# ISO AutoBoom®
# Installation Manual for Case IH 3230, 3240, 3320, 3330, 3340, 4420, 4430, & 4440 (MY2010 & Newer)

*016-0230-129 Rev. B* *7/2019* *E33223*

# 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 Safety Information ..... 1
- Hydraulic ..... 2
  - General ..... 2
  - Instructions for Hose Routing ..... 2
- Electrical ..... 3
  - General ..... 3
  - Instructions for Wire Routing ..... 3

Chapter 2 Introduction ..... 5
- Introduction ..... 5
- Preparing for Installation ..... 5
  - Recommendations ..... 6
  - Tools Needed ..... 6
  - Point of Reference ..... 6
- Hydraulic Fittings ..... 6
- Updates ..... 7
- Kit Contents ..... 7
  - AutoBoom Installation Kit - 90-100' Booms ..... 7
  - AutoBoom Installation Kit - 120' Booms ..... 9
  - Hydraulic Installation Kit ..... 11
  - Optional Inner Ultrasonic Sensor Installation Kit ..... 12
  - Optional Wheel Kit - 90'-100' Booms ..... 13
  - Optional Wheel Kit - 120' Booms ..... 14

Chapter 3 Hydraulic System Installation ..... 15
- Install Fittings on the AutoBoom Valve ..... 15
- Mount the AutoBoom Valve ..... 16
- Install the Pressure and Tank Hoses ..... 17
- Install the Left and Right Cylinder Hoses ..... 18
- Install the Left and Right Down Hoses ..... 19
- UltraGlide Hydraulic Schematic ..... 20

Chapter 4 Sensor Installation ..... 21
- Mount the Boom Sensors ..... 21
  - Boom Sensor Mounting Locations ..... 21
  - Mount the Boom Sensors ..... 22
  - Mount the Center Sensor ..... 23
- Connect the Sensor Cables ..... 24

Chapter 5 Gauge Wheel Installation - Optional ..... 25
- Gauge Wheel Mounting Locations ..... 25
- Mount the Gauge Wheels ..... 25
  - 90'-100' Booms ..... 25
  - 120' Booms ..... 26

Chapter 6 Wiring Installation ..... 27
Wiring Connections ..... 27
Install the AutoBoom Node ..... 27
Connect the Harness to the AutoBoom Valve ..... 28
Connect the Harness to the Sensors ..... 28
Connect the Harness to the Power/CAN Controls ..... 29
90'-100' Booms ..... 29
120' Booms ..... 30

Chapter 7 Replacement Parts ..... 33
Valve ..... 33
Sensors ..... 34

# CHAPTER 1 IMPORTANT SAFETY INFORMATION

## *NOTICE*

Read this manual and the operation and safety instructions included with your implement and/or controller carefully before installing the AutoBoom® 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 AutoBoom 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 AutoBoom, observe the following safety measures:

- Be alert and aware of surroundings.
- Do not operate AutoBoom or any agricultural equipment while under the influence of alcohol or an illegal substance.
- Remain in the operator position or a safe working distance away from the booms at all times when AutoBoom is engaged.
- Disable AutoBoom when exiting from the operator seat and machine.
- Do not drive the machine with AutoBoom enabled on any public road.
- Determine and remain a safe working distance from other individuals. The operator is responsible for disabling AutoBoom when the safe working distance has diminished.
- Ensure AutoBoom is disabled prior to starting any maintenance work on AutoBoom or the machine.

## ⚠ WARNING

- When starting the machine for the first time after installing AutoBoom, be sure that all persons stand clear in case a hose has not been properly tightened.
- The machine must remain stationary and switched off, with the booms unfolded and supported, during installation or maintenance.

## ⚠ CAUTION

# HYDRAULIC

## GENERAL

- Raven Industries recommends that appropriate protective equipment be worn at all times when working on the hydraulic system.
- Never attempt to open or work on a hydraulic system with the equipment running. Care should always be taken when opening a system that has been previously pressurized.
- When disconnecting the hydraulic hoses or purging is required, be aware that the hydraulic fluid may be extremely hot and under high pressure. Caution must be exercised.
- Any work performed on the hydraulic system must be done in accordance with the machine manufacturer approved maintenance instructions.
- When installing AutoBoom hydraulics or performing diagnostics, maintenance, or routine service, ensure that precautions are taken to prevent any foreign material or contaminants 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 damage the AutoBoom hydraulic valve.

## INSTRUCTIONS FOR HOSE ROUTING

The word "hose" is used to mean all flexible fluid carrying components. Follow existing hoses as much as possible and use these guidelines:

Hoses should not contact or be attached to:

- Components with high vibration forces
- Components carrying hot fluids beyond 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

Routing should not allow hoses 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 hose components
- Hoses should be protected or shielded if it needs to route near hot temperatures beyond hose component specifications

Hoses 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 steering and suspension systems

- Moving linkages, cylinders, articulation joints, attachments
- Ground engaging components

For hose 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 hoses securely to force controlled movement to occur in the desired hose section
- Avoid sharp twisting or flexing of hoses in short distances

Protect hoses 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
- High pressure wash

## ELECTRICAL

### 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.

### 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 steering 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.

# CHAPTER 2 INTRODUCTION

## INTRODUCTION

Congratulations on your purchase of the Raven AutoBoom system! This system is designed to provide automated boom height adjustment for agricultural equipment.

This manual applies to the following machines.

MAKE: Case IH
MODEL: 3230, 3240, 3320, 3330, 3340, 4420, 4430, and 4440
YEAR: 2010 & Newer

**FIGURE 1. Case IH 4420**

## PREPARING FOR INSTALLATION

Before installing AutoBoom, 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 best practices before installing or operating the AutoBoom system for the first time, at the start of the season, or when moving the AutoBoom 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 system, operate the boom and center rack raise/lower functions through the machine manual control functions first before operating them via the AutoBoom controller/field computer to ensure the hydraulic system has been installed correctly and air is released from the system.

Raven Industries recommends the following best practices when installing the AutoBoom 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 system:

- SAE 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

**SAE O-ring fitting**

**ORFS fitting**

**JIC fitting**

## UPDATES

Software and manual updates are available on the Raven Applied Technology website:

http://www.ravenhelp.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

-ISO AutoBoom® Installation Manual for Case IH 3230, 3240, 3320, 3330, 3340, 4420, 4430, & 4440 (MY2010 & Newer)
-016-0230-129 Rev. B
-Any comments or feedback (include chapter or page numbers if applicable).
-Let us know how long have you been using this or other Raven products.

We will not share your email or any information you provide with anyone else. Your feedback is valued and extremely important to us.

Thank you for your time.



## KIT CONTENTS

This section contains a list of the components that are included in the UltraGlide AutoBoom kit. Before beginning the AutoBoom installation, compare the items in the AutoBoom kit with the components on this list. If you have questions about the kit, contact your local Raven dealer.

### AUTOBOOM INSTALLATION KIT - 90-100' BOOMS

**TABLE 1. UltraGlide Installation Kit (P/N 117-0232-130)**

| Picture | Item Description | Part Number | Qty. |
|---|---|---|---|
| Not Pictured | Manual - ISO AutoBoom for Case IH Calibration and Operation | 016-0130-079 | 1 |
| Not Pictured | Manual - Case IH 3230/3240 and 3320/3330/3340/4420/4430/4440, Model Year 2010 & Newer AutoBoom Installation | 016-0230-129 | 1 |
|  | Valve - AutoBoom Hydraulic | 063-0131-124 | 1 |

**TABLE 1. UltraGlide Installation Kit (P/N 117-0232-130)**

| Picture | Item Description | Part Number | Qty. |
|---|---|---|---|
|  | Node - Case IH ISO AutoBoom | 063-0130-053 | 1 |
|  | Sensor - Left Ultrasonic | 063-0130-012 | 1 |
|  | Sensor - Right Ultrasonic | 063-0130-014 | 1 |
|  | Sensor - Center Ultrasonic | 063-0130-018 | 1 |
|  | Bracket - Valve Mounting | 107-0171-802 | 1 |
|  | Bracket - Sensor Mounting | 107-0172-501 | 3 |
|  | Cable - 60' Ultrasonic Sensor Extension | 115-0230-051 | 2 |
|  | Cable - AutoBoom Harness | 115-0230-073 | 1 |
|  | U-Bolt - 2-1/16" W x 3" L x 3/8" Thread | 107-0171-609 | 4 |
|  | U-Bolt - 2-9/16" W x 4" L x 3/8" Thread | 107-0172-645 | 2 |
|  | U-Bolt - 2-9/16" W x 3-1/2" L x 3/8" Thread | 107-0171-616 | 4 |

**TABLE 1. UltraGlide Installation Kit (P/N 117-0232-130)**

| Picture | Item Description | Part Number | Qty. |
|---|---|---|---|
|  | Bolt - 5/816"-18 x 7/8" Hex | 311-0052-104 | 4 |
|  | Bolt - 3/8"-16 UNC x 1-1/4" Hex | 311-0054-081 | 15 |
|  | Nut - 3/8"-16 Zinc Flanged Lock | 312-1001-164 | 31 |
|  | Washer - 5/816" Zinc Lock | 313-1000-019 | 4 |

## AUTOBOOM INSTALLATION KIT - 120' BOOMS

**TABLE 2. UltraGlide Installation Kit (P/N 117-0232-129)**

| Picture | Item Description | Part Number | Qty. |
|---|---|---|---|
| Not Pictured | Manual - ISO AutoBoom for Case IH Calibration and Operation | 016-0130-079 | 1 |
| Not Pictured | Manual - Case IH 3230/3240 and 3320/3330/3340/4420/4430/4440, Model Year 2010 & Newer AutoBoom Installation | 016-0230-129 | 1 |
|  | Valve - AutoBoom Hydraulic | 063-0131-124 | 1 |
|  | Node - Case IH ISO AutoBoom | 063-0130-053 | 1 |
|  | Sensor - Left Ultrasonic | 063-0130-012 | 1 |

**TABLE 2. UltraGlide Installation Kit (P/N 117-0232-129)**

| Picture | Item Description | Part Number | Qty. |
|---|---|---|---|
|  | Sensor - Right Ultrasonic | 063-0130-014 | 1 |
|  | Sensor - Center Ultrasonic | 063-0130-018 | 1 |
|  | Bracket - Valve Mounting | 107-0171-802 | 1 |
|  | Bracket - Sensor Mounting | 107-0172-501 | 2 |
|  | Cable - 70' Ultrasonic Sensor Extension | 115-0171-527 | 2 |
|  | Cable - AutoBoom Harness | 115-0230-032 | 1 |
|  | U-Bolt - 2-1/16" W x 3" L x 3/8" Thread | 107-0171-609 | 4 |
|  | U-Bolt - 2-9/16" W x 4" L x 3/8" Thread | 107-0172-645 | 2 |
|  | U-Bolt - 2-9/16" W x 3-1/2" L x 3/8" Thread | 107-0171-616 | 4 |
|  | Bolt - 5/816"-18 x 7/8" Hex | 311-0052-104 | 4 |
|  | Bolt - 3/8"-16 UNC x 1-1/4" Hex | 311-0054-081 | 15 |

**TABLE 2. UltraGlide Installation Kit (P/N 117-0232-129)**

| Picture | Item Description | Part Number | Qty. |
|---|---|---|---|
|  | Nut - 3/8"-16 Zinc Flanged Lock | 312-1001-164 | 31 |
|  | Washer - 5/816" Zinc Lock | 313-1000-019 | 4 |

## HYDRAULIC INSTALLATION KIT

**TABLE 3. Hydraulic Kit (P/N 117-0134-075)**

| Picture | Item Description | Part Number | Qty. |
|---|---|---|---|
|  | Fitting - -8 ORFS M/M/F Swivel Run Tee | 333-0012-028 | 2 |
|  | Fitting - -6 ORFS M/F 90° Swivel Elbow | 333-0012-065 | 2 |
|  | Fitting - -6 ORFS M/M/F Swivel Run Tee | 333-0012-069 | 4 |
|  | Fitting - -6 ORFS (M) to -6 SAE O-Ring (M) Straight Adapter | 333-0012-084 | 2 |
|  | Fitting - -6 ORFS (M) to -8 SAE O-Ring (M) 90° Elbow | 333-0012-165 | 2 |
|  | Fitting - -8 ORFS (M) to -8 SAE O-Ring (M) Straight Adapter | 333-0012-168 | 2 |
|  | Fitting - -6 Hex -6 O-Ring Plug | 333-0012-194 | 2 |

**TABLE 3. Hydraulic Kit (P/N 117-0134-075)**

| Picture | Item Description | Part Number | Qty. |
|---|---|---|---|
|  | Hydraulic Hose - -8 ORFS (F) to -8 ORFS (F) 90 ° - 36″ | 214-1000-311 | 2 |
|  | Hydraulic Hose - -6 ORFS (F) 90° to -6 ORFS (F) - 44″ | 214-1000-494 | 4 |

## OPTIONAL INNER ULTRASONIC SENSOR INSTALLATION KIT

**TABLE 4. Inner Ultrasonic Installation Kit (P/N 117-0137-026)**

| Picture | Item Description | Part Number | Qty. |
|---|---|---|---|
|  | Sensor - Left Ultrasonic | 063-0130-012 | 1 |
|  | Sensor - Right Ultrasonic | 063-0130-014 | 1 |
|  | Bracket - Sensor Mounting | 107-0172-501 | 3 |
|  | Cable - 40′ Ultrasonic Sensor Extension | 115-0171-602 | 2 |
|  | U-Bolt - 2-1/16″ W x 3″ L x 3/8″ Thread | 107-0171-609 | 4 |
|  | Bolt - 3/8″-16 UNC x 1-1/4″ Hex | 311-0054-081 | 8 |
|  | Nut - 3/8″-16 Zinc Flanged Lock | 312-1001-164 | 16 |

## OPTIONAL WHEEL KIT - 90'-100' BOOMS

**TABLE 5. Optional Wheel Kit (P/N 117-0134-006)**

| Picture | Item Description | Part Number | Qty. |
|---|---|---|---|
|  | Axle Assembly - Right Cushioned AutoBoom | 063-0131-585 | 1 |
|  | Axle Assembly - Left Cushioned AutoBoom | 063-0131-590 | 1 |
|  | Bracket - Left Weldment Receiver | 116-0159-544 | 2 |
|  | Bracket - Hub Retainer | 107-0171-617 | 2 |
|  | Wheel | 322-0131-008 | 2 |
|  | U-Bolt - 2-1/16" W x 3" L x 3/8" Thread | 107-0171-609 | 4 |
|  | U-Bolt - 1-5/16" W x 2" L x 3/8" Thread | 107-0171-612 | 4 |
|  | Bolt - 1/2"-13 x 1-1/2" SS Hex | 311-0058-186 | 4 |
|  | Nut - 1/2"-13 Zinc Plated Hex | 312-1001-043 | 4 |
|  | Nut - 3/8"-16 Zinc Flanged Lock | 312-1001-164 | 16 |

## OPTIONAL WHEEL KIT - 120' BOOMS

**TABLE 6. Optional Wheel Kit (P/N 117-0133-075)**

| Picture | Item Description | Part Number | Qty. |
|---|---|---|---|
|  | Axle Assembly - Straight AutoBoom | 063-0131-567 | 2 |
|  | Bracket - CaseIH 120' Boom Weldment | 116-0159-680 | 2 |
|  | Wheel | 322-0131-008 | 2 |
|  | U-Bolt - 2-1/16" W x 3" L x 3/8" Thread | 107-0171-609 | 8 |
|  | Bolt - 1/2"-13 x 1-1/2" Stainless Steel Hex | 311-0058-186 | 4 |
|  | Nut - 1/2"-13 Zinc Hex | 312-1001-043 | 4 |
|  | Nut - 3/8"-16 Zinc Flanged Lock | 312-1001-164 | 16 |

# CHAPTER 3 HYDRAULIC SYSTEM INSTALLATION

**⚠ WARNING**

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

**⚠ CAUTION**

When installing AutoBoom 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 AutoBoom hydraulic valve.

***NOTICE***

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

## INSTALL FITTINGS ON THE AUTOBOOM VALVE

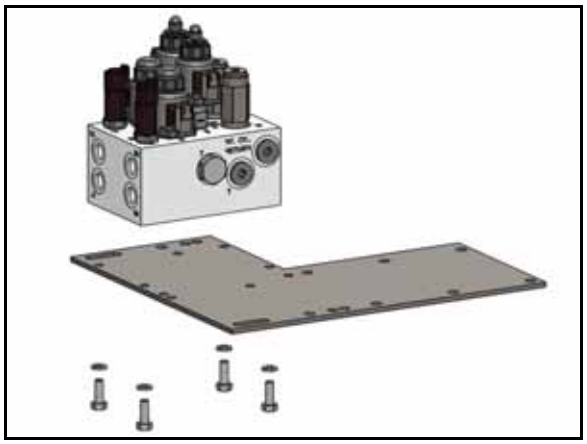
Before mounting the AutoBoom valve on the machine, install the proper fittings in the valve. This prepares the valve for installation and simplifies the hose connection process later in the procedure.

Refer to the following table to install the fittings in the appropriate ports of the AutoBoom valve.

| Fitting | Part Number | Port |
|---|---|---|
| Fitting - -6 ORFS (M) to -8 SAE O-Ring (M) 90° Elbow | 333-0012-165 | LF CYL RTN, RT CYL RTN |
| Fitting - -6 ORFS (M) to -6 SAE O-Ring (M) Straight Adapter | 333-0012-084 | LC, RC |
| Fitting - -8 ORFS (M) to -8 SAE O-Ring (M) Straight Adapter | 333-0012-168 | P, T |
| Fitting - -6 Hex 9/16" O-Ring Plug | 333-0012-194 | LV, RV |

## MOUNT THE AUTOBOOM VALVE

**FIGURE 1. AutoBoom Valve Mounted on the Valve Mounting Bracket**



1. Secure the UltraGlide AutoBoom valve (P/N 063-0131-124) to the mounting bracket (P/N 107-0171-802) using four 5/16" hex bolts (P/N 311-0052-104) and four 5/16" lock washers (P/N 313-1000-019).

**FIGURE 2. AutoBoom Valve Mounted on the Sprayer**

2. Secure the mounting bracket to the machine center rack using two 2-9/16" W x 3-1/2" L x 3/8" thread U-bolts (P/N 107-0171-616) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).

**NOTE:** Mount the AutoBoom valve so that Port P is facing up and LC and RC Ports are facing the center of the machine.

## INSTALL THE PRESSURE AND TANK HOSES

**⚠ WARNING**

Hydraulics are under pressure. Care should always be taken with a system that has been pressurized. When disconnecting or purging hydraulic hoses, be aware that the hydraulic fluid within the machine system may be extremely hot and under high pressure.

**⚠ CAUTION**

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

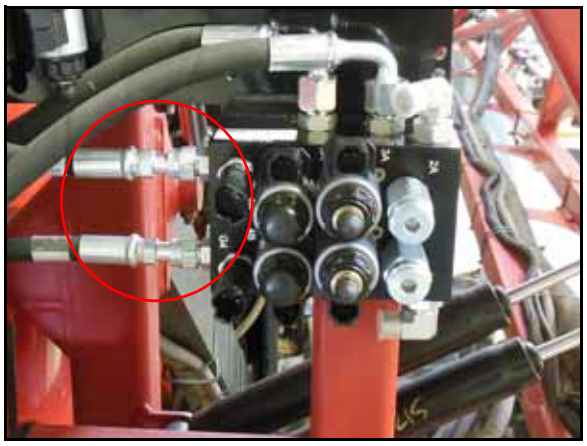
Objects or materials that are able to bypass the machine hydraulic filtration system will reduce performance and possibly cause damage to the AutoBoom hydraulic valve.

**FIGURE 3. Pressure and Tank Hoses Installed**

1. Disconnect the existing pressure hose from the machine hydraulic valve.
2. Install a -8 ORFS M/M/F swivel run tee fitting (P/N 333-0012-028) in the pressure port.
3. Attach the pressure hose to the opposite end of the installed tee fitting.
4. Connect the 90° end of the supplied hydraulic hose (P/N 214-1000-311) to the 90° end of the installed tee fitting.
5. Connect the straight end of the installed hydraulic hose to Port P on the AutoBoom valve.
6. Disconnect the existing tank hose from the machine hydraulic valve.
7. Install a -8 ORFS M/M/F swivel run tee fitting (P/N 333-0012-028) in the tank port on the machine hydraulic valve.
8. Attach the existing tank hose to the opposite end of the installed tee fitting.
9. Connect the 90° end of the supplied hydraulic hose (P/N 214-1000-311) to the 90° end of the installed tee fitting.
10. Connect the straight end of the installed hydraulic hose to Port T on the AutoBoom valve.

## INSTALL THE LEFT AND RIGHT CYLINDER HOSES

**FIGURE 4. Left and Right Cylinder Hoses Installed**

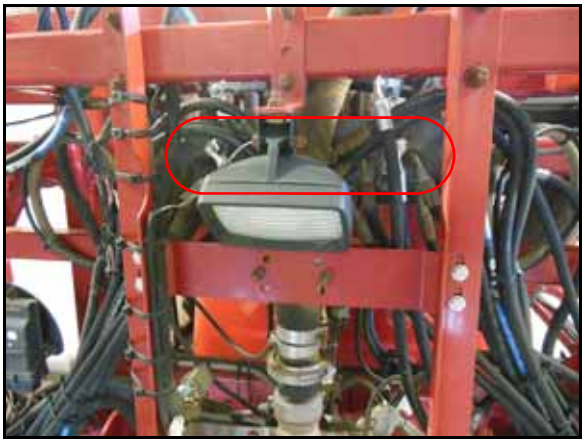


1. Trace the existing left and right cylinder tilt hoses from the rod-end of the tilt cylinders to the hydraulic valve.

2. Disconnect the existing left and right cylinder tilt hoses from the hydraulic valve.
3. Install -6 ORFS M/M/F swivel run tee adapter fittings (P/N 333-0012-069) in the tilt hose ports of the machine hydraulic block.
4. Connect the machine right tilt hose to the opposite end of the tee fitting installed in the right tilt port of the machine hydraulic valve.
5. Connect the 90° end of the supplied hydraulic hose (P/N 214-1000-494) to the 90° end of the installed tee fitting.
6. Connect the straight end of the installed hydraulic hose to the installed fitting in Port RC of the AutoBoom valve.
7. Connect the existing left tilt hose to the opposite end of the tee fitting installed in the left tilt port of the hydraulic valve.
8. Connect the 90° end of the supplied hydraulic hose (P/N 214-1000-494) to the 90° end of the installed tee fitting.
9. Connect the straight end of the installed hydraulic hose to the installed fitting in Port LC of the AutoBoom valve.

## INSTALL THE LEFT AND RIGHT DOWN HOSES

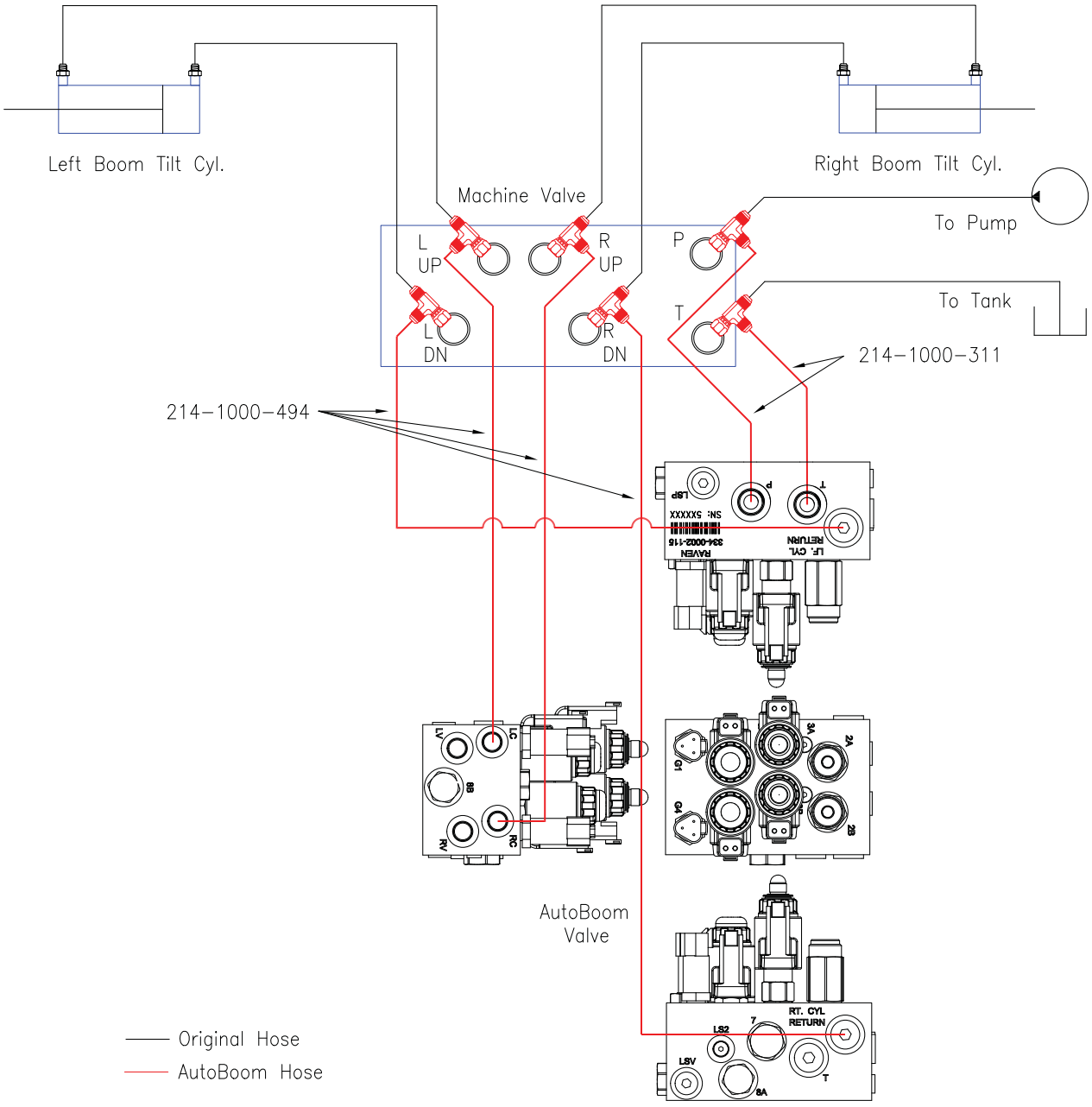
**FIGURE 5. Left and Right Down Hoses Installed**



1. Trace the existing left and right cylinder return hoses from the base-end of the tilt cylinders to the machine hydraulic valve.
2. Disconnect the existing left and right cylinder return hoses from the hydraulic valve.
3. Install -6 ORFS M/M/F swivel run tee adapter fittings (P/N 333-0012-069) in the return ports of the hydraulic valve.
4. Connect the existing right cylinder return hose to the opposite end of the tee fitting installed in the right return port.
5. Connect the 90° end of the supplied hydraulic hose (P/N 214-1000-494) to the 90° end of the installed tee fitting.
6. Connect the straight end of the installed hydraulic hose to the installed fitting in Port RT CYL RTN of the AutoBoom valve.
7. Connect the existing left cylinder return hose to the opposite end of the tee fitting installed in the left return port.
8. Connect the 90° end of the supplied hydraulic hose (P/N 214-1000-494) to the 90° end of the installed tee fitting.

9. Connect the straight end of the installed hydraulic hose to the installed fitting in Port LF CYL RTN of the AutoBoom valve.

## ULTRAGLIDE HYDRAULIC SCHEMATIC



# CHAPTER 4 SENSOR INSTALLATION

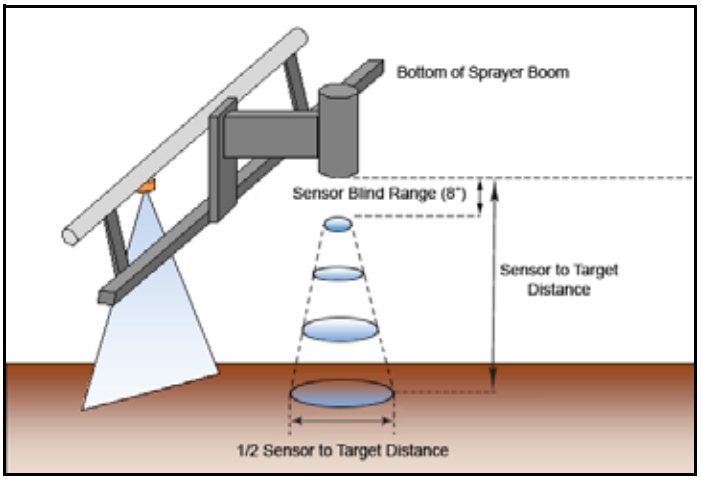
**NOTE:** For optimal system performance, Raven Industries recommends a five sensor system configuration. If the machine is not already equipped with inner sensors, a dual system upgrade kit (P/N 117-0137-026) is required to complete the five sensor configuration. The dual sensor upgrade kit is sold separately. Contact your local Raven dealer for ordering information.

## MOUNT THE BOOM SENSORS

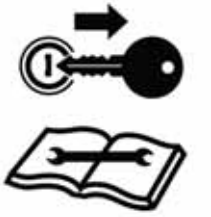
### BOOM SENSOR MOUNTING LOCATIONS

Sensor mounting locations may be influenced by the boom configuration. If an object enters the blind rage of the sensor unexpectedly, a false echo return to the sensor could occur, causing the boom to drop and the sensor or boom to be damaged. To ensure optimal operation of the UltraGlide system and to protect the sprayer boom, the sensor should be mounted on the front side of the boom, 8 - 10" above the lowest hanging part of the boom.

**FIGURE 1. Illustration of Sensor Blind Range**



## MOUNT THE BOOM SENSORS



**⚠ WARNING**

The machine must remain stationary and switched off, with the boom unfolded and supported, during installation or maintenance.

**FIGURE 2. Sensor Installed on Mounting Bracket**

1. Install the left and right ultrasonic sensors (P/N 063-0130-012 and 063-0130-014) on the ultrasonic sensor mounting brackets (P/N 107-0172-501) using four 3/8"-16 x 1-1/4" hex bolts (P/N 311-0054-081) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164) per sensor.

**FIGURE 3. Left Boom Sensor Installed**

2. Mount the left boom sensor assembly on the front of the left-outer boom section using two 2-1/16" W x 3" L x 3/8" thread U-bolts (P/N 107-0171-609) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
3. Mount the right boom sensor assembly on the front of the right-outer boom section using two 2-1/16" W x 3" L x 3/8" thread U-bolts (P/N 107-0171-609) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).

**FIGURE 4. Left Inner Boom Sensor Installed**

4. If optional inner boom sensors are being installed, repeat the steps above to mount the inner boom sensors to the front of the boom.

**NOTE:** Ensure that the sensor does not contact the inner boom section when the boom is folded in toward the cab.

## MOUNT THE CENTER SENSOR

**FIGURE 5. Center Sensor Installed**

1. Install the remaining ultrasonic sensor (P/N 063-0130-012) on the remaining ultrasonic sensor mounting bracket (P/N 107-0172-501) using four 3/8"-16 x 1-1/4" hex bolts (P/N 311-0054-081) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
2. Mount the center sensor assembly to the right side of the center rack using two 2-9/16" W x 4" L x 3/8" thread U-bolts (P/N 107-0172-645) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).

## CONNECT THE SENSOR CABLES

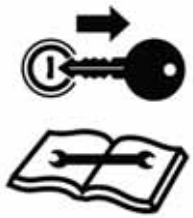
1. Connect the left sensor extension cable (P/N 115-0171-527 or 115-0230-051) to the connector on the left sensor.
2. Route the left sensor cable toward the AutoBoom valve.
3. Loop and tie-off any excess cable, allowing enough cable for boom folding and extension.
4. Repeat the steps above to connect the remaining sensor cables.

**NOTE:** The sensor cables will be connected to the AutoBoom system in the wiring phase of installation.

# CHAPTER 5 GAUGE WHEEL INSTALLATION - OPTIONAL

## GAUGE WHEEL MOUNTING LOCATIONS

Wheel mounting locations may be influenced by the boom configuration. Determine the appropriate location for mounting the wheels on the boom, ensuring the wheels will not interfere with or be damaged while folding or unfolding the booms. The wheel should be mounted outside of the boom fold, but inside the boom breakaway.



**⚠ WARNING**

The machine must remain stationary and switched off, with the booms unfolded and supported, while installation or maintenance is conducted.

## MOUNT THE GAUGE WHEELS

### 90'-100' BOOMS

**NOTE:** The appearance of the wheel axles may vary.

**FIGURE 1. Gauge Wheel Installed**

1. Remove the nuts from the right wheel axle (P/N 063-0131-585).
2. Place the wheel (P/N 322-0131-008) on the right wheel axle.
3. Align and place the hub retainer bracket (P/N 107-0171-617) over the wheel.
4. Reinstall the lug nuts on the wheel axle to secure the wheel and hub retainer bracket.
5. Mount the right wheel receiver bracket (P/N 116-0159-601) to the front of the right boom using two 1-5/16" W x 2" L x 3/8" thread U-bolts (P/N 107-0171-612), two 2-1/16" W x 3" L x 3/8" thread U-bolts (P/N 107-0171-609), and eight 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
6. Insert the right wheel axle into the right wheel receiver bracket, positioning it so that the bottom of the wheel touches the ground (or nearly so) and the wheel faces away from the machine.
7. Secure the gauge wheel assembly in the wheel mounting bracket by installing two 1/2"-13 x 1-1/2" SS hex bolts (P/N 311-0052-186) and two 1/2"-13 zinc hex nuts (P/N 312-1000-043).
8. Repeat the steps above to install the left wheel.

## 120' BOOMS

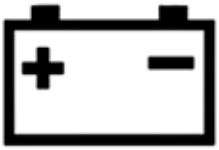
**NOTE:** The appearance of the wheel axles may vary.

**FIGURE 2. Gauge Wheel Installed**

1. Remove the nuts from the wheel axle (P/N 063-0131-567).
2. Remove the hub retainer bracket from the wheel axle.
3. Place the wheel (P/N 322-0131-008) on the wheel axle.
4. Align and place the hub retainer bracket over the wheel.
5. Reinstall the lug nuts on the wheel axle to secure the wheel and hub retainer bracket.
6. Mount the receiver bracket (P/N 116-0159-680) to the front of the left boom using four 2-1/16" W x 3" L x 3/8" thread U-bolts (P/N 107-0171-609) and eight 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
7. Insert the wheel axle into the receiver bracket, positioning it so that the bottom of the wheel touches the ground (or nearly so) and the wheel faces away from the machine.
8. Secure the gauge wheel assembly in the wheel mounting bracket by installing two 1/2"-13 x 1-1/2" SS hex bolts (P/N 311-0058-186) and two 1/2"-13 zinc hex nuts (P/N 312-1001-043).
9. Repeat the steps above to install the right wheel.

# CHAPTER 6 WIRING INSTALLATION

## WIRING CONNECTIONS



**⚠ CAUTION**

Always connect the power cable as the last step in the wiring process and verify that the power leads are connected with the correct polarity. Reversing power leads can cause severe damage to the equipment.

For wiring connections made outside the cab, apply dielectric silicone grease (P/N 222-0000-006) generously on both the male and female ends of the connectors. Application of the grease will prevent corrosion to the pins and wires.

## INSTALL THE AUTOBOOM NODE

**FIGURE 1. UltraGlide AutoBoom Node Installed**

1. Mount the AutoBoom node (P/N 063-0130-053) to the valve mounting bracket (P/N 107-0171-802) using three 3/8"-16 UNC x 1-1/4" zinc plated hex bolts (P/N 311-0054-106) and three 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).

**NOTE:** Position the node so that the cable connectors face down.

2. Insert the large, rectangular node connector on the harness cable (P/N 115-0230-032 or 115-0230-073) into the both ports of the AutoBoom node.
3. Tighten the bolt on the node connector to secure the connections.

## CONNECT THE HARNESS TO THE AUTOBOOM VALVE

1. Locate the LEFT PRESS and RIGHT PRESS connectors on the harness cable (P/N 115-0230-032 or 115-0230-073).
2. Route the connectors to the AutoBoom valve (P/N 063-0131-124).
3. Connect the LEFT PRESS connector to Port G1 on the AutoBoom valve.
4. Connect the RIGHT PRESS connector to Port G4 on the AutoBoom valve.
5. Locate the LEFT SOLENOID and RIGHT SOLENOID connectors on the harness cable.
6. Connect the LEFT SOLENOID connector to Port 4A on the AutoBoom valve.
7. Connect the RIGHT SOLENOID connector to Port 4B on the AutoBoom valve.
8. Locate the LEFT PROP and RIGHT PROP connectors on the harness cable.
9. Connect the LEFT PROP connector to Port 5A on the AutoBoom valve.
10. Connect the RIGHT PROP connector to Port 13A on the AutoBoom valve.

## CONNECT THE HARNESS TO THE SENSORS

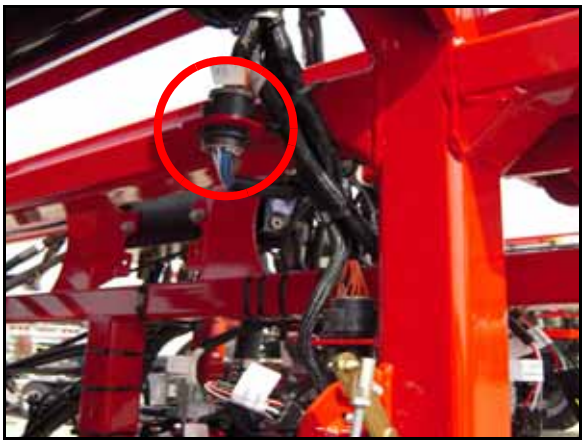
**FIGURE 2. Sensor Cables Connected**

1. Locate the LEFT SENSOR (OUTER) connector on the AutoBoom harness cable (P/N 115-0230-032 or 115-0230-073).
2. Connect the LEFT SENSOR (OUTER) connector to the sensor cable (P/N 115-0171-527 or 115-0230-051) installed on the end of the left boom.
3. Locate the RIGHT SENSOR (OUTER) connector on the AutoBoom harness cable.
4. Connect the RIGHT SENSOR (OUTER) connector to the sensor cable (P/N 115-0171-527 or 115-0230-051) installed on the end of the right boom.
5. If optional inside boom sensors are installed, repeat the steps above to connect the harness to the inner boom sensors.
6. Locate the CENTER SENSOR cable and connect it directly to the center sensor.

# CONNECT THE HARNESS TO THE POWER/CAN CONTROLS

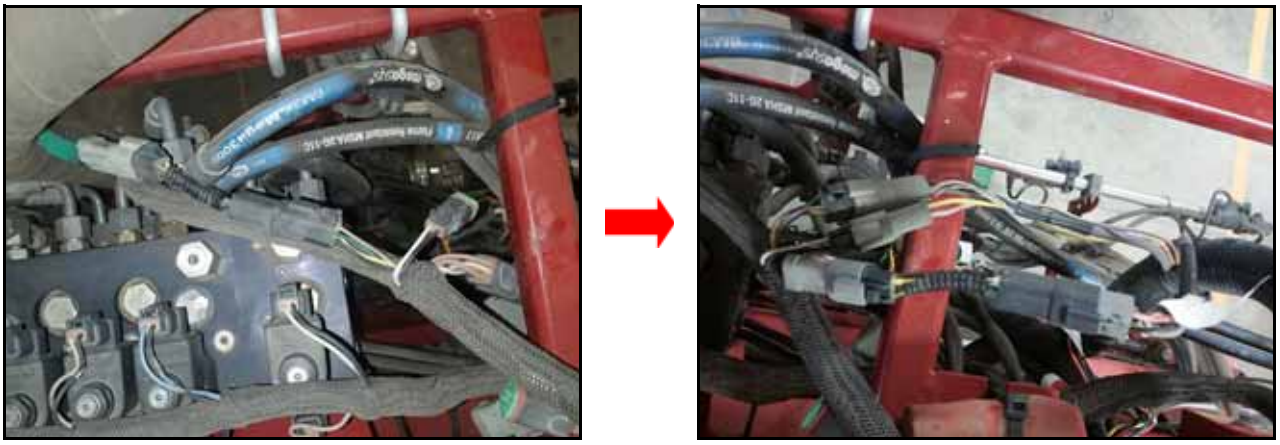
## 90'-100' BOOMS

**FIGURE 3. AutoBoom Harness Cable Installed**



1. Locate the existing harness cable bulkhead on the center boom section, near the pressure transducers on the sprayline.
2. Disconnect the cable from the bulkhead connector.
3. Attach the appropriate ends of the AutoBoom harness cable (P/N 115-0230-073) to the existing cable and the bulkhead connector

**FIGURE 4. CAN and Logic Power Connections**



4. Locate the existing CAN and auxiliary power connectors on the top of the center rack, near the machine hydraulic valve.
5. Connect the existing CAN connector to the CAN tee on the AutoBoom harness cable (P/N 115-0230-073).
6. Reconnect the existing harness or the CAN terminator on the other end of the CAN tee.

7. Connect the AUX POWER connector to the LOGIC POWER connector on the AutoBoom harness.

**NOTE:** If the AUX POWER connector is connected to another harness, disconnect it and connect it to the AUX POWER connector of the AutoBoom harness.

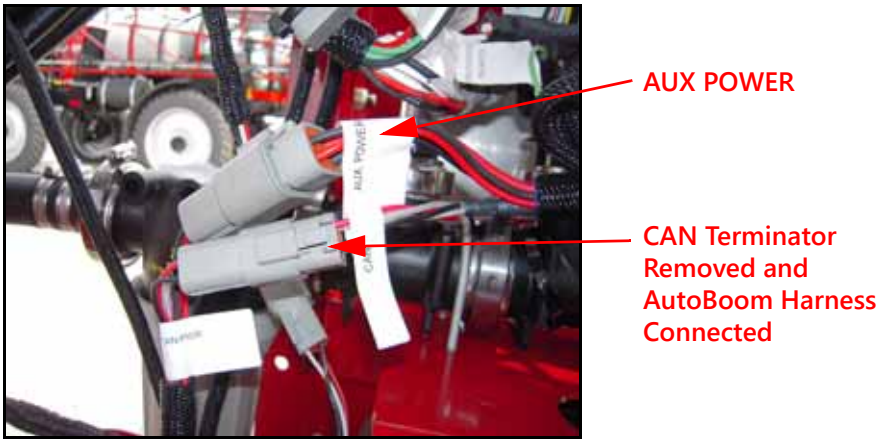
**NOTE:** The LEFT PROX SWITCH and RIGHT PROX SWITCH connections on the AutoBoom cable (P/N 115-0230-073) remain disconnected on after-market AutoBoom installations. They are connected only on machines that have factory-installed proximity switches on the main boom fold section

## 120' BOOMS

**FIGURE 5. AutoBoom Harness Cable Installed**

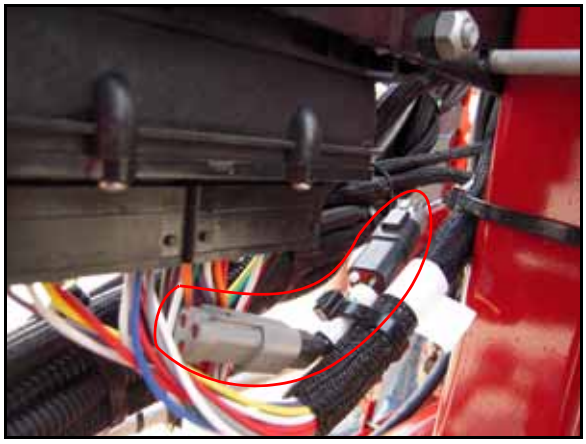
1. Locate the machine harness cable on the center boom section, near the pressure transducers on the spray line.

**FIGURE 6. CAN and Aux Power Connections**



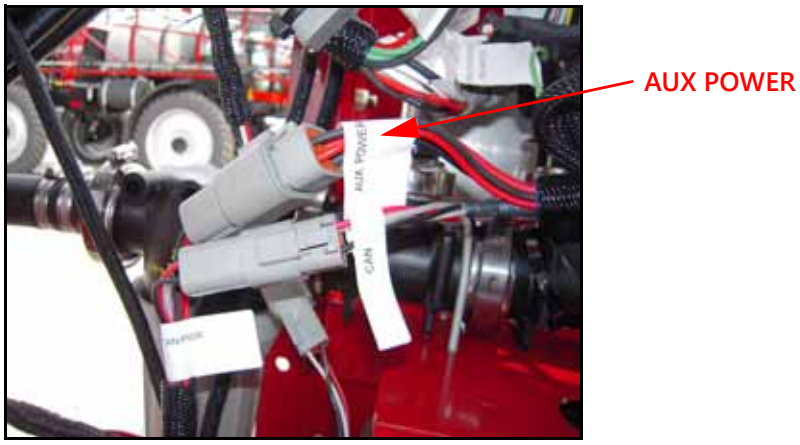

2. Disconnect the CAN terminator from the machine harness.

**FIGURE 7. CAN Terminator Connected to AutoBoom Harness Cable**



3. Connect the CAN terminator to the CAN connection on the harness cable (P/N 115-0230-032).
4. Connect the AutoBoom harness cable CAN connection to the open CAN connection on the machine harness.

**FIGURE 8. CAN and Aux Power Connections**

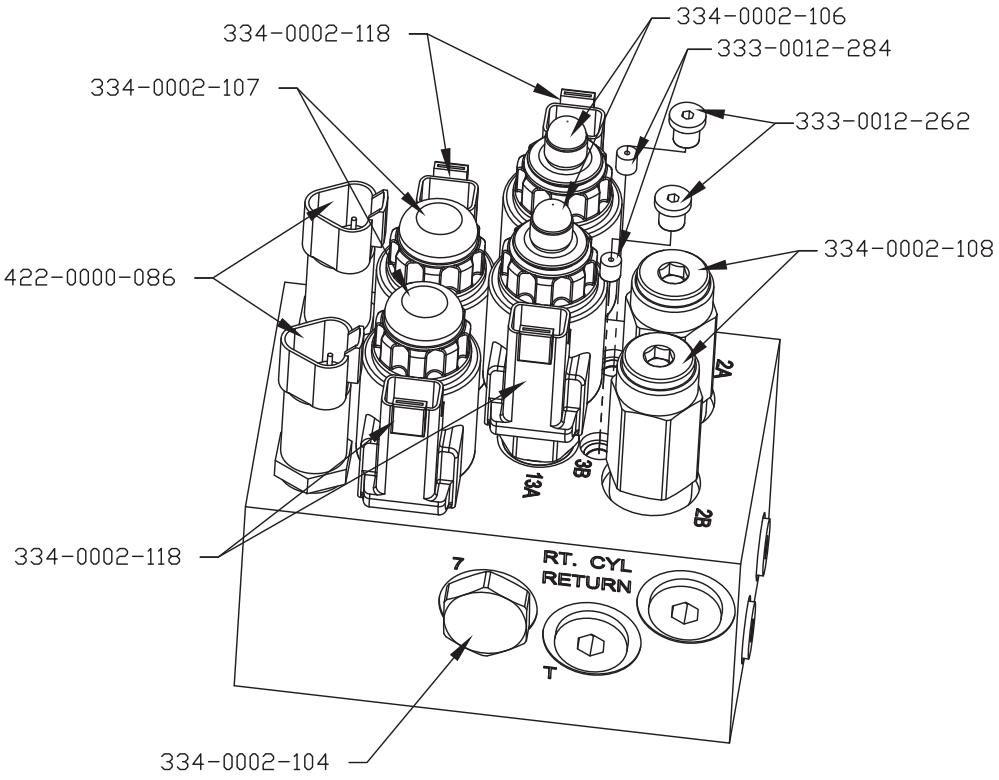



1. Locate the existing auxiliary power connectors on the center boom section, near the flow meter and filter.
2. Connect the AUX POWER connector to the AUX POWER connector on the AutoBoom harness cable.

# CHAPTER 7 REPLACEMENT PARTS

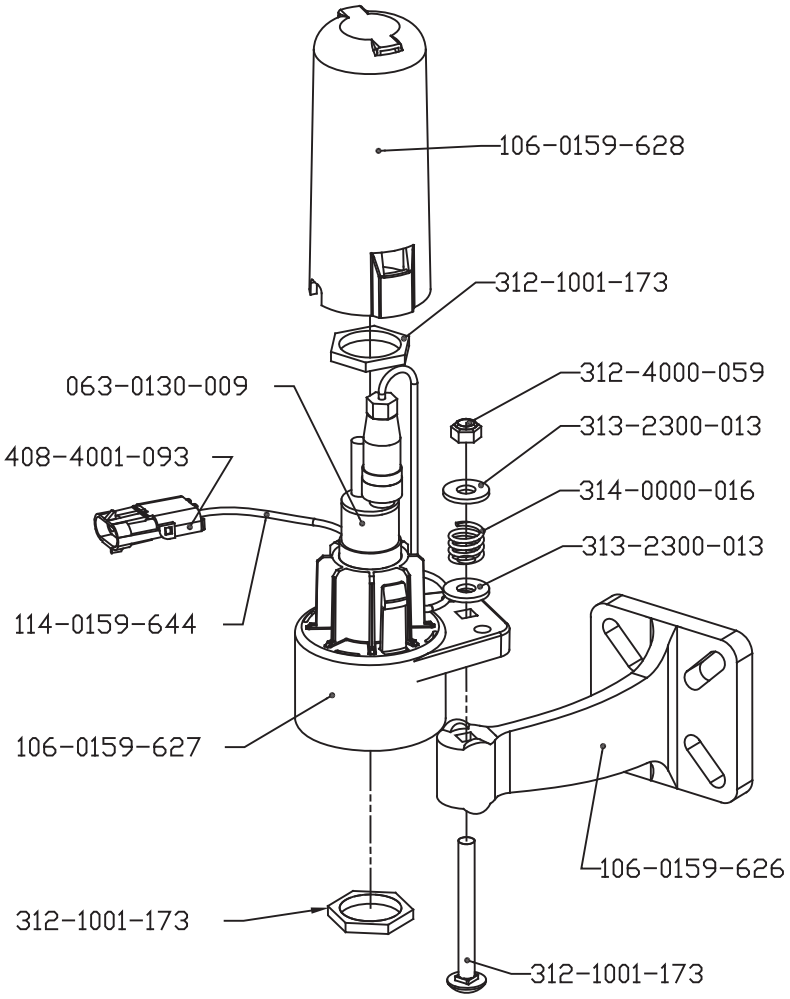
This section contains replacement part diagrams and listings for the AutoBoom system. Please refer to these diagrams when calling to request replacement parts.

## VALVE




063-0131-124
VALVE, HYDRAULIC POWERGLIDE
PLUS/ULTRAGLIDE, CLOSED CENTER, AUTOBOOM

## SENSORS


106-0159-628
312-1001-173
063-0130-009
312-4000-059
313-2300-013
408-4001-093
314-0000-016
313-2300-013
114-0159-644
106-0159-627
106-0159-626
312-1001-173
312-1001-173

# E

**Electrical Safety** 3

# G

**Gauge Wheel Installation** 25
Gauge Wheel Mounting Locations 25
Mounting the Gauge Wheels 25
120' Booms 26
90'-100' Booms 25

# H

**Hydraulic Safety** 2
**Hydraulic System** 15
Installing Fittings on the AutoBoom Valve 15
Installing the Left and Right Cylinder Hoses 18
Installing the Left and Right Down Hoses 19
Installing the Pressure and Tank Hoses 17
Mounting the AutoBoom Valve 16
UltraGlide Hydraulic Schematic 20

# I

**Important Safety Information**
Electrical Safety 3
General 3
Instructions for Wire Routing 3
Hydraulic Safety 2
General 2
Instructions for Hose Routing 2
**Introduction**
Hydraulic
Fittings 6
Kit Contents 7
AutoBoom Installation Kit
120' Booms 9
90'-100' Booms 7
Hydraulic Kit 11
Optional Inner Ultrasonic Sensor Installation Kit 12
Optional Wheel Kit
120' Booms 14
90'-100' Booms 13
Preparing or Installation 5
Point of Reference 6
Recommendations 6
Tools Needed 6
Updates 7

# K

**Kit Contents** 7

# P

**Preparing for Installation** 5

# R

**Replacement Parts** 33
Sensors 34
Valve 33

# S

**Sensor Installation** 21
Connecting the Sensor Cables 24
Mounting the Center Sensor 23

# U

**Ultrasonic Sensor Installation**
Mounting the Boom Sensors 21
Boom Sensor Mounting Locations 21
Mount the Boom Sensors 22

# W

**Wiring**
Connecting the Harness to the AutoBoom Valve 28
Connecting the Harness to the Power/CAN Controls 29
120' Booms 30
90'- 100' Booms 29
Connecting the Harness to the Sensors 28
Installing the AutoBoom Node 27
Wiring Connections 27

We Solve Great Challenges.

# 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.**

We Solve Great Challenges.

# 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.**



RAVEN