

VSN/RDR Installation  
Manual for Oxbo 7550/  
7650 Front Boom  
Sprayers MY 18+

*016-2025-005 Rev. A*

*6/2021*

*E37086*



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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.

- VSN version 20.4 or newer
- 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/RDR Installation Manual for Oxbo 7550/7650 Front Boom Sprayers MY 18+ -016-2025-005 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 Oxbo 7550/7650 Sprayer M18+ (P/N 117-2025-007 Rev. A)

QTY	PART #	DESCRIPTION
1	053-0159-180	BOX, SHIPPING
1	107-0172-642	SHIELD, DEBRIS, VSN
1	115-2020-034	CABLE, VSN, BOOM, OXBO 7550/7560 MY18 & NEWER
1	115-2020-035	CABLE, VSN, CHASSIS, OXBO 7550/7560 MY18 & NEWER
1	116-0159-835	WELDMENT, VSN, CRADLE MOUNT, GENERIC
1	116-0159-837	WELDMENT, VSN, MOUNT
1	053-0159-074	ENVELOPE, PLASTIC
8	311-4055-180N	BOLT, M8-1.25 x 25MM, CLASS V COATING
4	312-6001-027N	NUT, NYLOC, M8-1.25, CLASS V COATING
12	313-6000-013N	WASHER, M8, CLASS V COATING
4	313-6001-013N	WASHER, LOCK, M8, CLASS V COATING
4	313-5001-007	VITON WASHER

FIGURE 2. VSN Standalone Height Sensor for Oxbo 7550/7650 Sprayer M18+ (P/N 117-2020-006 Rev. A)

QTY	PART #	DESCRIPTION
1	053-0159-180	BOX, SHIPPING
1	063-0173-962	SENSOR, BOOM HEIGHT, RADAR, BAUMER
1	115-2020-036	CABLE, VSN, HEIGHT TEE, 7', OXBO
1	053-0159-074	ENVELOPE, PLASTIC
2	311-4056-137N	HEX, BOLT, DIN933, M6-1.25MM
4	313-6000-010N	WASHER, M6, STEEL, CLASS V COATING
2	312-6001-016N	HEX NUT, NYLOC, DIN985, M6

FIGURE 3. Radar Row Guidance Kit for Oxbo 7550/7650 Sprayers M18+ (P/N 117-2025-008 Rev. B)

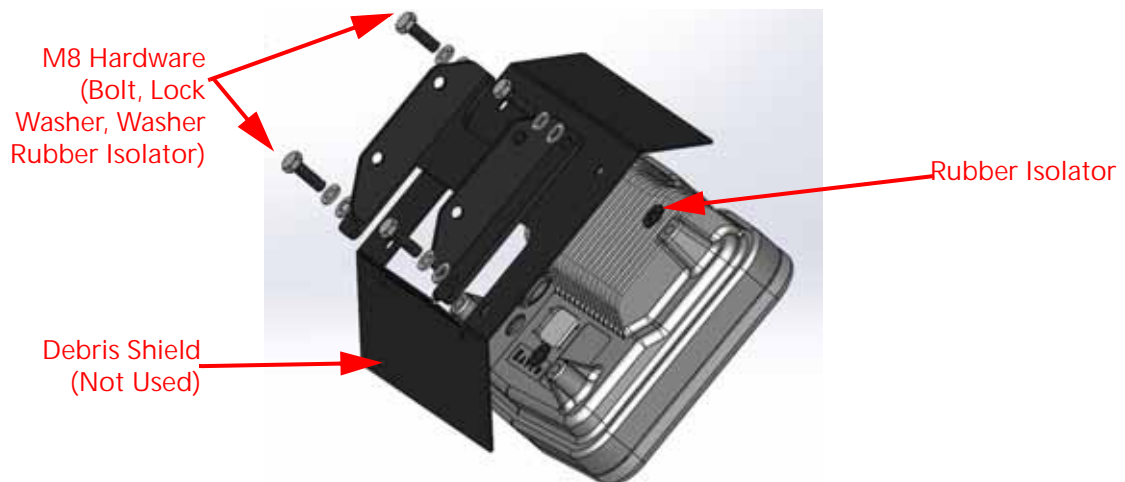
QTY	PART #	DESCRIPTION
1	053-0159-180	BOX, SHIPPING
1	016-0171-649	SHEET, WARRANTY/SHEET (016-2022-014)
2	063-0174-125	RADAR, MULTI-OBJECT DISTANCE SENSOR
2	107-0172-690	BRACKET, MULTI-OBJECT DISTANCE SENSOR, BASE
2	107-0172-721	SHIELD, PLASTIC MULTI-OBJECT DISTANCE SENSOR
2	107-0172-722	BRACKET, SHIELD, MULTI-OBJECT DISTANCE SENSOR
1	115-2020-042	CABLE, FULL CANOPY, FRONT BOOM. OXBO 7550/7650
2	116-0159-860	WELDMENT, MULTI-OBJECT DISTANCE SENSOR COVER
1	053-0159-074	ENVELOPE, PLASTIC
8	311-4055-180N	BOLT, M8-1.25X25MM, CLASS V COATING
4	311-4056-137N	HEX, BOLT, DIN 933, M6 X 1 X25MM
14	311-4056-224N	HEX, BOLT, DIN 933, M10 X 1.5 X 30MM
4	312-6001-016N	HEX, NUT, NYLOC, DIN 985, M6
6	312-6001-041N	HEX, NUT, NYLOC, DIN 985, M10
8	313-6000-010N	WASHER, M6 STEEL, CLASS V
8	313-6000-013N	WASHER, M8, CLASS V COATING
20	313-6000-016N	WASHER, M10, STEEL, CALSS V
8	313-6001-013N	WASHER, LOCK, M8, CLASS V COATING
8	313-6001-016N	WASHER, SPRING LOCK, DIN 127-M10



### MOUNT VSN

1. Lower the booms to a position in which the user can access the top cross bar, located on the center rack.
2. Assemble the VSN subassembly as pictured in Figure 1, "VSN Subassembly," below.

FIGURE 1. VSN Subassembly




NOTE: The black debris shield is not used in this installation.

3. Measure the center rack and mark the exact middle point. The VSN needs to be mounted as close to the center as possible.
4. Secure the VSN subassembly to the center rack cross bar with the three U-bolts and mounting hardware provided by Oxbo.

FIGURE 2. Frame



## INSTALL RADAR

	<b>NOTICE</b>
	<p>Oxbo part numbers are provided by Oxbo and are not controlled by Raven. Verify with a local Oxbo dealer that the part numbers are accurate and up-to-date.</p>

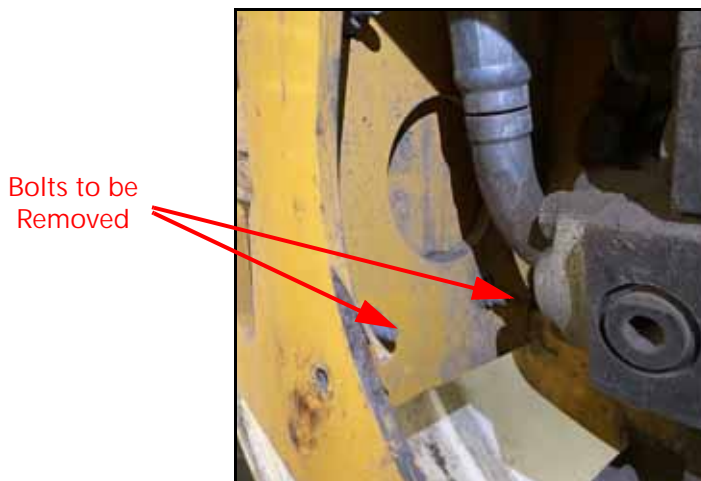
1. Choose which side of the sprayer, right or left, to begin the installation.
2. Remove the crop shield from the front axle, if applicable.

FIGURE 3. Crop Shield Covers



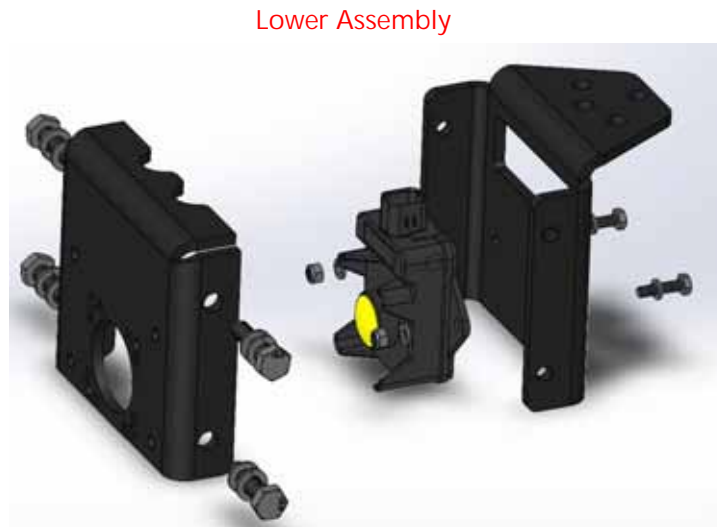
3. Remove the front two bolts and two additional support bolts and nuts that are holding the crop shield and mud flap bracket to the wheel motor.
4. Mount the wheel motor bracket (P/N 247844 supplied by Oxbo).

FIGURE 4. Wheel Motor Bracket



5. Install the brackets and radar sensors to each side, orientating the sensors at a 45 degree angle while facing forward. The mounting holes will ensure the proper angle.

FIGURE 5. Lower Assembly



NOTE: Prior to installing the sensor cover, record the serial number and whether the sensor is installed on the right or left side of the machine.

The sensor covers should be installed after routing the cabling.

FIGURE 6. Serial Number Location



NOTE: It is important to record the serial number. The radar device will be covered by a cover plate.

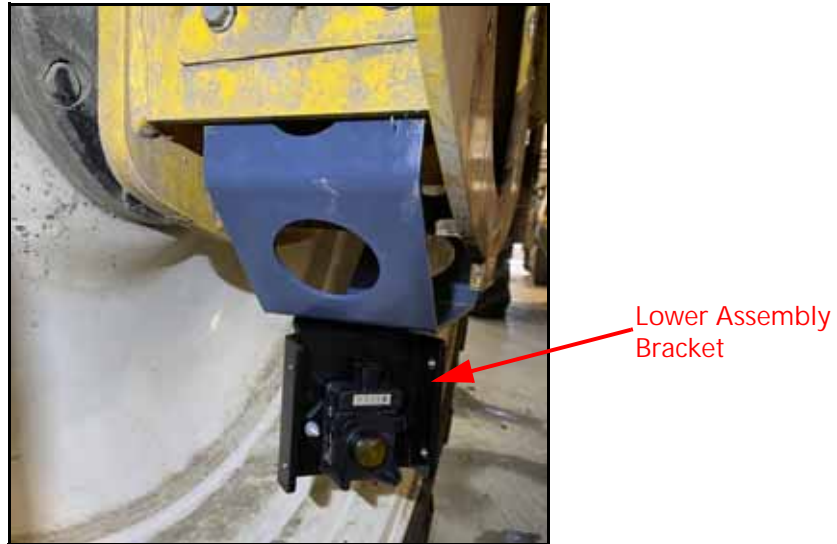


6. Mount the lower assembly, with the front cover removed, to the Oxbo wheel motor bracket using three M10X-1.4x30MM bolts, M10 nuts/bolts provided in kit 117-2025-088.

NOTE: Ensure the installed radar brackets will not interfere with the valve stem of the tire when the wheel rotates.

FIGURE 7. Mounted Lower Assembly

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7. Mount the multi-object sensor protective cover to the lower assembly bracket using the provided M10 hardware.

NOTE: Leave the protective cover off until the radar sensor brackets have been routed and connected to the radar sensor.

8. Once completed, repeat repeat step 2 through 7 for the opposite side, left or right, of the sprayer.



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## ROUTE THE VSN CABLES

1. Starting at the right lift arm, insert the bulkhead connector from the 115-2020-035 cable into the bulkhead port.

**IMPORTANT:** Ensure to route the cables along all of the hoses that lead to the drive motor to allow for the machine to change tread width without damaging cables.

Do not allow the cables to hang anywhere under the machine to prevent cable damage from crops.

2. Route the cable down the parallel arm and feed the rest of the cable through the square tube leading underneath the machine/cab.
3. Identify the two bulkheads directly below the cab and remove the existing terminator.
4. Connect the 115-2020-035 connector labeled TO OXBO ISO into the connection that previously held the terminator.

**NOTE:** Failure to properly route cabling will result in premature cable wear in high-crop conditions.

FIGURE 8. Connector with Terminator Removed



5. Route the video and T1 Ethernet connectors into the cab through the cab access point located at the front right corner of the cab.

FIGURE 9. Cab Access Point



6. Connect the analog video end of the 115-2020-035 cable to port number 6 on the Viper® 4.

FIGURE 10. Viper 4 Connection



7. At the bulkhead previously installed in step 1, attach the 115-2020-034 cable.
8. Route the VSN connection along the right side up to the top cross-bar and over to the VSN.

FIGURE 11. VSN Connection



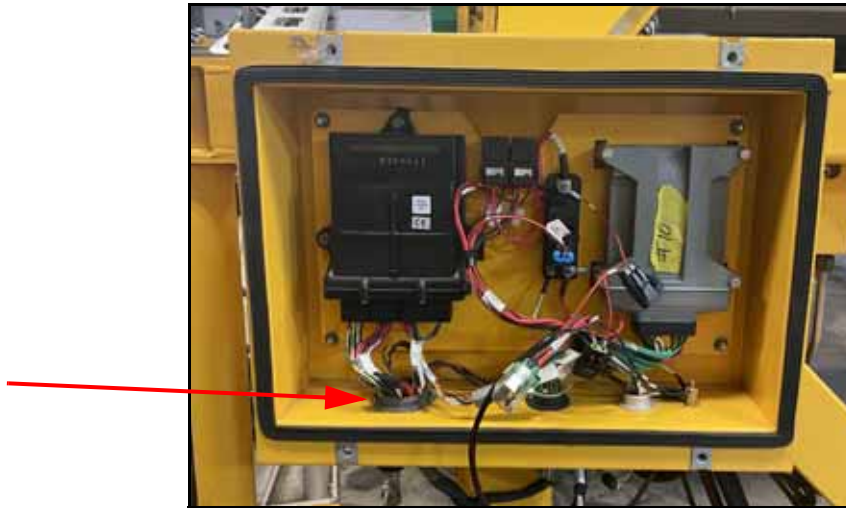
9. Remove the four screws on the control box cover, located on the front, right side of the boom.

FIGURE 12. Control Box Cover



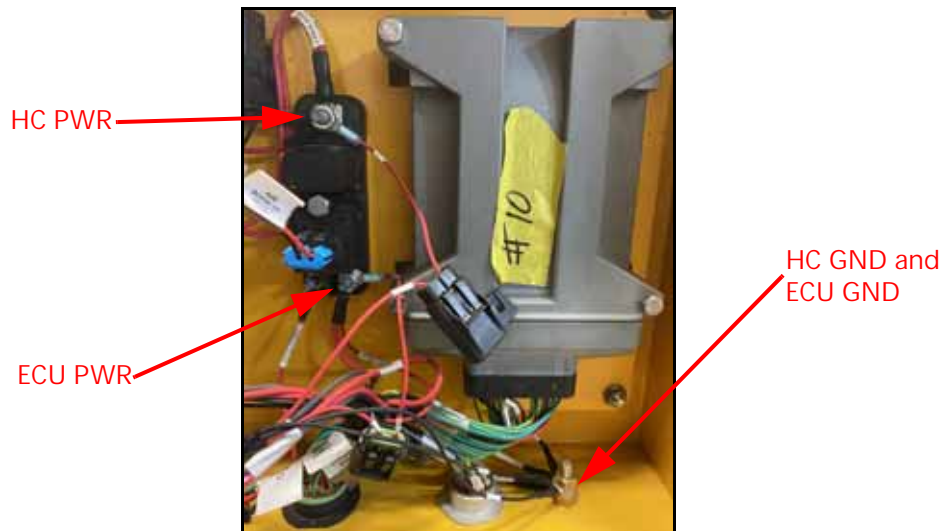
10. Route the four terminals and fuses through the cable pass-through hole.

FIGURE 13. Pass-through Hole



11. Connect the four terminals in the correct connections, as seen in Figure 14, "Terminal Connections," below.

FIGURE 14. Terminal Connections



12. Once connected, use zipties to secure the cabling and replace the factory shields.

13. Reinstall the control box cover.

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## INSTALL CANOPY RADAR

NOTE: The best practice is to tread the machine all the way before proceeding with cable routing.

1. Start on the right side of the sprayer, to begin the installation.
2. Remove the 12-pin-to-3-pin terminator cable from the 115-2020-035 cable, located along the right frame rail.

FIGURE 15. 12-Pin-to-3-Pin Terminator Cable Removed



3. Connect the 115-2020-042 cable to the 115-2020-035 cable as shown in Figure 19 on page 20.
4. Route the sensor connection to the middle of the machine, following the hydraulic hoses to ensure no cables will get pinched in the installation process.
5. Once all radars have been successfully connected, mount the multi-object sensor protective cover to the multi-object sensor bracket, using the provided M10 hardware.


FIGURE 16. Multi-Object Sensor Cover



6. Reinstall the previously removed crop shields.
7. Once completed, repeat step 2 through 5 for the opposite side, left or right, of the machine.

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**INSTALL STANDALONE HEIGHT SENSOR (IF APPLICABLE)**

	<p data-bbox="824 258 1011 300"><b>NOTICE</b></p> <p data-bbox="634 321 1182 447">Oxbo part numbers are provided by Oxbo and are not controlled by Raven. Verify with a local Oxbo dealer that the part numbers are accurate and up-to-date.</p>
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If the machine does not have XRT boom height control, the optional standalone XRT bracket (P/N 605087 provided by Oxbo) and hardware (P/N 117-2020-006) will need to be installed on the center rack directly below the VSN camera.

FIGURE 17. Standalone Height Sensor



1. Use the hardware supplied in the 117-2020-006 kit to mount the boom height radar sensor (P/N 063-0173-962) to the standalone height sensor bracket (P/N 605089 provided by Oxbo).
2. Remove the two bolts holding solution plumbing in place.
3. Replace these bolts with the longer bolts supplied with the standalone height sensor bracket supplied by Oxbo.



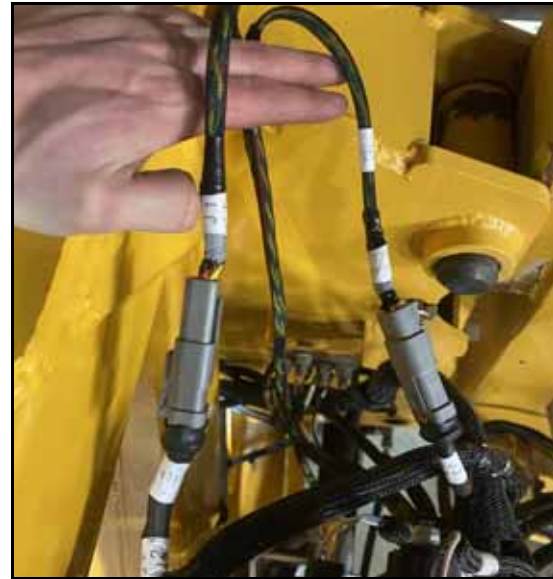
## ROUTE HEIGHT SENSOR CABLES

1. Locate the 4-pin breakout on the 115-2020-034 cable.
2. Plug the 4-pin breakout into the 115-2020-036 harness included in the standalone height sensor kit (P/N 117-2020-006).

FIGURE 18. 115-2020-034 Cable



115-2020-034  
Cable

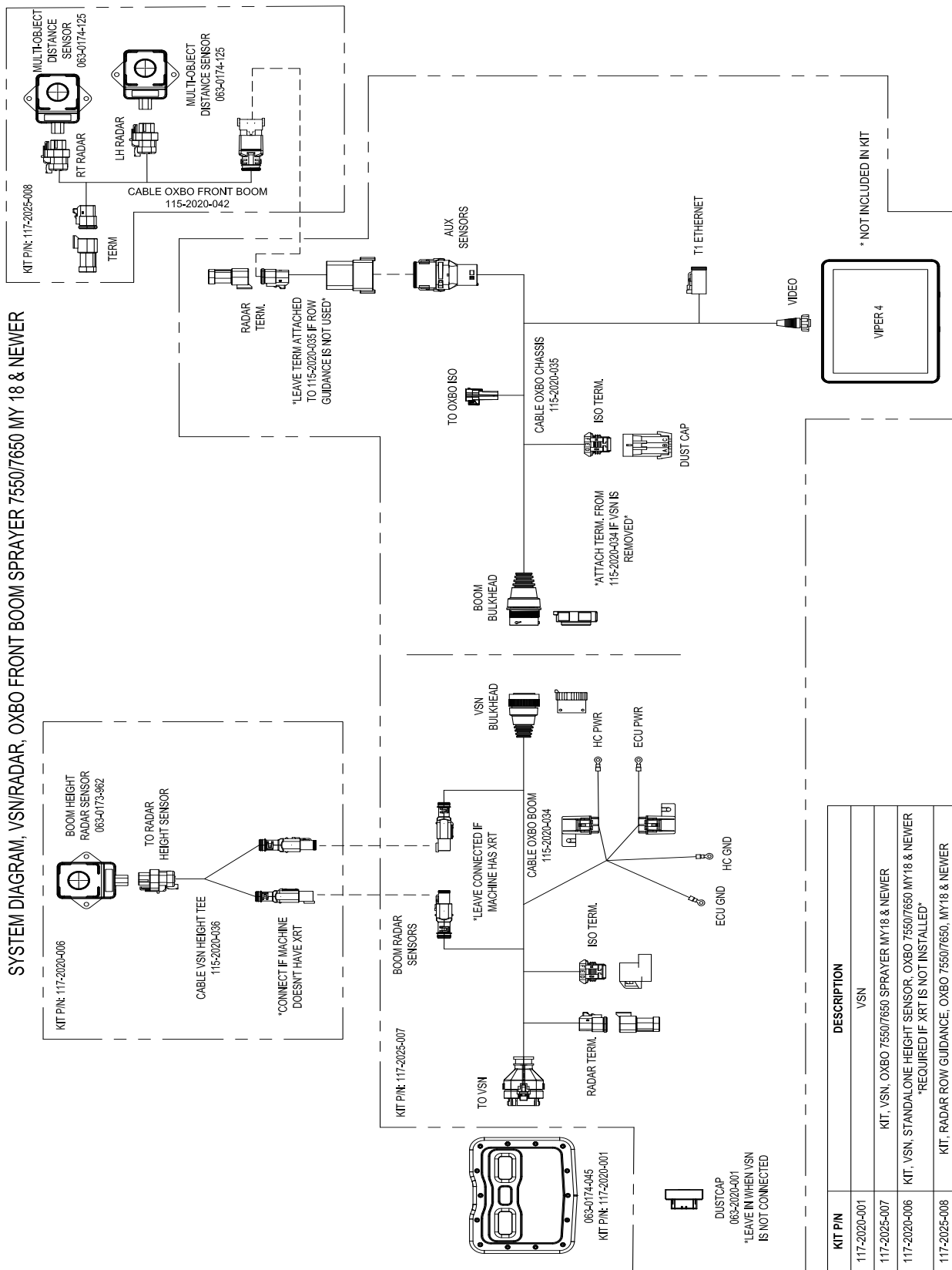


3. Route the radar connection along the boom tube plumbing out to the standalone height sensor.
4. Once connection, use zipties to secure the cabling and replace the factory shields.

**NOTE:** If the boom is removed and the bulkhead is disconnected, move the ISO terminator from the 115-2020-035 cable to the connection on the 115-2020-034 cable, as shown in Figure 19 on page 20.

If the boom is reconnected, move the ISO terminator from the 115-2020-035 cable to the connection on the 115-2020-034 cable, as shown in Figure 19 on page 20.

FIGURE 19. VSN/Radar Oxbo Front Boom Sprayer 7550/7650 MY 18+ Drawing (P/N 054-2025-007 Rev. C)





# 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.**