

VSN® Simulator Installation Manual

016-2020-004 Rev. A

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DISCLAIMER

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Chapter 1	Important Information.....	1
Safety		1
Electrical Safety		1
Touch Screen		2
Recommendations and Best Practices		2
Harness Routing		2
Chapter 2	Introduction.....	5
Preparing for Installation		5
Recommendations		5
Updates		6
Kit Contents		7
Chapter 3	Installation	9
Assemble the VSN® Demonstration Stand		9
Install the Wiring Harnesses		12
System Drawings		15
Machine Setup		19
Dimensions		19
Calibrate Row Spacing		19

SAFETY

NOTICE

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.

CAUTION

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 contaminants. 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.

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

PREPARING FOR INSTALLATION

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:

- 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.

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® Simulator Installation Manual
- 016-2020-004 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 simulator 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 Simulator Kit (P/N 117-2020-004-C)

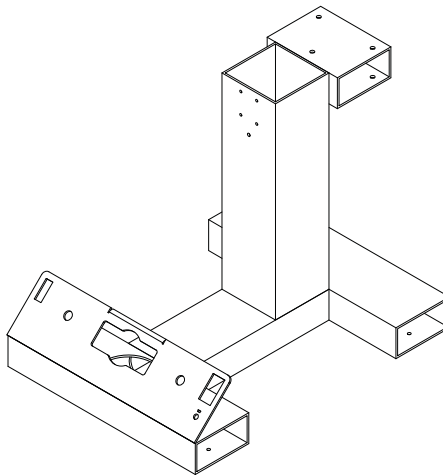
QTY	PART #	DESCRIPTION
1	053-0159-151	(LABELED BOX 1 OF 2) BOX, SHIPPING, NO BOTTOM
1	053-0159-152	BOX, SHIPPING, NO TOP
1	053-0159-153	BOX, BOTTOM, REINFORCED OSB
1	115-2020-022	CABLE, TEE, VSN, RS1 DEMO
1	115-2020-024	CABLE, VSN, DEMO, ROW SIM
1	116-0159-845	WELDMENT, DEMO STAND, RS1 RCM
1	053-0159-012	BOX, SHIPPING (LABELED BOX 2 OF 2)
1	063-0174-140	FIELD COMPUTER, VIPER 4+ CTS W/O GPS, ROW SIM
1	063-0174-166ND	ASSEMBLY, VSN W/ LEVEL 3 UNLOCKS
1	107-0172-698	BRACKET, DEMOSTAND, VSN
1	107-0172-699	BRACKET, DEMOSTAND, FIELD COMPUTER SIM
1	053-0159-057	ENVELOPE, PLASTIC
4	311-0002-042	SCREW, MACHINE PAN HEAD #10-32 UNF PHILLIPS SS, 1/2" L
3	311-0050-105	BOLT, HEX HEAD, 1/4"-20 UNC-2A, 1" LONG, GRADE 5 ZINC P
2	311-0058-095	BOLT, MACHINE 1/2"-13 UNC-2, GRADE 5, ZINC PLATED
4	311-4055-180N	HEX BOLT DIN933, M8 X 25MM, 8.8 STEEL, CLASS V
3	312-4000-057	NUT, LOCK, NYLON INSERT, 1/4"-20 UNC-2B, GRADE 2, ZINC P
2	312-4000-065	NUT, LOCK, NYLON INSERT, 1/2"-13 UNC-2B, GRADE 2, ZINC P
4	313-1000-014	WASHER, LOCK, SPLIT, HELICAL, #10, STAINLESS STEEL
6	313-2300-310	WASHER, STEEL, FLAT, 1/4", ZINC
4	313-2300-318	WASHER, STEEL, FLAT, 1/2", ZINC
4	313-2301-808	WASHER, FLAT, STAINLESS STEEL, #10
4	313-6000-013N	WASHER, DIN125, M8, ZINC, CLASS V
4	313-6001-013N	WASHER, SPRING LOCK, DIN127, M8, ZINC, CLASS V
4	316-3003-005	BUMPER, RUBBER, THREADED STUD



ASSEMBLE THE VSN® DEMONSTRATION STAND

1. Remove all components from the boxes.
2. Locate the demonstration stand weldment (P/N 116-0159-845).

FIGURE 1. Demonstration Stand Weldment



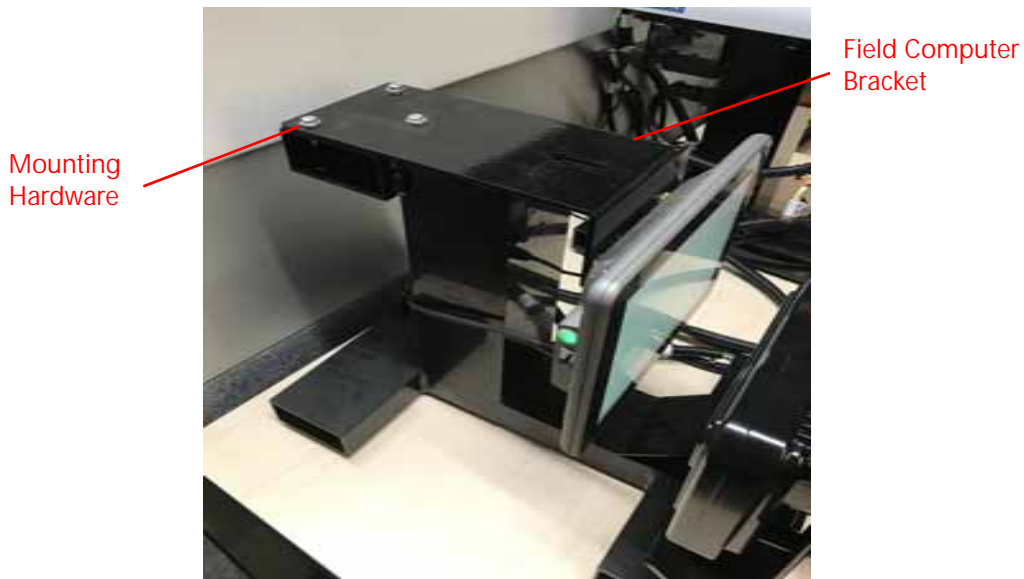
3. Screw the 4 threaded rubber bumpers (P/N 316-3003-005) by hand into the bottom of the stand.

FIGURE 2. Field Computer to Field Computer Bracket



4. Fasten the Field Computer (P/N 063-0174-140) to the field computer bracket (P/N 107-0172-699) with the provided #10-32 screws, lock washers, and washers.

FIGURE 3. Field Computer Bracket to Demonstration Stand



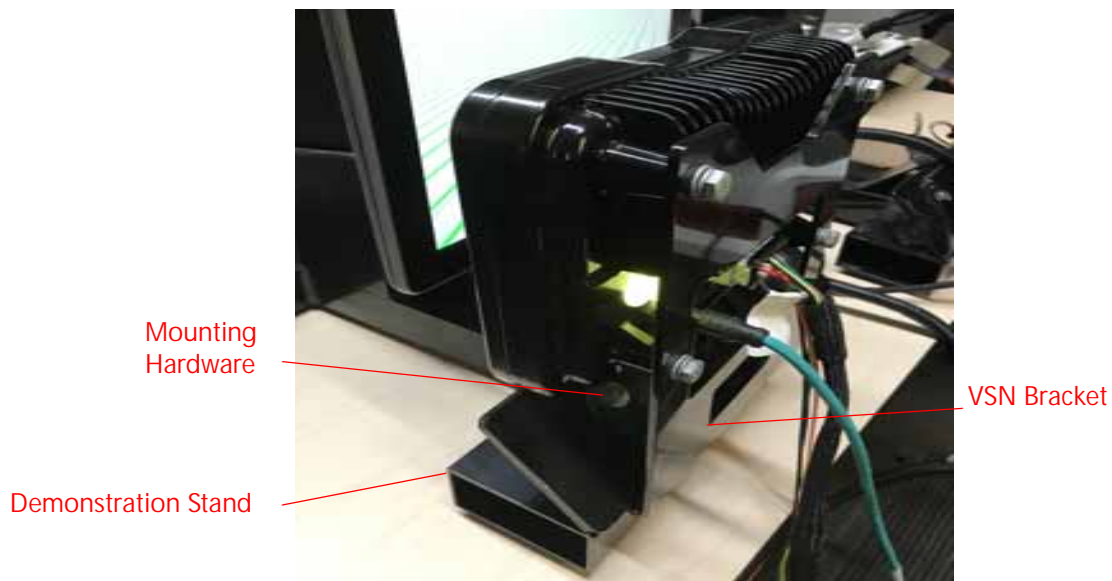
5. Fasten the Field Computer bracket to the Demonstration Stand with the provided 1/4" bolts, washers, and lock nuts.

FIGURE 4. VSN to VSN Bracket



6. Fasten the VSN (P/N 063-0174-045) to the VSN Bracket (P/N 107-0172-698) with the provided M8 bolts, washers, and lock nuts.

FIGURE 5. VSN Bracket to Demonstration Stand

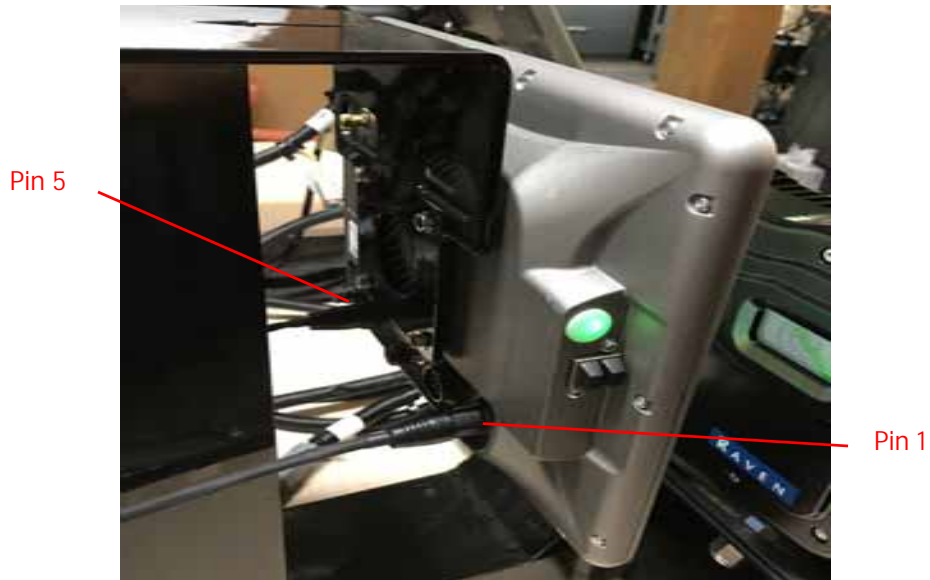


7. Fasten the VSN Bracket to the Demonstration Stand with the provided 1/2" bolts, washers, and lock nuts.

INSTALL THE WIRING HARNESSES

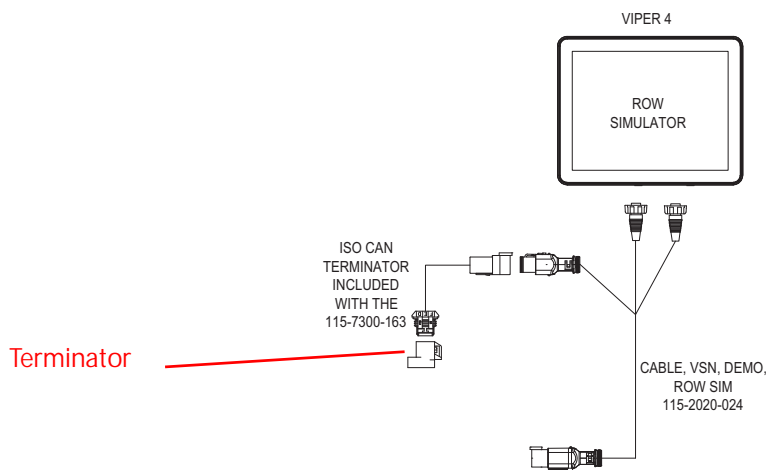
1. Install the VSN, DEMO, ROW SIM Cable (P/N 115-2020-024) to the Viper 4 Row Simulator.

FIGURE 6. Viper 4 Row Simulator



2. Install the power connector to Pin 1 of the Viper 4 Row Simulator.
3. Install the ISO connector to Pin 5 of the Viper 4 Row Simulator.

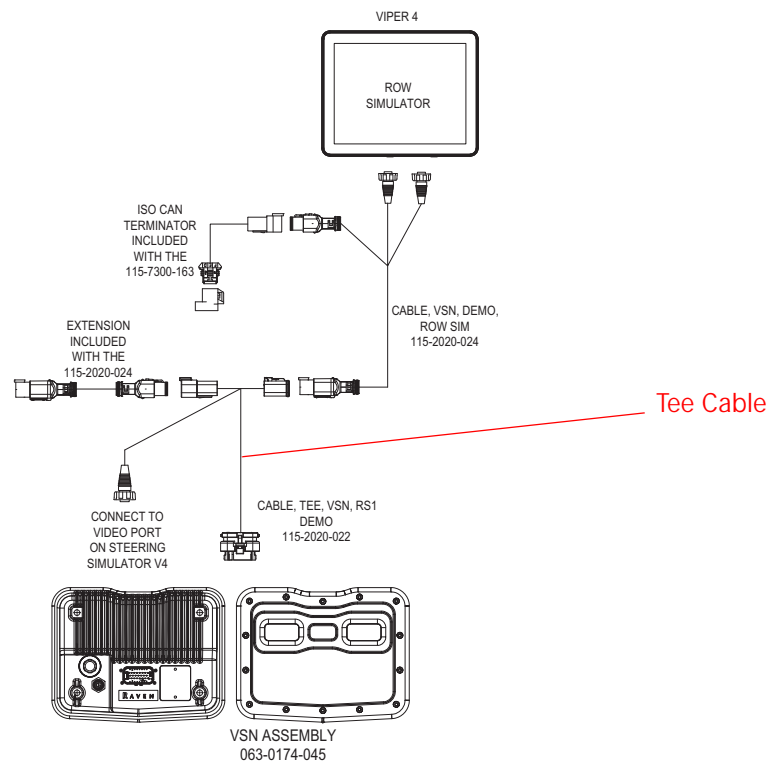
FIGURE 7. Terminator



4. Install the terminator into the rectangular 6 pin connector.

NOTE: The terminator will be removed from the steering simulator cable (P/N 115-7300-163).

FIGURE 8. Tee Cable



5. Install the Tee, VSN, RS1 DEMO Cable (P/N 115-2020-022) to the VSN, DEMO, ROW SIM Cable and the extension included with the cable (P/N 115-2020-024).

FIGURE 9. 23 Pin Connector



6. Install the 23 Pin Connector to the back of the VSN.

NOTE: For a cleaner installation, the VSN breakout can be ran through the demonstration stand and up through the VSN bracket hole.

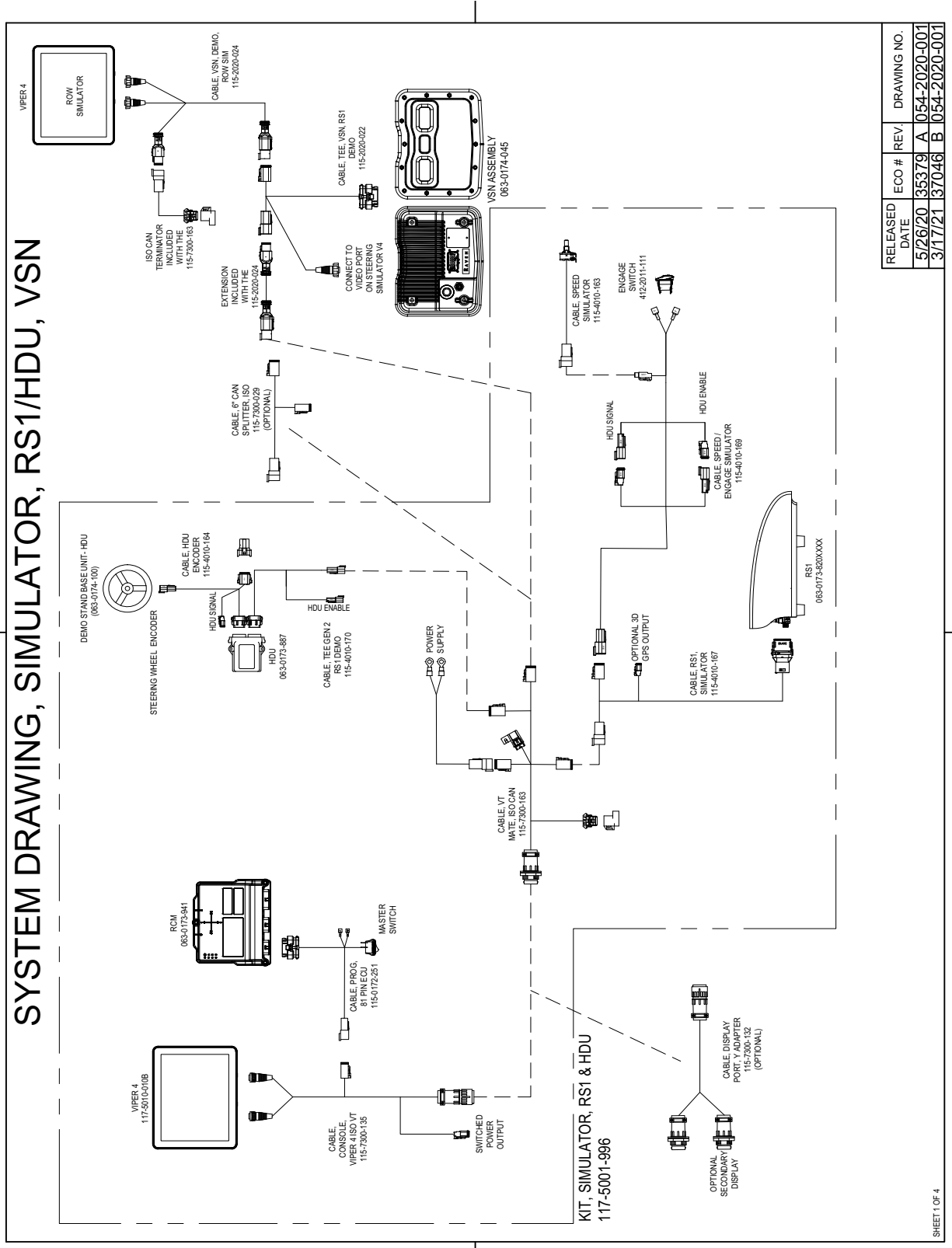
7. Install the Extension cable to VT MATE, ISO CAN Cable (P/N 115-7300-163).

NOTE: The VT MATE, ISO CAN Cable is not included in this kit.

8. Refer to the system diagram for more information.

SYSTEM DRAWINGS

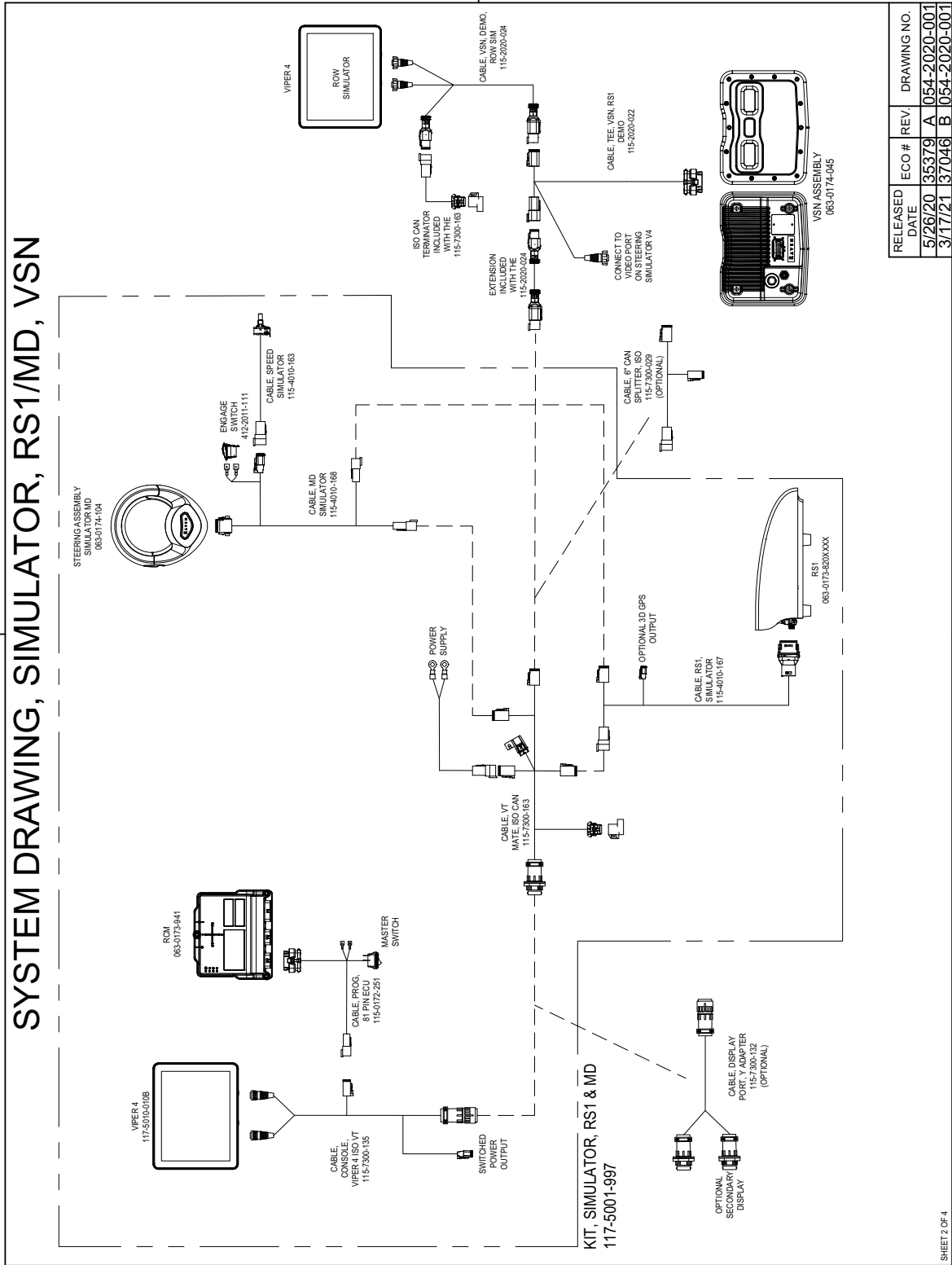
FIGURE 10. Simulator RS1/HDU, VSN



RELEASED DATE	ECO #	REV.	DRAWING NO.
5/26/20	35379	A	054-2020-001
3/17/21	137046	B	054-2020-001

SHEET 1 OF 4

FIGURE 11. Simulator RS1/MD, VSN



SHEET 2 OF 4

FIGURE 12. Simulator SC1/HDU, VSN

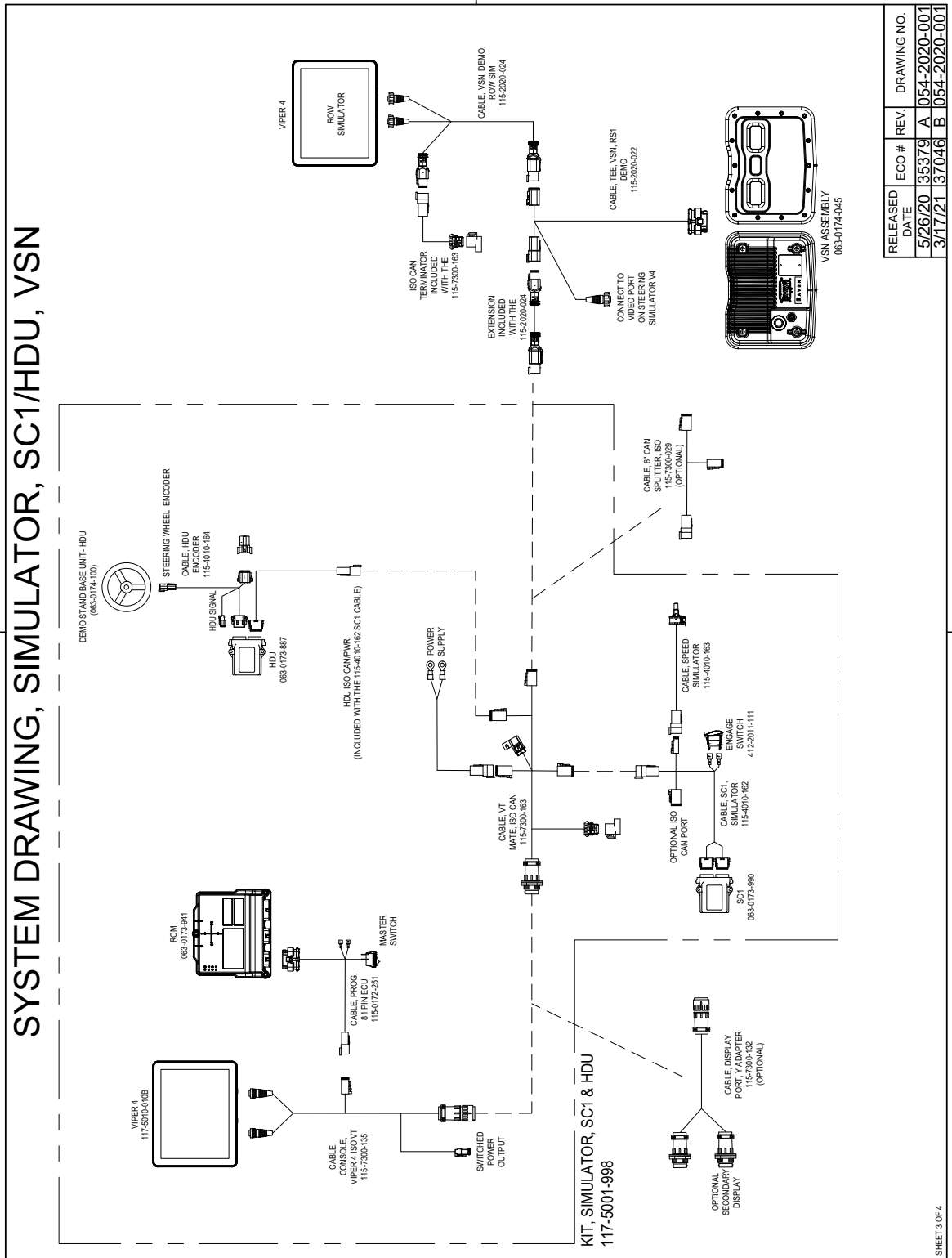
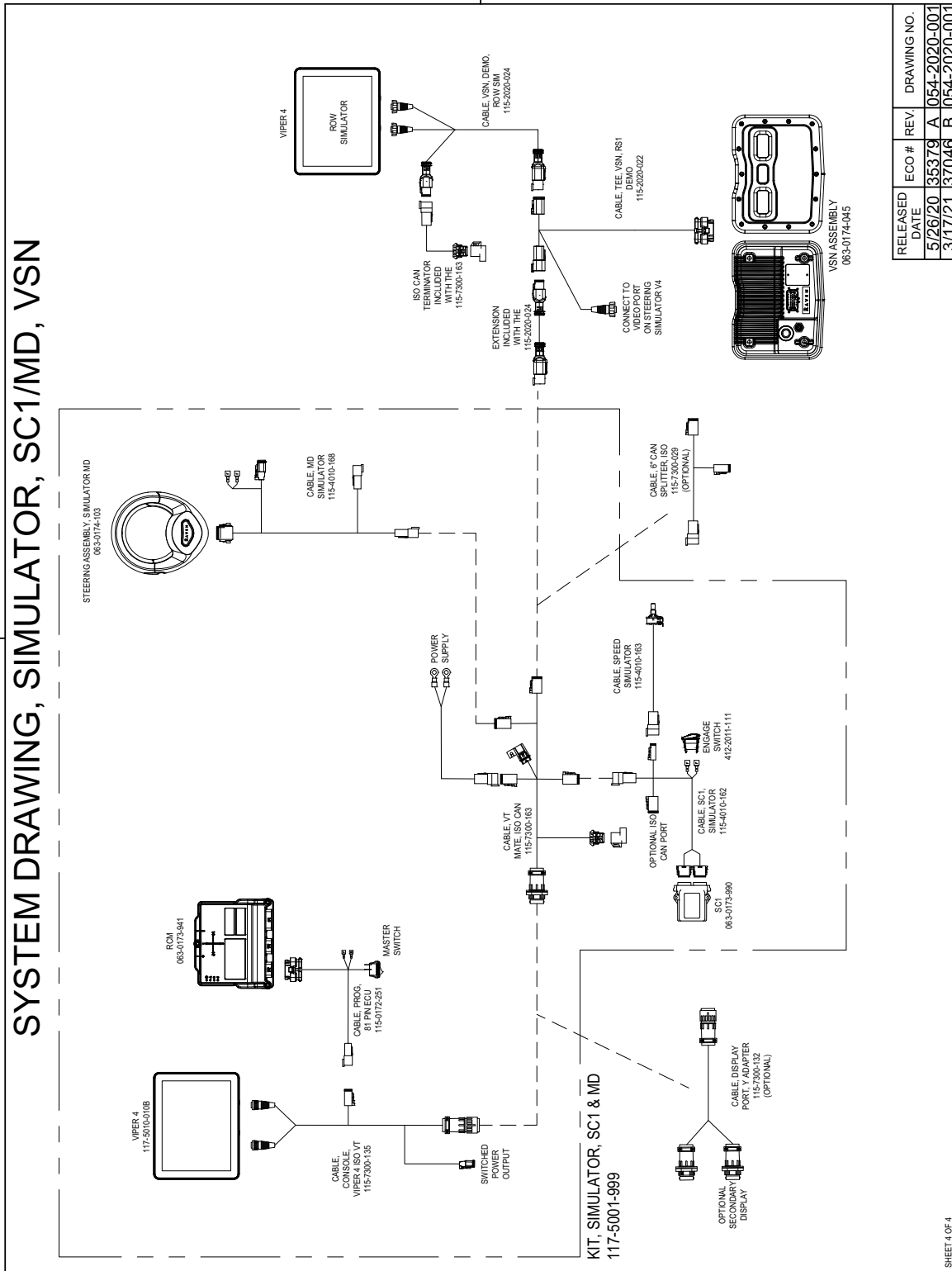


FIGURE 13. Simulator SC1/MD, VSN



MACHINE SETUP

On the machine selection screen select:

- Rear Boom Sprayer
- Generic
- Generic

DIMENSIONS

- Camera Height: 79"
- Camera Fore/Aft: 157.5"
- Camera Angle: 53 Degrees
- Wheelbase: 140.5"

CALIBRATE ROW SPACING

Calibrate VSN with 30" row spacing. Use the steering wheel and speed knob on the steering simulator stand to manually steer down a row. Make sure a row is not skipped or calibration will need to be started over. Keep the speed between 5-8 mph by using the V4 speed widget in a job.

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 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.