Operator's Manual

Model 2100
Forage and Receiver Box

PRELIMINARY

ART'S WAY

Art's-Way Manufacturing Co., Inc.
710600
Issued October 2022

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 Forage and Receiver Box. 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 Forage and Receiver Box. 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 Forage and Receiver Box.

Even if you are an experienced operator of this or similar equipment, we ask that you read this manual before operating this Forage and Receiver Box. 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 Forage and Receiver Box 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 Mfg. Co. Inc. shall void the warranty of this product.

In the interest of continued safe operation of this Forage and Receiver Box, 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., 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., be liable for any such act. In addition, Art's-Way Manufacturing Co., 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 information for this Forage and Receiver Box can be found on www.artsway-ag.com. There is also a seperate warrany document that accompanies this manual.

LIMITATIONS OF THIS MANUAL

This manual contains operating instructions for your 2100 Forage and Receiver Box only. Any mention of other machinery in this manual other than the 2100 Forage and Receiver Box 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 2100 Forage and Receiver Box.

PARTS & SERVICE

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

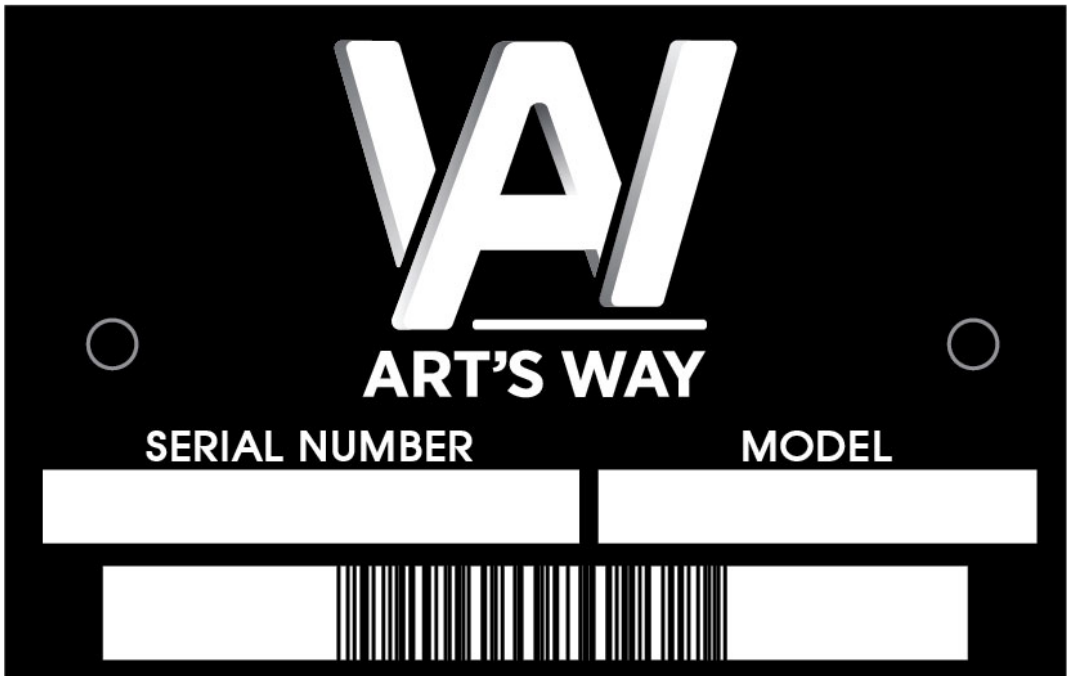
A. Original Quality

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 forage box. 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.



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WARRANTY INFORMATION MAY BE OBTAINED FROM WWW.ARTSWAY-AG.COM.

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 forage box.

Art's-Way Manufacturing Co., Inc. strives to make our equipment as safe as possible. The Art's-Way 2100 Forage and Receiver Box 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 forage box 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 forage box. (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 forage box 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 forage box 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

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 death.

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 forage box. 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 forage box.

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

Lower the lifter wheels when the forage box is not in use.

Install safety chain when attaching the forage box to the tractor.

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

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 forage box 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 forage box while in operation.

Do not allow riders while the forage box is in operation.

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

Stay away from overhead power lines. Electrocution 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 forage box. 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 forage box 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 forage box is securely attached to the tractor and install a safety chain to the forage box.

Make sure the tractor brake pedals are latched together.

Do not exceed 20 mph (32 km/h) when transporting the forage box. 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 forage box on the highway .

Stay away from overhead obstructions and power lines during transport. Electrocution 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 forage box 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 forage box 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 forage box 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.

SECTION 1: OPERATOR'S MANUAL

SAFETY PRECAUTIONS

This symbol is used to call your attention to instructions concerning you personal safety. Be sure to observe and follow these instructions. Take time to be careful!

DANGER

"DANGER" indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.

WARNING

"WARNING" indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.

CAUTION

"CAUTION" indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also alert against unsafe practices.

BEFORE you attempt to operate this forage box, read and study the following safety information. In addition, MAKE SURE that every individual who operates or works with this equipment, whether family member or employee, is familiar with these safety precautions. Miller- St. Nazianz provides guards for exposed moving parts for the operator's protection; however, some areas cannot be guarded or shielded in order to assure proper operation. The OPERATOR'S MANUAL AND DECALS on the machine itself warn you of dangers and SHOULD BE READ AND OBSERVED CLOSELY.

POWER SOURCE SHUTDOWN PROCEDURE

Before cleaning, unclogging, adjusting, lubricating or servicing this machine:

1. **Disengage the tractor PTO and disable electric/hydraulic power/flow by disconnecting hydraulic hoses and unplugging 7 pin power.**
2. **Shut off the tractor engine, remove the starter key and take it with you.**
3. **Wait for the all machine motion to stop.**
4. **Remove the telescoping PTO driveline and ALL power connections from the tractor.**

Failure to follow these precautions could result in death or serious injury.

Some photographs used herein may show doors, guards and shields opened and removed. BE SURE that all doors, guards and shields are fastened in their proper position before machine is operated.

Do not unclog, adjust, lubricate or service the forage box unless the "Power Source Shut Down Procedure" (previous page) has been performed.

KNOW how to stop the unloading unit of the forage box before starting it!

BE SURE the locking device on the telescoping PTO drive shaft is engaged onto the tractor PTO shaft groove before starting the tractor engine!

BE SURE all guards, doors and shields are in place and properly secured before starting the tractor engine!

KEEP hands, feet and clothing away from chains, augers and PTO when they are moving!

DO NOT connect a 1000 RPM tractor PTO shaft onto this unit!

DO NOT use a PTO adapter!

DO NOT allow minors to be near the machine unless properly

supervised!

KEEP the forage box away from power lines. Contact with electrical lines may result in serious injury or death by electrocution!

USE ONLY properly rated running gear and tires!

ALWAYS engage the tractor parking brake before proceeding to unload the forage box!

CHECK operation of the emergency clutch and of the activating mechanisms, safety bar and safety cable frequently, to insure that they are functioning properly!

BE SURE the rotating shields that are on the telescoping PTO drive shaft turns freely before starting the tractor engine!

DO NOT wear loose or baggy clothing when operating this unit!

DO NOT allow people other than a qualified operator near the unit!

DO NOT exceed a maximum towing speed of 20 MPH (32 KP H) while transporting the forage box!

DO NOT use PTO or PTO guard as a step!

OPERATING AND SAFETY EQUIPMENT

Become familiar with and know how to use all SAFETY DEVICES and controls BEFORE attempting to operate this equipment. Know how to stop the unit BEFORE starting it!

Shields

DO NOT operate this equipment unless ALL shields are properly secured in place!

Do not unclog, adjust, lubricate or service the forage box unless the "Power Source Shut Down Procedure" (previous page) has been performed.

Wherever possible and without affecting machine operation, shields have been used on this forage box to protect potentially hazardous areas. In many places, decals are also provided to warn of potential dangers as well as to display special operating procedures. Refer to Safety Label Location section. Page 10

Hinged Shields Figure 1-#1

Hinged Shields have been provided over the transmission , beater drive chains and front roller chain drive. These can be opened for lubrication, adjustment and/or service access when required. Shields should be inspected and cleaned periodically to avoid material build up.

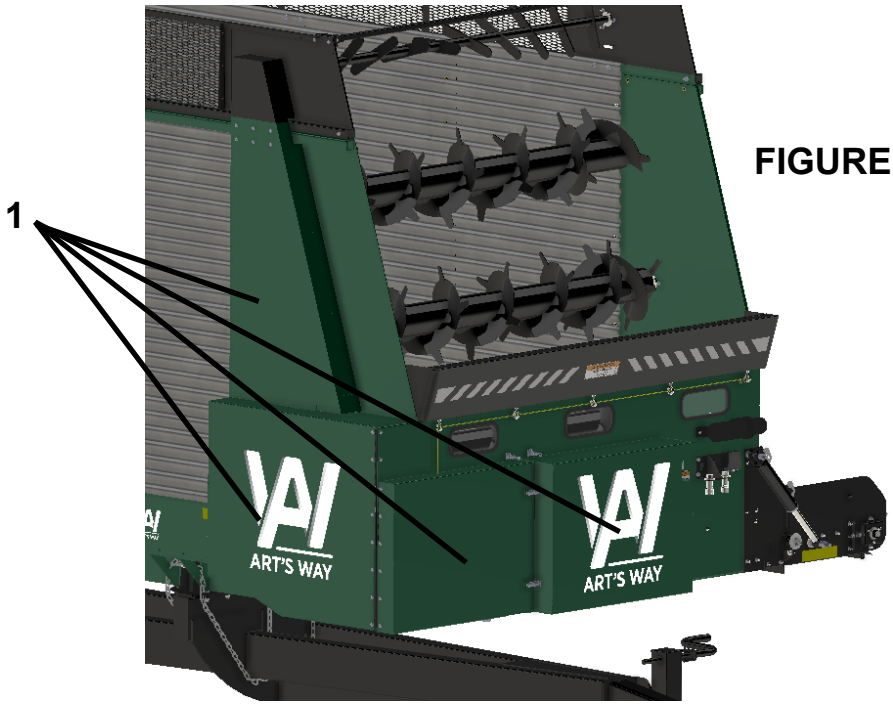


FIGURE 1

Hinged Shields Figure 4

Hinged shields have been provided over the apron takeup and rear roller chain drive. These can be opened for lubrication, adjustment and /or service access when required. Shields should be inspected and cleaned periodically to avoid material build up. The rear shield should be raised and pinned in the open position for servicing, Figure 4 #A. Return the pins to the storage position when finished, Figure 4 #B.

DO NOT LUBRICATE, ADJUST AND /OR SERVICE UNLESS TRACTOR PTO IS DISENGAGED AND TRACTOR ENGINE IS SHUT OFF!

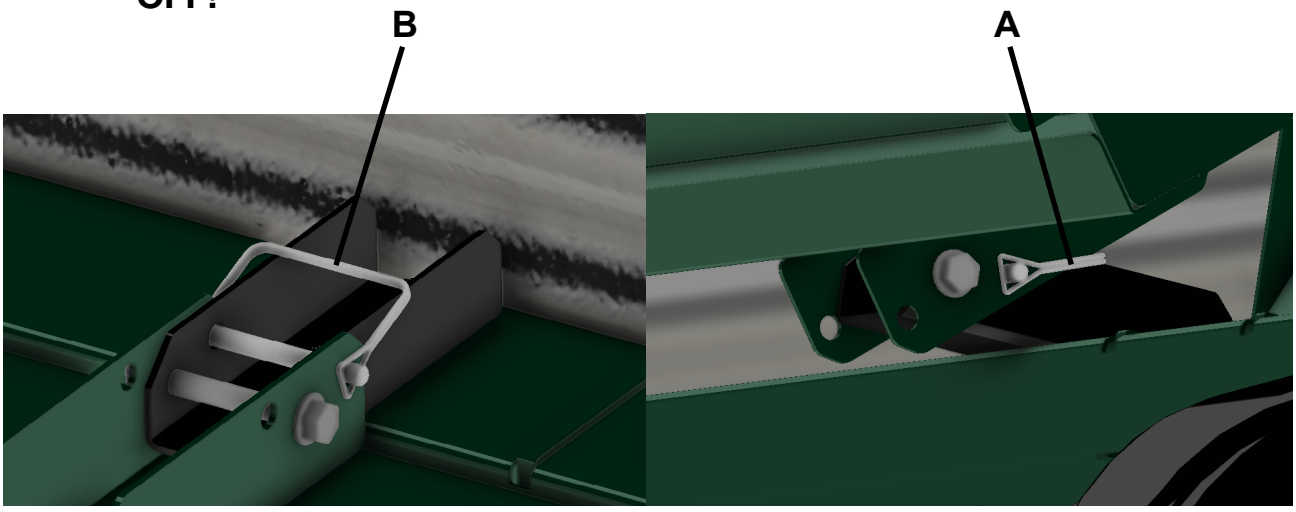


FIGURE 4

Emergency Clutch Bar and Cable Figure 2- #2 & #3

IN AN EMERGENCY, PUSH THE SAFETY BAR OR PULL THE SAFETY CABLE TO TRIP THE SAFETY/CROSS CONVEYOR CLUTCH AND STOP THE CROSS CONVEYOR, AUGERS AND MAIN APRONS.

To trip the safety/cross conveyor clutch, either push the safety bar (Figure 2-#2) which spans across the front of the unloading unit or pull the safety cable (Figure 2-#3) To reset push the safety valve under the right shield down.

Before operating equipment ensure the safety valve actuates freely and the cable is taught enough to actuate the safety valve when the safety bar is pushed in.

Valve shown below is shown in safety engaged orientation (plunger pulled up). For normal operation plunger must be pressed down after actuating.

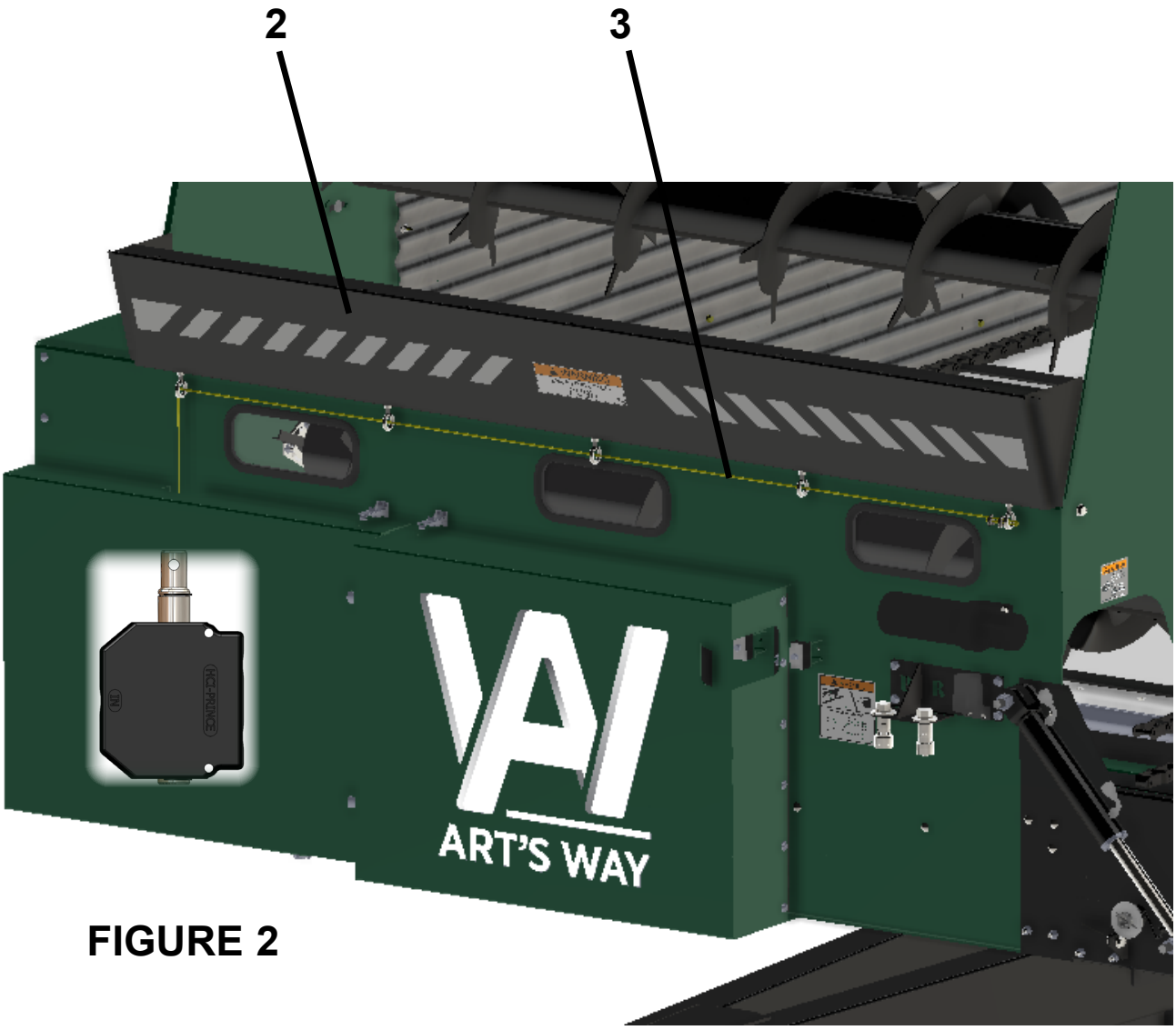


FIGURE 2

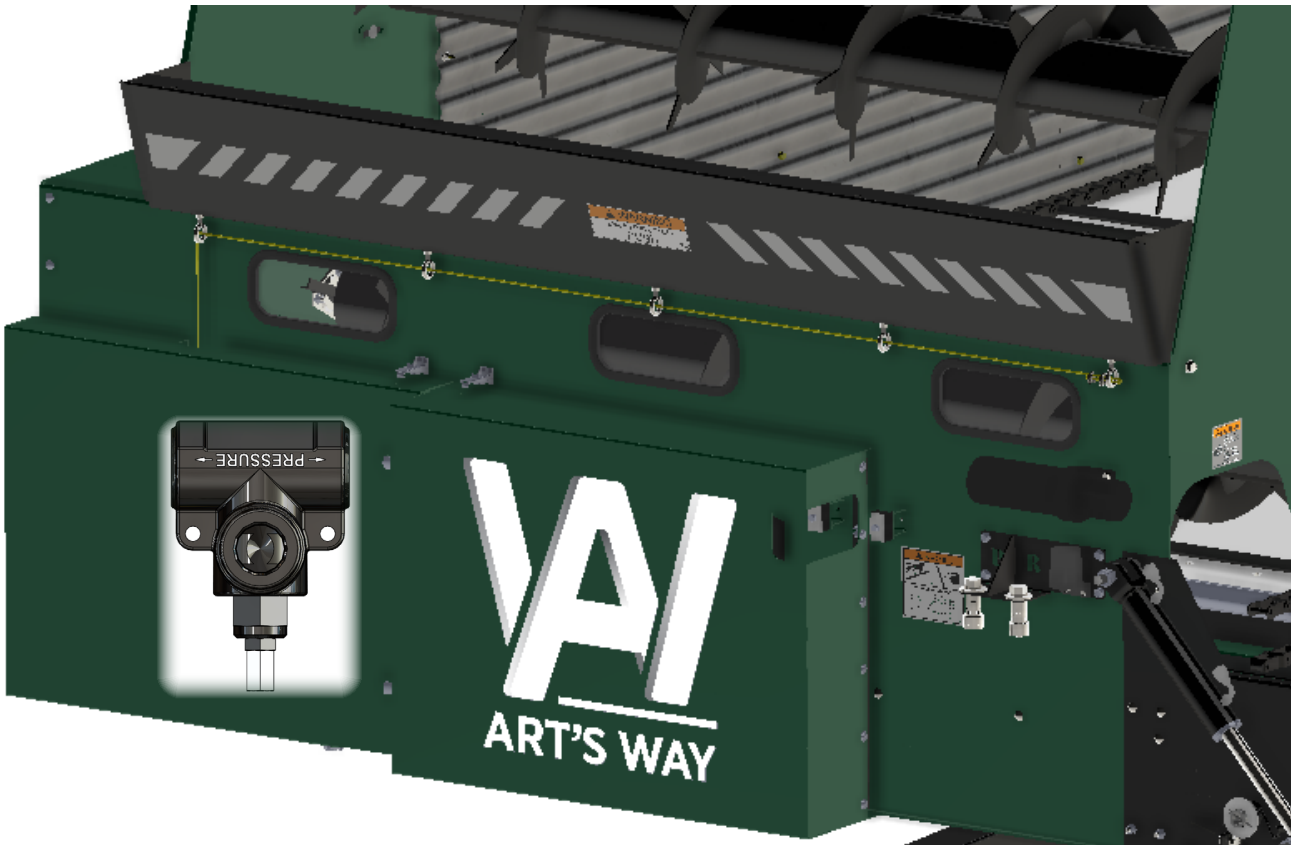
Pressure Relief System

Your combo/front unload hydraulically controlled forage box is equipped with a full system pressure relief valve (version 1 shown below) set to 2,750-3,000 psi to protect your equipment in the event of a clog, bind, snag, or failure of relief/pump compensator on the tractor side. If you notice your system is not functioning first check to make sure your safety valve is not engaged. If the safety valve is not tripped then it is possible you have gone over relief. A pressure gauge is provided on the manifold to check your current system pressure. If the gauge needle is reading 2,750-3,000 psi while functions are engaged and hydraulic power is being applied that means you have likely gone over relief. While fluid is going over relief an audible noise will likely be heard. This noise is normal, but the system should not be ran for an extended period of time in this state as excessive heat could be introduced to the system.

In some versions of the system it is normal and expected to go over relief before the cross conveyor has started while front unloading.

Next power off the tractor, fluid power, and all functions of the forage box. Inspect areas of movement like chains for signs of a bind, clog, or snag. If nothing is found you may be loaded with heavier than average material and are prematurely going over relief.

For Instructions on adjusting your relief valve please contact your dealer or Art's Way Mfg. Art's Way is not liable for any damages incurred from adjusting the relief valve beyond an approved setting.



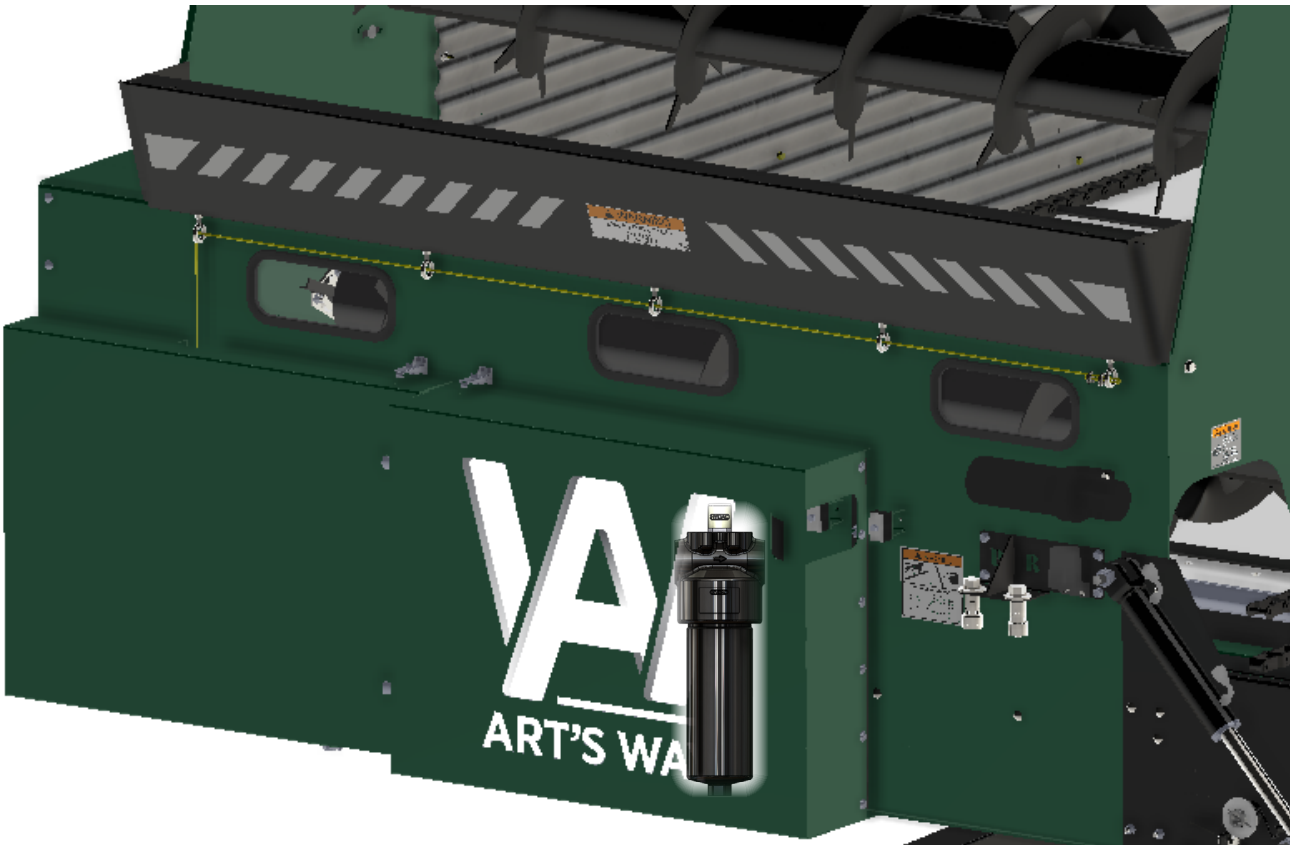
Hydraulic Filtration System

If your combo/front unload hydraulically controlled forage box is equipped with a hydraulic filter then the following applies to you. Your forage box is now equipped with a full system hydraulic filter (shown below). This ensures proper function as it mitigates the possibility for contaminates to enter the hydraulic system and introduce wear and unexpected operational issues.

In principle we recommend that the filter element is changed every 12 months or upon indication, whichever occurs first. Your filter comes with a clogging indicator on the top of the filter unit. If the clogging indicator responds, it is necessary to change the filter element without delay.

When filter elements are subject to high dynamic loading it may prove necessary to change them more frequently. The same applies when the hydraulic system is commissioned, repaired or when the oil is changed. The standard clogging indicators only respond when fluid is flowing through the filter. If the clogging indicator responds during a cold start only, it is possible that the element does not yet need to be changed. Keep tools, working area and equipment clean. After disassembling the filter, clean all parts, check for damage or wear and replace parts if necessary. When changing a filter element, a high level of cleanliness must be observed. Before changing the filter read all cautionary information on the next page.

Loosening or removing any hydraulic component will introduce air into the system. This may cause abnormal operation. After reinstallation ensure air is purged by opening and closing the cross conveyor chute repeatedly. Some latent air may still remain until all functions are fired. In this case run the functions with an empty box.



Hydraulic Filtration System (continued)

⚠ CAUTION

- The user must take appropriate action (e.g. venting) to prevent the formation of air pockets.
- Repairs, maintenance work and commissioning must only be carried out by trained personnel.
- Allow the pressure equipment to cool before handling.
- The stipulations of the operating instructions of the machine or the system must be followed.
- Statutory accident prevention regulations, safety regulations and safety data sheets for fluids must be observed.
- Filter housing must be grounded.
- When working on, or in the vicinity of, hydraulic systems, open flames, sparks and smoking are forbidden.
- Hydraulic oils and water-polluting fluids must not be allowed to enter the soil or watercourses or sewer systems. Please ensure safe and environmentally friendly disposal of hydraulic oils. The relevant regulations in the country concerned with regard to ground water pollution, used oil and waste must be complied with.
- Whenever work is carried out on the filter, be prepared for hot oil to escape which can cause injury or scalding as a result of its high pressure or temperature.

⚠ DANGER

- Caution: pressure equipment! Before any work is carried out on the pressure equipment, ensure the pressure chamber concerned (filter housing) is depressurized.
- On no account must any modifications (welding, drilling, opening by force...) be carried out on the pressure equipment.

Element Removal

1. Switch off hydraulic system and release filter pressure.
2. Unscrew filter bowl (drain fluid into a suitable container and clean or dispose of it in accordance with environmental regulations).
3. Remove filter element from element nozzle in filter head (check surface of element for contamination residue and larger particles; these can indicate damage to components).
4. Replace filter element (part number 710726 shown in illustrated parts list).
5. Clean filter bowl and filter head; particular attention must be given to the threads.
6. Examine filter, especially sealing surfaces, for mechanical damage.
7. Check O-rings – and replace if necessary (obtain parts from HYDAC component distributor).

Element Installation

1. Wet the sealing surfaces and thread on the filter head and bowl, as well as the O-ring, with clean operating fluid.
2. When installing a new filter element, check that the designation corresponds to that of the old element.
3. Place filter element carefully on to the element nozzle.
4. Apply silver grade anti-seize (per Mil-PRF- 907E) to threads. Screw in filter bowl fully (metal to metal contact) and then unscrew by one quarter-turn.
5. Switch on hydraulic system and vent filter at a suitable point in the system (actuate cross conveyor chute up and down to purge air)
6. Check filter for leakage.

Maintenance Tools

Size	Wrench for filter bowl	Wrench for VD 0 A.1
75-95	Hex 24	Hex 27

Torque Values Nm[ft-lb]

Type	Max. torque
VD clogging indicator	50Nm[36] (A, LE, LZ)
	100Nm[74] (B, C, D)
Bowl	Do not Torque

PTO POWERED VERSION OPERATION

Main Clutch Figure 2-#5

The main clutch lever is provided for stopping and starting the augers and main aprons.

The main clutch is engaged when the lever is in the "run" position. To disengage the clutch, move the lever to the "stop" position.

Use of the main clutch lever during unloading is further explained in the Operating Instructions section of this manual. Page 20.

DISENGAGING THE MAIN CLUTCH DOES NOT STOP THE CROSS CONVEYOR. TO STOP THE CROSS CONVEYOR, THE EMERGENCY PUSH BAR OR CABLE MUST BE TRIPPED OR SAFETY/CROSS CONVEYOR CLUTCH TURNED TO THE STOP POSITION!

Main Apron Shift Lever Figure 2-#6

The shift lever is used only to adjust the feeding rate of the main aprons. It is marked with seven positions:
1, Neutral (N); 2, Neutral (N); 3, Neutral (N); and 4 (Sweep).

CAUTION: The fourth or sweep speed should only be used at the end of the load for clean-out and not for normal unloading operation.

Front PTO Guard Figure 2-#7
A guard is provided over the input drive universal joint on the front of the unloading unit.

DO NOT USE THE PTO GUARD AS A STEP!

Rotating PTO Guard Figure 3-#8

The telescoping PTO shaft, between the forage box and the tractor, is equipped with a rotating shield.

BE SURE THE ROTATING PTO SHIELD TURNS FREELY BEFORE STARTING THE TRACTOR ENGINE!

PTO Transport Bracket Figure 3-#9

A bracket is provided on the front of the unloading unit to conveniently hold the telescoping PTO drive shaft during transport.

To safeguard the telescoping PTO drive shaft, be sure to shut off the tractor engine and disconnect the drive shaft from the PTO shaft and place it into the bracket when transporting or filling the forage box.

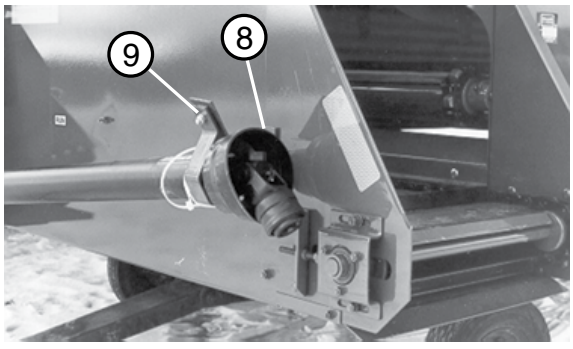


FIGURE 3

MANUAL HYDRAULIC VERSION OPERATION

INITIAL SETUP AND GETTING TO KNOW YOUR DEVICE

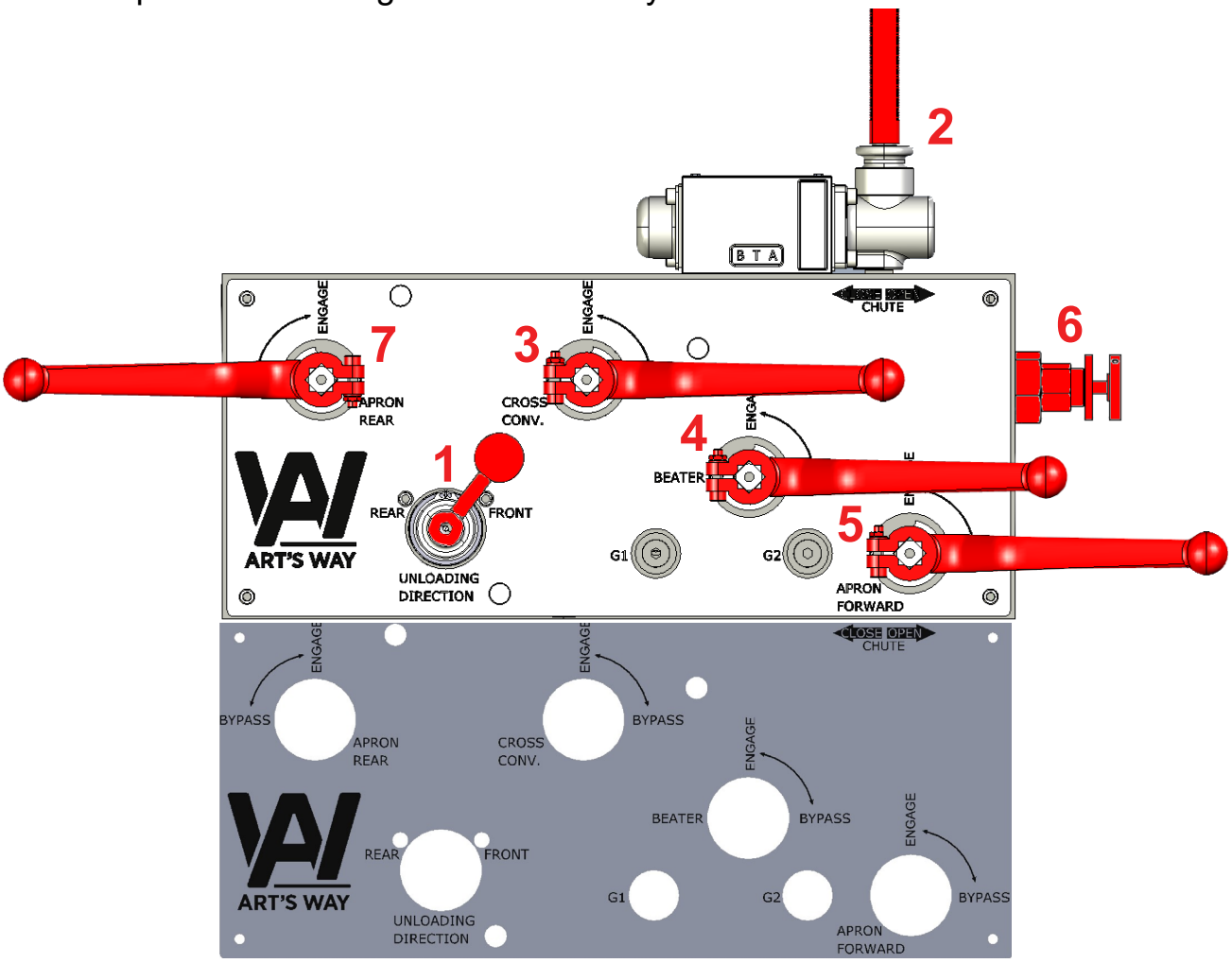
To start first ensure all power sources (hydraulic / pto / electric) are powered down and/or are in the "off" position including the tractor key.

Make sure hydraulic connections are secure and in the correct positions/locations. Refer to the hydraulic and electric diagrams in this or the IPL manual.

Hose grips and storage are labeled with symbols for pressure and return flows for your convenience. If still unsure which is which refer to the hydraulic diagram included in this or the IPL manual.

Before applying power familiarize yourself with the functions of the unit, failure to follow proper sequence may lead to damage of system.

The manifold and face plate are shown below and labeled with sequence numbers for clarity. Proper sequence will be shown on the following pages. Handle stops will be included (not shown) to promote correct sequence, but it is still up to the operator to operate in the correct order or damage may occur. Knob **(6)** has been moved up in the following visuals for clarity.



OPERATIONAL INSTRUCTIONS (REAR UNLOAD)

Once you have familiarized yourself with the manual manifold unit it is now time to test unloading. It is recommended to run through the unloading steps before loading the unit with forage.

Ensure ALL levers are set to the "BYPASS" setting. Failure to do so may result in damage.

With the hydraulic hoses connected to the correct ports on your tractor start up your tractor with the hydraulic functions turned off.

This unit is not equipped with its own hydraulic cooler. Please refer to your tractor's specifications on extended hydraulic function use. Under normal operation heat issues shouldn't occur. Avoid supplying hydraulic pressure for extended periods of time without engaging your forage box operations.

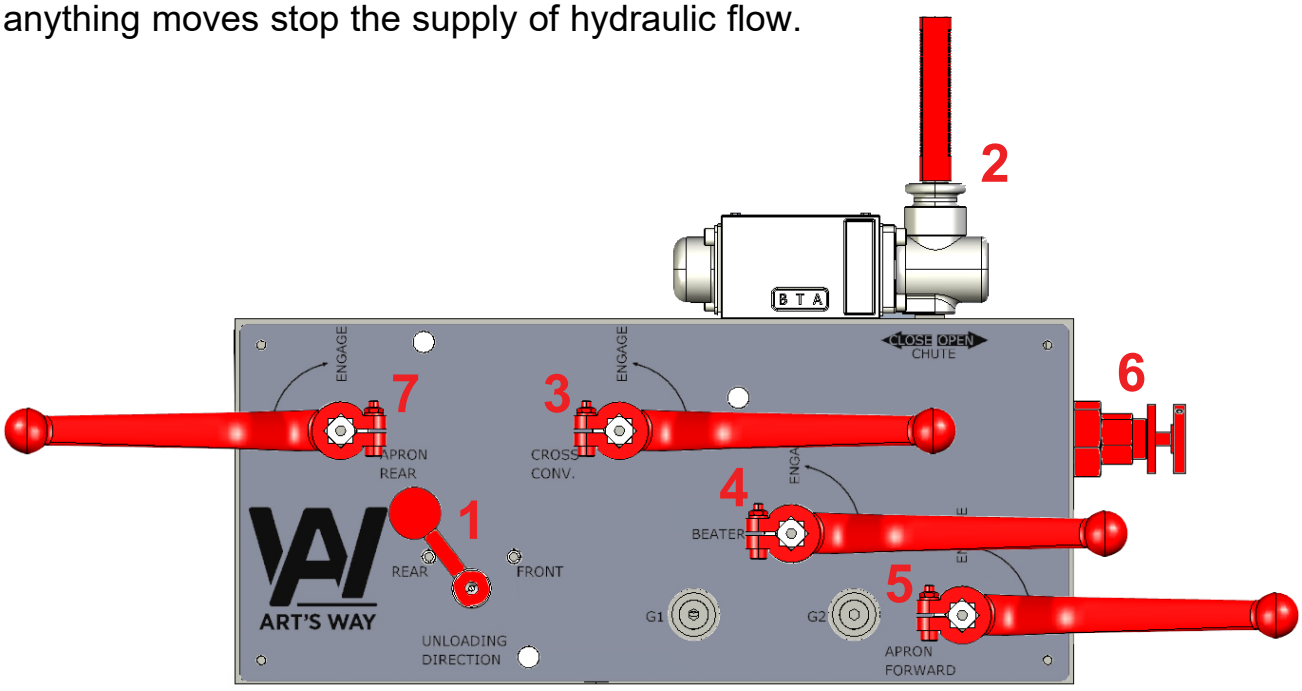
REAR UNLOAD

To start the rear unload process once again ensure ALL levers are set to "BYPASS".

Shift the "UNLOADING DIRECTION" knob **(1)** to the position labeled "REAR".

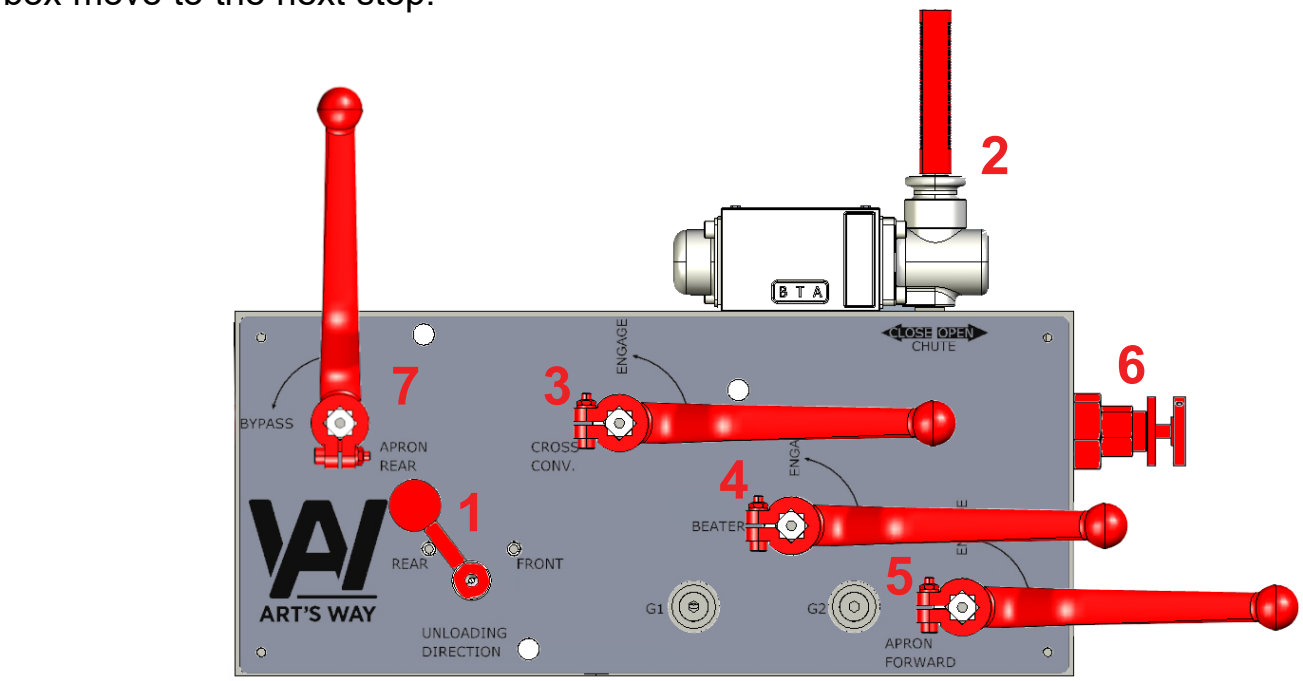
Supply hydraulic flow to the unit **(25GPM @ 3,000PSI max)**. It is recommended to start with a lower flow (~12GPM) for the first unload to get a feel for unload speed with your tractor's configuration and forage material being unloaded then ramp up as needed. Rear unload apron speed is not intended to be regulated by your manifold and is dependant on your tractor's flow/pressure.

Nothing should happen initially as ALL levers should be set to "BYPASS". If anything moves stop the supply of hydraulic flow.

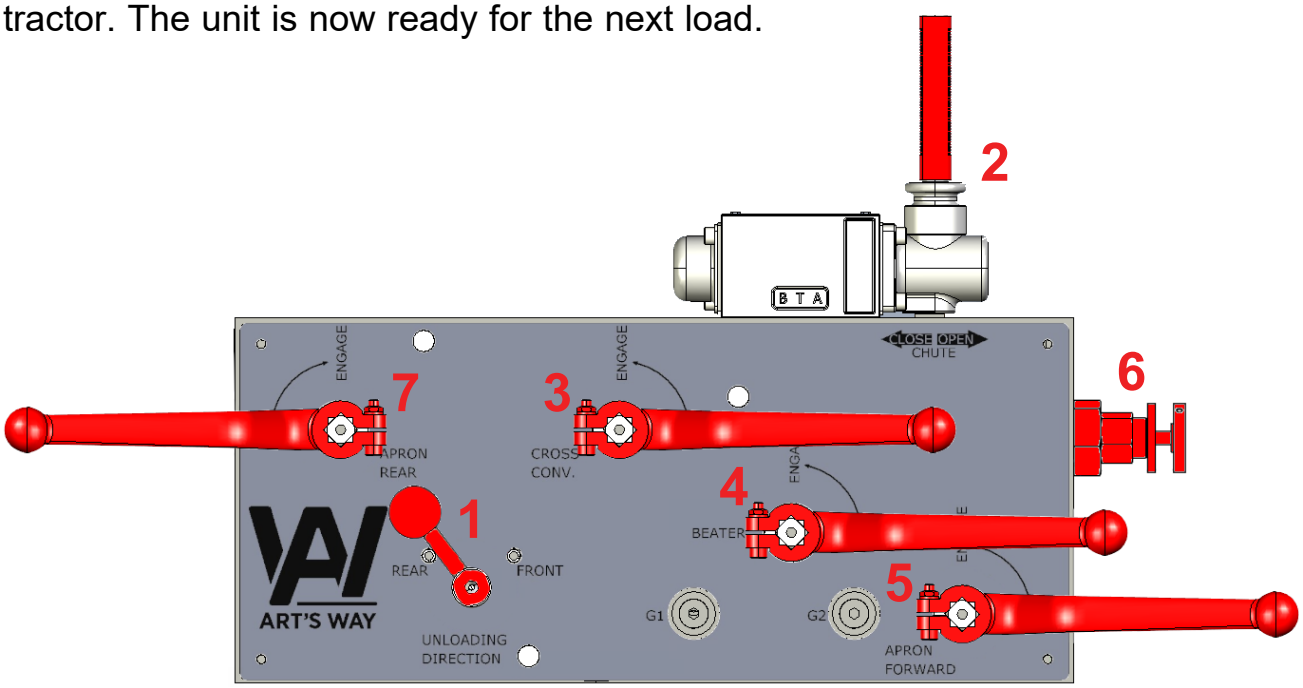


REAR UNLOAD (CONTINUED)

Slowly turn the "APRON REAR" lever **(7)** 90 degrees to the "ENGAGE" position. The apron chain will have started moving in the rear unload direction. Once again speed in this mode is dependent on your tractor pump **(25GPM @ 3,000PSI max).** Manifold levers should only be put into "BYPASS" or "ENGAGE" and should not be used to meter flow (speed). Once you have unloaded the forage box move to the next step.



Slowly turn the "APRON REAR" lever **(7)** 90 degrees to the "BYPASS" position. The apron chain will have stopped moving. Now turn off hydraulic supply from tractor. The unit is now ready for the next load.



OPERATIONAL INSTRUCTIONS (FRONT UNLOAD)

Once you have familiarized yourself with the manual manifold unit it is now time to test unloading. It is recommended to run through the unloading steps before loading the unit with forage.

Ensure ALL levers are set to the "BYPASS" setting. Failure to do so may result in damage.

With the hydraulic hoses connected to the correct ports on your tractor start up your tractor with the hydraulic functions turned off.

This unit is not equipped with its own hydraulic cooler. Please refer to your tractor's specifications on extended hydraulic function use. Under normal operation heat issues shouldn't occur. Avoid supplying hydraulic pressure for extended periods of time without engaging your forage box operations.

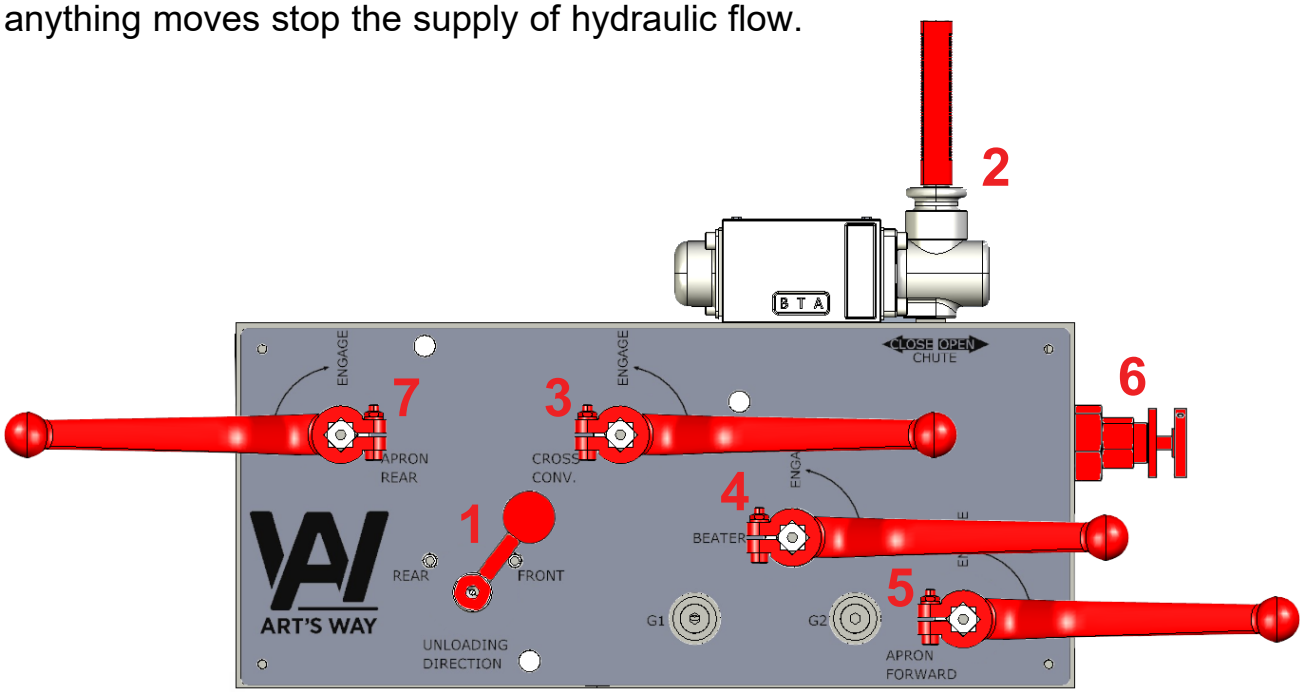
FRONT UNLOAD

To start the front unload process once again ensure ALL levers are set to "BYPASS".

Shift the "UNLOADING DIRECTION" knob **(1)** to the position labeled "FRONT".

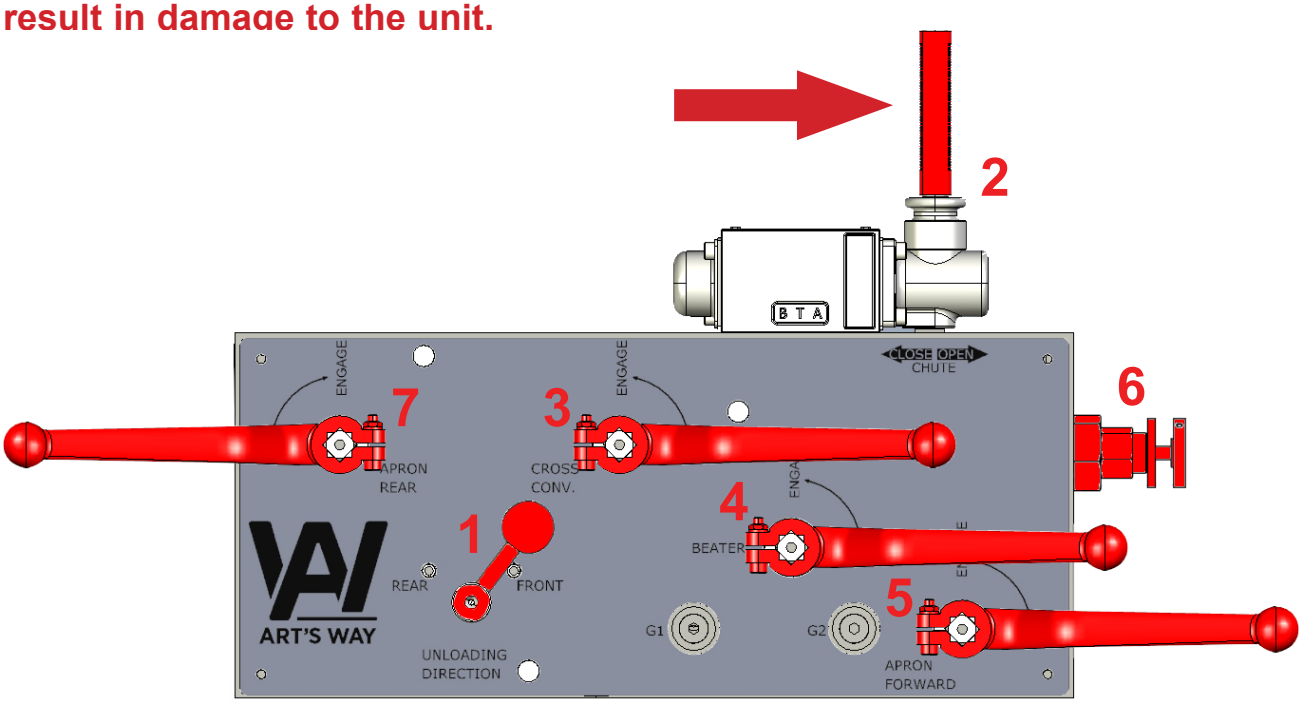
Supply hydraulic flow to the unit **(25GPM @ 3,000PSI max)**. It is recommended to start with a lower flow (~12GPM) for the first unload to get a feel for unload speed with your tractor's configuration and forage material being unloaded then ramp up as needed. Rear unload apron speed is not intended to be regulated by your manifold and is dependant on your tractor's flow/pressure.

Nothing should happen initially as ALL levers should be set to "BYPASS". If anything moves stop the supply of hydraulic flow.

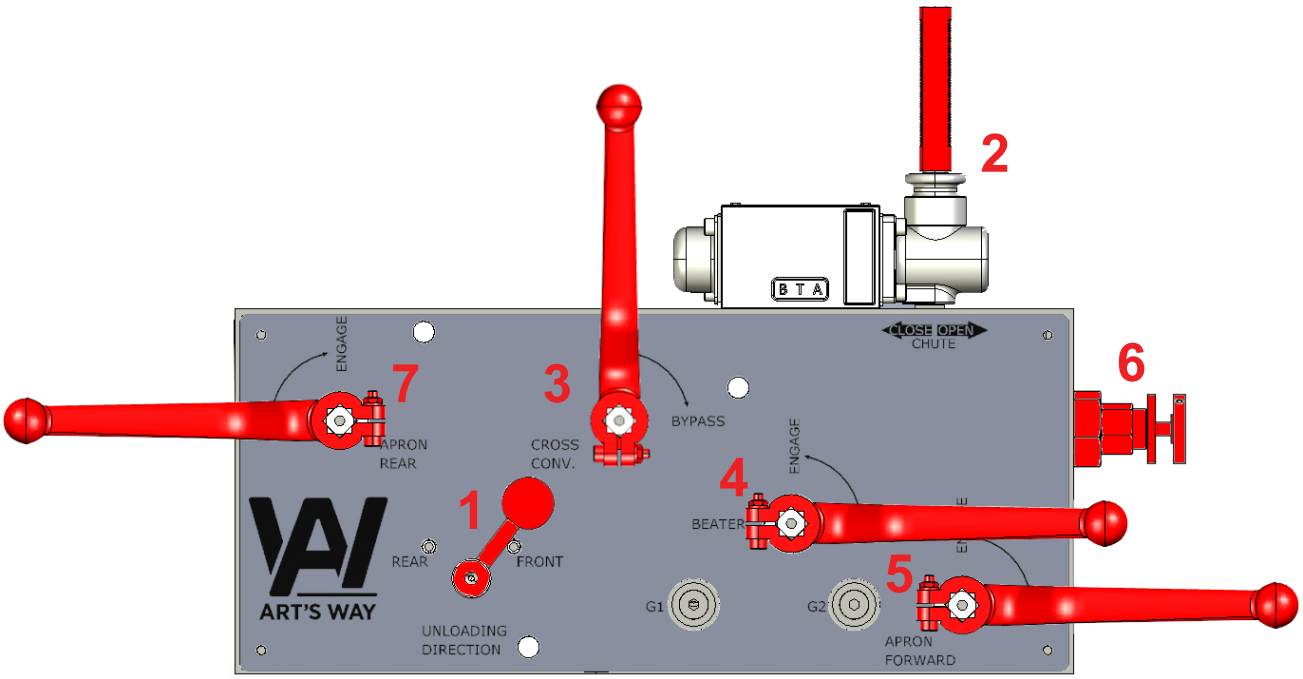


FRONT UNLOAD (CONTINUED)

Shift the "CHUTE" handle **(2)** in the "OPEN" direction shown. This will extend the cross conveyor chute cylinder and open the chute. **Ensure the cross conveyor chute is fully opened before moving to the next steps. Failure to do so may result in damage to the unit.**

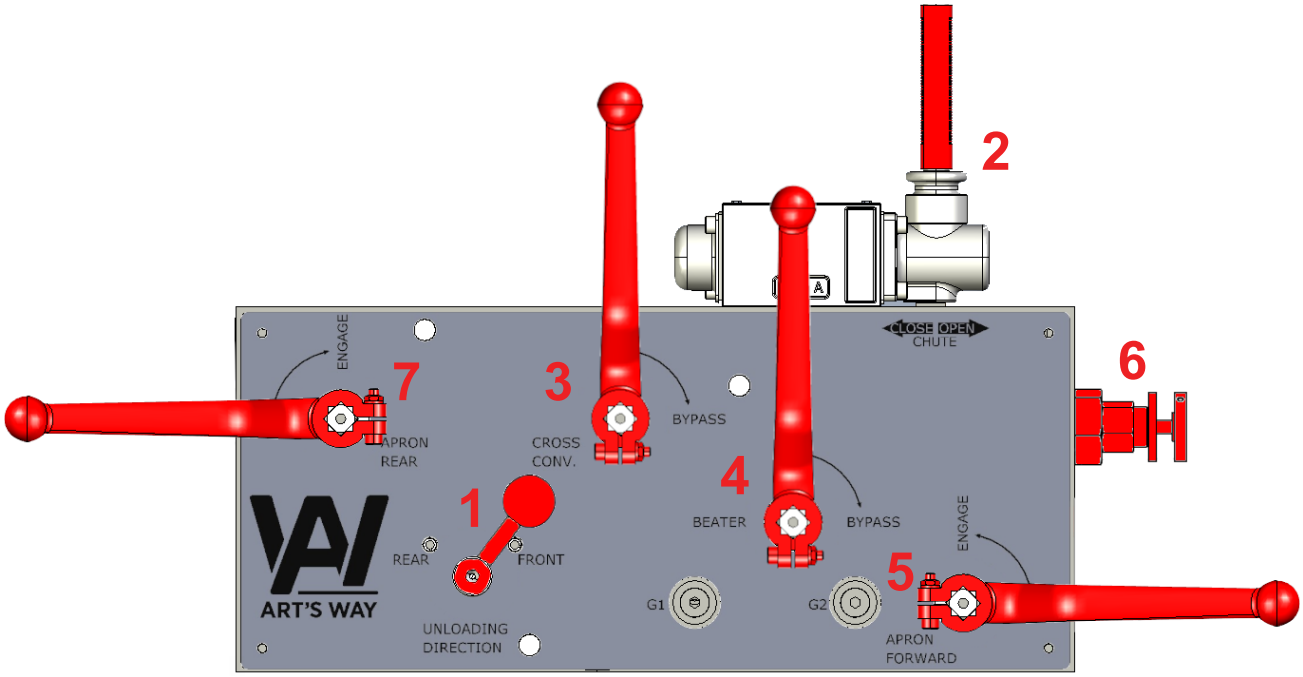


Next, to start the cross conveyor slowly turn the "CROSS CONV." lever **(3)** 90 degrees to the "ENGAGE" position. The cross conveyor will have started to move.

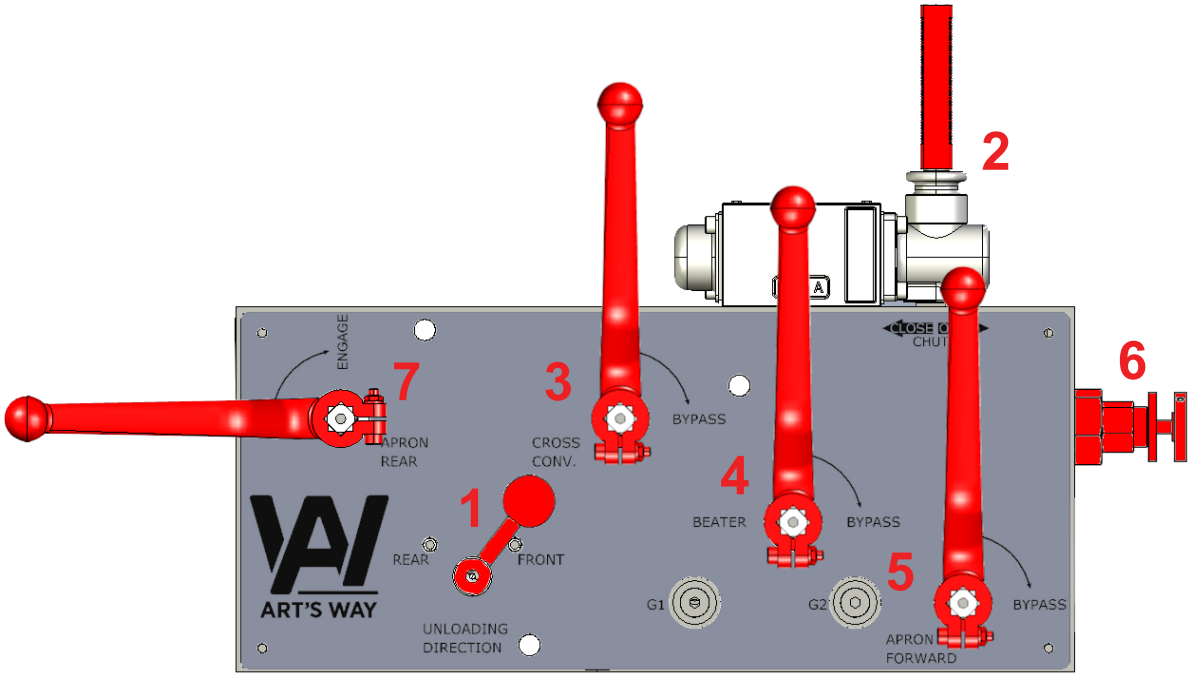


FRONT UNLOAD (CONTINUED)

Next, with the cross conveyor moving, to start the beaters slowly turn the "BEATER" lever **(4)** 90 degrees to the "ENGAGE" position. The beaters will have started to move.

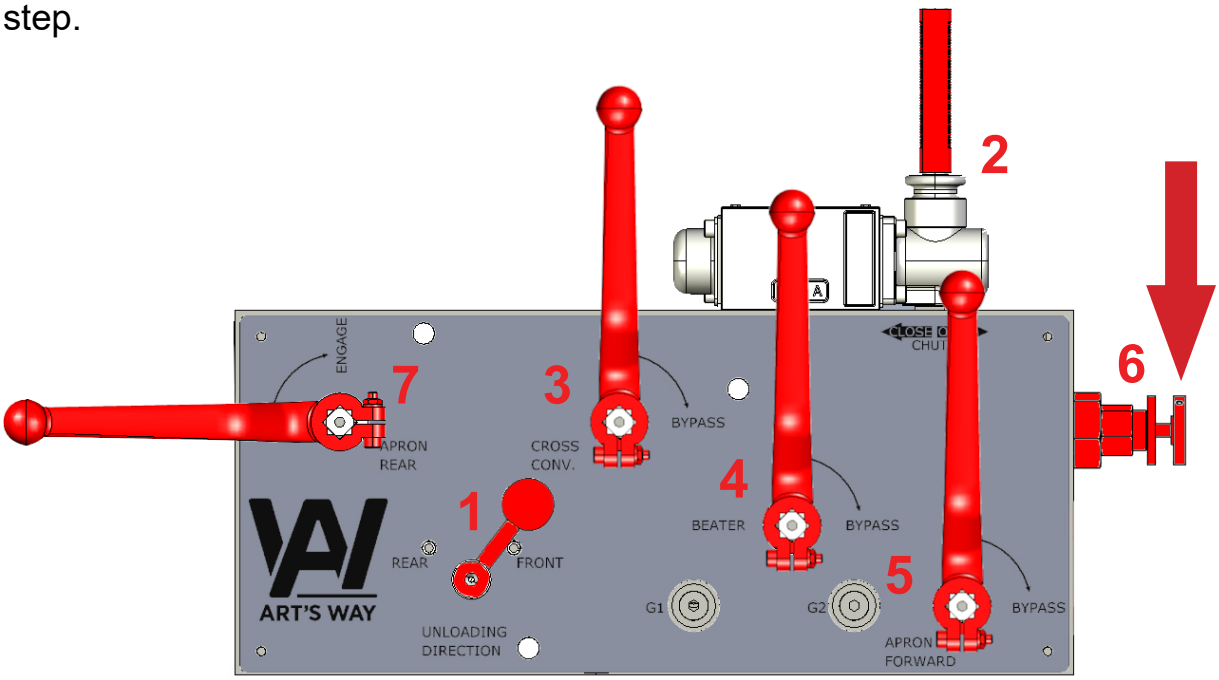


Next, with the cross conveyor and beaters moving, to start the apron chain slowly turn the "APRON FORWARD" lever **(5)** 90 degrees to the "ENGAGE" position. The apron chain will have started to move.

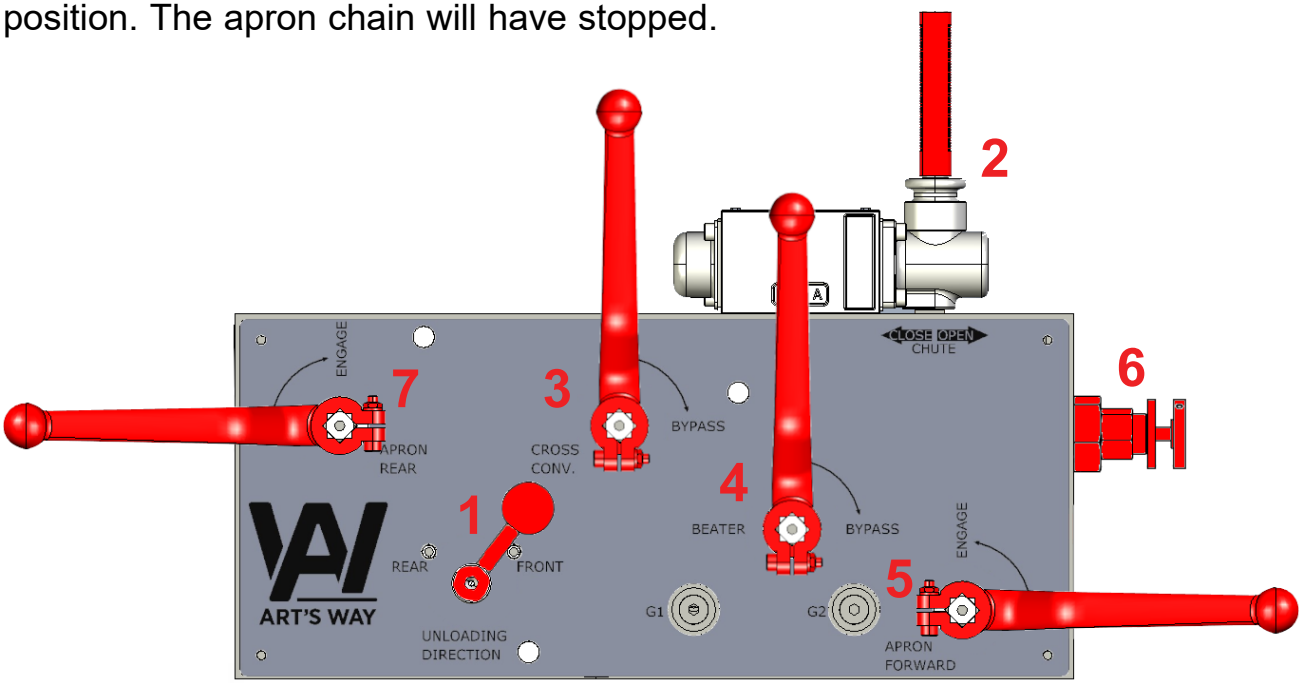


FRONT UNLOAD (CONTINUED)

Finally, with everything moving material feed rate may be controlled by turning knob **(6)** slowly which will control the speed of the apron chain movement. Turn the outer knob counter clockwise to increase speed and clockwise to decrease speed. The inner knob can be used to lock the speed setting in place. Manifold levers should only be put into "BYPASS" or "ENGAGE" and should not be used to meter flow (speed). Once you have unloaded the forage box move to the next step.

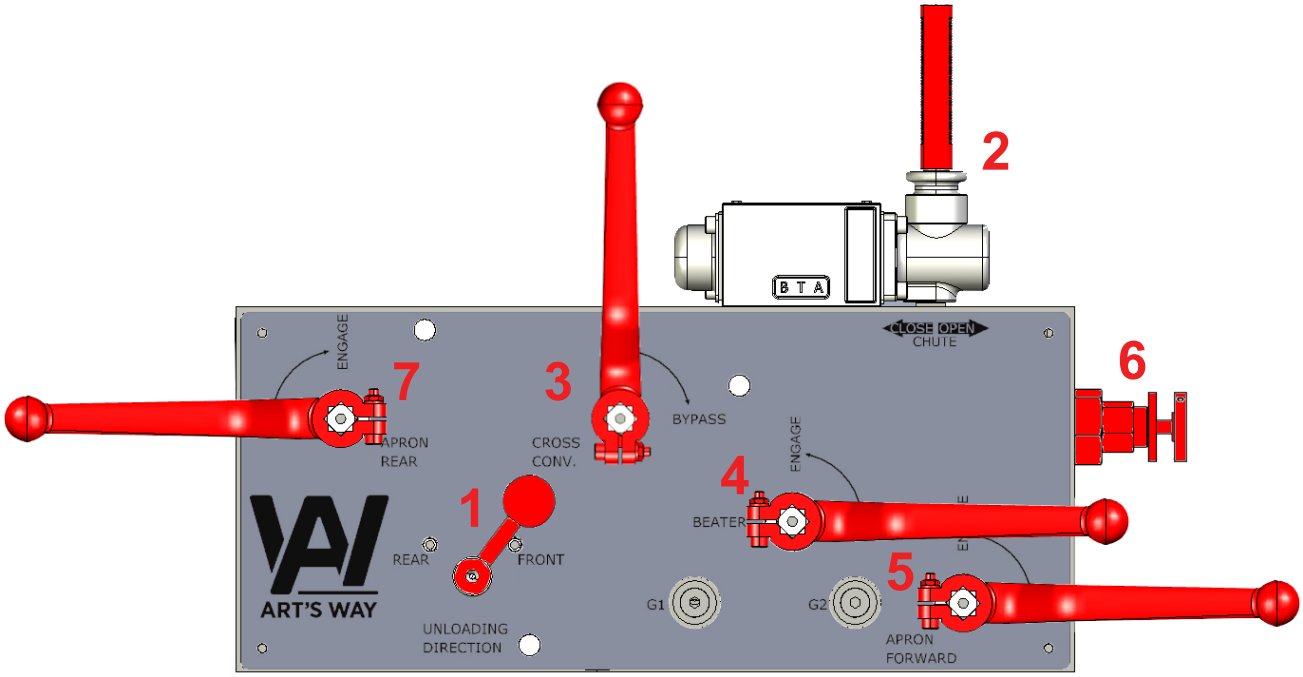


To stop the unloading process work your way backward with the lever order. First slowly turn the "APRON FORWARD" lever **(5)** 90 degrees to the "BYPASS" position. The apron chain will have stopped.

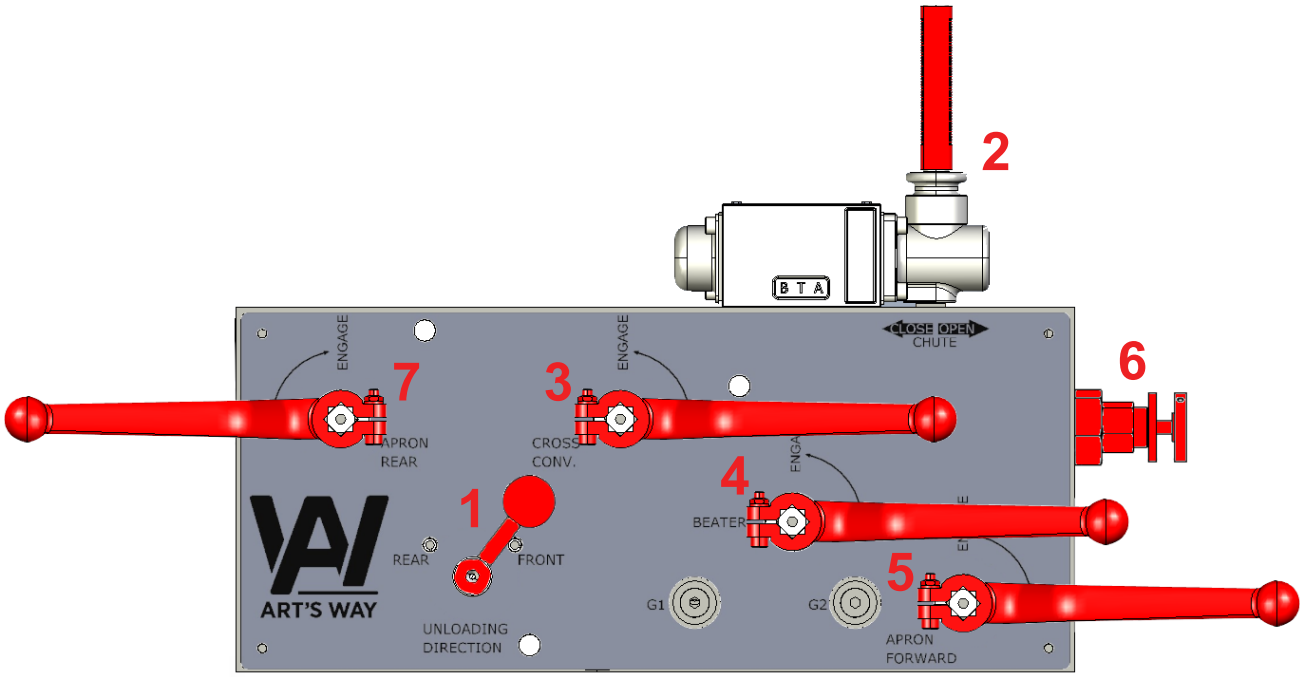


FRONT UNLOAD (CONTINUED)

Next slowly turn the "BEATER" lever **(4)** 90 degrees to the "BYPASS" position. The beaters will have stopped.

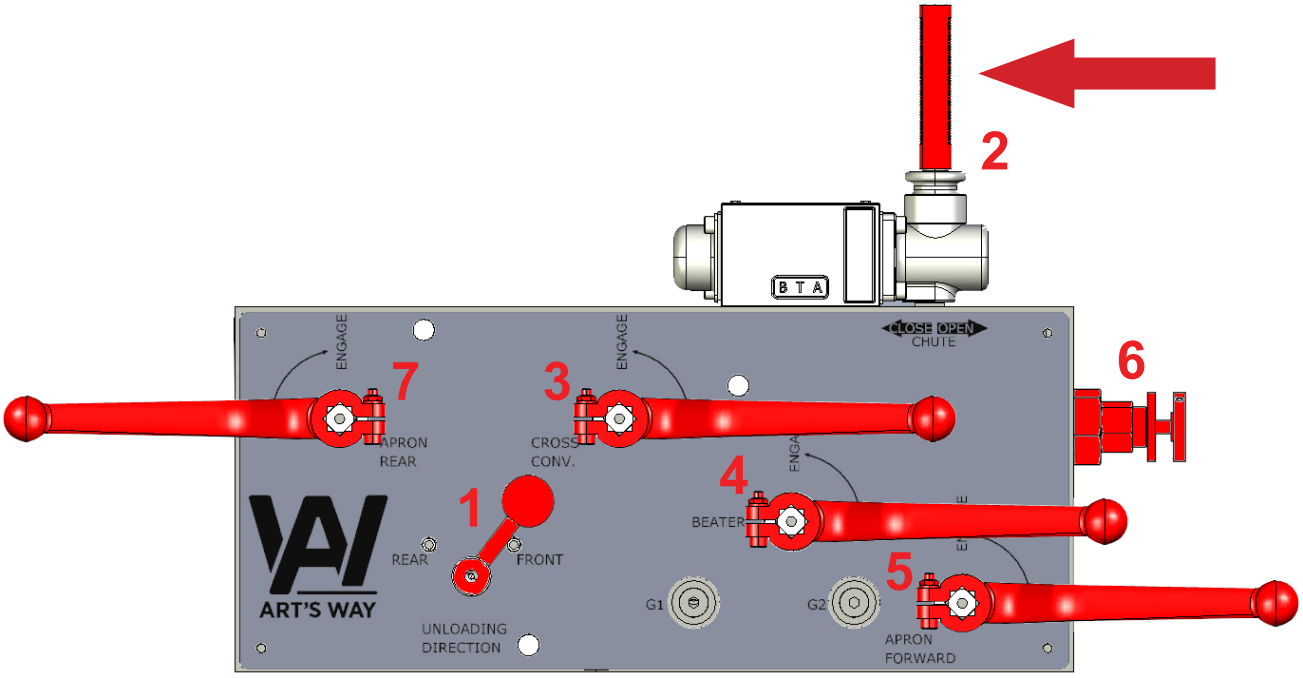


Next slowly turn the "CROSS CONV." lever **(3)** 90 degrees to the "BYPASS" position. The cross conveyor will have stopped.



FRONT UNLOAD (CONTINUED)

Ensure the cross conveyor lever is set to "BYPASS" and the cross conveyor chain has stopped before moving to the next steps. Failure to do so may result in damage to the unit. Once all functions have stopped you may now Shift the "CHUTE" handle **(2)** in the "CLOSE" direction shown. This will retract the cross conveyor chute cylinder and close the chute.



Now turn off hydraulic supply from tractor. The unit is now ready for the next load.

IN-CAB HYDRAULIC VERSION OPERATION

INITIAL SETUP AND GETTING TO KNOW YOUR DEVICE

To start in-cab controlled operation first ensure all power sources (hydraulic / pto / electric) are powered down and/or are in the "off" position including the tractor key.

Make sure hydraulic/electric connections are secure and in the correct positions/ locations. Refer to the hydraulic and electric diagrams in this or the IPL manual.

Hose grips and storage are labeled with symbols for pressure and return flows for your convenience. If still unsure which is which refer to the hydraulic diagram included in this of the IPL manual.

Connect the main harness to the canbus display harness and then the canbus display harness to the canbus display.

Mount the canbus display to your tractor cab in an accessible area using the supplied ram mount or by other non-destructive means.

Connect the hydraulic hoses in the correct positions and then connect the main 7 pin power connection on the main wire harness to the tractor.

Turn the tractor key power to on, but do not start the engine. Ensure the canbus monitor turns on. You should see an Art's Way Logo fill the screen for a few seconds on startup. You should then be met with a screen that looks like the one below.

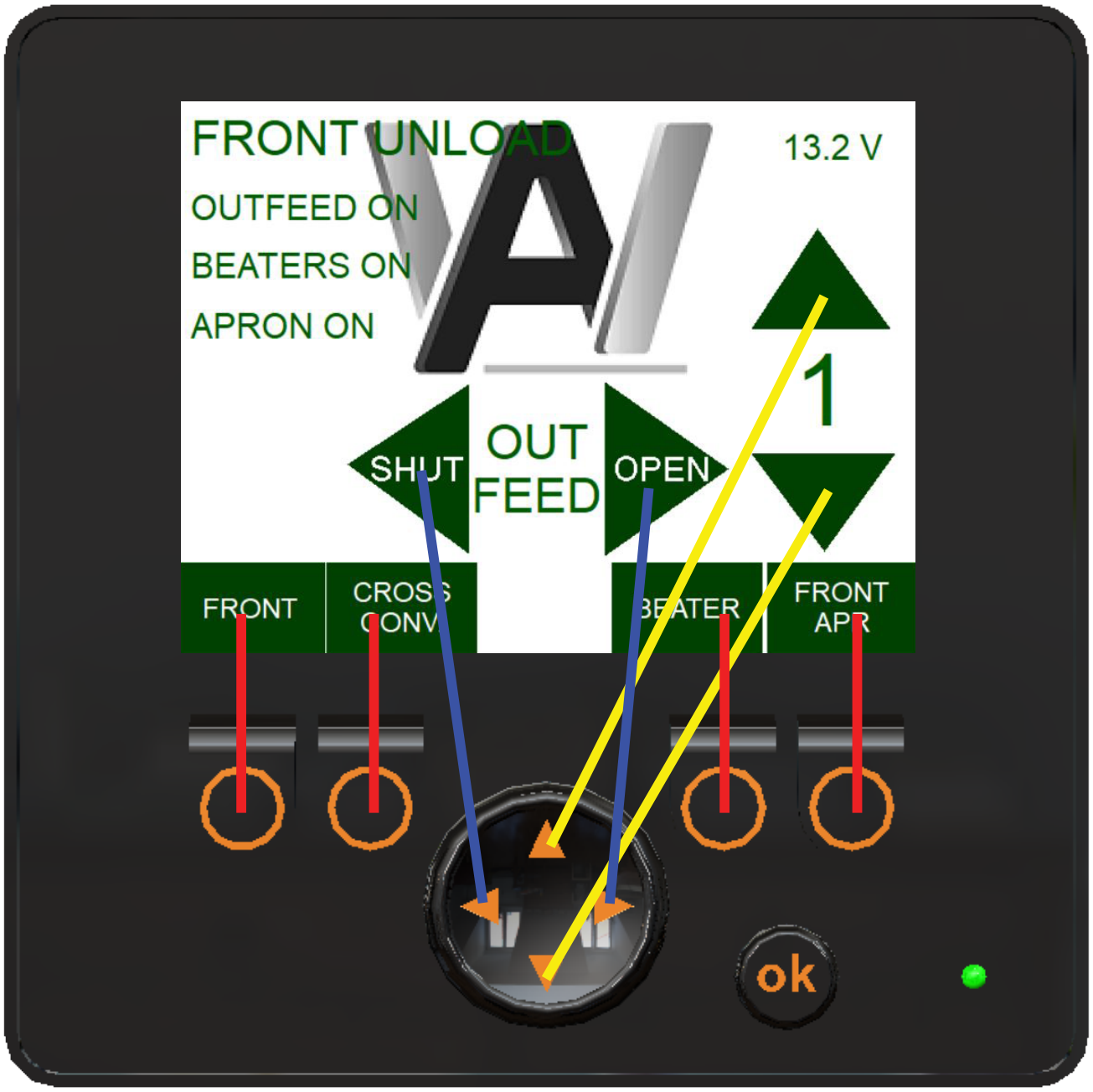
The canbus operational display is broken into 3 main sections noted above.

1. Current Status
2. Control Labels
3. Voltage

Current status gives a live display of what functions are currently enabled.

Control Labels are on screen equivalents that correspond to the physical buttons beneath them.

Voltage is a live updated heads up for the current voltage entering the canbus system. If this is out of an acceptable 12V range, functions may not perform correctly.



The above diagram illustrates what control labels correspond with each physical button. The "ok" button is used to access a settings menu. This menu can be assessed by pressing and holding the "ok" button for 5 seconds. Only access the settings menu when all operations are stopped and hydraulic power is turned off.

The settings menu can be navigated by use of the up/down directional buttons as well as the "ok" button. The menus screen also shows your current canbus display (PDM) and canbus controller (PLC) firmware versions. While firmware updates are not a necessity for the function of your machine Art's Way reserves the right to make firmware updates which can be obtained by contacting your authorized dealer. You have access to the "SETTINGS" submenu which lets you adjust front unload apron speed settings. "FACTORY SETTINGS" is locked by default and may only be accessed by Art's Way or an authorized dealer.

THIS SYSTEM IS DESIGNED TO TAKE 25GPM FLOW AT 3,000PSI MAX. EXCEEDING THESE RATINGS MAY LEAD TO PERFORMANCE ISSUES AND/OR DAMAGE. CONSULT YOUR TRACTOR'S SPECIFICATIONS BEFORE OPERATING.

Since every tractor has different hydraulic capabilities (pressure/flow), and your unit comes pre-loaded with default apron forward speed settings that meet the needs of a wide range of tractors. We recommend using the unit while empty before making any adjustments to these settings to see how your specific tractor behaves. Different forage materials may also have an effect on these settings.

The settings menu can be navigated by use of the up/down directional buttons as well as the "ok" button.

The apron forward speed is adjusted in operation on a scale from 1-10 which corresponds with the open % of the solenoid in the port labeled "PFR" on your hydraulic manifold. For most baggers 100% will be too fast so keep this in mind when adjusting/operating. To return to the default settings the "RES DEF" button may be pressed. Settings are stored in canbus memory even if power is disconnected.

OPERATIONAL INSTRUCTIONS

Once you have familiarized yourself with the canbus unit it is now time to test unloading. It is recommended to run through the unloading steps before loading the unit with forage.

With the hydraulic hoses connected to the correct ports on your tractor start up your tractor with the hydraulic functions turned off.

The canbus display may power cycle when turning your tractor on via the ignition key depending on the previous ignition key position.

For combination (front/rear) unload units the first step couldn't be easier compared to other forage box systems. To select your unload method (front/rear) simply press the button noted above to switch between front and rear unload.

Note how your current status area updates with the new unload method.

For front unload only units this button will not function. You may skip past the next rear unload related page(s).

REAR UNLOAD

To start the rear unload process first supply hydraulic flow to the unit **(25GPM @ 3,000PSI max)**. It is recommended to start with a lower flow (~12GPM) for the first unload to get a feel for unload speed with your tractor's configuration and forage material being unloaded then ramp up as needed. Rear unload apron speed is unregulated by your manifold/canbus system and is dependant on your tractor's flow/pressure.

Nothing should happen initially as the current status area tells us that the rear apron is "OFF" like shown below. This unit is not equipped with its own hydraulic cooler. Please refer to your tractor's specifications on extended hydraulic function use. Under normal operation heat issues shouldn't occur. Avoid supplying hydraulic pressure for extended periods of time without engaging your forage box operations.

Once hydraulic flow is being supplied to the forage box simply press the button noted below. Note the color of the "REAR APR" control label changes to green and the current status area tells us that the rear apron is now "ON".

Soft starts and stops are built into the canbus system to ensure there are no sharp torque spikes in operation when engaging functions.

Inversely if the button is pressed before hydraulic flow is supplied to the system know that the soft start timer will have likely already expired and flow/pressure will be supplied based on your tractors hydraulic controls. This is not recommended.

To stop the rear unload function press the button noted below again and the screen will return to the state on the previous page and rear unload function will stop.

Alternatively pressing the button correlated with the control label "REAR" will also stop the rear unload function.

FRONT UNLOAD

To start the front unload process first supply hydraulic flow to the unit. Nothing should happen initially as the current status area tells us that the front apron is "OFF" like shown below. This unit is not equipped with its own hydraulic cooler. Please refer to your tractor's specifications on extended hydraulic function use. Under normal operation heat issues shouldn't occur. Avoid supplying hydraulic pressure for extended periods of time without engaging your forage box operations. Soft starts and stops are programmed into all the functions to improve component longevity. Response time from pressing a function button and the corresponding action starting/stopping may be slightly delayed due to this.

Once hydraulic flow is being supplied to the forage box press the button noted below. The "OUTFEED" control label is used to shut and open the outfeed via the hydraulic cylinder connected to the outfeed.

Note the control label for "OPEN" changes to a bright green. This is a timed operation set to 7 seconds. After 7 seconds has passed to ensure the outfeed is fully open the next set of control labels will become available.

Also note that the current status area still tells us that the outfeed is "OFF" Since the outfeed is a two step function this will remain in "OFF" status until the cross conveyor is started later.

If needed you can interrupt the opening of the outfeed by pressing the left arrow button that corresponds with the "SHUT" control label. The outfeed shut operation is not timed but rather a momentary operation based on how long you press the button for this control label.

Alternatively press the button that corresponds with the "FRONT" control label to stop all current running functions. There will be a ramp down time as soft stops activate.

After the 5 second timer is finished and the outfeed is now open the next control label "CROSS CONV." will become available.

Press the button noted below to start the cross conveyor.

Note the "CROSS CONV." control label changes to green and the current status area changes the outfeed to "ON".

Also note that the "BEATER" control label appears as well as a new line for beaters in the current status area.

Like before pressing the button noted below will turn off the cross conveyor if needed. This is recommended for stop stops to engage.

Alternatively you can choose to shut the outfeed which will stop the cross conveyor or you can press the button with the "FRONT" control label to stop all current running functions. There will be a ramp down time as soft stops activate.

Attempting to shut the outfeed while the cross conveyor is running will bypass the system's soft stops and will cause everything to stop immediately. This is not recommended and should only be used for emergency shutdown.

With the outfeed now running you can now turn on the beaters by pressing the button noted below.

Note the "BEATER" control label changes to green and the current status area changes the beaters to "ON"

Also note that the "FRONT APR" and speed control labels appear as well as a new line for apron in the current status area.

Like before pressing the button noted below will turn off the beaters if needed.

Alternatively you can choose to stop the cross conveyor which will also stop the beaters, or like before shut the outfeed which will stop the cross conveyor. You can also still press the button with the "FRONT" control label to switch to stop all current running functions. There will be a ramp down time as soft stops activate.

Reminder: Attempting to shut the outfeed while the cross conveyor is running will bypass the system's soft stops and will cause everything to stop immediately. This is not recommended and should only be used for emergency shutdown.

With the outfeed and beaters now running you can start the apron chain operation by pressing the button noted below.

Note that the current status area changes the apron to "ON".

Apron speed can now be adjusted. The apron speed defaults to 1 when starting an unload cycle. Once again the % that the valve opens up for front apron speed is correlated with these numbers 1-10. The % that correlates with the numbers can be adjusted from the settings which is outlined in the initial setup section earlier in the manual.

To turn off the apron simply press the same button noted below or press any other button to turn off any number of functions like stated previously.

Remember for simultaneous shutdown of all operations the "FRONT" control label button may be pressed to stop all current running functions. There will be a ramp down time as soft stops activate.

Reminder: Attempting to shut the outfeed while the cross conveyor is running will bypass the system's soft stops and will cause everything to stop immediately. This is not recommended and should only be used for emergency shutdown.

With the apron chain turned on you may now adjust the speed of the apron chain by pressing the buttons noted below.

Note the corresponding arrow turns bright green to confirm a button press and the number changes based on an up or down arrow press.

To turn off the apron simply press the same button noted below or press any other button to turn off any number of functions like stated previously.

Remember for immediate shutdown of all operations the "FRONT" control label button may be pressed to stop all current running functions. There will be a ramp down time as soft stops activate.

Congratulations! You may now proceed with loading and using your new Art's Way 2100 Forage Box.

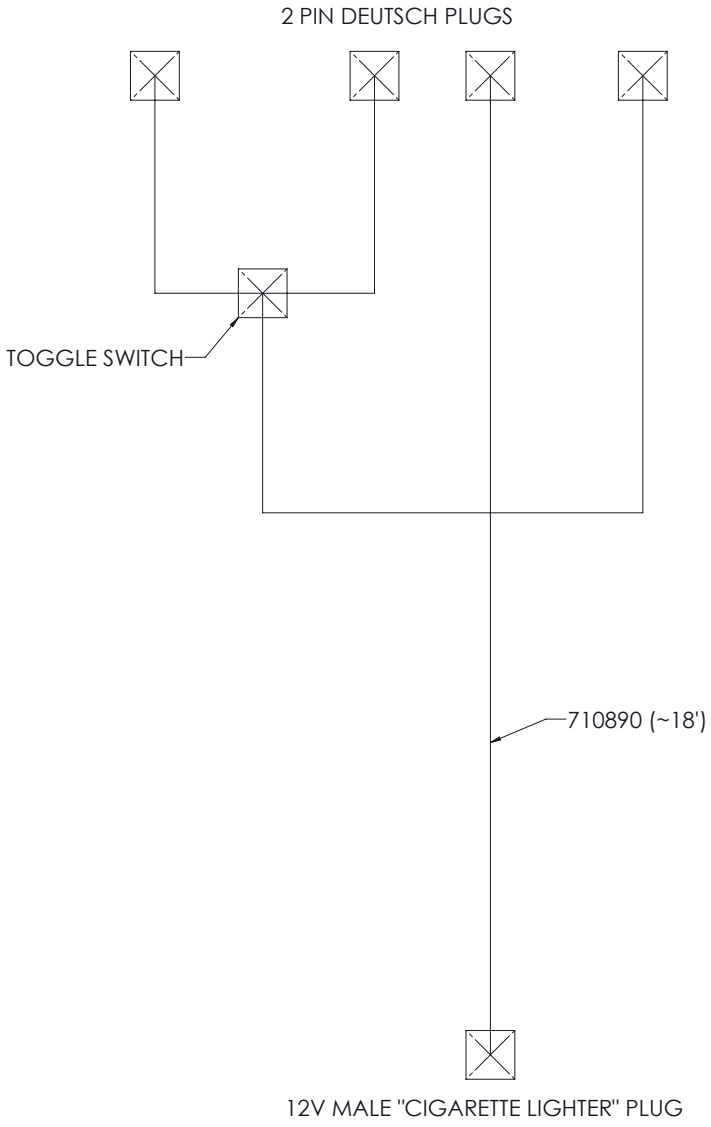
EMERGENCY UNLOAD / CAN-BUS SYSTEM BYPASS VER. 1

Your in-cab controlled forage box includes an emergency unload harness for use in the event of a canbus monitor or controller failure. This harness powers your manifold solenoids to open directly and must be used in conjunction with the following instructions.

Use of the emergency unload harness that does not apply the following directions can result in damage that Art's Way will not be liable for. Double and triple check all connections are accurate before applying power (electrical / hydraulic) and attempting to unload.

Version 1 of this emergency unload harness is shown below.

For front unload only units ignore "REAR UNLOAD" section and skip to "FRONT UNLOAD" section.



EMERGENCY REAR UNLOAD VER. 1

For rear unloading using the emergency unload harness take the following steps.

1. Power down tractor and all power sources (hydraulic / electric).

2. Unplug 7 pin power harness from tractor.

3. Unplug all cables connected to all solenoids on the hydraulic manifold. You can use the Electric Diagram near the end of the IPL manual as reference.

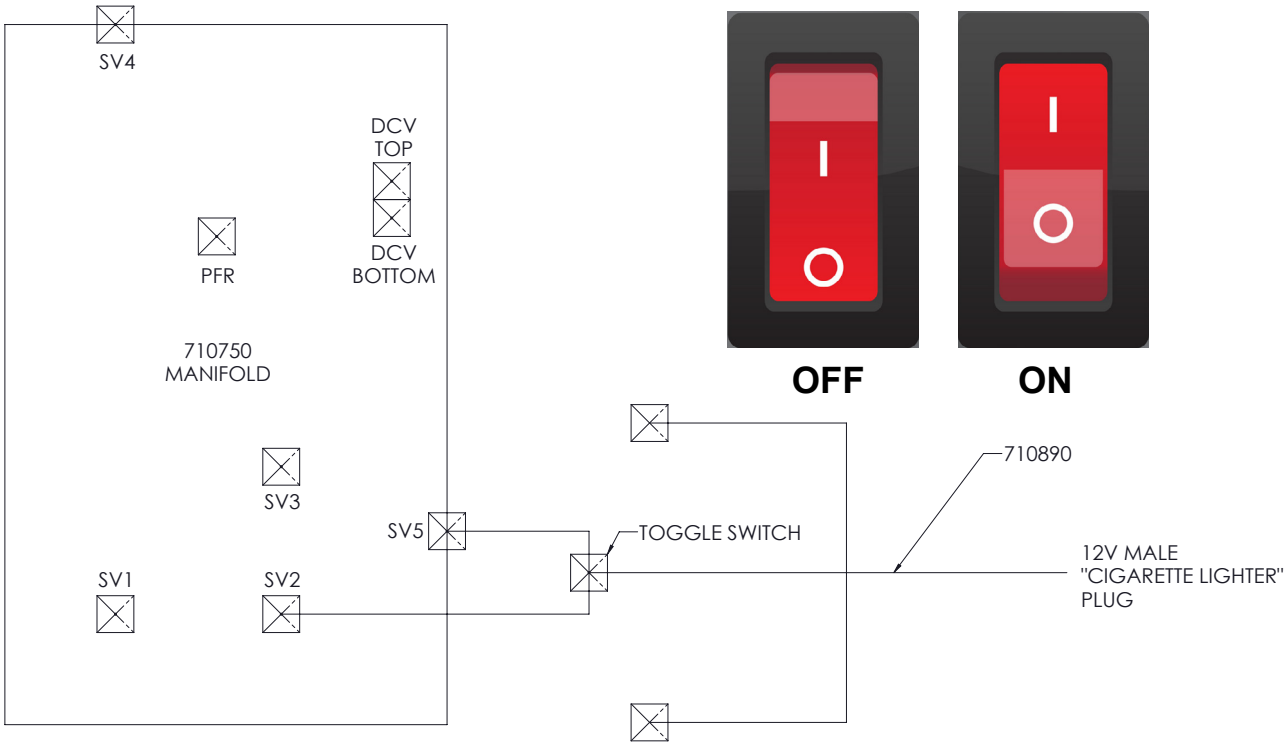
4. Plug the emergency harness in to the manifold solenoids as shown below.

5. Ensure the toggle switch is set to off as shown below.

6. Plug in the 12V male end of the emergency unload harness to you tractors 12V cigarette lighter receptacle.

7. Turn on tractor and supply 1/4 of available hydraulic power. Nothing should happen yet. If forage box functions start to move then turn off hydraulic power and repeat the above steps. This emergency unload method does not limit flow and full hydraulic power could damage equipment using this unload method.

8. Toggle the toggle switch on the emergency harness on and unloading should start. Use the toggle switch to control rear unloading on and off. Depending on your tractor you may need to gradually increase the amount of hydraulic power. Do not exceed 1/2 of available hydraulic power using this unload method.



EMERGENCY FRONT UNLOAD (STAGE 1) VER. 1

For front unloading using the emergency unload harness take the following steps.

1. Power down tractor and all power sources (hydraulic / electric).

2. Unplug 7 pin power harness from tractor.

3. Unplug all cables connected to all solenoids on the hydraulic manifold. You can use the Electric Diagram near the end of the IPL manual as reference.

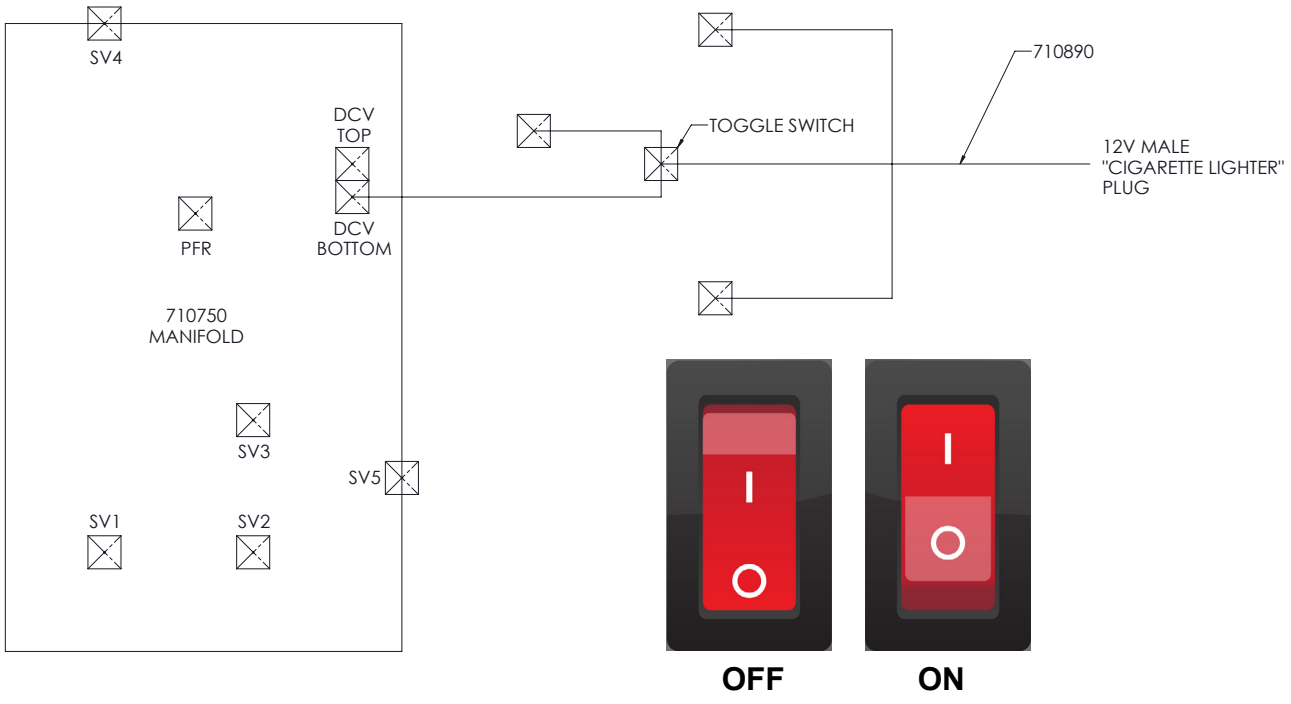
4. Plug the emergency harness in to the manifold solenoids as shown below.

5. Ensure the toggle switch is set to off as shown below.

6. Plug in the 12V male end of the emergency unload harness to you tractors 12V cigarette lighter receptacle.

7. Turn on tractor and supply 1/4 of available hydraulic power. Nothing should happen yet. If forage box functions start to move then turn off hydraulic power and repeat the above steps. This emergency unload method does not limit flow and full hydraulic power could damage equipment using this unload method.

8. Toggle the toggle switch on the emergency harness on and your outfeed cylinder should extend and open the outfeed. Make sure outfeed is fully open before continuing or damage could occur.



EMERGENCY FRONT UNLOAD (STAGE 2) VER. 1

For front unloading using the emergency unload harness take the following steps.

1. Power down tractor and all power sources (hydraulic / electric).

2. Unplug 7 pin power harness from tractor.

3. Unplug ALL cables connected to all solenoids on the hydraulic manifold. You can use the Electric Diagram near the end of the IPL manual as reference.

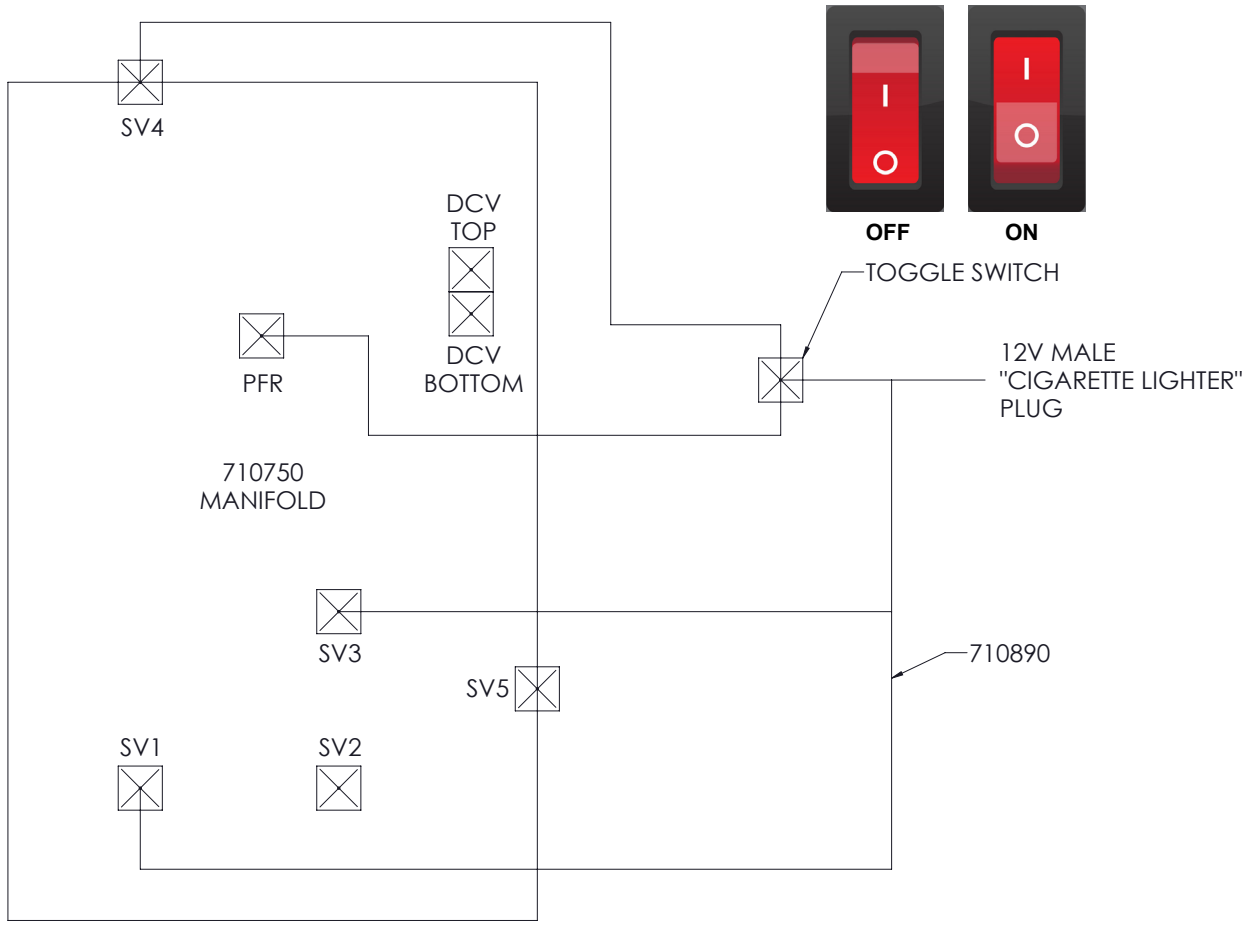
4. Plug the emergency harness in to the manifold solenoids as shown below.

5. Ensure the toggle switch is set to off as shown below.

6. Plug in the 12V male end of the emergency unload harness to you tractors 12V cigarette lighter receptacle.

7. Turn on tractor and supply 1/4 of available hydraulic power. Your cross conveyor and beaters should start functioning immediately.

8. Toggle the toggle switch on the emergency harness on and your main apron should start moving forward. There is no speed control using this method so use the toggle switch to start and stop the apron forward advancement as needed.



EMERGENCY FRONT UNLOAD (STAGE 3) VER. 1

For front unloading using the emergency unload harness take the following steps.

1. Power down tractor and all power sources (hydraulic / electric).

2. Unplug 7 pin power harness from tractor.

3. Unplug all cables connected to all solenoids on the hydraulic manifold. You can use the Electric Diagram near the end of the IPL manual as reference.

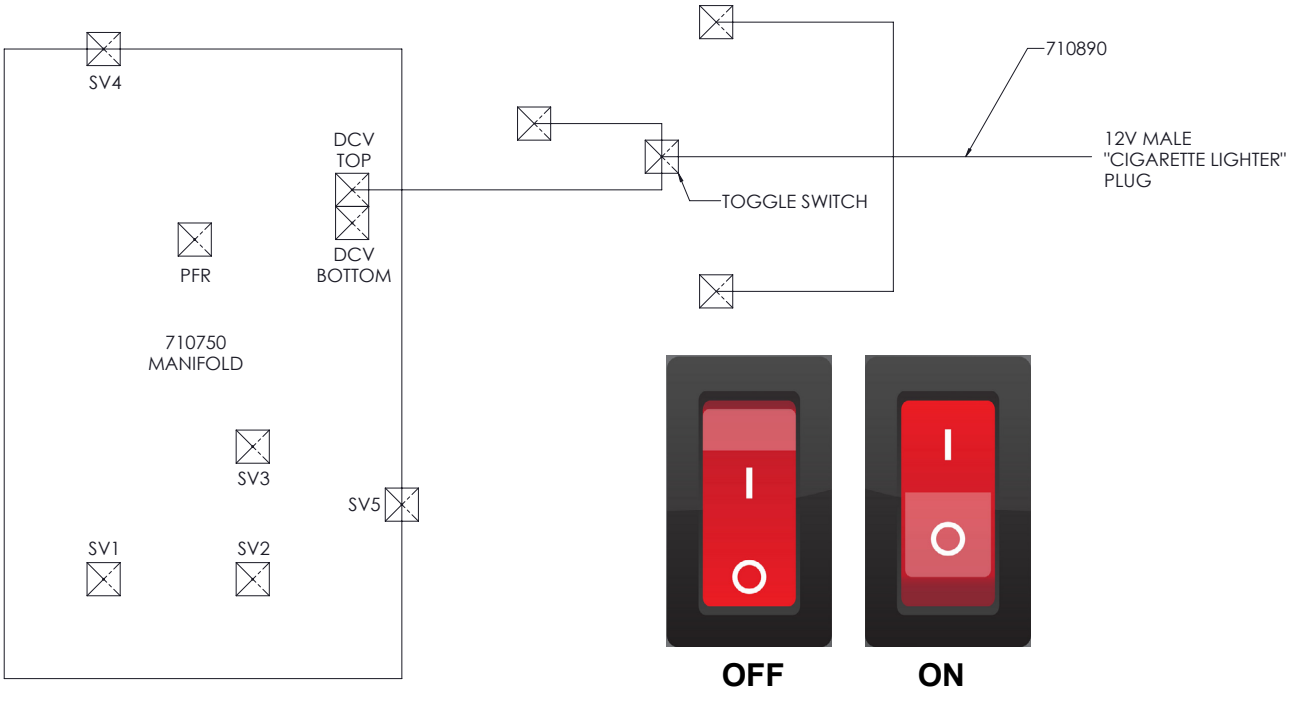
4. Plug the emergency harness in to the manifold solenoids as shown below.

5. Ensure the toggle switch is set to off as shown below.

6. Plug in the 12V male end of the emergency unload harness to you tractors 12V cigarette lighter receptacle.

7. Turn on tractor and supply 1/4 of available hydraulic power. Nothing should happen yet. If forage box functions start to move then turn off hydraulic power and repeat the above steps. This emergency unload method does not limit flow and full hydraulic power could damage equipment using this unload method.

8. Toggle the toggle switch on the emergency harness on and your outfeed cylinder should retract and close the outfeed. Make sure outfeed is fully closed then unplug the emergency harness and call your authorized dealer for help troubleshooting your canbus system.



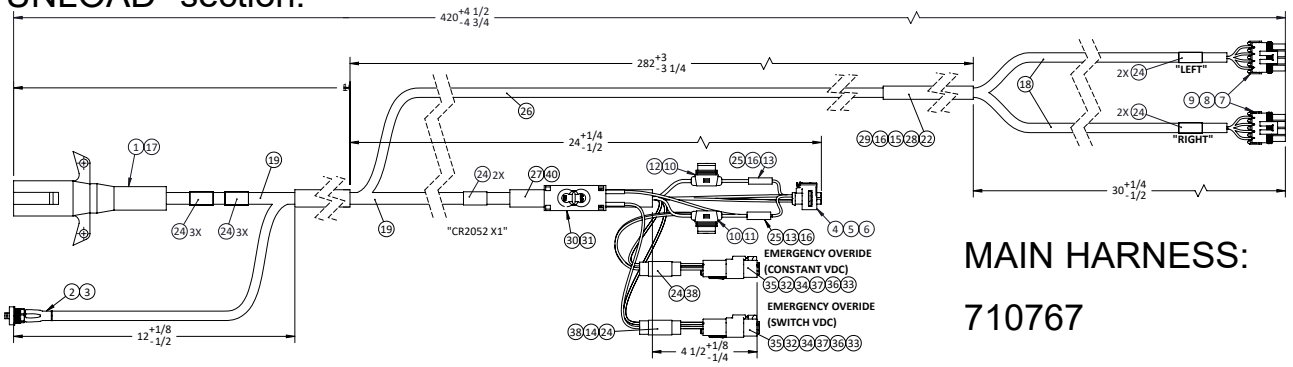
EMERGENCY UNLOAD / CAN-BUS SYSTEM BYPASS VER. 2

Your in-cab controlled forage box now integrates the emergency unload harness into the main harness and borrows the wires that usually attach the manifold to the controller. This simplifies the emergency unload procedure for use in the event of a canbus monitor or controller failure. This harness setup powers your manifold solenoids to open directly and must be used in conjunction with the following instructions.

Use of the emergency unload harness that does not apply the following directions can result in damage that Art's Way will not be liable for. Double and triple check all connections are accurate before applying power (electrical / hydraulic) and attempting to unload.

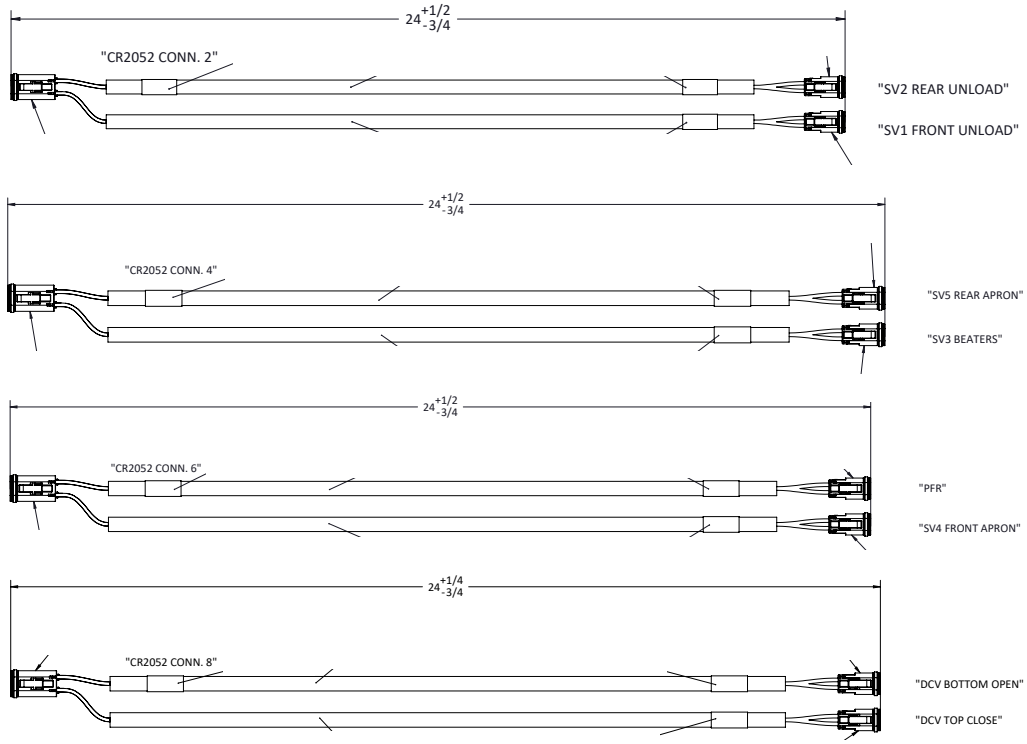
Version 2 of this emergency unload harness setup is shown below.

For front unload only units ignore "REAR UNLOAD" section and skip to "FRONT UNLOAD" section.



MAIN HARNESS:

710767



MANIFOLD HARNESS KIT:

710762

EMERGENCY REAR UNLOAD VER. 2

For rear unloading using the emergency unload harness take the following steps.

1. Power down tractor and all power sources (hydraulic / electric).

2. Unplug all cables connected to all solenoids on the hydraulic manifold. You can use the Electric Diagram near the end of the IPL manual as reference.

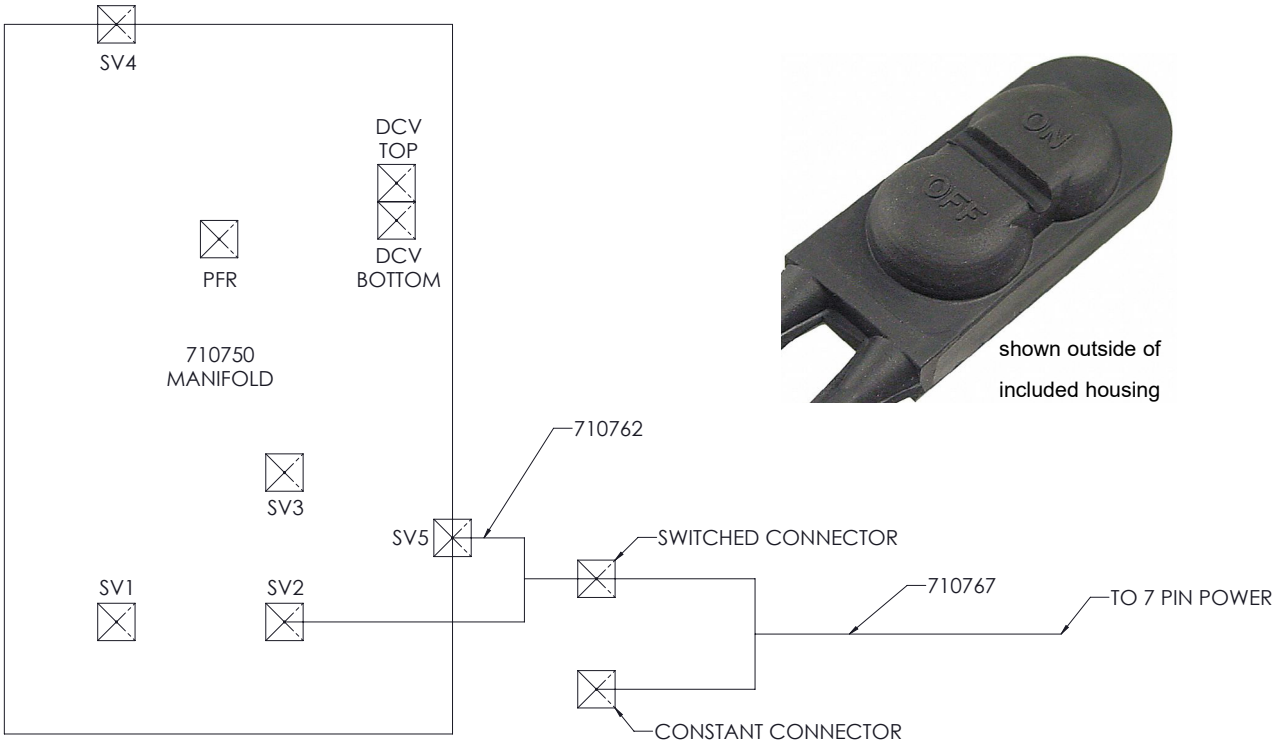
3. Take one of the short cables you unplugged from the manifold and disconnect it from the controller junction also. Then plug that short cable into the solenoids shown below and connect the other end to the main harness switched connector as shown below.

4. Ensure the toggle switch is set to off as shown below.

5. Ensure 7pin power from the main harness is plugged in and power is supplied.

6. Turn on tractor and supply 1/4 of available hydraulic power. Nothing should happen yet. If forage box functions start to move then turn off hydraulic power and repeat the above steps. This emergency unload method does not limit flow and full hydraulic power could damage equipment using this unload method.

7. Toggle the toggle switch on the main harness to on and unloading should start. Use the toggle switch to control rear unloading on and off. Depending on your tractor you may need to gradually increase the amount of hydraulic power. Do not exceed 1/2 of available hydraulic power using this unload method.



(Units equipped with dump block may look different than shown. Use included splitter (not pictured).)

EMERGENCY FRONT UNLOAD (STAGE 1) VER. 2

For front unloading using the emergency unload harness take the following steps.

1. Power down tractor and all power sources (hydraulic / electric).

2. Unplug all cables connected to all solenoids on the hydraulic manifold. You can use the Electric Diagram near the end of the IPL manual as reference.

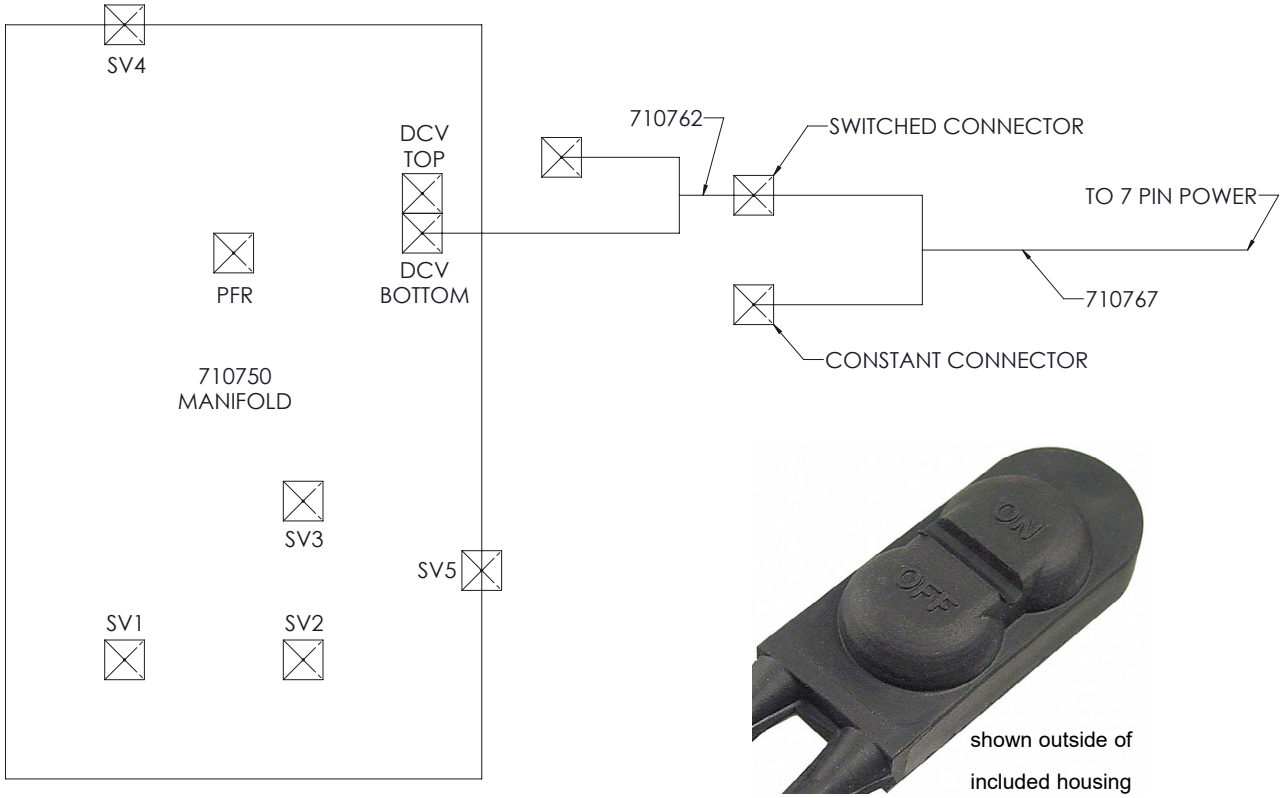
3. Take one of the short cables you unplugged from the manifold and disconnect it from the controller junction also. Then plug that short cable into the solenoids shown below and connect the other end to the main harness switched connector as shown below.

4. Ensure the toggle switch is set to off as shown below.

5. Ensure 7pin power from the main harness is plugged in and power is supplied.

6. Turn on tractor and supply 1/4 of available hydraulic power. Nothing should happen yet. If forage box functions start to move then turn off hydraulic power and repeat the above steps. This emergency unload method does not limit flow and full hydraulic power could damage equipment using this unload method.

7. Toggle the toggle switch on the emergency harness on and your outfeed cylinder should extend and open the outfeed. Make sure outfeed is fully open before continuing or damage could occur.



(Units equipped with dump block may look different than shown. Use included splitter (not pictured).)

EMERGENCY FRONT UNLOAD (STAGE 2) VER. 2

For front unloading using the emergency unload harness take the following steps.

1. Power down tractor and all power sources (hydraulic / electric).

2. Unplug all cables connected to all solenoids on the hydraulic manifold. You can use the Electric Diagram near the end of the IPL manual as reference.

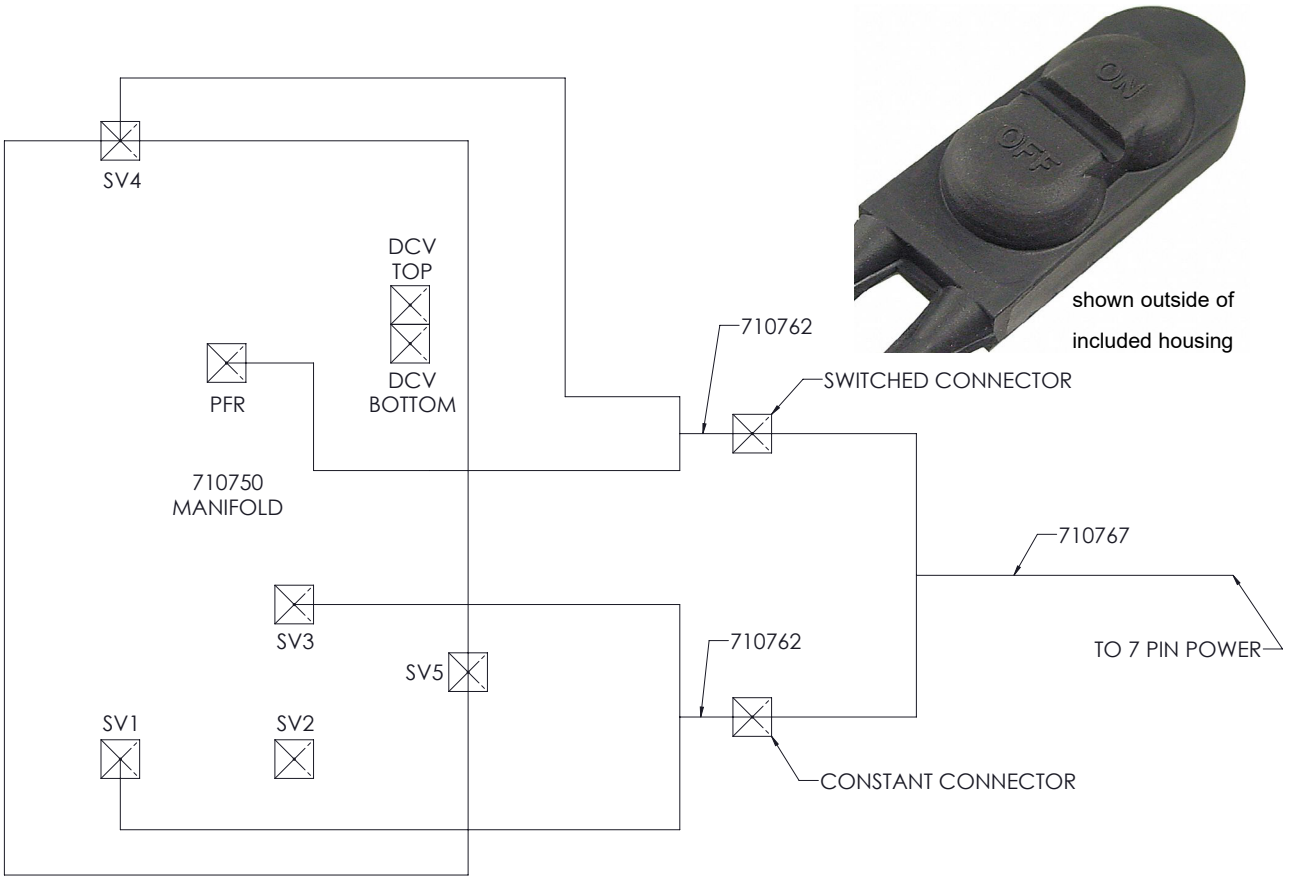
3. Take two of the short cables you unplugged from the manifold and disconnect them from the controller junction also. Then plug those short cables into the solenoids shown below and connect the other ends to the main harness switched connector and constant connector as shown below.

4. Ensure the toggle switch is set to off as shown below.

5. Ensure 7pin power from the main harness is plugged in and power is supplied.

6. Turn on tractor and supply 1/4 of available hydraulic power. Your cross conveyor and beaters should start functioning immediately.

7. Toggle the toggle switch on the emergency harness on and your main apron should start moving forward. There is no speed control using this method so use the toggle switch to start and stop the apron forward advancement as needed.



(Units equipped with dump block may look different than shown. Use included splitter (not pictured).)

EMERGENCY FRONT UNLOAD (STAGE 3) VER. 2

For front unloading using the emergency unload harness take the following steps.

1. Power down tractor and all power sources (hydraulic / electric).

2. Unplug all cables connected to all solenoids on the hydraulic manifold. You can use the Electric Diagram near the end of the IPL manual as reference.

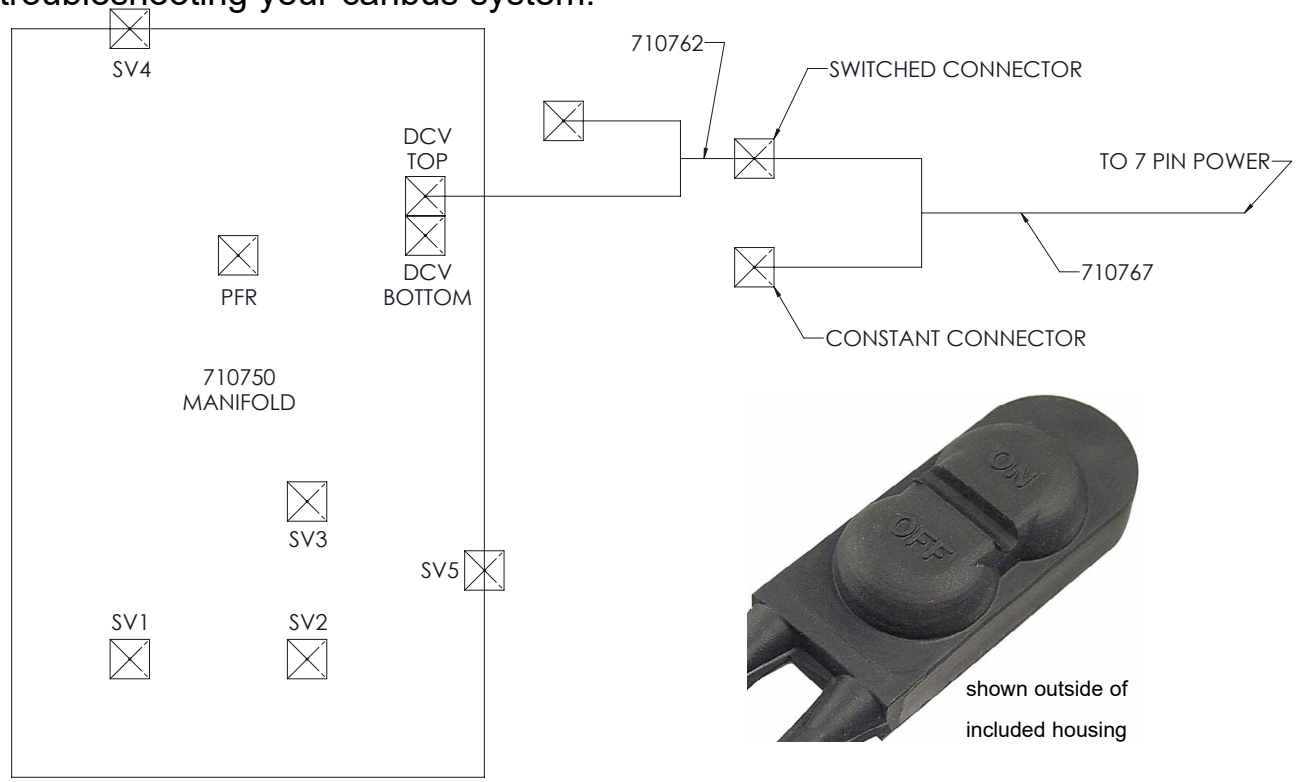
3. Take one of the short cables you unplugged from the manifold and disconnect it from the controller junction also. Then plug that short cable into the solenoids shown below and connect the other end to the main harness switched connector as shown below.

4. Ensure the toggle switch is set to off as shown below.

5. Ensure 7pin power from the main harness is plugged in and power is supplied.

6. Turn on tractor and supply 1/4 of available hydraulic power. Nothing should happen yet. If forage box functions start to move then turn off hydraulic power and repeat the above steps. This emergency unload method does not limit flow and full hydraulic power could damage equipment using this unload method.

7. Toggle the toggle switch on the emergency harness on and your outfeed cylinder should retract and close the outfeed. Make sure outfeed is fully closed then unplug the short cables and call your authorized dealer for help troubleshooting your canbus system.



(Units equipped with dump block may look different than shown. Use included splitter (not pictured).)

Unloading Operation - Left Hand Unload

Because forage blowers load from the right side (as viewed from behind), a left hand forage box will be stationed next to the forage blower so that the controls on the forage box as well as those on the blower and the blower tractor easily can be reached from the Operator's Position. See the line drawing (Figure 5).

WARNING

DO NOT STEP OVER PTO SHAFT!

DO NOT WALK OR CLIMB BETWEEN FORAGE BOX OUTFEED AREA AND BLOWER WHEN EITHER FORAGE BOX OR BLOWER IS OPERATING!

DO NOT TAKE A SHORT CUT!

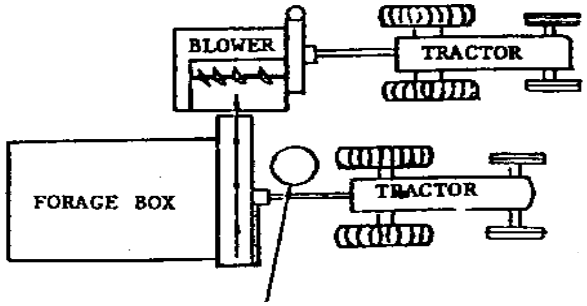


Figure 5

SAFETY LABEL LOCATIONS

Each Forage Box has been produced and assembled with the operator's safety in mind. As a reminder to the operator of proper operation of the machine, several labels of warning and instruction have been attached. Information on labels is, by necessity less than in the operator's manual. Do not depend solely on the labels for safe and proper operation. Use your operator's manual.

DO NOT REMOVE ANY OF THESE LABELS. THEY ARE FOR YOUR PROTECTION! TAKE NOTE OF THEIR MESSAGES AND OBSERVE!

PERIODICALLY CHECK ALL LABELS AND REPLACE ANY THAT ARE MISSING, WORN, OR ILLEGIBLE. WHEN REPLACING, CLEAN MACHINE SURFACE THOROUGHLY USING SOAP AND WATER OR CLEANING SOLVENT TO REMOVE DIRT AND GREASE. CONTACT YOUR DEALER OR ART'S WAY MFG. AT 712-864-3131 IF ANY LABELS ARE NOT UNDERSTOOD!

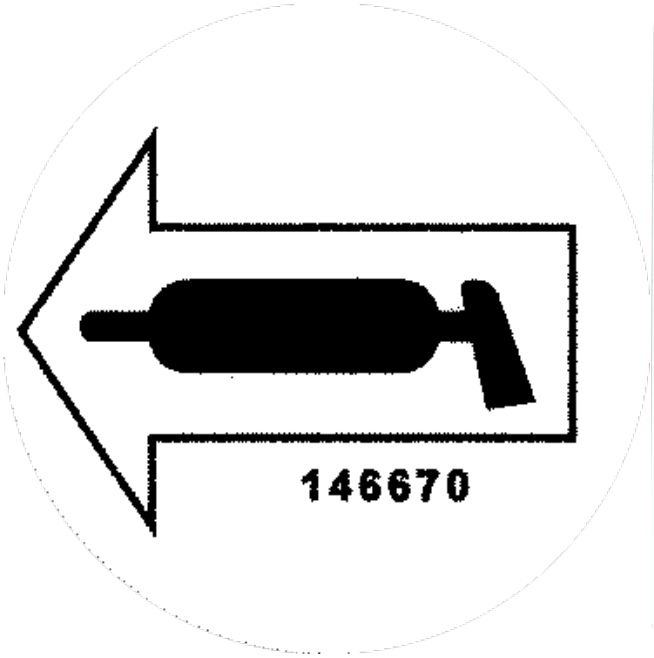
THE ART'S WAY FORAGE BOX WAS DESIGNED AS A FORAGE BOX. DO NOT USE FOR OTHER PURPOSES!

REPLACE ALL WORN, DAMAGED, UNUSABLE OR MISSING SAFETY SHIELDS AND GUARDS. CONTACT YOUR DEALER!

SAFETY LABEL LOCATIONS CAN BE FOUND NEAR THE END OF THE ILLUSTRATED PARTS LIST MANUAL ON THE PAGE TITLED "DECALS". REFER TO THE TABLE OF CONTENTS TO LOCATE THE PAGE NUMBER.

THE FOLLOWING PAGES SHOW DETAILED IMAGES OF THE CONTENT OF ALL THE INCLUDED SAFETY LABELS.

IF YOU REPLACE A COMPONENT OF YOUR MACHINE THAT HAS A SAFETY LABEL ON IT YOU ARE RESPONSIBLE FOR OBTAINING AND REPLACING THE SAFETY LABEL FOR THAT COMPONENT.



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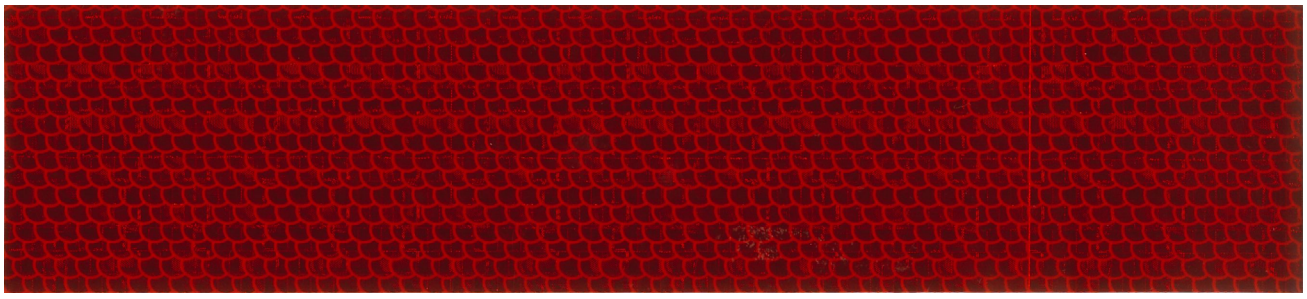
346310



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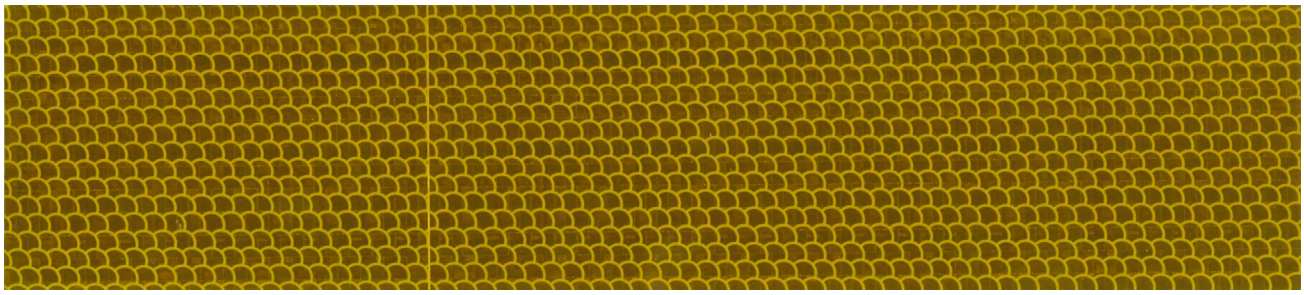

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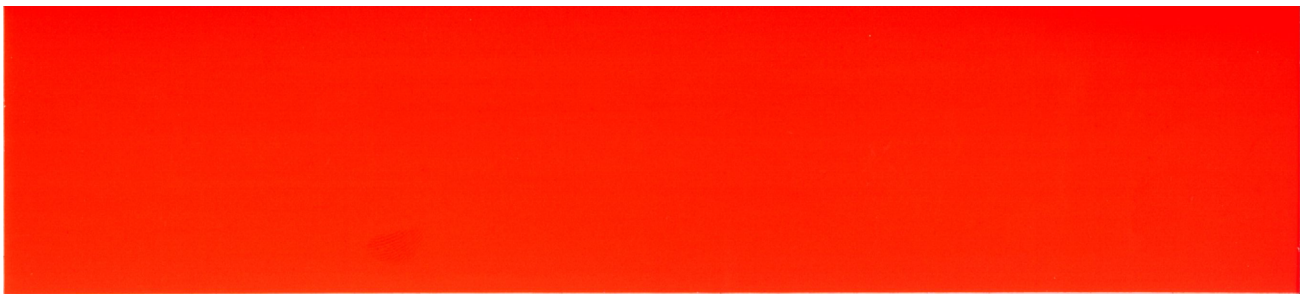


476470

MP01.77740

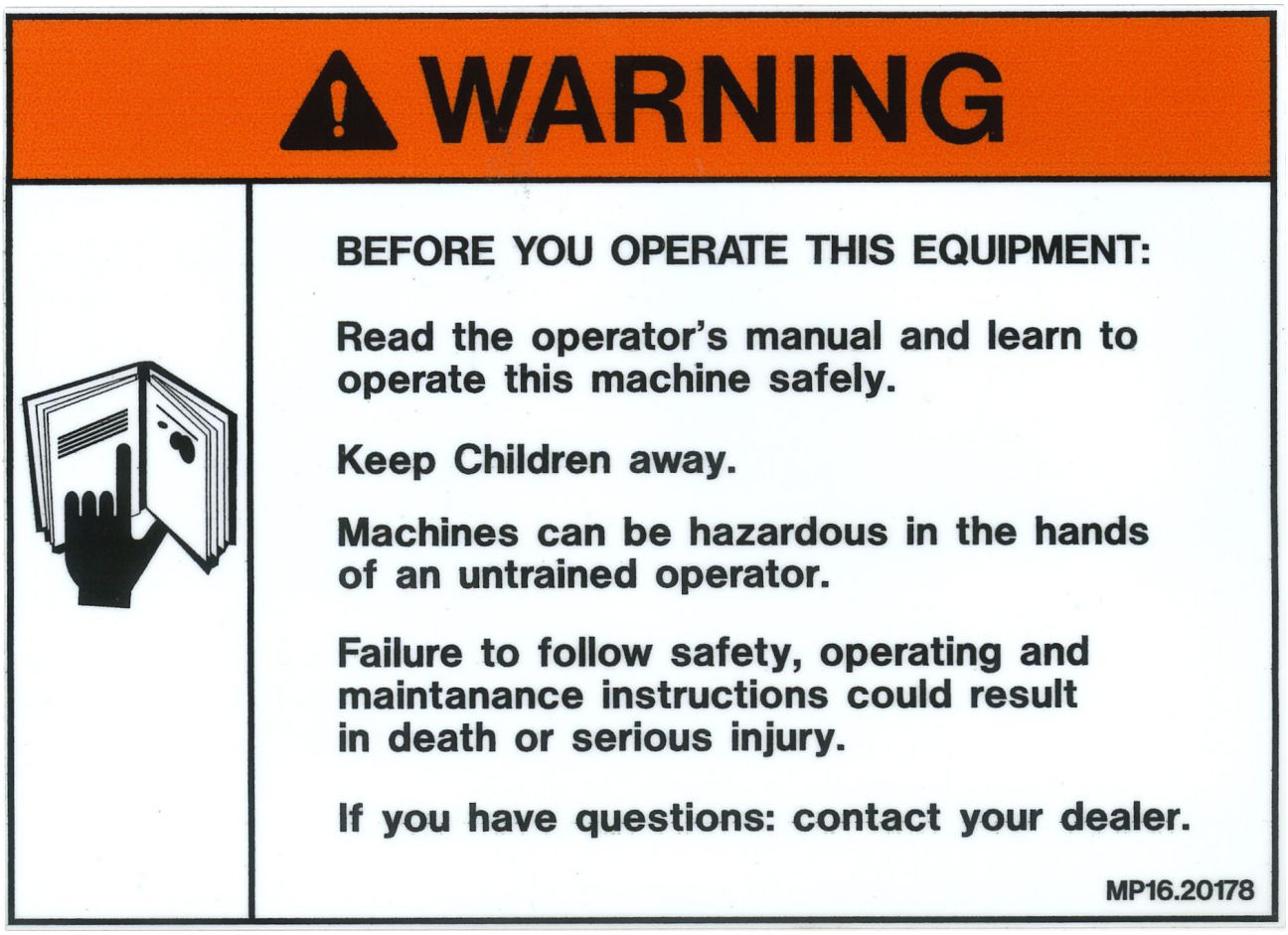
MP16.10552

MP16.20179

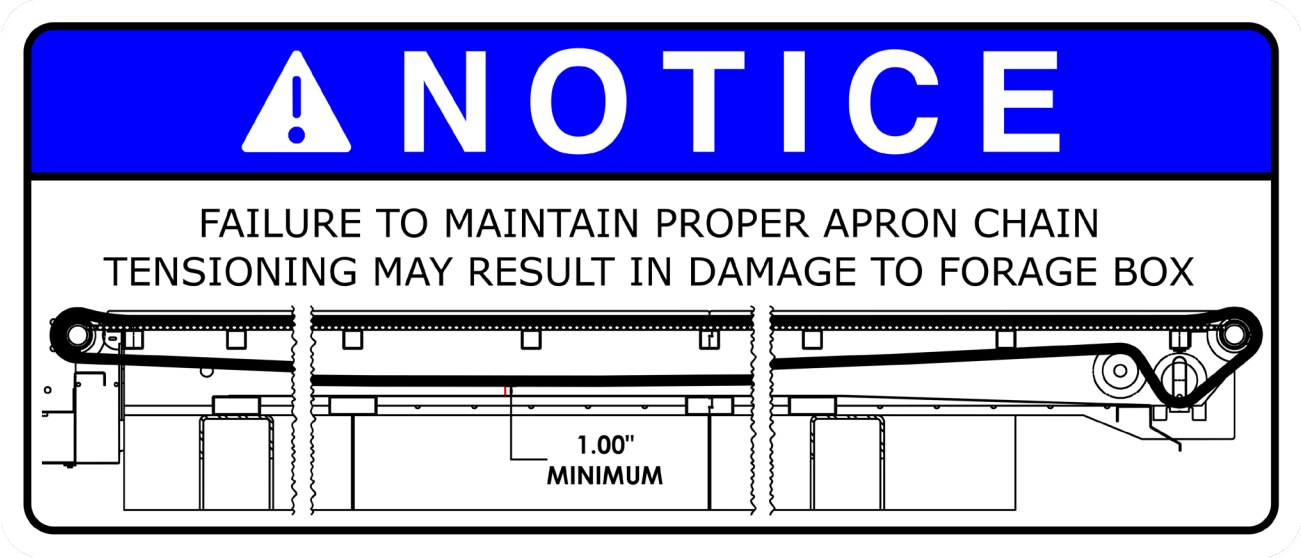
MP16.20181

WARNING
Moving parts can crush or dismember.
DO NOT OPERATE WITHOUT SHIELD IN PLACE.
Disconnect PTO before adjusting or servicing drives.
Failure to heed may result in serious injury.
NH9611750-B

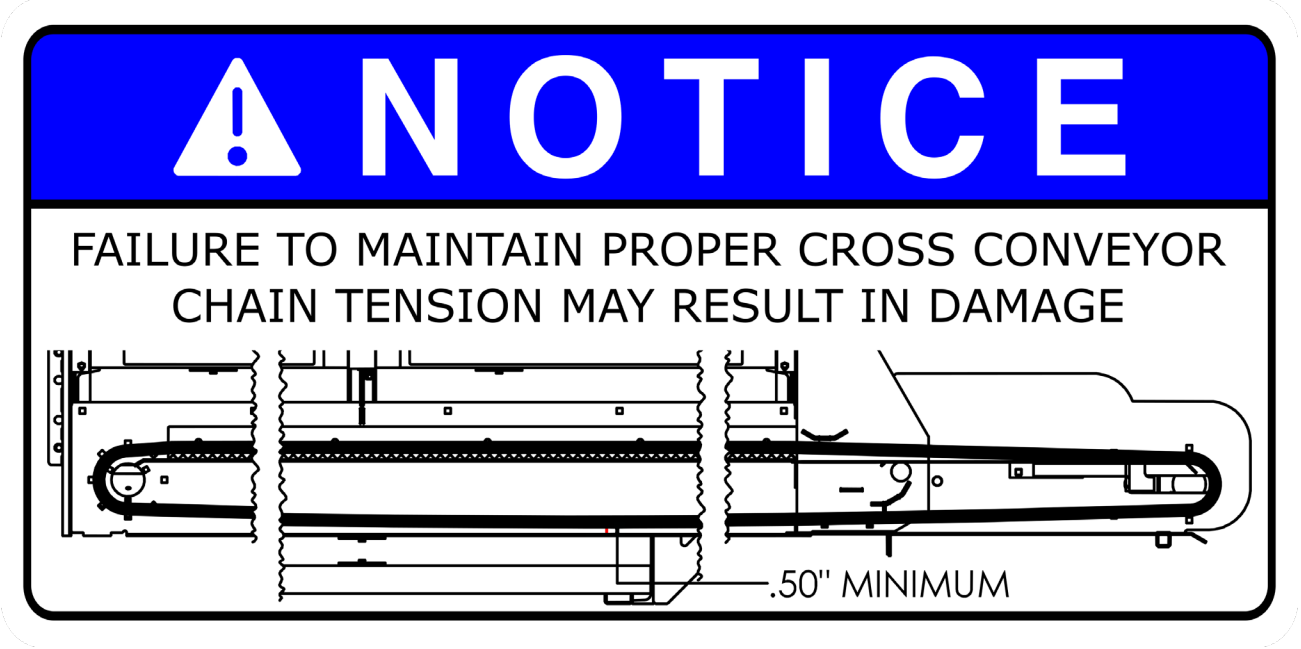
NH9611750


WARNING
BEFORE YOU OPERATE THIS EQUIPMENT:
Read the operator's manual and learn to operate this machine safely.
Keep Children away.
Machines can be hazardous in the hands of an untrained operator.
Failure to follow safety, operating and maintanance instructions could result in death or serious injury.
If you have questions: contact your dealer.
MP16.20178

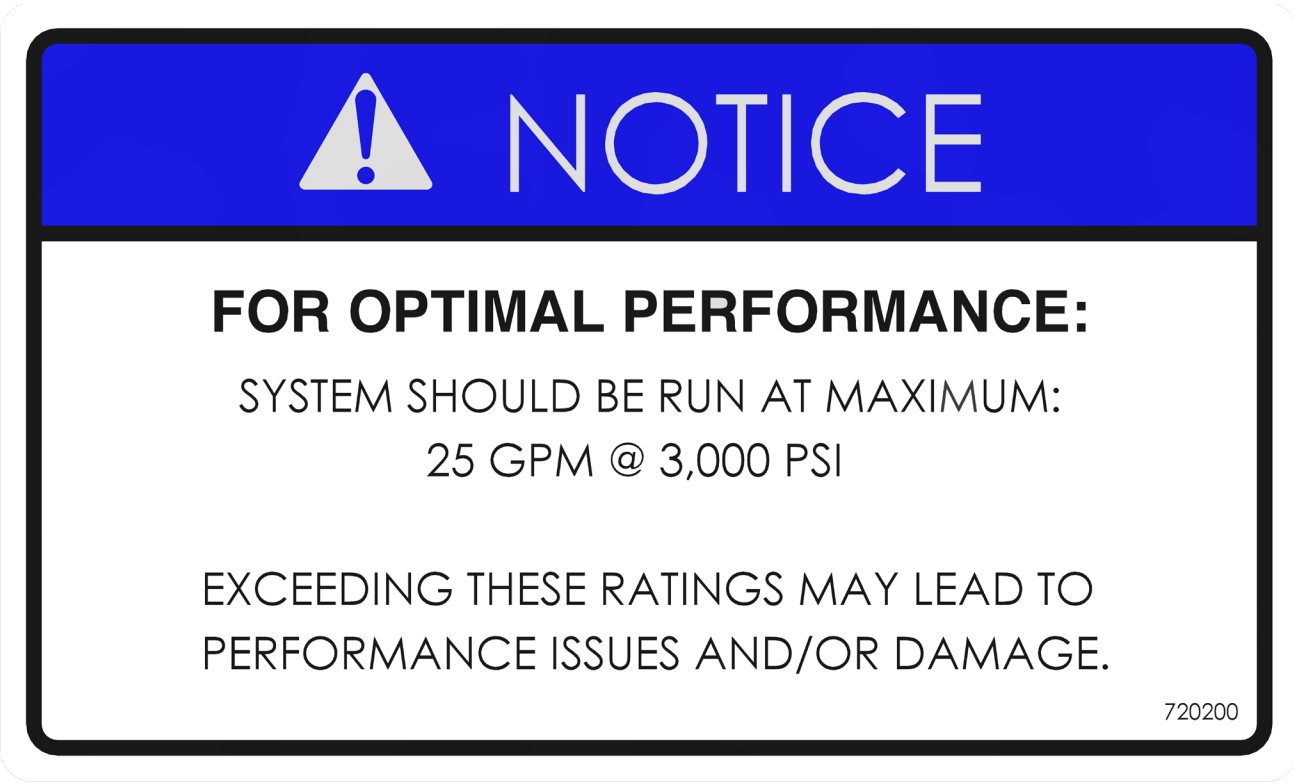
MP16.20178



720205



720210


NOTICE
FOR OPTIMAL PERFORMANCE:
SYSTEM SHOULD BE RUN AT MAXIMUM:
25 GPM @ 3,000 PSI
EXCEEDING THESE RATINGS MAY LEAD TO
PERFORMANCE ISSUES AND/OR DAMAGE.
720200

720200

SETUP INSTRUCTIONS

SMV Emblem

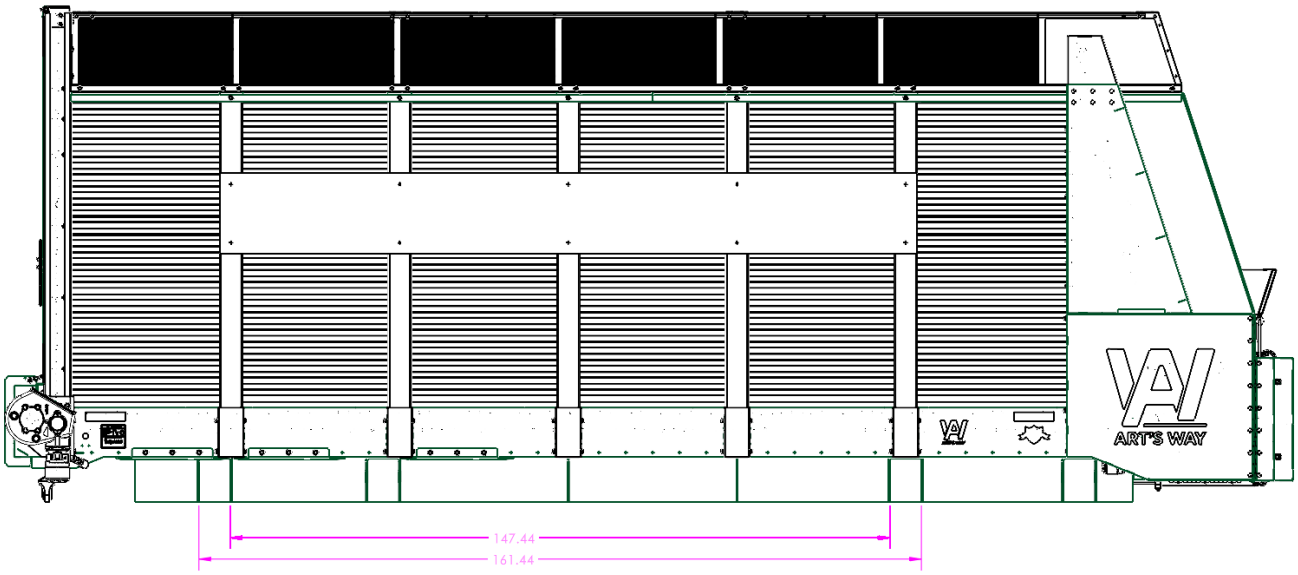
A Slow Moving Vehicle (SMV) Emblem is supplied with the forage box.

Mounting Forage Box to Running Gear

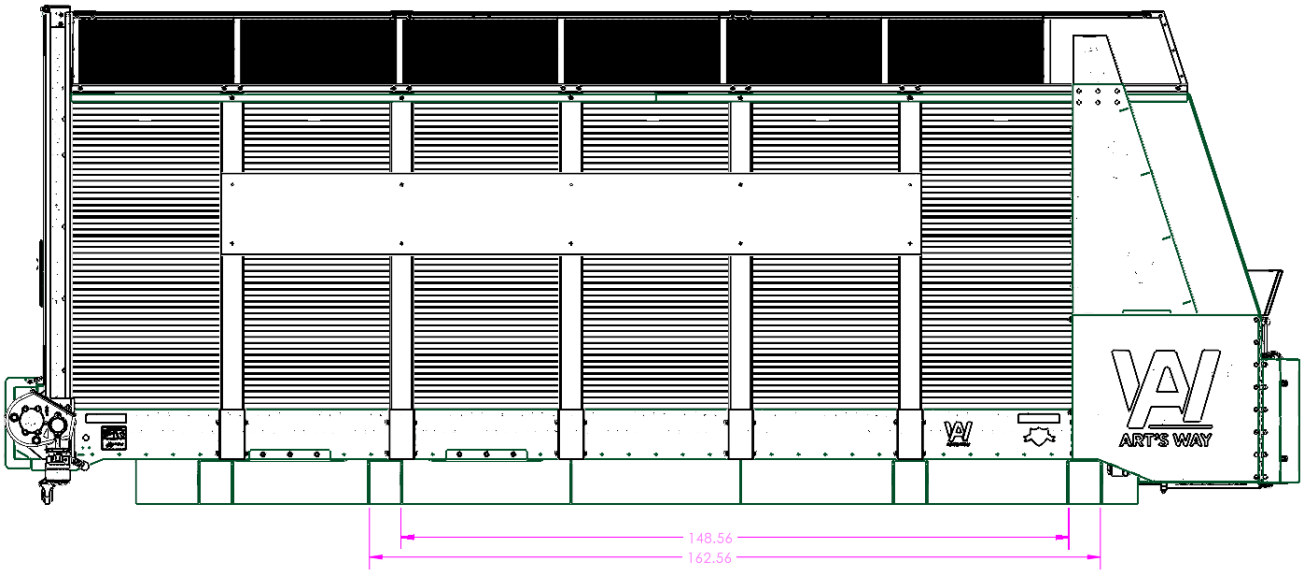
NOTE: This setup DOES NOT center forage box saddles on running gear bolster but are biased to prevent movement.

NOTE: Be sure the forage box is assembled to a running gear per included setup instructions or warranty may not apply.

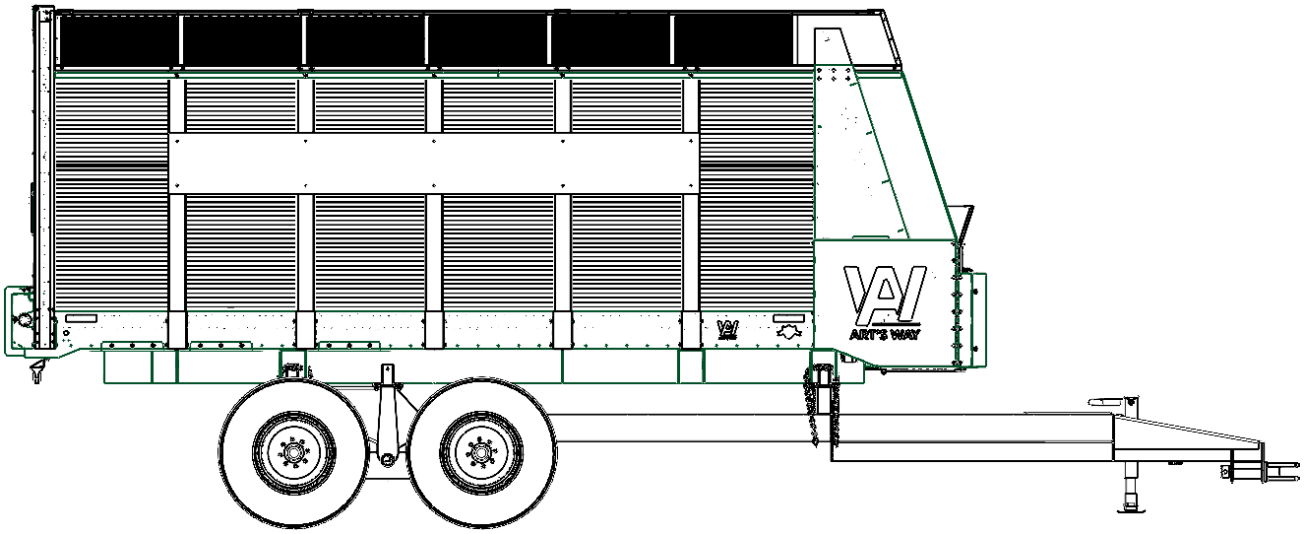
Use and maintain rubber pads between the forage box and running gear.



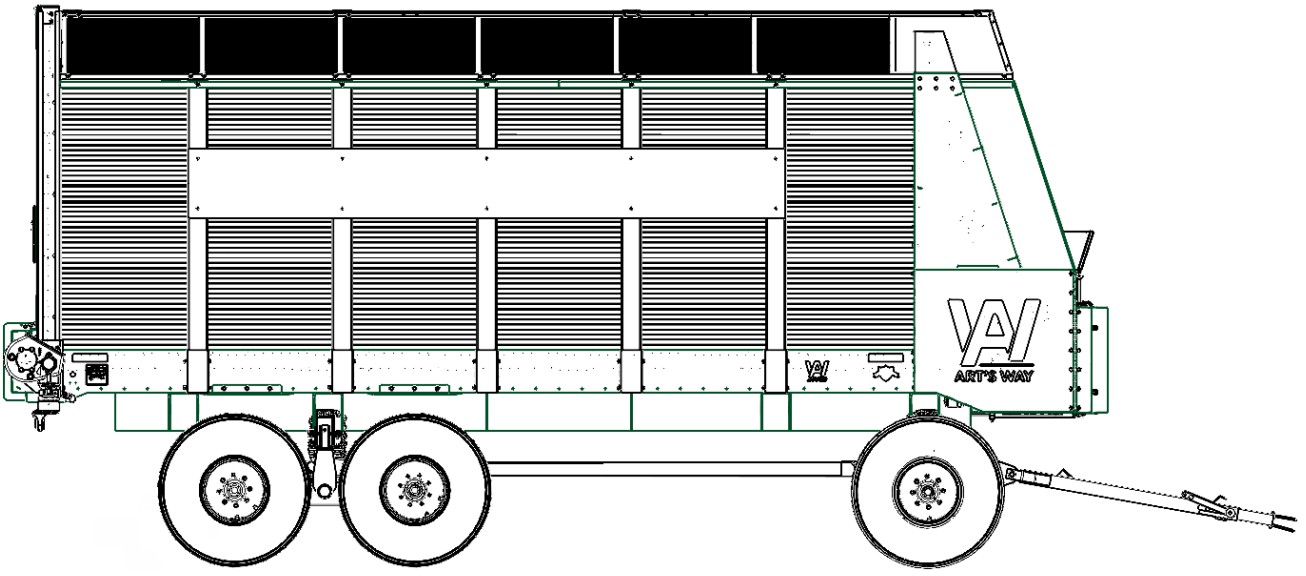
20' BOX SPACING 1



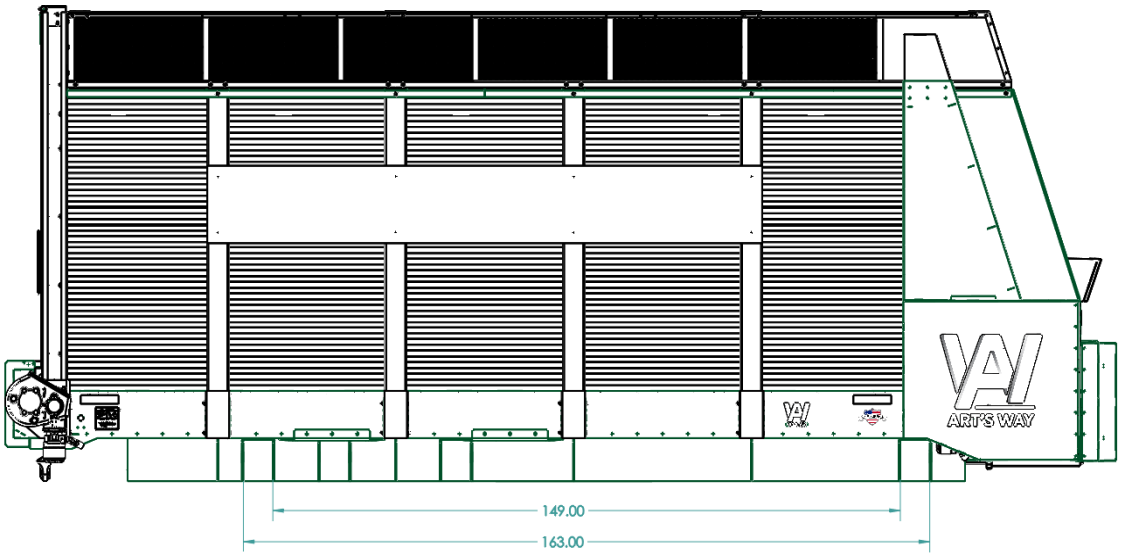
20' BOX SPACING 2



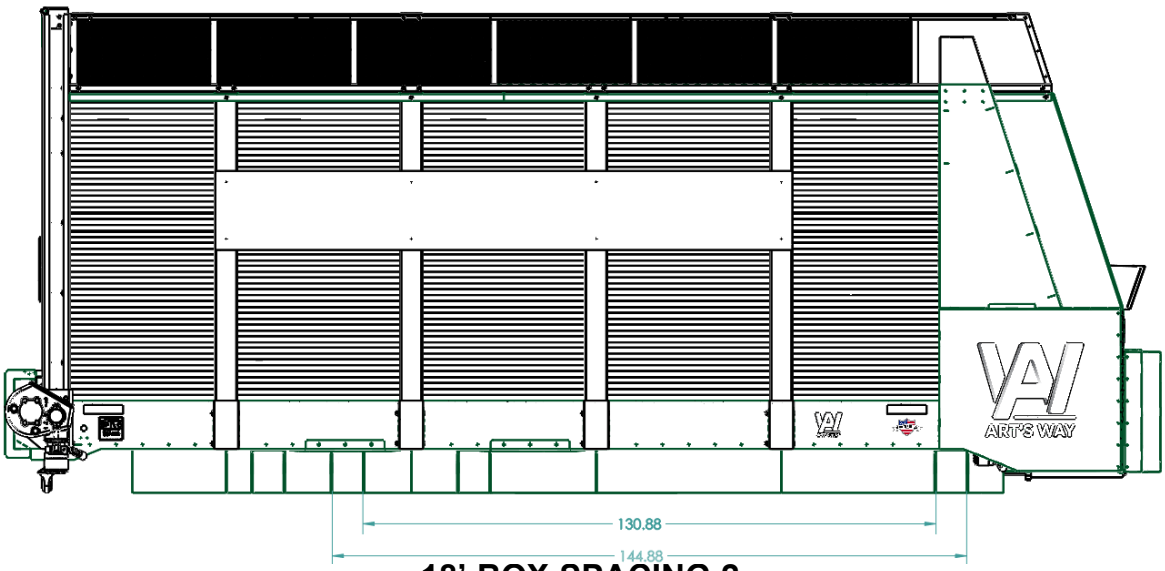
505 GEAR ON 20' BOX



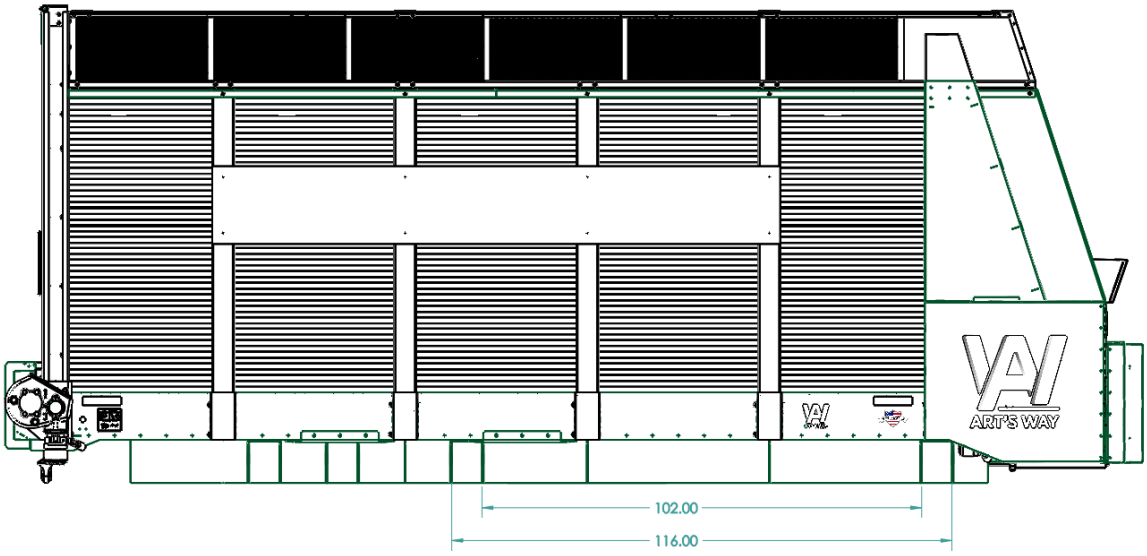
325 GEAR ON 20' BOX



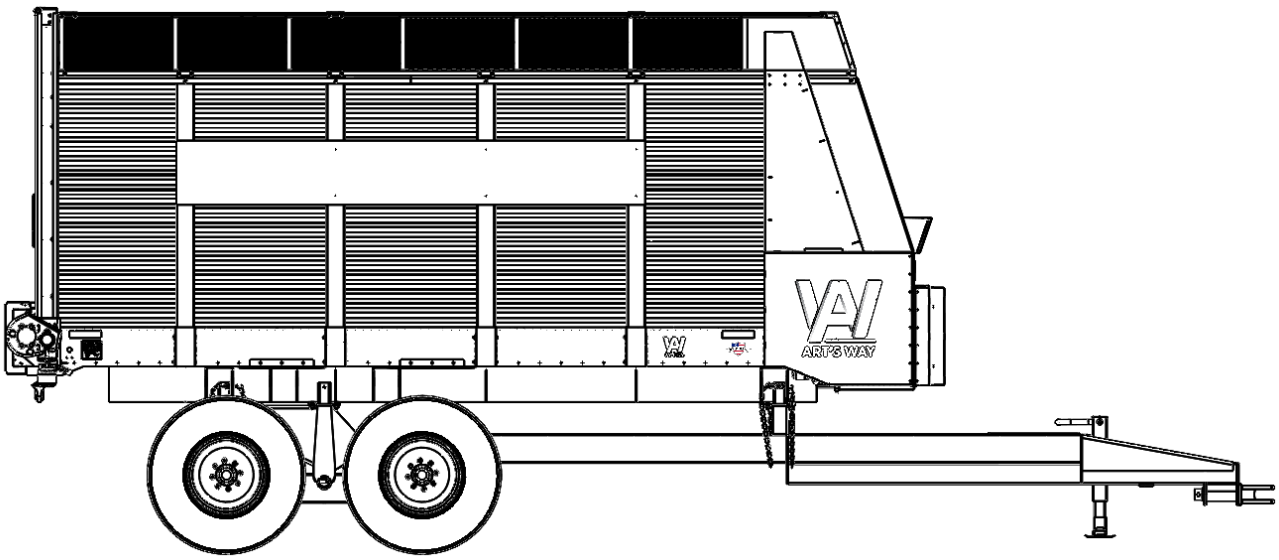
18' BOX SPACING 1



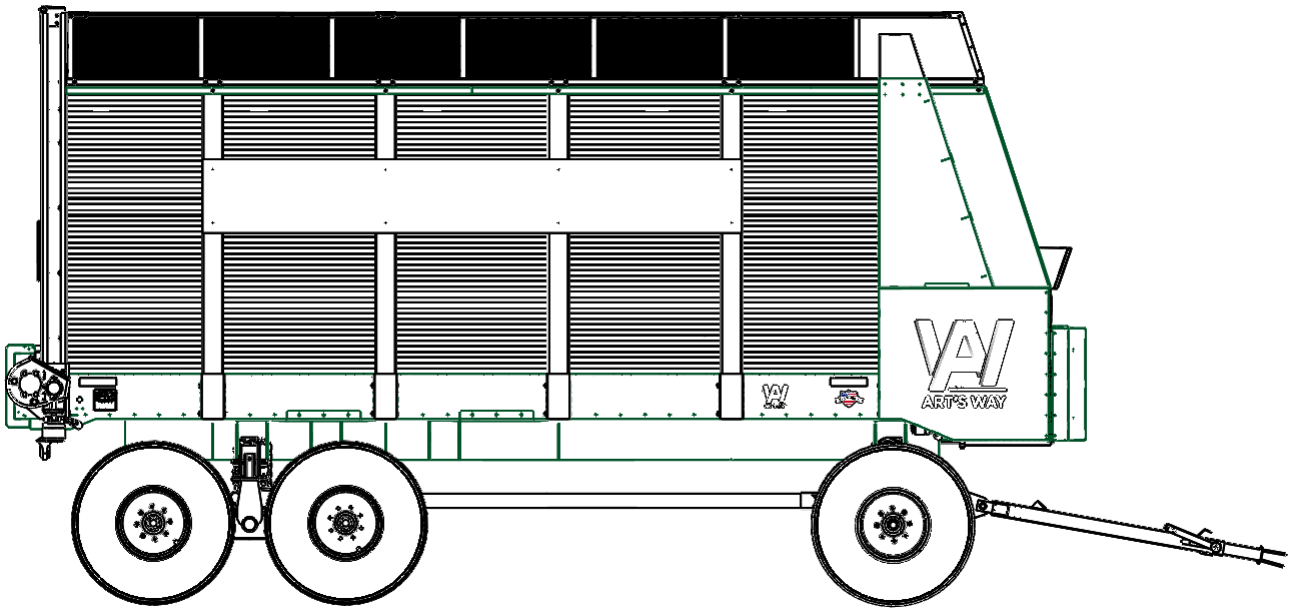
18' BOX SPACING 2



18' BOX SPACING 3



505 GEAR ON 18' BOX



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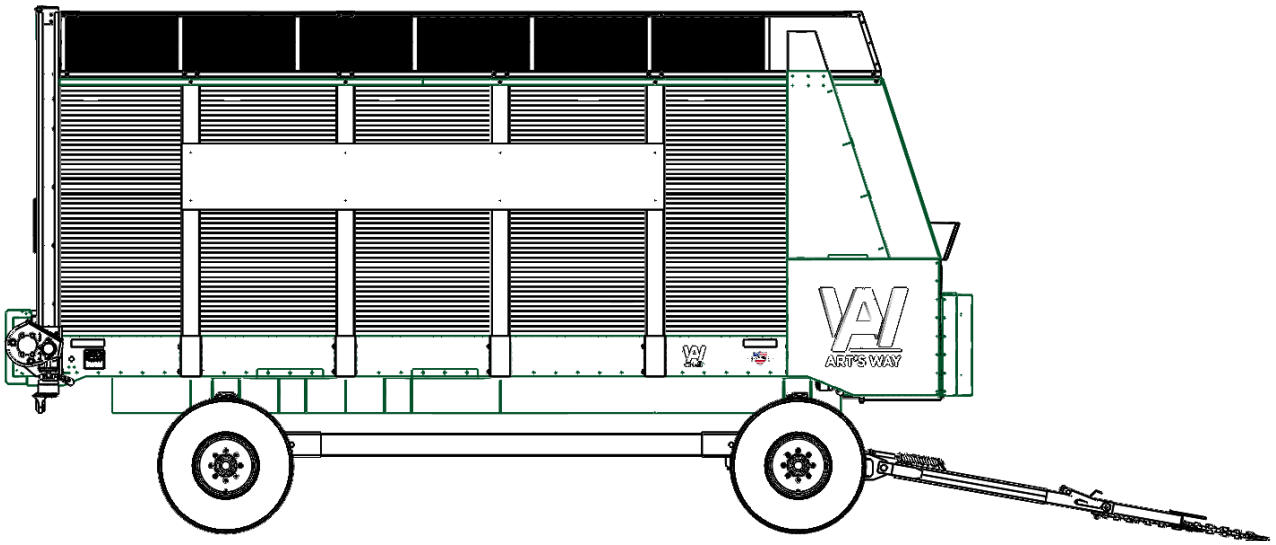
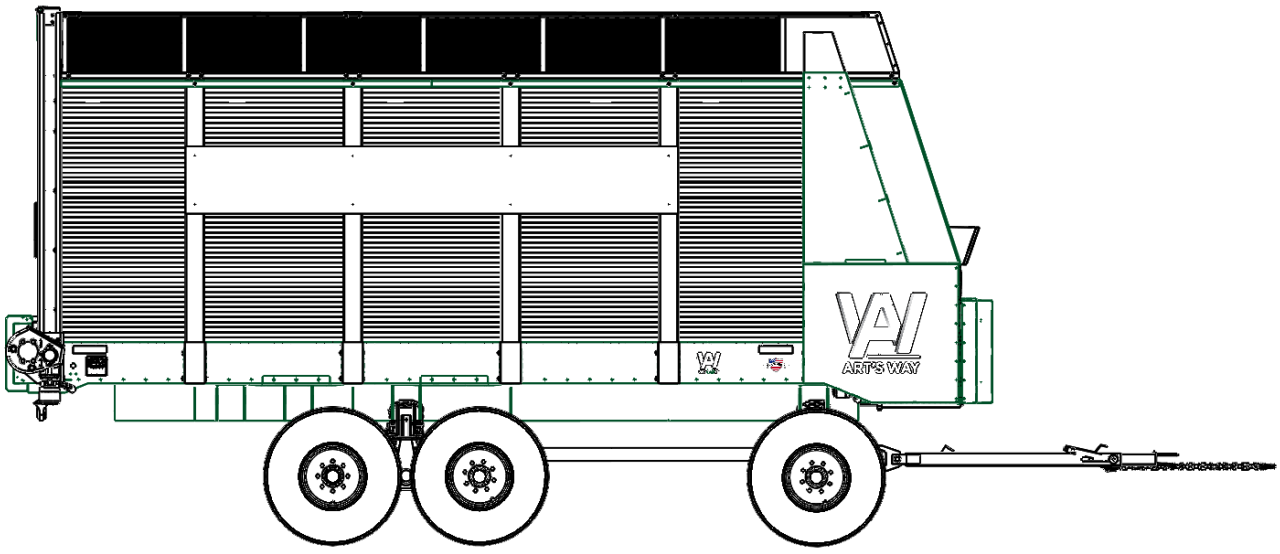


285 GEAR ON 18' BOX



265 GEAR ON 18' BOX

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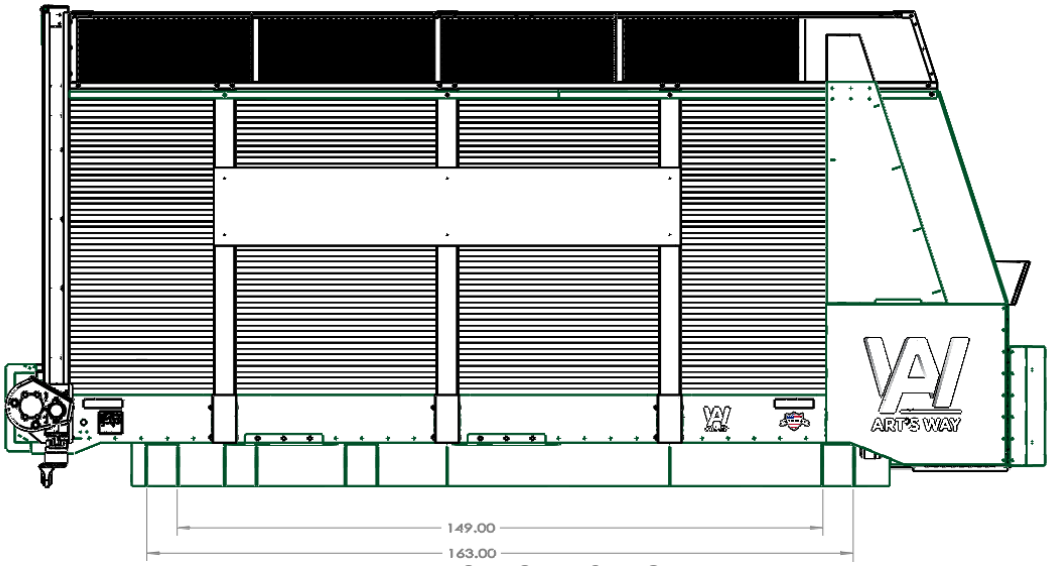
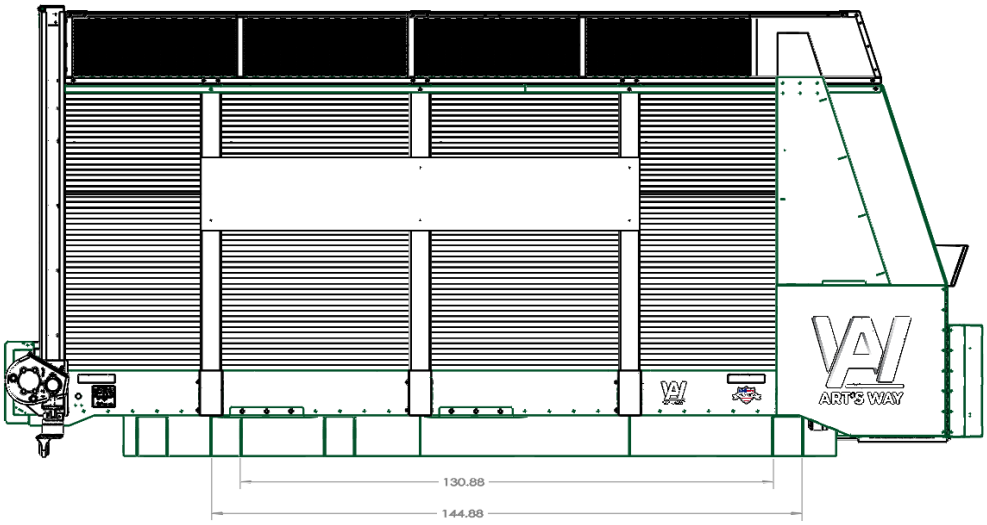
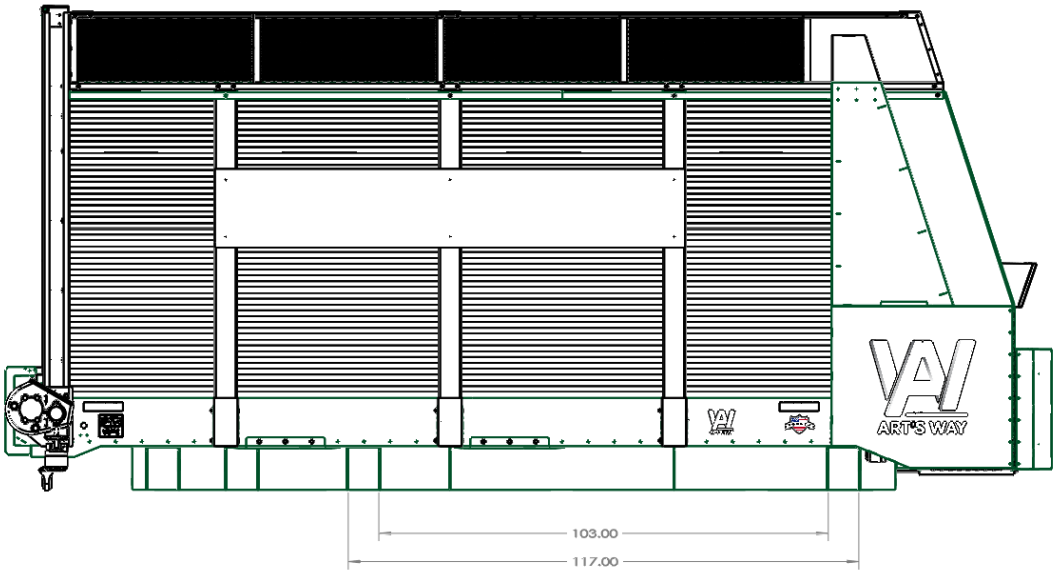


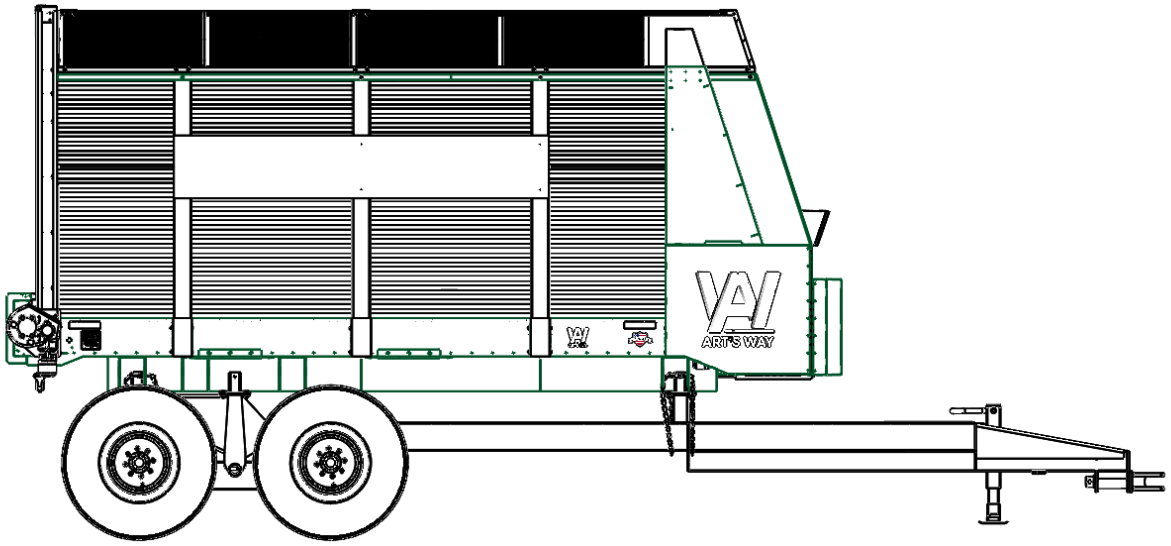
16' BOX SPACING 1



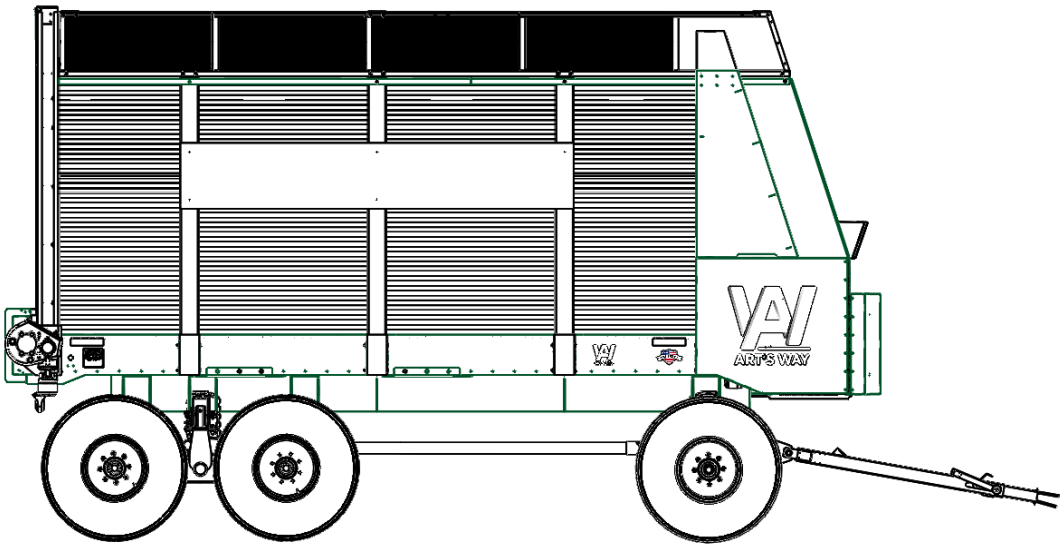
16' BOX SPACING 2



16' BOX SPACING 3



505 GEAR ON 16' BOX



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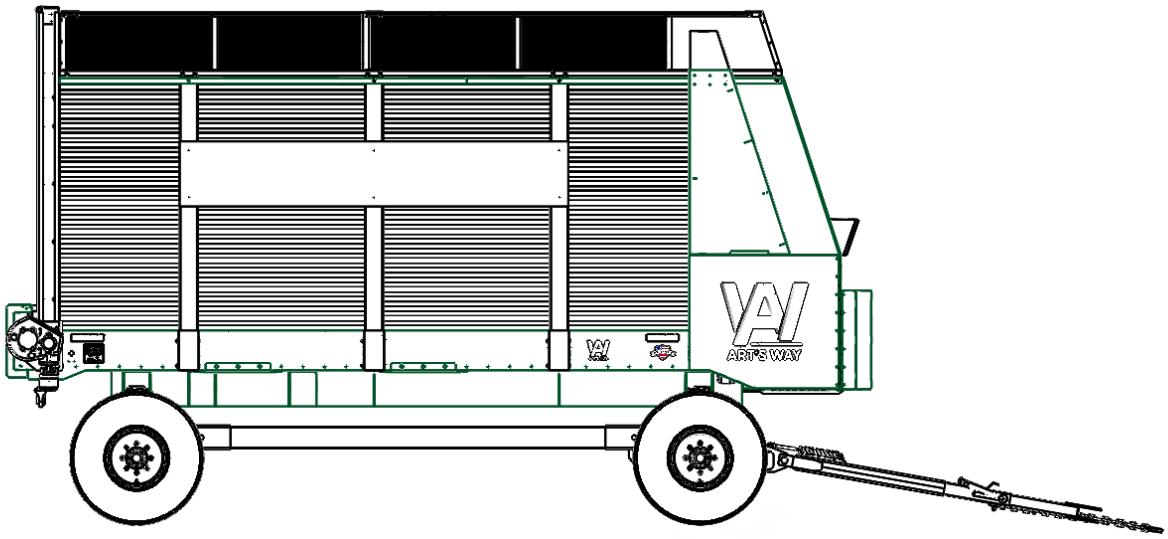

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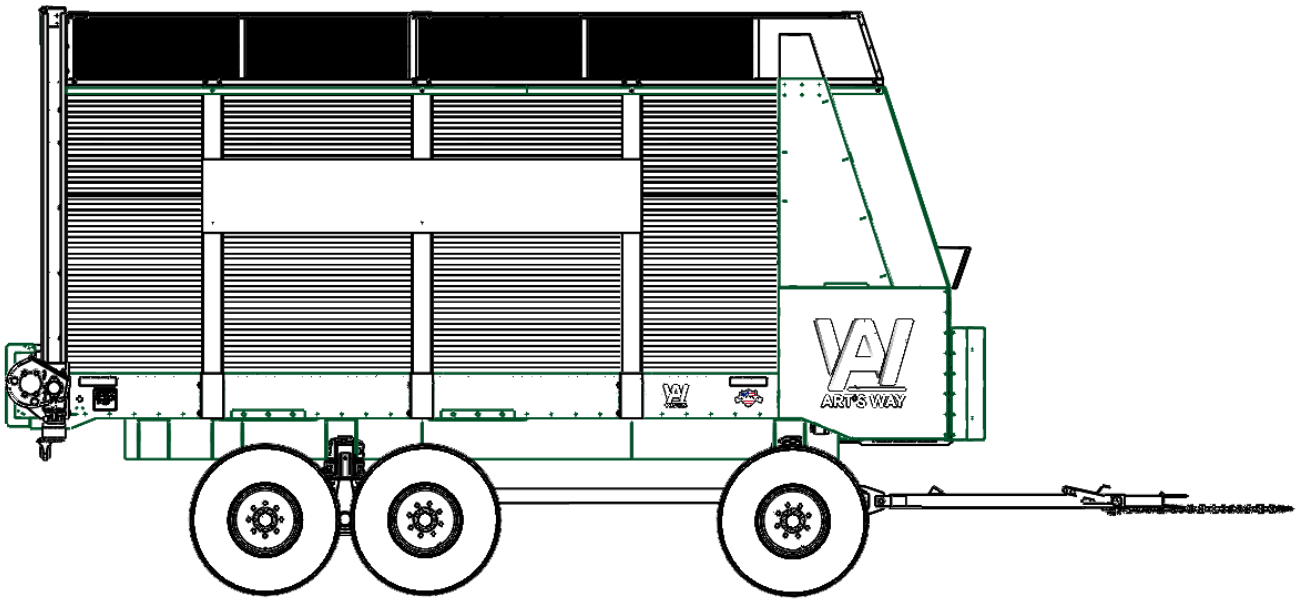
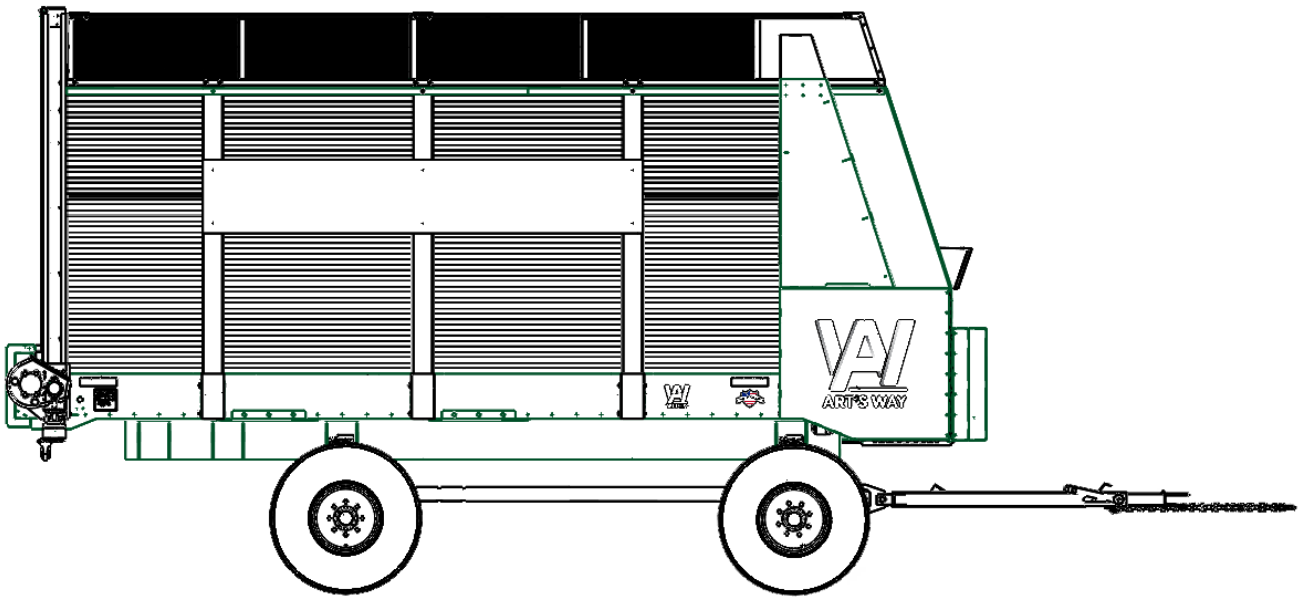


265 GEAR ON 16' BOX



205 GEAR ON 16' BOX

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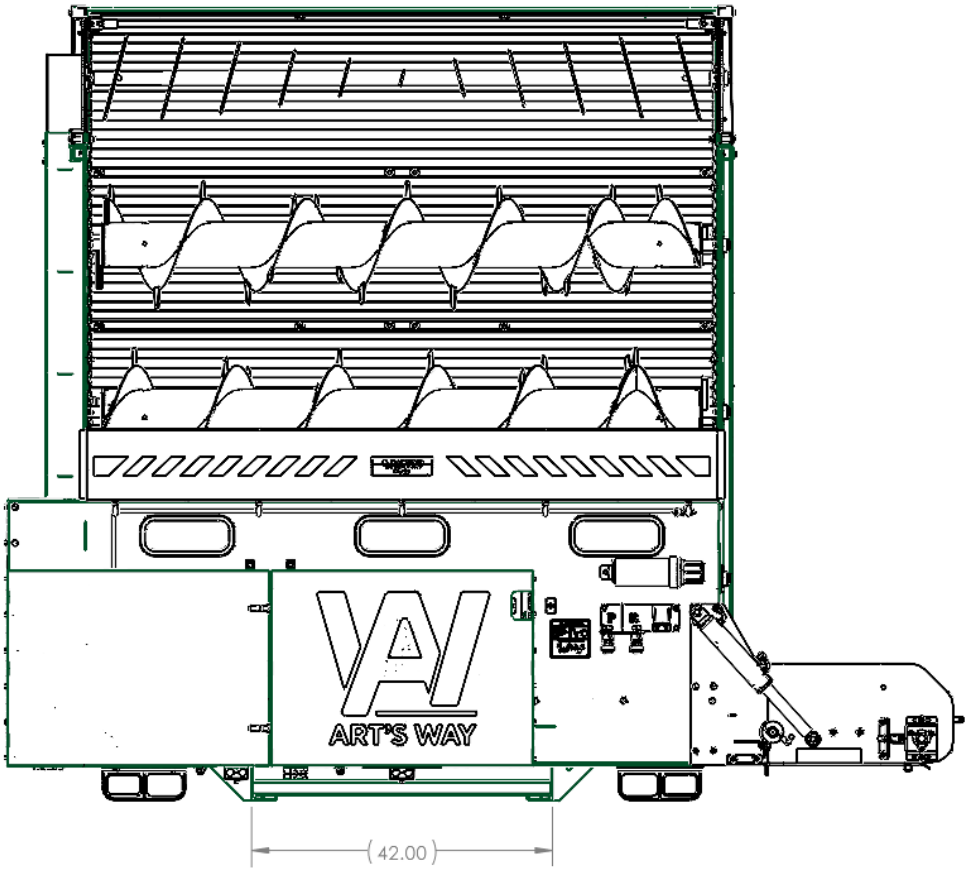
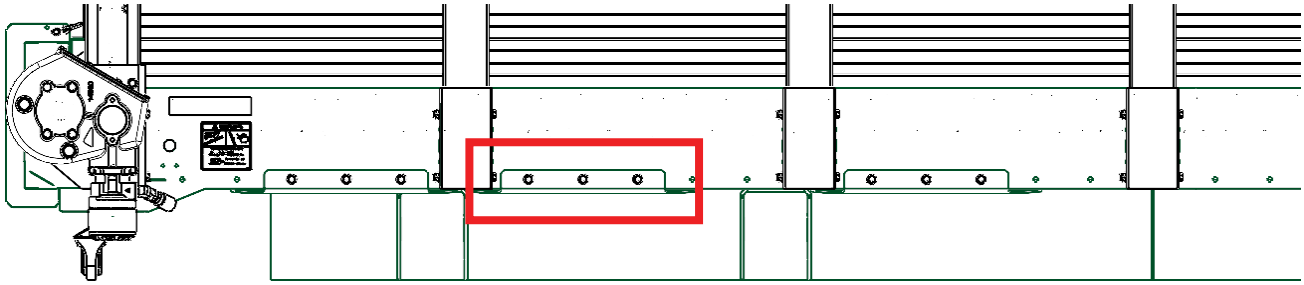




Tire bump stops are included with every Art's Way Forage box. You are responsible for re-positioning them in locations above tires for tandem / rocking style running gear. When installing ensure the gussets on the insides of the bump stops make contact with the "C" channel main frame members.

Failure to do so may result in damage that Art's Way will not be liable for.

You may end up with more bump stops than necessary which can be removed and stored or remain bolted to the forage box.

PRE-DELIVERY CHECKLIST

After the Art's Way Forage Box has been completely set-up, check to be certain it is in correct running order before delivering it to the customer. The following is a list of points to inspect. Check off each item as you have made the proper adjustments and found the item operating satisfactorily. Any adjustment must be made according to specifications defined in this manual.

- All shields and guards are in place and fastened.
- Safety bar and cable operate properly.
- All grease fittings have been lubricated and gear box filled to proper level and all chains are oiled. See "Lubrication" section in this manual.
- All mechanisms are operating trouble free.
- All chains are at proper tension. See "Adjustments" section in this manual.
- All bolts and other fasteners are tight.
- PTO shields turn freely.
- Apron chains are adjusted properly. See "Adjustments" section in this manual.
- Rear door opens, closes and latches properly.

LASHING RUNNING GEAR

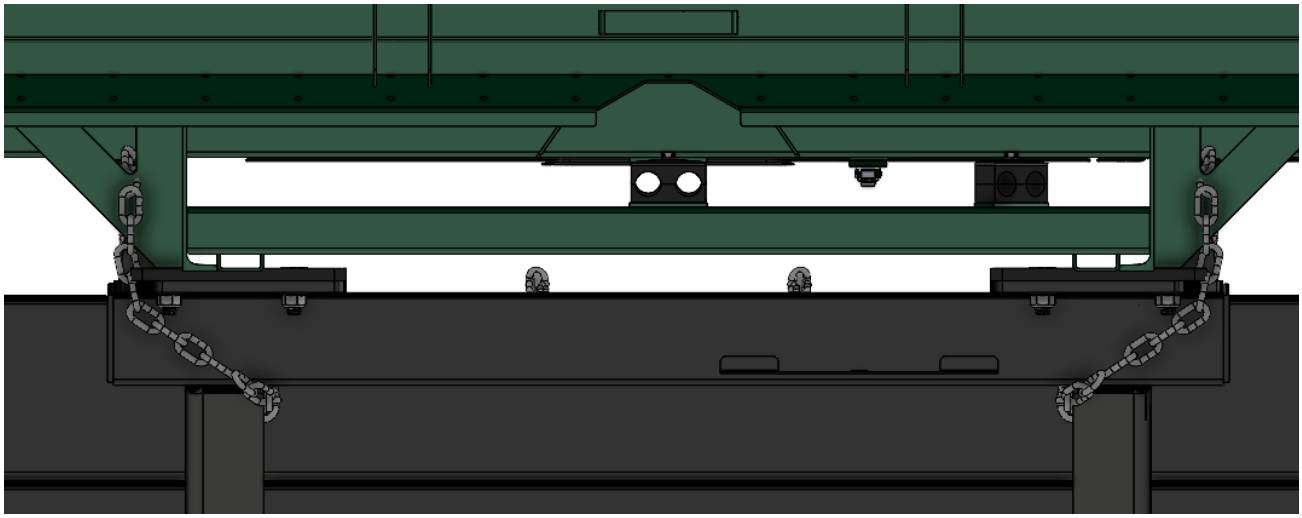
Lashing and hardware is included with the purchase of every Horst running gear from Art's Way.

If lashing to a running gear not sold by Art's Way you are responsible for proper lashing. Art's Way is not liable for damages incurred due to improper lashing materials or technique.

Art's Way uses 1/4" Grade 30 Import Proof Coil Chain connected to itself using 1/2"-13 grade 5 flanged locking hardware at minimum.

Your materials must meet or exceed these standards depending on your running gear.

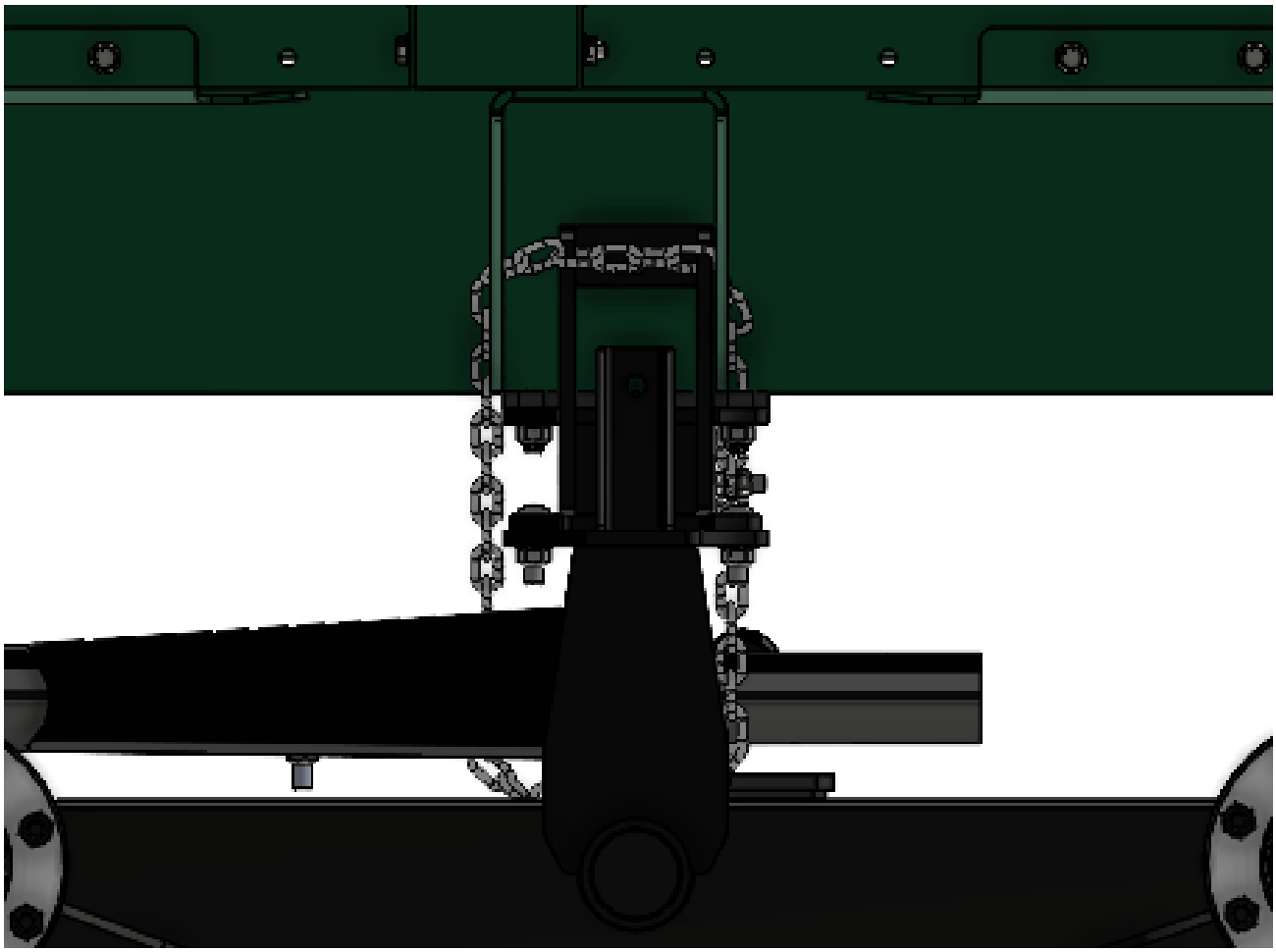
Horst 505 rear lashing as seen from side of forage box.



Horst 505 rear lashing as seen from rear of forage box.

Horst 505 front lashing as seen from side of forage box.

Horst 505 front lashing as seen from front of forage box.



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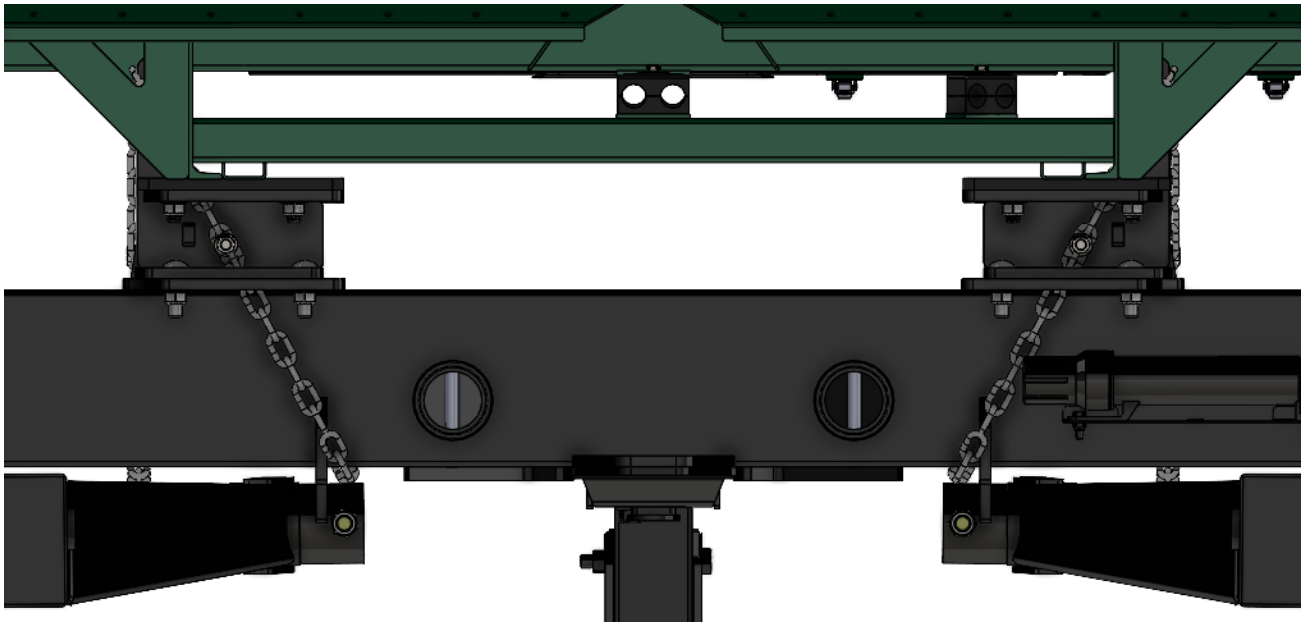

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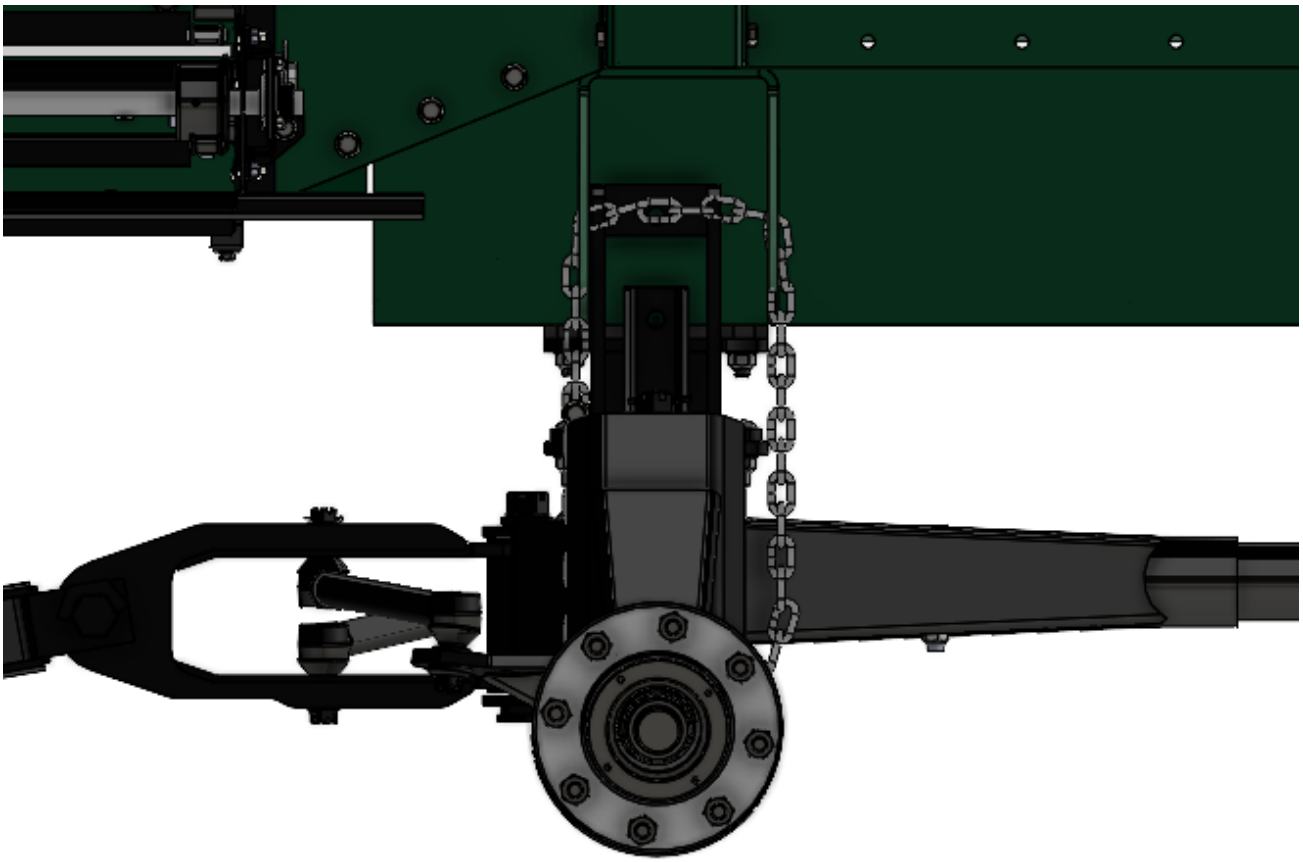

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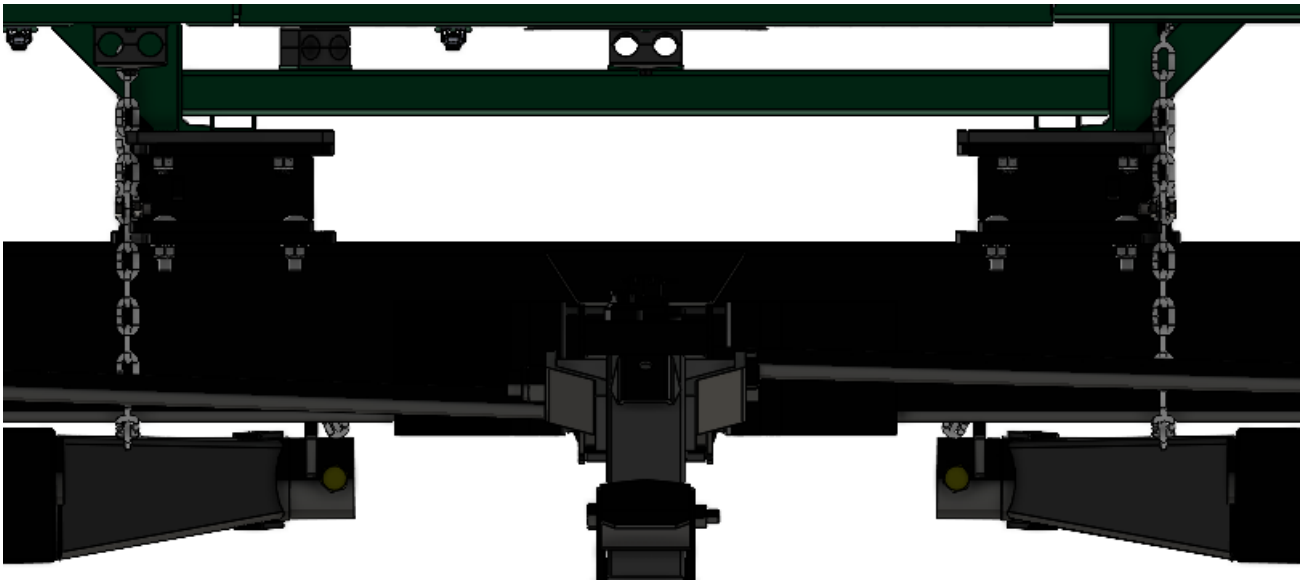

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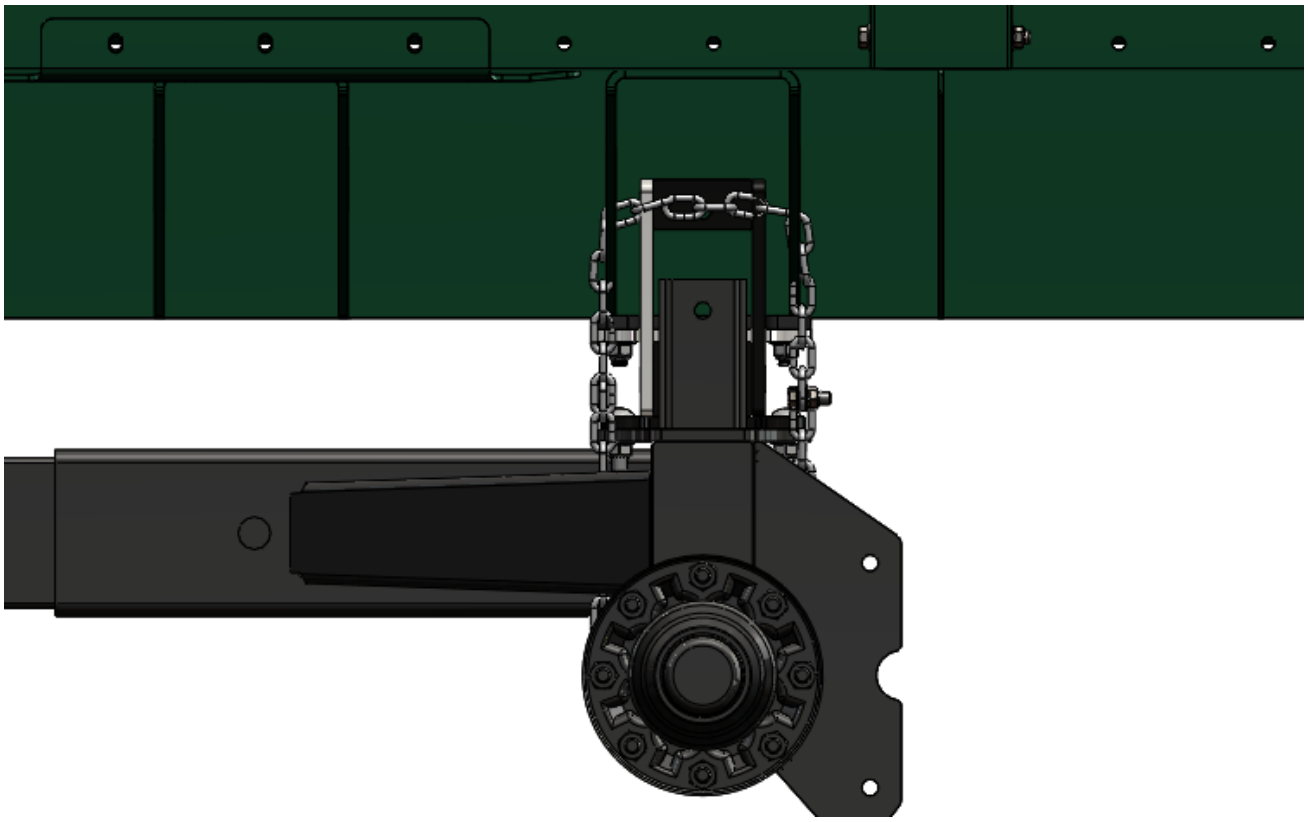

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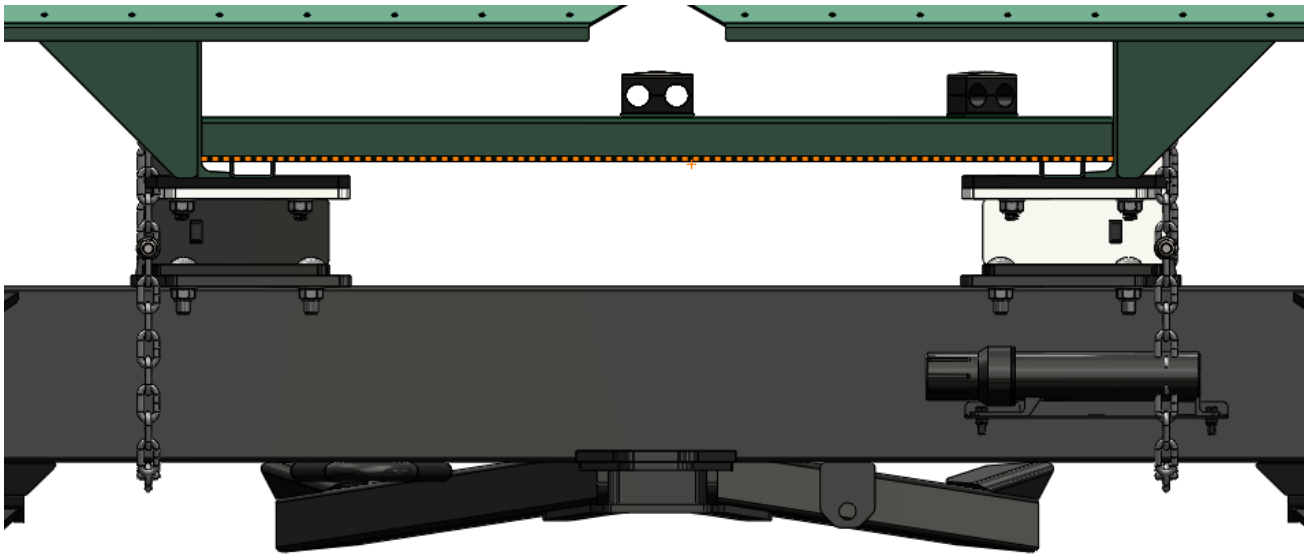

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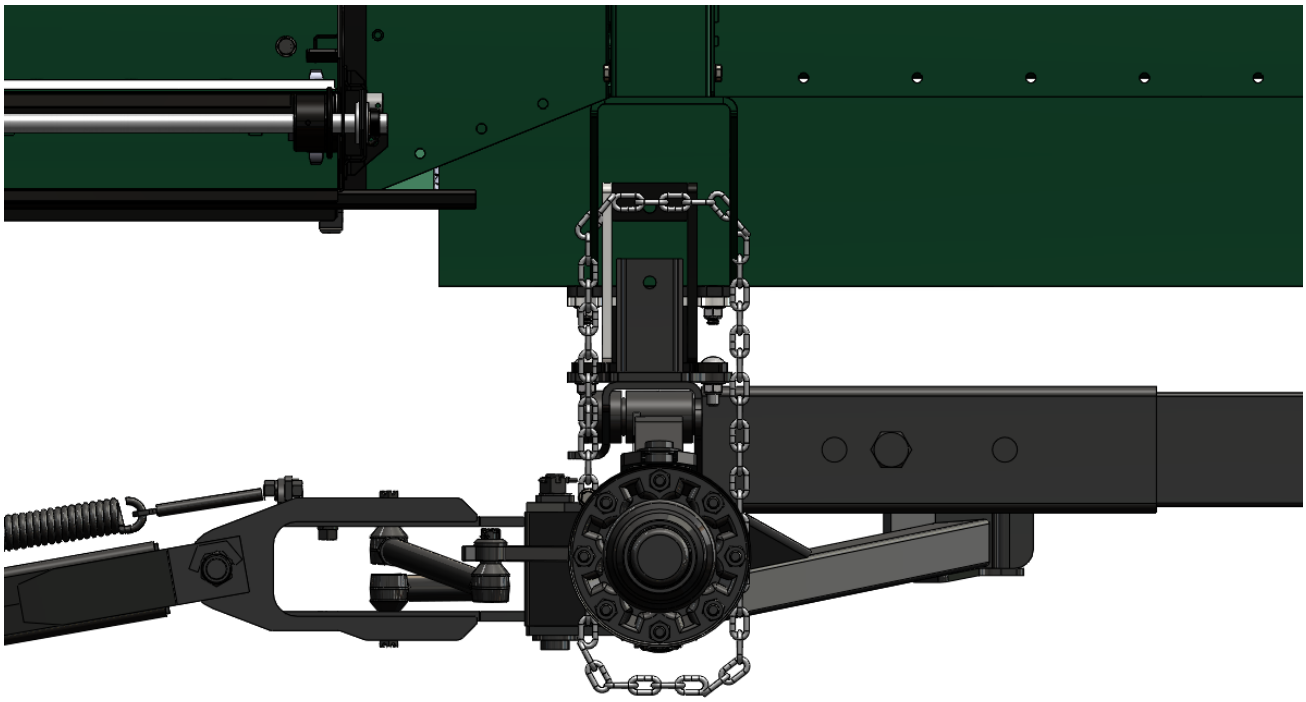

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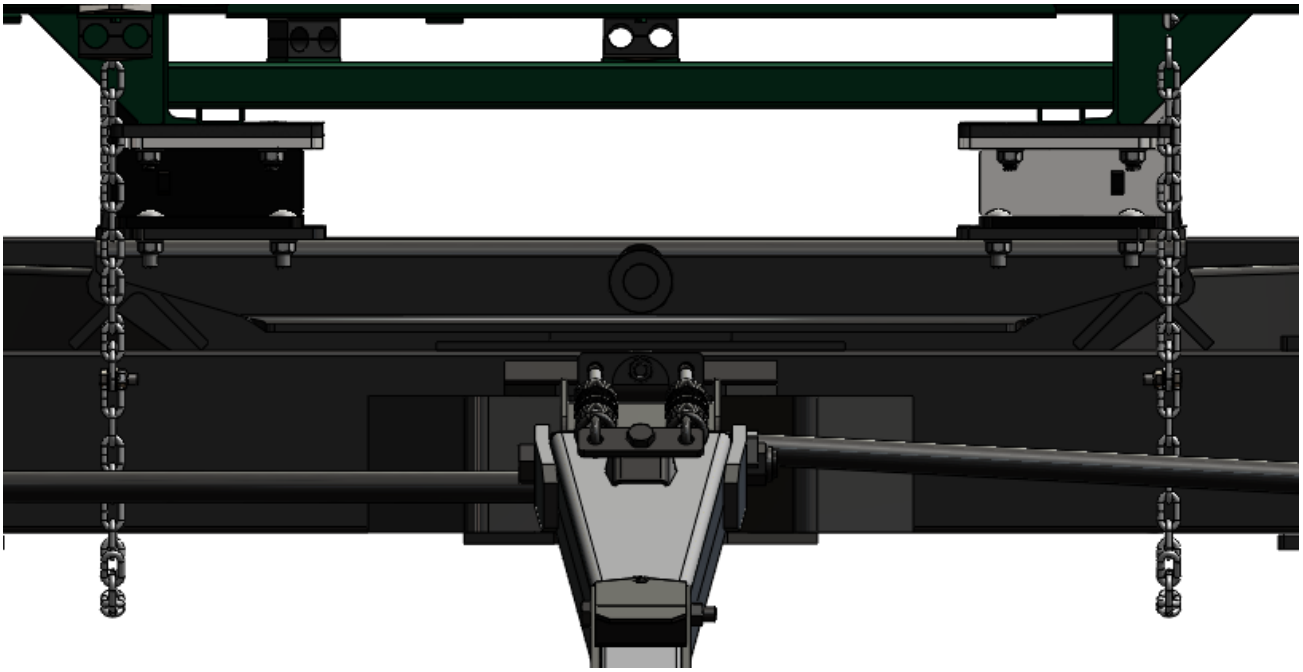

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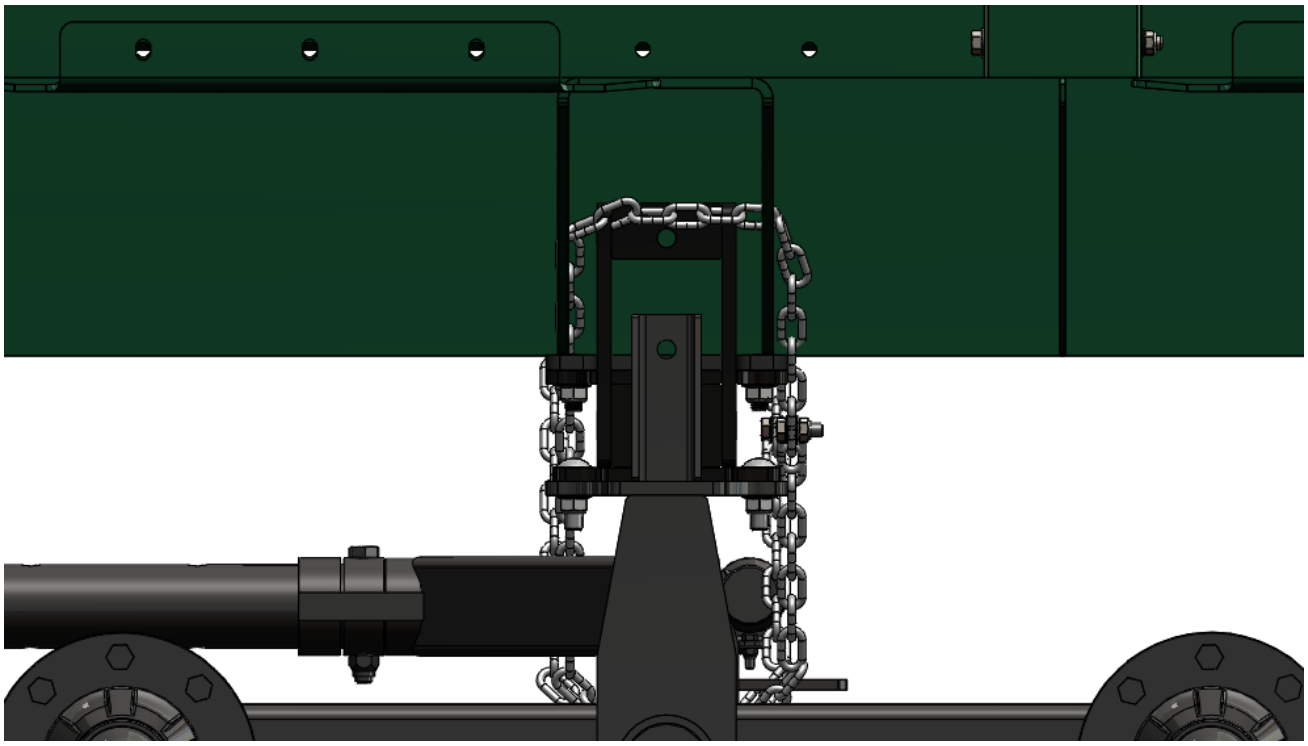

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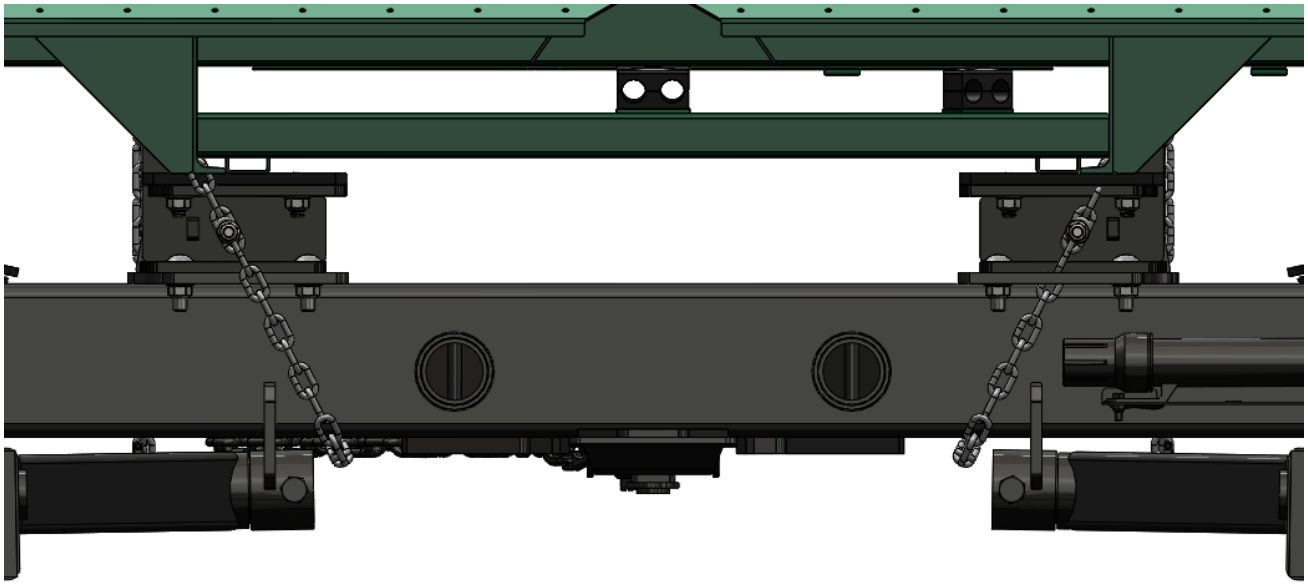

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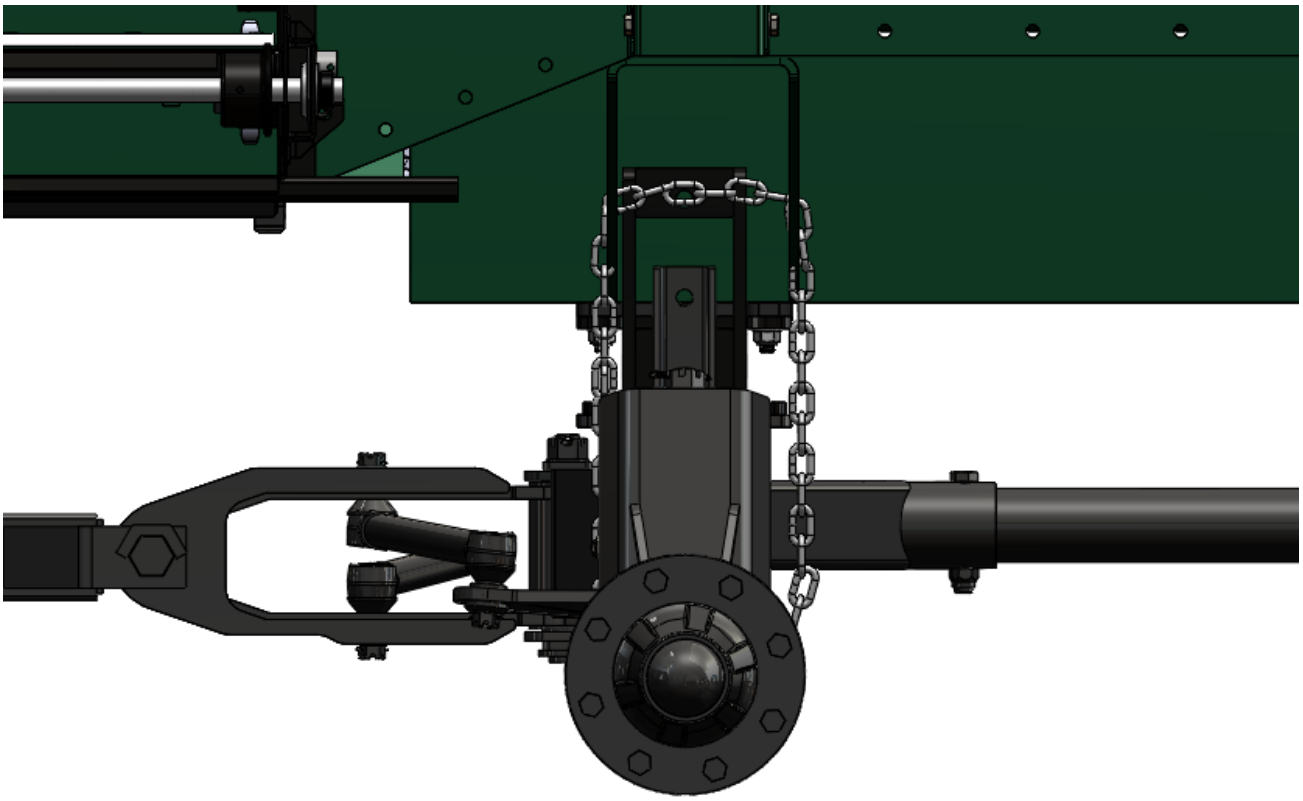

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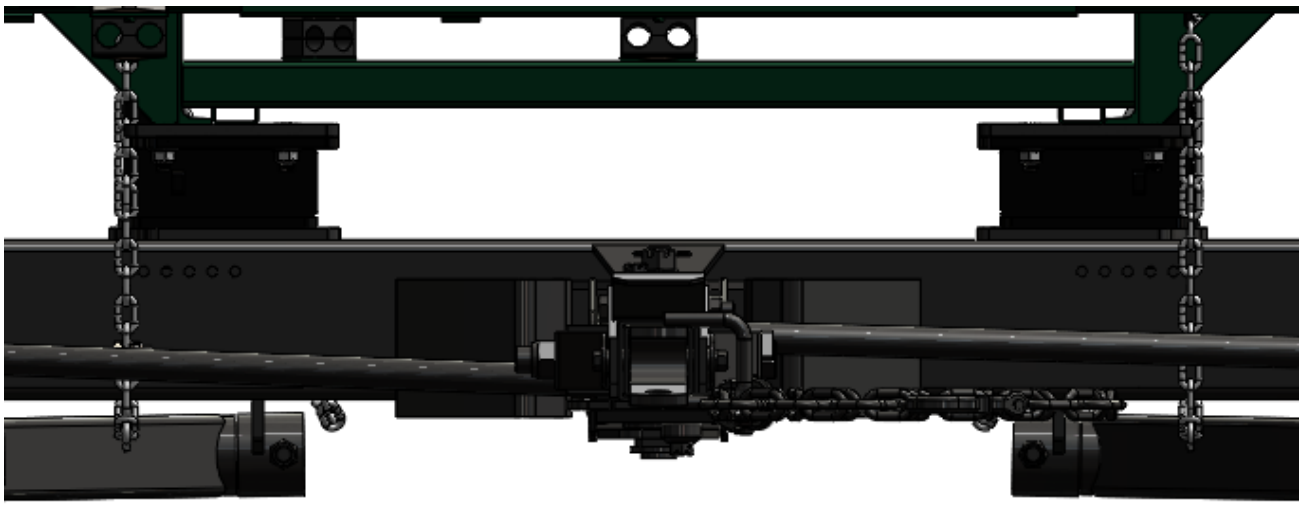

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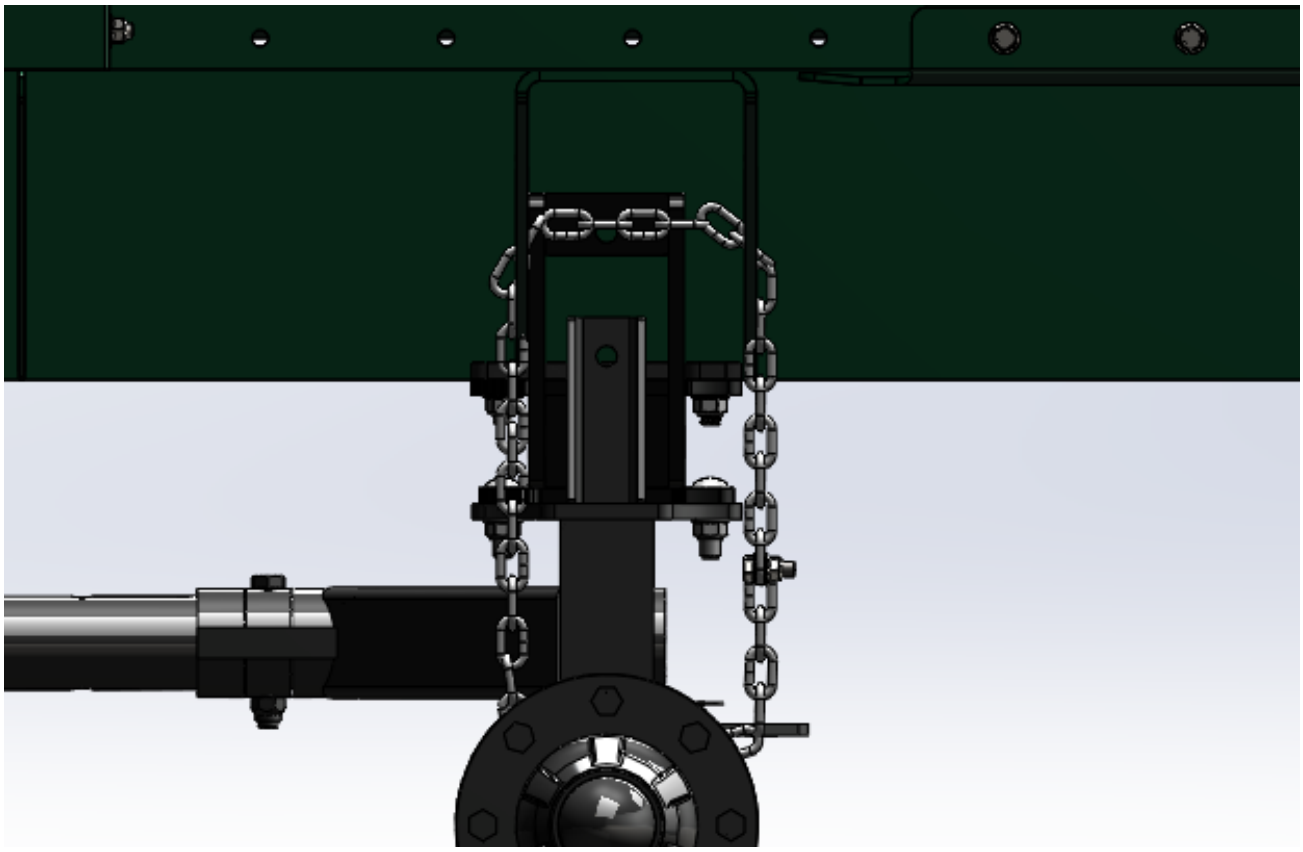
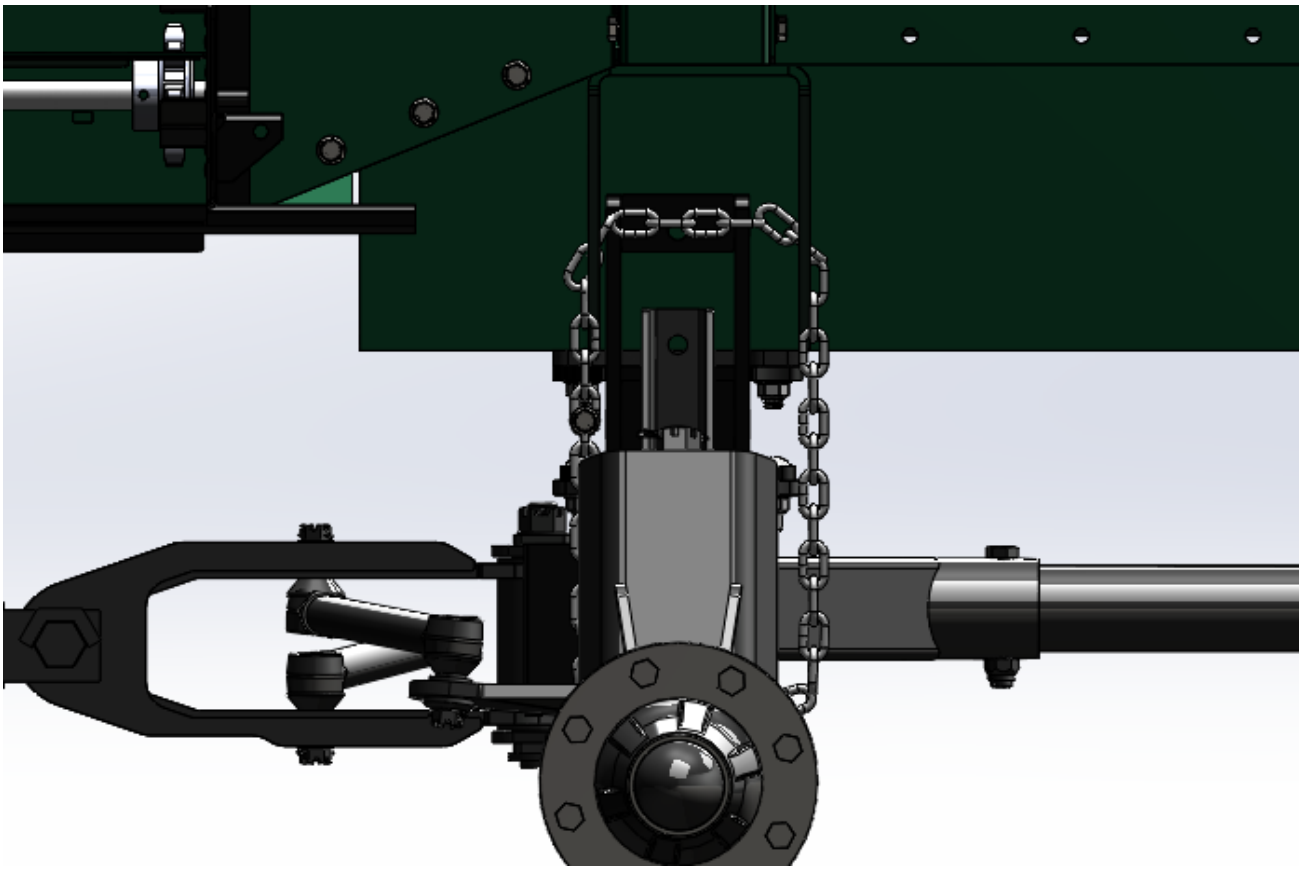


Horst 205 rear lashing as seen from side of forage box.

Horst 205 rear lashing as seen from rear of forage box.



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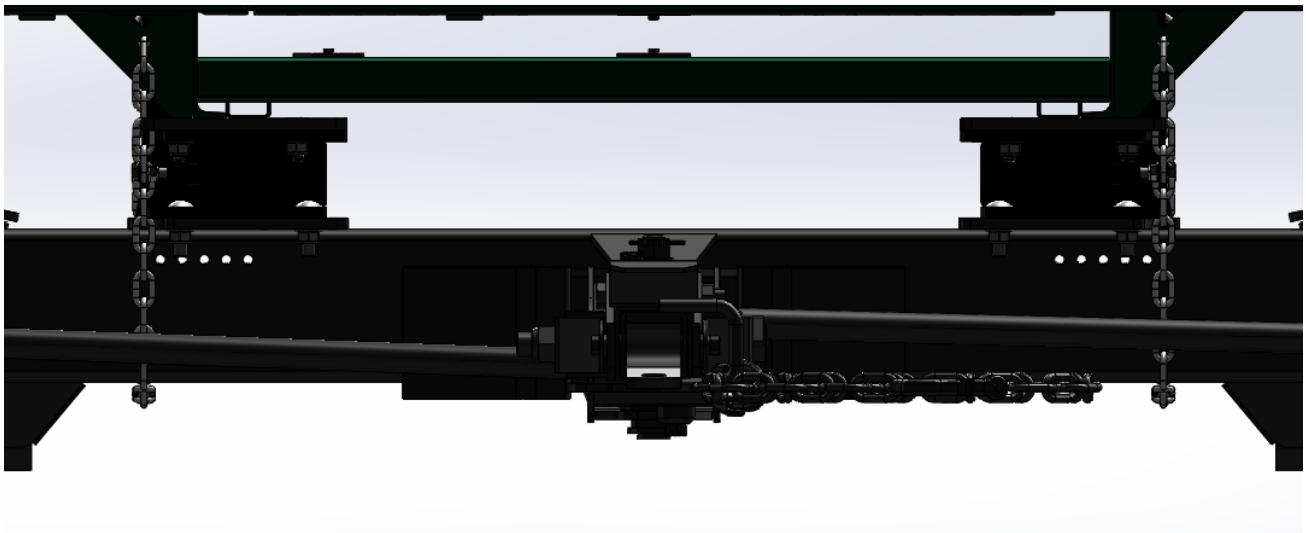


Horst 205 front lashing as seen from front of forage box.

OPERATION INSTRUCTIONS

Loading

The forage box load should be filled evenly so as to provide for even feeding into the unloading unit.

Do not fill the cross feed unloading area with crop to get extra capacity. Although overloading devices are provided as a protection, overloading puts unnecessary pressure and strains on the cross conveyor and auger drive.

Place the telescoping PTO drive shaft in the transport bracket during loading and transporting the forage box.

Transporting

The outfeed apron extension has been equipped with an amber reflector on front and a red reflector to the rear. There are 2 amber reflectors on each side of the forage box. Red reflectors also are attached to the rear of the forage box.

There are also red and amber transport lights at the rear on each side of the box. The plug for the light cord is mounted in the front For your safety, and the safety of others, it is recommended that the transport lights are used when traveling public roadways.

NEVER EXCEED A MAXIMUM TOWING SPEED OF 20 MPH (32 KPH) WHEN TRANSPORTING THE FORAGE BOX!

The telescoping PTO connection MUST be disconnected from the tractor when the forage box is being towed. Use the transport bracket provided for convenient storage of the drive shaft during transporting.

Capacity

The capacity of your forage box depends on the size of the box, the strength of the main apron chain, and the rating of the wagon gear and tires. The recommended maximum loads below are assuming running gear and tires are adequately rated for both the crop load and the weight of the forage box.

Recommended Forage Box Maximum Loads

Model	Chain	Maximum Crop Load	Weight (Approx.)*
2120 - 20'	667X Pintle	10.5 ton	2.50 ton

* Weight includes three augers and roof.

Tractor Connections

WARNING

- Use ONLY a 540 RPM tractor PTO shaft.
- Do not connect to 1000 RPM PTO or use an adapter. PTO damage and risk of entanglement may result.

The following tractor hookup provisions should be made: Figure 21

The hitch point of the tractor drawbar should be set at least 14" behind the end of the PTO shaft.

The hitch point of the tractor drawbar should be set at least 5" but not more than 12" below the tractor PTO shaft.

The hitch point of the tractor drawbar should be at least 13" but not more than 20" above the ground.

The hitch point of the tractor drawbar and PTO should be on the same vertical plane.

After the proper tractor drawbar/PTO shaft alignments are established, make the telescoping PTO drive shaft connection.

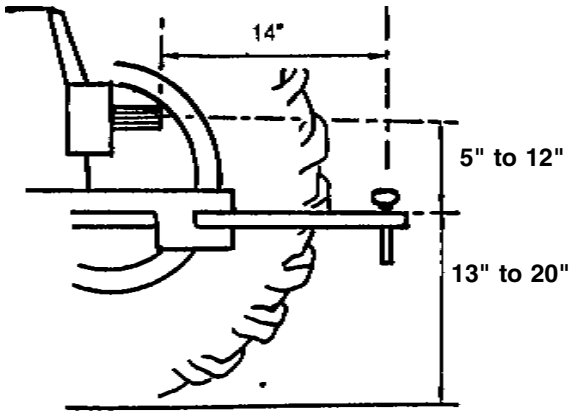


Figure 21

PTO Attachment Procedure
Figure 22

On units with plastic (two piece) locking ring, moving the ring, #30, back (away from the tractor) releases the retaining balls.

WARNING

THE ROTATING PTO FRONT HALF PTO JOINT MUST BE GUARDED BY THE TRACTOR MASTER PTO SHIELD PROVIDED BY THE TRACTOR MANUFACTURER. TO AVOID INJURY BE SURE TO HAVE IT INSTALLED BEFORE OPERATION!

WARNING

BE SURE THE TELESCOPING PTO DRIVE SHAFT LOCKING DEVICE IS POSITIVELY ENGAGED INTO THE TRACTOR PTO SHAFT BEFORE STARTING TRACTOR ENGINE!

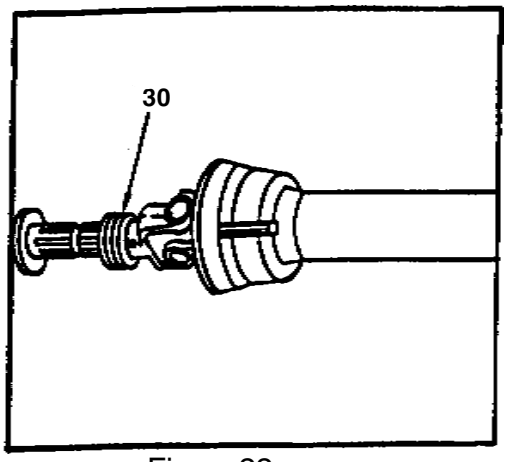


Figure 22

LUBRICATION

Do not unclog, adjust, lubricate or service the forage box unless the "Power Source Shut Down Procedure" has been performed.

Sufficient oil and grease will prevent excessive part wear and early failure. Lubricate according to instructions.

Main Apron Gearboxes

The gearbox oil level should be checked every 50 loads. Use No. 75W-90 SYNTHETIC gearlube if oil is needed. Add oil through top-most plug. The oil should be up to the check level plug in the front gear box and just below the fill plug on the rear gearbox. Some oil may weep out through the breather plugs.

Grease and Oil

Most grease fittings are a standard style 1/4" - 28 commonly found on farm implements and automotive equipment. A good grade of lithium base grease should be used.

Safety/Cross and Main Clutch Handles

If handle movement becomes hard, remove nuts and coat pivot bolt with grease and reinstall.

Qty	Description
8	Rear Idler Sprockets
2	Driveline Joints
3	Front Main Apron Bearings
3	Rear Main Apron Bearings
1	Outer Apron Shaft Support
2	Rear Drive Outer Bearings
1	Sprocket Bearing
1	Center Shaft Bearing

Periodic oiling of all drive chains and conveyor chains will assure longer life.

The main apron chains do not require lubrication.

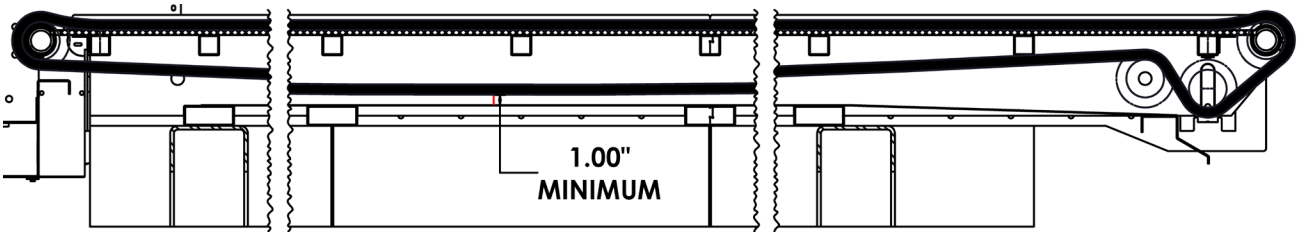
ADJUSTMENTS

Do not unclog, adjust, lubricate or service the forage box unless the "Power Source Shut Down Procedure" has been performed.

Main Apron

The main unloading aprons should be kept at proper tension at all times. On a new forage box tension should be checked every 5 loads until any excess slack has been taken up and during normal lubrication thereafter.

To obtain proper tension adjustments open rear access shield. Pin the rear shield in the raised position when adjusting the main apron. Take up any excess slack evenly with the (4) tightener bolts until the chains lift off of the lower frame by 1" minimum at the lowest droop point as illustrated below. Close the rear shield and return the pins to the storage positions when finished.



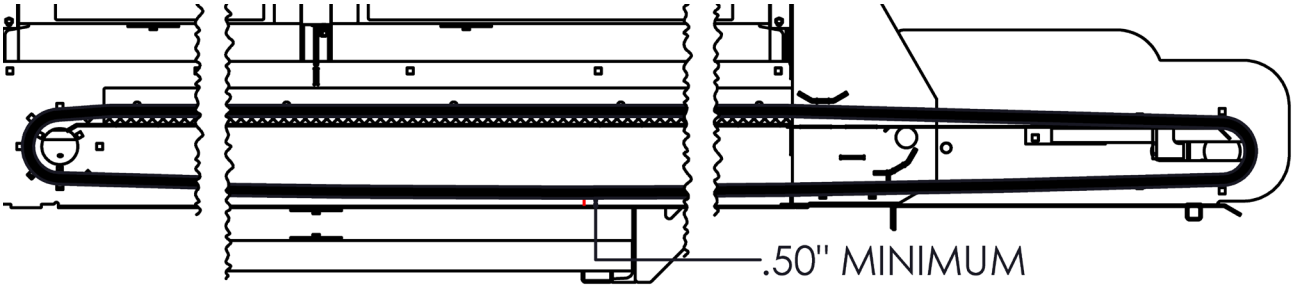
Failure to maintain proper chain tension on both the main apron and cross conveyor chains may lead to links jumping or rolling around sprockets which may result in damage.

Links may need to be removed as the chain naturally stretches during early lifespan.

CLOSE THE REAR SHIELD BEFORE STARTING THE UNLOADING MECHANISM!

Cross Conveyor Apron

The cross conveyor apron should be kept at proper tension at all times. Proper tension on the cross conveyor apron is obtained when the outfeed is lowered and the chain is lifted off of the bottom of the return by 0.5" minimum at the lowest droop point as illustrated below. To adjust cross conveyor tension loosen the 3/8" nuts that lock down the bearing holders, then loosen the 3/8" jam nuts and turn the inner adjusting nut until tension is achieved. Then re-tighten the bearing holder lock down nuts and jam nuts.



Beater Drive Chains

The beater drive chain is properly adjusted when all slack has been removed. To adjust the tension, loosen the nut holding the plastic tightener assembly and move the tightener in until proper tension is obtained and then retighten the nut.

CAUTION: Periodic cleaning of inside of Transmission Side Door may be required.

CLOSE THE TRANSMISSION SIDE DOOR BEFORE STARTING THE UNLOADING MECHANISM!

Fasteners

Retighten all fasteners every 50 loads or as required.

Storage

For off- season storage the following procedures are recommended:

1. Remove all crop material from the floor, cross conveyor, front door, emergency clutch housing and transmission side door.

2. Open cleanout pan provided in the non-outfeed side of the forage box. Remove debris and buildup. Be sure to replace this pan before resuming operation.

Clean out pan must be replaced before operation.

3. Lubricate all grease points and check gearbox oil level.

4. Oil all chains - outfeed apron, front drive chain, main apron drive chains and metering auger drive chains.

5. Run the forage box for several minutes to distribute lubrication.

6. Store inside.

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TORQUE SPECIFICATIONS

NOTE: Use these torque values when tightening hardware (excluding: locknuts and self-tapping, thread forming and sheet metal screw) unless specified otherwise.

SIZE	GRADE 5		GRADE 8	
	PLAIN TORQUE (K=.20)	ZINC TORQUE (K=.17)	PLAIN TORQUE (K=.20)	ZINC TORQUE (K=.17)
INCH POUNDS				
4-40	8	7	12	11
4-48	9	8	13	12
6-32	16	14	23	20
6-40	18	16	25	22
8-32	30	26	41	36
8-36	31	27	43	38
10-24	43	38	60	53
10-32	49	43	68	60
1/4"-20	96	86	144	126
1/4"-28	120	103	168	144
FOOT POUNDS				
5/16"-18	17	15	25	21
5/16"-24	19	16	27	23
3/8"-16	31	26	44	37
3/8"-24	35	30	49	42
7/16"-14	49	42	70	59
7/16"-20	55	47	78	66
1/2"-13	75	64	106	90
1/2"-20	85	72	120	102
9/16"-12	109	92	154	130
9/16"-18	121	103	171	146
5/8"-11	150	128	212	180
5/8"-18	170	144	240	204
3/4"-10	267	227	376	320
3/4"-16	297	253	420	357
7/8"-9	429	365	606	515
7/8"-14	474	403	669	568
1"-8	644	547	909	772
1"-12	722	614	1020	867
1-1/8"-7	800	700	1280	1120
1-1/8"-12	880	770	1440	1260
1-1/4"-7	1121	952	1817	1545
1-1/4"-12	1241	1055	2012	1710
1-3/8"-6	1460	1280	2380	2080
1-3/8"-12	1680	1470	2720	2380
1-1/2"-6	1950	1657	3162	2688
1-1/2"-12	2194	1865	3557	3024
TORQUE VALUES AQUIRED FROM SABRE INDUSTRIAL SUPPLIES AND FASTENAL				

TIGHTEN HYDRAULIC FITTINGS

CAUTION:

Escaping fluid under pressure can penetrate the skin caus ing serious injury. Relieve pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Keep hands and body away from pin holes and nozzles which eject fluids under high pressure. Use a piece of cardboard or paper to search for leaks. Do not use your hand.

Tightening Flare Type Fittings*

1. Check flare and flare seat for defects that might cause leakage.
2. Align hose end with fitting before tightening.
3. Lubricate connection and hand tighten swivel nut until snug.
4. To prevent twisting the hose, use two wrenches. Place one wrench on the hose end body and with the second wrench, tighten the swivel nut to the torque shown in this chart.

* Torque values shown are based on lubricated connections as in reassembly.

Tube Size OD	Nut Size Across Flats	Torque Value*		Recommended Turns To Tighten (After Finger Tightening)	
(In.)	(In.)	(Nm)	(lb-ft)	(Flats)	(Turns)
3/16	7/16	8	6	1	1/6
1/4	9/16	12	9	1	1/6
5/16	5/8	16	12	1	1/6
3/8	11/16	24	18	1	1/6
1/2	7/8	46	34	1	1/6
5/8	1	62	46	1	1/6
3/4	1-1/4	102	75	3/4	1/8
7/8	1-3/8	122	90	3/4	1/8

TIGHTEN HYDRAULIC FITTINGS continued

Tightening O-Ring Fittings*

1. Inspect O-ring and seat for dirt or obvious defects.
2. On angle fittings, back the locknut off until washer bottoms out at top of groove.
3. Hand tighten fitting until backup washer or washer face (if straight fitting) bottoms on face and O-ring is seated.
4. Position angle fittings by unscrewing no more than one turn.
5. Tighten straight fittings to torque shown.

* Torque values shown are based on lubricated connections as in reassembly.

Thread Size	Nut Size Across Flats	Torque Value*		Recommended Turns To Tighten (After Finger Tightening)	
(In.)	(In.)	(Nm)	(lb-ft)	(Flats)	(Turns)
3/8	1/2	8	6	2	1/3
7/16	9/16	12	9	2	1/3
1/2	5/8	16	12	2	1/3
9/16	11/16	24	18	2	1/3
3/4	7/8	46	34	2	1/3
7/8	1	62	46	1-1/2	1/4
1-1/16	1-1/4	102	75	1	1/6
1-3/16	1-3/8	122	90	1	1/6
1-5/16	1-1/2	142	105	3/4	1/8
1-5/8	1-7/8	190	140	3/4	1/8
1-7/8	2-1/8	217	160	1/2	1/12

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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.

Manuals are also available at www.artsway-ag.com free to download for your convenience.

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

Art's-Way Manufacturing Co., Inc. reserves the right to make improvements in design or changes in specifications at any time without incurring any obligation to install them on units previously sold.

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ART'S-WAY MANUFACTURING CO., INC.

5556 HWY 9 WEST

Armstrong, IA. 50514 U.S.A.

WWW.ARTSWAY-AG.COM