

**John Deere 47XX/48XX Series
AutoBoom® UltraGlide XT
Installation Manual**

P/N 016-0233-009 Rev. B

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Chapter 1	Important Safety Information	1
	Hydraulic Safety	2
	Electrical Safety	2
Chapter 2	Introduction	3
	Preparing for Installation	3
	Recommendations	3
	Point of Reference	4
	Hydraulic Fittings	4
	Updates	4
	Kit Contents	5
	UltraGlide Not Installed on the Machine	5
	UltraGlide Installed on the Machine	14
Chapter 3	Hydraulic System Installation	23
	Install Fittings on the AutoBoom Valve (If Applicable)	24
	Install Fittings in the UltraGlide XT Valve	24
	Mount the AutoBoom Valve on the Valve Mounting Bracket (If UltraGlide Is Not Installed)	25
	Mount the UltraGlide XT Valve on the Valve Mounting Bracket	26
	Install the Valve Mounting Bracket on the Machine (If UltraGlide Is Not Installed)	26
	Install the Pressure and Tank Hoses	27
	UltraGlide Not Installed on the Machine	27
	UltraGlide Installed on the Machine	28
	Remove the Orifices From the Machine's Tilt Cylinders (If UltraGlide Is Not Installed)	28
	Install the Left and Right Cylinder Hoses (If UltraGlide Is Not Installed)	29
	Install the Left and Right Down Hoses (If UltraGlide is Not Installed)	30
	Install the Load Sense Hoses	30
	Install the UltraGlide XT Cylinders	32
	Install the Cylinder Hose Retaining Bracket Assembly	36
	Install the Cylinder Hoses	36
	Hydraulic Schematic	40
Chapter 4	Sensor Installation	41
	Boom Sensor Mounting Locations	41
	Install the Sensors - UltraGlide Not Installed on the Machine	42
	Install the Boom Sensors	42
	Mount the Center Sensor	43
	Install the Sensors - UltraGlide Installed on the Machine (If Applicable)	43
	Mount the Boom Sensors	43
	Mount the Center Sensor	44
	Assemble the Rotary Sensor Assembly	45
Chapter 5	Wiring Installation	49
	Wiring Connections	49
	Install the UltraGlide XT Node	49

Table of Contents

Connect the UltraGlide XT Harness Cable to the Boom Function Controls	50
Install the Center Rack Control	52
Connect to the Load Sense Combo Valve	53
Connect the Harness Cable to the Sensors	53
Install the UltraGlide XT Auxiliary Sensor Cable	54
Install ISO CAN Wiring	54
Connect the UltraGlide XT Harness Cable to the Power Cable	54
UltraGlide not Installed on the Machine	55
UltraGlide Installed on the Machine	56
Wiring Schematic	57
Chapter 6 Startup Procedures.....	59
Verify the AutoBoom Hydraulic System Installation	59
Verify the UltraGlide XT Wiring	59
Calibrate the AutoBoom UltraGlide XT System	60
Chapter 7 Replacement Parts.....	61
Valve	62
Sensors	64

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[®] UltraGlide XT 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, 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.
- Always disconnect batteries before performing electrical work.

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: John Deere

MODEL: 4720, 4730, and 4830

FIGURE 1. John Deere 4720



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

- John Deere 47XX/48XX Series AutoBoom® UltraGlide XT Installation Manual
- P/N 016-0233-009 Rev. B
- Any comments or feedback (include chapter or page numbers if applicable).
- Let us know how long have you been using this or other Raven products.

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

Thank you for your time.

KIT CONTENTS

Determine whether or not AutoBoom is installed on the machine, then identify the applicable kit below.

ULTRAGLIDE NOT INSTALLED ON THE MACHINE

This section contains a list of the components that are included in the UltraGlide XT kit. This kit applies to machines that do not have UltraGlide AutoBoom installed. Before beginning the AutoBoom UltraGlide XT installation, compare the items in the kit with the components on this list. If you have questions about the kit, contact your Raven dealer.

TABLE 1. AutoBoom UltraGlide XT Installation Kit (P/N 117-0233-009)


Picture	Item Description	Part Number	Qty.
Not Pictured	Manual - ISO AutoBoom Calibration & Operation	016-0130-078	1
Not Pictured	Manual - John Deere 47XX and 48XX Series UltraGlide XT Installation	016-0233-009	1
	Valve - AutoBoom Hydraulic	063-0131-125	1

TABLE 1. AutoBoom UltraGlide XT Installation Kit (P/N 117-0233-009)

Picture	Item Description	Part Number	Qty.
	Valve - UltraGlide XT Hydraulic	063-0131-154	1
	Node - UltraGlide XT AutoBoom	063-0130-024	1
	Sensor - Ultrasonic	063-0130-026	5
	Bracket - Hydraulic Valve Mounting	107-0171-619	1
	Bracket - Hydraulic Valve Mounting	107-0171-802	1
	Bracket - Lower XT Cylinder Mount Backing	107-0172-347	1
	Bracket - Center Sensor Mounting	116-0159-684	1
	Bracket - Lower XT Cylinder Mounting	116-0159-760	1
	Bracket - Upper XT Cylinder Mounting	116-0159-761	2
	Cable - 70' Ultrasonic Sensor	115-0171-527	2
	Cable - 2-Pin Deutsch Boom Sense Adapter	115-0171-546	1

TABLE 1. AutoBoom UltraGlide XT Installation Kit (P/N 117-0233-009)

Picture	Item Description	Part Number	Qty.
	Cable - 40' Ultrasonic Sensor Extension	115-0171-602	2
	Cable - High Current Switched Power ISO/CAN AutoBoom	115-0230-025	1
	Cable - Center Rack Control Boom Sense Up	115-0230-048	1
	Cable - Center Rack Control Boom Sense Down	115-0230-049	1
	Cable - 20' Center Rack Control Load Sense Extension	115-0230-078	1
	Cable - ISO/CAN John Deere 20/30/40 Series AutoBoom Harness	115-0230-114	1
	Cable - UltraGlide XT Auxiliary Sensor	115-0230-147	1
	Cylinder - 1.5" x 8" x 0.75" Hydraulic	334-0004-006	2
	Shim - Hydraulic Valve Mounting	107-0171-620	8
	Clamp - 1-1/2" W x 2-1/2" L x 3/8" Thread U-Bolt	435-3003-047	4
	U-Bolt - 4" W x 5" L x 3/8" Thread	107-0171-606	4



TABLE 1. AutoBoom UltraGlide XT Installation Kit (P/N 117-0233-009)

Picture	Item Description	Part Number	Qty.
	U-Bolt - 3-1/16" W x 4" L x 3/8" Thread	107-0171-608	2
	U-Bolt - 2-1/16" W x 3" L x 3/8" Thread	107-0171-609	1
	U-Bolt - 1/1/8" W x 2" L x 3/8" Thread	107-0171-613	4
	U-Bolt - 2-9/16" W x 3-1/2" L x 3/8" Thread	107-0171-616	8
	U-Bolt - 2" W x 5" L x 3/8" Thread	107-0172-293	2
	Bolt - 5/16"-18 x 4" Hex	311-0052-092	2
	Bolt - 5/16"-18 x 7/8" Hex	311-0052-104	4
	Bolt - 3/8"-16 UNC x 1-1/4" Hex	311-0054-081	3
	Bolt - 1/2"-13 x 1-3/4" Machine	311-0058-098	4
	Bolt - 1/2"-13 x 6-1/2" Machine	311-0058-112	4
	Bolt - 3/4"-10 x 4-1/2" Machine	311-0062-098	4

TABLE 1. AutoBoom UltraGlide XT Installation Kit (P/N 117-0233-009)


Picture	Item Description	Part Number	Qty.
	Nut - 3/8"-16 Zinc Flanged Lock	312-1001-164	44
	Nut - 5/16"-18 Nylon Insert Lock	312-4000-059	2
	Nut - 3/8"-16 Nylon Insert Lock	312-4000-061	3
	Nut - 1/2"-13 Nylon Insert Lock	312-4000-065	8
	Nut - 3/4"-10 Nylon Insert Lock	312-4000-071	4
	Washer - 5/16" Split Lock	313-1000-019	4
	Washer - 3/4" Flat	313-2300-023	16
	Washer - 1/2" Steel Flat	313-2300-019	16

TABLE 2. Boom Sense Adapter Kit (P/N 117-0131-009)



Picture	Item Description	Part Number	Qty.
	Cable - Left Up Boom Sense Adapter	115-0171-254	1
	Cable - Left Down Boom Sense Adapter	115-0171-622	1

TABLE 2. Boom Sense Adapter Kit (P/N 117-0131-009)



Picture	Item Description	Part Number	Qty.
	Cable - Right Down Boom Sense Adapter	115-0171-623	1
	Cable - Right Up Boom Sense Adapter	115-0171-624	1

TABLE 3. AutoBoom Hydraulic Kit (P/N 117-0134-020)

Picture	Item Description	Part Number	Qty.
	Fitting - 9/16" ORFS M/M/F Swivel Run Tee	333-0012-022	2
	Fitting - 11/16" ORFS M/F 90° Swivel Elbow	333-0012-065	2
	Fitting - 11/16" ORFS M/M/F Swivel Run Tee	333-0012-069	3
	Fitting - 11/16" ORFS (M) to 9/16" SAE O-Ring (M) Straight Adapter	333-0012-084	2
	Fitting - 9/16" ORFS (M) to 3/4" SAE O-Ring (M) 90° Elbow	333-0012-166	2
	Fitting - 9/16" ORFS (M) to 9/16" SAE O-Ring (M) Straight Adapter	333-0012-195	1
	Fitting - 11/16" ORFS (M) to 3/4" SAE O-Ring (M) Straight Adapter	333-0012-199	2
	Fitting - 11/16" ORFS (M) to 9/16" SAE O-Ring (M), .060 Orifice Straight Adapter	333-0012-289	2

TABLE 3. AutoBoom Hydraulic Kit (P/N 117-0134-020)

Picture	Item Description	Part Number	Qty.
	Hydraulic Hose - 11/16" ORFS (F) to 11/16" ORFS 90° (F) - 84"	214-1000-318	1
	Hydraulic Hose - 11/16" ORFS (F) to 11/16" ORFS 90° (F) - 102"	214-1000-319	1
	Hydraulic Hose - 11/16" ORFS (F) to 11/16" ORFS 90° (F) - 36"	214-1000-333	2
	Hydraulic Hose - 11/16" ORFS (F) to 9/16" ORFS 90° (F) - 144"	214-1000-335	1
	Hydraulic Hose - 9/16" ORFS (F) to 9/16" JIC (F) 90° - 36"	214-1000-607	2

TABLE 4. UltraGlide XT Hydraulic Kit (P/N 117-0134-309)

Picture	Item Description	Part Number	Qty.
	Fitting - -6 JIC M/F 90° Elbow	333-0012-042	2
	Fitting - -6 JIC M/M/F Swivel Run Tee Adapter	333-0012-043	2
	Fitting - -6 JIC (M) to -6 SAE O-Ring (M) Straight Adapter	333-0012-045	2
	Fitting - -4 O-Ring Hex Plug	333-0012-051	7
	Fitting - -6 ORFS M/M/F Swivel Run Tee	333-0012-069	2

TABLE 4. UltraGlide XT Hydraulic Kit (P/N 117-0134-309)

Picture	Item Description	Part Number	Qty.
	Fitting - -6 ORFS (M) to -6 SAE O-Ring (M) Straight Adapter	333-0012-084	2
	Fitting - -6 O-Ring Hex Plug	333-0012-104	2
	Fitting - -6 ORFS (M) to -6 SAE O-Ring (M) Straight Adapter	333-0012-195	1
	Fitting - -4 ORFS (M) to -4 SAE O-Ring (M) Straight Adapter	333-0012-209	1
	Hydraulic Hose - -6 ORFS (F) to -6 ORFS 90° (F) - 36"	214-1000-333	2
	Hydraulic Hose - -6 JIC (F) to -6 JIC (F) 90° - 120"	214-1001-035	4
	Hydraulic Hose - -4 ORFS (F) to -4 ORFS (F) 90° - 20"	214-1001-098	1

TABLE 5. Ultrasonic Sensor Bracket Installation Kit (P/N 117-0131-082)


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

TABLE 5. Ultrasonic Sensor Bracket Installation Kit (P/N 117-0131-082)



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

TABLE 6. Ultrasonic Sensor Bracket Installation Kit (P/N 117-0131-087)




Picture	Item Description	Part Number	Qty.
Not Pictured	Sheet - AutoBoom Sensor Extension	016-0130-070	1
	Bracket - 12" S-Type AutoBoom Sensor	063-0131-592	3
	Nut - 1/4"-20 Nylon Insert Lock	312-4000-057	6
	Washer - 1/4" Steel Flat	313-2300-010	6

TABLE 7. Rotary Sensor Installation Kit (P/N 117-0131-089)




Picture	Item Description	Part Number	Qty.
	Sensor - 360° Rotary Sensor	416-0001-055	1
	Bracket - Rotary Sensor Arm	107-0172-297	1
	Bracket - Rotary Sensor	107-0172-436	1



TABLE 7. Rotary Sensor Installation Kit (P/N 117-0131-089)

Picture	Item Description	Part Number	Qty.
	Rod - M6 x 1.0 Threaded	107-0172-434	1
	Strap - Rotary Sensor	107-0172-435	1
	Bearing - M6 90° Rod-End	325-0000-031	2
	Screw - Phillips #10-32 x 1-1/2" SS Machine Pan Head	311-0002-048	2
	Screw - M6 x 1.0 x 8 mm SS PHMS	311-0005-128	2
	Nut - M6 x 1 mm Pitch DIN 934 Hex	312-1001-183	2
	Nut - #10-32 SS Nylon Insert Lock	312-4000-162	2
	Nut - M6 x 1 mm Pitch DIN 985 Hex	312-4000-214	2
	Washer - M6 DIN 125 Flat Washer	313-2300-182	2

ULTRAGLIDE INSTALLED ON THE MACHINE

This section contains a list of the components that are included in the UltraGlide XT upgrade kit. This kit applies to machines that already have UltraGlide AutoBoom installed. Before beginning the UltraGlide XT installation,

compare the items in the kit with the components on this list. If you have questions about the kit, contact your Raven dealer.

TABLE 8. UltraGlide XT Installation Kit (P/N 117-0234-009)

Picture	Item Description	Part Number	Qty.
Not Pictured	Manual - ISO AutoBoom Calibration & Operation	016-0130-078	1
Not Pictured	Manual - John Deere 47XX and 48XX Series UltraGlide XT Installation	016-0233-009	1
	Valve - UltraGlide XT Hydraulic	063-0131-154	1
	Node - UltraGlide XT AutoBoom	063-0130-024	1
	Sensor - Ultrasonic	063-0130-026	1
	Bracket - Hydraulic Valve Mounting	107-0171-619	1
	Bracket - Lower XT Cylinder Mount Backing	107-0172-347	1
	Bracket - Center Sensor Mounting	116-0159-684	1
	Bracket - Lower XT Cylinder Mounting	116-0159-760	1
	Bracket - Upper XT Cylinder Mounting	116-0159-761	2



TABLE 8. UltraGlide XT Installation Kit (P/N 117-0234-009)




Picture	Item Description	Part Number	Qty.
	Cable - ISO/CAN John Deere 20/30/40 Series AutoBoom Harness	115-0230-114	1
	Cable - UltraGlide XT Auxiliary Sensor	115-0230-147	1
	Cylinder - 1.5" x 8" x 0.75" Hydraulic	334-0004-006	2
	Shim - Hydraulic Valve Mounting	107-0171-620	8
	U-Bolt - 4" W x 5" L x 3/8" Thread	107-0171-606	4
	U-Bolt - 2-1/16" W x 3" L x 3/8" Thread	107-0171-609	1
	U-Bolt - 2-9/16" W x 3-1/2" L x 3/8" Thread	107-0171-616	8
	U-Bolt - 2" W x 5" L x 3/8" Thread	107-0172-293	2
	Bolt - 5/16"-18 x 4" Hex	311-0052-092	2
	Bolt - 3/8"-16 UNC x 1-1/4" Hex	311-0054-081	3
	Bolt - 1/2"-13 x 1-3/4" Machine	311-0058-098	4

TABLE 8. UltraGlide XT Installation Kit (P/N 117-0234-009)

Picture	Item Description	Part Number	Qty.
	Bolt - 1/2"-13 x 6-1/2" Machine	311-0058-112	4
	Bolt - 3/4"-10 x 4-1/2" Machine	311-0062-098	4
	Nut - 3/8"-16 Zinc Flanged Lock	312-1001-164	32
	Nut - 5/16"-18 Nylon Insert Lock	312-4000-059	2
	Nut - 3/8"-16 Nylon Insert Lock	312-4000-061	3
	Nut - 1/2"-13 Nylon Insert Lock	312-4000-065	8
	Nut - 3/4"-10 Nylon Insert Lock	312-4000-071	4
	Washer - 3/4" Flat	313-2300-023	16
	Washer - 1/2" Steel Flat	313-2300-019	16



TABLE 9. UltraGlide XT Hydraulic Kit (P/N 117-0134-309)

Picture	Item Description	Part Number	Qty.
	Fitting - -6 JIC M/F 90° Elbow	333-0012-042	2
	Fitting - -6 JIC M/M/F Swivel Run Tee Adapter	333-0012-043	2
	Fitting - -6 JIC (M) to -6 SAE O-Ring (M) Straight Adapter	333-0012-045	2
	Fitting - -4 O-Ring Hex Plug	333-0012-051	7
	Fitting - -6 ORFS M/M/F Swivel Run Tee	333-0012-069	2
	Fitting - -6 ORFS (M) to -6 SAE O-Ring (M) Straight Adapter	333-0012-084	2
	Fitting - -6 O-Ring Hex Plug	333-0012-104	2
	Fitting - -6 ORFS (M) to -6 SAE O-Ring (M) Straight Adapter	333-0012-195	1
	Fitting - -4 ORFS (M) to -4 SAE O-Ring (M) Straight Adapter	333-0012-209	1
	Hydraulic Hose - -6 ORFS (F) to -6 ORFS 90° (F) - 36"	214-1000-333	2

TABLE 9. UltraGlide XT Hydraulic Kit (P/N 117-0134-309)



Picture	Item Description	Part Number	Qty.
	Hydraulic Hose - -6 JIC (F) to -6 JIC (F) 90° - 120"	214-1001-035	4
	Hydraulic Hose - -4 ORFS (F) to -4 ORFS (F) 90° - 14"	214-1001-098	1

TABLE 10. Ultrasonic XT Sensor Bracket Installation Kit (P/N 117-0131-088)

Picture	Item Description	Part Number	Qty.
Not Pictured	Sheet - AutoBoom Sensor Extension	016-0130-070	1
	Bracket - 12" S-Type AutoBoom Sensor	063-0131-592	1
	Nut - 1/4"-20 Nylon Insert Lock	312-4000-057	2
	Washer - 1/4" Steel Flat	313-2300-010	2

TABLE 11. Rotary Sensor Installation Kit (P/N 117-0131-089)




Picture	Item Description	Part Number	Qty.
	Sensor - 360° Rotary Sensor	416-0001-055	1
	Bracket - Rotary Sensor Arm	107-0172-297	1
	Bracket - Rotary Sensor	107-0172-436	1



TABLE 11. Rotary Sensor Installation Kit (P/N 117-0131-089)

Picture	Item Description	Part Number	Qty.
	Rod - M6 x 1.0 Threaded	107-0172-434	1
	Strap - Rotary Sensor	107-0172-435	1
	Bearing - M6 90° Rod-End	325-0000-031	2
	Screw - Phillips #10-32 x 1-1/2" SS Machine Pan Head	311-0002-048	2
	Screw - M6 x 1.0 x 8 mm SS PHMS	311-0005-128	2
	Nut - M6 x 1 mm Pitch DIN 934 Hex	312-1001-183	2
	Nut - #10-32 SS Nylon Insert Lock	312-4000-162	2
	Nut - M6 x 1 mm Pitch DIN 985 Hex	312-4000-214	2
	Washer - M6 DIN 125 Flat Washer	313-2300-182	2

TABLE 12. Optional Dual Sensor Upgrade Kit (P/N 117-0137-076)







Picture	Item Description	Part Number	Qty.
Not Pictured	Kit - Ultrasonic Sensor Bracket Extension	117-0131-082	1
	Sensor - Ultrasonic	063-0131-026	2
	Cable - 40' Ultrasonic Sensor Extension	115-0171-602	2
	Clamp - 1-1/2" W x 2-1/2" L x 3/8" Thread	435-3003-047	4

TABLE 13. Optional Ultrasonic Sensor Bracket Extension Kit - Qty. 2 (P/N 117-0131-082)

Picture	Item Description	Part Number	Qty.
Not Pictured	Sheet - AutoBoom Sensor Extension	016-0130-070	1
	Bracket - 12" S-Type AutoBoom Sensor	063-0131-592	2
	Nut - 1/4"-20 Nylon Insert Lock	312-4000-057	4
	Washer - 1/4" Steel Flat	313-2300-010	4





⚠ WARNING

The machine must remain stationary and switched off, with the booms folded and in the transport position, during installation or maintenance.

Bleed pressure from the hydraulic system by operating the boom tilt functions while the key is on, but the machine's engine is off.



⚠ 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 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 FITTINGS ON THE AUTOBOOM VALVE (IF APPLICABLE)

Before mounting the AutoBoom valve (P/N 063-0131-125) on the machine, install the proper fittings on 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 - 11/16" ORFS (M) to 9/16" SAE O-Ring (M) Straight Adapter	333-0012-084	LC, RC
Fitting - 11/16" ORFS (M) to 9/16" SAE O-Ring (M), .060 Orifice Straight Adapter	333-0012-289	LV, RV
Fitting - 11/16" ORFS M/F 90° Swivel Elbow	333-0012-065	LV, RV
Fitting - 9/16" ORFS (M) to 9/16" SAE O-Ring (M) Straight Adapter	333-0012-195	LSP
Fitting - 11/16" ORFS (M) to 3/4" SAE O-Ring (M) Straight Adapter	333-0012-199	P, T
Fitting - 9/16" ORFS (M) to 3/4" SAE O-Ring (M) 90° Elbow	333-0012-166	LF CYL RTN, RT CYL RTN

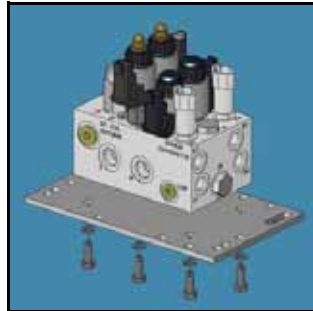
INSTALL FITTINGS IN THE ULTRAGLIDE XT VALVE

Before mounting the UltraGlide XT valve (P/N 063-0131-154) 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 figure and table below to install the fittings in the appropriate ports of the UltraGlide XT valve.

Fitting	Part Number	Port
Fitting - -4 SAE O-Ring Plug	333-0012-051	GT, GP, G1, G2, LS1, GLT, GRT
Fitting - -6 SAE O-Ring Plug	333-0012-104	P1, T1
Fitting - -6 ORFS (M) to -6 SAE O-Ring (M) Straight Adapter	333-0012-084	P2, T2
Fitting - -6 JIC (M) to -6 SAE O-Ring (M) Straight Adapter	333-0012-045	1, 2
Fitting - -4 ORFS (M) to -4 SAE O-Ring (M) Straight Adapter	333-0012-209	LS

MOUNT THE AUTOBOOM VALVE ON THE VALVE MOUNTING BRACKET (IF ULTRAGLIDE IS NOT INSTALLED)

FIGURE 1. AutoBoom Valve Mounting



1. Secure the AutoBoom valve (P/N 063-0131-125) to the valve mounting bracket (P/N 107-0171-802) using four 5/16"-18 x 7/8" hex bolts (P/N 311-0052-104) and four 5/16" lock washers (P/N 313-1000-019).

FIGURE 2. AutoBoom Valve Installed on Valve Mounting Bracket



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

MOUNT THE ULTRAGLIDE XT VALVE ON THE VALVE MOUNTING BRACKET

NOTE: If AutoBoom is already installed on the machine, remove the existing node from the existing node mounting bracket before installing the UltraGlide XT valve.

FIGURE 3. UltraGlide XT Valve Mounted on Valve Mounting Bracket



1. Secure the UltraGlide XT valve (P/N 063-0131-154) to the valve mounting bracket (P/N 107-0171-802) using two 5/16"-18 x 4" bolts (P/N 311-0052-092) and two 5/16"-18 nylon insert lock nuts (P/N 312-4000-059).
2. Tighten the bolts and nuts to ensure the valve is installed securely.

INSTALL THE VALVE MOUNTING BRACKET ON THE MACHINE (IF ULTRAGLIDE IS NOT INSTALLED)

FIGURE 4. AutoBoom and UltraGlide XT Valves Mounted on the Machine



1. Secure the valve mounting bracket (P/N 107-0171-802) on the left side of the diagonal brace of the upper parallel arm on the machine's center rack using two 4" W x 5" 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 valve mounting bracket is installed securely.

INSTALL THE PRESSURE AND TANK HOSES

ULTRAGLIDE NOT INSTALLED ON THE MACHINE

FIGURE 5. Pressure and Tank Hoses Installed on the Machine



1. Disconnect the machine's pressure hose from the left side of the machine's hydraulic valve.
2. Install a -6 ORFS M/M/F swivel run tee adapter fitting (P/N 333-0012-069) in the open pressure port and in Port P of the AutoBoom valve (P/N 063-0131-125).
3. Connect the machine's pressure hose to the straight end of the tee fitting installed in the machine's pressure port.
4. Install the straight end of the supplied hydraulic hose (P/N 214-1000-333) on the 90° end of the tee fitting installed in the machine's pressure port.
5. Connect the 90° end of the installed hydraulic hose to the straight end of the tee fitting installed in Port P of the AutoBoom valve.
6. Install the straight end of the supplied hydraulic hose (P/N 214-1000-333) on the 90° end of the tee fitting installed in Port P of the AutoBoom valve.
7. Connect the 90° end of the installed hydraulic hose to Port P2 of the UltraGlide XT valve (P/N 063-0131-154).
8. Disconnect the machine's tank hose from the left side of the machine's hydraulic valve.
9. Install a -6 ORFS M/M/F swivel run tee adapter fitting (P/N 333-0012-069) in the open tank port and in Port T of the AutoBoom valve.
10. Connect the machine's tank hose to the straight end of the tee fitting installed in the machine's tank port.
11. Install the straight end of the supplied hydraulic hose (P/N 214-1000-333) on the 90° end of the tee fitting installed in the machine's tank port.
12. Connect the 90° end of the installed hydraulic hose to the straight end of the tee fitting installed in Port T of the AutoBoom valve.
13. Install the straight end of the supplied hydraulic hose (P/N 214-1000-333) on the 90° end of the tee fitting installed in Port T of the AutoBoom valve.
14. Connect the 90° end of the installed hydraulic hose to Port T2 of the UltraGlide XT valve.

ULTRAGLIDE INSTALLED ON THE MACHINE

FIGURE 6. Pressure and Tank Hoses Installed on the Machine



1. Disconnect the pressure hose from the existing AutoBoom hydraulic valve (P/N 063.-0131-125).
2. Install a -6 ORFS M/M/F swivel run tee adapter fitting (P/N 333-0012-069) in Port P of the AutoBoom valve.
3. Connect the pressure hose that was removed in step 1 to the straight end of the installed tee fitting.
4. Install the straight end of the supplied hydraulic hose (P/N 214-1000-333) on the 90° end of the installed tee fitting.
5. Connect the 90° end of the installed hydraulic hose to the fitting installed in Port P2 of the UltraGlide XT valve (P/N 063-0131-154).
6. Disconnect the tank hose from the existing AutoBoom hydraulic valve.
7. Install a -6 ORFS M/M/F swivel run tee adapter fitting (P/N 333-0012-069) in Port T of the AutoBoom valve.
8. Connect the tank hose that was removed in step 6 to the straight end of the installed tee fitting.
9. Install the straight end of the supplied hydraulic hose (P/N 214-1000-333) on the 90° end of the installed tee fitting.
10. Connect the 90° end of the installed hydraulic hose to the fitting installed in Port T2 of the UltraGlide XT valve.

REMOVE THE ORIFICES FROM THE MACHINE'S TILT CYLINDERS (IF ULTRAGLIDE IS NOT INSTALLED)

1. Disconnect the machine's raise hose from the rod-end of the left tilt cylinder.
2. Remove the machine's cylinder fitting and the orifice located behind the fitting, if applicable.
3. Reinstall the machine's original cylinder fitting in the rod-end of the left tilt cylinder.

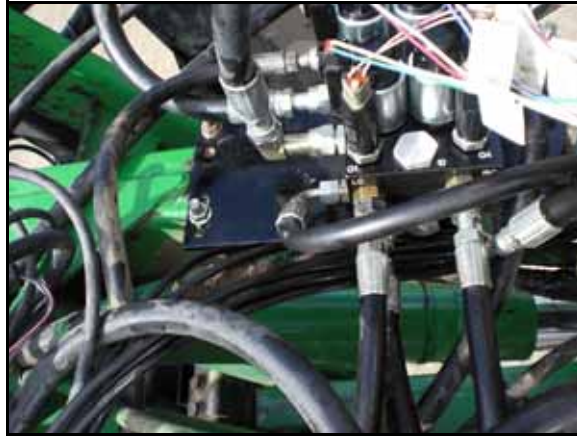
NOTE: Do not reconnect the machine's raise hose to the tilt cylinder.

4. Disconnect the machine's down hose from the base-end of the left tilt cylinder.
5. Remove the machine's cylinder fitting and the orifice located behind the fitting, if applicable.
6. Reinstall the machine's original cylinder fitting in the base-end of the left tilt cylinder.
7. Reconnect the machine's down hose to the base-end of the tilt cylinder.
8. Repeat the steps above to remove the orifice fittings from the machine's right tilt cylinder.

NOTE: These orifices are not used in the UltraGlide XT system.

INSTALL THE LEFT AND RIGHT CYLINDER HOSES (IF ULTRAGLIDE IS NOT INSTALLED)

FIGURE 7. Left and Right Cylinder Hoses Installed



1. Route the machine's left cylinder raise hose (disconnected from the rod-end of the left tilt cylinder) to the AutoBoom valve and connect it to the installed fittings in Port LV.
2. Connect the straight end of the supplied hydraulic hose (P/N 214-1000-318) to the installed fitting in Port LC of the AutoBoom valve.
3. Route the installed hydraulic hose back to the left tilt cylinder and connect it to the cylinder raise port (rod-end of the tilt cylinder).
4. Route the machine's right cylinder raise hose (disconnected from the rod-end of the right tilt cylinder) to the AutoBoom valve and connect it to the installed fittings in Port RV.
5. Connect the straight end of the supplied hydraulic hose (P/N 214-1000-319) to the installed fitting in Port RC of the AutoBoom valve.
6. Route the installed hydraulic hose back to the right tilt cylinder and connect it to the cylinder raise port (rod-end of the tilt cylinder).

INSTALL THE LEFT AND RIGHT DOWN HOSES (IF ULTRAGLIDE IS NOT INSTALLED)

FIGURE 8. Down Hoses Installed on the AutoBoom Valve



1. Disconnect the machine's left down hose from the machine's hydraulic valve.
2. Install a 9/16" ORFS M/M/F swivel run tee fitting (P/N 333-0012-022) in the left down port of the machine's hydraulic valve.
3. Connect the machine's down hose to the opposite end of the installed tee fitting.
4. Install the 90° end of the supplied hydraulic hose (P/N 214-1000-607) on the 90° end of the installed tee fitting.
5. Connect the straight end of the installed hydraulic hose to the Port LF CYL RTN of the AutoBoom valve.
6. Disconnect the machine's right down hose from the machine's hydraulic valve.
7. Install a 9/16" ORFS M/M/F swivel run tee fitting (P/N 333-0012-022) in the right down port of the machine's hydraulic valve.
8. Connect the machine's down hose to the opposite end of the installed tee fitting.
9. Install the 90° end of the supplied hydraulic hose (P/N 214-1000-607) on the 90° end of the installed tee fitting.
10. Connect the straight end of the installed hydraulic hose to Port RT CYL RTN of the AutoBoom valve.

INSTALL THE LOAD SENSE HOSES

NOTE: If AutoBoom is already installed on the machine, skip to step 7 in this section.

FIGURE 9. Load Sense Hose Connected to the Multi-Function Block



1. Locate the multi-function block beneath the machine's cab.
2. Disconnect the load sense hose from the S port of the multi-function block.
3. Install an -6 ORFS M/M/F swivel run tee fitting (P/N 333-0012-069) on the open S port.
4. Connect the machine's load sense hose to the opposite end of the installed tee fitting.
5. Install the straight end of the supplied hydraulic hose (P/N 214-1000-335) on the 90° end of the installed tee fitting.
6. Connect the 90° end of the hydraulic hose to the fitting installed in Port LSP of the AutoBoom valve (P/N 063-0131-125).

FIGURE 10. Load Sense Hose Installed

Load Sense
Hose Installed



7. Remove the plug from Port LSV of the AutoBoom valve.
8. Install a -4 ORFS (M) to -6 SAE O-ring (M) straight adapter fitting (P/N 333-0012-195) in the open port.
9. Install the 90° end of the supplied hydraulic hose (P/N 214-1000-098) on the installed adapter fitting.
10. Connect the straight end of the installed hydraulic hose to the fitting installed in Port LS of the UltraGlide XT valve (P/N 063-0131-154).

INSTALL THE ULTRAGLIDE XT CYLINDERS

FIGURE 11. Bottom Tube of Center Rack



1. Locate the center of the bottom tube of the center rack.

FIGURE 12. Lower Cylinder Mount and Backing Plate Brackets Installed

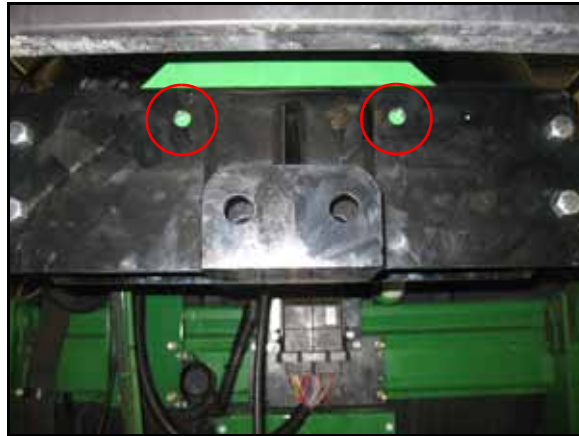


2. Install the lower cylinder mounting bracket (P/N 116-0159-760) and backing plate bracket (P/N 107-0172-347) on the center of the bottom tube of the center rack using four 1/2" x 6-1/2" bolts (P/N 311-0058-112), four 1/2" nylon insert lock nuts (P/N 312-4000-065), and four 1/2" washers (P/N 313-2300-019).

NOTE: The lower cylinder mounting bracket should be installed on the outside of the tube (away from the cab) and the backing plate should be installed on the inside of the tube (toward the cab) as shown in Figure 12 above.

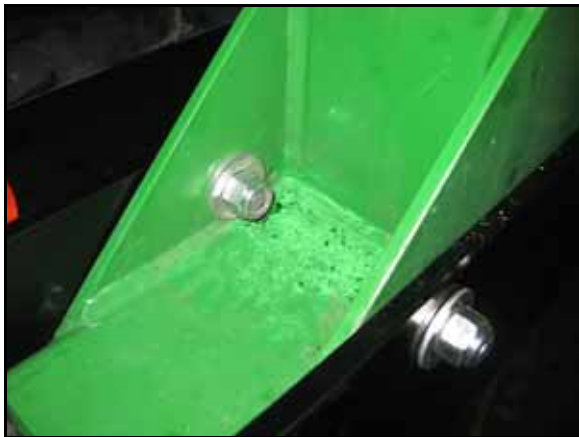
IMPORTANT: Use a tape measure to center the lower cylinder mounting bracket on the bottom tube of the center rack.

FIGURE 13. Holes in Cylinder Mount and Backing Plate Brackets



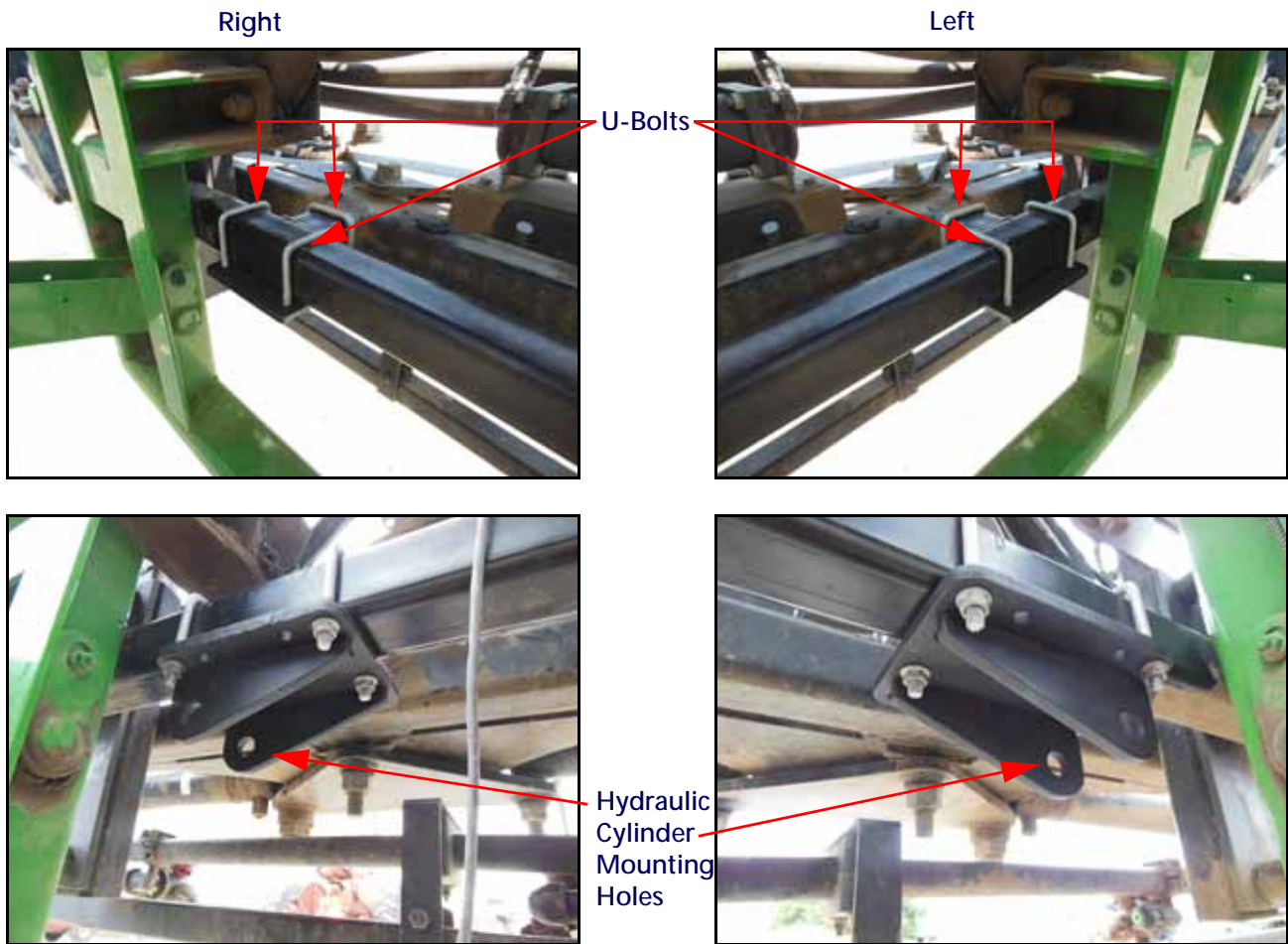
3. Using the four unused holes in the cylinder mount and backing plate brackets as a guide, drill holes through the machine's gusset plates.

FIGURE 14. Cylinder Mount and Backing Plate Brackets Installed on Gusset Plates



4. Install four 1/2" x 1-3/4" hex bolts (P/N 311-0058-098), four 1/2" nylon insert lock nuts (P/N 312-4000-065), and 1/2" washers (P/N 313-2300-019) in the holes in the machine's gusset plates.
5. Locate the cross-tubes on the lower square tube of the machine's center rack.

FIGURE 15. Upper Cylinder Mounting Bracket Installed (View From Under the Machine, Looking at the Center Rack)



6. Install an upper cylinder mounting bracket (P/N 116-0159-761) on both cross tubes of the center rack using three 2-9/16" W x 3-1/2" L x 3/8" thread U-bolts (P/N 107-0171-616) and six 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).

NOTE: Position the upper cylinder mounting brackets toward the rear of the machine so that the cylinder mounting holes point to the outside of the machine.

NOTE: Do not fully tighten the nuts.

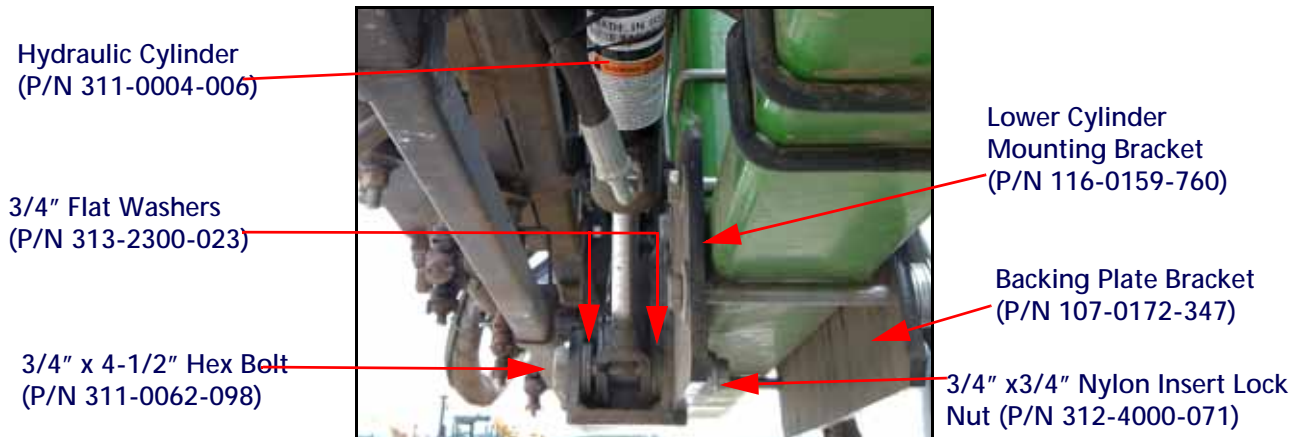
FIGURE 16. Base-End of Cylinder Installed on Upper Mounting Bracket



7. Install the base-end of the hydraulic cylinder (P/N 331-0004-006) in the upper left cylinder mounting bracket using one 3/4" x 4-1/2" hex bolt (P/N 311-0062-098), one 3/4" nylon insert lock nut (P/N 312-4000-071), and four 3/4" flat washers (P/N 313-2300-023) as shown in Figure 16 above.

NOTE: Do not use an impact wrench to tighten the mounting hardware - use hand tools only.

FIGURE 17. Rod-End of Cylinder Installed on Lower Mounting Bracket



8. Install the rod-end of the hydraulic cylinder in the lower cylinder mounting bracket (P/N 116-0159-760) using one 3/4" x 4-1/2" hex bolt (P/N 311-0062-098), one 3/4" nylon insert lock nut (P/N 312-4000-071), and four 3/4" flat washers (P/N 313-2300-023) as shown in Figure 17 above.



FIGURE 18. Right Hydraulic Cylinder Installed



9. Repeat steps 7 - 8 above to install the right hydraulic cylinder.
10. Tighten the 3/8" zinc flanged lock nuts installed on the upper cylinder mounting brackets.

INSTALL THE CYLINDER HOSE RETAINING BRACKET ASSEMBLY

FIGURE 19. Cylinder Hose Retaining Bracket Assembly Installed



1. Install two 3/8" zinc flanged lock nuts (P/N 312-1001-164) on the legs of the 2-1/16 W x 3" L x 3/8" thread U-bolt (P/N 107-0171-609).
2. Install the U-bolt on the boom mount weldment bracket (P/N 116-0159-684) using two 3/8" zinc flanged lock nuts (P/N 312-1001-164).
3. Secure the boom mount weldment bracket assembly to the inside of the vertical tube of the machine's center rack using a 4" W x 5" L x 3/8" thread U-bolt (P/N 107-0171-606) and two 3/8" zinc flanged lock nuts (P/N 312-1001-164).

INSTALL THE CYLINDER HOSES

1. Install -6 JIC M/M/F swivel run tee adapter fittings (P/N 333-0012-043) on the fittings installed in Ports 1 and 2 of the UltraGlide XT valve (P/N 063-0131-154).

2. Install -6 JIC M/F 90° swivel elbow fittings (P/N 333-0012-042) on the 90° ends of the installed tee fittings.

FIGURE 20. Cylinder Hose Installed on Hydraulic Cylinder



3. Install the 90° end of the supplied hydraulic hose (P/N 214-1001-035) on the base-end of the left hydraulic cylinder (P/N 334-0004-006).

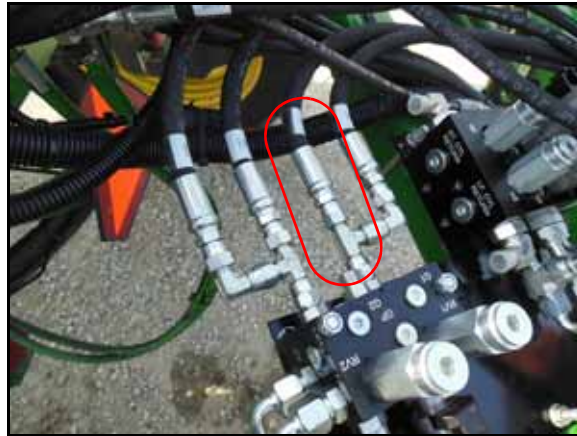
FIGURE 21. Cylinder Hose Routing



4. Route the installed hose over the cylinder and through the cylinder hose retaining bracket assembly toward the UltraGlide XT valve.

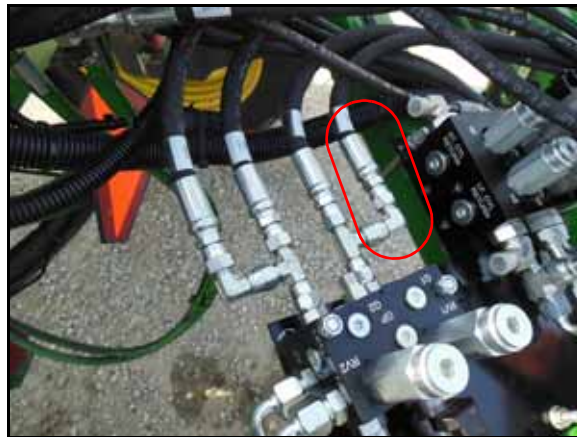


FIGURE 22. Cylinder Hoses Installed on UltraGlide XT Valve



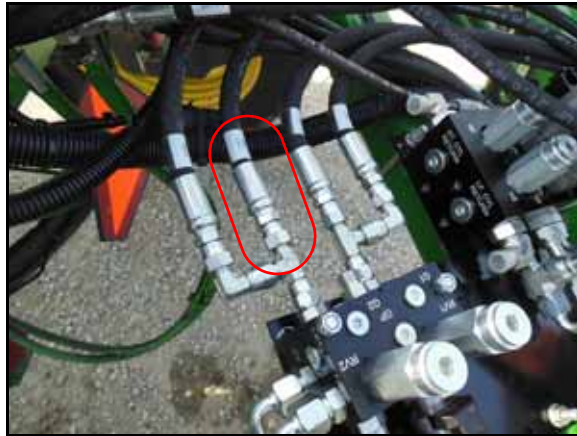
5. Connect the straight end of the installed hydraulic hose to the straight end of the tee fitting installed in Port 1 of the UltraGlide XT valve.
6. Install the 90° end of the supplied hydraulic hose (P/N 214-1001-035) on the rod-end of the right hydraulic cylinder.
7. Route the installed hose over the cylinder and through the cylinder hose retaining bracket assembly toward the UltraGlide XT valve.

FIGURE 23. Cylinder Hoses Installed on UltraGlide XT Valve



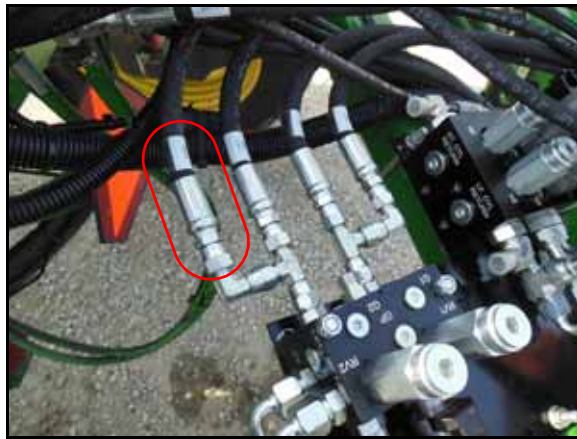
8. Connect the straight end of the installed hydraulic hose to the 90° elbow fitting on the tee fitting installed in Port 1 of the UltraGlide XT valve.
9. Install the 90° end of the supplied hydraulic hose (P/N 214-1001-035) to the base-end of the right hydraulic cylinder.
10. Route the hose over the cylinder and through the cylinder hose retaining bracket assembly toward the UltraGlide XT valve.

FIGURE 24. Cylinder Hoses Installed on UltraGlide XT Valve



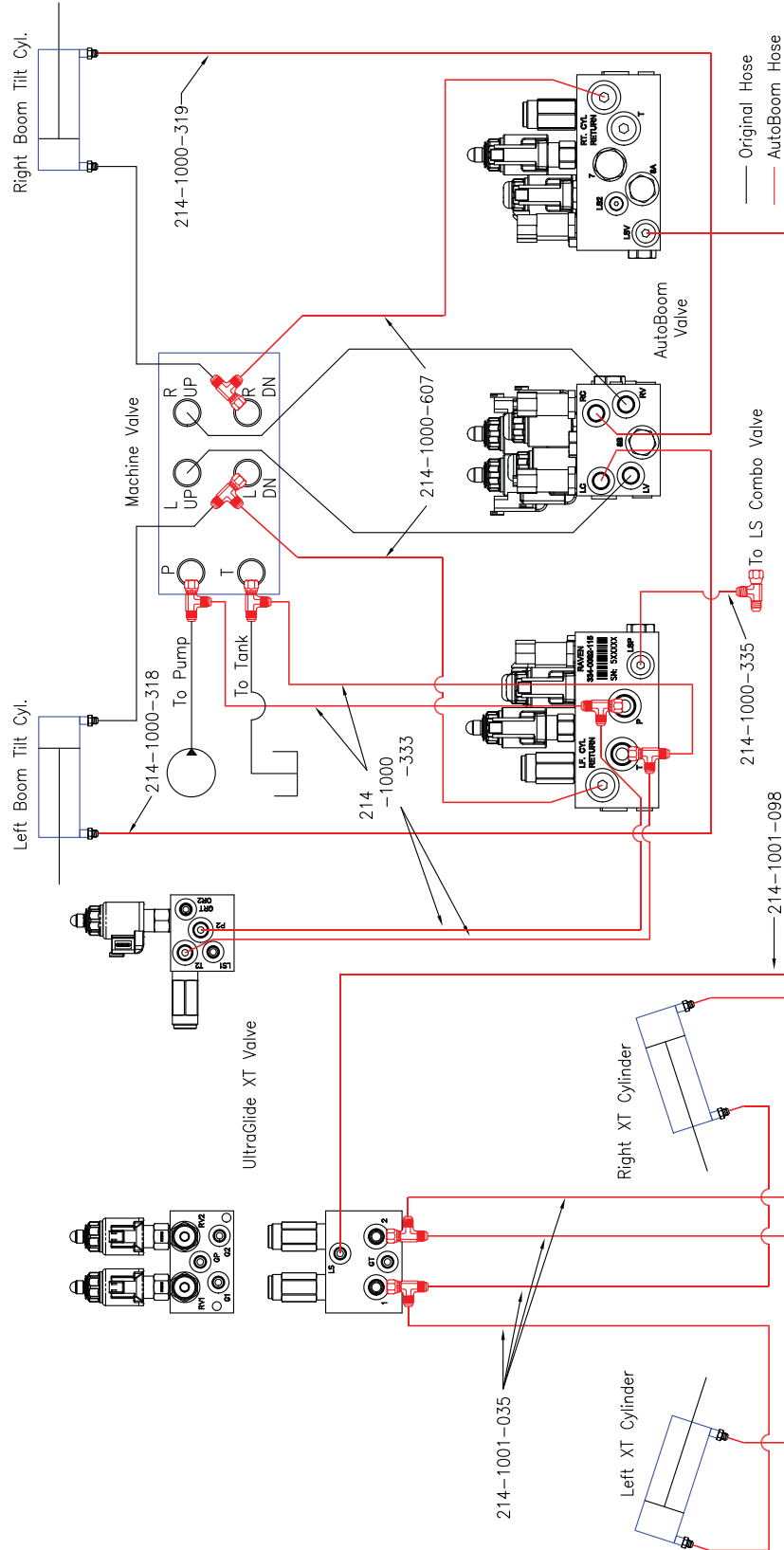
11. Connect the straight end of the installed hydraulic hose to the straight end of the tee fitting installed in Port 2 of the UltraGlide XT valve.
12. Install the 90° end of the supplied hydraulic hose (P/N 214-1001-035) to the rod-end of the left hydraulic cylinder.
13. Route the hose over the cylinder and through the cylinder hose retaining bracket assembly toward the UltraGlide XT valve.

FIGURE 25. Cylinder Hoses Installed on UltraGlide XT Valve

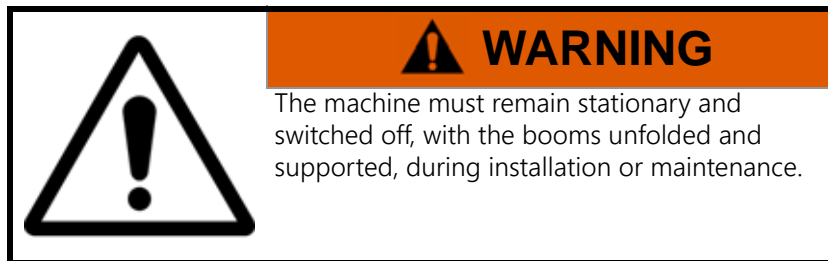


14. Connect the straight end of the installed hydraulic hose to the 90° elbow fitting on the tee fitting installed in Port 2 of the UltraGlide XT valve.
15. Ensure that all hoses are secured away from moving parts and heat sources and do not interfere with boom function.

HYDRAULIC SCHEMATIC



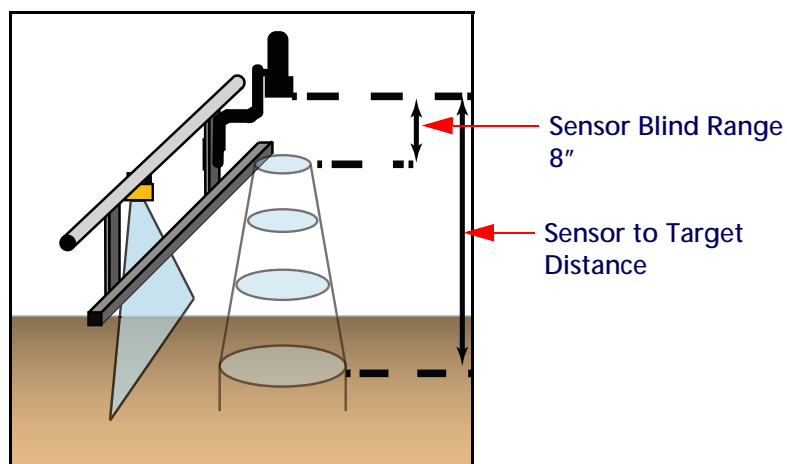
NOTE: If AutoBoom UltraGlide is already installed on the machine, it may or may not be necessary to install additional boom sensors. If boom sensors are being installed on the machine, complete all sections in this chapter. If no boom sensors are being installed, proceed to Assemble the Rotary Sensor Assembly section on page 45.



BOOM SENSOR MOUNTING LOCATIONS

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

FIGURE 1. Illustration of Sensor's Blind Range



INSTALL THE SENSORS - ULTRAGLIDE NOT INSTALLED ON THE MACHINE

INSTALL THE BOOM SENSORS

FIGURE 2. Boom Sensors Installed

Inner Sensor



Outer Sensor



1. Locate the ultrasonic sensors (P/N 063-0130-026) in the AutoBoom UltraGlide installation kit (P/N 117-0233-009).
2. Select two of the sensors to be installed on the outer end of the booms.
3. Install the sensors on the 12" S-type sensor arms (P/N 063-0131-592) from the sensor bracket installation kit (P/N 117-0131-082) using two 1/4"-20 nylon insert lock nuts (P/N 312-4000-057), and two 1/4" flat washers (P/N 313-2300-010) per sensor.
4. Mount the outer boom sensors on the breakaway boom, outside the breakaway joint using two 1-1/8" W x 2" L x 3/8" thread U-bolts (P/N 107-0171-613) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164) per sensor.
5. Install two of the sensors from the UltraGlide XT kit (P/N 117-0233-009) on the 12" S-type sensor arms from the UltraGlide XT sensor bracket installation kit (P/N 117-0131-087) using two 1/4"-20 nylon insert lock nuts (P/N 312-4000-057) and two 1/4" flat washers (P/N 313-2300-010) per sensor.
6. Mount the inner sensors on the front of the booms, just inside the fold joint using two 1-1/2" W x 2-1/2" L x 3/8" thread U-bolts clamps (P/N 435-3003-047) and their hardware per sensor.
7. Tighten all nuts to ensure the sensors are mounted securely.

MOUNT THE CENTER SENSOR

FIGURE 3. Center Sensor Installed



1. Install the remaining sensor (P/N 063-0130-026) from the AutoBoom UltraGlide installation kit (P/N 117-0233-009) on the remaining 12" S-type sensor arm (P/N 063-0131-592) using two 1/4"-20 nylon insert lock nuts (P/N 312-4000-057) and two 1/4" flat washers (P/N 313-2300-010).
2. Mount the center sensor on the right side of the center rack using two 2" W x 5" L x 3/8" thread U-bolts (P/N 107-0172-293) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
3. Tighten the nuts to ensure the sensor is mounted securely.

INSTALL THE SENSORS - ULTRAGLIDE INSTALLED ON THE MACHINE (IF APPLICABLE)

MOUNT THE BOOM SENSORS

NOTE: For optimal system performance, Raven Industries recommends a five sensor system configuration including 12" S-type bracket assemblies. One dual sensor upgrade kit (P/N 117-0137-076) and one ultrasonic sensor bracket extension kit (P/N 117-0131-082) are required to complete the five sensor configuration. These UltraGlide XT sensor upgrade kits are sold separately. Contact your Raven dealer for ordering information.

NOTE: If 12" S-type brackets are not being installed on the machine, skip this section and proceed to Mount the Center Sensor section on page 44.

1. Remove the existing UltraGlide boom sensors from the machine.

FIGURE 4. Boom Sensors Installed

Inner Sensor



Outer Sensor



2. Install the 12" S-type brackets (P/N 063-0131-592) from the UltraGlide XT sensor upgrade kit (P/N 117-0131-082) on the existing boom sensors using the bracket's bolts, two 1/4"-20 nylon insert lock nuts (P/N 312-4000-057), and two 1/4" flat washers (P/N 313-2300-010) per sensor.
3. Mount the boom sensors on the breakaway boom, outside the breakaway joint using two 1-1/8" W x 2" L x 3/8" thread U-bolts (P/N 107-0171-613) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164) per sensor.
4. Install the two sensors (P/N 063-0130-026) from the dual sensor upgrade kit (P/N 117--0137-076) on the 12" S-type sensor arms using two 1/4"-20 nylon insert lock nuts (P/N 312-4000-057) and two 1/4" flat washers (P/N 313-2300-010) per sensor.
5. Mount the inner sensors on the front of the booms, just inside the fold joint using two 1-1/2 W x 2-1/2" L x 3/8" thread U-bolts clamps (P/N 435-3003-047) and their hardware per sensor.
6. Tighten all nuts to ensure the sensors are mounted securely.

MOUNT THE CENTER SENSOR

NOTE: Optimal system performance is achieved by installing the center sensor as outlined in the steps below.

FIGURE 5. Center Sensor Installed



1. Remove the existing UltraGlide center sensor from the machine's center rack.

NOTE: This sensor will not be used in the UltraGlide XT system.

2. Install the sensor (P/N 063-0130-026) from the UltraGlide installation kit (P/N 117-0234-009) on the 12" S-type sensor arm (P/N 063-0131-592) from the same kit using the bracket's bolts, two 1/4"-20 nylon insert lock nuts (P/N 312-4000-057), and two 1/4" flat washers (P/N 313-2300-010).
3. Mount the center sensor on the right side of the center rack using two 2" W x 5" L x 3/8" thread U-bolts (P/N 107-0172-293) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
4. Tighten the nuts to ensure the sensor is mounted securely.

ASSEMBLE THE ROTARY SENSOR ASSEMBLY

FIGURE 6. Bearings Installed on Rod



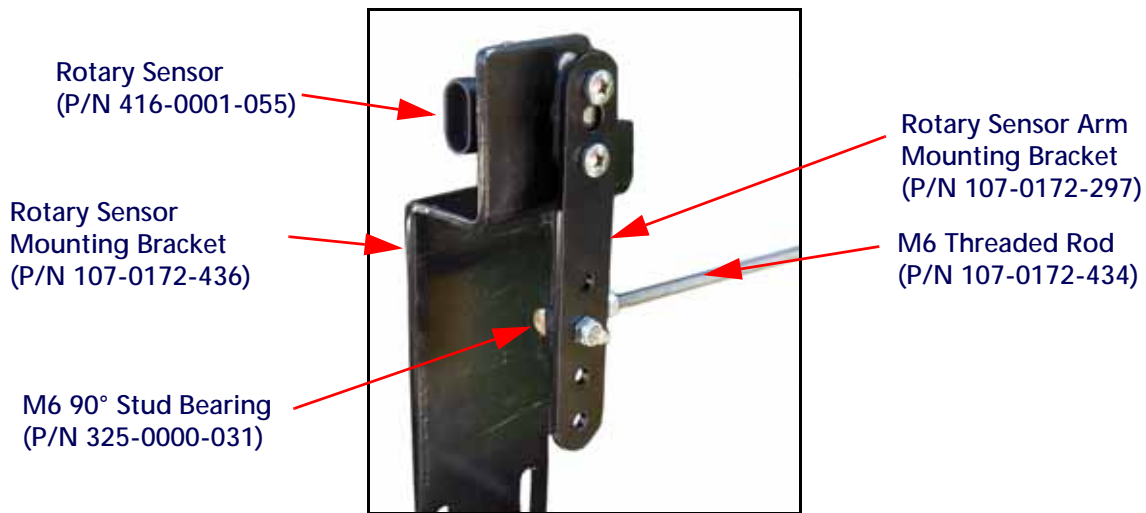
1. Install an M6 90° stud bearing (P/N 325-0000-031) and M6 jam nut (P/N 312-1001-183) on each end of the M6 threaded rod (P/N 107-0172-434), orienting the bearings so that they point 180° from each other as shown in Figure 6 above.
2. Tighten the bearings and nuts to ensure they are installed securely.

FIGURE 7. Rotary Sensor Installed on Mounting Bracket



3. Install the rotary sensor (P/N 416-0001-055) on the rotary sensor mounting bracket (P/N 107-0172-436) using two #10-32 x 1-1/2" machine screws, two #10-32 nylon insert lock nuts (P/N 312-4000-162), and two M6 washers (P/N 313-2300-182) as shown in Figure 7 above.

FIGURE 8. Arm Bracket and Rod Assembly Installed



4. Install the rotary sensor arm bracket (P/N 107-0172-297) on the rotary sensor using two M6 x 1.0 x 8 mm screws (P/N 311-0005-128).
5. Insert one of the M6 90° stud bearings through the back of the rotary sensor arm mounting bracket and secure it using one M6 nylon insert lock nut (P/N 312-4000-214).

FIGURE 9. Rotary Sensor Mounting Bracket Installed



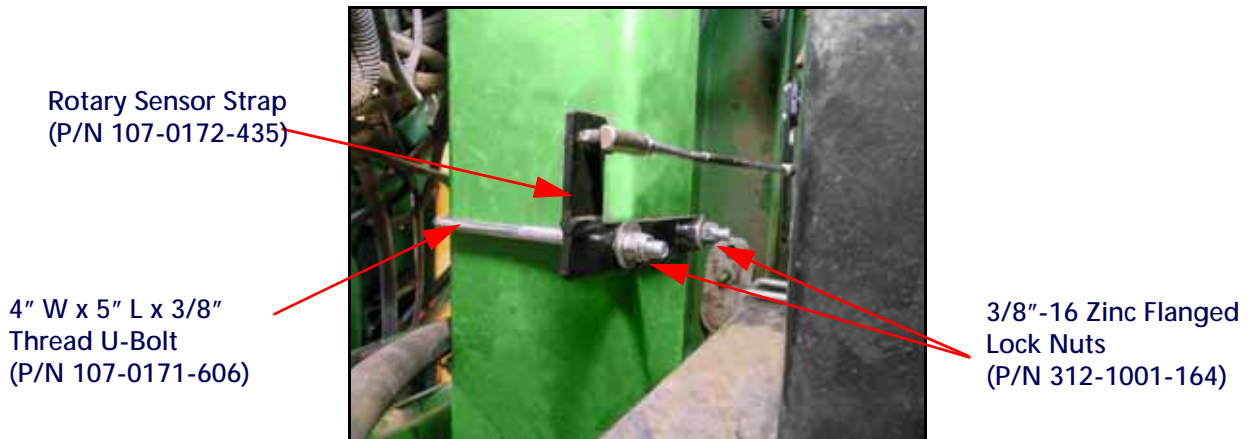
6. Mount the rotary sensor mounting bracket on the right side of the front, lower tube of the center rack using two 2-9/16" W x 3-1/2" L x 3/8" thread U-bolts (P/N 107-0171-616) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
7. Determine if the machine is equipped with a factory-installed rotary sensor and follow the appropriate step below:
 - a. If the machine is equipped with a factory-installed rotary sensor:

FIGURE 10. Installed Rotary Sensor Connection



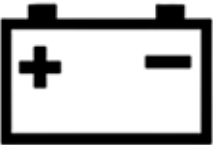
1. Disconnect the arm of the factory-installed sensor from the machine's welded bracket.
2. Secure the machine's factory-installed rotary sensor arm to the machine's support bracket with plastic cable ties as it will not be used in the UltraGlide XT system.
3. Secure the free end of the threaded rod assembly to the welded bracket on the center section using an M6 nylon insert lock nut (P/N 312-4000-214).
 - b. If the machine is not equipped with a factory rotary sensor:

FIGURE 11. Rotary Sensor Strap and Rotary Sensor Assembly Installed



1. Install the rotary sensor strap (P/N 107-0172-435) on the center section using one 4" W x 5" L x 3/8" thread U-bolt (P/N 107-0171-606) and two 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
2. Tighten the nuts to ensure the rotary sensor strap is installed securely.
3. Secure the free end of the threaded rod assembly to the rotary sensor strap (P/N 107-0172-435) using an M6 nylon insert lock nut (P/N 312-4000-214).

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>
---	---

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

INSTALL THE ULTRAGLIDE XT NODE

1. Locate the node mounting location on the horizontal cross-beam at the rear of the sprayer chassis.

FIGURE 1. U-Bolts and Shims Installed



2. Install two 4" W x 5" L x 3/8" thread U-bolts (P/N 107-0171-606) on the crossbeam so that the legs of the U-bolts are pointing out.
3. Place four mounting shims (P/N 107-0171-620) on the legs of each of the U-bolts.

FIGURE 2. Node Mounting Bracket Installed



4. Install the node mounting bracket (P/N 107-0171-619) over the shims on the legs of the U-bolts.
5. Position the node mounting bracket assembly in the center of the of the crossbeam.
6. Secure the node mounting bracket assembly on the horizontal crossbeam using four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).

FIGURE 3. AutoBoom Node Installed



7. Install the UltraGlide XT node (P/N 063-0130-024) on the node mounting bracket using three 3/8"-16 x 1-1/4" hex bolts (P/N 311-0054-081) and three 3/8"-16 nylon insert lock nuts (P/N 312-4000-061).
8. Insert the large, rectangular connectors of the UltraGlide XT harness cable (P/N 115-0230-114) into the correct ports of the node.
9. Tighten the bolts on the node connectors to secure the connections.

CONNECT THE ULTRAGLIDE XT HARNESS CABLE TO THE BOOM FUNCTION CONTROLS

1. If the machine is already equipped with the AutoBoom UltraGlide system, remove the existing UltraGlide harness cable.

NOTE: The UltraGlide harness cable is not used in the UltraGlide XT system.

2. Locate the LEFT PRESS and RIGHT PRESS connectors on the UltraGlide XT harness cable (P/N 115-0230-114).
3. Route the connectors to the AutoBoom valve (P/N 063-0131-125).
4. Connect the LEFT PRESS connector to Port G1 on the AutoBoom valve.
5. Connect the RIGHT PRESS connector to Port G4 on the AutoBoom valve.
6. Locate the LEFT SOLENOID and RIGHT SOLENOID connectors on the harness cable.
7. Connect the LEFT SOLENOID connector to Port 4A on the AutoBoom valve.
8. Connect the RIGHT SOLENOID connector to Port 4B on the AutoBoom valve.
9. Locate the LEFT PROP and RIGHT PROP connectors on the harness cable.
10. Connect the LEFT PROP connector to Port 5A on the AutoBoom valve.
11. Connect the RIGHT PROP connector to Port 13A on the AutoBoom valve.

FIGURE 4. Machine's Boom Function Coils



12. Locate the machine's boom function coils on the machine's hydraulic valve.
13. Disconnect the connector from the machine's left tilt up coil.
14. Install the left up boom sense adapter cable (P/N 115-0171-254) between the coil and the machine's coil connector.
15. Disconnect the connector from the machine's left tilt down coil.
16. Install the left down boom sense adapter cable (P/N 115-0171-622) between the coil and the machine's coil connector.
17. Disconnect the connector from the machine's right tilt up coil.
18. Install the right up boom sense adapter cable (P/N 115-0171-624) between the coil and the machine's coil connector.
19. Disconnect the connector from the machine's right tilt down coil.
20. Install the right down boom sense adapter cable (P/N 115-0171-623) between the coil and the machine's coil connector.
21. On the harness cable, locate the LEFT SOLENOID SENSE connectors.
22. Isolate the connector labeled UP and connect it to the left tilt up coil via the installed boom sense adapter cable.
23. Connect the other connector to the left tilt down coil via the installed boom sense adapter cable.
24. On the harness cable, locate the RIGHT SOLENOID SENSE connectors.
25. Isolate the connector labeled UP and connect it to the right tilt up coil via the installed boom sense adapter cable.
26. Connect the other connector to the right tilt down coil via the installed boom sense adapter cable.

INSTALL THE CENTER RACK CONTROL

FIGURE 5. Machine's Center Boom Function Coils



1. Locate the center up coil on the machine's hydraulic valve.
2. Install the JD 4700/4710/4720 center rack control up boom sense adapter cable (P/N 115-0230-048) between the coil and its connector.
3. Locate the CENTER SOLENOID UP CONTROL connector on the UltraGlide XT harness cable (P/N 115-0230-114) and plug it into the installed center rack boom function adapter cable.
4. Locate the CENTER SOLENOID UP SENSE connector on the UltraGlide XT harness cable and plug it into the connector that leads to the harness cable.
5. Locate the center down coil on the machine's hydraulic valve.
6. Install the JD 4700/4710/4720 center rack control down boom sense adapter cable (P/N 115-0230-049) between the coil and its connector.
7. Locate the CENTER SOLENOID UP CONTROL connector on the UltraGlide XT harness cable and plug it into the installed center rack boom function adapter cable.
8. Locate the CENTER SOLENOID UP SENSE connector on the UltraGlide XT harness cable and plug it into the connector that leads to the harness cable.

CONNECT TO THE LOAD SENSE COMBO VALVE

FIGURE 6. Load Sense Combo Valve Connection



1. Locate the load sense combo valve coil.

NOTE: The load sense combo solenoid is the smaller coil on the load sense combo valve.

2. Disconnect the coil connector from the load sense combo coil.
3. Install the supplied boom sense adapter cable (P/N 115-0171-546) between the coil and its connector.
4. Locate the OPEN CENTER VALVE connector on the UltraGlide XT harness cable (P/N 115-0230-114).
5. Connect one end of the John Deere load sense extension cable (P/N 115-0230-078) to the OPEN CENTER VALVE connector on the UltraGlide XT harness cable.
6. Route the extension cable back to the load sense combo valve.
7. Connect the other end of the extension cable to the installed boom sense adapter cable (P/N 115-0171-546).

CONNECT THE HARNESS CABLE TO THE SENSORS

1. Install the LEFT OUTER SENSOR connector of the UltraGlide XT harness cable (P/N 115-0230-114) on the 70' sensor extension cable (P/N 115-0171-527).
2. Connect the other end of the 70' sensor extension cable to the left outer sensor (P/N 063-0130-026).
3. Install the LEFT INNER SENSOR connector of the UltraGlide XT harness cable on the 40' sensor extension cable (P/N 115-0171-602).
4. Connect the other end of the 40' sensor extension cable to the left inner sensor.
5. Install the RIGHT OUTER SENSOR connector of the UltraGlide XT harness cable on the 70' sensor extension cable (P/N 115-0171-527).
6. Connect the other end of the 70' installed sensor extension cable to the right outer sensor.
7. Install the RIGHT INNER SENSOR connector of the UltraGlide XT harness cable on the 40' extension sensor cable (P/N 115-0171-602).
8. Connect the other end of the installed 40' sensor cable to the right inner sensor.
9. Connect the CENTER US SENSOR connector of the UltraGlide XT harness cable to the center sensor (P/N 063-0130-026) cable connection.

INSTALL THE ULTRAGLIDE XT AUXILIARY SENSOR CABLE

1. Connect the ULTRAGLIDE XT connector of the UltraGlide XT harness cable (P/N 115-0230-114) to the mating 12-pin connector of the XT auxiliary sensor cable (P/N 115-0230-147).
2. Connect the SLANT CCW connector of the XT auxiliary sensor cable to the coil connector in Port PRV1 of the UltraGlide XT valve (P/N 063-0131-154).
3. Connect the SLANT CW connector of the XT auxiliary sensor cable to the coil connector in Port PRV2 of the UltraGlide XT valve.
4. Route the slack of the ROTARY SENSOR cable connection along the UltraGlide XT cylinder hoses and through the cylinder hose retaining bracket assembly
5. Connect the ROTARY SENSOR connector of the XT auxiliary sensor cable to the rotary sensor cable connector.
6. Secure excess cable with plastic cable ties to prevent damage.

INSTALL ISO CAN WIRING

CONNECT THE ULTRAGLIDE XT HARNESS CABLE TO THE POWER CABLE

JOHN DEERE 4720 AND 4830 (MODEL YEAR 2007)

FIGURE 7. Hole in Cab Roof



1. Route the UltraGlide XT harness cable (P/N 115-0230-114) through the hole in the top-right rear corner of the cab.
2. Locate and disconnect the machine's passive terminator and connect the UltraGlide XT harness cable to the connection.
3. Install the terminator on the CAN BUS connector (located near the node) on the UltraGlide XT harness cable.

NOTE: John Deere model 4720 machines may have the passive terminator under the roof, behind the seat or behind the instrument panel on the right side of the machine.

JOHN DEERE 4730 AND 4830 (MODEL YEAR 2008 AND NEWER)

FIGURE 8. Access Plug



1. Remove the access plug in the left-rear corner of the cab.
2. Remove the cab pad behind the operator's seat.
3. Route the UltraGlide XT harness cable (P/N 115-0230-114) through the access plug hole.
4. Locate and disconnect the machine's passive terminator and connect the UltraGlide XT harness cable to the connection.
5. Install the terminator on the CAN BUS connector (located near the node) on the UltraGlide XT harness cable.

ULTRAGLIDE NOT INSTALLED ON THE MACHINE

1. Connect the CAN POWER connector of the UltraGlide XT harness cable (P/N 115-0230-114) to the mating connector of the ISO power harness (P/N 115-0230-025).
2. Install the power lead of the ISO power harness to the positive battery terminal.
3. Install the ground lead of the ISO power harness to the negative battery terminal.

FIGURE 9. Power Strip

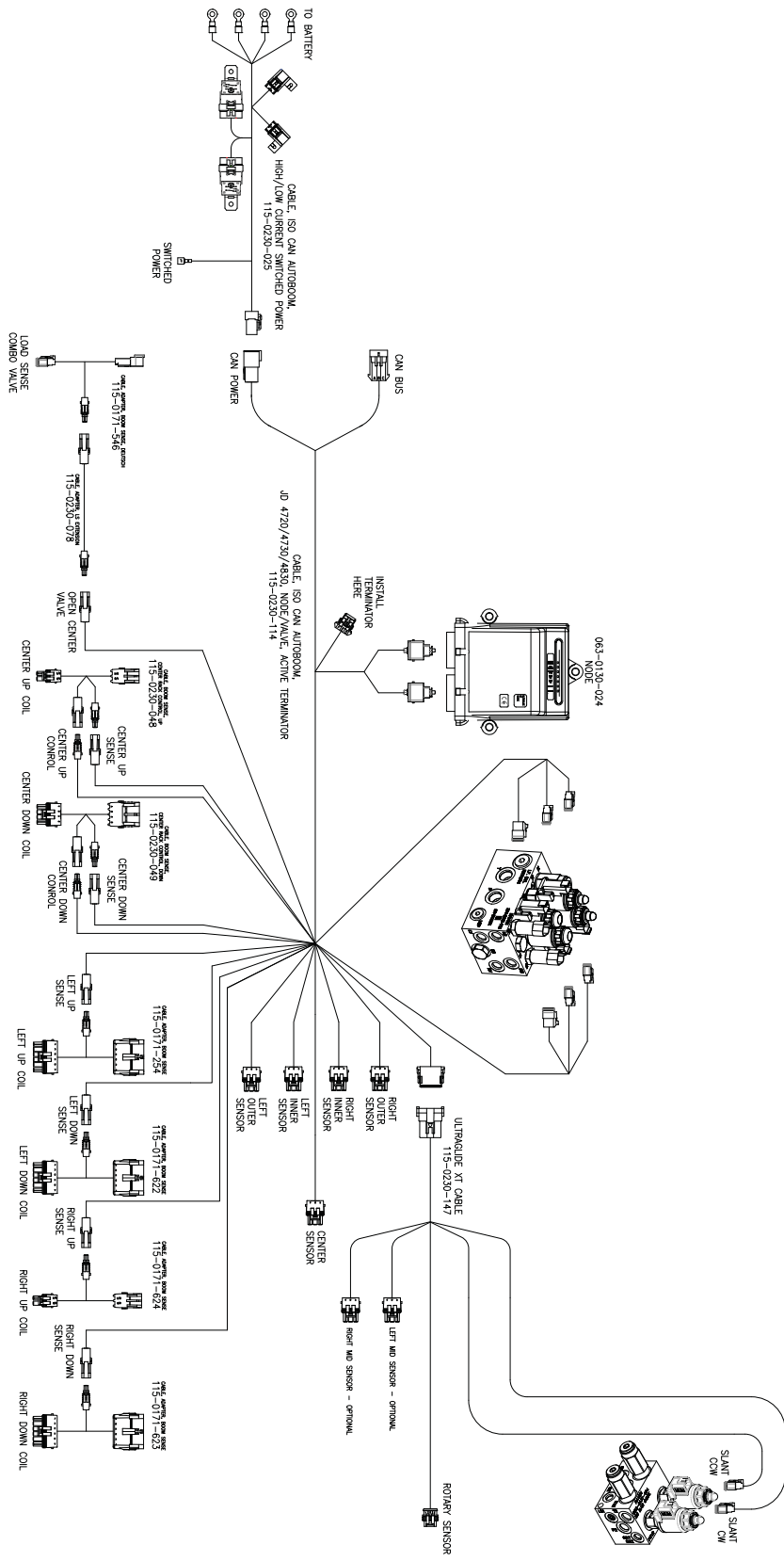



4. Connect the single wire with the spade connector to the John Deere power strip in the lower right corner of the cab.

ULTRAGLIDE INSTALLED ON THE MACHINE

1. Connect the UltraGlide XT harness cable (P/N 115-0230-114) to the existing ISO power harness (P/N 115-0230-025).
2. Remove the terminator from the existing AutoBoom harness cable and install it on the UltraGlide XT harness cable.


WIRING SCHEMATIC





WARNING

When starting the machine for the first time after installing UltraGlide XT, be sure that all persons stand clear in case a hose has not been properly tightened.



WARNING

Do not use hands to check for leaks. Hydraulic fluid under pressure can penetrate the skin and cause serious injury or death.

VERIFY THE AUTOBOOM HYDRAULIC SYSTEM INSTALLATION

1. Turn on the machine.
2. Double-check all fitting and hose connections to ensure that:
 - Hoses are not rubbing on or interfering with moving parts.
 - Hydraulic fluid is not leaking from the system.
3. Press and hold the UltraGlide XT manual control buttons to purge air out of the XT cylinders and hoses.

NOTE: Air must be purged from the system before performing the system calibration. If air pockets are present, the booms may not move consistently. Air is introduced into the hydraulic system during the AutoBoom system installation, whenever the hydraulic system is purged for maintenance, or when fittings are loosened or disconnected.

VERIFY THE ULTRAGLIDE XT WIRING

1. Navigate to the AutoBoom Diagnostics page that contains the manual boom control functions.
2. Press the button to manually rotate the boom clockwise via the UltraGlide XT system, verifying that the boom rotates clockwise as viewed from behind the machine.

3. Press the button to manually rotate the boom counterclockwise via the UltraGlide system, verifying that the boom rotates counterclockwise as viewed from behind the machine.

NOTE: If the boom rotates in the wrong direction, the UltraGlide XT valve harness corrections may need to be changed.

NOTE: If there are issues with the AutoBoom system, turn off the machine and correct them immediately. For additional assistance, refer to the ISO AutoBoom Calibration & Operation Manual (P/N 016-0130-078) or contact your local Raven dealer.

CALIBRATE THE AUTOBOOM ULTRAGLIDE XT SYSTEM

Refer to the ISO AutoBoom Calibration & Operation Manual (P/N 016-0130-078) for instructions on calibrating the system, adjusting system settings, and system operation.

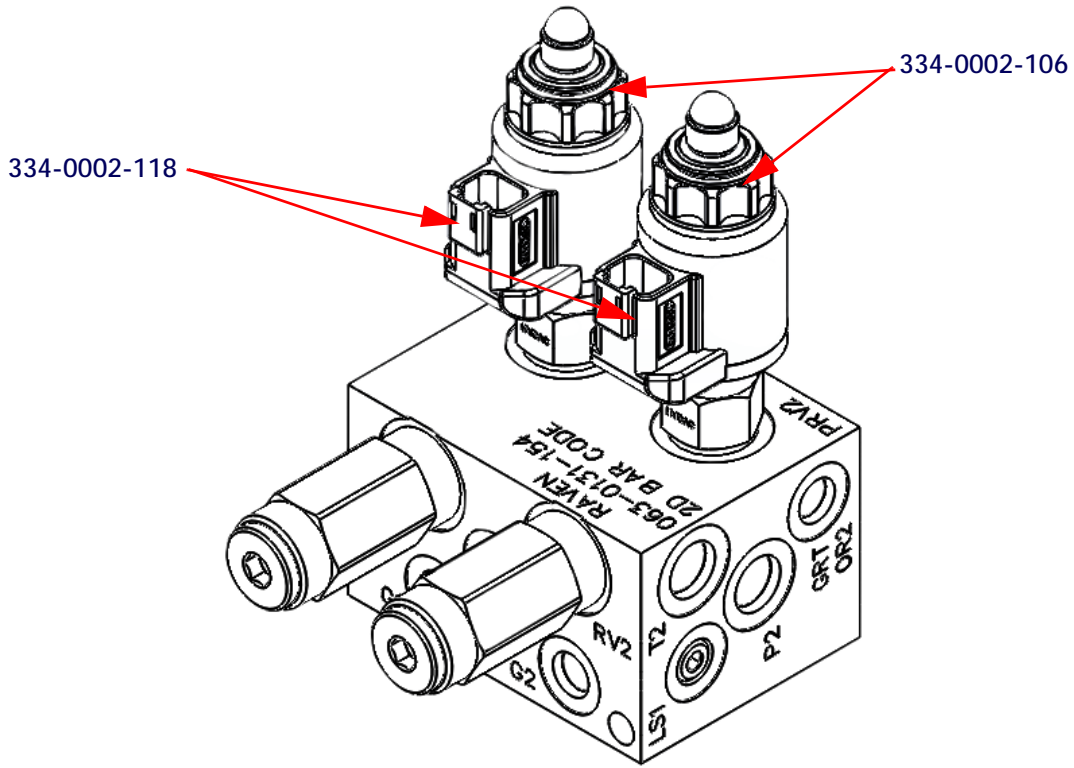
CHAPTER

REPLACEMENT PARTS

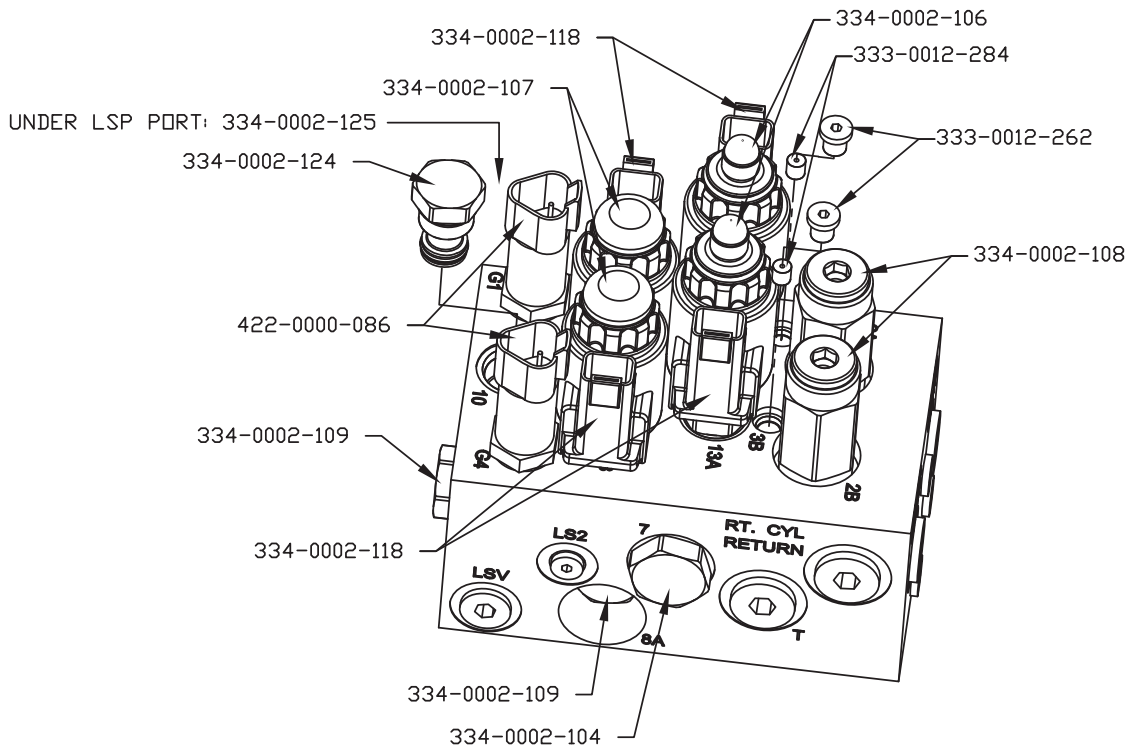
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This section contains replacement part diagrams for the PowerGlide Plus and UltraGlide systems. Refer to these diagrams when calling to request replacement parts.

VALVE

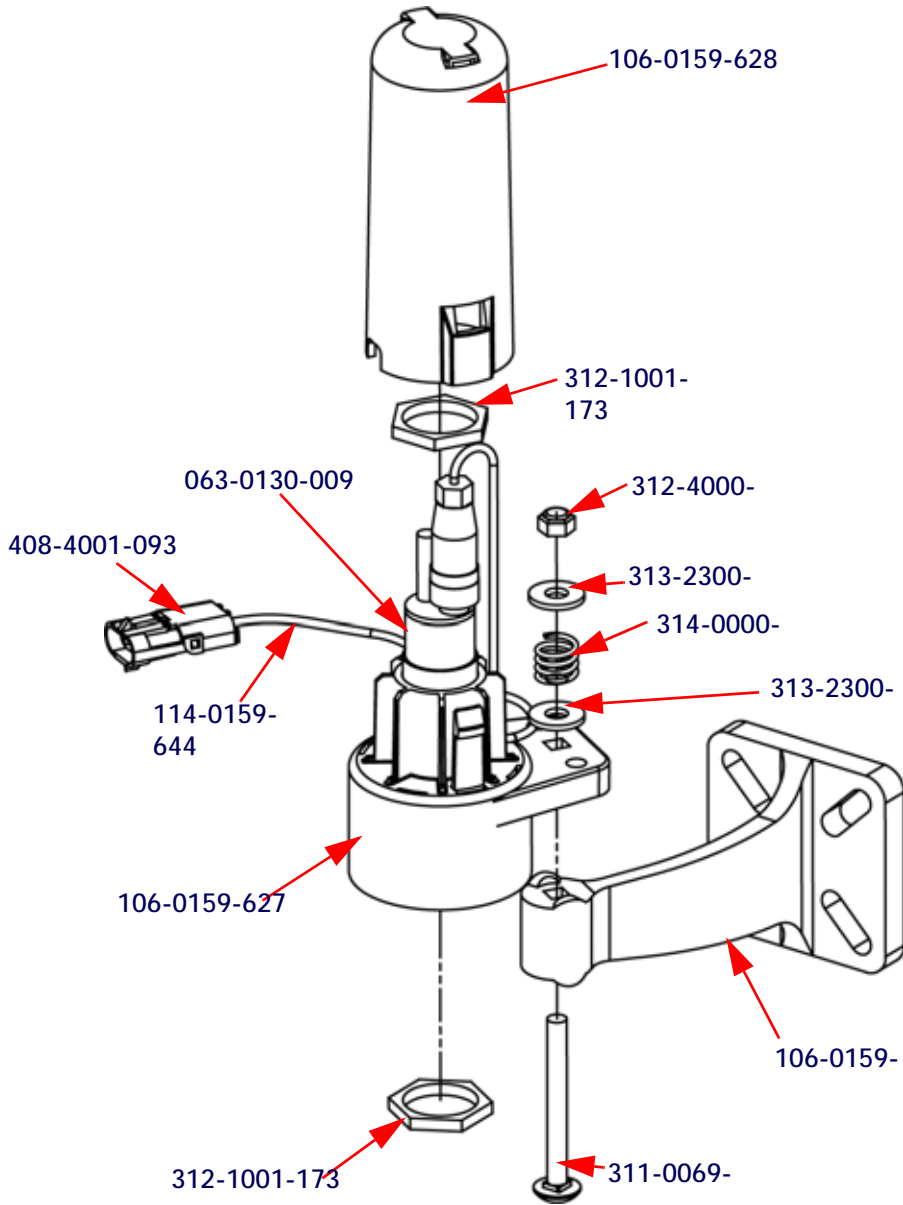


063-0131-154
Valve Assembly, Hydraulic
AutoBoom XT



063-0131-125
 VALVE, HYDRAULIC POWERGLIDE
 PLUS/ULTRAGLIDE, DYNAMIC LS, AUTOBOOM

SENSORS



E

Electrical
Safety 2

H

Hydraulic
Fittings 4
Safety 2
Hydraulic System Installation 23
Hydraulic Schematic 40
Install Fittings on the AutoBoom Valve (If Applicable) 24
Installing Fittings on the UltraGlide ST Valve 24
Installing the Cylinder Hose Retaining Bracket Assembly 36
Installing the Cylinder Hoses 36
Installing the Left and Right Cylinder Hoses (If UltraGlide Is Not Installed) 29
Installing the Left and Right Down Hoses (If UltraGlide Is Not Installed) 30
Installing the Load Sense Hoses 30
Installing the Pressure and Tank Hoses 27
UltraGlide Installed on the Machine 28
UltraGlide Not Installed on the Machine 27
Installing the UltraGlide XT Cylinders 32
Installing the Valve Mounting Bracket on the Machine (If UltraGlide Is Not Installed) 26
Mounting the AutoBoom Valve on the Valve Mounting Bracket (If UltraGlide Is Not Installed) 25
Mounting the UltraGlide XT Valve on the Valve Mounting Bracket 26
Removing the Orifices From the Machine's Tilt Cylinders (If UltraGlide Is Not Installed) 28

I

Important Safety Information 1
Electrical 2
Hydraulics 2
Introduction
Updates 4

K

Kit Contents 5
UltraGlide Installed on the Machine 14
UltraGlide Not Installed on the Machine 5

P

Point of Reference 4
Preparing for Installation 3

R

Recommendations 3
Replacement Parts 61
Sensors 64
Valves 62

S

Sensor Installation 41
Boom Sensor Mounting Locations 41
Installing the Sensors
UltraGlide Installed on the Machine 43
Mounting the Boom Sensors 43
Mounting the Center Sensor 44
UltraGlide Not Installed on the Machine 42
Installing the Boom Sensors 42
Mount the Center Sensor 43
Startup Procedures 59
Calibrating the AutoBoom UltraGlide XT System 60
Verifying the AutoBoom Hydraulic System Installation 59
Verifying the UltraGlide XT Wiring 59

T

Tools Needed 4

W

Wiring Installation 49
Connecting the Harness Cable to the Sensors 53
Connecting the UltraGlide XT Harness Cable to the Boom Function Controls 50
Connecting to the Load Sense Jam (Combo) Valve 53
Installing Center Rack Control 52
Installing the ISO CAN Wiring 54
Connecting the UltraGlide XT Harness Cable to the Power Cable
John Deere 4720 and 4830 (Model Year 2007) 54
John Deere 4730 and 4830 (Model Year 2008 and Newer) 55
Connecting the UltraGlide XT Harness Cable to the Power Cable 54
UltraGlide Installed on the Machine 56
UltraGlide not Installed on the Machine 55
Installing the UltraGlide XT Auxiliary Sensor Cable 54
Installing the UltraGlide XT Node 49
Wiring Connections 49
Wiring Schematic 57

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.