

R A V E N

AutoBoom® Installation Manual



AGCO RoGator 9X4, 11X4, and 13X6

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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's position in the machine at all times when AutoBoom is engaged.
- Disable AutoBoom when exiting from the operator's 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 been 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 while installation or maintenance is conducted.

CAUTION

Hydraulic Safety

- 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's 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's hydraulic system. Objects or materials that are able to bypass the machine's hydraulic filtration system will adversely reduce performance and possibly damage the AutoBoom hydraulic valves.

Electrical Safety

- 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.

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. For future reference, write your serial number in the space below.

MAKE: AGCO RoGator

MODEL: 984, 984H, 994, 994H, 1184, 1184H, 1194, 1194H, 1386, 1386H, 1396, and 1396 H

YEAR: 2010 and 2011

FIGURE 1. RoGator 1184



Note: *This manual contains the installation instructions for the PowerGlide Plus and UltraGlide systems. Be sure to identify which system you have and follow only the instructions for that system.*

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's hydraulic filters have been recently changed and there are no issues with the machine's hydraulic system (e.g., pump issues, faulty hydraulic motors, fine metal deposits in the hydraulic hoses, etc.).
- Operate each of the machine's boom hydraulic functions (i.e., tilt, fold, center rack, tongue extension, or other hydraulic valve functions) three times to ensure the machine's 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's 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 (M)



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

-AGCO RoGator 9X4, 11X4, and 13X6 Series, Model Year 2010-2011 AutoBoom® Installation Manual

-Manual No. 016-0230-099 Rev. A

-Any comments or feedback (include chapter or page numbers if applicable).

-Let us know how long have you been using this or other Raven products.

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

Thank you for your time.

PowerGlide Plus Kit Contents

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

TABLE 1. PowerGlide Plus Installation Kit (P/N 117-0231-085)




Picture	Item Description	Part Number	Qty.
Not Pictured	Manual - AutoBoom Calibration & Operation	016-0130-062	1
Not Pictured	Manual - RoGator 9X4, 11X4, and 13X6, Model Year 2010-2011 AutoBoom Installation	016-0230-099	1
	Valve - RoGator Add-On AutoBoom Hydraulic	063-0131-131	1
	Node - AutoBoom	063-0130-010	1
	Bracket - Node Mounting	107-0172-348	1
	Cable - Node Harness	115-0230-104	1

TABLE 1. PowerGlide Plus Installation Kit (P/N 117-0231-085)



Picture	Item Description	Part Number	Qty.
	Cable - Power/CAN	115-0230-105	1
	Cable - Valve and Sensor Harness	115-0230-106	1
	Screw - 1/4"-20 x 3/4" Self-Tapping	311-0001-345	1
	Bolt - 5/16"-18 x 1-3/4"	311-0052-108	1
	Bolt - 5/16"-18 x 2-1/2"	311-0052-111	3
	Bolt - 3/8"-16 x 1"	311-0054-105	3
	Nut - 3/8"-16 Nylon Insert Lock	312-4000-061	3
	Washer - 5/16" Zinc Lock	313-1000-019	4
	O-Ring 9"16 ID Buna-N	219-0001-015	4

TABLE 2. PowerGlide Plus Installation Kit (P/N 117-0231-099)









Picture	Item Description	Part Number	Qty.
Not Pictured	Manual - AutoBoom Calibration & Operation	016-0130-062	1
Not Pictured	Manual - RoGator 9X4, 11X4, and 13X6, Model Year 2010-2011 AutoBoom Installation	016-0230-099	1
	Valve - RoGator Add-On AutoBoom Hydraulic	063-0131-131	1
	Node - AutoBoom	063-0130-010	1
	Bracket - Node Mounting	107-0172-348	1
	Cable - Node Harness	115-0230-104	1
	Cable - CAN/Power	115-0230-105	1
	Cable - Valve and Sensor Harness	115-0230-106	1
	Screw - 1/4"-20 x 3/4" Self-Tapping	311-0001-345	1
	Bolt - 5/16"-18 x 1-3/4"	311-0052-108	1
	Bolt - 5/16"-18 x 2-1/2"	311-0052-111	3

TABLE 2. PowerGlide Plus Installation Kit (P/N 117-0231-099)

Picture	Item Description	Part Number	Qty.
	Bolt - 3/8"-16 x 1"	311-0054-105	3
	Nut - 3/8"-16 Nylon Insert Lock	312-4000-061	3
	Washer - 5/16" Zinc Lock	313-1000-019	4
	O-Ring 9"16 ID Buna-N	219-0001-015	4

TABLE 3. PowerGlide Plus Wheel Kit 90'-100' Booms (P/N 117-0133-101)







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	116-0159-609	1
	Bracket - Right Weldment Receiver	116-0159-610	1
	Bracket - Hub Retainer	107-0171-617	2
	Spacer - Receiver Bracket	116-0159-753	2






TABLE 3. PowerGlide Plus Wheel Kit 90'-100' Booms (P/N 117-0133-101)

Picture	Item Description	Part Number	Qty.
	Wheel	322-0131-003	2
	U-Bolt - 1-9/16" W x 2-1/2" L x 3/8" Thread	107-0171-611	4
	U-Bolt - 2-1/4" W x 4" L x 3/8" Thread	107-0172-308	4
	Bolt - 1/2"-13 x 1-1/2" SS Hex	311-0058-186	4
	Nut - 1/2"-13 Hex	312-1001-043	4
	Nut - 3/8"-16 Zinc Flanged Lock	312-1001-164	16


TABLE 4. PowerGlide Plus Wheel Kit - 120' Booms (P/N 117-0133-085)


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 - Weldment Receiver	116-0159-707	2
	Bracket - Hub Retainer	107-0171-617	2

TABLE 4. PowerGlide Plus Wheel Kit - 120' Booms (P/N 117-0133-085)


Picture	Item Description	Part Number	Qty.
	Wheel	322-0131-003	2
	U-Bolt - 1-9/16" W x 2-1/2" L x 3/8" Thread	107-0171-611	8
	Bolt - 1/2"-13 x 1-1/2" SS Hex	311-0058-186	4
	Nut - 1/2"-13 Hex	312-1001-043	4
	Nut - 3/8"-16 Zinc Flanged Lock	312-1001-164	16

Install the PowerGlide Plus Hydraulic System

	WARNING
	<p>The machine must remain stationary and switched off, with the booms unfolded and supported, during installation or maintenance.</p>
	<p>Hydraulics are under pressure. Care should always be taken with a system that has been pressurized.</p>
	<p>Before beginning the AutoBoom hydraulic installation, turn off the machine and relieve pressure by turning the steering wheel left and right.</p>
	<p>Never work on a hot machine. Always allow it to cool before performing diagnostics, maintenance, or routine service.</p>
	<p>When disconnecting or purging hydraulic hoses, be aware that the hydraulic fluid within the machine's system may be extremely hot and under high pressure.</p>
	<p>Tampering with hydraulic valves may cause serious injury or death, and will void the warranty.</p>

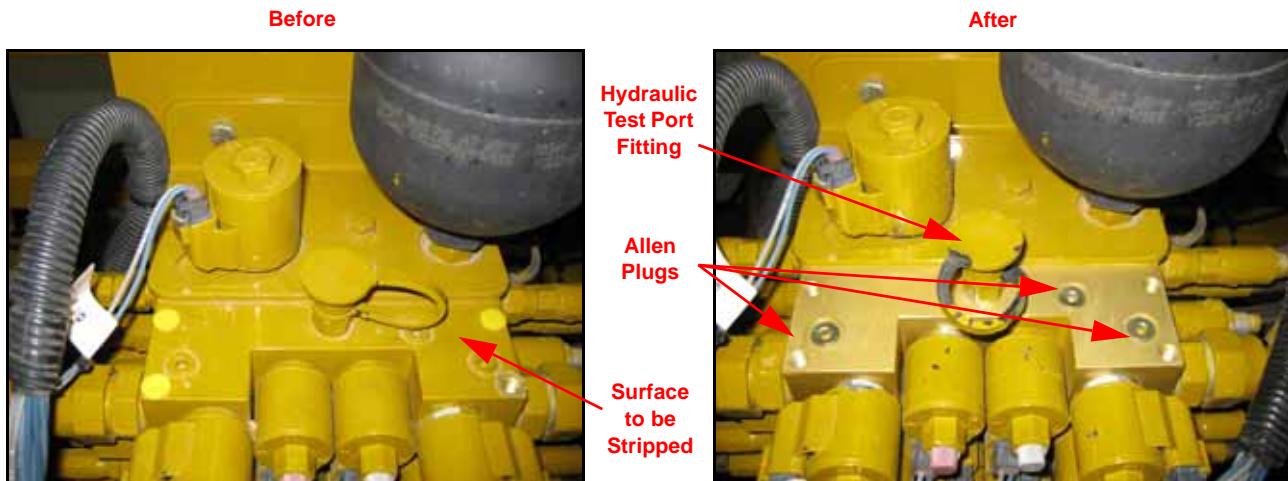
	CAUTION
	<p>When installing AutoBoom hydraulics or performing diagnostics, maintenance, or routine service, ensure precautions are taken to prevent any foreign material from being introduced into the machine's hydraulic system.</p>
	<p>Object or materials that are able to bypass the machine's hydraulic filtration system will reduce performance and possibly damage the AutoBoom hydraulic valve.</p>



	NOTICE
	<p>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.</p>

Mount the AutoBoom Valve

FIGURE 1. Machine's Hydraulic Valve Before AutoBoom Installation



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

Important: Do not scrape the paint from the machine's hydraulic valve. Scraping the paint may cause damage to the valve.

2. Remove the hydraulic test port fitting and Allen plugs from the machine's hydraulic valve.

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

3. Clean the remaining paint from the machine's hydraulic valve, taking care to prevent paint chips from entering the open hydraulic ports.

FIGURE 2. O-Rings Installed on the Machine's Hydraulic Valve

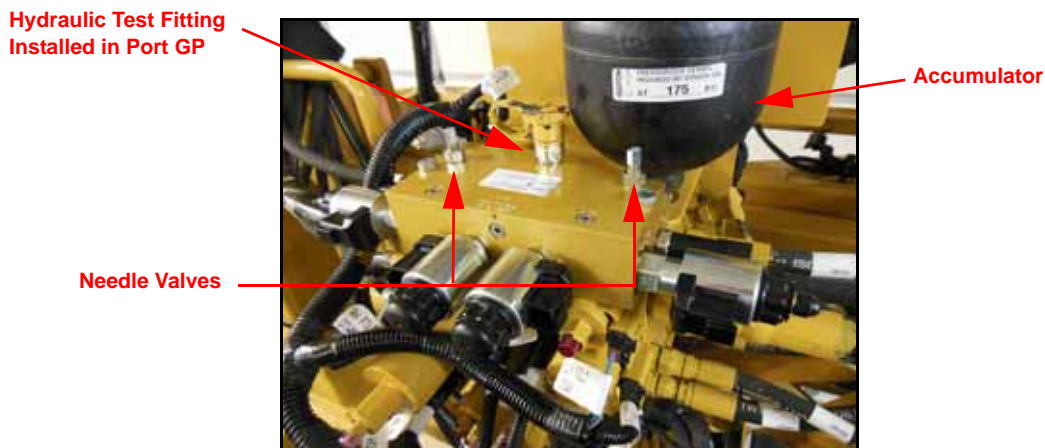


4. Install 9/16" ID Buna-N O-rings (P/N 219-0001-015) in the open ports of the machine's hydraulic valve.

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

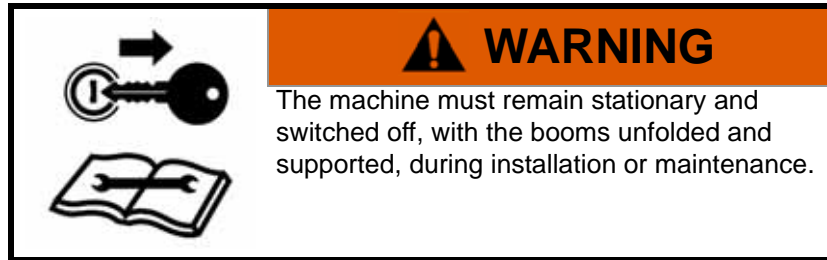
5. Blow the hydraulic port threads of any excess oil.
6. Clean excess oil, grease, and debris from the top of the machine's hydraulic valve.
7. Clean excess hydraulic fluid from the AutoBoom valve (P/N 063-0131-113).
8. Install the supplied 5/16"-18 x 1-3/4" hex bolts (P/N 311-0052-108) and 5/16"-18 x 2-1/2" hex bolts (P/N 311-0052-111) in the AutoBoom valve, placing the shorter bolt in the cut-out section of the AutoBoom valve.

FIGURE 3. AutoBoom Valve Mounted to the Machine's Hydraulic Valve



9. Carefully place the AutoBoom valve on the machine's 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 valve.
12. Locate the needle valves on the AutoBoom valve.
13. Loosen the jam nuts on the needle valves.
14. Turn the screws counter-clockwise until they won't move any further.
15. Tighten the jam nuts.

Install the Gauge Wheels



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 wheels should always be mounted inside the boom breakaway.

Mount the Gauge Wheels

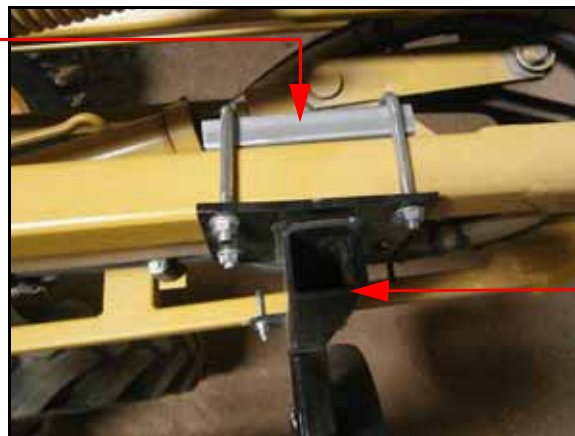
90' - 100 Booms Only

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

1. Remove the nuts from the right wheel axle (P/N 063-0131-585).
2. Place the wheel (P/N 322-0131-003) on the right wheel axle.
3. Align and place the hub retainer bracket (P/N 107-0171-617) over the wheel.
4. Reinstall the nuts on the wheel axle to secure the wheel and hub retainer bracket.

FIGURE 4. Spacer Installed

Receiver Bracket Spacer
(P/N 116-0159-753)



Receiver Bracket
(P/N 116-0159-610)

5. Secure the bottom of the right receiver bracket (P/N 116-0159-610) to the front of the right lower boom, just inside the boom fold, using two 1-9/16" W x 2-1/2" L x 3/8" thread U-bolts (P/N 107-0171-611) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
6. Tighten the nuts to ensure the bottom of the receiver bracket is mounted securely.
7. Loosely secure the top of the receiver bracket to the upper boom tube using two 2-1/4" W x 4" L x 3/8" thread U-bolts and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).

8. Insert a receiver bracket spacer (P/N 116-0159-753) between the upper boom tube and the receiver bracket.
9. Tighten the nuts to ensure the top of the receiver bracket is mounted securely.

FIGURE 5. Gauge Wheel Installed



10. Insert the right wheel axle assembly into the mounting 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.
11. 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" zinc hex nuts (P/N 312-1001-043).
12. Repeat the steps above to install the left gauge wheel on the front of the left boom.

120' Booms Only

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

FIGURE 6. Gauge Wheel Installed

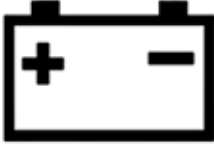


1. Remove the nuts from the right wheel axle (P/N 063-0131-585).
2. Place the wheel (P/N 322-0131-003) on the right wheel axle.
3. Align and place the hub retainer bracket (P/N 107-0171-617) over the wheel.
4. Reinstall the light nuts on the wheel axle to secure the wheel and hub retainer bracket.
5. Secure the receiver bracket (P/N 116-0159-707) to the boom tube using four 1-9/16" x 2-1/2" L x 3/8" thread U-bolts (P/N 107-0171-611) and eight 3/8"-16 flanged lock nuts (P/N 312-1001-164).

6. Insert the right wheel axle assembly into the mounting 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 311-0058-186) and two 1/2" zinc hex nuts (P/N 312-1001-043).
8. Repeat the steps above to install the left gauge wheel on the front of the left boom.

Install the PowerGlide Plus Wiring

Important: Route AutoBoom cables along the machine's existing cables whenever possible. Secure all cables with cable ties to prevent damage from moving parts, heat sources, or other hazards.

	<p style="text-align: center;">⚠ CAUTION</p> <p>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.</p>
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Wiring Connections

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.

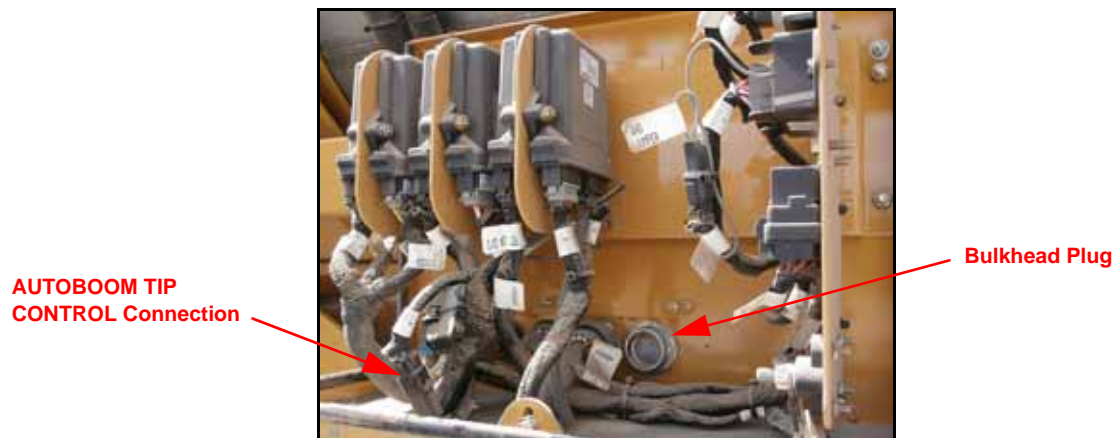
Install the AutoBoom Node and Node Harness

FIGURE 7. Node Mounting Location



1. Locate the node box on the right side of the machine and remove the cover.

FIGURE 8. Bulkhead Plug Location



2. Remove the bulkhead plug shown in Figure 6 above.

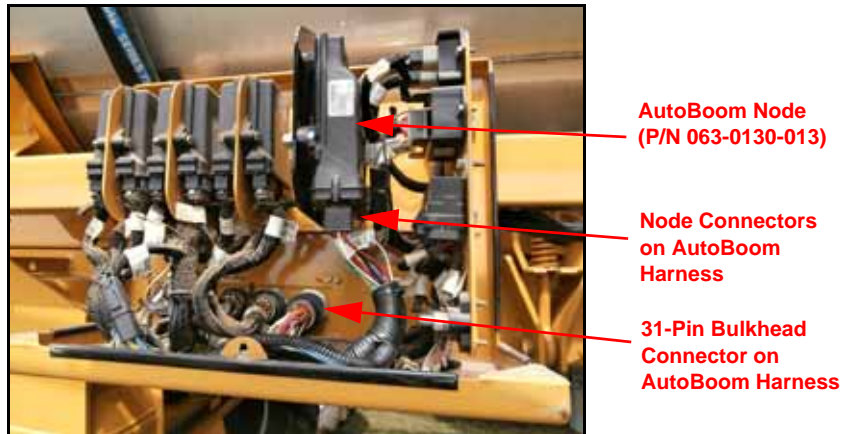
Note: Keep the bulkhead washer and lock nut for use later in this procedure.

FIGURE 9. AUTOBOOM TIP CONTROL Connectors



3. Locate and disconnect the machine's AUTOBOOM TIP CONTROL connectors.
4. Plug the AUTOBOOM TIP CONTROL connectors into the mating BOOM SENSE 1 and BOOM SENSE 2 connectors on the node harness cable (P/N 115-0230-104).

FIGURE 10. AutoBoom Node Installed



5. Connect the large, rectangular connectors on the node harness into the correct ports of the AutoBoom node (P/N 063-0130-010).
6. Tighten the bolts on the node connectors to secure the connections.
7. Secure the AutoBoom node to the node mounting plate (P/N 107-0171-348) using three 3/8"-16 x 1" hex bolts (P/N 311-0054-105) and three 3/8"-16 nylon insert lock nuts (P/N 312-4000-061).
8. Mount the node mounting plate to the node mounting box using the supplied 1/4"-20 x 3/4" self-tapping screw (P/N 311-0001-345).
9. Install the 31-pin connector on the node harness through the inboard side of the node box, securing it using the bulkhead washer and lock nut that were removed from the bulkhead plug.

Install the Valve Harness

Note: The *SENSOR* connectors on the valve harness are not used in the PowerGlide Plus AutoBoom system.

FIGURE 11. Valve Harness Installed on the AutoBoom Valve



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

1. Locate the LEFF PRESS and RIGHT PRESS connectors on the valve harness (P/N 115-0230-106).
2. Route the connectors to the AutoBoom valve (P/N 063-0131-131).

3. Connect the LEFT PRESS connector to Port GL of the AutoBoom valve.
4. Connect the RIGHT PRESS connector to Port GR of the AutoBoom valve.
5. Locate the LEFT SOLENOID and RIGHT SOLENOID connectors on the valve harness.
6. Connect the LEFT SOLENOID connector to Port 8 on the left side of the AutoBoom valve.
7. Connect the RIGHT SOLENOID connector to Port 8 on the right side of the AutoBoom valve.
8. Locate the LEFT PROP and RIGHT PROP connectors on the valve harness.
9. Connect the LEFT PROP connector to Port 6 on the left side of the AutoBoom valve.
10. Connect the RIGHT PROP connector to Port 6 on the right side of the AutoBoom valve.
11. Route the valve harness forward toward the node box.

Install the CAN/Power Cable

1. Connect the SYS HARNESS connector of the power/CAN cable (P/N 115-0230-105) to the mating 31-pin connector on the valve harness (P/N 115-0230-106).
2. Connect the 31-pin AB BULKHEAD connector to the mating 31-pin connector of the node harness (P/N 115-0230-104) installed on the machine's bulkhead.

FIGURE 12. Machine's Existing CAN Terminator



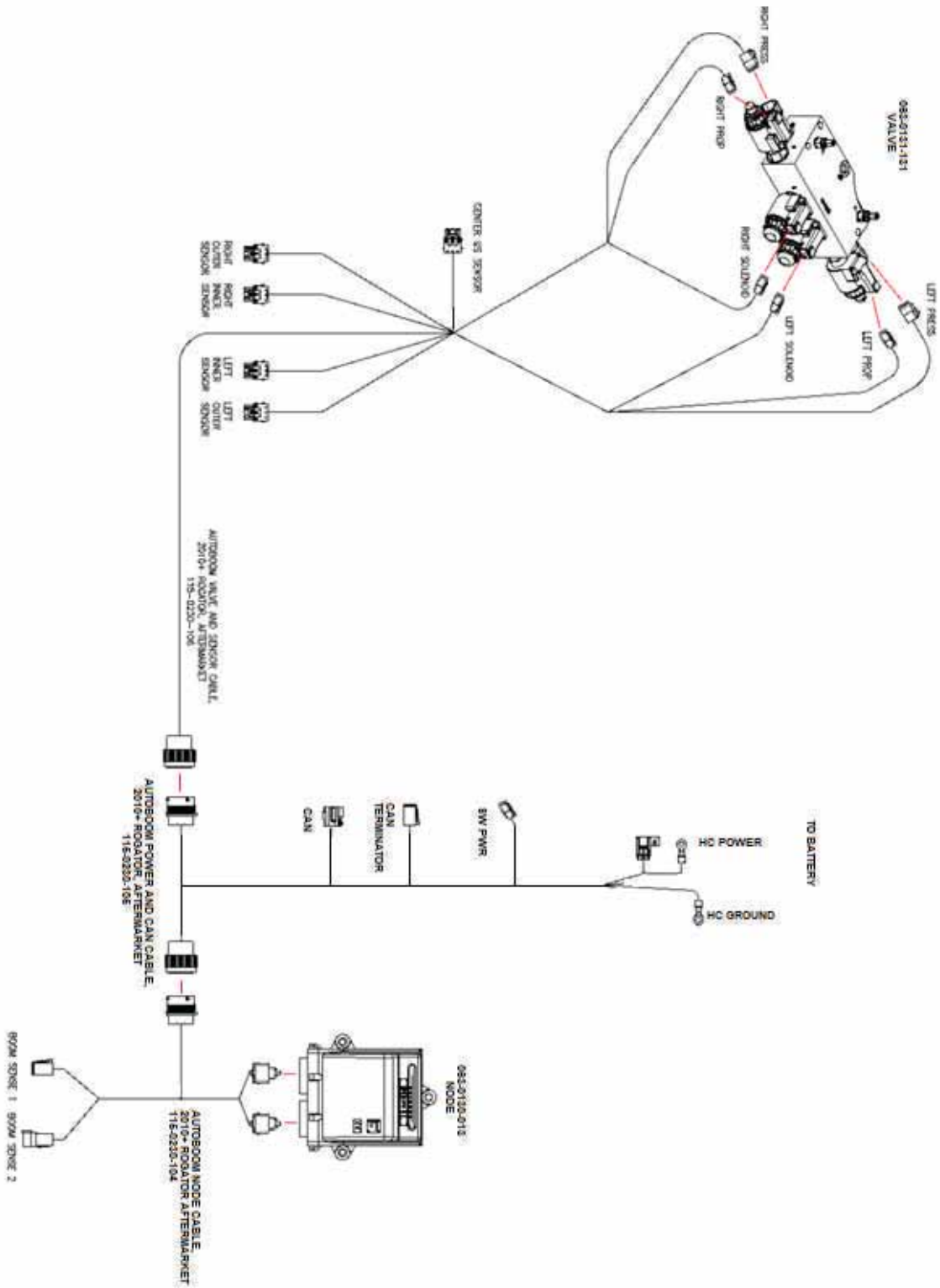
3. Remove the CAN terminator from the machine's harness located outside the node box.
4. Connect the CAN BUS cable on the AutoBoom power/CAN cable to the open connector on the machine's harness.
5. Install the CAN terminator on the TERMINATOR connection on the AutoBoom power/CAN cable.

FIGURE 13. Machine's CAN PWR Connector



6. Locate the machine's CAN PWR connection outside of the node box.
7. Remove the cap from the CAN PWR connection.
8. Connect the SW PWR connector of the AutoBoom power/CAN cable to the machine's CAN PWR connector.
9. Route the remaining AutoBoom power/CAN cable along the machine's existing cabling and toward the battery box at the front of the machine.
10. Install the high current power and ground wires on the power cable to the power and ground studs located in the machine's battery box.

Wiring Diagram



3

UltraGlide Kit Contents

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

TABLE 1. UltraGlide Installation Kit (P/N 117-0232-085)





Picture	Item Description	Part Number	Qty.
Not Pictured	Manual - AutoBoom Calibration & Operation	016-0130-062	1
Not Pictured	Manual - RoGator 9X4, 11X4, and 13X6, Model Year 2010-2011 AutoBoom Installation	016-0230-099	1
	Valve - RoGator Add-On AutoBoom Hydraulic	063-0131-131	1
	Bracket - Node Mounting	107-0172-348	1
	Bracket - Sensor Mounting	116-0159-684	1
	Sensor - Right Ultrasonic	063-0130-014	1

TABLE 1. UltraGlide Installation Kit (P/N 117-0232-085)

Picture	Item Description	Part Number	Qty.
	Sensor - Analog Ultrasonic	063-0130-026	2
	Node - AutoBoom	063-0130-013	1
	Cable - Sensor	115-0171-527	2
	Cable - RoGator AutoBoom Valve and Sensor	115-0230-104	1
	Cable - Power/CAN	115-0230-105	1
	Cable - Valve and Sensor Harness	115-0230-106	1
	U-Bolt - 3-1/16" W x 4" L x 3/8" Thread	107-0171-608	2
	U-Bolt - 1-9/16" W x 2-1/2" L x 3/8" Thread	107-0171-611	4
	Screw - 1/4"-20 x 3/4" Self-Tapping	311-0001-345	1
	Bolt - 5/16"-18 x 1-3/4" Hex	311-0052-108	1
	Bolt - 5/16"-18 x 2-1/2" Hex	311-0052-111	3

TABLE 1. UltraGlide Installation Kit (P/N 117-0232-085)


Picture	Item Description	Part Number	Qty.
	Bolt - 3/8"-16 x 1" Hex	311-0054-105	3
	Bolt - 3/8"-16 UNC x 1-1/4" Machine	311-0054-106	4
	Nut - 3/8"-16 Zinc Flanged Lock	312-1001-164	16
	Nut - 3/8"-16 Nylon Insert Lock	312-4000-061	3
	Washer - 5/16" Zinc Lock	313-1000-019	4
	O-Ring 9"16 ID Buna-N	219-0001-015	4

TABLE 2. UltraGlide Installation Kit (P/N 117-0232-099)



Picture	Item Description	Part Number	Qty.
Not Pictured	Manual - AutoBoom Calibration & Operation	016-0130-062	1
Not Pictured	Manual - RoGator 9X4, 11X4, and 13X6, Model Year 2010-2011 AutoBoom Installation	016-0230-099	1
	Valve - RoGator Add-On AutoBoom Hydraulic	063-0131-131	1
	Bracket - Node Mounting	107-0172-348	1

TABLE 2. UltraGlide Installation Kit (P/N 117-0232-099)

Picture	Item Description	Part Number	Qty.
	Bracket - Sensor Mounting	107-0172-349	1
	Sensor - Right Ultrasonic	063-0130-014	1
	Sensor - Analog Ultrasonic	063-0130-026	2
	Node - AutoBoom	063-0130-013	1
	Cable - Sensor	115-0230-051	2
	Cable - RoGator AutoBoom Valve and Sensor	115-0230-104	1
	Cable - Power/CAN	115-0230-105	1
	Cable - Valve and Sensor Harness	115-0230-106	1
	U-Bolt - 3-1/16" W x 4" L x 3/8" Thread	107-0171-608	1
	U-Bolt - 1-9/16" W x 2-1/2" L x 3/8" Thread	107-0171-611	4
	Screw - 1/4"-20 x 3/4" Self-Tapping	311-0001-345	1

TABLE 2. UltraGlide Installation Kit (P/N 117-0232-099)

Picture	Item Description	Part Number	Qty.
	Bolt - 5/16"-18 x 1-3/4" Hex	311-0052-108	1
	Bolt - 5/16"-18 x 2-1/2" Hex	311-0052-111	3
	Bolt - 3/8"-16 x 1" Hex	311-0054-105	3
	Bolt - 3/8"-16 UNC x 1-1/4" Machine	311-0054-106	4
	Nut - 3/8"-16 Zinc Flanged Lock	312-1001-164	14
	Nut - 3/8"-16 Nylon Insert Lock	312-4000-061	3
	Washer - 5/16" Zinc Lock	313-1000-019	4
	O-Ring 9"16 ID Buna-N	219-0001-015	4

TABLE 3. Ultrasonic Sensor Bracket Installation Kit (P/N 117-0131-082)


Picture	Item Description	Part Number	Qty.
Not Pictured	Sheet - AutoBoom Sensor Extension	016-0130-070	1
	Bracket - 12" S-Type AutoBoom Sensor	063-0131-592	2

TABLE 3. Ultrasonic Sensor Bracket Installation Kit (P/N 117-0131-082)



Picture	Item Description	Part Number	Qty.
	Nut - 1/4"-20 Nylon Insert Lock	312-4000-057	4
	Washer - 1/4" Corrosion-Resistant Flat	313-2300-010	4

TABLE 4. Optional Wheel Kit 90'-100' Booms (P/N 117-0133-101)

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	116-0159-609	1
	Bracket - Right Weldment Receiver	116-0159-610	1
	Bracket - Hub Retainer	107-0171-617	2
	Spacer - Receiver Bracket	116-0159-753	2
	Wheel	322-0131-003	2
	U-Bolt - 1-9/16" W x 2-1/2" L x 3/8" Thread	107-0171-611	4

TABLE 4. Optional Wheel Kit 90'-100' Booms (P/N 117-0133-101)





Picture	Item Description	Part Number	Qty.
	U-Bolt - 2-1/4" W x 4" L x 3/8" Thread	107-0172-308	4
	Bolt - 1/2"-13 x 1-1/2" SS Hex	311-0058-186	4
	Nut - 1/2"-13 Hex	312-1001-043	4
	Nut - 3/8"-16 Zinc Flanged Lock	312-1001-164	16

TABLE 5. Optional Wheel Kit - 120' Booms (P/N 117-0133-085)











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 - Weldment Receiver	116-0159-707	2
	Bracket - Hub Retainer	107-0171-617	2
	Wheel	322-0131-003	2
	U-Bolt - 1-9/16" W x 2-1/2" L x 3/8" Thread	107-0171-611	8

TABLE 5. Optional Wheel Kit - 120' Booms (P/N 117-0133-085)

Picture	Item Description	Part Number	Qty.
	Bolt - 1/2"-13 x 1-1/2" SS Hex	311-0058-186	4
	Nut - 1/2"-13 Hex	312-1001-043	4
	Nut - 3/8"-16 Zinc Flanged Lock	312-1001-164	16

Install the UltraGlide Hydraulic System



⚠ WARNING

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


Hydraulics are under pressure. Care should always be taken with a system that has been pressurized.

Before beginning the AutoBoom hydraulic installation, turn off the machine and relieve pressure by turning the steering wheel left and right.

Never work on a hot machine. Always allow it to cool before performing diagnostics, maintenance, or routine service.

When disconnecting or purging hydraulic hoses, be aware that the hydraulic fluid within the machine's system may be extremely hot and under high pressure.


Tampering with hydraulic valves may cause serious injury or death, and will void the warranty.



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's hydraulic system.

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

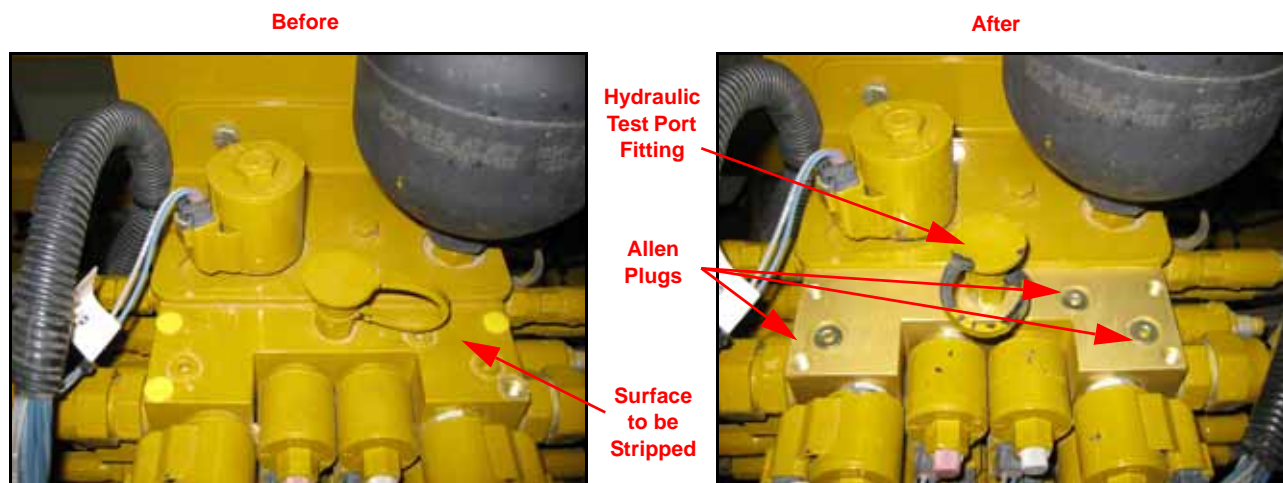


NOTICE

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.

Mount the AutoBoom Valve

FIGURE 1. Machine's Hydraulic Valve Before AutoBoom Installation



- Strip the factory paint from the top of the machine's hydraulic valve using a chemical approved for paint removal.

Important: Do not scrape the paint from the machine's hydraulic valve. Scraping the paint may cause damage to the valve.

- Remove the hydraulic test port fitting and Allen plugs from the machine's hydraulic valve.

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

3. Clean the remaining paint from the machine's hydraulic valve, taking care to prevent paint chips from entering the open hydraulic ports.

FIGURE 2. O-Rings Installed on the Machine's Hydraulic Valve



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

Note: Use grease or petroleum jelly to hold the O-rings in place during the AutoBoom 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 machine's hydraulic valve.
7. Clean excess hydraulic fluid from the AutoBoom valve (P/N 063-0131-113).
8. Install the supplied 5/16"-18 x 1-3/4" hex bolts (P/N 311-0052-108) and 5/16"-18 x 2-1/2" hex bolts (P/N 311-0052-111) in the AutoBoom valve, placing the shorter bolt in the cut-out section of the AutoBoom valve.

FIGURE 3. AutoBoom Valve Mounted to the Machine's Hydraulic Valve

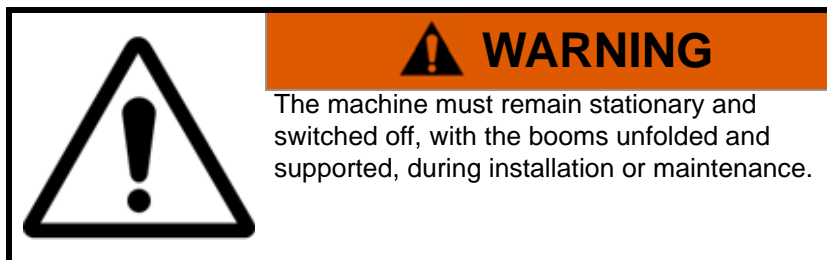
Hydraulic Test Fitting
Installed in Port GP



Accumulator

9. Carefully place the AutoBoom valve on the machine's 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 valve.
12. Ensure the needle valves on the AutoBoom valve are completely closed.
13. Tighten the jam nuts.

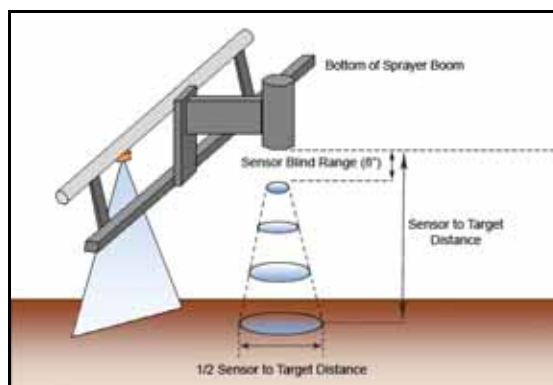
Install the UltraGlide Boom Sensors



Boom Sensor Mounting Locations

Sensor mounting locations may be influenced by the boom configuration. If an object enters the sensor's blind range 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 AutoBoom 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 4. Illustration of Sensor's Blind Range



Mount the Boom Sensors

FIGURE 5. Mounted Boom Sensor



1. Locate the ultrasonic sensors (P/N 063-0130-026) in the AutoBoom installation kit.
2. Install the sensors on the 12" S-type sensor arms (P/N 063-0131-592) using the four 1/4"-20 nylon insert lock nuts (P/N 312-4000-057) and four 1/4" corrosion-resistant flat washers (P/N 313-2300-010).
3. Mount the sensors to the front of the booms using two 1-9/16" W x 2-1/2" L x 3/8" thread U-bolts (P/N 107-0171-611) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
4. Tighten the nuts to ensure the sensors are mounted securely.

Install the Center Rack Sensor

90' - 100' Booms

FIGURE 6. Center Rack Sensor Installed



1. Mount the center sensor mounting bracket (P/N 107-0171-349) to the machine's center rack using a 3-1/16" x 4" L x 3/8" thread U-bolt (P/N 107-0171-608) and two 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
2. Secure the center sensor (P/N 063-0130-014) to the sensor mounting bracket using four 3/8"-16 UNC x 1-1/4" machine bolts and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
3. Tighten the nuts to ensure the sensor is mounted securely.

120' Booms

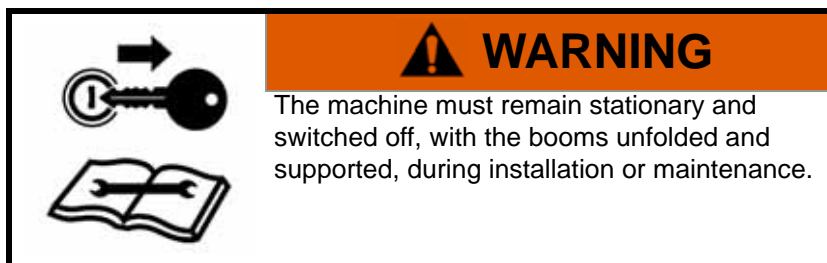
FIGURE 7. Center Sensor Installed



1. Secure the center sensor (P/N 063-0130-014) to the ultrasonic sensor boom mount weldment bracket (P/N 116-0159-684) using four 3/8"-16 UNC x 1-1/4" hex bolts (P/N 311-0054-106) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
2. Mount the center sensor to the outer post of the machine's center rack using two 3-1/16" W x 4" L x 3/8" thread U-bolts (P/N 107-0171-608) and four 3/8" zinc flanged lock nuts (P/N 312-1001-164).

Note: *If necessary, the sensor direction can be reversed by mounting the sensor on the opposite side of the mounting bracket.*

Install the Gauge Wheels - 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 wheels should always be mounted inside the boom breakaway.

Mount the Gauge Wheels

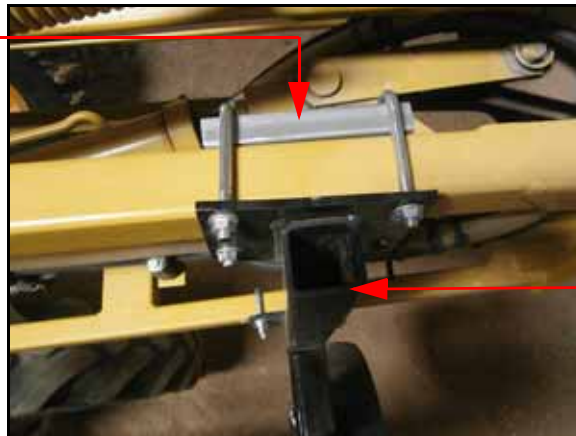
90' - 100 Booms Only

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

1. Remove the nuts from the right wheel axle (P/N 063-0131-585).
2. Place the wheel (P/N 322-0131-003) on the right wheel axle.
3. Align and place the hub retainer bracket (P/N 107-0171-617) over the wheel.
4. Reinstall the nuts on the wheel axle to secure the wheel and hub retainer bracket.

FIGURE 8. Spacer Installed

Receiver Bracket Spacer
(P/N 116-0159-753)



Receiver Bracket
(P/N 116-0159-610)

5. Secure the bottom of the right receiver bracket (P/N 116-0159-610) to the front of the right lower boom using two 1-9/16" W x 2-1/2" L x 3/8" thread U-bolts (P/N 107-0171-611) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
6. Tighten the nuts to ensure the bottom of the receiver bracket is mounted securely.
7. Loosely secure the top of the receiver bracket to the upper boom tube using two 2-1/4" W x 4" L x 3/8" thread U-bolts and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
8. Insert a receiver bracket spacer (P/N 116-0159-753) between the upper boom tube and the receiver bracket.
9. Tighten the nuts to ensure the top of the receiver bracket is mounted securely.

FIGURE 9. Gauge Wheel Installed



10. Insert the right wheel axle assembly into the mounting 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.
11. 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" zinc hex nuts (P/N 312-1001-043).
12. Repeat the steps above to install the left gauge wheel on the front of the left boom.

120' Booms Only

Note: The appearance of the wheel axles may vary.

FIGURE 10. Gauge Wheel Installed



1. Remove the nuts from the right wheel axle (P/N 063-0131-585).
2. Place the wheel (P/N 322-0131-003) on the right wheel axle.
3. Align and place the hub retainer bracket (P/N 107-0171-617) over the wheel.
4. Reinstall the light nuts on the wheel axle to secure the wheel and hub retainer bracket.
5. Secure the receiver bracket (P/N 116-0159-707) to the boom tube using four 1-9/16" x 2-1/2" L x 3/8" thread U-bolts (P/N 107-0171-611) and eight 3/8"-16 flanged lock nuts (P/N 312-1001-164).
6. Insert the right wheel axle assembly into the mounting 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 311-0058-186) and two 1/2" zinc hex nuts (P/N 312-1001-043).
8. Repeat the steps above to install the left gauge wheel on the front of the left boom.

Install the UltraGlide Wiring

Important: Route AutoBoom cables along the machine's existing cables whenever possible. Secure all cables with cable ties to prevent damage from moving parts, heat sources, or other hazards.

	<div style="background-color: yellow; text-align: center; padding: 5px;">⚠ CAUTION</div> <p>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.</p>
--	---

Wiring Connections

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.

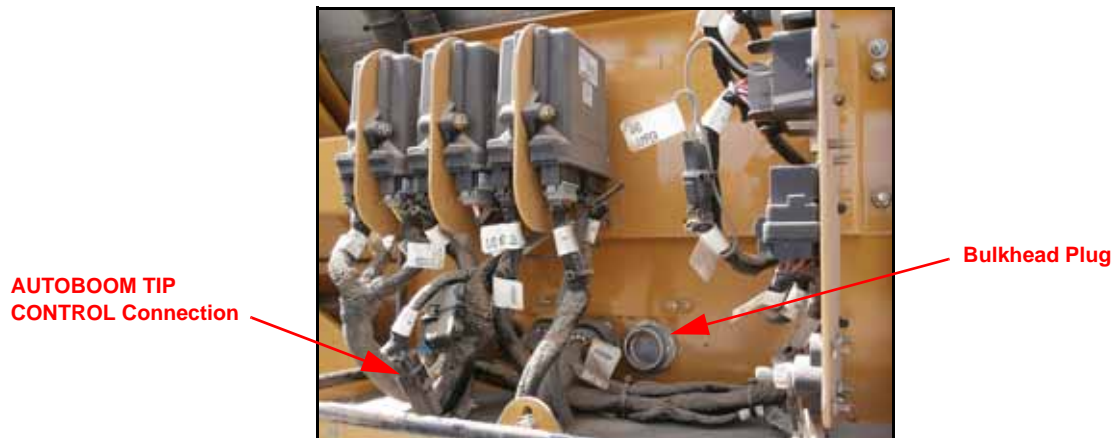
Install the AutoBoom Node and Node Harness

FIGURE 11. Node Mounting Location



1. Locate the node box on the right side of the machine and remove the cover.

FIGURE 12. Bulkhead Plug Location



2. Remove the bulkhead plug shown in Figure 6 above.

Note: Keep the bulkhead washer and lock nut for use later in this procedure.

FIGURE 13. AUTOBOOM TIP CONTROL Connectors



3. Locate and disconnect the machine's AUTOBOOM TIP CONTROL connectors.
4. Plug the AUTOBOOM TIP CONTROL connectors into the mating BOOM SENSE 1 and BOOM SENSE 2 connectors on the node harness cable (P/N 115-0230-104).

FIGURE 14. AutoBoom Node Installed



AutoBoom Node
(P/N 063-0130-013)

Node Connectors
on AutoBoom
Harness

31-Pin Bulkhead
Connector on
AutoBoom Harness

5. Connect the large, rectangular connectors on the node harness into the correct ports of the AutoBoom node (P/N 063-0130-013).
6. Tighten the bolts on the node connectors to secure the connections.
7. Secure the AutoBoom node to the node mounting plate (P/N 107-0171-348) using three 3/8"-16 x 1" hex bolts (P/N 311-0054-105) and three 3/8"-16 nylon insert lock nuts (P/N 312-4000-061).
8. Mount the node mounting plate to the node mounting box using the supplied 1/4"-20 x 3/4" self-tapping screw (P/N 311-0001-345).
9. Install the 31-pin connector on the node harness through the inboard side of the node box, securing it using the bulkhead washer and lock nut that were removed from the bulkhead plug.

Install the Valve Harness

FIGURE 15. Valve Harness Installed on the AutoBoom Valve



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

1. Locate the LEFT PRESS and RIGHT PRESS connectors on the valve harness cable (P/N 115-0230-106).
2. Route the connectors to the AutoBoom valve (P/N 063-0131-131).
3. Connect the LEFT PRESS connector to Port GL of the AutoBoom valve.
4. Connect the RIGHT PRESS connector to Port GR of the AutoBoom valve.
5. Locate the LEFT SOLENOID and RIGHT SOLENOID connectors on the valve harness.
6. Connect the LEFT SOLENOID connector to Port 8 on the left side of the AutoBoom valve.
7. Connect the RIGHT SOLENOID connector to Port 8 on the right side of the AutoBoom valve.
8. Locate the LEFT PROP and RIGHT PROP connectors on the valve harness.
9. Connect the LEFT PROP connector to Port 6 on the left side of the AutoBoom valve.
10. Connect the RIGHT PROP connector to Port 6 on the right side of the AutoBoom valve.

Connect the Sensor Cables

1. Install the LEFT OUTER SENSOR connector on the sensor cable (P/N 115-0171-527 or 115-0230-051).
2. Connect other end of the sensor cable to the left outer sensor (P/N 063-0130-026).
3. Install the RIGHT OUTER SENSOR connector on the sensor cable.
4. Connect the other end of the installed sensor cable to the right outer sensor.
5. Connect the CENTER US SENSOR connector to the center sensor (P/N 063-0130-014) cable connection.
6. If optional inside boom sensors are installed, repeat the steps above to connect the inside sensors.
7. Loop and tie-off any excess cable, allowing enough cable for boom folding and extension.

Install the Power/CAN Cable

1. Connect the SYS HARNESS connector of the power/CAN cable (P/N 115-0230-105) to the mating 31-pin connector on the valve and sensor harness (P/N 115-0230-106).
2. Connect the 31-pin AB BULKHEAD connector to the mating 31-pin connector of the node harness (P/N 115-0230-104) installed on the machine's bulkhead.

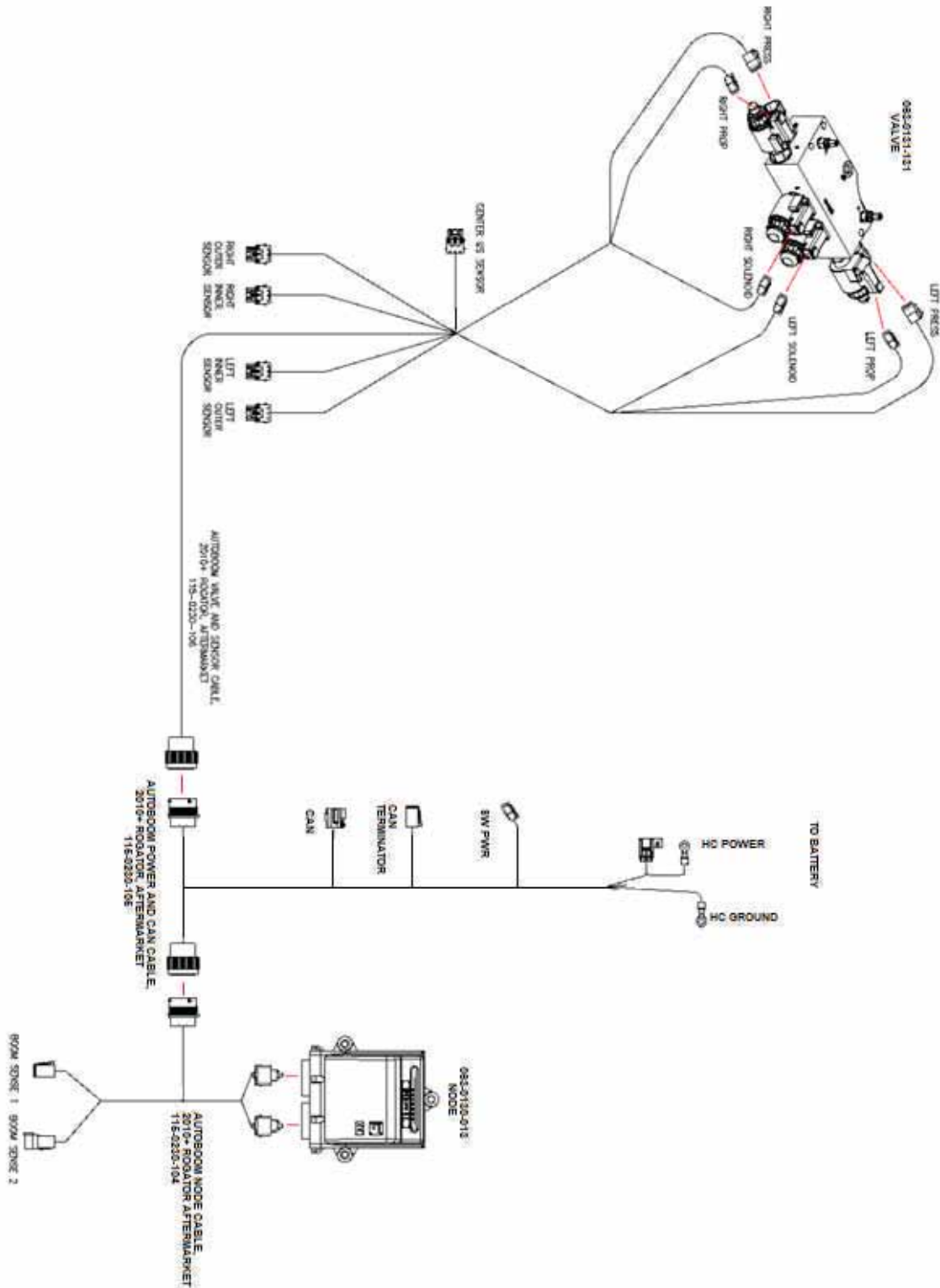
FIGURE 16. Machine's Existing CAN Terminator

3. Remove the CAN terminator from the machine's harness located outside the node box.
4. Connect the CAN BUS cable on the AutoBoom power/CAN cable to the open connector on the machine's harness.
5. Install the terminator on the TERMINATOR connection on the AutoBoom power/CAN cable.

FIGURE 17. Machine's CAN PWR Connector

6. Locate the machine's CAN PWR connection outside of the node box.
7. Remove the cap from the CAN PWR connection.
8. Connect the SW PWR connector of the AutoBoom power/CAN cable to the machine's CAN PWR connector.
9. Route the remaining AutoBoom power/CAN cable along the machine's existing cabling and toward the battery box at the front of the machine.
10. Install the high current power and ground wires on the power cable to the power and ground studs located in the machine's battery box.

Wiring Diagram



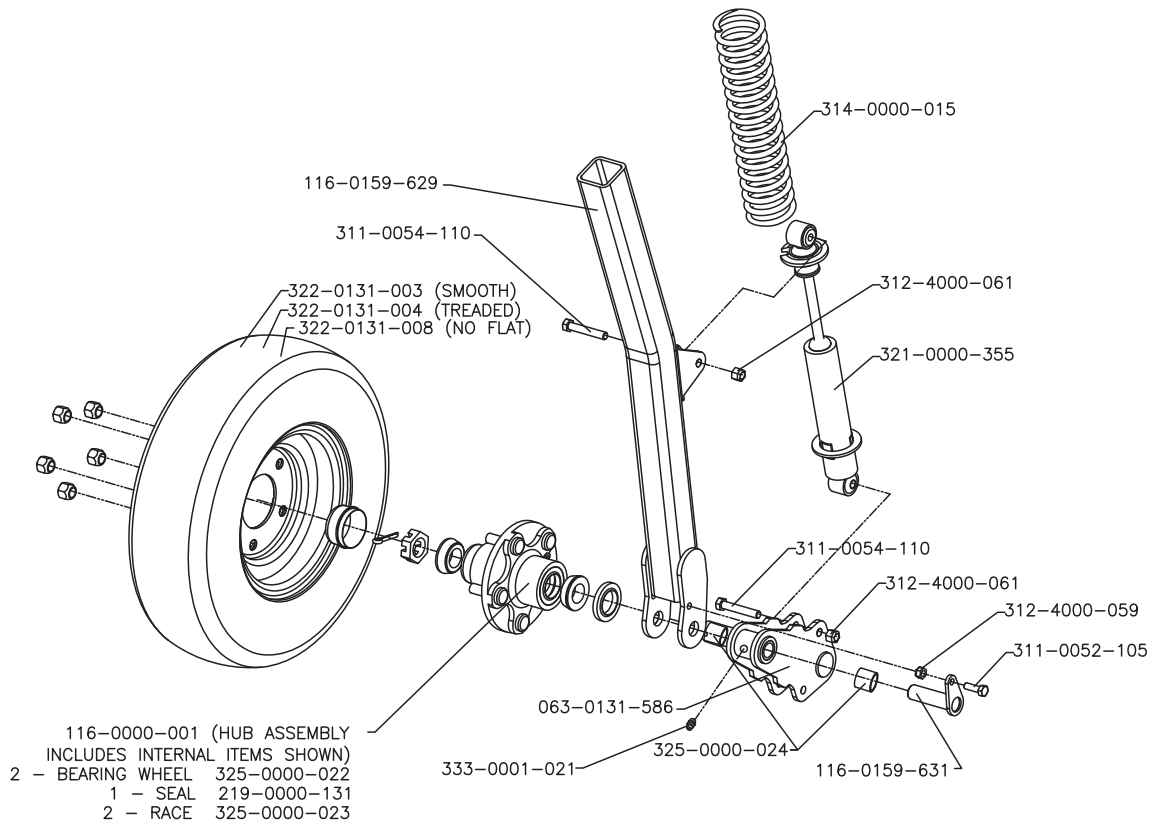
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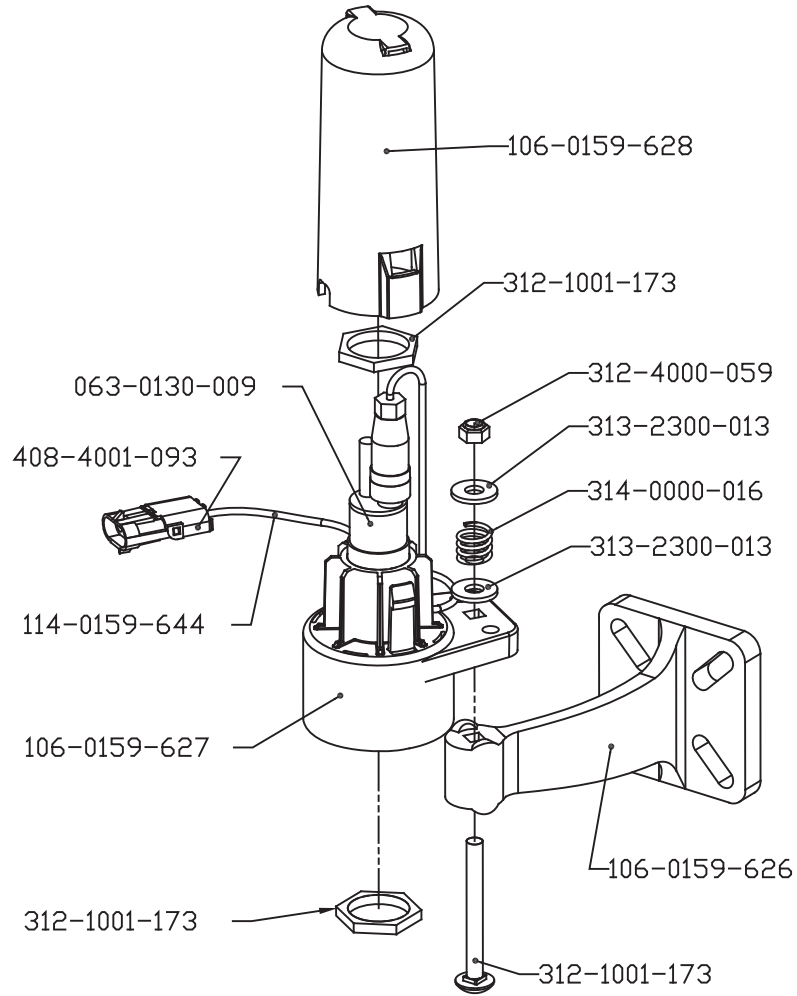
Replacement Parts

This section contains replacement part diagrams for PowerGlide Plus and UltraGlide systems. Refer to these diagrams when calling to request replacement parts.

Wheels



Sensors



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RAVEN

Limited Warranty

What Does this Warranty Cover?

This warranty covers all defects in workmanship or materials in your Raven Applied Technology Division product under normal use, maintenance, and service when used for intended purpose.

How Long is the Coverage Period?

Raven Applied Technology products are covered by this warranty for 12 months from the date of retail sale. In no case will the Limited Warranty period exceed 24 months from the date the product was issued by Raven Industries Applied Technology Division. This warranty coverage applies only to the original owner and is non-transferable.

How Can I Get Service?

Bring the defective part and proof of purchase to your Raven dealer. If the dealer approves the warranty claim, the dealer will process the claim and send it to Raven Industries for final approval. The freight cost to Raven Industries will be the customer's responsibility. The Return Materials Authorization (RMA) number must appear on the box and all documentation (including proof of purchase) must be included inside the box to be sent to Raven Industries.

What Will Raven Industries Do?

Upon confirmation of the warranty claim, Raven Industries will (at our discretion) repair or replace the defective product and pay for the standard return freight, regardless of the inbound shipping method. Expedited freight is available at the customer's expense.

What is not Covered by this Warranty?

Raven Industries will not assume any expense or liability for repairs made outside our facilities without written consent. Raven Industries is not responsible for damage to any associated equipment or products and will not be liable for loss of profit, labor, or other damages. The obligation of this warranty is in lieu of all other warranties, expressed or implied, and no person or organization is authorized to assume any liability for Raven Industries.

Damages caused by normal wear and tear, misuse, abuse, neglect, accident, or improper installation and maintenance are not covered by this warranty.



Extended Warranty

What Does this Warranty Cover?

This warranty covers all defects in workmanship or materials in your Raven Applied Technology Division product under normal use, maintenance, and service when used for intended purpose.

Do I Need to Register My Product to Qualify for the Extended Warranty?

Yes. Products/systems must be registered within 30 days of retail sale to receive coverage under the Extended Warranty. If the component does not have a serial tag, the kit it came in must be registered instead.

Where Can I Register My Product for the Extended Warranty?

To register, go online to www.ravenhelp.com and select Product Registration.

How Long is the Extended Warranty Coverage Period?

Raven Applied Technology products that have been registered online are covered for an additional 12 months beyond the Limited Warranty for a total coverage period of 24 months from the date of retail sale. In no case will the Extended Warranty period exceed 36 months from the date the product was issued by Raven Industries Applied Technology Division. This Extended Warranty coverage applies only to the original owner and is non-transferable.

How Can I Get Service?

Bring the defective part and proof of purchase to your Raven dealer. If the dealer approves the warranty claim, the dealer will process the claim and send it to Raven Industries for final approval. The freight cost to Raven Industries will be the customer's responsibility. The Return Materials Authorization (RMA) number must appear on the box and all documentation (including proof of purchase) must be included inside the box to be sent to Raven Industries. In addition, the words "Extended Warranty" must appear on the box and all documentation if the failure is between 12 and 24 months from the retail sale.

What Will Raven Industries Do?

Upon confirmation of the product's registration for the Extended Warranty and the claim itself, Raven Industries will (at our discretion) repair or replace the defective product and pay for the standard return freight, regardless of the inbound shipping method. Expedited freight is available at the customer's expense.

What is Not Covered by the Extended Warranty?

Raven Industries will not assume any expense or liability for repairs made outside our facilities without written consent. Raven Industries is not responsible for damage to any associated equipment or products and will not be liable for loss of profit, labor, or other damages. Cables, hoses, software enhancements, and remanufactured items are not covered by this Extended Warranty. The obligation of this warranty is in lieu of all other warranties, expressed or implied, and no person or organization is authorized to assume any liability for Raven Industries.

Damages caused by normal wear and tear, misuse, abuse, neglect, accident, or improper installation and maintenance are not covered by this warranty.

RAVEN

AGCO RoGator 9X4, 11X4, and 13X6
AutoBoom® Installation Manual
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Raven Industries

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