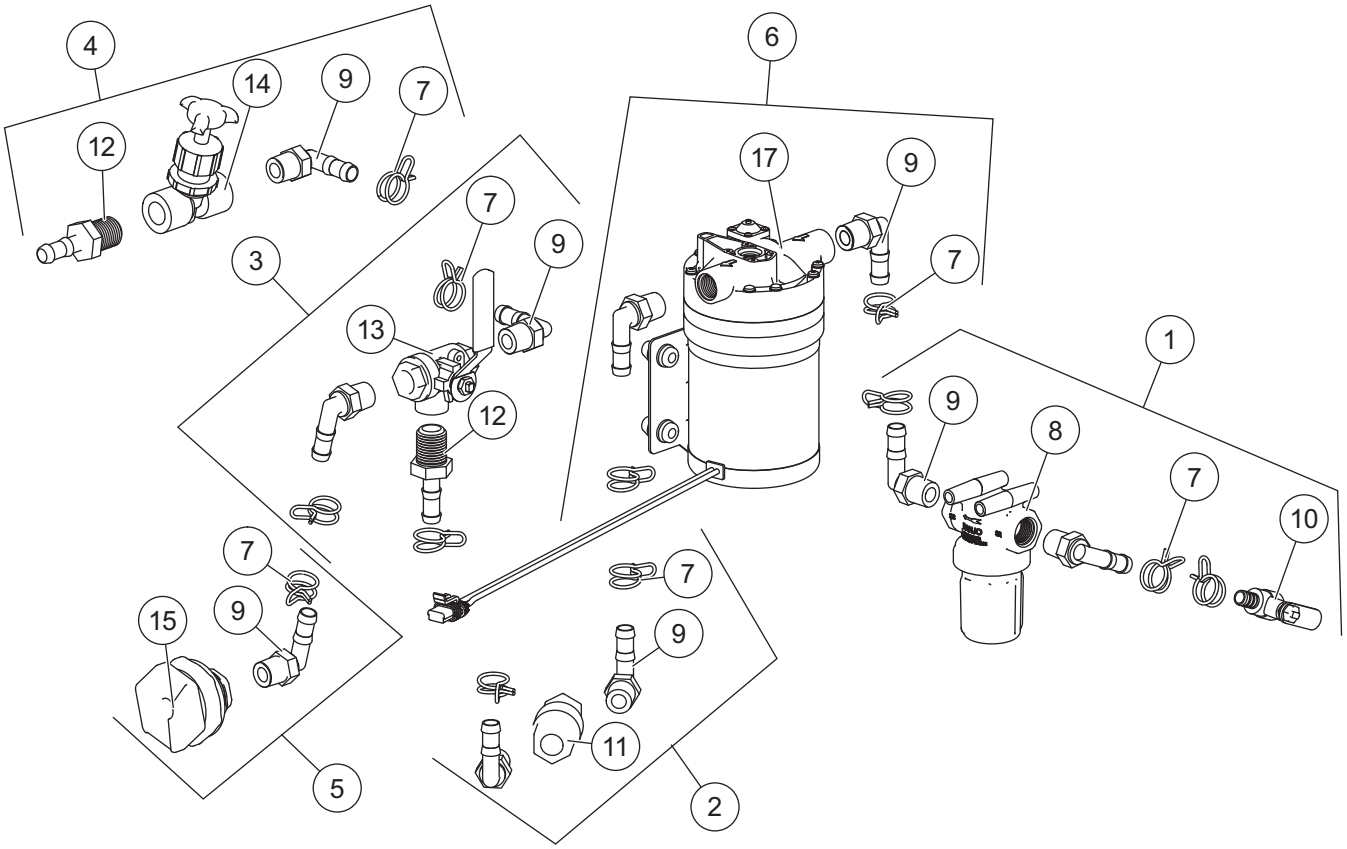
Spray System Components							
Item	**Part**	**Qty**	**Description**	**Item**	**Part**	**Qty**	**Description**
1	76406	1	1/2 x 48 Hose Kit	4	76407	1	Cam Lever Coupling, Male End
2	74617	1	Nozzle Manifold Kit – PS	5	74616	2	Manifold Mount Kit
3	74618	1	Nozzle Manifold Kit – DS				
Item 1			**76406 1/2 x 48 Hose Kit**				
		1	1/2 x 48 PVC Clear Hose			4	Double Spring Clamp, 1/2
Item 2			**74617 Nozzle Manifold Kit – PS**				
6	11260	1	1/2 Pipe Plug	9		1	1/2 Hose Barb to Male Thread, 90°
7	76426	1	1/2 M NPT to 1/2 Barb Fitting	10	D5241	1	Check Valve
8	11971	1	Manifold	11	D5215	1	Nozzle
Item 3			**74618 Nozzle Manifold Kit – DS**				
6	11260	2	1/2 Pipe Plug	10	D5241	1	Check Valve
8	11971	1	Manifold	11	D5215	1	Nozzle
9		1	1/2 Hose Barb to Male Thread, 90°				
Item 5			**74616 Manifold Mount Kit**				
		1	1/4-20 x 2 Hex Cap Screw			2	1/4-20 Locknut SS
		1	1/4-20 x 1-1/2 Hex Cap Screw				
SS = Stainless Steel				M = Male			

TANK COMPONENTS



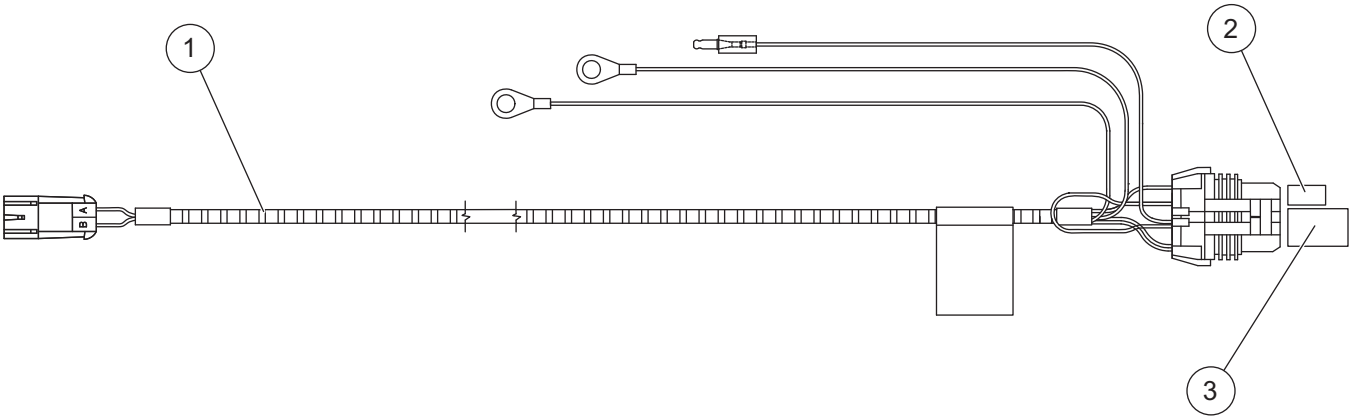
Tank Components							
Item	**Part**	**Qty**	**Description**	**Item**	**Part**	**Qty**	**Description**
1	76293	1	25 Gallon Tank	6	76422	1	Add-a-Tank Fitting Kit
2	76430	1	Pre-Wet Tank Cap	7	76431	1	3/4 M NPT Plug
3	76447	2	3/4 Bulkhead Fitting	8	76423	1	Tank to 1/2" Hose Kit
4	76418	1	25 Gallon Strap Kit	9	76424	1	1" Hose Kit – 15'
5	76421	1	J-Bolt Kit				
Item 1			**76293 25 Gallon Tank**				
2	76430	1	Pre-Wet Tank Cap	3	76447	2	3/4 Bulkhead Fitting
Item 4			**76418 25 Gallon Strap Kit**				
		1	Tray SS			1	3/8-16 x 1 Carriage Bolt
		1	Support Strap SS			5	3/8 Flat Washer SS
		2	3/8-16 x 1 Hex Cap Screw SS			3	3/8-16 Hex Locknut, Waxed
Item 5			**76421 J-Bolt Kit**				
		1	3/8-16 x 8 J-Bolt SS			1	3/8-16 Hex Locknut, Waxed
		2	3/8 x 2 Fender Washer SS				
Item 6			**76422 Add-a-Tank Fitting Kit**				
		1	1 x 3/4 M NPT Barb Elbow			1	11/16–1-1/2 Band Clamp
7	76431	1	3/4 M NPT Plug				
Item 8			**76423 Tank to 1/2" Hose Kit**				
		1	3/4 M NPT x 1/2 Hose Barb 90°			1	Double Spring Clamp, 1/2
Item 9			**76424 1" Hose Kit − 15'**				
		1	1" ID x 15' PVC Clear Hose			5	#10 x 3/4 Hex Washer-Head Driller Screw SS
		3	1-1/4 ID Loop Clamp SS				
		2	11/16–1-1/2 Band Clamp			2	1-1/4 Loop Clamp, Vinyl Coated
SS = Stainless Steel							M = Male

INTERNAL PUMP BOX COMPONENTS



Pump Box Components							
Item	**Part**	**Qty**	**Description**	**Item**	**Part**	**Qty**	**Description**
1	91520	1	Strainer Kit	4	91535	1	Liquid Flow Kit
2	91525	1	Check Valve Kit	5	91540	1	Bulkhead Kit
3	91530	1	3-Way Valve Kit	6	91545	1	Pump Kit
Item 1			**91520 Strainer Kit**				
7		3	Double Spring Clamp, 1/2	9		2	90° Hose Barb, 1/2 x 1/2 Male Thread
8	T20105	1	Strainer	10	76309	1	Ball Valve, 1/2 x 1/2 Barb
Item 2			**91525 Check Valve Kit**				
7		2	Double Spring Clamp, 1/2	11	76326	1	Check Valve, 1/2 x 1/2 FNPT
9		2	90° Hose Barb, 1/2 x 1/2 Male Thread				
Item 3			**91530 3-Way Valve Kit**				
7		3	Double Spring Clamp, 1/2	12		1	Hose Barb, 1/2 x 1/2 Male Thread
9		2	90° Hose Barb, 1/2 x 1/2 Male Thread	13	12029	1	1/2 Valve, 3-Way
Item 4			**91535 Liquid Flow Kit**				
7		1	Double Spring Clamp, 1/2	12		1	Hose Barb, 1/2 x 1/2 Male Thread
9		1	90° Hose Barb, 1/2 x 1/2 Male Thread	14	76345	1	1/2 Needle Valve
Item 5			**91540 Bulkhead Kit**				
7		1	Double Spring Clamp, 1/2	15	76314	1	Bulkhead Fitting NPTF
9		1	90° Hose Barb, 1/2 x 1/2 Male Thread	16	D5606	1	Cam Lever Coupling
Item 6			**91545 Pump Kit**				
7		2	Double Spring Clamp, 1/2	17	11974	1	Pump, Diaphragm – 7 gpm Bypass
9		2	90° Hose Barb, 1/2 x 1/2 Male Thread				

ELECTRICAL COMPONENTS



Electrical Components							
Item	**Part**	**Qty**	**Description**	**Item**	**Part**	**Qty**	**Description**
1	72523	1	Harness, Relay	3		1	35A Fuse, Micro Relay
2		1	30A Fuse, Mini ATM Style, Green				

The company reserves the right under its product improvement policy to change construction or design details and furnish equipment when so altered without reference to illustrations or specifications used. This equipment manufacturer or the vehicle manufacturer may require or recommend optional equipment for liquid systems. Do not exceed vehicle ratings with a liquid system. The company offers a limited warranty for all liquid systems and accessories. See separately printed page for this important information.

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