

CHAPTER

6

AutoBoom Control Console Calibration and Operation

Introduction

Console Updates

Software updates are periodically available for the AutoBoom controller on the Raven website. Go to:

<http://www.ravenprecision.com/Support/index2.jsp>

1. Select **Software** from the left side of the screen under the Support heading.
2. Select **Boom Controls**.
3. Select **AutoBoom**.
4. Select **More...** next to the AutoBoom - Console software.
5. Follow the steps outlined in the procedure for updating AutoBoom control consoles.

Console Navigation

To select one of the menu options at the bottom of the AutoBoom control console, select the button directly below the desired menu option.

Note: *The blue “power” button on the AutoBoom control console is multi-functional. It is not only used to power on/off the console, but also select the menu option listed directly above the button. To use the power button as a navigation button, momentarily depress the button. To use the button to power on/off the console, press and hold the button for 5 - 10 seconds.*

Advanced Setup Tools

Advanced setup tools allow fine-tuning of stability control, minimum boom pressure, and sensor height offset parameters in the AutoBoom system. To access these tools, select **Setup** from the Main Menu, then select **Next** three times.

```

->CT RACK: CTRL OFF
   CT RACK: DISABLED

NEXT   PREV   TOGGLE

```

- **Center Rack Control** - Turns the center rack control on and off. Selecting Center Rack Control ON allows center rack control to be enabled on the field computer/console or the machine's switch. If Center Rack Control OFF is selected, center rack control cannot be used.

```

->STABILITY           20
  MIN PRESSURE %     65
  OUTER SENSORS     ENA
NEXT   PREV   ENTER

```

- **Stability Factor** - Allows fine-tuning of the rigidity of the machine's center rack. The default value of 20 is recommended for machines with a rigid center rack. A value of 5 - 14 is recommended for machines with center racks that float freely. Adjust this value as needed to prevent boom oscillation.
 - Stability settings of 0 disable the stability control completely, making the left and right booms completely independent of each other. When above target, the control of both booms is accelerated to increase the down speed. This setting is useful for machines that have a rigid center rack.
 - Stability settings of 1 - 99 will adjust the stability of the center section. Lower numbers cause the opposing boom that is not being controlled to counteract the movement of the controlled boom by raising to balance or stabilize the center section and to prevent undesired rotation or movement. While lower numbers allow the booms to react at the same rate and time, low settings may prevent the booms from lowering. Higher stability settings allow the booms to react independently from each other, but may cause the center section to oscillate, diminishing performance.
- **Min Pressure %** - Sets a low limit pressure, preventing the boom pressure from falling below a percentage of static pressure, overriding the control when necessary to maintain a low limit of pressure on each boom. Minimum Pressure % also prevents the booms from resting on the stops in travel-limited booms.
- **Outer Sensors (UltraGlide Only)** - Allows the operator to disable outer boom sensors if the machine is equipped with optional inside boom sensors. This feature is useful when the outer boom tips are folded in, and only the inside boom sensors are needed for control.

Note: *The system must be re-calibrated if the outer sensors option is disabled, then re-enabled.*

```

->OUT HT OFFSET 0
   IN HT OFFSET 0
   CTR HT OFFSET 0
NEXT   PREV   ENTER
    
```

- **Height Offsets (Outer, Inner, and Center)** - Allows sensor heights to be adjusted according to the sensor mounting location. Enter a positive value if the sensors are mounted above the sprayer tips, and a negative value if the sensors are mounted below. Refer to the Sensor Height Offsets section on page 97 for more information.

```

->MANUAL DN SPEED 0
   MANUAL UP SPEED 0
   PWM FREQUENCY 60
NEXT   PREV   ENTER
    
```

- **Manual Dn Speed and Manual Up Speed** - Allows the speed at which the AutoBoom hydraulic valve manually raises and lowers the booms to be adjusted on machines that do not have their own hydraulic control. Since most machines are equipped hydraulically to control boom functions, the default setting is 0.

```

->UNITS: US--PSI/IN
   AUDIBLE ALARM: ENA
   MODE: ULTRAGLIDE
NEXT   PREV   TOGGLE
    
```

- **Units** - Allows the operator to select the desired units of measure.

Diagnostic Tools

Integrated diagnostic tools allow the status of all AutoBoom inputs and outputs to be viewed on the AutoBoom control console display. To access these tools, select **SETUP** from the Main Menu, select **Next** three times, then select **DIAG**.

Note: The information contained in the following screens are only examples.

Screen 1

```

PSI:  2268      3000
H 20   21   25   21  20
P100% B100 P100% B10
EXIT  MANUAL  MORE
    
```

Screen 2 (More)

```

L:R0 L0 U0 P 0% B69%
R:R0 L0 U0 P 0% B69%
C:R0 L0 V0 CTR IDLE
EXIT  MANUAL  PREV
    
```

Screen 1

- The first line indicates the left and right pressure readings on the AutoBoom valve.
- The second line Indicates the height readings of the ultrasonic sensors (from left to right).



- The “P” in the third line indicates the PWM cycle of the proportional control valve. The “B” indicates the base PWM percentage (the controller’s calculation of the static duty cycle required to hold the boom level).

Screen 2

- The first and second lines indicate inputs and outputs on the left and right booms, respectively. The “R” indicates the raise switch input, followed by ‘0’ for off and ‘1’ for on. The “L” indicates the lower switch input. the “U” indicates the unfold proximity switch (if equipped).
- The third line indicates the inputs and outputs of the center rack. The “V” indicates the center rack 2-speed valve inputs (if equipped). V0 is displayed on the screen when the valve is off, and V1 indicates the valve is on.
- Manual boom control can be used to troubleshoot wiring or hydraulic issues by using the AutoBoom valve for raising and lowering functions, and the machine’s valve for center rack functionality (if the machine is equipped with center rack control cabling).

Alarms

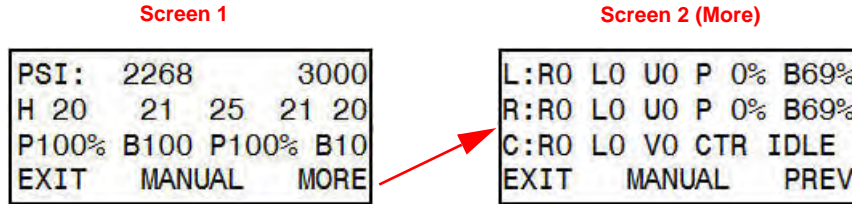
Alarm tones will not sound if the operator is navigating through any of the configuration menus. However, the enable/disable alarms will always sound when appropriate.

- **Pressure Alarms (PowerGlide Plus mode only)** - The pressure alarm occurs if the pressure is detected at a level lower than the alarm set point. The pressure alarms is a steady tone, and will continue to sound for one second after the pressure rises above the set point.
- **Proximity alarm (if equipped)** - The proximity alarm occurs if a boom is not completely folded but is enabled. The boom will be disabled after five seconds.
- **Check AutoBoom high current voltage alarm** - This alarm occurs if the node senses a low voltage supply to the node. Check the power and ground wiring to the node.
- **Pressure sensor failure alarms** - The pressure sensor failure alarm occurs immediately when a pressure sensor is not detected. The alarm is a steady tone, and will stop immediately after the sensor is located.
- **Ultrasonic sensor - too low alarm (UltraGlide mode only)** - This alarm occurs if the ultrasonic sensor is closer than ten inches to the ground for 1/2 a second. The alarm will continue to sound for three seconds.
- **Ultrasonic sensor - too high alarm (UltraGlide mode only)** - This alarm occurs when the ultrasonic sensor is higher than 65 inches from the ground for five seconds. The alarm will continue to sound for one second.
- **Ultrasonic sensor - failure alarm (UltraGlide mode only)** - This alarm occurs immediately when an ultrasonic sensor is not detected. The alarm is a steady tone, and will stop immediately after the sensor is located.
- **Boom unfold alarm** - This alarm applies only to machines that are equipped with proximity sensors. The alarm will occur if the operator tries to enable AutoBoom with the booms folded. It may also occur if the center sensor is greater than 60 inches off the ground, or it does not receive an echo from the ground.
- **Other tones** - When enabling the AutoBoom system in automatic mode via the machine’s boom control functions or switches, a single beep will occur. When disabling AutoBoom, a double beep will sound.

AutoBoom Pre-Calibration Diagnostics

While every effort has been made to properly label and document connections for the hydraulic and electrical components of the AutoBoom system, boom function connections may not be identified due to changes in the make and model of the machine. This makes it especially important to trace the hoses from the connection points and verify the electrical connections are correct to ensure proper AutoBoom system operation. In order to verify connections, it is necessary to perform a pre-calibration diagnostic test.

6. Select **SETUP** from the Main Menu.
7. Select **Next** three times.
8. Select **DIAG**. The following screen will appear:



9. Verify that the following components on the AutoBoom console screen are displayed correctly and change when raising and lowering the booms via the machine's controls:
 - Pressures
 - Sensor heights
 - Right and left raise/lower functions
 - Center raise/lower functions
 - Fold/unfold functions

PowerGlide Plus

The PowerGlide Plus AutoBoom system uses gauge wheels to maintain optimum boom height, while state-of-the-art hydraulics maintain constant hydraulic pressure to the tilt cylinders. PowerGlide Plus systems are typically used in pre-emergence applications.

Note: *Terrain conditions and the machine's hydraulic system dictate the actual speeds that can be achieved during application with an engaged AutoBoom system. Typically, rougher and varied terrain require slower speeds while AutoBoom is enabled.*

Calibration

After the AutoBoom installation is complete, it is necessary to calibrate the computer and vehicle before use. AutoBoom calibration requires pressure in the machine's cylinders and enough boom travel to allow the system to find the system base duty cycles for operation. Booms must be free to travel 10" up or down without reaching the tops or bottoms of the cylinder stops.



During calibration and operation, it is important to keep the machine running at a sufficient RPM so that the hydraulic pump is able to supply a full flow to the hydraulic system.

Note: *If the machine has an open center hydraulic system, or the type of hydraulic system is unknown, all calibration procedures should be performed with the machine operating at the normal operating engine RPM.*

1. Press the left button on the front of the AutoBoom control console to power on the system.

```
CAL POWERGLIDE PLUS
->CAL (REQUIRED)
PWM FREQUENCY 60
NEXT MANUAL BEGIN
```

2. Verify that the booms are unfolded, and lower the center rack so that the wheels are approximately six inches from the ground.

Note: *If the booms do not go over center or are travel-limited, raise the booms so that the boom tips are approximately ten inches above the horizontal position and lower the center section slightly below the normal spraying height.*

3. Select **BEGIN**.

Note: *The calibration process may take several seconds to complete. "Calibrating" will flash, indicating that calibration is in progress. If the boom fails to calibrate, select **STOP** and refer to Chapter 7, Troubleshooting on page 103. Once the boom calibration is complete, the following screen will appear:*

```
CAL POWERGLIDE PLUS
SYSTEM CALIBRATED
NODE S/N 1004
EXIT RESET DIAG
```

4. Select **EXIT**.

Center Rack Control Calibration (If Equipped)

There are many different valve configurations used to control the machine's center rack functions. The AutoBoom system must "learn" which of the machine's solenoids are used to raise and lower the booms. Complete the following steps to calibrate the center rack control feature after the individual booms have been calibrated.

1. Press and hold the center rack raise button on the machine's control panel or joystick for six seconds so that the center rack raises.

Note: *The center rack may reach the upper limit of travel during this time, but continue holding the button until the full six seconds has passed.*

2. Press and hold the center rack lower button on the machine's control panel or joystick for six seconds so that the center rack lowers.

Note: *The center rack may reach the lower limit of travel during this time, but continue holding the button until the full six seconds has passed.*

Routine Operation

Joystick Functions

- When AutoBoom control is on, control of each boom can be enabled or disabled via the AutoBoom console or by tapping the sprayer's switch functions (if equipped).

Note: *Pressing the down function for longer than 1/2 a second will switch the function to manual control. The operator must tap the down function to enable Autoboom.*

- A single up-tap sprayer's switch functions disables AutoBoom on that boom.
- A single down-tap sprayer's switch functions enables AutoBoom on that boom.
- The fast-down feature (double-tap down) is used to quickly lower the booms when the pressure setting is set to a higher setting, which causes the booms to lower slowly.
 - On machines with one proportional valve (square coils on the AutoBoom valve), a double-tap up will raise both booms slightly. A double-tap down will lower both booms quickly, and AutoBoom will re-engage to the set pressure setting.
 - On machines with two proportional valves (round coils on the AutoBoom valve), a double-tap up on the inside boom will raise only that boom slightly. A double-tap down will lower the one boom quickly, and AutoBoom will re-engage to the set pressure setting.

Enabling AutoBoom via the AutoBoom Console

When AutoBoom control is on, control of each boom can be enabled or disabled via the AutoBoom console or by pressing the **LT-BM** or **RT-BM** buttons or by tapping the sprayer's switch functions (if equipped).

Note: *Pressing the down function for longer than 1/2 a second will switch the function to manual control. The operator must tap the down function to enable AutoBoom.*

Center Rack Control (AutoBoom Enabled and Center Rack Control On) - If Equipped

Note: *The machine may require the activation of a boom valve and/or master spray switch for the center rack control feature to engage.*

Note: *Consecutive up-taps or down-taps must be performed within 1.5 seconds of each other.*

Note: *Return to height and return to transport heights are measurements relative to the crop canopy, not necessarily ground level.*

- **Center Down Switch** - A single down-tap will lower the center rack to the desired spray height, enable the center rack, and enable both booms.
- **Center Up Switch** - A single up-tap will disable the center rack and both booms. Two consecutive up-taps will raise the center rack to the desired transport height. Four consecutive up-taps will raise the center rack to the maximum height, turn AutoBoom off, and preserve the new transport height as the maximum height.
 - Set a lower transport height - While the center rack is returning to transport, down-tap once on the center switch when the new transport height is reached.

- Set the transport height to the maximum height - With the center rack positioned higher than the current transport height and with AutoBoom not currently returning to the transport height, up-tap twice on the center switch to move the center rack to the maximum height.

Center Rack Control (AutoBoom Enabled and Center Rack Control Off) - If Equipped

Note: *The machine may require the activation of a boom valve and/or master spray switch for the center rack control feature to engage.*

Note: *Consecutive up-taps or down-taps must be performed within 1.5 seconds of each other.*

Note: *Return to height and return to transport heights are measurements relative to the crop canopy, not necessarily ground level.*

- **Center Down Switch** - Two consecutive down-taps will lower the center rack to the desired spray height and enable both booms.

Note: *Center rack control will not be enabled since center rack control is off.*

- **Center Up Switch** - Two consecutive up-taps will disable both booms and raise the center rack to the desired transport height. four consecutive up-taps will raise the center rack to the maximum height and turn AutoBoom off, preserving the new transport position as the maximum height.
 - Set a lower transport height - While the center rack is returning to transport, down-tap once on the center switch when the new transport height is reached.
 - Set the transport height to the maximum height - With the center rack positioned higher than the current transport height and with the AutoBoom not currently returning to the transport height, up-tap twice on the center switch to move the center rack to the maximum height.

System Adjustments

During the calibration process, the AutoBoom system calculates a default Pressure Setting. Normally, the calculated value will be the level at which the machine should operate. However, at times an adjustment to the Pressure Setting may be necessary.

Note: *During routine operation, the gauge wheels should touch down momentarily, raise slightly, then lower back to the target height. Wheels should not continuously ride on the ground.*

LT:DISABLED	HT: 30IN
RT:DISABLED	
CENTER HEIGHT:	28 IN
SETUP	LT-BM RT-BM

1. Select LT-BM to enable the left boom.
2. Select RT-BM to enable the right boom.
1. Select SETUP.
2. Select ENTER.
3. Exit the cab and physically lift the end of each boom up, watching the responsiveness of the booms.

Note: *The force required by the operator to lift the boom should never exceed 200 lbs.*


```
->HEIGHT SETTING 30
  SENSITIVITY    15
  SPEED          25
INC      DEC      ENTER
```

4. Select INC or DEC to adjust the Pressure Setting of each boom as needed to optimize performance.
 - Increasing the Pressure Setting makes the boom lighter and reduces down speed.
 - Decreasing the Pressure Setting makes the boom heavier and increases the down speed.
5. Select ENTER.
6. Select PREV to return to the AutoBoom Main Menu.

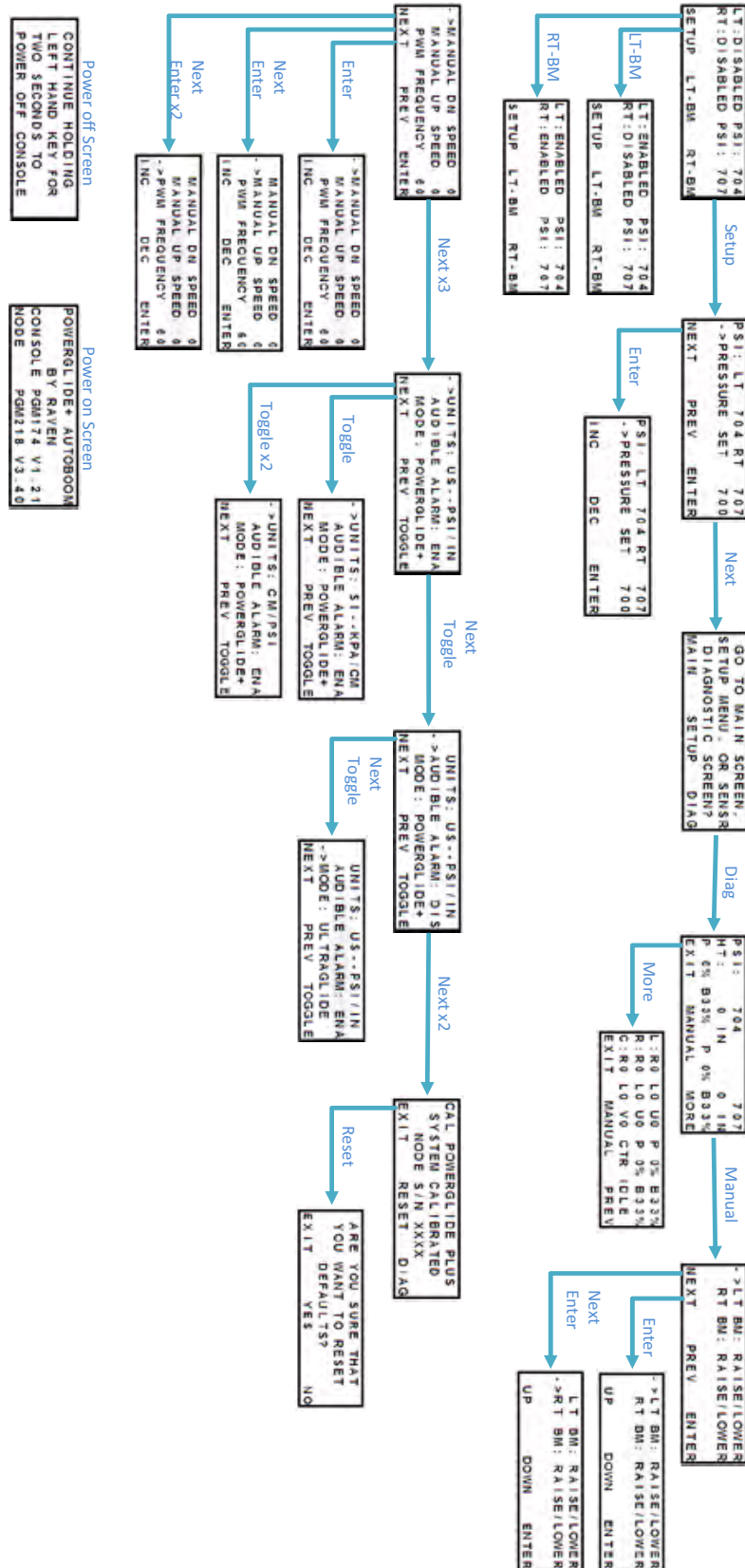
Resetting Defaults

Although it is not normally necessary, there may be circumstances under which it may be necessary to reset the system defaults. Resetting the defaults erases all AutoBoom settings and adjustments that have been performed. System calibration will be required after the defaults have been reset.

```
CALIBRATE ULTRAGLIDE
SYSTEM CALIBRATED
  NODE S/N  XXXX
EXIT   RESET  DIAG
```

1. Refer to the PowerGlide Plus Menu Navigation flow chart on the following page to navigate to the screen shown above.
2. Select **RESET** to reset the AutoBoom settings.

PowerGlide Plus Menu Navigation



UltraGlide

The UltraGlide AutoBoom system uses ultrasonic sensors to measure the boom's height above ground, and state-of-the-art hydraulics to maintain constant hydraulic pressure to the tilt cylinders. The UltraGlide AutoBoom system is ideal for use in pre-emergence and post-emergence applications.

Note: *Terrain conditions and the machine's hydraulic system dictate the actual speeds that can be achieved during application with an engaged AutoBoom system. Typically, rougher and varied field terrain require slower speeds while AutoBoom is enabled.*

Calibration

After the AutoBoom installation is complete, it is necessary to calibrate the computer and vehicle before use. AutoBoom calibration requires pressure in the machine's cylinders and enough boom travel to allow the system to find the system base duty cycles for operation. Booms must be free to travel 10" up or down without reaching the tops or bottoms of the cylinder stops.

During calibration and operation, it is important to keep the machine running at a sufficient engine RPM so that the hydraulic pump is able to supply a full flow to the hydraulic system.

Note: *If the machine has an open center hydraulic system, or the type of hydraulic system is unknown, all calibration procedures should be performed with the machine operating at the normal operating engine RPM.*

Important: *Be sure that the area is clear of people and obstructions before beginning the calibration process.*

1. Move the machine to a flat area.
2. Verify that AutoBoom is turned on.
3. Verify that the booms are unfolded, and lower the center rack so that the wheels (if equipped) are approximately six inches from the ground.

Note: *If the booms do not go over center or are travel limited, raise the booms so that the wheels are approximately ten inches above the horizontal position and lower the center section to approximately 20 inches.*

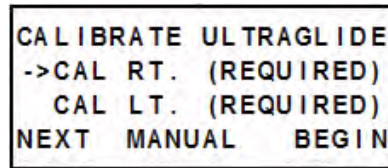
4. Verify the vertical sensor height offset settings in the AutoBoom console relative to the spray tip to sensor position.
 - Positive offsets indicate the sensor surface is located above the nearest spray tips.
 - Negative offsets indicate the sensor surface is located below the nearest spray tips.
 - Inner, outer, and center offsets are not required to be the same across the width of the machine, but they must be correctly measured relative to the spray tips.
5. Lower the center rack section to approximately 20 inches.

Note: *If the machine is equipped with a center sensor, the center rack height can be verified through the main menu or diagnostics screen in AutoBoom section of the AutoBoom console.*

6. Raise the boom tips to approximately the target height.

Note: *The default target height is 30 inches. Verify that the booms are not fully raised to the boom stops. If gauge wheels are installed, the setting must be adjusted to 40 - 45 inches to prevent the wheels from touching the ground during system calibration.*

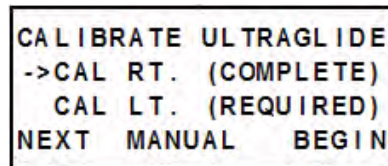
7. Press the left button on the front of the AutoBoom control console to power on the system.



CALIBRATE ULTRAGLIDE
->CAL RT. (REQUIRED)
CAL LT. (REQUIRED)
NEXT MANUAL BEGIN

8. Select **BEGIN**.

Note: The calibration process may take several seconds to complete. “Calibrating Right” will flash, indicating that calibration is in progress and the right boom will raise into the air and fall. If the boom fails to calibrate, select **STOP** and refer to Chapter 7, Troubleshooting on page 103. Once the boom calibration is complete, the following screen will appear:



CALIBRATE ULTRAGLIDE
->CAL RT. (COMPLETE)
CAL LT. (REQUIRED)
NEXT MANUAL BEGIN

9. Select **NEXT** to advance to the left boom, then select **BEGIN**.
10. Select **EXIT** once the AutoBoom system is finished calibrating the left boom.

Center Rack Control Calibration

There are many different valve configurations used to control the machine’s center rack functions. The AutoBoom system must “learn” which of the machine’s solenoids are used to raise and lower the booms. Complete the following steps to calibrate the center rack control feature after the individual booms have been calibrated.

1. Press and hold the center rack raise button on the machine’s control panel or joystick for six seconds so that the center rack raises.

Note: The center rack may reach the upper limit of travel during this time, but continue holding the button until the full six seconds has passed.

2. Press and hold the center rack lower button on the machine’s control panel or joystick for six seconds so that the center rack lowers.

Note: The center rack may reach the lower limit of travel during this time, but continue holding the button until the full six seconds has passed.

Routine Operation

Joystick Functions

- When AutoBoom control is on, control of each boom can be enabled or disabled via the AutoBoom console or by tapping the sprayer's switch functions (if equipped).

Note: *Pressing the down function for longer than 1/2 a second will switch the function to manual control. The operator must tap the down function to enable Autoboom.*

- A single up-tap on the sprayer's switch functions disables AutoBoom on that boom.
- A single down-tap on the sprayer's switch functions enables AutoBoom on that boom.
- The fast-down feature (double-tap down) is used to quickly lower the booms when the pressure setting is set to a higher setting, which causes the booms to lower slowly.
 - On machines with one proportional valve (square coils on the AutoBoom valve), a double-tap up will raise both booms slightly. A double-tap down will lower both booms quickly, and AutoBoom will re-engage to the set pressure setting.
 - On machines with two proportional valves (round coils on the AutoBoom valve), a double-tap up on the inside boom will raise only that boom slightly. A double-tap down will lower the one boom quickly, and AutoBoom will re-engage to the set pressure setting.

Enabling AutoBoom via the AutoBoom Console

When AutoBoom control is on, control of each boom can be enabled or disabled via the AutoBoom controller console or by pressing the **LT-BM** or **RT-BM** buttons or by tapping the sprayer's switch functions (if equipped).

Note: *Pressing the down function for longer than 1/2 a second will switch the function to manual control. The operator must tap the down function to enable AutoBoom.*

```
LT:DISABLED HT: 30IN
RT:DISABLED
CENTER HEIGHT: 28 IN
SETUP LT-BM RT-BM
```

1. Select LT-BM from the AutoBoom controller Main Menu. The following screen will appear:

```
LT:ENABLED HT: 30IN
RT:DISABLED
CENTER HEIGHT: 28 IN
SETUP LT-BM RT-BM
```

2. Select RT-BM from the AutoBoom controller Main Menu to enable the right boom.

Center Rack Control (AutoBoom Enabled and Center Rack Control On)

Note: *The machine may require the activation of a boom valve and/or master spray switch for the center rack control feature to engage.*

Note: *Consecutive up-taps or down-taps must be performed within 1.5 seconds of each other.*

Note: *Return to height and return to transport heights are measurements relative to the crop canopy, not necessarily ground level.*

- **Center Down Switch** - A single down-tap will lower the center rack to the desired spray height, enable the center rack, and enable both booms.
- **Center Up Switch** - A single up-tap will disable the center rack and both booms. Two consecutive up-taps will raise the center rack to the desired transport height. Four consecutive up-taps will raise the center rack to the maximum height, turn AutoBoom off, and preserve the new transport height as the maximum height.
 - Set a lower transport height - While the center rack is returning to transport, down-tap once on the center switch when the new transport height is reached.
 - Set the transport height to the maximum height - With the center rack positioned higher than the current transport height and with AutoBoom not currently returning to the transport height, up-tap twice on the center switch to move the center rack to the maximum height.

Center Rack Control (AutoBoom Enabled and Center Rack Control Off)

Note: *The machine may require the activation of a boom valve and/or master spray switch for the center rack control feature to engage.*

Note: *Consecutive up-taps or down-taps must be performed within 1.5 seconds of each other.*

Note: *Return to height and return to transport heights are measurements relative to the crop canopy, not necessarily ground level.*

- **Center Down Switch** - Two consecutive down-taps will lower the center rack to the desired spray height and enable both booms.

Note: *Center rack control will not be enabled since center rack control is off.*

- **Center Up Switch** - Two consecutive up-taps will disable both booms and raise the center rack to the desired transport height. Four consecutive up-taps will raise the center rack to the maximum height and turn AutoBoom off, preserving the new transport position as the maximum height.
 - Set a lower transport height - While the center rack is returning to transport, down-tap once on the center switch when the new transport height is reached.
 - Set the transport height to the maximum height - With the center rack positioned higher than the current transport height and with the AutoBoom not currently returning to the transport height, up-tap twice on the center switch to move the center rack to the maximum height.

Operating the UltraGlide AutoBoom System in PowerGlide Plus Mode (Square Coils on the AutoBoom Valve)

The UltraGlide AutoBoom system is also capable of operating in the PowerGlide Plus mode. In addition to the AutoBoom valve modification listed below, a gauge wheel kit is required for the system to operate in the PowerGlide Plus mode. For available kits and ordering information, contact your local Raven dealer

Complete the following steps to convert the UltraGlide AutoBoom valve to the PowerGlide Plus Mode.

FIGURE 1. Needle Valves on the UltraGlide AutoBoom Valve



1. Locate the needle valves in Ports RT and LF on the AutoBoom valve.
2. Loosen the jam nuts on the needle valves.
3. Use an Allen wrench to turn the set screws counter-clockwise until they won't move any further.
4. Tighten the jam nuts.

Note: When converting the AutoBoom system back to UltraGlide, the needle valves must be screwed all the way back in (clockwise).

```

GO TO MAIN SCREEN,
SETUP MENU, OR SENSR
DAIGNOSTIC SCREEN?
MAIN  SETUP  DIAG
    
```

5. Select SETUP, then NEXT three times until the screen shown above appears.
6. Select SETUP.
7. Select NEXT several times until the following screen appears:

```

->UNITS: US--PSI/IN
AUDIBLE ALARM: ENA
MODE: ULTRAGLIDE
NEXT  PREV  TOGGLE
    
```

8. Select TOGGLE to switch the mode from UltraGlide to PowerGlide Plus.
9. Select YES confirm the mode change.
10. Select NEXT.
11. Select MAIN to return to the Main Menu.

Note: When converting the AutoBoom system back to UltraGlide, the Viper Pro must be reprogrammed to run in the UltraGlide mode.



Operating the UltraGlide AutoBoom System in PowerGlide Plus Mode (Round Coils on the AutoBoom Valve)

Before populating the hydraulic fittings on the AutoBoom valve, it is necessary to remove orifice fittings from the valve in the PowerGlide Plus system. Failure to remove these fittings from the valve will restrict the down speed of the booms when the system is enabled.

FIGURE 2. Port 3A and 3B Location



1. Locate Ports 3A and 3B on the AutoBoom valve.

FIGURE 3. Coil Removed from the AutoBoom Valve



2. Remove the coils from the solenoids near Ports 3A and 3B to gain easy access to those ports.

FIGURE 4. Port Plugs Removed from the AutoBoom Valve



3. Use an Allen wrench to remove the plugs from Ports 3A and 3B.

FIGURE 5. Orifice Fitting Removed from the AutoBoom Valve



Orifice Fitting
Removed - Keep for
Future Use

4. Remove the orifice fittings from Ports 3A and 3B.

Important: *Tip the AutoBoom valve on its side and use the Allen wrench to remove the orifice from the cavity, taking care not to let the fitting fall into the valve.*

FIGURE 6. Port Plug Reinstalled on the AutoBoom Valve



5. Use the Allen wrench to reinstall the port plugs on Ports 3A and 3B of the AutoBoom valve.

FIGURE 7. Coil Reinstalled on the AutoBoom Valve



6. Reinstall the coils on the solenoids of the AutoBoom valve.

Note: When converting the AutoBoom system back to UltraGlide, the orifice fittings must be reinstalled.

```
GO TO MAIN SCREEN,  
SETUP MENU, OR SENSR  
DAIGNOSTIC SCREEN?  
MAIN  SETUP  DIAG
```

7. Select SETUP, then NEXT three times until the screen shown above appears.
8. Select SETUP.
9. Select NEXT several times until the following screen appears:

```
->UNITS: US--PSI/IN  
AUDIBLE ALARM: ENA  
MODE: ULTRAGLIDE  
NEXT  PREV  TOGGLE
```

10. Select TOGGLE to switch the mode from UltraGlide to PowerGlide Plus.
11. Select YES confirm the mode change.
12. Select NEXT.
13. Select MAIN to return to the Main Menu.

Note: When converting the AutoBoom system back to UltraGlide, the AutoBoom controller must be reprogrammed to run in the UltraGlide mode.

System Adjustments

Note: *AutoBoom must be enabled after both booms have been calibrated in order to make system adjustments.*

```
LT:DISABLED HT: 30IN
RT:DISABLED
CENTER HEIGHT: 28 IN
SETUP  LT-BM  RT-BM
```

1. Select SETUP. The following screen will appear:

```
->HEIGHT SETTING 30
  SENSITIVITY    15
  SPEED          25
INC      DEC    ENTER
```

2. Select INC or DEC to change the setting to the desired value.
3. Select ENTER.
4. Select NEXT or PREV to adjust the next setting.
5. Repeat the steps above until all of the settings are adjusted as desired.

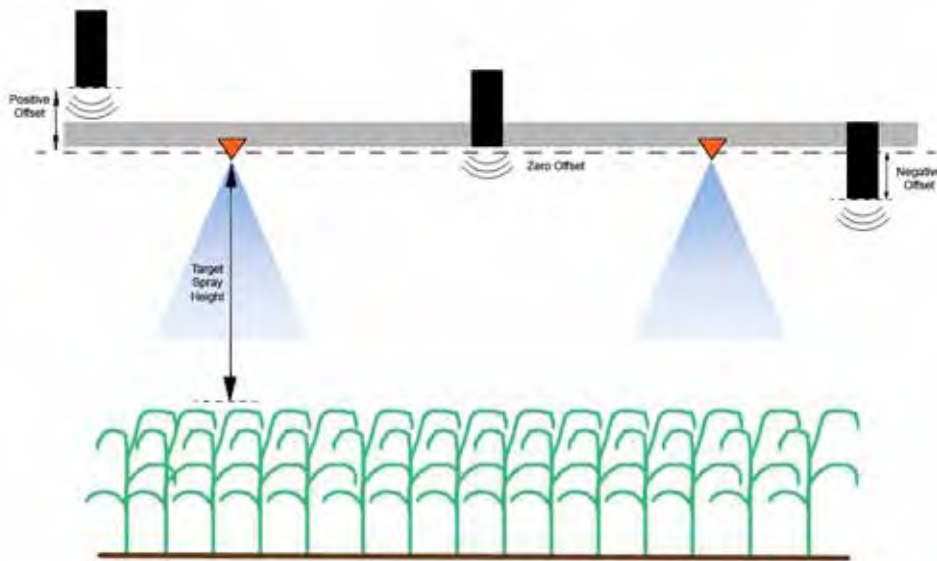
Ultrasonic Sensor Height Offsets

Ultrasonic sensor height offset adjustments are used to compensate for the difference between the height of the sensor surface and the height of the spray tip. The offset height is calculated by measuring the distance from the bottom of the sensor to the height of the crop, measuring the distance between the spray tip to the

height of the crop, and then subtracting the spray tip distance from the sensor distance. Refer to the diagram below to determine whether the offset value should be positive or negative.

Note: *The maximum offset height value is 20 inches.*

Note: *Ultrasonic sensors will react to the first object that reflects an echo, whether it is the ground or the crop. For row-crop situations, it may be beneficial to adjust the sensor positions to directly over a row, or add additional boom sensors.*



Note: *On machines with travel-limited booms, center sensor height offsets may need to be entered as less than the measured value from the sensor to the ground to ensure the boom cylinders have sufficient pressure during operation.*

Sensitivity

1. Place one hand at ground level below one boom sensor and raise it slowly (about one foot per second) to within 12 inches of the sensor surface.

Note: *The boom should react immediately and raise at approximately the same speed as your hand.*

2. Adjust the Sensitivity setting as needed to make the boom more or less reactive to hand motions.

Note: *The default setting is 15. If the Sensitivity is too high, the boom will appear unstable and jittery, reacting to slight changes in target height or crop movement. The typical Sensitivity setting that works best for most machines is 13 - 17. During routine operation, AutoBoom should be unresponsive to changes in height of 2" - 3", but should react quickly to changes of 5" or more.*

For row-crop situations, or when crop conditions are sparse and not fully covering the ground, it may be beneficial to decrease the sensitivity so the boom is less reactive to sudden changes in crop height, and less likely to cause sudden movements that diminish performance.

Speed

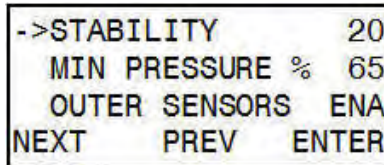
The Speed setting controls how fast the boom will move away from an obstacle, and how much the boom overshoots the target height. The Speed setting should be set so that the boom motion is smooth and the machine does not oscillate. Adjust the Speed setting as needed so that boom raise rates match hand movement rates, but so that the booms don't overreact and become unstable.

1. Place one hand at ground level below one boom sensor and raise it quickly (about 2 feet per second) to within 12 inches of the sensor surface.

Note: *The boom should react immediately and adjust at a raise speed matching the hand movement, overshooting the new target height by one foot or less.*

2. Adjust the Speed setting as needed.

Note: *The default setting is 25. The Speed setting should be set so that the boom motion is smooth and the machine does not oscillate. The typical Speed setting that works best for most machines is 22 - 27, but can be much higher depending on the static pressures of the boom, boom geometry, and the Sensitivity settings.*



Stability

1. Place one hand at ground level below one boom sensor and raise it quickly (about two feet per second) to within 12 inches of the sensor surface, while observing the movement of the opposite boom.

Note: *The opposite boom should raise slightly (usually no more than six inches) simultaneously.*

2. Adjust the Stability setting to minimize movement of the opposite boom.

Note: *Lower the Stability value to make the opposite boom more rigid, but keep the number high enough to allow for natural movement of the boom without affecting the chassis roll.*

Min Press %

Note: *On machines with travel-limited booms, operate the AutoBoom system with center rack control enabled, or with the center sensor at or slightly below the target height to prevent the booms from continuously entering the Min Press % mode. This mode is for boom emergency protection only, and AutoBoom system should not be run in this mode during routine operation.*

1. Raise the center rack section to the target height, so that the booms and center rack are horizontal.
2. Enable the AutoBoom system.
3. Locate the Min Press % setting in the AutoBoom control menus.

Note: *The default setting is 65.*

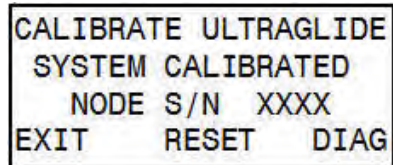
4. Increase the Min Press % value to approximately 80.
5. Place one hand at ground level below one boom sensor and raise it slowly (about one foot per second) to within 12 inches of the sensor surface, or until the boom travels up approximately three feet higher than the original target.

6. Pull hand away, and verify that the booms lower slowly after a slight delay.

Note: *If the booms do not lower, decrease the Min Press % setting value by one and repeat the steps above. Continue performing the Min Press % test until the booms begin to lower.*

Resetting Defaults

Although it is not normally necessary, there may be circumstances under which it may be necessary to reset the system defaults. Resetting the defaults erases all AutoBoom system settings and adjustments that have been performed. System calibration will be required after the defaults have been reset.



CALIBRATE ULTRAGLIDE
SYSTEM CALIBRATED
NODE S/N XXXX
EXIT RESET DIAG

1. Refer to the UltraGlide Menu Navigation flow chart on the following page to navigate to the screen shown above.
2. Select **RESET** to reset the AutoBoom settings.

