



MODEL E2020XT

UNIT SERIAL NUMBER _____

MANUAL NUMBER: 97411-H

EFFECTIVE 10/2015



Highway Equipment Company

Building the best since 1939.

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Insert Current Hi-Way Warranty

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:



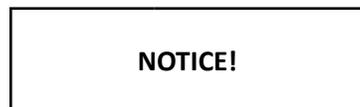
Indicates an imminently hazardous situation that, if not avoided, WILL result in death or serious injury. This signal word is to be limited to the most extreme situations and typically for machine components that, for functional purposes, cannot be guarded.



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.



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.



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.

SAFETY DECALS

! DANGER

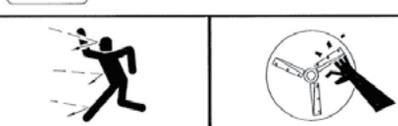


MOVING PART HAZARD
To prevent death or serious injury:

- 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



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.

368-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

! WARNING

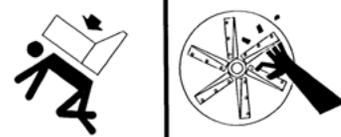


To prevent death or serious injury:

- Do not place objects on fenders.
- Keep off fenders. They are not intended to carry loads.

39200-D

! 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

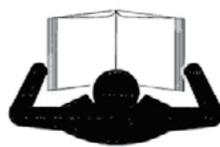


FALLING HAZARD
To prevent death, serious injury or machine damage:

- Do not stand or climb on guard.

55630-D

! 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

NOTICE

- Conveyor chain life will be noticeably extended by periodic lubrication.
- Use a 75% diesel fuel and 25% number 10 oil mixture on the links and rollers.
- Failure to keep the chain links loose and free running can result in severe damage to the conveyor chain, drag shaft, gear case, body structure, and is cause for voiding the warranty.

21476-D

! 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

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.

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 or 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.

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.



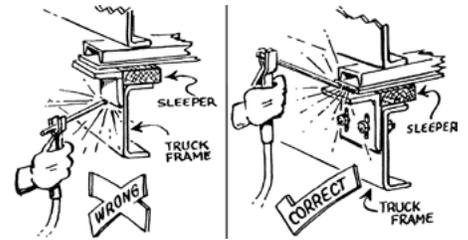
2. Follow mounting instructions in the Installation section of this manual. If mounting conditions require deviation from these instructions refer to factory.
3. When making the installation, be sure that the lighting meets Federal Motor Vehicle Safety Standard (FMVSS) No. 108, ASABE S279 and all applicable 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. W h e n 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

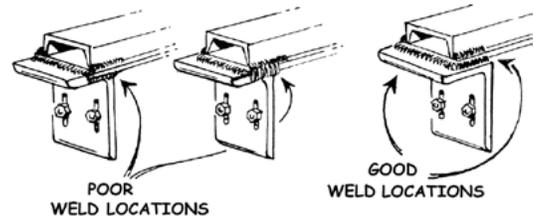
the cut, all necessary precautions should be taken to prevent fire. Cuts should not be made near fuel tanks and hydraulic oil reservoirs, fuel, brake, electric or hydraulic lines and such lines should be protected from flame, sparks or molten metal. Tires should be removed if there is any chance of their 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.

SAFETY

NOTES

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SAFETY



Refer to www.highwayequipment.com for installation instructions. Once on the website, click Customer support, then Other Hi-Way Manuals and Instructions, then V Box Deicing Spreader Installation Instructions.

The E2020XT is a hopper-type spreader intended for spreading abrasives and/or chemicals, primarily for ice and snow control. It is available for truck chassis or dump body mounting.

The unit is powered hydraulically. The standard control system is the "Series Type" providing independent, variable speed control for the spinner, with conveyor speed being a direct function of hydraulic pump speed. An optional manual dual pressure compensated valve type system provides independent, variable speed control for the spinner and conveyor.

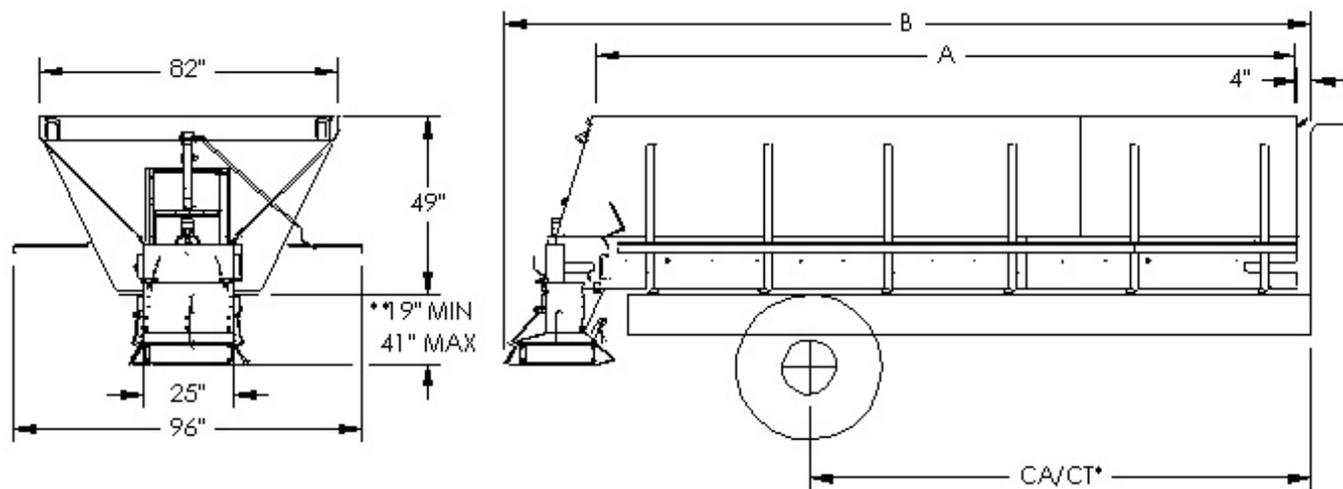
The conveyor runs the full length of the hopper bottom to deliver material to the spinner through an adjustable feedgate at the rear of the hopper body. Conveyors are:

1. No. 2 Type Roller or Pintle Chain – Cross-bars every other link.
2. No. 3 Type Roller Chain – Cross-bars every link.
3. No. 4 Type Belt-Over-Chain Conveyor with Roller or Pintle Chain.

Distributor spinner assembly has a twelve inch (12") (30.5cm) vertically adjustable height hopper with two (2) internal, adjustable deflectors and three (3) external adjustable baffles and a twenty inch (20") (50.8cm) diameter spinner with six formed, heat-treated replaceable fins.

This product is intended for commercial use only.

DIMENSIONS & CAPACITIES



A	B	CA/CT *			
INSIDE BODY LENGTH feet (m)	OVERALL LENGTH inches (cm)	TRUCK CAB TO AXLE/ TANDEM DIMENSION inches (cm)	STRUCK CAPACITY cubic yards (cu m)	CAPACITY ROUNDED 3:1 Slope cubic yards (cu m)	SPREADER WEIGHT*** pounds (kg)
9 (2.7)	138 (350.5)	72 (182.9) CA	4.65 (5.1)	5.49 (6)	1920 (870.9)
10 (3)	150 (381)	84 (213.4) CA	5.21 (5.7)	6.18 (6.8)	2020 (916.3)
11 (3.4)	162 (411.5)	84 (213.4) CA	5.77 (6.3)	6.87 (7.5)	2150 (975.2)
12 (3.7)	174 (442)	102 (259.1) CA	6.33 (6.9)	7.56 (8.3)	2385 (1081.8)
13 (4)	186 (472.4)	102 (259.1) CA / 108 (274.3) CT	6.89 (7.5)	8.25 (9)	2535 (1149.9)
14 (4.3)	198 (503)	120 (304.8) CT	7.45 (8.2)	8.94 (9.8)	2675 (1213.4)
15 (4.6)	210 (533.4)	130 (330.2) CT	8.01 (8.7)	9.63 (10.5)	2825 (1281.4)
16 (4.9)	222 (563.9)	138 (350.5) CT	8.57 (9.4)	10.32 (11.3)	2975 (1349.4)

***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.

** Spinner height ranges depending on type of spinner installed.

*** Spreader weight does not include spinner or any optional features.

Check over entire unit to be sure all guards and fasteners are in place and fasteners are properly tightened per *Standard Torques National Coarse (NC) Cap Screws* in this manual.

DIMENSIONS & CAPACITIES

Prior to testing the unit, check the position of the ON-OFF control in the cab. It should be in the OFF position. Do not load the hopper.

1. Check to be sure that no loose parts or other material are in body, on spinner hopper or on spinner disk.
2. Raise feedgate until it is completely clear of conveyor.
3. Fill the hydraulic tank with oil. Refer to the *Lubricant and Hydraulic Oil Specifications* section for proper oil. Check to make sure that the gate valve under the reservoir is fully open (rotate counter-clockwise to open).
4. If crankshaft PTO transmission has been installed, be sure transmission has proper amount of lubricant.
5. Start engine. Engage PTO or actuate electric clutch switch (if applicable). Let the engine run at approximately 1000 RPM for a few minutes, allowing the oil to circulate through the pump and back to the reservoir. In cold weather, allow greater warm-up time.



DANGER Stay clear of moving machinery.

6. Place the cab ON-OFF control in ON position and open the spinner control approximately one quarter (Position 3). Let the unit run until the air is expelled from the circuit and the spinner is running smoothly. Turn the spinner knob to the OFF position.
7. Open the conveyor knob approximately one quarter (Position 3) on the valve. Let the unit run for a few minutes until the conveyor is running smoothly.
8. Check all connections in the hydraulic system to make sure that there are no leaks.
9. Check hydraulic oil reservoir and refill to maintain level around mid-point of sight gauge. Unit is now ready for road testing.



DANGER

Do not check leaks with hands while system is operating as high pressure 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 with 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 hydraulic leaks adjacent to moving parts while system is operating as there may be danger of entanglement!

Before taking unit out to use, make a “walk-around” inspection to ensure that spreader is not damaged, that all essential parts are in place and that all fasteners are tight and all guards are in place. Check all controls to be sure that they are operating satisfactorily.

If material to be spread is not already in spreader, have the unit loaded. With ON-OFF control in OFF position, engage pump drive and allow oil to circulate until it is warm (this may be done while traveling to loading or starting point). The colder the weather, the more important this “warm-up.”

All spinner speed, flow deflector and baffle adjustments must be made with ON-OFF control in OFF position to stop spinner and conveyor to avoid injury from spinner and/or discharging material.

Set variable speed spinner control to obtain spread width desired. Since spread width is affected by spinner speed, spinner height, flow deflector settings, baffle positions, as well as material granule size, density and moisture content; proper settings are gained by trial and experience.

Spinner speed selected should be the lowest required to obtain the desired spread width with the material being spread. Use of high spinner speeds and attempting to control spread width by means of the external baffles will increase wear and tear on parts and create excessive damage to vehicle finishes through uncontrolled throw and bounce of materials. It will also degrade materials being spread by causing unnecessary particle break-up and waste material.

To increase spread to one side, raise the exterior baffle on that side. Raise (swing inward) the interior flow deflector on that side to direct material away from the direction of spread increase. Lower (swing downward) the interior flow deflector on the opposite side to allow material to fall on the side of the spinner away from the direction of the desired spread.

Determination of the volume of the material spread in cubic feet per mile (per inch of metering gate opening) depends upon the hydraulic system with which the spreader is equipped.

NOTE: Close feedgate before loading spreader and when traveling to point where spreading is to be done. Open feedgate before starting to spread.

In order to determine the spread rates for a particular truck, the following information is needed to perform the required calculations:

1. Calculations require accurate and complete information.
 - a. PTO Data
 1. PTO percentage of engine RPM.
 2. For calculations, PTO percentage of electric clutch drive will be 100%.
 - b. Transmission gear ratios.
 - c. Rear Axle Ratio. If two speed, determine both ratios.
 - d. Auxiliary transmission (if so equipped) gear ratios.
 - e. Rear tire size and type. From tire size and type, tire revolutions per mile may be obtained from a tire manual or tire distributor. The following lists some typical values:

HIGHWAY TIRES		
Tube Type	Tubeless Type	Tire Revolutions Per Mile
8.25 x 20	9.00 x 22.5	543
9.00 x 20	10.00 x 22.5	523
10.00 x 20	11.00 x 22.5	507
11.00 x 20		492
10.00 x 22	11.00 x 24.5	488

- f. Type of spreader conveyor.
- g. Displacement of pump in cubic inches per revolution.

2. Spread Rate Calculations:

From the data obtained above (1), the spread rate in cubic feet of material per mile per inch of feedgate opening will be:

$$Y = \frac{\text{PTO} \times \text{TR} \times \text{RA} \times \text{AUX} \times \text{TRM} \times \text{CFR} \times \text{PD}}{16665}$$

- Where:
- Y = Yield in cubic feet per mile per inch.
 - PTO = Power Take Off percentage.
 - TR = Transmission gear Ratio.
 - RA = Rear Axle ratio.
 - AUX = Auxiliary transmission gear ratio.
 - TRM = Tire Revolutions per Mile.
 - CFR = Cubic Feet per Revolution delivered by conveyor.
 - = .192 for #2 or #4 conveyor
 - = .237 for #5 conveyor
 - PD = Pump Displacement in cubic inches per revolution.

If the vehicle has no auxiliary transmission and is to be operated in third gear (Ratio 2.24), low range rear axle (Ratio 8.87), and a #2 conveyor is in the spreader, the equation would be solved as shown below.

$$Y = \frac{(\text{PTO}) (\text{TR}) (\text{RA}) (\text{TRM}) (\text{CFR}) (\text{PD})}{16665}$$

$$Y = \frac{47 \times 2.24 \times 8.87 \times 523 \times .192 \times 2.77}{16665}$$

$$Y = 15.586 \text{ Cubic Feet/Mile/Inch of Gate Opening}$$



GENERAL OPERATING PROCEDURES CONTINUED

MANUAL DUAL SYSTEM

When using the manual dual system, conveyor speeds and spinner speeds can be set independently of one another and will remain relatively constant regardless of truck road speed as long as speed is above low idle. Truck road speed, therefore, will affect volume of material spread per mile. An increase in truck road speed will decrease the volume per mile spread while a decrease in truck road speed will increase the volume spread per mile at any specific valve setting. The following delivery rate chart tabulates theoretical deliveries at various road speeds for various valve settings.

MANUAL DUAL CONTROL

Conveyor Hydraulic Valve Setting	Theoretical Delivery Cu. Ft./Mile/Inch of Gate		
	10 MPH	20 MPH	30 MPH
1	2.3	1.1	.8
2	5.9	2.9	2.0
3	9.1	4.6	3.0
4	12.5	6.3	4.2
5	15.1	7.5	5.0
6	17.8	8.9	5.9
7	20.2	10.1	6.7
8	22.3	11.2	7.4
9	24.3	12.1	8.1
10	26.1	13.1	8.7
11	27.7	13.9	9.2

NOTE: If other delivery rates are desired, they can be obtained by adjusting metering gate opening accordingly. Doubling gate opening will approximately double delivery. Changes in gate openings may affect spread pattern and may require changes in baffle and deflector adjustments.

OPERATING PROCEDURES



CALIBRATION PROCEDURE

The material delivery charts in this manual have been based upon theoretical volumes calculated from expected engine, pump, hydraulic valve and hydraulic motor operating characteristics, together with ideal material flow to conveyor and from conveyor to spinner. The attainment of the listed material volumes are not guaranteed.

It is recommended that the spreader be calibrated periodically (a yearly calibration is recommended) so that actual deliveries can be determined under a representative set of operating conditions. The following procedure is suggested.

Select a smooth, level test course about 1/4 mile long. Place a marker about 200 yards (183 m) from the starting point and a second marker just 100 feet down course from the first marker.

Set feedgate opening of spreader at one inch by measuring vertically from conveyor bottom with a #2 conveyor, or from belt surface at center of belt with #4 and #5 conveyors to bottom edge of feedgate belt. Fill spreader body about half full of material for which calibration is to be run (full load may be used if desired).

Place unit at start of test-course. Without moving truck, run conveyor and spinner until uniform discharge from spinner occurs. Shut off conveyor and spinner. Close spinner valve so that spinner does not turn. Brush off any material remaining on the spinner. Lower all external baffles so that they hang straight down and set in that position.

Weigh empty calibration box and record weight. Hang empty box below spinner by suspending from spinner hopper.

With conveyor control OFF, start truck, bring up to speed in gear for which calibration is desired. Turn conveyor ON when first marker is passed and turn conveyor OFF when second marker is passed. Bring truck to a halt. Lower calibration box and carefully brush all material on spinner into box.

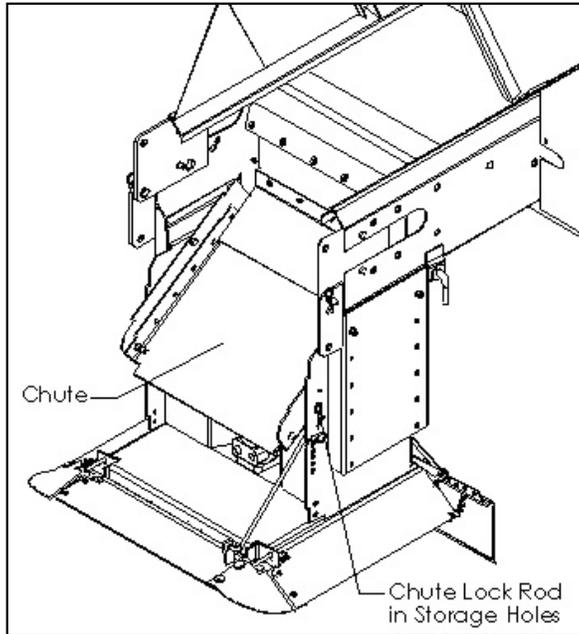
Weigh box with material. Subtract weight of empty box. Material weight represents amount of material discharged per 100 feet (30.9 m) of travel per inch of gate opening.

Repeat above for two more runs and average results of all three runs. The average weight of material discharged per 100 feet (30.9 m) of travel per inch of gate opening multiplied by 52.8 will give the weight of material used in test that would be delivered per mile of travel.

If volume is desired instead of weight, divide weight discharged by the weight of one cubic foot of the material used in the calibration above. Result will be volume discharge in cubic feet.

WEIGHTS OF VARIOUS MATERIALS

MATERIAL	APPROXIMATE WEIGHTS (Pounds)	
	Per Cu. Foot	Per Cu. Yard
Ashes	40	1080
Cinders	30	810
Limestone, Crushed	100	2700
Salt	80	2160
Sand	100	2700
Urea	60	1620

DUMP-OVER CHUTE CONVERSION**Figure 1 – Dump-Over Chute**

Remove hair pin from Chute Lock Rod and remove Chute Lock Rod from spinner. Rotate Chute to the dump-over position as shown in Figure 1. Store Chute Lock Rod and hair pin in Storage Holes. Chute is now ready for dump-over application.

Convert back to Spinner from Dump-Over Chute, by following the above steps in the reverse order. Make sure to install Chute Lock Rod in upper hole and secure with hair pin.

HYDRAULIC SYSTEM

The use of proper oil in the hydraulic system is one of the most important factors for satisfactory operation. Utmost cleanliness in handling the oil cannot be stressed enough. Keep the hydraulic oil in original closed containers, clean top of container before opening and pouring, and handle in extremely clean measures and funnels.

Refer to the *Lubricant and Hydraulic Oil Specifications* section of the manual for selection of the proper hydraulic fluid for use in the hydraulic system.

**DANGER**

Do not check leaks with hands while system is operating as high pressure 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 with 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 hydraulic leaks adjacent to moving parts while system is operating as there may be danger of entanglement!

Service Schedule

1. Check the hydraulic oil daily by means of dipstick. Add oil if required. Periodically inspect the hoses and fittings for leaks.

NOTICE!

CHANGE THE HYDRAULIC OIL FILTER AFTER THE FIRST WEEK (OR NOT MORE THAN 50 HOURS) OF OPERATION ON A UNIT.

2. After first filter change, replace filter when indicator reaches Danger Zone.
3. The reservoir should be drained through drain plug (not through suction outlet), flushed, and refilled annually, or the oil should be changed if it shows any signs of breaking down under continued high-pressure operation. Discoloration of oil is one sign of breakdown.

GEAR CASE

The oil in a new unit should be drained at the end of the first two weeks (or not more than 100 hours) of operation and the case should be thoroughly flushed with light oil. Refer to the Lubrication Specifications section for the proper grade oil. Refill 6:1 gear case with one pint (.47 liters) of recommended lubricant. After the initial change, the oil should be changed ever 2,000 hours of operation or annually, whichever occurs first.

Check the level in the gear case weekly.

CONVEYOR CHAIN



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. With the spinner shut down and the conveyor running slowly, spray the mixture of oil between the links of the chain by spraying through openings at the rear end of sill or from front outside body when access clearance is adequate. Do this at least once a week and after each time the machine is washed down. Allow to become dry before lubricating.

Hose down the machine and remove any material build-up on the sprockets or under the chain. If material is allowed to build up, the chain may ride up and damage the chain or body.

NOTE: If material builds up under the chain, the chain will ride on the material instead of the bottom panel. The more material allowed to build, the closer the chain will come to the chain shields. If the chain should catch a chain shield, it could permanently distort the chain, the chain shields or the body. In the same manner, if material is allowed to build up on the sprockets, the chain will have a larger diameter to follow. The more material allowed to build up, the closer the chain will run to the chain shields, until damage has occurred. Do not remove material while conveyor or spinner is running.

Lubricate the conveyor chain at least once a week. Use a mixture of 75% diesel fuel and 25% SAE 10 oil in a pressurized hand spray gun.

If a chain oiler is used, fill the oiler reservoir daily with a mixture of 75% diesel fuel and 25% SAE 10 oil. Before each filling of the spreader with material to be spread, open petcock and run the conveyor until the full length of chain has been oiled, then shut petcock.

Proper chain tension is also a factor in chain and sprocket life. The proper chain tension is illustrated in Figure 2. Be sure the chain is tensioned equally on both sides. This adjustment is made on each side of the unit at the idler bearings.

Figure 2 - Chain Tension to be Measured from Rear of Sill - Proper Tension 36" to 40" (91.4 to 101.6 cm).

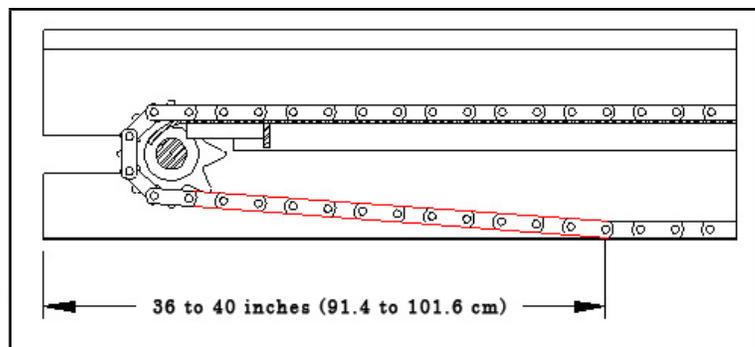


Figure 2 - Adjusting Chain Tension

Conveyor chains that are too tight will tend to stretch. This will cause excess sprocket wear and eventually cause breakage. Excess slack presents the possibility of the chain catching on sub-frame parts. Bent or distorted chain bars will cause damage to the body as well. Straighten or replace bent or distorted chain bars immediately.

LUBRICATION & MAINTENANCE

LUBRICATION OF BEARINGS

Grease in a bearing acts to prevent 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 maintains its proper consistency during operation. It must not be fluid and it must not channel.

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

Lubricate bearings by pumping grease until it forms a slight bead around the seals. This bead indicates adequate lubrication and also provides additional protection against the entrance of dirt.

FASTENERS

Tighten all screw fasteners to recommended torques after the first week of operation and annually thereafter. If loose fasteners are found at any time, tighten to the recommended torques. Replace any lost or damaged fasteners or other parts immediately upon finding such damage or loss. Check body mounting bolts every week.

CLEAN UP

For maintaining minimum maintenance operation, this equipment should be thoroughly washed every two (2) to three (3) days during the operating season. Hose the unit down under pressure to free all sticky and frozen material.

It is important that the machine be thoroughly cleaned at the end of each operating season. All lubrication and maintenance instructions should be closely followed. For longer life, repaint worn spots to prevent formation of rust.

NOTICE!

The lubricant distributor and/or supplier is to be held responsible for the results obtained from their products. Procure lubricants from distributors and/or suppliers of unquestionable integrity, supplying known and tested products. Do not jeopardize your equipment with inferior lubricants. No specific brands of oil are recommended. Use only products qualified under the following oil viscosity specifications and classification recommended by reputable oil companies.

HYDRAULIC SYSTEM

The following are the recommended procedures for selecting the proper hydraulic fluid for use in the hydraulic system. Select a major brand industrial PREMIUM QUALITY (anti-wear type) hydraulic oil to provide viscosity between 100-200 SSU at operating temperature. Premium hydraulic oils with viscosity indexes of 95 or above will provide the following temperature ranges :

INDUSTRY IDENTIFICATION VISCOSITY GRADE	OPERATING TEMPERATURE	VISCOSITY
150 SSU	122° F (50° C)	100 SSU
	84° F (28.9° C)	200 SSU
225 SSU	140° F (60° C)	100 SSU
	107° F (41.7° C)	200 SSU
300 SSU	150° F (66.6° C)	100 SSU
	116° F (46.1° C)	200 SSU
450 SSU	165° F (73.9° C)	100 SSU
	130° F (54.5° C)	200 SSU
600 SSU	182° F (83.3° C)	100 SSU
	145° F (62.8° C)	200 SSU

If, because of necessity or convenience, it is desirable to use an automotive engine oil, multi-viscosity oils of SC rating (formerly MS quality) which will provide between 100-200 SSU at operating temperature can be used. These will provide proper viscosity over a wide range. For example:

SAE VISCOSITY GRADE	OPERATING TEMPERATURE	VISCOSITY
10W-30	130° F (54.5° C)	100 SSU
	100° F (37.8° C)	200 SSU
10W-40	190° F (87.8° C)	100 SSU
	140° F (60° C)	200 SSU

LUBRICATION & MAINTENANCE



GEAR CASE LUBRICANT

Lubricate these assemblies with non-corrosive type SAE 90 EP (extreme pressure) gear oil conforming to MIL-L2105 B multi-purpose gear lubricating oil requirements (API Service GL 4) with ambient temperatures from 40° to 100° F (4.5° to 37.8° C). Ambient temperatures below 40° F (4.5° C) require SAE 80 EP lubricant; above 100° F (37.8° C) use SAE 140 EP grade oil.

Lubricate the gear cases with a synthetic or non-corrosive type gear oil conforming to MIL-L2105 B multi-purpose gear lubricating oil requirements according to the chart below:

Part	Refill Quantity	40° to 120° F (4.5° to 48.9° C)	Below 40° F (4.5° C)
6:1 Gear Case	1 pint (.47 liters)	SAE 80 or 90W	SAE 80 or 90W

PRESSURE GUN LUBRICANT

Use a ball and roller bearing lithium base lubricant with a minimum melting point of 300° F (148.9° C). This lubricant should have a viscosity that assures easy handling in the pressure gun at prevailing atmospheric temperatures. The lubricant must be waterproof. The grease should conform to NLGI No. 2 consistency.

CHAIN OILER LUBRICANT

Use a mixture of 75% No. 1 or No. 2 diesel fuel or kerosene mixed with 25% SAE 10 engine oil.

	<p>WARNING Shut off all power and allow all moving parts to come to a rest before performing any maintenance operation.</p>
--	--



WARNING

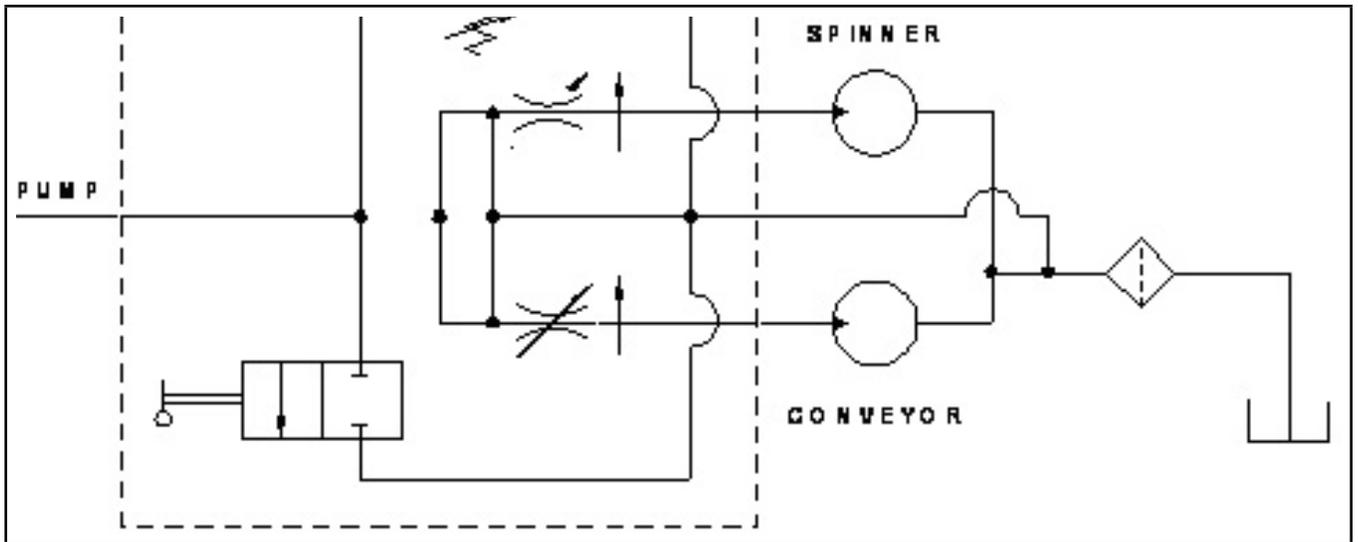
Shut off all power and allow all moving parts to come to rest before performing any maintenance operation. Entanglement with moving parts could cause serious injury.

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

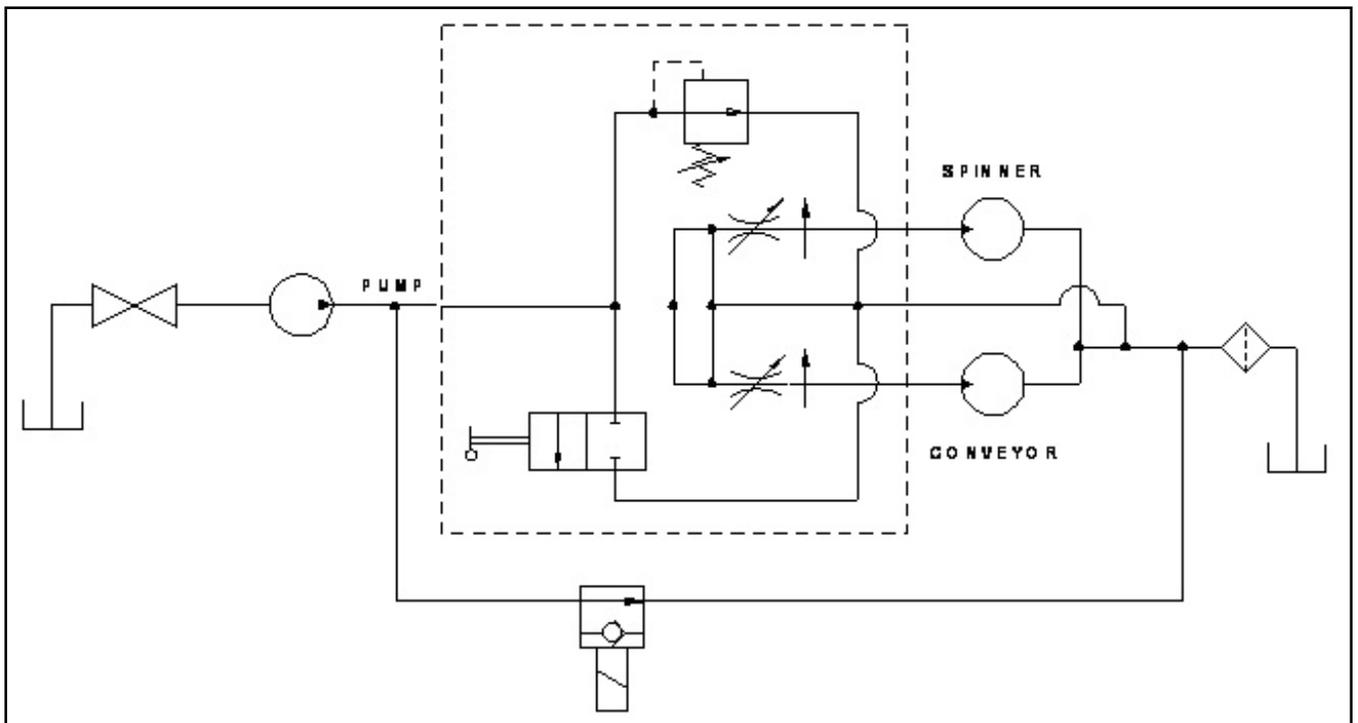
<u>LOCATION</u>	<u>PLACES</u>	<u>METHOD</u>	<u>FREQUENCY</u>
Hydraulic System			
Reservoir	1	Check Daily; Change Annually	
Filter	1	Check Daily; Change when indicator is red	
Hydraulic System - Dual Control Valve			
Hex Valve Stem (Under hand knob)	2	Hand Grease	Check Annually
Conveyor			
Drive Shaft Bearings	2	Grease Gun	Weekly
Idler Shaft Bearings	2	Grease Gun	Weekly
Take-up Screws	2	Hand Grease	Monthly
Chain	2 Strands	Spray Oil	Weekly
Chain Oiler (If so equipped)	1	Oil	Daily
Gear Case	1	Gear Box	Check Monthly
Feedgate			
Jack Assembly - Gears	1	Grease Gun	Monthly
Tube	1	Grease Gun	Monthly
Spinner Assembly - Drive Line Spinner Only			
Drive Shaft - Slip Joint	1	Hand Grease	Annually
U-Joints	2	Grease Gun	Weekly
Pillow Block Bearings	2	Grease Gun	Weekly

NOTE: Unusual conditions, such as excessive dust, temperature extremes or excessive moisture may require more frequent lubrication of specific parts.

HYDRAULICS SCHEMATIC – MANUAL DUAL VALVE IN CAB

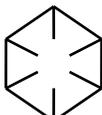


HYDRAULICS SCHEMATIC – MANUAL DUAL VALVE AT REAR



TROUBLESHOOTING

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

TORQUES CHART





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.

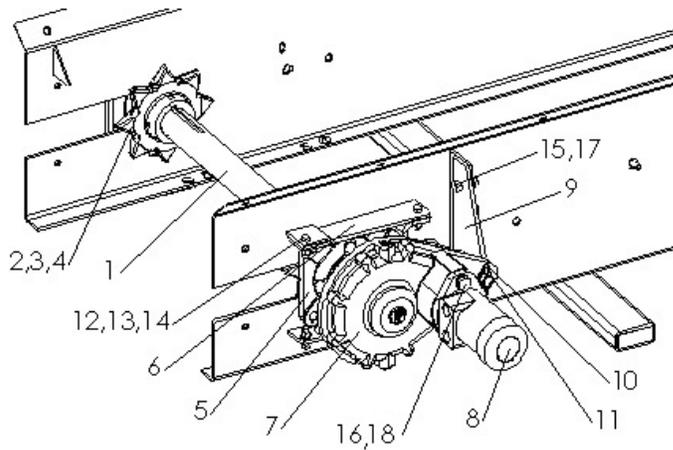
No responsibility is assumed for delay or damage to merchandise while in transit. Our responsibility ceases upon delivery of shipment to the transportation company from whom a receipt is received showing that shipment was in good condition when delivered to them, therefore, claims (if any) should be 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.



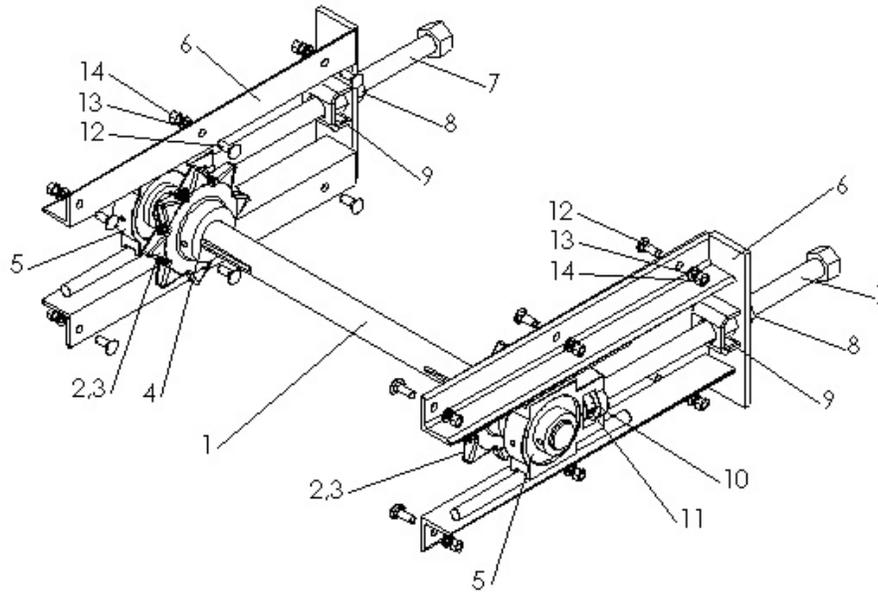
Bottom panel removed for clarity.

ITEM	PART NO.		DESCRIPTION	QTY
	CS	SS		
1	39582	39582	Shaft – Drive	1
2	27275	27275	Sprocket	2
3	6131	6131	Key – Square	2
4	20748	20748	Screw – Set	4
5	6465	6465	Bearing	2
6	82882	82885	Guide – Bearing	4
7	36671	36671	Gear Case 6:1 Single Pinion	1
8	38897	38897	Motor – Hydraulic 1-1/2"	1
	* 38897-X2	38897-X2	Motor – Hydraulic 1-1/2" with Sensor	1
	38898	38898	Motor – Hydraulic 2" (11'-16' Units)	1
	*38898-X2	38898-X2	Motor – Hydraulic 2" with Sensor (11'-16' Units)	1
9	82549	82551	Mount – Torque Arm RH	1
10	20833	20833	Pin – Cotter	1
11	2716	2716	Washer – Machine 3/4	2
12	20068	36399	Cap Screw – 3/8 x 1-1/4	8
13	20712	36420	Washer – Lock 3/8	8
14	20644	36414	Nut – Hex 3/8	8
15	20128	20128	Cap Screw – 1/2 x 1 1/4	2
16	20714	20714	Washer – Lock 1/2	2
17	20680	20680	Nut – Lock 1/2	2
18	20129	20129	Cap Screw - 1/2-13NC x 1-1/2	2
19	*74524	*74524	Gasket - SAE 101-2	1

* - Not Shown

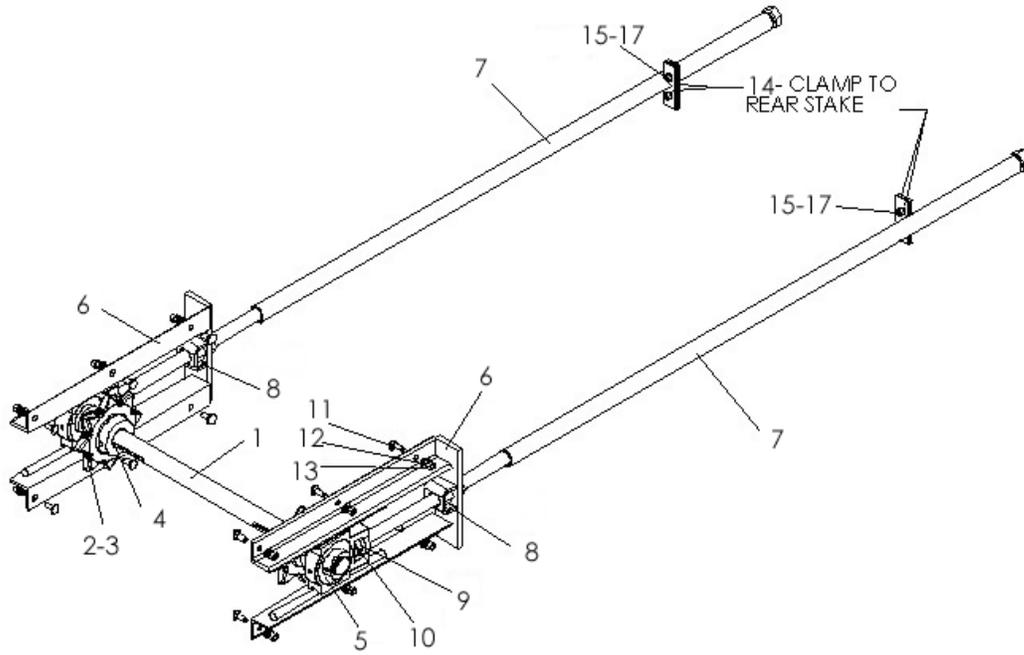
PARTS LIST

CONVEYOR IDLER



<u>ITEM</u>	<u>PART NO.</u>		<u>DESCRIPTION</u>	<u>QTY</u>
	<u>CS</u>	<u>SS</u>		
1	48279	48279	Shaft – Idler	1
2	1899	1899	Sprocket	2
3	20743	20743	Screw – Set	4
4	2135	2135	Key – Square	2
5	22511	22511	Bearing – 1.5 Take-up	2
6	7895	7895	Take-up – Wldmt	2
7	36508	36508	Screw – Adjusting	2
8	36509	36509	Nut – Hex 1-8NC	2
9	39110	39110	Nut – Wldmt	2
	* 86655	*86655	Nut – Wldmt, Spring-Loaded Idler	2
10	30725	30725	Collar – Set	2
11	20925	20925	Pin – Roll	2
12	20318	36408	Bolt – Carriage 3/8 x 1	12
13	20712	36420	Washer – Lock 3/8	12
14	20644	36414	Nut – Hex 3/8	12
15	* 86657	*86657	Spring – Spring-Loaded Idler Only	2

* - Not Shown



PARTS LIST



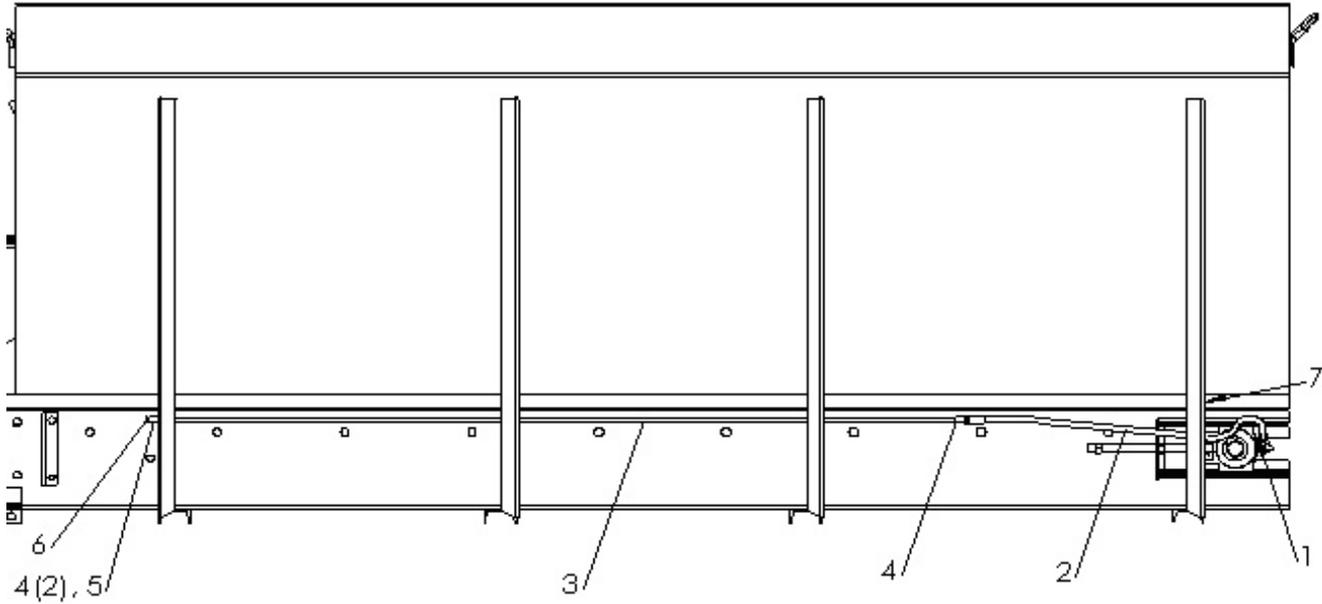
EXTENDED IDLER CONTINUED

<u>ITEM</u>	<u>PART NO.</u>		<u>DESCRIPTION</u>	<u>QTY</u>
	<u>CS</u>	<u>SS</u>		
1	48279	48279	Shaft – Idler	1
2	1899	1899	Sprocket	2
3	20743	20743	Screw – Set	4
4	2135	2135	Key – Square	2
5	22511	22511	Bearing – 1.5 Take-up	2
6	7895	7895	Take-up – Wldmt	2
7	97406-AA	97407-AA	Bolt – Idler Extended 9'	2
	97406-AB	97407-AB	Bolt – Idler Extended 10'	2
	97406-AC	97407-AC	Bolt – Idler Extended 11'	2
	97406-AD	97407-AD	Bolt – Idler Extended 12'	2
	97406-AE	97407-AE	Bolt – Idler Extended 13'	2
	97406-AF	97407-AF	Bolt – Idler Extended 14'	2
	97406-AG	97407-AG	Bolt – Idler Extended 15'	2
	97406-AH	97407-AH	Bolt – Idler Extended 16'	2
8	39110	39110	Nut – Wldmt	2
	* 86655	*86655	Nut – Wldmt, Spring-Loaded Idler	2
9	30725	30725	Collar – Set	2
10	20925	20925	Pin – Roll	2
11	20318	36408	Bolt – Carriage 3/8 x 1	12
12	20712	36420	Washer – Lock 3/8	12
13	20644	36414	Nut – Hex 3/8	12
14	84108	84108	Plate – Rear	4
15	20290	96880	Bolt – Carriage 5/16 x 3/4	4
16	20711	36419	Washer – Lock 5/16	4
17	20643	36413	Nut – Hex 5/16	4
18	* 86657	*86657	Spring – Spring-Loaded Idler Only	2

* - Not Shown



EXTENDED GREASE ZERKS

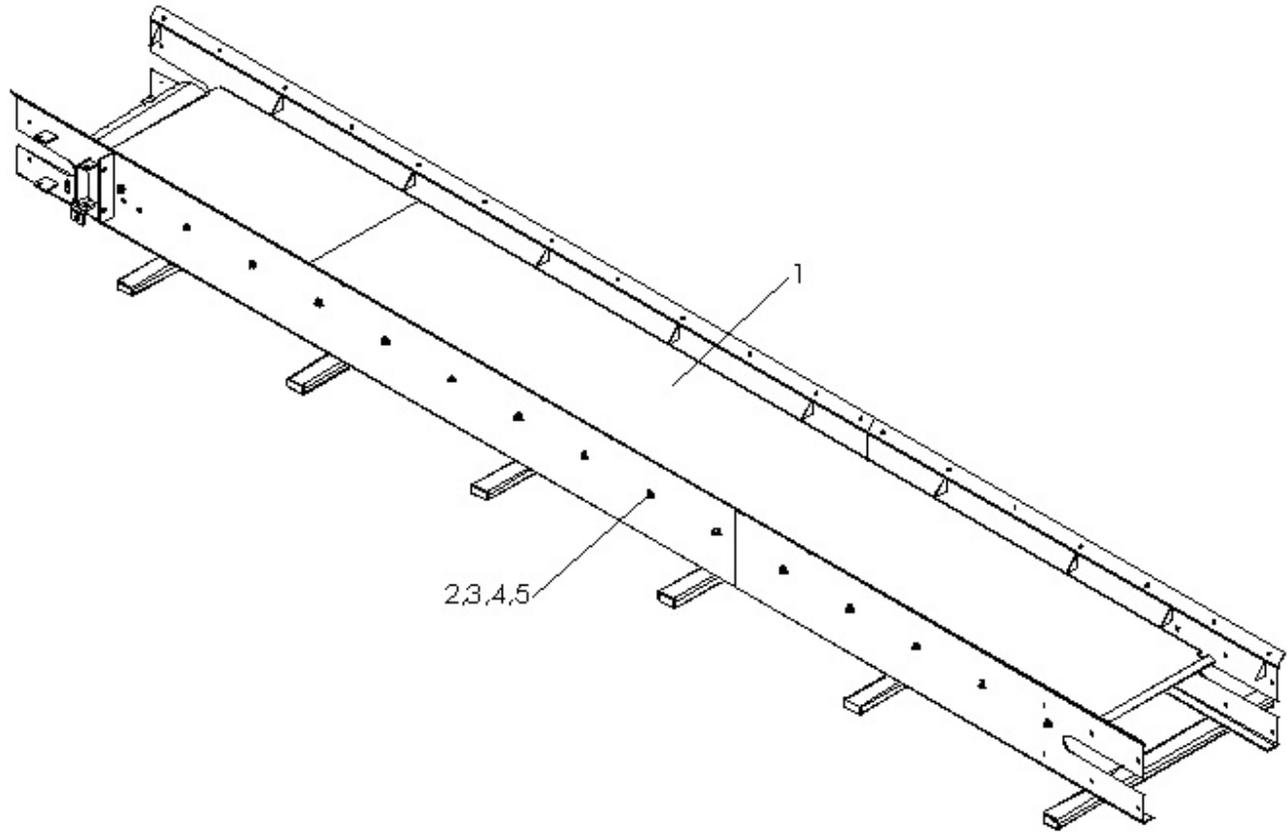


<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	34734	Adapter – Elbow 90°	2
2	79893	Hose Assy	2
3	79885	Pipe – Grease 9’ Unit	2
	79886	Pipe – Grease 10’ Unit	2
	79887	Pipe – Grease 11’ Unit	2
	79888	Pipe – Grease 12’ Unit	2
	79889	Pipe – Grease 13’ Unit	2
	79890	Pipe – Grease 14’ Unit	2
	79891	Pipe – Grease 15’ Unit	2
	79892	Pipe – Grease 16’ Unit	2
4	6000	Coupling – Pipe	6
5	6023	Nipple – Closed	2
6	6069	Zerk – Grease (from Idler Bearing)	2
7	73797-13	Liner – Edge	2

PARTS LIST



BOTTOM - REPLACEABLE

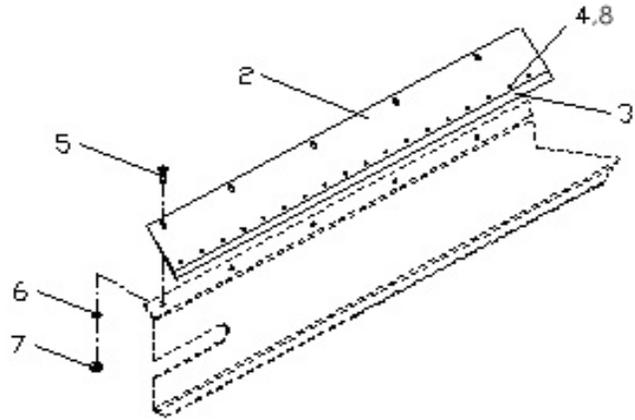
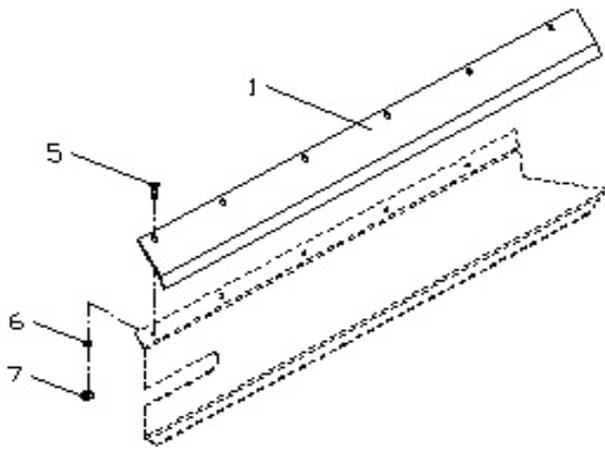


<u>ITEM</u>	<u>PART NO.</u>			<u>DESCRIPTION</u>	<u>QTY</u>
	<u>CS</u>	<u>409 SS</u>	<u>304 SS</u>		
1	87975	88118	88110	Panel – Wldmt Bottom 9'	1
	87976	88119	88111	Panel – Wldmt Bottom 10'	1
	87977	88120	88112	Panel – Wldmt Bottom 11'	1
	87978	88121	88113	Panel – Wldmt Bottom 12'	1
	87979	88122	88114	Panel – Wldmt Bottom 13'	1
	87980	88123	88115	Panel – Wldmt Bottom 14'	1
	87981	88124	88116	Panel – Wldmt Bottom 15'	1
	87982	88125	88117	Panel – Wldmt Bottom 16'	1
2	20318	36408	36408	Bolt – Carriage 3/8 x 1	AR
3	20693	36425	36425	Washer – Flat 3/8	AR
4	20712	36420	36420	Washer – Lock 3/8	AR
5	20644	36414	36414	Nut – Hex 3/8	AR

Please Give Part No., Description
& Unit Serial No.



CHAIN SHIELDS



ITEM	PART NO.			DESCRIPTION	QTY
	<u>CS</u>	<u>409 SS</u>	<u>304 SS</u>		
1				Shield – Chain #2 & #3, Includes 5-7	
	39614	43696	54118	9' Units	2
	39615	43697	54119	10' Units	2
	39616	43698	54120	11' Units	2
	97715-AA	97732-AA	97749-AA	12' Units	2
	97715-AB	97732-AB	97749-AB	13' Units	2
	97715-AC	97732-AC	97749-AC	14' Units	2
	97715-AD	97732-AD	97749-AD	15' Units	2
	97715-AE	97732-AE	97749-AE	16' Units	2
2				Shield – Chain #4 Assy, Includes 3,4,5-8	
	37366	43814	97850	9' Units	2
	37367	43816	97851	10' Units	2
	37368	43818	97852	11' Units	2
	97817	97835	97853	12' Units	2
	97818	97836	97854	13' Units	2
	97819	97837	97855	14' Units	2
	97820	97838	97856	15' Units	2
	97821	97839	97857	16' Units	2
3	7687-120	7687-120	305975	Belt - Sealer, 9' Units	2
	7687-132	7687-132	305975	Belt - Sealer, 10' Units	2
	7687-144	7687-144	305975	Belt - Sealer, 11' Units	2
	305975	305975	305975	Belt - Sealer, 12'-16' Units	2

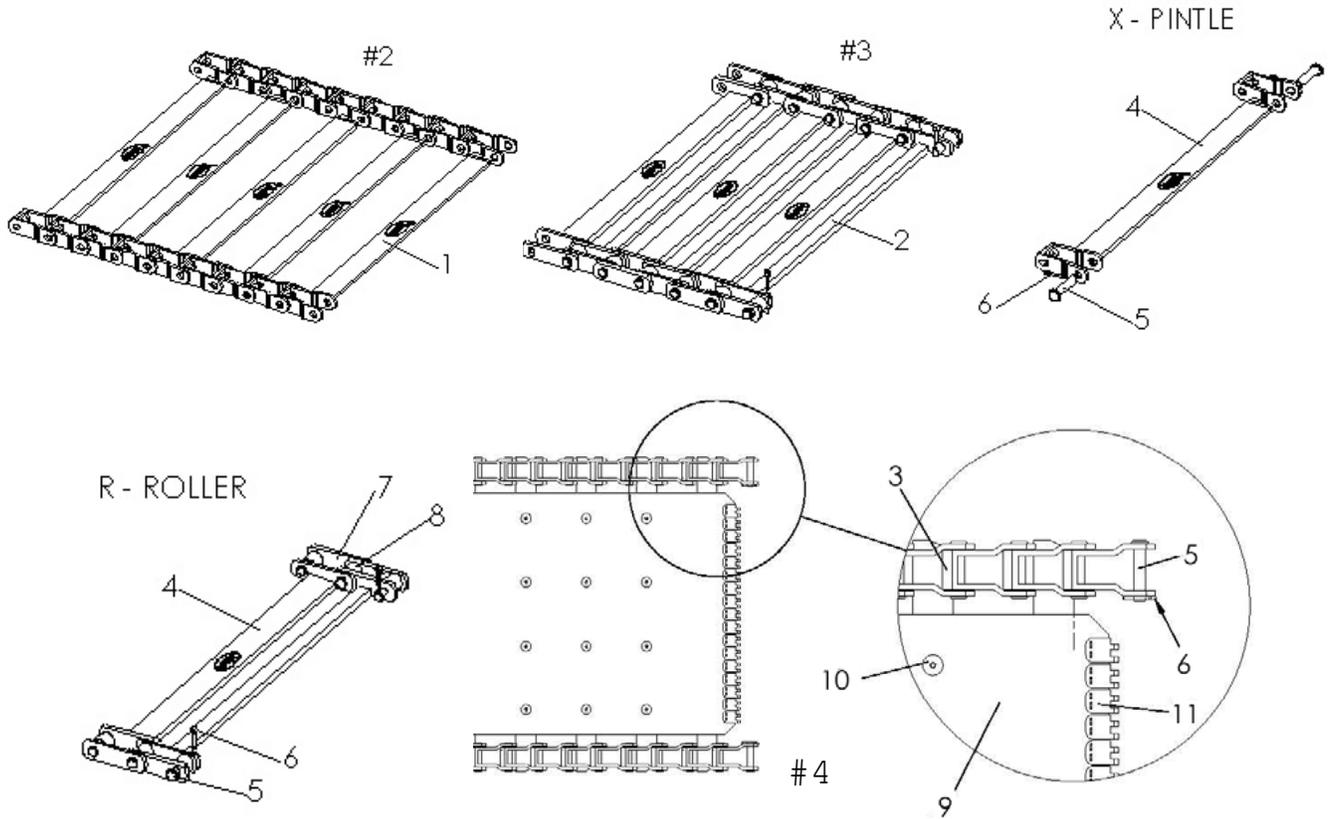
PARTS LIST



CHAIN SHIELDS CONTINUED

4	6244	6244	6244	Rivet 9'-10' Units	AR
	88931	88931	88931	Nut - Tee 11'-16' Units	AR
5	20318	----	----	Bolt – Carriage 3/8 x 1	AR
	----	71829	71829	Screw - Truss Head	AR
6	20712	36420	36420	Washer – Lock 3/8	AR
7	20644	36414	36414	Nut – Hex 3/8	AR
	----	----	88981	Nut - Tee 1/4 x 1/4	AR
8	20624	56258	56258	Screw - Truss Head 11'-16' Units	AR





<u>ITEM</u>	<u>PART NO.</u>		<u>DESCRIPTION</u>	<u>QTY</u>
	PINTLE	ROLLER		
1			Chain – Assy #2	
	12992	90673	9' Unit	1
	12993	90674	10' Unit	1
	12994	90675	11' Unit	1
	12995	90676	12' Unit	1
	12990	90677	13' Unit	1
	39605	90678	14' Unit	1
	12996	90679	15' Unit	1
	46598	90680	16' Unit	1

PARTS LIST

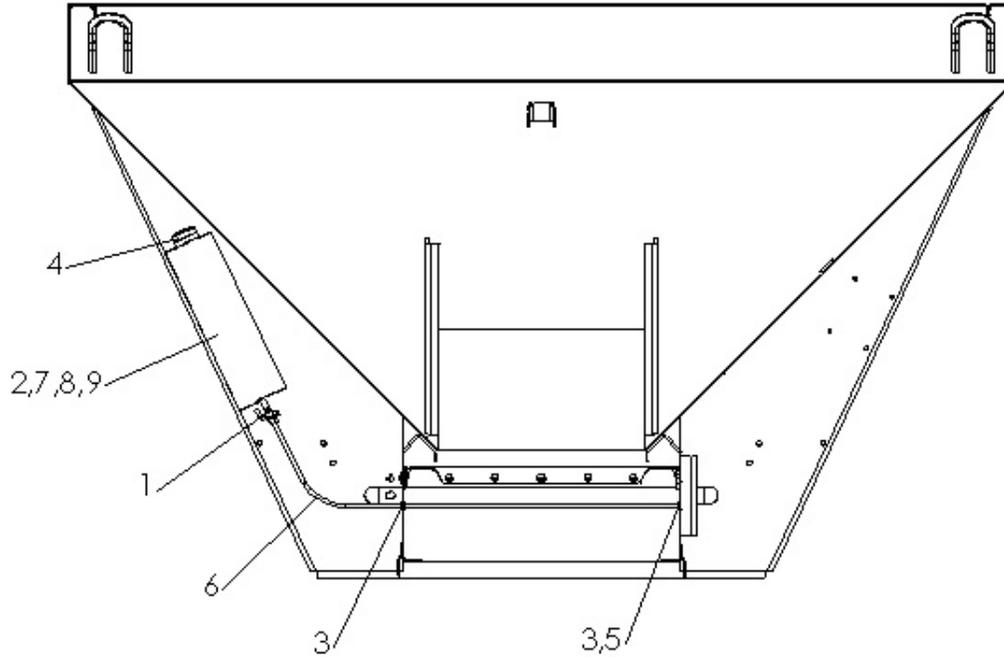
CONVEYOR CHAIN CONTINUED

<u>ITEM</u>	<u>PART NO.</u>		<u>DESCRIPTION</u>	<u>QTY</u>
	<u>PINTLE</u>	<u>ROLLER</u>		
2			Chain – Assy #3	
		90682	9' Unit	1
		90683	10' Unit	1
		90684	11' Unit	1
		90685	12' Unit	1
		90686	13' Unit	1
		90687	14' Unit	1
		90688	15' Unit	1
		90689	16' Unit	1
3			Chain – Assy #4 BOC	
	305611-AB	305612-AB	9' Unit	1
	305611-AC	305612-AC	10' Unit	1
	305611-AD	305612-AD	11' Unit	1
	305611-AE	305612-AE	12' Unit	1
	305611-AF	305612-AF	13' Unit	1
	305611-AG	305612-AG	14' Unit	1
	305611-AH	305612-AH	15' Unit	1
	305611-AI	305612-AI	16' Unit	1
4	99209	90659	Cross Bar – Wldmt Wide	AR
		33721	Cross Bar – Wldmt Narrow	AR
	70756	7126	Cross Bar – Wldmt #4 Rivets	AR
5	36697	6119	Pin – Clevis	AR
6	20817	20826	Pin – Cotter	AR
7		2127	Link – Side	AR
8		29919	Roller – Chain	AR
9	6251	6251	Belt – Specify Length and Pintle/Roller	1
10	305646	305646	Rivets	AR
11	73317-X1	73317-X1	Kit - Splicer	1
			Lacing Strips 23"	1
			Pin - Connecting	2
			Staples	1

Please Give Part No., Description
& Unit Serial No.



OILER - CONVEYOR

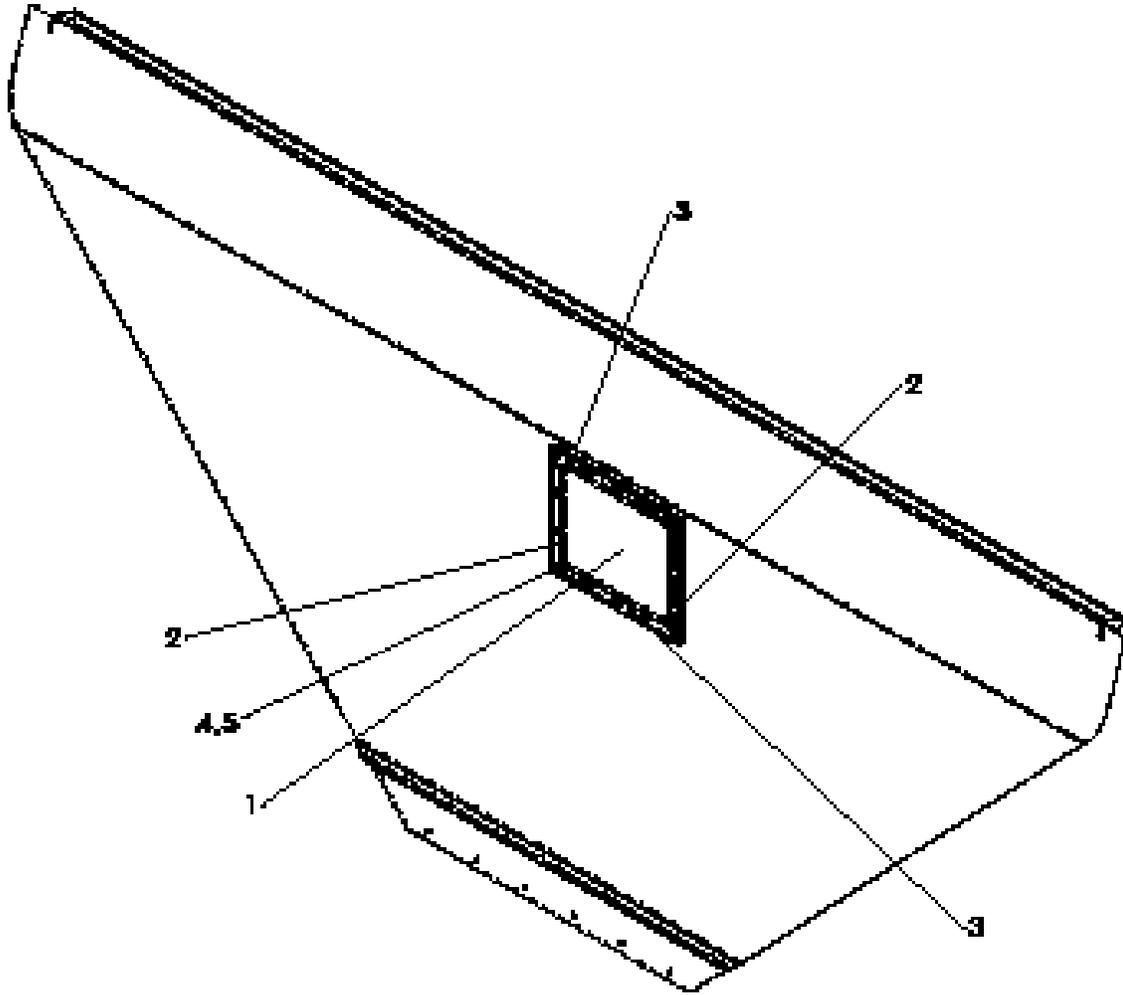


<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	21982	Valve – Shut-Off	1
2	1572	Tank – Wldmt Oiler	1
3	21983	Grommet – Rubber	2
4	21980	Cap – Vented	1
5	21984	Plug – Sleeve	1
6	88003	Tube – Oiler	1
7	20003	Cap Screw – 1/4 x 3/4	4
8	20710	Washer – Lock 1/4	4
9	20642	Nut – Hex 1/4	4

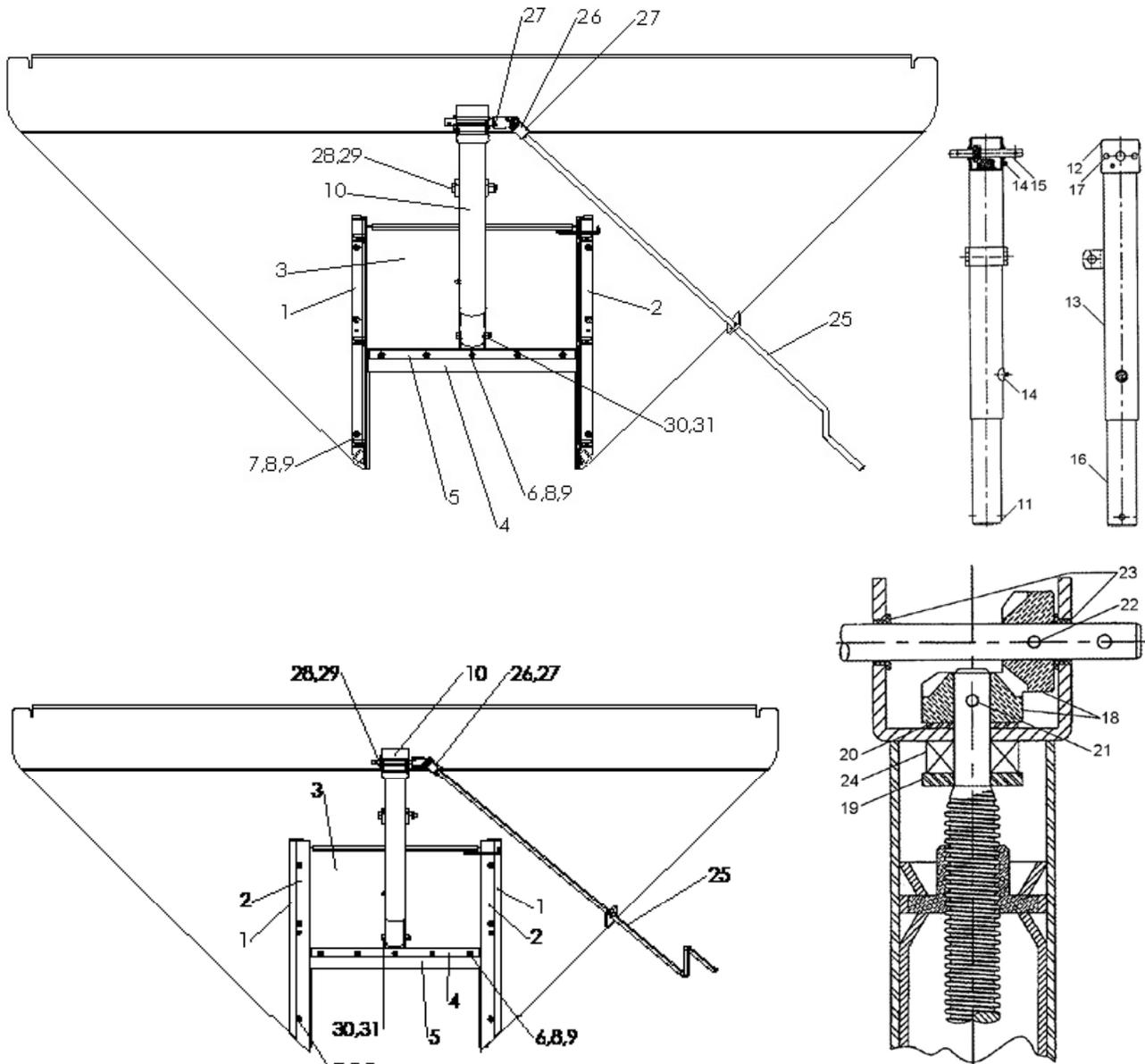
PARTS LIST



SIGHT WINDOW



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	80831	Window - Sight 8 x 10	1
2	80832-X1	Bar - Retainer Side	2
3	80833-X1	Bar - Retainer Top & Bottom	2
4	42033	Screw - Truss Head 1/4-20NC x 1 SS	14
5	42034	Nut - Lock 1/4-20 SS	14



ITEM	PART NO.			DESCRIPTION	QTY
	CS	409 SS	304 SS		
	83664	83665	83666	Feedgate Assy, Includes Items 3-6, 8 & 9	
1	2884	36385	36385	Slide – Feedgate LH	1
2	2885	36384	36384	Slide – Feedgate RH	1
3	83661	83662	83663	Feedgate – Wldmt	1
4	13816	13816	13816	Sealer – Belt	1
5	36388	36388	36388	Retainer – Sealer	1
6	20619	36405	36405	Screw – Machine 1/4 x	5
7	20006	40750	40750	Cap Screw - 1/4 x 1 1/4	7

PARTS LIST

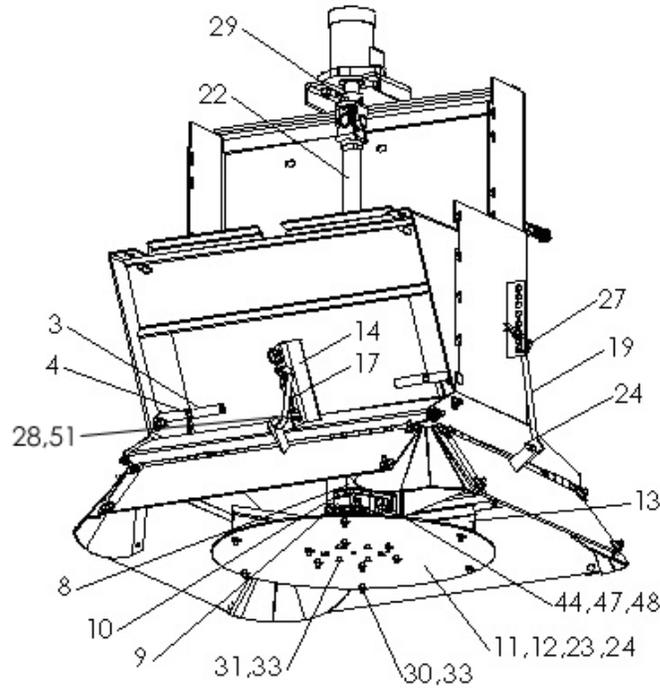
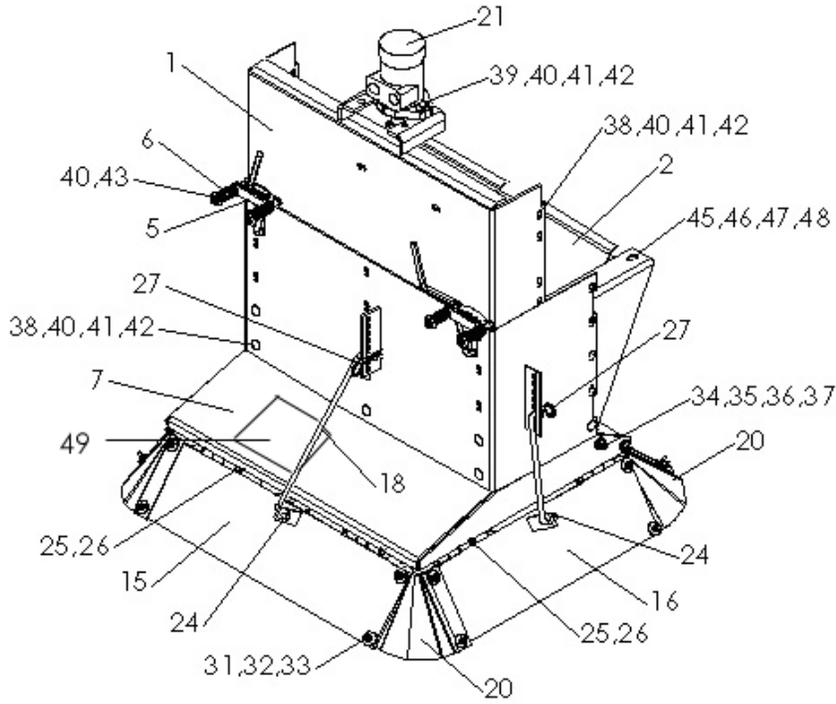
FEEDGATE & JACK CONTINUED

<u>ITEM</u>	<u>PART NO.</u>			<u>DESCRIPTION</u>	<u>QTY</u>
	<u>CS</u>	<u>409 SS</u>	<u>304 SS</u>		
8	20710	36418	36418	Washer - Lock, 1/4	12
9	20642	36412	36412	Nut - Hex, 1/4	12
10	40704	40704	40704	Jack Assy, Includes 11-24	1
	84221	84221	84221	Repair Kit, Includes Items 11, 18-24	1
11	40707	40707	40707	Cap – Tube Lower	1
12	NSS	NSS	NSS	Cover – Tube Upper	1
13	NSS	NSS	NSS	Tube – Assy Outer	1
14	NSS	NSS	NSS	Fitting – Grease	2
15	84217	84217	84217	Shaft	1
16	NSS	NSS	NSS	Tube – Assy Inner	1
17	84218	84218	84218	Bolt – 1/4 x 3	2
	84219	84219	84219	Nut – Lock 1/4	2
18	84214	84214	84214	Gear – Miter	2
19	84210	84210	84210	Washer – Thrust	1
20	84212	84212	84212	Washer	1
21	84216	84216	84216	Pin	1
22	84215	84215	84215	Pin – Groove	1
23	84213	84213	84213	Bushing	2
24	84211	84211	84211	Bearing – Thrust	1
25	14382	14382	14382	Handle	1
26	20918	20918	20918	Pin – Roll	2
27	85002	85002	85002	U-Joint	1
28	20138	80798	80798	Cap Screw - 1/2 x 3 3/4	1
29	20680	39016	39016	Nut – Hex 1/2	1
30	20074	36296	36296	Cap Screw - 3/8 x 2 3/4	1
31	20678	72054	72054	Nut – Lock 3/8	1
32	*21454	-----	-----	Key - Square 1/2 x 1/2 x 1	2

NSS - Not Serviced Separately * - Not Shown



SPINNER - DRIVELINE



Steel disc, standard height spinner shown.

PARTS LIST

SPINNER -DRIVELINE CONTINUED

<u>ITEM</u>	<u>PART NO.</u>			<u>DESCRIPTION</u>	<u>QTY</u>
	<u>CS</u>	<u>409 SS</u>	<u>304 SS</u>		
	86720	88873	88873	Hardware – Kit Spinner Mounting	1
	16352	16352	16352	Disc – Assy Steel Spinner Includes 11-13, 30, 31, 33	1
	76794	76794	76794	Disc – Assy Poly Spinner Includes 11, 12, 31-33	1
1	39650	76857	76856	Hopper – Wldmt Upper	1
	44362	76853	76852	Hopper – Extended Wldmt Upper	1
2	39663	76880	76879	Baffle – Chute	1
3	39665	76883	76883	Pin – Baffle Front	2
4	20986	20986	20986	Pin – Roll	2
5	1517	77258	76885	Plate – Adjustment	2
6	3126	3126	3126	Spring	4
7	86704	86721	86722	Hopper – Wldmt Lower	1
8	39636	39636	39636	Shaft – Spinner	1
9	3054	3054	3054	Bearing – Pillow Block	2
10	58896	58896	58896	Washer – Rubber 5/8	2
11	34853	34853	34853	Disc – Distributor Polyurethane	1
	9098	9098	9098	Disc – Distributor Steel	1
12	2242	2242	2242	Hub – Disc	1
13	4731	4731	4731	Fin – Formed	6
14	39669	76816	76815	Support – Baffle Front	1
15	99372	99378	99377	Baffle – End	2
16	99370	99366	99365	Baffle – Side	2
17	39672	80990	80990	Rod – Control Front	1
18	17639	76893	76893	Rod – Control Rear	1
19	17640	76900	76900	Rod – Control Side	2
20	36794	36794	36794	Belt – Deflector	4
21	37339	37339	37339	Motor – Hydraulic	1
22	86435	86435	86435	Shaft – Drive Telescopic	1
	86437	86437	86437	Shaft – Drive Extended Telescopic	1
23	6123	88229	88229	Pin – Clevis 3/8 x 2-1/4	1
24	20817	36427	36427	Pin – Cotter 1/8 x 1	5
25	17770	76821	76821	Pin – Clevis 5/16 x 3-1/2	8



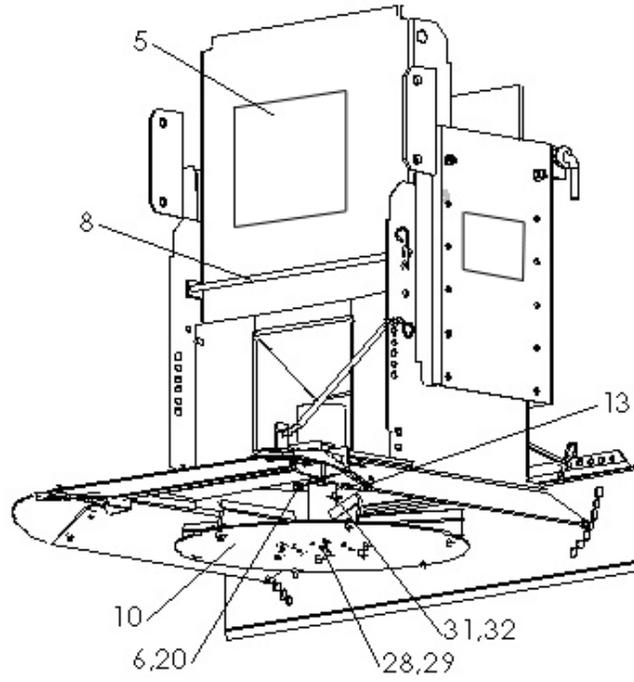
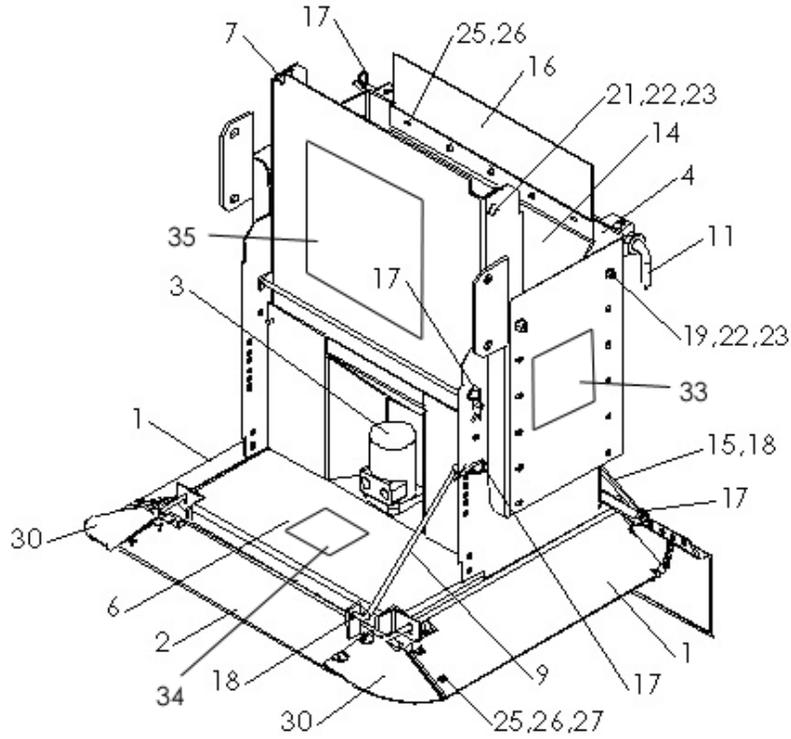
SPINNER -DRIVELINE CONTINUED

ITEM	PART NO.			DESCRIPTION	QTY
	CS	409 SS	304 SS		
26	20810	76822	76822	Pin – Cotter 3/32 x 1/2	8
27	40576	36429	36429	Pin – Hair	4
28	6122	6122	6122	Pin – Clevis 3/8 x 2	1
29	20742	20742	20742	Screw - Set 5/16-18 x 5/16	1
30	20003	20003	20003	Cap Screw – 1/4 x 3/4, Steel Disc	12
31	20004	36394	36394	Cap Screw – 1/4 x 7/8	16
	20004	20004	20004	Cap Screw – 1/4 x 7/8, Steel Disc	6
	20007	20007	20007	Cap Screw – 1/4 x 1-1/2, Poly Disc	6
32	21423	21423	21423-X1	Washer – Flat Special 1/4	16
	21423	21423	21423-X1	Washer – Flat 1/4, Poly Disc	6
33	20676	36412	36412	Nut – Lock 1/4	16
	20676	20676	20676	Nut – Lock 1/4, Disc	AR
34	20036	34580	34580	Cap Screw – 5/16 x 1	4
35	20692	36424	36424	Washer – Flat 5/16	4
36	20711	36419	36419	Washer – Lock 5/16	4
37	20643	36413	36413	Nut – Hex 5/16	4
38	20318	36408	36408	Bolt – Carriage 3/8 x 1	12
39	20069	34858	34858	Cap Screw – 3/8 x 1-1/2	2
40	20693	36425	36425	Washer – Flat 3/8	18
41	20712	36420	36420	Washer – Lock 3/8	14
42	20644	36414	36414	Nut – Hex 3/8	14
43	20678	72054	72054	Nut – Lock 3/8	4
44	20129	36539	36539	Cap Screw – 1/2 x 1-1/2	4
45	20364	72056	72056	Bolt – Carriage 1/2 x 1	2
46	20695	36426	36426	Washer – Flat 1/2	2
47	20714	36422	36422	Washer – Lock 1/2	6
48	20646	36416	36416	Nut – Hex 1/2	6
49	55630	55630	55630	Decal - Warning Falling Hazard	1
50	20817	20817	20817	Pin - Cotter 1/8 x 1	1
51	*368	*368	*368	Decal - Flying Material	1

* - Not Shown

PARTS LIST





Please Give Part No., Description
& Unit Serial No.



SPINNER - DIRECT DRIVE CONTINUED

<u>ITEM</u>	<u>PART NO.</u>			<u>DESCRIPTION</u>	<u>QTY</u>
	<u>CS</u>	<u>409 SS</u>	<u>304 SS</u>		
	87758	88481	88482	Spinner Assy – Steel	
	88483	88484	88485	Spinner Assy – Polyurethane	
1	87780	88463	88464	Baffle – Wldmt Side	2
2	87778	88461	88462	Baffle – Wldmt Rear	1
3	58806	58806	58806	Motor – Hydraulic	1
4	87775	88459	88460	Spinner – Wldmt Upper	1
5	87783	88465	88466	Chute Wldmt	1
6	87772	88457	88458	Spinner – Wldmt Lower	1
7	87751	88403	88404	Chute – Extension	1
8	87750	88401	88401	Rod – Lock Chute	1
9	87776	88420	88420	Rod – Control Rear	1
10	87757	87757	87757	Disc Assy – Steel, Includes:	1
	9098	9098	9098	Disc – Spinner Steel	1
	4731	4731	4731	Fin – Formed Spinner	6
	88002	88002	88002	Hub – Spinner	1
	20003	20003	20003	Cap Screw – 1/4 x 3/4	12
	20004	20004	20004	Cap Screw – 1/4 x 7/8	6
	20676	20676	20676	Nut – Lock 1/4	18
	88396	88396	88396	Disc Assy – Poly, Includes:	1
	34853	34853	34853	Spinner – Urethane	1
	88002	88002	88002	Hub – Spinner	1
	20007	20007	20007	Cap Screw – 1/4 x 1 1/2	6
	21423	21423	21423-X1	Washer – Flat special 1/4	6
	20676	20676	20676	Nut – Lock 1/4	6
11	88397	88397	88397	Lock – Wldmt Pivot	1
12	* 87809	88467	88468	Baffle – Wldmt RH Inner	1
13	87813	88469	88470	Baffle – Wldmt LH Inner	1
14	87803	88431	88432	Plate – Drop	1
15	87815	88444	88444	Rod – Control Front	2
16	87847	87847	87847	Belt – Spinner Wiper	1
17	40576	36429	36429	Pin – Hair	7
18	20822	36427	36427	Pin – Cotter	5
19	20067	36398	36398	Cap Screw – 3/8 x 1	6
20	20065	36293	36293	Cap Screw – 3/8 x 3/4	4

PARTS LIST



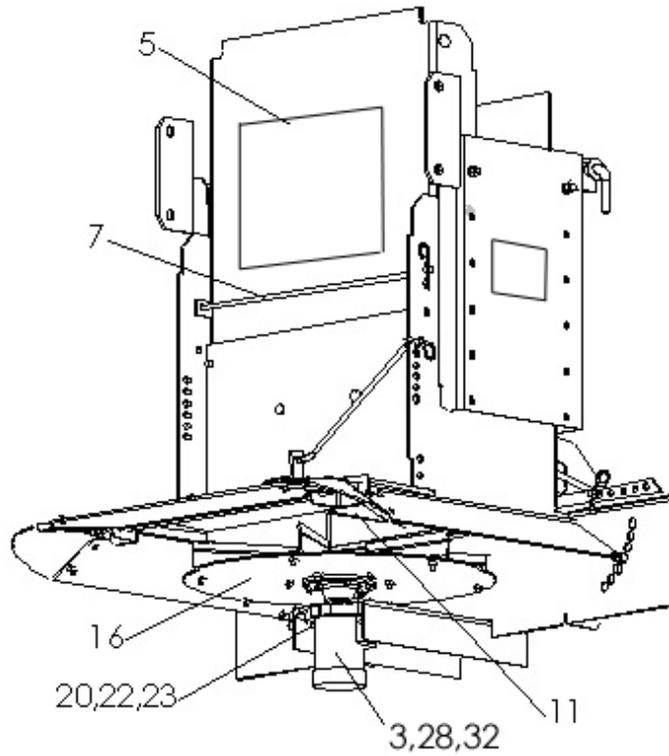
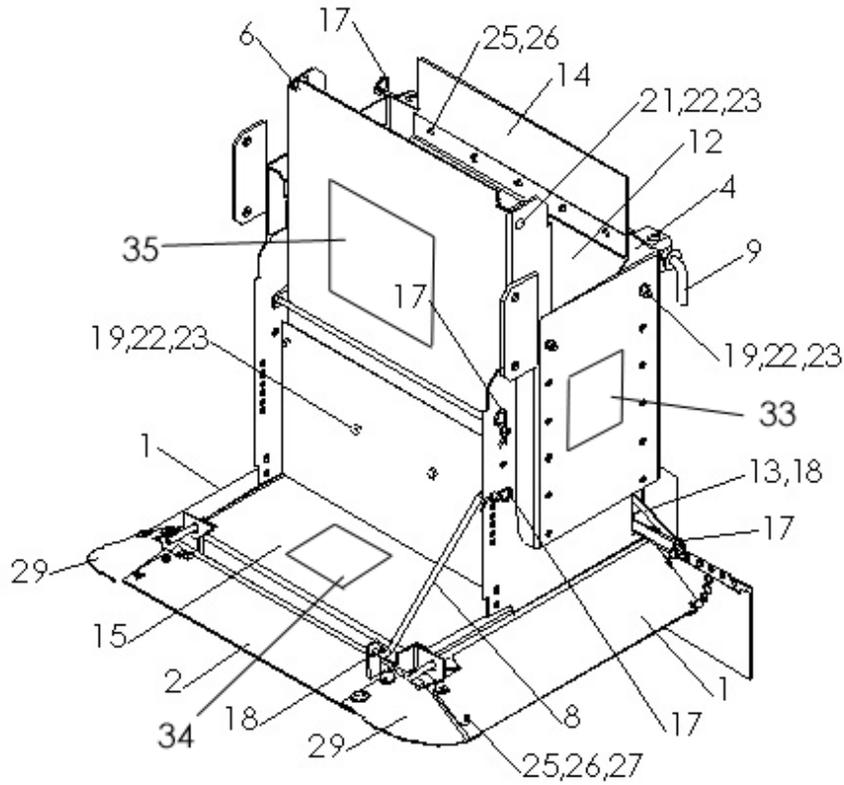
SPINNER - DIRECT DRIVE CONTINUED

<u>ITEM</u>	<u>PART NO.</u>			<u>DESCRIPTION</u>	<u>QTY</u>
	<u>CS</u>	<u>409 SS</u>	<u>304 SS</u>		
21	20319	36409	36409	Bolt – Carriage 3/8 x 1 1/4	2
22	20712	36420	36420	Washer – Lock 3/8	10
23	20644	36414	36414	Nut – Hex 3/8	6
24	* 20678	72054	72054	Nut – Lock 3/8	2
25	20003	36393	36393	Cap Screw – 1/4 x 3/4	13
26	20676	42034	42034	Nut – Lock 1/4	13
27	21423	21423	21423-X1	Washer – Flat special 1/4	8
28	20014	20014	20014	Cap Screw – 1/4 x 3 1/4	1
29	20710	20710	20710	Washer – Lock 1/4	1
30	87801	87801	87801	Deflector – Belt	2
31	6123	6123	6123	Pin – Clevis	1
32	20817	20817	20817	Pin – Cotter	1
33	71807	71807	71807	Decal - Warning Falling Spinner Hazard	2
34	55630	55630	55630	Decal - Warning Falling Hazard	1
35	368	368	368	Decal - Flying Material	1
36	* 88050	88050	88050	Spacer – Dump-Over Chute	2

* - Not Shown



SPINNER - UNDERSLUNG



PARTS LIST



SPINNER - UNDERSLUNG CONTINUED

<u>ITEM</u>	<u>PART NO.</u>			<u>DESCRIPTION</u>	<u>QTY</u>
	<u>CS</u>	<u>409 SS</u>	<u>304 SS</u>		
	87876	88477	88478	Spinner Assy – Steel	
	88486	88487	88488	Spinner Assy – Polyurethane	
1	87780	88463	88464	Baffle – Wldmt Side	2
2	87778	88461	88462	Baffle – Wldmt Rear	1
3	37339	37339	37339	Motor – Hydraulic	1
4	87775	88459	88460	Spinner – Wldmt Upper	1
5	87783	88465	88466	Chute Wldmt	1
6	87751	88403	88404	Chute – Extension	1
7	87750	88401	88401	Rod – Lock Chute	1
8	87776	88420	88420	Rod – Control Rear	1
9	88397	88397	88397	Lock – Wldmt Pivot	1
10	* 87809	88467	88468	Baffle – Wldmt RH Inner	1
11	87813	88469	88470	Baffle – Wldmt LH Inner	1
12	87803	88431	88432	Plate – Drop	1
13	87815	88444	88444	Rod – Control Front	2
14	87847	87847	87847	Belt – Spinner Wiper	1
15	87874	88475	88476	Spinner – Wldmt Lower	1
16	73492	73492	73492	Disc Assy – Steel, Includes:	
	9098	9098	9098	Disc – Spinner Steel	1
	4731	4731	4731	Fin – Formed Spinner	6
	74122	74122	74122	Hub – Spinner	1
	20003	20003	20003	Cap Screw – 1/4 x 3/4	12
	20004	20004	20004	Cap Screw – 1/4 x 7/8	6
	20676	20676	20676	Nut – Lock 1/4	18
	90831	90831	90831	Disc Assy – Poly, Includes:	
	34853	34853	34853	Spinner – Urethane	1
	39178	39178	39178	Plate – Spinner Mount	1
	74122	74122	74122	Hub – Spinner	1
	20007	20007	20007	Cap Screw – 1/4 x 1 1/2	6
	21423	21423	21423-X1	Washer - Flat 1/4	6
	20676	20676	20676	Nut – Lock 1/4	6
17	40576	36429	36429	Pin – Hair	7
18	20822	36427	36427	Pin – Cotter	5
19	20067	36398	36398	Cap Screw – 3/8 x 1	8

Please Give Part No., Description
& Unit Serial No.

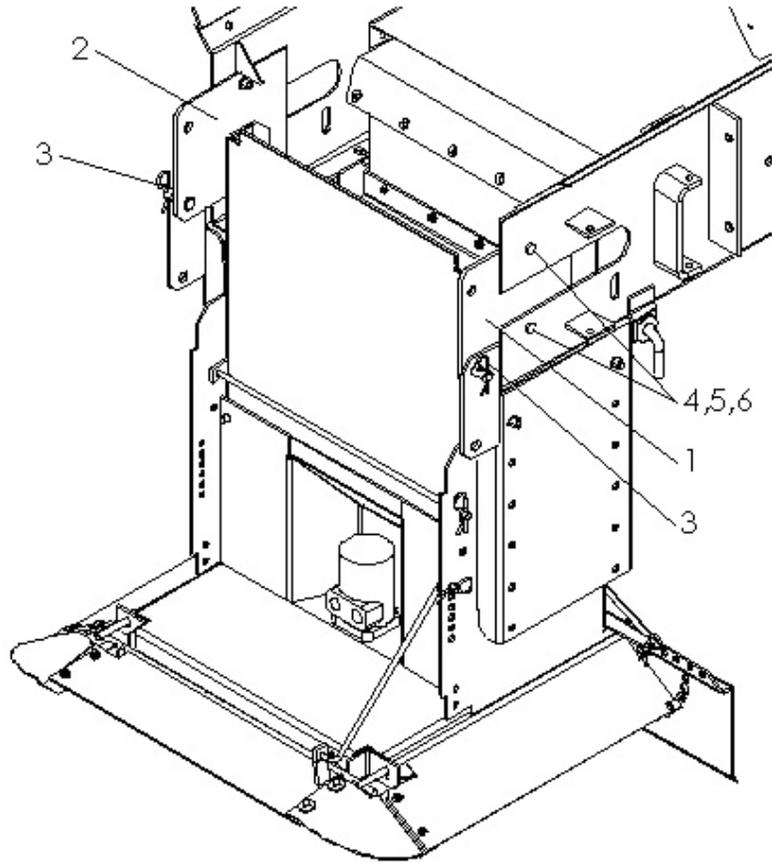


SPINNER - UNDERSLUNG CONTINUED

ITEM	PART NO.			DESCRIPTION	QTY
	<u>CS</u>	<u>409 SS</u>	<u>304 SS</u>		
20	20068	36399	36399	Cap Screw – 3/8 x 1 1/4	2
21	20319	36409	36409	Bolt – Carriage 3/8 x 1 1/4	2
22	20712	36420	36420	Washer – Lock 3/8	10
23	20644	36414	36414	Nut – Hex 3/8	10
24	* 20678	72054	72054	Nut – Lock 3/8	2
25	20003	36393	36393	Cap Screw – 1/4 x 3/4	13
26	20676	42034	42034	Nut – Lock 1/4	13
27	21423	21423	21423-X1	Washer – Special 1/4	8
28	20710	20710	20710	Washer – Lock 1/4	1
29	87801	87801	87801	Deflector – Belt	2
30	* 96242	88455	88456	Plate – Deflector	1
31	* 88050	88050	88050	Spacer – Dump-Over Chute	2
32	20003	20003	20003	Cap Screw - 1/4-20NC x 3/4	1
33	71807	71807	71807	Decal - Warning Falling Spinner Hazard	2
34	55630	55630	55630	Decal - Warning Falling Hazard	1
35	368	368	368	Decal - Flying Material	1

* - Not Shown

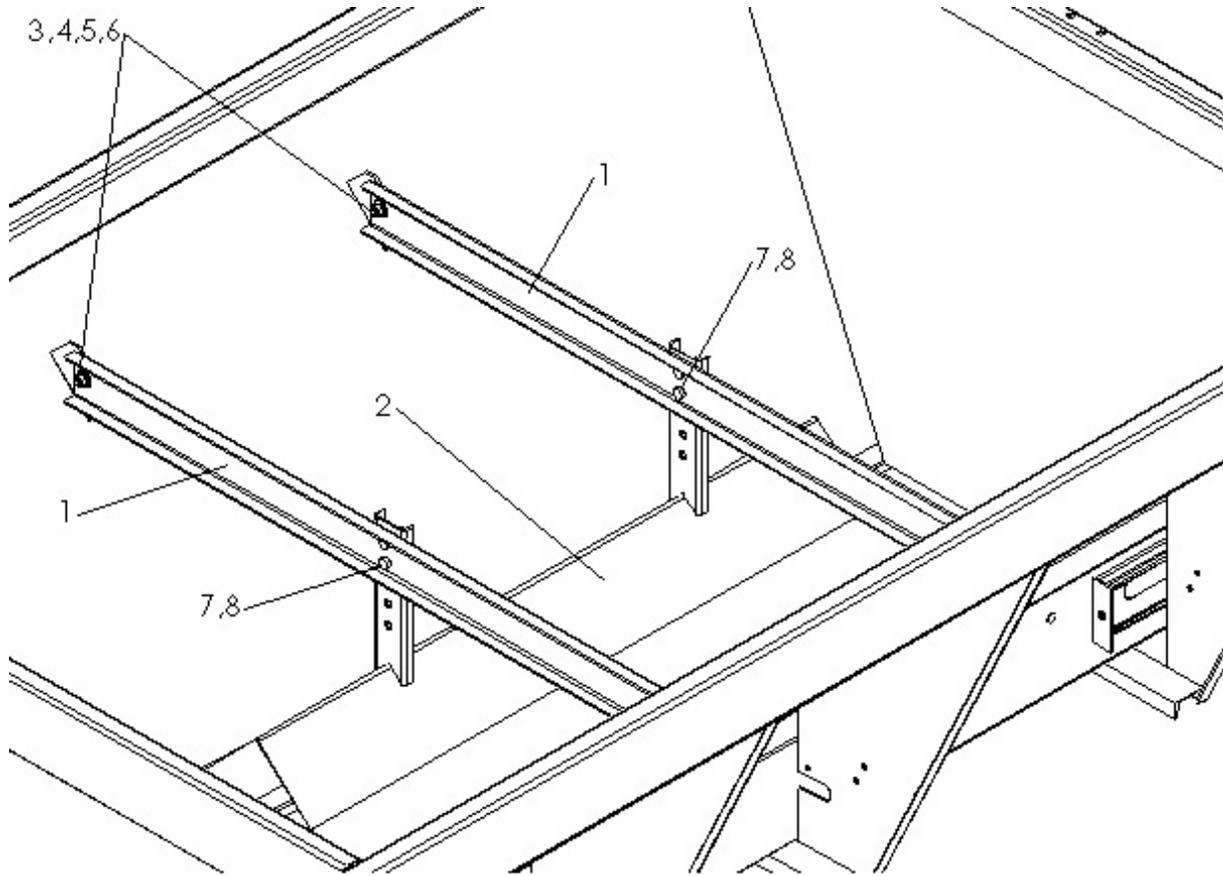
SPINNER MOUNTING KIT



<u>ITEM</u>	<u>PART NO.</u>			<u>DESCRIPTION</u>	<u>QTY</u>
	<u>CS</u>	<u>409 SS</u>	<u>304 SS</u>		
1	87845	97143	97145	Support – Pivot RH Wldmt	1
2	87846	97144	97146	Support – Pivot LH Wldmt	1
3	40576	36429	36429	Pin – Hair	2
4	20067	36398	36398	Cap Screw – 3/8 x 1	4
5	20712	36420	36420	Washer – Lock 3/8	4
6	20644	36414	36414	Nut – Hex 3/8	4
7	* 20364	72056	72056	Bolt – Carriage 1/2 x 1	2
8	* 20695	36426	36426	Washer – Flat 1/2	2
9	* 20714	36422	36422	Washer – Lock 1/2	2
10	* 20646	36416	36416	Nut – Hex 1/2	2
11	*20693	36425	36425	Washer - Flat 3/8	4

* - Not Shown – Used to prevent spinner from pivoting.

INVERTED V

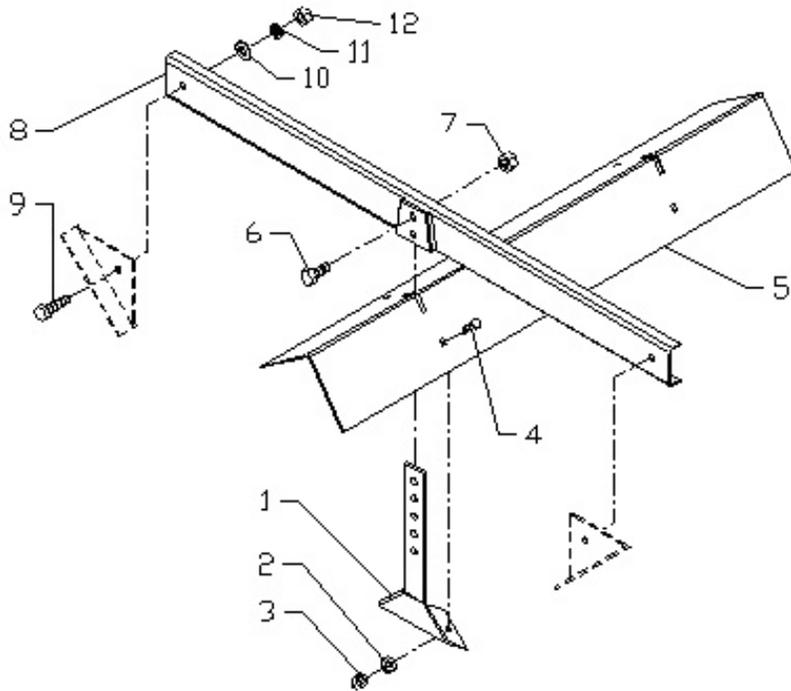


<u>ITEM</u>	<u>PART NO.</u>			<u>DESCRIPTION</u>	<u>QTY</u>
	<u>CS</u>	<u>409 SS</u>	<u>304 SS</u>		
1	81264-AA	81265-AA	81266	Channel – Hanger V	AR
2	87790	87880	87884	Inverted V – Wldmt 9'-10' Units	1
	87877	87881	87885	Inverted V – Wldmt 11'-12' Units	1
	87878	87882	87886	Inverted V – Wldmt 13'-14' Units	1
	87879	87883	87887	Inverted V – Wldmt 15'-16' Units	1
3	20128	36402	36402	Cap Screw – 1/2 x 1 1/4	AR
4	20695	36426	36426	Washer – Flat 1/2	AR
5	20714	36422	36422	Washer – Lock 1/2	AR
6	20646	36416	36416	Nut – Hex 1/2	AR
7	20176	58800	58800	Cap Screw – 5/8 x 1 3/4	AR
8	20682	41762	41762	Nut – Lock 5/8	AR

AR – As Required

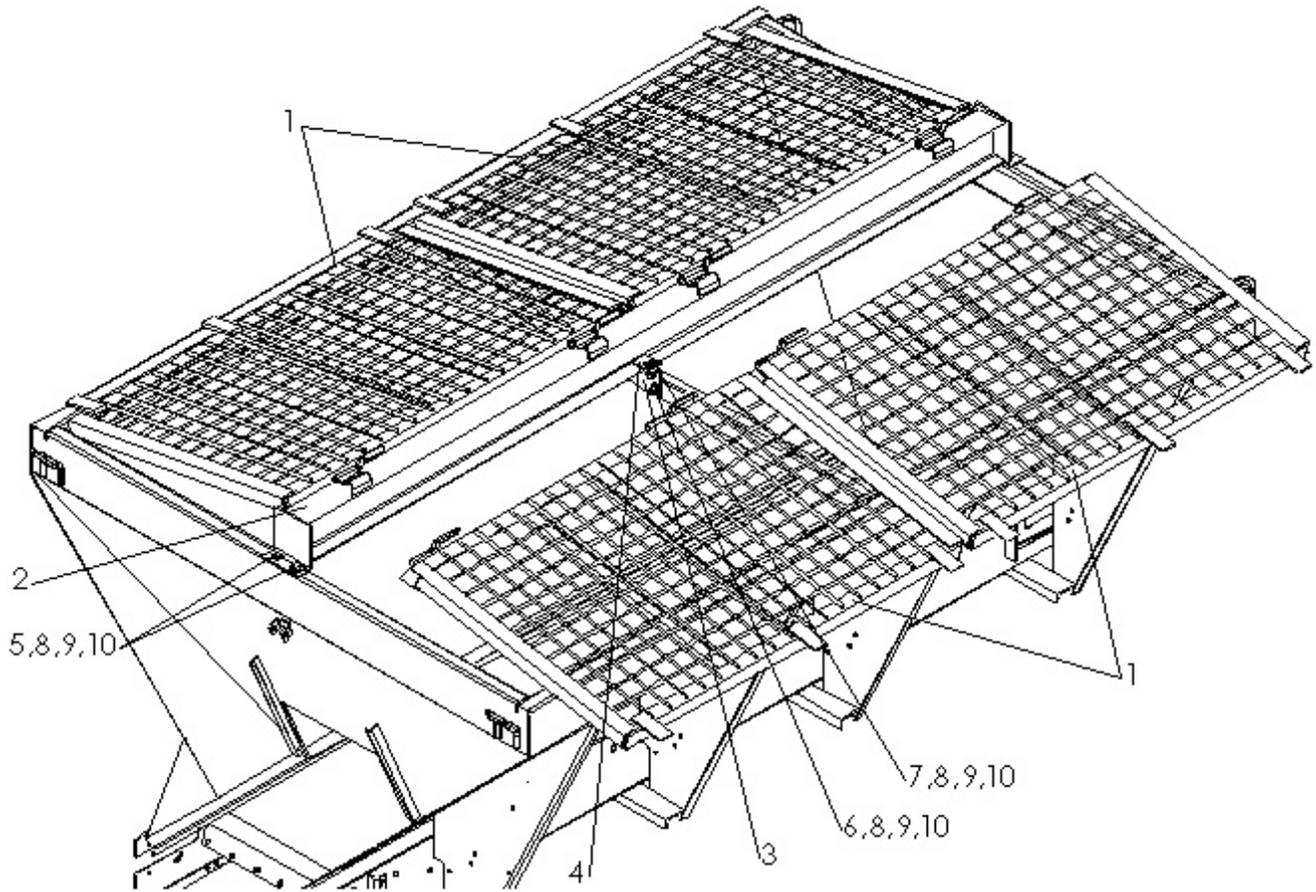
PARTS LIST

INVERTED V - SWINGING



ITEM	PART NO.			DESCRIPTION	QTY
	CS	409 SS	304 SS		
1	82625	82626	82626	Bar – Adjustment	AR
2	20692	36424	36424	Washer – Flat 5/16	AR
3	20677	42221	42221	Nut – Lock 5/16	AR
4	20291	42639	42639	Bolt – Carriage 5/16 x 1	AR
5	82613	82617	82621	Inverted V – Wldmt 9'-10' Units	1
	82614	82618	82622	Inverted V – Wldmt 11'-12' Units	1
	82615	82619	82623	Inverted V – Wldmt 13'-14' Units	1
	82616	82620	82624	Inverted V – Wldmt 15'-16' Units	1
6	20176	58800	58800	Cap Screw – 5/8 x 1 3/4	AR
7	20682	41762	41762	Nut – Lock 5/8	AR
8	81261	81262	81263	Hanger – Wldmt V	AR
9	20128	36402	36402	Cap Screw – 1/2 x 1 1/4	AR
10	20695	36426	36426	Washer – Flat 1/2	AR
11	20714	36422	36422	Washer – Lock 1/2	AR
12	20646	36416	36416	Nut – Hex 1/2	AR

AR – As Required



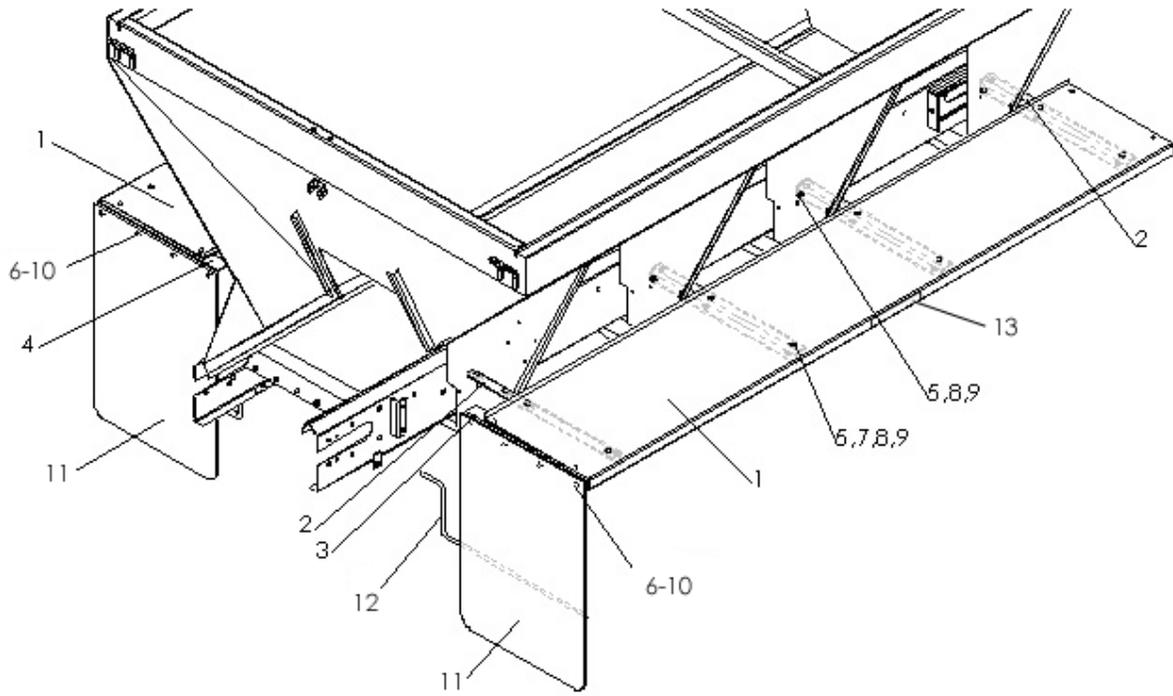
UNIT LENGTH	QUANTITY		
	4' SCREEN	5' SCREEN	6' SCREEN
9'	2	2	-
10'	-	4	-
11'	-	2	2
12'	-	-	4
13'	4	2	-
14'	2	4	-
15'	-	6	-
16'	-	4	2

PARTS LIST

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	44184	Screen Wldmt – 4'	AR
	44185	Screen Wldmt – 5'	AR
	44186	Screen Wldmt – 6'	AR
	* 77425	Screen Wldmt – 4' w/ Wide Openings	AR
	* 77426	Screen Wldmt – 5' w/ Wide Openings	AR
	* 77427	Screen Wldmt – 6' w/ Wide Openings	AR
2	44188	Ridgepole Wldmt – 9' Units	1
	44189	Ridgepole Wldmt – 10' Units	1
	44190	Ridgepole Wldmt – 11' Units	1
	44191	Ridgepole Wldmt – 12' Units	1
	44192	Ridgepole Wldmt – 13' Units	1
	44193	Ridgepole Wldmt – 14' Units	1
	44194	Ridgepole Wldmt – 15' Units	1
	44195	Ridgepole Wldmt – 16' Units	1
3	203886	Bracket – Angle, 12' – 16' Units	1
4	44238	Clamp – Flat, 12' – 16' Units	2
5	20128	Cap Screw – 1/2 x 1 1/4	4
6	20129	Cap Screw – 1/2 x 1 1/2, 12' – 16' Units	2
7	20130	Cap Screw – 1/2 x 1 3/4, 12' – 16' Units	2
8	20695	Washer – Flat 1/2	12
9	20714	Washer – Lock 1/2	8
10	20646	Nut – Hex 1/2	8

* - Not Shown

FENDERS



PARTS LIST



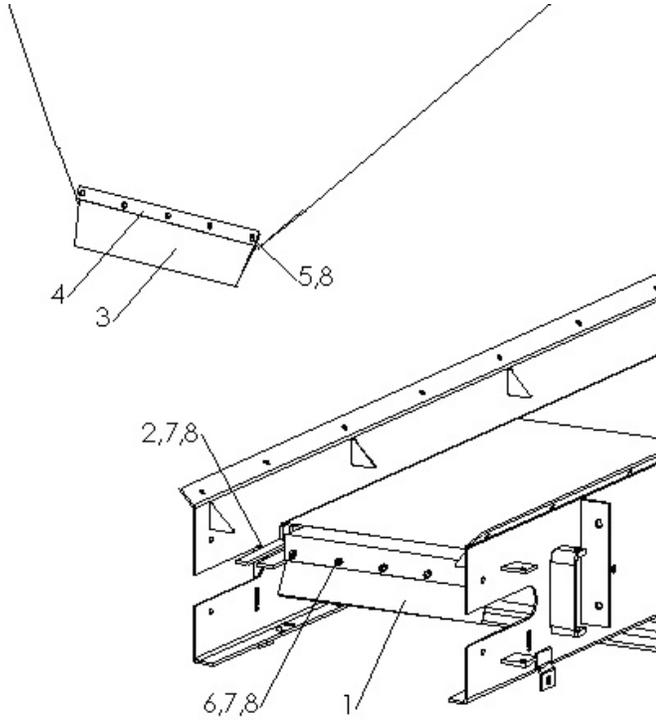
FENDERS CONTINUED

ITEM	PART NO.			DESCRIPTION	QTY
	CS	409 SS	304 SS		
1	81415	81440	81463	Fender – 9'	
	81416	81441	81464	Fender – 10'	2
	81417	81442	81465	Fender – 11'	2
	81418	81443	81466	Fender – 12'	2
	81419	81444	81467	Fender – 13'	2
	81420	81445	81468	Fender – 14'	2
	81421	81446	81469	Fender – 15'	2
	81422	81447	81470	Fender – 16'	2
2	46445	46445	46445	Angle – Fender	AR
3	46434	71900	71872	Bracket – Mudflap Mounting RH	1
4	46435	71901	71873	Bracket – Mudflap Mounting LH	1
5	20318	36408	36408	Bolt – Carriage 3/8 x 1	AR
6	20067	36398	36398	Cap Screw – 3/8 x 1	4
7	20693	36425	36425	Washer – Flat 3/8	AR
8	20712	36420	36420	Washer – Lock 3/8	AR
9	20644	36414	36414	Nut – Hex 3/8	AR
10	20067	20067	20067	Cap Screw - 3/8 x 1	8
11	21770	21770	21770	Mudflap	2
12	36844	36844	36844	Rod – Mudflap	2
13	39200	39200	39200	Decal - Warning Keep Off Fender	2
14	*21699	21699	21699	Anti-Skid Fabric (Specify Length)	2

* - Not Shown AR - As Required



WIPERS



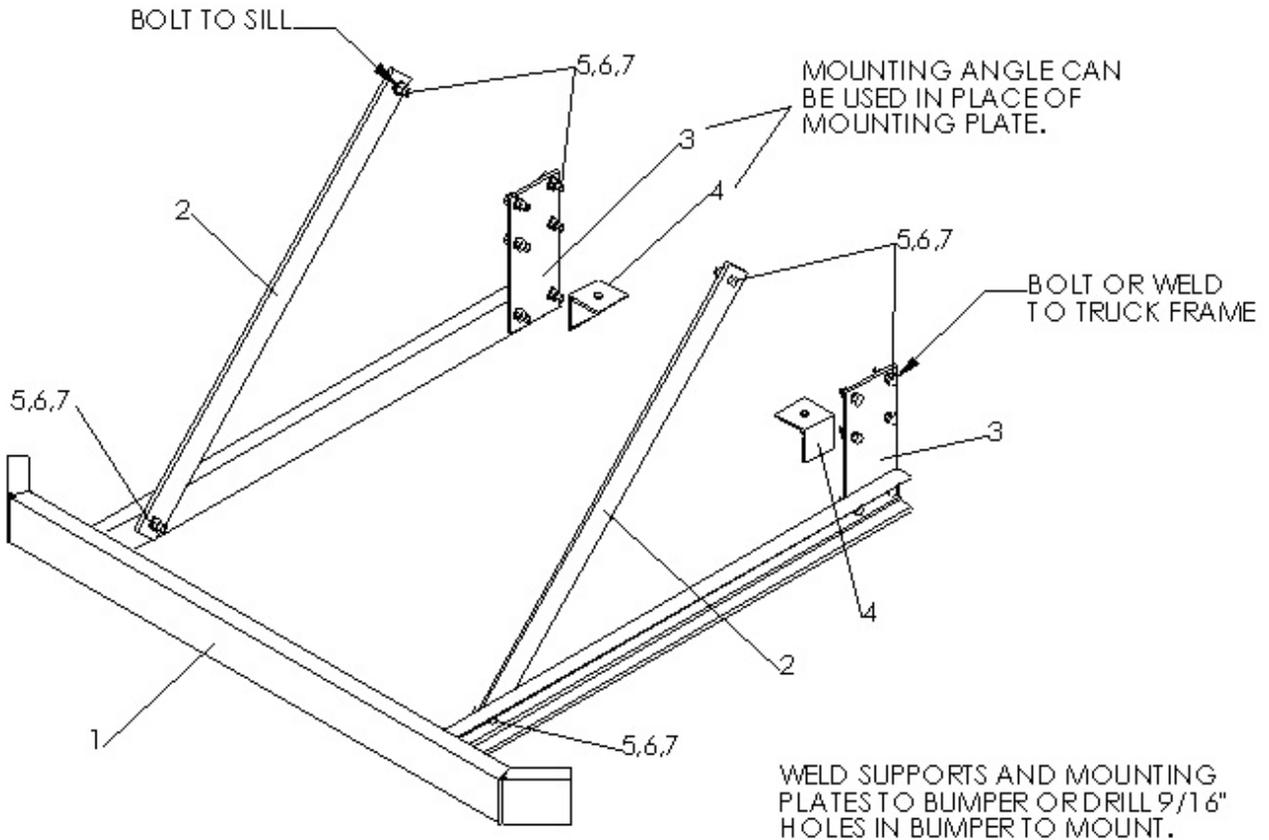
ITEM	PART NO.		DESCRIPTION	QTY
	CS	SS		
1	3735	3735	Wiper – Belt Rear	1
2	33207	33207	Sealer – Belt Sprocket	2
3	39426	39426	Wiper – Belt Front	1
4	54230	54230	Retainer – Belt	1
5	20583	32446	Screw – 1/4 x 3/4	5
6	20619	36405	Screw – Machine 1/4 x 3/4	5
7	20692	36423	Washer – Flat 1/4	AR
8	20642	36412	Nut – Hex 1/4	AR

AR - As Required

PARTS LIST

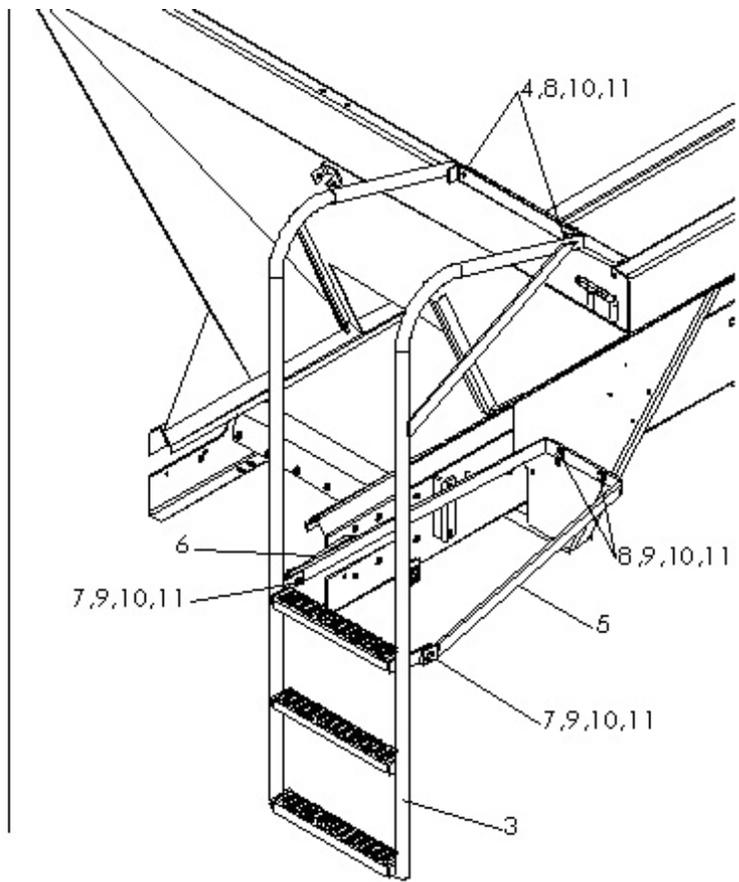
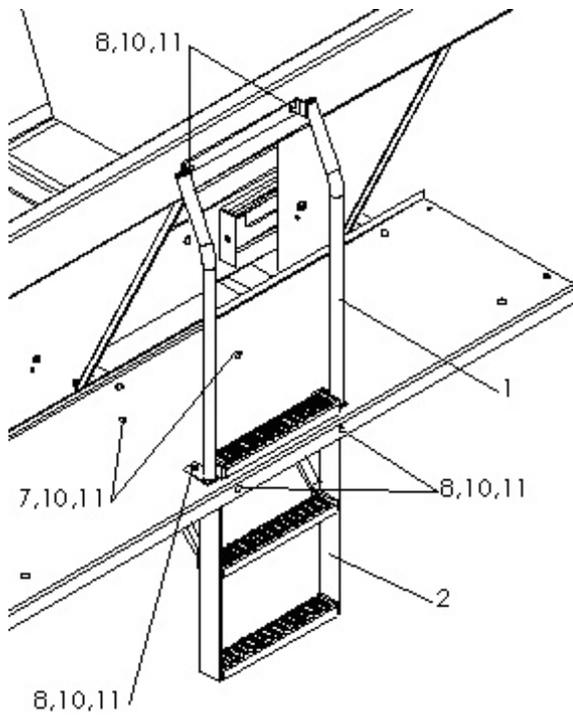


BUMPER



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	71272	Bumper Wldmt	1
2	851	Bar – Support	2
3	71274	Plate – Mounting	2
4	1014	Angle – Mounting (Can replace 71274)	2
5	20129	Cap Screw – 1/2 x 1 1/2	16
6	20714	Washer – Lock 1/2	16
7	20646	Nut – Hex 1/2	16

LADDERS

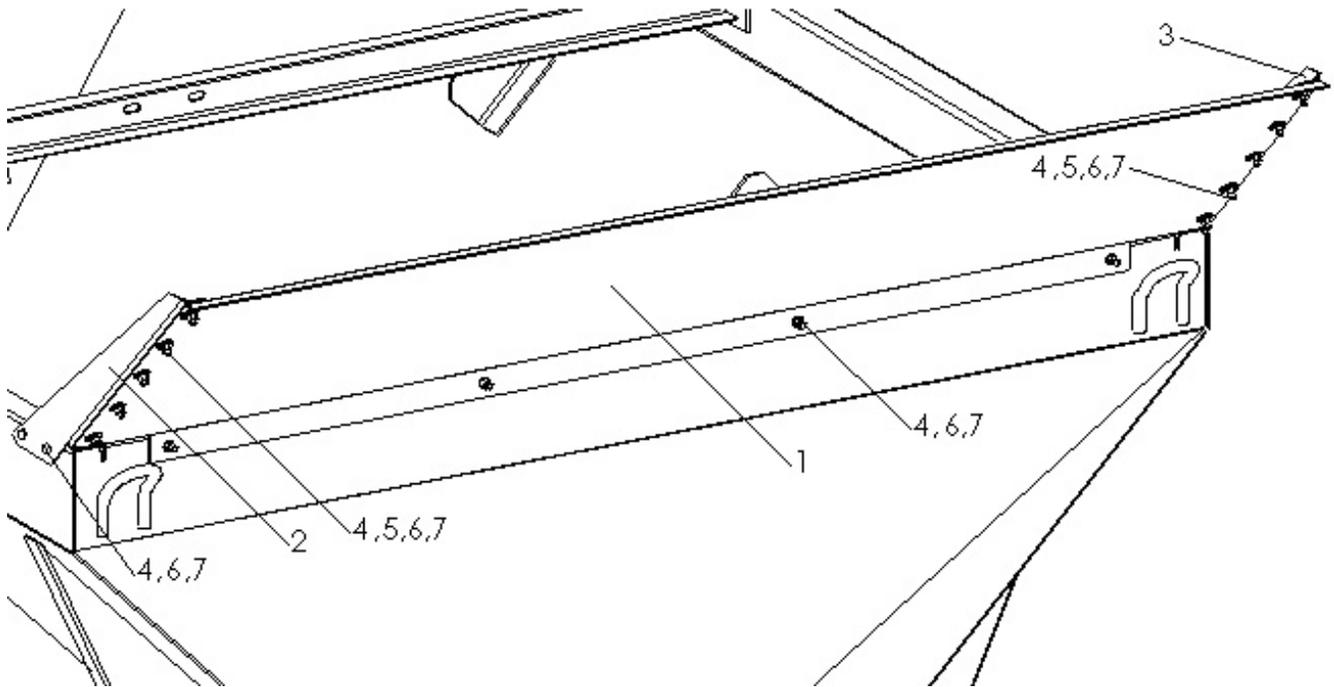


<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	72795	Ladder – Upper Wldmt	1
2	72797	Ladder – Lower Wldmt	1
3	72770	Ladder – Rear Wldmt	1
4	39935	Angle – Mounting, Use on standard units only	2
5	96237	Bracket – Ladder	1
6	72575	Bracket – Ladder	1
7	20069	Cap Screw – 3/8 x 1 1/2	AR
8	20068	Cap Screw – 3/8 x 1 1/4	AR
9	20693	Washer – Flat 3/8	AR
10	20712	Washer – Lock 3/8	AR
11	20644	Nut – Hex 3/8	AR

PARTS LIST



CAB SHIELD

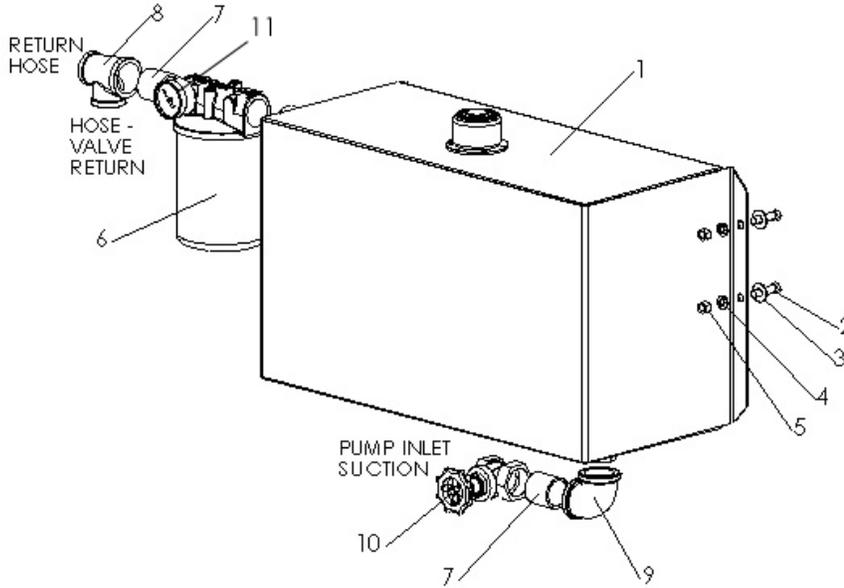


<u>ITEM</u>	<u>PART NO.</u>			<u>DESCRIPTION</u>	<u>QTY</u>
	<u>CS</u>	<u>409 SS</u>	<u>304 SS</u>		
1	31787	79153	79152	Panel – Shield 51" Cab Height	
	39812	79155	79154	Panel – Shield 57" Cab Height	1
	39818	79157	79156	Panel – Shield 63" Cab Height	1
	39824	79159	79158	Panel – Shield 69" Cab Height	1
2	31788	79167	79166	Support – RH 51" Cab Height	1
	39813	79171	79170	Support – RH 57" Cab Height	1
	39819	79175	79174	Support – RH 63" Cab Height	1
	39825	79179	79178	Support – RH 69" Cab Height	1
3	31789	79169	79168	Support – LH 51" Cab Height	1
	39815	79173	79172	Support – LH 57" Cab Height	1
	39821	79177	79176	Support – LH 63" Cab Height	1
	39827	79181	79180	Support – LH 69" Cab Height	1
4	20067	36398	36398	Cap Screw – 3/8 x 1	AR
5	20693	36425	36425	Washer – Flat 3/8	AR
6	20712	36420	36420	Washer – Lock 3/8	AR
7	20644	36414	36414	Nut – Hex 3/8	AR

Please Give Part No., Description
& Unit Serial No.



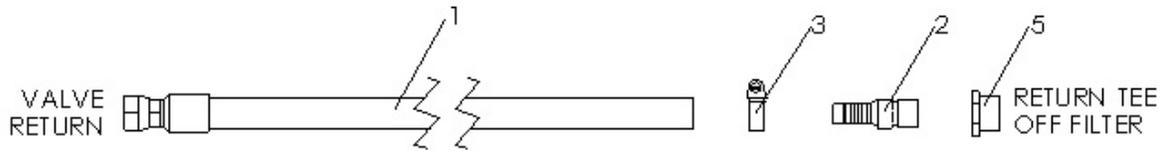
RESERVOIR & FILTER TRUCK CHASSIS MOUNT



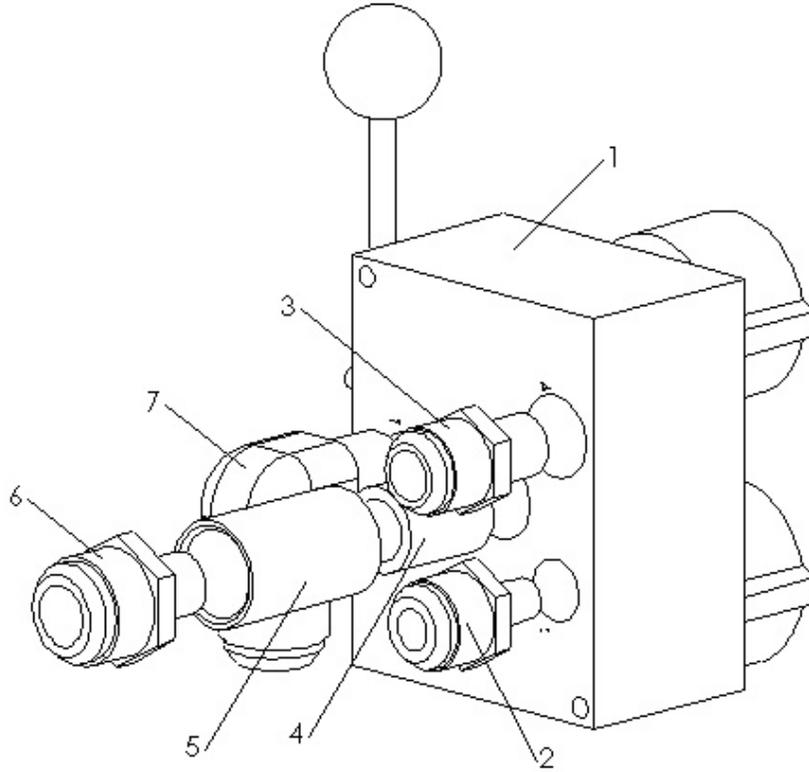
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	39796	Reservoir Wldmt, Includes:	1
	39929	Cap – Filler	1
	6033	Plug	1
2	20069	Cap Screw – 3/8 x 1 1/2	4
3	20693	Washer – Flat 3/8	4
4	20712	Washer – Lock 3/8	4
5	20644	Nut – Hex 3/8	4
6	39845	Filter Assy	1
	43530	Filter Element	1
7	6028	Nipple – Close	2
8	6318	Tee – Pipe	1
9	6011	Elbow – Pipe	1
10	22155	Valve – Gate	1
11	43534	Gauge	1

PARTS LIST





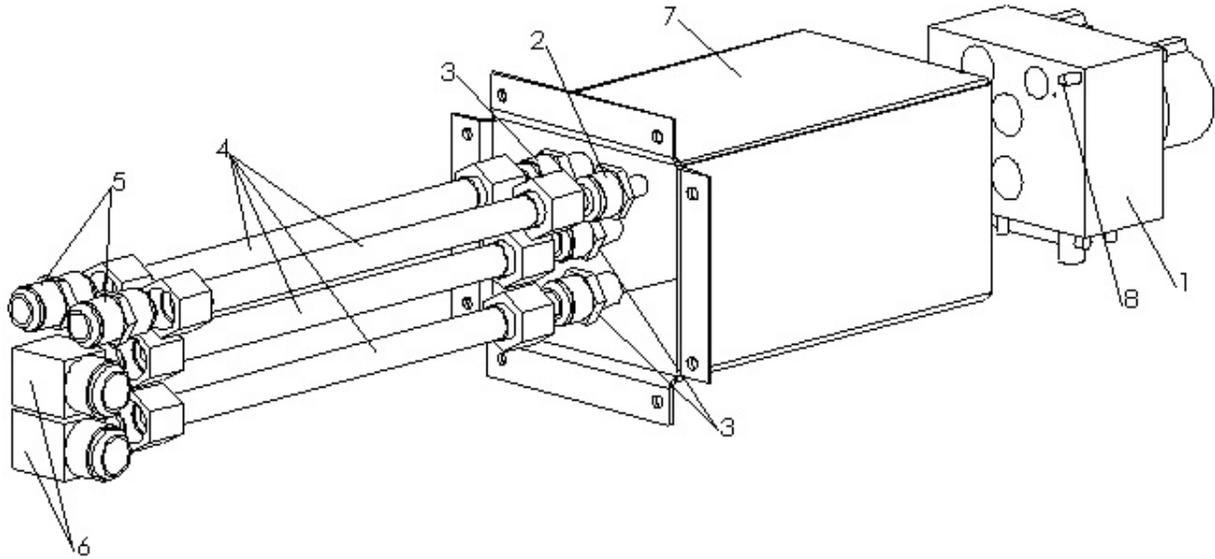
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	88326	Hose Assy, Valve at Cab	1
	88325	Hose Assy, Valve at Rear Series Valve	1
	88319	Hose Assy, Valve at Rear Series Valve	1
2	22426	End - Hose	1
	22425	End - Hose, Valve at Rear Series Valve	1
3	6335	Clamp - Hose 1"	1
	22381	Clamp - Hose 3/4", Valve at Rear Series Valve	1
4	6034	Plug - Pipe, Valve at Rear	1
5	22208	Bushing - Pipe	1



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	310650	Valve – Manual Dual	1
2	29784	Adapter – Connector	1
3	29752	Adapter – Connector	1
4	16362	Nipple – Pipe	1
5	16276	Coupling – Pipe	1
6	29757	Adapter – Connector	1
7	29779	Adapter – Elbow	1

PARTS LIST

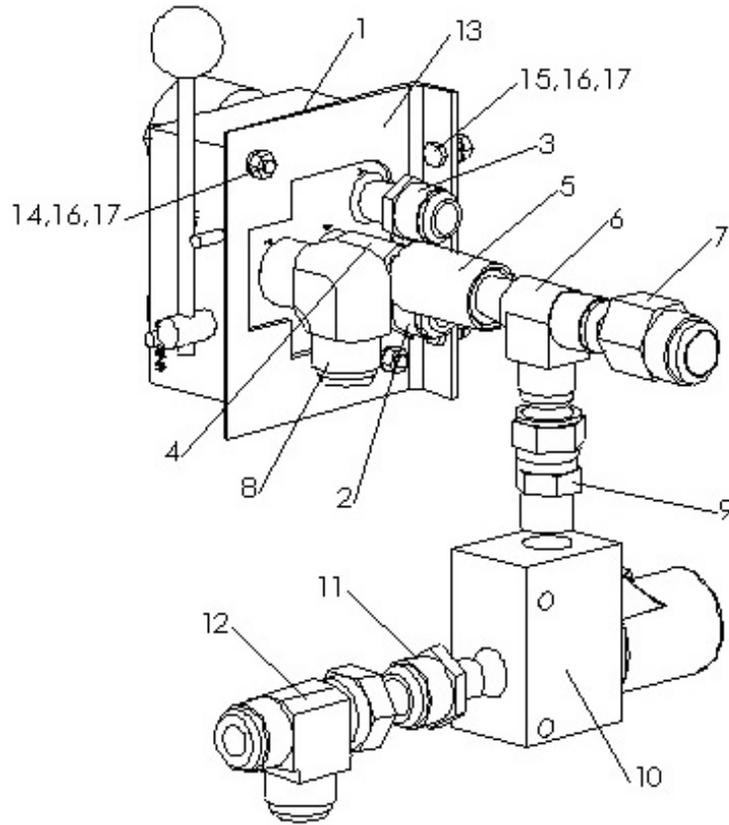
**VALVE - MANUAL, PEDESTAL MOUNT
TRUCK CHASSIS MOUNT RESERVOIR**



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	34144	Valve – Manual Dual	1
2	29784	Adapter – Connector	1
3	29752	Adapter – Connector	3
4	36800	Tube Assy	4
5	29817	Adapter – Union	2
6	29786	Adapter – Elbow	2
7	36803	Pedestal	1
8	20013	Cap Screw – 1/4 x 3	2

Please Give Part No., Description
& Unit Serial No.

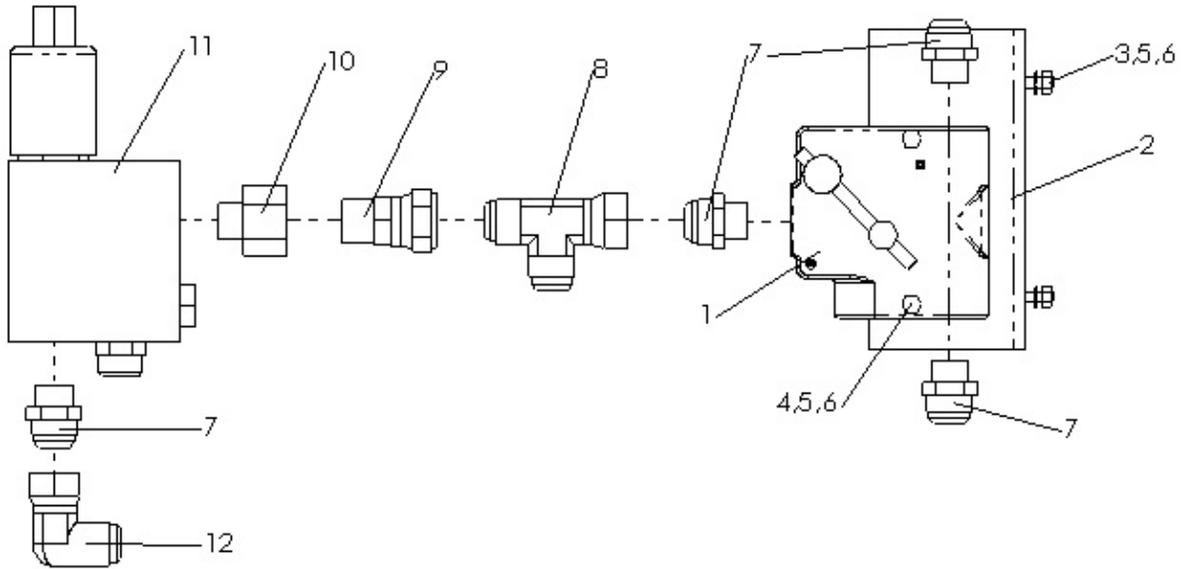




<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
	310655	Valve Assy – Manual, Rear Mount	
	*31375	Kit - Electrical Control Switch for Dump Valve	
1	34144	Valve – Manual Dual	1
2	29784	Adapter – Connector	1
3	29752	Adapter – Connector	1
4	16362	Nipple – Pipe	1
5	16276	Coupling – Pipe	1
6	29769	Tee – Swivel Nut	1
7	34712	Adapter	1
8	29779	Adapter – Elbow	1
9	34826	Adapter – Connector	1
10	302564	Valve - Solenoid 2-Way	1
11	29757	Adapter – Connector	1
12	29850	Tee – Swivel Nut	1
13	88049	Bracket – Valve	1
14	20013	Cap Screw – 1/4 x 3	2
15	20003	Cap Screw – 1/4 x 3/4	2
16	20710	Washer – Lock 1/4	4
17	20642	Nut – Hex 1/4	4
18	*31572	Terminal - Ring	1
19	*6488	Connector - Wire	3
20	*12373	Plug	1
21	*21583	Wire	3

* - Not Shown

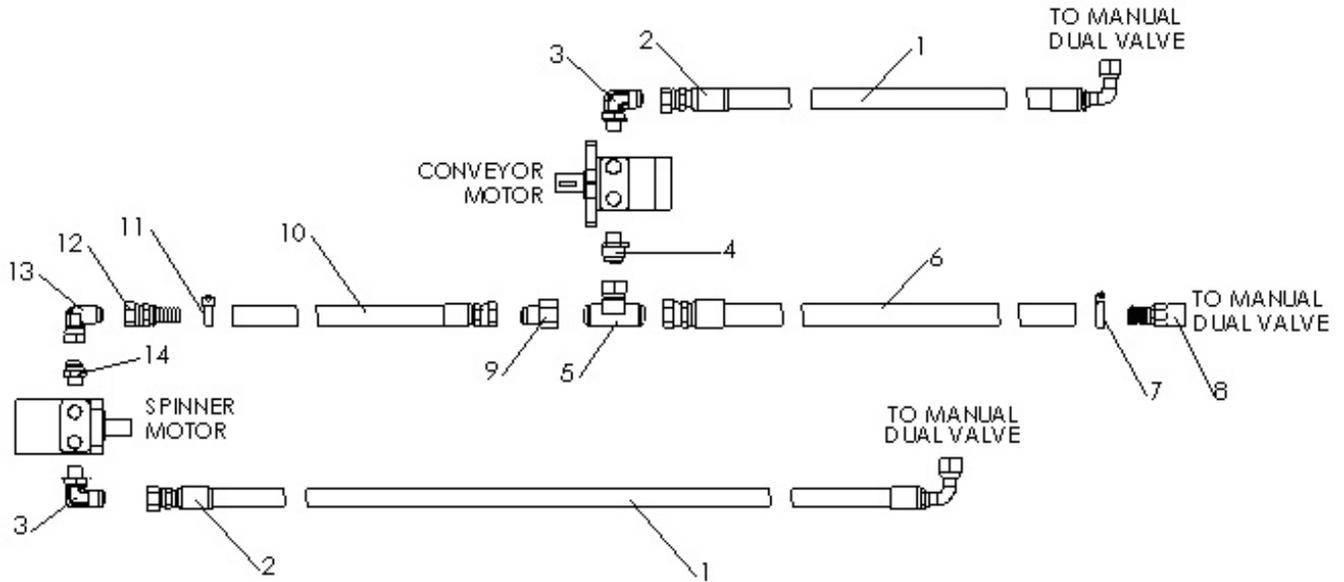
VALVE - SERIES



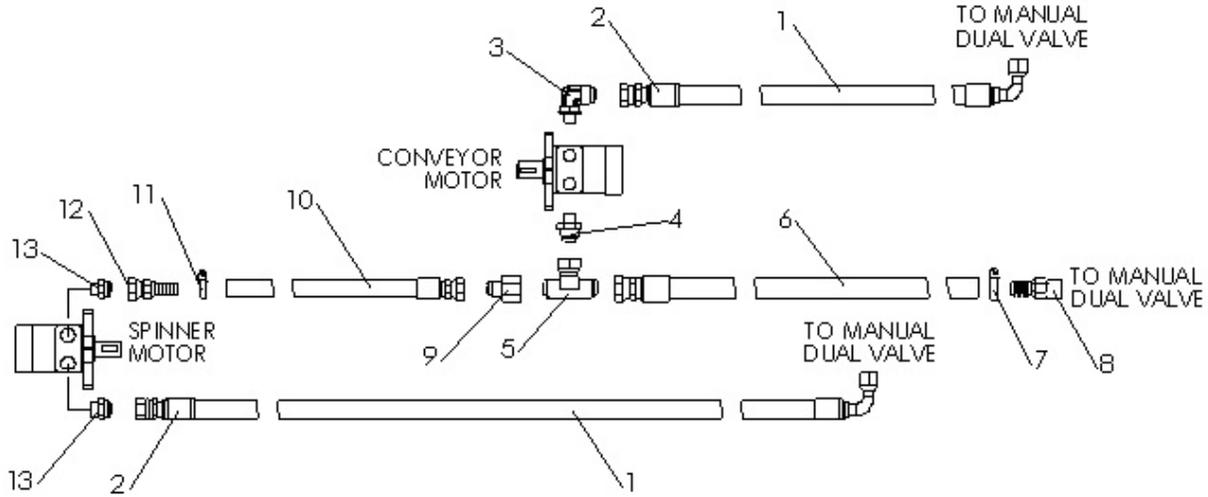
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	38420	Valve – Control	1
2	98779	Bracket – Valve	1
3	20003	Cap Screw – 1/4 x 3/4	2
4	20011	Cap Screw – 1/4 x 2-1/2	2
5	20710	Washer – Lock 1/4	4
6	20642	Nut – Hex 1/4	4
7	29753	Adapter – Connector	AR
8	29781	Tee – Swivel Nut	1
9	34826	Adapter – Connector	1
10	22020	Fitting	1
11	56296	Valve – Dump/Relief 1500 PSI	1
12	34709	Adapter – Elbow 90°	1
13	*31375	Kit - Electrical Control Switch	1

PARTS LIST



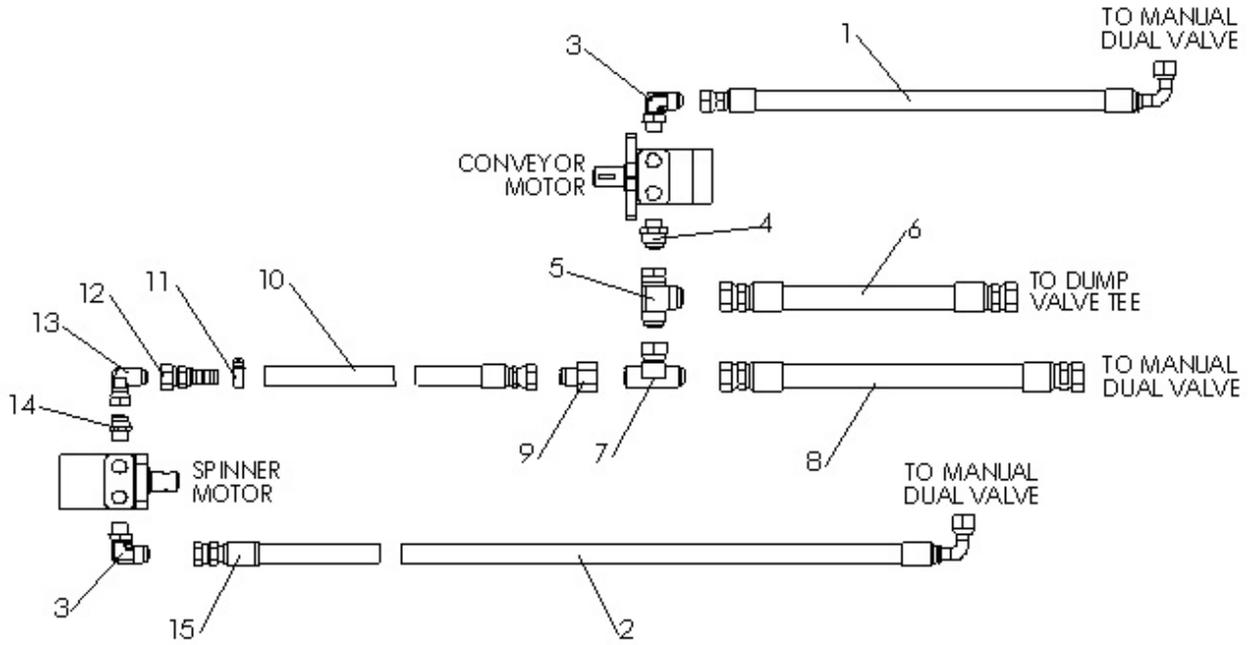


<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	88313	Hose Assy	2
2	56508	Fitting – Hose	2
3	29773	Adapter – Elbow	2
4	29778	Adapter – Connector	1
5	29836	Tee – Swivel Nut	1
6	88325	Hose Assy	1
7	6335	Clamp – Hose	1
8	22426	End – Hose	1
9	34849	Adapter	1
10	88320	Hose Assy	1
11	22381	Clamp – Hose	1
12	11424	End – Hose	1
13	34709	Adapter – Elbow	1
14	29753	Adapter - Connector	1

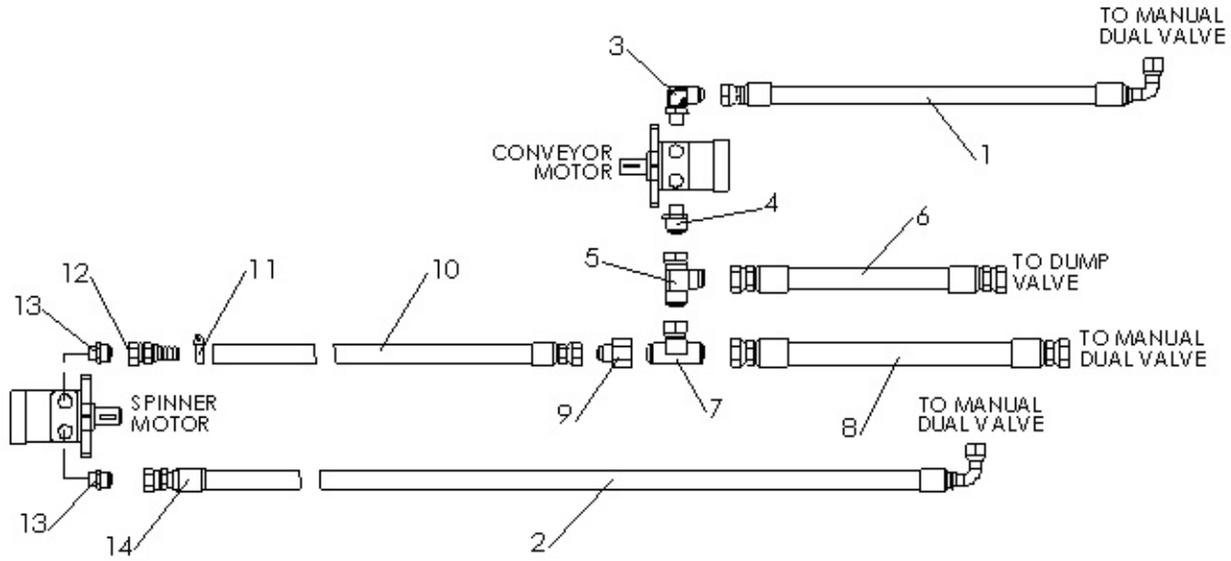


<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	88313	Hose Assy	2
2	56508	Fitting – Hose	2
3	29773	Adapter – Elbow	1
4	29778	Adapter – Connector	1
5	29836	Tee – Swivel Nut	1
6	88325	Hose Assy	1
7	6335	Clamp – Hose	1
8	22426	End – Hose	1
9	34849	Adapter	1
10	88320	Hose Assy	1
11	22381	Clamp – Hose	1
12	11424	End – Hose	1
13	29753	Adapter – Connector	2

PARTS LIST



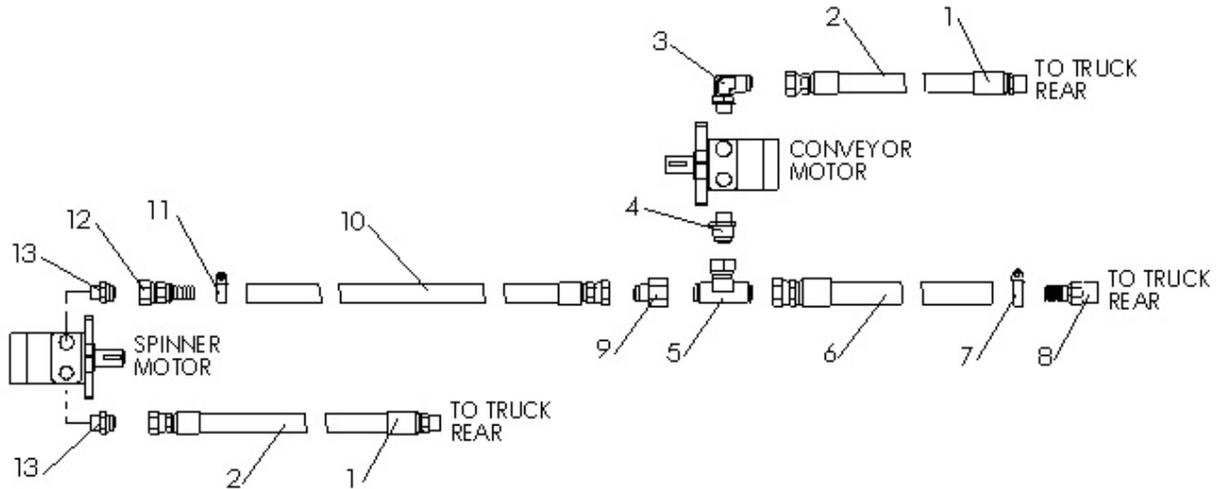
ITEM	PART NO.	DESCRIPTION	QTY
1	88316	Hose Assy	1
2	88312	Hose Assy	1
3	29773	Adapter – Elbow	2
4	29778	Adapter – Connector	1
5	29850	Tee – Swivel Nut	1
6	88328	Hose Assy	1
7	29836	Tee – Swivel Nut	1
8	88327	Hose Assy	1
9	34849	Adapter	1
10	88320	Hose Assy	1
11	22381	Clamp – Hose	1
12	11424	End – Hose	1
13	34709	Adapter – Elbow	1
14	29753	Adapter – Connector	1
15	56508	Fitting – Hose	1



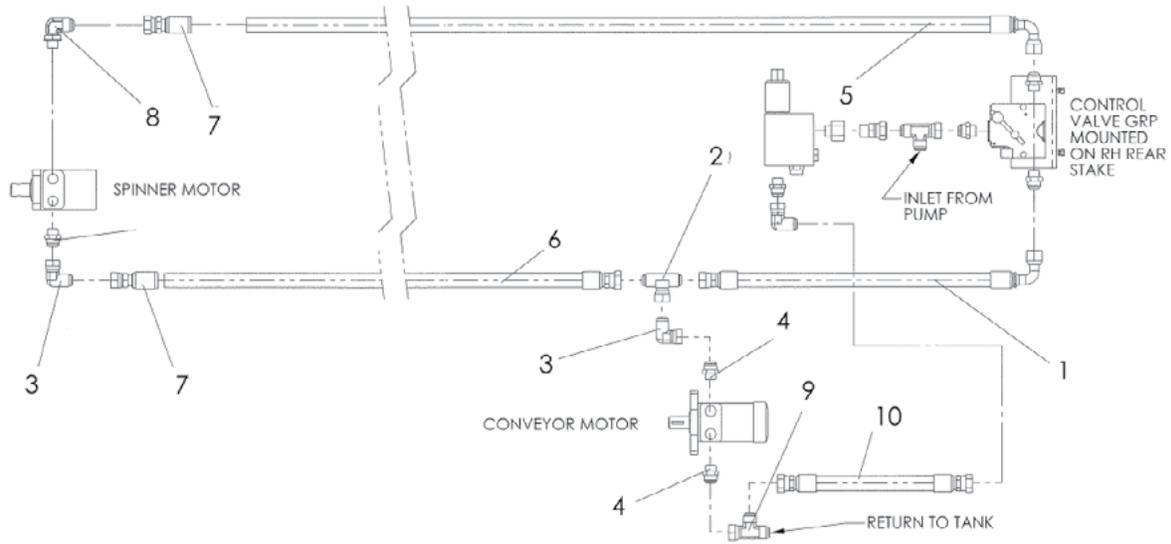
ITEM	PART NO.	DESCRIPTION	QTY
1	88316	Hose Assy	1
2	88312	Hose Assy	1
3	29773	Adapter – Elbow	1
4	29778	Adapter – Connector	1
5	29850	Tee – Swivel Nut	1
6	88328	Hose Assy	1
7	29836	Tee – Swivel Nut	1
8	88327	Hose Assy	1
9	34849	Adapter	1
10	88320	Hose Assy	1
11	22381	Clamp – Hose	1
12	11424	End – Hose	1
13	29753	Adapter – Connector	2
14	56508	Fitting – Hose	1

PARTS LIST





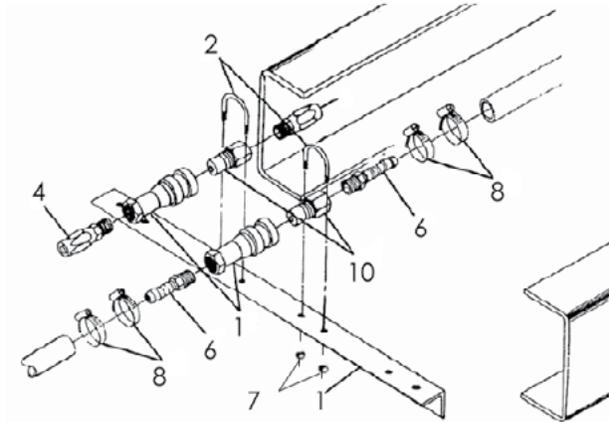
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	56503	End – Hose	2
2	88314	Hose Assy	2
3	29773	Adapter – Elbow	1
4	29778	Adapter – Connector	1
5	29836	Tee – Swivel Nut	1
6	88326	Hose Assy	1
7	6335	Clamp – Hose	1
8	22426	End – Hose	1
9	34849	Adapter	1
10	88320	Hose Assy	1
11	22381	Clamp – Hose	1
12	11424	End – Hose	1
13	29753	Adapter – Connector	2



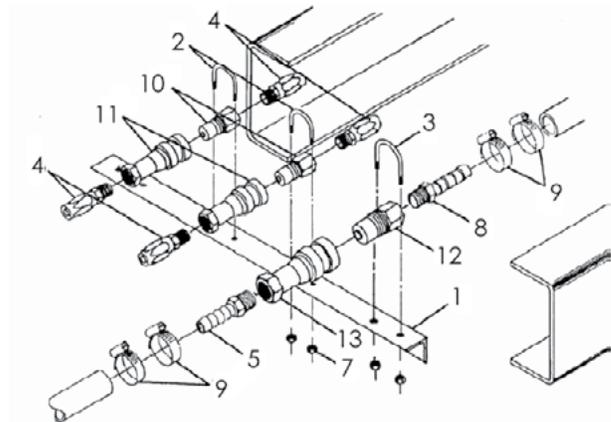
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	88316	Hose – Assy 3/4 x 27-1/2	1
2	29809	Adapter – Tee Branch	1
3	34709	Adapter – Elbow 90°	2
4	29753	Adapter – Connector	3
5	88312	Hose – Assy 3/4 x 118	1
6	56442	Hose – 3/4 x 90-5/8	1
7	56508	Fitting – Hose Reusable	2
8	29773	Adapter – Elbow 90°	1
9	29781	Tee – Swivel Nut	1
10	88324	Hose – Assy 3/4 x 16 CB	1

PARTS LIST

HYDRAULICS - QUICK DISCONNECT



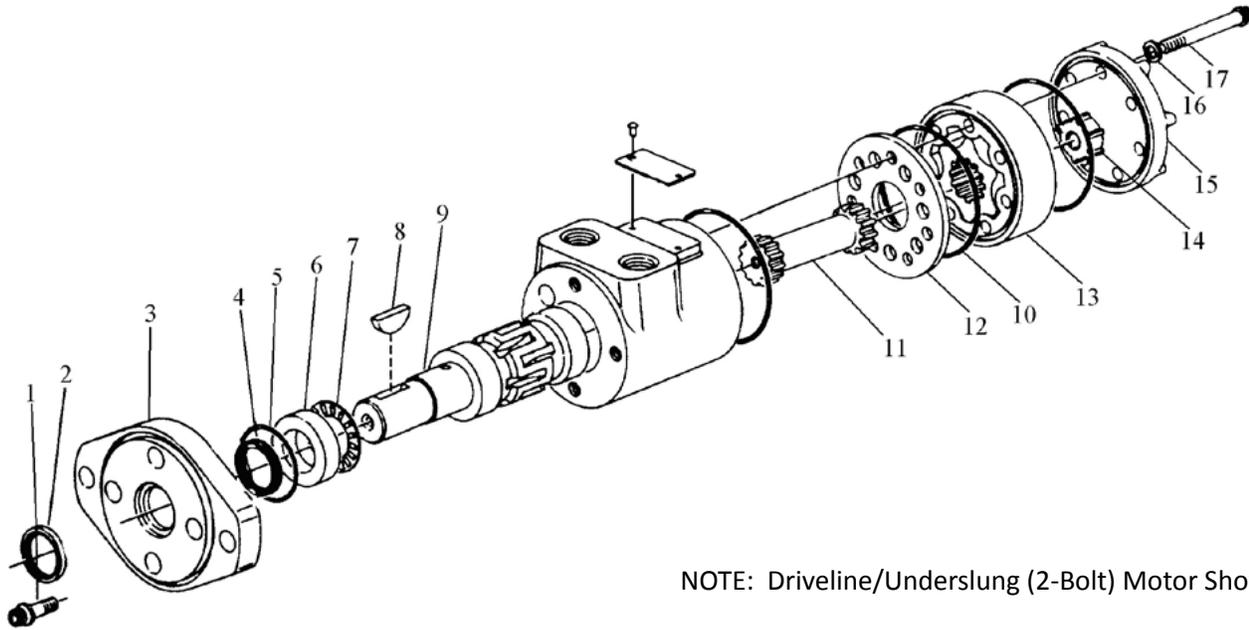
Quick Disconnect Series Valve



Quick Disconnect Manual Dual Valve

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	39851	Angle Mounting	1
2	39854	U-Bolt 1-1/2"	AR
3	39855	U-Bolt 1-3/4"	AR
4	56503	Hose - End, Reusable 3/4"	AR
5	22426	Hose - End Nipple	2
6	22425	Hose - End	2
7	20643	Nut - Hex 5/16	AR
8	22381	Clamp - Hose	4
9	6335	Clamp - Hose	4
10	39905	Disconnect - Quick Male 3/4"	2
11	39906	Disconnect - Quick Female 3/4"	2
12	39908	Disconnect - Quick Male 1"	AR
13	39909	Disconnect - Quick Female "	AR
14	*39910	Dust - Cap 3/4"	2
15	*39911	Dust - Cap 1"	AR
16	*39912	Dust - Plug 3/4"	2
17	*39913	Plug - Dust 1"	AR

* - Not Shown AR - As Required



NOTE: Driveline/Underslung (2-Bolt) Motor Shown

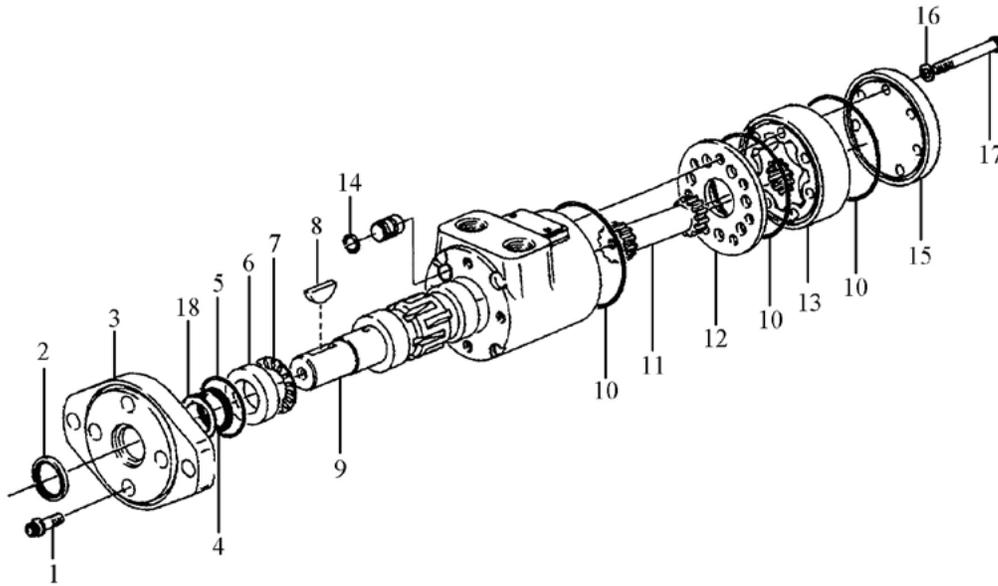
NOTE: Driveline/Underslung (2-Bolt) Motor Shown

SPINNER MOTOR CONTINUED

<u>ITEM</u>	<u>PART NO.</u>		<u>DESCRIPTION</u>	<u>QTY</u>
	<u>Direct Drive</u>	<u>Driveline & Underslung</u>		
	58806	37339	Motor – Hydraulic	
1	30665	30665	Cap Screw	4
2	37382	37382	Seal	1
3	37383	73546	Flange – Mounting	1
4	73473	73473	Seal	1
5	37379	37379	Seal – O-Ring	1
6	37385	37385	Race – Bearing	1
7	37401	37401	Bearing – Thrust Needle	1
8	NA	3065	Key – Woodruff	1
9	NS	37386	Shaft – Output	1
10	37380	37380	Seal – O-Ring	3
11	16945	16945	Drive	1
12	37388	37388	Plate – Spacer	1
13	37389	37389	Gerotor	1
14	37399	37399	Spacer	1
15	37400	37400	Cap – End	1
16	37381	37381	Washer – Seal	7
17	16931	16931	Cap Screw	7
18	* 22068	* 22068	Seal – O-Ring	1
19	73472	73472	Ring – Back-up	1
	39137	39137	Seal Kit, Includes Items 2, 4, 5, 10, 16	

* – Not Shown NA – Not Applicable NS – Not Serviced





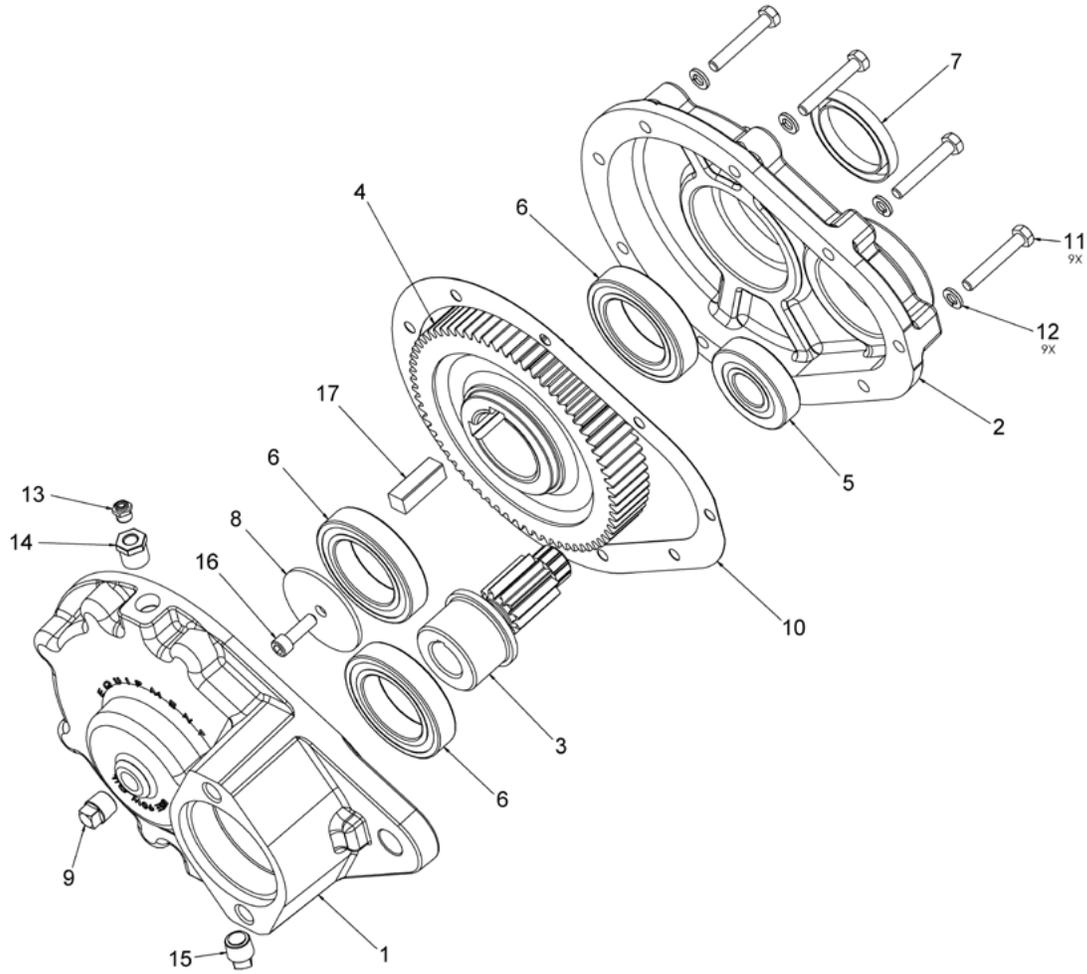
CONVEYOR MOTOR CONTINUED

<u>ITEM</u>	<u>PART NO.</u>		<u>DESCRIPTION</u>	<u>QTY</u>
	<u>1-1/2"</u>	<u>2"</u>		
	39137	39137	Kit – Seal, Includes Items 2,4,5,10,16,18 & 19	
1	30665	30665	Cap Screw	4
2	73471	37382	Seal	1
3	73555	73555	Flange – Mounting	1
4	73473	73473	Seal	1
5	73474	37379	Seal – O-Ring	1
6	37385	37385	Race – Bearing	1
7	37401	37401	Bearing – Thrust Needle	1
8	3065	3065	Key	1
9	37386	37386	Shaft - Output Keyed	1
10	73480	76480	Seal – O-Ring	3
11	83014	16946	Shaft – Drive	1
12	37388	37388	Plate – Spacer	1
13	73553	37395	Gerotor	1
14	22068	NA	Seal – O-Ring	1
15	37400	37400	Cap – End	1
16	37381	37381	Washer – Seal	7
17	16937	16938	Cap Screw	7
18	73472	73472	Washer – Back-up	1
19	* 73477	* 73477	Seal – O-Ring	1
20	NA	* 37399	Spacer	1
	39137	39137	Kit – Seal, Includes Items 2,4,5,10,16,18 & 19	

* – Not Shown NA – Not Applicable



GEAR CASE - SINGLE PINION



PARTS LIST

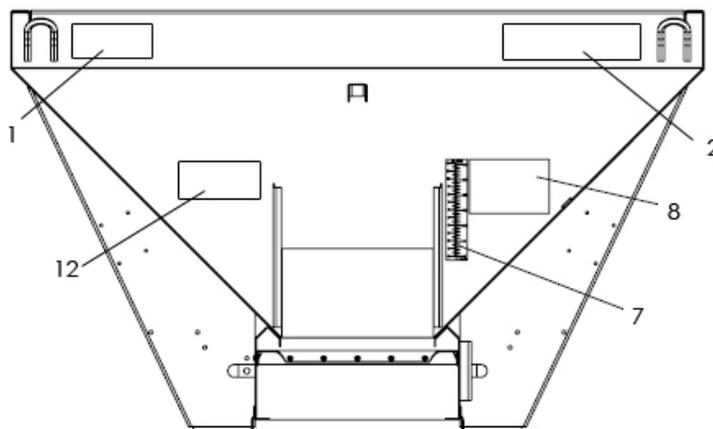
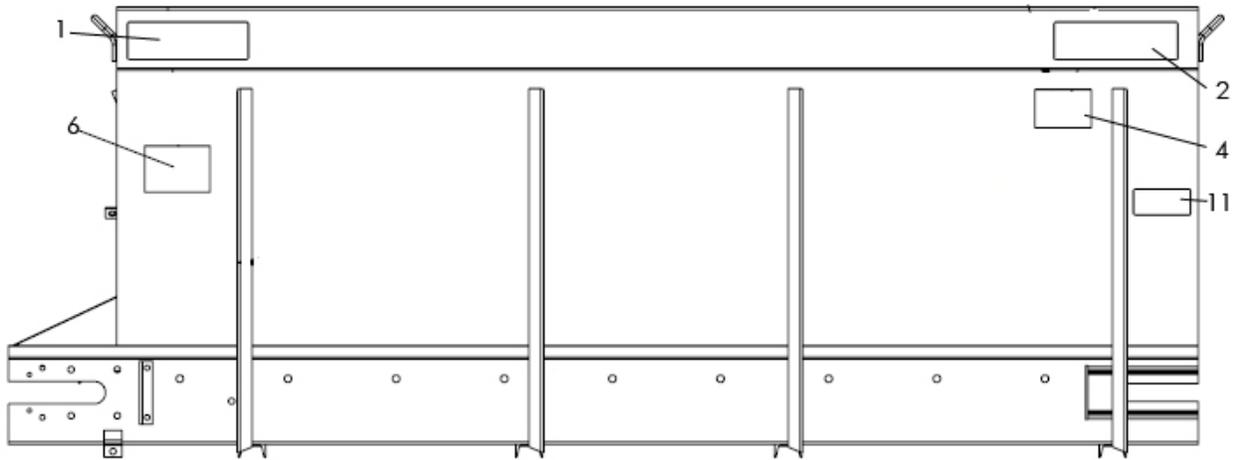
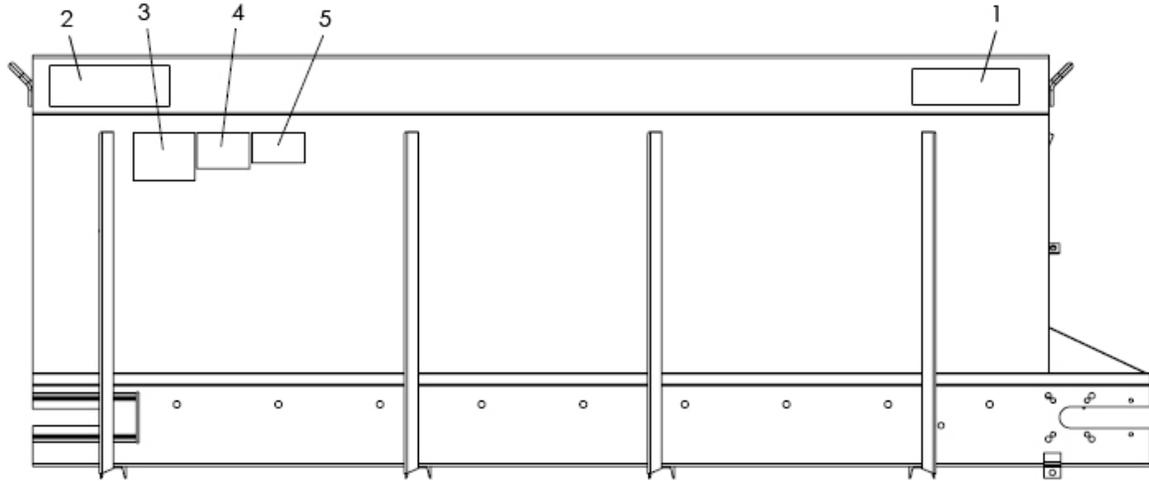


GEAR CASE - SINGLE PINION CONTINUED

<u>ITEM</u>	<u>PART NO.</u>		<u>DESCRIPTION</u>	<u>QTY</u>
	36671		Gear Case – Assy Single Pinion	
	<u>CS</u>	<u>SS</u>		
	304269-AA	304269-AB	Parts - Service, Includes 1-17	
1	37001	304559	Housing – Outboard	1
2	37002	304560	Housing – Inboard	1
3	37003	304561	Gear – Pinion 11 Tooth	2
4	38981	304562	Gear – Driven 67 Tooth	1
5	37007	37007	Bearing	2
6	37008	37008	Bearing	4
7	37006	37006	Seal – Oil	1
8	38979	38979	Washer – Flat 2-1/2 x 11/32	2
9	6031	6031	Plug – Pipe	1
10	37005	304563	Gasket – Housing	1
11	20040	20040	Cap Screw – 5/16NC x 2	10
12	20711	20711	Washer – Lock 5/16	10
13	2564	2564	Cap – Breather	1
14	27465	27465	Bushing – Pipe 1/8 x 3/8	1
15	21490	21490	Plug – Pipe Magnetic	1
16	38980	38980	Screw – Allen Head 5/16-18 x 1	1
17	37010	37010	Key – 1/2 x 1/2 x1-1/2	2

Please Give Part No., Description
& Unit Serial No.



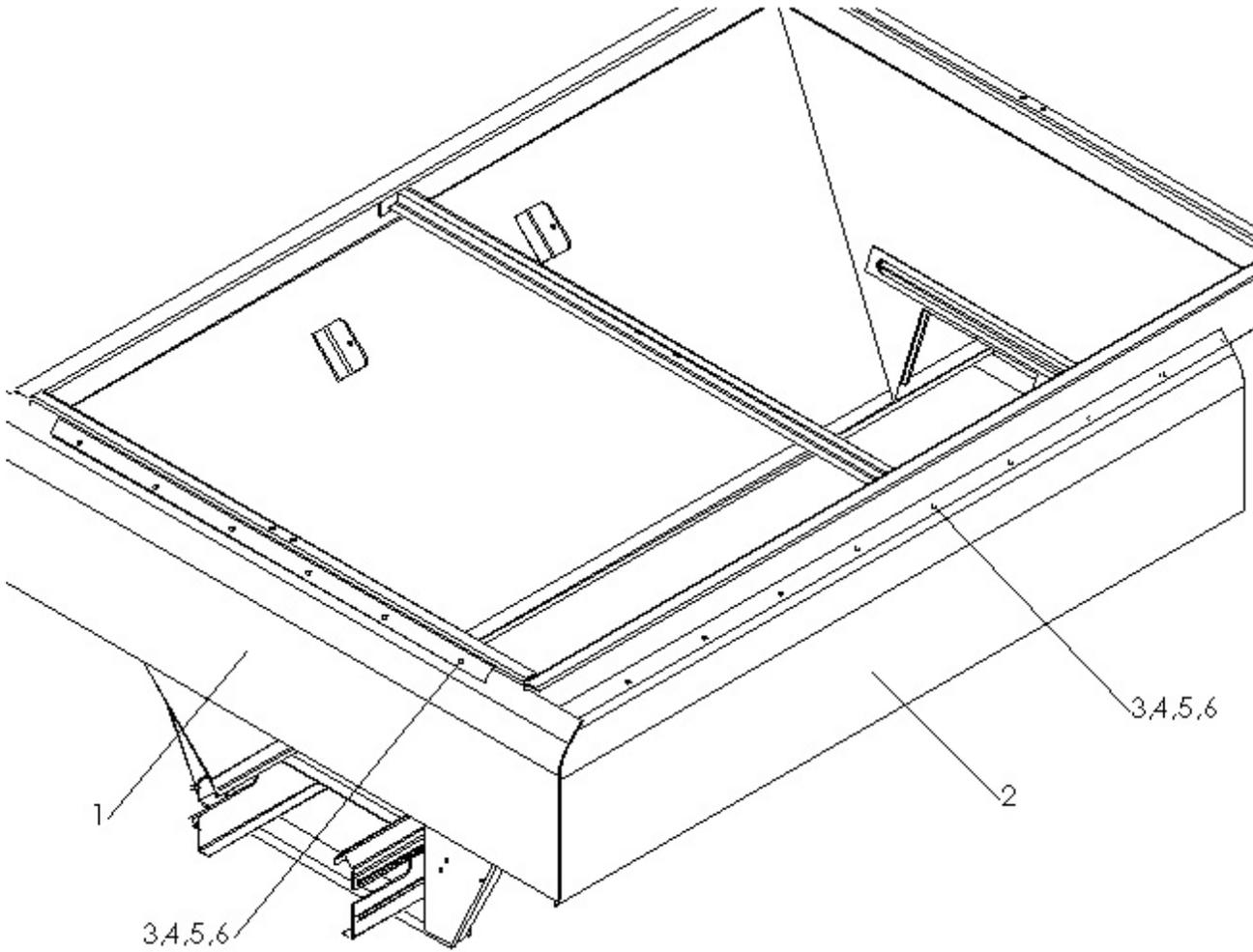


DECALS CONTINUED

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	39870	Hi-Way Black	3
	90639	Hi-Way White	3
2	83648	E2020XT - Black	3
	90638	E2020XT - White	3
3	150034	Decal - Caution Operation & Maintenance	1
4	364	Decal - Danger Moving Part Hazard	2
5	321	Decal - Caution Hazardous Material	1
6	39138	Decal - Warning High Pressure Fluid	1
7	23769	Ruler - Feedgate	1
8	368	Decal - Danger Flying Material (Spinner)	1
9	* 39200	Decal - Warning Slipping Hazard (Fenders)	2
10	* 71807	Decal - Warning Falling Spinner Hazard (Spinner)	2
11	21476	Decal - Notice Chain Life	1
12	71526	Decal - Notice Spread Test	1
13	*55630	Decal - Warning Falling Hazard (Spinner)	1

* - Not Shown - see *Spinner* parts pages for additional decals

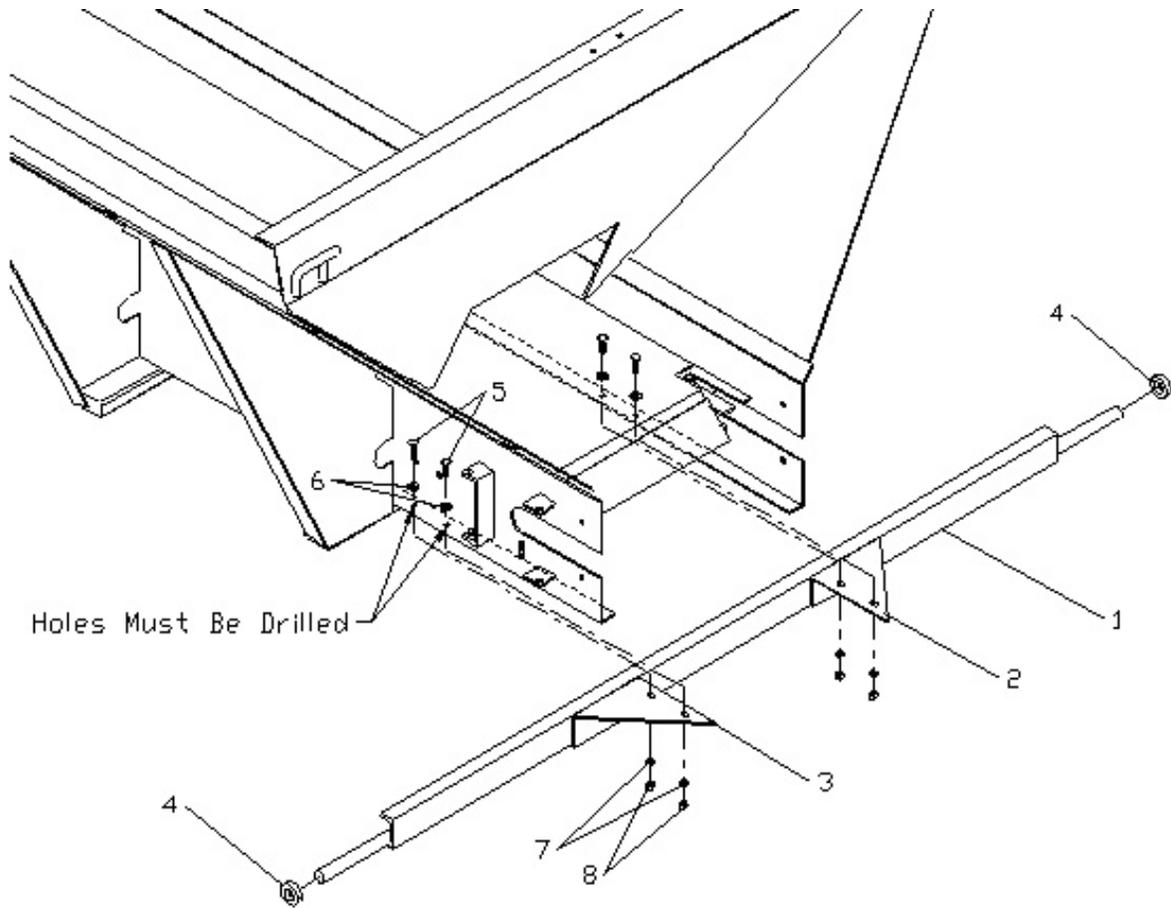
SKIRTING



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	84191	Skirt – Front	1
2	84202	Skirt – Side 9' Unit	2
	84203	Skirt – Side 10' Unit	2
	84204	Skirt – Side 11' Unit	2
	84205	Skirt – Side 12' Unit	2
	84206	Skirt – Side 13' Unit	2
	84207	Skirt – Side 14' Unit	2
	84208	Skirt – Side 15' Unit	2
	84209	Skirt – Side 16' Unit	2
3	36395	Cap Screw – 1/4 x 1	AR
4	36418	Washer – Flat 1/4	AR
5	36423	Washer – Lock 1/4	AR
6	36412	Nut – Hex 1/4	AR

PARTS LIST



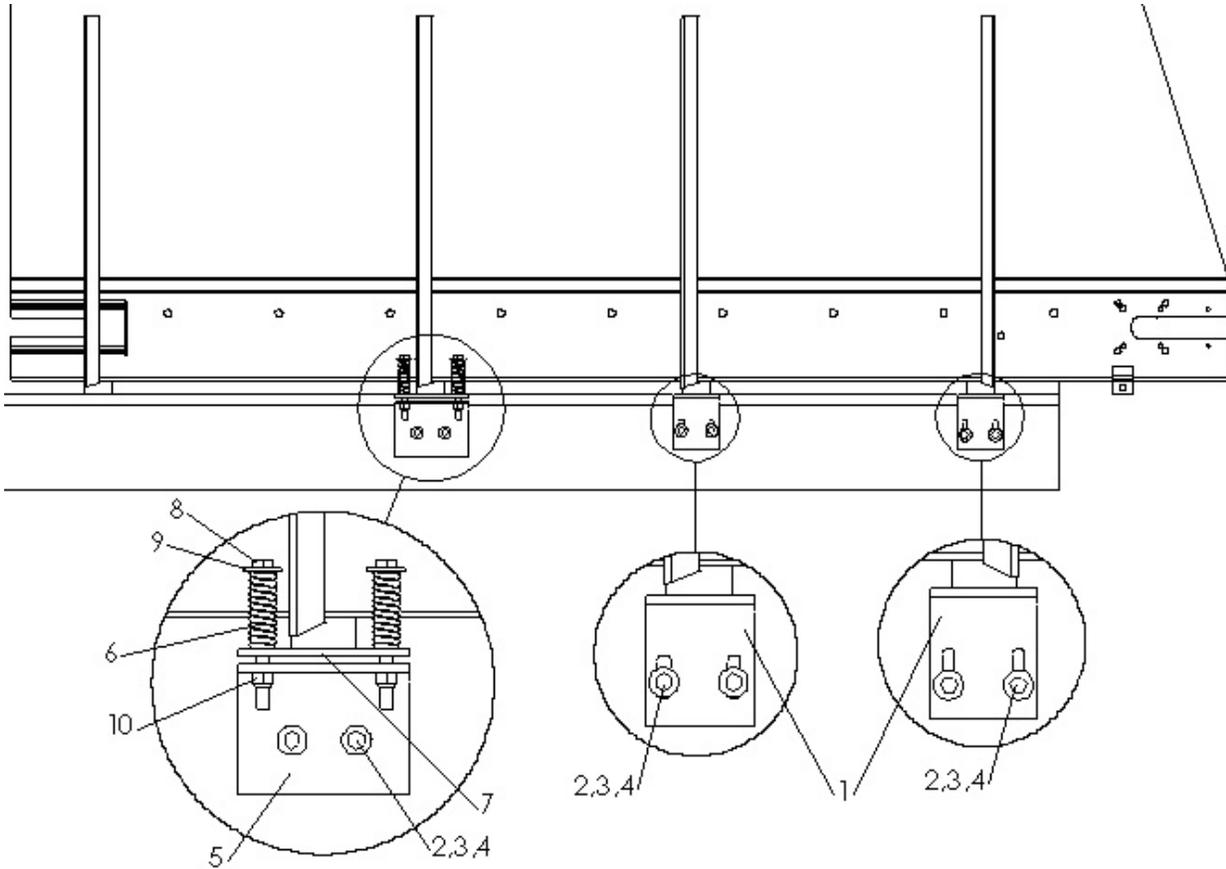


<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	39946	Tailgate Latch Wldmt	1
2	71254	Gusset – Mounting RH	1
3	71255	Gusset – Mounting LH	1
4	21055	Collar – Set	2
5	20319	Bolt – Carriage 3/8 x 1 1/4	8
6	20644	Nut – Hex 3/8	8
7	20693	Washer – Flat 3/8	8
8	20712	Washer – Lock 3/8	8
9	* 88291	Strap – Ratchet	4
10	* 308794	Hook – Upper Wldmt	4

Dump Body Hold Down and Tailgate Latch are both part of kit # 80999.

* - Not Shown

MOUNTING ANGLES



ITEM	PART NO.	DESCRIPTION	QTY
1	31856	Angle – Mounting	4
2	20131	Cap Screw – 1/2 x 2	12
3	20695	Washer – Flat 1/2	12
4	20680	Nut – Lock 1/2-13	12
5	81847	Angle – Tie Down	2
6	81000	Spring	4
7	81848	Mounting – Bar	2
8	20195	Cap Screw – 5/8 x 6 1/2	4
9	20697	Washer – Flat 5/8	4
10	41762	Nut – Lock 5/8	4
11	* 72071	Screw – Self Tapping 1/4 x 3/4	8
12	* 39942	Strap – Retainer	8

* - Not Shown

PARTS LIST

LIGHTS

LIGHTS & REFLECTORS

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	39830	Light – Kit Truck Chassis Mount	1
2	39852	Light – Kit Dump Body Mount	1

DIRECTIONAL LIGHTS

3	72734	Light – Kit Directional w/o Controls	1
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WARNING LIGHTS

4	29496	Light – Kit 1 Red Flashing	1
5	26421	Light – Kit 2 Red Flashing	1
6	29494	Light – Kit 1 Amber Flashing	1
7	26422	Light – Kit 2 Amber Flashing	1

FLOOD LIGHTS

8	21606	Light – Kit 1 Flood	1
9	21605	Light – Kit 2 Flood	1

Install lights and reflective devices to conform to FMVSS-108 and state requirements.