Case IH 120’ Booms AutoBoom® UltraGlide XT Installation Manual

P/N 016-0233-004 Rev. B *03/18* *E30616*

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CHAPTER 1 IMPORTANT SAFETY INFORMATION

NOTICE

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

- Follow all safety information presented within this manual.
- If you require assistance with any portion of the installation or service of your Raven equipment, contact your local Raven dealer for support.
- Follow all safety labels affixed to the AutoBoom system components. Be sure to keep safety labels in good condition and replace any missing or damaged labels. To obtain replacements for missing or damaged safety labels, contact your local Raven dealer.

When operating the machine after installing AutoBoom, observe the following safety measures:

- Be alert and aware of surroundings.
- Do not operate AutoBoom or any agricultural equipment while under the influence of alcohol or an illegal substance.
- Remain in the operator's position in the machine at all times when AutoBoom is engaged.
- Disable AutoBoom when exiting from the operator's seat and machine.
- Do not drive the machine with AutoBoom enabled on any public road.
- Determine and remain a safe working distance from other individuals. The operator is responsible for disabling AutoBoom when the safe working distance has been diminished.
- Ensure AutoBoom is disabled prior to starting any maintenance work on AutoBoom or the machine.

⚠ WARNING

- When starting the machine for the first time after installing AutoBoom, be sure that all persons stand clear, in case a hose has not been properly tightened.
- The machine must remain stationary and switched off, with the booms unfolded, during installation or maintenance

⚠ CAUTION

HYDRAULIC

GENERAL

- Raven 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 reduce performance and possibly damage the AutoBoom hydraulic valve.

INSTRUCTIONS FOR HOSE ROUTING

The word "hose" is used to mean all flexible fluid carrying components. Follow existing hoses as much as possible and use these guidelines:

Hoses should not contact or be attached to:

- Components with high vibration forces
- Components carrying hot fluids beyond component specifications

Avoid contact with any sharp edge or abrading surfaces such as, but not limited to:

- Sheared or flame cut edges
- Edges of machined surfaces
- Fastener threads or cap screw heads
- Ends of adjustable hose clamps

Routing should not allow hoses to:

- Hang below the unit
- Have the potential to become damaged due to exposure to the exterior environment. (i.e. tree limbs, debris, attachments)
- Be placed in areas of or in contact with machine components which develop temperatures higher than the temperature rating of hose components
- Hoses should be protected or shielded if it needs to route near hot temperatures beyond hose component specifications

Hoses should not have sharp bends

Allow sufficient clearance from machine component operational zones such as:

- Drive shafts, universal joints and hitches (i.e. 3-point hitch)
- Pulleys, gears, sprockets
- Deflection and backlash of belts and chains
- Adjustment zones of adjustable brackets
- Changes of position in steering and suspension systems
- Moving linkages, cylinders, articulation joints, attachments
- Ground engaging components

For hose sections that move during machine operation:

- Allow sufficient length for free movement without interference to prevent: pulling, pinching, catching or rubbing, especially in articulation and pivot points
- Clamp hoses securely to force controlled movement to occur in the desired hose section
- Avoid sharp twisting or flexing of hoses in short distances

Protect hoses from:

- Foreign objects such as rocks that may fall or be thrown by the unit
- Buildup of dirt, mud, snow, ice, submersion in water and oil
- Tree limbs, brush and debris
- Damage where service personnel or operators might step or use as a grab bar
- Damage when passing through metal structures
- High pressure wash

ELECTRICAL

GENERAL

- 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.
- A minimum of 12 VDC is required for system operation with a maximum of 15 VDC.

INSTRUCTIONS FOR WIRE ROUTING

The word “harness” is used to mean all electrical leads and cables, bundled and unbundled. When installing harness, secure it at least every 30 cm (12in) to the frame. Follow existing harness as much as possible and use these guidelines:

Harness should not contact or be attached to:

- Lines and hoses with high vibration forces or pressure spikes
- Lines and hoses carrying hot fluids beyond harness component specifications

Avoid contact with any sharp edge or abrading surfaces such as, but not limited to:

- Sheared or flame cut edges
- Edges of machined surfaces
- Fastener threads or cap screw heads
- Ends of adjustable hose clamps
- Wire exiting conduit without protection, either ends or side of conduit
- Hose and tube fittings

Routing should not allow harnesses to:

- Hang below the unit
- Have the potential to become damaged due to exposure to the exterior environment. (i.e. tree limbs, debris, attachments)
- Be placed in areas of or in contact with machine components which develop temperatures higher than the temperature rating of harness components
- Wiring should be protected or shielded if it needs to route near hot temperatures beyond harness component specifications

Harnessing should not have sharp bends

Allow sufficient clearance from machine component operational zones such as:

- Drive shafts, universal joints and hitches (i.e. 3-point hitch)
- Pulleys, gears, sprockets
- Deflection and backlash of belts and chains
- Adjustment zones of adjustable brackets
- Changes of position in steering and suspension systems
- Moving linkages, cylinders, articulation joints, attachments
- Ground engaging components

For harness sections that move during machine operation:

- Allow sufficient length for free movement without interference to prevent: pulling, pinching, catching or rubbing, especially in articulation and pivot points
- Clamp harnesses securely to force controlled movement to occur in the desired harness section
- Avoid sharp twisting or flexing of harnesses in short distances
- Connectors and splices should not be located in harness sections that move

Protect harnesses from:

- Foreign objects such as rocks that may fall or be thrown by the unit
- Buildup of dirt, mud, snow, ice, submersion in water and oil
- Tree limbs, brush and debris
- Damage where service personnel or operators might step or use as a grab bar
- Damage when passing through metal structures

IMPORTANT:

- Avoid directly spraying electrical components and connections with high pressure water. High pressure water sprays can penetrate seals and cause electrical components to corrode or otherwise become damaged. When performing maintenance:
- Inspect all electrical components and connections for damage or corrosion. Repair or replace components, connections, or cable as necessary.
- Ensure connections are clean, dry, and not damaged. Repair or replace components, connections, or cable as necessary.
- Clean components or connections using low pressure water, pressurized air, or an aerosol electrical component cleaning agent.
- Remove visible surface water from components, connections, or seals using pressurized air or an aerosol electrical component cleaning agent. allow components to dry completely before reconnecting cables.

CHAPTER 2 INTRODUCTION

Congratulations on your purchase of the Raven AutoBoom system! This system is designed to provide automated boom height adjustment for agricultural equipment.

This manual applies to the following machines. For future reference, write your serial number in the space below.

MAKE: Case IH
MODEL: 33X0 and 44X0 with 120' Booms

FIGURE 1. Case IH

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

-Case IH 120' Booms AutoBoom® UltraGlide XT Installation Manual
-P/N 016-0233-004 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.

RAVEN CAN ULTRAGLIDE KIT

TABLE 1. Raven CAN AutoBoom UltraGlide Installation Kit (P/N 117-0233-004)

Item Description	Part Number	Qty.
Manual - AutoBoom Calibration & Operatoin	063-0130-062	1
Manual - ROS ISO AutoBoom Calibration & Operation	016-0130-076	1
Manual - Case IH 33X0 and 44X0 Series with 120' Booms UltraGlide XT Installation	016-0233-004	1

TABLE 1. Raven CAN AutoBoom UltraGlide Installation Kit (P/N 117-0233-004)

Item Description	Part Number	Qty.
Valve - AutoBoom Hydraulic	063-0131-124	1
Valve - UltraGlide XT Hydraulic	063-0131-154	1
Node - UltraGlide XT AutoBoom	063-0130-023	1
Sensor - Right Ultrasonic	063-0130-012	3
Sensor - Left Ultrasonic	063-0130-014	2
Bracket - Hydraulic Valve Mounting	107-0171-802	1
Bracket - Ultrasonic Sensor Mounting	107-0172-501	5
Bracket - Node Mounting	107-0172-084	1
Bracket - Formed Hose Holder	107-0172-503	2
Bracket - Lower Cylinder Support	107-0172-504	2
Bracket - Upper Cylinder Support	116-0159-791	2

TABLE 1. Raven CAN AutoBoom UltraGlide Installation Kit (P/N 117-0233-004)

Item Description	Part Number	Qty.
Bracket - Upper Cylinder Mounting	116-0159-792	2
Cable - 70' Ultrasonic Sensor Extension	115-0171-527	2
Cable - 40' Ultrasonic Sensor Extension	115-0171-602	2
Cable - Case IH UltraGlide XT AutoBoom Harness	115-0230-154	1
Cylinder - 2" x 6" x 1.25" Hydraulic	334-0004-009	2
Pin - Hairpin Cotter	321-0000-399	4
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	8
U-Bolt - 2-9/16" W x 3-1/2" L x 3/8" Thread	107-0171-616	5
U-Bolt - 2-9/16" W x 4" L x 3/8" Thread	107-0172-471	4
Screw - 1/2"-13 x 1" Flat Head Socket Cap	311-0003-040	4

TABLE 1. Raven CAN AutoBoom UltraGlide Installation Kit (P/N 117-0233-004)

Item Description	Part Number	Qty.
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	23
Bolt - 1/2"-13 UNC x 1-1/2" Grade 8 Hex	311-0058-166	4
Bolt - 1/2"-13 UNC x 4-1/2" Grade 8 Hex	311-0058-177	8
Nut - 3/8"-16 Zinc Flanged Lock	312-1001-164	56
Nut - 1/2"-13 Grade 8 Flanged Lock	312-1001-187	20
Nut - 5/16"-18 Nylon Insert Lock	312-4000-059	2
Washer - 5/16" Split Lock	313-1000-019	4
Washer - 1" Steel Flat	313-2300-018	12

ISO AUTOBOOM ULTRAGLIDE XT KIT

TABLE 2. ISO AutoBoom UltraGlide Installation Kit (P/N 117-0233-019)

Item Description	Part Number	Qty.
Manual - ISO AutoBoom Calibration & Operation	016-0130-078	1
Manual - Case IH 33X0 and 44X0 Series with 120' Booms UltraGlide XT Installation	016-0233-004	1
Valve - AutoBoom Hydraulic	063-0131-124	1
Valve - UltraGlide XT Hydraulic	063-0131-154	1
Node - UltraGlide XT ISO AutoBoom	063-0130-024	1
Sensor - Right Ultrasonic	063-0130-012	3
Sensor - Left Ultrasonic	063-0130-014	2
Bracket - Hydraulic Valve Mounting	107-0171-802	1
Bracket - Ultrasonic Sensor Mounting	107-0172-501	5
Bracket - Node Mounting	107-0172-084	1

TABLE 2. ISO AutoBoom UltraGlide Installation Kit (P/N 117-0233-019)

Item Description	Part Number	Qty.
Bracket - Hydraulic Switch Sense Node Mounting	107-0172-580	1
Bracket - Formed Hose Holder	107-0172-503	2
Bracket - Lower Cylinder Support	107-0172-504	2
Bracket - Upper Cylinder Support	116-0159-791	2
Bracket - Upper Cylinder Mounting	116-0159-792	2
Cable - 70' Ultrasonic Sensor Extension	115-0171-527	2
Cable - 40' Ultrasonic Sensor Extension	115-0171-602	2
Cable - Case IH UltraGlide XT AutoBoom Harness	115-0230-154	1
Cylinder - 2" x 6" x 1.25" Hydraulic	334-0004-009	2
Pin - Hairpin Cotter	321-0000-399	4
U-Bolt - 3-1/16" W x 4" L x 3/8" Thread	107-0171-608	2

TABLE 2. ISO AutoBoom UltraGlide Installation Kit (P/N 117-0233-019)

Item Description	Part Number	Qty.
U-Bolt - 2-1/16" W x 3" L x 3/8" Thread	107-0171-609	8
U-Bolt - 2-9/16" W x 3-1/2" L x 3/8" Thread	107-0171-616	6
U-Bolt - 2-9/16" W x 4" L x 3/8" Thread	107-0172-471	4
Screw - 1/2"-13 x 1" Flat Head Socket Cap	311-0003-040	4
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	23
Bolt - 1/2"-13 UNC x 1-1/2" Grade 8 Hex	311-0058-166	4
Bolt - 1/2"-13 UNC x 4-1/2" Grade 8 Hex	311-0058-177	8
Nut - 3/8"-16 Zinc Flanged Lock	312-1001-164	58
Nut - 1/2"-13 Grade 8 Flanged Lock	312-1001-187	20

TABLE 2. ISO AutoBoom UltraGlide Installation Kit (P/N 117-0233-019)

Item Description	Part Number	Qty.
Nut - 5/16"-18 Nylon Insert Lock	312-4000-059	2
Washer - 5/16" Split Lock	313-1000-019	4
Washer - 1" Steel Flat	313-2300-018	12

ULTRAGLIDE HYDRAULIC KIT

TABLE 3. UltraGlide Hydraulic Kit (P/N 117-0134-075)

Item Description	Part Number	Qty.
Fitting - -8 ORFS M/M/F Swivel Run Tee	333-0012-028	2
Fitting - -6 ORFS M/F 90° Swivel Elbow	333-0012-065	2
Fitting - -6 ORFS M/M/F Swivel Run Tee Adapter	333-0012-069	4
Fitting - -6 ORFS (M) to -6 SAE O-Ring (M) Straight Adapter	333-0012-084	2
Fitting - -6 ORFS (M) to -6 SAE O-Ring (M) 90° Elbow	333-0012-165	2
Fitting - -8 ORFS (M) to -8 SAE O-Ring (M) Straight Adapter	333-0012-168	2

TABLE 3. UltraGlide Hydraulic Kit (P/N 117-0134-075)

Item Description	Part Number	Qty.
Fitting - 11/16 Hex to -6 O-Ring Plug	333-0012-194	2
Hydraulic Hose - -8 ORFS (F) 90° to -8 ORFS (F) 90° - 36"	214-1000-311	2
Hydraulic Hose - -6 ORFS (F) 90° to -6 ORFS (F) - 44"	214-1000-494	4

ULTRAGLIDE XT HYDRAULIC INSTALLATION KIT

TABLE 4. UltraGlide XT Hydraulic Kit (P/N 117-0134-304)

Item Description	Part Number	Qty.
Fitting - -8 ORFS M/M/F Swivel Run Tee	333-0012-028	2
Fitting - -4 SAE O-Ring Internal Hex Plug	333-0012-051	8
Fitting - -6 ORFS M/F 90° Swivel Elbow	333-0012-065	2
Fitting - -6 ORFS M/M/F Swivel Run Tee Adapter	333-0012-069	4
Fitting - -8 ORFS (M) to -6 SAE O-Ring (M) Straight Adapter	333-0012-082	2
Fitting - -6 ORFS (M) to -6 SAE O-Ring (M) Straight Adapter	333-0012-084	2

TABLE 4. UltraGlide XT Hydraulic Kit (P/N 117-0134-304)

Item Description	Part Number	Qty.
Fitting - -6 SAE O-Ring Internal Plug Hex	333-0012-104	2
Hydraulic Hose - -6 ORFS (F) 90° to -6 ORFS (F) - 60″	214-1001-155	2
Hydraulic Hose - -6 ORFS (F) 90° to -6 ORFS (F) - 120″	214-1001-156	2
Hydraulic Hose - -8 ORFS (F) 90° to -8 ORFS (F) - 24″	214-1001-157	2

ROTARY SENSOR INSTALLATION KIT

TABLE 5. Rotary Sensor Kit (P/N 117-0131-089)

Item Description	Part Number	Qty.
Sensor - 360° 3-Pin Am Hall Effect Rotary	416-0001-055	1
Bracket - Rotary Sensor Arm Mounting	107-0172-297	1
Bracket - Rotary Sensor Mounting	107-0172-436	1
Rod - M6 x 1.0 Threaded	107-0172-434	1
Strap - Rotary Sensor	107-0172-435	1

TABLE 5. Rotary Sensor Kit (P/N 117-0131-089)

Item Description	Part Number	Qty.
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 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.

RAVEN CAN ULTRAGLIDE XT INSTALLATION KIT

TABLE 6. Raven CAN AutoBoom UltraGlide XT Installation Kit (P/N 117-0234-004)

Item Description	Part Number	Qty.
Manual - AutoBoom Calibration & Operatoin	063-0130-062	1
Manual - ROS ISO AutoBoom Calibration & Operation	016-0130-076	1
Manual - Case IH 33X0 and 44X0 Series with 120’ Booms UltraGlide XT Installation	016-0233-004	1
Valve - UltraGlide XT Hydraulic	063-0131-154	1
Node - UltraGlide XT AutoBoom	063-0130-023	1
Sensor - Right Ultrasonic	063-0130-012	3
Bracket - Ultrasonic Sensor Mounting	107-0172-501	5
Bracket - Node Mounting	107-0172-084	1
Bracket - Hydraulic Switch Sense Node Mounting	107-0172-580	1
Bracket - Formed Hose Holder	107-0172-503	2

TABLE 6. Raven CAN AutoBoom UltraGlide XT Installation Kit (P/N 117-0234-004)

Item Description	Part Number	Qty.
Bracket - Lower Cylinder Support	107-0172-504	2
Bracket - Upper Cylinder Support	116-0159-791	2
Bracket - Upper Cylinder Mounting	116-0159-792	2
Cable - Case IH UltraGlide XT AutoBoom Harness	115-0230-154	1
Cylinder - 2" x 6" x 1.25" Hydraulic	334-0004-009	2
Pin - Hairpin Cotter	321-0000-399	4
U-Bolt - 3-1/16" W x 4" L x 3/8" Thread	107-0171-608	2
U-Bolt - 2-9/16" W x 3-1/2" L x 3/8" Thread	107-0171-616	3
U-Bolt - 2-9/16" W x 4" L x 3/8" Thread	107-0172-471	4
Screw - 1/2"-13 x 1" Flat Head Socket Cap	311-0003-040	4
Bolt - 5/16"-18 x 4" Hex	311-0052-092	2

TABLE 6. Raven CAN AutoBoom UltraGlide XT Installation Kit (P/N 117-0234-004)

Item Description	Part Number	Qty.
Bolt - 3/8"-16 UNC x 1-1/4" Hex	311-0054-081	23
Bolt - 1/2"-13 UNC x 1-1/2" Grade 8 Hex	311-0058-166	4
Bolt - 1/2"-13 UNC x 4-1/2" Grade 8 Hex	311-0058-177	8
Nut - 3/8"-16 Zinc Flanged Lock	312-1001-164	36
Nut - 1/2"-13 Grade 8 Flanged Lock	312-1001-187	20
Nut - 5/16"-18 Nylon Insert Lock	312-4000-059	2
Washer - 1" Steel Flat	313-2300-018	12

ISO AUTOBOOM ULTRAGLIDE XT KIT

TABLE 7. ISO AutoBoom UltraGlide XT Installation Kit (P/N 117-0234-019)

Item Description	Part Number	Qty.
Manual - ISO AutoBoom Calibration & Operation	016-0130-078	1
Manual - Case IH 33X0 and 44X0 Series with 120' Booms UltraGlide XT Installation	016-0233-004	1

TABLE 7. ISO AutoBoom UltraGlide XT Installation Kit (P/N 117-0234-019)

Item Description	Part Number	Qty.
Valve - UltraGlide XT Hydraulic	063-0131-154	1
Unit - UltraGlide XT ISO AutoBoom Electronic Control	063-0130-024	1
Sensor - Right Ultrasonic	063-0130-012	1
Bracket - Ultrasonic Sensor Mounting	107-0172-501	5
Bracket - Node Mounting	107-0172-084	1
Bracket - Hydraulic Switch Sense Node Mounting	107-0172-580	1
Bracket - Formed Hose Holder	107-0172-503	2
Bracket - Lower Cylinder Support	107-0172-504	2
Bracket - Upper Cylinder Support	116-0159-791	2
Bracket - Upper Cylinder Mounting	116-0159-792	2
Cable - Case IH UltraGlide XT AutoBoom Harness	115-0230-154	1

TABLE 7. ISO AutoBoom UltraGlide XT Installation Kit (P/N 117-0234-019)

Item Description	Part Number	Qty.
Cylinder - 2" x 6" x 1.25" Hydraulicx	334-0004-009	2
Pin - Hairpin Cotter	321-0000-399	4
U-Bolt - a3-1/16" 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	8
U-Bolt - 2-9/16" W x 3-1/2" L x 3/8" Thread	107-0171-616	4
U-Bolt - 2-9/16" W x 4" L x 3/8" Thread	107-0172-471	4
Screw - 1/2"-13 x 1" Flat Head Socket Cap	311-0003-040	4
Bolt - 5/16"-18 x 4" Hex	311-0052-092	2
Bolt - 3/8"-16 UNC x 1-1/4" Hex	311-0054-081	23
Bolt - 1/2"-13 UNC x 1-1/2" Grade 8 Hex	311-0058-166	4
Bolt - 1/2"-13 UNC x 4-1/2" Grade 8 Hex	311-0058-177	8

TABLE 7. ISO AutoBoom UltraGlide XT Installation Kit (P/N 117-0234-019)

Item Description	Part Number	Qty.
Nut - 3/8"-16 Zinc Flanged Lock	312-1001-164	38
Nut - 1/2"-13 Grade 8 Flanged Lock	312-1001-187	20
Nut - 5/16"-18 Nylon Insert Lock	312-4000-059	2
Washer - 5/16" Split Lock	313-1000-019	4
Washer - 1" Steel Flat	313-2300-018	12

ULTRAGLIDE XT HYDRAULIC INSTALLATION KIT

TABLE 8. UltraGlide XT Hydraulic Kit (P/N 117-0134-304)

Item Description	Part Number	Qty.
Fitting - -8 ORFS M/M/F Swivel Run Tee	333-0012-028	2
Fitting - -4 SAE O-Ring Internal Hex Plug	333-0012-051	8
Fitting - -6 ORFS M/F 90° Swivel Elbow	333-0012-065	2
Fitting - -6 ORFS M/M/F Swivel Run Tee Adapter	333-0012-069	4

TABLE 8. UltraGlide XT Hydraulic Kit (P/N 117-0134-304)

Item Description	Part Number	Qty.
Fitting - -8 ORFS (M) to -6 SAE O-Ring (M) Straight Adapter	333-0012-082	2
Fitting - -6 ORFS (M) to -6 SAE O-Ring (M) Straight Adapter	333-0012-084	2
Fitting - -6 SAE O-Ring Internal Plug Hex	333-0012-104	2
Hydraulic Hose - -6 ORFS (F) 90° to -6 ORFS (F) - 60"	214-1001-155	2
Hydraulic Hose - -6 ORFS (F) 90° to -6 ORFS (F) - 120"	214-1001-156	2
Hydraulic Hose - -8 ORFS (F) 90° to -8 ORFS (F) - 24"	214-1001-157	2

ROTARY SENSOR INSTALLATION KIT

TABLE 9. Rotary Sensor Kit (P/N 117-0131-089)

Item Description	Part Number	Qty.
Sensor - 360° 3-Pin Am Hall Effect Rotary	416-0001-055	1
Bracket - Rotary Sensor Arm Mounting	107-0172-297	1
Bracket - Rotary Sensor Mounting	107-0172-436	1

TABLE 9. Rotary Sensor Kit (P/N 117-0131-089)

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

CHAPTER 3 HYDRAULIC SYSTEM INSTALLATION

⚠ 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.

RELOCATE THE AUTOFOLD/SWITCH SENSE NODE

MODEL YEAR 2016 & OLDER

1. Remove the AutoFold/switch sense node mounting bracket from the vertical center rack tube.

FIGURE 1. AutoFold/Switch Sense Node Mounting Bracket Placement

2. Reinstall the AutoFold/switch sense node mounting bracket to the top of the diagonal center rack tube.

MODEL YEAR 2017 & NEWER

FIGURE 2. Hydraulic Sense Node Removed from Mounting Bracket

1. Remove the AutoFold node from the machine's existing mounting bracket.
2. Remove the switch sense bolts.

NOTE: Keep the switch sense bolts for future use.

3. Remove the hydraulic sense node from the machine's mounting bracket.
4. Reinstall the AutoFold node on the machine's mounting bracket using the existing hardware.
5. Adjust the position of the AutoFold mounting bracket as shown in Figure 2 above.

FIGURE 3. Hydraulic Sense Node Installed on Mounting Bracket

6. Install the hydraulic sense node on the hydraulic sense node mounting bracket (P/N 107-0172-580) using the existing hardware.
7. Install the hydraulic sense node mounting bracket on the vertical tube of the machine's center rack using a 2-9/16" W 3-1/2" L x 3/8" thread U-bolt (P/N 107-0171-616) and two 3/8" zinc flanged lock nuts (P/N 312-1001-164).

INSTALL THE ULTRAGLIDE XT CYLINDERS

FIGURE 4. Machine's Shock Absorbers

1. Remove the shock absorbers from the right side of the machine's center rack.

FIGURE 5. Lower Cylinder Support Bracket Secured to Shock Mounting Tab

2. Secure the lower cylinder support bracket (P/N 107-0172-504) to the rear of the right shock mounting tab using two 1/2"-13 x 1" flat head socket cap screws (P/N 311-0003-040).

FIGURE 6. Hole Location

3. Using the hole in the lower cylinder support bracket as a guide, drill a 1" hole in the right shock mounting tab.

FIGURE 7. Lower Cylinder Support Bracket Installed

4. Remove the lower cylinder mounting bracket from the machine's center rack and reinstall it on the front of the shock mounting tab using the socket cap screws that were removed.

NOTE: It may be necessary to grind on the lower cylinder support bracket or the shock mounting tab weld bead to align the cylinder support bracket flush with the mounting tab.

FIGURE 8. Machine's Hose Retaining Rod

5. If applicable, remove the machine's hose retaining rod and grind down the weld bead.
6. Model Years 2017 & Newer Only - Remove the retaining stud from the machine's frame.

FIGURE 9. Nut to be Removed

a. Remove the nut used to secure the AIM flex cable from the stud on the machine's frame.

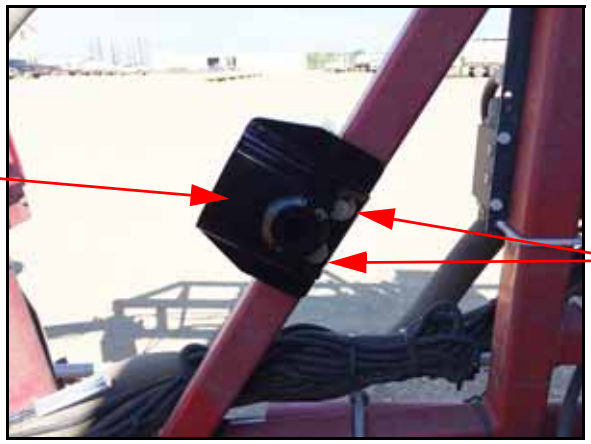
FIGURE 10. AIM Flex Cable Removed

b. Remove the AIM flex cable from the stud.

FIGURE 11. Stud Removed from Machine's Frame

c. Use a grinder to cut the stud off of the machine's frame.
d. Repeat the steps above to remove the stud from the other side of the center rack frame.

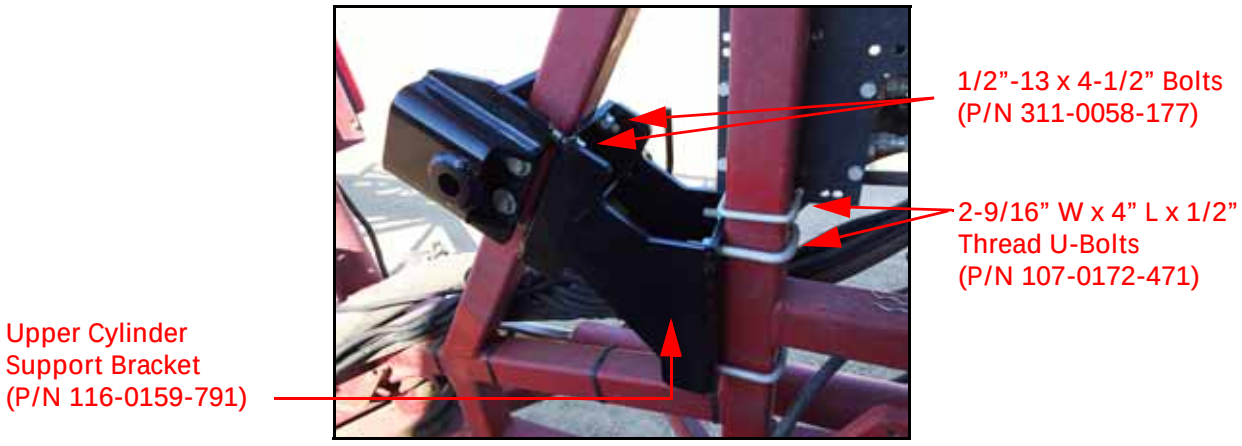
FIGURE 12. Upper Cylinder Mounting Bracket Installed



7. Align the right upper cylinder mounting bracket (P/N 116-0159-792) with the existing shock mounting holes on the right side of the center rack and secure it using two 1/2"-13 x 1-1/2" bolts (P/N 311-0058-166), two 1/2" flat washers (P/N 313-2300-018), and two 1/2"-13 flanged lock nuts (P/N 312-1001-187).

NOTE: Do not fully tighten the nuts until later in the installation procedure.

FIGURE 13. Upper Cylinder Support Bracket Installed



8. Install the upper cylinder support bracket (P/N 116-0159-791) between the two right center rack tubes.
9. Secure the top of the support bracket to the upper cylinder mounting bracket using four 1/2"-13 x 4-1/2" bolts (P/N 311-0058-177), four 1/2" washers (P/N 313-2300-018), and four 1/2"-13 flanged lock nuts (P/N 312-1001-187).

NOTE: Do not fully tighten the nuts until later in the installation procedure.

10. Secure the bottom of the support bracket to the vertical center rack tube using two 2-9/16" W x 4" L x 1/2" thread U-bolts (P/N 107-0172-471) and four 1/2"-13 grade 8 flanged lock nuts (P/N 312-1001-187).

NOTE: Do not fully tighten the nuts until later in the installation procedure.

11. Use a torque wrench to tighten the mounting hardware to 75 ft-lbs, alternating between the cylinder mounting bracket and cylinder support bracket until all parts are securely seated.

FIGURE 14. Hose Retainer Bracket Installed

12. Insert the hose retainer bracket (P/N 107-0172-503) through the hole in the upper cylinder mounting bracket and secure it by installing hairpin cotter pins (P/N 321-0000-399) on each side of the upper cylinder mounting bracket.
13. Route the machine's liquid product hose through the retainer bracket.

FIGURE 15. Hydraulic Cylinders Installed

14. Install the base-end of a 2" x 6" x 1.25" hydraulic cylinder (P/N 334-0004-009) on the upper cylinder mounting bracket using the pin supplied with the cylinder.
15. Secure the rod-end of the hydraulic cylinder to the lower cylinder mounting bracket using the pin supplied with the cylinder.
16. Repeat the steps above to install the hydraulic cylinder and brackets on the left side of the machine's center rack.

INSTALL FITTINGS IN THE AUTOBOOM VALVE (IF APPLICABLE)

Before mounting the AutoBoom valve (P/N 063-0131-124) 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	P, T
Fitting - -11/16" Hex to -6 O-Ring Plug	333-0012-194	LV, RV
Fitting - -6 ORFS (M) to -8 SAE O-Ring (M) 90° Elbow	333-0012-165	LF CYL RTN, RT CYL RTN

INSTALL FITTINGS IN THE ULTRAGLIDE XT VALVE

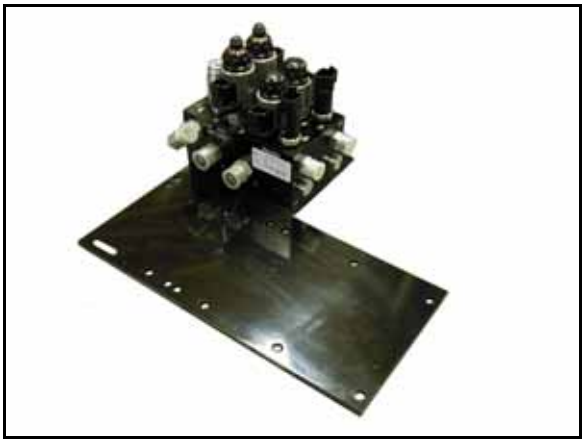
Before mounting the UltraGlide XT valve (P/N 063-0131-154) on the machine, install the proper fittings in the valve. This prepares the valve for installation and simplifies the hose connection process later in the procedure. Refer to the figure and table below to install the fittings in the appropriate ports of the UltraGlide XT valve.

Fitting	Part Number	Port
Fitting - -4 SAE O-Ring Plug	333-0012-051	GT, GP, G1, G2, LS, LS1, GLT, GRT
Fitting - -6 SAE O-Ring Plug	333-0012-104	P1, T2
Fitting - -8 ORFS (M) to -6 SAE O-Ring (M) Straight Adapter	333-0012-082	P2, T1
Fitting - -6 ORFS (M) to -6 SAE O-Ring (M) Straight Adapter	333-0012-084	1, 2

INSTALL THE AUTOBOOM VALVE(S) ON THE MACHINE

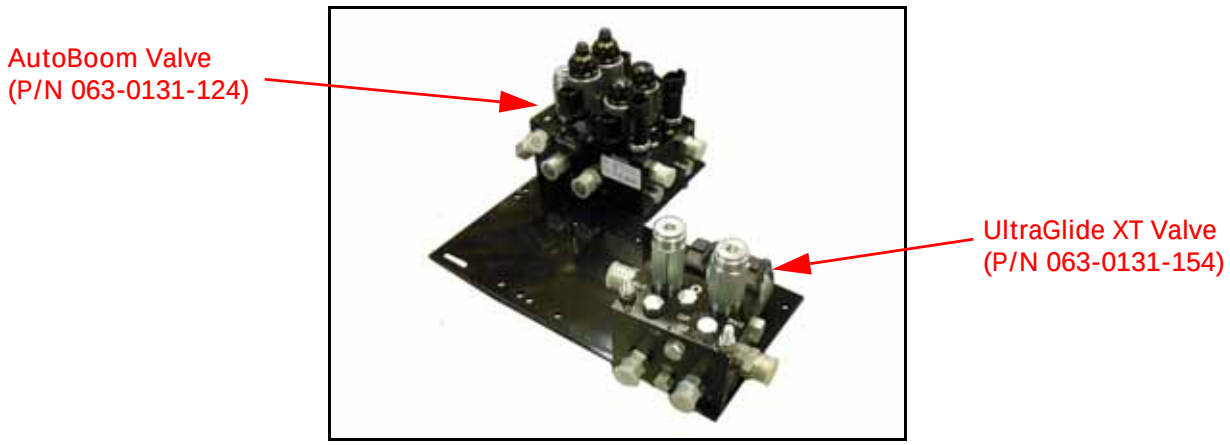
AUTOBOOM NOT INSTALLED ON THE MACHINE

FIGURE 16. AutoBoom Valve Installed on Valve Mounting Bracket



1. Secure the AutoBoom valve (P/N 063-0131-124) 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 washer to ensure that the valve is installed securely.

FIGURE 17. UltraGlide XT Valve Installed on Valve Mounting Bracket



3. 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" hex bolts (P/N 311-0052-092) and two 5/16"-18 nylon insert lock nuts (P/N 312-4000-059).
4. Tighten the bolts and nuts to ensure that the valve is mounted securely.

FIGURE 18. Valve Mounting Bracket Installed on the Machine

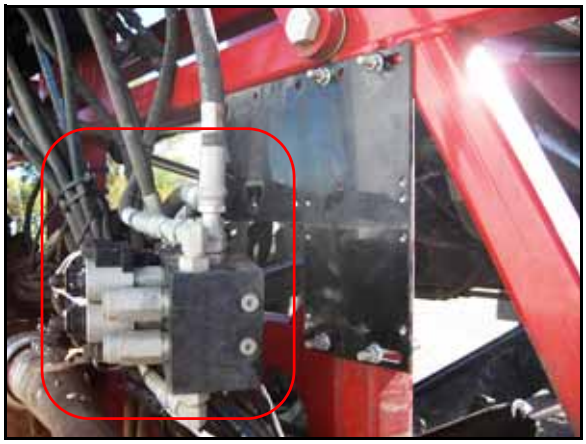
5. Secure the valve mounting bracket (P/N 107-0171-802) to the right side of the machine's center rack using two 2-9/16" W x 3-1/2" L x 3/8" thread U-bolts (P/N 107-0171-616) and four 3/8"-16 flanged lock nuts (P/N 312-1001-164).
6. Tighten the nuts to ensure that the valve mounting bracket is installed securely.

AUTOBOOM INSTALLED ON THE MACHINE

FIGURE 19. Existing AutoBoom Node to be Removed

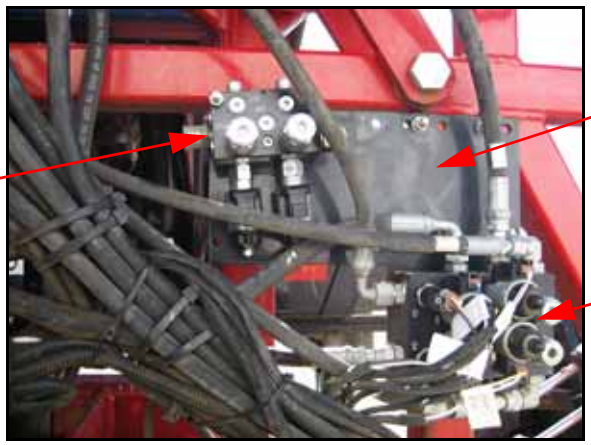
1. Remove the existing AutoBoom node from the existing valve mounting bracket.

FIGURE 20. Existing AutoBoom Valve Removed from Valve Mounting Bracket



2. Leaving the existing hydraulic hoses connected, remove the AutoBoom valve from the valve mounting bracket.
3. Remove the valve mounting bracket from the machine's center rack.

FIGURE 21. AutoBoom Valve and UltraGlide XT Valve Installed



4. Rotate the valve mounting bracket 180° and reinstall it on the machine's center rack using the existing mounting hardware.
5. Secure the AutoBoom valve on the valve mounting bracket using the existing mounting hardware.
6. Secure the UltraGlide XT valve (P/N 063-0131-154) to the valve mounting bracket 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).

INSTALL THE PRESSURE AND TANK HOSES

AUTOBOOM NOT INSTALLED ON THE MACHINE

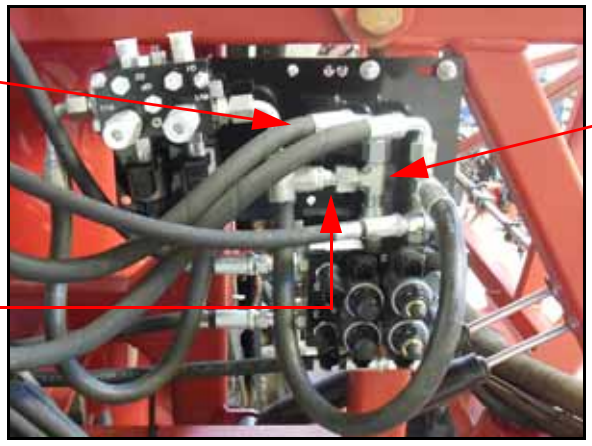
FIGURE 22. Oil Reservoir Cap Removed

1. Remove the oil reservoir cap to relieve residual pressure in the hydraulic system.

FIGURE 23. Pressure Hose Installed on Machine's Hydraulic Valve

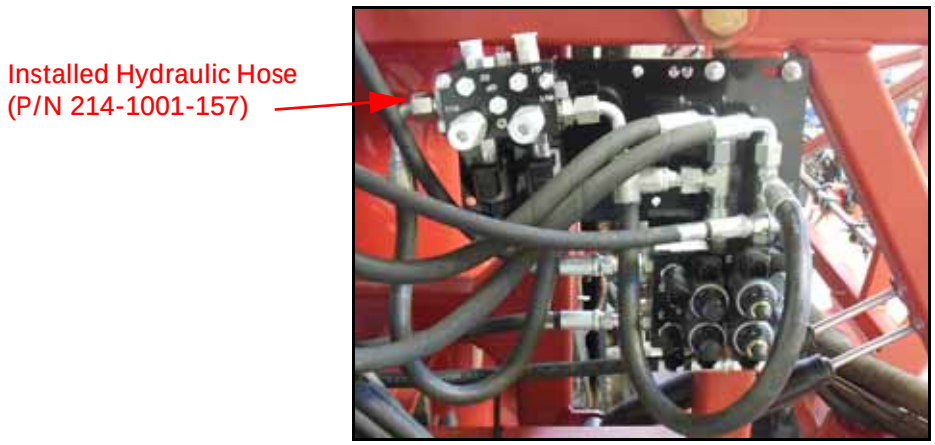
2. Disconnect the machine's pressure hose from the machine's hydraulic valve.
3. Install -8 ORFS M/M/F swivel run tee fittings (P/N 333-0012-028) in the open pressure port of the machine's hydraulic valve and Port P of the AutoBoom valve (P/N 063-0131-124).
4. Connect the machine's pressure hose to the opposite end of the tee fitting installed in the pressure port of the machine's hydraulic valve.
5. Install the straight end of the supplied hydraulic hose (P/N 214-1000-311) on the 90° end of the installed tee fitting.

FIGURE 24. Pressure Hose Installed on AutoBoom Valve



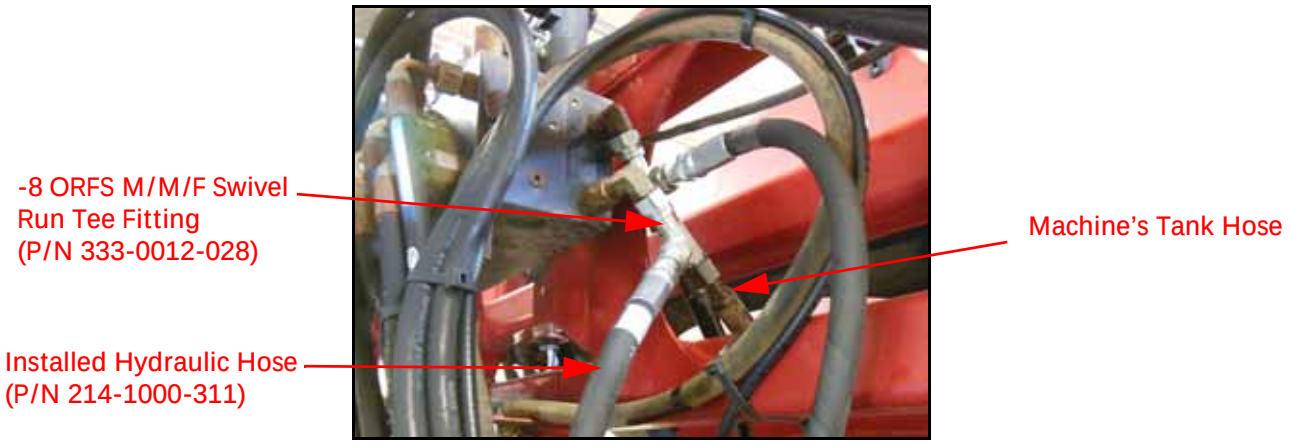
6. Connect the 90° end of the installed hydraulic hose on the upper end of the tee fitting installed in Port P of the AutoBoom valve.
7. Install the straight end of the supplied hydraulic hose (P/N 214-1001-157) on the 90° end of the tee fitting.

FIGURE 25. Pressure Hose Installed on UltraGlide XT Valve



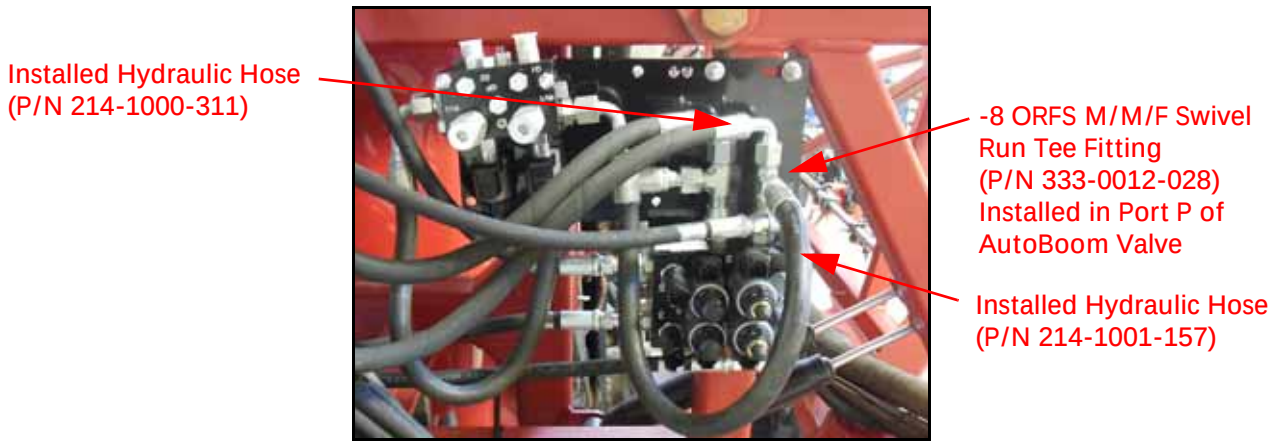
8. Connect the 90° end of the installed hydraulic hose to Port P2 of the UltraGlide XT valve (P/N 063-0131-154).
9. Disconnect the tank hose from the machine's hydraulic valve.

FIGURE 26. Tank Hose Installed on Machine's Hydraulic Valve



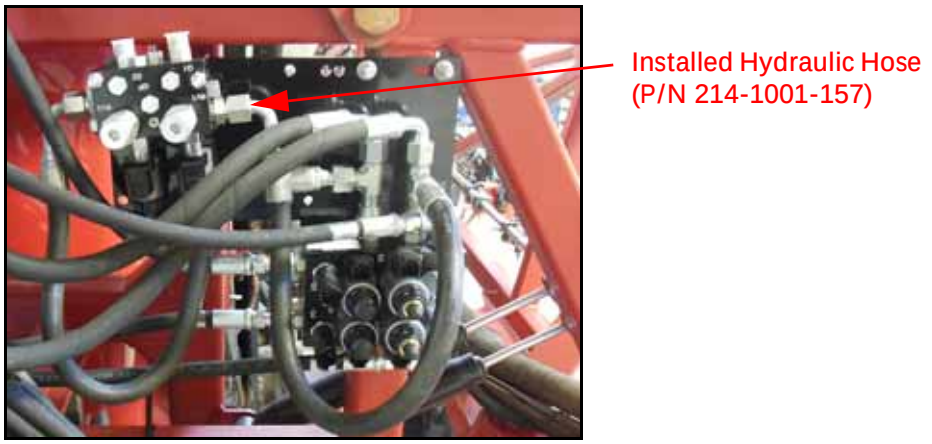
10. Install -8 ORFS M/M/F swivel run tee fittings (P/N 333-0012-028) in the open tank port of the machine's hydraulic valve and Port T of the AutoBoom valve.
11. Connect the machine's tank hose to the opposite end of the tee fitting in the tank port of the machine's hydraulic valve.
12. Install the straight end of the supplied hydraulic hose (P/N 214-1000-311) on the 90° end of the installed tee fitting.

FIGURE 27. Tank Hose Installed on AutoBoom Valve



13. Connect the 90° end of the installed hydraulic hose on the upper end of the tee fitting installed in Port T of the AutoBoom valve.
14. Install the straight end of the supplied hydraulic hose (P/N 214-1001-157) on the 90° end of the tee fitting.

FIGURE 28. Tank Hose Installed on UltraGlide XT Valve



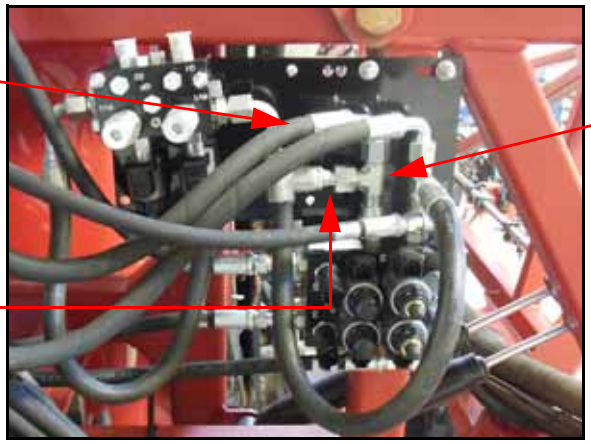
15. Connect the 90° end of the installed hydraulic hose to Port T1 of the UltraGlide XT valve.

AUTOBOOM INSTALLED ON THE MACHINE

FIGURE 29. Oil Reservoir Cap Removed

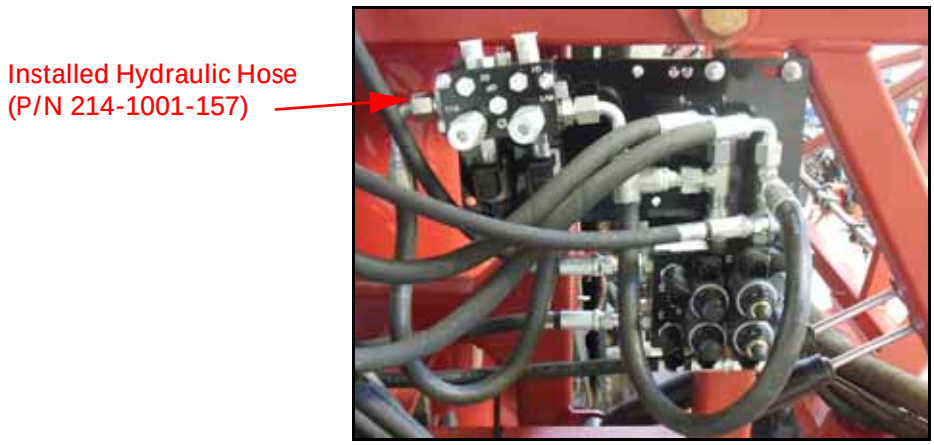
1. Remove the oil reservoir cap to relieve residual pressure in the hydraulic system.

FIGURE 30. Pressure Hose Installed on AutoBoom Valve



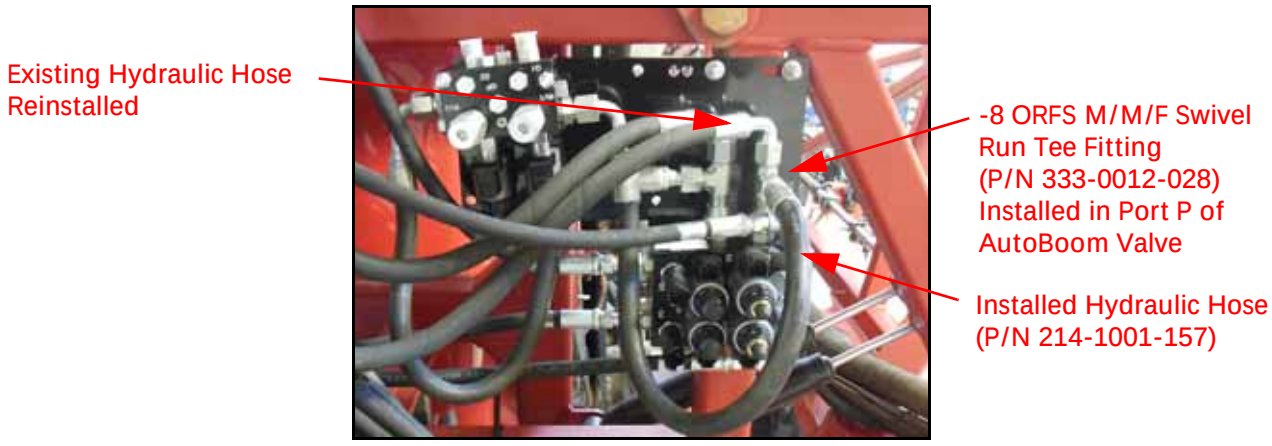
2. Disconnect the pressure hose installed in Port P of the existing AutoBoom valve (P/N 063-0131-124).
3. Install a -8 ORFS M/M/F swivel run tee fitting (P/N 333-0012-028) in Port P of the AutoBoom valve.
4. Connect the hydraulic hose that was removed in step 2 to the upper end of the installed tee fitting.
5. Install the straight end of the supplied hydraulic hose (P/N 214-1001-157) on the 90° end of the installed tee fitting.

FIGURE 31. Pressure Hose Installed on UltraGlide XT Valve



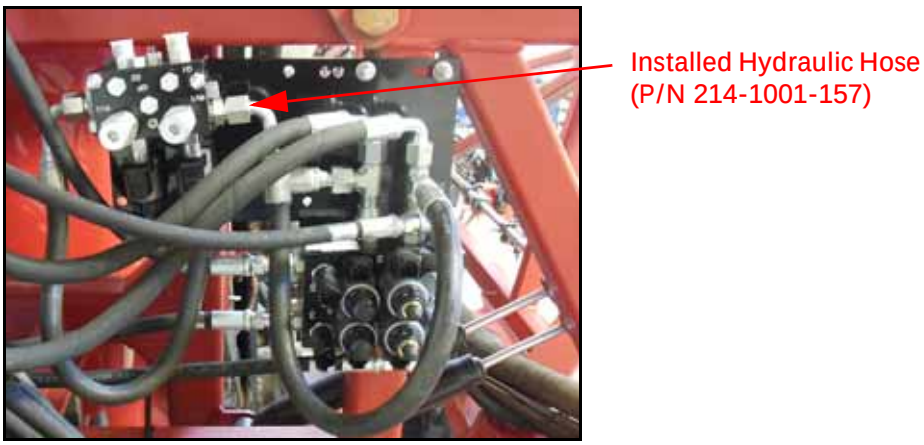
6. Connect the 90° end of the installed hydraulic hose to Port P2 of the UltraGlide XT valve (P/N 063-0131-154).

FIGURE 32. Tank Hose Installed on AutoBoom Valve



7. Disconnect the tank hose installed in Port T of the existing AutoBoom valve.
8. Install a -8 ORFS M/M/F swivel run tee fitting (P/N 333-0012-028) in Port T of the AutoBoom valve.
9. Connect the hydraulic hose that was removed in step 7 to the upper end of the installed tee fitting.
10. Install the straight end of the supplied hydraulic hose (P/N 214-1001-157) on the 90° end of the installed tee fitting.

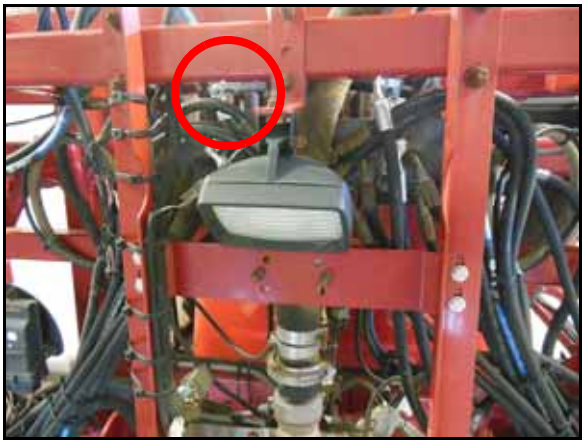
FIGURE 33. Tank Hose Installed on UltraGlide XT Valve



11. Connect the 90° end of the installed hydraulic hose to Port T1 of the UltraGlide XT valve.

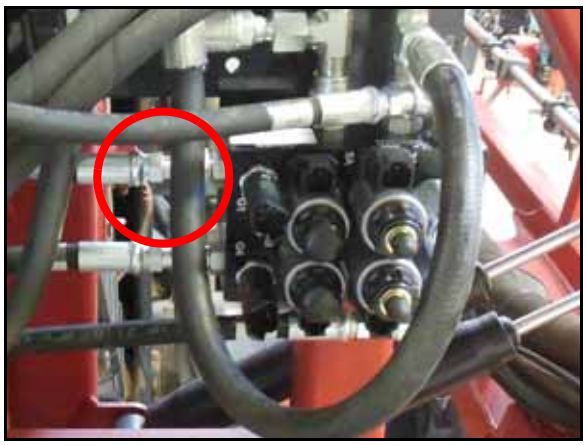
INSTALL THE LEFT AND RIGHT TILT CYLINDER HOSES - AUTOBOOM NOT INSTALLED ON THE MACHINE

FIGURE 34. Machine's Left Cylinder Hose



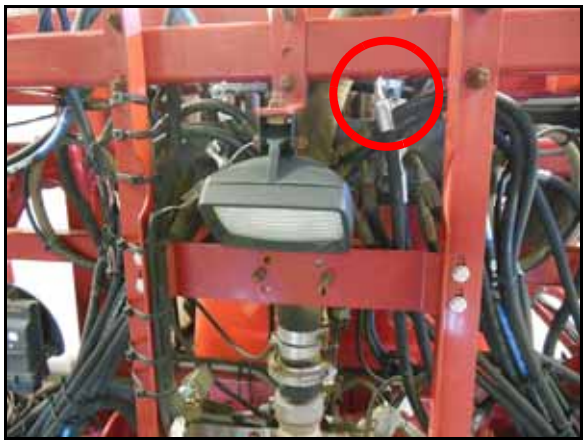
1. Disconnect the machine's left and right tilt hoses from the machine's hydraulic valve.
2. Install a -6 ORFS M/M/F swivel run tee fitting (P/N 333-0012-069) in the left tilt cylinder port of the machine's hydraulic valve.
3. Connect the machine's left tilt cylinder hose to the opposite end of the installed tee fitting.
4. Install the 90° end of the supplied hydraulic hose (P/N 214-1000-494) on the 90° end of the installed tee fitting.

FIGURE 35. Left Tilt Cylinder Hose Installed on AutoBoom Valve



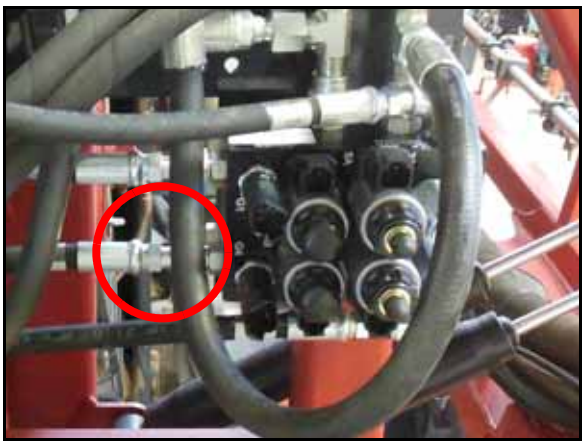
5. Connect the straight end of the installed hydraulic hose to the fitting installed in Port LC of the AutoBoom valve (P/N 063-0131-124).

FIGURE 36. Machine's Right Tilt Cylinder Hose



6. Disconnect the machine's right tilt cylinder hose from the machine's hydraulic valve.
7. Install a -6 ORFS M/M/F swivel run tee fitting (P/N 333-0012-069) in the right tilt cylinder port of the machine's hydraulic valve.
8. Connect the machine's right tilt cylinder hose to the opposite end of the installed tee fitting.
9. Install the 90° end of the supplied hydraulic hose (P/N 214-1000-494) on the 90° end of the installed tee fitting.

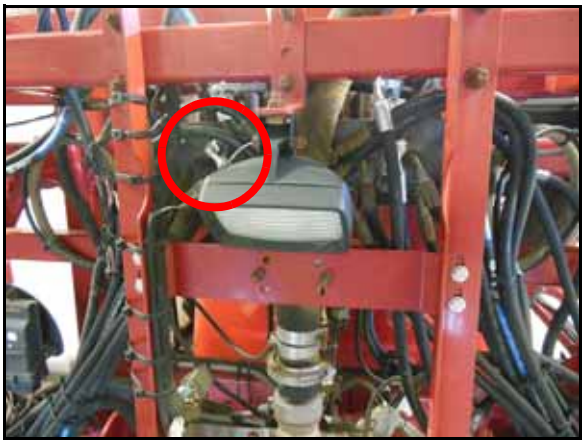
FIGURE 37. Right Tilt Cylinder Hose Installed on AutoBoom Valve



10. Connect the straight end of the installed hydraulic hose to the fitting installed in Port RC of the AutoBoom valve.

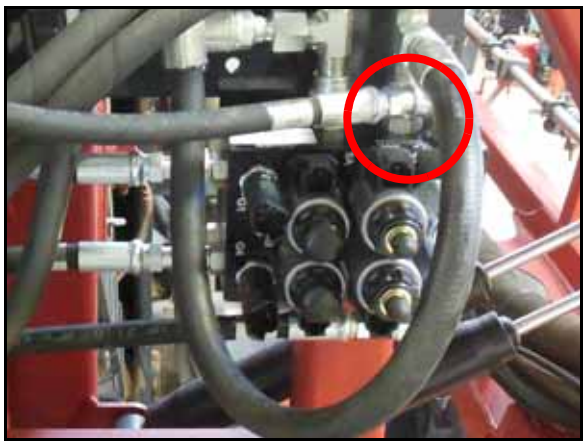
INSTALL THE LEFT AND RIGHT DOWN HOSES - AUTOBOOM IS NOT INSTALLED

FIGURE 38. Machine's Left Down Hose



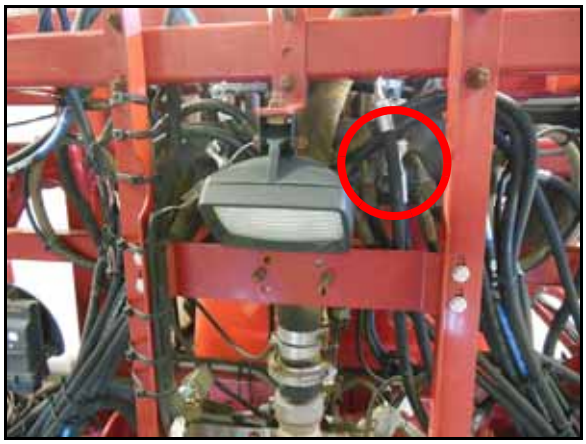
1. Disconnect the machine's left down hose from the machine's hydraulic valve.
2. Install a -6 ORFS M/M/F swivel run tee fitting (P/N 333-0012-0069) in the left down port of the machine's hydraulic valve.
3. Connect the machine's left down hose to the opposite end of the installed tee fitting.
4. Install the 90° end of the supplied hydraulic hose (P/N 214-1000-494) on the 90° end of the installed tee fitting.

FIGURE 39. Left Down Hose Installed on AutoBoom Valve



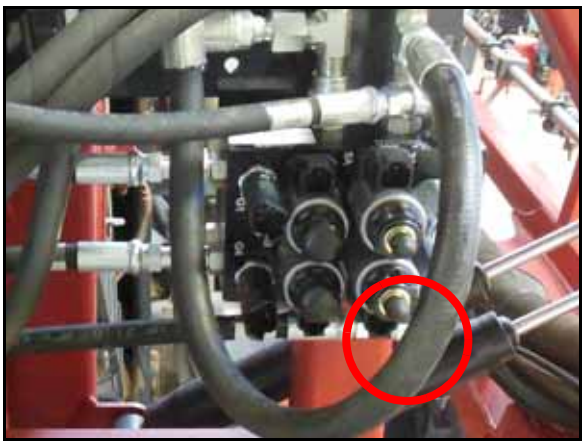
5. Connect the straight end of the installed hydraulic hose to the fitting installed in Port LF CYL RTN of the AutoBoom valve (P/N 063-0131-124).

FIGURE 40. Machine's Right Down Hose



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 fitting (P/N 333-0012-069) in the right down port of the machine's hydraulic valve.
8. Connect the machine's right down hose to the opposite end of the installed tee fitting.
9. Install the 90° end of the supplied hydraulic hose (P/N 214-1000-494) on the 90° end of the installed tee fitting.

FIGURE 41. Right Down Hose Installed on AutoBoom Valve



10. Connect the straight end of the installed hydraulic hose to the fitting installed in Port RT CYL RTN of the AutoBoom valve (P/N 063-0131-124).

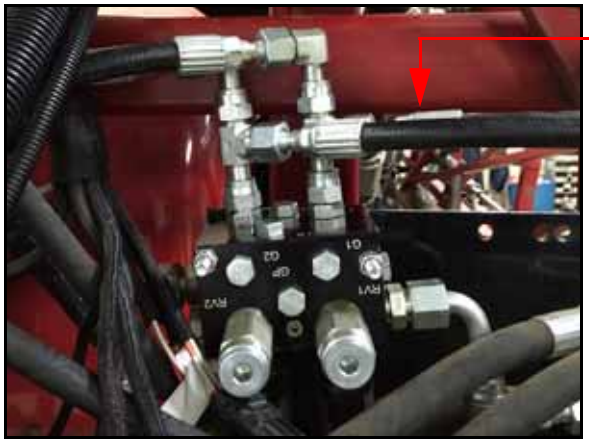
INSTALL THE ULTRAGLIDE XT CYLINDER HOSES

1. Install -6 ORFS M/M/F swivel run tee fittings in Port 1 and Port 2 of the UltraGlide XT valve (P/N 063-0131-154).
2. Install -6 ORFS M/F 90° swivel elbow fittings (P/N 333-0012-065) on the opposite end of the installed tee fittings.

FIGURE 42. Rod-End Right UltraGlide XT Cylinder Hose Installed

3. Install -6 ORFS (M) to -6 SAE O-ring (M) straight adapter fittings (P/N 333-0012-084) in the two open ports of the installed right hydraulic cylinder (P/N 334-0004-009).
4. Install the 90° end of the supplied hydraulic hose (P/N 214-1001-155) on the fitting installed in the rod-end of the right hydraulic cylinder.

FIGURE 43. Rod-End Right Cylinder Hose Installed on UltraGlide XT Valve



5. Connect the straight end of the installed hydraulic hose to the 90° end of the tee fitting installed in Port 1 of the UltraGlide XT valve.

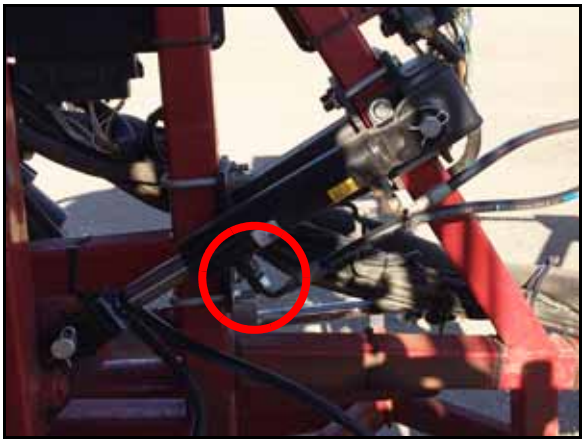
FIGURE 44. Base-End Right UltraGlide XT Cylinder Hose Installed

6. Install the 90° end of the supplied hydraulic hose (P/N 214-1001-155) on the fitting installed in the base-end of the right hydraulic cylinder.

FIGURE 45. Base-End Right Cylinder Hose Installed on UltraGlide XT Valve

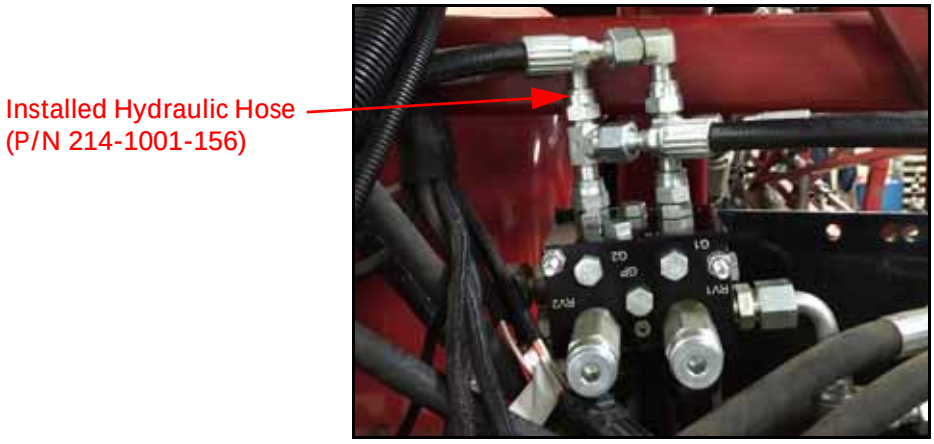
7. Connect the straight end of the installed hydraulic hose to the 90° end of the tee fitting installed in Port 2 of the UltraGlide XT valve.

FIGURE 46. Rod-End Left UltraGlide XT Cylinder Hose Installed



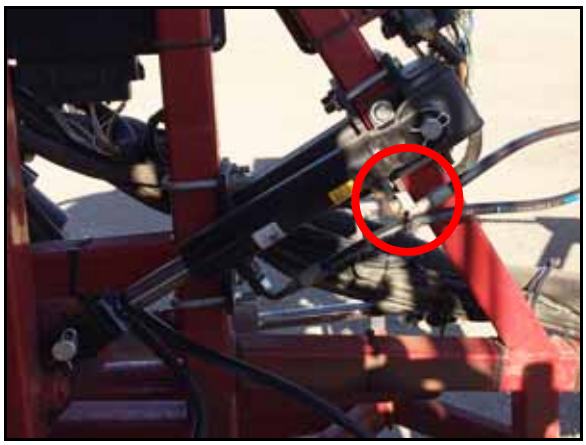
8. Install -6 ORFS (M) to -6 SAE O-ring (M) straight adapter fittings (P/N 333-0012-084) in the two open ports of the installed left hydraulic cylinder (P/N 334-0004-009).
9. Install the 90° end of the supplied hydraulic hose (P/N 214-1001-156) on the fitting installed in the rod-end of the left hydraulic cylinder.

FIGURE 47. Rod-End Left Cylinder Hose Installed on UltraGlide XT Valve



10. Connect the straight end of the installed hydraulic hose to the 90° elbow fitting installed on the end of the tee fitting in Port 2 of the UltraGlide XT valve.

FIGURE 48. Base-End Left UltraGlide XT Cylinder Hose Installed

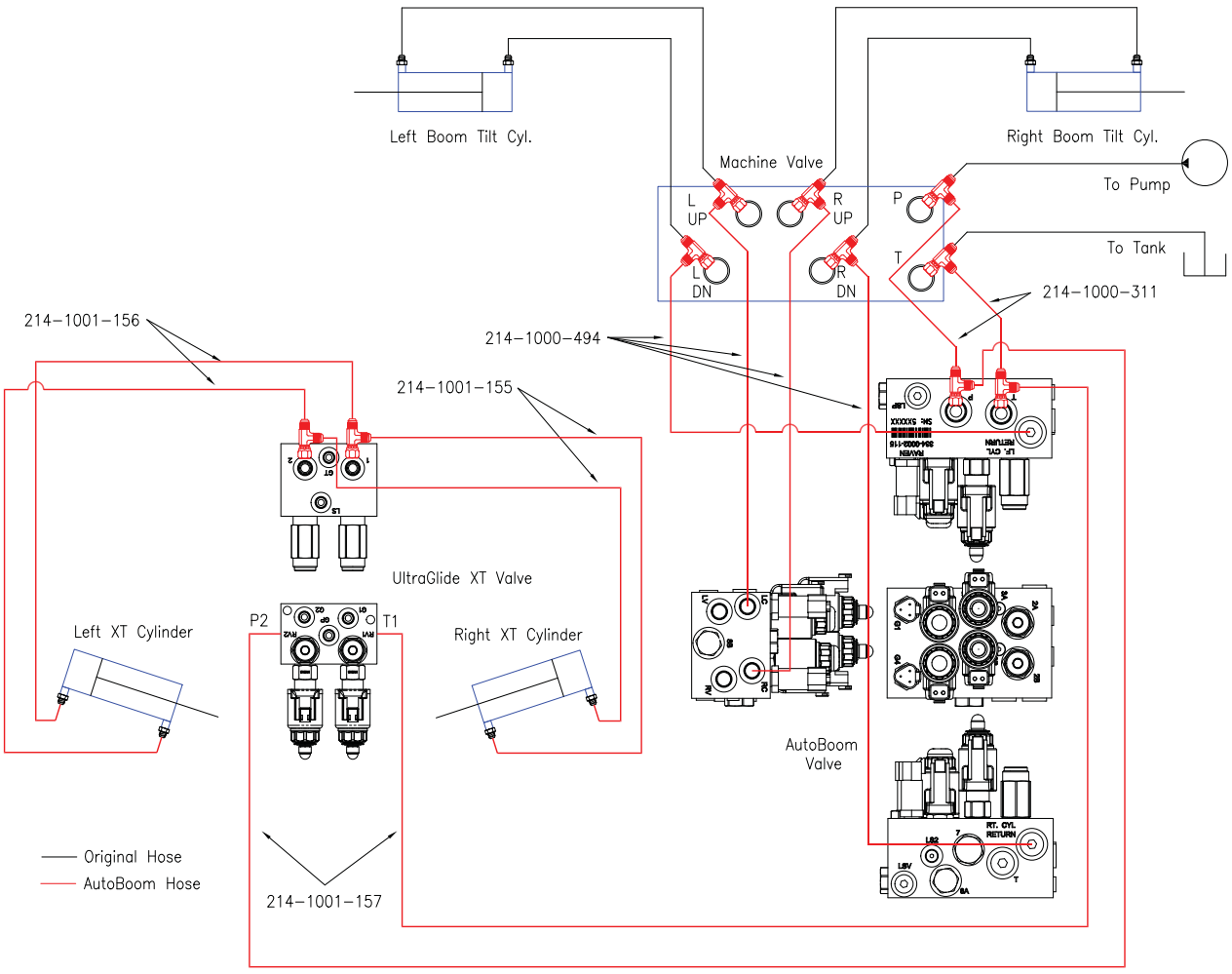


11. Install the 90° end of the supplied hydraulic hose (P/N 214-1001-156) on the fitting installed in the base-end of the left hydraulic cylinder.

FIGURE 49. Base-End Left Cylinder Hose Installed on UltraGlide XT Valve

12. Connect the straight end of the installed hydraulic hose to the 90° elbow fitting installed on the end of the tee fitting in Port 1 of the UltraGlide XT valve.
13. Reinstall the oil reservoir cap on the machine's hydraulic valve.

HYDRAULIC DIAGRAM



CHAPTER 4 SENSOR INSTALLATION

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 61.

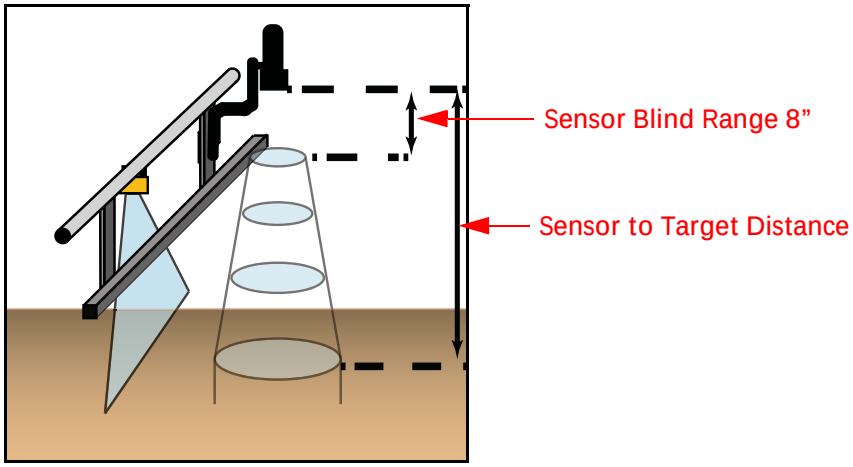
WARNING

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

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 - AUTOBOOM NOT INSTALLED ON THE MACHINE

INSTALL THE BOOM SENSORS

FIGURE 2. Sensor Installed on Mounting Bracket

1. Install the two left ultrasonic sensors (P/N 063-0130-014) on two of the ultrasonic sensor mounting brackets (P/N 107-0172-501) using four 3/8"-16 x 1-1/4" hex bolts (P/N 311-0054-081) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164) per sensor assembly.

FIGURE 3. Left Inner Boom Sensor Installed

2. Mount one of the boom sensor assemblies on the front of the left-middle boom section using two 2-1/16" W x 3" L x 3/8" thread U-bolts (P/N 107-0171-609) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).

NOTE: Ensure that the sensor does not contact the inner boom section when the boom is folded in toward the cab.

FIGURE 4. Left Outer Boom Sensor Installed

3. Mount the remaining boom sensor assembly to the front of the left boom break-away using two 2-1/16" x 3" L x 3/8" thread U-bolts (P/N 107-0171-609) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).

FIGURE 5. Sensor Installed on Mounting Bracket

4. Install the two right ultrasonic sensors (P/N 063-0130-012) on two of the ultrasonic sensor mounting brackets (P/N 107-0172-501) using four 3/8"-16 x 1-1/4" hex bolts (P/N 311-0054-081) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164) per sensor assembly.

FIGURE 6. Right Inner Boom Sensor Installed

5. Mount one of the boom sensor assemblies on the front of the right-middle boom section using two 2-1/16" W x 3" L x 3/8" thread U-bolts (P/N 107-0171-609) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).

NOTE: Ensure that the sensor does not contact the inner boom section when the boom is folded in toward the cab.

6. Mount the remaining boom sensor assembly to the front of the right boom break-away using two 2-1/16" x 3" L x 3/8" thread U-bolts (P/N 107-0171-609) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).

MOUNT THE CENTER SENSOR

FIGURE 7. Center Sensor Installed

1. Install the remaining ultrasonic sensor (P/N 063-0130-012) on the remaining ultrasonic sensor mounting bracket (P/N 107-0172-501) using four 3/8"-16 x 1-1/4" hex bolts (P/N 311-0054-081) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
2. Mount the center sensor assembly to the right side 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).

INSTALL THE SENSORS - AUTOBOOM INSTALLED ON THE MACHINE

INSTALL THE BOOM SENSORS

NOTE: For optimal system performance, Raven Industries recommends a five sensor system configuration. If the machine is not already equipped with inner sensors, a dual system upgrade kit (P/N 117-0137-026) is required to complete the five sensor configuration. The dual sensor upgrade kit is sold separately. Contact your local Raven dealer for ordering information.

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

FIGURE 8. Sensor Installed on Mounting Bracket

2. Install the existing sensors to the sensor mounting brackets (P/N 107-0172-501) using four 3/8"-16 x 1-1/4" hex bolts (P/N 311-0054-081) and four 3/8"-16 zinc flanged lock nuts (P/N 312-101-164) per sensor assembly.

FIGURE 9. Outer Sensor Installation Location

3. Reinstall the outer sensors on the left and right boom break away sections using two 2-1/16" W x 3" L x 3/8" thread U-bolts (P/N 107-0171-609) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164) per sensor assembly.

FIGURE 10. Left Inner Sensor Installed

4. Mount one of the left ultrasonic sensors (P/N 063-0130-014) from the dual sensor upgrade kit (P/N 117-017-026) to an ultrasonic sensor mounting bracket (P/N 107-0172-501) using four 3/8"-16 x 1-1/4" hex bolts (P/N 311-0054-081) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
5. Install the left inner sensor assembly on the middle of the left boom section using two 2-1/16" W x 3" L x 3/8" thread U-bolts (P/N 107-0171-609) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).

NOTE: Ensure that the sensor does not contact the inner boom section when the boom is folded in toward the cab.

6. Mount one of the right ultrasonic sensors (P/N 063-0130-012) from the dual sensor upgrade kit (P/N 117-017-026) to an ultrasonic sensor mounting bracket (P/N 107-0172-501) using four 3/8"-16 x 1-1/4" hex bolts (P/N 311-0054-081) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
7. Install the right inner sensor assembly on the middle of the left boom section using two 2-1/16" W x 3" L x 3/8" thread U-bolts (P/N 107-0171-609) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).

NOTE: Ensure that the sensor does not contact the inner boom section when the boom is folded in toward the cab.

MOUNT THE CENTER SENSOR

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

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

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

FIGURE 11. Center Sensor Installed

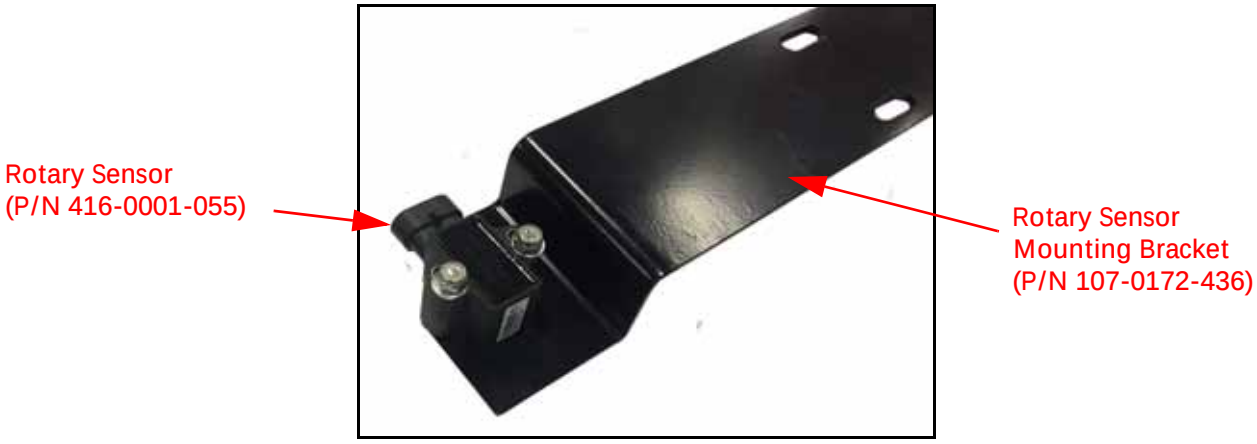
1. Install the remaining ultrasonic sensor (P/N 063-0130-012) on the remaining ultrasonic sensor mounting bracket (P/N 107-0172-501) using four 3/8"-16 x 1-1/4" hex bolts (P/N 311-0054-081) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
2. Mount the center sensor assembly to the right side 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).

ASSEMBLE THE ROTARY SENSOR ASSEMBLY

FIGURE 12. **Bearings Installed on Rod**

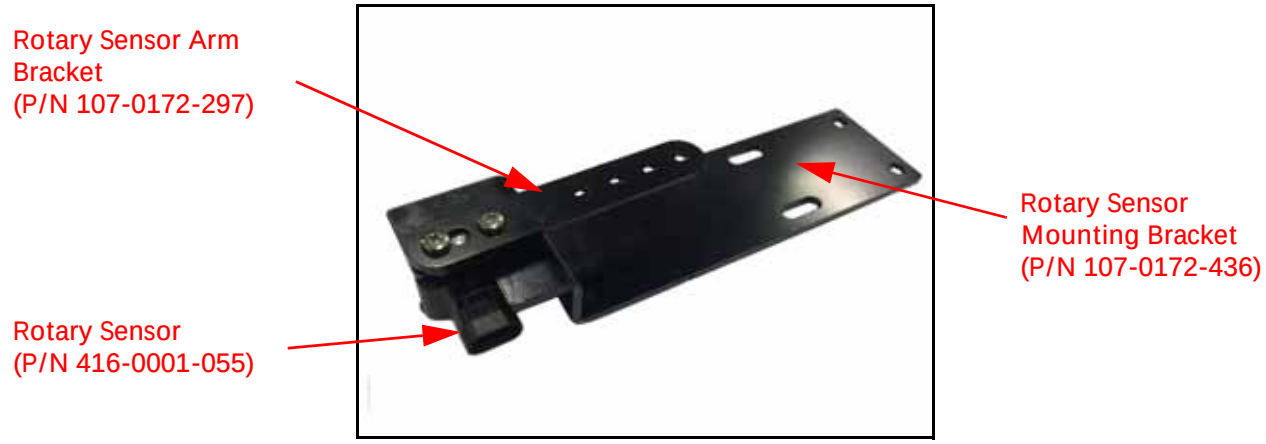
1. Install an M6 90° stud bearing (P/N 325-0000-031) and M6 jam nut (P/N 312-1001-183) on each end of the M6 threaded rod (P/N 107-0172-434), orienting the bearings so that they point 180° from each other as shown in Figure 12 above.
2. Tighten the bearings and nuts to ensure they are installed securely.

FIGURE 13. Rotary Sensor Installed on Mounting Bracket



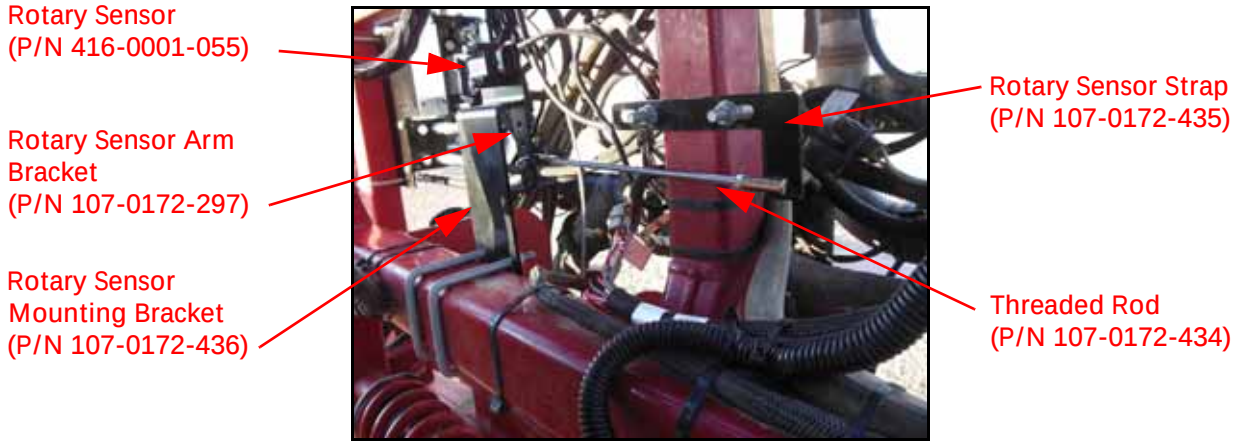
3. Secure the rotary sensor (P/N 416-0001-055) to the rotary sensor mounting bracket (P/N 107-0172-436) using two #10-32 x 1-1/2" pan head machine screws (P/N 311-0002-048), two #10-32 nylon insert lock nuts (P/N 312-4000-162), and two M6 flat washers (P/N 313-2300-182).

FIGURE 14. Rotary Sensor Arm Bracket Installed



4. Install the rotary sensor arm bracket (P/N 10-0172-297) on the rotary sensor using two M6 x 1.0 x 8 mm screws (P/N 311-0005-128).

FIGURE 15. Rotary Sensor Installed on Machine's Center Rack



5. Insert one of the M6 90° stud bearings installed on the M6 x 1.0 threaded rod (P/N 107-0172-434) through the second hole from the end of 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 horizontal tube on right-rear of the center rack using two 2-9/16" W x 3-/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).

NOTE: Do not fully tighten the nuts.

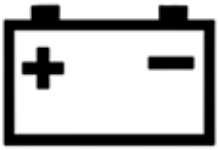
7. Install the rotary sensor strap (P/N 107-0172-435) on the vertical tube of the center frame using one 2-9/16" W x 3-1/2" L x 3/8" thread U-bolts (P/N 107-0171-616) and two 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).

NOTE: Do not fully tighten the nuts.

8. Insert the remaining end of the threaded rod through the hole in the rotary sensor strap and secure it using an M6 nylon insert lock nut (P/N 312-4000-214).
9. Adjust the rotary sensor mounting bracket and sensor strap so that the sensor arm bracket is positioned at a 90° angle to the threaded rod and the threaded rod is parallel to the horizontal tube of the machine's center rack.
10. Tighten all mounting hardware to ensure the sensor assembly is installed securely.

CHAPTER 5 WIRING INSTALLATION

WIRING CONNECTIONS



CAUTION

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. Machine's Fill Station

1. Locate the machine's fill station on the left side of the machine.

FIGURE 2. Node Mounting Location

2. Install the UltraGlide XT node (P/N 063-0130-023 or 063-0130-024) on the node mounting bracket (P/N 107-0172-084) using three 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
3. Insert the node mounting bracket into the fill station compartment.
4. Position the bracket horizontally so that it is snugged up to the ceiling compartment and aligned with the wall.
5. Mark the position of the bracket on the outside of the fill station compartment.
6. Remove the bracket from inside the fill station compartment and align it with the markings on the outside of the compartment.

FIGURE 3. Node Mounting Bracket Installed

7. Using the bracket as a template, mark the position of the holes in the bracket on the outside of the compartment wall.
8. Drill 3/8" clearance holes in the in the fill station compartment wall.
9. Position the node mounting bracket inside the fill station compartment wall, aligning it with the holes drilled in step 8.
10. Secure the node mounting bracket to the compartment wall using three 3/8"-16 UNC x 1-1/4" hex bolts (P/N 311-0054-081) and three 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
11. Insert the two large, rectangular connectors of the UltraGlide XT harness cable (P/N 115-0230-154) into the correct ports of the node, tightening the bolts 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. Route the UltraGlide XT harness cable along the existing cables and hoses down the left-lower parallel link and over the top of the center rack to the AutoBoom valve.
3. Route the connectors to the AutoBoom valve (P/N 063-0131-124).
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. Connect the LEFT SOLENOID connector to Port 4A on the AutoBoom valve.
7. Connect the RIGHT SOLENOID connector to Port 4B on the AutoBoom valve.
8. Connect the LEFT PROP connector to Port 5A on the AutoBoom valve.
9. Connect the RIGHT PROP connector to Port 13A on the AutoBoom valve.
10. Connect the SLANT CW connector to Port PRV1 of the UltraGlide XT valve (P/N 063-0131-154).
11. Connect the SLANT CCW connector to Port PRV2 of the UltraGlide XT valve.

FIGURE 4. Machine's CAN and Auxiliary Power Connectors

12. Locate the machine's CAN and auxiliary power connectors on the center rack.
13. Remove the existing CAN terminator from the machine's CAN cable.
14. Connect the CAN connector of the UltraGlide XT harness cable to the machine's CAN connector.
15. Install the terminator on the 4-pin Deutsch connector on the UltraGlide XT harness cable located near the UltraGlide XT node mounting location.
16. Connect the 4-pin PWR connector of the UltraGlide XT harness cable to the machine's auxiliary power connector.

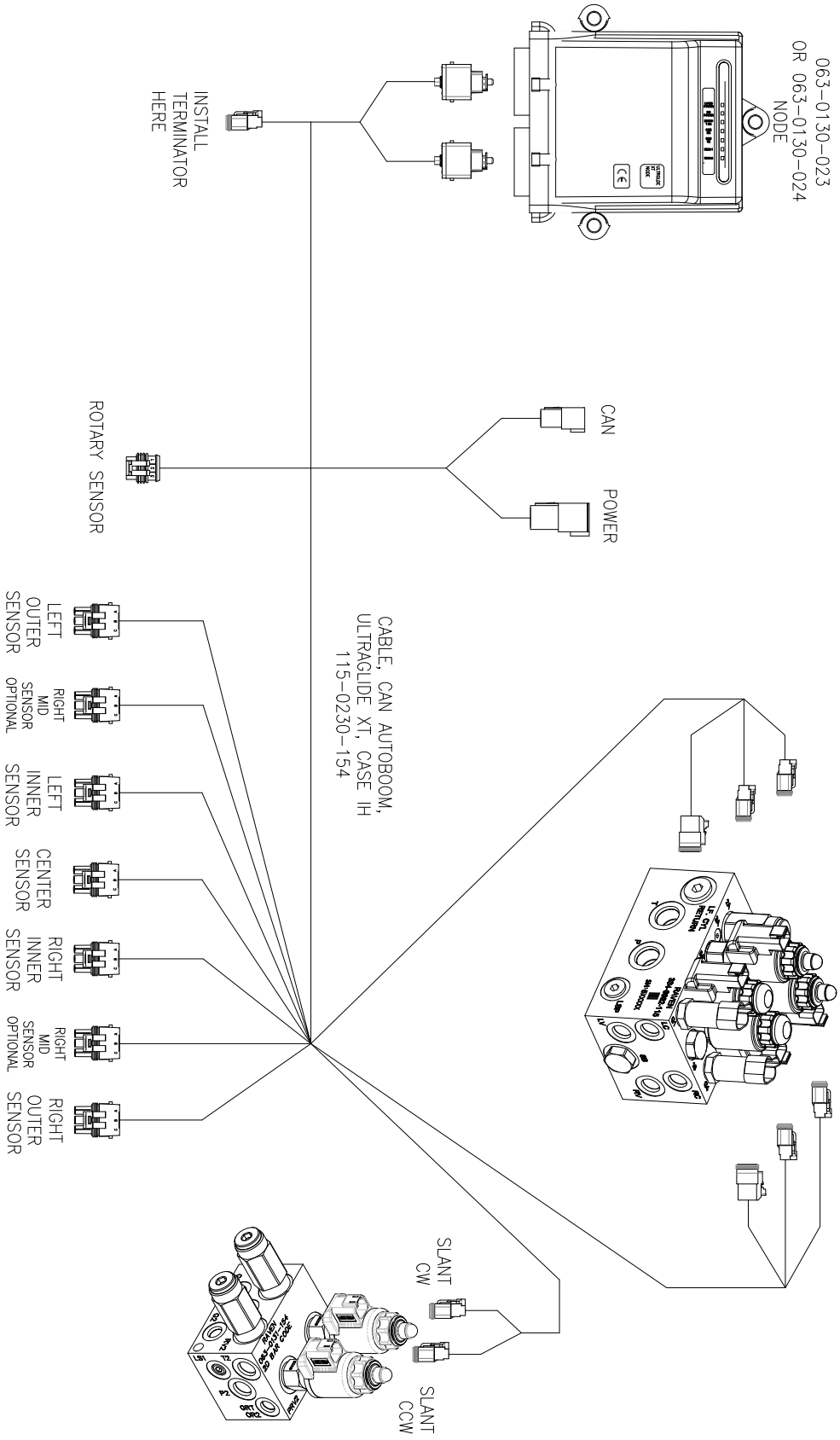
FIGURE 5. ROTARY SENSOR Connection

17. Connect the ROTARY SENSOR connector to the installed rotary sensor (P/N 416-0001-055).

CONNECT THE HARNESS CABLE TO THE SENSORS

1. Install the LEFT OUTER SENSOR connector of the UltraGlide XT harness cable (P/N 115-0230-154) 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 063-0130-014).
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 063-0130-012) cable connection.

WIRING DIAGRAM



CHAPTER 6 STARTUP PROCEDURES

⚠ 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.

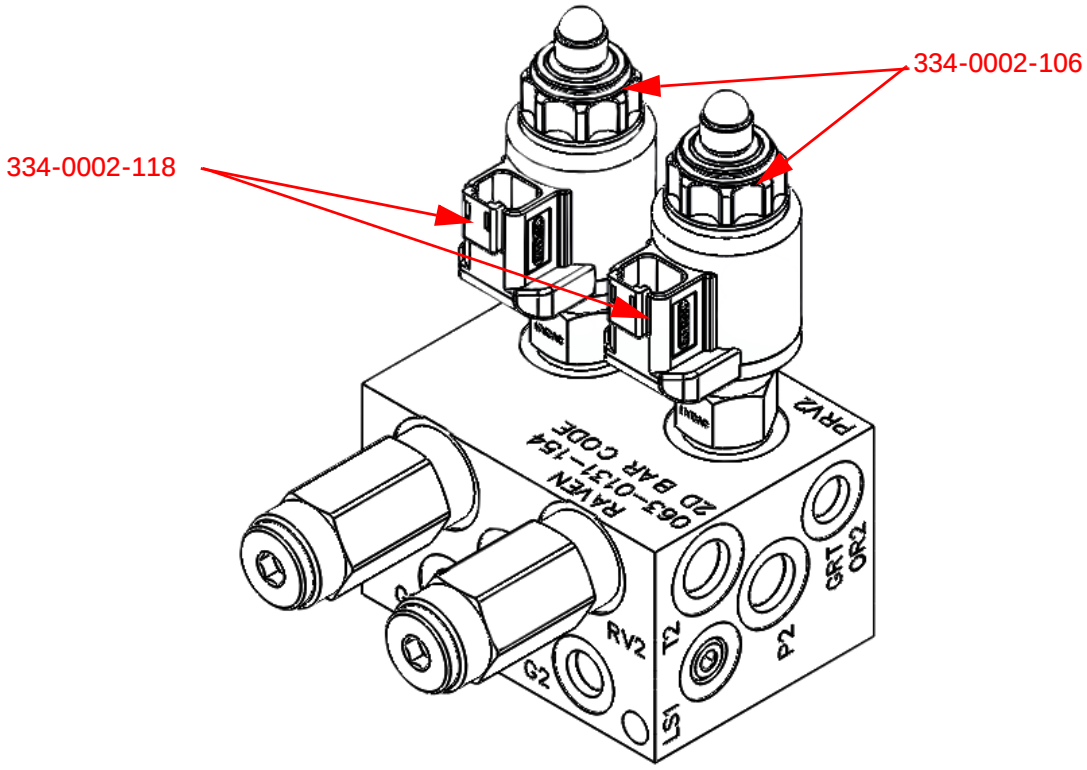
CALIBRATE THE AUTOBOOM ULTRAGLIDE XT SYSTEM

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.

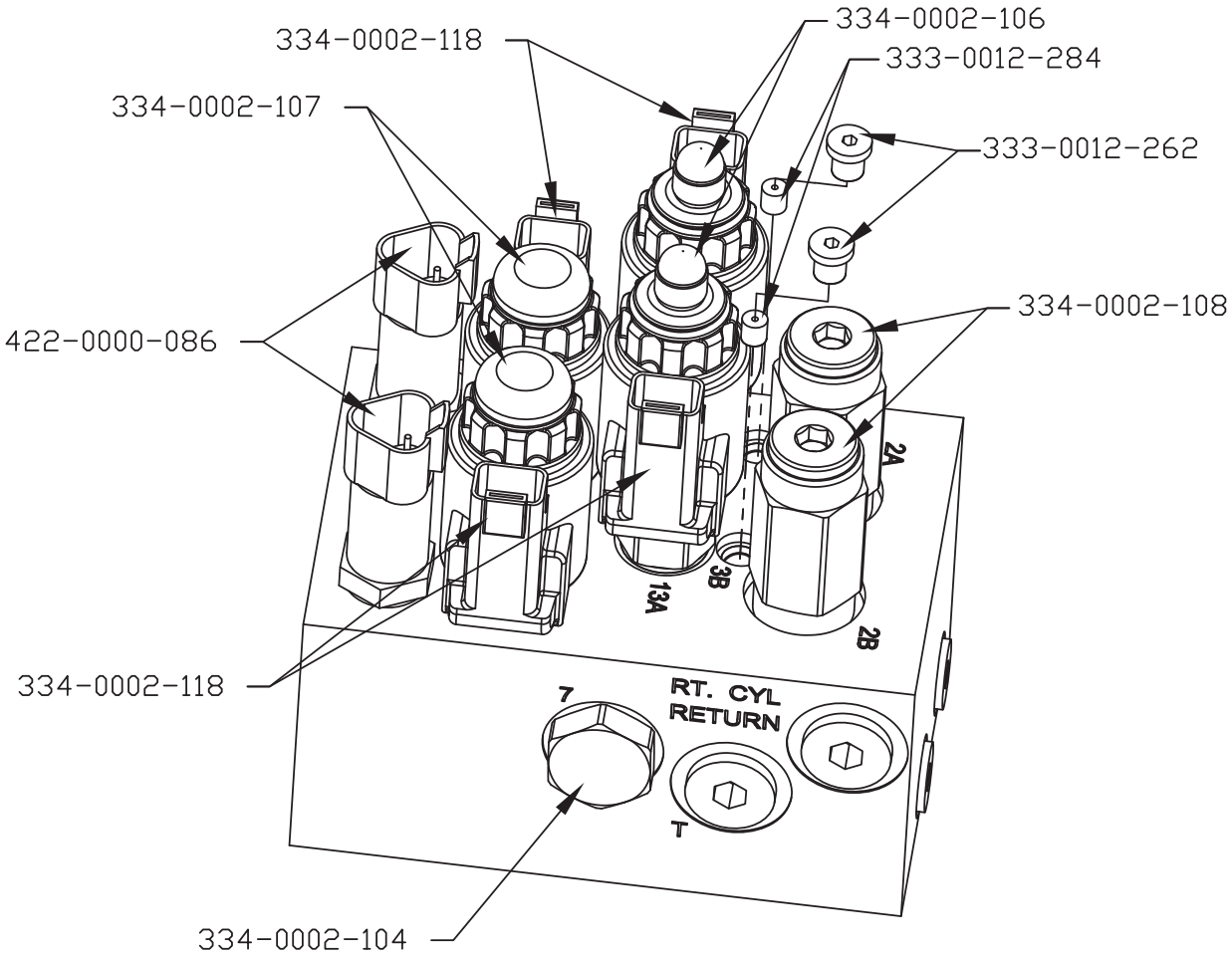
CHAPTER 7 REPLACEMENT PARTS

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

VALVE

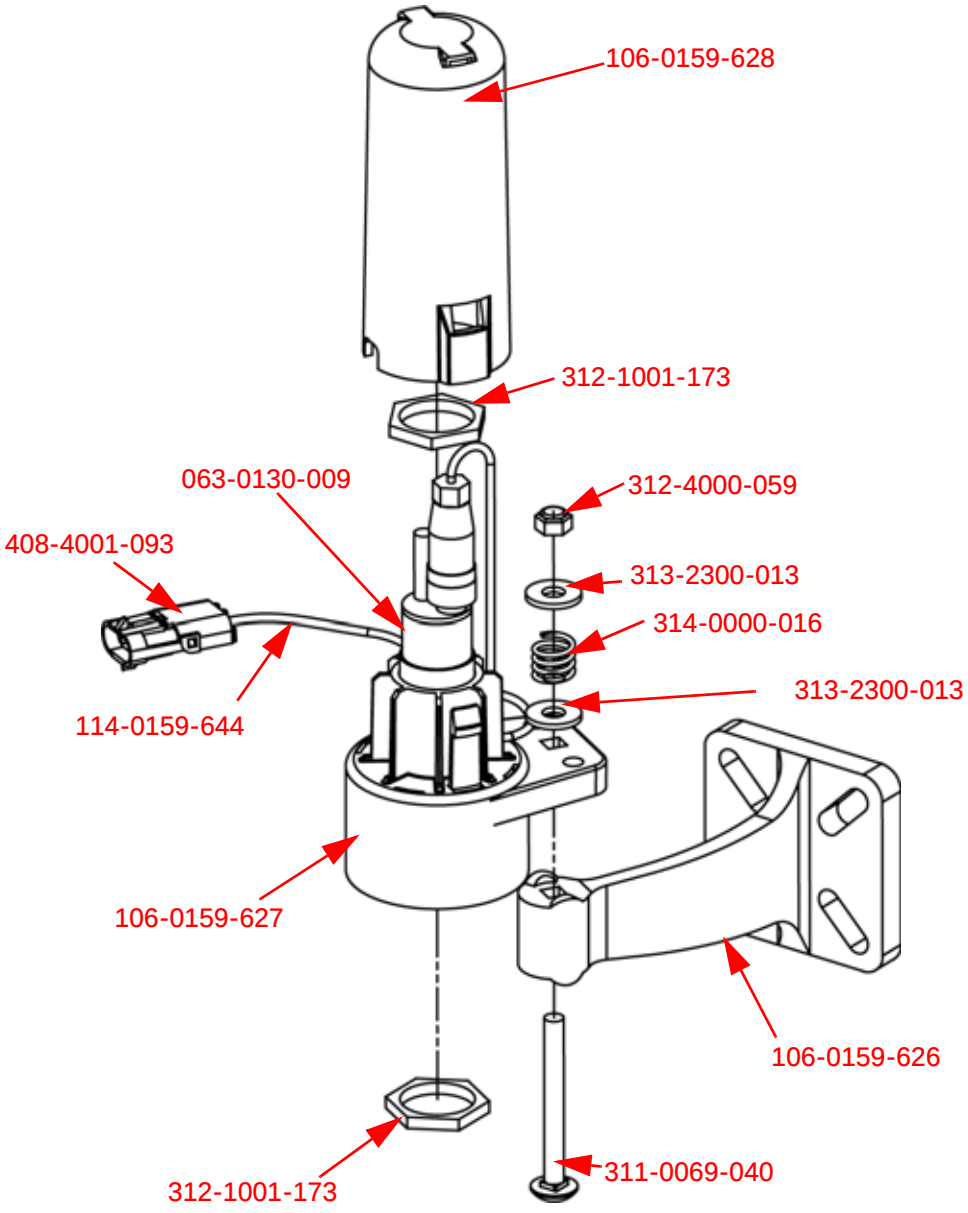


063-0131-154
Valve Assembly, Hydraulic
AutoBoom XT



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

SENSORS


106-0159-628
312-1001-173
063-0130-009
312-4000-059
408-4001-093
313-2300-013
314-0000-016
313-2300-013
114-0159-644
106-0159-627
106-0159-626
312-1001-173
311-0069-040

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RAVEN

Limited Warranty

What Does this Warranty Cover?

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

How Long is the Coverage Period?

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

How Can I Get Service?

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

What Will Raven Industries Do?

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

What is not Covered by this Warranty?

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

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

016-0171-537 Rev. A, E19889

RAVEN

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.