Raven Stand-alone ISO Implement Only Steering Installation Manual for CNHi TMR Tier 4B

016-4020-011 Rev. A *04/22* *E40729*

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.

CHAPTER 1 IMPORTANT INFORMATION

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.

DISPLAYS AND CONTROL CONSOLES

- If the display will not be used for an extended period, it is best to remove the display from the machine and store it in a climate controlled environment. This may help to extend the service life of electronic components.
- To prevent theft, secure the display and GPS antenna when leaving the machine unattended.

⚠ 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 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 2 INTRODUCTION

The following instructions are designed to assist with the proper installation of the Raven Stand-alone ISO Implement Only Steering system. Refer to the SC1™ Calibration & Operation Manual for Towed Implements (P/N 016-4010-008) for assistance with calibrating the software and using the SC1 system. Refer to the SC1 Installation Manual (see list below) for assistance with installing the SC1 Implement Steer system.

- SC1™ Twin Disc Implement Steer Installation Manual (P/N 016-8000-150)
- SC1™ Side Shift Implement Steer Installation Manual (P/N 016-8000-151)

PREPARING FOR INSTALLATION

Before installing the Raven Stand-alone ISO Implement Only Steering system, park the machine and implement 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 Raven Stand-alone ISO Implement Only Steering SC1 system for the first time, at the start of the season, or when moving the SC1 system to another machine:

- Install the SC1™ 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.

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

-Raven Stand-alone ISO Implement Only Steering Installation Manual for CNHi TMR Tier 4B
-016-4020-011 Rev. A
-Any comments or feedback (include chapter or page numbers if applicable).
-Let us know how long you have 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 Raven Stand-alone ISO Implement Only Steering 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. Raven Stand-alone ISO Implement Only Steering, CNHi TMR TIER 4B Kit (P/N 117-4020-011)

QTY	PART #	DESCRIPTION
1	053-0159-321	BOX, SHIPPING
1	115-4020-002	CABLE, IMPLEMENT, SMART ANTENNA TO RTK CORRECTIONS
1	115-4020-007	CABLE, CNHi CAN3 TO ISO IMPLEMENT CAN2
1	115-0172-448	CABLE, 48" ADAPTER, 3P DT SERIAL IN
1	115-8000-437	CABLE, RTK CORRECTIONS SPLIT
1	016-0171-649	SHEET, WARRANTY/HELP

CHAPTER 3 CABLING INSTALLATION

CNHi CAN CABLING

NOTE: An implement steering cable (P/N 115-4010-112) must already be installed on the implement.

1. Locate the SC1™/TC1™ on the implement.
2. Disconnect the gray communications connector of the Implement SC1™ cable (P/N 115-4010-112) and tee-in the CAN connection cable (P/N 115-4020-007).

FIGURE 1. Communications Connector of the Implement SC1™ Cable and SC1™

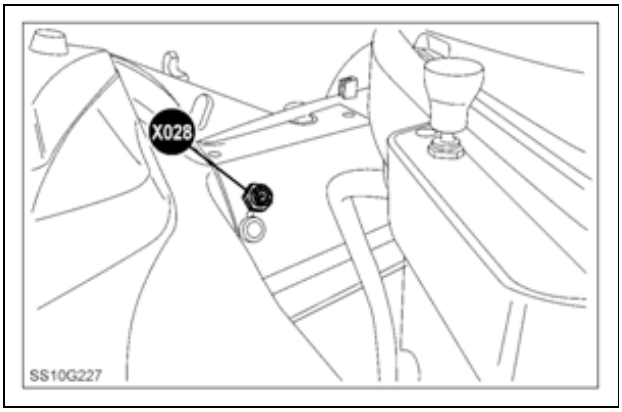
3. Route the green 9-pin connector along the implement frame member into the tractor cab. Typically, the cable may be routed through the rubber access point at the lower, right corner of the rear window.

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 3 for additional information and best practices.

4. Locate the green “Diagnose 2” connector (X-028) on the cab right hand side behind operator seat and remove the dust cap.

5. Connect the green 9-pin J1939 connector of CAN connection cable (P/N 115-4020-007).

FIGURE 2. Diagnose 2 Connector (X-028)



IMPLEMENT STEERING CABLING

1. Locate the Implement Bus Breakaway Connector (IBBC) at the back of the tractor.
2. Connect the ISOBUS cable from Raven Implement Steering.

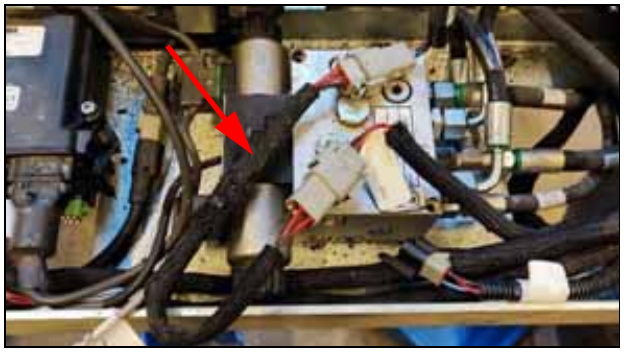
FIGURE 3. Implement Bus Breakaway Connector on the back of the tractor

NOTE: If the IBBC on the tractor is already used by another implement, use a GEN 1 ISOBUS TO IBBC TOW-BETWEEN IMPLEMENT cable (P/N 115-7100-013) to create an extra ISOBUS implement connection point.

RTK CORRECTIONS CABLING

1. Locate the gray 8-pin connector of the Implement SC1 cable (P/N 115-4010-112) going to the Implement Smart Antenna and disconnect the Implement Smart Antenna cable.
2. Tee-in the Smart Antenna to RTK Corrections cable (P/N: 115-4020-002).

FIGURE 4. RTK Corrections T-Cable (P/N 115-4020-002) connected to Implement SC1 cable and Smart Antenna Cable



NOTE: If the IBBC on the tractor is not available, use a GEN 1 ISOBUS TO IBBC TOW-BETWEEN IMPLEMENT cable (P/N 115-7100-013) to create an extra ISOBUS implement connection point.

3. Connect the 3-pin to Serial In cable (P/N 115-0172-448) to the RTK Corrections cable.

FIGURE 5. 3-pin to Serial cable (P/N 115-0172-448) connected to RTK Corrections cable

4. Route the 9-pin serial connector (together with the earlier installed CAN connection cable; P/N 115-4020-007) along the implement frame member into the tractor cab. The serial connector should be inside the cab, the 3-pin connector may be located outside of the cab. Typically, the cable may be routed through the rubber access point at the lower, right corner of the rear window.

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 3 for additional information and best practices.

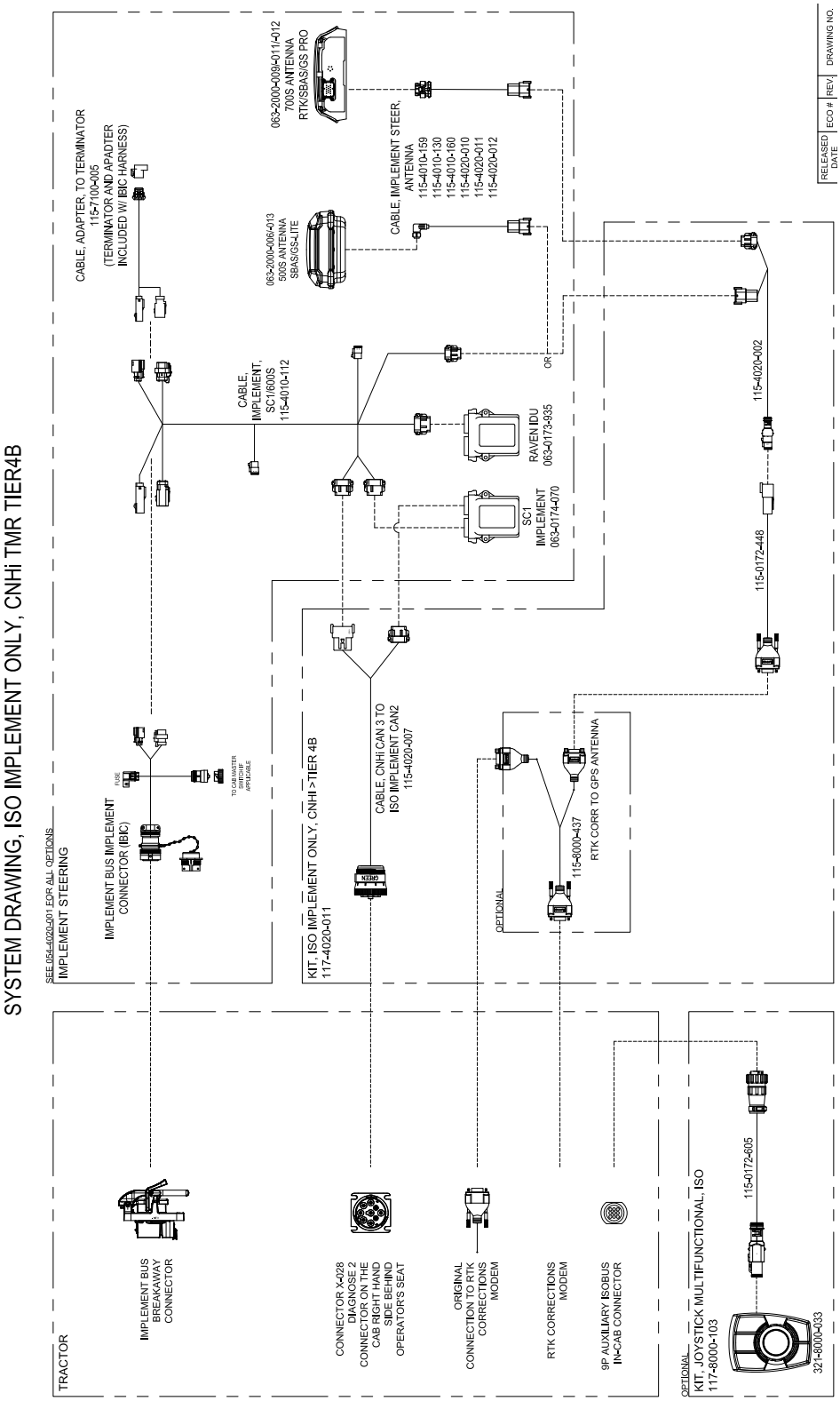
Different scenarios are possible depending on tractor type and preparation type. A RTK corrections modem with unencrypted correction data is required. A Trimble Sierra Wireless modem (GX-450; RV55) will not be able to provide unencrypted correction data to the 700S antenna. If no RTK Corrections Modem is available, a Slingshot® Field Hub should be installed. Contact a local Slingshot® dealer for assistance with Slingshot® Field Hub devices and service.

5. Disconnect the 9-pin serial connector from the RTK corrections modem.

6. Connect the 9-pin male pin serial-in connector of the RTK Corrections Split cable (P/N 115-8000-437) to the modem.
7. Connect the 9-pin serial connector of the original cable to Port A of the RTK corrections split cable (P/N 115-8000-437).
8. Connect the 9-pin serial connector of the 3-pin to Serial In cable (P/N 115-0172-448) to Port B of the RTK Corrections Split cable (P/N 115-8000-437).

SYSTEM DIAGRAMS

FIGURE 6. ISO Implement Only, CNHi TMR Tier 4B System Diagram (P/N 054-4020-011)

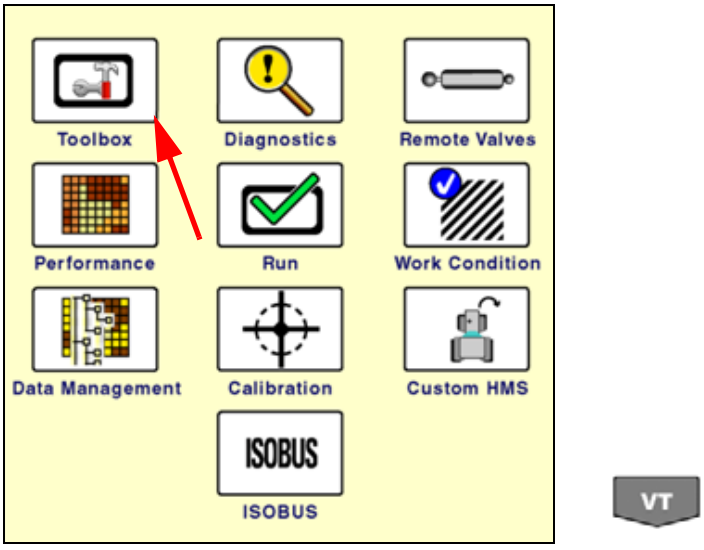


CHAPTER 4 TRACTOR DISPLAY SETUP

SETUP THE TRACTOR DISPLAY TO WORK WITH THE SC1™ SYSTEM

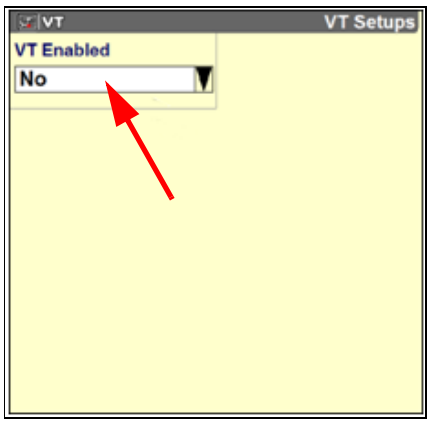
1. Turn on the tractor and turn on the display.
2. Open Toolbox, then select "VT"

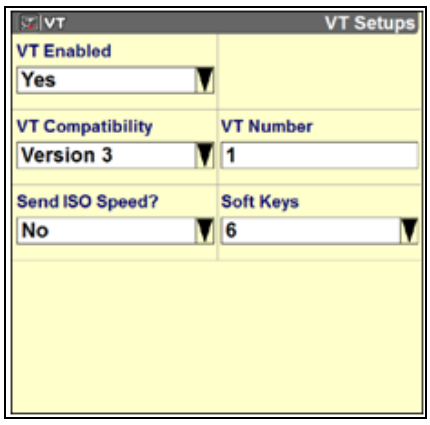
FIGURE 1. Toolbox



3. Choose VT Enabled "Yes" and set the VT Number to "2".

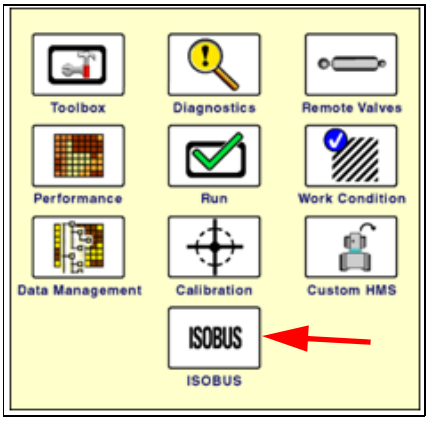
FIGURE 2. Enable VT on Intelliview IV / AFS PRO 700

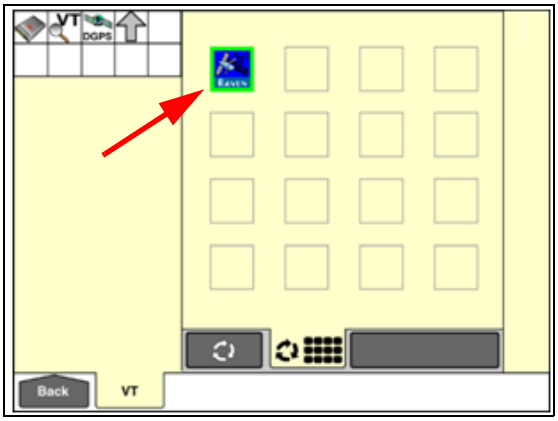




4. Go to the ISOBUS screen of the display.

FIGURE 3. ISOBUS Screen





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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 36 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 completed RMA form, Certificate of Decontamination, and retail 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 this product or any component of the product found to be defective during the warranty period. Replacement will be made with a new or remanufactured product or component. Standard return freight will be paid, regardless of 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 outside our facility 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, improper installation and maintenance are not covered by this warranty.
- Worn/Chafed hoses and cables.
- Items in contact with fluids and chemicals including seals and O-rings.
- Software downloads and updates.
- Tamper-Evident label broken or customer disassembly.
- Any customer modification to the original product outside normal calibration and adjustments, without written approval.
- Intentional modification to cables.
- Failures due to lack of cleaning or preventive maintenance, and any condition, malfunction or damage not resulting from defects in material or workmanship.
- Items in contact with fluids or chemicals, returned without proper cleaning, decontamination and documentation.

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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.portal.ravenprecision.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 completed RMA form, Certificate of Decontamination, and Extended Warranty Registration Number) 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 warranty claim, Raven Industries will (at our discretion) repair or replace this product or any component of the product found to be defective during the warranty period. Replacement will be made with a new or remanufactured product or component. Standard return freight will be paid, regardless of inbound shipping method. Expedited freight is available at the customer's expense.

RAVEN

WHAT IS NOT COVERED BY THE EXTENDED WARRANTY?

Raven Industries will not assume any expense or liability for repairs outside our facility 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, improper installation and maintenance are not covered by this warranty.
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- Any customer modification to the original product outside normal calibration and adjustments, without written approval.
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- Items in contact with fluids or chemicals, returned without proper cleaning, decontamination and documentation.