

AutoBoom® XRT Installation Manual for AGCO TerraGator C

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Disclaimer

While every effort has been made to ensure the accuracy of the information presented on this site, 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.

Important Safety Information

NOTICE

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

- Park the machine where the ground is level, clean, and dry.
- Bleed pressure from the hydraulic system and leave the machine turned off for the duration of the installation or maintenance process.

Follow the operation and safety instructions included with the implement and/or controller. Before installing or operating this Raven system, review and understand the information presented on this site.

- Failure to follow safety instructions may lead to equipment damage, personal injury, or death.
- Review equipment operation with your local dealer and follow all safety information presented on this site.
- 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 while operating this Raven system.
 - 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.
 - Do not operate the implement on any public road with this Raven system enabled.

- Maintain control of the vehicle at all times during operation. For example,
 - Remain in the operator seat while the system is enabled and disable automated Raven controls before exiting the operator seat.
 - Maintain control of safety devices such as E-Stops at all times during operation.
- 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.

Field Computers, 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 GNSS antenna when leaving the machine unattended.

 **DANGER**

 **WARNING**

Hydraulic Safety

When installing or servicing a hydraulic system or hydraulic components, be aware that hydraulic fluid may be extremely hot and under high pressure. Caution must be exercised.

- Always wear appropriate personal protective equipment when installing or servicing hydraulic systems.
- Never attempt to open or work on a hydraulic system with the implement running.
- Always take care when servicing or opening a system that has been pressurized.
- The implement or machine must remain stationary and switched off with booms or implement sections unfolded and supported during installation or maintenance.
- Any work performed on the hydraulic system must be done in accordance with the machine manufacturer's approved maintenance instructions.

- Before installing hydraulic components, ensure there are no issues with the machine hydraulic system (e.g. pump issues, faulty hydraulic motors, fine metal deposits in the hydraulic lines, etc.).
- Take precautions to prevent foreign material or contaminants from being introduced into the implement hydraulic system. Contaminants that are able to bypass the hydraulic filtration system will reduce performance and may damage hydraulic components.
 - Verify that the hydraulic system is using fresh oil and the filters have been changed.
- Stand clear of the implement when starting the system for the first time after installing or servicing hydraulic components in case a hose has not been properly connected or tightened.

⚠ 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 system power cable to the vehicle ignition or 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 or 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

Point of Reference

Instructions provided generally assume you are standing behind the machine facing toward the cab. More specific orientation may be provided as necessary to complete procedures.

Preparing for Install

- Ensure there are no issues with the machine hydraulic system (e.g., pump issues, faulty hydraulic motors, fine metal deposits in the hydraulic hoses, etc.).
- Verify that the machine hydraulic system is using fresh oil and that the filters have been recently changed.
- Ensure there are no issues with the steering system (e.g., worn bushings, faulty tie rod ends, improperly adjusted steering components, etc.)

Hose Routing

The word “hose” is used to describe any flexible, fluid carrying components. Use the following guidelines and recommendations when connecting and routing hoses while installing or maintaining this Raven system:

- Leave protective caps/covers over hose ends until connecting the end into the hydraulic system to help prevent contaminants from entering the system.
- Follow existing hose runs already routed on the implement as much as possible. Proper hose routing should:
 - Secure hoses and prevent hoses 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 hoses 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 hoses from sharp bends, twisting, or flexing over short distances and normal implement operation.

- 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 hoses securely to force controlled movement of the hose.
- Avoid abrasive surfaces and sharp edges such as sheared or flame cut corners, fastener threads or cap screw heads, hose clamp ends, etc.
- Avoid areas where the operator or service personnel might step or use as a grab bar.
- Do not connect, affix, or allow hoses to come into contact with components with high vibration forces, hot surfaces, or components carrying hot fluids beyond the temperature rating of hose components.
 - Hoses should be protected or shielded if routing requires the hose to be exposed to conditions beyond hose component specifications.
- Avoid routing hoses in areas where damage may occur due to build up of material (e.g. dirt, mud, snow, ice, etc.).

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.

Note: *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.

Installation Overview

The AutoBoom® XRT system is designed to provide automated boom height adjustment for agricultural equipment.

This installation procedure applies to the following machines:

MAKE: TerraGator

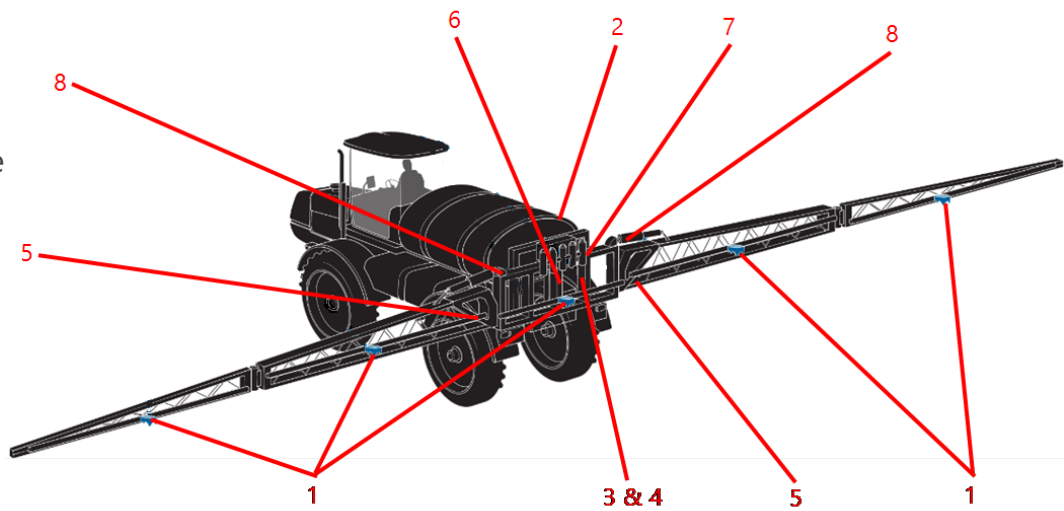
MODEL: 7300C, 8300C, 8400C, 9300C

YEAR: 2018-2019



The image below shows approximate installation locations for the sensor and nodes. Depending on machine configuration and desired performance some of the sensors and dampers may not be installed.

1. Radar Boom Sensors
2. ABM Node
3. **REM**¹ Node
4. Hydraulic Valve
5. Tilt Sensor
6. Rotary Sensor
7. Variable Damper
8. Proximity Sensor



For additional information on the component installation, refer to:

- Hydraulic valve mounting and installation instructions at Hydraulic System Installation Overview.
- Rotary sensor installation instructions at "Install the Rotary Sensor" on page 27.
- Variable damper installation instructions at "Install the Damper" on page 19.
- REM node installation instructions at "Mount the AutoBoom® XRT Valve" on page 15.
- ABM node installation instructions at "ABM and REM Node Installation" on page 31.
- Boom sensor installation information at "Mount the Boom Sensors" on page 24

¹Raven Expansion Module

Prepare for Installation

Before installing AutoBoom® XRT, park the machine where the ground is level, clean, and dry. Leave the machine 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 before installing or operating the AutoBoom® XRT system for the first time, at the start of the season, or when moving the AutoBoom® XRT system to another machine:

- Ensure the machine hydraulic filters have been recently changed and there are no issues with the machine hydraulic system (e.g., pump issues, faulty hydraulic motors, fine metal deposits in the hydraulic hoses, etc.).
- Operate each of the machine boom hydraulic functions (i.e., tilt, fold, center rack, tongue extension, or other hydraulic valve functions) three times to ensure the machine hydraulic valve is using fresh oil and debris is flushed from the hydraulic hoses, valves, and filters.
- Upon installation of the AutoBoom® XRT system, operate the boom and center rack raise/lower functions through the machine manual control functions first before operating them via the AutoBoom® XRT controller/field computer to ensure the hydraulic system has been installed correctly and air is released from the system.

Raven Industries recommends the following when installing the AutoBoom® XRT system.

- 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.

Tools Needed

The following tools are recommended for installation of the AutoBoom® XRT system:

- Standard-sized wrenches
- Cable ties

- Set of tools

Point of Reference

The instructions in this manual assume that you are standing behind the machine, looking toward the cab.

Hydraulic Fittings

This manual may reference the following types of hydraulic fittings:

SAE O-Ring Fittings



ORFS (O-Ring Face Seal) Fittings

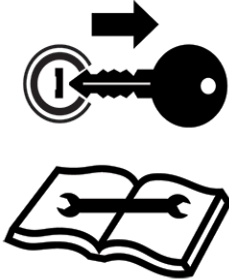


JIC Fittings



Mount the AutoBoom® XRT Valve

⚠ WARNING



The implement or machine must remain stationary and switched off with booms or implement sections unfolded and supported during installation or maintenance.

CAUTION



When installing hydraulics or performing diagnostics, maintenance, or routine service, ensure precautions are taken to prevent any foreign material from being introduced into the machine hydraulic system.

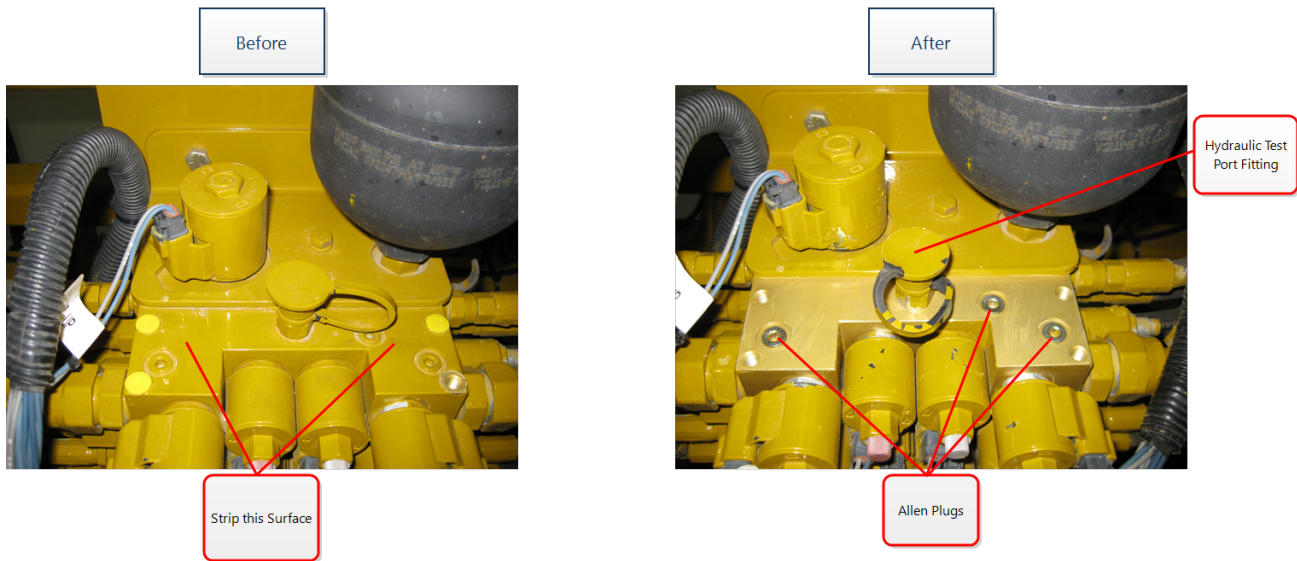
Objects or materials that are able to bypass the machine hydraulic filtration system will reduce performance and possibly cause damage to the hydraulic valve.

NOTICE



The appearance of the hydraulic valve may vary slightly from the images contained in this manual. However, the fittings, hose connections, and cable connections remain the same.

Adjusting Installed Hydraulic Valve



1. Strip the factory paint from the top of the existing hydraulic valve using a chemical approved for paint removal.

Note: Do not scrape the paint from the hydraulic valve. Scraping the paint may cause damage to the valve.

2. Remove the hydraulic test port fitting and Allen plugs from the existing hydraulic valve.

Note: The test port fitting will be installed on the AutoBoom® XRT hydraulic valve later in the procedure. Protect the test port fitting from dust and debris to avoid contamination of the hydraulic system.

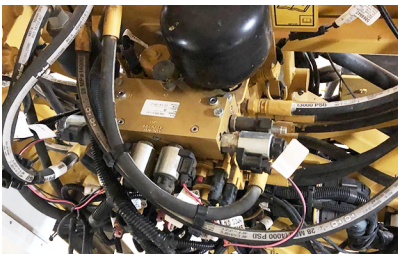
3. Clean any remaining paint from the existing hydraulic valve, taking care to prevent paint chips from entering the open hydraulic ports.



4. Install 9/16" ID Buna-N O-rings (P/N 219-0001-015) in the open ports of the hydraulic valve.

Note: Use grease or petroleum jelly to hold the O-rings in place during the AutoBoom® XRT valve installation, taking care to avoid contamination of the inside of the open ports.

5. Blow the hydraulic port threads of any excess oil.
6. Clean excess oil, grease, and debris from the top of the hydraulic valve.
7. Clean excess hydraulic fluid from the AutoBoom® XRT valve (P/N 334-0235-004).
8. Install the supplied hex bolts in the AutoBoom® XRT valve, placing the shorter bolt in the cut-out section of the AutoBoom® XRT valve.



Installation for Machines with Existing Hydraulic Valve

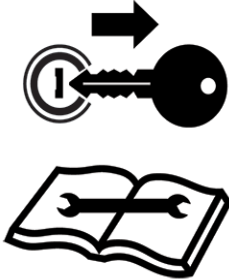
On machines with existing AutoBoom® XRT valves, back the existing needle valves out completely then tighten the jam nut.



9. Carefully place the AutoBoom® XRT valve on the existing hydraulic valve, positioning it so that the cut-out section faces the accumulator.
10. Alternately tighten each bolt a small amount to a maximum of 15-20 ft. lbs. per bolt.
11. Install the hydraulic test fitting in Port GP of the AutoBoom® XRT valve.

Install the Damper

⚠ WARNING

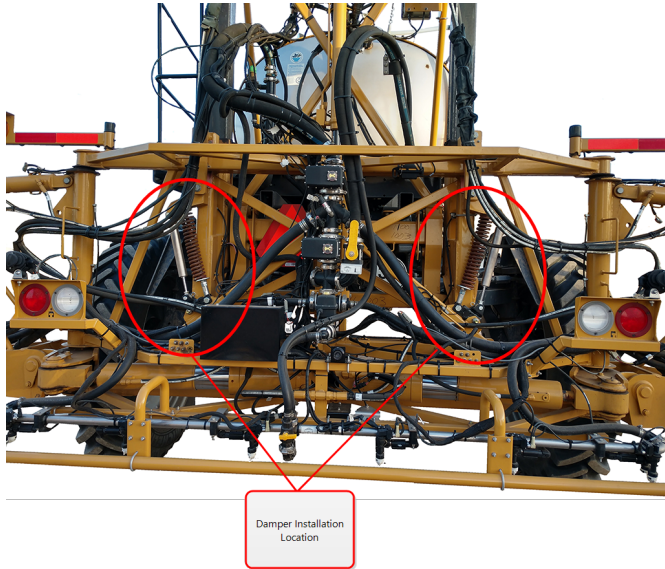


The implement or machine must remain stationary and switched off with booms or implement sections unfolded and supported during installation or maintenance.

Note: It will be necessary to purchase springs from your AGCO dealer if the machine is not already equipped with centering springs on the center rack.

AGCO Part Number	Quantity	Description
601102D1	2	Threaded Rod
AG517248	2	End Rod
SN1040	6	Lockwasher 3/4"
375100X1	6	Hex Nut 3/4"-10 SAE 5 ZN
AG561156	2	Flat Washer 3/4"
7701329	2	Hex Cap Screw 3/4"-10 x 2-1/4" GR5
AG562291	6	Hex Nut 3/4"-16
AG108604	2	Spring

1. Unfold the booms and remove the rubber bumpers that limit center rack rotation.
2. Identify the damper installation location.



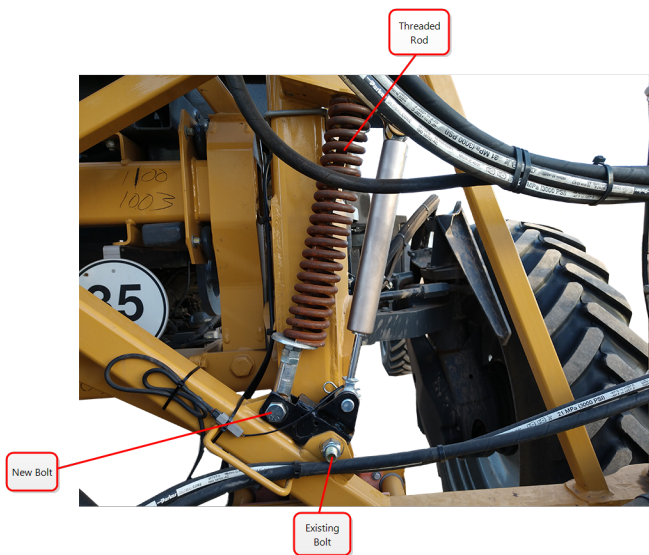
3. Measure and record the distance of thread showing between jam nuts and eye swivel on spring assembly.

Note: This distance will be needed when reinstalling the spring assemblies.

4. Loosen nuts on the threaded rod holding the spring to remove as much tension as possible.

Note: Ensure not to re-tighten the spring after installation.

5. Remove the 3/4"-10 bolt and nut holding the threaded rod and spring and remove from the machine.



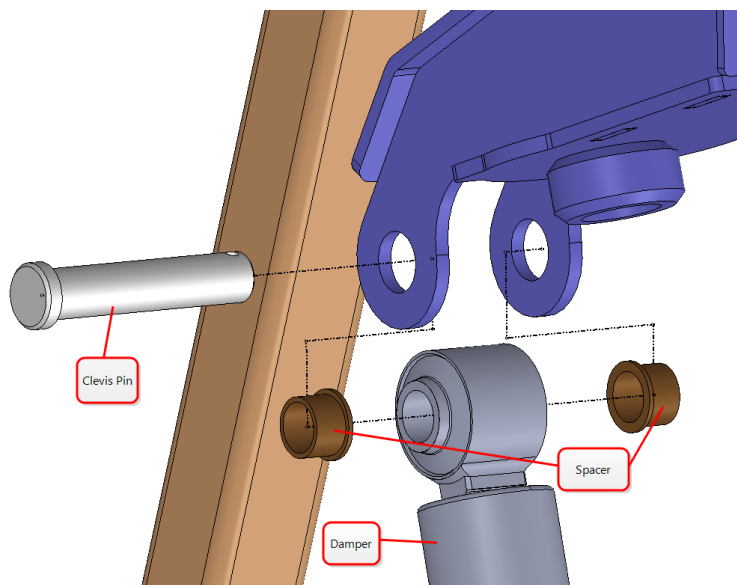
6. Install the damper mounting bracket in the location where the 3/4"-10 bolt was removed.
7. Reinstall the 3/4"-10 bolt and nut with the bolt head facing the front of the machine.

Note: It may be necessary to rotate the boom to ease mounting location access.

8. Install the threaded rod and spring back onto the center rack using the removed hardware. Do not tighten the spring.

Note: It will be necessary to compress the dampers to fit into the spacing. To do this:

- connect two ends of a ratchet strap to each other.
 - place the ratchet strap around the ends of the damper like a belt.
 - tighten the ratchet strap until the damper is the desired length.
9. With the rod end of the damper at the bottom, use the provided shorter 5/8" clevis pins and spacers to install the damper in the bottom holes on each bracket.



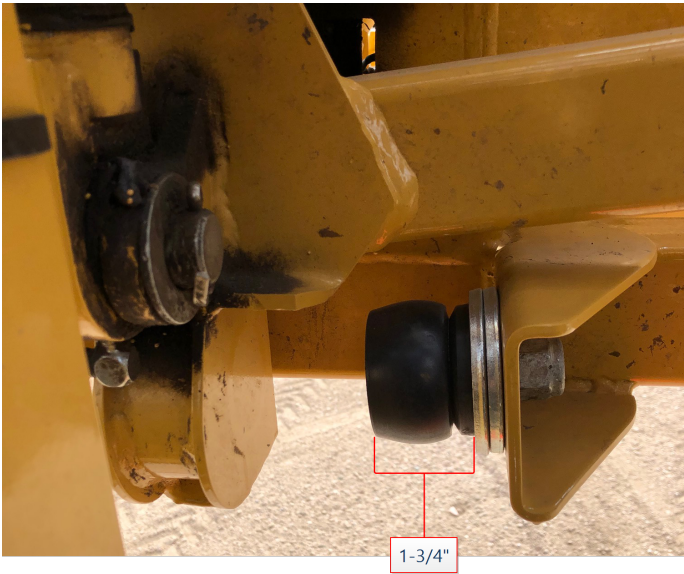
Note: Bushings may need to be tapped into the holes if the paint is too thick.

10. Use the provided longer 5/8" clevis pin and R-clip to install the base end of the damper in the hole in the upper bracket.

Note: The rack may need to be rotated to ease placing pins in the access holes.

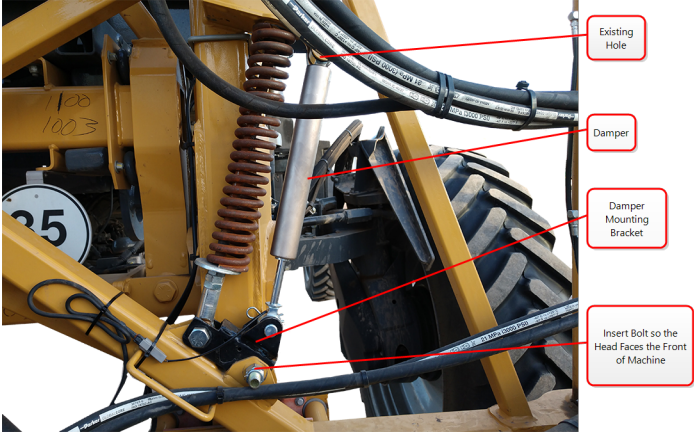
11. Reinstall the rubber bumpers on the center rack.

Note: Bumper may be 3-1/2" or 1-3/4". If the bumper measures 1-3/4", install two 3" fender washers onto the back of the bumper and use the provided countersunk bolt to secure in place.



12. Tighten jam nuts on spring assembly to a distance of 1.5in [3.81cm] between nuts.





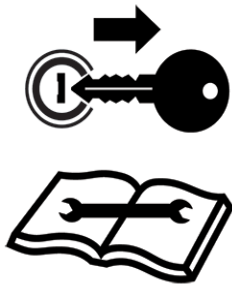
Mount the Boom Sensors

Boom Sensor Mounting Locations

Sensor mounting locations vary by boom configuration. If an object enters the sensor's blind range unexpectedly, a false return to the sensor could occur. To ensure optimal operation of the AutoBoom® XRT system and to protect the sprayer boom, the sensor should be mounted behind the boom structure (if possible), above the lowest hanging part of the boom.

Mount the Boom Sensors

⚠ WARNING



The implement or machine must remain stationary and switched off with booms or implement sections unfolded and supported during installation or maintenance.

1. The table below provides the approximate mounting locations for various boom widths. The information on this table is for reference only. If there is interference or other issues with these mounting locations, mount the sensors as close to these locations as possible.

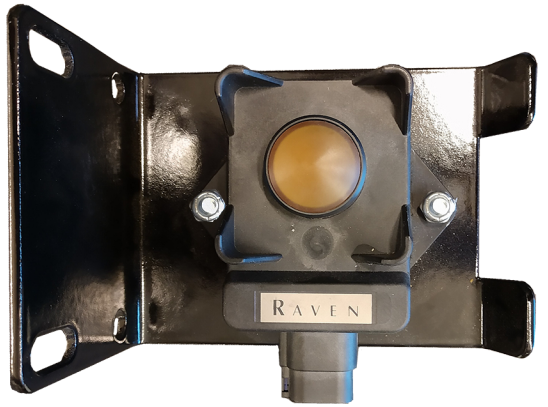
Boom Width	Boom Type	Inner Sensor Mounting Distance from Boom Pivot Point	Outer Sensor Mounting Distance from Boom Pivot Point
60/80'	Steel	320"	446"

Note: The numbers in the table above are the approximate distance. As a rule, the sensor should be mounted half way between two spray tips to minimize potential drift interference.

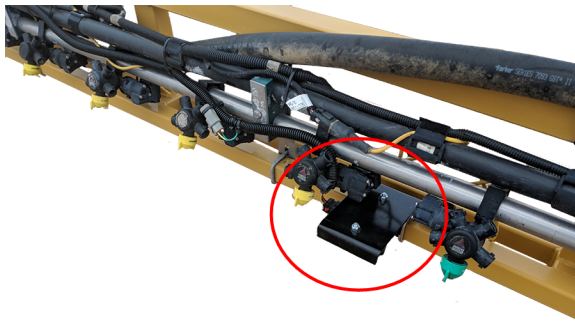
2. Install the radar sensors (P/N 063-0173-962) on the sensor mounting brackets (P/N 107-0235-032) using two 1/4"-20 x 5/8" Phillips pan head bolts (P/N 311-0050-255)

and two 1/4"-20 nylon locking nuts per sensor (P/N 312-4000-164).

Note: Install two of the sensors in one orientation and three in the other orientation on the bracket so, when installed, the sensor connection is facing towards the center of the machine.



3. Mount the boom sensor assemblies on the back of the left-outer boom sections using 1-9/16" W x 2-1/2" L x 3/8" thread U-bolts and 3/8"-16 flanged lock nuts.



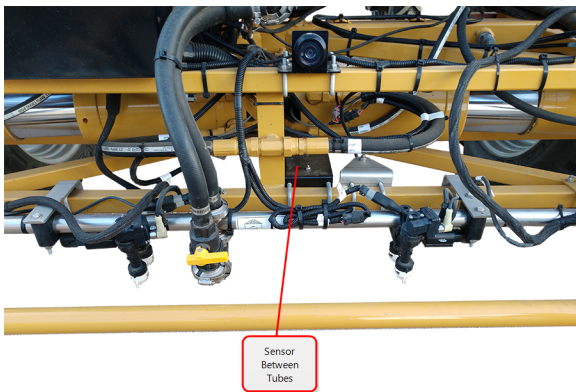
Note: The radar sensor will be mounted on the rear of the boom. Verify that the radar bracket does not hit inner boom when folding booms.

4. Mount the inner boom sensor assemblies using 1-9/16" W x 2-1/2" L x 3/8" thread U-bolts and 3/8"-16 flanged lock nuts.



Mount the Center Sensor

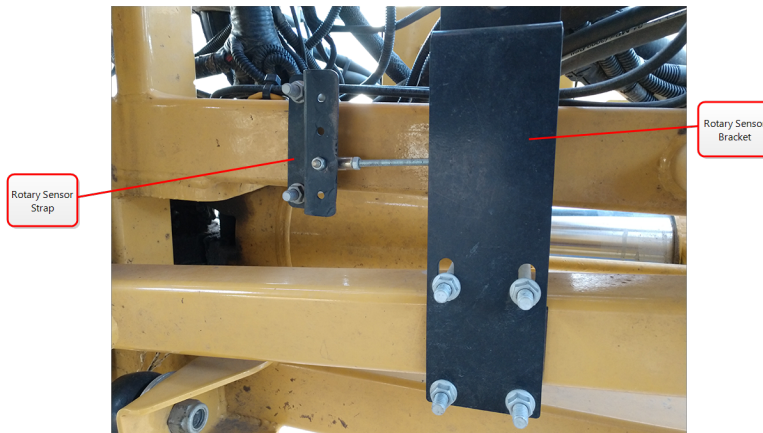
1. Mount the center sensor assembly to the middle of the center rack using 1-9/16" W x 2-1/2" L x 3/8" thread U-bolts and 3/8"-16 flanged lock nuts. The center sensor may be offset from center due to the structure of the center rack.



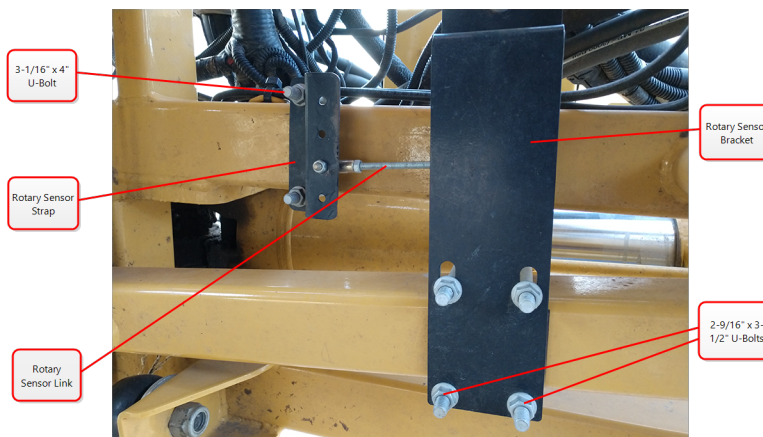
Note: *The center sensor can be moved off-center to be located directly above a row for better crop-detection performance.*

Install the Rotary Sensor

1. Locate the open position between the center rack and center frame to mount the rotary sensor assembly labeled 'CENTER RACK.'

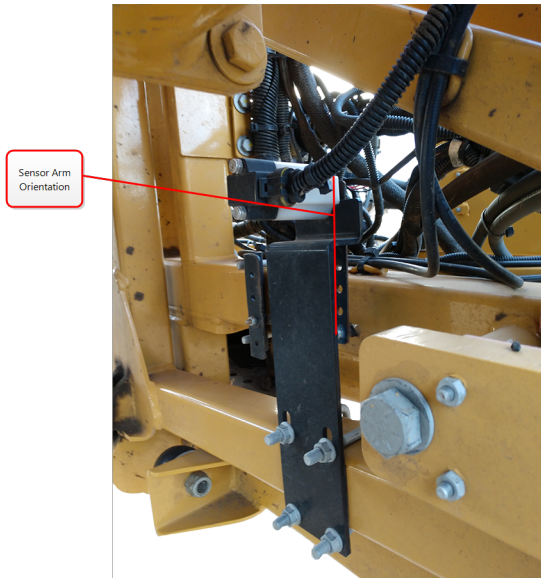


2. Using a provided 3-1/16" x 4" U-bolt, loosely install the rotary sensor strap bracket to the horizontal tube on the front side of the center rack.



3. On the center frame, use two provided 2-9/16" x 3-1/2" U-bolts to loosely install the rotary sensor bracket to the lower horizontal tube positioned between the center rack and the center frame. The sensor mounts on the right side of the center. The connector on the sensor will point toward the left side of the machine.
4. Install the rotary sensor link to the rotary sensor bracket arm and to the rotary sensor strap.
5. Using two wrenches, secure the rotary sensor link.

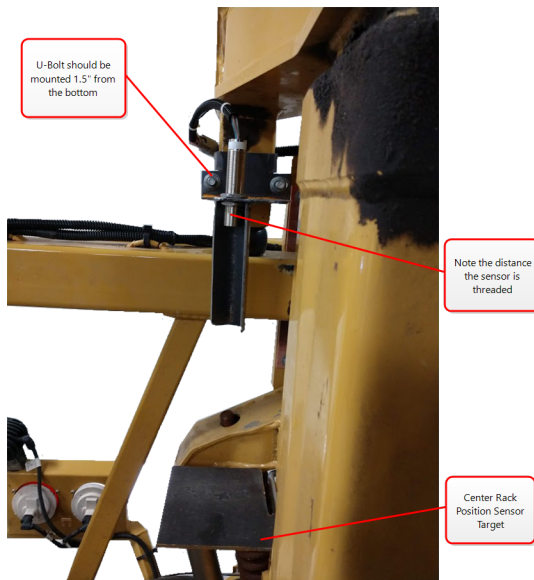
6. Adjust the rotary sensor bracket and the rotary sensor strap until the rotary sensor arm is vertical.



Install the Center Rack Position Sensor

1. Use the provided U-bolts to install the center rack position sensor bracket on the tube near the top of the right-hand damper.

Note: Thread approximately 1 inch through the bracket.



2. Install the height stop sensor assembly to the bracket shown above and secure with panel nuts.
3. Connect the 115-0235-041 cable to the height stop sensor.
4. Use the provided U-bolts to install the center rack position target below the center

rack height sensor.



ABM and REM Node Installation

1. Using the provided 1/4"-20 bolts and lock nuts, secure the **REM**¹ node to the clearance holes on the AutoBoom® XRT node mounting bracket.

Note: Mount the node so that the receptacles are facing down.



2. Locate the machine electrical box.
3. The ABM node is mounted inside the electrical node box. Use the provided hardware

¹Raven Expansion Module

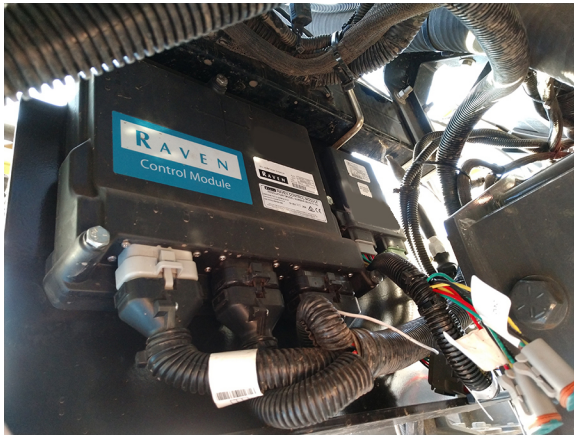
to mount the ABM node.



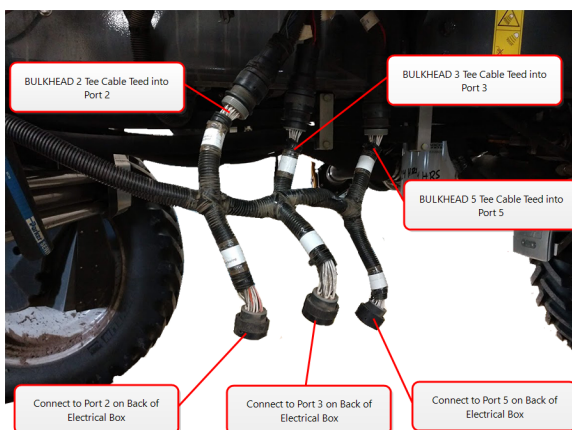
Connect the ABM/REM Harness

Note: While making the following connections, be aware of the cable routing and avoid cable pinch points and other issues.

1. Insert the gray 23-pin plug on the ABM/**REM**¹ cable (P/N 115-0235-178) to the mating connector on the bottom of the REM node.
2. Insert the black 23-pin plug on the XRT cable to the mating connector on the bottom of the REM node.
3. Insert the black 35-pin plug on the XRT cable to the mating connector on the bottom of the REM node.

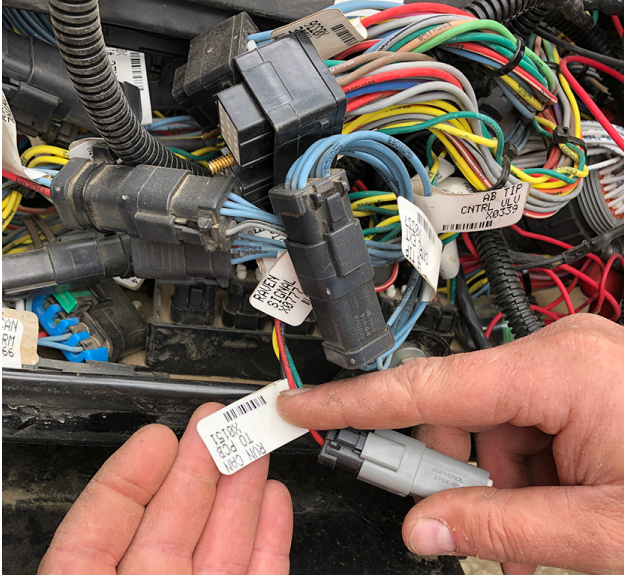


4. Disconnect the Bulkhead Connector 2 from port 2 on the back of the electrical box and connect it to the BULKHEAD 2 ABM/REM Tee cable.

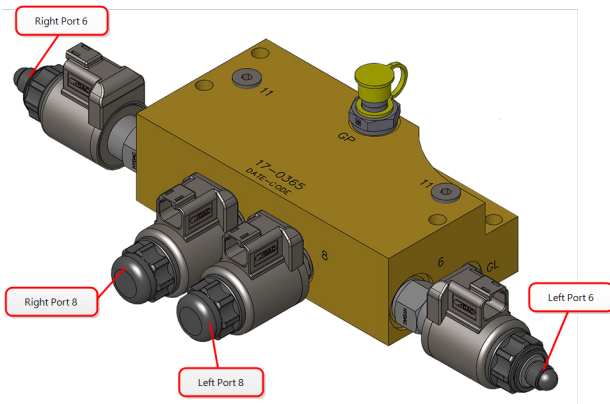


¹Raven Expansion Module

5. Connect the other end of the bulkhead 2 tee back into port 2 on the back of the electrical box.
6. Disconnect the Bulkhead Connector 5 from port 5 on the back of the electrical box.
7. Remove the nut securing the bulkhead 5 plug to the electrical box.
8. Access the inside of the electrical box and locate the bulkhead 5 plug.
9. Install the Chassis Adapter cable (P/N 115-0235-178) bulkhead plug into the open location on the back of the electrical box and secure with a nut.
10. Connect the other end of the bulkhead 5 tee back into the plug now in port 5 on the back of the electrical box.
11. Plug the machines bulkhead 5 connector into the mating connector on the Chassis Adapter cable.
12. Install the ground and power ring terminals to the power and grounds studs on the right wall of the electrical box.
13. Locate the C180 RVN POWER CONNECTOR on the inside of the electrical box.
 - If there isn't a cable connected to the C180 connector, plug the end into the LOGIC/POWER TEE connector on the chassis adapter cable.
 - If there is a cable connected to the C180 connector, disconnect the existing cable and install the LOGIC/POWER TEE cable into the C180 cable. Connect the plug that was originally in the C180 cable to the open receptacle on the LOGIC/POWER TEE cable.
14. Insert the connector labeled ABM to the AutoBoom® XRT node.
15. Use the provided 12-pin green DTM plug to protect the unused connector of the ABM node.



16. Plug the 4-pin connectors on the AutoBoom® XRT cable to any available ports on the inside row of the CAN distribution block.
17. Install the cover on the electrical box.
18. Install the RESISTOR BLOCK cable (P/N 115-0235-118) to the 6-pin plug on the XRT cable.
19. Locate the RoGator C Valve cable (P/N 115-0235-112).
20. Connect the plug labeled DAMPER 1 to the mating receptacle on the right damper.
21. Connect the plug labeled DAMPER 2 to the mating receptacle on the left damper.
22. Connect the LEFT SOLENOID plug on the XRT cable to the left port 8 on the AutoBoom® XRT valve.



23. Connect the RIGHT SOLENOID plug on the XRT cable to the right port 8 on the AutoBoom® XRT valve.
24. Connect the LEFT PROP plug on the XRT cable to left port 6 on the AutoBoom® XRT valve.
25. Connect the RIGHT PROP plug on the XRT cable to right port 6 on the AutoBoom® XRT valve.
26. Connect the 12-pin receptacle on the valve harness to the existing machine plug labeled X5033 behind the valve.

Note: *The ACCUMILATOR POWER connector is not used on this installation.*

Connect the Harness to the Sensors

1. Starting at the outside sensor on the right boom and working towards the center right, connect the secondary boom cable to the outside height sensor.
2. Connect the secondary boom cable to the primary boom cable.
Note: Leave sufficient slack in the harness to prevent pulling on connectors during operations such as boom folding.
3. Connect the plug on the primary boom cable to the inner height sensor.
4. Connect the 12-pin receptacle on the primary boom cable to the mating connector on the height sensor cable.
5. Repeat the previous steps for the left boom.
6. Connect the center height sensor to the mating plug on the Height Sensor cable (P/N 115-0235-153).
7. Connect the CENTER ROTATION POSITION SENSOR plug to the to the SUPERSEAL POSITION SENSOR cable (P/N 115-4010-069).
8. Connect the other end of the SUPERSEAL POSITION SENSOR cable to the rotary sensor installed earlier.
9. Connect the CENTER RACK VERT POSITION SENSOR plug to the 3-pin AMPSEAL cable (P/N 115-0235-041).
10. Connect the other end of the 3-pin AMPSEAL cable to the height stop sensor installed earlier.
11. Connect the remaining 12-pin receptacle on the height sensor cable to the mating connector on the ABM/**REM**¹ cable located near the electrical box.

Note: Refer to First Time Calibration to complete the XRT setup.

¹Raven Expansion Module

Limited and Extended Warranties

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 (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.

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 <https://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 (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.

Glossary

I

IMU

Inertial Measurement Unit

R

REM

Raven Expansion Module

