

---

**Miller Condor GC Series and New  
Holland Guardian R Series  
MonoBeam Boom AutoBoom®  
Installation Manual**

*P/N 016-0230-108 Rev. B*

*04/15*

*E23879*

*Copyright 2012, 2015*

## ***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.

<b>Chapter 1</b>	<b><i>Important Safety Information</i></b> .....	<b>1</b>
	Hydraulic Safety .....	2
	Electrical Safety .....	2
<b>Chapter 2</b>	<b><i>Introduction</i></b> .....	<b>3</b>
	Introduction .....	3
	Preparing for Installation .....	4
	Recommendations .....	4
	Point of Reference .....	4
	Hydraulic Fittings .....	4
	Updates .....	5
<b>Chapter 3</b>	<b><i>PowerGlide Plus</i></b> .....	<b>7</b>
	PowerGlide Plus Kit Contents .....	7
	Install the PowerGlide Plus Hydraulic System .....	10
	Remove the Orifice Fittings .....	10
	Install Fittings on the AutoBoom Valve .....	13
	Mount the AutoBoom Valve .....	13
	Install Left and Right Cylinder Hoses .....	15
	PowerGlide Plus Hydraulic Schematic .....	17
	Install the Gauge Wheels .....	18
	Gauge Wheel Mounting Locations .....	18
	Mount the Gauge Wheels .....	18
	Install the PowerGlide Plus Wiring .....	19
	Install the AutoBoom Node .....	19
	Connect the Harness - Power/CAN Connectors .....	19
	Connect the Harness to the Tilt and Center Rack Controls .....	20
	Connect the Harness to the AutoBoom Valve .....	20
<b>Chapter 4</b>	<b><i>UltraGlide</i></b> .....	<b>23</b>
	UltraGlide Kit Contents .....	23
	Install the UltraGlide Hydraulic System .....	27
	Install Fittings on the AutoBoom Valve .....	27
	Mount the AutoBoom Valve .....	28
	Install Left and Right Cylinder Hoses .....	30
	UltraGlide Hydraulic Schematic .....	31
	Install the UltraGlide Sensors .....	32
	Boom Sensor Mounting Locations .....	32
	Install the Sensor Brackets .....	32
	Mount the Center Rack Sensor .....	34
	Connect the Sensor Cables .....	34
	Install the Gauge Wheels - Optional .....	35

**Table of Contents**

---

Gauge Wheel Mounting Locations ..... 35  
Mount the Gauge Wheels ..... 35  
Install the UltraGlide Wiring ..... 36  
Install the AutoBoom Node ..... 36  
Connect the Harness - Power/CAN Connectors ..... 36  
Connect the Harness to the Tilt and Center Rack Controls ..... 37  
Connect the Harness to the AutoBoom Valve ..... 37  
Connect the Harness Cable to the Sensors ..... 38  
Install the Node Power Jumper (If Applicable) ..... 38  
Connect the Field Computer (If Applicable) ..... 38

**Chapter 5 Replacement Parts ..... 39**

Valves ..... 39  
Wheels ..... 40  
Sensors ..... 40

---

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 during installation or maintenance.

## **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.

---

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

**MAKE: Miller Condor**  
**MODEL: GC Series MonoBeam Boom**

**MAKE: New Holland**  
**MODEL: Guardian R Series MonoBeam Boom**

FIGURE 1. Miller Condor GC40



**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



---

## 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](mailto:techwriting@ravenind.com)

*-Miller Condor GC Series and New Holland Guardian R Series MonoBeam Boom AutoBoom® Installation Manual*

*-P/N 016-0230-108 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.*



*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 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.

**Note:** *The wheel receiver bracket is sold separately. Contact your local Miller dealer for ordering information.*

**TABLE 1. PowerGlide Plus Installation Kit (P/N 117-0231-108)**

Picture	Item Description	Part Number	Qty.
Not Pictured	Manual - CAN AutoBoom Calibration & Operation	016-0130-062	1
Not Pictured	Manual - Miller Condor GC Series and New Holland Guardian R Series Mono Boom AutoBoom Installation	016-0230-108	1
	Valve - PowerGlide Plus AutoBoom	063-0131-124	1
	Bracket - Hydraulic Block Mounting	107-0171-802	1
	AutoBoom PowerGlide Plus CAN Node	063-0130-010	1

TABLE 1. PowerGlide Plus Installation Kit (P/N 117-0231-108)

Picture	Item Description	Part Number	Qty.
	Cable - AutoBoom Harness	115-0230-102	1
	Axle Assembly - Right Cushioned AutoBoom	063-0131-585	1
	Axle Assembly - Left Cushioned AutoBoom	063-0131-590	1
	Wheel	322-0131-008	2
	U-Bolt - 3-1/16" W x 4" L x 3/8" Thread	107-0171-608	2
	Bolt - 5/16"-18 x 7/8" Grade 8 Hex	311-0052-104	4
	Bolt - 3/8"-16 UNC x 1-1/4" Hex	311-0054-106	3
	Bolt - 1/2"-13 x 1-1/2" SS 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	7
	Washer - 5/16" Zinc Plated Lock	313-1000-019	4

TABLE 2. Hydraulic Kit (P/N 117-0134-077)

Picture	Item Description	Part Number	Qty.
	Fitting - 3/4" ORFS M/M/F Swivel Run Tee Adapter	333-0012-028	4
	Fitting - 3/4" ORFS (M) to 9/16" SAE O-Ring (M) Straight Adapter	333-0012-082	2
	Fitting - 11/16" Hex 9/16" SAE O-Ring (M)	333-0012-194	2
	Fitting - 3/4" ORFS (M) to 3/4" SAE O-Ring (M) 90° Elbow	333-0012-229	2
	Hydraulic Hose - 3/4" ORFS to 3/4" ORFS - 40"	214-1000-529	4

## Install the PowerGlide Plus Hydraulic System

	<p><b>WARNING</b></p> <p>The machine must remain stationary and switched off, with the booms unfolded and supported, during installation or maintenance.</p>
---	--

	<p><b>CAUTION</b></p> <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>Objects or materials that are able to bypass the machine's hydraulic filtration system will reduce performance and possibly damage the AutoBoom hydraulic valve.</p>
---	--

	<p><b>NOTICE</b></p> <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>
---	--

### Remove the Orifice Fittings

Before populating the hydraulic fittings on the AutoBoom valve, it is necessary to remove orifice fittings from the valve in the PowerGlide Plus system. Failure to remove these fittings from the valve will restrict the down speed of the booms when the system is enabled.

**FIGURE 1. Port 3A and 3B Location**

1. Locate Ports 3A and 3B on the AutoBoom valve (P/N 063-0131-124).

**FIGURE 2. Coil Removed from the AutoBoom Valve**

2. Remove the coils from the solenoids near Ports 3A and 3B to gain easy access to those ports.

**FIGURE 3. Port Plugs Removed from the AutoBoom Valve**

3. Use an Allen wrench to remove the plugs from Ports 3A and 3B.

FIGURE 4. Orifice Fitting Removed from the AutoBoom Valve



Orifice Fitting  
Removed - Keep for  
Future Use

4. Remove the orifice fittings from Ports 3A and 3B.

**Important:** Tip the AutoBoom valve on its side and use the Allen wrench to remove the orifice from the cavity, taking care not to let the fitting fall into the valve.

FIGURE 5. Port Plug Reinstalled on the AutoBoom Valve



5. Use the Allen wrench to reinstall the port plugs on Ports 3A and 3B of the AutoBoom valve.

FIGURE 6. Coil Reinstalled on the AutoBoom Valve



6. Reinstall the coils on the solenoids of the AutoBoom valve.

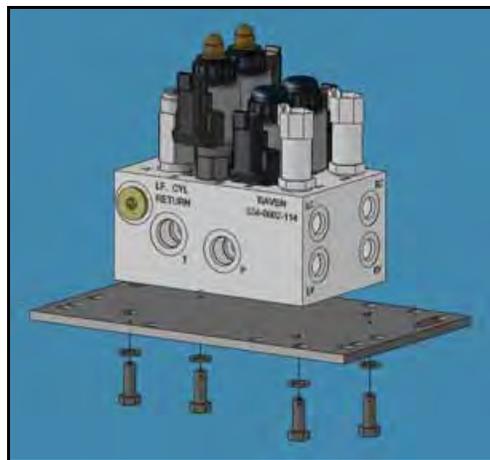
## Install Fittings on the AutoBoom Valve

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 - 13/16" ORFS (M) to 9/16" SAE O-Ring (M) Straight Adapter	333-0012-082	LC, RC
Fitting - 13/16" ORFS (M) to 3/4" SAE O-Ring (M) 90° Elbow	333-0012-229	P, T
Fitting - 11/16" Hex 9/16" SAE O-Ring (M)	333-0012-194	LV, RV

## Mount the AutoBoom Valve

**FIGURE 7. AutoBoom Valve Mounted on Valve Mounting Plate**



1. Secure the AutoBoom valve (P/N 063-0131-124) to the mounting plate (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 8. AutoBoom Valve Mounted on the Sprayer



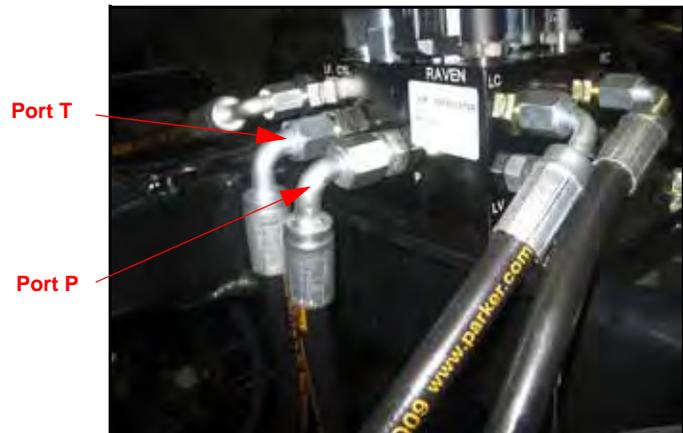
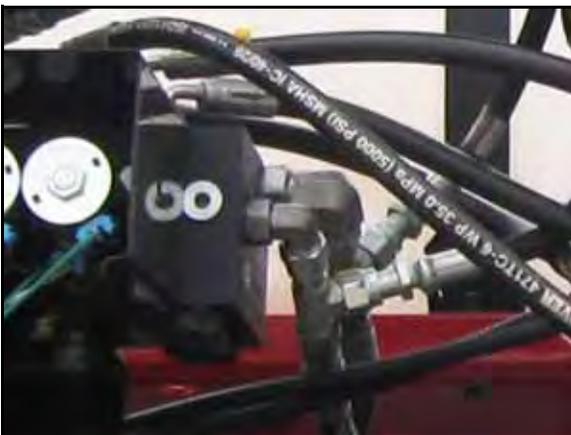
2. Secure the mounting plate to the outside of the machine's the center rack using two 4" W x 5" L x 3/8" thread U-bolts (P/N 107-0171-606) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).

### Install the Pressure and Tank Hoses

	<p><b>⚠ WARNING</b></p> <p>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's system may be extremely hot and under high pressure.</p>
--	---

	<p><b>⚠ CAUTION</b></p> <p>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's hydraulic system.</p> <p>Objects or materials that are able to bypass the machine's hydraulic filtration system will reduce performance and possibly damage the AutoBoom hydraulic valve.</p>
---	--

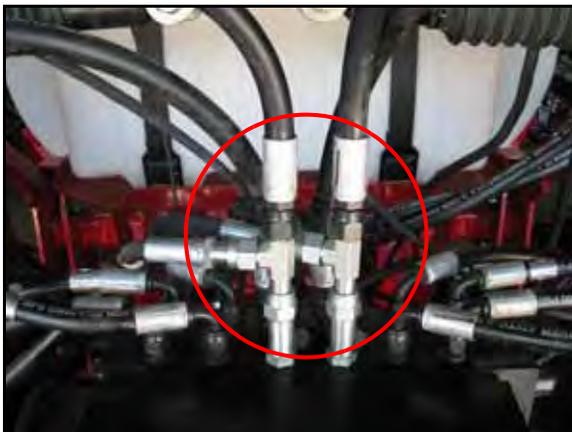
FIGURE 9. Pressure and Tank Hoses Installed



1. Disconnect the machine's pressure lines from the machine's hydraulic valve by disconnecting the machine's tee fitting from the hydraulic valve.
2. Install a 13/16" ORFS M/M/F swivel run tee adapter fitting (P/N 333-0012-028) in the machine's pressure port.
3. Attach the machine's tee fitting to the opposite end of the installed tee fitting.
4. Connect one end of the supplied hydraulic hose (P/N 214-1000-529) to the 90° end of the installed tee fitting.
5. Connect the other end of the hydraulic hose to the installed fitting in Port P on the AutoBoom valve.
6. Disconnect the machine's tank lines from the machine's hydraulic valve by disconnecting the machine's tee fitting from the hydraulic valve.
7. Install a 13/16" ORFS M/M/F swivel run tee adapter fitting (P/N 333-0012-028) in the machine's tank port.
8. Attach the machine's tee fitting to the opposite end of the installed tee fitting.
9. Connect one end of the supplied hydraulic hose (P/N 214-1000-529) to the 90° end of the installed tee fitting.
10. Connect the other end of the hydraulic hose to the installed fitting in Port T on the AutoBoom valve.

## Install Left and Right Cylinder Hoses

FIGURE 10. Left and Right Cylinder Hoses Installed

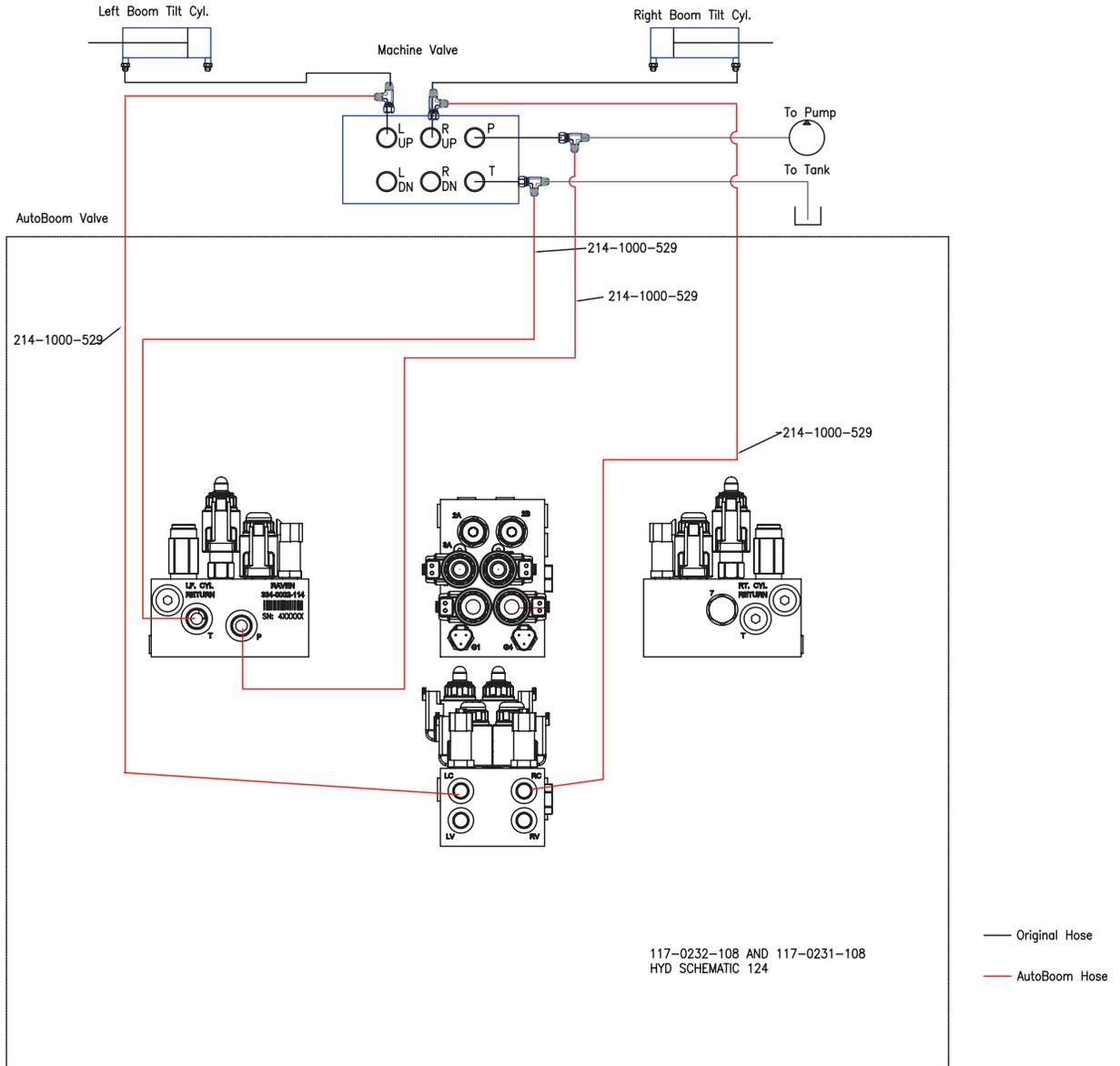


1. Disconnect the machine's left and right tilt lines from the machine's hydraulic valve.
2. Install 13/16" ORFS (M) to 9/16" SAE O-ring (M) swivel run tee adapter fittings (P/N 333-0012-028) in the L Up and R Up ports of the machine's hydraulic valve.

**Note:** *Align the tee fittings so that the 90° ends of the fittings point toward the right side of the machine.*

3. Connect the machine's left tilt line to the opposite end of the installed tee fitting in the L Up port.
4. Install one end of the supplied hydraulic hose (P/N 214-1000-529) on the 90° end of the installed tee fitting.
5. Connect the other end of the hydraulic hose to the installed fitting in Port LC on the AutoBoom valve.
6. Connect the machine's right tilt line to the opposite end of the installed tee fitting in the R Up port.
7. Install one end of the supplied hydraulic hose (P/N 214-1000-529) on the 90° end of the installed tee fitting.
8. Connect the other end of the hydraulic hose to the installed fitting in Port RC on the AutoBoom valve.

# PowerGlide Plus Hydraulic Schematic



## Install the Gauge Wheels

**Note:** The receiver bracket is sold separately. Contact your local Miller dealer for ordering information.

### 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 be mounted outside of the boom fold, but inside of the boom breakaway.



### Mount the Gauge Wheels

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

FIGURE 11. Gauge Wheel Mounting Location



1. Remove the nuts from the left wheel axle (P/N 063-0131-590).
2. Place the wheel (P/N 322-0131-008) on the left wheel axle.
3. Reinstall the lug nuts on the wheel axle to secure the wheel.
4. Secure the left wheel receiver bracket to the front of the left boom using the hardware supplied with the receiver bracket.
5. Insert the left wheel axle into the 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.
6. 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).
7. Repeat the steps above to install the right wheel.

## Install the PowerGlide Plus Wiring

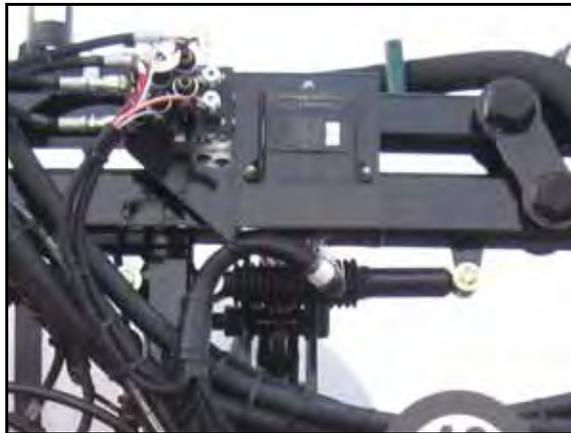
### Wiring Connections

	<p style="text-align: center;"><b>⚠ CAUTION</b></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>
---	---

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 12. AutoBoom Node Mounting Location



1. Mount the AutoBoom node (P/N 063-0130-010) on the valve mounting bracket (P/N 107-0171-802) using three 3/8"-16 UNC x 1-1/4" 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 connections point down.

2. Insert the large, rectangular node connectors on the harness cable (P/N 115-0230-102) into the correct ports of the AutoBoom node.
3. Tighten the bolts on the node connectors to secure the connections.

### Connect the Harness - Power/CAN Connectors

1. Locate the 8-pin Deutsch connectors labeled CD09 and CD10 on the machine's harness cable.
2. Disconnect the connectors.

FIGURE 13. AutoBoom Harness Connected to the Machine's Harness



3. Connect the harness cable (P/N 115-0230-102) 8-pin Deutsch connectors to the machine's CD09 and CD10 connectors.

## Connect the Harness to the Tilt and Center Rack Controls

FIGURE 14. Boom Function Wiring



1. Locate and disconnect the machine's 6-pin Deutsch connectors along the right rear chassis frame rail.
2. Locate the 6-pin Deutsch connectors on the AutoBoom harness cable (P/N 115-0230-102).
3. Route the AutoBoom harness cable connectors to the machine's 6-pin connectors.
4. Connect the harness cable's 6-pin connectors to the machine's connectors.

## Connect the Harness to the AutoBoom Valve

1. Locate the Left Press and Right Press connectors on the AutoBoom harness cable (P/N 115-0230-102).
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.
11. Secure the harness cable and unused connections with plastic ties, allowing enough slack in the harness cable to allow for boom racking.



*UltraGlide 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 Raven dealer.

**TABLE 1. UltraGlide Installation Kit (P/N 117-0232-108 or 117-0232-114)**

Picture	Item Description	Part Number	Qty.
Not Pictured	Manual - AutoBoom Calibration & Operation	016-0130-062 or 016-0130-065	1
Not Pictured	Manual - Miller Condor GC Series and New Holland Guardian R Series Mono Boom AutoBoom Installation	016-0230-108	1
	Valve - UltraGlide AutoBoom	063-0131-124	1
	Plate - Hydraulic Block Mounting	107-0171-802	1
	Node - UltraGlide AutoBoom	063-0130-013 or 016-0130-016	1
	Sensor - Left Ultrasonic	063-0130-014	1

**TABLE 1. UltraGlide Installation Kit (P/N 117-0232-108 or 117-0232-114)**

Picture	Item Description	Part Number	Qty.
	Sensor - Analog Ultrasonic	063-0130-026	2
	Cable - 60' Extension Ultrasonic Sensor	115-0230-051	2
	Cable - AutoBoom Harness	115-0230-102	1
	Jumper - Node Power (ISO AutoBoom Systems Only)	063-0173-614	1
	U-Bolt - 3-1/16" W x 4" L x 3/8" Thread	107-0171-608	6
	Clamp - 1-1/2" W x 2-1/2" L x 3/8" Thread U-Bolt	435-3003-047	2
	Bolt - 5/16"-18 x 7/8" Grade 8 Hex	311-0052-104	4
	Bolt - 3/8"-16 UNC x 1-1/4" Hex	311-0054-106	3
	Nut - 3/8"-16 Zinc Flanged Lock	312-1001-164	15
	Washer - 5/16" Zinc Plated Lock	313-1000-019	4

TABLE 2. Hydraulic Kit (P/N 117-0134-077)

Picture	Item Description	Part Number	Qty.
	Fitting - 3/4" ORFS M/M/F Swivel Run Tee Adapter	333-0012-028	4
	Fitting - 3/4" ORFS (M) to 9/16" SAE O-Ring (M) Straight Adapter	333-0012-082	2
	Fitting - 11/16" Hex 9/16" SAE O-Ring (M)	333-0012-194	2
	Fitting - 3/4" ORFS (M) to 3/4" SAE O-Ring (M) 90° Elbow	333-0012-229	2
	Hydraulic Hose - 3/4" ORFS to 3/4" ORFS - 40"	214-1000-529	4

TABLE 3. Ultrasonic Sensor Bracket Installation Kit (P/N 117-0131-084)

Picture	Item Description	Part Number	Qty.
Not Pictured	Sheet - AutoBoom Sensor Extension Installation	016-0130-075	1
	Bracket - AutoBoom Sensor Extension	063-0131-595	2
	Bolt - 5/16"-18 x 1-1/4" Hex	311-0052-106	2
	Nut - 5/16"-18 Nylon Insert Lock	312-4000-059	2
	Washer - 5/16" Flat	313-2300-012	4

## *Install the UltraGlide Hydraulic System*

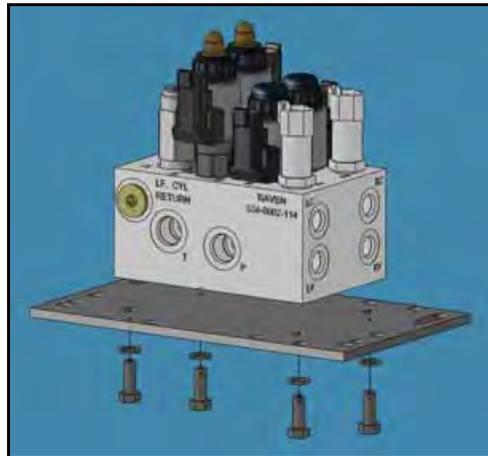
### Install Fittings on the AutoBoom Valve

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.

<b>Fitting</b>	<b>Part Number</b>	<b>Port</b>
Fitting - 13/16" ORFS (M) to 9/16" SAE O-Ring (M) Straight Adapter	333-0012-082	LC, RC
Fitting - 13/16" ORFS (M) to 3/4" SAE O-Ring (M) 90° Elbow	333-0012-229	P, T
Fitting - 11/16" Hex 9/16" SAE O-Ring (M)	333-0012-194	LV, RV

## Mount the AutoBoom Valve

**FIGURE 1. AutoBoom Valve Mounted on Valve Mounting Plate**



1. Secure the AutoBoom valve (P/N 063-0131-124) to the mounting plate (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 plate to the outside of the machine's the center rack using two 4" W x 5" L x 3/8" thread U-bolts (P/N 107-0171-606) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).

## Install the Pressure and Tank Hoses

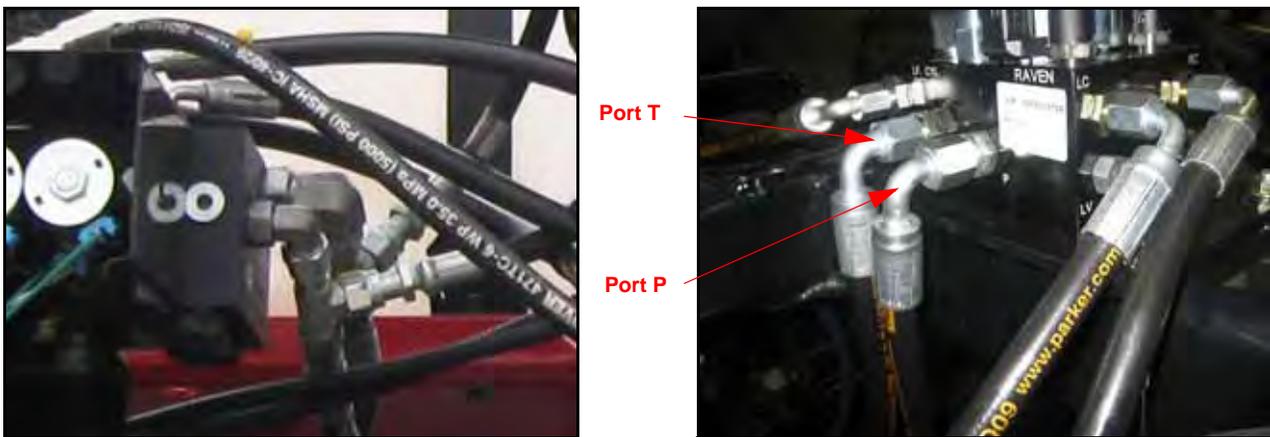


**⚠ WARNING**

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's system may be extremely hot and under high pressure.

	<b>! CAUTION</b>
	<p>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's hydraulic system.</p> <p>Objects or materials that are able to bypass the machine's hydraulic filtration system will reduce performance and possibly damage the AutoBoom hydraulic valve.</p>

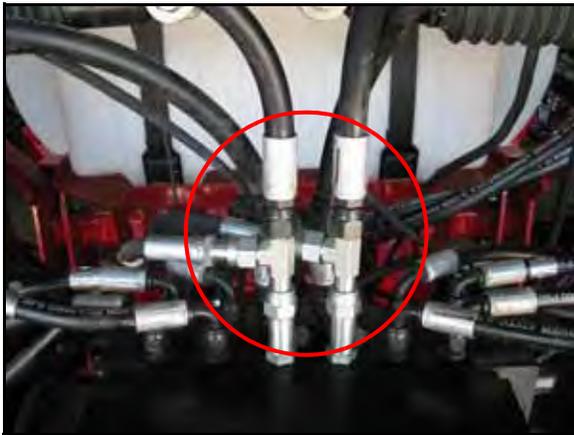
FIGURE 3. Pressure and Tank Hoses Installed



1. Disconnect the machine's pressure lines from the machine's hydraulic valve by disconnecting the machine's tee fitting from the hydraulic valve.
2. Install a 13/16" ORFS M/M/F swivel run tee adapter fitting (P/N 333-0012-028) in the machine's pressure port.
3. Attach the machine's tee fitting to the opposite end of the installed tee fitting.
4. Connect one end of the supplied hydraulic hose (P/N 214-1000-529) to the 90° end of the installed tee fitting.
5. Connect the other end of the hydraulic hose to the installed fitting in Port P on the AutoBoom valve.
6. Disconnect the machine's tank lines from the machine's hydraulic valve by disconnecting the machine's tee fitting from the hydraulic valve.
7. Install a 13/16" ORFS M/M/F swivel run tee adapter fitting (P/N 333-0012-028) in the machine's tank port.
8. Attach the machine's tee fitting to the opposite end of the installed tee fitting.
9. Connect one end of the supplied hydraulic hose (P/N 214-1000-529) to the 90° end of the installed tee fitting.
10. Connect the other end of the hydraulic hose to the installed fitting in Port T on the AutoBoom valve.

## Install Left and Right Cylinder Hoses

FIGURE 4. Left and Right Cylinder Hoses Installed

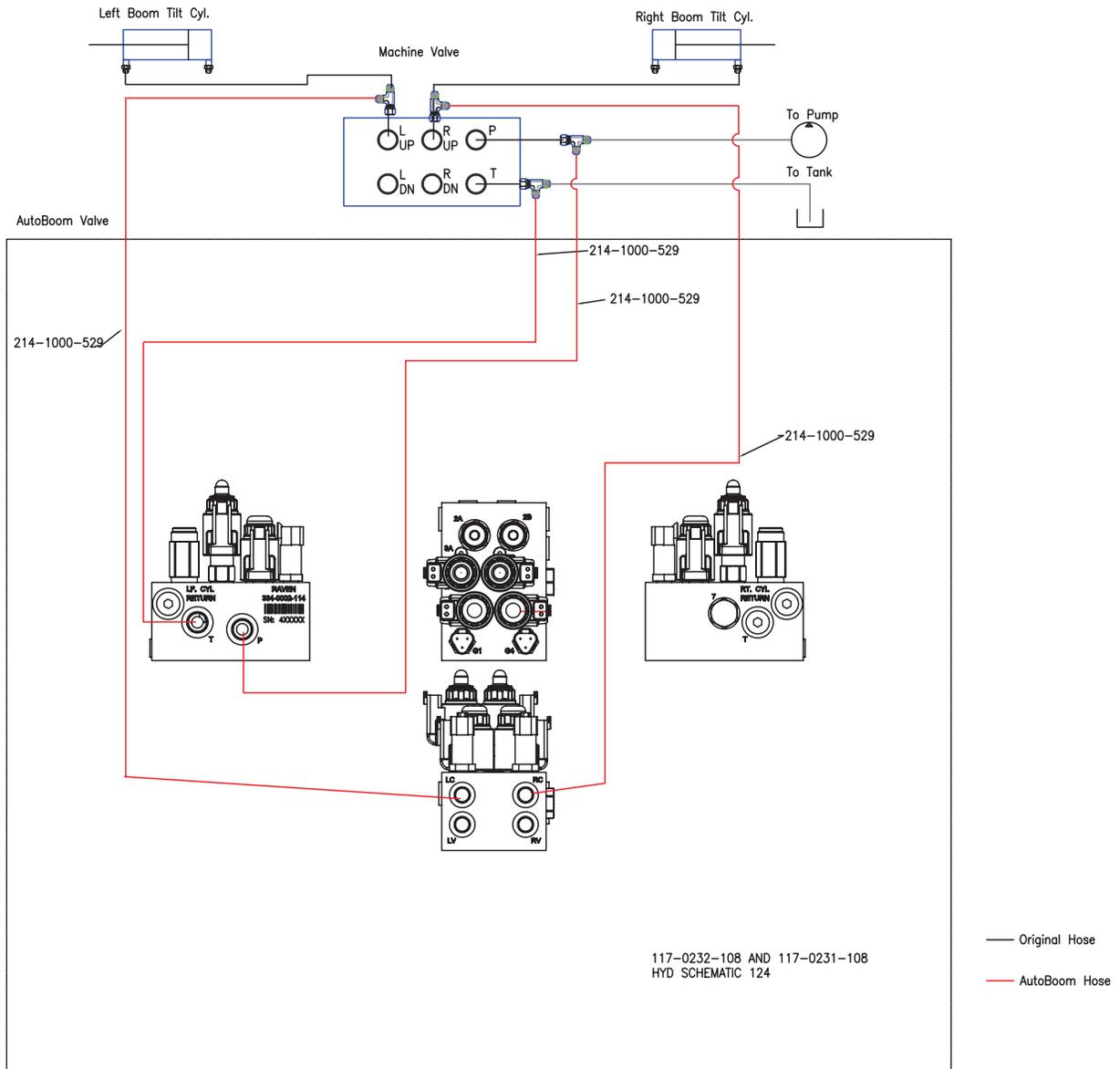


1. Disconnect the machine's left and right tilt lines from the machine's hydraulic valve.
2. Install 13/16" ORFS (M) to 9/16" SAE O-ring (M) swivel run tee adapter fittings (P/N 333-0012-028) in the L Up and R Up ports of the machine's hydraulic valve.

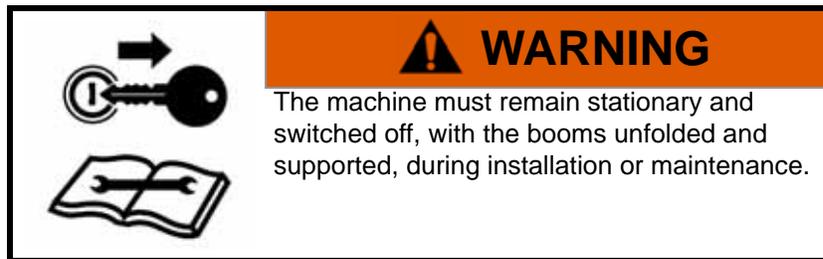
**Note:** *Align the tee fittings so that the 90° ends of the fittings point toward the right side of the machine.*

3. Connect the machine's left tilt line to the opposite end of the installed tee fitting in the L Up port.
4. Install one end of the supplied hydraulic hose (P/N 214-1000-529) on the 90° end of the installed tee fitting.
5. Connect the other end of the hydraulic hose to the installed fitting in Port LC on the AutoBoom valve.
6. Connect the machine's right tilt line to the opposite end of the installed tee fitting in the R Up port.
7. Install one end of the supplied hydraulic hose (P/N 214-1000-529) on the 90° end of the installed tee fitting.
8. Connect the other end of the hydraulic hose to the installed fitting in Port RC on the AutoBoom valve.

# UltraGlide Hydraulic Schematic



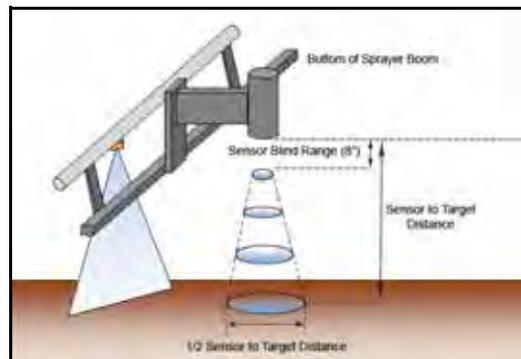
## Install the UltraGlide Sensors



### Boom Sensor Mounting Locations

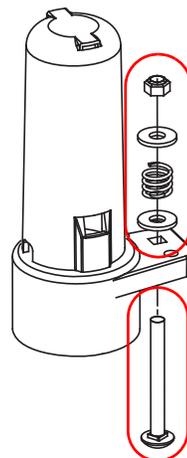
Sensor mounting locations may be influenced by the boom configuration. If an object enters the sensor's blind range unexpectedly, a false echo return to the sensor could occur, causing the boom to drop and the sensor or boom to be damaged. To ensure optimal options of the UltraGlide system and to protect the sprayer boom, the sensor should be mounted on the front side of the boom, 8 - 20" above the lowest hanging part of the boom.

FIGURE 5. Illustration of Sensor's Blind Range



### Install the Sensor Brackets

FIGURE 6. Sensor Parts to be Removed



1. Remove the lock nut, washers, spring, and bolt installed on the boom sensor housings (P/N 063-0130-026) as shown in Figure 6.

FIGURE 7. Sensor Installed on Mounting Bracket



2. Install one 5/16" flat washer (P/N 313-2300-012) on the end of one 5/16"-18 x 1-1/4" hex bolt (P/N 311-0052-106).
3. Align the hole in the analog sensor (P/N 063-0130-026) with the hole on the narrow end of the sensor extension bracket (P/N 063-0131-595).
4. Insert the bolt and washer through the aligned holes in the sensor and bracket.
5. Install another 5/16" flat washer (P/N 313-2300-012) on the end of the installed hex bolt and secure it using one 5/16"-18 nylon insert lock nut (P/N 312-4000-059).
6. Repeat the steps above to install the second sensor bracket on the remaining analog sensor.

## Mount the Boom Sensors

FIGURE 8. Installed Boom Sensors

90' - 100' Booms



120' Booms



Dual Sensor Mounting Locations



**Note:** Dual sensor kits contain the shorter boom sensor extension brackets (P/N 116-0159-619).

1. Mount the sensor bracket on the left boom using two 3-1/16" W x 4" L x 3/8" thread U-bolts (P/N 107-0171-608) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
2. Tighten the nuts to ensure the sensor is mounted securely.
3. Repeat the steps above to mount the remaining boom sensor(s).

## Mount the Center Rack Sensor

FIGURE 9. Center Rack Sensor Mounting



1. Mount the center sensor (P/N 063-0130-014) to the machine's center rack spray tube using two 1-1/2" W x 2-1/2" L x 3/8" thread U-bolt clamps (P/N 435-3003-047).
2. Tighten the nuts to ensure the sensor is mounted securely.

## Connect the Sensor Cables

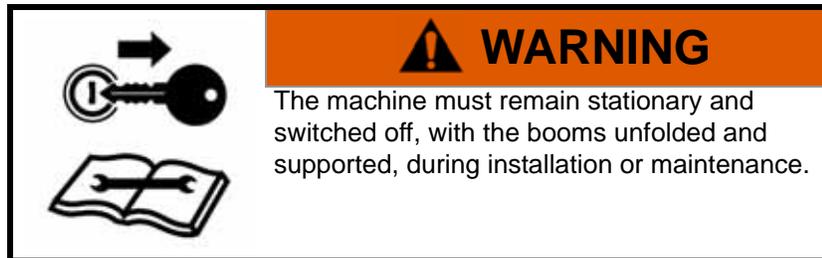
1. Connect the left sensor cable (P/N 115-0230-051) to the connector on the left sensor.
2. Route the left sensor cable toward the AutoBoom valve.
3. Loop and tie-off any excess cable, allowing enough cable for boom folding and extension.
4. Repeat the steps above to connect the remaining sensor cable(s).

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

## 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 be mounted outside of the boom fold, but inside of the boom breakaway.



### Mount the Gauge Wheels

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

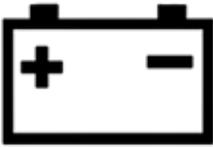
FIGURE 10. Gauge Wheel Mounting Location



1. Remove the nuts from the left wheel axle (P/N 063-0131-590).
2. Place the wheel (P/N 322-0131-008) on the left 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 left wheel receiver bracket (P/N 116-0159-542) to the front of the left boom using two U-bolts (P/N 107-0171-603, 107-0171-604, or 107-0171-608) and four nuts (P/N 312-1001-164 or 312-1001-165) appropriate for the size of the machine's booms.
6. Insert the left wheel axle into the left wheel receiver bracket, positioning it so that the bottom of the wheel touches the ground (or nearly so).
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 right wheel.

## Install the UltraGlide Wiring

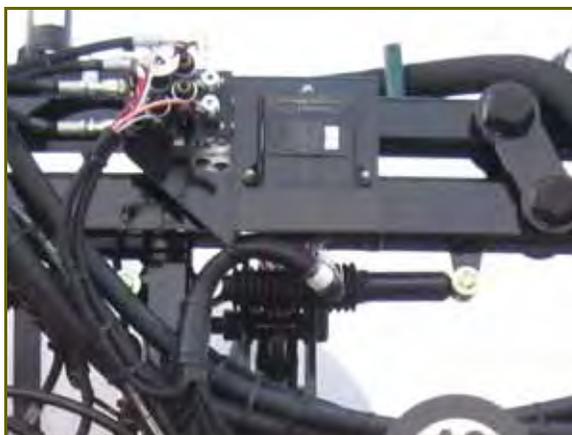
### Wiring Connections

	<p style="text-align: center;"><b>⚠ CAUTION</b></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>
---	---

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 11. AutoBoom Node Mounting Location



1. Mount the AutoBoom node (P/N 063-0130-013 or 016-0130-016) on the valve mounting bracket (P/N 107-0171-802) using three 3/8"-16 UNC x 1-1/4" 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 connections point down.

2. Insert the large, rectangular node connectors on the harness cable (P/N 115-0230-102) into the correct ports of the AutoBoom node.
3. Tighten the bolts on the node connectors to secure the connections.

### Connect the Harness - Power/CAN Connectors

1. Locate the 8-pin Deutsch connectors labeled CD09 and CD10 on the machine's harness cable.
2. Disconnect the connectors.



**FIGURE 12. AutoBoom Harness Connected to the Machine's Harness**



3. Connect the harness cable (P/N 115-0230-102) 8-pin Deutsch connectors to the machine's CD09 and CD10 connectors.

## Connect the Harness to the Tilt and Center Rack Controls

**FIGURE 13. Boom Function Wiring**



1. Locate and disconnect the machine's 6-pin Deutsch connectors along the right rear chassis frame rail.
2. Locate the 6-pin Deutsch connectors on the AutoBoom harness cable (P/N 115-0230-102).
3. Route the AutoBoom harness cable connectors to the machine's 6-pin connectors.
4. Connect the harness cable's 6-pin connectors to the machine's connectors.

## Connect the Harness to the AutoBoom Valve

1. Locate the LEFT PRESS and RIGHT PRESS connectors on the AutoBoom harness cable (P/N 115-0230-102).
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.
11. Secure the harness cable and unused connections with plastic ties, allowing enough slack in the harness cable to allow for boom racking.

## Connect the Harness Cable to the Sensors

1. Locate the CENTER SENSOR connector on the AutoBoom harness cable.
2. Connect the CENTER SENSOR connector to the installed center sensor (P/N 063-0130-012).
3. Locate the LEFT OUTER SENSOR connector on the AutoBoom harness cable.
4. Connect the LEFT OUTER SENSOR connector to the installed left sensor cable (P/N 115-0171-527).
5. Locate the RIGHT OUTER SENSOR connector on the AutoBoom harness cable.
6. Connect the RIGHT OUTER SENSOR connector to the installed right sensor cable.
7. If optional inside boom sensor sensors are installed, repeat the steps above to connect the sensors.

## Install the Node Power Jumper (If Applicable)

**Note:** This section applies only to ISO AutoBoom systems with no display connected to the right armrest bulkhead connector.

FIGURE 14. Node Power Jumper Installed



Install a node power jumper (P/N 063-0173-614) in the machine's right armrest bulkhead connector to provide power to the AutoBoom node.

## Connect the Field Computer (If Applicable)

Refer to the Installation & Operation Manual and the appropriate wiring schematic for installation and wiring instructions for your specific Raven field computer.



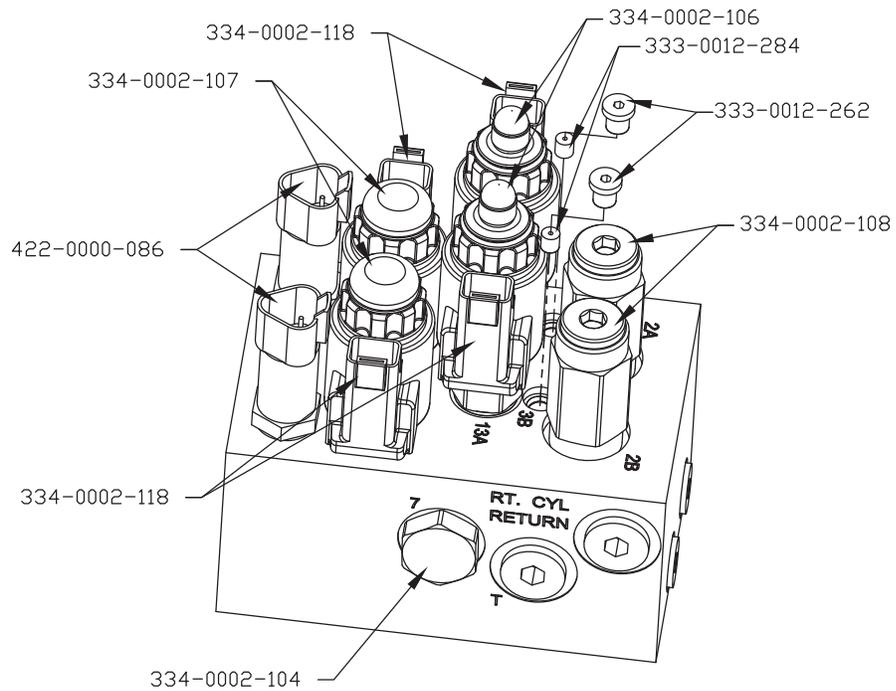
CHAPTER

5

*Replacement Parts*

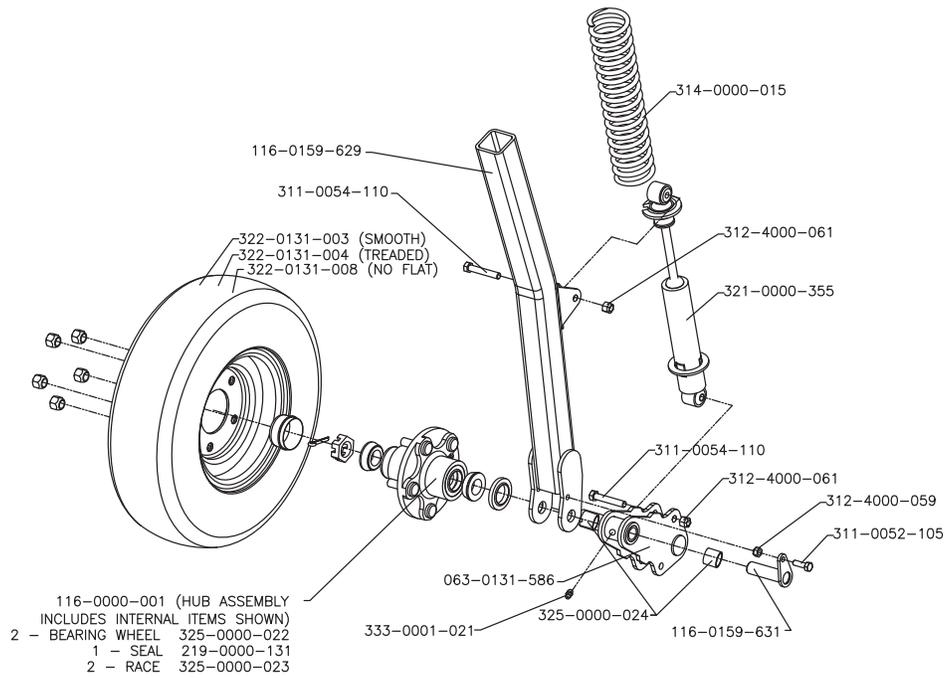
This section contains replacement part diagrams for PowerGlide Plus and UltraGlide systems. Refer to these diagrams when calling to request replacement parts.

*Valves*

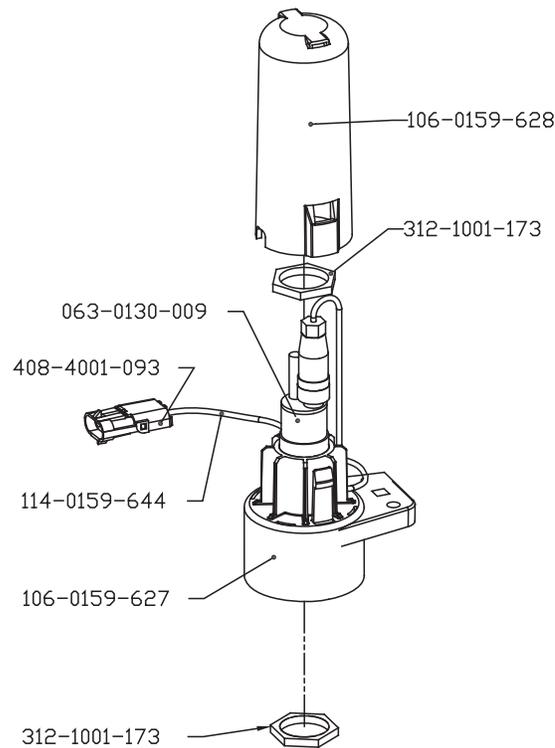


063-0131-124  
VALVE, HYDRAULIC POWERGLIDE  
PLUS/ULTRAGLIDE, CLOSED CENTER, AUTOBOOM

# Wheels



# Sensors



## E

**Electrical**

Safety 2

## H

**Hydraulic**

Fittings 4

Safety 2

## I

**Important Safety Information**

Electrical 2

Hydraulics 2

**Introduction**

Updates 5

## K

**Kit Contents**

PowerGlide Plus 7

UltraGlide 23

## P

**Point of Reference 4****PowerGlide Plus**

Install

Gauge Wheels 18

Gauge Wheel Mounting Locations 18

Mounting the Gauge Wheels 18

Hydraulic System 10

Hydraulic Schematic 17

Installing Fittings on AutoBoom Valve 13

Left and Right Cylinder Hoses 15

Mount the AutoBoom Valve 13

Pressure and Tank Hoses 14

Removing the Orifice Fittings 10

Wiring 19

AutoBoom Valve Connections 20

Power/CAN Connectors 19

Tilt and Center Rack Controls 20, 37

Wiring Connections 19

Kit Contents 7

**Preparing for Installation 4**

## R

**Recommendations 4****Replacement Parts**

Sensors 40

Valves 39

Wheels 40

## T

**Tools Needed 4**

## U

**UltraGlide**

Install

Gauge Wheels 35

Gauge Wheel Mounting Locations 35

Mounting the Gauge Wheels 35

Hydraulic System 27

Hydraulic Schematic 31

Installing Fittings on AutoBoom Valve 27

Left and Right Cylinder Hoses 30

Mounting AutoBoom Valve 28

Pressure and Tank Hoses 28

Sensors 32

Boom Sensor Mounting Locations 32

Connecting the Sensor Cables 34

Installing the Sensor Brackets 32

Mounting the Center Rack Sensor 34

Wiring 36

AutoBoom Valve Connections 37

Connecting the Field Computer 38

Connecting the Harness Cable to the  
Sensors 38

Installing the AutoBoom Node 36

Installing the Node Power Jumper 38

Power/CAN Connectors 36

Tilt and Center Rack Controls 37

Wiring Connections 36

Kit Contents 23



# 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](http://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.**