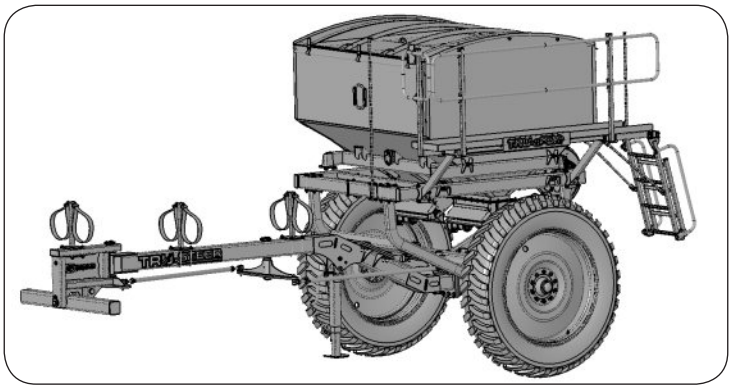


Fertilizer Application

Tru-aPLYr Dry 9-Ton with Tru-Steer

Part No. 572101

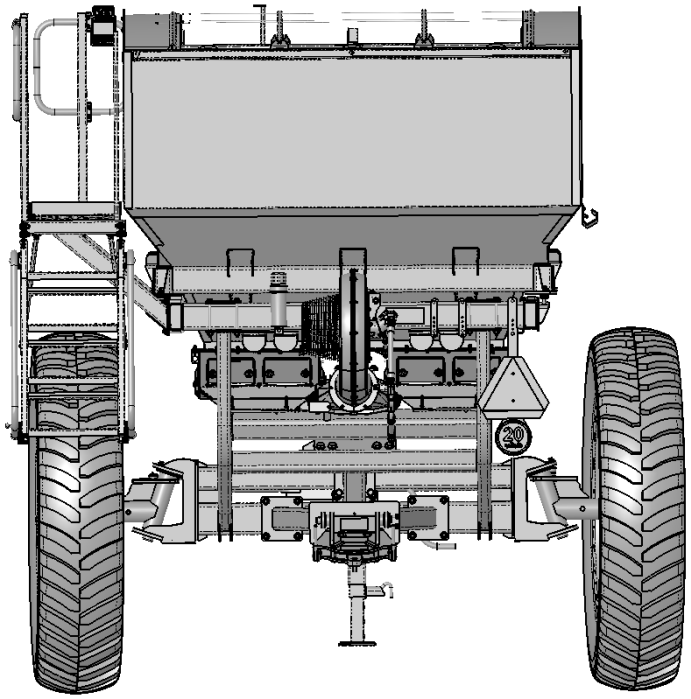
Foreword

This symbol identifies important safety messages. When you see it, read the message that follows and be alert to the possibility of personal injury.

Remember, safety instructions stated in this manual are for your protection. Read them carefully and follow them closely when working around or using this machine.

Read and study this manual completely before attempting to operate this implement. Take this manual to the field for handy reference when operating, adjusting, or servicing your machine.

When referenced, “Right-Hand” (RH) and “Left-Hand” (LH) side of the machine are determined by standing behind the machine and facing in the direction of travel.



Pre-Operation Checklist

- ☐ Wheel bolts tightened (recheck after initial use)
- ☐ Tire pressures checked
- ☐ Hardware tightened
- ☐ Machine lubricated
- ☐ Safety and operating procedures reviewed
- ☐ Field adjustment information reviewed
- ☐ Warranty information reviewed
- ☐ Hydraulic hoses properly routed/fittings tight

Product Information

IMPORTANT

The information, specifications, and illustrations in the manual are based on information available at the time it was written. Due to continuing improvements in the design and manufacture of Unverferth products, all specifications and information contained herein are subject to change without notice.

Please fill out and retain this portion for your records. All products manufactured by Unverferth Mfg. Co., Inc. are warranted to be free from material and workmanship defects for one full year from time of consumer delivery. Your local dealer will gladly assist you with any warranty questions.

The serial number plate is located as shown below.

Product _____

Serial Number _____

Date of Purchase _____

Dealer _____

City _____ **State** _____ **Zip** _____

Please supply this information when you have questions or when ordering repair or replacement parts. Your dealer needs this information to give you prompt, efficient service.

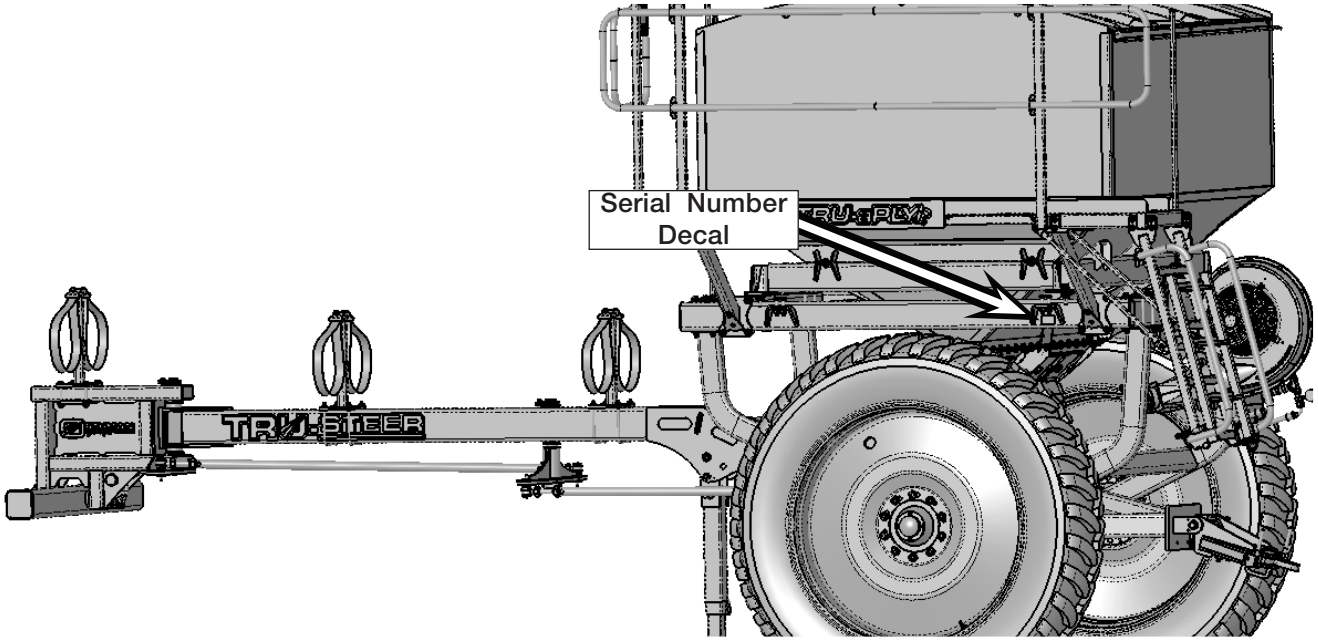


Table of Contents

SECTION I
Safety

Table of Contents

SECTION II
Set Up

Table of Contents

SECTION III
Operations

Table of Contents

SECTION IV
Maintenance

Table of Contents

SECTION V
Parts

SECTION I
Safety

General Hazard Information

No accident-prevention program can be successful without the wholehearted cooperation of the person who is directly responsible for the operation of the equipment.

A large number of accidents can be prevented only by the operator anticipating the result before the accident is caused and doing something about it. No power-driven equipment, whether it be transportation or processing, whether it is on the highway, in the field, or in the industrial plant, can be safer than the person who is at the controls. If accidents are to be prevented--and they can be prevented--it will be done by the operators who accept the full measure of their responsibility.

It is true that the designer, the manufacturer, and the safety engineer can help; and they will help, but their combined efforts can be wiped out by a single careless act of the operator.

It is said that, “the best kind of a safety device is a careful operator.” We, at Unverferth Mfg. Co., Inc. ask that you be that kind of operator.

REMEMBER:

THINK SAFETY

A CAREFUL OPERATOR IS THE BEST INSURANCE AGAINST AN ACCIDENT!

SIGNAL WORDS

DANGER

INDICATES AN EXTREMELY HAZARDOUS SITUATION OR ACTION THAT WILL RESULT IN SERIOUS INJURY OR DEATH.

WARNING

INDICATES A HAZARDOUS SITUATION OR ACTION THAT COULD RESULT IN SERIOUS INJURY OR DEATH.

CAUTION

INDICATES AN UNSAFE SITUATION OR ACTION THAT MAY RESULT IN PERSONAL INJURY.

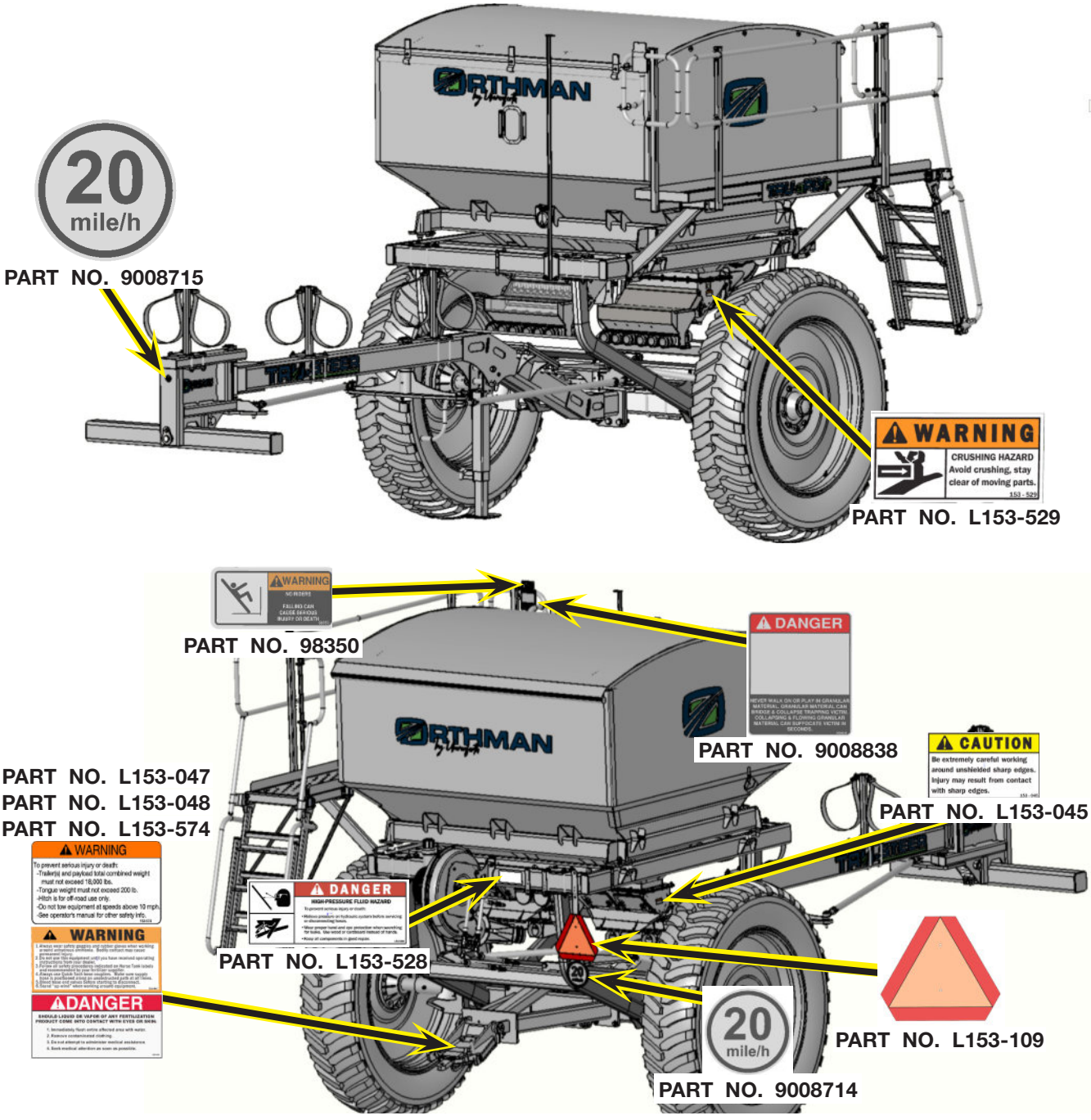
IMPORTANT

Is used for instruction on operating, adjusting, or servicing a machine.

Safety Decals

⚠ WARNING

- **REPLACE LOST, DAMAGED, PAINTED, OR UNREADABLE DECALS IMMEDIATELY. IF PARTS THAT HAVE DECALS ARE REPLACED, ALSO MAKE SURE TO INSTALL NEW DECALS. THESE DECALS INFORM AND REMIND THE OPERATOR WITH OPERATIONAL INFORMATION AND SAFETY MESSAGES.**



Following Safety Instructions

- Read and understand this operator's manual before operating.

- All machinery should be operated only by trained and authorized personnel.
- To prevent machine damage, use only attachments and service parts approved by the manufacturer.
- Always shut tractor engine off and remove key before servicing.

- Avoid personal attire such as loose fitting clothing, shoestrings, drawstrings, pants cuffs, long hair, etc., that may become entangled in moving parts.
- Do not allow anyone to ride on the implement. Make sure everyone is clear before operating machine or towing vehicle.

- Never walk on or play in granular material. Granular material can bridge and collapse trapping victim. Collapsing and flowing granular material can suffocate victim in seconds.
- Never attempt to operate implement unless you are in driver's seat.

Before Servicing or Operating

- Avoid working under an implement; however, if it becomes absolutely unavoidable, make sure the implement is safely blocked.

- Ensure that all applicable safety decals are installed and legible.
- When working around the implement, be careful not to be cut by sharp edges.
- Do not stand between towing vehicle and implement during hitching.
- Always make certain everyone and everything is clear of the machine before beginning operation.
- To prevent personal injury or death, always ensure that there are people who remain outside the tank to assist the person working inside, and that all safe workplace practices are followed. There is restricted mobility and limited exit paths when working inside the implement.
- Explosive separation of a tire and rim can cause serious injury or death. Only properly trained personnel should attempt to service a tire and wheel assembly.
- Hot parts can cause severe burns. Use caution when working around power system/ ground engaging components. Allow parts to cool before servicing.
- Ensure that the towing vehicle drawbar has sufficient strength to support the draft and vertical tongue load of a fully-loaded dry spreader.

During Operation

- Regulate speed to working conditions. Maintain complete control at all times.
- Never service or lubricate equipment when in operation.
- Use extreme care when operating close to ditches, fences, or on hillsides.
- Do not leave towing vehicle unattended with engine running.
- Comply with all laws and product label directions governing safe product application.

Before Transporting

- Install transport locks before transporting.
- Check for proper function of all available transport lights. Make sure that all reflectors are clean and in place on machine. Make sure that the SMV emblem and SIS decal are visible to approaching traffic.

During Transport

- Comply with all laws governing highway safety when moving machinery.
- Use transport lights as required by all laws to adequately warn operators of other vehicles.
- Use good judgment when transporting equipment on highways. Regulate speed to road conditions and maintain complete control.
- Slow down before making sharp turns to avoid tipping. Drive slowly over rough ground and side slopes.
- Maximum transport speed of this implement should never exceed 20 mph as indicated on the machine. Maximum transport speed of any combination of implements must not exceed the lowest specified speed of the implements in combination. Do not exceed 10 mph during off-highway travel.

Pressurized Oil

- Relieve the hydraulic system of all pressure before adjusting or servicing. See hydraulic power unit manual for procedure to relieve pressure.

- High-pressure fluids can penetrate the skin and cause serious injury or death. Leaks of high-pressure fluids may not be visible. Use cardboard or wood to detect leaks in the hydraulic system. Seek medical treatment immediately if injured by high-pressure fluids.

- Hydraulic system must be purged of air before operating to prevent serious injury or death.

- Do not bend or strike high-pressure lines. Do not install bent or damaged tubes or hoses.

- Repair all oil leaks. Leaks can cause fires, personal injury, and environmental damage.

- Route hoses and lines carefully to prevent premature failure due to kinking and rubbing against other parts. Make sure that all clamps, guards and shields are installed correctly.

- Check hydraulic hoses and tubes carefully. Replace components as necessary if any of the following conditions are found:
  - End fittings damaged, displaced, or leaking.
  - Outer covering chafed/cut or wire reinforcing exposed.
  - Outer covering ballooning locally.
  - Evidence of kinking or crushing of the flexible part of a hose.

Fertilizer and Chemical Hazards

- Seek and receive fertilizer and/or chemical product training prior to using agricultural fertilizers and/or chemicals.

- Always wear personal protective equipment when working with or near fertilizers and/or chemicals. This equipment includes, but is not limited to: protective eye wear, gloves, shoes, socks, long-sleeved shirt, and long pants. Additional protection may be required for many types of fertilizers and/or chemicals.

- Read and understand the entire label of every fertilizer and/or chemical being applied with this dry spreader.

- Wash hands before eating, drinking, chewing gum, or using the toilet.

- Dispose of unused fertilizer and/or chemical in accordance with fertilizer and/or chemical label directions and local/national regulations.

- Remove clothing immediately if fertilizers and/or chemicals penetrate clothing and contact skin. Wash thoroughly and put on clean clothing.

Preparing for Emergencies

- Keep a first aid kit and properly rated fire extinguisher nearby.

- Keep emergency numbers for fire, rescue, and poison control personnel near the phone.

Wearing Protective Equipment

- Wear clothing and personal protective equipment appropriate for the job.

- Wear steel-toed shoes when operating.

- Wear hearing protection when exposed to loud noises.

- Do not wear additional hearing impairing devices such as radio headphones, etc

SECTION II
Set Up

General Set Up Information

This section contains all of the instructions required for the complete assembly of the cultivator.

For your safety, and the safety of others, use proper tools and equipment and always use safe working procedures. Refer to these instructions before starting any work on your machine.

IMPORTANT

- *The procedures for assembling this unit are intended for two or more people.*

For ease of assembly, install all hardware loosely until assembly is complete and then tighten according to “Torque Chart” in MAINTENANCE section unless otherwise specified.

⚠ WARNING

- **KNOW AND UNDERSTAND SAFETY RULES BEFORE OPERATING OR SERVICING THIS MACHINE. REVIEW "SAFETY" SECTION IN YOUR MANUAL IF NECESSARY.**
- **EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING THE IMPLEMENT.**
- **KEEP HANDS CLEAR OF PINCH POINT AREAS.**
- **FALLING OBJECTS CAN CAUSE SERIOUS INJURY OR DEATH. DO NOT WORK UNDER THE MACHINE AT ANY TIME WHILE BEING HOISTED. BE SURE ALL LIFTING DEVICES AND SUPPORTS ARE RATED FOR THE LOADS BEING HOISTED. THESE ASSEMBLY INSTRUCTIONS WILL REQUIRE SAFE LIFTING DEVICES UP TO 26,000 LBS. SPECIFIC LOAD RATINGS FOR INDIVIDUAL LOADS WILL BE GIVEN AT THE APPROPRIATE TIME IN THE INSTRUCTIONS.**
- **TIPPING OR MOVEMENT OF THE MACHINE CAN CAUSE SERIOUS INJURY OR DEATH. BE SURE THE MACHINE IS SECURELY BLOCKED.**
- **MOVING PARTS CAN CRUSH AND CUT. KEEP AWAY FROM MOVING PARTS.**

Basic Set Up

Due to shipping requirements and various dealer-installed options, some initial implement set up will be required after it arrives from the factory. Use the following procedures as needed for initial implement set up.

Hydraulic System

Check all hoses and cylinders for signs of leakage. Hoses should not be kinked, twisted or rubbing against sharp edges. Re-route or repair hoses as necessary. Refer to SAFETY section for additional information on safe repair and inspection of hydraulic components.

SMV Emblem

Before the implement is used the reflective surface of the SMV must face rearward. This may require removal of film protecting the reflective surface or removing and reinstallation of the SMV.

When reinstalling the SMV make sure that it is mounted with the wide part of the SMV at the bottom. (Fig. 2-1)

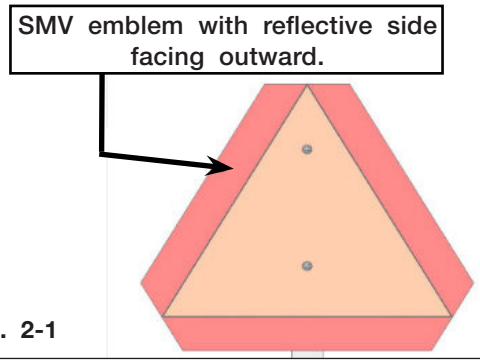


FIG. 2-1

Attaching Tru-Steer Cart

• When attaching the Tru-Steer cart to the toolbar, the wing rests and tongue swivels must first be mounted to the tool bar. The following information illustrates the correct placement and measurements of this process. All measurements are made from the center of the toolbar to the indicated spot on either the wing rest or swivel.

Model	Measurment	Description	Length
12 Row	A	Distance from point D to point E	24 1/2”
	B	Distance from point C to point E	40 1/2”
16 Row	A	Distance from point D to point E	24 1/2”
	B	Distance from point C to point E	56 1/2”

FIG. 2-2

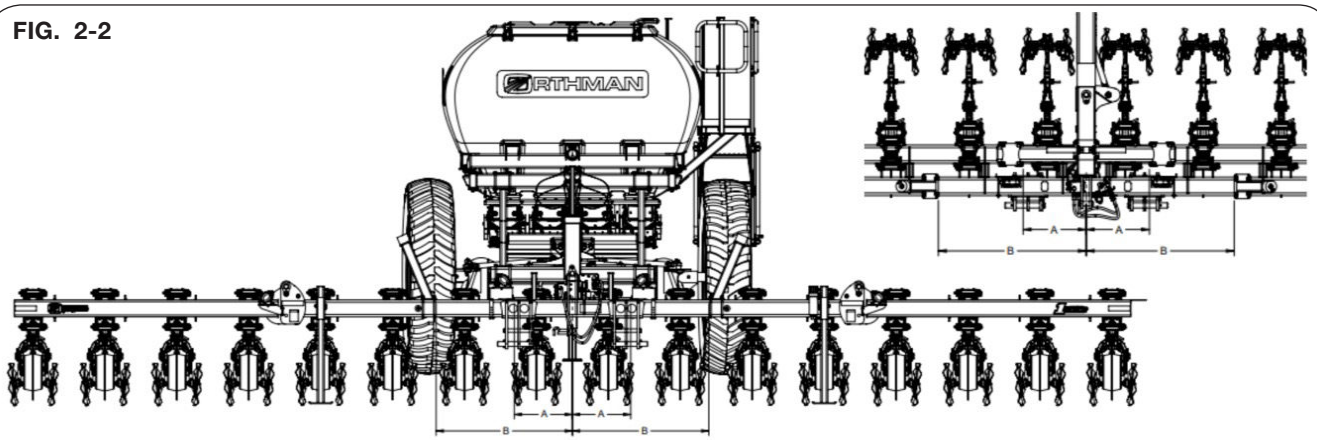
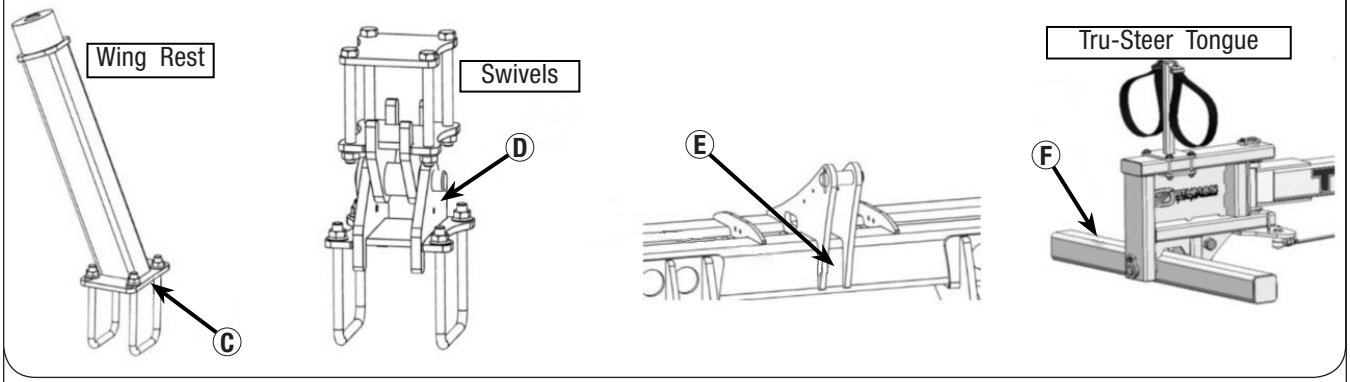


FIG. 2-3



Attaching Tru-Steer Cart (Continued)

WARNING

- **KEEP HANDS CLEAR OF PINCH POINT AREAS.**
- **EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING IMPLEMENT.**
- **TIPPING OR MOVEMENT OF THE MACHINE CAN CAUSE SERIOUS INJURY OR DEATH. BE SURE MACHINE IS SECURELY BLOCKED.**

1. Park the unit on a firm, level surface, then set the tractor's parking brake and remove the key.
2. Install the Tru-Steer tongue swivel to the toolbar using the u-bolts and lock nuts. (Fig. 2-5)
3. Install the Tru-Steer tongue cross bar onto the swivels, then install the clamping plate, capscrews, flat wshers, and lock nuts. (Fig. 2-5)
4. Torque all hardware to the specification listed in the maintenance section.

FIG. 2-4

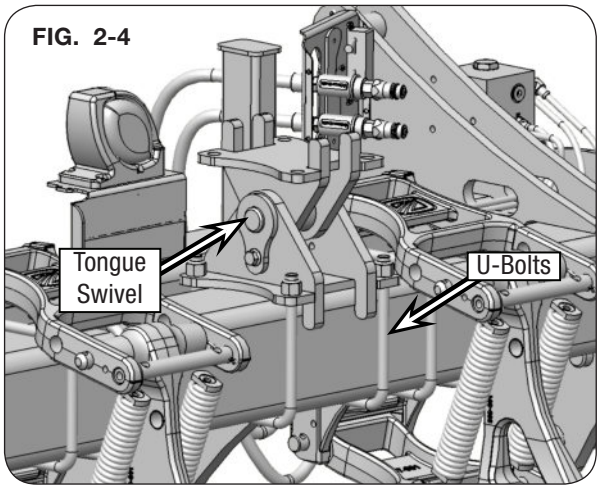
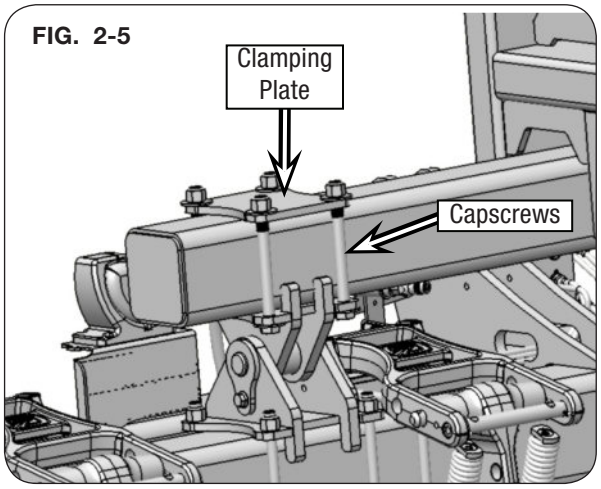


FIG. 2-5



Mercury Switch w/ Magnetic Mount

1. Install the switch by placing the red magnet onto the 3-point hitch arm with the wires running toward the implement.

2. Attatch the connector end of the Mercury switch wire harness to the part of the harness located on the TRU-aPLYr tank, labeled “Implement Switch.”

NOTE: Ensure that when the 3-point is in the operating position the mercury in the cylinder runs downhill, or toward the wires. This closes the switch and turns on the flow of fertilizer.

NOTE: When the 3-point is raised and the implement is out of the ground, the mercury switch should be positioned in such a way that the mercury inside the black cylinder is running downhill and away from the wire.

3. Loosen the screw that holds the cylinder in place to adjust the angle of the cylinder and where the switch turns on/off.

NOTE: The ideal point for the switch to change is when the shanks are just above the ground, so that the fertilizer has time to feed through the system and make it into the ground.

FIG. 2-6

FIG. 2-7 Wires Down = Run

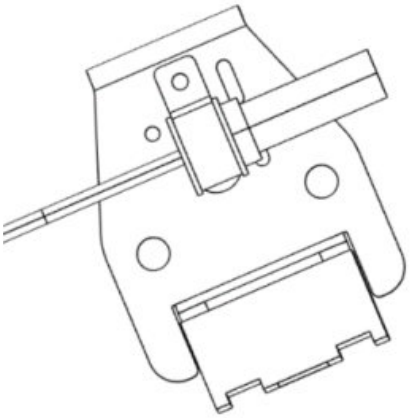
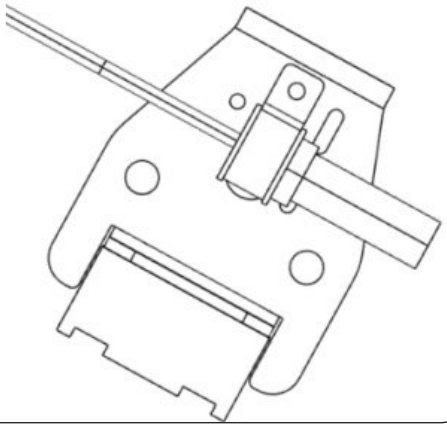


FIG. 2-8 Wires Up = Hold



Blockage Sensor Assembly

NOTE: The blockage detection kit includes 2 adapters, 2 couplers, and 6 hose clamps. The sensor assembly measures a total of 11.5", therefore the hose lengths provided in the set up section of this manual must be shortened by 11.5" if installing this blockage sensor.

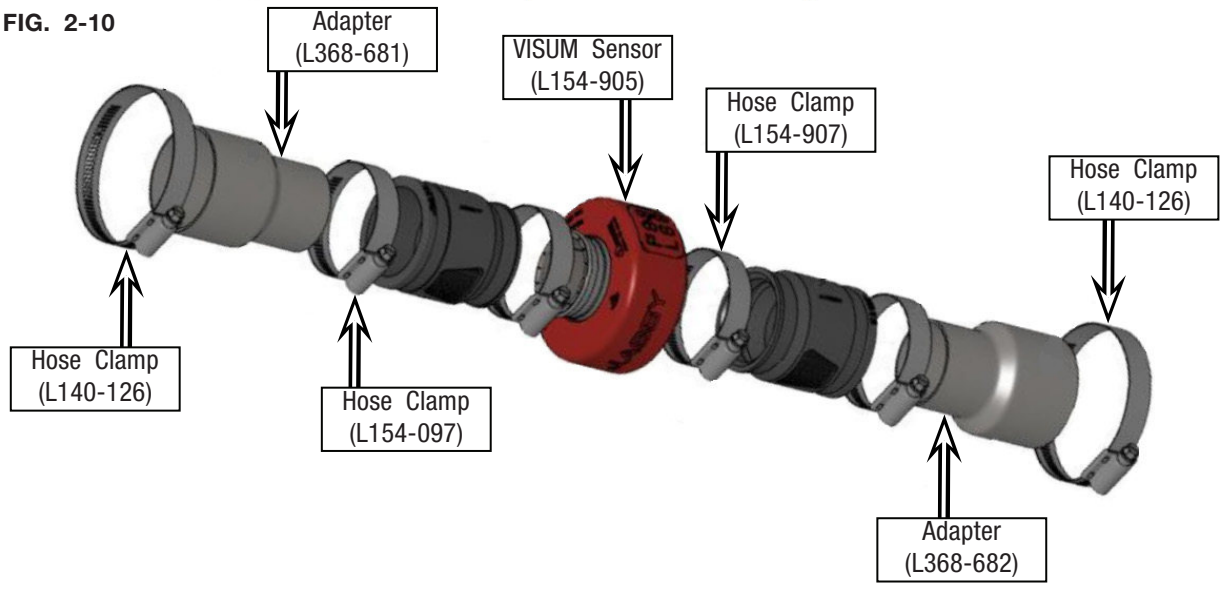
1. Attach a VISUM coupler (L154-906) to both ends of the VISUM sensor (L154-905) using the hose clamps (L154-907) provided. (Fig. 2-10)

2. Attach an adapter (L368-681 and L368-682) to both sides of the assembly using the hose calmps (L194-907) provided. (Fig. 2-10)

3. Attach the hose coming from the venturi boxes to the sensor assembly, then install the sensor assembly onto the row unit using the provided hose clamps (L140-126). (Fig. 2-9)

FIG. 2-9

FIG. 2-10



Venturi Box Assembly

⚠ WARNING

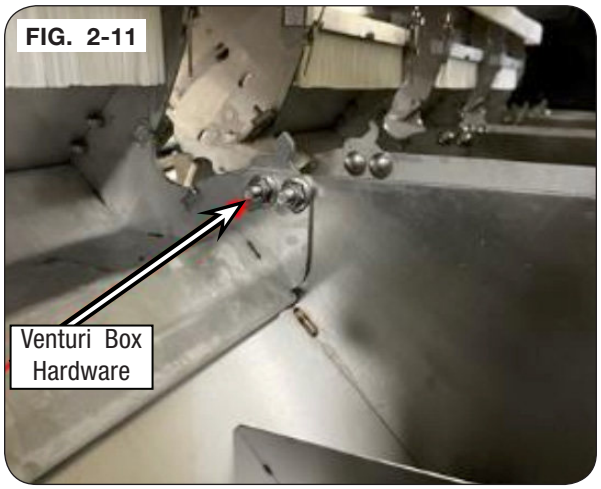
- **KEEP HANDS CLEAR OF PINCH POINT AREAS.**
- **EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING IMPLEMENT.**

NOTE: Venturi boxes are included in the hosing package. Due to the TRU-aPLYr's 2 or 4-section metering capabilities, all systems come with either 2 or 4 Venturi boxes that are attached below and in between the 2 bulk hoppers. The following are steps and procedures for assembling Venturi boxes and installing them to your 12 or 16 row TRU-aPLYr.

1. Attach each Venturi box to the corresponding metering box on the rear hopper using the hardware (4x L100-726) & (4x L102-615). (Fig. 2-11)

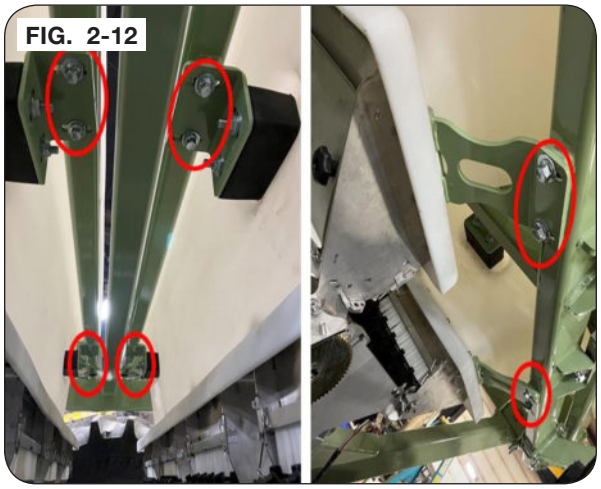
2. Ensure that all Venturi boxes are secured and aligned properly.

FIG. 2-11



3. Make adjustments to slide the two bulk hoppers together to close the gap between the front hopper metering boxes, and the Venturi boxes, then fasten down. (Fig. 2-12)

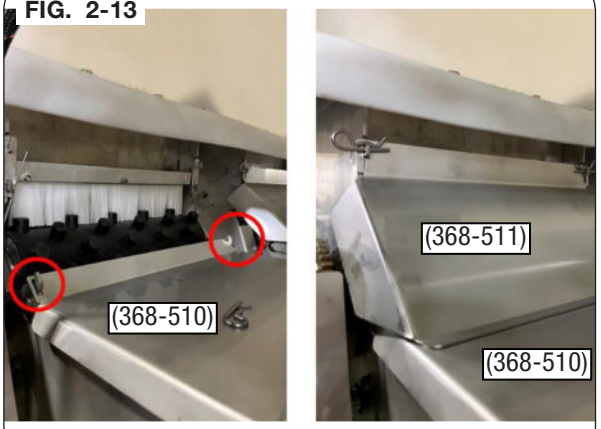
FIG. 2-12



Venturi Box Assembly (Continued)

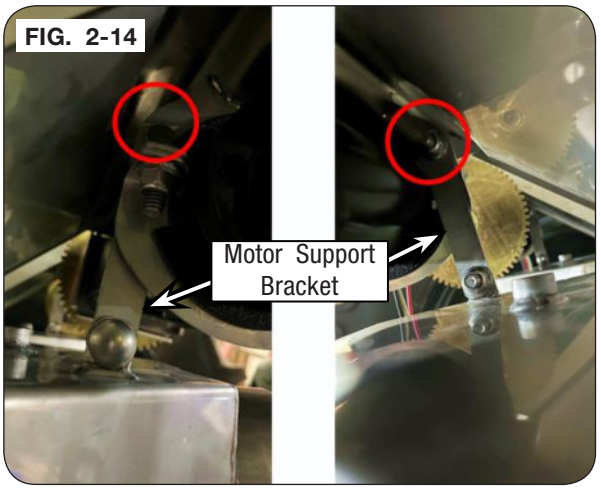
4. Remove the metering box rain cover (L368-511) in order to install the Venturi box rain cover (L368-510) on top of the Venturi box, then reinstall (L368-511) on top of (L368-510). (Fig. 2-13)

FIG. 2-13



5. Attach motor support bracket with hardware (L100-726) and (L102-615). (Fig. 2-14)

FIG. 2-14



Bracket Mounting

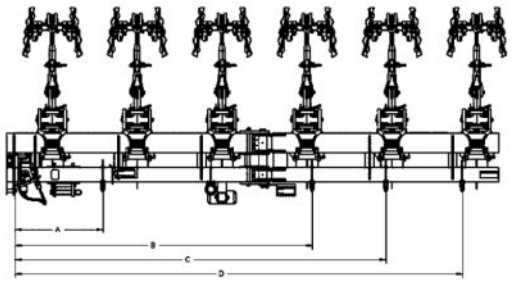
WARNING

- **KEEP HANDS CLEAR OF PINCH POINT AREAS.**
- **EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING IMPLEMENT.**
- **TIPPING OR MOVEMENT OF THE MACHINE CAN CAUSE SERIOUS INJURY OR DEATH. BE SURE MACHINE IS SECURELY BLOCKED.**

NOTE: Measurements are used for both sides of toolbar. Measure from the left side of hitch for the left brackets, and the right side of hitch for the right brackets. See figures 2-15 and 2-16 for measurments.

FIG. 2-15 12 row TRU-Steer

Recommended Bracket Placement		
A	4 hose	2’ 6”
B	3 hose	8’ 6”
C	2 hose	10’ 10”
D	1 hose	13’ 2”



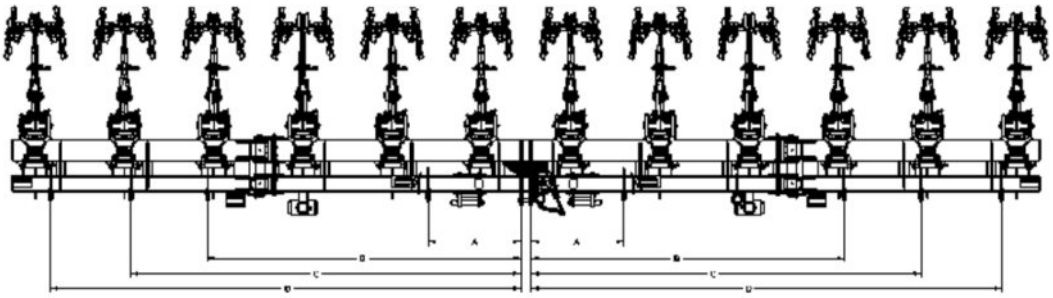
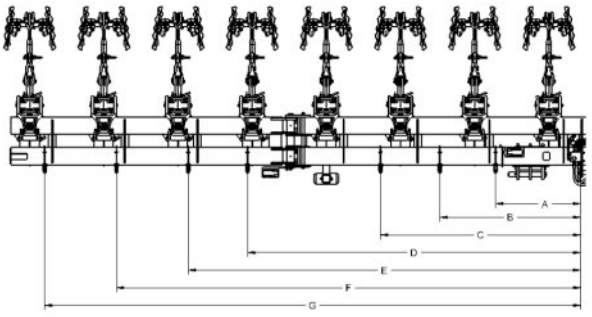
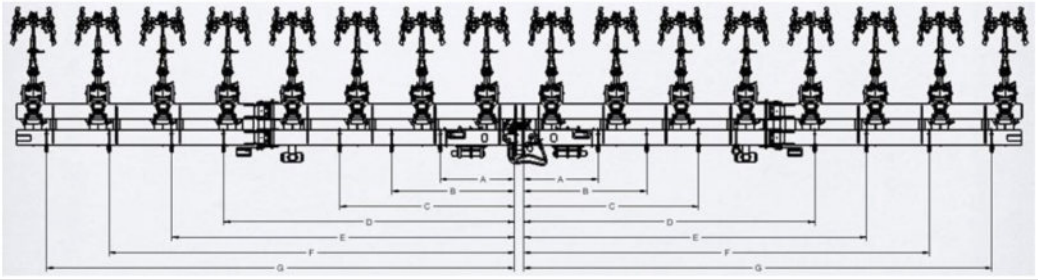


FIG. 2-16 16 row TRU-Steer

Recommended Bracket Placement		
A	5 hose	2’ 9”
B	5 hose	4’ 8”
C	4 hose	6’ 8”
D	4 hose	11’ 2”
E	3 hose	13’ 2”
F	2 hose	15’ 7”
G	1 hose	18’





12 Row Hose Routing

1. Cut the necessary pieces of PVC hosing into the proper lengths for each section of the machine. See charts below for hose lengths.

For The 4x 100' Rolls Of 2.5" Hose								
	Roll 1			Roll 2		Roll 3		Roll 4
Quantity	2	1	1	2	1	2	1	2
Length	22' 8"	25' 8"	28' 5"	35' 1"	28' 5"	35 10"	25' 8"	37' 11"
Location	H	G	F	D	F	E	G	C

For the small hosing provided (1 1/2" or 2")		
Quantity	Location	Length
12	J	18"

2. Install each hose onto it's designated port on the venturi boxes unsing the included hose clamps. Referance the images and charts below.

FIG. 2-17

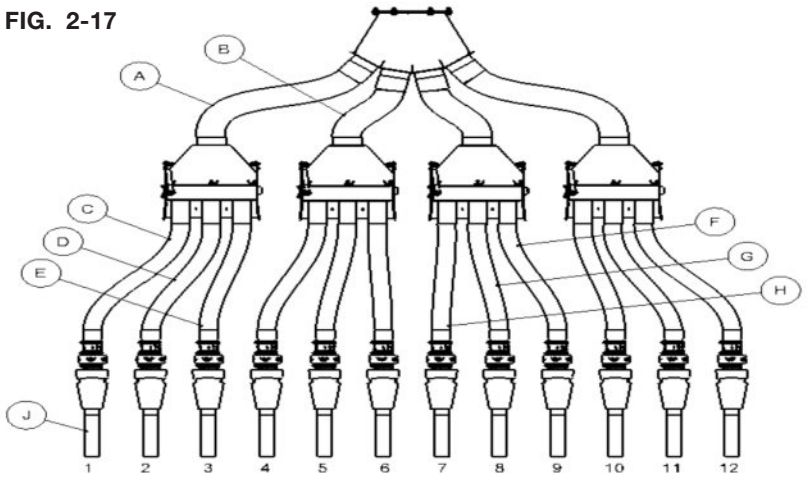
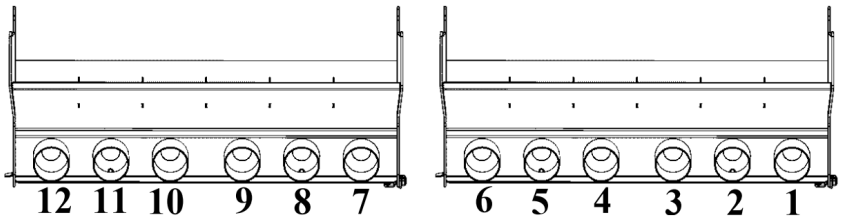


FIG. 2-18

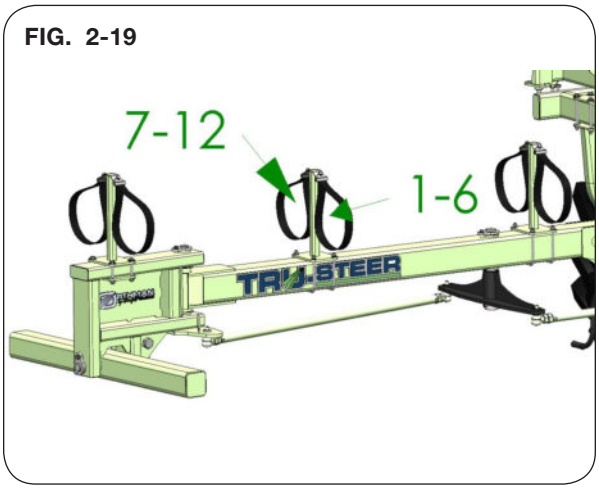


Row #	1	2	3	4	5	6	7	8	9	10	11	12
Hose	C	D	E	F	G	H	H	G	F	E	D	C

12 Row Hose Routing (Continued)

1. Route the row unit hoses throught the three straps on the machine tongue. (Fig. 2-10)

FIG. 2-19



2. Attach the row unit 1 hose to row unit 1 and fasten to the left A, B, C, and D brackets with the top most U-bolt on each bracket.

3. Attach the row unit 2 hose to row unit 2 and fasten to the left A, B, and C brackets with the second top most U-bolt on each bracket.

4. Attach the row unit 3 hose to row unit 3 and fasten to the left A and B brackets with the third top most U-bolt on each bracket.

NOTE: Let the hoses droop below the toolbar between brackets A and B to ensure amble slack when folding the toolbar.

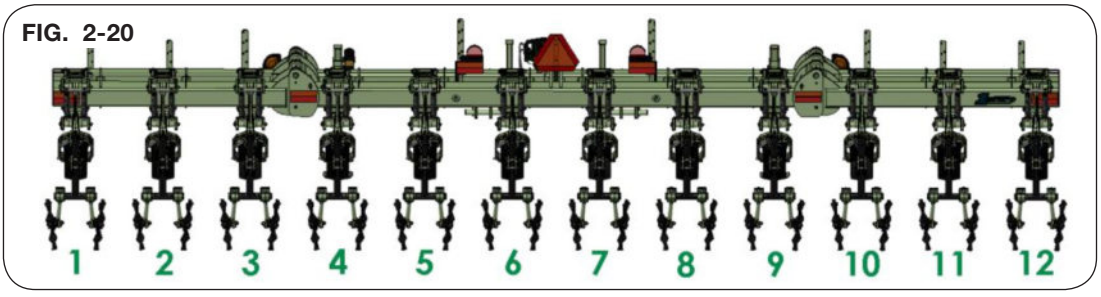
5. Attach the row unit 4 hose to row unit 4 and fasten to the left bracket A with the last remaining U-bolt on each bracket.

6. Attach the row unit 5 and 6 hose to their row units.

7. Repeat steps 2-6 with the remaining hoses on the opposite side of the toolbar.

8. Ensure that all hoses are properly attached to brackets and hose clamps, then carefully fold the toolbar to identify any pinch points or kinks in the hoses caused by folding.

FIG. 2-20



16 Row Hose Routing

1. Cut the necessary pieces of PVC hosing into the proper lengths for each section of the machine. See charts below for hose lengths.

For The 7x 100' Rolls Of 2.5" Hose												
	Roll 1		Roll 2			Roll 3			Roll 4	Roll 5	Roll 6	Roll 7
Quantity	2	1	1	1	1	1	1	1	2	2	2	1
Length	37' 6"	22' 8"	32' 3"	28' 5"	25' 8"	32' 3"	28' 5"	25' 8"	41' 6"	42' 2"	41'	22' 8"
Location	E	J	G	H	I	G	H	I	C	D	F	J

For the small hosing provided (1 1/2" or 2")		
Quantity	Location	Length
16	L	18"

2. Install each hose onto it's designated port on the venturi boxes unsing the included hose clamps. Referance the images and charts below.

FIG. 2-21

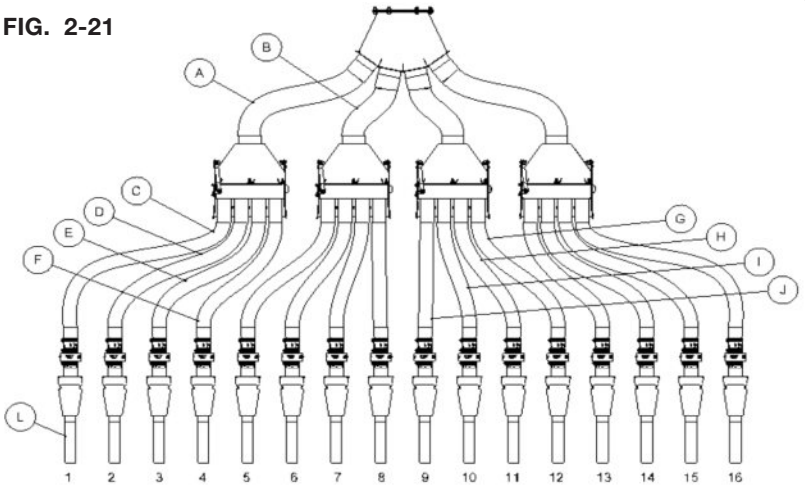
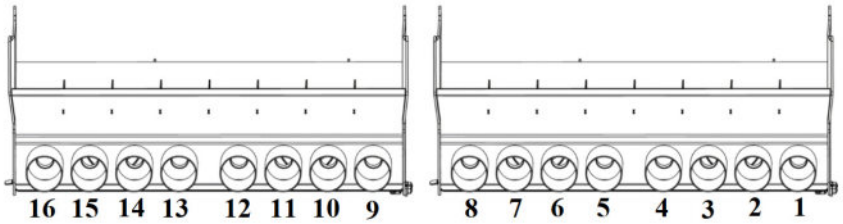


FIG. 2-22

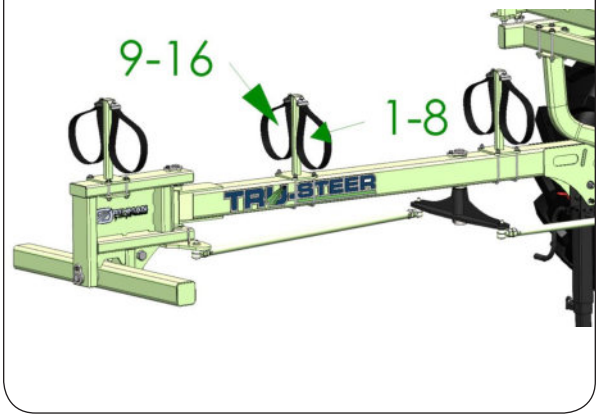


Row #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hose	C	D	E	F	G	H	I	J	J	I	H	G	F	E	D	C

16 Row Hose Routing (Continued)

1. Route the row unit hoses throught the three straps on the machine tongue. (Fig. 2-14)

FIG. 2-23



2. Attach the row unit 1 hose to row unit 1 and fasten to the left A, B, C, D, E, F, and G brackets with the top most U-bolt on each bracket.

3. Attach the row unit 2 hose to row unit 2 and fasten to the left A, B, C, D, E, and F brackets with the second top most U-bolt on each bracket.

4. Attach the row unit 3 hose to row unit 3 and fasten to the left A, B, C, D, and E brackets with the third top most U-bolt on each bracket.

5. Attach the row unit 4 hose to row unit 4 and fasten to the left A, B, C, and D brackets with the next top most U-bolt on each bracket.

NOTE: Let the hoses droop below the toolbar between brackets C and D to ensure amble slack when folding the toolbar.

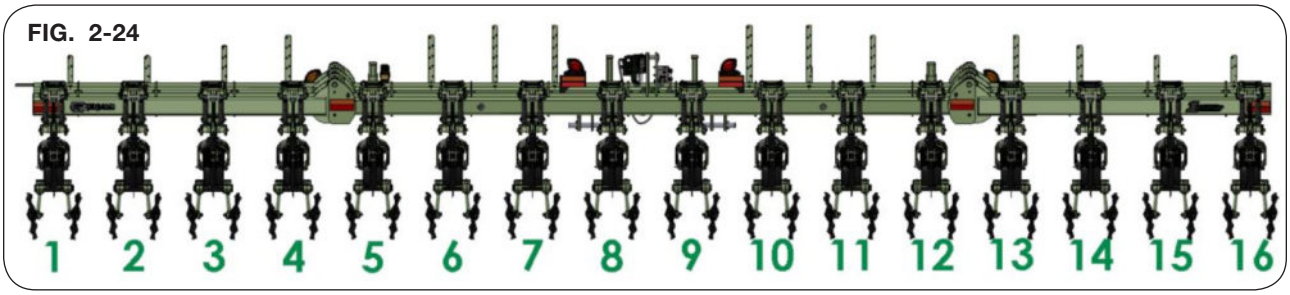
6. Attach the row unit 5 hose to row unit 5 and fasten to the left A, and B brackets with the next top most U-bolt on each bracket.

7. Attach the row unit 6, 7, and 8 hose to their row units.

8. Repeat steps 2-7 with the remaining hoses on the opposite side of the toolbar.

9. Ensure that all hoses are properly attached to brackets and hose clamps, then carefully fold the toolbar to identify any pinch points or kinks in the hoses caused by folding.

FIG. 2-24



Rate Controller Set Up

Product Overview Screen

1. To get to the product overview screen, select the Sentinel icon (3) on the upper right side of the screen.

2. The product overview screen will show the operator the target rate, actual rate, and rate mode. The rate mode can switch between user defined (User Def) and prescription (Rx). If the product is in User Def mode, then the rate can be pressed to enter a manual rate. The bottom section shows three customizable predefined rates (for use in User Def mode only), fan status/RPM, and will show the weight of the bin (if equipped). The chain icon will also appear in between the front and rear bins if the bin chaining is activated.

3. The information on the tool bar at the top of the home screen represents the information belonging to the Product (1) underlined at the top.

4. Pressing the Next Product button (4) on the right-hand side of the screen will change the selected product. This toolbar can be customized by touching the gear icon (2) in the toolbar.

5. Selecting the graph icon (5) will change the display to the full screen bar graph view (8).

6. Setup, diagnostics, and other information on a specific product can be viewed by touching the bin icon on the overview screen

FIG. 2-25

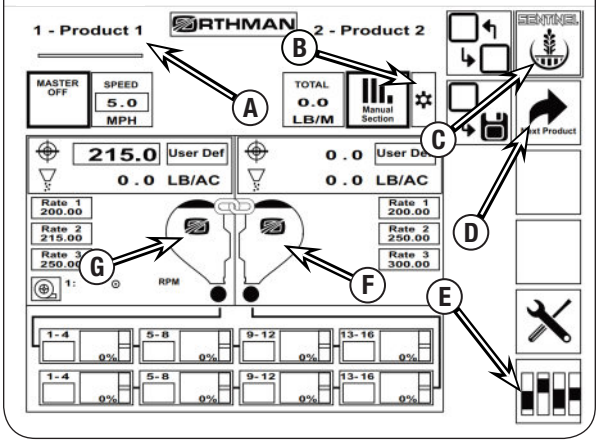
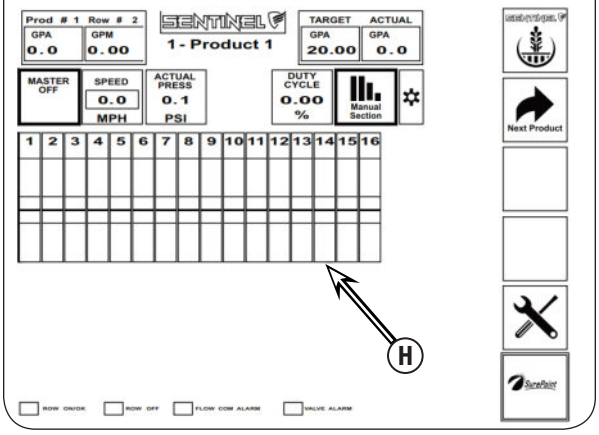


FIG. 2-26



Rate Controller Set Up (Continued)

Operate Tab

NOTE: Target and actual rate is shown at the top Weight will show next to the bin image (if equipped).

- **Calibration Adjust -** This icon can be used to temporarily increase or decrease the calibration across the product's section up to +/- 20%. For a long-term change, it is recommended to perform a section calibration.

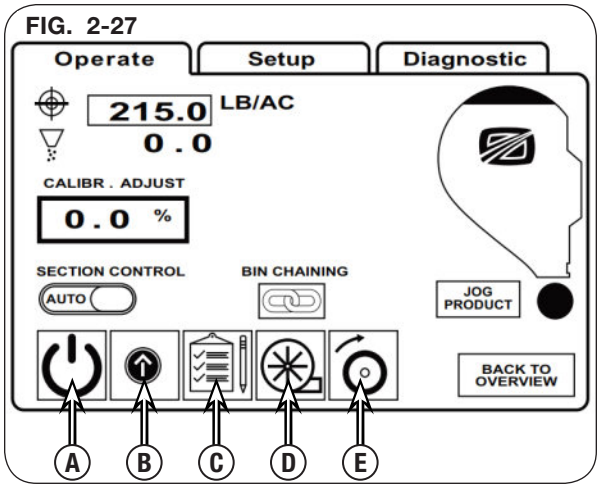
- **Section Control -** This icon is visible when task control is enabled on the hardware setup screen. When in AUTO, it allows the tractor's section control to control the sections. In Manual, all sections are enabled and can be disabled in the manual section dialog by pressing the manual section button on the toolbar.

- **Bin Chaining -** Pressing this button opens the bin chain setup. Bin chain is used to treat the two bins as one product by running one bin until empty and then switching or splitting the desired rate between the two bins and running them both at the same time. This will be covered later on in this guide.

- **Jog Product -** This allows the user to jog all sections (that aren't manually disabled) for the product.

- **Run Status Bar -** This status bar allows the operator to see what is preventing the product from running. A green icon shows that the condition is met to run, red icon shows that it is not, and a gray icon shows that it is disabled. If height switch isn't used, it would show as a gray icon

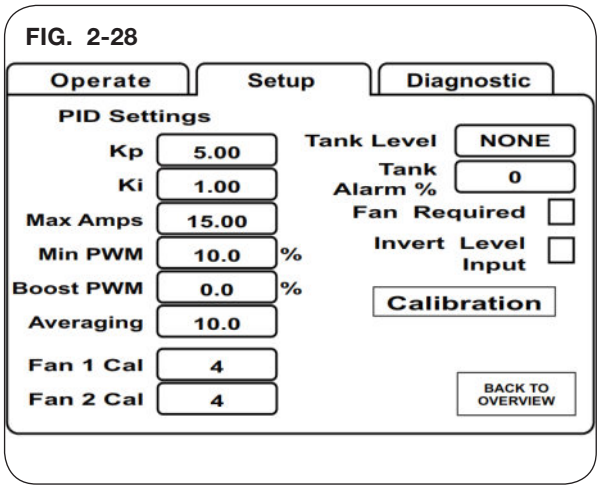
FIG. 2-27



Rate Controller Set Up (Continued)

Setup Tab

FIG. 2-28



- **Kp/Ki -** This is the main auto control adjustment. If system is oscillating, lower the Ki value. If it is taking too long to get to rate, raise the value. There is a Ki adjustment that can be changed on the Product Setting > More screen. Ki goes along with control speed to adjust the algorithm. This can help bring the system to setpoint if it is hovering off of setpoint. Making the value too big can cause oscillation. These are the gain and integral control values that affect the control loop. This determines how quickly the control loop reacts to hit target.

- **Max Amps -** Software settable amp setpoint to disable motor.

- **Min/Boost PWM -** Min is the slowest pulse-width module (PWM) sent to the motor. It can be used to keep motors from stalling. Boost is the speed that the motor starts up at before controlling to hit target. If left at 0, the motor will start back up at the same speed it shut off.

- **Averaging -** This is the number of samples averaged to get a motor speed from the encoder. Leave the number at 10.

- **Fan 1 and 2 Cal -** This is the number of pulses per fan revolution.

- **Tank Level /Alarm % -** Tank Level is the mode that can be set for bin level. The options are None, Calc, Scale1, and Scale2. Calc uses run and start information from the operator to calculate a level. Scale1 (front) and Scale2 (rear) are used when load cells are equipped. Alarm % will trigger a system alarm when the level is below the specified percentage of full.

- **Fan Required -** If checked, fan speed is a condition that must be met before the product will apply.

- **Invert Level Input -** This is checked if the low level input for the bin needs inverted.

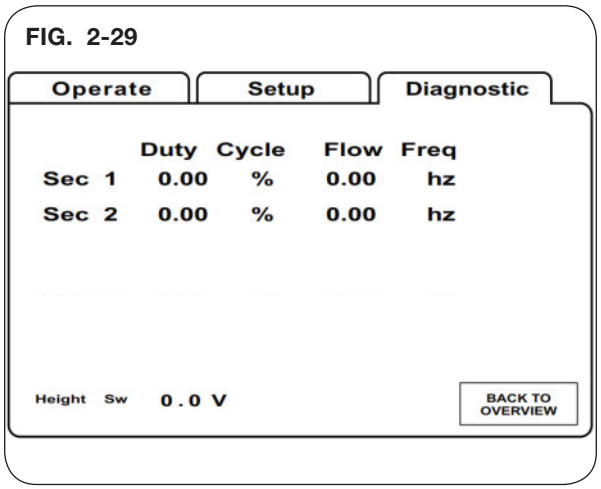
- **Calibration -** This takes the operator to the section and scale assisted calibration.

Rate Controller Set Up (Continued)

Diagnostic Tab

- The Diagnostic tab is used for troubleshooting purposes. It displays each section's motor speed percent and encoder frequency. If an analog height switch is used, the current voltage is displayed at the bottom.

FIG. 2-29



Section Detail

- In-depth information about each section can be seen on the overview page. Each box displays the section's information.

- The numbers across the top show the individual rows in the section. The toggle icon (1) allows the user to manually toggle that section On/Off. The icon will appear red if manually disabled. Motor command speed (2) is shown as a percentage and the target bar (3) to the right shows if the section is above, below, or on target. Any errors (EMC fault, speed at max/ min limit, CANBus) will appear in the motor command speed box. Clicking anywhere in the motor command speed box will also display further info

- The operator can navigate to different sections using the navigation arrows (4). Any errors for a section will be further explained here. Touching the Calibration button (5) will take the operator to the calibration dialog for that specific section.

FIG. 2-30

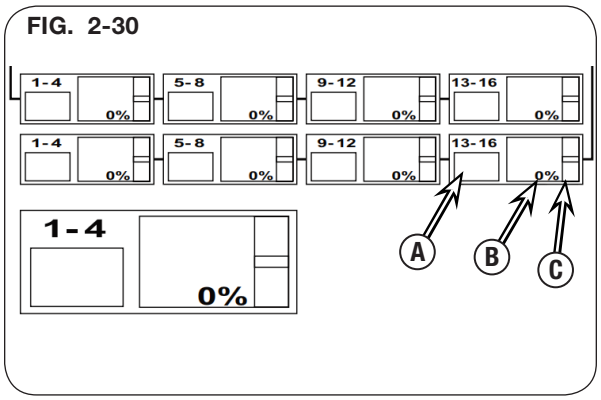
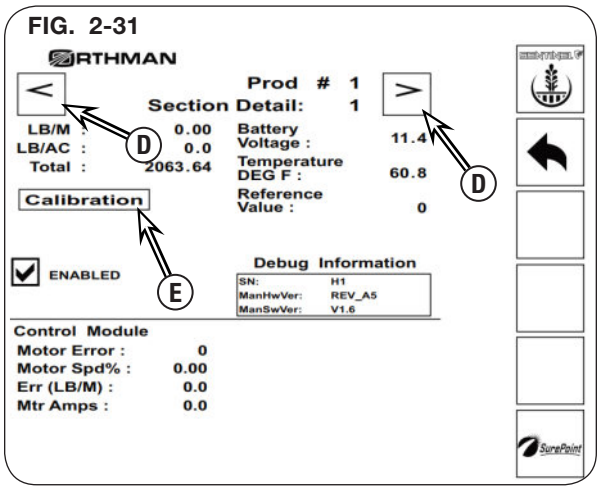


FIG. 2-31



Rate Controller Set Up (Continued)

Product Setup

- Selecting the settings icon will take the operator to the settings screen. The buttons to the right lead to the other system setups. A product can be selected for setup.

- The product name can be changed by clicking the top text entry bar (1). For this system, DryControl is the only device type that may be selected for now. Next, select the number of Sections (2), then the number of rows. The system will then autofill all the sections with equal rows if possible. Set the row Spacing (3) as needed. Tolerance is the amount of variation that is allowed before the system shows a rate alarm. Click the disk icon to save and reload the VT

- The More button (4) takes you to the next product setup screen. Rate mode and manual speed can be set here. Rate Smooth (5) is the smoothing that is applied to the overall machine actual applied value. The Row Smooth (6) is used as applied information sent for records as well as the individual section rowbar information to visualize if that section is on target. User Defined Manual Rates (7)\ allow you to set user defined manual rates for the three push buttons on the overview screen. The max allowed motor amps can also be set here.

FIG. 2-32

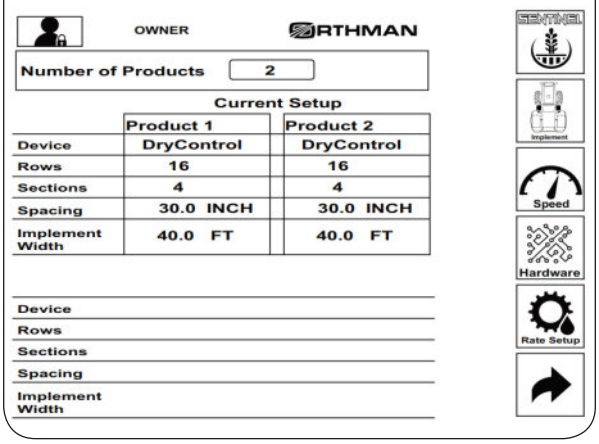


FIG. 2-33

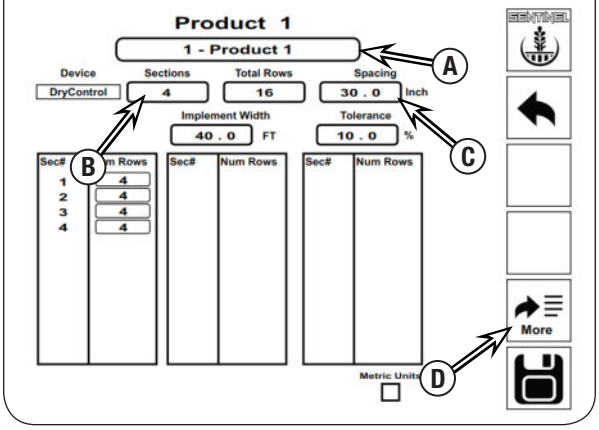
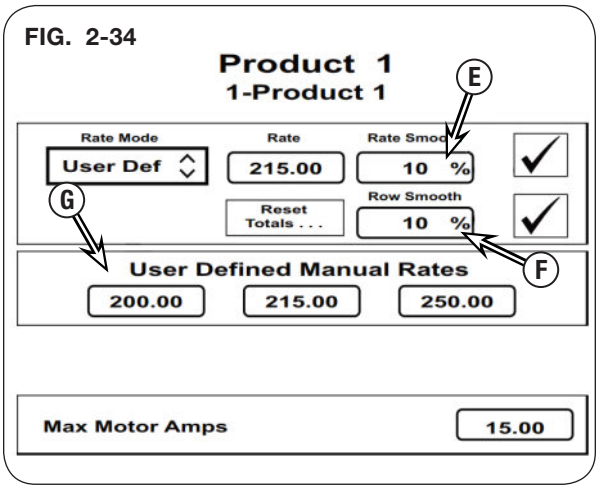


FIG. 2-34

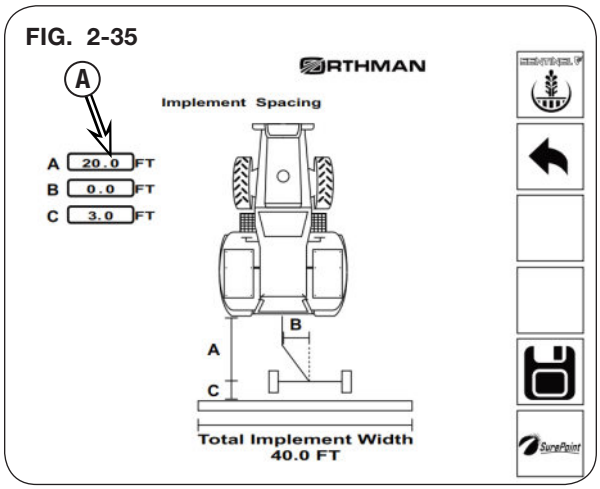


Rate Controller Set Up (Continued)

Implement Setup

- In the main setup screen, selecting the Implement icon will take the operator to the implement setup screen where the operator can enter the implement dimensions (1).

FIG. 2-35

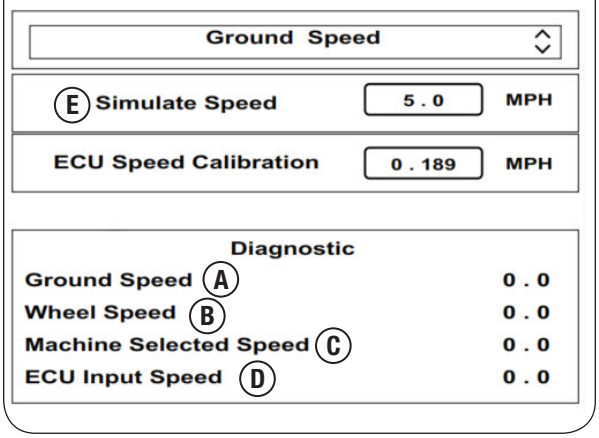


Speed Setup

- In the main setup screen, selecting the speed icon will take the operator to the speed setup screen.

- The source of tractor speed needs to be specified. The options are: Ground Speed (1), Wheel Speed (2), Machine Selected Speed (3), ECU Input Speed (4) and Simulate Speed (5). Simulated can be used during troubleshooting. With the tractor moving, the diagnostics section can be used to determine which source to use. If using ECU speed, the calibration number can be adjusted on this page.

FIG. 2-36

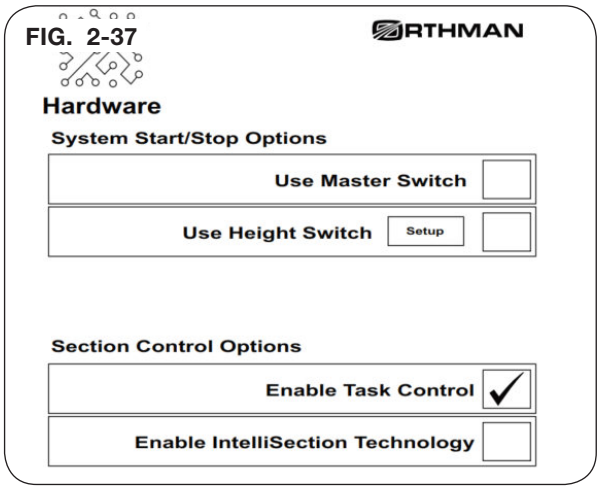


Rate Controller Set Up (Continued)

Hardware

- **In the main setup screen, selecting the Hardware icon will take the operator to the hardware setup screen.**
- **If using a physical Master Switch, it can be enabled. If a Height Switch is used, it can be enabled here. Clicking the Setup button will allow to configure if it is a digital or analog switch as well as the switch voltage. The default is to enable task control, which allows tractor section control, prescriptions, etc. In some situations, this may be disabled but all controls will be manual. The IntelliSection is not used.**

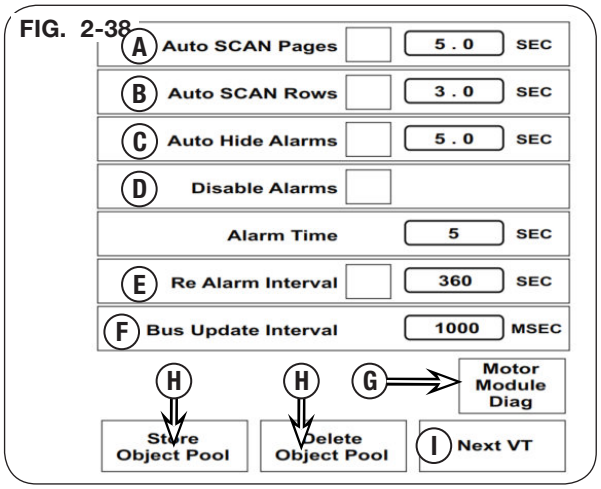
FIG. 2-37



Other System

- In the main setup screen, selecting the Hardware icon will take the operator to the hardware setup screen.
- Auto SCAN Pages (1)—Automatically switches between products on the overview screen at the specified interval.
- Auto SCAN Rows (2)—Not used.
- Auto Hide Alarms (3)—This will acknowledge alarms after so many seconds.
- Disable Alarms (4)—Prevents all alarms.
- Re-Alarm Interval (5)—This will bring back active alarms after specified amount of time.
- Bus Update Interval (6)—Only change this value if instructed to do so by support.
- Motor Module Diag (7)—Shows the diagnostic screens that explain which modules are online, and can also be used to readdress the motor control modules.
- Store/Delete Object Pool (8)—Store is not used, but delete will cause the pool to reload on startup. Sometimes needed after a program update.
- Next VT (9)—Used to display the system on the next VT if available.

FIG. 2-38



Rate Controller Set Up (Continued)

Tank Level Setup

- If the machine is equipped with load cells, it will need to be set up in both of the product's setup tabs.
- For Product 1, click the Tank Level box (1) and select Scale A. Repeat the process for Product 2 but select Scale B instead. Use the DigiStar VT to zero the scales when empty if necessary.
- The visual maximum level of the tank can be set up on the operate tab by pressing the Tank Full button (2) when the bin is full.
- You can manually type in a maximum level by clicking on the lever bar of the tank
- The system can calculate an estimated level of the tank it the operator lets it know the starting amount, and then the amount used will be subtracted as the machine is ran. At any time, the estimated tank level can be adjusted on the product's operation tab. The visual maximum level of the tank can be seen by pressing the Tank Full button (1) when the bin is full or manually set by clicking on the lever bar (2) of the tank and entering the desired value.

FIG. 2-42

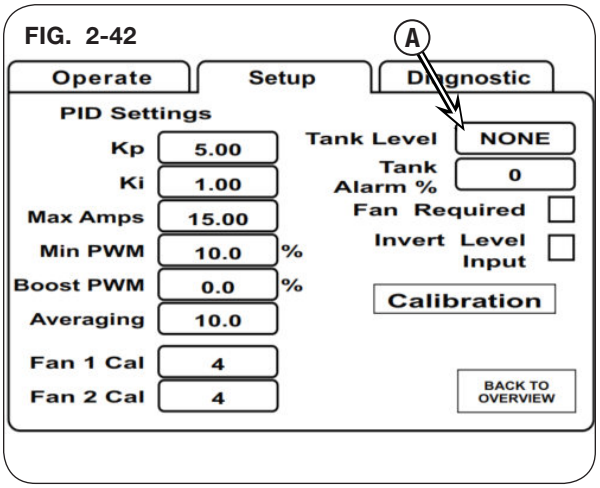


FIG. 2-43

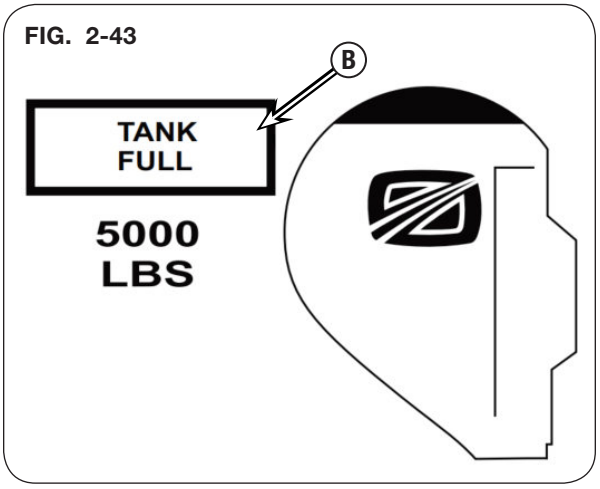
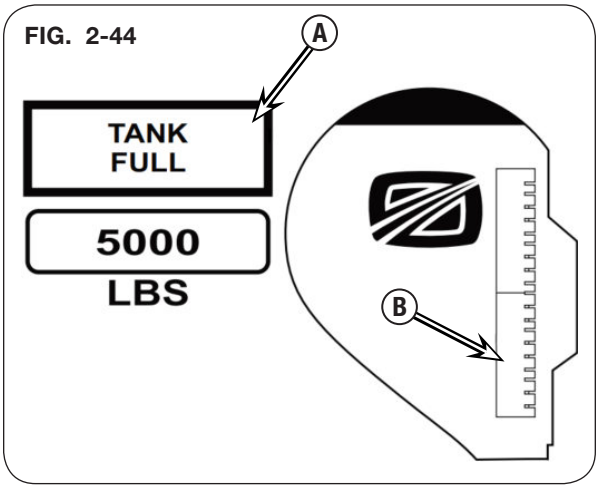


FIG. 2-44



Rate Controller Set Up (Continued)

Task Control

- Task control is the magical ISOBUS box that everyone knows about; but knows nothing about. The hardest part with task control is that every display implements it differently and the process to get a task running on each display is very different. Task control is the ISOBUS method of allowing the display to communicate prescription and section information to an implement on the bus. A task generally has to be created for the implement, and then started before prescription and section information can be sent to the implement. Some displays automatically start and stop the task; so this is not as obvious on those displays. Shown here are some of the screens and setup on the John Deere 4600 series displays. This display probably makes the process easier than most other displays currently.

- There are two main places to go to set up task control in the 4600 series John Deere displays. First is the work setup and second is the section control setup

- Here is an example Work Setup screen (1)

- If the Sentinel is working correctly, it should show up under the tractor as a Fertilizer (2). Then if you click on the equipment box you can then click on Fertilizer and check all of the settings of the Sentinel to see if everything is correct. Most of this information is pre-populated from the Sentinel setup, so it should not need to be changed unless you want to change the implement offsets for the GPS position to make sure the sections are turning on and off at the correct time

FIG. 2-45

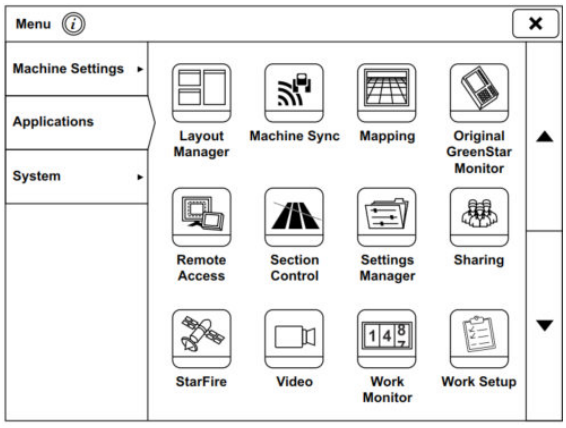
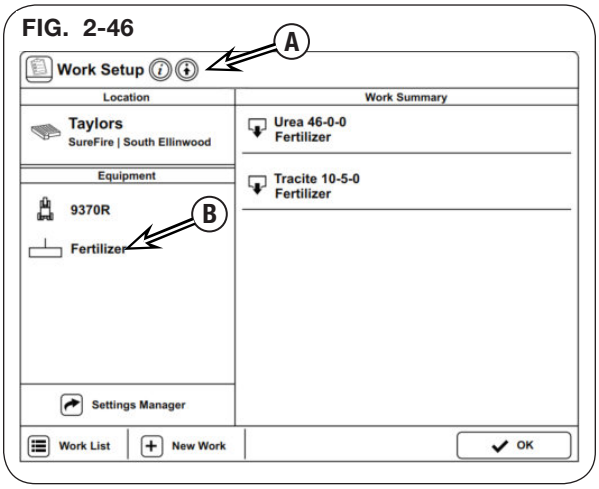


FIG. 2-46



Rate Controller Set Up (Continued)

- If the system you are connecting to uses a John Deere rate controller like JDRC2000, use the Add Operation (3) underneath Fertilizer to add it there.

- Target Rate/Rx: If the operator wants to use the manual rate in the Sentinel, then this should be set to controller rate by clicking the product in the work summary. If they want to use a prescription, then this should be set to the shapefile that contains the prescription. If bin chaining is to be used, the two products should be the same and both set to the same prescription or both set to controller rate

- The other place to check is the Section Control screen (4). The following is the Section Control screen. If everything is communicating and working as it should, you should see something similar to the following. Make sure the Master (5) is on and that the product being controlled has a check mark in the check mark box (6) and a green LED next to it. If so, then section control should be ready to go.

FIG. 2-47

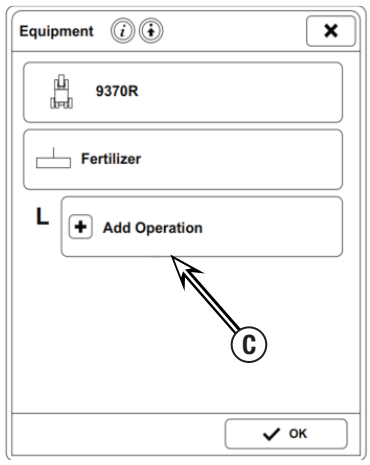


FIG. 2-48

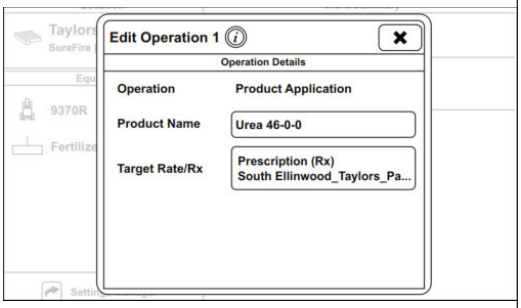
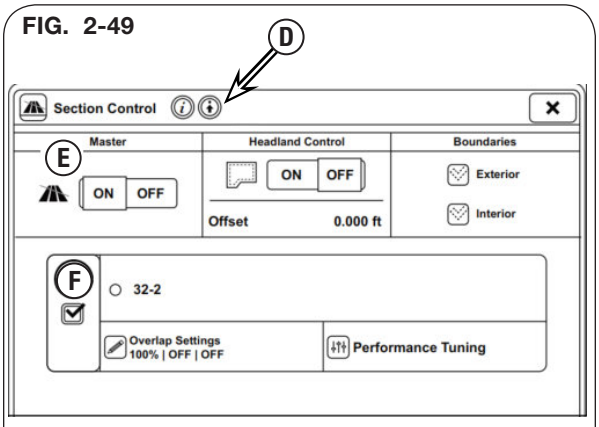


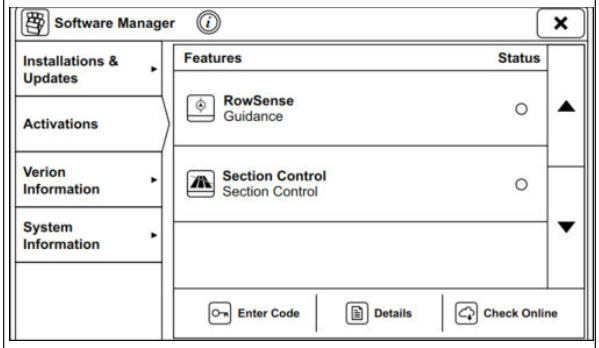
FIG. 2-49



Rate Controller Set Up (Continued)

- Finally, to make sure section control is enabled, go to Menu > System > Software Manager > Activations and make sure that Section Control is green.

FIG. 2-50



Rate Controller Set Up (Continued)

Scale Setup

Adding The Preset Weight:

NOTE: Calibration is completed at the factory; however, some fine tuning may be required as load cells settle.

1. Press the Scale A box (1) for the front 6-ton tank.

NOTE: Tap the net/gross (2) button if it shows Net on scale A instead of Gross

2. Press and hold ZERO (3) to zero Scale A.

3. Add a known weight.

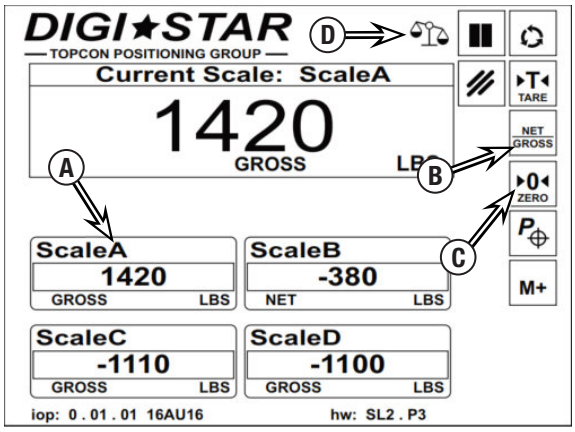
NOTE: The scale displays in multiples of 10. To be as accurate as possible, enter several 100 pounds or more

4. Record the weight reading on display.

5. If there is a significant (>3%) difference between known weight and weight displayed, use this formula to generate a new CAL value: New CAL value=known weight/weight reading•old CAL value.

6. Input the new CAL value (no decimals, round up or down necessary) into ScaleA using instructions below: • Validate the results by repeating the test weight.

FIG. 2-51



Rate Controller Set Up (Continued)

Inputing a CAL Value:

1. Make sure that the scale ID (5) to be changed is highlighted as the active scale.

2. Press the scale/balance (6) button.

3. Press the Cal Number entry box (7) and enter the new calibration number.

4. Press the home button (8) to get back to the main screen.

   The default setup number is completed at the factory.

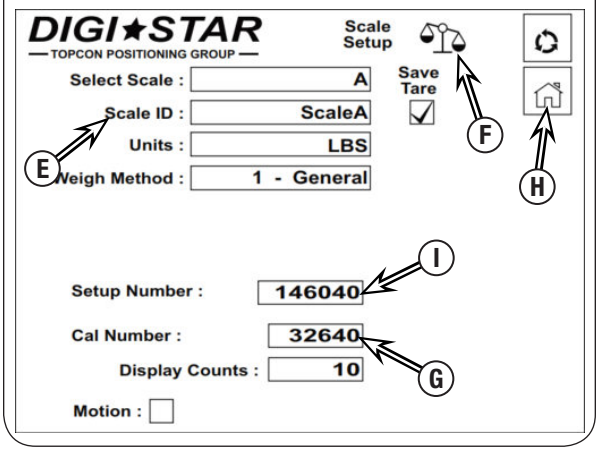
1. Make sure that the scale to be changed is highlighted as the active scale.

2. Press the button with the scale/balance.

3. Press the Setup Number (9) text entry box and change to the desired value. The factory default is 146040.

   Press the home button to get back to the main screen

FIG. 2-52



Rate Controller Set Up (Continued)

Section Calibration

NOTE: Section calibration is recommended when a new product is ran or there is significant change in product supply. The software allows for five product calibration profiles to be saved (five for the front bin and five for the back bin).

1. Press the section to be calibrated (A), then press the calibration icon (B).

- The calibration page allows for the calibration of each section in the product selected.

- **Change Profile (1) -** This brings up the dialog for selecting saved profiles, creating new profiles, renaming profiles.

- **Calibrate With Scale (2) -** If equipped, opens the dialog for calibration using bin load cells.

- **Section Select (3) -** Selects which section is to be calibrated (active section will be highlighted in bright green).

- **Jog Section (4) -** Pressing this while the Master Switch is enabled will allow the selected section to run to perform a catch test. The Jog push button on the machine can also be pressed on the machine to start the section moving.

- **Reset (5) -** This resets the Expected Amt value to zero to restart the calibration.

- **Calibrate Accept (6) -** This applies the calculated new calibration value to the selected section.

- **Apply All Sects (7) -** This applies this section's calibration number to all other sections.

- **Current/New Cal (8) -** The existing and calculated new calibration values are displayed here.

FIG. 2-53

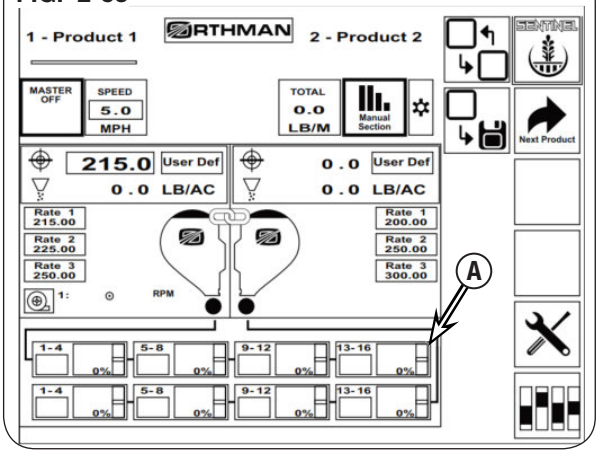


FIG. 2-54

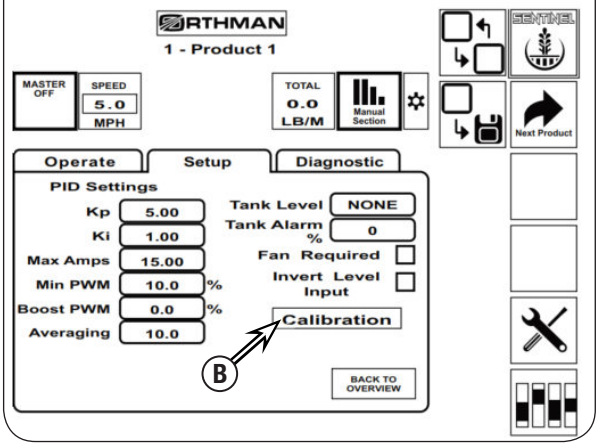
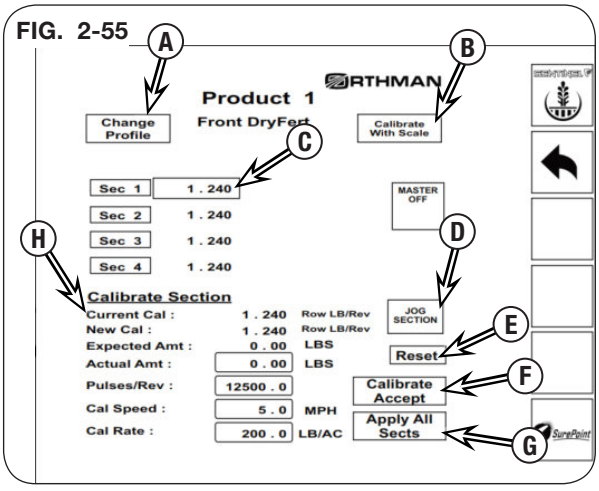


FIG. 2-55



Rate Controller Set Up (Continued)

Expected Amt (9) - This value increments as the section is jogged. It is the amount metered out based off of the current calibration number.

Actual Amt (10) - After the section is jogged and the amount is caught and weighed, the value is entered here to calculate a new calibration value.

Pulses/Rev (11) - This is the number of pulses from the encoder for a full revolution of the output of the gear motor. This value should be set to 12 500 unless otherwise specified.

Cal Speed/Rate (12) - For a more accurate calibration, average expected tractor speed and application rate should be entered here so the section turns at the appropriate speed during the calibration.

Name Text Entry (13) - Click on the text entry bar to edit the name of the profile.

Left/Right Arrows (14) - Used to navigate through the available profiles.

Select Profile (15) - After a profile is found, created, or altered, this button must be pressed to load the profile; otherwise, whatever is already selected for this bin will be active.

Delete Profile (16) - Deletes the profile in the text entry bar, an active profile can't be deleted.

Create New (17) - Creates a new profile with the name "Profile #". The name can be clicked and changed. Select Profile must be pressed if the user wants to load the newly created profile.

FIG. 2-56

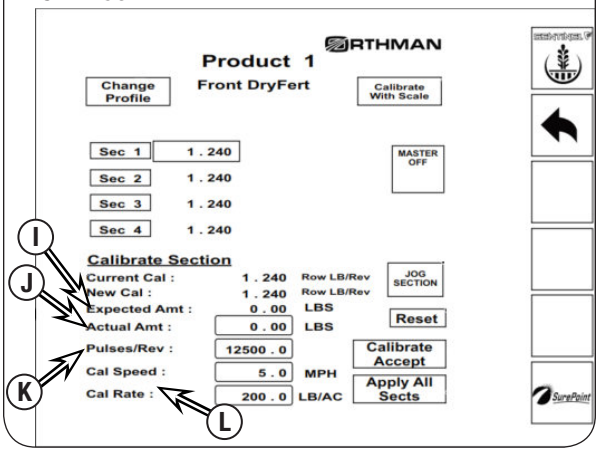
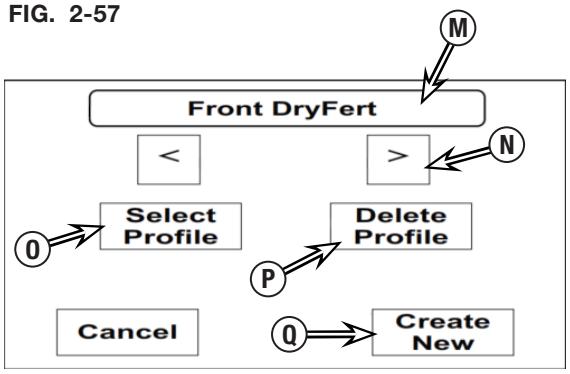


FIG. 2-57



Rate Controller Set Up (Continued)

2. Press the Change Profile button to rename the profile, select another profile, or create a new one. The name will appear as “Default” unless other profiles have been set up.

3. If the profile you wish to calibrate is already selected, then press cancel. If not, use the navigation arrows to select the one you want to calibrate and then press Select Profile.

4. To calibrate, you will be jogging each section for a period of time and entering the weight of the amount caught. Enter the average tractor speed and application rate you will be using for this product before performing catch tests.

5. Once this has been set up, open the venturi cleanout for that section and place a bucket, bag, or other container underneath to catch the product as it drops. The section can only be jogged with the Master Switch enabled. The jog can be activated on\ the calibration screen or the physical push button on the machine. You must press and hold the button until the desired amount is caught. It is recommended that at least 20 lbs is caught for the calibration. The higher the amount, the more accurate the catch test will be.

6. Weigh the amount caught during the jog, subtract any weight added by the container, and enter that value in the Actual Amt entry bar. Once this is done, the New Cal value will be updated on the screen.

7. Pressing the Calibrate Accept button will apply the new calibration value to the section. Another calibration can be ran if necessary to check the new value.

8. Steps 4–8 can be repeated for all the sections. Press the desired next section to calibrate (Sec 1, Sec 2, Sec 3, Sec 4 buttons). Each section should be individually calibrated because motor and mechanical differences will necessitate different calibration numbers.

NOTE: If at any time the calibration screen is left during a calibration, the calibration will be aborted

Rate Controller Set Up (Continued)

NOTE: This feature can be used to adjust calibration across all the sections by comparing the calculated amount applied against the scale value. This is not meant to replace the individual section calibration on startup but allows the user to fine tune the overall machine calibration.

1. Navigate to the calibration page (refer to Section Calibration for navigation). Press the Calibrate With Scale button (1)

2. When entering this screen, you will need to have the proper profile loaded already. If not, click the Change Profile button to select a desired profile

3. To start the calibration, you must have the tractor stopped and no motion on the scale. If there is an issue, a warning will display in red on the bottom of the screen. Press the Begin Cal button to begin

4. The following screen will appear to show that the scale assisted calibration is ready to begin. At any time, Cancel Cal (2) can be pressed to stop the process.

5. Once calibration has been started, you can navigate away from the calibration screen and apply product in the field. You must run at least 1000 lbs before a new calibration value will be calculated

6. Navigate back to the calibration page, bring the tractor to a stop, and let the load cells stop moving. If more than 1000 lbs has been reported as ran, press the Calculate Cal button. An adjustment factor will be calculated. This adjustment factor will be what is applied to the calibration number of each section. Press Accept Cal (3) to apply the adjustment to the calibration profile.

7. Press the Section Calibrate to display the normal section calibration dialog.

FIG. 2-58

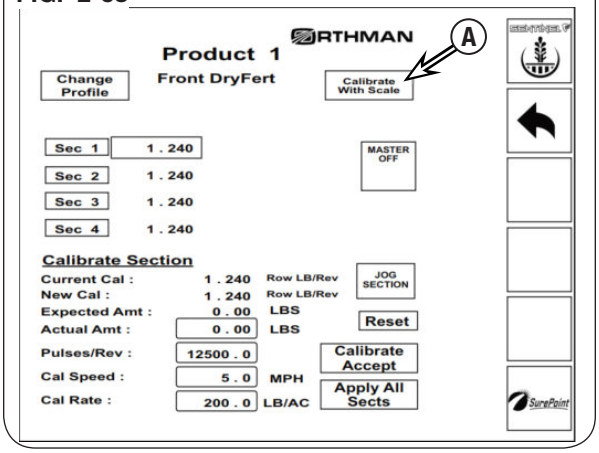


FIG. 2-59

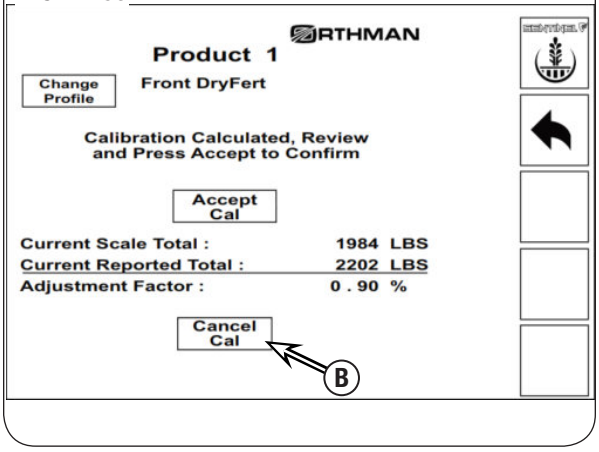
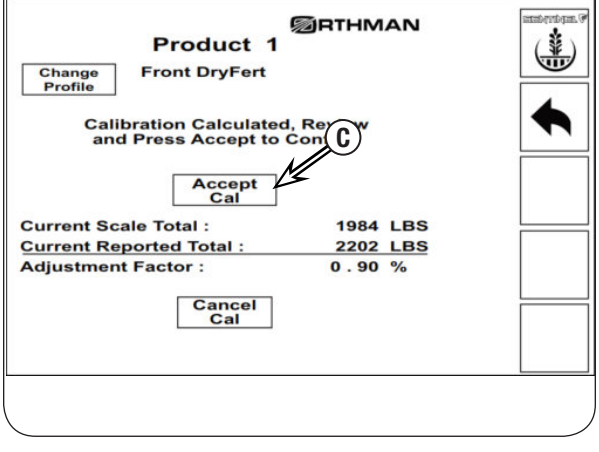


FIG. 2-60



Fertilizer Flow Monitor Installation

1. Disassemble the bracket of the monitor by removing the two side nuts.

2. Clean the installation surface with a cloth and alcohol.

3. Remove the film from the double-sided tape and fasten the bracket to the surface by pressing the whole area of the tape.

4. Wait for 15 minutes and then mount the monitor on the bracket with the two side nuts.

5. If you install the bracket over a glass surface, put the anti-UV tape on the opposite side of the glass in order to protect the double-sided tape from the sun.

6. Press the power button to turn on the monitor and hold it for 5 seconds to turn it off.

Fertilizer Flow Monitor Setup

NOTE: Do not install the blockage sensor flat. This will cause sensor wake-up issues.

1. Cut a piece of the hose at the diffuser side with the length of the sensor-coupler assembly, so that the total length will be the same as the original hose

2. Place the sensor with the internal antenna facing “up” or “skyward” (1). The internal antenna is located to the left of the square patch with “P” and “L” between the “J” and “A” of the word J. Assy

3. Securely fasten the rubber couplers with the metal clamps (2).

NOTE: Do not point or align the sensor antenna toward a metal barrier. This could degrade the communication efficiency from the sensor to the monitor.

FIG. 2-61

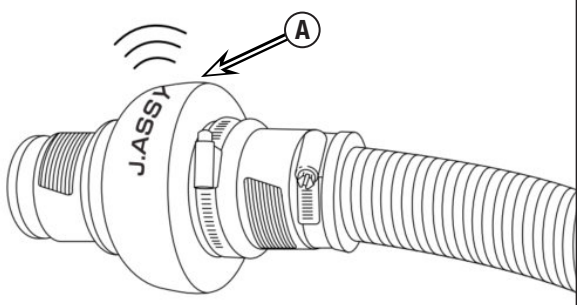
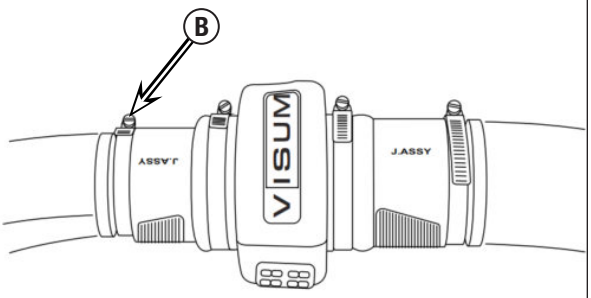


FIG. 2-62



SECTION III
Operation

General Operation Information

WARNING

- **READ AND UNDERSTAND SAFETY RULES BEFORE OPERATING OR SERVICING THIS MACHINE. REVIEW "SAFETY" SECTION IN THIS MANUAL IF NECESSARY.**

Read this operation section thoroughly. Acquaint yourself with the adjustments required to obtain efficient and trouble-free operations.

Preparing Tractor

WARNING

- **TRANSPORTING THE IMPLEMENT SIGNIFICANTLY CHANGES THE WEIGHT AND BALANCE OF YOUR TRACTOR. MAKE SURE THE TRACTOR IS PROPERLY BALLASTED.**
- **DO NOT EXCEED THE TRACTOR'S LIFT CAPACITY OR BALLAST RECOMMENDATIONS.**

Read this operation section thoroughly. Acquaint yourself with the adjustments required to Before operating implement, refer to tractor operator's manual for information concerning safe methods of operation, hitch adjustment, tire inflation, wheel adjustments, and tractor weights.

Check tractor brakes and transport lights. Make sure they are in proper working order.

Preparing Implement

Perform the service checks as outlined below. Repair or replace any damaged or worn parts before operating.

• Bolts And Nuts

Before going to the field, check all hardware for tightness. Recheck all bolts for tightness, after the unit has been operated for several hours.

• Pins

Before going to the field, check that all pins are in place and are in good condition. Replace any worn, damaged, or missing pins.

Check that locking hardware for pins are in place and tight.

• Lubrication

Lubricate unit as outlined in MAINTENANCE section.

Ladder Position

WARNING

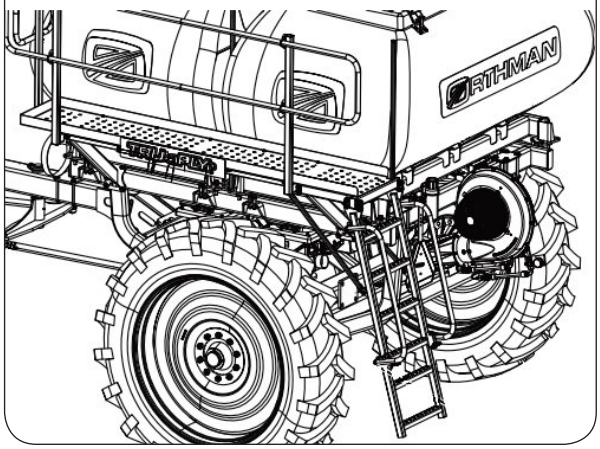
- **KEEP HANDS CLEAR OF PINCH POINT AREAS.**

1. Park the unit on a firm, level surface, then set the tractor's parking brake and remove the key.

1. Pull the ladder locking pin out and slowly fold the ladder into the down positon. (Fig. 3-1)

2. Once the ladder is in the down position, re-insert the locking ladder locking pin. (Fig. 3-1)

FIG. 3-1



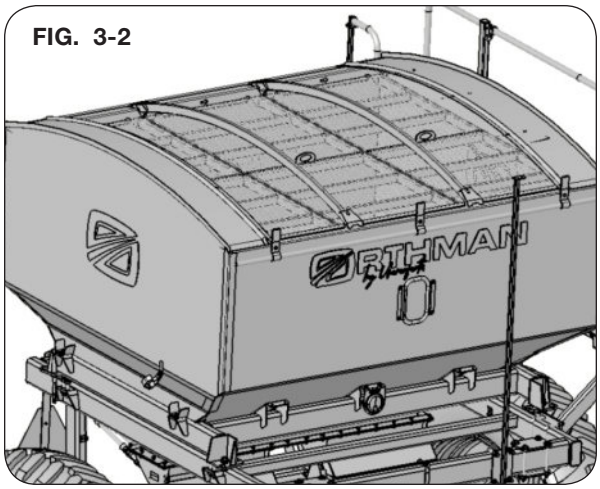
Filling The Hopper

⚠ WARNING

- **TO PREVENT PERSONAL INJURY OR DEATH, DO NOT ALLOW ANYONE ON A CLOSED TARP. TARP SYSTEM IS NOT DESIGNED TO SUPPORT A PERSON.**

1. Park the unit on a firm, level surface, then set the tractor's parking brake and remove the key.
2. Make sure fan and meters are turned off, then open the tarp.
3. Keep the hopper screen (Fig. 3-2) in place to prevent larger debris (stones, clumps, etc.) from getting into the tank that could damage or plug the meter wheels and air hoses.
4. Fill hopper with the correct amount of fertilizer needed for the day. Hopper should be emptied at the end of each day to prevent crusting and corrosion.
5. After filling hoppers, close the tarp.

FIG. 3-2



Fan Speed

NOTE: There are two pressure gauges on the unit, one on the front of the dry hopper and one connected to the hydraulic pressure line.

1. Set the fan speed as close to 28 inches of water as possible using the SCV on the tractor
2. Fan does have the ability to spin down to a stop. It is recommended that the hydraulics be shut down into float

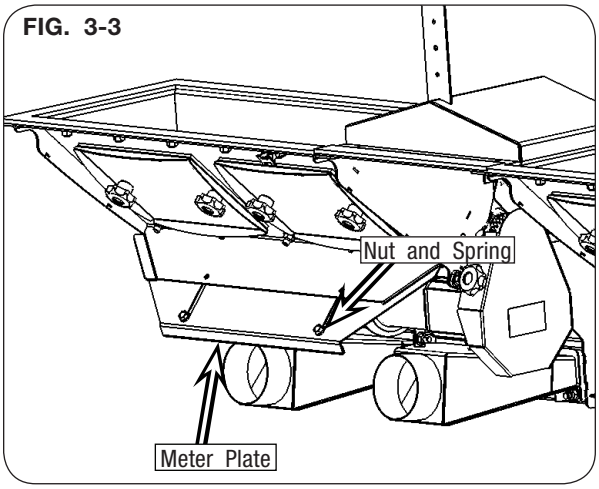
Meter Housing Flow

WARNING

- **EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING IMPLEMENT.**
- **KEEP HANDS CLEAR OF PINCH POINT AREAS.**

1. Park the unit on a firm, level surface, then set the tractor's parking brake and remove the key.
2. Pull meter gate to the open position.
3. Make sure that the only meter gates that are open are the ones with the meter wheels.
4. When all fertilizer has been used from the machine, push meter plate into the closed position.

FIG. 3-3



Fertilizer Flow Monitor Operation

The visum monitor (1) communicates with the fertilizer flow sensors indicating the presence or absence/blockage of fertilizer flow

When the monitor is turned on, the monitor should display “00“ and both LED’s should be OFF, indicating that no sensor has communicated with the monitor.

Under normal conditions (sensors communicating and indicate flow), the display shows two dashes and the LED of respect function (fertilizer or seed) will light up green, indicating that everything is correct.

FIG. 3-4

The monitor only communicates with sensors assigned to its ID, which is on a label on the back of the monitor.

In case of flow failure (absence or blockage), the monitor will beep and the display will show the row number. Also, the LED related to the flow product (seed or fertilizer) will turn red.

If the sensor loses the communication for more than 5 minutes, the monitor will indicate missing sensor. In that case, the monitor will beep and the display will show the row number. Also, the LED related to the flow product (seed or fertilizer) will blink blue. If the monitor is power cycled, this sensor will no longer be listed.

In case of a MANEUVER state, a light will be whirling on the display and the LED related to the flow product (seed or fertilizer) will turn green

The monitor will enter into a MANEUVER state if 75 percent of the rows (or more than 8 sensors, if the implement has more than 12 rows) indicate no flow at the same time.

The monitor gets out of the MANEUVER state when more than 50 percent of the sensors indicate the presence of flow.

To extend the life of the internal batteries, flow sensors will enter a “sleep mode” when they are not in use. They wake up only when they detect motion.

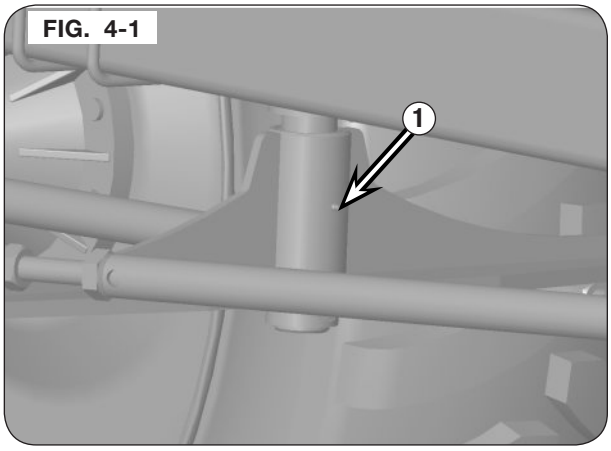
SECTION IV
Maintenance

Lubrication

Lubrication Service Intervals			
Item		# of Grease Points	Interval (Hours)
1	Front Steering Knuckle	1	50
2	Rear Steering Knuckle	1	50
3	Steering Linkages	8	50

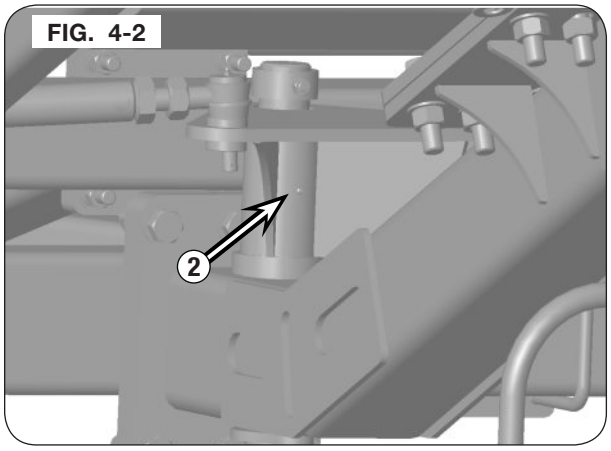
Front Steering Knuckle

FIG. 4-1



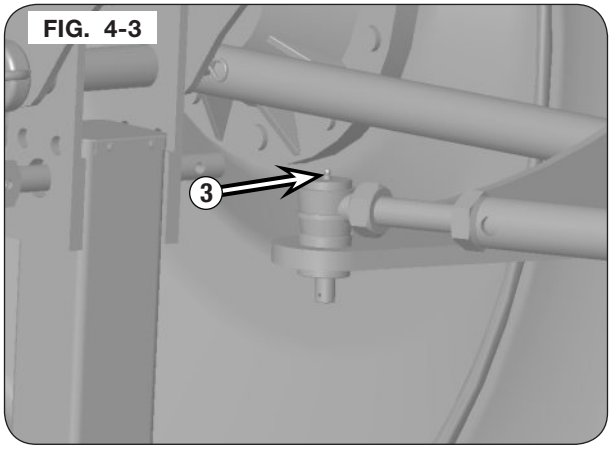
Rear Steering Knuckle

FIG. 4-2



Steering Linkages

FIG. 4-3



Metering Housing Cleaning

WARNING

- **EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING IMPLEMENT.**
- **KEEP HANDS CLEAR OF PINCH POINT AREAS.**

1. Park the unit on a firm, level surface, then set the tractor's parking brake and remove the key.
2. Close all metering gates and remove the rain shields. (Fig. 4-3)
3. Remove the gear cover, then remove the lynch pins. (Fig. 4-4)
4. Rotate the gear until clear of the wheel housing, then remove the meter assembly.
5. Clean and inspect the meter housing, then inspect for damaged or worn part. Repair or replace as needed.
6. Using air, clean the meter housing assembly.
7. Align the sprockets, then install the meter into the meter box.
8. Rotate the meter until clear of the wheel housing, then latch both Lynch pins, and install all covers. (Fig. 4-3 and 4-4)

FIG. 4-3

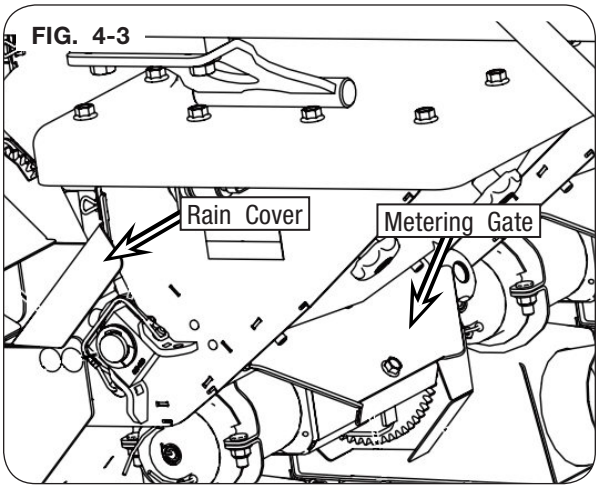
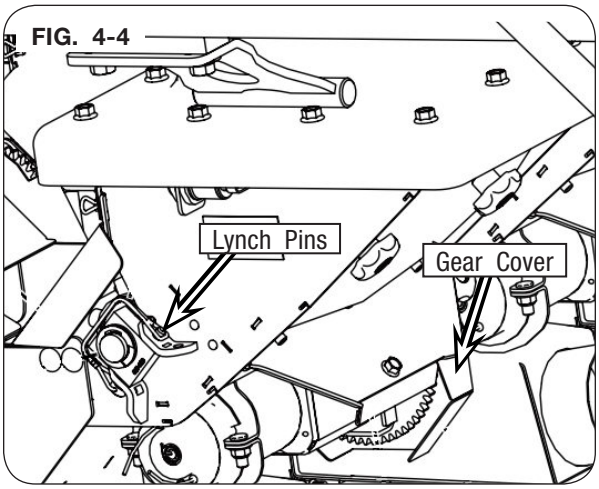


FIG. 4-4



Emptying Hoppers

WARNING

- **EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING IMPLEMENT.**
- **KEEP HANDS CLEAR OF PINCH POINT AREAS.**

1. Park the unit on a firm, level surface, then set the tractor's parking brake and remove the key.
2. Place a large enough container under the implement to catch the remaining product.
3. Close all metering gates, then open the the catch test doors to release the remaining product. (Fig. 4-5)
4. Remove the meters, see "Meter Housing Cleaning" on the previous page.
5. Remove the clean out cover, then remove any remaining product. (Fig. 4-6)
6. Once the hoppers are empty close the catch test doors, and install the meters.
7. Install and secure all covers. (Fig. 4-5 and 4-6)

FIG. 4-5

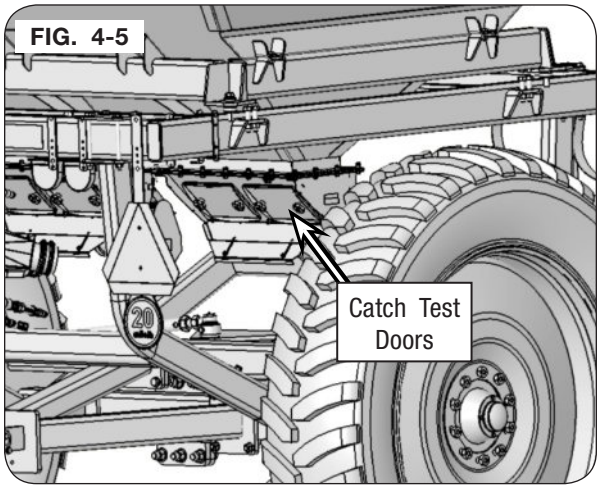
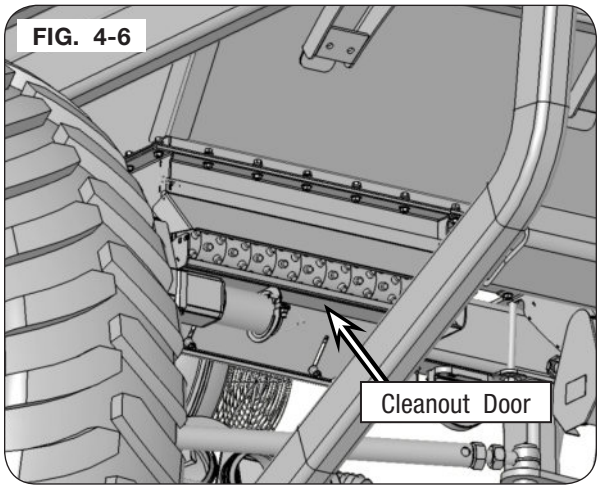


FIG. 4-6



Storage

Do the following before placing the implement in storage:

1. Remove dirt and trash which could cause rusting.
2. Repaint any chipped or scraped areas.
3. Inspect for damage or worn parts, replace before next season.
4. Store implement inside, away from livestock.
5. Replace all worn, torn or faded decals and reflectors.

Troubleshooting

Problem	Possible Cause	Corrective Action
Product being applied is lower than expected	Meter housing assembly is loosing air.	Check fan pressure. (28 in. of water) Check air hoses for leaks.
	Restricted product flow.	Product buildup from moisture. Check meter housing.
	Damaged sprockets or bearings creating slippage.	Repair or replace components as necessary.
Fertilizer flow monitor does not turn on	Inspect power cable for damage.	Repair or replace components as necessary.
	Inspect condition of fuse.	
No communication from one sensor (no show on F1 list and/or alarm with orange LED)	Sensor not connected.	Add sensor to the network with function F5.
	Monitor has a low battery.	Check power source.
	There is a faulty sensor.	Replace sensor as necessary.
Maneuver state occurs during normal operation	Flow rate settings incorrect.	Inspect the flow rate.
	Section(s) left in off position.	Inspect sections and ensure all sections are in the ON position.

Complete Torque Chart

Capscrews - Grade 5

NOTE:

- Grade 5 capscrews can be identified by three radial dashes on the head.
- For wheel torque requirements, refer to Wheels and Tires.
- Tighten U-bolts evenly and equally to have the same number of threads exposed on each end.

SIZE	FOOT POUNDS	NEWTON METERS
1/4-20 1/4-28	8-10 9-11	11-13 12-15
5/16-18 5/16-24	15-17 17-19	20-23 23-26
3/8-16 3/8-24	25-28 28-31	34-38 38-42
7/16-14 7/16-20	40-45 45-50	54-61 61-68
1/2-13 1/2-20	62-68 68-75	84-92 92-102
9/16-12 9/16-18	90-98 100-110	122-133 134-148
5/8-11 5/8-18	120-135 124-137	162-183 168-186
3/4-10 3/4-16	200-220 210-230	270-300 285-310
7/8-9 7/8-14	330-350 360-380	425-475 460-515
1-8 1-14	500-525 540-560	675-710 730-760
1 1/8-7 1 1/8-12	600-635 665-700	815-860 920-950
1 1/4-7 1 1/4-12	850-895 940-990	1150-1215 1275-1340
1 3/8-6 1 3/8-12	1125-1175 1280-1335	1525-1590 1735-1810
1 1/2-6 1 1/2-12	1500-1560 1685-1755	2035-2115 2285-2380

IMPORTANT

- *Follow these torque recommendations except when specified in text.*

Complete Torque Chart (continued)

Capscrews - Grade 8

NOTE:

- Grade 8 capscrews can be identified by six radial dashes on the head.
- For wheel torque requirements, refer to Wheels and Tires.
- Tighten U-bolts evenly and equally to have the same number of threads exposed on each end.

SIZE	FOOT POUNDS	NEWTON METERS
5/16-18 5/16-24	20-22 21-23	27-30 28-31
3/8-16 3/8-24	35-39 36-41	47-53 49-55
7/16-14 7/16-20	54-58 55-60	73-78 75-80
1/2-13 1/2-20	82-88 94-99	110-120 125-135
9/16-12 9/16-18	127-134 147-155	170-180 199-210
5/8-11 5/8-18	160-170 165-175	215-230 225-235
3/4-10 3/4-16	280-295 330-365	380-400 445-495
7/8-9 7/8-14	410-430 420-440	555-580 570-595
1-8 1-14	630-650 680-700	850-880 920-950
1 1/8-7 1 1/8-12	900-930 930-950	1220-1260 1260-1290
1 1/4-7 1 1/4-12	1250-1300 1280-1320	1695-1760 1735-1790

IMPORTANT

- *Follow these torque recommendations except when specified in text.*

Complete Torque Chart

Metric Capscrews - Grade 8.8

NOTE:

- Grade 8.8 capscrews can be identified by the number “8.8” on the head.
- For wheel torque requirements, refer to Wheels and Tires.
- Tighten U-bolts evenly and equally to have the same number of threads exposed on each end.

SIZE	INCH POUNDS	FOOT POUNDS	NEWTON METERS
M6	79-100		8.9-11.3
M8	194-243		22-27.5
M10		32-40	43-55
M12		55-70	75-95
M14		88-110	120-150
M16		140-175	190-240
M18		195-245	265-330
M20		275-350	375-475
M22		375-480	510-650
M24		480-600	650-820
M27		700-885	950-1200
M30		950-1200	1290-1630
M33		1300-1625	1750-2200
M36		1650-2100	2250-2850

IMPORTANT

- *Follow these torque recommendations except when specified in text.*

Complete Torque Chart

Metric Capscrews - Grade 10.9

NOTE:

- Grade 10.9 capscrews can be identified by the number “10.9” on the head.
- For wheel torque requirements, refer to Wheels and Tires.
- Tighten U-bolts evenly and equally to have the same number of threads exposed on each end.

SIZE	INCH POUNDS	FOOT POUNDS	NEWTON METERS
M6	115-146		13-16.5
M8		23.5-29.5	32-40
M10		46-59	63-80
M12		80-105	110-140
M14		130-165	175-220
M16		200-255	275-350
M18		275-350	375-475
M20		390-500	530-675
M22		535-680	725-920
M24		680-850	920-1150
M27		1000-1250	1350-1700
M30		1350-1700	1850-2300
M33		1850-2325	2500-3150
M36		2350-3000	3200-4050

IMPORTANT

- *Follow these torque recommendations except when specified in text.*

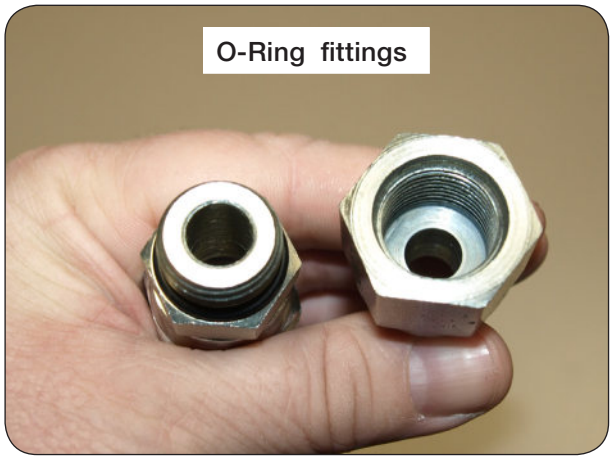
Hydraulic Fittings – Torque and Installation

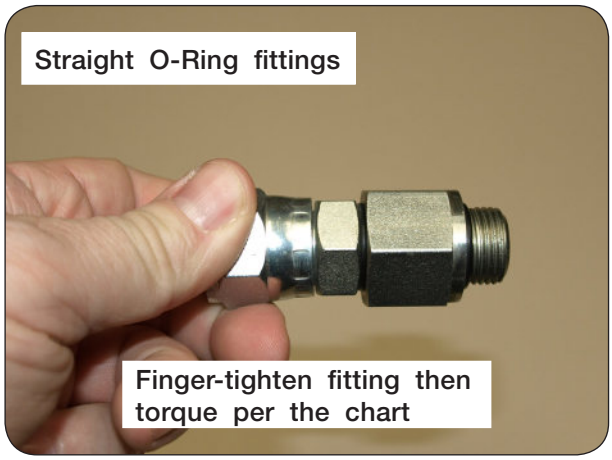
Tightening O-Ring Fittings

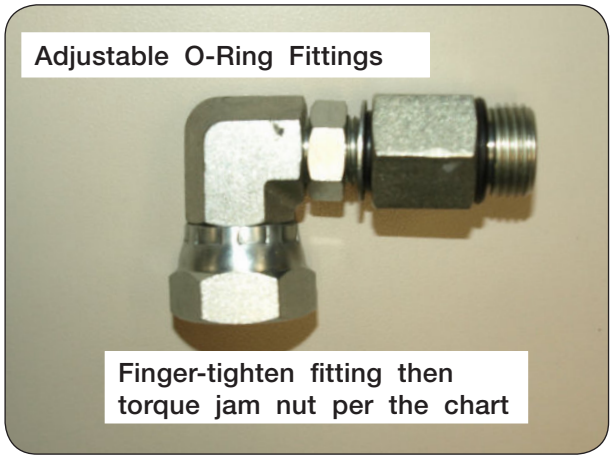
1. Inspect components for damage or contamination. Do not connect any other type of fitting to an O-ring fitting.
2. For adjustable fittings, insure the jam nut and washer are fully backed up.
3. Lubricate the O-ring and threads on the fitting.
4. Turn the fitting into the port until it is finger tight.
5. For adjustable fittings, set in the desired position.
6. Using a wrench, torque the fitting to the value in the below table. For adjustable fittings the jam nut will be tightened.

Note: Never use a power tool to install a fitting.

Dash Size	Thread Size	Straight Stud Torque (Ft-Lbs)	Adjustable Stud Torque (Ft-Lbs)
-5	1/2-20	14-19	10-14
-6	9/16-18	18-24	12-16
-8	3/4-16	27-43	20-30
-10	7/8-14	36-48	30-36
-12	1-1/16-12	65-75	44-54
-14	1-3/16-12	75-99	53-70
-16	1-5/16-12	85-123	59-80
-20	1-5/8”-12	115-161	75-100
-24	1-7/8”-12	125-170	105-125







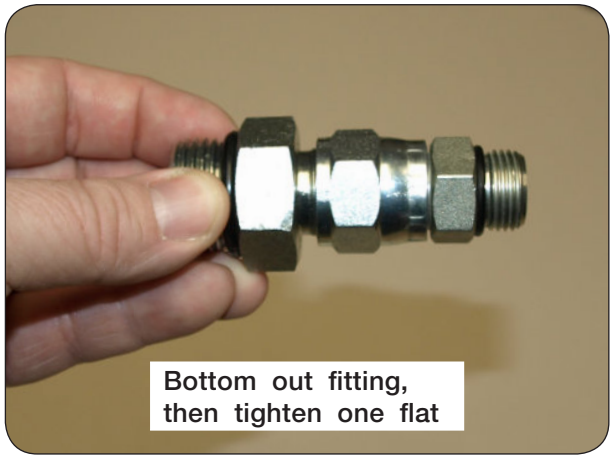
Hydraulic Fittings – Torque and Installation

Tightening JIC Fittings

1. Inspect all components for damage or contamination. Do not connect any other type of fitting to a JIC fitting.
2. Lubricate the threads.
3. Turn the fitting into the port until it bottoms out.
4. Use one wrench on the fixed hex on the hose to prevent twisting and a second on the swivel. Tighten the fitting another 60 degrees (or one flat)

Note: Never use a power tool to install a fitting

JIC fittings

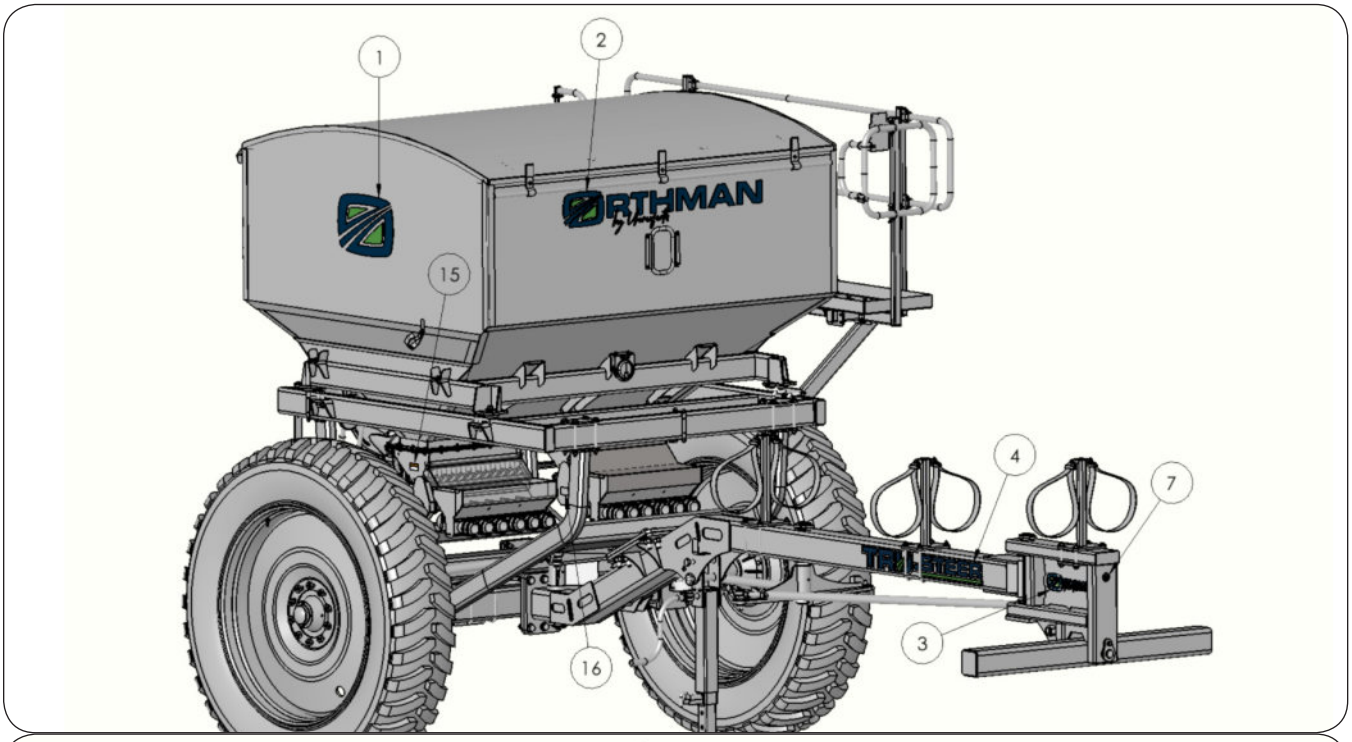


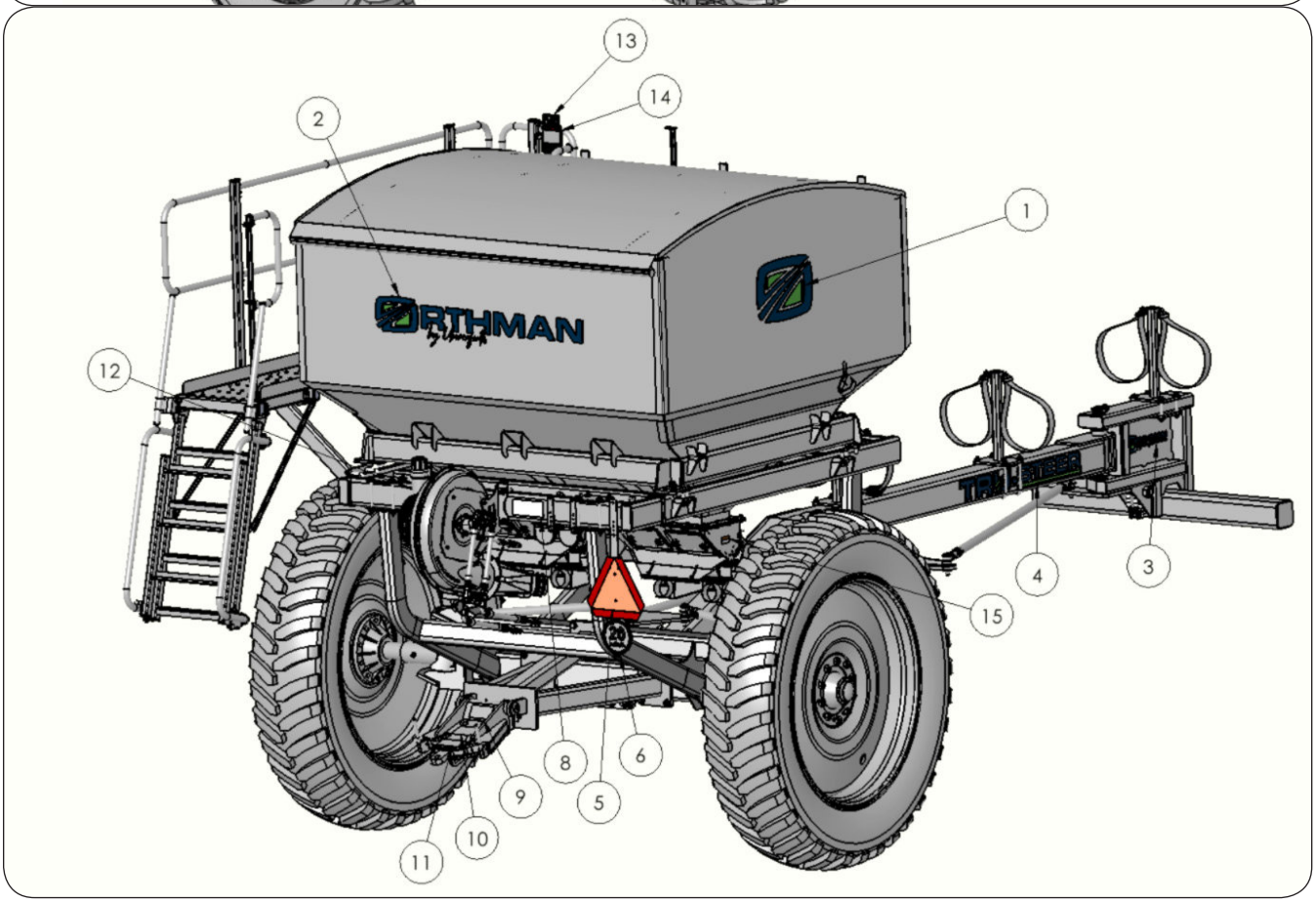
Bottom out fitting, then tighten one flat

SECTION V
Parts

Decals

Please visit www.unverferth.com/parts/ for the most current parts listing.





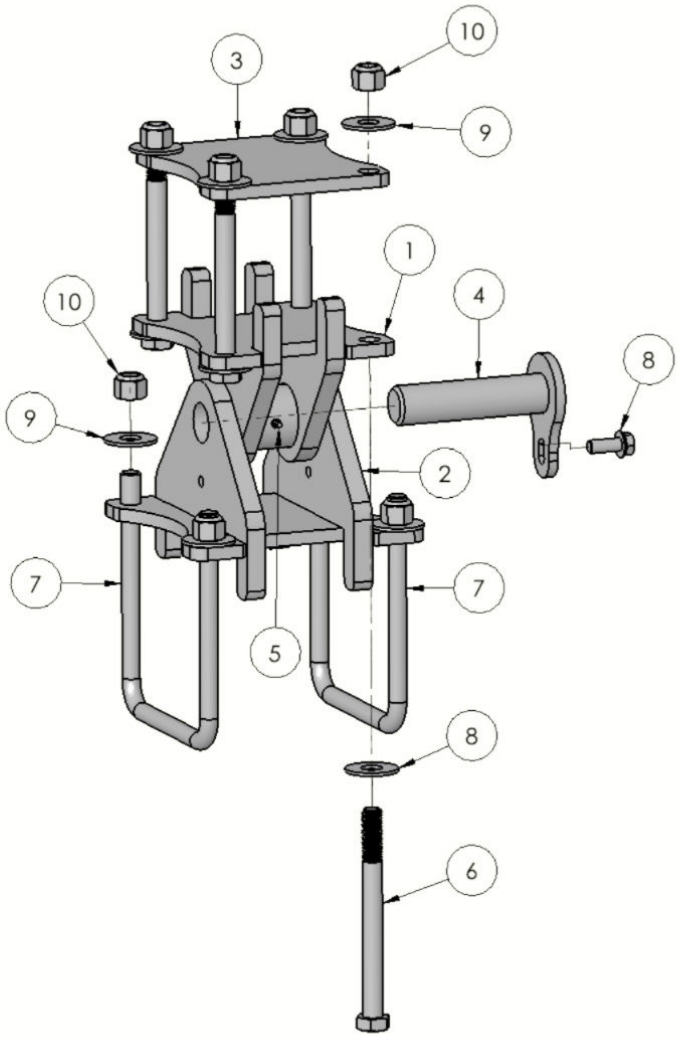
Decals

Please visit www.unverferth.com/parts/ for the most current parts listing.

ITEM	PART NO.	DESCRIPTION	QTY	NOTES
1	L153-497	Orthamn Logo Decal	2	
2	L153-499	Large Orthamn Decal	2	
3	L153-430	Small Orthman Decal	2	
4	L153-810	Tru-Steer Decal	2	
5	L153-109	SMV Emblem	1	
6	L9008714	Rear SIS Decal, MPH	1	
		Rear SIS Decal, KPH		
7	L9008715	Front SIS Decal, MPH	1	
		Front SIS Decal, KPH		
8	L153-528	Hydraulic Pressure Warning Decal	1	
9	L153-047	Payload Warning Decal	1	
10	L153-574	Safety Equpiment Warning Decal	1	
11	L153-048	Liquid/Vapor Warning Decal	1	
12	L153-256	Read Operator Manual Decal	1	
13	L98350	No Riders Warning Decal	1	
14	L9008838	Collapsing Danger Decal	1	
15	L153-529	Crushing Hazard Warning Decal	1	
16	L153-045	Sharp Edges Caution Decal	1	

Tongue Swivel Components

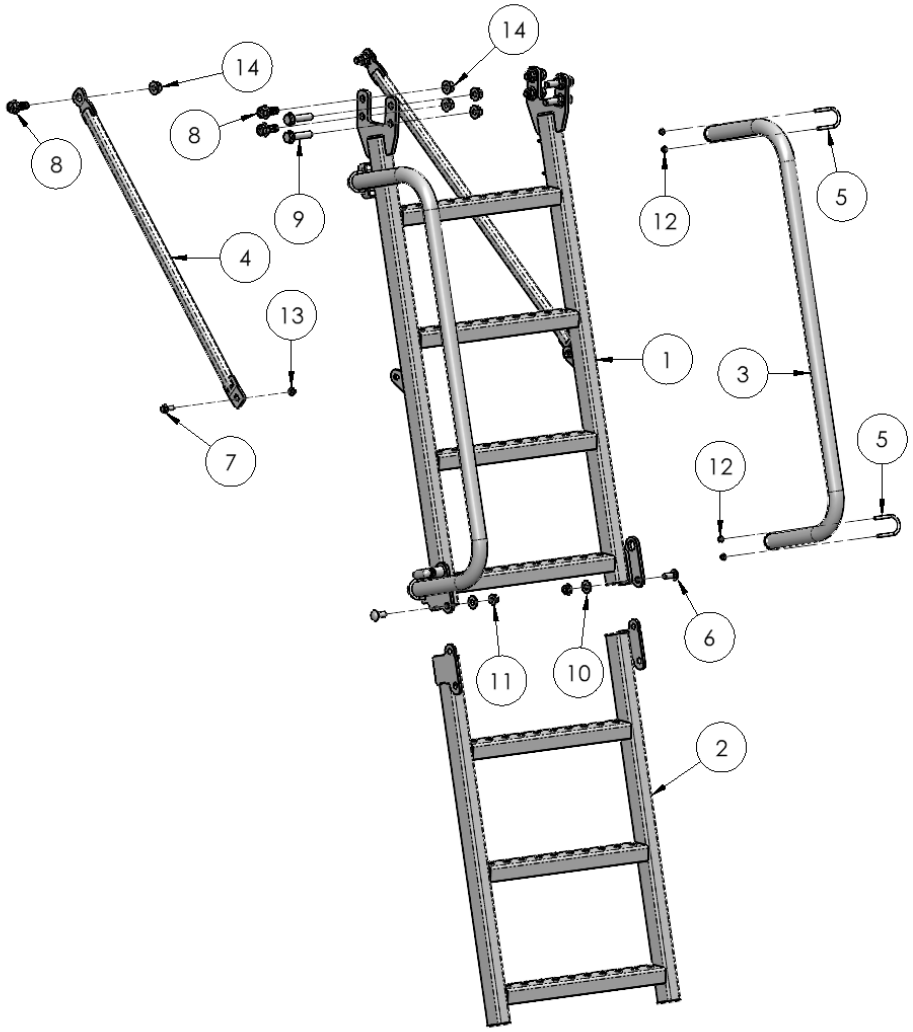
Please visit www.unverferth.com/parts/ for the most current parts listing.



ITEM	PART NO.	DESCRIPTION	QTY	NOTES
1	L352-893	Tongue Swivel Upper Weldment	1	
2	L352-894	Tongue Swivel Lower Weldment	1	
3	L352-897	Tongue Swivel Clamp Plate	1	
4	L321-670	Tongue Swivel Pivot Pin	1	
5	L110-001	Grease Fitting	1	
6	L100-204	Capscrew, 3/4"-10UNC x 8" Grade 5	4	
7	L315-031	U-Bolt, 3/4"-10UNC 7" x 7" Tube	2	
8	L100-305	Flange Bolt, 1/2"-13UNC x 1" Grade 8	1	
9	L108-011	Flat Washer, 3/4"	12	
10	L102-215	Lock Nut, 3/4"-10UNC	12	

Ladder Components

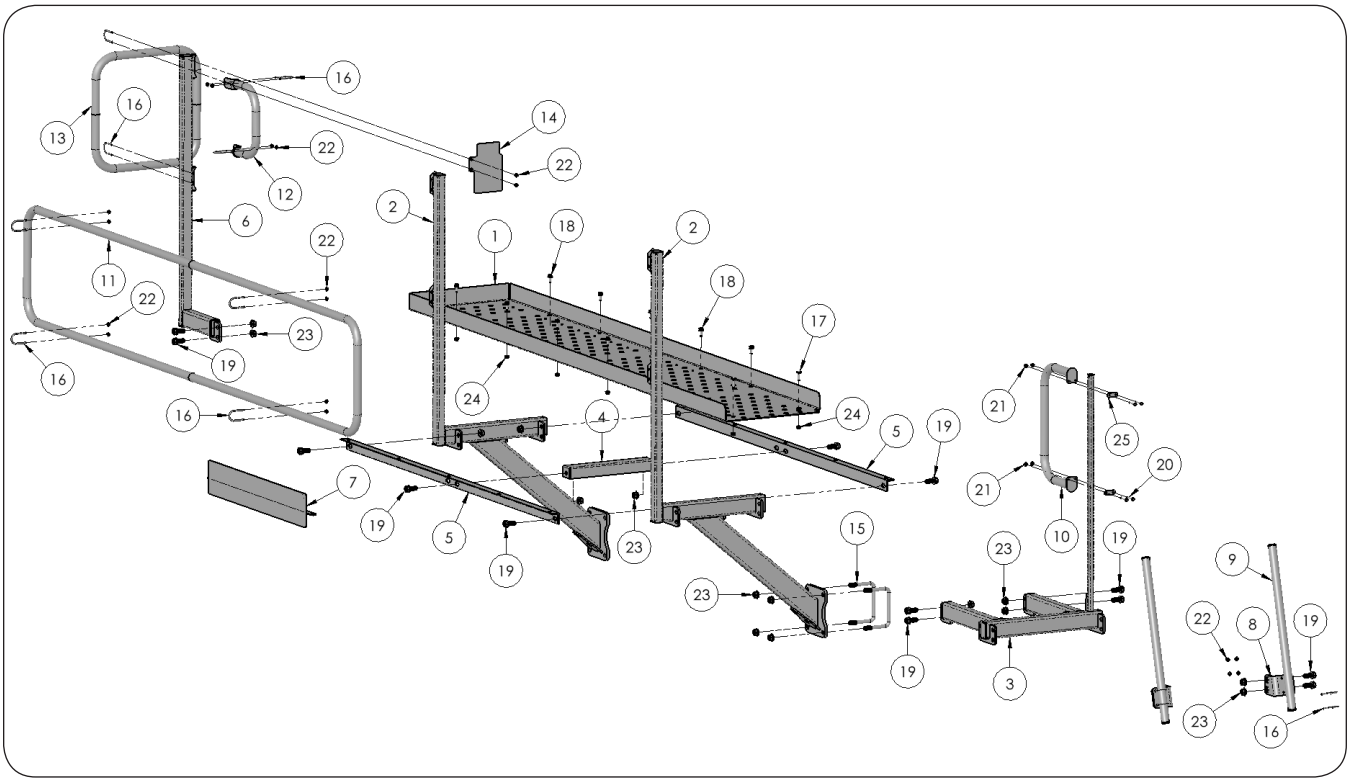
Please visit www.unverferth.com/parts/ for the most current parts listing.



ITEM	PART NO.	DESCRIPTION	QTY	NOTES
1	L368-1051	Upper Ladder	1	
2	L368-1386	Lower Ladder	1	
3	L368-1060	Handrail	2	
4	L368-611	Ladder Support	2	
5	L368-256	U-Bolt,	4	
6	L100-012	Carriage Bolt, 1/2"-13UNC x 1 1/4" Grade 5	2	
7	L100-627	Capscrew, 1/2"-13UNC x 3/4" Grade 5	2	
8	L100-732	Capscrew, 5/8"-11UNC x 1 1/2" Grade 8	6	
9	L100-325	Capscrew, 5/8"-11UNC x 2 1/8" Grade 8	4	
10	L108-075	Flat Washer, 1/2" SAE Stainless	2	
11	L102-112	Flange Nut, 1/2"-13UNC Grade 5	2	
12	L102-085	Flange Nut, 1/4"-20UNC Grade 2	4	
13	L102-114	Locking Flange Nut, 3/8"-16UNC Grade 2	2	
14	L102-122	Locking Flange Nut, 5/8"-11UNC Grade 2	10	

Platform Components

Please visit www.unverferth.com/parts/ for the most current parts listing.



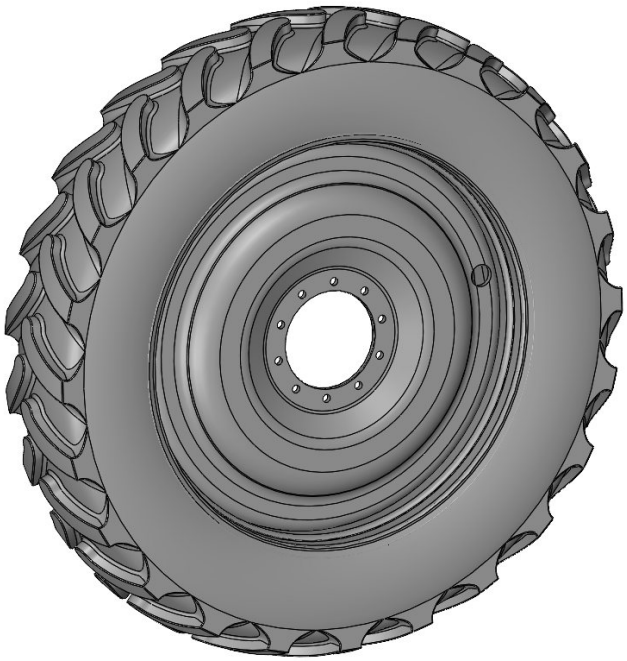
Platform Components

Please visit www.unverferth.com/parts/ for the most current parts listing.

ITEM	PART NO.	DESCRIPTION	QTY	NOTES
1	L368-546	Platform	1	
2	L368-561	Platform Support	2	
3	L368-586	Ladder Support	1	
4	L368-577	Inner Platform Support	1	
5	L368-606	Outer Platfrom Support	2	
6	L368-570	Handrail Support	1	
7	L368-639	Tru-Aplyr Decal Plaque	1	
8	L368-1397	Handrail Bracket	2	
9	L368-1399	Ladder Handrail	2	
10	L368-1392	Rear Handrail	1	
11	L368-600	Middle Handrail	1	
12	L368-1394	Front Handrail (Small)	1	
13	L368-603	Front Handrail (Large)	1	
14	L368-583	Warning Decal Plaque	1	
15	L315-428	U-Bolt, 5/8”-11UNC x 3” x 6”	4	
16	L368-256	U-Bolt, 1/4”-20UNC x 1 1/2”	12	
17	L100-006	Carriage Bolt, 3/8”-16UNC x 1 1/2” Grade 5	2	
18	L100-627	Capscrew, 3/8”-16UNC x 1” Grade 5	10	
19	L100-732	Capscrew, 5/8”-11UNC x 1 1/2” Grade 8	16	
20	L100-213	Capscrew, 1/4”-20UNC x 2” Grade 5	4	
21	L102-227	Flange Nut, 1/4”-20UNC Grade 5	4	
22	L102-085	Flange Nut, 1/4”-20UNC Grade 2	4	
23	L102-122	Flange Nut, 5/8”-11UNC Grade 5	24	
24	L102-114	Flange Nut, 3/8”-16UNC Grade 2	12	
25	L368-1393	Handrail Strap	2	

Wheels and Tires

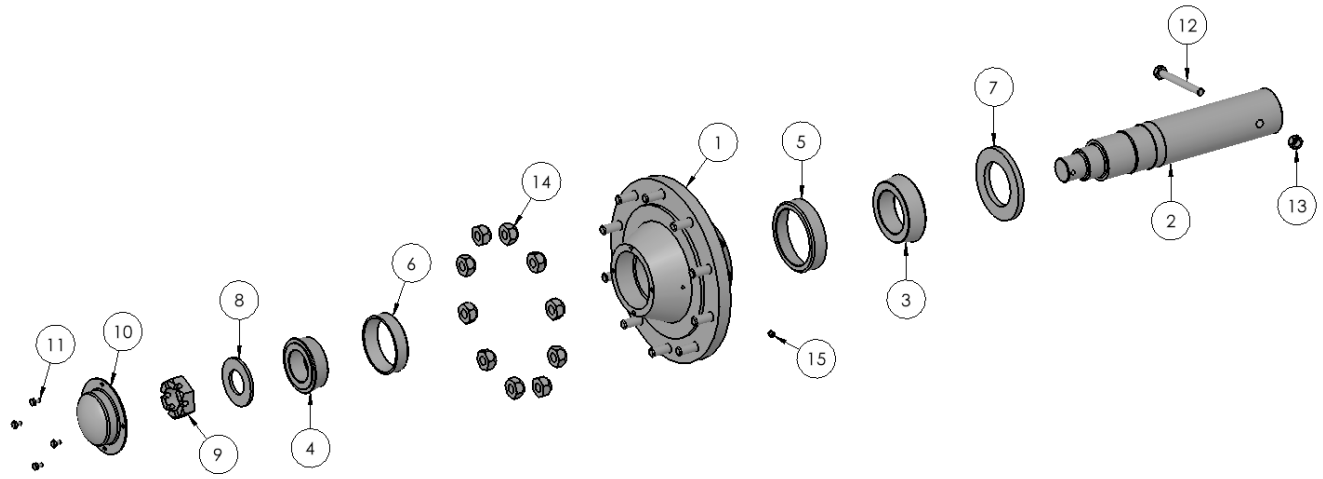
Please visit www.unverferth.com/parts/ for the most current parts listing.



ITEM	PART NO.	DESCRIPTION	QTY	NOTES
1	L857-555	380/90R 46S Wheel and Tire	2	

Hub Components

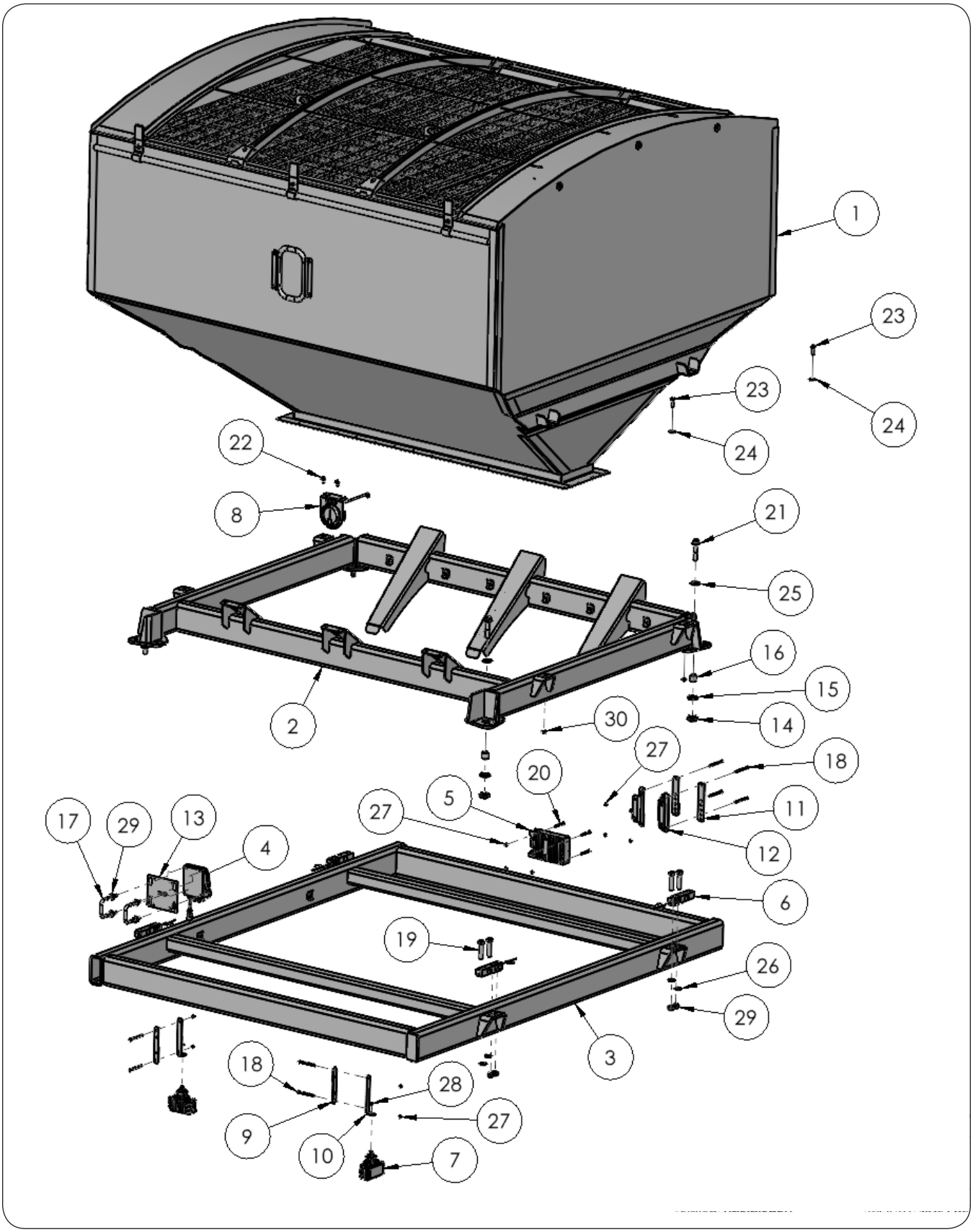
Please visit www.unverferth.com/parts/ for the most current parts listing.



ITEM	PART NO.	DESCRIPTION	QTY	NOTES
1	L170-042	Hub	1	Includes Items 5 and 6
2	L188-026	Spindle	1	
3	L120-084	Bearing	1	
4	L120-085	Bearing	1	
5	L120-087	Bearing Cup	1	
6	L120-086	Bearing Cup	1	
7	L150-142	Seal	1	
8	L134-028	Bushing, 2 1/16" x 4" x 1/4"	1	
9	L102-088	Castle Nut, 2"-12UNC Grade 2	1	
10	L150-034	Dust Cover	1	
11	L100-104	Capscrew, 5/16"-18UNC x 1/2" Grade 5	4	
12	L100-143	Capscrew, 5/8"-11UNC x 5 1/2" Grade 5	1	
13	L102-029	Locking Hex Nut, 5/8"-11UNC Grade 2	1	
14	L102-089	Hex Nut, 3/4"-16 SAE Grade 8	10	
15	L110-003	Grease Fitting	1	

Hopper and Cradle Components

Please visit www.unverferth.com/parts/ for the most current parts listing.



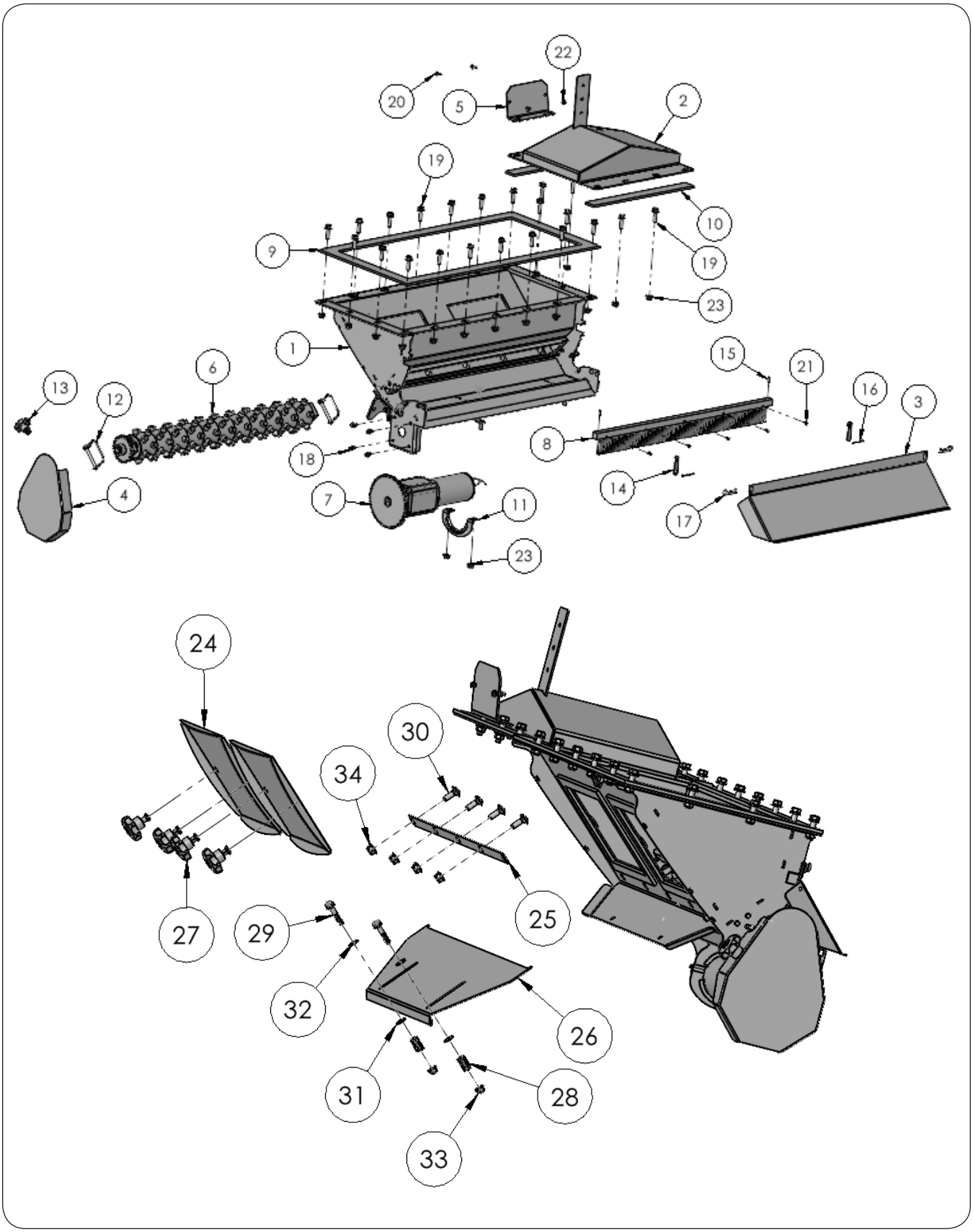
Hopper and Cradle Components

Please visit www.unverferth.com/parts/ for the most current parts listing.

ITEM	PART NO.	"DESCRIPTION	QTY	NOTES
1	47901	Hopper Assembly	1	
2	L368-355	Hopper Cradle	1	
3	L368-1151	Hopper Main Frame	1	
4	L154-885	Controller	1	
5	L154-887	Controller	1	
6	L154-875	Scale Load Cell	4	
7				
8	L368-635	Pressure Gauge Assembly	1	
9	L368-858	Flood Light Mounting Bracket	2	
10	L368-859	Flood Light Mounting Bracket	2	
11	L368-292	Controller Mounting Strap	2	
12	L368-217	Controller Mounting Plate	2	
13	L154-884	Controller Mounting Plate	1	
14	L368-346	Load Cell Spacer	4	
15	L368-356	Load Cell Thrust Washer	4	
16	L368-357	Load Cell Spacer Bushing	4	
17				
18	L100-751	Carriage Bolt, 1/4"-20UNC x 4" SS	8	
19	L100-161	Capscrew, 3/4"-10UNC x 3 1/4" Grade 5	8	
20	L100-750	Carriage Bolt, 1/4"-20UNC x 2 3/4" SS	4	
21	L100-733	Flanged Capscrew, 3/4"-16UNF x 3 1/2" Grade 8	4	
22	L100-629	Flanged Capscrew, 3/8"-16UNC x 3/4" Grade 5	2	
23	L100-116	Capscrew, 1/2"-13UNC x 1 1/2" Grade 5	4	
24	L108-009	Flat Washer, 1/2"	4	
25	L108-011	Flat Washer, 3/4"	4	
26	L108-033	Flat Washer, 3/4" SAE	8	
27	L102-617	Locking Flange Nut, 1/4"-20UNC SS	8	
28				
29	L102-215	Lock Nut, 3/4"-10UNC	12	
30	L102-028	Lock Nut, 1/2"-13UNC	4	

Metering Box Components

Please visit www.unverferth.com/parts/ for the most current parts listing.



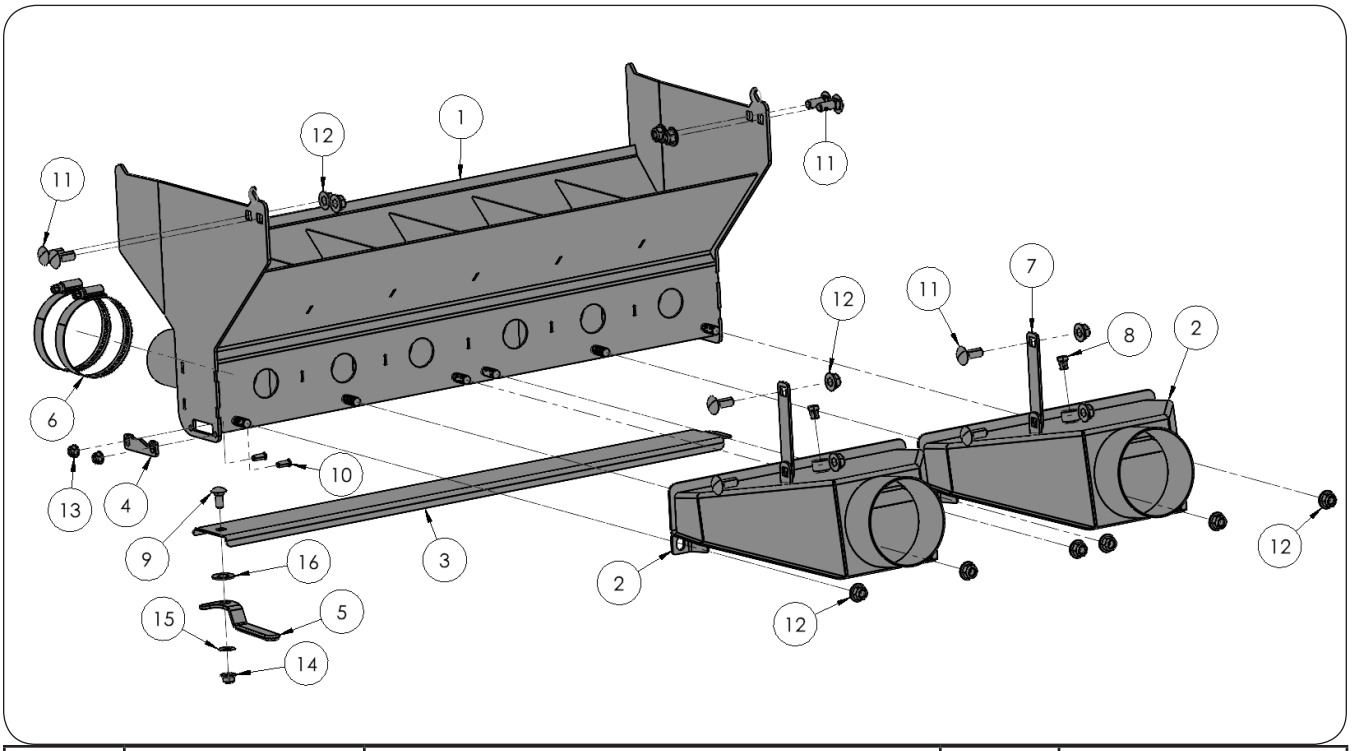
Metering Box Components

Please visit www.unverferth.com/parts/ for the most current parts listing.

ITEM	PART NO.	DESCRIPTION	QTY	NOTES
1	L368-1004	Metering Box Body	1	
2	L368-1024	Metereing Box Divider	1	
3	L368-1030	Metering Box Top Cover	1	
4	L368-400	Metering Box Motor Cover	1	
5	L368-522	Metering Box Driver Mounting Bracket	1	
6	L368-1002	Metering Box Drum	1	
7	L368-460	Metering Box Motor Assmebly	1	
8	L368-1016	Metering Box Brush	1	
9	L368-1014	Metering Box Gasket	1	
10	L368-524	Divider Gasket	2	
11	L368-501	Motor Mounting Strap	1	
12	L104-265	Lynch Pin	2	
13	L104-260	Star Grip Knob	5	
14	L368-408	Brush Holder Plate	2	
15	L104-266	Roll Pin, 1/8" x 1 1/2"	2	
16	L104-257	Cotter Pin, 1/8" x 1 1/2"	2	
17	L104-259	Cotter Pin, 1/8" x 2"	2	
18	L100-728	Capscrew, 1/4"-20UNC x 1/2" SS	4	
19	L100-729	Capscrew, 3/8"-16UNC x 1 1/4" SS	22	
20	L100-731	Capscrew, #10-24 x 3/4" SS	2	
21	L106-199	Socket Head Capscrew, #8-32 x 1/4" SS	5	
22	L102-618	Lock Nut, #10-24 SS	2	
23	L102-615	Flange Nut, 3/8"-16 SS	2	
24	L368-392	Metering Box Door Hatch	2	
25	L368-1010	Clamp Seal Plate	1	
26	L368-1013	Metering Box Gate Assembly	1	
27	L100-747	Stud Bolt, 3/8"-16UNC x 1" SS	5	
28	L148-218	Spring, SS	2	
29	L100-725	Capscrew, 5/16"-18UNC x 1 1/2" SS	2	
30	L100-726	Capscrew, 3/8"-16UNC x 1" SS	4	
31	L108-347	Flat Washer, 5/16" SS	2	
32	L108-346	Flat Washer 5/16"	2	
33	L102-616	Locking Flange Nut, 5/16"-18 SS	2	
34	L102-615	Locking Flange Nut, 3/8"-16 SS	4	

Venturi Box Components

Please visit www.unverferth.com/parts/ for the most current parts listing.



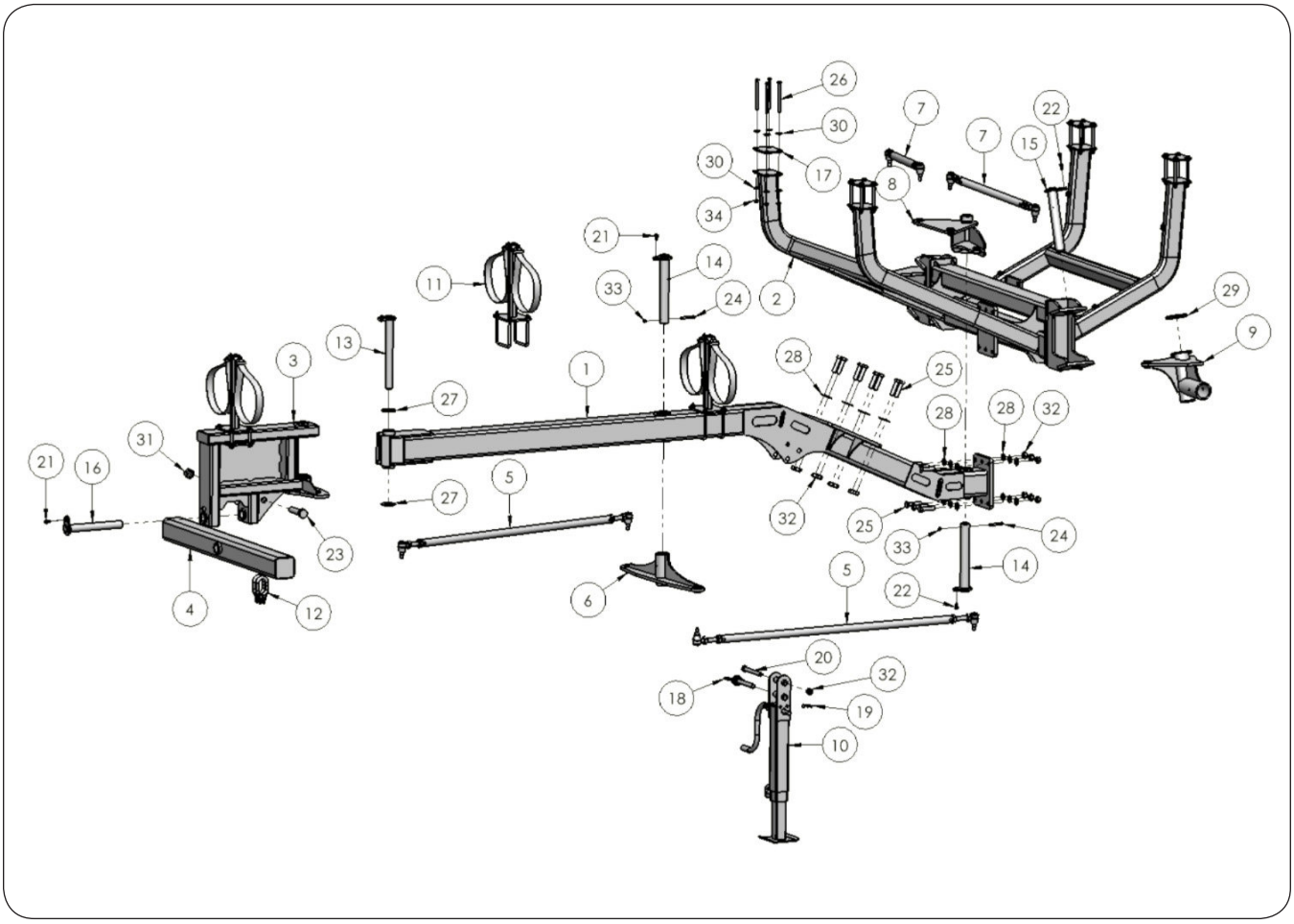
ITEM	PART NO.	DESCRIPTION	QTY	NOTES
1	L368-1019	Venturi Box Housing	2	For 12 Row Models
	L368-1032	Venturi Box Housing	2	For 16 Row Models
			1	For 8 Row Models
2	L368-622	Venturi Manifold, 3 Row	4	For 12 Row Models
	L368-415	Ventuiri Manifold, 4 Row	4	For 16 Row Models
			2	For 8 Row Models
3	L368-1023	Venturi Box Hatch	1	
4	L368-505	Venturi Box Hatch Lock	1	
5	L368-506	Venturi Box Hatch Handle	1	
6	L140-126	Hose Clamp 2 /34" to 3 5/8"	12	
7	L368-513	Venturi Manifold Hanger	2	
8	L152-992	Hex Head Plug, Hollow	2	
9	L100-727	Carriage Bolt, 5/16"-18UNC x 3/4" SS	1	
10	L100-749	Threaded Stud, 1/4"-20UNC x 5/8" SS	2	
11	L100-726	Carriage Bolt, 3/8"-16UNC x 1" SS	8	
12	L102-615	Locking Flange Nut, 3/8"-16 SS	14	
13	L102-617	Locking Flange Nut, 1/4"-20UNC SS	2	
14	L102-616	Locking Flange Nut, 5/16"-18UNC SS	1	
15	L108-346	Flat Washer, 5/16"	1	
16	L108-348	Flat Washer, 7/16"	1	

Notes

Please visit www.unverferth.com/parts/ for the most current parts listing.

Tru-Steer Cart Components

Please visit www.unverferth.com/parts/ for the most current parts listing.



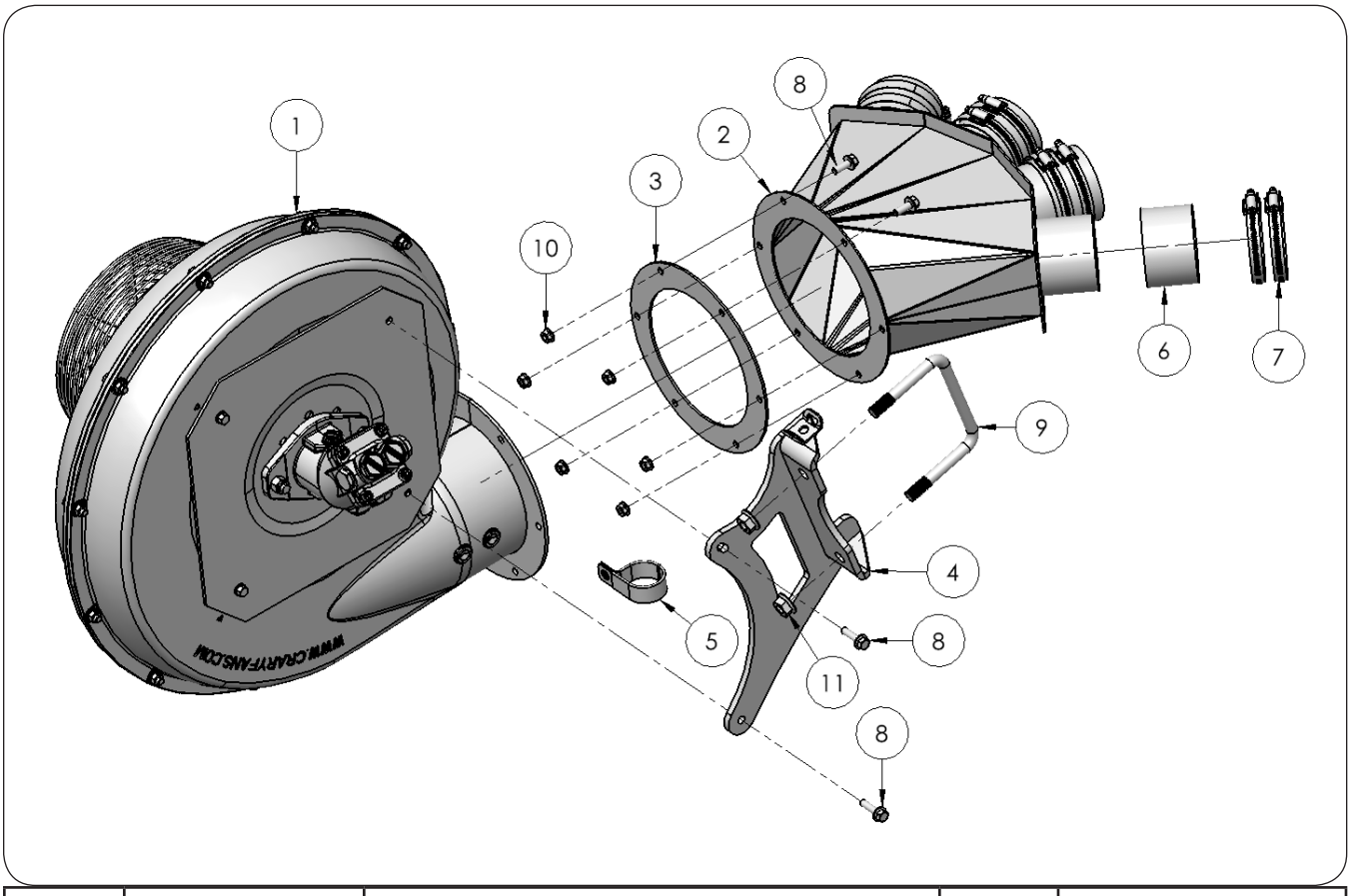
Tru-Steer Cart Components

Please visit www.unverferth.com/parts/ for the most current parts listing.

ITEM	PART NO.	"DESCRIPTION	QTY	NOTES
1	L857-251	Tru-Steer Center Arm	1	
2	L857-235	Tru-Steer Frame, 22" Spacing	1	
	L857-240	Tru-Steer Frame, 30" Spacing	1	
	L857-245	Tru-Steer Frame, 36" Spacing	1	
	L857-250	Tru-Steer Frame, 38" and 40" Spacing	1	
3	L857-615	Tru-Steer Steering Knuckle	1	
4	L857-253	Tru-Steer Hitch	1	
5	L857-014	Steering Assembly Tie Rod	2	
6	L857-614	Input Pivot Wledment	1	
7	L857-011	Steering Assembly Tie Rod	2	
8	L857-468	Rear Steering Weldment	1	
9	L857-530	Spindle, LH	1	
	L857-525	Spindle, RH	1	
10	L857-491	Jack Assembly	1	
11	L857-020	Hose Routing Loops	3	
12	L857-507	Safety Chain	2	
13	L857-483	Steering Knuckle Pin	1	
14	L857-506	Steering Weldment Pin	2	
15	L352-1024	Spindle Pin	1	
16	L857-481	Hitch Pivot Pin	1	
17	L857-417	Hopper Cradle Clamping Pad	4	
18	L857-490	Jack Pin	1	
19	L104-094	Hair Pin, 5/32" x 3 1/4"	1	
20	L100-210	Capscrew, 1"-8UNC x 3 1/2" Grade 8	1	
21	L100-696	Flanged Capscrew, 1/2"-13UNC x 1" Grade 5	3	
22	L100-697	Flanged Capscrew, 1/2"-13UNC x 1 1/4" Grade 5	2	
23	L100-088	Capscrew, 1 1/2"-6UNC x 6 1/2"	1	
24	L100-319	Caspcrew, 1/2"-13UNC x 3 3/4" Grade 8	2	
25	L100-517	Capscrew, 1"-8UNC x 4" Grade 8	14	
26	L100-148	Capscrew, 5/8"-11UNC x 8" Grade 5	16	
27	L343-123	Knuckle Pivot Bushing	2	
28	L108-004	Flat Washer, 1" SAE	14	
29	L352-1021	Spindle Bushing	4	
30	L108-010	Flat Washer, 5/8"	16	
31	L102-066	Lock Nut, 1 1/2"-6UNC	1	
32	L102-214	Lock Nut, 1"-8UNC	1	
33	L102-028	Lock Nut, 1/2"-13UNC	2	
34	L102-030	Lock Nut, 5/8"-11UNC	16	

Blower Fan Components

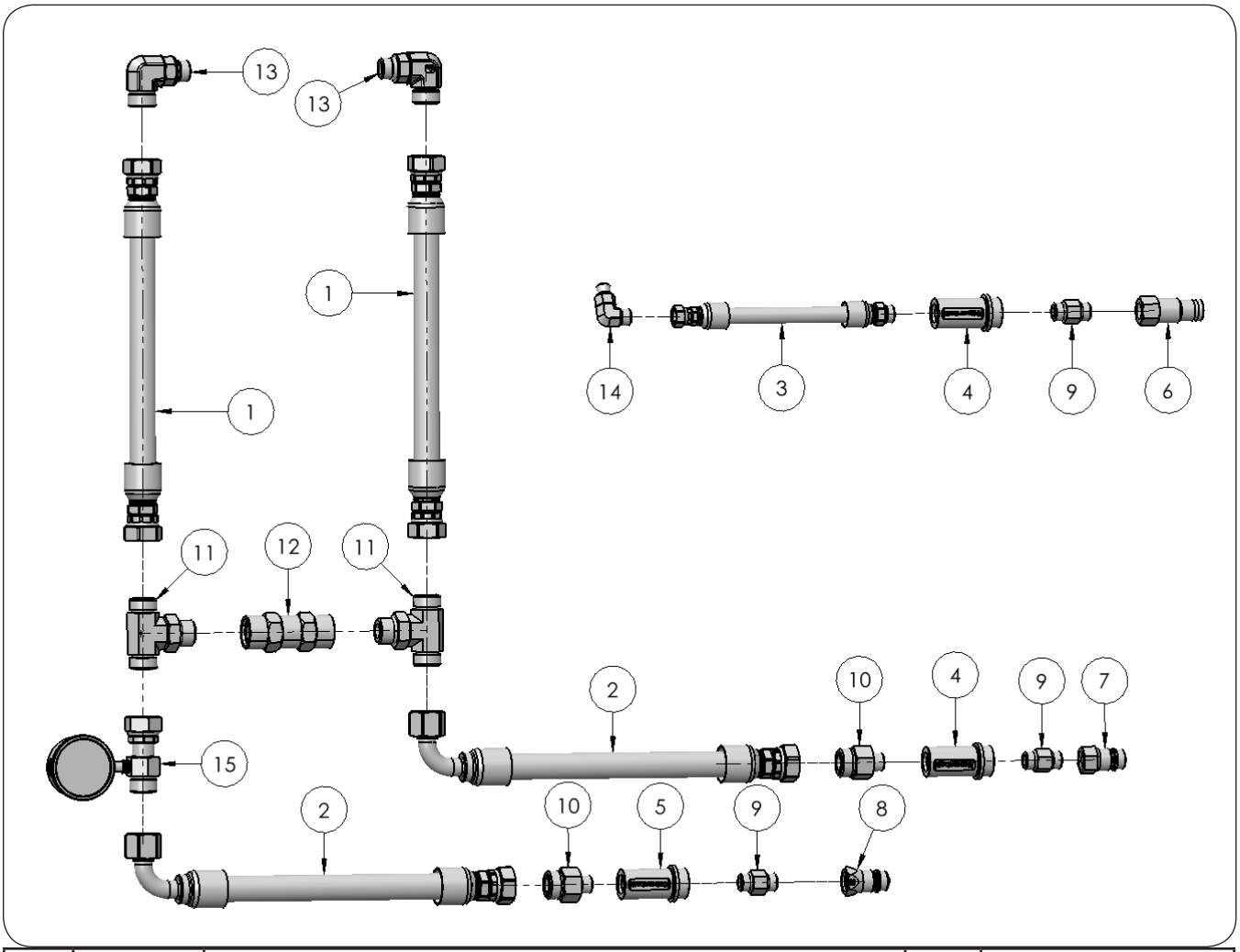
Please visit www.unverferth.com/parts/ for the most current parts listing.



ITEM	PART NO.	DESCRIPTION	QTY	NOTES
1	L180-357	Blower Fan Assembly	1	
2	L368-624	Blower Fan Manifold	1	
3	L368-437	Gasket	1	
4	L368-442	Blower Fan Mounting Bracket	1	
5	N198631	Clamp	1	
6	L368-193	Adapter Tubing, 40"	4	
7	L140-127	Hose Clamp, 3 3/4" to 4 5/8"	8	
8	L100-627	Capscrew, 3/8"-16UNC x 1" Grade 5	8	
9	L315-428	U-Bolt, 5/8"-11UNC x 3" x 6"	1	
10	L102-114	Locking Flange Nut, 3/8"-16UNC Grade 2	6	
11	L102-104	Flange Nut, 5/8"-11UNC Grade 5	2	

Blower Fan Hydraulic Components

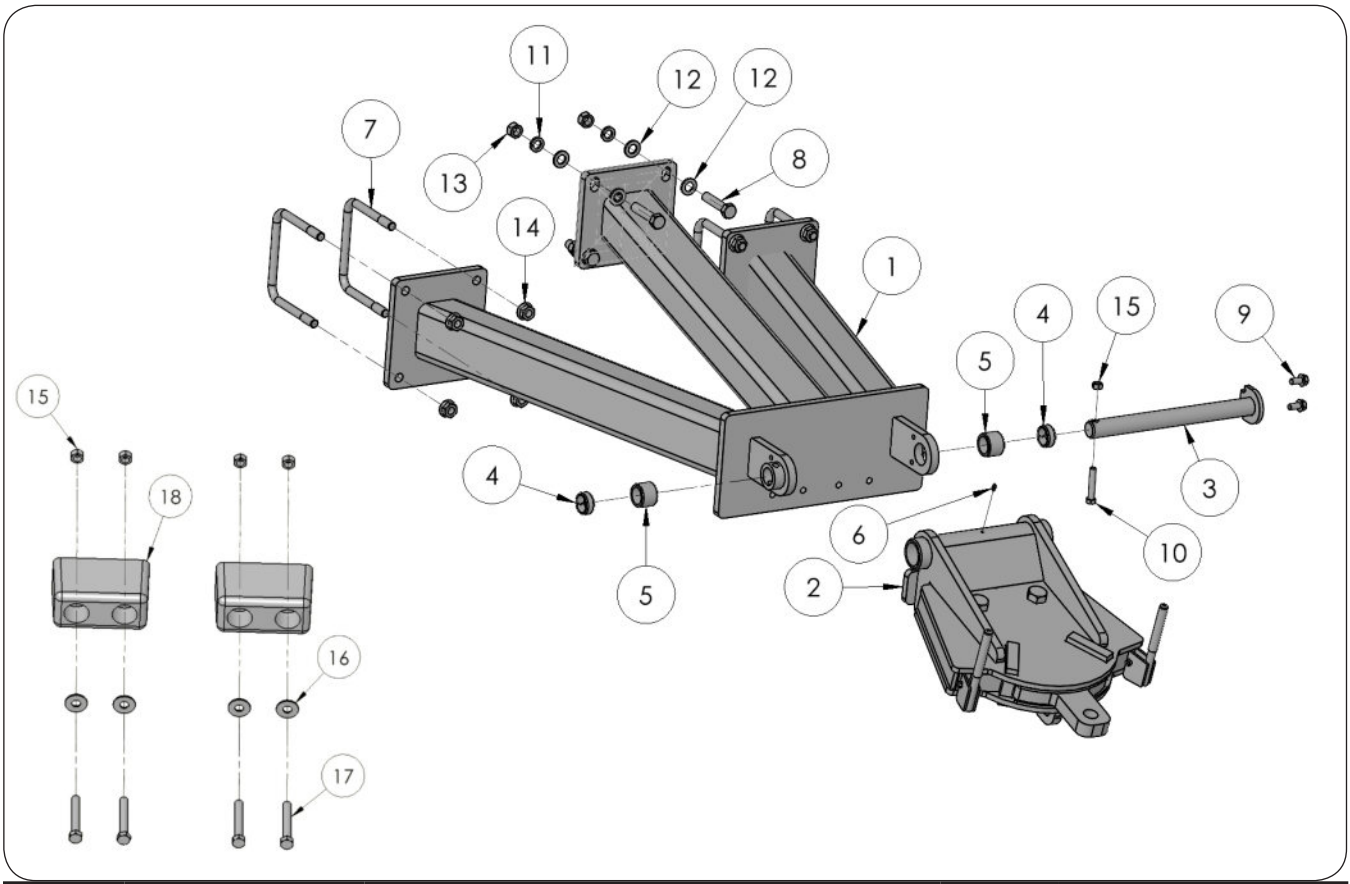
Please visit www.unverferth.com/parts/ for the most current parts listing.



ITEM	PART NO.	DESCRIPTION	QTY	NOTES
1	L196-1096	Hydrauliuc Hose, 3/4" X 9" 1-3/16" FORFSX, X 1-3/16" FORRSX	2	
2	L196-1119	Hydrauliuc Hose, 3/4" X 545" 12-12 FORF X 12-12FORFSX	2	
3	L196-1120	Hydrauliuc Hose, 3/8 X 545" 11/16 FORFSX - 3/4 MORB	1	
4	9009760	Hose Grip, Yellow (-)	2	
5	9009759	Hose Grip, Yellow (+)	1	
6	L140-117	Hydraulic Coupler, Case Drain	1	
7	L140-118	Hydraulic Coupler, Free Return	1	
8	L140-092	ISO Tip, 3/4"-16 F Boss	1	
9	98508	Adaptor, O-R Union 3/4"-16 Male O-R x 3/4"-16 Male O-R	3	
10	L198-412	Adaptor, 1 11/16" to 3/4"	2	
11	L198-459	Tee Fitting, 1 3/16MORFS X 1 3/16MORFS X 1 1/16MORB	2	
12	L180-361	Check Valve, 3/4 SAE, 1 1/16 X 1 1/16 UN X 1 1/16 UN, 65 PSI	1	
13	L198-453	Elbow Fitting, 7/8 MORB X 1-3/16 MORFS	2	
14	L198-350	Elbow Fitting, 9/16MB X 11/16MORS	1	
15	L198-455	Adaptor, 1-3/16 FORFSX X 1-3/16 MORFS X 7/16 FORB	1	

Nurse Hitch Components (Optional)

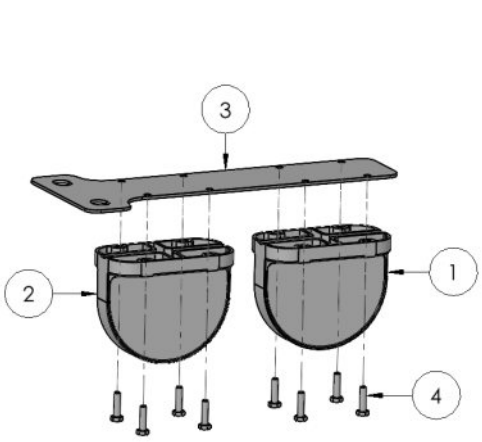
Please visit www.unverferth.com/parts/ for the most current parts listing.

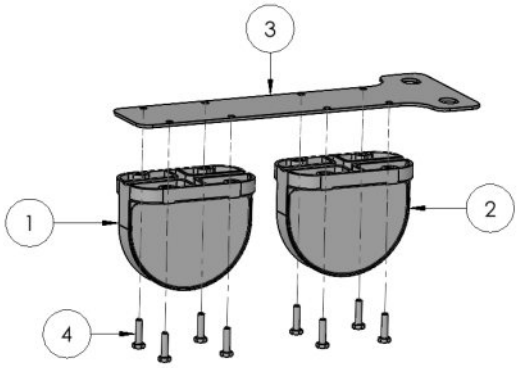


ITEM	PART NO.	DESCRIPTION	QTY	NOTES
	L852-210	Nurse Hitch Kit	1	
1	L857-565	Hitch Frame	1	
2	L310-701	Hitch Body Assembly	1	
3	L310-721	Pin	1	
4	L134-040	Split Bushing, 1 7/8" x 1 1/2" x 3/4"	2	
5	L134-077	Bushing, 2" x 1 1/2" x 1 1/2"	2	
6	L110-001	Grease Fitting	1	
7	L315-028	U-Bolt, 3/4"-10UNC x 5" x 7"	4	
8	L100-162	Caspcrew, 3/4"-10UNC x 3 1/2" Grade 5	4	
9	L100-305	Caspcrew, 1/2"-13UNC x 1" Grade 8	2	
10	L100-306	Caspcrew, 1/2"-13UNC x 2 3/4" Grade 8	1	
11	L108-022	Lock Washer, 3/4"	4	
12	L108-003	Flat Washer, 3/4" SAE	4	
13	L102-009	Hex Nut, 3/4"-10UNC Grade 5	4	
14	L102-121	Locking Flange Nut, 3/4"-10UNC Grade 5	8	
15	L102-224	Locking Hex Nut, 1/2"-13UNC Grade 5	5	
16	L108-009	Flat Washer, 1/2"	4	
17	L100-222	Capscrew, 1/2"-13UNC x 3 1/2"	4	
18	L152-027	Bumper	2	

Light Components

Please visit www.unverferth.com/parts/ for the most current parts listing.





ITEM	PART NO.	DESCRIPTION	QTY	NOTES
1	L154-1001	Red Light	2	
2	L154-1000	Orange Light	2	
3	L587-459	Light Mounting Bracket	2	
4	L100-249	Capscrew, 1/4"-20UNC x 1" Grade 5	16	

MEMBER

FEMA

FARM EQUIPMENT MANUFACTURERS ASSOCIATION