



# G1 Systems

#### СНАРТЕК

# 1

# **INTRODUCTION**

Congratulations on your purchase of the Raven 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. To calibrate your system, make sure it is warmed up and that the hydraulic oil is at normal operating temperature. If you fail to warm the system, it may not perform properly. It is also 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 G1 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.

## Controller Description



- right side
- C. Right Alarm Light Lights up if cylinder pressure drops
- D. Disable/Enable Button Toggle switch to enable or disable the G1 system
- E. Pressure Dial Used to set the down and up speed pressures
- F. Power 'On' Light Lights up when power is on
- G. Left Alarm Light Lights up if cylinder pressure drops
- **H. Left Auto Pressure Light** Lights up when Autoboom is engaged on the left side
- I. Adjustment Screws Used for calibrating the Autoboom system

#### **C H A P T E R**

# 2

# CALIBRATION

# Calibrating a System

Use this procedure if this is the first time you are calibrating the system.



**Important:** Before beginning calibration, ensure that:

- the hydraulic installation has been completed
- the wheels are attached to the boom and are on the ground
- the system hydraulics are warmed to normal operating temperatures
- the engine RPMs are adjusted to a level that allows full hydraulic capacity
- 1. Turn the power switch to the 'On' position. The pressure alarm will sound.



### Setting the Pressure Alarms

1. Turn the #1 screw counter clockwise until the alarm shuts off. Give the #1 screw another 1/2 turn counter clockwise.

### Setting the Down Speed

1. Turn the Pressure Dial to 10.



2. Depress the down function on the sprayer joystick for either the left or right boom. The Auto Pressure enable light for that side should turn on and the boom should go up.



**Important:** If the boom did not go up, turn the #2 screw clockwise 15 revolutions. Turn the #3 screw counter clockwise 15 revolutions.

3. Turn the #2 screw counter clockwise until the boom begins to fall. The goal is that the booms fall at a 3 to 4 second rate from full up to resting on the tire. You will need to raise the boom up with the joystick then

enable Autoboom again so that you can time the boom once the #2 screw has been decreased past the point where it will raise the boom.



**Helpful Hint:** It is recommended that you double check the fall rate of the booms. You should begin counting when the switch is depressed. The faster the booms fall, the heavier the booms will be.

#### Setting the Static Pressure

The wheel should be resting on the ground.

- 1. Turn the Pressure Dial to zero (0).
- 2. Turn the #3 screw clockwise until the boom begins to rise, then stop turning the screw.



**Important:** The boom should NOT continue to rise. If it does, the boom static pressure is set too high. Turn the #3 screw counter clockwise a little to stop it from rising.

### Verifying Autoboom Setup

The calibration of the G1 system is very basic, but some verification of the correct setup should be performed before doing any field work.

#### **Testing the Pressure Alarms**

- 1. Be sure Autoboom is disabled.
- 2. Go to the boom and physically attempt to lift it up. The alarm should sound when you do this.
- 3. Repeat the test on the other boom.

#### **Testing the Static Pressure**

- 1. Turn the Pressure Dial on the controller to zero (0).
- 2. Enable the booms.
- 3. Go to the boom and physically attempt to lift it up. It should lift with very little effort and should not come back down, but stay at the point where it was lifted to.
- 4. Repeat the test on the other boom.

#### **Testing the Maximum Down Speed**

- 1. Turn the Pressure Dial on the controller to ten (10).
- 2. Enable the booms.

- 3. Go to the boom and physically attempt to lift it up. There should be approximately 50 to 100 pounds of weight on the boom.
- 4. Repeat the test on the other boom.



# 3

# SYSTEM OPERATION

Operation of the G1 Autoboom system is very simple. Assuming that the previous chapters' instructions were followed and that the Autoboom is installed and operational, there are only a few basic operations necessary for the system.

### Enabling Autoboom



**Important:** Always have the wheels on the ground when initially activating the Autoboom system.

For most sprayers, there are two ways of enabling Autoboom:

• Press the down function on the sprayer joystick for both the left and right boom. Look at the controller and verify that the green LEDs are turned on.

#### OR

• Press the Disable/Enable switch. This will enable both booms on the machine at the same time.



## Controlling the Down Speed of the Booms

A G1 system only controls the down speed of the boom. This was set during the calibration process. If a boom appears to be too heavy, refer to the 'Setting the Down Speeds' section in the Calibration chapter. The faster the drop speed of the boom, the heavier the boom will be using the Pressure Dial on the controller. The Pressure Dial is what controls the down speed of the booms. Remember that the slowest (or lightest) setting is zero (0) and the fastest (heaviest) setting is ten (10).





**Helpful Hint:** The hillier the terrain, the heavier the Autoboom Pressure Dial needs to be set.

#### СНАРТЕК

# 4

# TROUBLESHOOTING

FAQs	1. How do I keep my wheel from pivoting on the ground when I turn around?
	<b>Answer:</b> It is recommended, on ground that has been worked, that the operator lift the inside boom, when turning on the ends. Nothing is being hurt if this isn't done, but the wheel may dig when pivoting.
	<ul> <li>2. My boom is too heavy when my Pressure Dial is set to ten (10). How do I adjust this?</li> <li>Answer: Refer to the Calibration chapter in this manual. The 'Setting the Down Pressure' section will assist you in re-calibrating this setting.</li> </ul>
	<ol> <li>Why are my pressure alarms always going off?</li> <li>Answer: Typically the main reason is because the pressure alarms haven't been set correctly. Refer to the Calibration chapter in this manual. The 'Setting the Pressure Alarms' section will assist you in re-calibrating this setting.</li> </ol>
	<ul> <li>4. Why don't the 'enable' lights come on when I press the down switch on my sprayer joystick?</li> <li>Answer: Either the boom sense harness is not correctly installed or the sprayer does not have down coils. Refer to the Autoboom Installation Manual to determine if the boom sense harness is correctly connected. If your sprayer doesn't have down coils, press the Enable switch on the G1 controller and both enable lights will come on.</li> </ul>
	<ul><li>5. How heavy should my booms be?</li><li>Answer: During the calibration process, a test should be done to verify that the booms are no heavier than 100 lbs. on a ten (10) setting of the</li></ul>

Pressure Dial.

How do I disable Autoboom?
 Answer: Simply lift the boom with the sprayer joystick to disable the Autoboom system.

## 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 Enable on the controller.

#### Solutions:

- 1. Check the interface wires at the solenoids for proper hook up: LUP = White, LDN = Red, RUP = Green, RDN = 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 'enable' switch on a G1 controller or Function Keys 1 and 4 on a G2 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.
- 5. Check that the green lights come on when you hit the downs on your boom controller.

Problem 2: The pressure alarm is always on.

#### Solutions:

- 1. Verify that calibration has been completed. Refer to the 'Setting Pressure Alarms' section of the Calibration chapter and complete all steps.
- 2. Verify that the pressure transducer is plugged in and that the white dots on the transducer and plug are lined up as shown below.



3. Test the continuity of the cable by using the ' $\Omega$ ' function on a multimeter, being sure that pin 1 on the pressure transducer connector matches up to pin 3 on the weather pack, and pin 2 matches to pin 4.

**Problem 3:** Autoboom activates but the boom isn't controlled or the boom won't come up.

#### Solutions:

- 1. The driver on the proportional valve is wet. Look at the 'clear' window and identify if there is moisture inside.
- 2. Look at the green LED's inside the controller and identify if there is any information on the driver.

**Problem 4:** Cannot set the static pressure. The booms keep falling when the down dials are on 0.

**Solution:** Reset the 'Max' pressure on the Down Speed dials. The booms have to be creeping up on the 'Max' setting, usually around 200 psi higher than the static pressure.

# **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.





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