Fertilizer Applicator

NutriMax® Liquid Applicator
1000 Gallon Model

Serial Number D70520100 & Higher

Part No. 45868

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-Delivery Checklist

- ☐ Hardware tightened
- ☐ Machine lubricated
- ☐ Safety and operating procedures reviewed
- ☐ Field adjustment information reviewed
- ☐ Warranty information reviewed

IMPORTANT

The information, specifications, and illustrations in the manual are based on the 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.

Product Information

When ordering parts or when requesting further information or assistance, always give the following information:

- Machine name
- Model number
- Serial number

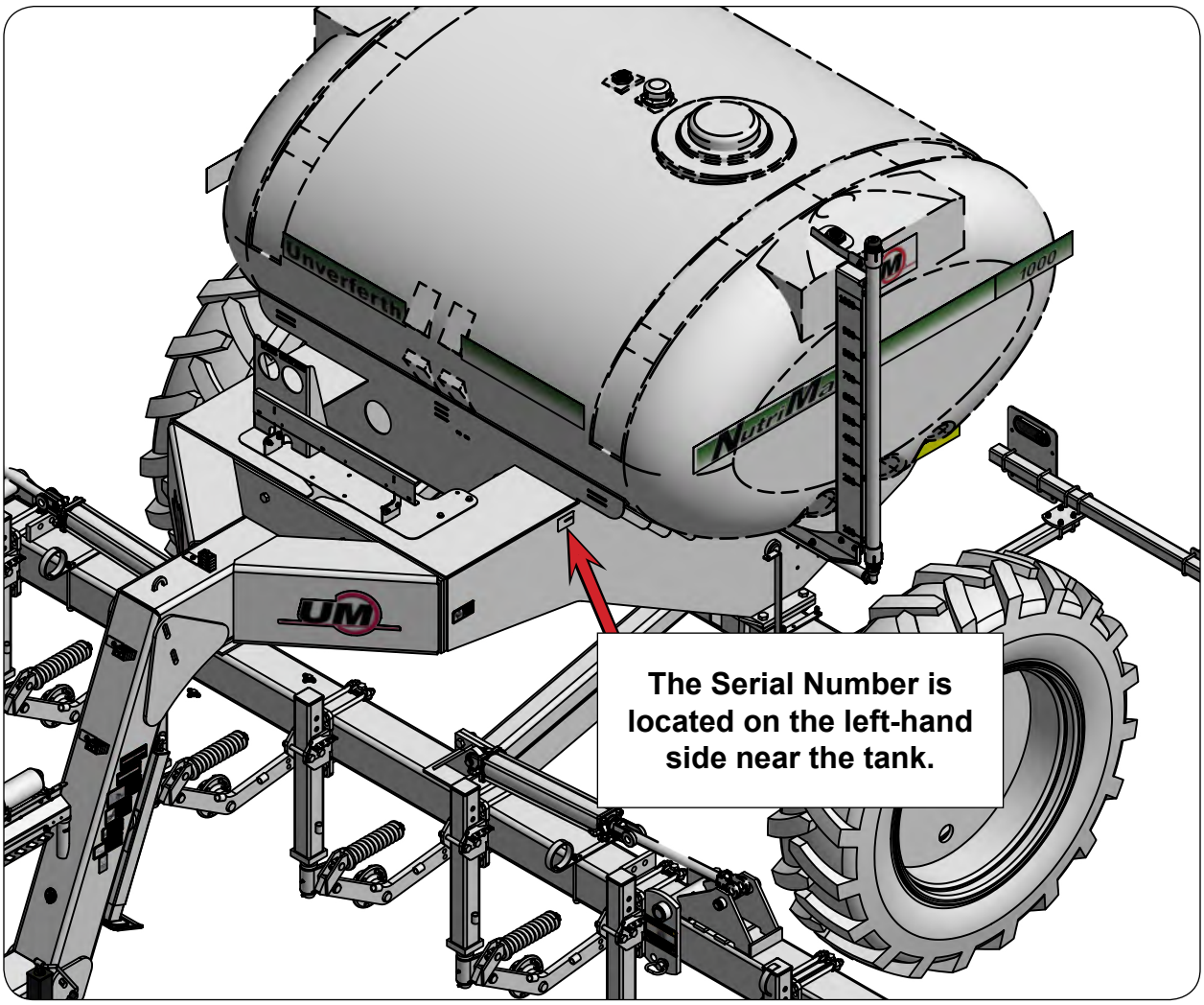
All products manufactured by Unverferth are warranted to be free from material and workmanship defects for one full year from time of consumer delivery. Your local dealer will gladly assist you with any warranty questions.

Please fill out and retain this portion for your records.

Purchase Date _____Model _____Serial Number _____

Dealer _____ City _____

Dealer Contact _____ Phone _____



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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 be 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

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

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

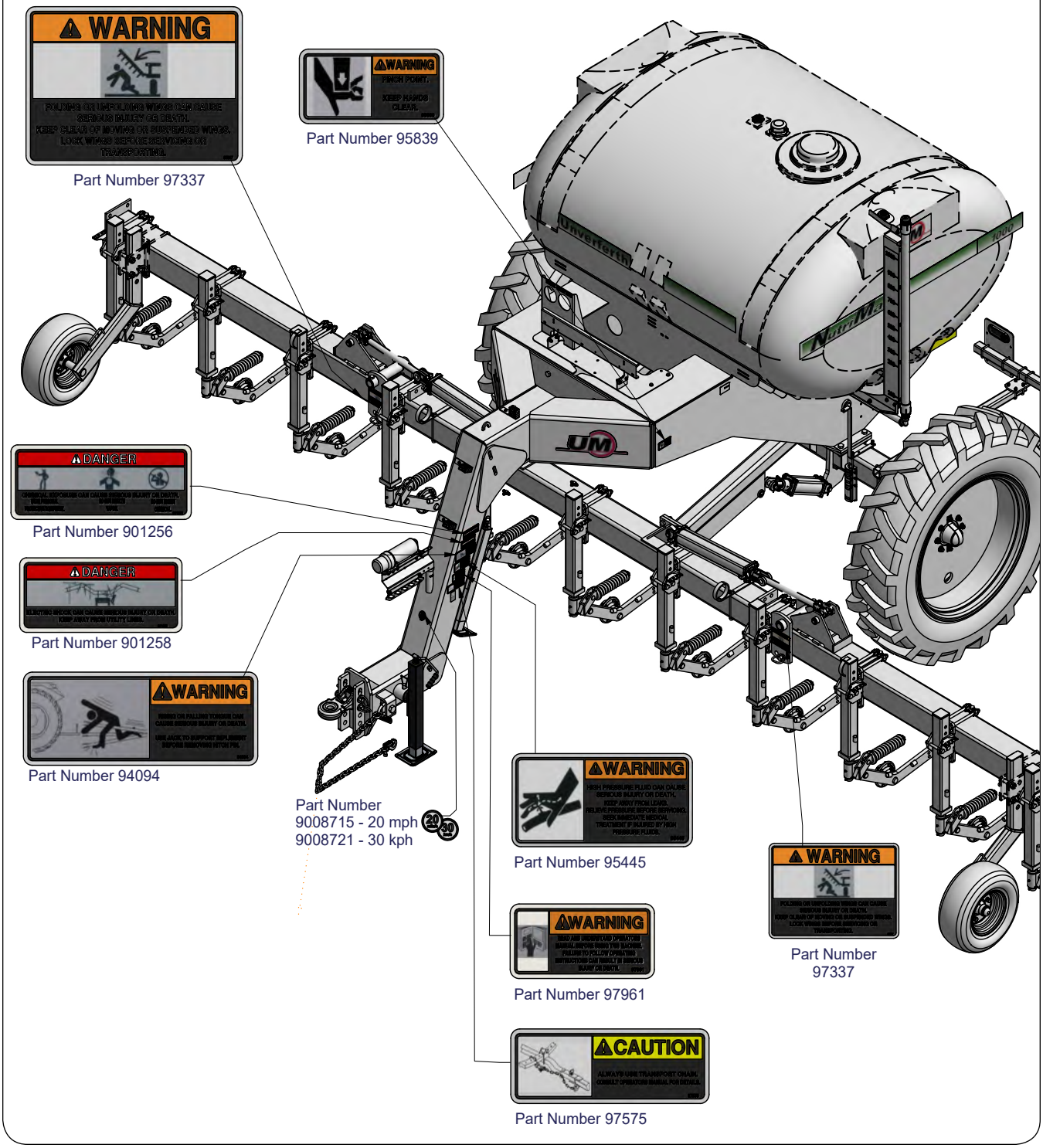
INDICATES AN UNSAFE SITUATION OR ACTION THAT MAY RESULT IN PERSONAL INJURY.

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

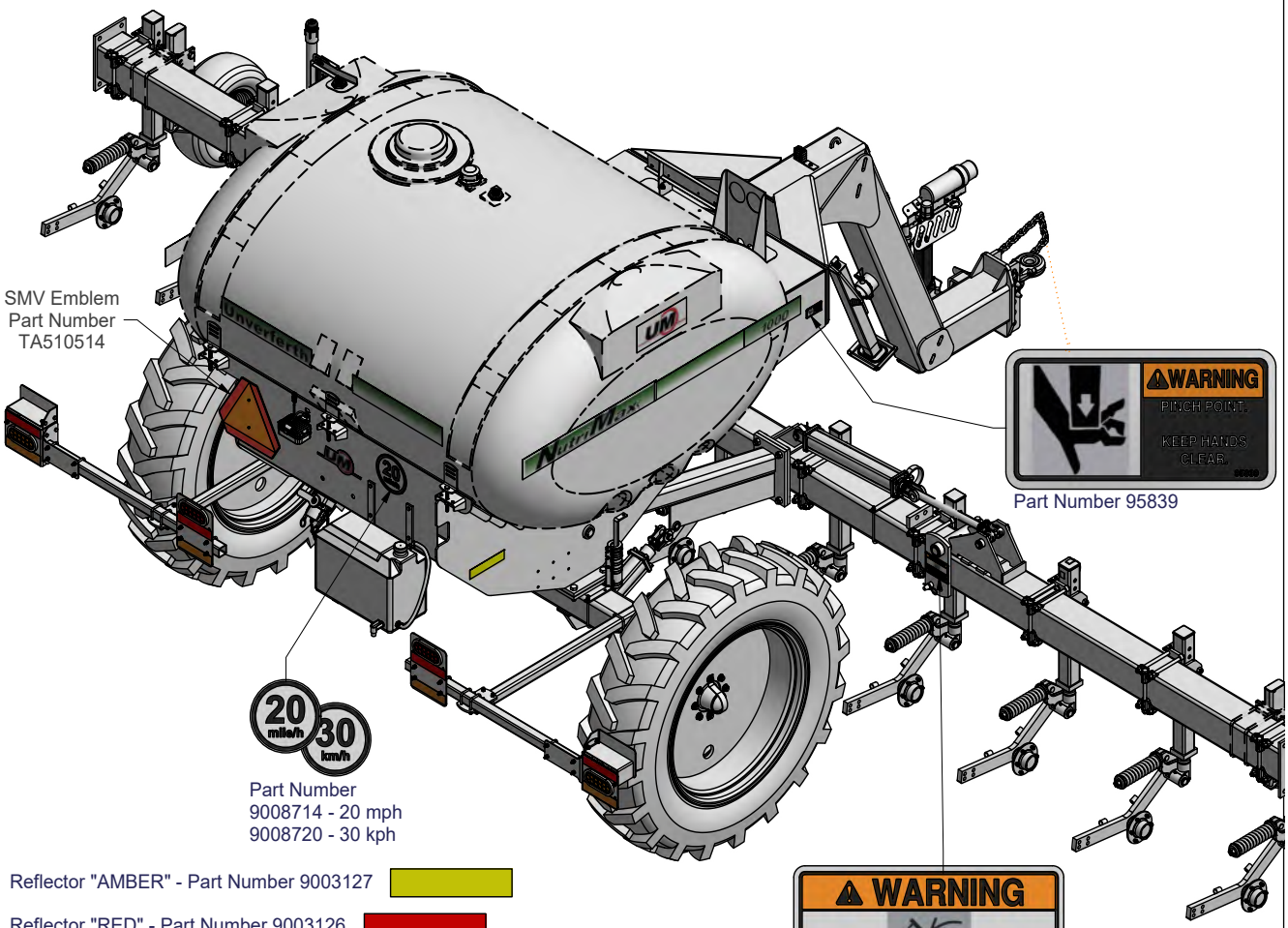
Safety Decals

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.**



Safety Decals (continued)



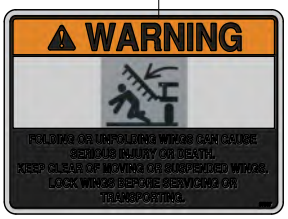
Part Number 95839

Part Number
9008714 - 20 mph
9008720 - 30 kph

Reflector "AMBER" - Part Number 9003127

Reflector "RED" - Part Number 9003126

Decal, Fluorescent, Red-Orange - Part Number 9003125



Part Number 97337

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 attempt to operate implement unless you are in driver's seat.

Before Servicing

- 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.
- 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.
- Add sufficient ballast to tractor to maintain steering and braking control at all times. Do not exceed tractor's lift capacity or ballast capacity.
- Hitch applicator to towing vehicle and clear all personnel from the surrounding area before folding and unfolding wings.
- Check all applicator equipment for leaks. Repair any leaks before beginning or resuming operation.
- Residual pressure may exist in applicator plumbing even when unit is not in use. Remove pressure before servicing any plumbing.

Before Operating

- Do not stand between towing vehicle and implement during hitching.
- Always make certain everyone and everything is clear of the machine before beginning operation.
- Verify that all safety shields are in place and properly secured.
- Ensure that all applicable safety decals are installed and legible.
- When working around the implement, be careful not to be cut by sharp edges.
- Add sufficient ballast to tractor to maintain steering and braking control at all times. Do not exceed tractor's lift capacity or ballast capacity.
- This applicator is intended to apply only agricultural chemicals. Attempting to apply other liquids may cause equipment damage and introduce unexpected personal hazards.
- Hitch applicator to towing vehicle and clear all personnel from the surrounding area before folding and unfolding wings.
- Residual pressure may exist in applicator plumbing even when unit is not in use. Remove pressure before servicing any plumbing.

During Operation

- Regulate speed to field conditions. Maintain complete control at all times.
- Never service or lubricate equipment when in operation.
- Keep away from overhead power lines. Electrical shock can cause serious injury or death.
- Use extreme care when operating close to ditches, fences, or on hillsides.
- Do not leave towing vehicle unattended with engine running.

Before Transporting

- Secure transport chains to towing vehicle before transporting. DO NOT transport without chains.
- 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.
- This implement may not be equipped with brakes. Ensure that the towing vehicle has adequate weight and braking capacity to tow this unit.

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.
- 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.
- Slow down before making sharp turns to avoid tipping. Drive slowly over rough ground and side slopes.
- It is probable that this implement is taller, wider and longer than the towing vehicle. Become aware of and avoid all obstacles and hazards in the travel path of the equipment, such as power lines, ditches, etc.

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:
    - o End fittings damaged, displaced, or leaking.
    - o Outer covering chafed/cut or wire reinforcing exposed.
    - o Outer covering ballooning locally.
    - o Evidence of kinking or crushing of the flexible part of a hose.

Chemical Hazards

- Always wear personal protective equipment when working with or near 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 chemicals.

- Seek and receive chemical product training prior to using agricultural chemicals.

- Read and understand the entire label of every chemical being applied with this applicator.

- Avoid breathing applicator mist or vapor.

- Wash hands and exposed skin immediately after contact with spray/fertilizer solution and application equipment.

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

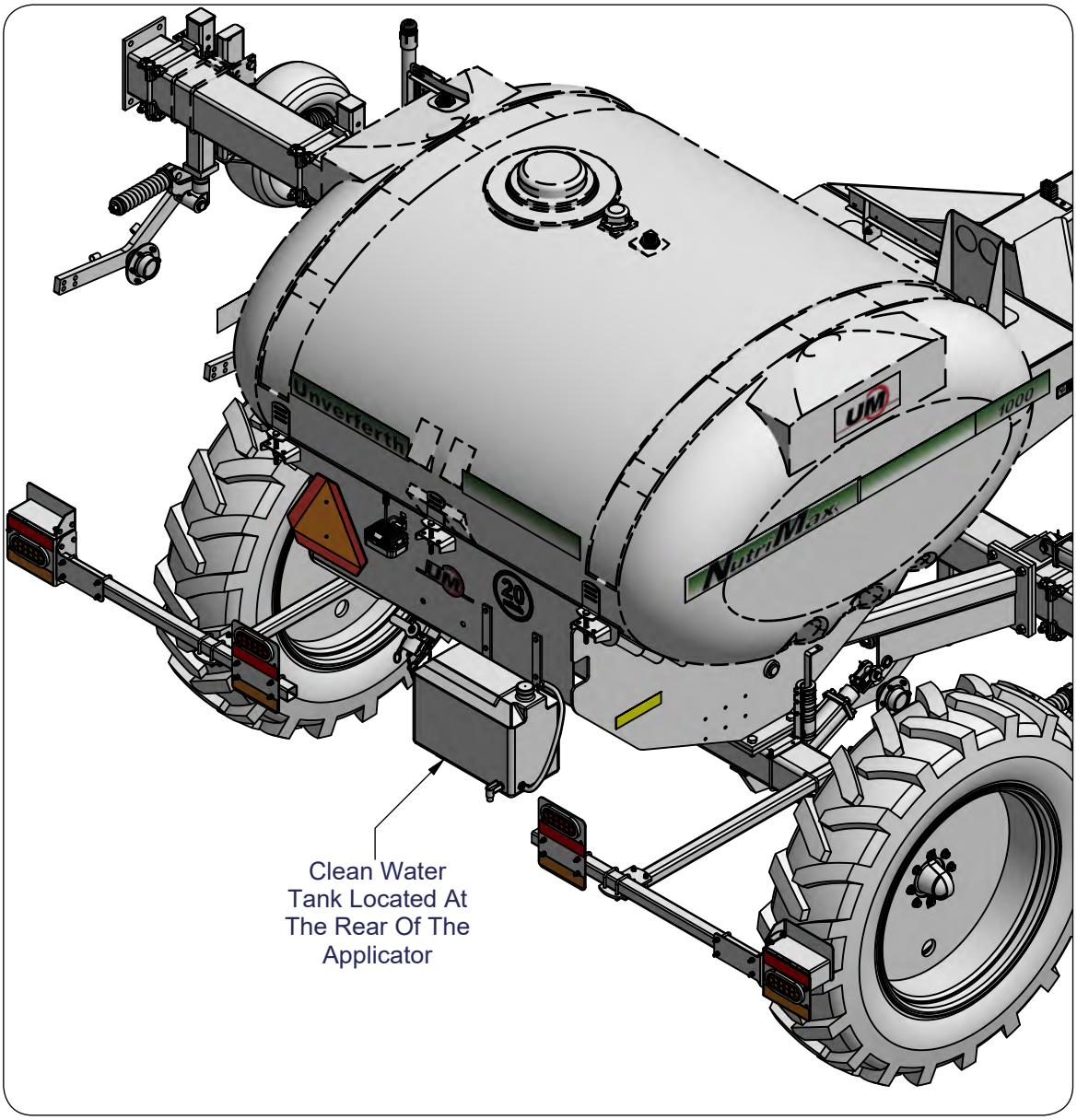
- Dispose of unused chemical in accordance with chemical label directions and local/national regulations.

Clean Water Tank

- A clean water tank is provided as standard equipment. It is equipped with a spigot for general washing and a hose for emergency eye washing.

- Always keep clean water in tank. Water in clean water tank is not suitable for human consumption.

- For emergency eyewash, pull hose off of the top fitting and flush affected area.



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

Pre-Delivery Checklist

- ☐ Torque wheel nuts as specified in MAINTENANCE section.
- ☐ Check tire pressure as specified in MAINTENANCE section.
- ☐ Axles are adjusted from shipping position to desired operating width.
- ☐ All grease fittings have been lubricated.
- ☐ Check to be sure all safety decals are correctly located and legible. Replace if damaged.
- ☐ Check to be sure all reflective decals are correctly located.
- ☐ Check to be sure SMV emblem is in place and shipping film is removed.
- ☐ Check to be sure transport lights are working properly.
- ☐ Transport chains are properly installed and hardware is torqued to specification. See "Transport Chain Connection" in OPERATION section.
- ☐ Check hydraulic components for leaks.
- ☐ Check all plumbing components for leaks.
- ☐ Paint all parts scratched during shipment and dealer set up.

General Setup Information

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.

For ease of assembly, install all hardware loosely until assembly is complete and then tighten according to "Torque Chart" unless otherwise specified.

⚠ WARNING

- **READ AND UNDERSTAND SAFETY RULES BEFORE OPERATING OR SERVICING THIS MACHINE. REVIEW SAFETY SECTION IN THIS MANUAL, IF NECESSARY.**
- **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.**
- **KEEP HANDS CLEAR OF PINCH POINT AREAS.**
- **TIPPING OR MOVEMENT OF THE APPLICATOR CAN CAUSE SERIOUS INJURY OR DEATH. APPLICATOR MUST BE HITCHED TO THE TRACTOR BEFORE OPERATING.**
- **FALLING OBJECTS CAN CAUSE SERIOUS INJURY OR DEATH. DO NOT WORK UNDER THE MACHINE AT ANY TIME WHILE BEING HOISTED. THESE ASSEMBLY INSTRUCTIONS WILL REQUIRE SAFE LIFTING DEVICES UP TO 8,000 LBS. SPECIFIC LOAD RATING FOR INDIVIDUAL LOADS WILL BE GIVEN AT THE APPROPRIATE TIME IN THE INSTRUCTIONS.**
- **EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING THE IMPLEMENT.**

IMPORTANT

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

Unloading Applicator from Shipping Trailer

Tongue Assembly to Main Frame Assembly

1. Remove the four 3/4”-10UNC x 2” capscrews, grade 8 (91299-145), ten 3/4”-10UNC x 3” capscrews, grade 8 (91299-149), fourteen 3/4”-10UNC lock nuts (97025), and four corner brace plates (JAM3566) from the tongue assembly. (FIG. 2-1)

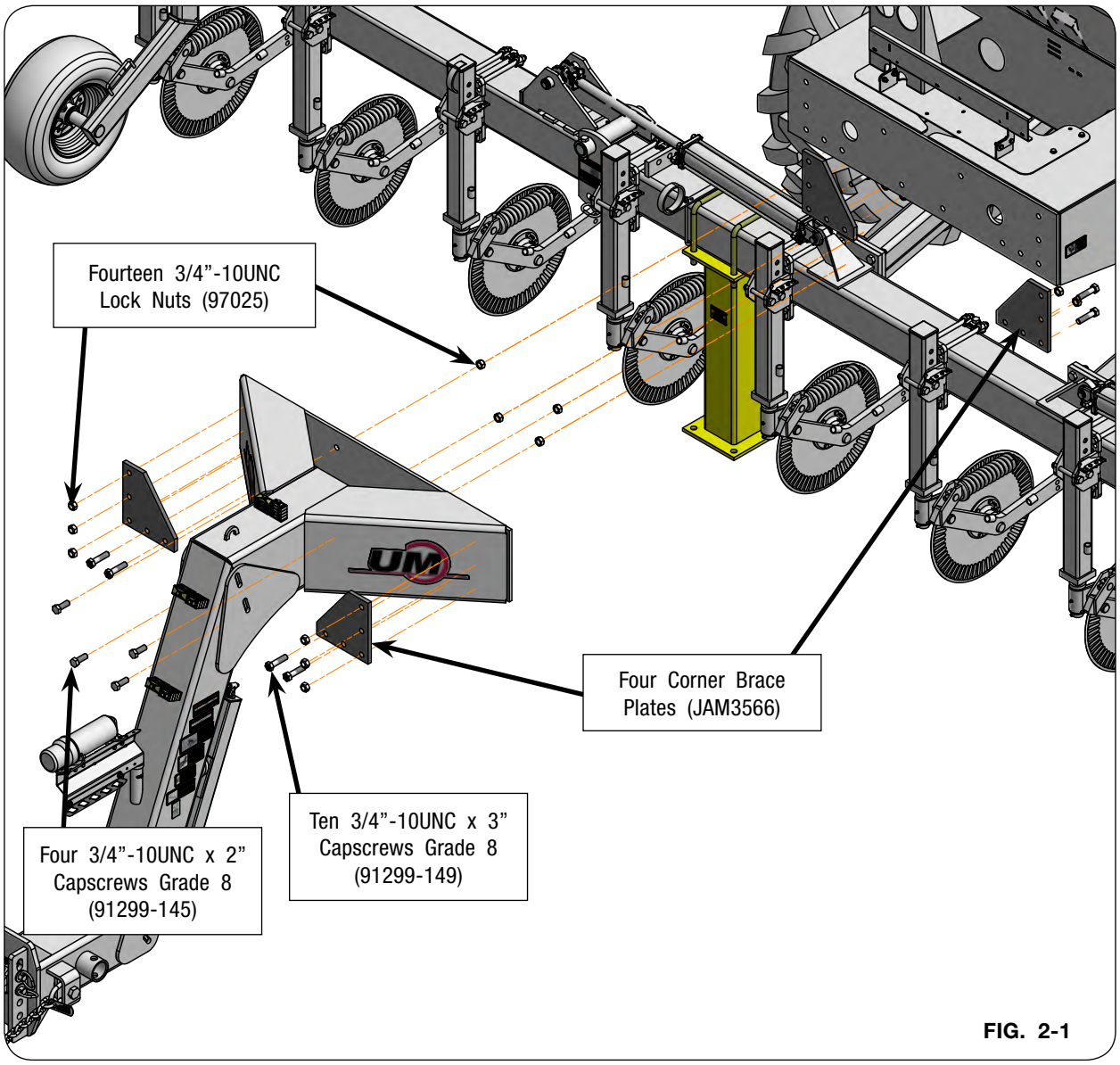


FIG. 2-1

2. Using a safe lifting device rated at a minimum of 1,000 lbs., support the tongue assembly. Attach the tongue assembly to main frame with four 3/4”-10UNC x 2” capscrews, grade 8 (91299-145), ten 3/4”-10UNC x 3” capscrews, grade 8 (91299-149), fourteen 3/4”-10UNC lock nuts (97025), and four corner brace plates (JAM3566) (FIG. 2-1). Torque hardware according to “Torque Chart” in MAINTENANCE section.

Unloading Applicator from Shipping Trailer (continued)

3. Route hydraulic hoses along the tongue assembly.

4. Attach the hose with the double hose clamps.

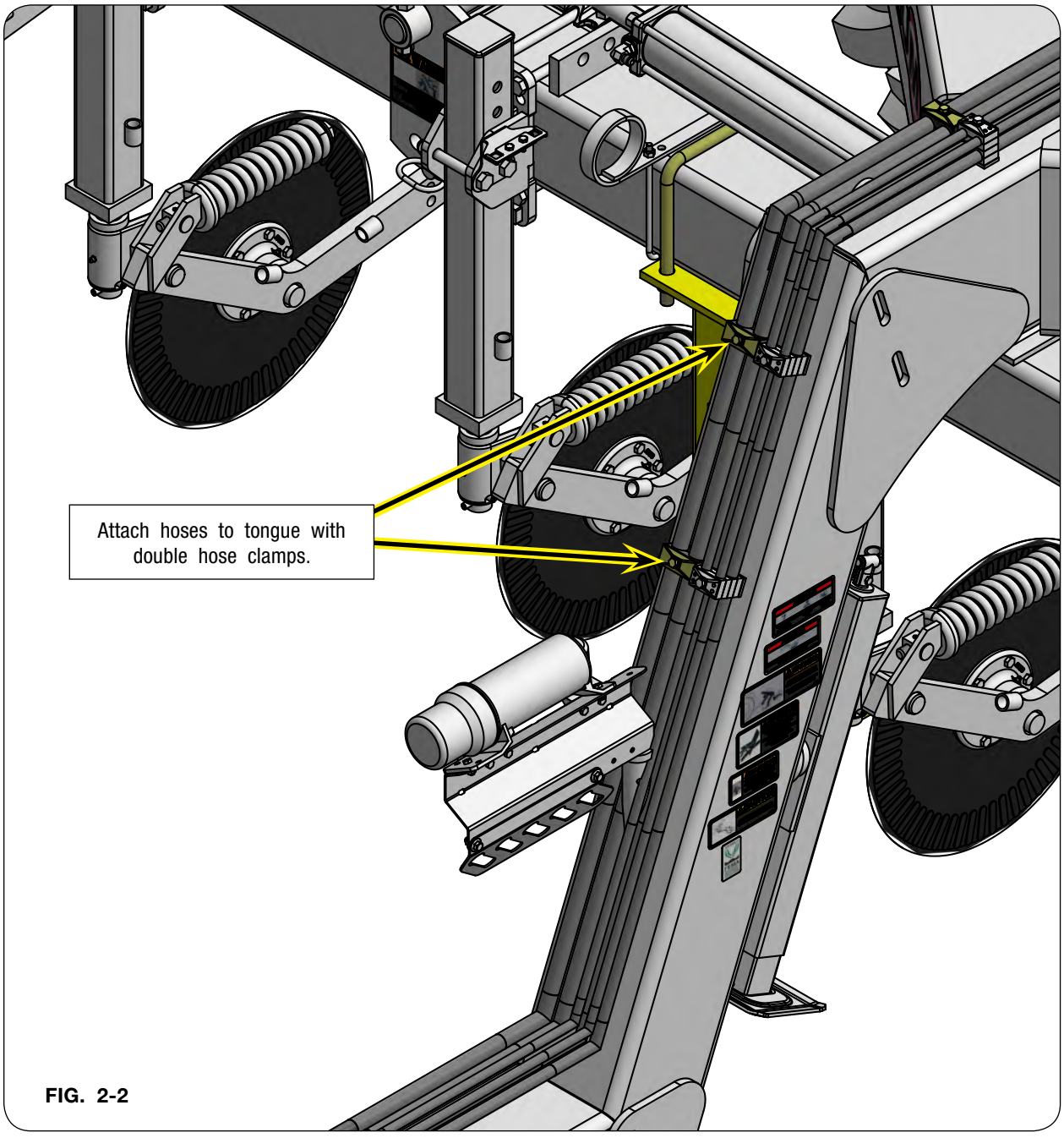


FIG. 2-2

5. Torque hardware according to “Torque Chart” in MAINTENANCE section.

Unloading Applicator from Shipping Trailer (continued)

6. Move jack stand from “operating position” to “parked position”. (FIG. 2-3)

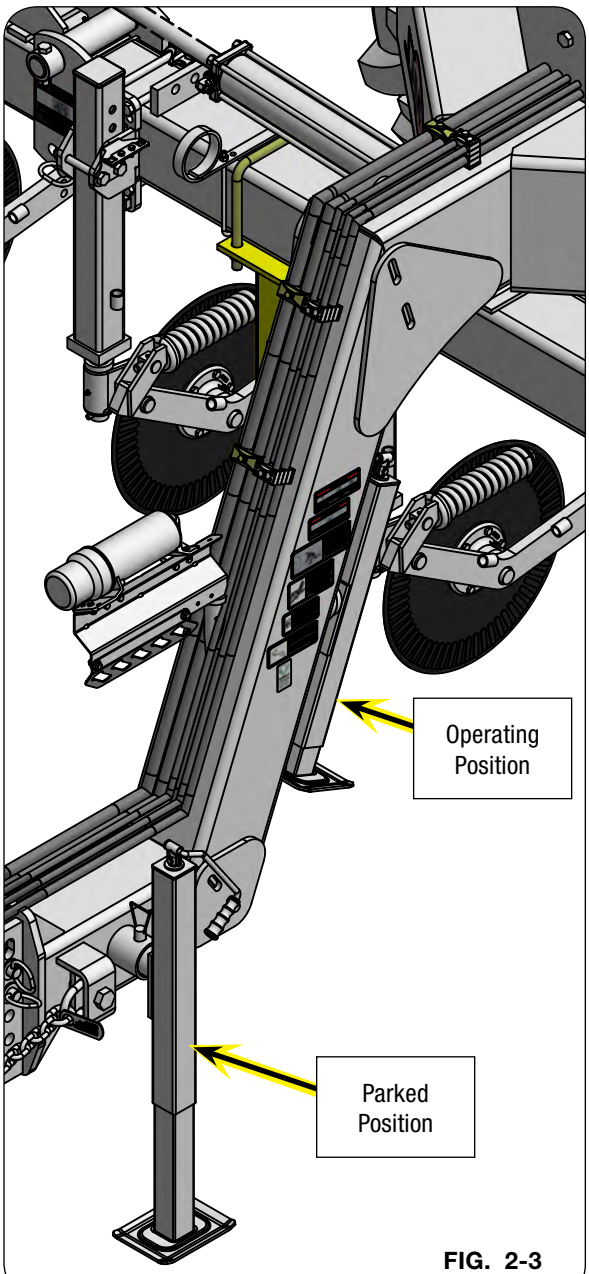


FIG. 2-3

Unloading Applicator from Shipping Trailer (continued)

7. Refer to “Hitching to the Tractor” in OPERATION section. Attach Applicator to the tractor.

8. 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.

9. Raise the toolbar and remove the yellow transport brackets and hardware from the main frame cylinder transport wheels (FIG. 2-4). Insert cylinder 1” Dia. x 4” clevis pins (JBP3497) and 3/16” Dia. x 1 3/4” cotter pins (9391-045).

10. Raise applicator into transport position.

⏚

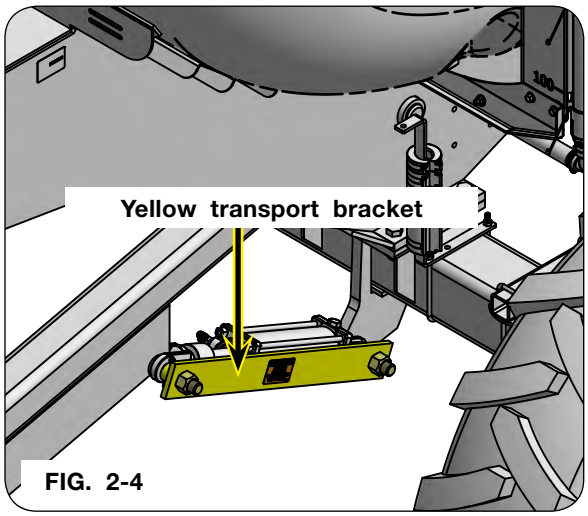


FIG. 2-4

11. Remove the toolbar shipping stands and hardware. (FIG. 2-5)

12. With the tractor connected and the applicator raised, pull the applicator from the shipping trailer.

13. Park the unit on a firm, level surface. Unfold the wings and lower the machine onto the transport stops. Set the towing vehicle’s parking brake, shut-off the engine and remove the ignition key.

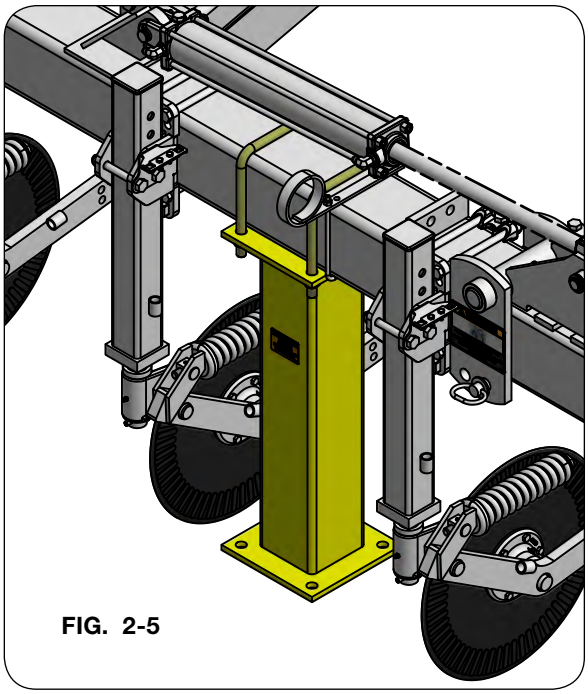


FIG. 2-5

Pump Drive

1. Lower the toolbar to working position.

2. Using a safe lifting device rated at a minimum of 150 lbs., support the pump drive wheel and axle.

3. Remove the 1/2”-13UNC x 4 1/2” capscrews (9390-112) and 1/2”-13UNC lock nuts (9800) from the pump drive axle mounting plate.

4. Reposition the pump drive wheel so it contacts the left-hand main frame wheel and reinstall the previously removed 1/2”-13UNC x 4 1/2” capscrews (9390-112) and 1/2”-13UNC lock nuts (9800) from the pump drive axle mounting plate.

5. Torque hardware according to “Torque Chart” in MAINTENANCE section.

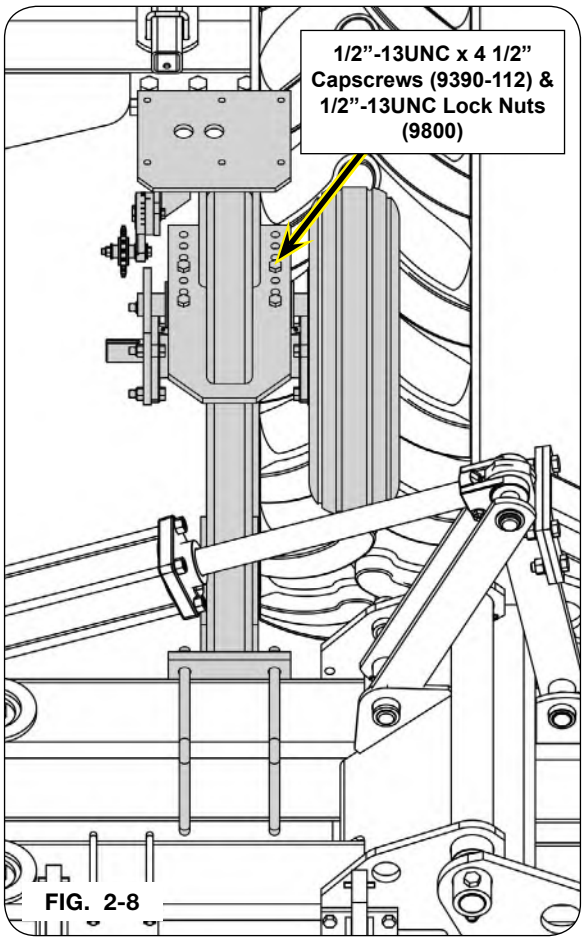


FIG. 2-8

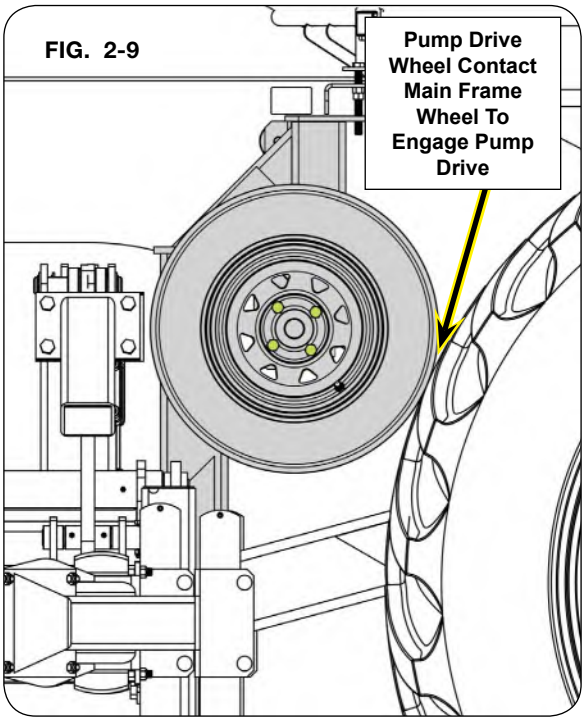


FIG. 2-9

Coulter Assembly

1. Use “Overhead Layouts” in this section to properly position coulter assemblies. Torque hardware according to “Torque Chart” in MAINTENANCE section.

Gauge Wheel Assembly

1. Use “Overhead Layouts” in this section to properly position gauge wheels. Torque hardware according to “Torque Chart” in MAINTENANCE section.

Transport Lighting Assembly

Compliance with all lighting and marking laws is the responsibility of the operator at the time of travel.

See federal regulation 49 CFR 562; available at www.govinfo.gov for US federal law requirements.

See your Unverferth dealer for additional brackets, reflectors, or lights to meet your requirements.

NOTE: Consult “Overhead Layouts” for light kit placement.

SMV Emblem & SIS Decal

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. 2-10.

Ensure the SIS decals (one on the front and one on the rear of the applicator) are clean and visible.

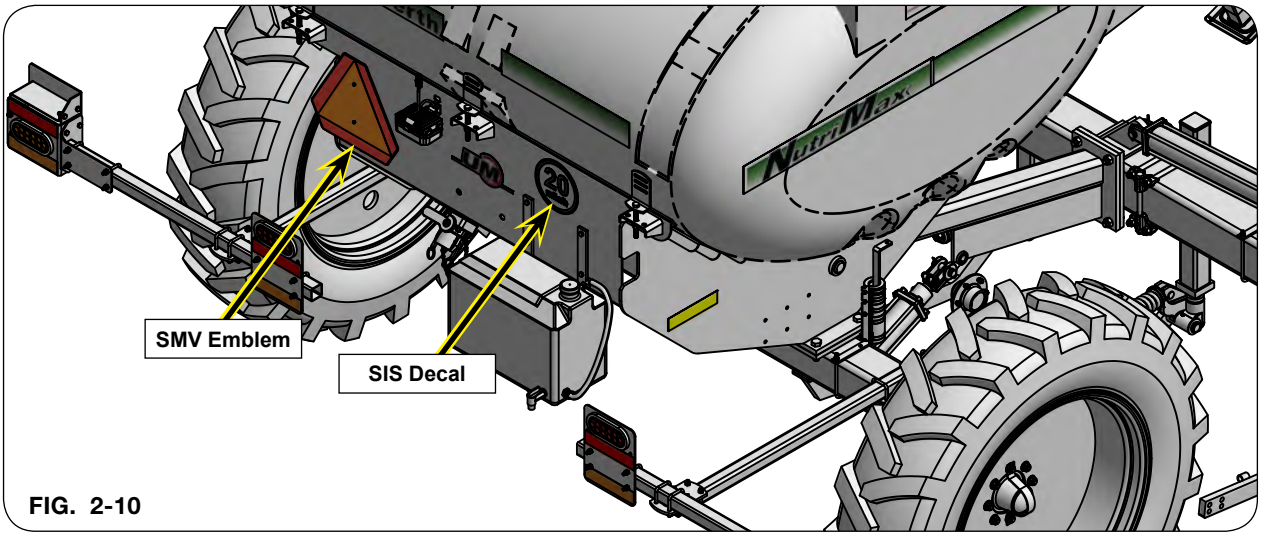


FIG. 2-10

Pump Hydraulic System Set Up

For set up of a PWM (Pulse Width Modulated) pump, refer to your rate controller manual for details. For specific details related to your product pump, please refer to your pump manual.

NOTE: Foot switch must be installed and connected for PWM pump to function properly.

FIG. 2-11

IMPORTANT

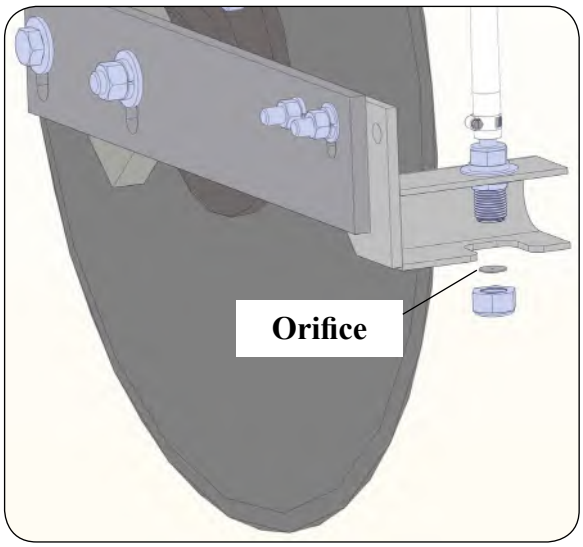
- *Do not run pump for extended periods with outlet flow fully blocked. Overheating and pump damage can result.*
- *Liquid must be in the Solution Tank. Refer to Filling Applicator in the OPERATION section.*
- *Toolbar should be unfolded when setting the pump pressure. Refer to toolbar operation in the OPERATION section.*
- *The Pump Inlet valve should be open.*
- *Do not run pump without solution. Running a dry pump will shorten its life.*

Setting the Pump Pressure (PWM Pump)

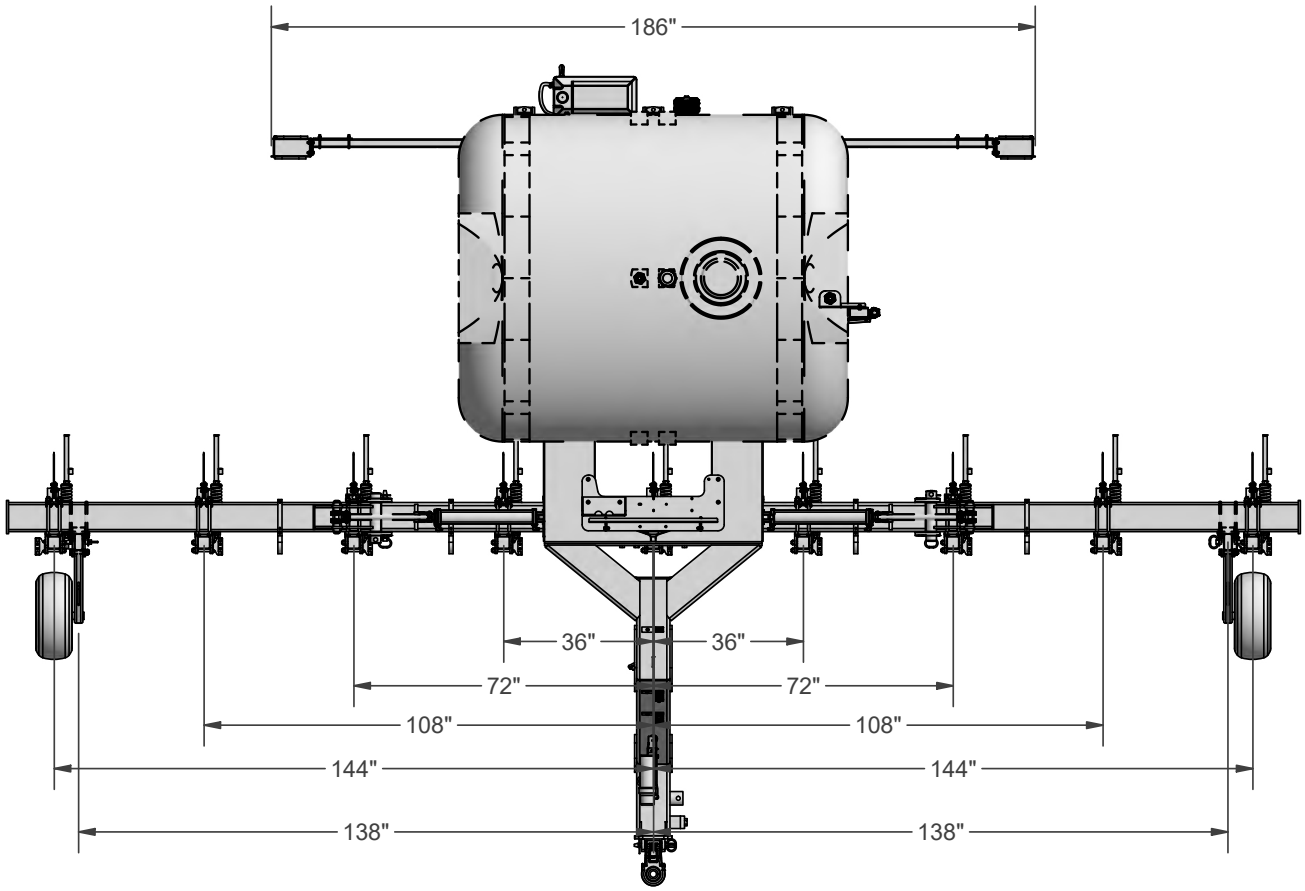
1. Rate controller must be calibrated. See pump calibration in section “RCM Set Up.”
2. Select manual control on the console and turn the master switch on. Press and hold the Inc. button for 5 seconds to verify cartridge valve is fully open.
3. Turn off section valves and agitation valve if equipped.
4. Turn the hydraulic flow dial to 100%. The PWM cartridge valve is sized to divert a maximum of 11 GPM to the pump. Decrease the tractor’s hydraulic flow until Nutrimax system pressure starts to drop, approximately around 100 PSI.

Rate Orifice Installation

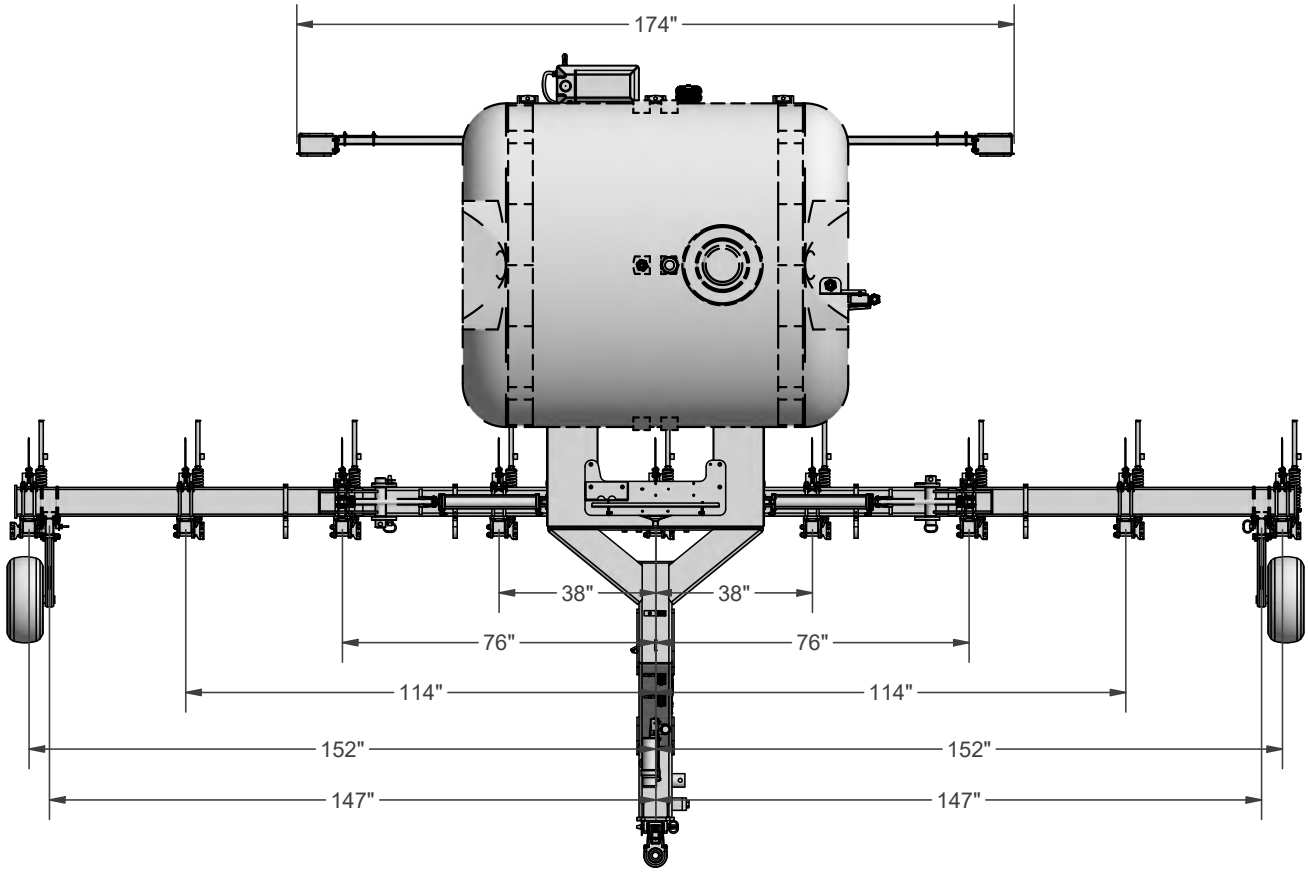
1. Consult “Row Spacing Rate Chart” in MAINTENANCE section for orifice size.
2. Remove nozzle nut and insert orifice.
3. Travel a few feet and check blade depth. Adjust gauge wheels or coulters to achieve the 4” depth.
4. Check all nozzles for stream of liquid behind blade.
5. Make adjustment to nozzle assembly so stream is in line with the blade trench.



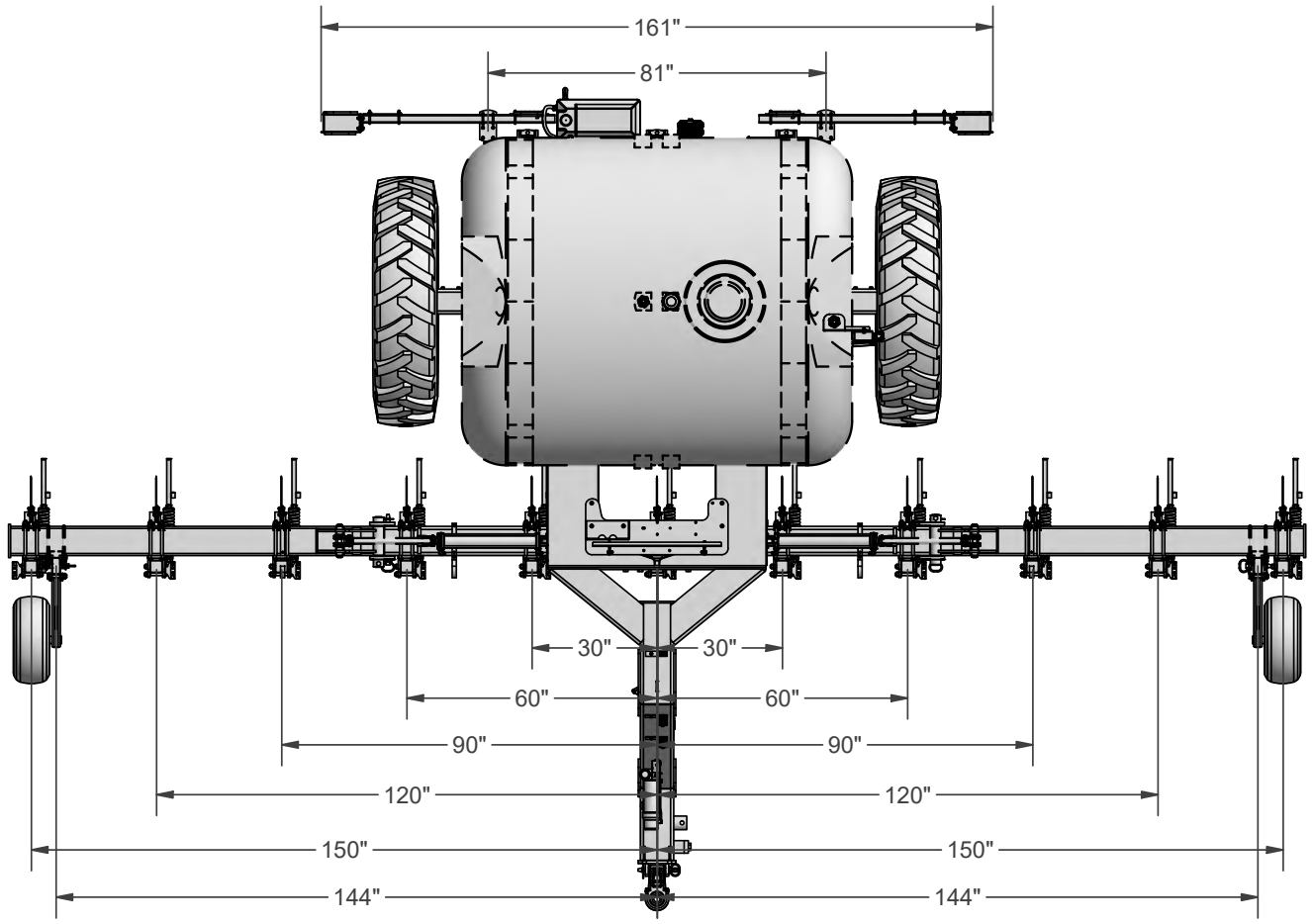
Layout — 9 Row 36” Spacing with Standard Toolbar

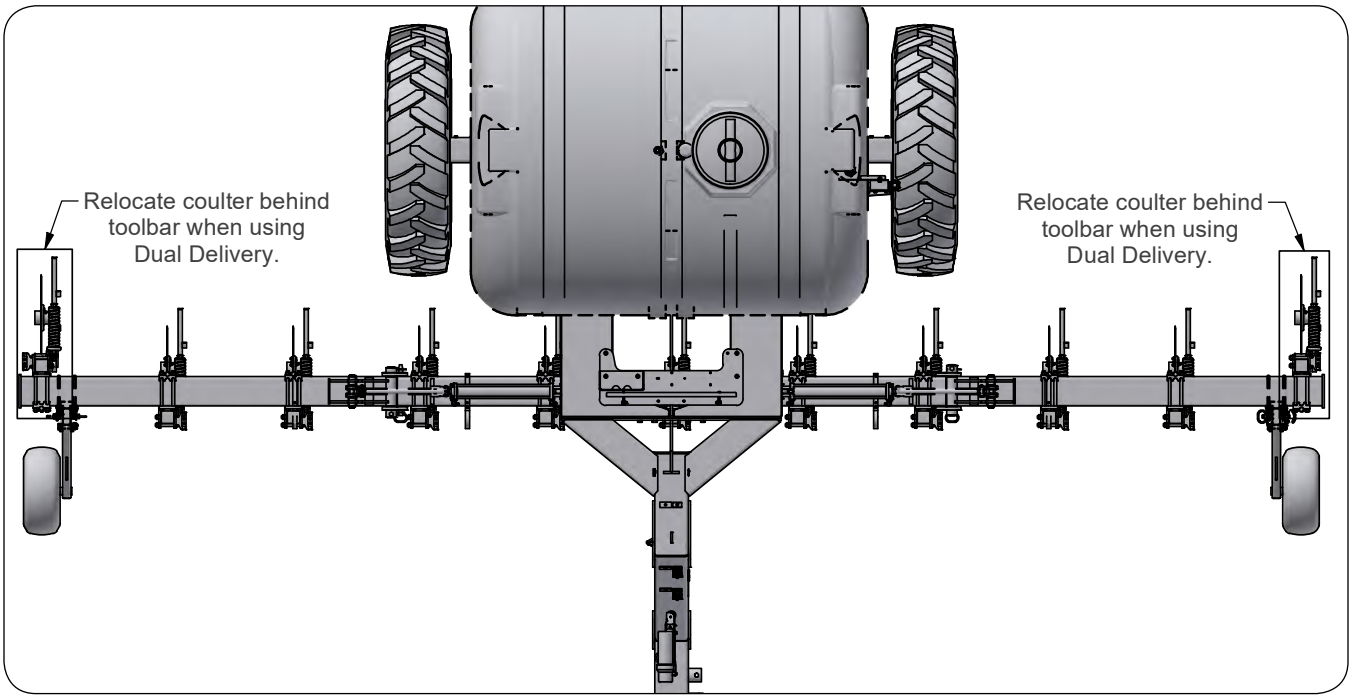


Layout — 9 Row 38” Spacing with Standard Toolbar

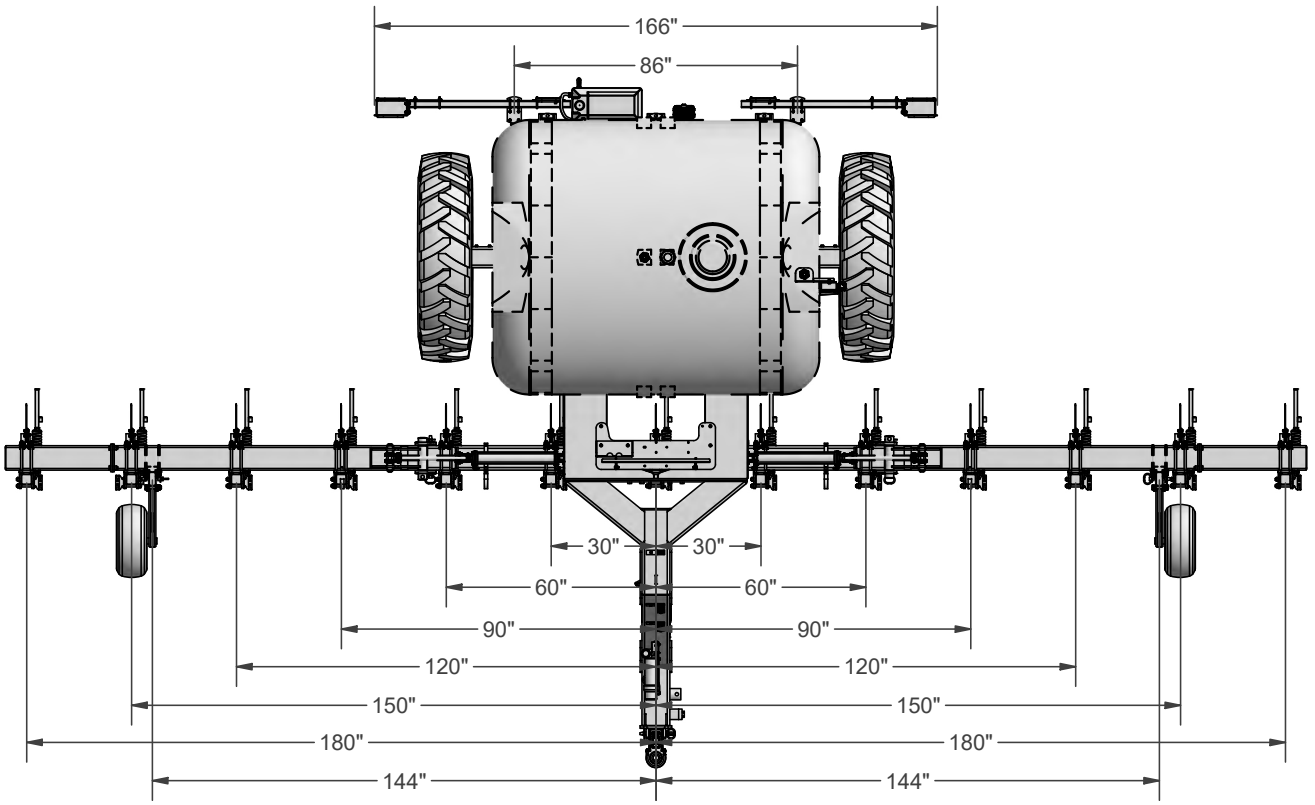


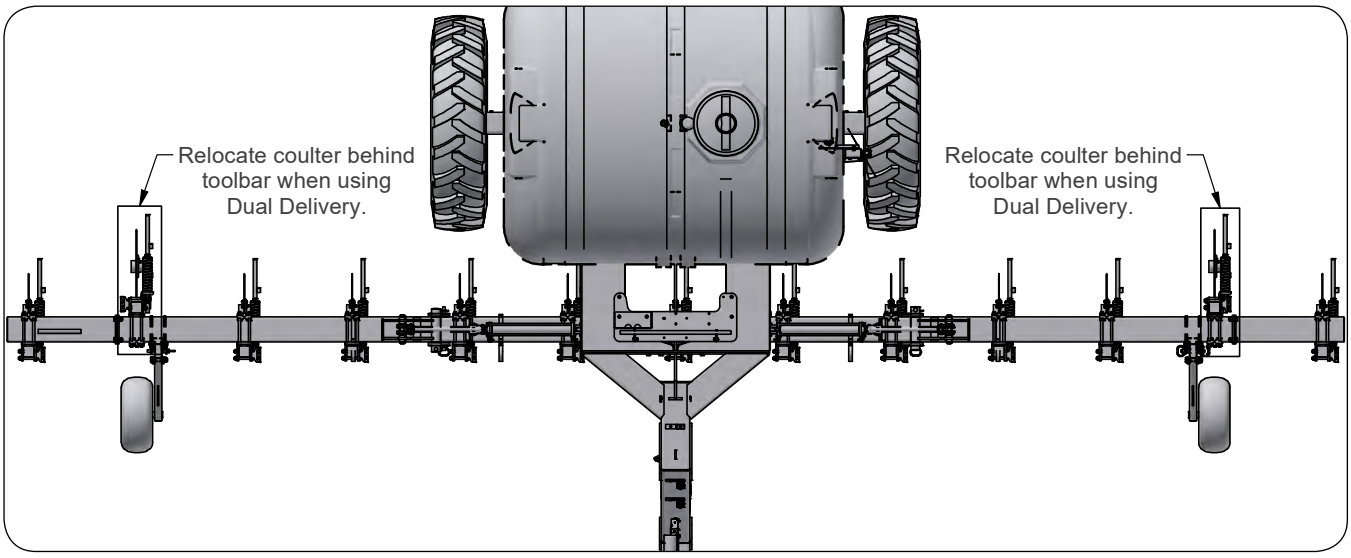
Layout — 11 Row 30” Spacing with Standard Toolbar





Layout — 13 Row 30” Spacing with Standard Toolbar





Raven RCM Guide

RCM Set-Up

NOTE: Before programming the RCM, ensure the RCM monitor is connected to the battery.

1. On the initial start-up screen, begin by entering the profile name for your liquid fertilizer applicator.

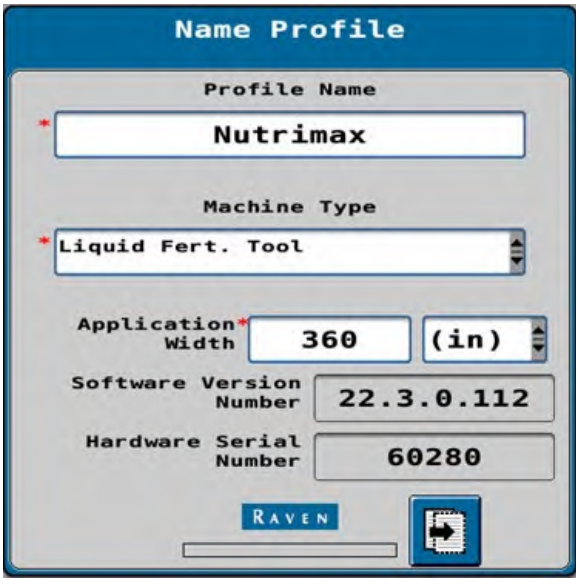
2. Select “Liquid Fert. Tool” as the desired machine type from the drop down menu.

3. Enter the application width of your liquid fertilizer applicator.

NOTE: Highest value for Application Width is 30ft or 360”. Make sure the application width is the coverage width and not the max coulter width. For example, if you have 11 rows on 30” spacing, the coverage width would be 30ft not 27.5ft because you will skip the guess row and apply 1.5x your desired rate on the outside rows of the bar. The below table is the application widths and section widths for all sizes assuming we are using 1.5x rate and 0.5x rate orifices on the outer rows.

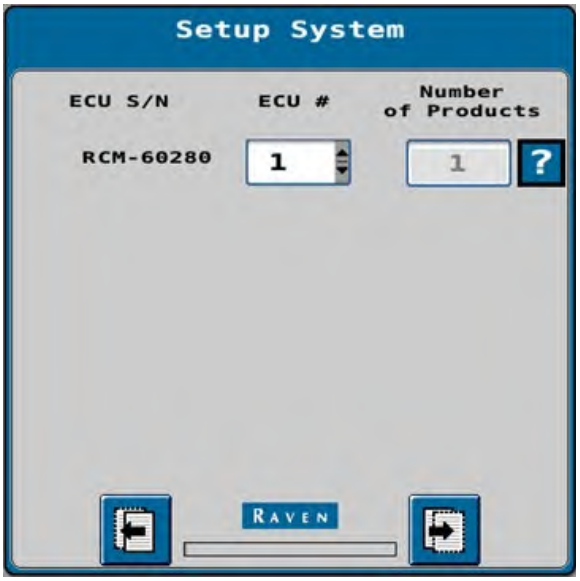
NutriMax Rows	Planter Rows	Row Spacing	Application Width
13	12	30"	360"
9	8	38"	304"
11	12	30"	360"
9	8	36"	288"
15	16	20"	320"
13	12	22"	264"

4. Press the Next Page icon.



5. Default for ECU box is 1. Verify Number of Products box is 1.

6. Press the Next Page icon.



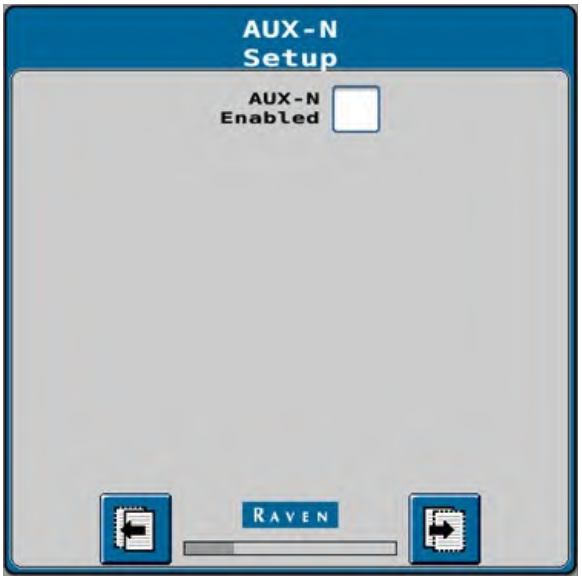
Raven RCM Guide (continued)

7. Under Application Type, select “Liquid (Gal)”.
8. Press the Next Page icon.

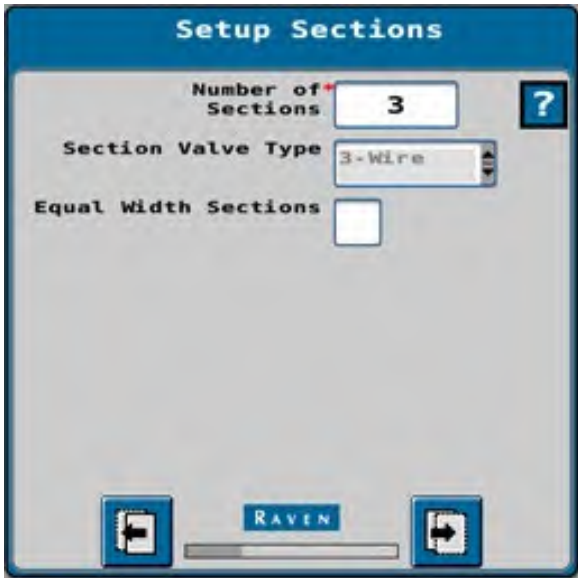
9. Under Application Mode, select “Liquid”.
10. Press the Next Page icon.

Raven RCM Guide (continued)

11. Ensure “AUX-N Enabled” is unchecked.
12. Press the Next Page icon.



13. Enter the number of sections. If applicable, select equal width sections.
14. Press the Next Page icon.

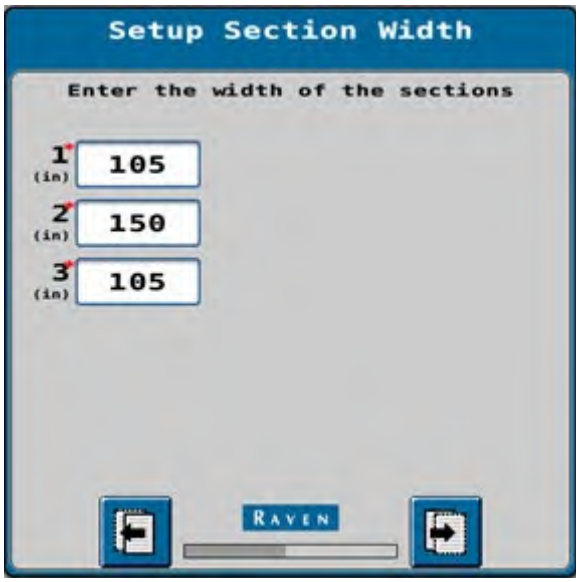


Raven RCM Guide (continued)

15. Verify or enter the widths of the individual sections.

NutriMax Rows	Row Spacing	Section Widths		
		Section 1	Section 2	Section 3
13	30"	105"	150"	105"
9	38"	95"	114"	95"
11	30"	105"	150"	105"
9	36"	90"	108"	90"
15	20"	110"	100"	110"
13	22"	77"	110"	77"

16. Press the Next Page icon.



17. Ensure all the boxes are selected as “None”.

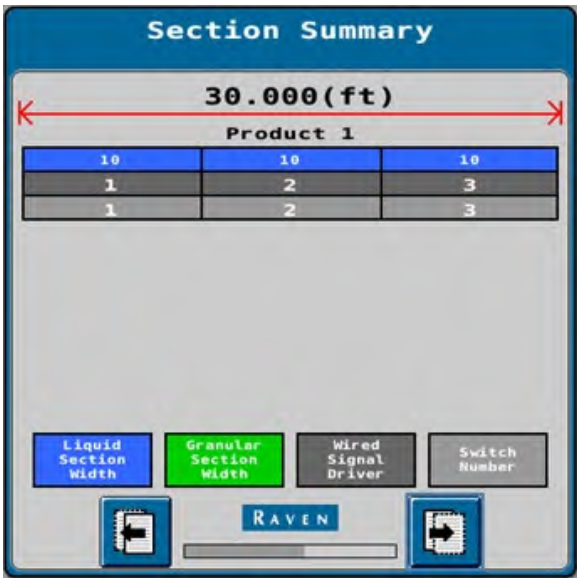
18. Press the Next Page icon.

Raven RCM Guide (continued)

19. Review the information on the Section Summary screen.

20. If the information is correct, press the Next Page icon. To make adjustments to the configuration, press Back and adjust settings as needed.

21. Press the Next Page icon.



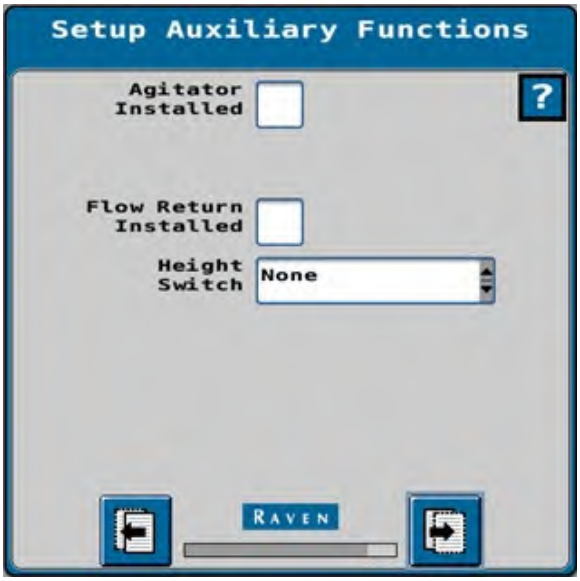
22. Ensure both Pressure Sensors are selected as “None”.

23. Press the Next Page icon.

Raven RCM Guide (continued)

24. Ensure both boxes are unchecked. If the unit is equipped with a height switch, select "Default" from the drop-down list. If not equipped, leave as "None."

25. Press the Next Page icon.



26. Select "PWM" for control valve type.

27. Enter the desired Valve Response Rate, Control Deadband, and Valve Delay. Leave the Enable PWM Smart Control unchecked.

NOTE: The pictured values are suggested starting numbers. You can fine tune these values to best fit your application. The white question mark outlines what happens when adjusting each value.

28. Press the Next Page icon.

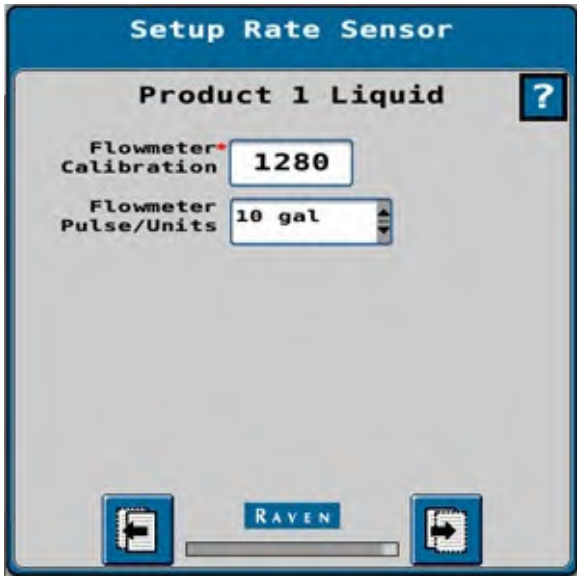
Raven RCM Guide (continued)

29 Enter “122” for the coil frequency, “100” for the PWM High Limit, “10” for the PWM Low Limit, and “0” for the PWM Standby.

30. Press the Next Page icon.

31. Enter the Flowmeter Calibration number. This is unique to each Flowmeter. Check the tag on your flow meter to find the value. The value represented in the picture below does not necessarily represent the number for your flow meter.

32. Press the Next Page icon.



Raven RCM Guide (continued)

33. Ensure Tank Fill/Level Sensor is selected as “None”. Enter the Tank Capacity, Current Tank Level, and Low Tank Level values.

34. If desired, select the Alarm? Checkbox to be notified when the tank fill level falls below the low tank level threshold. Max Tank Fill PWM can be left at “100.0”.

35. Press the Next Page icon.

36. The Setup Rates page determines the application rates that the RCM will regulate to. Enter any desired three Preset Rate Values which can be selected on the home screen. On the home screen, target rates can be entered as well.

37. Enter Rate Bump value in an increment as desired.

38. For Rate Selection, select “Predefined or Rx”. This enables selection of rate from the preset value choices or from a prescription map that is imported from a Universal Terminal.

39. Check Display Smoothing.

40. Select a decimal shift of “0”.

41. Press the Next Page icon.

Raven RCM Guide (continued)

42. Enter “20” for Off Rate Alarm and check Alarm? box. Enter “0” for minimum flow rate.

NOTE: Alarm prompts when over 20% off target rate.

43. Press the Next Page icon.

44. No action required on this screen. Shows the setup summary. Make sure all the values are correct.

45. Press the Next Page icon to finish the RCM set-up

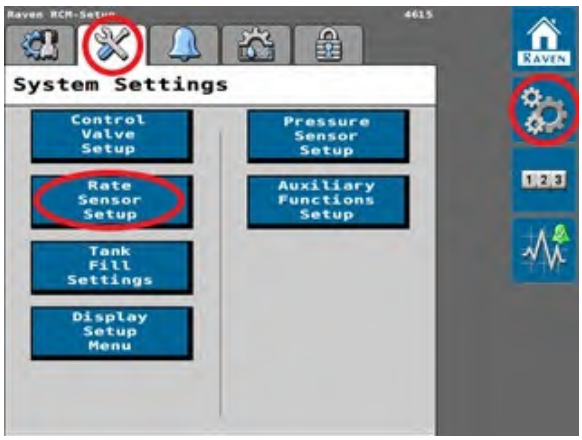
Raven RCM Guide (continued)

Flow Meter Calibration

Flow Meter Calibration can be accomplished by performing a catch test calibration or an Applied Product Calibration. This calibration should only be done if the applied rate differs greatly from the target rate.

Catch Test Calibration

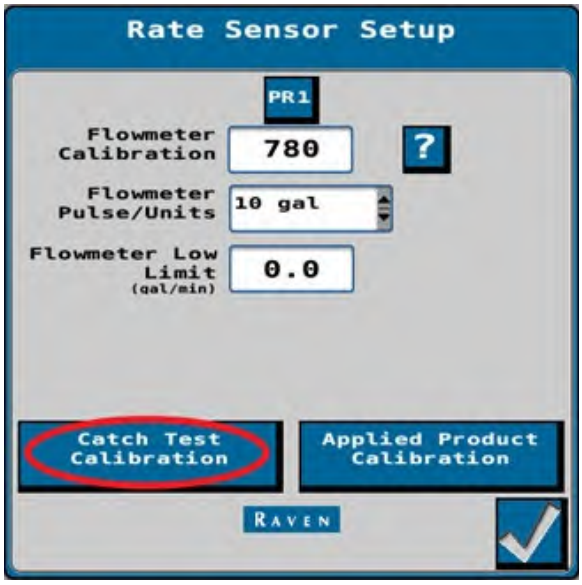
A catch test calibration will calibrate the flow meter by dispensing product through user defined sections into a container without moving the machine. The collected amount is then entered into the display to complete calibration.



1. Navigate to the settings page and select the System Settings tab.

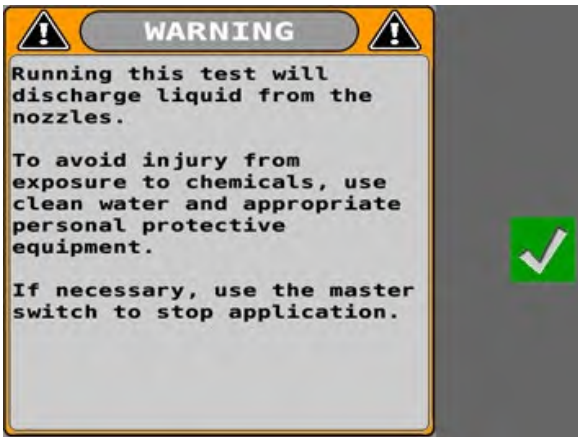
2. Touch the Rate Sensor Setup button.

3. Touch the Catch Test Calibration

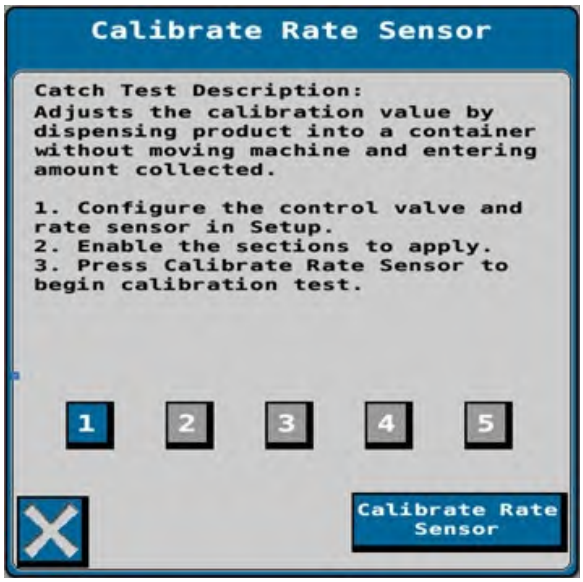


Raven RCM Guide (continued)

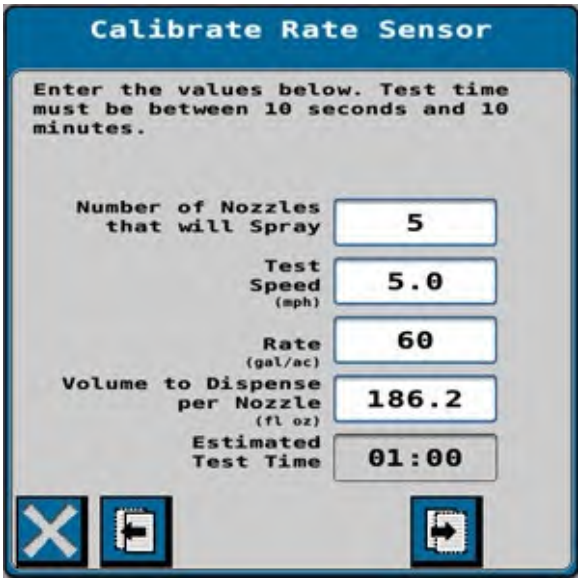
4. A warning message will be displayed. Review the message and touch the Green Checkmark.



5. Select which sections to dispense product through and touch Calibrate Rate Sensor.



6. Enter the number of nozzles in the sections selected that will dispense product into the Number of Nozzles that will Spray. Enter a Test Speed similar to what will be used for field application. Enter the Rate that will be used for field application. Enter the Volume to Dispense per Nozzle. Touch Next Page icon.



NOTE: When choosing how much volume to dispense per nozzle, consider how large of containers you are using to collect the product. It is also important to choose an amount that will have an estimated test time between 10 seconds and 10 minutes. The more product dispensed, the more accurate the test will be.

Raven RCM Guide (continued)

7. Turn the master switch on and then press start to begin the test. Once the test is complete, collect the product and measure how much was dispensed.

8. Enter the amount collected and touch the calibrate/finish button to complete calibration.

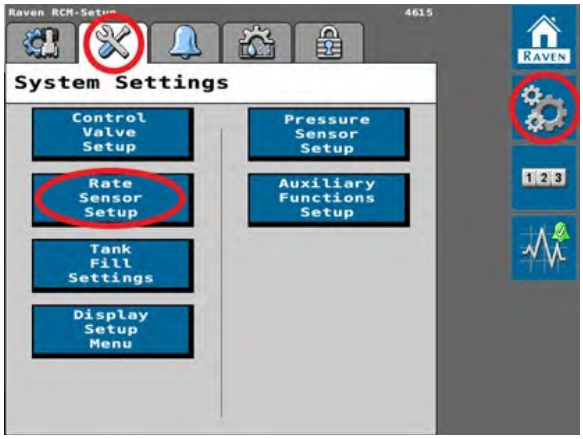
Raven RCM Guide (continued)

Applied Product Calibration

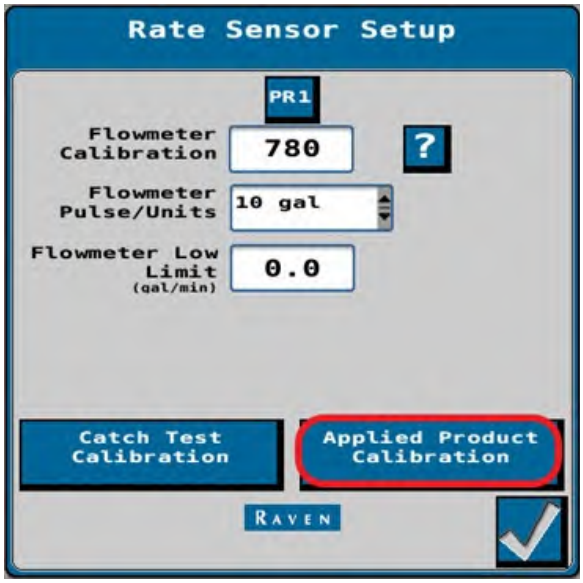
An applied product calibration compares the amount of product that is applied during normal field application to the amount of product the flow meter thinks was applied. This test can be used when time doesn't allow for a full catch test or if calibration of a larger quantity of product is desired.

1. Navigate to the settings page and select the System Settings tab.

2. Touch the Rate Sensor Setup button.

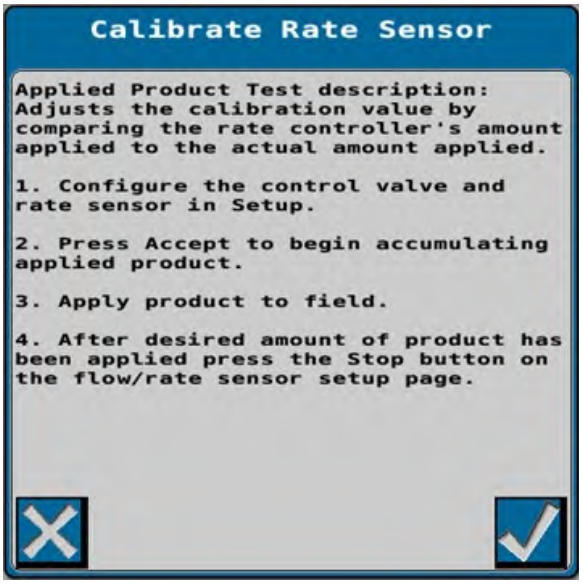


3. Touch the Applied Product Calibration



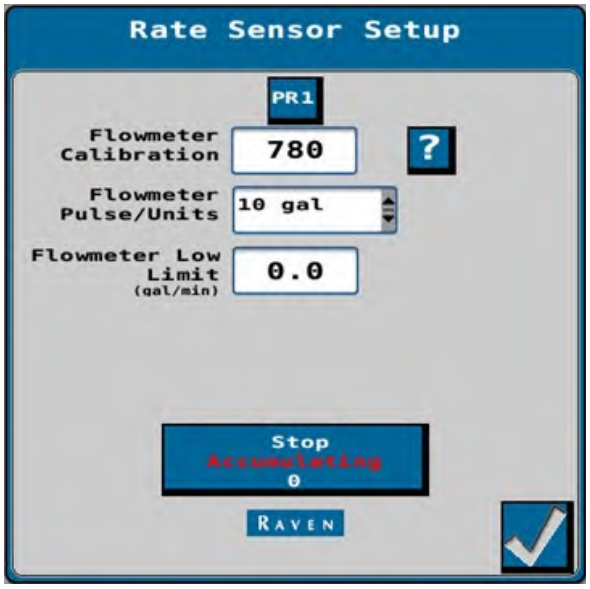
Raven RCM Guide (continued)

4. A message outlining the test procedure will be displayed. Review the instruction and touch the checkmark.



5. Ensure that the applied product is being recorded. A button should be displayed indicating the accumulated total. Once the application is complete, touch the Stop Accumulating button.

6. Follow the on screen steps to complete the applied product calibration.

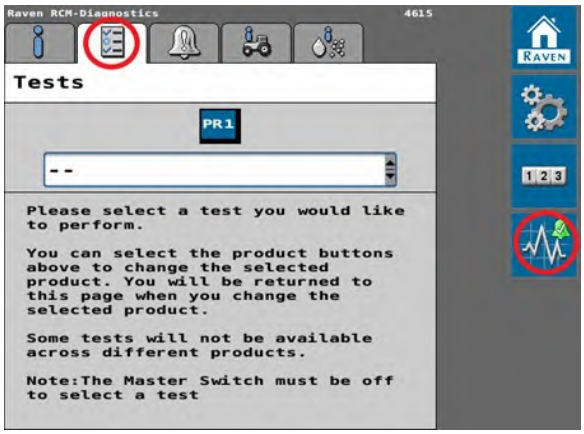


Raven RCM Guide (continued)

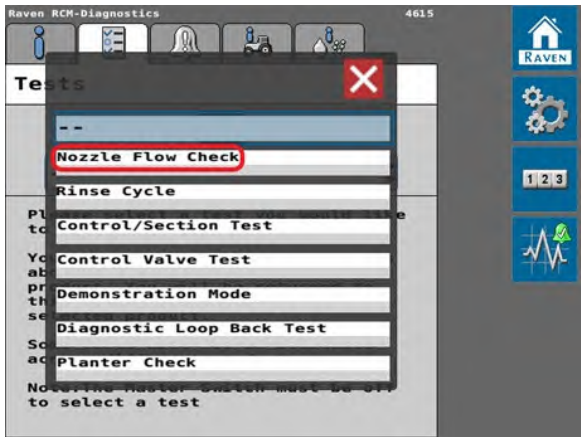
Nozzle Flow Check

An applied product calibration compares the amount of product that is applied during normal A nozzle flow check test allows the operator to check nozzle flow by turning on the pump and valves while remaining stationary. This could be necessary if having issues with nozzle flow.

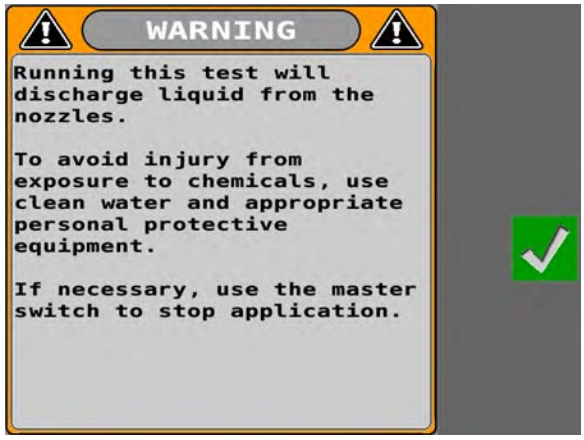
1. Navigate to the Diagnostics page and select the Tests tab.



2. Select “Nozzle Flow Check” from the drop down menu.

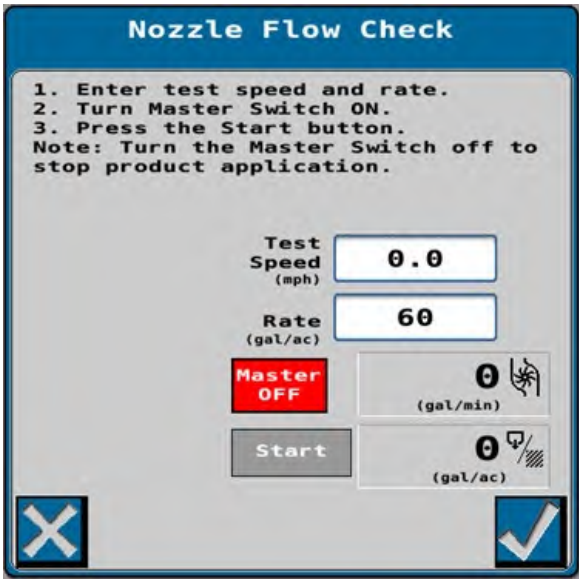


3. Press begin to start the process. A warning alarm will pop up saying that the test will discharge product. Make sure to read the warning carefully. Touch the green checkmark.



Raven RCM Guide (continued)

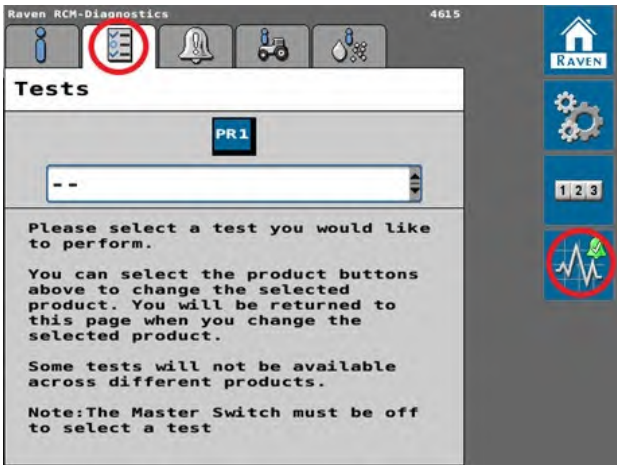
4. Review the step by step instructions. Touch Start to initiate product flow. Complete system inspection as necessary.



Control Section Test

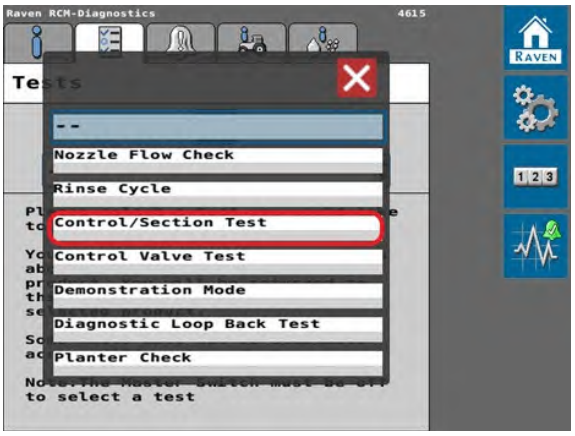
A Control Section Test is used to manually operate each section shut off valves. This test can be used when diagnosing issues with the section control system.

1. Navigate to the Diagnostics page and select the Tests tab.

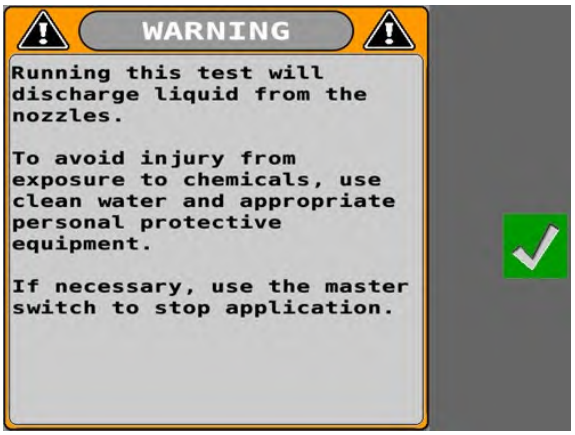


Raven RCM Guide (continued)

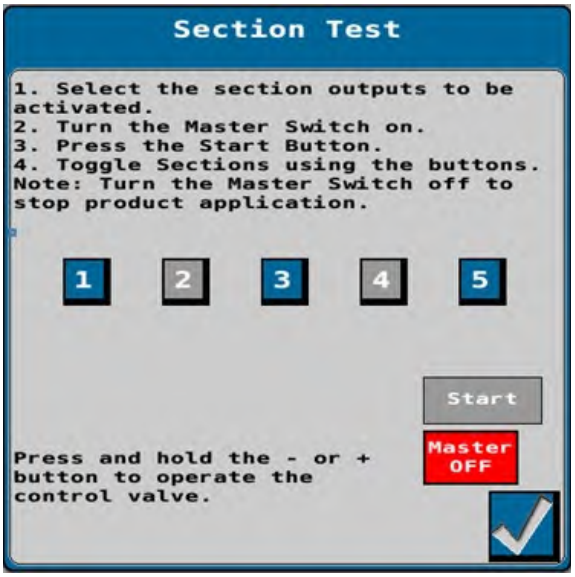
2. Select “Control/Section Test” from the drop down menu.



3. Press begin to start the process. A warning alarm will pop up saying that the test will discharge product. Make sure to read the warning carefully. Touch the green checkmark.



4. Review the step by step instructions and then press start. Each section can be toggled on and off by touching the corresponding section button.



Section III
Operation

Preparing Tractor

Before operating applicator, read the tractor operator's manual and gain an understanding of its safe methods of operation.

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

Check the tractor hydraulic oil reservoir and add oil if needed.

Verify that the tractor is adequately ballasted for drawbar operation at the anticipated draft and vertical tongue load. Vertical tongue load of a loaded applicator is approximately 8,500 lbs. unfolded (4800 lbs. with toolbars folded to transport position). Ensure that the tractor's drawbar has sufficient strength to support this load.

If possible, adjust the tractor drawbar vertically so the top side of the drawbar is at least 18 inches from the ground. Alternately, the applicator hitch may be adjusted vertically by choosing other mounting holes provided.

Raise and secure all tractor 3-point hitch linkage to prevent interference with the implement tongue and hydraulic hoses during turning.

Preparing Applicator

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

Hardware

Check for loose bolts and nuts, and tighten as needed. Check again after the first half-day of operation.

Pivot Pins

Check that all pins are in place and in good condition. Replace any worn, damaged or missing pins.

Hitch

Check hitch and hitch retention hardware for damage and wear.

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.

Preparing Applicator (continued)

Tires/Wheels

Check tire pressures and maintain at recommended values listed in the MAINTENANCE section.

⚠ CAUTION

- **IMPROPERLY TORQUED WHEEL NUTS/BOLTS CAN CAUSE A LOSS OF IMPLEMENT CONTROL AND MACHINE DAMAGE. WHEEL NUTS/BOLTS MUST BE CHECKED REGULARLY. SEE TORQUE PAGE IN THE "MAINTENANCE" SECTION FOR PROPER WHEEL NUT/BOLT SPECIFICATIONS. WARRANTY DOES NOT COVER FAILURES CAUSED BY IMPROPERLY TORQUED WHEEL NUTS/BOLTS.**

IMPORTANT

- *Installing wheels without the proper inset could result in hub or spindle failure. This will cause substantial damage to the applicator.*

For questions regarding new tire warranty, please contact your local original equipment tire dealer. Used tires carry no warranty. Tire manufacturers' phone numbers and web sites are listed in the "MAINTENANCE" section for your convenience.

Lubrication

Lubricate the applicator as outlined in the MAINTENANCE section.

Hitching to the Tractor

Drawbar Hitching

WARNING

- **DO NOT STAND BETWEEN THE APPLICATOR AND TRACTOR WHEN HITCHING. ALWAYS ENGAGE PARKING BRAKE AND STOP ENGINE BEFORE INSERTING HITCH PIN.**

Connect the hitch to the tractor drawbar. Do not attempt to hitch to any other location on the tractor.

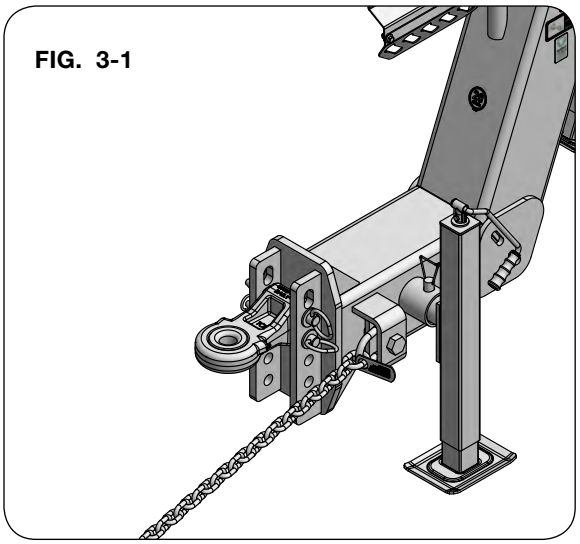
NOTE: Only use the centered position on the drawbar.

The applicator is equipped with a clevis and single tang hitches. Use a hitch pin of the correct diameter.

The applicator must be relatively level in order for the tank volume indicator to read accurately.

The holes in the hitch and vertical holes in the tongue allow for adjustment so the tank sits level.

FIG. 3-1



IMPORTANT

- *The use of a smaller-diameter hitch pin will result in additional clearance between the implement hitch and pin. This additional clearance may cause accelerated pin and hitch wear, along with more pronounced jolting from the applicator during operation.*
- *Verify and/or adjust the applicator hitch height before coupling to the tractor. The applicator hitch is adjusted by unbolting the hitch and reinstalling in a different set of holes provided.*
- *After inserting drawbar pin, secure with a locking device to help prevent uncoupling during use.*

Hitching to the Tractor (continued)

Transport Chain

Always use a transport chain when connecting the applicator directly to a tractor. Make sure the intermediate chain support is in use. DO NOT use the intermediate chain support as the chain attaching point. FIG. 3-2 shows how the transport chain must be installed between the tractor and applicator.

Transport chain should have a minimum rating equal to the gross weight of the implement and all attachments. Use only ASABE approved chain. Allow no more slack in the chain than necessary to permit turning.

Transport chain connection shown for illustration purposes only. Refer to tractor manufacturer for proper attachment.

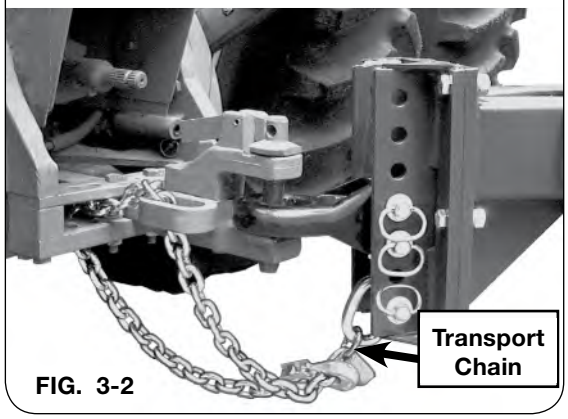


FIG. 3-2

⚠ CAUTION

- **REPLACE TRANSPORT CHAIN IF ANY LINK OR END FITTING IS BROKEN, STRETCHED OR DAMAGED. DO NOT WELD TRANSPORT CHAIN.**

Hitching to the Tractor (continued)

Hydraulic Connections

⚠ WARNING

- **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.**
- **RELIEVE THE HYDRAULIC SYSTEM OF ALL PRESSURE BEFORE ADJUSTING OR SERVICING. SEE THE HYDRAULIC POWER UNIT OPERATOR'S MANUAL FOR PROPER PROCEDURES.**

⚠ CAUTION

- **DO NOT UNFOLD OR FOLD TOOLBAR WITHOUT HITCHING TO THE TRACTOR.**

After cleaning hydraulic hose couplers, connect to tractor hydraulic circuits as follows:

1. Connect the toolbar hydraulic hoses to the tractor remote couplers. The 3/8" hoses supply oil to the toolbar lift cylinders. The 1/4" hoses supply oil to the wing fold cylinders. The 5/8" hoses supply pressure and return to the pump.

NOTE: Use the retract outlets to utilize float feature.

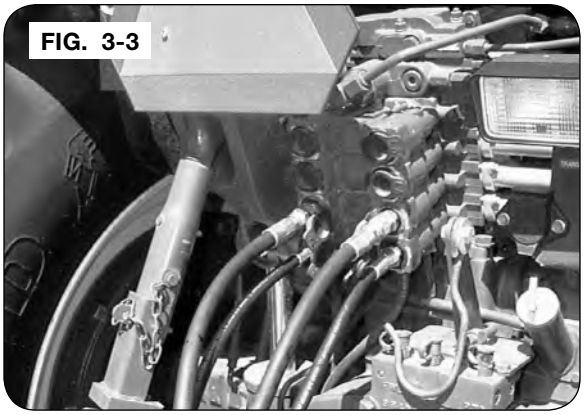
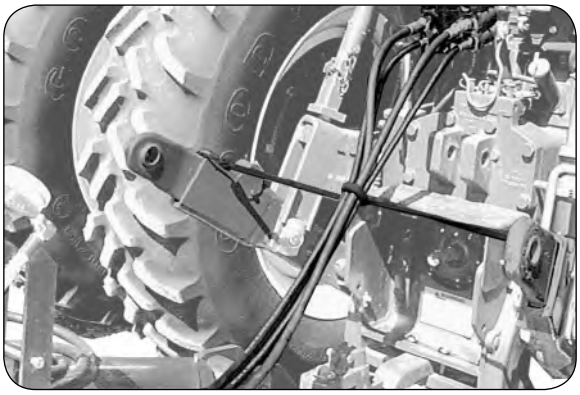


FIG. 3-3

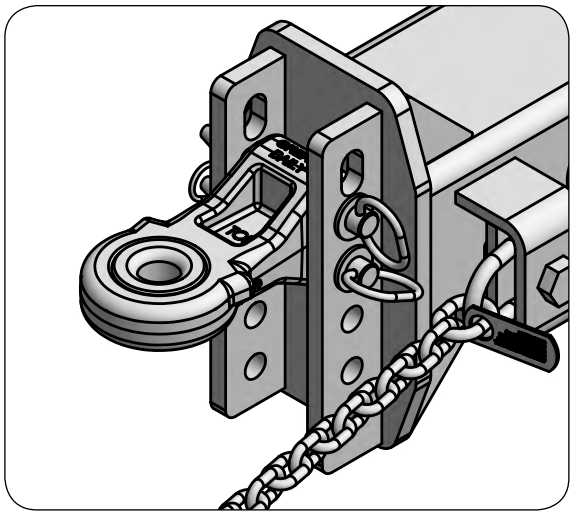
2. It may be necessary to tie the hydraulic hoses up to keep them away from the hitch area. A tarp strap around the hoses and between the two point arms works well.



Hitching to the Tractor (continued)

Leveling Main Frame

1. Before leveling the machine tire pressure should be checked. Inflate mainframe tires to 56 P.S.I. Max. Before beginning operation of this machine the mainframe must be level. Place toolbar on level surface. Adjust the hitch up or down in the tongue connector and connect to tractor.



Electrical Harness Connection

1. Attach 7 pin electrical harness before road transport.

Jack Usage

WARNING

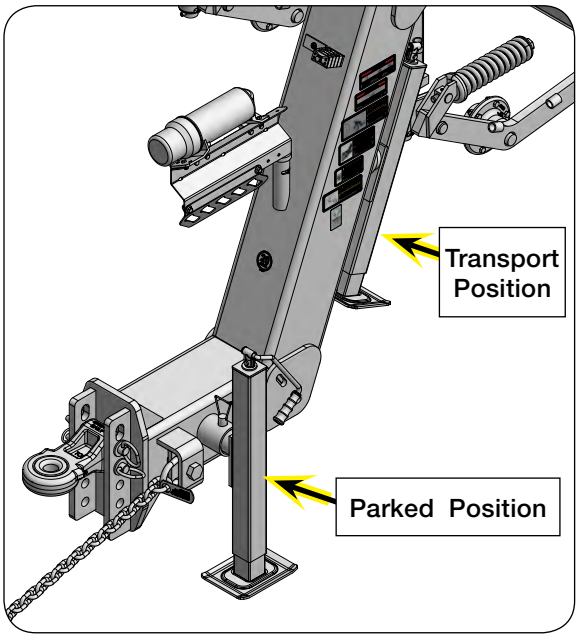
- **UNHITCHING A LOADED APPLICATOR CAN CAUSE SERIOUS INJURY OR DEATH DUE TO TONGUE RISING OR FALLING. ALWAYS HAVE A LOADED APPLICATOR ATTACHED TO A TRACTOR.**

Use jack to support an empty applicator, never a loaded applicator. Always have a loaded applicator hooked to tractor.

After tractor connection is established, raise jack leg of the jack to highest position to maximize ground clearance.

Remove jack pin.

Remove jack and move to transport mount location on the side of the tongue. Reinstall the jack pin



Transporting

Drawbar Connection

⚠ WARNING

- **USE EXCEPTIONAL CARE WHEN OPERATING APPLICATOR EQUIPPED WITH SINGLE TIRES AND SET AT NARROW WHEEL SPACING. THE POSSIBILITY OF TIPPING OVER DURING TURNS OR TRAVEL ON ROUGH ROADS IS INCREASED UNDER THESE CONDITIONS.**

⚠ CAUTION

- **THIS IMPLEMENT IS NOT EQUIPPED WITH BRAKES. ENSURE THAT THE TOWING VEHICLE HAS ADEQUATE WEIGHT AND BRAKING CAPACITY TO TOW THIS IMPLEMENT.**
- **IMMEDIATELY PRIOR TO ROAD TRANSPORT, RUN THE FULL FOLD SEQUENCE FOR PROPER SYSTEM PRESSURES AND TO AVOID INADVERTENT MOVEMENT.**

See towing vehicle manual for towing and braking capacity. Regulate speed to road conditions. Maximum speed of applicator with wheels should never exceed 20 m.p.h. Maximum speed of applicator with tracks should never exceed 15 m.p.h.

Secure drawbar pin with a locking device and lock tractor drawbar in centered position.

Secure transport chain to tractor before transporting, see FIG. 3-7. Use good judgment when transporting equipment on highways. Regulate speed to road conditions and maintain complete control.

It is probable that this implement is taller, wider, and longer than the towing tractor. Become aware of and avoid all obstacles and hazards in the travel path of the equipment, such as power lines, ditches, etc.

Slow down before making sharp turns to avoid tipping. Drive slowly over rough ground and side slopes.

Transporting (continued)

DANGER

- **PERFORM TOOLBAR UNFOLDING AND FOLDING OPERATIONS ONLY IN AREAS WITH ADEQUATE HEIGHT, WIDTH AND LENGTH CLEARANCES. IN PARTICULAR, BE MINDFUL OF LOCATION OF OVERHEAD POWER LINES. FAILURE TO DO SO CAN RESULT IN PERSONAL INJURY AND PROPERTY DAMAGE.**

WARNING

- **KEEP ALL PERSONNEL A SAFE DISTANCE AWAY FROM THE APPLICATOR WHEN UNFOLDING OR FOLDING THE TOOLBAR. PERSONAL INJURY CAN RESULT FROM IMPACT WITH TOOLBAR.**
- **DO NOT EXCEED 10 MPH DURING OFF-HIGHWAY TRAVEL.**

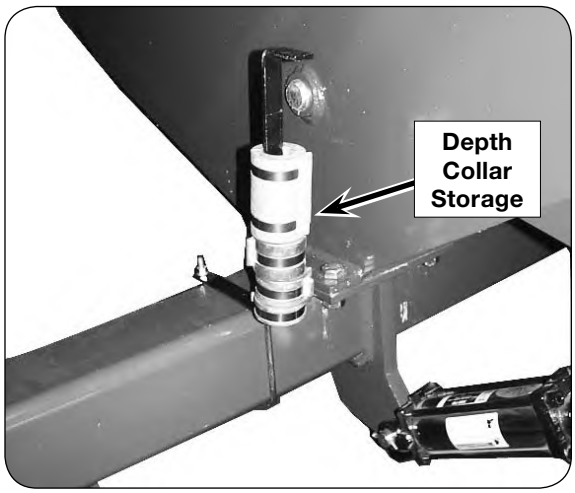
IMPORTANT

- *Never unfold the unit without attaching to tractor first. Refer to "Hitching to the Tractor" and "Jack Usage" in this section.*

Depth Collar Depth Control

NOTE: To lock transport height, install all depth collars.

1. Set working depth using 4 1/4" depth collars as a starting depth. Adjust as desired.



Transporting (continued)

Standard Toolbar Wing Lock

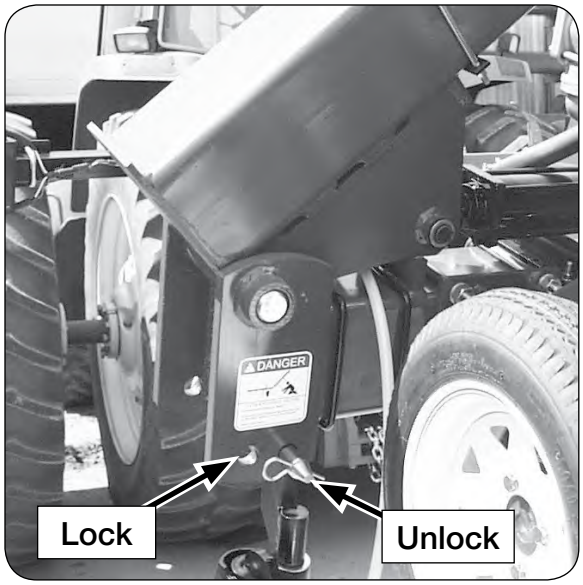
WARNING

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

1. Wing lock pin storage.

IMPORTANT

- *Lock wings during operation. Failure do do so could result in damage to wing fold cylinders.*



Coulter Shank Adjustments

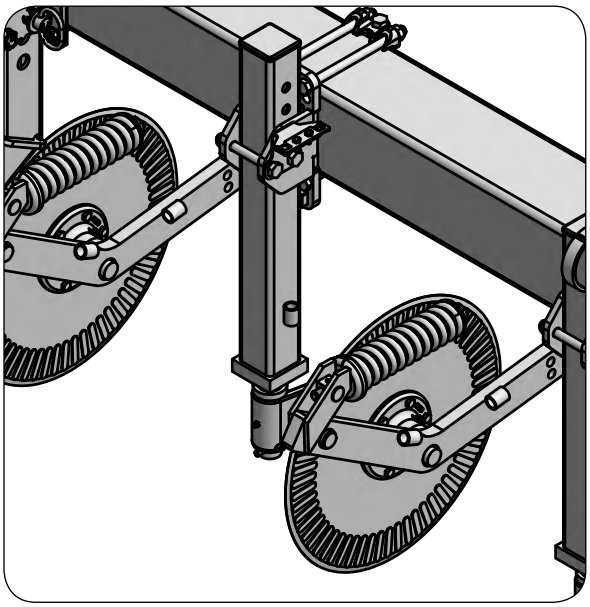
Vertical Position

To adjust the vertical positioning refer to the following steps:

⚠ WARNING

- **TIPPING OR MOVEMENT OF THE MACHINE CAN CAUSE SERIOUS INJURY OR DEATH. BE SURE THE MACHINE IS SECURELY BLOCKED.**

1. Determined how deep the shank will operate (page 3-16).
2. Lower the unit, machine should be leve on the ground.
3. The coulter blade will operate 4-5” deep in the soil. Subtract the blade working depth from the shank working depth. (i.e. - If the shank operates 14” deep, coulter blades 5” deep, distance from the ground to the bottom of the blade should measure 8”). Adjust coulter height accordingly.
4. After positioning, retighten hardware and be sure depths of all coulters are the same.



NOTE: Recommended coulter depth is between 3-5”. If rocks are present in fields, shallower depths should be used.

NOTE: Wavy coulters are used on the front coulter. These blades help to cut the soil deeper ahead of the shank resulting in less soil disturbance.

The coulter springs are preset at the factory at 9 3/8”. This measurement is the total amount of exposed spring.

NOTE: Adjusting the spring below 9 3/8” could cause premature part failure and void any warranty considerations.

Orifice and Nozzle Installation

WARNING

- **KEEP HANDS CLEAR OF PINCH POINT AREAS.**
- **ALWAYS WEAR PERSONAL PROTECTIVE EQUIPMENT WHEN WORKING WITH OR NEAR 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 CHEMICALS.**
- **WASH HANDS AND EXPOSED SKIN IMMEDIATELY AFTER CONTACT WITH SPRAY/ FERTILIZER SOLUTION AND APPLICATION EQUIPMENT.**

1. Consult row spacing rate chart for orifice size.
2. Remove nozzle nut and insert orifice.
3. Travel a few meters and check blade depth. Adjust gauge wheels or coulters to achieve the 4” depth.
4. Check all nozzles for stream of liquid behind blade.
5. Make adjustment to nozzle assembly so stream is in line with the blade trench.

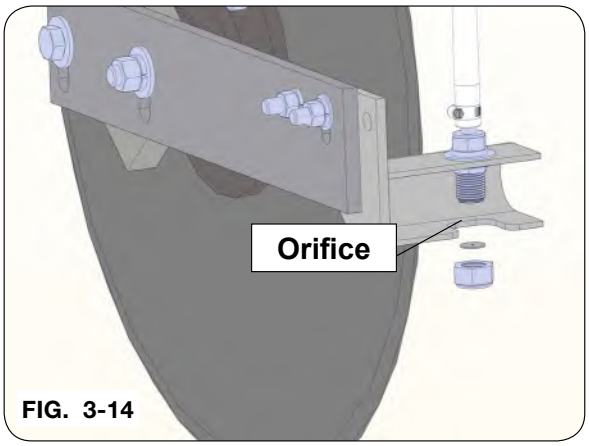


FIG. 3-14

NOTE: Rotate the coulter assembly about the vertical shaft to assure proper hose slack in the hose below the nozzle body to allow for oscillation of the coulter assembly.

Bottom Fill Valve

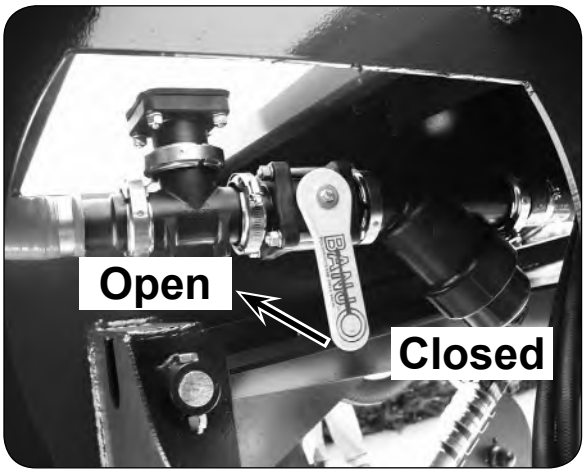
⚠ WARNING

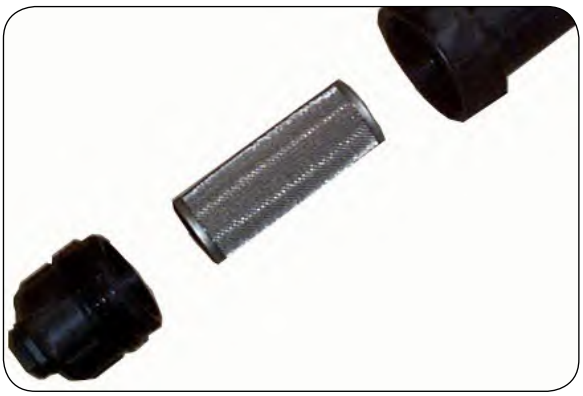
- **ALWAYS WEAR PERSONAL PROTECTIVE EQUIPMENT WHEN WORKING WITH OR NEAR CHEMICALS. THIS EQUIPMENT INCLUDES, BUT IS NOT LIMITED TO: PROTECTIVE EYE WEAR, GLOVES, SHOES, SOCKS, LONG-SLEEVED SHIRT, AND LONG PANTS. ADDITIONAL PROTECTION MAY BE REQUIRED FOR MANY TYPES OF CHEMICALS.**
- **WASH HANDS AND EXPOSED SKIN IMMEDIATELY AFTER CONTACT WITH SPRAY/FERTILIZER SOLUTION AND APPLICATION EQUIPMENT.**

⚠ CAUTION

- **NEVER LEAVE APPLICATOR UNATTENDED WHILE FILLING. TANK CONTENTS MAY SPILL OUT OF AIR VENTS IF OVERFILLED.**

1. After the tank is filled open valve before engaging pump.
2. Screen should be checked and cleaned periodically.

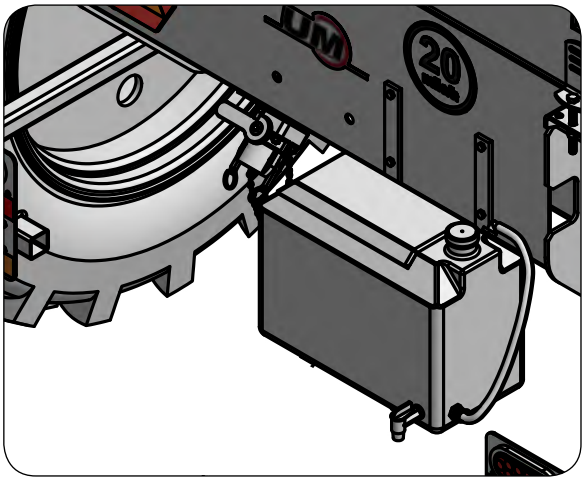




Clean Water Tank

1. Location of nine-gallon emergency water tank/toolbox. Change water daily to provide fresh clean water to flush exposed skin or eyes. Drain water daily in cold temperatures to prevent freezing and bursting tank.

2. In case of exposure to fertilizer, open faucet or pull top end of hose loose to flush exposed part of body. Remove contaminated clothes as soon as possible.



Ground/Positive Contact Pump Drive Set Up

Go to https://johnblue.com/calculators/metering-pumps/ OR use QR code for the John Blue Pump Calculator and instructions.

Drive System Type – Press/Rub Wheel
Pump Type – Piston
John Blue Pump Model – NGP-7055 (Single Piston Pump)
or NGP-9055 (Twin Piston Pump)
Loaded Radius – 10.6”
Drive Sprocket Teeth – 40 or 50
- 40 is the standard drive sprocket (Use 40 tooth unless pump setting exceeds 10 with the desired application rate and ground speed. Then switch to the 50 tooth sprocket)
- 50 is for high rate application

Driven Sprocket Teeth – 18

NOTE: Swath width is the number of rows being applied (Example: A 15 row 30” machine will cover 16 rows.) times the spacing between the rows.

Rows x Spacing = Swath width
16 rows x 30” = 480” (swath width)

Inductor

Basic Operation

IMPORTANT

- *The main solution tank should contain at least 50 gallons of liquid.*

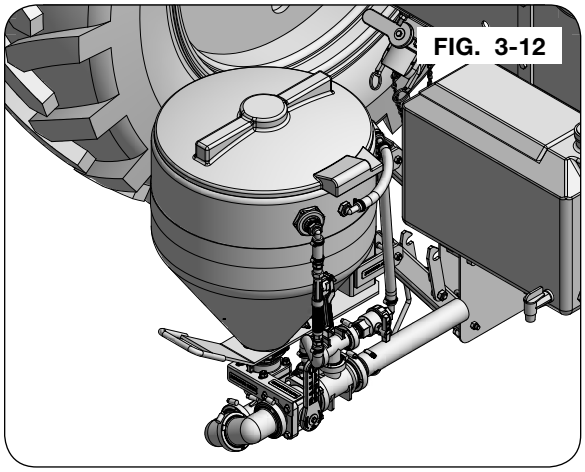


FIG. 3-12

The INDUCTION VALVE, INDUCTOR MIX VALVE, and tank are shown in FIG. 3-12 and 3-13 for reference.

1. Assure INDUCTION VALVE on the bottom of the inductor tank is in the <OFF> position.
2. Push the tank lever and lower it to the "fill" position.
3. Set valves:

VALVE SETTINGS

PUMP INLET VALVE	OPEN
INDUCTOR MIX VALVE (OPT.)	OFF
AGITATION CONTROL (100 PSI)	PARTIALLY OPEN 1/4
INDUCTION VALVE	OFF

4. Start pump.
5. Open lid and pour chemical into inductor tank. (If using dry chemical, open INDUCTOR MIX valve to mix chemical, using care not to overfill inductor tank.)
6. Close the lid.
7. Open INDUCTION VALVE on the bottom of the inductor tank to evacuate the inductor tank.
8. Close INDUCTION VALVE when the inductor tank is empty and rinse. See "Jug and Inductor Tank Rinsing" in this secton.
9. Raise the tank to storage position.


FIG. 3-13

⚠ WARNING

- **WHEN USING JUG RINSER, BE CAREFUL NOT TO SPRAY SOLUTION INTO EYES OR FACE.**

Tank Mixing

Fertilizer additives can be added to the solution tank through the use of the optional inductor. Before adding fertilizer additives, ensure that the tank contains at least 50 gallons of liquid.

⚠ WARNING

- **ALWAYS WEAR PERSONAL PROTECTIVE EQUIPMENT WHEN WORKING WITH OR NEAR 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 CHEMICALS.**

Inductor (continued)

Jug and Inductor Tank Rinsing

⚠ WARNING

- **ALWAYS WEAR PERSONAL PROTECTIVE EQUIPMENT WHEN WORKING WITH OR NEAR 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 CHEMICALS.**

IMPORTANT

- *Do not allow pump to run dry. Pump damage will result.*
- *Rinse the jug, nozzle, or tank with the product in the main solution tank.*

The INDUCTION VALVE, INDUCTOR MIX VALVE, and tank are shown in FIG. 3-14 and 3-15 for reference.

1. To rinse a chemical container, place container upside down on rinse nozzle and squeeze handle on rinse wand.
2. To rinse inductor tank, close lid, open INDUCTOR MIX valve and squeeze rinse wand handle for approximately 10 seconds.
3. To rinse out container nozzle, close lid, and activate jug rinser for approximately 10 seconds.
4. Repeat steps 2 and 3 for additional rinsing, if desired.
5. Close INDUCTOR MIX valve and release rinse wand when rinsing is complete.
6. When inductor tank is empty, close INDUCTOR DRAIN valve.
7. Close INDUCTOR FLOW valve then set AGITATION CONTROL to proper settings.
8. Raise tank to storage position.

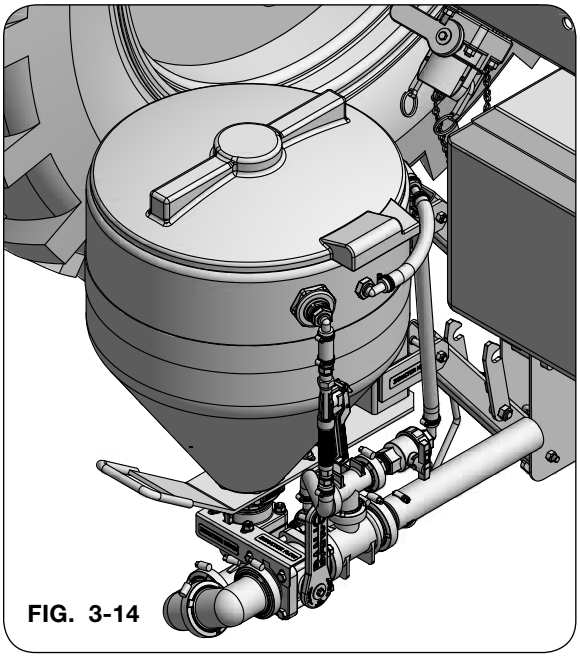


FIG. 3-14

FIG. 3-15

⚠ WARNING

- **WHEN USING JUG RINSER, BE CAREFUL NOT TO SPRAY SOLUTION INTO EYES OR FACE.**

Flow Ball Indicator

⚠ WARNING

- **ALWAYS WEAR PERSONAL PROTECTIVE EQUIPMENT WHEN WORKING WITH OR NEAR 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 CHEMICALS.**
- **WASH HANDS AND EXPOSED SKIN IMMEDIATELY AFTER CONTACT WITH SPRAY/FERTILIZER SOLUTION AND APPLICATION EQUIPMENT.**
- **REMOVE CLOTHING IMMEDIATELY IF CHEMICALS PENETRATE CLOTHING AND CONTACT SKIN. WASH THOROUGHLY AND PUT ON CLEAN CLOTHING.**

The Flow Ball Indicator plumbing kit allows the operator to easily determine changes occuring in the hoses. It operates by utilizing hoses of equal length and size allowing for the ball to float at equal levels.

1. When liquid is flowing evenly all balls hover at the same level.
2. A ball that is lower than the others indicates the flow is too low due to a restriction or blockage.
3. A ball that is higher than the others indicates the flow is too high due to a leaking fitting or hose.

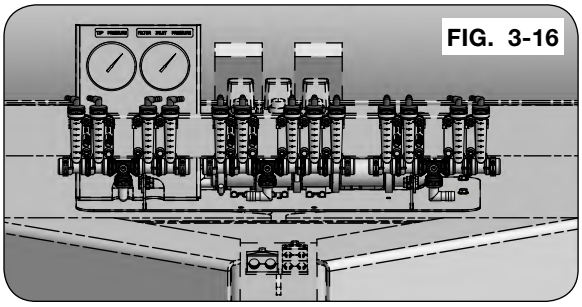


FIG. 3-16

Selecting the Correct Flow Ball

1. Calculate the flow rate required per flow indicator with the following formula:

$$\text{Flow Rate} = \frac{\text{MPH x GPA x Nozzle Spacing (in) x DCF*}}{5940}$$

*DCF = Density Conversion Factor

Weight of Solution	Density Conversion Factor (DCF)
8.34 lb./gal. (Water)	1.00
10.65 lb./gal. (28% Nitrogen)	1.13
11.05 lb./gal. (32% Nitrogen)	1.15

Example:

Speed = 8 miles per hour
Rate = 10 gallons per acre
Nozzle Spacing = 20 inches
Liquid = 28% Nitrogen

$$\text{Flow Rate } 0.304 = \frac{\text{8 MPH x 10 GPA x 20” Nozzle Spacing (in) x 1.13 DCF*}}{5940}$$

Flow Ball Indicator (continued)

2. Select the flow indicator ball required for you application using the calculated flow rate and the guide below.

Flow Indicator Ball Selector Guide		
Part Number	**Color**	**Flow Rate - U.S. GPM Range**
9007782	Green Polyproplene	0.05 - 0.18
9007781	Red Celcon	0.09 - 0.30
9007780	Maroon Glass	0.31 - 0.72
9007779	1/2" Stainless Steel	0.40 - 1.33
9007883	7/16" Stainless Steel	1.00 - 2.70

Flow Ball for Half Rate Nozzles

NOTE: With the applicator unfolded, the end rows use the half rate nozzles. If applicator is running folded, internal rows use half rate nozzles.

1. Half rate nozzles require a different size ball than full rate nozzles. Once the ball has been sized for the full rate nozzles, pick the ball that corresponds to half the full rate of flow for the half rate nozzles. The half rates hoses have been marked with a gray sleeve.

Ball Removal/Replacement

NOTE: Flush the system with clean water before servicing.

1. Remove the fittings from the top of the flow ball manifold by removing the retaining clip (Fig. 3-18)

NOTE: During operation in the event of a blockage, each hose has been connected in order, beginning with the left most coulter nozzle representing the left most flow ball indicator. It is recommended the fittings be removed to access the ball and re-installed in the same location to maintain similar visual troubleshooting capabilities.

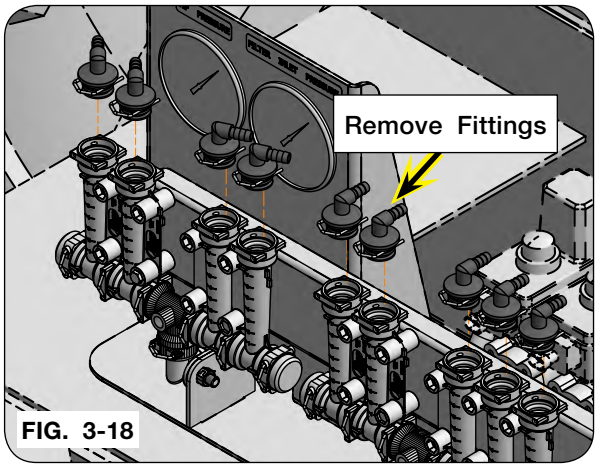


FIG. 3-18

2. Remove the rear capscrews from the flow ball manifold mounting brackets. This will allow the flow ball manifold assembly to be rotated (Fig 3-19).


FIG. 3-19

Flow Ball Indicator (continued)

3. Rotate the manifold assembly down carefully to avoid any residual liquid that may be in the manifold to avoid coming in contact with exposed skin, eyes, or other sensitive areas. (Fig. 3-20)

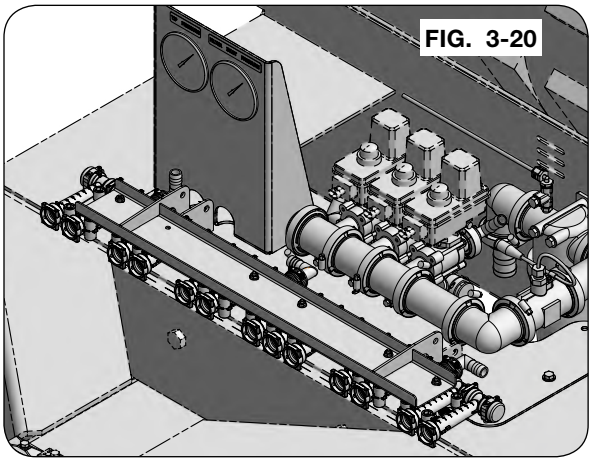


FIG. 3-20

4. Fully tilt manifold bracket down and remove plastic ball stop. This will allow indicator balls to roll out of flow monitors. (Fig. 3-21)

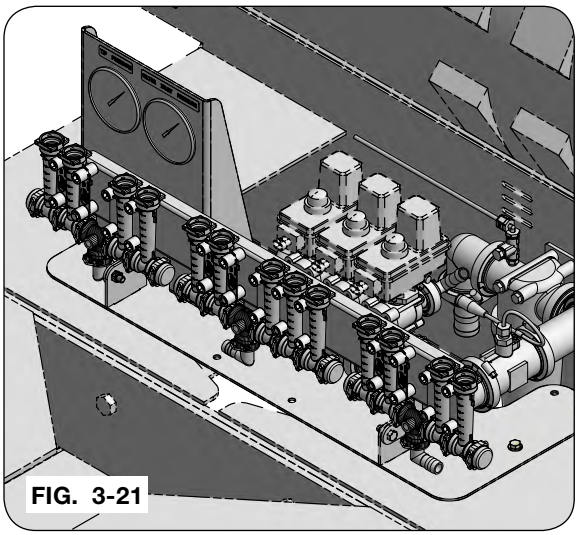


FIG. 3-21

5. Rotate bracket up completely, align capscrew holes, and reinsert hardware removed in Step 2, and insert indicator balls into the flow monitors.

6. Reinsert the fittings removed in step 1 ensuring that the hoses marked with the gray sleeves are inserted on the flow monitors that have the balls selected for the half rate nozzles. Reinsert retaining clips.

Section IV
Maintenance

Applicator Maintenance

DANGER

- **ELECTROCUTION WILL CAUSE SERIOUS INJURY OR DEATH. ELECTROCUTION CAN OCCUR WITHOUT DIRECT CONTACT. KEEP AWAY FROM ALL ELECTRICAL LINES AND DEVICES.**

WARNING

- **TIPPING OR MOVEMENT OF THE MACHINE CAN CAUSE SERIOUS INJURY OR DEATH. BE SURE MACHINE IS SECURELY BLOCKED.**
- **EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING IMPLEMENT.**
- **KEEP HANDS CLEAR OF PINCH POINT AREAS.**
- **ALWAYS WEAR PERSONAL PROTECTIVE EQUIPMENT WHEN WORKING WITH OR NEAR 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 CHEMICALS.**
- **AVOID BREATHING SPRAY MIST OR VAPOR.**
- **WASH HANDS BEFORE EATING, DRINKING, CHEWING GUM, OR USING TOILET.**
- **NEW HYDRAULIC SYSTEMS OR SYSTEMS THAT HAVE BEEN MAINTAINED MUST BE PURGED OF AIR BEFORE OPERATING OR MOVING MACHINE TO PREVENT SERIOUS INJURY OR DEATH.**

CAUTION

- **SHARP EDGES ON COULTER BLADES AND KNIVES CAN CAUSE SERIOUS INJURY. BE CAREFUL WHEN WORKING AROUND COULTER BLADES AND KNIVES.**

Seasonal Storage

Always open all product valves to remove any fluids and to allow moisture to dry.

Immediately after season is finished, completely wash machine to remove corrosive fertilizer inside and out before storing. When using pressure washers, maintain an adequate distance to avoid blasting water into bearings or electrical connections.

Repaint all areas where paint has been removed to keep rust from developing. Coat areas of coulter blades and knives, if equipped, and coulter posts with rust prohibitive material.

Applicator Maintenance (continued)

Seasonal Storage (continued)

Coat exposed cylinder piston rods with rust preventative material.

Inspect machine for parts that may need to be replaced so they may be ordered in the off season.

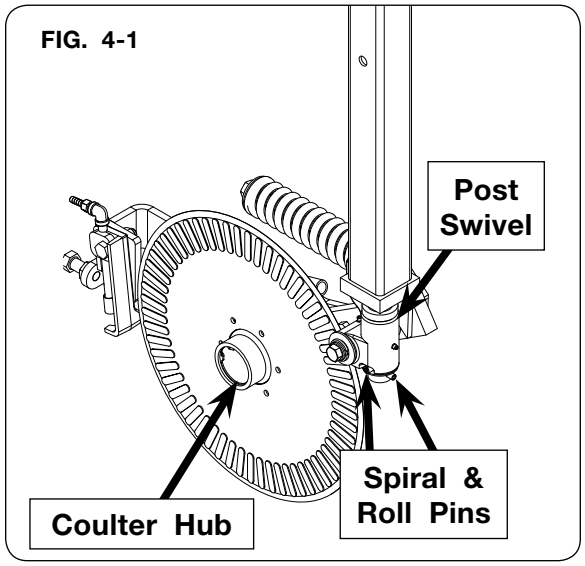
Lubricate machine at all points outlined.

Check coulter blade post swivel limit spiral and roll pins. Replace as needed. (FIG. 4-1)

Check coulter post blade hubs for free rotation. If blade hubs do not rotate, replace and/or pack bearings with grease. Replace coulter arm if spindle is damaged. (FIG. 4-1)

Check coulter post swivel for free movement. If post swivel does not move, free the swivels and grease. Grease the coulter post swivel until fresh grease purges top or bottom of swivel casting to prevent the coulter pivot seizing on post. (FIG. 4-1) Refer to "Lubrication" in this section.

FIG. 4-1



After any period of unused time, unit should be unfolded and refolded to check function of hydraulic system.

Purging Hydraulic System

⚠ WARNING

- **RELIEVE THE HYDRAULIC SYSTEM OF ALL PRESSURE BEFORE ADJUSTING OR SERVICING. SEE THE HYDRAULIC POWER UNIT OPERATOR'S MANUAL FOR PROPER PROCEDURES.**

- **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.**

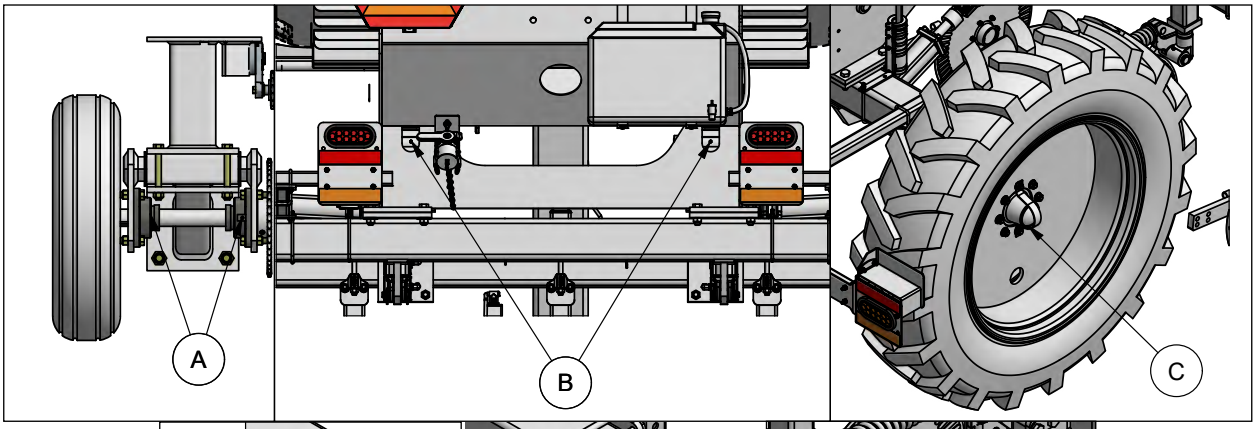
1. Purge air from system as follows:
   A. Clear all personnel and objects from the area, including where the machine will have full range of motion during the hydraulic movement.
   B. Pressurize the system and maintain the system at full pressure for at least 5 seconds after the cylinder rods stop moving. Check that all cylinders have fully extended or retracted.
   C. Check oil reservoir in the hydraulic power source and refill as needed.
   D. Pressurize the system again to reverse the motion of step B. Maintain pressure on the system for at least 5 seconds after the cylinder rods stop moving. Check that all cylinders have fully extended or retracted.
   E. Check for hydraulic oil leaks using cardboard or wood. Tighten connections according to directions in the Torque Specifications in the MAINTENANCE section.
   F. Repeat steps in B, C, D, and E 10-12 times.

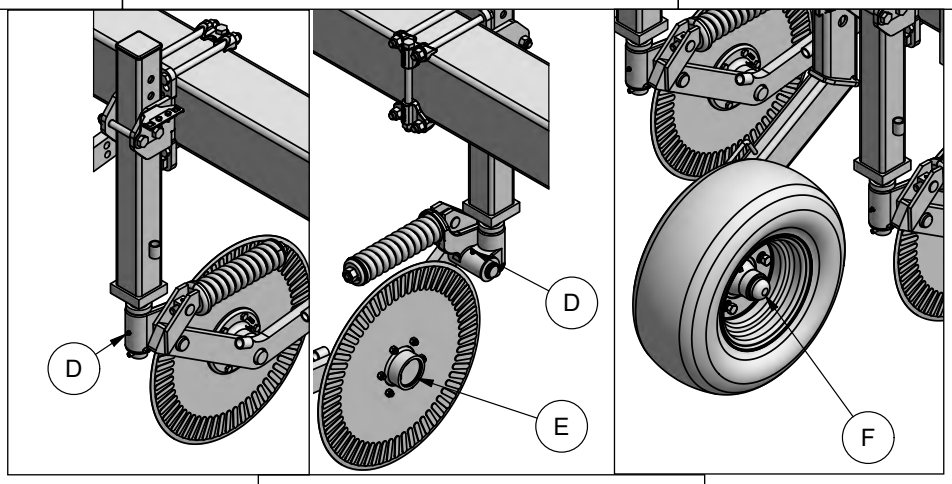
Applicator Maintenance (continued)

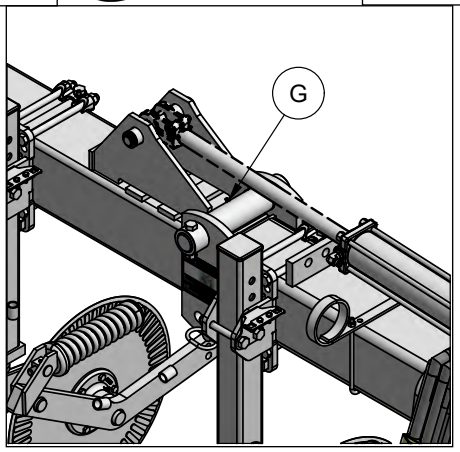
Relieving Hydraulic Pressure

To relieve hydraulic pressure in the system, be sure hydraulic motor is disengaged and/or hydraulic cylinder is not exerting force on the system. Next, consult tractor operators manual for procedure to relieve pressure.

Lubrication







Lubrication (continued)

To keep your applicator in top operating condition and to assure its proper performance and reliability for a long period of time, periodic inspection and lubrication is a must.

Use EP-2 lubricant at the locations described in the chart.

The lubrication locations and recommended schedule are as follows:

ITEM	DESCRIPTION	POINT	QTY.	HOURS
A	Pump Drive Assembly - Pillow Block Bearings	2	2 Shots	Weekly
B	Toolbar Lift Arms	2	2 Shots	Daily
C	Applicator Frame Wheel Hub	2	Repack	Once Every Season
D	Coulter Swivel	2	2 Shots	Weekly
E	Coulter Hub	-	10 Shots	Once Every Season
F	Gauge Wheel Hub	2	Repack	Once Every Season
G	Standard Toolbar to Primary Wing Hinge	2	5 Shots	Weekly
H	John Blue Pump - Refer to pump manual for details. (NOT SHOWN)	-	-	-

Solution Filters

This applicator uses two filters to help ensure proper operation. These filters will need to be cleaned periodically during use and prior to applicator storage.

⚠ WARNING

- **ALWAYS WEAR PERSONAL PROTECTIVE EQUIPMENT WHEN WORKING WITH OR NEAR 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 CHEMICALS.**

- **RESIDUAL PRESSURE MAY EXIST IN APPLICATOR PLUMBING EVEN WHEN UNIT IS NOT IN USE. RELIEVE PRESSURE BEFORE SERVICING ANY PLUMBING.**

Primary Filter

To clean the filter located towards the front of the frame underneath the tongue, (FIG. 4-9):

1. Rotate the pump inlet valve to <CLOSE>.
2. Drain the strainer into an approved container.
3. Unscrew the filter housing by turning counter-clockwise and remove the filter screen.
4. Clean filter by flushing strainer element with water.
5. Reassemble filter, open pump inlet valve, and check for leaks.

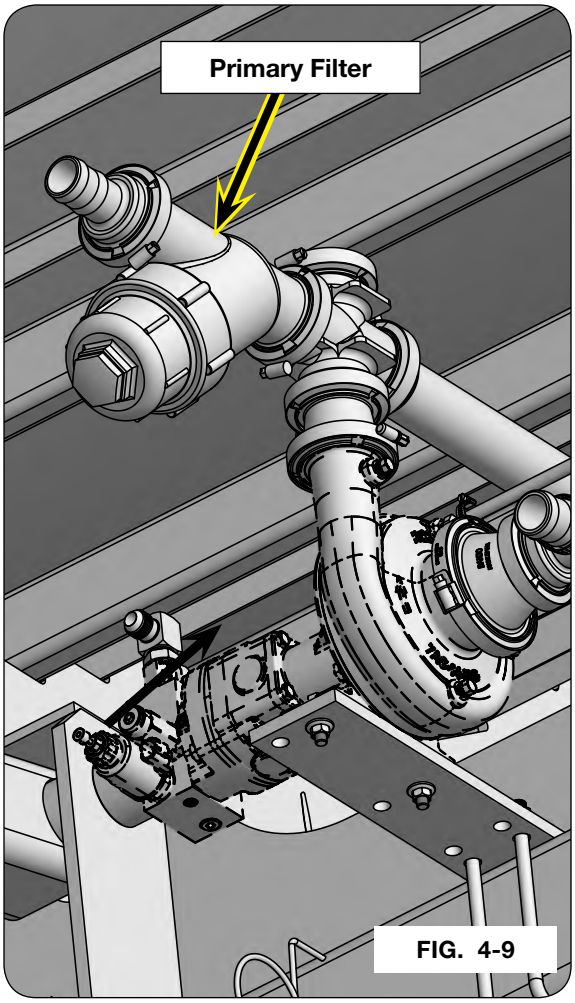


FIG. 4-9

Solution Filters (continued)

Secondary Filter

A secondary filter is located on the tongue near the toolbar electric valves. This filter is used to eliminate the need for strainers at the tips. To clean this filter, first drain the filter housing. Then unscrew the filter housing and remove the screen. Flush the strainer element with water. After cleaning, reassemble filter and check for leaks. (FIG. 4-10)

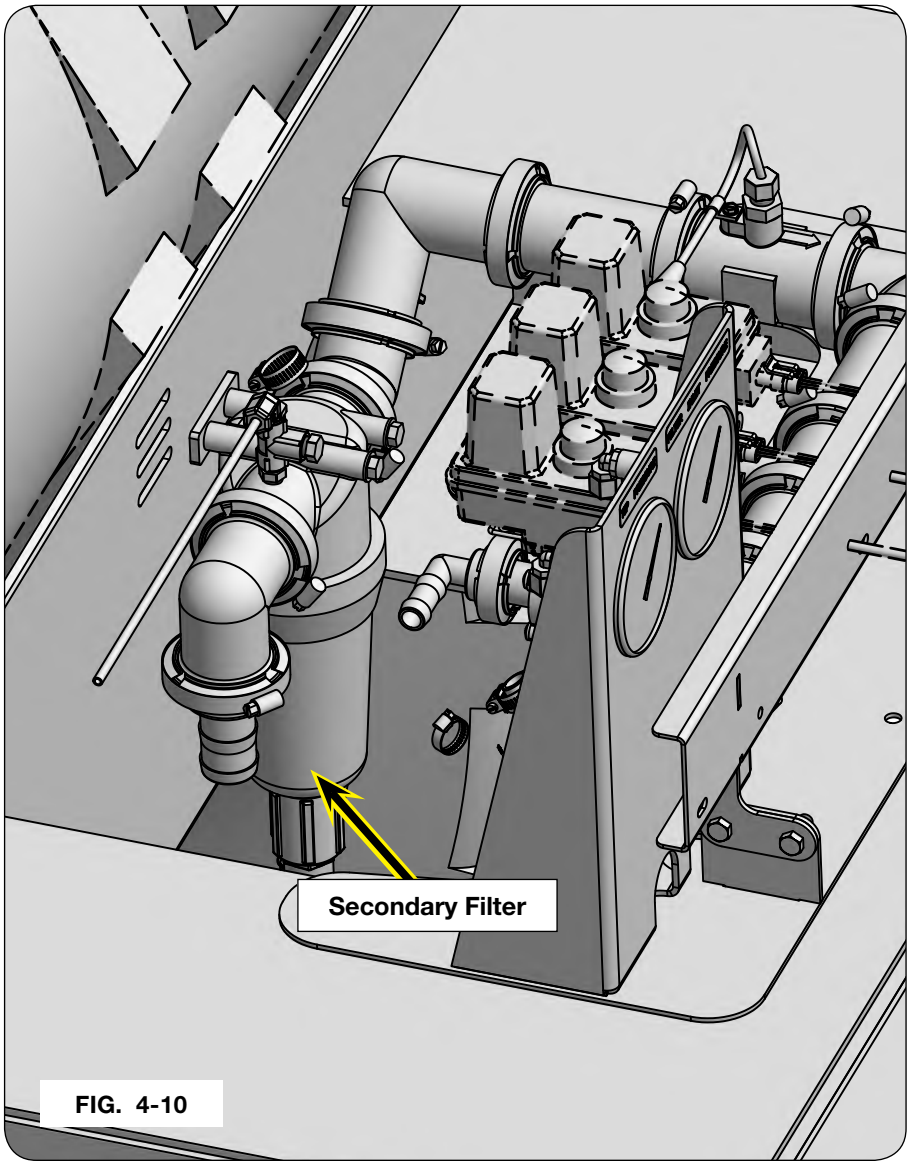


FIG. 4-10

Winterizing

⚠ WARNING

- **ALWAYS WEAR PERSONAL PROTECTIVE EQUIPMENT WHEN WORKING WITH OR NEAR 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 CHEMICALS.**

IMPORTANT

- *Do not allow pump to run dry. Pump damage will result.*

Before storing the applicator in freezing climates, perform the following winterizing procedure:

1. Perform a complete system rinse using procedure in the "OPERATION SECTION, INDUCTOR - Jug and Inductor Tank Rinsing" of this manual.
2. Wash the applicator thoroughly inside and out with a high-pressure washer.
3. Remove as much water from the main tank as possible. Close drain valve on main tank after draining.
4. Pour approximately 50 gallons of R.V. antifreeze into main tank.

NOTE: If equipped with an inductor, the applicator can circulate the R.V. antifreeze.

5. Loosen diaphragm caps on nozzle bodies to relieve pressure and allow excess antifreeze to drain from wings.

Flow Ball Indicator

Off-Season Storage

1. Protect the flow monitors from UV degradation by covering the clear flow monitors to block exposure to sunlight. Storing unit in a dark building free from sunlight exposure is also acceptable.

Coulter Spring Replacement

The following guidelines are for replacing the spring on the coulters.

⚠ WARNING

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

⚠ CAUTION

- **SHARP EDGES ON COULTER BLADES CAN CAUSE SERIOUS INJURY. BE CAREFUL WHEN WORKING AROUND COULTER BLADES.**

IMPORTANT

- *The spring should only be adjusted when repairs are being made. The springs have been preset before leaving the factory.*

1. Loosen the set screw retaining the spring bolt on the coulter arm (FIG. 4-11).
2. Slowly unscrew the spring bolt which will relieve spring pressure (FIG. 4-11).
3. Once the bolt is removed, replace with new spring and re-insert bolt.
4. Tighten bolt until a deflection of 1” is obtained on spring (FIG. 4-12).

The coulter springs are preset at the factory to 9 3/8”. This measurement is the total amount of exposed spring.

NOTE: Adjusting the spring below 9 3/8” could cause premature part failure and void any warranty considerations.

5. Tighten set screw to secure bolt.

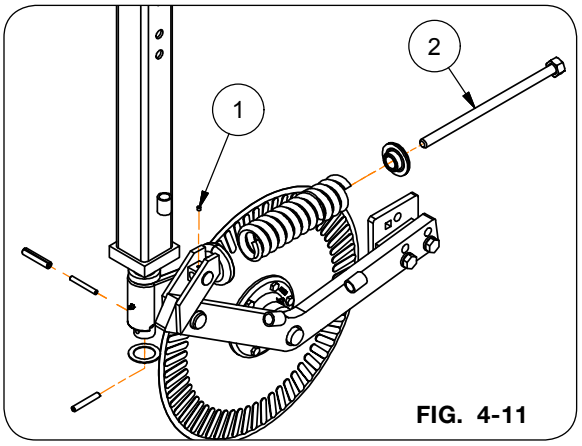


FIG. 4-11

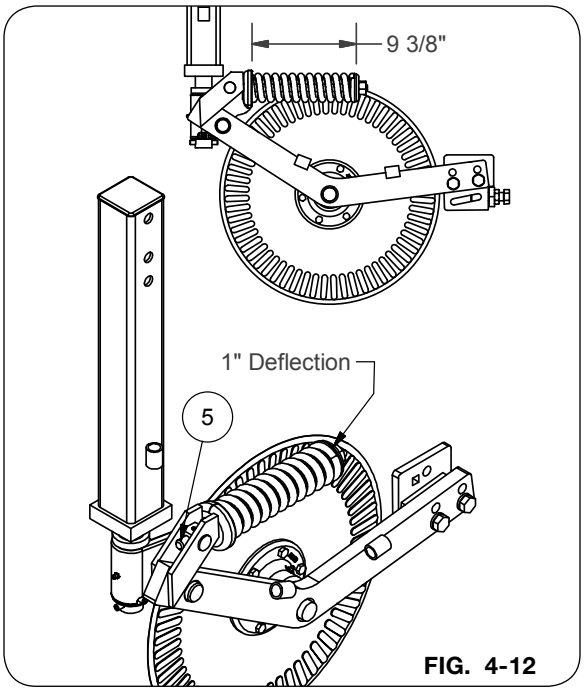


FIG. 4-12

Coulter Hub Adjustment and Replacement

The following instructions are for adjusting and lubricating the hub and replacing the "O"-ring and seal.

After the first 100 acres, the hubs should be checked for tightness and wear.

⚠ CAUTION

- **SHARP EDGES ON COULTER BLADES CAN CAUSE SERIOUS INJURY. BE CAREFUL WHEN WORKING AROUND COULTER BLADES.**

IMPORTANT

- *Do not allow dirt and debris to contaminate the hub and its internal components. Neglecting to do so could result in failure of the hub and its components due to excessive wear.*

1. Check the coulter hub and bearing for looseness or wobble by gripping the ends of the blade. Rotate and laterally push and pull on the coulter blade. A tight hub will have no wobble and will rotate smoothly with a slight resistance.

2. If there is wobble in the hub, the hub must be tightened to the spindle. To do this, remove retaining ring and the hub cap. Remove the nut retainer and tighten the slotted nut. The nut should be torqued to 40-45 foot-pounds. Increase the tightness to reinsert the c-ring (FIG. 4-13).

3. After tightening, retest the hub for wobble by repeating Step #1. If wobble still exists, continue with the following guidelines.

IMPORTANT

- *When tightening slotted nut onto spindle, rotate hub back and forth so that flats do not form on bearings.*

4. Turn the blade and feel for any roughness in the rotation. Also, check the base of the hub to see if the seal is intact and in position. If either problem exists, the hub must be dismantled, cleaned, inspected for damage, and repacked with grease. Refer to the following guidelines for this procedure (FIG. 4-13).

   A. Remove the blade and hub cap. Remove the C-ring securing the slotted nut.

IMPORTANT

- *Removal of C-ring is best accomplished by using two screwdrivers or similar tools and prying on the outside ends to spread ring. If ring is damaged discard and replace.*

- *When removing the hub and its components, be sure to keep them free of debris and dirt. Failure to do so will result in contamination of hub and bearing failure.*

   B. Unscrew the nut and carefully remove the hub from the spindle.

   C. Remove the components, clean, and inspect for any damage or wear. If even the slightest imperfection exists, replace the component(s). Once the hub is dismantled, always replace the bearing and seal assembly, o-ring, and triple lip seal.

Coulter Hub Adjustment and Replacement (continued)

IMPORTANT

- *Always replace the "O"-ring and seal if dismantling the hub. Failure to do so could result in premature failure of hub and its components.*

D. **Replace any damaged parts before reassembling the components. Be sure to remove any debris or dirt and repack bearings with an SAE approved hub grease.**

E. **Assemble "O"-ring onto spindle first. Assemble seal and bearings into hub and position onto spindle.**

F. **After reassembling the hub, position the slotted nut back onto the spindle and torque to 40-45 foot-pounds. Slightly tighten the nut to align slot (in nut) with the closest cotter pin hole and install C-ring and O-ring (902158) (FIG. 4-13).**

IMPORTANT

- *Rotate coulter hub when torquing slotted nut. Doing this will prevent flats from forming on bearings.*
- *Assembly of C-ring is best accomplished by the use of a hog ring type pliers or similar tool. After installation be sure C-ring will lay flat against the spindle retaining nut to allow for proper installation of hub cap.*

G. **Reinstall the hub cap and blade.**

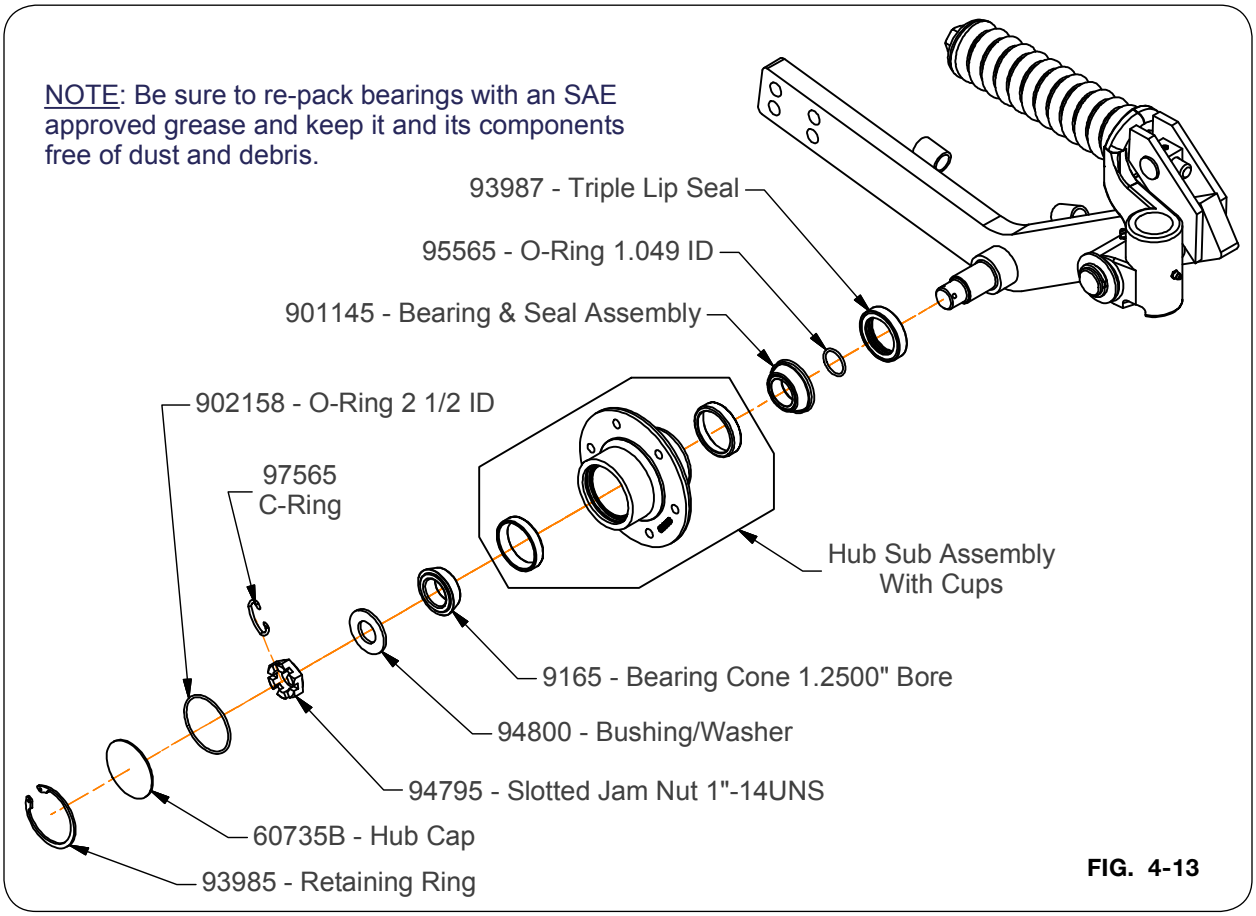


FIG. 4-13

High-Pressure Coulter Injection System Nozzle Calibration Worksheet

Calibration of these systems involves two separate sets of calculations. The first being a procedure of setting rate and the second being a procedure of obtaining system pressure.

FIRST:

These systems utilize a positive-displacement, ground-driven, piston pump to establish the GPA (gallon per acre) rate. Because the pump is ground-driven, this rate will be very consistent provided you do not exceed the pumps capacity or pressure ratings (120 PSI Maximum).

SECOND:

The injection system nozzles are what determine system operation pressure at a particular flow rate and ground speed. Because the system requires nozzle pressure in the 60 PSI to 120 PSI range to inject fertilizer into the soil properly, it becomes necessary to size the nozzle correctly to maintain this 60-120 PSI optimum operating pressure at various speeds. In effect, the operating speed is limited by the range of pressure necessary for proper injection system operation. Remember that nozzle size has no affect on rate, only system operating pressure.

High Pressure Injection System Pump Calibration Work sheet

Step 1: Rate Calculation (gallons per acre)
Actual pounds of nitrogen per acre desired ÷ percent of nitrogen in solution equals pounds of solution per acre
Actual N ÷ % of N = lbs. solution per acre

Examples:
100 lbs. of actual N desired ÷ .28 (% of N in solution) = 357 lbs. per acre
100 lbs. of actual N desired ÷ .32 (% of N in solution) = 312 lbs. per acre

Step 2: Pounds per acre of solution ÷ weight per gallon of solution equal GPA
(GPA= gallons per acre of solution)
lbs. solution per acre ÷ weight per gallon = GPA

Examples:
357 lbs. of 28% N solution ÷ 10.65 lbs. per gallon = 33.5 GPA
312 lbs. of 32% N solution ÷ 11.4 lbs. per gallon = 27.37 GPA

Step 3: Use the John Blue, pump setting, slide-rule chart.
The standard Nutrimax sprocket combination is 18 to 50.

Step 4: Loaded Radius:
We recommend using a loaded radius of 10” for the standard Nutrimax tire drive wheel when used with the John Blue NGP-9055 pump.
Add 1/2” to the loaded radius if soil builds up on the small tire in wet conditions.

High-Pressure Coulter Injection System Nozzle Calibration Worksheet

Step 5: Swath width is the number of rows being applied (Example: A 15 row 30" machine will cover 16 rows.) times the spacing between the rows.

Rows x Spacing = Swath width

16 rows x 30" = 480" (swath width)

Step 6: Example:

1. Using the chart, align loaded radius (10") with 18 to 50 sprocket combination setting.
2. Using the chart, align swath width (480") with arrow under sprocket ratio.
3. Using the chart, GPA rate (NGP-7055 or NGP-9055 pump) from step 2 above will align with correct pump setting.

Once the correct pump setting has been obtained from the pump calibration work sheet it becomes necessary to select a nozzle size that will result in a system operating pressure that falls within the recommended range of 60 PSI to 120 PSI. It is important to remember that GPA rate will not be affected by changing nozzle sizes. The only way the GPA rate will change is if you change pump settings. A gauge is provided to double check calculations and monitor pressure during operation.

To simplify calibration we supplied a chart based on 28% nitrogen solution in 30" row spacings.

Example: Using the 30" spacing chart, with 7 MPH as the target operating speed and 115 lbs. N/acre as the target rate; you can see that nozzle size 4916-95 will produce 80 PSI @ 7 MPH. Also if you look under the 8 MPH column you will see that this nozzle size will produce 100 PSI.

It is recommended that a mid-range pressure of 80 to 100 PSI is used to allow for speed variances in field operation, if possible.

It is recommended that the stream stabilizer nozzle inserts always be used with these nozzles to improve the solid-stream characteristics of the spray pattern and consequently the injection and over spray reduction characteristics of nozzle. These stainless steel nozzle orifices are commercially available almost everywhere and there are several sizes available between those on our chart if needed. It is recommended that a fine line (80 mesh) stainer be used on extremely low rate applications to prevent plugging nozzles.

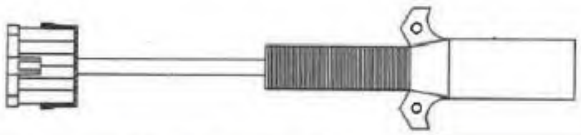
30 Inch Spacing Rate Chart

Orifice #	PSI	GPM 10.65 lb./gal 28%	Gallons per Acre 30 Inch Spacing							
			5 mph	6 mph	7 mph	8 mph	9 mph	10 mph	11 mph	12 mph
4916 49	60	0.320	12.7	10.5	9.0	7.9	7.0	6.3	5.8	5.3
	80	0.369	14.6	12.2	10.4	9.1	8.1	7.3	6.6	6.1
	100	0.413	16.3	13.6	11.7	10.2	9.1	8.2	7.4	6.8
	120	0.452	17.9	14.9	12.8	11.2	9.9	8.9	8.1	7.5
4916 57	60	0.432	17.1	14.3	12.2	10.7	9.5	8.6	7.8	7.1
	80	0.499	19.8	16.5	14.1	12.4	11.0	9.9	9.0	8.2
	100	0.558	22.1	18.4	15.8	13.8	12.3	11.1	10.0	9.2
	120	0.612	24.2	20.2	17.3	15.1	13.5	12.1	11.0	10.1
*4916 63	60	0.528	20.9	17.4	14.9	13.1	11.6	10.5	9.5	8.7
	80	0.610	24.2	20.1	17.3	15.1	13.4	12.1	11.0	10.1
	100	0.682	27.0	22.5	19.3	16.9	15.0	13.5	12.3	11.3
	120	0.747	29.6	24.7	21.1	18.5	16.4	14.8	13.4	12.3
*4916 70	60	0.652	25.8	21.5	18.4	16.1	14.3	12.9	11.7	10.8
	80	0.753	29.8	24.9	21.3	18.6	16.6	14.9	13.6	12.4
	100	0.842	33.3	27.8	23.8	20.8	18.5	16.7	15.2	13.9
	120	0.922	36.5	30.4	26.1	22.8	20.3	18.3	16.6	15.2
*4916 78	60	0.810	32.1	26.7	22.9	20.0	17.8	16.0	14.6	13.4
	80	0.935	37.0	30.9	26.4	23.1	20.6	18.5	16.8	15.4
	100	1.045	41.4	34.5	29.6	25.9	23.0	20.7	18.8	17.2
	120	1.145	45.3	37.8	32.4	28.3	25.2	22.7	20.6	18.9
*4916 86	60	0.984	39.0	32.5	27.8	24.4	21.7	19.5	17.7	16.2
	80	1.137	45.0	37.5	32.2	28.1	25.0	22.5	20.5	18.8
	100	1.271	50.3	41.9	35.9	31.5	28.0	25.2	22.9	21.0
	120	1.392	55.1	45.9	39.4	34.5	30.6	27.6	25.1	23.0
*4916 95	60	1.201	47.6	39.6	34.0	29.7	26.4	23.8	21.6	19.8
	80	1.387	54.9	45.8	39.2	34.3	30.5	27.5	25.0	22.9
	100	1.551	61.4	51.2	43.9	38.4	34.1	30.7	27.9	25.6
	120	1.699	67.3	56.1	48.1	42.0	37.4	33.6	30.6	28.0
4916 107	60	1.524	60.3	50.3	43.1	37.7	33.5	30.2	27.4	25.1
	80	1.760	69.7	58.1	49.8	43.5	38.7	34.8	31.7	29.0
	100	1.967	77.9	64.9	55.6	48.7	43.3	39.0	35.4	32.5
	120	2.155	85.3	71.1	61.0	53.3	47.4	42.7	38.8	35.6
4916 120	60	1.917	75.9	63.2	54.2	47.4	42.2	37.9	34.5	31.6
	80	2.213	87.6	73.0	62.6	54.8	48.7	43.8	39.8	36.5
	100	2.474	98.0	81.7	70.0	61.2	54.4	49.0	44.5	40.8
	120	2.710	107.3	89.4	76.7	67.1	59.6	53.7	48.8	44.7

The 4916 series of orifices are available in many sizes falling between those listed on this chart.
* Standard equipment sizes.

Schematics

Main Electrical Harness 10' - 5 Wire, 7 Pin (Part #JAP3142)



6 M TERMINAL WEATHER-PACK SHROUD		
PIN #	DESCRIPTION	WIRE COLOR
1	GROUND	WHITE
2	SWITCHED POWER	BLUE
3	LEFT TURN/FLASHING	YELLOW
4	STOP LAMPS	RED
5	RIGHT TURN/FLASHING	GREEN
6	TAIL LAMPS	BROWN

7 F-TERMINAL PLUG		
PIN #	DESCRIPTION	WIRE COLOR
1	GROUND	WHITE
2	EMPTY	
3	LEFT TURN/FLASHING	YELLOW
4	STOP LAMPS	RED
5	RIGHT TURN/FLASHING	GREEN
6	TAIL LAMPS	BROWN
7	SWITCHED POWER	BLUE

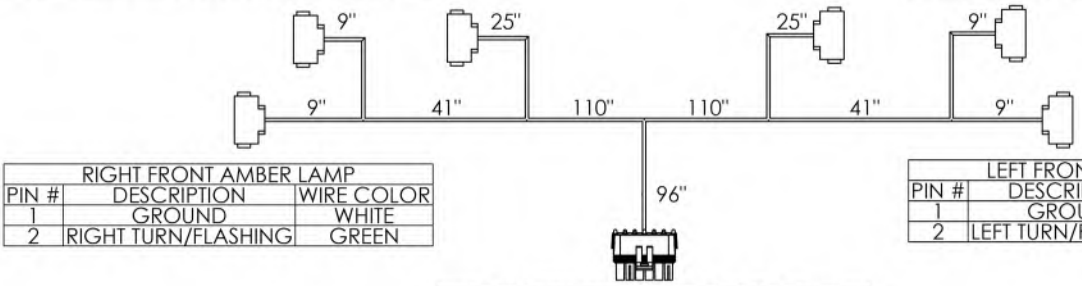
Light Electrical Harness 17' - 5 Wire, 2 Pin (Part #JAP3197)

RIGHT REAR RED LAMP		
PIN #	DESCRIPTION	WIRE COLOR
1	GROUND	WHITE
2	STOP LAMPS	RED
3	TAIL LAMPS	BROWN

LEFT REAR RED LAMP		
PIN #	DESCRIPTION	WIRE COLOR
1	GROUND	WHITE
2	STOP LAMPS	RED
3	TAIL LAMPS	BROWN

RIGHT REAR AMBER LAMP		
PIN #	DESCRIPTION	WIRE COLOR
1	GROUND	WHITE
2	RIGHT TURN/FLASHING	GREEN

LEFT REAR AMBER LAMP		
PIN #	DESCRIPTION	WIRE COLOR
1	GROUND	WHITE
2	LEFT TURN/FLASHING	YELLOW

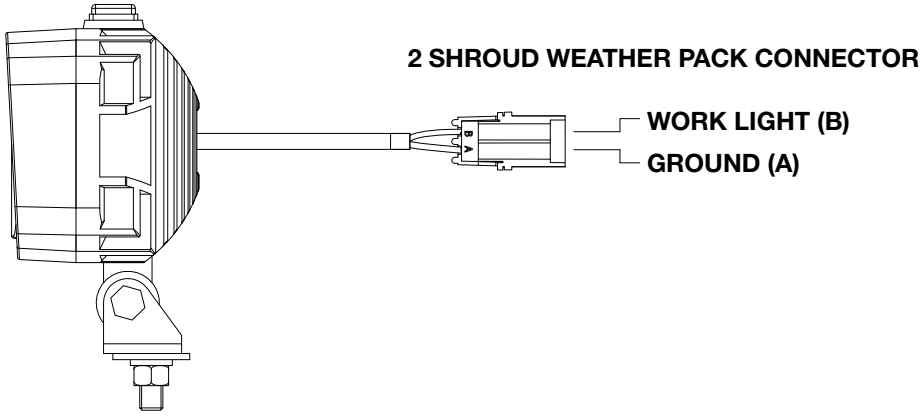


RIGHT FRONT AMBER LAMP		
PIN #	DESCRIPTION	WIRE COLOR
1	GROUND	WHITE
2	RIGHT TURN/FLASHING	GREEN

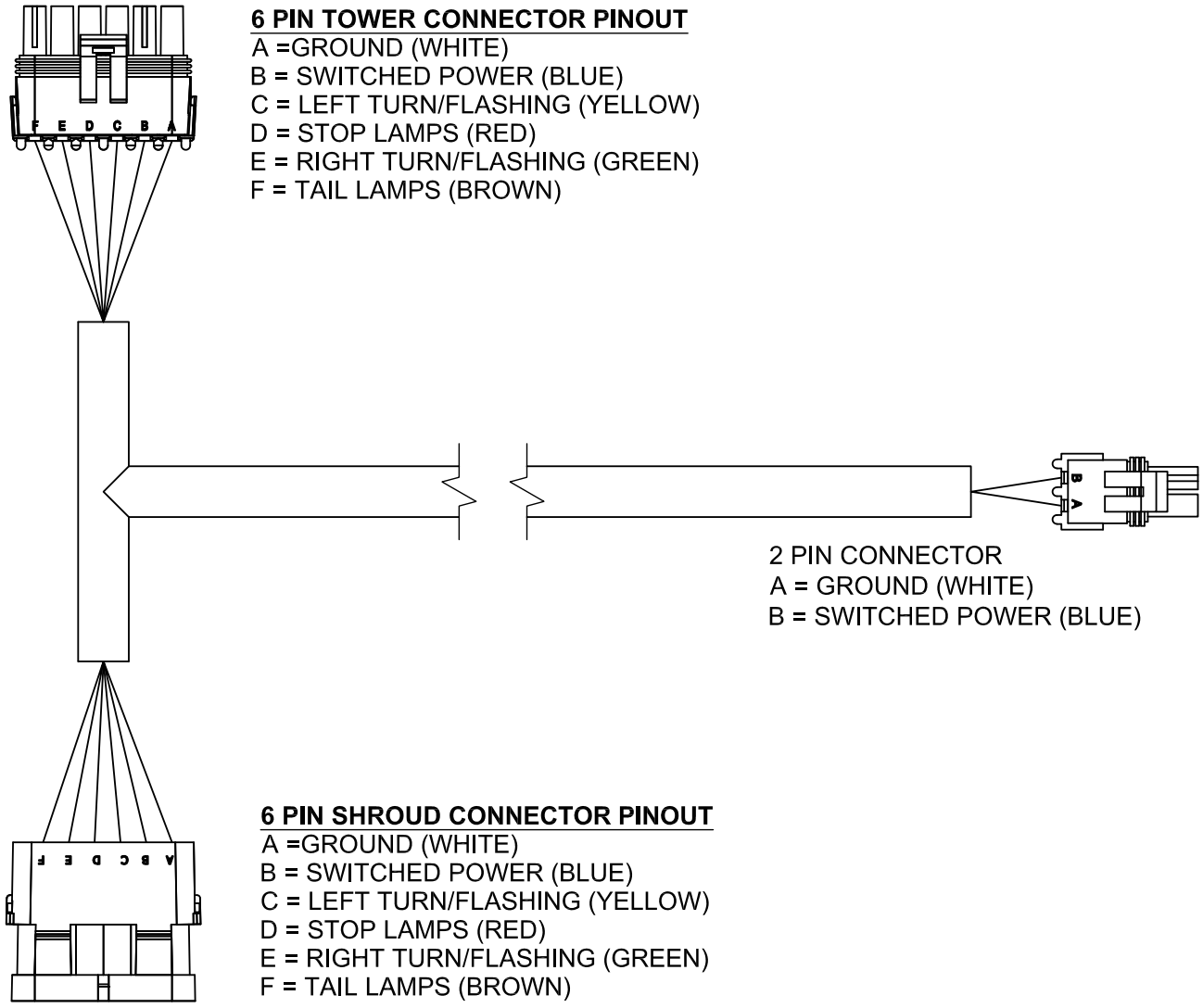
LEFT FRONT AMBER LAMP		
PIN #	DESCRIPTION	WIRE COLOR
1	GROUND	WHITE
2	LEFT TURN/FLASHING	YELLOW

6 F-TERMINAL WEATHER-PACK TOWER		
PIN #	DESCRIPTION	WIRE COLOR
1	GROUND	WHITE
2	(OPEN)	
3	LEFT TURN/FLASHING	YELLOW
4	STOP LAMPS	RED
5	RIGHT TURN/FLASHING	GREEN
6	TAIL LAMPS	BROWN

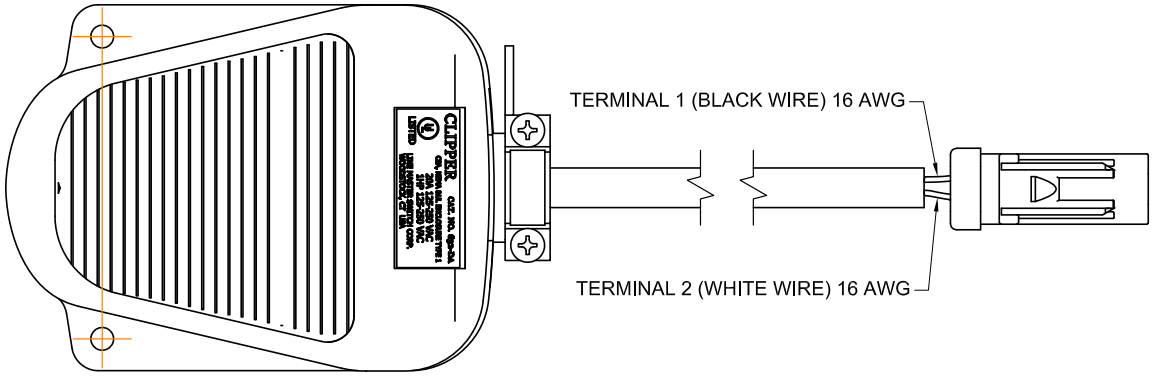
Schematic — Electrical — Work Light (9500801)



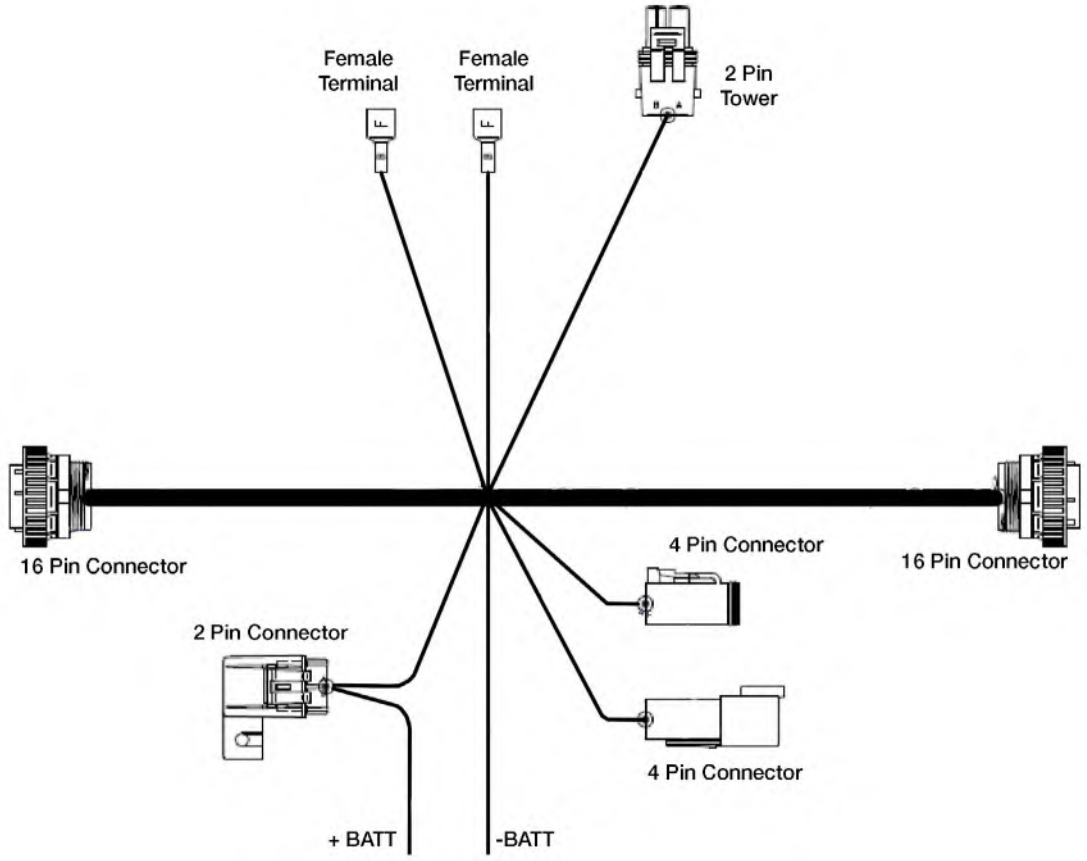
Schematic — Electrical — Work Light Wire Harness (9504372)



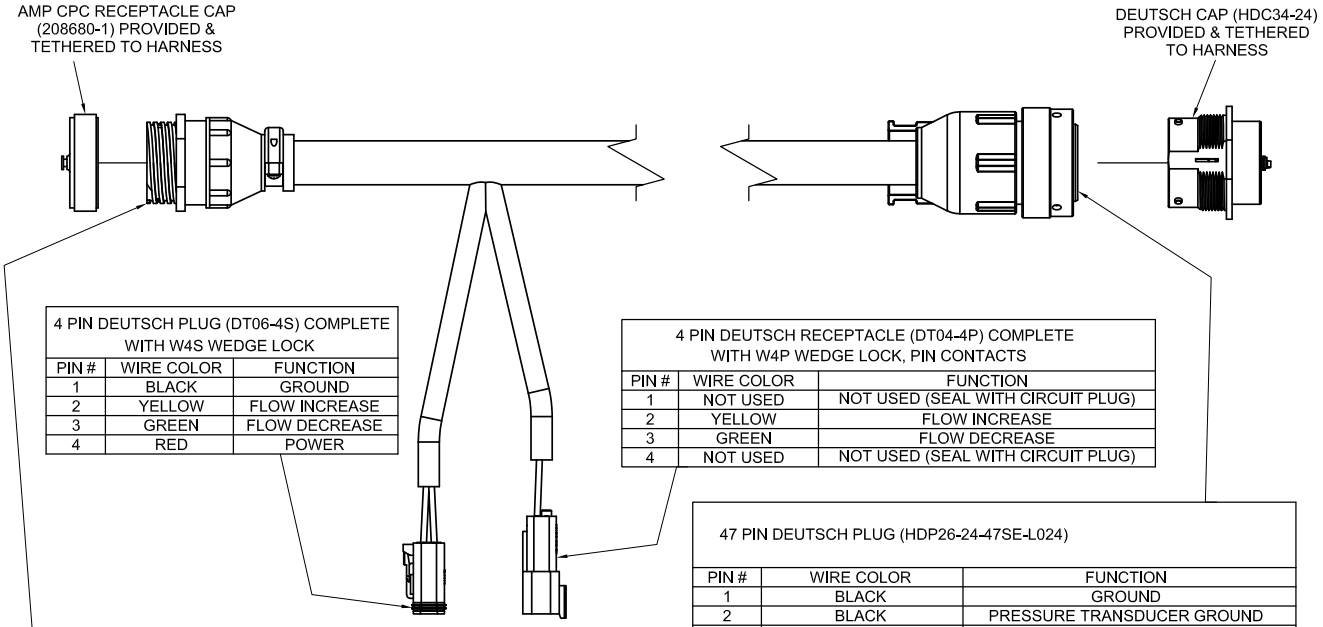
Electrical Schematic - Foot Switch #9005916



Schematics — 450 Controller, Console Wire Harness (9007549)



Schematic — Electrical
Less Rate Controller Wire Harness (9009175)



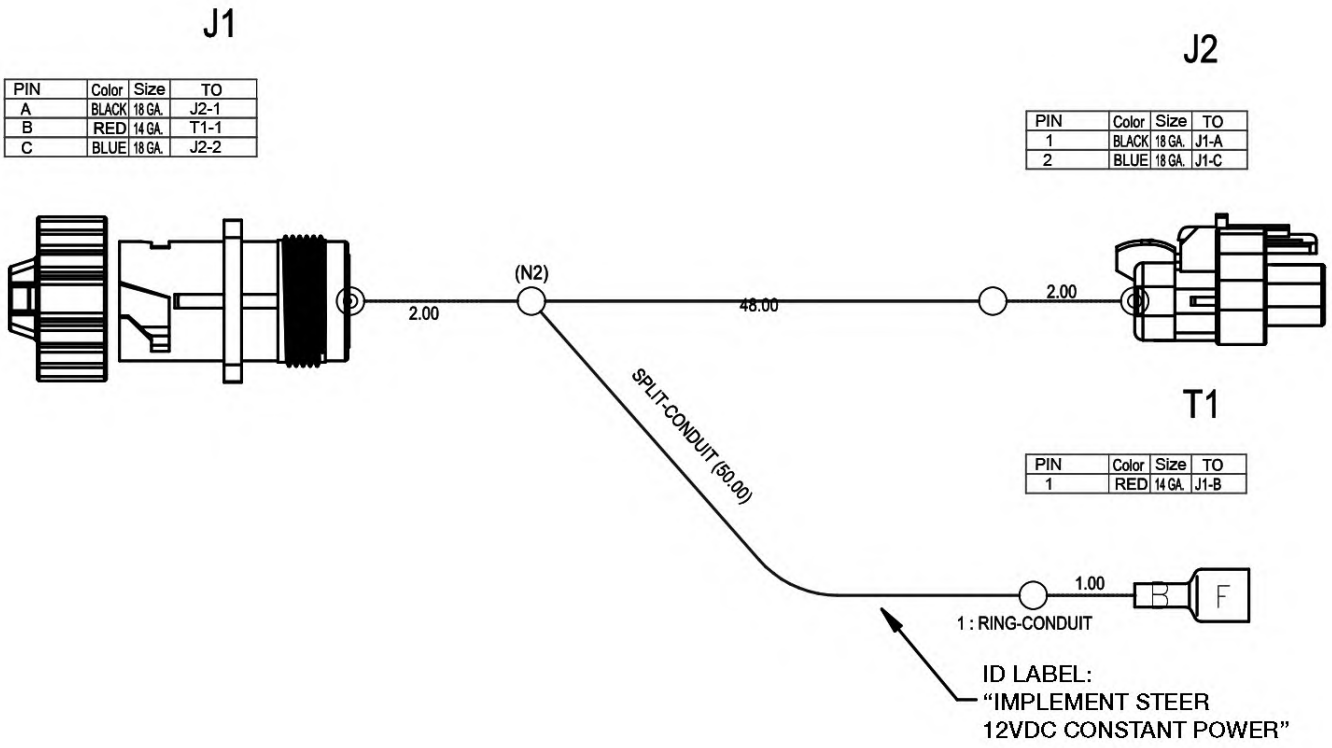
4 PIN DEUTSCH PLUG (DT06-4S) COMPLETE WITH W4S WEDGE LOCK		
PIN #	WIRE COLOR	FUNCTION
1	BLACK	GROUND
2	YELLOW	FLOW INCREASE
3	GREEN	FLOW DECREASE
4	RED	POWER

4 PIN DEUTSCH RECEPTACLE (DT04-4P) COMPLETE WITH W4P WEDGE LOCK, PIN CONTACTS		
PIN #	WIRE COLOR	FUNCTION
1	NOT USED	NOT USED (SEAL WITH CIRCUIT PLUG)
2	YELLOW	FLOW INCREASE
3	GREEN	FLOW DECREASE
4	NOT USED	NOT USED (SEAL WITH CIRCUIT PLUG)

37 PIN AMP CPC RECEPTACLE (206151-2)		
PIN #	WIRE COLOR	FUNCTION
1	BLACK	GROUND
2	BLACK	GROUND
3	NOT USED	NOT USED
4	GRAY	BOOM 1
5	BROWN	BOOM 2
6	BLUE	BOOM 3
7	BLACK/WHITE STRIPE	BOOM 4
8	BROWN/WHITE STRIPE	BOOM 5
9	BLUE/WHITE STRIPE	BOOM 6
10	WHITE/BLACK STRIPE	BOOM 7
11	WHITE/BROWN STRIPE	BOOM 8
12	WHITE/BLUE STRIPE	BOOM 9
13	PINK	BOOM 10
14	NOT USED	NOT USED
15	GREEN	FLOW DECREASE
16	YELLOW	FLOW INCREASE
17	NOT USED	NOT USED
18	NOT USED	NOT USED
19	NOT USED	NOT USED
20	NOT USED	NOT USED
21	BLACK	FLOW METER GROUND
22	NOT USED	NOT USED
23	NOT USED	NOT USED
24	NOT USED	NOT USED
25	RED	FLOW METER +5V POWER
26	NOT USED	NOT USED
27	NOT USED	NOT USED
28	VIOLET	FLOW METER SIGNAL
29	BLACK	PRESSURE TRANSDUCER GROUND
30	RED	PRESSURE TRANSDUCER POWER
31	ORANGE	PRESSURE TRANSDUCER SIGNAL
32	NOT USED	NOT USED
33	NOT USED	NOT USED
34	NOT USED	NOT USED
35	NOT USED	NOT USED
36	RED	POWER
37	RED	POWER

47 PIN DEUTSCH PLUG (HDP26-24-47SE-L024)		
PIN #	WIRE COLOR	FUNCTION
1	BLACK	GROUND
2	BLACK	PRESSURE TRANSDUCER GROUND
3	BLACK	GROUND
4	BLACK	GROUND
5	RED	POWER
6	RED	POWER
7	ORANGE	PRESSURE TRANSDUCER SIGNAL
8	NOT USED	NOT USED (SEAL WITH CIRCUIT PLUG)
9	NOT USED	NOT USED (SEAL WITH CIRCUIT PLUG)
10	NOT USED	NOT USED (SEAL WITH CIRCUIT PLUG)
11	NOT USED	NOT USED (SEAL WITH CIRCUIT PLUG)
12	VIOLET	FLOW METER SIGNAL
13	NOT USED	NOT USED (SEAL WITH CIRCUIT PLUG)
14	NOT USED	NOT USED (SEAL WITH CIRCUIT PLUG)
15	RED	POWER
16	NOT USED	NOT USED (SEAL WITH CIRCUIT PLUG)
17	NOT USED	NOT USED (SEAL WITH CIRCUIT PLUG)
18	NOT USED	NOT USED (SEAL WITH CIRCUIT PLUG)
19	NOT USED	NOT USED (SEAL WITH CIRCUIT PLUG)
20	NOT USED	NOT USED (SEAL WITH CIRCUIT PLUG)
21	NOT USED	NOT USED (SEAL WITH CIRCUIT PLUG)
22	RED	FLOW METER +5V POWER
23	GREEN	FLOW DECREASE
24	YELLOW	FLOW INCREASE
25	NOT USED	NOT USED (SEAL WITH CIRCUIT PLUG)
26	NOT USED	NOT USED (SEAL WITH CIRCUIT PLUG)
27	NOT USED	NOT USED (SEAL WITH CIRCUIT PLUG)
28	NOT USED	NOT USED (SEAL WITH CIRCUIT PLUG)
29	NOT USED	NOT USED (SEAL WITH CIRCUIT PLUG)
30	NOT USED	NOT USED (SEAL WITH CIRCUIT PLUG)
31	NOT USED	NOT USED (SEAL WITH CIRCUIT PLUG)
32	RED	PRESSURE TRANSDUCER POWER
33	RED	POWER
34	BLACK	FLOW METER GROUND
35	NOT USED	NOT USED (SEAL WITH CIRCUIT PLUG)
36	GRAY	BOOM 1
37	BROWN	BOOM 2
38	BLUE	BOOM 3
39	BLACK/WHITE STRIPE	BOOM 4
40	BROWN/WHITE STRIPE	BOOM 5
41	BLUE/WHITE STRIPE	BOOM 6
42	WHITE/BLACK STRIPE	BOOM 7
43	WHITE/BROWN STRIPE	BOOM 8
44	WHITE/BLUE STRIPE	BOOM 9
45	PINK	BOOM 10
46	NOT USED	NOT USED (SEAL WITH CIRCUIT PLUG)
47	NOT USED	NOT USED (SEAL WITH CIRCUIT PLUG)

Schematics — Foot Switch Wire Harness (9503390)



Schematics — Controller Wire Harness (9503471)

47 Pin Connector

Pin 1 - BLACK - HC Ground
Pin 2 - BLACK - Sensor RTN
Pin 3 - BLACK - Sensor RTN
Pin 4 - BLACK - HC Ground
Pin 5 - RED
Pin 6 - RED
Pin 7 - GREY
Pin 8 through Pin 11 - NONE
Pin 12 - GREY
Pin 13 through Pin 14 - NONE
Pin 15 - RED - HC Power
Pin 16 through Pin 21 - NONE
Pin 22 - RED
Pin 23 - GREEN
Pin 24 - YELLOW
Pin 25 through Pin 31 - NONE
Pin 32 - RED/WHITE
Pin 33 - RED/WHITE
Pin 34 - BLACK
Pin 35 - NONE
Pin 36 - GREY
Pin 37
Pin 38
Pin 39
Pin 40
Pin 41
Pin 42 through Pin 47 - NONE

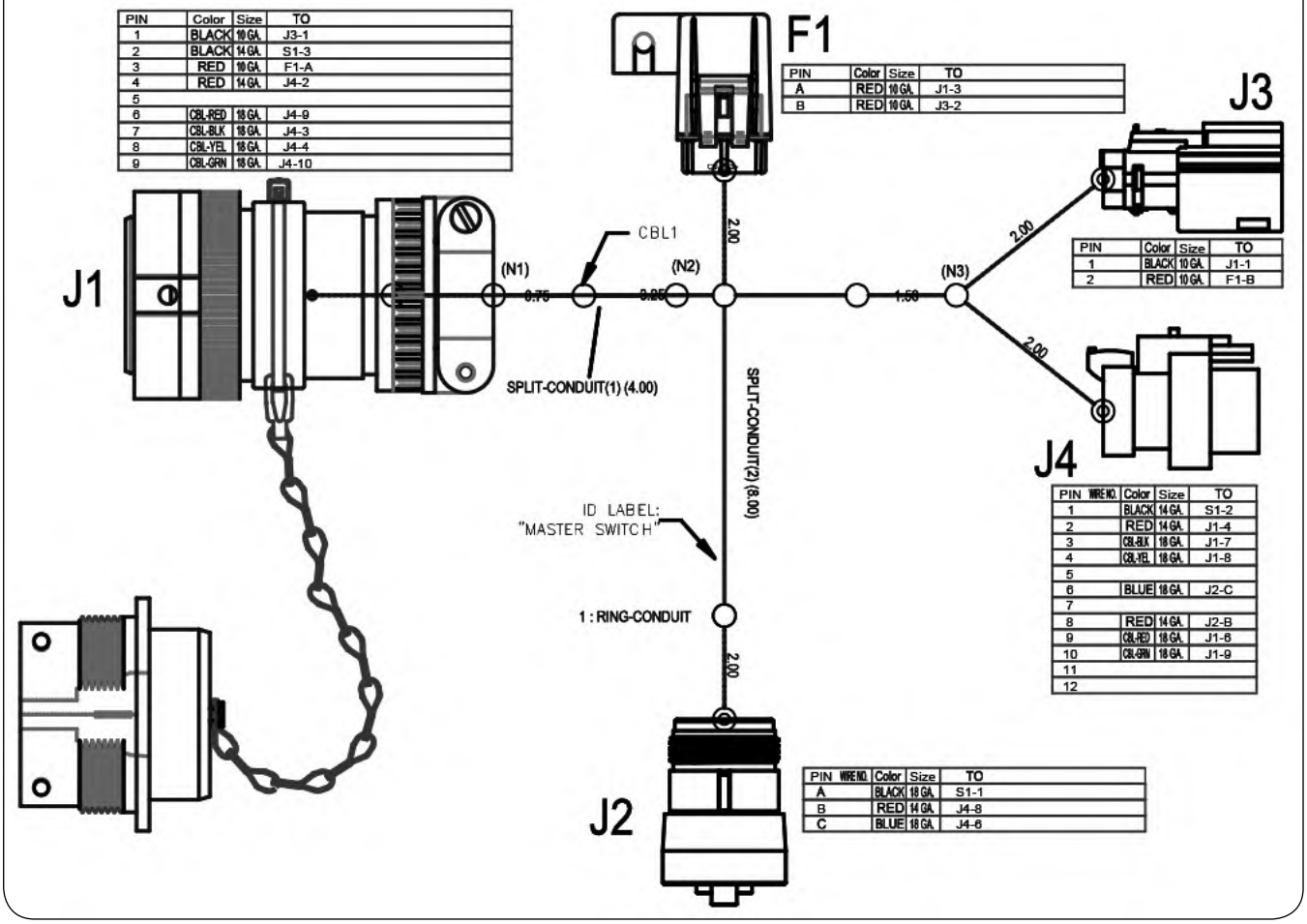
3 Pin Connector

Pin 1 - NONE
Pin 2 - NONE
Pin 3 - GREY - Pressure Signal

Console 16 Pin Connector

Pin 1 - BLACK - HC Ground
Pin 2 - BROWN - Section 2 Signal
Pin 3 - YELLOW - Valve INC
Pin 4 - GREEN - Valve DEC
Pin 5 - BLUE - Section 3 Signal
Pin 6 - GREY - Section 1 Signal
Pin 7 - BLACK/WHITE - Section 4 Signal
Pin 8 - BROWN/WHITE - Section 5 Signal
Pin 9 - BLUE/WHITE - Section 6 Signal
Pin 10 - NONE
Pin 11 - BLACK - Sensor RTN
Pin 12 - RED - Sensor 5V Power
Pin 13 - GREY - Flow Signal
Pin 14 - RED - HC Power
Pin 15 - BLACK - HC Ground
Pin 16 - RED - HC Power

Schematics — Wire Harness (9503387)



PIN	Color	Size	TO
1	BLACK	10 GA.	J3-1
2	BLACK	14 GA.	S1-3
3	RED	10 GA.	F1-A
4	RED	14 GA.	J4-2
5			
6	CBL-RED	18 GA.	J4-9
7	CBL-BLK	18 GA.	J4-3
8	CBL-YEL	18 GA.	J4-4
9	CBL-GRN	18 GA.	J4-10

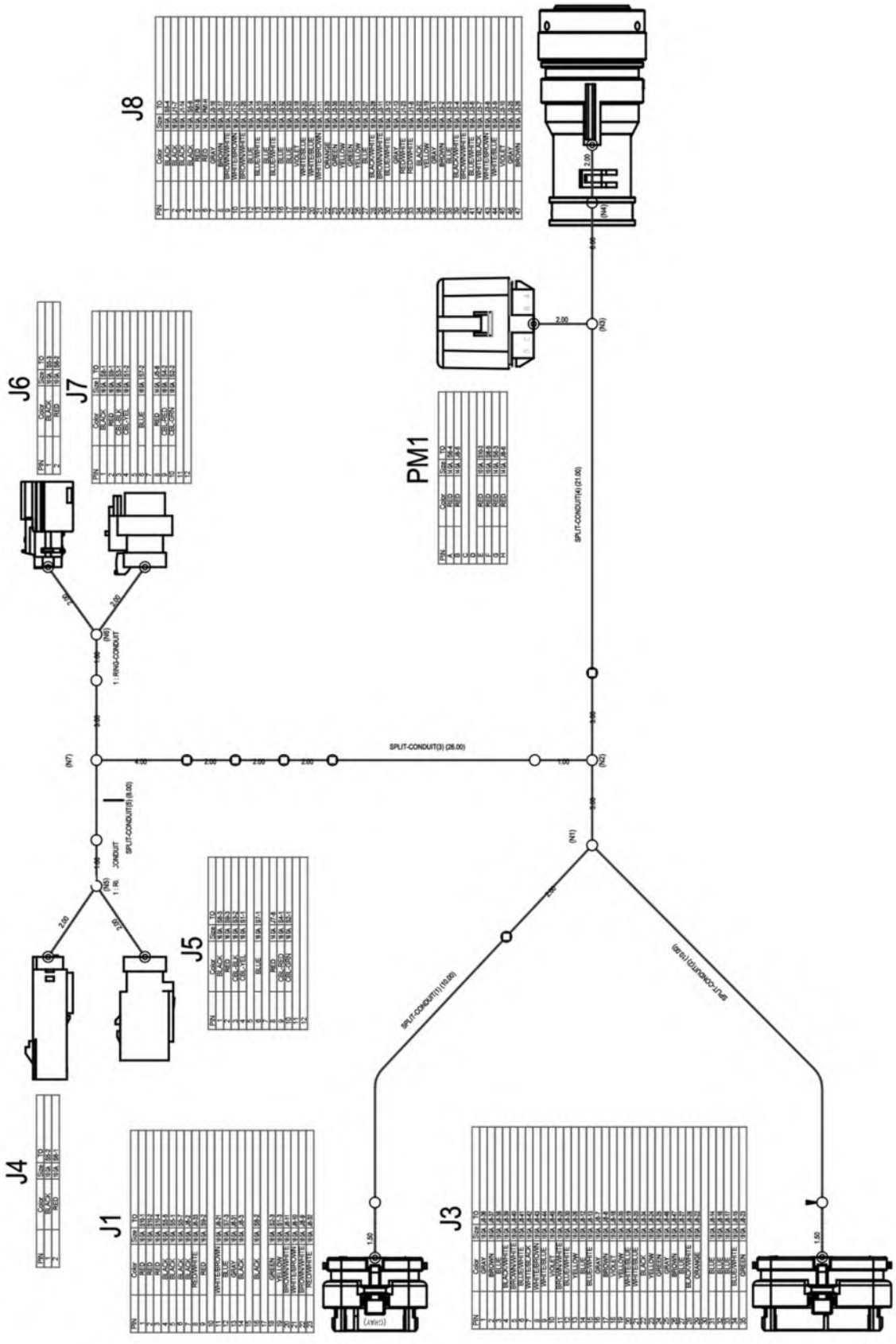
PIN	Color	Size	TO
A	RED	10 GA.	J1-3
B	RED	10 GA.	J3-2

PIN	Color	Size	TO
1	BLACK	10 GA.	J1-1
2	RED	10 GA.	F1-B

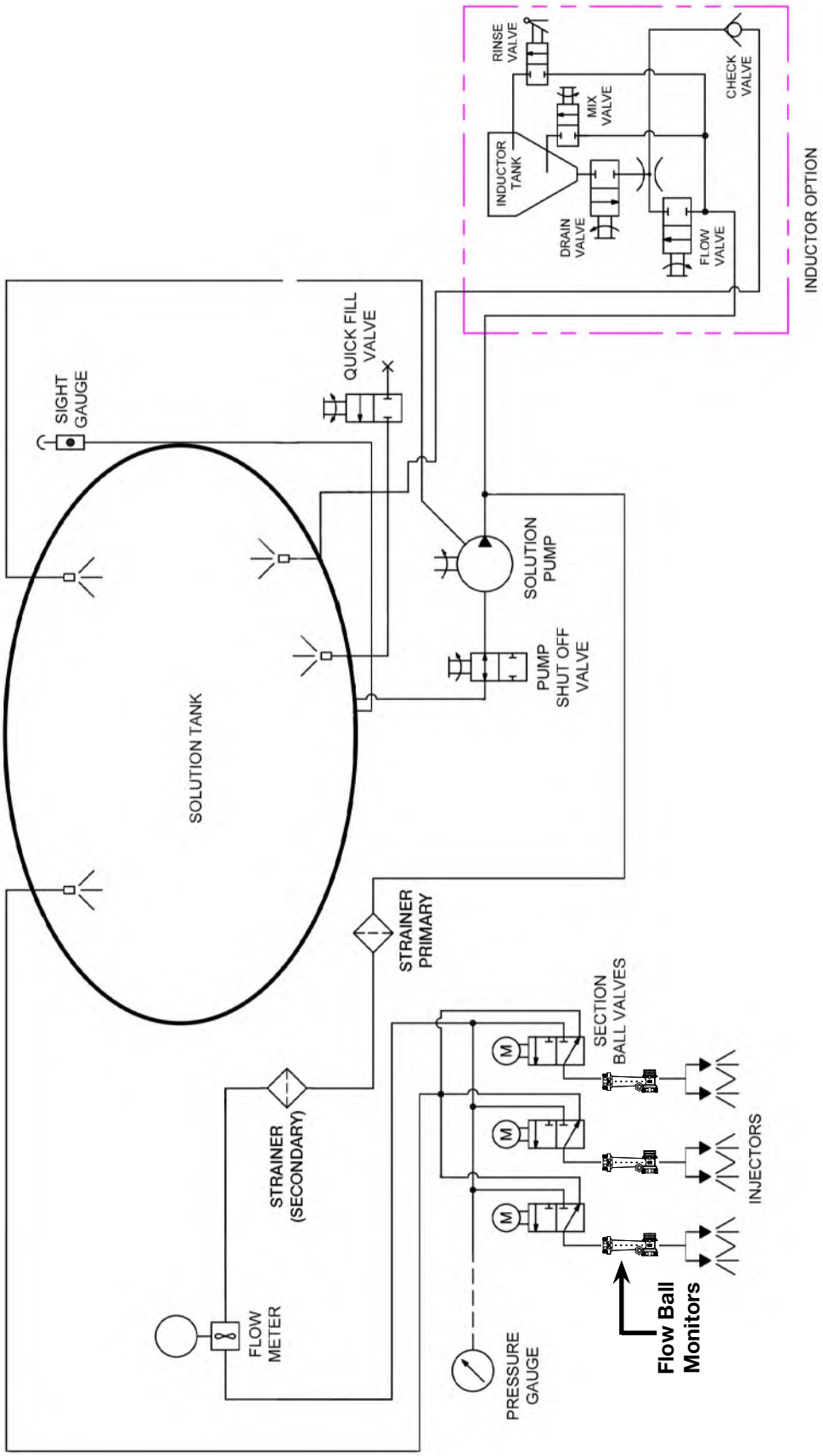
PIN	WIRE NO.	Color	Size	TO
1		BLACK	14 GA.	S1-2
2		RED	14 GA.	J1-4
3		CBL-BLK	18 GA.	J1-7
4		CBL-YEL	18 GA.	J1-8
5				
6		BLUE	18 GA.	J2-C
7				
8		RED	14 GA.	J2-B
9		CBL-RED	18 GA.	J1-6
10		CBL-GRN	18 GA.	J1-9
11				
12				

PIN	WIRE NO.	Color	Size	TO
A		BLACK	18 GA.	S1-1
B		RED	14 GA.	J4-8
C		BLUE	18 GA.	J4-6

Schematics — ISOBUS Controller ECU Wire Harness (9008095)



Schematics - Plumbing



Wheel, Hub and Spindle Disassembly and Assembly

⚠ WARNING

- **TIPPING OR MOVEMENT OF THE MACHINE CAN CAUSE SERIOUS INJURY OR DEATH. BE SURE MACHINE IS SECURELY BLOCKED.**

- **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 10,000 LBS. SPECIFIC LOAD RATINGS FOR INDIVIDUAL LOADS WILL BE GIVEN AT THE APPROPRIATE TIME IN THE INSTRUCTIONS.**

- **EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING IMPLEMENT.**

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

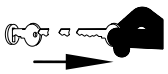
⚠ CAUTION

- **IMPROPERLY TORQUED WHEEL NUTS/BOLTS CAN CAUSE A LOSS OF IMPLEMENT CONTROL AND MACHINE DAMAGE. TORQUE WHEEL NUTS/BOLTS TO VALUES IN TABLE. CHECK TORQUE BEFORE USE, AFTER ONE HOUR OF UNLOADED USE OR AFTER FIRST LOAD, AND EACH LOAD UNTIL WHEEL NUTS/BOLTS MAINTAIN TORQUE VALUE. CHECK TORQUE EVERY 10 HOURS OF USE THERE-AFTER. AFTER EACH WHEEL REMOVAL START TORQUE PROCESS FROM BEGINNING. WARRANTY DOES NOT COVER FAILURES CAUSED BY IMPROPERLY TORQUED WHEEL NUTS/BOLTS.**

IMPORTANT

- *Remove only one wheel and tire from a side at any given time in the following procedure.*

1. Hitch implement to tractor. Park on a firm, level surface. Set the tractor's parking brake, shut off engine and remove key.



2. Use a safe lifting device rated at 10,000 lbs. to support the weight of your implement. Place the safe lifting device under the axle closest to the tire.
3. Use a 500 lbs. safe lifting device to support the wheel and tire during removal.
4. If only removing wheel and tire, skip to Step 8; otherwise continue with Step 4.

   Remove the hardware retaining the hubcap. Next, remove the hubcap, gasket, cotter pin, castle nut and spindle washer. Remove hub with bearings from old spindle using a 200 lbs. lifting device.

Wheel, Hub and Spindle Disassembly and Assembly (continued)

5. Inspect the spindle and replace if necessary. If spindle does not need to be replaced, skip to Step 6; otherwise continue with Step 5.

   Remove the bolt and lock nut that retain the spindle to the axle. Using a lifting device rated for 150 lbs., remove the old spindle. Coat spindle shaft with anti-seize lubricant prior to installation. Reuse bolt and lock nut to retain spindle to axle. Torque as outlined in Maintenance Section.

6. Remove seal and inspect bearings, spindle washer, castle nut and cotter pin. Replace if necessary. Pack both bearings with Extreme Pressure NLGI #2 grease and reinstall inner bearing. Install new seal in hub with garter spring facing inward to the hub by tapping on flat plate that completely covers seal while driving it square to hub. Install until flush with back face of hub. Using a 200 lb. rated lifting device, install hub assembly onto spindle. Install outer bearing, spindle washer and castle nut.

IMPORTANT

- *Do not use an impact wrench!*

7. Slowly tighten castle/slotted nut while spinning the hub until hub stops rotating. Turn castle nut counterclockwise until the hole in the spindle aligns with the next notch in castle nut. Hub should spin smoothly with minimal drag and no end play. If play exists, tighten to next notch of castle nut. If drag exists, then back castle nut to next notch. Spin and check again. Install cotter pin. Clean face for hub cap gasket and install gasket, grease- filled hub cap and retain hubcap with hardware removed. Tighten hubcap hardware in alternating pattern.

8. Attach the wheel(s) and tire(s) to the hub using the same rated safe lifting device for removal. Tighten wheel nuts to appropriate requirements and recheck as outlined in the Wheels and Tires section of this manual.

9. Raise implement, remove lifting device and lower tire to the ground.

Wheels and Tires

Wheel Nut Torque Requirements

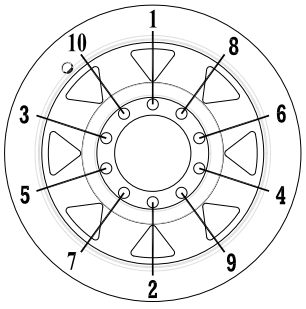
⚠ CAUTION

- **IMPROPERLY TORQUED WHEEL NUTS/BOLTS CAN CAUSE A LOSS OF IMPLEMENT CONTROL AND MACHINE DAMAGE. TORQUE WHEEL NUTS/BOLTS TO VALUES IN TABLE. CHECK TORQUE BEFORE USE, AFTER ONE HOUR OF UNLOADED USE OR AFTER FIRST LOAD, AND EACH LOAD UNTIL WHEEL NUTS/BOLTS MAINTAIN TORQUE VALUE. CHECK TORQUE EVERY 10 HOURS OF USE THEREAFTER. AFTER EACH WHEEL REMOVAL START TORQUE PROCESS FROM BEGINNING. WARRANTY DOES NOT COVER FAILURES CAUSED BY IMPROPERLY TORQUED WHEEL NUTS/BOLTS.**

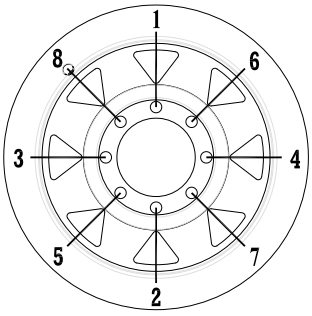
Failure to check torque before first load may damage wheel nut/bolt seats. Once seats are damaged, it will become impossible to keep nuts/bolts tight. Tighten nuts/bolts to applicable torque value shown in table. Start all nuts/bolts by hand to prevent cross threading. Torque nuts/bolts in the recommended sequence as shown in Diagram 1.

WHEEL HARDWARE	
SIZE	**FOOT-POUNDS**
1/2”-20(UNF) Grade 5	75 Ft.-Lbs.
5/8”-18(UNF) Grade 5	165 Ft.-Lbs.
5/8”-18(UNF) Grade 8	175 Ft.-Lbs.
3/4”-16(UNF) Grade 8	365 Ft.-Lbs.

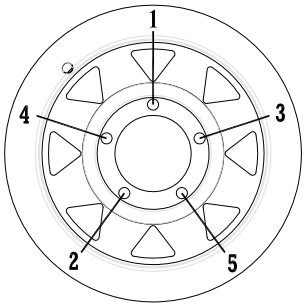
Diagram 1



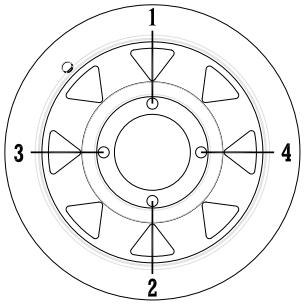
10 Bolt



8 Bolt



5 Bolt



4 Bolt

Wheels and Tires (continued)

Tire Pressure

The following is to be used as a general guide for tire inflation and figures can vary depending on specific brand of tire used. It is important that tires are inspected after unit is loaded. The tire should stand up with no side-wall buckling or distress as tire rolls. Record the pressure needed to support the full load and maintain this pressure to achieve proper tire life. **Do not exceed maximum recommended tire pressure.**

Tire Pressure For Nutrimax Liquid Applicators

Tire Make	Tire Size	Load Index / Ply Rating	Max PSI
Mitas	VF380/90R46 R-1	173D	64
Goodyear	320/90R46 R-1	159D	64
Goodyear	12.4x38 R-1	14-Ply	56
Carlisle	20.5x8.0B10	F-Ply	35
	145/12	Load Range D	65

(All tire pressures in psi)

Tire Warranty

For questions regarding new tire warranty, please contact your local original equipment tire dealer. Used tires carry no warranty. Following are phone numbers and Websites for your convenience:

Carlisle/Ironman
www.carlisletire.com
Phone 800-260-7959
Fax 800-352-0075

Firestone
www.firestoneag.com
Phone 800-847-3364

Titan
or
Goodyear
www.titan-intl.com
Phone 800-USA-BEAR
Fax 515-265-9301

Trelleborg
www.trelleborg.com
Phone 866-633-8473

Continental/Mitas
www.mitas-tires.com
Phone 704-542-3422
Fax 704-542-3474

Carlstar Group LLC
www.carlstargroup.com
Phone 800-260-7959
Fax 800-352-0075

Kenda/Americana Tire & Wheel
www.americanatire.com
Phone 800-225-4714

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

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

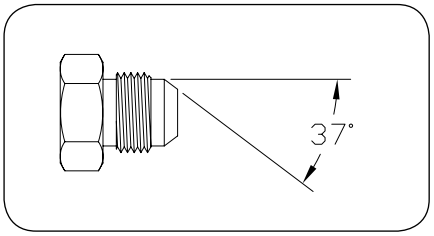
IMPORTANT

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

Hydraulic Fittings – Torque and Installation

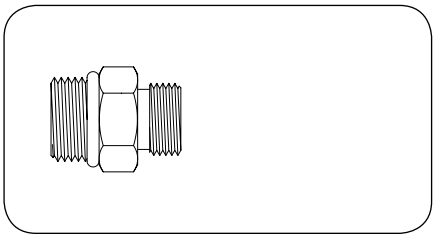
SAE Flare Connection (J. I. C.)

1. Tighten nut with finger until it bottoms the seat.
2. Using a wrench, rotate nut to tighten. Turn nut 1/3 turn to apply proper torque.



SAE Straight Thread O-Ring Seal

1. Back off jam nut and washer to expose smooth surface for O-ring seal.
2. Lubricate o-ring.
3. Thread into port until washer bottoms onto spot face.
4. Position elbows by backing up adapter.
5. Tighten jam nut.



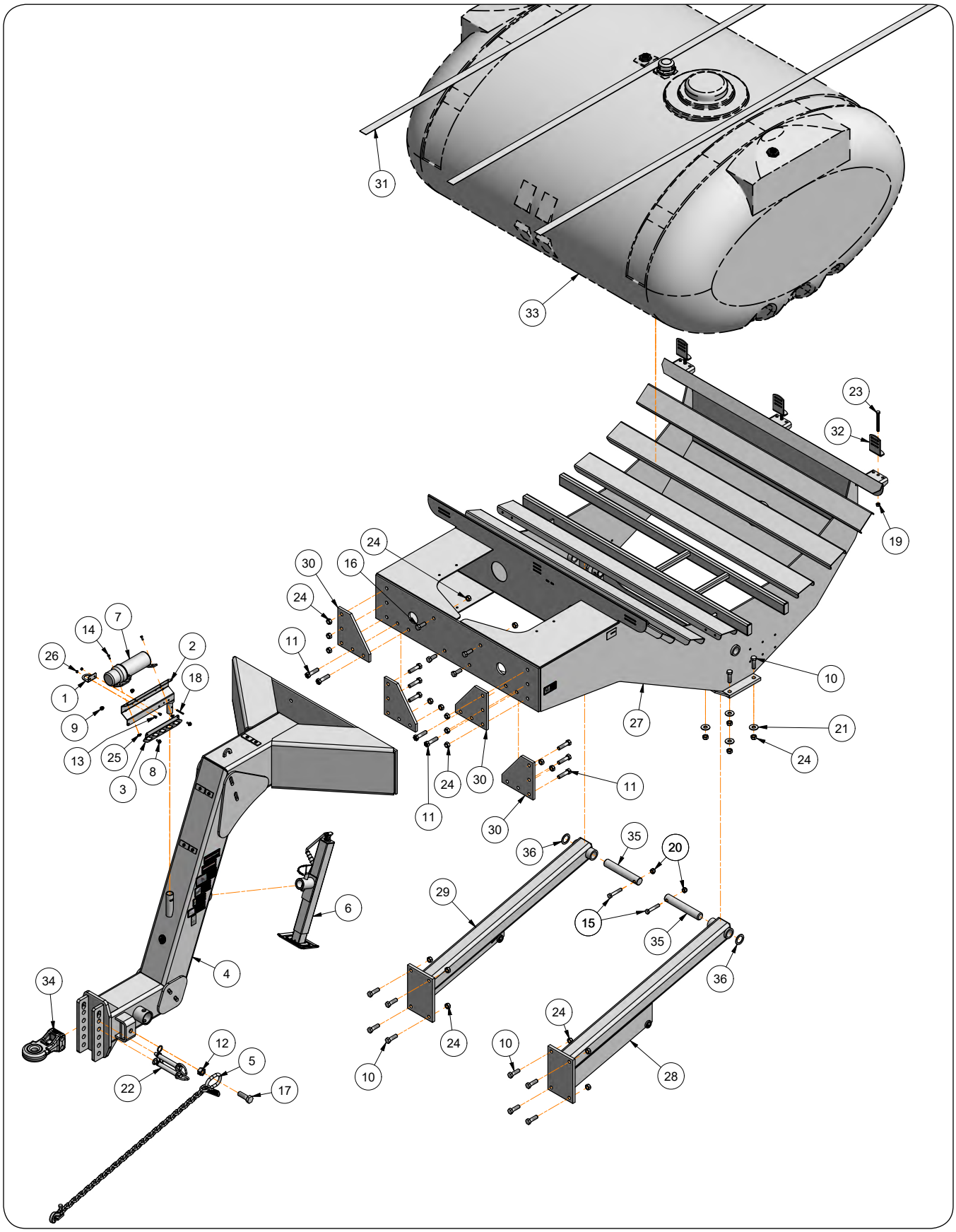
Notes

Section V
Parts

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

Tongue, Jack, Transport Chain & Main Frame Components

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



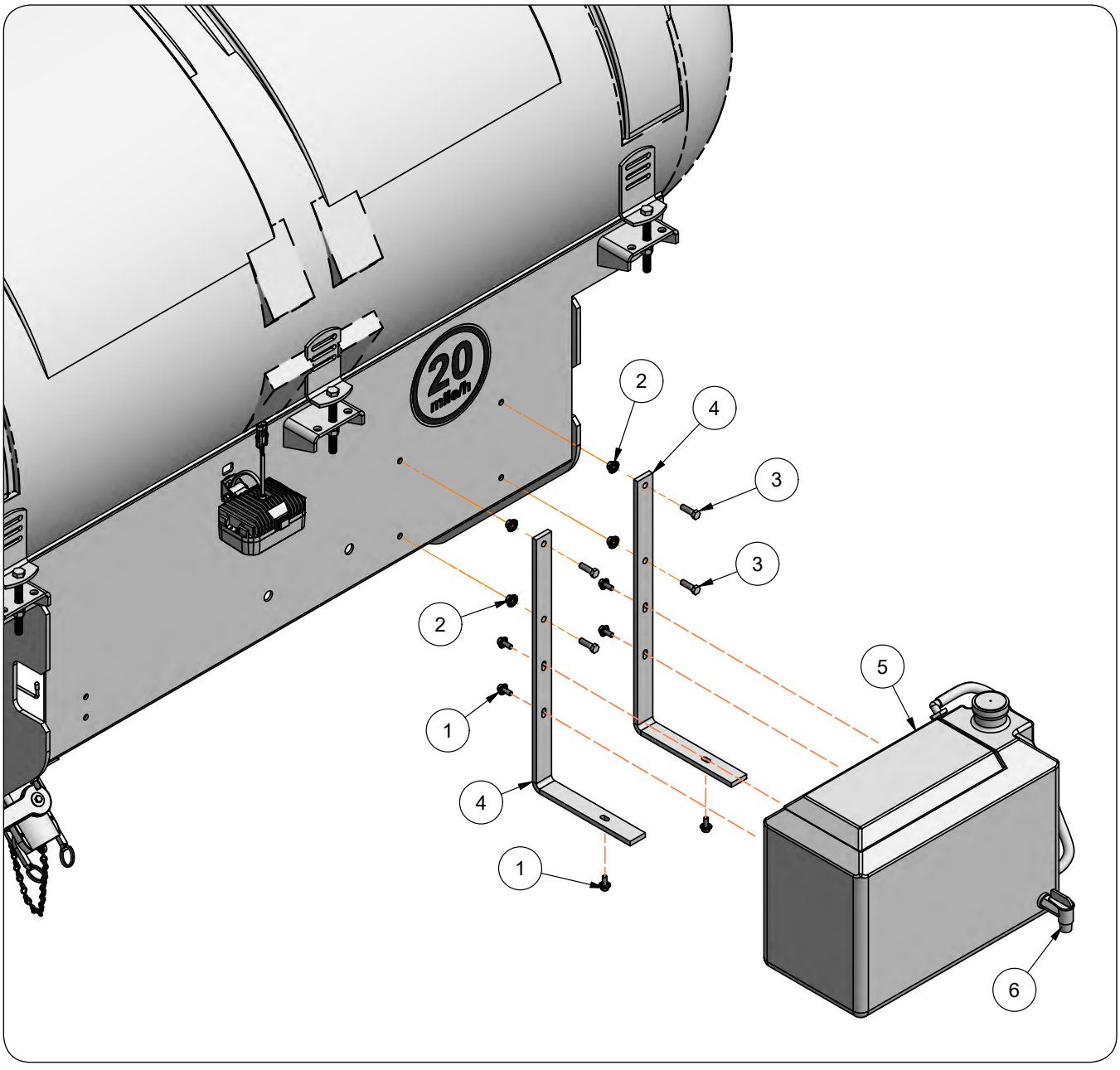
Tongue, Jack, Transport Chain & Main Frame Components

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

ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1	281837B	Plate-Holder	1	
2	415532B	Hose Caddy Weldment =Black=	1	
3	415536	Plate-Caddy, Hose	1	
4	47139G	Tongue Weldment with Decals =Green=	1	
	47139R	Tongue Weldment with Decals =Red=		
5	9003278	Transport Chain, 20,200 Lbs.	1	
6	9003295	Jack - Top Wind	1	
7	900552	Manual Holder	1	
8	91256	Flange Screw, 5/16"-18UNC x 3/4"	8	
9	91257	Large Flange Hex Nut, 5/16"-18UNC	2	
10	91299-147	Capscrew, 3/4"-10UNC x 2 1/2" G8	16	
11	91299-149	Capscrew, 3/4"-10UNC x 3" G8	10	
12	92199	Lock Nut/Center, 1"-8UNC	1	
13	9390-001	Capscrew, 1/4"-20UNC x 1/2" G5	2	
14	9390-003	Capscrew, 1/4"-20UNC x 3/4" G5	2	
15	9390-130	Capscrew, 5/8"-11UNC x 3 1/2" G5	2	
16	9390-145	Capscrew, 3/4"-10UNC x 2" G5	4	
17	9390-187	Capscrew, 1"-8UNC x 3" G5	1	
18	9392-140	Roll Pin, 1/4" Dia. x 2"	1	
19	9394-010	Hex Nut, 1/2"-13UNC	6	
20	9398-019	Elastic Lock Nut, 5/8"-11UNC	2	
21	9405-106	Flat Washer, 3/4" USS	4	
22	93950	Hitch Pin, 1" Dia. x 8" with Hairpin	2	
23	95791	Capscrew, 1/2"-13UNC x 5" G5	3	
24	97025	Lock Nut/Top, 3/4"-10UNC	30	
25	97189	Large Flange Hex Nut, 1/4"-20UNC	2	
26	9936	Lock Nut/Top, 1/4-20UNC	2	
27	JAM3524G	Tank Main Frame =Green=	1	
	JAM3524R	Tank Main Frame =Red=		
28	JAM3555B	Toolbar Left-Hand Lift Arm Weldment =Black=	1	
29	JAM3556B	Toolbar Right-Hand Lift Arm Weldment =Black=	1	
30	JAM3566	Corner Brace =Black=	4	
31	JAM3580	Tank Strap, 2" x 132"	3	
32	JAM4432	Tank Strap Adjustment Bracket =Black=	3	
33	JAP3203	Tank, 1000 Gallon Elliptical Includes Lid	1	
34	JAP3231	Ball Swivel Hitch, CAT 3	1	
35	JBM3496	Pin, 1 3/4" Dia. x 10 3/4"	2	
36	JBP3205	Machinery Bushing, 2 1/2" OD x 1 3/4" ID x 10GA	2	

Clean Water Tank Components

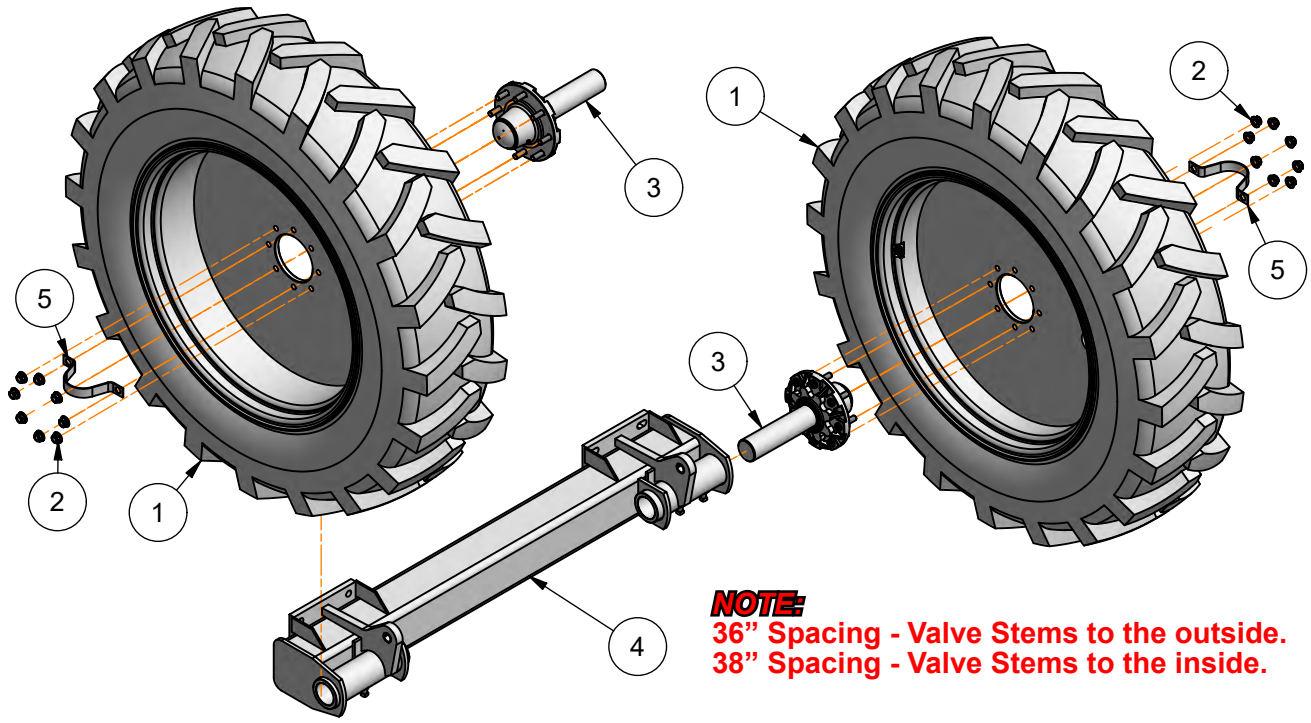
Please visit www.unverferth.com/parts/ for the most current parts listing.



ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1	91256	Flange Screw, 5/16”-18UNC x 3/4”	8	
2	91257	Large Flange Hex Nut, 5/16”-18UNC	15	
3	9390-056	Capscrew, 3/8”-16UNC x 1 1/4” G5	5	
4	JAM4421	Tank Mounting Bracket =Black=	2	
5	JAP2137	Clean Fresh Water Tank Assembly - 9 Gallon	1	Includes Item 6
6	JAP2329	Spigot	1	

Wheel/Axle - 76” Wheel Spacing, Single

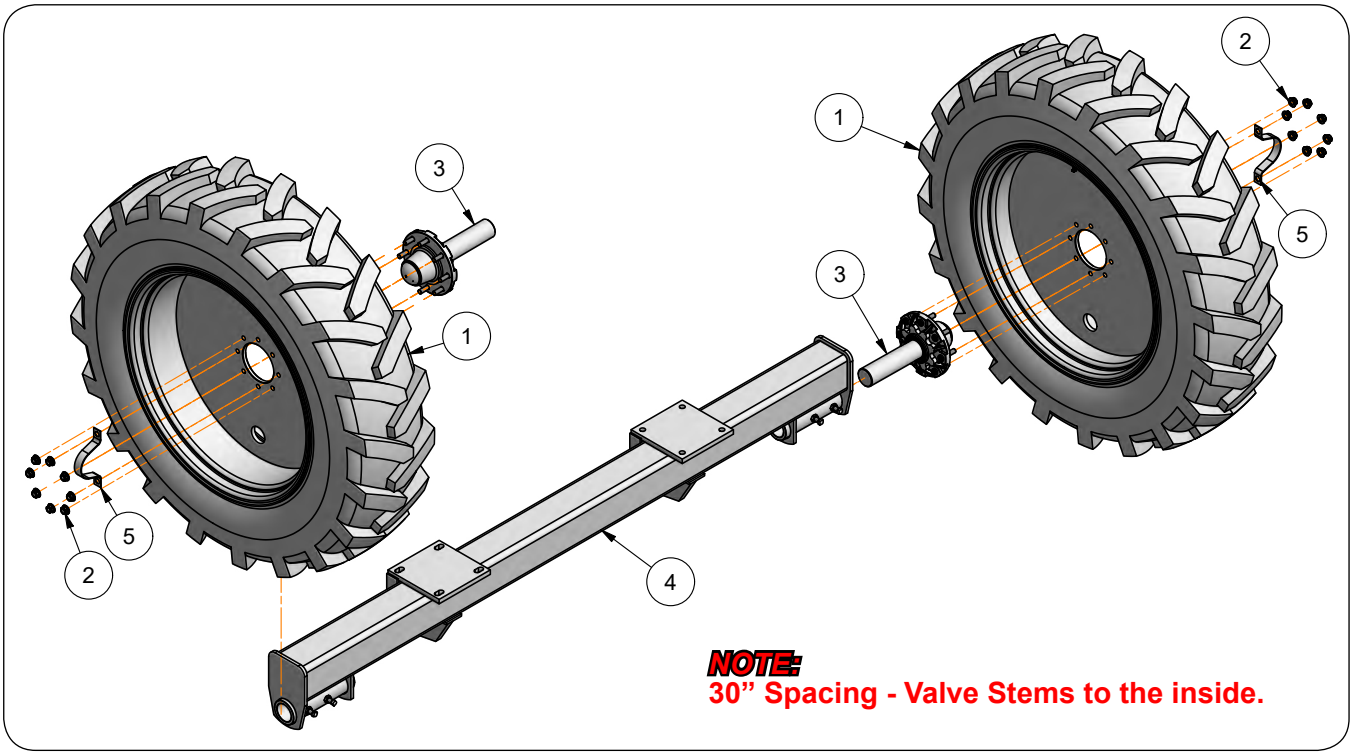
Please visit www.unverferth.com/parts/ for the most current parts listing.



ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
	45866B	Wheel/Axle - 76” Wheel Spacing, Single	-	Includes Items 1-5
1	111273SM	Mounted 1334 Wheel w/TL380/85R34 R-1W =Silver Mist=	2	
	N/A	Valve Stem	-	
	N/A	Tire, TL380/85R34 R-1W (146A8/146B)	-	
	111144SM	Wheel, 13 x 34, 8 Bolt	-	
2	9002237	Flange Nut, 5/8-18UNF G8	16	
3	JAAM2800-1	Hub & Spindle Assembly - 8 Bolt	2	
4	JAM3530B	Axle Weldment - Wide Row Wheel Spacing =Black=	1	
5	JAM4597	Hub Cap Strap =Black=	2	

Wheel/Axle - 120” Wheel Spacing, Single

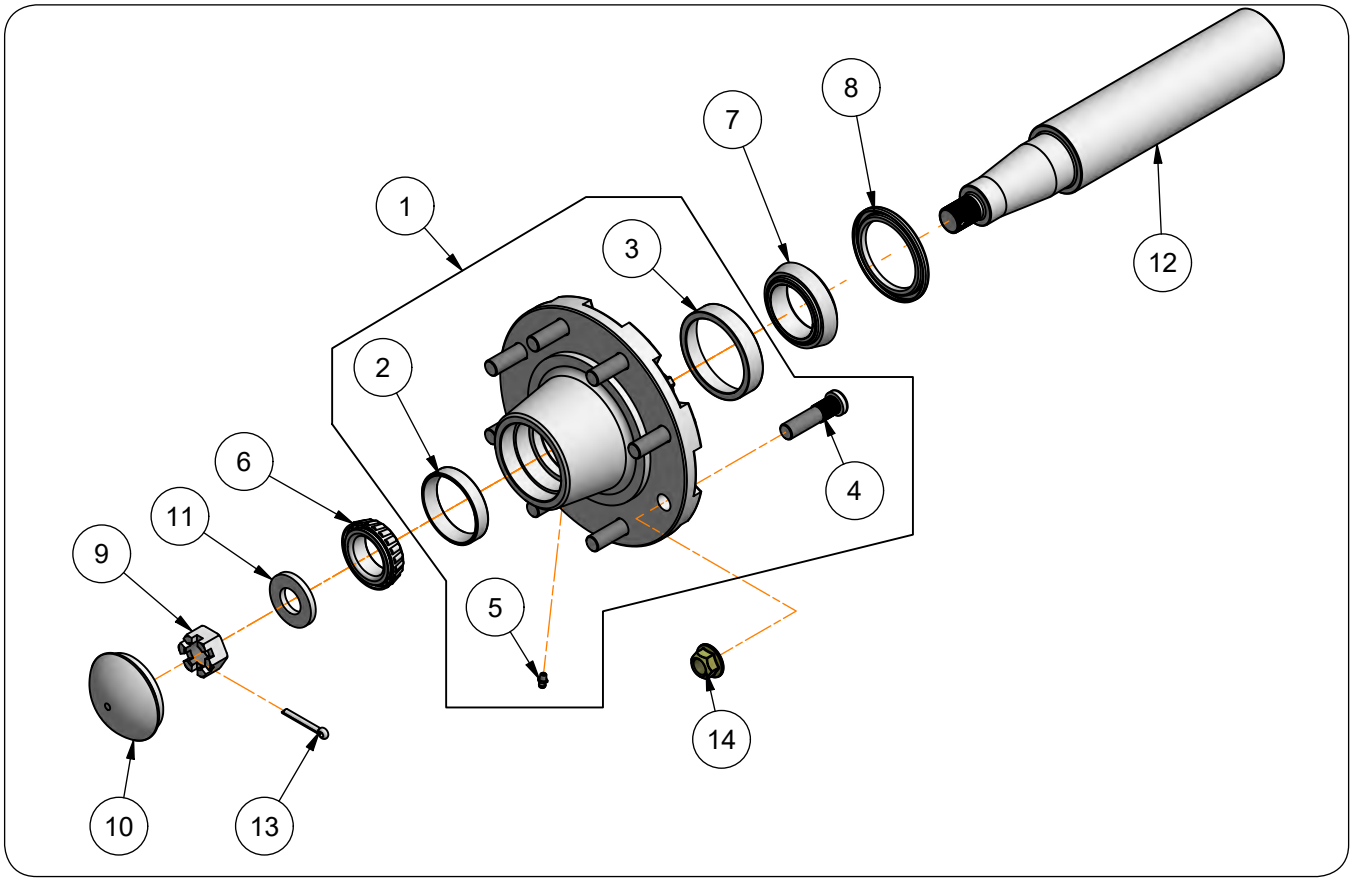
Please visit www.unverferth.com/parts/ for the most current parts listing.



ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
	45865B	Wheel/Axle - 120” Wheel Spacing, Single	-	Includes Items 1-5
1	111273SM	Mounted 1334 Wheel w/TL380/85R34 R-1W =Silver Mist=	2	
	N/A	Valve Stem	-	
	N/A	Tire, TL380/85R34 R-1W (146A8/146B)	-	
	111144SM	Wheel, 13 x 34, 8 Bolt	-	
2	9002237	Flange Nut, 5/8-18UNF G8	16	
3	JAAM2800-1	Hub & Spindle Assembly - 8 Bolt	2	
4	JAM3522B	Axle Weldment - Narrow Row Wheel Spacing =Black=	1	
5	JAM4597	Hub Cap Strap =Black=	2	

Hub and Spindle Components

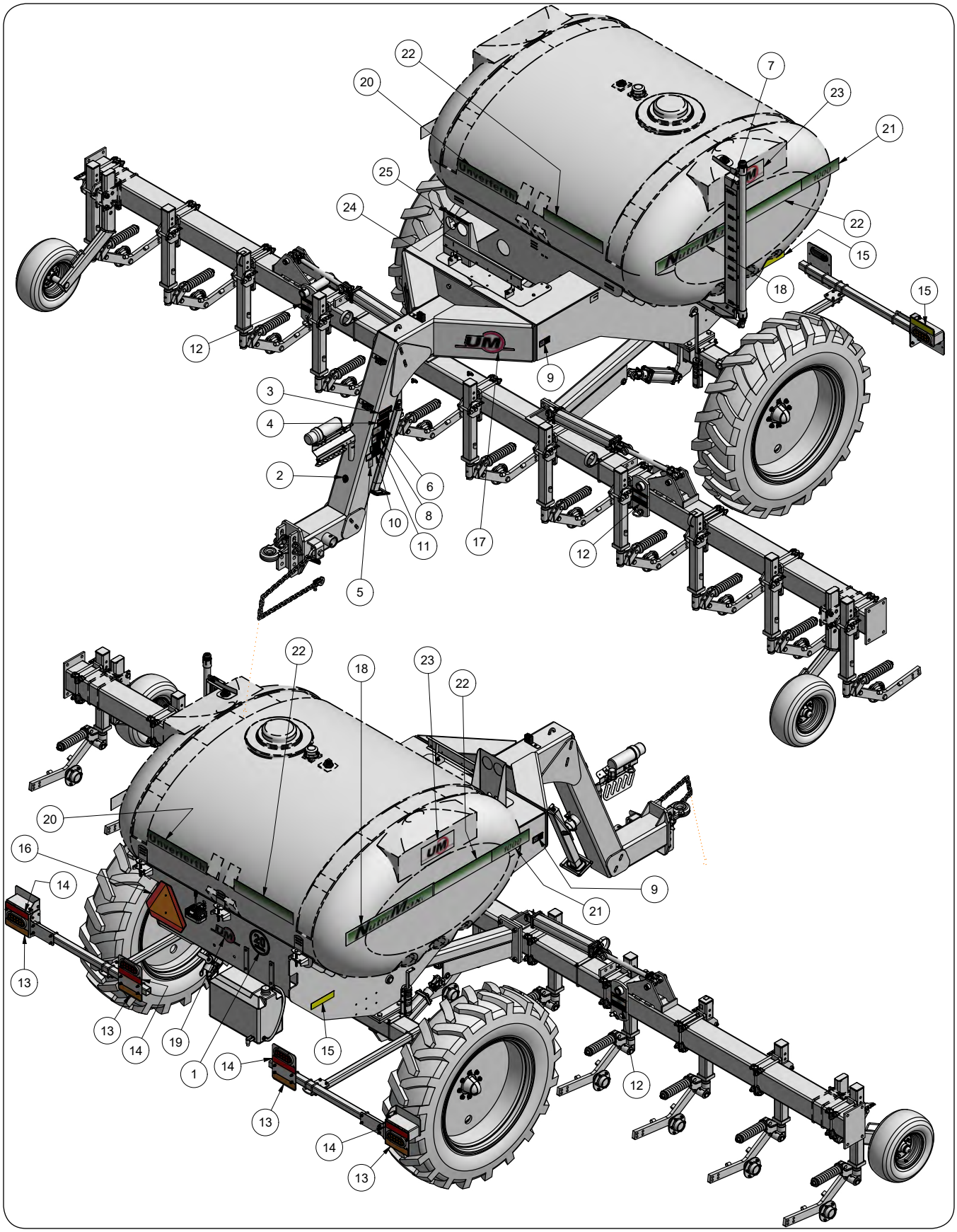
Please visit www.unverferth.com/parts/ for the most current parts listing.



ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
	JAAM2800-1	Hub & Spindle Assembly 8-Bolt (608) =Black=		Includes Items 1-13
1	91854	Hub 8-Bolt Subassembly w/Cups & Studs =Black=	1	Includes Items 2-5
2	9349	Bearing Cup, LM501310	1	
3	91809	Bearing Cup, JLM506810	1	
4	9000939	Stud Bolt, 5/8"-18UNF x 2 1/2" G5	8	
5	91160	Grease Zerk	1	
6	9247	Bearing Cone, LM501349	1	
7	92610	Bearing Cone, JLM506849	1	
8	92612	Grease Seal, CR27394	1	
9	9393-020	Slotted Nut, 1"-14UNS	1	
10	9442B	Hub Cap, 1609	1	
11	9448	Flat/Spindle Washer, 2.13 OD x 1.06" ID x .25	1	
12	JAP2171	Spindle, 2 3/4" Dia. x 16"	1	
13	TA37809	Cotter Pin, 7/32" Dia. x 1 3/4"	1	
14	9002237	Flange Nut, 5/8"-18UNF, G8	8	

Decals

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



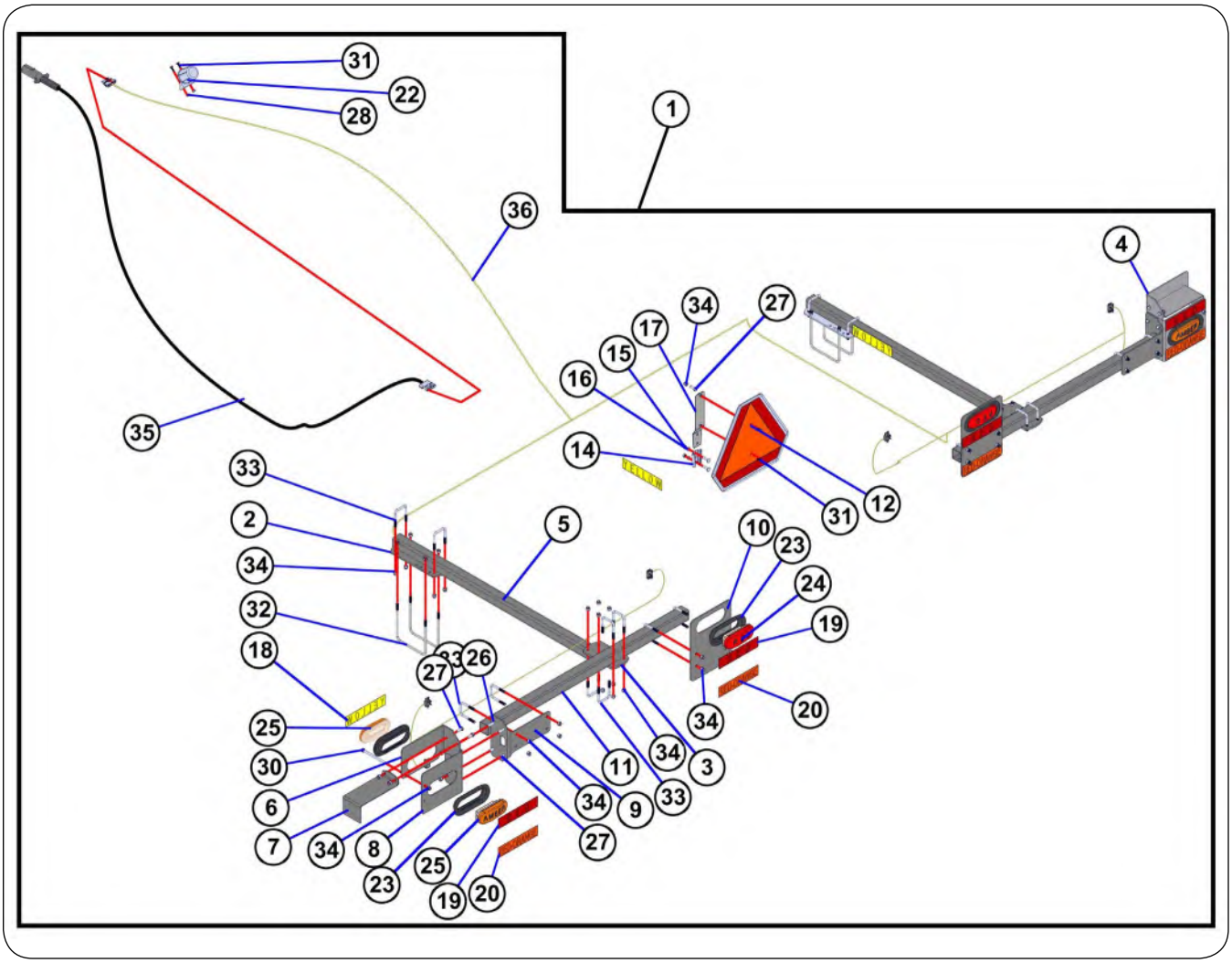
Decals

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

ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1	9008714	Rear SIS Decal, 20MPH	1	
	9008720	Rear SIS Decal, 30KPH	1	
2	9008715	Front SIS Decal, 20MPH	1	
	9008721	Front SIS Decal, 30KPH	1	
3	901256	Decal, DANGER (Chemical Exposure...)	1	
4	901258	Decal, DANGER (Electric Shock...)	1	
5	91605	Decal, FEMA	1	
6	94094	Decal, WARNING (Rising or Falling Tongue...)	1	
7	9504044	Decal, Volume - 1000 Gallon	2	
8	95445	Decal, WARNING (High-Pressure Fluid...)	1	
9	95839	Decal, WARNING (Pinch Point)	2	
10	97575	Decal, CAUTION (Transport Chain)	1	
11	97961	Decal, WARNING (Read and Understand...)	1	
12	97337	Decal, WARNING (Folding or Unfolding Wings...)	4	
13	9003125	Decal, Fluorescent Orange	4	
14	9003126	Reflector =Red=	4	
15	9003127	Reflector =Amber=	4	
16	TA510514	SMV Emblem	1	
17	9007562	Decal, Front UM Tank Logo	2	
18	9007585	Decal, Tank “Nutrimax” (Green)	2	
	9007586	Decal, Tank “Nutrimax” (Red)	2	
19	901607	Decal, UM Oval	1	
20	9504449	Decal, “Unverferth” (Green)	2	
	9504448	Decal, “Unverferth” (Red)	2	
21	9504451	Decal, “1000” (Green)	2	
	9504450	Decal, “1000” (Red)	2	
22	9504453	Decal, Stripe (Green)	4	
	9504452	Decal, Stripe (Red)	4	
23	9504570	Decal, Side UM Tank Logo	2	
24	9003687	Decal, Filter Inlet Pressure	1	
25	9003841	Decal, Tip Pressure	1	

Light Kit Components

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



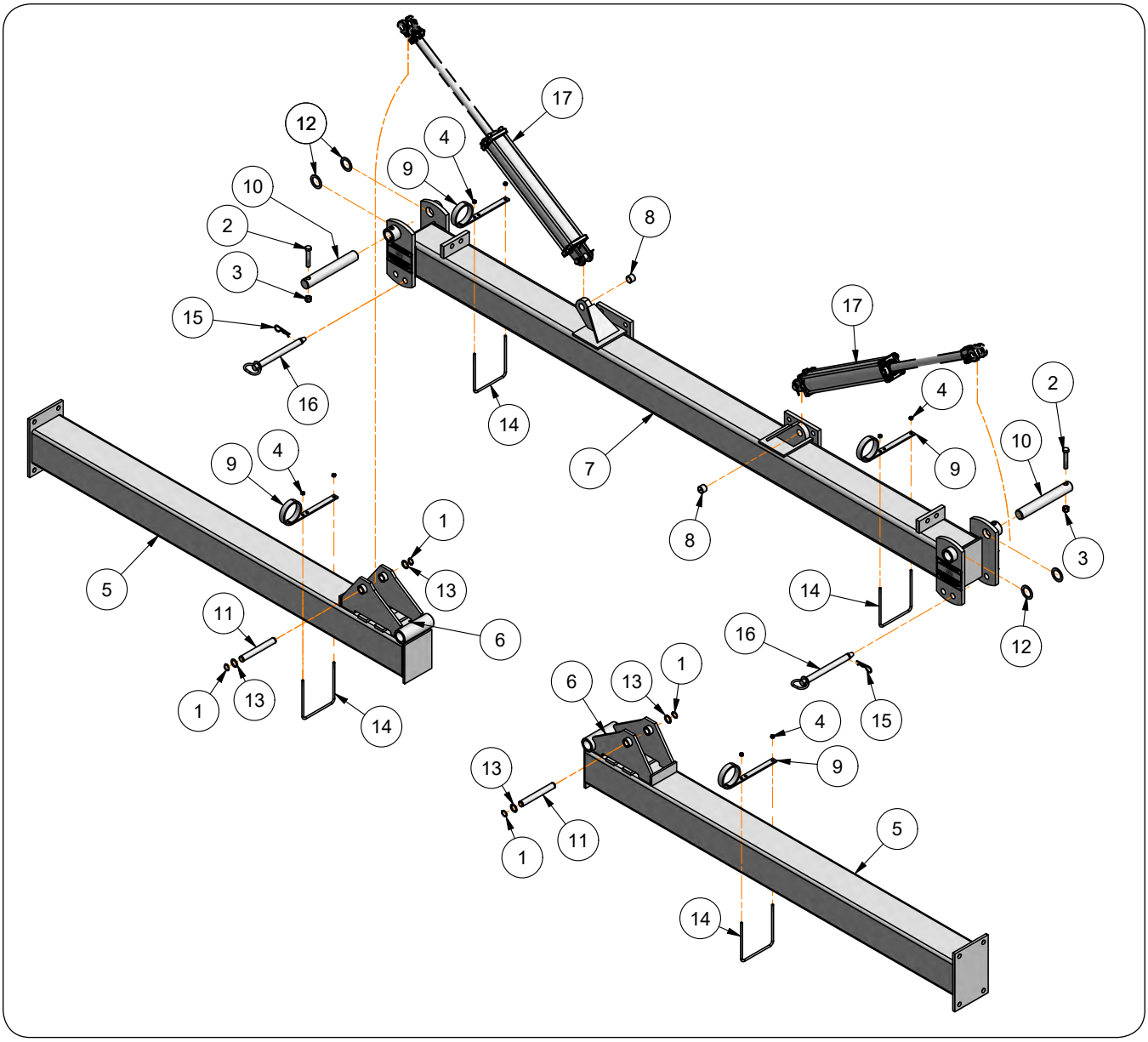
Light Kit Components

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

ITEM	PART NUMBER	DESCRIPTION	QTY		NOTES
			11 Row 30" 13 Row 30"	9 Row 36" 9 Row 38"	
1	J41000048	Lighting Kit, AT Liquid Applicator	1	0	
	J41000049	Lighting Kit, AT Liquid Applicator	0	1	
2	JAM3408	Light Post Mounting Plate	2	0	
3	JAM3410	Mounting Plate, Light Post	2	0	
4	JAM3415	Light Bracket, Front, Left-Hand	1	1	
5	JAM3416	Light Bracket Tube (2" x 2" x 48")	2	0	
	JAM3434	Light Bracket Tube (2" x 2" x 36 1/2")	0	2	
6	JAM3417	Light Bracket, Front, Right-Hand	1	1	
7	JAM3418	Light Bracket Shield	2	2	
8	JAM3421	Side Mount Light Bracket	2	2	
9	JAM3422	Mounting Side Mount Light Bracket	2	2	
10	JAM3429	Light Mount Plate	2	2	
11	JAM3432	Light Bracket Tube (2" x 2" x 46")	2	0	
	JAM3433	Light Bracket Tube (2" x 2" x 59 3/4")	0	2	
12	TA510514	SMV Sign	1	1	
14	TA510515	SMV Mounting Socket	1	1	
15	9394-004	Hex Nut, 5/16"-18UNC	2	2	
16	9404-019	Lock Washer, 5/16"	2	2	
17	TA510516	SMV Mounting Spade	1	1	
18	9003127	Decal, Reflector, Yellow, 2" x 9"	4	4	
19	9003126	Decal, Reflector, Red, 2" x 9"	4	4	
20	9003125	Decal, Fluorescent, Red-Orange, 2 x 9	4	4	
21	JAP2824	Electrical Harness, 10' Main, 7 Pin	1		
22	9001968	Dust Cap, Electrical Harness, Cole Hersee 11750 Or Equivalent	1	1	
23	97182	Grommet, Oval, MODEL 60	6	6	
24	902217	Lamp, LED, Oval, Stop Turn & Tail, Red	2	2	
25	JAP4415	Lamp, LED, Oval, Turn Signal, Amber, LED	4	4	
26	9390-057	Capscrew, 3/8"-16UNC x 1 1/2", G5	4	4	
27	9390-055	Capscrew, 3/8"-16UNC x 1", G5	9	9	
28	9394-002	Hex Nut, 1/4"-20UNC	4	4	
29	9405-064	Flat Washer, 1/4" USS	2	2	
30	9390-069	Capscrew, 3/8"-16UNC x 5", G5	2	2	
31	9390-003	Capscrew, 1/4"-20UNC x 3/4", G5	4	4	
32	JBP3351	U-Bolt, 3/8"-16UNC x 7, 6 7/16 CC	4	0	
	JBP3362	U-Bolt, 3/8"-16UNC x 4, 3 7/16 CC	0	6	
33	JBP3736	U-Bolt, 3/8"-16UNC x 2"W x 3"L	20	8	
34	9398-012	Elastic Lock Nut, 3/8"-16UNC	63	43	
35	JAP3142	Electrical Harness, 10' Main 5-Wire, 7 Pin	1	1	
36	JAP3197	Electrical Harness, 17' 2 Post, 5 Wire	1	1	

Standard Toolbar Components

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



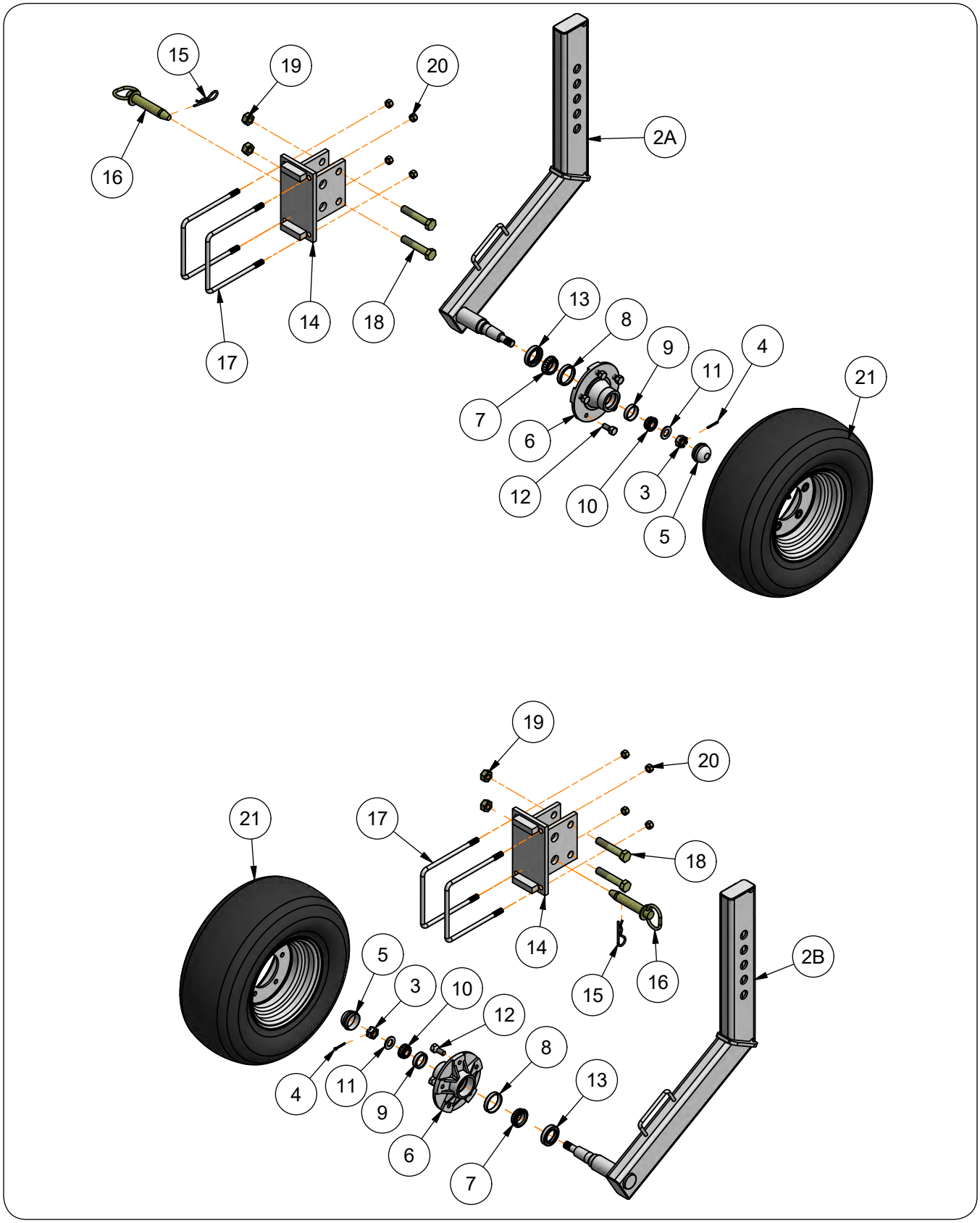
Standard Toolbar Components

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

ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1	91192	Retaining Ring, 1"	4	
2	9390-130	Capscrew, 5/8"-11UNC x 3 1/2", G5	2	
3	9398-019	Elastic Lock Nut, 5/8"-11UNC	2	
4	9928	Lock Nut/Top, 3/8"-16UNC	12	
5	JAM3520G	Wing Weldment, Standard Toolbar, 7'-5" =Green=	2	Includes item 6
	JAM3520R	Wing Weldment, Standard Toolbar, 7'-5" =Red=		
6	91160	Grease Zerk, 1/4"-28	2	
7	JAM3523G	Toolbar Frame Center Section w/Decal =Green=	1	Includes Item 8
	JAM3523R	Toolbar Frame Center Section w/Decal =Red=		
8	91268	Tension Bushing, 1 1/4" OD x 1" ID x 1"	2	
9	JAM4015	Hose Retainer, Closed Loop, 6" & 7" Mounting	4	
10	JBM3485	Pin, 1 3/4" Dia. x 12 1/8", Plated	2	
11	JBM3725	Pin, 1" Dia. x 7.97"	2	
12	JBP3205	Machinery Bushing, 2 1/2" OD x 1 3/4" ID, 10 GA.	4	
13	JBP3215	Machinery Bushing, 1 1/2" OD x 1" ID, 14 GA.	4	
14	JBP3335	U-Bolt, 3/8"-16UNC x 7"W x 8"L	4	
15	JBP3500	Pin, Hair Clip, 3/16"	2	
16	JBP3510	Pin, 1" Dia. x 10"	2	
17	JDP4492	Hydraulic Cylinder 3" x 20" with Base End Pin and Cotter Pins	2	

Gauge Wheel Components

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



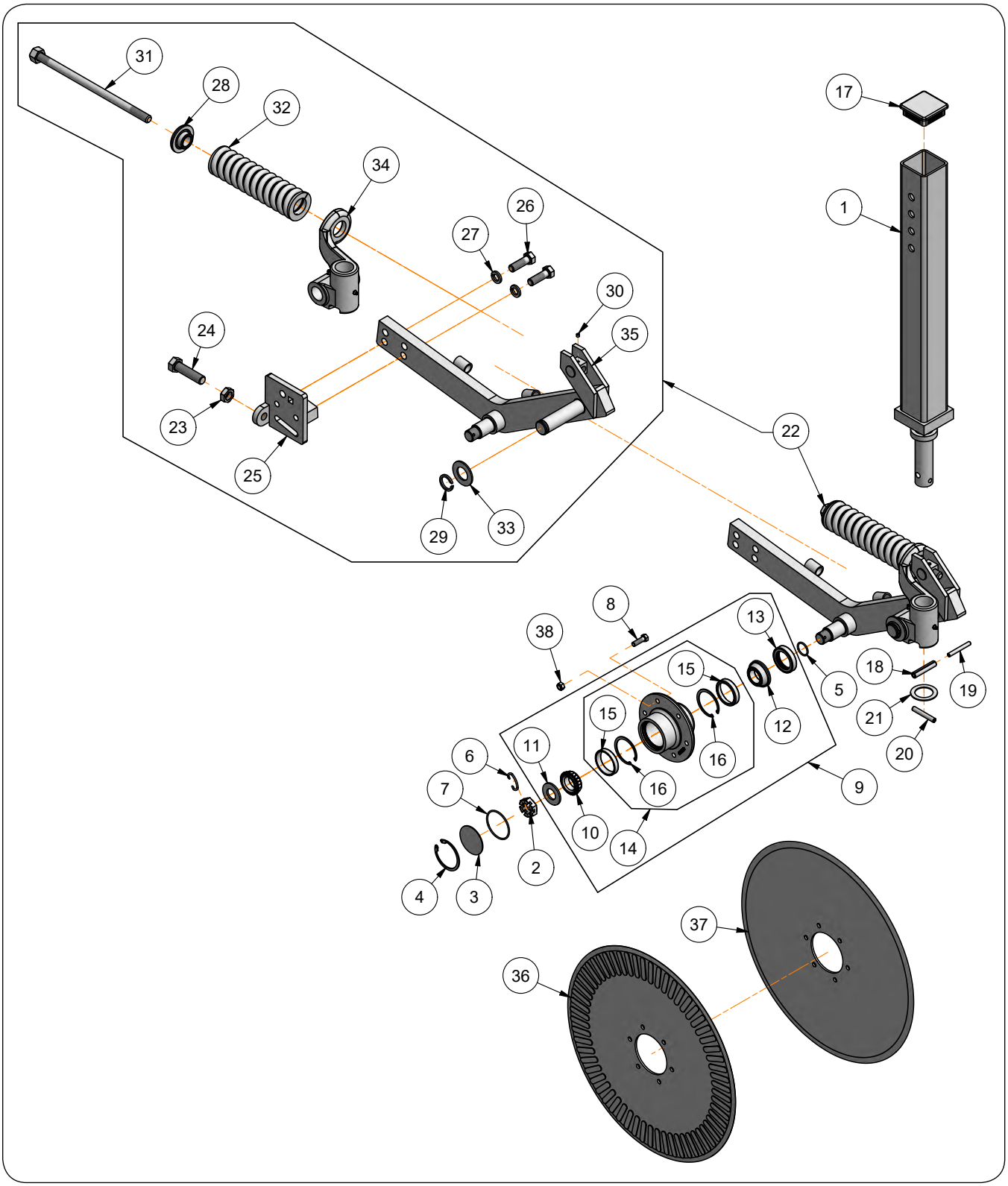
Gauge Wheel Components

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

ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1A	JAM3585	Gauge Wheel Leg LH Assembly	1	Includes Items 2A, 3-13
1B	JAM3586	Gauge Wheel Leg RH Assembly	1	Includes Items 2B, 3-13
2A	JEM7675	Gauge Wheel Leg Weldment LH	1	
2B	JEM7676	Gauge Wheel Leg Weldment RH	1	
3	9393-016	Slotted Nut, 3/4"-16UNF G2	1	
4	9391-034	Cotter Pin 5/32" Dia. x 1 1/4"	1	
5	9787	Hub Cap	1	
6	9503449B	Hub 5 Bolt Assembly Complete (Model 511)	1	Includes Items 7-13
7	9165	Bearing Cone 1.2500" Bore (LM67048)	1	
8	9345	Bearing Cup 2.328" OD (LM67010)	1	
9	9784	Bearing Cup 1.780" OD (LM11910)	1	
10	9789	Bearing Cone 0.75" ID (LM11949)	1	
11	91050	Flat Washer 1.469" OD x 0.812" ID	1	
12	91829	Wheel Bolt, 1/2"-20UNF x 1 5/8" G5	5	
13	JAP2747	Seal, 2.328" OD x 1.500" ID Double Lip with Garter Spring	1	
14	JAM3587	Gauge Wheel Bracket Weldment Mounting 2" Wide	2	
15	JBP3500	Hairpin Cotter, 0.172" Dia. x 3 1/2"	2	
16	JBP3475	Hitch Pin, 1" Dia. x 4"	2	
17	JBP3356	U-Bolt, 1/2"-13UNC x 8 1/4", 7 9/16" C/C G5	4	
18	9390-153	Capscrew, 3/4"-10UNC x 4" G5	4	
19	96732	Lock Nut/Center, 3/4"-10UNC	4	
20	9800	Lock Nut/Top, 1/2"-13UNC	8	
21	9503258SM	Wheel & Tire Assembly, 6 x 10 Wheel, TL20.5x8.0B10CA	2	

Coulter Assembly & Coulter Blade

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



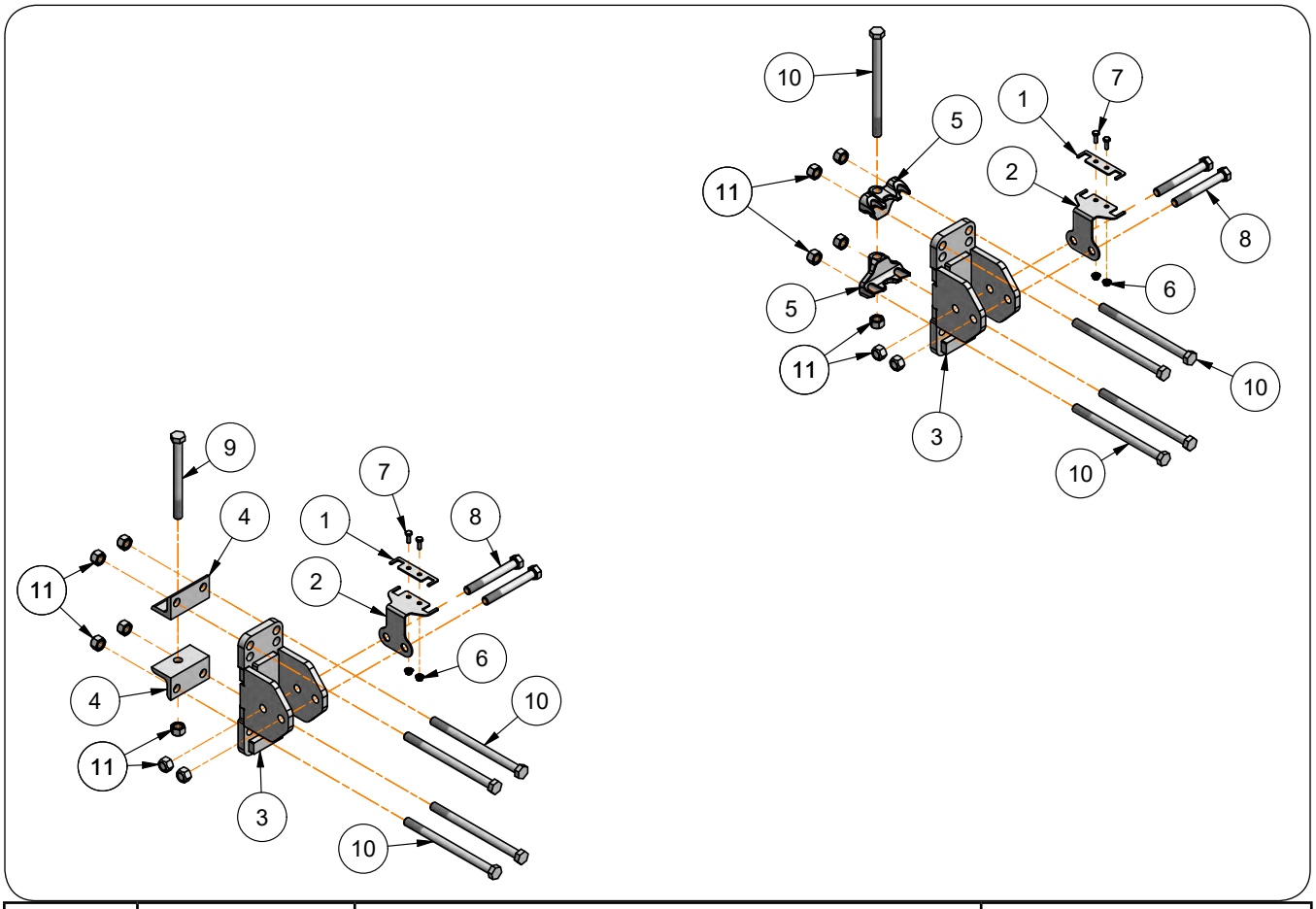
Coulter Assembly & Coulter Blade

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

ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1	415736B	Vertical Post Weldment =Black=	1	
2	94795	Slotted Jam Nut, 1"-14UNS	1	
3	60735B	Hub Cap Plate	1	
4	93985	Retaining Ring, 2 9/16" Dia.	1	
5	95565	O-Ring, 1.049" ID	1	
6	97565	C-Ring	1	
7	902158	O-Ring, 2 1/2" ID	1	
8	9501438-056	Capscrew, 3/8"-16UNC x 1 1/4" G5	6	
9	68656B	Hub 6 Bolt Assembly	1	Includes Items 10-16
10	9165	Bearing Cone, 1.25" Bore (LM67048)	1	
11	94800	Machinery Bushing, 2" OD x 1.01" ID	1	
12	901145	Bearing & Seal	1	
13	93987	Seal Triple Lip	1	
14	68655B	Hub 6 Bolt Sub Assembly w/Bearing & Seal Kit	1	Includes Items 15 & 16
15	9345	Bearing Cup, 2.328" OD (LM67010)	2	
16	94796	Retaining Ring, 2 1/2" Dia.	2	
17	9008253	Square Plug, 3"	1	
18	9501441-210	Roll Pin, 1/2" Dia. x 2 1/2"	1	
19	9501442-188	Spiral Pin, 5/16" Dia. x 2 1/2"	1	
20	9501442-209	Spiral Pin, 3/8" Dia. x 2 1/2"	1	
21	9501463	Washer, 2 1/4" OD x 1 1/2" ID	1	
22	68634B	Coulter Arm & Spring LH Assembly	1	Includes Items 9, 23-35
23	9501444-037	Hex jam Nut, 3/4"-10UNC	1	
24	9501438-149	Capscrew, 3/4"-10UNC x 3" G5	1	
25	68704B	Adjustment Plate Weldment LH	1	
26	9501438-124	Capscrew, 5/8"-11UNC x 2" G5	2	
27	9501440-029	Lock Washer, 5/8"	2	
28	82826B	Spring Washer, 2 1/2" OD x 13/16" ID	1	
29	94144	Retaining Ring, 1 1/4" Dia. Shaft	1	
30	9399-057	Set Screw, 1/4"-20UNC x 1/4" Cup Point/Hex Socket	1	
31	83371B	Spring Rod Weldment 3/4" Dia.	1	
32	94756B	Compression Spring, 2 5/8" Dia. x 10 5/8"	1	
33	92528B	Bushing, 2 1/4" OD x 1 1/4" ID	1	
34	68280B	Swivel LH Bracket	1	
35	68637B	Coulter Arm LH Weldment	1	
36	93934	Coulter Blade 20" Dia., Ripple	1	
37	99986	Coulter Blade 20 7/16" Dia., Smooth	1	
38	9501439-032	Lock Nut/Top, 3/8"-16UNC	6	

Coulter Mounting Components

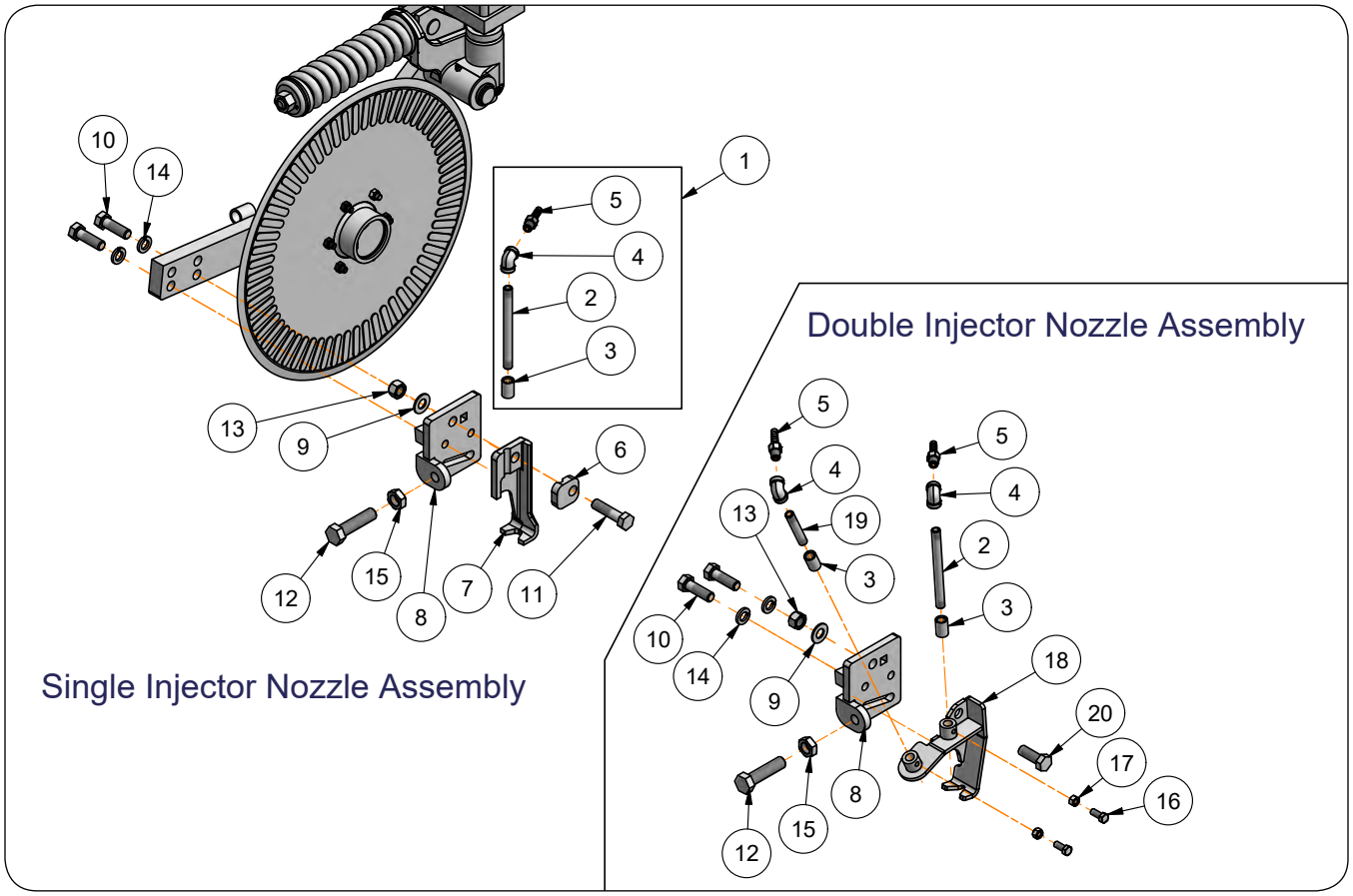
Please visit www.unverferth.com/parts/ for the most current parts listing.



ITEM	PART NUMBER	DESCRIPTION	NOTES
1	411916B	Nozzle Retainer Plate =Black=	
2	411917B	Nozzle Mount Plate =Black=	
3	414887B	Coulter Mount Weldment =Black=	
4	60271	Angle Clamp =Black=	
5	67922B	Extension Clamp =Black=	
6	9004720	Serrated Flange Nut 1/4”-20UNC	
7	900900-003	Capscrew 1/4”-20UNC 3/4” (Stainless Steel)	
8	9501438-134	Capscrew 5/8”-11UNC x 5” (Black)	
9	9501438-138	Capscrew 5/8”-11UNC x 7” (Black)	
10	9501438-442	Capscrew 5/8”-11UNC x 9” (Black)	
11	9501439-036	Locknut 5/8”-11UNC (Black)	

Injector Nozzle Components

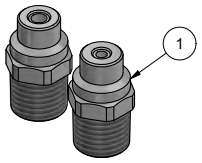
Please visit www.unverferth.com/parts/ for the most current parts listing.



ITEM	PART NUMBER	DESCRIPTION	QTY.	NOTES
1	411284	Injector Nozzle Pipe Assembly	1	Includes Items 2-5
2	9501131	Pipe Nipple 1/4-18NPT	1	
3	93941	Pipe Coupling 1/4-14NPTF Female x 1 1/8"	1	
4	9007369	90° Elbow 1/4-18NPTF Female x 1/4-18NPT Female	1	
5	9007370	Hose Shank 1/4-18NPT Male x 3/8 Hose Barb	1	
6	68169B	Clamp	1	
7	68175B	Injector Guard	1	
8	68704B	Adjustment Plate LH Weldment =Black=	1	
9	900902-049	Flat Washer 5/8" SAE	1	Stainless Steel
10	9501438-124	Capscrew, 5/8"-11UNC x 2" G5 (Black)	2	
11	9501438-126	Capscrew 5/8-11UNC x 2 1/2	1	
12	9501438-149	Capscrew, 3/4"-10UNC x 3" G5 (Black)	1	
13	9501439-036	Locknut 5/8-11UNC	1	
14	9501440-029	Lock Washer, 5/8" (Black)	2	
15	9501444-037	Hex Jam Nut, 3/4"-10UNC (Black)	1	
16	900900-054	Capscrew 3/8-16UNC x 7/8 (Stainless Steel)	2	
17	900901-006	Hex Nut 3/8-16UNC (Stainless Steel)	2	
18	410911B	Double Nozzle Weldment	1	
19	9007631	Pipe Nipple 1/4-18NPT	1	
20	9501438-123	Capscrew 5/8-11UNC x 1 3/4	1	

Injector Nozzle Kits

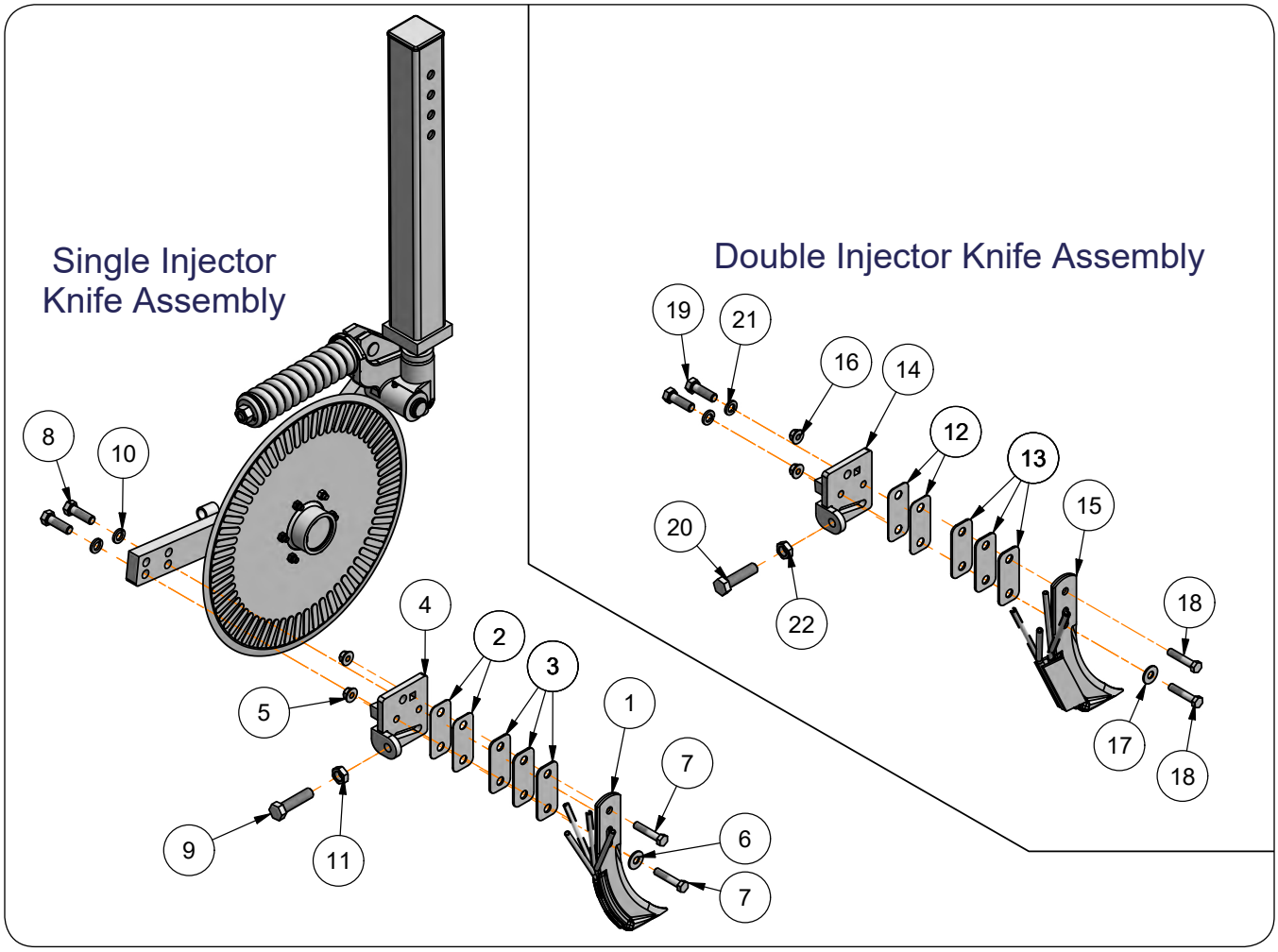
Please visit www.unverferth.com/parts/ for the most current parts listing.



ITEM	PART NUMBER	DESCRIPTION	QTY BY SPACING		NOTES
			9 ROW 36"/38" SPACING	11 & 13 ROW 30" SPACING	
1	46782	Nozzle Kit - #0004, 30' Rigid - 36"/38" Spacing	1	-	
	46790	Nozzle Kit - #0004, 30' Rigid - 30" Spacing	-	1	
	9007403	Nozzle Tip - #0002 Stainless Steel, 1/4-18NPT	2	2	
	TA852145	Nozzle Tip - #0004 Stainless Steel, 1/4-18NPT	7	11	
	46783	Nozzle Kit - #0006, 30' Rigid - 36"/38" Spacing	1	-	
	46791	Nozzle Kit - #0006, 30' Rigid - 30" Spacing	-	1	
	93959	Nozzle Tip - #0003 Stainless Steel, 1/4-18NPT	2	2	
	9007404	Nozzle Tip - #0006 Stainless Steel, 1/4-18NPT	7	11	
	46784	Nozzle Kit - #0008, 30' Rigid - 36"/38" Spacing	1	-	
	46792	Nozzle Kit - #0008, 30' Rigid - 30" Spacing	-	1	
	TA852145	Nozzle Tip - #0004 Stainless Steel, 1/4-18NPT	2	2	
	9007405	Nozzle Tip - #0008 Stainless Steel, 1/4-18NPT	7	11	
	46785	Nozzle Kit - #0010, 30' Rigid - 36"/38" Spacing	1	-	
	46793	Nozzle Kit - #0010, 30' Rigid - 30" Spacing	-	1	
	93960	Nozzle Tip - #0005 Stainless Steel, 1/4-18NPT	2	2	
	93961	Nozzle Tip - #0010 Stainless Steel, 1/4-18NPT	7	11	
	46786	Nozzle Kit - #0015, 30' Rigid - 36"/38" Spacing	1	-	
	46794	Nozzle Kit - #0015, 30' Rigid - 30" Spacing	-	1	
	9007405	Nozzle Tip - #0008 Stainless Steel, 1/4-18NPT	2	2	
	93962	Nozzle Tip - #0015 Stainless Steel, 1/4-18NPT	7	11	
	46787	Nozzle Kit - #0020, 30' Rigid - 36"/38" Spacing	1	-	
	46795	Nozzle Kit - #0020, 30' Rigid - 30" Spacing	-	1	
	93961	Nozzle Tip - #0010 Stainless Steel, 1/4-18NPT	2	2	
	93963	Nozzle Tip - #0020 Stainless Steel, 1/4-18NPT	7	11	
	46788	Nozzle Kit - #0030, 30' Rigid - 36"/38" Spacing	1	-	
	46796	Nozzle Kit - #0030, 30' Rigid - 30" Spacing	-	1	
	93962	Nozzle Tip - #0015 Stainless Steel, 1/4-18NPT	2	2	
	93964	Nozzle Tip - #0030 Stainless Steel, 1/4-18NPT	7	11	
	46789	Nozzle Kit - #0040, 30' Rigid - 36"/38" Spacing	1	-	
	46797	Nozzle Kit - #0040, 30' Rigid - 30" Spacing	-	1	
	93963	Nozzle Tip - #0020 Stainless Steel, 1/4-18NPT	2	2	
	93965	Nozzle Tip - #0040 Stainless Steel, 1/4-18NPT	7	11	

Injector Knife Components

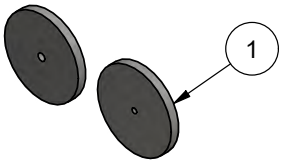
Please visit www.unverferth.com/parts/ for the most current parts listing.



ITEM	PART NUMBER	DESCRIPTION	QTY.	NOTES
1	67923	Injector Knife/Fertilizer Shank w/ 3/8" Dia. Tube	1	
2	67928	Shim 14 Ga.	2	
3	67929	Shim 10 Ga.	3	
4	68704B	Adjustment Plate LH Weldment =Black=	1	
5	9007642	Locking Flange Nut, 1/2"-13UNC (Black)	2	
6	900902-044	Flat Washer, 1/2" USS	1	Stainless Steel
7	9501438-105	Capscrew, 1/2"-13UNC x 2 1/2" G5 (Black)	2	
8	9501438-124	Capscrew, 5/8"-11UNC x 2" G5 (Black)	2	
9	9501438-149	Capscrew, 3/4"-10UNC x 3" G5 (Black)	1	
10	9501440-029	Lock Washer, 5/8" (Black)	2	
11	9501444-037	Hex Jam Nut, 3/4"-10UNC (Black)	1	
12	9007544	Injector Knife/Fertilizer Shank w/ Two 3/8" Dia. Tube	1	

Knife Orifice Kits

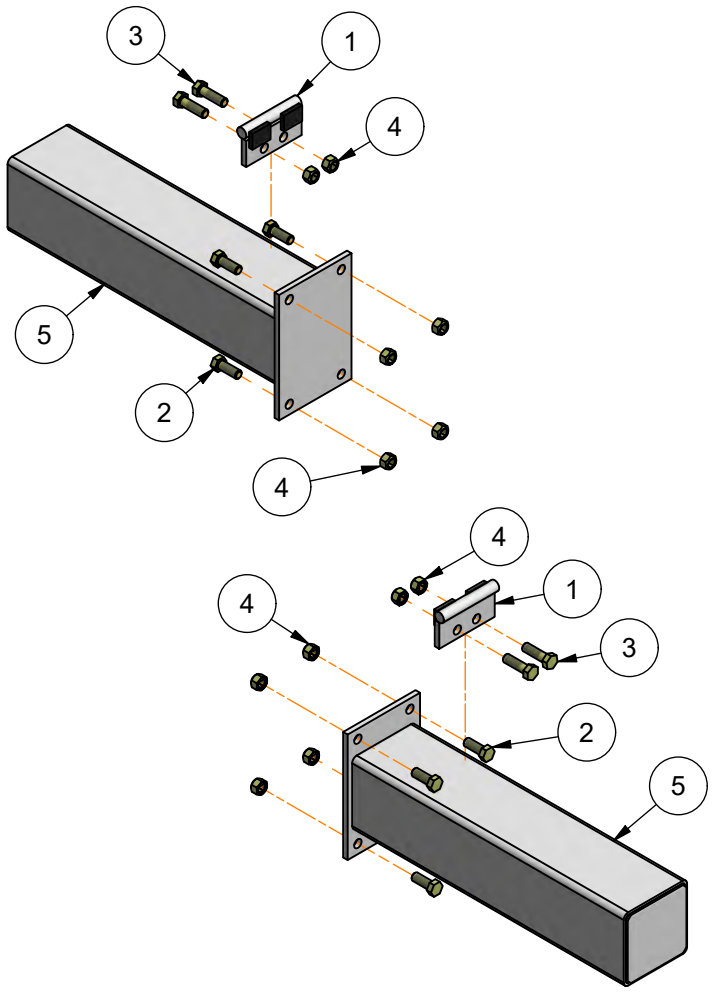
Please visit www.unverferth.com/parts/ for the most current parts listing.



ITEM	PART NUMBER	DESCRIPTION	QTY BY SPACING		NOTES
			9 ROW 36"/38" SPACING	11 & 13 ROW 30" SPACING	
1	46798	Orifice Kit - #57, 30' Rigid - 36/38" Spacing	1	-	
	46806	Orifice Kit - #57, 30' Rigid - 30" Spacing	-	1	
	TA862017	Orifice Plate - 0.040 ID	2	2	
	TA862029	Orifice Plate - 0.057 ID	7	11	
	46799	Orifice Kit - #70, 30' Rigid - 36/38" Spacing	1	-	
	46807	Orifice Kit - #70, 30' Rigid - 30" Spacing	-	1	
	TA862024	Orifice Plate - 0.049 ID	2	2	
	TA862036	Orifice Plate - 0.070 ID	7	11	
	46800	Orifice Kit - #80, 30' Rigid - 36/38" Spacing	1	-	
	46808	Orifice Kit - #80, 30' Rigid - 30" Spacing	-	1	
	TA862029	Orifice Plate - 0.057 ID	2	2	
	TA862041	Orifice Plate - 0.080 ID	7	11	
	46801	Orifice Kit - #89, 30' Rigid - 36/38" Spacing	1	-	
	46809	Orifice Kit - #89, 30' Rigid - 30" Spacing	-	1	
	TA862032	Orifice Plate - 0.063 ID	2	2	
	TA862045	Orifice Plate - 0.089 ID	7	11	
	46802	Orifice Kit - #107, 30' Rigid - 36/38" Spacing	1	-	
	46810	Orifice Kit - #107, 30' Rigid - 30" Spacing	-	1	
	TA862041	Orifice Plate - 0.080 ID	2	2	
	TA862051	Orifice Plate - 0.107 ID	7	11	
	46803	Orifice Kit - #125, 30' Rigid Toolbar - 36/38" Spacing	1	-	
	46811	Orifice Kit - #125, 30' Rigid - 30" Spacing	-	1	
	TA862045	Orifice Plate - 0.089 ID	2	2	
	TA862055	Orifice Plate - 0.125 ID	7	11	
	46804	Orifice Kit - #151, 30' Rigid Toolbar - 36/38" Spacing	1	-	
	46812	Orifice Kit - #151, 30' Rigid - 30" Spacing	-	1	
	TA862051	Orifice Plate - 0.107 ID	2	2	
	TA862062	Orifice Plate - 0.151 ID	7	11	
	46805	Orifice Kit - #177, 30' Rigid Toolbar - 36/38" Spacing	1	-	
	46813	Orifice Kit - #177, 30' Rigid - 30" Spacing	-	1	
	TA862055	Orifice Plate - 0.125 ID	2	2	
	TA862068	Orifice Plate - 0.177 ID	7	11	

Wing Extension Components

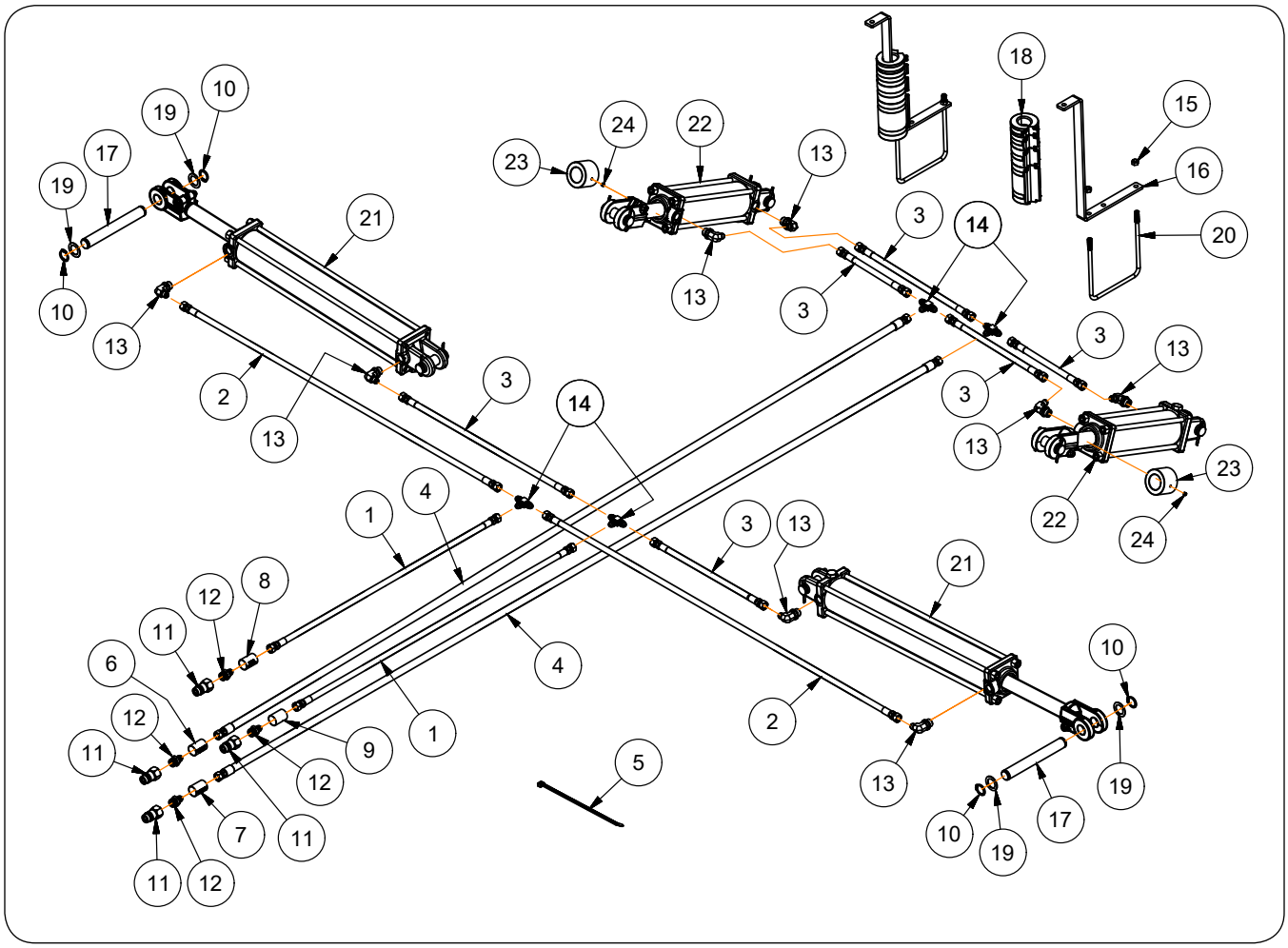
Please visit www.unverferth.com/parts/ for the most current parts listing.



ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
	JAAM2732G	Wing Extension Kit 30" =Green=	1	Includes Items 1-5
	JAAM2732R	Wing Extension Kit 30" =Red=		
1	JAM3562	Wing Stop Extension Weldment =Black=	2	
2	9390-145	Capscrew, 3/4"-10UNC x 2" G5	8	
3	9390-147	Capscrew, 3/4"-10UNC x 2 1/2" G5	4	
4	9802	Lock Nut/Top, 3/4"-10UNC	12	
5	JAM3533G	Wing Extension Weldment 30" =Green=	2	
	JAM3533R	Wing Extension Weldment 30" =Red=		

Transport & Wing Hydraulic Components

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



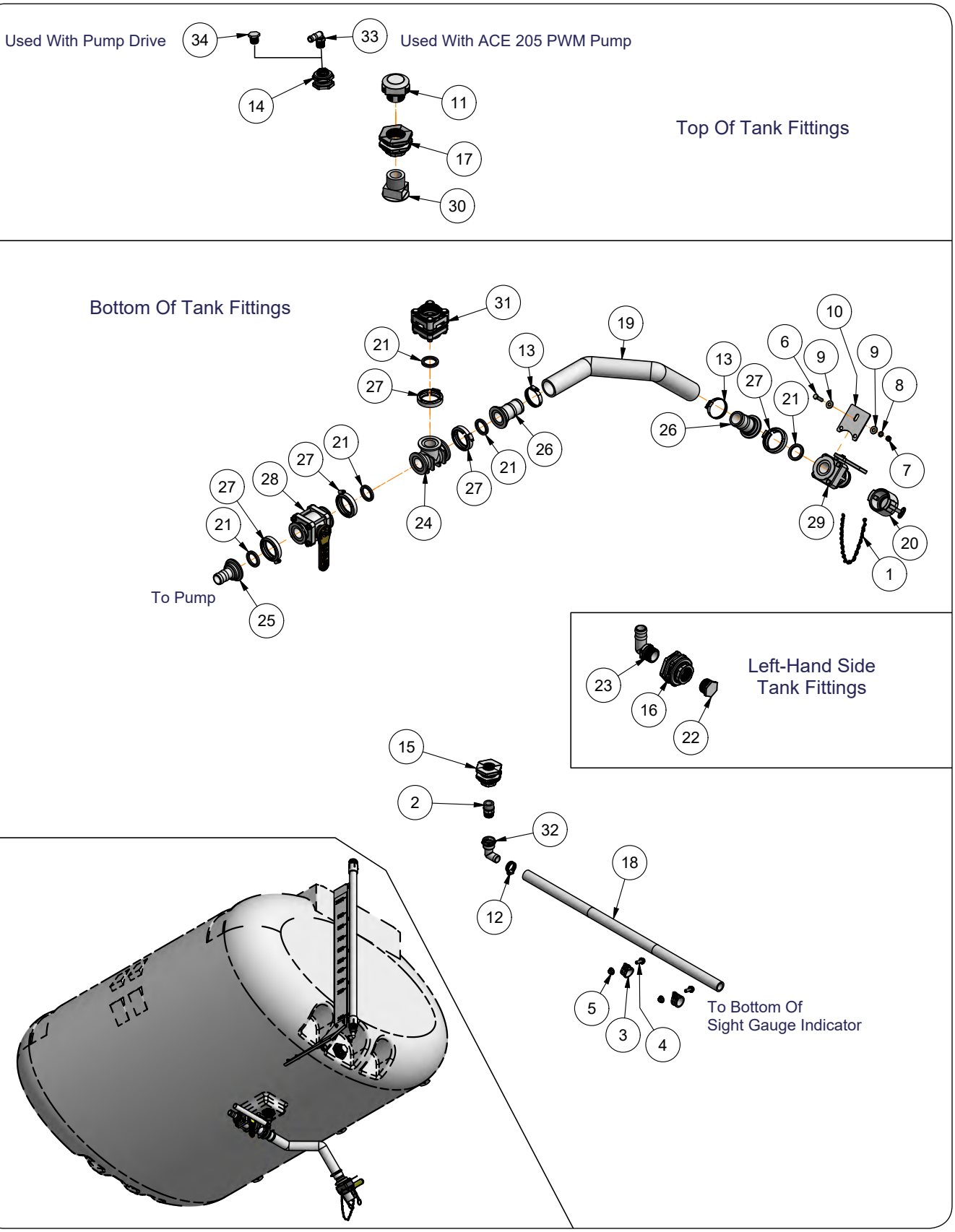
Transport & Wing Hydraulic Components

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

ITEM	PART NUMBER	DESCRIPTION	QTY
1	9003432	Hydraulic Hose, 1/4" x 185 1/2" (9/16-18 JIC Female x 9/16-18 JIC Female)	2
2	JDP5263	Hydraulic Hose, 1/4" x 54" (9/16-18 JIC Female x 9/16-18 JIC Female)	2
3	JDP5111	Hydraulic Hose, 1/4" x 30" (9/16-18 JIC Female x 9/16-18 JIC Female)	6
4	9501692	Hydraulic Hose, 3/8" x 239 1/2" (9/16-18 JIC Female x 9/16-18 JIC Female)	2
5	9003735	Cable Tie 11 3/8" Standard	15
6	9007463	Hose Marker, Main Lift Down =Red=	1
7	9007464	Hose Marker, Main Lift Up =Red=	1
8	9007467	Hose Marker, Wing Fold In =Gray=	1
9	9007468	Hose Marker, Wing Fold Out =Gray=	1
10	91192	Retaining Ring, 1"	4
11	91383	Male Tip Coupling, 3/4-16 O-Ring Female	4
12	92927	Adapter, 9/16-18 JIC Male x 3/4-16 O-Ring Male	4
13	9874	90° Elbow, 9/16-18 JIC Male x 3/4-16 O-Ring Male	8
14	9875	Tee, 9/16-18 JIC Male x 9/16-18 JIC Male x 9/16-18 JIC Male	4
15	9928	Lock Nut/Top, 3/8"-16UNC	10
16	JAM2090	Bracket, Depth Collar & Lockup Storage	2
17	JBM3725	Pin, 1" Dia. x 7.97"	2
18	JBP3076	Depth Collar Set, 1 1/4" to 1 1/2", Winged	2
19	JBP3215	Machinery Bushing, 1 1/2" OD x 1" ID, 14 GA.	4
20	JBP3351	U-Bolt, 3/8"-16UNC x 7, 6 7/16 CC	2
21	JDP4492	Cylinder, Hydraulic, 3 x 20, Side Ported, B300200ABAAA03B	2
22	JDP4656	Cylinder, Hydraulic, 3 x 8, 3000 PSI, Side Port, A300080BBAAA07A	2
23	JEM7236	Hydraulic Cylinder Spacer With Set Screw	2
24	9399-057	Set Screw, 1/4"-20UNC x 1/4"	1

Tank Plumbing Components

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



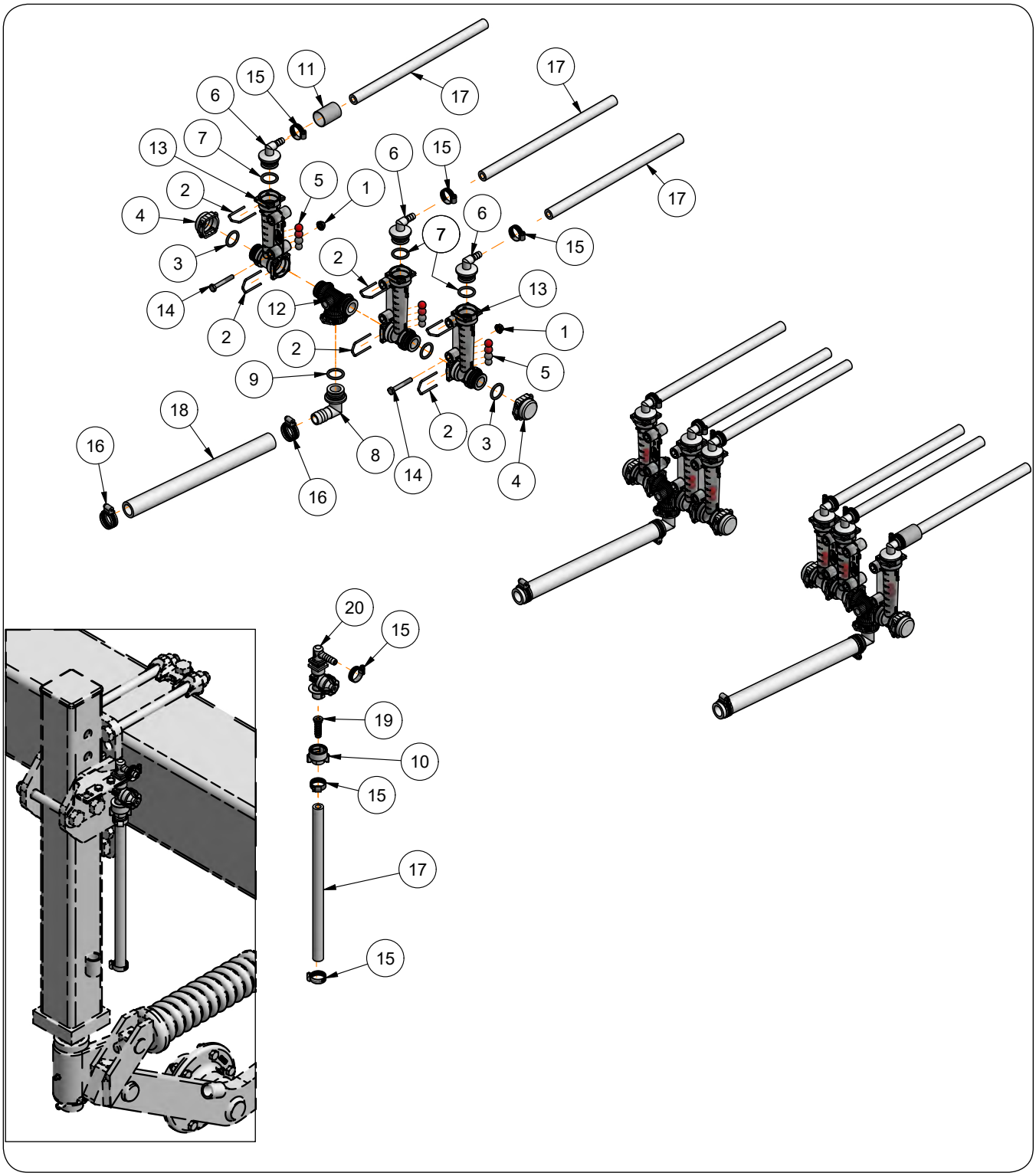
Tank Plumbing Components

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

ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1	45655	End Fill Chain, 18”	1	
2	9006477	Adapter, 1” Male Pipe t Quick Connect	1	
3	9008246	Clamp, 1 1/4” Dia. with EPDM Cushion	2	
4	91262	Flange Screw, 3/8”-16UNC x 1” G5	3	
5	91263	Large Flange Nut, 3/8”-16UNC	15	
6	9390-057	Capscrew, 3/8”-16UNC x 1 1/2”, G5	1	
7	9394-006	Hex Nut, 3/8”-16UNC	1	
8	9404-021	Lock Washer, 3/8”	1	
9	9405-076	Flat Washer, 3/8” USS	2	
10	JAM4827	Bracket, Fill Valve Support Plate	1	
11	JCP2042	Hooded Vent, 2” MPT Poly W/Screen	1	
12	TA800912	Hose Clamp, Worm Gear, 1/2” - 1” Tubing, SS	2	
13	TA800922	Hose Clamp, Worm Gear, 2” - 2-1/2” Tubing, SS	2	
14	TA805408	Manifold Fitting, 3/4” Double Threaded	2	
15	TA805412	Tank Fitting, 1” Double Threaded	1	
16	TA805422	Tank Fitting, 1 1/2” Double Threaded	1	
17	TA805428	Tank Fitting EPDM Gasket	1	
18	TA806275	Hose 1” Dia. EPDM (200PSI)	4	
19	TA806332	2” Fertilizer Solution Hose	1	
20	TA811500	Cap, 2” 200 Cap	1	
21	TA811944	Gasket, EPDM, 2 Flange, 3/4 Bulkhead, 150G	5	
22	TA814754	Plug, Poly 1 1/2 NPT Male	1	
23	TA814975	Elbow, 90*, 1 1/2”MP x 1 1/2”HB, Poly	1	
24	TA815007	Tee, 2 Flange	1	
25	TA815015	Hose Barb, 2 Flange x 1 1/2 Hose	1	
26	TA815016	Hose Barb, 2” Flange x 2” Hose	2	
27	TA815025	Clamp, 2” Worm Screw, Flange	5	
28	TA815045	Valve, Ball, 2” - 1 1/2” Ports	1	
29	TA815047	Valve, Ball, 2” - 1 1/2” Port - 2” Male Adapter	1	
30	TA815074	Hooded Vent, 2” MPT Poly WO/Screen	1	
31	TA815075	Tank Outlet Fitting, 2” FlangeD	1	
32	TA854886	90° Hosebarb 1” Quick Connect Kit	1	
33	TA814961	90° Elbow/Hosebarb, 3/4” Dia x 3/4-14 NPTF Male	1	For ACE 205 PWM Pump
34	TA814751	Plug, 3/4-14 NPTF Male	1	For Pump Drive

Flow Ball Hose Kit For 9 Row 36”/38” Spacing Components

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



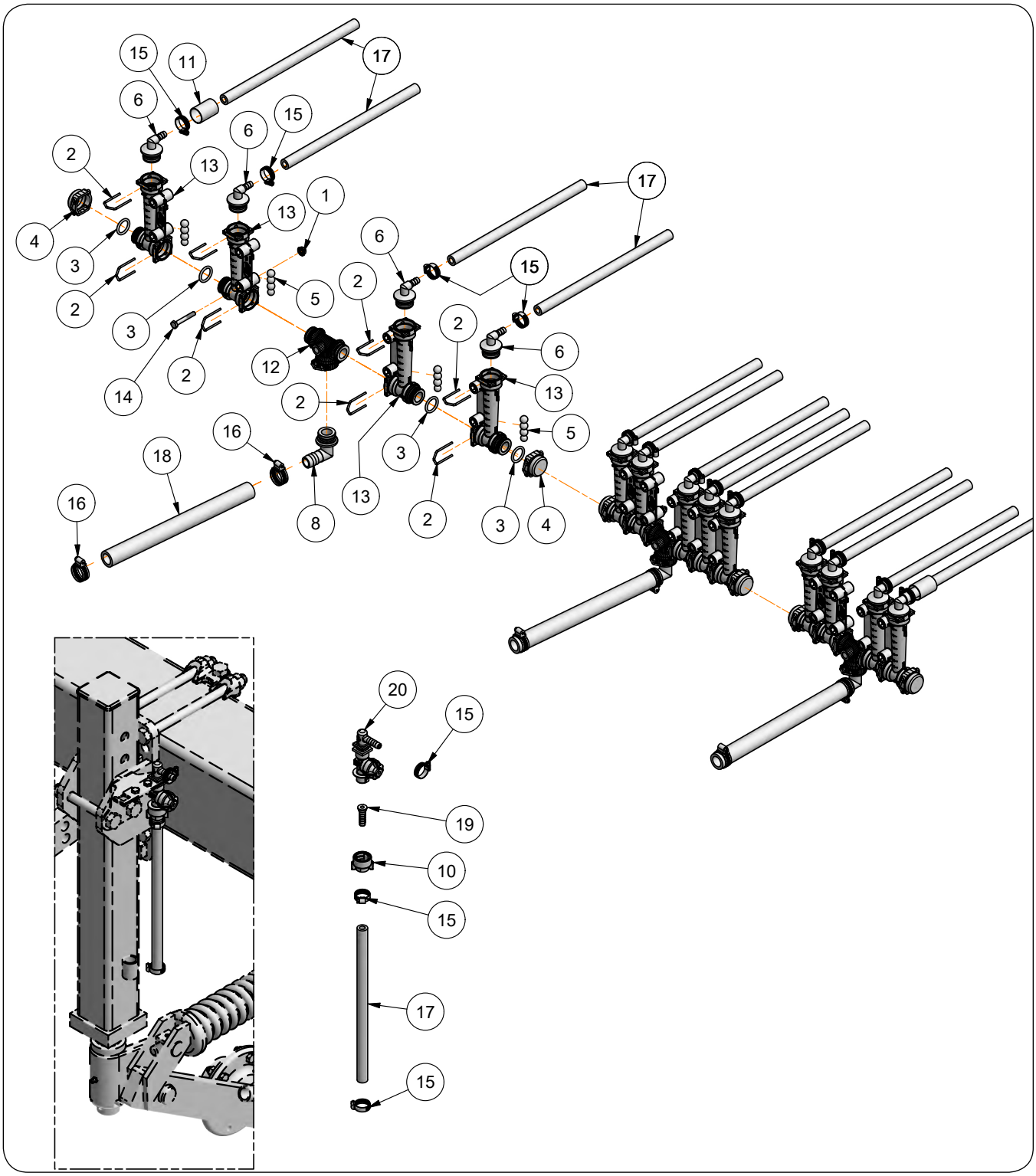
Flow Ball Hose Kit For 9 Row 36”/38” Spacing Components

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

ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1	9004720	Flange Nut 1/4”-20UNC (Stainless Steel)	6	
2	9007705	Locking Clip	18	
3	9007706	O-Ring, 0.859” Dia.	9	
4	9007707	Cap with Locking Clip	6	
	9007705	Locking Clip	1	
5	9007779	Flow Ball (1/2” Stainless Steel)	9	
	9007780	Flow Ball (Glass - Maroon)	9	
	9007781	Flow Ball (Celron - Red)	9	
	9007883	Flow Ball (7/16” Stainless Steel)	9	
6	9007710	90° Elbow Indicator Fitting 3/8” With O-Ring	9	
7	9007706	O-Ring, 0.859” Dia.	1	
8	9007713	90° Elbow Indicator Fitting 3/4” With O-Ring	3	Includes Item 9
9	9007706	O-Ring, 0.859” Dia.	1	
10	9007736	Quick Nozzle Cap Assembly With Gasket	9	
	9007735	Nozzle End Cap Gasket	1	
11	9007772	Hose Marker Sleeve (Grey)	4	
12	9007778	Tee Indicator Fitting with O-Ring & Locking Clip	3	
	9007706	O-Ring, 0.859” Dia.	2	
	9007705	Locking Clip	1	
13	9008659	Body Flow Indicator	9	
14	900900-008	Capscrew, 1/4”-20UNC x 1 3/4” (Stainless Steel)	6	
15	TA800902	Hose Clamp 7/8”	36	
16	TA800910	Hose Clamp 1/2”	6	
17	TA806200	Hose EPDM 3/8” Dia.	227 Ft.	
18	TA806250	Hose EPDM 3/4” Dia.	7 Ft.	
19	TA865665	Hose Shank	9	
20	TA880149	Single Nozzle Body 3/8” Elbow	9	

Flow Ball Hose Kit For 11/13 Row 30” Spacing Components

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



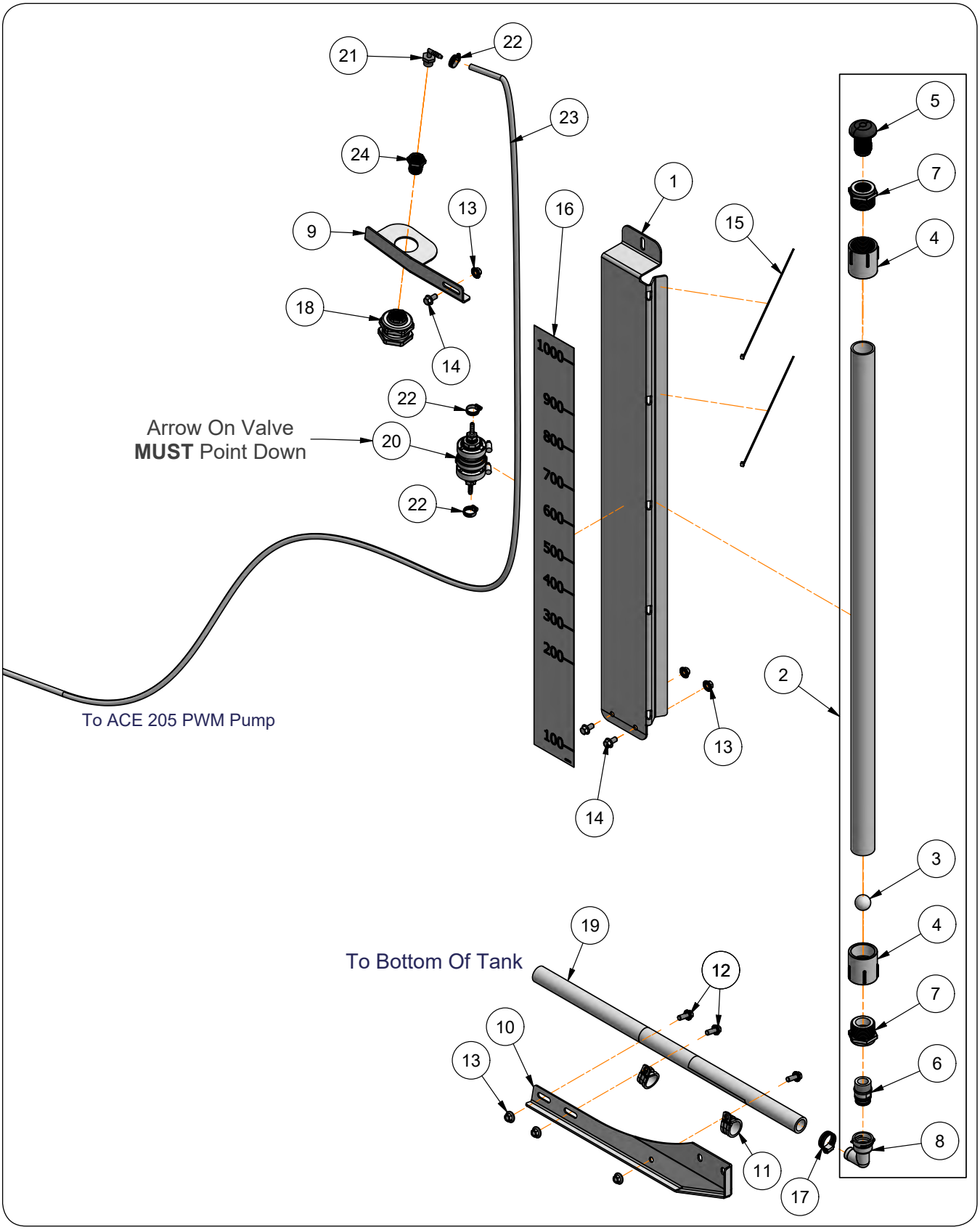
Flow Ball Hose Kit For 11/13 Row 30” Spacing Components

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

ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1	9004720	Flange Nut 1/4”-20UNC (Stainless Steel)	6	
2	9007705	Locking Clip	26	
3	9007706	O-Ring, 0.859” Dia.	13	
4	9007707	Cap with Locking Clip	6	
	9007705	Locking Clip	1	
5	9007779	Flow Ball (1/2” Stainless Steel)	13	
	9007780	Flow Ball (Glass - Maroon)	13	
	9007781	Flow Ball (Celron - Red)	13	
	9007883	Flow Ball (7/16” Stainless Steel)	13	
6	9007710	90° Elbow Indicator Fitting 3/8” With O-Ring	13	Includes Item 7
7	9007706	O-Ring, 0.859” Dia.	1	
8	9007713	90° Elbow Indicator Fitting 3/4” With O-Ring	3	Includes Item 9
9	9007706	O-Ring, 0.859” Dia.	1	
10	9007736	Quick Nozzle Cap Assembly With Gasket	13	
	9007735	Nozzle End Cap Gasket	1	
11	9007772	Hose Marker Sleeve (Grey)	4	
12	9007778	Tee Indicator Fitting with O-Ring & Locking Clip	3	
	9007706	O-Ring, 0.859” Dia.	2	
	9007705	Locking Clip	1	
13	9008659	Body Flow Indicator	13	
14	900900-008	Capscrew, 1/4”-20UNC x 1 3/4” (Stainless Steel)	6	
15	TA800902	Hose Clamp 7/8”	52	
16	TA800910	Hose Clamp 1/2”	6	
17	TA806200	Hose EPDM 3/8” Dia.	367 Ft.	
18	TA806250	Hose EPDM 3/4” Dia.	7 Ft.	
19	TA865665	Hose Shank	13	
20	TA880149	Single Nozzle Body 3/8” Elbow	13	

Sight/Volume Gauge & Plumbing Components

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



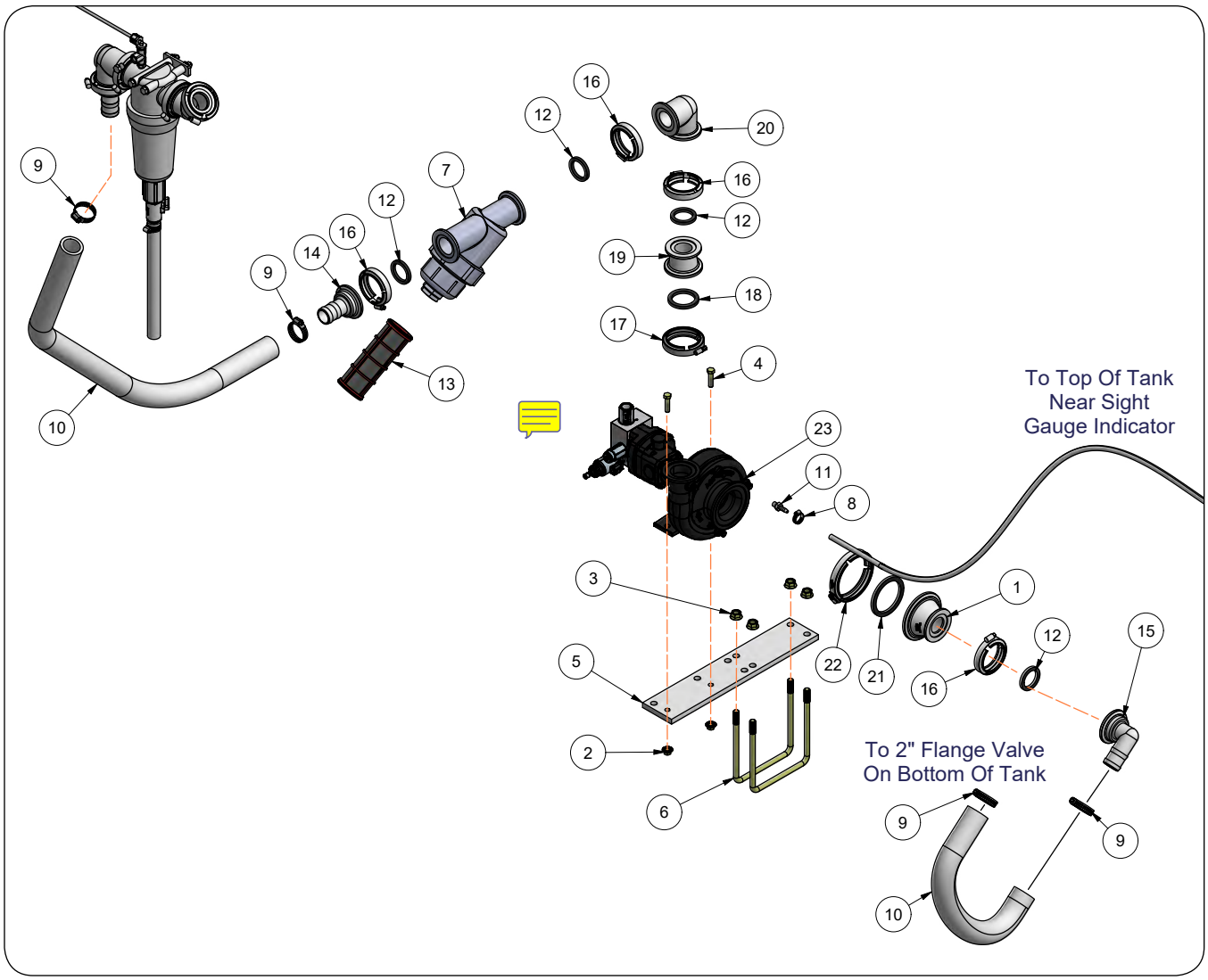
Sight/Volume Gauge & Plumbing Components

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

ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1	45929B	Sight Tube Mount Bracket =Black=	1	
2	45934	Sight Gauge Tube Assembly	1	Includes Items 3-8
3	9003683	Indicator Ball 1 1/4" Dia. (RED)	1	
4	9004547	Adapter, 1 1/2 SCH40 Female x 1 1/2 NPT Female	2	
5	9005558	Breather, Tank Vent	1	
6	9006477	Adapter, 1" Male Pipe to Quick Connect	1	
7	TA814661	Reducer Bushing, 1 1/2"-11 1/2 NPTF Male x 1"-11 1/2 NPTF Female	2	
8	TA854886	90° Elbow, 1" Hosebarb x Quick Connect	1	Includes O-Ring & Retainer Clip
9	46452B	Upper Sight Tube Support Weldment =Black=	1	
10	46699B	Lower Sight Tube Mount Weldment =Black=	1	
11	9008246	Plated Steel Clamp, 1 1/4" Dia. w/EPDM Cushion	2	
12	91262	Flange Screw, 3/8"-16UNC x 1" G5	3	
13	91263	Large Flange Nut, 3/8"-16UNC	15	
14	93649	Flange Screw, 3/8"-16UNC x 3/4" G5	3	
15	94037	Cable Tie, 15 1/2"	7	
16	9504044	Decal, 1000 Gallon Volume	2	
17	TA800912	Hose Clamp, 13/16" to 1 1/2" (Stainless Steel)	2	
18	TA805408	Manifold Fitting, 3/4" Double Threaded	2	
19	TA806275	Hose, 1" Dia. EPDM (200 PSI)	4	
20	46003	Air Vent Assembly	1	
21	JCP2085	90° Elbow, 1/4" Dia. Hosebarb x 1/2"-14 NPT	1	
22	TA800902	Hose Clamp, 7/8", M-6 (Stainless STeel)	4	
23	TA806420	EVA Tubing, 1/4" Dia.	AR	Specify Length By Feet
24	TA814653	Reducer Bushing, 3/4-14 NPTF Male x 1/2-14 NPTF Female	1	

ACE 205 PWM Pump Plumbing Components

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



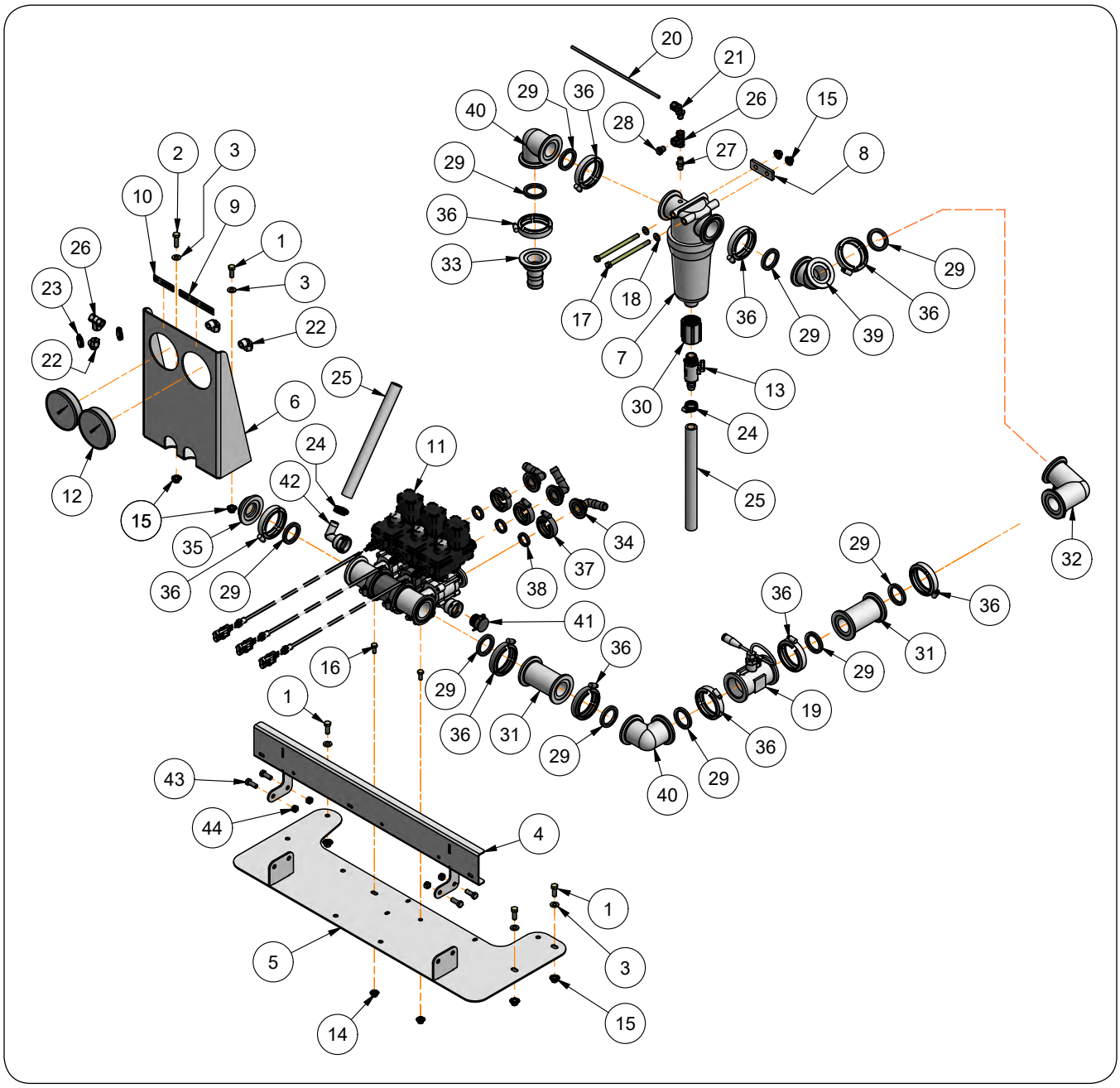
ACE 205 PWM Pump Plumbing Components

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

ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1	9007201	Reducer Coupler, 3" Flange x 2" Flange	1	
2	91263	Large Flange Nut, 3/8"-16UNC	4	
3	91267	Flange Nut, 1/2"-13UNC	4	
4	9390-057	Capscrew, 3/8"-16UNC x 1 1/2" G5	2	
5	JAM3672	Centrifugal Pump Mounting Plate	1	
6	JBP3357	U-Bolt, 1/2"-13UNC x 7 1/4", 6 9/16" C/C G5	2	
7	JCP2050	Line Strainer "Y" (Less Screen)	1	
8	TA800902	Hose Clamp 7/8", M-6 (Stainless Steel)	6	
9	TA800918	Hose Clamp 1 1/4" to 2 1/2" (Stainless Steel)	4	
10	TA806325	Hose, 1 1/2" EPDM, 200 PSI	2	
11	TA810040	Hose Barb, 1/8" MPT x 1/4" Hose Shank	1	
12	TA811944	Gasket, 2 3/16" OD x 1 5/8" ID x .25"	14	
13	TA811983	30 Mesh Screen	1	
14	TA815015	Hose Barb, 2" Flange x 1 1/2" Hose Shank	2	
15	TA815020	90° Elbow, 2" Flange x 1 1/2" Hose Barb	1	
16	TA815025	2" Worm Screw Flange Clamp	14	
17	TA816000	Clamp 2" Full Port Flange	1	
18	TA816001	Gasket 2" Full Port Flange	1	
19	TA816007	Reducer Coupling, 2" Full Flange x 2" Std Flange	1	
20	TA816017	90° Elbow, 2" Flange x 2" Flange	3	
21	TA816038	Gasket, 3"	1	
22	TA816039	Clamp Worm Screw, 3" Flange	1	
23	9007100	ACE 205 Pump & PWM Motor Assembly	1	

Flo-Bak Ball Valve, Pressure Gauges & Strainer Plumbing

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



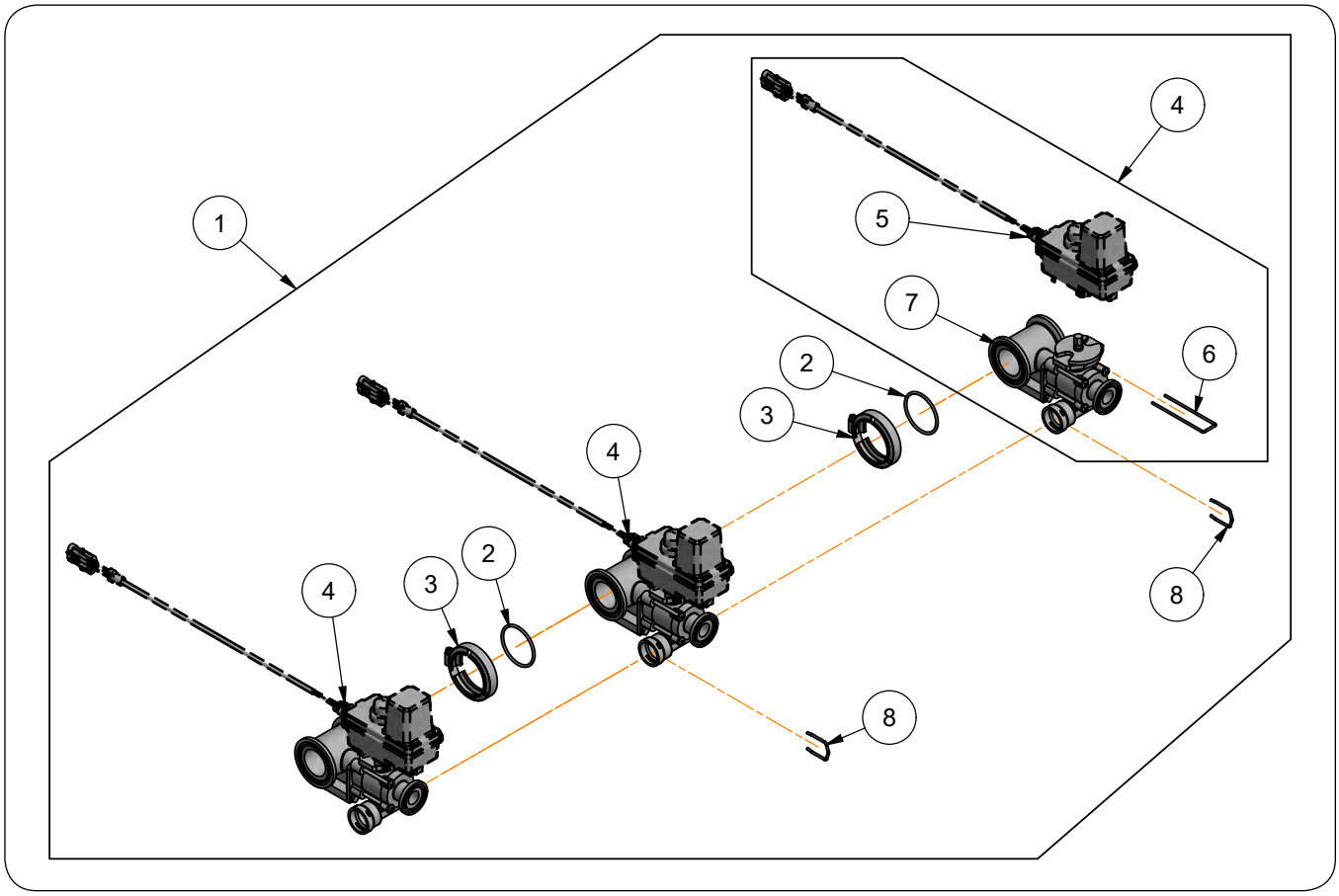
Flo-Bak Ball Valve, Pressure Gauges & Strainer Plumbing

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

ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1	9390-055	Capscrew, 3/8"-16UNC x 1" G5	4	
2	9390-056	Capscrew, 3/8"-16UNC x 1 1/4" G5	1	
3	9405-074	Flat Washer, 3/8" SAE	5	
4	45743SM	Flow Monitor Panel Weldment - 3 Section, =Silver Mist=	1	
5	45793B	Mounting Plate Weldment =Black=	1	
6	45809B	Gauge Mount Plate Weldment =Black=	1	
7	402255	Strainer 2" Flanged Line	1	
8	45819B	Spacer Block =Black=	1	
9	9003687	Decal, Filter Inlet Pressure	1	
10	9003841	Decal, Tip Pressure	1	
11	9006627	Flo-Bak Valve Assembly (3 Section)	1	
12	9007569	Gauge, Pressure (0-160 PSI)	2	
13	9007699	Valve, Micro 3/4" MPT x Hosebarb	1	
14	91257	Large Flange Hex Nut, 5/16"-18UNC	2	
15	91263	Large Flange Nut, 3/8"-16UNC	4	
16	9390-028	Capscrew, 5/16"-18UNC x 3/4" G5	2	
17	9390-070	Capscrew, 3/8"-16UNC x 5 1/2" G5	2	
18	9405-074	Flat Washer, 3/8" SAE	2	
19	TA720365	Flow Meter Complete	1	
20	TA720620	Gauge Tubing 1/4" Dia.	AR	
21	TA720802	90° Elbow, 1/4" NPT x 1/4" Gauge Tube	1	
22	TA720812	90° Elbow, 1/4" FPT x 1/4" Tube	3	
23	TA800902	Hose Clamp 7/8", M-6 (Stainless Steel)	6	
24	TA800910	Hose Clamp, 1/2" SAE (Stainless Steel)	3	
25	TA806250	Hose, 3/4" EPDM	6	
26	TA809190	Tee, 1/4" FPT	1	
27	TA809325	Hex Pipe Nipple, 1/4"	1	
28	TA809875	Hex Plug, 1/4-18 NPT	1	
29	TA811944	Gasket, 2 3/16" OD x 1 5/8" ID x .25"	14	
30	TA814710	Reducer Coupling, 1" x 3/4"	1	
31	TA815003	Coupling Poly, 2" Flange x 2" Flange	2	
32	TA815004	90° Elbow, 2" Flange x 2" Flange	1	
33	TA815015	Hose Barb, 2" Flange x 1 1/2" Hose Shank	2	
34	TA815017	90° Elbow, 1" Flange x 3/4" Hose Barb	3	
35	TA815023	Plug, 2" Flange	1	
36	TA815025	2" Worm Screw Flange Clamp	14	
37	TA815026	Flange Clamp 1" Worm Screw	3	
38	TA815029	Gasket/Seal 1 3/8" x 1" x 1/4"	3	
39	TA816004	45° Elbow, 2" Flange x 2" Flange	1	
40	TA816017	90° Elbow, 2" Flange x 2" Flange	3	
41	TA854884	Plug with Quick Connect	1	
42	TA854885	90° Elbow, 3/4" Hose Barb with Quick Connect	1	
43	900900-055	Capscrew, 3/8"-16UNC x 1" (Stainless Steel)	4	
44	900906-006	Lock Nut/Center, 3/8"-16UNC (Stainless Steel)	4	

Flo-Bak Ball Valve Components

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



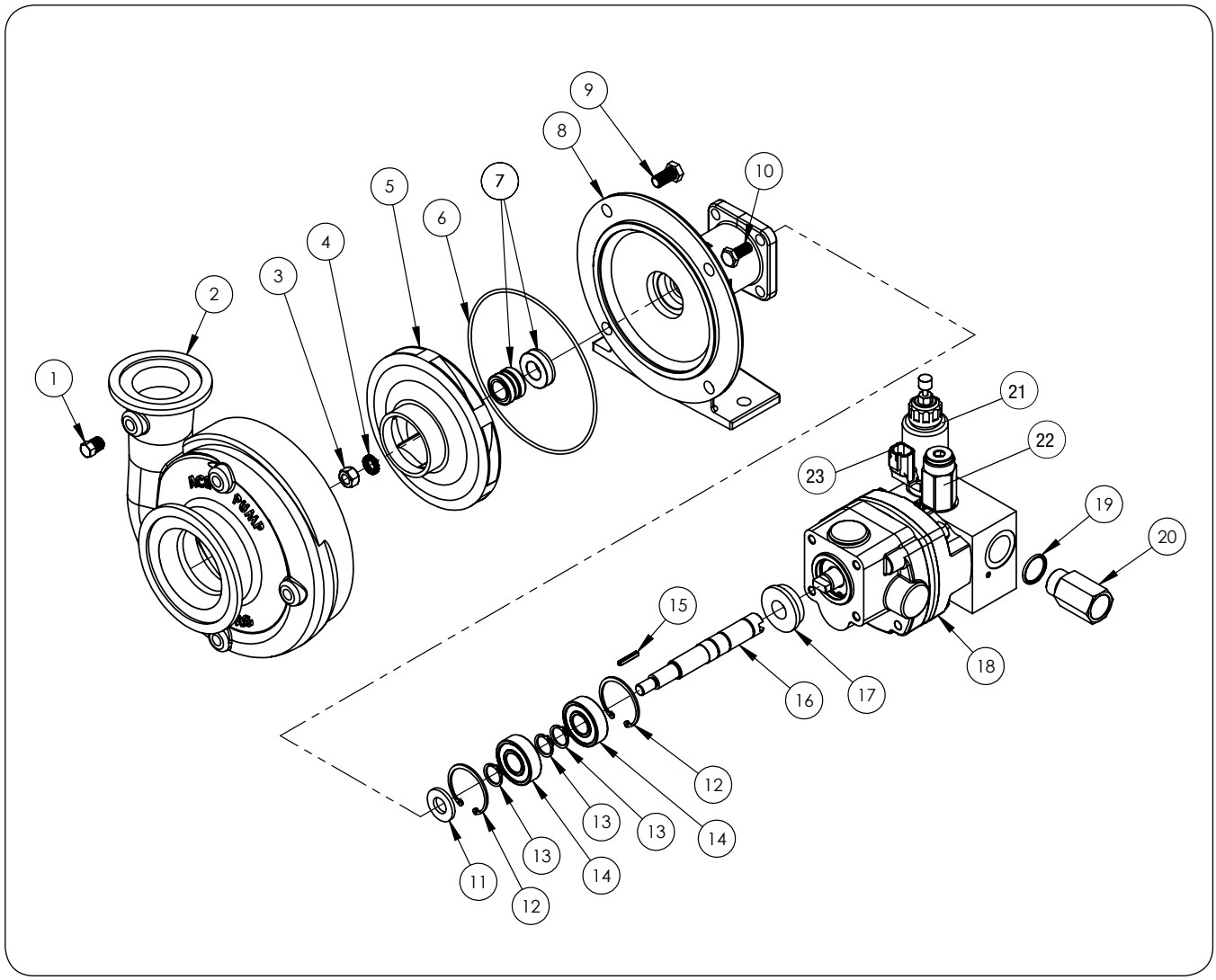
Flo-Bak Ball Valve Components

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

ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1	9006627	Ball Valve Flanged 453 BEC (3-Section)	1	Includes Items 2-8
2	9006626	O-Ring, 2 5/8" Dia.	2	
3	TA815025	Worm Screw Flange Clamp 2"	2	
4	TA854881	Ball Valve, Flanged 450 Single	3	Includes Items 5-7
5	TA854874	Shutoff Ball Valve Motor Head	1	
6	TA854875	Retainer Clip	1	
7	TA854882	Ball Valve Assembly	1	
8	TA854883	Wire Clip Retainer	2	

Hydraulically Driven Centrifugal PWM Pump FMCSC 205F HYD 304

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



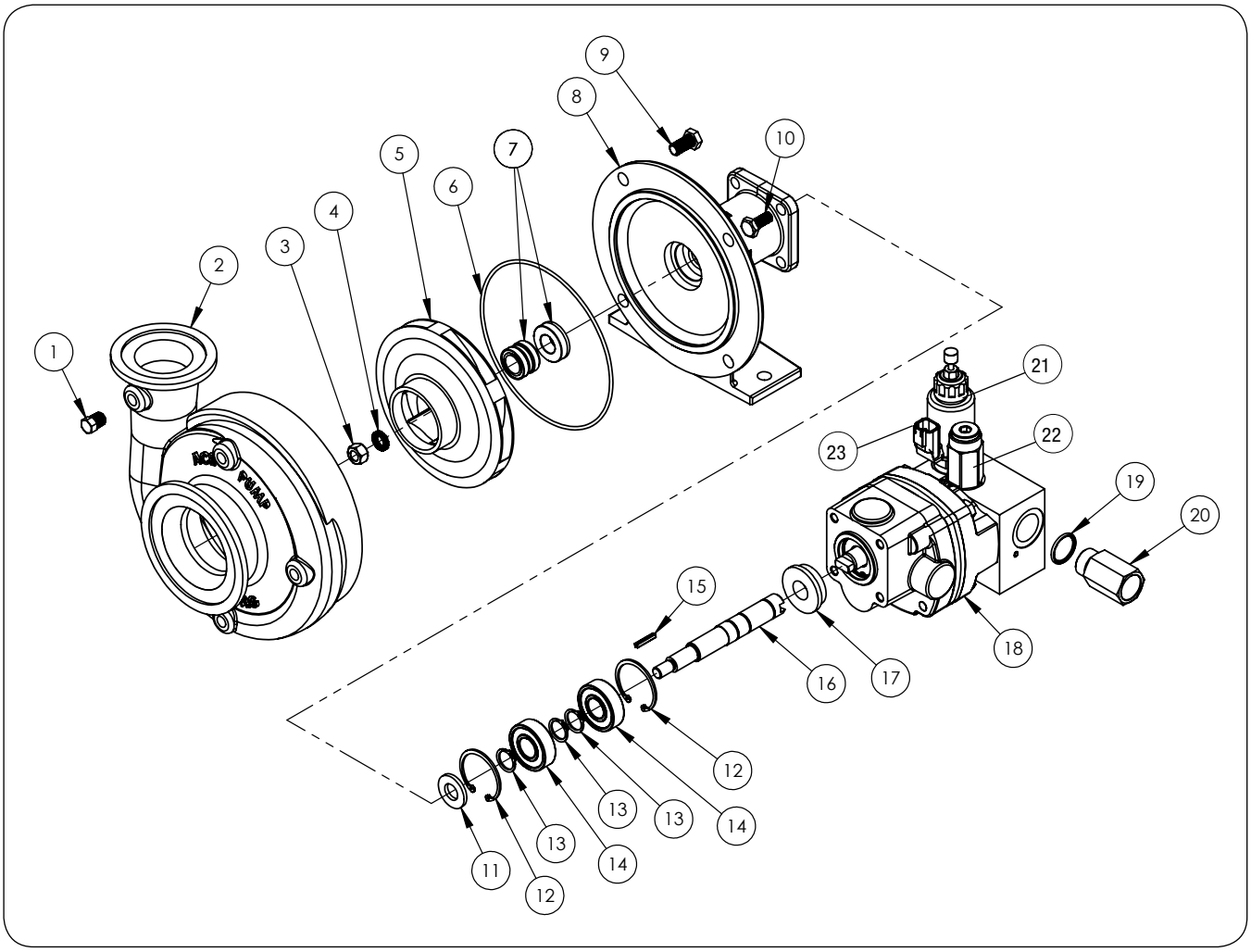
Hydraulically Driven Centrifugal PWM Pump FMCSC 205F HYD 304

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

ITEM	PART NUMBER	DESCRIPTION	QTY.	NOTES
	9007100	Pump Complete, ACE FMCSC-205-HYD-304	1	Includes Items 1 thru 22
1	TA826325	Pipe Plug	4	
2	9007526	Volute, 300 Standard Flange x 220 Full Port Flange, Cast Iron	1	
	9005902	Repair Kit - FMC-205 Pump w/Carbide Shaft Seal	-	Not Shown
3	900901-005	Nut, 3/8" UNF, Stainless Steel	1	
4	9007531	Washer, 3/8", Stainless Steel, Self-Locking	1	
5	TA827920	Impeller, Thermoplastic	1	
	TA830732	Impeller, Cast Iron (Optional)		
6	TA827875	O-Ring	1	
7	9005894	Silicon Carbide Seal	1	
8	9005895	Mounting Frame, 205 Pump	1	
9	9390-053	Capscrew, 3/8-16UNC x 3/4	4	
10	TA829300	Capscrew, 5/16-18UNC x 3/4 (Motor to Pump)	4	
11	TA826275	Slinger	1	
12	9005897	Snap Ring, Internal	2	
13	9005898	Snap Ring, External	3	
14	9005899	Ball Bearing, Sealed	2	
15	TA830736	Key, 1/8 x 1/8 x 13/16” - Extended	1	
16	9005900	Shaft, Extended Keyway, Impeller	1	
17	9005901	Seal Support Spacer	1	
18	9007396	Hydraulic Motor, 304/205 - 11 GPM, PWM	1	
	TA830910	Repair Kit - Hydraulic Motor	-	Not Shown
19	TA831035	O-ring, #10 SAE fitting	1	
20	9007530	Reverse check assembly, #10 SAE x #10 SAE	1	
21	9007887	Cartridge Valve Assembly	1	
22	9007889	Pressure Reducing Valve Assembly	1	
23	9009262	PWM Pump Coil	1	

Hydraulically Driven Centrifugal PWM Pump ACE 205 PWM (SS)

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



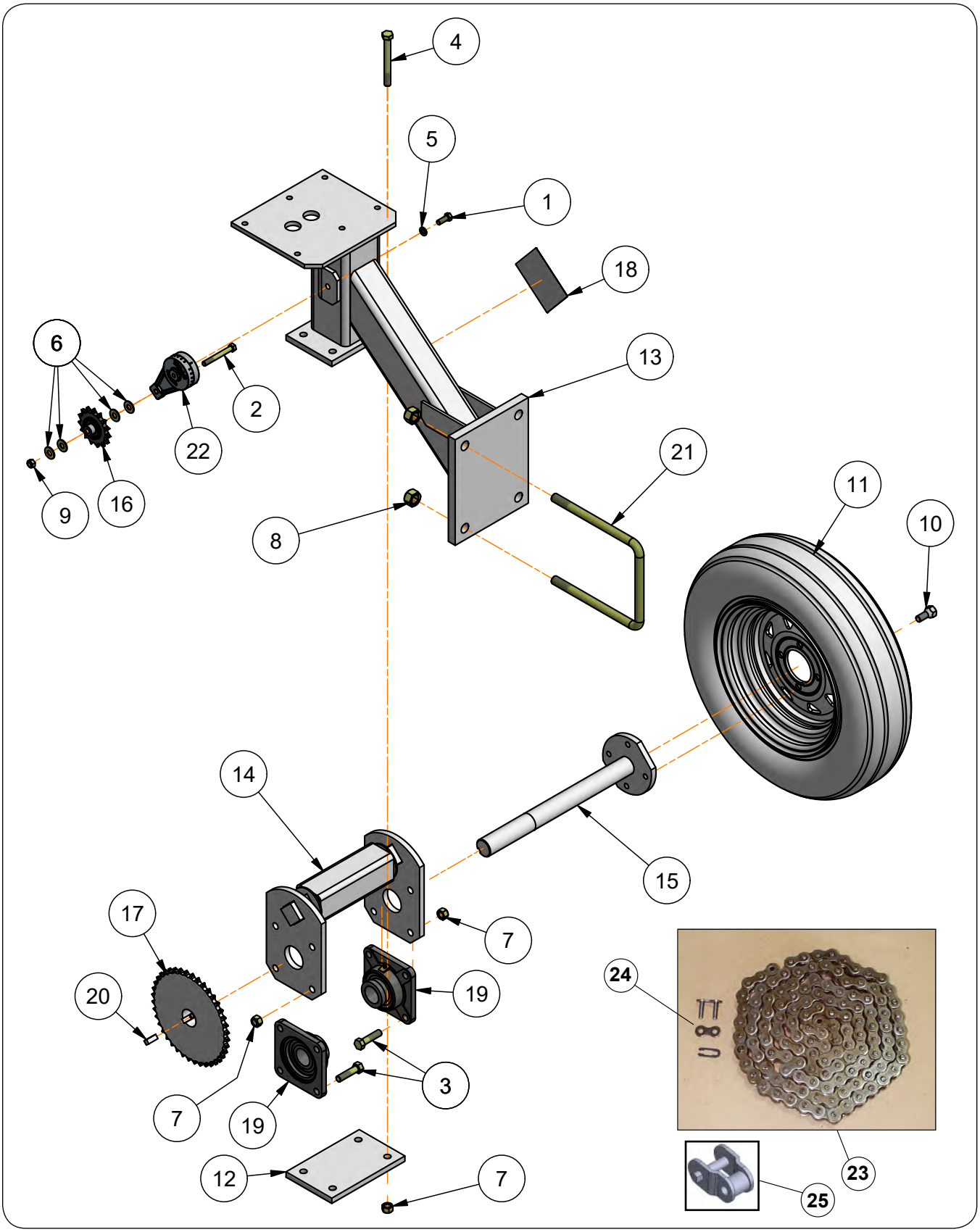
Hydraulically Driven Centrifugal PWM Pump ACE 205 PWM (SS)

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

ITEM	PART NUMBER	DESCRIPTION	QTY.	NOTES
	9007431	Pump Complete, ACE FMCSC-205-HYD-304	1	Includes Items 1 thru 22
1	TA826325	Pipe Plug, Stainless Steel	4	
2	9007527	Volute, 300 Standard Flange x 220 Full Port Flange, Stainless Steel	1	
	9005902	Repair Kit - FMC-205 Pump w/Carbide Shaft Seal	-	Not Shown
3	900901-005	Nut, 3/8" UNF, Stainless Steel	1	
4	9007531	Washer, 3/8", Stainless Steel, Self-Locking	1	
5	TA827920	Impeller, Thermoplastic	1	
	9007528	Impeller, Stainless Steel (Optional)		
6	TA827875	O-Ring	1	
7	9005894	Silicon Carbide Seal	1	
8	9007529	Mounting Frame, 205 Pump, Stainless Steel	1	
9	900900-053	Capscrew, 3/8-16UNC x 3/4	4	
10	TA829300	Capscrew, 5/16-18UNC x 3/4 (Motor to Pump)	4	
11	TA826275	Slinger	1	
12	9005897	Snap Ring, Internal	2	
13	9005898	Snap Ring, External	3	
14	9005899	Ball Bearing, Sealed	2	
15	TA830736	Key, 1/8 x 1/8 x 13/16” - Extended	1	
16	9005900	Shaft, Extended Keyway, Impeller	1	
17	9005901	Seal Support Spacer	1	
18	9007396	Hydraulic Motor, 304/205 - 11 GPM, PWM	1	
	TA830910	Repair Kit - Hydraulic Motor	-	Not Shown
19	TA831035	O-ring, #10 SAE fitting	1	
20	9007530	Reverse check assembly, #10 SAE x #10 SAE	1	
21	9007887	Cartridge Valve Assembly, 12-Volt Proportional	1	
22	9007889	Pressure Reducing Valve Assembly	1	
23	9009262	PWM Pump Coil, ACE 205	1	

Pump Drive Components

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



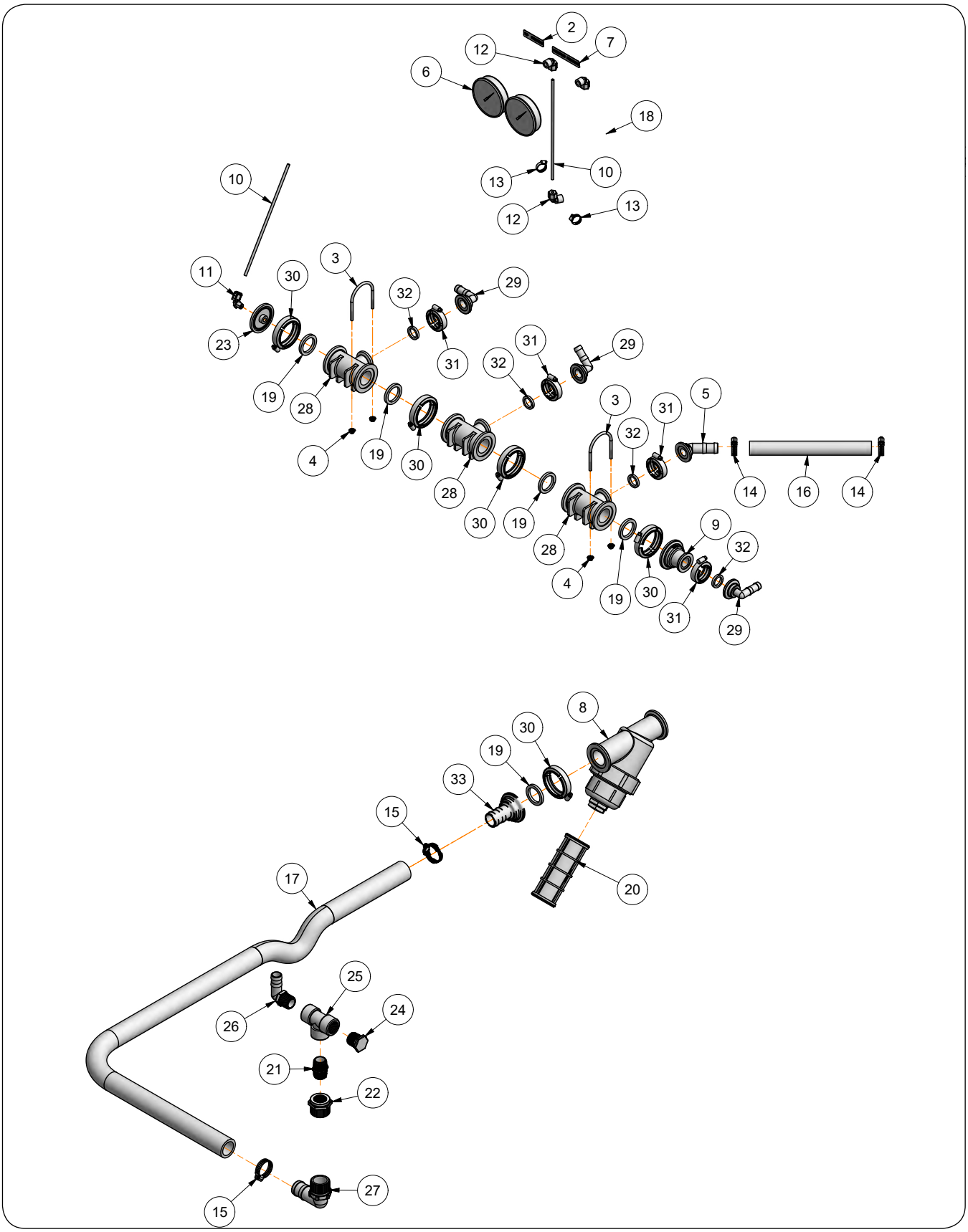
Pump Drive Components

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

ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1	9390-055	Capscrew, 3/8"-16UNC x 1", G5	1	
2	9390-063	Capscrew, 3/8"-16UNC x 3", G5	1	
3	9390-103	Capscrew, 1/2"-13UNC x 2", G5, Plated	8	
4	9390-112	Capscrew, 1/2"-13UNC x 4 1/2", G5	4	
5	9404-021	Lock Washer, 3/8"	1	
6	9405-076	Flat Washer, 3/8" USS	4	
7	9800	Hex Nut, 1/2"-13UNC	12	
8	9802	Lock Nut/Top, 3/4"-10UNC	4	
9	9928	Lock Nut/Top, 3/8"-16UNC	1	
10	91829	Wheel Bolt, 1/2"-20UNF x 1 5/8"	4	
11	9503374ACW	Wheel & Tire Assembly (4x12, ST145/12LRD) 4-Bolt	1	
	9002500	Valve Stem, Metal	1	
	9503375	Tire, ST145/12CA LRD, Radial D Range	1	
	N/A	4 x 12 Implement Wheel	1	
12	JAM3513	Backing Plate, Pump Drive	1	
13	JAM3514	Pump Mounting	1	
14	JAM3515	Axle Mount, Pump Drive	1	
15	JAM3516	Pump Drive Wheel Mount	1	
16	JAP2382	Sprocket, Idler, 15 Tooth #50 Chain, With Clevis Adapter	1	
17	JAP2392	Sprocket, 40 Tooth #50 Chain	1	Standard Rate
	JAP2369	Sprocket, 50 Tooth #50 Chain		High Rate
18	JAP2472	Decal, CAUTION	1	
19	JAP2697	Bearing, 1 1/2", Square 4 Bolt Flange & Lock Collar	2	
20	JBM3526	Key, 3/8" x 3/8" x 1"	1	
21	JBP3058	U-Bolt, 3/4"-10UNC x 9", 7 13/16" C/C	2	
22	JBP3239	Rotary Tensioner, RT1002 (Aluminum)	1	
23	JAP2111	Chain, Roller, Stainless Steel, #50, 63.36"	1	
24	JAP2112	#50 Stainless Connector Link	1	
25	JAP2113	#50 Stainless 1/2" Link	1	

Ground Drive Pump Plumbing Components

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



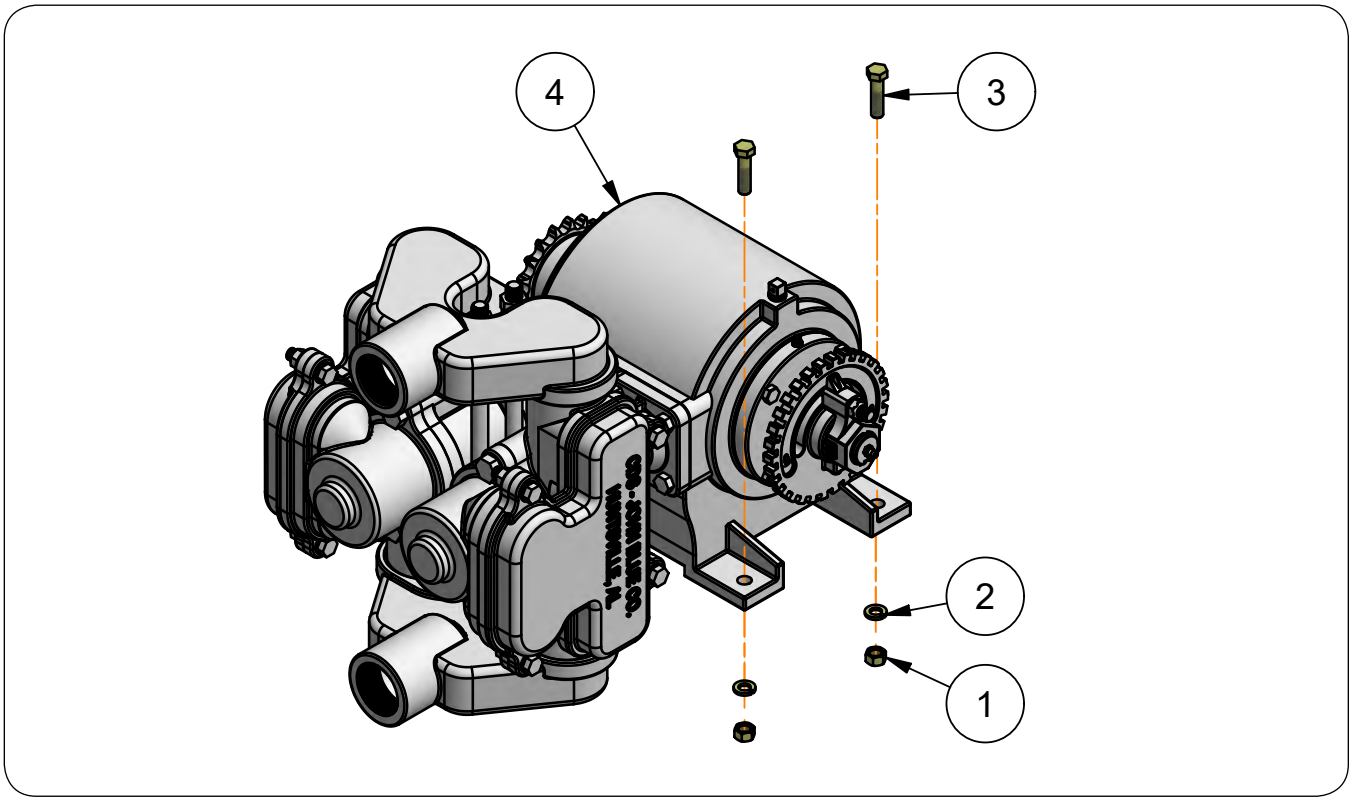
Ground Drive Pump Plumbing Components

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

ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1	N/A	Ground Drive Pump Kit	-	Includes Items 2-32
2	9003841	Decal, Pressure, Tip	1	
3	9004681	U-Bolt, 1/4"-20UNC x 3 1/2", 2 7/8 C/C (Stainless Steel)	2	
4	9004720	Hex Flange Nut, 1/4"-20UNC (Stainless Steel)	4	
5	9007336	45° Hose Barb, 1" Flange x 1" Hose Shank	1	
6	9007569	Pressure Gauge, 0-160 PSI, 4" Liquid Filled Panel	2	
7	9007760	Decal, Pressure, Manifold	1	
8	JCP2050	Line Strainer "Y", 2" Std Port, Flange Body & Cap Less Screen	1	
9	JCP2714	Reducer Flange Coupling, 2" x 1"	1	
10	TA720620	Gauge Tubing, 1/4" Dia. x 12"	4	Specify Length in Feet
11	TA720802	90° Elbow, 1/4" NPT x 1/4" Gauge Tube	1	
12	TA720812	90° Elbow, 1/4" FPT x 1/4" Gauge Tube	3	
13	TA800902	Hose Clamp, 7/8" Stainless Steel (M-6)	2	
14	TA800912	Hose Clamp, 13/16" - 1 1/2" Stainless Steel (SAE 16)	2	
15	TA800918	Hose Clamp, 1 1/4" - 2 1/2" Stainless Steel (SAE J1670C)	1	
16	TA806275	Hose 1" Dia. EPDM (200PSI)	4	
17	TA806325	Hose 1 1/2" Dia. EPDM (200PSI)	6	
18	TA810488	Tee, 1/4" MPT x 3/8" Hose Barb x 3/8" Hose Barb	1	
19	TA811944	Gasket, EPDM, 2 Flange, 3/4 Bulkhead, 150G	5	
20	TA811983	30 Mesh Screen Fits 1 1/2" & 2" Strainer "Y" Type	1	
21	TA814610	Hex Pipe Nipple, 1"-11 1/2 NPT Male x 2"	1	
22	TA814661	Reducer Bushing Poly, 1 1/2"-11 1/2 NPTF Male x 1"-11 1/2 NPTF Female	1	
23	TA883114	Plug, 2" Flanged with 1/4" FPT Gauge Port	1	
24	TA814752	Plug, 1"-11 1/2 NPTF x 1 1/2"	1	
25	TA814782	Tee, 1"-11 1/2 NPTF Female x 1"-11 1/2 NPTF Female x 1"-11 1/2 NPTF Female	1	
26	TA814966	90° Elbow/Hose Barb, 1"-11 1/2 NPTF Male x 1" Hose Shank	1	
27	TA814975	90° Elbow/Hose Barb, 1 1/2"-11 1/2 NPTF Male x 1 1/2" Hose Shank	1	
28	TA815006	Tee, 2" Flange x 2" Flange x 1" Flange	3	
29	TA815017	90° Elbow/Hose Barb, 1" Flange x 3/4"	3	
30	TA815025	Clamp, 2" Worm Screw, Flange	5	
31	TA815026	Clamp, 1" Worm Screw, Flange	4	
32	TA815029	Gasket/Seal, 1 3/8" x 1 1/4"	4	
33	TA815015	Hose Barb, 2 Flange x 1 1/2 Hose	1	

Twin Piston Pump, NGP-9055, 68.4 Gallon

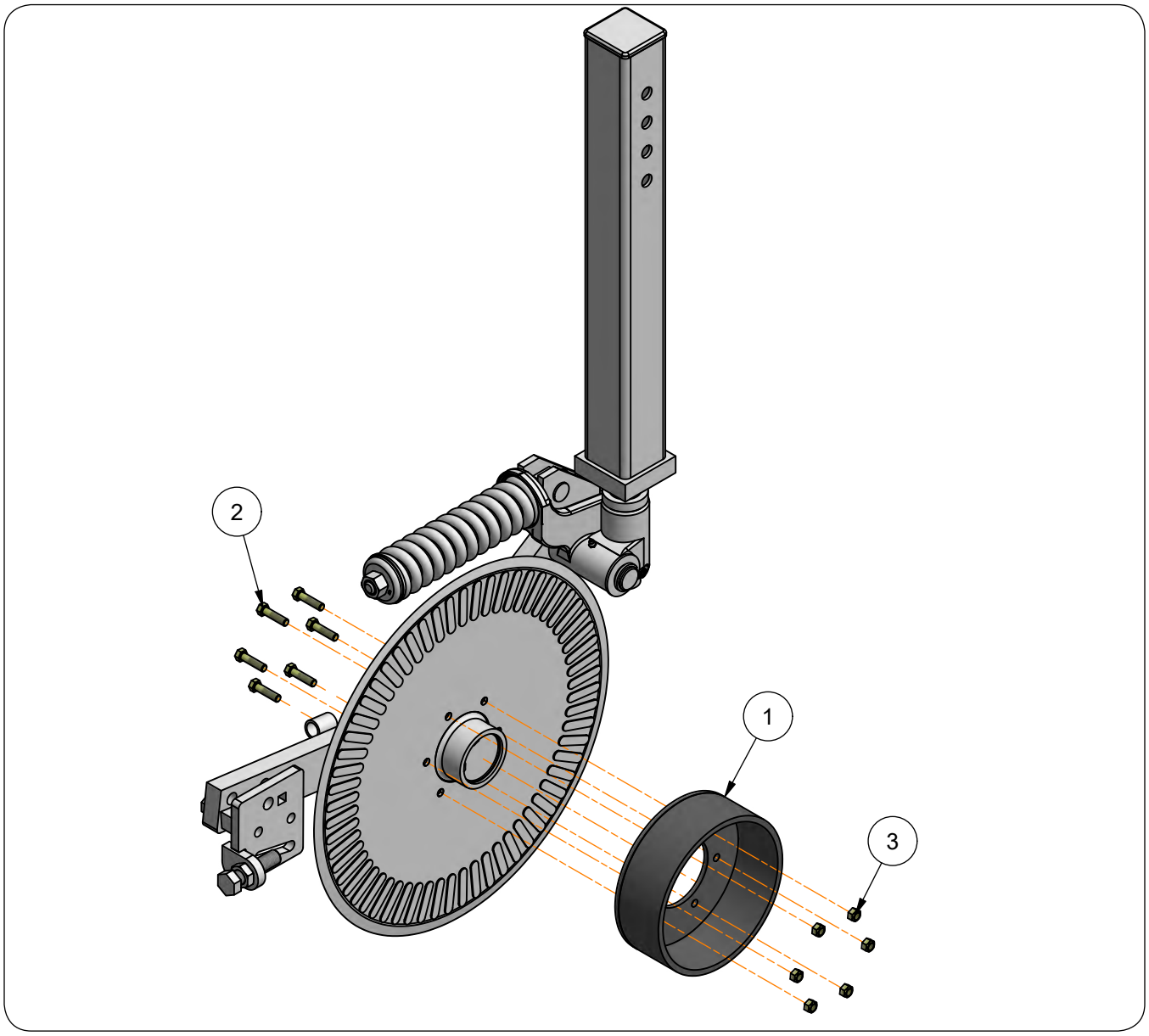
Please visit www.unverferth.com/parts/ for the most current parts listing.



ITEM	QTY	PART NUMBER	DESCRIPTION
1	4	9394-006	Hex Nut, 3/8”-16UNC
2	4	9404-021	Lock Washer, 3/8”
3	4	9390-057	Capscrew, 3/8”-16UNC x 1 1/2”, G5
4	1	JCP2569	Pump, TWIN PISTON, NGP-9055, 68.4 GALLON
		9503891	Pump, TWIN PISTON, NGP-9055-S-BLK, 68.4 GALLON (Stainless Steel)

Coulter Depth Band Components

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



ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
	412485B	Depth Band Assembly	-	Includes Items 1-3
1	62459	Depth Band Weldment =Black=	1	
2	9390-057	Capscrew, 3/8"-16UNC x 1 1/2" G5	6	
3	9928	Lock Nut/Top, 3/8"-16UNC	6	

Controller Components

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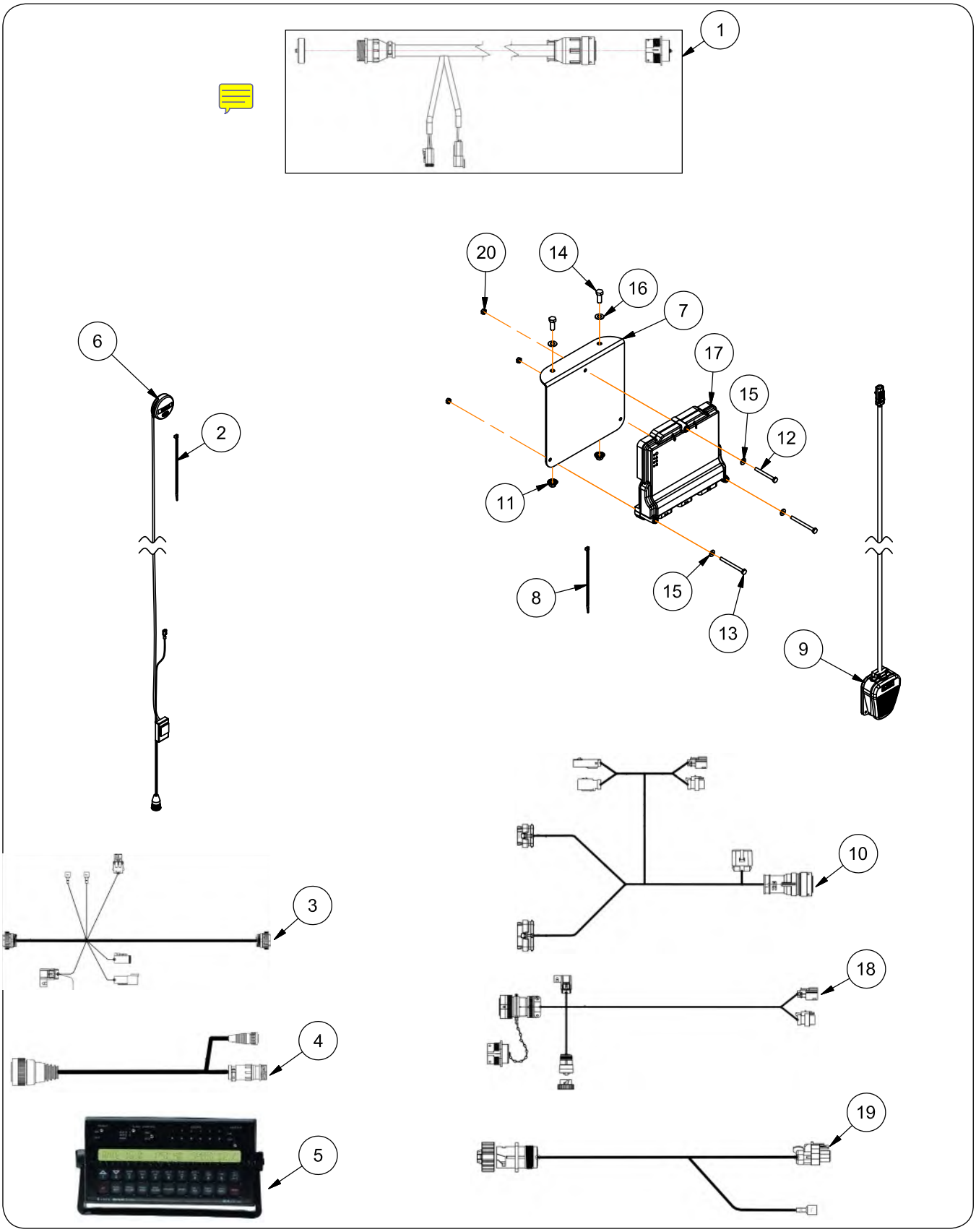

Controller Components

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ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1	9009175	Wire Harness 30 Ft. 16-Pin Console to 47-Pin Connector	1	Less Rate Controller
2	9000106	Cable Tie 7 1/2"	6	Raven 450 Controller
3	9007549	Console Harness (450 Controller)	1	
4	9503471	Wire Harness 30 Ft. 16-Pin Console to 47-Pin Connector	1	
5	TA720315	Control Console, Raven SCS 450	1	
6	TA723025	Astro GPS Speed Sensor w/3-Pin Raven Conxall	1	
7	44440B	Mounting Bracket Plate	1	ISOBUS Controller
8	9000106	Cable Tie 7 1/2"	6	
9	9005916	Foot Switch, ISO Node w/Harness	1	
10	9008095	Wire Harness, RCM ECU 47 Pin Rate	1	
11	91263	Nut/Large Flange, 3/8"-16UNC	2	
12	9390-011	Capscrew, 1/4"-20UNC x 2 1/2" G5	1	
13	9390-013	Capscrew, 1/4"-20UNC x 3" G5	2	
14	9390-055	Capscrew, 3/8"-16UNC x 1" G5	2	
15	9405-062	Flat Washer, 1/4" SAE	3	
16	9405-074	Flat Washer, 3/8" SAE	2	
17	9504611	Rate Control Module	1	
18	9503387	Wire Harness, 12 Ft. Adapter 9-Pin IBIC to Gen 1, Hitch Cable	1	
19	9503390	Wire Harness, Foot Switch 23 Ft.	1	
20	9936	Lock Nut, 1/4"-20UNC	3	

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