

Hawkeye® John Deere Sprayers Installation Manual

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CHAPTER

1

IMPORTANT SAFETY INFORMATION

NOTICE

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

- 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 retain a safe working distance from other individuals. The operator is responsible for disabling Hawkeye when the safe working distance has been diminished.
- Ensure Hawkeye 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 Hawkeye system ECUs and control console before jump starting the vehicle or welding on any part of the implement or machine.

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

IMPORTANT: Avoid directly spraying electrical components and connections with high pressure water. High pressure water sprays can penetrate seals and cause electrical components to corrode or otherwise become damaged. When performing maintenance:

- Inspect all electrical components and connections for damage or corrosion. Repair or replace components, connections, or cable as necessary.
- Ensure connections are clean, dry, and not damaged. Repair or replace components, connections, or cable as necessary.
- Clean components or connections using low pressure water, pressurized air, or an aerosol electrical component cleaning agent.
- Remove visible surface water from components, connections, or seals using pressurized air or an aerosol electrical component cleaning agent. allow components to dry completely before reconnecting cables.

INSTRUCTIONS FOR HOSE ROUTING

The word "hose" 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 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

CHAPTER

INTRODUCTION

2

Hawkeye is a pressure based nozzle product control system designed for precise sprayer application in a variety of conditions. Pressure based application provides accurate control of droplet size which reduces spray drift during field operations.

Hawkeye is compatible with the ISOBUS communication platform which allows the system to work with most ISO Virtual Terminals (VTs) and Task Controllers on the market. This manual is intended to provide installation instructions on the following equipment:

TABLE 1. John Deere Make and Model Information

Make	Model	Boom Configuration
John Deere	4630/R4023	80' 15" & 20" Standard Flow
John Deere	4720, 4730, 4830	90' 15" & 20" Standard and High Flow
		100' 15" & 20" Standard and High Flow
John Deere	4920, 4930	120' 15" & 20" Standard and High Flow
John Deere	4940	120' 15" & 20" Standard and High Flow
John Deere	R4030, R4038, R4045	90' 15" & 20" Standard and High Flow
		100' 15" & 20" Standard and High Flow
		120' 15" & 20" Standard and High Flow

NOTE: Kits for custom boom configuration available upon request.

Standard and High Flow boom configuration is in reference to wetboom plumbing.

FIGURE 1. John Deere 30/40/R



OVERVIEW OF THE INSTALLATION PROCESS

This manual provides information for installing the Hawkeye system on JD 30/40/R series sprayers. Most of the sections in this manual are generic to all machines but the ECU Bracket mounting information is equipment specific. Refer to the appropriate ECU mounting sections for your specific piece of equipment when installing those components.

The recommended process for installing the Hawkeye nozzle control system is as follows:

1. Check Hawkeye kit contents. See the Kit Contents section on page 7.
2. Replace existing strainer with an 80 mesh (or finer) strainer for use with the Hawkeye nozzle control system. See Chapter 3, Installation Preparation.
3. Remove spray tips and flush each section individually for a minimum of 20 seconds to thoroughly flush the boom.
4. Mount Hawkeye nozzle control valves. See Chapter 8, Nozzle and Nozzle Cable Installation.
5. Mount the Hawkeye product controller II ECUs. Refer to:
 - Chapter 5, ECU Bracket Installation
 - Chapter 6, R Series ECU Bracket Installation
 - Chapter 6, ECU Boom Feedback Module Installation.
6. Route and connect chassis cable. See the Boom Cable Routing and Connection section on page 33.

REQUIRED COMPONENTS

The following components are required with the Hawkeye nozzle control system:

- Raven compatible flow meter
- Raven compatible pressure transducer
- 80 mesh (or finer) strainer

NOTE: Do not use air induction tips with the Hawkeye nozzle control system. A fan or cone style spray tip is required for the Hawkeye system to operate properly.

TOOLS AND MATERIALS NEEDED

- SAE and metric sized wrenches and tools
- Drill bit set and drill
- Dielectric grease (supplied)
- Cable ties (supplied)

POINT OF REFERENCE



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

KIT CONTENTS

Kit contents vary based on boom width, spacing, and model. Please familiarize yourself with the kits shipped for your installation and the kit components before starting the installation.




Every Hawkeye comes with a service kit. Depending on the nozzle manufacturer, you will be one of the service kits listed below.

FIGURE 2. Hawkeye Service Kit Components (P/N 117-1005-057)

Picture	Item Description	Part Number	Quantity
	Hawkeye Nozzle Control Valve, ARAG/Hydro	063-0173-673	1
Not Pictured	Kit, Seal, Hawkeye Valve, ARAG/Hydro	117-1005-051	3
Not Pictured	Hawkeye Valve Jumper	115-7303-139	2
	Hawkeye Valve Tool	321-0000-457	2

Picture	Item Description	Part Number	Quantity
	Hawkeye Fly Nut Wrench	321-0000-459	1
Not Pictured	O-Ring, Viton	219-1005-115	1

TABLE 2. Hawkeye Service Kit Components (P/N 117-1005-058)

Picture	Item Description	Part Number	Quantity
	Hawkeye Nozzle Control Valve, Wilger	063-0173-674	2
Not Pictured	Kit, Seal, Hawkeye Valve, Wilger	117-1005-051	2
Not Pictured	Hawkeye Valve Jumper	115-7303-139	2
	Hawkeye Valve Tool	321-0000-457	2
	Hawkeye Fly Nut Wrench	321-0000-459	1
Not Pictured	O-Ring, Viton	219-1005-116	1

UPDATES

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

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

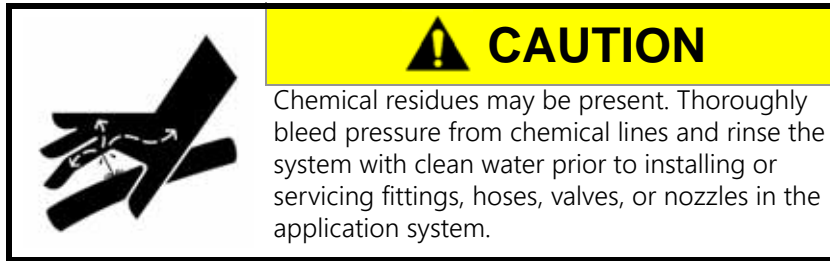
techwriting@ravenind.com

- Hawkeye® John Deere Sprayers Installation Manual
- P/N 016-0171-620 Rev. E
- 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.

Perform the following procedure to prepare the implement for installation of the Hawkeye nozzle control system.



1. Rinse and fill the tank with clean water.
2. Move the equipment to an open area suitable for testing application system operation and rinsing the boom plumbing.
3. Unfold the boom and enable the application control system. Verify that all control hardware (e.g. control valves, section valves, etc.) and spray tips function as expected.
4. Operate the system until any chemicals are rinsed from the boom supply lines.
5. Disable the application control system and de-pressurize the boom.
6. Replace existing carrier line strainer(s) with an 80 mesh strainer. An 80 mesh (or finer) strainer is required for use with the Hawkeye nozzle control system.
7. If turret style nozzle bodies are installed on the implement, rotate the turret to an open spray position, if available. If an open spray position is not available, or for nozzle bodies without a turret, remove the spray tips from the boom and set aside for later use.
8. Enable the application control system and run clean water for at least 20 seconds to rinse any remaining debris from the boom plumbing and nozzle bodies.
9. Remove the cap and diaphragm from the nozzle bodies.

FIGURE 1. Nozzle Body Cap and Diaphragm Removed



Cap and
Diaphragm
Removed

CHAPTER

4

CAB COMPONENT INSTALLATION

INSTALLING CAB COMPONENTS

NOTE: A second field computer must be installed in the cab for the system to function. This can be either a Raven Viper 4 or a John Deere 2630.

This section uses components included in the box marked 117-1007-088 (Viper 4 systems) or 117-1007-089 (John Deere 2630 systems).

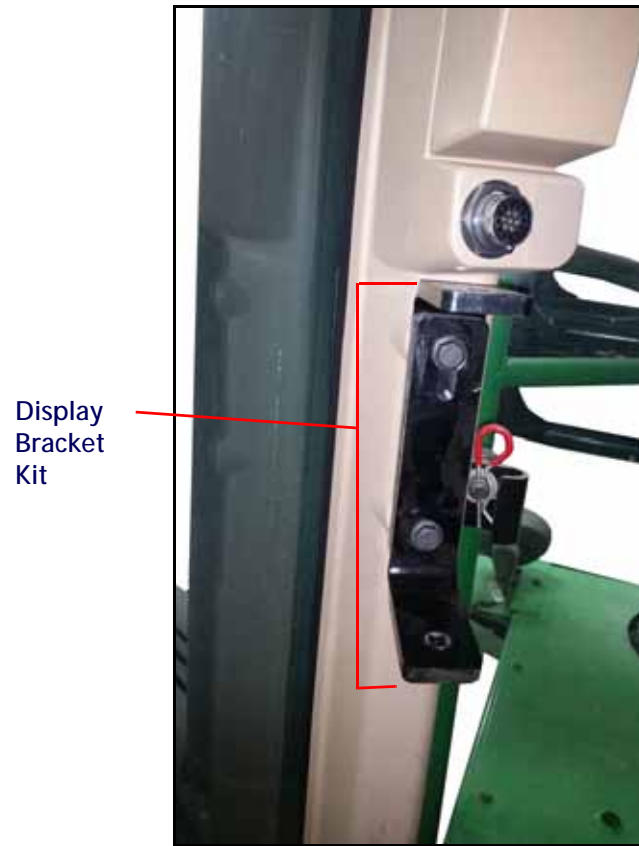
NOTE: These instructions assume the secondary monitor will be mounted to the front pillar along with the primary monitor. These machines offer multiple monitor mounting locations. Any location may be used. Cable routing may vary slightly based on the monitor installation location.

INSTALLATION

1. Remove the display mounted to the front right corner post in the cab.
2. Remove the existing display bracket from the corner post.
3. Open the PF90385 display bracket kit. Attach both monitor brackets to the corner post using the M10 x 35 mm flanged hex head bolts. Refer to Figure 1 on page 14.

NOTE: If mounting only one monitor bracket use the M20 x 20 mm flanged hex head bolt supplied in the PF90385.

FIGURE 1. Display Bracket Installed



4. Use the original hardware to reinstall the primary monitor on the lower bracket.
5. Use the components from the PF90385 to install the adjustable mounting bar onto the upper bracket.
 - If using a John Deere 2630 as the VT, use the display adapter included in PF90385.
 - If using a Viper 4 use the 1.5" RAM mounting ball and 5/16" flanged nut. Refer to Figure 2 on page 15.

FIGURE 2. John Deere 2630 and RAM Mounting Ball



6. Attach the secondary display to the upper bracket.

FIGURE 3. Installed Monitors



7. Locate the 115-0172-337 cable (StarFire tee cable).

8. Disconnect the StarFire cable from the machine's connector located under the cab roof near the StarFire receiver.
9. Connect the StarFire receiver to the mating connector on the StarFire tee cable.
10. Connect the other end of the tee back into the StarFire port under the cab roof of the machine.

FIGURE 4. StarFire Connection



StarFire Connection

11. Use cable clamps supplied in the kit and zip ties to secure the cable to the roof of the cab.
12. Route the cable down along the right rear corner of the cab. Secure the cable with cable clamps.
13. Route the cable into the cab through the grommet at the bottom of the rear window.

FIGURE 5. Cable Routing



14. Locate the console cable (115-7300-103 for Viper 4, 115-73003-104 for John Deere 2630) and connect it to the back of the appropriate display.
15. Pull back the floor mat from the right side of the cab and route the console cable towards the rear window. Refer to Figure 6 on page 17.

FIGURE 6. Cable Routing



16. Connect the console cable to the StarFire tee cable. Use the following table to make the proper connections.

TABLE 1. StarFire Tee Cable Connections

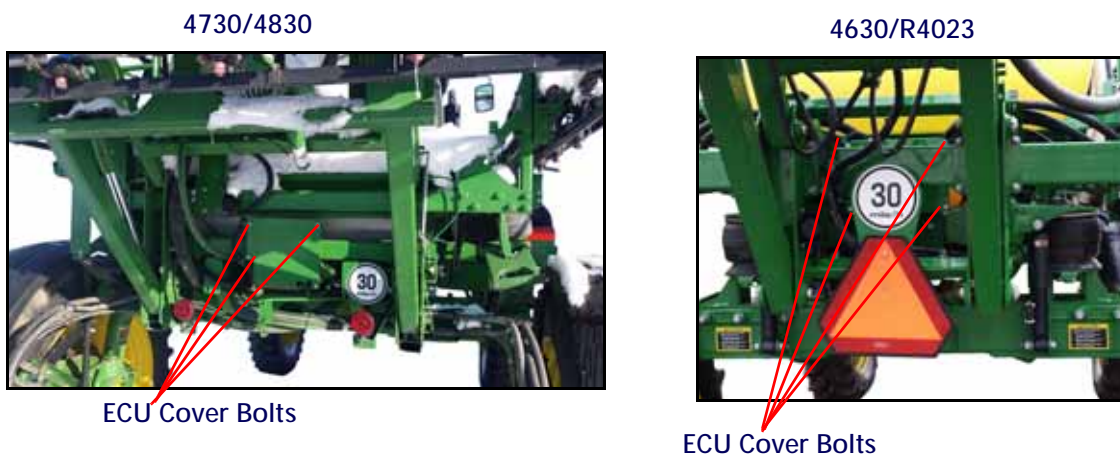
115-0172-337 Cable	Connect to:	117-7300-103 Cable	or	115-7300-104 Cable
Serial GPS		Port 1/DGPS In		Port 1/DGPS In
Simulated Radar		No Connection		Radar
Switched Power		IGN PWR		IGN PWR

17. Leave the connector labeled "To Chassis Harness" on the console cable near the rear window. The connector will be used later in the installation.
18. Ensure all cables are routed away from pinch points and replace the floor mat.

4X30 ECU MOUNTING

1. Locate the OEM ECU cover at the rear of the machine. Remove the three bolts along the top and left sides.

FIGURE 1. OEM ECU Cover on 4730/4830 Machines



2. Attach the provided ECU bracket to the cover using the three bolts removed in step 1.

FIGURE 2. Mounted ECU Bracket



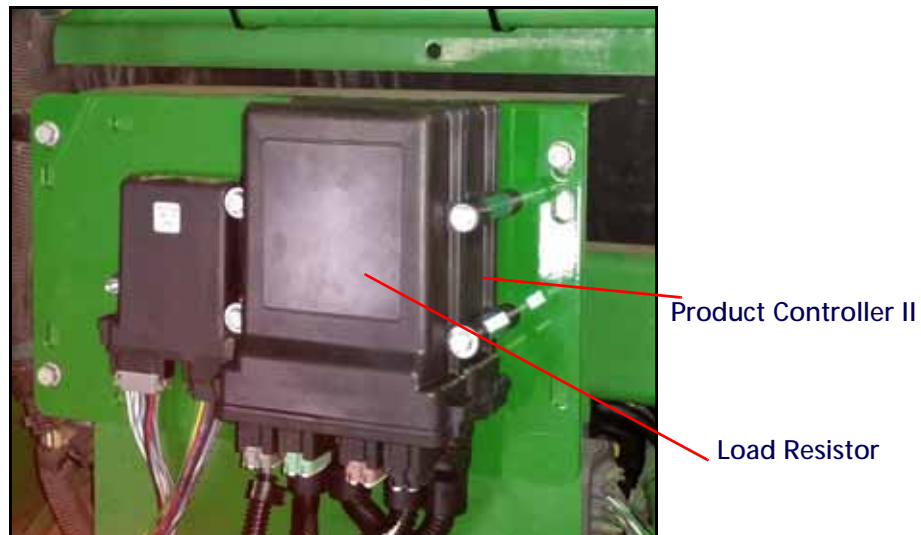
3. Secure Product Controller II (063-0173-704) to the bracket using the provided 1/4" - 20 x 1.5" hex standoffs.
4. Secure the Boom Sense/Speed Node to the bracket using the 1/4" x 20 serrated flange nuts.

FIGURE 3. Installed PC II and BoomSense Node



5. Secure the Load Resistor Enclosure (063-0173-824) on top of the Product Controller II using the 1/4" - 20 x 1.25" hex bolts and 1/4" washers.

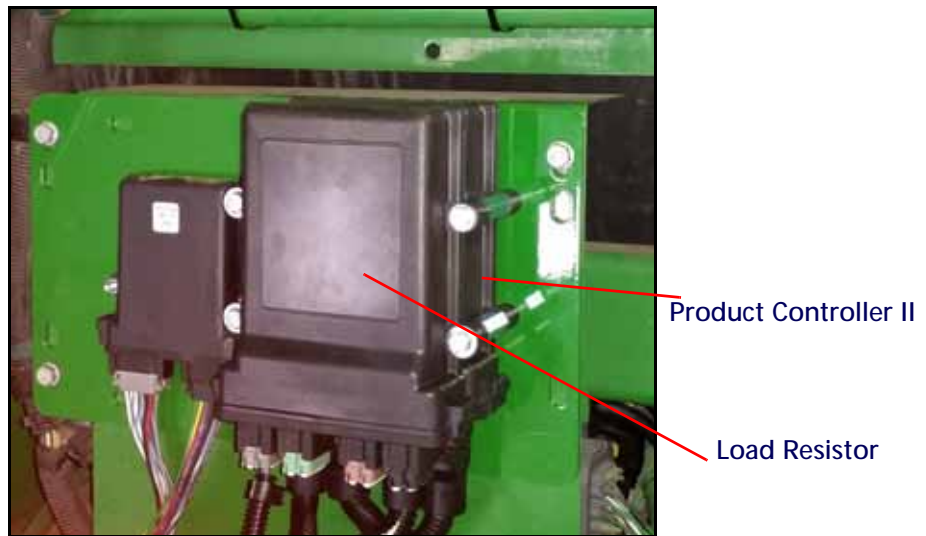
FIGURE 4. Load Resistor Mounted on PC II



4930/4940 AND R 40XX ECU MOUNTING

1. Secure Product Controller II (P/N 060-0173-704) to the bracket using the provided 1/4" - 20 x 1.5" hex standoffs.
2. Secure the Boom Sense/Speed node to the bracket using the 1/4" x 20 serrated flange nuts.
3. Secure the Load Resistor Enclosure (P/N 063-0173-824) on top of the Product Controller II using the 1/4" - 20 x 1/25" hex bolts and 1/4" washers.

FIGURE 5. Load Resistor Mounted on PC II



4. Identify the ECU mounting location near the right rear wheel.

FIGURE 6. ECU Mounting Bracket Location



5. Mount the ECU bracket with the ECUs facing the front of the machine. Use the provided U-bolts and 3/8" - 16 serrated flange nuts.



FIGURE 7. Mounted ECUs



MOUNTING THE BOOM FEEDBACK ECU TO THE MACHINE

The directions in this section apply to 4940 and R40XX machines only. If you are not working on one of the listed machines, continue to the next section in the manual.

BOOM FEEDBACK INSTALLATION

1. Identify a location near the middle of the center rack to mount the boom feedback ECU bracket. The suggested location for 40 and R series sprayers are shown below.

FIGURE 1. R Series Installation



NOTE: Mount the controller so the electrical connections are facing down.

2. Mount the ECU bracket using the hardware already on the machine. If needed, there are extra bolts, nuts, and washers provided in the kit.
3. Attach the boom feedback ECU to the bracket using the supplied 3/8" x 1.25" bolts and lock nuts. The images below show the bracket and ECU installation on 30/40 and R series machines.

FIGURE 2. R Series Bracket and ECU Installation



FIGURE 3. 40 Series Installation

ECU Mounting Hole



NOTE: On 40 series machines, use the hole indicated to attach the ECU and bracket to the machine. Use the bracket as a template to drill an additional hole where shown. Use the provided 5/16" bolt, washers, and lock nut to secure.

FIGURE 4. Completed Installation



CHASSIS CABLE ROUTING AND CONNECTION

BEST PRACTICES AND RECOMMENDATIONS

- Do not connect battery leads until all cables are installed and connected.
- Route chassis cabling along existing cabling or plumbing to help avoid pinch points or stretching the cable during normal equipment operation.

CHASSIS AND HAWKEYE POWER CABLE ROUTING

1. Locate the chassis cable shipped with the kit.
2. Starting under the sprayer, route the connector labeled "To Cab Cable" behind the cab and through the grommet at the bottom of the rear window.
3. Connect the connector labeled "To Cab Cable" to the "To Chassis Harness" installed in Chapter 4, Cab Component Installation.

FIGURE 1. Connected Chassis Harness Cable



4. Route the end of the cable with the ring terminals towards the battery compartment near the front-left side of the sprayer.
5. Carefully route the ring terminals into the battery compartment. Avoid contacting the battery terminals.
6. Starting near the Cab Cable branch in on the chassis harness, route the ring terminal end of the Hawkeye power cable to the battery compartment.

7. Connect the black leads on the chassis harness and the Hawkeye power cable to the ground terminal in the battery compartment. If the machine has a battery disconnect on the ground side, connect the leads after the disconnect.

FIGURE 2. Grounded Chassis Cable and Hawkeye Power Cables



8. Connect the positive leads directly to the positive power leads on the battery.

FIGURE 3. Chassis and Power Cables Connected to Battery



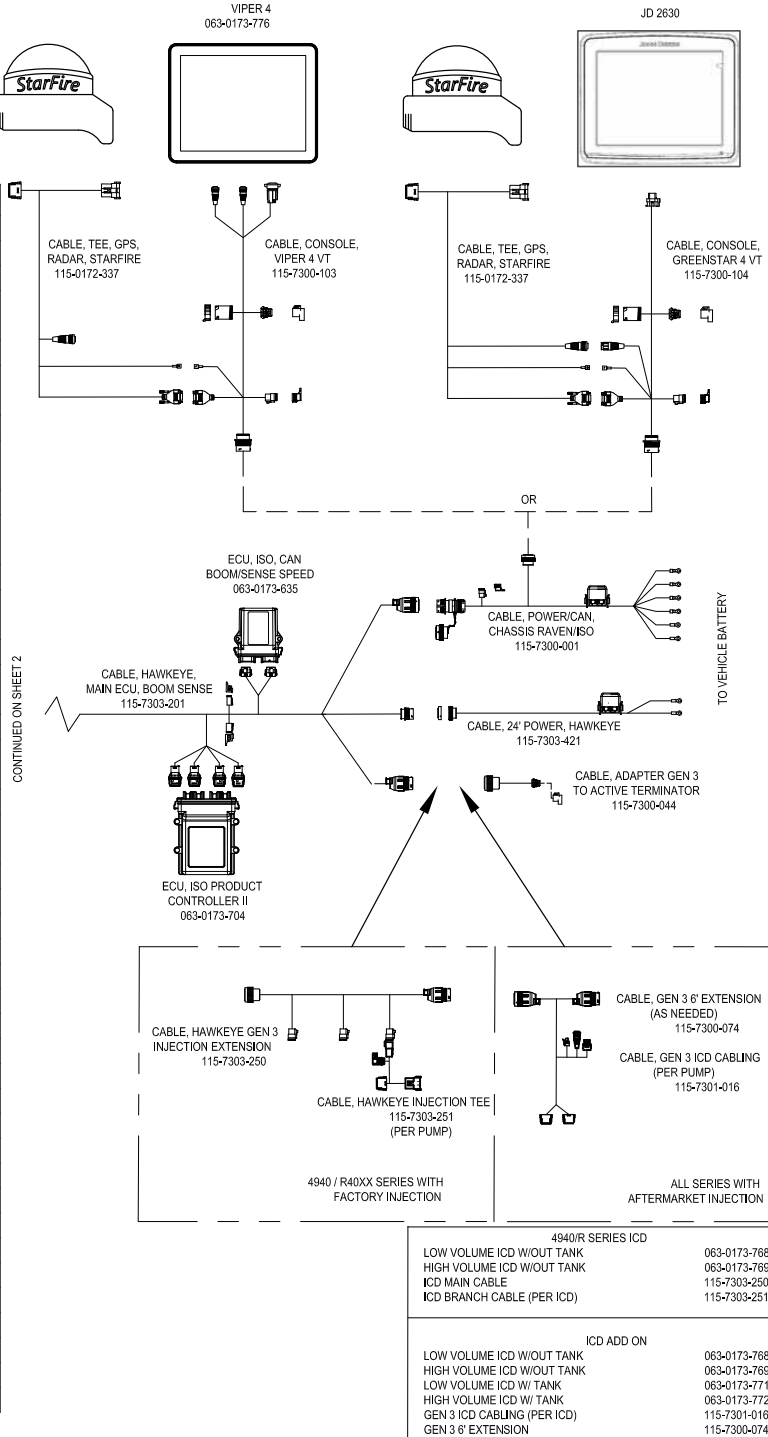
9. Route the remaining end of the Hawkeye Power and Chassis cables to the Product Controller II installed earlier.

SYSTEM DIAGRAMS

BASE KIT	
BASE KIT, JD 4000 SERIES SPRAYERS	117-1007-090
CAB KIT (CHOOSE ONE)	
VIPER 4+ JD 2630	117-1007-088 117-1007-089
INTERFACE CABLE (R SERIES CHOOSE ONE)	
7 SECTION INTERFACE CABLE	115-7347-027
9 SECTION INTERFACE CABLE	115-7347-028
11 SECTION INTERFACE CABLE	115-7347-029
OPTIONS	
HAWKEYE HD UNLOCK	077-0180-161
TANK FILL MONITOR KIT	117-0171-654
RAVEN SERVICE TOOL KIT	117-0171-464
*20/30/40 SERIES INTERFACE CABLES ARE INCLUDED IN APPROPRIATE BOOM KIT	
ORDER BOOM KIT FROM TABLE BELOW	

HAWKEYE, JOHN DEERE

BOOM KIT			
DESCRIPTION	SERIAL NUMBER	BOOM CONFIGURATION	KIT NUMBER
JD 4630	ALL	80' 15" STANDARD FLOW	117-1007-091
JD 4630	ALL	80' 20" STANDARD FLOW	117-1007-092
JD 4720	ALL	90' 15" STANDARD FLOW	117-1007-122
JD 4730/4830	BSN 2000	90' 15" STANDARD FLOW	117-1007-093
JD 4720	ALL	90' 20" STANDARD FLOW	117-1007-123
JD 4730/4830	BSN 2000	90' 15" HIGH FLOW	117-1007-124
JD 4730/4830	ASN 2000	90' 15" HIGH FLOW	117-1007-095
JD 4720	ALL	90' 20" HIGH FLOW	117-1007-125
JD 4730/4830	BSN 2000	90' 20" HIGH FLOW	117-1007-096
JD 4720	ALL	100' 15" STANDARD FLOW	117-1007-126
JD 4730/4830	BSN 2000	100' 15" STANDARD FLOW	117-1007-097
JD 4720	ALL	100' 20" STANDARD FLOW	117-1007-127
JD 4730/4830	ASN 2000	100' 20" STANDARD FLOW	117-1007-098
JD 4720	ALL	100' 15" HIGH FLOW	117-1007-128
JD 4730/4830	BSN 2000	100' 15" HIGH FLOW	117-1007-099
JD 4730/4830	ASN 2000	100' 15" HIGH FLOW	117-1007-100
JD 4720	ALL	100' 20" HIGH FLOW	117-1007-129
JD 4730/4830	BSN 2000	100' 20" HIGH FLOW	117-1007-101
JD 4920/4930	ALL	120' 15" STANDARD FLOW	117-1007-102
JD 4920/4930	ALL	120' 20" STANDARD FLOW	117-1007-103
JD 4920/4930	ALL	120' 15" HIGH FLOW	117-1007-104
JD 4940	ALL	120' 15" STANDARD FLOW	117-1007-105
JD 4940	ALL	120' 20" STANDARD FLOW	117-1007-106
JD 4940	ALL	120' 15" HIGH FLOW	117-1007-107
JD 4940	ALL	120' 20" HIGH FLOW	117-1007-108
JD R40XX	ALL	90' 15" STANDARD FLOW	117-1007-109
JD R40XX	ALL	90' 20" STANDARD FLOW	117-1007-110
JD R40XX	ALL	90' 15" HIGH FLOW	117-1007-111
JD R40XX	ALL	90' 20" HIGH FLOW	117-1007-112
JD R40XX	ALL	100' 15" STANDARD FLOW	117-1007-113
JD R40XX	ALL	100' 20" STANDARD FLOW	117-1007-114
JD R40XX	ALL	100' 15" HIGH FLOW	117-1007-115
JD R40XX	ALL	100' 20" HIGH FLOW	117-1007-116
JD R40XX	ALL	120' 15" STANDARD FLOW	117-1007-117
JD R40XX	ALL	120' 20" STANDARD FLOW	117-1007-118
JD R40XX	ALL	120' 15" HIGH FLOW	117-1007-119
JD R40XX	ALL	120' 20" HIGH FLOW	117-1007-120
JD R40XX	ALL	132' 20" HIGH FLOW	117-1007-121



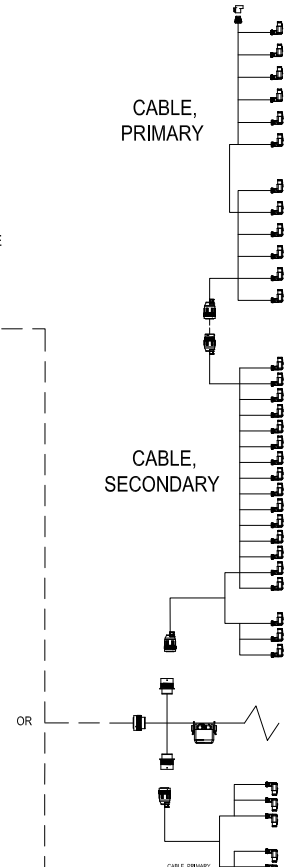
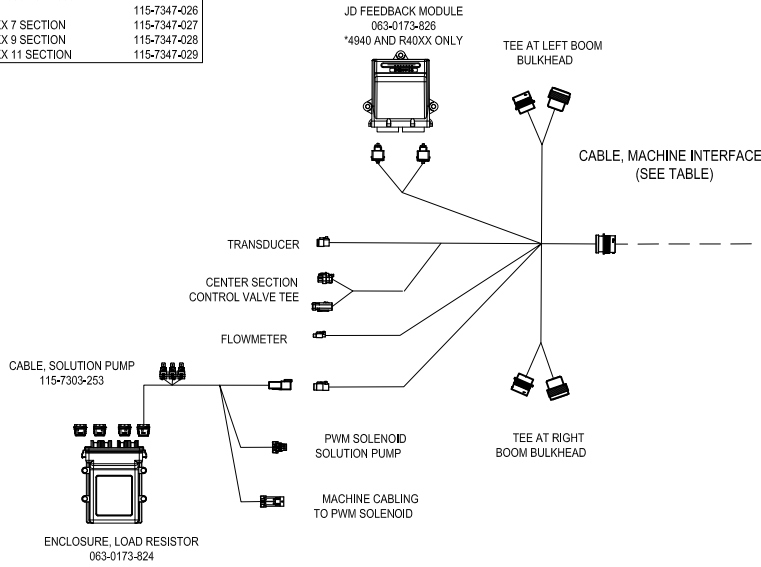
4940/R SERIES ICD	
LOW VOLUME ICD W/OUT TANK	063-0173-768
HIGH VOLUME ICD W/OUT TANK	063-0173-769
ICD MAIN CABLE	115-7303-250
ICD BRANCH CABLE (PER ICD)	115-7303-251
ICD ADD ON	
LOW VOLUME ICD W/OUT TANK	063-0173-768
HIGH VOLUME ICD W/OUT TANK	063-0173-769
LOW VOLUME ICD W/ TANK	063-0173-771
HIGH VOLUME ICD W/ TANK	063-0173-772
GEN 3 ICD CABLING (PER ICD)	115-7301-016
GEN 3 6' EXTENSION	115-7300-074

RELEASED DATE	ECO #	REV.	DRAWING NO.
8/11/16	28303	C	054-1005-009
7/10/18	31718	D	054-1005-009

SHEET 1 OF 2

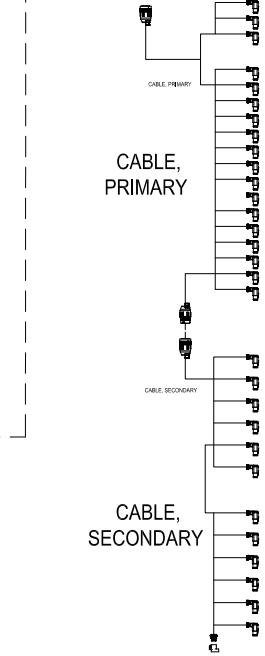
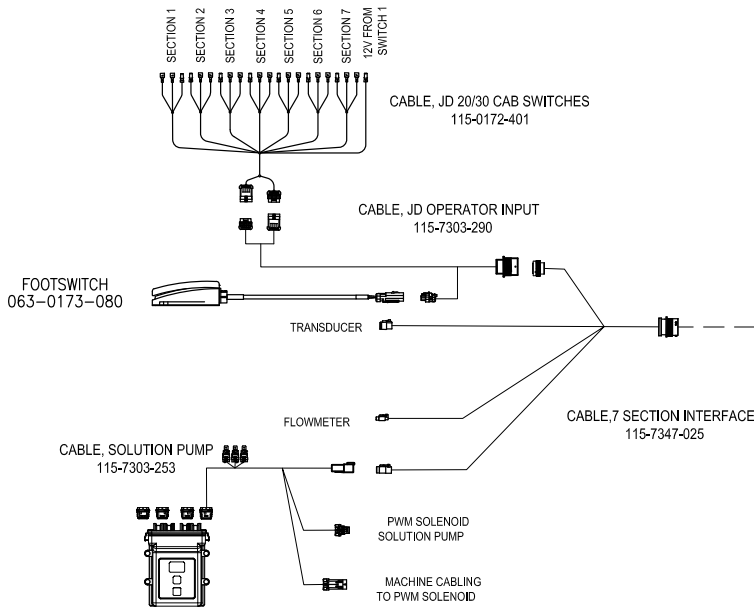
MACHINE INTERFACE FOR 4630, 4730/4830 ASN 2000, 4940, R40XX

INTERFACE CABLE	
JD 4630	115-7347-023
JD 4730/4830 ASN 2000	115-7347-024
JD 4940	115-7347-026
JD R40XX 7 SECTION	115-7347-027
JD R40XX 9 SECTION	115-7347-028
JD R40XX 11 SECTION	115-7347-029



CONTINUED FROM SHEET 1

MACHINE INTERFACE FOR 4X20, 4730/4830 BSN 2000, 4930



RELEASED DATE	ECO #	REV.	DRAWING NO.
8/11/16	28303	C	054-1005-009
7/10/18	31718	D	054-1005-009

CHAPTER

8

NOZZLE AND NOZZLE CABLE INSTALLATION

NOZZLE INSTALLATION

REUSING FACTORY NOZZLES

This section applies to machines reusing the factory nozzle bodies.

1. Remove the cap and diaphragm from the nozzle body.

FIGURE 1. Nozzle Body Cap and Diaphragm Removed



Cap and
Diaphragm
Removed

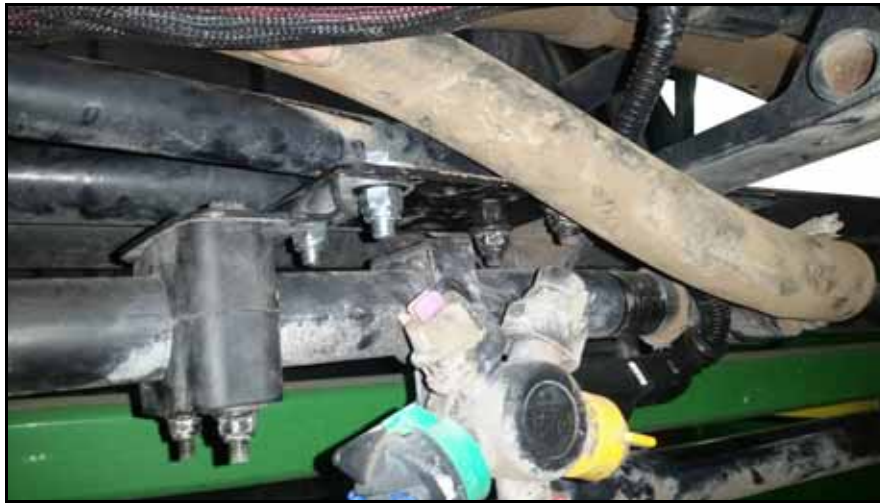
2. Install the Hawkeye valve with the supplied O-ring onto the nozzle body. Orient the Hawkeye valve with the label facing down as this typically provides the greatest clearance.

FIGURE 2. Installed Hawkeye Valve



NOTE: It may be necessary to relocate the factory boom hanger brackets to provide adequate clearance. Brackets and hardware are provided to relocate boom hanger brackets if they can not slide to a new location.

FIGURE 3. Boom Hanger Bracket Relocation



WILGER NOZZLE BODIES

This section applies to machines replacing the factory nozzle bodies with the supplied Wilger nozzle bodies.

1. Remove the factory nozzle bodies from the machine.
2. Assemble and install the provided nozzle bodies onto the right side of the nozzle body for standard configurations. If clearance is an issue, assemble the nozzle body so the Hawkeye valve is on the top or left side of the nozzle body.

FIGURE 4. Wilger Nozzle Bodies Installed



BOOM CABLE ROUTING AND CONNECTION

BEST PRACTICES AND RECOMMENDATIONS

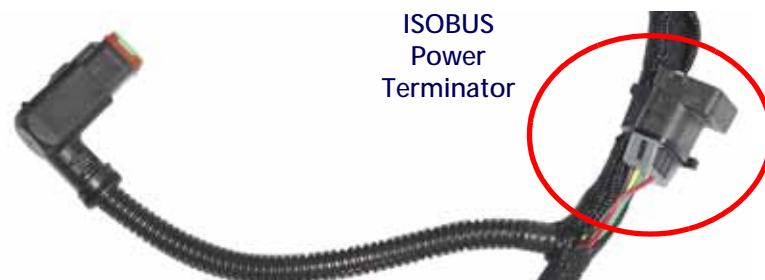
- Route the Hawkeye primary and secondary boom cables along existing cables or plumbing to help avoid damage to the cable.
- Route cables to avoid pinch points and to avoid stretching the cable during folding and unfolding operations. Pay special attention to cable routing near folding or break-away points.
- Route cables through existing cable retention devices as appropriate.
- When securing the primary and secondary boom cables on the implement, begin at the outer boom tips. Adjust the cable position to provide sufficient slack between valve tee branches while working toward the center of the implement.
- It is recommended to route the boom cables on the inside of the boom frame work when applicable.
- Secure cables using a zip tie at each nozzle control valve tee branch, and one between each tee branch along the cable length.

SECONDARY BOOM CABLE ROUTING AND CONNECTIONS

NOTE: Please review the Best Practices and Recommendations section on page 33 before routing or securing the boom cables on the implement. Do not connect or secure the cable until instructed to do so in the procedure.

1. Locate the terminator on each of the secondary boom cables.

FIGURE 5. Secondary Cable ISOBUS Powell Terminator



2. Route the secondary boom cables so the terminators are located at the outer tips of the left and right boom.
3. Starting from the mid-boom fold point, feed the terminator end of the secondary boom cable through the boom framework along existing cable or plumbing runs and through any existing cable retention devices as appropriate.

NOTE: If there is interference between the connector and boom components, remove the 90° back shell from the connector.

4. If not already applied, apply a single short burst of corrosion inhibitor (Corrosion X HD (Raven P/N 222-0000-020 or available from <http://www.corrosionx.com/corrosionx-heavy-duty.html>)) into the NCV connection. Be sure the corrosion inhibitor has coated the NCV contacts and recessed portions of the connector.

NOTE: To determine if corrosion inhibitor has been applied, inspect for a thick liquid in the bottom of the connector.

5. Once the secondary boom cable is routed appropriately, begin connecting the valve tee branches to the nozzle control valves, starting with the nozzle control valve at the outer end of the boom.

FIGURE 6. Securing Valve Branches



- At each valve branch, adjust the cable as necessary to provide slack between nozzle control valve connections. The large round connector on the secondary boom cable should reach the mid-boom fold point after all nozzle control valves are connected.

FIGURE 7. Primary and Secondary Boom Cable Connection at Mid-Boom Fold Point



- Repeat this procedure to route and connect the secondary boom cable on the opposite boom.

NOTE: Route and connect the primary and secondary cables before securing the cable with the supplied zip ties.

PRIMARY BOOM CABLE ROUTING AND CONNECTIONS

NOTE: Review the Best Practices and Recommendations section on page 33 before routing or securing the boom cables on the implement. It is recommended not to connect or secure the cable until instructed to do so in the procedure.

- Locate the large, round connectors on the primary boom cables (refer to the Kit Contents section on page 5). The primary boom cables must be routed such that the connector with female pins is located at the mid-boom fold point of the left or right boom and will connect to the secondary boom cable.

FIGURE 8. Primary Cable Ends



Male Connector
To Center Rack/Chassis Connector



Female Receptacle
To Secondary Boom

2. Starting at the center of the implement, feed the female receptacle end of the primary boom cable through the boom framework along existing cable or plumbing runs and through any existing cable retention devices as appropriate.
3. Connect the large, round connectors on the primary and secondary boom cables.
4. Adjust the primary and secondary boom cables to ensure sufficient slack around the mid-boom fold point and allow each cable to reach nozzle control valves near the folding point.
5. Secure the primary and secondary connection using the supplied zip ties as necessary to protect the connector from damage during folding and unfolding operations.
6. Once the primary and secondary boom cables are connected, begin connecting the valve tee branches to the nozzle control valves, starting with the valve on the primary boom segment furthest from the center of the implement.
7. At each valve branch, adjust the cable as necessary to provide slack between nozzle control valve connections and use the supplied zip ties to secure the cable at each valve branch. Refer to Figure 6 on page 34. The large, round connector with male pins on the primary boom cable should reach to the center of the implement after all nozzle control valves are connected.
8. Repeat this procedure to route the primary boom cable on the opposite boom.

NOTE: On machines with 15" nozzle spacings, both the left and right primary cable have branches for the center nozzle. Install the provided jumper or the right primary cable "Center Nozzle" branch.

FENCE ROW SETUP

If the implement is equipped with fence rows, configure the fence rows as a section in the controller. Section 15 will be the left fence row and Section 16 will be the right fence row.

NOTE: Skip this step if using a system with a foot switch. Fence row switches will function properly but will not be visible on the VT.

OPTIONAL RFM 100 KIT INSTALLATION

This section provides directions for installing a Raven Flow Meter (RFM) 100 on machines that currently have dual flow meters installed.

KIT COMPONENTS

The table shows the parts, and part quantities, provided in the kit and needed for installation.

TABLE 1. 117-0171-671 Kit Components

Component Description	Quantity
Assembly, Flowmeter, RFM-100P, Deutsch DRM-HP	1
Cable, Flowmeter, Adapter, Metripack to DTM	1
2" EPDM Hose 200 PSI Burst 21" +/- 0.5"	2
Fitting, Flanged, M220 to 2" Hose Barb	4
Clamp, V-Band FC-220, Stainless for Flanged Fittings	4
Clamp, T-Bolt, Band, 2.50" Nominal ID	4
Clamp, 2.5" ID, Vinyl Coated	4
Bolt, Hex Head, 5/16" - 18 x 1.25"	4
Washer, Flat, 5/16" ID	4
Nut, Flanged Lock, 5/16" - 18	4
Gasket, Flange, M-220	4

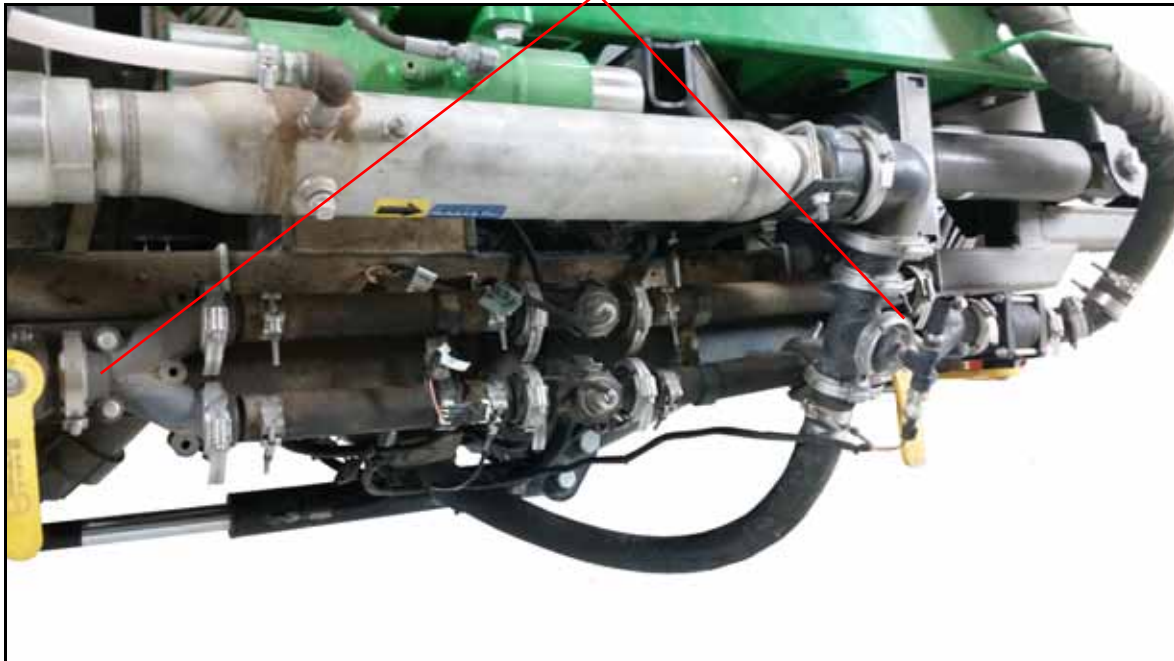
INSTALLATION PROCEDURE

1. Disconnect the flowmeter assembly.

FIGURE 1. Flowmeter Removal



Disconnect Here



2. Remove the existing dual flowmeter assembly from the machine.
3. Secure the bracket for the OEM flowmeter harness out of the way.

FIGURE 2. OEM Harness After Flowmeter Removed



OEM Harness Secure

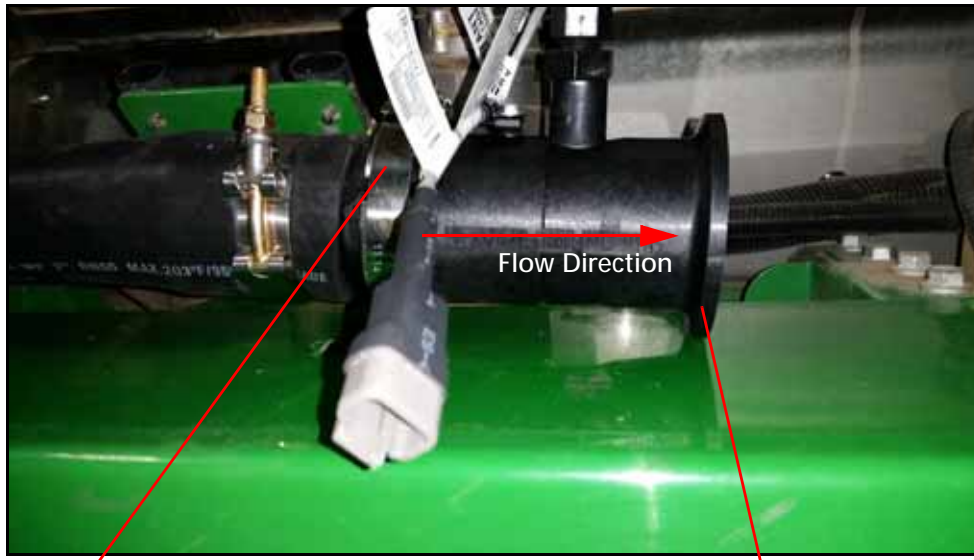
4. Use the provided flanges and hose clamps to assemble one of the EPDM hoses.

FIGURE 3. Assembled EPDM Hose



5. Attach the provided RFM to the installed EPDM hose with a clamp and a viton gasket. Verify that the flow direction arrow matches the flow direction on the machine.

FIGURE 4. Installed RFM



Installed Clamp

Flowmeter

6. Measure the distance between the end of the flow meter and the OEM throttling valve.
7. Subtract 2" from the measured value to calculate the minimum hose length. If necessary, trim the provided EPDM hose to the proper length.
8. Assemble the hose using the provided flange fittings and hose clamps.
9. Install the hose between the RFM and the OEM throttling valve.

FIGURE 5. RFM Installed to OEM Throttling Valve



RFM

Hose

OEM Throttling Valve

10. Attach the flowmeter adapter harness to the flowmeter. Use the provided dust plug to plug one of the ports on the OEM harness flowmeter receptacle.

NOTE: The other connector on the adapter harness will be connected later. Another dust plug will also be provided later in the installation process.

FIGURE 6. Flowmeter Adapter Harness



Flowmeter Adapter Harness

11. Use the provided hose clamps and 5/16" bolts, washers, and lock nuts to secure the flowmeter assembly to prevent damage.

FIGURE 7. Installed Hose Clamps



CHAPTER 10

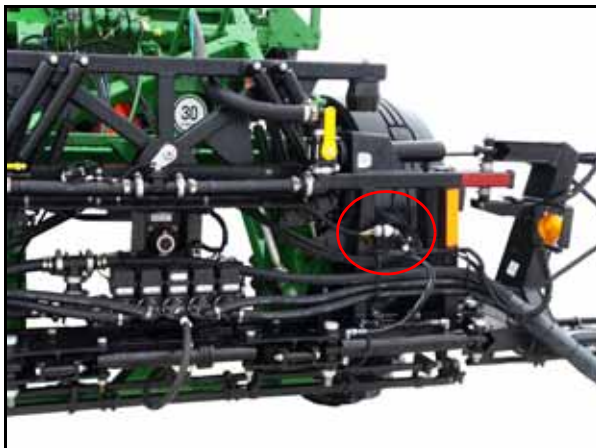
INTERFACE, ECU, AND PUMP CABLE INSTALLATION

INTERFACE, ECU AND PUMP CABLE INSTALLATION

NOTE: For all 4720's, 4290's, 4930's and 4730/4830's prior to Serial Number 2000, refer to instructions at the end of this chapter.

1. Disconnect the round bulkhead connectors for the left and right booms. The connectors are located near the left and right boom hinge points of the center rack.

FIGURE 1. Bulkhead Connectors



2. Remove the nut and washer attaching the bulkhead connector to the bracket. If necessary, use penetrating oil to remove the nut.
3. Locate the machine interface cable.
4. Identify the connectors on the machine interface cable that mate with the bulkhead connectors.

FIGURE 2. Boom Plug



5. Insert and secure the bulkhead connector labeled "Left Boom" into the bracket on the left side of the machine.
6. Reconnect the boom cable to the bulkhead connector and reconnect the original harness to the other side of the Left Boom tee.

FIGURE 3. Connected Boom Cable

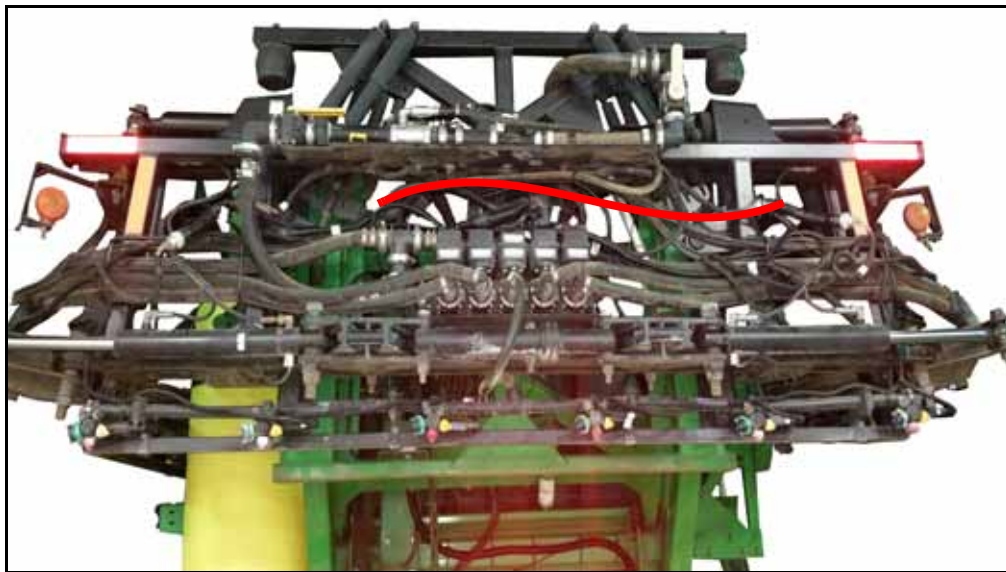


7. Route the cable across the machine and repeat step 2 through step 7 for the right boom.

FIGURE 4. Recommended Routing for R Series



FIGURE 5. Recommended Routing for 40 Series



8. Locate the connectors labeled "Center Boom Valve" on the interface harness. Disconnect the center boom valve from the machine harness and insert the interface harness connectors between the machine and valve connectors.

NOTE: On 4730 and 4830 machines there are five boom valves on the center rack. Repeat step 8 for Boom 2/3 and Boom 4/5 connectors on the interface cable.

FIGURE 6. Center Boom Connection



FIGURE 7. Transducer Locations



9. Use the provided polypropylene NPT fittings to add the provided pressure sensor to the system.

FIGURE 8. Installed Transducer



10. Identify the "PSI" connector on the interface harness and insert it into the pressure transducer.
11. Connect the "Flow" connector on the interface harness to the flowmeter.

NOTE: An extension cable is provided for the flowmeter on R series machines. Route the extension cable harness down the solution hose to the flowmeter on the left side of the machine.

12. On 4940 and R40XX machines, locate the "Feedback Enclosure" connector on the interface harness and connect to the boom feedback ECU.

FIGURE 9. Feedback Enclosure to Boom Feedback ECU



13. Carefully secure all cables to avoid pinch points, sharp edges, and interference.

ECU CABLE INSTALLATION

1. Locate the Hawkeye Main ECU cable
2. Connect the 47 pin round connector labeled "Interface Cable" to the 47 pin connector on the interface cable.
3. Route the "Left Nozzles" and "Right Nozzle" connectors towards the left and right booms.

4. Route the main ECU cable down the from the center rack following the existing lines. Use zip ties at least every 12". Route the ECU cable towards the Product Controller II ECU.

FIGURE 10. ECU Cable Routing



5. Connect the set of four 12 pin Deutsch connectors to the mating receptacles on the bottom of the Product Controller II ECU.

FIGURE 11. 12-Pin Deutsch Connections

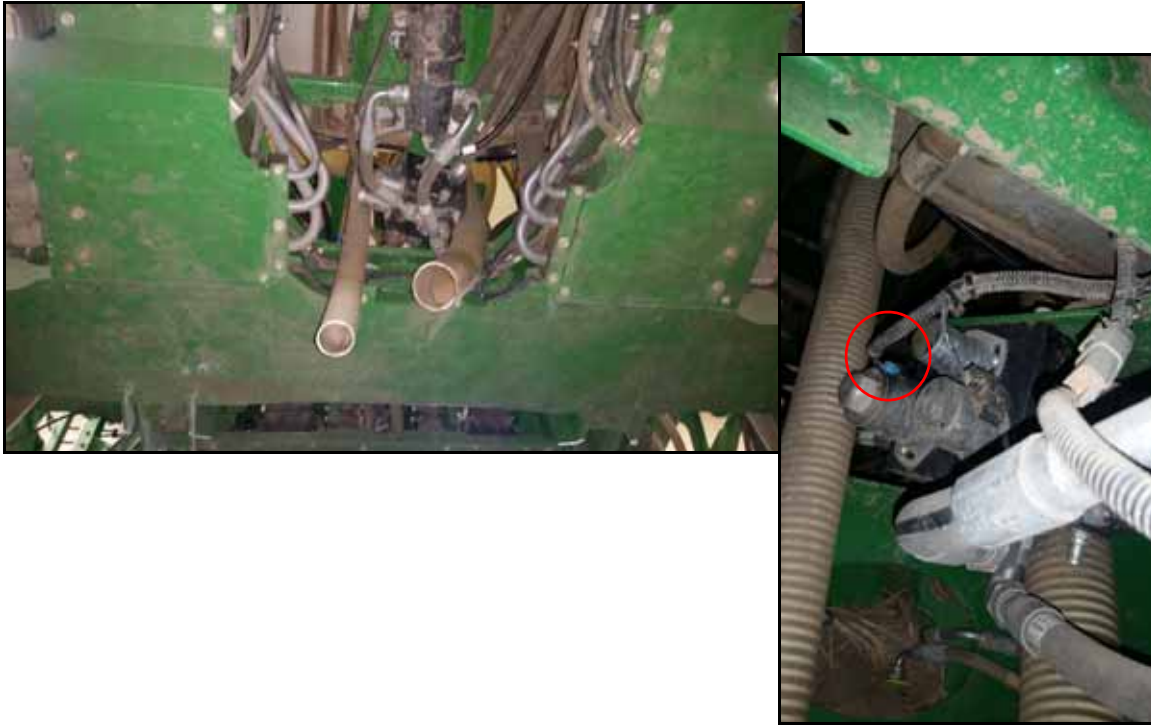


6. Connect the set to two 12 pin mini-Deutsch connectors to the mating receptacles on the bottom of the BoomSense node
7. Install the included terminator onto the connector labeled "Chassis Extension."
8. Connect the "Chassis Harness" connector to the chassis harness installed earlier.
9. Connect the "Hawkeye Power" connector to the Hawkeye power harness installed earlier.

PUMP CABLE INSTALLATION

1. Locate the pump cable.
2. Attach the connector labeled "Interface Harness" to the "Pump Cable" connector on the interface harness.
3. Route the pump cable down from the center rack along the ECU cable.
4. Continue routing the pump cable under the machine to the primary solution pump solenoid.

FIGURE 12. Solenoid Connections



5. Disconnect the machine harness from the solenoid and connect it to the "PWM Sense" receptacle on the pump cable.
6. Plug the "PWM Out" plug of the pump cable into the solenoid on the primary solution pump.
7. Route the connector labeled "Load Resistor" to the load resistor enclosure and insert it into the mating receptacle.
8. Install the provided 12-pin dust plugs into the unused ports on the load resistor.

4930 SERIAL NUMBER GREATER THAN 4000 SECTION INTERFACE

1. Locate the boom switch panel on the right side of the machine cabin.
2. Remove the screw and retainer plate to access the boom switches.

FIGURE 13. Switch Panel Access



3. Carefully open the switch panel to access the switch connections.
4. Locate the auxiliary power strip in front of the control panel housing.
5. Route the foot switch cable behind the control panel between the window and control panel housing near the auxiliary power strip.

FIGURE 14. Auxiliary Power Strip



6. Route the 115-7303-290 cable into the cab through the rear window entry. Route the cable behind the control panel housing.

FIGURE 15. Cable Through the Rear Window Entry



7. Connect the foot switch cable to the 115-7303-290 cable.
8. Disconnect the OEM switch harness interface and tee in the 115-7303-290 cable.

FIGURE 16. Tee Cable Connection



9. Reassemble the side panel and control panel housing.

FIELD OPERATION

1. Turn on the master switch located on the OEM joystick.
2. Toggle the foot switch on and off for master switch operation.

4930 SERIAL NUMBER LESS THAN 4000, 4730/4830 SERIAL NUMBER LESS THAN 2000, AND 4920/4720 CAB INTERFACE

1. Locate the boom switch panel on the right side of the machine cabin.
2. Remove the screw and retainer plate to access the boom switches.

FIGURE 17. Switch Panel Access



3. Carefully open the switch panel to access the switch connections.
4. Locate the auxiliary power strip in front of the control panel housing.
5. Route the foot switch cable behind the control panel between the window and control panel housing near the auxiliary power strip.
6. Route the 115-7303-290 cable into the cab through the rear window entry. Route the cable behind the control panel housing.

FIGURE 18. Switch Interface and Foot Switch Connections



7. Connect the foot switch cable to 115-7303-290 cable.
8. Connect the 115-0172-401 cable to the 115-4303-290 cable.
9. Remove the switch base from the section 1 switch.
10. Locate the single red wire with a male spade connector and insert it into the switch base aligned with the red wires from the factory.

11. Locate the bundle of three wires labeled "Section 1".
12. Insert the red wire with the female spade terminal onto the center post on the switch.
13. Insert the colored wire with the female spade terminal onto the corresponding bottom post of the switch.
14. Insert the remaining colored wire with the male spade terminal into the bottom switch base.
15. Repeat step 10 - step 14 for the remaining sections. Depending on the number of sections on the machine, not all section wires will be used.

FIGURE 19. Spade Connections



4930 SERIAL NUMBER LESS THAN 4000, 4730/4830 SERIAL NUMBER LESS THAN 2000, AND 4920/4720 FIELD OPERATION

1. Turn on the master switch located on the OEM joystick.
2. Toggle the foot switch on and off for master switch operation.

INJECTION PUMP INSTALLATION

If the machine has factory direct injection pumps, replace the factory pumps with Raven ICD pumps. Contact a local Raven dealer for additional information.

1. Rinse the tank and the lines according to the machine manufacturers instructions.
2. Remove the cabling and plumbing connections attached to the pump.
3. Remove the old pump and install the ICD pump in the same location using existing hardware.
4. Reconnect the plumbing to the pump.
5. Locate the Hawkeye Injection Extension cable.
6. Remove the CANbus terminator from the ECU harness. This is typically installed on the "Chassis Extension" connector.
7. Connect the Injection Extension cable to the ECU harness location where the CANbus terminator was removed in step 6.

FIGURE 1. Injection Extension Cable Installation



8. Reattach the CANbus terminator to the other end of the Hawkeye Injection Extension cable.
9. Route the Hawkeye Injection Extension cable to the ICD pumps.
10. Locate gray and black receptacles from the pump assembly.

11. Insert the plug of the provided ICD Injection Tee Cable into the black receptacle on the ICD pump.

FIGURE 2. ICD Tee Cable Installed



12. Connect the plug that was installed in the black receptacle on the pump assembly into the mating connector on the injection tee.
13. Connect the plug that was originally installed in the gray receptacle to the gray receptacle on the new pump.
14. Connect the 4-Pin Deutsch receptacle on the Injection Tee Cable to one of the mating connectors on the Injection Extension cable.
15. Repeat step 2 through step 14 for the remaining replacement pumps.

CHAPTER 12

GREENSTAR DISPLAY CONFIGURATION

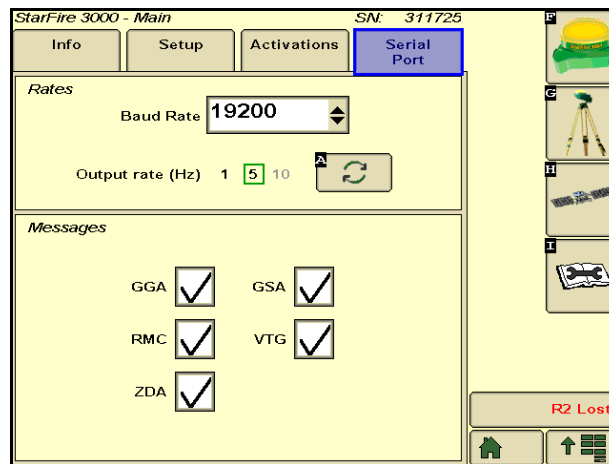
CONFIGURING THE PRIMARY GREENSTAR™ DISPLAY

NOTE: Perform the following steps on the primary display. The primary display is the display that was installed in the machine prior to the Hawkeye system installation.

The minimum required GreenStar software version is 3.32.1226. If necessary, update the GreenStar rate controller.

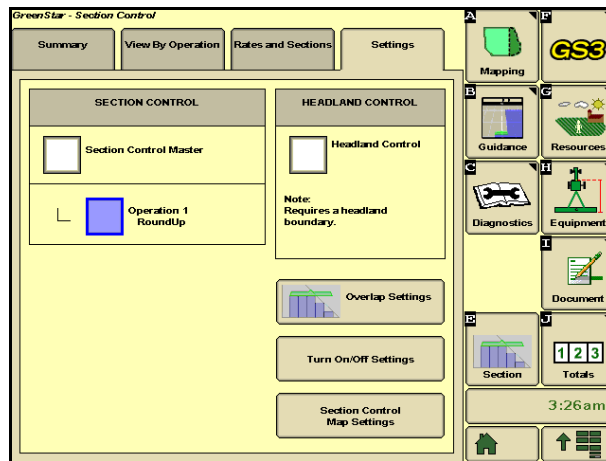
1. Press the Menu button on the primary GreenStar display.
2. Select the StarFire™ icon.
3. Press the Serial Port tab at the top of the screen.
4. Configure the Baud Rate, Output Rate, and Messages. Refer to Figure 1 on page 57.

FIGURE 1. StarFire Port Configuration



5. Press the Menu button and select the GS3 icon.
6. Press the Section button.
7. Press the Settings tab at the top of the screen.
8. Deselect Section Control Master and all of the other options.

FIGURE 2. Selection Control Master



9. Locate the Spray Rate dial and set it to manual.

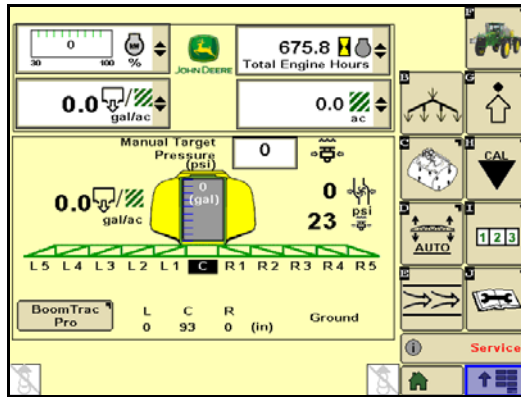
FIGURE 3. Manual Spray Rate



10. Press the Menu button on the display.
11. Select the Sprayer icon.
12. Set the Manual Target pressure to zero.

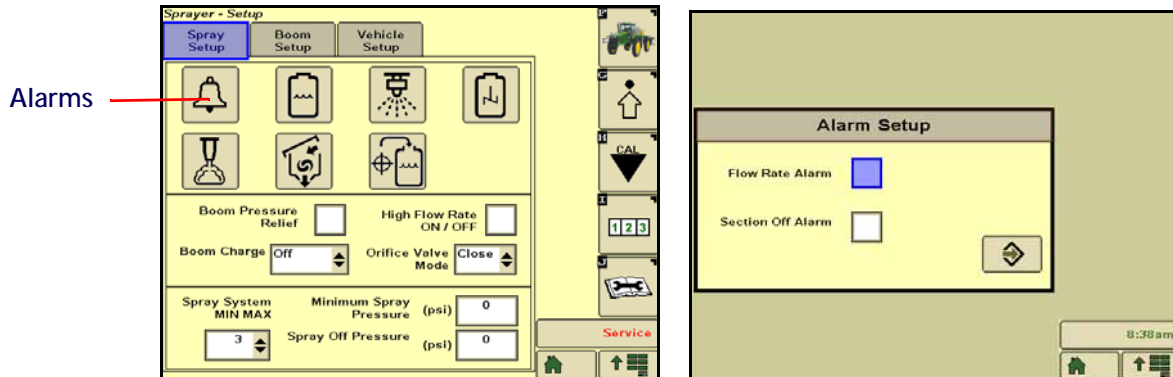
NOTE: If the manual target pressure is not visible, ensure the spray rate dial is set to manual.

FIGURE 4. Target Pressure



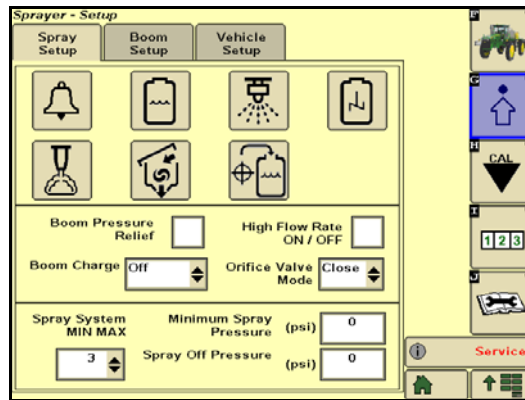
13. Press the Menu button.
14. Select the Sprayer icon.
15. Press Settings then Alarm Setup.
16. Deselect all of the alarms.

FIGURE 5. Alarms Selection and Deselected Alarms Screens



17. Press the Menu button.
18. Select the Sprayer icon.
19. Select Settings.
20. Set the Minimum Spray pressure and Spray Off Pressure to zero. Refer to Figure 6 on page 60.

FIGURE 6. Minimum Spray Pressure and Spray Off Pressure

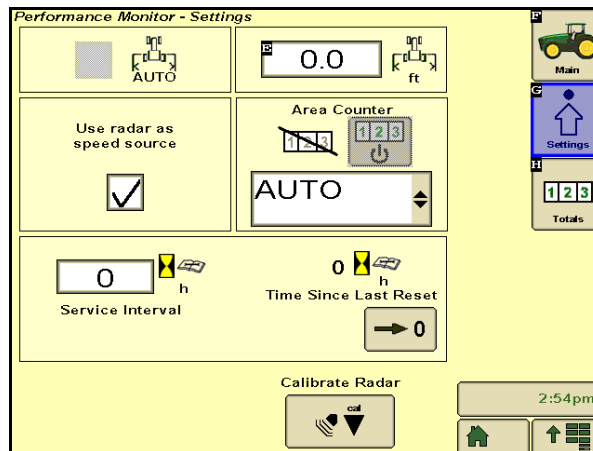


CONFIGURING THE SECONDARY GREENSTAR DISPLAY

Skip this section if using a Viper 4 as the secondary display.

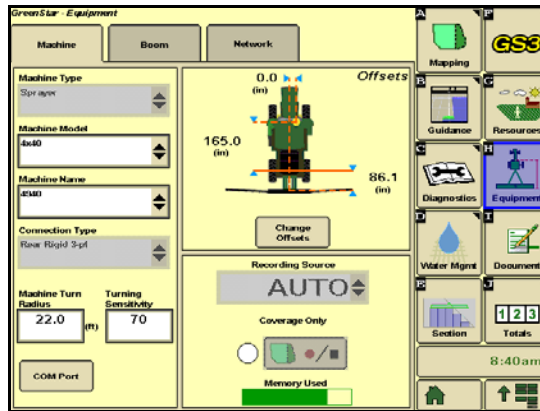
1. Press the Menu button and select the Performance Monitor icon.
2. Press the Settings button.
3. Select Use Radar as Speed Source.

FIGURE 7. Speed Source



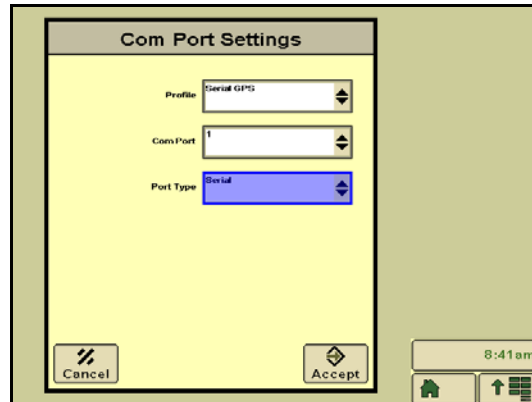
4. Press the Menu button and select GS3.
5. Select the Equipment icon.
6. Press the Com Port button in the lower left corner of the display.

FIGURE 8. Com Port Selection



7. Press the drop down Profile box and select new.
8. Create a new profile named "Serial GPS".
9. Select Com Port 1.
10. Assign the port type as serial.
11. Press Accept.

FIGURE 9. Serial Port Selected

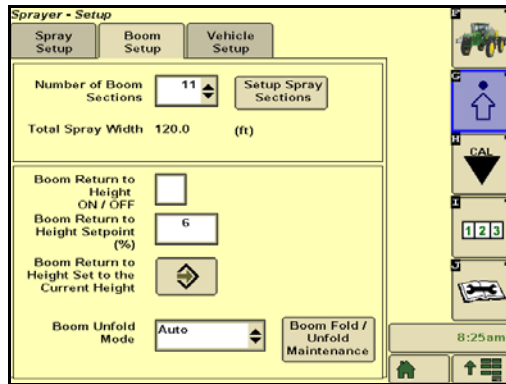


ACCESSING MACHINE INFORMATION FROM THE PRIMARY GREENSTAR DISPLAY

The following section provides information on how to access information needed with using the Hawkeye Setup Wizard. For full Hawkeye setup and operation, refer to the Hawkeye Calibration and Operation Manual (P/N 016-0171-584).

1. Press the Menu button.
2. Select the Sprayer icon.
3. Press the Settings button.
4. Select Boom Setup from the top of the screen. The number of physical sections present on the machine will display.

FIGURE 10. Present Physical Sections



5. Press the Setup Spray Sections button. The width of each section will display.

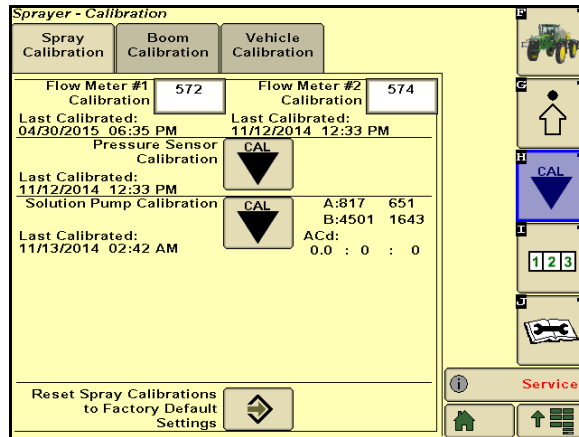
FIGURE 11. Section Width

Spray Sections				
Section #	Total Spray Width		120.0 (ft)	
	# of Nozzles	Nozzle Spacing (in)	Nozzle (in)	Section Width (in)
L 5	6	20	20	120
L 4	8	20	20	160
L 3	6	20	20	120
L 2	7	20	20	140
L 1	5	20	20	100
C	8	20	20	160
R 1	5	20	20	100
R 2	7	20	20	140
R 3	6	20	20	120
R 4	8	20	20	160
R 5	6	20	20	120

Below the table, there is a dropdown menu showing 'C', and input fields for 8, 20, and 20, along with a refresh button. A 'Service' button is visible in the bottom right corner.

6. Press the Menu button and select the sprayer icon.
7. Press the Setting button.
8. Select the Spray Calibration tab. The Flowmeter calibration value will display.

FIGURE 12. Flowmeter Calibration Value



NOTE: The display value is pulses per gallon.

NOTE: If you installed a Raven flowmeter, do not use the value currently displayed on the 2630. Use the display on the flowmeter tag.

9. Setup the system as a rear rigid three point connection type.
10. Enter the machine dimensions accordingly.

FIGURE 13. Machine Configuration/Dimensions

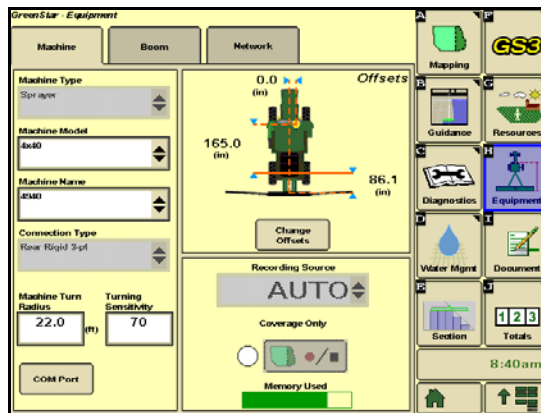
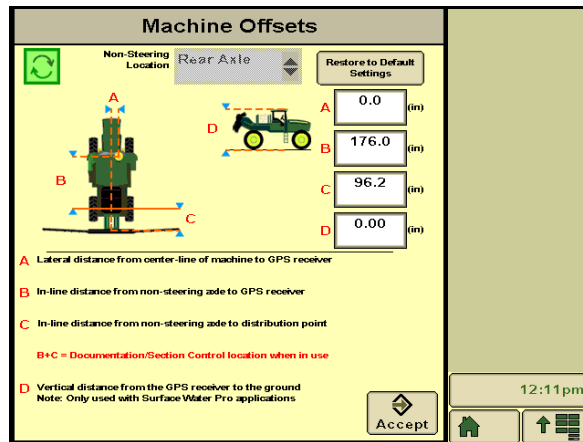


FIGURE 14. Machine Offsets



OPERATION

TURNING SPRAYER ON

1. Simultaneously turn on the Hawkeye pump switch and machine pump switch.
2. Turn on the machine master switch and desired section switches.

FOR SIDE FILL

1. Simultaneously turn off the machine pump switch and the Hawkeye pump switch.

TANK FILL, TANK RINSE, LOAD COMMAND, AND OTHER OPERATIONS

1. Simultaneously turn off the machine pump switch and the Hawkeye pump switch.

THROTTLE VALVE INSTALLATION

For systems using the single OEM flowmeter or Raven flowmeter, turn on the OEM throttling valve so that it is completely open and not restricting flow to the system.

FIGURE 1. R Series Throttling Valve



FIGURE 2. 4630/R4023 Throttling Valve



FIGURE 3. 4730-4830 Throttling Valve



FIGURE 4. 4940 Throttling Valve



POWER AND ECU HARNESS MAINTENANCE

1. Disconnect the ECU harness connector and inspect for signs of moisture or corrosion.
2. If moisture or corrosion is detected, use Deoxit D5, brushes, and compressed air to clean and dry the connector.
3. When clean, apply a coating of Corrosion X HD to the connector mating surfaces and contacts.
4. Reattach the connectors.

HAWKEYE BOOM HARNESS CONNECTOR MAINTENANCE

Prior to connecting the Hawkeye boom cable to the Hawkeye Nozzle Control Valves (NCV), perform the following steps to all 6-pin NCV connectors and 19-pin circular connectors between the boom cables and ECU cable connections to ensure high quality connections:

1. Verify the NCV connectors and the accompanying boom cable connectors are free of moisture, contamination, or oxidation. Oxidation will appear as a dry, white coating on the contacts. If any connectors show signs of moisture, contamination, or oxidation, perform Step 2 - Step 6. If this is a new installation, skip to Step 7. All components listed below can be ordered in the Hawkeye NCV Connection Maintenance Kit (P/N 117-0171-692).
2. Spray the connection with a deoxidizing agent (DeoxIT D5 is recommended (P/N 222-4001-006)).



3. Clean contacts with a small wire brush (P/N 321-0000-477).



4. Spray the contacts again with the deoxidizing agent. This will rinse out debris.
5. Remove all residue of deoxidizing agent from the connection. Not removing deoxidizing agent can damage the connector seal.
6. Dry out the connection with dry, compressed air. Dust Off Electronics Duster (P/N 222-4001-007) is recommended however, if unavailable, alternate compressed air sources can be used. If using compressed air from a large volume air compressor, be sure the lines are free of moisture.



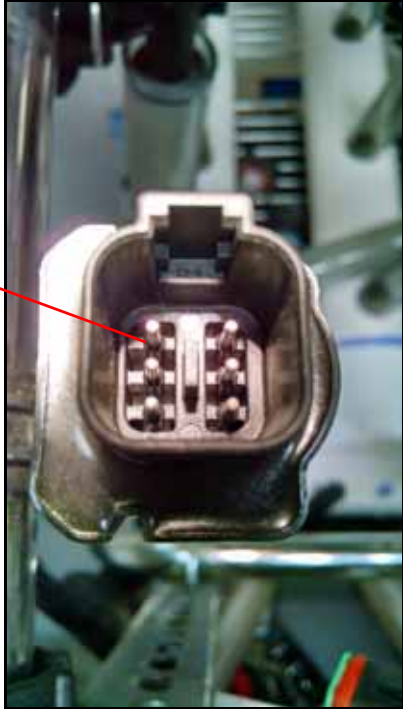
7. If not already applied, apply a single short burst of corrosion inhibitor (Corrosion X HD (Raven P/N 222-0000-020 or available from <http://www.corrosionx.com/corrosionx-heavy-duty.html>)) into the NCV connection. Be sure the corrosion inhibitor has coated the NCV contacts and recessed portions of the connector.

NOTE: To determine if corrosion inhibitor has been applied, inspect for a thick liquid in the bottom of the connector (as shown in the Corrosion Inhibitor Applied image below).

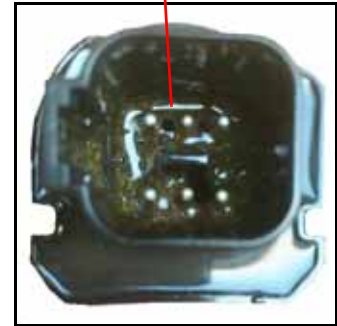
NCV Connector

Applying Corrosion Inhibitor

Spray in Void Between Pins



Corrosion Inhibitor Applied



B

The following images provide examples of run screen configurations. Refer to Viper 4+ Operation manual and the Hawkeye Operation manual to learn more about available widgets and their function.

FIGURE 1. Viper 4+ Screen Example 1

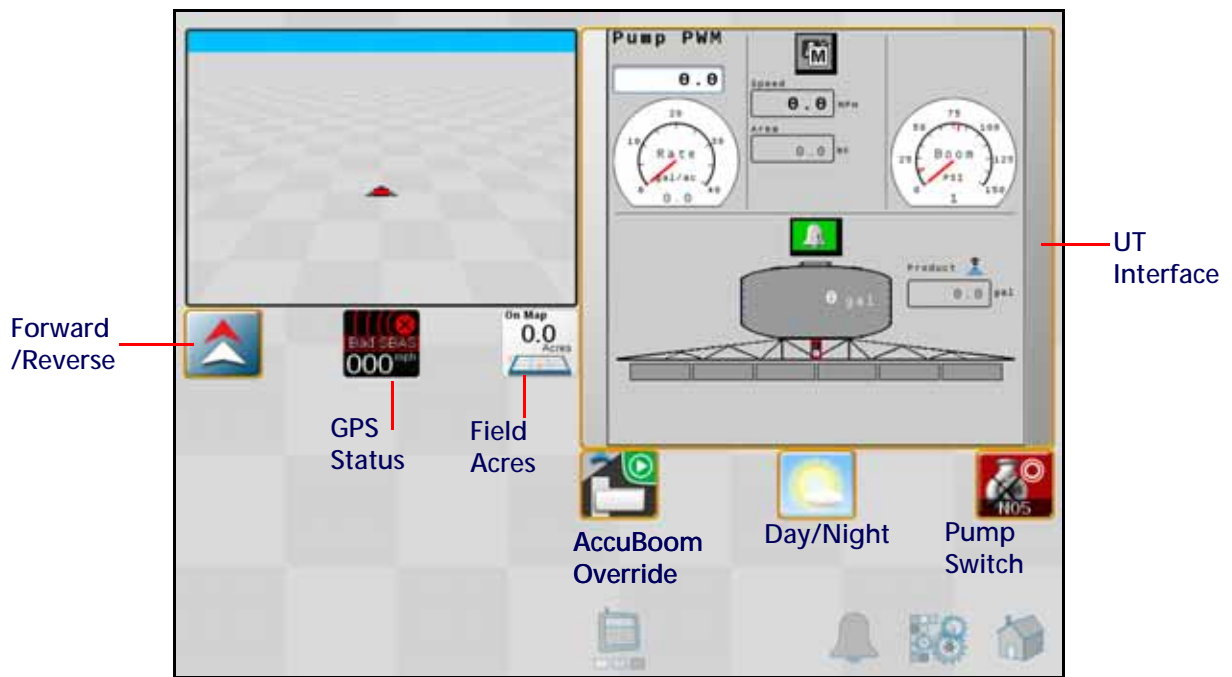


FIGURE 2. Viper 4+ Screen Example 2



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 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.