

Art's Way

Since 1956



Art's-Way Manufacturing Co., Inc.

Model 6812D
Sugar Beet Harvester

Operator's Manual
599500

Issued August 2014



This symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED. The message that follows the symbol contains important information about your safety. Carefully read the message. Make sure you fully understand the causes of possible injury or death.

IF THIS MACHINE IS USED BY AN EMPLOYEE, IS LOANED, OR IS RENTED, MAKE SURE THAT THE OPERATOR UNDERSTANDS THE TWO INSTRUCTIONS BELOW.

BEFORE THE OPERATOR STARTS THE ENGINE:

GIVE INSTRUCTIONS TO THE OPERATOR ON SAFE AND CORRECT USE OF THE MACHINE.

MAKE SURE THE OPERATOR READS AND UNDERSTANDS THE OPERATOR'S MANUAL FOR THIS MACHINE.

 **WARNING**

IMPROPER OPERATION OF THIS MACHINE CAN CAUSE INJURY OR DEATH.

BEFORE STARTING THE ENGINE, DO THE FOLLOWING:

1. READ THE OPERATOR'S MANUAL.
2. READ ALL SAFETY DECALS ON THE MACHINE.
3. CLEAR THE AREA OF OTHER PERSONS.
4. LEARN AND PRACTICE SAFE USE OF MACHINE CONTROLS IN A SAFE AND CLEAR AREA BEFORE YOU OPERATE THIS MACHINE ON A JOB SITE.

It is your responsibility to observe pertinent laws and regulations and to follow manufacturer's instructions on machine operation and maintenance.

See your Authorized Art's-Way Manufacturing Co., Inc. dealer or Art's-Way Manufacturing Co., Inc. for additional operator's manuals, illustrated parts catalogs, and service manuals.

TO THE OWNER

Congratulations on the purchase of your new Art's-Way Sugar Beet Harvester. You have selected a top quality machine that is designed and built with pride to ensure you have many years of efficient and reliable service.

Many people have worked on the design, production, and delivery of this Sugar Beet Harvester. The information in this manual is based on the knowledge, study, and experience through years of specializing in the manufacturing of farm machinery. This manual is designed to provide you with important information regarding safety, maintenance, and machine operation so you can and will get the best possible performance from your Sugar Beet Harvester.

Even if you are an experienced operator of this or similar equipment, we ask that you read this manual before operating this Sugar Beet Harvester. The way you operate, adjust, and maintain this unit will have much to do with its successful performance. Any further questions you may have about this product of Art's-Way equipment should be directed to your local Art's-Way dealer or to Art's-Way Manufacturing Co., Inc., Armstrong, Iowa, 50514, (712) 864-3131.

SPECIFICATIONS AND DESIGN ARE SUBJECT TO CHANGE WITHOUT NOTICE

Art's-Way Manufacturing Co., Inc. is continually making product improvements. In doing so, we reserve the right to make changes and/or add improvements to our products without obligation for the equipment previously sold.

Modifications to this Sugar Beet Harvester may affect the performance, function, and safety of its operation. Therefore, no modifications are to be made without the written permission of Art's-Way Manufacturing Co., Inc. Any modification made without the written permission of Art's-Way Manufacturing Co., Inc. shall void the warranty of this product.

In the interest of continued safe operation of this Sugar Beet Harvester, pay particular attention to the safety alert symbol(s) throughout this manual.

Art's-Way Manufacturing Co., Inc. STATEMENT OF PRODUCT LIABILITY

Art's-Way Manufacturing Co., Inc. recognizes its responsibility to provide customers with a safe and efficient product. Art's-Way Manufacturing Co., Inc., attempts to design and manufacture its products in accordance with all accepted engineering practices effective at the date of design. This statement should not be interpreted to mean that our products will protect against the user's own carelessness or failure to follow common safety practices nor will Art's-Way Manufacturing Co., Inc., be liable for any such act. In addition, Art's-Way Manufacturing Co., Inc., assumes no liability for any altered product or any modified product by users or anyone other than an authorized dealer.

IMPORTANT WARRANTY INFORMATION

The warranty for this Sugar Beet Harvester appears on page 6 of this manual. In order to establish proper warranty registration, the Warranty Registration must be completed and returned to the factory. Failure to comply with this requirement may result in reduced warranty allowances.

LIMITATIONS OF THIS MANUAL

This manual contains operating instructions for your 6812D Sugar Beet Harvester only. Any mention of other machinery in this manual other than the 6812D Sugar Beet Harvester is for reference only. This manual does not replace nor is it to be used for any machinery that may be attached to or used in conjunction with the 6812D Sugar Beet Harvester.

PARTS & SERVICE

As the purchaser of your new harvester, it is very important to consider the following factors:

A. Original Quality

B. Availability of Service Parts

C. Availability of Adequate Service Facilities

Art's-Way Manufacturing Co., Inc. has an excellent dealership network ready to answer any questions you may have about your harvester. Parts for your machine may be ordered through our dealers. When placing a parts order, please have the **model** and **serial number** ready. This will allow the dealer to fill your order as quickly as possible.

For your convenience, we have provided this space for you to record your model number, serial number, and the date of purchase, as well as your dealer's name and address.



Location of Serial & Model Number Placard on Header



Serial and Model Number Placard

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LIMITED WARRANTY

Art's-Way Manufacturing Co., Inc. warrants the products it sells to be free from defects in material and workmanship for a period of one (1) season after the date of delivery to the first (original) purchaser, subject to the following conditions:

Art's-Way Manufacturing Co., Inc. obligation and liability under this warranty is to repair or replace (at the company's option) any parts that upon manufacture were defective in material or workmanship.

All parts and repairs under this warranty shall be supplied at Art's-Way Manufacturing Co., Inc. or an authorized Art's-Way Manufacturing Co., Inc. dealer, at the option of Art's-Way Manufacturing Co., Inc.

Art's-Way Manufacturing Co., Inc. warranty does not extend to parts and elements not manufactured by Art's-Way Manufacturing Co., Inc. and which carry the warranty of other manufacturers.

Transportation or shipping to an authorized dealer for necessary repairs is at the expense of the purchaser.

Art's-Way Manufacturing Co., Inc. makes no other warranty expressed or implied and makes no warranty of merchantability or fitness for any particular purpose beyond that expressly stated in this warranty. Art's-Way Manufacturing Co., Inc. liability is limited to the terms set forth in this warranty and does not include any liability for direct, indirect, incidental or consequential damages or expenses of delay and the company's liability is limited to repair or replacement of defective parts as set forth herein.

Any improper use and/or maintenance, including operation after discovery of defective or worn parts, operation beyond the rated capacity, substitution of parts not approved by Art's-Way Manufacturing Co., Inc., or any alternation or repair by other than an authorized Art's-Way Manufacturing Co., Inc. dealer which affects the product materially and adversely, shall void the warranty.

No dealer, employee or representative is authorized to change this warranty in any way or grant any other warranty unless such change is made in writing and signed by an officer of Art's-Way Manufacturing Co., Inc.

Some states do not allow limitations on how long an implied warranty lasts or exclusions of, or limitations on relief such as incidental or consequential damages, so the above limitations or exclusions may not apply to you. This warranty gives you the specific legal rights and you may have other rights that vary from state to state.

SAFETY FIRST

SAFETY INSTRUCTIONS

“A careful operator is the best insurance against an accident.” Quote from the National Safety Council.

Most accidents can be prevented if the operator:

1. Fully understands how the machine functions.
2. Can anticipate situations which may produce problems.
3. Can make necessary corrections before problems develop.

**THIS SYMBOL MEANS ATTENTION!
BECOME ALERT!
YOUR SAFETY IS INVOLVED!**



- Universal Safety Alert Symbol

The American Society of Agricultural Engineers has adopted the Universal Safety Alert Symbol as a way to identify areas of potential danger if the equipment is not operated correctly. Please be alert whenever you see this symbol in the manuals or on your harvester.

Art's-Way Manufacturing Co., Inc. strives to make our equipment as safe as possible. The Art's-Way 6812D Sugar Beet Harvester conforms to applicable safety standards at the time of manufacturing. A safety conscious equipment operator makes an effective accident-prevention program complete.

Safety features and instructions for the harvester are detailed in the Safety Guidelines section of this Operator's Manual. It is the responsibility of the owner to ensure that all operators read and understand the manual before they are allowed to operate the beet harvester. (Occupational Safety and Health Administration (OSHA) regulations 1928.57).

NOTICES OF DANGER, WARNING, AND CAUTION

Signal Words: Note the use of signal words **DANGER**, **WARNING**, and **CAUTION** on the harvester and in this manual. The appropriate signal word for each has been selected using the following guidelines:

⚠ DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

SAFETY INSTRUCTIONS

Safety instructions (or equivalent) signs indicate specific safety-related instructions or procedures.

Note: Contains additional information important to a procedure and will be found within the regular text body of this manual.

SAFETY INSTRUCTIONS

GENERAL

Most work related accidents are caused by failure to observe basic safety rules or precautions. An accident can often be avoided by recognizing potentially hazardous situations before an accident occurs. As you operate and maintain the beet harvester you must be alert to potential hazards. You should also have the necessary training, skills, and tools to perform any assembly procedure.

Improper operation and/or maintenance of this unit could cause a dangerous situation that results in injury or death.

Do not use this unit until you read and understand the information contained in this manual. Do not use this equipment for anything other than its intended purpose.



Safety precautions and warnings are provided in this manual and on the unit. If these hazard warnings are not heeded, bodily injury or death could occur to you or to other persons.

Art's-Way Manufacturing Co., Inc. cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this manual and on the product are, therefore, not all-inclusive. If a method of operation not specifically recommended by us is used, you must satisfy yourself that it is safe for you and for others. You should also ensure that the unit will not be damaged or be made unsafe by the methods that you choose.

The information, specifications, and illustrations in this manual are based on the information that was available at the time this material was written and can change at any time.

Safety Alert Symbols



death.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or

This manual contains DANGERS, WARNINGS, CAUTIONS, NOTICES, SAFETY INSTRUCTIONS, and NOTES which must be followed to prevent the possibility of improper service, damage to the equipment, personal injury, or death. The following key words call the readers attention to potential hazards.

Hazards are identified by the "Safety Alert Symbol" and followed by a signal word such as "DANGER", "WARNING", or "CAUTION".

**SAFETY
INSTRUCTIONS**

**Remember:
"The Best Operator is a Safe Operator"**

CAUTION



Read and understand the operator's manual and all the safety decals before operating the harvester. Review all safety instructions with all operators annually.

BEFORE OPERATING

SAFETY
INSTRUCTIONS

Do not wear loose fitting clothing as it may catch in moving parts.



Make sure all guards and shields are installed, including the tractor power take-off (PTO) master shield, before starting or operating the harvester.



Be sure that the correct implement driveline parts are used and that they are properly secured.

Lower the lifter wheels when the harvester is not in use.

Install safety chain when attaching the harvester to the tractor.



Clear the area of bystanders, especially children, when making repairs, adjustments, or performing maintenance on the harvester.



Do not allow riders.

Put all tractor and machine controls in “neutral” and disengage the PTO before starting. Follow the starting instructions according to the OEM tractor manual.



Operate the harvester only while seated on the tractor seat.



Make sure the unit is adequately supported with safety blocks or safety stands when changing tires or performing maintenance.

DURING OPERATION

CAUTION



Entanglement Hazard
Keep hands, feet, hair, and clothing away from moving parts. Wait for all movement to stop before approaching equipment.

Before making adjustments:

1. Shut off the tractor,
2. Set parking brake,
3. Put machine in neutral, and
4. Remove key while making adjustments.



Keep all shields and guards in place and in good working condition.



Keep all bystanders, especially children, away from the harvester while in operation.



Do not allow riders while the harvester is in operation.



Do not attempt to unclog, clean, or adjust the harvester while it is running.



Stay away from overhead power lines. Electrocutation can occur even without direct contact.



Keep all hydraulic lines, fittings, and couplers tight and free of leaks. (Refer to Safety Guidelines – Hydraulic Safety).



Use caution when ascending or descending on the harvester. Wet shoes or boots are slippery.

MAINTENANCE SAFETY

SAFETY
INSTRUCTIONS

Follow all operating, maintenance, and safety instructions found in this Manual.



Before servicing, adjusting, repairing, or unclogging the machine, always make sure the tractor engine is stopped,

key in your pocket, the machine is lowered to the ground, all controls are placed in neutral, the parking brake is set, and all the moving parts have stopped.



Use sufficient tools, jacks, and hoists that have the capacity for the job.



Use support blocks or safety stands when changing tires or performing maintenance.



Follow good shop practices of keeping the service area clean and dry, and use adequate light for the job at hand.



Before applying pressure to the hydraulic system, make sure all lines, fittings, and couplers are tightly secured and in good condition.



Make sure all shields/guards are in place and properly secured when performing maintenance.

HYDRAULIC SAFETY

SAFETY INSTRUCTIONS

Follow all operating, maintenance, and safety instructions found in this Manual.

Make sure components in the hydraulic system are kept clean and in good working condition.



Relieve pressure from the hydraulic system before servicing or disconnecting from the tractor.



Keep all hydraulic lines, fittings, and couplers tightly secured and free of leaks.



Replace any worn, cut, abraded, flattened, or crimped hoses.



Do not make any temporary repairs to the hydraulic lines, fittings, or hoses using tape, clamps, or cement. The hydraulic system operates under extremely high pressure and temporary repairs may fail suddenly and create a hazardous/dangerous situation.



Wear proper hand and eye protection when searching for a high-pressure hydraulic leak. Use a piece of wood or cardboard as a backstop instead of hands to identify and isolate a leak. If injured by a concentrated high-pressure stream of hydraulic fluid, seek medical attention immediately. Serious infection or toxic reaction can develop if hydraulic fluid penetrates the surface of the skin.



Before applying pressure to the system, make sure all components are tight and that the hydraulic lines, hoses, and couplings are not damaged.

TRANSPORTATION SAFETY

SAFETY INSTRUCTIONS

Follow all operating and safety instructions found in this manual when transporting this equipment.

Make sure the harvester complies with all local regulations regarding transporting equipment on public roads and highways.



Make sure the Slow Moving Vehicle (SMV) emblem and all lights and reflectors required by local highway and transportation authorities are properly in place, clean, and clearly visible to traffic.



Do not allow riders on any machinery during transport.

Make sure the harvester is securely attached to the tractor and install a safety chain to the harvester.

Make sure the tractor brake pedals are latched together.

Do not exceed 20 mph (32 km/h) when transporting the harvester. Always reduce speed on rough roads and surfaces, or when going down inclines.

Use caution when turning and always use the turn signals on the tractor to indicate your turning intentions to the other traffic.

The weight of the trailed machine should NEVER exceed the weight of the towing vehicle.

Check all clearances carefully whenever the machine is towed.

Lower the elevator into the transport position before transporting the harvester on the highway.



Stay away from overhead obstructions and power lines during transport. Electrocutation can occur even without direct contact.

STORAGE SAFETY

SAFETY INSTRUCTIONS

Follow all operating and safety instructions found in this manual when storing this equipment.



Store the harvester in an area away from human activity.



Do not permit children to play on or around the stored machine at any time.

Make sure that the harvester is stored in an area with a firm and level base to prevent the machine from tipping or sinking into the ground.



Block the wheels to prevent the machine from rolling.

TIRE SAFETY**SAFETY
INSTRUCTIONS**

Follow all operating and safety instructions found in this manual when working around tires.

Have only a qualified tire dealer or tire repair service perform tire repairs.

Do not attempt to install a tire on a wheel or rim unless you have the proper equipment and experience to do the job.

Do not substitute tires with a lesser road rating and/or capacity for the original equipment tires.

WARNING

Explosive Force Hazard
Tire replacement, repair, and/or maintenance should be done by a qualified tire dealer or qualified repair service.

Failure to follow proper procedures when installing a tire on a wheel or rim can produce an explosive force that will result in serious injury or death.

Do not attempt to install a tire without proper equipment and experience to perform the job.

ASSEMBLY SAFETY**SAFETY
INSTRUCTIONS**

Follow all assembly, operating, and safety instructions found in this manual when assembly this equipment.



Use adequate manpower to perform assembly procedures safely.

Assemble the harvester in an area with sufficient space to maneuver the largest components and allow easy access to all sides of the machine.



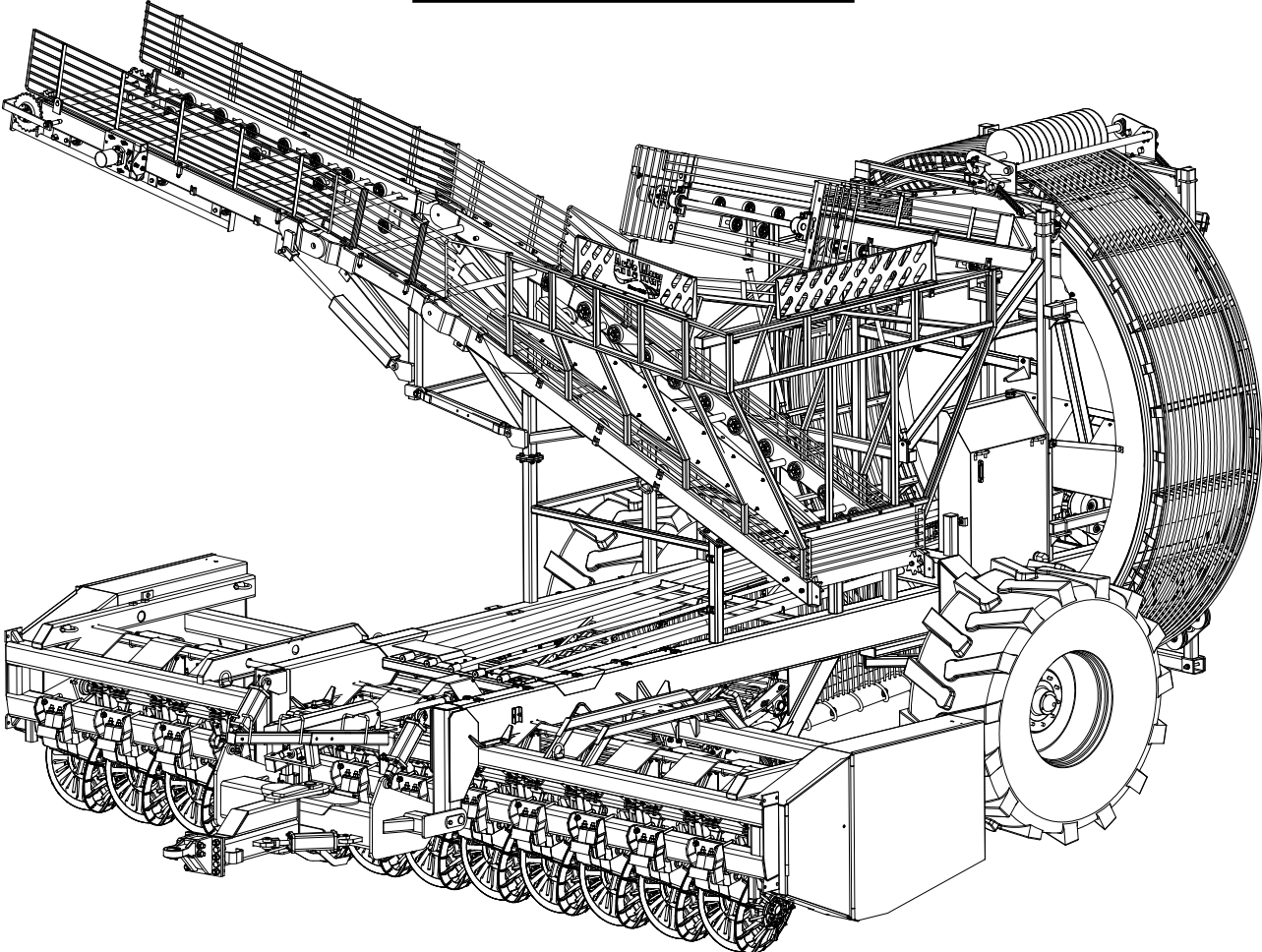
Use only forklifts, lift cranes, jacks, and tools with sufficient capacity for the loads.



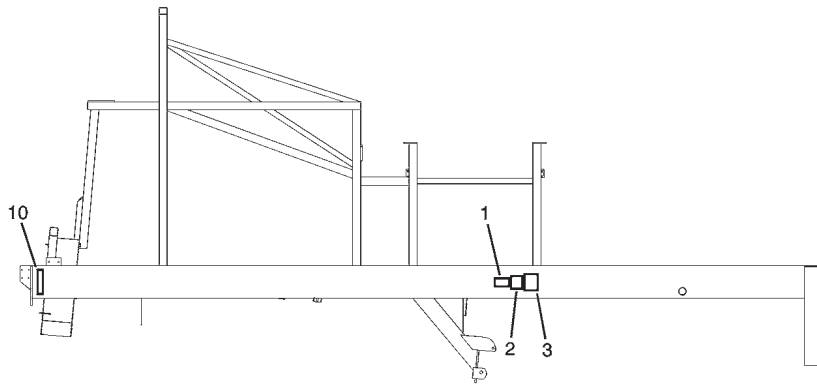
Do not allow spectators, especially children, in the working area.

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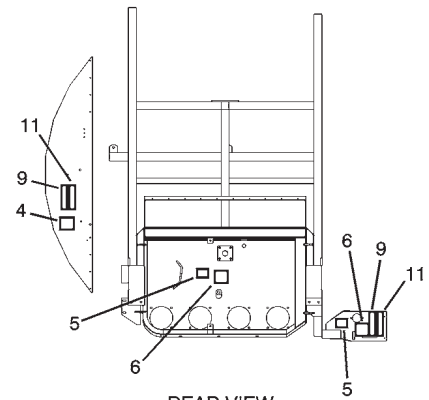
SECTION 1: HARVESTER



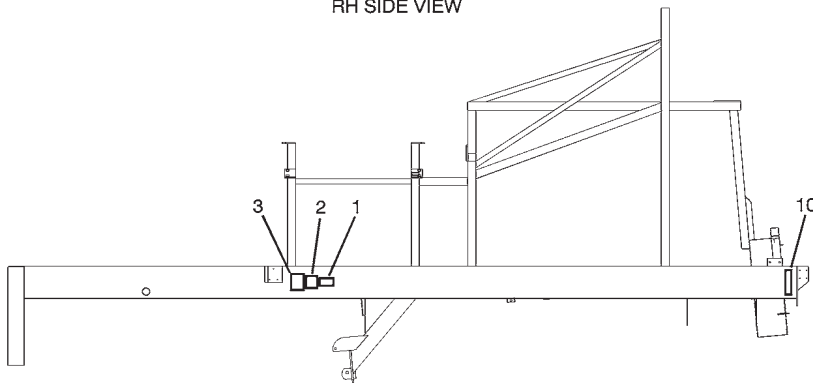
SAFETY DECALS



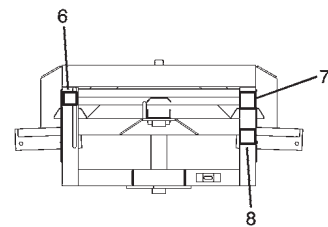
RH SIDE VIEW



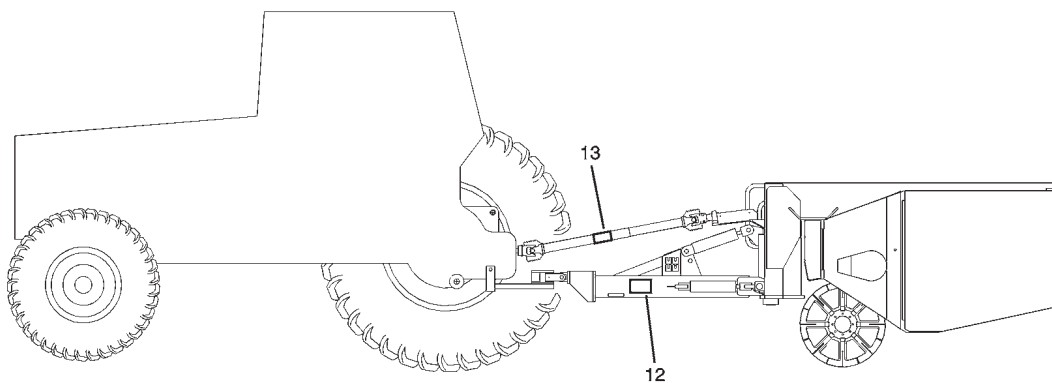
REAR VIEW

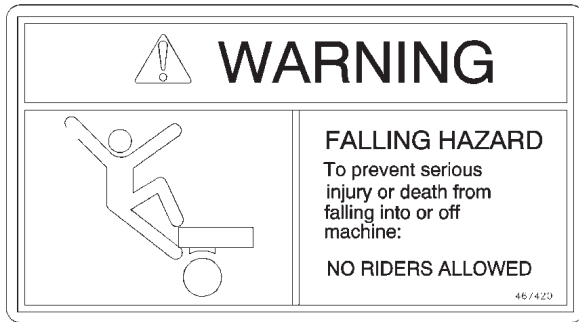


LH SIDE VIEW

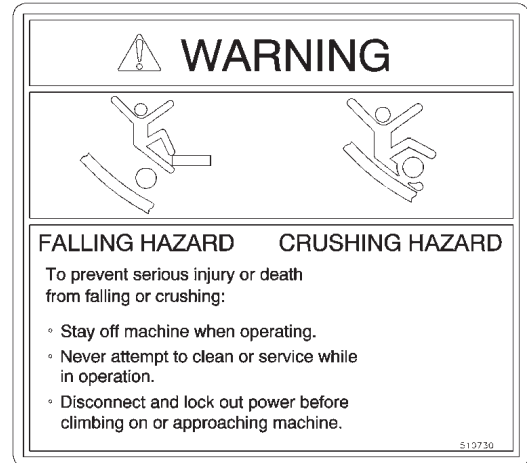


FRONT VIEW





1 P/N: 467420
Decal, Warning, No Riders/Falling Hazard



4 P/N: 510730
Decal, Warning, Falling / Crush Hazard



2 P/N: 467410
Decal, Danger Rotating Roll Hazard



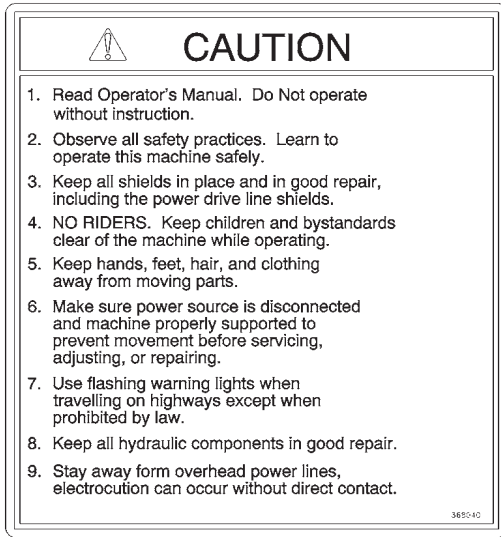
5 P/N: 467430
Decal, Danger, Shield Missing



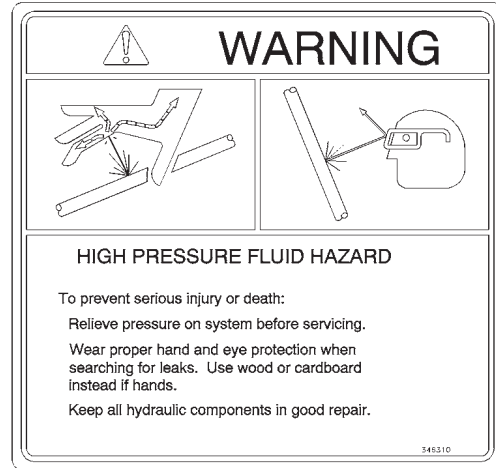
3 P/N: 467400
Decal, Warning, Thrown Object Hazard



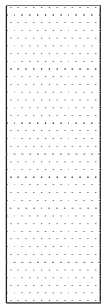
6 P/N: 467450
Decal, Warning, Moving Part Hazard



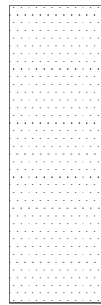
7 P/N: 368040
Decal, Caution, Safety Instructions



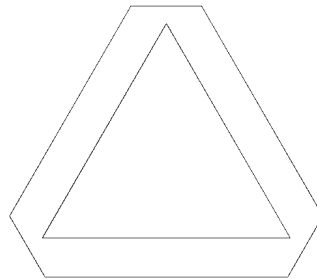
8 P/N: 366310
Decal, Warning, High Pressure Fluid Hazard



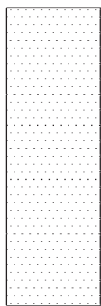
9 P/N: 476450
Tape, Red, Retro-Reflective



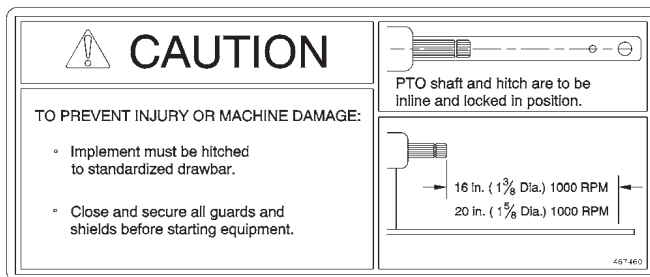
10 P/N: 476460
Tape, Yellow, Retro-Reflective



P/N: E224138
Decal-Slow Moving Vehicle Emblem



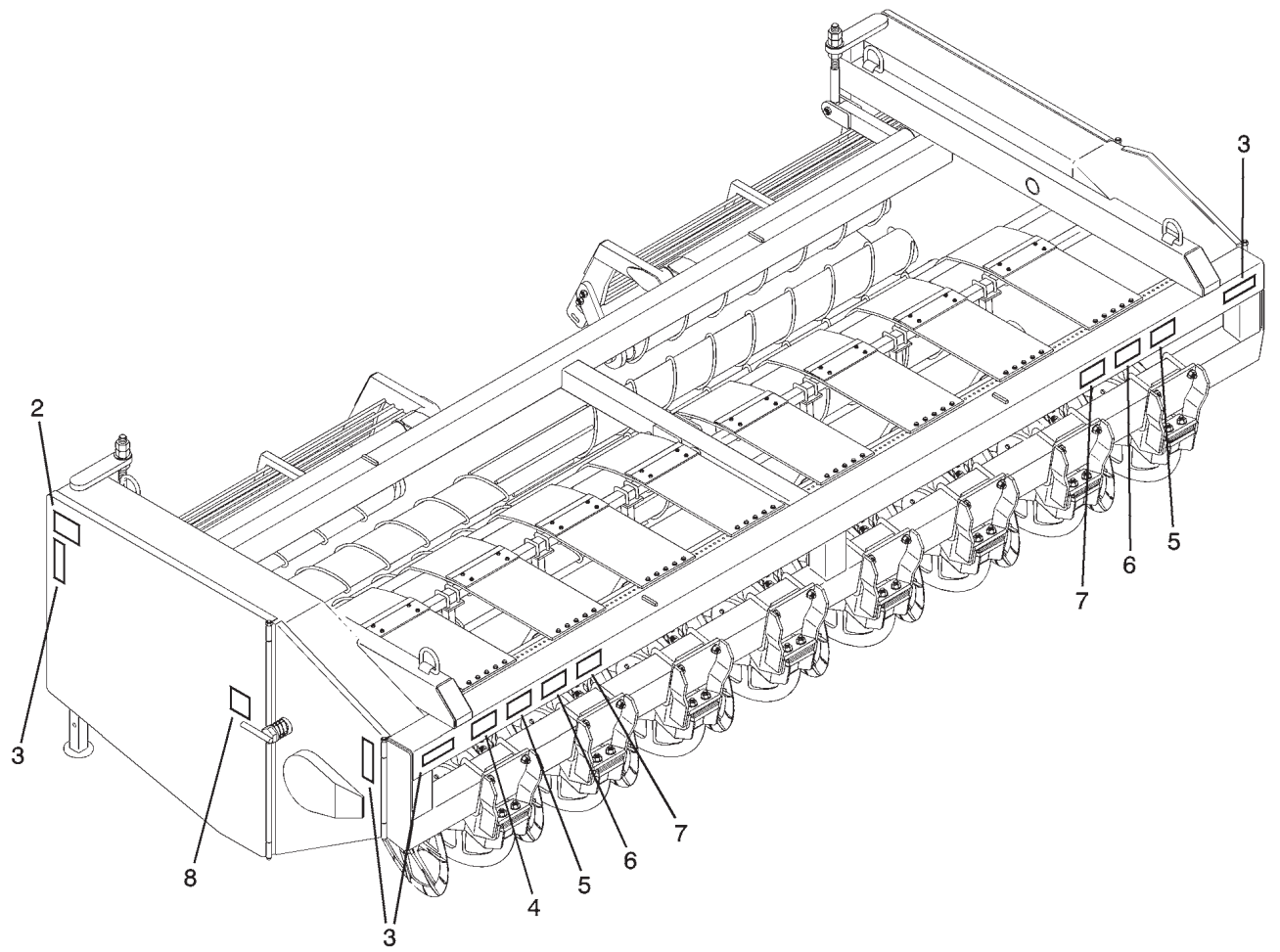
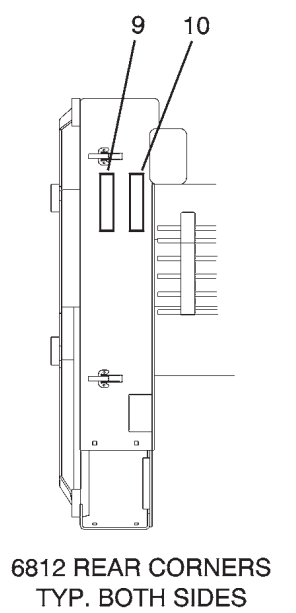
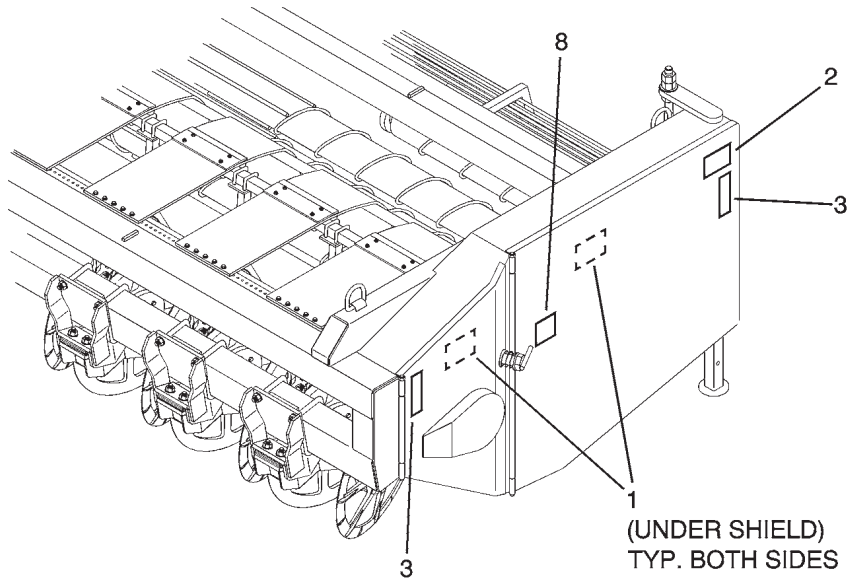
11 P/N: 476470
Tape, Red-Orange, Retro-Reflective



12 P/N: 467460
Decal, Caution, Hitch



13 P/N: 268860
Decal, Danger, Rotating Driveline (located on PTO)

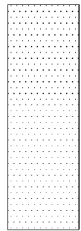




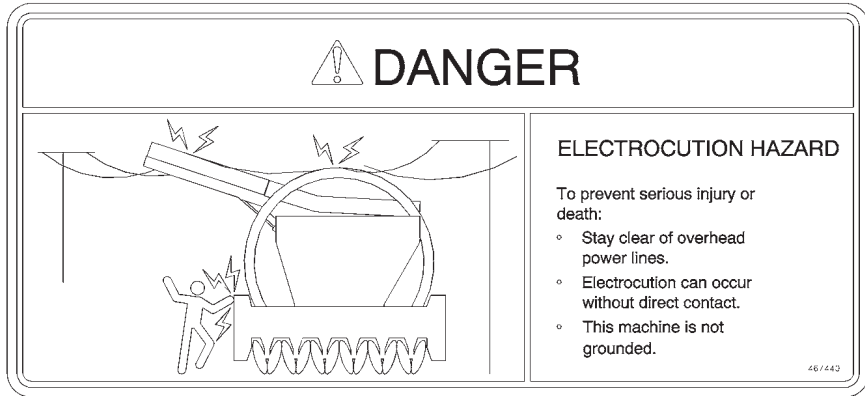
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Decal, Danger, Shield Missing



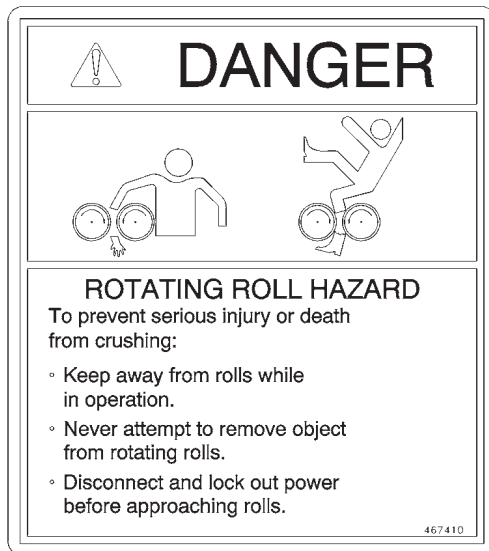
2 P/N: 467470
Decal, Warning, Overhead Hazard



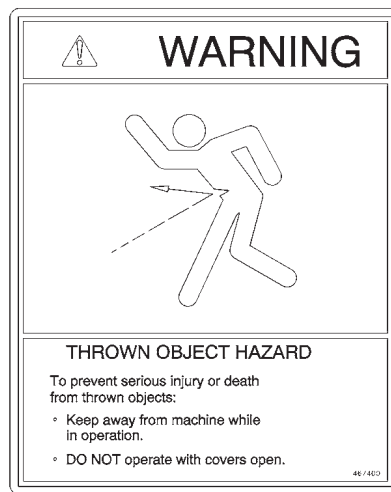
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Tape, Yellow, Retro-Reflective



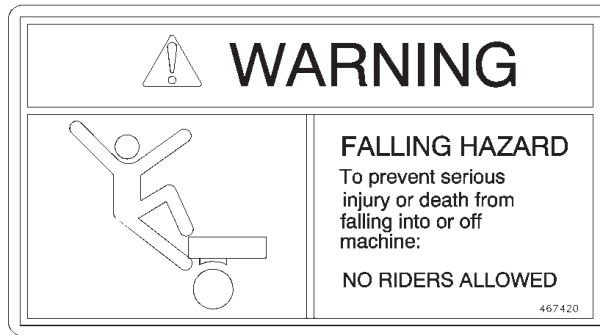
4 P/N: 467440
Tape, Danger, Electrocution



5 P/N: 467410
Decal, Danger Rotating Roll Hazard



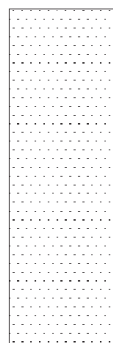
6 P/N: 467400
Decal, Warning, Thrown Object Hazard



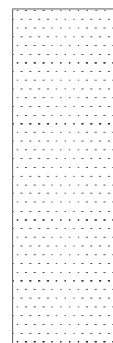
7 P/N: 467420
Decal, Warning, No Riders/Falling Hazard



8 P/N: 467450
Decal, Warning, Moving Part Hazard



9 P/N: 476450
Tape, Red, Retro-Reflective



10 P/N: 476470
Tape, Red-Orange, Fluorescent

HARVESTER OVERVIEW

This manual has been prepared to familiarize the owner/ operator with the proper assembly, operation, adjustment, service, and lubrication of the harvester. Take adequate time to better understand the efficient operation and care of your harvester. Whenever the term(s) “left-hand” and “right-hand” are used, it should be understood that this means you are standing behind the harvester and facing the direction of forward travel.



Figure 7. – 6812B Sugar Beet Harvester

BEEF FLOW HARVESTING SEQUENCE

The lifter wheels of the header (A) penetrate the soil and lift the beets upward out of the ground.

The revolving rubber paddles (B – Not Seen) located above and slightly rear of the lifter push the beets towards the header conveyor rollers. The paddles also serve to clean the beets by removing excess dirt from the beets surface.

The header conveyor rollers (C) also serve to remove dirt from the beets, as well as transfer the beets to the main harvester grabrollers. Depending upon the owner/operators preference, the first header roller can be either a star or smooth roller to match soil conditions. The diverter roller is smooth and acts as a grabroll with the rear header conveyor roll.

A short conveyor (D) located to the rear of the header serves to transfer the beets from the header to the

main harvester grabrollers (E). This short conveyor is secured to the header and is allowed to free float on the main harvester frame to allow for orientation changes between the header and main harvester frame.

The main harvester grabroller bed consists of four spiral grab rollers paired with four smooth rollers that strip dirt, soil, and trash from the beets as they are transferred to the wheel elevator (F).

The wheel elevator, set slightly lower than the main harvester grabroller bed, receives and then carries the beets to the top of the harvester. A retainer (G) holds the beets in the wheel elevator until they reach the top where the beets fall onto the holding tank conveyor (H). A stripper (I) clears the wheel elevator of any rocks or beets that may become wedged between the wheel elevator rods.

The transfer conveyor transports the beets from the wheel elevator to the holding tank.

The off-loading conveyor (K) also serves as the bottom of the holding tank. The off-loading conveyor extends up and outward to facilitate the off-loading of the beets to a truck or other appropriate vehicle.

HARVESTER STRUCTURE

The basic structure of the harvester is its frame. From the frame all of the major assemblies, such as the header, holding tank, wheels, and conveyors are attached. In its operational configuration, (i.e. the header attached and the holding tank empty) the harvester has a total weight ranging from 30,000 lbs (13,607 kg) for the 6 row 28/30 to 37,000 lbs (16,782 kg) for the 12 row 22.

The main structures of the harvester are:

- Frame
- Tongue
- Carrier wheels
- Header (4 different configurations)
 - o 6 row header – 28 or 30 inch (71.12 to 76.2cm)
 - o 8 row header – 22 inch (55.88cm)
 - o 8 row header – 28 or 30 inch (71.12 to 76.2cm)
 - o 12 row header – 22 inch (55.88cm)
- Short conveyor
- Harvester grabroll bed
- Wheel elevator
- Transfer conveyor
- Holding tank
- Off-loading conveyor/truck boom

ELECTRICAL SYSTEM

Harvester components powered by the tractor’s electrical power are:

- Road hazard lights
- Work lights
- Steerable wheel option

HYDRAULIC SYSTEM

The harvester has two hydraulic systems. The first hydraulic system is powered from the tractors hydraulic system and the second is a self-contained system powered by the harvester’s drive shaft.

HARVESTER/TRACTOR HYDRAULIC SYSTEM

Harvester components powered by the tractor’s hydraulic power are:

- Tongue lift cylinders
- Rowfinder
- Rowfinder override
- Truck conveyor motor, also powers the transfer conveyor lateral cylinder
- Truck conveyor cylinders

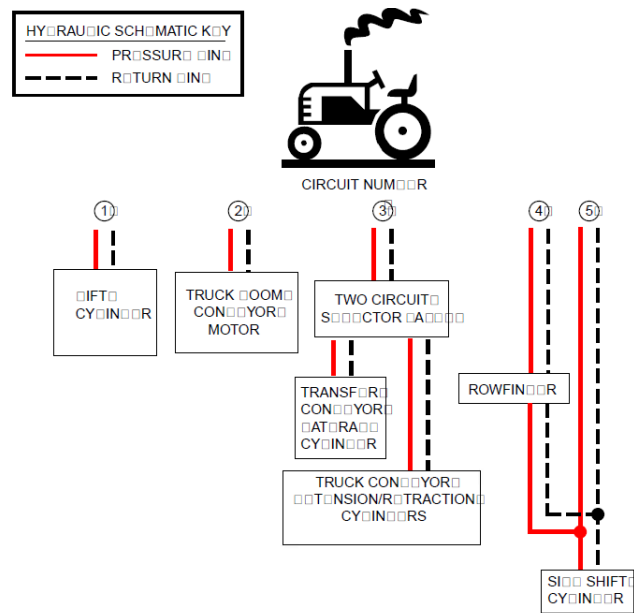


Figure 8. – Harvester/Tractor Hydraulic System

The harvester/tractor hydraulic system operates well with current tractor hydraulic systems. There are 10 hydraulic hose connections (5 circuits) between the tractor and the harvester with no hydraulic reservoir associated with this system.

NOTE: The circuit that runs the truck/tank conveyor has a high hydraulic demand. The load sense system on the tractors continually try to supply oil needed. If power beyond circuit is used for the rowfinder, it should be connected to the load sense. Contact your dealer for the best way to accomplish this.



Figure 9. – Hydraulic Connection, Needle Valve Near The Front Left Corner

The truck conveyor motor circuit has the lateral transfer conveyor tee'd into it so when the truck conveyor motor is turned off, the reverse direction moves the transfer conveyor left as the operator chooses. When the truck conveyor motor is started, the transfer conveyor moves back right at the speed controlled by the needle valve.

While the rowfinder and the steering cylinder have their own connections, both systems are connected. This allows the rowfinder to independently operate the steering cylinder, as well as allow the operator to manually adjust the steering cylinder.

The only components that operate from their own connections are the tongue lift cylinder and boom lift cylinders.

HARVESTER SELF-CONTAINED HYDRAULIC SYSTEM

Harvester components powered by the harvester's self-contained hydraulic system:

- Wheel elevator motor
- Short small conveyor motor
- Transfer conveyor belt motor

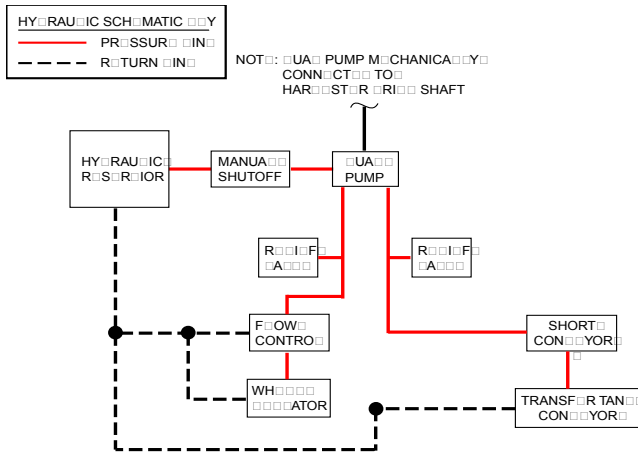


Figure 10. – Harvester Self-Contained Hydraulic
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The harvester's self-contained hydraulic system operates on a dual pump, located on the rear of the harvester and is mechanically powered by the harvester's drive shaft.

From the pump, the two pressure hoses connect to relief valves. The relief valves protect the entire self-contained system from over-pressurization. From the pressure relief valves one pressure line powers the wheel elevator motor while the other powers the short conveyor and transfer conveyor.

The pressure hose leading to the wheel elevator connects to a flow control valve. This control valve allows the operator to manually control the revolution speed of the wheel elevator.

MECHANICAL SYSTEM

DRIVE SHAFTS AND GEARBOX

The harvester's mechanical power comes from the tractor's power takeoff (PTO). The harvester's drive shaft is connected to a gearbox.

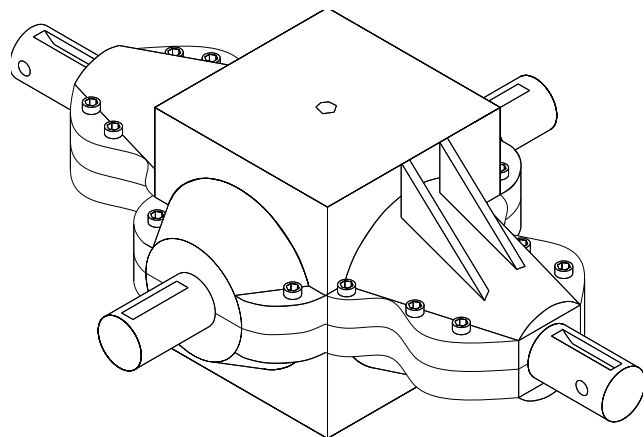


Figure 11. – Harvester Gearbox

The gearbox drives to the left and right sides of the header and to the rear of the harvester. An additional gearbox on the 12 row 22 and 8 row 30 reverses drive to the left side of the head.

Mechanically driven harvester systems:

1. Left and right paddle shafts.
2. Right conveyor roll and front roll or star drive.
3. Rear spiral grabroll drive.
4. Hydraulic pump drive.
5. Spiral rolls drive back to smooth.



Figure 12. – Header Left-Hand Paddle Shaft Chain/ Drive

The drive shaft connects at the rear of the harvester to an additional gearbox. The left output shaft drives the hydraulic pump for the harvester's self contained hydraulics. The rear output drives the harvesters grabrolls in the rear drive box.



Figure 14. – Harvester Left-Hand Chain and Gear Drive. (6 Row 30 And 8 Row 22)



Figure 13. – Harvester Right-Hand Belt Drive (Rear Grabroll Option Shown)



Figure 15. – Harvester Rear Belt Drive System and Pump Drive



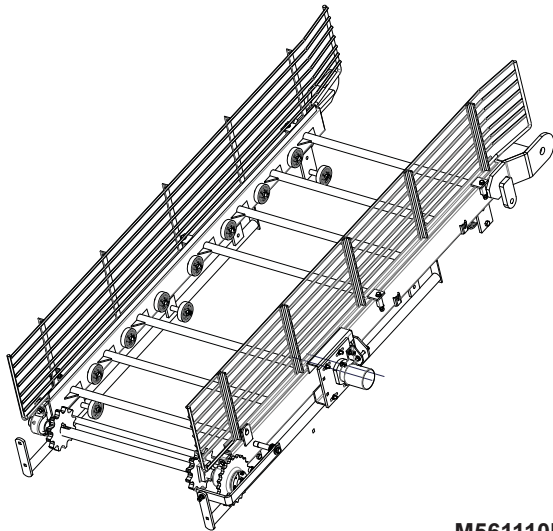
Figure 16. – Harvester Grab Roller Forward Belt Drive Spring Tensioner



Figure 17. – Wide Heads, LH (8 Row 30 And 12 Row 22) (Rear Grabroll Option Shown)

Other drives associated with the harvester hydraulic system:

1. Truck conveyor and chain drive.
2. Wheel elevator chain drive.
3. Appropriate sprockets to drive belted draper chain.



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Figure 18. – Truck Conveyor Sprocket and Drive Chain

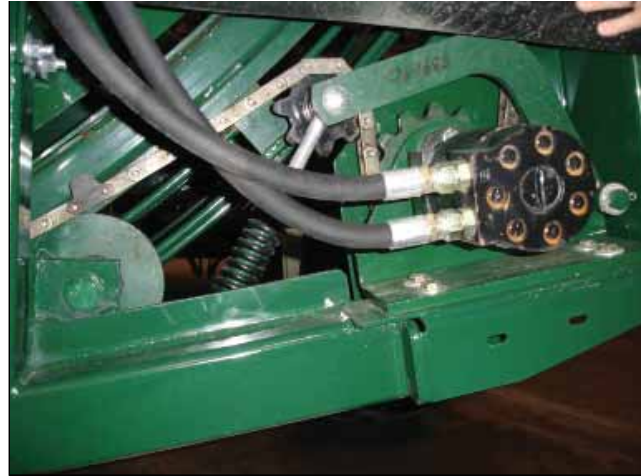


Figure 19. – Wheel Elevator Motor Sprocket and Drive Chain



Figure 20. – Draper Chain Drives, Short Conveyor Shown

TRACTOR/HARVESTER CONNECTION







TRACTOR REQUIREMENTS

The Art's-Way 6812D Sugar Beet Harvester is designed to be used by large agricultural tractors. To ensure good performance, Art's-Way recommends that the harvester be operated by a tractor with 200 PTO horsepower or larger. Utilizing a tractor with a 200 PTO horsepower rating or higher will provide the stability and control necessary for safe operation and highway transport.

NOTE: The 8 row 28/30 and the 12 row 22 heads must be operated by a tractor with 220 PTO horsepower or larger.

TRACTOR/HARVESTER CONNECTION PROCEDURES

Figure 21. – PTO Connection

1.  Clear the area of bystanders, especially small children.
2.  Block the harvester wheels to prevent rolling.
3. Position the tractor near the harvester hitch.
4. Attach the lift cylinder hoses only to tractor outlets.
5. Activate the lift cylinders, and lift the harvester tongue above the tractor hitch.
6.    Place all tractor controls in neutral, set the park brake, and stop the engine.
7.  Remove the ignition key from the tractor before dismounting.
8. Set the tractor drawbar according to the size of the tractor's PTO.

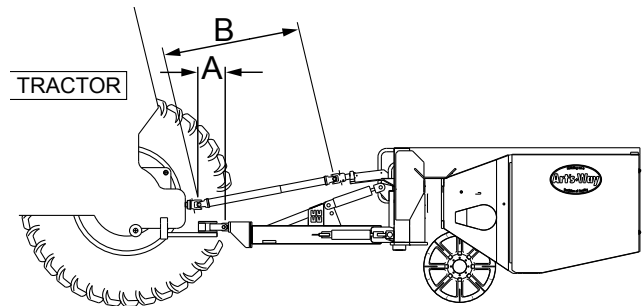


Figure 22. – Drawbar And PTO Specifications

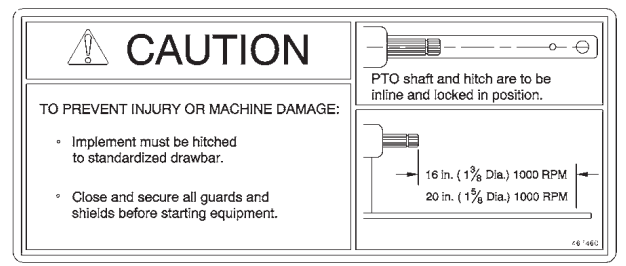


Figure 23. – Decal - Caution - Hitch

9. Attach the harvester to the tractor with yoke weldment and bolts provided. Make sure to install the hardened washers between the yoke and the hitch clevis. The existing tractor clevis may be used if a 3 inch (7.62 cm) spacing can be maintained. Install hardened washers to shim the hitch clevis so that it is snug. If the tractor drawbar-mounting hole is smaller than 1-3/8 inch (3.493 cm), a 1-1/4 inch (3.175 cm) pin is available from your Art's-Way Dealer (AW Part Number 456220). If the tractor drawbar-mounting hole is larger than 1-7/16 inch (3.65 cm), a bushing should be installed or the spacer can be left out (the holes in the clevis is for 2.0 inch (5.08 cm) diameter bolt) and hook directly to the tractor wheatland hitch using the tractor pin.

NOTE: Additional support for the tractor drawbar is recommended.

10. Check the oil level in the hydraulic reservoir by visually checking the sight gage. Make sure the valve in the suction line is open.

11. Clean any dirt or hydraulic fluid build-up from around the remote hydraulic receptacles and the hydraulic hose male tips.

12. Insert the male tips into the receptacle. Make sure the hydraulic hoses are securely fastened.

13. The needle valve that supplies oil to the lateral transfer conveyor needs to be adjusted for speed when moving left and for when the truck conveyor motor is turned on.

14. Make sure the hydraulic hoses are properly routed in the hose support to provide adequate clearance when turning.

15. Run tractor hydraulic systems functions to purge the hydraulic system.

16. Check the hydraulic fluid levels of the tractor. Verify hydraulic fluid levels are at the proper levels. Service the hydraulic systems as needed.

17. Cycle the lift cylinders and observe the lift height. Position the front bolt-on hitch to obtain the desired lift height while still allowing adequate penetration into the ground.

NOTE: The hitch must have at least three (3) bolts installed on each side, for a total of six (6) bolts.

18. Attach the safety chain to the harvester hitch by inserting the large chain eyelet through the chain brackets on the tongue (from the back side). Route all chain links through the large chain link and pull tight. Route chain through the intermediate chain support and secure the chain to the tractor drawbar carrier. Be certain to allow enough slack in the chain for full articulation of the tractor and harvester without binding.

19. Clean the splines inside the yoke and on the tractor shaft. Be sure the driveline and safety guard move easily and that the guard rotates freely.

20. Retract the slide collar on the PTO yoke and slide the yoke over the shaft. Stop when the slide collar clicks into place. Pull on the yoke to make sure it is securely locked in place.

21. Be sure there is sufficient clearance between the drawbar, three-point hitch links, and the driveline to allow maneuvering in the field. Make sure to check the distance between the universal joint centers.

22. Lower the tractor PTO shield over the universal joint and properly secure the shield.

NOTE: Dimension B in Figure 22 must be between 58 and 68 inches.

23. The harvester requires five (5) tractor hydraulic circuits to operate. Connect the tractor hydraulics according to the appropriate circuit per Figure 8.

NOTE: It is important to have the lift and truck boom conveyor motor on the number one and number two priority valves. Adjust the flow at the tractor to the minimum required to operate all functions.

24. There may be special requirements in the circuit for the truck conveyor on some of the load sense systems. Check with your tractor dealer.

25. Connect tractor hydraulics to the harvester to suit the owners preferred positions.

26. Lift the harvester so the lifter wheels are off the ground.

27. Cycle the rowfinder cylinder by moving the rowfinder arms from side-to-side. The harvester should move in the same direction as the rowfinder arms.

CAUTION



Crush Hazard

Injury can occur if trapped or caught in moving machinery. Keep clear of machine as it shifts sideways.

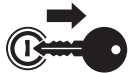
28. When boom motor is shut off, transfer conveyor moves left. Adjust to the desired speed with the needle valve that supplies oil to the cylinder for lateral transfer conveyor.

29. If the machine has not been test run, refer to the Dealer Assembly Instructions section for instructions.

FIELD OPERATIONS

WARNING

Entanglement / Crush Hazard
 Serious injury will occur if caught in rotating parts.
 Keep clear of moving parts.



Shut off tractor and remove key before making adjustments.



Wait for all movement to stop before approaching machine.

OPERATING SPEEDS

It is recommended the harvester be operated at a speed between 3.5 and 4.5 mph (5.6 and 7.2 km/h). During harvesting operations, make sure the tractor PTO maintains at least 950 rpm output.

BASIC CONTROLS**Power Takeoff (PTO) – Constant Velocity****NOTICE**

It is extremely important to follow the lubrication guidelines and lubricate parts as described. (Refer to Lubrication Schedule).

Always engage the PTO with the tractor at low rpm. Once the PTO is engaged, gradually increase the tractor rpm to the desired setting.

Turning The Harvester

Normal operation with wide end rows is to slow the tractor so the PTO is at a maximum of 600 rpm prior to raising the harvester. Complete the turn, lower the harvester, and then increase the PTO to the desired rpm setting.

It is recommended that if making a sharp turn in irrigated areas or in rough terrain, the PTO be shut off prior to raising the harvester.

It is not necessary to operate the constant velocity PTO while turning.

NOTE: If the telescoping members become hard to slide between seasons, it is recommended that the PTO be disassembled, solvent cleaned, recoated with grease, and then assembled.

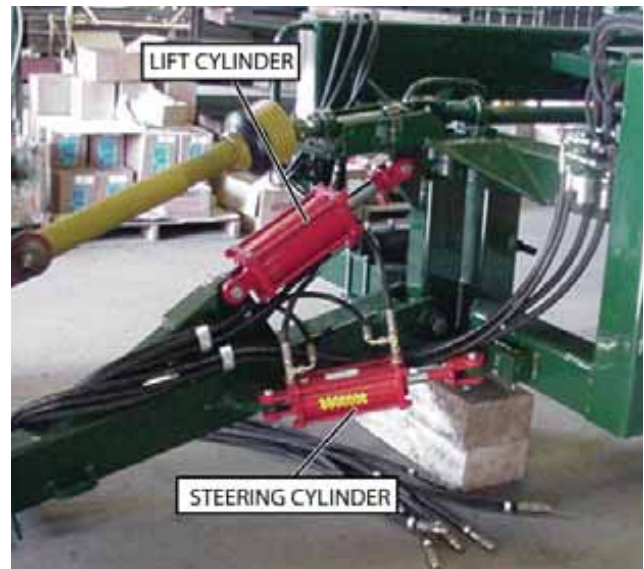
Harvester Lift Cylinder

Figure 24. – Harvester Lift & Steering Cylinders

The harvester lift cylinders are powered by the tractor/harvester hydraulic system. By extending or retracting, the operator can increase or decrease the height of the harvester header.

The depth can be set by adding stops on the cylinder rod, then fine adjusting with the adjustable nut on the rod end of the cylinder to the desired position.

NOTE: It is very important to have both cylinders stopped to exactly the same length.

Steering Cylinder

The side shift cylinder is powered by the tractor/harvester hydraulic system and can be controlled automatically by the rowfinder or manually by the operator (See Figure 24).

Rowfinder

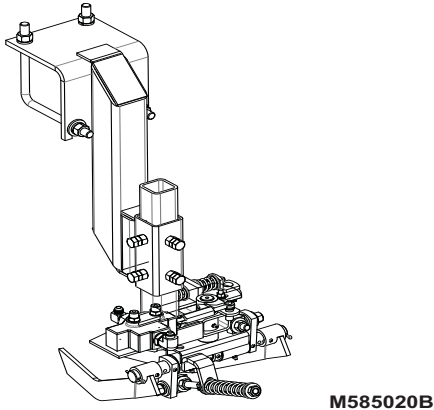


Figure 25. – Rowfinder

The rowfinder assists in keeping the harvester aligned with the rows. The feeler arms rest astride the row and follow the line of beets, sensing any changes in the direction of the row or the position of the harvester. Lateral (sideward) movement of the feeler arms actuates the hydraulic valve, which controls oil flow to the rowfinder steering cylinder.

The rowfinder steering cylinder extends or retracts according to the action of the feeler arms, steering the harvester back onto the row. A manually controlled hydraulic override function allows the operator to steer the harvester. The override function is helpful when entering rows.

The rowfinder should be installed so that the tips of the rowfinder arms move in the same direction as the harvester.

NOTICE

Raise harvester before backing up to prevent damage to rowfinder.

Header



Figure 26. – Header (8 Row - 22 inch Header Shown)
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The harvester has been designed with three different headers. Each header has been designed for various sugar beet planting multiples. For example, if beets have been planted in rows of eight (8) with a spacing of 22 inches, then the owner will require the 8 row 22 inch header. Refer to the Harvester Structure Section, Page 17.

NOTE: Beets must be harvested in the same multiple as they are planted.

Lifter Wheels



Figure 27. – Header Lifter Wheels

The lifter wheels dig into the ground and lift both beet and dirt upwards towards the paddle assemblies. The lifter wheels attach to the lifter wheel struts, which come in two different configurations: fixed and flex.

In rocky soil conditions, the flex struts help absorb shock loads as large rocks are encountered. The flex struts also allow the entire strut and lifter wheel to roll up over the rock.

The entire lifter wheel and strut assembly can be adjusted left and right (laterally) to match the specific multiple beet row center lines.



Figure 28. – Lifter Wheel Scrapers

Attached to the lifter wheel strut are wheel scrapers. The scrapers keep dirt and trash from building up on the lifter wheel hubs.

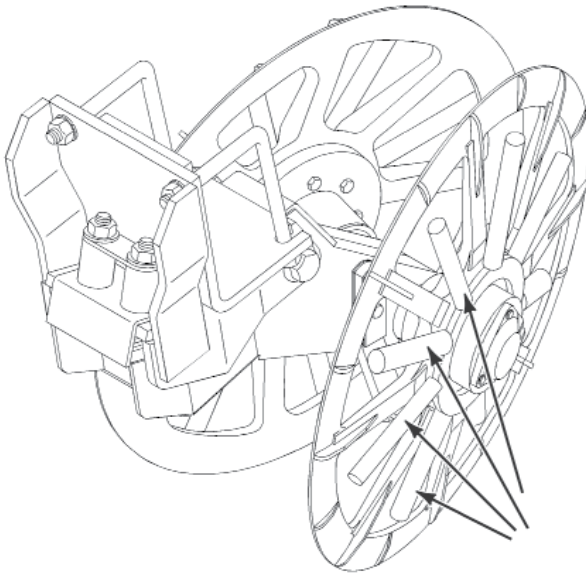


Figure 29. – Lifter Wheel Optional Equipment: Close-Up Attachments

The lifter wheel has an optional close-up attachment.

Close-up attachments prevent small beets from falling out between the lifter wheel spokes. Slot adjustments are provided on the close-up attachments so they may be rotated out of the way as conditions warrant.

PADDLE ASSEMBLIES



Figure 30. – Header Paddle Assembly

The paddle assemblies push the harvested beets from the lifter wheels to the header grab rollers. Mechan-

ical rotation of the paddle assemblies comes from the harvester gearbox through a sprocket and chain drive system. The paddle assemblies are equipped with a split rubber paddle. This allows each paddle to be narrowed or widened for certain conditions. For example, in muddy conditions, the paddle can be moved to the open position to help clean mud off the wheels.

The paddles also have two holes to adjust the length of the rubber being exposed. The longer position will help in muddy conditions as well as to help push small beets back into the rollers.

NOTE: If the entire lifter wheel and strut assembly is adjusted left or right (laterally), the paddle assemblies and barriers must also be adjusted.

CONVEYOR ROLLERS



Figure 31. – Header Conveyor Rollers

The conveyor rollers rotate rearward, pushing the beets toward the center of the rollers and towards the short conveyor.

The conveyor rollers are mechanically rotated using both a belt and chain drive system.

If the poly rolls have been selected as an option, the spacing can be adjusted to an open or closed position. Poly rolls are set to the closed position at the factory. To move the rolls to the open position, the outside bearings must be rotated backwards and fastened into the new bolt holes. On the 8R28/30 and 12R22, the center bearing holders must be adjusted by rotating the assembly up and towards the rear of the machine and fastened in the new hole (See Figure 32, Figure 33, and Figure 34).

The steel rolls leave the factory in the open position to allow for more room for rocks to clear the rolls and are not adjustable. The closed position does not allow enough space for the rolls to float without hitting.

Rear Short Diverter Roll Options

Standard Rear Diverter Rolls

These rolls turn the same direction as the smooth and four (4) spiraled conveyor rolls. These rolls push any beets at the rear of the bed to the center of the machine.

Optional Rear Smooth Diverter Grab Rolls

These rolls turn the opposite direction of the front smooth and four (4) spiraled conveyor rolls and act as a grabroll. These rolls are used to pull thru excess mud and dirt from the conveyor roll bed so it doesn't travel through the short conveyor. These rolls are designed to help control the windrow of mud that can form under the harvester.

Header Drive Shaft

The header drive shaft is the primary means for transferring mechanical power from the harvester's gearbox to the header. On the header, there are two drive shafts per side. Each pair of drive shafts are connected by a U-joint.

Header Mechanical Drive (Left-Hand Side)



Figure 32. – Header Left-Hand Drive. (8 Row 22 Header Shown)



Figure 33. – Header Left-Hand Drive With Diverter Grab Roll Option (12 Row 22 And 8 Row 30)

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The header drive shaft is connected to the harvester's gearbox. On the other end of the header drive shaft is a sprocket with a paddle shaft slip clutch using a #80 roller chain. An idler sprocket between the drive shaft and paddle shaft slip clutch ensures the chain is tight.

In addition there is a second chain drive system that connects the full length grab roller to the smaller left-hand diverter roller. As with the previous system, an idler sprocket keeps the chain tight.

Header Mechanical Drive (Right-Hand Side)



Figure 34. – Header Right-Hand Drive

The paddle shaft is always driven from both sides with a #80 roller chain. When the slip clutch needs to rotate in the opposite direction, two additional idler sprockets have been installed to route the chain properly.

The slip clutch is jaw type with steel rolls, and friction type with poly rolls.

The 6 Row 30 and 8 Row 22 headers have full length conveyor rollers which are belt driven from the right-hand side only. The 8 Row 30 and 12 Row 22 headers have conveyor rollers split in the middle which are belt driven from both the left and right-hand sides. A gearbox is required to reverse the rotation to the left-hand side.

A V-belt is routed around each grab roller belt sheave allowing the mechanical power to be transferred from the header drive shaft to each grab roller. A spring loaded tension roller ensures proper belt tension is maintained. Additional chain drives are required for the front smooth or star roll and the left-hand diverter roll on the left-hand side for the 6 Row 30 and 8 Row 22.

Short Conveyor

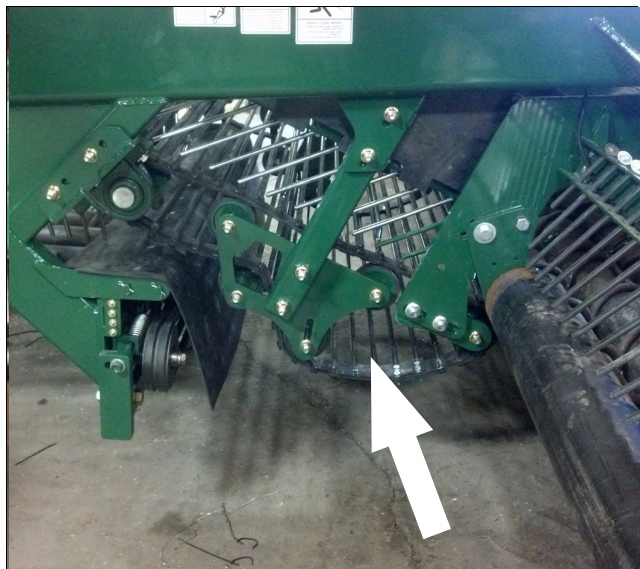


Figure 35. – Short Conveyor

The purpose of the short conveyor is to transport the beets from the header to the harvester's main grab rollers. The short conveyor is attached to the header and is positioned slightly below the rear full length header conveyor roller. The rear end of the short conveyor free floats on the harvester's frame.

As the beets are transported to the back of the header, they transfer onto the short conveyor. The rear end of the short conveyor overlaps the harvester's main grab rollers. Therefore, the beets will drop off the short conveyor directly onto the grab rollers and then to the wheel elevator.

The short conveyor is powered by the harvesters self-contained hydraulic system and is physically rotated using four sprockets.

Harvester Grab Rollers



Figure 36. – Harvester Grab & Smooth Rollers

The purpose of the grab rollers is to transport the beets from the short conveyor to the wheel elevator. In addition, the grab rollers are designed to remove dirt and rocks from the harvested beets. The spacing between the grab rollers can be manually changed from a single point at the front and rear. (Refer to Harvester Adjustments – Header – Harvester Grab Rollers).



Figure 37. – Harvester Rear Belt Drive System

The harvester grab rollers are connected to a V-belt drive in the rear of the harvester that is powered by the harvester's rear drive shaft. Only the four (4) spiraled grab rollers are powered by this belt drive.



Figure 38. – Harvester Grab Rollers Front Drive

At the front of the grab rollers is an additional V-belt drive. This belt drive connects the four (4) spiraled grab rollers to the four (4) smooth rollers.

Wheel Elevator



Figure 39. – Wheel Elevator

The wheel elevator transports the beets from the harvester conveyor up to the holding tank conveyor. The beets are carried up to the holding tank conveyor as the wheel elevator revolves clockwise.

To make sure beets do not fall downward as the wheel elevator rotates, a retainer applies spring pressure outward against the wheel elevator. At the top of the wheel elevator, the beets fall downward onto the transfer conveyor.

A stripper installed at the top of the wheel elevator clears any rocks or beets that may have become wedged between the wheel elevator rods.

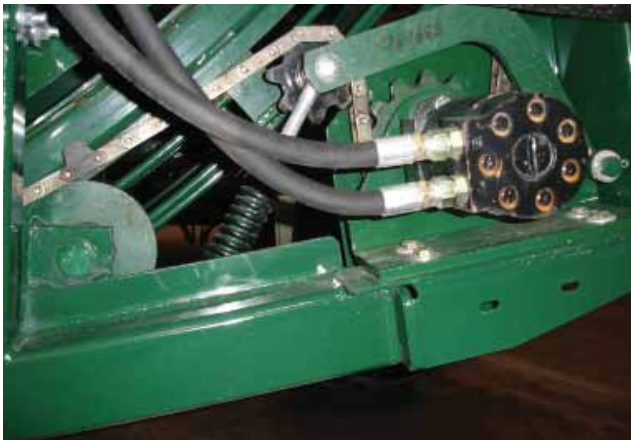


Figure 40. – Wheel Elevator Hydraulic Motor, Sprocket, Chain Drive, and Roller



Figure 41. – Wheel Elevator Roller (Left-Hand Side)

The wheel elevator is powered by the harvester’s self-contained hydraulic system and is physically rotated using sprockets and metal chain. The wheel elevator is supported on the heavy rollers to the rear. The wheel elevator is also held from going forward by two small rollers at the top. The rotation rpm of the wheel elevator can be changed using the control valve on the harvester’s self-contained hydraulic system. (Refer to Harvester Adjustments – Wheel Elevator).



Figure 42. – Wheel Elevator Stripper

The stripper is an adjustable device with several disks which help clear the wheel elevator of any rocks, trash, soil, or beets that may become wedged between the wheel elevator rods.

Transfer Conveyor



Figure 43. – Transfer Conveyor

The transfer conveyor moves the beets from the wheel elevator to the holding tank. This is powered by the harvester's self-contained hydraulic system and is physically rotated using two sprockets.



Figure 44. – Transfer Conveyor Pivot System



Figure 45. – Transfer Conveyor Pivot Cylinder

A unique feature of the transfer conveyor is the ability for the conveyor to pivot left and right to ensure the holding tank is filled totally and the beets have a minimum drop into the tank. This is accomplished using a hydraulic cylinder powered by the harvester/tractor hydraulic system.

The height of the discharge end of the transfer conveyor can be changed by changing the length of the parallel arms.

Truck Boom Conveyor



Figure 46. – Truck Boom Conveyor With Boom Extended

The truck boom conveyor transfers the beets from the holding tank to the truck on the right-hand side of the harvester. The truck boom conveyor also serves as the bottom surface of the holding tank.

The truck boom conveyor is powered by the tractor/harvester hydraulic system and is physically rotated using two sprockets and a metal chain.

The operation of the truck boom conveyor is controlled by operator using the tractor hydraulic lever. It is prevented from turning backwards by a check valve.

Truck boom

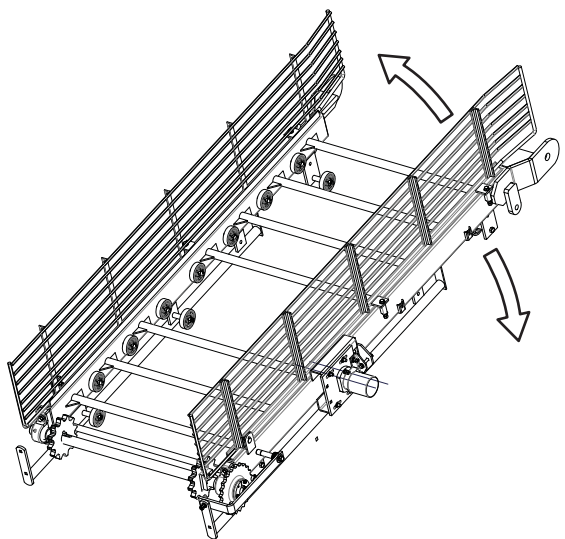


Figure 47. – Truck Boom

The truck boom is the outer section of the off-loading conveyor. The truck boom has the ability to raise and lower and is selected by operator using a small switch attached on the hydraulic lever. The truck boom must be raised if the operator is going to be transferring the harvested beets to a truck on the right-hand side of the harvester.



Figure 48. – Truck Boom Conveyor Hydraulic Cylinders

CAUTION



Overhead Hazards
Extending truck boom conveyor increases height of harvester and could contact overhead objects.

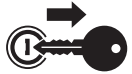
Check for adequate clearance before raising conveyor.

The height can be adjusted to the desired position for the truck height. For harvester transport, the truck boom must be lowered.

HARVESTER ADJUSTMENTS

WARNING

Entanglement / Crush Hazard
 Serious injury will occur if caught in rotating parts.
 Keep clear of moving parts.



Shut off tractor and remove key
 before making adjustments.



Wait for all movement to stop
 before approaching machine.

The Beet Harvester is designed for simplicity and trouble free operation. Art's-Way Manufacturing Co., Inc. has provided a wide range of adjustments on this machine to allow the best operation in various operating conditions. It is essential that all adjustments be set for your operating conditions. Continual review during harvest must be done for optimum performance. When field or crop conditions change, recheck your harvesting operation and adjustments. The following explains the operation and adjustment of the machine. See your dealer if questions arise.

POWER TAKEOFF (PTO) – CONSTANT VELOCITY

Refer to the Harvester Adjustments connection section.

HARVESTER LIFT CYLINDERS

Refer to the Harvester Adjustments connection section.

ROWFINDER STEERING CYLINDER

The steering cylinder is activated by the rowfinder or by the operator with the tractor control valve. The factory-installed cylinder should not require adjustment.

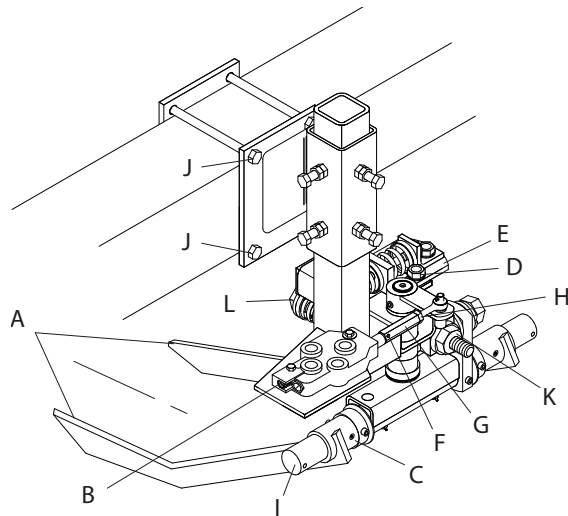


Figure 49. – Rowfinder Details

The rowfinder is adjustable to accommodate beet size, beet height, operating depth, and soil conditions. Correct adjustment of the rowfinder and a good understanding of the importance of each adjustment will provide maximum satisfaction during field operation.

Make the following adjustments, as necessary, to meet crop and field conditions before taking the machine to the field.

NOTE: Be sure to raise the harvester when backing up so the rowfinder is not damaged.

Feeler Arm Spacing

For this adjustment, the feeler arms (A) should be set so the largest beets will just pass through the opening, between the arms, remove the spring pins (C), set the arms to the appropriate width, then install the spring pins.

Feeler Arm Centering

The horizontal shaft (I) in the rowfinder must be parallel with the front of the harvester frame to function accurately. Remove the pin (F) and loosen the nuts (D), then slide the plate (E) until the shaft is parallel with the frame. Tighten the nuts.

The hydraulic control valve must be centered each time the shaft (I) is adjusted. Loosen the lock nut (H) and adjust the nut (G) until the pin (F) can be inserted freely through the nut (G) and valve spool. Tighten the lock nut (H) and make sure the pin (F) is still free.

The feeler arms must be centered with the gap between the lifter wheels to function accurately. To adjust, loosen the bolts (J) and slide the entire assembly on the tube until they are centered. Tighten the bolts (J).

Rowfinder Height

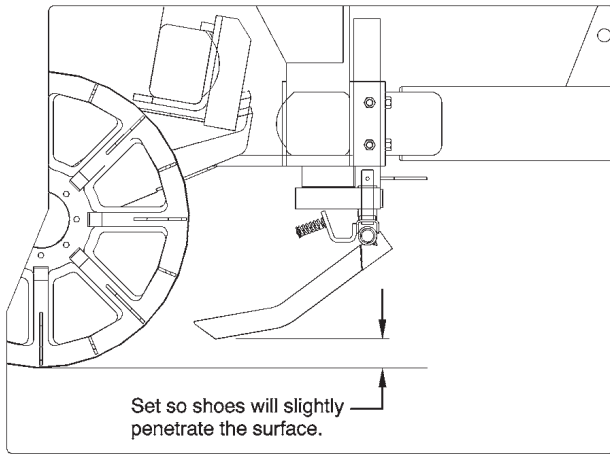


Figure 50. – Distance between Bottom of Rowfinder and Bottom of Lifter Wheel

The feeler arms should ride along the surface of the ground or slightly penetrating the surface. Set the rowfinder height in its correct relationship to the lifter wheel working depth to assure proper function. Example: If the lifter wheels will work at a depth of 3 inches (7.62 cm), the bottom edge of the feeler arms should be about 3 inches (7.62 cm) above the rims of the lifter wheels when operating in the rows.

To change the rowfinder height by more than 1 inch (2.54 cm), loosen bolts attaching the rowfinder vertical tube to the support plate and move to the desired operating height. Tighten the bolts snug first so the unit is forced into corner then set jam nuts.

NOTE: For less than 1 inch (2.54 cm) height adjustments raise or lower the feeler arms by adjusting the nuts (Figure 54, Item K).

Feeler Arm Down Pressure

The down pressure of the rowfinder is factory set at a spring length of 4.25 inches (10.795 cm). If the beet crowns are below the ground surface, adjust down pressure so the rowfinder arms penetrate the soil. To increase the down pressure, turn lock nut (Figure 49, Item L) to compress the spring.

HEADER

Lifter Wheels

Spacing

Make sure the lifter wheels are located at the proper row widths. This measurement is taken at the pinch point, to prevent slicing and breaking of the beet tails.



Figure 51. – Header Lifter Wheel Lateral Adjustment

Loosen the strut mounting L-bolts, paddle bolts, and the bolts holding the barriers.

NOTE: When adjusting a lifter wheel, adjustment of the paddle assemblies, barriers, and protective rubber covers maybe required.

Adjust the rubber covers so they are centered over the row and routed over the round tube. Slide and adjust all to the proper row spacing. Tighten all of the bolts.

Pinch Point Width



Figure 52. – Header Lifter Wheel Width Shims

The distance between each pair of lifter wheels can be increased to accommodate larger beets, or decreased for smaller beets. Lifter wheel spacing is adjusted by inserting or removing spacers between the lifter wheel and the hub. Be sure to set the spacing at the widest position possible to prevent beet damage. When adding spacers, be sure to add to the same side one set on each row so the row spacing stays the same. Whenever the lifter wheel pinch point is adjusted, adjust the scrapers.

Pinch Point Height

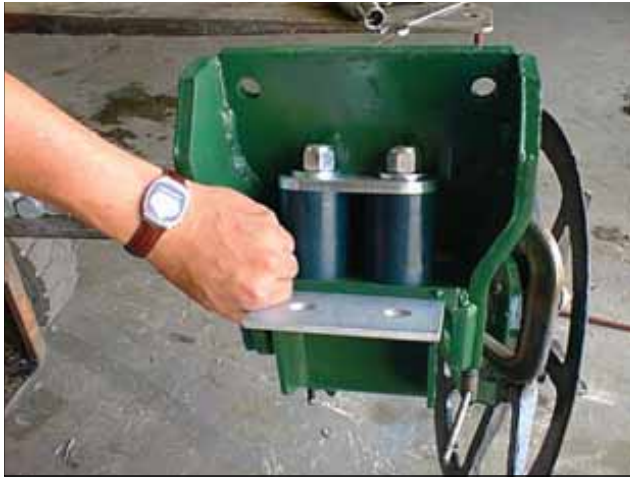


Figure 53. – Header Lifter Wheel Height Shims

To adjust the pinch point height, insert or remove spacers between the upper portion of the strut and the mounting pad. The pinch point height is factory preset with three (3) 0.25 inch (6.35 mm) and one (1) 0.125 inch (3.175 mm) thick spacers. Spacers of this size function well in most conditions.

Scrapers



Figure 54. – Header Lifter Wheel Scraper Adjustments

Operating Depth

As a starting point, the lifter wheels should be set to dig approximately 2 to 3.5 inches (5.08 to 8.89 cm) deep. This setting will change with soil conditions. Set the lifter wheels to run as shallow as possible to prevent lifting excessive amounts of dirt and to reduce power requirements. To prevent breaking the beet tails in extremely hard ground, add shims to widen the lifter wheels before you try deeper settings. Set the stop on the lift cylinder to help maintain the proper digging depth.

Procedure for finding the correct depth

1. Make sure the harvester is not digging across guess rows between rounds.
2. Begin digging as deep as necessary to keep from breaking the beet tails.
3. Raise the lifter wheels gradually until some minor beet tail breakage occurs.
4. Lower the lifter wheels about 0.25 inch (6.35 mm).
5. Set the lift cylinder stop to maintain this depth.

Cylinder Flotation In Rocky Conditions

In rocky conditions, it is strongly recommended that the lift cylinder be allowed to float in the running position. Set your tractor valve in the float position, connect the lift cylinder to this circuit, and make sure the control lever is in the float position. The cylinder may require the use of depth stops.

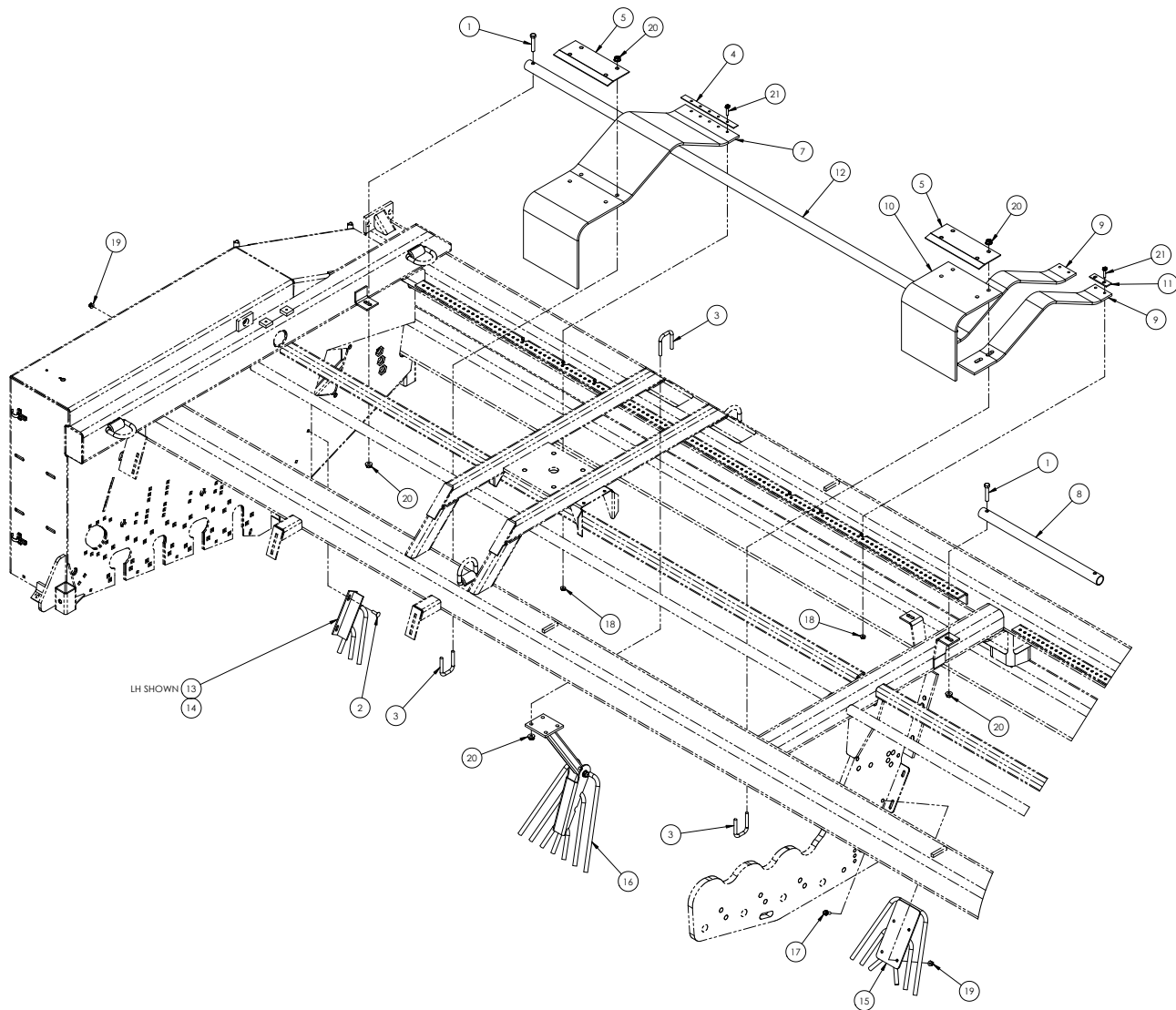
Flex Struts



Figure 55. – Header Lifter Wheel Flex Struts

In rocky conditions, flex lifter wheel struts are recommended. These struts are mounted with flex cushions that help absorb shock loads as large rocks are encountered. They flex to allow the strut to roll up over the rock. The lifter wheels are also protected by rock cushions that allow the lifter wheels to spread apart when rocks are pinched between the wheels.

As a starting position, set the flex strut cushions at 3.25 inches (8.25 cm) (actual cushion length). Adjust to match conditions as necessary. Flex strut cushions may need to be adjusted to 3.12 inches (7.92 cm) to reduce the amount of flexing on hard ground.



Paddles

The rubber paddles may be removed if desired (except when flex struts are used). If removed, reposition the paddle shaft by lowering it to the bottom set of the bearing holes. This will keep the paddle tips in their correct relationship.

Make sure the paddles are positioned sequentially around the paddle shaft so adjacent paddles contact beats at 30 degree intervals. This avoids excessive shock loads to the paddle shaft and drives.

When flex lifter wheel struts are used, the paddle shaft bearings must stay mounted in the top holes. The rubber paddles must be attached to the steel paddles. With the paddle shaft in the top holes, the lifter wheel struts can flex without hitting the paddle shaft. The paddles are split in two pieces to allow the desired settings for extreme mud or rocks. If extremely muddy conditions exist, it is best to move the steel portion

closer to the lifter wheels. In rocky conditions moving the steel away from the lifter wheels may reduce the rocks catching in the wheels.

Barriers and Covers

Barriers

To adjust the barriers, loosen the U-bolts, center the barriers between the lifter wheels, and then tighten the U-bolts.

Rubber Covers



Figure 59. – Header Protective Rubber Covers

The rubber covers located above the paddles, are only effective when they are centered over the paddle clusters and routed over the round tube.

The rubber covers are attached to a front tightening tube and the barrier tube. They must be moved to the holes on the front tube and slid on the 2x2 inch (5.08 x 5.08 cm) tube.

Paddle Shaft Slip Clutch

Prior to each seasons use, it is recommended to loosen the slip clutch, allow it to slip, and then tension the springs to proper setting.



Figure 61. – Friction Slip Clutch

Torque for the slip clutch is set by the spacers. If excessive slippage occurs, the friction disks must be replaced.

Roller Chain Tensions

Use appropriate idlers to tension roller chains for paddle shaft, front roller, rear roller, and truck conveyor drive.

Roller chain drives are tensioned by moving idler sprockets in slots. Check roller chains frequently and tension approximately 20 force pounds (lbf) (88.96 N) deflects chain 0.5 to 1.0 inch (1.27 to 2.54 cm).

Also, frequently check sprocket alignment. If more wear appears on one side of a sprocket, realign the sprockets.

Roller Belt Drive



Figure 62. – Header Grab Roller Belt Drive. (12 Row Header Shown)

The conveyor rolls and grab roll drive belts are tensioned by spring-loaded idlers. These should be tightened so the springs are compressed to 4.5 inches (11.43 cm) for the 6-5V wide belt. Recheck tension frequently and retention promptly if slippage occurs.

On harvesters with the 12 row 22 inch or 8 row 30 inch, install the front header gage wheels on the front corners of the header with the clamps provided. The suggested setting is 3.5 inches (8.89 cm) (4 x 4) with the lifter wheels on concrete. There is also an extension available for gage wheels to front mount.



Figure 63. – Front Head Gage Wheels (Standard on 8 row 28/30, 9 row 24/26, and 12 row 22 Heads - Optional on 6 row 22/24, 6 row 28/30, and 8 row 22 Heads)

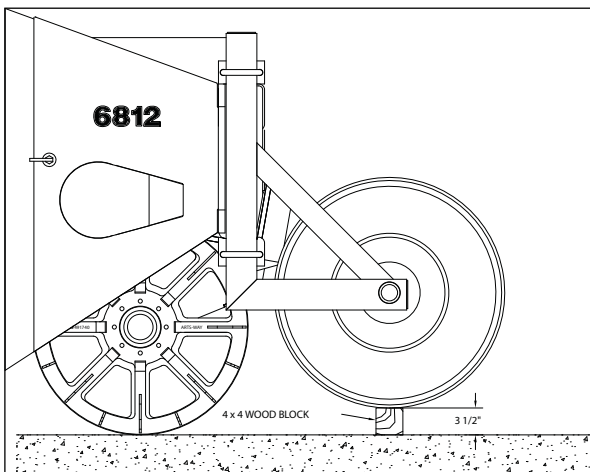


Figure 64. – Front Gage Wheel Height

Manual No. 599500

Short Conveyor



Figure 65. – Short Conveyor

See Figure 20, Figure 35, and Figure 65.

Adjust the tension of the draper chain by loosening bearings and moving upper shaft. To adjust clearance of the short conveyor or to service:

1. To adjust front height, attach a come-along to the upper loop and front of short conveyor. Loosen bolts and tighten in desired position.
2. To adjust clearance to rear conveyor roll, loosen bolts ahead of 1 inch (2.54 cm) adjusting bolts and adjust with 1 inch (2.54 cm) nuts. Tighten in desired position.

NOTE: Riser link is closest to roll.

3. For the rear, the roller must be revised to adjust height.
4. Readjust grates if required.

Harvester Grab Rollers



Figure 66. – Harvester Grabrollers

The smooth steel grabrollers are cushioned to flex open in rocky conditions. These cushions should be set to 2.50 inches (6.35 cm) actual cushion length (both front and rear). Cushions may easily be added to poly rolls if needed.

ART'S-WAY MANUFACTURING COMPANY, INC.



Figure 67. – Harvester Grabrollers - Single Point Adjustment (Front)



Figure 68. – Harvester Grabrollers - Single Point Adjustment (Back)

After the length of the cushions is set, the spacing can be set with a single 1 inch (2.54 cm) bolts to the front and rear on the left-hand side. **Always** maintain a wider gap at the back. Open the rolls as wide as possible without losing beets.



Figure 69. – Tension of Wheel Drive Chain

WHEEL ELEVATOR

The recommended speed of the wheel elevator is 11 rpm. In some conditions a slower speed of 9 to 10 rpm may be desirable. Adjust the flow control to control the wheel elevator speed.

Wheel Drive Chain To Hydraulic Motor



Figure 70. – Wheel Elevator Sprocket, Chain Drive, and Roller

To tighten the wheel elevator drive chain, see Figure 70. Loosen nuts (A) directly below the idler. Reposition until the chain can be pulled 1.25 inch (3.18 cm) away from the wheel (as shown in Figure 69). The spring length directly below these nuts is factory set to 6-3/4 inches (17.15 cm) long (nuts below spring). It should not deviate from this.

The hydraulic motor mounting can be adjusted forward and aft if needed. Adjust the motor position so the chain is in line with the wheel.

Adjustments Of The Retainer

The spring loaded retainer on the 6812D harvester is adjustable to accommodate varied harvest conditions, see figures 71-72. The upper pivot position can be adjusted two ways depending on the amount of adjustment desired. First, the U-bolts holding the pivot brackets in place can be loosened and the pivot bracket can be moved using the slotted holes. The second option is to change the pivot point from its current location on the pivot bracket to the alternate position. These adjustments can be made independently or a combination of the two may be use.

The lower portion of the retainer can be adjusted independently from the upper pivoting position. To change the lower position of the retainer the hex nuts on both sides of the ball joints should first be loosened as they are acting as jam nuts. Once loosened, make adjustments by loosening and tightening adjacent hex nuts, loosening one while tightening the other will move the retainer. Once the desired position is reached tighten the hex nuts down against the ball joints.



Figure 71. - U-Bolts & Pivot Bracket



Figure 72. - Retainer Spring

STRIPPER



Figure 73. – Wheel Elevator Stripper

The stripper disks (A) must be centered between the wheel elevator rods so they do not make contact. Adjust the position so the disks do not hit the cross tube weldments of the wheel.

TRUCK CONVEYOR



Figure 74. – Truck Boom Conveyor

The draper chain tension is maintained by the weight of the large bag area in the center. An additional position is provided if needed. The roller chain drive to the hydraulic motor is maintained by loosening the mounting plate using the take-up bolt and retightening.

The speed of the truck conveyor may appear to be slow. Speeding it up will normally take the beets at a lower depth and not really speed the unloading. Adjust the speed so when starting to unload a full tank, the beets do not overflow the grates. This should still allow the tank to unload in less than one minute.

TIRES

Frequently check tire pressures. Lists recommended pressure for tires used on 6812B Beet Harvester.

24.5-32 – 12 Ply	24 psi Recommended (165.5 kPa)
	28 psi Maximum (193 kPa)
Optional Tire 30.5L-32 – 14 Ply	22 psi Recommended (151.5 kPa)

Tire Changing and Maintenance

WARNING



Explosive Hazard
Explosive separation of a tire and/or rim parts will cause serious injury or death. When changing a tire always follow manufacturer’s recommendations. If repair or replacement is required use a dealer or qualified tire repair service.

WARNING



Explosion Hazard
Explosive force from a tire will cause serious injury or death. When inflating a tire, stand to the side (behind tread) of tire and use a long hose with a self-attaching chuck. Do not over inflate tires.

HYDRAULIC SYSTEM

Refer to Figure 76 for the Tractor/Harvester Hydraulic System and Figure 77 for the Harvester Self-Contained Hydraulic System. Both of these figures will show specific routings and components.

Tractor/Harvester Hydraulic System

The five hydraulic circuits are noted as follows:

1. Truck Conveyor Drive Motor And Transfer Conveyor Lateral Movement
 - a. Connect to the No. 2 priority valve, if applicable.
 - b. The circuit has a check valve installed to allow for operation in only the proper direction.
 - c. Set the speed with the tractor flow control.
 - d. The cylinder for lateral movement of the transfer conveyor is also tee'd into this circuit. When the truck conveyor motor is turned off, the reverse direction moves the transfer conveyor left as the operator chooses. When the truck conveyor is started, the transfer conveyor moves back right at a speed controlled by the needle valve.
2. Main Machine Lift Cylinder
 - a. Connect to the No. 2 priority valve, if applicable.
 - b. The lift cylinders are equipped with an adjustable nut. Add segments on the cylinder rod to control the depth of the machine.
 - c. This will most likely work best at a mid-range flow.
3. Rowfinder Operation (Valve and Cylinder)
 - a. If a power beyond circuit is used, it should be connected to this function. Check with dealer for proper connection.
 - b. This circuit normally requires 5 to 7 gpm to operate. The circuit has an orifice restrictor to control this flow if connected to the power beyond circuit.
 - c. If this circuit is connected to a regular outlet, the flow should be reduced to the minimum needed. It may be desirable to remove the restrictor.
4. Rowfinder Override to Cylinder
 - a. Reduce flow to a comfortable speed for you.
 - b. A restrictor also in this circuit.
5. Operates the cylinders for the two cylinders that raise and lower the truck elevator. The lock valves mounted on the cylinders prevent the truck elevator from falling, if a hose should break.

**SAFETY
INSTRUCTIONS**

Never remove the lock valves.

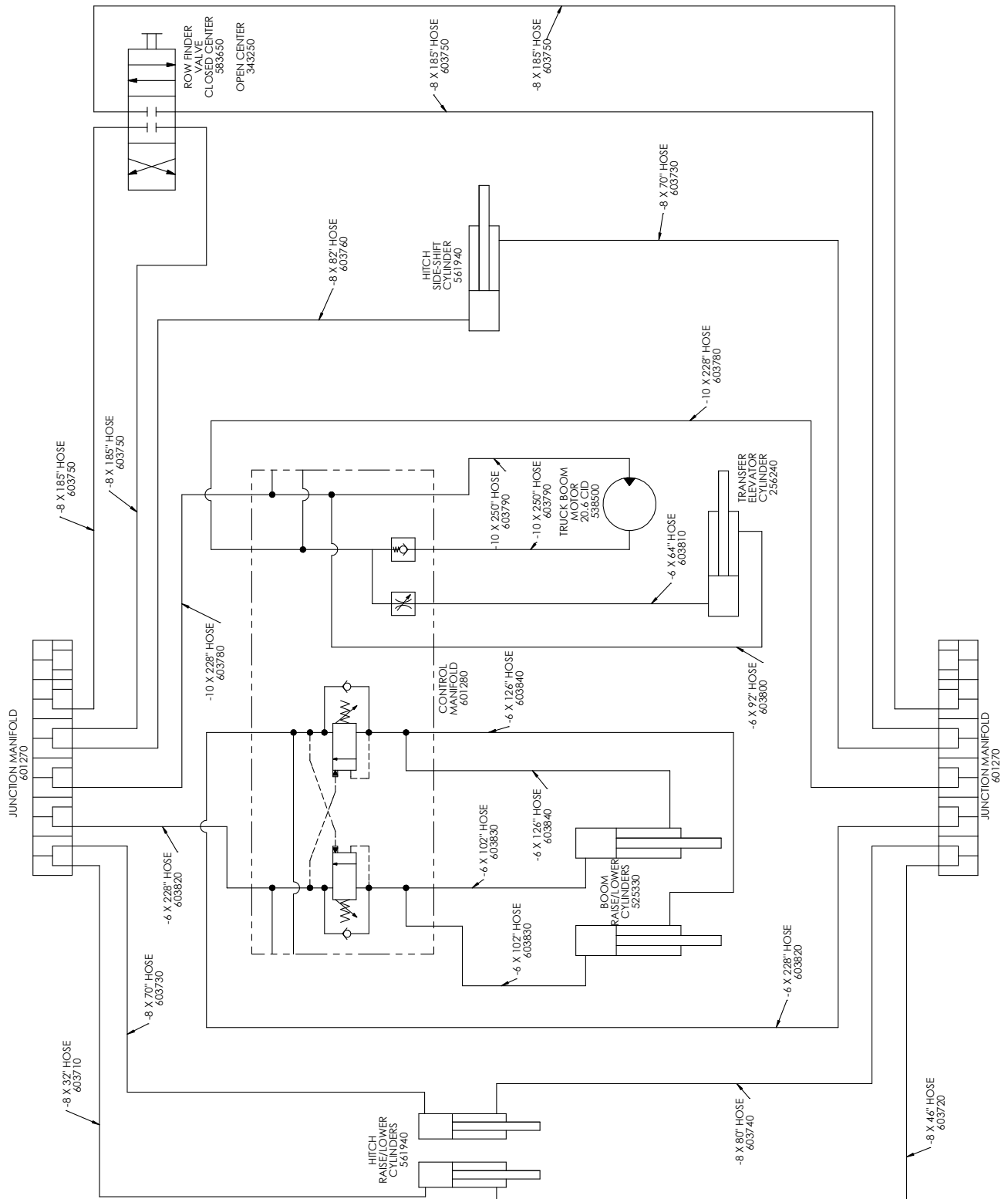


Figure 75. – Tractor/Harvester Hydraulic System

Harvester Self-Contained Hydraulic System

The self-contained hydraulic system consists of the following main components.

1. The hydraulic reservoir holds approximately 50 gallons of 10W/30 hydraulic oil. Use the same type of hydraulic oil as your tractor's hydraulic system. Make sure a visible oil level appears in the hydraulic reservoir level gauge.
 - a. Strainer in fill neck.
 - b. Strainer in the lower suction line, along with a shut-off valve. Never shut-off this valve unless required.
 - c. Filter in the return line.



Figure 76. – Harvester Pump Drive

- d. Dual hydraulic pump providing approximately 16 gpm to each circuit.
- e. A dual relief and junction block limits the pressure to 2,250 psi in these circuits. This block also can be used to attach a pressure gauge in each circuit if required.
- f. Circuit for the wheel elevator hydraulic motor drive is equipped with a flow control to allow for the wheel elevator to be slowed down if required.
- g. The remaining circuit runs the short conveyor and transfer conveyor hydraulic motors that are connected in a series.

SAFETY INSTRUCTIONS

When working with hydraulic systems, use every precaution to keep hydraulic oil clean and free of contaminates.

WARNING



High Pressure Fluid
High pressure fluids will cause bodily harm. Relieve all pressure before removing hydraulic fitting or component.

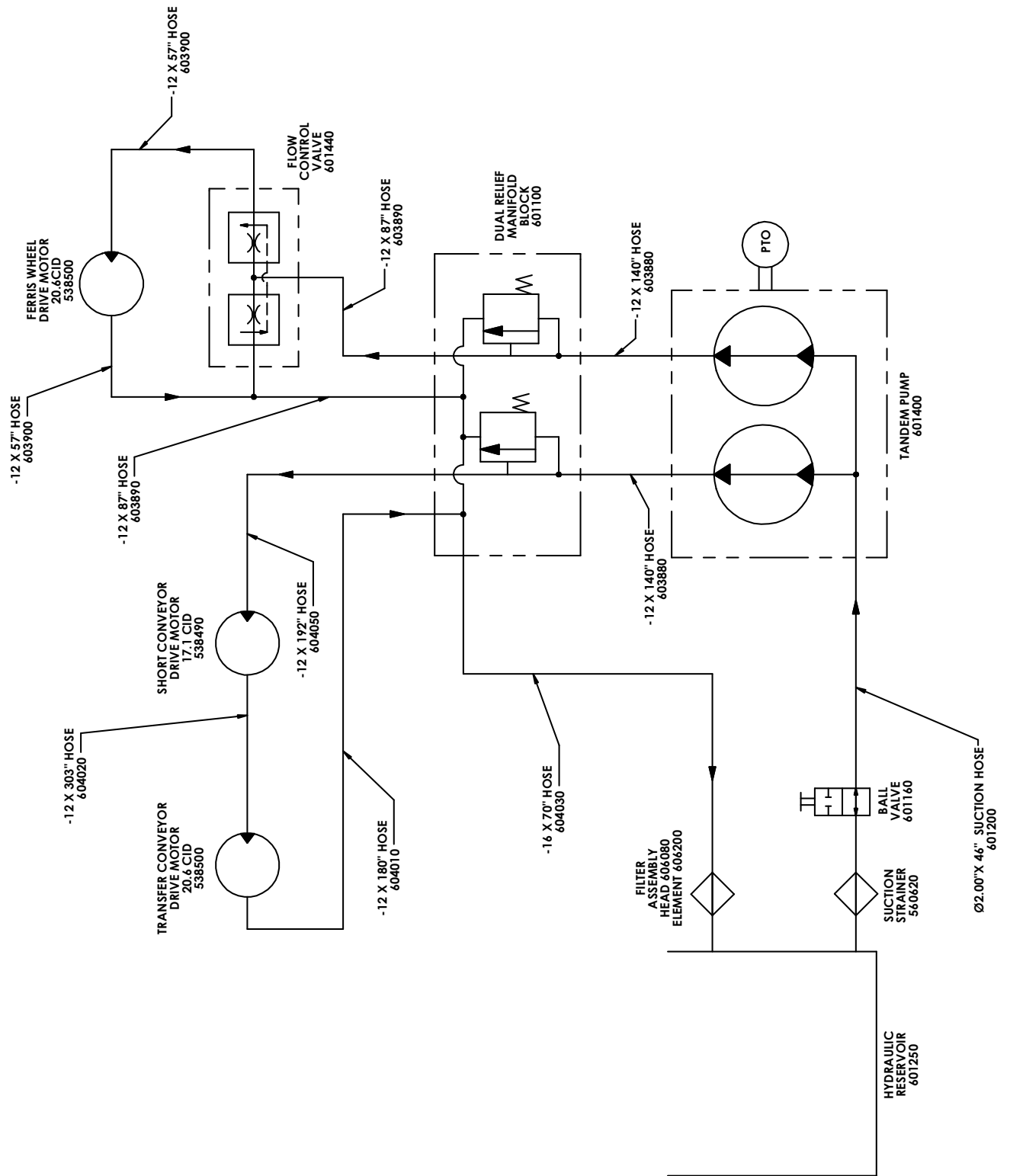


Figure 77. – Harvester Self-Contained Hydraulic System

TROUBLESHOOTING GUIDE

The Art's-Way 6812B Sugar Beet Harvester is designed to provide simple and reliable operation throughout beet harvest. Its full range of adjustments ensures efficiency in varying operating conditions.

If you encounter a problem with the Harvester, check this Troubleshooting section for possible cause and solutions. If you have a problem that is not covered in this section, please call your local Art's-Way dealer for assistance. Make sure you give the dealer your model and serial numbers when you call.

BASIC MACHINE

Problem	Possible Cause	Possible Remedy
Pulls too hard	Lifter wheels running too deep	Do not run the lifter wheels deeper than necessary
	Tractor too small	Use a larger tractor
	Grabrolls building up with mud	Wait for dry conditions
	Grabroll spacing wrong between pairs	Adjust grabrolls to a wider setting – must be further apart at discharge end
	Hydraulics system too much demand	Review speeds and check with dealer for best connection for your tractor.
Gear case runs hot, leaks oil	Dirt buildup around main gearbox	Clean and lubricate the machine to avoid overload
	Low Oil	Check oil/add
	Lubrication viscosity too light for climate	If weather is hot and problems persist, change to No. 140 gear lube
Hard to keep on rows	Lifter wheel strut assemblies not set properly with rows	Make sure the lifter wheels struts assemblies match the rows at the pinch
	Machine straddling the guess row	Make sure you are not straddling the guess row
	Rowfinder not adjust correctly	Adjust rowfinder
	Conditions suitable for utilization of rowfinder	Install a rowfinder for automatic tongue steering
Will not dig deep	Tractor drawbar not set properly	Set tractor drawbar properly
	Front hitch in wrong hole setting	Adjust front hitch to the proper holes
	Improper cylinder being used	Use correct depth control cylinder
	Machine running uneven	Adjust tire pressure
Premature wear of roller chains	Improper lubricant or infrequent intervals	Lubricate chains with proper oil and more frequently
Lose small beets	Conditions suitable for utilization of close-ups	Install close-ups
	Grabroll spacing too wide	Reduce gap of grabroll pairs
	Ground speed too slow	Increase ground speed – this may help get the beets to the paddles and onto the cleaning bed
	Lifter wheels too far apart	Space the wheels closer together

Problem	Possible Cause	Possible Remedy
Break the tails off	Lifter wheels not running deep enough	Run lifter wheels deeper
	Lifter wheel strut assemblies not properly spaced	Make sure lifter wheel strut assemblies are spaced to fit rows
	Not steering properly (if so equipped)	Adjust steering toe in and/or tracking
	Lifter wheels too narrow, pinch point is too tight	Adjust rowfinder arms
	Rowfinder not adjusted properly	Adjust down pressure
	Pinch point too high or too low	Lower or raise pinch point. Make sure suggested spacers are installed
	Front smooth roll too high or too low	Lower or raise front roll
Beet slicing	Rowfinder not adjusted properly	Adjust rowfinder
		Adjust down pressure
	Harvester positioned over guess rows	Dig on planted row only
	Lifter wheels too narrow	Space wheels further apart
	Replanted beets	
	Tractor moving beets	Check tire size and spacing
Beets moved from sprayer or other		
Loads too many clods	Lifter wheels set too deep	Run lifter wheels shallower, if possible without breaking tails
	Lifter wheels too wide	Remove shims
	Grabrolls not set wide enough	Set grabrolls for wider gap
	Very dry soil conditions	Irrigate field or wait for moisture
Excessive trash or dirt in the truck	Cleaning areas built up with mud or trash	Remove mud or trash
	Cloddy, stony field conditions	Space grabrolls further apart
	Improper defoliating	Improve defoliating operation
Beet plugging cleaning bed	PTO speed too slow	Increase PTO speed to a minimum of 950 RPM
	Grabroll spacing wrong between pairs	Adjust grabrolls must be further apart at discharge end
	Loading too much dirt	Raise digging depth of machine
	Flighting and transfer areas of spiral worn	Repair rolls or replace
	Ground speed too fast	Decrease ground speed
	Small beets	Space the grabrolls closer together

ROWFINDER

Problem	Possible Cause	Possible Remedy
Lifter wheels moving away from beets	Hydraulic hoses incorrectly connected	Check the valve connections at the tractor outlets
Lifter wheels not tracking properly	Feeler arms not centered	Center feeler arms
Lifter wheels jump off rows	Not enough down-pressure	Increase down-pressure or lower rowfinder
	Rowfinder arms too high	Lower arms
	Drawbar mounting hole greater than 1.25 inch (3.175 cm)	Insert bushing
	Reaction too fast	Decrease oil flow to rowfinder

LUBRICATION SCHEDULE

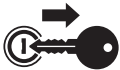
GENERAL

Economical and efficient operation of the Beet Harvester depends upon the regular and proper lubrication of all moving parts with quality lubricant. Failure to lubricate can result in reduced efficiency, premature wear, mechanical breakdown, and needless and costly replacement of parts.

WARNING



Entanglement / Crush Hazard
 Serious injury will occur if caught in rotating parts.
 Keep clear of moving parts.



Shut off tractor and remove key
 before making adjustments.



Wait for all movement to stop
 before approaching machine.

NOTE: All unmarked locations 1, 2, or 3 pumps every 10 hours. Every 20-30 hours on items marked with ① .

NOTE: For items marked with ② see special instructions.

QUICK REFERENCE BY SYSTEM

1. CV PTO ②

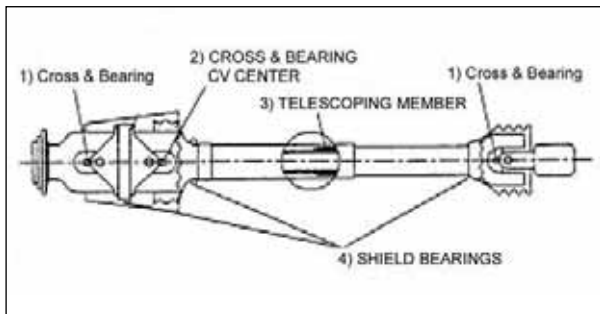


Figure 78. – Constant Velocity PTO

- a. Cross and Bearings (2 places) until grease is purged around the seal (4 to 5 pumps).
- b. CV, Cross, and Bearings (1 place - 8 to 12 pumps).
- c. Telescoping Members, until grease fills the telescoping area. Disassemble occasionally to ensure components are adequately greased (4 to 8 pumps).
- d. Shield Bearings (3 plastic zerks) (2 pumps).

NOTE: A high quality general-purpose grease may be used. However, a lithium-based grease is recommended. **Lubricate every 8 hours of operation.**

NOTICE

When turning frequently or making sharp turns, grease the CV center housing at 4-hour intervals. Failure to frequently grease the CV center housing and telescoping members will reduce the life of the CV.

2. Hitch, Input Drive, and Rowfinder.

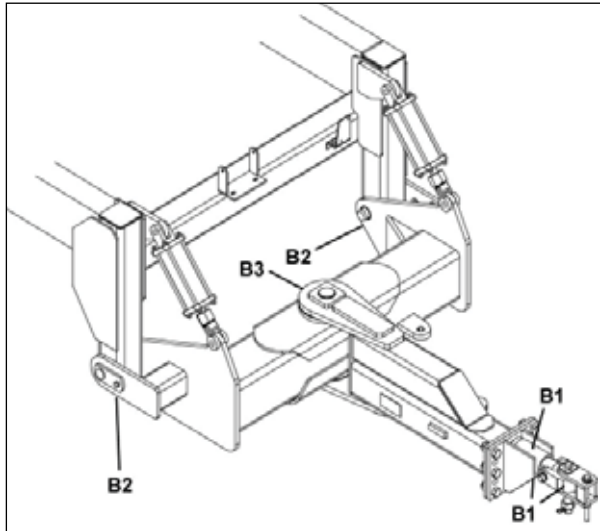


Figure 79. – Harvester Hitch Area

- a. Hitch pin and swivel at tractor connection pivot.
- b. Pivot at rear center of tongue.
- c. Slide hitch to frame (2 zerks).
- d. Pillow block bearings on short jackshaft and on other side of double U-joint and center of long jackshaft (4 zerks) (not shown).
- e. U-joints (not shown).
- f. Rowfinder (not shown).

3. Harvester Gearbox (Qty 2).

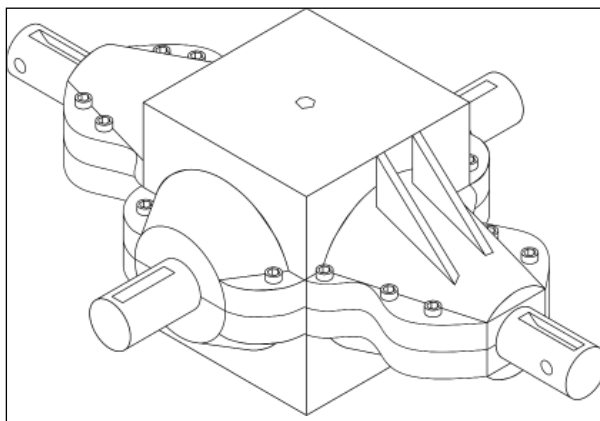


Figure 80. – Harvester Gearbox (3 On Wide Heads)

- a. U-joints, 4 shafts of gearbox and head jackshafts.
- b. ② Check oil level in gearbox every 50 hours. Oil level should be about half-way up shafts.

4. Header Lifter Wheels

- a. ② Lifter wheel hubs every 20 to 50 hours depending on conditions.

5. Right Hand drives.



Figure 81. – Header Right-Hand Drive

- a. ① Flange block bearings on conveyor rolls and center bearing of Star roll (2 zerks).
- b. ① Paddle shaft pillow block bearing.
- c. ② Slip clutch paddle shaft (if jaw clutch). Very sparingly.

6. Left Hand drives.



Figure 82. – Header Left-Hand Drive. (8 Row Header Shown)

- a. ① Flange block bearings on ends of conveyor rolls and grabrolls (7 zerks).
- b. ② Paddle shaft pillow block bearings.
- c. ② Slip Clutch – Paddle shaft (if jaw clutch). Very sparingly.

7. Grabrolls
 - a. Flange block bearings – Front drive CC drive.
 - b. Flange block bearings – Rear drive and upper drive shaft.
8. Elevator and Tank Area.
 - a. ❶ Flange block bearings drive and idler end of elevators, short conveyor, transfer conveyor, and truck conveyor
 - b. ❶ Pivot slide of stripper adjusting rod.
9. Harvester Wheels.



Figure 83. – Harvester Wheel And Tire

- a. ❷ Carrier wheel bearings, clean and pack with wheel bearing grease every 200 hours or each season.
10. Self Contained Hydraulic System
 - a. Check oil level in reservoir.
 - b. ❷ Replace filter at the start of each season. Run system prior to replacement.

QUICK REFERENCE BY HOUR

1. Every 8 hours
 - a. CV PTO. If making frequent or sharp turns, grease the CV center housing at four (4) hour intervals.
 - b. Cross and Bearings until grease is purged around the seal (2 to 4 pumps).
 - c. CV center Housing until grease is evident around the center section disk (6 to 12 pumps).
 - d. Telescoping Members until grease fills the telescoping area. Disassemble occasionally to ensure components are adequately greased (4 to 8 pumps).
 - e. Shield Bearings (3 plastic zerks) (2 pumps).
2. Every 10 hours
 - a. All roller chains, oil lightly.
 - b. Hitch, Input Drive, and Rowfinder.
 - c. Pillow block bearings on short jackshaft and on other side of double U-joint and center of long shaft (4 zerks).
3. Every 20 to 30 hours
 - a. Right-hand Drives
 - Flange block bearings on conveyor rolls and center bearing of star rolls.
 - Paddle shaft pillow block bearing.
 - Flange block bearings on discharge ends of grabrolls.
 - b. Left-hand Drives.
 - Flange block bearings on ends of conveyor rolls.
 - Paddle shaft pillow block bearing.
 - c. Grabrolls
 - Front grabroll flange bearings.
 - Rear grabroll flange bearings.
 - d. Pillow block bearings drive ends of conveyors.
 - e. Pivot slide of stripper adjusting rod.
4. Every 20 to 50 hours
 - a. Lifter wheel hubs.
5. Every 50 to 100 hours
 - a. Check oil level in the gearbox.
 - b. Slip clutch hub. Grease very sparingly.
6. Every 200 hours or every season
 - a. Carrier wheel bearings, clean and pack with wheel bearing grease.

SEASONAL STORAGE

Proper storage of the harvester will increase the service life and make it easier to place it back into service at the beginning of the next season.

PREPARING THE HARVESTER FOR STORAGE

1. Store harvester in a dry place.
2. Squirt diesel fuel on seals of bearing prior to washing with a power washer.
3. Wash the harvester thoroughly.
4. Clean and then apply heavy oil to the drive chains to prevent rust.
5. Lubricate harvester. Grease threads of adjusting bolts. Run harvester briefly to distribute grease.
6. Remove belt tension.
7. Scrape and repaint all worn parts or coat with light oil to prevent rust.
8. Block up harvester to remove load from tires, do not deflate tires. If stored outside, remove the wheels and tires. Store both in a cool, dark, dry place.
9. Place a plank under lifter wheels so they do not sink into ground, if harvester is not stored on a hard surface.
10. List the replacement parts needed before next season and order early. Your dealer can give better service in the off-season. Replacement parts can be installed in your spare time – no delay at time of need.
11. If the hydraulic cylinders will remain on the harvester and extended, apply grease to the exposed rod end.
12. If the harvester is not sheltered, the belted elevator chain should be protected from direct sunlight.
13. Make sure reservoir is full of oil and oil remains in all hydraulic components.

RETURNING THE HARVESTER FROM STORAGE

1. Replace wheels, if they were removed, and remove blocking.
2. Inflate tires to 25 psi (172.3 kPa), 30 psi (206.8 kPa) maximum.
3. Clean harvester thoroughly.
4. Check drive and conveyor chains making certain they have proper tension.
5. Clean the slip clutches. Check and adjust spring lengths as necessary.
6. Retention belt drives.
7. Lubricate harvester; then run at half speed for 10 to 15 minutes listening for any unusual noises. Stop harvester and check bearings for overheated or excessive looseness. Recheck chain tension.
8. Review safety and operating instructions in this manual.
9. Inspect all connections and make certain that hardware is tight and cotter pins are in place.
10. If cylinders were stored on machine and cylinder rods were extended and coated with grease, clean grease from exposed rods.
11. Make sure all shields are in place and properly fastened.

TRANSPORTING THE HARVESTER**SAFETY
INSTRUCTIONS**

It is the responsibility of the operator to know the lighting and marking requirements of local highway authorities. Road hazard lights provided with this harvester conform to current ASAE standard 279.10 Lighting and marking of agricultural equipment on highways. Be sure to use and maintain the proper warning lights and markings at all times on public roads.

1. Connect the harvester to the tractor. (Refer to Tractor/Harvester Connection Section).
2. Ensure a safety chain is connected to the tractor and harvester.

**SAFETY
INSTRUCTIONS**

A safety chain will help control drawn equipment should it accidentally separate from the drawbar while transporting. Using the appropriate adapter parts, attach the chain to the tractor drawbar or other specified anchor location. Provide only enough slack in the chain to permit turning.

3. Lower the harvester's off-loading boom.
4. Raise the harvester so the header lifter wheels do not contact the ground.
5. Ensure the harvester will pass below any overpasses, power lines, or elevated obstacles.
6. Transport the harvester empty when possible.
7. Transport the harvester at speeds below 20 mph (32 km/h).
8. Ensure the harvester is equipped with road hazard lights, a slow moving vehicle (SMV) emblem, two (2) red reflectors, and two (2) red-orange reflectors mounted on the rear of the harvester. Keep the lights, emblem, and reflectors clean and visible at all times.
9. Ensure the harvester is equipped with amber reflectors mounted on the front and sides of the harvester. Keep the reflectors clean and visible at all times.
10. Turn on the road hazard lights when transporting the harvester on public roads.
11. Adhere to all safety guidelines. (Refer to Safety Instructions – Transportation Safety).

DEALER ASSEMBLY INSTRUCTIONS

PRE-DELIVERY**SAFETY
INSTRUCTIONS**

The harvester has a total weight ranging from 29,000 lbs (13,145 kg) for the 6 row 28/30 to 35,400 lbs (16,057 kg) for the 12 row 22. While working on the machine, be sure to work safely. Be sure to use adequate blocking. Use adequately rated lifting devices. Make sure parts are secured before working under or near them.

Check harvester and head for various components: Main Frame Unit, Head, Short Conveyor, Stripper, Grates for Truck Conveyor. If 12 row 22 or 8 row 30 machine also find Gage Wheels and Truck Conveyor Extension.

NOTE: A hoist or lift truck is necessary to assemble the harvester this must be capable of reaching across the head and picking up and moving the tongue of the machine which weighs approximately 1000 pounds (453.6 kg).

It also must be capable of lifting the heads, which are approximately 8,000 & 10,000 pounds (3628.7 & 4535.9 kg) for the 6 row 28/30 & 8 row 22. The 12 row 22 weighs approximately 14,000 pounds (6350.3 kg). The 8 row 30 weighs approximately 11,000 pounds (4989.5 kg). The Main Frame Unit weighs approximately 22,000 pounds (9979 kg).

NOTE: Parts required for assembly are stored in the side shields of the head and the rear shield of the harvester, remove for assembly.

NOTE: Set the frame on a level area to assemble. Set the header lifter wheels on a board so they do not penetrate into soft ground.

ASSEMBLY INSTRUCTIONS

Figure 84. – Wheel & Tire Installation

1. Installation of wheel and tire assemblies.
2. Adjust the axle to the outermost position.
 - a. Install the left and right-hand wheel and tire assemblies on the hub and spindle assembly. Larger distance of the dish in on the 8 row 22/ 6 row 30; dish out on the 8 row 30 & 12 row 22. Tires in the ground drive direction (lugs point rearward on the top of the tire).
 - b. Secure each wheel and tire assembly to the hub and spindle assembly using the ten nuts provided.
 - c. Install the rubber flap to the inside of the axle to close up where the axle had extended over the grabrolls.

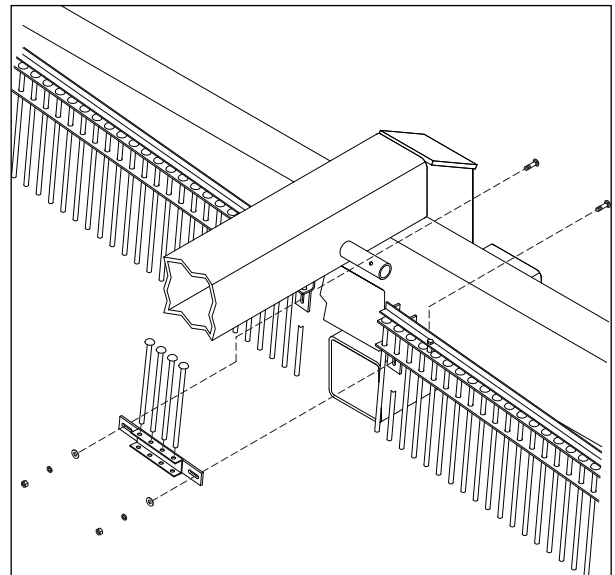


Figure 85. – Axle Grate Installation

3. Install tongue to cross hitch (see Figure 86). Parts loosely attached. If needed, install the front hitch swivel to the tongue with the six (6) 1 inch (2.54 cm) x 3.0 inch (7.62 cm) bolts provided.

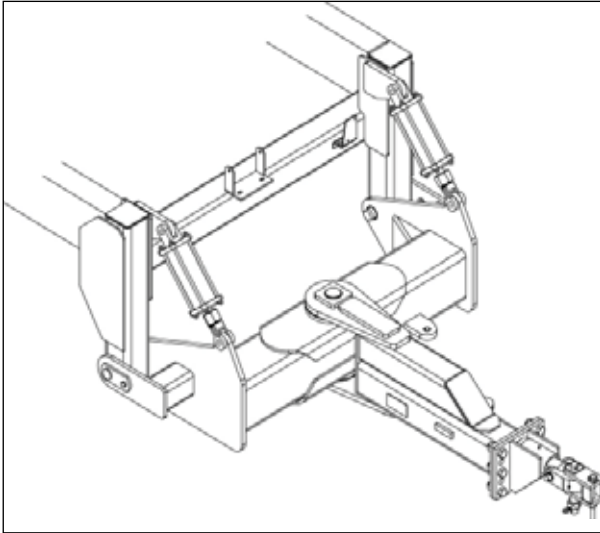


Figure 86. – Harvester Hitch Area

4. Prepare head to install to basic unit.
 - a. For the 12 Row 22 head, rotate the head back to its correct position and remove the shipping stands. The 12 Row 22 head will also have the rear grate rods removed. Install in the diagonal position.
 - b. For all heads, loosen the U-joints on the shafts that connect to the center gearbox. Slide both U-joints on both shafts onto shafts as far as possible. The temporary stands for the shafts should be removed and the shafts positioned so the notch in the frame clear the shafts.



Figure 87. – Header Drive Shafts

NOTE: Do not tighten setscrews at this time and leave through bolts off.



Figure 88. – Header Positioning

5. Position the header.
 - a. Position the header just in front of the main frame of the harvester. Ensure the header and harvester centerlines are aligned and square with each other. Leave enough room for the tongue of the harvester to be raised over the header.



Figure 89. – Harvester Alignment

- b. Reaching from the front of the header. Raise the tongue of the harvester over the header and move the harvester forward until it can be lowered to the header into position. Carefully observe the positioning and that the U-joints clear on the 12 row.
6. Installation of the header to the harvester.
 - a. Secure the header to the harvester, using the plates and bolts provided. See Figure 90, Figure 91, and Figure 92.

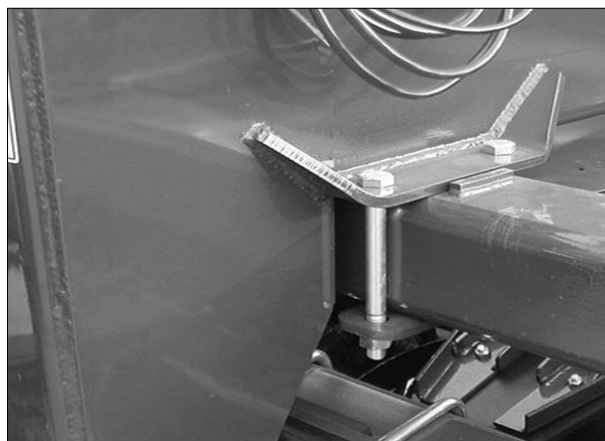


Figure 90. – Front Mounting Plate Header To Harvester Attaching Hardware (2 Bolts)



Figure 91. – Rear Mounting Plate Header To Harvester Attaching Hardware (8 Bolts)

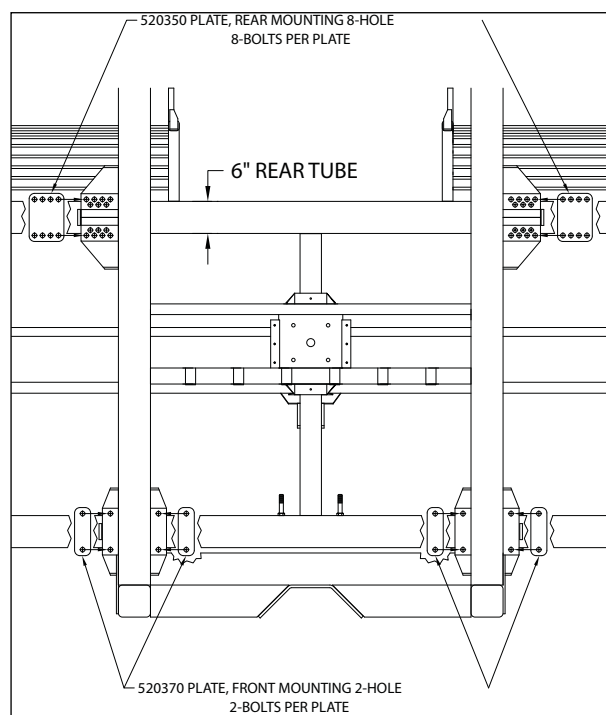
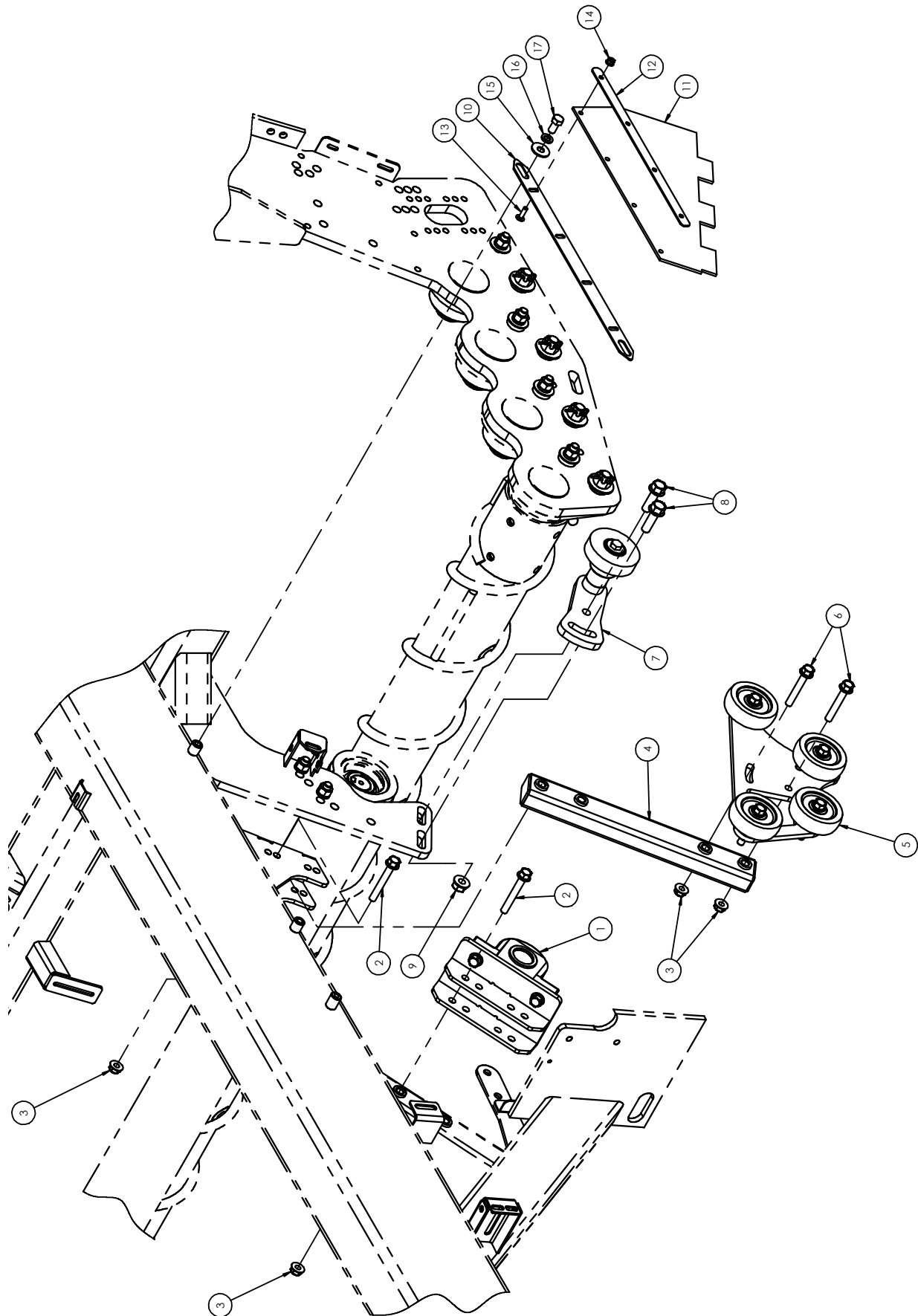


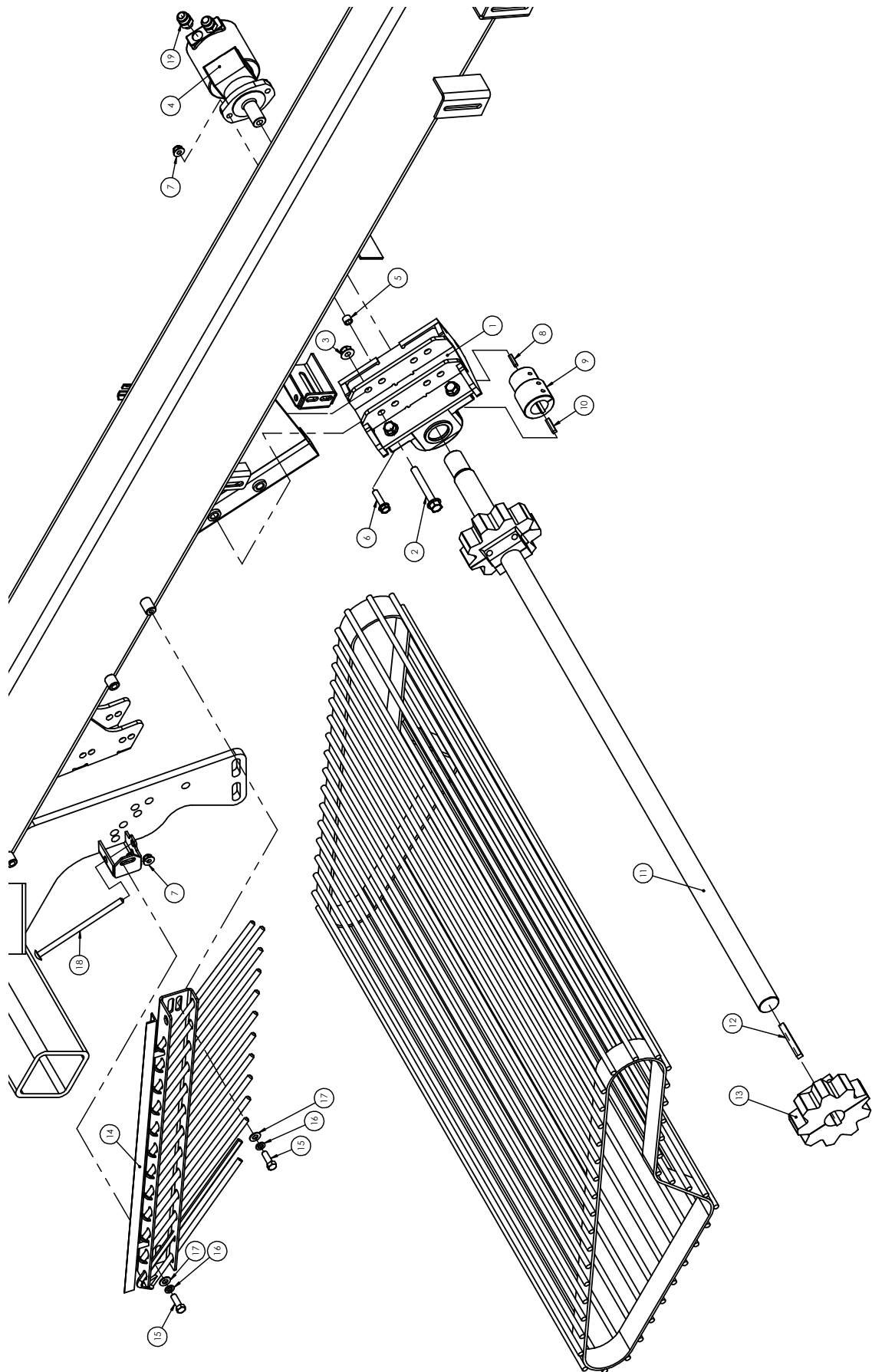
Figure 92. – Mounting Plate Details

- b. Attach U-Joints back to shafts. Tighten setscrews and replace through bolts and lock nuts on U-Joints and tighten.
 - c. Install four pipes under 12 inch (30.5 cm) cover flaps with HHCS 1/2 x 2-3/4 flat lock washers and nut that are in pipes.
7. Installation of short conveyor, see Figure 93, Figure 95, and assembly illustration figure.
- a. Remove parts from short conveyor and review compared to illustration.
 - b. Move the short conveyor into position between the header and the harvester.
 - c. Lift the short conveyor into position on the angles over the grab rolls and secure to the front position with bolts shown. Position so rods of draper chain are slightly lower than the top of the roll flighting. Then so the riser links clear the spiral of the roll 1/8 to 3/16. This is done by loosening bolts and adjusting with 1 inch nuts.
 - d. Install the grates and rubber flap per Figure 95



Figure 93. – Short Conveyor Attachment Point





8. On harvesters with the 12 row 22 inch or 8 row 30 inch, install the front header gage wheels on the front corners of the header with the clamps provided. The suggested setting is 3.5 inches (8.89 cm) (4 x 4) with the lifter wheels on concrete. Optional front mounts attach gage wheels to front of head.

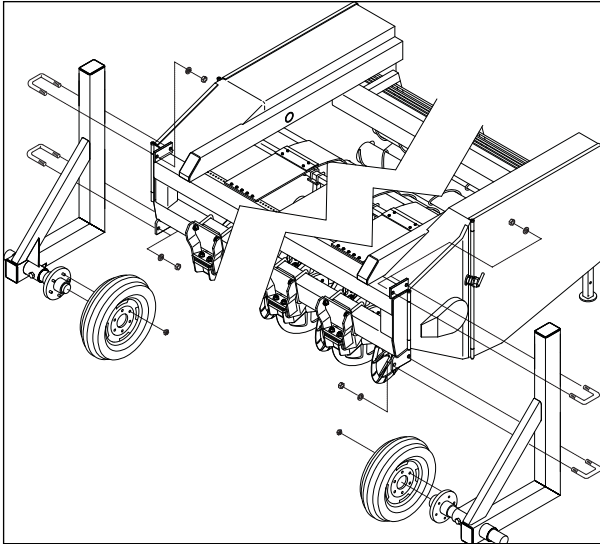


Figure 94. – Front Header Wheels (12 Row 22 and 8 Row 30 Only) (Optional On 6 Row 28/30, and 8 Row 22)

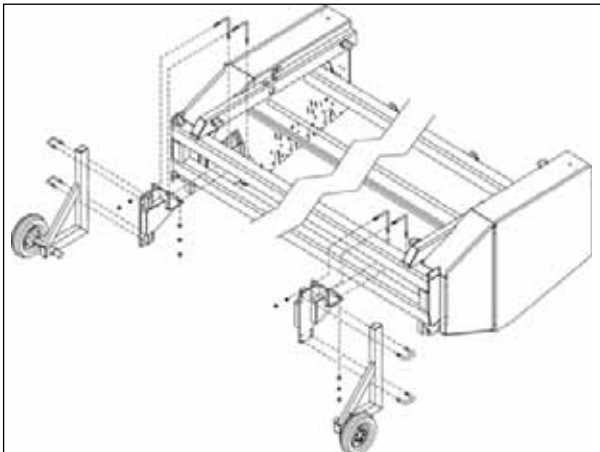


Figure 95. – Wheel Mounts, Front (Optional)

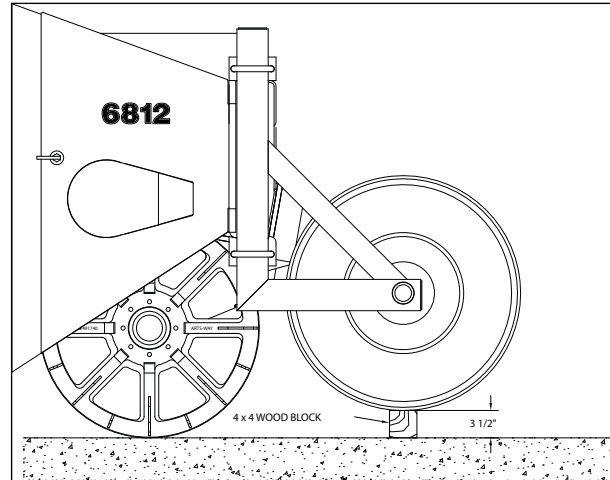


Figure 96. – Front Header Wheels Height

9. Install the grates on the off loading conveyor using 0.5 x 3.75 inch (1.27 x 9.525 cm) HHCS, two (2) flat washers, lock washer, and nut.
10. Install the boom extension on the 8 Row 30 or 12 Row 22 machine. See separate instructions.

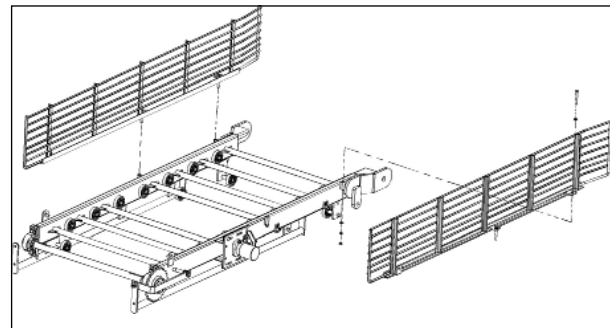


Figure 97. – Off-loading Conveyor Grates

11. Connect the upper mounting of the truck conveyor hydraulic cylinders.
12. Install draper chain in the tank and boom. Make sure lap is proper direction (top surface trailing). See Figure 98.
13. Install two tank extensions and grates on transfer elevator, as shown in Figure 100 and Figure 101.

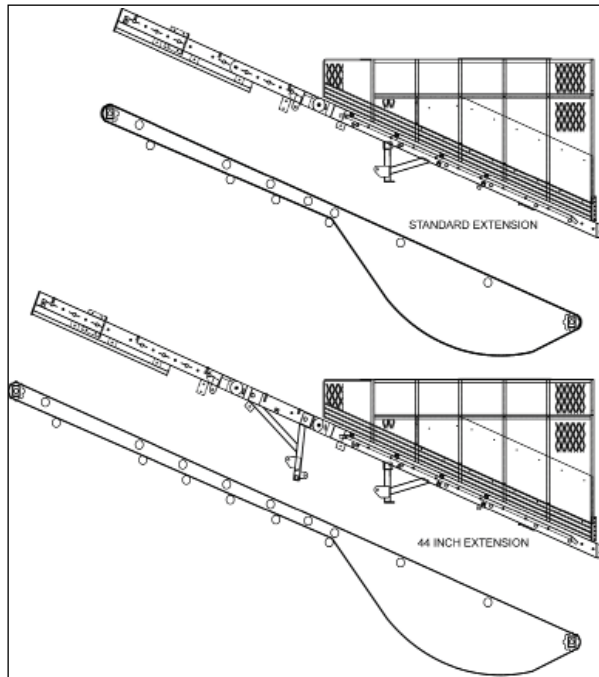


Figure 98. – Draper Chain Routing

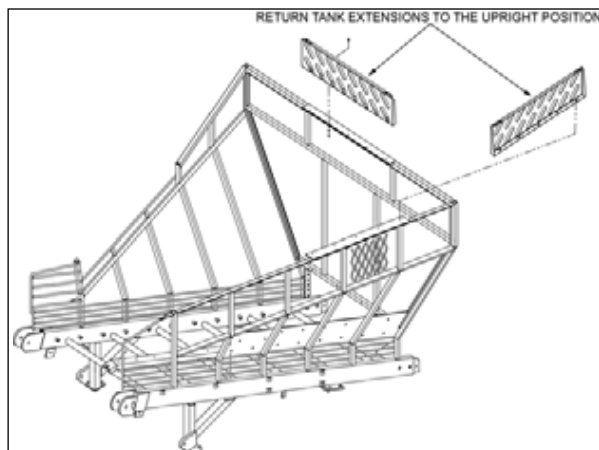


Figure 99. – Extensions For Tank

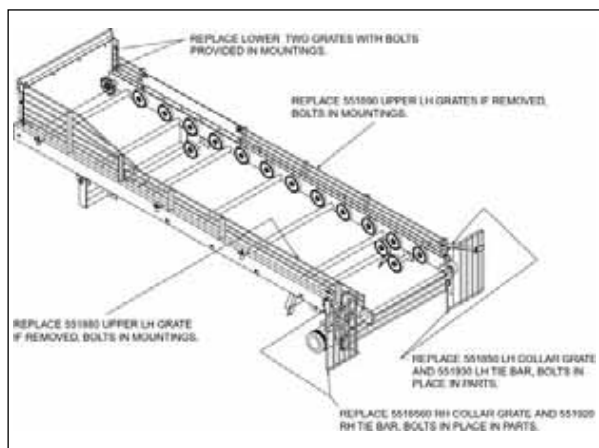


Figure 100. – Grates For Transfer Elevator

14. Install the wheel elevator stripper.
 - a. Position the stripper so it is the desired depth into the ferris wheel, this will most likely be 4 to 6 inches (10.16 to 15.24 cm) from the outside of the lower frame tube.

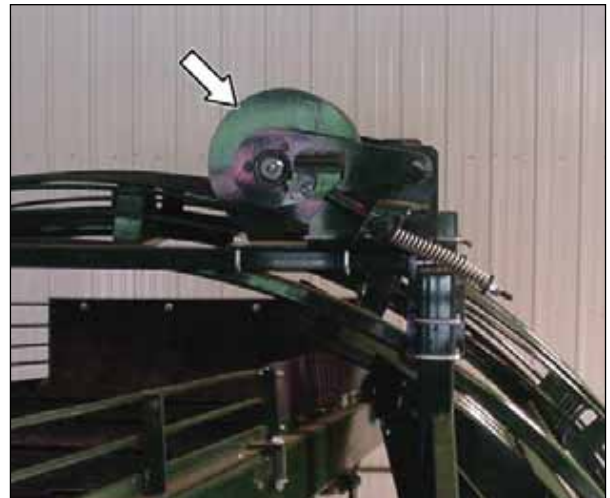


Figure 101. – Wheel Elevator Stripper

- b. Secure the stripper using four u-bolts, flat washers, lock washers, and nuts.
 - c. Center the round disks between the wheel elevator rods, allowing for the coupler tubes. Ensure the disks do not strike against the square cross tubes or joint cross bar. Make sure they allow the optional rubber flaps to drop out of the way.
 - d. Rotate the wheel elevator one or two full revolutions to check for stripper disk and support clearances.
15. Installing the rowfinder.
 - a. Remove the rowfinder from the shipping position and install in proper running position.
 - b. Install the feeler arms to the desired width with double roll pins and safety cotter pins.
 - c. See instructions to adjust rowfinder.

16. Five (5) tractor hydraulic circuits are required. The rowfinder may be a power beyond circuit. Be sure to connect this circuit to the power beyond as needed to reduce power consumption. See HARVESTER ADJUSTMENTS – Figure 76.

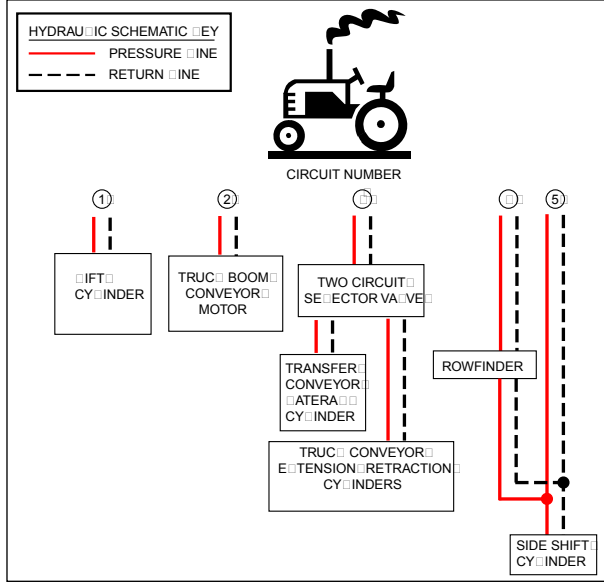


Figure 102. – Tractor/Harvester Hydraulic System

17. The self contained system runs three (3) hydraulic motors. The short conveyor and transfer conveyor are connected in series. The wheel elevator is driven by the second circuit.

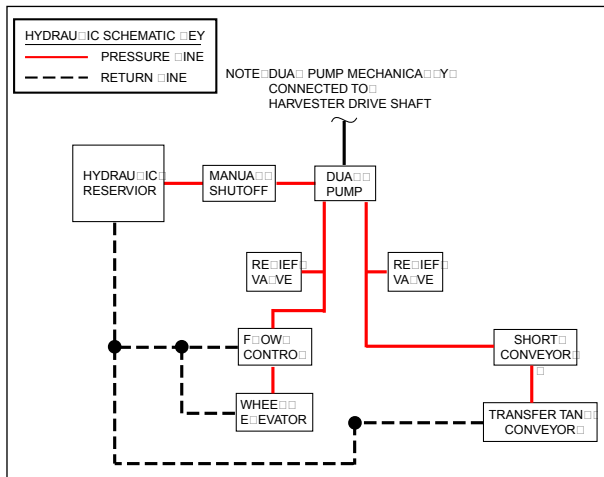


Figure 103. – Harvester Self-Contained Hydraulic System



Figure 104. – Hose Routing And Rowfinder

18. Complete assembly of the hazard lights.

NOTE: Main harness has pigtail wires to connect running lights.

- a. Install the amber flashing lights on top of the left and right header drive housings.

NOTE: Wiring can be routed inside through side drive housing.



Figure 105. – Hazard Light Installation

- b. Connect lights to wiring y-harness on main machine.
- c. Route and secure wires with power cord to tractor.

19. Connect the Power Take-off to the harvester input shaft with woodruff key and 0.375 inch (0.9525 cm) x 3.25 inches (8.255 cm) bolt and lock nut.

20. Check the hydraulic reservoir oil level and make sure the valve on the lower suction line is open (lever parallel with line).

21. Service the harvester gearbox. Add SAE 90 oil is required.
22. Install boom extension on 8 row 30 and 12 row 22 machines, see separate instructions.
23. Perform a visual inspection of the harvester. Make sure of the following:
 - a. All bolts and screws are tight.
 - b. Roller chains, drive belts, and draper chains have proper tension.
 - c. The PTO is properly installed and lubricated.
 - d. Hydraulic hoses, routing, and connections are correct and secured.
 - e. Electrical wiring harnesses and connections are correct and secured.
 - f. The gearbox has the proper oil level.
 - g. All shields, guards, access covers, and doors are installed/closed.
 - h. Tires have correct air pressure.

HARVESTER ADJUSTMENTS




1. Adjust the harvester components to ensure efficient operation. (Refer to Harvester Adjustments).

ASSEMBLY INSTRUCTIONS 44 INCH BOOM EXTENSION

SAFETY INSTRUCTIONS

The harvester weights approximately 29,000 to 35,400 lbs (13,145 to 16,057 kg), depending upon the header configuration.

CAUTION

-  **Crush Hazard**
The harvester and its components are very heavy and can cause serious crushing injuries. Securely block or fasten all parts before working under or near them.
-  Use blocking that will safely support load.
-  Use lifting devices rated to lift weight of load.

A 44 inch (111.76 cm) fixed boom extension is provided for the 8 row 30 inch and 12 row 22 inch head.

1. The belted draper chain for the truck conveyor and tank is shipped loose.
2. Remove the hoses from the hydraulic motor and remove the truck conveyor from the tank. This hardware will be reused to attach the truck conveyor back onto the extension. Remove the lift cylinders and tie out of the way.
3. Assemble rollers to extension frame, as shown.
4. Attach the 44 inch (111.76 cm) extension frame and the two arms to tan, as shown.
5. Reinstall the truck conveyor to the extension.
6. Install appropriate draper chain in bottom and tank.
7. Install the draper chain extension onto the existing chain. Install draper chain back into conveyor.
8. Install the extension hoses to the hydraulic motor.
9. Move the hydraulic cylinders to the new position. Loosen and pull hoses from connection front left corner of machine, install the extension hoses to valve. The cross hoses can be tied to the 2 x 2 tube on the extension.
10. Raise and lower the truck conveyor to assure proper function. Run hydraulic motor to assure proper function.

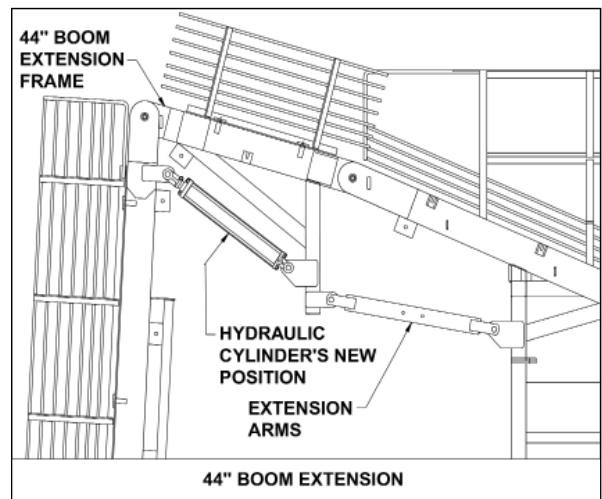
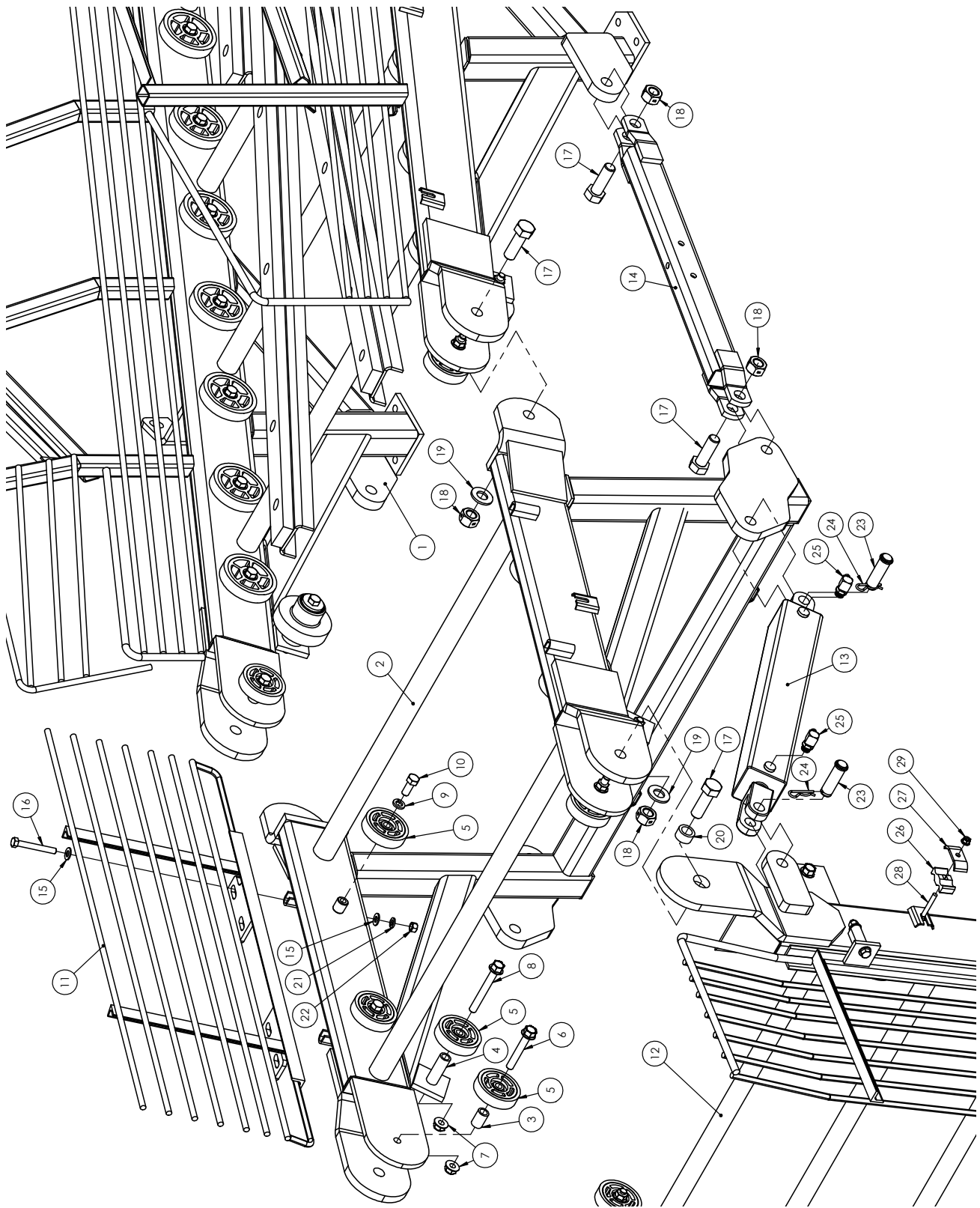
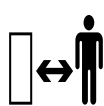


Figure 105b.



ITEM NO.	PARTNUMBER	DESCRIPTION	QTY.
1	527190	BEET TANK ASM	1
2	524010	BOOM WLDT	1
3	E724252	SPACER	2
4	532770	SPACER,STEEL (POLY ROLLS ONLY)	2
5	343280	ROLLER, RUBBER 4.00 DIA	8
6	600360	BOLT, HFH 5/8-11	2
7	600150	NUT, HFH NYLOC 5/8-11	4
8	600410	BOLT, HFH 5/8-11 X 5"	2
9	020440	WASHER, LOCK 5/8	4
10	990610	BOLT, HHCS 5/8-11 X 1-1/2"	4
11	530540	GRATE WLDT,	2
12	561110	CONVEYOR ASSEMBLY	1
13	525330	CYL. 3" X 20" DOUBLE ACTING HYD.	2
14	524100	ARM WLDT, EXT. SUPT.	2
15	005200	WASHER, FLAT 1/2 STD	8
16	031870	BOLT, HHCS 1/2-13 X 3-3/4"	4
17	R66338	BOLT, HHCS 1-8 X 3"	8
18	990510	NUT, TWO-WAY LOCK 1-8	8
19	042180	WASHER, FLAT 1 X 2 X 3/16	4
20	524040	BUSHING, ELEVATOR PIVOT	2
21	005370	WASHER, LOCK 1/2	4
22	005360	NUT, HEX 1/2-13	4
23	596860	PIN, CLEVIS	4
24	051670	HAIRPIN, .148 X 2-11/16	4
25	505780	FITTING, HYD 90° -8M ORB X -8M JIT	4
26	527700	CLAMP, HOSE	1
27	527680	BAR, HOSE CLAMP	1
28	035540	BOLT, CRG, 3/8-16 X 2.750 GR5 ZN	1
29	600120	NUT, HFH NYLOC 3/8-16	1

PRE-DELIVERY TEST RUN**CAUTION**

Crushing Hazard
Visibility when moving harvester is limited due to its size. To prevent injury or death, when conducting pre-delivery test run, keep all children and bystanders away from harvester.

1. Lubricate the constant velocity PTO. (Refer to Lubrication Schedule – Quick Reference By System).
2. Connect the tractor to the harvester. PTO and five (5) hydraulic circuits.
3. Connect the 7-plug connector to the tractor and check operation of the hazard lights. See separate section.
4. Connect tongue to tractor drawbar. Check PTO length per preparing for field operations.
5. Clear the area of bystanders.
6. Check that the harvester is clear of foreign objects and that the elevator chains and belts are free to operate.
7. Operate the tractor hydraulic functions. Raise the truck conveyor before running the hydraulic motor. Make sure the rowfinder is moving in the proper direction per rowfinder instructions.
8. Engage the PTO with the tractor at low rpm quickly on and off. Make sure ferris wheel, short conveyor, and transfer conveyor are turning the proper direction. Observe operation at low speed and listen for any unusual noises.
9. Gradually speed up the PTO to a speed of 1,000 rpm.

WARNING

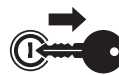
Entanglement / Crush Hazard
Serious injury will occur if caught in rotating parts.
Keep clear of moving parts.



Put tractor's transmission in neutral.



Set parking brake.



Shut off tractor and remove key before making adjustments.



Wait for all movement to stop before approaching harvester.

10. Check operation, alignment, and clearances of all moving parts. If adjustments are necessary, shut down the tractor to make any necessary adjustments.
11. Operate for 10 to 15 minutes.
12. Check the harvester for any loose hardware review all drives.
13. Check the hydraulic connections for leaks. Tighten as necessary. (Refer to the Safety Instructions – Hydraulic Safety).
14. Disconnect the tractor/harvester hydraulic and electrical connections.
15. Disconnect the tractor from the harvester.

SPECIFICATIONS

GENERAL

Model

- 6, 8, or 12 Row Tank Type Harvester

Overall Dimensions

- Operating – 13' 11" H x 15' 1" W x 30' 10" L
(3.96 m 28 cm H x 4.57 m 2.5 cm W x 9.14 m 25 cm L)
- Machine Weight – 29,000 to 35,400 lbs
(13,145 to 16,057 kg)
- Tread Width – Adjustable to row spacing

Tires

- Implement – 24.5 x 32 – 12 ply
- Operating Pressure – 24 psi (165.5 kPa)
- Optional Tire – 30.5L x 32 – 14 ply
- Operating Pressure – 22 psi (151.5 kPa)

Row Spacing

Header Option 1

Non-Adjustable 6 row header – 22 inch (55.88 cm)

Header Option 2

Adjustable 6 row header – 30 inch (76.2 cm) or
Adjustable 8 row header – 22 inch (55.88 cm).

Header Option 3

Non-Adjustable 8 row header – 30 inch (76.24 cm)

Header Option 4

Non-Adjustable 12 row header – 22 inch (55.88 cm)

- Operating speed – 4.5 mph (7.2 km/h)
 - Lift and depth control* - Hydraulic
 - Steering hitch control** - Hydraulic
- * Two 4" x 8" (10.2 x 20.3 cm) remote cylinders for lift
** One 4" x 8" (10.2 x 20.3 cm) remote cylinder for rowfinder

Lifter Wheels

- Two (2) per row – 28 inch (71.12 cm) solid rim heavy-duty cast alloy steel.

Lifter Struts

- Heavy-duty tapered bearings.

Lifter Wheel Scrapers

- To prevent mud buildup on lifter wheels.

Paddle Shaft and Drive

- Type – three steel per row
- Drive – Heavy #80H roller chain with heavy-duty slip clutch

Gearboxes (Qty 2 or 3)

- Heavy, 1.75 inch (4.445 cm) diameter shafts
- Capacity 0 5 quart (0.47 L) 90W gear oil

Conveyor Roll Bed and Drive

- Size –
 - o 6 Row 22 – 36 sq feet (3.34 sq m)
 - o 6 Row 30 & 8 Row 22 – 48 sq feet (4.46 sq m)
 - o 8 Row 30 – 64 sq feet (5.95 sq m)
 - o 12 Row 22 – 76 sq feet (7.06 sq m)
- Type – Four spiral conveyor rolls
- Drive – Belt drive with spring loaded idlers

Grab Rolls and Drive

- Size – 46 sq ft. (4.27 sq m)
- Type – Four (4) grab rolls with 0.75 inch (1.9 cm) spiral rods and four (4) smooth grab rolls adjustable spring loading and spacing
- Drive – Belt drive with spring loaded idlers
- Single point adjustment

Off-loading Boom

- Size – Width, 42" (107 cm). Optional 19.7 or 22 inch (50 or 56 mm) pitch belted chain
- Type – Hydraulic motor driven belted chain with tractor hydraulics

Tank

- Construction – Welded steel
- Capacity – 9,000 lbs. (4,082 kg)
- Unloading – Chain type conveyor, and hydraulic motor.

SAE Bolt Identification

Identification of SAE Bolt Grades; Head Markings

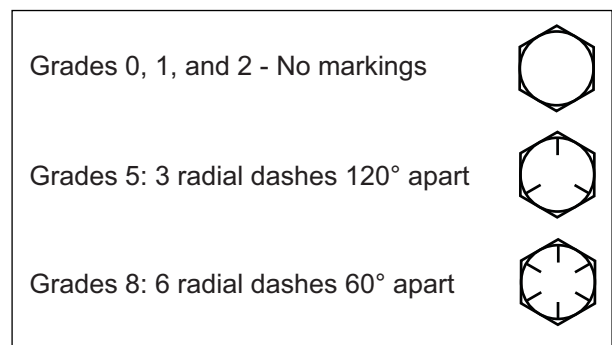


Figure 107. – Identification of SAE Bolt Grades; Head Markings

Torque Specification Guide

(SAE Grade 5 Coarse Thread)

Size	Clamp Load	Plain ft. lbs.	Plated ft. lbs.
1/4-20 (.250)	2,205	8	6
5/16-18 (.3125)	3,338	17	13
3/8-16 (.375)	4,950	31	23
7/16-14 (.4375)	6,788	50	37
1/2-13 (.500)	9,075	76	57
9/16-12 (.5625)	11,625	109	82
5/8-11 (.625)	14,400	150	112
3/4-10 (.750)	21,300	266	200
7/8-9 (.875)	29,475	430	322
1-8 (1.00)	38,625	644	483
1-1/8-7 (1.125)	42,375	794	596

TRACTOR REQUIREMENTS

Recommended Horsepower Rating

- 00 PTO Horsepower (MINIMUM)
- 220 PTO Horsepower (MINIMUM for 8 Row 30 and 12 Row 22 Headers)

Remote Cylinders: (Furnished)

Hydraulic Requirements

- Tractor must be equipped with five remote hydraulic outlets. The tractor must be capable of supplying 22 gpm (21 L) flow. If using the "Power Beyond", connect to rowfinder.

PTO Shaft

- Tractors must have 1.375 inch (3.49 cm) or 1.75 inch (4.445 cm) diameter 1,000 rpm PTO shaft (Do not use an adapter shaft).

Front Ballast

- Maximum tractor front ballast is required

Drawbar Support (Recommended)

Electrical System

- 12 Volt

ATTACHMENTS

Rowfinder

- To keep the harvester on the row

Lifter Wheel Close-up (Optional)

- To prevent loss of small beets through lifter wheels

Lifter Wheel Spacers

- To increase lifter wheel opening by 0.25 inch (6.35 mm) increments

Flex Struts (Optional)

- To protect lifter wheels in rocky soil conditions

Constant Velocity PTO

- Standard – Allows turning without disengaging PTO

Flashing Warning Light Kit

- Standard

Light Package (Optional)

- To light machine for night use (3 sealed beam halogen lights)

Fixed or Steerable Wheels

Wheel Elevator Stripper

Polyethylene Covered Grab Rolls

Gage Wheels

- Optional on 6R28/30, and 8R22
- Standard on 8R28/30 and 12R22
- Front Gage Wheel Mounts (Optional)

NOTES:

Art's

Since

NOTES:





Art's-Way Manufacturing Co., Inc. TECHNICAL MANUALS

Manuals are available from your local dealer or Art's-Way Manufacturing Co., Inc. for the operation, service, and repair of your machine. For prompt convenient service, contact your local dealer for assistance in obtaining the manuals for your machine.

Your local dealer can expedite your order for operator manuals, illustrated parts catalogs, service manuals, and maintenance records.

Always give the Machine Name, Model, and Serial Number so your local dealer can provide the correct manuals for your machine.

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HWY 9 WEST - PO Box 288
Armstrong, IA. 50514 U.S.A**

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