

# VSN Installation Manual for RBR Vector Ventuir/ Vortex, MY18+

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*E34392*



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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 VSN 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 VSN 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 VSN, observe the following safety measures:

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

## WARNING

- The machine must remain stationary and switched off, with the booms unfolded and supported, during installation or maintenance.

## CAUTION

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### 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 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.



Congratulations on your purchase of the VSN system!

The following instructions are designed to assist with the proper installation of the VSN system. Refer to the VSN Calibration & Operation Manual (P/N 016-2020-001) for assistance with calibrating and using the VSN system.

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### PREPARING FOR INSTALLATION

Before installing the VSN 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 to complete the installation process.

### PREREQUISITES

The following components must be installed with the VSN system.

- RS1™
- Viper® 4 with ROS version 3.4 or newer

Follow the installation instructions provided with these components before installing VSN.

### RECOMMENDATIONS

Raven Industries recommends the following best practices when installing or operating the VSN system for the first time or at the start of the season:

- Install the VSN unit in the recommended location.
- Use part numbers to help identify parts.
- Do not remove the plastic wrap 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](mailto:techwriting@ravenind.com)

- VSN Installation Manual for RBR Vector Ventuir/Vortex, MY18+
- 016-2025-001 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 VSN 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.

FIGURE 1. VSN Installation Kit for RBR Vector Ventuir/Vortex, MY18+

#	QTY	PART #	DESCRIPTION
	1	053-0159-263	PALLET, SHIPPING
	1	116-0159-846	WELDMENT, RECT. TUBE, ARM MOUNT, VSN, RBR
	1	053-0159-012	BOX, SHIPPING
	1	115-2020-012	CABLE, VSN, RBR, MY18+
	1	116-0159-834	WELDMENT, VSN MOUNT, CASE IH PATRIOT 120'
	1	116-0159-837	WELDMENT, VSN MOUNT
	1	107-0172-642	BRACKET, VSN DEBRIS SHIELD
	1	107-0172-668	BRACKET, MACHINE MOUNT, FRONT, VSN, RBR
	1	107-0172-669	BRACKET, MACHINE MOUNT, REAR, VSN, RBR
	1	107-0172-677	BRACKET, SUPPORT ARM, VSN MOUNT, RBR
	1	016-0171-649	SHEET, WARRANTY/HELP (016-2025-001)
	1	053-0159-074	ENVELOPE, PLASTIC
	8	311-4055-180N	HEX BOLT DIN933, M8 X 25MM, 8.8 STEEL, CLASS V
	4	313-6001-013N	WASHER, SPRING LOCK, DIN127, M8, ZINC, CLASS V
	12	313-6000-013N	WASHER, DIN125, M8, ZINC, CLASS V
	4	312-6001-027N	HEX NUT, NYLOCK, DIN985, M8 X 1.25, CLASS 8, CLASS V
	4	313-5001-007	GASKET, VITON, .29 I.D. X .688 O.D. X .062 THK
	6	311-4051-233N	HEX BOLT, DIN931, M10 X 75MM, 10.9 STEEL, CLASS V
	8	311-4051-224N	HEX BOLT, DIN931, M10 X 30MM, 10.9 STEEL, CLASS V
	1	311-0058-101	BOLT, MACHINE, 1/2"-13 UNC-2, 2-1/2" LG, GRADE 5
	14	312-6001-043N	HEX NUT, NYLOCK, DIN985, M10 X 1.25, CLASS 8, CLASS V
	28	313-6000-016N	WASHER, DIN125, M10, ZINC, CLASS V
	1	312-4000-101	NUT, LOCK, NYLON INSERT, 1/2"-13 UNC-2B, GRADE 2, CARBON
	2	313-2300-018	WASHER, STEEL, FLAT, 1/2", HIGH CORROSION RESISTANT
	3	435-3001-043	CLAMP, CABLE, 1" DIA. INSULATED AG-CHEM
	3	313-2301-810	WASHER, FLAT, STAINLESS STEEL, 1/4"
	3	312-4000-164	NUT, LOCK, NYLON INSERT, 1/4"-20 UNC-2B, STAINLESS STEEL



MOUNTING VSN

	<b>WARNING</b>
Unfold and lower the booms during the installation process.	

1. Locate the battery box on the front right frame rail.

FIGURE 1. Battery Box Location

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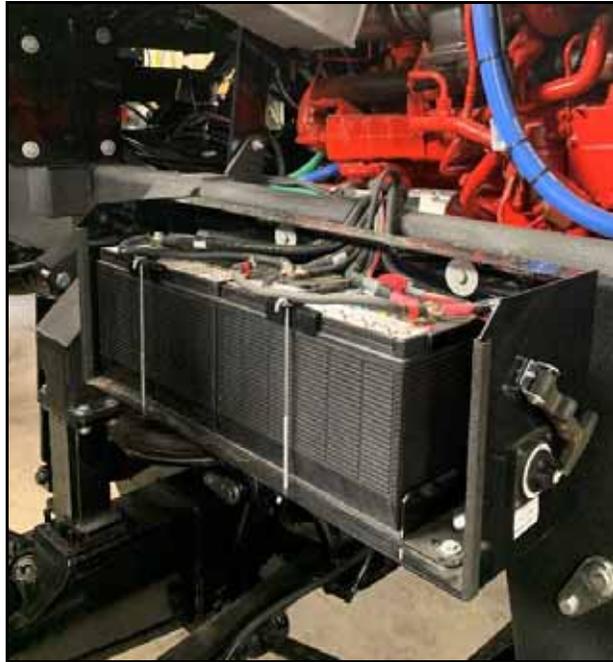


2. Turn the battery disconnect off.

3. Remove the battery box cover.

FIGURE 2. Removed Battery Box Cover

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4. Remove the batteries from the battery box compartment.

NOTE: Be sure to note how the battery cables connect to the batteries prior to removal.

FIGURE 3. Removed Batteries

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5. Locate and remove the two 3/8" bolts at the rear of the battery that secure the battery box to the frame mount.
6. Install the rear vertical support bracket (P/N 107-0172-669) using the two 3/8" bolts that were removed in the previous step.

NOTE: Do not tighten the bolts until all brackets are installed.

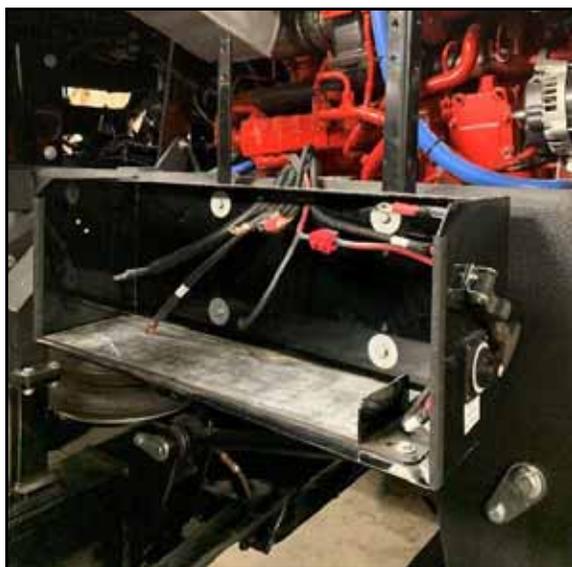
FIGURE 4. Installed Rear Vertical Support Bracket



7. Locate and remove the two 3/8" bolts at the front of the battery that secure battery box to the frame mount.
8. Install the front vertical support bracket (P/N 107-0172-668) using the two 3/8" bolts that were removed in the previous step.

NOTE: Do not tighten the bolts until all brackets are installed.

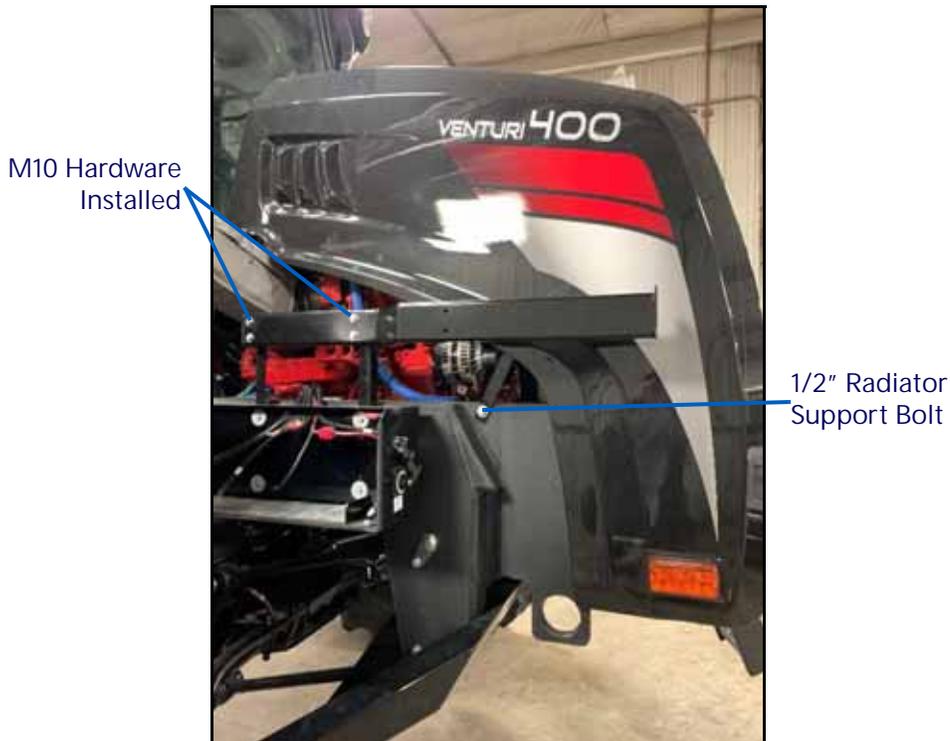
FIGURE 5. Installed Front Vertical Support Bracket



9. Install the VSN Visual Guidance rectangular tube mounting arm (P/N 116-0159-846) onto the vertical support brackets using the provided M10 hardware.
  - a. Qty. 4 – 311-4051-224N – M10 x 30MM Bolt.
  - b. Qty. 4 – 311-4051-233N – M10 x 75MM Bolt.
  - c. Qty. 16 – 313-6000-016N – M10 Flat Washer.
  - d. Qty. 8 – 312-6001-043N – M10 x 1.25 Nylock Nut.

FIGURE 6. Installed VSN

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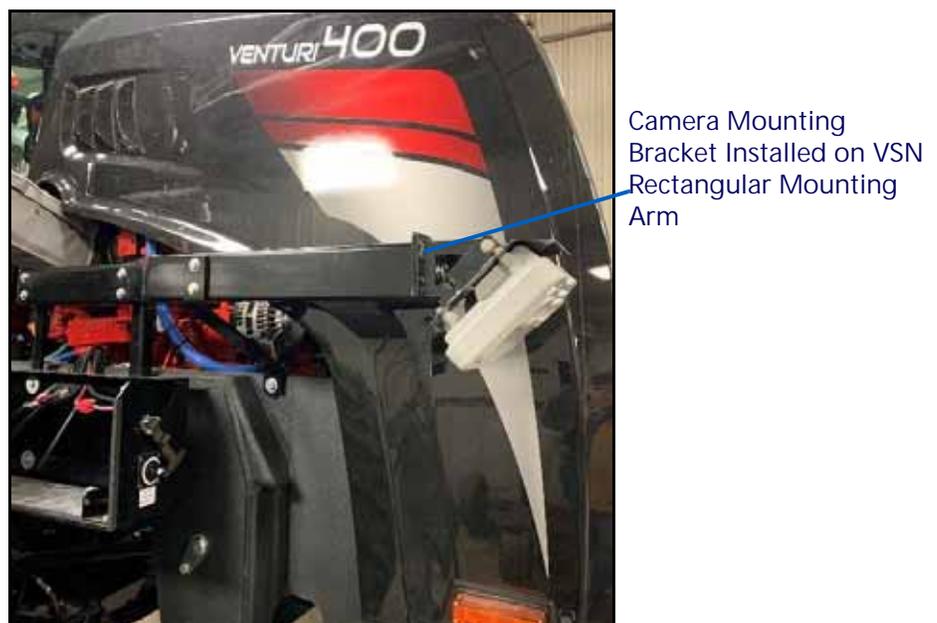
10. Locate and remove the 1/2" bolt that secures the radiator support bracket to the frame as shown in figure 6.
11. Install the frame support bracket (P/N 107-0172-677) to the machine frame using the provided 1/2" hardware.
  - a. Qty. 1 – 311-0058-101 – 1/2"-13 x 2.5" Bolt.
  - b. Qty. 2 – 313-2301-810 – 1/2" Flat Washer.
  - c. Qty. 1 – 312-4000-101 – 1/2"-13 Nylock Nut.
12. Secure the other end of the frame support bracket (P/N 107-0172-677) to the VSN Visual Guidance rectangular tube mounting arm (P/N 116-0159-846) using the provided M10 hardware.
  - a. Qty. 2 – 311-4051-233N – M10 x 75MM Bolt.
  - b. Qty. 4 – 313-6000-016N – M10 Flat Washer.
  - c. Qty. 2 – 312-6001-043N – M10 x 1.25 Nylock Nut.

FIGURE 7. Installed Frame Support Arm



13. Install the camera mounting bracket (P/N 116-0159-834) to the VSN Visual Guidance rectangular mounting arm (P/N 116-0159-846) using the provided M10 hardware.
- Qty. 4 – 311-4051-224N – M10 x 30MM Bolt.
  - Qty. 8 – 313-6000-016N – M10 Flat Washer.
  - Qty. 4 – 312-6001-043N – M10 x 1.25 Nylock Nut.

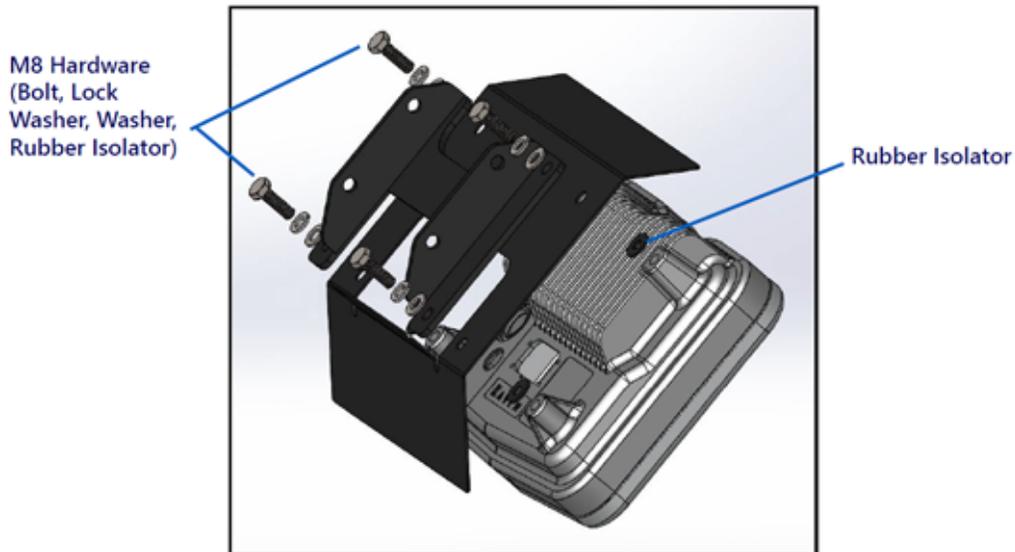
FIGURE 8. Installed Camera Mounting Bracket



14. Ensure that the VSN Visual Guidance rectangular mounting arm is square and level to the machine.
15. Securely tighten all installed hardware.
16. Assemble the VSN Visual Guidance camera bracketry using the provided M8 hardware.
  - a. Qty. 1 – 116-0159-837 – VSN Mount.
  - b. Qty. 1 – 107-0172-642 – VSN Debris Shield.
  - c. Qty. 4 – 313-5001-007 – Rubber Isolator.
  - d. Qty. 4 – 311-4055-180N – M8 x 25MM Bolt.
  - e. Qty. 4 – 313-6001-013N – M8 Lock Washer.
  - f. Qty. 4 – 313-6000-013N – M8 Flat Washer.

FIGURE 9. Camera Assembly

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17. Mount the VSN Visual Guidance camera assembly to the installed camera mounting bracket (116-0159-834) using the provided M8 hardware.
  - a. Qty. 4 – 311-4055-180N – M8 x 25MM Bolt.
  - b. Qty. 8 – 313-6000-013N – M8 Flat Washer.
  - c. Qty. 4 – 312-6001-027N – M8 x 1.25 Nylock Nut.

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FIGURE 10. Installed Camera Assembly

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18. Reinstall the machine batteries in the reverse order in which they were removed.
19. Reinstall the machines battery box cover.
20. Turn on the machine battery disconnect.

## CABLE INSTALLATION

### OUTSIDE OF CAB

1. Identify the VSN Visual Guidance cable (P/N 115-2020-012)
2. Locate the cab access panel in the right rear corner of the machines cab.

FIGURE 11. Cab Access Panel

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3. Remove the panel cover.
4. Locate RS1 tee cable (P/N 115-4010-068 or P/N 115-4010-096) which is connected to the bulkhead connector labeled "Raven".

**NOTE:** If the machine is equipped with a bed that utilizes CAN ECUs (L4000 or CaseIH Flex Air), you will have a 115-4010-068 cable.

If the machine is equipped with a bed that utilizes ISO ECU's (L4500, L5000, Salford, or Vortex liquid skid), you will have a 115-4010-096 cable.

5. On the RS1 tee cable, locate the two, 6 pin Deutsch connectors that are plugged together.

**NOTE:** If machine is equipped with RS1 tee cable (P/N 115-4010-068), the cable revision level will need to be Rev. D or higher.

If the machine is equipped with RS1 tee cable (P/N 115-4010-096), the cable revision level will need to be Rev. B or higher.

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FIGURE 12. RS1 Tee Cable 6-Pin Connectors

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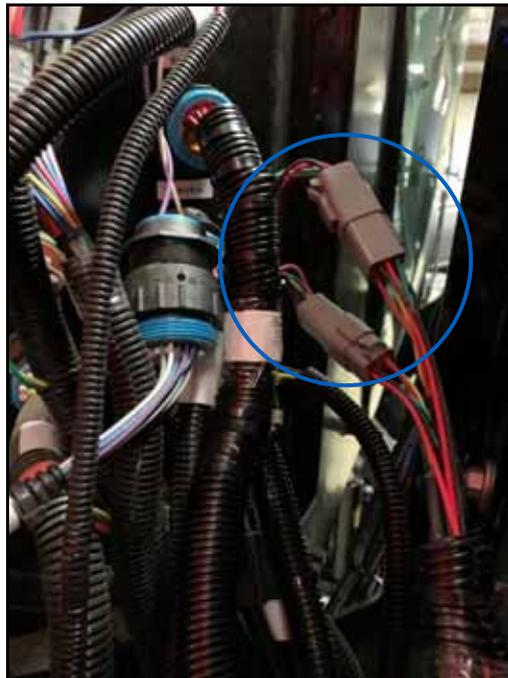


6. Disconnect the two 6 pin Deutsch connectors.
7. Connect the mating 6 pin Deutsch connectors on the VSN Visual Guidance cable (P/N 115-2020-012) labeled "TO RS1 Tee Cable" to the 6 pin Deutsch connectors on the RS1 tee cable.

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FIGURE 13. VSN Visual Guidance Cable Connected to RS1 Tee Cable

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8. Route the 23 pin connector on the VSN Visual Guidance cable, PN 115-2020-012, towards the front of the machine where the VSN Visual Guidance assembly is installed.

9. Connect the 23 pin connector to the back of the VSN Visual Guidance assembly.

FIGURE 14. VSN Visual Guidance Camera Connection

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10. Use the provided cable clamps and  $\frac{1}{4}$ " hardware to secure the cable to the threaded studs on the VSN Visual Guidance rectangular mounting arm, PN 116-0159-846.
  - a. Qty. 3 – 435-3001-043 – Cable Clamp.
  - b. Qty. 3 – 312-4000-164 –  $\frac{1}{4}$ "-20 Nylock Nut.
  - c. Qty. 3 – 313-2301-810 –  $\frac{1}{4}$ " Flat Washer.

### INSIDE OF CAB

1. On the VSN Visual Guidance cable (P/N 115-2020-012), locate the connectors labeled "To V4 Video Port" and "To V4 Video Tee."
2. Route those connectors into the cab utilizing the floor cut out located on the bottom, right, rear corner of the cab.

FIGURE 15. Cab Access



3. Route the connector labeled "TO V4 Video Port" to the back of the Viper 4/4+ display and connect it to Port 6 on the Viper 4/4+.

NOTE: Utilize the connector labeled "TO V4 Video Port Tee" if there is a secondary video feed connected to the Viper 4/4+ previously.

FIGURE 16. Viper 4 Connection



## CABLING AND CONNECTION

### OPTIONAL ETHERNET CABLE

1. Connect the blue/green Ethernet cable to the back of the VSN camera.
2. Route the Ethernet cable along the frame and up to the RS1.
3. Connect remaining end to the RS1.

FIGURE 17. RS1 Connection

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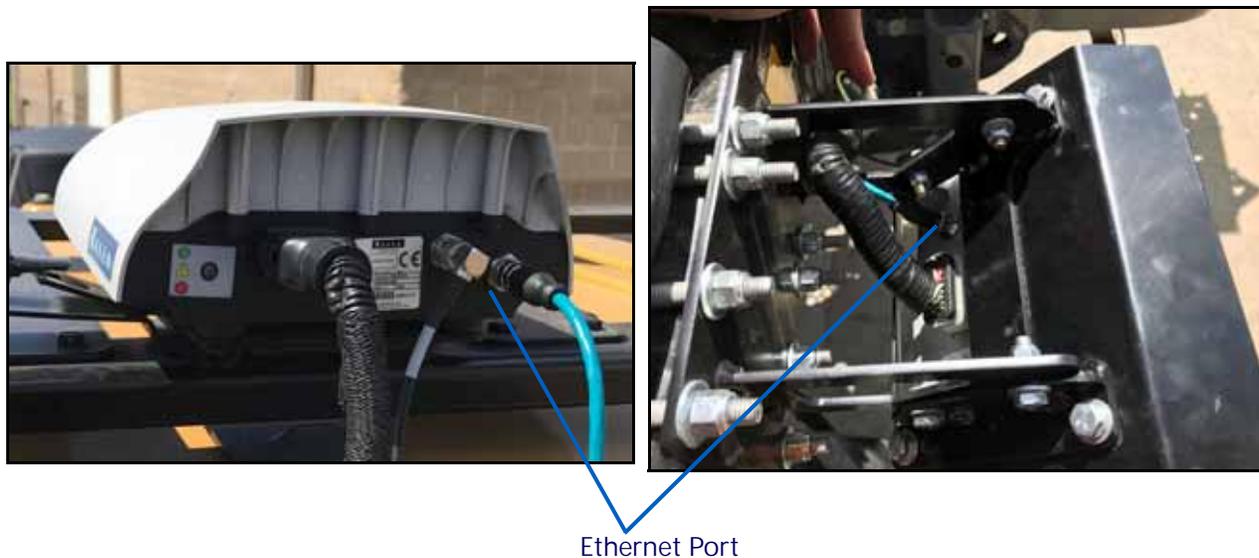
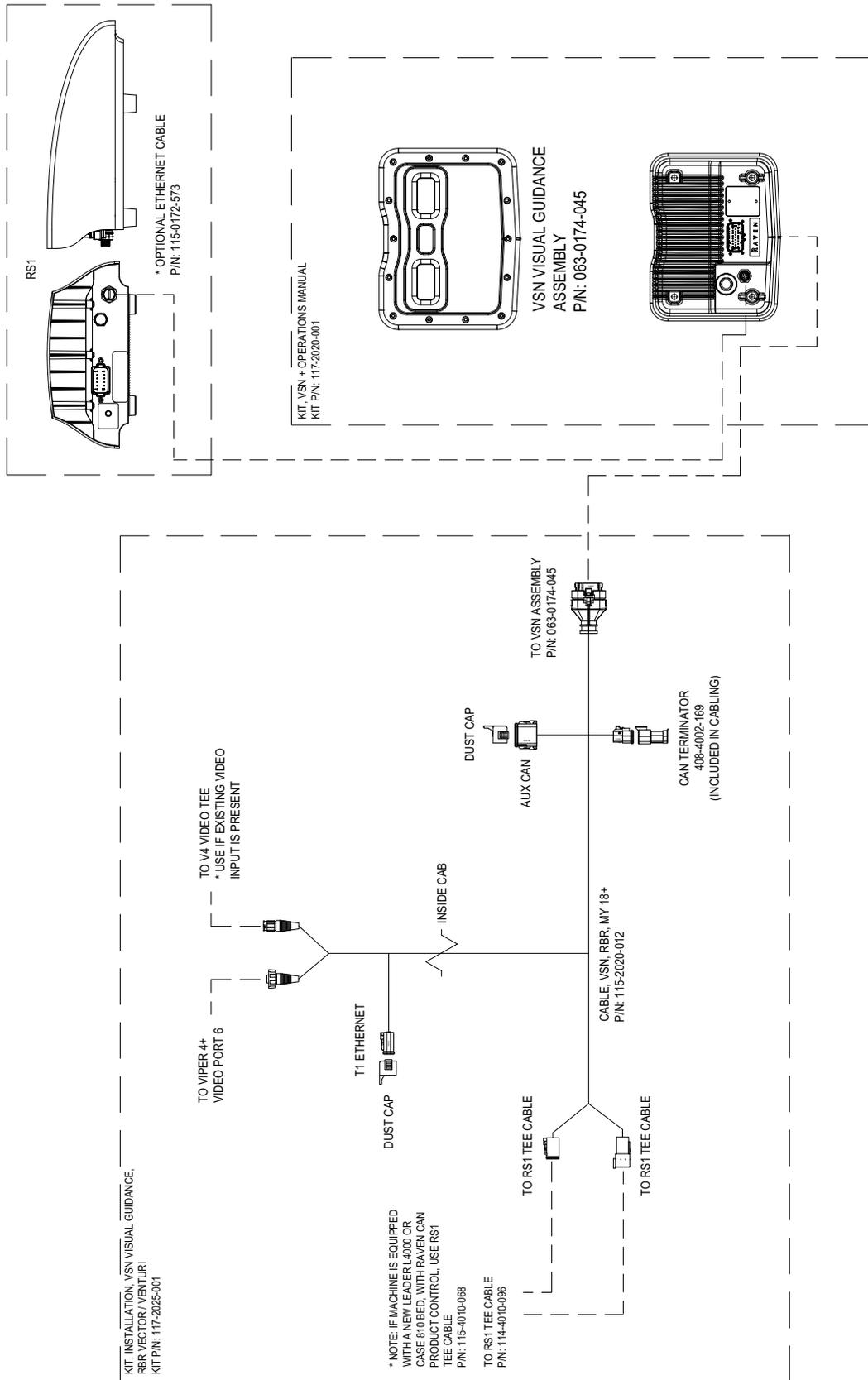


FIGURE 18. RBR Vector 350 / Vortex - MY19 (P/N 054-3900-003 Rev. C)





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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.**