MODEL XZALT

MANUAL NUMBER: 308216-E

EFFECTIVE 12/2015

1330 76TH AVE SW

Highway Equipment Company

Building the best since 1939.

CEDAR RAPIDS, IA 52404-7052
PHONE (319) 363-8281 | FAX (319) 286-3350
www.highwayequipment.com

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PREFACE

PLEASE ! ALWAYS THINK SAFETY FIRST !!

The purpose of this manual is to familiarize the person (or persons) using this unit with the information necessary to properly install, operate, and maintain this system. The safety instructions indicated by the safety alert symbol in the following pages supersede the general safety rules. These instructions cannot replace the following: the fundamental knowledge that must be possessed by the installer or operator, the knowledge of a qualified person, or the clear thinking necessary to install and operate this equipment. Since the life of any machine depends largely upon the care it is given, we suggest that this manual be read thoroughly and referred to frequently. If for any reason you do not understand the instructions, please call your authorized dealer or our Product Sales and Support Department at (319) 363-8281 or 1-800-363-8006.

It has been our experience that by following these installation instructions, and by observing the operation of the spreader, you will have sufficient understanding of the machine enabling you to troubleshoot and correct all normal problems that you may encounter. Again, we urge you to call your authorized dealer or our Product Sales and Support Department if you find the unit is not operating properly, or if you are having trouble with repairs, installation, or removal of this unit.

We urge you to protect your investment by using genuine HECO parts and our authorized dealers for all work other than routine care and adjustments.

Highway Equipment Company reserves the right to make alterations or modifications to this equipment at any time. The manufacturer shall not be obligated to make such changes to machines already in the field.

This Safety Section should be read thoroughly and referred to frequently.

ACCIDENTS HURT !!!

ACCIDENTS COST !!!

ACCIDENTS CAN BE AVOIDED !!!

TAKE NOTE! THIS SAFETY ALERT SYMBOL FOUND THROUGHOUT THIS MANUAL IS USED TO CALL YOUR ATTENTION TO INSTRUCTIONS INVOLVING YOUR PERSONAL SAFETY AND THAT OF OTHERS. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN INJURY OR DEATH.

In this manual and on the safety signs placed on the unit, the words "DANGER," "WARNING," "CAUTION," and "NOTICE" are used to indicate the following:

DANGER	Indicates an imminently hazardous situation that, if not avoided, WILL result in death or serious injury. This signal word is to be limited to the most extreme situations and typically for machine components that, for functional purposes, cannot be guarded.
WARNING	Indicates a potentially hazardous situation that, if not avoided, COULD result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.
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.
NOTICE!	Is used for informational purposes in areas which may involve damage or deterioration to equipment but generally would not involve the potential for personal injury.
NOTE:	Provides additional information to simplify a procedure or clarify a process.

The need for safety cannot be stressed strongly enough in this manual. At Highway Equipment Company, we urge you to make safety your top priority when operating any equipment. We firmly advise that anyone allowed to operate this machine be thoroughly trained and tested, to prove they understand the fundamentals of safe operation.

The following guidelines are intended to cover general usage and to assist you in avoiding accidents. There will be times when you will run into situations that are not covered in this section. At those times the best standard to use is common sense. If, at any time, you have a question concerning these guidelines, please call your authorized dealer or our factory at (319) 363-8281 or 1-800-363-8006.

MAINTENANCE INSTRUCTIONS

1. Keep safety decals and signs clean and legible at all times.

2. Replace safety decals and signs that are missing or have become illegible.

3. Replaced parts that displayed a safety sign should also display the current sign.

4. Safety decals or signs are available from your dealer's Parts Department or our Cedar Rapids factory.

INSTALLATION INSTRUCTIONS

1. Clean Surface
   Wash the installation surface with a synthetic, free-rinsing detergent. Avoid washing the surface with a soap containing creams or lotion. Allow to dry.

2. Position Safety Decal
   Decide on the exact position before application. Application marks may be made on the top or side edge of the substrate with a lead pencil, marking pen, or small pieces of masking tape. NOTE: Do not use chalk line, china marker, or grease pencil. Safety decals will not adhere to these.

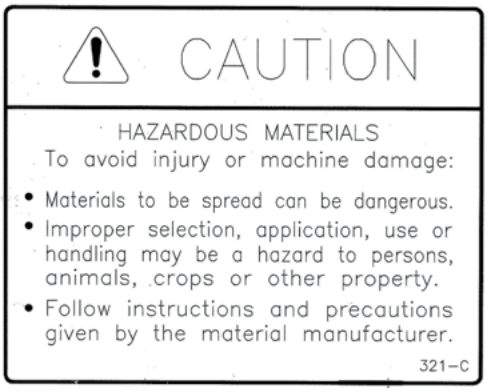
3. Remove the Liner
   A small bend at the corner or edge will cause the liner to separate from the decal. Pull the liner away in a continuous motion at a 180-degree angle. If the liner is scored, bend at score and remove.

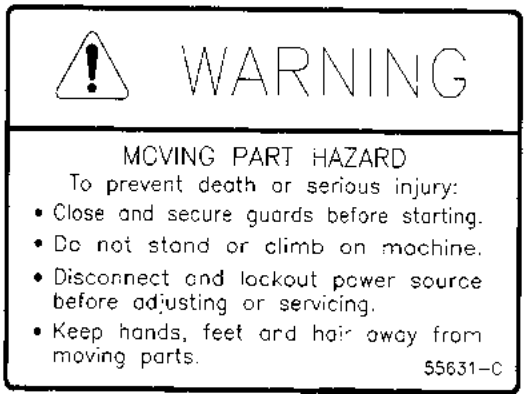
4. Apply Safety Decal
   a. Tack decal in place with thumb pressure in upper corners.
   b. Using firm initial squeegee pressure, begin at the center of the decal and work outward in all directions with overlapping strokes. NOTE: Keep squeegee blade even—nicked edges will leave application bubbles.
   c. Pull up tack points before squeegeeing over them to avoid wrinkles.

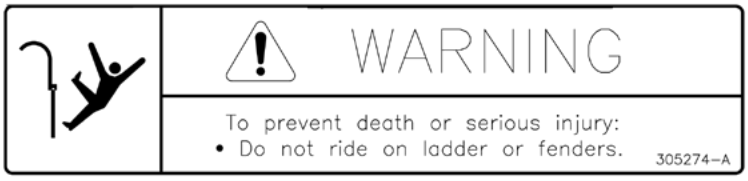
5. Remove Pre-mask
   If safety decal has a pre-mask cover remove it at this time by pulling it away from the decal at a 180 degree angle. NOTE: It is important that the pre-mask covering is removed before the decal is exposed to sunlight to avoid the pre-mask from permanently adhering to the decal.

6. Remove Air Pockets
   Inspect the decal in the flat areas for bubbles. To eliminate the bubbles, puncture the decal at one end of the bubble with a pin (never a razor blade) and press out entrapped air with thumb moving toward the puncture.

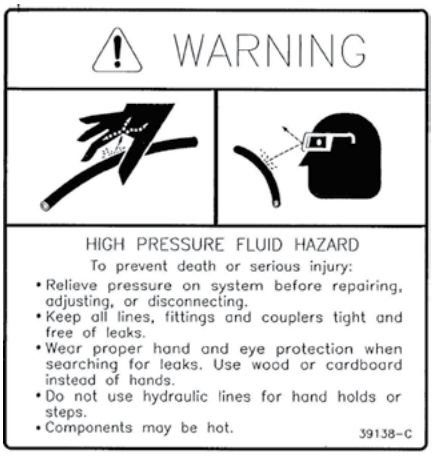
7. Re-Squeegee All Edges.

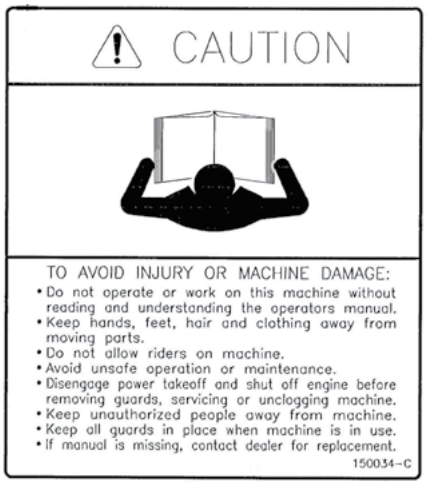

CAUTION
HAZARDOUS MATERIALS
To avoid injury or machine damage:
• Materials to be spread can be dangerous.
• Improper selection, application, use or handling may be a hazard to persons, animals, crops or other property.
• Follow instructions and precautions given by the material manufacturer.
321–C


WARNING
MOVING PART HAZARD
To prevent death or serious injury:
• Close and secure guards before starting.
• Do not stand or climb on machine.
• Disconnect and lockout power source before adjusting or servicing.
• Keep hands, feet and hair away from moving parts.
55631–C


WARNING
To prevent death or serious injury:
• Do not ride on ladder or fenders.
305274–A

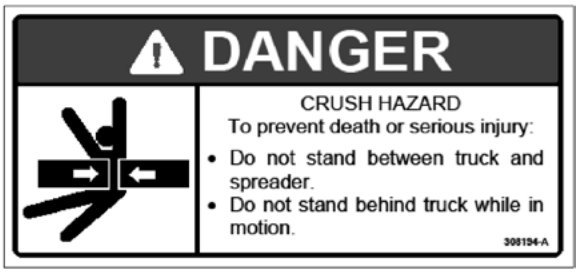

WARNING
FALLING SPINNER HAZARD
To prevent death or serious injury:
• Stay out from under spinner in raised position or while lowering hopper.
• Do not operate or transport in raised position.
• Keep away from rotating spinner.
71807–C

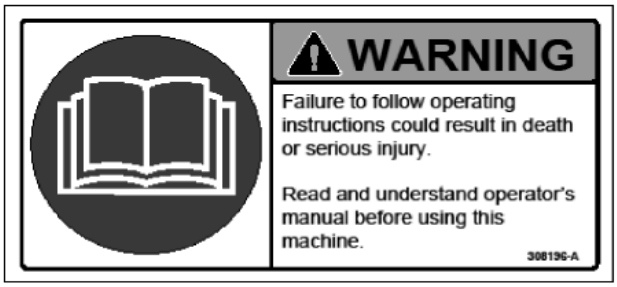

WARNING
HIGH PRESSURE FLUID HAZARD
To prevent death or serious injury:
• Relieve pressure on system before repairing, adjusting, or disconnecting.
• Keep all lines, fittings and couplers tight and free of leaks.
• Wear proper hand and eye protection when searching for leaks. Use wood or cardboard instead of hands.
• Do not use hydraulic lines for hand holds or steps.
• Components may be hot.
39138–C

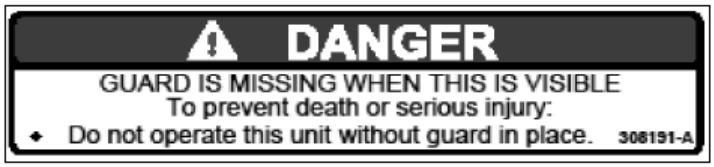

CAUTION
TO AVOID INJURY OR MACHINE DAMAGE:
• Do not operate or work on this machine without reading and understanding the operators manual.
• Keep hands, feet, hair and clothing away from moving parts.
• Do not allow riders on machine.
• Avoid unsafe operation or maintenance.
• Disengage power takeoff and shut off engine before removing guards, servicing or unclogging machine.
• Keep unauthorized people away from machine.
• Keep all guards in place when machine is in use.
• If manual is missing, contact dealer for replacement.
150034–C

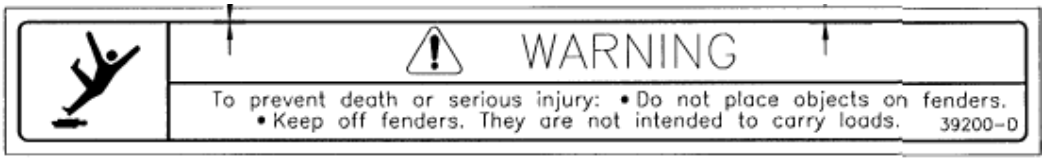

WARNING
FALLING HAZARD
To prevent death, serious injury or machine damage:
• Do not stand or climb on guard.
308193-A


DANGER
MOVING PART HAZARD
To prevent death or serious injury:
• Stay out of box while conveyor is moving.
• Disconnect and lockout power source before adjusting or servicing.
• Do not ride on spreader.
364-C

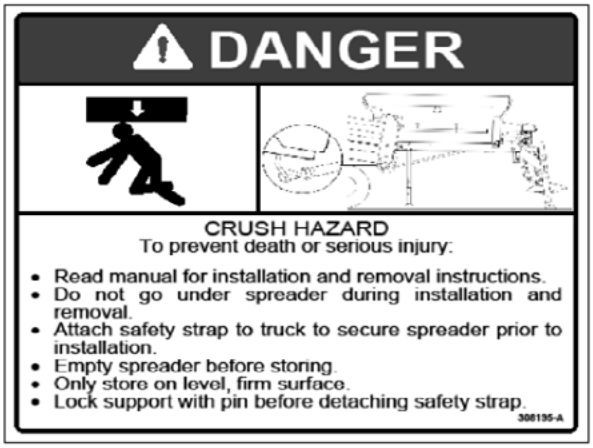

DANGER
CRUSH HAZARD
To prevent death or serious injury:
• Do not stand between truck and spreader.
• Do not stand behind truck while in motion.
308194-A


WARNING
Failure to follow operating instructions could result in death or serious injury.
Read and understand operator's manual before using this machine.
308196-A


DANGER
GUARD IS MISSING WHEN THIS IS VISIBLE
To prevent death or serious injury:
• Do not operate this unit without guard in place.
308191-A


WARNING
To prevent death or serious injury: • Do not place objects on fenders.
• Keep off fenders. They are not intended to carry loads.
39200-D


DANGER
FLYING MATERIAL & ROTATING SPINNER HAZARD
To prevent death or serious injury:
• Wear eye protection.
• Stop machine before servicing or adjusting.
• Keep bystanders at least 60 feet away.
308192-A


DANGER
CRUSH HAZARD
To prevent death or serious injury:
• Read manual for installation and removal instructions.
• Do not go under spreader during installation and removal.
• Attach safety strap to truck to secure spreader prior to installation.
• Empty spreader before storing.
• Only store on level, firm surface.
• Lock support with pin before detaching safety strap.
308195-A

SAFETY

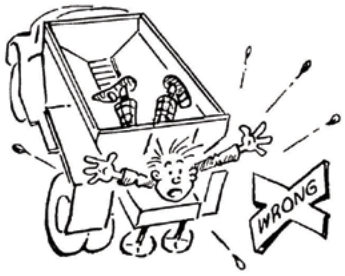
1. Before attempting to operate this unit, read and be sure you understand the operation and maintenance manual. Locate all controls and determine the use of each. Know what you are doing!

2. When leaving the unit unattended for any reason, be sure to:
   a. Take power take-off out of gear.
   b. Shut off conveyor and spinner drives.
   c. Shut off vehicle engine and unit engine (if so equipped).
   d. Place transmission of the vehicle in “neutral” or “park”.
   e. Set parking brake firmly.
   f. Lock ignition and take keys with you.
   g. Lock vehicle cab.
   h. If on steep grade, block wheels.

   These actions are recommended to avoid unauthorized use, runaway, vandalism, theft and unexpected operation during start-up.

3. Do not read, eat, talk on a mobile phone or take your attention away while operating the unit. Operating is a full-time job.

4. Stay out of the spreader. If it’s necessary to enter the spreader, return to the shop, empty body, turn off all power, set vehicle brakes, lock engine starting switch and remove keys before entering. Tag all controls to prohibit operation. Tags should be placed, and later removed, only by person working in the body.

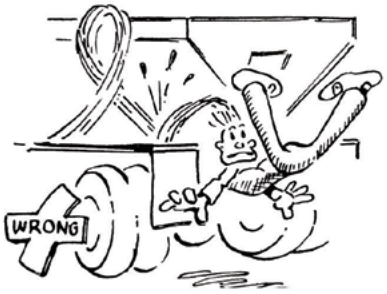


5. Guards and covers are provided to help avoid injury. Stop all machinery before removing them. Replace guards and covers before starting spreader operation.

6. Stay clear of any moving members, such as shafts, couplings and universal joints. Make adjustments in small steps, shutting down all motions for each adjustment.

7. Before starting unit, be sure everyone is clear and out of the way.

8. Do not climb on unit. Use the inspection ladder or a portable ladder to view the unit. Be careful in getting on and off the ladder, especially in wet, icy, snowy or muddy conditions. Clean mud, snow or ice from steps and footwear.



9. Do not allow anyone to ride on any part of unit for any reason.

10. Keep away from spinners while they are turning:
    a. Serious injury can occur if spinners touch you.
    b. Rocks, scrap metal or other material can be thrown off the spinner violently. Stay out of discharge area.
    c. Make sure discharge area is clear before spreading.

11. Inspect spinner fins, spinner frame mounting and spinner fin nuts and screws every day. Look for missing fasteners, looseness, wear and cracks. Replace immediately if required. Use only new SAE grade 5 or grade 8 screws and new self-locking nuts.

12. Inspect all bolts, screws, fasteners, keys, chain drives, body mountings and other attachments periodically. Replace any missing or damaged parts with proper specification items. Tighten all bolts, nuts and screws to specified torques according to the torque chart in this manual.

13. Shut off engine before filling fuel and oil tanks. Do not allow overflow. Wipe up all spills. Do not smoke. Stay away from open flame. FIRE HAZARD!

14. Starting fluids and sprays are extremely flammable. Don't smoke. Stay away from flame or heat!

15. All vehicles should be equipped with a serviceable fire extinguisher of 5 BC rating or larger.

16. Hydraulic system and oil can get hot enough to cause burns. DO NOT work on system that is hot. Wait until oil has cooled. If an accident occurs, seek immediate medical assistance.

17. Wear eye protection while working around or on unit.

18. Read, understand and follow instructions and precautions given by the manufacturer or supplier of materials to be spread. Improper selection, application, use or handling may be hazardous to people, animals, plants, crops or other property.

CAUTION If spreader is used to transport chemicals, check with your chemical supplier regarding DOT (Department of Transportation) requirements.

19. Cover all loads that can spill or blow away. Do not spread dusty materials where dust may create pollution or a traffic visibility problem.

20. Turn slowly and be careful when traveling on rough surfaces and side slopes, especially with a loaded spreader. Load may shift causing unit to tip.

21. Read and understand the precautionary decals on the spreader. Replace any that become defaced, damaged, lost or painted over. Replacement decals can be ordered from your dealer's parts department or from Highway Equipment Company by calling (319) 363-8281 or 1-800-363-8006.

SAFETY

1. Maintenance includes all lubrication, inspection, adjustments (other than operational control adjustments such as feedgate openings, conveyor speed, etc.) part replacement, repairs and such upkeep tasks as cleaning and painting.

2. When performing any maintenance work, wear proper protective equipment—always wear eye protection—safety shoes can help save your toes—gloves will help protect your hands against cuts, bruises, abrasions and from minor burns—a hard hat is better than a sore head!

3. Use proper tools for the job required. Use of improper tools (such as a screwdriver instead of a pry bar, a pair of pliers instead of a wrench, a wrench instead of a hammer) not only can damage the equipment being worked on, but can lead to serious injuries. USE THE PROPER TOOLS.

4. Before attempting any maintenance work (including lubrication), shut off power completely. DO NOT WORK ON RUNNING MACHINERY!

5. When guards and covers are removed for any maintenance, be sure that such guards are reinstalled before unit is put back into operation.

6. Check all screws, bolts and nuts for proper torques before placing equipment back in service. Refer to torque chart in this manual.

7. Some parts and assemblies are quite heavy. Before attempting to unfasten any heavy part or assembly, arrange to support it by means of a hoist, by blocking or by use of an adequate arrangement to prevent it from falling, tipping, swinging or moving in any manner which may damage it or injure someone. Always use lifting device that is properly rated to lift the equipment. Do not lift loaded spreader. NEVER LIFT EQUIPMENT OVER PEOPLE.

8. If repairs require use of a torch or electric welder, be sure that all flammable and combustible materials are removed. Fuel or oil reservoirs must be emptied, steam cleaned and filled with water before attempting to cut or weld them. DO NOT weld or flame cut on any tank containing oil, gasoline or their fumes or other flammable material, or any container whose contents or previous contents are unknown.

9. Keep a fully charged fire extinguisher readily available at all times. It should be a Type ABC or a Type BC unit.

10. Cleaning solvents should be used with care. Petroleum based solvents are flammable and present a fire hazard. Don't use gasoline. All solvents must be used with adequate ventilation, as their vapors should not be inhaled.

11. When batteries are being charged or discharged, they generate hydrogen and oxygen gases. This combination of gases is highly explosive. DO NOT SMOKE around batteries—STAY AWAY FROM FLAME—don't check batteries by shorting terminals as the spark could cause an explosion. Connect and disconnect battery charger leads only when charger is "off". Be very careful with "jumper" cables.

12. Batteries contain strong sulfuric acid—handle with care. If acid gets on you, flush it off with large amounts of water. If it gets in your eyes, flush it out with plenty of water immediately and get medical help.

13. Hydraulic fluid under high pressure leaking from a pin hole are dangerous as they can penetrate the skin as though injected with a hypodermic needle. Such liquids have a poisonous effect and can cause serious wounds. To avoid hazard, relieve pressure before disconnecting hydraulic lines or performing work on system. Any fluid injected into the skin must be treated within a few hours as gangrene may result. Get medical assistance immediately if such a wound occurs. To check for such leaks, use a piece of cardboard or wood instead of your hand. Make sure all hydraulic fluid connections are tight and all hydraulic hoses and lines are in good condition before applying pressure to system. Wear protective gloves and safety glasses or goggles when working with hydraulic systems.

14. The fine spray from a small hydraulic oil leak can be highly explosive—DO NOT SMOKE—STAY AWAY FROM FLAME OR SPARKS.

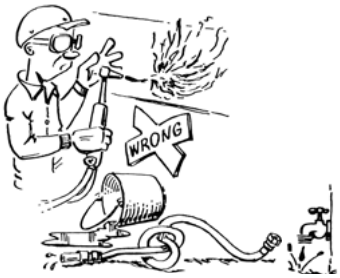
SAFETY

1. The selection of the vehicle on which a spreader body is to be mounted has important safety aspects. To avoid overloading:
   a. Do not mount spreader on a chassis which, when fully loaded with material to be spread, will exceed either the Gross Axle Weight Rating (GAWR) or the Gross Vehicle Weight Rating (GVWR) for the chassis.
   b. Do install the spreader only on a vehicle with cab-to-axle dimension recommended for the spreader body length shown.

2. Follow mounting instructions in the Installation section of this manual. If mounting conditions require deviation from these instructions refer to factory.

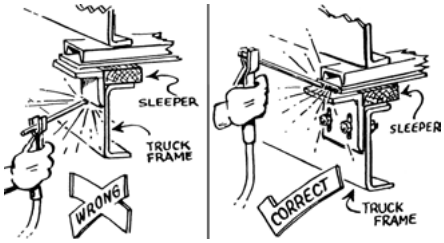
3. When making the installation, be sure that the lighting meets Federal Motor Vehicle Safety Standard (FMVSS) No. 108, ASABE S279 and all applicable local and state regulations.

4. When selecting a PTO to drive hydraulic pump, do not use a higher percent speed drive than indicated in the Installation section of this manual. Too high a percent PTO will drive pump at excessive speed, which can ruin the pump, but more importantly, will overheat the hydraulic oil system and increase the possibility of fire.

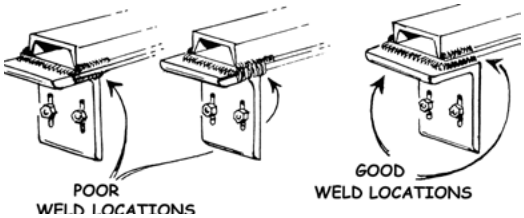


5. When truck frame must be shortened, cut off only the portion that extends behind rear shackle in accordance with the truck manufacturer's recommendations. If a torch is used to make the cut, all necessary precautions should be taken to prevent fire. Cuts should not be made near fuel tanks and hydraulic oil reservoirs, fuel, brake, electric or hydraulic lines and such lines should be protected from flame, sparks or molten metal. Tires should be removed if there is any chance of their being struck by flame, sparks or molten metal. Have a fire extinguisher handy.

6. Do not weld on vehicle frame as such welding can lead to fatigue cracking and must be avoided. When drilling holes in frame member, drill only through the vertical web portions do not put holes in top or bottom flanges. Refer to truck manufacturer's recommendations.



7. Be sure that welds between mounting bars and sill or between mounting angles and spreader cross sills are sound, full fillet welds. Center mounting angles so that good fillet welds can be made on three sides—and edge bead weld is not a satisfactory weld for this service. Use 309 rod/wire for carbon steel and 409 steel. On 304 stainless steel bodies use SAE grade 5 bolts—welding is recommended if type 308 welding rod is available.



8. Install controls so that they are located of convenient use. Position them so that they do not interfere with any vehicle control and that they do not interfere with driver or passenger or with access to or exit from the vehicle.

9. Check for vehicle visibility, especially toward the rear. Reposition or add mirrors so that adequate rearward visibility is maintained.

10. Add Caution, Warning, Danger and Instruction decals as required. Peel off any label masking which has not been removed.

11. Install all guards as required.

12. Check installation completely to be sure all fasteners are secure and that nothing has been left undone.

The XZALT is a hopper-type spreader with direction control intended for accurate and even spreading of material for snow and ice control. Material combines with liquid at a high 70% salt to 30% de-icing solution ratio, such as salt brine or calcium chloride. This provides for better granular salt activation, less material bounce and better placement control. The unit can also spread dry sand. It is available for dump truck installation with minimal installation steps.

The unit is powered hydraulically, providing independent, variable speed control for the spinner, conveyor and liquid system flow. The control provides on-the-go adjustment of directional spinner allowing placement of mixture where needed. The spreader is intended for use with the FORCE® America, Inc. SSC6100 Spreader Control.

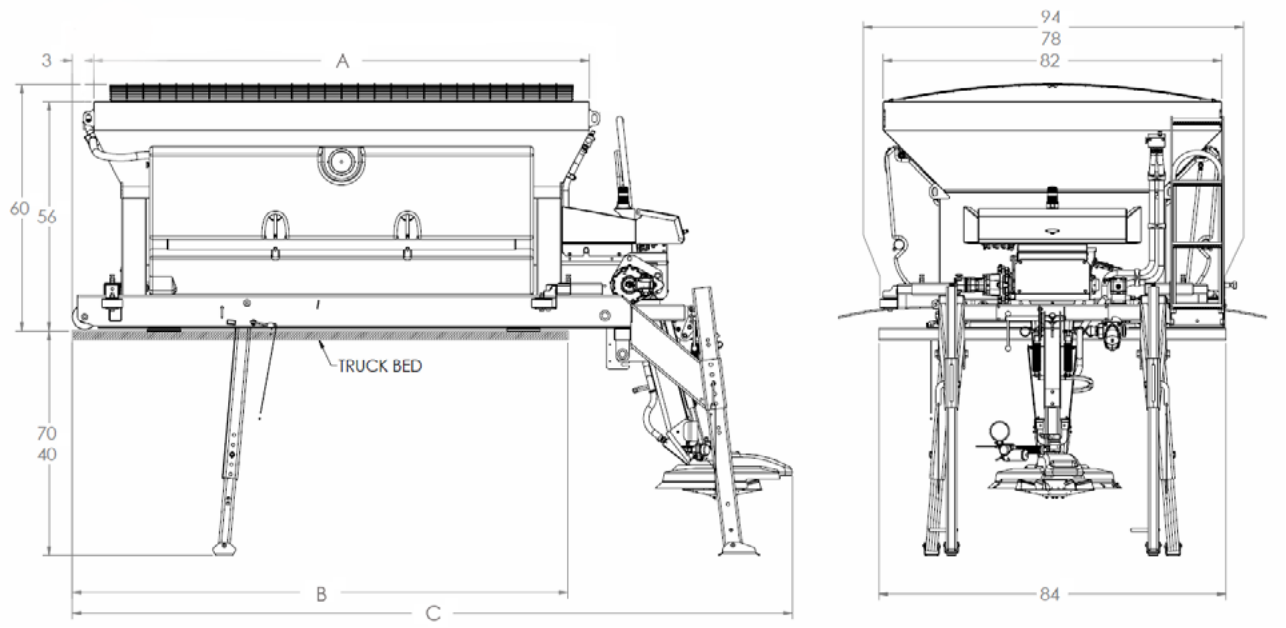
The endless cleated belt conveyor runs the full length of the hopper bottom to deliver material to the spinner through a metering system at the rear of the hopper body.

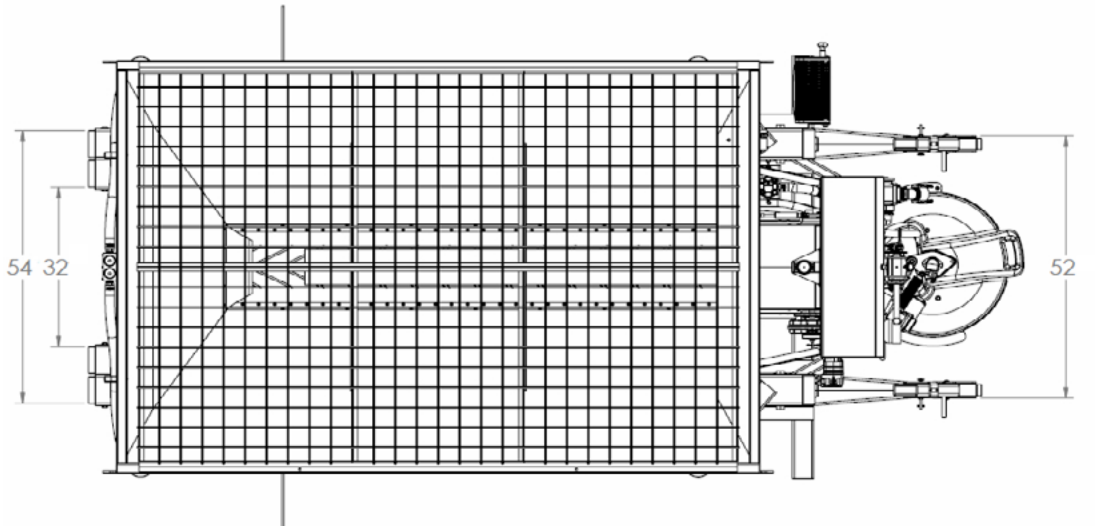
The spinner sits below the unit and locks in an upright position when not in use or unloading. Material can be spread from 6 to 36 ft., or up to three lanes wide. Material moves from the hopper, down the chute and onto the spinner. Liquid is mixed with the granular material at the end of the chute and on the spinner disc assembly. Spinner height is set independently by changing the length of the chute.

The preset metering door can break up clumps, preventing blockage. Bolt-in, galvanized screens also limit material clump size.

The galvanized storage legs allow for easy spreader installation and removal, no cranes required.

This product is intended for use by trained personnel only.





A BODY LENGTH inches (cm)	B MIN. DUMP BODY LENGTH feet (m)	C OVERALL LENGTH inches (cm)	SPREADER WEIGHT pounds (kg)	CAPACITY STRUCK cubic yards (cu m)	CAPACITY ROUNDED cubic yards (cu m)	CAPACITY LIQUID gallons (liters)
120 (305)	10 (3.05)	174 (442)	3375 (1530)	5.2 (4.0)	6.2 (4.7)	464 (1756)
144 (366)	12 (3.66)	198 (503)	3915 (1776)	6.4 (4.9)	7.6 (5.8)	594 (2249)
168 (427)	14 (4.27)	222 (564)	4455 (2021)	7.5 (5.7)	9.0 (6.9)	724 (2741)

NOTICE!	Hydraulic and truck requirements must be met prior to installation of the spreader.

TRUCK REQUIREMENTS

In mounting the spreader on a truck, the following major questions must be considered:

1. Is the truck chassis axle placement and the dump body length correct for the size of the spreader?

   The Dimensions and Capacities chart will assist in matching spreader to truck.

Spreader Inside Body Length Feet (m)	Truck CA/CT Dimension Inches (cm)	Truck Dump Body Length Feet (m)
10 (3)	84 (213.4) CA	10 (3)
12 (3.5)	102 (259.1 CA/108 (274.3) CT	12 (3.5)
14 (4)	120 (304.8) CT	14 (4)

NOTICE!	The Cab to Axle/Tandem dimensions are only guidelines. Consult federal, state and local weight laws and chassis manufacturer's ratings to ensure neither government weight restrictions, nor GVWR and GAWRs are exceeded.

2. Is the truck's GAWR (Gross Axle Weight Rating) and the GVWR (Gross Vehicle Weight Rating) adequate to carry the fully loaded spreader and any auxiliary equipment like plows, wings and scrapers?

   Refer to your Hi-Way dealer to find the GAWR and GVWR for most trucks, and how to calculate the weight distribution on each axle and total loaded vehicle weight.

HYDRAULIC REQUIREMENTS

NOTICE!	Too low hydraulic flow or pressure will cause limited or unacceptable spreader performance. The specified flow and pressure is required to maintain spread width and material delivery to the spinner.

The spreader requires 10 GPM at 3000 psi. As the spreader is intended to be plug and play, a suitable quick connect system should be mounted at rear of truck.

Please refer to typical system schematics in the *Vehicle Connections: Hydraulic Connections* section. A flow control, pressure reducing valve is available from your Hi-Way dealer to aid installations.

CONTROLLER REQUIREMENTS

The spreader is intended for use with a FORCE America SSC6100 Spreader Control consisting of a display, core controller, operator pad, cabling and appropriate manuals. All controller system components and truck side cabling is available through FORCE America. The system must be installed per FORCE America standards and meet the following minimum requirements:

- The 6100 core module must be 94096 A001.
- The 6100 Firmware must be upgraded to version 0.38 or higher.
- The 6100 GEN3 system must be setup with an ESTOP Power Contactor and all power to the XZALT machine must be supplied through that contactor per FORCE America standards.

The controller system is connected to the spreader at the rear of the truck through an ISOBUS bulkhead connector supplied with the spreader. The Mixed Material Module which controls spreader functions is supplied with the spreader.

LOADING PREPARATION

Roller Sidebars

The four roller sidebars are intended to guide the spreader along the sidewalls during loading and unloading. Settings on each side of the spreader must be equal to center spreader on the dump body.

NOTE: If the dump body has large corner radii, the sidebars can be flipped to increase the height of the roller.

1. Measure the inside width of the dump body at the front just above any radiused corner.
2. Measure the distance between the two front rollers on the spreader as shown in Figure 1. Start from the outside edge of one roller and measure to the outside edge of the opposite roller.

Figure 1 - Distance Between Front Rollers

3. Adjust the roller sidebars as necessary so distance between rollers is just less than the inside width of dump body:
   a. Loosen the locknut and bolt on top of side bar.
   b. Adjust roller sidebars as shown in Figure 2. Align bolt with sidebar hole.
   c. Verify the distance between two front rollers. Adjust if necessary.
   d. Tighten bolt so it is securely in sidebar hole.
   e. Tigthen locknut.

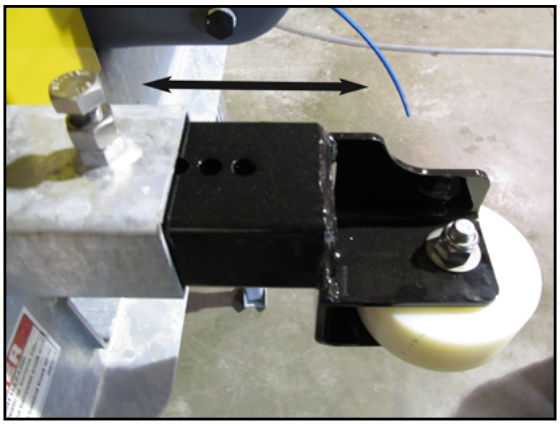


Figure 2 - Adjust Roller Sidebars

4. Repeat for the two rear roller sidebars.

LOADING AND UNLOADING

WARNING	Stand clear of moving machinery. Entanglement of body part or hair could cause serious injury or death.

WARNING	Spreader must fit on chassis in accordance with statutory regulations and chassis manufacturers recommendations including but not limited to maximum total weight and axle load and dimensions of chassis. Not meeting regulations could cause injury and damage to spreader.

WARNING	Load and unload spreader on a level, firm surface. Storing spreader on uneven or soft surface could cause spreader to tip causing death, serious injury or damage. Loading on soft surface could cause spreader to sink making removal difficult or causing damage.

CAUTION	Load spreader on truck before filling spreader or liquid tanks. Weight from dry or liquid material could collapse free-standing spreader, causing injury and damage to spreader.

Lifting the Spreader

WARNING	Use only lifting devices that meet or exceed OSHA standard 1910.84 or ASME B30.20-2006. Never lift equipment over people. Never lift spreader with anything or anybody in the body. Loads may shift or fall if improperly supported, causing injury or damage to spreader.

CAUTION	Do not use a lifting device to free unit from chassis, storage stands or frozen ground, or to lift the chassis in any way. Shock loading is prohibited and sudden acceleration should be avoided. Lifting in such a manner could result in damage to unit or injury.

Always inspect unit lift points for signs of wear, cracking, corrosion, gouges, alterations, or distortion.

Always use a sling, spreader bar, or lifting bar that attaches to the lifting points with a minimum of 60 degrees from horizontal. It is preferable to use an “H” style lifting bar that keeps the attaching chains in a near vertical orientation as shown in Figure 3. Operators of lifting devices must be qualified and knowledgeable in their use and application.

Position the truck with adequate room around the unit. Work in an environment that permits clear communication to others nearby. Keep area clear of persons when loads are to be lifted and suspended. Do not allow the lifted load to come in contact with any obstruction.

Store spreader on a solid level surface using storage legs.

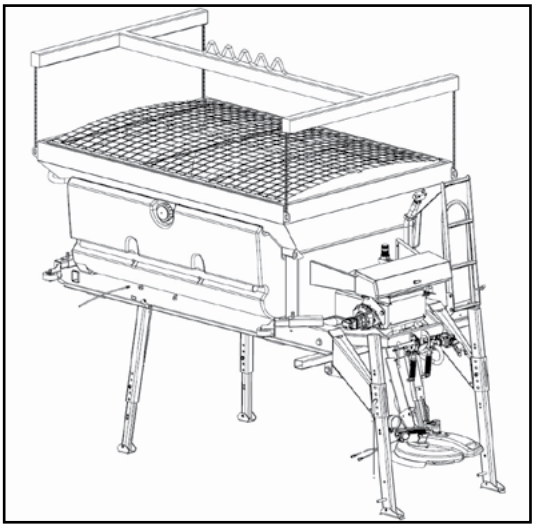


Figure 3 - Lifting Spreader

Loading

The storage leg system is designed to be used where the dump body floor is between the height of 42" to 68". The height of the legs will need to be adjusted for first time use to match the dump body floor height. The legs should be adjusted so the spreader sits level or slightly elevated at the front.

Check to make sure the vehicle is suitable for the spreader. Consider all other auxiliary equipment such as front snow plows, wings and scrapper blades. Consider the total weight of the spreader, liquid and granular materials.

The dump body floor must be clear of sand, salt, snow, ice or any other debris and the four rubber pads should always contact the floor when the spreader is installed.

1. Raise loading platform approximately 10°.
2. Back truck underneath spreader until dump body sides contact stopping flags and spreader's front leg supports leave the ground.
3. Apply truck's parking brake and chock wheels.
4. Attach safety strap to chassis and tighten so strap is taut as shown in Figure 4. Front legs remain locked.

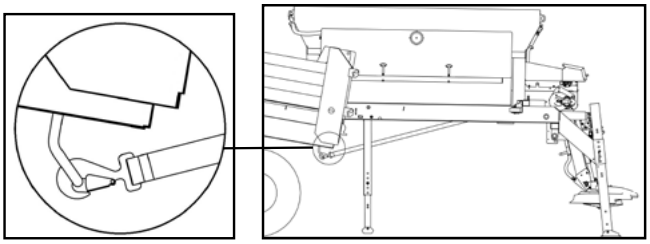


Figure 4 - Attach Safety Strap

5. Remove front leg supports' locking pins from hole as shown in Figure 5. Store locking pin in loop holder on side of frame.

   Note: On high truck floors and short spreader bodies, the front legs may need to be shortened to fold up.

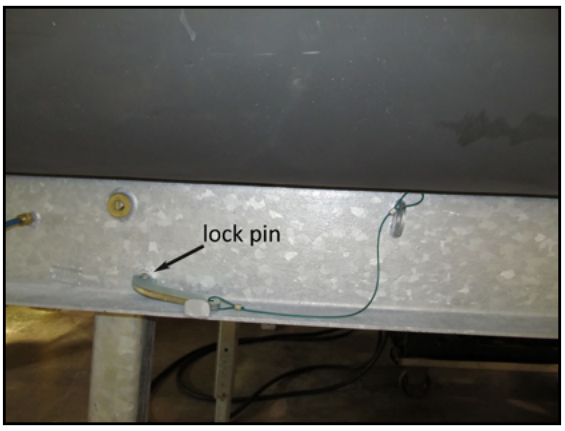


Figure 5 - Leg Support Lock Pin

6. Continue to back dump body underneath spreader until front leg supports fold up against edge of loading platform and truck makes contact with spreader.
7. Apply truck's parking brake and chock wheels.
8. Lower the dump body completely. The rear legs should be off the ground.

NOTICE!	Spreader angle may need to be increased or decreased to properly position on truck.

9. Raise rear legs:
   a. Remove lock pin as shown in Figure 6.
   b. Grip rear leg at handle.
   c. Lift leg above the height of the spinner.
   d. Insert lock pin into diagonal slot.

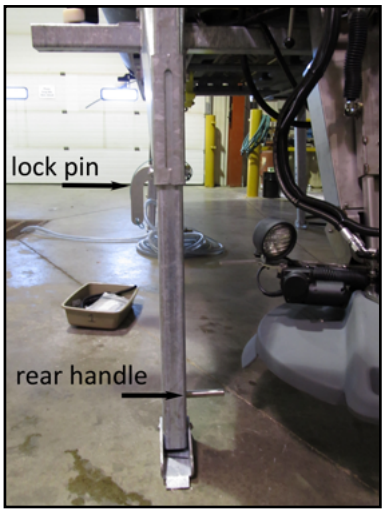


Figure 6 - Rear Leg detail

10. Secure spreader. See *Securing Spreader* this section.
11. Hook up all connections between spreader and chassis.
    - Control Cable - See *Vehicle Connections: Control System*.
    - Hydraulics - See *Vehicle Connecctions: Hydraulic Lines.*

Unloading Spreader

1. Empty spreader of granular and liquid materials.
2. Drive to level, firm surface to unload spreader.
3. Disconnect connections from spreader to truck. See *Vehicle Connections* this section.
4. Remove all chains and belts securing spreader to truck except safety strap. Store in appropriate area.
5. Lower rear legs to approximately 1" (5.1cm) above ground.
6. Make sure safety strap is still attached.
7. Raise dump body approximately 10°, so the spreader rests on rear legs and rubber pads lift off dump body floor.
8. Drive truck forward until front leg supports fold down.
9. Apply truck's parking brake and chock wheels.
10. Secure front legs with locking pins (Figure 5).
11. Unhook safety strap from truck.
12. Slowly drive truck out from under spreader. Lower dump body.

SECURING SPREADER

Securing Devices

⚠	**WARNING**	Inspect securing devices and tie-down points for wear and tear. Replace securing device and repair tie-down points if any sign of wear or damage. Make sure securing devices do not contact sharp edges, moving or hot components. If securing device fails, spreader could slide causing damage or serious injury.

Spreader must be secured to dump body to eliminate movement caused by braking, cornering and acceleration of truck. Operator is responsible for supplying and attaching appropriate securing devices as the spreader can be installed in many different types of dump bodies with a variety of tie downs. The Federal Motor Carrier Safety Administration may be used as a guide for securing loads.

Roller sidebars should be correctly positioned to restrict side to side movement.

Fastening Locations on Spreader

⚠	**CAUTION**	Avoid sharp edges and corners when attaching straps to prevent personal injury.

1. Secure spreader to chassis and dump body using the securing hooks located on the top and sides of the spreader as shown in Figure 7.

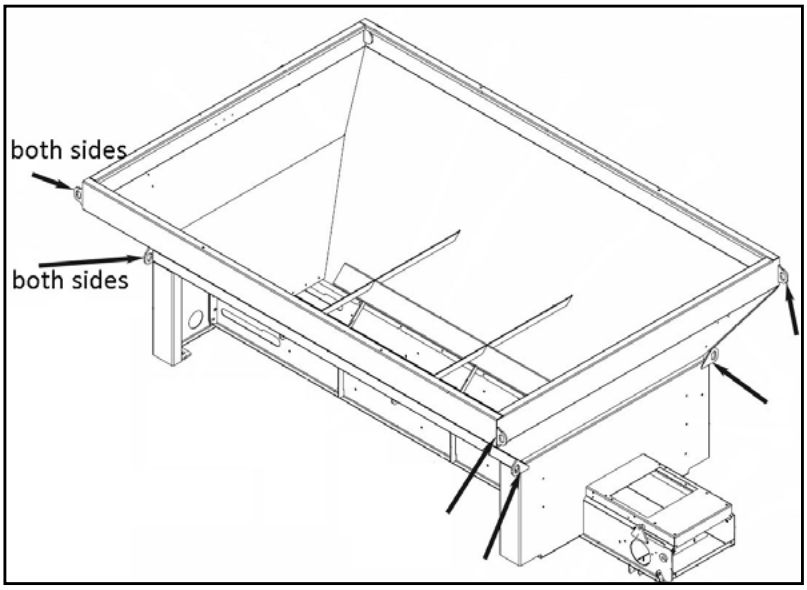


Figure 7 - Securing Hook Locations

VEHICLE CONNECTIONS

CAUTION	If a threaded connection is tightened too tightly, the coupling or housing into which the coupling is placed could be distorted and an unstoppable leak could occur.

WARNING	Do not use one manufacturer's hose with another manufacturer's fittings. Such use will void any warranty and may cause premature burst or leak of hydraulic fluids. Severe injury and/or fire could result.

Electrical Connections

The control system is the FORCE America 6100. The control box controls the spreader functions.

Attach cable on spreader, shown in Figure 8, on spreader to Powell ISOBUS bulkhead connector, on rear of truck. Refer to control system's operation manual for further instructions.

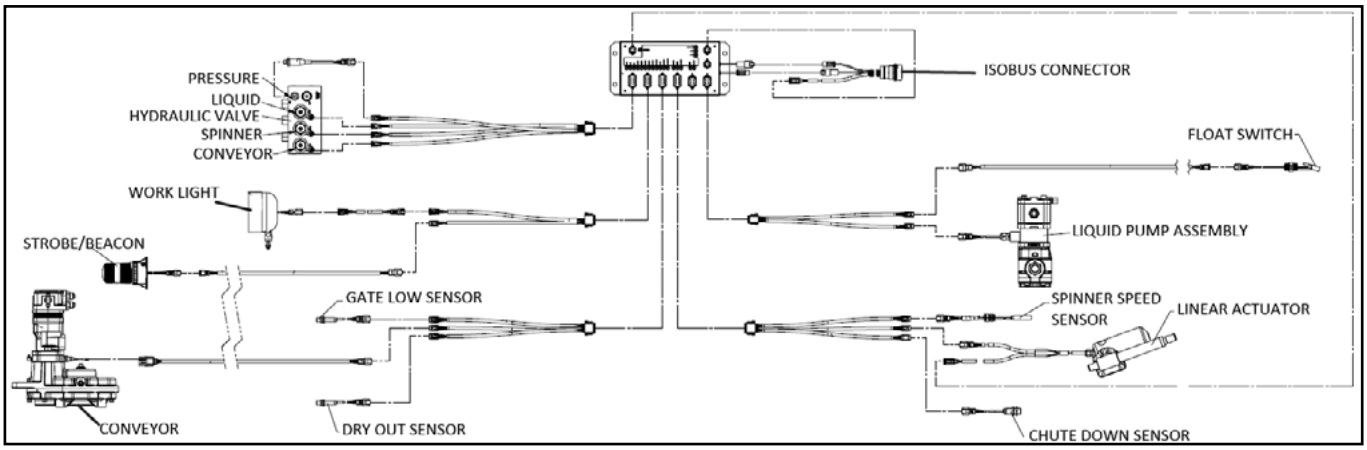


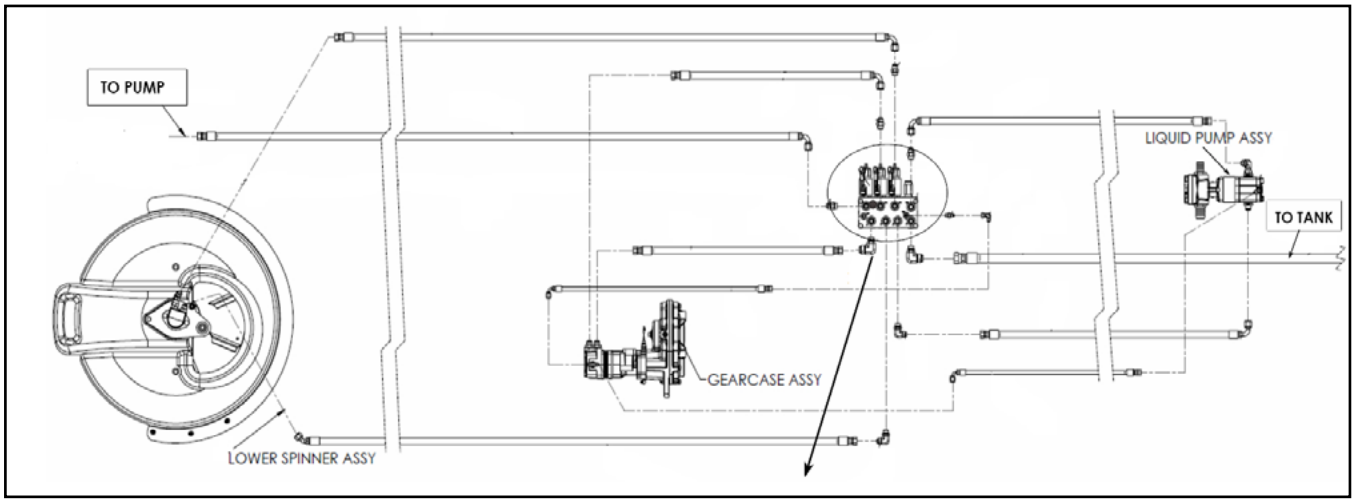
Figure 8 - Electrical System (see page 74 for details)

Hydraulic Connections

NOTICE! Fill oil level to full as necessary.

The hydraulic valve, located in enclosure at rear of spreader, connects to truck via the three hoses listed below (Figure 8). Hoses are provided with the spreader but should be fitted with quick connects provided and installed by dealer on truck. Refer to Figure 9 and the "Hydraulic Schematic" page in the *Troubleshooting* section of this manual.

HOSE	PART NUMBER	DIMENSIONS
Pump	308206	.5 x 108
Tank	308207	.75 x 108



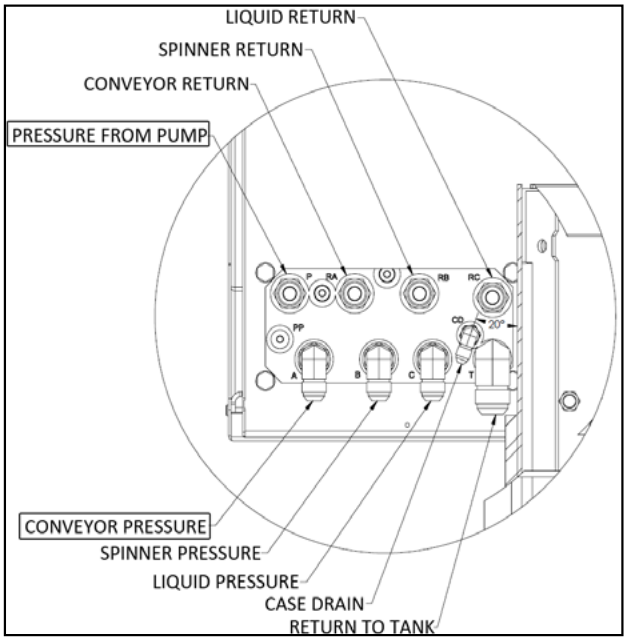


Figure 9 - Hydraulic System and Valve

SPINNER

⚠	**CAUTION**	Spinner is counterbalanced to aid lifting. Do not stand under spinner when raising or lowering. Falling spinner can cause injury. Do not adjust spinner position when machine is operating to avoid entanglement, causing injury or death.

Storage Position

1. Loosen clamp. Turn handle counterclockwise to release spinner as shown in Figures 10.

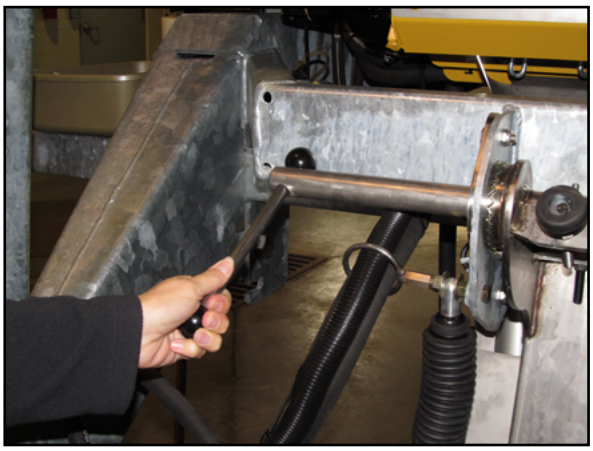


Figure 10 - Detail of Handle

2. Grip handle on front of spinner hood and raise spinner to storage position as shown in Figures 11.

Figure 11 - Storage Position

3. Turn handle clockwise until clamp is tight.

Spreading Position

1. Loosen clamp two full turns.
2. Grip handle on back of chute and begin to lower the distribution system.
3. Use spinner hood handle to finish lowering system until it can't go any further.
4. Tighten clamp. Clamp must be tightly closed for spinner to operate.

Drop Point

The drop point, or point on the spinner cone at which the bottom part of the chute is aimed, must be set to 1-3/16" (30mm) above the spinner disc. The tolerance cannot be greater than 3/16" (5mm).

1. Position spinner to produce a symmetrical spread pattern, such as 3' left hand and 3' right hand..
2. Hold a flat strip or equivalent flush against inside, bottom of chute with the strip's bottom touching the spinner hub.
3. Measure the distance between where the strip hits the spinner hub and the base of the hub as shown in Figure 12.

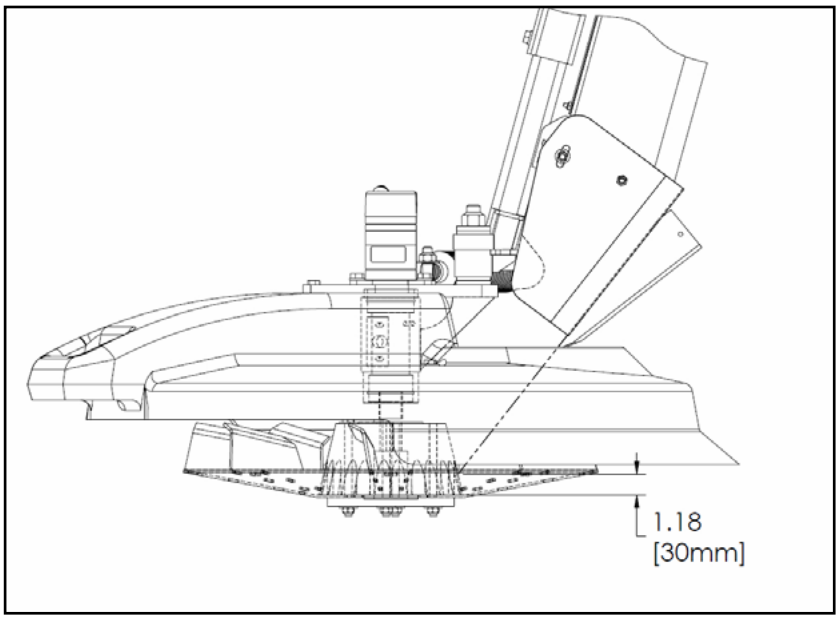


Figure 12 - Drop Point

4. Adjust as needed:
   a. Loosen hardware on bottom of chute where chute meets the spinner hood.
   b. Aim bottom part of chute at correct drop point.
   c. Adjust to 1-3/16" (30mm) +/- 3/16" (5mm).
   d. Tighten chute hardware.
   e. Verify distance.

Set for Spinner Height

NOTICE!	Set spinner height when spreader is half full. Spinner height may be different between a full and empty load.

Spinner disc should be horizontal to ground when spreading. If disc is not horizontal to ground, spread pattern will be off. Adjust spinner as necessary.

1. Make Spinner Horizontal.
   a. Verify that clamp is tight.
   b. Loosen hardware on spinner clamp two turns as indicated in Figure 13.
   c. Position disc horizontal to ground.
   d. Verify that rubber stop to front of spinner between mounting ears holds spinner nearly horizontal or at a slight angle. Adjust if necessary.
   e. Tighten spinner clamp hardware to proper torque.

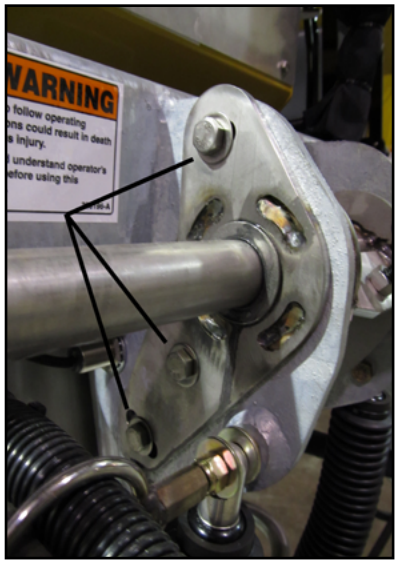


Figure 13- Detail of Clamp

2. Adjust spinner height.
   a. Measure distance from outer edge of spinner disc to ground as shown in Figure 14. Distance between disc and road surface must be 16” +/- 2” (356-457mm). Note difference between required and actual height of disc.

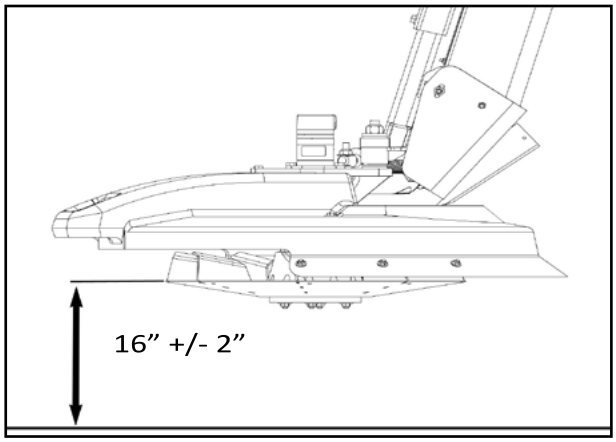


Figure 14 - Measure Spinner Height

b. Loosen clamp and raise distribution system until horizontal to ground as shown in Figure 15.
c. Tighten clamp to hold position.

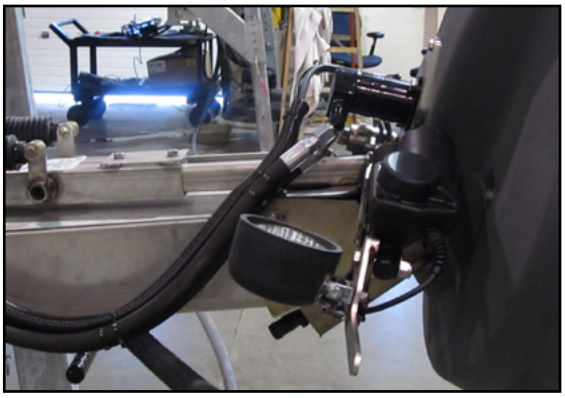


Figure 15 - Chute at Horizontal

d. Loosen hardware on chute lock plate (1) indicated in Figure 16.
e. Move chute difference noted in step 2a. If disc is too high, move chute rearward. If too low, move forward.
   For example: actual height of spinner disc is 13". Move chute forward one to two inches to achieve required spinner height.

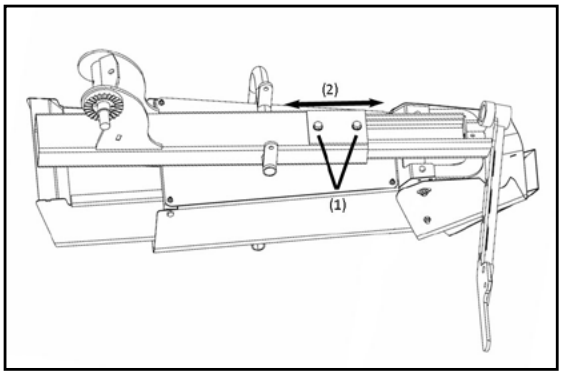


Figure 16 - Adjust Spinner Height

f. Tighten bolts.
g. Lower chute to proper position and tighten clamp. See *Spinner: Spreading Position.*
h. Verify spinner height and repeat previous steps if necessary.

TARP (if equipped)

To open the tarp, first pull the left-hand rope (1), then pull the right-hand rope (2) as shown in Figure 17. To close the tarp, pull the ropes starting with the right-hand rope (1).

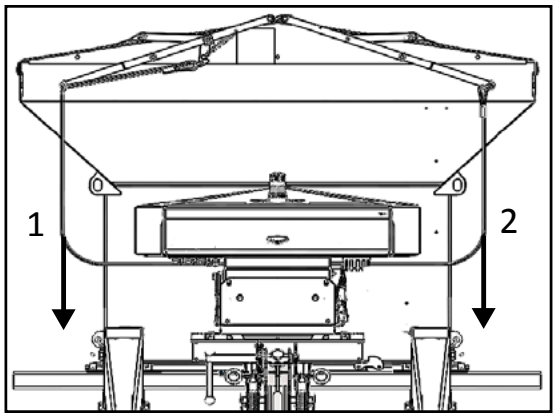


Figure 17A - Open Tarp

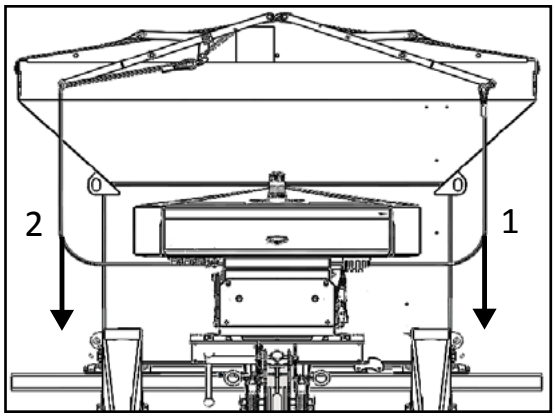


Figure 17B - Close Tarp

INTIAL START-UP

DANGER	Stay clear of moving machinery to avoid entanglement, causing injury or death.

WARNING	DO NOT check leaks with hands while system is operating as high pressure oil leaks can be dangerous! If skin is pierced with hydraulic fluid at high pressure seek immediate medical attention as fluid injected into the skin could cause gangrene if left untreated. Relieve pressure before disconnecting hydraulic lines or working system. Make sure all hydraulic fluid connections are tight and all hydraulic hoses and lines are in good condition before applying pressure to the system. Wear protective gloves and safety glasses or goggles when working with hydraulic systems.

WARNING	DO NOT check for leaks adjacent to moving parts while system is operating as there may be danger of entanglement!

Refer to the control system's operation manual for spinner, conveyor and liquid system and conveyor initial start-up instructions.

FILLING HOPPER

WARNING	Stand clear of moving machinery and hopper when loading material to avoid injury or crushing.

WARNING	Load and unload spreader on a level firm surface. Failure to do so could cause spreader to tip causing injury or even death.

NOTICE!	Do not allow loading device to contact hopper. Doing so could cause damage.

Only use high quality, granular material for best performance.

LIQUID SYSTEM

The liquid system can be filled through tank caps or connection on rear of spreader.

Liquid Valve
To set liquid valve, turn handle to proper position as referenced below in Figure 18.

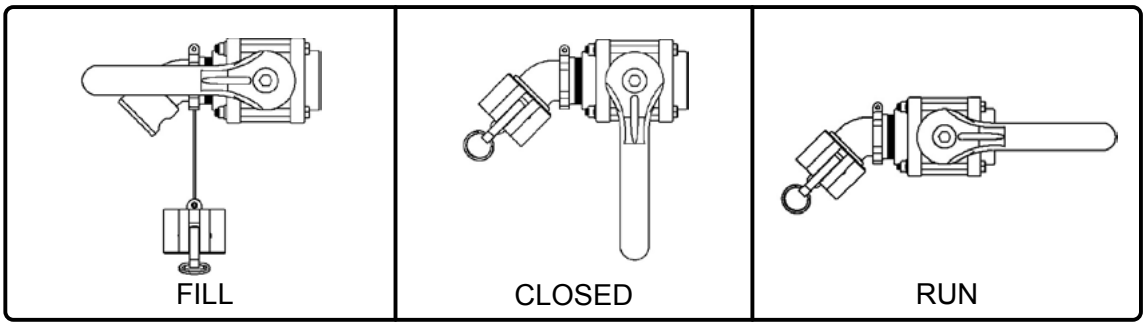


Figure 18A - Fill Position **Figure 18B - Close Position** **Figure 18C - Run Position**

NOTE: Close valve before connecting filling hose.

- *Fill* Position while filling the liquid tanks.
- *Closed* Position after spreading and during maintenance.
- *Run* Position while spreading.

Filling Liquid Tanks

⚠	**CAUTION**	Load spreader on truck before filling tanks. Liquid weight could collapse free-standing spreader, causing injury and damage to spreader.

NOTICE!	Valve must be in run position before operating liquid system or damage to pump may occur.

NOTICE!	Refer to liquid tank capacity at beginning of manual before filling tanks.

Valve Fill

1. Turn liquid valve to “Closed” position (Figure 18B).
2. Unlock liquid valve cap and remove (Figure 19).

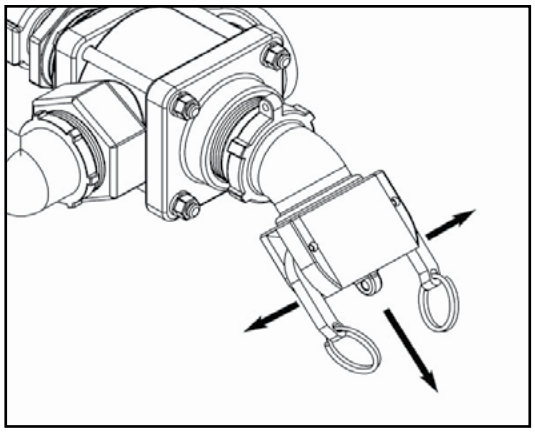


Figure 19 - Liquid Valve Cap

3. Attach filling hose to liquid valve.
4. Turn liquid valve toward you to “Fill” position (Figure 18A).
5. Fill tanks to the desired amount indicated by sight gauge attached to rear of right tank (Figure 20).
6. Turn liquid valve to “Closed” position (Figure 18B).
7. Remove filling hose from liquid valve.
8. Turn liquid valve to “Run” position (Figure 18A).

Figure 20 - Liquid Tank Gauge

METERING GATE

To set metering gate, move to proper position as referenced below in Figure 21.

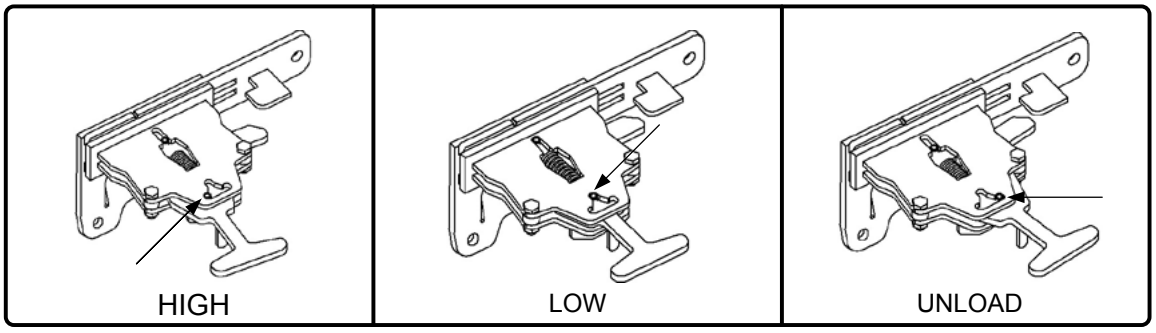


Figure 21A - High Position **Figure 21B - Low Position** **Figure 21C - Unload Position**

- *Low - 1-9/16" (40mm)* Standard position for spreading material at normal rates. Typically for materials like salt or salt/liquid.
- *High - 5-1/8" (130mm)* Position for spreading material at high rates.
- *Unload* Position for unloading bin after spreading. When no material is present, the metering gate will move downward automatically locking at 1-9/16" (40mm).

SPREADING PROCEDURE

1. Set metering gate based on type of spreading material (Figure 21A or 21B). See "Spread Rate Limits" on pages 46-47.
2. Verify liquid valve is in "Run" position (Figure 18C).
3. Turn on control box. Refer to control system's operation manual for instructions.

MANUAL OPERATION

⚠	**WARNING**	Flying material and rotating spinner can cause injury or death. Do not adjust spinner or valves when machine is running to avoid entanglement of hair or body parts, causing injury or death. Adjust valves with machine Off, then turn machine On and verify settings.

Use the manual override on the control valves in the rear enclosure to manually spread material if control system malfunctions. Only use this procedure as a last resort to unload or spread material. The hydraulic enable valve can be used to turn hydraulics on and off to spread manually.

To adjust valves:

1. Disconnect control cable at rear of truck.
2. Open rear enclosure to see valves. Valve function from left to right is: conveyor, spinner, liquid.
3. Turn valve knob/stem clockwise to increase hydraulic flow to function and increase conveyor output, spinner rpm and liquid output.
4. Adjust valves to visually achieve desired spread width and rates.
5. Close rear enclosure.

After repairing control system, return valves to original position.

The handling and spreading of commercial salt and sand compounds is a most severe operation with respect to metal corrosion. Establish a frequent, periodic preventative maintenance program to prevent rapid damage to spreading equipment. Proper cleaning, lubrication and maintenance will give you longer life, more satisfactory service and more economical use of your equipment.

WARNING Shut off all power and allow all moving parts to come to rest before performing any maintenance operation. Entanglement with moving parts could cause serious injury.

ELECTRIC SYSTEM

NOTICE! Refer to control system's operation manual for correct battery voltage for spreader and conveyor. Incorrect voltage can cause damage to the control box and/or spreader's electronics.

NOTICE! DO NOT weld on spreader while power supply is connected to spreader and control box. Damage could occur to the electric system.

Disconnected plugs must always be protected from corrosion. Remove any corrosion from plug connections and lubricate with contact spray and cap with a sealed end. Replace any damaged and worn plugs and cables. Check connections between cables and plugs.

LIQUID SYSTEM

NOTICE! Ensure liquid system is filled with salt solution or other agent at all times to prevent freezing.

The liquid system must be checked regularly for wear and tear and leaks in the tanks and tubes.

The liquid pump must always be filled to avoid corrosion of internal components. If there is no liquid in the pump, liquid will not be delivered initially when conveyor is activated. Flush the liquid system with non-corrosive agent if system is idle for 5-10 days to avoid crystallization of chemicals in pump. Flush pump with hot water should crystallization occur.

See "Filling the Liquid Tanks" in *Operating Procedures* section for filling instructions.

Clean the suction strainer with water weekly or after every major event. Turn liquid valve to the "Closed" position (Figure 18B) and unscrew cap behind liquid valve (Figure 22). Remove strainer and rinse with water until clean. Replace strainer and screw cap on tight.

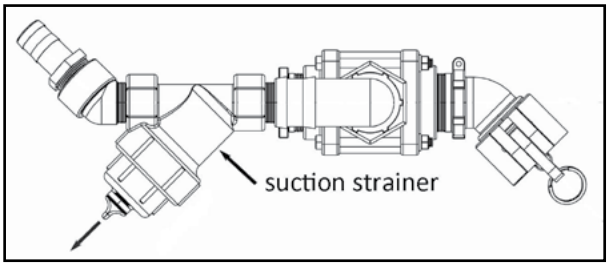


Figure 22 - Suction Strainer Location

At end of season, thoroughly flush and clean liquid system with hot soapy water.

CONVEYOR BELT SYSTEM

DANGER	When conveyor is running, stay out of the body. Stay clear of all moving parts. Entanglement of clothes, any part of your body or anything you have in your hands can cause serious injury. Do not use a bar, rod or hammer on conveyor while it is moving--if it gets caught it could cause injury.

WARNING	Stay out of the spreader. If it is necessary to enter the spreader, return to the shop, empty body, turn off all power, set truck's brakes, lock engine starting switch and remove key before entering. Tag all controls to prohibit operation. Tags should be placed, and later removed, only by person working in the body.

WARNING	Do not climb on spreader. Use the inspection ladder or a portable ladder to view the spreader. Be careful in getting on and off the ladder, especially in wet, icy, snowy or muddy conditions. Clean mud, snow or ice from steps and footwear.

Conveyor Belt Tracking and Tension

Regularly check the tracking and tension on the conveyor belt. A properly tracked belt should run centered over the rollers at both front and rear of machine. Visually check the tracking by watching the cleats on the seamless belt.

NOTE: A properly adjusted belt will remain in a steady centered position or may wander back and forth as much as 1/2" across the roller. The belt should never contact the side walls of the conveyor.

Adjusting Tension

1. Check torque of tensioning bolts on either side of the idler roller at front of spreader. Tightening torque should be 29lbs/ft (40Nm).
2. If tensioning is required, torque both sides evenly at 1-2 turns per side.

NOTE: For new belts, it may be necessary to re-tension after 24 hours.
NOTE: It is not necessary to release the tension after spreading or for storage.

Adjusting Tracking

1. Use controller "Unload" function to run belt at low speed.
2. Remove conveyor cover at front of spreader.
3. At slow speed, observe the tracking of the belt.
4. Adjust belt according to Figure 23.
   - Belt tracks to left - tighten left hand tensioning bolt clockwise.
   - Belt tracks to right - tighten right hand tensioning bolt clockwise.

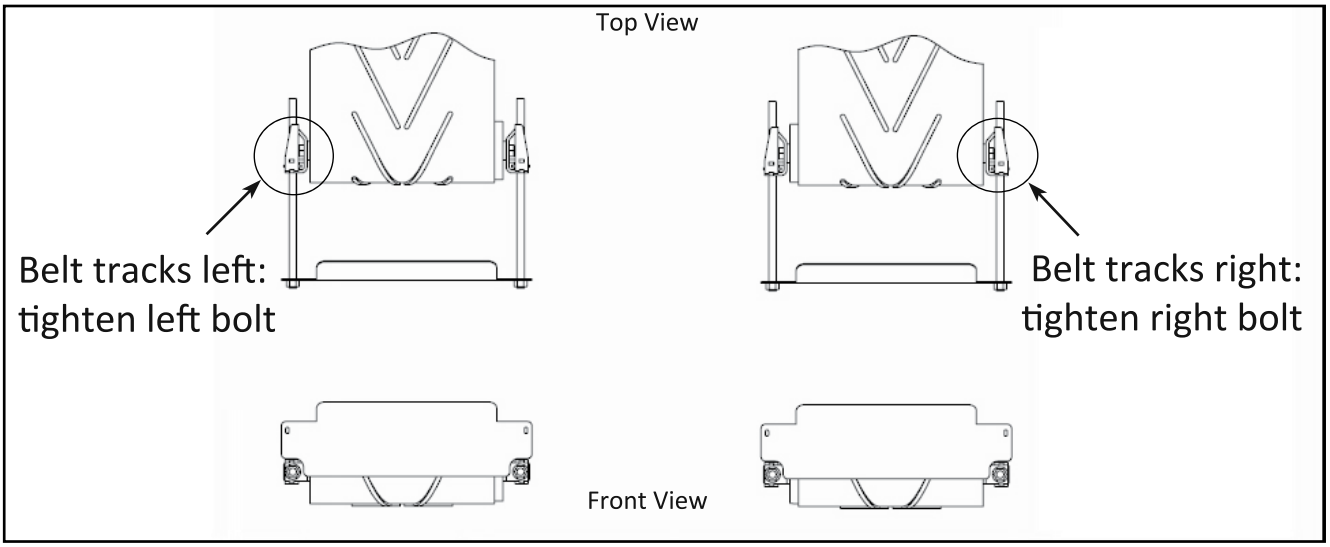


Figure 23 - Adjust Conveyor Tracking

5. Gradually increase speed and adjust tensioning bolt until belt tracks correctly.
6. Operate belt for 10 minutes at high speed to check adjustment. Repeat as necessary.

NOTE: Always tighten belt to adjust - do not loosen.

WIPE-OFF BRUSHES

Regularly check the wear and tear of the wipe-off brushes under the rear of the conveyor belt. Bristles must brush across the entire width of the conveyor belt without bending severely. Brushes must be replaced if they are worn or not functioning properly.

Adjusting Brushes

1. Loosen brush hardware (Figure 24).
2. Position brush so edge contacts underneath side of conveyor belt.
3. Tighten hardware.

Replacing Brushes

1. Loosen hardware.
2. Remove worn brush.
3. Fit new brush and position so edge contacts underneath side of conveyor belt.
4. Tighten hardware.

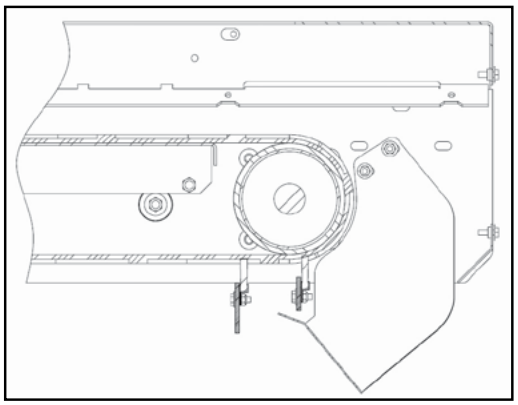


Figure 24 - Wipe-off Brushes

Cleaning Under Conveyor

With conveyor off, regularly inspect for material build up at the front of the machine near the tensioning roller.

GEAR CASE

Fill gear case with approximately 1.0 pints (.70 liters) of SAE 90 E.P. (extreme pressure) gear oil conforming to MIL L2105 B multi-purpose gear lubricating oil requirements (API Service GL4) with ambient temperatures from 40 to 100 degrees F.

1. Remove cap from gear case as shown in Figure 25.
2. Check oil level at center plug and fill as necessary.
3. Replace cap.

NOTE: Make sure vent tube is not plugged. Clear if necessary.

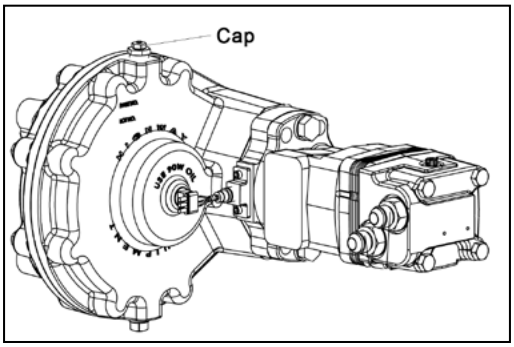


Figure 25 - Gear Case

BEARINGS

Grease in a bearing prevents excessive wear of parts, protects ball races, and balls from corrosion and aids in preventing excessive heat within the bearing. It is very important the grease maintain its proper consistency during operation. It must not be fluid and it must not channel.

Make sure all fittings are thoroughly cleaned before injecting grease. Points to be lubricated by means of a grease gun have standard grease fittings.

Lubricate bearings by pumping grease slowly until it forms a slight bead around the seals. This bead indicates adequate lubrication and also provides additional protection against the entrance of dirt. Refer to the "Lubrication Chart" in this section.

FASTENERS

Tighten all screw fasteners to recommended torques after first week of operation and annually thereafter. If loose fasteners are found at anytime, tighten to recommended torque. Replace any lost or damaged fasteners or other parts immediately. Check body mounting hardware every week.

SENSORS

The four sensors are installed and set at the factory (Figure 25). Resetting will be required if parts are replaced or issues occur. To adjust, follow the instructions detailed in figures 26-29 below:

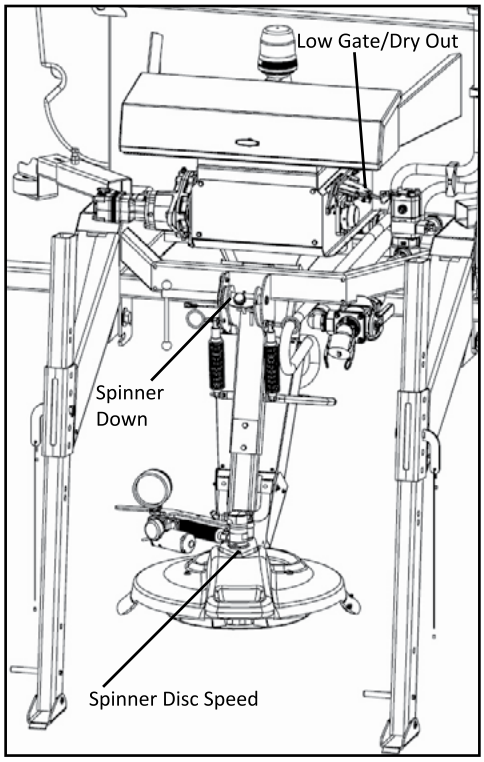


Figure 26 - Sensor Locations

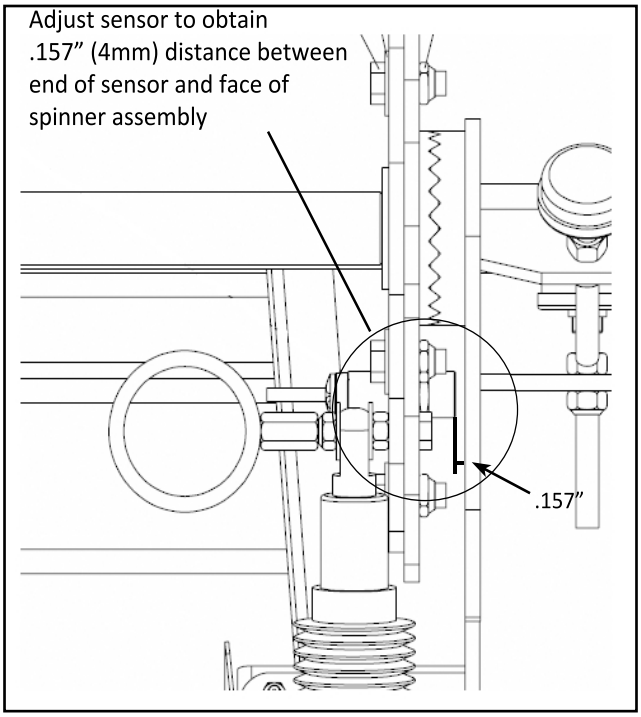


Figure 27 - Spinner Down Sensor

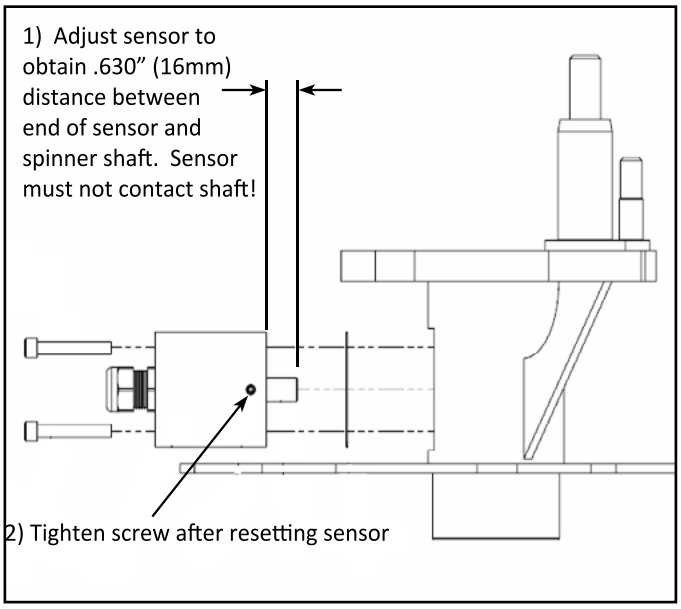


Figure 28 - Spinner Disc Speed Sensor

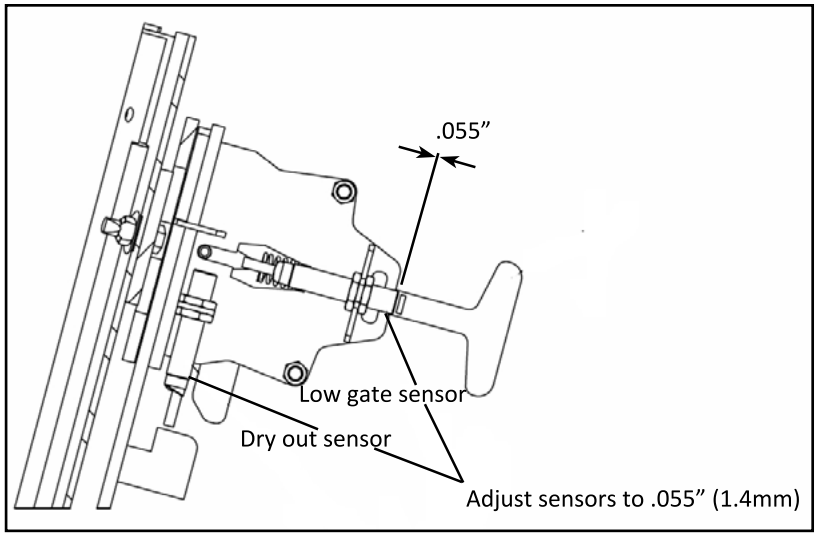


Figure 29 - Low Gate and Dry Out Sensor

POST-SPREAD

WARNING	Stand clear of moving machinery and hopper when loading or unloading material to avoid entanglement or being crushed, causing serious injury or death.

WARNING	Load and unload spreader on a level, firm surface. Storing spreader on uneven or soft surface could cause spreader to tip causing death, serious injury or damage. Loading on soft surface could cause spreader to sink making removal difficult or causing damage.

Emptying Hopper

1. Use controller "Unload" function.
2. Set metering gate to "Unload" position (Figure 20C).
3. Refer to control system's operation manual for instructions.

Emptying Liquid Tanks

Set liquid valve to "Fill" position (Figure 17C). Tanks will empty by gravity drain.

NOTE: Controller liquid "Unload" function can be used to empty tanks. Refer to control system's operation manual for instructions.

CLEAN UP

NOTICE!	High pressure wash can inject water, salt and/or sand into control components, causing damage. Protect electrical and hydraulic connections from moisture. Use caution when cleaning these areas.

Thoroughly wash spreader every two to three days during the operating season to maintain minimal maintenance operation. Hose spreader down under pressure to free all sticky and frozen material.

It is important the spreader be thoroughly cleaned at the end of each operating season. All lubrication and maintenance instructions should be closely followed. Repaint worn spots to prevent formation of rust.

After cleaning, check cables for wear and tear and loose connections. Also check hydraulic components. If damaged, repair or replace immediately.

WARNING Shut off all power and allow all moving parts to come to rest before performing any maintenance operation. Entanglement with moving parts could cause serious injury.

The spreader should be regularly lubricated with the lubricants recommended in this manual in accordance with the following chart:

LOCATION (see figure 30)	PLACES	METHOD	FREQUENCY
Conveyor			
Gear Case	1	Gear Lube	Monthly
Conveyor Motor (a)	1	Grease Gun	Annually*
Conveyor Bearing (b)	1	Grease Gun	Monthly
Spinner			
Spinner Pivot (c)	1	Grease Gun	Monthly
Spinner Bearings (d)	1	Grease Gun	Monthly
Front Support Leg Hinge (e)	Both sides	Grease Gun	Monthly

*** 2 pumps with hand grease gun only**

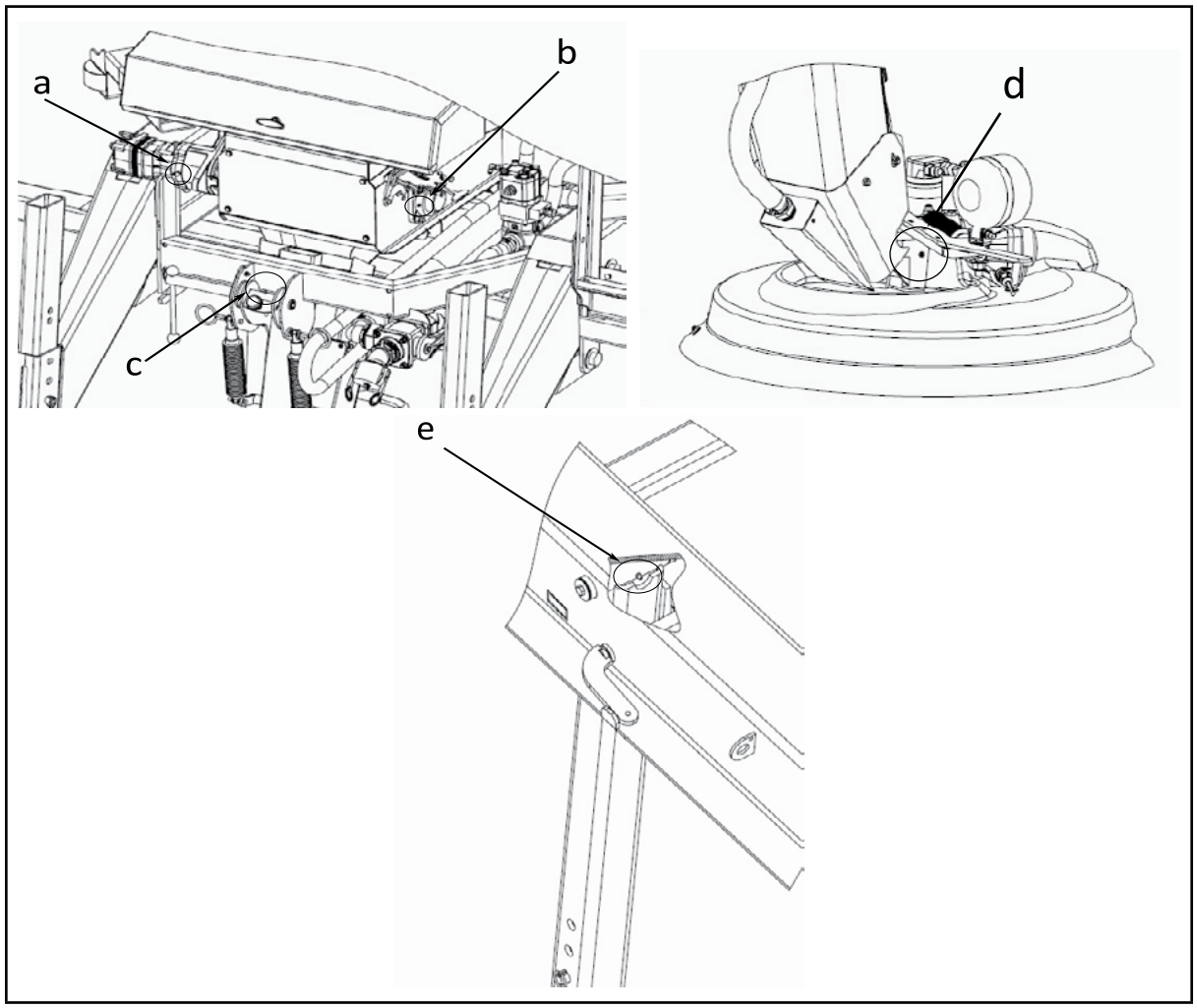
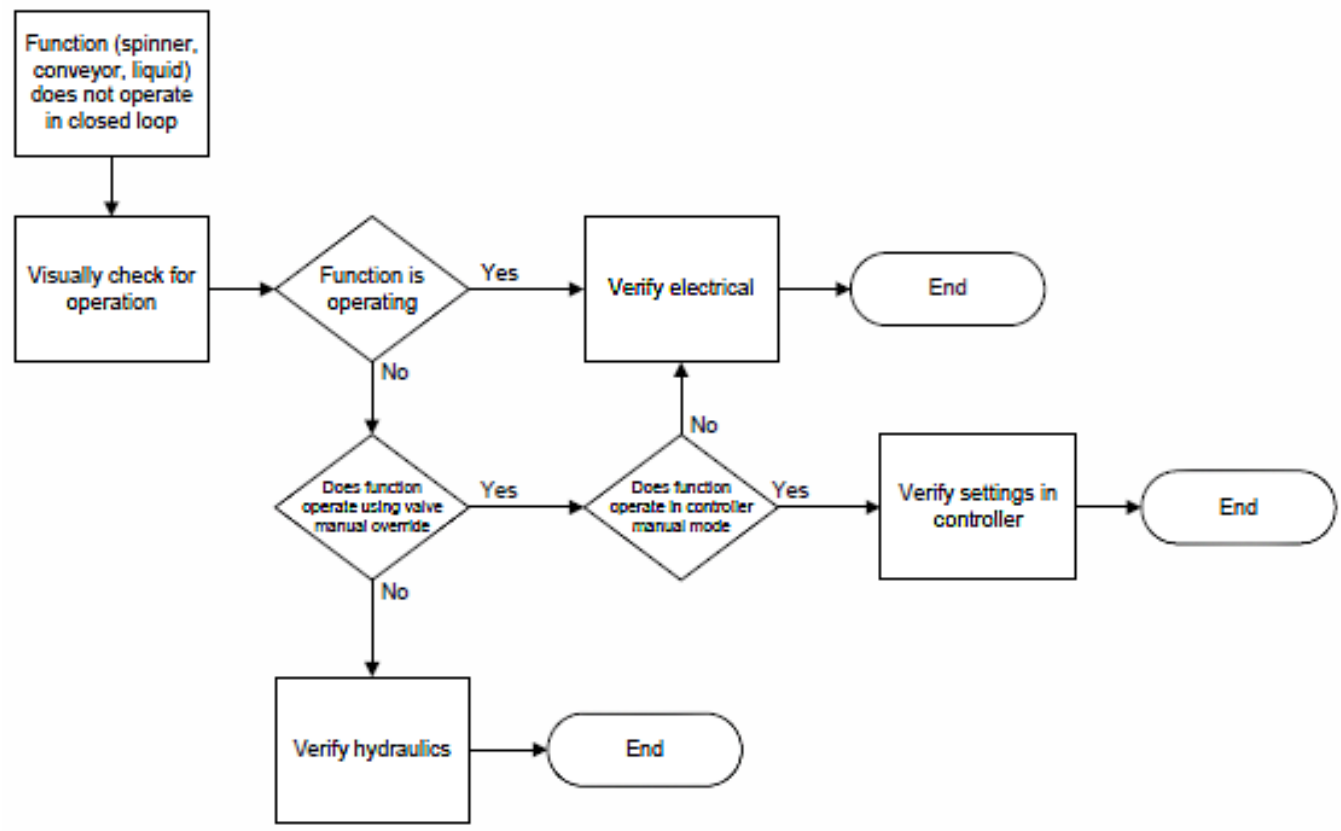
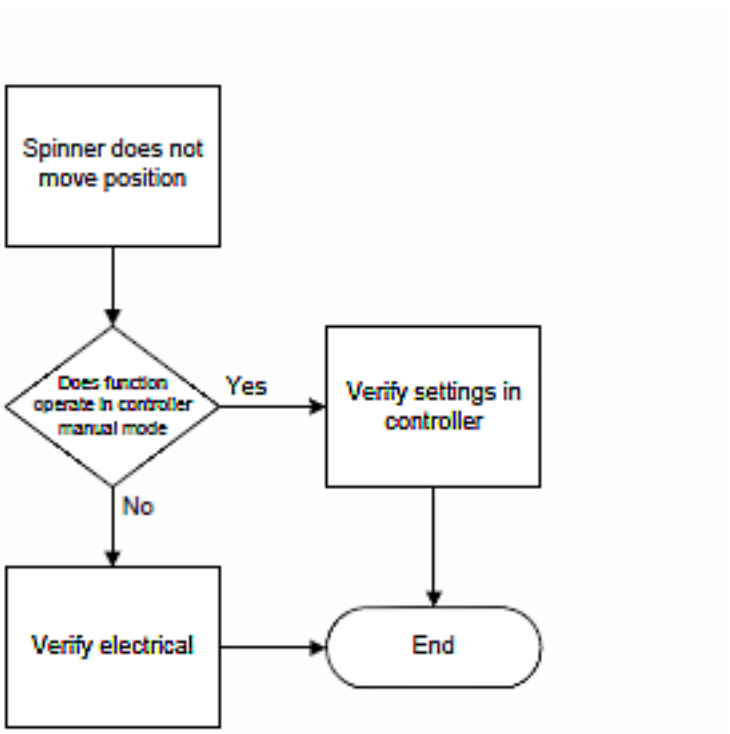


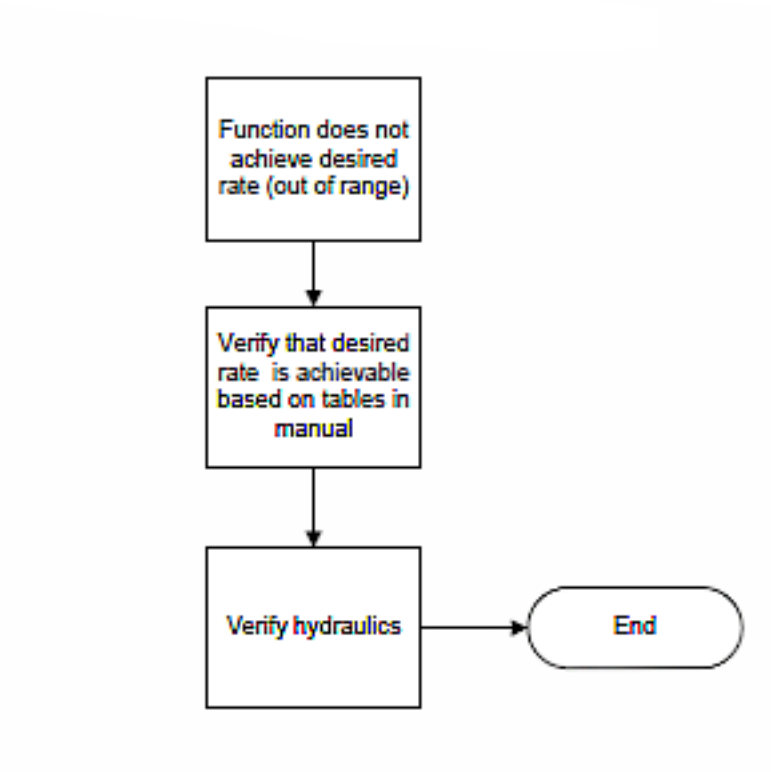
Figure 30 - Zerk Locations

COMMON REASONS FOR FAILURE

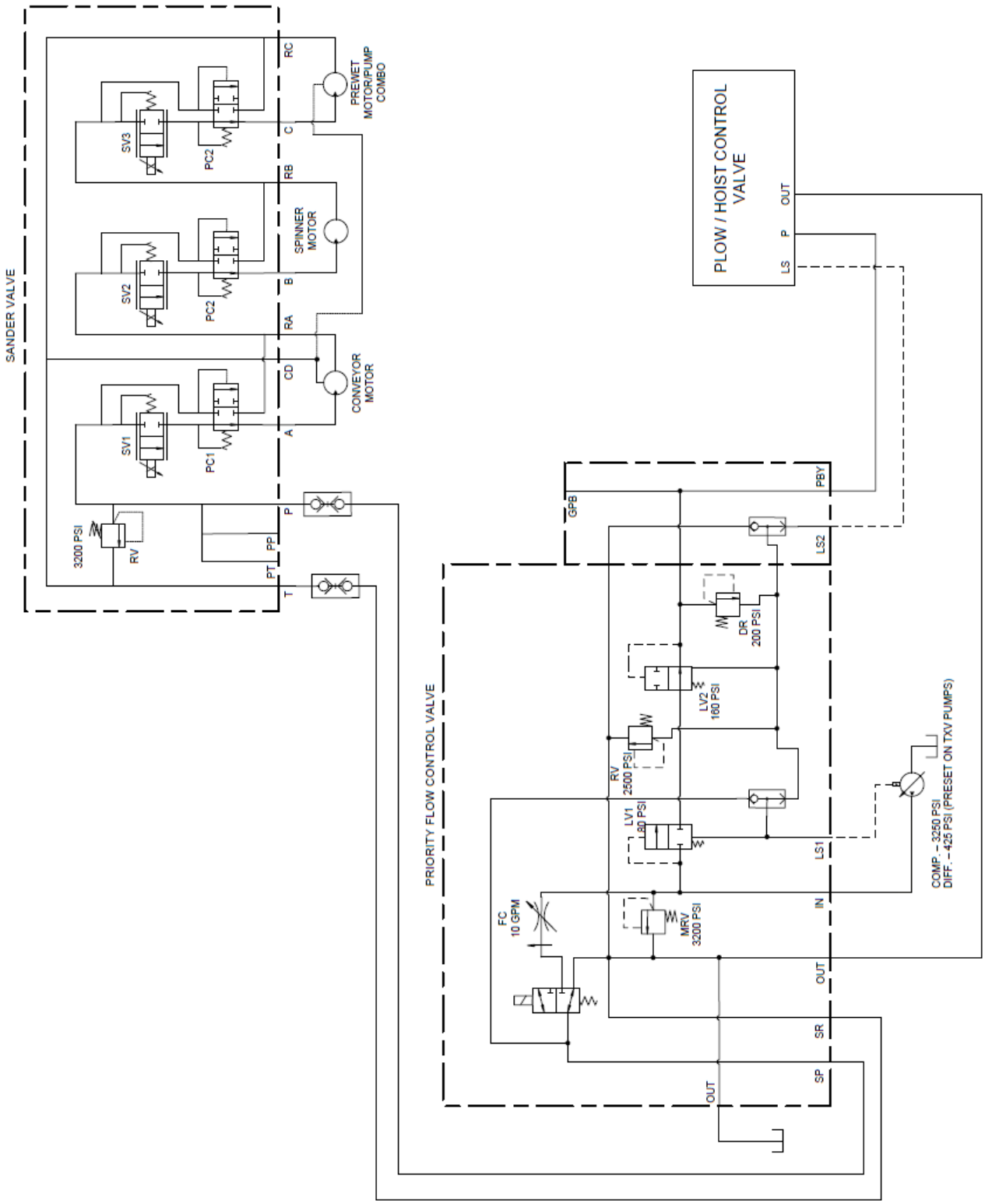
Mechanical:	**Electrical:**	**Hydraulic:**	**Controller:**
-Siezed -Broken key -Conveyor slip -Plugged strainer -Fill valve position -Meter gate malfunction	-Power -Fuse -Solenoid -MMM -CAN power -CAN communication -Connectors -Harnesses	-Pump -Flow -Pressure -RPM -Oil Level -Relief -Enable -Load Sense	-Settings

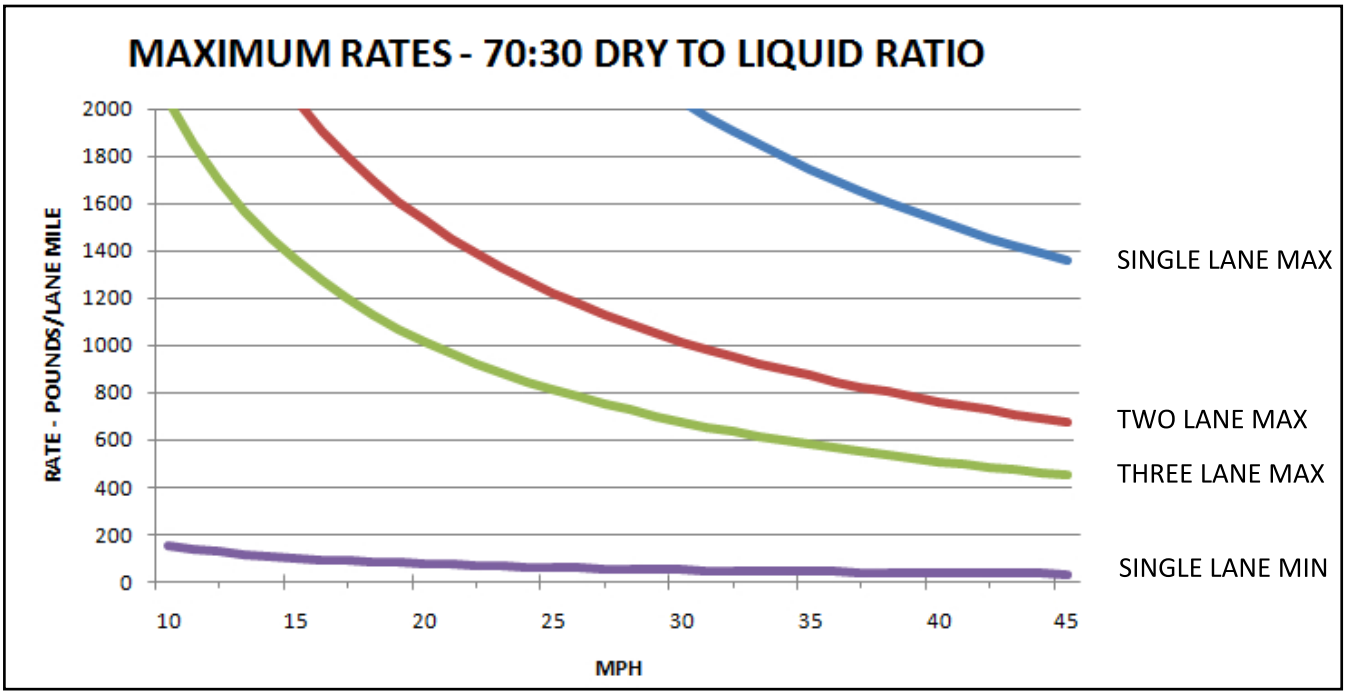


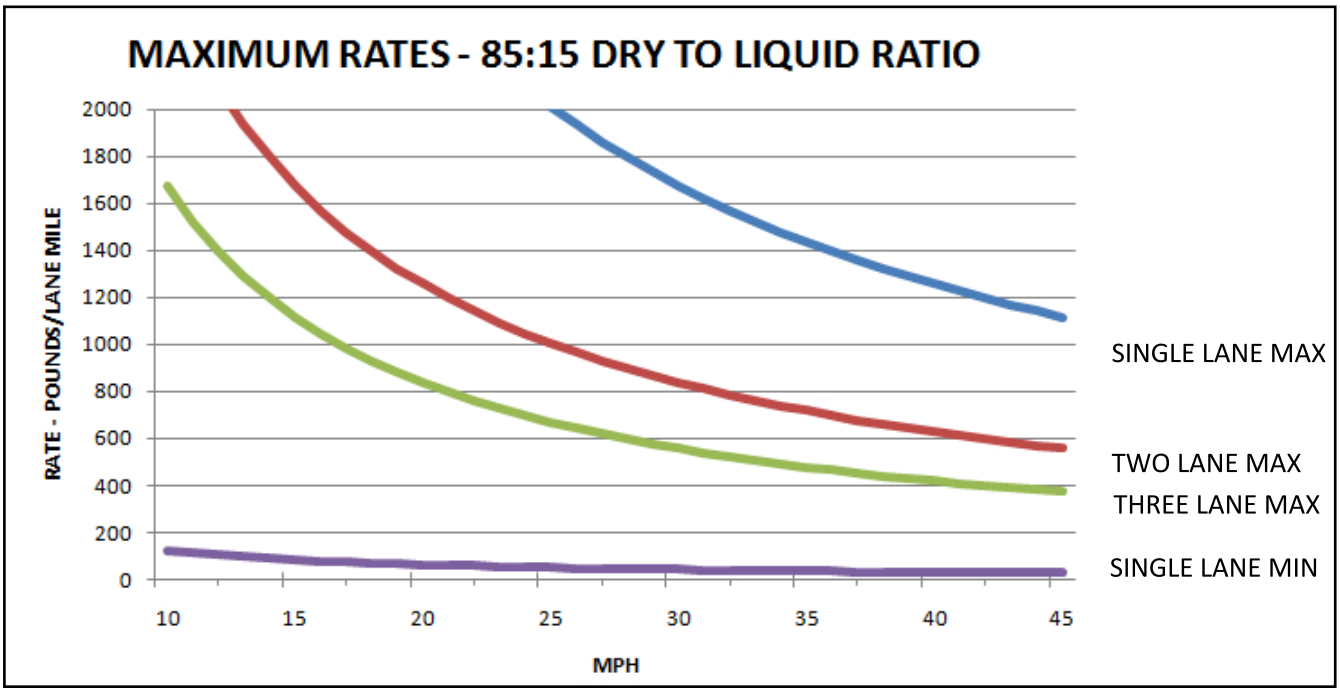

Spinner does not move position
Does function operate in controller manual mode
Yes
Verify settings in controller
No
Verify electrical
End

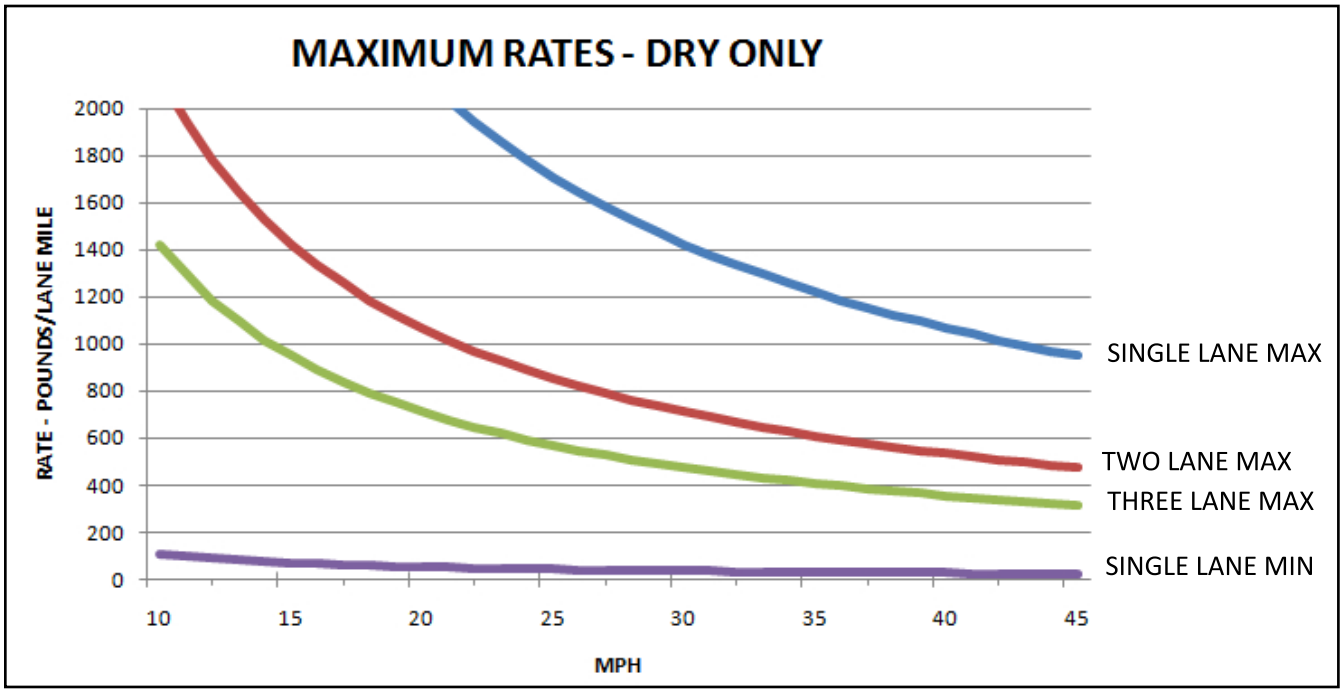

Function does not achieve desired rate (out of range)
Verify that desired rate is achievable based on tables in manual
Verify hydraulics
End

Hydraulic Schematic - Load Sense




MAXIMUM RATES - 70:30 DRY TO LIQUID RATIO
RATE - POUNDS/LANE MILE
2000
1800
1600
1400
1200
1000
800
600
400
200
0
10
15
20
25
30
35
40
45
MPH
SINGLE LANE MAX
TWO LANE MAX
THREE LANE MAX
SINGLE LANE MIN


MAXIMUM RATES - 85:15 DRY TO LIQUID RATIO
RATE - POUNDS/LANE MILE
2000
1800
1600
1400
1200
1000
800
600
400
200
0
10
15
20
25
30
35
40
45
MPH
SINGLE LANE MAX
TWO LANE MAX
THREE LANE MAX
SINGLE LANE MIN



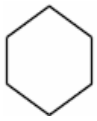
TYPICAL LIQUID DENSITIES

LIQUID	**DENSITY** (lbs/gal)
Salt Brine	10.2
Calcium Chloride	10.92
Magnesium Chloride	10.53

NOTE: Liquids have specific gravity mixture. Consult product labels.

STANDARD TORQUES NATIONAL COURSE (NC) CAP SCREWS

CAP SCREW GRADE IDENTIFICATION - MARKINGS ON HEAD

SAE GRADE 2  NO MARKINGS

SAE GRADE 5  THREE MARKS - 120 DEGREES APART

SAE GRADE 8  SIX MARKS - 60 DEGREES APART

USE GRADE 2 TORQUES FOR STAINLESS STEEL FASTENERS AND CARRIAGE BOLTS.

CAP SCREW SIZE	TORQUE - FOOT-POUNDS					
	GRADE 2		GRADE 5		GRADE 8	
	DRY	LUBE	DRY	LUBE	DRY	LUBE
1/4”	5	4	8	6	12	9
5/16”	11	8	17	13	25	18
3/8”	20	15	30	23	45	35
7/16”	30	24	50	35	70	55
1/2”	50	35	75	55	110	80
9/16”	65	50	110	80	150	110
5/8”	90	70	150	110	220	170
3/4”	100	120	260	200	380	280
7/8”	140	110	400	300	600	460
1”	220	160	580	440	900	650

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NOTES

Hi-Way NEW LEADER
Highway Equipment Company
Building the best since 1939.

Order from the AUTHORIZED DEALER in your area.

1. Always give the pertinent model and serial number.

2. Give part name, part number and the quantity required.

3. Give the correct address to where the parts are to be shipped, and the carrier if there is a preference.

Unless claims for shortages or errors are made immediately upon receipt of goods they will not be considered. Any part returns should be directed through the dealer from which they were purchased.

When broken goods are received, a full description of the damage should be made by the carrier agent on the freight bill. If this description is insisted upon, full damage can always be collected from the transportation company.

No responsibility is assumed for delay or damage to merchandise while in transit. Our responsibility ceases upon delivery of shipment to the transportation company from whom a receipt is received showing that shipment was in good condition when delivered to them, therefore, claims (if any) should be filed with the transportation company and not with Highway Equipment Company.

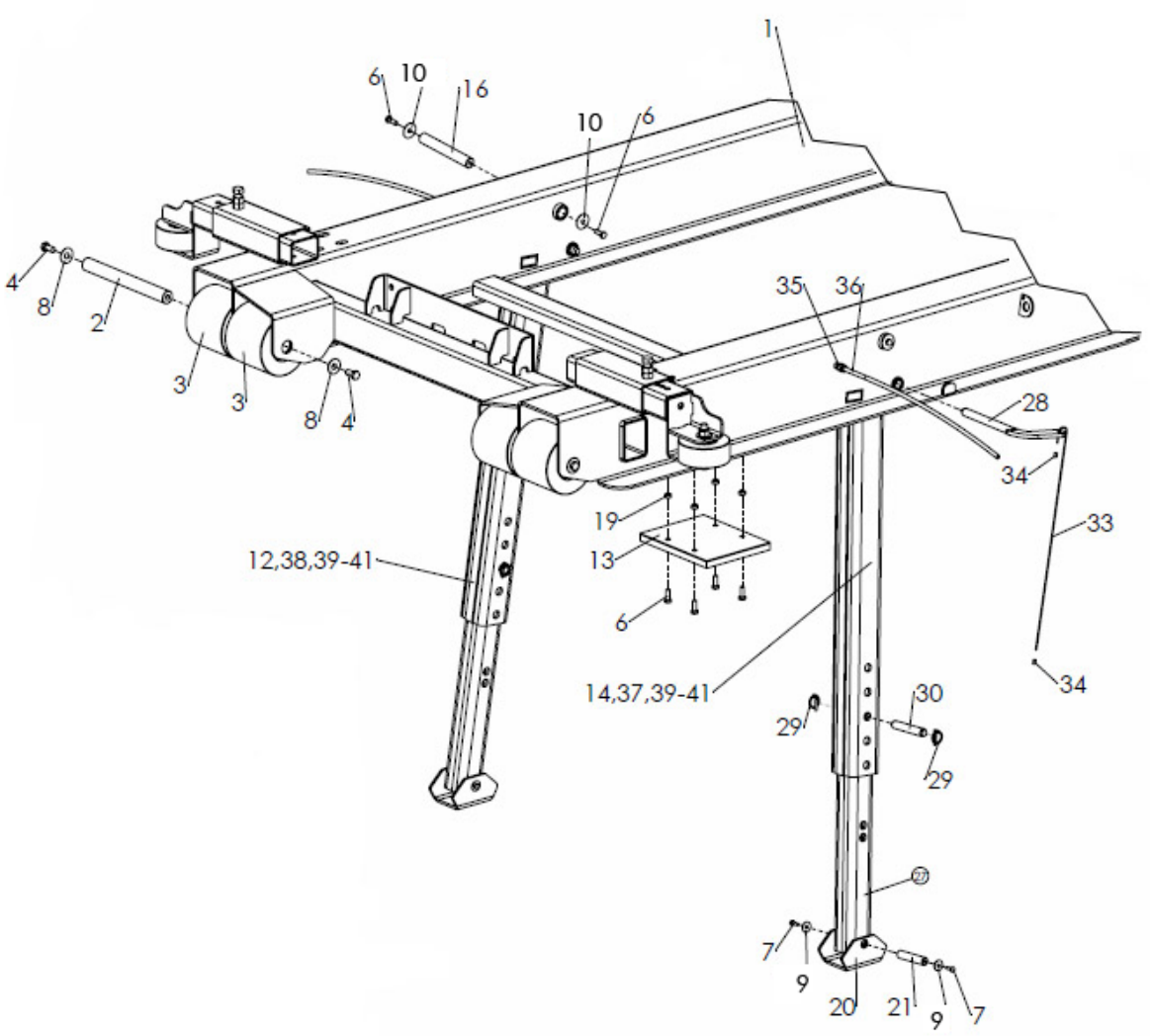
If your claims are not being handled (by the transportation company) to your satisfaction, please call the Parts Manager at Highway Equipment Company (319-363-8281) for assistance.

In the parts list the following symbols and abbreviations stand for:

* - Not Shown
AR – As Required
CS – Carbon Steel
SS – Stainless Steel

The parts listed under the different steel types (CS, 409 SS and 304 SS) are for that type of unit and do not necessarily mean the part is made of that type of steel.

SUBFRAME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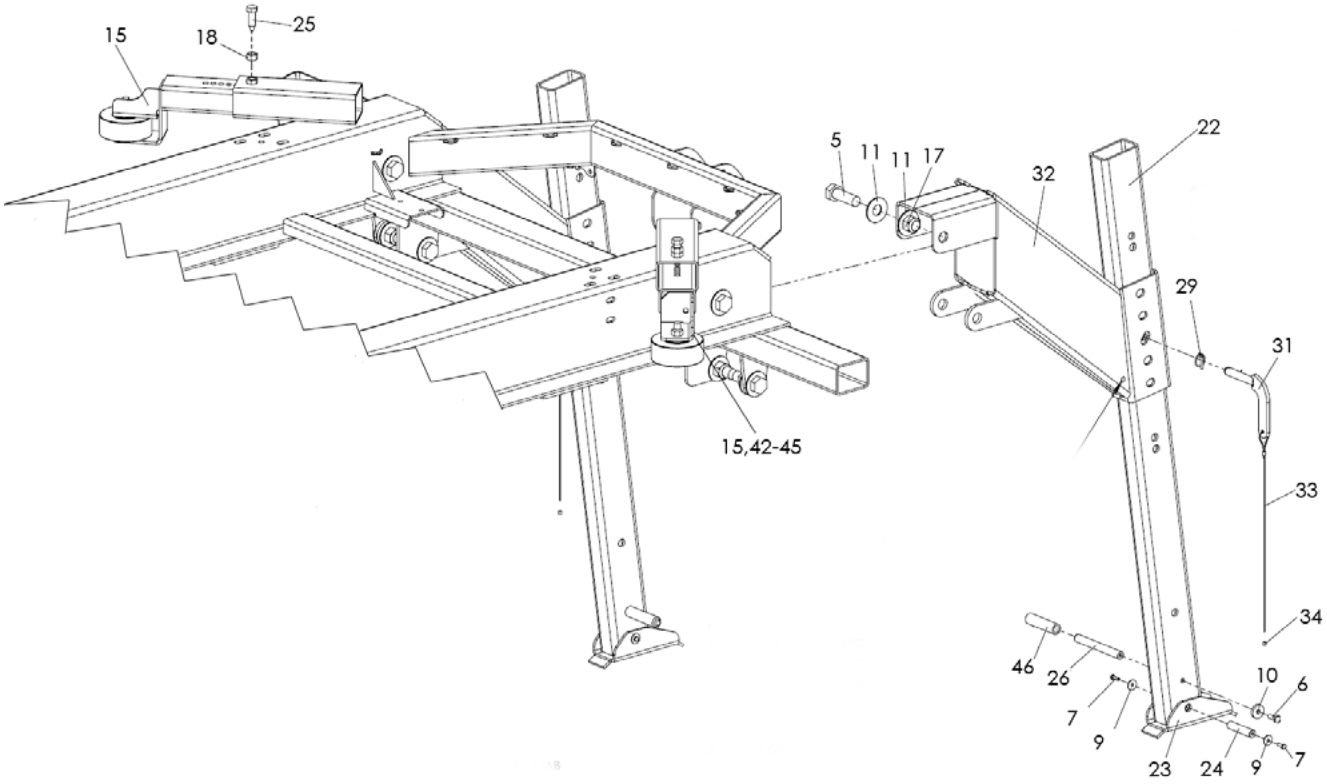
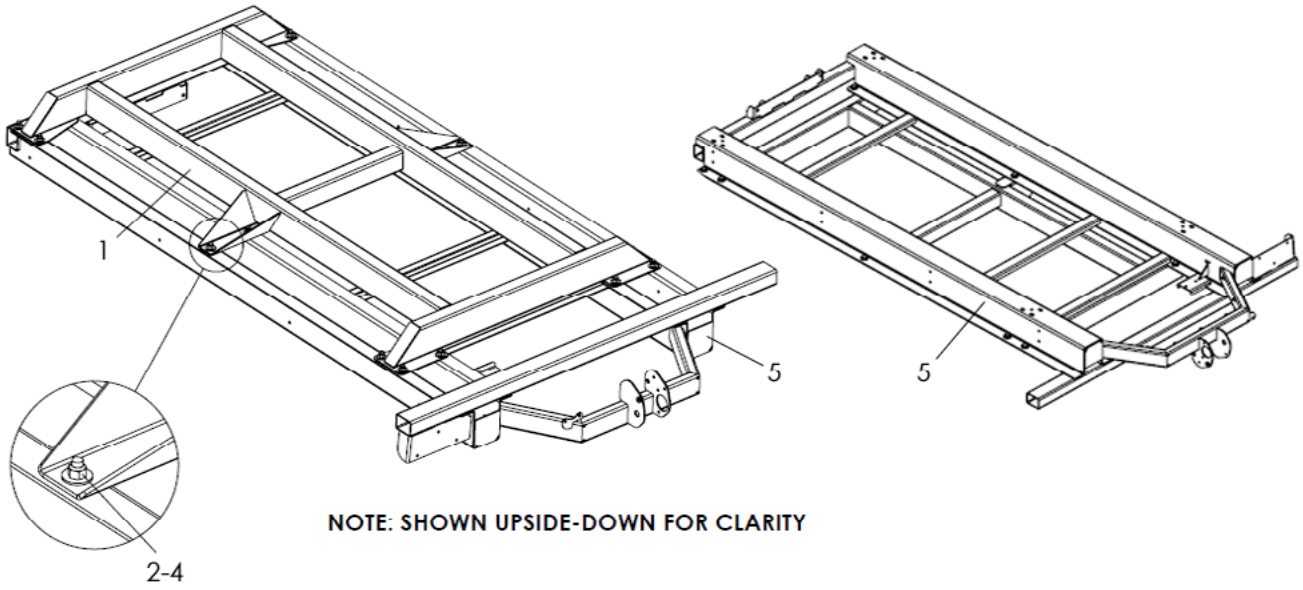


ITEM	PART NO.	DESCRIPTION	QTY
1	308068	Sub-frame - Galvanized 10’	1
	308338	Sub-frame - Galvanized 12’	
	308339	Sub-frame - Galvanized 14’	
2	307790	Axle - wheel sub-frame 304	2
3	307764	Wheel - Mount roll-on	4
4	36401	Cap Screw - .5-13NC x 1 SS	4
5	308086	Cap Screw - 1-8NC x 2.5 SS	8
6	36398	Cap Screw - .375-16NC x 1 SS	22
7	36393	Cap Screw - .25-20NC x .75 SS	8
8	308089	Washer - Fender .5 x 1.5 SS	4
9	308088	Washer - Fender .375 x 1.50 SS	8
10	307746	Spacer - .438 x .25 304	6
11	20700-X1	Washer - Flat 1 SS	16
12	308079	Leg - Assy front RH includes items 38-41	1
13	307794	Pad - Mount rubber	4
14	308078	Leg - Assy front LH includes items 37 and 39-41	1
15	307766	Assy - Guide Wheel includes items 42-45	4
16	307808	Pin - Hinge leg 304	2

ITEM	PART NO.	DESCRIPTION	QTY
17	308087	Nut - Lock 1-8NC SS	8
18	36417	Nut - Hex .625-11NC SS	4
19	72054	Nut - Lock .375-16NC SS	16
20	308074	Foot - Front galvanized	2
21	307809	Pin - Hinge foot front 304	2
22	308073	Leg - Rear galvanized	2
23	308075	Foot - Rear galvanized	2
24	307824	Pin - Hinge rear foot 304	2
25	307997	Cap Screw - .625-11NC x 2.5 SS modified	4
26	308001	Handle - Leg 304	2
27	308072	Leg - Front galvanized	2
28	308076	Pin - Lock zinc plated	2
29	308053	Pin - Lynch .188 x 1.25	6
30	308037	Pin - Leg front adjustment 304	2
31	308077	Pin - Rear leg pin plated	2
32	308069	Transition - Galvanized	2
33	308084	Cable - .094 x 24 coated	4
34	308085	Ferrule - .185 x .374	8
35	9005-0-7818	Fitting - 6-2 AA01028	2
36	9005-0-7797	Tubing - .375 OD air brake blue	AR
37	308070	Leg - Front LH galvanized	1
38	308071	Leg - Front RH galvanized	1
39	308080	Tape - VHb 5952 black 1” x 45 mil	6 ft.
40	307806	Flat - 1 x .125 x 36 304	2
41	6072	Zerk - Grease	2
42	308238	Insert - Wldmt wheel guide	4
43	307765	Wheel - Guide side mount	4
44	90967	Cap Screw - .625 -11NC x 4 SS	4
45	41762	Nut - Lock .625-11NC SS	4
46	308246	Handgrip - Foam Tube	2

AR - As Required

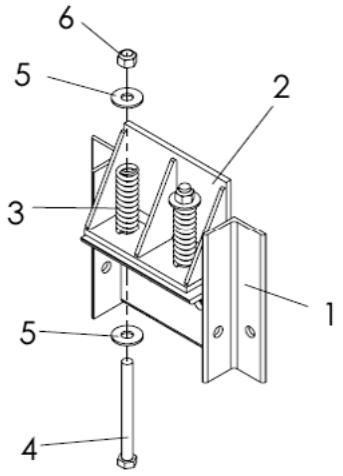
FRAME/SUBFRAME - TRUCK CHASSIS MOUNT



NOTE: SHOWN UPSIDE-DOWN FOR CLARITY

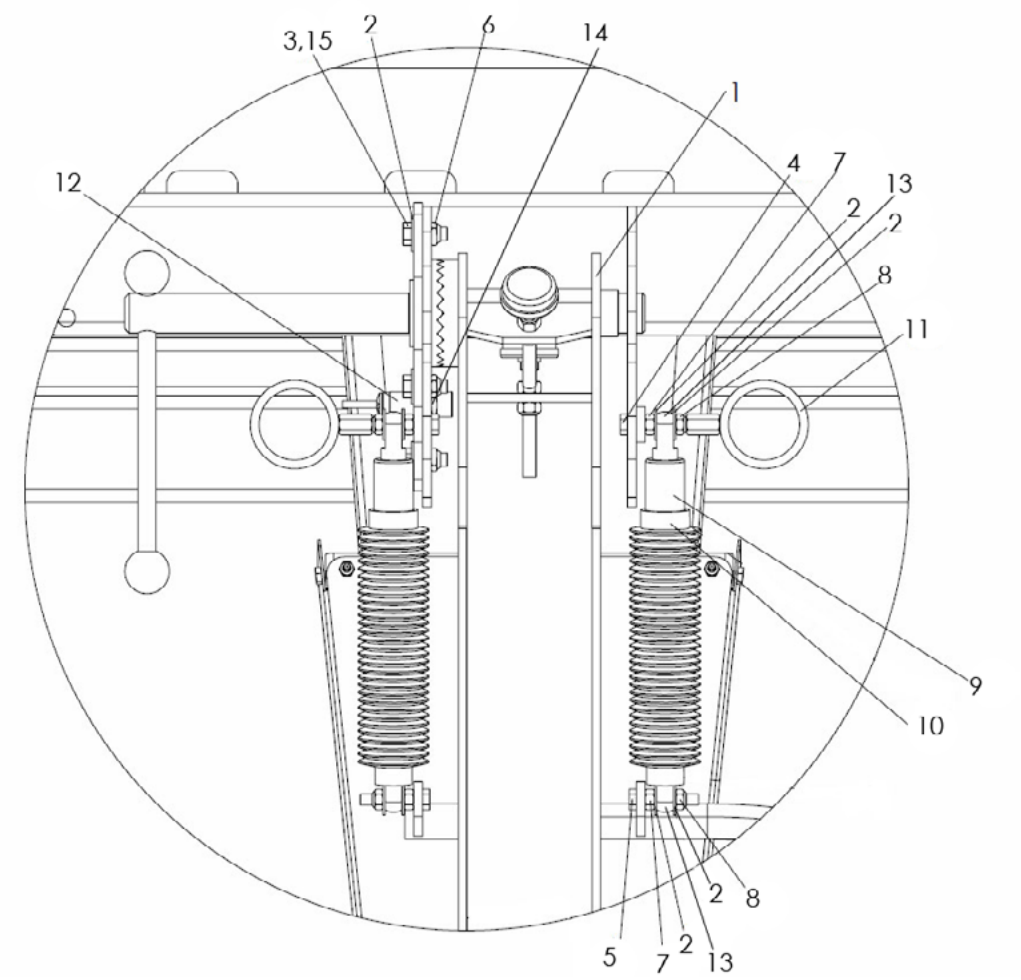
ITEM	PART NO.	DESCRIPTION	QTY
	309494	Frame - Group Truck Chassis Mount, Includes 1-4	
1	309487	Frame - Wldmt 10’	1
	309482	Frame - Wldmt 12’	1
	309466	Frame - Wldmt 14’	1
2	20176	Cap Screw - 5/8-11NC x 1-3/4	AR
3	20697	Washer - Flat 5/8	AR
4	20682	Nut - Lock 5/8-11NC	AR
5	309484	Subframe - Wldmt 10’	1
	309479	Subframe - Wldmt 12’	1
	309464	Subframe - Wldmt 14’	1

MOUNT - TRUCK CHASSIS MOUNT



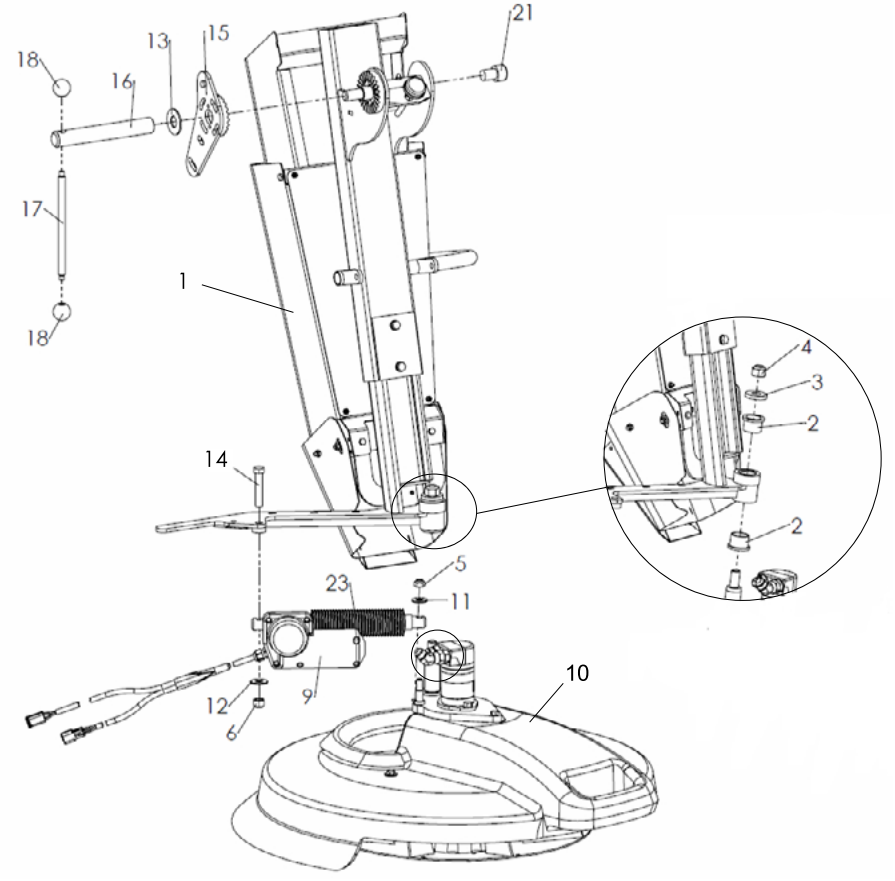
ITEM	PART NO.	DESCRIPTION	QTY
1	301624	Angle - Mount Wldmt	2
2	300275	Mount - Spring Wldmt	2
3	81000	Spring - Compression	4
4	20195	Cap Screw - 5/8-11NC x 6-1/2	4
5	20697	Washer - Flat 5/8	8
6	20682	Nut - Lock 5/8-11NC	4

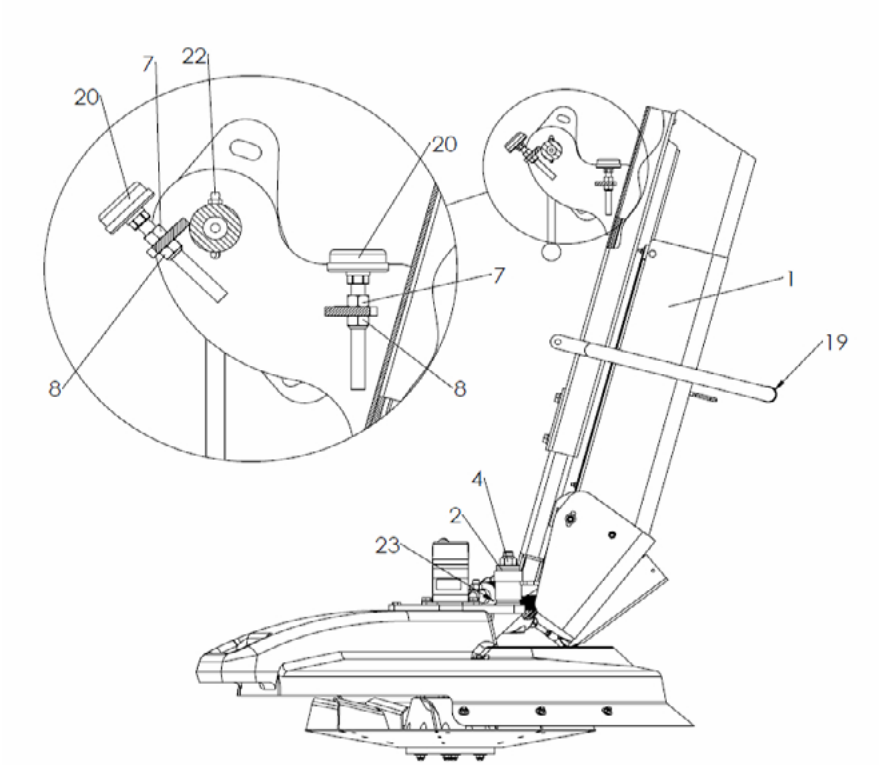
SPINNER GROUP



ITEM	PART NO.	DESCRIPTION	QTY
1	308057	Spinner - Group	1
2	36425	Washer - Flat .375 SS	8
3	36399	Cap Screw - .375-16NC x 1-1/4 SS	3
4	308224	Cap Screw - .375-16NC x 2.5	2
5	308225	Cap Screw - .375-16NC x 1.75	2
6	307395	Nut - Lock thin .375-16NC SS	3
7	36414	Nut - Hex .375-16NC SS	4
8	72054	Nut - Lock .375-16NC SS	4
9	307972	Spring - Gas	2
10	307969	Bellows - Rod	2
11	307984	Ring - Wldmt 304	2
12	308179	Sensor - 18mm	1
13	308315	Rod End 304	4
14	308237	Washer - Star Internal	2
15	307746	Spacer - .438 x 1/4 304	3

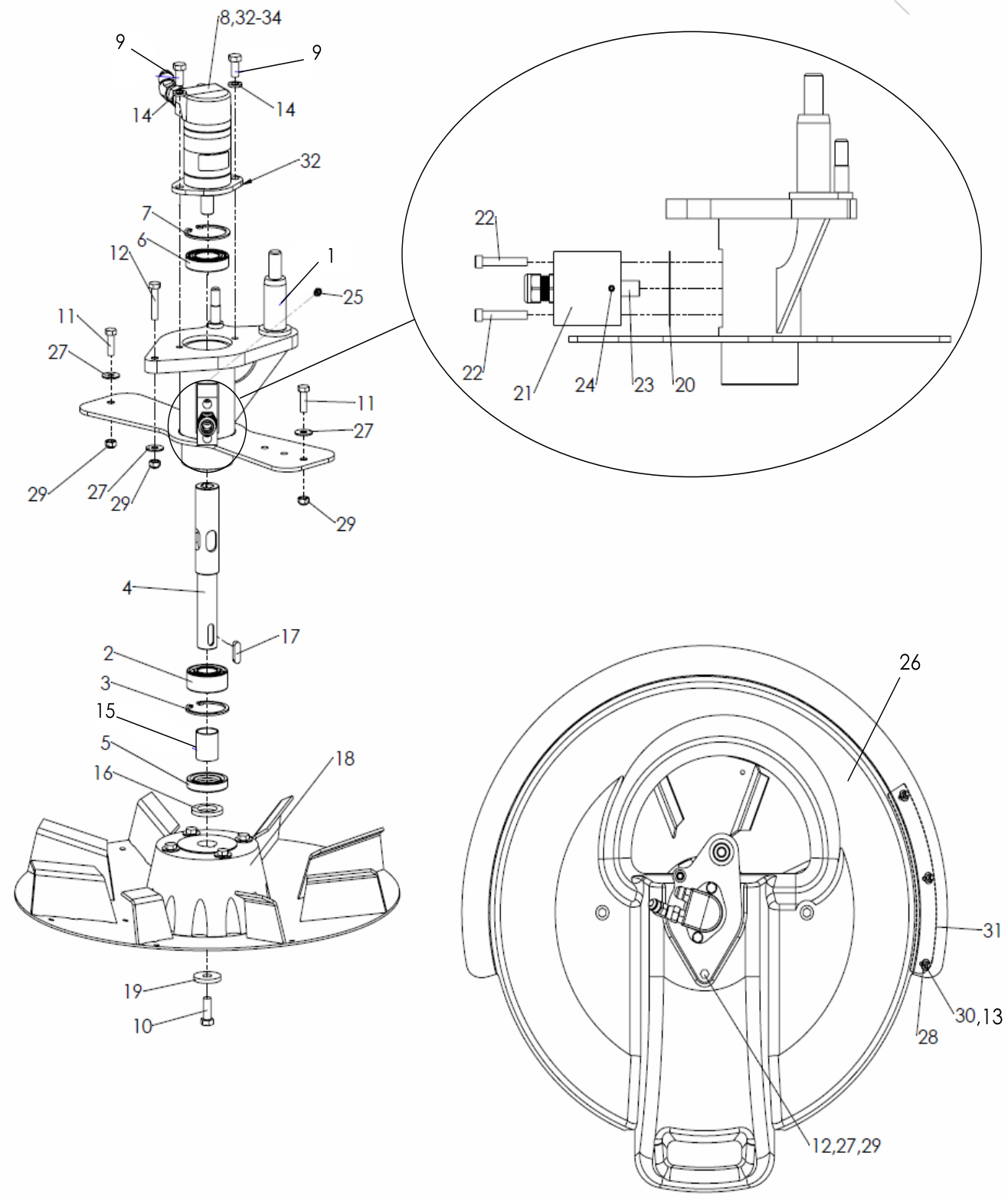
SPINNER ASSEMBLY





ITEM	PART NO.	DESCRIPTION	QTY
1	307827	Chute - Assy 304 * parts list under “Chute Assembly”	1
2	307887	Bearing - Flanged Bronze	2
3	307935	Washer - 1.563 OD x .656 ID x .250 304	1
4	41762	Nut - Lock .625-11NC SS	1
5	307987	Nut - Lock .438-20NF SS	1
6	39016	Nut - Lock .5-13NC SS	1
7	36414	Nut - Hex .375-16NC SS	2
8	72054	Nut - Lock .375-16NC SS	2
9	310168	Actuator - Linear Electric with DTM04-3P and DT06-4S	1
10	307861	Spinner - Assy Lower * parts list under “Lower Spinner Assembly”	1
11	36295	Washer - Flat .438 SS	1
12	36426	Washer - Flat .5 SS	1
13	56408	Washer - Flat .75 304	1
14	42454	Cap Screw - .5-13NC x 2.5 SS	1
15	307914	Lock - Wldmt Chute 304	1
16	307916	Bar - Chute Rotation Lock 304	1
17	307917	Handle - 304	1
18	307918	Knob - 1.25	2
19	307953	Grip - Round Vinyl	1
20	307973	Foot - Leveling Neoprene	2
21	307920	Screw - Socket HD .75-10NC x 1 SS	1
22	6072	Zerk - Grease	1
23	307969	Bellows - Rod	1

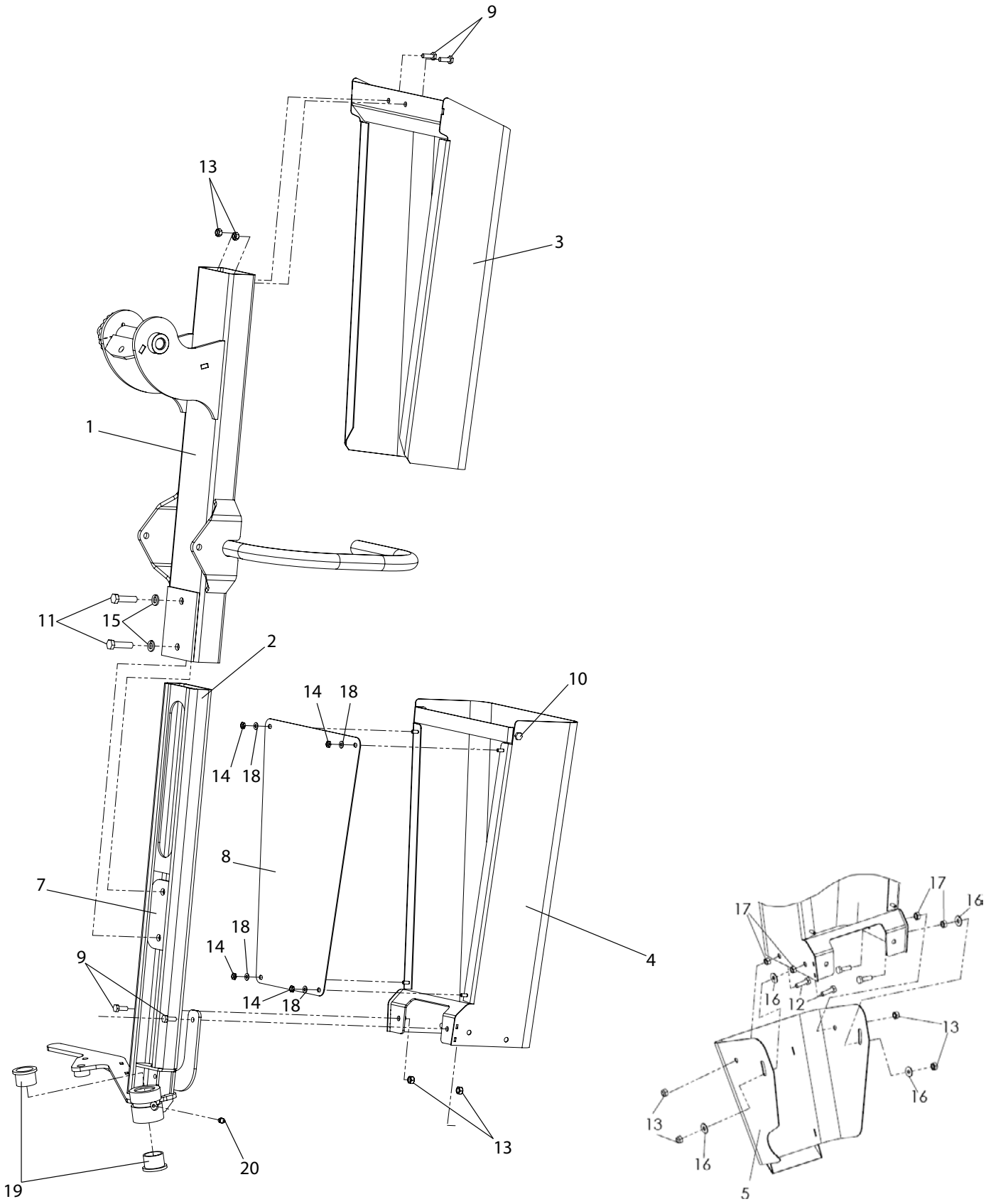
LOWER SPINNER ASSEMBLY



LOWER SPINNER ASSEMBLY CONTINUED

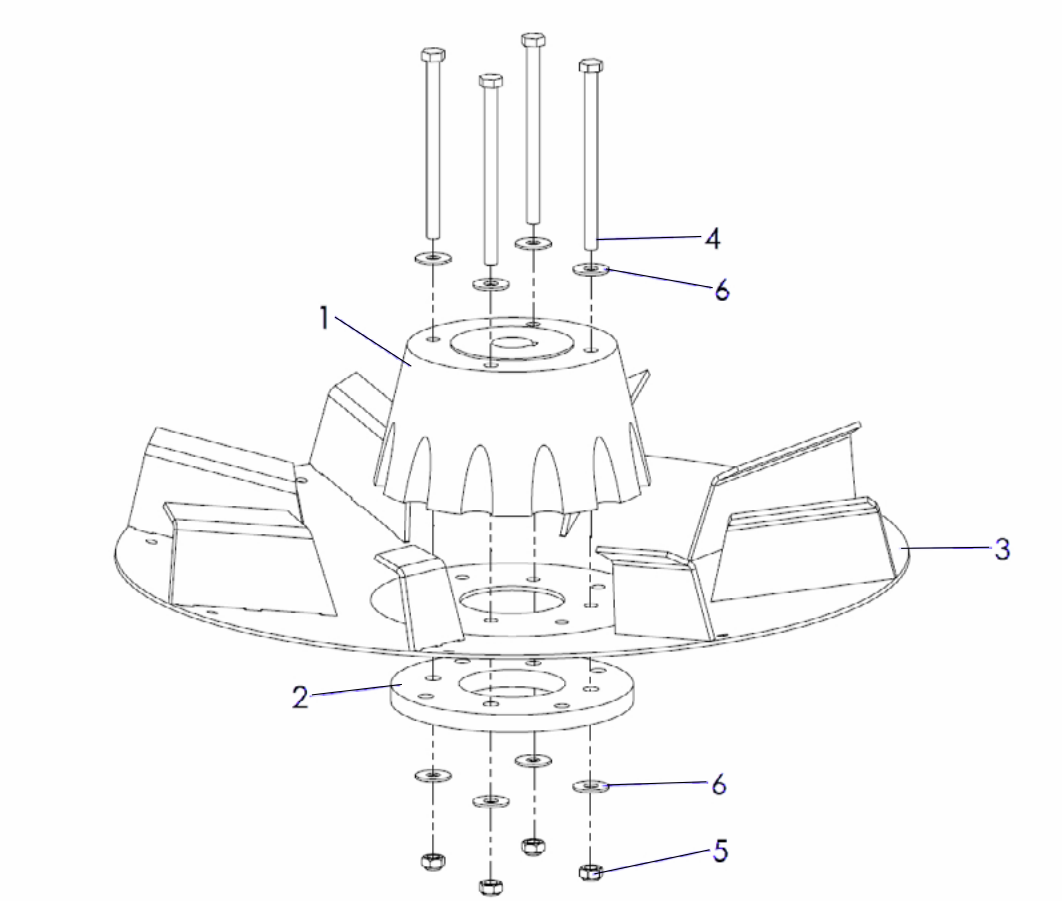
ITEM	PART NO.	DESCRIPTION	QTY
1	307883	OHLA - Wldmt 304	1
2	307876	Bearing - Ball Double Row 25mm	1
3	307877	Ring - Snap Internal 52mm	1
4	307873	Shaft - OHLA 304	1
5	307881	Seal - Shaft 28mm	1
6	307878	Bearing - Ball 30mm	1
7	307879	Ring - Snap Internal 55mm	1
8	307967	Motor - Assy Hyd includes items 32-34	1
9	36293	Cap Screw - .375-16NC x .75 SS	2
10	312456	Cap Screw - .375-16NC x 1 SS w/ Nylon Strip	1
11	34580	Cap Screw - .313-18NC x 1 SS	2
12	308056	Cap Screw - .313-18NC x 1.5 SS	1
13	36394	Cap Screw - .25-20NC x .875 SS	3
14	36420	Washer - Lock .375 SS	2
15	307882	Spacer - Spinner 304	1
16	307880	Spacer - 1.000 ID x 7 GA 304	1
17	307747	Key - Rect .313 x .25 x 1 SS	1
18	307773	Spinner - Disc Assy * parts list under “Spinner Disc Assembly”	1
19	307746	Spacer - .438 ID x 7GA 304	1
20	307885	Gasket - Mount Sensor	1
21	307884	Block - Sensor	1
22	308047	Cap Screw - Socket HD .25-20NC x 1.5 SS	2
23	308177	Sensor - 12mm	1
24	308048	Screw - Set Nylon Tip #10-24NC x .25 SS	1
25	6072	Zerk - Grease	1
26	307919	Shroud - Spinner	1
27	36424	Washer - Flat .313 SS	3
28	36423	Washer - Flat .25 SS	6
29	42221	Nut - Lock .313-18NC SS	3
30	42034	Nut - Lock .25-20NC SS	3
31	307961	Strip - Wear 304	1
32	307783	Motor - Hyd 1.21 CID	1
33	34809	Fitting - 8-6 070120	2
34	34805	Fitting - 8-8 070321	1

CHUTE ASSEMBLY



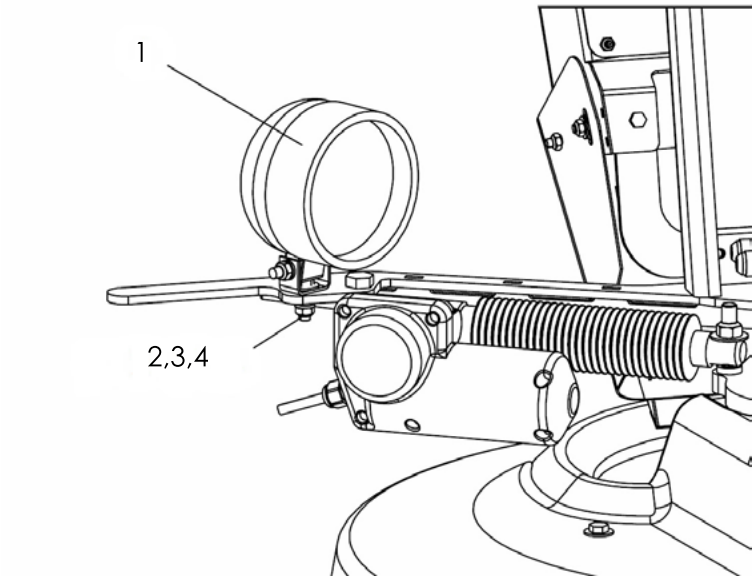
ITEM	PART NO.	DESCRIPTION	QTY
1	307828	Support - Wldmt chute upper 304	1
2	307833	Lower Chute Support - Wldmt 304	1
3	307842	Chute - Wldmt upper 304	1
4	307845	Chute - Wldmt lower 304	1
5	308059	Chute - Lower deflector coated 304	1
6	308312	Bracket - Wldmt Lower Chute 304	1
7	307853	Chute Lock Plate - Wldmt 304	1
8	307856	Cover - Lower chute 304	1
9	36393	Cap Screw - .25-20NC x .75 SS	4
10	308227	Cap Screw - .25-20NC x .625 SS	2
11	34858	Cap Screw - .375-16NC x 1.5 SS	2
12	36394	Cap Screw - .25-20NC x .875 SS	4
13	42034	Nut - Lock .25-20NC SS	10
14	307974	Nut - Lock #10-32NF SS	4
15	36420	Washer - Lock .375 SS	2
16	36423	Washer - Flat .25 SS	4
17	36412	Nut - Hex .25-20NC SS	4
18	171052	Washer - Flat SS	4
19	307887	Bearing - Flanged Bronze	2
20	311663	Zerk - Greasde .25-28 SS	1

SPINNER DISC



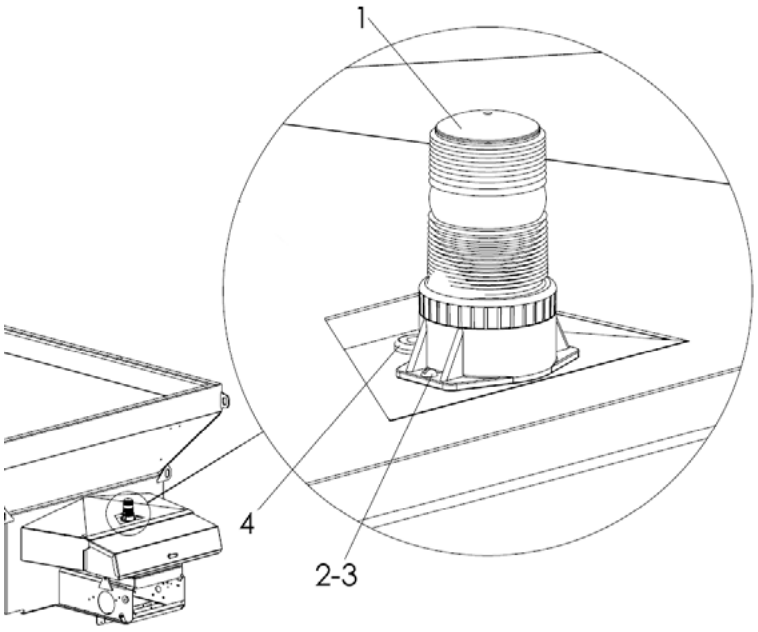
ITEM	PART NO.	DESCRIPTION	QTY
1	307776	Hub	1
2	307777	Hub - Bottom Doubler	1
3	307774	Spinner - Wldmt Disc 304	1
4	307921	Cap Screw - .313-18NC x 4.5 SS	4
5	42221	Nut - Lock .313-18NC SS	4
6	36424	Washer - Flat .313 SS	8

SPINNER FLOOD LIGHT



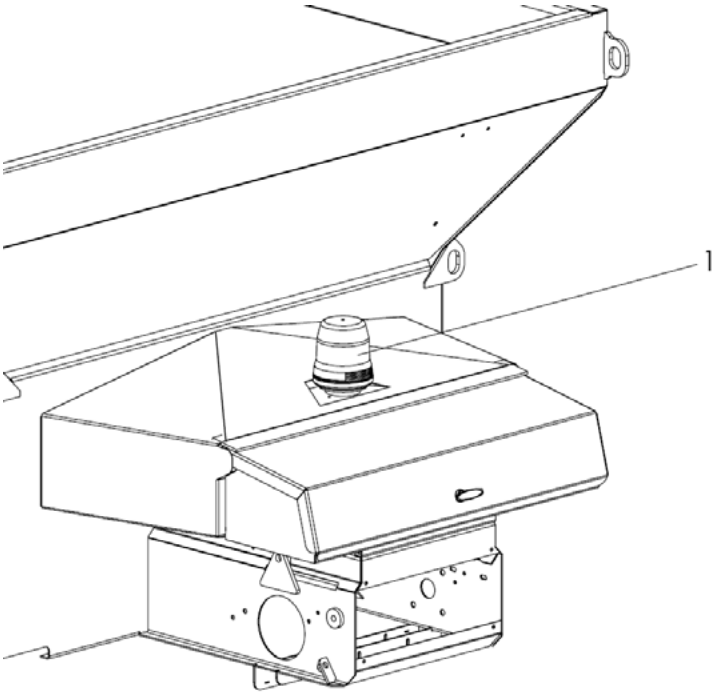
ITEM	PART NO.	DESCRIPTION	QTY
1	308189	Light - Work/Flood	1
2	36424	Washer - Flat .313 SS	2
3	42221	Nut - Lock .313- 18NC SS	1
4	34580	Cap Srcrew - .313- 18NC x 1 SS	1

STROBE LIGHT

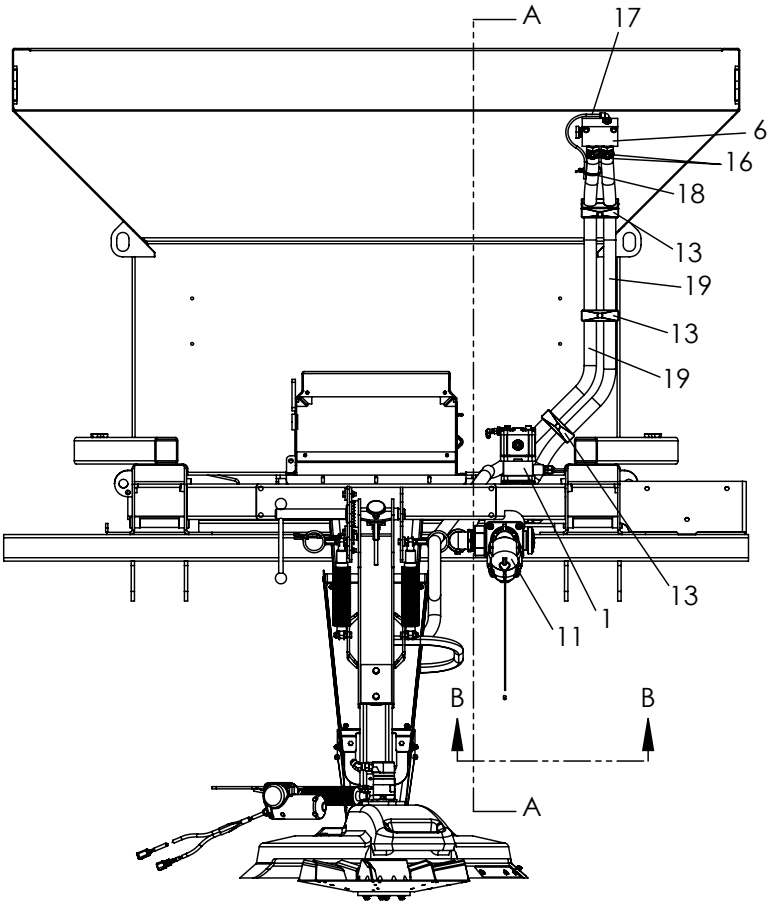


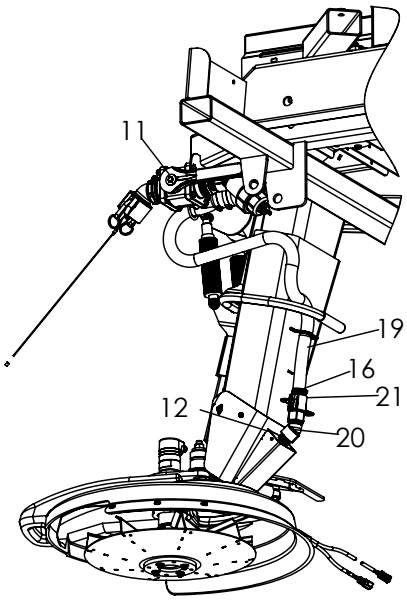
ITEM	PART NO.	DESCRIPTION	QTY
1	308188	Strobe - 360	1
2	47264	Screw - Round #10-24NC x .75 SS	2
3	56355	Nut - Lock #10-24NC SS	2
4	21985	Grommet - Rubber .75	1

BEACON LIGHT

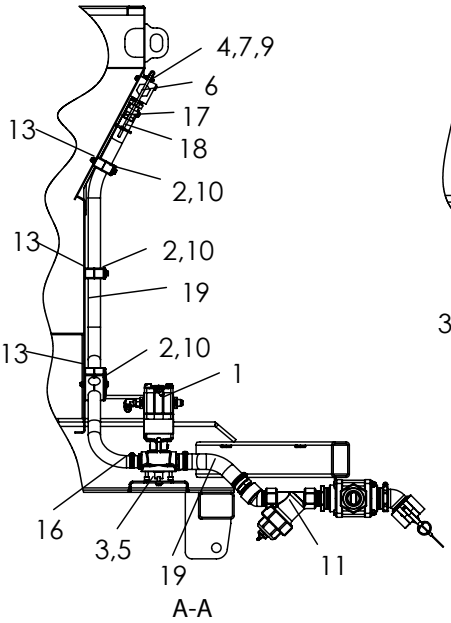


ITEM	PART NO.	DESCRIPTION	QTY
1	308187	Beacon - Revolving	1

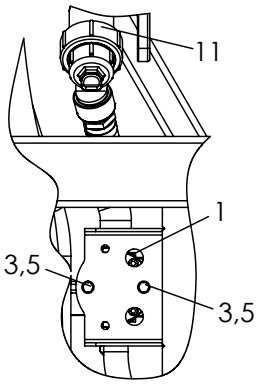




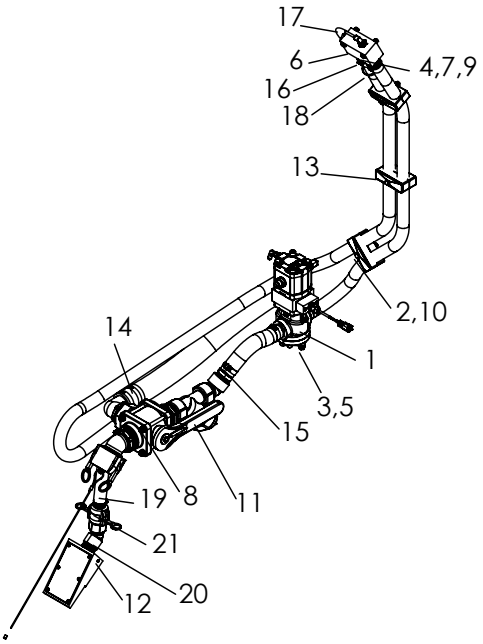
LIQUID DIFFUSER PLUMBING



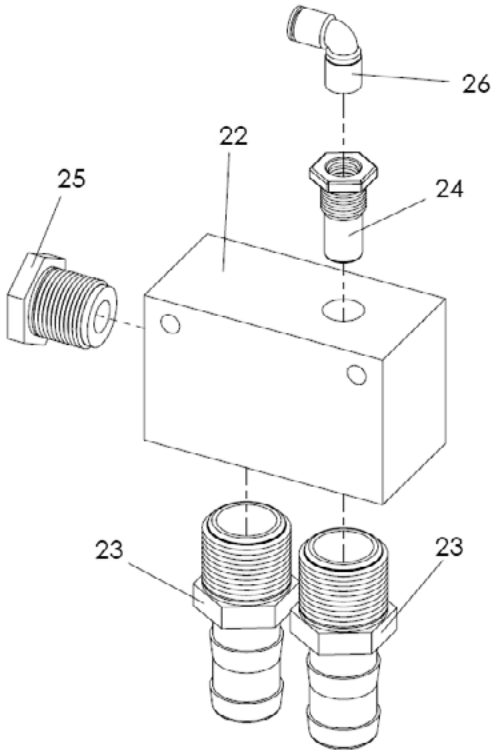
A-A



B-B



PARTS LIST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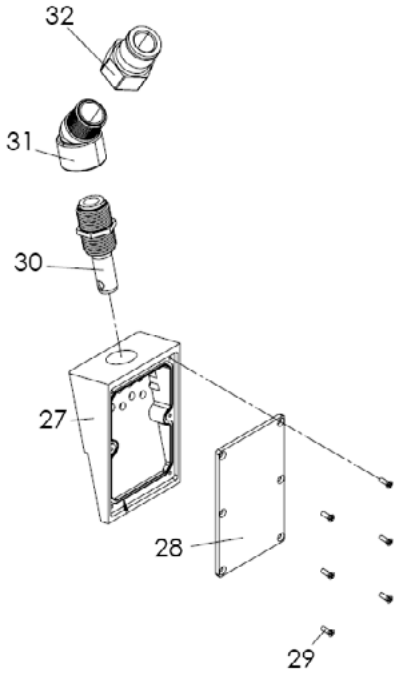
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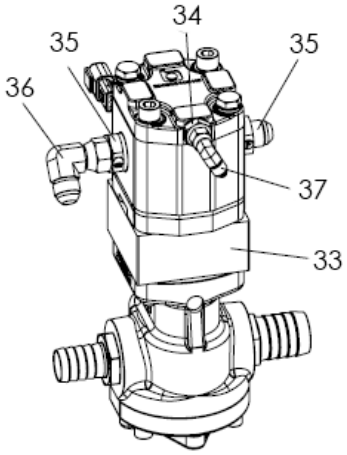
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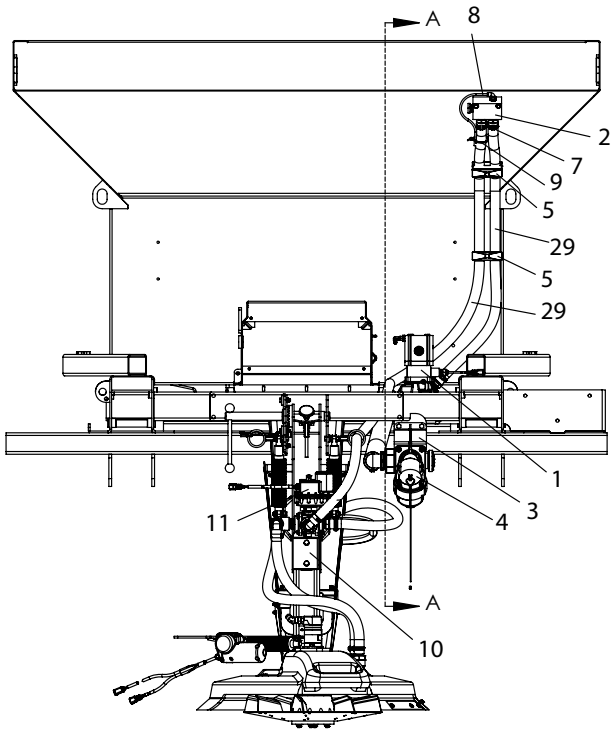
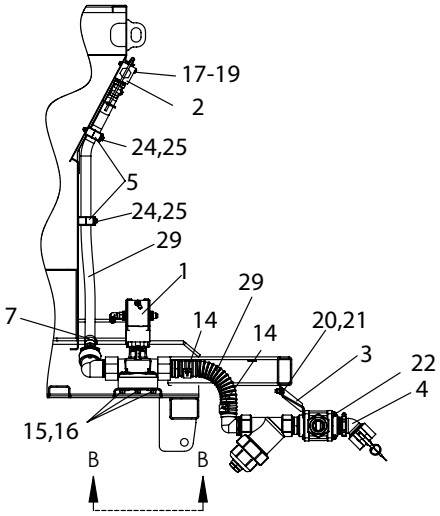
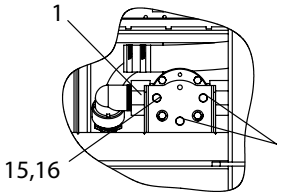
ITEM	PART NO.	DESCRIPTION	QTY
1	308043	Pump - Assy, includes items 33-37	1
2	96258	Cap Screw - .313-18NC x 3 SS	3
3	308040	Cap Screw - M8 x 20 SS	2
4	34501	Cap Screw - .25-20NC x 2.5 SS	2
5	36420	Washer - Lock .375 SS	2
6	308011	Manifold - Assy Anti-Siphon, includes items 22-26	1
7	36423	Washer - Flat .25 SS	2
8	307395	Nut - Lock Thin .375-16NC SS	2
9	42034	Nut - Lock .25-20NC SS	2
10	42221	Nut - Lock .313-18NC SS	3
11	308019	Valve - Assy Fill/Pump Poly, see *Fill/Pump Valve Assy* parts list	1
12	56315	Screw - Self drilling #6-20NC x .5 SS	2
13	308033	Clamp - Tubing 1.33	3
14	308029	Clamp - Hose SAE 36 SS	4
15	308028	Clamp - Hose SAE 24 SS	2
16	308223	Clamp - Hose SAE 16 SS	4
17	9005-0-7761	Tubing - .25 OD air brake black	1ft
18	306836	Wire Tie	1
19	309426	Hose - Group Liquid, see *Liquid System Hose Group* parts list	1
20	310678	Diffuser - Assy, includes items 27-32	1
21	310675	Coupling - 1” female x 1” hose poly	1
22	307970	Manifold - Anti-Siphon	1
23	307895	Fitting - Hose barb 1” Hose x 1” MNPT Poly	2
24	308012	Valve - Vacuum breaker .375 NPT SS	1
25	307901	Fitting - Plug .75 NPT hex Head Poly	1
26	308222	Fitting - 4-4 630202K	1
27	307948	Diffuser	1
28	307949	Cover - Diffuser	1
29	307947	Screw - Self-Tapping	6
30	310677	Insert - Assy Diffuser	1
31	310673	Elbow - 90 deg 1” NPT Poly	1
32	310674	Adapter - 1” male x 1” female MNPT poly	1
33	308181	Pump - Hyd 50cc Gear with DTM04-3P 57”	1
34	308045	Fitting - .25 BSPP male x .25 JIC male	1
35	308044	Fitting - .50 BSPP male x .50 JIC male	2
36	34803	Fitting - 8-8 070221	1
37	34868	Fitting - 4-4 070221	1

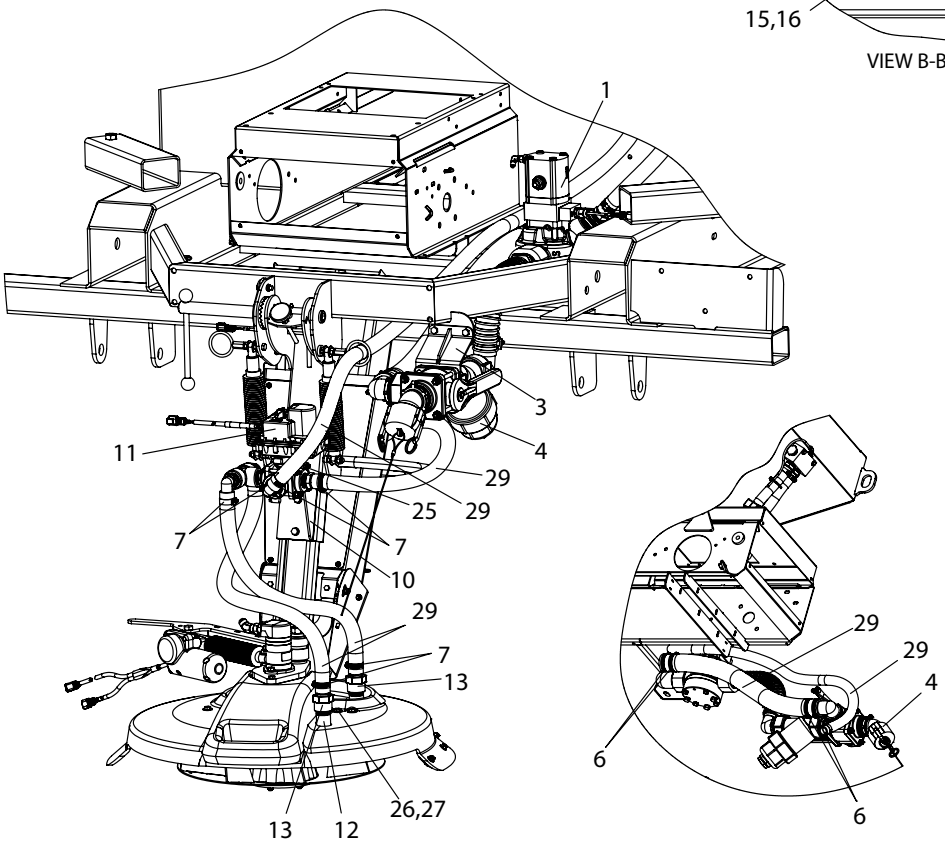




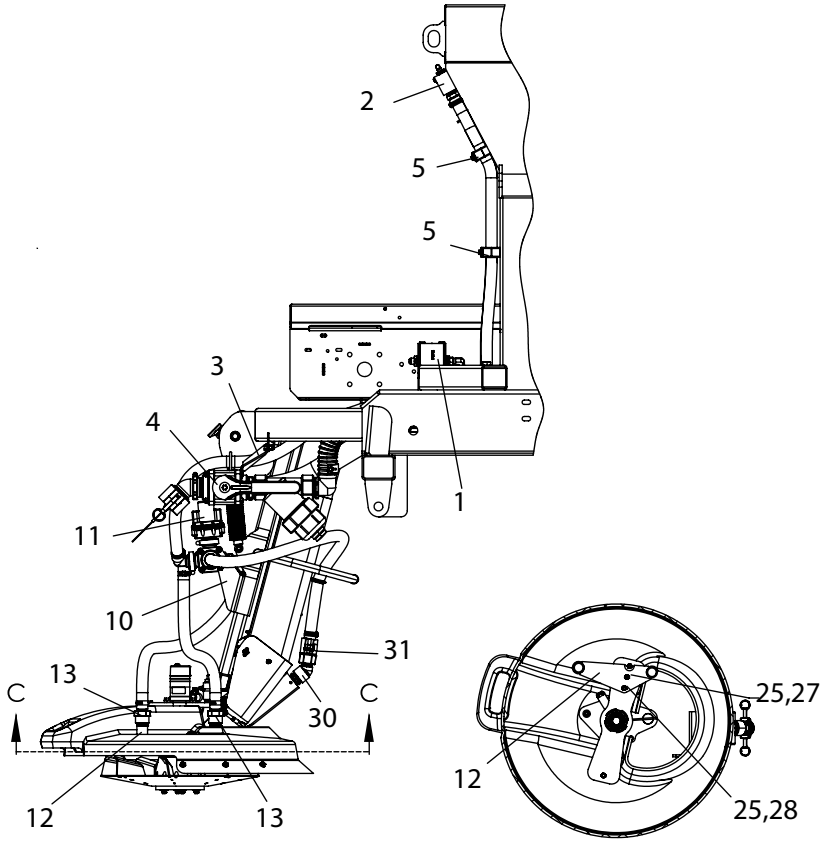
SECTION A-A



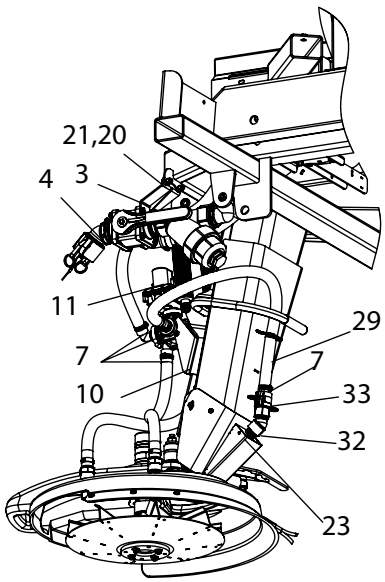
VIEW B-B



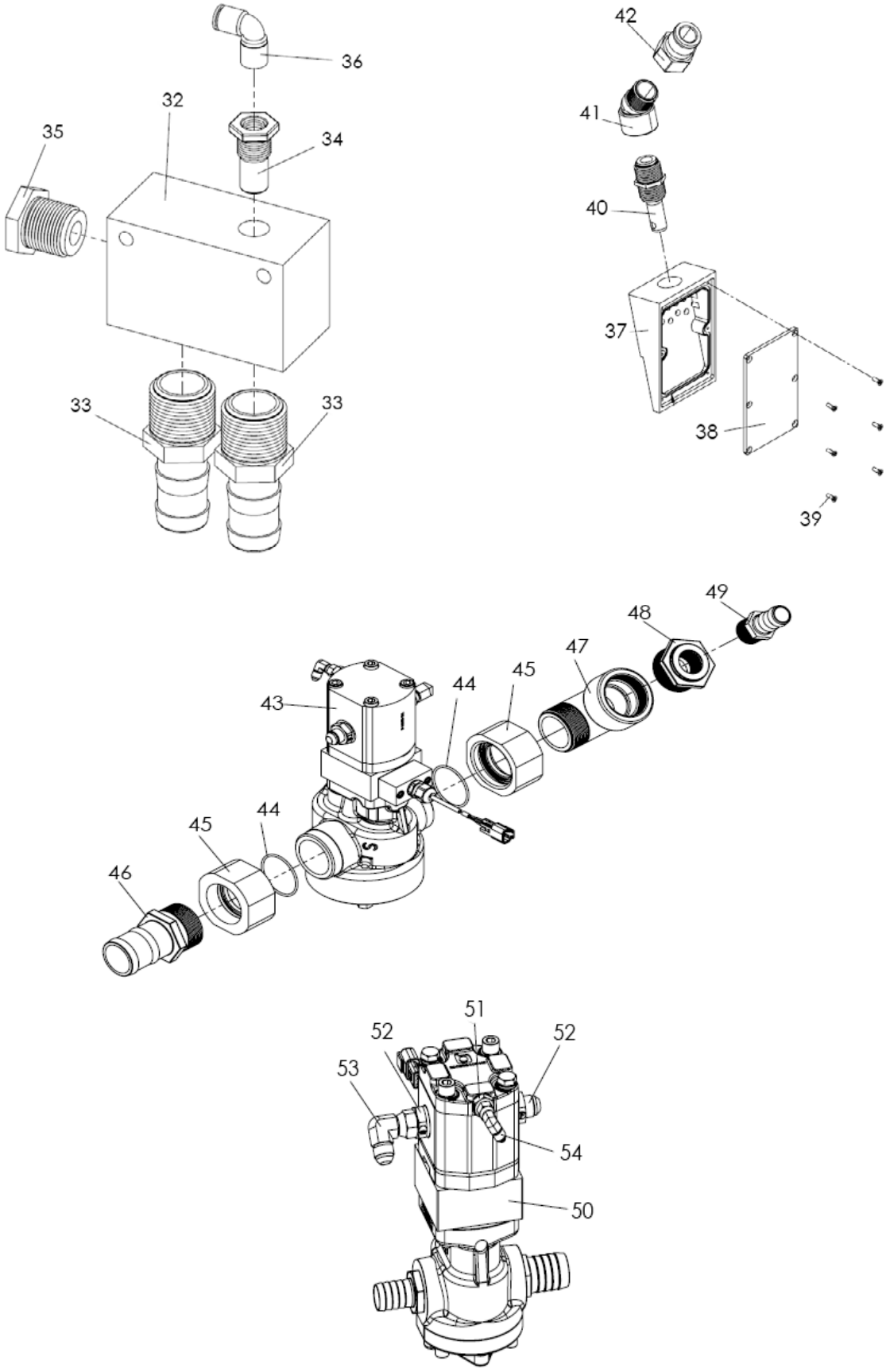
SELECTOR VALVE DETAIL



SECTION C-C



LIQUID DIFFUSER PLUMBING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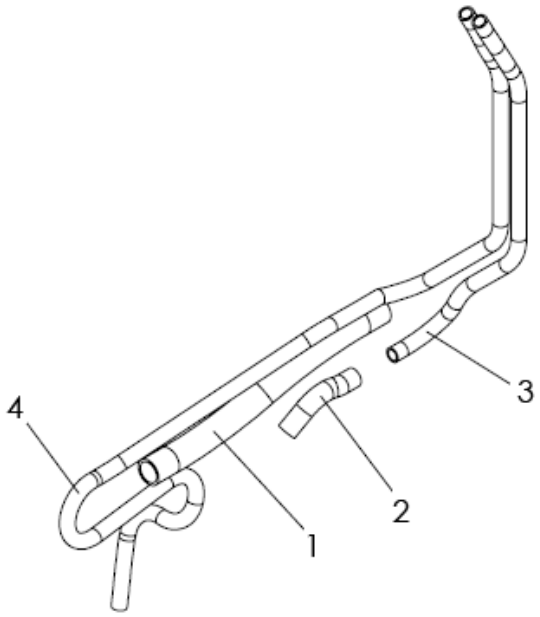
ITEM	PART NO.	DESCRIPTION	QTY
1	309939	Pump - Fitting Assy, includes items 43-49	1
2	308011	Manifold - Assy Anti-Siphon, includes item 32-36	1
3	309935	Mount - Valve 304	1
4	309937	Valve - Assy Fill/Pump poly, see *Fill/Pump Valve Assy High Volume* parts list	1
5	308033	Clamp - Tubing 1.33 Twin	2
6	308029	Clamp - Hose SAE 36 SS	4
7	308223	Clamp - Hose SAE 16 SS	10
8	9005-0-7761	Tubing - .25 air brake black	1 ft.
9	306836	Wire Tie - 11	1
10	309936	Bracket - Valve 304	1
11	309938	Valve - Assy 3 way motorized Poly, see *3 Way Valve Assy* parts list	1
12	309932	Bracket - Wldmt 304	1
13	309926	Fitting - Hose Barb 1.00 HOse x 1.00 FNPT Poly	2
14	308170	Clamp - 2 spiral double bolt	2
15	36421	Washer - Lock .438 SS	3
16	96921	Cap Screw - M10 x 20 SS	3
17	36423	Washer - Flat .25 SS	2
18	34501	Cap Screw - .25-20NC x 2.5 SS	2
19	42034	Nut - Lock .25-20NC SS	2
20	36398	Cap Screw - .375-16NC x 1 SS	2
21	72054	Nut - Lock .375-20NC SS	2
22	307395	Nut - Lock Thin .375-16NC SS	2
23	56315	Screw - Self drilling #6-20NC x .5 SS	2
24	96258	Cap Screw - .313-18NC x 3 SS	2
25	42221	Nut - Lock .313-18NC SS	6
26	36424	Washer - Flat .313 SS	1
27	36397	Cap Screw - .313-18NC x 1.25 SS	1
28	34580	Cap Screw - .313-18NC x 1 SS	1
29	309945	Hose - Group High Volume Liquid, see *Liquid System Hose Group High Volume* parts list	1
30	310678	Difusser - Assy, includes items 37-42	1
31	310675	Coupling - 1” female x 1” Hose poly	1
32	307970	Manifold - Anti-Siphon	1
33	307895	Fitting - Hose barb 1” hose x 1” MNPT poly	2
34	308012	Valve - Vacuum breaker .375 NPT SS	1
35	307901	Fitting - Plug .75 NPT hex Head poly	1
36	308222	Fitting - 4-4 630202K	1

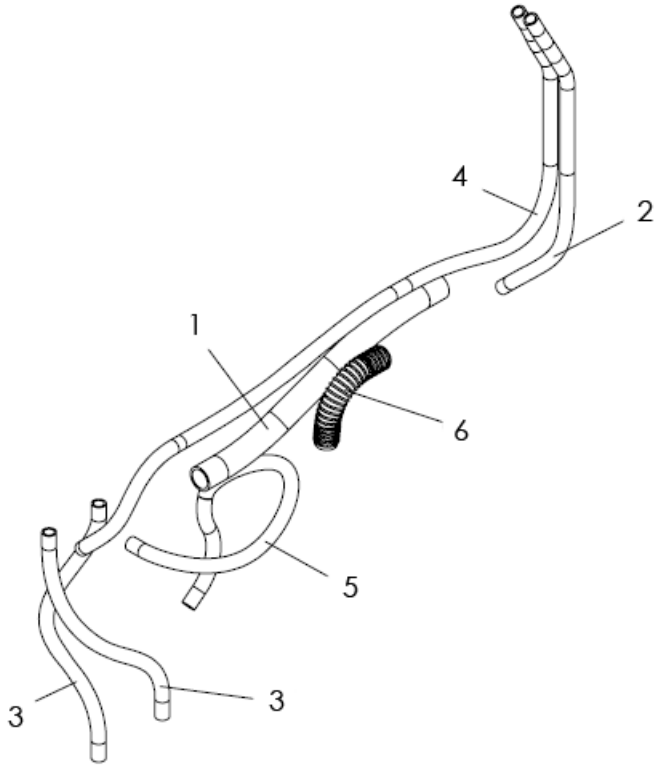
ITEM	PART NO.	DESCRIPTION	QTY
37	307948	Diffuser	1
38	307949	Cover - Diffuser	1
39	307947	Screw - Self-Tapping #8-15 x .5 SS	6
40	310677	Insert - Assy Diffuser	1
41	310673	Elbow - 90 deg 1” NPT poly	1
42	310674	Adapter - 1” male x 1” female MNPT poly	1
43	309914	Pump - Assy High Liquid, includes items 50-54	1
44	309916	O-Ring - 139	2
45	309915	Adapter - 2.25 BSPPF x 2 NPTF	2
46	308018	Fitting - Hose Barb 2” Hose x 2” MNPT poly	1
47	309921	Fitting - Street Elbow 2.00 NPT 90 deg poly	1
48	309922	Fitting - Bushing 2.00 MNPT x 1.00 FNPT poly	1
49	307895	Fitting - Hose barb 1” Hose x 1” MNPT poly	1
50	309913	Pump - Hyd 95cc gear with DTM04-3P 57”	1
51	308045	Fitting - .25 BSPP male x .25 JIC male	1
52	308044	Fitting - .50 BSPP male x .50 JIC male	2
53	34803	Fitting - 8-8 070221	1
54	34868	Fitting - 4-4 070221	1

LIQUID SYSTEM HOSE GROUP



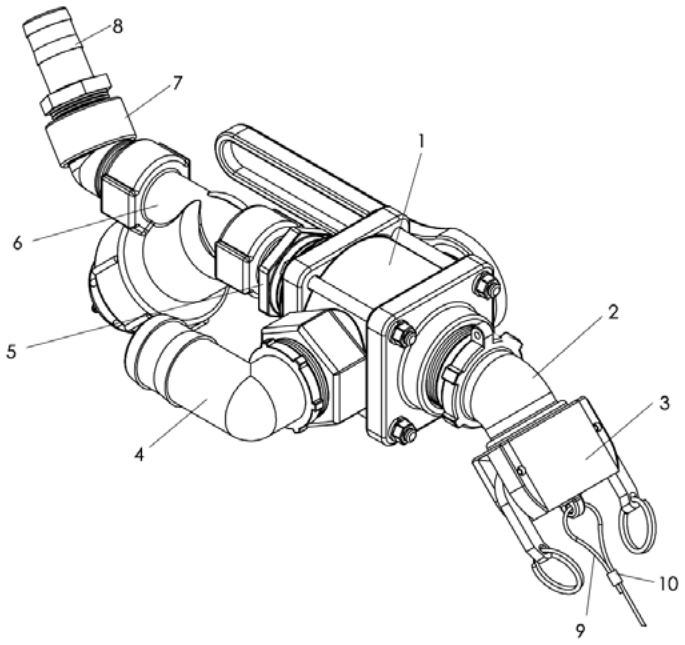
ITEM	PART NO.	DESCRIPTION	QTY
1	307905	Hose - 2” Vaccum/Transfer PVC	26 in.
2	307906	Hose - 1.25 Vaccum/Transfer PVC	9 in.
3	307907	Hose - 1” Vaccum/Transfer PVC	48 in.
4	307909	Hose - 1” EPDM Suction	120 in.

LIQUID SYSTEM HOSE GROUP HIGH VOLUME



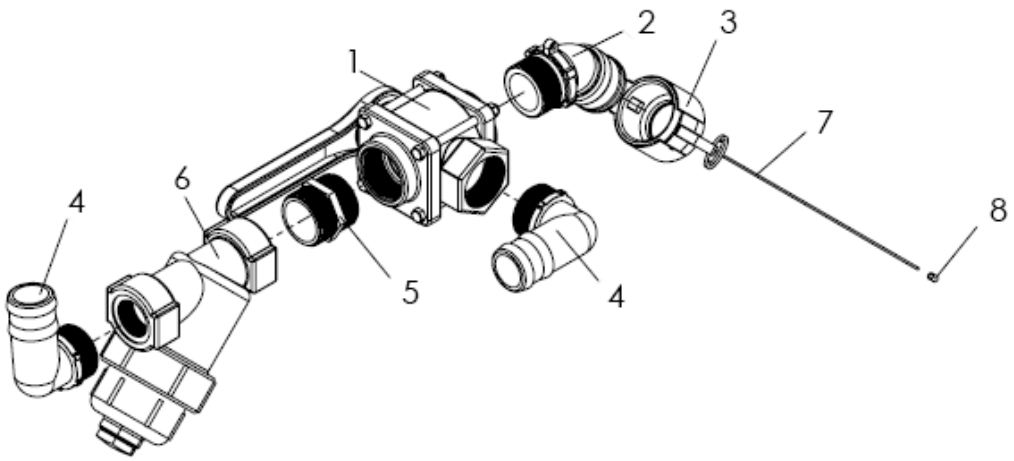
ITEM	PART NO.	DESCRIPTION	QTY
1	307905	Hose - 2” Vaccum/Transfer PVC	31 in.
2	307907	Hose - 1” Vaccum/Transfer PVC	42 in.
3	307907	Hose - 1” Vaccum/Transfer PVC	72 in.
4	307909	Hose - 1” EPDM Suction	100 in.
5	307909	Hose - 1” EPDM Suction	50 in.
6	308169	Hose - 2” PVC	12 in.

FILL/PUMP VALVE ASSY



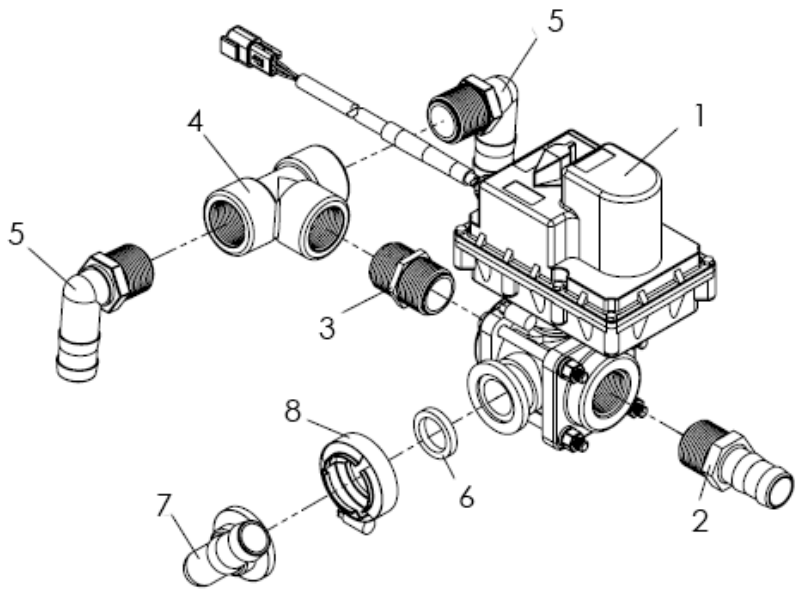
ITEM	PART NO.	DESCRIPTION	QTY
1	307911	Valve - 2” NPT 3-way poly	1
2	307912	Fitting - 2” camlock x 2” MNPT 45 deg	1
3	307913	Dust Cap - 2” camlock poly	1
4	307897	Fitting - Hose barb 90 deg 2” hose x 2” MNPT poly	1
5	307899	Fitting - Nipple reducing 2” NPT x 1.25 NPT poly	1
6	307910	Y Strainer - 1.25 NPT	1
7	308020	Fitting - Street elbow 1.25 NPT 45 deg poly	1
8	307896	Fitting - Hose barb 1.25 ose x 1.25 MNPT poly	1
9	308084	Cable - Coated	1
10	308085	Ferrule	2

FILL/PUMP VALVE ASSY HIGH VOLUME



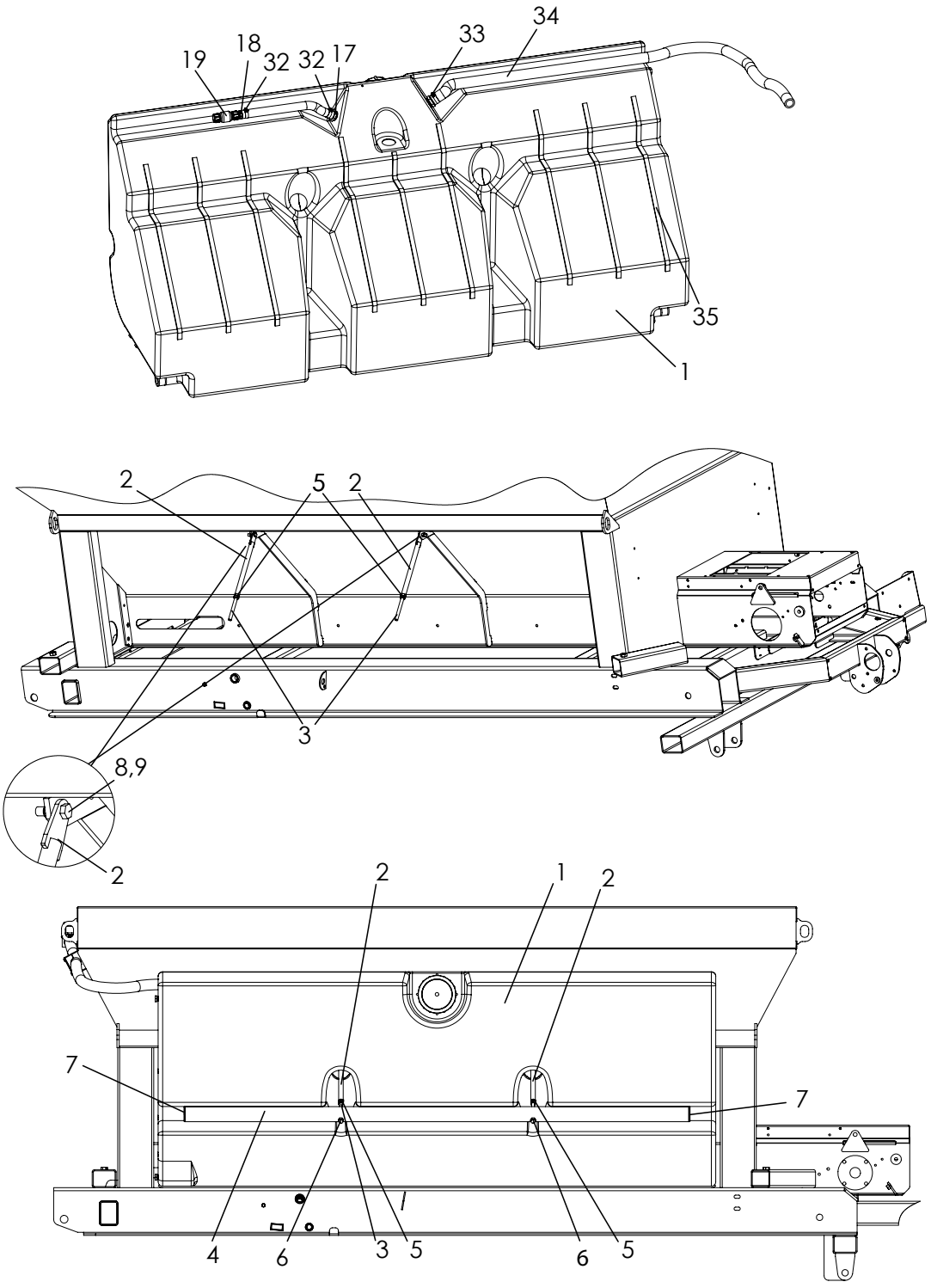
ITEM	PART NO.	DESCRIPTION	QTY
1	307911	Valve - 2” NPT 3-way poly	1
2	307912	Fitting - 2” camlock x 2” MNPT 45 deg	1
3	307913	Dust Cap - 2” camlock poly	1
4	307897	Fitting - Hose Barb 90 deg 2” hose x 2” MNPT poly	2
5	309920	Fitting - Nipple short 2.00 NPT poly	1
6	309919	Y Strainer - 2.00 NPT poly	1
7	308084	Cable - .094 x 24 coated	1
8	308085	Ferrule - .185 x .374	2

3 WAY VALVE ASSEMBLY

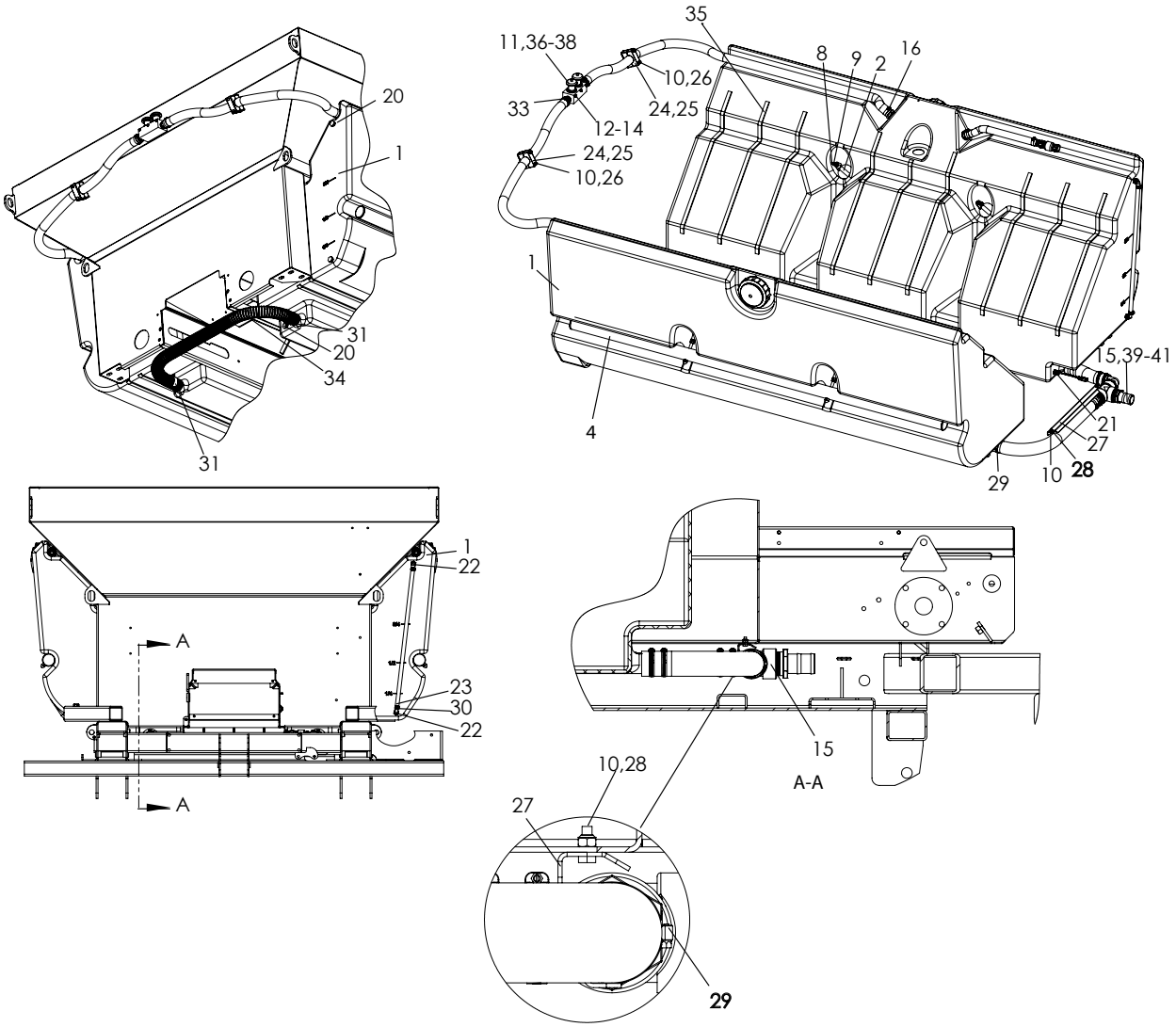


ITEM	PART NO.	DESCRIPTION	QTY
1	309918	Valve - 1” elec 3-Way with DTM04-3P	1
2	307895	Fitting - Hose Barb 1” hose x 1”MNPT poly	1
3	309923	Fitting - Nipple Short 1.00 NPT poly	1
4	309924	Fitting - Tee Poly 1.00 NPT poly	1
5	309925	Fitting - Hose Barb 90 deg 1.00 hose x 1.00 NPT poly	2
6	309929	Gasket - 1.00 flange EPDM	1
7	309927	Fitting - Hose Barb 90 deg 1.00 hose x 1.00 flange poly	1
8	309928	Clamp - Flange 1.00	1

LIQUID TANK GROUP



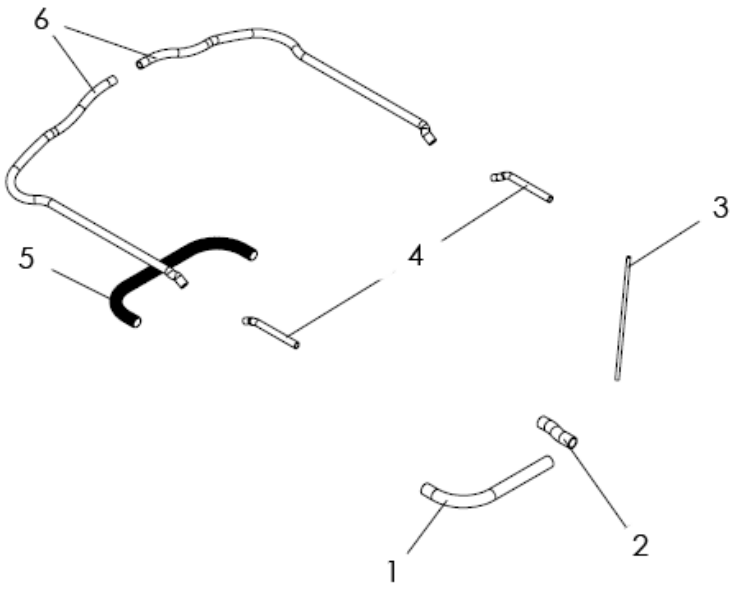
LIQUID TANK GROUP CONTINUED



ITEM	PART NO.	DESCRIPTION	QTY
1	307937	Tank - 232 Gal 10’	2
	307938	Tank - 292 Gal 12’	2
	307939	Tank - 350 Gal 14’	2
2	308005	Wldmt - Turn Buckle 304	AR
3	308008	Rod - Threaded .5-13NC x 6 SS	AR
4	308009	Tube - Tank Mount Galvanized (10’)	2
	312451	Tube - Tank Mount (10’)	2
	308316	Tube - Tank Mount Galvanized (12’)	2
	312452	Tube - Tank Mount (12’)	2
	308317	Tube - Tank Mount Galvanized (14’)	2
	312453	Tube - Tank Mount (14’)	2
5	36416	Nut - Hex .5-13NC SS	AR

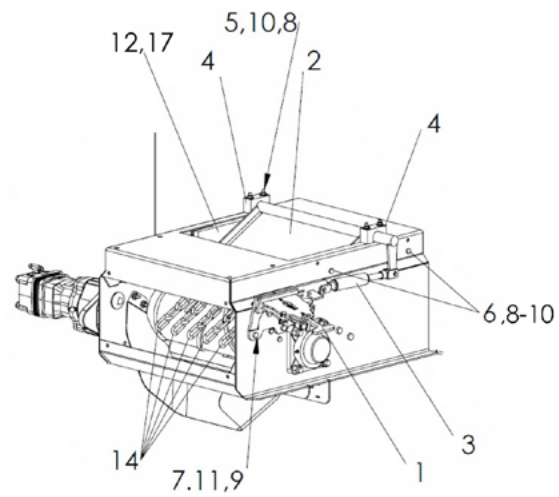
ITEM	PART NO.	DESCRIPTION	QTY
6	308010	Nut - Acorn .5-13NC SS	AR
	312454	Washer - Formed	AR
7	308024	Plug - Poly 2.5	4
8	36399	Cap Screw - .375-16NC x 1.25 SS	AR
9	72054	Nut - Lock .375-16NC SS	AR
10	42034	Nut - Lock .25-20NC SS	6
11	308014	Vent - Assy Tank poly, includes items 36-38	1
12	171052	Washer - Flat #10 SS	3
13	44398	Screw - Round Head #10-24NC x 3 SS	3
14	56355	Nut - Lock #10-24NC SS	3
15	308016	Tee - Assy 2” Poly, includes items 39-41	1
16	307896	Fitting - Hose Barb 1.25 hose x 1.25 MNPT poly	2
17	308021	Fitting - Hose Barb 1” hose x 1.25 MNPT poly	2
18	308022	Fitting - Hose Barb 1” hose x .75 MNPT poly	2
19	307922	Valve - Check 5 PSI .75 FNPT PVC	2
20	307902	Fitting - Plug .5 NPT Hex head poly	3
21	308183	Float Switch - .5 MNPT side mtg poly with DT04-2P	1
22	307898	Fitting - Hose barb 90 deg .t hose x .t MNPT poly	2
23	308023	Float - Ball poly	1
24	308165	Clamp Pair - 1.75” Tube	2
25	308164	Plate - Cover Clamp 1.75 OD Tube Hys SS	2
26	56396	Capscrew - .25-20NC x 3.25 SS	4
27	308051	Bracket - Hose 304	1
28	36393	Capscrew - .25-20NC x .75 SS	2
29	308029	Clamp - Hose SAE 36 SS	8
30	308027	Clamp - Hose SAE 8 SS	2
31	308028	Clamp - Hose SAE 24 SS	4
32	308223	Clamp - Hose SAE 16 SS	4
33	308170	Clamp - 2.00 Spiral Double bolt	2
34	308245	Group - Liquid Hose 10’	1
	308318	Group - Liquid Hose 12’	1
	308319	Group - Liquid Hose 14’	1
35	84280	Strip - Rubber	AR
36	307971	Manfold - Vent	1
37	307904	Vent - Labyrinth Air poly	2
38	308015	Fitting - Hose barb 1.25 x hose x 1” MNPT poly	2
39	308017	Fitting - TEE 2” FNPT poly	1
40	308018	Fitting - Hose barb 2” Hose x 2” MNPT poly	2
41	307897	Fitting - Hose barb 90 deg 2” hose x 2” MNPT poly	1

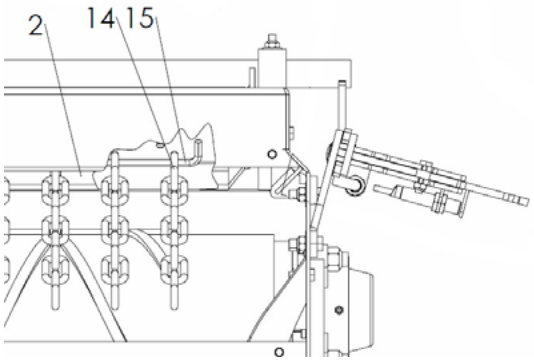
LIQUID TANK HOSE GROUP

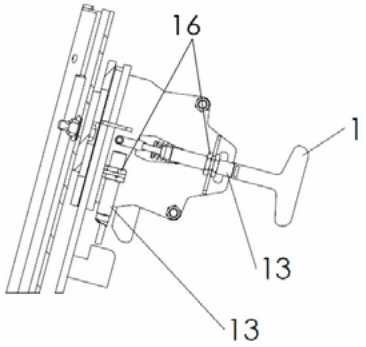


ITEM	PART NO.	DESCRIPTION	QTY
1	307905	Hose - 2” Vaccum/Transfer PVC	31.5 in.
2	307905	Hose - 2” Vaccum/Transfer PVC	9.8 in.
3	307908	Hose - .5” Clear PVC sight	29 in.
4	307907	Hose - 1” Vaccum/Transfer PVC	32.6 in.
5	308169	Hose - 2” Vaccum/Transfer PVC	48 in.
6	307906	Hose - 1.25” Vaccum/Transfer PVC (10’ unit)	170 in.
	307906	Hose - 1.25” Vaccum/Transfer PVC (12’ unit)	194 in.
	307906	Hose - 1.25” Vaccum/Transfer PVC (14’ unit)	218 in.

METERING GATE

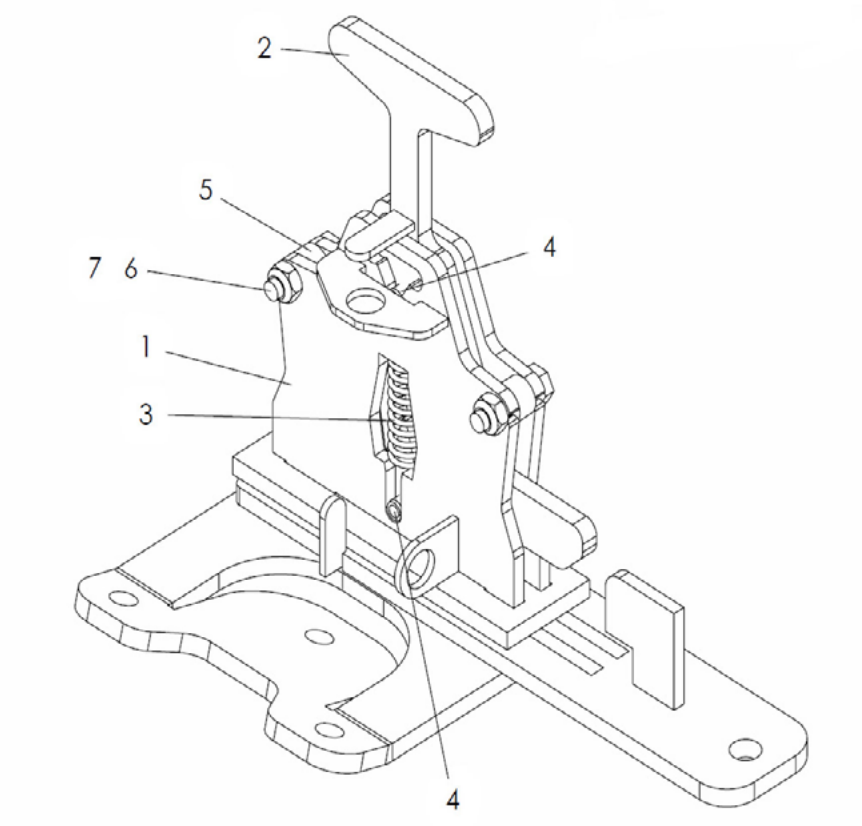




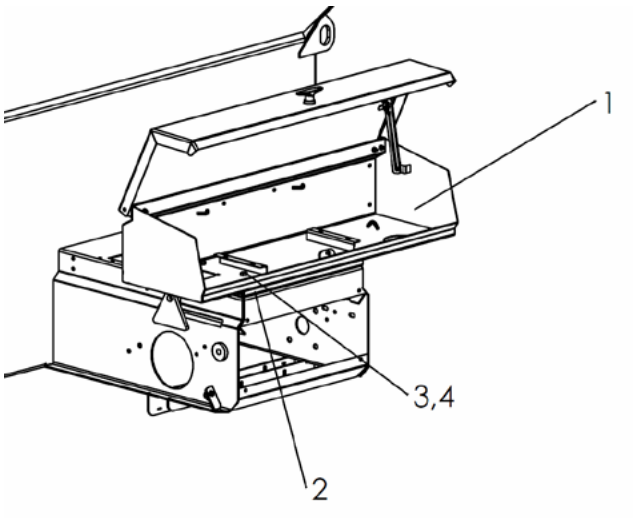


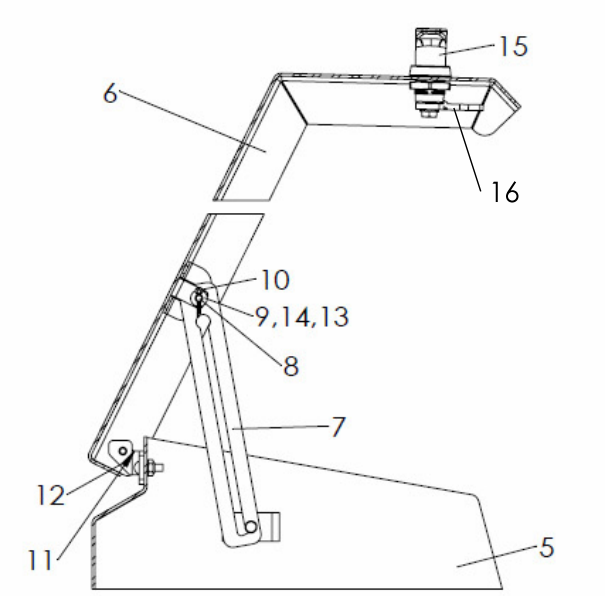
ITEM	PART NO.	DESCRIPTION	QTY
1	308094	Mechanism - Assy metering gate 304 * parts list on other page	1
2	308108	Gate - Wldmt Metering 304	1
3	308113	Spring - Gas	1
4	308116	Pivot - Bearing	2
5	308112	Cap Screw - .25-20NC x 2 SS	4
6	36395	Cap Screw - .25-20NC x 1 SS	4
7	34580	Cap Screw - .313-18NC x 1 SS	3
8	36423	Washer - Flat .25 SS	8
9	36424	Washer - Flat .313 SS	3
10	42034	Nut - Lock .25-20NC SS	8
11	42221	Nut - Lock .313-18NC SS	3
12	310670	Guide - Metering Gate RH	1
13	308175	Sensor - 12mm	2
14	308114	Chain - Straight link coil 5/0 9LK	5
15	308115	Bar - Retainer 304	1
16	308236	Washer - Star Internal	4
17	310671	Guide - Metering Gate LH	1

METERING GATE MECHANISM



ITEM	PART NO.	DESCRIPTION	QTY
1	308098	Plate - Wldmt metering gate mech 304	1
2	308095	Bolt - Wldmt metering gate 304	1
3	308081	Spring SS	1
4	308082	Pin - Roll . 25 x .625 SS	2
5	308107	Spacer - .281 ID x .290 304	2
6	40750	Cap Screw - .25-20NC x 1.25 SS	2
7	42034	Nut - Lock .25-20NC SS	2

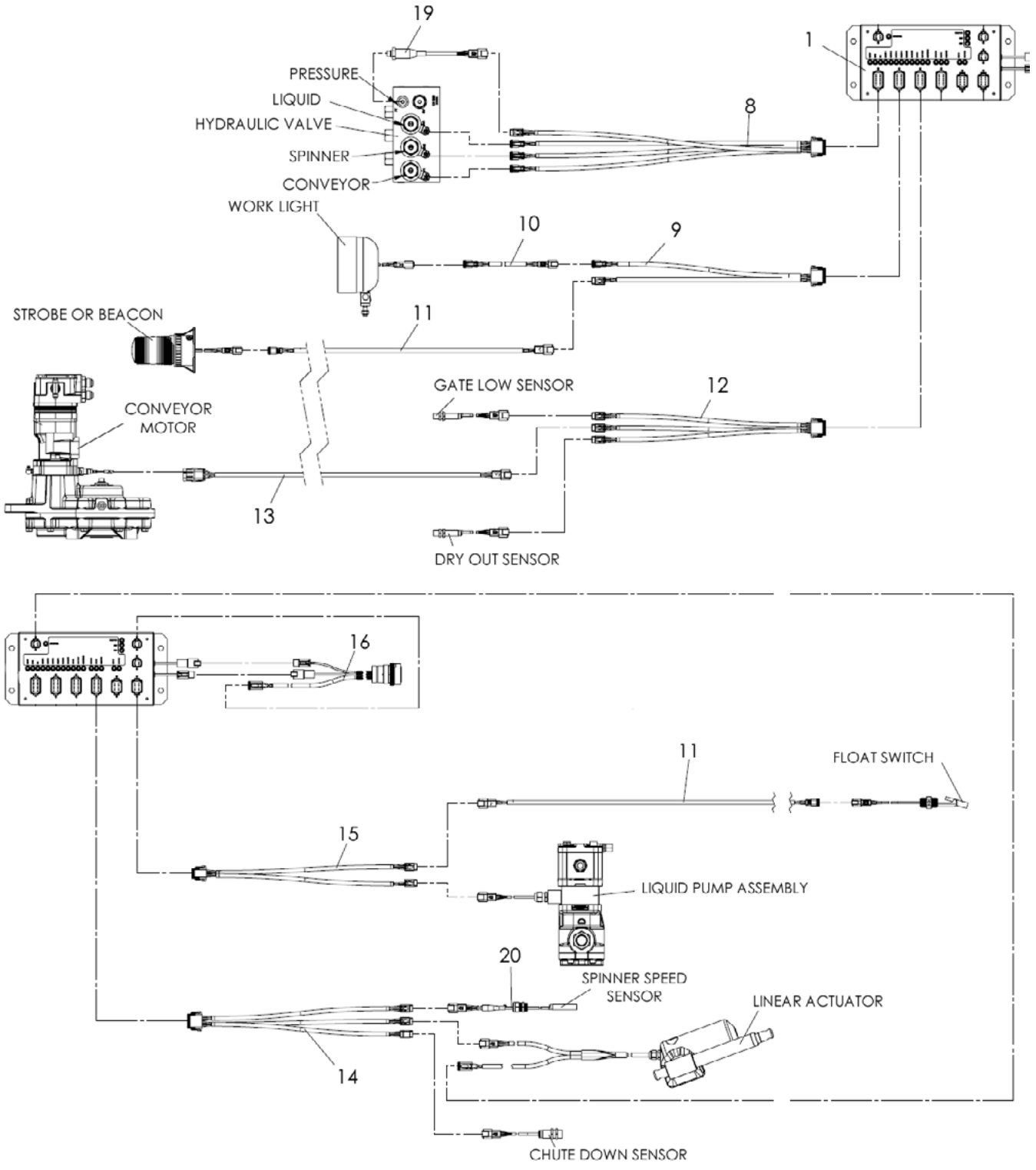


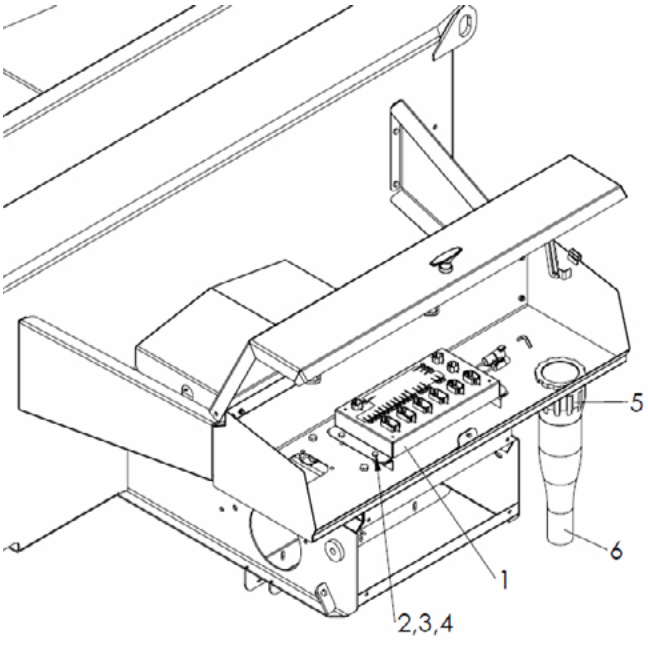


ITEM	PART NO.	DESCRIPTION	QTY
1	308130	Enclosure - Assembly includes items 5-17	1
2	308171	Mount - Enclosure 304	2
3	36293	Cap Screw - .375-16NC x .75 SS	8
4	72054	Nut - Lock .375-16NC SS	8
5	308131	Enclosure - Wldmt base 304	1
6	308138	Enclosure - Wldmt lid 304	1
7	308142	Stop - Lid 304	1
8	308137	Pin - Clevis .188 x .625 SS	1
9	171052	Washer - Flat #10 SS	5
10	76822	Pin - Cotter .094 x .5 SS	1
11	308141-AA	Hinge - LH 304	1
12	308141-AB	Hinge - RH 304	1
13	44453	Screw - Round head #10-24NC x .625 SS	4
14	56355	Nut - Lock #10-24NC SS	4
15	308144	Latch - Cam E5	1
16	308145	Hook - Cam E5	1
17	*308120	Seal - Strip	8.33’

* -- not shown

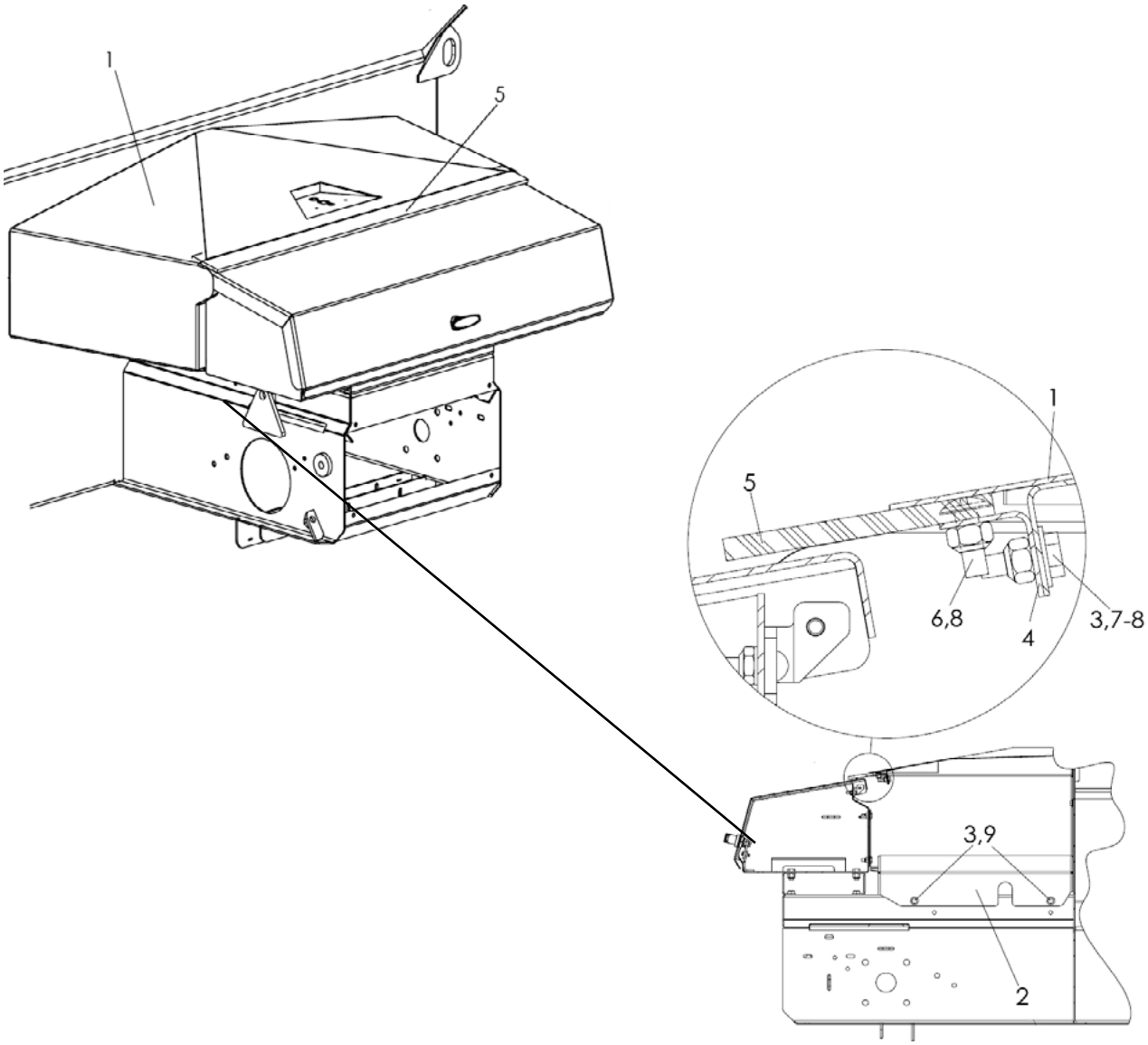
CONTROL ASSEMBLY



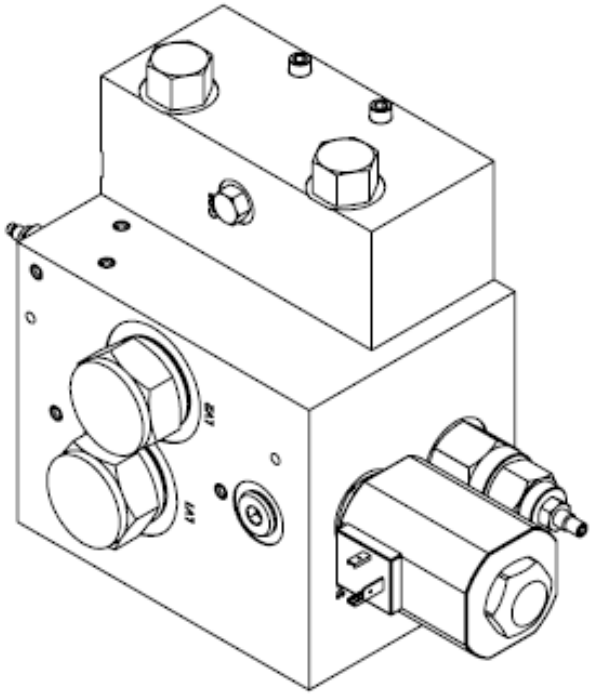


ITEM	PART NO.	DESCRIPTION	QTY
1	308143	Module	1
2	36393	Cap Screw - .25-20NC x .75 SS	4
3	36423	Washer - Flat .25 SS	4
4	42034	Nut - Lock .25-20NC SS	4
5	308121	Seal	1
6	308220	Abrasion Sleeve	1.2 ft
7	*4307	Clamp - Tubing .375	1
8	308172	Harness	1
9	308185	Harness	1
10	308186	Harness	1
11	308182	Harness	2
12	308173	Harness	1
13	308174	Harness	1
14	308176	Harness	1
15	308180	Harness	1
16	308184	Harness	1
17	*46168	Conduit - Flexible	4 ft
18	*308219	Conduit - Flexible	7.5 ft
19	308230	Transducer - Pressure	1
20	58728	Conduit - Corrugated	1.5 ft
21	*312708	Cable - ISOBUS Extension 12 ft	1

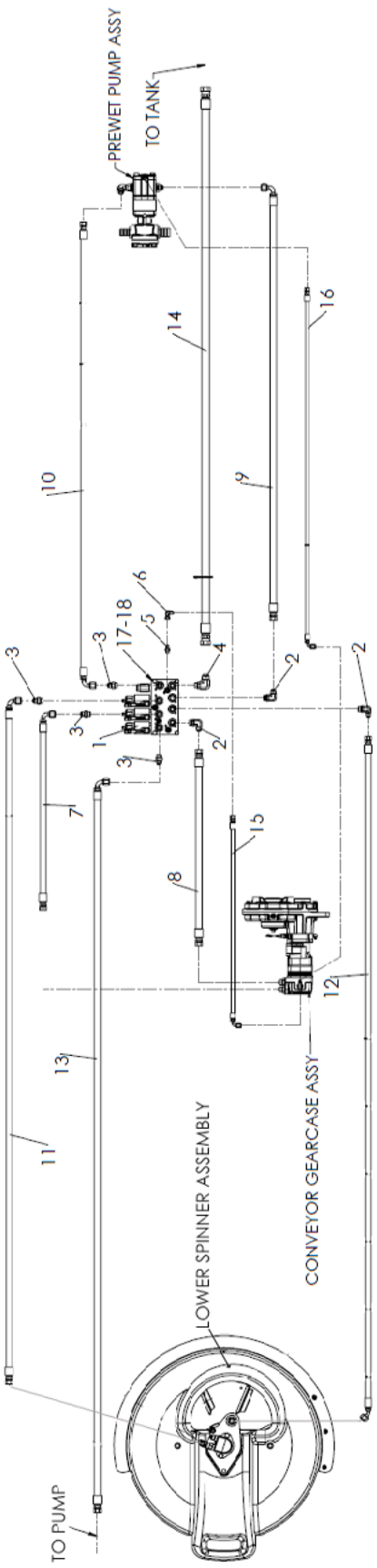
* -- not shown



ITEM	PART NO.	DESCRIPTION	QTY
1	308299	Cover - Wldmt Rear 304	1
2	308117	Cover - Metering Gate 304	1
3	36423	Washer - Flat .25 SS	16
4	308304	Angle 304	1
5	53251	Belt - .25 x 3 skirtboard	3 ft.
6	32446	Screw - Truss Head .25-20NC x .75 SS	7
7	36393	Cap Screw - .25-20NC x .75 SS	12
8	42034	Nut - lock .25-20NC SS	19
9	58799	Cap Screw - .25-20NC x .5 SS	4



ITEM	PART NO.	DESCRIPTION	QTY
1	308366	Valve - Hydraulic Flow Control	1


PREWET PUMP ASSY
TO TANK
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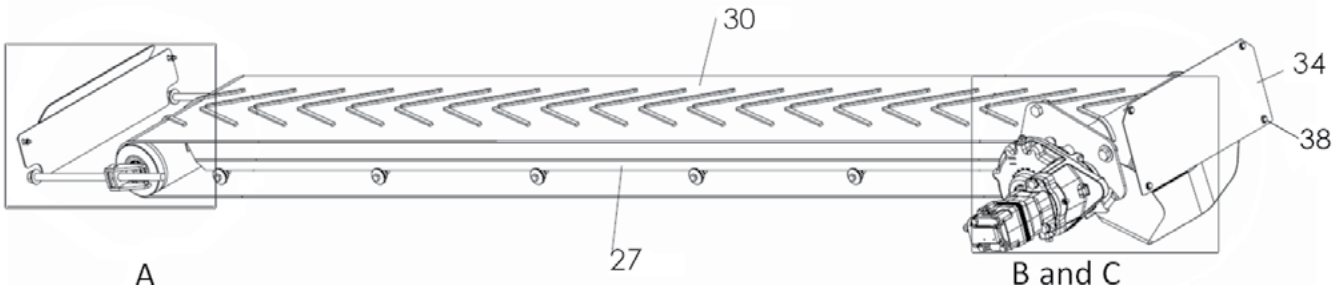
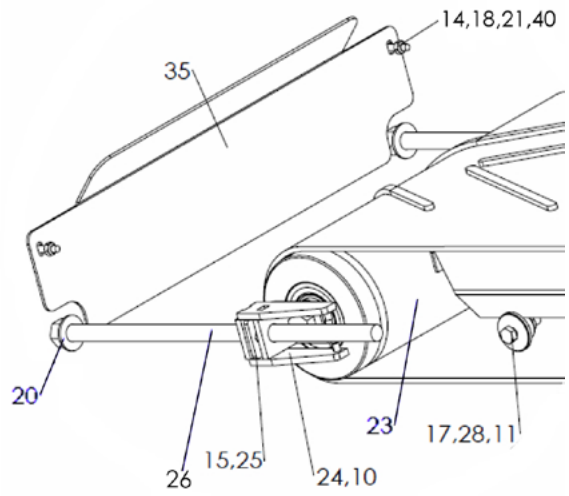
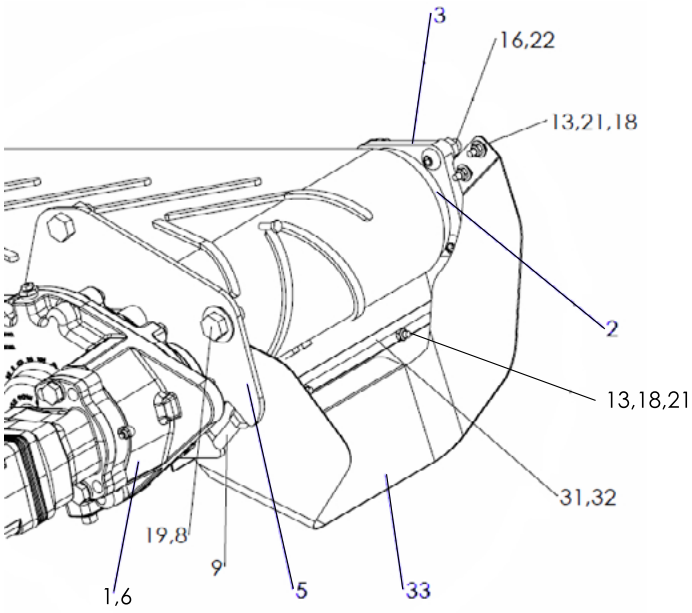
11
CONVEYOR GEARCASE ASSY
LOWER SPINNER ASSEMBLY
TO PUMP

ITEM	PART NO.	DESCRIPTION	QTY
1	307941	Valve - Hydraulic	1
2	34822	Fitting - 8-8 070220	3
3	29770	Fitting - 8-8 070120	4
4	308211	Fitting - 12-8 070220	1
5	29849	Fitting - 4-4 070120	1
6	34868	Fitting - 4-4 070221	1
7	308200	Hose - Assy .5 x 29 100	1
8	308201	Hose - Assy .5 x 29 100	1
9	308202	Hose - Assy .5 x 64 100	1
10	308203	Hose - Assy .5 x 68.5 100	1
11	308204	Hose - Assy .5 x 101 100	1
12	308205	Hose - Assy .5 x 101 100	1
13	308206	Hose - Assy .5 x 108 100	1
14	308207	Hose - Assy .75 x 108 100	1
15	308208	Hose - Assy .25 x 31 100	1
16	308209	Hose - Assy .25 x 53 100	1
17	308212	Cap Screw - .313-18NC x .5 SS	4
18	36419	Washer - Lock .313 SS	4

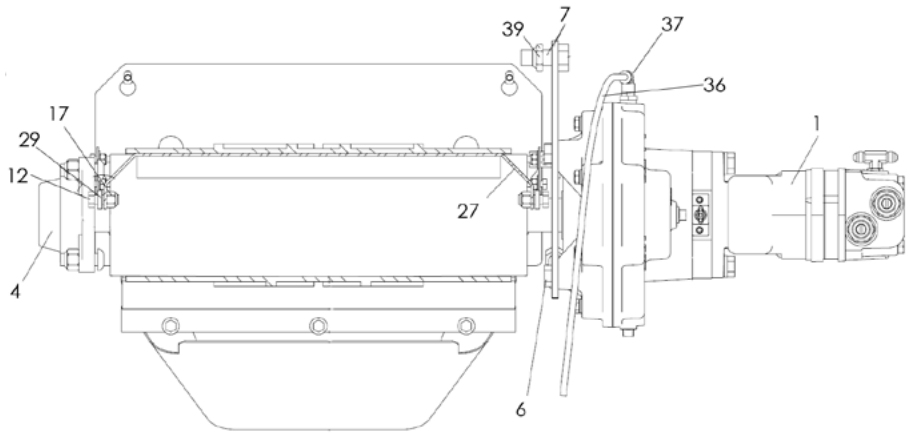




DETAIL A



DETAIL B



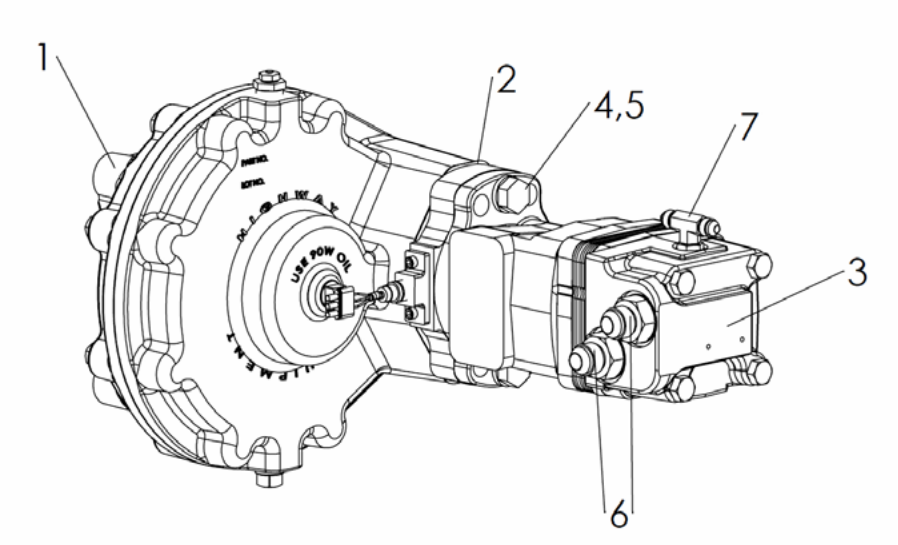
DETAIL C

ITEM	PART NO.	DESCRIPTION	QTY
1	307995	Gear Case - Assy Single Pinion 6:1 * parts list under “Gear Case”	1
2	307934	Roller - Drive Crowned	1
3	307958	Bearing - 4BF 1.375 Bore Composite	1
4	307981	Cap - Bearing Closed	1
5	307954	Mount - Gear Case 304	1
6	36401	Cap Screw - .5-13NC x 1 SS	4
7	307960	Cap Screw - .625-11NC x 1.5 SS	1
8	34857	Cap Screw - .625-11NC x 1.25 SS	1
9	307959	Cap Screw - .5-13NC x 1.75 SS Fully Threaded	1
10	308217	Cap Screw - .625-18NF x 1.75 SS	2
11	34858	Cap Screw - .375-16NC x 1.5 SS	AR
12	36398	Cap Screw - .375-16NC x 1 SS	2
13	36393	Cap Screw - .25-20NC x .75 SS	10
14	40750	Cap Screw - .25-20NC x 1.25 SS	2
15	36417	Nut - Hex .625-11NC SS	2
16	39016	Nut - Lock .5-13NC SS	4
17	72054	Nut - Lock .375-16NC SS	AR
18	42034	Nut - Lock .25-20NC SS	12
19	56857	Washer - Flat .625 SS	1
20	307977	Washer - Flat .625 SAE SS	2
21	36423	Washer - Flat .25 SS	14
22	304484	Screw - Buttonhead .5-13NC x 1.5	4
23	307933	Roller - Assy Idler * parts list under “Idler Assembly”	1
24	307962	Take-up - Wldmt 304	2
25	307966	Retainer - Nut 304	2
26	307991	Take-up - Wldmt Bolt	2
27	307989	Bottom - Panel 10’ 304	1
	308348	Bottom - Panel 12’ 304	1
	308349	Bottom - Panel 14’ 304	1
28	307990	Support - Bottom Panel 304	AR
29	307996	Spacer - .391 ID x 7GA 304	2
30	307762	Belt - Endless 240	1
	308350	Belt - Endless 288	1
	308351	Belt - Endless 336	1
31	307998	Holder - Brush 16” SS	2
32	307781	Brush - Strip	2

ITEM	PART NO.	DESCRIPTION	QTY
33	310672	Chute - Conveyor Coated 304	1
34	308128	Cover - Conveyor Rear 304	1
35	380127	Cover - Conveyor Front 304	1
36	9005-0-7761	Tubing - .25 OD Air Brake	1.5 ft.
37	306891	Fitting - 4-2 630202K	1
38	308239	Cap Screw - Flange .25-20NC x .75 SS	4
39	56288	Nut - Lock Thin .625-11NC SS	1
40	36412	Nut - Hex .25-20NC SS	2

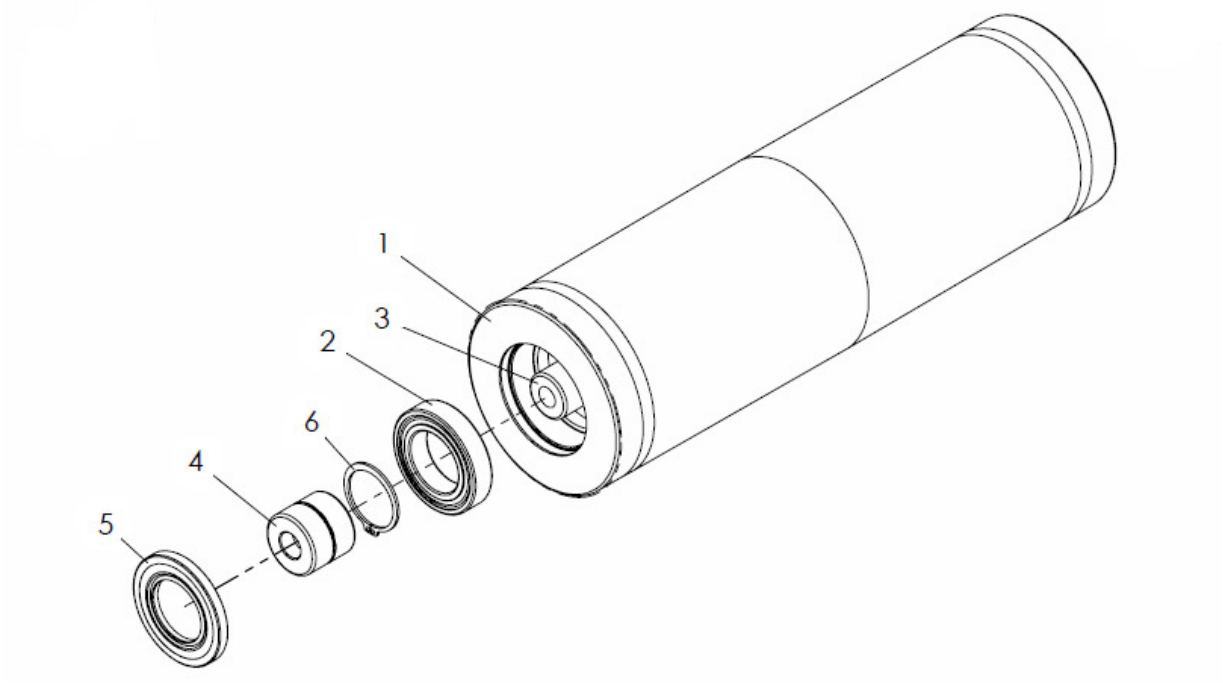
AR - As Required

GEAR CASE

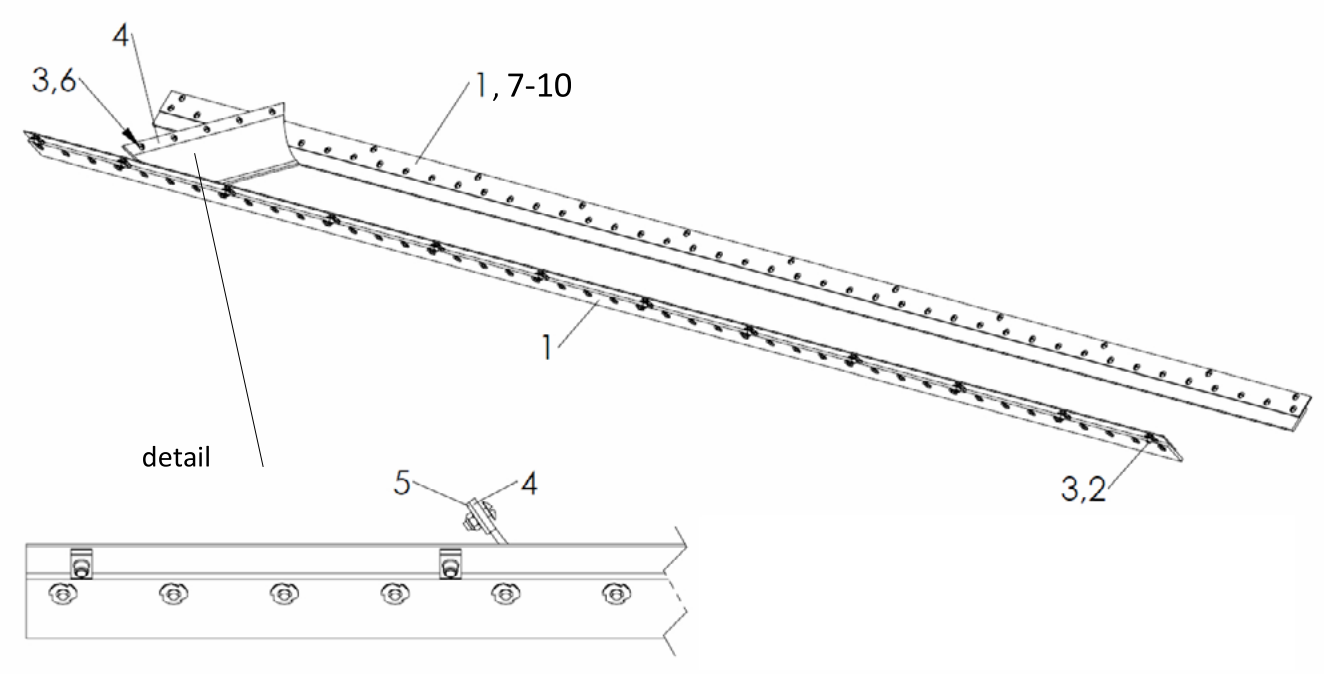


ITEM	PART NO.	DESCRIPTION	QTY
1	307943	Gear Case - 6:1 Single Pinion	1
2	74524	Gasket - SAE 101-2 (B)	1
3	307869	Motor - Hyd 4.6 CID	1
	56257	Speed - Sensor 3-Pin Weather Pack (Service Only)	
4	20132	Cap Screw - .5-13NC x 2.25	2
5	20714	Washer - Lock .5	2
6	29771	Fitting - 8-10 070120	2
7	34700	Fitting - 4-4-4 070429	1

IDLER

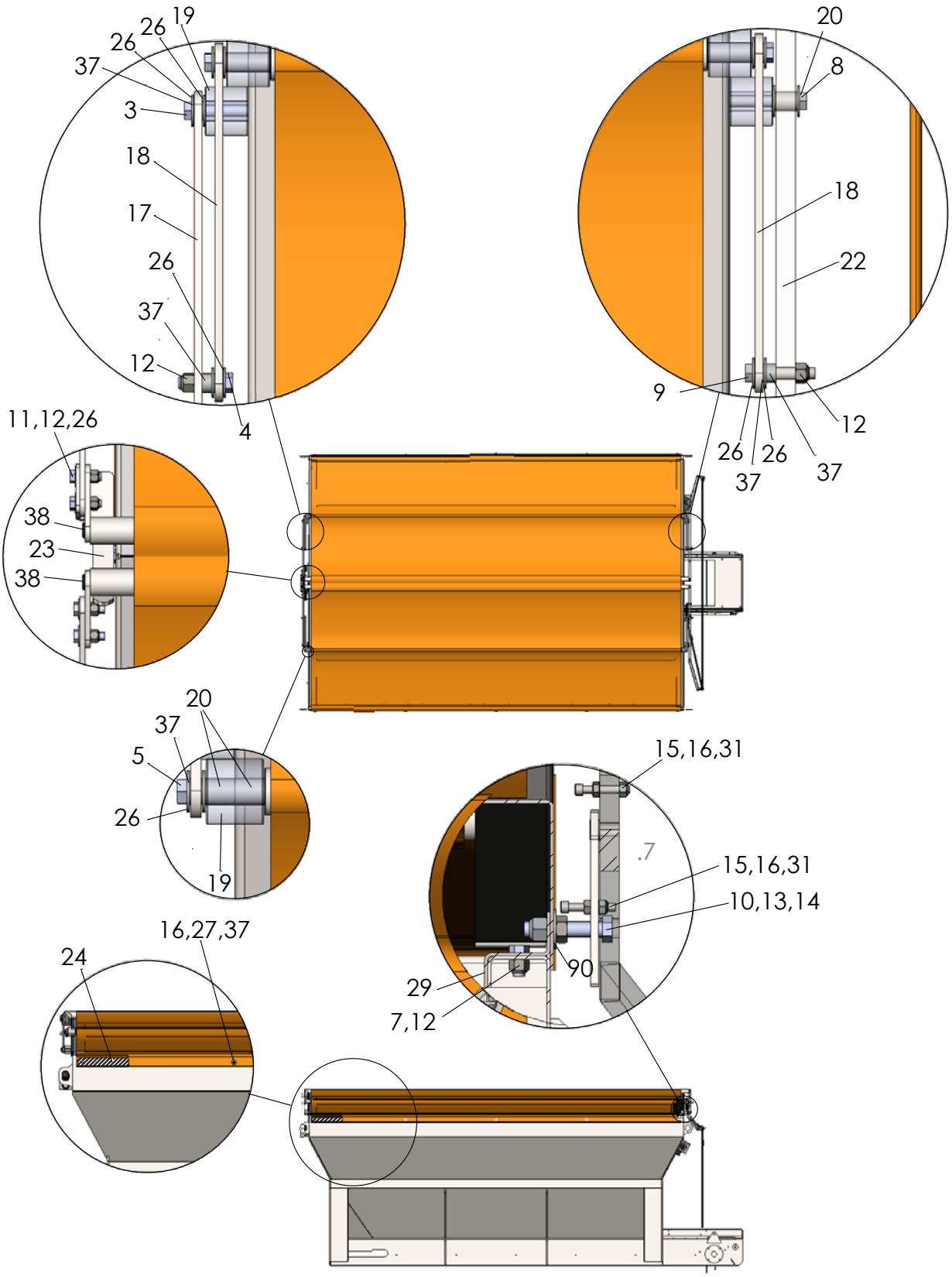


ITEM	PART NO.	DESCRIPTION	QTY
1	307750	Roller - Idler crowned SS	1
2	307928	Bearing - Ball 40mm	2
3	307929	Shaft - Idler	1
4	307930	Cap - Shaft retaining 304	2
5	307932	Seal - Shaft 40mm	2
6	307931	Ring - Snap external 40mm	2



ITEM	PART NO.		DESCRIPTION	QTY
	CS	304		
1	308123	308309	Shield - Chain Assy 10’ includes 7-10	2
	308354	308360	Shield - Chain Assy 12’ includes 7-10	2
	308355	308361	Shield - Chain Assy 14’ includes 7-10	2
2	300252	300252	U-Nut .25-20	AR
3	21378	32446	Screw - Truss Head .25-20NC x .75	AR
4	308125	308125	Belt - Wiper Front	1
5	308126	308311	Retainer - Belt	1
6	20676	42034	Nut - Lock .25-20NC	5
7	308124	308310	Shield - Chain 10’	2
	308356	308362	Shield - Chain 12’	2
	308357	308363	Shield - Chain 14’	2
8	53950	53950	Belting	AR
9	88931	88931	Nut - Tee .25 x .25	AR
10	20624	56258	Screw - Truss Head .25-20NC x .5	AR

AR - As Required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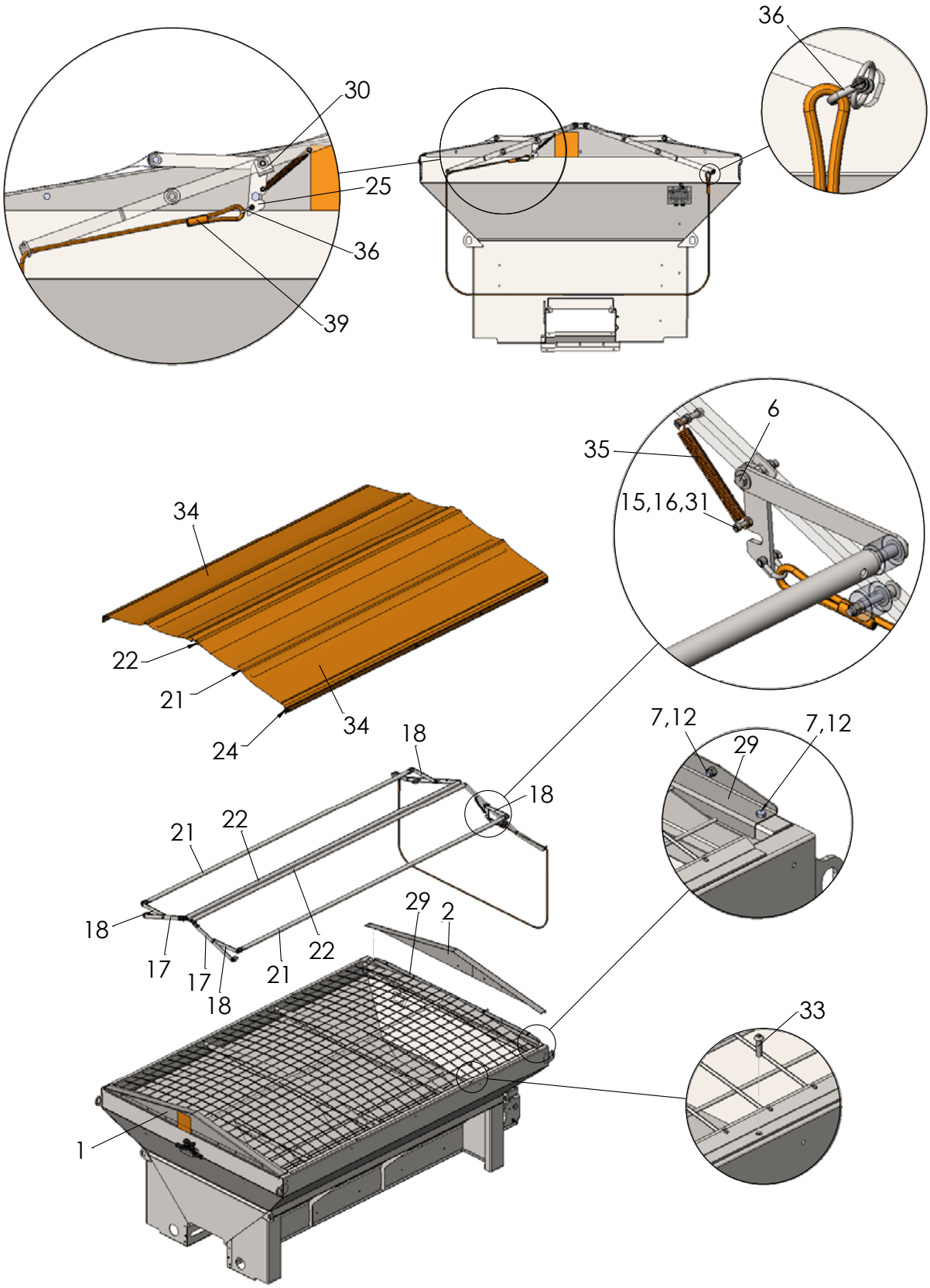
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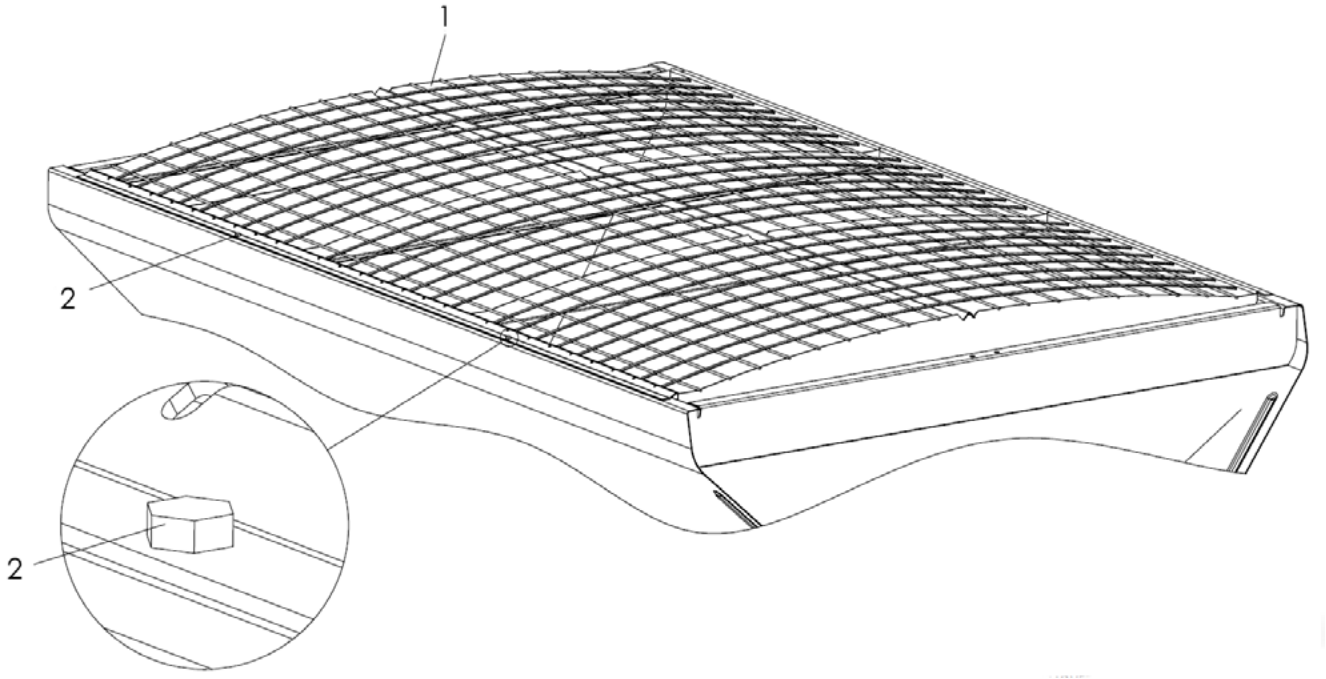
ITEM	PART NO.	DESCRIPTION	QTY
1	308407	Plate - Wldmt Tarp End Front 304	1
2	308408	Plate - Wldmt Tarp End Rear 304	1
3	36296	Cap Screw - .38-16NC x 2-3/4 SS	2
4	34858	Cap Screw - 3/8-16NC x 1-1/2 SS	2
5	36400	Cap Screw - 3/8-16NC x 2-1/2 SS	4
6	71828	Cap Screw - 3/8-16NC x 2-1/4 SS	1
7	36293	Cap Screw - 3/8-16NC x 3/4 SS	14
8	71827	Cap Screw - 3/8-16NC x 3 SS	2
9	34859	Cap Screw - 3/8-16NC x 2 SS	1
10	42454	Cap Screw - 1/2-13NC x 2-1/2 SS	1
11	36399	Cap Screw - 3/8-16NC x 1-1/4 SS	4
12	72054	Nut - Lock 3/8-16NC SS	26
13	36416	Nut - Hex 1/2-13NC SS	1
14	39016	Nut - Lock 1/2-13NC SS	1
15	42034	Nut - Lock 1/4-20NC SS	2
16	36412	Nut - Hex 1/4-20NC SS	12
17	309504	Linkage - Tarp Long Galvanized	2
18	309505	Linkage - Tarp Short Galvanized	4
19	308398	Roller - Tarp	8
20	308401	Spacer 304	10
21	309501	Pipe - Tarp Outer 10’ Galvanized	2
	309502	Pipe - Tarp Outer 12’ Galvanized	2
	305903	Pipe - Tarp Outer 14’ Galvanized	2
22	309498	Pipe - Tarp Inner 10’ Galvanized	2
	309499	Pipe - Tarp Inner 12’ Galvanized	2
	309500	Pipe - Tarp Inner 14’ Galvanized	2
23	309506	Lock - Tarp Front Galvanized	1
24	309508	Flat - Anchor Tarp 10’ Galvanized	2
	305909	Flat - Anchor Tarp 12’ Galvanized	2
	305910	Flat - Anchor Tarp 14’ Galvanized	2
25	309507	Lock - Tarp Rear Galvanized	1
26	36425	Washer - Flat 3/8 SS	29
27	21423-X1	Washer - Flat 1/4 Special SS	10
28	36426	Washer - Flat 1/2 SS	1
29	308404	Angle - Mounting Plate End 304	2
30	309497	Stop - Lock Galvanized	1
31	308047	Screw - Sockethead 1/4-20NC x 1-1/2 SS	2
32	42033	Screw - Truss Head 1/4-20NC x 1 SS	10

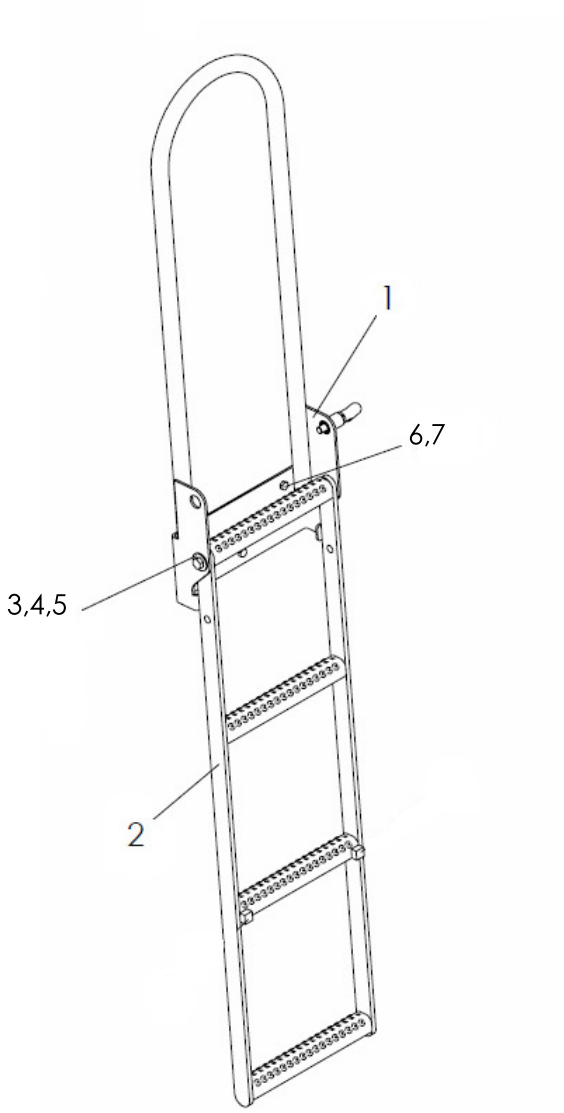
TARP CONTINUED

ITEM	PART NO.	DESCRIPTION	QTY
33	71772	Screw - Buttonhead 3/8-16NC x 1-1/4 SS	2
34	308409	Tarp - 10’	2
	308373	Tarp - 12’	2
	308422	Tarp - 14’	2
35	308411	Spring - SS	1
36	308412	D-Shackle - SS	2
37	88050	Spacer	14
38	308406	Plug - Plastic 3/4	4
39	308400	Rope - Tarp	1



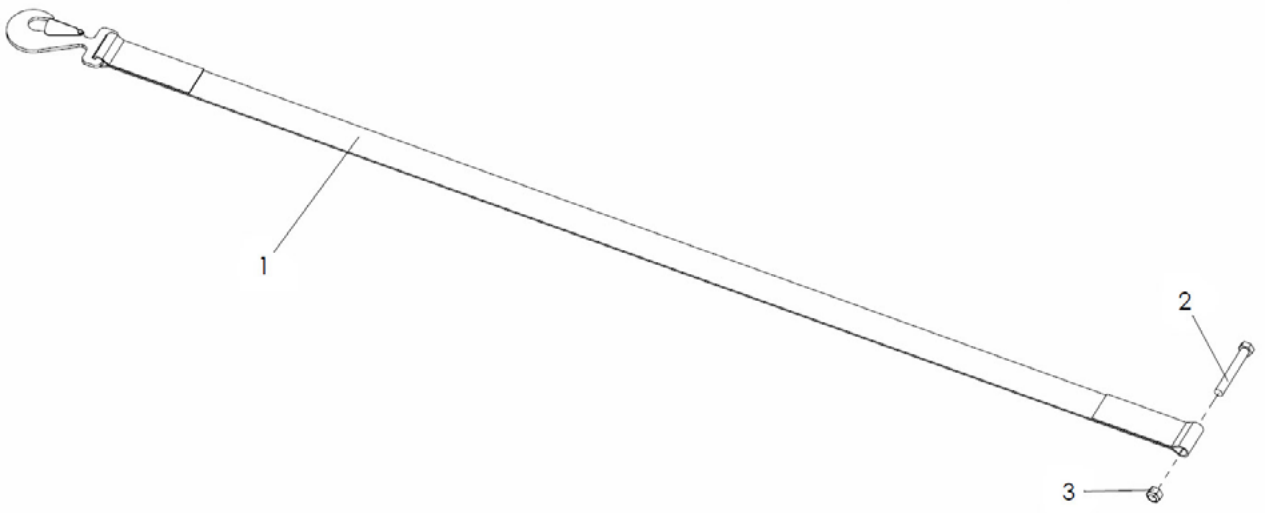
ITEM	PART NO.	DESCRIPTION	QTY
1	308228	Screen - 10’ x 82” Galvanized	1
	308324	Screen - 12’ x 82” Galvanized	1
	308325	Screen - 12’ x 82” Galvanized	1
2	36293	Cap Screw - .375-16NC x .75 SS	AR

AR - As Required



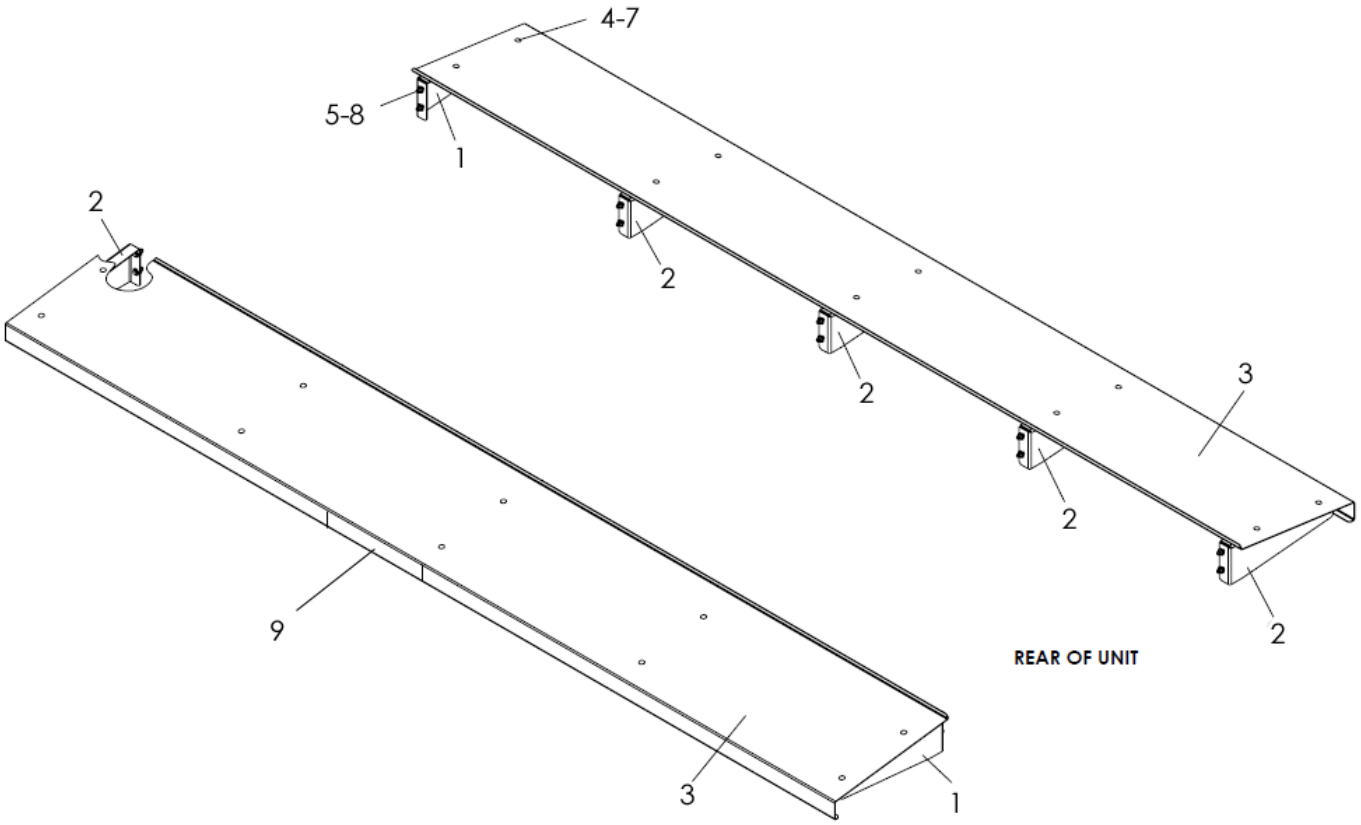
ITEM	PART NO.	DESCRIPTION	QTY
1	308153	Mount - Wldmt Ladder Inspection	1
2	308157	Ladder - Wldmt Inspection	1
3	20695	Washer - Flat .5	2
4	20129	Cap Screw - .5-13NC x 1.5	2
5	20680	Nut - Lock .5-13NC	2
6	20067	Cap Screw - .375-16NC x 1	3
7	20678	Nut - Lock .375-16NC	3

SAFETY STRAP

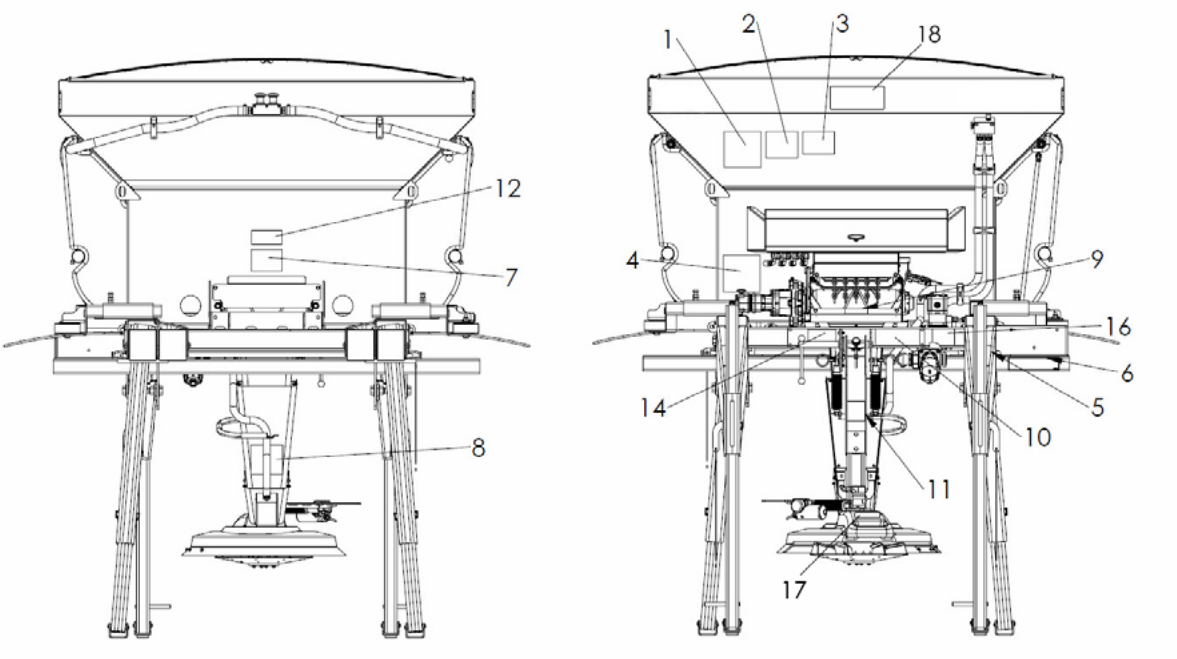


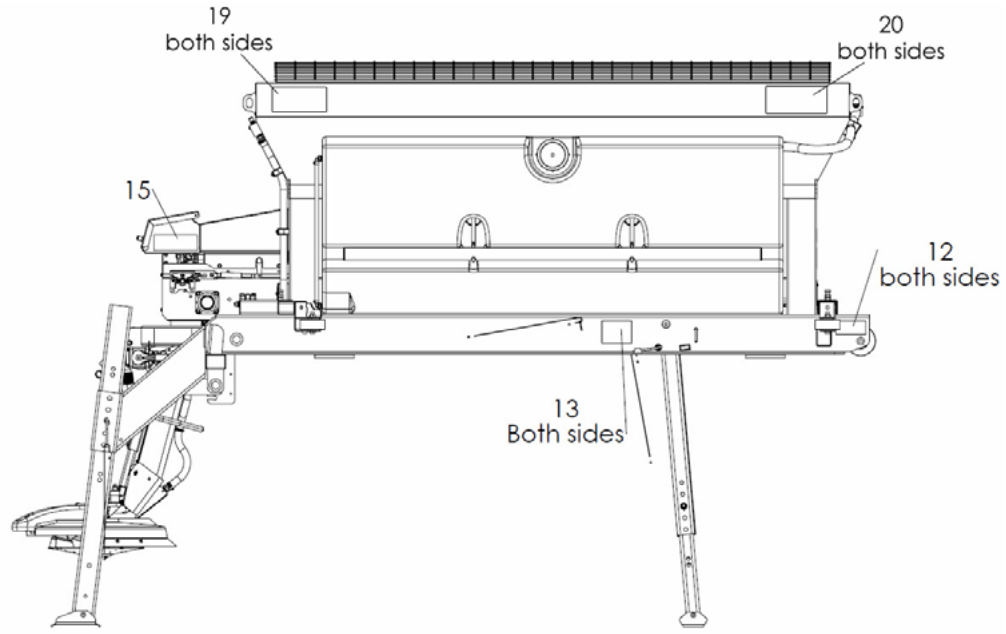
ITEM	PART NO.	DESCRIPTION	QTY
1	308090	Strap - Safety	1
2	20138-X1	Cap Screw - .5-13NC x 3.75	1
3	39016	Nut - Lock .5-13NC SS	1

FENDERS - 14' 100" WIDE



ITEM	PART NO.	DESCRIPTION	QTY
1	309470	Bracket - Fender RH 201	5
2	309471	Bracket - Fender LH 201	5
3	309469	Fender - panel 14' 201	2
4	36408	Bolt - Carriage 3/8-16NC x 1 SS	20
5	36425	Washer - Flat 3/8 SS	60
6	36420	Washer - Lock 3/8 SS	40
7	36414	Nut - Hex 3/8-16NC SS	40
8	36399	Cap Screw - 3/8-16NC x 1-1/4 SS	20
9	39200	Decal - Warning Slipping Hazard	2


12
7
8
1
2
3
18
4
9
16
6
14
5
10
11
17


19
both sides
20
both sides
15
12
both sides
1
13
Both sides

DECALS CONTINUED

ITEM	PART NO.	DESCRIPTION	QTY
1	150034	Decal - Caution Operation & Maint	1
2	364	Decal - Danger Moving Part	1
3	321	Decal - Caution Hazardous Material	1
4	39138	Decal - Warning High Pressure Fluid	1
5	39017	Decal - No Step	2
6	305274	Decal - Falling Hazard	1
7	55631	Decal - Warning Moving Part Hazard	1
8	71807	Decal - Warning Falling Spinner Hazard	1
9	308191	Decal - Guard is Missing	1
10	308192	Decal - Flying Material	1
11	308193	Decal - Falling Hazard	1
12	308194	Decal - Crushing Hazard	3
13	308195	Decal - Lock Leg (units equipped with storage legs)	2
14	308196	Decal - Read Manual	1
15	308197	Decal - Metering Gate Positions	1
16	308198	Decal - Liquid Valve Positions	1
17	308199	Decal - No Step	1
18	308306	Decal - HiWay/Xzalt	1
19	39870	Decal - HiWay Large	2
20	308305	Decal - Xzalt	2
21	*39200	Decal - Warning Slipping Hazard (Fenders)	2

* – Not Shown