



UltraGlide

СНАРТЕК

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INTRODUCTION

Congratulations on your purchase of the Raven UltraGlide Autoboom system! This system is designed to provide worry-free operation of your hydraulically controlled booms. Once set up, your system is very easy to use and requires almost no attention. When you first install your system, it will need to be calibrated. It is important to make sure the machine is running at a sufficient engine speed so that the hydraulic pump is able to supply full flow to the system.



Important: For open center hydraulic models, all calibration procedures should be done at full engine RPM.

The following instructions are designed to assist you in the proper calibration of your UltraGlide system. Installation should be complete before calibrating the system. If you have any questions regarding the installation of the system, see the Autoboom Installation Manual for the specific machine you are using.



- **G. Left and Right Down Speed Adjustment dials -** Used to adjust the down speed for the left and right booms (in PowerGlide Plus mode only).
- **H. Sensitivity** Used to set how responsive the system is to height changes (in UltraGlide mode only).
- **I. Speed Dial** Used to adjust the overall speed of the system (in the UltraGlide mode only).
- J. Power 'On' Light Lights up when power is on.
- K. Serial Update Port RS232 serial port for system updates.



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Calibrating a System

Use this procedure if this is the first time you are calibrating the system or if the default settings have been restored.



Important: Be sure to have the boom unfolded and approximately 30" from the ground.

1. Turn the power switch to the 'On' position. The main screen displays with the word "CALIBRATE" flashing.:



2. Press Function Key 2 (Menu Button) to display the 'Configuration' menu screen.



3. Press Function Key 2 to calibrate the system.



4. The screen briefly displays "Initializing" while the system prepares for the automatic calibration process.



5. The "Calibrate System" screen displays. Press Function Key 1 (LCal) to start the automatic calibration of the left boom.





Important: The left boom will lift into the air and then fall. This is part of the calibration process. Use caution to be sure the area is clear of people or hardware before starting the process.

6. The left boom will indicate "CALing" on the screen. This indicates that the calibration process has begun.





Important: If the boom fails to calibrate, press Function Key 1 again to stop the calibration and see Appendix B for more information.

7. The left boom screen displays "CALd" when the left boom calibration process is complete. Press Function Key 4 (RCal) to start the calibration process for the right boom. The screen should flash

"CALing" next to the right boom.





Important: If the boom fails to calibrate, press Function Key 4 again to stop the calibration and see Appendix B for more information.

8. When the right boom calibration is finished the screen will display "Calibration Complete". Press any button to return to the main screen.





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SYSTEM OPERATION

UltraGlide Operation



Remember: Previous controllers are labeled "Up Speed" for system speed adjustments or "Reaction" for system sensitivity adjustment.

Dials



Speed Dial

The "Speed" dial controls the speed at which the booms rise or fall in UltraGlide mode. You may adjust the dial 'on the fly' as needed, using 0 as

the slowest speed and 10 as the fastest speed.



Remember: For hilly terrain, increase the "Speed" dial so that the booms will rise and fall faster.

Sensitivity Dial

The Sensitivity dial on the controller adjusts how quickly the system reacts to height settings. At 10, the system will react sooner to changes in height. At 0, the system will react slower. If the system seems to twitch or jump, the sensitivity may be set too high. Sensitivity can be adjusted at any time as needed, using 0 as the lowest sensitivity and 10 as the highest.

Buttons

Boom Height

The Boom Height buttons adjust the boom height and can only be used in UltraGlide mode.

To set spray height:

- 1. Determine the desired spray height (note any difference in height between the sensor and spray tip).
- 2. Press the Boom Height buttons until the desired height is displayed on the controller.



Start up

Once the system has been calibrated system, start up is as simple as turning on the controller and enabling the left and/or right boom via the controller or by pressing the boom down buttons on the joystick. When the system is first turned on, you should see a screen that looks similar to this:



On most systems you should also be able to 'tap' the left and right down boom controls on the tractor, sprayer panel, or joystick, to enable the automatic mode. Once you have done this, you should see a screen similar to this, with an 'A' on it to indicate the system is in automatic mode:



The up and down motion should be very smooth and not erratic. A good starting point for the Speed and Sensitivity dials is "2". If the boom starts to oscillate or acts otherwise unstable, this is an indication that either the "Speed Dial" or the "Sensitivity Dial" is set too high. Reducing the setpoint for either should improve performance. Once the Speed and Sensitivity dials are set, only minor adjustments are required to account for changing field conditions.

System Diagnostics

1. From the main screen press Function Key 3 (Diag) to go to the System Information screen. This screen displays the current left and right cylinder pressures and the current sensor height reading (not setpoint) above the ground or crop. The system information screen also allows the booms to be enabled or disabled.



2. Press Function Key 3 (Diag) from the System Information page to go to the Firmware screen. From this screen you can determine the current revision of firmware installed.



3. Press any button from the Firmware screen to return to the main screen.

Changing Boom Mode (PowerGlide Plus or UltraGlide)

- 1. Press Function Key 2 (Menu) from the main screen to return to the configuration menu.
- 2. Press Function Key 1 (SET BOOM MODE).



3. Press Function Key 1 (PowerGlide Plus). This will place the controller in the pressure mode and the ultrasonic sensors will no longer be used to control boom height.



- 4. A warning screen is displayed regarding the need to have gauge wheels installed and adjusted to prevent boom damage when entering PowerGlide Plus mode.
- 5. Press Function Key 1 (OK) to enable PowerGlide Plus mode.



6. After acknowledging the warning, the screen will display PowerGlide Plus mode.



PowerGlide Plus Operation

Left Down Dial

The Left Down dial adjusts the speed at which the left booms will fall. Turning the dial towards 10 makes the boom heavier, while turning the dial toward 0 makes the boom lighter.

Right Down Dial

The Right Down dial adjusts the speed at which the right booms will fall. Turning the dial towards 10 makes the boom heavier, while turning the dial toward 0 makes the boom lighter.



- PowerGlide Plus Setup Adjustments
- 1. To make setup adjustments to the PowerGlide Plus mode or to return to the UltraGlide mode, press Function Key 2 (Menu).



2. Press Function Key 3 (Press Mode Adj) to make setup adjustments to the PowerGlide Plus mode.



- 3. The Pressure Alarm screen allows for adjustment of the alarms. The default setpoints should be correct in most situations so no adjustment should be required. If adjustment is needed go to step 4. If not, go to step 5.
- 4. To adjust the left or right pressure alarm setpoints, first press Function Key 1 (left) or Function Key 4 (right) to select the pressure setpoint you would like to adjust.



5. Once either the left or right "Pressure Alarm" setpoint has been selected, the setpoint may be adjusted using Functions Keys 2 (-) or 3 (+) to decrease or increase the Alarm setpoint, if needed.



1. Press the "Menu" down button to go to the next screen.

Left Boom Down Speed Adjustment



2. The Left Boom Down Speed Adjustment screen appears. To make adjustments be sure that the left boom is disabled (Function Key 1 displays "LDis"). If Function Key 1 displays "LEna", then the boom is enabled. Press Function Key 1 to disable the left boom.

3. Press Function Key 4 to toggle the adjustment mode between the lightest and heaviest setpoints. Once the correct setpoint is selected, adjust the setpoint using Function Keys 2 (-) or 3(+).





Helpful Hint: By increasing the lightest value, the "zero" setting becomes lighter and by decreasing the heaviest value, the "ten" setting becomes heavier.

4. After making adjustments, the boom down speed can be tested by pressing the Function Key 1 to enable the left boom. The left boom down speed dial will now adjust the system pressure between the lightest setpoint (0 on the dial) and the heaviest setpoint (10 on the dial).





1. Press the "Menu" down button to go to the next screen.

Right Boom Down Speed Adjustment



2. Use the instructions from the Left Boom Down Speed Adjustment section to adjust the right boom down speed, using the right boom instead of the left and the appropriate Function Keys.



Helpful Hint: By increasing the lightest value, the "zero" setting becomes lighter and by decreasing the heaviest value, the "ten" setting becomes heavier.

Resetting Defaults



Important: In some situations it may be necessary to reset system defaults. Resetting the system defaults will erase all calibration settings and require the system to be recalibrated.

1. Press Function Key 4 (Reset Defaults) to reset the system.



2. The screen will show a warning. Press Function Key 1 to reset the system defualts. After pressing "OK", the system will sound the alarm four times to indicated that the default settings have been reset. Once the power is cycled the system will need to be calibrated. Go to the "Calibrating the System" section to recalibrate the system.



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SYSTEM TROUBLESHOOTING

Misc. Problems and Solutions

Problem 1: The booms won't enable. 'Automatic' mode won't come on when tapping left or right down on the joystick, but it will enable by pushing Function Keys 1 and 4 on the controller.

Solutions:

- 1. Check the interface wires at the solenoids for proper hook up: LUP = Yellow, LDN = Black, RUP = White/Yellow, RDN = White/Black.
- 2. The boom sense cable is not properly connected to the down coils on the valve stack.
- 3. The sprayer doesn't have down coils, so the only way to enable them is to use the Function Keys 1 and 4 on the UltraGlide controller.
- 4. Verify that there is 12 volts on the down coil wires. Use a volt meter to verify there is a voltage spike while the down switch is held down. It isn't necessary to have the machine running, but the key needs to be switched on.

Problem 2: The pressure alarm is always on.

Solutions:

1. Verify that the pressure transducer is plugged in and that the white dots on the transducer and plug are lined up as shown below.



2. Verify the pressure alarm settings in PowerGlide Plus mode. Refer to the 'Setting Pressure Alarms' section of the Calibration chapter and complete all steps.

Problem 3: The booms go up when enabling left or right and a 'U with a slash' appears on the monitor.

Solutions:

1. There may be a bad wire connection to the ultrasonic sensors at the main harness or at the sensors themselves.

A defective ultrasonic sensor.



Helpful Hint: If the sensor loses signal or power, the sensor is programmed to make the boom go up.

Problem 4: A hand under one boom sensor makes the other boom react.

Solutions:

- 1. The left and right ultrasonic sensor wires are reversed.
- 2. The proportional drivers on the valve are reversed.

Problem 5: The booms oscillate when standing still (UltraGlide mode).

Solutions:

- 1. The Speed dial is too high.
- 2. The Sensitivity dial is set too high.

Ultrasonic Tones and Alarms

Alarm tones will **NOT** sound if a user is in any of the configuration menus. However, the enable/disable beeps should always sound when appropriate.

Pressure Alarms (PowerGlide Plus Mode)

This alarm occurs if a pressure less than the alarm setpoint is detected for at least one second by the controller. This alarm is a steady tone and will sound for one second after the pressure rises above the setpoint. A 'P' is displayed on the screen for the boom side that is causing the alarm.

Pressure Sensor - Failure Alarm

This alarm occurs if a sensor is not detected by the controller and without intentional delay. This alarm is a steady tone and does not persist after the sensor is located. A 'P' with a slash through it is displayed on the screen for the boom side with the sensor failure.

Ultrasonic Sensor Alarms (UltraGlide Mode)

Ultrasonic Sensor - Too Low Alarm

This alarm occurs if the sensor is closer than 10 inches to the ground. After the sensor is within the 10 inches for 1/2 a second, the alarm will sound and stay on for approximately 3 seconds. This alarm tone is a fast tone, with 1/10 of a second on, 1/10 of a second off. A 'U' is displayed on the screen on the boom side with the alarm.

Ultrasonic Sensor - Too High Alarm

This alarm occurs if the sensor is higher than 65 inches from the ground. After the sensor is above 65 inches for 5 seconds, the alarm will sound and stay on for one second. This alarm tone is a slow tone, 1/10 of a second on, 3/4 of a second off. A 'U' is displayed on the screen on the boom side with the alarm.

Ultrasonic Sensor - Failure Alarm

This alarm occurs if a sensor is not detected by the controller and without intentional delay. This alarm is a steady tone and does not persist after the sensor is located. A 'U' with a slash through it is displayed on the screen for the boom side with the sensor failure.

Other Tones

When enabling the Autoboom (via keypad or joystick and in automatic mode) a single beep (1/2 a second long) will sound. When disabling the Autoboom, a double beep will sound.

Autoboom UltraGlide Calibration Guide

Notes:



MAIN HARNESS WIRING DIAGRAM

The following page shows the main harness wiring diagram. If you have questions, refer to the Troubleshooting chapter.

1 >	LT SOL AUTO +		(1)
34 >	lt sol auto -	BLACK 16 GA. (29A)	< 2
13>	GND	- CABLE1-SHIELD 20 GA. (11A)	
4 >	LT PRESS +	- CABLE1-RED 20 GA. (4A)	- (1)
8 >	LT PRESS -	- CABLE1-BLACK 20 GA. (7A)	< 2
11>	GND	- CABLE2-SHIELD 20 GA. (10A)	
6 >	LT PROP AMP SIG	- CABLE2-CLEAR 20 GA. (6A)	→ c
10>	LT PROP AMP -	- CABLE2-BLACK 20 GA. (9A)	→ в
5 >	LT PROP AMP +	- CABLE2-RED 20 GA. (5A)	-> A
27 >	GND	- CABLE4-SHIELD 20 GA. (23A)	
21 >	LT ULTRASONIC SIG	- CABLE4-CLEAR 20 GA. (17A)	K c
32 >-	LT ULTRASONIC -	- CABLE4-BLACK 20 GA. (27A)	-< в
15 >	LT ULTRASONIC +	- CABLE4-RED 20 GA. (13A)	-< A
77 >	GND		
28 >	RT ULTRASONIC SIG	- CARLEG_CLEAR 20 GA (24A)	
20 >	rt ultrasonic –		
01 ∕ 22 ∖	RT ULTRASONIC +		
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	DC POWER +	DED 18 CA (3A)	
- J /- - ZG \	DC POWER -	RED TO GA. (3A)	
- 00 	lt sol up sense	DEACK TO GA. (JTA)	
29 >	lt sol down sense		
30 >-	rt sol up sense		
25 >	rt sol down sense		
26 >	RT SOL AUTO +	— WHI/BLK 18 GA. (22A) —	
2 >	rt sol auto –		
35 >-	GND	BLACK 16 GA. (30A)	<del>K</del> 2
20 >	RT PRESS -	- CABLE3-SHIELD 20 GA. (16A)	
14 >-	RT PRESS +	- CABLE3-BLACK 20 GA. (12A)	-< 2
9 >	GND	- CABLES-RED 20 GA. (8A)	<del>K</del> 1
24 >	RT PROP AMP SIG	- CABLES-SHIELD 20 GA. (20A)	
17>	RT PROP AMP -	- CABLE5-CLEAR 20 GA. (15A)	+ <b>&gt;</b> c
23 >-		- CABLE5-BLACK 20 GA. (19A)	+> В
16>		- CABLE5-RED 20 GA. (14A)	$\downarrow \land \land$

#### **A P P E N D I X**

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# MANUAL SETTINGS CALIBRATION

The following instructions show the manual settings calibration process. Not all sprayers may calibrate correctly using the automatic settings calibration procedure. In these circumstances, it will be required to manually adjust the speed and sensitivity settings necessary for proper calibration by following the instructions below.

1. Press Function Key 2 to enter manual settings calibration.



- 2. Adjust the Speed dial to approximately "2".
- 3. Adjust the Sensitivity dial to approximately "1 1/2".
- 4. To begin calibrating the left boom, press Function Key 1. The left boom status should now flash "CALing".



**Helpful Hint:** If the booms are too responsive or react to quickly, try decreasing the speed and/or sensitivity settings slowly. If the booms are not responsive enough, increase the speed and/or sensitivity settings slowly. The up and down motion of the booms should be smooth and not erratic.

- 5. Once the left boom has finished calibrating and "CALd" is displayed, repeat the procedure for the right boom.
- 6. When the right boom calibration is complete, the screen will then display "Calibration Complete". Press any button to return to the main screen.



# **RAVEN INDUSTRIES**

# LIMITED WARRANTY

#### WHAT IS COVERED?

This warranty covers all defects in workmanship or materials in your Raven Flow Control Product under normal use, maintenance, and service.

#### HOW LONG IS THE COVERAGE PERIOD?

This warranty coverage runs for 12 months from the purchase date of your Raven Flow Control Product. This warranty coverage applies only to the original owner and is not transferrable.

#### HOW CAN YOU GET SERVICE?

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

#### WHAT WILL RAVEN INDUSTRIES DO?

When our inspection proves the warranty claim, we will, at our option, repair or replace the defective part and pay for return freight.

#### WHAT DOES THIS WARRANTY NOT COVER?

Raven Industries will not assume any expense or liability for repairs made outside our plant without written consent. We are not responsible for damage to any associated equipment or product 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 is authorized to assume for us any liability. Damages caused by normal wear and tear, mis-use, abuse, neglect, accident, or improper installation and maintenance are not covered by this warranty.

UltraGlide Autoboom Calibration Manual (P/N 016-0130-030 Rev B 10/06)



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