September 15, 2024
Lit. No. 79199, Rev. 04

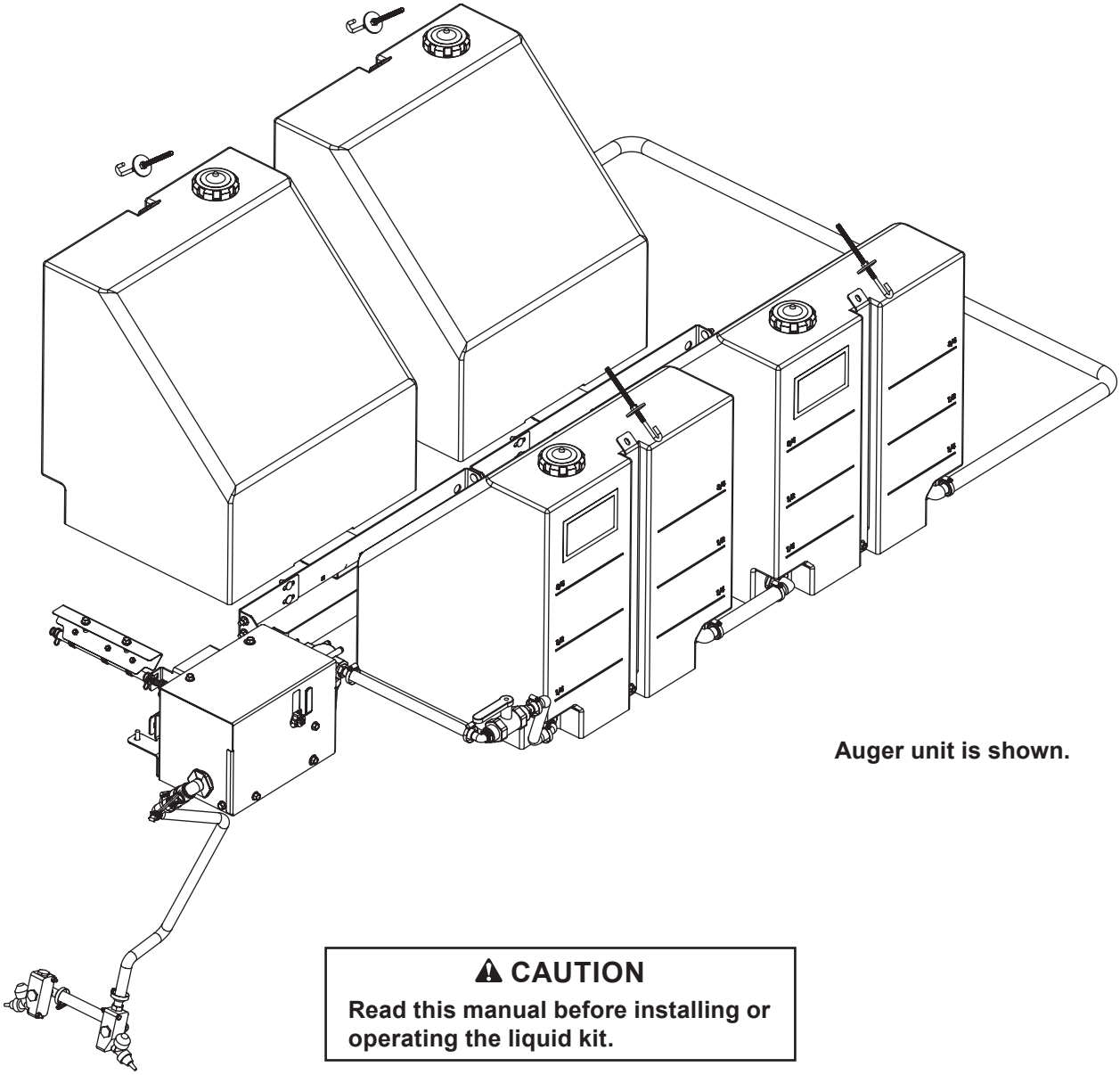
200-Gallon Pre-Wet and DLA System

#93270

and 100-Gallon Expansion Kit

#93275

Owner's Manual / Installation Instructions / Parts List



Auger unit is shown.

⚠ CAUTION

Read this manual before installing or operating the liquid kit.

TABLE OF CONTENTS

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.

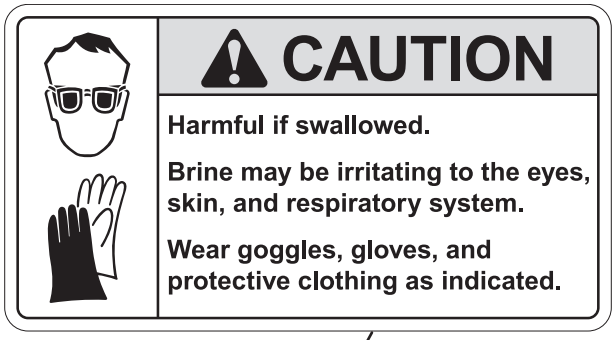
NOTE: Indicates a situation or action that can lead to damage to your liquid system and vehicle or other property. Other useful information can also be described.

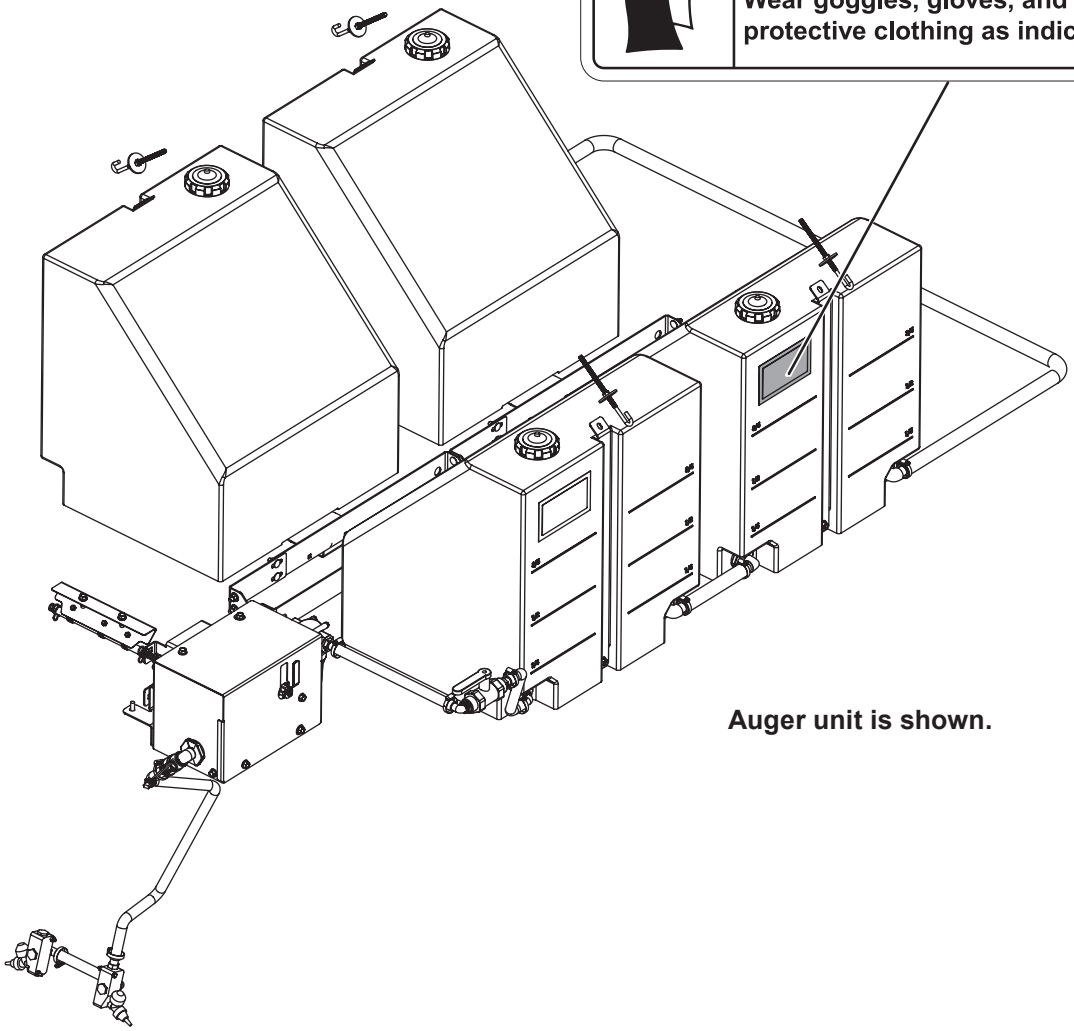
WARNING/CAUTION LABELS

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





Auger unit is shown.

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 or auger 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 corner post of the vehicle. See Loading section of your spreader Owner's Manual to determine maximum volumes of spreading material.

⚠ WARNING

- **The drive shafts, conveyor, auger, 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 the unit. 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

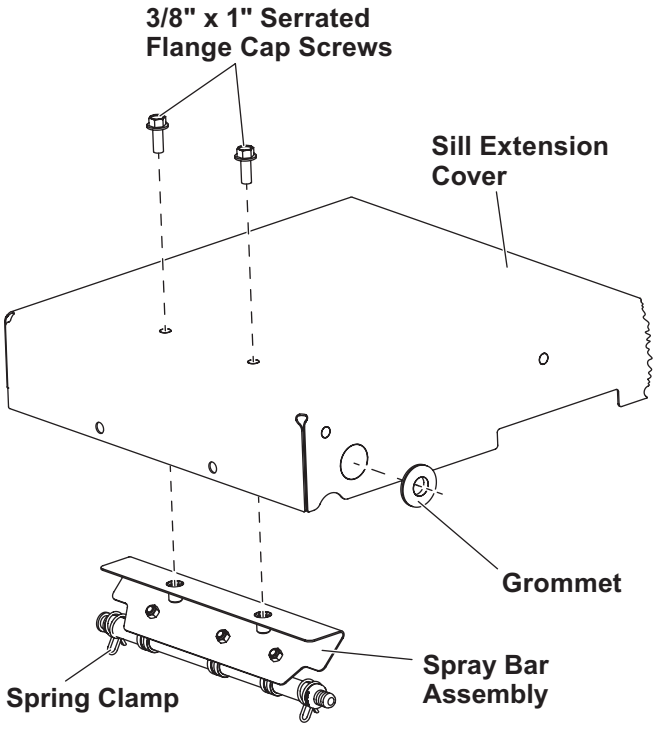
Metric Fasteners Class 8.8 and 10.9

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 SPRAY BRACKET

1. Remove all packing material from the liquid kit before installation.
2. Remove four 3/8" bolts and sill extension cover. Remove the knockouts from the top and the grommet knockout from the passenger's side of the extension cover. Install a hose grommet on the passenger-side hole on the extension cover.
3. Use two 3/8" x 1" serrated flange cap screws to fasten the spray bar assembly to the sill extension cover as shown. The spray bar assembly is fed through the grommet and secured with a spring clamp.



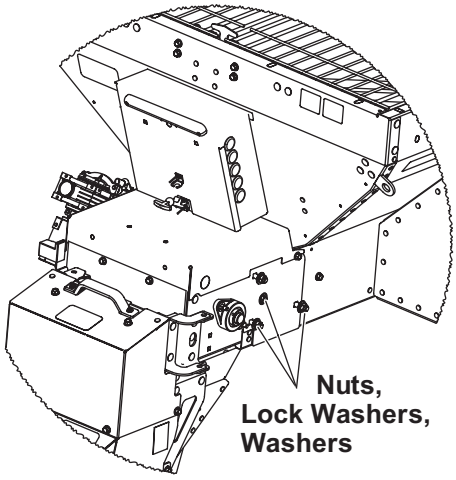
4. Verify that the slits in the spray hose face the sill bed when installed. The slits will be along the painted line.
5. **For auger units only:** Once the spray bar assembly is installed, put the sill extension cover back in place and fasten with the four 3/8" bolts removed in Step 2.

MOUNTING THE PUMP BOX BRACKET

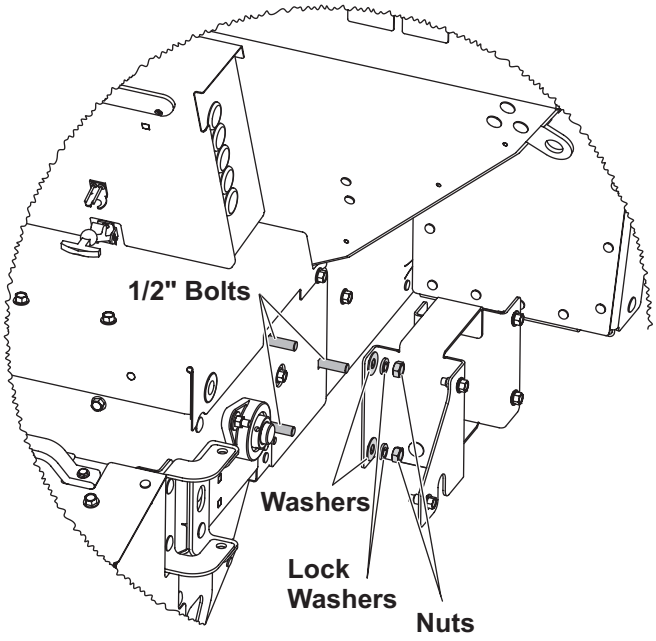
Remove pump box cover during installation and reinstall with three 3/8" flanged cap screws after the box has been mounted.

Chain Units

1. From the passenger's side of the spreader, remove the three nuts, lock washers, and washers as shown.



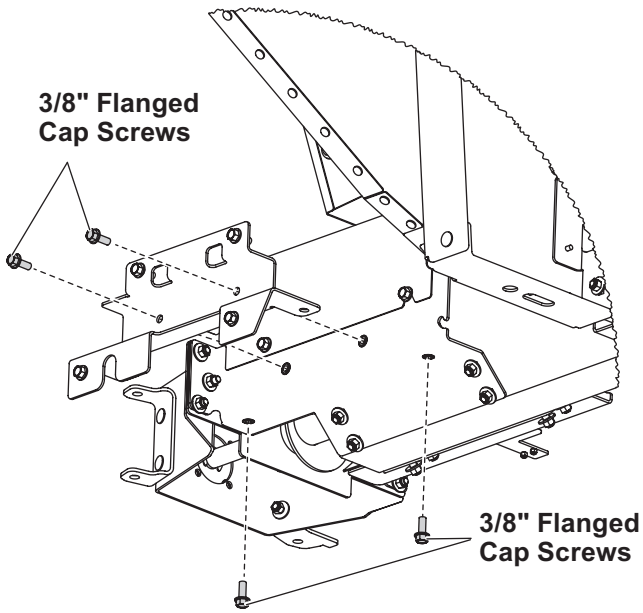
2. Slide the pump box mount bracket assembly onto the three 1/2" bolts, replace washers and nuts.



3. Put the extension cover back in place and fasten with the four 3/8" flanged cap screws.

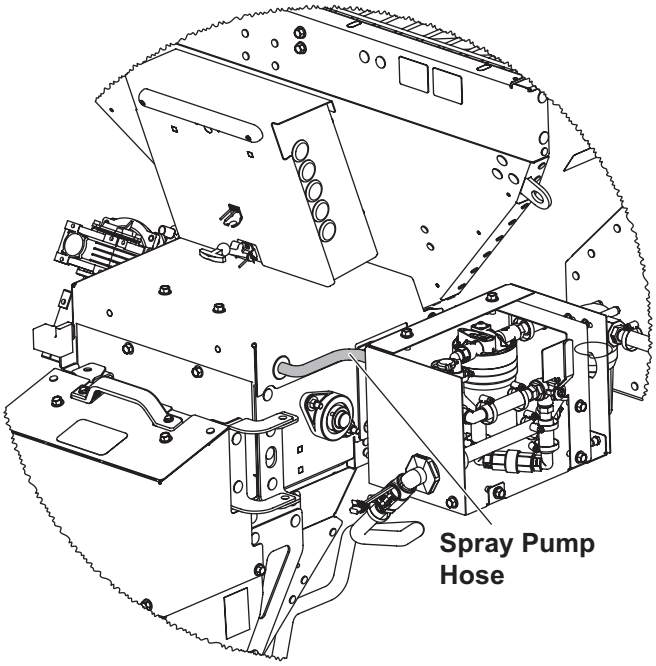
Auger Units

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

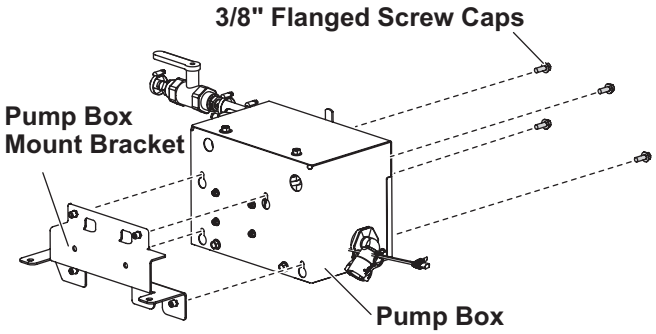


MOUNTING THE PUMP BOX

1. Insert the spray bar hose from the extension cover through the grommet in the rear face of the pump box and, using a spring clamp, attach the hose to the 1/2" barb fitting. Trim hose length if desired.



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



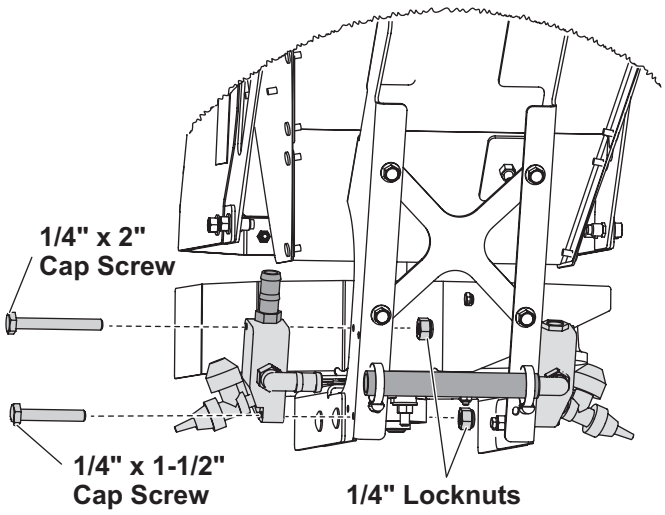
3. Complete wiring harness installation as shown on Page 19.
4. Reattach the pump box cover with the supplied fasteners.

MOUNTING MANIFOLDS & NOZZLES

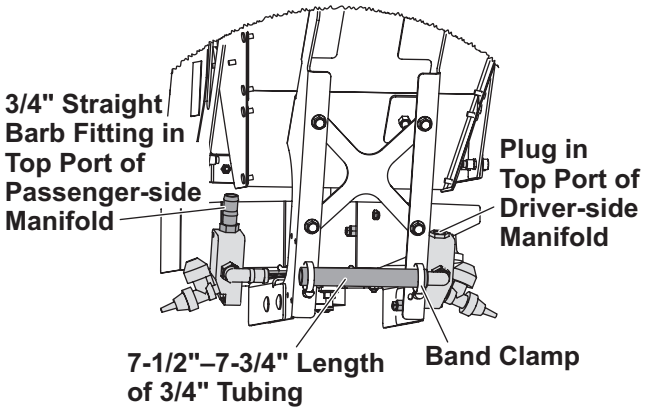
1. Position a manifold assembly with fittings to each side of the chute frame and align the mounting holes.

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

2. Install manifold 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 7-1/2"–7-3/4" length of 3/4" tubing between the 90° elbow fittings. Secure the tubing with band-type clamps.



MOUNTING THE TANKS

Before You Begin

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.

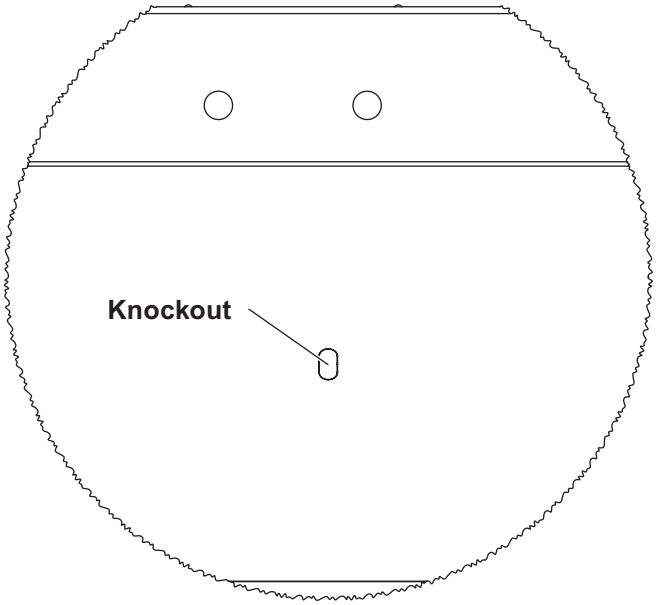
If the spreader has been previously installed in the vehicle, empty all material from the spreader, then **remove the spreader from the vehicle**. Ensure that the spreader mounting bolts are in the mounting bar holes before installing the liquid tanks to the hopper.

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.

NOTE: It is recommended to set spreader on blocks or 4 x 4 dimensional lumber to ease access to fasteners on and near the sill. Two people are recommended for this action.

CREATING THE MOUNTING HOLES

1. Determine the desired tank configuration.
2. Remove knockout from the hopper wall.



INSTALLING TANKS & STRAPS

Refer to the illustrations on the following pages when installing tanks and straps.

1. **For Chain:** Use two of the stainless steel 3/8" carriage bolts, locknuts, and washers to install the tank trays to the sill.

   For Auger: Use four of the stainless steel 3/8" carriage bolts and locknuts to attach the tank mount runner to the sill. Then use two stainless steel 3/8" carriage bolts, locknuts, and washers to install the tank trays to the tank mount runner.

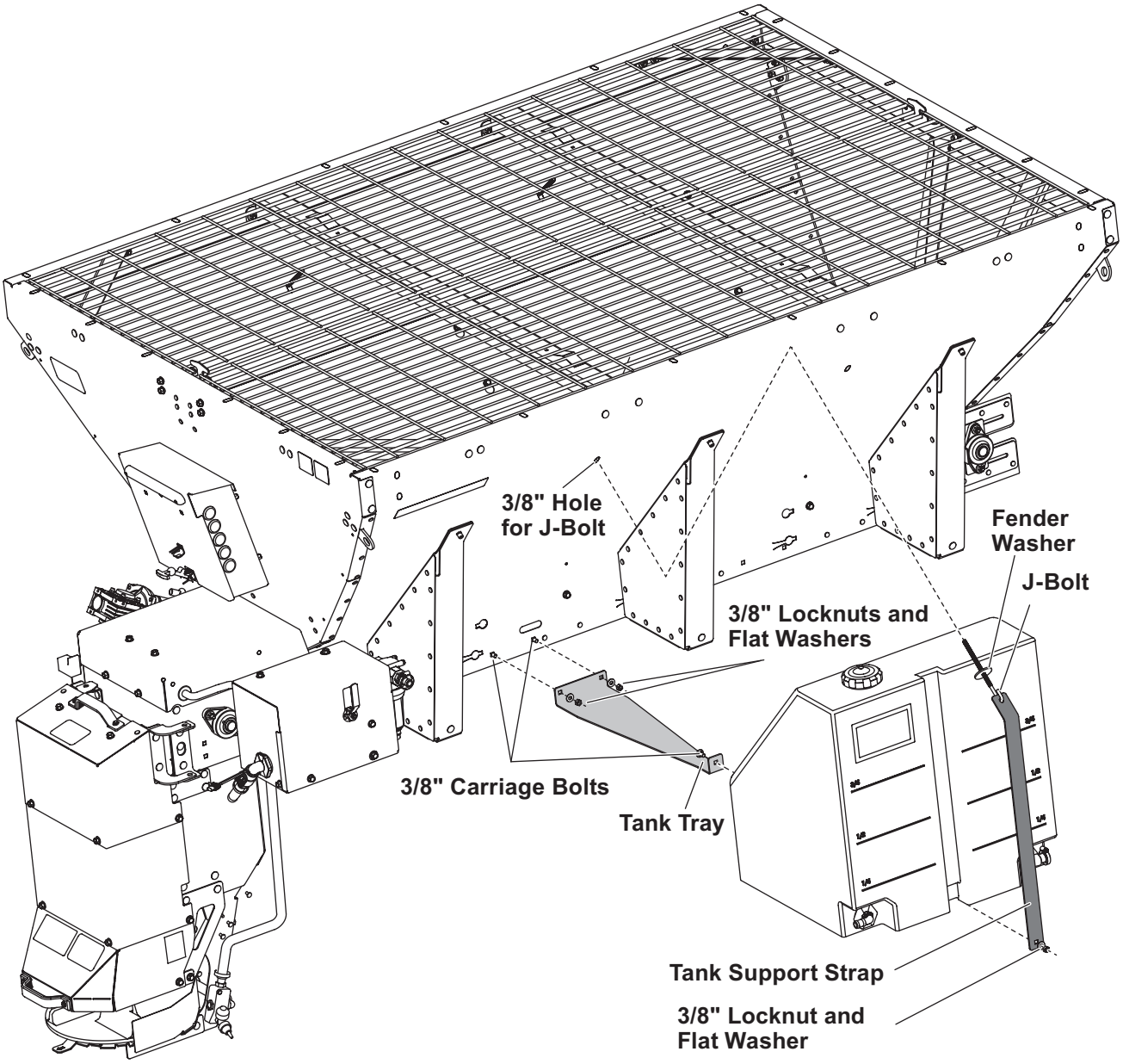
NOTE: The bolts at the hopper center leg are used to fasten both runners through that leg.

2. Place the tank on the tank tray. Verify that the recess in the bottom of the tank is seated into the tray.
3. Use a 3/8" carriage bolt, washer, and locknut to install the tank support strap with the button head facing the tank.
4. Loop the 3/8" x 8" J-bolt through the tank support strap and insert it through the knockout hole in the hopper body. Loop the J-bolt so that the hook is facing upward.
5. 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.

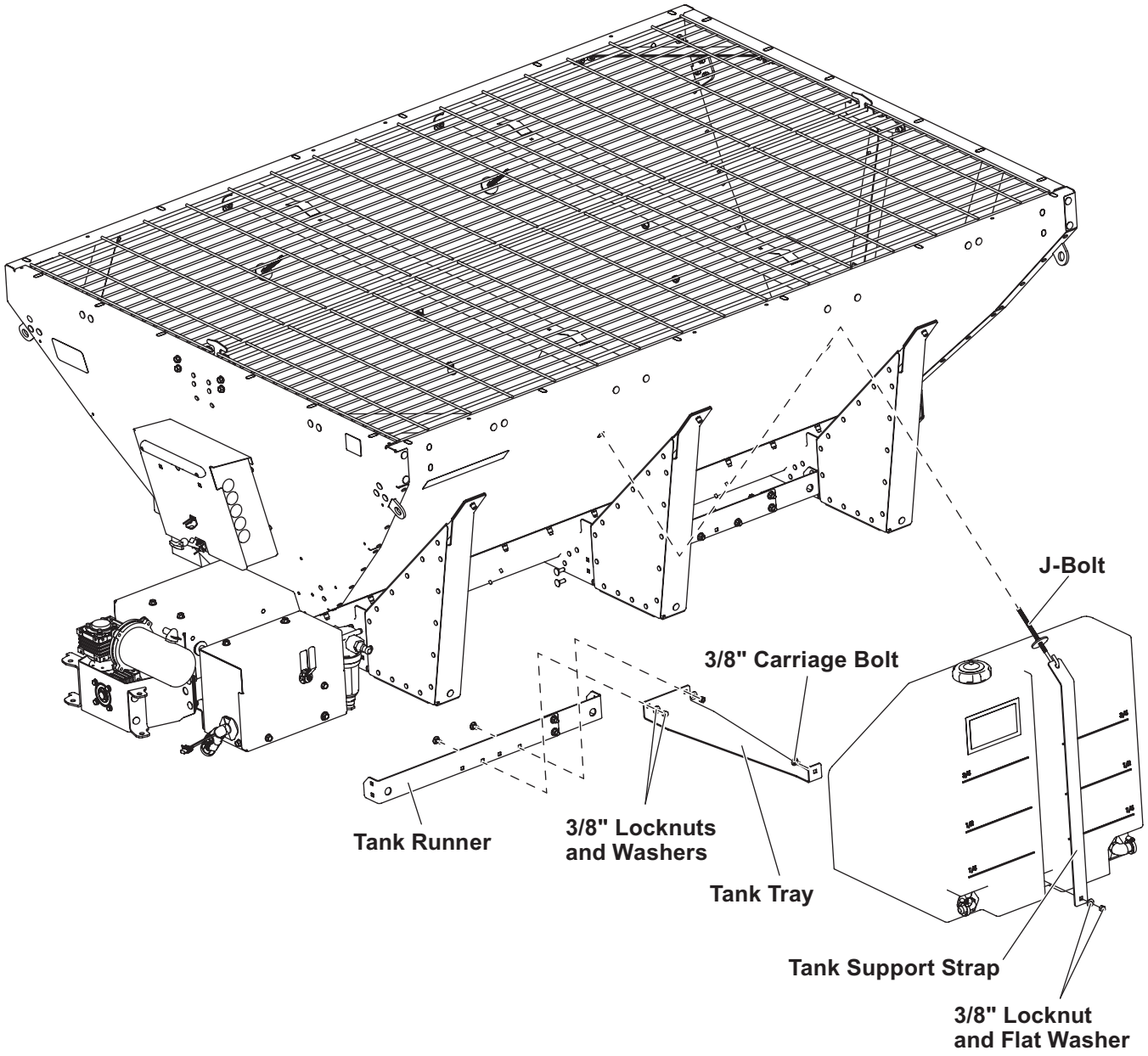
NOTE: Do not use power tools to tighten the J-bolts; use hand tools only. Overtightening can cause galling of the stainless steel threads.

6. Cut the excess bolt length from the J-bolt if desired.
7. Repeat Steps 1–6 for the remaining tanks.

Chain Units


3/8" Hole
for J-Bolt
Fender
Washer
J-Bolt
3/8" Locknuts and
Flat Washers
3/8" Carriage Bolts
Tank Tray
Tank Support Strap
3/8" Locknut and
Flat Washer

Auger Units


J-Bolt
3/8" Carriage Bolt
Tank Runner
3/8" Locknuts
and Washers
Tank Tray
Tank Support Strap
3/8" Locknut
and Flat Washer

PLUMBING THE SYSTEM

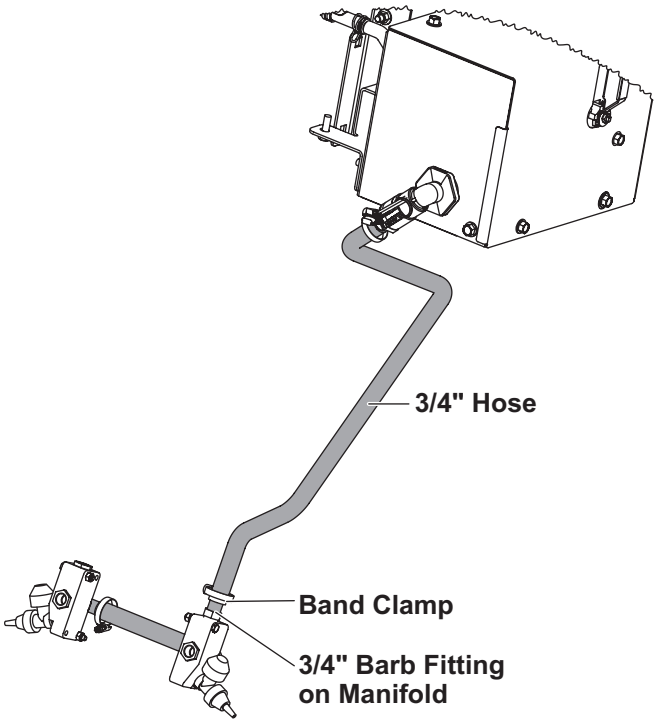
Secure all connections using hose clamps.

- **1/2" Hoses:** Use spring-type clamps.
- **3/4" and 1" Hoses:** Use stainless band clamps.

Use pipe sealant on all NPT fittings.

PLUMBING THE OUTPUT SIDE

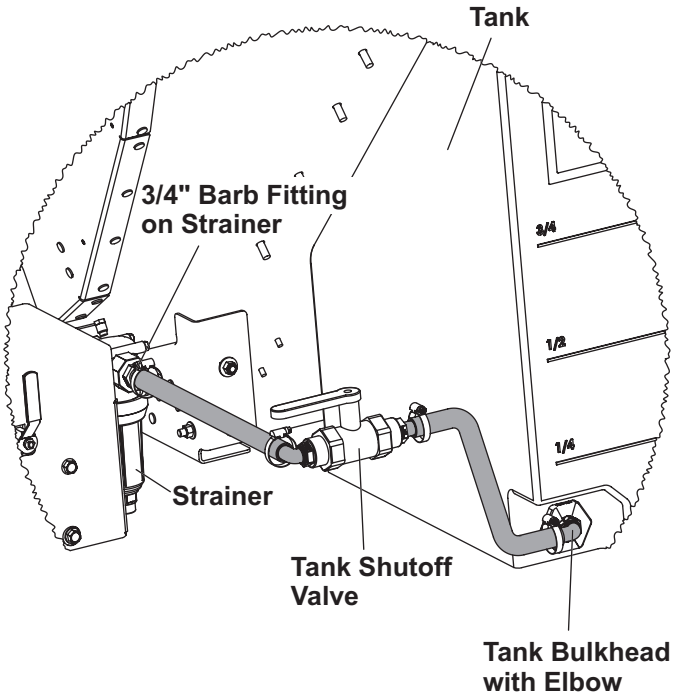
1. Connect a 3/4" ID hose to the 3/4" barb fitting on top of the passenger-side manifold. Secure with a clamp.



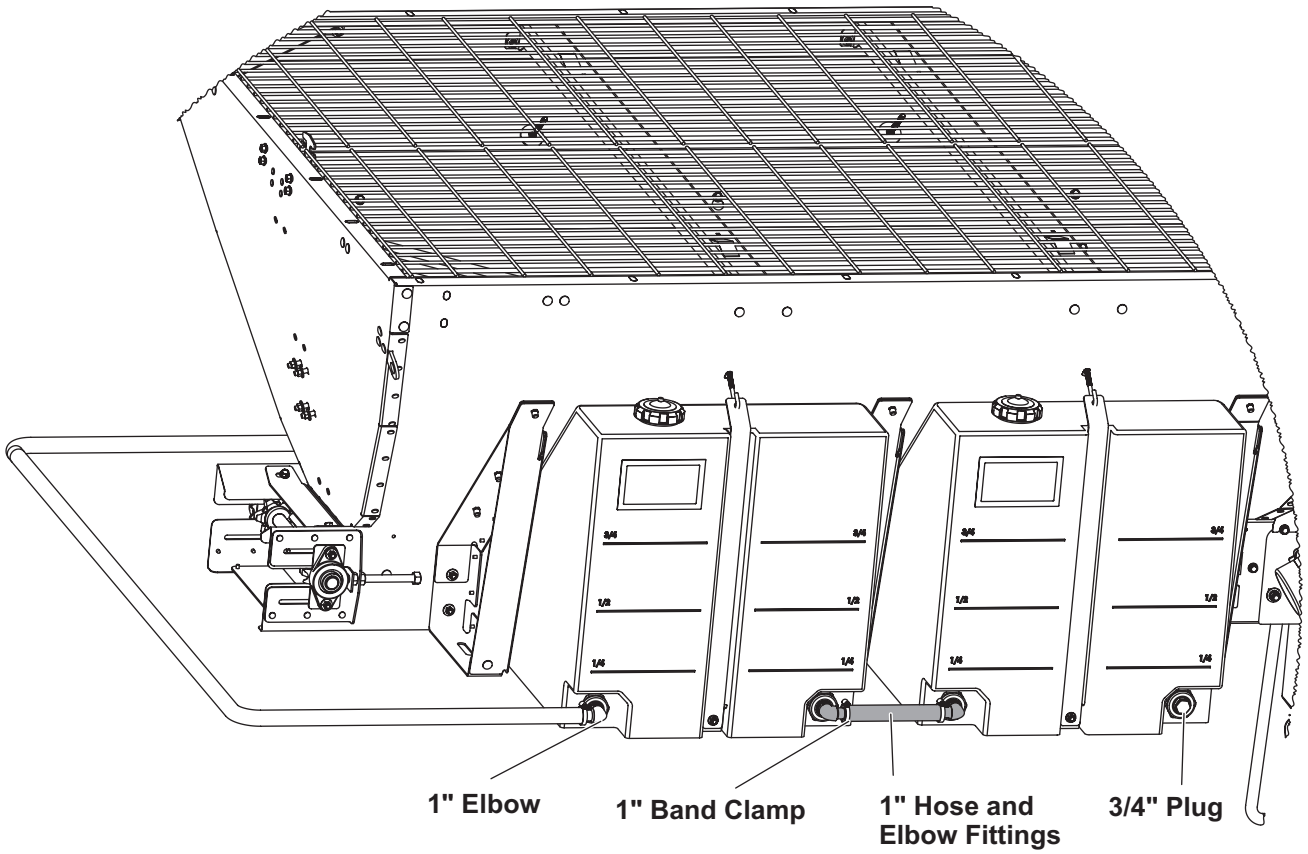
2. With the chute installed on the spreader, cut the hose to a suitable length to reach the quick coupler on the pump box. Install the cam lever coupler (male end) and connect it to the pump box.

PLUMBING THE INPUT SIDE

1. Use the 3/4" ID hose and 3/4" barb fitting to connect the straight end of the tank shut-off valve to the tank closest to the pump box, then connect the other end of the shut-off valve to the strainer.



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 (refer to the illustration on the next page).
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.


1" Elbow
1" Band Clamp
1" Hose and Elbow Fittings
3/4" Plug

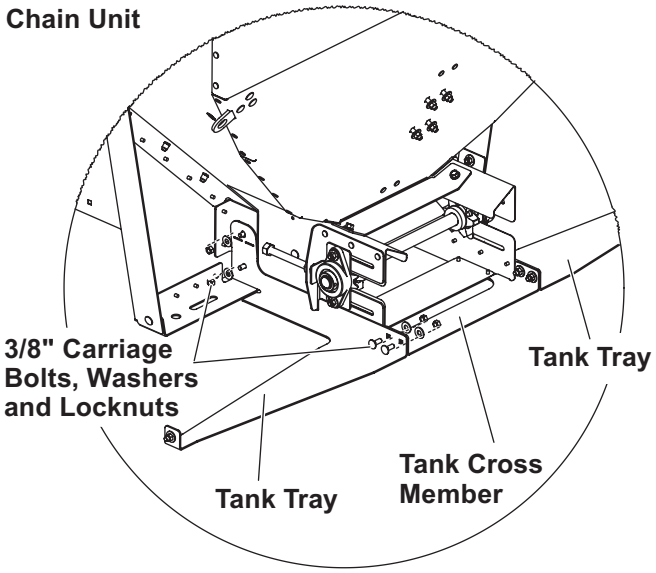
INSTALLING THE TANKS TRAYS

1. **Auger unit only:** Begin by removing the two lower carriage bolts from the auger cover, then refasten with the tank cross member in place.

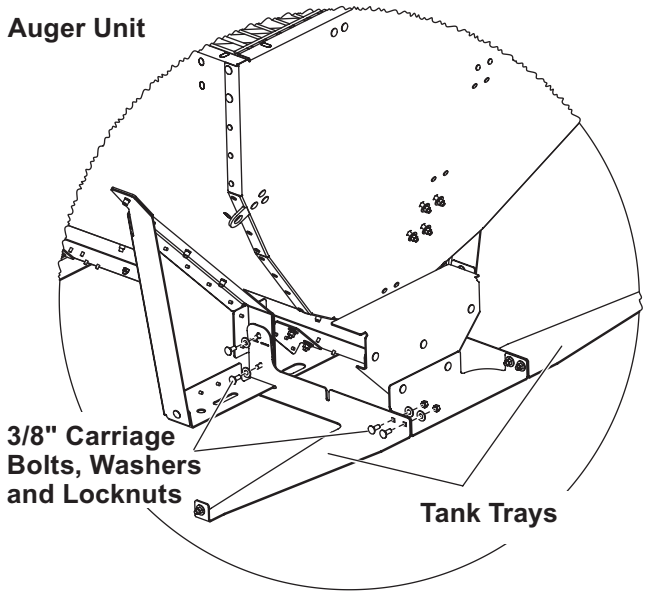
All units:

2. Unbolt the four 3/8" locknuts on the lower legs of the front side of the hopper, then refasten with the expansion tank trays in place.
3. Connect the two trays with the tank cross member variation required for hopper type. Use four 3/8"-16 x 1" carriage bolts, 3/8" washers, and 3/8" locknuts to fasten. Loosen lower leg clip nuts to adjust leg position for alignment if necessary.

Chain Unit



Auger Unit

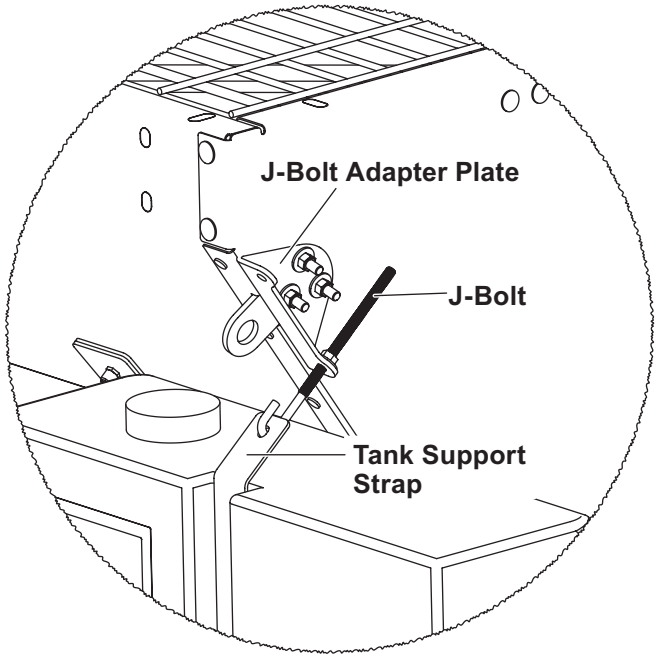


INSTALLING THE TANKS STRAPS

1. Place the tank on the tray. Verify that the recess in the bottom of the tank is seated into the tray.
2. Use the 3/8" x 1" carriage bolt, 3/8" locknut and 3/8" washer to install the tank support strap, with the button head facing the tank.
3. **For eight foot, 3-yard hoppers:**

   a. Replace the six 3/8" carriage bolts in the tie-down brackets with the supplied 3/8" x 1-1/2" carriage bolts and set locknuts aside for later use.

   b. Loop the 3/8" x 8" J-bolt through the tank support strap and insert it through the J-bolt adapter plate as shown.



   c. Start one locknut on the J-bolt by hand and hang the adapter bracket on the three carriage bolts.

   d. Add three washers and locknuts to fasten the adapter plate and tighten all locknuts.

4. **For all other hoppers:**

   a. Remove the necessary knockout for the J-bolt to go through the hopper wall.

   b. Loop the 3/8" x 8" J-bolt through the tank support strap and insert it through the knockout hole. Loop the J-bolt so that the hook is facing upward.

   c. For the J-bolt, place one 2" fender washer and locknut on the inside of the hopper. Tighten the locknut toward the hopper body.

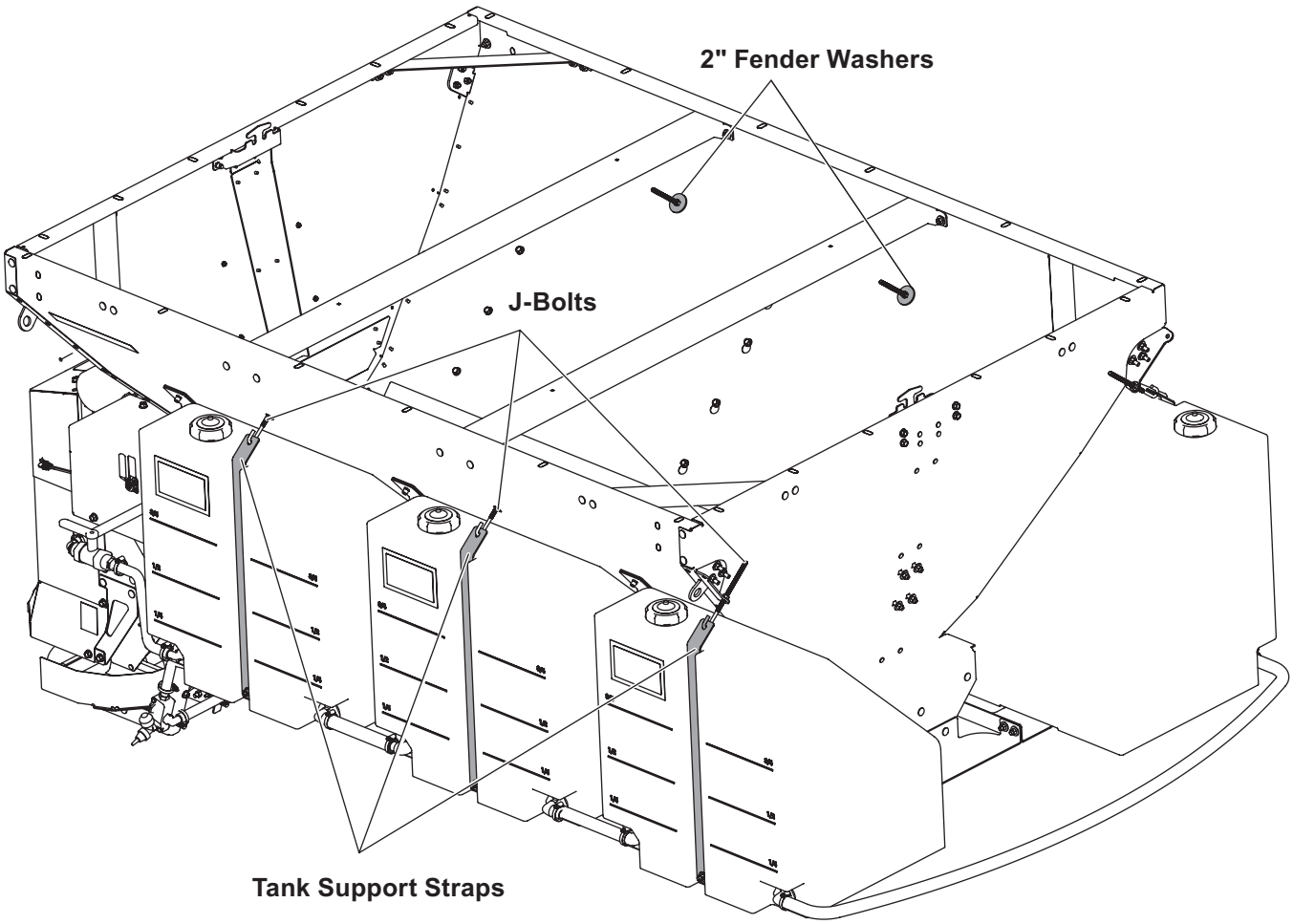
NOTE: Do not use power tools to tighten the J-bolts; use hand tools only. Overtightening can cause galling of the stainless steel threads.

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

6. Adjust the width of the frame spacer to 26" so that the spacer fits firmly between tanks. If frame spacer has not been previously installed, refer to hopper spreader Installation Instructions for directions to build one. **Failure to install this spacer could result in damage to the spreader and/or pre-wet tanks and components.**

PLUMBING THE EXPANSION TANKS

1. To connect additional expansion tanks, install a 1" barb elbow into the bulkheads and use a 1" hose to connect the tanks in series.
2. Verify that all bulkhead fittings are tightened to 20 ft-lb.



INSTALLING THE ON/OFF PUMP KIT

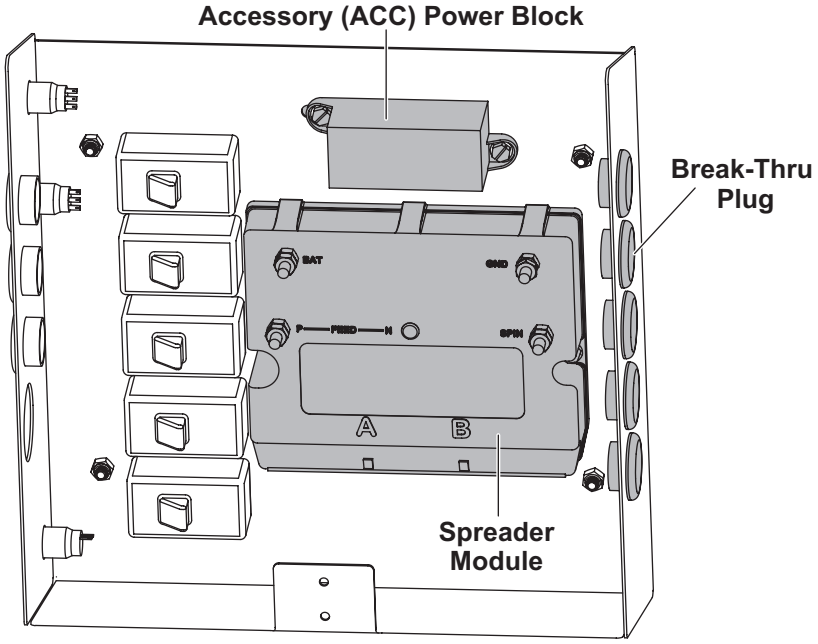
NOTE: The liquid accessory harness kit provides an ON/OFF switch to activate the liquid system from inside the vehicle.

To properly wire the ON/OFF pump kit, follow these instructions and refer to the Liquid Kit Harness Wiring Diagram on Page 19.

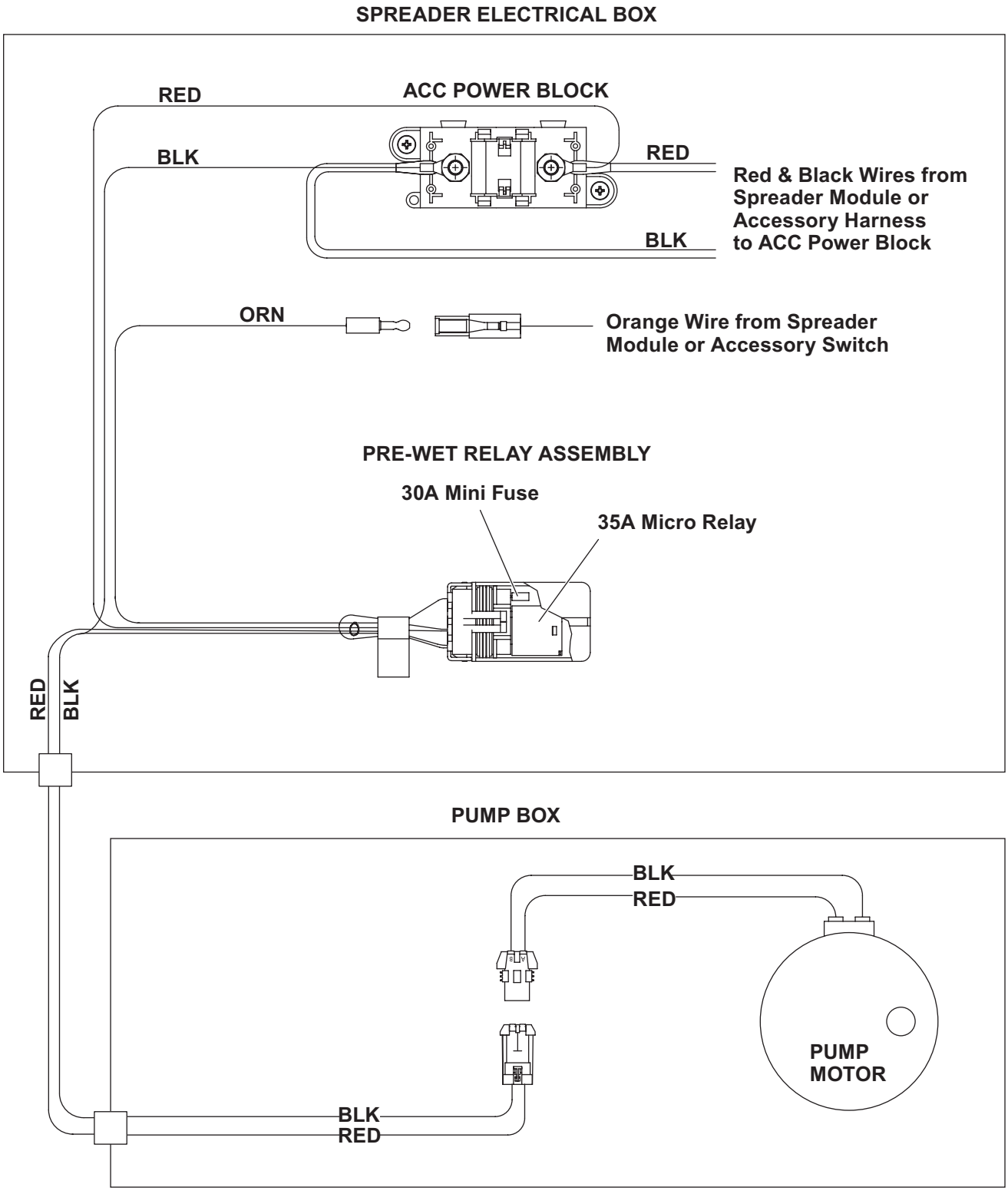
⚠ CAUTION

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

1. Remove the cover from the hopper electrical enclosure located on the end of the hopper.
2. Remove a break-thru plug on the passenger's side of the electrical enclosure. Route the liquid kit relay assembly harness through the opening.
3. Remove the break-thru plug on the inside face of the pump box. Route the harness from the passenger's side of the electrical box into the opening.
4. To protect the harness from wear, starting with one end of a split grommet, work a grommet into each opening and around the harness.
5. Remove the cover from the ACC power block.
6. Attach the ring terminal connected to the red wire of the liquid kit harness to the POSITIVE (+) terminal of the ACC power block.
7. Attach the ring terminal connected to the black wire of the liquid kit harness to the NEGATIVE (–) terminal of the ACC power block.
8. Connect the male bullet terminal of the liquid kit relay assembly harness to the orange wire coming from the spreader module.
9. Reinstall the covers onto the ACC power block and electrical enclosure.
10. 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).

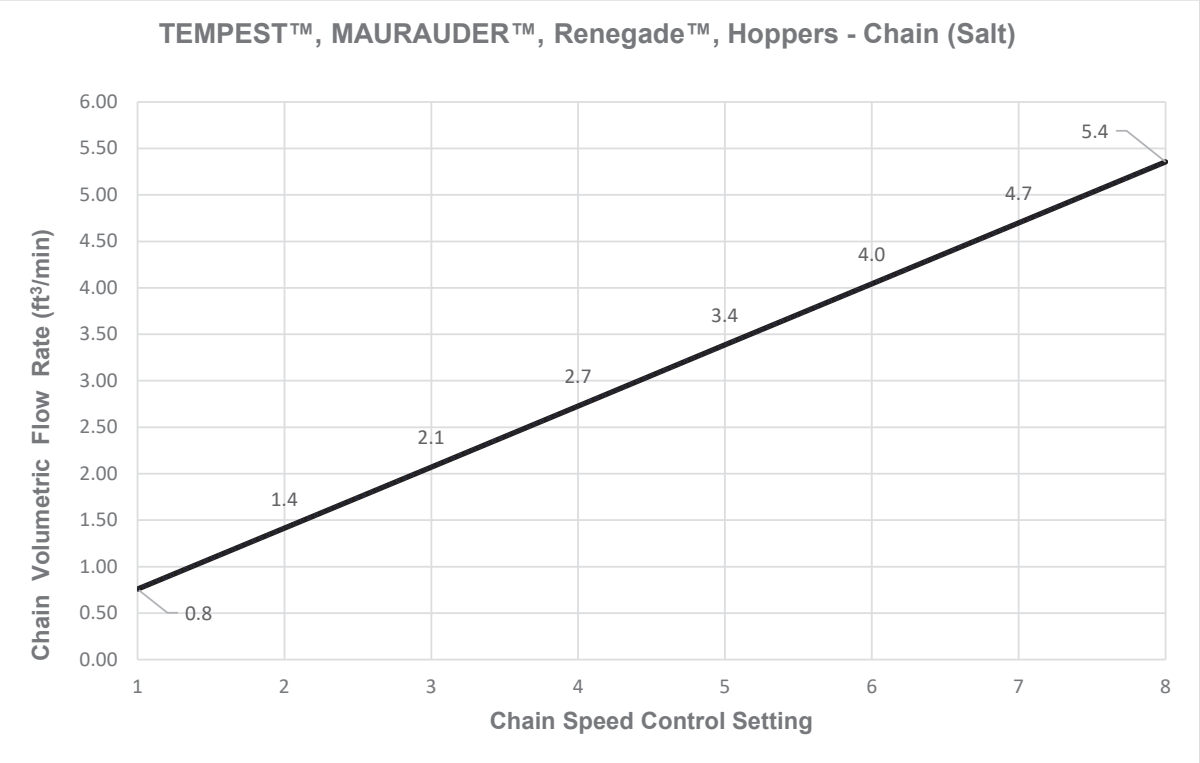
Example:

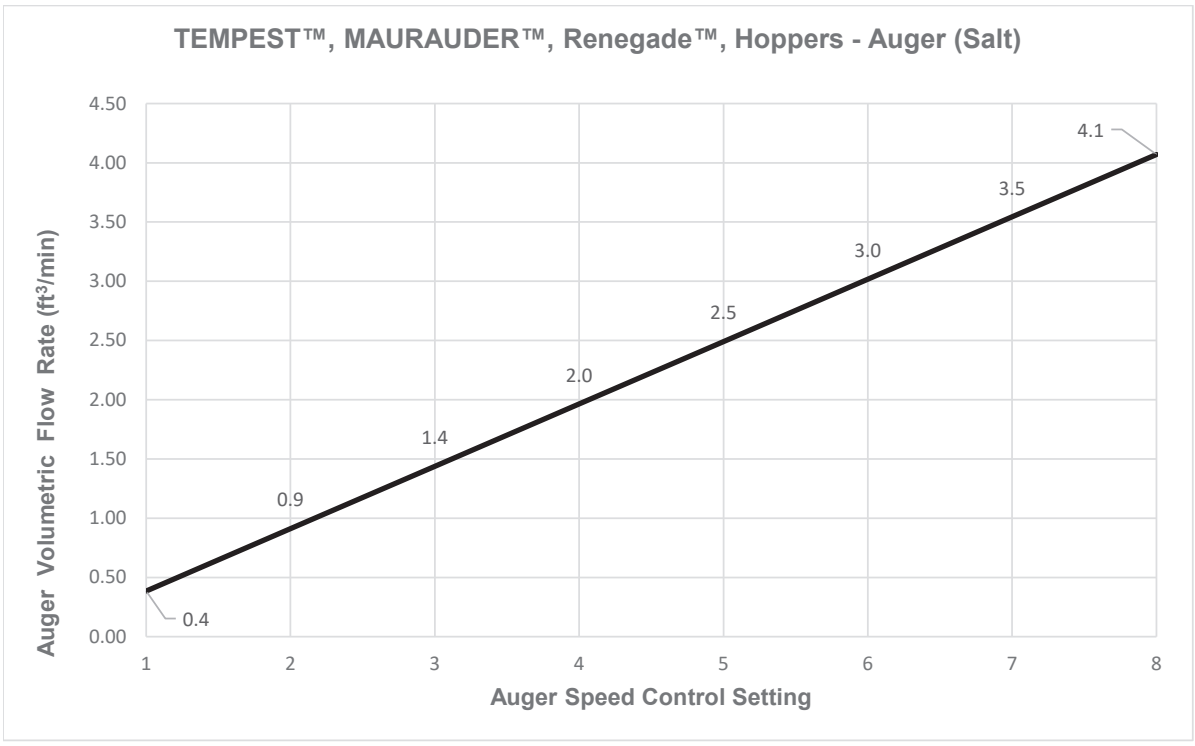
It took 165 seconds to fill the bucket.

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

APPLICATION RATES

The following application chart shows the approximate material delivery rate for installed spreader. Use these charts to determine the auger delivery rate of de-icing salt, which is based on the conveyer or auger drive speed.





After the 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.

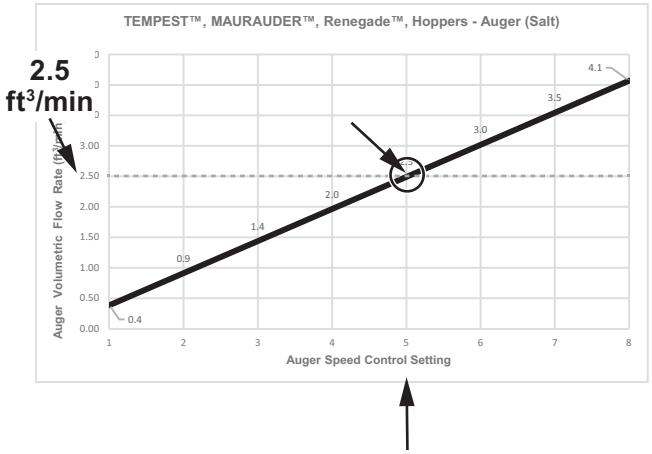
Optimal Flow Rate

	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	–	–	–

Application Example:
Auger hopper spreader is running at delivery-drive 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 Rates charts on Page 21, refer to the appropriate chart for your application (chain or auger), and find the point on the graph where the 5 on the Control Speed axis and the line intersect.
2. Follow from the point of intersection across to the 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 22, 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 20.

PERIODIC MAINTENANCE

- Wash unit after each use to prevent material build-up and corrosion.
- When the system is not in use, remove chute nozzles from manifolds to prevent clogging with road dirt/grime.
- 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.

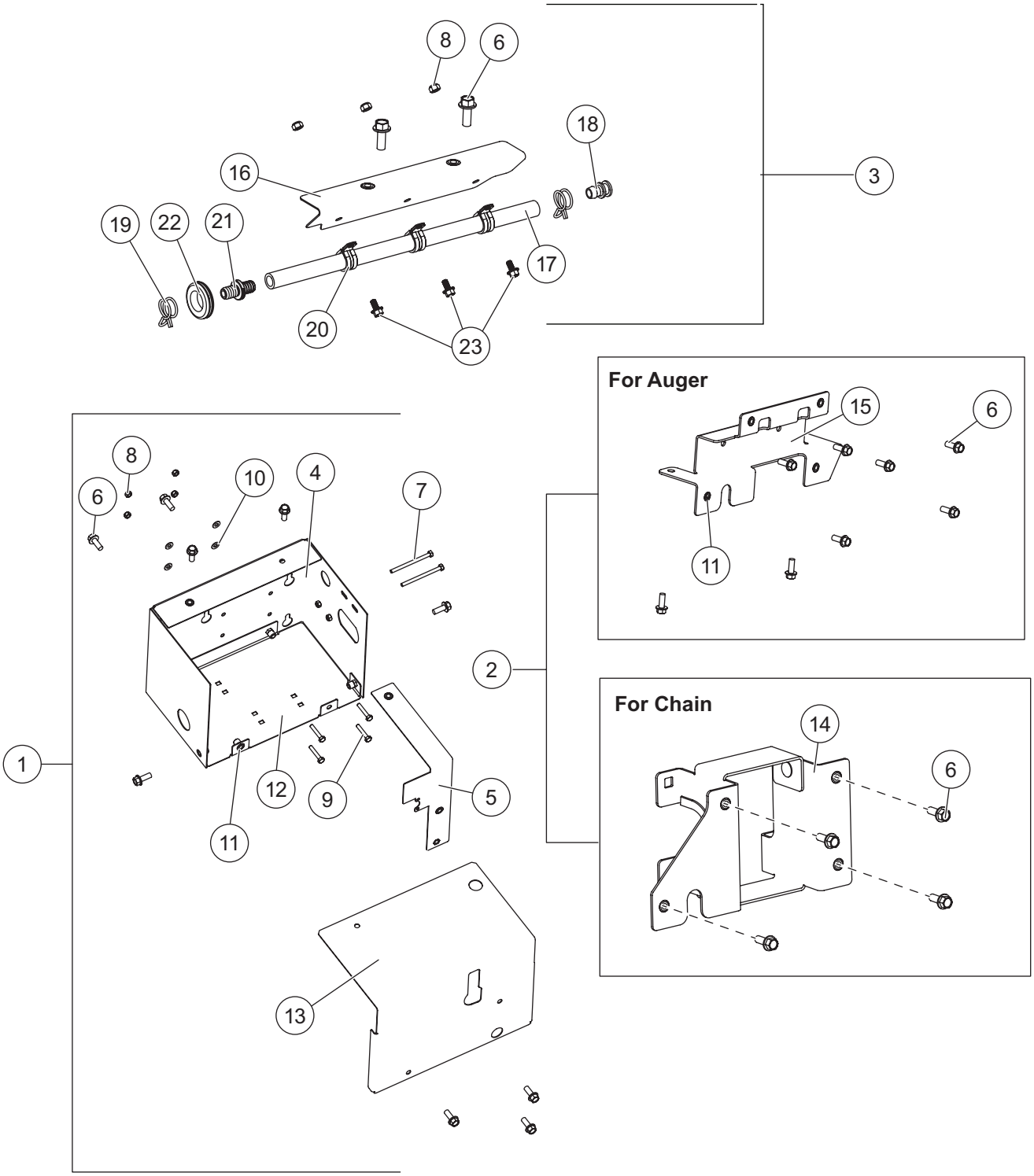
END OF SEASON AND STORAGE

- Before long periods of storage, flush out the tanks and pumping system to remove salt build-up and prevent corrosion.
- Empty the tanks first if you are removing the hopper from the vehicle.
- Do not leave unused material in the unit for a prolonged period of time.

TROUBLESHOOTING GUIDE

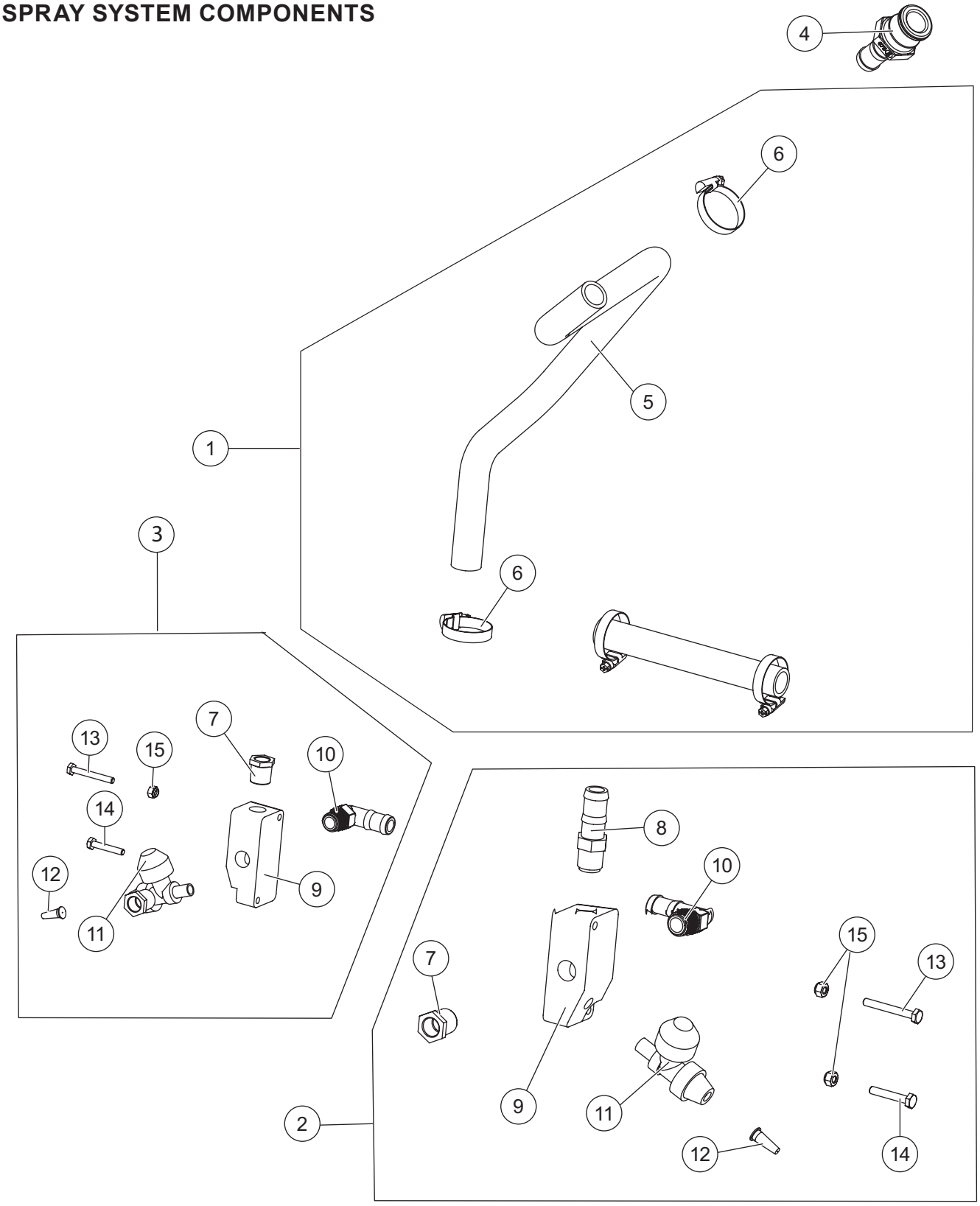
Problem	Possible Cause	Suggested Solution
Pump is not operating.	1. Loose electrical connection.	1. Check all electrical connections for corrosion.
	2. Blown fuse.	2. Replace the fuse.
	3. Pump seized.	3. Replace the pump.
Control shut down.	1. Loose electrical connection.	1. Check all electrical connections 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 "Mounting the Spray Bracket" on Page 7.
	3. Flow rate is set too low.	3. See "Adjusting the Flow" on Page 20.
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



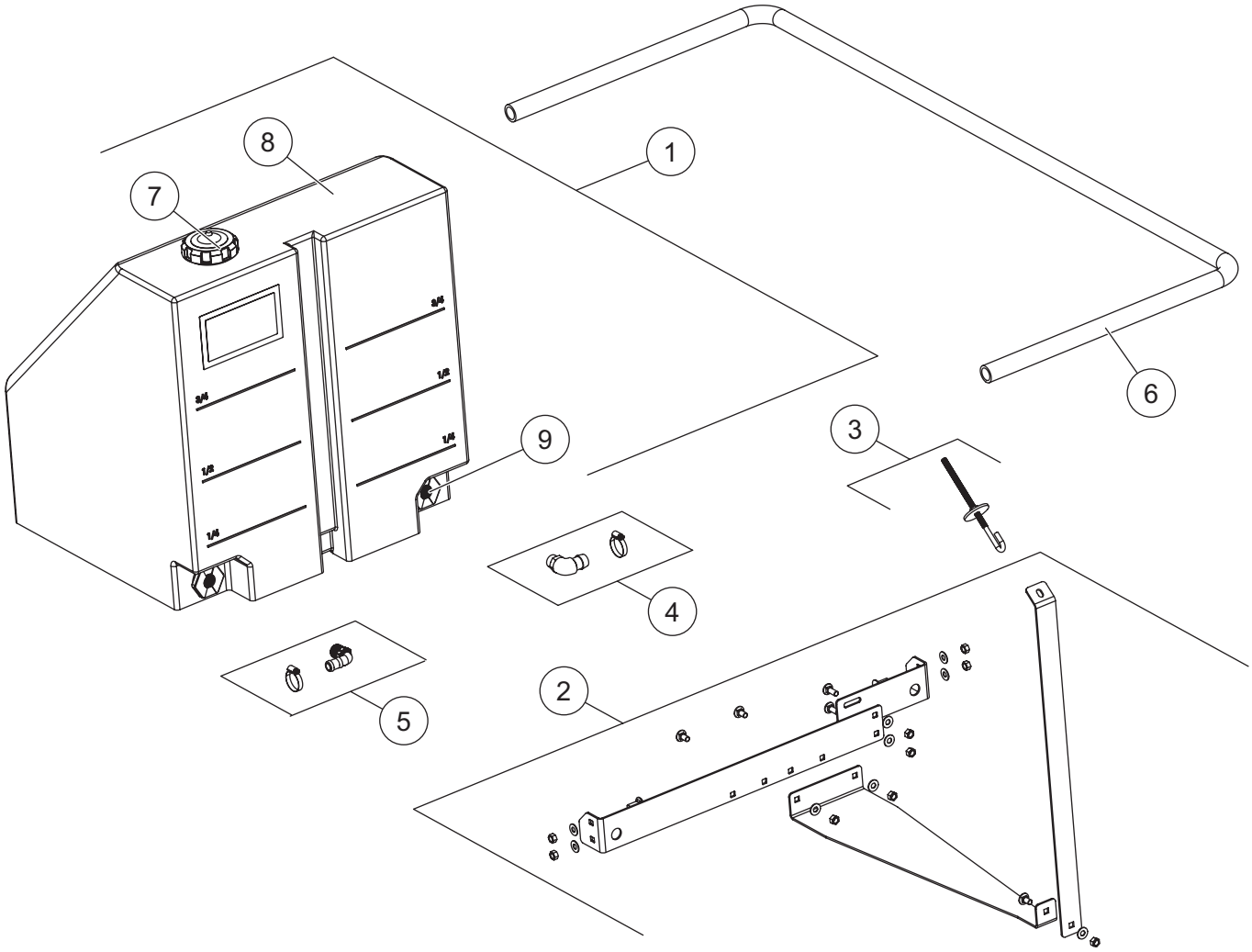
Pump Box Components							
Item	**Part**	**Qty**	**Description**	**Item**	**Part**	**Qty**	**Description**
1	31640	1	Pump Box Enclosure Kit	3	31651	1	Liquid Spray Bar Kit
2	31625	1	Pump Box Mount Kit				
Item 1			**31640 Pump Box Enclosure**				
4		1	Pre-Wet Box Walls	9		4	1/4-20 x 1-1/2 Hex Cap Screw SS
ns	99195	1	Break-Thru Plug	10		6	1/4 Flat Washer Type A Narrow
ns		1	Hose Grommet, 1/2 Hose	11		9	3/8-16 Rivnut
5		1	Pre-Wet Valve Bracket	12		1	Pre-Wet Box Bottom
6		9	3/8-16 x 1 Serrated Flanged Cap Screw SS	13		1	Pre-Wet Box Cover
				ns		2	10-24 x 5/16 SS Button Head Socket Cap Screw
7		2	1/4-20 x 3-1/2 Hex Cap Screw				
8		6	1/4-20 Hex Locknut				
Item 2			**31625 Pump Box Mount Kit**				
6		8	3/8-16 x 1 Serrated Flange Cap Screw SS	14		1	Mounting Bracket, Chain
				15		1	Mounting Bracket, Auger
Item 3			**31651 Liquid Spray Bar Kit**				
6		2	3/8-16 x 1 Serrated Flanged Cap Screw SS	19	F51638	4	Double Spring Clamp, 1/2
				20		3	7/8 ID Loop Clamp SS
8		3	1/4-20 Hex Locknut	21		1	Hose Mender Barb
11		2	3/8-16 Rivnut	22		1	Hose Grommet, 1/2 Hose
16		1	Hose Bracket	23		3	1/4-20 x 1/2 Serrated Flange Hex Cap Screw SS
17		1	Slit Rubber Tubing, 11-1/2				
18		1	1/2 Barb Plug	ns		1	1/2 x 24 PVC Clear Hose
ns = not shown				SS = Stainless Steel			

SPRAY SYSTEM COMPONENTS



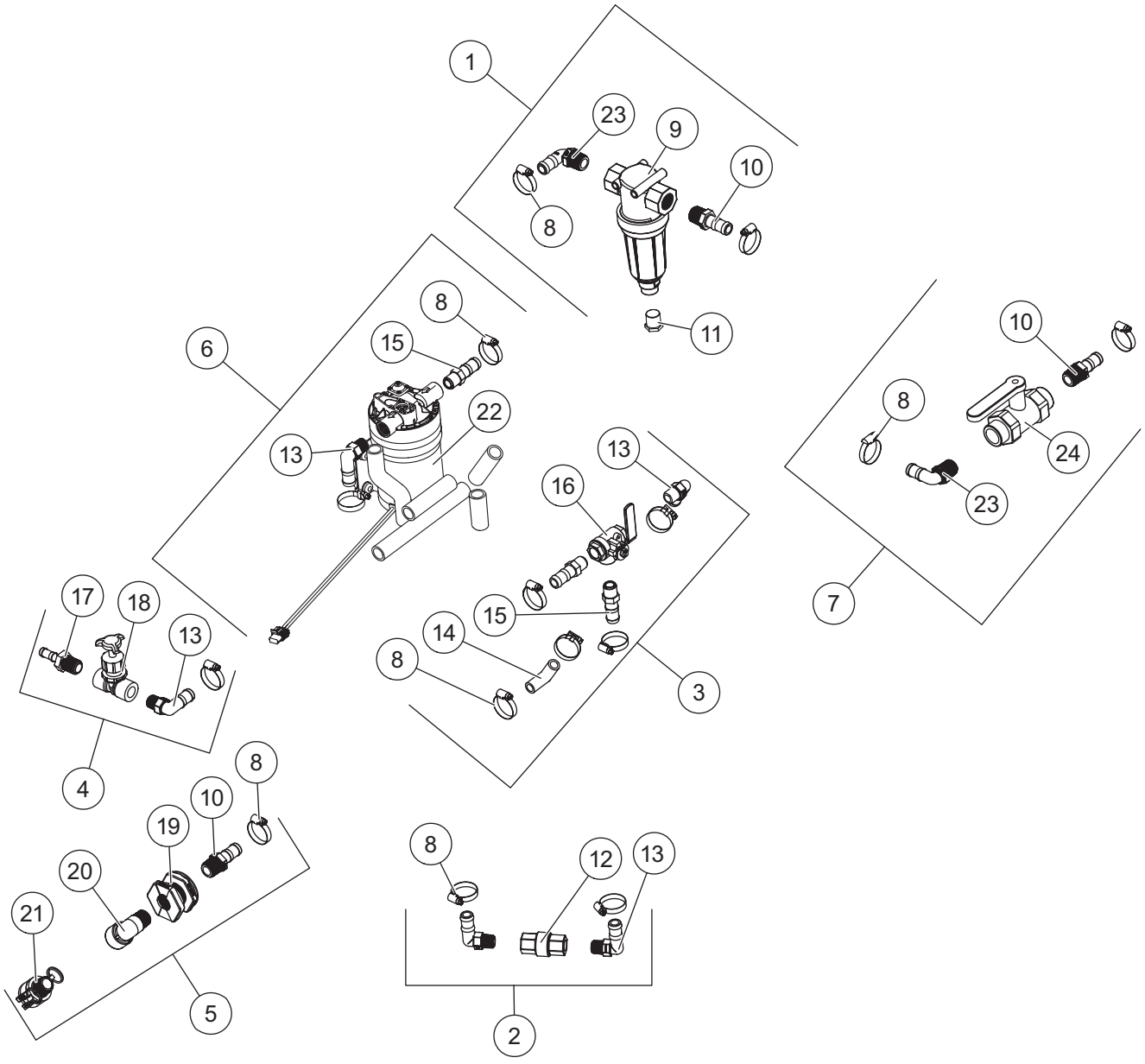
Spray System Components							
Item	**Part**	**Qty**	**Description**	**Item**	**Part**	**Qty**	**Description**
1	31646	1	3/4 x 48 Hose Kit	3	31630	1	Nozzle Manifold Kit – DS
2	31629	1	Nozzle Manifold Kit – PS	4	31143	1	Cam Lever Coupling, Male End
Item 1			**31646 3/4 x 48 Hose Kit**				
5		1	3/4 x 48 PVC Clear Hose	6		4	Band Clamp, 11/16 – 1-1/2
Item 2			**31629 Nozzle Manifold Kit – PS**				
7		1	1/2 Pipe Plug	12	D5215	1	Nozzle
8	D5609	1	1/2 M NPT to 3/4 Barb Fitting	13		1	1/4-20 x 2 Hex Cap Screw
9	11971	1	Manifold	14		1	1/4-20 x 1-1/2 Hex Cap Screw
10	D5328	1	90° Hose Barb, 3/4 x 1/2 Male Thread	15		2	1/4-20 Locknut SS
11	D5241	1	Check Valve				
Item 3			**31630 Nozzle Manifold Kit – DS**				
7		2	1/2 Pipe Plug	12	D5215	1	Nozzle
9	11971	1	Manifold	13		1	1/4-20 x 2 Hex Cap Screw
10	D5328	1	90° Hose Barb, 3/4 x 1/2 Male Thread	14		1	1/4-20 x 1-1/2 Hex Cap Screw
11	D5241	1	Check Valve	15		2	1/4-20 Locknut SS
SS = Stainless Steel							

TANK COMPONENTS



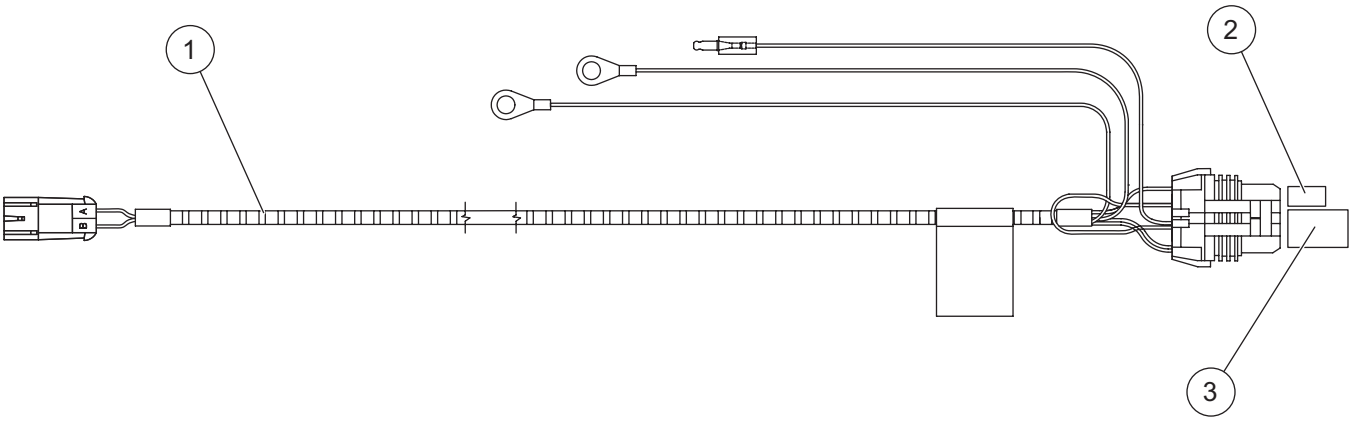
Tank Components							
Item	**Part**	**Qty**	**Description**	**Item**	**Part**	**Qty**	**Description**
1	31991	4	50 Gallon Tank	5	31611	1	Tank to 3/4 Hose Kit
2	31839	4	50 Gallon Strap Kit	6	76424	1	1" Hose Kit – 15'
3	76421	4	J-Bolt Kit	ns	76431	1	3/4 M NPT Plug
4	76422	6	Add-a-Tank Fitting Kit				
Item 1			**31991 50 Gallon Tank**				
7	76430	1	Pre-Wet Tank Cap	9	76447	2	3/4 Bulkhead Fitting
8	31991	1	50 Gallon tank				
Item 2			**31839 50 Gallon Strap Kit**				
		1	50G Tray SS			4	3/8-16 x 1 Carriage Bolt
		1	50G Support Strap SS			7	3/8 Flat Washer SS
		1	50G Tank Mount Runner			7	Hex Locknut 3/8-16 GB SS
		3	3/8-16 x 3/4 Carriage Bolt				
Item 3			**76421 J-Bolt Kit**				
		1	3/8-16 x 8 J-Bolt SS			1	Hex Locknut 3/8-16 GB SS
		1	3/8 x 2 Fender Washer SS				
Item 4			**76422 Add-a-Tank Fitting Kit**				
		1	1 x 3/4 M NPT Barb Elbow			1	11/16–1-1/2 Band Clamp
ns	76431	1	3/4 M NPT Plug				
Item 5			**31611 Tank to 3/4" Hose Kit**				
		1	3/4 M NPT x 3/4 Hose Barb 90°			1	11/16–1-1/2 Band Clamp
Item 6			**76424 1" Hose Kit – 15'**				
		1	1" ID x 15' PVC Clear Hose			6	11/16–1-1/2 Band Clamp
			ns = not shown				SS = Stainless Steel

INTERNAL PUMP BOX COMPONENTS



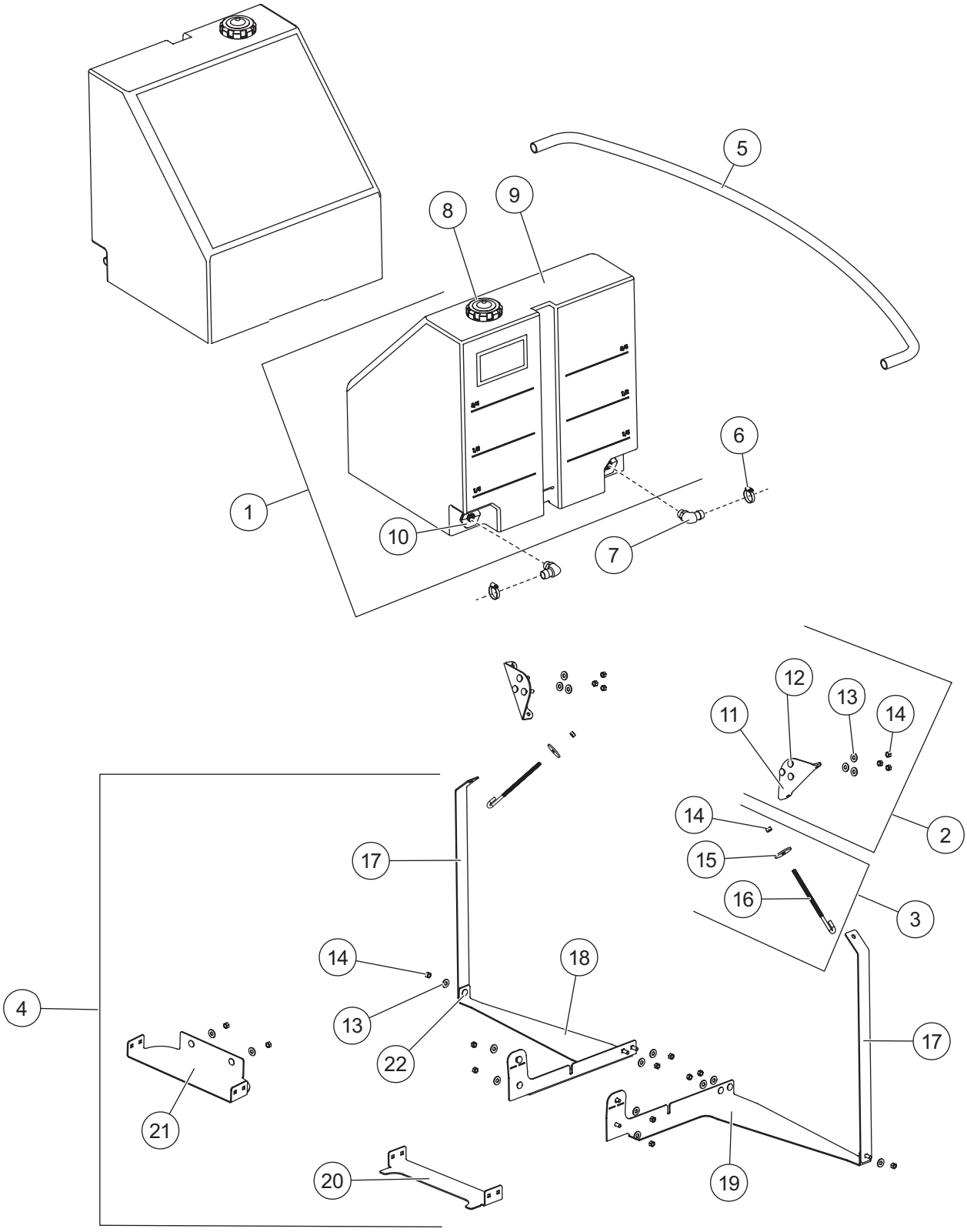
Internal Pump Box Components							
Item	**Part**	**Qty**	**Description**	**Item**	**Part**	**Qty**	**Description**
1	31659	1	Strainer Kit	5	31890	1	Bulkhead Kit
2	31669	1	Check Valve Kit	6	31635	1	Pump Kit
3	31713	1	3-Way Valve Kit	7	31834	1	Shut-Off Valve Kit
4	31880	1	Liquid Flow Kit				
Item 1			**31659 Strainer Kit**				
8		2	11/16–1-1/2 Band Clamp	11		1	Pipe Plug, 1/2 M NPT, Poly
9		1	Strainer	23		1	90° Hose Barb, 3/4 x 3/4 Male Thread
10		1	Hose Barb, 3/4 x 3/4 Male Thread				
Item 2			**31669 Check Valve Kit**				
8		2	11/16–1-1/2 Band Clamp	13	D5328	2	90° Hose Barb, 3/4 x 1/2 Male Thread
12	76326	1	Check Valve, 1/2 x 1/2 F NPT				
Item 3			**31713 3-Way Valve Kit**				
8		5	11/16–1-1/2 Band Clamp	15	D5609	2	Hose Barb, 3/4 x 1/2 Male Thread
13	D5328	1	90° Hose Barb, 3/4 x 1/2 Male Thread	16		1	1/2 Valve, 3-Way
14		1	90° Hose Barb, 3/4 x 3/4				
Item 4			**31880 Liquid Flow Kit**				
8		1	11/16–1-1/2 Band Clamp	17	T20119	1	Hose Barb, 1/2 x 1/2 Male Thread
13	D5328	1	90° Hose Barb, 3/4 x 1/2 Male Thread	18	76345	1	1/2 Needle Valve
Item 5			**31890 Bulkhead Kit**				
8		1	11/16–1-1/2 Band Clamp	20		1	90° Elbow, 3/4 NPT PP
10		1	Hose Barb, 3/4 x 3/4 Male Thread	21		1	Cam Lever Coupling
19	D6917	1	Bulkhead Fitting NPTF				
Item 6			**31635 Pump Kit**				
8		2	11/16–1-1/2 Band Clamp	15	D5609	1	Hose Barb, 3/4 x 1/2 Male Thread
13	D5328	1	90° Hose Barb, 3/4 x 1/2 Male Thread	22	11974	1	Pump, Diaphragm – 7 gal/min Bypass
Item 7			**31834 Shut-Off Valve Kit**				
8		2	11/16–1-1/2 Band Clamp	23		1	90° Hose Barb, 3/4 x 3/4 Male Thread
10		1	Hose Barb, 3/4 x 3/4 Male Thread	24		1	Shut-Off Valve 3/4 NPT

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				

100-GALLON EXPANSION COMPONENTS



93275 100 Gallon Expansion Tank Components							
Item	**Part**	**Qty**	**Description**	**Item**	**Part**	**Qty**	**Description**
1	31991	2	50 Gallon Tank	5		1	Hose, 1" ID PVC Clear 15'
2	79991	1	J-Bolt Bracket Kit	6		4	Band Clamp, 11/16 x 1-1/2
3	76421	2	J-Bolt Kit	7		4	Elbow, 1 Barb x 3/4 M NPT
4	79951	1	Expansion Tank Bracket Kit	ns		3	Loop Clamp, 1-1/2 SS
Item 1			**31991 50 Gallon Tank**				
8	76430	1	Pre-Wet Tank Cap	10	76447	2	3/4 Bulkhead Fitting
9		1	50 Gallon Tank				
Item 2			**79991 J-Bolt Bracket Kit**				
11		2	J-Bolt Tie Down Bracket	13		6	Flat Washer 3/8 Type A Wide SS
12		6	3/8-16 x 1-1/2 Carriage Bolt	14		6	Hex Locknut 3/8-16 GB SS
Item 3			**76421 J-Bolt Kit**				
14		1	Hex Locknut 3/8-16 GB SS	16		1	J-Bolt, 3/8-16 x 8 SS
15		1	Washer, 3/8 x 2 Fender SS				
Item 4			**79951 Expansion Tank Bracket Kit**				
13		12	Flat Washer 3/8 Type A Wide SS	19		1	Support Tray, 50 Gallon Tank - DS
14		12	Hex Locknut 3/8-16 GB SS	20		1	Tank Cross Member, Chain
17		2	Support Strap, 50 Gallon Tank	21		1	Tank Cross Member, Auger
18		1	Support Tray, 50 Gallon Tank - PS	22		12	3/8-16 x 1 Carriage Bolt
SS = Stainless Steel							

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