

Hawkeye® 2 Installation  
Manual for AGCO RoGator  
A/B-Series (RG900,  
RG1100, RG1300)

*016-2005-008 Rev. A*

*3/2021*

*E36901*



## DISCLAIMER

While every effort has been made to ensure the accuracy of this document, Raven Industries assumes no responsibility for omissions and errors. Nor is any liability assumed for damages resulting from the use of information contained herein.

Raven Industries shall not be responsible or liable for incidental or consequential damages or a loss of anticipated benefits or profits, work stoppage or loss, or impairment of data arising out of the use, or inability to use, this system or any of its components. Raven Industries shall not be held responsible for any modifications or repairs made outside our facilities, nor damages resulting from inadequate maintenance of this system.

As with all wireless and satellite signals, several factors may affect the availability and accuracy of wireless and satellite navigation and correction services (e.g. GPS, GNSS, SBAS, etc.). Therefore, Raven Industries cannot guarantee the accuracy, integrity, continuity, or availability of these services and cannot guarantee the ability to use Raven systems, or products used as components of systems, which rely upon the reception of these signals or availability of these services. Raven Industries accepts no responsibility for the use of any of these signals or services for other than the stated purpose.

## Table of Contents

---

<b>Chapter 1</b>	<b>Important Information.....</b>	<b>1</b>
Safety .....		<b>1</b>
Agricultural Chemical Safety .....		<b>2</b>
Electrical Safety .....		<b>2</b>
Recommendations and Best Practices .....		<b>3</b>
Harness Routing .....		<b>3</b>
<b>Chapter 2</b>	<b>Introduction.....</b>	<b>5</b>
Make and Model Compatibility .....		<b>5</b>
Machine Configuration Notes .....		<b>5</b>
Installation Overview .....		<b>6</b>
Required Components .....		<b>6</b>
Tools and Materials Needed .....		<b>6</b>
Point of Reference .....		<b>6</b>
Kit Contents .....		<b>7</b>
Updates .....		<b>13</b>
<b>Chapter 3</b>	<b>Installation Preparation .....</b>	<b>15</b>
<b>Chapter 4</b>	<b>Nozzle Body and Nozzle Control Valve Installation .....</b>	<b>17</b>
Hawkeye® 2 Nozzle Body Installation .....		<b>17</b>
Best Practices and Recommendations .....		<b>17</b>
Hypro Nozzle Body Installation .....		<b>17</b>
Wilger Nozzle Body Assembly and Installation .....		<b>18</b>
Nozzle Control Valve 2 (NCV2) Installation .....		<b>21</b>
Boom Cable Routing and Connection .....		<b>22</b>
Best Practices and Recommendations .....		<b>22</b>
Boom Cable Routing and Connections (Inner, Middle, and Outer Boom Cables) .....		<b>22</b>
<b>Chapter 5</b>	<b>Install the Hawkeye® 2 RCM - Sprayer .....</b>	<b>25</b>
RCM - Sprayer Installation .....		<b>25</b>
Best Practices and Recommendations .....		<b>25</b>
RCM - Sprayer Mounting Location .....		<b>25</b>
ECU Cabinet Preparation .....		<b>29</b>
In Cab Connections .....		<b>34</b>
<b>Chapter 6</b>	<b>Chassis Cable Installation.....</b>	<b>35</b>
Chassis Cable Routing and Connection .....		<b>35</b>
Best Practices and Recommendations .....		<b>35</b>
ECU Cabinet to RCM - Sprayer Connections .....		<b>35</b>
Hawkeye® 2 ECU NCV Power Cable Installation .....		<b>36</b>
Hawkeye® 2 Power Connections .....		<b>37</b>
System Diagrams .....		<b>38</b>

**Table of Contents**

---

**Chapter 7 Sidekick Pro™ ICD Installation..... 41**  
    Connecting Sidekick PRO ICD Direct Injection Pumps to the ISOBUS .....41

**Appendix A Connecting Virtual Terminal to ISOBUS ..... 43**  
    Viper 4 ISOBUS Adapter Cable .....43

**Appendix B Cable and Connector Maintenance ..... 45**  
    Power and ECU Harness Maintenance .....45  
    Hawkeye® 2 Boom Harness Connector Maintenance .....45

## SAFETY

### **NOTICE**

Follow the operation and safety instructions included with the implement and/or controller and read this manual carefully before installing or operating this Raven system.

- Follow all safety information presented within this manual. Review implement operation with your local dealer.
- Contact a local Raven dealer for assistance with any portion of the installation, service, or operation of Raven equipment.
- Follow all safety labels affixed to system components. Be sure to keep safety labels in good condition and replace any missing or damaged labels. Contact a local Raven dealer to obtain replacements for safety labels.

Observe the following safety measures when operating the implement after installing this Raven system:

- Do not operate this Raven system or any agricultural equipment while under the influence of alcohol or an illegal substance.
- Be alert and aware of surroundings and remain in the operator seat at all times when operating this Raven system.
  - Do not operate the implement on any public road with this Raven system enabled.
  - Disable this Raven system before exiting the operator seat.
  - Determine and remain a safe working distance from obstacles and bystanders. The operator is responsible for disabling the system when a safe working distance has diminished.
  - Disable this Raven system prior to starting any maintenance work on the implement or components of this Raven system.
- Do not attempt to modify or lengthen any of the system control cables. Extension cables are available from a local Raven dealer.

## **WARNING**

### AGRICULTURAL CHEMICAL SAFETY

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 properly disposing of them. Contact a local environmental agency or recycling center for additional information.

- 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.
- When storing unused agricultural chemicals:
  - Store agricultural chemicals in the original container and do not transfer chemicals to unmarked containers or containers used for food or drink.
  - Store chemicals in a secure, locked area away from human and livestock food.
  - Keep children away from chemical storage areas.
- 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.
- Follow all label instructions for chemical mixing, handling, and disposal.
- Avoid direct contact with agricultural chemicals or inhaling chemical dust or spray particulate. Seek immediate medical attention if symptoms of illness occur during, or soon after, use of agricultural chemicals or products.
- After handling or applying agricultural chemicals:
  - Thoroughly wash hands and face after using agricultural chemicals and before eating, drinking, or using the restroom.
  - 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.

## **CAUTION**

### ELECTRICAL SAFETY

- Always verify that power leads are connected to the correct polarity as marked. Reversing the power leads could cause severe damage to the Raven system or other components.
- To prevent personal injury or fire, replace defective or blown fuses with only fuses of the same type and amperage.
- Do not connect the power leads to the battery until all system components are mounted and all electrical connections are completed.
- Always start the machine before initializing this Raven system to prevent power surges or peak voltage.
- To avoid tripping and entanglement hazards, route cables and harnesses away from walkways, steps, grab bars, and other areas used by the operator or service personnel when operating or servicing the equipment.

---

## RECOMMENDATIONS AND BEST PRACTICES

### HARNESS ROUTING

The word “harness” is used to describe any electrical cables and leads, both bundled and unbundled. Use the following guidelines and recommendations when connecting and routing harnesses while installing or maintaining this Raven system:

- Leave protective caps/covers over harness connectors until needed to avoid dirt and moisture from contaminating electrical circuits.
- Secure the harness to the frame or solid structural members at least every 12 in [30 cm].
- Follow existing harness runs already routed on the implement as much as possible. Proper harness routing should:
  - Secure harnessing and prevent the harness from hanging below the implement.
  - Provide sufficient clearance from moving components and operational zones around shafts; universal joints and suspension components; pulleys, gears, belts, and chains; moving linkages, cylinders, articulation joints, etc.
  - Protect harnessing from field debris and surrounding hazards (e.g. tree limbs, fence posts, crop stubble, dirt clumps or rocks that may fall or be thrown by the implement).
  - Protect harnessing from sharp bends, twisting, or flexing over short distances and normal implement operation.
  - Connectors and splices should not be located at bending points or in harness sections that move.
  - Ensure sufficient length for free movement of the implement during normal operation and prevent pulling, pinching, catching, or rubbing, especially in articulation and pivot points. Clamp harnessing securely to force controlled movement of the harness.
  - Avoid abrasive surfaces and sharp edges such as sheared or flame cut corners, fastener threads or cap screw heads, hose clamp ends, etc.
- Do not connect, affix, or allow harnessing to come into contact with components with high vibration forces, hot surfaces, or components carrying hot fluids beyond the temperature rating of harness components.
  - Harnessing should be protected or shielded if routing requires the hose to be exposed to conditions beyond harnessing component specifications.
- Avoid routing harnesses in areas where damage may occur due to build up of material (e.g. dirt, mud, snow, ice, etc.).
- Avoid routing harnesses in areas where the operator or service personnel might step or use as a grab bar.

**IMPORTANT:** Avoid applying direct spray or pressure washing of electrical components and connections. High pressure streams and sprays can penetrate seals, cause corrosion, or otherwise damage electrical components. When performing maintenance:

- Inspect electrical components and connectors for corrosion, damaged pins or housings, etc. Repair or replace components or harnessing as necessary.
- Ensure connectors are kept clean and dry. Apply dielectric grease to the sealing surfaces of all connections exposed to moisture, dirt, debris, and other contaminants. Repair or replace harnessing as necessary.
- Clean electrical components with pressurized air, aerosol electrical cleaning agent, or low pressure rinse.
- Remove visible surface water from electrical components and connections using pressurized air or an aerosol cleaning agent. Allow components to dry thoroughly before reconnecting cables.





---

## MAKE AND MODEL COMPATIBILITY

Hawkeye® 2 is a pressure-based product control system which allows for precise sprayer application over a range of conditions and reduced spray drift. Each nozzle is controlled by an individual pulsing valve giving a consistent spray pattern as speed and conditions change.

Hawkeye® 2 is built on the ISOBUS communication platform which allows the system to work with most ISO Universal Terminals (UTs) and task controllers, including the Viper® 4.

This manual is intended to provide installation instructions on the following equipment:

TABLE 1. Compatible Equipment Information

Make and Model	Nozzle Body Type	Nozzle Spacing	Boom Width	Kit Number
AGCo RoGator A/B-Series (RG900, RG1100, RG1300)	Hypro	20"	120'	117-2005-190
			100'	117-2005-191
		19"	100'	117-2005-192

## MACHINE CONFIGURATION NOTES

- It is not necessary to check the fence row option as this functionality is controlled via AGCO switches and cabling.
- When prompted to enter the number of sections and section widths in the wizard, refer to the machine configuration and setup for sections and section widths.
- Do not modify the switch mapping because Hawkeye® 2 will auto-fill the switch mapping values. The sections will map the same number of switches as there are sections.
- The AGCO AccuTerminal does not need to have settings changed to function with Hawkeye® 2.
- The AGCO AccuTerminal and other ECUs should be updated to the latest software by an AGCO Service Provider.

### INSTALLATION OVERVIEW

The recommended process for installing the Hawkeye® 2 nozzle control system is as follows:

1. Confirm Hawkeye® 2 kit contents. See the *Kit Contents* section on page 7.
2. Replace existing strainer with an 80 mesh (or finer) strainer. 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. Install provided nozzle bodies as needed. See Chapter 4, *Nozzle Body and Nozzle Control Valve Installation*.
5. Mount Hawkeye® 2 nozzle control valves.
6. Route and connect the inner, mid, and outer boom cables (as applicable). See the *Boom Cable Routing and Connections (Inner, Middle, and Outer Boom Cables)* section on page 22.
7. Mount the RCM - Sprayer. See Chapter 5, *Install the Hawkeye® 2 RCM - Sprayer*.
8. Route and connect chassis and RCM - Sprayer cables. See Chapter 6, *Chassis Cable Installation*.
9. Review the Post-Installation Notes for machine configuration tips.

### REQUIRED COMPONENTS

The following components must be installed with the Hawkeye® 2 nozzle control system:

- Updated software on field computers or control monitors and other ECUs. Contact your local AGCO dealer for the latest software.
- PWM pump control valve
- Raven compatible flow meter
- Raven compatible pressure transducer
- 80 mesh (or finer) strainer

**NOTE:** A fan or cone style spray tip is recommended for the Hawkeye® 2 system to operate properly. Air induction tips are not recommended for use with the nozzle control system.

### TOOLS AND MATERIALS NEEDED

The following tools are recommended for completing the installation:

- SAE and metric sized wrenches and tools
- 1-1/2" hole saw
- Drill bit set and drill
- CorrosionX HD (recommended) or other dielectric contact treatment
- Cable ties (supplied)
- Phillips screwdriver
- Side cutters

### POINT OF REFERENCE

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

## KIT CONTENTS

FIGURE 1. Hawkeye 2 AGCO RoGator A/B-Series, 120'/20" Boom Kit Components with ARAG/HYPRO Nozzle Bodies (P/N 117-2005-190 Rev. A)

QTY	PART #	DESCRIPTION
1	053-0159-197	BOX, SHIPPING (LABELED BOX 1 OF 6)
1	063-0173-956	RCM, HAWKEYE 2
1	115-2005-316	CABLE, RCM TO LEFT/RIGHT, ROGATOR A-B, HAWKEYE 2
1	115-2005-317	CABLE, ECU BOX, ROGATOR A-B, HAWKEYE 2
1	115-2005-318	CABLE, ECU BOX TO RCM, ROGATOR A-B, HAWKEYE 2
2	115-2005-003	CABLE, MID, 120/20, ROGATOR, HAWKEYE 2
2	115-2005-004	CABLE, OUTER, 120/20, ROGATOR, HAWKEYE 2
1	117-2005-051	KIT, HAWKEYE 2 SYSTEM SERVICE, HYPRO
1	107-0235-015	PLATE, MOUNTING, RCM, ROGATOR
1	063-0173-635	ECU, ISO, CAN, BOOM SENSE SPEED
1	115-7303-084	CABLE, BOOM SENSE, AGCO RETROFIT
1	115-0172-325	CABLE, ROGATOR, ISO CAN
1	115-0172-247	CABLE, ADAPTER, VIPER 4 TO 3 PIN ISO BUS
1	053-0159-110	ENVELOPE, PLASTIC
2	311-4050-147K	BOLT, HEX, M6-1 X 75MM, GRADE 8, CLASS II COATING
1	311-4050-145K	BOLT, HEX, M6-1 X 65MM, GRADE 8, CLASS II COATING
1	311-4050-154K	BOLT, HEX, M6-1 X 110MM, GRADE 8, CLASS II COATING
2	311-4050-159K	BOLT, HEX, M6-1 X 140MM, GRADE 8, CLASS II COATING
3	312-4000-216	NUT, FLANGED NYLOC, M6-1, ZINC COATING
3	313-1000-046	WASHER, M6, ZINC COATING
1	053-0159-015	ENVELOPE, PLASTIC
1	016-0171-649	SHEET, WARRANTY/HELP
1	053-0159-110	ENVELOPE, PLASTIC
2	107-0171-852	U-BOLT, 4-1/16" W x 3" L x 3/8-16 UNC, ZINC
4	312-1001-164	NUT, FLANGED LOCK, 3/8-16 UNC, ZINC

FIGURE 2. Hawkeye 2 AGCO RoGator A/B-Series, 120'/20" Boom Kit Components with ARAG/HYPRO Nozzle Bodies (P/N 117-2005-190 Rev. A) Cont.

<b>QTY</b>	<b>PART #</b>	<b>DESCRIPTION</b>
1	115-2005-002	(LABELED BOX 2 OF 6) CABLE, INNER, 120/20, ROGATOR, HAWKEYE 2
1	115-2005-002	(LABELED BOX 3 OF 6) CABLE, INNER, 120/20, ROGATOR, HAWKEYE 2
36 1	063-2005-002 219-2005-115M	(LABELED BOX 4 OF 6) NOZZLE CONTROL VALVE, HAWKEYE 2, HYPRO O-RING, VITON, PURPLE, SIZE -115, 38 PACK
36 1	063-2005-002 219-2005-115M	(LABELED BOX 5 OF 6) NOZZLE CONTROL VALVE, HAWKEYE 2, HYPRO O-RING, VITON, PURPLE, SIZE -115, 38 PACK
1 72	053-0159-079 333-0002-359	BOX, SHIPPING (LABELED BOX 6 OF 6) NOZZLE BODY, HYPRO 5-WAY TURRET, AGCO, LEFT PORT

FIGURE 3. Hawkeye 2 AGCO RoGator A/B-Series, 100'/20" Boom Kit Configuration with ARAG/HYPRO Nozzle Bodies (P/N 117-2005-191 Rev. A)

<b>QTY</b>	<b>PART #</b>	<b>DESCRIPTION</b>
1	053-0159-197	BOX, SHIPPING (LABELED BOX 1 OF 6)
1	063-0173-956	RCM, HAWKEYE 2
1	115-2005-316	CABLE, RCM TO LEFT/RIGHT, ROGATOR A-B, HAWKEYE 2
1	115-2005-317	CABLE, ECU BOX, ROGATOR A-B, HAWKEYE 2
1	115-2005-318	CABLE, ECU BOX TO RCM, ROGATOR A-B, HAWKEYE 2
2	115-2005-124	CABLE, MID, 100/20, ROGATOR, HAWKEYE 2
2	115-2005-125	CABLE, OUTER, 100/20, ROGATOR, HAWKEYE 2
1	117-2005-051	KIT, HAWKEYE 2 SYSTEM SERVICE, HYPRO
1	107-0235-015	PLATE, MOUNTING, RCM, ROGATOR
1	063-0173-635	ECU, ISO, CAN, BOOM SENSE SPEED
1	115-7303-084	CABLE, BOOM SENSE, AGCO RETROFIT
1	115-0172-325	CABLE, ROGATOR, ISO CAN
1	115-0172-247	CABLE, ADAPTER, VIPER 4 TO 3 PIN ISO BUS
1	053-0159-110	ENVELOPE, PLASTIC
2	311-4050-147K	BOLT, HEX, M6-1 X 75MM, GRADE 8, CLASS II COATING
1	311-4050-145K	BOLT, HEX, M6-1 X 65MM, GRADE 8, CLASS II COATING
1	311-4050-154K	BOLT, HEX, M6-1 X 110MM, GRADE 8, CLASS II COATING
2	311-4050-159K	BOLT, HEX, M6-1 X 140MM, GRADE 8, CLASS II COATING
3	312-4000-216	NUT, FLANGED NYLOC, M6-1, ZINC COATING
3	313-1000-046	WASHER, M6, ZINC COATING
1	053-0159-015	ENVELOPE, PLASTIC
1	016-0171-649	SHEET, WARRANTY/HELP
1	053-0159-110	ENVELOPE, PLASTIC
2	107-0171-852	U-BOLT, 4-1/16" W x 3" L x 3/8-16 UNC, ZINC
4	312-1001-164	NUT, FLANGED NYLOC, M6-1, ZINC COATING

FIGURE 4. Hawkeye 2 AGCO RoGator A/B-Series, 100'/20" Boom Kit Configuration with ARAG/HYPRO Nozzle Bodies (P/N 117-2005-191 Rev. A) Cont.

<b>QTY</b>	<b>PART #</b>	<b>DESCRIPTION</b>
1	115-2005-123	(LABELED BOX 2 OF 6) CABLE, INNER, 100/20, ROGATOR, HAWKEYE 2
1	115-2005-123	(LABELED BOX 3 OF 6) CABLE, INNER, 100/20, ROGATOR, HAWKEYE 2
36 1	063-2005-002 219-2005-115M	(LABELED BOX 4 OF 6) NOZZLE CONTROL VALVE, HAWKEYE 2, HYPRO O-RING, VITON, PURPLE, SIZE -115, 38 PACK
24 1 25	063-2005-002 053-0159-110 219-2005-115	(LABELED BOX 5 OF 6) NOZZLE CONTROL VALVE, HAWKEYE 2, HYPRO ENVELOPE, PLASTIC O-RING, VITON, PURPLE, SIZE -115, INDIVIDUAL
1 60	053-0159-079 333-0002-359	BOX, SHIPPING (LABELED BOX 6 OF 6) NOZZLE BODY, 5-WAY TURRET, AGCO, LEFT PORT

FIGURE 5. Hawkeye 2 AGCO RoGator A/B-Series, 100'/19" Boom Kit Components with ARAG/HYPRO Nozzle Bodies (P/N 117-2005-192 Rev. A)

<b>QTY</b>	<b>PART #</b>	<b>DESCRIPTION</b>
1	053-0159-197	BOX, SHIPPING (LABELED BOX 1 OF 6)
1	063-0173-956	RCM, HAWKEYE 2
1	115-2005-316	CABLE, RCM TO LEFT/RIGHT, ROGATOR A-B, HAWKEYE 2
1	115-2005-317	CABLE, ECU BOX, ROGATOR A-B, HAWKEYE 2
1	115-2005-318	CABLE, ECU BOX TO RCM, ROGATOR A-B, HAWKEYE 2
2	115-2005-181	CABLE, MID, ROGATOR, 100'/19", HAWKEYE 2
2	115-2005-182	CABLE, OUTER, ROGATOR, 100'/19", HAWKEYE 2
1	117-2005-051	KIT, HAWKEYE 2 SYSTEM SERVICE, HYPRO
1	107-0235-015	PLATE, MOUNTING, RCM, ROGATOR
1	063-0173-635	ECU, ISO, CAN, BOOM SENSE SPEED
1	115-7303-084	CABLE, BOOM SENSE, AGCO RETROFIT
1	115-0172-325	CABLE, ROGATOR, ISO CAN
1	115-0172-247	CABLE, ADAPTER, VIPER 4 TO 3 PIN ISO BUS
1	053-0159-110	ENVELOPE, PLASTIC
2	311-4050-147K	BOLT, HEX, M6-1 X 75MM, GRADE 8, CLASS II COATING
1	311-4050-145K	BOLT, HEX, M6-1 X 65MM, GRADE 8, CLASS II COATING
1	311-4050-154K	BOLT, HEX, M6-1 X 110MM, GRADE 8, CLASS II COATING
2	311-4050-159K	BOLT, HEX, M6-1 X 140MM, GRADE 8, CLASS II COATING
3	312-4000-216	NUT, FLANGED NYLOC, M6-1, ZINC COATING
3	313-1000-046	WASHER, M6, ZINC COATING
1	053-0159-015	ENVELOPE, PLASTIC
1	016-0171-649	SHEET, WARRANTY/HELP
1	053-0159-110	ENVELOPE, PLASTIC
2	107-0171-852	U-BOLT, 4-1/16" W x 3" L x 3/8-16 UNC, ZINC
4	312-1001-164	NUT, FLANGED NYLOC, M6-1, ZINC COATING

FIGURE 6. Hawkeye 2 AGCO RoGator A/B-Series, 100'/19" Boom Kit Components with ARAG/HYPRO Nozzle Bodies (P/N 117-2005-192 Rev. A) Cont.


QTY	PART #	DESCRIPTION
1	115-2005-179	(LABELED BOX 2 OF 6) CABLE, LEFT INNER, 100/19, ROGATOR, HAWKEYE 2
1	115-2005-180	(LABELED BOX 3 OF 6) CABLE, RIGHT INNER, 100/19, ROGATOR, HAWKEYE 2
36 1	063-2005-002 219-2005-115M	(LABELED BOX 4 OF 6) NOZZLE CONTROL VALVE, HAWKEYE 2, HYPRO O-RING, 38-PACK, VITON, PURPLE, SIZE -115
27 1 28	063-2005-002 053-0159-110 219-2005-115M	(LABELED BOX 5 OF 6) NOZZLE CONTROL VALVE, HAWKEYE 2, HYPRO ENVELOPE, PLASTIC O-RING, 38-PACK, VITON, PURPLE, SIZE -115

TABLE 2. Hawkeye® 2 Service Kit Components for Wilger Nozzle Bodies (P/N 117-2005-052)

Picture	Item Description	Part Number	Quantity
	Nozzle Control Valve, Hawkeye® 2, Wilger	063-2005-003	1
Not Pictured	Kit, Individual Repair, Hawkeye® 2 NCV, Wilger	117-2005-062	3
Not Pictured	Cable, Hawkeye® 2 8-pin Ampseal Jumper	115-2005-070B	2
Not Pictured	O-Ring, Size -116 Black Viton (Single)	219-2005-116	1
Not Pictured	Tool, Hawkeye® 2 Universal	321-0000-490	2
Not Pictured	Relay, SPST Micro 12V N.O. 280 SRS	415-1001-020	2
Not Pictured	Fuse, Mini-Blade Type 15 Amp	510-1003-041	2



TABLE 3. Hawkeye® 2 Service Kit Components for Hypro Nozzle Bodies (P/N 117-2005-051)

Picture	Item Description	Part Number	Quantity
	Nozzle Control Valve, Hawkeye® 2, Hypro.	063-2005-002	1
Not Pictured	Kit, Individual Repair, Hawkeye® 2 NCV, Hypro/Arag	115-2005-061	3
Not Pictured	Cable, Hawkeye® 2 8-pin Ampseal Jumper	115-2005-070B	2
Not Pictured	O-Ring, Size -115 Purple (Single)	219-2005-115	1
Not Pictured	Tool, Hawkeye® 2 Universal	321-0000-490	2
Not Pictured	Relay, SPST Micro 12V N.O. 280 SRS	415-1001-020	2
Not Pictured	Fuse, Mini-Blade Type 15 Amp	510-1003-041	2

## UPDATES

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

[portal.ravenprecision.com](http://portal.ravenprecision.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)

- Hawkeye® 2 Installation Manual for AGCO RoGator A/B-Series (RG900, RG1100, RG1300)
- 016-2005-008 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.



---


# CHAPTER

# INSTALLATION PREPARATION

## 3

---

Perform the following procedure to prepare for the Hawkeye® 2 system installation.

	<p><b>⚠ CAUTION</b></p> <p>Chemical residues may be present. 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.</p>
---	--

1. Rinse and fill the tank with clean water.
2. Move the equipment to an open area suitable for testing the application system 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 all chemicals are rinsed from the boom supply lines.
5. Disable the application control system and relieve boom pressure.
6. Replace existing carrier line strainer(s) with an 80 mesh (or finer) strainer. An 80 mesh (or finer) strainer is required for use with the Hawkeye® 2 nozzle control system.
7. Remove the spray tips from the boom and set aside for later use.

**NOTE:** If turret style nozzle bodies are installed on the implement, the turret may be rotated to an open spray position, if available. If an open spray position is not available, remove spray tips from a spray position 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





# CHAPTER

# 4

# NOZZLE BODY AND NOZZLE CONTROL VALVE INSTALLATION

## HAWKEYE® 2 NOZZLE BODY INSTALLATION

After completing the steps in Chapter 3, *Installation Preparation*, install the provided nozzle bodies and nozzle control valves.

### BEST PRACTICES AND RECOMMENDATIONS

- Do not connect battery leads until all cables are installed and connected.
- If a dual outlet nozzle body is installed on the boom, always mount the Hawkeye® 2 nozzle control valve to the closest port to the boom tube to avoid higher stress on the nozzle body.

### HYPRO NOZZLE BODY INSTALLATION

**NOTE:** For some Hypro kits, the standard Hypro nozzle bodies will need to be replaced with left-handed versions of the 5-way nozzle body in order to prevent interferences with the NCV2.

FIGURE 1. Valve Face O-Ring and Nozzle Control Valve Installed



Valve Body Face O-Ring  
(Place O-Ring Here)



Purple O-Ring



Nozzle Body

1. Locate included Hypro 5-way, left-handed nozzle bodies in the kit.

2. Remove existing Hypro 5-way, right-handed nozzle bodies from the sprayer by unscrewing the Phillips screw located in the clamp.
3. Install the left-handed nozzle bodies, replacing all right-handed nozzle bodies.

**NOTE:** Boom tube support brackets may need to be adjusted to provide clearance for left-handed nozzle bodies and NCV2s. If obstructions cannot be removed, a right-handed nozzle body may be reinstalled in that position, however the NCV2 may interfere with rotating the 5-way turret.

4. Replace any spray tips on the newly installed nozzle bodies as needed.

FIGURE 2. Hypro Left-Handed Nozzle Bodies Installed

---



## WILGER NOZZLE BODY ASSEMBLY AND INSTALLATION

**NOTE:** For Wilger versions of the Hawkeye® 2 kit, the Wilger nozzle bodies require some assembly before installation onto the plumbing. The assemblies will vary with boom type and location on the sprayer.

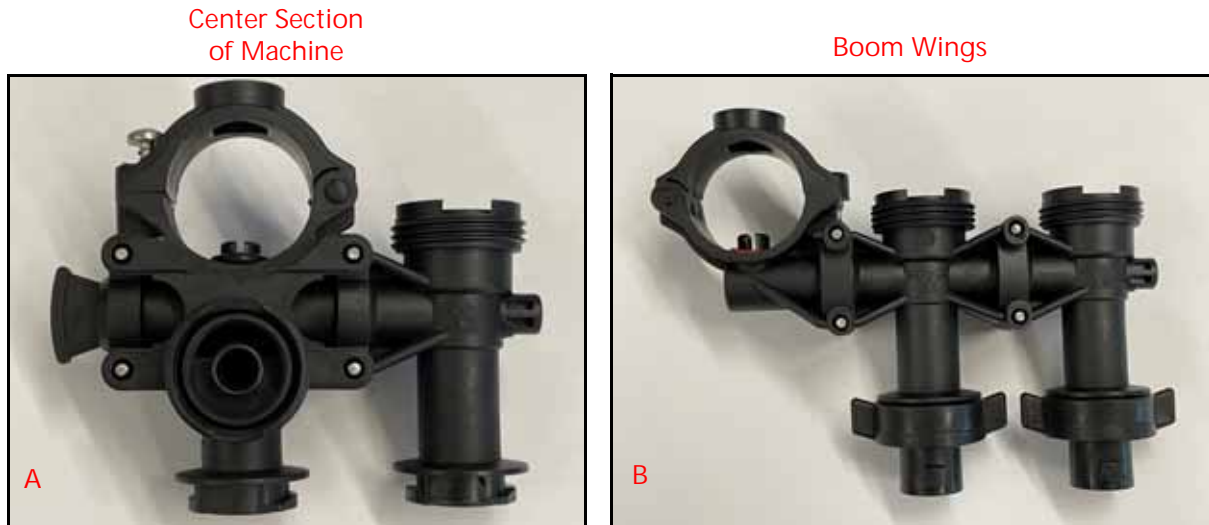
There are two different types of Wilger nozzle bodies that will need to be assembled and installed. See Figure 3 on page 19.

Wilger-to-Square lug tip adapters are also included to allow use with a wider variety of spray tips.

AGCO SPRAY BOOMS WILGER NOZZLE BODY ASSEMBLY

1. Locate the components provided to assemble the two configurations of the nozzle bodies.

FIGURE 3. Wilger Nozzle Body Configurations



2. Remove the stainless steel U-clip provided with the nozzle bodies.
3. Align the nozzle body or plug as necessary and reinstall the U-clip to secure.
4. If the Wilger-to-Square lug tip adapters are needed to accommodate the tips to be used, install them on the outlets of the nozzle bodies by rotating them a quarter turn.

FIGURE 4. Outlets of the Nozzle Body



AGCO SPRAY BOOMS WILGER NOZZLE BODY INSTALLATION

NOTE: The Center Rack and first three locations on the primary boom to the left and right of the center rack will use the Saddle with Integrated Nozzle + End Body configuration. These locations do not have the structural boom tube running below the wet boom tube, thus it does not interfere with the spray pattern. Refer to image "A" in Figure 3 on page 19.

The remaining locations on the spray boom will use the Side Take-off Saddle + Thru Body + End Body configuration. These locations have the structural boom tube that runs directly below the wet boom tube, thus the nozzle outlets need to be offset behind this tube. Refer to image "B" in Figure 3 on page 19.

1. Remove the existing nozzle bodies from the spray boom, if necessary.
2. Install the Wilger nozzle bodies on the spray boom by aligning the inlet with the hole in the boom tube in each location.
3. Close the clamp and tighten the screw to secure.

MILLENNIUM SPRAY BOOMS WILGER NOZZLE BODY ASSEMBLY

NOTE: Millennium spray booms can accommodate the Wilger dual outlet with 5-way turret configuration in every location.

1. Locate the components provided to assemble the nozzle bodies.

FIGURE 5. Wilger Dual Outlet with 5-Way Turret Assemblies



2. Remove the stainless steel U-clip provided with the nozzle bodies.
3. Align the 5-way turret body or plug as necessary and reinstall the U-clip to secure, observing the "This Side Down" indicator on the 5-way turret.



4. If the Wilger-to-Square lug tip adapters are needed to accommodate the tips, install those on the outlets of the nozzle bodies by rotating them a quarter turn.

FIGURE 6. Wilger Nozzle Body Assembly with Tip Adapter Installed



Tip Adapter  
Installed

#### MILLENNIUM SPRAY BOOMS WILGER NOZZLE BODY INSTALLATION

1. Remove the existing nozzle bodies from the spray boom if necessary.
2. Install the Wilger nozzle bodies with 5-way turrets on the spray boom by aligning the inlet with the hole in the boom tube at each location.
3. Close the clamp and tighten the screw to secure.

#### NOZZLE CONTROL VALVE 2 (NCV2) INSTALLATION

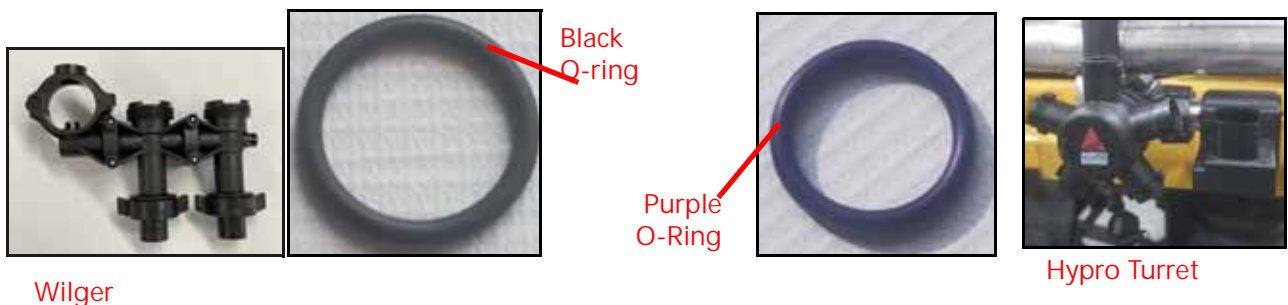
1. Locate the Hawkeye® 2 NCVs and the O-rings provided with the kit.

NOTE: Hypro NCV2 and nozzle body will use the purple-colored (size 115) O-rings (P/N 219-2005-115)

Wilger NCV2 and nozzle body will use the black-colored (size 116) O-rings (P/N 219-2005-116)

2. Place the supplied O-ring on the inside of the fly nut flush with the valve body face.

FIGURE 7. Black and Purple O-Rings



Wilger

Hypro Turret

3. Align the NCV2 with the port of the nozzle body while being careful not to lose the O-ring.

4. Turn the fly nut of the NCV2 to engage the threads of the nozzle body. Tighten the fly nut using the supplied universal wrench (P/N 333-0002-490) included in the system service kit. Tighten until the NCV2 no longer rotates freely or at approximately 50 in-lbs..
5. Repeat step 1 through step 4 for each nozzle location on the spray boom.

**NOTE:** A leak test is recommended after the installation is complete.

---

## BOOM CABLE ROUTING AND CONNECTION

### BEST PRACTICES AND RECOMMENDATIONS

- Route the Hawkeye® 2 primary, mid, and outer boom cables along existing cables or plumbing to avoid cable damage.
- 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, mid, and outer 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.
- Route the boom cables on the inside of the boom frame when possible.
- Secure cables using a zip tie at each nozzle control valve tee branch, and one between each tee branch along the cable length.

### BOOM CABLE ROUTING AND CONNECTIONS (INNER, MIDDLE, AND OUTER BOOM CABLES)

1. Locate the boom cables included with the Hawkeye® 2 installation kit. There are typically six boom cables for a single system:
  - 2 inner boom cables (may be left and right specific).
  - 2 mid boom cables.
  - 2 outer boom cables.
2. Starting with an inner boom cable, identify the beginning of each boom cable by locating the rotating locking collar.
3. Start with the beginning of the cable near the center of the center rack and route the cable going outwards towards the boom tip, following plumbing routing whenever possible.

**NOTE:** Keep the boom connections clean and off the ground while routing.

Do not secure cables with cable ties until all cables are in place and routings are checked for pinch points and other interferences.

Ensure sufficient slack is available at fold and break-away joints to allow for full range of motion without stretching the cable.

4. Next, repeat step 2 and step 3 for the corresponding opposite side boom cable.
5. Continue routing both mid and outer boom cables by repeating step 2 through step 4. Start the mid and outer boom cable beginnings by connecting the rotating locking collar to the end of the inside boom cable.
6. If not already applied, apply a single, short burst of corrosion inhibitor to all connections. Corrosion X HD (P/N 222-0000-020 or available from <http://www.corrosionx.com/corrosionx-heavy-duty.html>) is recommended.

7. 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.

8. Once all boom cables are routed along the boom as desired, begin connecting the boom cables to the Hawkeye® 2 NCVs previously installed.
9. Use provided cable ties to secure the boom cables to the boom components as needed to ensure they are secure.

NOTE: Do not put strain on cables and connections while applying tie-downs.

Do not leave any exposed cable loops that may get caught on crops or other debris while the vehicle is in use.

Allow enough cable slack for the boom to fully fold and unfold without stretching the harness or catching on the boom.

10. The inner boom cables will be connected to the RCM TO LEFT/RIGHT chassis cable in a later section.



---

# CHAPTER

# 5

# INSTALL THE HAWKEYE® 2 RCM - SPRAYER

---

## RCM - SPRAYER INSTALLATION

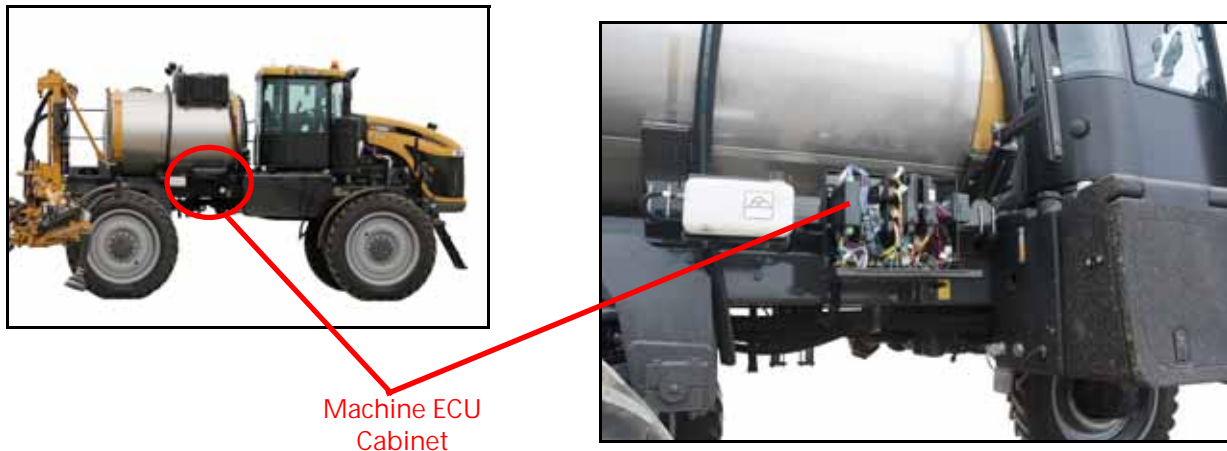
### BEST PRACTICES AND RECOMMENDATIONS

- Do not connect battery leads until all cables are installed and connected.
- If a protected mounting location is not available on the equipment, mount the RCM - Sprayer with the connectors facing down toward the ground to prevent moisture from accumulating in the RCM - Sprayer connections.

### RCM - SPRAYER MOUNTING LOCATION

1. Locate the foam marker pump (if applicable) and ECU cabinet between the axles on the right side of the machine.

FIGURE 1. RoGator ECU Cabinet Location



NOTE: If a foam marker is present on the machine, refer to the “RCM - Sprayer Mounting With Foam Marker” on page 26.

If Raven Autoboomb XRT is already installed on this machine, refer to “RCM - Sprayer Mounting with Raven Autoboomb XRT” on page 28.

2. Use the supplied u-bolts (P/N 107-0171-852) and 3/8” hardware to secure the RCM - Sprayer mounting plate (P/N 107-0235-015) to the outside of the frame structure, roughly 12” behind the ECU cabinet. Mount the plate so that the tabs at the bottom of the plate face toward the center of the machine.

3. Secure the RCM - Sprayer (P/N 063-0173-956) to the plate using the supplied bolts (M6 x75mm (qty 2), M6 x 65mm (qty 1), and flanged nylon lock nuts (qty 3)). It is recommended to mount the RCM - Sprayer to the inside of the mounting plate.

FIGURE 2. RCM - Sprayer Mounted

---



#### RCM - SPRAYER MOUNTING WITH FOAM MARKER

1. Remove the four bolts from the bottom of the foam marker mounting bracket and remove the foam marker.

FIGURE 3. Remove the Foam Marker

---



2. Remove the hardware holding the foam marker mounting bracket and slip the bracket off of the existing u-bolts.
3. Place the RCM - Sprayer mounting plate (P/N 107-0235-015) on the existing u-bolts with the tabs at the bottom of the bracket facing toward the center of the machine.
4. Replace the foam marker mounting bracket.
5. Replace the existing nuts to secure the plate and foam marker mounting bracket.

FIGURE 4. RCM - Sprayer Mounted



- Secure the RCM - Sprayer (P/N 063-0173-956) to the plate using the supplied bolts (M6 x75mm (qty 2), M6 x 65mm (qty 1), and flanged nylon lock nuts (qty 3)). It is recommended to mount the RCM - Sprayer to the inside of the mounting plate.

FIGURE 5. RCM - Sprayer Mounted

---



#### RCM - SPRAYER MOUNTING WITH RAVEN AUTOBOOM XRT

If the Raven Autoboam XRT system is installed on this machine, the Autoboam XRT ECUs are mounted in this same location, so alternative RCM - Sprayer mounting steps are required:

- Remove the hardware securing the Autoboam XRT REM to the mounting plate.
- Place the RCM - Sprayer on the opposite side of the mounting plate from the REM, aligning with the mounting holes.

**NOTE:** Some drilling may be required depending on the revision of the mounting plate.

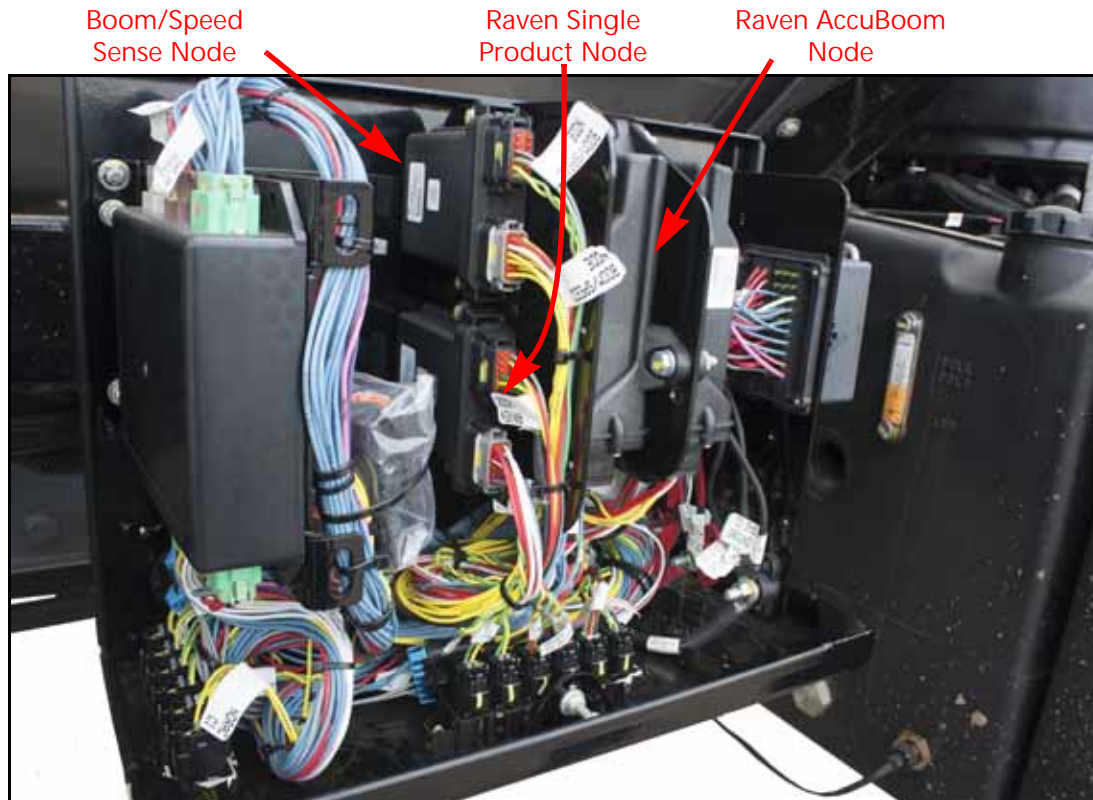
- Use the provided M6 x 110mm (qty 1) and M6 x 140mm (qty 2) bolts, along with M6 washers and M6 flanged nylon lock nuts to pass through both ECUs and fasten them to the mounting plate, one ECU on each side of the plate.



## ECU CABINET PREPARATION

1. Locate the ECU cabinet on the right side of the machine between the axles, as seen in Figure 1 on page 25, and remove the cover.

FIGURE 6. Node Mounting Plate Modifications



2. Locate the node mounting plate with the Raven boom/speed sense node and single product node.
3. Remove the bolts securing the boom/speed sense node and single product node to the mounting plate.

**NOTE:** Do not disconnect the nodes from the cable connections at this time.

4. Use a socket and socket extension to loosen the bolts securing the node mounting plate to the rear cabinet wall and remove the plate from the ECU cabinet.
5. Remove the Raven AccuBoom node from the machine ECU cabinet. The AccuBoom node will not be reused with the Hawkeye® 2 system and may be set aside.
6. Tuck the two rectangular node plugs connected to the AccuBoom out of the way at the bottom of the ECU cabinet. These will not be used in the Hawkeye® 2 system.

**NOTE:** It is recommended to cover the unused electrical connections so no water/dust collects on the pins.

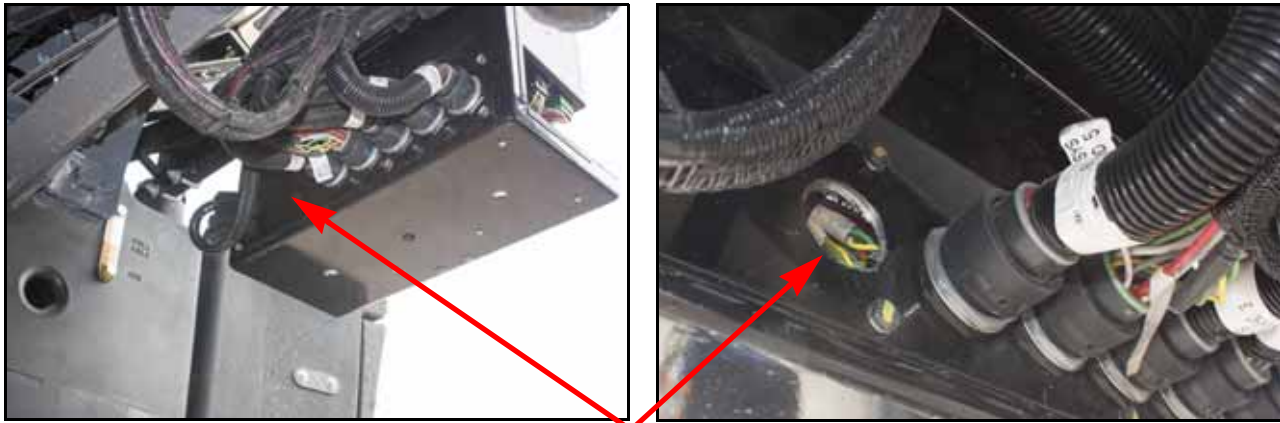
7. Locate the two brown connectors labeled "AccuBoom Tee" in the ECU cabinet. Adjust the harness to allow access to the connectors for future steps.

8. Use a 1/2" hole saw to drill a hole through the back of the ECU cabinet in a location where additional harnessing will not interfere with the existing electrical components.

**NOTE:** Use care to not damage any existing electrical components while drilling. This hole will be used later to connect the chassis cable to the ECU cabinet cabling for final system connections.

FIGURE 7. Access to ECU cabinet for Hawkeye Chassis Cable

---



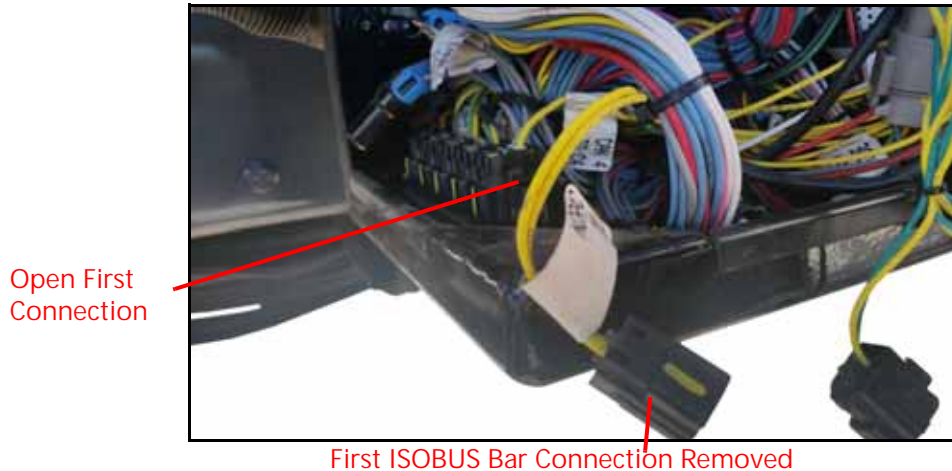
Drill 1-1/2" Hole

9. Locate the Hawkeye® 2 ECU cabinet cable (P/N 115-2005-317) and remove the nut and washer from the large, round receptacle.
10. Feed the receptacle through the previously drilled hole on the outside of the ECU cabinet.
11. Replace the washer and nut onto the receptacle from the back of the ECU cabinet.
12. Route the opposite end of the cable harness through the ECU cabinet to the front side. This end of the cable will be connected in later steps.
13. Reinstall the node mounting plate into the ECU cabinet and use a socket and socket extension to secure the plate in place with existing hardware.
14. Reuse the hardware from the boom/speed sense node or single product node to mount the new ISO Boom Speed Sense ECU (P/N 063-0173-635) to the side of the node mounting plate facing toward the front of the machine.

ROGATOR ISOBUS TEE CABLE INSTALLATION (P/N 115-0172-325)

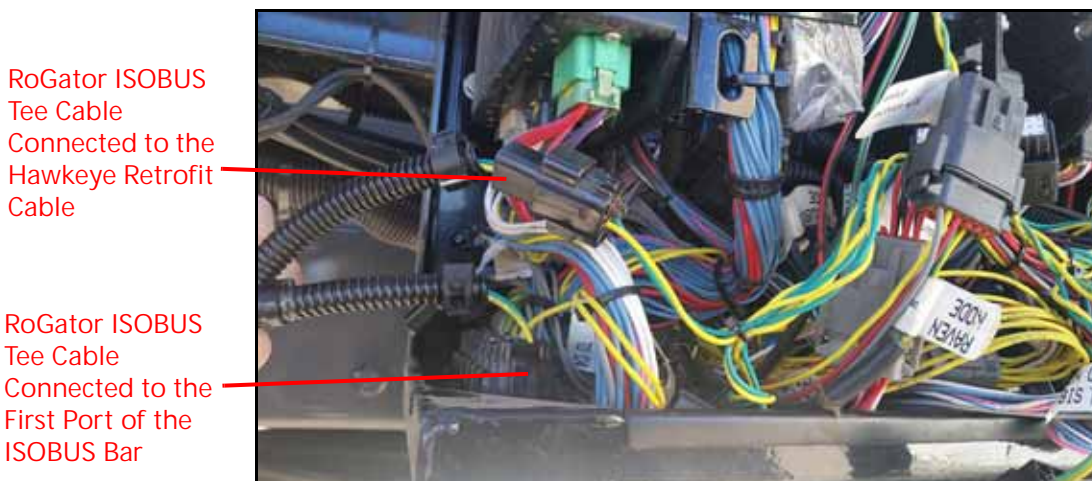
1. Locate the ISOBUS Bar inside the ECU cabinet. The ISOBUS bar is adjacent to the edge of the box closest to the rear of the machine.

FIGURE 8. ISOBUS Bar



2. Disconnect the connector farthest on the right on the ISOBUS bar.
3. Locate the provided RoGator ISOBUS Tee Cable (P/N 115-0172-325).
4. Locate and connect the mating receptacle of the RoGator ISOBUS Tee Cable to the open connector on the ISOBUS bar.
5. Locate the mating connection on the previously installed ECU cabinet cable (P/N 115-2005-317) and plug it into the ISOBUS Tee Cable (P/N 115-0172-325).

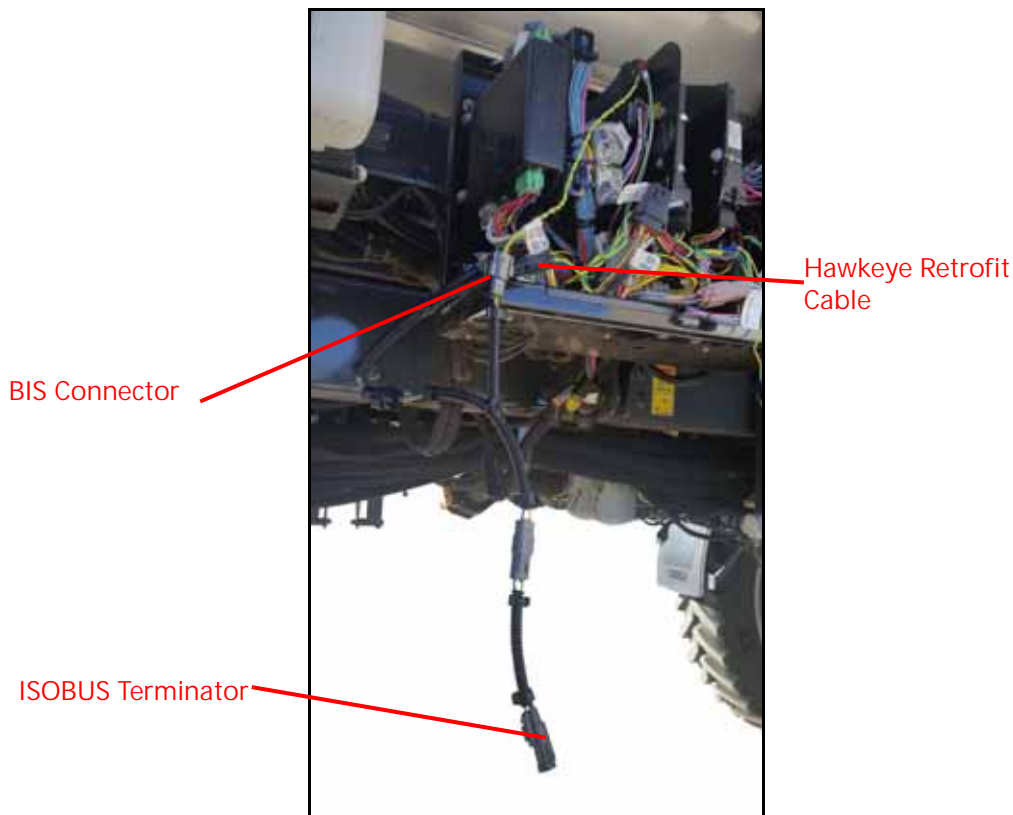
FIGURE 9. Hawkeye Retrofit Cable Connected to ISOBUS Tee Cable



6. Locate the Raven CANbus bar along the edge of the ECU cabinet furthest from the center of the machine.
7. Locate and disconnect the connector labeled "BIS" from the Raven CANbus bar.

8. Connect the BIS connector removed in the previous step to the remaining open plug on the RoGator ISOBUS Tee Cable (P/N 115-0172-325).

FIGURE 10. RoGator ISOBUS Tee Cable Installed



**NOTE:** The 3-pin cap on the end of the RoGator ISOBUS Tee Cable is an ISOBUS terminator. This must be left in place unless Sidekick Pro Injection Pump(s) are being connected to the ISOBUS. See Chapter 7, *Sidekick Pro™ ICD Installation* for connecting injection pumps to the ISOBUS with the RoGator ISOBUS Tee Cable.

#### SINGLE PRODUCT NODE REMOVAL

1. Locate the gray and black connectors on the existing single product node and the gray and black receptacles on the Hawkeye® 2 retrofit cable (P/N 115-2005-317).
2. Disconnect the black plug from the single product node and connect to the black receptacle on the retrofit cable.
3. Disconnect the gray plug from the single product node and connect to the gray receptacle on the retrofit cable. The single product node will not be reused with the Hawkeye® 2 system and may be set aside.

#### BOOM/SPEED SENSE NODE REMOVAL AND ECU CONNECTION

1. Locate the gray and black connectors on the existing boom/speed sense node and the gray receptacle on the boom/speed retrofit cable (P/N 115-7303-084).
2. Disconnect the gray plug from the boom/speed node and connect to the gray receptacle on the boom/speed retrofit cable.
3. Insert the remaining gray plug on the boom/speed retrofit cable into the new ISO boom/speed ECU (P/N 063-0173-635) previously installed.

4. Disconnect the black connector from the boom/speed node and connect to the black receptacle on the new ISO boom/speed ECU. The existing boom/speed node will not be reused with the Hawkeye® 2 system and may be set aside.

#### SECTION VALVE CABLE CONNECTIONS

1. Disconnect the two brown "AccuBoom Tee" connections located earlier in the installation process.
2. Locate the existing plug and receptacle labeled with an 'A1' and 'A2' or 'N1' and 'N2' at the base of the label and connect these two together.

FIGURE 11. A1 and A2 Connectors



3. Locate the existing female "AccuBoom Tee" receptacle labeled 'E1' or 'KB1' and connect to the brown receptacle on the supplied Hawkeye® 2 Retrofit Cable (P/N 115-2005-084).
4. Locate the existing male "AccuBoom Tee" plug labeled 'E2' or 'KB2' and connect to the brown receptacle on the Hawkeye® 2 ECU Cabinet cable (P/N 115-7303-317).

**NOTE:** The remaining 12-pin plug and receptacle lead to the AccuBoom node which is no longer used with the Hawkeye® 2 system. These connectors will not be used. Connect this plug and receptacle together to protect the pins from corrosion.

After Hawkeye® 2 system installation is complete, if the boom switches or valves do not operate correctly, it is possible the wrong connectors were identified above. Switching connectors should correct the issue.

5. Tuck cables back into the ECU cabinet and replace the cover.

## IN CAB CONNECTIONS

### VIPER 4 ISOBUS CONNECTION

1. Connect the two 2-pin Deutsch ISOBUS connectors located behind the Viper<sup>®</sup> 4 together.

NOTE: For older machines that do not have the two 2-pin connectors, the ISOBUS adapter cable (P/N 115-0172-247) is required. See Appendix A, *Connecting Virtual Terminal to ISOBUS* for more information.

FIGURE 12. ISOBUS Connections

---



### 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.

#### ECU CABINET TO RCM - SPRAYER CONNECTIONS

1. Locate the single, round connector on the RCM - Sprayer cable (P/N 115-2005-318) provided in the kit.
2. Route this connector to the outside back wall of the ECU Cabinet and connect to the bulkhead connector of the Hawkeye® 2 ECU cabinet cable (P/N 115-2005-317) installed previously. Align the connector keyways and rotate the locking collar to secure.
3. Route the RCM - Sprayer cable (P/N 115-2005-318) back along the frame rail towards the RCM - Sprayer installed previously.
4. Connect the gray and black rectangular plugs to their mating connections of the RCM - Sprayer.
5. Secure the cable with the cable ties provided.

FIGURE 1. Chassis Cable ECU Cabinet Connection

---

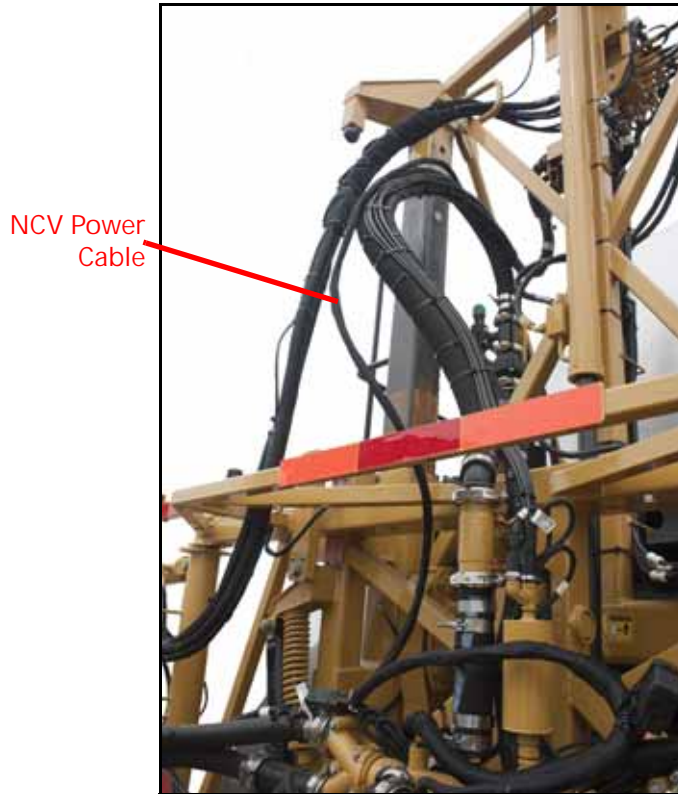


## HAWKEYE® 2 ECU NCV POWER CABLE INSTALLATION

1. Locate the Hawkeye® 2 NCV Power cable (P/N 115-2005-316) provided in the kit.
2. Connect the black rectangular AmpSeal connector to the center port of the RCM - Sprayer installed previously.
3. Route the round connectors labeled “left boom” and “right boom” along the right frame rail towards the rear of the machine.
4. At the rear of the applicator tank, route the chassis cable underneath the rear catwalk and then up and over the center rack framework. Follow the supply lines to ensure adequate slack for operating the center rack during field operations and when folding and unfolding the booms.

FIGURE 2. NCV Power Cable Center Rack Routing

---



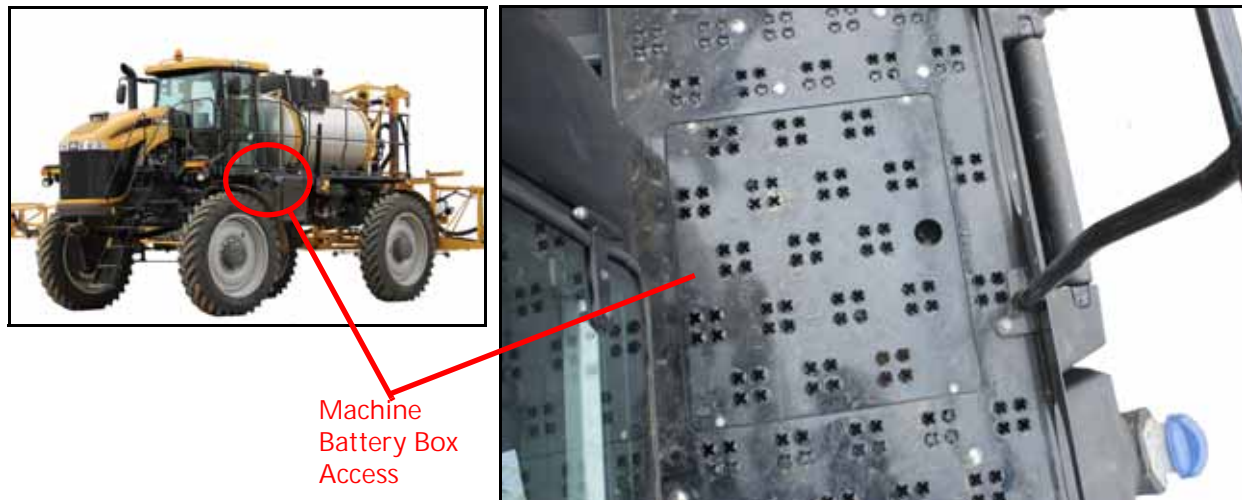
5. Use zip ties to secure the NCV Power cable to existing system lines to keep the cable from being damaged during normal equipment operation.
6. Connect the NCV power cable to the left and right boom cable connectors at the center rack.
7. Use supplied zip ties to secure any excess cabling on the center rack framework.



## HAWKEYE® 2 POWER CONNECTIONS

1. Disconnect the battery switch by turning the battery disconnect switch below the catwalk near the cabin floor.
2. Locate the battery compartment under the catwalk outside of the cabin door.

FIGURE 3. RoGator Battery Compartment Location



3. Remove the walkway cover and the battery compartment cover.
4. Route the power and ground wires of the Hawkeye® 2 NCV power cable (P/N 115-2005-316) along the frame rail and then behind the cab to the battery compartment.
5. Route the power and ground wires into the battery compartment. Keep the breaker on the outside of the battery compartment.
6. Use zip ties to secure the breaker to the existing cables near the battery compartment.
7. Connect the red battery power lead to a positive battery terminal.
8. Locate the battery disconnect switch and remove the nut from the top-left terminal.
9. Connect the black battery ground lead to the negative bolt on the battery disconnect switch and reinstall the nut.
10. After the installation is complete, reconnect the battery disconnect switch before operating any equipment.

FIGURE 4. Battery Disconnect Switch Location

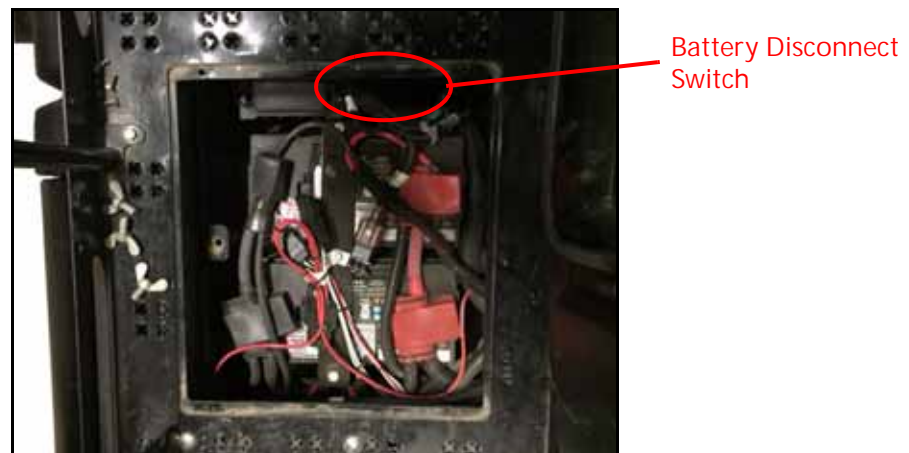
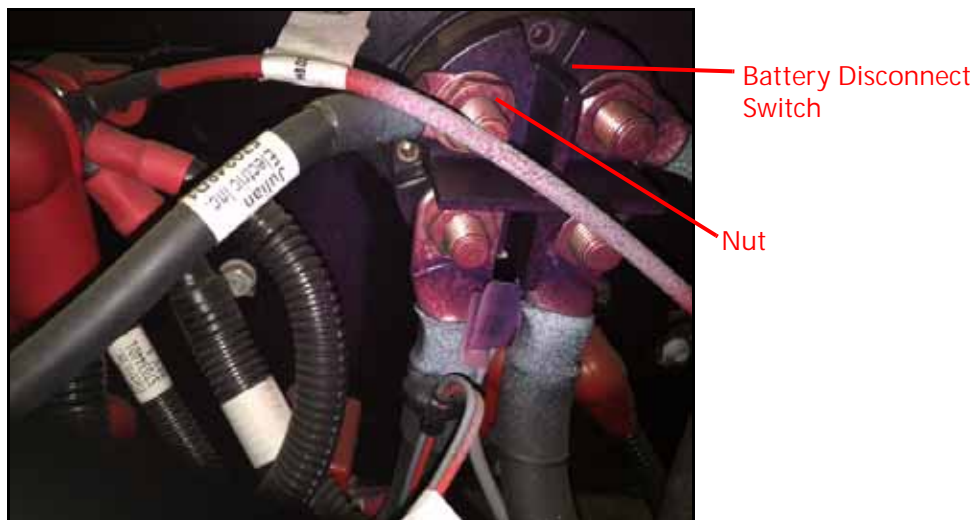


FIGURE 5. Battery Disconnect Switch



---

## SYSTEM DIAGRAMS

Diagrams start on the next page.

FIGURE 6. Hawkeye® 2 AGCO RoGator A/B-Series System Diagram (P/N 054-2005-008 Rev. A, Page 1)

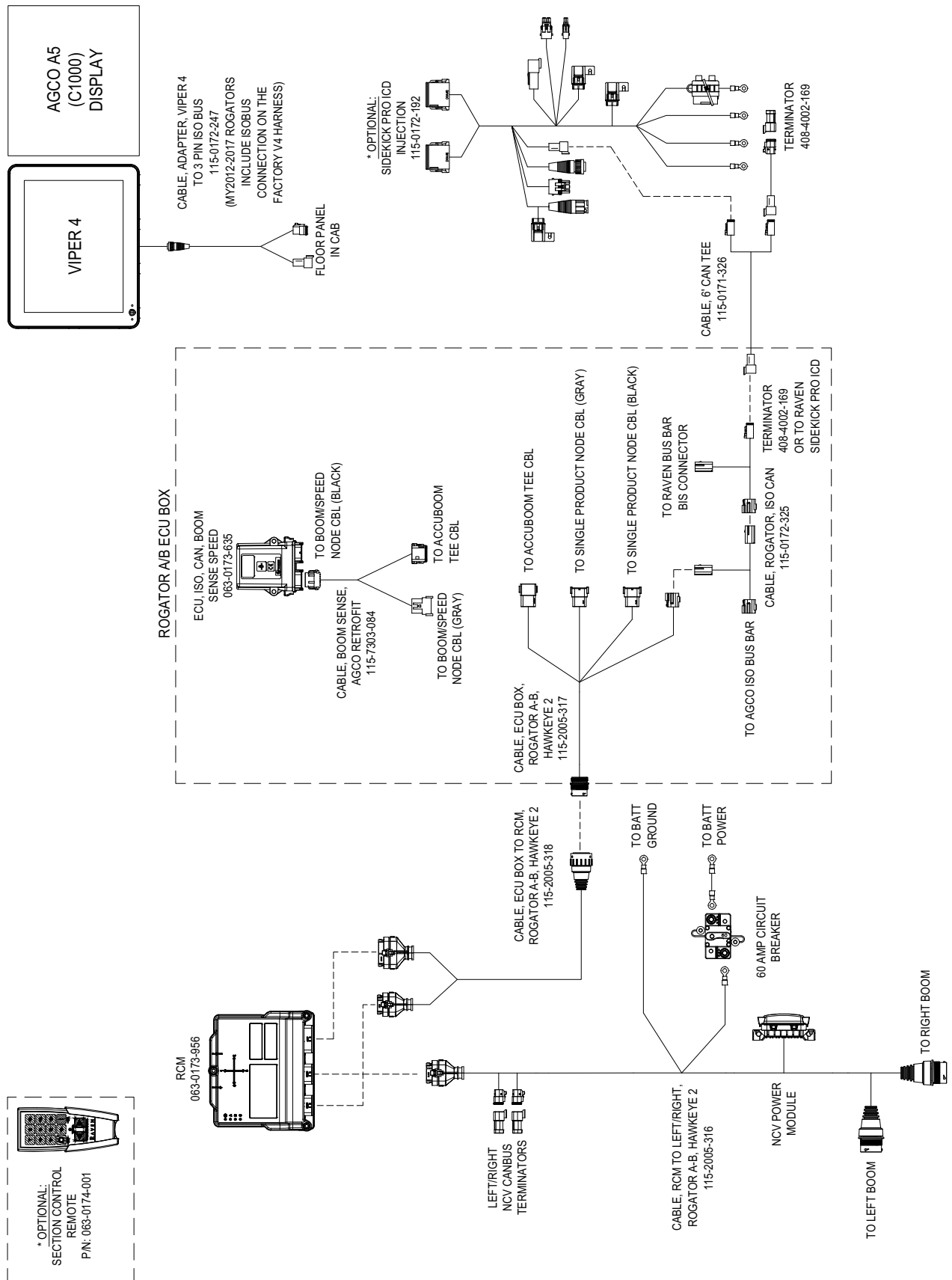
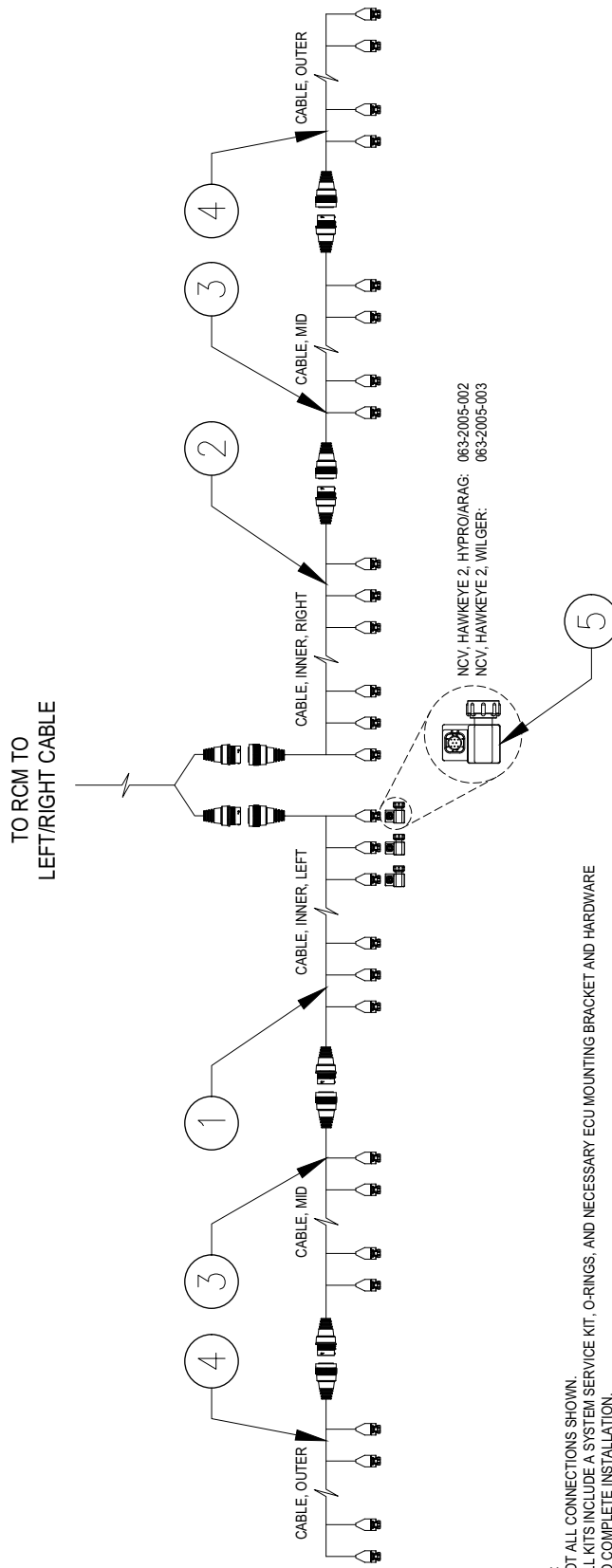


FIGURE 7. Hawkeye® 2 AGCO RoGator A/B-Series System Diagram (P/N 054-2005-008 Rev. A, Page 2)

BOOM CABLES AND KITS AGCO ROGATOR A-B			
ITEM NO.	DESCRIPTION	100' BOOM 19" SPACING	120' BOOM 20" SPACING
1	CABLE, INNER (LEFT)	115-2005-179	115-2005-002
2	CABLE, INNER (RIGHT)	115-2005-180	115-2005-002
3	CABLE, MID (QTY 2)	115-2005-181	115-2005-003
4	CABLE, OUTER (QTY 2)	115-2005-182	115-2005-004
5	ARAGHYPRO NCV WILGER NCV	063-2005-002 063-2005-003 (QTY: 63)	063-2005-002 063-2005-003 (QTY: 72)
N/A	KITS	117-2005-192 (ARAGHYPRO)	117-2005-190 (ARAGHYPRO)



- NOTES:
1. NOT ALL CONNECTIONS SHOWN.
  2. ALL KITS INCLUDE A SYSTEM SERVICE KIT, O-RINGS, AND NECESSARY ECU MOUNTING BRACKET AND HARDWARE TO COMPLETE INSTALLATION.
  3. A 1.5" HOLE MUST BE DRILLED IN THE REAR OF THE ECU CABINET WITH A HOLE SAW (NOT PROVIDED) FOR A CABLE BULKHEAD CONNECTION.
  4. ARAGHYPRO KITS INCLUDE HYPRO LEFT PORT 5-WAY OUTLET NOZZLE BODIES TO REPLACE RIGHT PORT NOZZLE BODIES WITH WHEN INTERFERENCE OCCURS UPON INSTALLATION.

---

## CHAPTER

# 7

## SIDEKICK PRO™ ICD INSTALLATION

---

### CONNECTING SIDEKICK PRO ICD DIRECT INJECTION PUMPS TO THE ISOBUS

Sidekick Pro direct injection pumps installed by AGCO are Raven CAN version and are connected to the CANbus. To work with the Hawkeye® 2 Product Control System, change the pumps to Sidekick Pro ICD pumps and connect them to the machine's ISOBUS using a Raven adapter cable (P/N 115-0172-325). Contact a local Raven dealer to order this cable and ICD pumps if necessary.

**NOTE:** If adding a new injection system to the machine, also order the required AGCO cable harness from your local AGCO dealer.

1. Inspect the Sidekick Pro label to determine if it is the ICD version. The label will either read Raven Sidekick Pro™ ICD and the part number will be one of the following:
  - P/N: 1-063-0173-768 (1-40 oz/min pump)
  - P/N: 1-063-0173-769 (5-200 oz/min pump)

FIGURE 1. Raven Sidekick Pro ICD Label

---



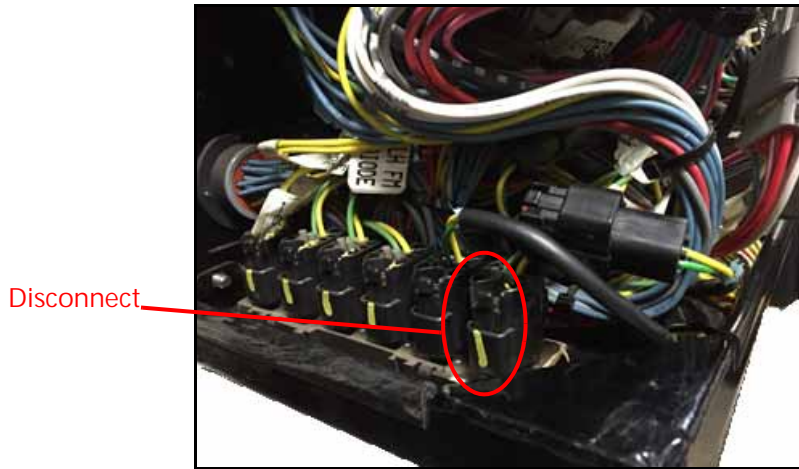
2. Remove the cover of the ECU cabinet that contains the product control ECU's on the middle of the right frame rail. Refer to Figure 1, "RoGator ECU Cabinet Location," on page 25.
3. Locate the RoGator ISOBUS Tee Cable (P/N 115-0172-325). This may have been provided with your Hawkeye® 2 system kit, or it may need to be ordered.
4. Remove the 4-Pin to 3-Pin Deutsch adapter cable with ISOBUS Terminator and set aside. This will be used in a later step.
5. Follow the cable from the injection pumps down the frame rail to the round bulkhead connector on the back of the ECU cabinet. This is typically the bulkhead connector furthest towards the front of the machine on the ECU cabinet.
6. Locate the mating bulkhead connector on the inside of the ECU cabinet.
7. Identify and disconnect the green/yellow twisted wires from the identified bulkhead connector that lead to a 4-pin Deutsch connector in the ECU cabinet.
8. Connect the 4-pin Deutsch receptacle coming from the bulkhead connector to the mating 4-pin plug on the ISOBUS adapter tee (P/N 115-0172-325) where the adapter and terminator were removed.
9. Locate and disconnect the square Raven passive terminator on the cable harness near the Sidekick Pro Injection Pumps.

10. Locate the 4-Pin adapter cable and ISOBUS terminator removed from the ISOBUS Tee Cable (P/N 115-0172-325) in a previous step.
11. Install the adapter and ISOBUS terminator onto the connection that the Raven Passive Terminator was removed from.

**NOTE:** If the ISOBUS Tee Cable (P/N 115-0172-325) was previously installed, skip step 12 through step 17.

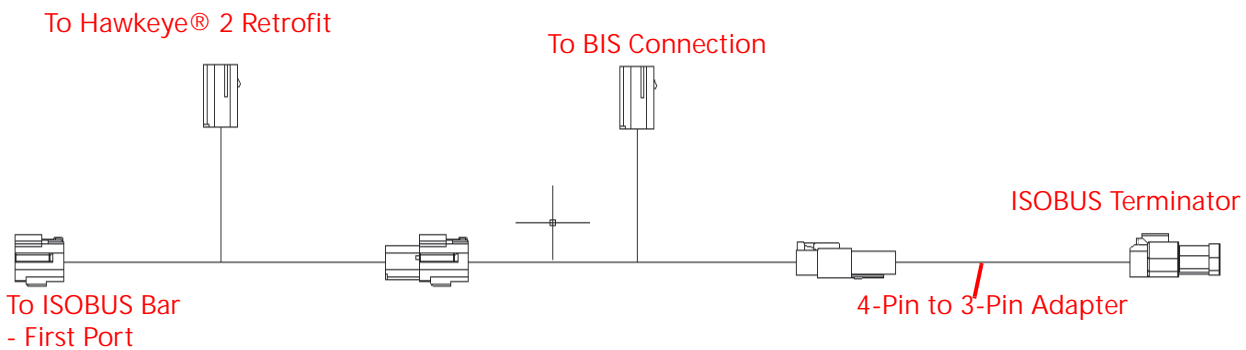
12. Remove the first connector from the front of the ISOBUS bar located in the bottom of the ECU cabinet along the edge closest to the rear of the machine.

FIGURE 2. First ISOBUS Bar Connector.



13. Plug the mating connector of the ISOBUS adapter tee (P/N 115-0172-325) into the open first port of the ISOBUS bar.
14. Locate the mating connection on P/N 115-2005-317 and plug it into the ISOBUS Tee Cable (P/N 115-0172-325).
15. Locate the Raven CANbus bar along the edge of the ECU cabinet furthest from the center of the machine.
16. Locate and disconnect the connector labeled “BIS” from the Raven CANbus bar.
17. Connect the BIS connector removed in the previous step to the remaining open plug on the RoGator ISOBUS Tee Cable (P/N 115-0172-325).

FIGURE 3. Adapter Cable (P/N 115-0172-325)



18. Secure any cables.
19. Replace the cover of the ECU cabinet.

---

## APPENDIX

# CONNECTING VIRTUAL TERMINAL TO ISOBUS

## A

---

Contact a local equipment or Raven dealer for additional assistance with any adapter cables required for connecting the Hawkeye® 2 nozzle control system to the virtual terminal (VT).

---

### VIPER 4 ISOBUS ADAPTER CABLE

**NOTE:** For 2012 - 2015 machines, the ISOBUS adapter cable (P/N 115-0172-247) is required for a ROS device to interface with the Hawkeye® 2 nozzle control system. Refer to the Installation Manual provided with the ROS device for additional assistance with installing a Raven display.

2016 and newer machines with an existing Viper 4 field computer may already have the ISOBUS connected to the Viper 4.

Look for a cable connected to Port 5 on the back of the Viper 4 to verify. If present, the ISOBUS adapter cable (P/N 115-0172-247) will not be used. There will be two 2-pin Deutsch connectors on the existing console cable that need to be connected together to finish connecting the Viper 4 to the ISOBUS.

1. Locate the top panel to the right of the operator seat in the vehicle cabin.

FIGURE 1. Upper Panel Right of the Operator Seat

---



2. Remove the panel cover to access the ISOBUS terminator and connections.
3. Locate the connection labeled "ISO Terminator" toward the rear of the exposed panel.

FIGURE 2. Upper Panel Right of the Operator Seat



4. Disconnect the ISO terminator from the 3-pin connector.
5. Plug in the ISOBUS adapter cable to the connectors to allow the ROS device to interface with the machine ISOBUS and the Raven Hawkeye® 2 nozzle control system.
6. Plug the ISO terminator plug on to the second connector on the cable.
7. Route the adapter cable to the back of the ROS device and connect to the receptacle labeled "5."
8. To prevent issues with the Hawkeye® 2 Icon showing up on the C1000, perform the steps in AGCO Service Bulletin Number 16-0104. This bulleting provides the steps to set the ISOBUS Terminal Generation to UT 2, turn the ISOBUS Terminal Functions On, and assign the terminal number.

**NOTE:** If step 8 does not resolve any issues, contact an AGCO technician for assistance with updating the C1000 software to the latest version.



---

## APPENDIX

# CABLE AND CONNECTOR MAINTENANCE

## B

---

### 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® 2 BOOM HARNESS CONNECTOR MAINTENANCE

Prior to connecting the boom cable to the Hawkeye® 2 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 through step 6. If this is a new installation, skip to step 7. All components listed below can be ordered in the Hawkeye® 2 NCV Connection Maintenance Kit (P/N 117-0171-692).
2. Spray the connection with a deoxidizing agent.

NOTE: DeoxIT D5 (P/N 222-4001-006) is recommended.

FIGURE 1. DeoxIT D5 Applied to Hawkeye® 2 NCV




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

FIGURE 2. Cleaning Contacts with a Wire Brush

---



4. Spray the contacts again with the deoxidizing agent to help rinse out debris.
5. Remove residue of the deoxidizing agent from the connection.

	<p style="text-align: center;"><b>CAUTION</b></p> <p>Damage to the connector seal may occur if residue is not removed from the connector.</p>
---	---

6. Dry out the connection with dry, compressed air such as Dust Off Electronics Duster (P/N 222-4001-007) or equivalent air duster suitable for electronic components.

NOTE: If using compressed air from a large volume air compressor, be sure the lines are free of moisture.

FIGURE 3. Electronics Duster Used on NCV

---



- 
7. If not already applied, apply a single, short burst of corrosion inhibitor such as CorrosionX HD (P/N 222-0000-020) to the NCV2 connection. Be sure the corrosion inhibitor has coated the NCV2 contacts and recessed portions of the connector.

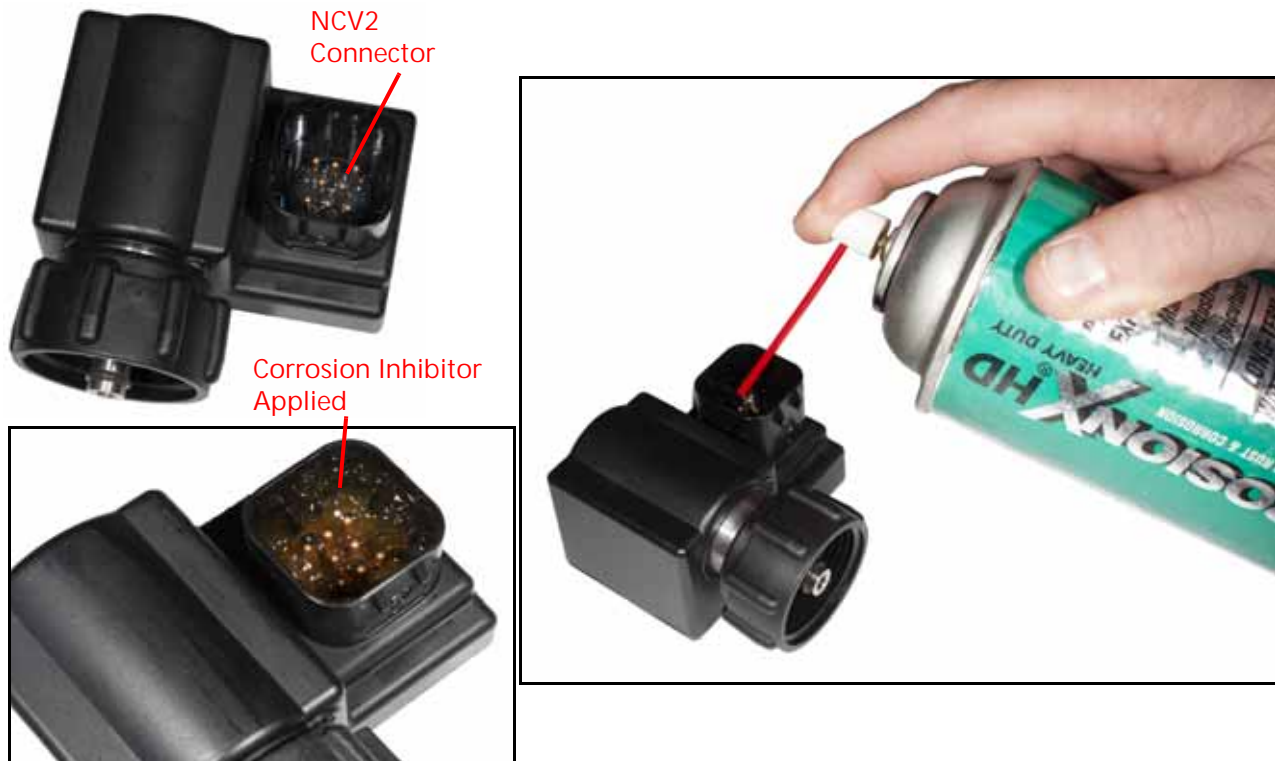
NOTE: To determine whether corrosion inhibitor has been applied, inspect for a thick liquid in the bottom of the connector as shown in the image below.

CorrosionX may also be purchased from the manufacturer website:

<https://www.corrosionx.com/products/corrosionx-heavy-duty>.

FIGURE 4. Applying Corrosion Inhibitor

---





# 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.**