

# Case Magnum - Steering Ready, Model Year 2014-2018, Raven RS1 HDU Guidance and Steering Installation Manual

*P/N 016-5032-123 Rev. A*

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# CHAPTER

# 1

# IMPORTANT SAFETY INFORMATION

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## NOTICE

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

- Follow all safety information presented within this manual.
- If you require assistance with any portion of the installation or service of your Raven equipment, contact your local Raven dealer for support.
- Follow all safety labels affixed to the 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 your local Raven dealer.

When operating the machine after installing, observe the following safety measures:

- Be alert and aware of surroundings.
- Do not operate or any agricultural equipment while under the influence of alcohol or an illegal substance.
- Remain in the operator's position or a safe working distance away from the booms at all times when RS1 is engaged.
- Disable RS1 when exiting from the operator's seat and machine.
- Do not drive the machine with RS1 enabled on any public road.
- Determine and remain a safe working distance from other individuals. The operator is responsible for disabling RS1 when the safe working distance has diminished.
- Ensure RS1 is disabled prior to starting any maintenance work on RS1 or the machine.



## WARNING

- When starting the machine for the first time after installing RS1, be sure that all persons stand clear in case a hose has not been properly tightened.
- The machine must remain stationary and switched off, with the booms unfolded and supported, during installation or maintenance.



## CAUTION

## GENERAL

- 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.
- Ensure that the power cable is the last cable to be connected.
- A minimum of 12 VDC is required for system operation with a maximum of 15 VDC.

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## INSTRUCTIONS FOR WIRE ROUTING

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

Harness should not contact or be attached to:

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

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

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

Routing should not allow harnesses to:

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

Harnessing should not have sharp bends

Allow sufficient clearance from machine component operational zones such as:

- Drive shafts, universal joints and hitches (i.e. 3-point hitch)
- Pulleys, gears, sprockets
- Deflection and backlash of belts and chains
- Adjustment zones of adjustable brackets
- Changes of position in RS1 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.



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The following instructions are designed to assist with the proper installation of the RS1 system. Refer to the RS1 Calibration & Operation Manual (P/N 016-4010-001) for assistance with calibrating the software and using the RS1 system.

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### PREPARING FOR INSTALLATION

Before installing the RS1 /HDU system, park the machine where the ground is level, clean, and dry. Turn off the machine and leave it turned off for the duration of the installation process.

During the installation process, follow good safety practices. Be sure to carefully read the instructions in this manual as you complete the installation process.

### RECOMMENDATIONS

Raven Industries recommends the following best practices when installing or operating the RS1 system for the first time, at the start of the season, or when moving the RS1 system to another machine:

- Install the RS1 unit in the recommended location.
- Use part numbers to identify the parts.
- Do not remove the plastic wrap from a part until it is necessary for installation.
- Do not remove plastic caps from a part until it is necessary for installation.

### POINT OF REFERENCE

The instructions in this manual assume that you are standing behind the machine, looking toward the cab.

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### UPDATES

Software and manual updates are available on the Raven Applied Technology website:

<http://www.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)

- Case Magnum - Steering Ready, Model Year 2014-2018, Raven RS1 HDU Guidance and Steering Installation Manual
- P/N 016-5032-123 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.

## KIT CONTENTS

This section contains a list of the components that are included in the RS1 kit. Before beginning the system installation, compare the items in the kit with the components on this list. If you have questions about the kit, contact your Raven dealer.

**TABLE 1. RS1 Case IH Magnum Installation Kit MY 14-18 (P/N 117-5032-123)**

Item Description	Part Number	Qty.
Sheet, Warranty/Help (016-5032-123)	016-0171-649	1
ECU, Hydarulic Driver Unit (HDU)	063-0173-887	1
Cable, HDU, Magnum Tractor	115-4010-100	1
Cable, Power, RS1 Magnum	115-4010-107	1
Kit, Roof, RS1, CNH	117-5001-053	1

**TABLE 1. RS1 Case IH Magnum Installation Kit MY 14-18 (P/N 117-5032-123)**

<b>Item Description</b>	<b>Part Number</b>	<b>Qty.</b>
Bracket, Mounting, RS1	107-0172-628	1
Cable, RS1, Case IH Steiger, MY 11-15	115-4010-084	1
Nut, Flanged Lock, 1/4" - 20	312-1001-168	4
Nut, Flanged Lock, M5, Zinc Plated	312-4000-215	4

**TABLE 2. Kit, Roof, RS1, CNH (P/N 117-5001-053)**

<b>Item Description</b>	<b>Part Number</b>	<b>Qty.</b>
Bracket, Mounting, RS1, CNH	107-0172-498	1
Machine Screw, Countersink, Zinc, 1/4" - 20 x 1/2" UNC	311-0003-041	4



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## CHAPTER

# 3

## EXTERNAL HARDWARE AND CABLING INSTALLATION

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### NODE AND BRACKET INSTALLATION

1. Locate and remove the rear access panel on the cab.

**FIGURE 1. Machine's Rear Access Panel**

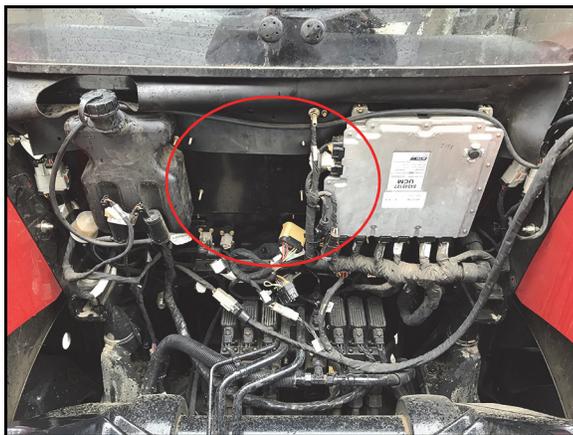
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2. Locate the four mounting studs on the rear wall of the cab.

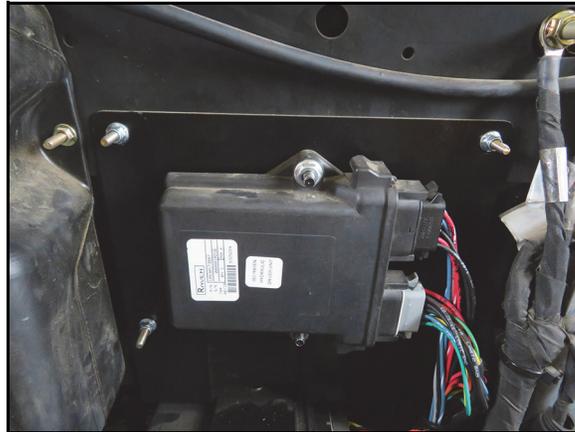
**FIGURE 2. Mounting Studs**

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3. Install the ECU mounting bracket (P/N 107-0172-628) to the mounting studs. Secure the mounting bracket with the M5 flanged locking nuts (P/N 312-4000-215).

FIGURE 3. ECU on Mounting Bracket



4. Install the HDU onto the studs of the installed ECU bracket and secure with the supplied 1/4 - 20 lock nuts.

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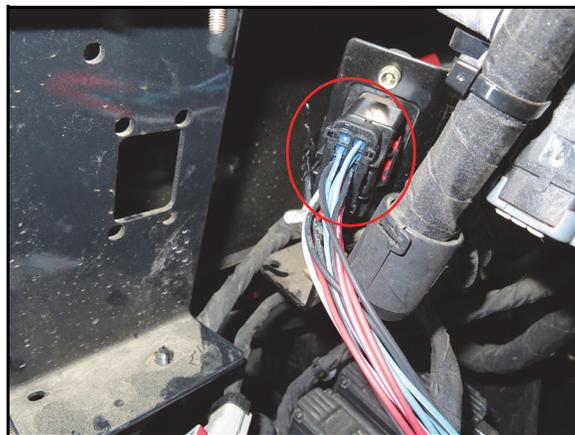
## CABLE INSTALLATION

1. Remove the Nav II harness from the machine.

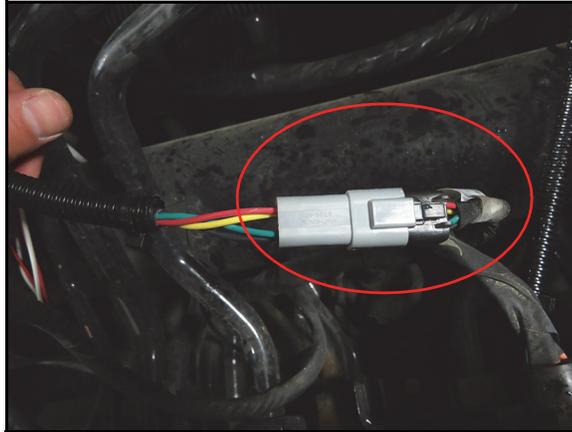
**NOTE:** The HDU Cable (P/N 115-4010-100) will plug into the machines connections where the Nav II cable were connected.

2. Install the two rectangular plugs on the HDU cable (P/N 115-4010-100) to the installed HDU.
3. Locate the 14-pin factory connector located to the lower right of the ECU.
4. Connect the STEERING INPUTS plug to where the factory 14-pin connector was removed.

FIGURE 4. Steering Inputs Connection



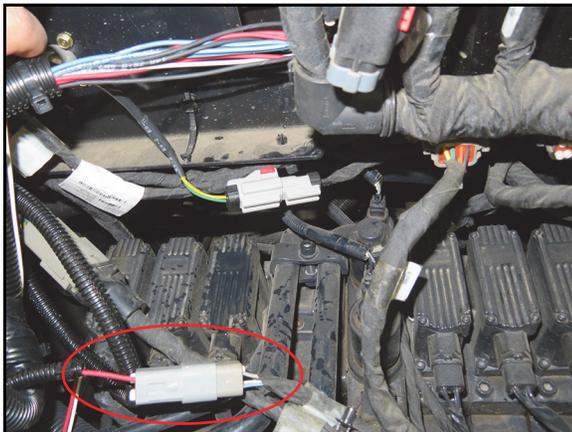
5. Locate the IBBC bulkhead connector on the rear of the machine and remove the existing 4-pin connector.

**FIGURE 5. IBBC Connection**

6. Connect the 4-pin plug to the mating connector on the ECU cable labeled TO MACHINE IBBC CONNECTION.
7. Insert the plug labeled TO IBBC on the ECU cable to the back of the ISO bulkhead connector.

**FIGURE 6. ECU Cable to IBBC Bulkhead Connector**

8. Plug the 6-pin GPS plug into the mating receptacle on the HDU cable.

**FIGURE 7. GPS Connection**

9. Locate and remove the 12-pin Deutsch bulkhead connector located on the lower-left side of the cab wall.
10. Install the bulkhead receptacle on the HDU cable to the cab with the existing hardware.

**FIGURE 8. Bulkhead Connector to ECU**

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11. Locate and disconnect the 2-pin connector near the steering orbital.

**NOTE:** Depending on the machine model number, the ISOLATION connector may be either on the left or right side of the orbital.

**FIGURE 9. ISOLATION Connector Installed on Valve**

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12. Route the ISOLATION connector from the rear of the machine up and to the orbital.
13. Connect the plug to the receptacle on the steering orbital.
14. Reinstall all access panels.

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## INSTALL THE RS1 UNIT

**FIGURE 10. Mounting Bracket Installed**



1. Install the RS1 mounting bracket (P/N 107-0172-498) on the bottom of the RS1 unit using four 1/4"-20 x 1/2" flat head machine screws (P/N 311-0003-041).
2. Locate the existing receiver mounting bracket on the front of the cab's roof.
3. Insert the tab of the RS1 latch mounting bracket into the slotted tab of the receiver mounting bracket to interlock the brackets.
4. Secure the RS1 mounting bracket to the latch mounting bracket by securing the latch.

**NOTE:** It may be necessary to adjust the latch in order to secure the RS1 unit.

**FIGURE 11. Installed RS1**



5. Plug the black 12-pin Deutsch connector on the 115-4010-084 harness to the RS1.
6. Plug the other end of the 115-4010-84 harness into the machine's roof bulkhead connection.



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# CHAPTER

# 4

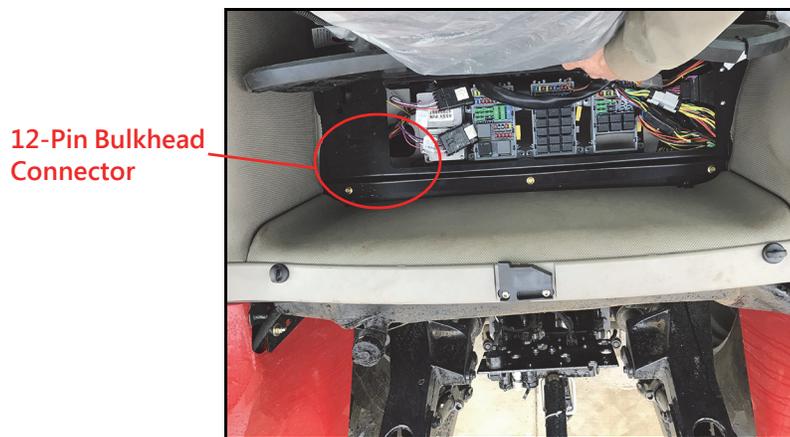
# CAB COMPONENT INSTALLATION

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## POWER CABLE

1. Locate the floor panel behind the seat and remove the panel cover.

**FIGURE 1. Panel Cover**



2. Connect the 12-pin plug from the power cable (P/N 115-4010-107) to the bulkhead connector of the HDU cable that was installed in Chapter 3, External Hardware and Cabling Installation.
3. Locate and remove the controls dash panel on the right side of the cab.

**FIGURE 2. Control Panel and Power Panel**



4. Route the remainder of the power cable along the back of the cab, under the floor panel, and up behind the right control panel wall.

5. Locate the auxiliary power connector near the right-rear of the seat.

**FIGURE 3. Auxiliary Panel**

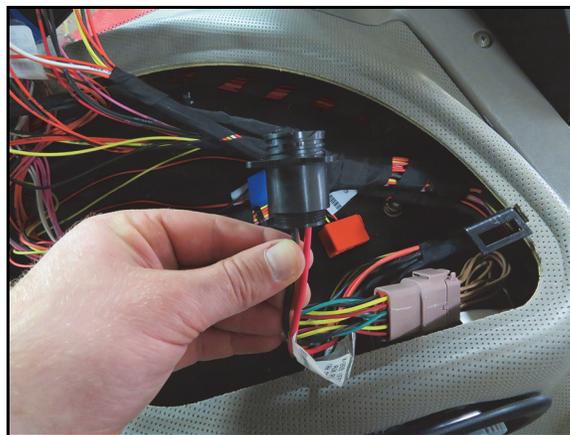
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6. Remove the three screws securing the Auxiliary Power connector to the panel.

**FIGURE 4. Mating Round 3-Pin Connector**

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7. Plug the existing power port into the mating 3-pin receptacle on the power cable.
8. Install the round power plug on the power cable into the auxiliary power port location removed earlier.
9. Use the screws removed in step 6 to install the auxiliary power port.
10. Reinstall all panels.

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## FIELD COMPUTER POWER CABLE CONNECTION

### OPTION 1

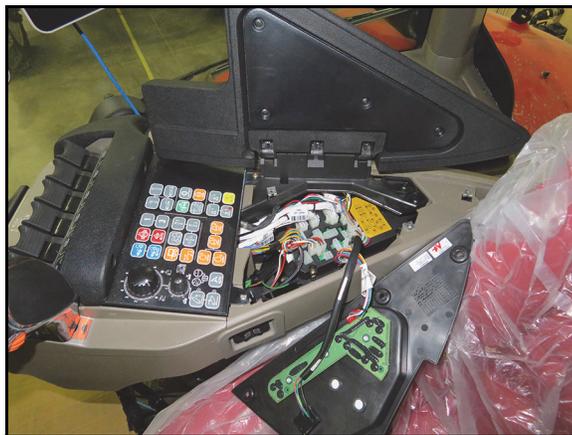
1. Locate the flip up cover on the arm rest.

**FIGURE 5. Arm Rest Cover**



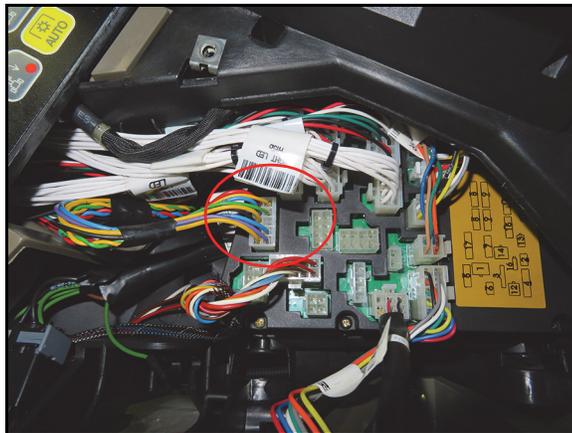
2. Open the arm rest cover and remove the control panel.

**FIGURE 6. Control Panel Removed**



3. Locate and remove the 10-pin monitor plug.

**FIGURE 7. 10-Pin Connector**



4. Locate the access slot under the arm rest and route the white 10-pin connector of the console cable (P/N 115-7300-154) into the armrest.

**FIGURE 8. Arm Rest Access Slot**

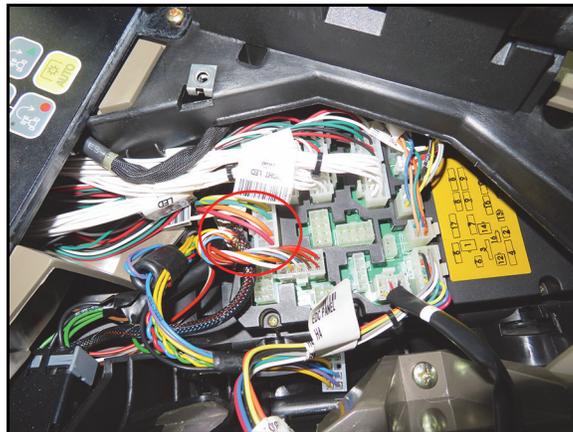
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5. Plug the mating 10-pin plug to the arm rest.

**FIGURE 9. 8-Pin Connected to Arm Rest**

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6. Connect the other end of the display cable to the console cable.
7. Reinstall the control panel cover.

## OPTION 2

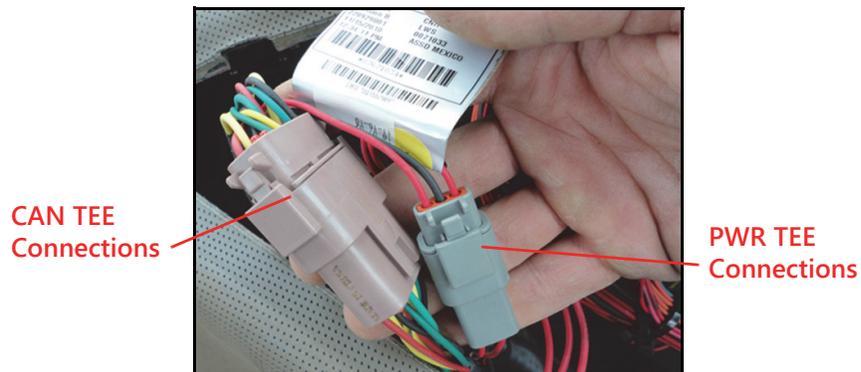
1. Remove the control panel from the right-rear corner of the cab.

FIGURE 10. Control Panel



2. Locate the brown 12-pin CAN TEE Connection and gray 3-pin PWR TEE Connections.

FIGURE 11. Field Computer Harness Connected to Machines Harness



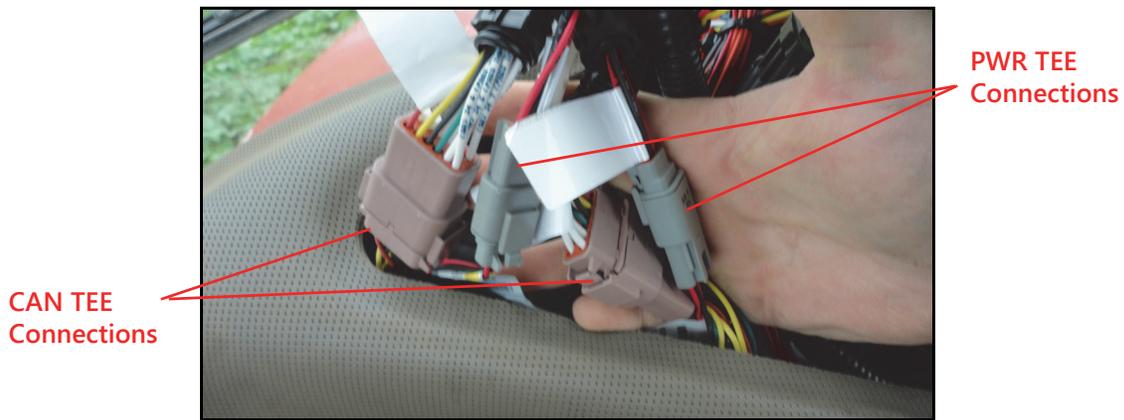
3. Disconnect the machine's connections.

**NOTE:** Depending on machine features, there may or may not be anything connected to the 3-pin harness connection.

4. Connect the machine's harness connection to the mating CAN TEE and PWR TEE connections on the field computer harness (P/N 115-4010-085).

**NOTE:** If there was not an existing harness connection, one PWR TEE connection will remain disconnected.

FIGURE 12. Field Computer Harness Routing



5. Route the round 19-pin connector of the 115-4010-005 harness up the right-rear corner post and along the mounting bar.

**NOTE:** It may be necessary to cut a hole in the post cover in order to route the field computer harness along the mounting bar.

FIGURE 13. Field Computer Harness Routing



6. Connect the 19-pin connector of the field computer harness to the mating 19-pin connector of the RS1 cable (P/N 115-4010-085).

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## ROUTINE OPERATION

FIGURE 14. Master and Resume Switch Locations

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Road Switch



Resume Switch



Locate and identify the road switch and the resume switch as they are required for RS1 system operation.

Refer to the Raven RS1 Guidance and Steering Calibration & Operation Manual (P/N 016-4010-001) for instructions on Calibrating the RS1 system, adjusting system settings, and system operation.







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# 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.**