

**RAVEN**

# AutoBoom™ Installation Manual



**Top Air 1200/1600/2400  
UltraGlide XT**

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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™ 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 diminished.
- Ensure AutoBoom is disabled prior to starting any maintenance work on AutoBoom or the machine.

## **WARNING**

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

 **CAUTION**

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## *Hydraulic Safety*

- Raven Industries recommends that appropriate protective equipment be worn at all times when working on the hydraulic system.
- Never attempt to open or work on a hydraulic system with the equipment running. Care should always be taken when opening a system that has been previously pressurized.
- When disconnecting the hydraulic hoses or purging is required, be aware that the hydraulic fluid may be extremely hot and under high pressure. Caution must be exercised.
- Any work performed on the hydraulic system must be done in accordance with the machine manufacturer's approved maintenance instructions.
- When installing AutoBoom hydraulics or performing diagnostics, maintenance, or routine service, ensure that precautions are taken to prevent any foreign material or contaminants from being introduced into the machine's hydraulic system. Objects or materials that are able to bypass the machine's hydraulic filtration system will reduce performance and possibly damage the AutoBoom hydraulic valve.

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## *Electrical Safety*

- Always verify that the power leads are connected to the correct polarity as marked. Reversing the power leads could cause severe damage to the equipment.
- Ensure that the power cable is the last cable to be connected.

Congratulations on your purchase of the Raven AutoBoom UltraGlide XT system! This system is designed to provide automated boom height adjustment for agricultural spraying equipment, and is an addition to the UltraGlide AutoBoom system.

This manual applies to the following machines:

**MAKE: Top Air**

**MODEL: 1200/1600/2400 - 80'-132' Booms**

**FIGURE 1. Top Air**



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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



## UltraGlide XT Kit Contents

This section contains a list of the components that are included in the UltraGlide AutoBoom kit. Before beginning the AutoBoom installation, compare the items in the AutoBoom kit with the components on this list. If you have questions about the kit, contact your Raven dealer.

**Note:** In addition to the following kit components, the UltraGlide AutoBoom kit (P/N 117-0138-014) and UltraGlide XT AutoBoom node (P/N 063-0130-023 or 063-0130-024) are required for the operation of the UltraGlide XT AutoBoom system. For ordering information, contact your local Raven dealer.

**TABLE 1. UltraGlide XT Installation Kit (P/N 117-0138-051)**

| Picture   | Item Description   | Part Number  | Qty. |
|---|--|--------------|------|
| Not Pictured  | Manual - UltraGlide XT Calibration & Operation                                       | 016-0130-073 | 1    |
| Not Pictured  | Manual - Top Air 1200/1600/2400 - 80'-132' Booms UltraGlide XT AutoBoom Installation | 016-0233-003 | 1    |
|   | Sensor Assembly - Con-X-All Non-Contact Rotary                                       | 063-0181-018 | 1    |
|  | Valve - UltraGlide XT AutoBoom Hydraulic   | 063-0131-138 | 1    |
|  | Cable - UltraGlide XT Auxiliary Sensor   | 115-0230-100 | 1    |

**TABLE 2. UltraGlide XT Hydraulic Installation Kit (P/N 117-0144-003)**

| Picture   | Item Description                | Part Number  | Qty. |
|---|---------------------------------|--------------|------|
|  | Fitting - 7/16" SAE O-Ring Plug | 333-0012-051 | 6    |
|  | Fitting - 9/16" SAE O-Ring Plug | 333-0012-104 | 2    |

**TABLE 2. UltraGlide XT Hydraulic Installation Kit (P/N 117-0144-003)**

| Picture   | Item Description  | Part Number  | Qty. |
|---|---|--------------|------|
|    | Fitting - 3/4" SAE O-Ring (M) to 3/4" JIC (F) Straight Swivel Adapter   | 333-0012-278 | 1    |
|    | Fitting - 9/16" JIC O-Ring M/M/F Swivel Run Tee                         | 333-0012-347 | 2    |
|    | Fitting - 3/4" JIC O-Ring M/M/F Swivel Run Tee                          | 333-0012-348 | 2    |
|    | Fitting - 9/16" JIC O-Ring (M) to 9/16" SAE O-Ring (M) Straight Adapter | 333-0012-350 | 4    |
|   | Fitting - 9/16" JIC O-Ring M/F 90° Swivel Elbow                         | 333-0012-358 | 2    |
|  | Fitting - 9/16" SAE O-Ring (M) to 9/16" JIC O-Ring (M) 90° Swivel Elbow | 333-0012-366 | 4    |
|  | Fitting - 3/4" SAE O-Ring F/F Hydraulic Coupler                         | 333-0012-369 | 1    |
|  | Hydraulic Hose - 3/4" JIC (F) to 9/16" JIC (F) - 28"                    | 214-1000-839 | 2    |
|  | Hydraulic Hose - 9/16" JIC (F) to 9/16" JIC (F) - 51"                   | 214-1000-840 | 1    |
|  | Hydraulic Hose - 9/16" JIC (F) 90° to 9/16" JIC (F) - 53"               | 214-1000-841 | 1    |

TABLE 2. UltraGlide XT Hydraulic Installation Kit (P/N 117-0144-003)

| Picture   | Item Description  | Part Number  | Qty. |
|---|---|--------------|------|
|  | Hydraulic Hose - 9/16" JIC (F) 90° to 9/16" JIC (F) - 67" | 214-1000-844 | 1    |
|  | Hydraulic Hose - 9/16" JIC (F) to 9/16" JIC (F) - 64"     | 214-1000-845 | 1    |





**⚠ WARNING**

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



**⚠ CAUTION**

When installing AutoBoom hydraulics or performing diagnostics, maintenance, or routine service, ensure precautions are taken to prevent any foreign material from being introduced into the machine's hydraulic system.

Objects or materials that are able to bypass the machine's hydraulic filtration system will reduce performance and possibly damage the AutoBoom hydraulic valve.



**NOTICE**

The appearance of the AutoBoom hydraulic valve may vary slightly from the images contained in this manual. However, the fittings, hose connections, and cable connections remain the same.

## Install Fittings in the UltraGlide XT Valve

Before mounting the AutoBoom XT valve (P/N 063-0131-138) on the machine, install the proper fittings in the valve. This prepares the valve for installation and simplifies the hose connection process later in the procedure. Refer to the following table to install the fittings in the appropriate ports of the AutoBoom valve.

| Fitting   | Part Number  | Port                       |
|---|--------------|----------------------------|
| Fitting - 9/16" JIC O-Ring to 9/16" SAE O-Ring (M) Straight Adapter | 333-0012-350 | 1, 2<br>P2, T2             |
| Fitting - 9/16" JIC O-Ring M/M/F Swivel Run Tee Adapter             | 333-0012-347 | 1, 2                       |
| Fitting - 9/16" JIC O-Ring M/F 90° Swivel Elbow                     | 333-0012-358 | P2, T2                     |
| Fitting - 9/16" SAE O-Ring Plug                                     | 333-0012-104 | P1, T1                     |
| Fitting - 7/16" SAE O-Ring Plug                                     | 333-0012-051 | LS, LS1, G1,<br>G2, GP, GT |

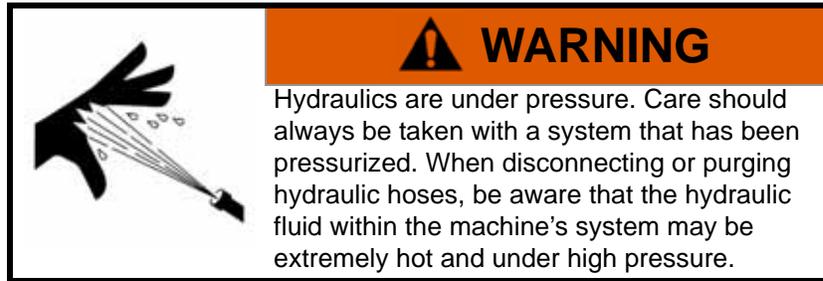
## Mount the UltraGlide XT Valve

**FIGURE 1. UltraGlide XT Valve Mounted to Existing Mounting Plate**



1. Remove the installed AutoBoom node.
2. Mount the UltraGlide XT hydraulic valve (P/N 063-0131-138) to the holes in the existing mounting plate using two hex bolts, lock washers, and nuts.
3. Tighten the nuts to ensure the valve is mounted securely.
4. Reinstall the AutoBoom node.

## Install the Pressure and Tank Hoses



**FIGURE 2. Pressure Hoses Installed**



1. Locate and disconnect the machine's pressure hose installed in Port P of the AutoBoom valve (P/N 063-0131-126).
2. Install a 3/4" JIC (M) to 3/4" SAE O-ring (M) straight adapter fitting (P/N 333-0012-351 - supplied with the AutoBoom UltraGlide kit) in Port P of the AutoBoom valve.
3. Install a 3/4" JIC O-ring M/M/F swivel run tee adapter fitting (P/N 333-0012-348) on the fitting installed in Port P of the AutoBoom valve.
4. Install a 3/4" JIC (F) to 3/4" SAE O-ring (M) straight adapter fitting (P/N 333-0012-278) on the opposite end of the installed tee fitting.
5. Install a 3/4" SAE O-ring F/F hydraulic coupler (P/N 333-0012-369) on the opposite end of the installed adapter fitting.
6. Connect the machine's pressure hose to the installed coupler fitting.
7. Install the supplied hydraulic hose (P/N 214-1000-839) on the 90° end of the installed tee fitting.
8. Connect the other end of the installed hydraulic hose to the fitting installed in Port P2 of the UltraGlide XT valve (P/N 063-0131-138).

FIGURE 3. Tank Hoses Installed



9. Locate and disconnect the machine's tank hose from the fitting installed in Port T of the AutoBoom valve.
10. Install a 3/4" JIC O-ring M/M/F swivel run tee adapter fitting (P/N 333-0012-348) on the existing fitting in Port T of the AutoBoom valve.
11. Connect the machine's tank hose to the opposite end of the installed tee fitting.
12. Install the supplied hydraulic hose (P/N 214-1000-839) on the 90° end of the installed tee fitting.
13. Connect the other end of the installed hydraulic hose to the fitting installed in Port T2 of the UltraGlide XT valve.

## *Install the UltraGlide XT Cylinders and Hoses*

FIGURE 4. Machine's Stabilizers



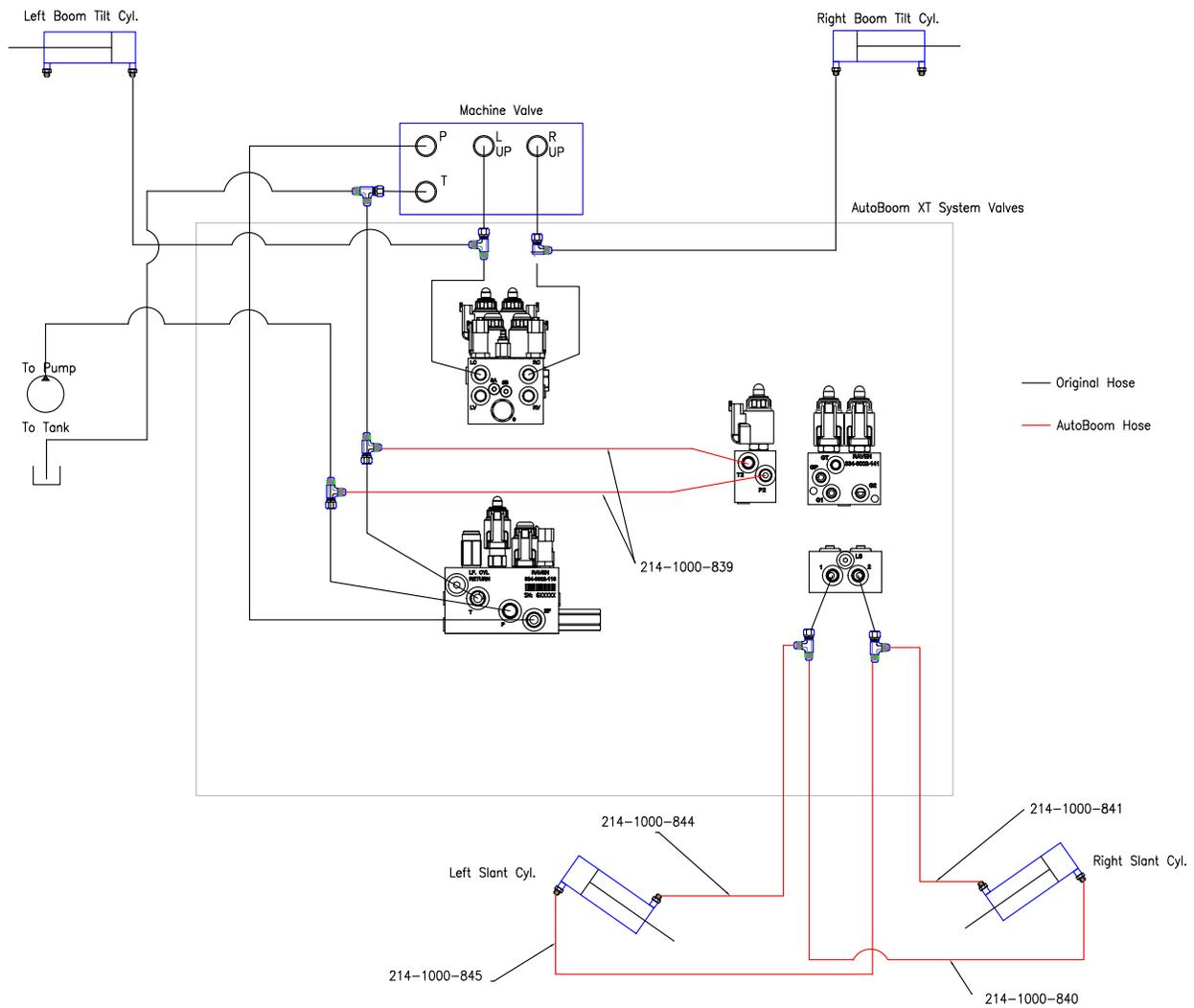
1. Locate and remove the machine's stabilizers from the booms.

FIGURE 5. Cylinder Installed



2. Install the cylinders in the locations from which the stabilizers were removed using the correct hardware.
3. Install the 9/16" JIC O-ring (M) to 9/16" SAE O-ring (M) 90° elbow fittings (P/N 333-0012-366) in the open ports of the installed hydraulic cylinders.
4. Install the straight end of the supplied hydraulic hose (P/N 214-1000-844) to the 90° fitting installed in the rod-end of the left slant cylinder.
5. Connect the 90° end of the installed hydraulic hose to the 90° end of the tee fitting installed in Port 1 of the UltraGlide XT valve (P/N 063-0131-138).
6. Install one end of the supplied hydraulic hose (P/N 214-1000-845) to the 90° fitting installed in the base-end of the left slant cylinder.
7. Connect the other end of the installed hydraulic hose to the straight end of the tee fitting installed in Port 2 of the UltraGlide XT valve.
8. Install the straight end of the supplied hydraulic hose (P/N 214-1000-841) to the 90° fitting installed in the rod-end of the right slant cylinder.
9. Connect the 90° end of the installed hydraulic hose to the 90° end of the tee fitting installed in Port 2 of the UltraGlide XT valve.
10. Install one end of the supplied hydraulic hose (P/N 214-1000-840) to the 90° fitting installed in the base-end of the right slant cylinder.
11. Connect the other end of the installed hydraulic hose to the straight end of the tee fitting installed in Port 1 of the UltraGlide XT valve.

# Hydraulic Diagram



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CHAPTER

4

*UltraGlide XT Sensor  
Installation*

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*Install the King Pin Sensor Bracket*

FIGURE 1. King Pin Retainer Removed



1. Remove the bolts that secure the boom king pin retainer to the boom king pin.

FIGURE 2. King Pin Sensor Bracket Installed



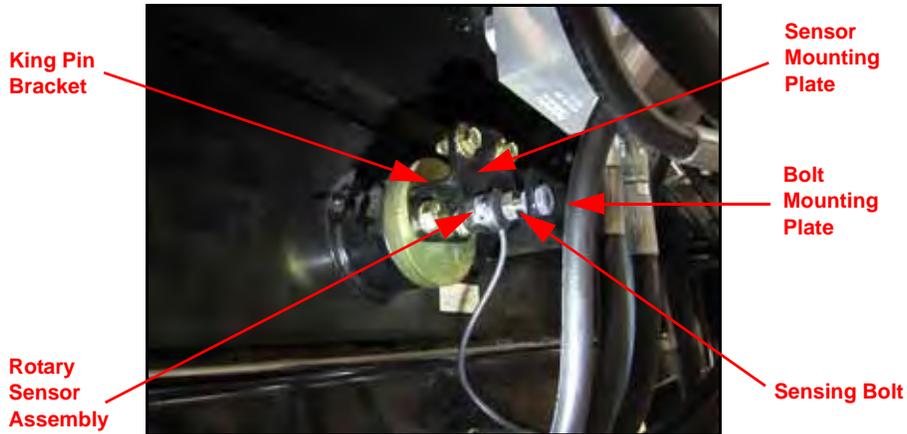
2. Secure the king pin bracket to the king pin using the machine's original bolts.

**Note:** *It may be necessary to install shims between the king pin retainer and the king pin to ensure the retainer does not contact the boom and rotate with the boom during operation.*

## Install the Rotary Sensor

1. Install the rotary sensor assembly (P/N 063-0181-018) on the sensor mounting plate.

**FIGURE 3. Sensor Mounting Plate Installed on King Pin Bracket**



2. Mount the sensor mounting plate to the king pin bracket.
3. Install the sensing bolt on the bolt mounting plate.
4. Mount the bolt mounting plate on the machine.

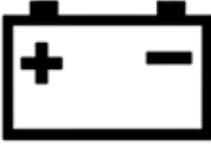
**FIGURE 4. Rotary Sensor Alignment**



5. Using the supplied plastic alignment tool and Rotary Sensor Installation and Alignment Instruction Sheet (P/N 016-0130-074), adjust the sensing bolt so that the center of the bolt aligns with the center of the sensor and the notch in the side of the bolt surface aligns with the sensor cable.

---

*Wiring Connections*

|   |   |
|---|---|
|  | <p data-bbox="820 760 1117 814"><b>⚠ CAUTION</b></p> <p data-bbox="685 829 1205 982">Always connect the power cable as the last step in the wiring process and verify that the power leads are connected with the correct polarity. Reversing power leads can cause severe damage to the equipment.</p> |
|---|---|

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

---

*Install the UltraGlide XT Node*

**FIGURE 1. UltraGlide XT Node Installed**



1. Mount the UltraGlide XT AutoBoom node (P/N 063-0130-023 or 063-0130-024) to the machine's existing mounting plate using the appropriate hardware.

**Note:** Position the node so that the cable connections face down.

2. Insert the large, rectangular node connectors on the UltraGlide XT harness cable (P/N 115-0230-095) into the correct ports of the UltraGlide XT node.
3. Tighten the bolts on the node connectors to secure the connections.

---

## Connect the Harness to the UltraGlide XT Valve and Center Rotation Sensor

**FIGURE 2. Machine's Boom Function Controls**

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1. Connect the UltraGlide XT auxiliary sensor cable (P/N 115-0230-100) to the UltraGlide XT connector on the AutoBoom harness cable (P/N 115-0230-095).
2. Connect the Slant CCW connector on the UltraGlide XT auxiliary sensor cable to the coil connector labeled PRV1.
3. Connect the Slant CW connector to the coil connector labeled PRV2.
4. Connect the Rotary Sensor connector to the center rotation sensor connection.
5. If more than five ultrasonic sensors are installed on the machine, connect the Right Mid Sensor connector to the middle sensor installed on the right boom and connect the Left Mid Sensor connector to the middle sensor installed on the left boom.

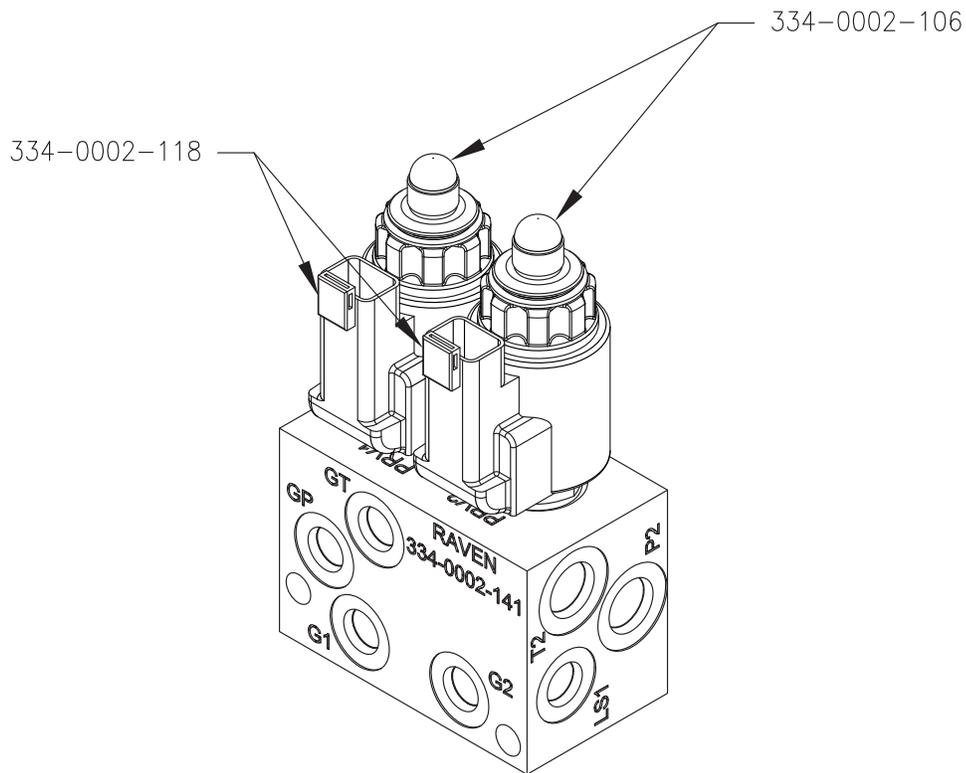
CHAPTER

6

*Replacement Parts*

This section contains replacement part diagrams and listings for the UltraGlide XT AutoBoom system. Please refer to these diagrams when calling to request replacement parts.

*Valves*



063-0131-138  
VALVE ASSEMBLY, HYDRAULIC  
AUTOBOOM XT



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**RAVEN**

# **RAVEN INDUSTRIES**

## **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.

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

Raven Applied Technology Division products are covered by this warranty for 12 months after the date of purchase. This warranty coverage applies only to the original owner and is nontransferable.

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

Bring the defective part and proof of purchase to your Raven dealer. If your dealer agrees with the warranty claim, the dealer will send the part and proof of purchase to their distributor or to Raven Industries for final approval.

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

Upon confirmation of the warranty claim, Raven Industries will, at our discretion, repair or replace the defective part and pay for return freight.

### ***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 or other special 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.

# RAVEN

Top Air 1200/1600/2400 UltraGlide XT  
AutoBoom™ Installation Manual  
(P/N 016-0233-003 Rev A 01/12 E18996)



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