VSN® Installation Manual
for Generic Implements

016-2025-004 Rev. B   *9/2021*   *E37904*

DISCLAIMER

While every effort has been made to ensure the accuracy of this document, Raven Industries assumes no responsibility for omissions and errors. Nor is any liability assumed for damages resulting from the use of information contained herein.

Raven Industries shall not be responsible or liable for incidental or consequential damages or a loss of anticipated benefits or profits, work stoppage or loss, or impairment of data arising out of the use, or inability to use, this system or any of its components. Raven Industries shall not be held responsible for any modifications or repairs made outside our facilities, nor damages resulting from inadequate maintenance of this system.

As with all wireless and satellite signals, several factors may affect the availability and accuracy of wireless and satellite navigation and correction services (e.g. GPS, GNSS, SBAS, etc.). Therefore, Raven Industries cannot guarantee the accuracy, integrity, continuity, or availability of these services and cannot guarantee the ability to use Raven systems, or products used as components of systems, which rely upon the reception of these signals or availability of these services. Raven Industries accepts no responsibility for the use of any of these signals or services for other than the stated purpose.

RAVEN

CHAPTER 1   IMPORTANT INFORMATION

SAFETY

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NOTICE

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Follow the operation and safety instructions included with the implement and/or controller and read this manual carefully before installing or operating this Raven system.

- Follow all safety information presented within this manual. Review implement operation with your local dealer.
- Contact a local Raven dealer for assistance with any portion of the installation, service, or operation of Raven equipment.
- Follow all safety labels affixed to system components. Be sure to keep safety labels in good condition and replace any missing or damaged labels. Contact a local Raven dealer to obtain replacements for safety labels.

Observe the following safety measures when operating the implement after installing this Raven system:

- Do not operate this Raven system or any agricultural equipment while under the influence of alcohol or an illegal substance.
- Be alert and aware of surroundings and remain in the operator seat at all times when operating this Raven system.
    - Do not operate the implement on any public road with this Raven system enabled.
    - Disable this Raven system before exiting the operator seat.
    - Determine and remain a safe working distance from obstacles and bystanders. The operator is responsible for disabling the system when a safe working distance has diminished.
    - Disable this Raven system prior to starting any maintenance work on the implement or components of this Raven system.
- Do not attempt to modify or lengthen any of the system control cables. Extension cables are available from a local Raven dealer.

<div align="center">

⚠ CAUTION

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ELECTRICAL SAFETY

- Always verify that power leads are connected to the correct polarity as marked. Reversing the power leads could cause severe damage to the Raven system or other components.
- To prevent personal injury or fire, replace defective or blown fuses with only fuses of the same type and amperage.
- Do not connect the power leads to the battery until all system components are mounted and all electrical connections are completed.

• Always start the machine before initializing this Raven system to prevent power surges or peak voltage.

• To avoid tripping and entanglement hazards, route cables and harnesses away from walkways, steps, grab bars, and other areas used by the operator or service personnel when operating or servicing the equipment.

TOUCH SCREEN

• Only touch the touch-screen with your finger or by using a special touch-screen stylus/pen. Operating the touch-screen with sharp objects may cause permanent damage to the screen.

• Only clean the screen using a damp cloth. Never use caustic or other aggressive substances.

RECOMMENDATIONS AND BEST PRACTICES

HARNESS ROUTING

The word "harness" is used to describe any electrical cables and leads, both bundled and unbundled. Use the following guidelines and recommendations when connecting and routing harnesses while installing or maintaining this Raven system:

• Leave protective caps/covers over harness connectors until needed to avoid dirt and moisture from contaminating electrical circuits.

• Secure the harness to the frame or solid structural members at least every 12 in [30 cm].

• Follow existing harness runs already routed on the implement as much as possible. Proper harness routing should:

    • Secure harnessing and prevent the harness from hanging below the implement.

    • Provide sufficient clearance from moving components and operational zones around shafts; universal joints and suspension components; pulleys, gears, belts, and chains; moving linkages, cylinders, articulation joints, etc.

    • Protect harnessing from field debris and surrounding hazards (e.g. tree limbs, fence posts, crop stubble, dirt clumps or rocks that may fall or be thrown by the implement).

    • Protect harnessing from sharp bends, twisting, or flexing over short distances and normal implement operation.

    • Connectors and splices should not be located at bending points or in harness sections that move.

    • Ensure sufficient length for free movement of the implement during normal operation and prevent pulling, pinching, catching, or rubbing, especially in articulation and pivot points. Clamp harnessing securely to force controlled movement of the harness.

    • Avoid abrasive surfaces and sharp edges such as sheared or flame cut corners, fastener threads or cap screw heads, hose clamp ends, etc.

• Do not connect, affix, or allow harnessing to come into contact with components with high vibration forces, hot surfaces, or components carrying hot fluids beyond the temperature rating of harness components.

    • Harnessing should be protected or shielded if routing requires the hose to be exposed to conditions beyond harnessing component specifications.

• Avoid routing harnesses in areas where damage may occur due to build up of material (e.g. dirt, mud, snow, ice, etc.).

• Avoid routing harnesses in areas where the operator or service personnel might step or use as a grab bar.

IMPORTANT: Avoid applying direct spray or pressure washing of electrical components and connections. High pressure streams and sprays can penetrate seals, cause corrosion, or otherwise damage electrical components. When performing maintenance:

- Inspect electrical components and connectors for corrosion, damaged pins or housings, etc. Repair or replace components or harnessing as necessary.

- Ensure connectors are kept clean and dry. Apply dielectric grease to the sealing surfaces of all connections exposed to moisture, dirt, debris, and other contaminates. Repair or replace harnessing as necessary.

- Clean electrical components with pressurized air, aerosol electrical cleaning agent, or low pressure rinse.

- Remove visible surface water from electrical components and connections using pressurized air or an aerosol cleaning agent. Allow components to dry thoroughly before reconnecting cables.

CHAPTER   INTRODUCTION

2

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.

PREPARING FOR INSTALLATION

Before installing the VSN system, park the machine where the ground is level, clean, and dry. Unfold the implement and lower it to the ground. 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.

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

-VSN® Installation Manual for Generic Implements
-016-2025-004 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.
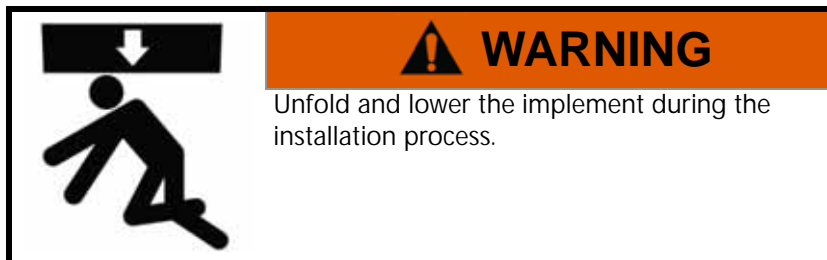
Thank you for your time.

KIT CONTENTS

This section contains a list of the components that are included in the 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 Generic Implements with Gen1 ISOBUS (P/N 117-2025-004-B)

QTY	PART #	DESCRIPTION
1	053-0159-324	BOX, SHIPPING
1	115-2020-020	CBL, VSN, TEE, GEN I, ISOBUS
1	115-2020-021	CBL, CAB/VIDEO TO V4, 20FT
1	116-0159-864	WELDMENT, VSN MOUNT, GENERIC IMPLEMENT, VSN SIDE
1	116-0159-865	WELDMENT, VSN MOUNT, GENERIC IMPLEMENT, IMPL. SIDE
1	107-0172-731	BRACKET, VSN MOUNT, GENERIC IMPLEMENT, HOOK RIGHT
1	107-0172-732	BRACKET, VSN MOUNT, GENERIC IMPLEMENT, HOOK LEFT
1	107-0172-642	BRACKET, VSN, DEBRIS SHIELD
1	200-0001-009	STRUT PROFILE, ALUMINIUM, BSB 40X80L, SLOT 10, 1M
1	016-0171-649	SHEET, WARRANTY/HELP
		REMOVED
		REMOVED
		REMOVED
1	053-0159-384	ENVELOPE, PLASTIC
4	311-4055-180N	BOLT, M8-1.25 X 25MM, CLASS V COATING
4	313-6001-013N	WASHER, LOCK, M8, CLASS V COATING
4	313-6000-013N	WASHER, M8, CLASS V COATING
		REMOVED
4	313-5001-007	GASKET, VITON, .29 I.D. x .688 O.D. x .062 THK
1	053-0159-384	ENVELOPE, PLASTIC
2	309-1000-029	CLAMPING HANDLE, NYLON/STEEL, MALE THREAD, M6X16
8	311-4055-179K	HEX BOLT, DIN933 8.8-M8X20
8	313-6001-013K	SPRING L WASHER, ZN DIN127 M8
8	321-0000-513	SLIDING BLOCK, STEEL, GALVANIZED, BSB N10-M8

CHAPTER   INSTALLATION

3

MOUNTING VSN®

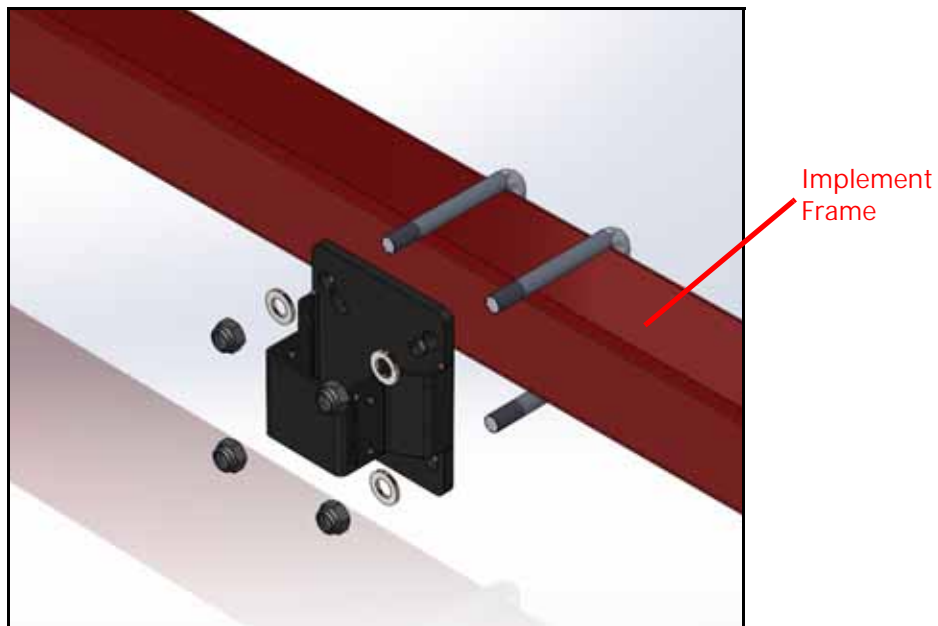| ⚠ **WARNING** |
| Unfold and lower the implement during the installation process. |

NOTE: Depending upon the implement configuration, it may be necessary to create additional bracketry to mount the VSN camera.

1. Locate a suitable mounting position for the VSN camera on the implement.
    a.   Mount VSN at the front of the implement.
    b.   Mount VSN as far towards the left or the right end of the implement as possible.
    c.   VSN may be mounted either in between rows or on top of a row.
2. Mount the VSN Implement Side Bracket (P/N 116-0159-865) to the implement frame as shown in Figure 1 on page 10. The example in this figure represents M16 U-bolts around a 100 mm x 100 mm square frame tube.
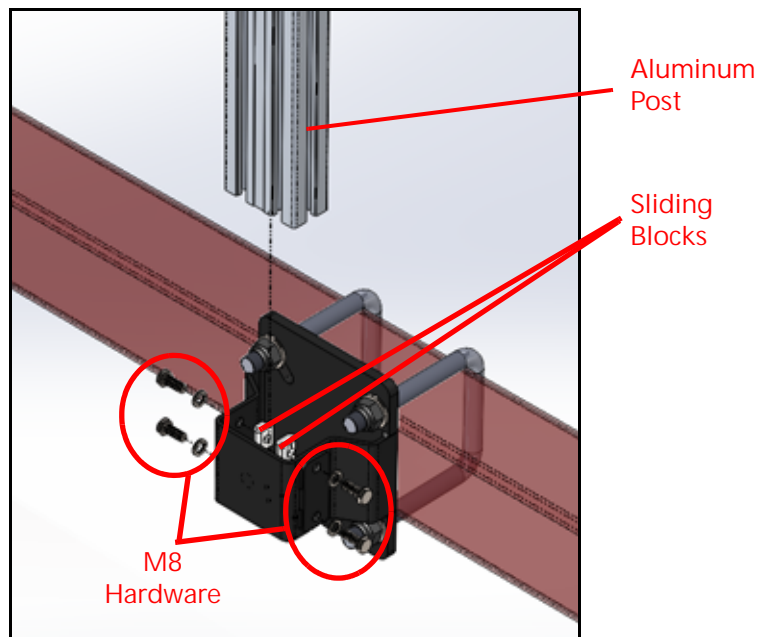
NOTE: Ensure the bracket mounting location will not cover or impair use of any warning or instruction labels or reflective decals.

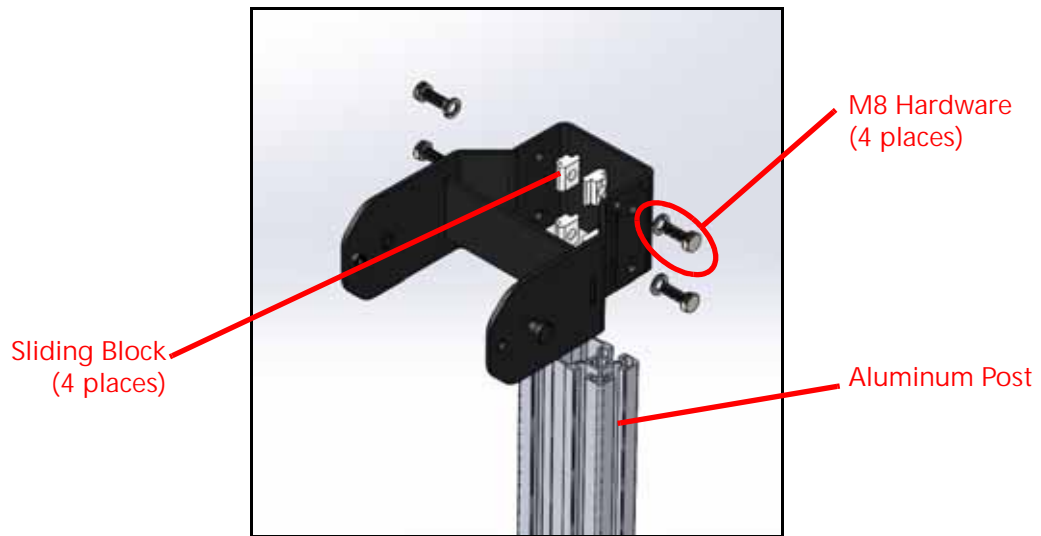FIGURE 1. Implement Side Mounting Bracket on Square Frame

3. Mount the sliding blocks inside the VSN implement side bracket with the provided hardware as shown in Figure 2 on page 10.

FIGURE 2. Aluminum Post Secured to Implement Side Mounting Bracket

4. Slide the aluminum post into the bracket and secure the post by tightening the bolts.
5. Install the remaining sliding blocks on the VSN mounting bracket using M8 hardware as shown in Figure 3 on page 11.
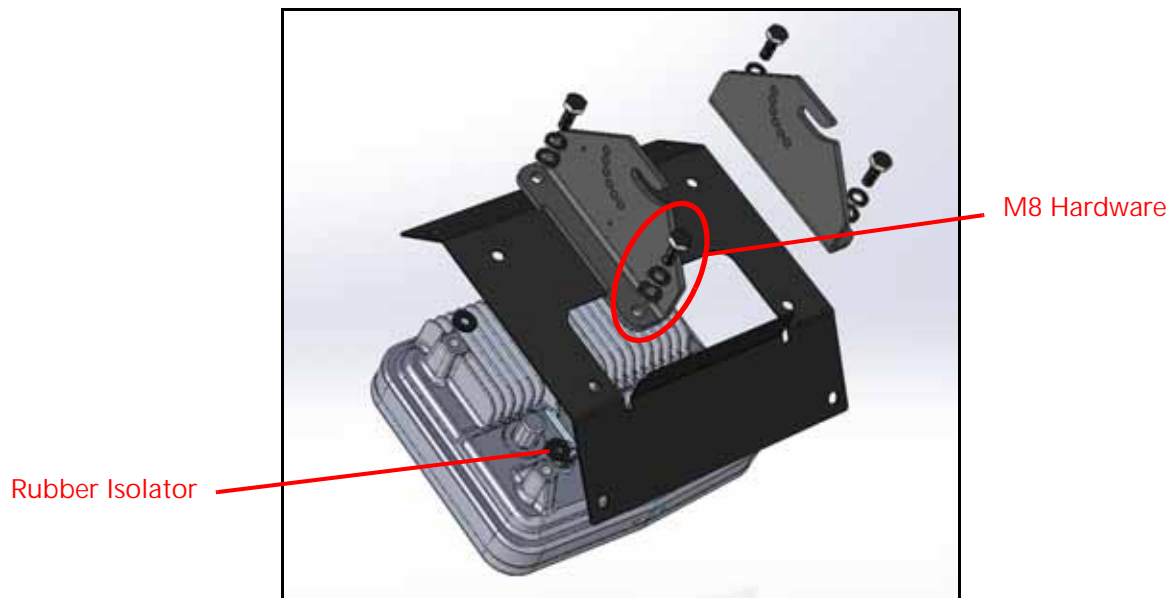
FIGURE 3. VSN Mounting Bracket

6. Mount the VSN mounting bracket on the aluminum post previously mounted to the implement frame bracket.

7. Mount the debris shield (P/N 107-0172-642) and brackets (P/N 107-0172-731 and -732) to the back of the VSN camera as shown in Figure 4 on page 11.
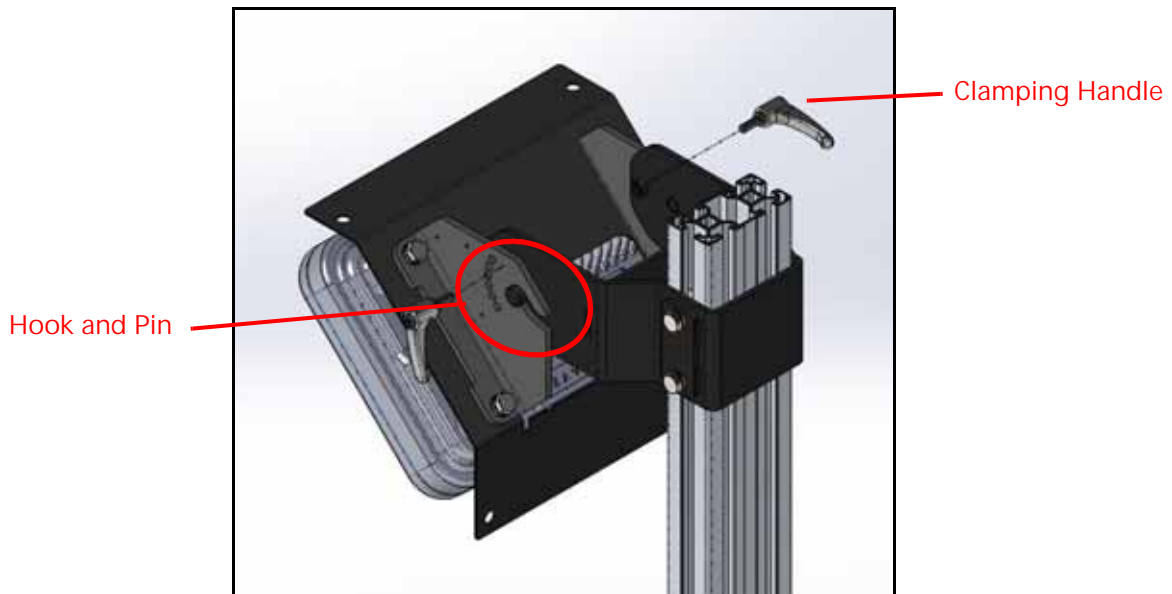
NOTE: The camera must be mounted with the lens at the top when mounted to the equipment.
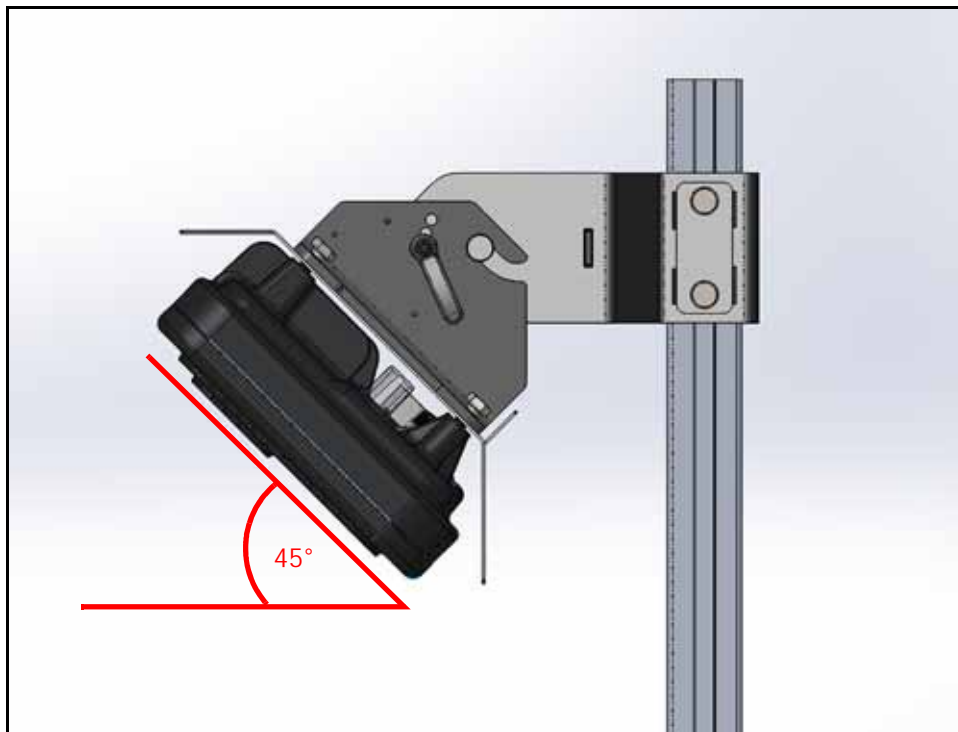
FIGURE 4. VSN Camera Debris Shield and Bracketry

8. Mount the VSN camera to the aluminum post by hanging the hooks over the VSN mounting bracket pins as shown in Figure 5 on page 12.

FIGURE 5. VSN Camera Mounting to Post
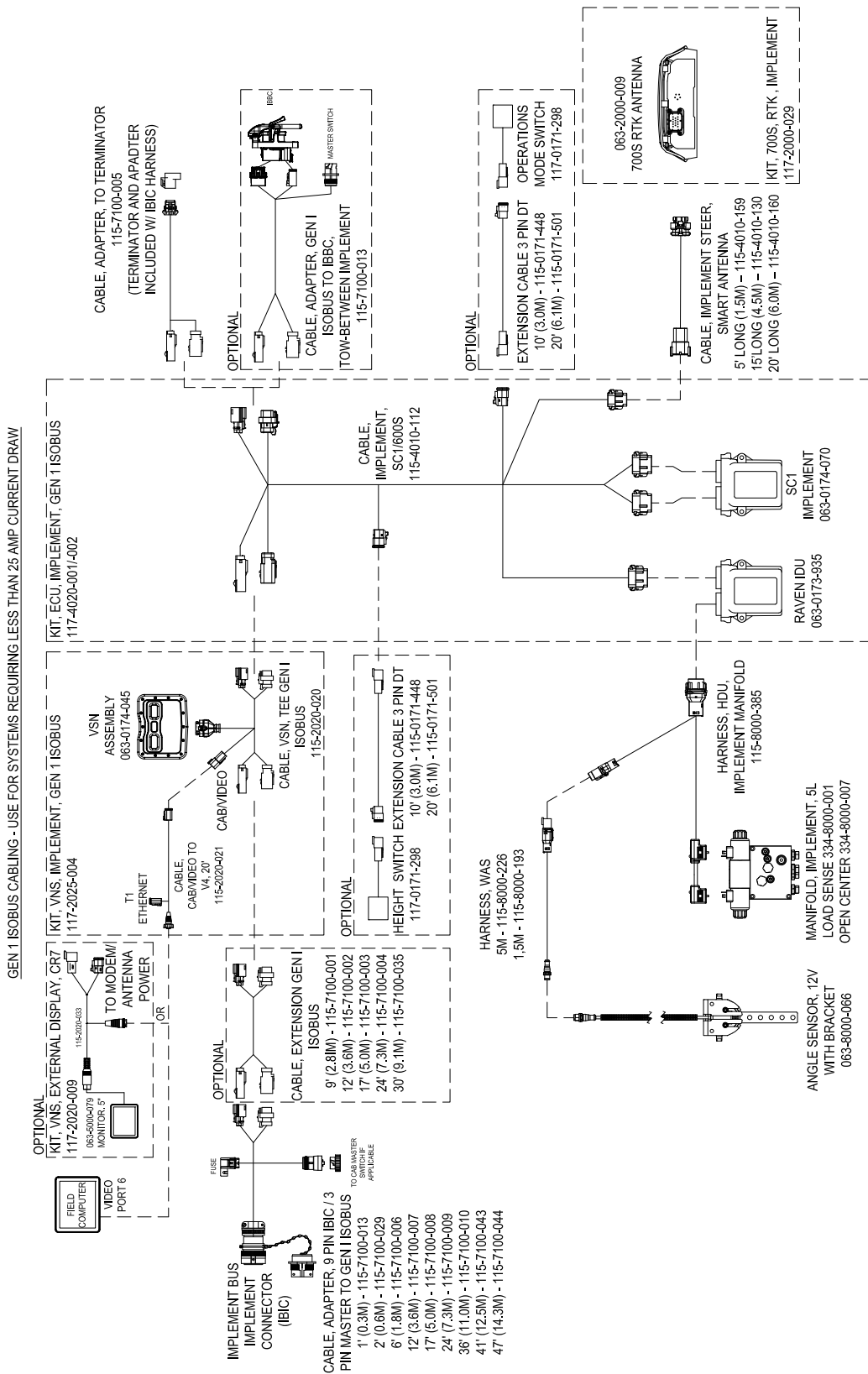

Clamping Handle

Hook and Pin

9. Set the VSN camera angle at a 45° angle to the ground and secure by tightening the provided clamping handles (P/N 309-1000-029).

FIGURE 6. Setup Camera Angle

45°

CABLING AND CONNECTION

FIGURE 7. VSN Steering System Diagram for Generic Implement Steering (P/N 054-2025-004 Rev. A)

VSN® CAMERA CABLE

NOTE: Implement steering cable (P/N 115-4010-112) must already be installed on the implement.
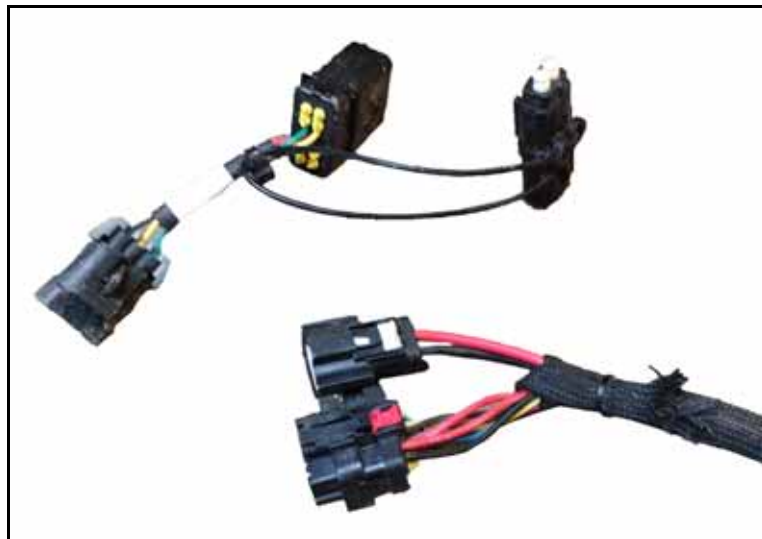
1. Locate the round, ISOBUS Implement Connector (IBIC) on the back of the tractor. Disconnect the IBIC from the IBBC before proceeding.

FIGURE 8. IBIC and IBBC Connectors

2. Locate the Gen 1 implement steering cable connectors.

FIGURE 9. Gen 1 Implement Steering Connectors

3. Tee the mating 2-pin and 12-pin Gen 1 connectors on the VSN camera cable (P/N 115-2020-020) between the existing steering cables.

4. Route the gray 23-pin connector along the implement frame member to the VSN camera.

NOTE: Be sure the cable is routed to prevent the cable from being pinched by the frame or other moving components of the implement. Review the *Harness Routing* section on page 2 for additional information and best practices.

5. Connect 23-pin connector to back of VSN camera.

FIGURE 10. VSN Camera Connection

6. Connect the analog video cable (P/N 115-2020-021) to the 6-pin connector on the VSN implement gen 1 tee cable (P/N 115-2020-020).

FIGURE 11. 6-Pin Cab/Video Connector on VSN Implement Cable

7. Route the analog video connector into the tractor cab. Typically, the cable may be routed through the rubber access point at the lower, right corner of the rear window as shown in Figure 12 on page 16.

FIGURE 12. Cab Access Point

8. Connect the video connector to port 6 on the CR12. If Port 6 is populated by another cable, connect the analog video cable (P/N 115-2020-021) to the connector for the Camera #4 Input.

NOTE: A 5-pin to 8-pin video adapter cable (P/N 115-0172-608) is required if the existing camera cable is an 8-pin camera input cable (P/N 115-0172-077).

FIGURE 13. CR12 Connection

NOTE: The 4-pin T1 Ethernet connector on the analog video cable will not be used.

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.

RAVEN

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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