SkyAzúl
EQUIPMENT SOLUTIONS

GREER *INSIGHT*

Operator's Manual

NOTICE

SkyAzúl makes no warranty of any kind with regard to this material, including, but not limited to, the implied warranties of merchantability and/or its fitness for a particular purpose.

SkyAzúl will not be liable for errors contained in this manual or for incidental or consequential damages in connection with the furnishing, performance, or use of this manual. This document contains proprietary information, which is protected by copyright, and all rights are reserved.

No part of this document may be photocopied, reproduced, or translated to another language without the prior written consent of SkyAzúl.

SkyAzúl reserves proprietary rights to all drawings, photos and the data contained therein. The drawings, photos and data are confidential and cannot be used or reproduced without the written consent of SkyAzúl. The drawings and/or photos are subject to technical modification without prior notice.

All information in this document is subject to change without notice.

SkyAzúl, Inc.
16 Walnut Street
Middletown, MD 21769
Fax 301-371-0029
info@skyazul.com

Table of Contents

Outline of Operation....3
System Components....3
Power-Up Self-Test....5
Home Display....5
The Configuration Display....6
Home Button....7
Man Button....7
POL Button....7
Jib Options....8
Pick Point Button....8
Stow (Stowed Jib)....8
Winch....9
Outrigger/Tire Selection....9
The Home Display....10
Outrigger/Tires....10
Actual Load....11
Cancel Alarm Button....11
Parts of Line....12
Information....12
Rated Capacity....12
Erected Jib....13
System....13
Anti-Two-Block....13
Jib Stowed....14
Pick Points....14
Configuration Button....15
Boom Length Window....15
Boom Angle Window....15
Load Radius Window....16
Swing Angle Window....16
Bar Graph....16
Cancel Alarm Button....17
Reset Function Kickout....17
Operator Programmable Alarms....18
Setting the Operator Alarms....18
Setting the Minimum/Maximum Boom Angle Alarms....19
Setting the Maximum Boom Length/Tip Height Alarms....20
Setting the Swing Alarms....21
Swing Alarms Illustrated....23
Work Area Alarms....24
Setting the Work Area Alarms....25

Introduction

The Greer Insight system is designed for use as an aid to crane operation.

Do not use this system without a properly trained operator who is knowledgeable in safety guidelines, crane capacity information, and the crane manufacturer's specifications.

This manual describes the operation of the Greer Insight, hereinafter referred to as the system. Please read the contents and instructions contained in this manual.

Outline of Operation

The system is an aid to crane operation. Crane functions are monitored by a variety of sensors.

The system compares the load suspended below the boom head to the crane capacity chart stored within the computer's memory.

At approach to overload, the system sends audible and visual warning signals. The system can be configured to cause function kick-out by sending a signal to function disconnect solenoids.

System Components

- Display Unit
- Computer Unit
- Pressure Sensors
- Reeling Drum Assembly, with Extension and Angle Sensors
- Anti-Two-Block Switches
- Cables
- Audible Alarm
- Installation/Operator Manuals

Display Unit

The display unit provides the operator with:

- Rated Capacity
- Actual Load
- Bar graph representation of Actual Load vs. Rated Capacity
- Radius of the Load
- Boom Angle
- Main Boom Length
- Working Area
- Crane Configuration

BOOM ANGLE SENSOR

The boom angle is measured by a potentiometer/pendulum assembly. It provides a voltage proportional to boom angle. This sensor is mounted inside the cable reeling drum assembly.

EXTENSION SENSOR

The extension sensor provides a voltage proportional to the extension of the boom. The extension sensor is mounted inside the cable reeling drum assembly.

PRESSURE SENSORS

There are two pressure sensors which measure pressure in the boom hoist cylinder. One sensor measures the rod-side pressure and one sensor measures the piston-side pressure.

ANTI-TWO-BLOCK (ATB)

A switch monitors the approach of the hookblock or overhaul ball to the boom head. The switch is held in the normal position until the hookblock or overhaul ball raises a weight that is mounted around the hoist rope. When the weight is raised it opens the switch. The resultant switch open signal is sent to the computer via the reeling drum. This results in the ATB alarm operating and a function kick-out to occur.

FUNCTION KICK-OUT

Electrically-operated hydraulic solenoids disconnect the control lever functions for boom hoist lower, telescope out, and winch up when an overload or ATB alarm condition occurs.

OPERATOR PROGRAMMABLE ALARMS

These alarms, when properly set by the operator, define the operating area. These alarms are programmable for each job site and allow the operator to work in a defined area.

- Minimum/Maximum Boom Angle Alarm
- Maximum Boom Length Alarm
- Maximum Tip Height Alarm
- Left and Right Swing Alarm
- Work Area Alarm

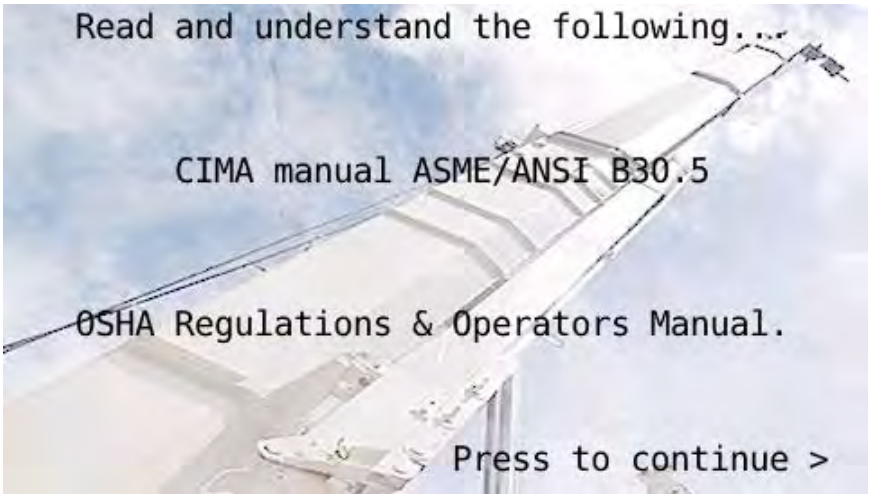
OUTRIGGER POSITION SENSING

This alarm alerts the operator, audibly and visually, when the selected outrigger position does not match the detected outrigger position.

Power Up Self-Test

Immediately following system power up, the system executes a system self-test which lasts for approximately 10 seconds. During this time the display shows the rating chart number, units in use, and load.

During this time, crane motions are disabled by the system function kick-out. Press the ***Press to Continue*** button to acknowledge the home display message and allow the system to start normal operation.

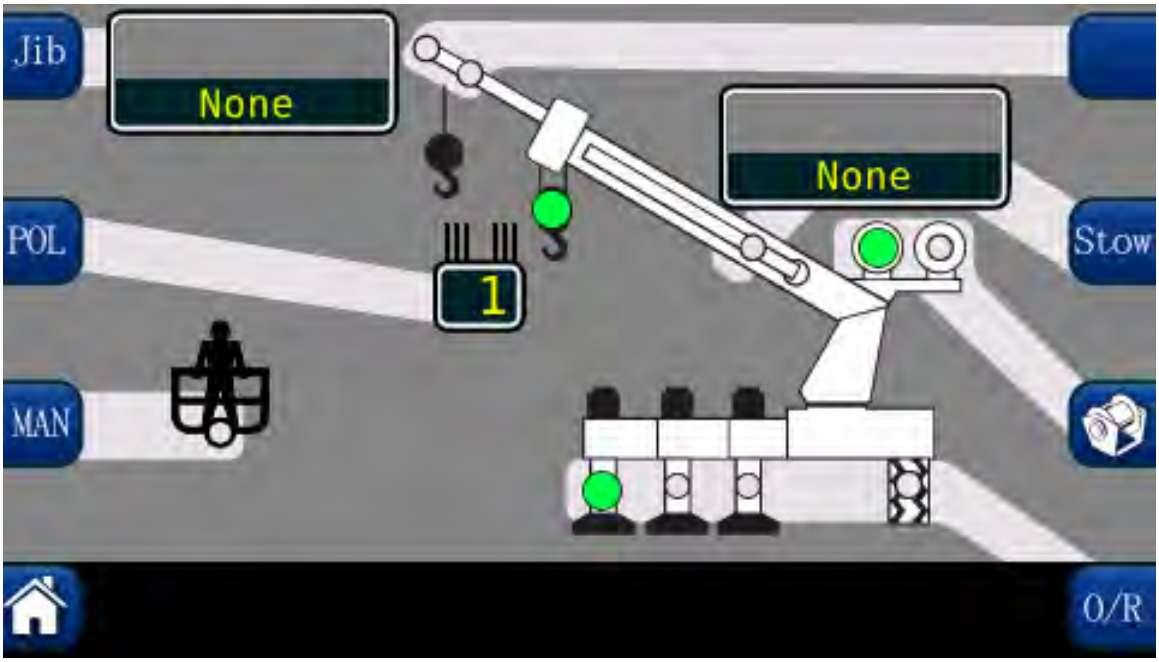


NOTE: *Not all applications will have this screen. In such applications, the home display will be shown without the need to select "CONTINUE".*

Home Display

The configuration display may be accessed from the home display by pressing the ***Configuration*** button.

The Configuration Display



NOTE: *The graphic above is only a representation of the system. The shaded areas may vary in configuration depending on the application.*

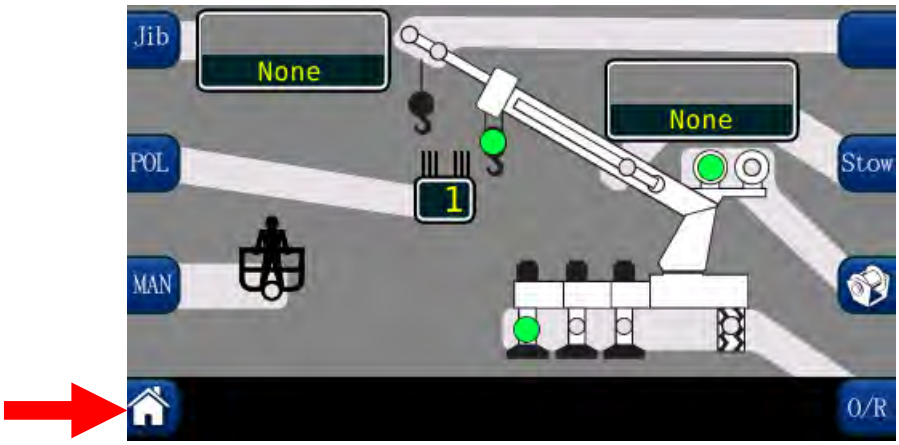
NOTE: *Always check the point of lift and parts of line upon selection of the winch.*

The configuration display gives a pictorial representation of the current system setup. Each shaded area contains one or more green indicators and a button to change the setup selection. In groups with multiple options, green indicators illuminate individually to indicate the selection. When the configuration is complete, press the ***Home*** button to return to the main operation screen.

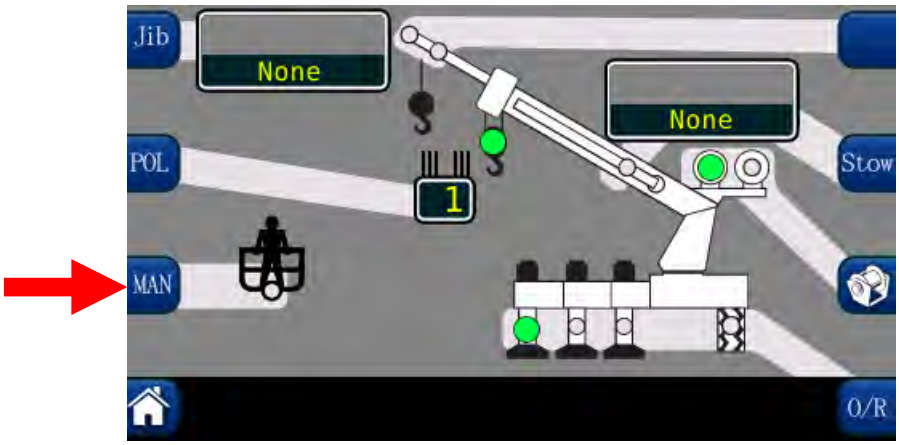
WARNING!!

THE DISPLAYED LOAD AND CAPACITY ARE BASED UPON THE CURRENT SELECTED POINT OF LIFT. NEITHER THE GREER INSIGHT SYSTEM, NOR THE CRANE CAPACITY CHART ALLOWS FOR LIFTING FROM MORE THAN ONE HOOK AT A TIME.

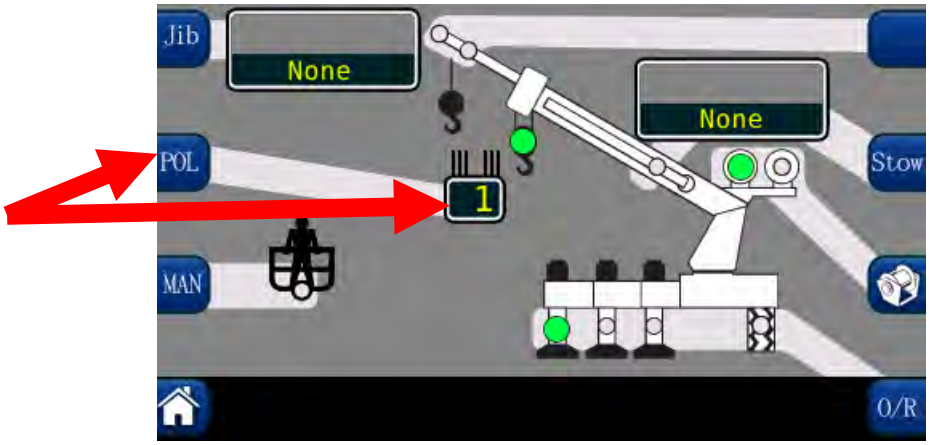
1. The ***HOME*** button will return the user to the Home display.



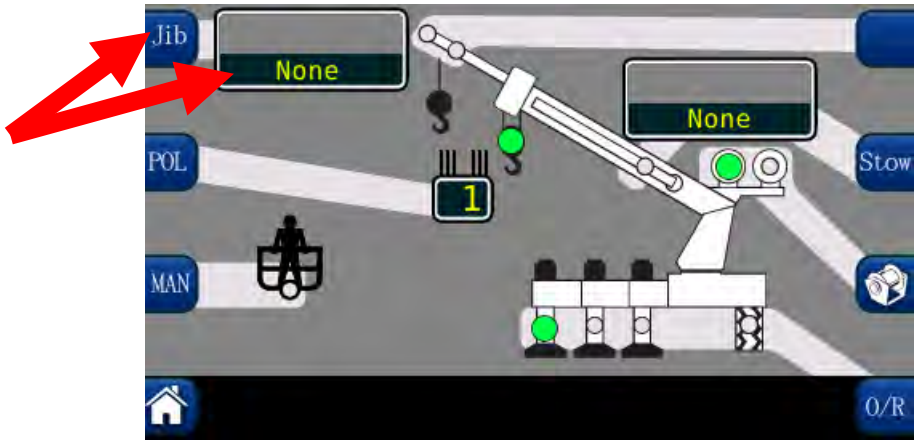
2. The ***MAN*** button enables the optional Personnel Platform.



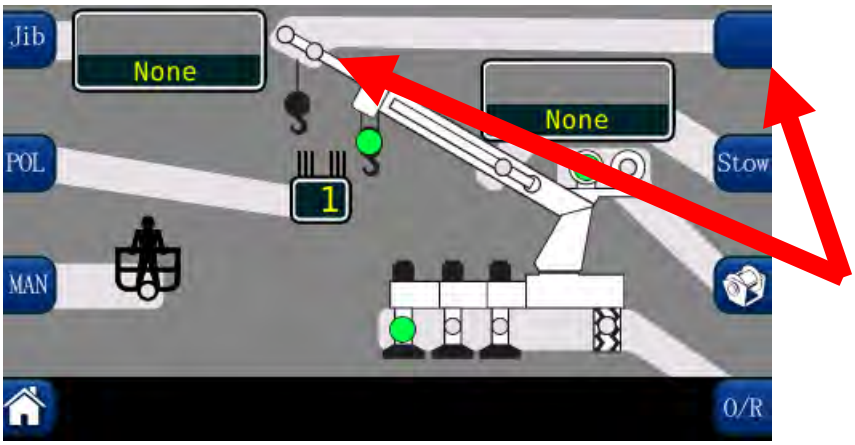
3. The ***POL*** button selects the current parts of line. Pressing the ***POL*** button will increment the parts of line. When the maximum parts of line for the equipment being used is reached, the indicator will rollover to one **POL**.



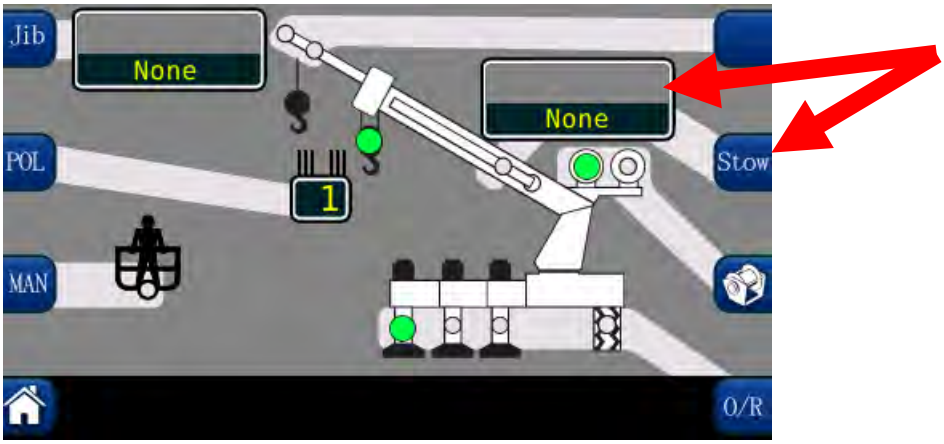
4. The **JIB OPTIONS** may be selected by pressing the ***Jib*** button multiple times to scroll through the jib options. If there are no options available, the display will show "**None**".



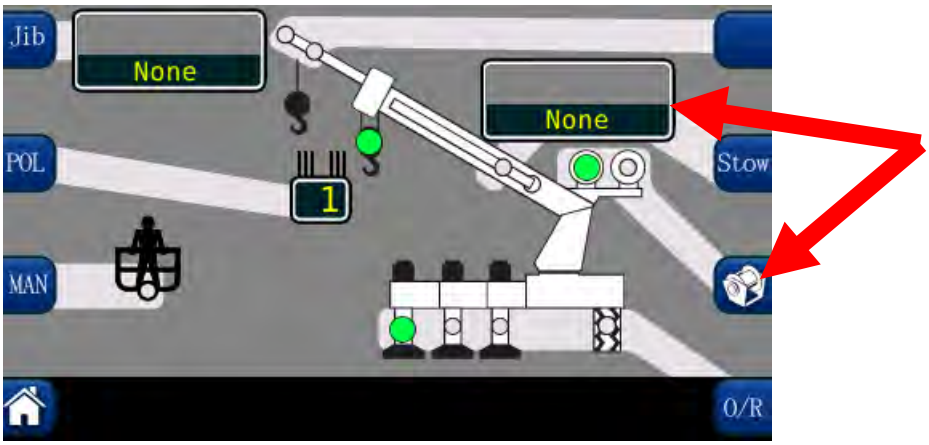
5. The **PICK LONG**, **PICK SHORT**, **PICK MAIN** selections are dependent upon the model of crane being used.



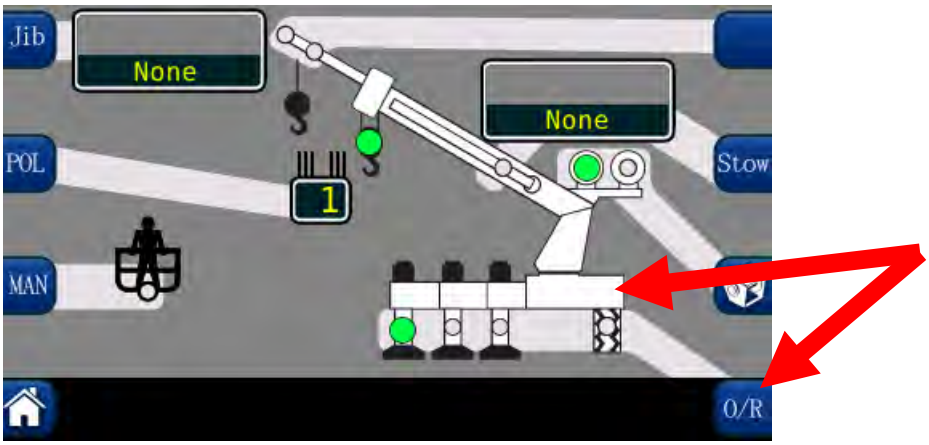
6. The **STOW (STOWED JIB)**, group contains one green indicator. This will illuminate when a jib is stowed on the boom. Press the ***Stow*** button multiple times to scroll through jib options. If there are no options available, the display will show "**None**".



7. The **WINCH** group contains two green indicators, which indicate the selection of front or rear winch. ***NOTE:*** *If the crane is equipped with two winches, always select the winch to be used for the lift, prior to selecting the parts of line selections for each winch.*



8. The **OUTRIGGER/TIRE** selections are made by pressing the ***O/R*** button. ***NOTE:*** *Some cranes will not have the option of selecting different outrigger positions*.



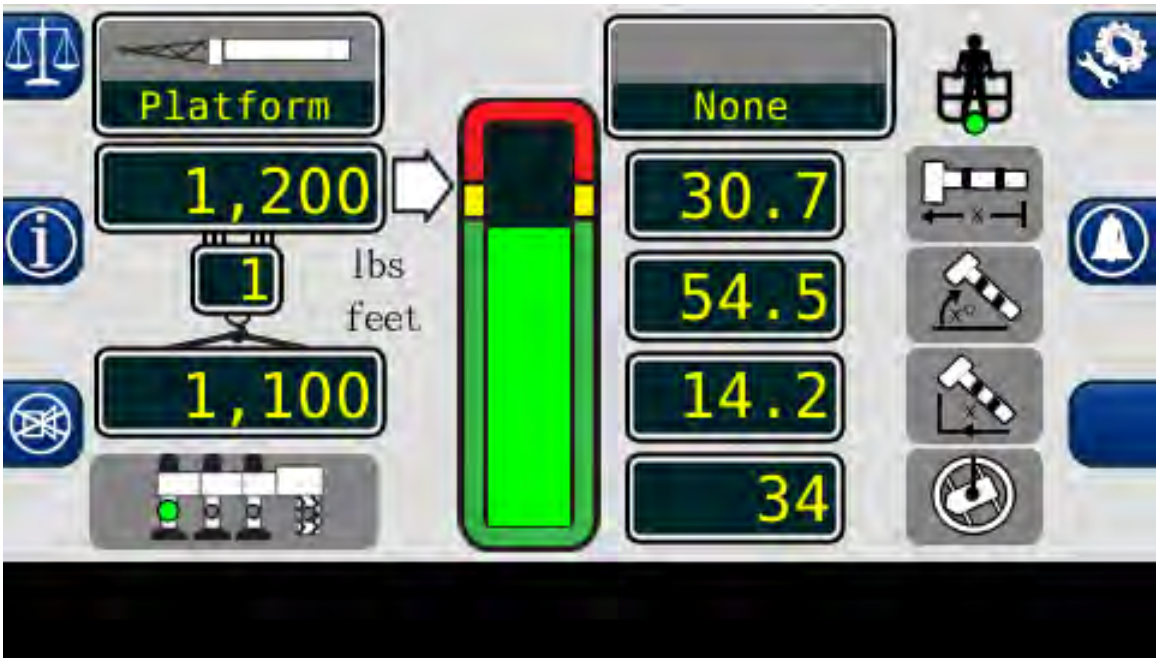
OUTRIGGER POSITION SENSING (IF EQUIPPED)

The operator will be warned if the selected outrigger position does not match the detected outrigger position.

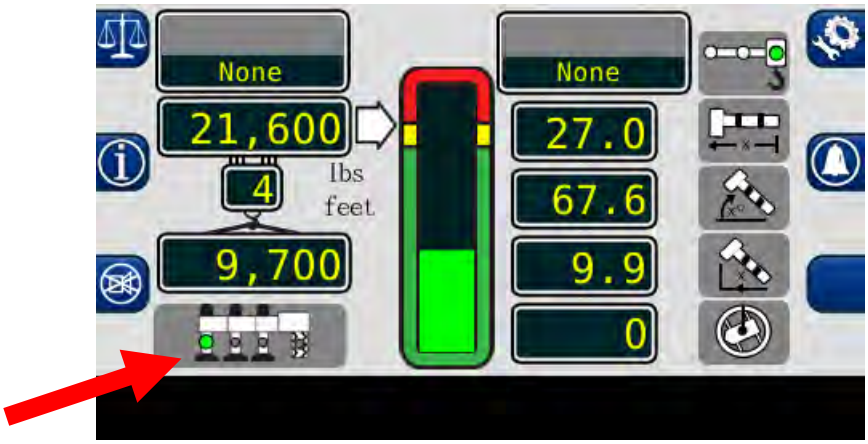
Correct Selection: The selection will have a solid green indicator, when the selected and detected outrigger positions match.

Incorrect Selection: The detected position will flash a red indicator and the selected position will be a solid yellow indicator. On the main screen, an audible alarm will sound if the selected position is greater than the detected position. The alarm will sound if the operator has selected fully extended outriggers, but the outriggers are in the intermediate or fully retracted position.

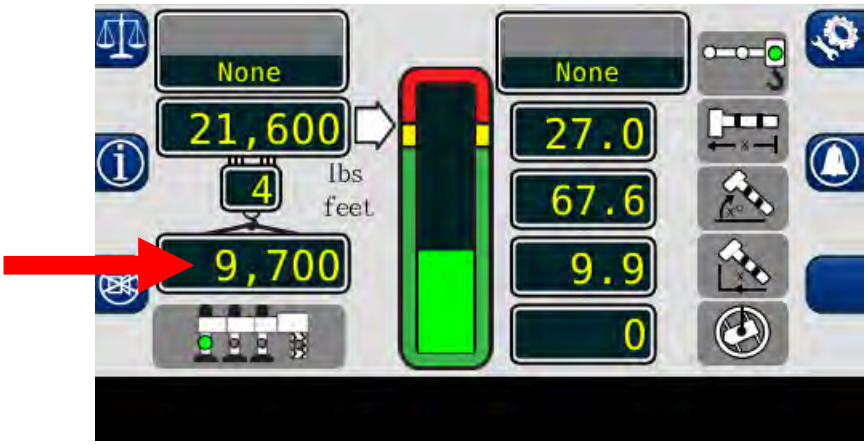
The Home Display



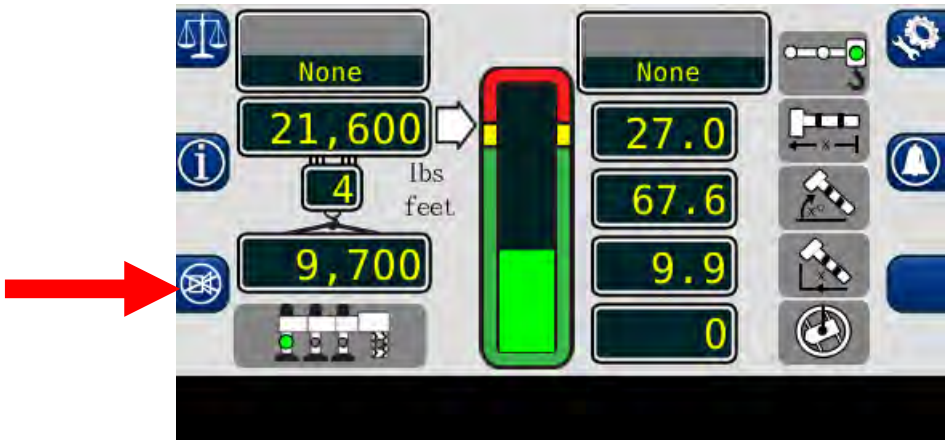
1. The **OUTRIGGER/TIRES** setting contains four green indicators. They indicate the selection of tires, full, intermediate, or retracted outriggers. The user must make the selection from the configuration display. ***NOTE:*** *OUTRIGGER/TIRE selections are dependent on the crane being used.*



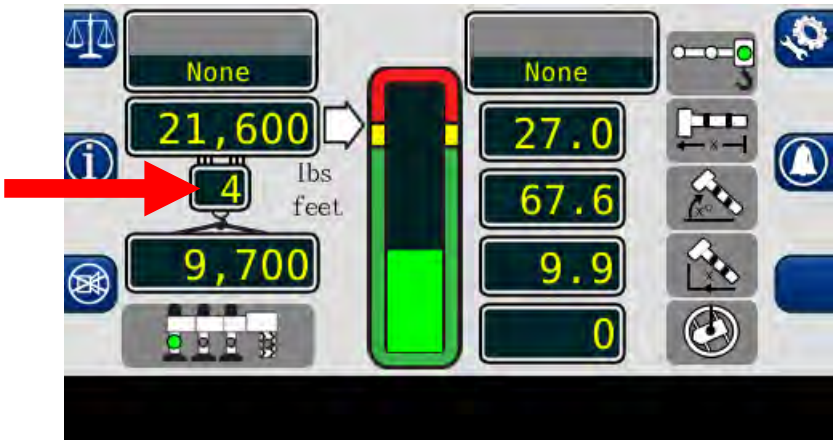
2. The **ACTUAL LOAD** value displays the total load, including slings, etc., suspended below the lifting point. ***NOTE:*** *The system load reading is most accurate in static situations. Due to system dynamic response, the load reading may vary when lifting or lower the load. Meter functions carefully, especially boom down to minimize the dynamic effects.*



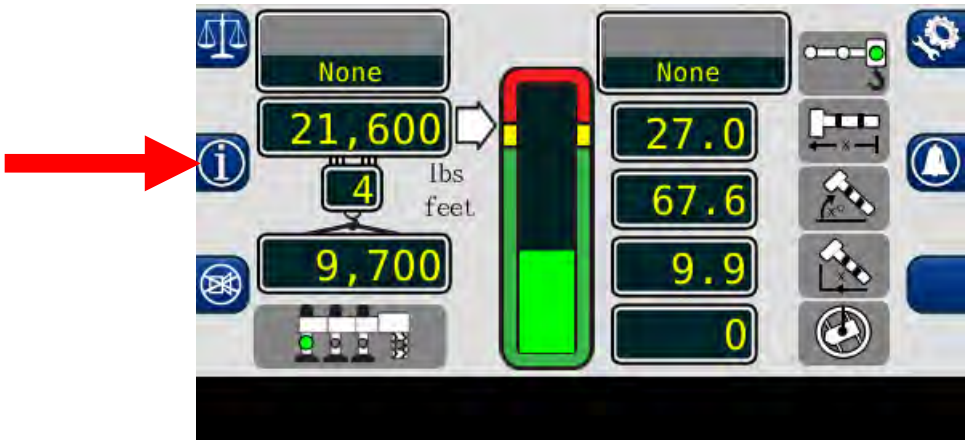
3. The ***CANCEL ALARM*** button is used to silence the audible alarm generated by an overload, ATB Alarm, operator programmable alarm, or outrigger position horizontal beam mismatch. The audible alarm remains cancelled until the condition causing the alarm has been resolved.



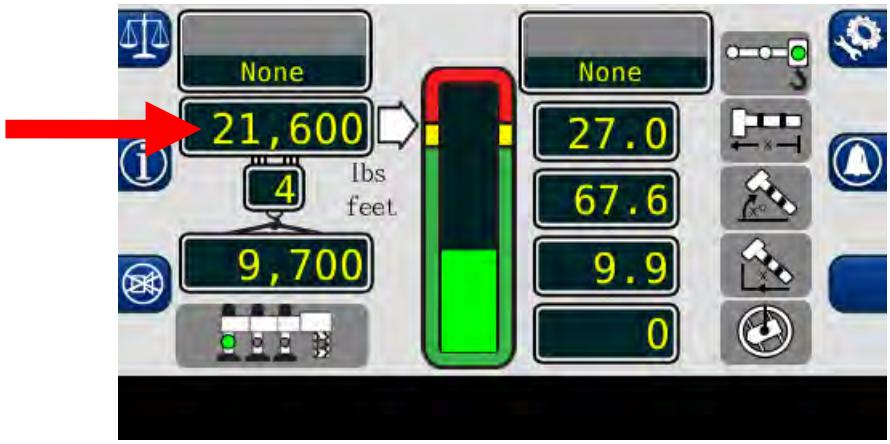
4. The **PARTS OF LINE** window displays the amount of line chosen for the configuration selected. It is adjustable from the configuration screen.



5. The ***INFORMATION*** button displays system generated messages regarding the software versions of the equipment and fault codes. Press and hold the ***Information*** button to display the data. The messages will remain on the screen until the button is released.

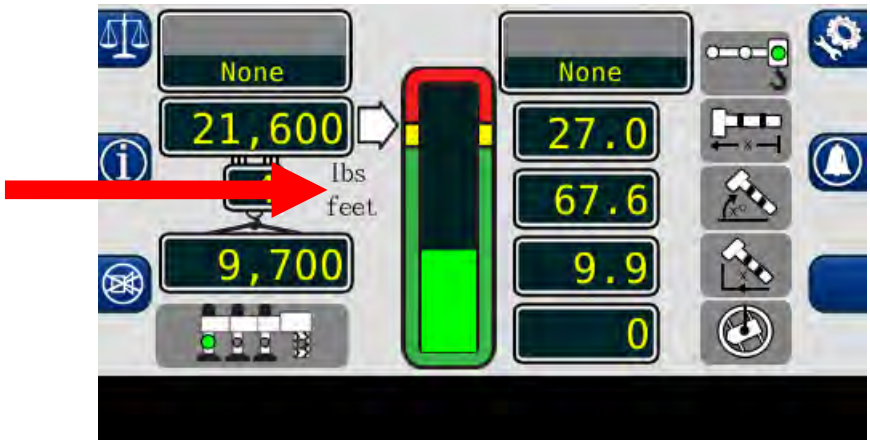


6. The **RATED CAPACITY** window displays the maximum rated capacity of the machine in the current configuration.

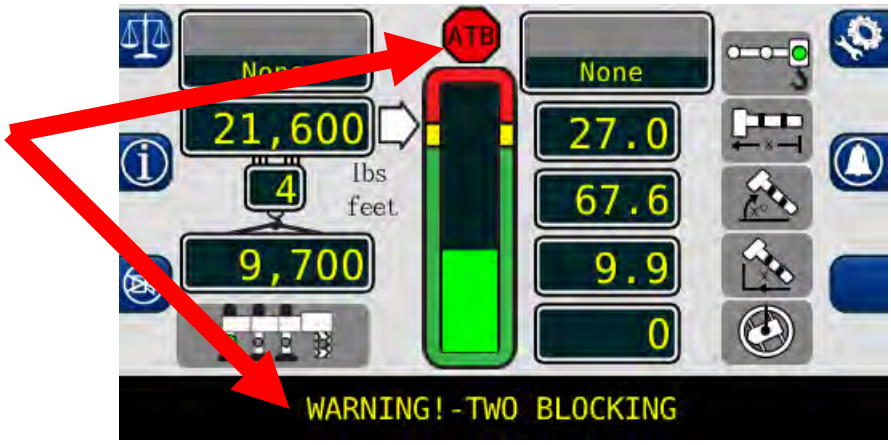


7. The **ERECTED JIB** window displays the jib option selected for the machine. If there are no jib options available, the display will show “**None**”.

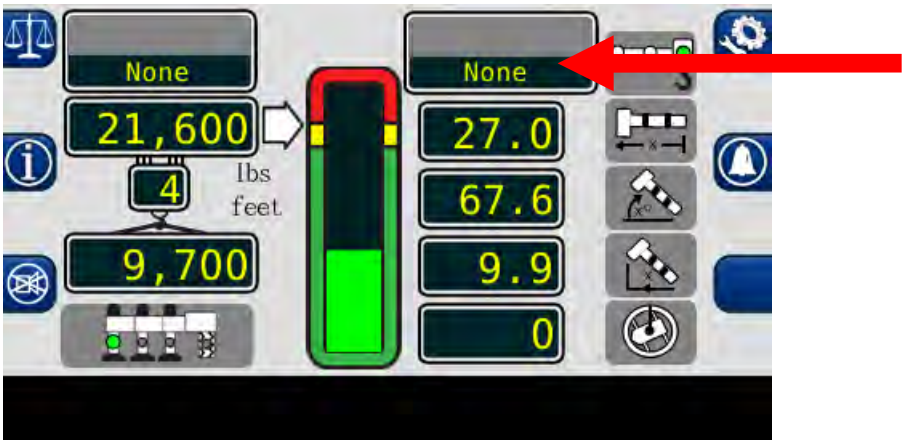
8. The **SYSTEM** has the capability of showing metric or imperial units. This can be changed in the calibration menu.



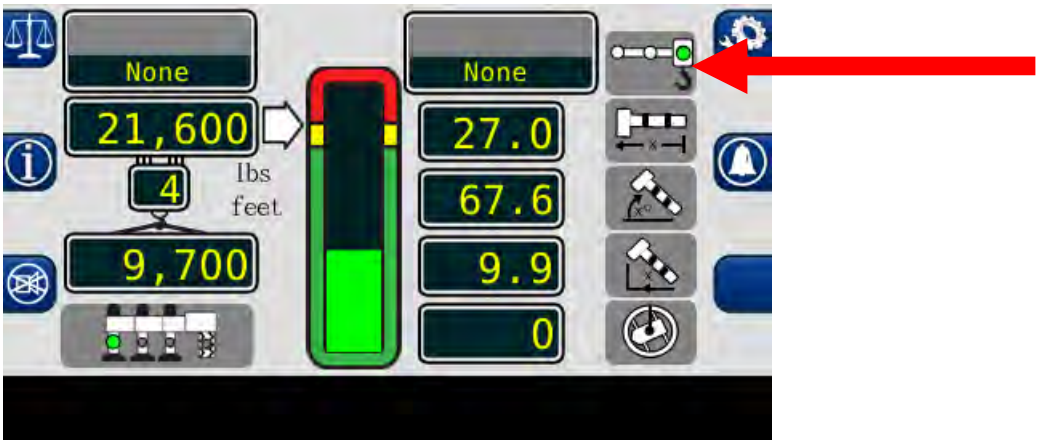
9. The **ANTI-TWO-BLOCK** indicator illuminates when the ATB limit switch detects an approach to a two-block condition.



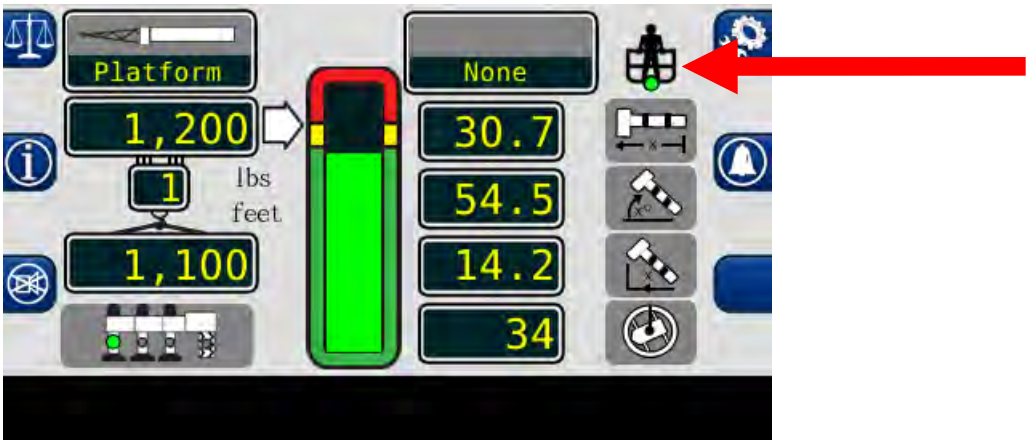
10. The **JIB STOWED** window displays the stowed jib from the configuration screen. The length and offset of the jib in use is also shown in the home display.



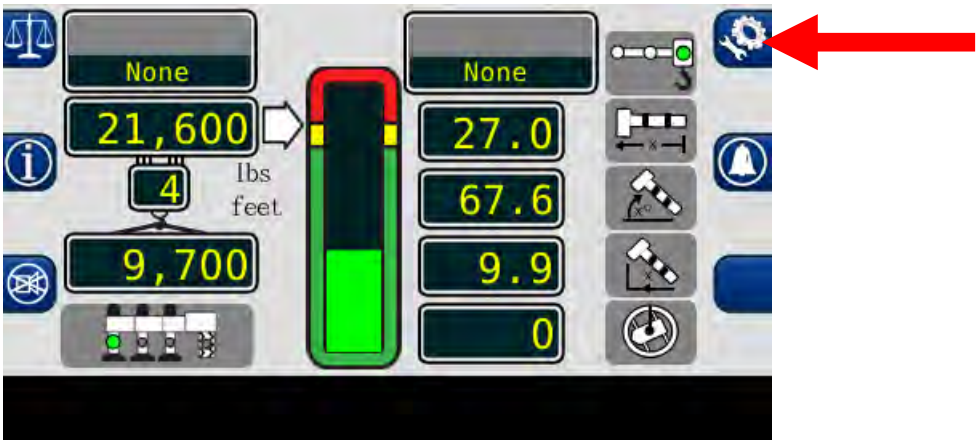
11. The **PICK POINT** icon displays the currently selected pick point chosen on the Configuration screen.



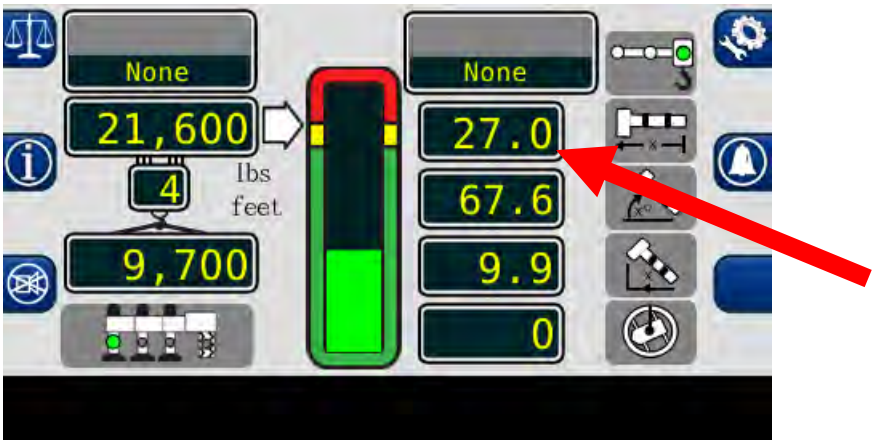
If the operator has chosen the Personnel Platform on the Configuration Screen, the main operating page will display the basket icon.



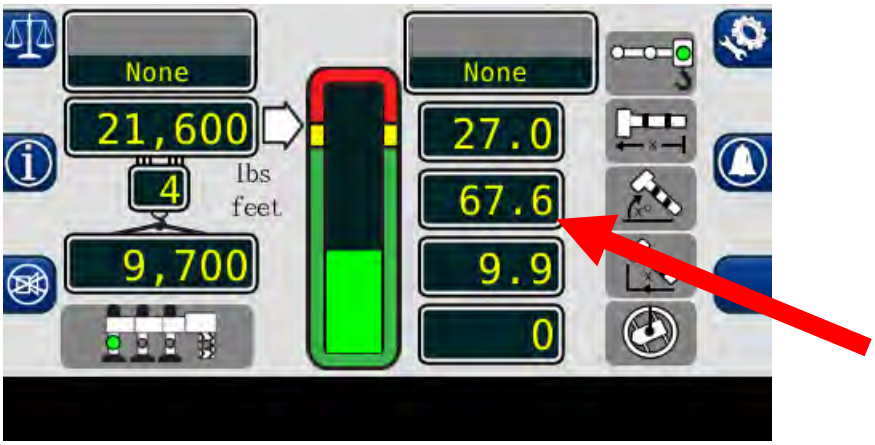
12. The ***CONFIGURATION*** button accesses the configuration display screen.



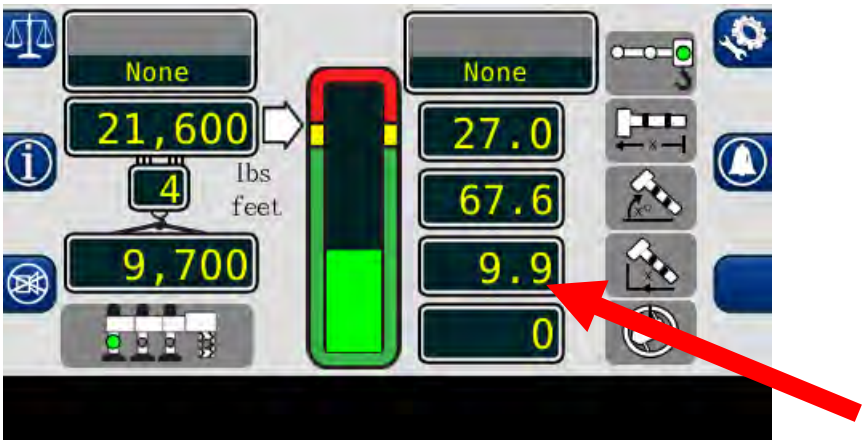
13. The **BOOM LENGTH** window displays the length of the main boom from the boom foot pin to the sheave pin of the main boom head machinery.



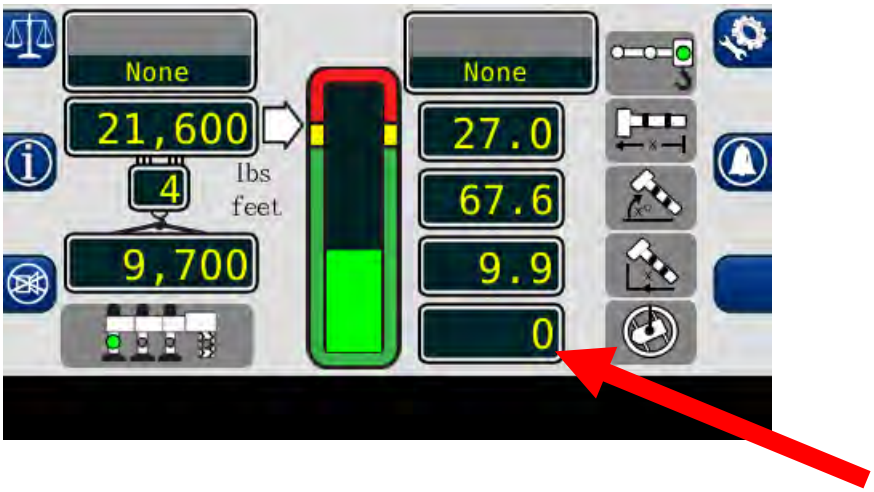
14. The **BOOM ANGLE** window displays the angle of the main boom in degrees relative to horizontal.



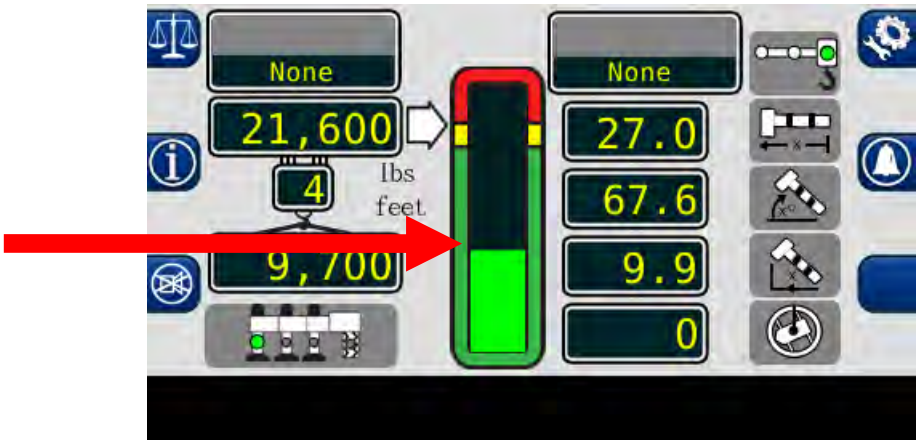
15. The **LOAD RADIUS** window displays the radius of the main boom.



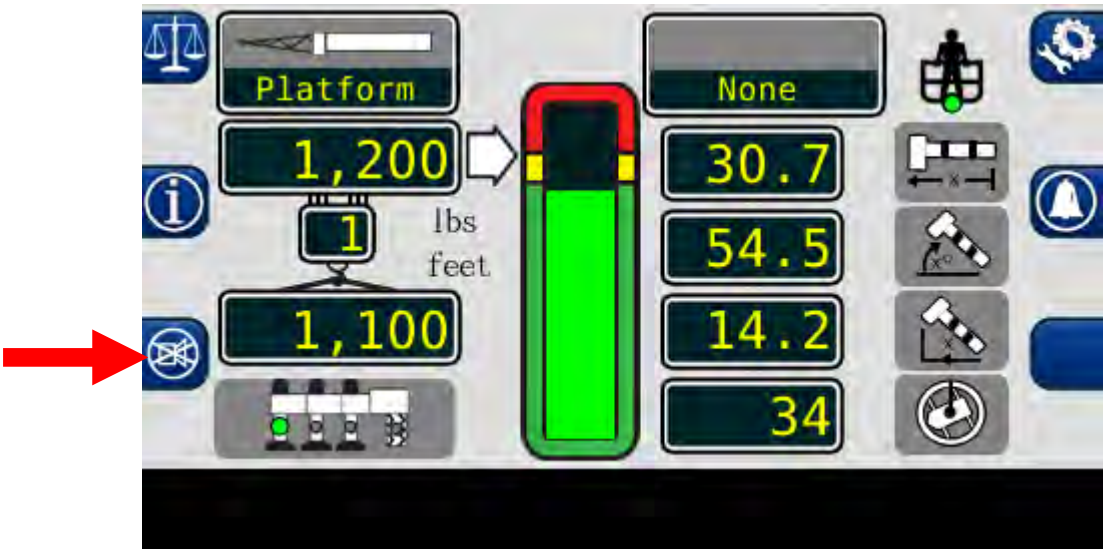
16. The **SWING ANGLE** window displays the swing of the boom relative to the zero point.



17. The **BAR GRAPH** indicates the actual load as a percent of the rated capacity of the current configuration of the machine.



Cancel Alarm Button



The ***Cancel Alarm*** button is used to silence the audible alarm. Press this button to cancel an audible alarm from an:

- Overload
- ATB Alarm
- Outrigger Horizontal Beam Mismatch
- Operator Programmable Alarm.

The audible alarm remains cancelled until the condition which caused the alarm has been resolved.

Reset Function Kick-Out

When rigging the machine, it may be necessary to place the boom in a position which could cause a function kick-out. In this situation, it would be necessary to use the ***Cancel Alarm*** button. The ***Cancel Alarm*** button is also used to reset the function disconnect relay. Press and hold the button for 5 seconds to reset the relay. A second beep is heard confirming the bypass. Continue to hold the button to maintain the function kick-out.

Should a different alarm condition occur while the relay is overridden, the new alarm will cause another function kick-out. When the condition which caused the alarm is no longer present, the function disconnect relay will reset to the normal condition.

WARNING!!

WHEN THE FUNCTION DISCONNECT RELAY IS RESET BY MEANS OF THE CANCEL ALARM BUTTON, THERE IS NO LONGER PROTECTION AGAINST THE CONDITION THAT CAUSED THE FUNCTION KICK-OUT.

Operator Programmable Alarms

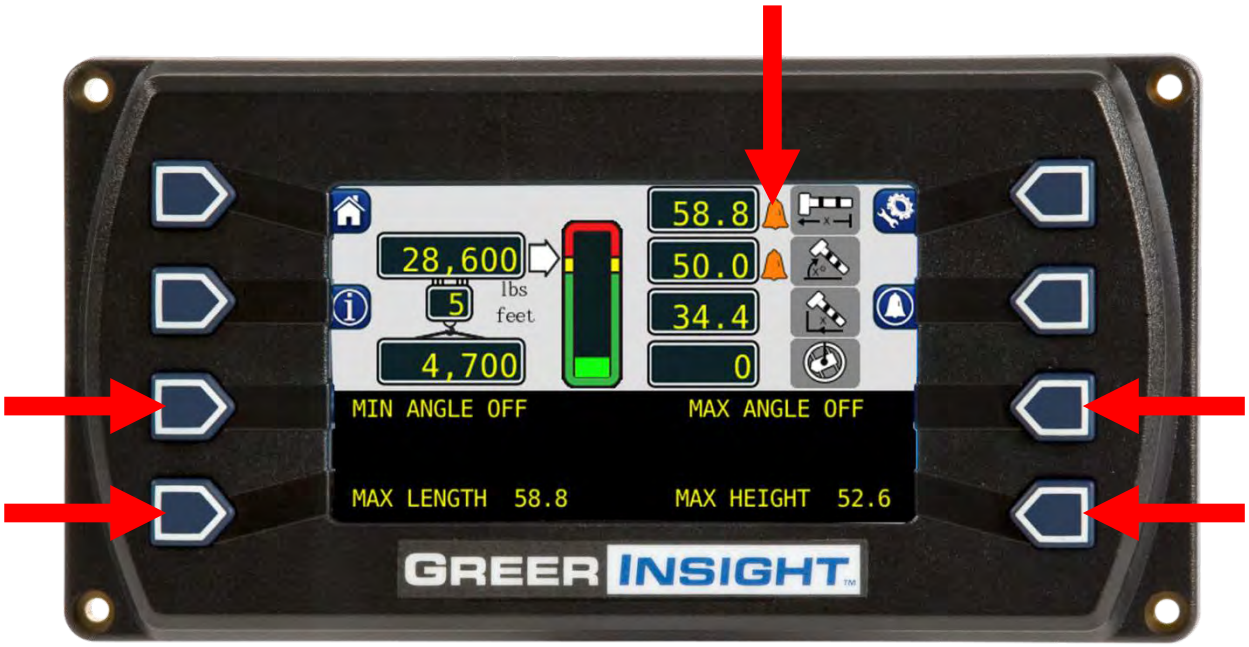
Setting the Operator Alarms

1. Press the ***Operator Alarm*** button. The information screen will show the current status of the operator alarms.

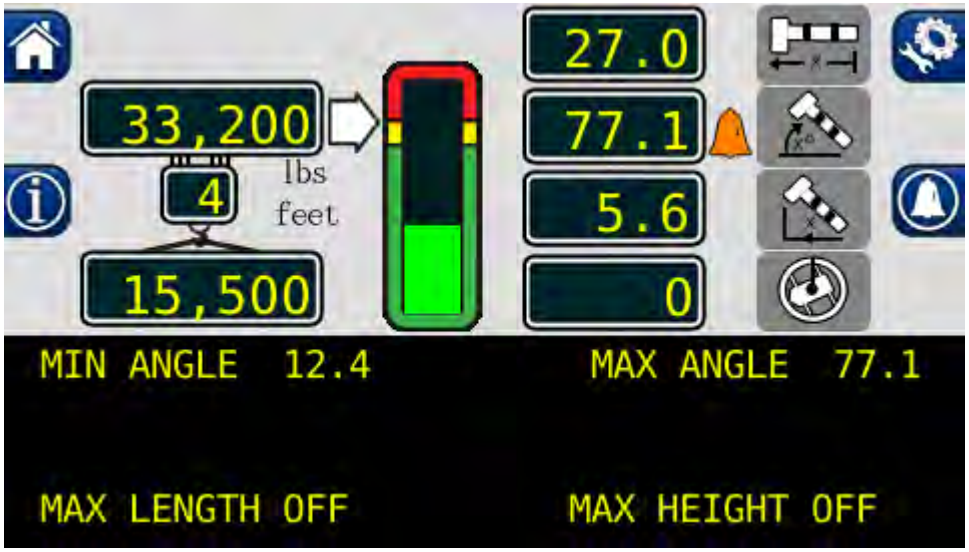
Each button corresponds to the displayed alarm. These buttons operate as a toggle switch. If the alarm to be set is OFF, pressing the button will turn the alarm ON. If the alarm to be set is ON, pressing the button will turn the alarm OFF.

NOTE: *Press the* ***Operator Alarm*** *button in order to cycle through the various user programmable alarms. Press the home button to return to the main screen. Exit at any time*.

When operator alarms are set, the orange alarm will appear. An example below:



Operator Programmable Alarms



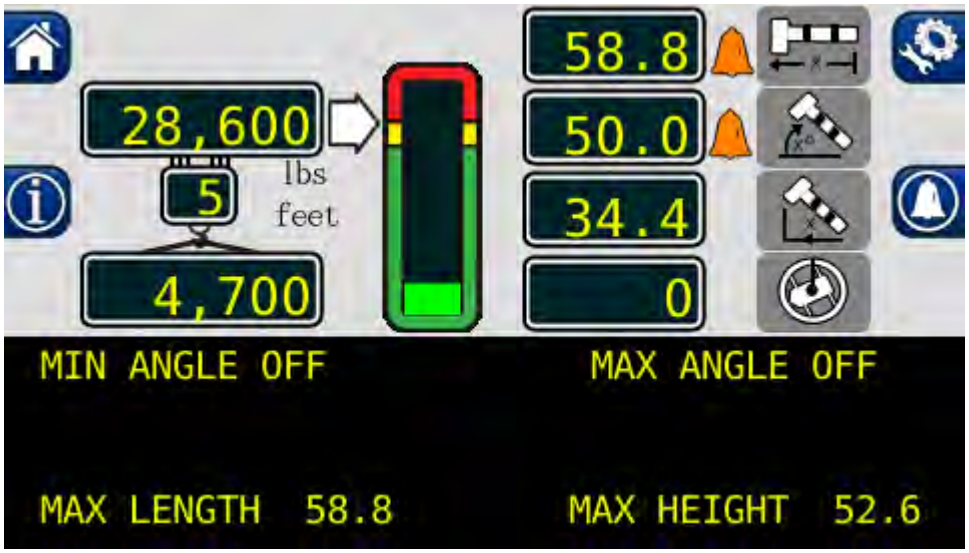
Setting the Minimum Boom Angle Alarm

1. Move the boom to the desired minimum angle, in this example, 12.4°.
2. Press the ***MIN ANGLE OFF*** button.
3. The display will show the desired minimum angle, in this example, 12.4°.
4. Press the ***MIN ANGLE*** button again to cancel the alarm. The display will read: **"MIN ANGLE OFF"**.

Setting the Maximum Boom Angle Alarm

1. Move the boom to the desired maximum angle, in this example, 77.1°.
2. Press the ***MAX ANGLE OFF*** button.
3. The display will show the desired maximum angle, in this example, 77.1°.
4. Press the ***MAX ANGLE*** button again to cancel the alarm. The display will read **"MAX ANGLE OFF"**.

Operator Programmable Alarms



Setting the Maximum Boom Length Alarm

1. Move the boom to the desired maximum length, in this example, 58.8 ft.
2. Press the ***MAX LENGTH OFF*** button.
3. The display will show the desired maximum length, in this example, 58.8 ft.
4. Press the ***MAX LENGTH*** button again to cancel the alarm. The display will read **"MAX LENGTH OFF"**.

Setting the Maximum Tip Height Alarm

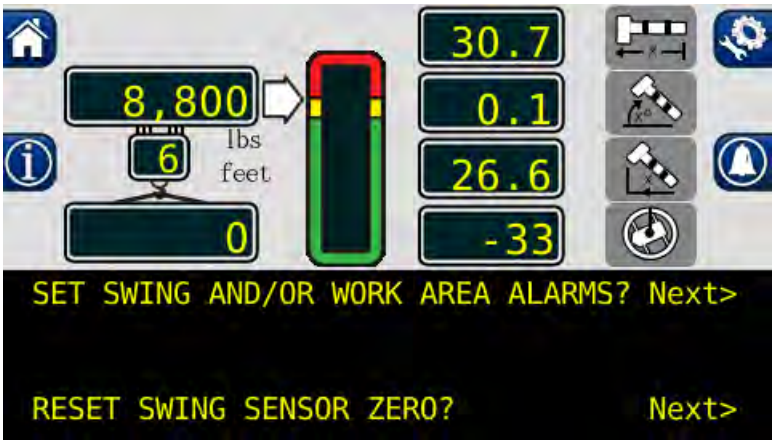
1. Move the boom to the desired maximum height, in this example 52.6 ft.
2. Press the ***MAX HEIGHT OFF*** button.
3. The display will show the desired maximum height, in this example 52.6 ft.
4. Press the ***MAX HEIGHT*** button again to cancel the alarm. The display will read **"MAX HEIGHT OFF"**.

Operator Programmable Alarms

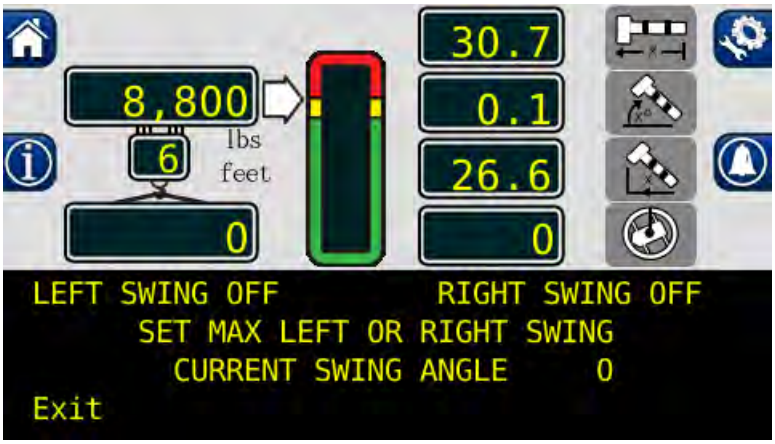
Setting the Swing Alarms

When the swing travels one degree past either set point, the operator will be visually and audibly warned. The display will show either, **“WARNING! – RIGHT SWING!”** or **“WARNING! – LEFT SWING!”** The alarm condition will once the crane is back into the working area.

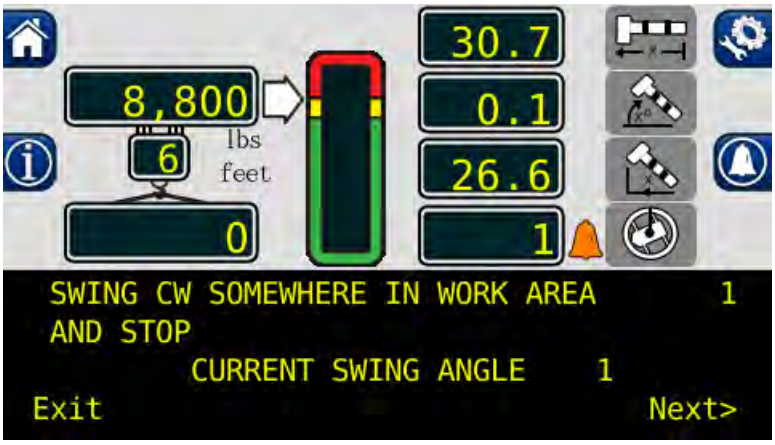
1. Press the ***Operator Alarm*** button twice.
2. Press ***Next*** button adjacent to **“SET SWING AND/OR WORK AREA ALARMS?”**



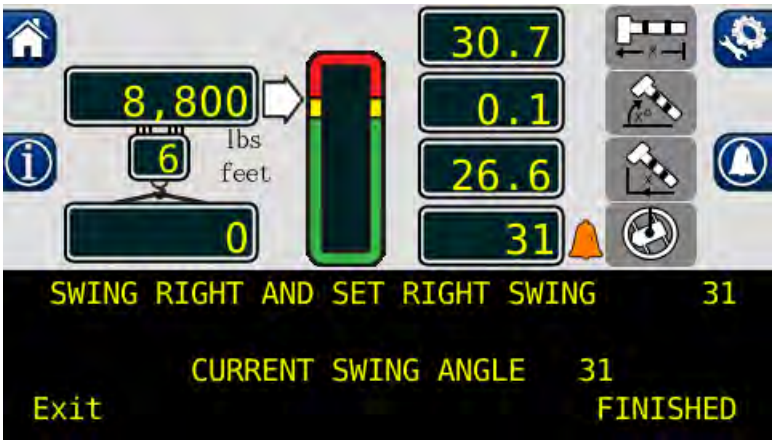
3. Press the ***Next*** button corresponding to **“SET LEFT AND RIGHT SWING ALARMS”**.
4. If a swing alarm is already set, press the ***LEFT SWING*** and ***RIGHT SWING*** buttons, to turn off the current alarms.



5. Swing the boom to the desired left swing point and press the ***LEFT SWING OFF*** button. This sets the left swing point value.
6. Press the ***Next*** button to continue.
7. Move the boom into the safe area and press the ***SET*** button.
8. Press the ***Next*** button.



9. Swing the boom to the desired right swing point and press the ***OFF*** button.



10. The swing alarms are now set. Press the ***Exit*** button to return to the calibration menu.

Operator Programmable Alarms

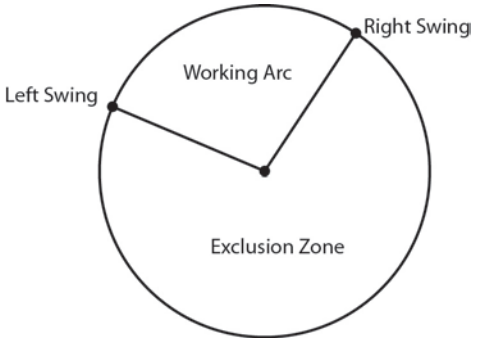
Swing Alarms Illustrated

These alarms permit the operator to define a working arc and an exclusion zone by two set points. The following diagram illustrates the working arc and exclusion zone.

A left swing alarm is activated when swinging to the left.

A right swing alarm is activated when swinging to the right.

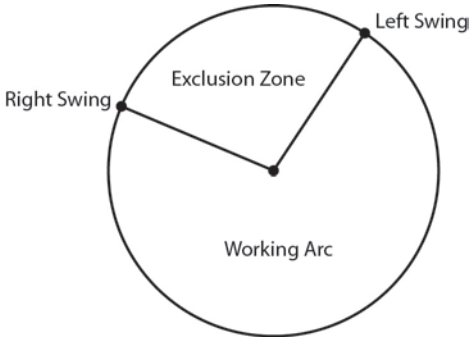
In this example the working arc is the smaller piece of the pie.



A left swing alarm is activated when swinging to the left.

A right swing alarm is activated when swinging to the right

In this example the working arc is the larger piece of the pie.



WARNING!

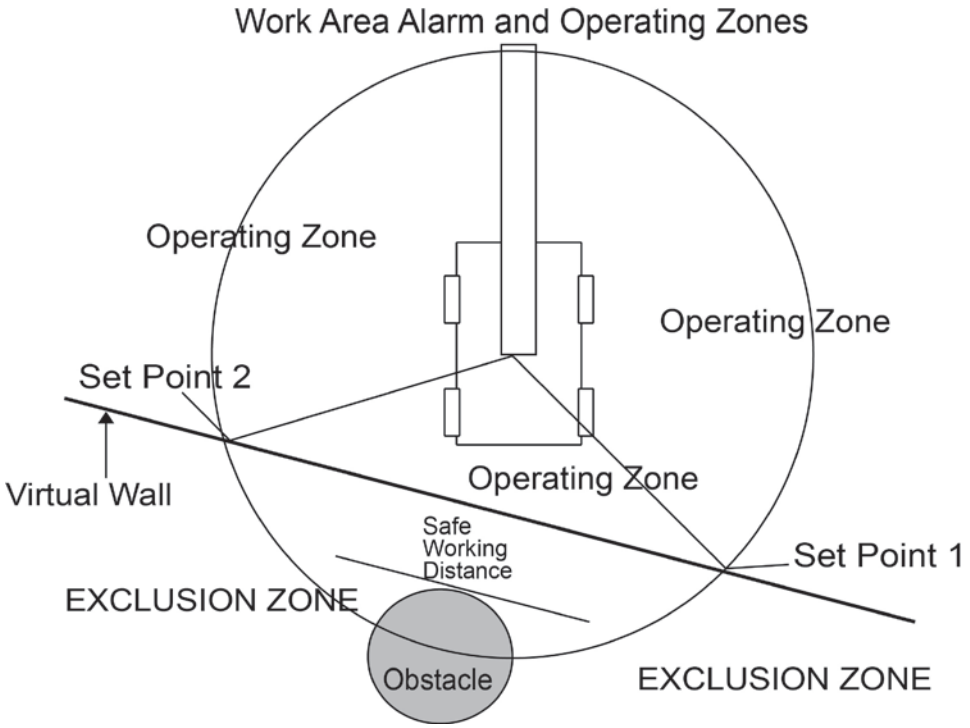
THE OPERATOR DEFINED SWING ALARM IS A WARNING DEVICE. ALL FUNCTIONS REMAIN OPERATIONAL WHEN ENTERING THE OPERATOR DEFINED EXCLUSION ZONE. IT IS THE RESPONSIBILITY OF THE OPERATOR TO SET SWING ALARMS THAT ENSURE THE CRANES BOOM, ATTACHMENT, LOAD, RIGGING, ETC. MAINTAIN A SAFE WORKING DISTANCE FROM THE OBSTACLE. AVOID POSITIONING THE BOOM, ATTACHMENT, LOAD, RIGGING ETC. IN THE EXCLUSION ZONE WHEN MOVING TO THE LEFT AND RIGHT SWING POINTS. WHEN SELECTING LEFT AND RIGHT SWING POINTS ENSURE THE LOAD WILL MAINTAIN A SAFE DISTANCE FROM THE OBSTACLE. RESET THE SWING ALARMS IF THE CRANE OR OBSTACLE IS MOVED OR IF A DIFFERENT SIZE LOAD IS LIFTED.

Operator Programmable Alarms

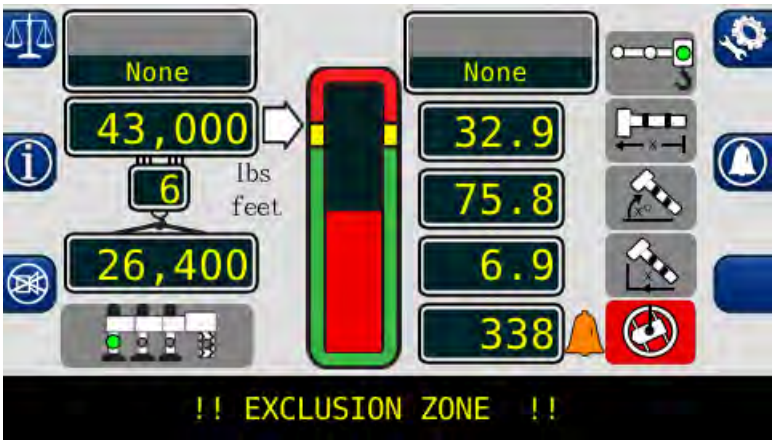
Work Area Alarms

This alarm permits the operator to define an operating zone by only two set points. The use of this method results in a more defined operating zone. The following diagram illustrates the operating zone and the exclusion zone.

The set points are calculated using the tip of the boom. This means the set point isn't determined just by the swing of the boom, but also the distance from the centerline of rotation to the tip of the boom.



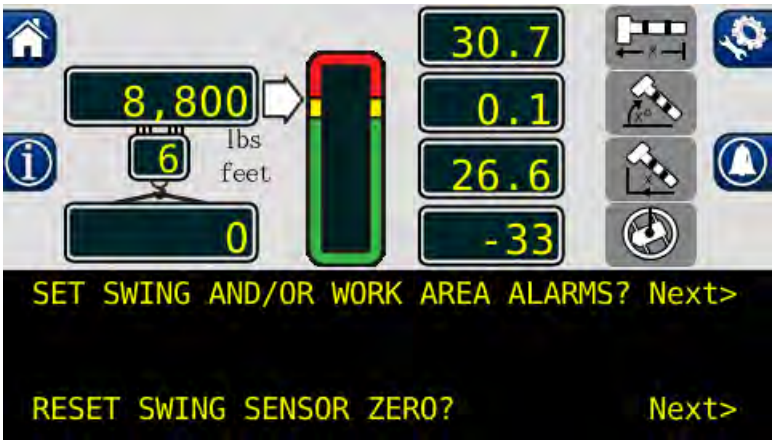
The work area alarm, defines an imaginary vertical plane between two set points. When the plane is passed the red warning indicator will be displayed, the alarm will sound, and the message **"!! EXCLUSION ZONE !!"** will flash as shown below.



Operator Programmable Alarms

Setting the Work Area Alarm

1. Press the ***Operator Alarm*** button twice. The information screen will show the current status of the swing and work area alarms. Press ***Next*** button adjacent to **"SET SWING AND/OR WORK AREA ALARMS?"**



2. Press the ***Next*** button.
3. To set a new swing area, the left and right points must be reset. Press the ***LEFT POINT*** and ***RIGHT POINT*** buttons. This will reset the set points

   NOTE: *In order for the swing alarms to function properly both alarms must be set. If the procedure is aborted before both points are set, the alarms will default to* ***"OFF".***
4. The display will now show **"LEFT POINT OFF"** **"RIGHT POINT OFF"**.

5. Rotate the boom to the desired left point. This should be the point to the left of the obstacle facing the exclusion zone to be defined.
6. Press the ***LEFT POINT*** button. The left point will now be set.

7. Rotate the boom to the right, taking care to avoid the obstacle by raising or retracting the boom. Or rotate the boom to the left to avoid moving the boom through the exclusion zone.
8. Press the ***RIGHT POINT*** button.
9. The work area alarm set points are now set.
10. To deactivate the alarms, go back to the screen displaying the left and right set points.

11. Press the ***LEFT POINT*** and ***RIGHT POINT*** buttons to toggle the alarms OFF.

www.skyazul.com

SkyAzúl, Inc.
16 Walnut Street
Middletown, MD 21769
Phone 301-371-6126
Fax 301-371-0029
info@skyazul.com