



## MODEL E3020

UNIT SERIAL NUMBER \_\_\_\_\_

MANUAL NUMBER: 72400-I

EFFECTIVE 10/2015



1330 76TH AVE SW  
CEDAR RAPIDS, IA 52404-7052  
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# Insert Current Hi-Way Warranty



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

**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.**

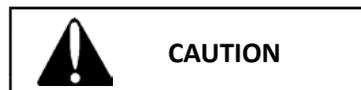
In this manual and on the safety signs placed on the unit, the words “DANGER,” “WARNING,” “CAUTION,” and “NOTICE” are used to indicate the following:



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**

	 <b>WARNING</b>
	<p>To prevent death or serious injury:</p> <ul style="list-style-type: none"> <li>• Do not place objects on fenders.</li> <li>• Keep off fenders. They are not intended to carry loads.</li> </ul> <p style="text-align: right;">39200-D</p>

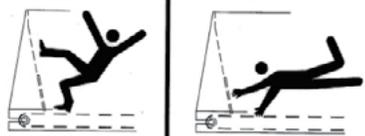
 <b>WARNING</b>

<p><b>FALLING HAZARD</b> To prevent death, serious injury or machine damage:</p> <ul style="list-style-type: none"> <li>• Do not stand or climb on guard.</li> </ul> <p style="text-align: right;">55630-D</p>

 <b>WARNING</b>

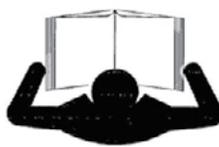
<p><b>HIGH PRESSURE FLUID HAZARD</b> To prevent death or serious injury:</p> <ul style="list-style-type: none"> <li>• Relieve pressure on system before repairing, adjusting, or disconnecting.</li> <li>• Keep all lines, fittings and couplers tight and free of leaks.</li> <li>• Wear proper hand and eye protection when searching for leaks. Use wood or cardboard instead of hands.</li> <li>• Do not use hydraulic lines for hand holds or steps.</li> <li>• Components may be hot.</li> </ul> <p style="text-align: right;">39138-C</p>

 <b>CAUTION</b>
<p><b>HAZARDOUS MATERIALS</b> To avoid injury or machine damage:</p> <ul style="list-style-type: none"> <li>• Materials to be spread can be dangerous.</li> <li>• Improper selection, application, use or handling may be a hazard to persons, animals, crops or other property.</li> <li>• Follow instructions and precautions given by the material manufacturer.</li> </ul> <p style="text-align: right;">321-C</p>

 <b>DANGER</b>

<p><b>MOVING PART HAZARD</b> To prevent death or serious injury:</p> <ul style="list-style-type: none"> <li>• Stay out of box while conveyor is moving.</li> <li>• Disconnect and lockout power source before adjusting or servicing.</li> <li>• Do not ride on spreader.</li> </ul> <p style="text-align: right;">364-C</p>

<b>NOTICE</b>
<ul style="list-style-type: none"> <li>• Use SAE 15W-40 for hydraulic fluid.</li> <li>• Extreme operating temperatures may require a different viscosity oil range.</li> <li>• Consult dealer for recommendation.</li> </ul> <p style="text-align: right;">8665-D</p>

<b>NOTICE</b>
<ul style="list-style-type: none"> <li>• Conveyor chain life will be noticeably extended by periodic lubrication.</li> <li>• Use a 75% diesel fuel and 25% number 10 oil mixture on the links and rollers.</li> <li>• 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.</li> </ul> <p style="text-align: right;">21476-D</p>

 <b>CAUTION</b>

<p><b>TO AVOID INJURY OR MACHINE DAMAGE:</b></p> <ul style="list-style-type: none"> <li>• Do not operate or work on this machine without reading and understanding the operators manual.</li> <li>• Keep hands, feet, hair and clothing away from moving parts.</li> <li>• Do not allow riders on machine.</li> <li>• Avoid unsafe operation or maintenance.</li> <li>• Disengage power takeoff and shut off engine before removing guards, servicing or unclogging machine.</li> <li>• Keep unauthorized people away from machine.</li> <li>• Keep all guards in place when machine is in use.</li> <li>• If manual is missing, contact dealer for replacement.</li> </ul> <p style="text-align: right;">150034-C</p>

<b>NOTICE</b>
<p>Keep valve open while pump is running.</p> <p style="text-align: center;">↓</p> <p style="text-align: right;">8664-D</p>

 <b>WARNING</b>
<p><b>MOVING PART HAZARD</b> To prevent death or serious injury:</p> <ul style="list-style-type: none"> <li>• Close and secure guards before starting.</li> <li>• Do not stand or climb on machine.</li> <li>• Disconnect and lockout power source before adjusting or servicing.</li> <li>• Keep hands, feet and hair away from moving parts.</li> </ul> <p style="text-align: right;">55631-C</p>

 <b>DANGER</b>

<p><b>FLYING MATERIAL &amp; ROTATING SPINNER HAZARD</b> To prevent death or serious injury:</p> <ul style="list-style-type: none"> <li>• Wear eye protection.</li> <li>• Stop machine before servicing or adjusting.</li> <li>• Keep bystanders at least 60 feet away.</li> </ul> <p style="text-align: right;">368-C</p>

 <b>WARNING</b>
<p><b>MOVING PART HAZARD</b> To prevent death or serious injury:</p> <ul style="list-style-type: none"> <li>• Close and secure guards before starting.</li> <li>• Do not stand or climb on machine.</li> <li>• Disconnect and lockout power source before adjusting or servicing.</li> <li>• Keep hands, feet and hair away from moving parts.</li> </ul> <p style="text-align: right;">55631-C</p>

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. Be careful in getting on and off the unit, 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.



SAFETY

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.

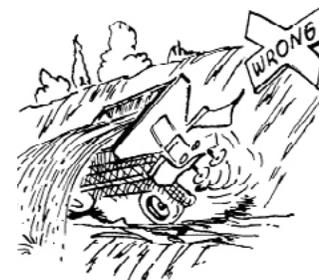
18. Read, understand and follow instructions and precautions given by the manufacturer or supplier of materials to be spread. Improper selection, application, use or handling may be hazardous to people, animals, plants, crops or other property.



**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.

- 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.



- 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!

- 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.**



- Before attempting any maintenance work (including lubrication), shut off power completely. **DO NOT WORK ON RUNNING MACHINERY!**
- When guards and covers are removed for any maintenance, be sure that such guards are reinstalled before unit is put back into operation.
- Check all screws, bolts and nuts for proper torques before placing equipment back in service. Refer to torque chart in this manual.

- 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.**



- 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.



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

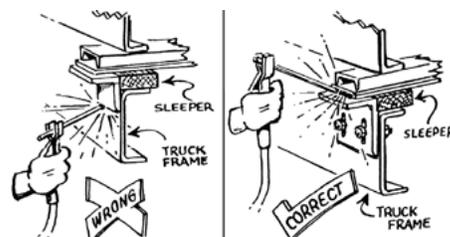


5. When truck frame must be shortened, cut off only the portion that extends behind rear shackle in accordance with the truck manufacturer's recommendations.

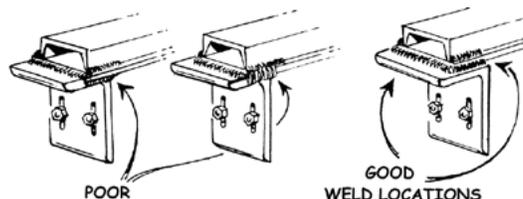
If a torch is used to make the cut, all necessary precautions should be taken to prevent fire. Cuts should not be made near fuel tanks and hydraulic oil reservoirs, fuel, brake, electric or hydraulic lines and such lines should be protected from flame, sparks or molten metal. Tires should be removed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

handy.

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



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



8. Install controls so that they are located of convenient use. Position them so that they do not interfere with any vehicle control and that they do not interfere with driver or passenger or with access to or exit from the vehicle.
9. Check for vehicle visibility, especially toward the rear. Reposition or add mirrors so that adequate rearward visibility is maintained.
10. Add Caution, Warning, Danger and Instruction decals as required. Peel off any label masking which has not been removed.
11. Install all guards as required.
12. Check installation completely to be sure all fasteners are secure and that nothing has been left undone.

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NOTES



The E3020 is a hydraulic, rear dump, truck chassis mounted spreader. The unit can be used for dumping crushed rock, hot mix, etc. directly into a paved hopper. It can also be used for spreading materials with the spinner—sand and chips in seal coating, ag lime, dried sludge, litter, manure, gypsum for agriculture, and sand, salt, cinders, calcium chloride, etc. for ice control.

The unit is powered hydraulically. The standard control system is the manual dual hydraulic system, providing independent variable speed control for both the conveyor and the spinner. An automatic dual-type (Hydra-Tach) is available as an option.

Also available as an option is a series/parallel hydraulic system. This system provides a high and low speed for the conveyor. The control valve is located at the front of the spreader. With the lever in the forward position the conveyor is in the low (parallel) range. This speed is normally used when spreading, salt, sand, etc. for ice control. Moving the lever rearward shifts the conveyor into high speed (series) which is normally used for pit dumping material or spreading at high application rates.

A gear-type hydraulic pump provides hydraulic pressure for the unit. Pump drives available are:

1. Truck Transmission PTO Drive.
2. Engine Crankshaft PTO Drive.

To use the unit for pit dumping, windrowing, or charging a paver hopper, the spinner assembly can be removed. With the optional swinging assembly, it can be swung to the right or left and out of the way. A lever located on the left-hand side of the spreader releases the optional swinging endgate.

NOTE: When the spinner is not mounted, the cab control knob should be turned off and the pressure line to the spinner motor must be connected directly into the return line by means of the quick disconnect fittings provided.

The conveyor runs the full length of the hopper bottom to deliver material through an adjustable metering gate at the rear of the hopper body. Three types of spinner hopper are available: the standard bolted-on unit, a quick-detachable unit and a swing-away unit.

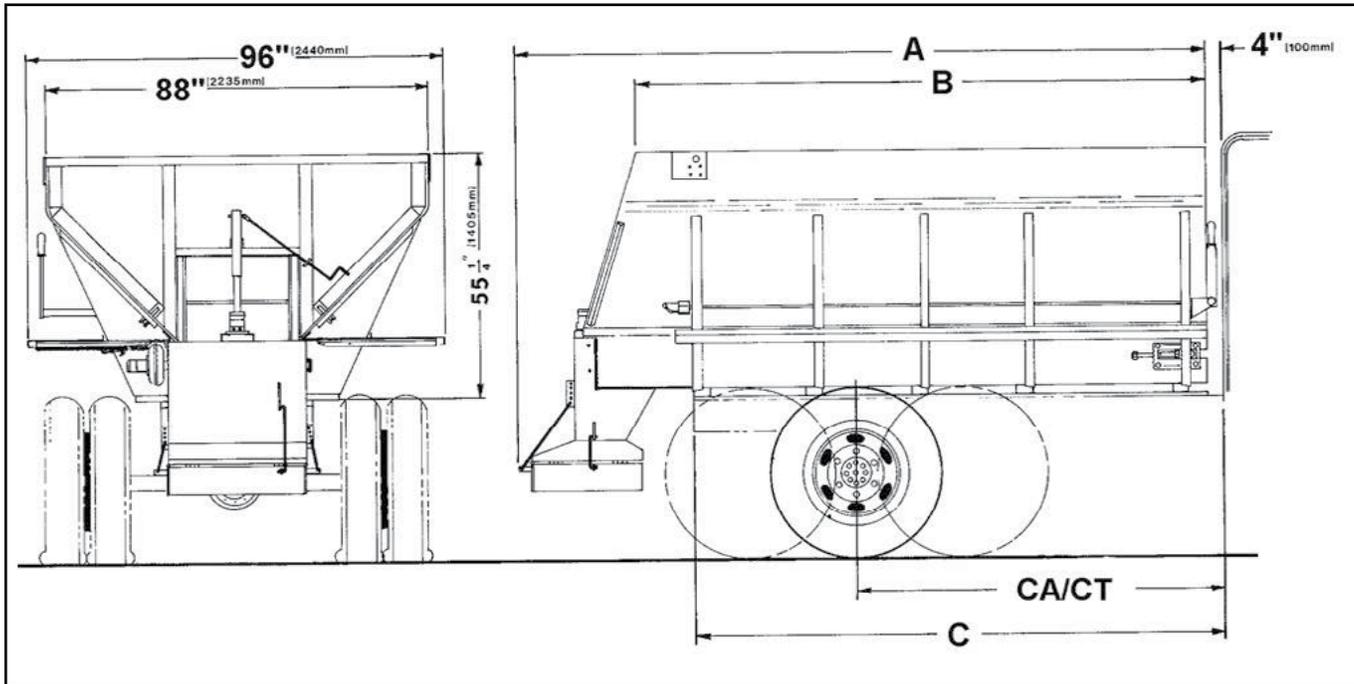
A single 24" spinner, driven by a hydraulic motor is used to spread material. Adjustable baffles and internal deflectors provide complete control of material spread.

The standard conveyor consists of a Number 2 type, having parallel strands of pintle chain joined by cross bars every other link. Optional conveyors are:

1. Number 4 Type – Belt-over-chain Conveyor.
2. Number 4 Type – Hi-Temp Belt-over-chain Conveyor.
3. Number 4 Type – Hi-Temp Abrasion Resistant Belt-over-chain Conveyor.

The cab control valve has an On/Off control for spot spreading or shut-down, and has a built in relief valve for system protection. A conveyor shut-down solenoid valve and control switch kit is available as an option.

This product is intended for commercial use only.



GENERAL SPECIFICATIONS

Spreader Length	Overall A	Inside B	Frame C	Cab to Axle C.A.
10'	148" (3759 mm)	120" (3048 mm)	111" (2819 mm)	84" (2134 mm)
11'	160" (4064 mm)	132" (3353 mm)	123" (3124 mm)	84" (2134 mm)
12'	172" (4368 mm)	144" (3657 mm)	135" (3429 mm)	102" (2591 mm)
13'	184" (4674 mm)	156" (3962 mm)	147" (3734 mm)	102 – 108" (2591 – 2743 mm)
14'	196" (4978 mm)	168" (4267 mm)	159" (4038 mm)	120" (3048 mm)
15'	208" (5283 mm)	180" (4572 mm)	180" (4572 mm)	130" (3302 mm)
16'	220" (5588 mm)	192" (4877 mm)	183" (4648 mm)	138" (3505 mm)

STRUCK CAPACITIES – Cu. Yds. (m3) Cu. Ft.

Spreader Length	Standard	W/6" Lower Sides	W/6" Higher Sides	Approx. Spreader Weight
10'	7.0 (5.4) 188	5.5 (4.2) 148	5.5 (4.2) 148	2865 lbs (1300 kg)
11'	7.7 (5.9) 208	6.1 (4.7) 164	9.3 (7.1) 252	3152 lbs (1430 kg)
12'	8.5 (6.5) 228	6.7 (5.1) 180	10.2 (7.8) 276	3432 lbs (1557 kg)
13'	9.2 (7.0) 248	7.3 (5.6) 196	11.1 (8.5) 300	3725 lbs (1690 kg)
14'	9.9 (7.6) 268	7.9 (6.0) 212	12.0 (9.2) 324	4011 lbs (1819 kg)
15'	10.7 (8.2) 288	8.4 (6.4) 228	12.9 (9.9) 348	4298 lbs (1950 kg)
16'	11.4 (8.7) 308	9.0 (6.9) 244	13.8 (10.6) 372	4584 lbs (2079 kg)

DIMENSIONS & CAPACITIES

Refer to [www.highwayequipment.com](http://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.

Check over entire unit to be sure all fasteners are in place and properly tightened per Torque Chart in this manual. Disengage PTO driving pump. Be sure On-Off control in cab is in the Off position.

NOTE: DO NOT LOAD SPREADER WITH MATERIAL.

1. Check to see that no loose parts are in the body, on the conveyor or on the spinner. Be sure to remove any loose pieces.
2. Open the feedgate until it is completely clear of the conveyor.
3. Fill the hydraulic reservoir with oil. Refer to the Lubricant Specifications section of this manual for proper oil. Open the gate valve under the reservoir fully (rotate counterclockwise to open).
4. If crankshaft PTO transmission has been installed, make sure transmission has proper amount of lubricant.
5. Engage PTO. Start the truck engine and set throttle so engine runs at about 1000 RPM. Allow pump to run and circulate oil for several minutes. In cold weather, increase warm-up time.
6. Place the cab On-Off control in the On position and move the spinner control knob to position #3. Let the unit run until air is expelled from the circuit and the spinner is running smoothly. Turn the spinner control knob to the Off position.
7. Open conveyor control knob to position #3. Allow conveyor to run until it is operating smoothly and all air is purged from the system.
8. Move the spinner and conveyor control knobs to position #5 and allow both the spinner and conveyor to run. Shut down the system.
9. Check over entire unit to be sure all fasteners are in place and properly tightened per Torque Chart in this manual.



**DANGER** Stay clear of moving machinery.

10. Check all connections in the hydraulic system to make sure that there are no leaks.



**WARNING**

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



**WARNING**

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

11. Check hydraulic oil reservoir and refill as necessary. Unit is now ready for road testing.

Before taking unit out to use, make a walk-around inspection to assure that spreader is not damaged, that all essential parts 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, load the unit. 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 becomes.

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. As spread width is affected by spinner speed, spinner height, flow deflector settings, baffle positions as well as material granular 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, will degrade materials being spread by causing unnecessary particle break-up and will waste material. High spinner speeds can also create excessive damage to vehicle finishes through uncontrolled throw and bounce of materials.

To increase spread to one side, the exterior baffle on that side should be raised and the interior flow deflector on that side should be raised (swung inward) to direct material to the side of the spinner away from the direction of spread increase. The interior flow deflector on the opposite side should be lowered (swung downward) to allow material to fall on the side of the spinner away from the direction of desired spread.

An optional On-Off solenoid (dump) valve and control switch is available for the conveyor. Two switches are used, one in the truck cab and the other at the rear of the spreader.

An optional high/low conveyor speed control is also available. It mounts at the front of the spreader. Push in on the handle for low speed, pull out for high speed.

A lever located on the front of the spreader releases the optional swinging endgate. Make sure the endgate is closed and latched before loading the spreader.

Refer to the theoretical Spread Rate Charts for various settings of the conveyor.

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

NOTE: Disengage PTO when spreader is not in use for long periods of time or when moving to and from the job after initial warm-up.

**AUTOMATIC DUAL CONTROL SYSTEM**

This system utilizes a ground-speed sensing arrangement to automatically adjust the conveyor control portion of a dual pressure compensated valve so that conveyor speed is coordinated with ground speed.

This system has three basic spread rate ranges which, when properly adjusted, should achieve the following deliveries which should be fairly constant for road speeds of 10 miles per hour and above:

Spread Rate Range	Theoretical Delivery Cu. Ft./Mile/Inch of Gate
1	2.3
2	6.0
3	8.3

OPERATING INSTRUCTIONS



**GENERAL OPERATING PROCEDURES**

(NOTE: If other delivery rates are desired, they can be obtained by adjusting metering gate opening accordingly.)

As factory settings of the automatic dual control system may not be suitable, the system should be adjusted before initial use. Readjustment should be done if there is any question that delivery rates are not desired. Calibration procedure is listed in Fluid Control, Inc. "Hydra-Tach Adjustment" instructions included in the installation bulletin.

If the tachometer simulator (GTS - 1300) is not available, truck can be driven on smooth roadway at speeds indicated in the Adjustment Instructions to obtain proper ground speed signals. Follow remainder of instructions for adjustment.

	<b>CAUTION</b>	Do not jack or block up rear wheels so that road speeds can be simulated since vibration from engine, driveline and wheels could jar truck off jacks or blocks and cause an accident.
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Recommended settings for adjusting Automatic Dual Control System are:

Spread Rate Range	Valve Setting			
	10MPH	15MPH	30MPH	40MPH
1	1			3
2		3		9
3		4	9	

**CALIBRATION PROCEDURE**

The material delivery charts in this manual are 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 is 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 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 conveyor 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 lock 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 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 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**

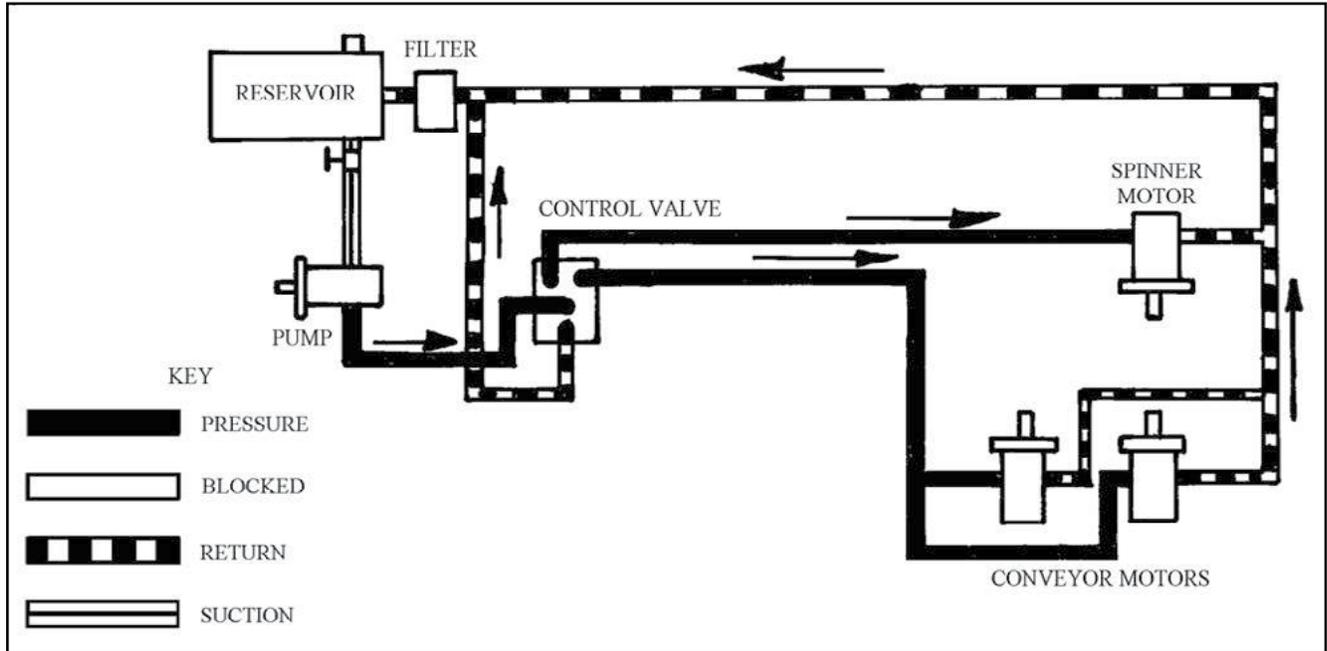
MATERIAL	APPROX. WEIGHT (lbs.)		MATERIAL	APPROX. WEIGHT (lbs.)	
	Per Cu. Ft	Per Cu. Ft		Per Cu. Ft	Per Cu. Ft
Ashes	40	1080	Salt	80	2160
Cinders	30	810	Sand	100	2700
Limestone, Crushed	100	2700	Urea	60	1620

OPERATING INSTRUCTIONS



**GENERAL OPERATING PROCEDURES**

**HYDRAULIC SYSTEM**



**Figure 1 - Standard Parallel System**

When the engine is running and the PTO is engaged, the pump delivers oil to the cab control valve. If the On-Off valve is in the Off position, the oil flows through the valve and returns to the reservoir (Figure 1).

When the On-Off control is moved to the On position, the oil will still flow through the valve and back to the reservoir as long as the spinner and conveyor controls are off.

When the conveyor or spinner control is rotated, oil under pressure is metered to the spinner or conveyor motors. The further the control is moved, the more oil is sent to the motors, and the faster they turn. Excess oil is returned to the reservoir, from the control valve by a return line. After passing through the motors, that oil also is returned to the reservoir through the return lines.

The conveyor motors are in parallel. The oil flow from the conveyor is split and half is sent to each motor.

All of the return oil flows through an oil filter before entering the hydraulic reservoir. There is a bypass in the filter. If the filter is clogged, oil will flow through the bypass instead of the filter element. This condition is indicated when the filter indicator gauge is in the red "Danger" zone. The filter must be changed.

OPERATING INSTRUCTIONS

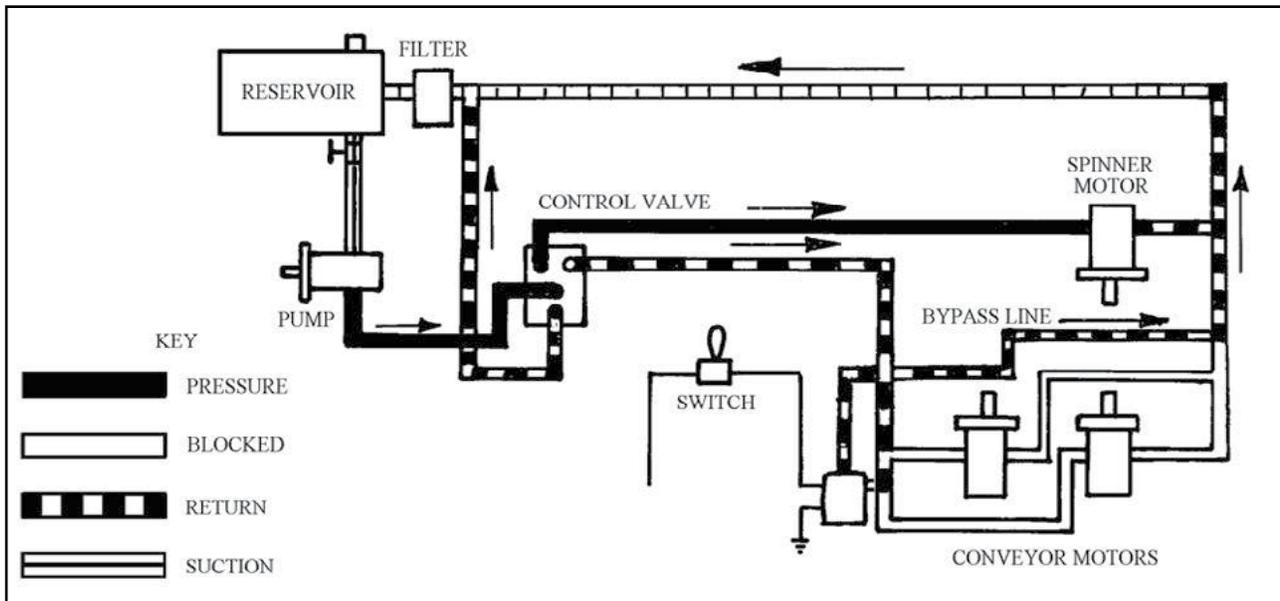


Figure 2 - Dump Valve Operation

When the optional conveyor stop switch is operated, it operates the dump valve. The dump valve is a normally open solenoid valve. When the valve is open, oil flows through it and back to the reservoir instead of turning the conveyor motors.

When the switch is actuated to energize the solenoid, the valve closes the return or bypass line, thereby directing the oil through the conveyor motors, causing them to run.

When the switch is actuated to de-energize the solenoid, the valve opens, and the conveyor motors stop, as shown in Figure 2.

OPERATING INSTRUCTIONS

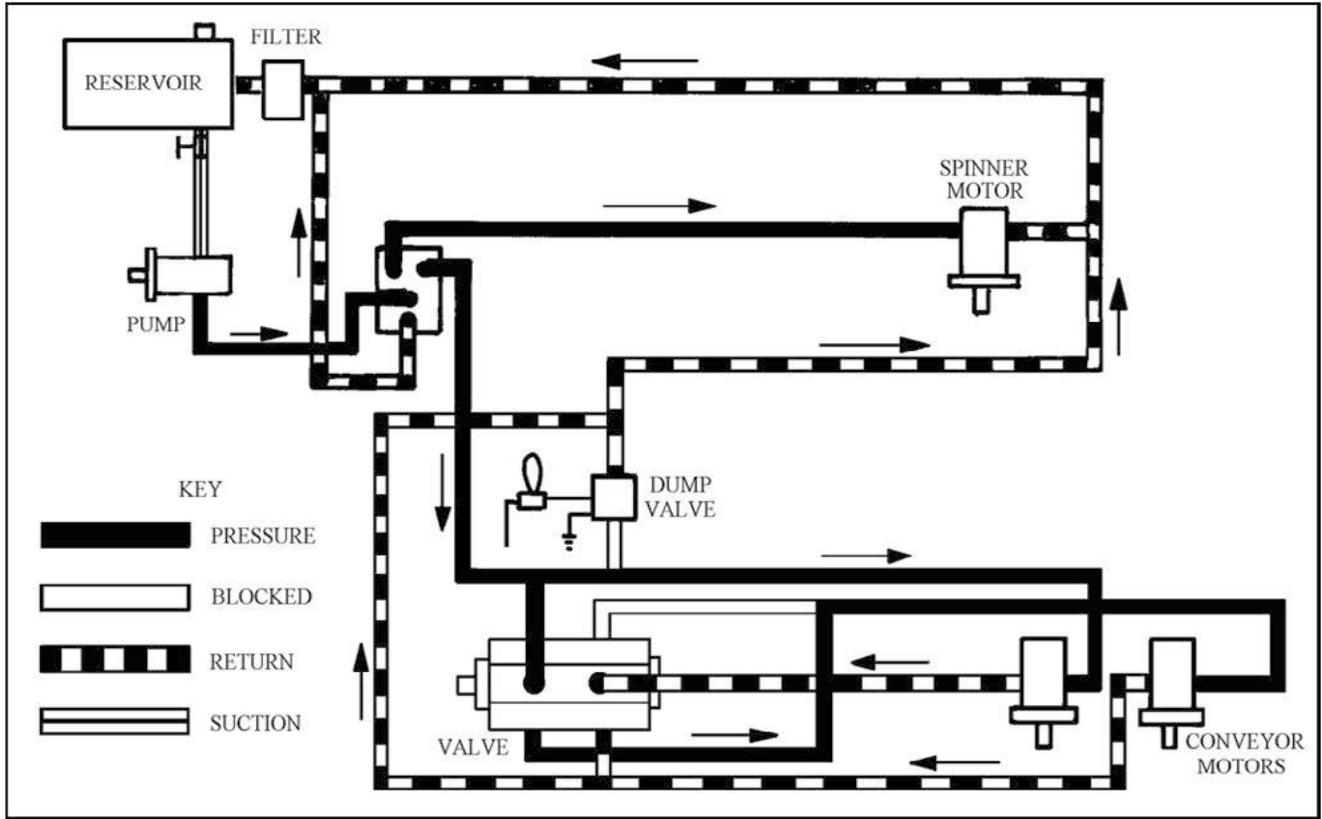
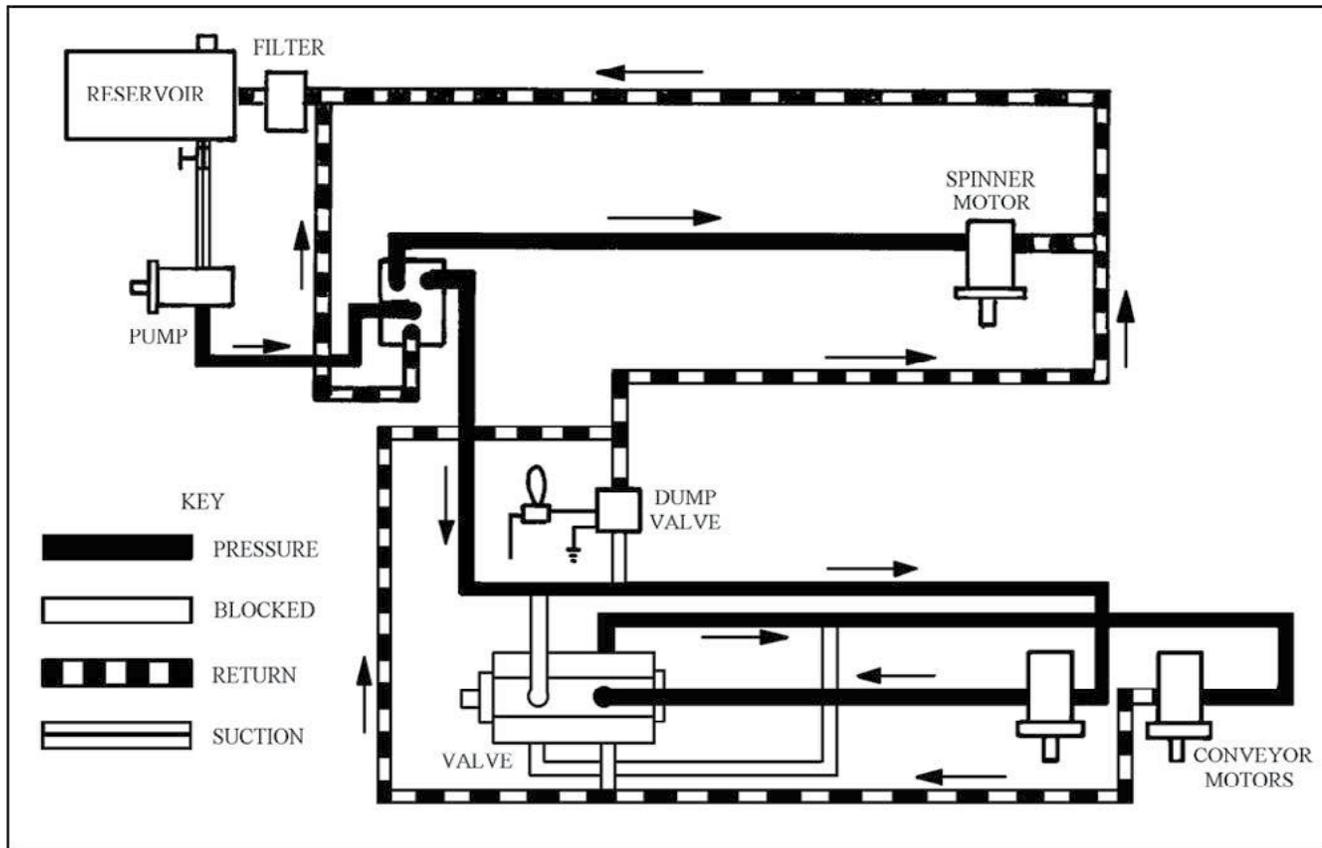


Figure 3 - Series/Parallel System - Parallel Operation

An extra control valve and plumbing is added to the standard system to allow either series or parallel operation of the conveyor motors. When shifted into the parallel mode, the hydraulic system operates as explained earlier under "Standard Parallel System".

Figure 3 is shown with dump valve in On position with conveyor motors running.



**Figure 4 - Series/Parallel System - Series Operation**

When shifted into series operation, oil flows from the control valve to one motor and through it. The discharge oil from the first motor flows back to the control valve and is then directed to the second motor. Oil leaving the second motor is routed back to the reservoir. (Figure 4)

The spinner circuit is the same with the standard system or the series/parallel system.

**PRESSURE SETTING**

The system relief valve is set at 2000 PSI. The relief valve is located in the cab control valve. Set the pressure as follows:

1. Turn both spinner and conveyor controls to Off. Disengage the PTO.
2. Disconnect the pressure line leading to the spinner motor. Install a gauge of at least 3000 PSI capacity in the line. Block the line downstream from the gauge. The easiest way to do this is to install a "tee" in the line. Block one port on the "tee" and install the gauge in the other. Make sure the "tee" is capable of withstanding 2500 PSI.
3. Engage the PTO. Turn the spinner control full On and read the pressure. Adjust the relief valve as required.

NOTE: Back off on the adjustment, then turn back in until proper pressure is reached. Tighten the jam nut on the relief valve.

**CAUTION**

Don't run the pump over relief for long periods of time. This will cause oil to overheat and may cause component damage.

4. Turn control to Off position. Disengage the PTO. Remove the gauge and reconnect the hydraulic lines.

**CHECKING PUMP FLOW**

Pump output can be checked with a flow meter. Disconnect the pressure line leading from the pump at the cab control valve. Connect this line to the flow meter inlet port. Disconnect the return line from the cab control valve. Connect this line to the flow meter return port. Plug the two open ports on the control valve to prevent oil loss and entry of foreign material.

Open the load valve fully. Operate the truck engine at 2500 RPM and read the flow meter. Slowly close the load valve on the flow meter until pressure reads 1000 PSI. Flow should not fall off more than 3 GPM. If flow loss is greater, the pump is worn and must be replaced.

**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 this manual for selection of the proper hydraulic fluid in the hydraulic system.

**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 new unit.

2. After first filter change, replace filter when indicator reaches Red 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 oil shows any signs of breaking down under continued high-pressure operation. Discoloration of oil is one sign of breakdown.

**CONVEYOR 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 Lubricant Specifications section for the proper grade oil. Refill gear case with one (1) pint (.47 liters) of recommended lubricant. After the initial change, the oil should be changed every 2,000 hours of operation or annually, whichever occurs first. Check the level of the gear case monthly and fill as necessary.

**CONVEYOR CHAIN**

Hose down the machine and remove any material build-up on the sprockets or beneath the chain. If material is allowed to build-up, the chain may ride up and damage the 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 spreader 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, the closer the chain will run to the chain shields, until damage occurs. Do not remove material while conveyor or spinner is running.

The conveyor chain should be lubricated at least once every week using a mixture of 75% diesel fuel and 25% SAE 10 oil in a pressurized hand spray can.

**CAUTION**

When conveyor is running, stay out of spreader 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 be very dangerous.

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 ends of the sill, or from the 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 dry before lubricating.

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

An automatic chain oiler is available. A pressure switch in the conveyor hydraulic lines actuates a control valve on the automatic oiler. This valve opens to let oil flow onto the chains. Check the reservoir daily. Fill, if required, with a mixture of 75% diesel fuel and 25% SAE 10 oil. Adjust the two petcocks so that oil drips slowly onto each chain.

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

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.

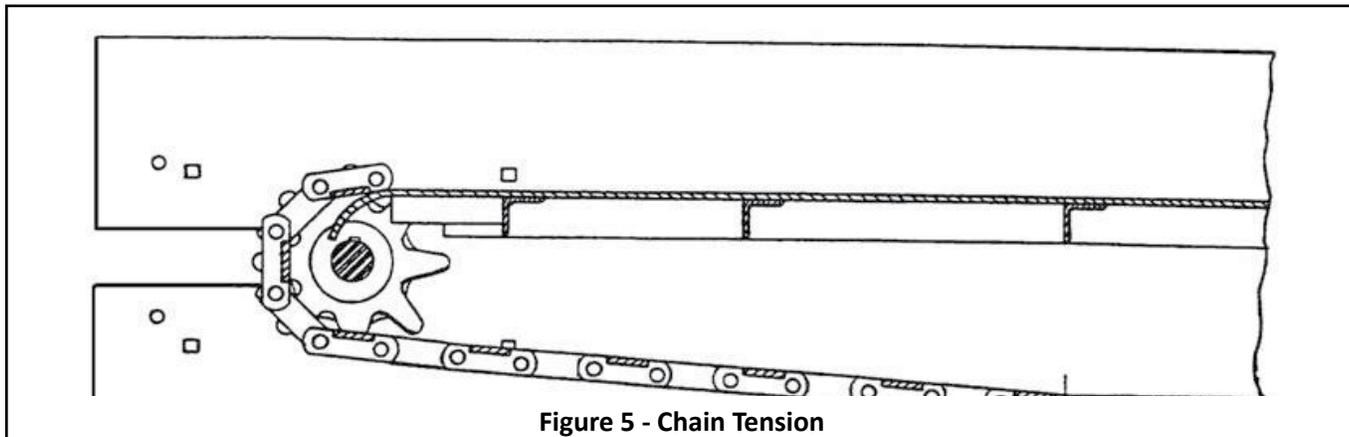


Figure 5 - Chain Tension

### **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 bearings. It is very important the grease maintains its proper consistency during operation. It must not be fluid and it must not channel.

Bearings should be lubricated by pumping grease in slowly until a slight bead forms around the seals. This bead indicates adequate lubrication and also provides additional protection against the entrance of dirt. Be sure that all fittings are thoroughly cleaned before grease is injected. Points to be lubricated by means of a grease gun have standard grease fittings.

### **CLEAN UP**

To maintain a minimum maintenance operation, this equipment should be thoroughly washed every two or three days when operating. 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 listed in this section should be closely followed. For longer body life, repaint worn spots to prevent formation of rust.

### **FASTENERS**

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

### **CONVEYOR BELT MAINTENANCE**

The standard belt for the #4 chain has a nylon fabric that is impervious to moisture, weathering, or normal chemical action except oil. The optional high-temperature belting is highly recommended where an asphalt mix is going to be run through the spreader. Inspect the belt fasteners occasionally for wear or "raveling" of the belt grip area.

**HIGH-TEMPERATURE BELTING**

In order to achieve maximum life out of the high-temperature belting, the following recommendations should be followed:

1. Keep the belt free from build-up of asphalt or other material.
2. Spray the belt often with oil to assure flexibility of the rubber.
3. Hot asphalt mix should be kept below 300° F.
4. Do not let hot asphalt mix remain on the belt any longer than necessary. Keep belt running as much as possible to allow a cooling cycle on the belt.

In normal use, a properly cared for belt will first experience cracking of the belt cover. This is normal for a belt of this type in an asphalt environment and does not indicate a failing belt. Eventually, the belt cover will begin to harden and chunks of the cover begin falling off, exposing the carcass. When this happens, it is time for belt replacement.

**NOTICE!**

The lubricant distributor and/or supplier are to be held responsible for the results obtained from their products. Procure lubricants from distributors and/or suppliers of unquestioned 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 classifications and recommended by reputable oil companies.

**HYDRAULIC SYSTEM**

The hydraulic reservoir has a capacity of 20 gallons. 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	84° F - 122° F	200 SSU - 100 SSU
225 SSU	107° F - 140° F	200 SSU - 100 SSU
300 SSU	116° F - 150° F	200 SSU - 100 SSU
450 SSU	130° F - 165° F	200 SSU - 100 SSU
600 SSU	145° F - 182° F	200 SSU - 100 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 provide between 100 and 200 SSU at operating temperature can be used. These will provide proper viscosity over a wide range:

SAE VISCOSITY GRADE	OPERATING TEMPERATURE	VISCOSITY
10W-30	100 F - 130° F	200 SSU - 100 SSU
10W-40	140 F - 190° F	200 SSU - 100 SSU

The above recommendations cover the normal system operating temperatures. For system temperatures above or below those shown in the charts above, contact the Product Support Department at Highway Equipment Company. For additional information contact your Highway Equipment Company dealer.

**PRESSURE GUN LUBRICANT**

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

**GEAR BOX LUBRICANT**

Lubricate these assemblies with a non-corrosive type SAE 90 E.P. (Extreme Pressure) gear oil conforming to MIL-L 2105B multi-purpose gear lubricating oil requirements (API Service GL 4) with ambient temperatures from 40° to 100° F. Ambient temperatures below 40° F require an SAE 80 E.P. lubricant; above 100° F use SAE 140 E.P. grade oil.

**CHAIN OILER LUBRICANT**

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

**CRANKSHAFT PTO GEAR BOX LUBRICANT**

Use SAE 50 petroleum base oil.

	<b>WARNING</b> Shut off all power and allow all moving parts to come to rest before performing any maintenance operation.
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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>
<b>Pump Drive</b>			
Trans. PTO - Slip Yoke	1	Grease Gun	Weekly
Trans. PTO - Universal Joint	2	Grease Gun	Monthly
Crankshaft PTO - Sliding Spline	1	Grease Gun	Weekly
Crankshaft PTO - Universal Joint	2	Grease Gun	Monthly
Crankshaft PTO - Pipe Plug on Cast Mounting Plate	1	Oil	Annually
<b>Hydraulic System</b>			
Reservoir	1	Check Daily; Change Annually	
Filter	1	Check Daily; Change when indicator is red	
Dual Control Valve - Hex Valve Stem (Under Hand Knob)	2	Hand Grease	Annually
Auto. Dual Control - Hex Valve Stem	2	Hand Grease	Annually
Auto. Dual Control - Control Gears	2	Hand Grease	Annually
Auto. Dual control - Speedometer "T" Drive Adapter	1	Hand Grease	Annually
<b>Conveyor</b>			
Dragshaft Bearings	2	Grease Gun	Weekly
Idler Shaft Sprockets	2	Grease Gun	Daily
Take-up Screws	2	Hand Grease	Monthly
Chain	2 Strands	Spray Oil	Weekly
Chain Oiler (If so equipped)	1	Oil	Daily
Gear Case - Breather Plug	1	Gear Oil	Check Monthly; Change Annually
<b>Feedgate</b>			
Jack Assembly - Gears	1	Hand Grease	Annually
Jack Assembly - Tube	1	Grease Gun	Monthly
Tube	1	Grease Gun	Monthly
<b>Spinner Assembly</b>			
Driveshaft - Universal Joints	2	Grease Gun	Weekly
Driveshaft - 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.

\*See Lubricant and Hydraulic Oil Specifications for types of lubricants and oil to be used.

**SPEED RATE CHARTS**

**THEORETICAL DELIVERY IN  
CUBIC FEET/MILE/INCH OF GATE OPENING**

**SERIES/PARALLEL CONVEYOR MOTOR DRIVE SYSTEM**

VALVE POSITION IN CAB	MPH 15		MPH 20		MPH 25		MPH 30		MPH 35		MPH 30	
	LO	HI										
1	4.8	9.6	3.6	7.2	2.9	5.8	2.4	4.8	2.1	4.2	1.8	3.6
2	9.6	19.2	7.2	14.4	5.8	11.6	4.8	9.6	4.1	8.2	3.6	7.2
3	14.4	28.8	10.8	21.6	8.6	17.2	7.2	14.4	6.2	12.4	5.4	10.8
4	18.9	37.8	14.2	28.4	11.3	22.6	9.4	18.8	8.1	16.2	7.1	14.2
5	22.9	45.8	17.2	24.4	13.7	27.4	11.4	22.8	9.8	19.6	8.6	17.2
6	26.4	52.8	19.8	39.6	15.8	31.6	13.2	26.4	11.3	22.6	9.9	19.8
7	29.7	*	22.3	*	17.8	*	14.8	*	12.7	*	11.1	*
8	32.5	*	24.4	*	19.5	*	16.2	*	13.9	*	12.2	*
9	35.6	*	26.7	*	21.3	*	17.8	*	15.2	*	13.3	*
10	37.4	*	28.1	*	22.5	*	18.7	*	16.1	*	14.0	*
11	38.7	*	29.0	*	23.2	*	19.3	*	16.6	*	14.5	*

**STANDARD PARALLEL CONVEYOR MOTOR DRIVE SYSTEM**

VALVE POSITION IN CAB	MPH 15	MPH 20	MPH 25	MPH 30	MPH 35	MPH 30
1	4.8	3.7	2.8	2.4	2.1	1.8
2	9.6	7.2	5.8	4.8	4.1	3.6
3	14.4	10.8	8.6	7.2	6.2	5.4
4	18.9	14.7	11.3	9.4	8.1	7.1
5	22.9	17.2	13.7	11.4	9.8	8.6
6	26.4	19.8	15.8	13.2	11.3	9.9
7	29.7	22.3	17.8	14.8	12.7	11.1
8	32.5	24.4	19.5	16.2	13.9	12.2
9	35.6	26.7	21.3	17.8	15.2	13.3
10	37.4	28.1	22.5	18.7	16.1	14.0
11	38.7	29.0	23.2	19.3	16.6	14.5

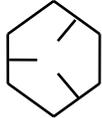
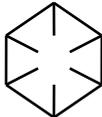
SPEED RATE CHARTS



<u>Reason:</u>	<u>Correction:</u>
<b>Symptom : Neither conveyor or spinner system will operate.</b>	
1. Low reservoir oil level.	Check and fill as required.
2. PTO not engaged	Engage PTO. Check for broken or disconnected control cable.
3. PTO malfunction	Check out PTO.
4. Pump drive shaft.	Check for broken or disconnected pump drive shaft.
5. Reservoir shut off valve.	Make sure valve is fully open.
6. Pump not rotating.	Check for broken key in pump. (Also, check out PTO and check for broken or disconnected pump drive shaft.)
7. Worn pump.	Check with flow meter.
8. Relief valve set too low.	Adjust relief valve setting.
<b>Symptom : conveyor system operates but spinner does not.</b>	
1. Jammed spinner.	Turn spinner control Off., then check for jams.
2. Frozen shaft bearings.	Turn spinner control Off, then check bearings. Replace as required.
3. Spinner not turning.	Check for broken key or failed motor. Repair or replace.
4. Spinner drive shaft.	Check for broken or missing keys or pins, and/or broken u-joints. Repair or replace.
5. Pinched or crushed hoses or lines.	Repair or replace as required.
<b>Symptom : Spinner Operates but conveyor does not.</b>	
1. Jammed or broken conveyor.	Turn conveyor Off, then check for jams or breakage.
2. Broken conveyor or drive shaft.	Check for broken or missing keys and/or broken shaft. Repair or replace as required.
3. Gear case.	Check for broken or missing keys, broken shafts or broken gears. Repair or replace as required.
4. Dump valve stuck open, or faulty dump valve switch.	Check out valve and/or switch. Repair or replace as required.
5. Frozen dragshaft bearings.	Turn conveyor Off, then check bearings. Replace as required.
6. Pinched or crushed hoses or lines.	Repair or replace as required.
<b>Symptom : Hydraulic oil overheats</b>	
1. Low oil level.	Check oil level, add as necessary.
2. Check for proper pump/PTO matching.	Install proper sized pump.
3. Incorrect relief valve setting.	Check setting. Adjust to proper setting.
4. Pinched or crushed hoses or lines.	Repair or replace as required.
5. Worn motor in system.	Repair or replace as required.



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

STANDARD TORQUES

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NOTES



## INSTRUCTIONS FOR ORDERING PARTS



**Highway Equipment Company**

*Building the best since 1939.*

Order from the AUTHORIZED DEALER in your area.

1. Always give the pertinent model and serial number.
2. Give part name, part number and the quantity required.
3. Give the correct address to where the parts are to be shipped, and the carrier if there is a preference.

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

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

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

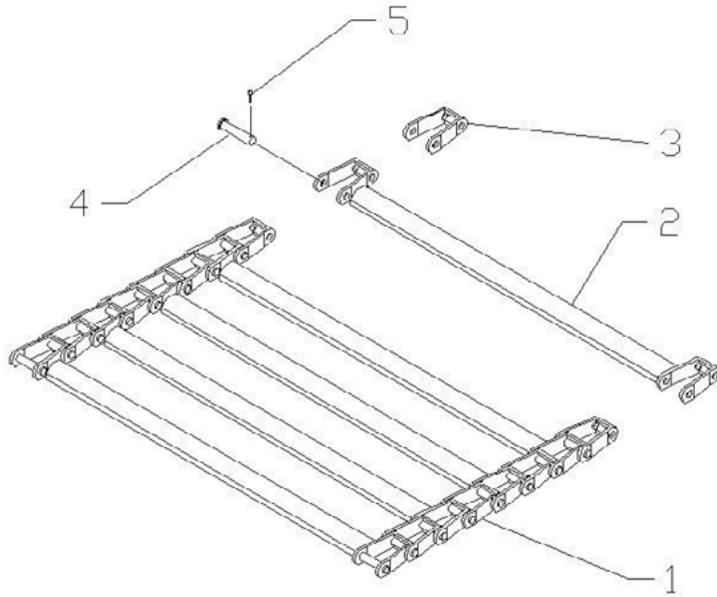
If your claims are not being handled (by the transportation company) to your satisfaction, please call the Parts Manager at Highway Equipment Company (319-363-8281) for assistance.

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

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

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

**CONVEYOR - #2 & #3 PINTLE CHAIN**

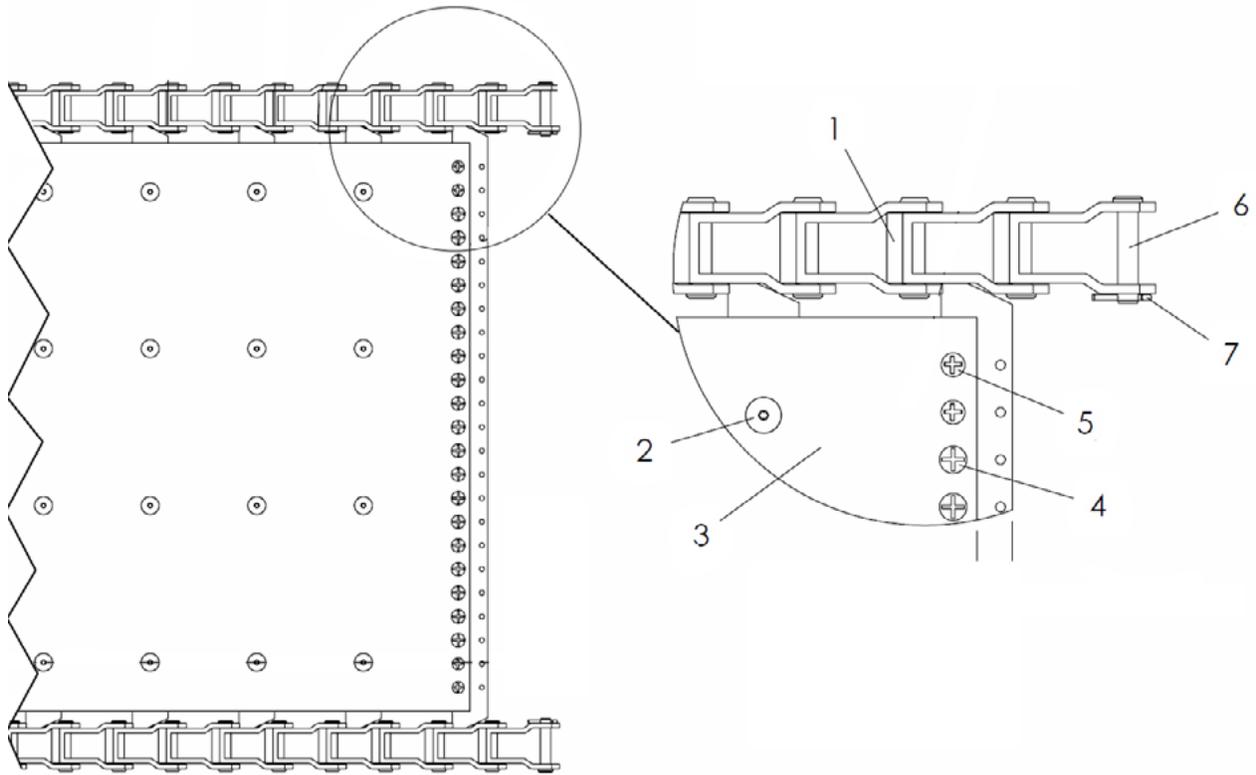


<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1		Chain - #2 Pintle Assy	
	99166	Chain - #2 Pintle Assy, 10' Unit	
	99167	Chain - #2 Pintle Assy, 11' Unit	
	99168	Chain - #2 Pintle Assy, 12' Unit	
	99169	Chain - #2 Pintle Assy, 13' Unit	
	99170	Chain - #2 Pintle Assy, 14' Unit	
	99171	Chain - #2 Pintle Assy, 15' Unit	
	99172	Chain - #2 Pintle Assy, 16' Unit	
		Chain - #3 Pintle Assy	
	99173	Chain - #3 Pintle Assy, 10' Unit	1
	99174	Chain - #3 Pintle Assy, 11' Unit	1
	99175	Chain - #3 Pintle Assy, 12' Unit	1
	99177	Chain - #3 Pintle Assy, 13' Unit	1
	99178	Chain - #3 Pintle Assy, 14' Unit	1
	99179	Chain - #3 Pintle Assy, 15' Unit	1
	99180	Chain - #3 Pintle Assy, 16' Unit	1
2	--	Cross Bar Wldmt	AR
3	36699	Link - Pintle Chain	AR
4	36697	Pin - Clevis	AR
5	20817	Pin - Cotter	AR
AR -	As Required		

PARTS LIST



CONVEYOR - #4 BELT-OVER-PINTLE-CHAIN

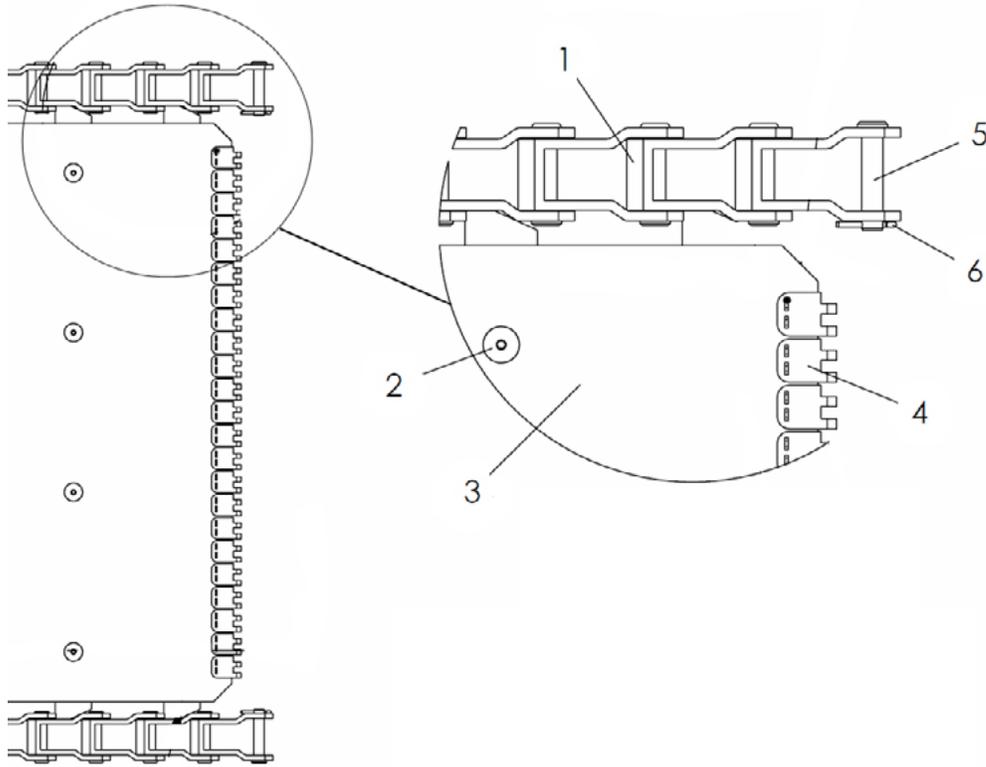


<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	308665	#4 Belt-Over-Chain Assy - 10' Unit	1
	308666	#4 Belt-Over-Chain Assy - 11' Unit	1
	308667	#4 Belt-Over-Chain Assy - 12' Unit	1
	308668	#4 Belt-Over-Chain Assy - 13' Unit	1
	308669	#4 Belt-Over-Chain Assy - 14' Unit	1
	308670	#4 Belt-Over-Chain Assy - 15' Unit	1
	308671	#4 Belt-Over-Chain Assy - 16' Unit	1
	2	305646	Screw - #4 BOC Flat Head
3	18027	Belt	AR
4	20624	Screw - Truss Head	AR
5	20617	Screw - Flat Head	AR
6	36697	Pin - Clevis	AR
7	20817	Pin - Cotter	AR

AR - As Required

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



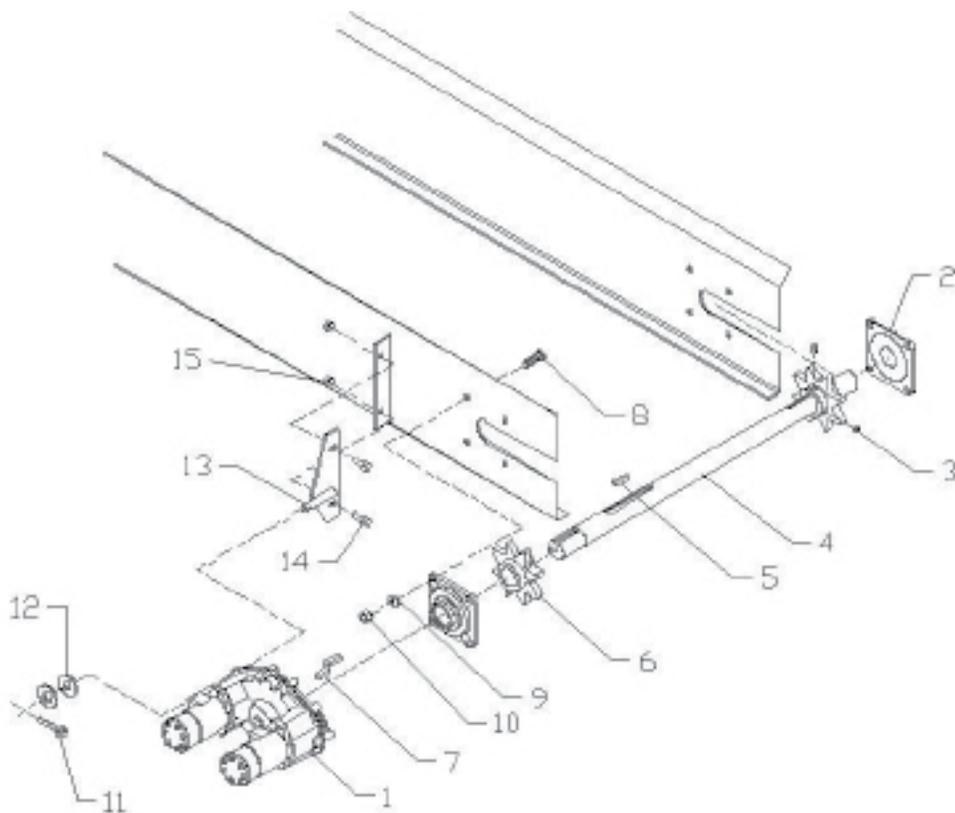


ITEM	PART NO.	DESCRIPTION	QTY
1	308672	#4 Belt-Over-Chain Assy - 10' Unit	1
	308673	#4 Belt-Over-Chain Assy - 11' Unit	1
	308674	#4 Belt-Over-Chain Assy - 12' Unit	1
	308675	#4 Belt-Over-Chain Assy - 13' Unit	1
	308676	#4 Belt-Over-Chain Assy - 14' Unit	1
	308677	#4 Belt-Over-Chain Assy - 15' Unit	1
	308678	#4 Belt-Over-Chain Assy - 16' Unit	1
	2	305646	Screw - #4 BOC Flat Head
3	55794	Belt	AR
4	73317	Lacing - 23" wide	AR
5	36697	Pin - Clevis	AR
6	20817	Pin - Cotter	AR

AR - As Required

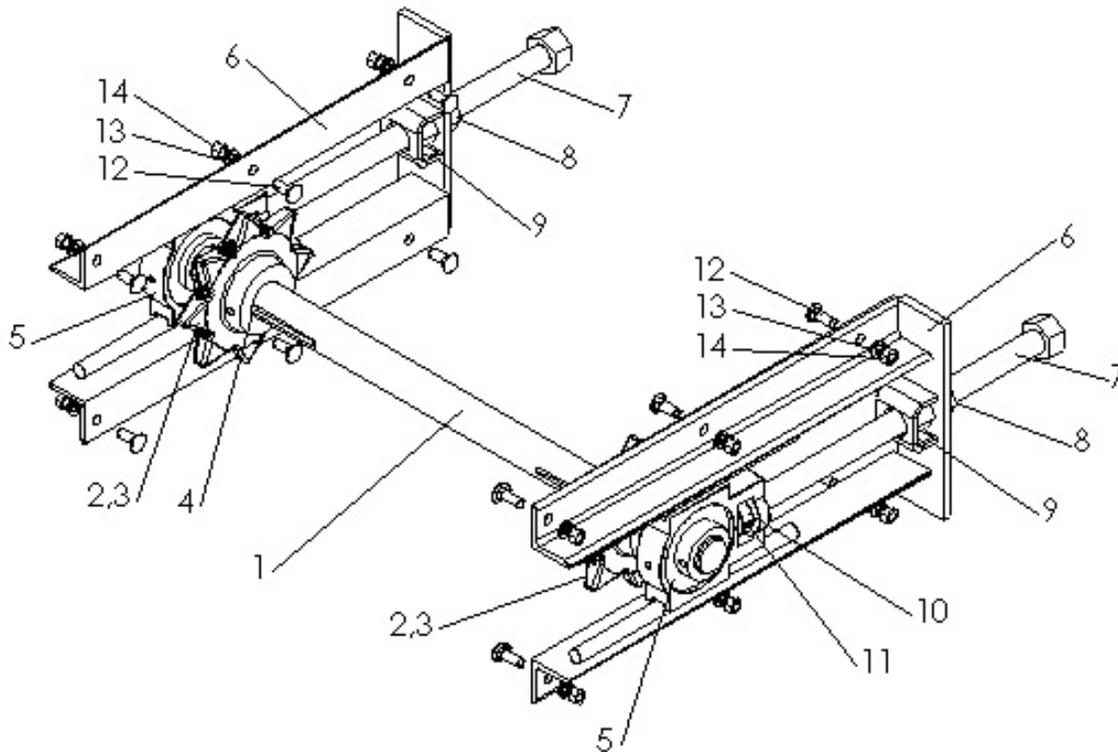
PARTS LIST

CONVEYOR DRIVE



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	57303	Gear Case	1
2	6465	Bearing	2
3	20748	Screw - Set 3/8	4
4	38600	Shaft - Drive	1
5	6131	Key - Square, 3/8 x 1 1/2	2
6	27275	Sprocket	2
7	37010	Key - Square, 1/2 x 1 1/2	2
8	20068	Cap Screw - 3/8 x 1 1/4	8
9	20712	Washer - Lock 3/8	8
10	20644	Nut - Hex 3/8	8
11	20833	Pin - Cotter 1/4 x 1 1/2	1
12	2716	Washer - Flat 3/4	2
13	82550	Torque Arm - L.H. Wldmt	1
14	20128	Cap Screw - 1/2-13 x 1-1/4	2
15	20680	Nut - Lock 1/2	2
16	*82882	Guide - Bearing Wldmt	4

\* - Not Shown

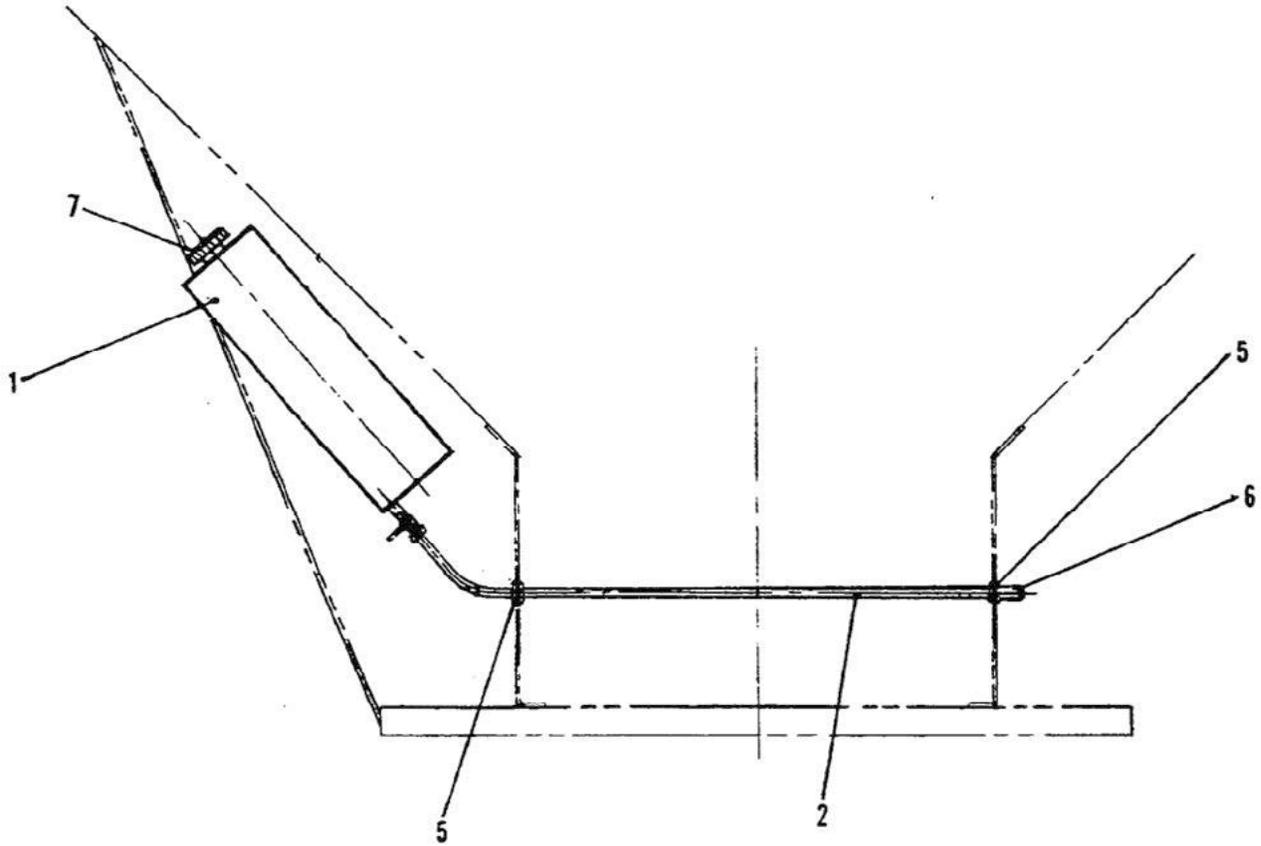


<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	82799	Shaft – Idler	1
2	1899	Sprocket	2
3	20743	Screw – Set	4
4	2135	Key – Square	2
5	22511	Bearing – 1.5 Take-up	2
6	7895	Take-up – Wldmt	2
7	36508	Screw – Adjusting SS	2
8	36509	Nut – Hex 1-8NC SS	2
9	39110	Nut – Wldmt SS	2
10	30725	Collar – Set	2
11	20925	Pin – Roll 1/4 X 1-1/2	2
12	20318	Bolt – Carriage 3/8 x 1	12
13	20712	Washer – Lock 3/8	12
14	20644	Nut – Hex 3/8	12
15	*20319	Bolt - Carriage 3/8 x 1-1/4	4

\* - Not Shown

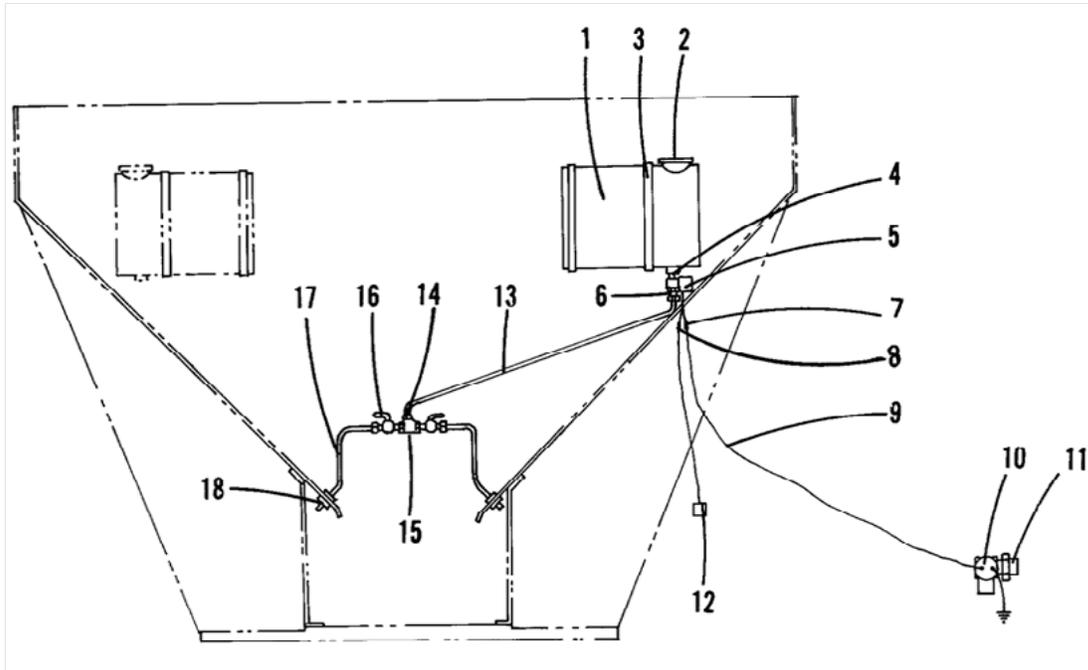
PARTS LIST

CONVEYOR CHAIN OILER



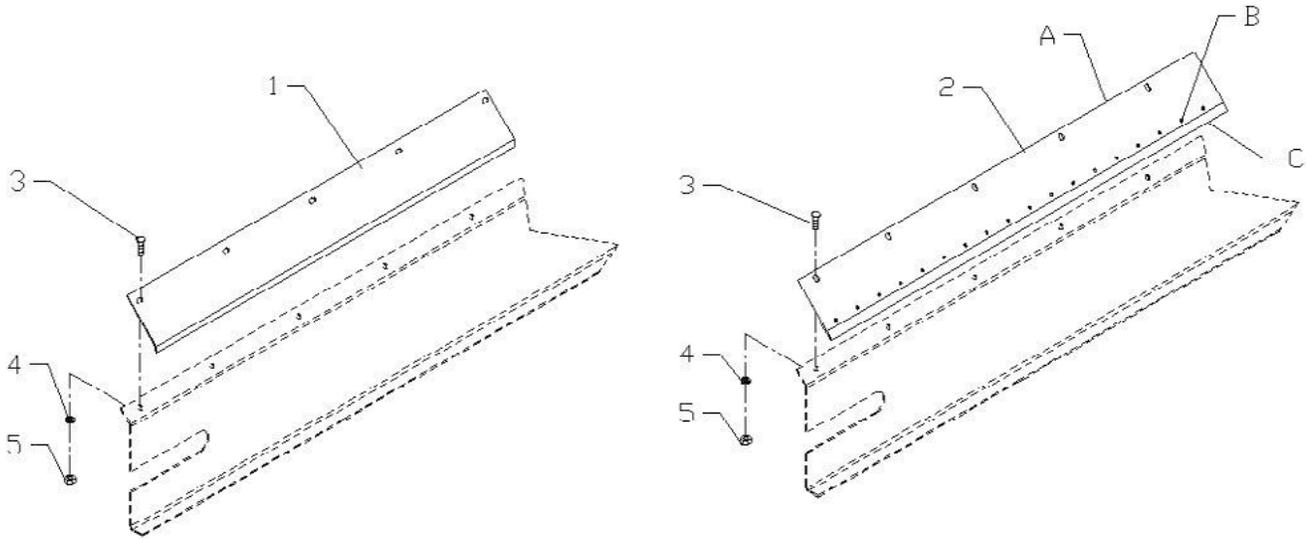
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	1571	Oiler Tank Assy includes Item 7	1
2	1582	Tube - Oiler 24" Bottom	1
3	20004*	Cap Screw - 1/4 x 7/8	4
4	20710*	Washer - Lock 1/4	4
5	21983	Grommet - Rubber	2
6	21984	Sleeve - Plug	1
7	21980	Cap - Tank	1

\* - not shown



## AUTOMATIC CONVEYOR CHAIN OILER CONTINUED

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	3156	Tank - Oiler	1
2	21980	Cap - Tank	1
3	3838	Bracket	2
	20005	Cap Screw - 1/4 x 1	2
	20710	Washer - Lock 1/4	2
	20642	Nut - Hex 1/4	2
4	6023	Nipple - Close	1
5	21836	Valve - Shut Off	1
6	22417	Connector - Male	1
7	6549	Connector	1
8	12374	Connector - Tap	1
9	21580-288	Wire - 14 Ga	1
10	37037	Switch - Pressure	1
	6065	Bushing - Pipe	1
11	31142	Adapter - 90deg Elbow	1
12	39293	Plug - Connector	1
	31572	Connector - Ring	1
13	6081-38	Tube - Copper	1
14	22417	Connector - Male	2
15	24895	Tee Wldmt	1
	20644	Nut - Hex	1
16	21982	Valve - Shut Off	2
17	6081-15	Tube - Copper	2
18	21983	Grommet - Rubber	1



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1		Chain Shield Wldmt - #3 Chain For:	
	72169	10' Unit	2
	72170	11' Unit	2
	72171	12' Unit	2
	72172	13' Unit	2
	72173	14' Unit	2
	72174	15' Unit	2
	72175	16' Unit	2
2		Chain Shield Assy - #4 BOC For:	
	72189	10' Unit	2
	72190	11' Unit	2
	72191	12' Unit	2
	72192	13' Unit	2
	72193	14' Unit	2
	72194	15' Unit	2
	72195	16' Unit	2
		Chain Shield Assy - Hi-Temp #4 BOC For:	
	72216	10' Unit	2
	72217	11' Unit	2
	72218	12' Unit	2
	72219	13' Unit	2
	72220	14' Unit	2
	72221	15' Unit	2
	72222	16' Unit	2

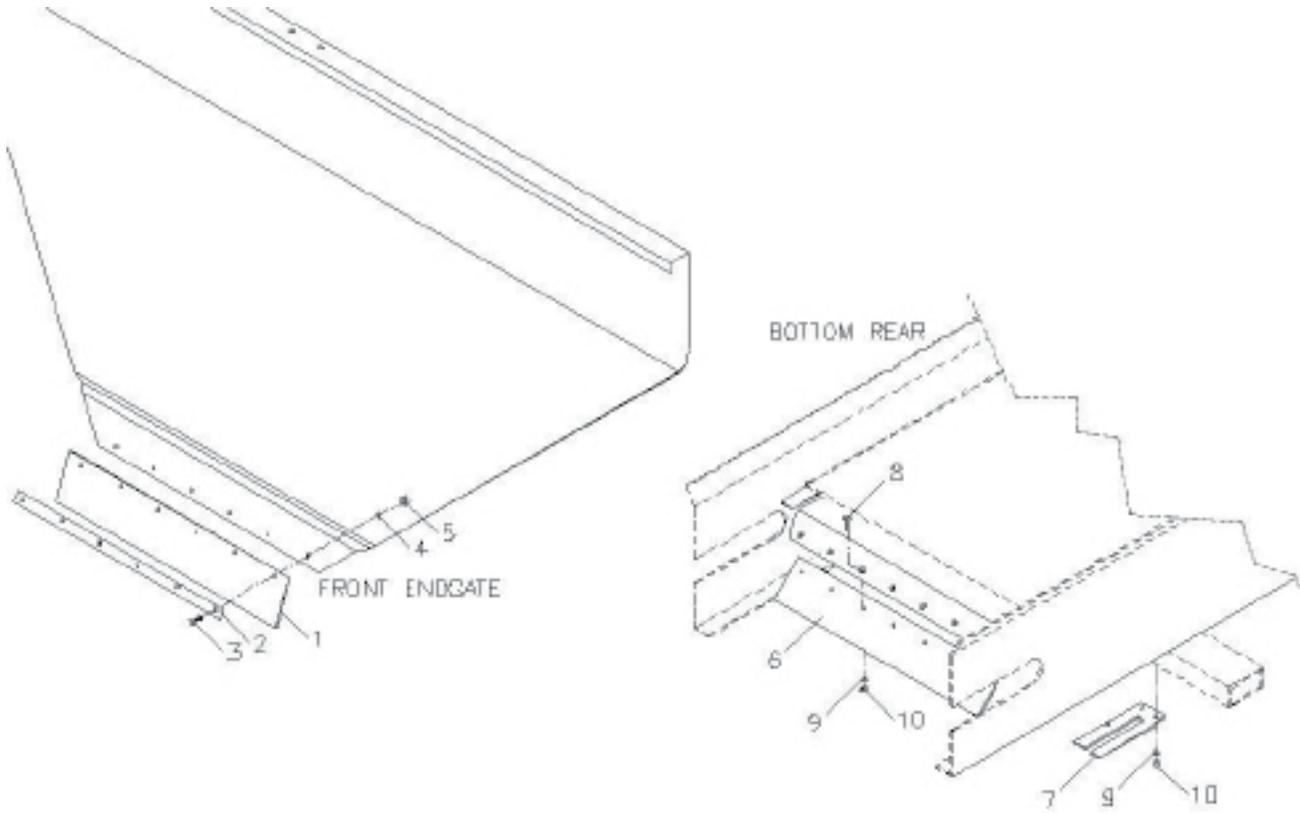
PARTS LIST



**CHAIN SHIELDS CONTINUED**

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
A		Shield - Chain Wldmt For:	
	72196	10' Unit	1
	72197	11' Unit	1
	72198	12' Unit	1
	72199	13' Unit	1
	72200	14' Unit	1
	72201	15' Unit	1
	72202	16' Unit	1
B	20624	Screw - Truss Head 1/4-20NC x 1/2	AR
	88931	Nut - Tee 1/4 x 1/4	AR
C	7687	Sealer - Belt #4 BOC (Specify Length)	AR
	38349	Sealer - Belt Hi-Temp #4 BOC (Specify Length)	AR
3	20318	Bolt - Carriage 3/8 x 1	AR
4	20712	Washer - Lock 3/8	AR
5	20644	Nut - Hex 3/8	AR

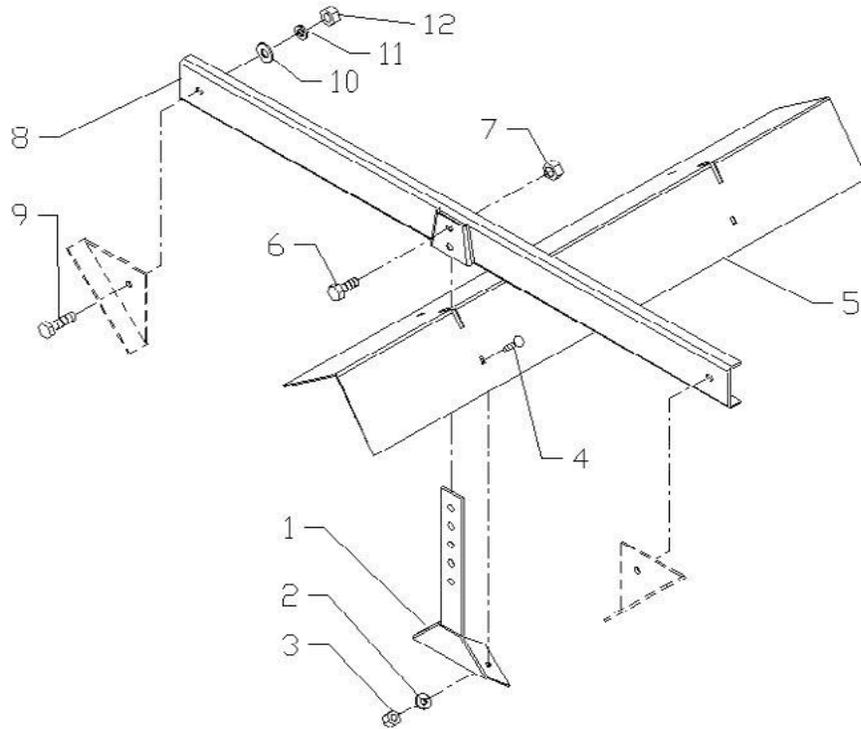
AR - As Required



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	14743	Wiper - Belt Front	1
2	14742	Retainer - Belt Front	1
3	20583	Screw - Machine 1/4 x 3/4	6
4	20710	Washer - Lock 1/4	6
5	20642	Nut - Hex 1/4	6
6	27243	Wiper - Belt Rear	1
7	33207	Sealer - Belt	2
8	36405	Screw - Machine 1/4 x 3/4	7
9	36423	Washer - Flat 1/4	13
10	36412	Nut - Hex 1/4	13

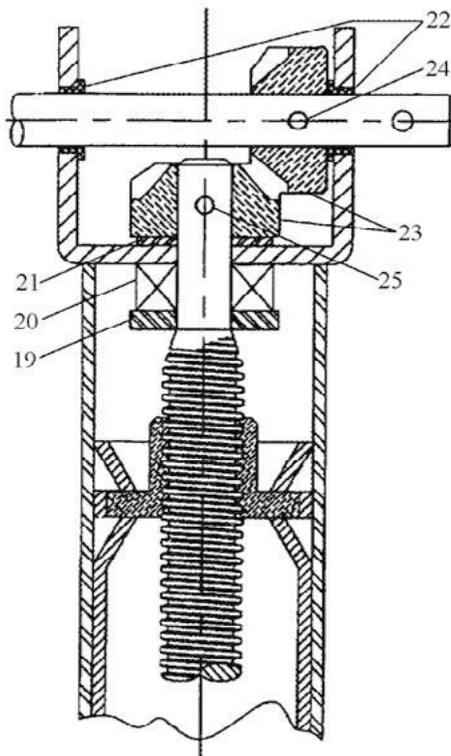
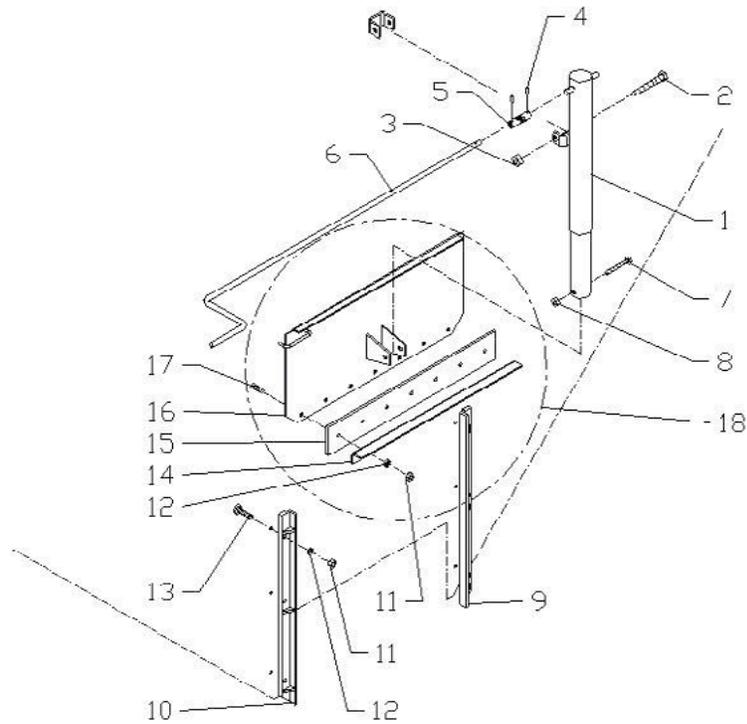
PARTS LIST

**INVERTED "V"**



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	82625	Bar - Adjusting Wldmt	AR
2	20692	Washer - Flat 5/16	AR
3	20677	Nut - Lock 5/16	AR
4	20291	Bolt - Carriage 5/16 x 1	AR
5	82613	"V" - Inverted 5' (10' Units)	1
	82614	"V" - Inverted 7' (11'-12' Units)	1
	82615	"V" - Inverted 9' (13'-14' Units)	1
	82616	"V" - Inverted 11' (15'-16' Units)	1
6	20176	Cap Screw - 5/8 x 1 3/4	AR
7	20682	Nut - Hex 5/8 Locking	AR
8	81261	Channel "V" hanger Wldmt	AR
9	20128	Cap Screw - 1/2 x 1 1/4	AR
10	20695	Washer - Flat 1/2	AR
11	20714	Washer - Lock 1/2	AR
12	20646	Nut - Hex 1/2	AR
13	*81271	Angle - Mounting Bracket	AR

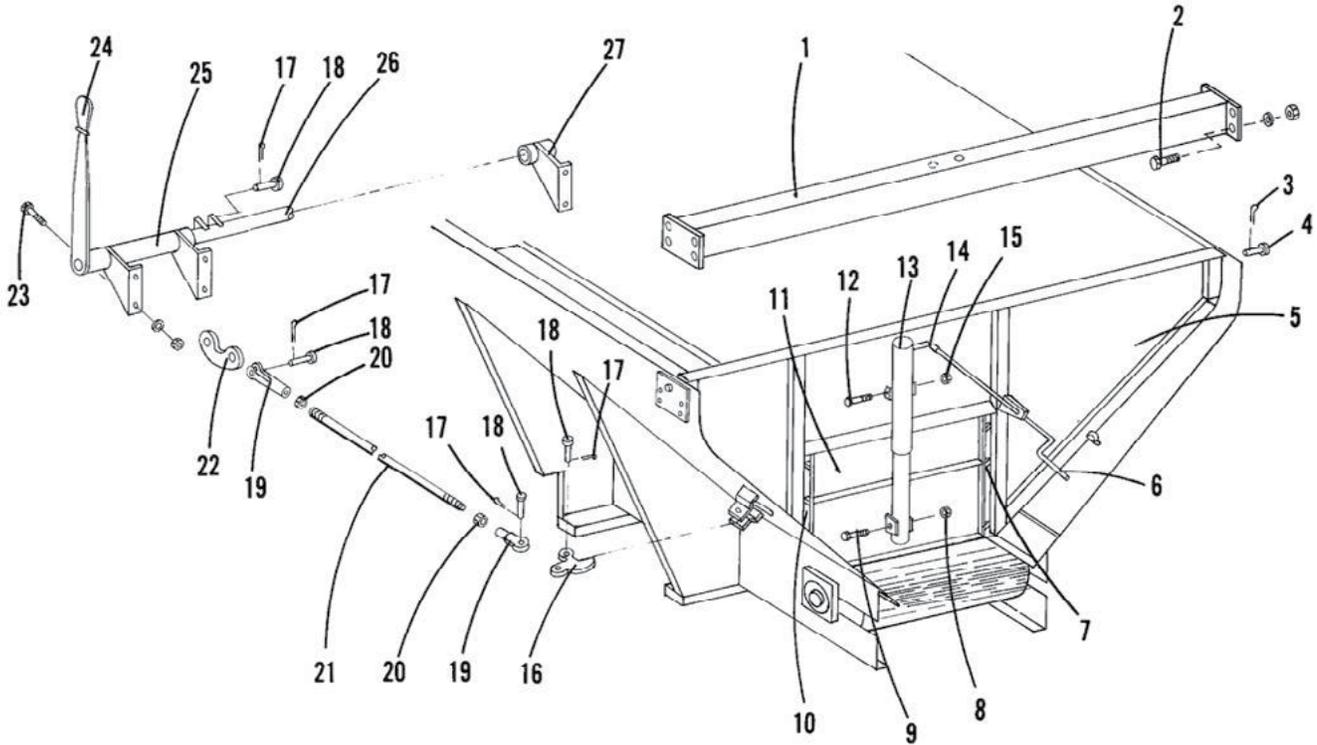
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## FEEDGATE &amp; JACK CONTINUED

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	40704	Jack, Includes 19-25	1
2	20138	Cap Screw - 1/2 x 3 3/4	1
3	20680	Nut - Hex 1/2	1
4	20918	Pin - Roll	2
5	85002	U-Joint	1
6	14382	Handle	1
	36725	Handle (Use w/ Swinging Rear Endgate)	1
7	20074	Cap Screw - 3/8 x 2 3/4	1
8	20678	Nut - Lock 3/8	1
9	2885	Slide - Feedgate RH	2
10	2884	Slide - Feedgate LH	2
11	20642	Nut - Hex 1/4	13
12	20710	Washer - Lock 1/4	13
13	20006	Cap Screw - 1/4 x 1 1/4	6
14	27297	Belt - Retainer	1
15	27296	Belt - Sealer	1
16	14262	Feedgate Wldmt	1
	42835	Feedgate Wldmt (Use with Swinging Rear Endgate)	1
17	20621	Screw - Machine 1/4 x 1	7
18	14261	Feedgate Assy includes items 11,12,14-17	
19	84210	Washer - Thrust	1
20	84211	Bearing - Thrust	1
21	84212	Washer	1
22	84213	Bushing	2
23	84214	Gear - Miter	2
24	84215	Pin - Groove	1
25	84216	Pin - Roll	1

AR - As Required \* - Not Shown



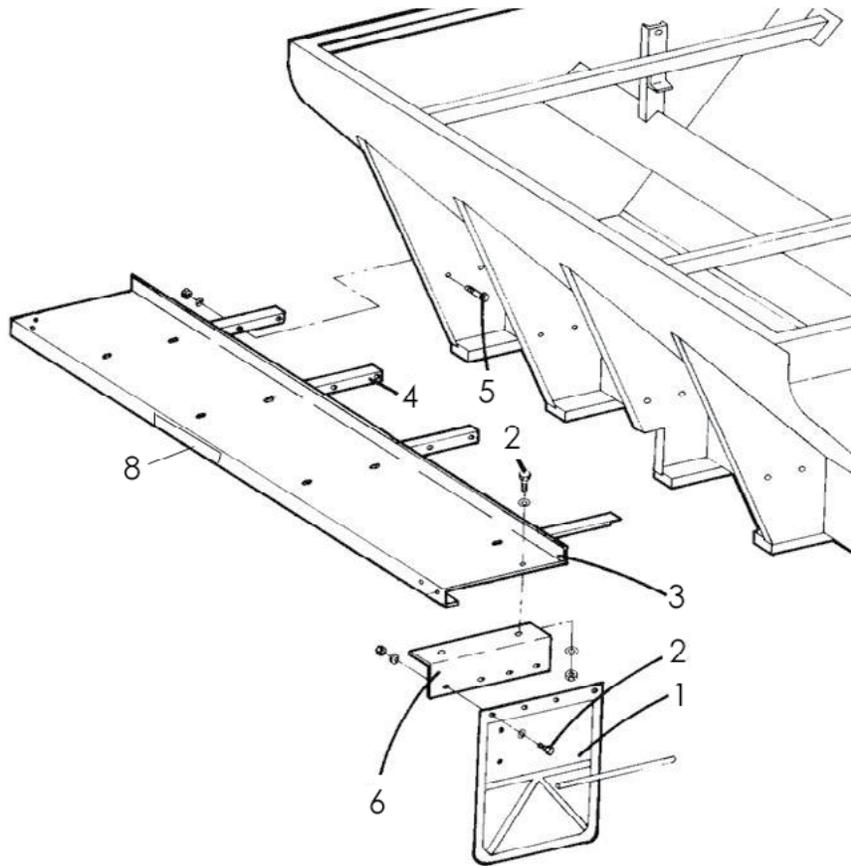
ITEM	PART NO.	DESCRIPTION	QTY
1	72247	Tube - Support	1
2	20067	Cap Screw - 3/8 x 1	8
	20712	Washer - Lock 3/8	8
	20644	Nut - Hex 3/8	8
3	20828	Pin - Cotter	2
4	36719	Pin - Clevis	2
5	72240	Endgate - Rear Swinging	1
	72241	Endgate - Rear 6" Higher Swinging	1
6	36725	Handle - Jack	1
7	2885	Slide - Feedgate RH	1
	20005	Cap Screw - 1/4 x 1	3
	20710	Washer - Lock 1/4	3
	20642	Nut - Hex 1/4	3
8	20678	Nut - Lock 3/8	1
9	20074	Cap Screw - 3/8 x 2 3/4	1
10	2884	Slide - Feedgate LH	1
	20005	Cap Screw - 1/4 x 1	3
	20710	Washer - Lock 1/4	3

PARTS LIST



## SWINGING REAR ENDGATE CONTINUED

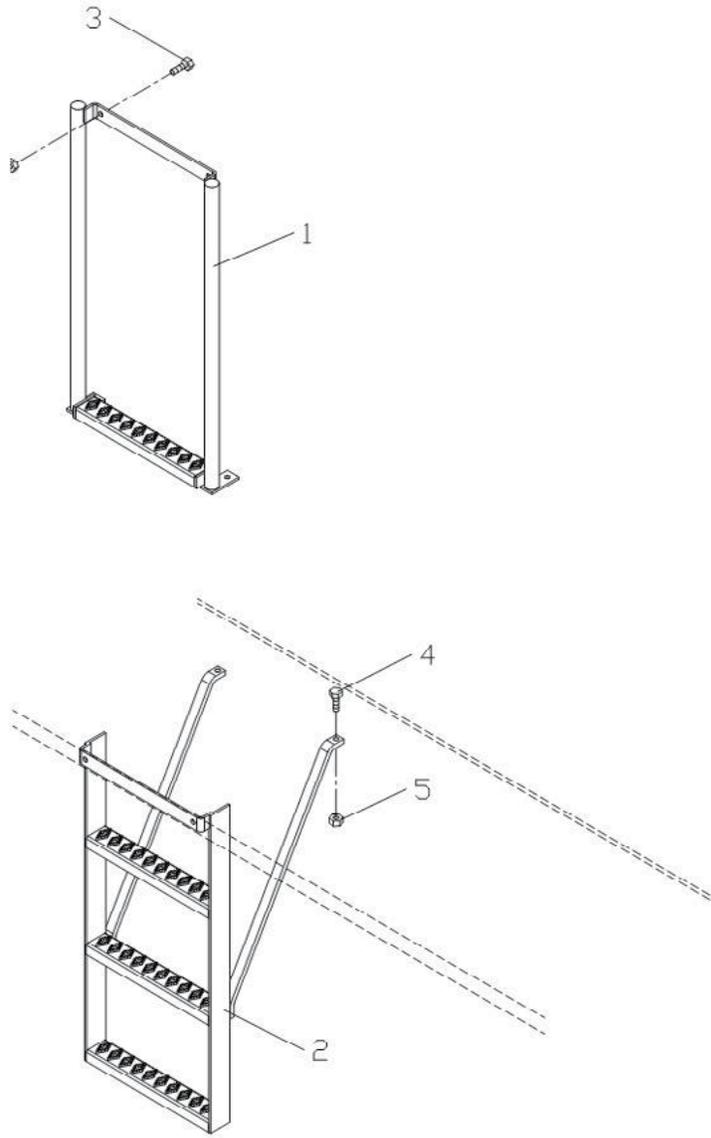
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
	20642	Nut - hex 1/4	3
11	14261	Feedgate Assy	1
	14262	Feedgate Assy	1
	27297	Retainer	1
	27296	Belt - Sealer	1
	20621	Screw - Machine 1/4	7
	20710	Washer - Lock 1/4	7
	20642	Nut - Hex 1/4	7
12	20135	Cap Screw - 1/2 x 3	1
13	40735	Jack Assy	1
14	20986	Pin - Roll	1
15	20680	Nut - Lock 1/2	2
16	36736	Hook - Endgate	2
17	20821	Pin - Cotter	8
18	21027	Pin - Clevis	8
19	9342	Yoke - Female	4
20	21084	Nut - Jam 1/2	4
21	56072	Rod - Control 10' Unit	2
	56073	Rod - Control 11' Unit	2
	56074	Rod - Control 12' Unit	2
	56075	Rod - Control 13' Unit	2
	56076	Rod - Control 14' Unit	2
	56077	Rod - Control 15' Unit	2
	56078	Rod - Control 16' Unit	2
22	36819	Link - Over-center	2
23	20067	Cap Screw - 3/8 x 1	6
	20712	Washer - Lock 3/8	6
	20644	Nut - Hex 3/8	6
24	36899	Handle	1
25	56080	Pivot - Long	1
26	36727	Shaft - Lever	1
27	56079	Pivot - Short	1



**FENDERS & MUDFLAPS CONTINUED**

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	21770	Mudflap	2
2	20067	Cap Screw - 3/8 x 1	8
	20693	Washer - Flat 3/8	8
	20712	Washer - Lock 3/8	8
	20644	Nut - Hex 3/8	8
3	73044	Fender - RH 10' Unit	1
	73059	Fender - LH 10' Unit	1
	73045	Fender - RH 11' Unit	1
	73060	Fender - LH 11' Unit	1
	73046	Fender - RH 12' Unit	1
	73061	Fender - LH 12' Unit	1
	73047	Fender - RH 13' Unit	1
	73062	Fender - LH 13' Unit	1
	73048	Fender - RH 14' Unit	1
	73063	Fender - LH 14' Unit	1
	73049	Fender - RH 15' Unit	1
	73064	Fender - LH 15' Unit	1
	73050	Fender - RH 16' Unit	1
	73065	Fender - LH 16' Unit	1
4	85855	Angle - Mounting	AR
5	20318	Bolt - Carriage 3/8 x 1	AR
	20693	Washer - Flat 3/8	AR
	20712	Washer - Lock 3/8	AR
	20644	Nut - Hex 3/8	AR
6	55854	Bracket - Mudflap RH	1
	55855	Bracket - Mudflap LH	1
7	*36844	Rod - Mudflap	2
8	39200	Decal - Warning Slipping Hazard	2

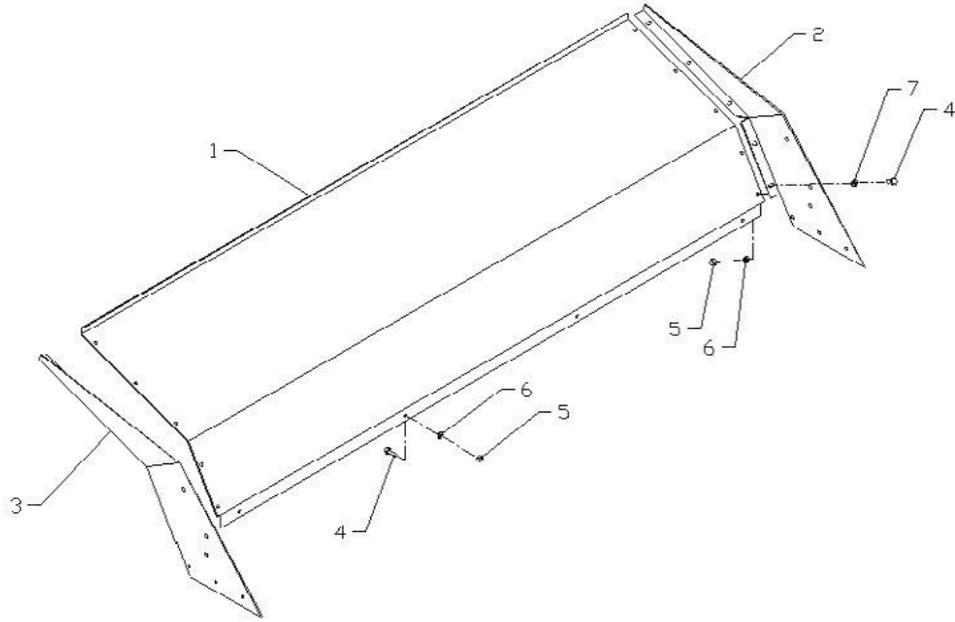




<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
	55915	Ladder Assy (RH or LH Mount)	
1	72776	Ladder - Upper Wldmt	1
2	72797	Ladder - Lower Wldmt	1
3	20068	Cap Screw - 3/8 x 1 1/4	6
4	20069	Cap Screw - 3/8 x 1 1/2	2
5	20644	Nut - Hex 3/8	8
6	*20693	Washer - Flat 3/8	4
7	*20712	Washer - Lock 3/8	8

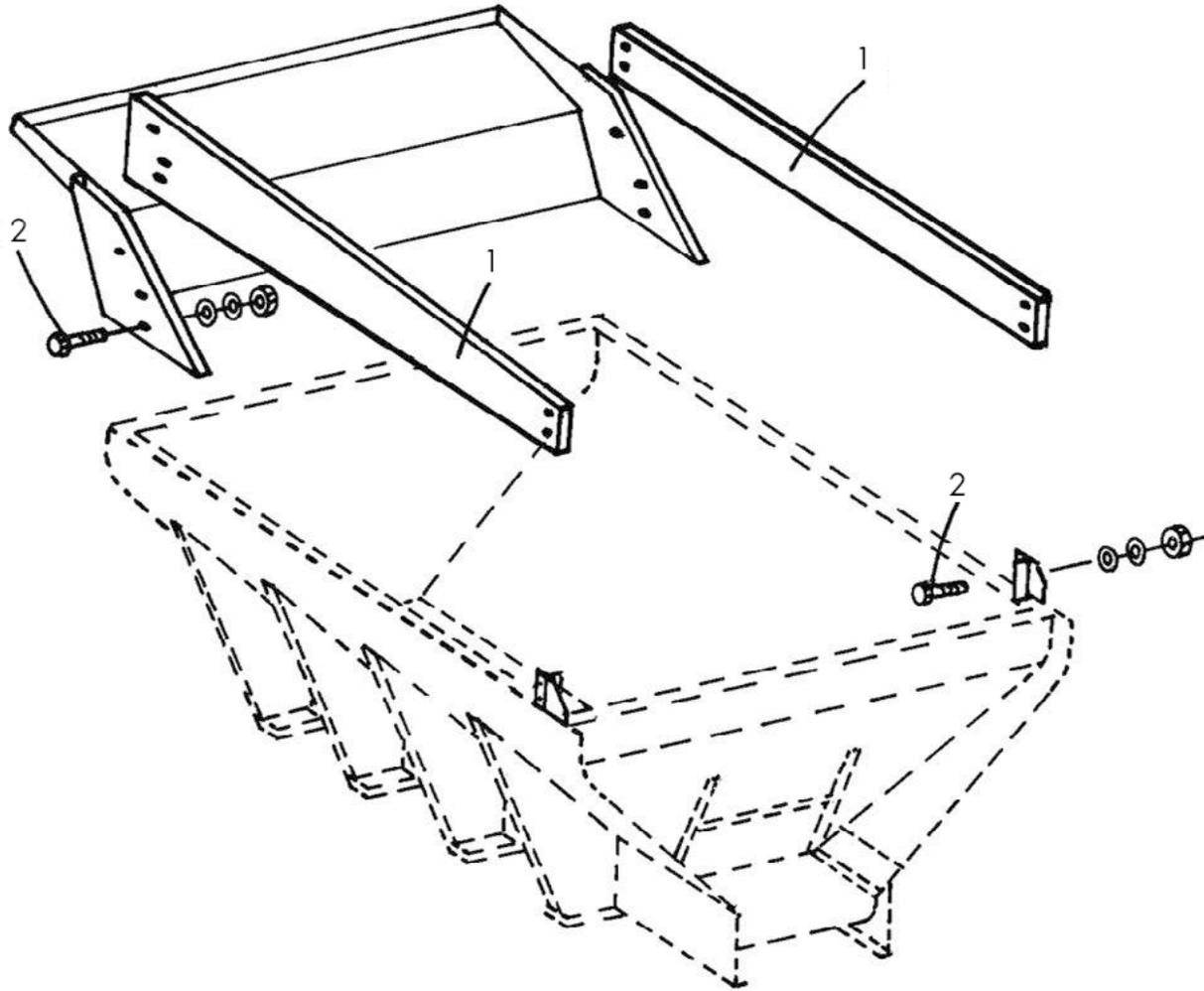
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PARTS LIST



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	55926	Panel - Cab Shield 57" x 88"	1
	55927	Panel - Cab Shield 63" x 88"	1
	55928	Panel - Cab Shield 69" x 88"	1
2	31788	Support - RH Wldmt 57"	1
	39813	Support - RH Wldmt 63"	1
	39819	Support - RH Wldmt 69"	1
3	31789	Support - LH Wldmt 57"	1
	39815	Support - LH Wldmt 63"	1
	39821	Support - LH Wldmt 69"	1
4	20067	Screw - Cap 3/8 x 1	AR
5	20644	Nut - Hex 3/8	AR
6	20712	Washer - Lock 3/8	AR
7	20693	Washer - Flat 3/8	AR

AR - As Required



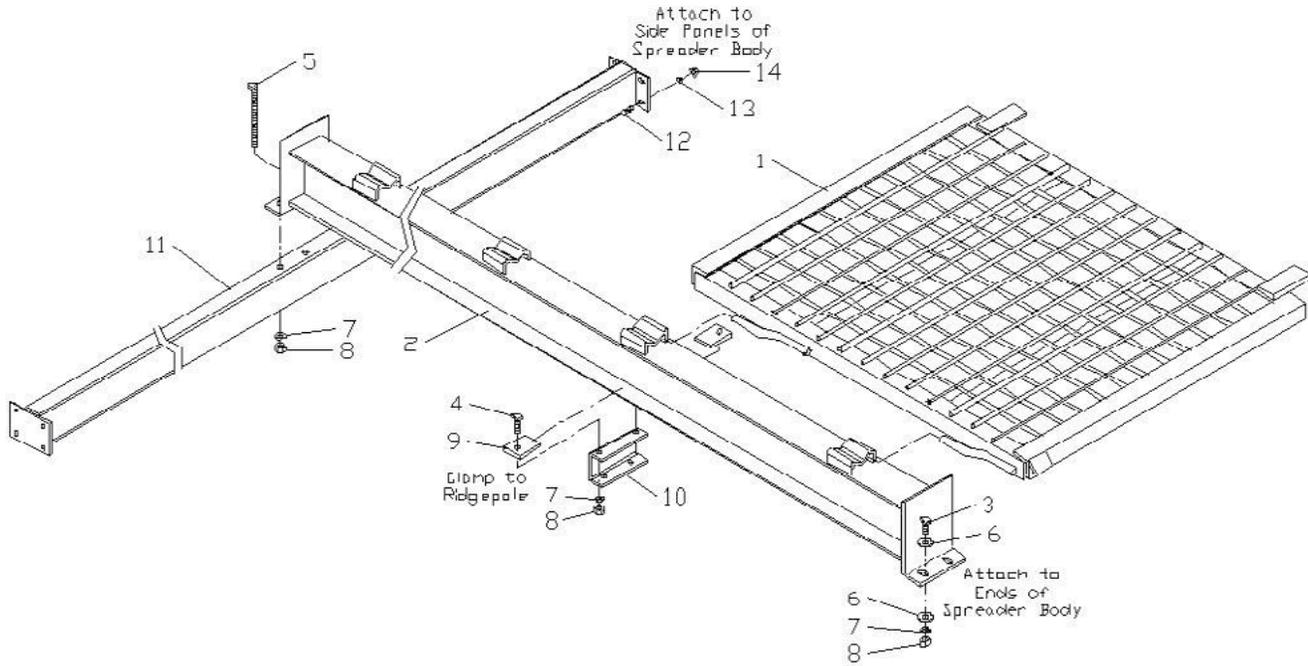
**SIDE BOARDS CONTINUED**

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1		Side Board Kit - Tapered 6" x 12"	
	72500	Side Board - RH 10' Unit	1
	72513	Side Board - LH 10' Unit	1
	72501	Side Board - RH 11' Unit	1
	72514	Side Board - LH 101 Unit	1
	72502	Side Board - RH 12' Unit	1
	72515	Side Board - LH 13' Unit	1
	72503	Side Board - RH 13' Unit	1
	72516	Side Board - LH 13' Unit	1
	72504	Side Board - RH 14' Unit	1
	72517	Side Board - LH 14' Unit	1
	72505	Side Board - RH 15' Unit	1
	72518	Side Board - LH 15' Unit	1
	72506	Side Board - RH 16' Unit	1
	72519	Side Board - LH 16' Unit	1
		Side Board Kit - 6" Steel	
	72482	Side Board - 6" 10' Unit	2
	72483	Side Board - 6" 11' Unit	2
	72484	Side Board - 6" 12' Unit	2
	72485	Side Board - 6" 13' Unit	2
	72486	Side Board - 6" 14' Unit	2
	72487	Side Board - 6" 15' Unit	2
	72488	Side Baord - 6" 16' Unit	2
2	20128	Cap Screw - 1/2 x 1 1/4	AR
	20695	Washer - Flat 1/2	AR
	20714	Washer - Lock 1/2	AR
	20646	Nut - Hex 1/2	AR

AR - As Required



**SCREENS - STANDARD HEIGHT & 6" HIGHER SIDES**



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	72382	Screen Wldmt - 4' (Standard)	AR
	72320	Screen Wldmt - 4' (Swinging)	AR
	72321	Screen Wldmt - 5' (Standard)	AR
	72383	Screen Wldmt - 6' (Standard)	AR
	72322	Screen Wldmt - 6' (Swinging)	AR
2		Ridgepole Wldmt - Standard Rear Endgate	
	44189	10' Unit	1
	44190	11' Unit	1
	44191	12' Unit	1
	44192	13' Unit	1
	44193	14' Unit	1
	44194	15' Unit	1
	44195	16' Unit	1
		Ridgepole Wldmt - Swinging Rear Endgate	
	72304	10' Unit	1
	72305	11' Unit	1
	72306	12' Unit	1
	72307	13' Unit	1
	72308	14' Unit	1
	72309	15' Unit	1
	72310	16' Unit	1

**PARTS LIST**

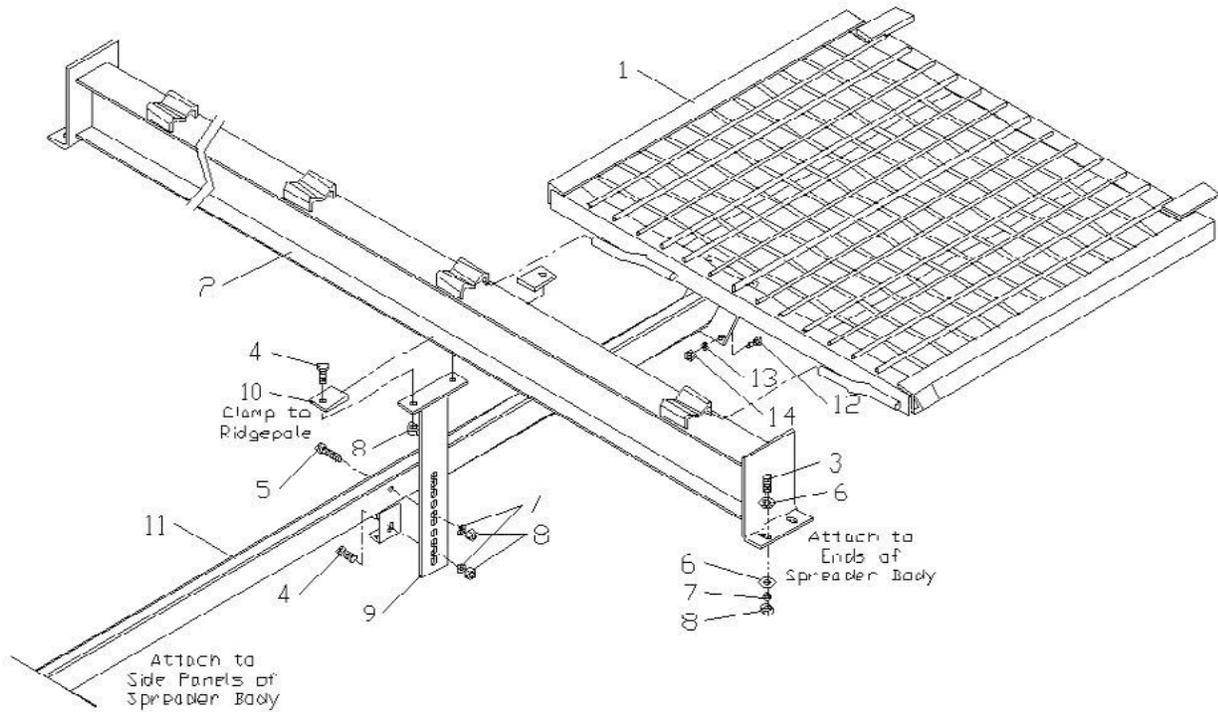


<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
3	20128	Cap Screw - 1/2 x 1 1/4	4
4	20129	Cap Screw - 1/2 x 1 1/2	2
5	20145	Cap Screw - 1/2 x 5 1/2	2
6	20695	Washer - Flat 1/2	12
7	20714	Washer - Lock 1/2	4
8	20646	Nut - Hex 1/2	8
9	44238	Bracket - Support (12'-16' Units)	1
10	72331	Spacer - Support Standard (12'-16' Units)	1
	72332*	Spacer - Support 6" Higher Sides (12'-16' Units)	1
11	72247	Support Tube Wldmt (12'-16' Units)	1
12	20068	Cap Screw - 3/8 x 1	8
13	20712	Washer - Lock 3/8	8
14	20644	Nut - Hex 3/8	8

\* - not shown AR - As Required

E3020 Length	STANDARD REAR ENDGATE	SWINGING REAR ENDGATE
10' Unit	2 - 4' & 2 - 5'	4 - 5'
11' Unit	4 - 5'	2 - 5' & 2 - 6'
12' Unit	2 - 5' & 2 - 6'	4 - 6'
13' Unit	6 - 4'	4 - 4' & 2 - 5'
14' Unit	4 - 4' & 2 - 5'	2 - 4' & 4 - 5'
15' Unit	4 - 4' & 2 - 6'	6 - 5'
16' Unit	2 - 4', 2 - 5' & 2 - 6'	4 - 5' & 2 - 6'





<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	72382	Screen Wldmt - 4' (Standard)	AR
	72320	Screen Wldmt - 4' (Swinging)	AR
	72321	Screen Wldmt - 5' (Standard)	AR
	72383	Screen Wldmt - 6' (Standard)	AR
	72322	Screen Wldmt - 6' (Swinging)	AR
2		Ridgepole Wldmt - Standard Rear Endgate	
	44189	10' Unit	1
	44190	11' Unit	1
	44191	12' Unit	1
	44192	13' Unit	1
	44193	14' Unit	1
	44194	15' Unit	1
	44195	16' Unit	1
		Ridgepole Wldmt - Swinging Rear Endgate	
	72391	10' Unit	1
	72392	11' Unit	1
	72393	12' Unit	1
	72394	13' Unit	1
	72395	14' Unit	1
	72396	15' Unit	1
	72397	16' Unit	1

PARTS LIST

**SCREENS - 6" LOWER SIDES CONTINUED**

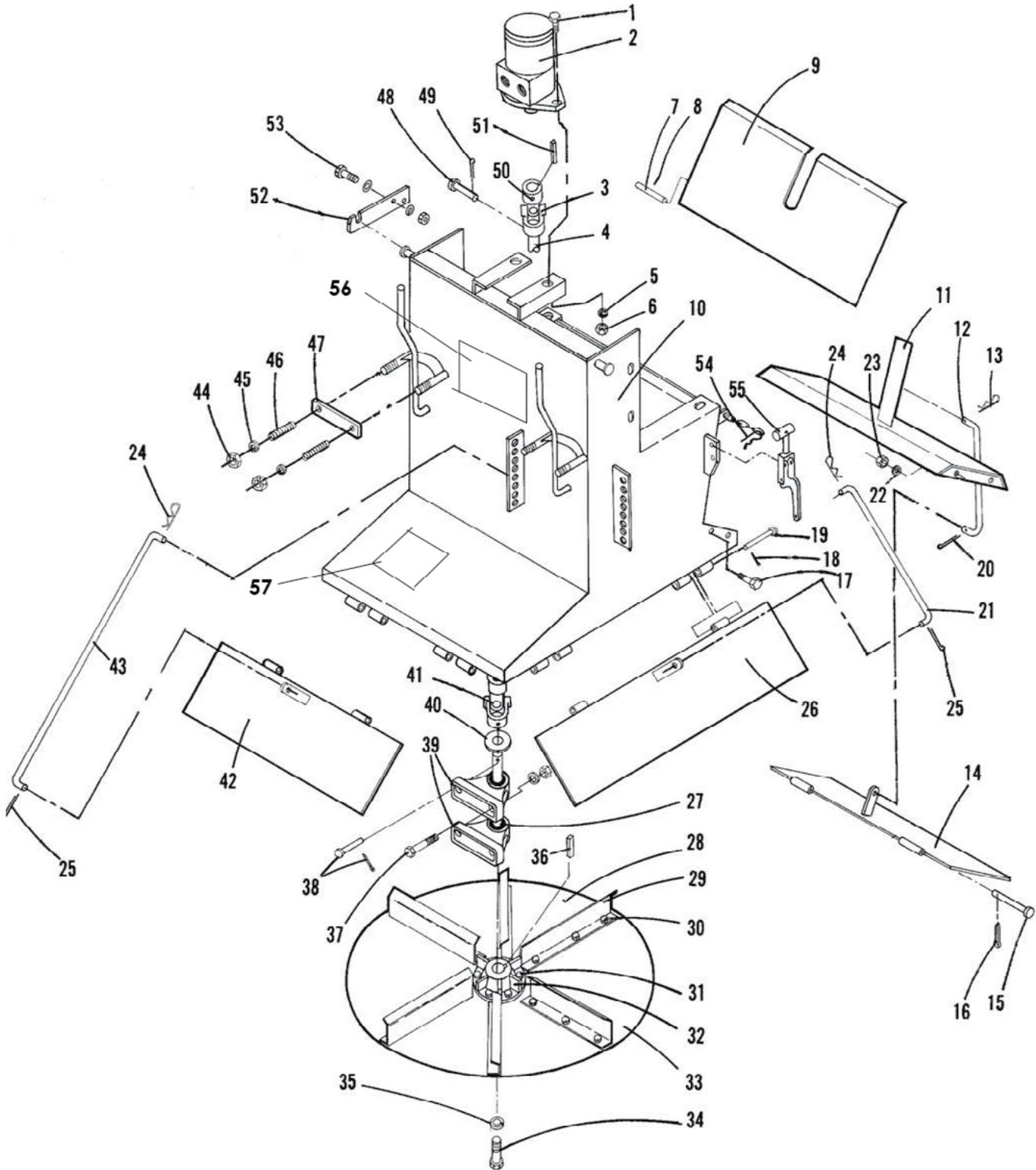
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
3	20128	Cap Screw - 1/2 x 1 1/4	4
4	20129	Cap Screw - 1/2 x 1 1/2	2
5	20132	Cap Screw - 1/2 x 2 1/2	2
6	20695	Washer - Flat 1/2	8
7	20714	Washer - Lock 1/2	4
8	20646	Nut - Hex 1/2	8
9	44235	Support - Ridgepole Wldmt (12'-16' Units)	1
10	44238	Bracket - Support (12'-16' Units)	2
11	37240	Hanger - Support Wldmt	1
12	20068	Cap Screw - 3/8 x 1	8
13	20712	Washer - Lock 3/8	8
14	20644	Nut - Hex 3/8	8

AR - As Required

E3020 Length	STANDARD REAR ENDGATE	SWINGING REAR ENDGATE
10' Unit	2 - 4' & 2 - 5'	4 - 5'
11' Unit	4 - 5'	2 - 5' & 2 - 6'
12' Unit	2 - 5' & 2 - 6'	4 - 6'
13' Unit	6 - 4'	4 - 4' & 2 - 5'
14' Unit	4 - 4' & 2 - 5'	2 - 4' & 4 - 5'
15' Unit	4 - 4' & 2 - 6'	6 - 5'
16' Unit	2 - 4', 2 - 5' & 2 - 6'	4 - 5' & 2 - 6'



**SPINNER HOPPER -  
STANDARD OR QUICK DISCONNECT**



**PARTS LIST**



**SPINNER HOPPER -  
STANDARD OR QUICK DISCONNECT CONTINUED**

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	20068	Cap Screw – 3/8 x 1 1/4	2
2	37345	Motor - Hydraulic	1
3	22464	U-Joint	1
4	72289	Shaft – Drive	1
5	20693	Washer – Flat, 3/8	2
6	20644	Nut – Hex, 3/8	2
7	39665	Pin – Chute, Baffle	2
8	20986	Pin – Roll	2
9	72281	Baffle – Chute Wldmt	1
10	72269	Hopper – Spinner Wldmt	1
11	72291	Support – Front Baffle Wldmt	1
12	39672	Rod – Control	1
13	40576	Pin – Hair	2
14	72285	Baffle – Optional Fourth	1
15	17770	Pin – Clevis	1
16	20810	Pin – Cotter	1
17	20035	Cap Screw – 5/16 x 7/8	4
18	20810	Pin – Cotter	6
19	17770	Pin – Clevis	6
20	20821	Pin – Cotter	1
21	17640	Rod - Control	2
22	20692	Washer – Flat, 5/16	4
23	20643	Nut – Hex, 5/16	4
24	40576	Pin – Hair	3
25	20821	Pin – Cotter	3
26	72287	Baffle – Side	2
27	72283	Shaft – Spinner	1
28	36751	Spinner Assy	1
29	36752	Fin	6
30	20677	Nut – Lock, 5/16	18
	20035	Cap Screw – 5/16 x 7/8	18
31	20004	Cap Screw – 1/4 x 7/8	6
	20676	Nut – Hex, 1/4	6
32	14353	Hub	1
33	36918	Disc – Spinner	1
34	20128	Cap Screw – 1/2 x 1 1/4	1
35	20714	Washer – Lock, 1/2	1
36	21445	Key	1

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

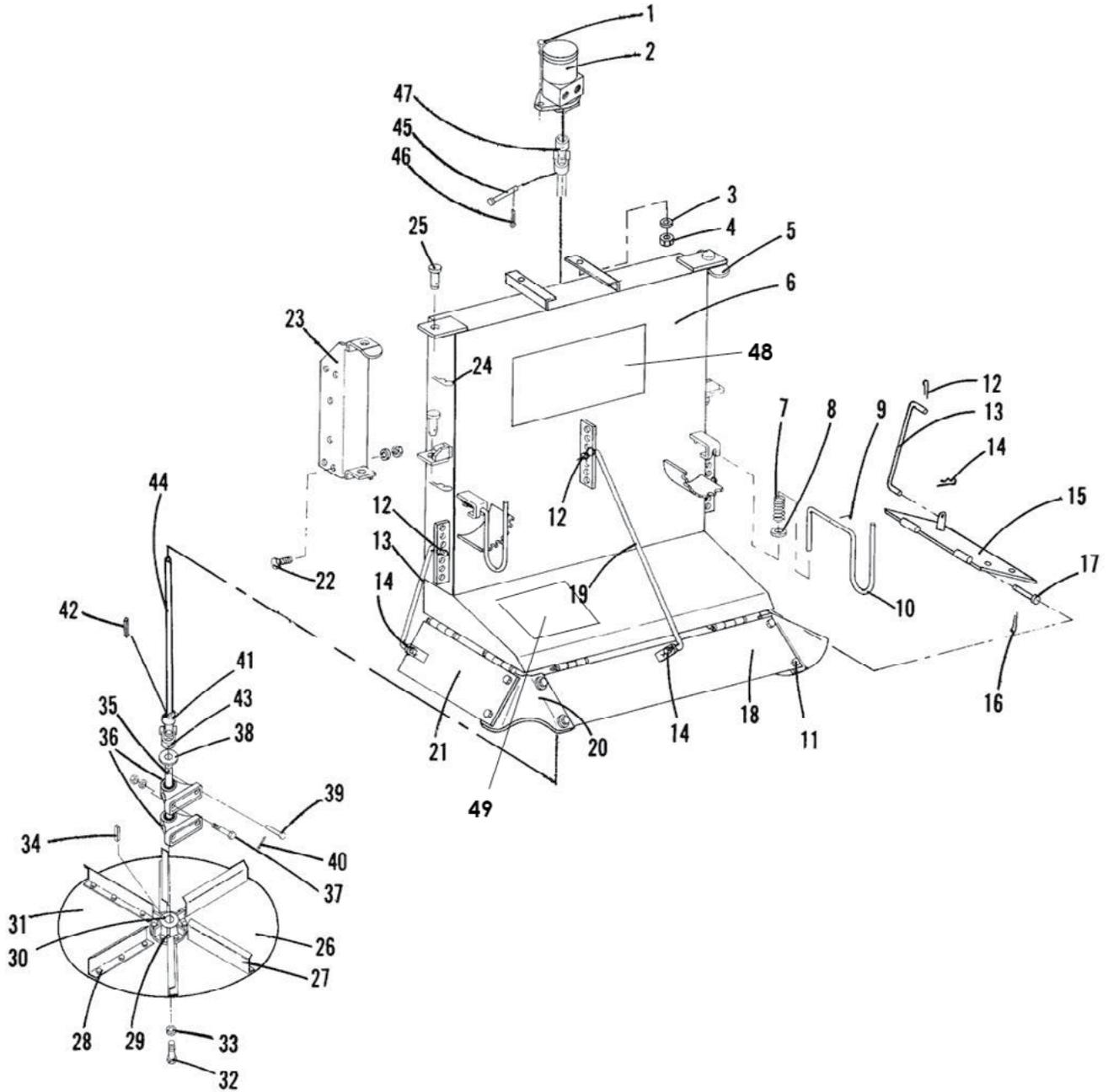


<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
37	20176	Cap Screw – 5/8 x 1 3/4	4
	20716	Washer – Lock, 5/8	4
	20648	Nut – Hex, 5/8	4
38	6122	Pin – Clevis	2
	20817	Pin – Cotter	2
39	72284	Bearing – Pillow Block	2
40	72294	Seal – Bearing Cover	2
41	45989	U-Joint	1
42	72285	Baffle – End	1
43	36796	Rod - Control	1
44	20678	Nut – Lock, 3/8	4
45	20693	Washer – Flat, 3/8	4
46	3126	Spring	4
47	1517	Plate – Adjusting	2
48	6124	Pin – Clevis	1
49	20817	Pin – Cotter	1
50	20748	Screw – Set	1
51	2212	Key	1

The following items are available with the quick-disconnect spinner hopper:

52	72068	Support – Upper, R.H.	1
	72069	Support – Upper, L.H.	1
53	20068	Cap Screw – 3/8 x 1 1/4	4
	20693	Washer – Flat, 3/8	4
	20712	Washer – Lock, 3/8	4
	20644	Nut – Hex, 3/8	4
54	40576	Pin – Hair	2
55	72070	Binder – Load	2
56	368	Decal - Flying Material	1
57	55630	Decal - Warning Falling Hazard	1

72579  
Includes Items 11-17,20,22,23  
Kit – Service, 3-Section Baffle,  
Includes Items 18,19,21,24-26,42,43

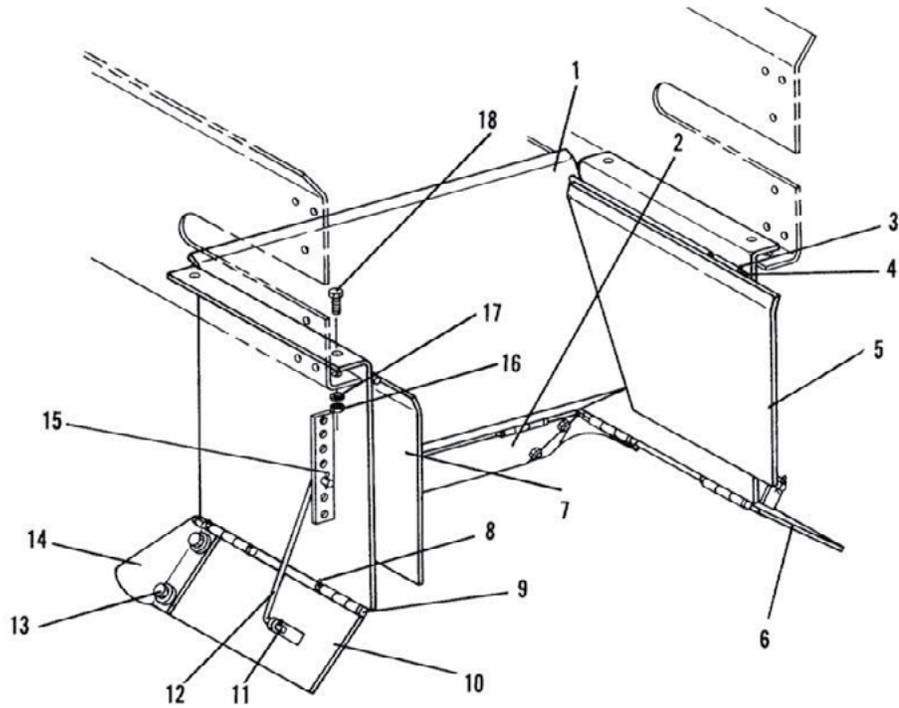


Please Give Part No., Description  
& Unit Serial No.



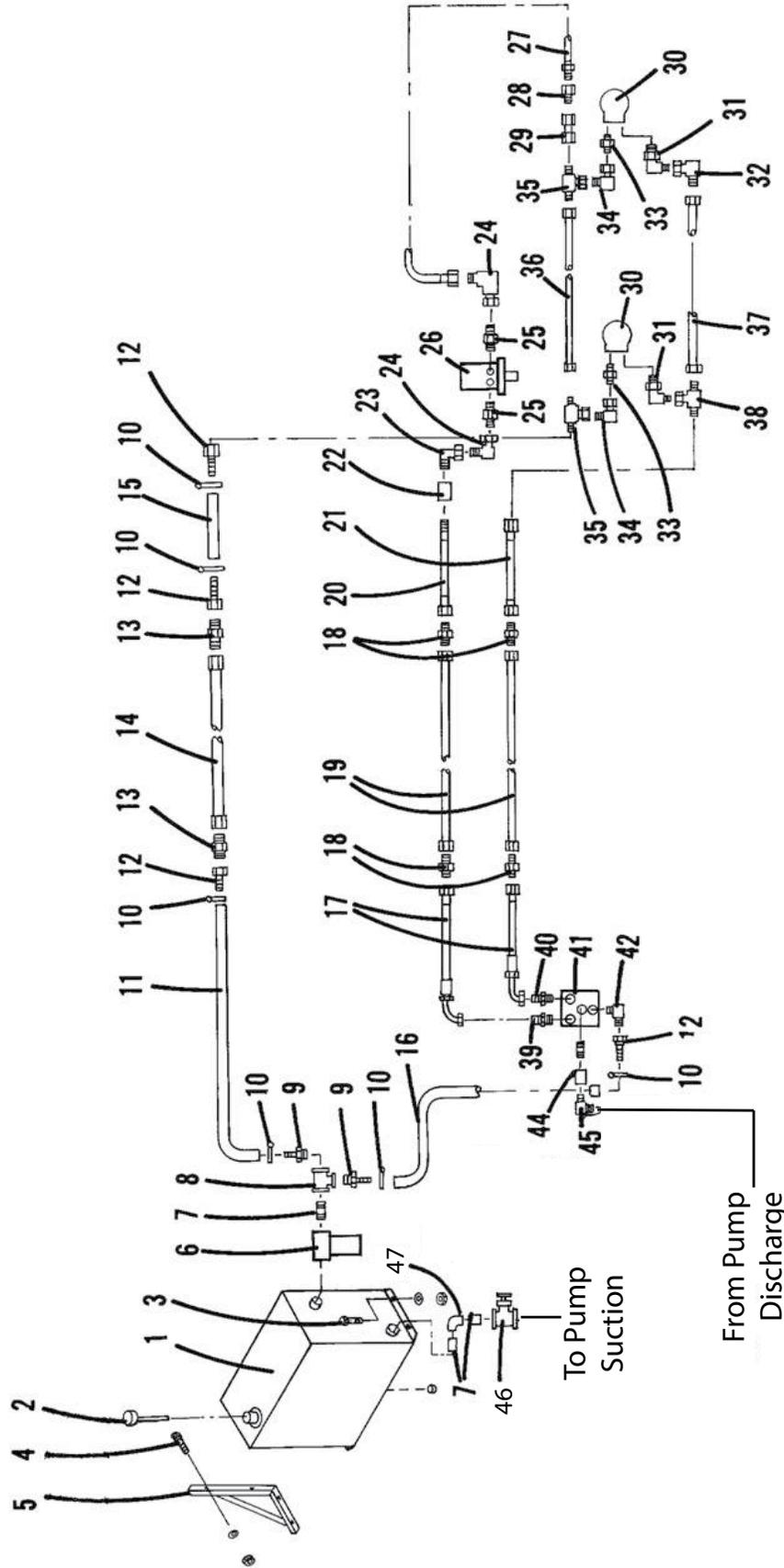
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	20068	Cap – Screw, 3/8 x 1 1/4	2
2	37345	Motor – Hydraulic	1
3	20693	Washer – Flat, 3/8	2
4	20644	Nut – Hex, 3/8	2
5	72259	Hinge – R.H.	1
	36867	Pin – Clevis	2
	40576	Pin – Hair	2
6	72253	Frame – Spinner Wldmt	1
7	3126	Spring	2
8	20694	Washer – Flat, 7/16	2
9	20907	Pin – Roll	2
10	36722	Handle – Baffle Control	2
11	20004	Cap Screw – 1/4 x 7/8	8
	21423	Washer – Flat, 1/4	8
	20676	Nut – Lock, 1/4	8
12	40576	Pin – Hair	3
13	17640	Rod – Control	2
14	20821	Pin – Cotter	3
15	36791	Baffle – R.H.	1
16	20810	Pin – Cotter	6
17	17770	Pin – Shear	6
18	72257	Baffle – End	1
19	36796	Rod – Control	1
20	36794	Deflector – Belt	2
21	36793	Baffle – L.H.	1
22	20068	Cap Screw – 3/8 x 1 1/4	12
	20712	Washer – Lock, 3/8	12
	20644	Nut – Hex, 3/8	12
23	72260	Hinge – L.H.	1
24	40576	Pin – Hair	2
25	36867	Pin – Clevis	2
26	36751	Spinner Assy	1
27	36752	Fin	6
28	20035	Cap Screw – 5/16 x 7/8	18
	20677	Nut – Lock, 5/16	18
29	20004	Cap Screw – 1/4 x 7/8	6
	20676	Nut – Lock, 1/4	6
30	14353	Hub	1

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
31	36918	Disc – Spinner	1
32	20128	Cap Screw – 1/2 x 1 1/4	1
33	20714	Washer – Lock, 1/2	1
34	21445	Key	1
35	72283	Shaft – Spinner	1
36	72284	Bearing – Pillow Block	2
37	20176	Cap Screw – 5/8 x 1 3/4	4
	20716	Washer – Lock, 5/8	4
	20648	Nut – Hex, 5/8	4
38	72294	Seal – Bearing Cover	2
39	6124	Pin – Clevis	1
40	20817	Pin – Cotter	1
41	45989	U-Joint	1
42	2212	Key	1
43	20748	Screw – Set	1
44	72339	Shaft – Drive	1
45	6122	Pin – Shear	2
46	20817	Pin – Cotter	2
47	22464	U-Joint	1
48	368	Decal - Flying Material	1
49	55630	Decal - Warning Falling Hazard	1
	72580	Kit – Service, Hopper Half of 6-Section Baffle, Includes Items 11-21	



## CHUTE CONTINUED

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	72264	Chute Wldmt	1
2	72257	Baffle – End	1
3	20817	Pin – Cotter	4
4	36783	Rod – Hinge	2
5	36784	Baffle – Inside, R.H.	1
6	36791	Baffle – Front Side, R.H.	1
7	36787	Baffle – Inside, L.H.	1
8	20810	Pin – Cotter	6
9	17770	Pin – Shear	6
10	36793	Baffle – Rear Side, L.H.	1
11	40576	Pin – Hair	3
12	17640	Rod – Control	3
13	20004	Cap Screw – 1/4 x 7/8	8
	21423	Washer – Flat, 1/4	8
	20676	Nut – Lock, 1/4	8
14	36794	Belting – Deflector	2
15	20821	Pin – Cotter	3
16	36414	Nut – Hex, 3/8 SS	4
17	20712	Washer – Lock, 3/8	4
18	36399	Cap Screw – 3/8 x 1 1/4 SS	4



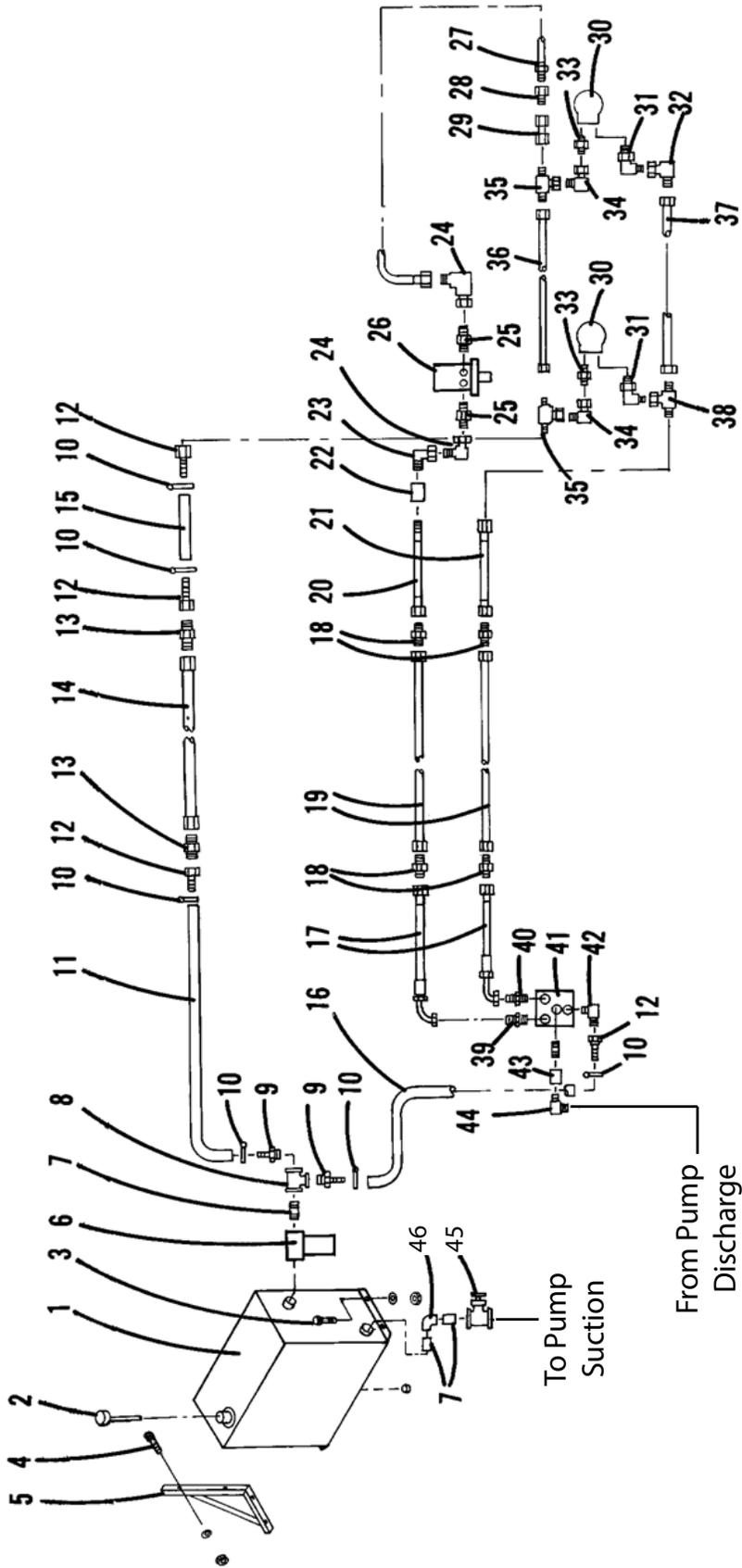
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	14820	Reservoir – Hydraulic	1
	6033	Plug – Drain	1
2	21850	Cap – Filler	1
3	20068	Cap Screw – 3/8-16 x 1 1/4	4
	20712	Washer – Lock, 3/8	4
	20644	Nut – Hex, 3/8-16	4
4	20069	Cap Screw, 3/8-16 x 1 1/2	4
	20712	Washer – Lock, 3/8	4
	20644	Nut – Hex, 3/8	4
5	33652	Mount – R.H.	1
	33653	Mount – L.H.	1
6	39845	Filter – Oil	1
7	6028	Nipple – Close	3
8	6318	Tee – Pipe	1
9	22426	Nipple – Hose, Male	2
10	6335	Clamp – Hose	2
11	16521-48	Hose – 1”	1
12	36802	Nipple – Hose, Female	2
13	34719	Adapter – Union	2
14	72356	Tubing – 10’ Unit	1
	72357	Tubing – 11’ Unit	1
	72358	Tubing – 12’ Unit	1
	72359	Tubing – 13’ Unit	1
	72360	Tubing – 14’ Unit	1
	72361	Tubing – 15’ Unit	1
	72362	Tubing – 16’ Unit	1
15	16521-36	Hose – Return	1
16	16521-60	Hose – Return	1
17	58952	Hose – Pressure	1
18	29817	Adapter	4
19	72349	Tubing – 10’ Unit	1
	72350	Tubing – 11’ Unit	1
	72351	Tubing – 12’ Unit	1
	72352	Tubing – 13’ Unit	1
	72353	Tubing – 14’ Unit	1
	72354	Tubing – 15’ Unit	1
	72355	Tubing – 16’ Unit	1
20	58951	Hose – Pressure	1
21	29717	Hose – Pressure	1

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
22	16276	Coupling – Pipe	1
23	29827	Adapter – Elbow, 90°	1
24	34709	Adapter – Elbow, 90°	2
25	29753	Adapter – Connector	2
26	37345	Motor – Hydraulic, Spinner	1
27	56138	Hose – Return	1
28	22208	Bushing – Pipe	1
29	34716	Adapter – Coupling	1
30	55970	Motor – Hydraulic, Conveyor	2
31	29773	Adapter – Elbow, 90°	2
32	34709	Adapter – Elbow, 90°	2
33	29778	Adapter	2
34	29807	Adapter – Elbow, 90°	2
35	29836	Tee	2
36	80888	Tube Assy	1
37	80886	Tube Assy	1
38	29809	Adapter – Tee	1
39	29752	Adapter	1
40	29784	Adapter	1
41	34145	Valve	1
42	29779	Adapter – Elbow, 90°	1
43	16362	Nipple – Close	1
44	16276	Coupling – Pipe, Female	1
45	29779	Adapter – Elbow, 90°	1
46	22155	Valve – Gate	1
47	6011	Elbow – Pipe, 90°	1

**OPTIONAL QUICK-DISCONNECT REMOVABLE SPINNER**

* 39905	Quick Disconnect – 3/4 Male	2
39906	Quick Disconnect – 3/4 Female	2
* 34748	Adapter – Elbow, 90°	1

\* - not shown



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



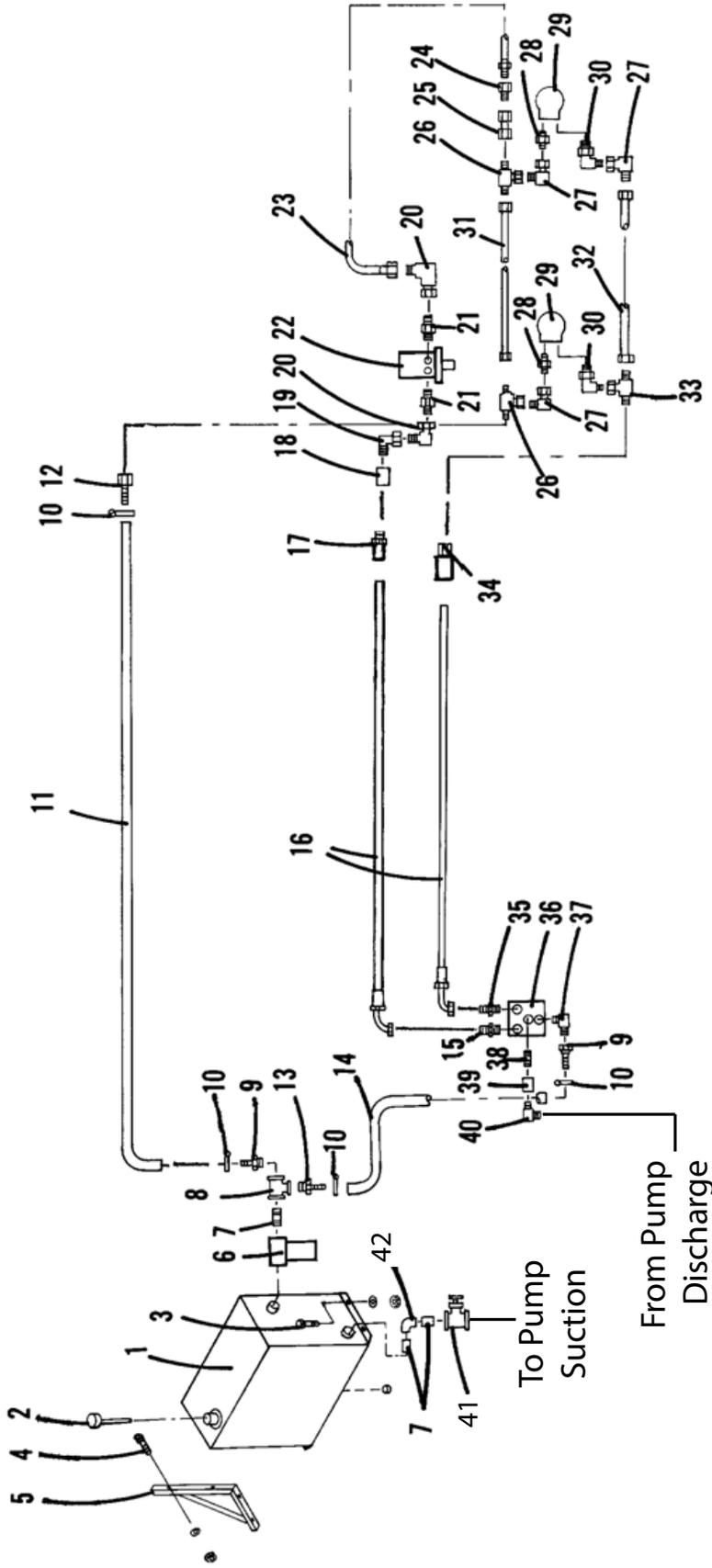
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	14820	Reservoir – Hydraulic	1
	6033	Plug – Drain	1
2	21850	Cap – Filler	1
3	20068	Cap Screw – 3/8-16 x 1 1/4	4
	20712	Washer – Lock, 3/8	4
	20644	Nut – Hex, 3/8-16	4
4	20069	Cap Screw, 3/8-16 x 1 1/2	4
	20712	Washer – Lock, 3/8	4
	20644	Nut – Hex, 3/8	4
5	33652	Mount – R.H.	1
	33653	Mount – L.H.	1
6	39845	Filter – Oil	1
7	6028	Nipple – Close	3
8	6318	Tee – Pipe	1
9	22426	Nipple – Hose, Male	2
10	6335	Clamp – Hose	6
11	16521-48	Hose – 1”	1
12	36802	Nipple – Hose, Female	2
13	34719	Adapter – Union	2
14	72356	Tubing – 10’ Unit	1
	72357	Tubing – 11’ Unit	1
	72358	Tubing – 12’ Unit	1
	72359	Tubing – 13’ Unit	1
	72360	Tubing – 14’ Unit	1
	72361	Tubing – 15’ Unit	1
	72362	Tubing – 16’ Unit	1
15	16521-36	Hose – Return	1
16	16521-60	Hose – Return	1
17	58952	Hose – Pressure	1
18	29817	Adapter	4
19	72349	Tubing – 10’ Unit	1
	72350	Tubing – 11’ Unit	1
	72351	Tubing – 12’ Unit	1
	72352	Tubing – 13’ Unit	1
	72353	Tubing – 14’ Unit	1
	72354	Tubing – 15’ Unit	1
	72355	Tubing – 16’ Unit	1
20	58951	Hose – Pressure	1
21	29717	Hose – Pressure	1



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

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
22	16276	Coupling – Pipe	1
23	29827	Adapter – Elbow, 90°	1
24	34709	Adapter – Elbow, 90°	2
25	29753	Adapter – Connector	2
26	37345	Motor – Hydraulic, Spinner	1
27	56138	Hose – Return	1
28	22208	Bushing – Pipe	1
29	34716	Adapter – Coupling	1
30	55970	Motor – Hydraulic, Conveyor	1
31	29773	Adapter – Elbow, 90°	2
32	34709	Adapter – Elbow, 90°	2
33	29778	Adapter	2
34	29807	Adapter – Elbow, 90°	2
35	29836	Tee	2
36	80888	Tube Assy	1
37	80886	Tube Assy	1
38	29809	Adapter – Tee	1
39	29752	Adapter	1
40	29784	Adapter	1
41	34145	Valve	1
42	29779	Adapter – Elbow, 90°	1
43	16276	Coupling – Pipe, Female	1
44	29779	Adapter – Elbow, 90°	1
45	22155	Valve – Gate	1
46	6011	Elbow – Pipe, 90°	1
OPTIONAL QUICK-DISCONNECT REMOVABLE SPINNER			
	* 39905	Quick Disconnect – 3/4 Male	2
	39906	Quick Disconnect – 3/4 Female	2
	* 34748	Adapter – Elbow, 90°	1

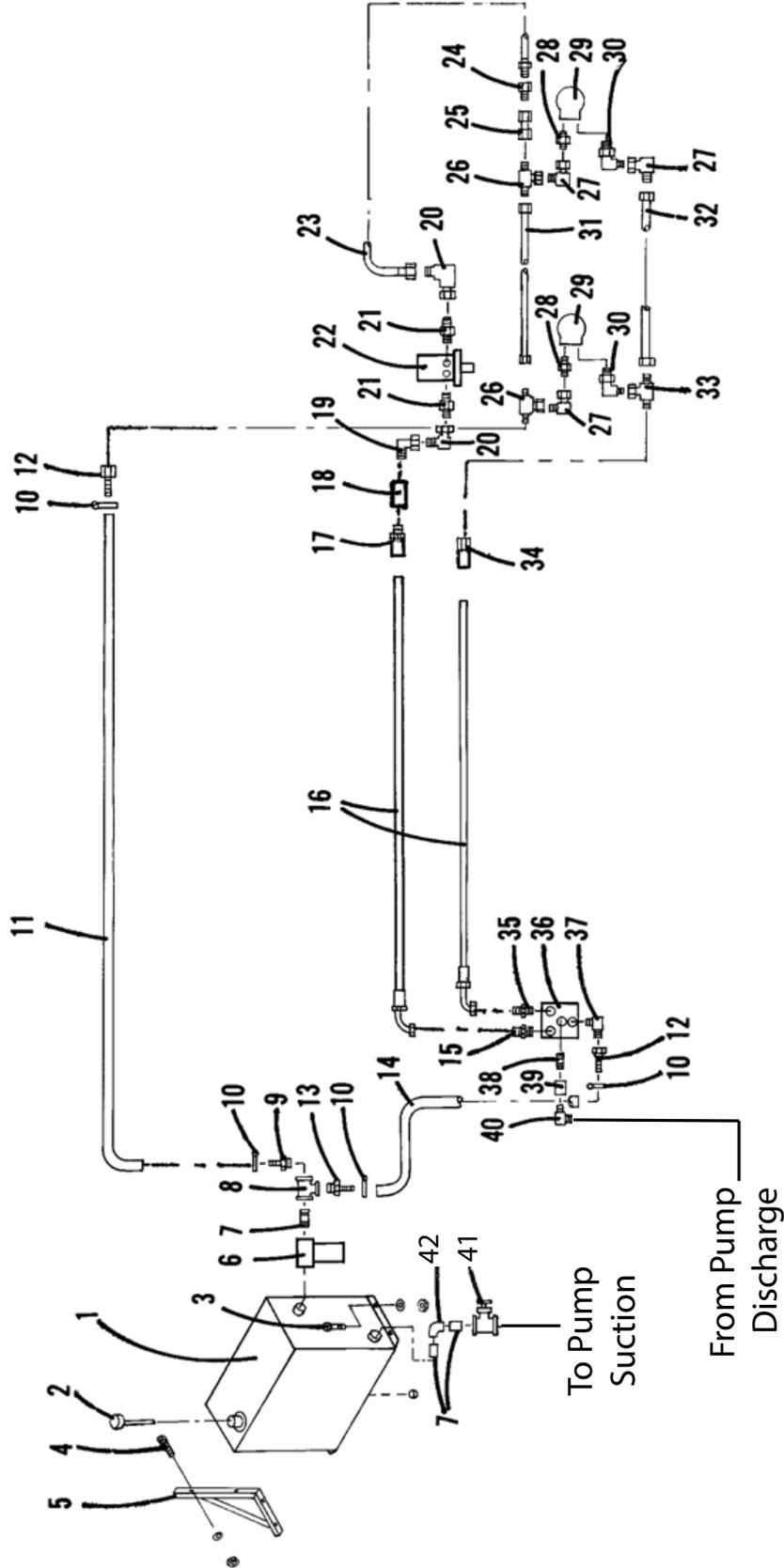
\* - not shown



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	14820	Reservoir – Hydraulic	1
	6033	Plug – Drain	1
2	21850	Cap – Filler	1
3	20068	Cap Screw – 3/8-16 x 1 1/4	4
	20712	Washer – Lock, 3/8	4
	20644	Nut – Hex, 3/8-16	4
4	20069	Cap Screw, 3/8-16 x 1 1/2	4
	20712	Washer – Lock, 3/8	4
	20644	Nut – Hex, 3/8	4
5	33652	Mount – R.H.	1
	33653	Mount – L.H.	1
6	39845	Filter – Oil	1
7	6028	Nipple – Close	3
8	6318	Tee – Pipe	1
9	22426	Nipple – Hose, Male	1
10	6335	Clamp – Hose	4
11	16521-204	Hose – 1”	1
12	36802	Nipple – Hose, Female	1
13	22426	Nipple – Hose, Male	1
14	16521-60	Hose – Return	1
15	29752	Adapter	1
16	29722	Hose – Pressure	2
17	56503	Nipple – Hose, Male	1
18	16276	Coupling – Pipe	1
19	29827	Adapter – Elbow, 90°	1
20	34709	Adapter – Elbow, 90°	2
21	29753	Adapter – Connector	2
22	37345	Motor – Hydraulic, Spinner	1
23	56138	Hose – Return	1
24	22208	Bushing – Pipe	1
25	34716	Adapter – Coupling	1
26	29836	Tee	2
27	29807	Adapter – Elbow, 90°	2
28	29778	Adapter	2
29	55970	Motor – Hydraulic, Conveyor	1
30	29773	Adapter – Elbow, 90°	2
31	80888	Tube Assy	1
32	80886	Tube Assy	1

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
33	29809	Adapter – Tee	1
34	56508	Nipple – Hose, Female	1
35	29784	Adapter	1
36	34145	Valve	1
37	29779	Adapter – Elbow, 90°	1
38	16362	Nipple – Close	1
39	16276	Coupling – Pipe, Female	1
40	29779	Adapter – Elbow, 90°	1
41	22155	Valve – Gate	1
42	6011	Elbow – Pipe, 90°	1
OPTIONAL QUICK-DISCONNECT FOR REMOVABLE SPINNER			
	* 39905	Quick Disconnect – 3/4 Male	2
	39906	Quick Disconnect – 3/4 Female	2
	* 34748	Adapter – Elbow, 90°	1

\* - not shown



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



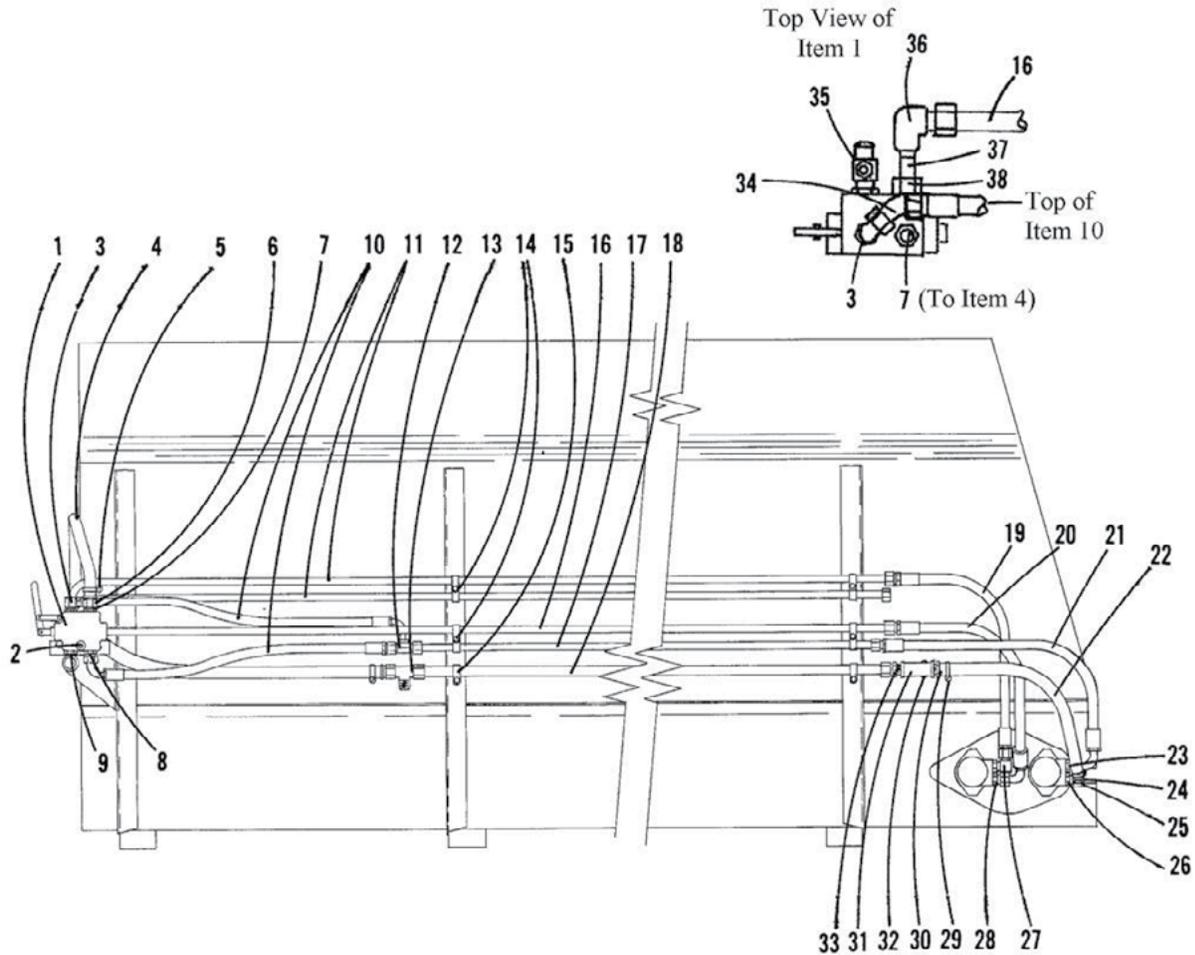
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	14820	Reservoir – Hydraulic	1
	6033	Plug – Drain	1
2	21850	Cap – Filler	1
3	20068	Cap Screw – 3/8-16 x 1 1/4	4
	20712	Washer – Lock, 3/8	4
	20644	Nut – Hex, 3/8-16	4
4	20069	Cap Screw, 3/8-16 x 1 1/2	4
	20712	Washer – Lock, 3/8	4
	20644	Nut – Hex, 3/8	4
5	33652	Mount – R.H.	1
	33653	Mount – L.H.	1
6	39845	Filter – Oil	1
7	6028	Nipple – Close	3
8	6318	Tee – Pipe	1
9	22426	Nipple – Hose, Male	1
10	6335	Clamp – Hose	4
11	16521-204	Hose – 1”	1
12	36802	Nipple – Hose, Female	1
13	22426	Nipple – Hose, Male	1
14	16521-60	Hose – Return	1
15	29752	Adapter	1
16	29722	Hose – Pressure	2
17	56503	Nipple – Hose, Male	1
18	16276	Coupling – Pipe	1
19	29827	Adapter – Elbow, 90°	1
20	34709	Adapter – Elbow, 90°	2
21	29753	Adapter – Connector	2
22	37345	Motor – Hydraulic, Spinner	1
23	56138	Hose – Return	1
24	22208	Bushing – Pipe	1
25	34716	Adapter – Coupling	1
26	29836	Tee	2
27	29807	Adapter – Elbow, 90°	2
28	29778	Adapter	2
29	55970	Motor – Hydraulic, Conveyor	1
30	29773	Adapter – Elbow, 90°	2
31	80888	Tube Assy	1
32	80886	Tube Assy	1



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

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
33	29809	Adapter – Tee	1
34	56508	Nipple – Hose, Female	1
35	29784	Adapter	1
36	34145	Valve	1
37	29779	Adapter – Elbow, 90°	1
38	16362	Nipple – Close	1
39	16276	Coupling – Pipe, Female	1
40	29632	Adapter – Elbow, 90°	1
41	22155	Valve – Gate	1
42	6011	Elbow - Pipe, 90°	
OPTIONAL QUICK-DISCONNECT FOR REMOVABLE SPINNER			
	* 39905	Quick Disconnect – 3/4 Male	2
	39906	Quick Disconnect – 3/4 Female	2
	* 34748	Adapter – Elbow, 90°	1

\* - Not shown



ITEM	PART NO.	DESCRIPTION	QTY
1	36831	Valve – Selector	1
2	20074	Cap Screw – 3/8-16 x 2 3/4	1
	20693	Washer – Flat, 3/8	1
	20712	Washer – Lock, 3/8	1
	20644	Nut – Hex, 3/8-16	1
3	29847	Adapter – Elbow, 90°	1
4	16521-69	Hose – Return	1
5	6335	Clamp – Hose	2
6	36802	Fitting – Hose End	2
7	29775	Adapter	1
8	29789	Adapter	1
9	29790	Adapter – Plug	1
10	29749	Hose	2
11	72431	Tube – 10’ Unit	2

PARTS LIST



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

**SERIES/PARALLEL HYDRAULIC SYSTEM CONTINUED**

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
	72432	Tube – 11’ Unit	2
	72433	Tube – 12’ Unit	2
	72434	Tube – 13’ Unit	2
	72435	Tube – 14’ Unit	2
	72436	Tube – 15’ Unit	2
	72437	Tube – 16’ Unit	2
12	29792	Adapter – Tee	1
13	34711	Adapter – Tee	1
14	21993	Clamp – Conduit	AR
	20908	Screw – Self Tapping	AR
15	21994	Clamp – Conduit	AR
	20908	Screw – Self Tapping	AR
16	72438	Tube – 10’ Unit	1
	72439	Tube – 11’ Unit	1
	72440	Tube – 12’ Unit	1
	72441	Tube – 13’ Unit	1
	72442	Tube – 14’ Unit	1
	72443	Tube – 15’ Unit	1
	72444	Tube – 16’ Unit	1
17	72424	Tube – 10’ Unit	1
	72425	Tube – 11’ Unit	1
	72426	Tube – 12’ Unit	1
	72427	Tube – 13’ Unit	1
	72428	Tube – 14’ Unit	1
	72429	Tube – 15’ Unit	1
	72430	Tube – 16’ Unit	1
18	72417	Tube – 10’ Unit	1
	72418	Tube – 11’ Unit	1
	72419	Tube – 12’ Unit	1
	72420	Tube – 13’ Unit	1
	72421	Tube – 14’ Unit	1
	72422	Tube – 15’ Unit	1
	72423	Tube – 16’ Unit	1
19	58955	Hose Assy	1
20	58954	Hose Assy	1
21	58953	Hose Assy	1
22	16529-22	Hose – Return	1

AR - As Required

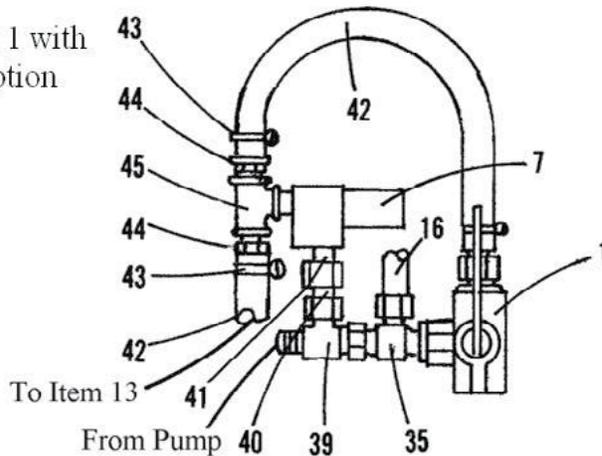


**SERIES/PARALLEL HYDRAULIC SYSTEM CONTINUED**

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
23	29753	Adapter	1
24	22381	Clamp – Hose	1
25	11424	Fitting – Hose End	1
26	29773	Adapter – Elbow, 90°	1
27	29773	Adapter – Elbow, 90°	1
28	29753	Adapter	1
29	22381	Clamp – Hose	1
30	22425	Fitting – Hose End	1
31	22221	“Y” Branch Pipe	1
32	22208	Bushing – Pipe	1
33	29751	Adapter	1
34	29782	Adapter – Elbow, 45°	1
35	29791	Adapter – Tee	1
36	29758	Adapter – Elbow, 90°	1
37	34773	Nipple – Pipe	1
38	22021	Adapter – Bushing	1

**DUMP VALVE OPTION**

End View of Item 1 with Dump Valve Option



Refer to Hydraulic Schematic, Page 96, for connecting information

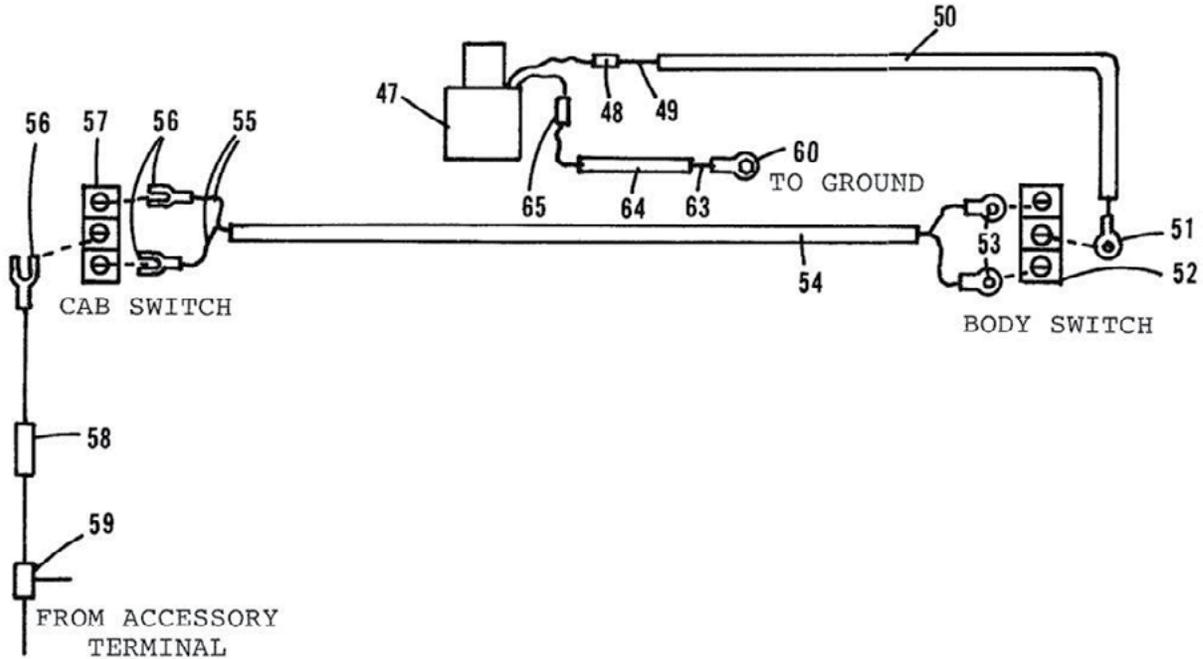
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
39	24781	Adapter – Tee	1
40	29787	Adapter	1
41	16362	Nipple – Close	1
42	16521-69	Hose (makes 2 hoses)	1
43	6335	Clamp – Hose	2
44	22426	Fitting – Hose	2
45	6067	Pipe – Tee, Reducing	1

**PARTS LIST**



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

DUMP VALVE OPTION CONTINUED



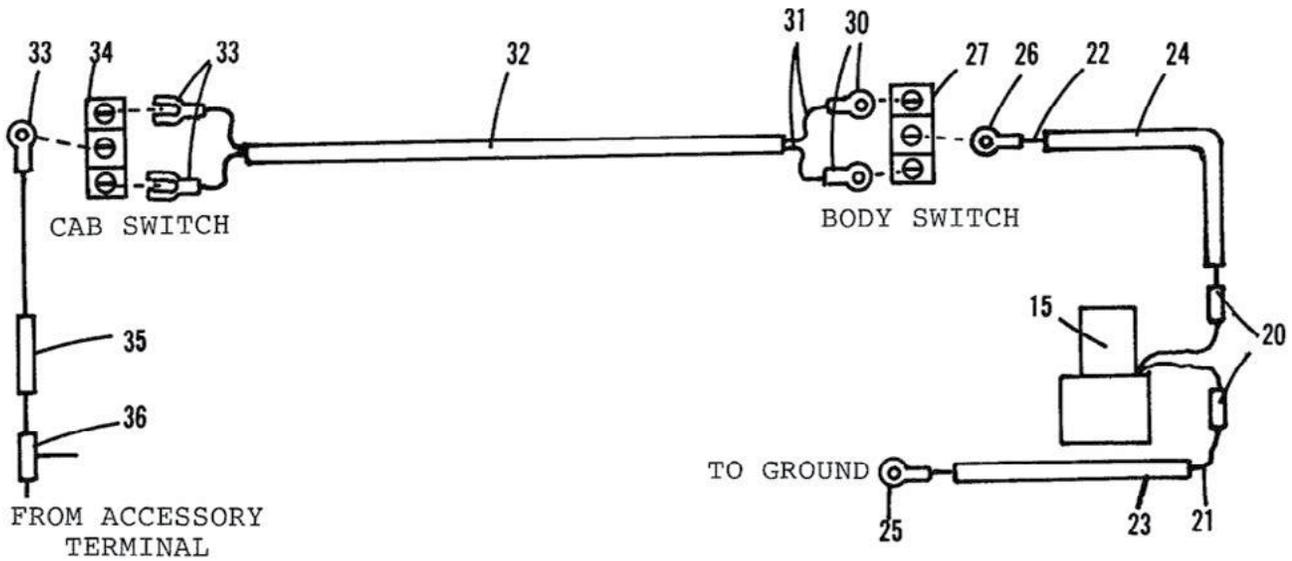
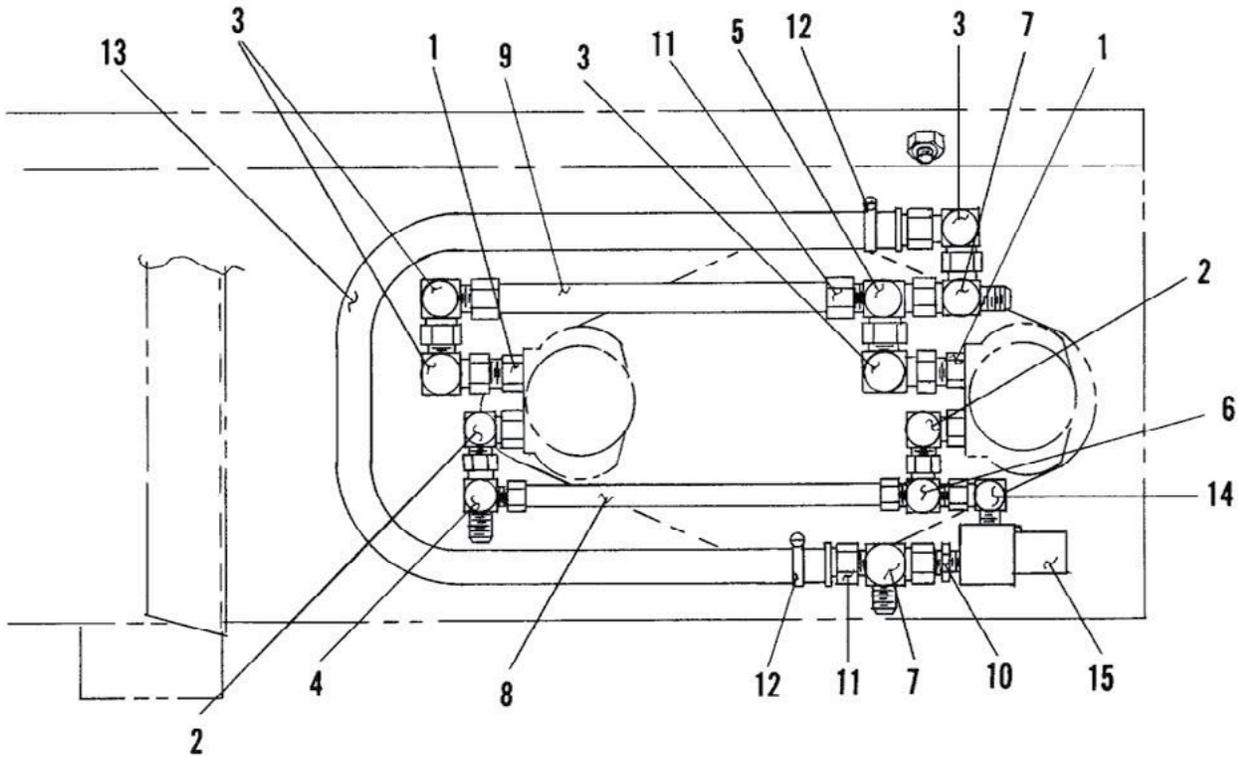
ITEM	PART NO.	DESCRIPTION	QTY
46	*6026	Nipple – Close	1
48	6649	Terminal – Butt Connector	1
49	21582-200	Wiring – Red, 14 Ga.	AR
50	36864-200	Tubing	AR
51	6536	Terminal – Ring	1
52	21479	Switch – Toggle	1
53	21663	Terminal – Ring	2
54	36864-200	Tubing	AR
55	21582-200	Wiring – Red, 14 Ga.	AR
56	6485	Terminal	3
57	58895	Switch – Toggle	1
58	39952	Fuse – In-line	1
59	12374	Connector – Tap	1
60	31572	Terminal – Ring	1
61	* 22377	Clamp – Insulated	1
62	* 20908	Screw – Self Drilling	1
63	21582-10	Wire – Red, 14 Ga.	AR
64	36864-20	Tubing	AR
65	6649	Terminal – Butt Connector	1

\* - Not Shown AR - As Required

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



PARALLEL HYDRAULIC SYSTEM WITH OPTIONAL DUMP VALVE



PARTS LIST

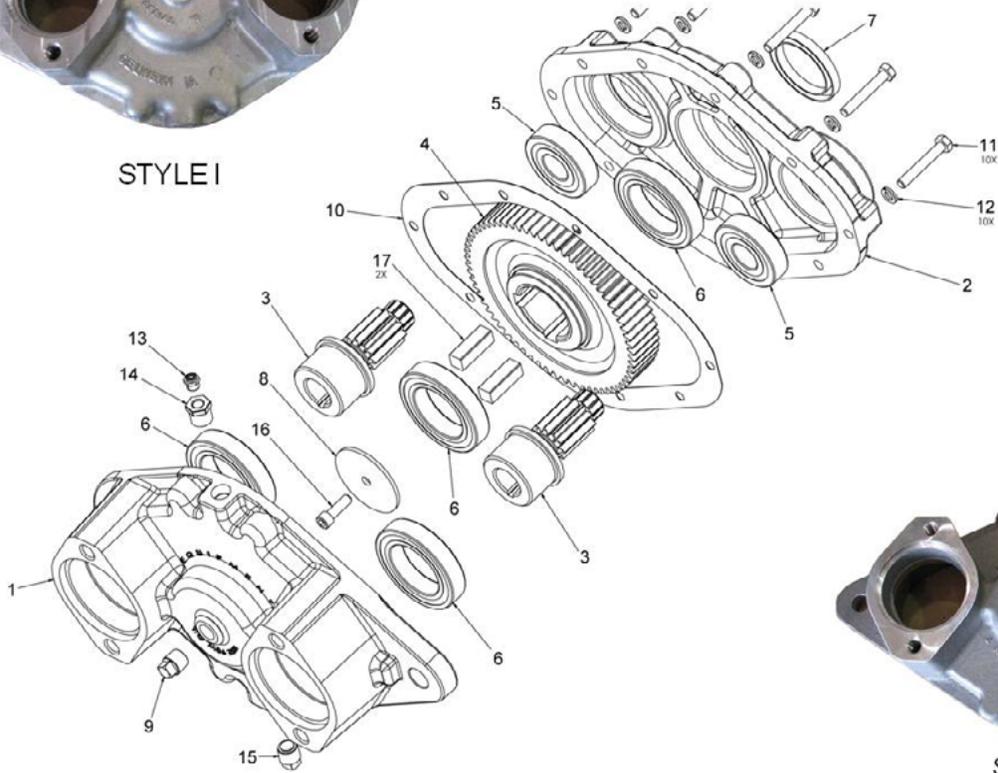


Please Give Part No., Description & Unit Serial No.

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	29778	Adapter	2
2	29773	Adapter – Elbow, 90°	2
3	29807	Adapter – Elbow, 90°	4
4	29781	Adapter – Tee	1
5	29836	Adapter – Tee	1
6	29809	Adapter – Tee	1
7	29850	Adapter – Tee	2
8	80886	Tubing Assy	1
9	80888	Tubing Assy	1
10	29757	Adapter	1
11	36802	Nipple – Hose End	2
12	6335	Clamp – Hose	2
13	16521-23	Hose – Return	1
14	29827	Adapter – Elbow, 90°	1
15	33712	Valve – Dump, Electric	1
20	6649	Terminal – Butt Connector	2
21	21582-10	Wire – Red	1
22	21582-26	Wire – Red	1
23	36864-20	Tubing	1
24	36864-36	Tubing	AR
25	31572	Terminal – Ring	1
26	6536	Terminal – Ring	1
27	58895	Switch – Toggle	1
28	* 22377	Clamp – Insulated	1
29	* 20908	Screw – Self Drilling	1
30	21479	Switch – Toggle	1
31	21582-200	Wiring – Red, 14 Ga.	AR
32	36864-200	Tubing	AR
33	6485	Terminal – Spade	3
34	21479	Switch – Toggle	1
35	39952	Fuse – In-line	1
36	12374	Connector – Tap	1



STYLE I



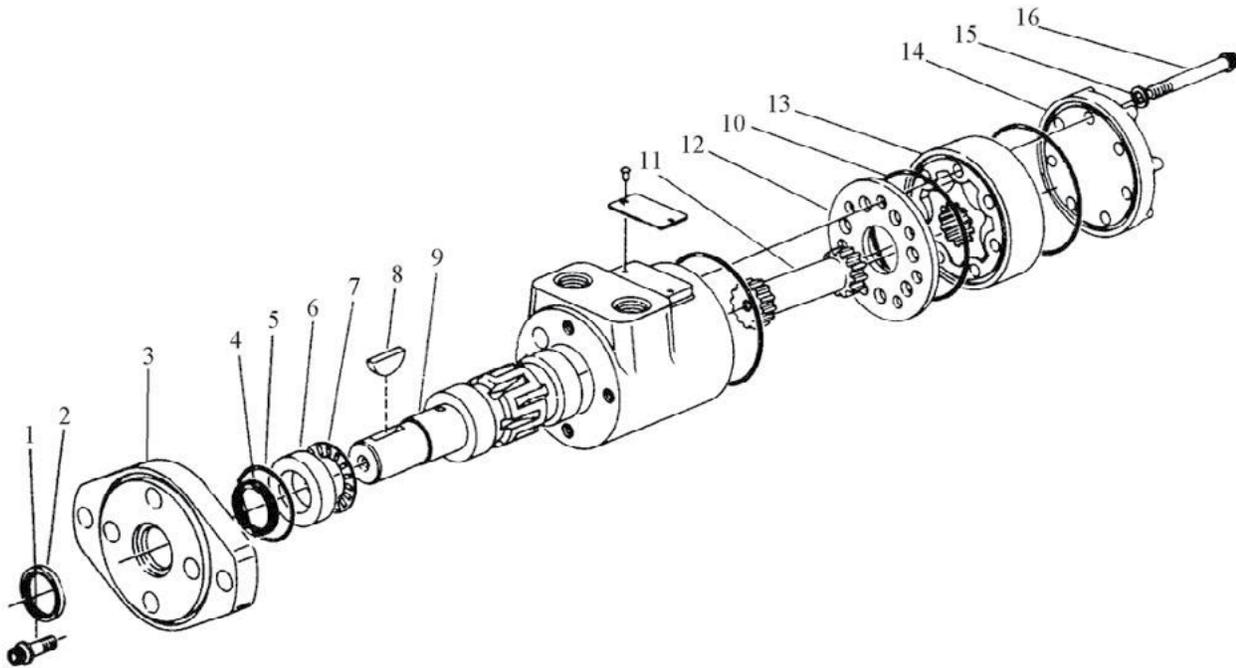
STYLE II

PARTS LIST



**GEARCASE CONTINUED**

<u>ITEM</u>	<u>PART NO.</u>		<u>DESCRIPTION</u>	<u>QTY</u>
	37985		Gear Case – Assy Dual Pinion	
	Style I	Style II		
	304268-AA	304268-AB	Parts - Service, Include 1-17	
1	38983	304557	Housing – Outboard	1
2	38982	304558	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	38978	304564	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



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
	37345	Motor – Hydraulic	1
1	30665	Cap Screw	4
2	37382	Seal	1
3	37384	Flange – Mounting	1
4	37378	Seal	1
5	37379	Seal – O-Ring	1
6	37385	Race – Bearing	1
7	37401	Bearing – Needle Thrust	1
8	3065	Key – Woodruff	1
9	37386	Shaft	1
10	16946	Drive	1
11	37388	Plate – Spacer	1
12	37380	Seal – O-Ring	3
13	37391	Gerotor	1
14	37400	Cap – End	1
15	37381	Washer – Seal	7
16	16933	Cap Screw	7
17	* 22068	Seal – O-Ring	1
	37352	Seal Kit, Includes Items 2,4,5,12,15,17	

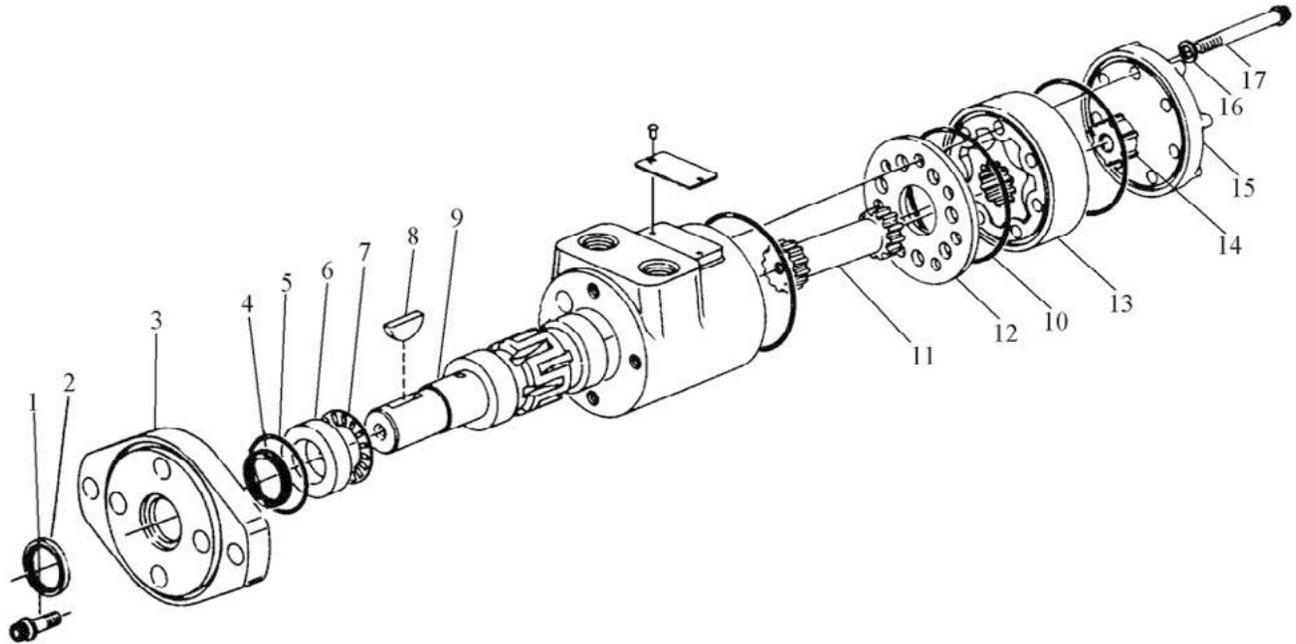
\* - Not Shown

PARTS LIST



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

MOTOR - HYDRAULIC, CONVEYOR

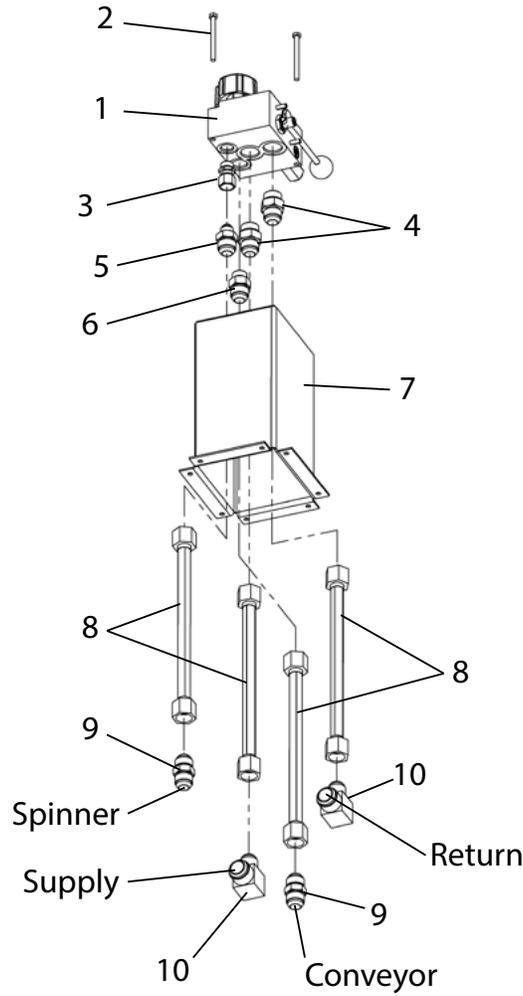


<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
	55970	Motor – Hydraulic, 1”	
1	30665	Cap Screw	4
2	37382	Seal	1
3	55220	Flange – Mounting	1
4	37378	Seal	1
5	37379	Seal – O-Ring	1
6	37385	Race – Bearing	1
7	37401	Bearing – Needle Thrust	1
8	3065	Key – Woodruff	1
9	37386	Shaft – Output, Keyed	1
10	37380	Seal – O-Ring	3
11	47062	Drive	1
12	37388	Plate – Spacer	1
13	47063	Gerotor – 1”	1
14	47064	Spacer	1
15	37400	Cap – End	1
16	37381	Washer – Seal	7
17	47065	Cap Screw	7
	37352	Seal Kit, Includes Items 2,4,5,12,15,17	

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



**CONTROL VALVE MOUNT ASSEMBLY**



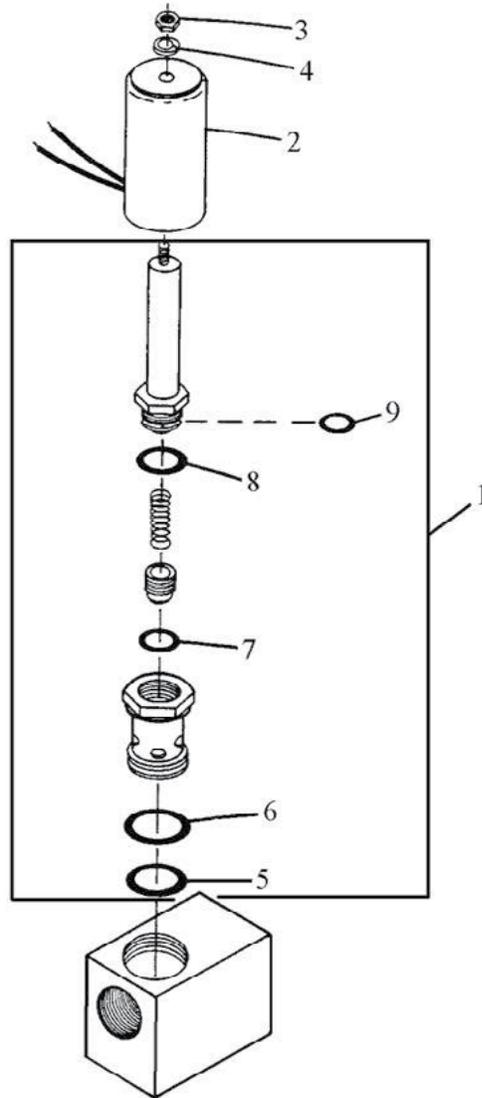
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	308645	Valve - Control	1
2	20013	Cap Screw - 1/4 x 3	2
3	34846	Adapter - Straight Non Standard	1
4	29789	Adapter - Straight 12-12	2
5	306377	Adapter - Straight 12-8	1
6	29753	Adapter - Straight 12-10 Special	6
7	36803	Mount - Valve Weldment	1
8	36800	Tube - Assy 12"	4
9	29817	Adapter - Straight 12-12	2
10	29786	Adapter - Elbow, 90°	2

PARTS LIST



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

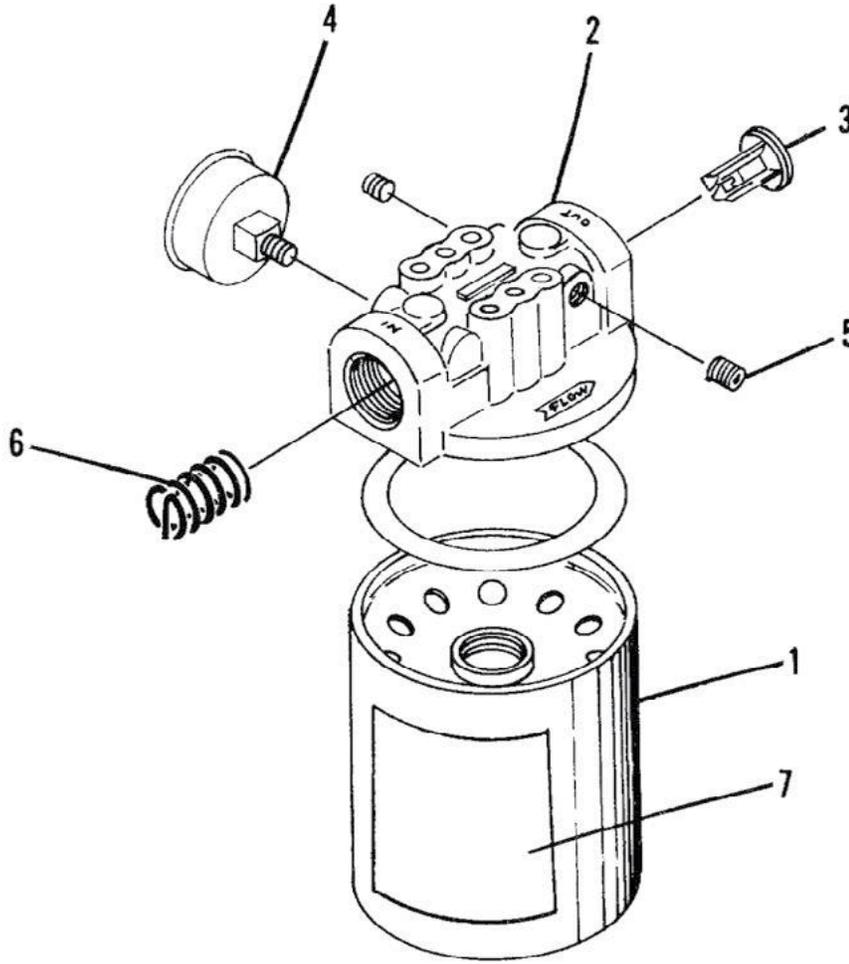
DUMP VALVE - SOLENOID



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
	33712	Dump Valve – Solenoid	
1	NSS	Cartridge Assy	1
2	1922	Coil	1
3	NSS	Nut – Hex	1
4	NSS	Washer – Lock	1
5	29892	O-Ring	1
6	29893	O-Ring	1
7	29891	O-Ring	1
8	30648	O-Ring	1
9	29891	O-Ring	1
	33714	O-Ring Kit, Includes Items 5-9	

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





<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
	39845	Filter – Hydraulic with Indicator	
1	43530	Filter – Element Kit	1
2	NSS	Head Casting	1
3	43533	Relief Valve Poppet	1
4	43534	Indicator	1
5	6029	Pipe – Plug	1
6	43492	Spring – Relief Valve	1
7	39379	Decal	1

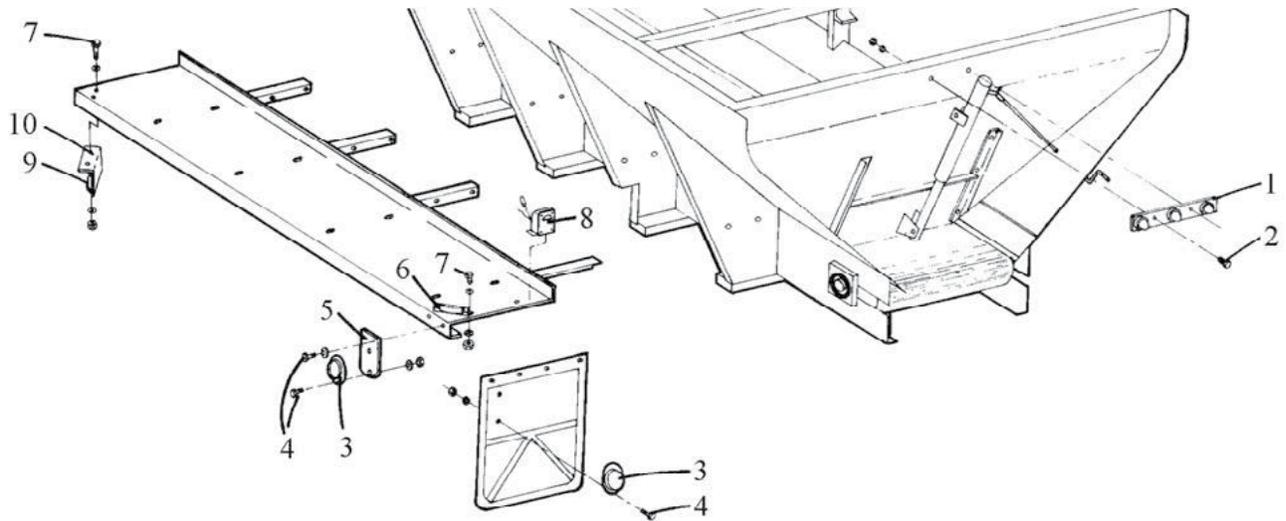
NSS - Not Serviced Separately

PARTS LIST



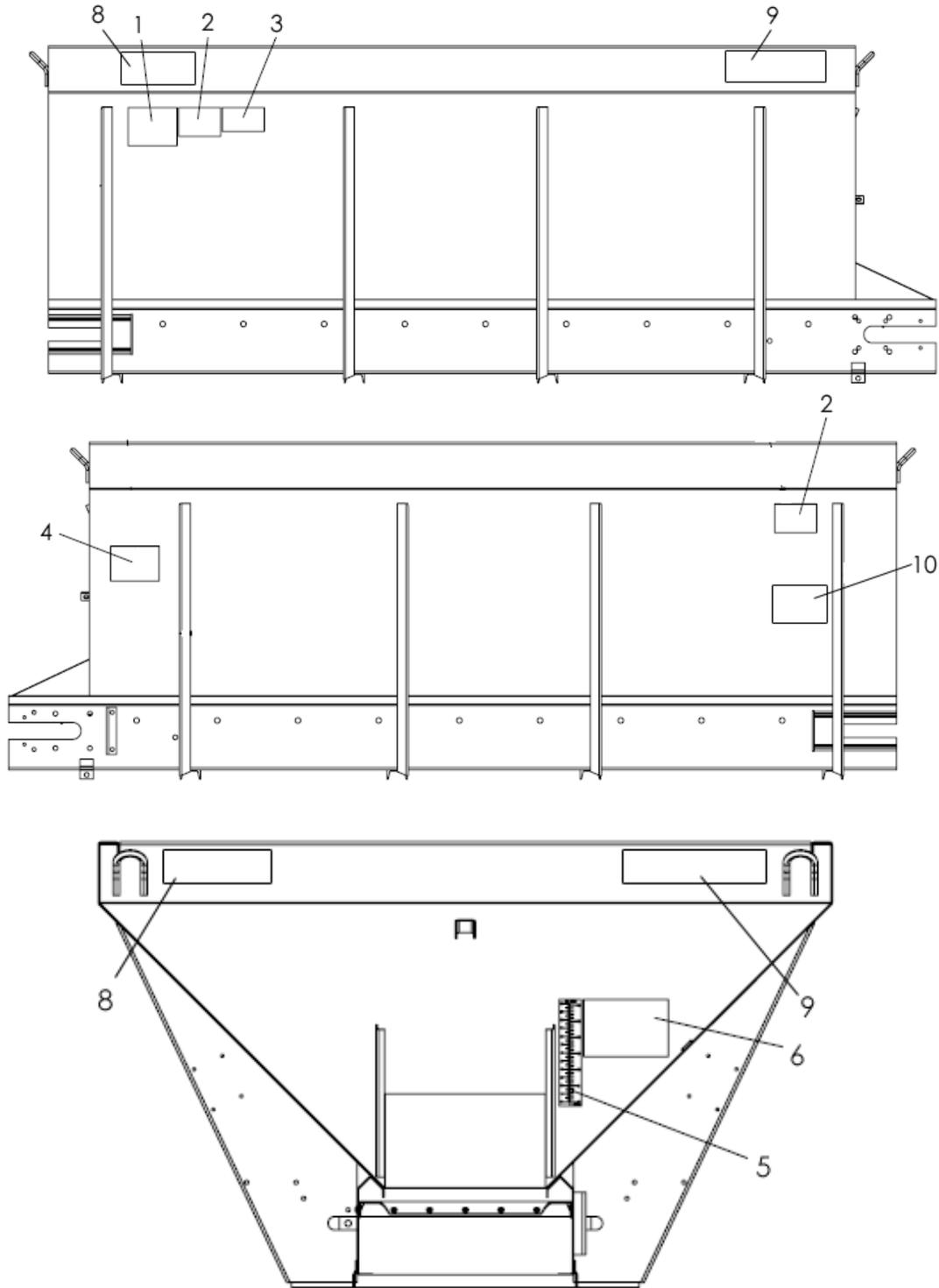
Please Give Part No., Description  
& Unit Serial No.

LIGHTS



ITEM	PART NO.	DESCRIPTION	QTY
1	6114	Lamp – Cluster, Red	1
2	20572	Screw – Machine, 3/16 x 3/4	12
	20709	Washer – Lock, 3/16	12
	20641	Nut – Hex, 3/16	12
3	6107	Reflector – Red	4
4	20003	Cap Screw – 1/4 x 3/4	AR
	20691	Washer – Flat, 1/4	AR
	20642	Nut – Hex, 1/4	AR
5	3824	Mount – Belt, Reflector	AR
6	6110	Light – Clearance, Red, Includes 4 of Item 2	2
	3775	Bracket – Clearance Light	2
7	20003	Cap Screw – 1/4 x 3/4	AR
	20691	Washer – Flat, 1/4	AR
	20710	Washer – Lock 1/4	AR
	20642	Nut – Hex, 1/4	AR
8	21629	Lamp – Turn Signal	2
	6549	Connector – Butt	4
	21581-120	Wire – Light, 14 Ga. Blue	1
	21607	Bracket – Mounting	2
9	6108	Light – Clearance, Amber, Includes 4 of Item 2	2
10	38611	Bracket – Mounting	2
	* 6198	Clip – Wire	21
	* 21986	Grommet – Rubber, 3/16	10

\* - Not Shown AR - As Required



## DECALS CONTINUED

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	150034	Decal - Caution Operation & Maint	1
2	364	Decal - Danger Moving Part	2
3	321	Decal - Caution Hazardous Material	1
4	39138	Decal - Warning High Pressure Fluid	1
5	23769	Decal - Ruler	1
6	368	Decal - Flying Material	1
7	*39200	Decal - Warning Slipping Hazard (Fenders)	2
8	39870	Decal - HiWay Large	3
9	72081-X1	Decal - Decor 3020	3
10	21476	Decal - Important Conveyor Chain Life	1
11	*368	Flying - Material (Spinner)	1
12	*55630	Decal - Warning Falling Hazard (Spinner)	1
13	*8664	Decal - Keep Valve Open (Hydraulic Tank)	1
14	*39378	Decal - Change Filter Element (Hydraulic Tank)	1
15	*8665	Decal - Hydraulic Oil Only (Hydraulic Tank)	1

\* - Not Shown See *Spinner* and *Fenders & Mudflaps* parts lists for more decals