Case IH Patriot 3240/3340 - Steering Ready, Model Year 2017-2019 Raven RS1™ HDU Guidance and Steering Installation Manual

P/N 016-5032-111 Rev. B *01/19* *E32122*

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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™ HD 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 HD 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 HD, observe the following safety measures:

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

⚠ WARNING

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

CHAPTER 2 INTRODUCTION

Congratulations on your purchase of the RS1™ HDU system!

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.

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

-Case IH Patriot 3240/3340 - Steering Ready, Model Year 2017-2019 Raven RS1™ HDU Guidance and Steering Installation Manual
-P/N 016-5032-111 Rev. B
-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 HD 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. **Raven RS1 HD Installation Kit (P/N 117-5032-111)**

Item Description	Part Number	Qty.
Sheet - Help/Warranty	016-0171-649	1
ECU - Hydraulic Drive Unit (HDU)	063-0173-887	1
Bracket - RS1 Mounting	107-0172-498	1
Bracket - HDU Mounting	107-0172-543	1
Cable - WAS Adapter	115-4010-032	1

TABLE 1. **Raven RS1 HD Installation Kit (P/N 117-5032-111)**

Item Description	Part Number	Qty.
Cable - RS1 Tee	115-4010-036	1
Cable - HDU Harness	115-4010-038	1
Screw - 1/4”-20 x 1/2” Flat Head	311-0003-041	4
Nut - 1/4”-20 Nylon Insert Lock	312-1001-168	2
Nut - M6 Lock	312-4000-216	4
Clamp - 0.625” Insulated Cable	435-3001-049	1

TABLE 2. **CNH RS1 HD Installation Kit - 2G/3G (P/N 117-5032-134)**

Item Description	Part Number	Qty.
Manual, Installation, Case IH Patriot 3XXX SR	016-5032-111	1
ECU, Hydraulic Drive Unit (HDU), CNH	107-0172-498	1
Bracket, Mounting, RS1 CNH	107-0172-498	1
Bracket, Node Mounting, HDU Generic	107-0172-543	1
Cable, WAS Adapter, 4P DTM to M12	115-4010-032	1
Cable, HDU, Patriot 2250-3X40 SR MY2017	115-4010-038	1

TABLE 2. **CNH RS1 HD Installation Kit - 2G/3G (P/N 117-5032-134)**

Item Description	Part Number	Qty.
Cable, RS1, Patriot 3XXX/Trident Roof	115-4010-081	1
Kit, WAS, CIH Patriot	117-0192-049	1
Screw, Machine, 1/4: - 20 x 1/2” Flat Head	311-0003-041	4
Nut, Flanged, Lock, 1/4” - 20	312-1001-168	2
Nut, Flanged, Nylock Lock, M6	312-4000-216	4
Clamp, Cable, 0.625” Insulated	435-3001-049	5
Manual, Operation, RS1	016-4001-001	1
RS1 Slingshot Guide, CNH 2G-3G	016-4001-007	1
Plate, Assemlby, 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 3. **CNH RS1 HD Installation Kit (P/N 117-5032-135)**

Item Description	Part Number	Qty.
Manual, Installation, Case IH Patriot 3XXX SR	016-5032-111	1
ECU, Hydraulic Drive Unit (HDU), CNH	063-0174-014	1
Bracket, Mounting, RS1, CNH	107-0172-498	1
Bracket, Node Mounting, HDU Generic	107-0172-543	1
Cable, WAS Adapter, 4P DTM to M12	115-4010-032	1
Cable, HDU, Patriot 2250/3X40 SR MY2017	115-4010-038	1
Cable, RS1, Patriot 3XXX/Trident Roof	115-4010-081	1
Kit, WAS, CIH Patriot	115-0192-049	1
Screw, Machine, 1/4” - 20 x 1/2” Flathead	311-0003-041	4
Nut, Flanged Lock, 1/4” - 20	312-1001-168	2
Nut, Flanged Nylon Lock, M6	312-4000-216	4
Clamp, Cable, 0.625” Insulated	435-3001-049	5
Manual, Operations, RS1	016-4001-001	1
RS1 Slingshot Guide, CNH 4G	016-4001-006	1

TABLE 3. **CNH RS1 HD Installation Kit (P/N 117-5032-135)**

Item Description	Part Number	Qty.
Plate, Assembly, Aierial Antenna Mount	063-0172-971	1
Asemlby, 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. **Wheel Angle Sensor Kit (P/N 117-0192-049)**

Item Description	Part Number	Qty.
Bracket, WAS, CIH Patriot, Base End, L Shape	107-0172-604	1
Senesor, Linear NON-Contact, 300 mm	416-0001-052	1
Weldment, WAS, CIH Patriot, Base End, Straight	116-0159-828	1
Mount, Univerisal, M10 Ball	103-0001-029	2
Bracket, WAS Rod Mounting	107-0172-030	1
Spacer, Steel .406” ID X. 750” OD X .75” Long	107-0172-037	2
Nut, Jam, M10 X 1.5 Pitch X 5MM Thick	312-1002-035	2
Bolt, Hex, Metric, M10 X 40 mm , Class 8.8	311-0070-039	1
Nut, M10 X 1.5 Lock Nyloc Insert	312-4000-208	2
Bolt, Flanged Hex, Metric, M10 - 1.5 X 35 mm, Class 8.8	311-0070-060	1

TABLE 4. **Wheel Angle Sensor Kit (P/N 117-0192-049)**

Item Description	Part Number	Qty.
Washer, Flat, 5/16” SS	313-2301-005	4
Clamp, U-Bolt, 1.25” X 5/16” - 18	435-3003-056	1
Screw, SHCS, M8 x 40, 8.8, Class III	311-4070-183L	2
Hex Nut, M8 - 1.25”, Class 8 Steel, Class III Coating	312-6000-027L	2
Washer, Helical Lock, 8 mm	313-1000-042	2
Washer, Flat, 8 mm, Steel	313-2300-121	2
Spacer, Steel, .406” ID X .750” OD X .375” Long	107-0172-103	2

TABLE 5. **Raven 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

CHAPTER 3 WHEEL ANGLE SENSOR INSTALLATION

ASSEMBLE THE WHEEL ANGLE SENSOR (WAS)

FIGURE 1. WAS

1. Install the M10 universal ball mounts (P/N 103-0001-029) 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 ball mounts loose until the sensor is installed later in the procedure.

INSTALL THE WAS

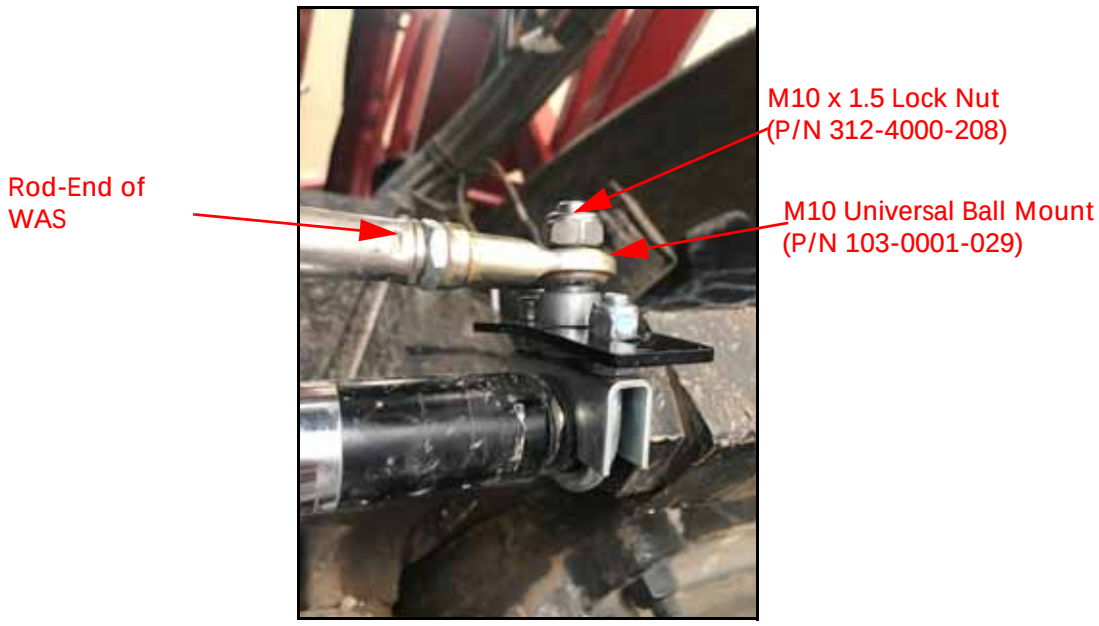
1. Park the machine on a level surface with the wheels pointing to the left.
2. Install the WAS base end mounting brackets on the right steering cylinder clevis using the provided M8 flat-head machine screws, flat washers, lock washers, and nuts.

FIGURE 2. WAS Base End Mounting Brackets Installed

FIGURE 3. Small WAS Mounting Bracket Installed on Rod-End of Steering Cylinder

3. Remove the nuts and clamp from the 1-1/4" U-bolt clamp (P/N 435-3003-056).
4. Install the U-bolt clamp on the threaded rod-end of the right steering cylinder adjacent to the existing jam nut, positioning the U-bolt so that the threaded ends point upward.
5. Tighten the nuts to secure the U-bolt clamp in place.
6. Install 5/16" washers (P/N 313-2301-005) on the ends of the U-bolt clamp.
7. Insert one of the M10 x 1.5 x 40 metric hex bolts (P/N 311-00470-025) through the center hole of the small WAS mounting bracket (P/N 107-0172-030).
8. Install the small WAS mounting bracket on the ends of the U-bolt clamp so that the installed hex bolt points upward.
9. Install one 5/16" flat washer (P/N 313-2301-005) and one 5/16"-18 nylon insert lock nut (P/N 312-4000-059) on the each end of the U-bolt clamp to secure the small WAS mounting bracket.
10. Tighten the nuts to ensure the small WAS mounting bracket is installed securely.
11. Install a 0.406" ID x 0.750" OD x 0.375" long spacer (P/N 107-0172-037) on the end of the protruding hex bolt.

FIGURE 4. Rod-End of WAS Installed on Rod-End of Steering Cylinder

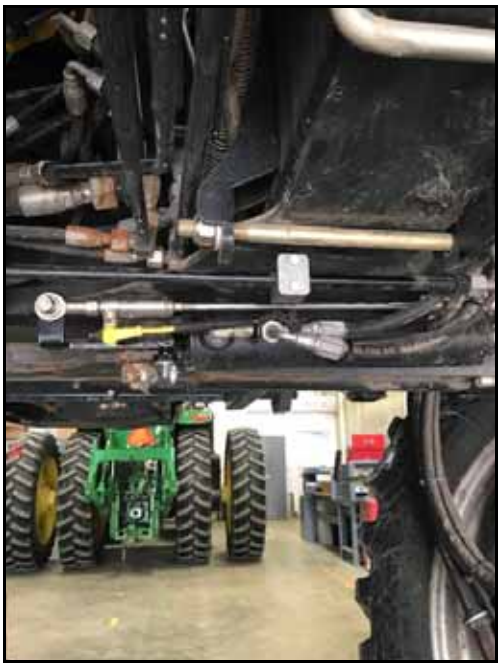


12. Install the ball mount on the rod-end of the WAS assembly on the installed hex bolt and secure it using an M10 x 1.5 lock nut (P/N 312-4000-208).

FIGURE 5. Base-End of WAS Installed on Base-End of Steering Cylinder

13. Insert an M10 x 1.5 x 35 hex bolt (P/N 311-0070-025) through the back of the WAS base end mounting bracket.
14. Install the base-end of the WAS assembly on the hex bolt and secure it using an M10 x 1.5 nylon insert lock nut (P/N 312-4000-208).
15. Orient the WAS so the cable plug is oriented as shown in Figure 5 on page 13.

FIGURE 6. WAS Installed

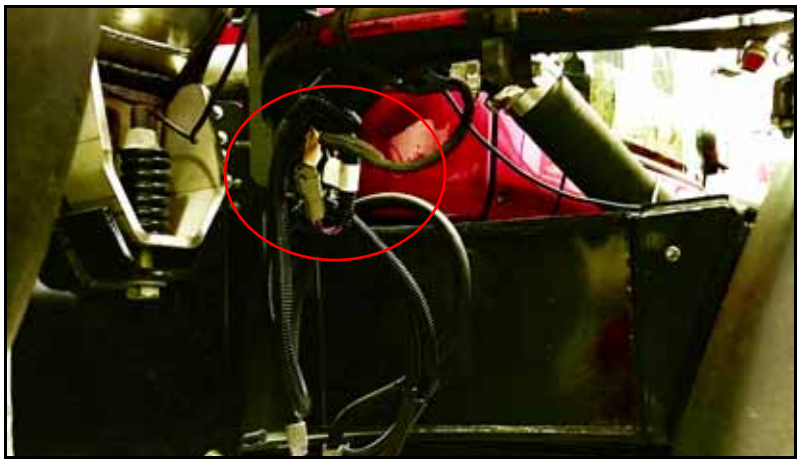


16. Tighten the M10 universal ball mounts and M10 jam nuts to each other on the WAS assembly to ensure they are installed securely.
17. Install the WAS adapter cable (P/N 115-4010-032) on the base-end of the WAS.

FIGURE 7. Machine's AUTO Yaw Connection

18. Disconnect the machine's existing X-716 connector located near the AutoSense Sensor and plug in the mating connector on the WAS adapter cable.

FIGURE 8. WAS Connection



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).

FIGURE 2. Machine's Existing Receiver Mounting Bracket

2. Locate the existing receiver mounting bracket on the front of the cab's roof.

FIGURE 3. RS1 Unit Installed on Cab 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.

INSTALL THE HYDRAULIC DRIVE UNIT (HDU)

INSTALL THE HDU HARNESS

FIGURE 4. Access Panel to be Removed

1. Locate and remove the wall panel behind the operator's seat.

FIGURE 5. Machine's XB-7 Bulkhead Connection

2. Locate the machine's existing XB-7 bulkhead connection in the upper-left of the access panel.
3. From outside the cab, remove the nut and disconnect the machine's 31-pin plug from the XB-7 bulkhead connector.
4. From inside the cab, remove the XB-7 bulkhead connector from the hole in the cab wall.
5. Install the male 31-pin connector of the HDU harness (P/N 115-4010-038) in the hole in the cab wall and secure it using the nut that was removed in step 3.
6. From outside the cab, connect the machine's 31-pin connector on the installed HDU harness connector.
7. Connect the machine's XB-7 bulkhead connector to the 31-pin connector of the HDU harness.
8. Inside the cab, connect the 40-pin connector of the HDU harness to the machine's NAV CONNECTOR 1 connection.
9. Connect the CAN connector of the HDU harness to the machine's X-211 PRODUCT CAN connector.

FIGURE 6. HDU Harness Cable Installed on HDU

10. Install the two rectangular connectors of the HDU harness into the mating ports of the HDU.

MOUNT THE HDU

FIGURE 7. HDU Installed on HDU Mounting Bracket

1. Install the HDU on the HDU mounting bracket (P/N 107-0172-543) using two 1/4"-20 flanged lock nuts (P/N 312-1001-168).

FIGURE 8. HDU Mounting Bracket Installed

2. Secure the HDU mounting bracket in the access panel so that the HDU faces the cab wall using the existing mounting studs and four M6 flanged lock nuts (P/N 312-4000-216).

FIGURE 9. Access Panel to be Removed

3. Reinstall the wall panel behind the operator's seat.

INSTALL THE RS1 TEE CABLE

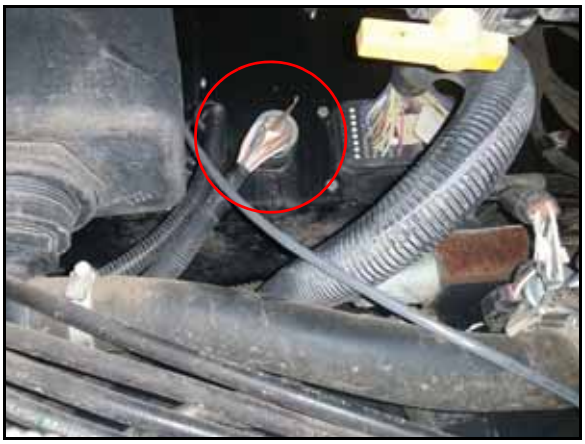
FIGURE 10. RS1 Tee Cable Connection

1. Connect the black 12-pin connector of the RS1 tee cable (P/N 115-4010-036) to the back of the RS1 unit.
2. Use insulated cable clamps (P/N 435-3001-049) to secure the cable to the bolts on the cab.

FIGURE 11. RS1 Tee Cable Routing

3. Route the RS1 tee cable along the roof and down the back-right corner of the cab.
4. Locate the machine's 35-pin XB-5 BULKHEAD PRODUCT CAB connector beneath the cab, near the back-left corner.
5. Disconnect the machine's XB-5 connector from the bulkhead.
6. Connect the machine's harness connector to the mating 35-pin connector on the RS1 tee cable.

FIGURE 12. RS1 Tee Cable Connected to Machine's Bulkhead



7. Connect the remaining 35-pin connector of the RS1 tee cable to the open port of the machine's bulkhead.

ROUTINE OPERATION

FIGURE 13. Master and Resume Switch Locations

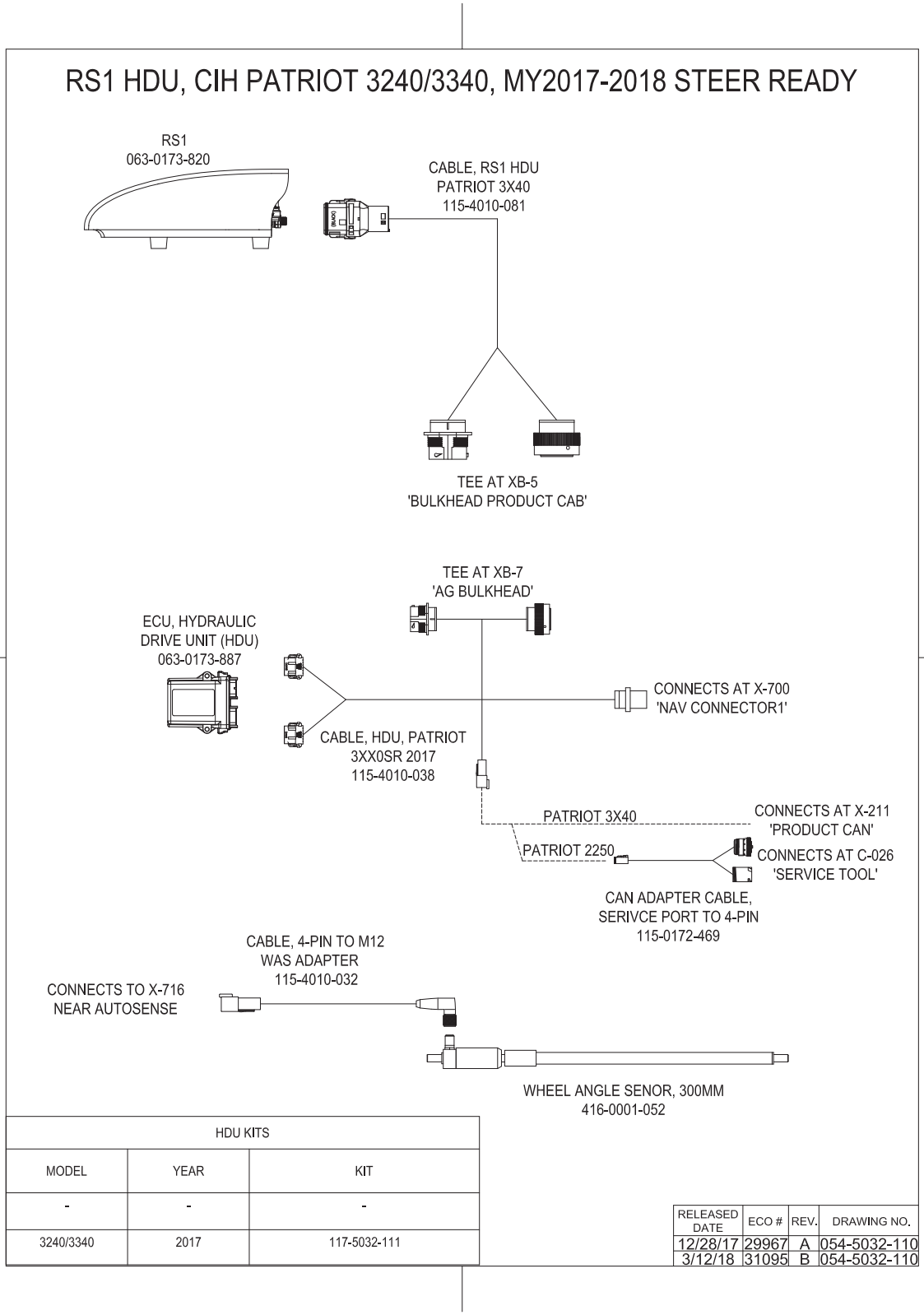
Master Switch

Resume 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.

SYSTEM DIAGRAM



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We Solve Great Challenges.

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.

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We Solve Great Challenges.

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.

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