

**John Deere 4920 Series AutoBoom®  
UltraGlide XT Installation Manual**

*P/N 016-0233-006 Rev. B*

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# CHAPTER

# 1

# IMPORTANT SAFETY INFORMATION

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## NOTICE

Read this manual and the operation and safety instructions included with your implement and/or controller carefully before installing the AutoBoom<sup>®</sup> 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

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- 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

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- 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.

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# CHAPTER

# INTRODUCTION

## 2

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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: 4920

**FIGURE 1. John Deere 4920**

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## 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.

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## 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**



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## UPDATES

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

<http://www.ravenhelp.com>



At Raven Industries, we strive to make your experience with our products as rewarding as possible. One way to improve this experience is to provide us with feedback on this manual.

Your feedback will help shape the future of our product documentation and the overall service we provide. We appreciate the opportunity to see ourselves as our customers see us and are eager to gather ideas on how we have been helping or how we can do better.

To serve you best, please send an email with the following information to

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

- John Deere 4920 Series AutoBoom® UltraGlide XT Installation Manual
- P/N 016-0233-006 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 117-0233-006)**


Picture	Item Description	Part Number	Qty.
Not Pictured	Manual - ISO AutoBoom Calibration & Operation	016-0130-078	1
Not Pictured	Manual - John Deere 4920 Series UltraGlide XT Installation	016-0233-006	1
	Valve - AutoBoom Hydraulic	063-0131-125	1

TABLE 1. AutoBoom UltraGlide XT Installation Kit (P/N 117-0233-006)

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 - Wide Backing	107-0172-462	2
	Bracket - Narrow Backing	107-0172-463	2
	Bracket - Upper Cylinder Mounting	116-0159-783	2
	Bracket - Left Lower Cylinder Mounting	116-0159-784	1
	Bracket - Right Lower Cylinder Mounting	116-0159-785	1
	Shim - Hydraulic Valve Mounting	107-0171-620	2

TABLE 1. AutoBoom UltraGlide XT Installation Kit (P/N 117-0233-006)

Picture	Item Description	Part Number	Qty.
	Cable - 70' Ultrasonic Sensor	115-0171-527	2
	Cable - 2-Pin Deutsch Boom Sense Adapter	115-0171-546	1
	Cable - 40' Ultrasonic Sensor Extension	115-0171-602	2
	Cable - B-F Polar Boom Sense Adapter	115-0171-674	1
	Cable - A-F Polar Boom Sense Adapter	115-0171-789	1
	Cable - High Current Switched Power ISO/CAN AutoBoom	115-0230-025	1
	Cable - Center Rack Control B-F Polar Boom Sense Adapter	115-0230-040	1
	Cable - Center Rack Control A-F Polar	115-0230-041	1
	Cable - 20' Center Rack Control Load Sense Extension	115-0230-078	1
	Cable - John Deere 20/30/40 Series ISO CAN AutoBoom Valve Harness	115-0230-114	1
	Cable - UltraGlide XT Auxiliary Sensor	115-0230-147	1

TABLE 1. AutoBoom UltraGlide XT Installation Kit (P/N 117-0233-006)

Picture	Item Description	Part Number	Qty.
	Cylinder - 2" x 12" x 1.25" Hydraulic	334-0004-008	2
	Pin - Lower Cylinder	107-0172-465	2
	Clamp - 2" W x 3-1/4" L x 3/8" Thread U-Bolt	435-3003-047	8
	U-Bolt - 4" W x 5" L x 3/8" Thread	107-0171-606	2
	U-Bolt - 3-1/16" W x 5" L x 3/8" Thread	107-0171-607	2
	U-Bolt - 3-1/16" W x 4" L x 3/8" Thread	107-0171-608	2
	U-Bolt - 2" W x 7" L x 3/8" Thread	107-0171-855	2
	U-Bolt - 4" W x 6-5/8" L x 3/8" Thread	107-0172-133	1
	U-Bolt - 3-1/16" W x 4-1/2" L x 1/2" Thread	107-0172-470	4
	U-Bolt - 2-9/16" W x 4" L x 1/2" Thread	107-0172-471	4
	U-Bolt - 6-1/16" W x 4" L x 1/2" Thread	107-0172-472	6

TABLE 1. AutoBoom UltraGlide XT Installation Kit (P/N 117-0233-006)

Picture	Item Description	Part Number	Qty.
	Bolt - 1/4"-20 UNC x 2-3/4" Hex	311-0050-112	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	4
	Bolt - 1"-UNC x 6-1/2" Hex	311-0066-092	2
	Nut - 3/8"-16 Zinc Flanged Lock	312-1001-164	19
	Nut - 1/2"-13 Flanged Lock	312-1001-166	28
	Nut - 1/4"-20 Nylon Insert Lock	312-4000-057	2
	Nut - 5/16"-18 Nylon Insert Lock	312-4000-059	2
	Nut - 3/8"-16 Nylon Insert Lock	312-4000-061	3
	Nut - 1"-8 Nylon Insert Lock	312-4000-075	2

TABLE 1. AutoBoom UltraGlide XT Installation Kit (P/N 117-0233-006)




Picture	Item Description	Part Number	Qty.
	Washer - 5/16" Split Lock	313-1000-019	4
	Washer - 1" Steel Flat	313-2300-027	12
	Washer - 1/2" Steel Flat	313-2300-019	16

TABLE 2. Hydraulic Kit (P/N 117-0134-011)

Picture	Item Description	Part Number	Qty.
	Fitting - 9/16" ORFS M/M/F Swivel Run Tee	333-0012-022	1
	Fitting - 13/16" ORFS M/M/F Swivel Run Tee	333-0012-028	2
	Fitting - 1-3/16" ORFS M/M/F Swivel Run Tee	333-0012-029	2
	Fitting - 1-3/16" ORFS (F) to 13/16" ORFS (M) Reducer	333-0012-030	2
	Fitting - 11/16" ORFS M/M/F Swivel Run Tee	333-0012-069	2
	Fitting - 11/16" ORFS (M) to 9/16" SAE O-Ring (M) Straight Adapter	333-0012-084	2
	Fitting - 11/16" ORFS (M) to 3/4" SAE O-Ring (M) 90° Elbow	333-0012-165	2

TABLE 2. Hydraulic Kit (P/N 117-0134-011)

Picture	Item Description	Part Number	Qty.
	Fitting - 13/16" ORFS (M) to 3/4" SAE O-Ring (M) Straight Adapter	333-0012-168	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 9/16" SAE O-Ring (M) .060 Orifice	333-0012-289	2
	Hydraulic Hose - 13/16" ORFS (F) to 13/16" ORFS (F) 90° - 36"	214-1000-311	2
	Hydraulic Hose - 11/16" ORFS (F) to 11/16" ORFS (F) 90° - 96"	214-1000-314	1
	Hydraulic Hose - 11/16" ORFS (F) to 11/16" ORFS (F) 90° - 120"	214-1000-315	1
	Hydraulics Hose - 9/16" ORFS (F) to 9/16" ORFS (F) 90° - 228"	214-1000-421	1
	Hydraulic Hose - 11/16" ORFS (F) to 11/16" ORFS (F) 90° - 52"	214-1000-605	2

TABLE 3. UltraGlide XT Hydraulic Kit (P/N 117-0134-306)



Picture	Item Description	Part Number	Qty.
	Fitting - -8 ORFS M/M/F Swivel Run Tee	333-0012-028	2
	Fitting - -4 O-Ring Internal Hex Plug	333-0012-051	7

TABLE 3. UltraGlide XT Hydraulic Kit (P/N 117-0134-306)

Picture	Item Description	Part Number	Qty.
	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	4
	Fitting - -6 ORFS (M) to -6 SAE O-Ring (M) 90° Elbow	333-0012-085	4
	Fitting - -6 O-Ring Internal Hex Plug	333-0012-104	2
	Fitting - -4 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 90° (F) to -8 ORFS (F) - 36"	214-1001-116	2
	Hydraulic Hose - -6 ORFS (F) to -6 ORFS (F) - 132"	214-1001-118	4
	Hydraulic Hose - -4 ORFS (F) to -4 ORFS 90° (F) - 36"	214-1001-119	1



TABLE 4. 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
	Nut - 1/4"-20 Nylon Insert Lock	312-4000-057	4
	Washer - 1/4" Steel Flat	313-2300-010	4

TABLE 5. 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 6. 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
	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

TABLE 6. Rotary Sensor Installation Kit (P/N 117-0131-089)

Picture	Item Description	Part Number	Qty.
	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 7. UltraGlide XT Installation Kit (P/N 117-0234-006)

Picture	Item Description	Part Number	Qty.
Not Pictured	Manual - ISO AutoBoom Calibration & Operation	016-0130-078	1
Not Pictured	Manual - John Deere 4920 Series UltraGlide XT Installation	016-0233-006	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

TABLE 7. UltraGlide XT Installation Kit (P/N 117-0234-006)

Picture	Item Description	Part Number	Qty.
	Bracket - Wide Backing	107-0172-462	2
	Bracket - Narrow Backing	107-0172-463	2
	Bracket - Upper Cylinder Mounting	116-0159-783	2
	Bracket - Left Lower Cylinder Mounting	116-0159-784	1
	Bracket - Right Lower Cylinder Mounting	116-0159-785	1
	Shim - Hydraulic Valve Mounting	107-0171-620	2
	Cable - John Deere 20/30/40 Series ISO CAN AutoBoom Valve Harness	115-0230-114	1
	Cable - UltraGlide XT Auxiliary Sensor	115-0230-147	1
	Cylinder - 2" x 12" x 1.25" Hydraulic	334-0004-008	2
	Pin - Lower Cylinder	107-0172-465	2
	U-Bolt - 4" W x 5" L x 3/8" Thread	107-0171-606	2

TABLE 7. UltraGlide XT Installation Kit (P/N 117-0234-006)










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" W x 7" L x 3/8" Thread	107-0171-855	2
	U-Bolt - 4" W x 6-5/8" L x 3/8" Thread	107-0172-133	1
	U-Bolt - 3-1/16" W x 4-1/2" L x 1/2" Thread	107-0172-470	4
	U-Bolt - 2-9/16" W x 4" L x 1/2" Thread	107-0172-471	4
	U-Bolt - 6-1/16" W x 4" L x 1/2" Thread	107-0172-472	6
	Bolt - 1/4"20 UNC x 2-3/4" Hex	311-0050-112	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"-UNC x 6-1/2" Hex	311-0066-092	2

TABLE 7. UltraGlide XT Installation Kit (P/N 117-0234-006)

Picture	Item Description	Part Number	Qty.
	Nut - 3/8"-16 Zinc Flanged Lock	312-1001-164	14
	Nut - 1/2"-13 Flanged Lock	312-1001-166	28
	Nut - 1/4"-20 Nylon Insert Lock	312-4000-057	2
	Nut - 5/16"-18 Nylon Insert Lock	312-4000-059	2
	Nut - 3/8"-16 Nylon Insert Lock	312-4000-061	3
	Nut - 1"-8 Nylon Insert Lock	312-4000-075	2
	Washer - 1" Steel Flat	313-2300-027	12

TABLE 8. Hydraulic Kit (P/N 117-0134-011)




Picture	Item Description	Part Number	Qty.
	Fitting - 9/16" ORFS M/M/F Swivel Run Tee	333-0012-022	1
	Fitting - 13/16" ORFS M//M/F Swivel Run Tee	333-0012-028	2
	Fitting - 1-3/16" ORFS M/M/F Swivel Run Tee	333-0012-029	2

TABLE 8. Hydraulic Kit (P/N 117-0134-011)

Picture	Item Description	Part Number	Qty.
	Fitting - 1-3/16" ORFS (F) to 13/16" ORFS (M) Reducer	333-0012-030	2
	Fitting - 11/16" ORFS M/M/F Swivel Run Tee	333-0012-069	2
	Fitting - 11/16" ORFS (M) to 9/16" SAE O-Ring (M) Straight Adapter	333-0012-084	2
	Fitting - 11/16" ORFS (M) to 3/4" SAE O-Ring (M) 90° Elbow	333-0012-165	2
	Fitting - 13/16" ORFS (M) to 3/4" SAE O-Ring (M) Straight Adapter	333-0012-168	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 9/16" SAE O-Ring (M) .060 Orifice	333-0012-289	2
	Hydraulic Hose - 13/16" ORFS (F) to 13/16" ORFS (F) 90° - 36"	214-1000-311	2
	Hydraulic Hose - 11/16" ORFS (F) to 11/16" ORFS (F) 90° - 96"	214-1000-314	1
	Hydraulic Hose - 11/16" ORFS (F) to 11/16" ORFS (F) 90° - 120"	214-1000-315	1

TABLE 8. Hydraulic Kit (P/N 117-0134-011)



Picture	Item Description	Part Number	Qty.
	Hydraulics Hose - 9/16" ORFS (F) to 9/16" ORFS (F) 90° - 228"	214-1000-421	1
	Hydraulic Hose - 11/16" ORFS (F) to 11/16" ORFS (F) 90° - 52"	214-1000-605	2

TABLE 9. 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 10. 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 10. 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 11. Optional Dual Sensor Upgrade Kit (P/N 117-0137-075)







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	435-3003-046	4

TABLE 12. 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.

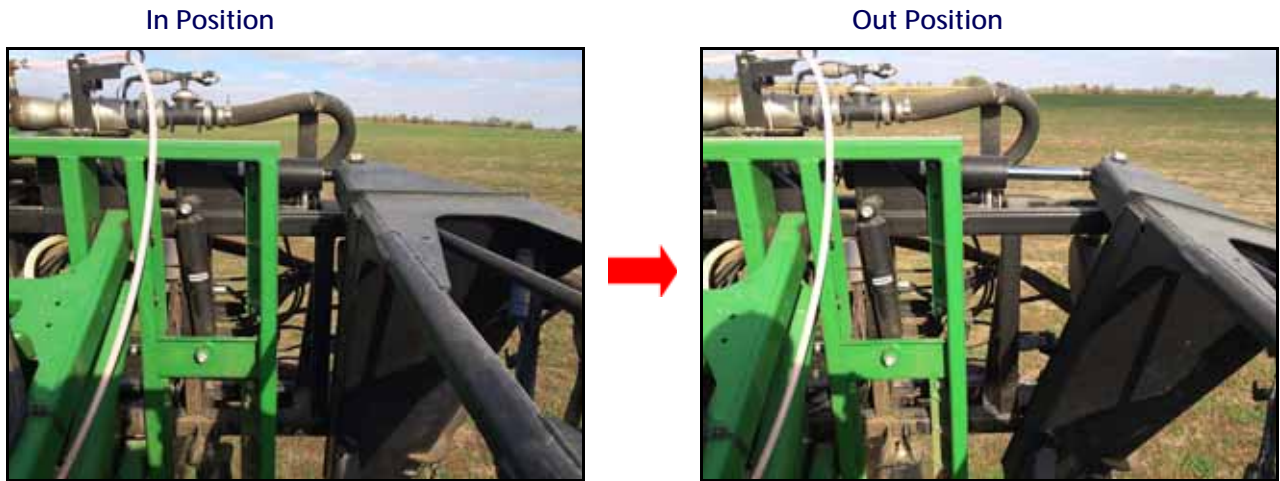


**NOTICE**

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 THE ULTRAGLIDE XT CYLINDERS

FIGURE 1. Boom Position



1. With the booms racked, press the left and right lower joystick buttons to “roll out” the booms.

FIGURE 2. Left Lower Cylinder Mount Weldment Bracket Installed

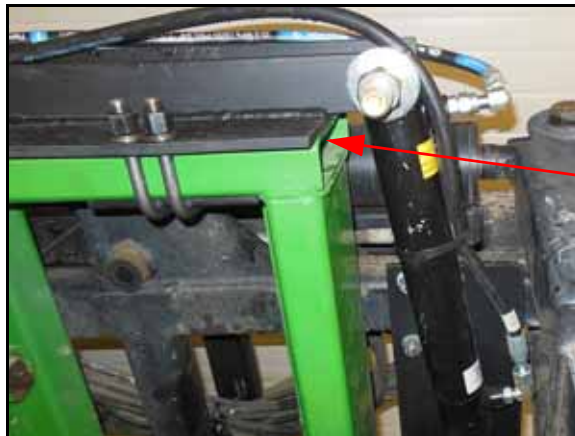


2. Install the left lower cylinder mounting bracket (P/N 116-0159-784) on the left side of the center rack as shown in Figure 1 using two 3-1/16" W x 4-1/2" L x 1/2" thread U-bolts (P/N 107-0172-470) in the top holes and two 2-9/16" W x 4" L x 1/2" U-bolts (P/N 107-0172-471) in the bottom holes.

**NOTE:** The left lower cylinder mounting bracket should be oriented parallel with the vertical center rack tube.

3. Secure the installed U-bolts using eight 1/2"-13 flanged lock nuts (P/N 312-1001-166).
4. Tighten the nuts to 75 ft-lbs using a torque wrench.
5. Repeat the steps above to install the right lower cylinder mounting bracket (P/N 116-0159-785) on the right side of the center rack.

FIGURE 3. Upper Cylinder Mounting Bracket Aligned with Center Frame



Upper Cylinder  
Mounting Bracket  
Aligned with Edge  
of Center Frame

6. Position the end of the upper cylinder mounting bracket (P/N 116-0159-783) with the edge of the rectangular tube on the center frame as shown in Figure 2 above.

FIGURE 4. Upper Cylinder Mounting Bracket Installed



7. Secure the upper cylinder mounting bracket on the center frame using three 6-1/16" W x 4" L x 1/2" thread U-bolts (P/N 107-0172-472) and six 1/2"-13 flanged lock nuts (P/N 312-1001-166).

**NOTE:** Install the flanged lock nuts so that the nuts are on the very end of the U-bolts, leaving space between the U-bolt and the center frame tube.

FIGURE 5. Backing Plates Installed

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8. Insert the wide backing plate (P/N 107-0172-462) between the center frame and the pair of installed U-bolts.
9. Insert the narrow backing plate (P/N 107-0172-463) between the center frame and the single installed U-bolt.
10. Finger-tighten the nuts to secure the mounting bracket and backing plates.

FIGURE 6. Base-End of Hydraulic Cylinder Installed

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11. Position the hydraulic cylinder (P/N 334-0004-008) over the upper cylinder mounting bracket so that the hydraulic ports point to the outside of the machine.
12. Install the base-end of the hydraulic cylinder in the upper cylinder mounting bracket using one 1"-x UNC x 6-1/2" hex bolt (P/N 311-0066-091), one 1"-8 nylon insert lock nut (P/N 312-4000-075), and 1" flat washers (P/N 313-2300-027) as needed.

**NOTE:** Use hand tools to install the cylinder. Do not use in impact wrench to tighten the mounting hardware.

FIGURE 7. Rod-End of Hydraulic Cylinder Installed

1/4"-20 UNC x 2-3/4"  
Bolt (P/N 311-0050-  
112) and 1/4"-20 Nylon  
Insert Lock Nut  
(P/N 312-4000-057)



13. Secure the rod-end of the cylinder to the left lower cylinder mounting bracket using the supplied lower cylinder pin (P/N 107-0172-465).
14. Secure the lower cylinder pin with a 1/4"-20 UNC x 2-3/4" hex bolt (P/N 311-0050-112) and a 1/4"-20 nylon insert lock nut (P/N 312-4000-057).
15. Tighten the 1/2"-13 flanged lock nuts installed in step 7 to 75 ft-lbs using a torque wrench.
16. Repeat the steps above to install the right cylinder.

### 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 - -6 ORFS (M) to -6 SAE O-Ring (M) Straight Adapter	333-0012-084	LC, RC
Fitting - -8 ORFS (M) to -8 SAE O-Ring (M) Straight Adapter	333-0012-168	Left T, P
Fitting- -4 ORFS (M) to -6 SAE O-Ring (M) Straight Adapter	333-0012-195	LSP
Fitting - -6 ORFS (M) to -8 SAE O-Ring (M) 90° Elbow	333-0012-165	LF CYL RTN, RT CYL RTN
Fitting - -6 ORFS (M) to -6 SAE O-Ring (M) .060 Orifice Straight Adapter	333-0012-289	LV, RV



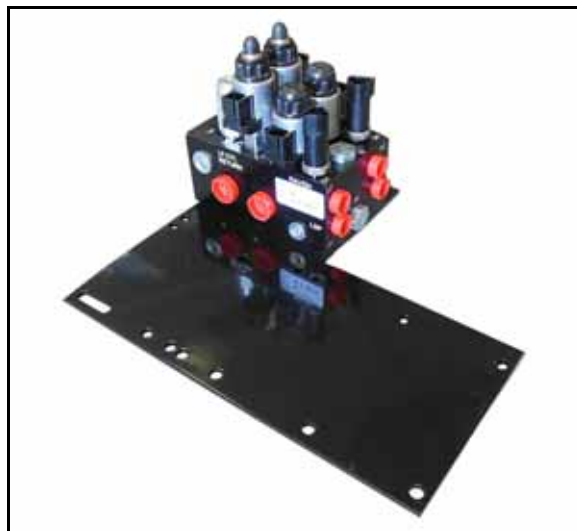
## INSTALL FITTINGS IN THE ULTRAGLIDE XT VALVE

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 ORFS (M) to -6 SAE O-Ring (M) Straight Adapter	333-0012-084	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 8. 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).

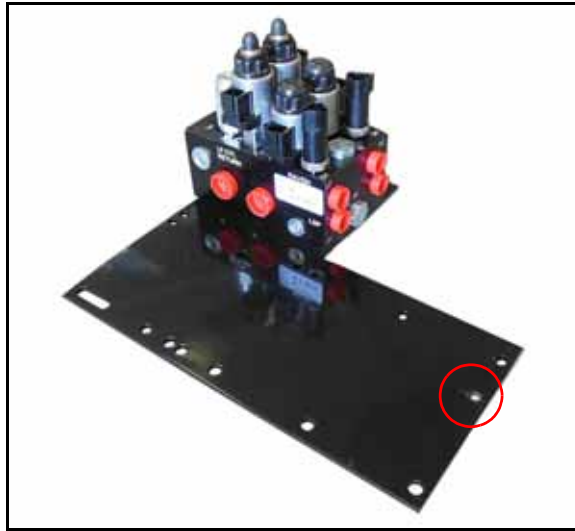


2. Tighten the bolts and washers to ensure the valve is installed securely.

## 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 9. Hole Drilled in Valve Mounting Bracket**



1. Using the holes in the UltraGlide XT valve (P/N 063-0131-154) as a template, drill an additional 5/16" hole in the valve mounting bracket.

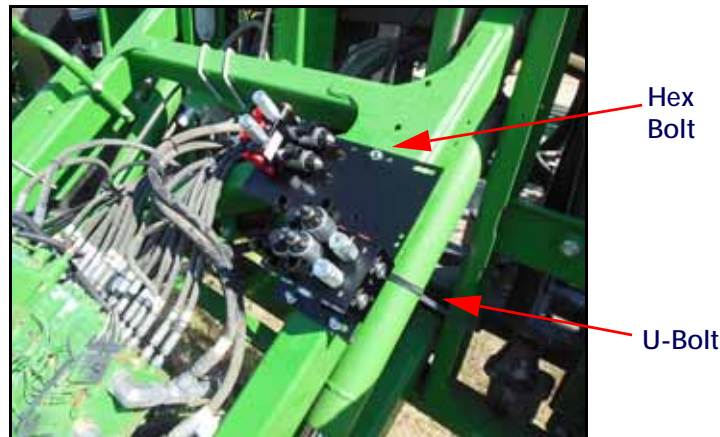
**FIGURE 10. UltraGlide XT Valve Mounted on the Valve Mounting Bracket**



1. Secure the UltraGlide XT valve 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 mounted securely.

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

FIGURE 11. AutoBoom and UltraGlide XT Valves Mounted on the Machine



1. Secure the valve mounting bracket (P/N 107-0171-802) on the upper-left parallel arm of the center rack, using one 3-1/16" W x 5" L x 3/8" thread U-bolt (P/N 107-0171-607), one 3/8" UNC x 1-1/4" hex bolt (P/N 312-0054-106), and three 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 12. Pressure and Tank Hoses Installed on the Machine



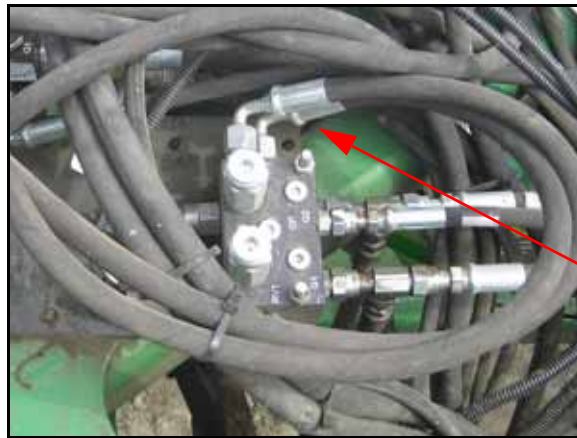
1. Disconnect the machine's pressure hose from the left side of the machine's hydraulic valve.

2. Depending on the machine's hose size, install either a -8 ORFS M/M/F swivel run tee adapter fitting (P/N 333-0012-028) or a -12 ORFS M/M/F swivel run tee adapter fitting (P/N 333-0012-029) in the machine's pressure port.

**NOTE:** If the -12 ORFS M/M/F swivel run tee fitting is used, install a -12 ORFS (F) to -8 ORFS (M) reducer fitting (P/N 333-0012-030) in the 90° end of the installed tee fitting.

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 214-1000-311) 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 214-1001-116) on the 90° end of the tee fitting installed in Port P of the AutoBoom valve.

**FIGURE 13. Pressure and Tank Hoses Installed on the Machine**



Port P2

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. Depending on the machine's hose size, install either a -8 ORFS M/M/F swivel run tee adapter fitting (P/N 333-0012-028) or a -12 ORFS M/M/F swivel run tee adapter fitting (P/N 333-0012-029) in the machine's pressure port.

**NOTE:** If the -12 ORFS M/M/F swivel run tee fitting is used, install a -12 ORFS (F) to -8 ORFS (M) reducer fitting (P/N 333-0012-030) in the 90° end of the installed tee fitting.

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 214-1000-311) 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 214-1001-116) on the 90° end of the tee fitting installed in Port T of the AutoBoom valve.

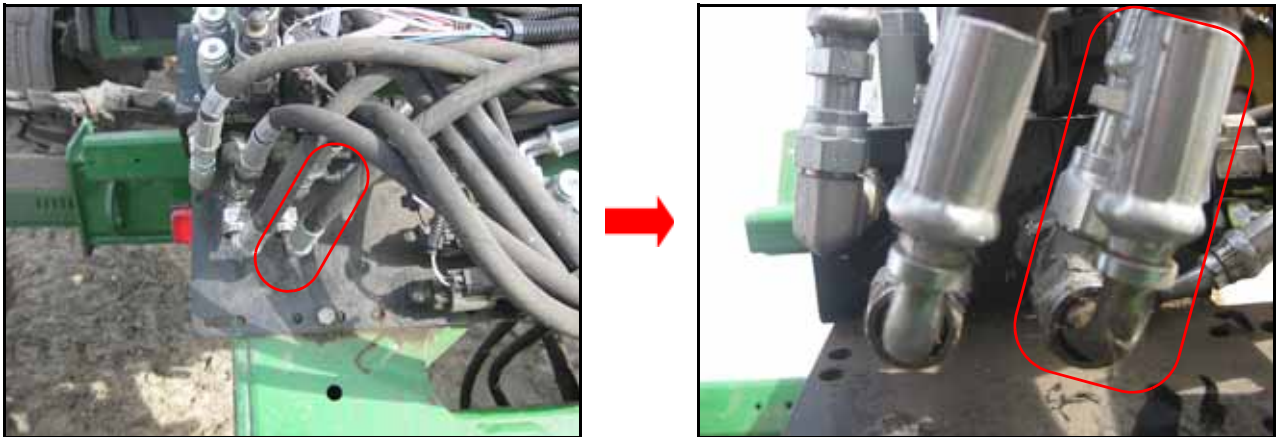
FIGURE 14. Pressure and Tank Hoses Installed on the Machine



14. Connect the 90° end of the installed hydraulic hose to Port T2 of the UltraGlide XT valve.

### ULTRAGLIDE INSTALLED ON THE MACHINE

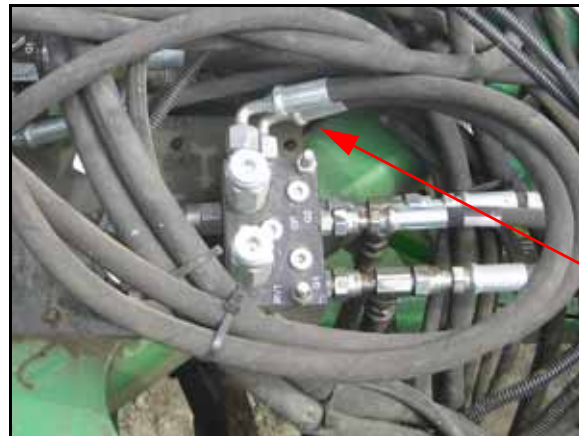
FIGURE 15. Hoses Installed on AutoBoom Hydraulic Valve



1. Disconnect the pressure hose from the existing AutoBoom hydraulic valve (P/N 063-0131-125).
2. Install a -8 ORFS M/M/F swivel run tee adapter fitting (P/N 333-0012-028) 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 214-1001-116) on the 90° end of the installed tee fitting.



FIGURE 16. Pressure and Tank Hoses Installed on the Machine



Port P2

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).

FIGURE 17. Hoses Installed on AutoBoom Hydraulic Valve



6. Disconnect the tank hose from the existing AutoBoom hydraulic valve.
7. Install a -8 ORFS M/M/F swivel run tee adapter fitting (P/N 333-0012-028) 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 214-1001-116) on the 90° end of the installed tee fitting.

FIGURE 18. Pressure and Tank Hoses Installed on the Machine

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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:** The raise hose will be connected to the system later in the procedure.

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 19. Left and Right Cylinder Hoses Installed



1. Route the machine's left cylinder raise hose (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 of the AutoBoom valve.
2. Connect the straight end of the supplied hydraulic hose (P/N 214-1000-314) 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 (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 of the AutoBoom valve.
5. Connect the straight end of the supplied hydraulic hose (P/N 214-1000-315) 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 20. Down Hoses Installed on the AutoBoom Valve

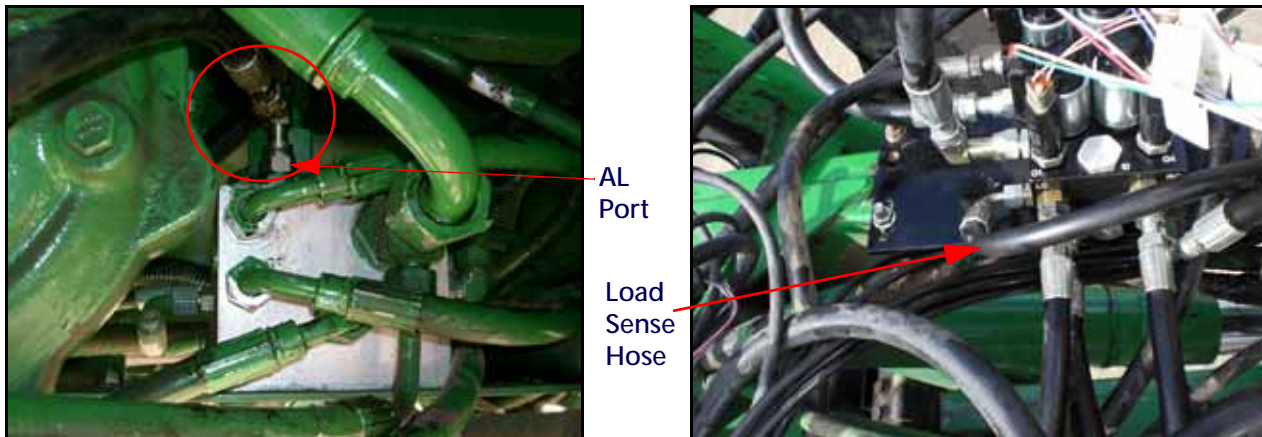


1. Disconnect the machine's left down hose from the machine's hydraulic valve.
2. Install a -6 ORFS M/M/F swivel run tee adapter fitting (P/N 333-0012-069) in the open down port of the machine's hydraulic valve.
3. Connect the machine's down hose to the opposite end of the installed tee fitting.
4. Install the 90° end of the supplied hydraulic hose (P/N 214-1000-605) on the 90° end of the installed tee fitting.
5. Connect the straight end of the installed hydraulic hose to the fitting installed in 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 -6 ORFS M/M/F swivel run tee adapter fitting (P/N 333-0012-069) in the open 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 214-1000-605) on the 90° end of the installed tee fitting.
10. Connect the straight end of the installed hydraulic hose to the fitting installed in Port RT CYL RTN of the AutoBoom valve.

## INSTALL THE LOAD SENSE HOSES

**NOTE:** If AutoBoom is already installed on the machine, proceed to step 7 of this section.

FIGURE 21. Load Sense Hose Installed



1. Locate the load sense combo valve beneath the cab/tank of the machine.
2. Disconnect the machine's load sense hose from port AL on the load sense combo valve.
3. Install a -4 ORFS M/M/F swivel run tee fitting (P/N 333-0012-022) on the load sense combo valve.
4. Reconnect the machine's load sense hose to the opposite end of the installed tee fitting.
5. Connect the straight end of the supplied hydraulic hose (P/N 214-1000-421) on the 90° end of the installed tee fitting.
6. Connect the 90° end of the installed hydraulic hose to the installed fitting in Port LSP of the AutoBoom valve.
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 214-1000-119) 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).



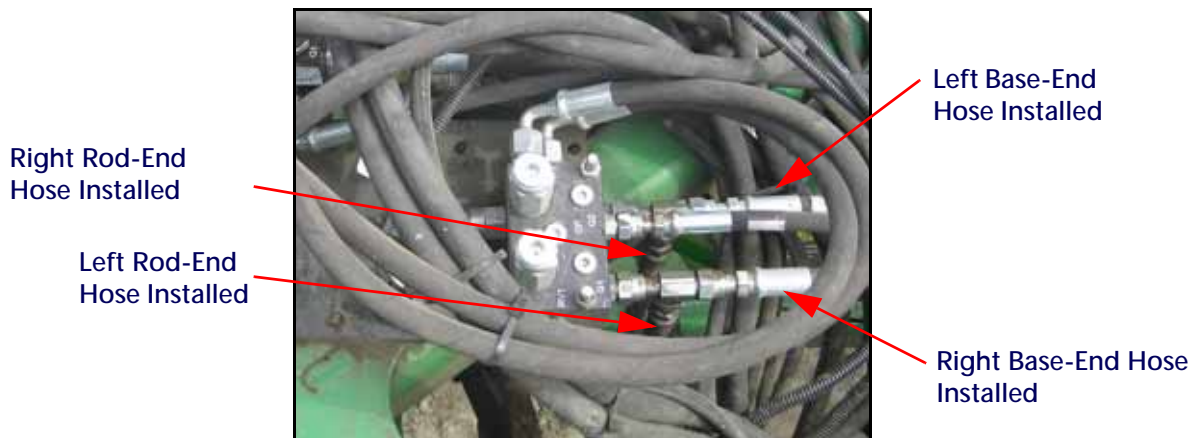
## INSTALL THE CYLINDER HOSES

FIGURE 22. Cylinder Hose Installed



1. Install -6 ORFS (M) to -6 SAE O-ring (M) 90° elbow fitting (P/N 333-0012-085) in each port of the hydraulic cylinders, orienting the rod-end fittings so that the 90° ends point up and the base-end fittings so that 90° ends point to the rear of the machine.
2. Install -6 ORFS M/M/F swivel run tee adapter fittings (P/N 333-0012-069) on the fittings installed in Port 1 and Port 2 of the UltraGlide XT valve (P/N 063-0131-154), orienting it so that the 90° end of the fitting points down.

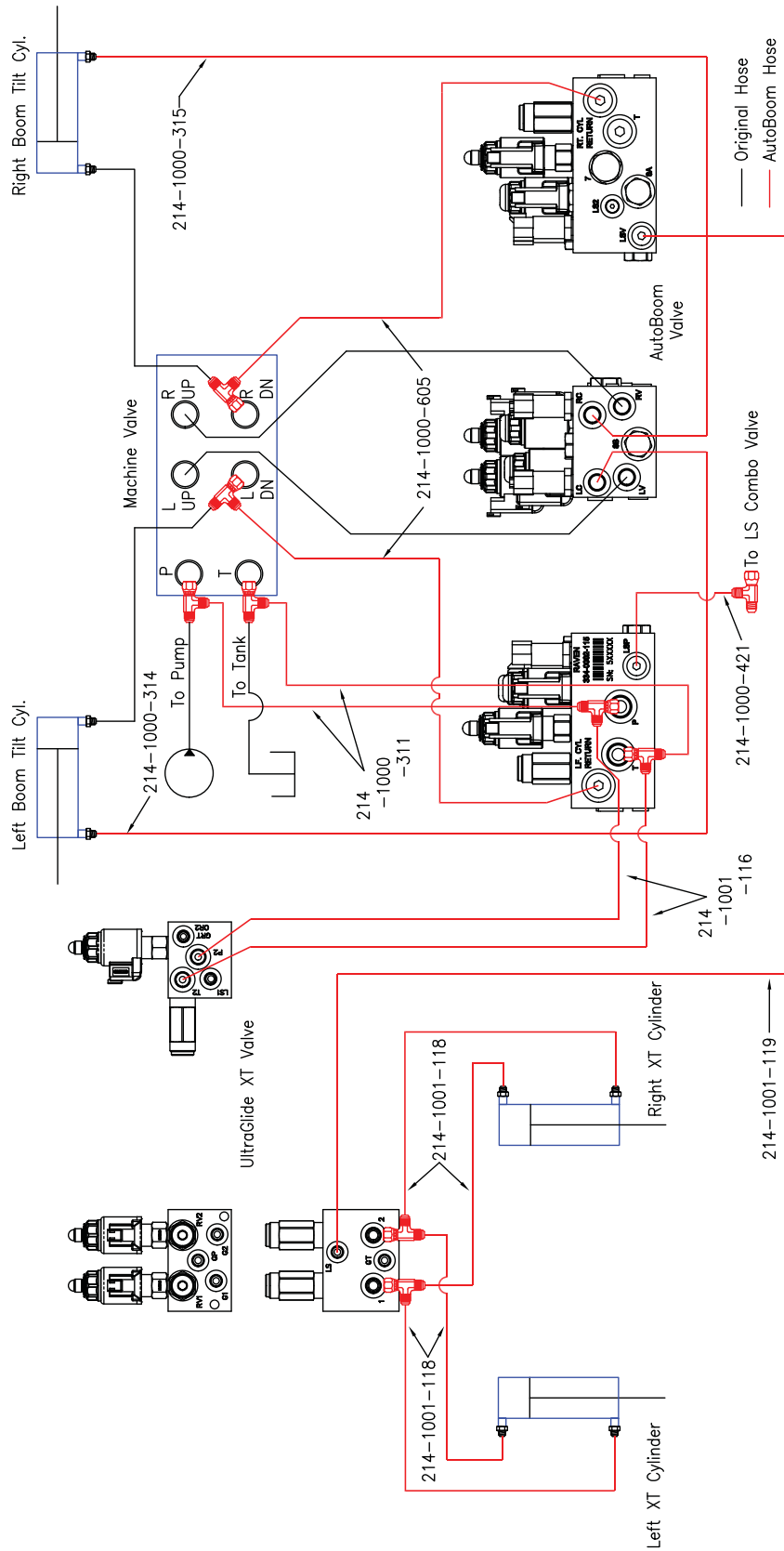
FIGURE 23. Cylinder Hoses Installed on UltraGlide XT Valve



3. Install one end of the supplied hydraulic hose (P/N 214-1001-118) on the 90° end of the tee fitting installed in Port 1 of the UltraGlide XT valve.
4. Connect the other end of the installed hydraulic hose to the fitting installed in the rod-end port of the left hydraulic cylinder.
5. Install one end of the supplied hydraulic hose (P/N 214-1001-118) on the remaining end of the tee fitting installed in Port 1 of the UltraGlide XT valve.
6. Connect the other end of the installed hydraulic hose to the fitting installed in the base-end of the right hydraulic cylinder.
7. Install one end of the supplied hydraulic hose (P/N 214-1001-118) on the 90° end of the tee fitting installed in Port 2 of the UltraGlide XT valve.
8. Connect the other end of the installed hydraulic hose to the fitting installed in the rod-end of the right hydraulic cylinder.

9. Install one end of the of the supplied hydraulic hose (P/N 214-1001-118) on the remaining end of the tee fitting installed in Port 2 of the UltraGlide XT valve.
10. Connect the other end of the installed hydraulic hose to the fitting installed in the base-end of the left hydraulic cylinder.


HYDRAULIC DIAGRAM





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**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 44.

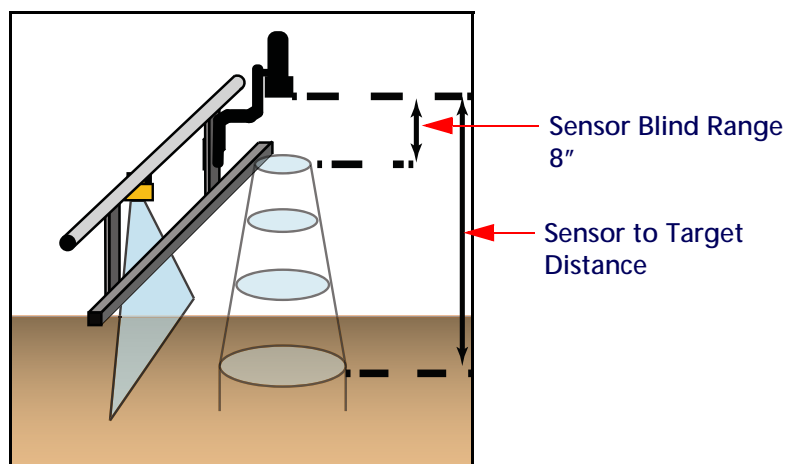
	<b>WARNING</b>
	The machine must remain stationary and switched off, with the booms unfolded and supported, during installation or maintenance.

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## 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. Install four of the ultrasonic sensors (P/N 063-0130-026) on four 12" S-type sensor arms (P/N 063-0131-592) using two 1/2"-20 nylon insert lock nuts (P/N 312-4000-057) and two 1/4" flat washers (P/N 313-2300-010) per sensor.
2. Mount the outer boom sensors on the breakaway boom, outside the breakaway joint using two 2" W x 3-1/8" L x 3/8" thread U-bolt clamps (P/N 435-3003-046) per sensor.
3. Mount the inner sensors on the front of the booms, just inside the fold joint using two 2" W x 3-1/8" L x 3/8" thread U-bolt clamps (P/N 435-3003-046) per sensor.
4. 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) 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 7" L x 3/8" thread U-bolts (P/N 107-0172-855) 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 117-0137-075) 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



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 2" W x 3-1/8" L x 3/8" thread U-bolt clamps (P/N 435-3003-046) per sensor.
4. Install the two sensors (P/N 063-0130-026) from the dual sensor upgrade kit (P/N 117-0137-075) 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 2" W x 3-1/8" L x 3/8" thread U-bolt clamps (P/N 435-3003-046) 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

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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 117-0234-007) 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 7" L x 3/8" thread U-bolts (P/N 107-0172-855) 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.



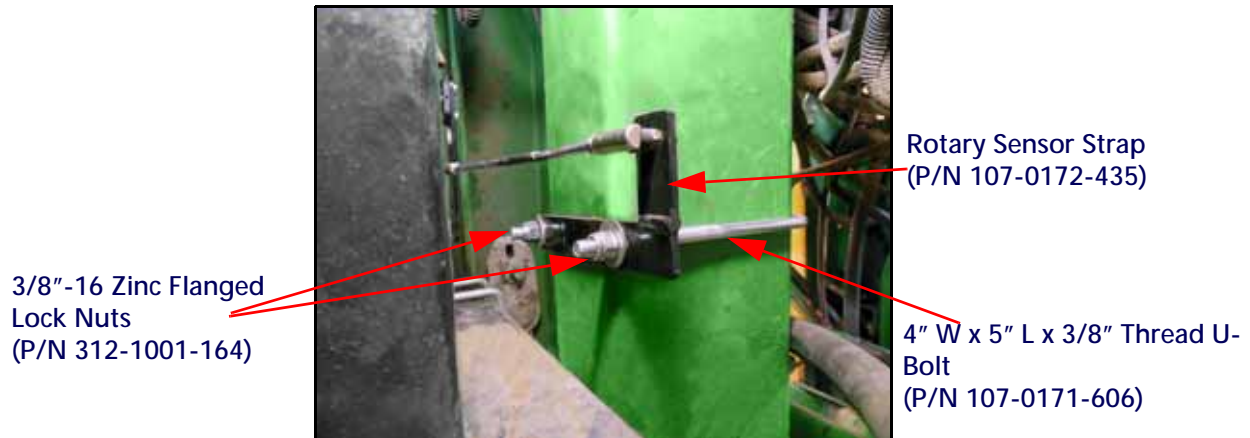
**FIGURE 7. Rotary Sensor Installed on Mounting Bracket**

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. Rotary Sensor Mounting Bracket Installed**

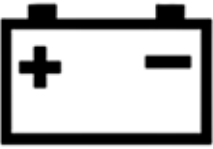
4. Install the rotary sensor arm bracket (P/N 107-0172-297) on the rotary sensor using two M6 x 1.0 x 8 mm screws (P/N 311-0005-128).
5. Insert one of the M6 90° stud bearings through the front of the rotary sensor arm bracket and secure it using one M6 nylon insert lock nut (P/N 312-4000-214).
6. Mount the rotary sensor mounting bracket on the left side of the front, lower tube of the center rack using two 3-1/16" W x 4" L x 3/8" thread U-bolts (P/N 107-0171-608) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).

FIGURE 9. Rotary Sensor Strap and Rotary Sensor Assembly Installed



7. Install the rotary sensor strap (P/N 107-0172-435) on the center section using one 4" W x 6-5/8" L x 3/8" thread U-bolt (P/N 107-0172-133) and two 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
8. Tighten the nuts to ensure the rotary sensor strap is installed securely.
9. 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

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

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

---

## INSTALL THE ULTRAGLIDE XT NODE

FIGURE 1. Node Mounting Location



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

FIGURE 2. AutoBoom Node 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 one mounting shim (P/N 107-0171-620) on the legs of each of the U-bolts.
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).
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 3. Machine's Boom Function Controls



12. Locate the machine's boom function controls on the hydraulic valve.
13. Disconnect the connectors from the machine's left/right tilt up coils.
14. Install the A-F or B-F polar John Deere 4920 boom sense adapter cable (P/N 115-0171-674 or 115-0171-789) between the coils and the machine's coil connectors.
15. Disconnect the connectors from the machine's left/right down coils.
16. Install the remaining boom sense adapter cable between the coils and the machine's coil connector.
17. On the harness cable, locate the LEFT SOLENOID SENSE connectors.
18. Isolate the connector labeled UP and connect it to the left tilt up coil via the installed boom sense adapter cable.
19. Connect the unlabeled down left sense connector to the left tilt down coil via the installed boom sense adapter cable.
20. On the harness cable, locate the RIGHT SOLENOID SENSE connectors.
21. Isolate the connector labeled UP and connect it to the right tilt up coil via the installed boom sense adapter cable.
22. Connect the unlabeled down right sense connector to the right tilt down coil via the installed boom sense adapter cable.

---

## INSTALL THE CENTER RACK CONTROL

FIGURE 4. Machine's Center Rack Coils



**IMPORTANT:** Each boom sense cable has unique end connections that will fit on only one of the connectors. If the cables do not easily join, do not force the connection! Instead, try connecting the other boom sense cable to that connector.

1. Locate the center up coil on the machine's hydraulic valve.
2. Unplug the coil connector from the center up coil.
3. Install the B-F polar John Deere boom sense adapter cable (P/N 115-0230-040) on the center up coil connector.
4. Connect the coil connector to the installed boom sense adapter cable.
5. Plug the single connectors on the installed boom sense adapter cable into the CENTER UP harness connectors of the AutoBoom harness cable (P/N 115-0230-114).
6. Locate the center down coil on the machine's hydraulic valve.
7. Unplug the coil connector from the center down coil.
8. Install the A-F polar John Deere boom sense adapter cable (P/N 115-0230-041) on the center down coil.
9. Connect the coil connector to the installed boom sense adapter cable.
10. Plug the single connectors on the installed boom sense adapter cable into the CENTER DOWN harness connectors of the AutoBoom harness cable.

## CONNECT THE HARNESS CABLE TO THE LOAD SENSE VALVE

FIGURE 5. Load Sense Combo Valve



1. Locate the load sense valve on the combo valve.

**NOTE:** The load sense valve is the smallest valve on the combo valve.

2. Disconnect the coil from the load sense combo coil.
3. Install the boom sense adapter cable (P/N 115-0171-546) between the coil and its connector.
4. Locate the OPEN CENTER VALVE connector on the AutoBoom 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 AutoBoom 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.

## 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.



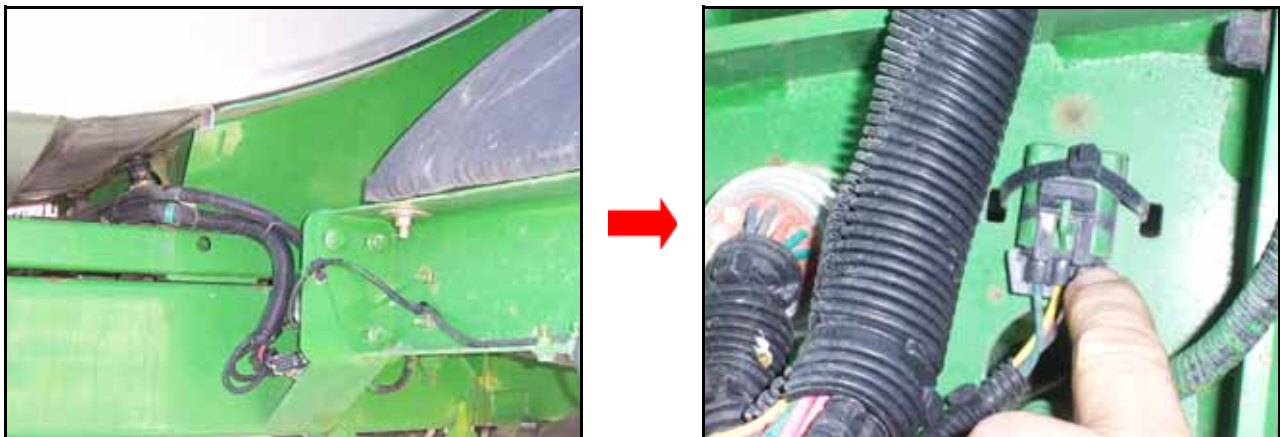
## INSTALL THE ULTRAGLIDE XT AUXILIARY SENSOR CABLE

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 CW 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 CCW connector of the XT auxiliary sensor cable to the coil connector in Port PRV2 of the UltraGlide XT valve.
4. Connect the ROTARY SENSOR connector of the XT auxiliary sensor cable to the rotary sensor cable connector.
5. Secure excess cable with plastic cable ties to prevent damage.

## INSTALL ISO CAN WIRING

### CONNECT THE ULTRAGLIDE XT HARNESS CABLE TO THE POWER CABLE

FIGURE 6. Machine's Harness Terminator



1. Remove the machine's harness cable terminator under the spray tank on the right side of the machine.
2. Connect the UltraGlide XT harness cable (P/N 115-0230-114) CAN connector to the machine's terminator connection.
3. Install the terminator that was removed in step 1 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 on the positive battery terminal.
3. Install the ground lead of the ISO power harness on the negative battery terminal.



FIGURE 7. Power Strip

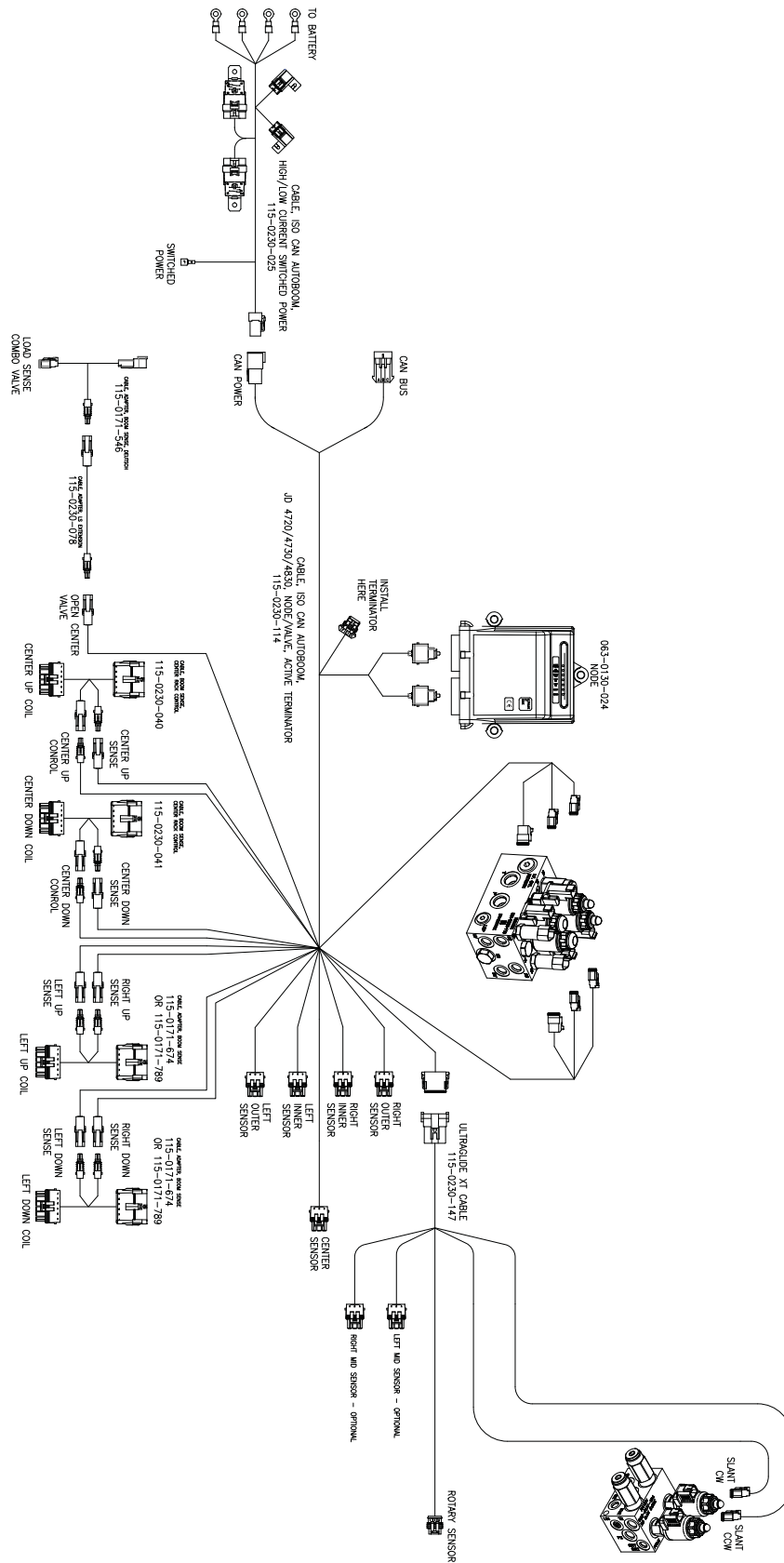



4. Connect the single wire with the spade connector to the John Deere power strip in the lower right corner of the cab.

#### 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.

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# CHAPTER

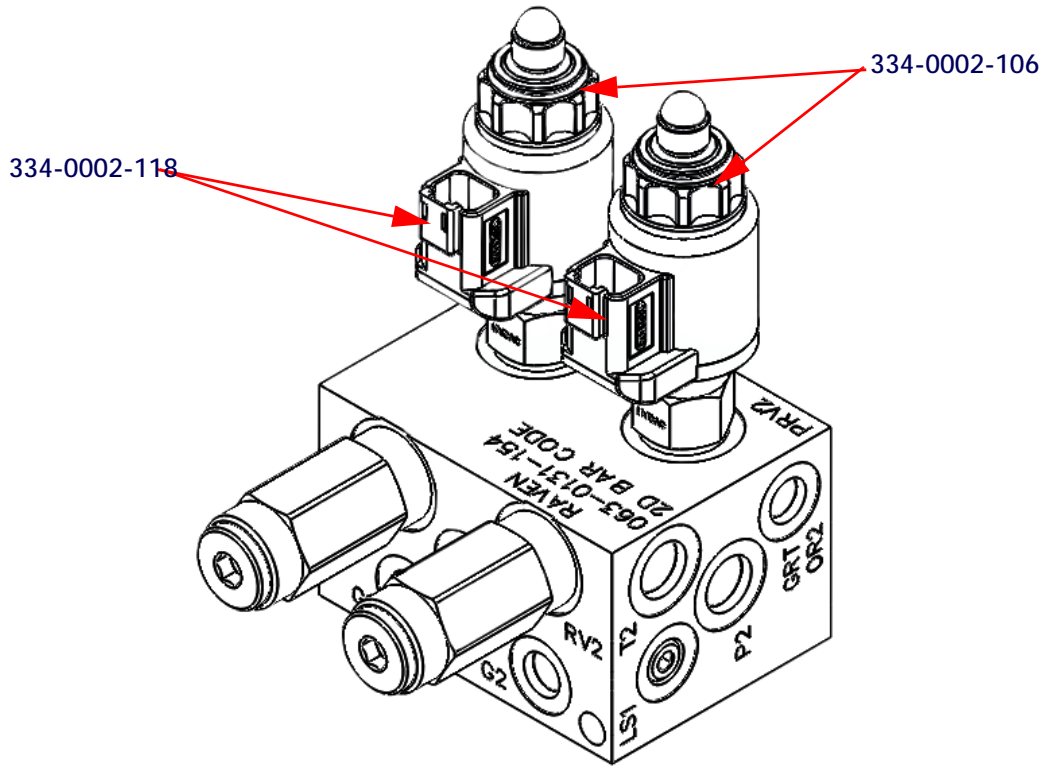
# REPLACEMENT PARTS

## 7

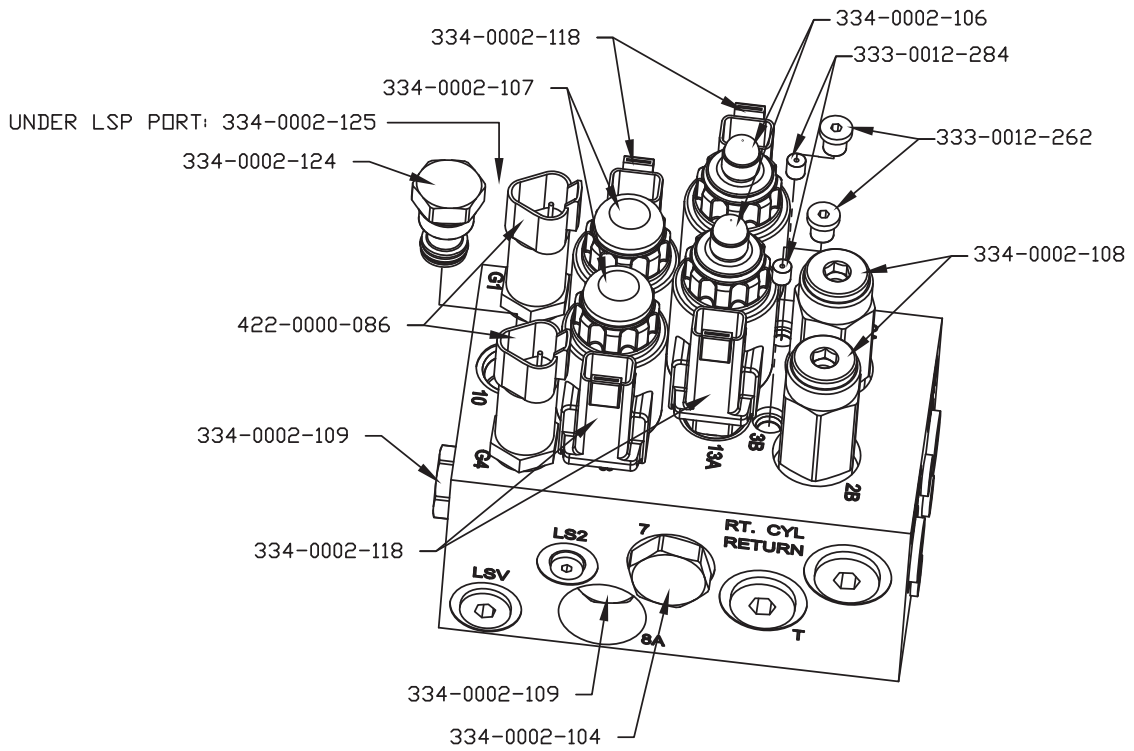
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This section contains replacement part diagrams for the PowerGlide Plus and UltraGlide systems. Refer to these diagrams when calling to request replacement parts.

VALVE

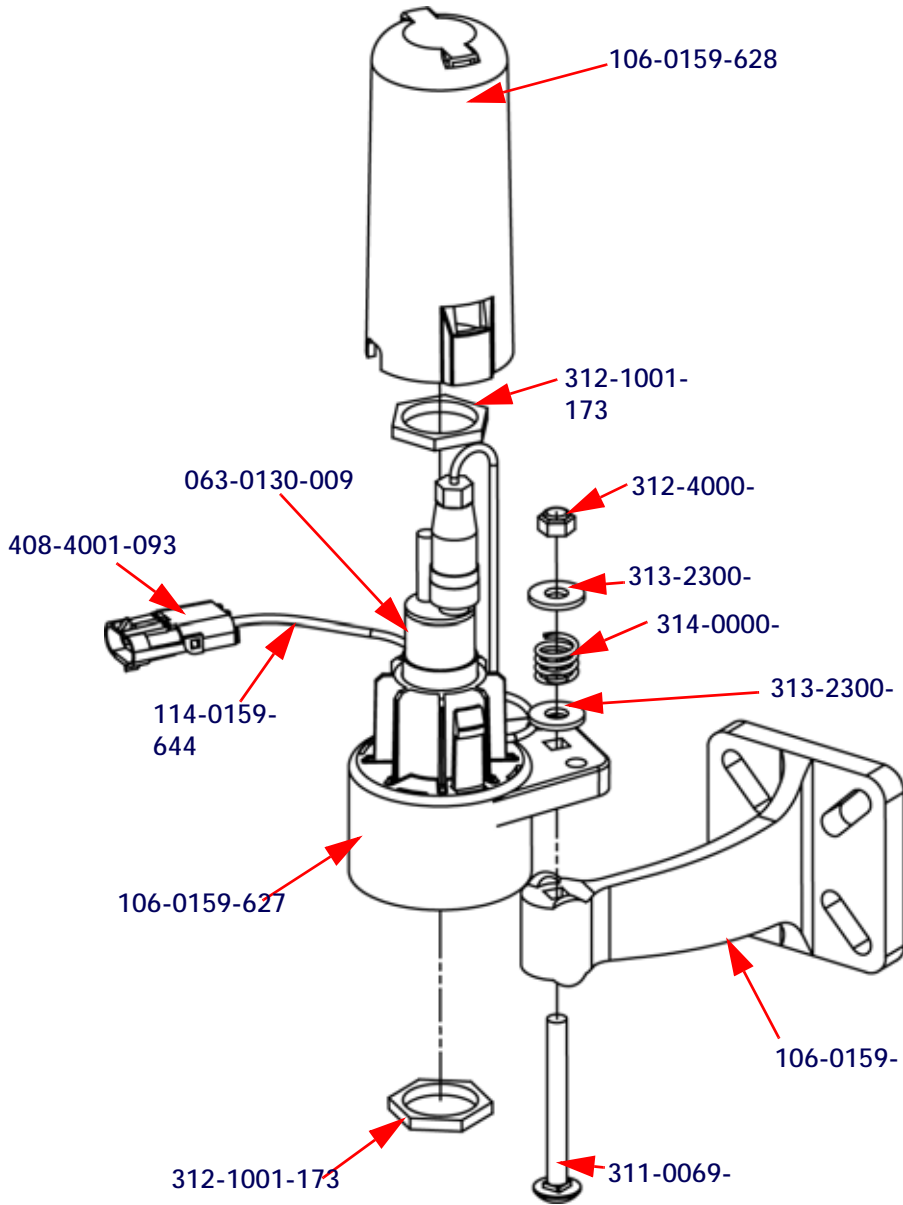


063-0131-154  
Valve Assembly, Hydraulic  
AutoBoom XT



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

SENSORS





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# RAVEN

## Limited Warranty

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### ***What Does this Warranty Cover?***

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

### ***How Long is the Coverage Period?***

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

### ***How Can I Get Service?***

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

### ***What Will Raven Industries Do?***

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

### ***What is not Covered by this Warranty?***

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

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



## Extended Warranty

### ***What Does this Warranty Cover?***

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

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

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

### ***Where Can I Register My Product for the Extended Warranty?***

To register, go online to [www.ravenhelp.com](http://www.ravenhelp.com) and select Product Registration.

### ***How Long is the Extended Warranty Coverage Period?***

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

### ***How Can I Get Service?***

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

### ***What Will Raven Industries Do?***

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

### ***What is Not Covered by the Extended Warranty?***

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

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