SkyAzúl
EQUIPMENT SOLUTIONS

MicroGuard 540
Rated Capacity Limiter

Operator's Manual

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MicroGuard 540 Rated Capacity Limiter

The following describes the function and operation of the MicroGuard 540 Rated Capacity Limiter. The system is intended to aid the operator in the efficient operation of the crane by continually monitoring the load and warning of an approach to an overload or unsafe condition.

WARNING

Although the system will alert the operator of an approaching overload or unsafe condition, it remains the responsibility of the operator to operate the crane safely at all times.

This system must never be substituted for the good judgment of the crane operator using safe operating procedures. The operator is solely responsible for safe operation of the crane.

!!THIS SYSTEM IS AN OPERATOR'S AID — NOT A SAFETY DEVICE!!

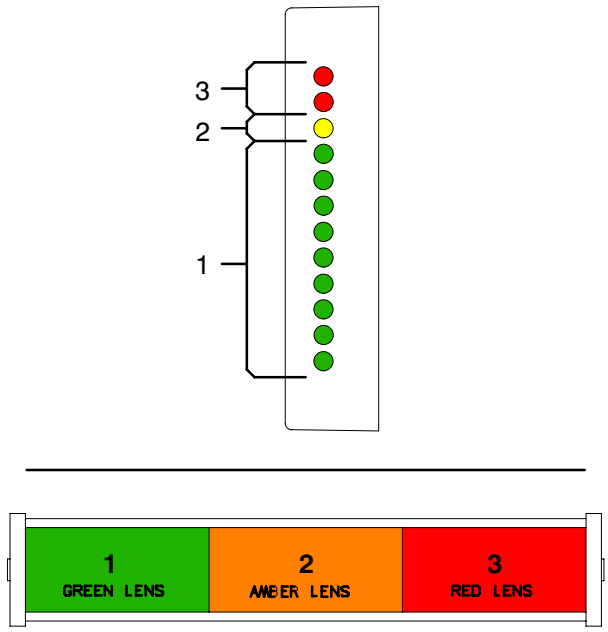
System Description

The system monitors crane functions by means of high accuracy sensors and continuously compares the load with a copy of the crane capacity chart which is stored in the computer memory. If an overload is approached, the system warns by means of audible and visual alarms and is configured to cause function limitation.

The MicroGuard 540 Rated Capacity Limiter provides the operator with a continuous display of:

- Rated Capacity
- Actual Load
- Percentage of Rated Capacity
- Radius of the Load
- Angle of the Main Boom
- Crane Configuration
- Length of the Main Boom
- Height of the Main Boom Head

An additional feature of the system is the provision of operator settable alarms. These alarms, when properly set, provide a method of obstacle avoidance. This is achieved by means of minimum and maximum boom angle, maximum load radius, maximum boom head height, left and right swing, and defined area alarms. These alarms can be programmed for each job site and set rapidly for the prevailing site conditions thereby aiding the operator in safe operation of the crane.



1. Green Lights — Percentage of Rated Load
2. Yellow Or Amber Lights — Approaching Overload
3. Red Lights — Overload

Figure 1—59
Overhead Bar Graph And External Light Bar (If Equipped)

Display Unit

The following is a description of the control buttons, indicators, and windows on the display unit. Refer to Figure 1—60.

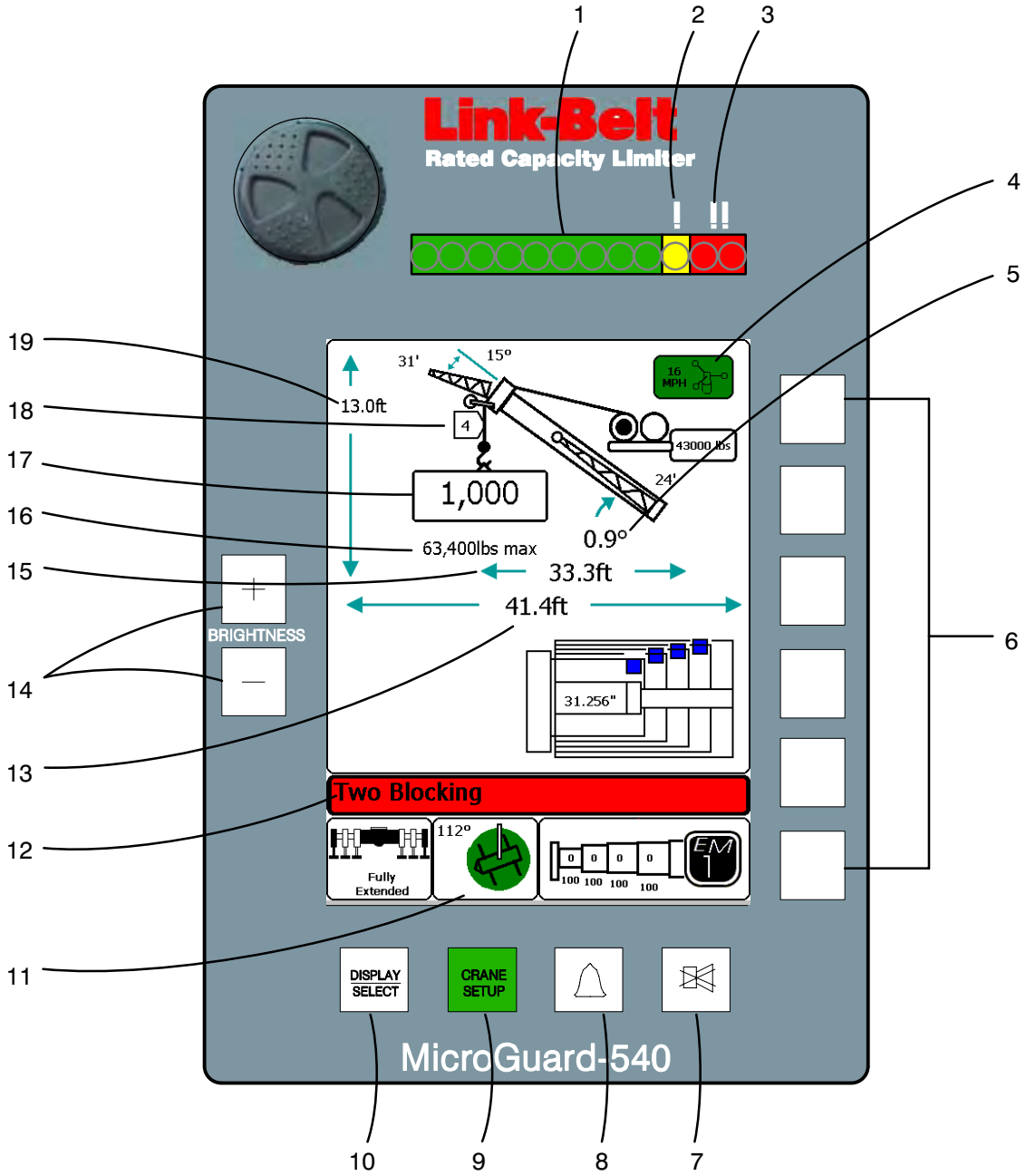
1. Bar-Graph

The Bar-Graph is a series of twelve colored lights which gives a visual indication of how much of the crane's capacity is being used and the rate at which an overload is being approached. Each green light represents 10% of the crane's rated capacity is being used. Yellow indicates 90—99.9%, and the red lights indicate an overload.

Note: System may be equipped with an overhead bar-graph or an external light bar which operates similar to the bar graph on the display. Refer to Figure 1—59.

2. Pre-Alarm Indicator

The Pre-Alarm (yellow) Indicator illuminates at a preset value of 90% of Maximum Rated Capacity and provides a visual indication of an approach to an overload.



1. Bar-Graph
2. Pre-Alarm Indicator
3. Overload Indicator
4. Wind Speed Indicator
5. Boom Angle Display
6. Configuration Selection Buttons
7. Cancel Alarm
8. Operator Alarms Button
9. Crane Setup Button
10. Display/Select Button
11. Working Area Display
12. Warning Message Area
13. Boom Length Display
14. Brightness Buttons
15. Load Radius Display
16. Maximum Rated Capacity Display
17. Actual Load Display
18. Parts-of-Line Display
19. Boom Head Height Display

Figure 1–60
Microguard 540 Rated Capacity Limiter

3. Overload Indicator

The Overload Indicator (red) illuminates at a pre-set value of 100% of Maximum Rated Capacity and provides a visual indication of Maximum Allowed Load. It will also illuminate whenever a wire rope limit is exceeded. Function limiters will occur simultaneously for an Overload, Wire Rope Limit or a Two-Block condition, but function limiters will not occur when exceeding an operator settable alarm. An audible alarm will sound and a message will appear in the warning message area for all 4 conditions.

4. Wind Speed Indicator

The wind speed indicator is used to monitor wind speeds at the main boom head or the fly head when erected.

5. Boom Angle Display

The Boom Angle Display gives a continuous indication of the angle of the main boom relative to horizontal.

6. Configuration Selection Buttons

These buttons are used during the crane configuration selection routine. Refer to "Configuration Selection" found later in this Section of the Operator's Manual.

7. Cancel Alarm Button

This button is used to silence the audible alarm when the alarm has occurred as a result of either an Overload, a Two Block, or an Operator Settable alarm. It is also used to reset the function limit relay when it is necessary to by-pass function limit which has occurred as a result of either an Overload or a Two Block alarm.

8. Operator Alarms Button

This button is used to start the operator settable alarms routines. Refer to "Operator Settable Alarms" found later in this Operator's Manual.

9. Crane Setup Button

This button is used to start the configuration selection routine. Refer to "Configuration Selection" found later in this Section of the Operator's Manual.

10. Display/Select Button

This button is used to access the boom telescope screen for visual feedback about what is occurring while telescoping. Refer to "Boom Telescope System" found earlier in this Section of the Operator's Manual.

11. Working Area Display

This area displays a graphical representation of the allowable lifting quadrant(s) based on the selected configuration. A quadrant not allowed will be filled red, an allowable quadrant will be filled green.

12. Warning Message Area

The Warning Message Area displays text messages of various alarms which may occur during normal operation of the system. When an alarm occurs, the rectangular area fills in red.

13. Boom Length Display

The Boom Length Display gives a continuous indication of the boom length in feet (*m*). It is the distance from the centerline of the boom foot pin to the center line of the boom head machinery.

14. Brightness Buttons

These buttons are used to adjust the display brightness.

15. Load Radius Display

The Load Radius Display gives a continuous indication of the radius of the load in feet. It is the horizontal distance from the centerline of rotation to the centerline of the hook.

16. Maximum Rated Capacity Display

The Maximum Rated Capacity is a digital display of the maximum permitted capacity. It is derived from a copy of the crane's capacity chart which is stored in the computer memory and is the reference capacity for any lifting operation. It is dependent on the configuration currently selected, which is shown in the crane setup screen, and which determines the section of the capacity chart to be used as the rated capacity reference.

17. Actual Load Display

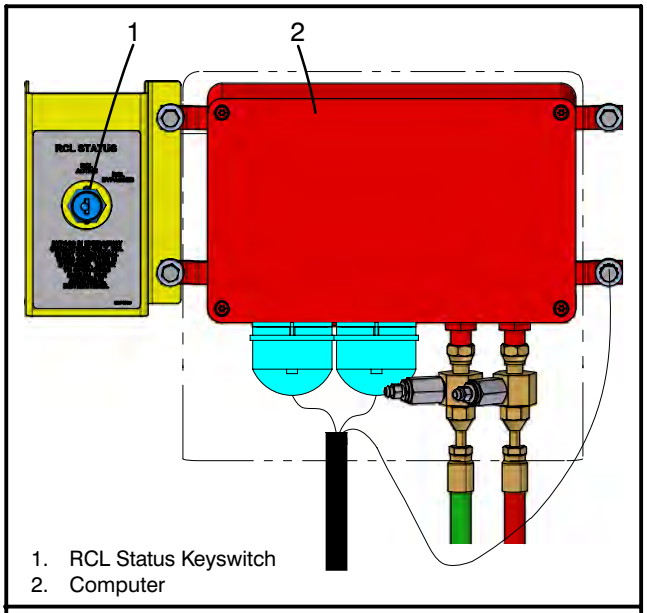
The Actual Load Display is a digital display which shows total load suspended below the boom or fly head. It includes the load, any slings, pins, or tackle used to secure the load and the hook block or ball.

18. Parts-of-Line Display

Parts-of-Line displays the parts of line currently selected for the winch in use.

19. Boom Head Height Display

The Boom Head Height Display gives a continuous display of the height of the boom head shaft or attachment head shaft above ground level, that is the vertical distance from the ground to the working head shaft.



1. RCL Status Keyswitch
2. Computer

Figure 1–61
Rated Capacity Limiter Computer

System Operation

The following is a list of procedures which are used to operate the multiple features of the Rated Capacity Limiter. Use these procedures in conjunction with the previous display unit control descriptions.

System Self-Test

At start-up the system automatically performs a self test after which all lamps, audible alarms, and digital displays will be functionally tested and all memory areas checked for accuracy. If faults in the system are detected during a test, the warning message area will show the words SYSTEM FAULT. If the words SYSTEM FAULT occur, press the Display/Select button to display the diagnostic screen. The diagnostic screen lists information about the fault condition by means of an error code. Contact your local distributor for details of the fault codes.

Note: If the batteries have been disconnected interrupting power to the computer, the start-up time for on-board computer systems will be longer than normal.

System Bypass

In emergency situations, the Rated Capacity Limiter computer can be bypassed. The computer is located on the back of the operator's cab. There is a RCL Status keyswitch adjacent to the computer to bypass the system. Move the key to the "Bypass" position to bypass the system. For emergency use while the system is bypassed, refer to "System Inoperative or Malfunctioning" that follows.

⚠ WARNING

The MicroGuard 540 is not operational when the computer is bypassed. Bypass the system in emergency situations only.

System Inoperative Or Malfunctioning

When operational aids are inoperative or malfunctioning, the following recommendations for continued use of the crane should be followed or the crane should be shutdown.

1. Steps shall be taken to schedule repairs and recalibration immediately. The operational aids shall be put back into service as soon as replacement parts, if required, are available and the repairs and recalibration can be carried out. Every reasonable effort must be made to expedite the repairs and recalibration.
2. When the Rated Capacity Limiter is inoperative or malfunctioning, the designated person responsible for supervising the lifting operations shall establish procedures for determining load weights and shall ascertain that the weight of the load does not exceed the crane ratings at the radius where the load is to be handled.
3. When a boom angle or radius indicator is inoperative or malfunctioning, the radius or boom angle shall be determined by measurement.
4. When the anti-two block warning device is inoperative or malfunctioning, the designated person responsible for supervising the lifting operations shall establish procedures, such as assigning an additional signal person, to furnish equivalent protection. This does not apply when lifting personnel in load line supported baskets. Personnel shall not be lifted in load line supported baskets when the anti-two block devices are not functioning properly.
5. When a boom length indicator is inoperative or malfunctioning, the designated person responsible for supervising the lifting operations shall establish the boom length at which the lift will be made by actual measurement or markings on the boom.
6. When a level indicator is inoperative or malfunctioning, other means shall be used to level the crane.
7. In situations where inconsistency exists, verified weights, measured radii, measured boom lengths, and authorized crane capacities must always take precedence over indicator readings.

Configuration Selection

In the normal operational mode the system is programmed to remember the last configuration selected. Each time the system is powered up it will automatically default to that configuration. Only when the crane is rigged differently must a new configuration be selected. Use the following procedure to select the crane configuration.

Note: When selecting configurations allowed on outriggers, all beams must be equally extended; all fully retracted, intermediate extended, or fully extended.

Depending on how the crane is equipped or which selections have been made, some screens shown may not appear or may not appear as illustrated. The system cannot be programmed for configurations not allowed by the capacity charts listed in the Crane Rating Manual.

Note: Figure 1—87 illustrates a typical crane attachment setup. It can be used for correct identification of attachments.

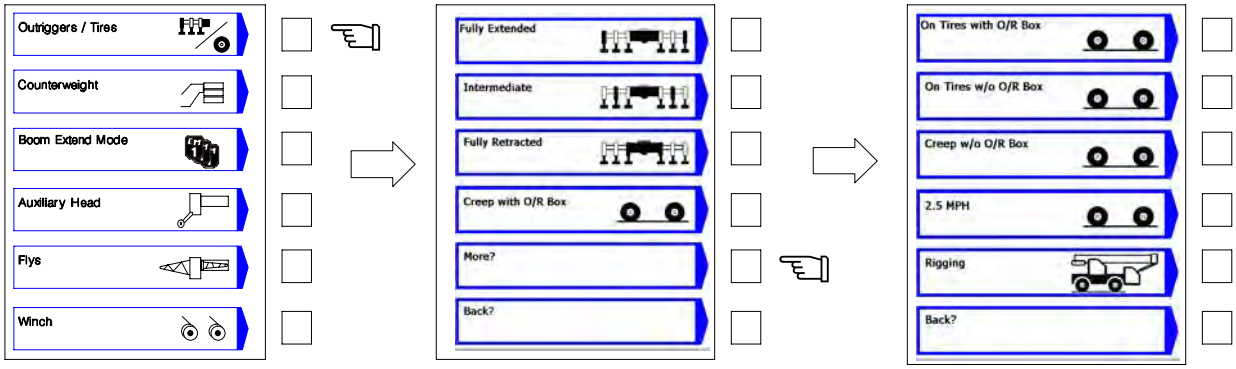


Figure 1—62
Carrier Selection

1. From the normal working screen press the CRANE SETUP button. The normal working screen will change and graphically display the crane configurations that can be selected from the crane set up screen. Press the corresponding configuration selection button to select the carrier configuration.
2. The crane setup screen will change and graphically display the carrier options. Press the corresponding configuration selection button to select the desired carrier configuration. If rigging is desired, refer to "To Select Rigging Mode" found later in this Section of the Operator's Manual.

WARNING

The MicroGuard 540 is not operational when in the RIGGING Mode. Return the MicroGuard 540 to normal operation before operating the crane.

3. Press the CRANE SETUP button to return to the crane setup screen.

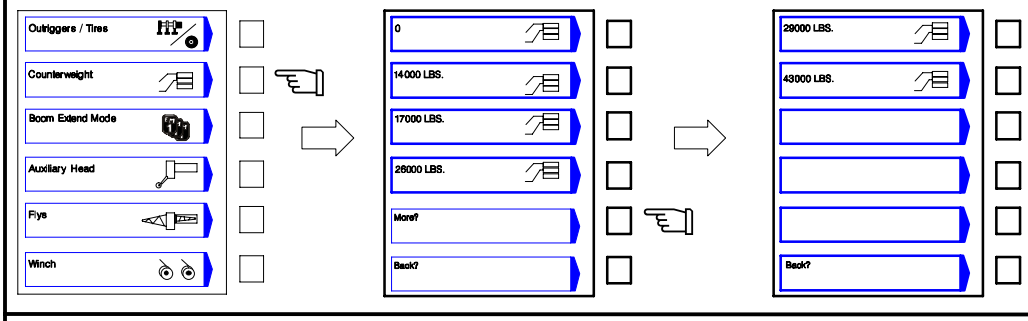


Figure 1–63
Counterweight Selection

4. On the crane set up screen, press the corresponding configuration selection button to select the counterweight options. Press the corresponding configuration selection button to select the installed counterweight.
5. Press the CRANE SETUP button to return to the crane setup screen.

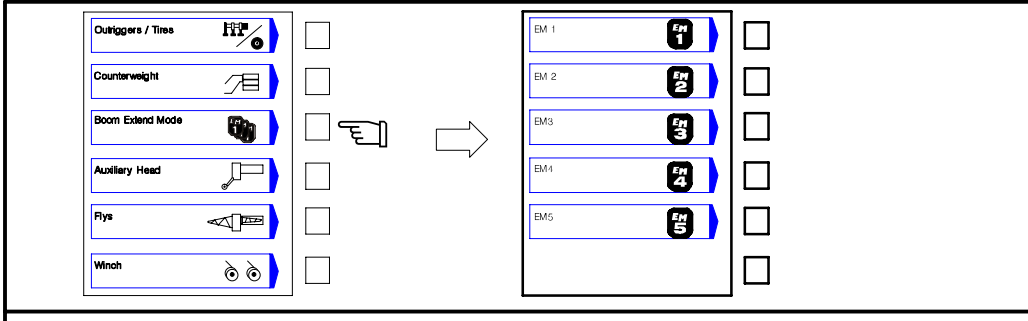


Figure 1–64
Boom Extend Mode Selection

6. On the crane set up screen, press the corresponding configuration selection button to select the boom mode options. Press the corresponding configuration selection button to select the desired boom mode.

   Note: Boom mode options will only be displayed when the boom is fully retracted. Consult the Crane Rating Manual to determine the best boom mode to maximize lift capacity at working radius.

7. Press the CRANE SETUP button to return to the crane setup screen.

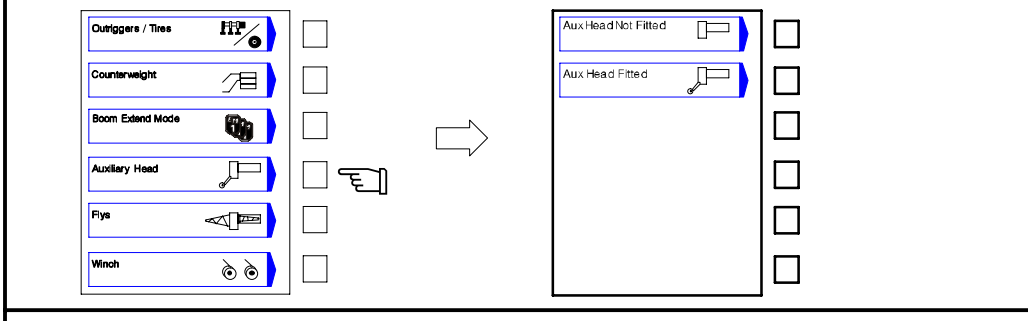


Figure 1–65
Auxiliary Head (Auxiliary Lifting Sheave) Selection

8. On the crane set up screen, press the corresponding configuration selection button to display the auxiliary lifting sheave fitted or not fitted. Press the corresponding configuration selection button to select the desired auxiliary lifting sheave position.
9. Press the CRANE SETUP button to return to the crane setup screen.

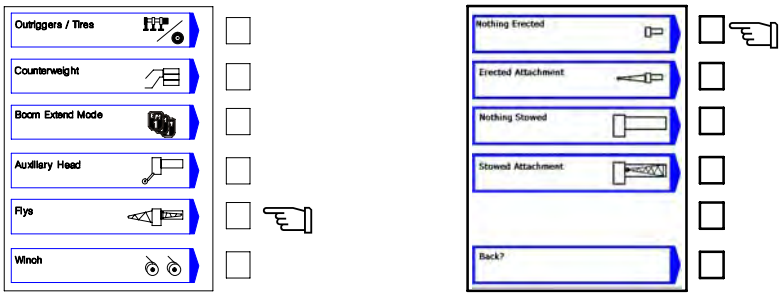


Figure 1–66
Nothing Erected Selection

10. On the crane set up screen, press the corresponding configuration selection button to display the fly options.
    a. If Nothing Erected or Nothing Stowed is selected, the attachment screen will return to the crane setup screen.
    b. If fly is installed, press the corresponding configuration selection button to select the erected or stowed attachment.

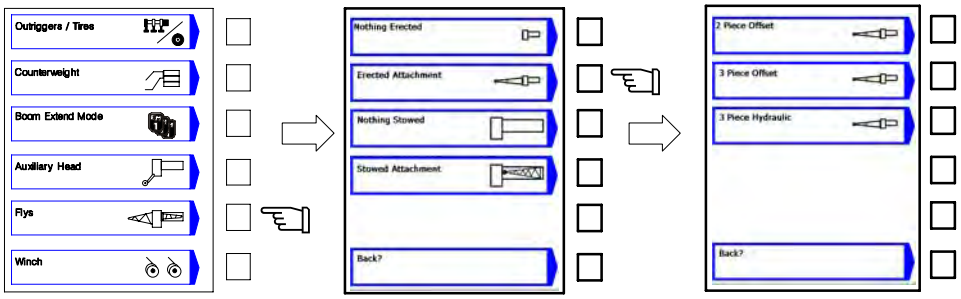


Figure 1–67
Erected Attachment Selection

    c. If Erected Attachment is selected, the attachment screen will change and graphically display the available attachments as required.

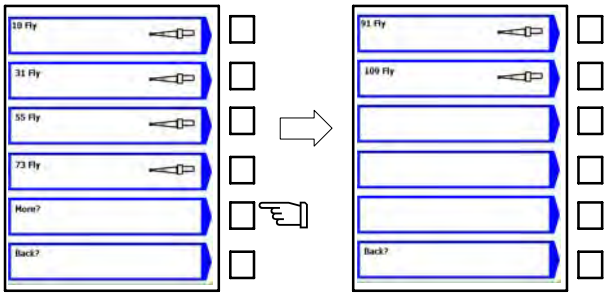


Figure 1–68
Erected Attachment Selection

    d. Press the corresponding configuration selection button to select the installed erected attachment.

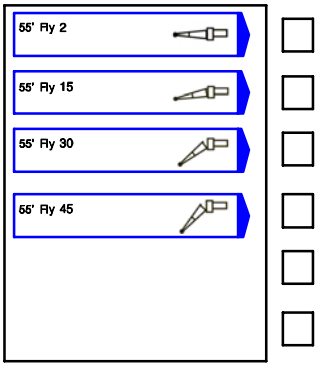


Figure 1–69
Erected Attachment Offset Selection

e. If Erected Attachment is selected, the attachment screen will change and graphically display the available offsets as required.
f. Press the corresponding configuration selection button to select the installed offset angle.
g. Press the CRANE SETUP button to return to the crane setup screen.

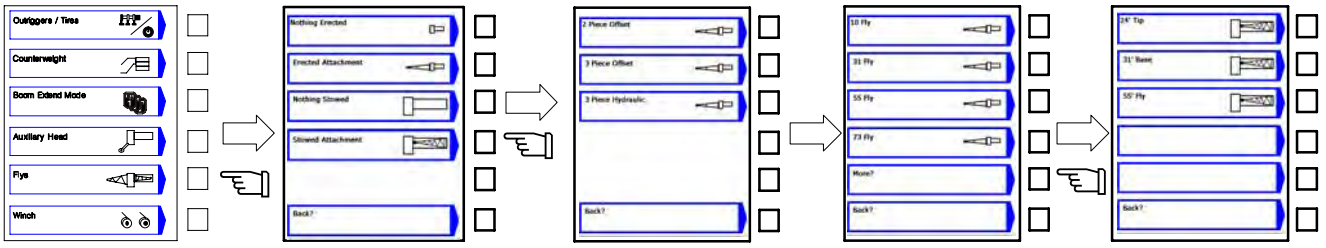


Figure 1–70
Stowed Attachment Selection

11. If the crane is equipped with a fly and was not selected as an erected attachment, press the corresponding configuration selection button to select Flys. Press the corresponding configuration selection button to select Stowed Attachment. Press the corresponding configuration selection button to select the actual stowed attachment.
12. Press the CRANE SETUP button to return to the crane setup screen.

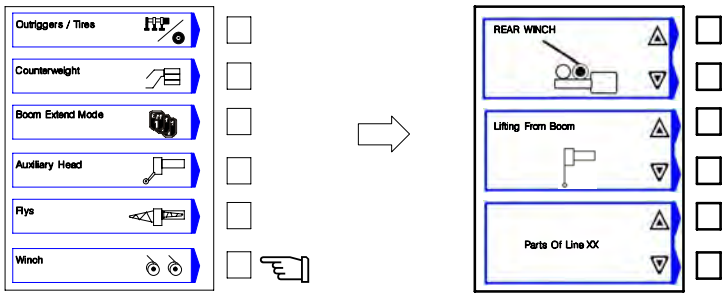


Figure 1–71
Winch Configuration

13. Press the corresponding configuration selection button to select the winch configuration.

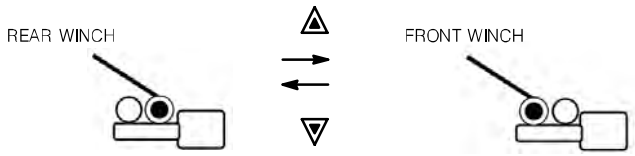


Figure 1—72
Winch Selection

a. Press the corresponding configuration selection button to toggle between the front and rear winch until the winch to be used is displayed.

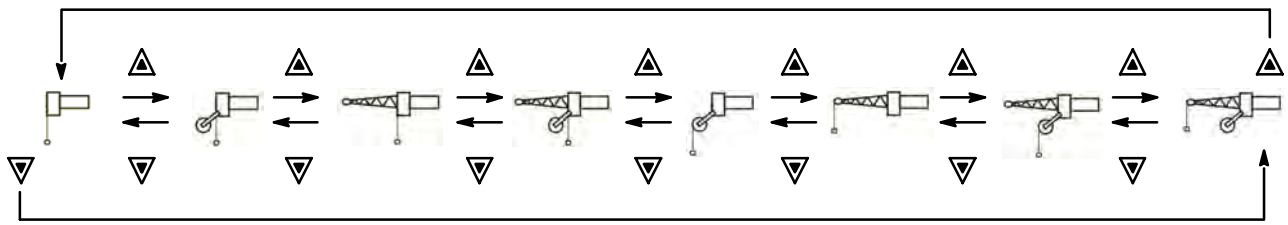


Figure 1—73
Lifting Point Selection

b. Press the corresponding configuration selection button to scroll through the available lifting points until the actual lifting point, for the winch selected, is displayed.

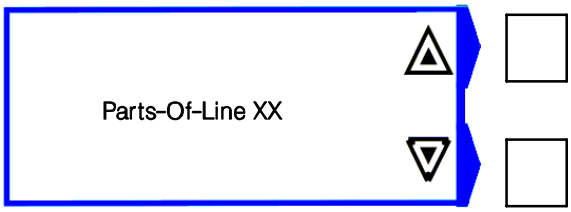


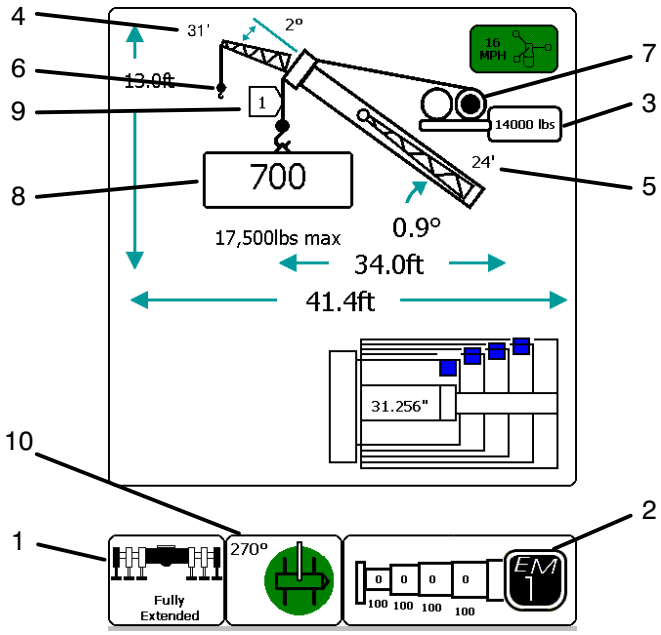
Figure 1—74
Parts Of Line Selection

c. Press the corresponding configuration selection button to scroll through the available parts-of-line until the actual parts of line, for the winch selected, is displayed.
d. Repeat Steps a thru c for the other winch, if required.

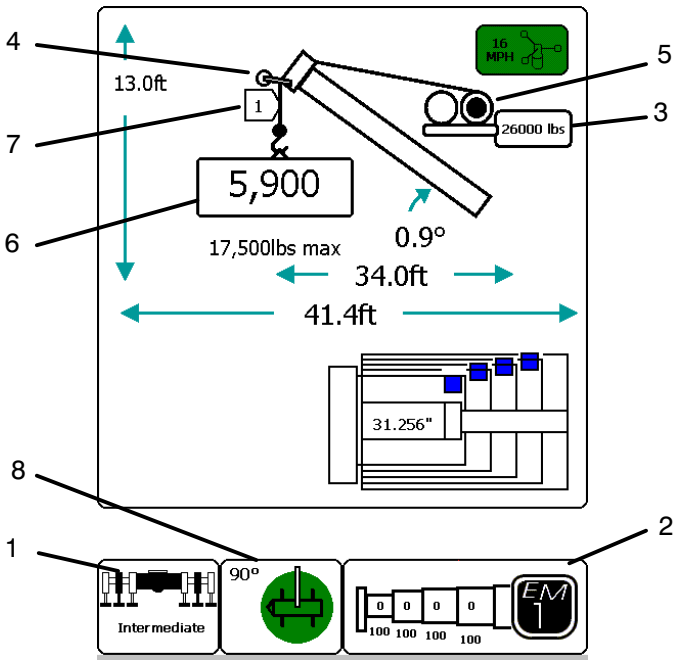
14. Press the CRANE SETUP button to return to the crane setup screen.

Note: A change to any selection can be made at anytime during the configuration routine. When at the crane set up screen, simply press the desired configuration button to go directly to that sub-routine.

15. Press the CRANE SETUP button again to return to the normal working screen and graphically display the crane configuration as previously selected.

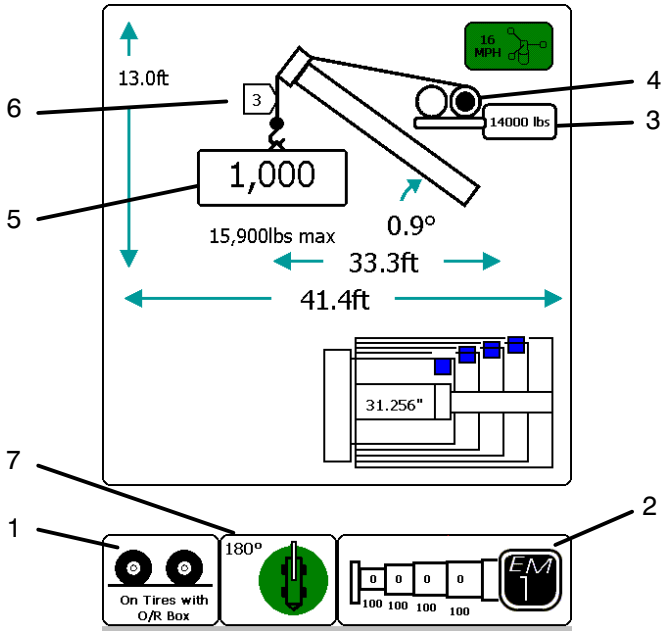


In this example the crane is setup on fully extended outriggers (1), boom mode EM1 (2), 14,000 lb counterweight (3), fly base erected at 2 degree offset (4), fly tip stowed (5), the front winch available with the fly base (6) and the rear winch selected (7), with the main boom as the lifting point (8), with one part of line (9), and 360 degree capacities with the boom currently positioned 270˚ over the side (10).

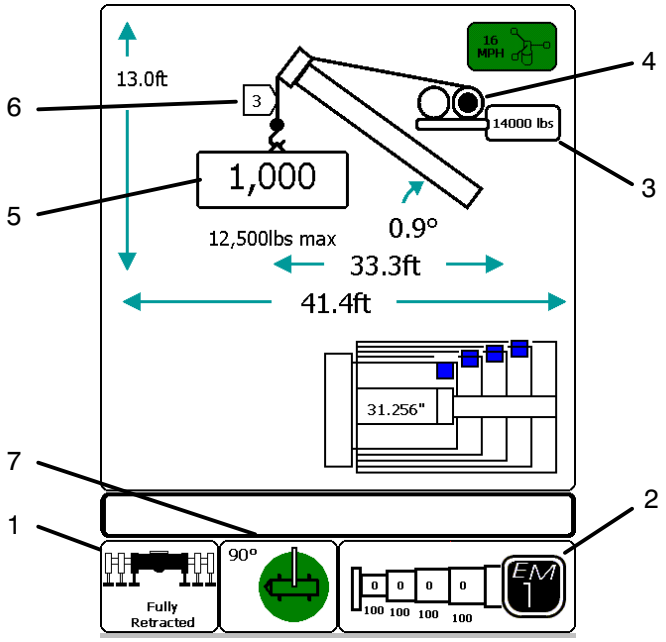


In this example the crane is setup on intermediate extended outriggers (1), boom mode EM1 (2), 26,000 lb counterweight (3), the front winch available with the auxiliary head (4) and the rear winch selected (5), with the main boom head as the lifting point (6), with one part of line (7) and 360 degree capacities with the boom currently positioned 90˚ over the side (8).

Figure 1–75
Normal Working Screen Examples



In this example the crane is setup for stationary on tires (1), boom mode EM1 (2), 14,000 lb of counterweight (3), front winch not available and the rear winch selected (4), with the main boom as the lifting point (5), with three parts of line (6), and 360 degree capacities with the boom currently positioned over the rear (7).



In this example the crane is setup on fully retracted outriggers (1), boom mode EM1 (2), 14,000 lb of counterweight (3), front winch not available and the rear winch selected (4), with the main boom as the lifting point (5), with three parts of line (6), and 360 degree capacities with the boom currently positioned 90˚ over the side (7).

Figure 1–76
Normal Working Screen Examples

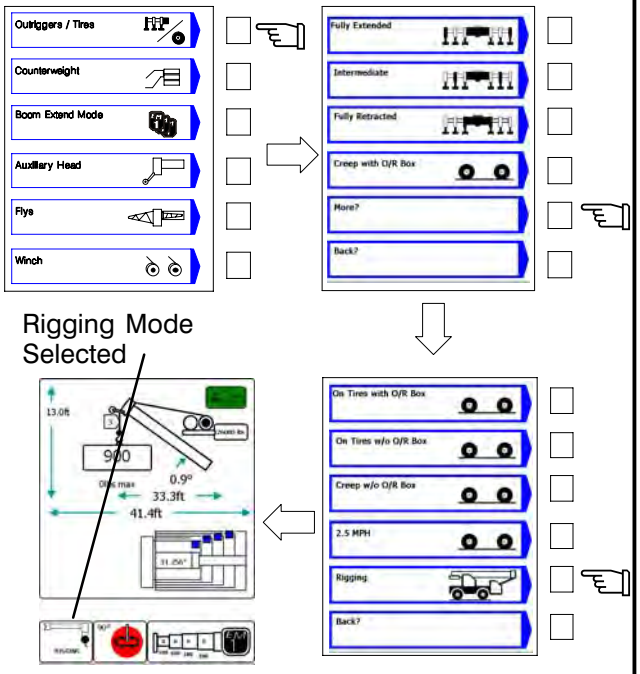


Figure 1–77
Rigging Mode Selection

To Select Rigging Mode

The CRANE SETUP button is also used to select RIGGING mode. This mode is used to facilitate rigging and travel of the crane by inhibiting function limiters and the audible alarm while selected. To resume crane operation, select proper outrigger or tire configuration per the proper procedure.

WARNING

The MicroGuard 540 is not operational when in the RIGGING Mode. Return the MicroGuard 540 to normal operation before operating the crane.

1. From the normal working screen press the CRANE SETUP button. The crane setup screen will change and graphically display the carrier options.
2. Press the corresponding configuration selection button to select RIGGING mode. Refer to Figure 1–77.

Cancel Audible Alarm And Reset Function Limiters

The CANCEL ALARM button is used to cancel the audible alarm when the alarm has occurred as a result of either an Overload, a Two Block alarm, a Wire Rope Limit, or an Operator Settable alarm. The audible alarm may be canceled by pressing and releasing the CANCEL ALARM button. The audible alarm remains canceled until the condition which caused the alarm has been removed. For example, if the audible alarm was canceled because of an overload condition, it will remain canceled until the overload condition is removed. However, if a different alarm, e.g. two block condition, was to occur when the audible alarm was still canceled for an earlier overload condition, the new alarm condition would cause the audible alarm to be re-started.

WARNING

Once the function limiters have been by-passed, the crane is no longer protected against the condition that initially caused the function limiters to occur.

Note: The CANCEL ALARM feature is a temporary function. The audible alarm or function limit is automatically reset when the condition which caused the alarm is no longer present.

The CANCEL ALARM is also used to reset the function limiters when it is necessary to by-pass the function limiters which has occurred as a result of either an Overload, a Two Block alarm, or a Wire Rope Limit. Function limiters are reset by first canceling the audible alarm (as described previously) and then pressing and holding the CANCEL ALARM button for about 3 seconds, after which the function limiters will be reset to allow normal operation. However, should another different alarm condition occur when the function limiters had previously been over-ridden, then the newly occurring alarm condition would cause the function limiters to activate again.

Operator Settable Alarms

Some alarms occur automatically as a result of limitations imposed by the capacity chart. The operator has control over additional alarms which can be set to operate within the normal chart limitations which are in addition to, those already set by the chart.

Operator settable alarms will be stored in the computer memory, even if the crane is shutdown, until they are cleared. Refer to Figure 1–78.

Alarms which are available for operator use are:
- Maximum and Minimum Boom Angle
- Maximum and Minimum Boom Head Height
- Maximum and Minimum Load Radius
- Maximum and Minimum Boom Length
- Left and Right Swing
- Operator Defined Area
- First Layer/Third Wrap

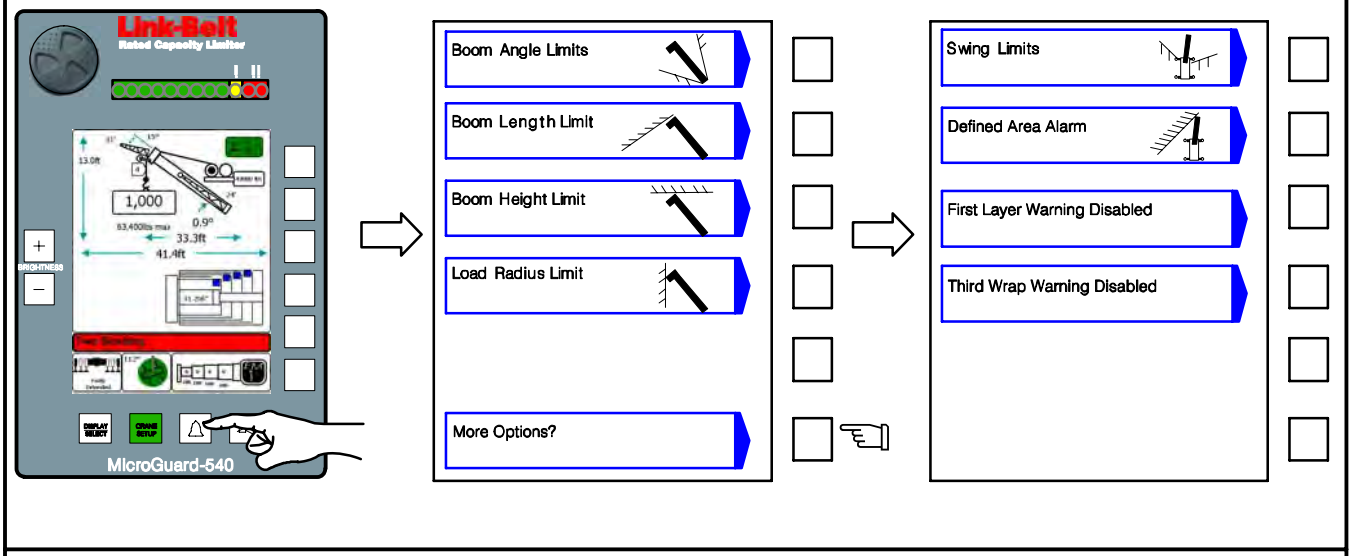


Figure 1—78
Operator Settable Alarms

WARNING

The operator settable alarms are a warning device. All functions remain operational when entering the operator defined bad area. For safe operation, adequate distance must be maintained to allow for operator reaction time to avoid entering the bad area. It is the responsibility of the operator to set points which ensure that the crane's boom, attachment, load, rigging, etc. maintains a safe working distance and complies with local safety regulations.

Setting Angle, Length, Height, Radius, And Swing Operator Alarms

1. From the normal working screen press OPERATOR ALARM button to access the Operator Settable Alarm screen.
2. Press the corresponding selection button to select the desired alarm to be set.

WARNING

Avoid positioning the boom, attachment, load, rigging, etc. into the bad area when setting the alarm values.

When selecting the alarm values, ensure that the load will maintain a safe distance from the obstacle.

3. Place the crane in the desired position depending upon the alarm to be set. The numerical value displayed will be the current position of the crane.

Note: If an alarm had been previously set, the numerical value displayed will be the previously set alarm value and indicated by the ✓ icon. The previous alarm must first be disabled, then set the new alarm. Refer to "To Disable Operator Settable Alarms" found later in this Section of the Operator's Manual. Alarms which are disabled are indicated by the ✗ icon.

4. Press the corresponding selection button to set the alarm value.
5. When all alarm values are set, press the OPERATOR ALARM button to return to the alarm screen.
6. Press the corresponding selection button to set another alarm if desired. When all desired alarms are set, press the OPERATOR ALARM button to return the normal working screen.
7. Test the alarm, with no load, to ensure the alarm points have been properly set. When approaching the alarm set point, the audible will sound intermittently and a warning message will appear in the warning message area. When exceeding the alarm set point, the audible alarm will sound continuously and a warning message will appear in warning message area.

   Note: An alarm icon will appear on the normal working screen to alert the operator that an operator alarm has been set.

8. Use the following examples to understand the use of the alarms.

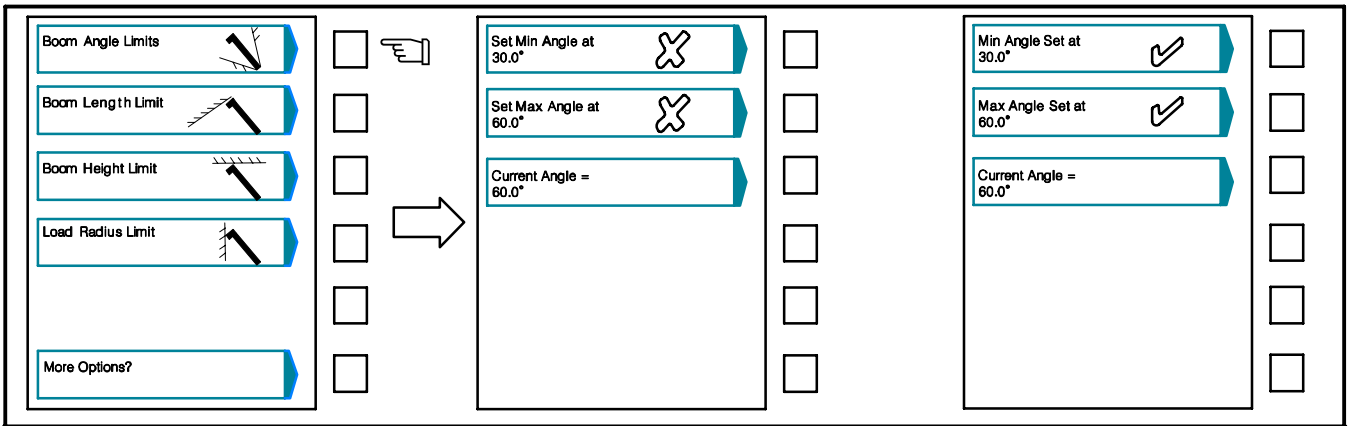


Figure 1–79
Boom Angle Alarm

WARNING

If crane or obstacle is moved or if a different size load is lifted, the alarm(s) must be reset.

WARNING

Check the crane's current configuration, capacity chart, and Working Areas chart in the Crane Rating Manual to ensure safe, stable operation under conditions described in the following examples.

To Set Minimum Angle Alarm

Refer to Figure 1–79.

Example: To have an alarm whenever the boom is below a 30 degree angle, use the following procedure:

1. From the normal working screen, Press the OPERATOR ALARM button to access the alarm screen.
2. Press the corresponding button for Boom Angle Limits.
3. Move the boom to a 30 degree angle.
4. Press the corresponding button for "Set Min Angle at" to enter the alarm. The displayed value will be the alarm setting. The ✓ will appear to indicate that the alarm is set.
5. Press the OPERATOR ALARM button to return to the alarm screen. Press the OPERATOR ALARM button again to return to the normal working screen.
6. Test the alarm, with no load, to ensure the alarm point has been properly set. When approaching 30 degree boom angle, the audible alarm will sound intermittently and "Minimum Angle" will appear in the warning message area. Whenever the boom is lowered to or below 30 degrees, the audible alarm will sound continuously and "Minimum Angle" will appear in warning message area.

To Set Maximum Angle Alarm

Refer to Figure 1–79.

Example: To have an alarm whenever the boom is above a 60 degree angle use the following procedure:

1. From the normal working screen press the OPERATOR ALARM button to access the alarm screen.
2. Press the corresponding button for Boom Angle Limits.
3. Move the boom to a 60 degree angle.
4. Press the corresponding button for "Set Max Angle at" to enter the alarm. The displayed value will be the alarm setting. The ✓ will appear to indicate that the alarm is set.
5. Press the OPERATOR ALARM button to return to the alarm screen. Press the OPERATOR ALARM button again to return to the normal working screen.
6. Test the alarm, with no load, to ensure the alarm point has been properly set. When approaching 60 degree boom angle, the audible alarm will sound intermittently and "Maximum Angle" will appear in the warning message area. The audible alarm will sound continuously whenever the boom is raised to or above 60 degrees and "Maximum Angle" will appear in warning message area.

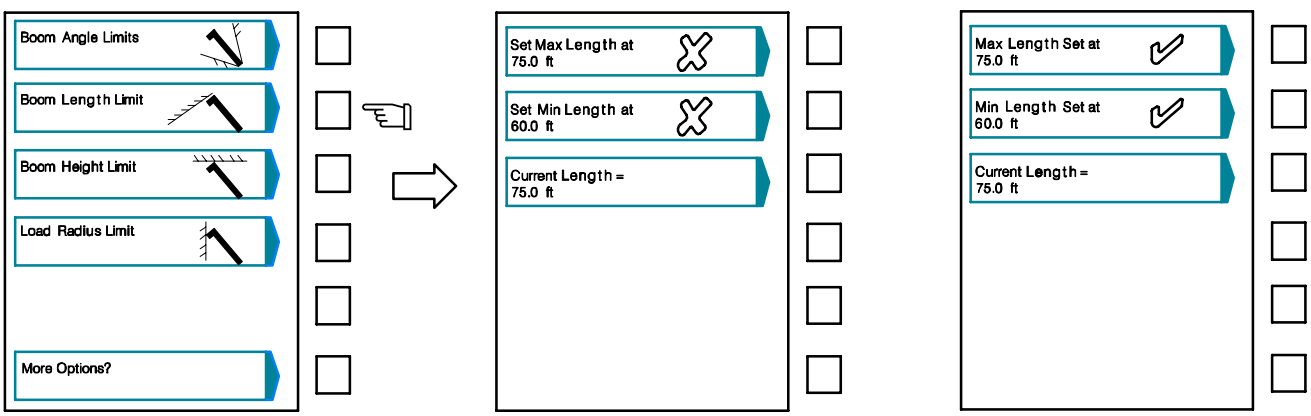


Figure 1—80
Boom Length Alarm

To Set Minimum Length Alarm

Refer to Figure 1—80.

Example: To have an alarm whenever the boom length is retracted to 60 feet or less, use the following procedure:

1. Press the OPERATOR ALARM button to access the alarm screen.
2. Press the corresponding button for Boom Length Limit.
3. Retract the boom so that the length is 60 feet.
4. Press the corresponding button for "Set Min Length at" to enter the alarm. The displayed value will be the alarm setting. The ✓ will appear to indicate that the alarm is set.
5. Press the OPERATOR ALARM button to return to the alarm screen. Press the OPERATOR ALARM button again to return to the normal working screen.
6. Test the alarm, with no load, to ensure the alarm point has been properly set. When approaching 60 foot boom length, the audible alarm will sound intermittently and "Minimum Length" will appear in the warning message area. The audible alarm will sound continuously whenever the boom length is 60 feet or less and "Minimum Length" will appear in the warning message area.

To Set Maximum Length Alarm

Refer to Figure 1—80.

Example: To have an alarm whenever the boom length exceeds 75 feet, use the following procedure:

1. Press the OPERATOR ALARM button to access the alarm screen.
2. Press the corresponding button for Boom Length Limit.
3. Extend the boom so that the length is 75 feet.
4. Press the corresponding button for "Set Max Length at" to enter the alarm. The displayed value will be the alarm setting. The ✓ will appear to indicate that the alarm is set.
5. Press the OPERATOR ALARM button to return to the alarm screen. Press the OPERATOR ALARM button again to return to the normal working screen.
6. Test the alarm, with no load, to ensure the alarm point has been properly set. When approaching 75 foot boom length, the audible alarm will sound intermittently and "Maximum Length" will appear in the warning message area. The audible alarm will sound continuously whenever the boom length reaches or exceeds 75 feet and "Maximum Length" will appear in the warning message area.

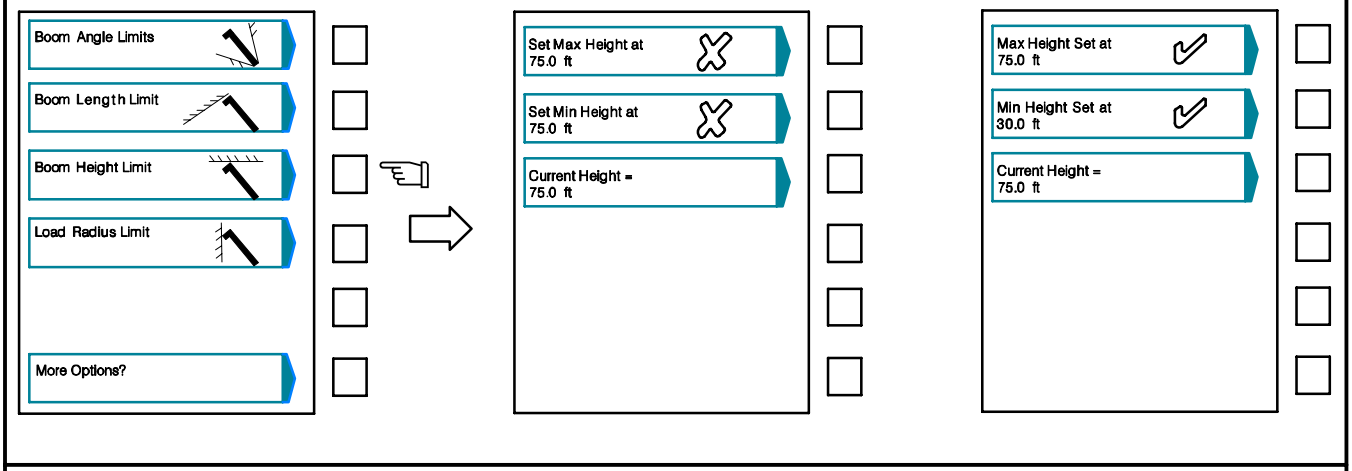


Figure 1–81
Boom Height Alarm

To Set Minimum Height Alarm

Refer to Figure 1–81.

Example: To have an alarm whenever the boom tip height is lowered to 30 feet or less, use the following procedure:

1. Press the OPERATOR ALARM button to access the alarm screen.
2. Press the corresponding button for Boom Height Limit.
3. Lower the boom and/or adjust the boom angle so that the tip height is 30 feet.
4. Press the corresponding button for "Set Min Height at" to enter the alarm. The displayed value will be the alarm setting. The ✓ will appear to indicate that the alarm is set.
5. Press the OPERATOR ALARM button to return to the alarm screen. Press the OPERATOR ALARM button again to return to the normal working screen.
6. Test the alarm, with no load, to ensure the alarm point has been properly set. When approaching 30 foot boom tip height, the audible alarm will sound intermittently and "Minimum Height" will appear in the warning message area. The audible alarm will sound continuously whenever the boom tip height reaches 30 feet or less and "Minimum Height" will appear in the warning message area.

To Set Maximum Height Alarm

Refer to Figure 1–81.

Example: To have an alarm whenever the boom tip height exceeds 75 feet, use the following procedure:

1. Press the OPERATOR ALARM button to access the alarm screen.
2. Press the corresponding button for Boom Height Limit.
3. Extend the boom and/or adjust the boom angle so that the tip height is 75 feet.
4. Press the corresponding button for "Set Max Height at" to enter the alarm. The displayed value will be the alarm setting. The ✓ will appear to indicate that the alarm is set.
5. Press the OPERATOR ALARM button to return to the alarm screen. Press the OPERATOR ALARM button again to return to the normal working screen.
6. Test the alarm, with no load, to ensure the alarm point has been properly set. When approaching 75 foot boom tip height, the audible alarm will sound intermittently and "Maximum Height" will appear in the warning message area. The audible alarm will sound continuously whenever the boom tip height reaches or exceeds 75 feet and "Maximum Height" will appear in the warning message area.

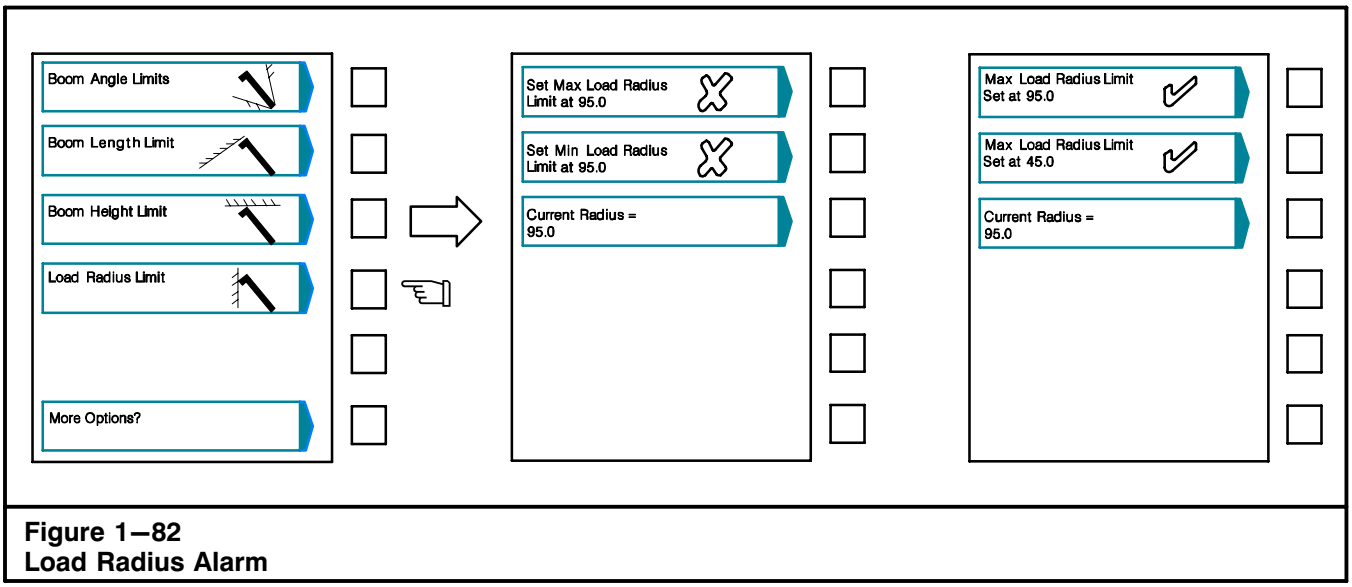


Figure 1–82
Load Radius Alarm

To Set Minimum Radius Alarm

Refer to Figure 1–82.

Example: To have an alarm whenever the boom radius is 45 feet or less, use the following procedure:

1. Press the OPERATOR ALARM button to access the alarm screen.
2. Press the corresponding button for Load Radius Limit.
3. Retract the boom and/or adjust the boom angle so that the radius is 45 feet.
4. Press the corresponding button for "Set Min Load Radius Limit at" to enter the alarm. The displayed value will be the alarm setting. The ✓ will appear to indicate that the alarm is set.
5. Press the OPERATOR ALARM button to return to the alarm screen. Press the OPERATOR ALARM button again to return to the normal working screen.
6. Test the alarm, with no load, to ensure the alarm point has been properly set. When approaching 45 foot boom radius, the audible will sound intermittently and "Minimum Radius" will appear in the warning message area. The audible alarm will sound continuously whenever the boom radius is 45 feet or less and "Minimum Radius" will appear in warning message area.

To Set Maximum Radius Alarm

Refer to Figure 1–82.

Example: To have an alarm whenever the boom radius exceeds 95 feet, use the following procedure:

1. Press the OPERATOR ALARM button to access the alarm screen.
2. Press the corresponding button for Load Radius Limit.
3. Extend the boom and/or adjust the boom angle so that the radius is 95 feet.
4. Press the corresponding button for "Set Max Load Radius Limit at" to enter the alarm. The displayed value will be the alarm setting. The ✓ will appear to indicate that the alarm is set.
5. Press the OPERATOR ALARM button to return to the alarm screen. Press the OPERATOR ALARM button again to return to the normal working screen.
6. Test the alarm, with no load, to ensure the alarm point has been properly set. When approaching 95 foot boom radius, the audible will sound intermittently and "Maximum Radius" will appear in the warning message area. The audible alarm will sound continuously whenever the boom radius reaches or exceeds 95 feet and "Maximum Radius" will appear in warning message area.

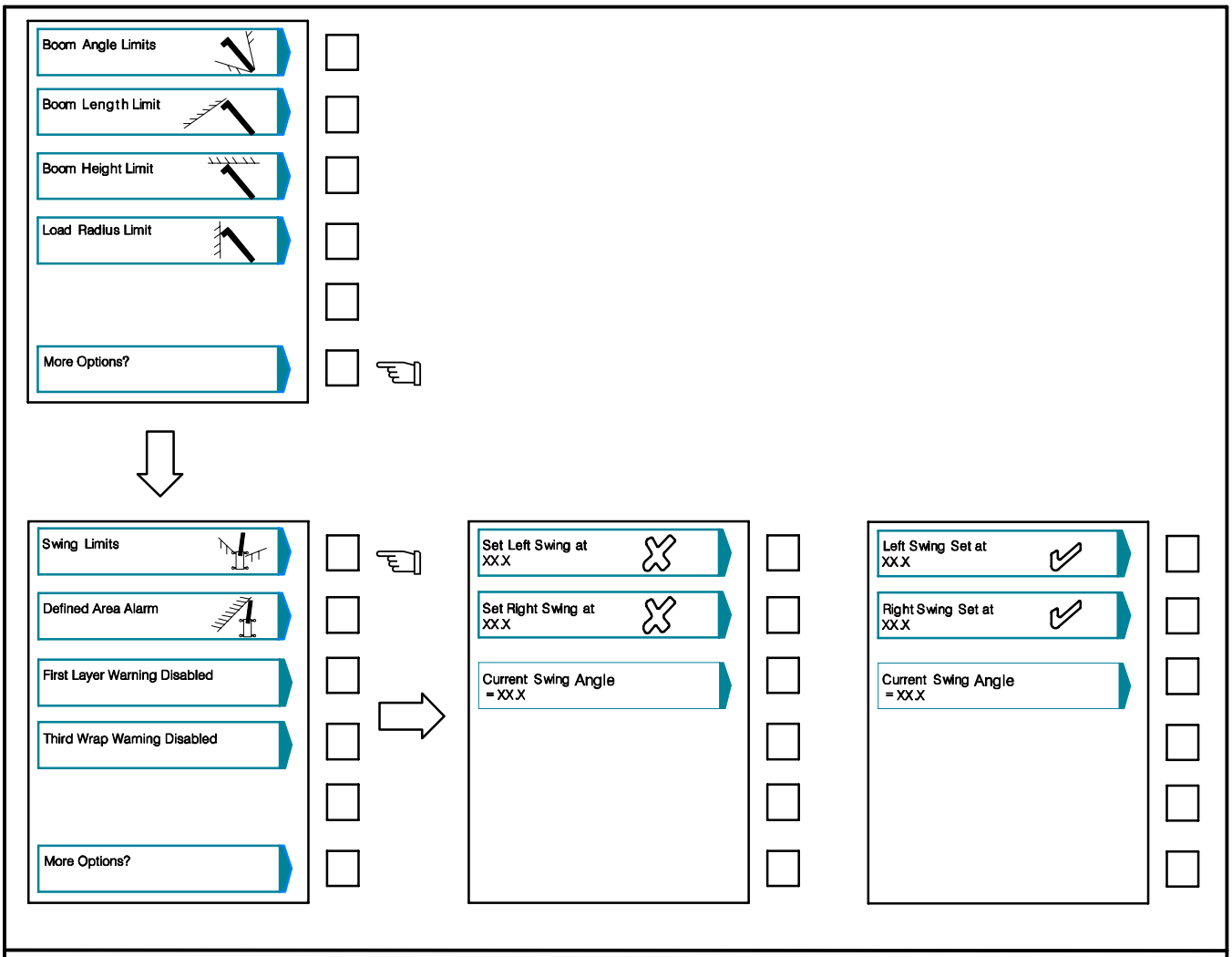


Figure 1–83
Swing Alarm

To Set Left And Right Swing Alarms

Refer to Figure 1–83.

Example: To have an alarm whenever the LEFT SWING AND RIGHT SWING exceed pre-determined alarm points, use the following procedure:

1. Press the OPERATOR ALARM button to access the alarm screen.
2. Press the corresponding button for More Options.
3. Press the corresponding button for Swing Limits.

   Note: Both the left and right swing alarms must be set for the system to determine the operator set working area.

4. Swing the boom to the left alarm point.
5. Press the corresponding button for "Set Left Swing at" to enter the left alarm point. The displayed value will be the left alarm setting. The ✓ will appear to indicate that the alarm is set.
6. Swing the boom to the right alarm point.
7. Press the corresponding button for "Set Right Swing at" to enter the right alarm point. The displayed value will be the right alarm setting. The ✓ will appear to indicate that the alarm is set.
8. Press the OPERATOR ALARM button to return to the alarm screen. Press the OPERATOR ALARM button again to return to the normal working screen.
9. Test the alarm, with no load, to ensure the alarm points have been properly set. When approaching the set alarm point, the audible alarm will sound intermittently and "Swing Alarm" will appear in the warning message area. The audible alarm will sound continuously whenever the swing reaches or exceeds the alarm points and "Swing Alarm" will appear in warning message area.

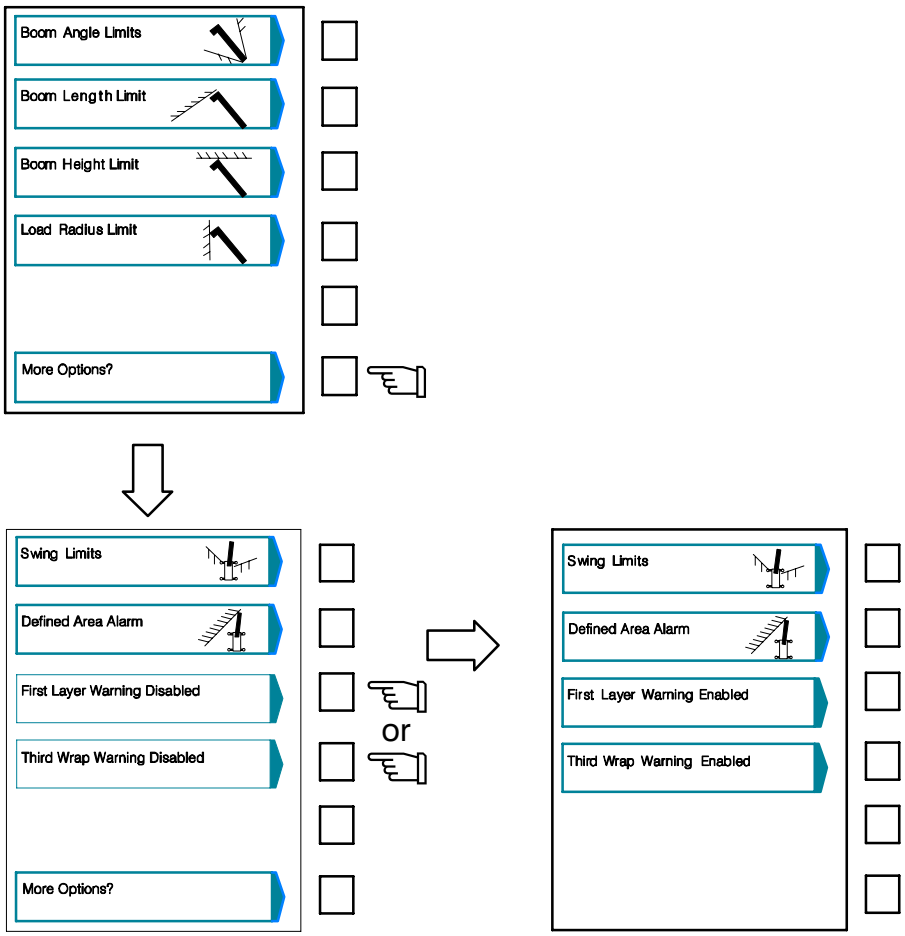


Figure 1–84
First Layer/Third Wrap Alarm

First Layer/Third Wrap Alarm (If Equipped)

Refer to Figure 1–84.

The crane may be equipped with a first layer/third wrap alarm system for the winch drum(s). When the system is enabled, the audible alarm will sound intermittently, and "First Layer" will appear in the warning message area to alert the operator when the wire rope is down to the first layer on the winch drum(s). The audible alarm will sound continuously and "Third Wrap" will appear in the warning message area to alert the operator when the wire rope is down to the third wrap on the winch drum(s).

WARNING

Three (3) full wraps of wire rope must be maintained on the winch drum at all times during operation. Rope failure may occur.

1. Press the OPERATOR ALARM button to access the alarm screen.
2. Press the corresponding button for More Options.
3. Press the corresponding button for First Layer or Third Wrap until the word "Enabled" appears.
4. Press the OPERATOR ALARM button to return to the alarm screen. Press the OPERATOR ALARM button again to return to the normal working screen.
5. Select the winch drum to monitor by using the winch drum selector switch located on the seat console. Refer to Figure 1–36

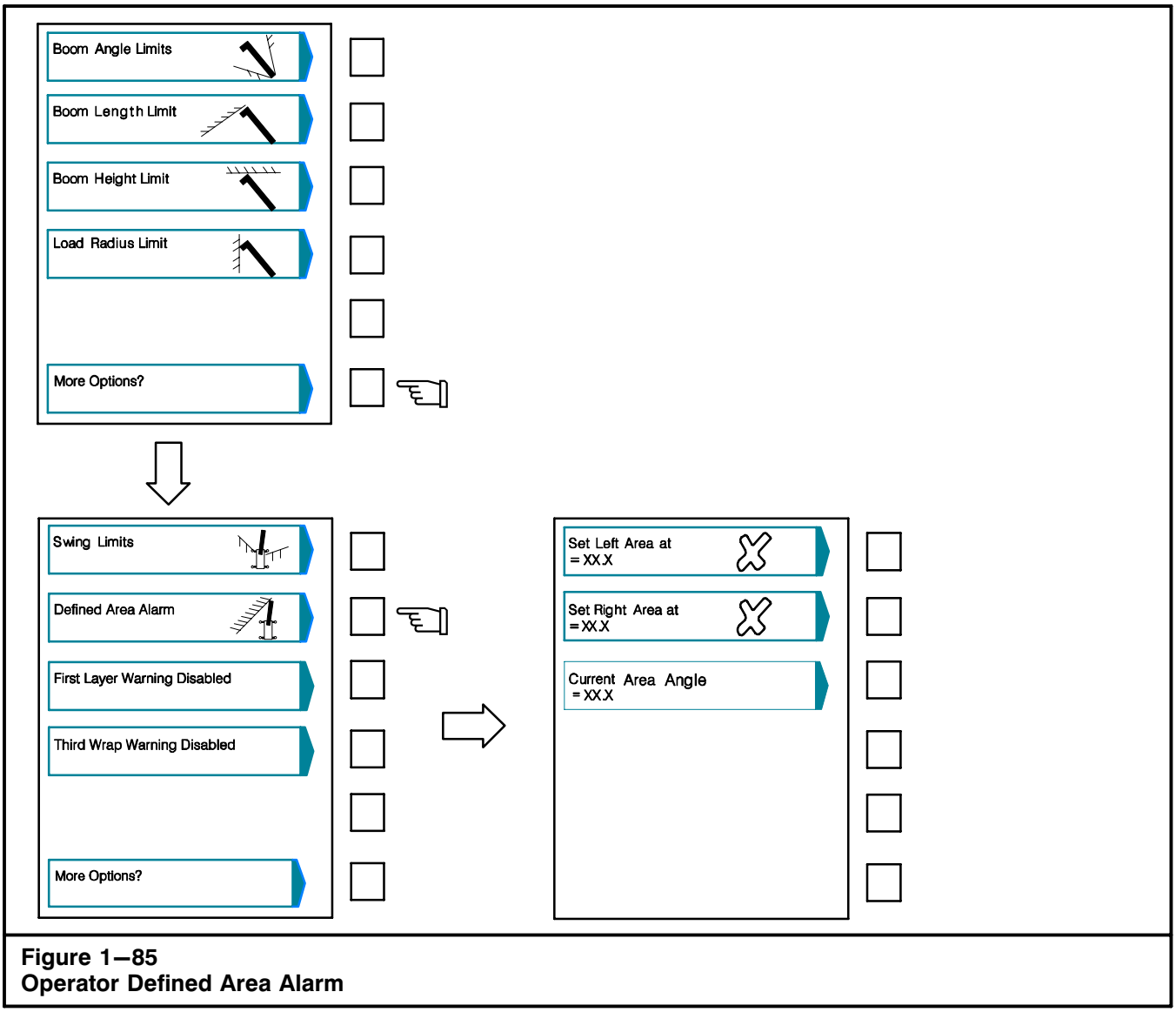


Figure 1—85
Operator Defined Area Alarm

Operator Defined Area Alarm

Refer to Figure 1—85.

The operator defined area alarm, when set, will define an imaginary vertical plane between two set points to optimize the working area. When approaching the plane, the audible alarm will sound intermittently, and the message "Bad Working Area" will appear in the warning message area. When passing the plane, the audible alarm will sound continuously and the message "Bad Working Area" will appear on the warning message area. Use the following procedure, Figure 1—85, and Figure 1—86 to set the operator defined area alarm.

WARNING

The operator defined area alarm is a warning device. All functions remain operational when entering the operator defined bad area. For safe operation, adequate distance must be maintained to allow for operator reaction time to avoid entering the bad area. It is the responsibility of the operator to set points which ensure that the crane's boom, attachment, load, rigging, etc. maintains a safe working distance and complies with local safety regulations.

Setting Operator Defined Area Alarm

1. From the normal working screen press the OPERATOR ALARM button to access the Operator Alarm screen.
2. Press the corresponding button for More Options.
3. Disable any previously set left and right swing alarms if required. Refer to "To Disable Operator Settable Alarms" found later in this Section of the Operator's Manual.

   Note: The left and right swing alarms must be cleared prior to setting the defined area alarm.

4. Press the corresponding button for Defined Area Alarm.

WARNING

Avoid positioning the boom, attachment, load, rigging, etc. into the bad area when setting the left or right alarm points.

When selecting the left and right alarm points, ensure that the load will maintain a safe distance from the obstacle. Also ensure that the two points are set so that the tailswing of the crane will not enter the bad area.

Note: For best results, the two points should be separated by a minimum of 10 ft (*3m*) or 30 degrees.

5. Position the boom, attachment, load, rigging, etc. to the left alarm point and press the corresponding button for "Set Left Area at" to enter the left alarm point. The displayed value will be the left alarm setting. The ✓ will appear to indicate that the left alarm point is set.
6. Position the boom, attachment, load, rigging, etc. to the right alarm point and press the corresponding button for "Set Right Area at" to enter the right alarm point. The displayed value will be the right alarm setting. The ✓ will appear to indicate that the right alarm point is set.
7. When both alarm points are set, press the OPERATOR ALARM button to return to the alarm screen. Press the OPERATOR ALARM button again to return to the normal working screen.
8. Test the alarm, with no load, to ensure the alarm points have been properly set. When approaching the plane, the audible alarm will sound intermittently and the message "Bad Working Area" will appear on the warning message area. When passing the plane, the audible alarm will sound continuously and the message "Bad Working Area" will appear on the warning message area.

WARNING

If crane or obstacle is moved or if a different size load is lifted, the area alarm must be reset.

To Disable Operator Settable Alarms

1. From the normal working screen press the OPERATOR ALARM button to access the Operator Alarm screen.
2. Press the corresponding selection button to select the desired alarm to be disabled.
3. Press the corresponding button for each alarm. The ✗ icon indicates the alarm has been cleared.
4. When all desired alarms are disabled press the DISPLAY/SELECT button to return to the alarm screen.

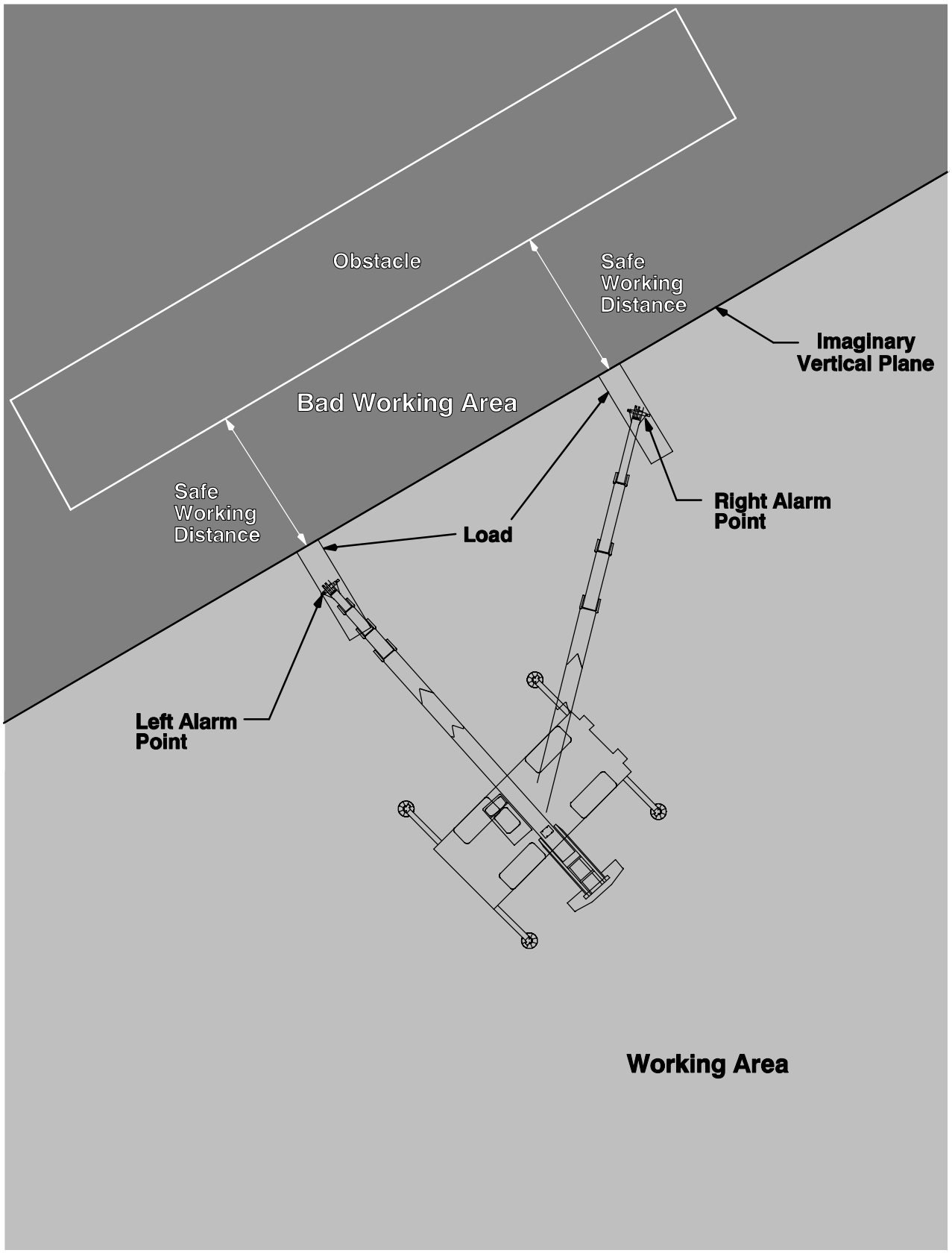


Figure 1—86
Operator Defined Area Alarm Example

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