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**Injection for John Deere 4730/4830  
Installation and Operation Manual**

*P/N 016-0171-666 Rev. A*

*06/17*

*E29550*

# LIMITED WARRANTY

## WHAT DOES THIS WARRANTY COVER?

This warranty covers all defects in workmanship or materials in your Raven Applied Technology Division product under normal use, maintenance, and service when used for intended purpose.

## HOW LONG IS THE COVERAGE PERIOD?

Raven Applied Technology products are covered by this warranty for 12 months from the date of retail sale. In no case will the Limited Warranty period exceed 24 months from the date the product was issued by Raven Industries Applied Technology Division. This warranty coverage applies only to the original owner and is non-transferable.

## HOW CAN I GET SERVICE?

Bring the defective part and proof of purchase to your Raven dealer. If the dealer approves the warranty claim, the dealer will process the claim and send it to Raven Industries for final approval. The freight cost to Raven Industries will be the customer's responsibility. The Return Materials Authorization (RMA) number must appear on the box and all documentation (including proof of purchase) must be included inside the box to be sent to Raven Industries.

## WHAT WILL RAVEN INDUSTRIES DO?

Upon confirmation of the warranty claim, Raven Industries will (at our discretion) repair or replace the defective product and pay for the standard return freight, regardless of the inbound shipping method. Expedited freight is available at the customer's expense.

## WHAT IS NOT COVERED BY THIS WARRANTY?

Raven Industries will not assume any expense or liability for repairs made outside our facilities without written consent. Raven Industries is not responsible for damage to any associated equipment or products and will not be liable for loss of profit, labor, or other damages. The obligation of this warranty is in lieu of all other warranties, expressed or implied, and no person or organization is authorized to assume any liability for Raven Industries.

**Damages caused by normal wear and tear, misuse, abuse, neglect, accident, or improper installation and maintenance are not covered by this warranty.**

# EXTENDED WARRANTY

## WHAT DOES THIS WARRANTY COVER?

This warranty covers all defects in workmanship or materials in your Raven Applied Technology Division product under normal use, maintenance, and service when used for intended purpose.

## DO I NEED TO REGISTER MY PRODUCT TO QUALIFY FOR THE EXTENDED WARRANTY?

Yes. Products/systems must be registered within 30 days of retail sale to receive coverage under the Extended Warranty. If the component does not have a serial tag, the kit it came in must be registered instead.

## WHERE CAN I REGISTER MY PRODUCT FOR THE EXTENDED WARRANTY?

To register, go online to [www.ravenhelp.com](http://www.ravenhelp.com) and select Product Registration.

## HOW LONG IS THE EXTENDED WARRANTY COVERAGE PERIOD?

Raven Applied Technology products that have been registered online are covered for an additional 12 months beyond the Limited Warranty for a total coverage period of 24 months from the date of retail sale. In no case will the Extended Warranty period exceed 36 months from the date the product was issued by Raven Industries Applied Technology division. This Extended Warranty coverage applies only to the original owner and is non-transferable.

## HOW CAN I GET SERVICE?

Bring the defective part and proof of purchase to your Raven dealer. If the dealer approves the warranty claim, the dealer will process the claim and send it to Raven Industries for final approval. The freight cost to Raven Industries will be the customer's responsibility. The Return Materials Authorization (RMA) number must appear on the box and all documentation (including proof of purchase) must be included inside the box to be sent to Raven Industries. In addition, the words "Extended Warranty" must appear on the box and all documentation if the failure is between 12 and 24 months from the retail sale.

## WHAT WILL RAVEN INDUSTRIES DO?

Upon confirmation of the product's registration for the Extended Warranty and the claim itself, Raven Industries will (at our discretion) repair or replace the defective product and pay for the standard return freight, regardless of the inbound shipping method. Expedited freight is available at the customer's expense.

## WHAT IS NOT COVERED BY THE EXTENDED WARRANTY?

Raven Industries will not assume any expense or liability for repairs made outside our facilities without written consent. Raven Industries is not responsible for damage to any associated equipment or products and will not be liable for loss of profit, labor, or other damages. Cables, hoses, software enhancements, and remanufactured items are not covered by this Extended Warranty. The obligation of this warranty is in lieu of all other warranties, expressed or implied, and no person or organization is authorized to assume any liability for Raven Industries.

**Damages caused by normal wear and tear, misuse, abuse, neglect, accident, or improper installation and maintenance are not covered by this warranty.**

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# CHAPTER

# 1

# IMPORTANT SAFETY INFORMATION

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## NOTICE

Read this manual and all operation and safety instructions included with the implement and/or controller carefully before installing the system.

- Follow all safety information presented within this manual.
- If you require assistance with any portion of the installation or service of Raven equipment, contact a local Raven dealer for support.
- Follow all safety labels affixed to system components. Be sure to keep safety labels in good condition and replace any missing or damaged labels. To obtain replacements for missing or damaged safety labels, contact a local Raven dealer.

When operating the machine, observe the following safety measures:

- Be alert and aware of surroundings.
- Do not operate agricultural equipment while under the influence of alcohol or an illegal substance.
- Remain in the operator's position in the machine at all times when equipment is engaged. Disable system functions or features when exiting from the operator's seat and machine.
- Do not drive the machine with equipment enabled on any public road.
- Determine and remain a safe working distance from other individuals. The operator is responsible for disabling the system when the safe working distance has been diminished.
- Ensure the system is disabled prior to starting any maintenance work on the system or the implement.

## DANGER

### AGRICULTURAL CHEMICAL SAFETY

- Thoroughly bleed pressure from chemical lines and rinse the system with clean water prior to installing or servicing fittings, hoses, valves, or nozzles in the application system.
- Always follow safety labels and instructions provided by the chemical manufacturer or supplier.
- Always wear appropriate personal protective equipment as recommended by the chemical and/or equipment manufacturer.
- Fill, flush, calibrate, and decontaminate chemical application systems in an area where runoff will not reach ponds, lakes, streams, livestock areas, gardens, or populated areas.
- Avoid inhaling chemical dust or spray particulate and avoid direct contact with any agricultural chemicals. Seek immediate medical attention if symptoms of illness occur during, or soon after, use of agricultural chemicals, products, or equipment.
- After handling or applying agricultural chemicals:

- Thoroughly wash hands and face after using agricultural chemicals and before eating, drinking, or using the rest room.
- Thoroughly flush or rinse equipment used to mix, transfer, or apply chemicals with water after use or before servicing any component of the application system.
- Follow all federal, state, and local regulations regarding the handling, use, and disposal of agricultural chemicals, products, and containers. Triple-rinse and puncture or crush empty containers before disposing of them properly. Contact a local environmental agency or recycling center for additional information.

## CAUTION

### ELECTRICAL SAFETY

- Always verify that the power leads are connected to the correct polarity as marked. Reversing the power leads could cause severe damage to the equipment.
- Disconnect the system ECUs and control console before jump starting the vehicle or welding on any part of the implement or machine.

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## INSTRUCTIONS FOR WIRE ROUTING

The word harness is used to mean all electrical leads and cables, bundled and unbundled. When installing harness, secure it at least every 30 cm (12in) to the frame. Follow existing harness as much as possible and use these guidelines:

Harness should not contact or be attached to:

- Lines and hoses with high vibration forces or pressure spikes
- Lines and hoses carrying hot fluids beyond harness component specifications

Avoid contact with any sharp edge or abrading surfaces such as, but not limited to:

- Sheared or flame cut edges
- Edges of machined surfaces
- Fastener threads or cap screw heads
- Ends of adjustable hose clamps
- Wire exiting conduit without protection, either ends or side of conduit
- Hose and tube fittings

Routing should not allow harnesses to:

- Hang below the unit
- Have the potential to become damaged due to exposure to the exterior environment. (i.e. tree limbs, debris, attachments)
- Be placed in areas of or in contact with machine components which develop temperatures higher than the temperature rating of harness components
- Wiring should be protected or shielded if it needs to route near hot temperatures beyond harness component specifications

Harnessing should not have sharp bends.

Allow sufficient clearance from machine component operational zones such as:

- Drive shafts, universal joints and hitches (i.e. 3-point hitch)
- Pulleys, gears, sprockets
- Deflection and backlash of belts and chains
- Adjustment zones of adjustable brackets
- Changes of position in steering and suspension systems
- Moving linkages, cylinders, articulation joints, attachments
- Ground engaging components

For harness sections that move during machine operation:

- Allow sufficient length for free movement without interference to prevent: pulling, pinching, catching or rubbing, especially in articulation and pivot points
- Clamp harnesses securely to force controlled movement to occur in the desired harness section
- Avoid sharp twisting or flexing of harnesses in short distances
- Connectors and splices should not be located in harness sections that move

Protect harnesses from:

- Foreign objects such as rocks that may fall or be thrown by the unit
- Buildup of dirt, mud, snow, ice, submersion in water and oil
- Tree limbs, brush and debris
- Damage where service personnel or operators might step or use as a grab bar
- Damage when passing through metal structures
- High pressure wash

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## INSTRUCTIONS FOR HOSE ROUTING

The word hoses is used to mean all flexible fluid carrying components. Follow existing hoses as much as possible and use these guidelines:

Hoses should not contact or be attached to:

- Components with high vibration forces
- Components carrying hot fluids beyond hoses component specifications

Avoid contact with any sharp edge or abrading surfaces such as, but not limited to:

- Sheared or flame cut edges
- Edges of machined surfaces
- Fastener threads or cap screw heads
- Ends of adjustable hose clamps

Routing should not allow hoses to:

- Hang below the unit
- Have the potential to become damaged due to exposure to the exterior environment. (i.e. tree limbs, debris, attachments)
- Be placed in areas of or in contact with machine components which develop temperatures higher than the temperature rating of hose components

- Hoses should be protected or shielded if it needs to route near hot temperatures beyond hose component specifications

Hoses should not have sharp bends

Allow sufficient clearance from machine component operational zones such as:

- Drive shafts, universal joints and hitches (i.e. 3-point hitch)
- Pulleys, gears, sprockets
- Deflection and backlash of belts and chains
- Adjustment zones of adjustable brackets
- Changes of position in steering and suspension systems
- Moving linkages, cylinders, articulation joints, attachments
- Ground engaging components

For hose sections that move during machine operation:

- Allow sufficient length for free movement without interference to prevent: pulling, pinching, catching or rubbing, especially in articulation and pivot points
- Clamp hoses securely to force controlled movement to occur in the desired hose section
- Avoid sharp twisting or flexing of hoses in short distances

Protect hoses from:

- Foreign objects such as rocks that may fall or be thrown by the unit
- Buildup of dirt, mud, snow, ice, submersion in water and oil
- Tree limbs, brush and debris
- Damage where service personnel or operators might step or use as a grab bar
- Damage when passing through metal structures
- High pressure wash

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## SYSTEM OVERVIEW

The Raven Sidekick Pro ICD injection system is designed to provide efficient and accurate application of liquid chemicals applied from an injection module. Using a separate injection module, or tank, eliminates mixing chemicals and reduces chemical waste, and simplifies equipment care and maintenance.

Sidekick Pro ICD provides connectivity to a Raven CANbus system to allow an existing Raven CAN control console to control the rate of the chemical injection system.

After proper installation and calibration of the injection system and Raven controller, including a set target rate for the carrier and injected chemicals, the operator enables the product control system and the control console will automatically maintain the flow regardless of vehicle speed or active boom sections.

Performance of the Raven injection system relies upon proper installation and maintenance of the complete sprayer system. Please review this manual before installing or operating this system to help ensure proper setup and follow instructions provided for proper care and maintenance of the Raven injection system.

## INJECTION SYSTEM COMPONENTS

The Raven injection system consists of:

- Raven UT (Viper 4) or John Deere 2630
- Sidekick Pro ICD injection pump(s)
- In-line mixer
- Chemical tanks
- Check valves
- Plumbing components including hoses, fittings, and valves
- Brackets and hardware to fasten above components to the machine

**TABLE 1. John Deere Make and Model Information,**

Make	Model
John Deere	4730/4830

## REQUIRED COMPONENTS

The following components must be installed with the Sidekick Pro ICD:

- Raven OS Version 2.1.5.32 for the Viper 4 Console.

## TOOLS AND MATERIALS NEEDED

The following tools are recommended for completing the installation:

- SAE wrenches and tools
- Drill bit set and drill
- Dielectric grease (supplied)
- Cable ties (supplied)
- Tape measure
- Center punch
- 9/16" drill bit
- Torque wrench
- Thread sealant tape

## POINT OF REFERENCE

The instructions provided in this manual assume the installer is standing behind the machine, looking toward the machine cabin.

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## UPDATES

Raven software and documentation updates may be made available periodically on the Raven Applied Technology web site:

[www.ravenhelp.com](http://www.ravenhelp.com)

At Raven Industries, we strive to make your experience with our products as rewarding as possible. One way to improve this experience is to provide us with feedback on this manual.

Your feedback will help shape the future of our product documentation and the overall service we provide. We appreciate the opportunity to see ourselves as our customers see us and are eager to gather ideas on how we have been helping or how we can do better.

To serve you best, please send an email with the following information to

[techwriting@ravenind.com](mailto:techwriting@ravenind.com)

- Injection for John Deere 4730/4830 Installation and Operation Manual
- P/N 016-0171-666 Rev. A
- Any comments or feedback (include chapter or page numbers if applicable).
- Let us know how long have you been using this or other Raven products.

We will not share your email or any information you provide with anyone else. Your feedback is valued and extremely important to us.

Thank you for your time.

## INSTALLATION PREPARATION

Verify Software version 2.1.5.32 or higher is present on the Raven Viper 4.

### SYSTEM CLEANOUT

Remove all pressure from plumbing components. Drain out the main carrier tank, rinse tank, and boom plumbing.

### THREAD SEALANT

Apply thread sealant tape to all threaded plumbing connections before assembly.

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## INSTALLATION INSTRUCTIONS

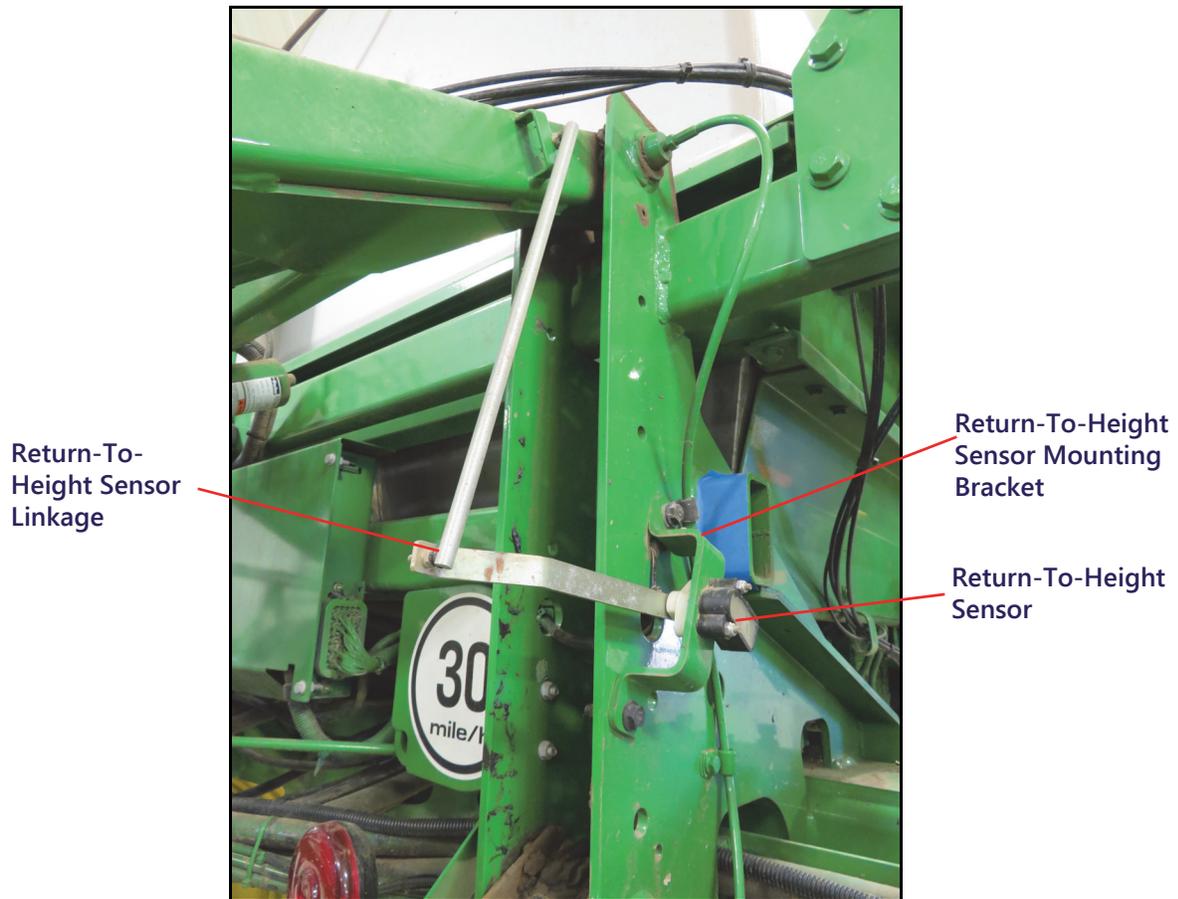
These instructions assume that a Raven Hawkeye<sup>®</sup> or Hawkeye ready system has already been installed on the machine. See the Hawkeye Installation Manual (P/N 106-0171-620) for guidance on installing the Hawkeye system.

### RETURN-TO-HEIGHT SENSOR RELOCATION (IF PRESENT)

If the machine is equipped with a Return-To-Height sensor it will need to be relocated. If a Return-To-Height sensor is not present, skip to Tank Support Installation section on page 10. If a Return-To-Height sensor is installed:

1. Remove the sensor, sensor bracket, and linkages from the machine.

FIGURE 1. Return-To-Height Sensor



2. Use the provided 3/8" U-bolt, washer, and lock nuts to install the provided linkage relocation bracket (P/N 107-0172-535) onto the 3" cross member near the base of the top linkage arms.

FIGURE 2. Return to Height Sensor Bracket



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**FIGURE 3. Installed Linkage Relocation Bracket**

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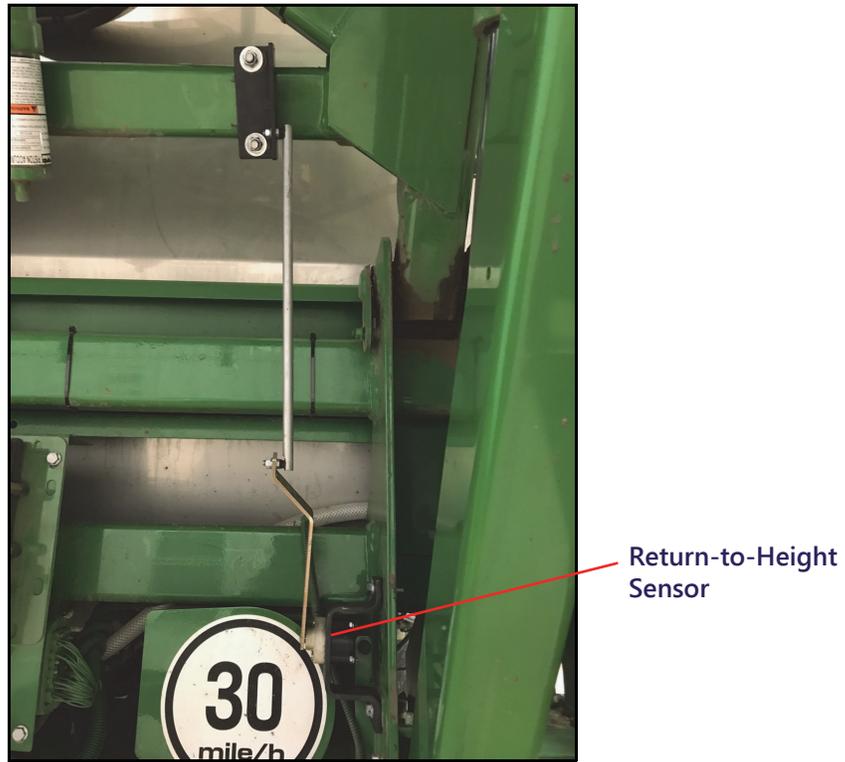


3. Remove the Return-To-Height sensor from the original bracket and install it into the provided sensor relocation bracket (P/N 107-0172-536). Verify it is oriented in the same way as shown in Figure 2 on page 8.
4. Verify that the original linkage rod can be connected to the sensor arm and the bracket without exceeding the sensor's travel limit.

**NOTE:** Do not install the linkage rod yet.

5. Lower the boom to the ground.
6. Verify that the linkage rod can be connected to the sensor arm and the new sensor linkage relocation bracket. If travel limits are acceptable, install the linkage rod.

FIGURE 4. Reinstalled Return-To-Height Sensor

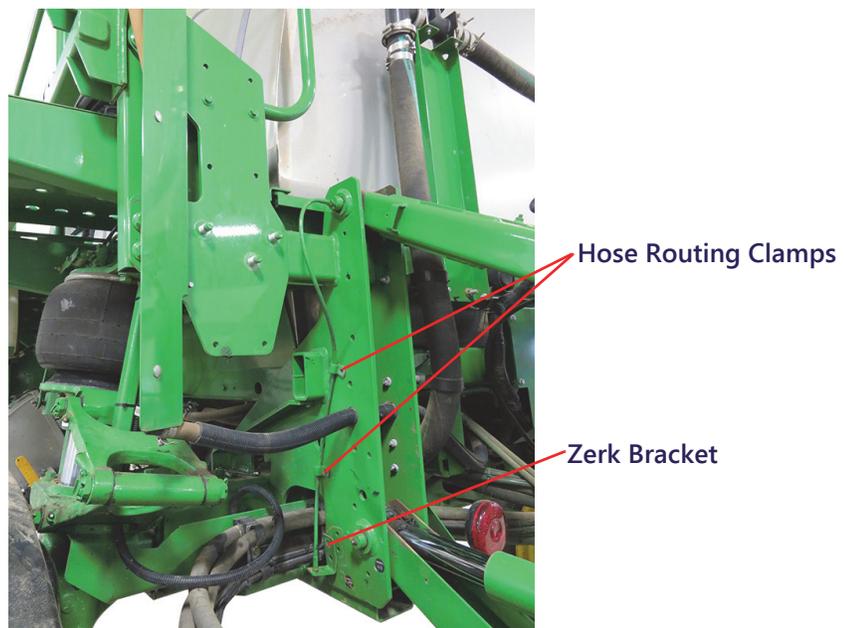


7. Recalibrate the Return-To-Height sensor using the original display installed in the cab.

### TANK SUPPORT INSTALLATION

1. Remove the bolts retaining the hose routing clamps and zerk bracket.

FIGURE 5. Zerk Bracket



- Route the hose in front of the 2" x 4" box tube and reattach the clamps and bracket.

**NOTE:** The clamps may need to be reoriented for reassembly.

**FIGURE 6. Hose Routing**



Route Hose In-Front  
of 2" x 4" Box Tube

- On the lower box tube, measure and mark a point 3/4" from the edge of the tube and centered vertically on the box tube.

**FIGURE 7. Marked Box Tube**



Desired Hole  
Location

4. Center punch the marked location.
5. Drill a 9/16" hole in the marked location through one wall of the box tube.
6. Remove the three bolts indicated in Figure 8 on page 12.

**FIGURE 8. Bolt Removal**

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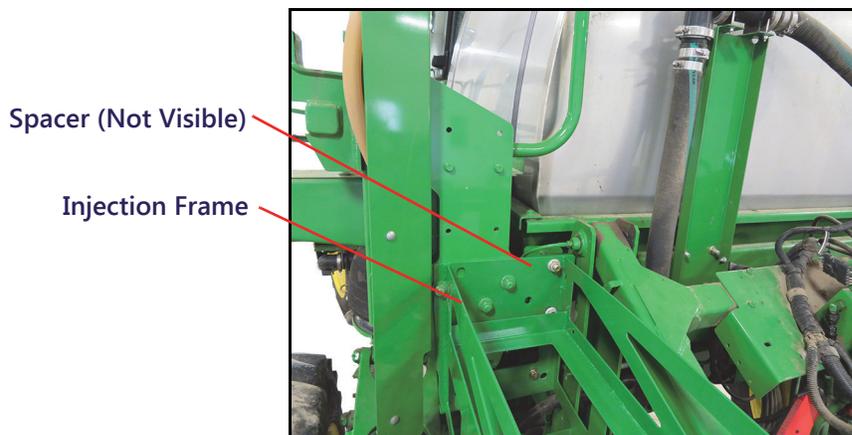


7. Using the three bolts removed in the previous step, install the provided injection frame weldment (P/N 116-0159-801) in the location where the three bolts were removed in the previous step. It will be easier to reinstall the bolts pointing towards the rear of the machine prior to lifting the injection frame weldment into place.

**NOTE:** It may be necessary to loosen or remove the bolt holding the bottom of the sight gauge bracket in place. Hand tighten the bolts at this point.

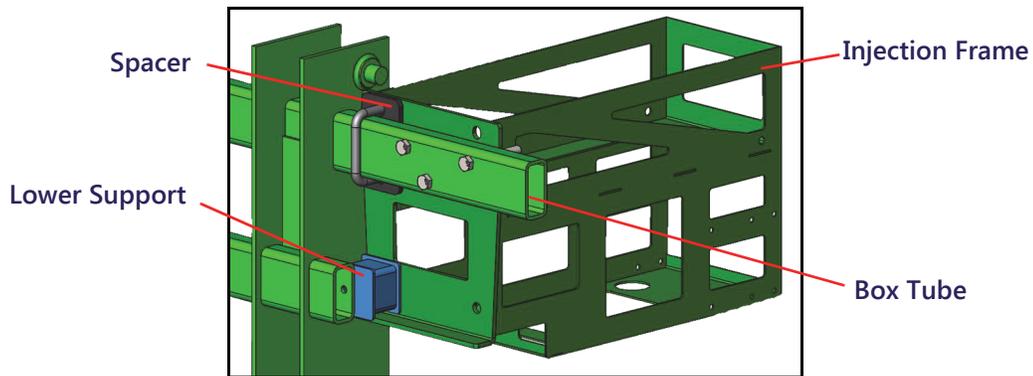
**FIGURE 9. Injection Frame**

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8. Install the provided M16 U-bolt (P/N 107-0172-532) and spacer (P/N 107-0172-633). The spacer fits between the injection frame weldment and the 2" x 4" box tube.
9. Install the lower support (P/N 116-0159-800) between the injection frame weldment and the hole drilled in step 5.

FIGURE 10. Lower Support

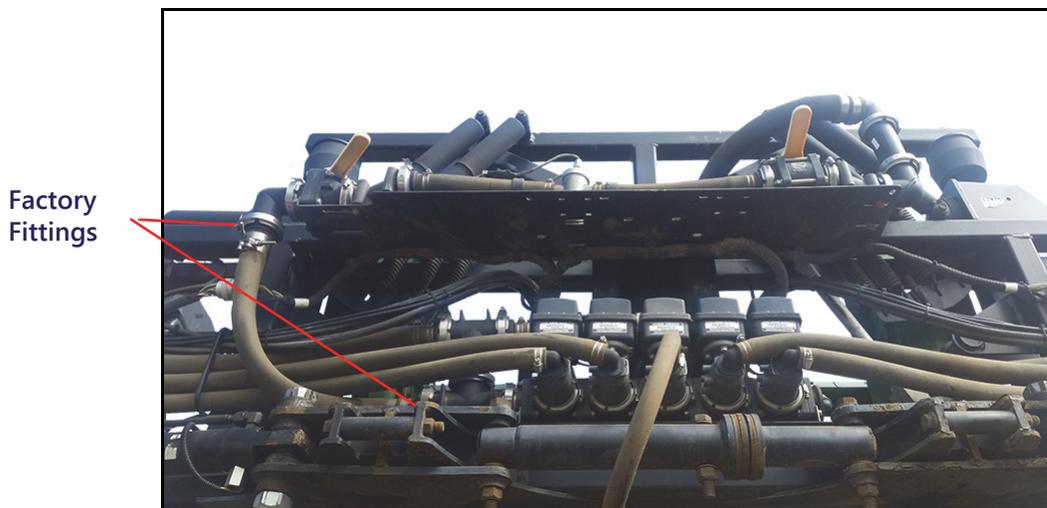


10. Secure the lower support to the injection frame and machine's box tube using the 1/2" bolts, lock washers, and flat washers.
11. Use a level to verify the injection frame is installed vertically and tighten all the hardware.
12. Use the provided 1/2" hardware to install the tank cage (P/N 116-0159-799) onto the injection frame.
13. Repeat step 1 through step 13 on the right hand side of the machine.

### MIXER INSTALLATION

1. Remove the factory hose and flange fittings from between the flowmeter and section control valve manifold.

FIGURE 11. Hose and Flange Fittings

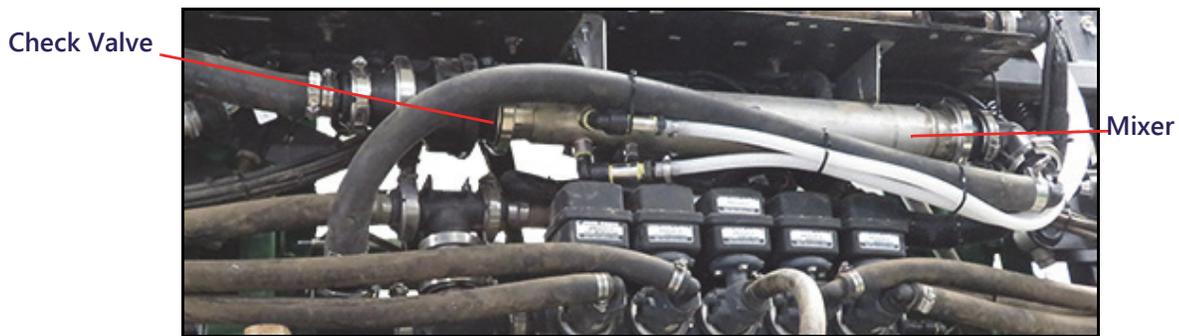


2. Use the provided 3/8" hardware, install the mixer (P/N 063-0173-698) onto the bottom side of the existing flowmeter bracket.

**NOTE:** The left side may use existing holes. On the right side, drill holes that match the mixer's hole pattern.

3. Verify that the check valve is installed to the left side of the machine.

FIGURE 12. Installed Check Valve



4. Use the provided gasket and flange clamp to attach a M300 to M220 reducing flanged fitting to the check valve on the left side of the mixer.
5. Use the provided gasket and flange clamp to attach a M220 to 1.5" hose barb fitting to the M220 flange.
6. Attach one end of the hose removed in step 1 to the 1 1/2" hose barb.
7. Use the provide M220 to 1 1/2" 90° hose barb fitting to mark where to cut the original hose so it will fit with the flowmeter outlet.
8. Cut the hose to length.
9. Use the provided hose clamps, gaskets, and flange clamp to install the hose elbow fitting.
10. On the right side of the mixer, use the provided gaskets and flange clamps to:
  - a. Attach the mixer to the M300 to M220 reducer.
  - b. Connect the M300 to M220 reducer to the M220 90° elbow.
  - c. Connect the M220 90° elbow to the M220 x 1 1/2" hose barb.

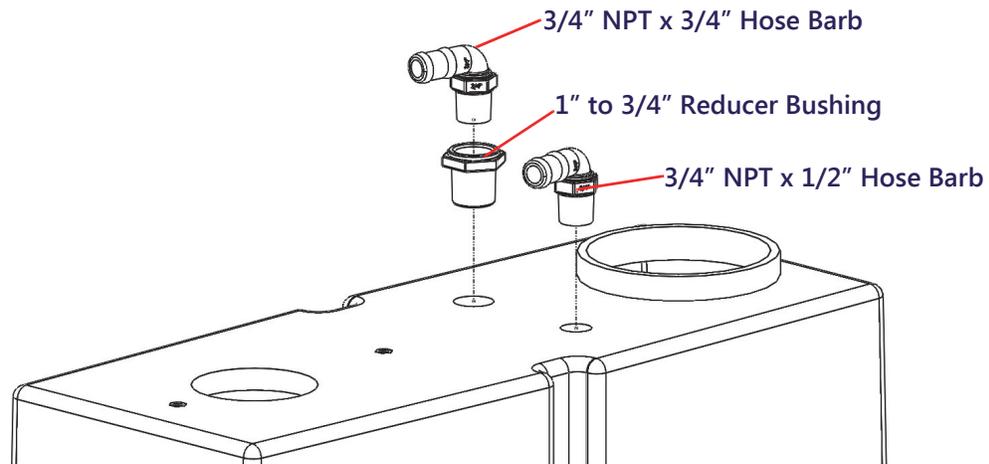
**NOTE:** Do not fully tighten at this time.

11. On the left side of the section control valve manifold, install a M220 90° elbow. Orient the elbow so it points back and up to avoid existing solution hoses.
12. Cut 2" EPDM hose (not provided) to length.
13. Use the provided hose clamps, gaskets, and flange clamps to install the 2" EPDM hose between the right side of the mixer and the inlet manifold.
14. Tighten all flange clamps and hose clamps.

## TANK INSTALLATION

1. In the 1" port on the top of the tank, connect a 1" to 3/4" reducing bushing.

FIGURE 13. Top of Tank Installation

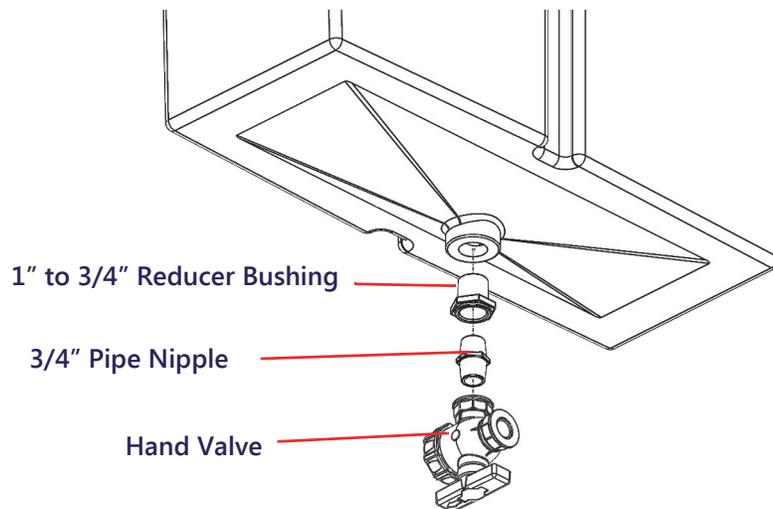


2. Connect a 3/4" NPT x 3/4" hose barb 90° elbow into the reducing bushing.
3. In the other port of the top of the tank, install a 3/4" NPT x 1/2" hose barb 90° elbow.

**NOTE:** If the system will only have one pump, install the provided 3/4" plug into this port on the second tank.

4. In the 1" port of the bottom of the tank, install a 1" to 3/4" reducing bushing.

FIGURE 14. Bottom of Tank Installation



5. Connect a 3/4" pipe nipple into the 1" to 3/4" reducing bushing.
6. Connect the center port of the 3/4" hand valve onto the pipe nipple. Tighten the hand valve so the side ports face the long sides of the tank.
7. Place the tank into the tank cage with the lid towards the front of the machine.

**FIGURE 15. Completed Tank Installation**



8. Locate the provided stainless steel tank strap.
9. Insert the t-bolt into one of the holes on the tank cage square tubing and secure with a lock nut.
10. Route the stainless steel tank strap over the top of the tank and secure in the opposite mounting hole using 5/16" x 5" bolt, nut, and washer.
11. Repeat step 1 through step 10 on the right-hand side of the machine.

### PUMP INSTALLATION

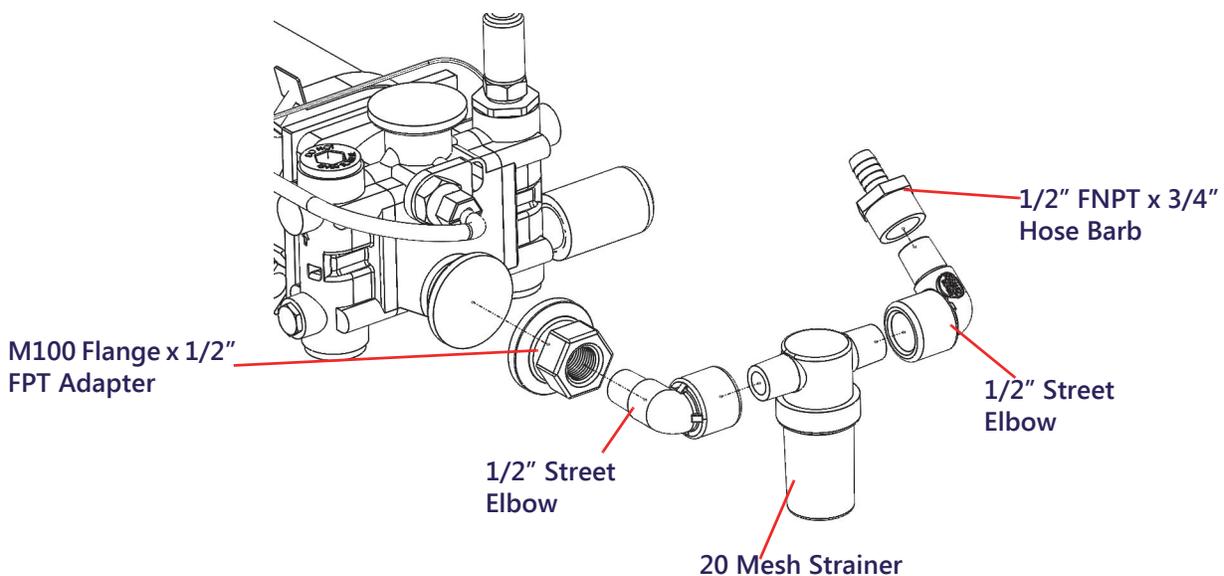
1. Locate the injection pump (P/N 063-0173-768 or P/N 016-0173-769) and loosen the straps secure the mounting feet to the pump.
2. Rotate the legs 90° so they face out the left side of the pump when viewed from the inlet end of the pump.

**FIGURE 16. Installed Pump**



3. Tighten the pump foot straps.
4. Install the pump into the bottom of the injection frame as shown in Figure 16 on page 16.
5. Secure the pump to the injection frame using the provided 5/16" bolts, washers, and lock nuts.
6. Use the supplied gasket and flange clamp to install the calibrator assembly (P/N 063-0173-260) onto the outlet of the pump.
7. Route the provided 1/2" hose from the check valve on the calibrator up to the 1/2" hose barb installed on the top of the tank. Secure using the provided hose clamps and zip ties.
8. Route the provided 3/4" hose from the 3/4" hose barb installed on the top of the tank and down to a point below the injection frame weldment. This is the vent/overflow line.
9. Secure the vent/overflow hose with zip ties.
10. Install the following components to the pump inlet:
  - a. M100 Flange x 1/2" FPT adapter.
  - b. 1/2 NPT Street elbow.
  - c. 1/2" NPT 20 Mesh Strainer (P/N 333-9000-060).
  - d. 1/2" NPT Street elbow.
  - e. 1/2" FNPT x 3/4" hose barb.

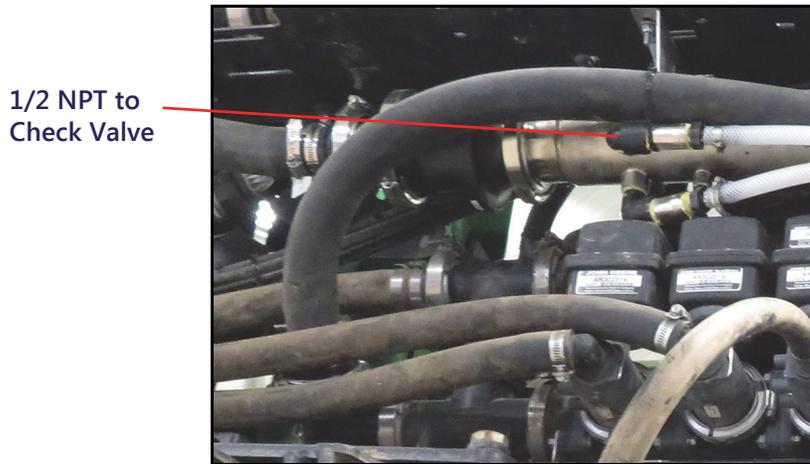
**FIGURE 17. Pump Inlet Assembly**



### PLUMB PUMP TO MIXER

1. Install a 1/2" street elbow into one of the inlet ports on the side of the mixer.
2. Attach the provided check valve to the street elbow.
3. Attach a 1/2" NPT x 1/2" hose barb fitting into the check valve.

FIGURE 18. Check Valve and Mixer

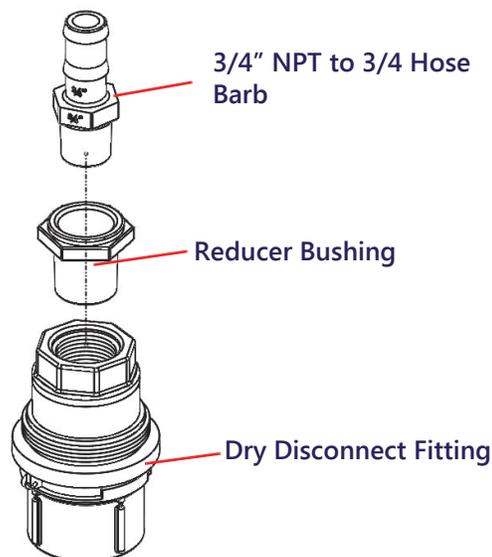


4. Attach a 1/2" hose to the hose barb fitting.
5. Route the 1/2" hose along the main carrier hose down to the injection pump.
6. Attach the other end of the 1/2" hose to the port on the calibrator assembly that does not have a check valve.
7. Verify the center rack can be raised and lowered without damaging the hose.
8. Secure the hose with zip ties.

### INSTALL DRY DISCONNECT

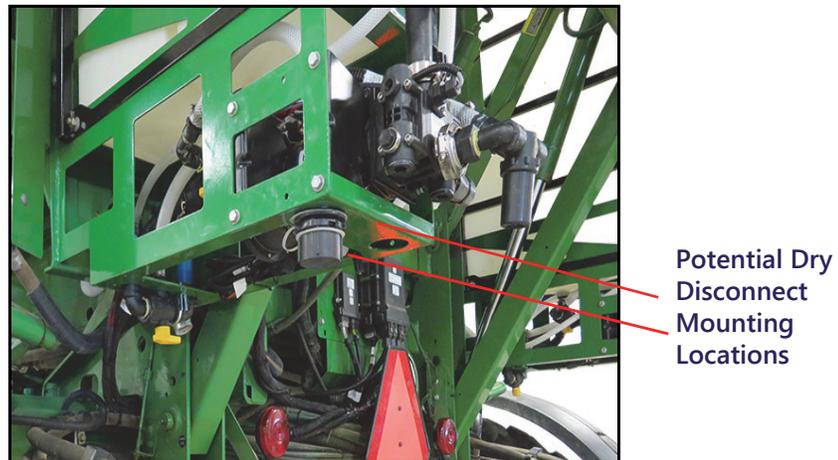
1. Locate the male dry disconnect fittings (P/N 333-0006-036). Install a 1" NPT to 3/4" reducing bushing into the dry disconnect fitting.
2. Install a 3/4" NPT to 3/4" hose barb adapter into the reducing bushing.

FIGURE 19. Quick Fill Assembly



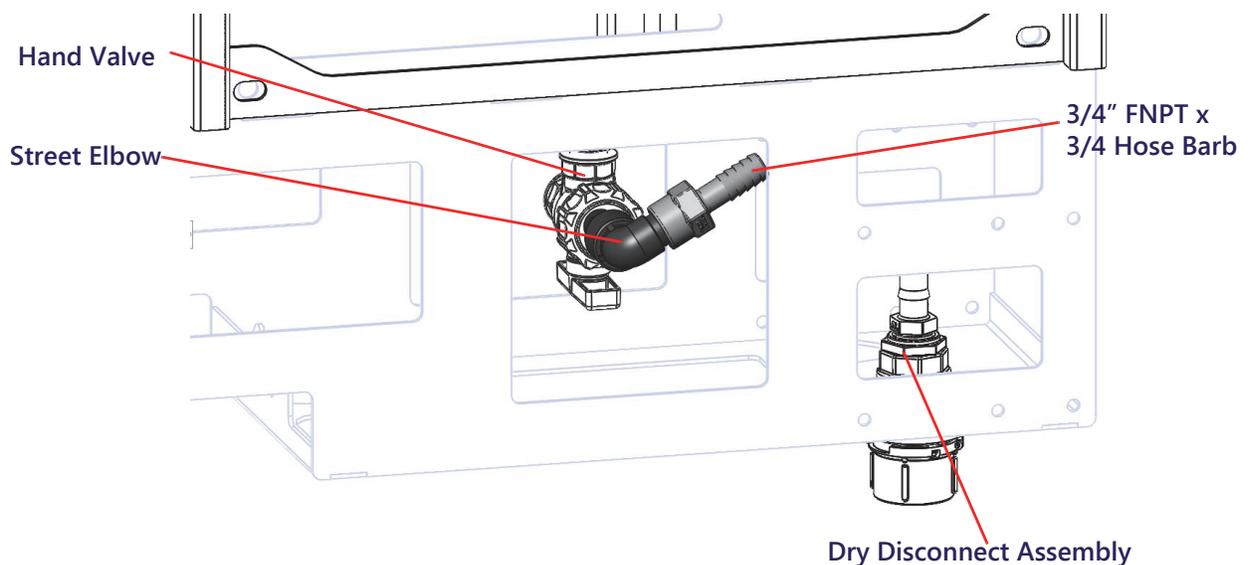
3. Insert the assembly into the injection frame weldment to one of the two locations shown.

FIGURE 20. Dry Disconnect Mount Locations



4. Use a 2" NPS flanged nut to secure the quick fill assembly.
5. Install the 3/4" NPT nipple, 3/4" NPT street elbow, and 3/4" FNPT x 3/4" hose barb adapter into the left port of the tank's hand valve.

FIGURE 21. Hand Valve Left Port Assembly



6. Use the supplied 3/4" tubing and hose clamps to connect the dry disconnect assembly to the tank valve.
7. Repeat step 1 through step 6 for the other tank.

## INSTALL RINSE VALVE

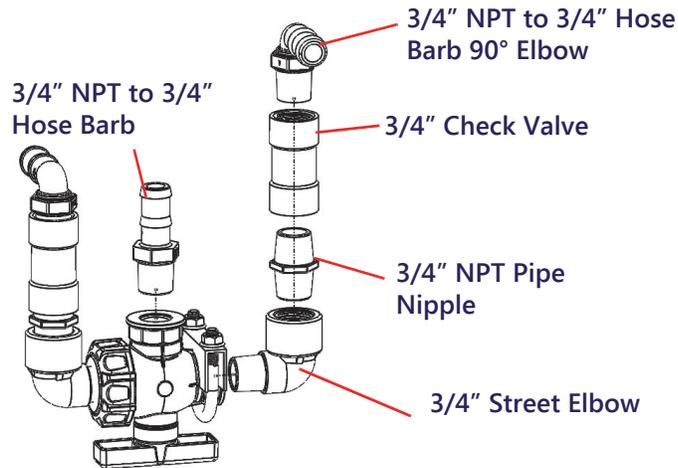
### MANUAL

1. Install a 3/4" NPT to 3/4" hose barb fitting into the center port of the manual rinse valve (P/N 334-0001-068).
2. Install the following components into each side port of the manual rinse valve.
  - a. 3/4" NPT Street Elbow
  - b. 3/4" NPT Pipe Nipple

- c. 3/4" Check Valve with the flow direction/arrow towards the valve body.
- d. 3/4" NPT to 3/4" hose barb 90° Elbow

**NOTE:** On systems with a single pump, replace the right hand hose barb elbow with a 3/4" pipe nipple and 3/4" FPT x 3/4" Hose Barb tee.

**FIGURE 22. Manual Rinse Assembly**



- 3. Use the 5/16" U-Bolt clamp to attach the manual rinse valve assembly to the bottom of the injection frame weldment.

**FIGURE 23. Rinse Valve Assembly Installed**



- 4. Run a hose from the 3/4" hose barb on the center port of the valve to the injection pump. Refer to Figure 17 on page 17.
- 5. Run a hose from the 3/4" hose barb on the main port to the open hose barb on the valve installed into the bottom of the injection concentrate tank.

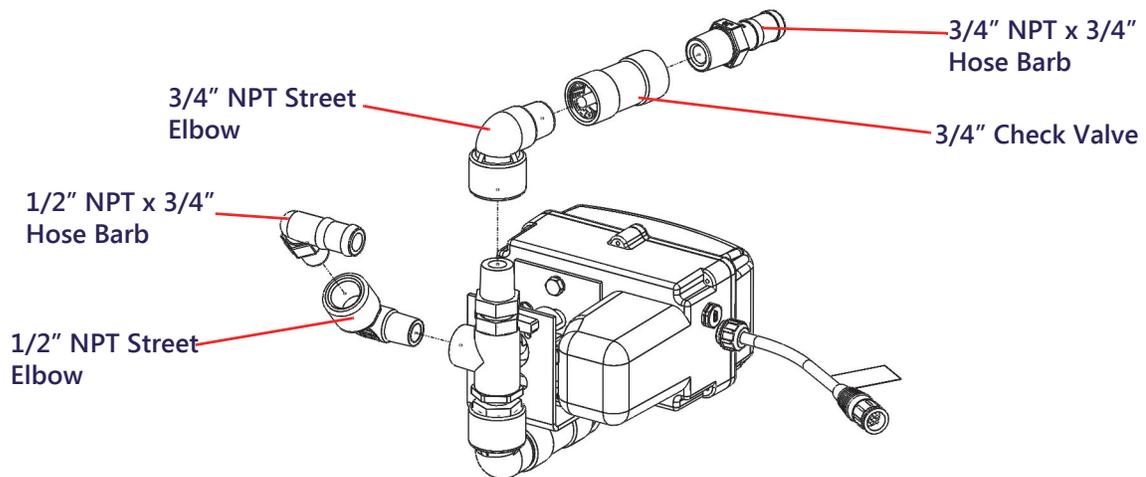
AUTO (OPTIONAL)

The Auto Rinse function is an optional upgrade for this kit. All of the fittings from the base kit can be used but the Auto Rinse Valve (P/N 063-0173-620) must be ordered separately.

1. Install the following fittings into the center (common) port of the valve:
  - a. 1/2" NPT Street elbow
  - b. 1/2" NPT x 3/4" hose barb 90° elbow.
2. Install the following items into the two other ports on the valve:
  - a. 1/2" NPT x 3/4" NPT nipple
  - b. 3/4" NPT Street elbow
  - c. 3/4" check valve with the flow direction/arrow pointing towards the valve body
  - d. 3/4" NPT x 3/4" Hose Barb fitting

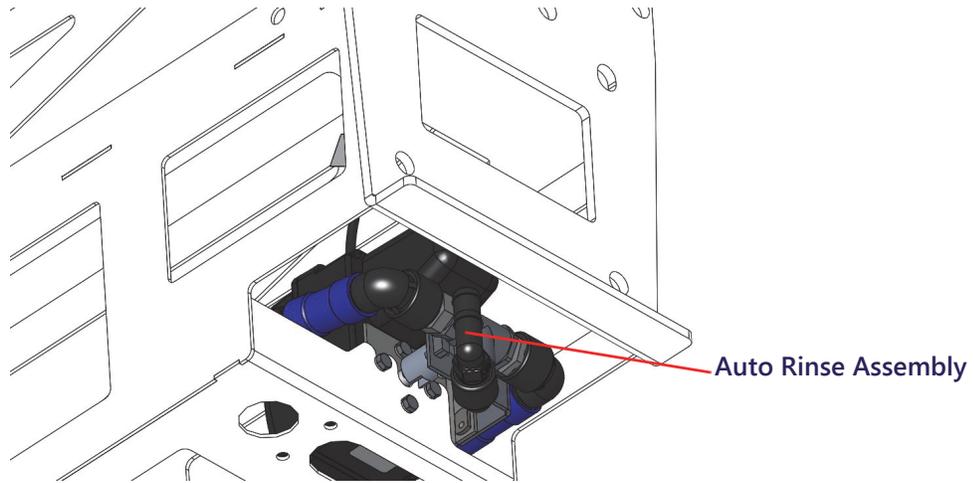
**NOTE:** Systems with one pump, replace the hose barb fitting on the main port with a 3/4" pipe nipple and 3/4" NPT x 3/4" Hose Barb tee.

**FIGURE 24. Auto Rinse Assembly**



3. Using the longer bolts provided in the kit, mount the Auto Rinse valve assembly to the injection frame weldment.

FIGURE 25. Installed Auto Rinse Assembly



4. Replace the three mounting bolts with the 1/4" x 5/8" stainless steel bolts provided in the kit.
5. Run a hose from the 3/4" hose barb on the center port to the inlet on the injection pump.

#### CONNECT RINSE TANK TO RINSE VALVE(S)

1. Install a 3/4" NPT x 3/4" hose barb 90° elbow into a 3/4" hose barb tee fitting.
2. Locate the 3/4" hose connected to the bottom of the sprayer's rinse tank.
3. Cut the sprayer's hose and install the provided tee.

FIGURE 26. Installed Tee



4. Connect a 3/4" hose to the open port on the tee fitting and route it to the open port on the manual or auto rinse valve.

MOTOR CONTROL NODE LED STATUS INDICATORS

The Sidekick Pro ICD integrated motor control node displays the status of the injection pump with the following node status indicators.

FIGURE 1. LED Status Indicators

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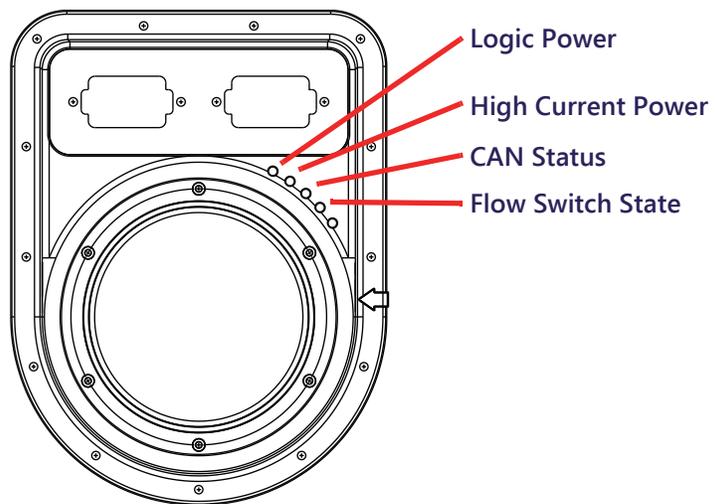


TABLE 1. LED Status Indicators

LED	Status Display
Logic Power	If logic power is present at the motor control node, the logic power indicator will be on.
High Current Power	If high current power is present at the motor control node, the high current power indicator will be on.
CAN Status	The CAN status indicator will flash once per second if the motor control node is communicating on the CANbus. If the motor control node cannot communicate via the CANbus, the CAN status indicator will flash four times per second.
Flow Switch State	The flow switch indicator will flash once per revolution of the injection pump shaft.

## ALARMS

TABLE 2. Sidekick Pro ICD Error Codes

Error Description	Possible Cause	Solution
Off Rate Alarm	<ul style="list-style-type: none"> <li>Difference between actual and target application rates has been greater than the entered value for the "Off Rate Percent" for more than 5 seconds</li> </ul>	<ul style="list-style-type: none"> <li>Required flow rate is out of range for the injection pump. Calculate the volume per minute required for the application and verify rate is within range of the injection pump.</li> </ul>
Low Tank Alarm	<ul style="list-style-type: none"> <li>Chemical supply tank is below the refill threshold level</li> </ul>	<ul style="list-style-type: none"> <li>Refill injection chemical supply tank and reset tank level in UT display.</li> </ul>
Flow Error Alarm	<ul style="list-style-type: none"> <li>Flow obstruction in inlet cartridges</li> <li>Chemical supply tank is out of chemical</li> </ul>	<ul style="list-style-type: none"> <li>Perform a pump calibration test. If the pump does not calibrate properly, remove the intake cartridges and perform pump maintenance to clear obstructions.</li> <li>Refill chemical supply tank and perform the pump priming procedure.</li> </ul>
Flow Error Alarm	<ul style="list-style-type: none"> <li>Flow obstruction in discharge cartridges</li> </ul>	<ul style="list-style-type: none"> <li>Perform a pump calibration test. If the pump does not calibrate properly, remove the discharge cartridges and perform pump maintenance to clear obstructions.</li> </ul>
Low Pressure Alarm	<ul style="list-style-type: none"> <li>Injection pressure is lower than carrier pressure</li> </ul>	<ul style="list-style-type: none"> <li>Perform a pump calibration test. If the pump does not calibrate properly, clean the injection pump inlet and discharge valves.</li> <li>Calibrate the pump transducer.</li> <li>Check lines between injection pump and in-line mixer.</li> <li>Verify all hand valves are in the correct position.</li> <li>Replace the pump transducer.</li> </ul>

Error Description	Possible Cause	Solution
Maximum Vacuum Alarm	<ul style="list-style-type: none"> <li>• Clogged pump strainer</li> <li>• Tubing or plumbing size restriction</li> <li>• Hand Valve Closed</li> <li>• Chemical too thick</li> </ul>	<ul style="list-style-type: none"> <li>• Clean pump strainer and check for obstructions in injection line between the pump inlet and chemical supply tank.</li> <li>• Verify the proper size of injection supply tubing is used between the chemical supply tank and pump inlet.</li> <li>• Check that hand valves are open and allow flow from the tank to the injection pump inlet</li> <li>• Dilute product in chemical supply tank. Some chemicals may not be applied using a direct injection system.</li> </ul>
Maximum Pressure Alarm	<ul style="list-style-type: none"> <li>• Clogged or restricted pump outlet supply lines</li> <li>• Tubing or plumbing size restriction</li> <li>• Faulty PSI transducer</li> <li>• Hand valve closed</li> <li>• Low injection pressure</li> </ul>	<ul style="list-style-type: none"> <li>• Check for restrictions or blockages in outlet supply lines. Flush the injection system to clear clogs and residue buildup.</li> <li>• Verify the proper size of injection outlet tubing is used between the point of injection and pump outlet.</li> <li>• Check hand valves are open and allow flow from the injection pump outlet port.</li> </ul>
Pressure Sensor Alarm	<ul style="list-style-type: none"> <li>• Boom pressure transducer not connected</li> <li>• Faulty boom pressure transducer</li> </ul>	<ul style="list-style-type: none"> <li>• If installed, check that the boom pressure transducer is installed and properly connected.</li> <li>• Replace boom pressure transducer.</li> </ul>
Motor/Encoder Alarm	<ul style="list-style-type: none"> <li>• No power to pump motor</li> <li>• Pump motor or encoder issue</li> </ul>	<ul style="list-style-type: none"> <li>• Verify that the high current LED on the injection pump node is lit.</li> <li>• Check motor connections. If these connections appear secure, return pump to a local Raven dealer for service.</li> </ul>
HC Power Alarm	<ul style="list-style-type: none"> <li>• Injection node not connected to high current power</li> </ul>	<ul style="list-style-type: none"> <li>• Verify high current breaker is not tripped.</li> <li>• Verify battery connections.</li> </ul>
Zero Speed Alarm	<ul style="list-style-type: none"> <li>• Faulty cabling, connection or speed sensor.</li> </ul>	<ul style="list-style-type: none"> <li>• Verify speed sensor and signal. Refer to the field computer operation manual for information on testing speed and flow cabling and troubleshooting the speed sensor.</li> </ul>
Low Limit Alarm	<ul style="list-style-type: none"> <li>• Implement speed or width is insufficient to maintain pump rate and the pump "low limit" rate has become active</li> </ul>	<ul style="list-style-type: none"> <li>• Increase vehicle speed.</li> <li>• The pump will maintain the programmed low limit rate. If this rate is the desired lowest injection rate, no action is required. If the current field operation requires a lower rate of injection, reduce the programmed low limit setting to allow the pump to reduce the rate of injection. Refer to the console or field computer operation manual for additional information on the low limit feature.</li> </ul>



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# CHAPTER

# REPLACEMENT PARTS

## 5

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### REPLACEMENT PARTS

**TABLE 1. Pumps and Cabling**

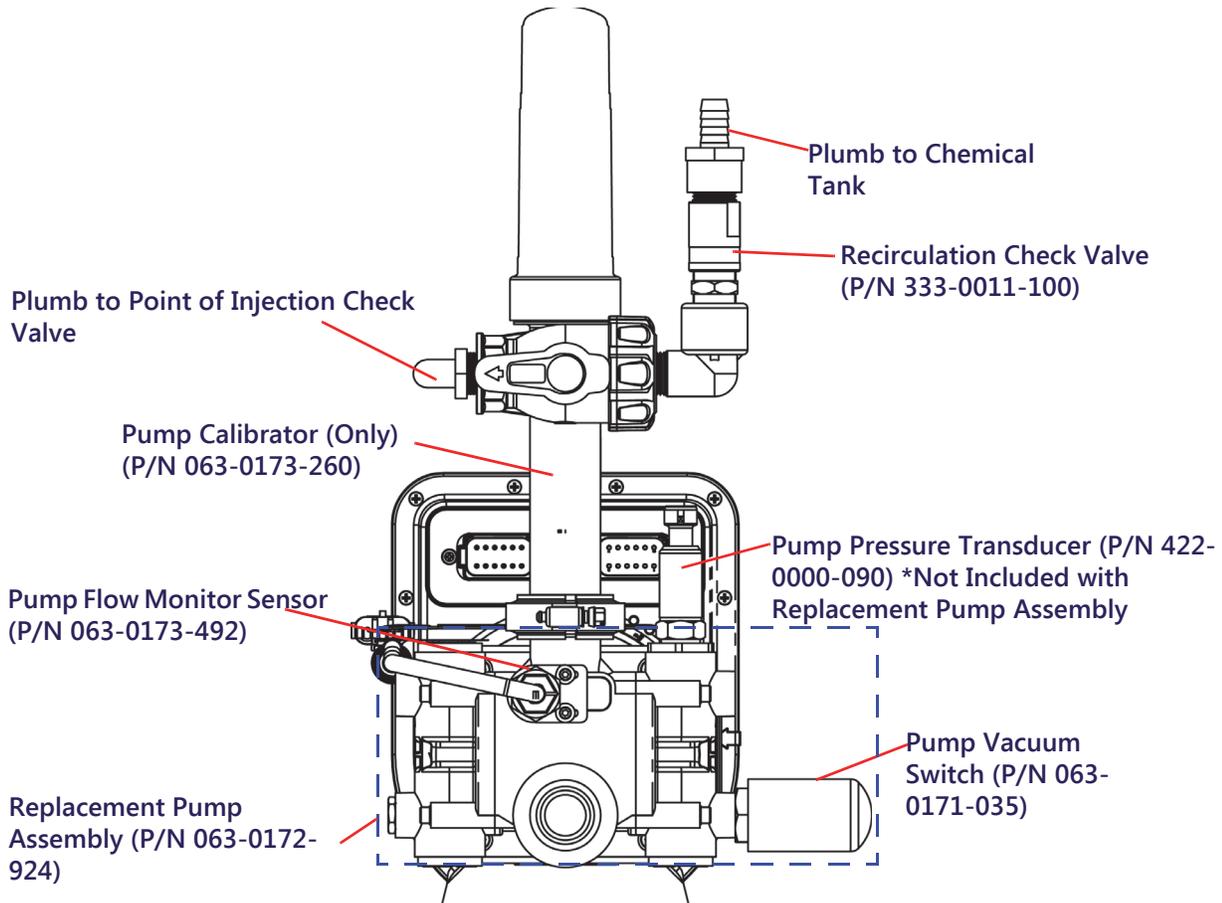
Item Description	Raven Part Number
Vacuum Switch	063-0171-035
Exhaust Check (No Transducer)	063-0172-504
Calibrator, Pump	063-0172-822
Pump Assembly (no Motor or Node)	063-0172-924
Calibration Assembly	063-0173-260
Exhaust Check (Transducer)	063-0173-310
Flow Sensor	063-0173-492
Intake Check Valve	063-0172-677
Calibrator Cover	106-0159-637
Pump Seal Kit	117-0159-987
Valve, Check, 1/2" with Bleed Hole	333-0011-100
Pressure Transducer	422-0000-090
Pump, Sidekick Pro ICD, 5 to 200 oz/min	063-0173-769
Pump, Sidekick Pro ICD, 1 - 40 OZ	063-0173-768

**TABLE 2. Plumbing**

Item Description	Raven Part Number
Mixer, 3" with 3" Check Valve, Flanged	063-0173-698
Cover, Tank, Vented Female Threaded ARAG	118-0159-043
Tank, 50 Gallon	118-0159-059
Coupler, Dry Disconnect, 1", Banjo, Female	333-0006-035
Coupler, Dry Disconnect, 1", Banjo, Male	333-0006-036
Valve, Check, 3/4" Delrin, .5 PSI	333-0011-087
Valve, Check, EXTR 1/2" Point of Injection, 12 PSI	333-0011-102
3" Full Port Manifold Check Valve	333-0011-105
Strainer, 1/2" MNPT, Polypropylene, 20 Mesh	333-9000-060
Valve, 3 Way, Poly 1/2" NPT	334-0001-037

Item Description	Raven Part Number
Fitting, 3 Way Ball Valve, 3/4" NPT	334-0001-068
Valve, 3 Way, Poly 1/2" NPT Continuous Flow	334-0001-054

**FIGURE 1. Injection Pump Components**



**NOTE:** Refer to the flow monitor specific documentation for additional adjustment information.

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CHAPTER

SYSTEM DIAGRAMS

**6**

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ELECTRICAL

Drawings start on next page.

FIGURE 1. Boom Kit Diagram

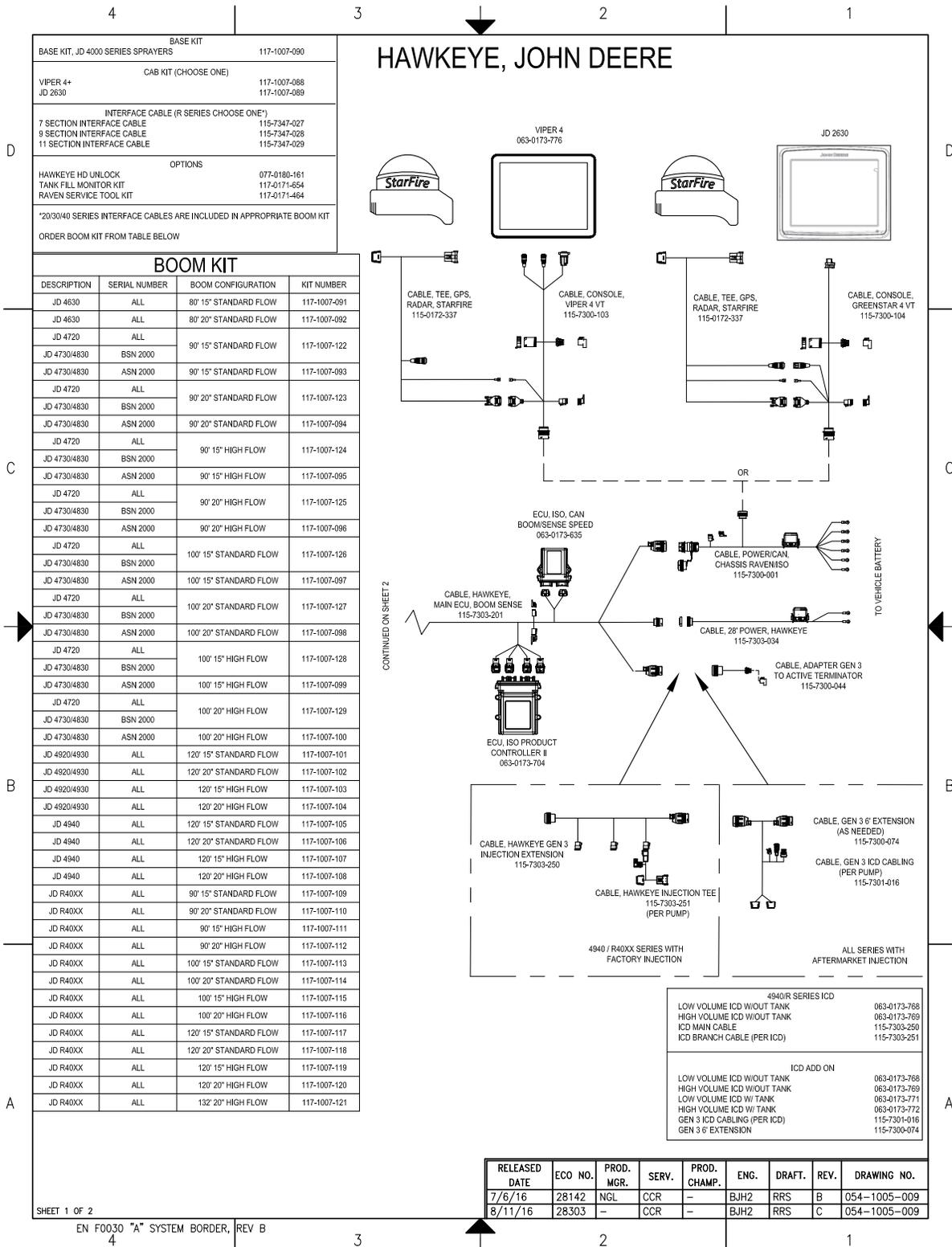


FIGURE 2. Machine Interface Cabling

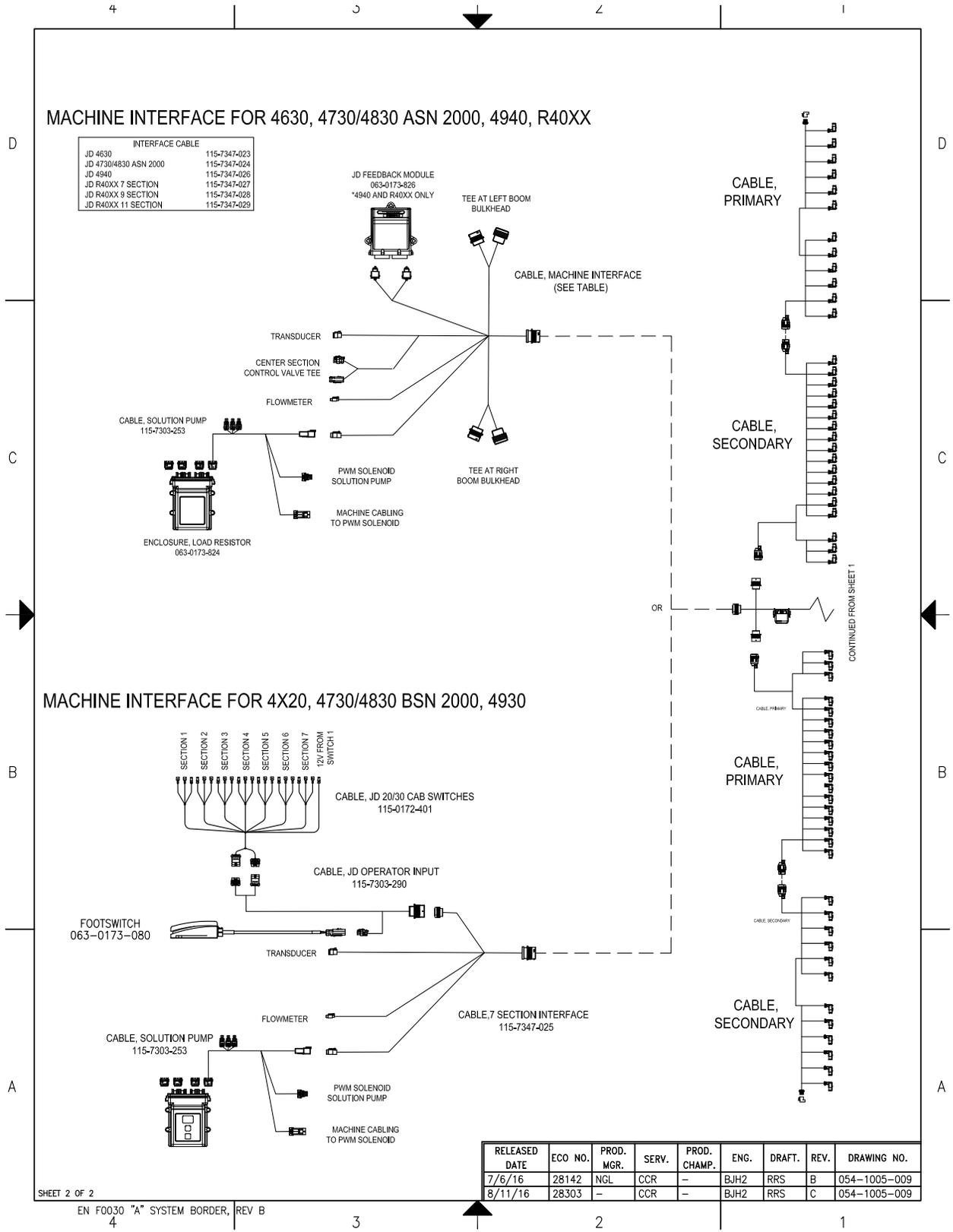
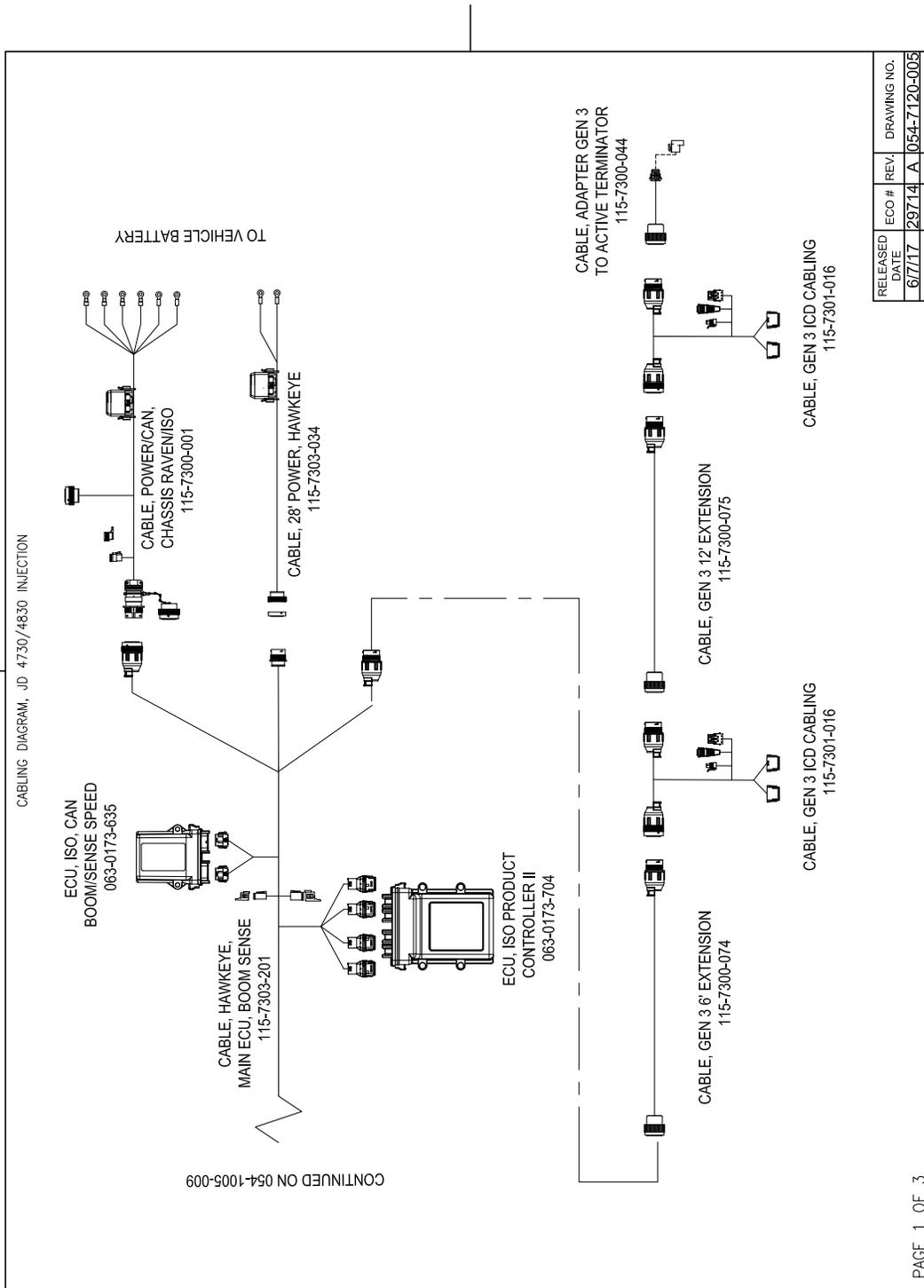


FIGURE 3. JD 4730/4830 Injection



PLUMBING

FIGURE 4. JD 4730/4830 Dual Pump

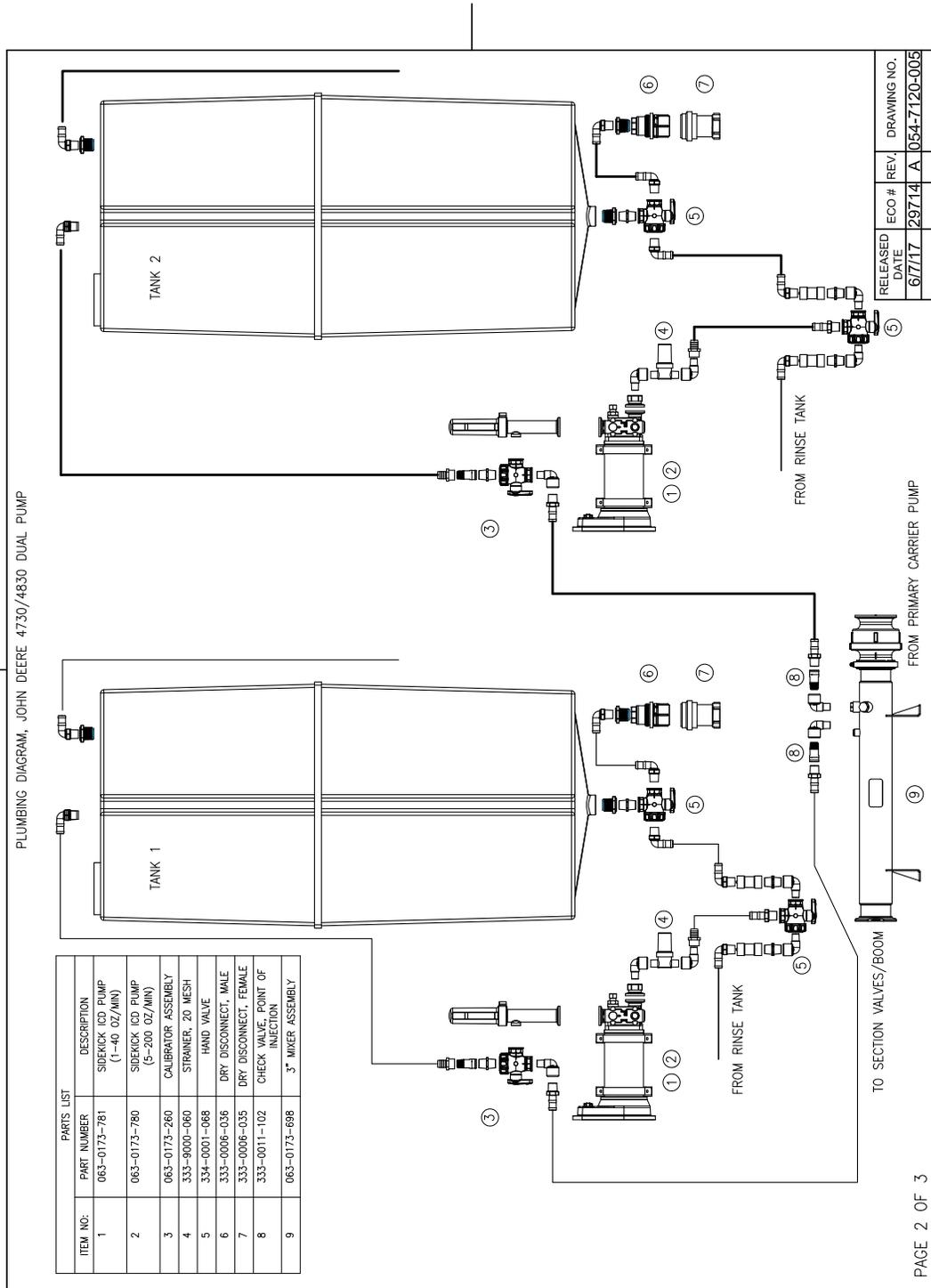
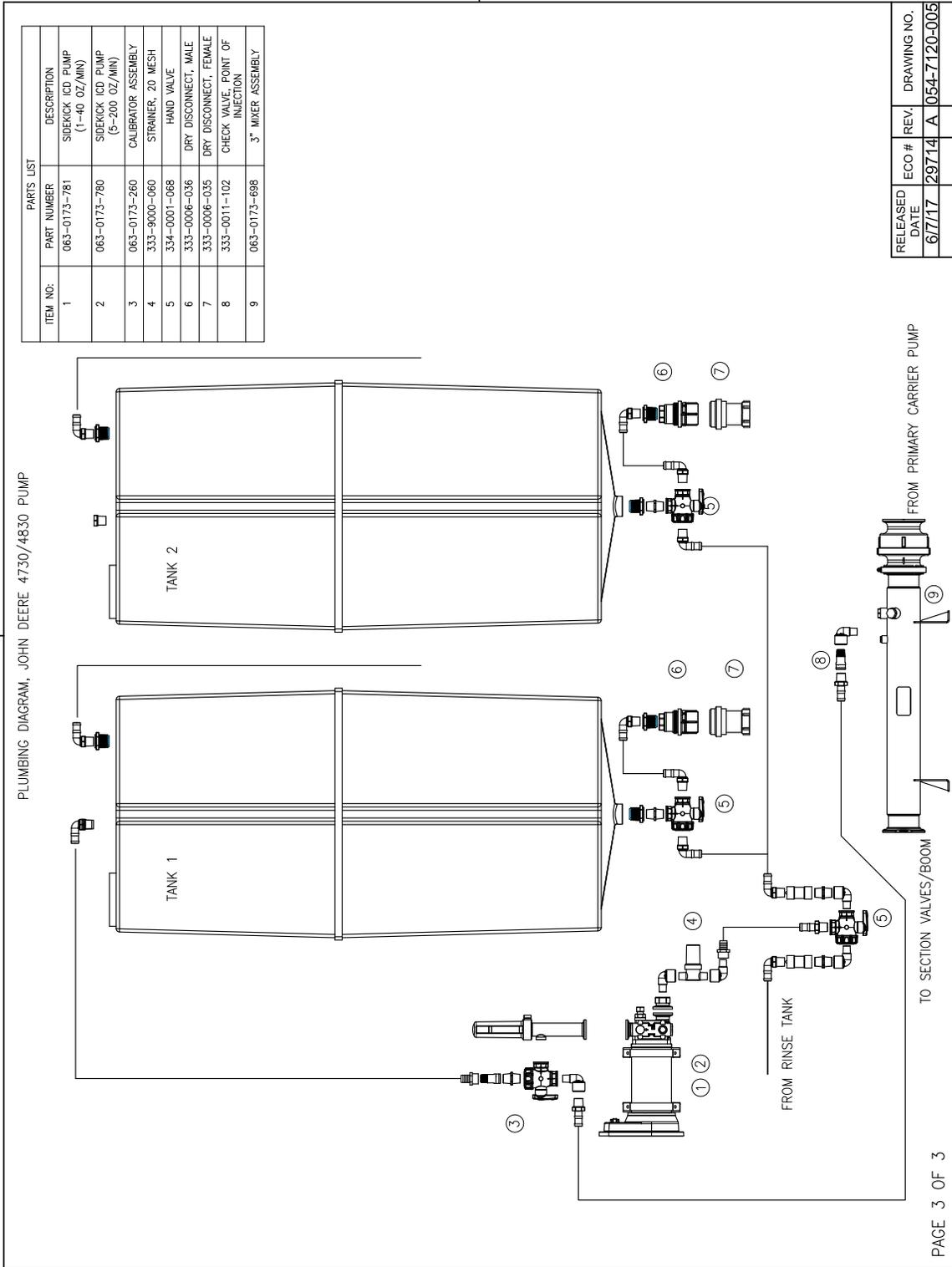


FIGURE 5. JD 4730/4830 Pump Plumbing



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