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AutoBoom™ Installation Manual



Sprayer Specialties XLRD Contour Series

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CHAPTER

1

Important Safety Information

NOTICE

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

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

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

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

WARNING

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

 **CAUTION**

Hydraulic Safety

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

Electrical Safety

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

CHAPTER

2

Introduction

Introduction

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

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

MAKE: Sprayer Specialties
MODEL: XLRD Contour Series Boom
YEAR:
SERIAL NUMBER:

FIGURE 1. Sprayer Specialties XLRD Contour Series



Recommendations

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

Preparing for Installation

Before installing AutoBoom, park the machine on a level, clean, and dry surface. 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.

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 (M)



UltraGlide Kit Contents

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

TABLE 1. UltraGlide Installation Kit (P/N 117-0232-089)


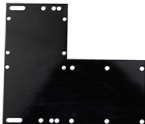






Picture	Item Description	Part Number	Qty.
Not Pictured	Manual - Sprayer Specialties XLRD Contour Series AutoBoom Installation Manual	016-0171-089	1
	Valve - UltraGlide AutoBoom	063-0131-126	1
	Plate - Hydraulic Block Mounting	107-0171-802	1
	Sensor - Right Ultrasonic	063-0130-012	1
	Sensor - Left Ultrasonic	063-0130-014	1
	Sensor - Center Ultrasonic	063-0130-018	1
	Splice - Scotch Lock 16-18 Gauge Parallel	405-2001-079	4
	U-Bolt - 1-9/16" W x 2-1/2" L x 3/8" Thread	107-0171-611	2
	U-Bolt - 4" W x 3" L x 3/8" Thread	107-0171-852	2



TABLE 1. UltraGlide Installation Kit (P/N 117-0232-089)






Picture	Item Description	Part Number	Qty.
	U-Bolt - 2" W x 4" L x 3/8" Thread	321-0000-363	4
	Bolt - 5/16"-18 x 7/8" Hex	311-0052-104	4
	Bolt - 3/8"-16 x 1-1/4" Hex	311-0054-106	3
	Nut - 3/8"-16 Zinc Flanged Lock	312-1001-164	19
	Washer - 5/16" Zinc Plated Lock	313-1000-019	4

TABLE 2. Hydraulic Kit (P/N 117-0134-089)






Picture	Item Description	Part Number	Qty.
	Fitting - 3/4" JIC M/M/F Swivel Run Tee	333-0012-039	2
	Fitting - 9/16" JIC M/F 90° Swivel Elbow	333-0012-042	3
	Fitting - 9/16" M/M/F Swivel Run Tee	333-0012-043	1
	Fitting - 9/16" JIC (M) to 9/16" SAE O-Ring (M) Straight Adapter	333-0012-045	2
	Fitting - 9/16" JIC (M) to 3/4" SAE O-Ring (M) Straight Adapter	333-0012-046	3

TABLE 2. Hydraulic Kit (P/N 117-0134-089)








Picture	Item Description	Part Number	Qty.
	Fitting - 11/16" Hex to 9/16" O-Ring Plug	333-0012-194	2
	Hydraulic Hose - 9/16" JIC (F) 90° to 9/16" JIC (F) - 38"	214-1000-392	2
	Hydraulic Hose - 9/16" JIC (F) 90° to 3/4" JIC (F) - 60"	214-1000-548	2

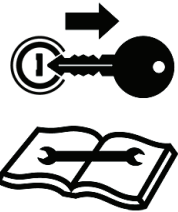
TABLE 3. UltraGlide Wiring Kit (P/N 117-0137-024)

Picture	Item Description	Part Number	Qty.
Not Pictured	CAN AutoBoom Calibration & Operation Manual	016-0130-062	1
	AutoBoom Node	063-0130-013	1
	Cable - Sensor	115-0171-527	2
	Cable - Harness	115-0230-045	1
	Cable - Power/CAN	115-0230-007	1

CHAPTER

3

Hydraulic System



⚠ WARNING

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



⚠ CAUTION

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

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



NOTICE

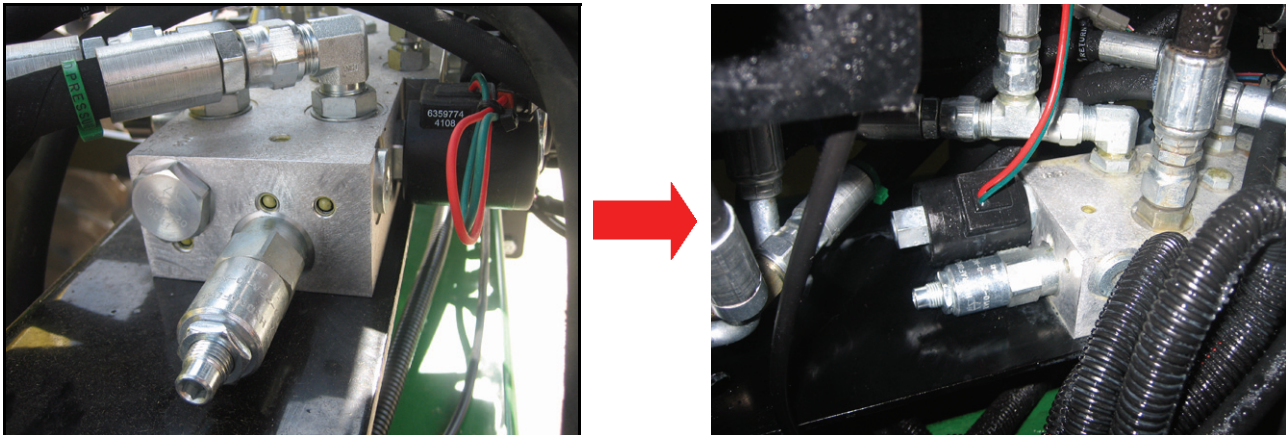
The appearance of the AutoBoom hydraulic valve may vary slightly from the images contained in this manual. However, the fittings, hose connections, and cable connections remain the same.

Convert the Sprayer's Hydraulic Valve to Open Center (If Applicable)

By factory default, the machine's main hydraulic valve is configured as a "closed center" hydraulic system. In order for AutoBoom to function properly and to prevent the hydraulic system from overheating, Raven recommends converting the machine's hydraulic system to an "open center" system.

Note: Contact your Sprayer Specialties dealer to obtain the open center conversion kit.

FIGURE 1. Converted Hydraulic Valve - Closed Center to Open Center



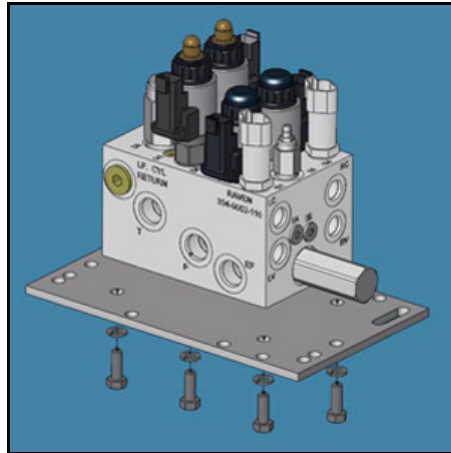
Install Fittings on the AutoBoom Valve

Before mounting the AutoBoom valve 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 - 9/16" JIC (M) to 9/16" SAE O-Ring (M) Straight Adapter	333-0012-045	LC, RC
Fitting - 11/16" Hex to 9/16" O-Ring Plug	333-0012-194	LV, RV
Fitting - 9/16" JIC (M) to 3/4" SAE O-Ring (M) Straight Adapter	333-0012-046	P, T, EF
Fitting - 9/16" JIC M/F 90° Swivel Elbow	333-0012-042	P

Mount the AutoBoom Valve

FIGURE 2. AutoBoom Valve Mounted on the Valve Mounting Plate




1. Secure the AutoBoom valve (P/N 063-0131-126) to the mounting plate (P/N 107-0171-802) using four 5/16"-18 x 7/8" hex bolts (P/N 311-0052-104) and four 5/16" lock washers (P/N 313-1000-019).

FIGURE 3. AutoBoom Valve Mounting Location



2. Secure the mounting plate to the machine's center rack using two 4" W x 3" L x 3/8" thread U-bolts (P/N 107-0171-852) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).

Install the Pressure and Tank Hoses

	<p>⚠ WARNING</p> <p>Hydraulics are under pressure. Care should always be taken with a system that has been pressurized. When disconnecting or purging hydraulic hoses, be aware that the hydraulic fluid within the machine's system may be extremely hot and under high pressure.</p>
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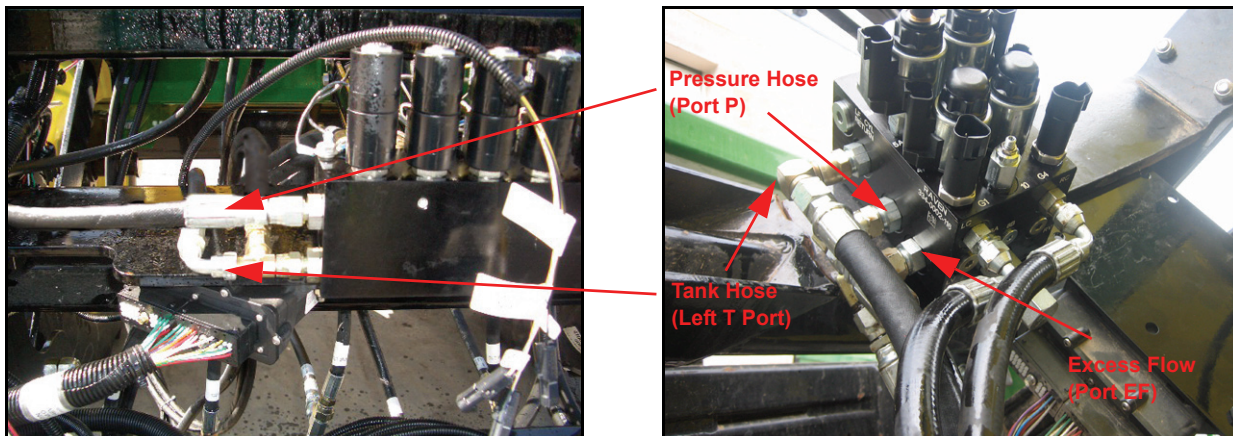
	<p>⚠ CAUTION</p> <p>When installing AutoBoom hydraulics or performing diagnostics, maintenance, or routine service, ensure precautions are taken to prevent any foreign material or contaminants from being introduced into the machine's hydraulic system.</p> <p>Objects or materials that are able to bypass the machine's hydraulic filtration system will reduce performance and possibly cause damage to the AutoBoom hydraulic valve.</p>
---	---

FIGURE 4. Pressure and Tank Hoses Installed



1. Locate and disconnect the pressure hose from port P of the machine's hydraulic valve.
2. Connect the machine's pressure hose to the installed fitting in Port P of the AutoBoom valve.
3. Install the straight end of the supplied hydraulic hose (P/N 214-1000-392) in port P of the machine's hydraulic valve.

Note: *It may be necessary to install a 9/16" JIC M/F 90° swivel elbow fitting (P/N 333-0012-042) in the machine's pressure port before installing the hydraulic hose.*

4. Connect the 90° end of the installed hydraulic hose on the installed fitting in Port EF of the AutoBoom valve.
5. Locate and disconnect the tank hose from port T of the machine's hydraulic valve.

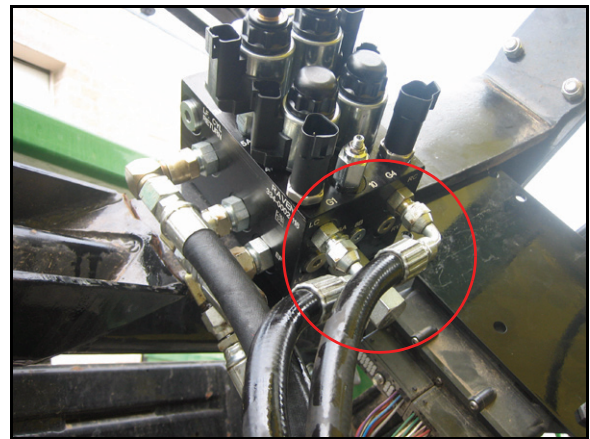
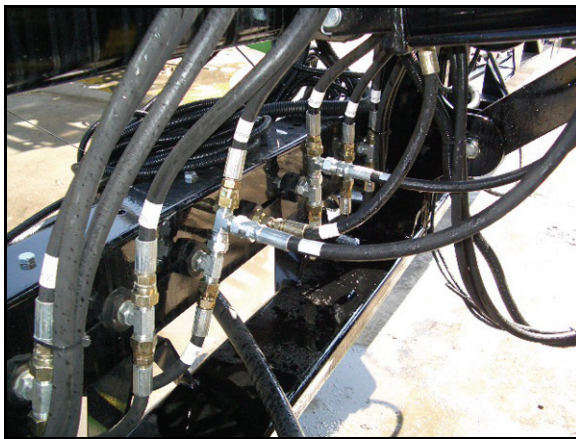
6. Install a 9/16" JIC M/M/F swivel run tee adapter fitting (P/N 333-0012-043) in port T of the machine's hydraulic valve.
7. Connect the machine's tank hose to the opposite end of the installed tee fitting.
8. Connect the straight end of the supplied hydraulic hose (P/N 214-1000-392) to the 90° end of the installed tee fitting.

Note: *It may be necessary to install a 9/16" JIC M/F 90° swivel elbow fitting (P/N 333-0012-042) on the 90° end of the installed tee fitting before installing the hydraulic hose.*

9. Connect the 90° end of the installed hydraulic hose to the fitting installed in the Left T Port of the AutoBoom valve.

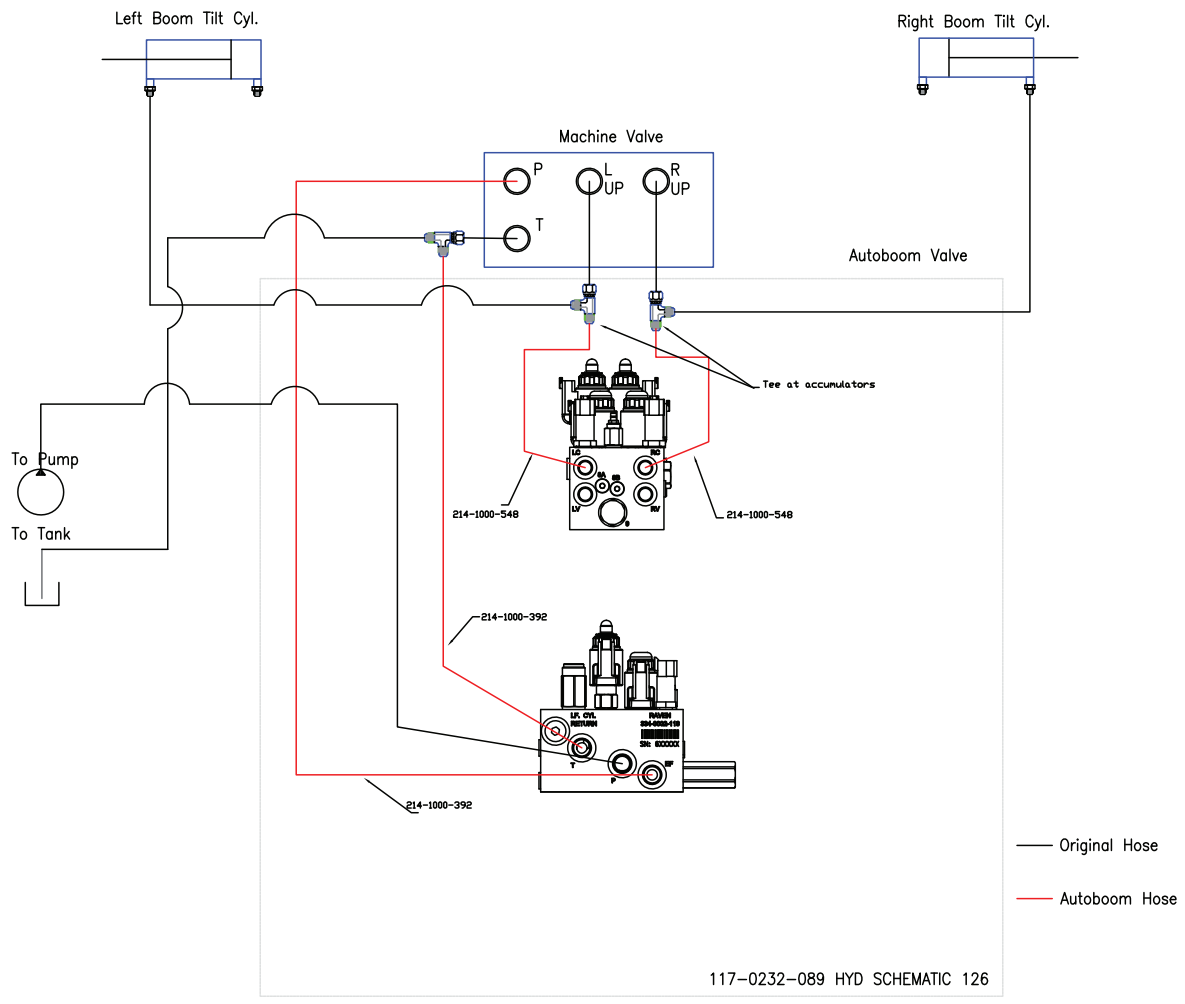
Install the Left and Right Cylinder Hoses

FIGURE 5. Left and Right Cylinder Hoses Installed



1. Disconnect the machine's left cylinder up hose from the machine's left tilt cylinder accumulator.
2. Install a 3/4" JIC M/M/F swivel run tee fitting (P/N 333-0012-039) in the left tilt cylinder accumulator.
3. Connect the machine's left cylinder up hose to the opposite end of the installed tee fitting.
4. Install the straight end of the supplied hydraulic hose (P/N 214-1000-548) on the 90° end of the tee fitting installed in the left tilt cylinder accumulator.
5. Connect the 90° end of the installed hydraulic hose to Port LC of the AutoBoom valve.
6. Disconnect the machine's right cylinder up hose from the machine's right tilt cylinder accumulator.
7. Install a 3/4" JIC M/M/F swivel run tee fitting (P/N 333-0012-039) in the right tilt cylinder accumulator.
8. Connect the machine's right cylinder up hose to the opposite end of the installed tee fitting.
9. Install the straight end of the supplied hydraulic hose (P/N 214-1000-548) on the 90° end of the tee fitting installed in the right tilt cylinder accumulator.
10. Connect the 90° end of the installed hydraulic hose to Port RC of the AutoBoom valve.

UltraGlide Hydraulic Schematic



CHAPTER

4

Sensors

Boom Sensor Mounting Locations

Sensor mounting locations may be influenced by the boom configuration. Determine the appropriate location for mounting the sensors on the boom, ensuring the sensors will not interfere with or be damaged while folding or unfolding the booms.

Mount the Boom Sensors

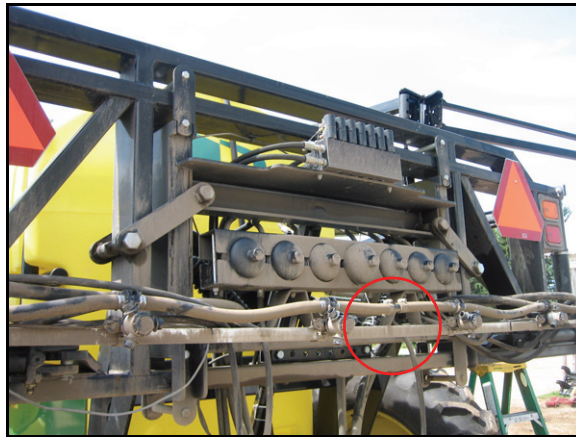
FIGURE 1. Mounted Boom Sensor



1. Mount the left sensor (P/N 063-0130-014) to the front of the top left boom rail using two 2" W x 4" L x 3/8" thread U-bolts (P/N 107-0171-363) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
2. Tighten the nuts to ensure the sensor is mounted securely.
3. Repeat the steps above to mount the remaining boom sensor(s).

Mount the Center Rack Sensor

FIGURE 2. Center Rack Sensor Mounting Location



1. Mount the center sensor (P/N 063-0130-018) to the machine's center rack boom tube support using two 1-9/16" W x 2-1/2" L x 3/8" thread U-bolts (P/N 107-0171-611) and four 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
2. Tighten the nuts to ensure the sensor is mounted securely.

Connect the Sensor Cables

1. Connect the left sensor cable (P/N 115-0171-527) to the connector on the outer left sensor.
2. Route the left sensor cable toward the AutoBoom valve.
3. Loop and tie-off any excess cable, allowing enough cable for boom folding and extension.
4. Repeat the steps above to connect the remaining sensor cable(s).

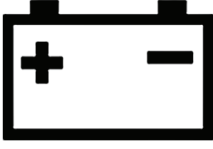
Note: *The sensor cables will be connected to the AutoBoom system in the wiring phase of installation.*

CHAPTER

5

Wiring

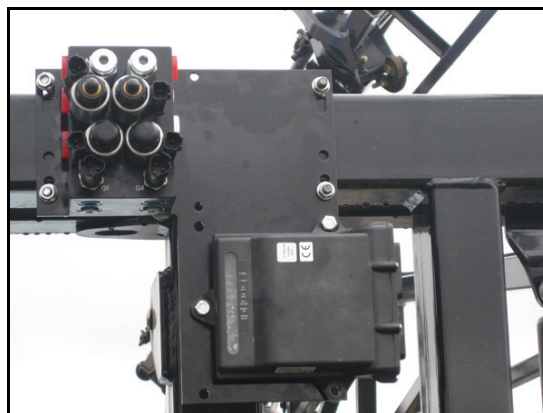
Wiring Connections

	<p data-bbox="820 760 1117 814">⚠ CAUTION</p> <p data-bbox="685 829 1205 987">Always connect the power cable as the last step in the wiring process and verify that the power leads are connected with the correct polarity. Reversing power leads can cause severe damage to the equipment.</p>
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Note: For wiring connections made outside the cab, apply dielectric silicone grease (P/N 222-0000-006) generously on both the male and female ends of the connectors. Application of the grease will prevent corrosion to the pins and wires.

Install the AutoBoom Node

FIGURE 1. AutoBoom Node Installed (Example Only)



1. Mount the AutoBoom node (P/N 063-0130-013) to the valve mounting plate (P/N 107-0171-802) next to the AutoBoom valve using three 3/8"-16 UNC x 1-1/4" zinc plated hex bolts (P/N 311-0054-106) and three 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).

Note: Install the node so that the cable connectors face down.

2. Insert the large, rectangular node connectors on the harness cable (P/N 115-0230-045) into the correct ports of the AutoBoom node.
3. Tighten the bolts on the node connectors to secure the connections.

Connect the Harness to the Boom Function Controls

1. Locate the Left Press and Right Press connectors on the AutoBoom harness cable (P/N 115-0230-045).
2. Route the connectors to the AutoBoom valve (P/N 063-0131-126).
3. Connect the Left Press connector to Port G1 on the AutoBoom valve.
4. Connect the Right Press connector to Port G4 on the AutoBoom valve.
5. Locate the Left Solenoid and Right Solenoid connectors on the AutoBoom harness cable.
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. Locate the Left Prop and Right Prop connectors on the AutoBoom harness cable.
9. Connect the Left Prop connector to Port 5A on the AutoBoom valve.
10. Connect the Right Prop connector to Port 13A on the AutoBoom valve.

FIGURE 2. Machine's Boom Function Coils



11. Locate the machine's boom function coils near the machine's hydraulic valve.
12. Locate the left tilt up coil.
13. Determine which wire feeding into the coil receives the signal from the switches in the cab by pressing the switch and using a test light or multi-meter to detect +12 volts.
14. Locate the Left Solenoid Sense Up connector on the AutoBoom harness cable (P/N 115-0230-045).
15. Use a 16-18 gauge scotch lock parallel splice connector (P/N 405-2001-079) to connect the left tilt up coil wire to the Left Solenoid Sense Up connector.
16. Locate the left tilt down coil.
17. Determine which wire feeding into the coil receives the signal from the switches in the cab by pressing the switch and using a test light or multi-meter to detect +12 volts.
18. Locate the Left Solenoid Sense Down connector on the AutoBoom harness cable (P/N 115-0230-045).

19. Use a 16-18 gauge scotch lock parallel splice connector (P/N 405-2001-079) to connect the left tilt down coil wire to the Left Solenoid Sense Down connector.
20. Repeat the steps above to connect the right tilt up and down coils to the Right Solenoid Sense Up and Down connectors on the AutoBoom harness cable.

Connect the Harness Cable to the Sensors

1. Locate the Center Sensor connector on the AutoBoom harness cable.
2. Connect the Center Sensor connector to the installed center sensor (P/N 063-0130-018).
3. Locate the Left Outer Sensor connector on the AutoBoom harness cable.
4. Connect the Left Outer Sensor connector to the installed left sensor cable (P/N 115-0171-527).
5. Locate the Right Outer Sensor connector on the AutoBoom harness cable.
6. Connect the Right Outer Sensor connector to the installed right sensor cable.
7. If optional inside boom sensors are installed, repeat the steps above to connect the sensors.

Connect the Harness Cable to the Controller Cable

1. Route the AutoBoom harness cable (P/N 115-0230-045) toward the machine's cab.

Note: *Be sure to allow enough slack in the harness cable to allow for boom racking.*

2. Connect the harness cable to the controller cable (P/N 115-0230-007).
3. Tighten the connector screw cap to secure the connection.

Connect the Controller (If Applicable)

1. Route the controller cable (P/N 115-0230-007) into the right side of the machine's cab.
2. Locate the two controller connectors and connect them to the AutoBoom controller (P/N 063-0130-011).

Note: *Mount the AutoBoom controller in the machine's cab so that the machine's operator has easy access to it.*

Connect the Field Computer (If Applicable)

Refer to the Installation & Operation Manual and the appropriate wiring schematic beginning on page 21 for installation and wiring instructions for the specific field computer being used.

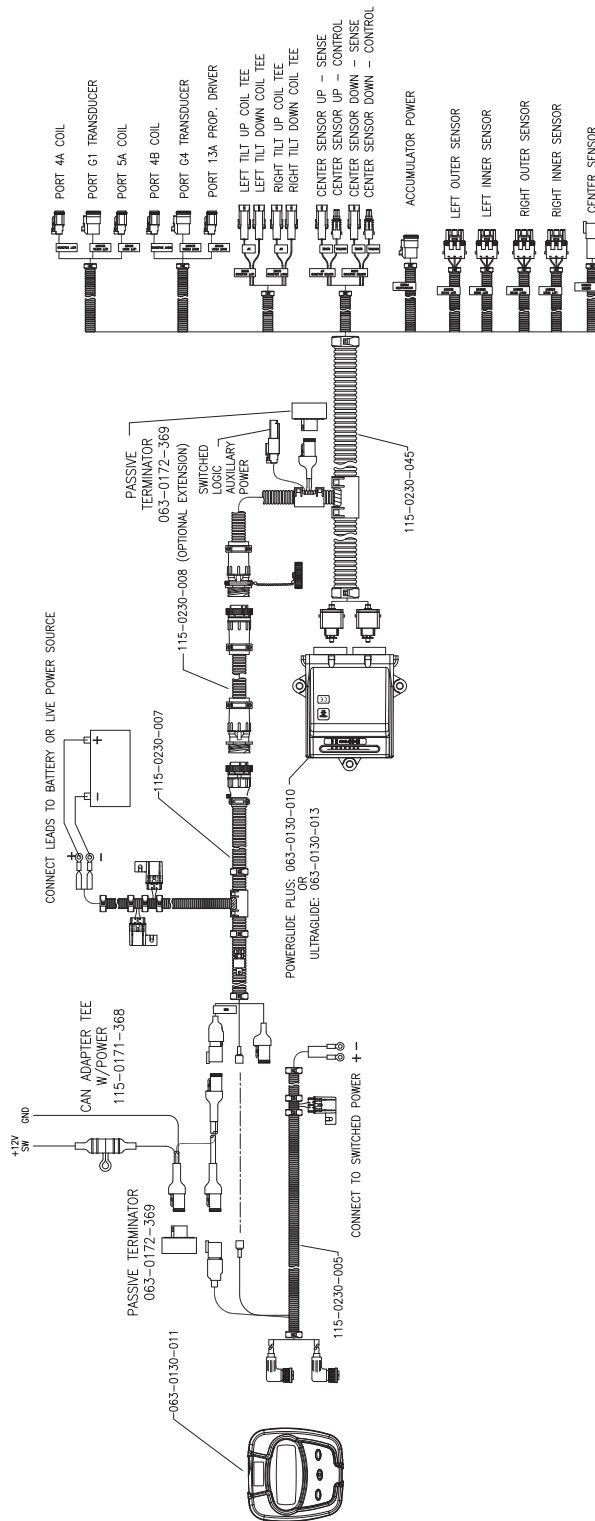


Connect the Power Leads

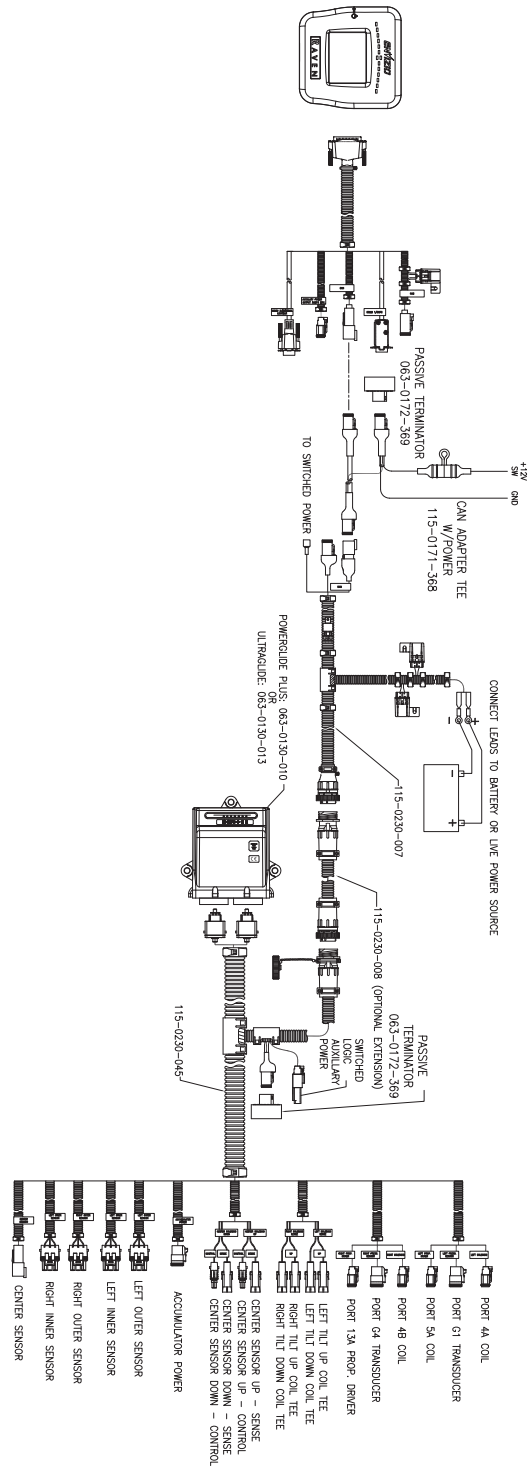
1. Locate the power cable that has the red and white power leads at one end.
2. Disconnect the machine's connectors from the battery terminals.
3. Install the red power lead on the positive battery terminal and reinstall the machine's battery connector.
4. Install the white power lead on the negative battery terminal and reinstall the machine's battery connector.

UltraGlide Wiring Schematics

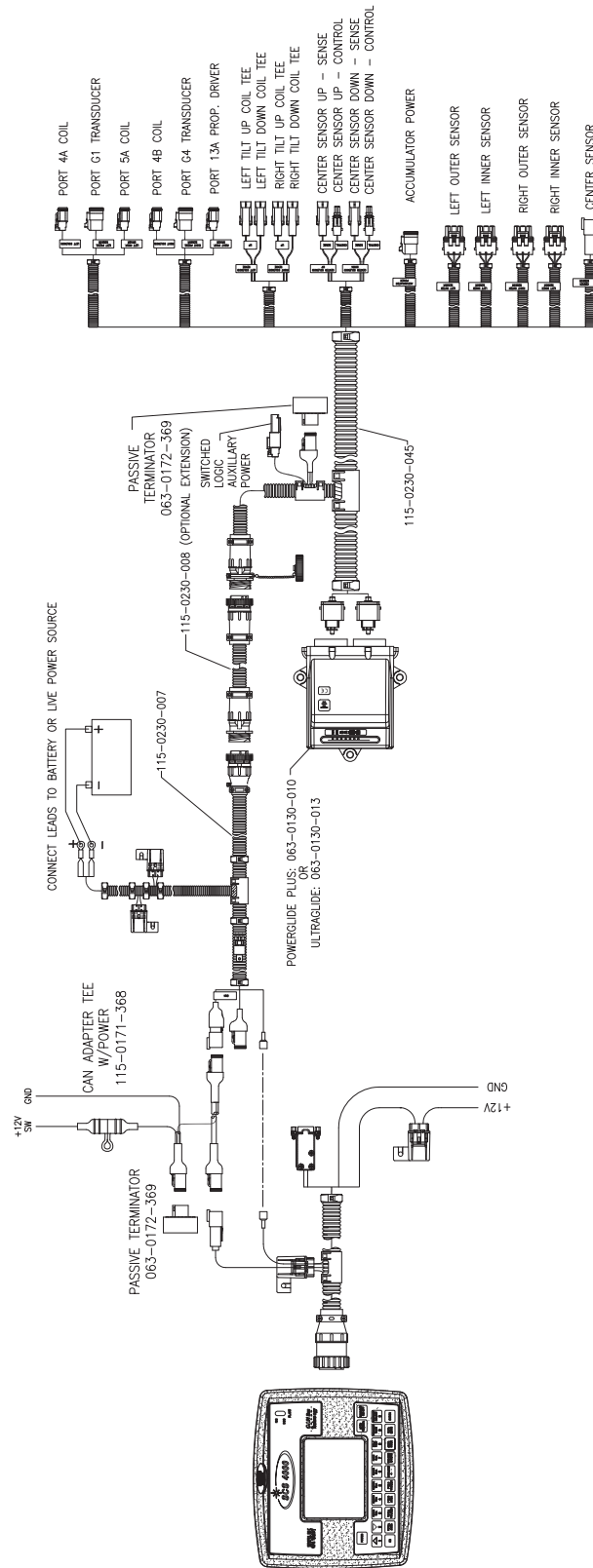
AutoBoom Controller



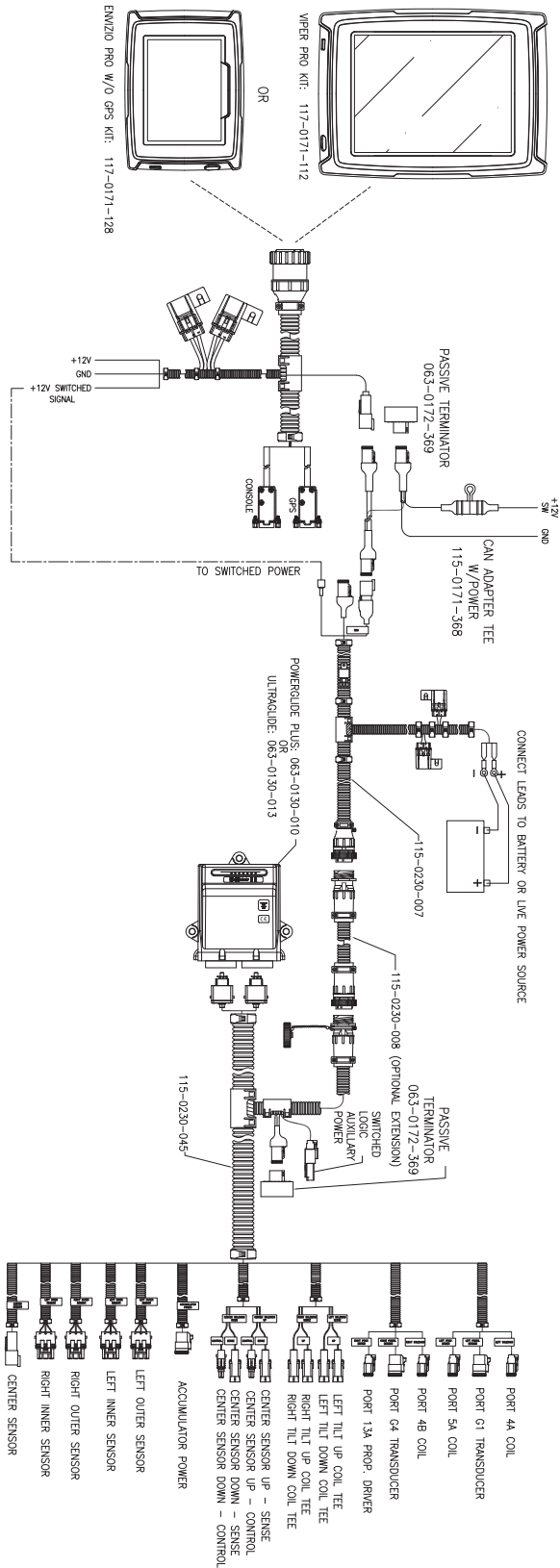
Envizio Plus



SCS 4000/5000



Viper Pro & Envizio Pro



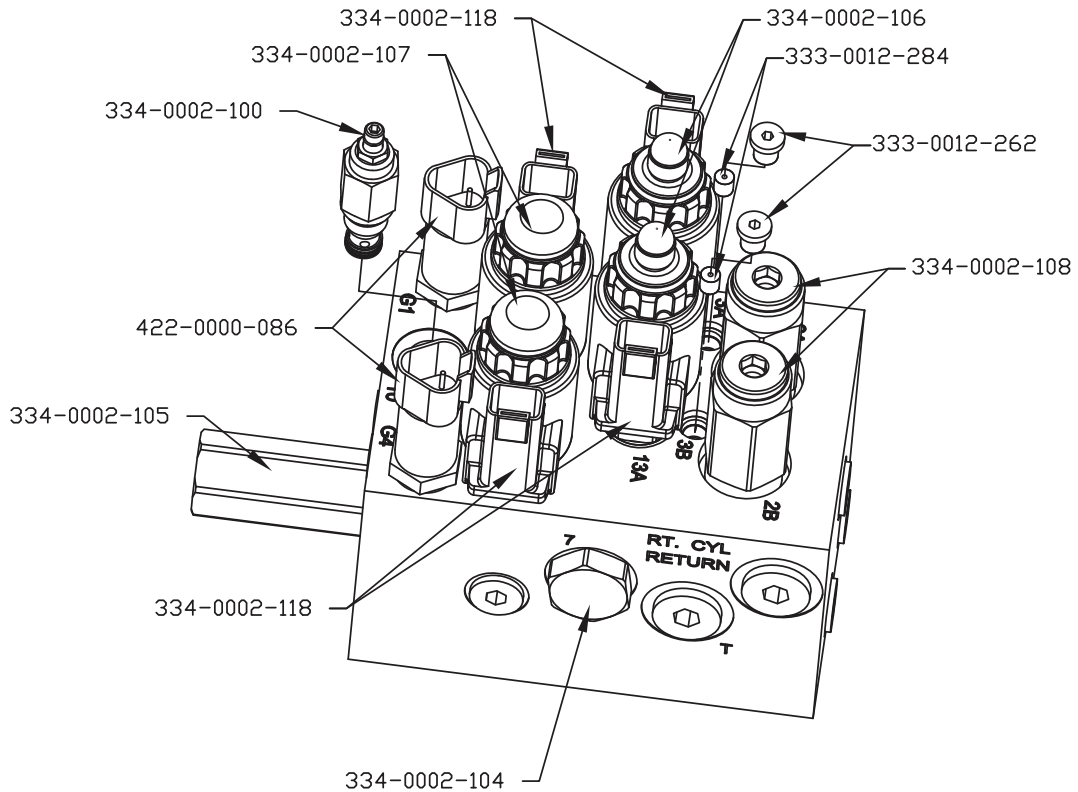
CHAPTER

6

Replacement Parts

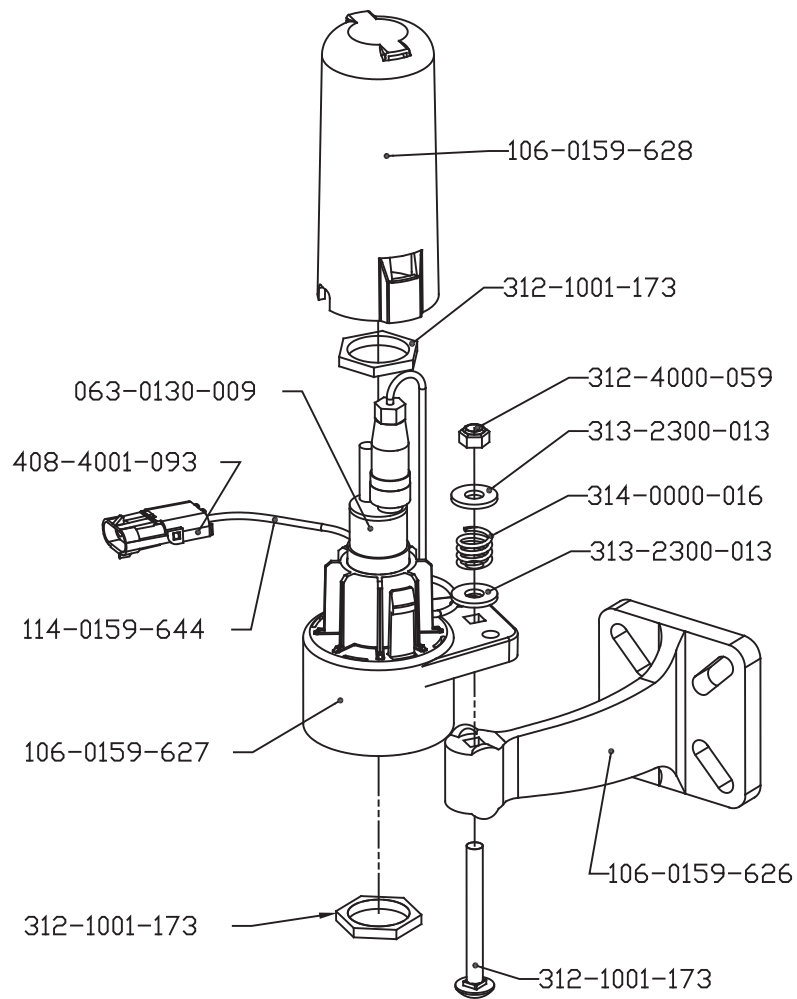
This section contains replacement part diagrams for the UltraGlide system. Please refer to these diagrams when calling to request replacement parts.

Valve



063-0131-126
VALVE, HYDRAULIC POWERGLIDE
PLUS/ULTRAGLIDE, OPEN CENTER, AUTOBOOM

Sensors



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RAVEN

RAVEN INDUSTRIES

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.

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?

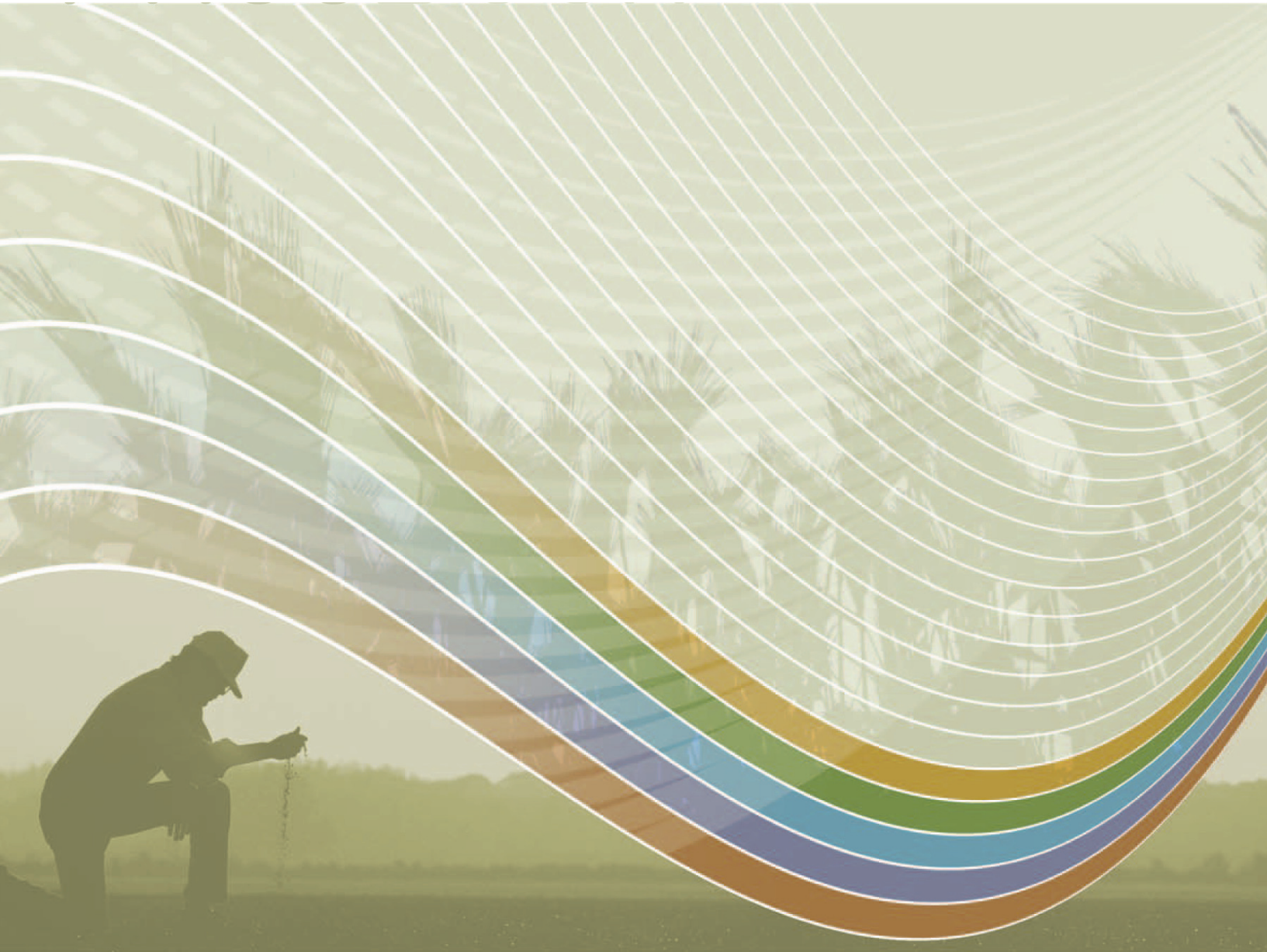
Raven Industries will not assume any expense or liability for repairs made outside our facilities without written consent. Raven Industries is not responsible for damage to any associated equipment or products and will not be liable for loss of profit or other special damages. The obligation of this 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.

R A V E N

Sprayer Specialties XLRD Contour Series
AutoBoom™ Installation Manual
(P/N 016-0230-089 Rev A 07/10 E16439)

Simply improving your position.SM



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