

**New Holland Guardian F/Miller Nitro
N5 Series with AD Truss
AutoBoom® Installation Manual**

P/N 016-0230-121 Rev. A

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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.

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: New Holland
MODEL: Guardian F Series with AD Truss Boom

MAKE: Miller
MODEL: Nitro N5 Series with AD Truss Boom

FIGURE 1. Miller Nitro N5 Series with AD Truss Boom



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

*-New Holland Guardian F/Miller Nitro N5 Series with AD Truss AutoBoom® Installation Manual
-P/N 016-0230-121 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 installation, compare the items in the AutoBoom kit with the components on this list. If you have questions about the kit, contact your local Raven dealer.

TABLE 1. PowerGlide Plus Installation Kit (P/N 117-0231-121)

Picture	Item Description	Part Number	Qty.
Not Pictured	Manual - AutoBoom Calibration & Operation	016-0130-062	1
Not Pictured	Manual - Miller Nitro N5 Series with AD Truss AutoBoom Installation	016-0230-121	1
	Valve - PowerGlide Plus AutoBoom	063-0131-124	1
	Node - PowerGlide Plus CAN AutoBoom	063-0130-010	1
	Cable - AutoBoom Harness	115-0230-102	1
	Bolt - 5/16"-18 x 7/8" Hex	311-0052-104	4

TABLE 1. PowerGlide Plus Installation Kit (P/N 117-0231-121)




Picture	Item Description	Part Number	Qty.
	Bolt - 3/8"-16 UNC x 1" Hex	311-0054-105	3
	Nut - 3/8"-16 Zinc Flanged Lock	312-1001-164	3
	Washer - 5/16" Split Lock	313-1000-019	4

TABLE 2. Hydraulic Kit (P/N 117-0134-082)

Picture	Item Description	Part Number	Qty.
	Fitting - 13/16" ORFS M/M/F Swivel Run Tee Adapter	333-0012-028	2
	Fitting - 13/16" ORFS M/F 90° Swivel Elbow	333-0012-067	3
	Fitting - 13/16" ORFS (M) to 9/16" SAE O-Ring (M) Straight Adapter	333-0012-082	2
	Fitting - 13/16" ORFS (M) to 3/4" SAE O-Ring (M) Straight Adapter	333-0012-168	1
	Fitting - 9/16" SAE O-Ring (M) to 11/16" Hex Plug	333-0012-194	2
	Fitting - 13/16" ORFS (M) to 3/4" SAE O-Ring (M) 90° Elbow	333-0012-229	3

TABLE 2. Hydraulic Kit (P/N 117-0134-082)





Picture	Item Description	Part Number	Qty.
	Hydraulic Hose - 13/16" ORFS (F) to 13/16" ORFS (F) 90° - 48"	214-1000-497	2
	Hydraulic Hose - 13/16" ORFS (F) to 13/16" ORFS (F) - 64"	214-1000-951	2


TABLE 3. PowerGlide Plus Wheel Kit (P/N 117-0133-081)

Picture	Item Description	Part Number	Qty.
	Axle Assembly - Right	063-0131-585	1
	Axle Assembly - Left	063-0131-590	1
	Wheel	322-0131-008	2
	Bracket - Nitro Left Weldment	116-0159-697	1
	Bracket - Nitro Right Weldment	116-0159-698	1
	Clamp - 2.5" OD x 3/8" Thread U-Bolt Muffler	435-3003-062	8
	Bolt - 1/2"-13 x 1-1/2" SS	311-0058-186	4
	Nut - 3/8"-16 Zinc Flanged Lock	312-1001-164	16

Install the PowerGlide Plus Hydraulic System

	<p>WARNING</p> <p>The machine must remain stationary and switched off, with the booms unfolded and supported, during installation or maintenance.</p>
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	<p>CAUTION</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>
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	<p>NOTICE</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>
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Remove the Orifice Fittings

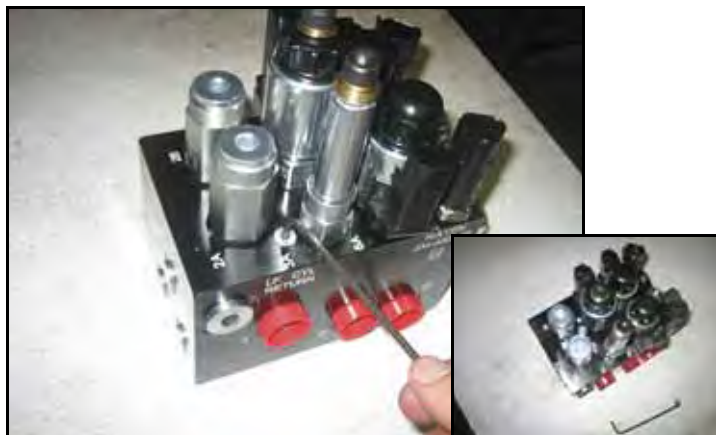
Before populating the hydraulic fittings on the AutoBoom valve, it is necessary to remove orifice fittings from the valve in the PowerGlide Plus system. Failure to remove these fittings from the valve will restrict the down speed of the booms when the system is enabled.

FIGURE 1. Port 3A and 3B Location

1. Locate Ports 3A and 3B on the AutoBoom valve.

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 the Fittings on the AutoBoom Valve

Before mounting the AutoBoom valve on the machine, install the fittings in the appropriate ports of the AutoBoom 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.

Fitting	Part Number	Port
Fitting - 13/16" ORFS (M) to 3/4" SAE O-Ring (M) 90° Elbow	333-0012-229	P
Fitting - 13/16" ORFS (M) to 3/4" SAE O-Ring (M) Straight Adapter	333-0012-168	T
Fitting - 13/16" ORFS M/F 90° Swivel Elbow	333-0012-067	T
Fitting - 9/16" SAE O-Ring (M) to 11/16" Hex Plug	333-0012-194	LV, RV
Fitting - 13/16" ORFS (M) to 9/16" SAE O-Ring (M) Straight Adapter	333-0012-082	LC, RC

Mount the AutoBoom Valve

FIGURE 7. AutoBoom Valve Installed



1. Secure the AutoBoom valve (P/N 063-0131-124) to the machine's built-in mounting plate using four 5/16"-18 x 7/8" hex bolts (P/N 311-0052-104) and four 5/16" split lock washers (P/N 313-1000-019).

Note: The AutoBoom valve should be installed so that Ports LC and RC face the center of the machine.

2. Tighten the bolts to ensure the valve is securely installed.

Install the Pressure and Tank Hoses



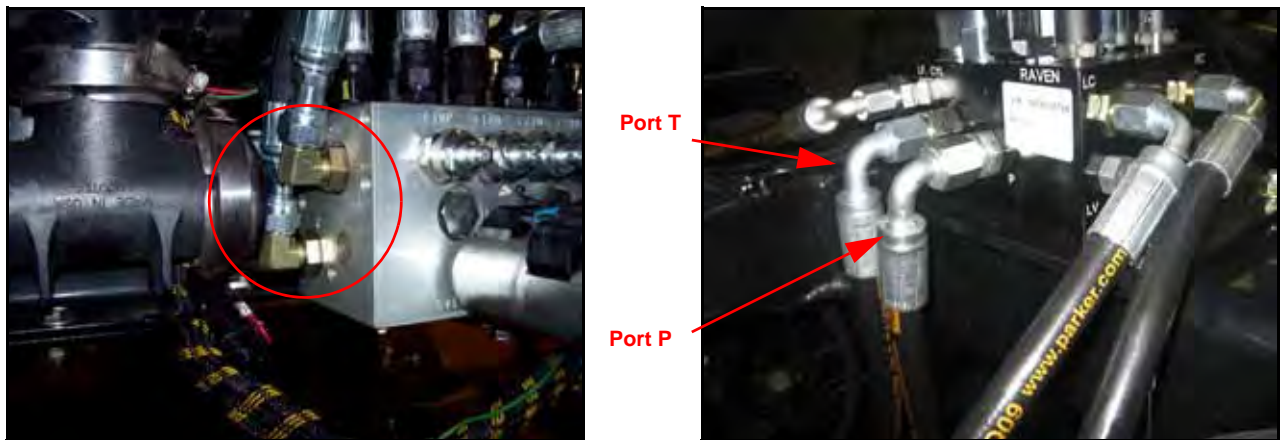
	<p>⚠ WARNING</p> <p>Hydraulics are under pressure. Care should always be taken with a system that has been pressurized. When disconnecting or purging hydraulic hoses, be aware that the hydraulic fluid within the machine's system may be extremely hot and under high pressure.</p>
	<p>⚠ CAUTION</p> <p>When 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>

FIGURE 8. Pressure and Tank Lines Installed

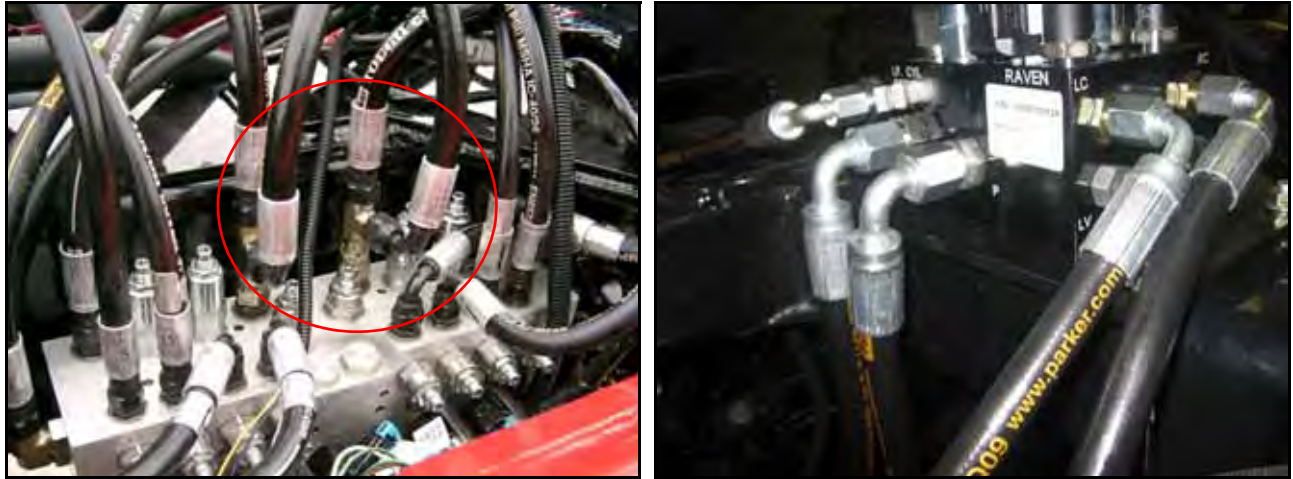


1. Locate the pressure and tank port plugs on the machine's hydraulic valve. The plugs are located on the side opposite from the pressure and tank hoses on the hydraulic valve.
2. Remove the port plugs from the hydraulic valve.
3. Install two 13/16" ORFS (M) to 3/4" SAE O-ring (M) 90° elbow fittings (P/N 333-0012-229) in the pressure and tank ports.
4. Connect one end of the supplied hydraulic hose (P/N 214-1000-951) to the installed fitting in the pressure port of the machine's hydraulic valve.
5. Connect the other end of the hydraulic hose to the installed fitting on Port P on the AutoBoom valve.
6. Connect one end of the supplied hydraulic hose (P/N 214-1000-951) to the installed fitting in the tank port of the machine's hydraulic valve.

7. Connect the other end of the hydraulic hose to the installed fittings on Port T on the AutoBoom valve.

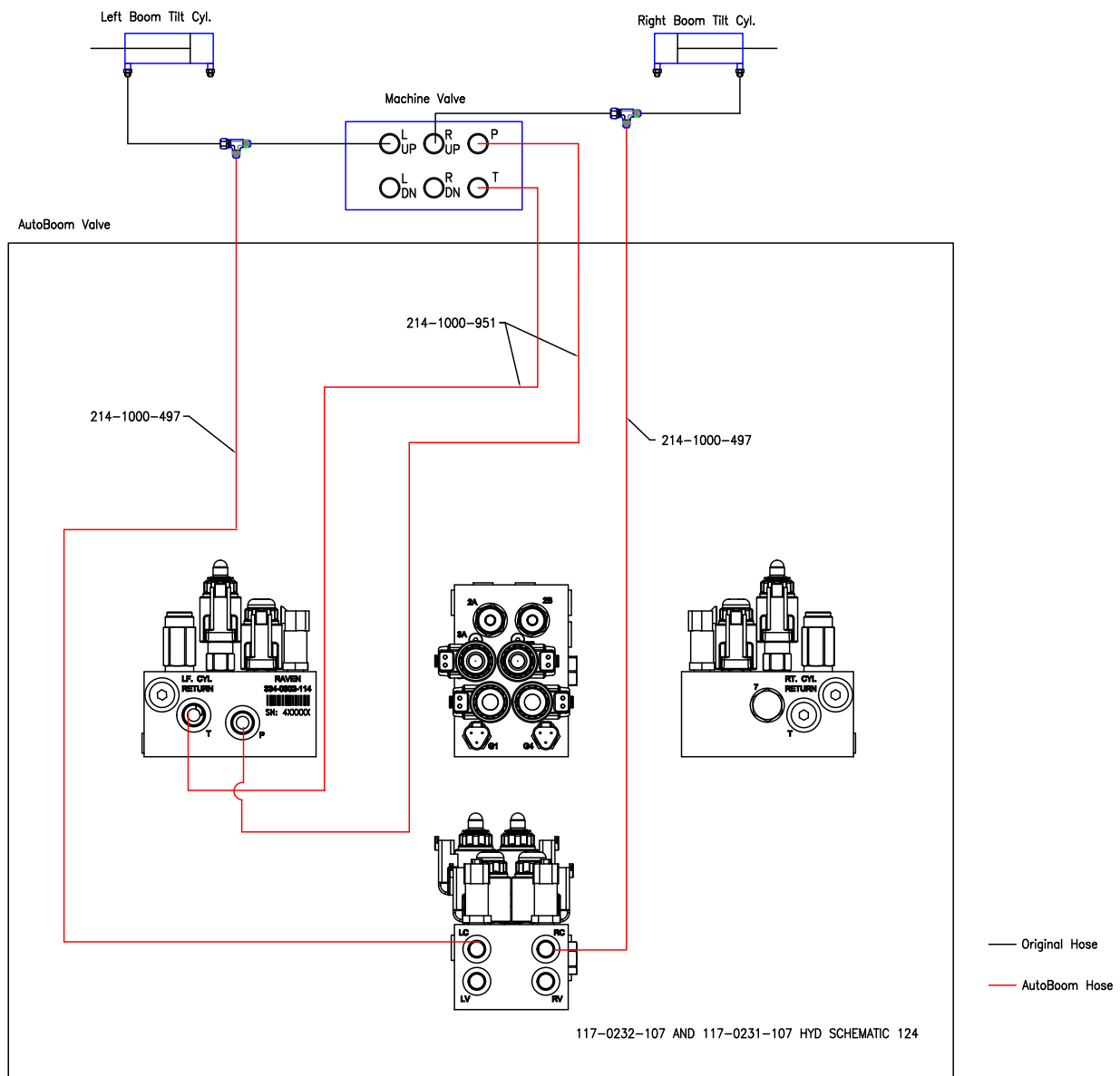
Install Left and Right Cylinder Hoses

FIGURE 9. Left and Right Cylinder Hoses Installed



1. Disconnect the machine's right and left cylinder hoses from the machine's hydraulic valve.
2. Install the 13/16" ORFS M/M/F swivel run tee adapter fitting (P/N 333-0012-028) in the right tilt port of the machine's hydraulic valve.
3. Connect the machine's right tilt hose on the opposite end of the installed tee fitting.
4. Connect the straight end of the supplied hydraulic hose (P/N 214-1000-497) to the 90° end of the installed tee adapter fitting.
5. Connect the 90° end of the hydraulic hose to the installed fittings in Port RC on the AutoBoom valve.
6. Install the 13/16" ORFS M/M/F swivel run tee adapter fitting (P/N 333-0012-028) in the left tilt port of the machine's hydraulic valve.
7. Connect the machine's left tilt hose on the opposite end of the installed tee fitting.
8. Connect the straight end of the supplied hydraulic hose (P/N 214-1000-497) to the 90° end of the installed tee adapter fitting.
9. Connect the 90° end of the hydraulic hose to the installed fittings in Port LC on the AutoBoom valve.

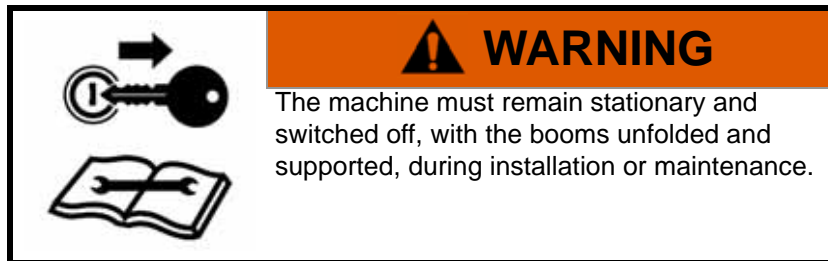
PowerGlide Plus Hydraulic Schematic



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 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 Installed



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 and hub retainer bracket.
4. Mount the left wheel receiver bracket (P/N 116-0159-697) to the front of the left boom by installing four 2.5" OD x 3/8"16 thread U-bolt muffler clamps (P/N 435-3003-062) through the back of the receiver bracket and securing them with eight 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
5. 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).
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 312-1000-043).
7. Repeat the steps above to install the right wheel.

Install the PowerGlide Plus Wiring

Wiring Connections

	<p>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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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 063-0130-010) in the node mounting cabinet next to the AutoBoom valve (P/N 063-0131-124) using three 3/8"-16 UNC x 1" hex bolts (P/N 311-0054-105) and 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
2. Install the large, rectangular node connectors of the AutoBoom harness cable (P/N 115-0230-102) in the correct ports of the node.
3. Tighten the bolts on the node connectors to secure the connections.

Connect the AutoBoom Harness to the AutoBoom Valve

1. Locate the LEFT PRESS (PORT G1) and RIGHT PRESS (PORT G4) connectors on the 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 (PORT G1) connector to Port G1 on the AutoBoom valve.
4. Connect the RIGHT PRESS (PORT G4) connector to Port G4 on the AutoBoom valve.
5. Locate the LEFT SOLENOID (PORT 4A) and RIGHT SOLENOID (PORT 4B) connectors on the harness cable.
6. Connect the LEFT SOLENOID (PORT 4A) connector to Port 4A on the AutoBoom valve.
7. Connect the RIGHT SOLENOID (PORT 4B) connector to Port 4B on the AutoBoom valve.
8. Locate the LEFT PROP (PORT 5A) and RIGHT PROP (PORT 13A) connectors on the harness cable.
9. Connect the LEFT PROP (PORT 5A) connector to Port 5A on the AutoBoom valve.
10. Connect the RIGHT PROP (PORT 13A) connector to Port 13A on the AutoBoom valve.

Connect the AutoBoom Harness to the Machine's Harness

FIGURE 12. Machine's Existing Boom Function Connections



11. Locate the machine's boom function connections along the machine's right parallel arm.

FIGURE 13. AutoBoom Harness Boom Function Connections



12. Disconnect the boom function connections.
13. Connect the boom function connectors to the mating 6-pin boom function connectors on the AutoBoom harness cable.

FIGURE 14. Machine's CAN and Power Connection



14. Remove the dust cap from the machine's 8-pin CAN and power connector.
15. Connect the machine's CAN and power connector to the mating 8-pin connector on the AutoBoom harness cable.
16. Loop and tie-off the ultrasonic SENSOR connectors, securing them with plastic cable ties as necessary.

Note: *The ultrasonic SENSOR connectors are not used in the PowerGlide Plus AutoBoom system. Ensure the cable connectors are secured away from moving parts and heat sources.*

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 local Raven dealer.

TABLE 1. UltraGlide Installation Kit (P/N 117-0232-121)

Picture	Item Description	Part Number	Qty.
Not Pictured	Manual - AutoBoom Calibration & Operation	016-0130-062	1
Not Pictured	Manual - Miller Nitro N5 Series wi AD Truss AutoBoom Installation	016-0230-121	1
	Valve - UltraGlide AutoBoom	063-0131-124	1
	Node - UltraGlide CAN AutoBoom	063-0130-013	1
	Sensor - Right Ultrasonic	063-0130-012	1
	Sensor - Left Ultrasonic	063-0130-014	1

TABLE 1. UltraGlide Installation Kit (P/N 117-0232-121)

Picture	Item Description	Part Number	Qty.
	Sensor - Center Ultrasonic	063-0130-026	1
	Cable - 60' Ultrasonic Sensor Extension	115-0230-051	2
	Cable - AutoBoom Harness	115-0230-102	1
	Bracket - Miller Nitro Center Sensor	107-0172-186	1
	Clamp - 2.2" ID x 3" Long x 3/8" Thread U-Bolt Muffler	434-3003-046	4
	Bolt - 5/16"-18 x 7/8" Hex	311-0052-104	4
	Bolt - 5/16"-18 x 1-1/4" Hex	311-0052-106	1
	Bolt - 3/8"-16 UNC x 1" Hex	311-0054-105	5
	Nut - 3/8"-16 Zinc Flanged Lock	312-1001-164	5
	Nut - 5/16"-18 Nylon Insert Lock	312-4000-059	1

TABLE 1. UltraGlide Installation Kit (P/N 117-0232-121)



Picture	Item Description	Part Number	Qty.
	Washer - 5/16" Split Lock	313-1000-019	4
	Washer - 5/16" Flat	313-2300-012	2


TABLE 2. Hydraulic Kit (P/N 117-0134-082)

Picture	Item Description	Part Number	Qty.
	Fitting - 13/16" ORFS M/M/F Swivel Run Tee Adapter	333-0012-028	2
	Fitting - 13/16" ORFS M/F 90° Swivel Elbow	333-0012-067	3 (2 extra)
	Fitting - 13/16" ORFS (M) to 9/16" SAE O-Ring (M) Straight Adapter	333-0012-082	2
	Fitting - 13/16" ORFS (M) to 3/4" SAE O-Ring (M) Straight Adapter	333-0012-168	1
	Fitting - 9/16" SAE O-Ring (M) to 11/16" Hex Plug	333-0012-194	2
	Fitting - 13/16" ORFS (M) to 3/4" SAE O-Ring (M) 90° Elbow	333-0012-229	3
	Hydraulic Hose - 13/16" ORFS (F) to 13/16" ORFS (F) 90° - 48"	214-1000-497	2
	Hydraulic Hose - 13/16" ORFS (F) to 13/16" ORFS (F) - 64"	214-1000-951	2

TABLE 3. Optional Wheel Kit (P/N 117-0133-081)


Picture	Item Description	Part Number	Qty.
	Axle Assembly - Right	063-0131-585	1
	Axle Assembly - Left	063-0131-590	1
	Wheel	322-0131-008	2
	Bracket - Nitro Left Weldment	116-0159-697	1
	Bracket - Nitro Right Weldment	116-0159-698	1
	Clamp - 2.5" OD x 3/8" Thread U-Bolt Muffler	435-3003-062	8
	Bolt - 1/2"-13 x 1-1/2" SS	311-0058-186	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.



⚠ 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.

Objects 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.

Install the Fittings on the AutoBoom Valve

Before mounting the AutoBoom valve on the machine, install the fittings in the appropriate ports of the AutoBoom 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.

Fitting	Part Number	Port
Fitting - 13/16" ORFS (M) to 3/4" SAE O-Ring (M) 90° Elbow	333-0012-229	P
Fitting - 13/16" ORFS (M) to 3/4" SAE O-Ring (M) Straight Adapter	333-0012-168	T
Fitting - 13/16" ORFS M/F 90° Swivel Elbow	333-0012-067	T

Fitting	Part Number	Port
Fitting - 9/16" SAE O-Ring (M) to 11/16" Hex Plug	333-0012-194	LV, RV
Fitting - 13/16" ORFS (M) to 9/16" SAE O-Ring (M) Straight Adapter	333-0012-082	LC, RC

Mount the AutoBoom Valve

FIGURE 1. AutoBoom Valve Installed




1. Secure the AutoBoom valve (P/N 063-0131-124) to the machine's built-in mounting plate using four 5/16"-18 x 7/8" hex bolts (P/N 311-0052-104) and four 5/16" split lock washers (P/N 313-1000-019).

Note: The AutoBoom valve should be installed so that Ports LC and RC face the center of the machine.

2. Tighten the bolts to ensure the valve is securely installed.

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.

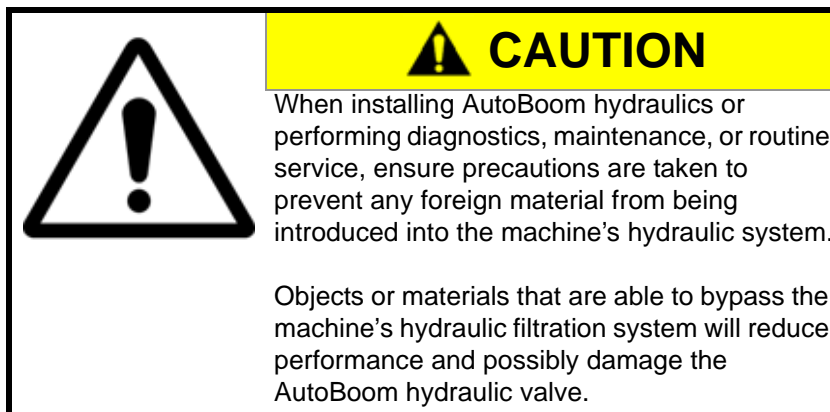
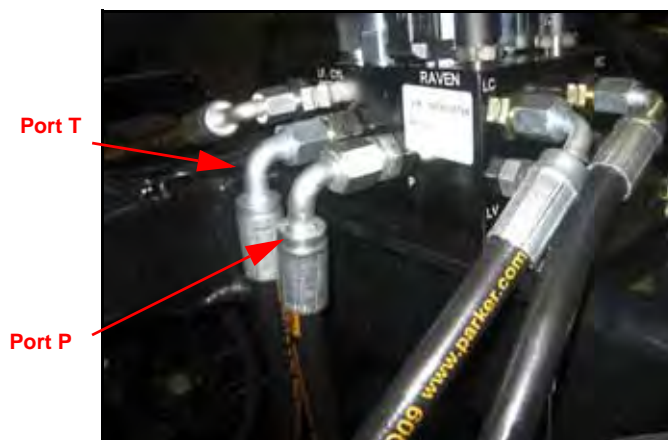
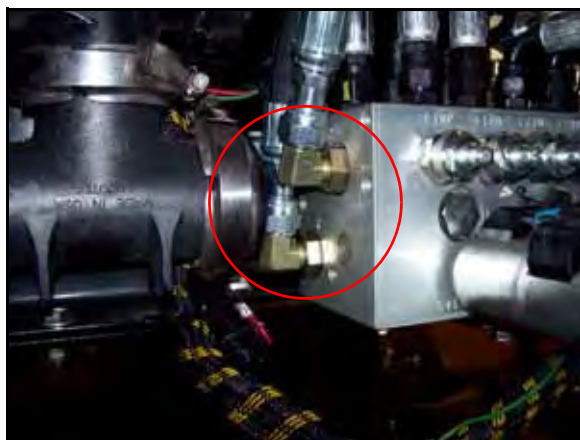


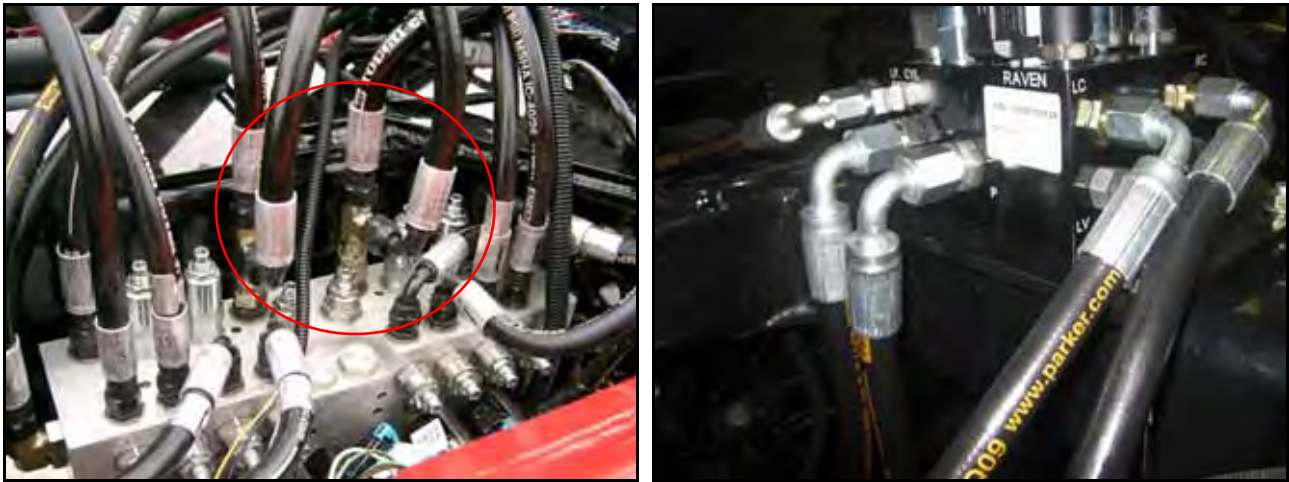
FIGURE 2. Pressure and Tank Lines Installed



1. Locate the pressure and tank port plugs on the machine's hydraulic valve. The plugs are located on the side opposite from the pressure and tank hoses on the hydraulic valve.
2. Remove the port plugs from the hydraulic valve.
3. Install two 13/16" ORFS (M) to 3/4" SAE O-ring (M) 90° elbow fittings (P/N 333-0012-229) in the pressure and tank ports.
4. Connect one end of the supplied hydraulic hose (P/N 214-1000-951) to the installed fitting in the pressure port of the machine's hydraulic valve.
5. Connect the other end of the hydraulic hose to the installed fitting on Port P on the AutoBoom valve.
6. Connect one end of the supplied hydraulic hose (P/N 214-1000-951) to the installed fitting in the tank port of the machine's hydraulic valve.
7. Connect the other end of the hydraulic hose to the installed fittings on Port T on the AutoBoom valve.

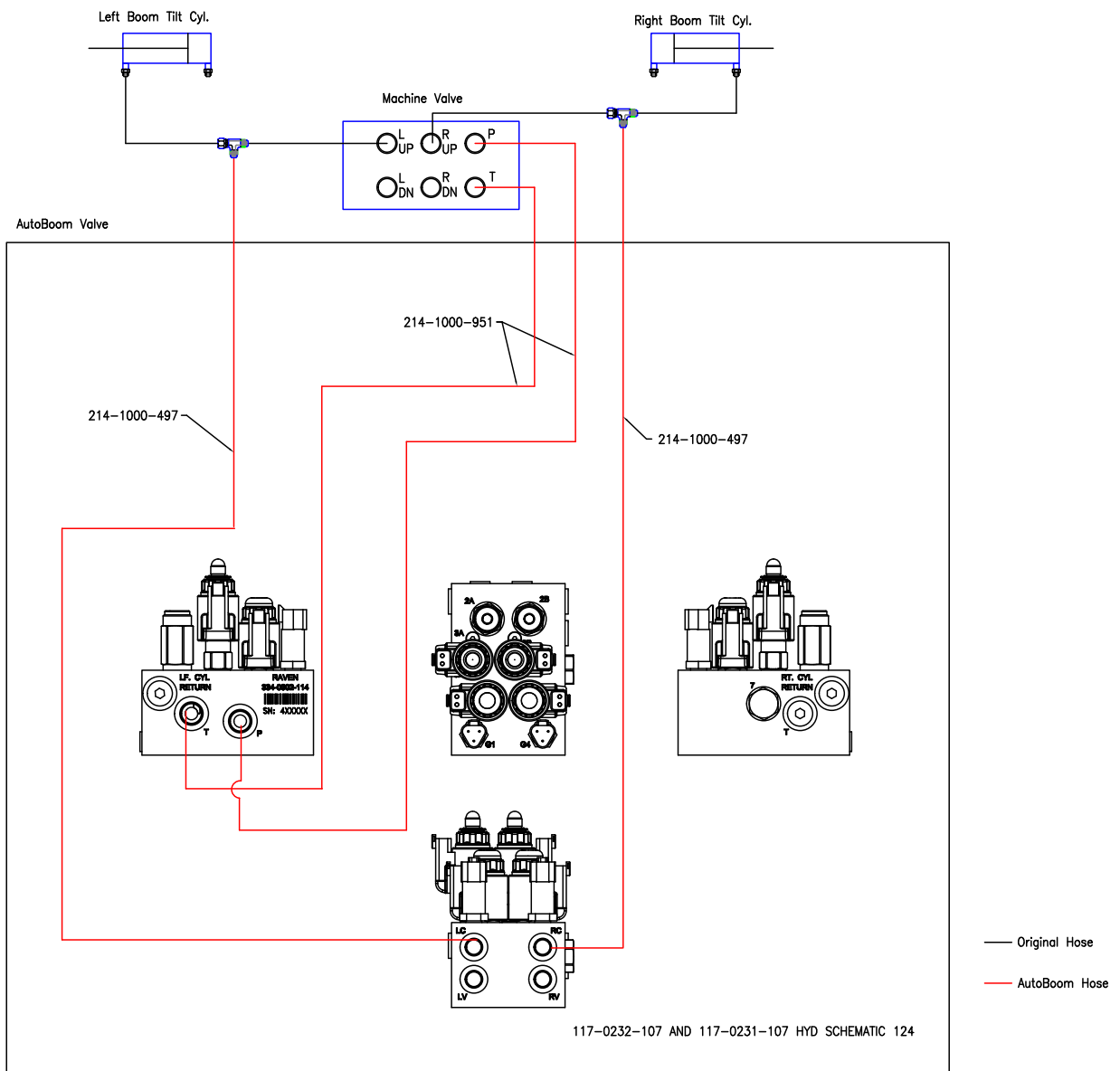
Install Left and Right Cylinder Hoses

FIGURE 3. Left and Right Cylinder Hoses Installed



1. Disconnect the machine's right and left cylinder hoses from the machine's hydraulic valve.
2. Install a 13/16" ORFS M/M/F swivel run tee adapter fitting (P/N 333-0012-028) in the right tilt port of the machine's hydraulic valve.
3. Connect the machine's right tilt hose on the opposite end of the installed tee fitting.
4. Connect the straight end of the supplied hydraulic hose (P/N 214-1000-497) to the 90° end of the installed tee adapter fitting.
5. Connect the 90° end of the hydraulic hose to the installed fittings in Port RC on the AutoBoom valve.
6. Install a 13/16" ORFS M/M/F swivel run tee adapter fitting (P/N 333-0012-028) in the left tilt port of the machine's hydraulic valve.
7. Connect the machine's left tilt hose on the opposite end of the installed tee fitting.
8. Connect the straight end of the supplied hydraulic hose (P/N 214-1000-497) to the 90° end of the installed tee adapter fitting.
9. Connect the 90° end of the hydraulic hose to the installed fittings in Port LC on the AutoBoom valve.

UltraGlide Hydraulic Schematic



Install the UltraGlide Sensors

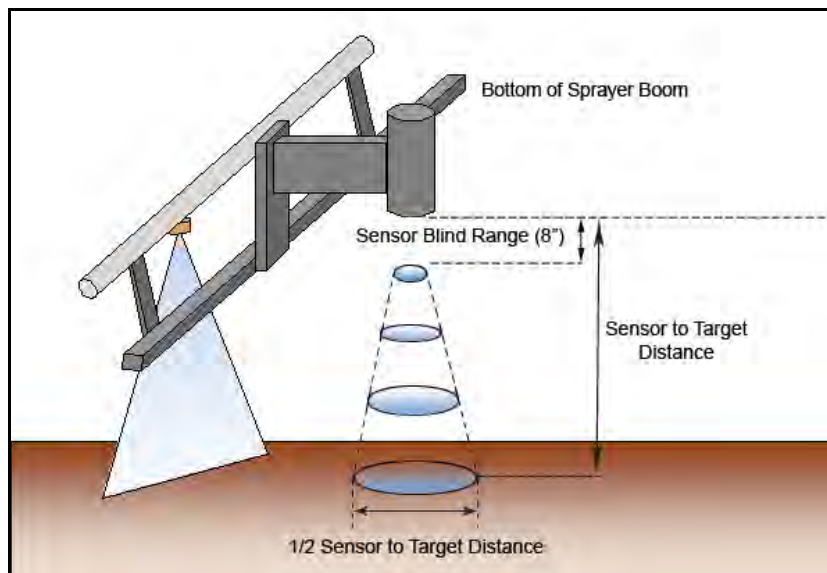
Boom Sensor Mounting Locations

FIGURE 4. Boom Sensor Mounting Location




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



Mount the Boom Sensors



⚠ **WARNING**

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

Note: When mounting two sensors per boom, mount the inside sensors on the main wing in front of the fold. When booms are racked, the sensors will be pointing toward the hood.

FIGURE 6. Mounted Sensor



1. Secure the left sensor (P/N 063-0130-014) to the front of the left boom using two 2-1/2" ID x 3.0" L x 3/8" thread clamp U-bolts (P/N 435-3003-046).
2. Tighten the nuts to ensure the sensor is mounted securely.
3. Secure the right sensor (P/N 063-0130-012) to the front of the right boom using two 2-1/2" ID x 3.0" L x 3/8" thread clamp U-bolts (P/N 435-3003-046).
4. Tighten the nuts to ensure the sensor is mounted securely.

Mount the Center Rack Sensor

FIGURE 7. Center Rack Sensor Mounting



1. 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).
2. Align the hole in the sensor with the hole on the narrow end of the sensor extension bracket (P/N 107-0172-186).
3. Insert the bolt and washer through the aligned holes in the sensor and bracket.
4. 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).
5. Mount the sensor bracket to the front-right side of the machine's center rack using two 3/8"-16 UNC x 1" hex bolts (P/N 311-0054-105) and two 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164) as shown in Figure 7 above.
6. Tighten the nut to ensure the sensor is mounted securely.

Connect the Sensor Cables

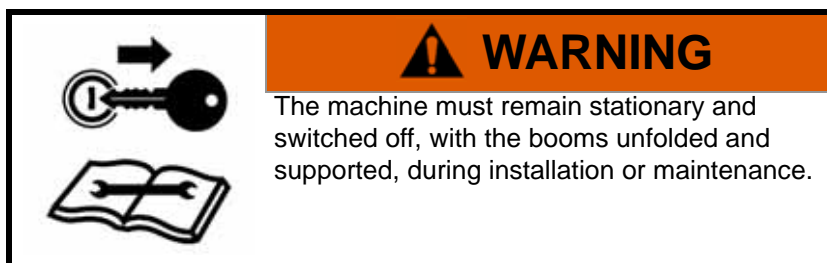
1. Connect the left sensor cable (P/N 115-0230-051) to the connector on the left sensor.
2. Route the left sensor cable toward the AutoBoom valve.
3. Loop and tie-off any excess cable, allowing enough cable for boom folding and extension.
4. Repeat the steps above to connect the remaining sensor cable(s).

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 8. Gauge Wheel Installed



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 and hub retainer bracket.
4. Mount the left wheel receiver bracket (P/N 116-0159-697) to the front of the left boom by installing four 2.5" OD x 3/8"16 thread U-bolt muffler clamps (P/N 435-3003-062) through the back of the receiver bracket and securing them with eight 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
5. 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).
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 312-1000-043).
7. Repeat the steps above to install the right wheel.

Install the UltraGlide Wiring

Wiring Connections

	<p>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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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 9. AutoBoom Node Mounting Location



1. Mount the AutoBoom node (P/N 063-0130-013) in the node mounting cabinet next to the AutoBoom valve (P/N 063-0131-124) using three 3/8"-16 UNC x 1" hex bolts (P/N 311-0054-105) and three 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
2. Install the large, rectangular node connectors of the AutoBoom harness cable (P/N 115-0230-102) in the correct ports of the node.
3. Tighten the bolts on the node connectors to secure the connections.

Connect the AutoBoom Harness to the AutoBoom Valve

1. Locate the LEFT PRESS (PORT G1) and RIGHT PRESS (PORT G4) connectors on the 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 (PORT G1) connector to Port G1 on the AutoBoom valve.
4. Connect the RIGHT PRESS (PORT G4) connector to Port G4 on the AutoBoom valve.
5. Locate the LEFT SOLENOID (PORT 4A) and RIGHT SOLENOID (PORT 4B) connectors on the harness cable.
6. Connect the LEFT SOLENOID (PORT 4A) connector to Port 4A on the AutoBoom valve.
7. Connect the RIGHT SOLENOID (PORT 4B) connector to Port 4B on the AutoBoom valve.
8. Locate the LEFT PROP (PORT 5A) and RIGHT PROP (PORT 13A) connectors on the harness cable.
9. Connect the LEFT PROP (PORT 5A) connector to Port 5A on the AutoBoom valve.
10. Connect the RIGHT PROP (PORT 13A) connector to Port 13A on the AutoBoom valve.

Connect the AutoBoom Harness to the Machine's Harness

FIGURE 10. Machine's Existing Boom Function Connections



11. Locate the machine's boom function connections along the machine's right parallel arm.

FIGURE 11. AutoBoom Harness Boom Function Connections



12. Disconnect the boom function connections.
13. Connect the boom function connectors to the mating 6-pin boom function connectors on the AutoBoom harness cable.

FIGURE 12. Machine's CAN and Power Connection



14. Remove the dust cap from the machine's 8-pin CAN and power connector.
15. Connect the machine's CAN and power connector to the mating 8-pin connector on the AutoBoom harness cable.

Connect the Harness Cable to the Sensors

1. Locate the CENTER SENSOR connector on the AutoBoom harness cable (P/N 115-0230-102).
2. Connect the CENTER SENSOR connector to the installed center sensor (P/N 063-0130-026).
3. Locate the LEFT SENSOR (OUTER) connector on the AutoBoom harness cable.
4. Connect the LEFT SENSOR (OUTER) connector to the installed left sensor cable (P/N 115-0230-051).
5. Locate the RIGHT SENSOR (OUTER) connector on the AutoBoom harness cable.
6. Connect the RIGHT SENSOR (OUTER) connector to the installed right sensor cable.
7. If optional inside boom sensors are installed, repeat the steps above to connect the inside sensors.

Install the Node Power Jumper (If Applicable)

Note: *This section applies only to ISO AutoBoom systems that do not have a display connected to the right armrest bulkhead connector.*

FIGURE 13. Node Power Jumper Installed



Install a node power jumper (P/N 063-0173-614) in the bulkhead connector located in the right arm rest.

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.

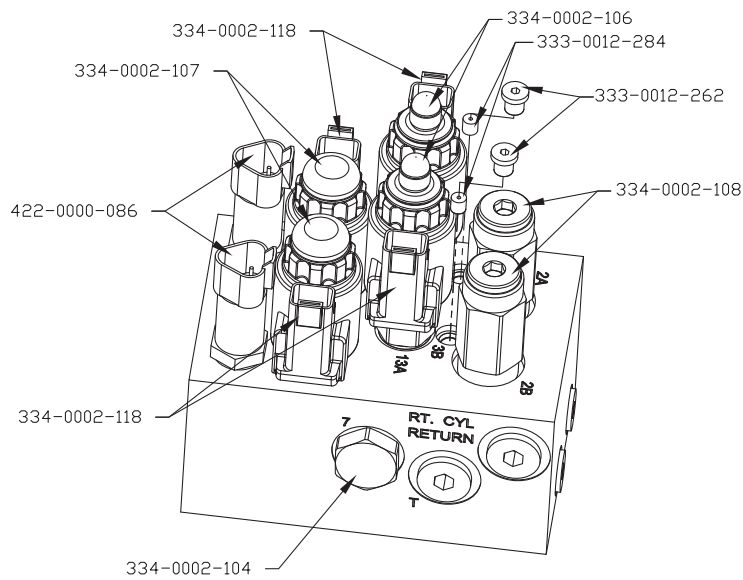
CHAPTER

5

Replacement Parts

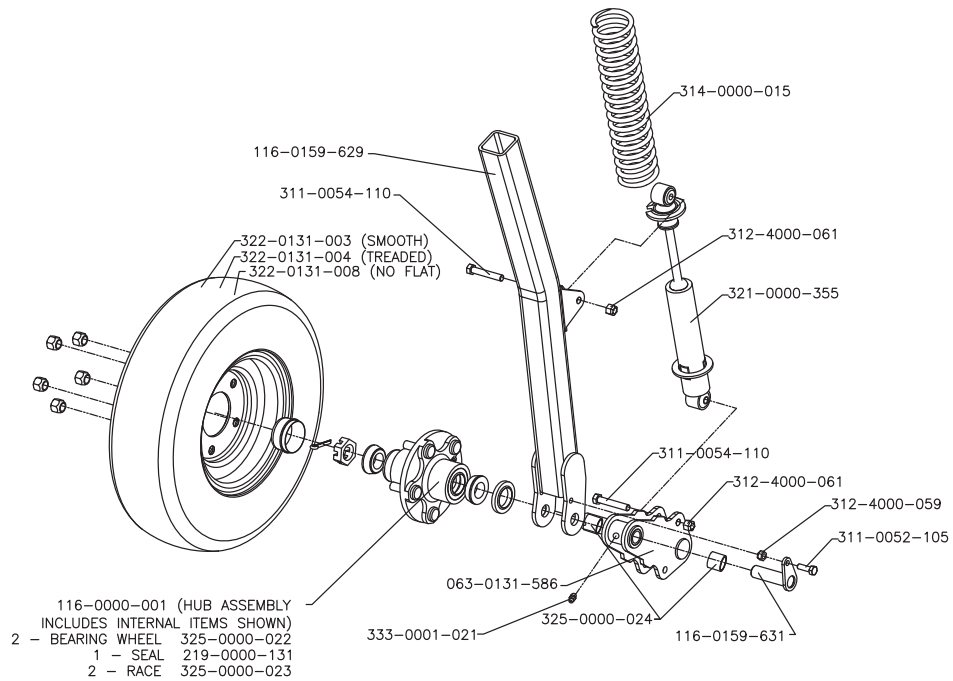
This section contains replacement part diagrams for PowerGlide Plus and UltraGlide systems. Refer to these diagrams when calling to request replacement parts.

Valves

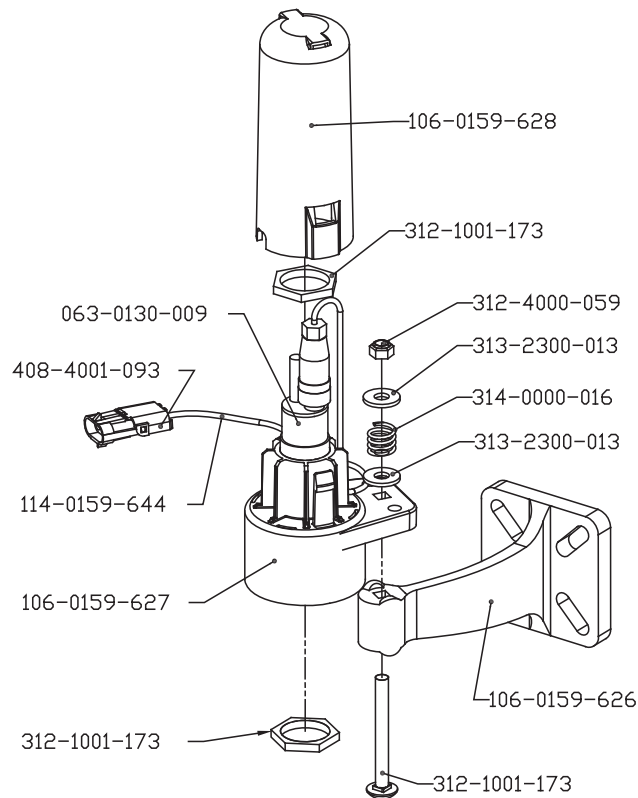


063-0131-124
VALVE, HYDRAULIC POWERGLIDE
PLUS/ULTRAGLIDE, CLOSED CENTER, AUTOBOOM

Wheels



Sensors



E**Electrical**

Safety 2

H**Hydraulic**

Fittings 4

Safety 2

I**Important Safety Information**

Electrical Safety 2

Hydraulic Safety 2

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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.