



MODEL P

UNIT SERIAL NUMBER _____

MANUAL NUMBER: 303046-E

EFFECTIVE 11/2015



1330 76TH AVE SW
CEDAR RAPIDS, IA 52404-7052
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www.highwayequipment.com

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Insert Current Hi-Way Warranty



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 1-888-363-8006.

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 !!!

SAFETY



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

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



DANGER

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



WARNING

Indicates a potentially hazardous situation that, if not avoided, COULD result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.



CAUTION

Indicates a potentially hazardous situation that, if not avoided, MAY result in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTICE!

Is used for informational purposes in areas which may involve damage or deterioration to equipment but generally would not involve the potential for personal injury.

NOTE:

Provides additional information to simplify a procedure or clarify a process.

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

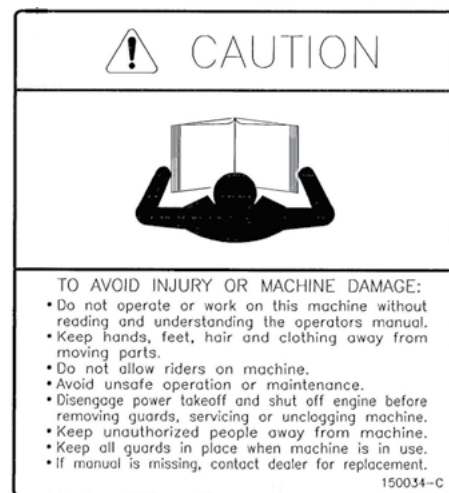
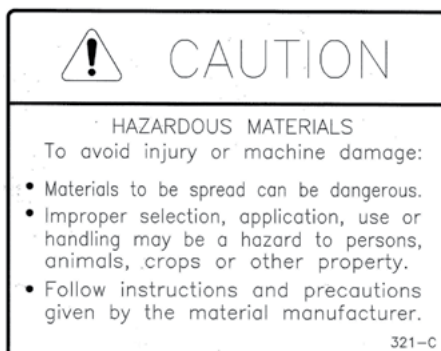
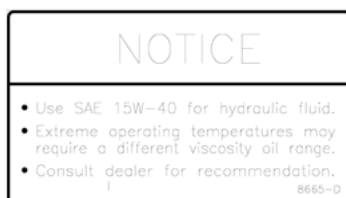
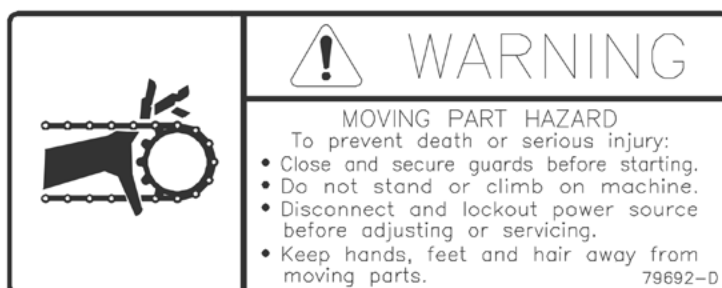
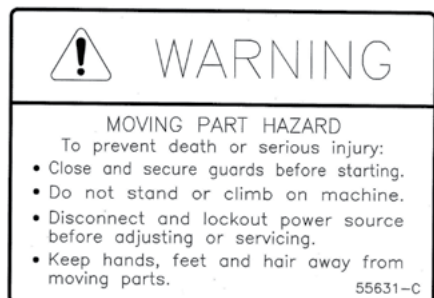
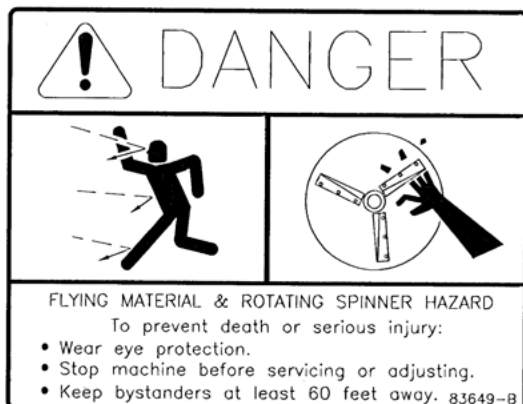
The following guidelines are intended to cover general usage and to assist you in avoiding accidents. There will be times when you will run into situations that are not covered in this section. At those times the best standard to use is common sense. If, at any time, you have a question concerning these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

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.



- 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!

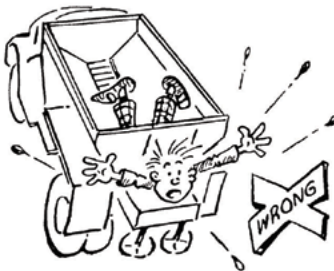


- When leaving the unit unattended for any reason, be sure to:
 - Take power take-off out of gear.
 - Shut off conveyor and spinner drives.
 - Shut off vehicle engine and unit engine (if so equipped).
 - Place transmission of the vehicle in "neutral" or "park".
 - Set parking brake firmly.
 - Lock ignition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

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

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

- 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.

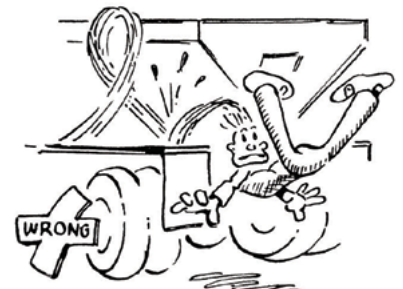


- Guards and covers are provided to help avoid injury. Stop all machinery before removing them. Replace guards and covers before starting spreader operation.

- 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.



- Before starting unit, be sure everyone is clear and out of the way.
- Do not climb on unit. Use the inspection ladder or a portable ladder to view the unit. Be careful in getting on and off the ladder, especially in wet, icy, snowy or muddy conditions. Clean mud, snow or ice from steps and footwear.



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



- Keep away from spinners while they are turning:

- Serious injury can occur if spinners touch you.

- Rocks, scrap metal or other material can be thrown off the spinner violently. Stay out of discharge area.

- Make sure discharge area is clear before spreading.



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

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



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



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



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



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

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

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

**CAUTION**

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

19. Cover all loads that can spill or blow away. Do



not spread dusty materials where dust may create pollution or a traffic visibility problem.



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

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

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



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

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



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

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



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



9. Keep a fully charged fire extinguisher readily available at all times. It should be a Type ABC or a Type BC unit.
10. Cleaning solvents should be used with care. Petroleum based solvents are flammable and present a fire hazard. Don't use gasoline. All solvents must be used with adequate ventilation, as their vapors should not be inhaled.

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



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

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



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

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.



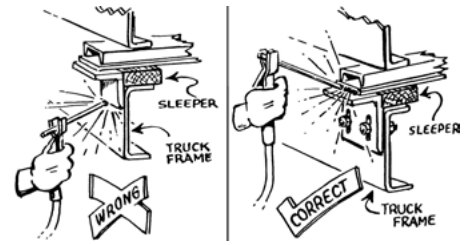
2. Follow mounting instructions in the Installation section of this manual. If mounting conditions require deviation from these instructions refer to factory.
3. When making the installation, be sure that the lighting meets Federal Motor Vehicle Safety Standard (FMVSS) No. 108, ASABE S279 and all applicable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

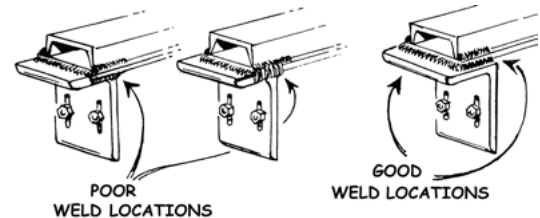
the cut, all necessary precautions should be taken to prevent fire. Cuts should not be made near fuel tanks and hydraulic oil reservoirs, fuel, brake, electric or hydraulic lines and such lines should be protected from flame, sparks or molten metal. Tires should be removed if there is any chance of their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



Refer to www.highwayequipment.com for installation instructions. Once on the website, click Customer Support, then Other HiWay Manuals and Instructions, then V-Body Spreader Installation Instructions.

The Model P is a hopper-type spreader and in many respects a smaller version of the Hi-Way Model E2020XT. It is intended for spreading abrasives for the control of snow or ice. The unit can be mounted into a pick-up truck.

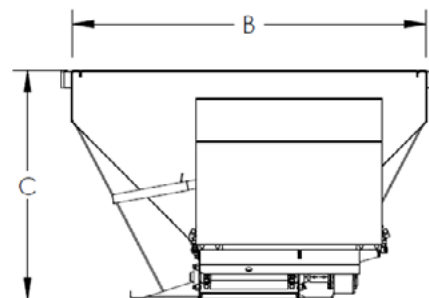
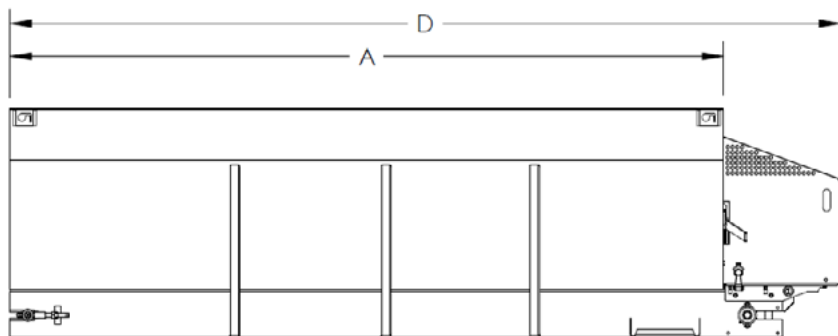
The spreader is powered by an engine or hydraulics:

- The engine options are a 10.5 HP Briggs & Stratton or 11 HP Honda four-cycle gasoline engine mounted at the rear. The engine drives a 20:1 worm gear case. The spinner is driven from the input shaft of the worm gear and the conveyor is driven from the output shaft. Variable speed control is obtained by the use of an electric throttle.
- The hydraulic options are single motor, dual motor or direct drive. The spinner is driven from the input shaft of a 20:1 worm gear case or directly driven by a hydraulic motor. The conveyor is driven from the output shaft of the worm gear or a hydraulic motor. Spinner and conveyor speed are adjusted by means of control valves.

The conveyor runs the full length of the hopper bottom to deliver material through an adjustable feedgate to the spinner.

The spinner hopper has two internal baffles and three external baffles for adjusting the spread to the desired pattern.

This product is intended for commercial use only.



A	B	C	D		
UNIT LENGTH Feet (cm)	INSIDE BODY WIDTH Inches (cm)	HEIGHT Inches (cm)	OVERALL LENGTH Inches (cm)	WEIGHT (EMPTY) Pounds (kg)	CAPACITY - HEAPED cu. yd. (cu. m.)
7 (213.5)	54 (137)	31.8 (80.8)	103.6 (262.8)	585 (265)	1.9 (1.45)
8 (244.0)	54 (137)	31.8 (80.8)	115.6 (293.2)	640 (290)	2.1 (1.60)
9 (274.5)	54 (137)	31.8 (80.8)	127.6 (323.6)	695 (315)	2.3 (1.75)
10 (305.0)	54 (137)	31.8 (80.8)	139.6 (354.1)	750 (340)	2.5 (1.90)

Check over entire unit to be sure all fasteners are in place and properly tightened per *Torque Chart* in this manual.

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

1. Check to be sure that no loose parts or other material is in the hopper body, spinner hopper or on the spinner disc.
2. Raise the feedgate until it is completely clear of the conveyor.

If unit is equipped with auxiliary engine read "Auxiliary Engine Driven Units" instructions below. If unit is hydraulic driven, skip to "Hydraulic Driven Units" instructions on next page.

AUXILIARY ENGINE DRIVEN UNITS

3. Check the oil level in the auxiliary engine crankcase. Add oil if necessary. See *Lubricant Specifications* later in this manual or the engine manufacturer's manual.
4. Be sure all bearings, shafts and gear case are properly lubricated.
5. Check for proper alignment between conveyor and spinner sprockets and between engine and conveyor sprockets. Then make sure sprocket set screws are properly tightened.

Check to see if chain tension is correct. Use a straight edge to check. Chain movement at center of one side of the chain should be $5/16"$ (8mm). (Figure 1) Chain tension is adjusted by loosening the engine mounting bolts and moving the engine on its base. Tighten the mounting screws to maintain adjustment.

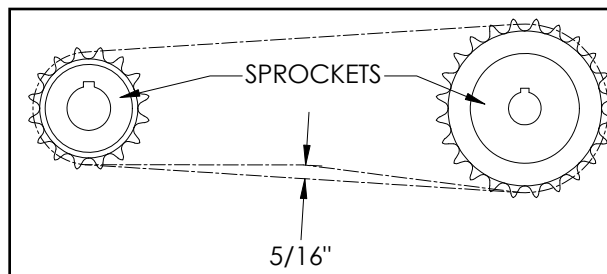


Figure 1 - Adjusting Chain Tension

A loose drive chain will cause shock loads, resulting in damage or failure of related components. Over-tightening of drive chain causes excessive wear and heat, greatly reducing chain and sprocket life and may cause damage to other components of the drive system.



WARNING Stay clear of moving machinery.



DANGER

Stay clear of the spinner when it is operating. Contact with a moving spinner can cause serious injury.



WARNING

Shut down engine before servicing unit. When making adjustments to the engine that requires it to be running, remove the drive chain before performing the service.

6. Start auxiliary engine and allow it to warm up at idle speed. Actuate electric clutch switch if so equipped.
7. Bring auxiliary engine up to speed. Conveyor and spinner should operate smoothly at normal operating speeds.

HYDRAULIC DRIVEN UNITS

3. Fill the hydraulic reservoir with oil. Refer to Lubricant Specifications section later in this manual for the proper oil. Open gate valve fully (rotate counterclockwise to open).
4. Be sure all bearings, shafts and gear case are properly lubricated. Make sure gear case shipping pull plug is removed from vent plug.
5. Check for proper alignment between spinner sprockets. Then check to be sure sprocket set screws are tightened sufficiently.
6. Start engine. Engage PTO or actuate electric clutch switch (if applicable). Let engine run at about 1000 RPM for a few minutes, allowing oil to circulate through the pump and back to the reservoir. In cold weather allow greater warm-up time.

**DANGER**

Stay clear of spinner when it is operating. Contact with a moving spinner can cause severe injury.

7. Move hydraulic control valve to position 3. Conveyor and spinner should run at low speed. Allow to run until they operate smoothly to indicate air has been purged from the system.

**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!

8. Bring engine speed up (about 3000 RPM) and move hydraulic control valve to position 5. Run a few minutes to be sure unit runs smoothly. Shut down the system. When all parts have come to rest, check all hydraulic system connections for leaks.
9. Check hydraulic oil level. Add oil as necessary. When you remove the fill cap, oil should be visible in the bottom of the strainer basket. Unit is now ready for road testing.



CAUTION Be sure all fasteners are tight to avoid spreader coming loose.



CAUTION Be careful where you spread materials. Avoid operating near or around personnel.

Before using the Model P, make a walk-around inspection to assure the spreader is not damaged, that all essential parts are in place, and that all fasteners are tight and all guards are in place. Check all controls to be sure they are operating satisfactorily.

CHAIN TENSION

Check both the drive chain to the spinner and the main drive chain for proper tension. See Step #5 "Auxiliary Engine Driven Units" under *Initial Start-Up* to adjust chain tension and "Drive Chains" under *Lubrication and Maintenance* for lubrication instructions. Adjust and lubricate both drive chains accordingly.

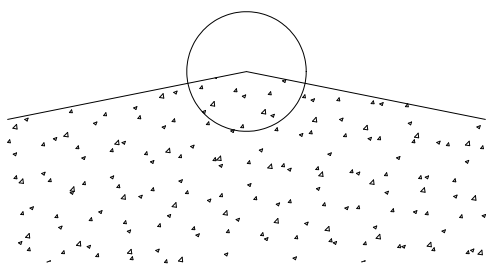
SPREAD PATTERN ADJUSTMENT

Fill the body with material and start the engine. Before spreading some preliminary adjustments are necessary to give an even spread pattern.

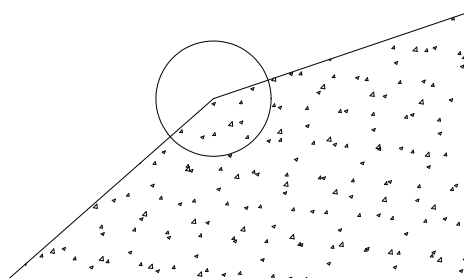
The spread pattern is adjusted by using the internal and external baffles. The adjustment of these baffles depends on the pattern desired.

First, decide what type of pattern you desire. Do you want the pattern to be to the right, to the left, or centered? Do you want a full pattern or a confined one? Do you have to protect people and property from the direct throw of material?

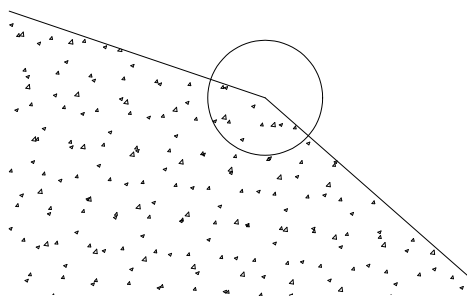
Should you wish a centered pattern for intersections and still protect people and property, you need to use all baffles on the hopper.

**Internal Baffle Effect**

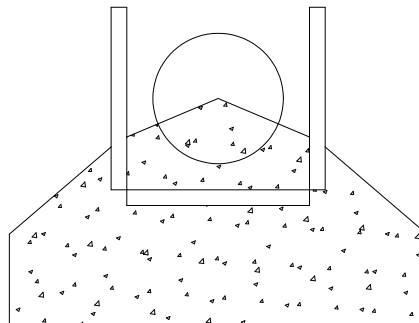
Both internal baffles up. Pattern width depends on engine RPM. External baffles full up.

**Internal Baffle Effect**

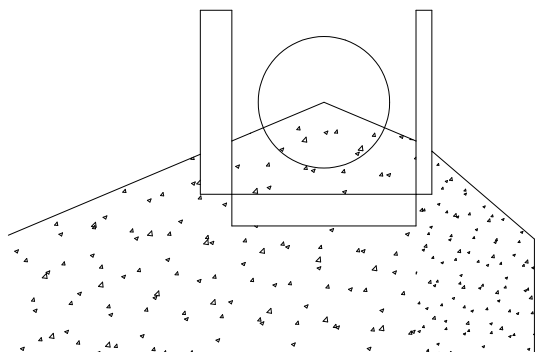
Right baffle full up, left down. Pattern width depends on engine RPM. External baffles full up.

**Internal Baffle Effect**

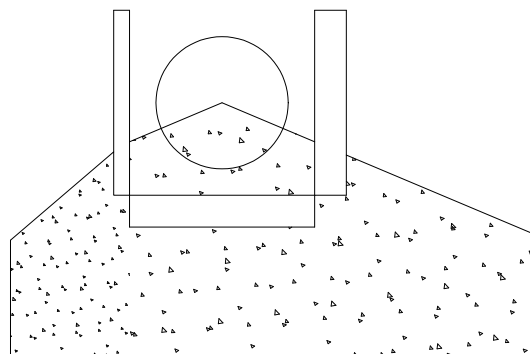
Left baffle full up, right down. Pattern width depends on engine RPM. External baffles full up.

**External Baffle Effect**

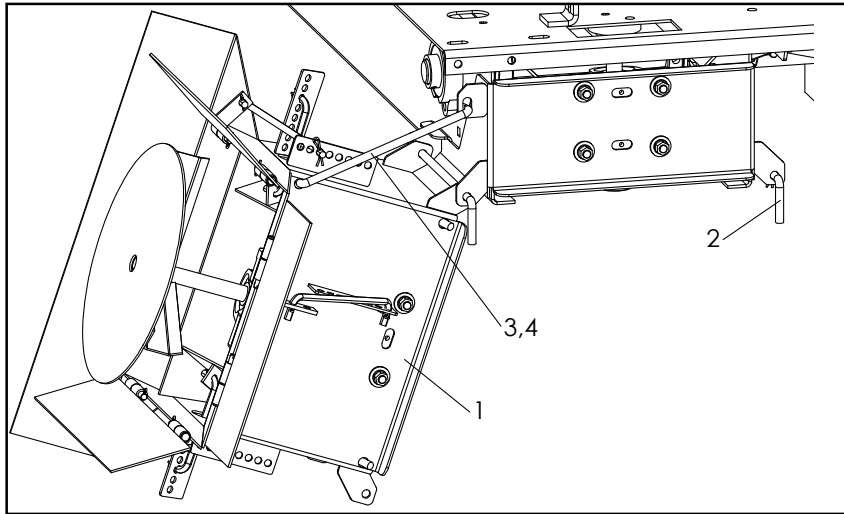
All baffles properly adjusted for a confined spread pattern.

**External Baffle Effect**

Right-hand baffle deflects material down. Heavy on RH side. Adjust internal baffles to minimize streaking.

**External Baffle Effect**

Left-hand baffle deflects material down. Heavy on LH side. Note area of double coverage. Rear baffle is necessary to control double coverage area.

FLIP-UP SPINNER

<u>Item</u>	<u>Description</u>
1	Spinner
2	Rod – Spinner Mount
3	Rod – Hanger Flip-up
4	Hair Pin

Purpose:

- Empty the unit without dumping product through the hopper.
- Provide easier storage.

Figure 2 – Flip-Up Spinner**Operation****CAUTION**

Make sure the area is clear before removing the spinner mount rod. The spinner will swing when the rod is removed. If the spinner strikes something it may cause damage or injury.

Remove hair pin and Spinner Mount Rod (2) from right-hand side. Swing Spinner (1) over and secure with Flip-Up Hanger Rod (3) and Hair Pin (4) as shown in Figure 2.

Reposition spinner for spreading by removing Hair Pin and Flip-Up Hanger Rod. Make sure lower shaft aligns with upper shaft. Rotate lower shaft as necessary. Raise Spinner into spreading position, insert Spinner Mount Rod and secure with Hair Pin.

**CAUTION**

Do not transport spinner in flip-up position. Make sure spinner is secured in spreading position before transport. If spinner is not secured during transport it could bounce, or may even break loose, causing damage.

**WARNING**

Do not disengage spinner while it is running. Do not attempt to run spinner while it is in the flipped-up position. Allow spinner to come to rest before disengaging spinner, otherwise injury could occur.

AUXILIARY ENGINE DRIVEN UNITS**Engine Preparation****CAUTION**

Never fill the tank with the engine running. Avoid spilling gasoline on a hot engine. This could cause an explosion and serious injury. Do not smoke while handling gasoline.

Release the two clamps holding the engine hood and swing the hood back and down. Check the crankcase. See *Lubrication and Maintenance Chart*. Refer to engine manufacturer's manual for the proper amount and grade of oil. Fill crankcase as required.

Fill the fuel tank according to engine manual. Make sure the fuel shut-off valve is open if so equipped.

Starting Starter-Alternator-Type Engines

NOTICE! Do not run engine in choke.

1. Place engine switch in "On" position.
2. Press top of throttle switch for choke. Note: Light will illuminate when unit is in choke.
3. Press engine "Start" until engine runs.
4. Press bottom of throttle switch to take engine out of choke. Note: Light turns off when unit is out of choke.

The optional electric clutch procedure is as follows.

1. Drive to the area to be spread.
2. Open feedgate to provide desired amount of material. This unit will deliver one cubic foot per minute at 3600 engine RPM with the feedgate open only 1/2 inch (13mm). It will deliver 6.3 cubic feet per minute with a 4-1/4 inch (108mm) gate opening at the same engine speed. The amount of material will be decided by the engine RPM and the gate opening together.
3. Set throttle to a fast idle, engage clutch, and bring engine RPM up to spreading speed. The clutch draws current only when engaged.
4. This clutch may be engaged or disengaged at any time. However, it is suggested that the clutch NOT be engaged with the engine operating at high speed. This prevents excessive shock loads from being transmitted to the entire system.
5. Adjust engine throttle to desired speed and drive ahead.
6. When the pass is completed, disengage electric clutch and return engine to an idle.

Carburetor Adjustments

Carburetors are adjusted at the factory and normally do not need adjustment unless they have been disassembled. If adjustment is necessary, refer to engine manufacturer's manual.

Control Panel

- Engine switch - Starts and stops engine.
- Throttle switch - Controls engine speed.
Push top of switch to choke—light illuminates when engine in choke.
Back off from choke to run RPM.
- Spreader switch - Controls conveyor and spinner function—light illuminates when spreading.
Run - Push for continuous spreading.
Off - Turns both conveyor and spinner off.
Spot - Spreads only while being pushed, for “spot” spreading.

NOTICE! Do not run engine in choke.

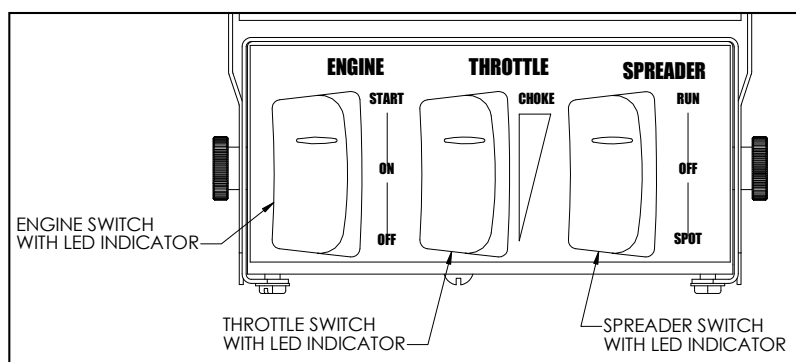


Figure 3 – Control Panel

HYDRAULIC DRIVEN UNITS**System Operating Parameters**

Operating pressure: 900 - 1200 PSI (62-83 bar)
 Relief at: 1500 PSI (103.5 bar)
 Flow, Single: 8.25 GPM (31 LPM)
 Flow, Dual: 12 GPM (45.5 LPM)

Read the following before operating the spreader. Fill the hydraulic oil tank with hydraulic oil.

NOTICE! Make sure shut-off valve at bottom of tank is fully opened by turning handle counter-clockwise until it stops.

Check for proper rotation of conveyor and spinner shaft. The conveyor should move towards the rear. The spinner should rotate clockwise when viewed from the top. If unit runs backwards, the hydraulic system is assembled incorrectly. Shut unit down and determine why. Correct the problem before further operation. Refill the tank after unit has been running long enough to circulate oil through all lines.

**WARNING**

Shut off all power and allow all moving parts to come to rest before performing any maintenance operation. Otherwise, you could be injured.

DRIVE CHAINS**CAUTION**

Make sure truck engine is shut down when working on drive chain. If drive chain moves, you could be injured.

Twice a year remove drive chains. Soak chain in a solvent to remove all old or contaminated oil. Check chain for any frozen links. Soak chain in SAE 10 oil. Soak chain until, when flexed, no bubbles appear on chain. Reinstall chains. Chain should be tensioned enough to prevent whipping at operating speed. Over-tensioning of chain will create excessive heat that will freeze chain or cause damage to other parts of drive system.

ENGINE

Refer to engine maintenance instructions furnished by engine manufacturer.

Carburetor Adjustments

Carburetors do not normally require adjustment unless they have been disassembled. Refer to engine manufacturer's manual if adjustment is necessary.

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 for selection of the proper hydraulic fluid for use in the hydraulic system.

Service Schedule

1. Check the hydraulic oil level daily. Add oil if required. When you remove the fill cap, oil should be visible in the bottom of the strainer basket. Periodically inspect the hoses and fittings for leaks.

NOTICE!

2. Change the hydraulic oil filter after the first week (or not more than 50 hours) of operation on a new unit.

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

HYDRAULIC HOSE

Hose assemblies in operation should be inspected frequently for leakage, kinking, abrasion, corrosion or any other signs of wear or damage. Worn or damaged hose assemblies should be replaced immediately.

**WARNING**

Testing should be conducted in approved test stands with adequate guards to protect the operator.

GEAR CASE

Drain oil in a new unit after first two weeks (or not more than 100 hours) of operation, and flush gear case thoroughly with light oil. Refer to Lubricant and Hydraulic Oil Specifications section for proper grade oil. Refill gear case up to level plug or 3/4 pint of recommended lubricant. (See "Checking Installation" in Installation Instructions.) After initial change, oil should be changed every 2,000 hours of operation or annually, whichever occurs first.

Check gear case oil level monthly.

BEARINGS

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

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

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

FASTENERS

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

CLEAN UP**NOTICE!**

High pressure wash can inject water and/or material into control components, causing damage. Use caution when cleaning these areas.

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

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

CONVEYOR CHAIN

Hose down unit and remove any material build-up on sprockets and under chain.

NOTICE!

The conveyor will move away from the bottom panel if material accumulates under the conveyor or on the sprockets. If the conveyor should catch on the unit, it could permanently damage the conveyor or the unit. Do not remove material while conveyor or spinner is running!

Lubricate conveyor chain at least once a week. Shut down spinner and run conveyor slowly to lubricate chain. Use a mixture of 75% diesel fuel and 25% SAE 10 oil in a pressurized hand spray gun. Spray oil mixture between links of chain through openings provided at rear end of sill or from front outside body when clearance is adequate. Do this at least once a week and after each unit washing. Allow to dry before lubricating.

**WARNING**

Stay out of body when conveyor is running. 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 bar, rod or hammer on conveyor while it is moving—if it gets caught it could cause injury!

Proper chain tension is also a factor in chain and sprocket life (Figure 4). Measure from rear of unit forward to achieve proper chain tension. Make sure chain is tensioned equally on both sides. This adjustment is made on each side of the unit at the idler bearings.

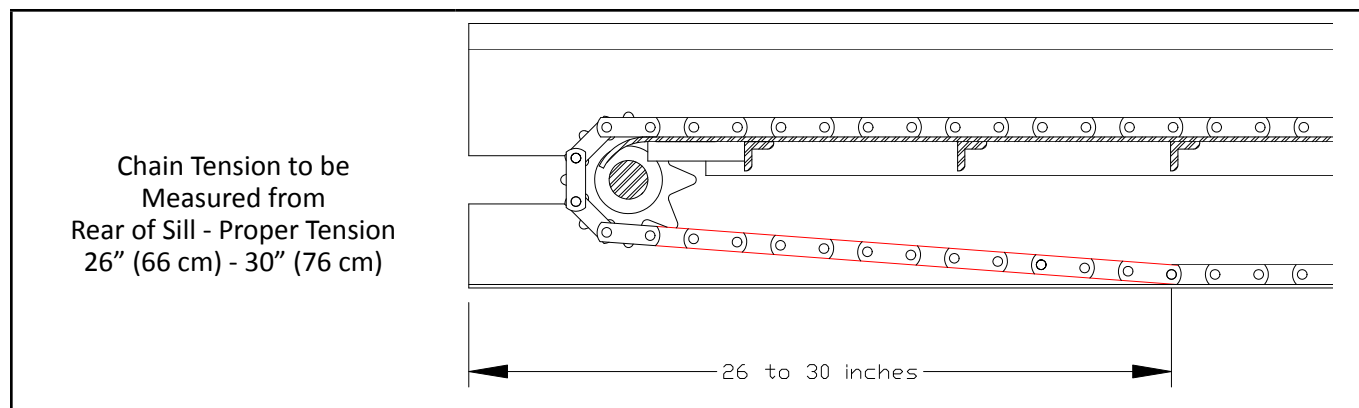


Figure 4 - Adjusting Conveyor Chain Tension

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

REPLACEMENT OF CONVEYOR

Check drive and idler sprockets for wear and replace if necessary.

Removal

Remove spreader from vehicle. Take spinner assembly off unit. Rotate conveyor so that “master link pins”, attached with cotter pins, can be accessed at rear of spreader. Loosen idler screws on both sides. Remove cotter pins and “master link pins” at rear of unit. Take chain off rear sprockets and pull chain from front of unit.

Installation

Remove “master link pins” from the new chain. Lay the new chain at the front of the unit with the chain bars up/ HI-WAY down and the barrel end (Figure 5) of the master link facing the unit. (Installation is easier if you can place the chain on something that is level with the bottom.) Insert the chain between the bottom panel and the cross angles with the barrel end first. Slide the remaining half on top of the bottom panel with the open end of the master link first. Push the chain along the bottom panel until the master link reaches the rear of the unit so the ends meet at rear of unit. Make sure the chain is positioned on all the sprockets. Install the “master link pins” previously removed—you may have to rotate the sprockets by hand to align the link’s pin holes.

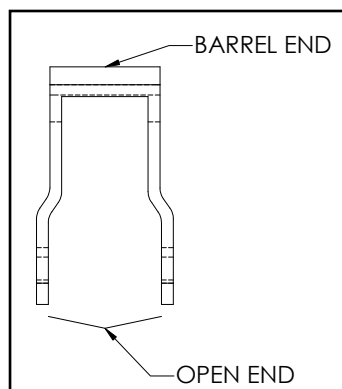


Figure 5 – Chain Link

Tension the chain by tightening the idler screws. Reinstall spinner assembly according to “Spinner Assembly Installation” for *V Box Deicing Spreader Installation Instructions* at www.highwayequipment.com and install the spreader according to “Mounting” section, both in the Installation Instructions. Be sure to lubricate the idler bearings and chain before operation.

Make sure the drive sprocket drives against the barrel end of the links—Not against the connecting pins.

Open ends of chain links face front of unit on top of bottom panel. Likewise, open ends face rear of unit underneath unit.

NOTICE!

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

ENGINE

Refer to engine manufacturer's manual for oil recommendations.

HYDRAULIC SYSTEM

The following are 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 / SAE VISCOSITY GRADE	OPERATING TEMPERATURE	VISCOSITY
150 SSU	122° F / 84° F (50° C / 29° C)	100 SSU / 200 SSU
225 SSU	140° F / 107° F (60° C / 42° C)	100 SSU / 200 SSU
300 SSU	150° F / 116° F (66° C / 47° C)	100 SSU / 200 SSU
450 SSU	165° F / 130° F (74° C / 54.5° C)	100 SSU / 200 SSU
600 SSU	182° F / 145° F (83° C / 63° C)	100 SSU / 200 SSU
10W-30	130° F / 100° F (54.5° C / 38° C)	100 SSU / 200 SSU
10W-40	190° F / 140° F (88° C / 60° C)	100 SSU / 200 SSU

If necessary, automotive oil can be used. Use multi-viscosity oils of SC rating, providing between 100 and 200 SSU at operating temperature. These will provide proper viscosity over a wide range.

Consult your Hi-Way dealer for systems operating outside normal conditions.

GEAR CASE LUBRICANT

Gear cases are factory equipped with synthetic oil for best performance at high loads. Lubricate the gear case with multi-purpose gear lubricating oil conforming to MIL-L2105B according to the chart below:

Part	Refill Quantity	40° to 120° F (4.5° to 49° C)	Below 40° F (4.5° C)
Gear Case	.75 pints (.35 liters)	SAE 85W 140	SAE 88W 90

GREASE GUN LUBRICANT

Use a waterproof ball and roller bearing lithium base lubricant with a minimum melting point of 300° F (149° C). This lubricant should have a viscosity which assures easy handling in the pressure gun at prevailing atmospheric temperatures. The grease should conform to NLGI No. 2 consistency.

LUBRICATION CHART**WARNING**

Shut off all power and allow all moving parts to come to rest before performing any maintenance operation.

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

<u>LOCATION</u>	<u>PLACES</u>	<u>METHOD</u>	<u>FREQUENCY</u>
Hydraulic Pump Drive			
Transmission PTO - Slip Joint	1	Grease	Weekly
Transmission PTO - U-Joint	2	Grease Gun	Monthly
Hydraulic System			
Reservoir	1	Check Daily; Change Annually	
Filter	1	Check Daily; Change when indicator is red	
Drive Chains			
Main Drive Chain - Engine to Gear Case	1	Spray Oil	Daily
Spinner Drive Chain - Gear Case to Spinner	1	Spray Oil	Daily
Conveyor			
Dragshaft Bearings	2	Grease Gun	Weekly
Idler Adjuster	2	Hand Grease	Weekly
Chain	2 Strands	Spray Oil	Weekly
Input Shaft Bearing - Gear Case	1	Grease Gun	Weekly
Gear Case	1	Fill Through Vent Plug	Check monthly; Change annually.
Spinner			
Shaft 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.

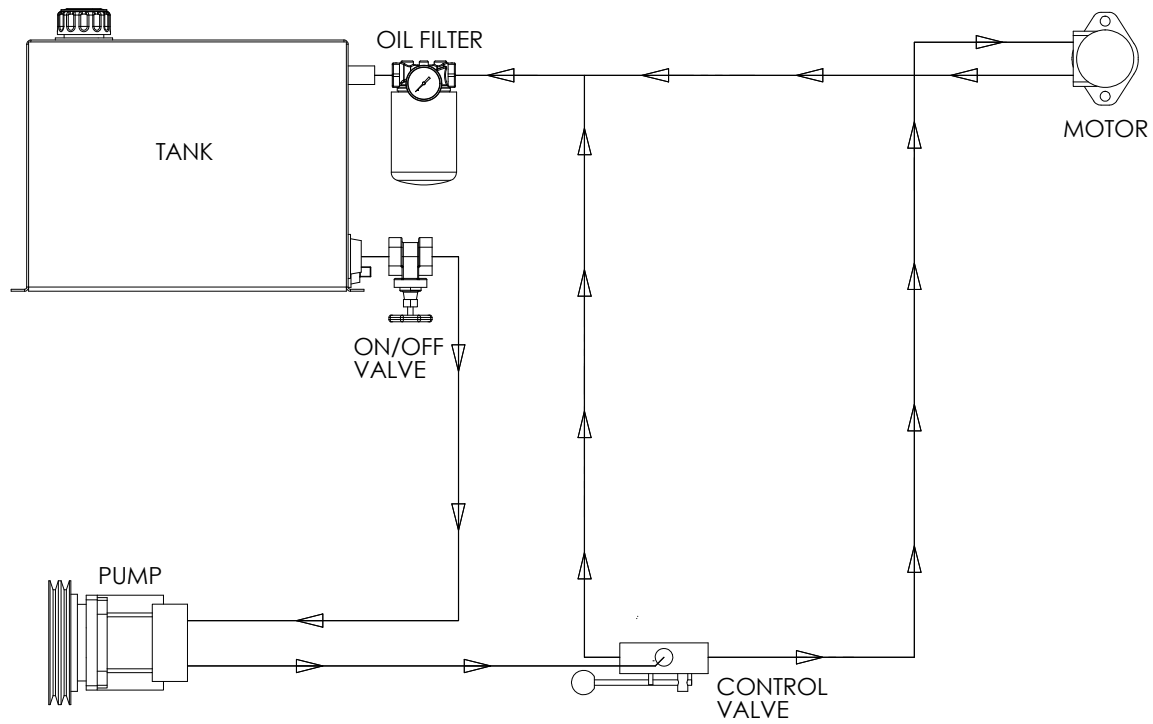
* See *Lubricant and Hydraulic Oil Specifications* for types of lubricants and oil to be used.

ENGINE DRIVEN UNITS

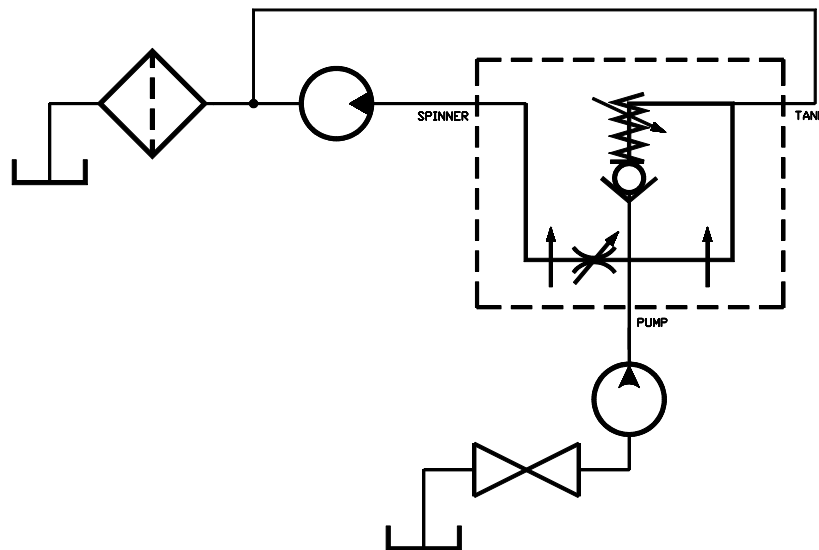
Refer to engine manufacturer's manual for troubleshooting procedures.

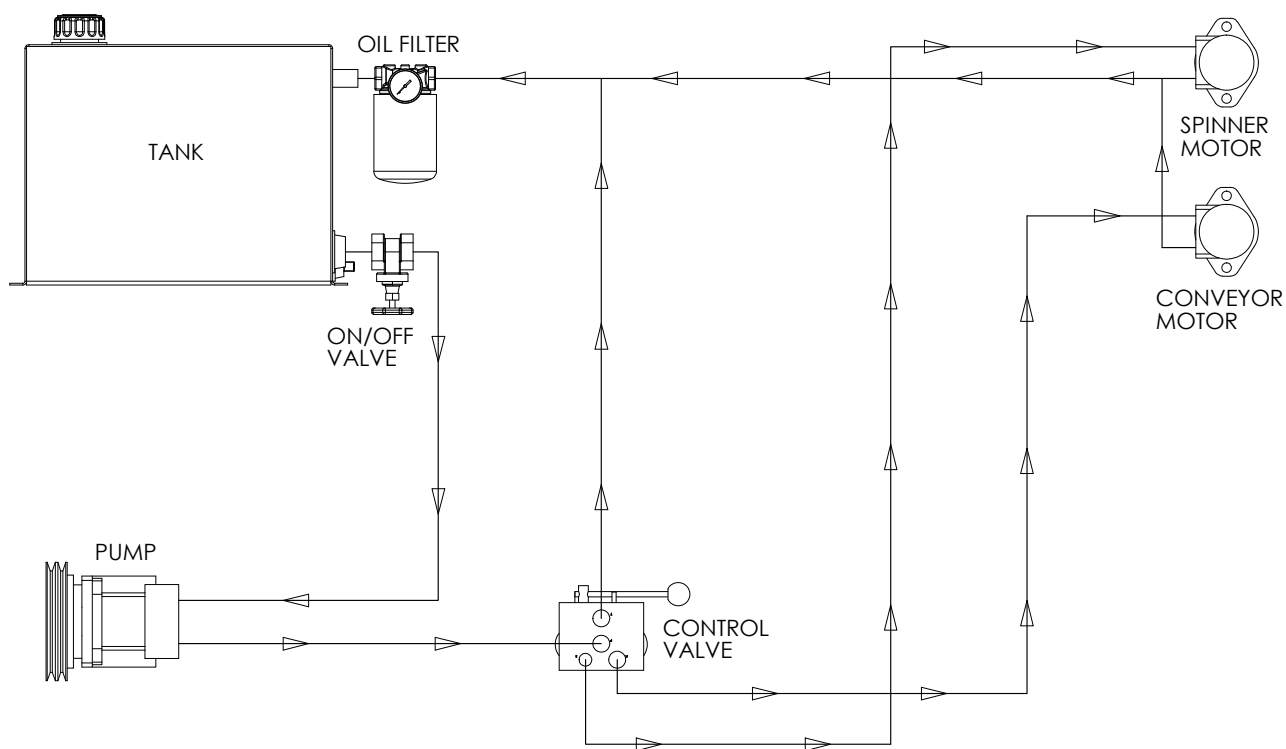
HYDRAULIC DRIVEN UNITS

SYMPTOM	REMEDY
1. Unit speed does not increase with the dial setting.	a. Increase truck engine speed. b. Check condition of pump. c. Check for adequate PTO percent.
2. Unit stalls under load.	Check circuit pressure. 900 - 1200 PSI (62 - 83 bar) maximum with relief valve dumping at 1500 PSI (103.5 bar).
3. Unit speed fluctuates momentarily when main control is first turned on.	a. Cold oil. Wait until oil has warmed up. b. Change to lighter weight oil.
4. Pump blows seals at start-up.	Pump installed backwards, replace seals and reverse pump in drive line. (Note arrow on pump.)

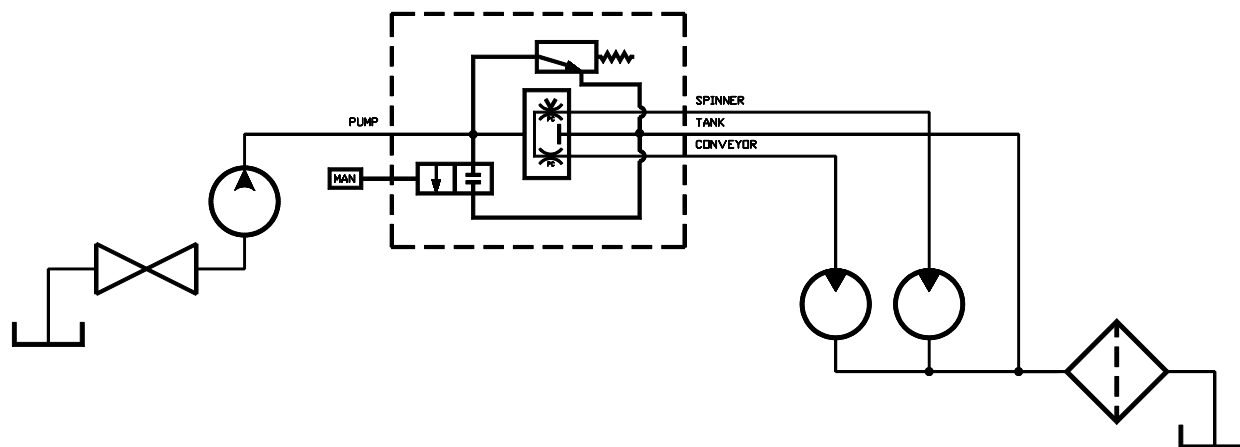
SINGLE HYDRAULICS FLOW DIAGRAM**SINGLE HYDRAULICS SCHEMATIC**

Operating pressure: 900 - 1200 PSI (62 - 82.74 bar)
 Relief at: 1500 PSI (103.42 bar)
 Flow, Single: 8.25 GPM (31.23 LPM)

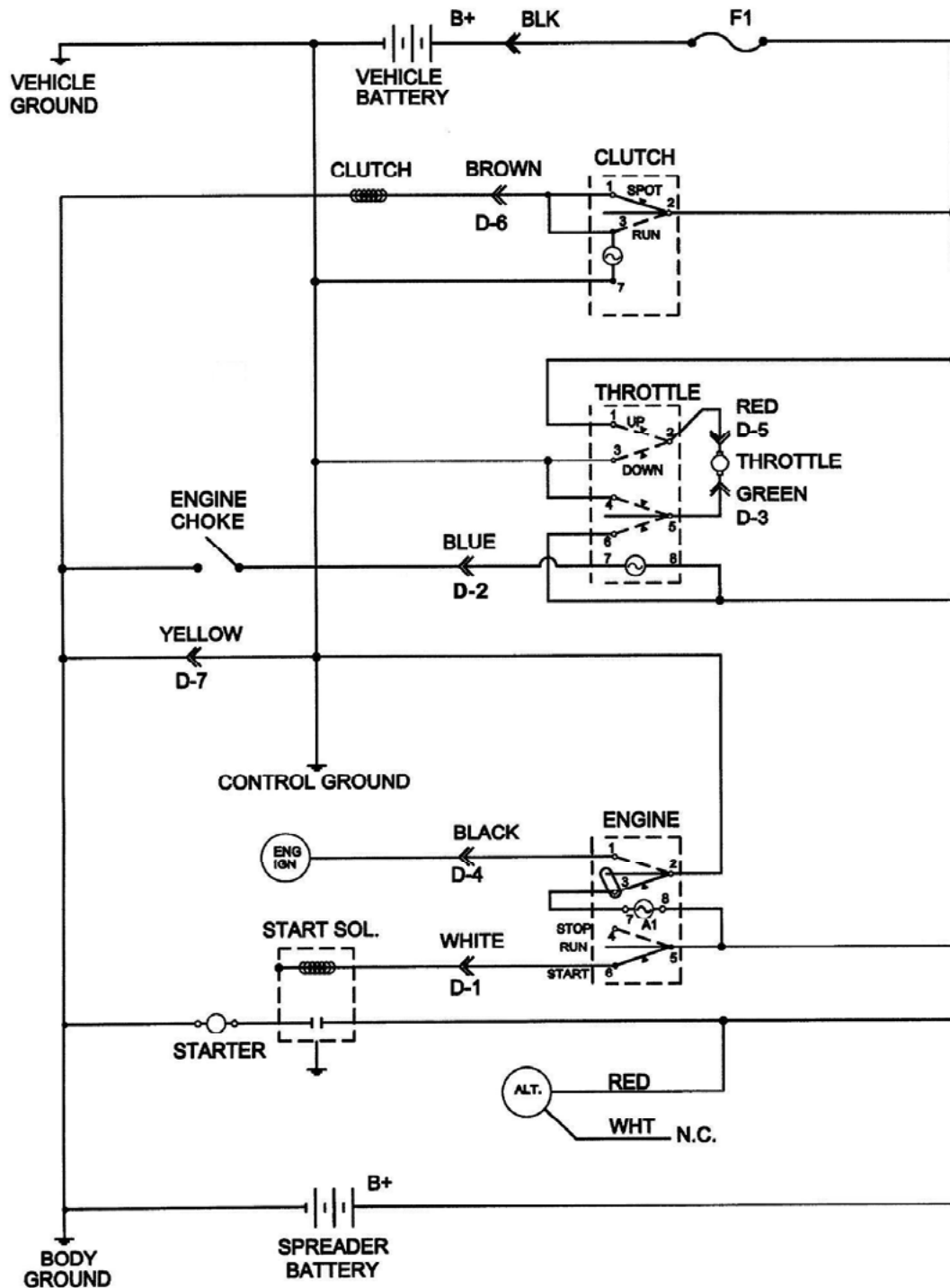


DUAL HYDRAULICS FLOW DIAGRAM

Operating pressure: 900 - 1200 PSI (62 - 82.74 bar)
 Relief at: 1500 PSI (103.42 bar)
 Flow, Dual: 12 GPM (42.42 LPM)

DUAL HYDRAULICS SCHEMATIC

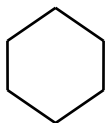
WIRING SCHEMATIC



Attach black wire of two-conductor cable to a switched circuit and white wire to a ground.
NOTE: Disconnect vehicle battery prior to making any electrical connections.

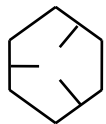
CAP SCREW GRADE IDENTIFICATION - MARKINGS ON HEAD

SAE GRADE 2



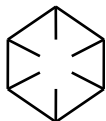
NO MARKINGS

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



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.

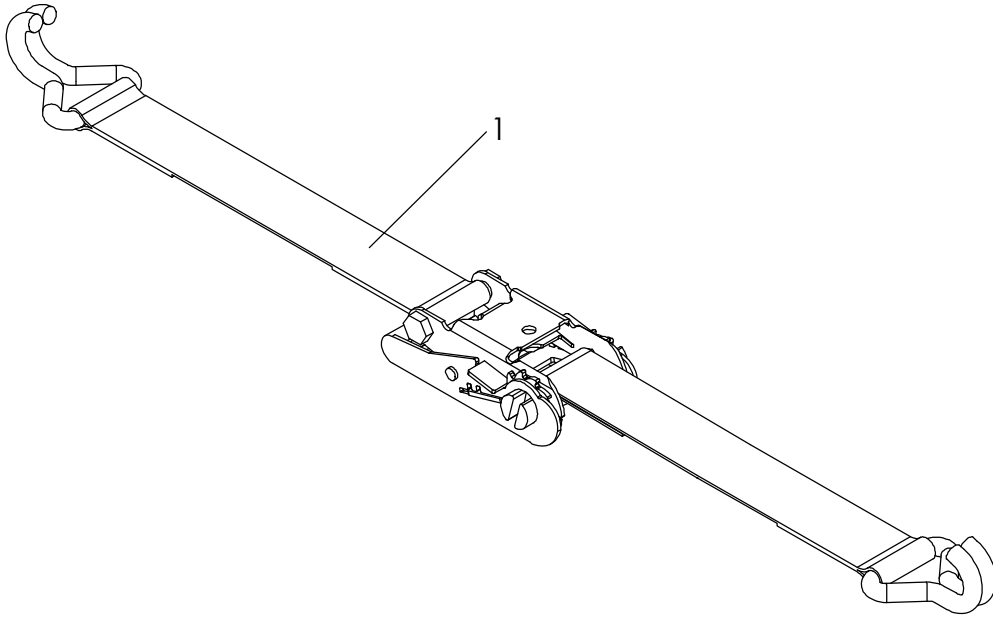
No responsibility is assumed for delay or damage to merchandise while in transit. Our responsibility ceases upon delivery of shipment to the transportation company from whom a receipt is received showing that shipment was in good condition when delivered to them, therefore, claims (if any) should be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

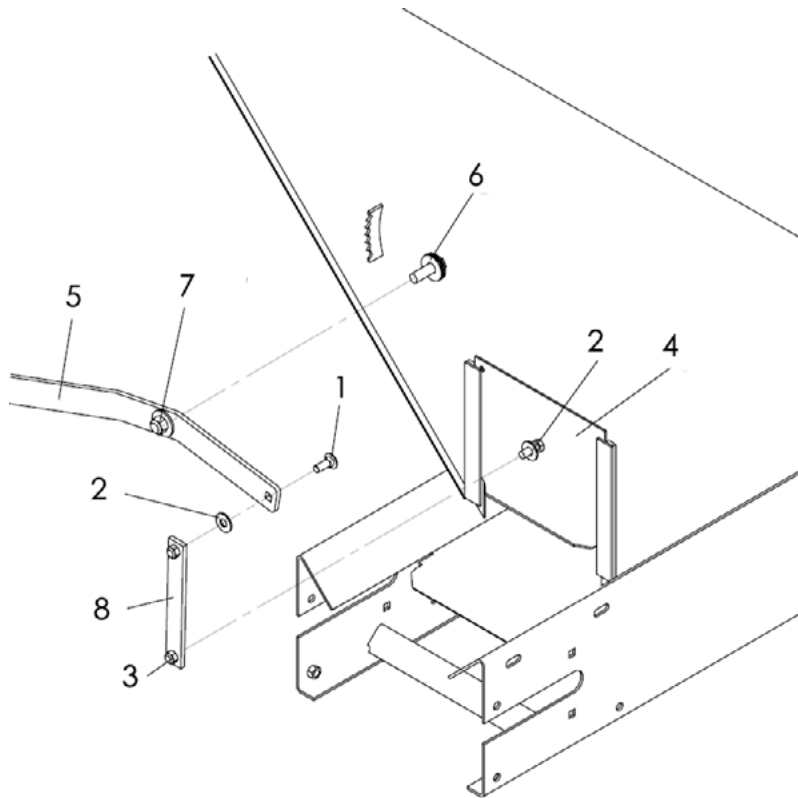
In the parts list the following symbols and abbreviations stand for:

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

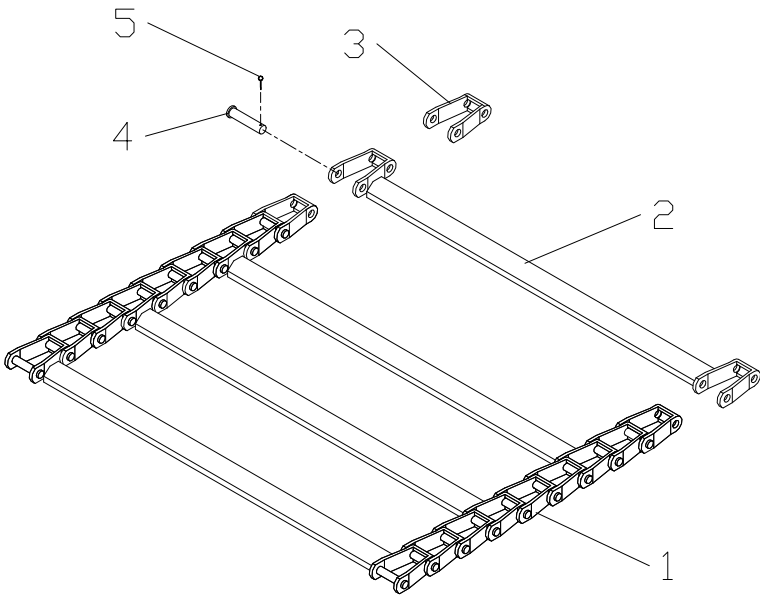
The parts listed under the different steel types (CS, and 304 SS) are for that type of unit and do not necessarily mean the part is made of that type of steel.



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	99417	Strap – Ratchet	4
2	* 301340	Mounting – Kit Canada Only, Includes Items A-C	
A	84996	Hardware – Kit Canada Only, Includes:	1
	90564	Link – Clevis Double 5/16	8
	34078	Bolt – Eye 3/8 x 1-1/4	4
	20644	Nut – Hex 3/8	4
B	34080	Load Binder	4
C	6167-42	Chain – 1/4 x 42	4
	*301341	Mounting - Kit, Includes Items A-C	
A	84989	Hardware - Kit, Includes:	1
	31562	Link - Clevis Double 5/16	8
	20644	Bolt - Eye 3/8 x 1-1/4	4
	34028	Nut - Hex 3/8	4
B	34080	Loan Binder	4
C	6167-42	Chain - 1/4 x 42	4

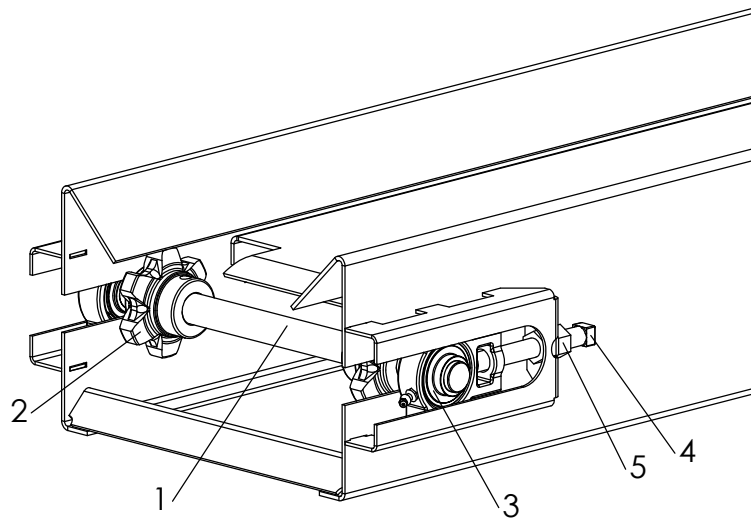


<u>ITEM</u>	<u>PART NO.</u>		<u>DESCRIPTION</u>	<u>QTY</u>
	<u>CS</u>	<u>SS</u>		
1	20318	36408	Bolt – Carriage 3/8 x 1	1
2	20693	36425	Washer – Flat 3/8	2
3	20678	72054	Nut – Lock 3/8	2
4	26663	77064	Feedgate Wldmt	1
5	84267	84268	Lever Wldmt	1
6	20695	36426	Washer – Flat 1/2	5
7	20680	39016	Nut – Lock 1/2	1
8	84261	84262	Link	1

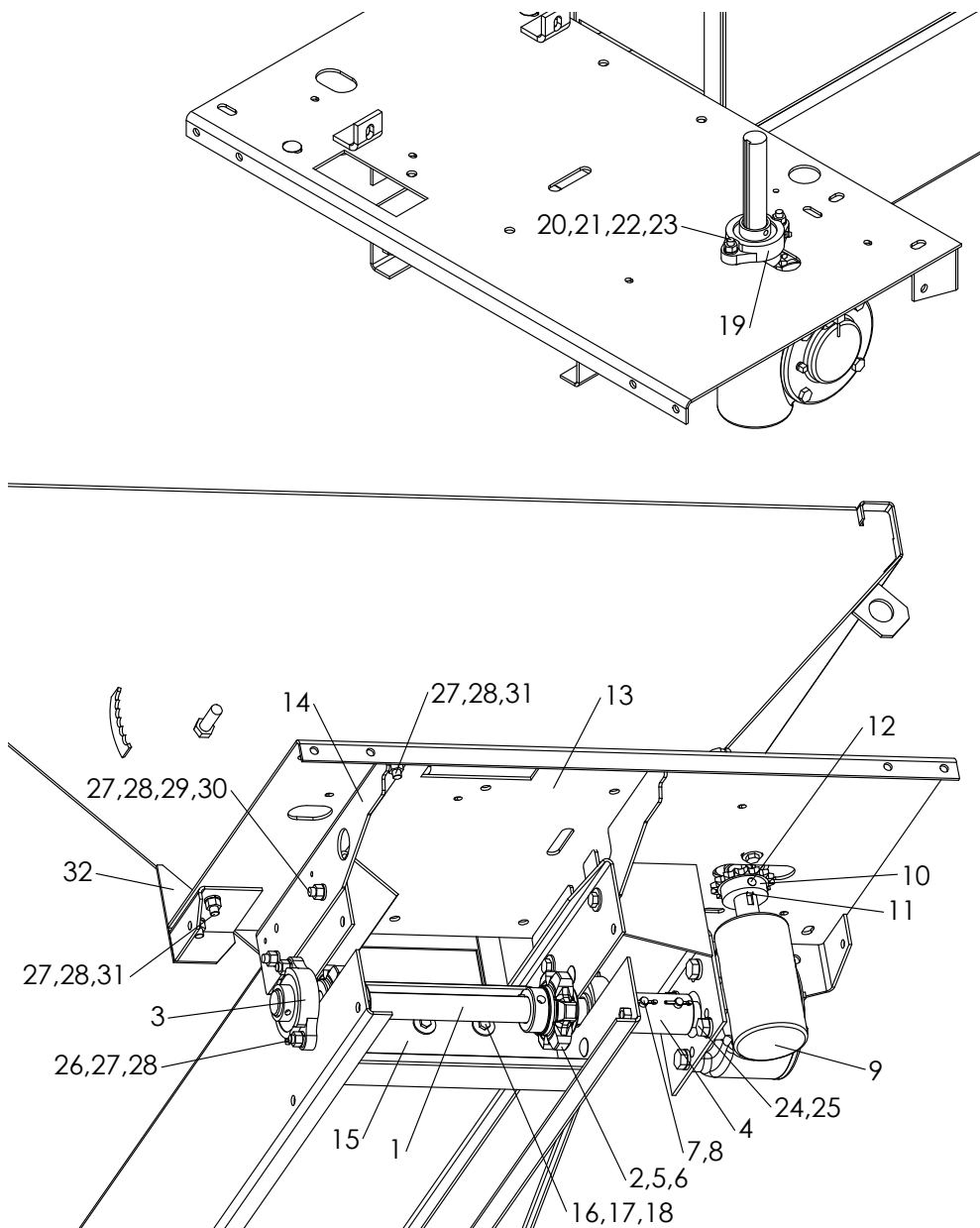


ITEM	PART NO.	DESCRIPTION	QTY
1	26614	Chain – Conveyor Assy, 7’ Unit	1
	34066	Chain – Conveyor Assy, 8’ Unit	1
	99785	Chain – Conveyor Assy, 9’ Unit	1
	34066-X2	Chain – Conveyor Assy, 10’ Unit	1
2	26700	Bar – Chain Wldmt	AR
3	26701	Link – Chain	AR
4	26702	Pin – Chain	AR
5	20811	Pin – Cotter	AR

AR - As Required

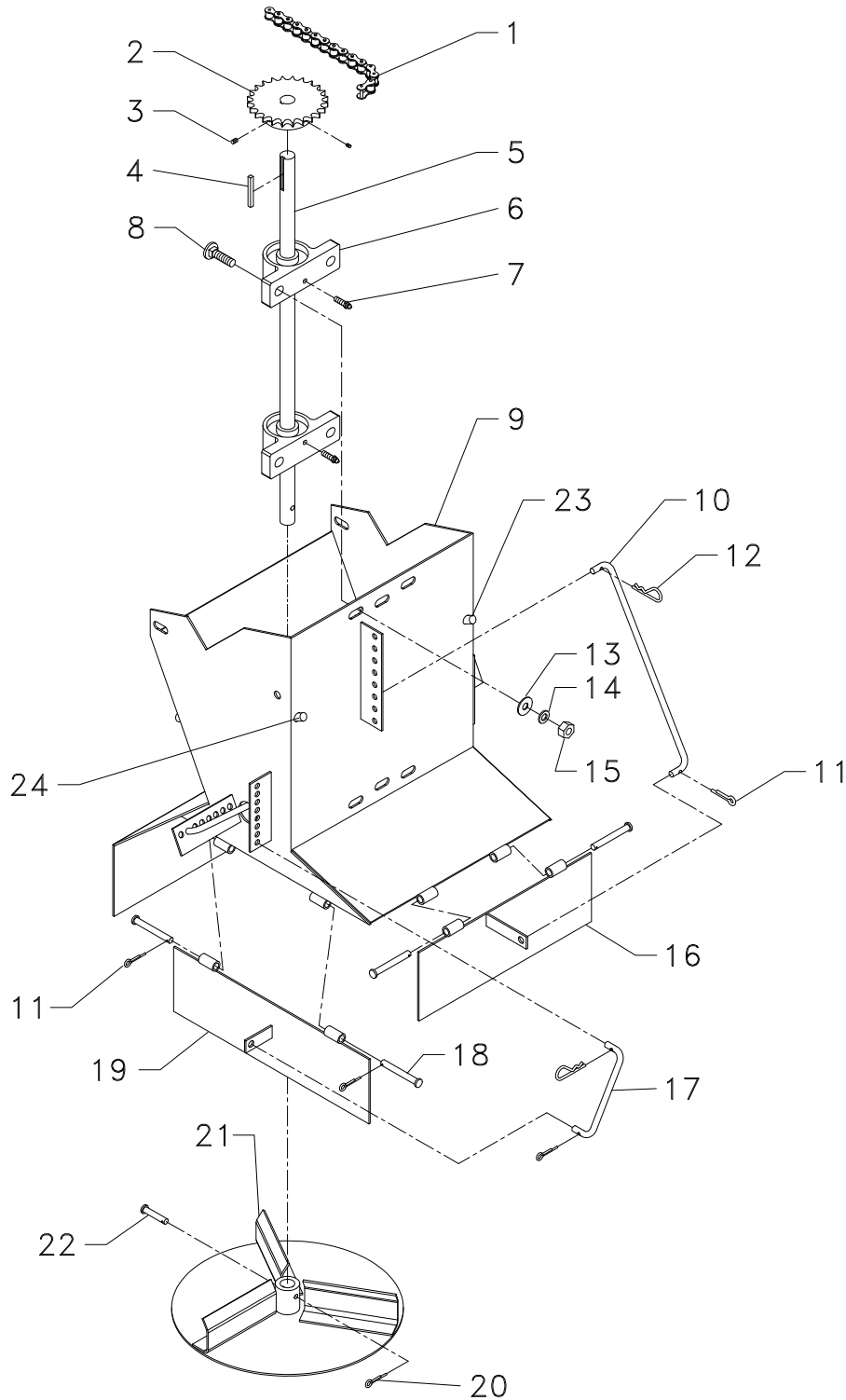


<u>ITEM</u>	<u>PART NO.</u>		<u>DESCRIPTION</u>	<u>QTY</u>
	<u>CS</u>	<u>SS</u>		
1	99416	99416	Shaft – Idler	1
2	99413	99413	Sprocket – Idler	2
3	99415	99415	Bearing	2
4	21398	77074	Screw – 5/8 Take-up	2
5	20648	36417	Nut – Hex 5/8	2



ITEM	PART NO.		DESCRIPTION	QTY
1	26651	26651	Shaft – Drive	1
2	99414	99414	Sprocket – Drive	2
3	22568	22568	Bearing – Flange	2
4	26652	26652	Coupling – Drive Shaft, Engine & Hyd.	1
	79709	79709	Coupling – Drive Shaft, Direct Hyd.	1
5	20735	20735	Screw – Set	4
6	2152	2152	Key	2
7	6122	6122	Pin – Clevis, Engine & Hydraulic	2

ITEM	PART NO.		DESCRIPTION	QTY
	6123	6123	Pin – Clevis, Direct Hydraulic	1
8	20817	20817	Pin – Cotter, Engine & Hydraulic	2
	20811	20811	Pin – Cotter, Direct Hydraulic	1
9	27118	27118	Gear Case – Conveyor, Engine Drive	1
	11428	11428	Gear Case – Conveyor, Hydraulic Drive	1
	42787	42787	Plug – Pull	1
10	26810	26810	Sprocket	1
11	6137	6137	Key	1
12	20748	20748	Screw – Set	2
13	301222	301223	Base – Engine Wldmt	1
	301274	301275	Base – Hydraulic Wldmt	1
14	301257	301258	Support – Engine Base	1
	303044	303045	Support – Hydraulic Base	1
15	27141	27141	Belt – Wiper	1
16	20005	36395	Cap Screw – 1/4 x 1	5
17	21423	21423-X1	Washer – Flat 1/4 SS	5
18	20642	36412	Nut – Hex 1/4	5
19	22563	22563	Bearing – Flange	1
20	20037	36397	Cap Screw – 5/16 x 1 1/4	2
21	20692	36424	Washer – Flat 5/16	2
22	20711	36419	Washer – Lock 5/16	2
23	20643	36413	Nut – Hex 5/16	2
24	20127	36401	Cap Screw – 1/2 x 1	4
25	20714	36422	Washer – Lock 1/2	4
26	20319	36409	Bolt – Carriage 3/8 x 1 1/4	4
27	20712	36420	Washer – Lock 3/8	AR
28	20644	36414	Nut – Hex 3/8	AR
29	20067	36398	Cap Screw – 3/8 x 1	4
30	20693	36425	Washer – Flat 3/8	4
31	20318	36408	Bolt – Carriage 3/8 x 1	AR
32	301410	301411	Support – Wldmt Hood Hook	1



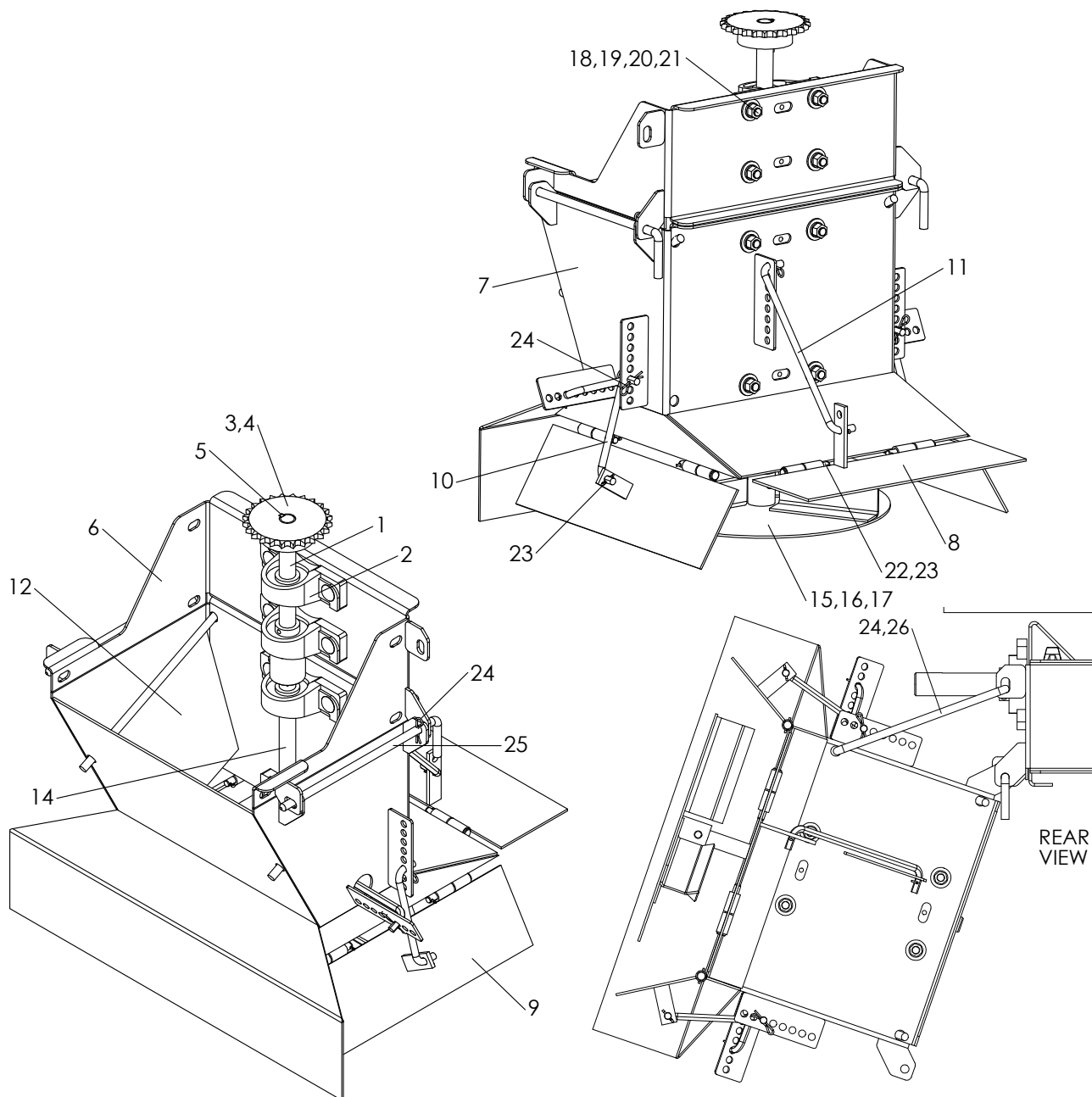
Note: Standard height, engine/single hydraulic drive.

ITEM	PART NO.		DESCRIPTION	QTY
	<u>CS</u>	<u>SS</u>		
	90417	90419	Spinner – Assy, Engine & Single Hydraulic Drive	
	90417-X2	90419-X2	Spinner – Assy, Dual Hydraulic Drive	
	90420	90422	Spinner – Assy 12" Ext., Engine & Single Hydraulic Drive	
	* 84985	84986	Hardware – Kit Spinner Mount, Includes 25-28	
1	26697	26697	Chain – Roller	1
	23745	23745	Link – Connecting	1
2	23742	23742	Sprocket – Engine & Single Hydraulic	1
	*11431-X1	11431-X1	Coupling – Dual Hydraulic	1
3	20735	20735	Screw – Set 1/4-20 x 1/4	2
4	6134	6134	Key – Square 3/16 x 1-1/2	1
5	26889	26889	Shaft – Spinner	1
	26890	26890	Shaft – Spinner 12" Ext.	1
6	26816	26816	Bearing	2
7	79848	79848	Zerk – Grease Extended	2
8	20319	36409	Bolt – Carriage 3/8 x 1-1/4	4
9	90429	90431	Hopper – Wldmt	1
	90432	90434	Hopper – Wldmt 12" Ext.	1
10	79652	79653	Rod – Rear Adjustment	1
11	20810	76822	Pin – Cotter	11
12	40562	41779	Pin – Hair	5
13	20693	36425	Washer – Flat 3/8	4
14	20712	36420	Washer – Lock 3/8	4
15	20644	36414	Nut – Hex 3/8	4
16	90484	90486	Baffle – Rear Wldmt	1
17	79650	79651	Rod – Side Adjustment	4
18	71066	79654	Pin – Clevis 5/16 x 2-1/2	6
19	90481	90483	Baffle – Side Wldmt	2
20	20811	20811	Pin – Cotter	1
21	26888	26888	Disc – Spinner Wldmt	1
22	6299	6299	Pin – Clevis 1/4 x 1-1/2	1
23	90554	90558	Baffle – Inner RH	1
24	90555	90559	Baffle – Inner LH	1
25	* 20067	36398	Cap Screw – 3/8 x 1	4
26	* 20693	36425	Washer – Flat 3/8	4
27	* 20712	36420	Washer – Lock 3/8	4
28	* 20644	36414	Nut – Hex 3/8	4

* - Not Shown

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



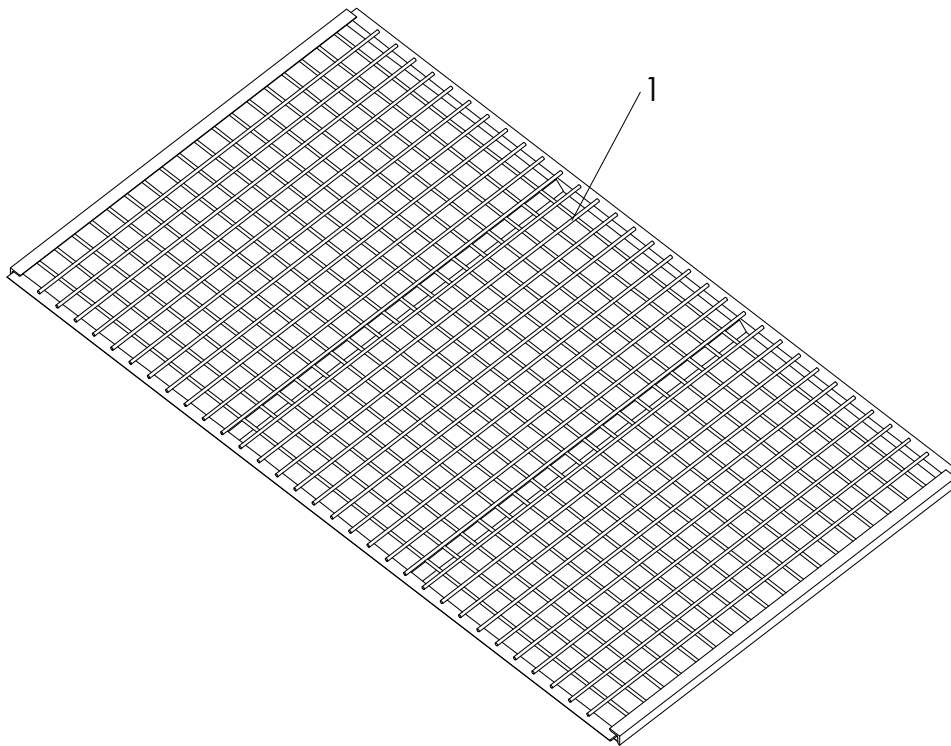


Note: Standard height, engine/single hydraulic drive spinner shown.

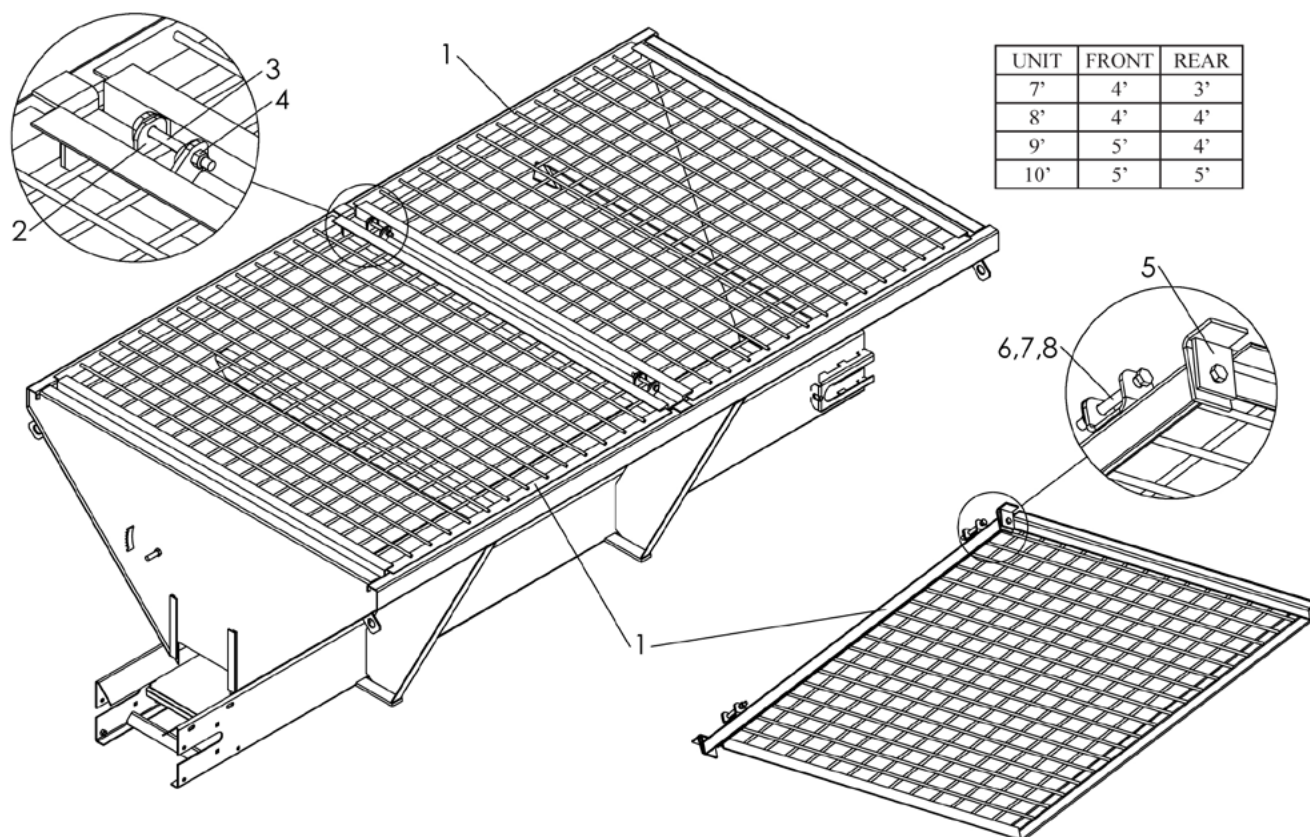
ITEM	PART NO.		DESCRIPTION	QTY
	<u>CS</u>	<u>SS</u>		
	302973	303056	Spinner – Assy Flip-Up, Eng. & Single Hyd. Drive	
*	303058	303059	Spinner – Assy Flip-Up, Dual Hydraulic Drive	
*	302992	303057	Spinner – Assy Flip-Up 12" Ext., Engine & Single Hydraulic Drive	
*	303388	303389	Hardware – Kit Spinner, Includes 24 (1) & 26–30	

ITEM	PART NO.		DESCRIPTION	QTY
1	302976	302976	Shaft – Wldmt Flip-Up	1
2	26816	26816	Bearing – Pillow Block	4
3	6134	6134	Key – Square 3/16 x 1-1/2	1
4	20735	20735	Screw – Set 1/4-20 x 1/4	2
5	23742	23742	Sprocket – 24T, Engine & Single Hyd.	1
	* 11431-X1	11431-X1	Coupling – Motor, Dual Hydraulic	1
6	302971	303076	Panel – Wldmt Wrap	1
7	302980	303077	Hopper – Wldmt Flip-Up	1
	* 302994	303078	Hopper – Wldmt Flip-Up, 12" Ext.	1
8	90484	90486	Baffle – Wldmt Rear	1
9	90481	90483	Baffle – Wldmt Side	2
10	79650	79651	Rod – Control Side	4
11	302987	303051	Rod – Control Rear	1
12	90555	90559	Baffle – Wldmt Inner LH	1
13	* 90554	90558	Baffle – Wldmt Inner RH	1
14	302986	302986	Shaft – Wldmt Spinner	1
	* 302990	302990	Shaft – Wldmt Spinner, 12" Ext.	1
15	26888	26888	Disc – 11-3/4 Wldmt	1
16	6299	6299	Pin – Clevis 1/4 x 1-1/2	1
17	20811	20811	Pin – Cotter 3/32 x 3/4	1
18	20319	36409	Bolt – Carriage 3/8 x 1-1/4	8
19	20693	36425	Washer – Flat 3/8	8
20	20712	36420	Washer – Lock 3/8	8
21	20644	36414	Nut – Hex 3/8	8
22	71066	79654	Pin – Clevis 5/16 x 2-1/2	6
23	20810	76822	Pin – Cotter 3/32 x 1/2	11
24	40562	41779	Pin – Hair 1-7/16 x .073	8
25	302970	302970	Rod – Spinner Flip-Up	2
26	303048	303048	Rod – Hanger Flip-up	1
27	* 20067	36398	Cap Screw – 3/8 x 1	6
28	* 20693	36425	Washer – Flat 3/8	6
29	* 20712	36420	Washer – Lock 3/8	6
30	* 20644	36414	Nut – Hex 3/8	6

* - Not Shown



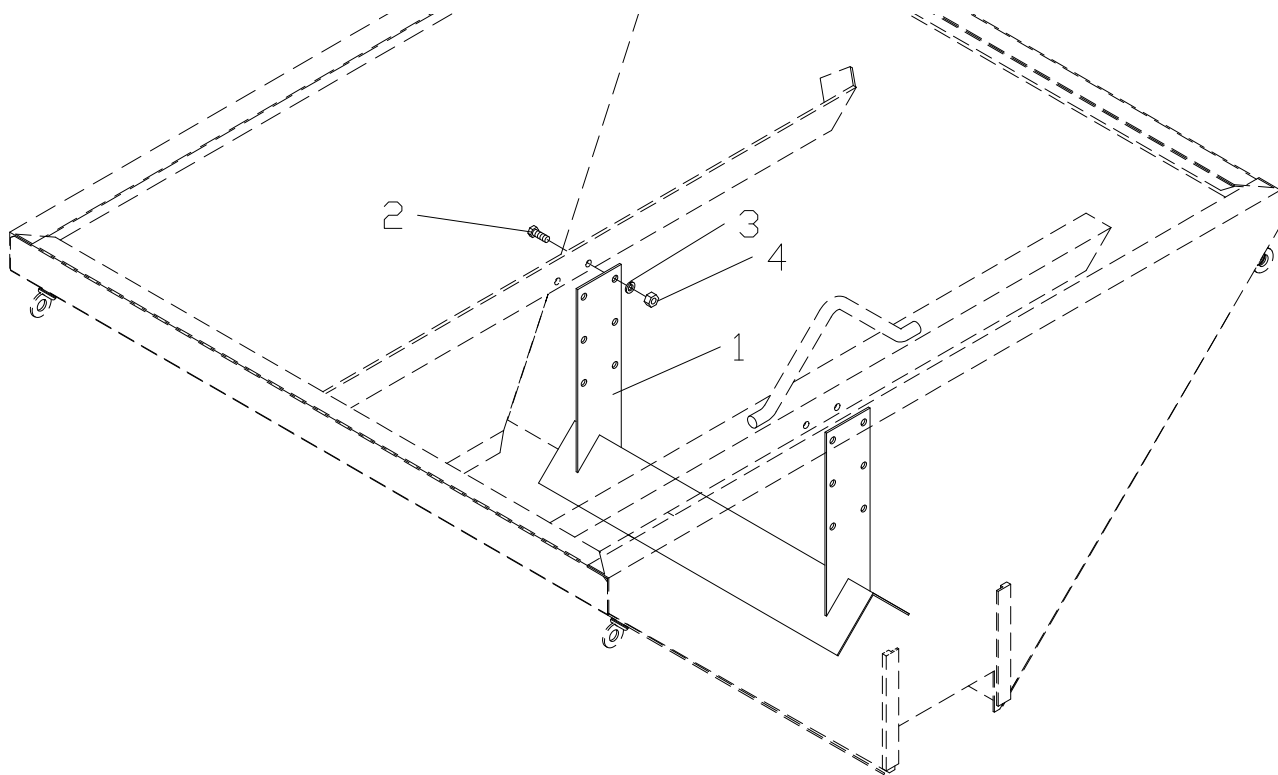
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	26926	Screen – 7' Wldmt	1
	34070	Screen – 8' Wldmt	1
	99924	Screen – 7' HD Wldmt	1
	99925	Screen – 8' HD Wldmt	1
	99926	Screen – 9' HD Wldmt	1
	99927	Screen – 10' HD Wldmt	1



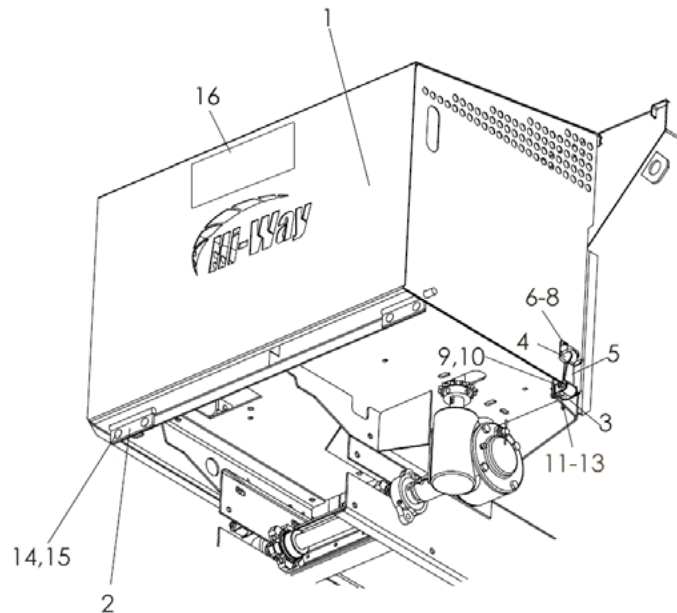
UNIT	FRONT	REAR
7'	4'	3'
8'	4'	4'
9'	5'	4'
10'	5'	5'

ITEM	PART NO.	DESCRIPTION	QTY
	303262	Hardware – Kit, Includes 3-8	
1	303251	Screen – Wldmt 3'	AR
	303252	Screen – Wldmt 4'	AR
	303253	Screen – Wldmt 5'	AR
2	303254	Pivot – Wldmt	1
3	20077	Cap Screw – 3/8-16 x 3-1/2	2
4	20678	Nut – Lock 3/8-16	2
5	303392	Clamp – Screen	2
6	20068	Cap Screw – 3/8-16 x 1-1/4	2
7	20712	Washer – Lock 3/8	2
8	20644	Nut – Hex 3/8	2

AR - As Required

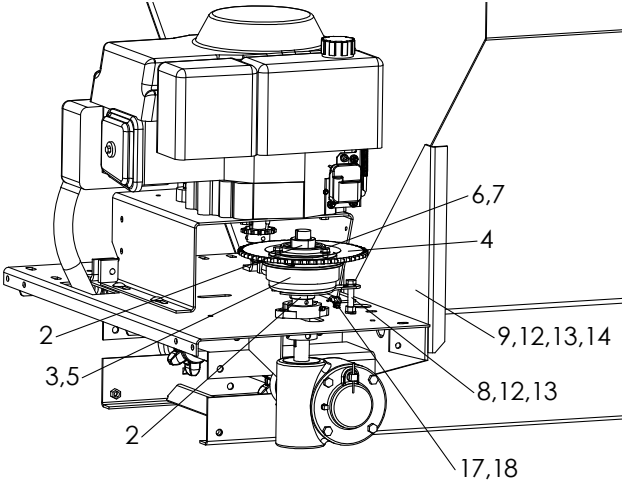
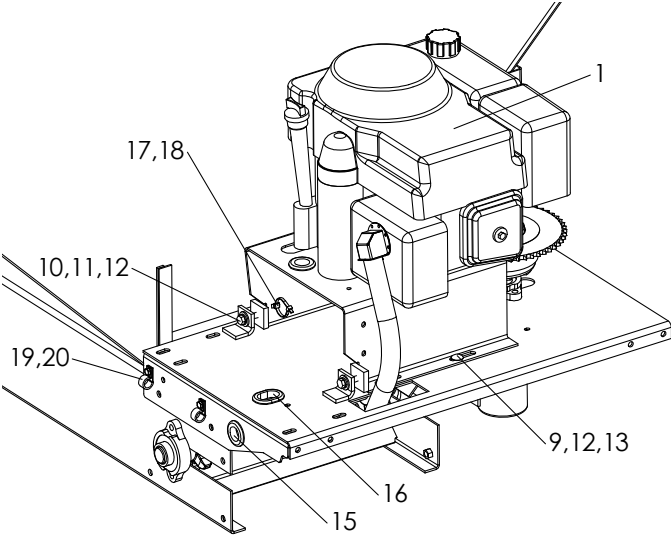


ITEM	PART NO.		DESCRIPTION	QTY
	CS	SS		
1	77690	77692	V – Inverted 7' Unit	1
	77693	77695	V – Inverted 8' Unit	1
	303735	77695-X1	V – Inverted 9' Unit	1
	303736	303737	V – Inverted 10' Unit	1
2	20067	36398	Cap Screw – 3/8 x 1	4
3	20712	36420	Washer – Lock 3/8	4
4	20644	36414	Nut – Hex 3/8	4



ITEM	PART NO.		DESCRIPTION	QTY
	<u>CS</u>	<u>SS</u>		
1	301495	301496	Hood – Wldmt	1
2	301304	301305	Pivot – Wldmt	2
3	73344	73344	Bracket – Anchor	2
4	57086	57086	Bracket – Hood	2
5	73343	73343	Hook – Rubber	2
6	20570	44452	Cap Screw - #10 x 1/2	4
7	20709	44451	Washer – Lock #10	4
8	20641	47295	Nut – Hex #10	4
9	20007	42448	Cap Screw – 1/4 x 1-1/2	2
10	20676	42034	Nut – Lock 1/4	2
11	20033	56858	Cap Screw – 5/16 x 3/4	2
12	20711	36419	Washer – Lock 5/16	2
13	20643	36413	Nut – Hex 5/16	2
14	20290	96880	Bolt – Carriage 5/16 x 3/4	4
15	20677	42221	Nut – Lock 5/16	4
16	79692	79692	Decal - Warning Moving Part Hazard	1
17	*55224	55224	Decal – Danger Guard Missing (Engine Base)	1
18	*306818	306818	Seal - Rubber	AR

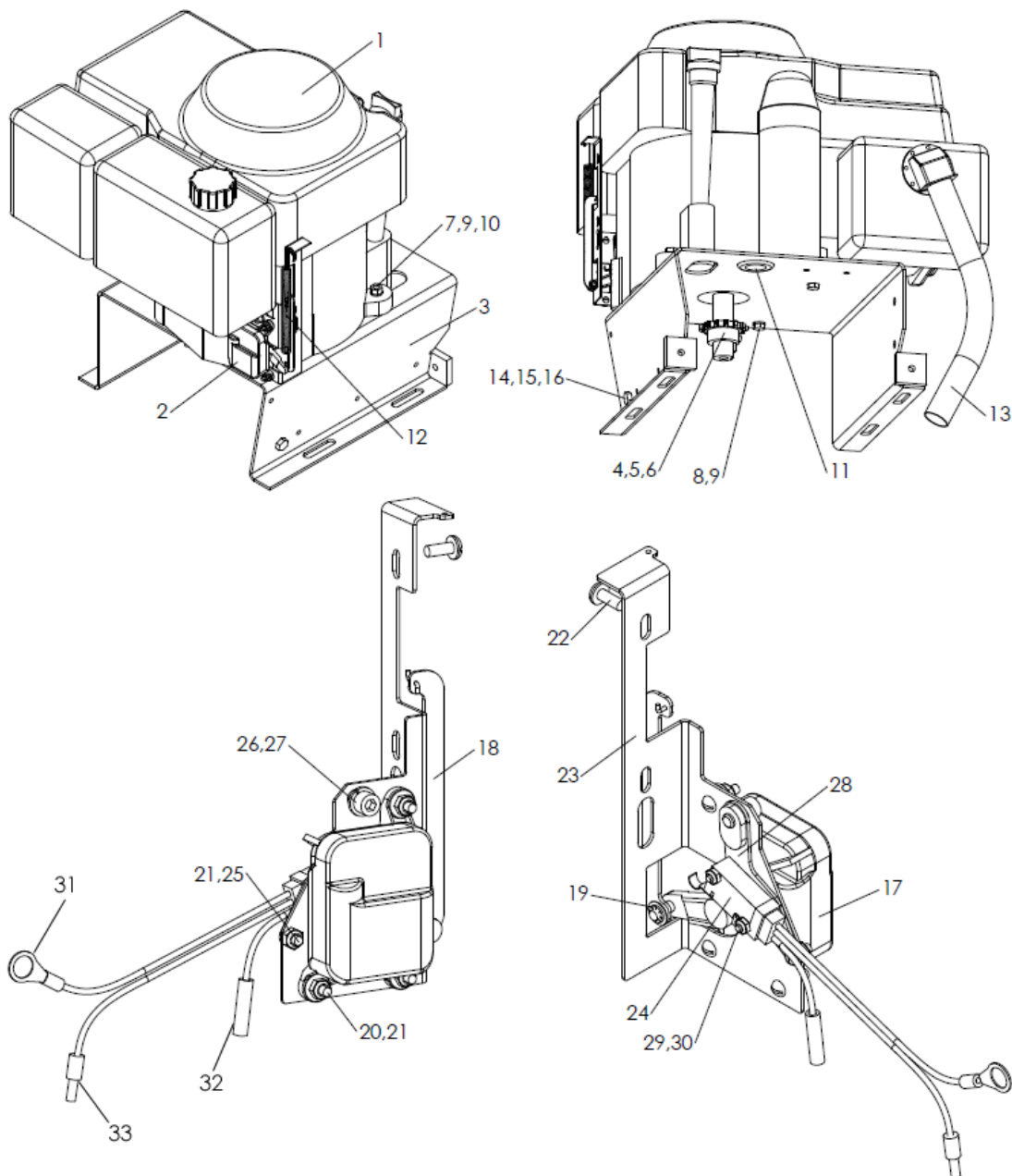
* - Not Shown AR - As Required



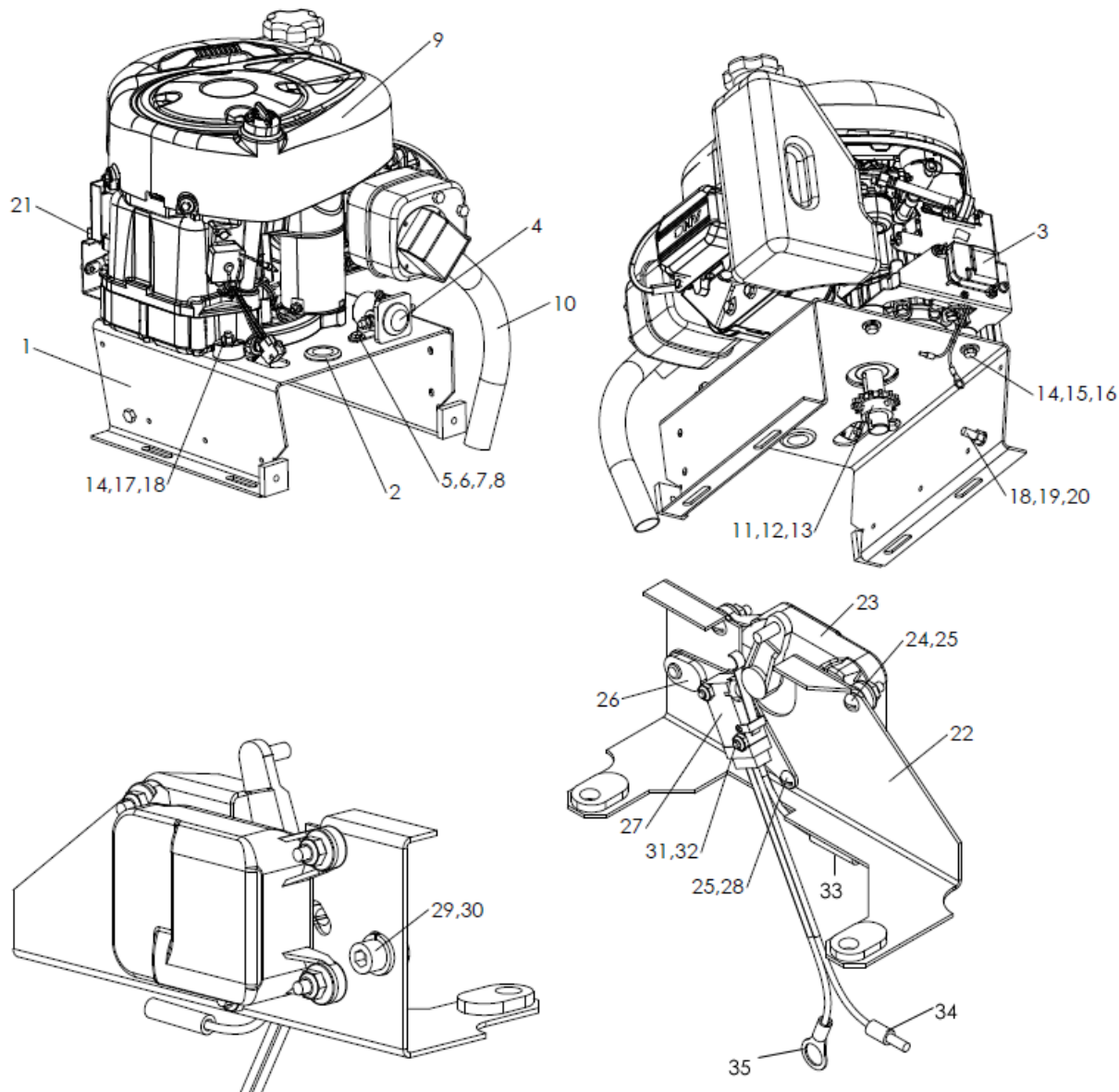
Note: Honda engine shown.

ITEM	PART NO.		DESCRIPTION	QTY
	<u>CS</u>	<u>SS</u>		
	303681	303682	Engine – Assy 11 HP Honda	1
	303679	303680	Engine – Assy 10.5 HP B&S	1
2	2696	2696	Collar – Set 1"	2
3	79695	79695	Clutch – Electric	1
4	11775	11775	Sprocket – 52T	1
	84291	84291	Chain – Roller	
5	82466	82466	Key – 1/4 x 3/16 x 1-1/2	1
6	20033	20033	Cap Screw – 5/16 x 5/8	3
7	20711	20711	Washer – Lock 5/16	3
8	20074	36296	Cap Screw – 3/8-16 x 2-3/4	1
9	20318	36408	Bolt – Carriage 3/8-16 x 1	6
10	20070	20258	Cap Screw – 3/8-16 x 1-3/4	2
11	20693	36425	Washer – Flat 3/8	2
12	20712	36420	Washer – Lock 3/8	11
13	20644	36414	Nut – Hex 3/8-16	9
14	301290	301291	Guard – Plate Engine	1
15	24812	24812	Grommet – Rubber	1
16	34129	34129	Grommet – Rubber	1
17	99675	99675	Base – Wire Tie	4
18	99674	99674	Tie – Wire	4
19	36987	36987	Clamp – Rubber Coated	2
20	72071	72071	Screw – Self Tapping	2
21	* 301322	301322	Cable – Battery Ground	1
22	* 99716	99716	Wire – Assy, Honda only	1
23	* 26990	26990	Cable – Assy, B&S only	1
24	* 99673	99673	Cable – Battery Honda Engine	1
	* 6205	6205	Cable – Battery B&S Engine	1
25	301922	301922	Harness – Assy Honda Engine, See <i>Control Panel</i> parts list	1
	301923	301923	Harness – Assy B&S Engine, See <i>Control Panel</i> parts list	1

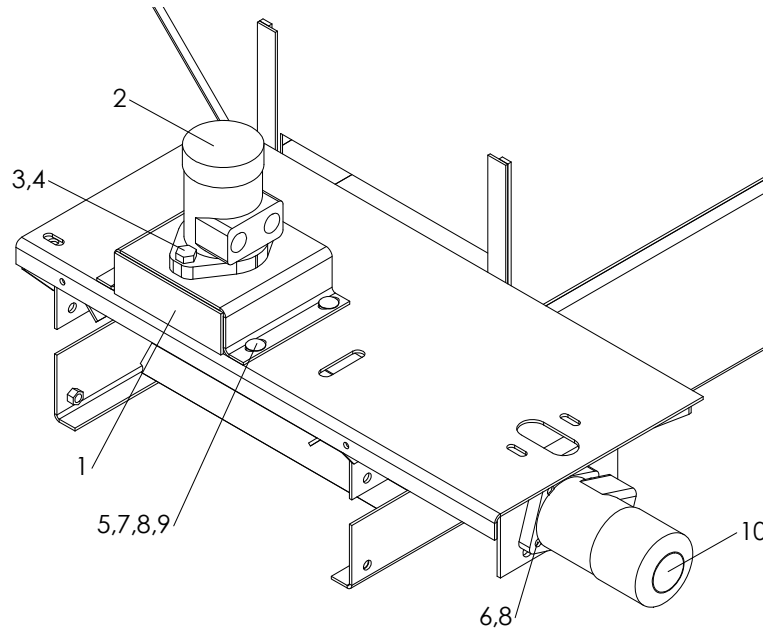
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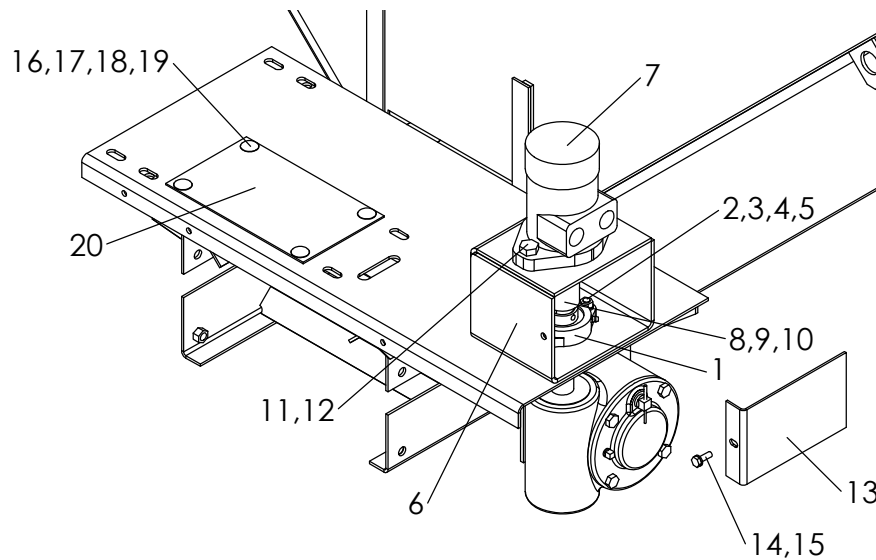
<u>ITEM</u>	<u>PART NO.</u>		<u>DESCRIPTION</u>	<u>QTY</u>
	<u>CS</u>	<u>SS</u>		
	303681	303682	Engine – Assy Honda 11 HP	
1	99407	99407	Engine – Honda 11 HP	1
2	301920	301920	Throttle – Assy 11 HP, Includes 17-21,23-30	1
3	301238	301239	Base – Wldmt Engine	1
4	26688	26688	Sprocket	1
5	2212	2212	Key – Square 1/4 x 1-1/2	1
6	20735	20735	Screw – Set 1/4 x 1/4	2
7	20038	308056	Cap Screw – 5/16-18 x 1-1/2	2
8	221154	221154	Cap Screw – 5/16-24 x 3/4	2
9	20711	36419	Washer – Lock 5/16	2
10	20677	42221	Nut – Hex Lock 5/16-18	2
11	24812	24812	Grommet – Rubber	1
12	96243	96243	Spring – Choke	1
13	303398	303398	Exhaust – Wldmt Honda	1
14	20068	36399	Cap Screw – 3/8 x 1-1/4	1
15	20712	36420	Washer – Lock 3/8	1
16	20644	36414	Nut – Hex 3/8	1
17	47444	47444	Control – Electric Throttle	1
18	99574	99574	Linkage – Throttle	1
19	99679	99679	Retainer – Push	1
20	301932	301932	Screw – Machine #8-32 x 5/8	3
21	45168	45168	Nut – Lock #8-32	4
22	99678	99678	Screw – Pan Head M5 x 12	1
23	301915	301915	Bracket – Throttle	1
24	301913	301913	Switch – Snap Action	1
25	20568	20568	Screw – Machine #8-32 x 3/8	1
26	99506	99506	Screw – 1/4-20 x 3/8 Hex Head	1
27	20710	20710	Washer – Lock 1/4	1
28	301918	301918	Plate – Wldmt Switch	1
29	301930	301930	Screw – Machine #4-40 x 5/8	2
30	301931	301931	Nut – Lock #4-40	2
31	31572	31572	Terminal - Ring	1
32	6549	6549	Connector - Butt Splice	1
33	6488	6488	Connector - Wire Male	1



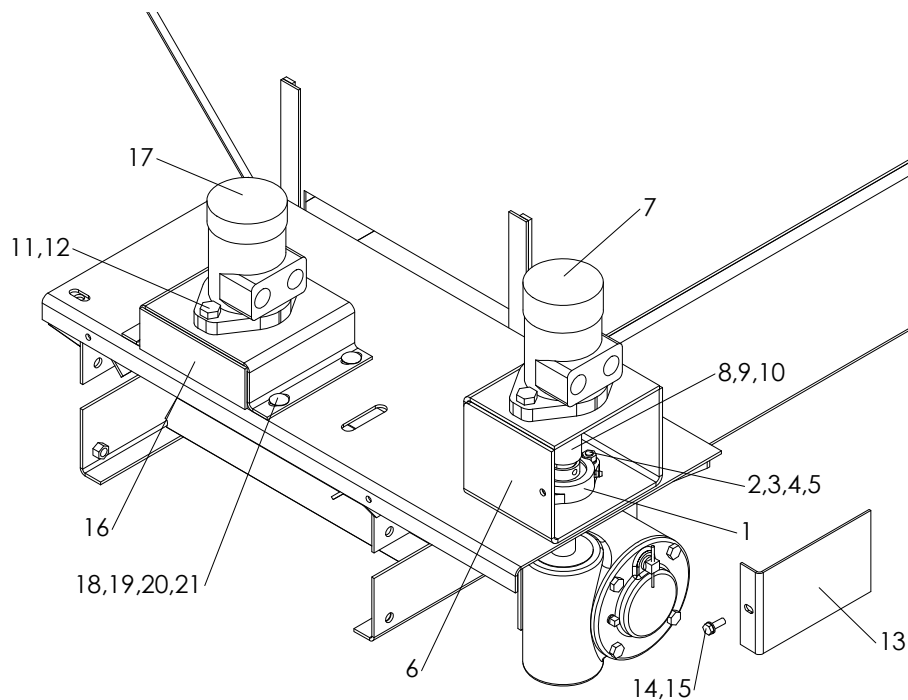
<u>ITEM</u>	<u>PART NO.</u>		<u>DESCRIPTION</u>	<u>QTY</u>
	<u>CS</u>	<u>SS</u>		
1	301238	301239	Base – Wldmt Engine	1
2	24812	24812	Grommet – Rubber	1
3	301921	301921	Throttle – Assy 10.5 HP, Includes 22-35	1
4	18101	18101	Switch – Solenoid Magnetic	1
5	20002	36393	Cap Screw – 1/4 x 5/8	2
6	20691	36423	Washer – Flat 1/4	2
7	20710	36418	Washer – Lock 1/4	2
8	20642	36412	Nut – Hex 1/4	2
9	308916	308916	Engine – B&S 10.5 HP	1
10	303399	303399	Exhaust – Wldmt B & S	1
11	26688	26688	Sprocket	1
12	2212	2212	Key – Square 1/4 x 1-1/2	1
13	20735	20735	Screw – Set 1/4 x 1/4	2
14	20038	308056	Cap Screw – 5/16 x 1-1/2	4
15	20692	36424	Washer – Flat 5/16	4
16	20711	36419	Washer – Lock 5/16	4
17	20643	36413	Nut – Hex 5/16	2
18	20068	36399	Cap Screw – 3/8 x 1-1/4	1
19	20712	36420	Washer – Lock 3/8	1
20	20644	36414	Nut – Hex 3/8	1
21	47447	47447	Block – Throttle	1
22	301917	301917	Bracket – Wldmt Throttle	1
23	47444	47444	Control – Electric Throttle	1
24	301932	301932	Screw – Machine #8-32 x 5/8	3
25	45168	45168	Nut – Lock #8-32	4
26	301919	301919	Plate – Wldmt Switch	1
27	301913	301913	Switch – Snap Action	1
28	20568	20568	Screw – Machine - #8-32 x 3/8	1
29	99506	99506	Screw – 1/4-20 x 3/8	1
30	20710	20710	Washer – Lock 1/4	1
31	301930	301930	Screw – Machine #4-40 x 5/8	2
32	301931	301931	Nut – Lock #4-40	2
33	6549	6549	Connector - Butt Splice	1
34	6488	6488	Connector - Wire Male	1
35	31572	31572	Terminal - Ring	1



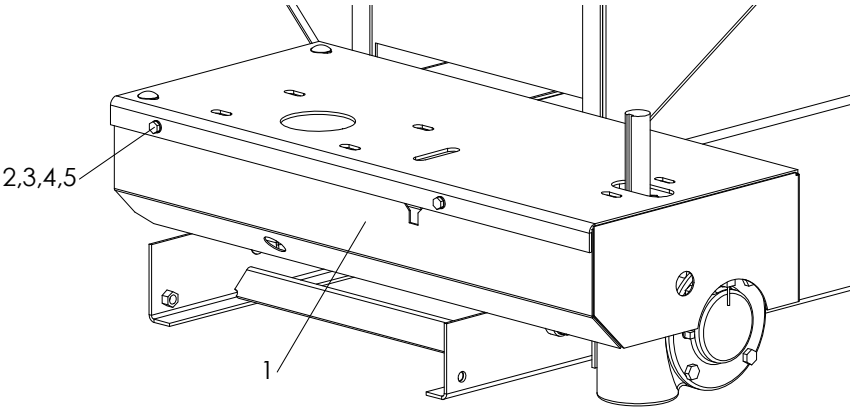
<u>ITEM</u>	<u>PART NO.</u>		<u>DESCRIPTION</u>	<u>QTY</u>
	<u>CS</u>	<u>SS</u>		
1	84729	84586	Mount – Wldmt Motor	1
2	37339	37339	Motor – Hydraulic	1
	37352	37352	Seal Kit – Motor	1
	37350	37350	Service Kit – Motor	1
3	20129	36539	Cap Screw – 1/2 x 1-1/2	2
4	20680	39016	Nut – Hex 1/2	2
5	20318	36408	Bolt – Carriage 3/8 x 1	4
6	20065	36293	Cap Screw – 3/8 x 3/4	4
7	20693	36425	Washer – Flat 3/8	4
8	20712	36420	Washer – Lock 3/8	8
9	20644	36414	Nut – Hex 3/8	4
10	37338	37338	Motor – Hydraulic	1
	39137	39137	Seal Kit – Motor	1



ITEM	PART NO.		DESCRIPTION	QTY
	<u>CS</u>	<u>SS</u>		
1	22563	22563	Bearing – 2-Bolt	1
2	20037	36397	Cap Screw – 5/16 x 1-1/4	2
3	20692	36424	Washer – Flat 5/16	2
4	20711	36419	Washer – Lock 5/16	2
5	20643	36413	Nut – Hex 5/16	2
6	79876	79877	Mount – Wldmt Motor	1
7	79993	79993	Motor – Hydraulic	1
	39137	39137	Seal Kit – Motor	1
8	11431	11431	Coupling – Motor	1
9	2212	2212	Key – Square 1/4 x 1-1/2	1
10	20735	20735	Screw – Set 1/4-20 x 1/4	4
11	20129	36539	Cap Screw – 1/2 x 1-1/2	2
12	20680	39016	Nut – Hex 1/2	2
13	79870	79871	Guard – Panel	1
14	20003	36393	Cap Screw – 1/4 x 3/4	1
15	20710	36418	Washer – Lock 1/4	1
16	20318	36408	Bolt – Carriage 3/8 x 1	4
17	20693	36425	Washer – Flat 3/8	4
18	20712	36420	Washer – Lock 3/8	4
19	20644	36414	Nut – Hex 3/8	4
20	301288	301289	Guard – Plate Hydraulic	1

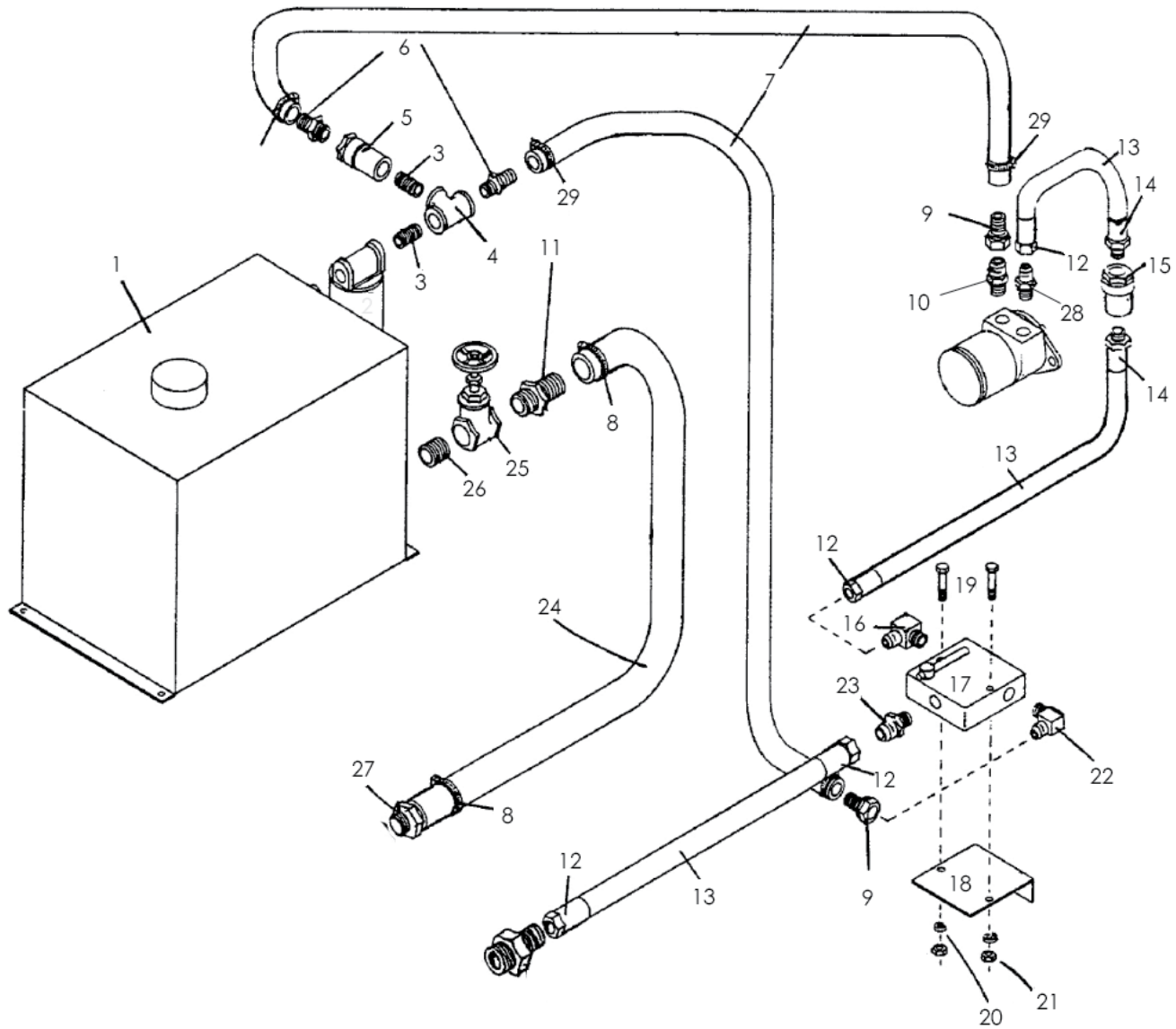


<u>ITEM</u>	<u>PART NO.</u>		<u>DESCRIPTION</u>	<u>QTY</u>
	<u>CS</u>	<u>SS</u>		
1	22563	22563	Bearing – 2-Bolt	1
2	20037	36397	Cap Screw – 5/16 x 1-1/4	2
3	20692	36424	Washer – Flat 5/16	2
4	20711	36419	Washer – Lock 5/16	2
5	20643	36413	Nut – Hex 5/16	2
6	79876	79877	Mount – Wldmt Motor	1
7	79993	79993	Motor – Hydraulic	1
	39137	39137	Seal Kit – Motor	1
8	11431	11431	Coupling – Motor	1
9	2212	2212	Key – Square 1/4 x 1-1/2	1
10	20735	20735	Screw – Set 1/4-20 x 1/4	4
11	20129	36539	Cap Screw – 1/2 x 1-1/2	2
12	20680	39016	Nut – Hex 1/2	2
13	79870	79871	Guard – Panel	1
14	20003	36393	Cap Screw – 1/4 x 3/4	1
15	20710	36418	Washer – Lock 1/4	1
16	84729	84586	Mount - Wldmt Motor	1
17	37339	37339	Motor - Hydraulic	1
	39137	39137	Seal - Kit Motor	1
18	20318	36408	Bolt – Carriage 3/8 x 1	4
19	20693	36425	Washer – Flat 3/8	4
20	20712	36420	Washer – Lock 3/8	4
21	20644	36414	Nut – Hex 3/8	4



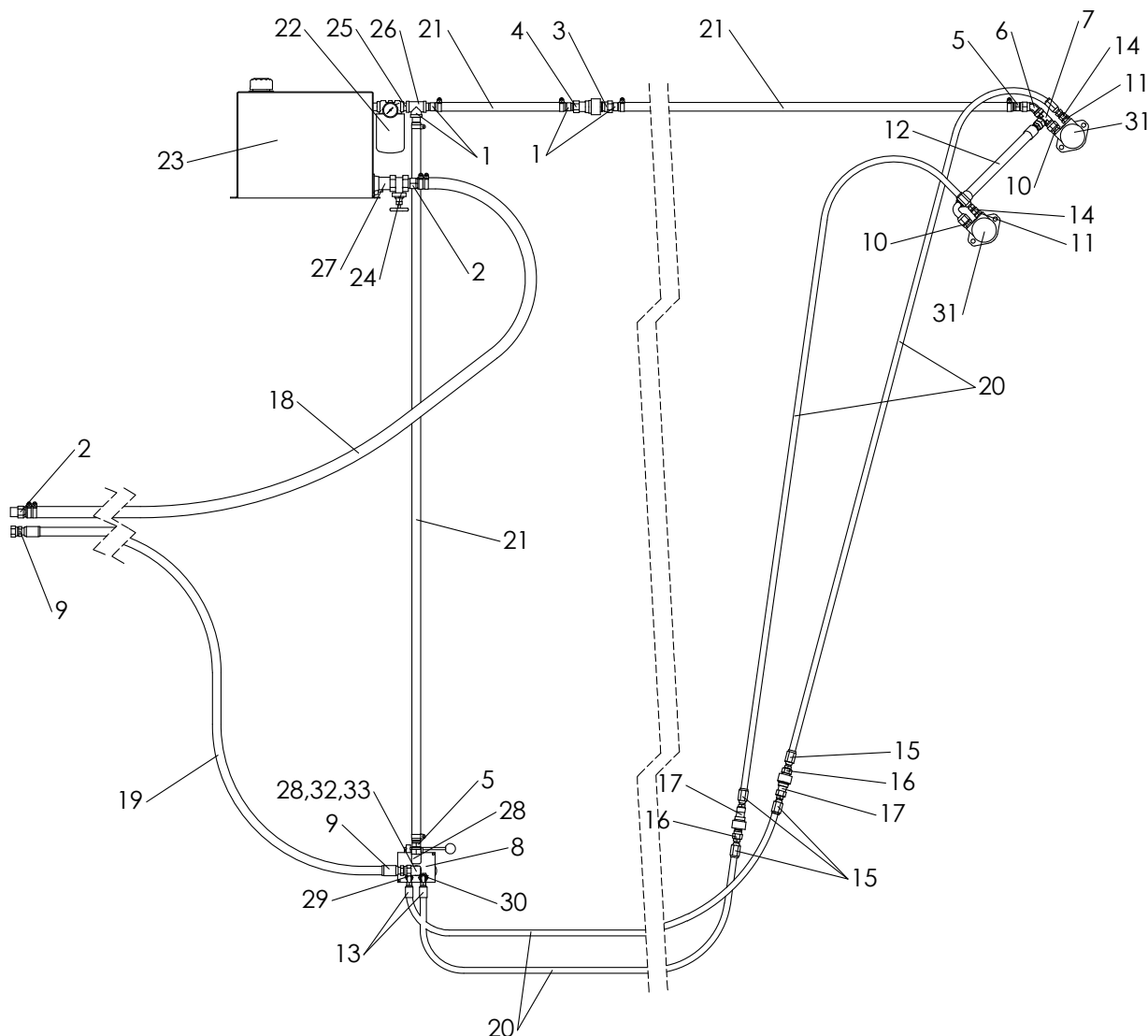
<u>ITEM</u>	<u>PART NO.</u>		<u>DESCRIPTION</u>	<u>QTY</u>
	<u>CS</u>	<u>SS</u>		
1	301259-X1	301261-X1	Guard – Wldmt Engine	
	303033	303035	Guard – Wldmt Hydraulic	1
2	20003	36393	Cap Screw – 1/4 x 3/4	3
3	20691	36423	Washer – Flat 1/4	3
4	20710	36418	Washer – Lock 1/4	3
5	20642	36412	Nut – Hex 1/4	3

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<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	11436	Tank – Hydraulic Assy	1
	* 87349	Cap – Filler Assy	1
	* 6033	Plug – Pipe	1
2	30743	Filter – Hydraulic	1
3	6026	Nipple – Close	2
4	6020	Tee	1
5	39905	Disconnect – Quick Male	1
	39906	Disconnect – Quick Female	1
6	22425	Nipple – Hose	2
7	16529-300	Hose – Return	1
8	6335	Clamp – Hose	4
9	11424	Nipple – Hose	2
10	29753	Adapter	1
11	16582	Nipple – Hose	1
12	31598	End – Hose Reusable	4
13	56453-360	Hose	1
14	31599	End – Hose Reusable	2
15	40008	Disconnect – Quick Male	1
	40009	Disconnect – Quick Female	1
16	30759	Adapter	1
17	30745	Valve – Control	1
18	30862	Bracket – Valve Mounting	1
19	20011	Cap Screw - 1/4 x 2	2
20	20710	Washer – Lock 1/4	2
21	20642	Nut – Hex 1/4	2
22	34722	Adapter	1
23	29767	Adapter	1
24	23184-240	Hose – Suction	1
25	22155	Valve – Gate	1
26	34777	Nipple	1
27	16572	Nipple – Hose	1
28	29771	Adapter	1
29	22381	Clamp - Hose	2

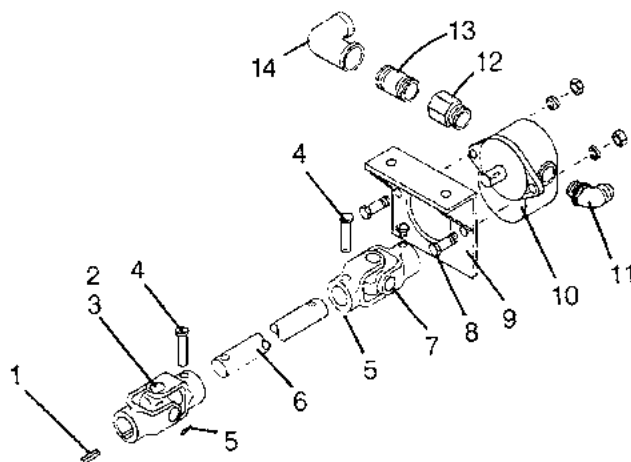
* - Not shown



ITEM	PART NO.	DESCRIPTION	QTY
1	22425	End – Hose	4
2	16582	End – Hose	2
3	39905	Disconnect – Quick Male	1
4	39906	Disconnect – Quick Female	1
5	11424	End – Hose	2
6	29782	Adapter – Elbow 45°	1
7	29781	Tee – Swivel Nut	1
8	310650	Valve – Control	1
9	56508	Fitting – Hose Reusable	2
10	29753	Adapter – Connector	2

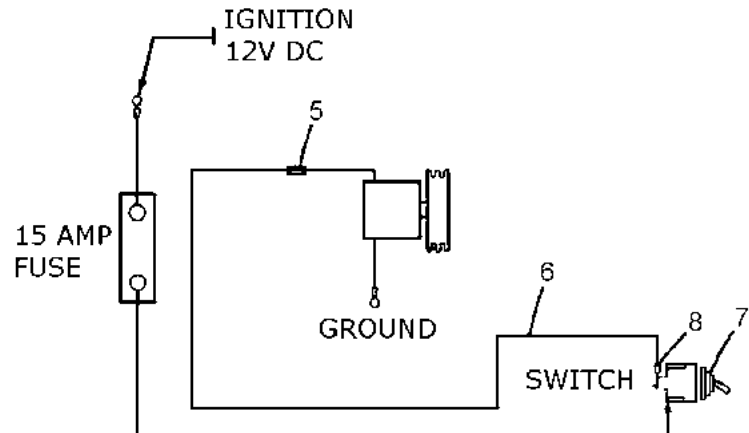
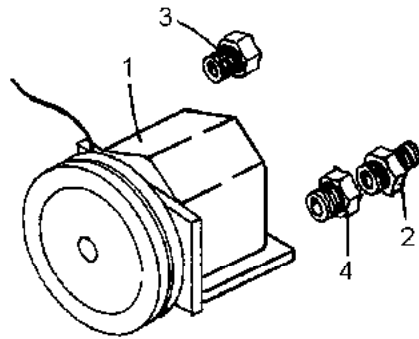
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
11	29771	Adapter – Connector	2
12	99384	Hose Assy	1
13	56485	End – Hose 90°	2
14	31598	Fitting – Hose Reusable	2
15	31599	Fitting – Hose Reusable	4
16	40008	Disconnect – Quick Male	2
17	40009	Disconnect – Quick Female	2
18	23184-144	Hose	AR
	* 6335	Clamp – Hose	AR
19	56459-120	Hose	AR
20	56453-416	Hose – Cut to Length	AR
21	16529-336	Hose	AR
	* 22381	Clamp – Hose	AR
22	30743	Filter – Oil	1
	39934	Filter	1
	43534	Indicator – Service	1
23	11436	Tank – Hydraulic	1
	* 87349	Cap – Filler	1
	* 6033	Plug – Pipe	1
24	22155	Valve – Gate	1
25	6026	Nipple – Pipe	1
26	6020	Tee – Pipe	1
27	34777	Nipple – Pipe	1
28	29764	Adapter – Elbow 90°	2
29	29808	Adapter – Connector	1
30	29767	Adapter – Connector	1
31		Motor – Hydraulic, See Dual Hydraulic Drive	2
32	16362	Nipple – Pipe	1
33	16276	Coupling	1

* - Not Shown AR - As Required

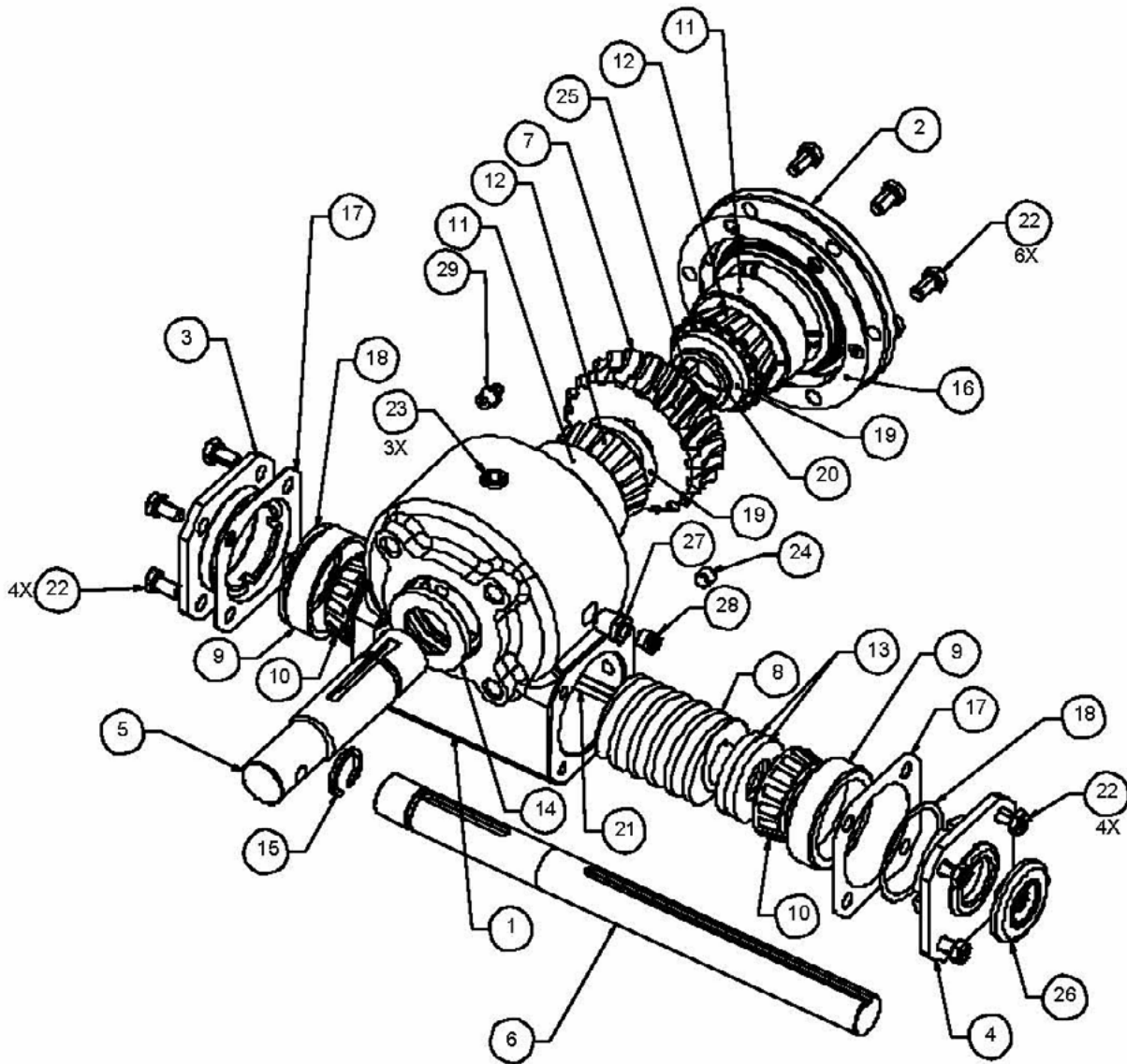


<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
	11756	Hardware – Kit	
1	2211	Key – Square, 1/4 x 1	1
2	20748	Screw – Set	2
3	5649	U-Joint	1
4	6122	Pin – Shear	1
5	20817	Pin – Cotter	1
6	17932	Shaft – Drive	1
7	2655	U-Joint	1
	6069	Zerk – Grease	1
	2776	Key – Square 1/4 x 4	1
8	20069	Cap Screw – 3/8 x 1 1/2	4
	20712	Washer – Lock 3/8	4
	20644	Nut – Hex 3/8	4
	20129	Cap Screw – 1/2 x 1-1/2	4
	20714	Washer – Lock 1/2	4
	20646	Nut – Hex 1/2	4
9	22337	Mount – Pump Wldmt	1
10	11427	Pump – Hydraulic Assy	1
	29363	Repair – Kit, Pump 11427	1
11	29772	Adapter	1
12	14378	Adapter	1
13	6026	Nipple – Close	1
14	42233	Elbow – Reducing	1

* - Not Shown

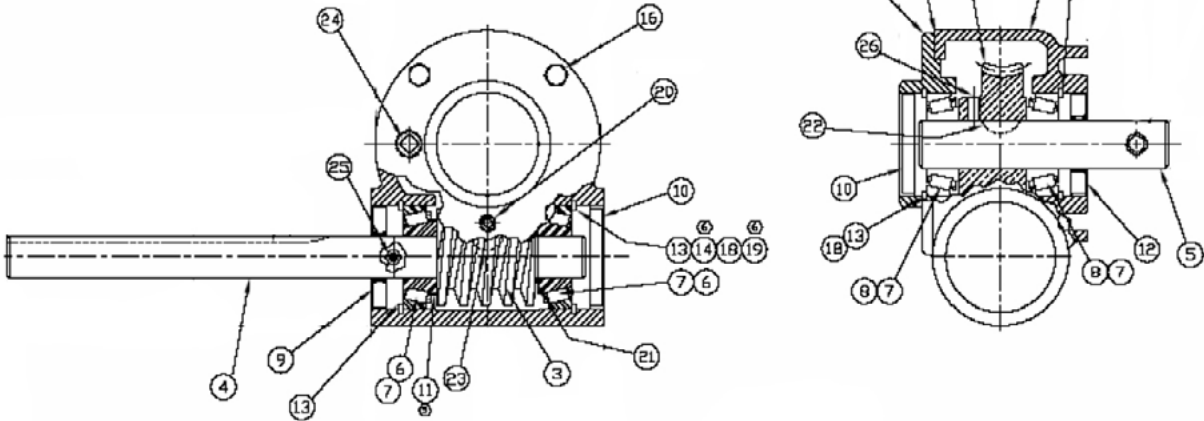


<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	71196	Pump – Kit Elec. Clutch for Dual Hydraulics	
	34568	Pump – Hydraulic Assy for Single Hyd.	1
	34569	Pump – Hydraulic Assy for Dual Hyd.	1
	34576	Pump – Hydraulic, Single Hydraulics	1
	34577	Pump – Hydraulic, Dual Hydraulics	1
	34563	Seal Kit – Elec. Clutch Pumps	1
	34570	Clutch – Electric Assy	1
	34571	Bracket – Mounting	1
2	29808	Adapter – Single Hydraulics	1
3	22017	Adapter – Single Hydraulics	1
	29835	Adapter – Dual Hydraulics	1
4	22021	Adapter – Single Hydraulics	1
	22018	Adapter – Dual Hydraulics	1
5	6549	Connector	1
6	21580	Wire – Electric, Specify Length	1
7	21681	Switch	1
8	21679	Terminal	1



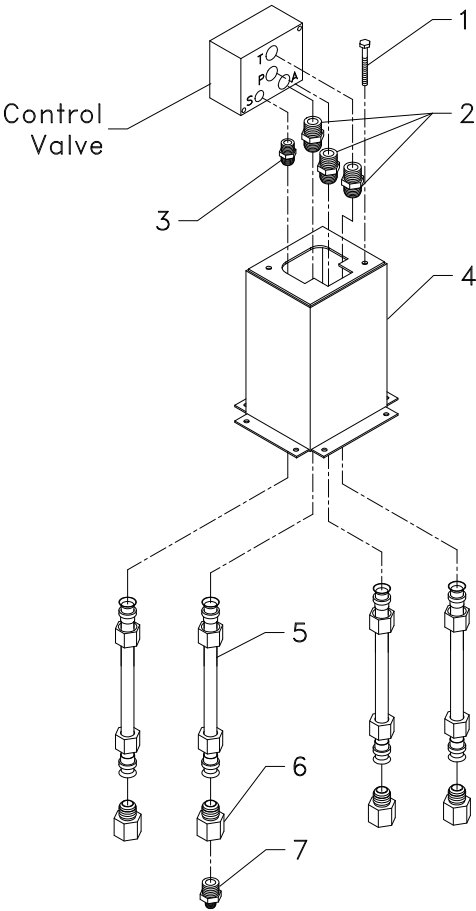
ITEM	PART NO.	DESCRIPTION	QTY
	11428	Gear Case – Conveyor, Hydraulic Drive	
	27118	Gear Case – Conveyor, Engine Drive	
1	27118-SB	27119 Housing	1
2	27118-SC	22824 Cover	1
3	27118-SD	19404 End Cap	AR
4	27118-SE	22832 End car, Thru	1
5	27118-SF	27176 Shaft, Output	1
6	27118-SG	27175 Shaft, Input	1
		11429 Shaft, Input, Hydraulic Drive	
7	27118-SH	27172 Gear, Wheel , LH	1
		30742 Screw - Set	1
8	27118-SI	26809 Gear, Worm, LH	1
9	27118-SJ	24225 Bearing, Input Cup	2
10	27118-SK	24230 Bearing, Input Cone	2
11	27118-SL	24225 Bearing, Output Cup	2
12	27118-SM	27170 Bearing, Output Cone	2
13	27118-SN	27171 Seal, Input	2
14	27118-SO	27171 Seal, Output	1
15	27118-SP	6089 Retaining Ring, Input	1
16	27118-SQ	22834 Gasket, Cover	1
17	27118-SR	22834 Gasket, Input	2
18	27118-SS	19407 Shim, Input	AR
19	27118-ST	19407 Shim, Output	AR
20	27118-SU	22832 Retaining Ring, Output	1
21	6136	24234 Key, Input 1/4 x 1/4 x 2	1
22	27118-SV	20065 Hex Cap Screw 5/16-18 x 5/8	AR
23	6031	Plug, 3/8-18 NPT	3
24	21835	Plug, 1/8-27 NPT	1
25	27118-SW	22798 Key, Output 1/4 x 1/4 x 2	1
26	27118-SX	24232 String, Guard	1
27	27465	Bushing, 3/8 x 1/8	1
28	27118-SY	42787 5-PSI Relief Plug	1
29	6069	6072 Grease Zerk, 1/8-27 NPT	1
30	27118-SZ	Oil, EP 85W140	Ounces 12oz

AR - As Required



ITEM	PART NO.	DESCRIPTION	QTY
	11428	Gear Case – Conveyor, Hydraulic Drive	
	27118	Gear Case – Conveyor, Engine Drive	
1	27119	Housing	1
2	27172	Gear, Wheel , LH	1
3	26809	Gear, Worm, LH	1
4	27175	Shaft, Input	1
	11429	Shaft, Input, Hydraulic Drive	
5	27176	Shaft, Output	1
6	24230	Bearing, Input Cone	2
7	24225	Bearing, Output Cup	4
8	27170	Bearing, Output Cone	2
9	24232	Key, Input 1/4 x 1/4 x 2	1
10	22839	Cap - End	2
11	96122	Ring	1
12	27171	Seal - Oil	1
13	22832	Ring - Snap	4
14	19407-X1	Shim	1
15	22824	Cover	1
16	20065	Cap Screw - 3/8-16NC x 3/4	4
17	22834	Gasket - Cover	1
18	19407	Shim	AR
19	19407-X2	Shim	AR
	19407	Shim	AR
20	6029	Plug - Pipe 1/8 NPT	1
	6031	Plug - Pipe 3/8NPT Hydraulic Drive	1
21	6089	Ring - Snap 1"	1
22	22798	Key - Woodruff	1
23	24234	Key - Woodruff	1
24	3014	Plug - Vent	1
25	6072	Zerk - Grease	1
26	22837	Set - Screw	1
27	----	Plug - Ball	1
28	----	Plug - Pipe	2
29	----	Plug - Pipe	4

AR - As Required

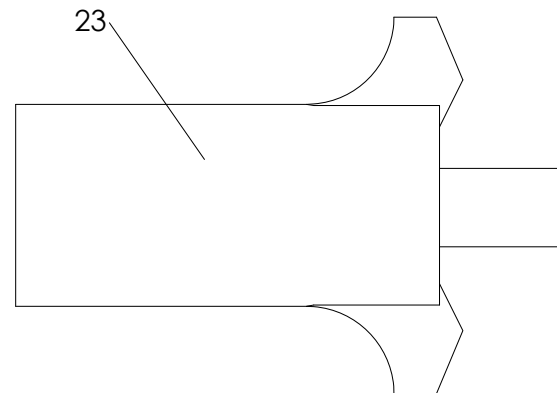
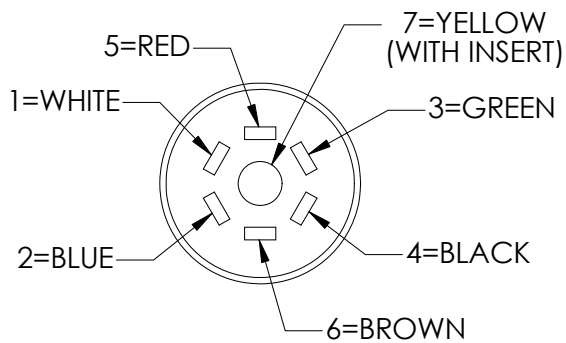
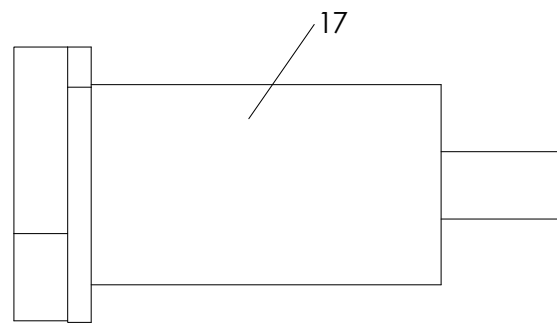
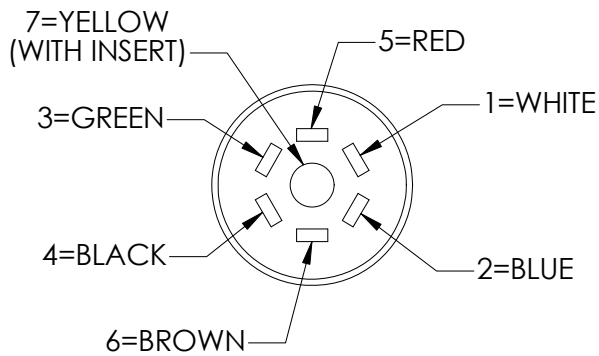
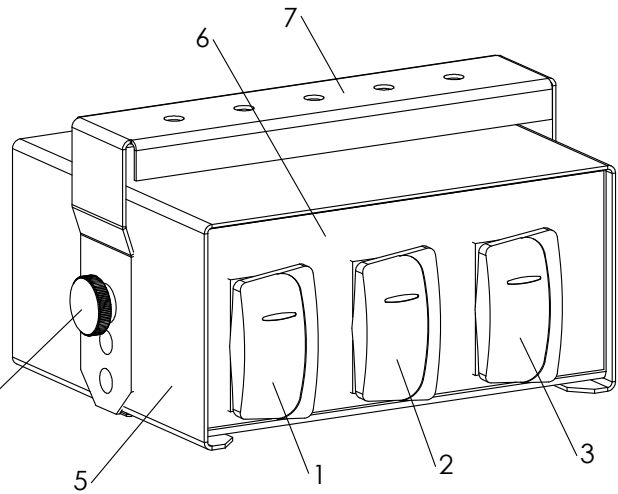
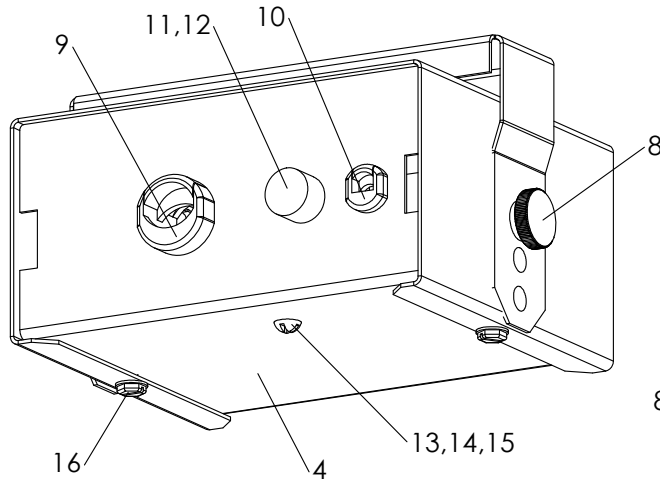


<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	20013	Cap Screw – 1/4 x 3	2
2	29752	Adapter	3
3	29784	Adapter	1
4	36803	Mount – Valve Wldmt	1
5	36800	Tube – Hydraulic	4
6	29799	Adapter – Bushing	4
7	29808	Adapter	1

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	* 18738	Light – Kit Warning Red	1
2	* 79881	Light – Kit Warning Amber	1

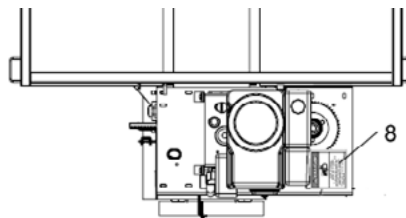
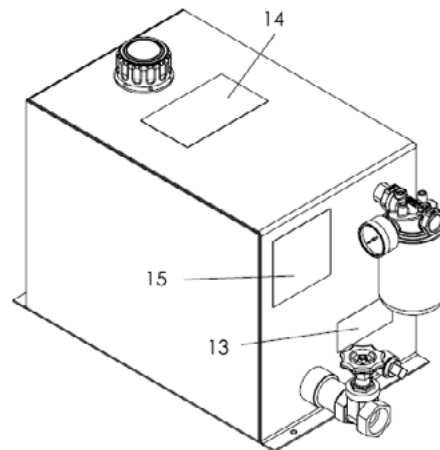
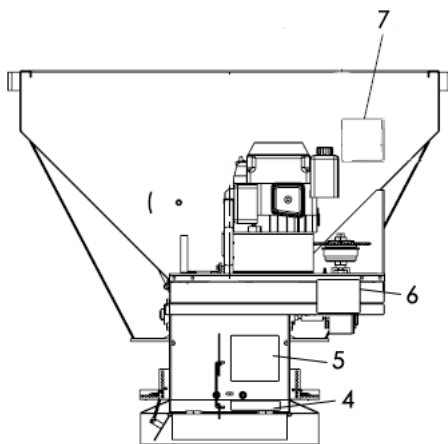
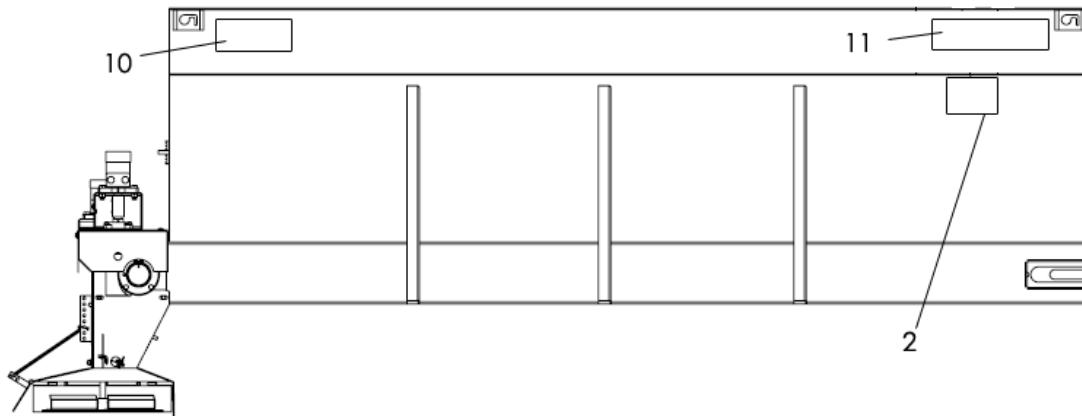
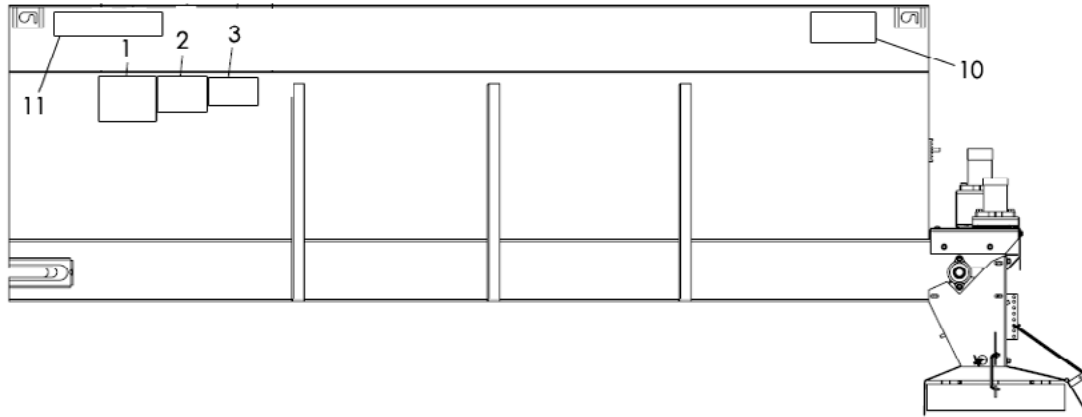
* - Not Shown

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



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
	301929	Control Panel – Rear with Choke Light, Includes 1-19	
	* 99818	Control Panel – Kit Plug Mounting, Includes 20-22	
	* 303019	Loom – Assy 12' Extension w/ Choke Lt.	1
1	99495	Switch – Rocker Double Pole	1
2	301933	Switch – Rocker Double Pole	1
3	99493	Switch – Rocker	1
4	303025	Panel – Front	1
5	303026	Cover – Wldmt Panel	1
6	303023	Decal – Control Panel	1
7	303028	Bracket – Mount	1
8	99507	Knob Assy	2
9	99490	Bushing - .56	1
10	99491	Bushing - .27	1
11	99492	Holder – Fuse	1
12	99676	Fuse – 10 Amp	1
13	20570	Screw – Round Head	1
14	99677	Washer – Star	1
15	20641	Nut – Hex #10	2
16	87340	Screw – Self Tapping	2
17	301927	Cable – Assy Control Panel	1
18	* 301949	Harness – Assy	1
19	* 99557	Cable – Assy	1
20	* 99720	Bracket – Mounting	1
21	* 20570	Screw – Round Head	4
22	* 20641	Nut – Hex #10	4
23	301922	Harness – Assy Honda Engine	1
	301923	Harness – Assy B&S Engine	1

* - Not Shown



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	150034	Decal – Caution Improper Operation	1
2	364	Decal – Warning Stay Out of Box	2
3	321	Decal – Caution Material to be Spread	1
4	55630	Decal – Falling Hazard	1
5	83649	Decal – Warning Flying Material	1
6	55631	Decal – Warning Guard for Protection	1
7	363	Decal – Warning Fire Hazard	1
8	55224	Decal – Danger Guard Missing	1
9	*79692	Decal – Warning Moving Part Hazard (Engine Hood)	1
10	83628	Decal – Hi-Way	2
11	23228	Decal – Model P	2
12	* 39138	Decal – Warning High Pressure Fluid (Unit Rear)	1
13	8664	Decal – Caution Keep Valve Open	1
14	8665	Decal – Caution Hydraulic Oil Only	1
15	39378	Decal – Oil Filter	1
16	* 42791	Tag – Important Plug Removal	1

* - Not Shown See *Engine Hood* parts list for more decals