

**Case IH Titan 3XXX/4XXX -
Steering Ready, Model Years
13 and Newer Raven RS1™
HDU Guidance and Steering
Installation Manual**

P/N 016-5032-118 Rev. B

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CHAPTER

1

IMPORTANT SAFETY INFORMATION

NOTICE

Read this manual and the operation and safety instructions included with your implement and/or controller carefully before installing the RS1™ HDU 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 RS1 HDU 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 RS1 HDU, observe the following safety measures:

- Be alert and aware of surroundings.
- Do not operate RS1 HDU 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 HDU is engaged.
- Disable RS1 HDU when exiting from the operator's seat and machine.
- Do not drive the machine with RS1 HDU enabled on any public road.
- Determine and remain a safe working distance from other individuals. The operator is responsible for disabling RS1 HDU when the safe working distance has diminished.
- Ensure RS1 HDU is disabled prior to starting any maintenance work on RS1 HDU or the machine.

WARNING

- When starting the machine for the first time after installing RS1 HDU, 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.

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 HDU 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.

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

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 HDU system for the first time, at the start of the season, or when moving the RS1 HDU 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.

KIT CONTENTS

This section contains a list of the components that are included in the RS1 HDU 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 HDU Installation Kit (P/N 117-5032-118)

Item Description	Part Number	Qty.
Sheet - Help/Warranty	016-0171-649	1
Unit - Hydraulic Drive	063-0173-887	1
Kit - Roof, RS1, CNH	117-5001-053	1
Cable - Roof, RS1, Case Floater	115-4010-066	1
Cable - HDU, RS1, Case Floater	115-4010-065	1
Cable - Console, V4, Case Floater	115-7300-148	1
Cable - WAS Adapter	115-4010-032	1
Cable - ISOBus Extension, 3-Pin Deutsch	115-4010-099	1
Nut - Flanged Lock, 1/4" - 20	312-1001-168	2
Bracket - HDU/Boom Sense Generic	107-0172-578	1
Bolt - M6 x 25 1.0, Hex Head	311-0070-059	2
Kit, WAS, CIH Titan 3XXX	117-0192-050	1

TABLE 2. Kit, RS1 HDU, Case IH Titan, 3XXX, 2013 and Newer, Steer Ready (P/N 117-5032-130)

Item Description	Part Number	Qty.
ECU Hydraulic Driver Unit	063-0171-014	1
Bracket, Mounting, RS1, CNH	107-0172-498	1
Bracket, HDU/Boom Sense, Genric	107-0172-578	1
Cable, 4-Pin to M12 WAS Adapter	115-4010-032	1
Cable, HDU, RS1, Case Floater	115-4010-065	1
Cable, Roof, RS1, Case Floater	115-4010-066	1
Cable, Console, V4, Case Floater	115-7300-148	1
Kit, WAS, CIH Titan 3XXX	117-0192-050	1
Cable, ISO Bus Extension, 3-Pin Deutsch, 13'	115-4010-099	1
Machine Screw, Couterzink, Zinc, 1/4 - 2- x 1/2" UNC	311-0003-041	4
Bolt, M6 x 25 1.0, Hex Head	311-0070-059	2
Nut, Flanged Lock, 1/4" - 20	312-1001-0168	2
Manual, Installation, Titan, 3XXX/4XXX RS1/HDU	016-5032-118	1
Manual, Operation, RS1	016-4010-007	1

Item Description	Part Number	Qty.
Plate, Assembly, Aerial Antenna Mount	063-0172-971	1
Assembly, RS1, CNH, International 2G/3G Modem	0630-0173-930BNSC	1
Antenna, NMO Mount, Cellular LTE, with Mag Base 36	121-0000-042	1

TABLE 3. Kit, RS1/HDU, Case IH Titan, 3XXX, 2013 and Newer, Steer Ready, 4G Verizon Modem (P/N 117-5032-0131)

Item Description	Part Number	Qty.
ECU Hydraulic Driver Unit	063-0174-014	1
Bracket, Mounting, RS1, CNH	107-0172-489	1
Bracket, HDY/Boom Sense, Generic	107-0172-578	1
Cable, 4-Pin to M12 WAS Adapter	115-4010-032	1
Cable, HDU, RS1, Case Floater	115-4010-065	1
Cable, Roof, RS1, Case Floater	115-4010-066	1
Cable, Console, V4, Case Floater	115-7300-148	1
Kit, WAS, CIH Titan 3XXX	117-0192-050	1
Cable, ISO Bus Extension, 3-Pin Deutsch, 13"	115-4010-099	1
Machine Screw, Countersink, Zinc, 1/4 - 20 x 1/2" UNC	311-0003-041	4

Item Description	Part Number	Qty.
Bolt, M6 x 25 1.0, Hex Head	311-0070-059	2
Nut, Flanged Lock, 1/4" - 20	312-1001-0168	2
Manual, Installation, Titan 3XXX/4XXX RS1/HDU	016-5032-118	1
Manual, Operations, RS1	016-4010-001	1
RS1 Slingshot Guide, CNH 4G	016-4010-006	1
Plate, Assembly, Aerial Antenna Mount	063-0172-971	1
Assembly, RS1, CNH, Verizon 4G Modem, W/Steering	063-0173-929BNSE	1
Antenna, NMO Mount, Cellular LTE, With Mag Base 36	121-0000-042	1

TABLE 4. Case IH Titan 3XXX WAS Installation Kit (P/N 117-0192-050)

Item Description	Part Number	Qty.
Sensor - 300 mm Non-Contact Linear	416-0001-052	1
Bracket - WAS Rod	107-0172-030	1
Bracket - WAS Base End, Titan 3XXX	107-0172-584	1
Bracket - WAS Rod End, Titan 3XXX	107-0172-585	1
Spacer - 0.406" ID x 0.750" OD x 0.75" Long Steel	107-0172-037	2

TABLE 4. Case IH Titan 3XXX WAS Installation Kit (P/N 117-0192-050)

Item Description	Part Number	Qty.
Nut - Jam, M10 x 1.5 Pitch x 5 mm Thick	312-1002-035	2
Nut - M1- x 1.5 Lock Nylon Insert	312-4000-208	2
Washer - Flat, Stainless Steel	313-2301-805	4
Screw - #6 - 32 x 1.25" Stainless Steel, Button Head Socket	311-0071-018	4
Screw - #6 - 32 x 1/2" Stainless Steel, Button Head Socket	311-0071-013	4

TABLE 5. HDU Kit (P/N 117-5032-119)

Item Description	Part Number	Qty.
ECU - Hydraulic Driver Unit	063-0173-887	1
Kit - Roof RS1 CNH	117-2001-053	1
Cable - Roof, RS1, Case Floater	115-4010-066	1
Cable - HDU, RS1, Case Floater	115-4010-065	1
Cable - Console, V4, Case Floater	115-7300-148	1
Cable - 4-Pin to M12 WAS Adapter	115-4010-032	1

Item Description	Part Number	Qty.
Bracket - HDU/Boom Sense, Generic	107-0172-578	2
Nut - Flanged Lock, 1/4" - 20	312-1001-168	2
Bolt - M6 x 25 1.0, Hex Head	311-0070-059	1
Kit - WAS Case IH Titan 4XXX	117-0192-051	1

TABLE 6. Kit, RS1/HDU, Case IH Titan, 4XXX, 2013 and Newer, Steer Ready, 2G/3G Modem (P/N 117-5032-0132)

Item Description	Part Number	Qty.
ECU Hydraulic Driver Unit	063-0174-014	1
Bracket, Mounting, RS1, CNH	107-0172-498	1
Bracket, HDU/Boom Sense, Generic	107-0172-578	1
Cable, 4-Pin to M12 WAS Adapter	115-4010-032	1
Cable, HDU, RS1, Case Floater	115-4010-065	1
Cable, Roof, RS1, Case Floater	115-4010-066	1
Cable, Console, V4, Case Floater	115-7300-148	1

Item Description	Part Number	Qty.
Kit, WAS, Case IH Titan 4XXX	117-0192-051	1
Cable, ISO Bus Extension, 3-Pin Deutsch, 13"	115-4010-099	1
Machine Screw, Countersink, Zinc, 1/4 - 20 x 1/2" UNC	311-0003041	4
Bolt, M6 x 25 1.0, Hex Head	311-0070-059	2
Nut, Flanged Lock, 1/4" - 20	312-1001-168	2
Manual, Installation, Titan 3XXX/4XXX RS1/HDU	016-5032-118	1
Manual, Operation, RS1	016-4010-001	1
RS1 Slingshot Guige, CNH 2G/3G	016-4010-007	1
Plate, Assembly, Aerial Antenna Mount	063-0172-971	1
Assembly, RS1, CNH, International 2G/3G Modem	063-0173-930BNSC	1
Antenna, NMO Mount, Cellular LTE, with Mag Base 36	121-0000-042	1

TABLE 7. Kit, RS1/HDU, Case IH Titan, 4XXX, 2013 and Newer, Steer Ready, 4G Verizon Modem (P/N 117-5032-133)

Item Description	Part Number	Qty.
ECU Hydraulic Driver Unit	0630-0174-014	1
Bracket, Mounting, RS1, CNH	107-0172-498	1

Item Description	Part Number	Qty.
Bracket, HDU/Boom Sense, Generic	107-0172-578	1
Cable, 4-Pin to M12 WAS Adapter	115-1040-032	1
Cable, HDU, RS1 Case Floater	115-4010-066	1
Cable, Console, V4, Case Floater	115-7300-148	1
Kit, WAS, Case IH Titan 4XXX	117-0192-051	1
Cable, ISO Bus Extension, 3-Pin Deutsch	115-4010-099	1
Machine Screw, Countersink, Zinc, 1/4 - 20 x 1/2" UN	311-0003-041	4
Bolt, M6 x 25 1.0, Hex Head	311-0070-059	2
Nut, Flanged, Lock, 1/4" - 20	312-1001-168	2
Manual, Installation, Titan 3XXX/4XXX RS1 HDU	016-5032-118	1
Manual, Operation, RS1	016-4010-001	1
RS1 Slingshot Guide, CNH 4G	016-4010-006	1
Plate, Assembly, Aerial Antenna Mount	0630-0172-971	1
Assembly, RS1, CNH, Verizon 4G Modem, W/Steering	063-0173-929BNSE	1
Antenna, NMO Mount, Cellular LTE, with Mag Base 36	121-0000-042	1

TABLE 8. Case IH Titan 4XXX WAS Installation Kit (P/N 117-0192-051)

Item Description	Part Number	Qty.
Bracket - WAS Offset Clamp	107-0172-641	1
Sensor - Linear Non-Contact, 300 MM	416-0001-052	1
Mount - Universal, M10 Stud	103-0001-030	1
Clamp - U-Bolt, 2.5"	435-3003-062	1
Mount - Linear Sensor, M10 Ball	103-0001-029	1
Nut - Jam, M10 x 1.5 Pitch x 5 mm Thick	312-1002-035	2
Bolt - Flanged Hex, M10 - 1.5 x 35 mm	311-4050-181K	2
Nut - M10 x 1.5 Lock Nylon Insert	312-4000-208	2

TABLE 9. RS1 Unit Kit

Item Description	Part Number	Qty.
Manual - RS1 Operation	016-4010-001	1
RS1	063-0173-820, 063-0173-921, or 063-0173-922	1

UPDATES

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

portal.ravenprecision.com

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-P/N 016-5032-118 Rev. B

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Thank you for your time.

CHAPTER

3

WHEEL ANGLE SENSOR INSTALLATION

3XXX WAS INSTALLATION

ASSEMBLE THE WHEEL ANGLE SENSOR (WAS)

FIGURE 1. WAS



1. Install the M10 universal stud ends (P/N 103-0001-030) and M10 jam nuts (P/N 312-1002-035) on both ends of the linear WAS (P/N 416-0001-052).
2. Leave the nuts and stud ends loose until the sensor is installed later in the procedure.

INSTALLING THE WAS

NOTE: Ensure that the machine's wheel is pointed straight ahead.

1. Locate the top of the pivot point of the front wheel, and remove the AutoSense Sensor (if necessary).

FIGURE 2. Pivot Point



2. Use the four provided #6-32 screws (P/N 311-0071-013) and washers (P/N 313-2301-805) to secure the WAS Rod Bracket (P/N 107-0172-585) to the top of the pivot point.

NOTE: The four steel spacers (P/N 107-0172-037) can be used to mount the plate if needed. Use the longer #6 - 32 screws (P/N 311-0071-018) if the spacers are installed.

FIGURE 3. WAS Mounting Plate Installed on the Pivot Point



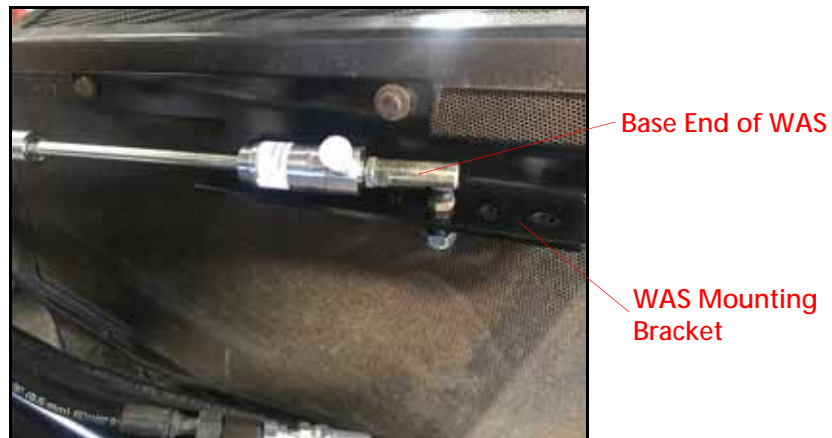
3. Locate and remove the two bolts and washers on the left side of the radiator.
4. Using the bolts and washers removed in the previous step to install the base end mounting bracket (P/N 107-0172-584).

FIGURE 4. 3XXX WAS Bracket on Installed on the Radiator Cover



5. Using the provided M10 lock nut, secure the base end of the WAS sensor to the WAS base end bracket.

FIGURE 5. WAS Installed in Bracket on Side of Base End Bracket



6. Using the provided M10 lock nut (P/N 312-4000-208), connect and secure the WAS end of the sensor to the plate installed on the pivot point.

FIGURE 6. WAS Rod End Installed



7. Secure all hardware.
8. Turn the machine wheels to the left and right locks to ensure the sensor is not over compressed or extended.
9. Tighten all mounting hardware.
10. Connect one end of the WAS Adapter Cable (P/N 115-4010-032) to the WAS sensor.
11. Connect the other end of the WAS Adapter Cable to the AutoSense Connection.

FIGURE 7. Machine's AutoSense Connection



4XXX WAS INSTALLATION

ASSEMBLE THE WHEEL ANGLE SENSOR (WAS)

FIGURE 8. 4XXX WAS



1. Install one M10 universal stud end (P/N 103-0001-030), on the base end of the Linear WAS (P/N 416-0001-052), and one M10 universal ball joint end (P/N 103-0001-029) on the rod end WAS along with the M10 jam nuts (P/N 312-1002-035).
2. Leave the nuts and ball mounts loose until the sensor is installed later in the procedure.

INSTALLING THE WAS

NOTE: Ensure that the machine's wheels are pointed straight ahead.

1. Use the provided 2.5" U-bolt (P/N 435-3003-046) and mounting hardware provided with the U-bolt to install the WAS Rod Mounting Plate (P/N 107-0172-461) on the left side of the machine's tie rod. Ensure the M10 - 1.5" x 35 mm" bolt (P/N 311-0070-060) is through the third hole and is pointed straight up so the WAS can attach to that bolt.

NOTE: Do not fully tighten the U-Bolt at this time.

FIGURE 9. 4XXX Series WAS Mounting Bracket on Tie Rod



- Using the supplied M10 lock nut (P/N 312-4000-208), attach the rod end of the sensor to the M10 - 1.5 x 35 mm bolt in the WAS Mounting bracket.

FIGURE 10. Rod End of the WAS Secured to the WAS Bracket



- Install the WAS Base End Mounting Bracket (P/N 107-0172-591) by inserting it between the hydraulic manifold and front axle.
- Use the provided M8 - 1.25 x 30 mm bolts (P/N 311-4050-181K) to secure the WAS bracket and the hydraulic manifold.

FIGURE 11. WAS Installing Location



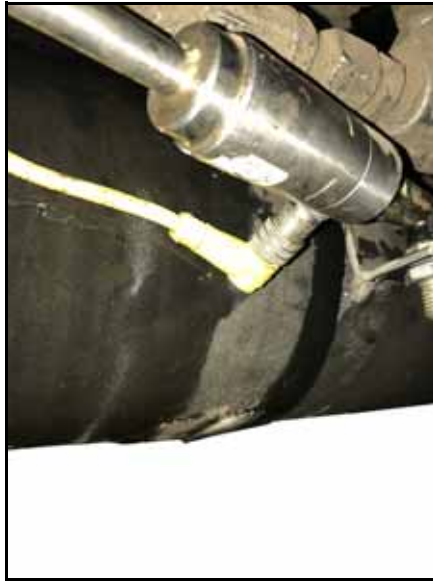
5. Feed the stud on the base end of the WAS into the closest hole in the WAS base end mounting bracket.

FIGURE 12. Base End Installed in the WAS Bracket



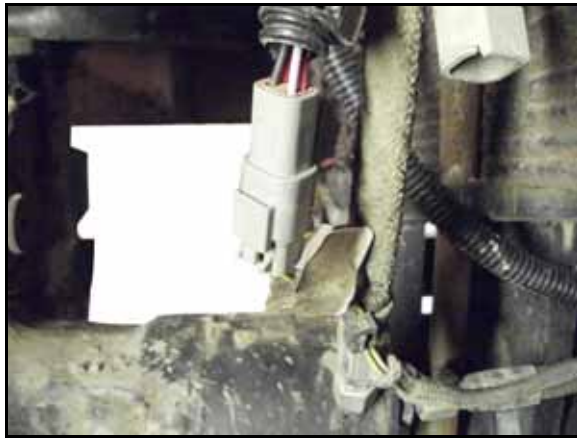
6. Using the provided M10 lock nut, secure the base end of the WAS to WAS Mounting bracket.
7. With the wheels pointed straight ahead, adjust the U-bolt until half of the sensor stroke length is used.
8. Tighten the U-bolt hardware.
9. Connect the WAS Adapter Cable (P/N 115-4010-032) to the WAS.

FIGURE 13. WAS Adapter Cable Installed



10. Connect the other end of the WAS adapter cable to the AutoSense connection.

FIGURE 14. AutoSense Connection



11. Turn the machine wheels to the left and right locks to ensure the sensor is not over compressed or extended.

CHAPTER

4

CAB COMPONENT INSTALLATION

INSTALL THE RS1 UNIT

FIGURE 1. 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.

FIGURE 2. Existing Receiver Mounting Bracket



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.

FIGURE 3. Installed RS1 Unit



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

INSTALL THE HYDRAULIC DRIVE UNIT (HDU)

1. Lift the instructional seat cushion.

FIGURE 4. HDU Installed



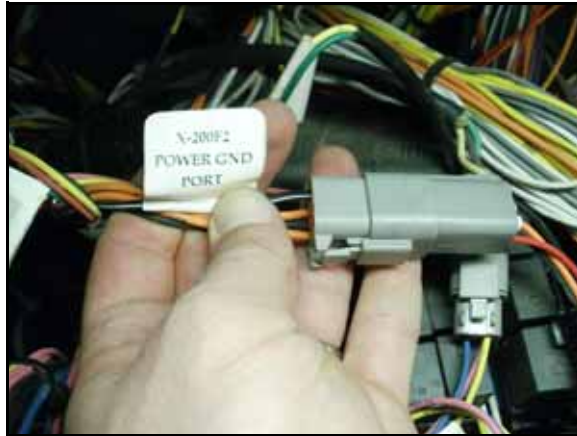
2. Remove the hardware used to secure the machine's existing electronic control unit (ECU) to the wall of the instructional seat.
3. Install the HDU to the HDU mounting bracket (P/N 107-0172-578) using two 1/4"-20 UNC flanged lock nuts (P/N 312-1001-168).
4. Align the holes in the machine's ECU with the remaining holes in the HDU mounting bracket and insert the ECU mounting hardware that was removed in step 2.
5. Align the HDU mounting bracket with the existing ECU holes in instructional seat wall.
6. Tighten the mounting hardware to secure the mounting bracket to the instructional seat wall.

INSTALL THE RS1 CABLES

INSTALL THE HDU HARNESS CABLE

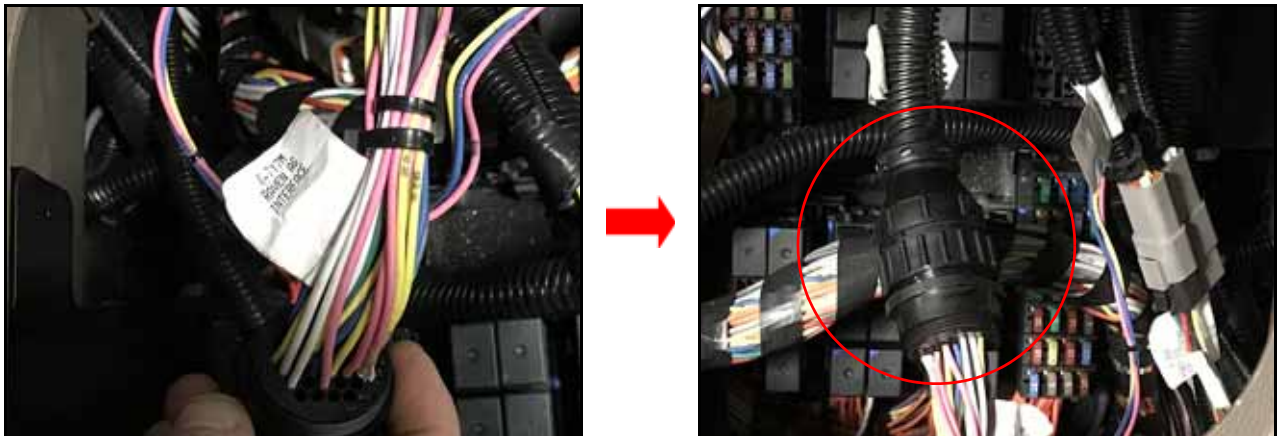
1. Lift the top of the instructional seat.

FIGURE 5. POWER Connection



2. Locate the machine's X-200 POWER GND PORT INTERFACE connection on the machine's harness, stored under the instructional seat.
3. Connect the POWER connector of the RS1 harness cable (P/N 115-4010-065) to the machine's X-200 POWER GND PORT INTERFACE.

FIGURE 6. 37-Pin Interface Connection



4. Connect the 37-pin connector of the RS1 harness cable to the machine's X-717 RAVEN AG INTERFACE connection, located on the floor of the instructional seat compartment.

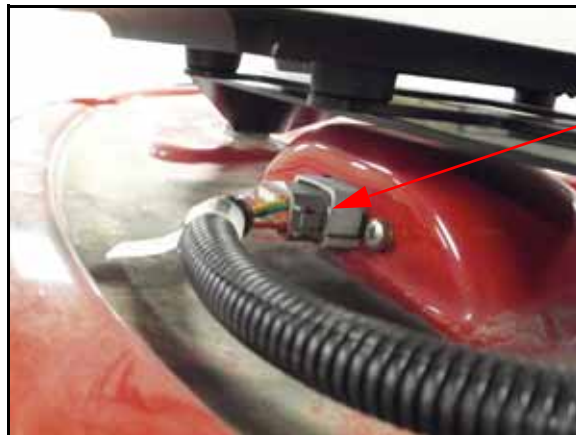
INSTALL THE RS1 CABLE

FIGURE 7. RS1 Cable Connection



1. Connect the black 12-pin connector of the RS1 cable (P/N 115-4010-066) to the back of the RS1 unit.
2. Connect the other end of the cable into the roof's bulkhead connector.

FIGURE 8. RS1 Cable Routing



RS1 Cable
(P/N 115-4010-066)

3. Connect the round connectors of the Viper 4 cable (P/N 115-7300-148) to the mating ports on the back of the Viper 4.

FIGURE 9. Viper 4 Connections



4. Connect the round 16-pin connector on the Viper 4 Harness Cable (P/N 115-7300-148) to the machine's mating connector located on the machine's A-post.

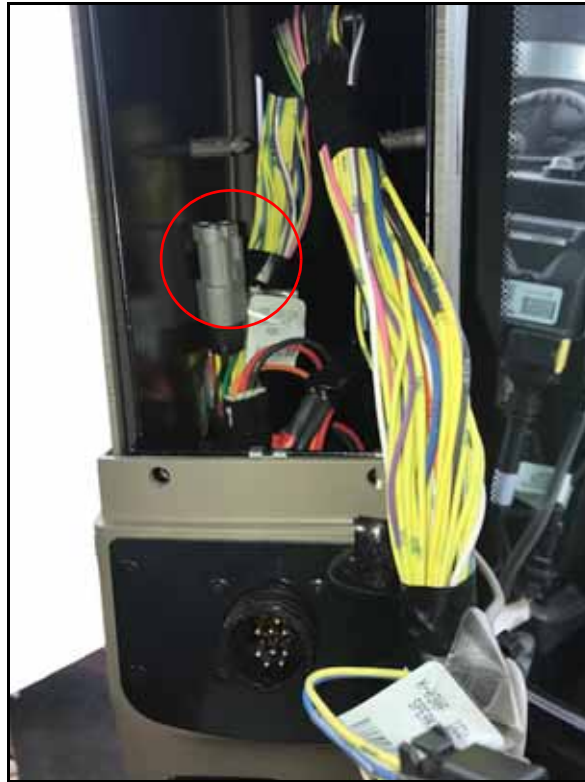
NOTE: RS1 will not work without this cable.

INSTALLING THE ISOBUS EXTENSION HARNESS (IF APPLICABLE)

If a New Leader ISO Bed is on the machine, perform the following steps:

1. Remove the cover over the A-post.
2. Locate the 3-pin ISOBus terminator.

FIGURE 10. 3-Pin ISOBus Terminator



3. Remove the terminator.
4. Install one end of the ISOBus Extension Harness (P/N 115-4010-099) onto the 3-Pin connector.
5. Route the other end of the ISOBus Extension harness under the instructional seat.

FIGURE 11. ISOBus Extension Harness



6. Locate the 40-pin and 24-pin connectors of the steering harness. Trace the harness back to the 3-pin ISO Terminator under the instructional seat. Remove the terminator and plug the other end of the ISOBus Extension Harness into the mating 3-pin connector.

NOTE: The terminators are not used in this system.

ROUTINE OPERATION

FIGURE 12. Master and Resume Switch Locations

Master Switch



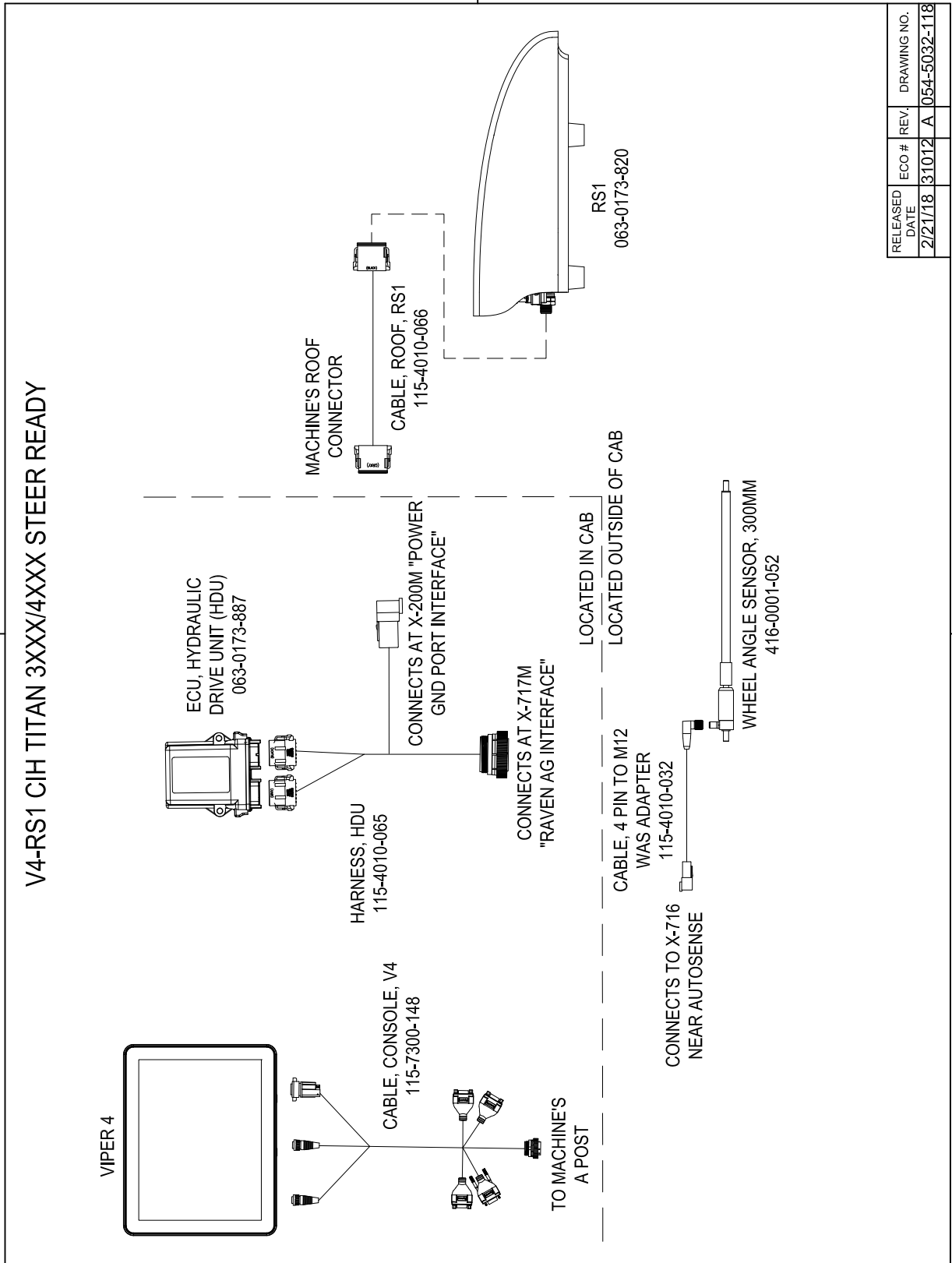
Enable Switch



Locate and identify the machine's master switch on the control panel and the resume switch on the joystick 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 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.