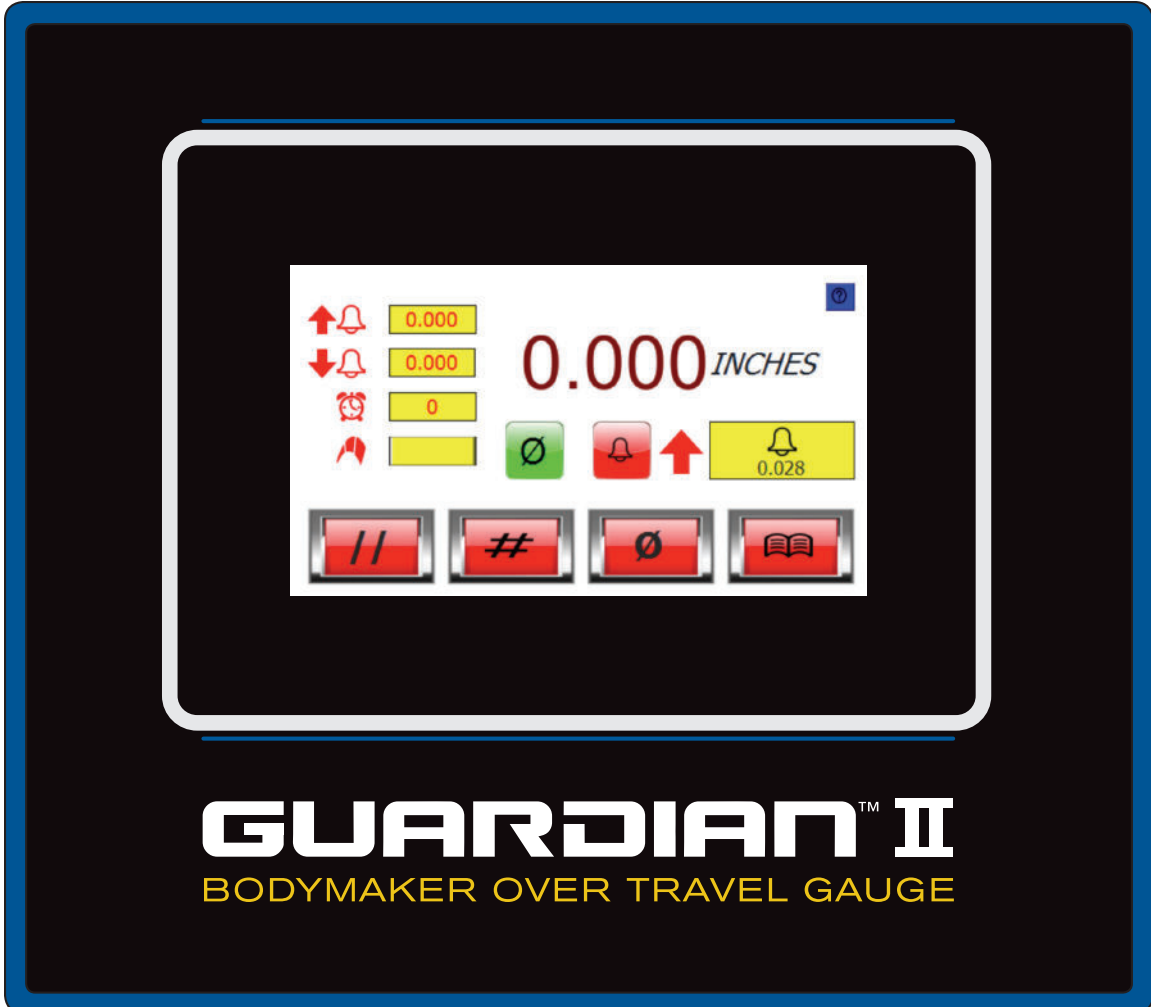


# GUARDIAN II

## BODYMAKER OVER TRAVEL GAUGE



## USER'S MANUAL

English Version 5.0 | Original Instructions | Date of Issue: March 15, 2021



Pride Engineering, LLC | 10301 Xylon Ave. N., Suite 100 | Minneapolis, MN 55445  
USA Phone: +1 (763) 427-6250 | E-mail: customer@pridecan.com

[www.pridecan.com](http://www.pridecan.com)

# 1. Introduction to Equipment and Safety

## 1.1 INTRODUCTION TO USER'S MANUAL

The purpose of this manual is to provide initial set-up, operational, part identification, and maintenance information for Pride's Guardian II Over Travel Monitoring and Control System. Pride Engineering, LLC, Minneapolis, Minnesota +1 (763) 427-6250 should be consulted prior to major field repairs.



### READ MANUAL THOROUGHLY BEFORE INSTALLING OR OPERATING EQUIPMENT

The User's Manual is intended to help familiarize the user with the safe and effective operation of Pride's Guardian II Monitoring and Control System. Following the instructions in the manual will reduce safety risks while facilitating the effective use of the equipment.

#### 1.1.1 SAFETY RELATED SYMBOLS DEFINITIONS



Signifies read manual



Signifies general warning,  
indicating danger to life and limb  
or extensive machine damage



Signifies mandatory action



Signifies electrical hazard



Signifies important information

## **1.2 TECHNICAL CHARACTERISTICS**

### **1.2.1 INTENDED USE**

The Pride Engineering Guardian II is intended to be used to measure and report bodymaker over travel amounts.

### **1.2.2 MODIFICATION OF EQUIPMENT**

Do not modify the equipment. Modification of the equipment may defeat measures taken to ensure safe operation of the equipment.

### **1.2.3 TECHNICAL CHARACTERISTICS**

- Weight: 13.2 lbs. (6 kg)
- Height: 6.7 inches (17 cm)
- Length: 9.5 inches (24 cm)
- Width: 11.4 inches (29 cm)
- Operating Conditions:
  - Air Temperature: 60 F – 120 F (15 C – 50 C)
  - Relative Humidity: 35 – 85 % Non-condensating
  - Altitude: 0 – 10,000 feet (0 – 3,000 m)
- Ingress Protection Level: IP65
- Equipment requires a source of 24V DC power, 3 amps.

## **1.3 SAFETY**

### **1.3.1 PROPER USE FOR INTENDED PURPOSE**

#### **1.3.1.1**

This equipment is intended for use in conjunction with Pride Engineering's bottom former when used in can bodymaking equipment in an indoor environment.

#### **1.3.1.2**

You can contact Pride Engineering, LLC for technical assistance at:

Pride Engineering, LLC  
10301 Xylon Ave. N  
Minneapolis, MN 55445 USA  
+1 (763) 427-6250

## **1.3.2 IMPROPER USE**

### **1.3.2.1**

The following are improper, prohibited uses of the equipment:

- Using the equipment with the case open.
- Using the equipment with the name plate or warning labels removed or illegible.
- Connecting the equipment to a power source that does not meet the specifications for the equipment.
- Using the equipment while wired differently than as directed.
- Using the equipment with any sensor other than the sensor specified by Pride Engineering for the equipment.
- Working on or trying to mount the sensor while the bodymaker is operating.

## **1.3.3 USER SAFETY**

Operators of the equipment should ensure they are following the safety procedures for the environment for which the equipment is installed. Operator's and maintenance personnel should read the user's manual prior to installation and use of the equipment. Only trained maintenance personnel should gain access to the inside of the case.

## **1.3.4 NOISE MEASUREMENT**

Noise produced by this equipment is less than 70 db(A). However, this equipment is usually installed in an environment that requires hearing protection. Follow the requirements for the facility where the equipment is installed.

## 2. Installation and Preparation for Use



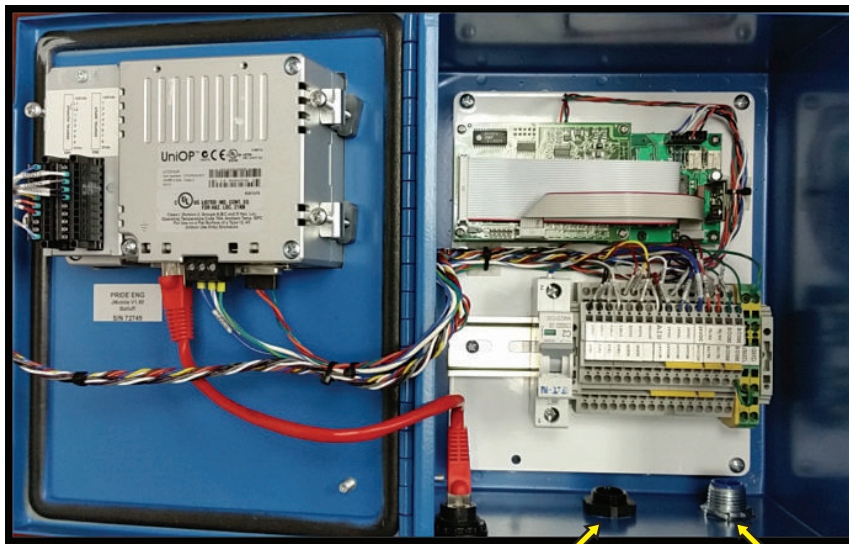
The safety of any system incorporating the Guardian II product is the responsibility of the assembler of the system.



Make sure bodymaker is stopped before installing sensor on the bottom former.

1

Mount the Guardian II in a location that provides access by the operator and facilitates wiring by the electrician to the bodymaker control.

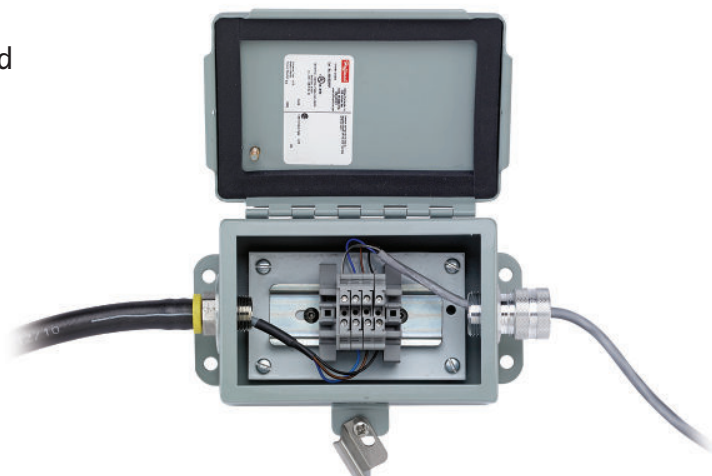


From Bodymaker  
Control PLC

From Sensor on Domer  
(Via Junction Box)

2

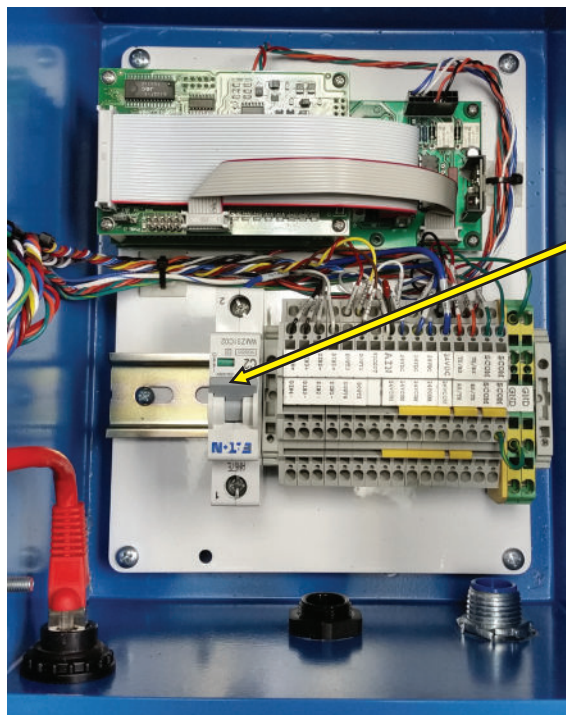
Mount the sensor junction box to allow the sensor to be routed between the domer and the Guardian II.



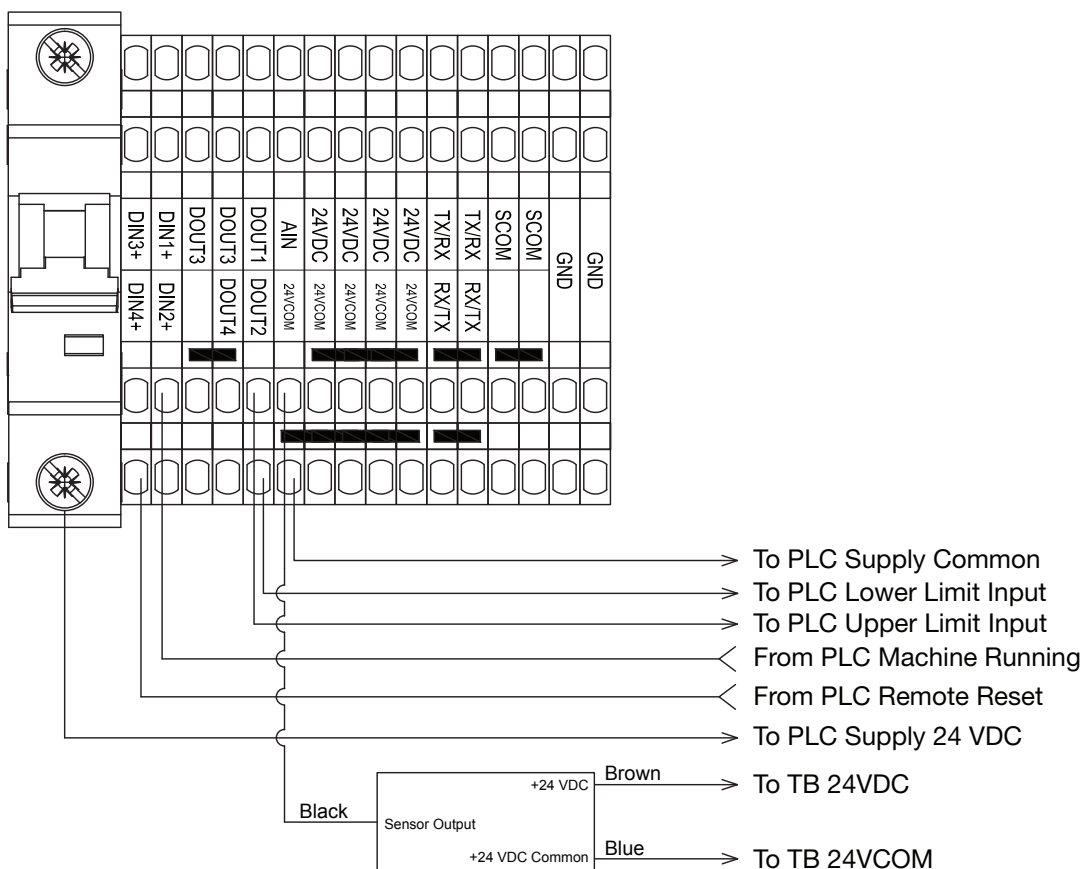
Sensor Junction Box

3

Connect wires from Bodymaker PLC to Guardian II and Guardian II to the Sensor as shown below.

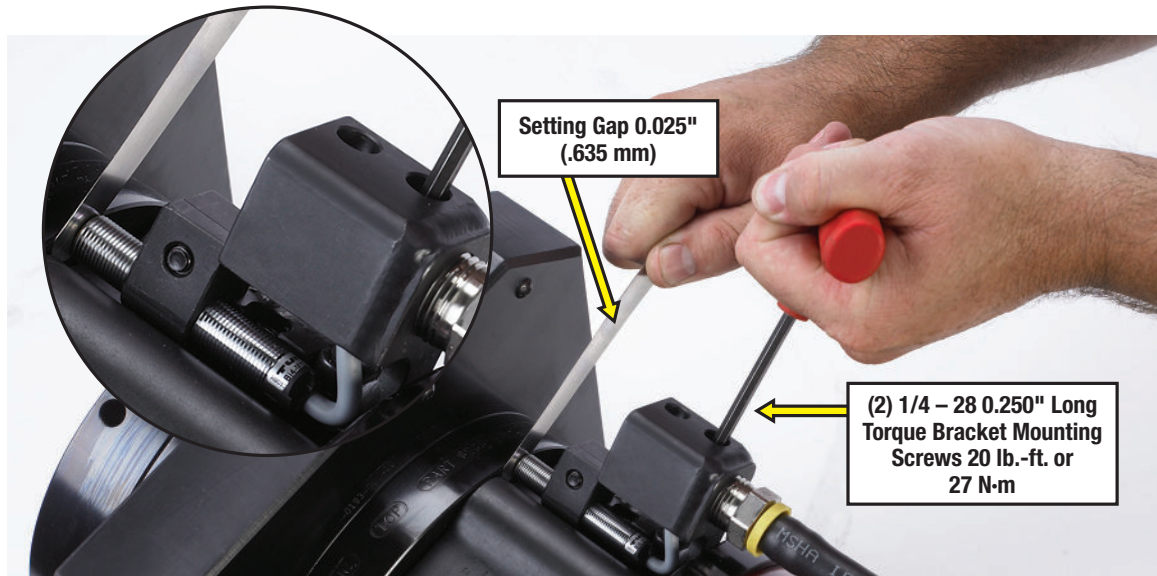


**Circuit Breaker.  
Green Means Open and Red Means Closed.**



4

Install the sensor bracket, with Sensor and wire attached, to the bottom former with two 1/4 -28 screws, 0.250" long. Do not torque them yet because they must be loose to set the sensor gap in the next step below.






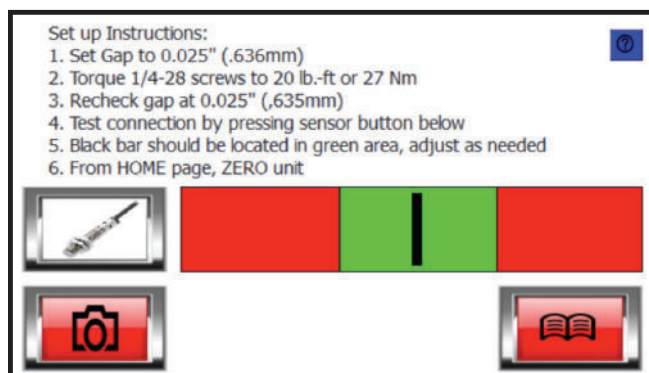
5

Set the distance between the sensor and the Outer Housing flange. Use a 0.025" (0.635 mm) thick feeler gauge to set the gap as accurately as possible. The size of the gap is very important because the gap directly effects the strength of the signal from the sensor. The Guardian interprets the strength of the signal to determine value of the over travel.

6

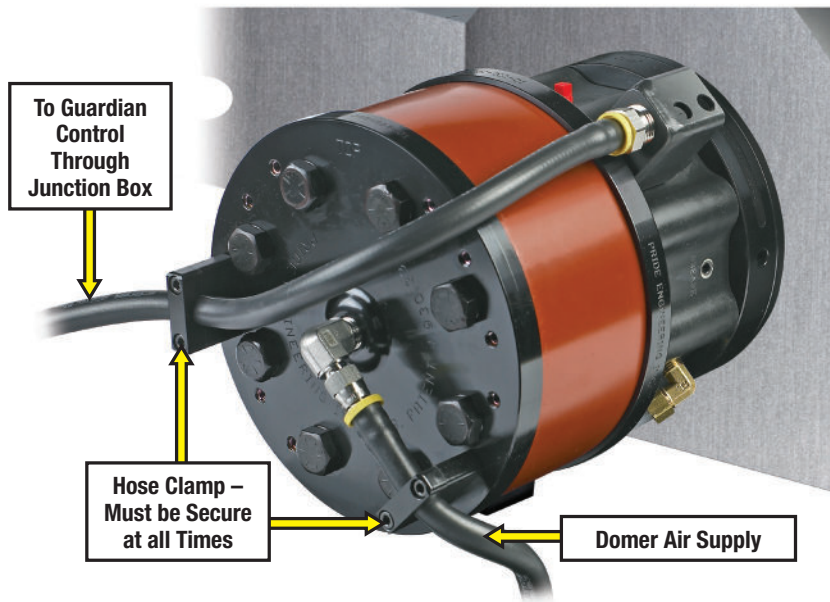
Once the gap is set, torque both screws to 20 lb.-ft or 27 N·m. Re-check the gap to be certain that the sensor did not move while the screws were being tightened. The 0.025" (0.635 mm) gap should be maintained.

- Select 
- Select  for over travel setup page
- Test sensor connection by selecting 
- Black bar should be in green zone, adjust sensor position as needed



7

Secure cable to the rear of the bottom former with the Hose Clamp provided.

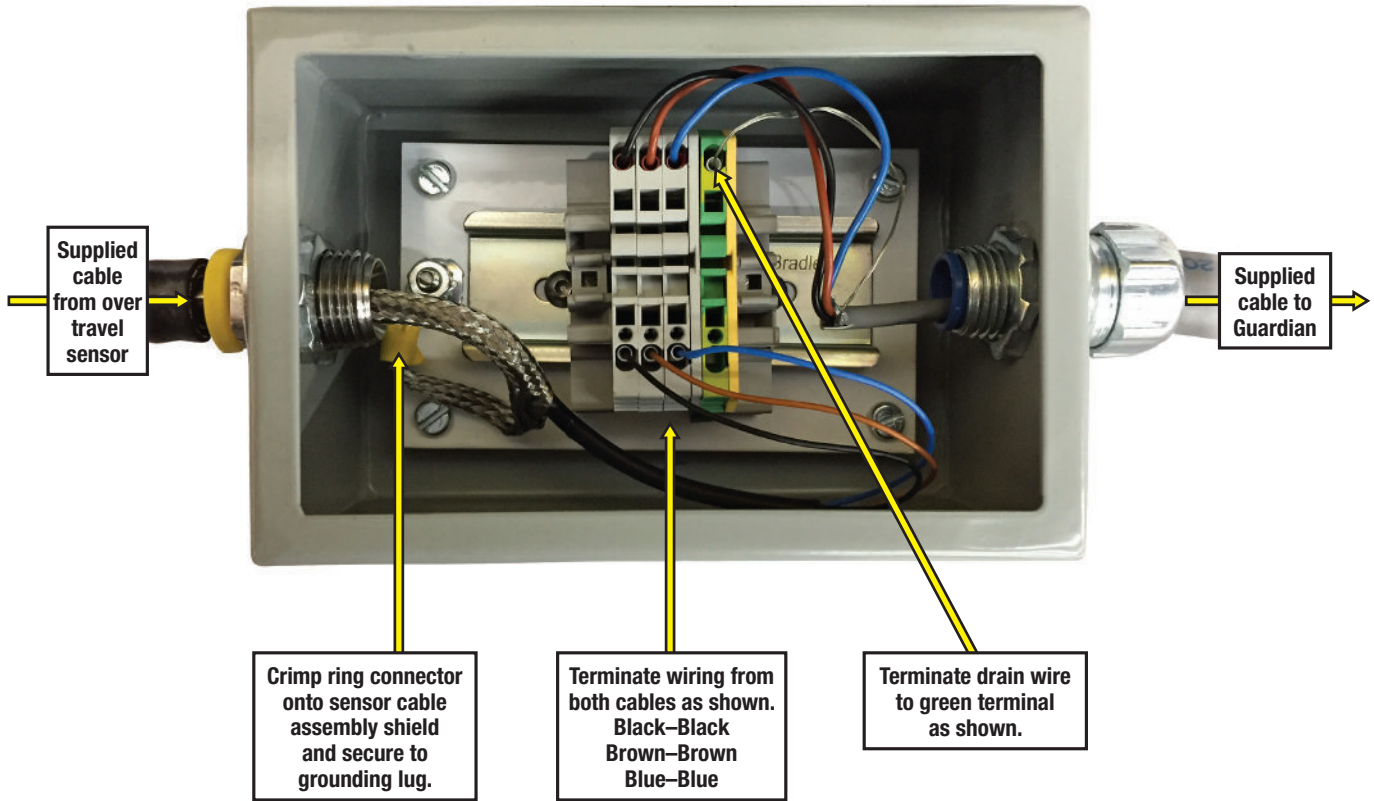


**WARNING:** THE GUARDIAN CABLE MUST BE SECURED WITH THE HOSE CLAMP TO THE BACK OF THE DOME AT ALL TIMES OR THE SENSOR/WIRING CONNECTION WILL BE DAMAGED.



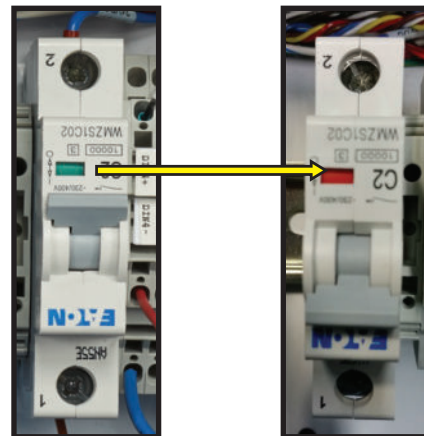
8

Connect wires from Sensor to Guardian II via the junction box as shown below.



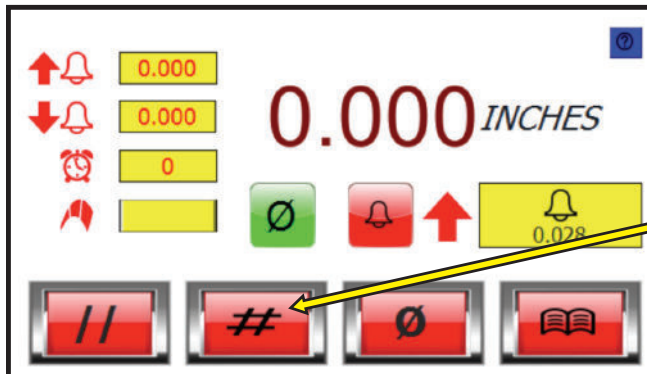
9

When the wiring is complete, the circuit breaker in the Guardian II should be switched to closed. This will start the Guardian II computer and display.



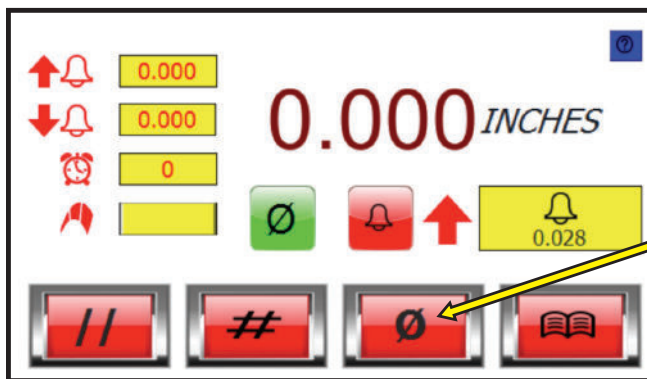
### 3. Operating Instructions

1




Select UNITS to set the unit of measure to either mm or inches.

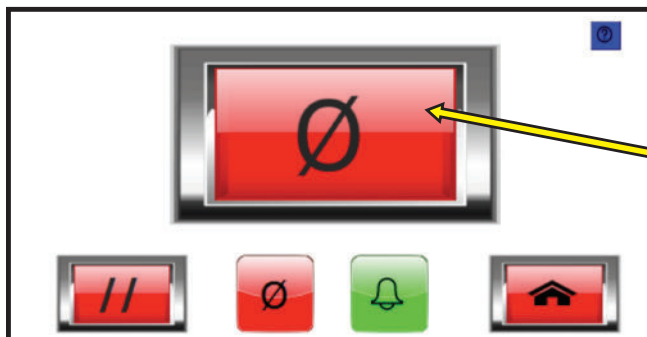
2



Select ZERO to set the over travel sensor to zero.

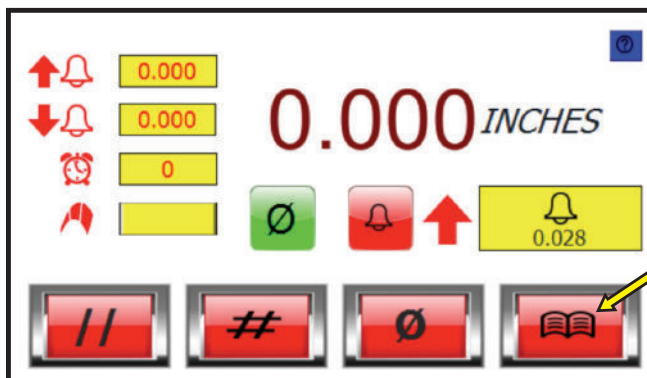
 **Bodymaker must be stopped before setting zero.**

3



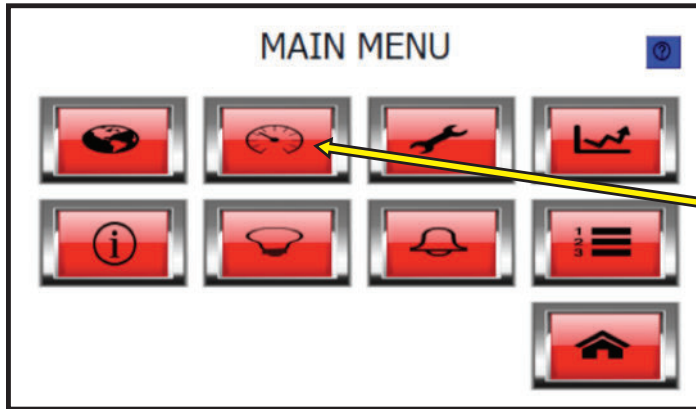
Press ZERO to set the over travel sensor to zero.

4



Select MENU to set the LO LIMIT, HI LIMIT and DELAY parameters.

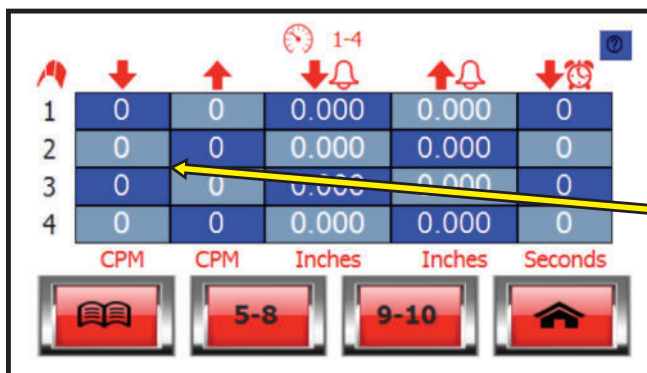
5



Select OVER TRAVEL SETUP page.

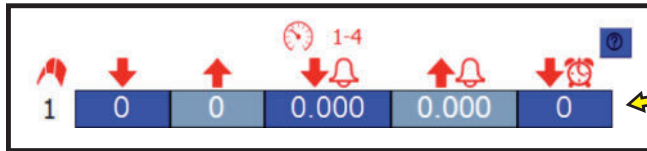
- 1-4 SPEED SETUP 1 - 4
- SPEED SETUP NUMBER
- LOWER LIMIT CPM
- UPPER LIMIT CPM
- LOWER OVERTRAVEL ALARM VALUE
- UPER OVERTRAVEL ALARM VALUE
- LOWER ALARM TIME DELAY
- CPM** CANS PER MINUTE
- Inches** IMPERIAL
- MM** METRIC
- Seconds** SECONDS
- OPEN MENU PAGE
- OPEN SPEED 5 - 8
- OPEN SPEED 9 - 10
- OPEN HOME PAGE

6




Input the bodymaker speed range for which you want to set the parameters.

7



Press on screen to select the parameter you want to set.

 Set the upper limit of the speed zone. The low limit for the next zone will automatically fill in based on the high limit of the previous zone.

**UPPER LIMIT:** Most can makers set the upper limit parameter so that a double can will trigger the Guardian II to issue an upper limit error alarm.

**LOWER LIMIT:** This should be set so as to detect a diminishing over travel.

**DELAY:** This is used to set a delay before the low limit error signal is issued to allow time for the bodymaker to get to operating speed.

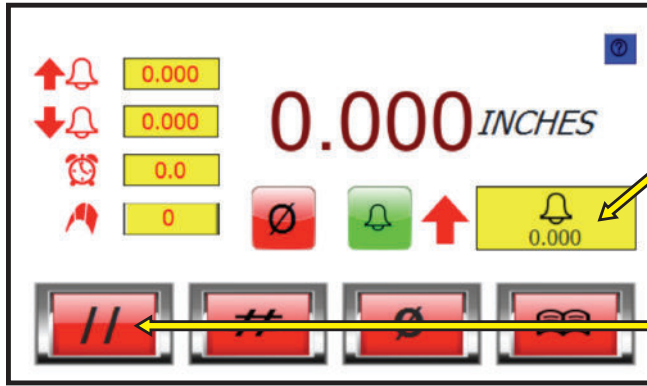
Add these parameters for each of the speed ranges you specify. You can have as few as 1 zone and up to 10 zones.

### HOW THE GUARDIAN II WORKS

The Guardian II senses each over travel cycle and compares the reading to the upper and lower limits. If the individual reading falls outside of one of the limits, it will display an 'Upper Limit' or 'Lower Limit' error and send a signal to shut down the bodymaker (if configured to do so). The display shows an average of the last 16 individual over-travel readings.

The Guardian II will automatically use the settings appropriate for the current operations speed.

8



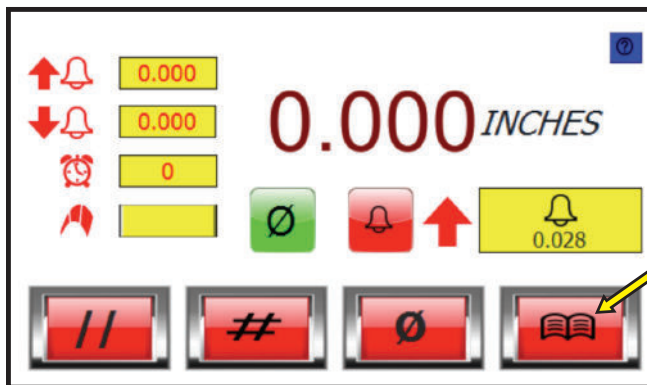
Actual over travel value that caused the limit error.

Select the RESET button to clear limit errors.

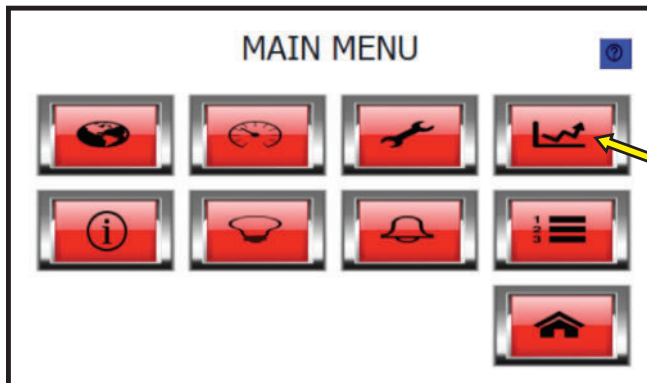
9

## USING THE DATA COLLECTION FEATURES

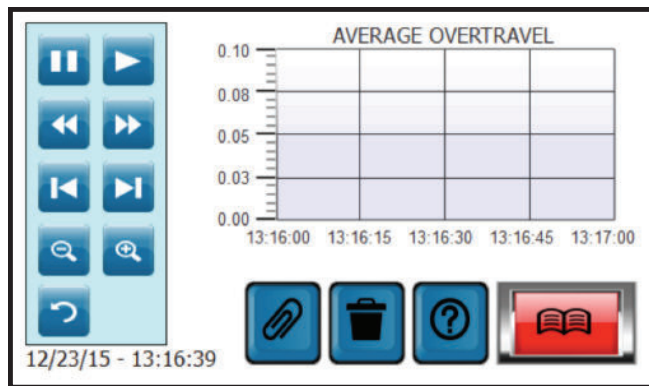
The Guardian II provides the ability to collect over travel data and view it in several ways.















Select MENU.




Select CHARTING function.




-  CREATE .CSV FILE OF STORED TREND DATA
-  ERASE STORED TREND DATA
-  OPEN MENU PAGE
-  PLAY
-  PAUSE
-  SCROLL LEFT
-  SCROLL RIGHT
-  PAGE LEFT
-  PAGE RIGHT
-  REFRESH
-  10 MIN PAGE
-  1 MIN PAGE

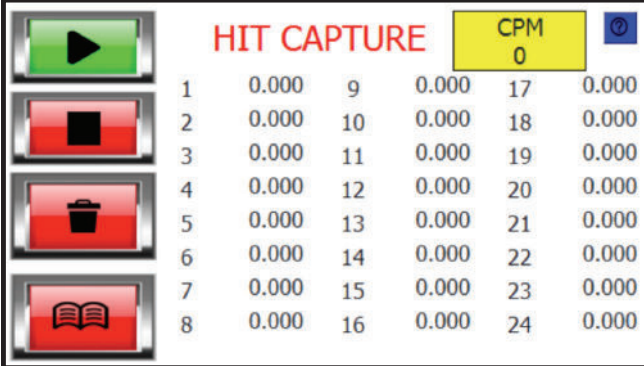
You can view the data using the history trend screen.

Data can be downloaded to a USB memory device by inserting the USB memory into the USB port on the bottom of the Guardian II.


Press  to download a .cvs file of the data. The Guardian II memory can hold approximately 26 hours of data. The readings are the overtravel average (rolling average of previous 16 hits) taken every 1 second.

10 Select  to see a history of alarms.

11 Select  to view a history of individual actual over travel readings.



HIT CAPTURE		CPM 0			
1	0.000	9	0.000	17	0.000
2	0.000	10	0.000	18	0.000
3	0.000	11	0.000	19	0.000
4	0.000	12	0.000	20	0.000
5	0.000	13	0.000	21	0.000
6	0.000	14	0.000	22	0.000
7	0.000	15	0.000	23	0.000
8	0.000	16	0.000	24	0.000

The Guardian II can store 24 actual over travel values. Press  to collect the next 24 strokes.

## 4. Maintenance

No periodic maintenance of the equipment is required. Investigation of any issues with the performance of the equipment needs to be performed in a safe manner. Only trained maintenance personnel should gain access to the inside of the case.



**Make sure bodymaker is stopped before installing sensor on the bottom former.**

The circuit breaker is rated for 2 amps.

The equipment is safe to use if the circuit breaker will close. If the circuit breaker will not close, check the wiring to ensure it matches the wiring diagram.

## 5. Part Identification

Sensor and Bracket Assembly: P/N 200-77-32

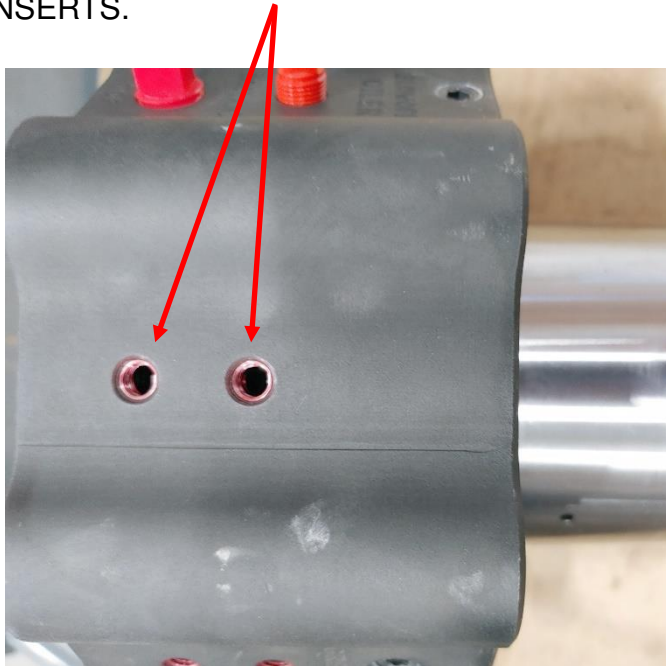


## Maintenance Supplement – Sensor Bracket Retention

It is important to ensure the screws holding the sensor bracket to the Cylinder Housing are able to hold the sensor bracket in place for proper functioning and to avoid potential damage to the sensor or bracket. Specialized washers have been implemented beginning in 2021 and can be used retroactively to reduce the potential for the screws to loosen.

### Cylinder Housing Sensor Mounting Hole Maintenance

Check mounting hole helicoil [P/N PP-3591-4-250] condition and replace if necessary. Verify that the thread inserts are in good condition and there is nothing in the hole that will keep the screw from fully seating on the mount. **REPLACE BROKEN THREAD INSERTS.**



Helical Insert Extraction Tool  
for M5 to M10, 10-24 to 5/16"-32 Thread Sizes



Installation Tool  
for 1/4"-28 RH Threaded Helical Insert

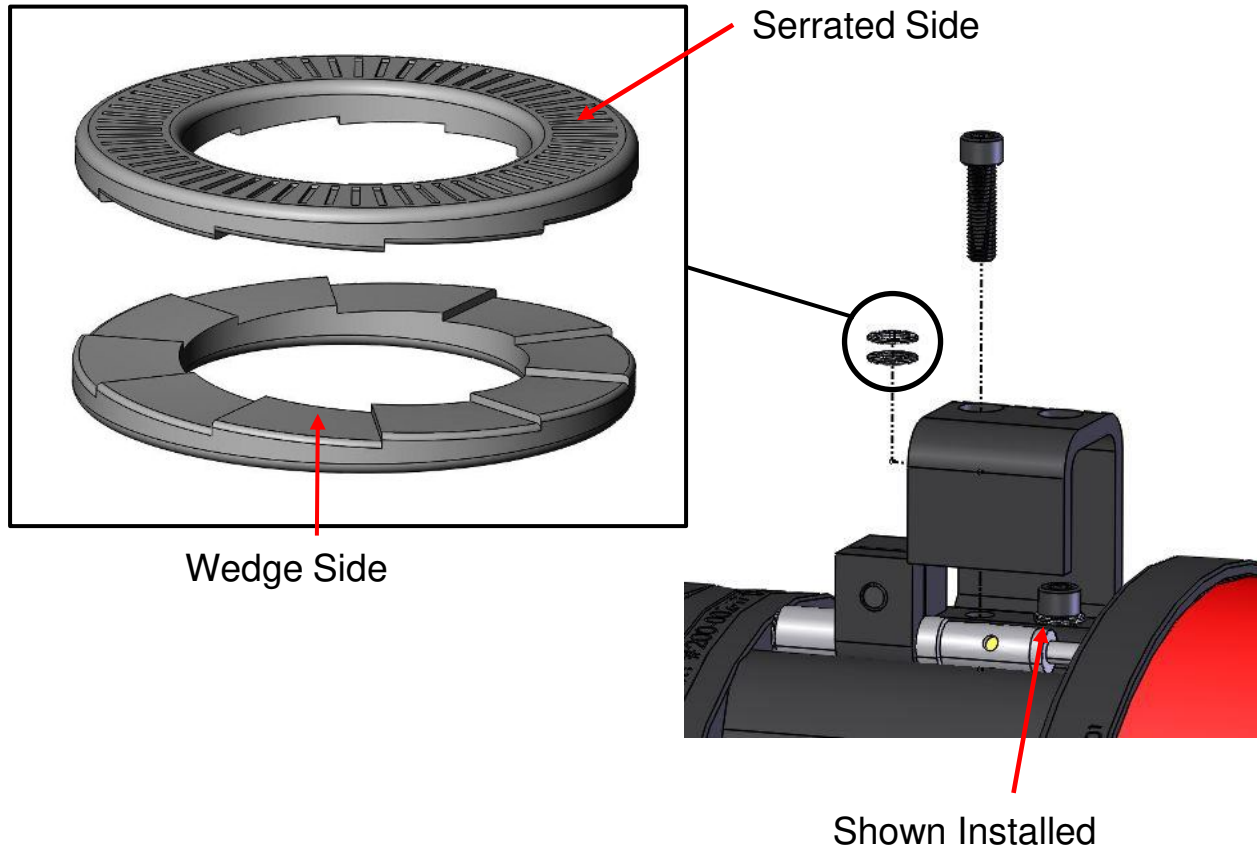


Prong Break-Off Tool  
for 1/4"-20, 1/4"-28 Thread Size Helical Insert



## Lockwasher Installation – P/N HDW-WSH-01015

Check mounting hole helicoil condition and replace if necessary.



When installing the Guardian sensor mount, use these included washers, installed as shown above to reduce the chances of the mount loosening during operation. Washers can be reused until there is visual deterioration of the serrations or wedges.

Adjust, install and torque mounting screws to 20 lb.-ft or 27 N·m.



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