

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

P/N 016-5032-116 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. Case IH Titan 3XXX Non-Steer Ready RS1 HDU Installation Kit (P/N 117-5032-116)

| Item Description | Part Number | Qty. |
|---|--------------|------|
| Sheet - Help/Warranty | 016-0171-649 | 1 |
| Unit - Hydraulic Drive | 063-0173-887 | 1 |
| Kit - Roof, RS1, CNH, Non-Steer Ready | 117-5001-056 | 1 |
| Cable - Roof, RS1, Case Floater | 115-4010-066 | 1 |
| Cable - HDU, CIH Titan, MY 13 and Newer Non-Steer Ready | 115-4010-076 | 1 |
| Cable - Steering, RS1, CNH Titan, Roof, Bulkhead | 115-4010-077 | 1 |
| Cable - Sauer Valve to Bulkhead, Single Transducer | 115-4010-078 | 1 |
| Cable - HDU Cab Switch Breakout with Master | 115-4010-028 | 1 |
| Cable - Console, V4, Case Floater | 115-7300-148 | 1 |
| Cable - HDU, B to Bulkhead | 115-4010-057 | 1 |
| Cable - ISOBus Extension, 3-Pin Deutsch | 115-4010-099 | 1 |
| Assembly - Master Switch, RS1 | 063-0173-961 | 1 |

TABLE 1. Case IH Titan 3XXX Non-Steer Ready RS1 HDU Installation Kit (P/N 117-5032-116)

| Item Description | Part Number | Qty. |
|--|--------------|------|
| Assembly - Swtich, SmarTrax Enabled | 063-0172-470 | 1 |
| Bracket - HDU/Boom Sense Generic | 107-0172-578 | 1 |
| Bracket - Universal Hydraulic, Mounting, Part "A" | 107-0171-907 | 1 |
| Kit - WAS, Titan 3XXX Series | 1170192-050 | 1 |
| Kit - Hydraulic, SmarTrax, Sauer, CNH, Titan 3X30 | 117-0199-142 | 1 |
| Valve - Hydraulic, SmarTrax, DLS, PVG32 W/PVES, 17 GPM | 334-0003-089 | 1 |
| Transducer - Pressure, 4 - 20 MA, 0 - 3000 PSI | 422-0000-086 | 1 |
| Nut - Flanged Lock, 1/4" - 20 | 312-1001-168 | 2 |
| Nut - 3/8" 16 | 312-1001-037 | 3 |
| Bolt - M6 x 25 1.0, Hex Head | 311-0070-059 | 2 |
| Bolt - 5-16" - 18 x 7/8", Hex Head | 311-0052-104 | 4 |
| Bolt - Hex, 3/8" - 16 UNC x 1" | 311-0054-105 | 2 |
| Bolt - Hex, DIN931 8.8, M6 x 16 | 311-4050-134 | 2 |
| Bolt - Hex Socket, Flat Head, DIN791 8.8, M5 x 16 | 311-4070-091 | 1 |

TABLE 1. Case IH Titan 3XXX Non-Steer Ready RS1 HDU Installation Kit (P/N 117-5032-116)

| Item Description | Part Number | Qty. |
|----------------------------|--------------|------|
| Washer - 5/16" Lock, Split | 313-1000-019 | 4 |
| Washer - Lock, Split, 3/8" | 313-1000-022 | 2 |
| Washer - Flat, 3/8" | 313-2300-013 | 2 |
| Kit, WAS, CIH Titan 3XXX | 117-0192-050 | 1 |

TABLE 2. 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 |
| Nut - Jam, M10 x 1.5 Pitch x 5 mm Thick | 312-1002-035 | 2 |
| Nut - M1- x 1.5 Lock Nlon Insert | 312-4000-208 | 2 |
| Washer - Flat, Stainless Steel | 313-2301-805 | 4 |

TABLE 2. Case IH Titan 3XXX WAS Installation Kit (P/N 117-0192-050)

| Item Description | Part Number | Qty. |
|---|--------------|------|
| 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 3. 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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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 Titan 3XXX - Model Years 13 and Newer, Non-Steer Ready, Raven RS1™ HDU Guidance and Steering Installation Manual

-P/N 016-5032-116 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.

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 Auto Yaw Sensor (if necessary).

FIGURE 2. Pivot Point



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

NOTE: The four steel spacers can be used to mount the plate if needed.

FIGURE 3. WAS Mounting Plate Installed on the Pivot Point



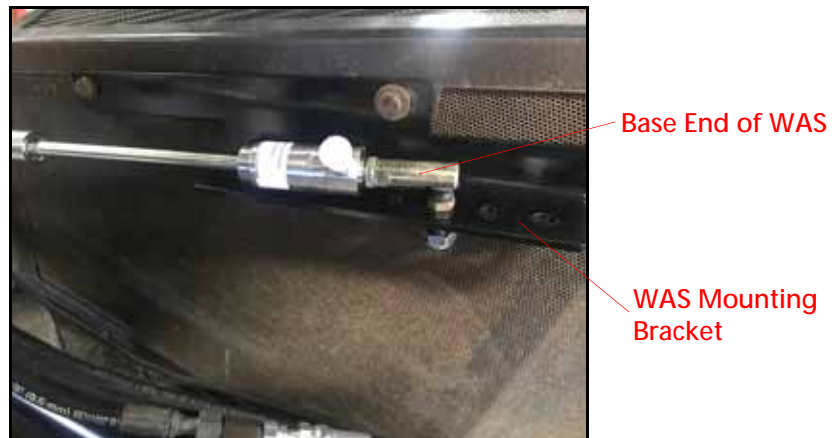
3. Locate and remove the two bolts and washers on the left side of the radiator.
4. Using the bolts and washers removed in the previous step to install the base end mounting bracket.

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, 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.



⚠ WARNING

Hydraulics are under pressure. Care should always be taken with a system that has been pressurized.

Before beginning the hydraulic installation, turn off the machine and relieve pressure by turning the steering wheel left and right.

Never work on a hot machine. Always allow it to cool before performing diagnostics, maintenance, or routine service.

When disconnecting or purging hydraulic hoses, be aware that the hydraulic fluid within the machine's system may be extremely hot and under high pressure.


Tampering with hydraulic valves may cause serious injury or death, and will void the warranty.



⚠ CAUTION

When installing hydraulics or performing diagnostics, maintenance, or routine service, ensure precautions are taken to prevent any foreign material from being introduced into the machine's hydraulic system.

Objects or materials that are able to bypass the machine's hydraulic filtration system will reduce performance and possibly damage the hydraulic system.



NOTICE

The appearance of the hydraulic valve may vary slightly from the images contained in this manual. However, the fittings, hose connections, and cable connections remain the same.

INSTALL FITTINGS IN THE VALVE

Before mounting the valve (P/N 334-0003-089) on the machine, install the proper fittings in the valve. This prepares the valve for installation and simplifies the hose connection process later in the procedure.

FIGURE 1. Fittings Installed in the Valve



| Fitting | Part Number | Port |
|--|--------------|----------|
| Fitting - -6 ORFS (M) to -6 SAE O-Ring (M) Straight Adapter | 333-0012-084 | LS STEER |
| Fitting - -4 ORFS (M) to -6 SAE O-Ring (M) Straight Adapter | 333-0012-195 | LSPV |
| Fitting - -6 ORFS (M) to -8 SAE O-Ring (M) Straight Adapter | 333-0012-199 | P, T |
| Fitting - -6 ORFS (M) to -10 SAE O-Ring (M) Straight Adapter | 333-0012-233 | A, B |
| Transducer - 0-3000 PSI Pressure | 422-0000-086 | PS |

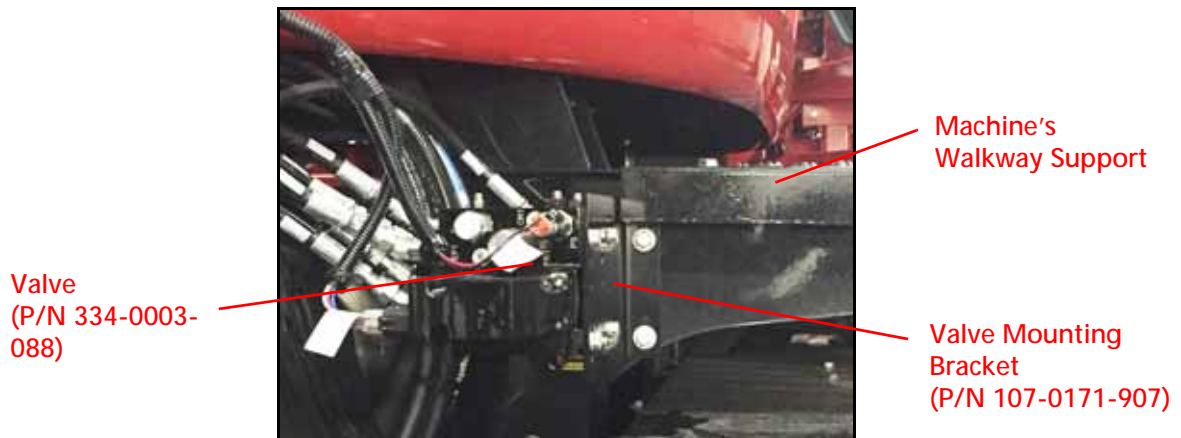
MOUNT THE VALVE

FIGURE 2. Valve Mounting Location



1. Identify the valve mounting location under the front-left center of the cab.

FIGURE 3. Valve Mounted on the Machine



2. Using the holes in the hydraulic valve mounting bracket (P/N 107-0171-907) as a template, drill 5/16" holes in the machine's walkway support.
3. Secure the valve (P/N 334-0003-089) to the valve mounting bracket using four 5/16"-18 x 7/8" hex bolts (P/N 311-0052-104) and four 5/16"-18 lock washers (P/N 313-1000-019).
4. Mount the valve mounting bracket to the machine's existing mounting plate using two 3/8"-16 x 1" hex bolts (P/N 311-0054-105), two 3/8" flat washers (P/N 313-230-013), two 3/8" lock washers (P/N 313-1000-022), and two 3/8"-16 nuts (P/N 312-1001-037).

INSTALL THE LEFT AND RIGHT STEERING HOSES

FIGURE 4. Left Steering Hose Installed on Steering Orbital



1. Disconnect the machine's left steering hose from the machine's steering orbital.
2. Install a -8 ORFS M/M/F swivel run tee adapter fitting (P/N 333-0012-028) in the open port of the steering orbital.
3. Connect the machine's left steering hose to the opposite end of the installed tee fitting.

NOTE: If may be necessary to install a -8 ORFS M/F 90° swivel elbow fitting (P/N 333-0012-067) or -8 ORFS M/F 45° swivel elbow fitting (P/N 333-0012-102) on the installed tee fitting to achieve the connection.

4. Install the 90° end of the supplied hydraulic hose (P/N 214-1000-778) on the 90° end of the installed tee fitting.
5. Connect the straight end of the installed hydraulic hose to the fitting installed in Port A of the valve (P/N 334-0003-088).

NOTE: It may be necessary to install a -6 ORFS M/F 45° swivel elbow fitting (P/N 333-0012-090) to achieve the connection.

FIGURE 5. Right Steering Hose Installed on Steering Orbital



6. Disconnect the machine's right steering hose from the steering orbital.
7. Install a -8 ORFS M/M/F swivel run tee adapter fitting (P/N 333-0012-028) in the open port of the steering orbital.
8. Connect the machine's right steering hose to the opposite end of the installed tee fitting.

NOTE: It may be necessary to install a -8 ORFS M/F 90° swivel elbow fitting (P/N 333-0012-067) or -8 ORFS M/F 45° swivel elbow fitting (P/N 333-0012-102) on the installed tee fitting to achieve the connection.

9. Install the 90° end of the supplied hydraulic hose (P/N 214-1000-778) on the 90° end of the installed tee fitting.

FIGURE 6. Right Steering Hose Installed on Valve

Hose Installed on
Port B of Valve

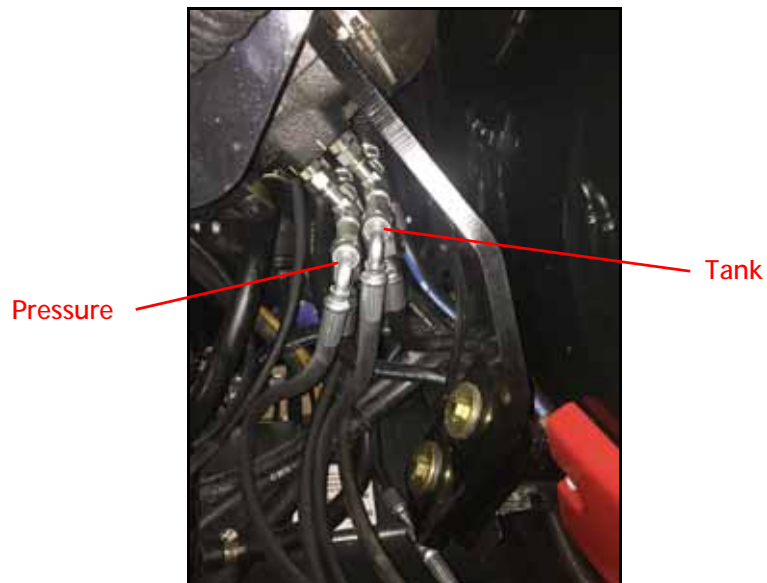


10. Connect the straight end of the installed hydraulic hose to the fitting installed in Port B of the valve.

NOTE: It may be necessary to install a -6 ORFS M/F 45° swivel elbow fitting (P/N 333-0012-090) to achieve the connection.

INSTALL THE PRESSURE AND TANK HOSES

FIGURE 7. Pressure Hose Installed



1. Disconnect the machine's pressure hose from the steering orbital.
2. Install a -8 ORFS M/M/F swivel run tee adapter fitting (P/N 333-0012-028) in the open port of the steering orbital.
3. Connect the machine's pressure hose to the opposite end of the installed tee fitting.

NOTE: It may be necessary to install a -8 ORFS M/F 90° swivel elbow fitting (P/N 333-0012-067) or -8 ORFS M/F 45° swivel elbow fitting (P/N 333-0012-102) on the installed tee fitting to achieve the connection.

4. Install the 90° end of the supplied hydraulic hose (P/N 214-1000-778) on the 90° end of the installed tee fitting.

FIGURE 8. Pressure Hose Installed on Valve

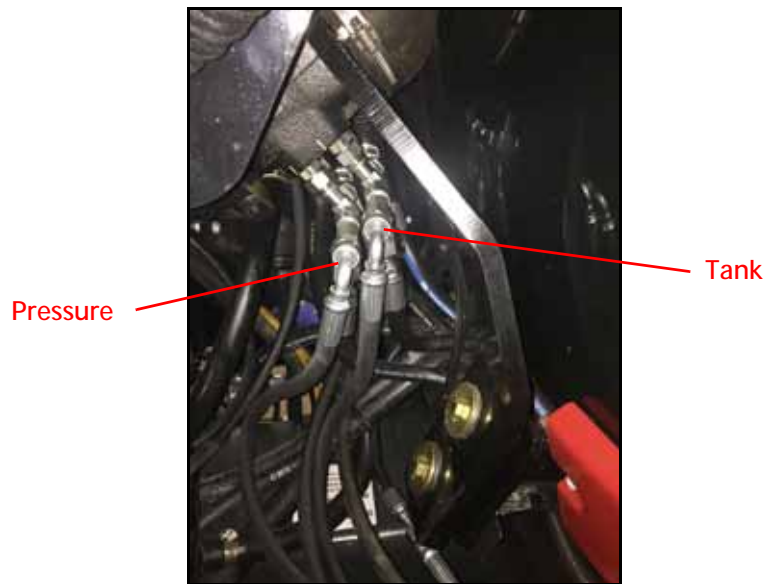
Hose Installed on
Port P of Valve



5. Connect the straight end of the installed hydraulic hose to the fitting installed in Port P of the valve (P/N 334-0003-088).

NOTE: It may be necessary to install a -6 ORFS M/F 45° swivel elbow fitting (P/N 333-0012-090) on the fitting installed in Port P to achieve the connection.

FIGURE 9. Tank Hose Installed

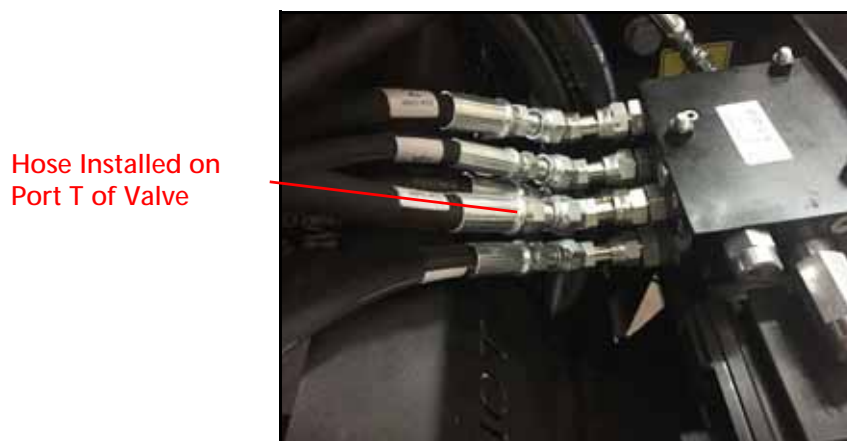


6. Disconnect the machine's tank hose from the steering orbital.
7. Install a -8 ORFS M/M/F swivel run tee adapter fitting (P/N 333-0012-028) in the open port of the steering orbital.
8. Connect the machine's tank hose to the opposite end of the installed tee fitting.

NOTE: It may be necessary to install a -8 ORFS M/F 90° swivel elbow fitting (P/N 333-0012-067) or -8 ORFS M/F 45° swivel elbow fitting (P/N 333-0012-102) on the installed tee fitting to achieve the connection.

9. Install the 90° end of the supplied hydraulic hose (P/N 214-1000-778) on the 90° end of the installed tee fitting.

FIGURE 10. Tank Hose Installed on Valve



10. Connect the straight end of the installed hydraulic hose to the fitting installed in Port T of the valve.

NOTE: It may be necessary to install a -6 ORFS M/F 45° swivel elbow fitting (P/N 333-0012-090) on the fitting installed in Port T to achieve the connection.

INSTALL THE LOAD SENSE HOSES

FIGURE 11. Load Sense Hose Installed on Steering Orbital



1. Disconnect the machine's load sense hose from 90° fitting in the load sense port of the steering orbital.
2. Install the male end of the supplied hydraulic hose (P/N 214-1000-464) on the end of the machine's load sense hose.

FIGURE 12. Load Sense Hose Installed on Steering Orbital

Hose Installed on
Port LSPV of Valve



3. Connect the female end of the installed hydraulic hose to the fitting installed in Port LSPV of the valve (P/N 334-0004-088).

NOTE: It may be necessary to install a -4 ORFS M/F 90° swivel elbow fitting (P/N 333-0012-023) on the fitting installed in Port LSPV to achieve the connection.

4. Connect the -4 ORFS end of the supplied hydraulic hose (P/N 214-1000-665) to the open port of the steering orbital.

FIGURE 13. Load Sense Hose Installed on Valve

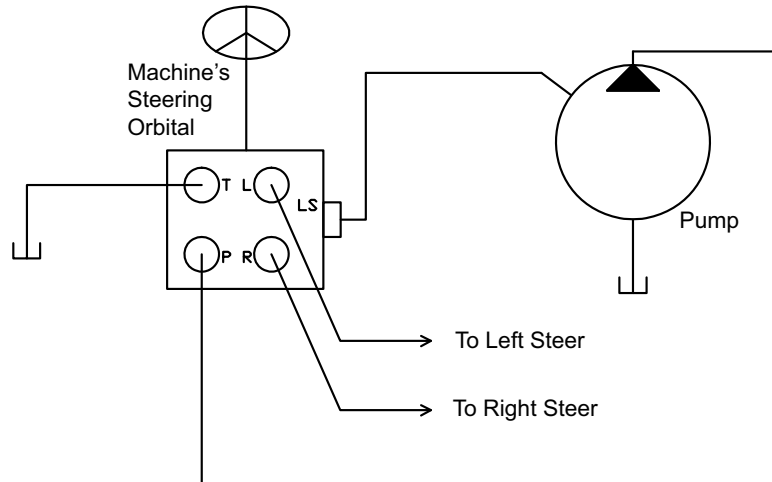


5. Connect the -6 ORFS end of the installed hydraulic hose to the fitting installed in Port LS STEER of the valve.

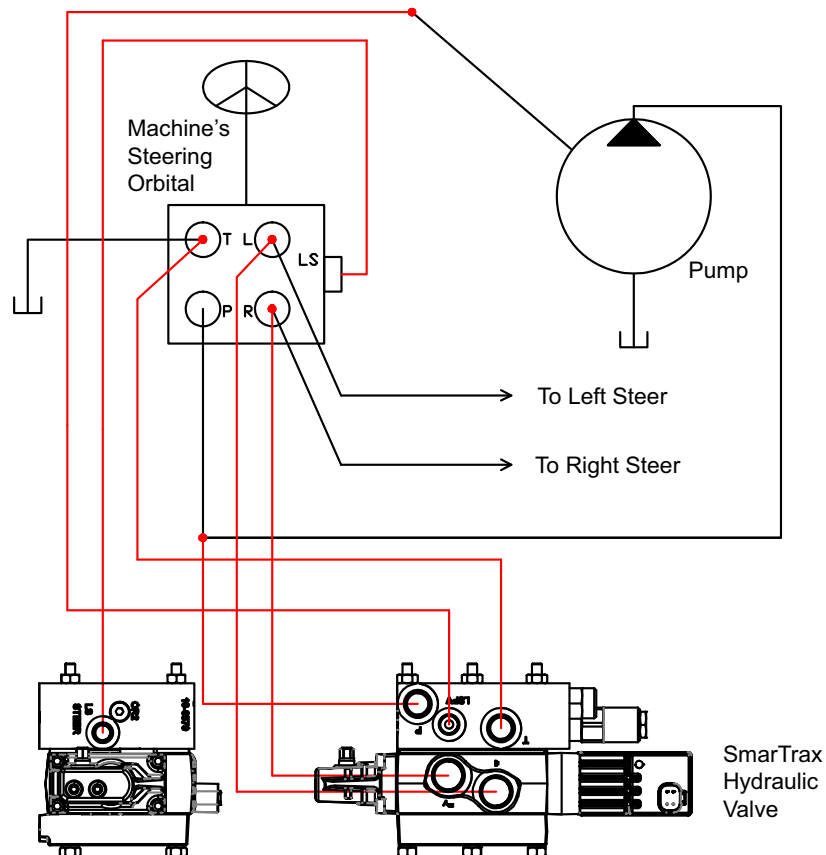
NOTE: It may be necessary to install a -6 ORFS M/F 90° swivel elbow fitting (P/N 333-0012-065) on the fitting installed in Port LS STEER to achieve the connection.

HYDRAULIC DIAGRAM

Before SmarTrax Installation



After SmarTrax Installation



CHAPTER

5

RS1 ROOF BULKHEAD CONNECTION

RS1 ROOF BULKHEAD CONNECTION

1. Remove the cab roof cap.

FIGURE 1. Roof Cap Removed



2. Locate the bulkhead connector on the right, front side of the cab roof.

FIGURE 2. Bulkhead Connector



3. Install the bulkhead connector (P/N 115-4010-077) onto the machine's mating connector.

FIGURE 3. Completed Bulkhead Connection



4. Route the other end of the cable to roof cap.
5. Using the provided M6 bolts, install the connector in the cutout.

FIGURE 4. Connector Cutout Installation



6. Reinstall the cab roof cap.

CHAPTER

6

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. Install the RS1 mounting bracket (P/N 116-0159-803) on the front of the cab roof using the machine's existing hardware.

NOTE: The RS1 mounting bracket should be installed so the latch is on the left side.

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



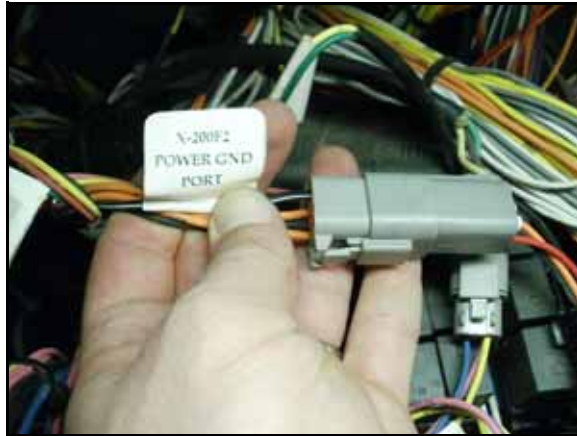
2. Remove the hardware used to secure the machine's existing electronic control unit (ECU) to the wall of the instructional seat (if applicable).
3. Install the HDU (P/N 063-0173-887) to the HDU mounting bracket (P/N 107-0172-578) using two 1/4"-20 UNC flanged lock nuts (P/N 312-1001-168).
4. Align the 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



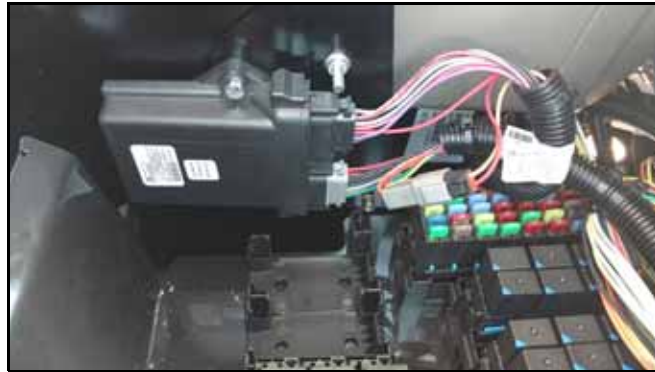
2. Locate the machine's X-200 POWER GND PORT INTERFACE connection on the machine's harness, stored under the instructional seat.
3. Connect the POWER connector of the RS1 harness cable (P/N 115-4010-076) to the machine's X-200 POWER GND PORT INTERFACE.
4. Connect the CAN connection on the HDU harness to the machine's mating CAN connection (C047F) located behind the instruction seat.

FIGURE 6. CAN Connection



5. Connect the gray HDU connection on the HDU harness to the HDU.

FIGURE 7. Completed HDU Connections



INSTALL THE HDU SWITCH HARNESS CABLE

FIGURE 8. HDU Harness Cable Connection



1. Connect the 8-pin CAB SWITCHES connector of the HDU harness cable (P/N 115-4010-059) to the mating female 8-pin connector of the HDU switch harness cable (P/N 115-4010-056).

FIGURE 9. Seat Switch Harness Connections



2. Locate and disconnect the machine's seat switch harness connections.

3. Connect the SEAT SWITCH harness connections of the HDU switch harness cable between the machine's seat switch connections.
4. Plug the ENABLE connector on the HDU switch harness cable to the mating connector on the engage foot switch (P/N 063-0172-470).

FIGURE 10. Master Switch Installation Location



5. Locate an unused switch port of the machine's control console.
6. Use a flat-head screwdriver to gently remove the cover of the unused switch port.
7. Route the MASTER connector on the HDU switch harness cable to the unused port.
8. Pull the MASTER connector through the switch port opening.

FIGURE 11. Master Switch Installed



9. Install the master switch (P/N 063-0173-961) on the MASTER connector of the HDU switch harness cable (P/N 115-4010-059).
10. Feed the harness and switch wires back into the console casing.
11. Press on the switch casing to ensure the switch is securely installed.

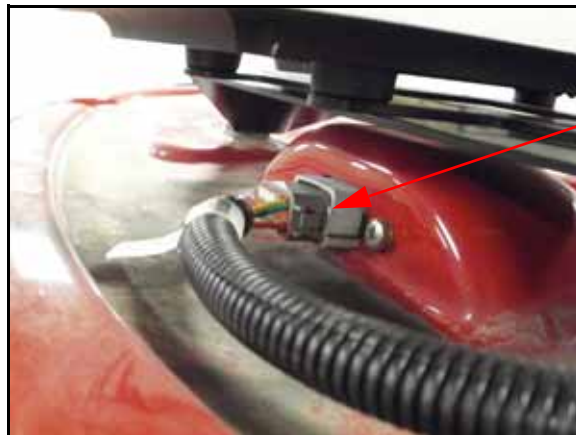
INSTALL THE RS1 CABLE

FIGURE 12. 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.

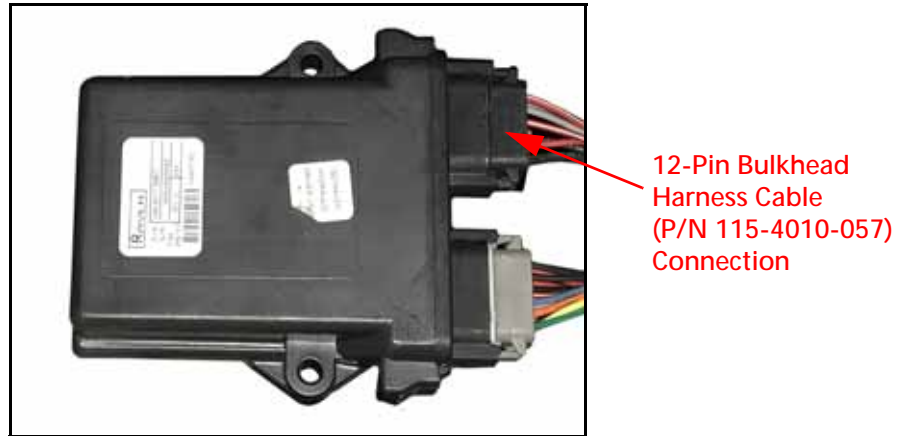
FIGURE 13. RS1 Tee Cable Routing



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

INSTALL THE HDU/VALVE BULKHEAD HARNESS

FIGURE 14. RS1 to Bulkhead Cable Installed on HDU



1. Connect the black, rectangular 12-pin connector of the RS1 to bulkhead harness cable (P/N 115-4010-057) to the mating port of the installed HDU.
2. Connect the 2-pin connector of the RS1 to bulkhead harness to the mating 2-pin connector of the RS1 HDU harness cable (P/N 115-4010-028).

FIGURE 15. Bulkhead Connection

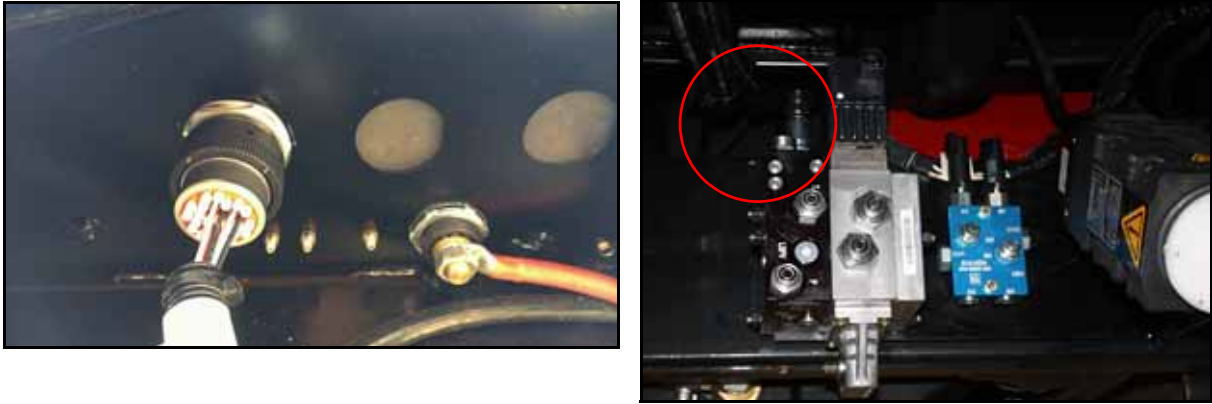


3. Locate the unused bulkhead opening in the back wall of the cab.
4. Remove the adhesive film from the bulkhead opening.
5. Install the 31-pin connector of the RS1 to bulkhead harness in the bulkhead opening, securing it with the supplied nut.

INSTALL THE VALVE HARNESS CABLE

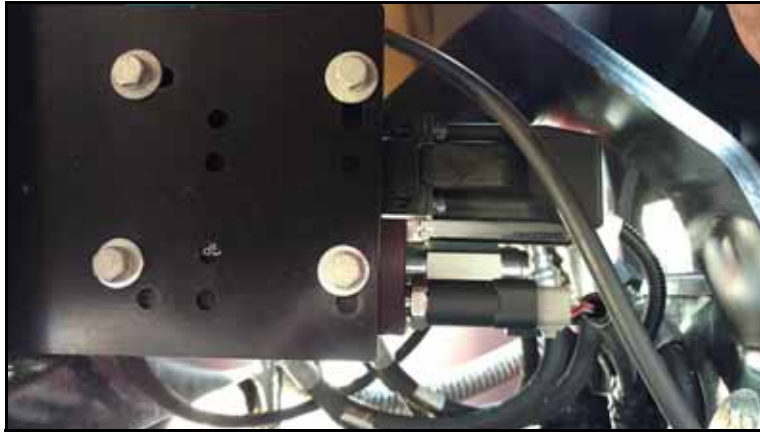
1. From beneath the cab, connect the round, 31-pin connector of the valve harness (P/N 115-4010-058) to the mating 31-pin connector of the bulkhead harness cable (P/N 115-4010-057).

FIGURE 16. VALVE Harness Cable Installation Locations



2. Connect the 4-pin VALVE connector to the open port of the RS1 hydraulic valve (P/N 334-0003-088).

FIGURE 17. PS1 and PS2 Connections



3. Install the PSI connector on the pressure transducer installed in the steering valve.

FIGURE 18. WAS Connection



4. Connect the WAS connector to the base-end of the installed WAS (P/N 416-0001-052).

VIPER 4/4+ CONNECTIONS

1. 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.

FIGURE 19. 16-Pin on Harness Cable Connection



NOTE: RS1 will not work without this cable.

2. Attach the other connectors to the mating connectors on the back of the Viper 4/4+.

FIGURE 20. Viper 4 Connections

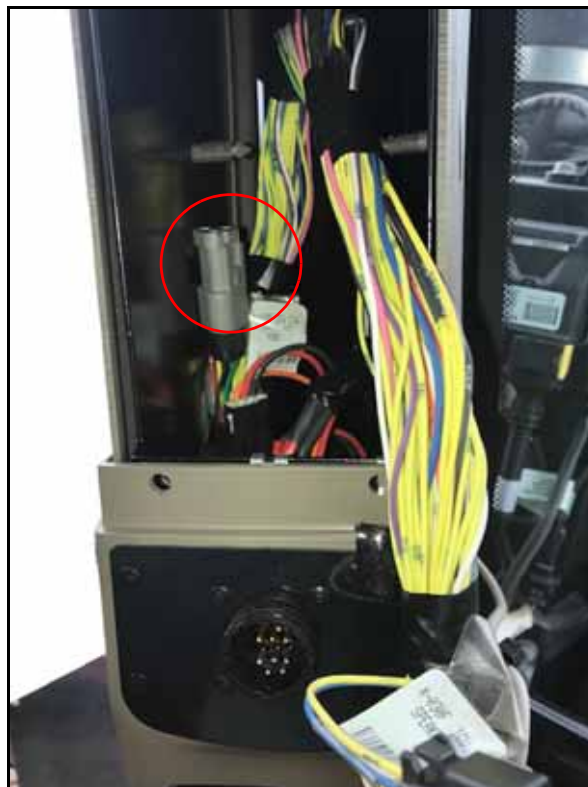


INSTALLING THE ISOBUS EXTENSION HARNESS (IF APPLICABLE)

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 21. 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.
6. Remove the ISOBus Terminator on the HDU harness and plug the ISOBus extension harness into the mating 3-Pin connector.

FIGURE 22. ISOBus Extension Harness



NOTE: The terminators are no longer needed on the system.

ROUTINE OPERATION

FIGURE 23. Master and Resume Switch Locations

Master Switch



Enable Switch

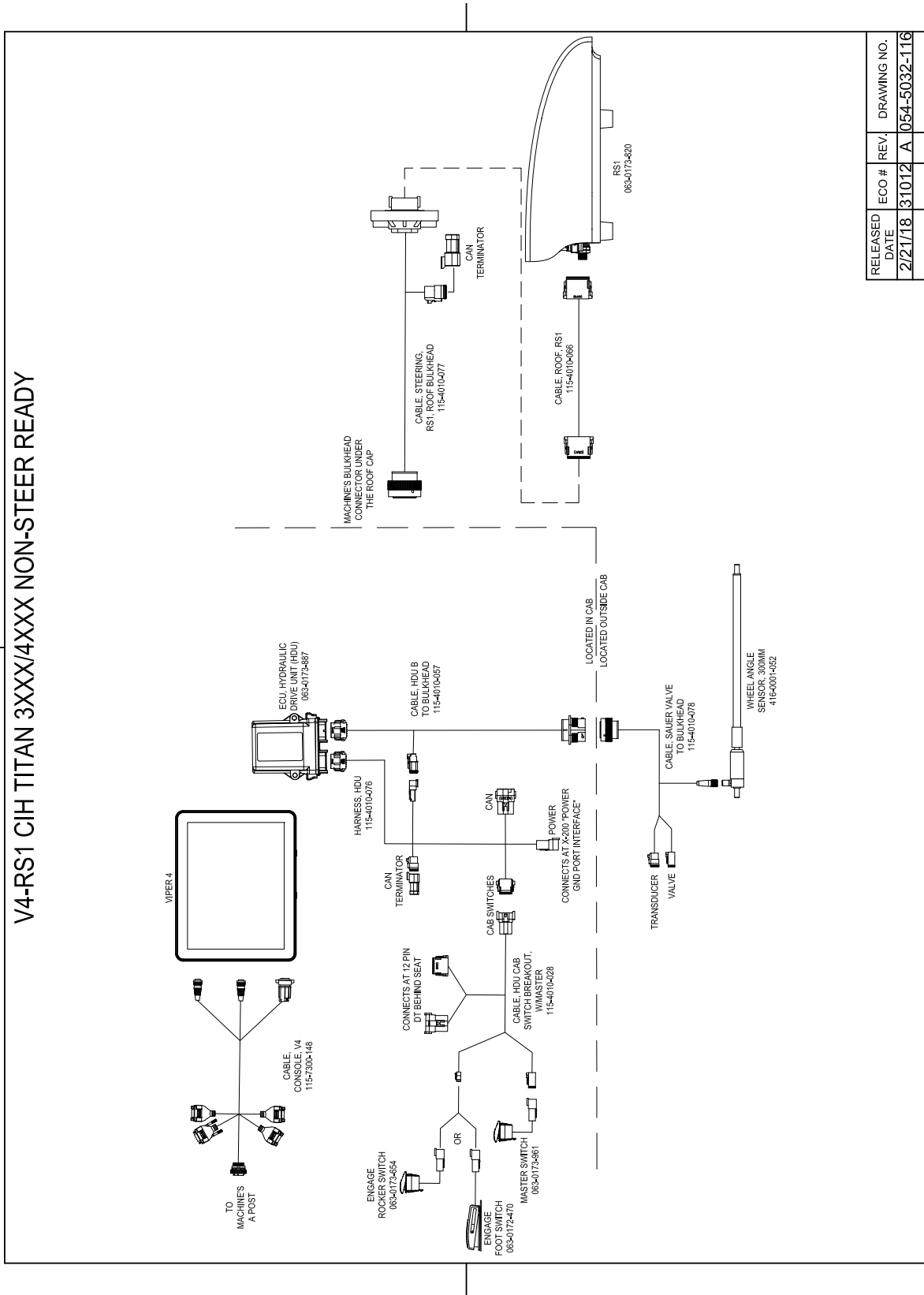


Locate and identify the machine's master switch on the control panel and the resume switch on the joystick as they are required for RS1 system operation.

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.

SYSTEM DIAGRAM

V4-RS1 CIH TITAN 3XXX/4XXX NON-STEER READY



| RELEASED DATE | ECO # | REV. | DRAWING NO. |
|---------------|-------|------|--------------|
| 2/21/18 | 31012 | A | 054-5032-116 |

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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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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.