

MicroGuard[®] 586

Rated Capacity Indicator/Limiter System



Operation/Setup Manual

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Overview

The MicroGuard® 586 Rated Capacity Indicator/Limiter System is an electronic system used in the operation of small cranes and boom trucks. The system is designed to provide the crane operator with information to aid in ensuring safe crane operation. The MicroGuard® 586 System is simple to operate. This manual describes the system and its operation.

PROVIDING THE CONTENTS AND INSTRUCTIONS CONTAINED WITHIN THIS MANUAL ARE CAREFULLY READ, UNDERSTOOD, AND FOLLOWED, THE OPERATOR WILL HAVE A CLEAR INDICATION OF RATED CAPACITY, APPROACH TO OVERLOAD, AND TWO-BLOCK CONDITIONS; HOWEVER, IMPROPER INSTALLATION OF THIS SYSTEM CAN RESULT IN SYSTEM MALFUNCTION!



The MicroGuard® 586 System is designed for use as an aid to crane operation. Do not use this system as a substitute for the experienced crane operator who has been trained in crane operation and related safety guidelines, or for crane capacity information and guidelines supplied by the crane manufacturer.

System Description

The MicroGuard[®] 586 Rated Capacity Indicator/Limiter System is a visual and audible alert system used in the operation of industrial cranes. The System, which includes a computer, an operator's display console, an extension reel, and various types of cables and sensors, is designed to measure and display load weight, calculate and display maximum capacity and percent rated capacity, display code configuration numbers, and warn of an approaching overload or two-block condition for each crane configuration.

Please refer to pages 6 and 7 of this manual. The **computer (L)** provides all of the functions necessary to read the System sensors, work out computations, and control the disconnect functions. In order to reliably calculate crane parameters, such as load and rated capacity, and interpret the crane capacity chart and code configuration numbers, information defining the physical characteristics of the crane has been loaded during factory setup.

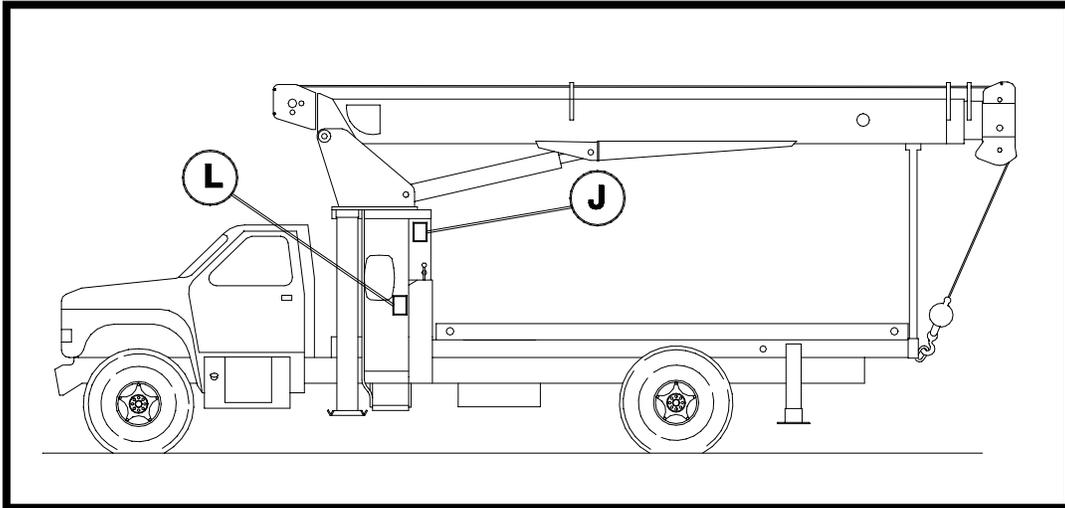
Two **hydraulic pressure sensors**, housed in the computer, measure the pressure in both sides of the boom hoist cylinder. Other System sensors, mounted elsewhere on the crane, are connected to the computer via electrical cables.

The **extension reel (P)** measures the extended length of the telescoping sections of the boom and enables calculation of crane radius, load weight, and percent rated capacity. The **reel-off cable (M)** provides a path, from the boom head to the computer via the **extension reel computer cable (R)**. This path is used to signal a possible two-block condition. The **boom angle sensor (N)** measures the angle of the boom.

The **operator's display console (J)** translates data received from the computer and displays the actual load weight and percent of rated capacity in the **display console** windows. Visual and audible warnings and alarms activate when capacity limits are approached or exceeded, or when a two-block condition is encountered.

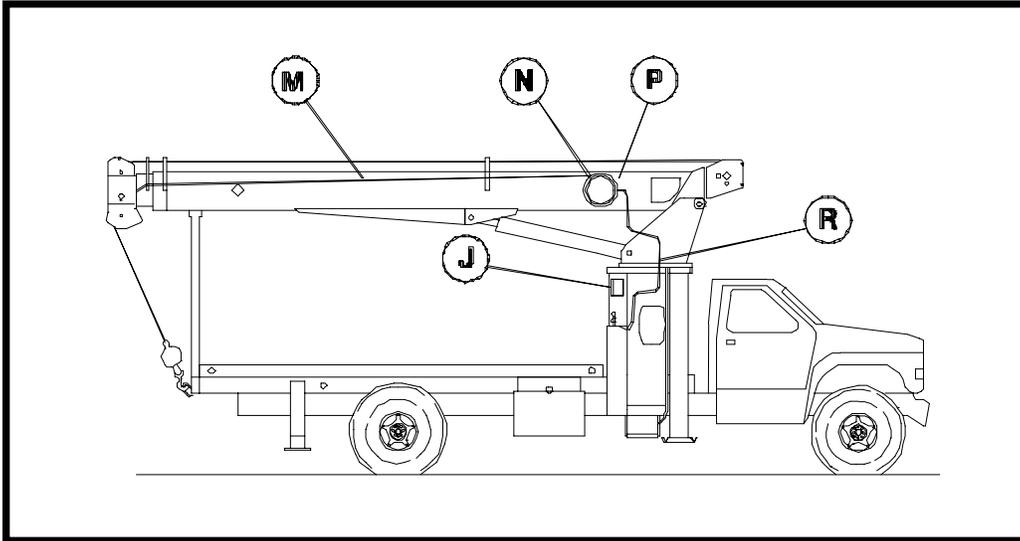
This manual describes the system components and the operation of the System; it also includes maintenance recommendations.

The MicroGuard® 586 Rated Capacity Indicator/ Limiter System



L Computer with Hydraulic Pressure Sensors inside **J** Operator's Display Console

The MicroGuard® 586 Rated Capacity Indicator/Limiter System



J Operator's Display Console
(standard location)

P Extension Reel

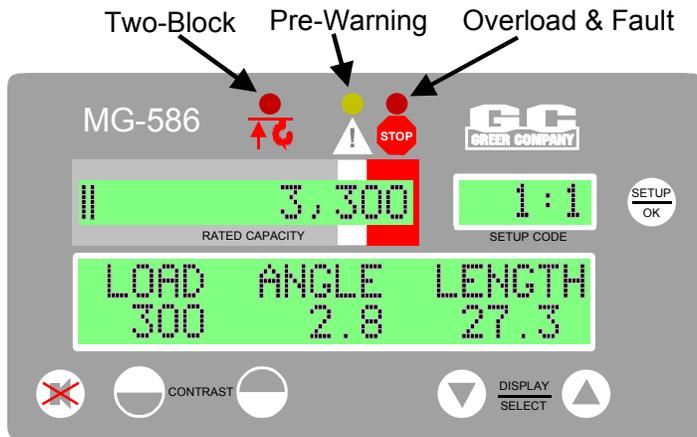
M Reel-Off Cable to Boom Head

R Extension Reel Cable to
Computer

N Boom Angle Sensor (inside reel)

Operator's Display Console - Overview

Warning/Alarm Indications

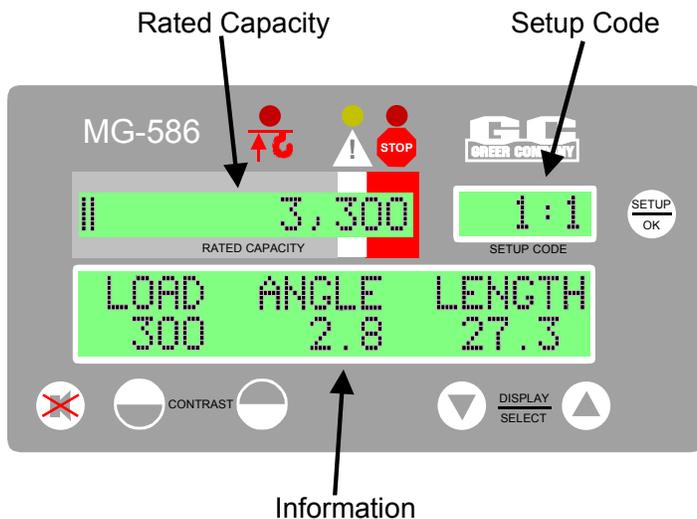


The red two-block indicator will light up when a two-block condition occurs.

The yellow pre-warning light will illuminate at a 90% approach to overload.

The red overload warning lamp will illuminate when the load reaches or exceeds 100% of the allowed capacity.

Display Windows

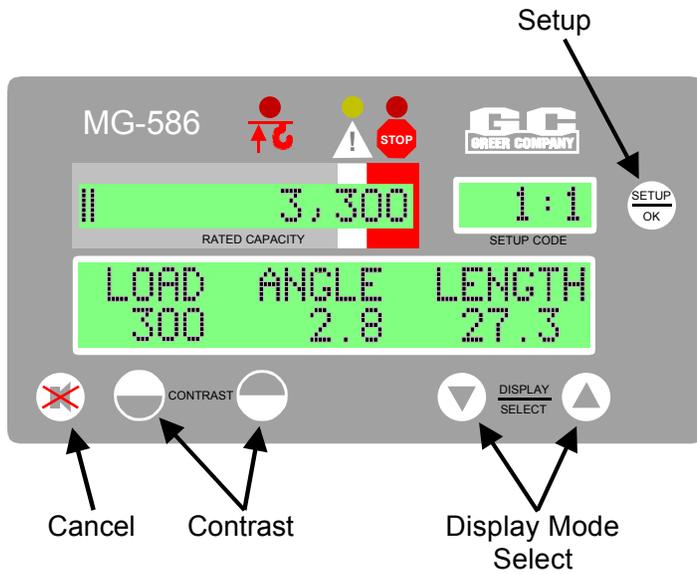


The current rated capacity for the crane in the given configuration will be displayed in this window along with the current percentage of rated capacity shown as a bar graph.

The system needs to be configured to match the current setup of the crane. The setup codes are shown in this window, along with the parts-of-line and the stowed jib option (if available).

The information window shows crane specific information regarding boom length, boom angle, and working radius, along with the load on hook. In addition, information regarding any warnings or alarms will be flashed in this display area.

Push Buttons



The **setup button** allows the operator to configure the system to match the actual setup of the crane.

Codes are present for:

- stowed jib attachments.
If no stowed options are available, this code will not appear.
- crane configuration.
- number of parts-of-line.

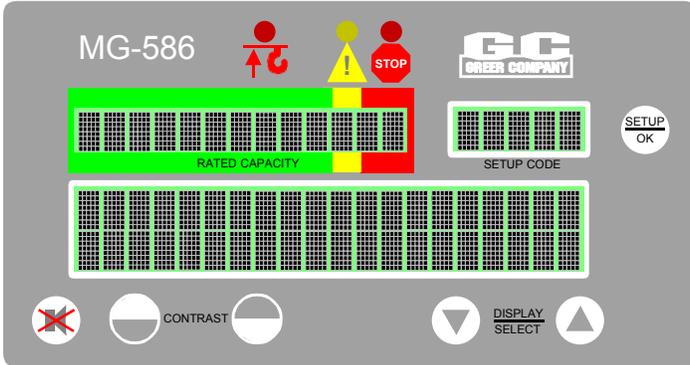
The **cancel key** is used to cancel the audible warning and to override the function kickout during alarm conditions.

The **contrast keys** are used to adjust the contrast of the display area.

The **display mode keys** are used to switch to different display formats showing various combinations of boom angle, boom length, and radius.

System Operation

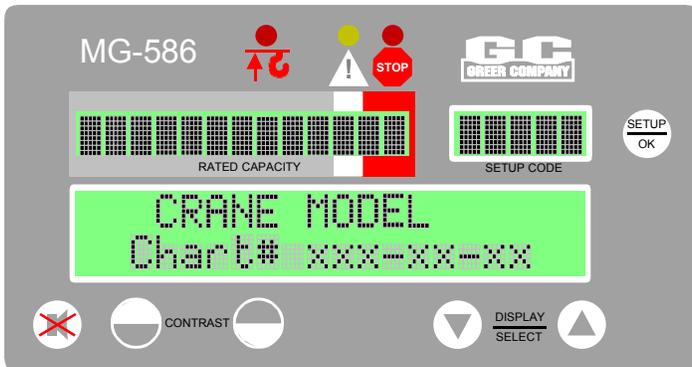
System Self-Test



When the System is turned on, it briefly goes through a self-testing process.

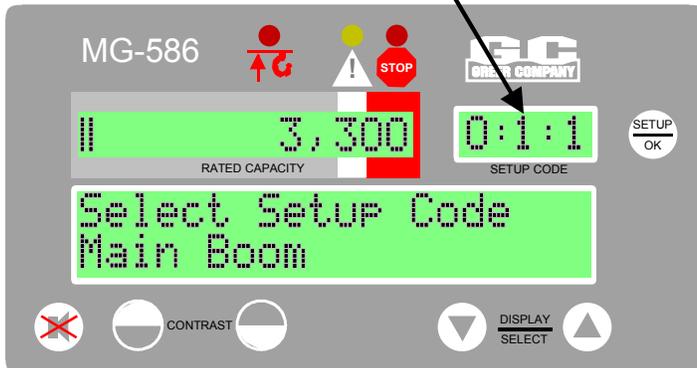
The display should look like the illustration to the left.

All three alarm indicators will light up, all display windows will appear black, and the audible alarm will sound.



The information display will now show the crane model and capacity chart number for the System configured.

Setup Code

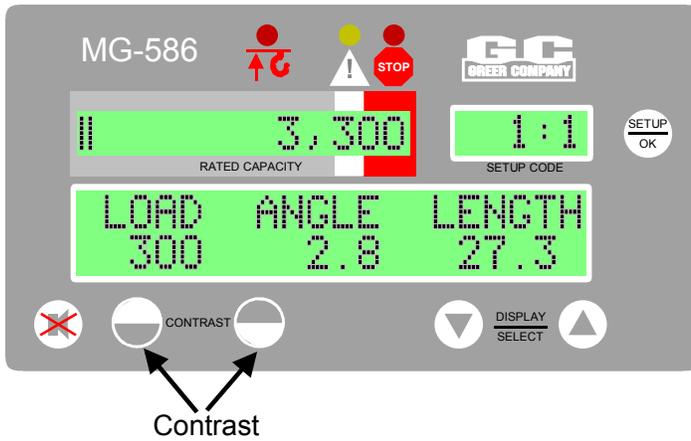


Following self-test, the System will go into the setup mode. The setup code window will display the same setup code used when the system was last powered off.

Check that the correct setup code is displayed before operating the crane.

See the Configuration Selection section for code setup instructions.

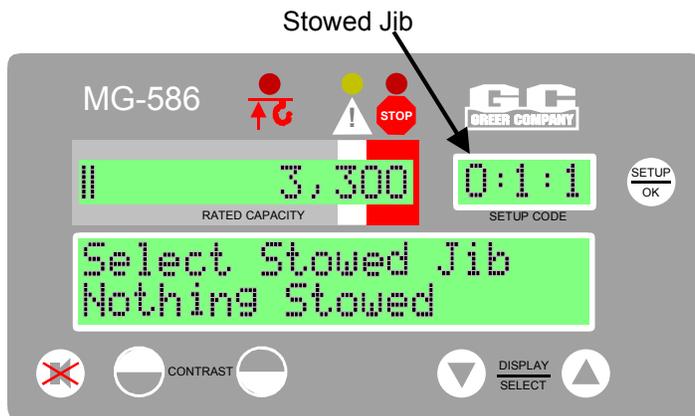
Adjusting Display Contrast



Changes in temperature and lighting conditions may require adjustment of the display contrast buttons.

Use the contrast adjustment keys to make the display area lighter or darker, as desired.

Configuration Selection



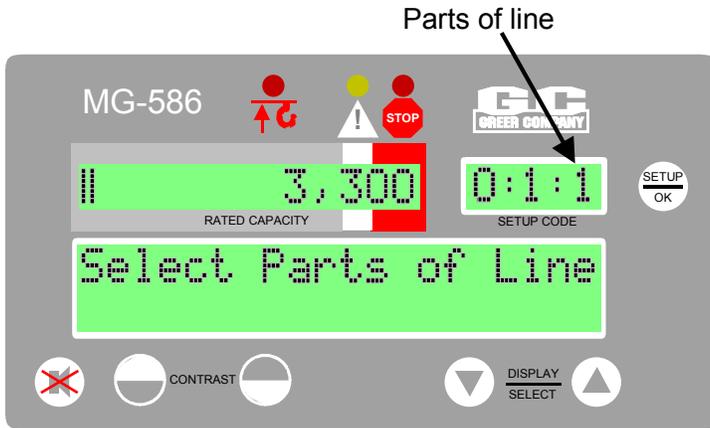
Configuration selection is required upon system power up; however, it can also be entered by pressing the setup key.

- The first phase allows selection of the stowed jib code.
Note: If no stowed jib options are available, this selection option is skipped.
- The current stowed jib code will be flashing. The description of the jib is displayed on the bottom of the display.
- To select a different stowed jib, use the display select arrow keys to display the desired option.
- Press the setup key to move to the next stage.

The current configuration appears at the bottom of the display.

The configuration code will flash.

- To change the configuration code, use the display select arrows to show the desired option.
- Press the setup key to select and move on to the next stage.



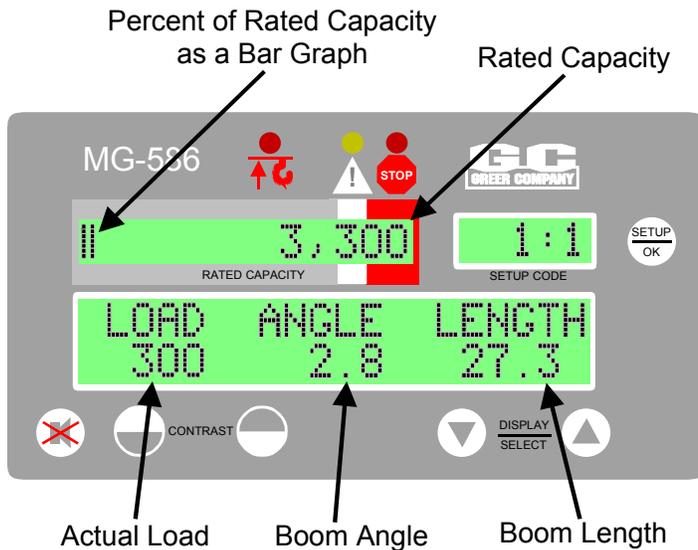
- The current number of parts-of-line is now flashing.
- To change the parts-of-line, use the display select arrow keys to display the desired number.
- To move to the next stage, press the setup key.

Note: Some configurations allow only single part-of-line operation.

In these cases, the whole parts-of-line selection phase will be skipped and the parts-of-line will be set to 1.

Once the correct parts-of-line are entered, the system will exit the configuration mode and return to the normal working screen.

Normal Operation



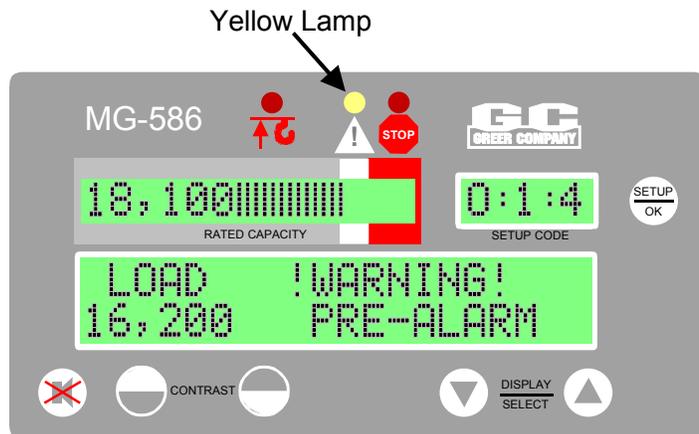
- **"Rated Capacity"** is the heaviest load that the crane can lift in the current crane position and configuration. **Note:** This value may be limited by the number of parts-of-line selected.
- **"Percent of Rated Capacity"** indicates how near the operation is to full capacity and overload.
- The **Percent of Rated Capacity** is shown as a **bar graph**. This Bar Graph progresses to the right as the percentage increases.
- As long as the bar graph remains within the green-bordered normal zone, the Percent of Rated Capacity is within normal operating limits.

- The **weight** of the **"actual load"** appears in the display console window underneath the "LOAD" logo. The Actual Load includes the weight of the load plus the weight of everything hanging below the boom (hook block, etc.).
- Next to the "LOAD" logo is the "ANGLE" or "RADIUS" logo; this logo will switch **automatically** to match the current configuration (whether angle or radius related). The corresponding angle or radius value is displayed underneath on the bottom line.
- The final display logo will show "ANGLE", "RADIUS" or "LENGTH" by default. When operating, this display area will display "LENGTH". However, the display select arrow keys can be used to toggle this display area to show "ANGLE" (for a radius related configuration) or "RADIUS" (for an angle related configuration).
- If the system has any internal faults, it will display a fault message (see section on faults). These fault messages can be viewed by using the display select arrow keys to move to the fault message display. **Note:** If there are no faults, no fault messages will appear.

Note: Both the bar graph and capacity share the same display window. The displayed capacity will move to the left of the bar graph when the bars value exceeds 60%.

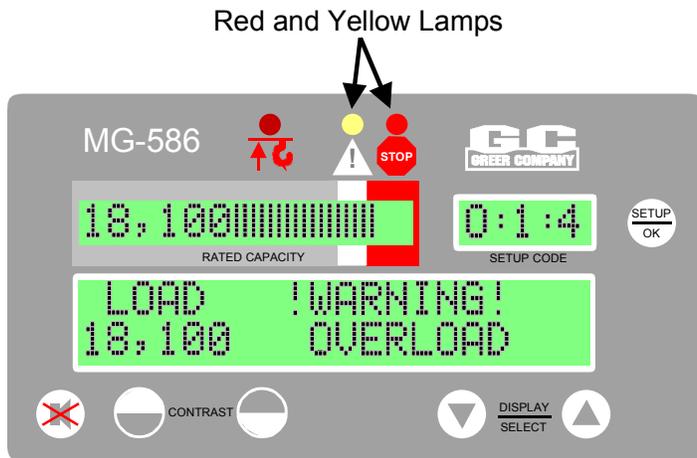
Warning: The operator **must** select the correct crane configuration code number for each setup configuration change. Inaccurate or non-selection of the appropriate Code Number will result in incorrect calculations and readings of the **actual load** weight and **Percent of Rated Capacity**. Refer to Configuration Selection, page 12.

Approaching Overload



- The System monitors the weight of the load suspended below the boom head. The System compares this information with rated capacity data stored within the computer.
- When the rated capacity of the configuration reaches 90%, the **bar graph** in the window of the display console progresses from the normal (green-bordered) zone into the caution (yellow-bordered) zone.
- A **yellow light** above the caution zone of the bar graph lights up and an alarm beeps continuously.
- The message **“WARNING! – PRE-ALARM”** will flash in the information portion of the screen.

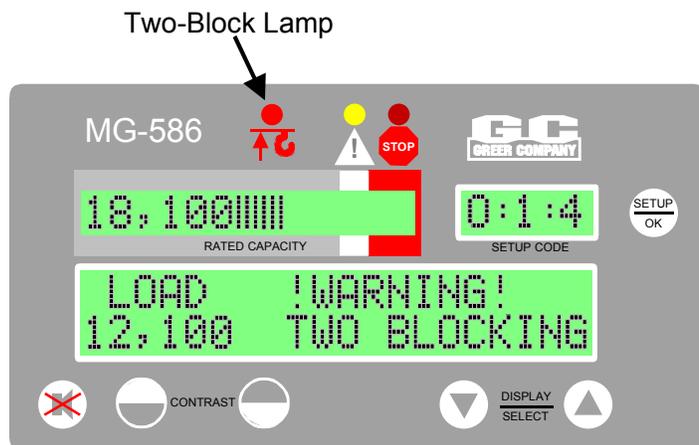
Maximum Capacity and Overload



- When the rated capacity of the crane reaches 100%, the **bar graph** in the window of the display console moves from the caution (yellow-bordered) zone into the warning red zone.
- A **red light** above the alarm zone of the bar graph lights up and an alarm sounds continuously.
- **Crane motions** (boom extend, boom down, and winch up) are cut in order to prevent damage to the crane and the endangerment of persons near the lifting area.
- As the **bar graph** moves into the overload (red-bordered) zone, crane motions remain cut.

The message, “**WARNING! – OVERLOAD**” will flash in the information portion of the screen.

Two-Block Warning



- A **red light** appears and an alarm sounds continuously when the hook block is on a collision course with the head machinery at the end of the boom.
- Crane motions (boom extend, boom down, and winch up) are cut in order to prevent damage to the crane and the endangerment of persons near the lifting area.

The message, **“WARNING! TWO BLOCKING”** will appear in the information area of the display.

Alarm Override



Cancel

The **alarm override button** is used to temporarily silence the **current** audible alarms and to disable the automatic motion cutout operation built into the System for protection.

The audible alarm will sound following any new occurrence of alarm. Overriding the audible alarm only cancels the audible warning for current alarms.

To deactivate the audible alarms, press the override button. Continue to hold the button down for 5 seconds to cancel any existing motion cuts. The override button must be held down to continue overriding the motion cut.



The alarm override button should be used with caution. Automatic audible alarms warning against overload, two-block dangers, and hazardous tipping conditions are temporarily silenced when this option is activated. Motion cutout may also be discontinued.

Other Displayed Warnings

Other warning messages that may flash on the display are shown below. If more than one warning is present at any one time, the system will display them in a strict rotation.

“MAX LOAD ROPE LIMITED”

This message can only accompany an overload or a pre-alarm warning. For example, such a message will be displayed if the maximum operational capacity of the crane is being limited by the number of parts-of-line.

“OPERATING OUTSIDE CHART!”

On certain capacity charts stored within the system, additional capacities may have been provided in order to allow crane movements in areas outside of the published capacity charts supplied with the crane. These capacities are determined by the manufacturer of the crane to be sufficient to allow movements during rigging, erection, and setup of the machine prior or subsequent to lifting operations. In such areas, the system displays a warning message, a yellow pre-warning light.

System Care

We recommend that the System checks (1 -9) be carried out when using the MicroGuard® 586 Rated Capacity Indicator/Limiter System.

1 Routine Checks and Maintenance

Items to Check before Each Shift or Crane Operation

- Crane configuration and System setup
- Extension reel – reel-off cable to boom tip – Extension reel cable to computer
- Hydraulic connections
- The anti-two-block weight
- The anti-two-block switch
- Checking the two-block warning signals and cutout of machine motions

MINIMUM MONTHLY CHECKS

- Load test

2 Routine Checks and Maintenance

Crane Configuration and System Setup

The **crane configuration** defines the physical setup of the crane. The **system setup** defines the load parameters for each configuration. The data for these calculations are loaded in the **capacity chart** and installed in the crane's computer prior to factory shipment.



ENSURE THAT THE **CONFIGURATION CODE NUMBER** IN THE DISPLAY CONSOLE WINDOW IDENTIFIES THE **CRANE'S CONFIGURATION** FOR THE CURRENT OPERATION.

IF IN DOUBT, SELECT THE CODE NUMBER AGAIN FOLLOWING THE STEPS OUTLINED IN THE SECTION ON **CRANE OPTIONS AND SETUP CODES**.

CHECK THE ABOVE OPERATIONS BEFORE EACH SHIFT OR CRANE OPERATION

3 Routine Checks and Maintenance

Extension Reel

The extension reel houses the reel-off cable to the boom tip, a cable from the extension reel to the computer, and the boom angle sensor. The extension reel **provides the following signals** that are sent directly to the computer via the extension reel computer cable.

- **Boom Extension Signal** – generated within the extension reel, and controlled by the reel-off cable, as the boom is extended or retracted. The extension reel measures the boom extension and provides a signal, which enables the computer to calculate the operating radius of the crane, the weight of the actual load, and the percent of rated capacity.
- **Two-Block Signal** – transmitted from the boom head, through the reel-off cable, to the extension reel and the extension reel cable to the computer. This signal becomes active when the anti-two-block switch opens, indicating a two-block condition. When this signal reaches the computer, it causes an immediate display of a flashing light and an audible alarm on the operator's display console, and the motion cutouts are activated.
- **Boom Angle Signal** – is generated within the extension reel, and designed to measure the angle of the boom relative to the horizon.

4 Routine Checks and Maintenance

Reel-Off Cable

The reel-off cable (extension cable) extends from the extension reel to the boom tip. The reel-off cable provides an electrical path for passage of the two-block warning signal from the boom tip to the computer cable in the extension reel.

Check Points:

- Carefully examine the reel-off cable for damage.
- Fully telescope the boom in and out. As you extend or retract the boom, ensure that the reel-off cable is smoothly fed on and off the extension reel without drooping along the boom or jumping, especially as the boom is telescoped in.



The extension reel extension setting is factory preset. If the reel-off cable has been broken, call your Service Representative. Do not attempt to repair a break in the reel-off cable without consulting with your Service Representative.

Computer Cable

The extension reel cable to the computer acts as a channel for passage of signals to the System computer.

Check Points:

- Ensure that the cable exiting from the extension reel and running down the boom and around its pivot to the computer is free from damage. If this cable has been **damaged in any way**, it should be carefully tested and may need to be replaced to ensure accurate transmission of signals.

CHECK THE ABOVE OPERATIONS BEFORE EACH SHIFT OR CRANE OPERATION

5 Routine Checks and Maintenance

Hydraulic Connections

The two hydraulic pressure sensors, mounted in the computer, measure the pressure within each side of the boom hoist cylinder. The pressure sensors are connected to the boom hoist cylinder valve block by two flexible hoses. Both hoses are subject to the full hydraulic pressure contained within the upper and lower sides of the boom hoist cylinder.

Check Point:

- Ensure that there are no hydraulic leaks at either connection end of both hoses. Check for signs of wear or damage along the length of each hose.

6 Routine Checks and Maintenance

The Anti-Two-Block Weight

Check Points:

- Ensure that the anti-two-block weight and its parts are undamaged, in proper position, and correctly connected.
- Check the chain on the anti-two-block weight for damage and stress, ensuring that there are no open links in the chain.
- Ensure that the chain is securely attached with screw pin and shackle to the narrow vertical connector projecting from the base of the anti-two-block switch.
- Ensure that the anti-two-block weight has been installed around one part of the load line.

7 Routine Checks and Maintenance

The Anti-Two-Block Switch

Checkpoints:

- Ensure that the anti-two-block switch is secure on its mounting post with safety pin inserted through the end of the mounting post and locked into position.
- Ensure that the switch cable is secured to the strain relief thimble and that the thimble is on the mounting post **behind** the switch.
- Ensure that all electrical cables and connectors are free from damage and correctly connected. See anti-two-block switch installation.

CHECK THE ABOVE OPERATIONS BEFORE EACH SHIFT OR CRANE OPERATION

8 Routine Checks and Maintenance

Checking the Two-Block Warning Signals and Cutout of Machine Motions

The following test activates the anti-two-block warning signals and the valve controlling cut out of crane motions to ensure proper operation. **No other pre-existing alarm conditions may be active when performing this test.**



1. Before performing this test, turn the crane power off and then on again to ensure that an existing two-block warning and/or motion cut has not been overridden.
2. During this test, **do not** use the cancel alarm button to clear audible warnings or motion cuts.
3. During this test, **do not** winch the hook block into the boom tip, in case the System does not cut the crane motions.

TEST FOR OPERATION OF TWO-BLOCK WARNINGS AND CUTOUT OF CRANE MOTIONS

1. Slowly raise the hook block until it lifts the anti-two-block weight and deactivates the anti-two-block switch.
NOTE: This action should cut out the *winch up* motion as well as the *boom down*, and *boom extend* motions. Audible and visual alarms on the operator's display console should become active.
2. Lower the hook block by winching down.
NOTE: This action should disable the audible and visual alarms on the operator's display console and activate the boom motions.



CHECK THE ABOVE OPERATIONS BEFORE EACH SHIFT OR CRANE OPERATION.

9 Routine Checks and Maintenance

Load Test

The best way to identify a possible problem in the System is to do a **load test**. The accuracy of the **load test** is dependent upon accurate operation of all of the sensors in the System and the correct **code number** setting for the configuration of the crane.

If no stowed deduct configuration is provided by the system, perform this test with stowed attachments removed.

It is recommended that a load test be performed monthly.



Ensure that the **configuration code number** in the display console window identifies the **crane configuration** for the current operation. If in doubt, select the Code Number again following the steps outlined in the **CRANE OPTIONS AND SETUP CODES**.

Load Test Steps

1. Select a known weight of at least 20% of maximum rated capacity.
2. Calculate the weight of the total load, including the slings and hook block.
3. Lift the weight, and record the load weight displayed on the MicroGuard[®] 586 operator's display console. The load weight on the console should be between 0 to 10% higher than the load that was lifted.

EXAMPLE:

When lifting 5000 lbs., the display console window should read between 5000 and 5500 lbs.



A load reading on the MicroGuard[®] 586 Operator's Display Console that falls outside of a 10% range may indicate a sensor problem. Call your Service Representative.

MINIMUM SIX MONTHLY CHECK

Faults

System Fault Messages

When the MicroGuard® 586 System detects a fault, the red warning lamp will illuminate and the message, "WARNING: SYSTEM FAULT" will flash on the display. When a more serious fault is detected, the message, "WARNING: SYSTEM OUT OF SERVICE" may flash.

To determine the nature of the problem, press the UP or DOWN arrow key once or twice, which will change the display mode and exhibit the related fault message. This message will appear for up to 20 seconds before the display returns to the normal display mode. If the UP or DOWN arrow key is pressed before the 20 seconds have elapsed, the display will also automatically return to the normal display mode.

Fault messages that can appear on the display and the required corrective action follow:

1. Reselect Crane Setup

This message indicates that there is an error in the CRANE SETUP selection, or there is an internal computer fault. Reselect the correct Crane Setup Code; the error should correct itself.

If not, replace the computer, as described in *Replace the Computer* on the next page.

2. Check Extension

This message indicates a problem with the boom extension sensor.

- a. Inspect/check cabling and connections from computer to extension reel on the side of the boom.
- b. Inspect/check the extension reel-off cable for damage.
- c. Follow *Boom Extension Sensor Zero* and *Boom Length Trim* sections (pages 38 and 39) of this manual.
- d. Remove the extension reel cover and use the *Extension Reel Voltage Checks* section (page 29) in this manual to verify operation of the extension reel.

3. Check Angle

This message indicates a problem with the boom angle sensor.

- a. Inspect/check cabling and connections from computer to extension reel on the side of the boom.
- b. Follow the *Boom Angle Sensor Zero* section (page 37) in this manual.
- c. Remove the extension reel cover and use the *Extension Reel Voltage Checks* section (page 29) in this manual to verify operation of the extension reel.

4. Check ATB Wiring

This message indicates an Anti Two-Block wiring problem usually due to an electrical short to the boom or a damaged cable.

- a. Inspect/check cabling and connections from computer to extension reel on the side of the boom.
- b. Inspect/check reel-off cable from extension reel to boom tip and Anti Two-Block switch connections.
- c. Refer to the *Extension Reel Voltage Checks* section (page 29) to verify electrical signals for the Two-Block drive and signal within the extension reel.

5. Check FKO

This message indicates a Function Kick-Out wiring problem that is usually caused by a fuse or crane circuit breaker failure. Remove the computer unit lid and check the 10A fuse.

6. Replace System Chip

This message indicates a problem with the System chip fitted inside the computer.

- a. Remove the computer lid and replace the System chip.

Note: Use only proper chip insertion and removal tools to perform this operation.

Never use a screwdriver.

7. Replace the Computer

This message indicates an internal fault in the computer. In some cases, it may not be necessary to replace the computer unit.

- a. Remove the computer unit lid and check the Internal LED status indicators located on the computer circuit board.
- b. Review the *Computer Internal Status Indicators* section (page 30) in this manual.

To replace the computer unit:

- *Place the boom in its rest.*
- *Turn off electrical power.*
- *Disconnect all electrical connectors from/to the computer.*
- *Disconnect hydraulic hose connections from/to the computer.*
- *Remove computer from mounting.*

Note: The hydraulic hoses connect directly to the boom hoist cylinder. Do not operate the crane unless the computer has been properly replaced or the hydraulic connections are properly capped.

To fit a new computer unit:

- Mount the computer unit.
- Ensure that a new system chip has been supplied with the computer.
Note: Do not use the system chip from the original computer unit.
- Ensure that all electrical power is turned off.
- Connect all electrical connectors to the computer unit.
- Connect hydraulic hoses to the computer pressure ports.
(*Green* is base-side and *red* is rod-side of the boom hoist cylinder.)
- Follow the System setup instructions in this manual.

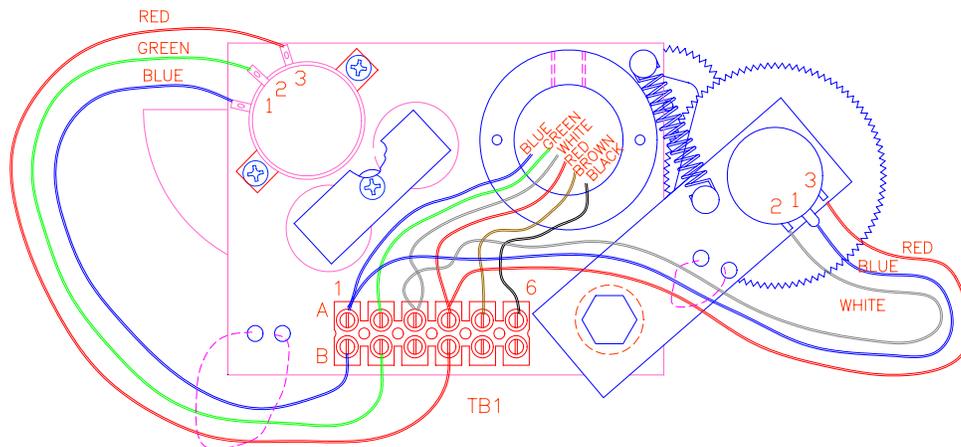
Note: If more than one fault is present, the most serious fault will appear first and must be resolved first. When the first fault is corrected, other existing faults will be displayed and must be resolved one at a time until no further fault codes are listed.

Fault messages should be reported to the Service Representative along with any noticeable damage done during System installation or routine checks. Please refer to Routine Checks and Maintenance in this manual.

Extension Reel Voltage Checks

If problems occur with the Two-Block alarm operation, Angle, or Extension sensor, the following chart details voltage checks that may be made within the extension reel. Follow the action column before measuring voltages at the specified points in the voltmeter connection columns.

SIGNAL	BOOM POSITION / ACTION	VOLTAGE		VOLTMETER CONNECTION	
		MIN	MAX	RED (+)	BLACK (-)
SENSOR DRIVE	-	+4.7V	+5.3V	TB1/4 - RED	TB1/1 - BLUE
ANGLE SENSOR OUTPUT	0 Degrees	0.4V	0.6V	TB1/2 - GREEN	TB1/1 - BLUE
EXT'N SENSOR OUTPUT	0ft (0m) FULLY RETRACTED	0.15V	0.35V	TB1/3 - WHITE	TB1/1 - BLUE
TWO-BLOCK DRIVE	A2B WEIGHT DOWN	5.5V	7.5V	TB1/6 - BLACK	TB1/1 - BLUE
	A2B WEIGHT UP	9.5V	10.5V	TB1/6 - BLACK	TB1/1 - BLUE
TWO-BLOCK SIGNAL	A2B WEIGHT DOWN	5.5V	7.5V	TB1/5 - BROWN	TB1/1 - BLUE
	A2B WEIGHT UP	0V	2V	TB1/5 - BROWN	TB1/1 - BLUE



Notes:

- ANGLE SENSOR OUTPUT IS SET TO 10% (1/10th) OF SENSOR DRIVE VOLTAGE WITH BOOM AT ZERO DEGREES.
- EXTENSION SENSOR IS SET TO 5% (1/20th) OF SENSOR DRIVE VOLTAGE WITH BOOM FULLY RETRACTED.
- MEASURE ALL VOLTAGES WITH A DIGITAL VOLTMETER SET TO DC VOLTS RANGE.

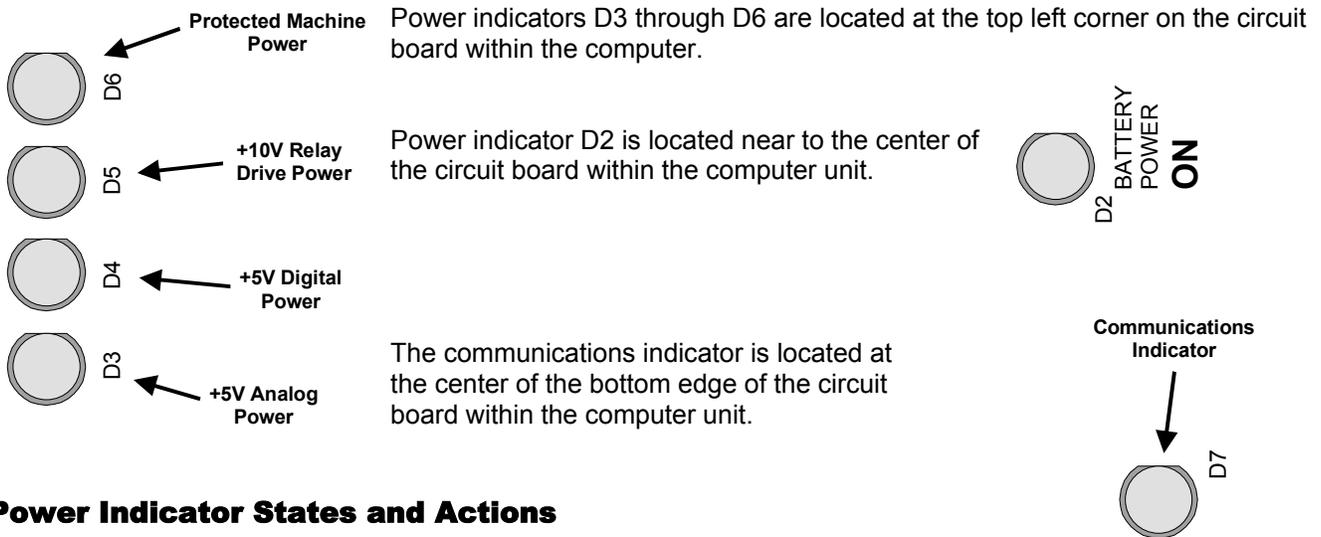
Computer Internal Status Indicators

The computer unit contains six LED indicators that provide an aid to checking presence of power supply voltages and communications between the computer and display console.

All Indicators are bright green light emitting diodes. There are five power indicators (D2 through D6) and one communications indicator (D7).

With the exception of the communications indicator, all indicators should be illuminated at the same brightness level with the system power on.

A missing or dimly lit indicator indicates a power supply problem.



Power Indicator States and Actions

- **All indicators OFF**
Check power and ensure that PTO switch is properly engaged.
- **D2 ON but all other indicators OFF**
Check display console cable and connection.
- **D5 OFF but all other indicators ON**
Replace computer
- **D3, D4 and D7 OFF but all other indicators ON**
Replace computer
- **D3 OFF but all other indicators ON**
Check extension reel signal cable and internal voltages within extension reel.

Communication Indicator

The Communication Indicator provides an indication of the success or otherwise of communication with the display console, and of the running state of the computer program.

Carefully observe the Communication indicator and the display console at power on and through self-test, and then use the following chart to help decide the course of action.

COMMUNICATION INDICATOR indications at power ON	ACTION
<p>From the moment the system power is applied, the COMM indicator does not illuminate. During and after the self-test period of eight seconds, the COMM indicator remains off.</p>	<p>The computer is not running. Check status indicators (D2 through D6). Try to reset the system by powering off and on again. Listen to the computer for the relays to click. If they do not click, replace the System Chip - If not successful, replace the computer. If the relays do click, replace Communication chips IC1, 2.</p>
<p>From the moment the system power is applied, the COMM indicator does not illuminate. The display console, which never goes to normal, continually reads: "No Communication with MicroGuard."</p>	<p>Communication with the display has not been made. Is the display console connected? Check connector and cabling to the display console.</p>
<p>At the moment power is applied, the COMM indicator flashes briefly, then switches off. After a few seconds, the COMM indicator starts to flash at a fast rate and never stops.</p>	<p>This is the normal operation of the communication between the computer and display console.</p>

Troubleshooting

Start-up Problems

- Display unit lights and alarms are flashing; the computer unit sounds as if it is buzzing.
 - Make sure the PTO is fully engaged.
- During system setup, it is not possible to adjust the angle sensor. The display shows “---”.
 - Make sure the extension reel is installed the correct way up.
 - Make sure the extension reel signal cable is correctly connected to the computer unit.
 - Check the extension reel voltages according to the chart on the following page.
- A few seconds after power up, the display shows “No communications with MicroGuard®” in the load display window.
 - Computer is possibly not running.
 - Check that the computer unit has a system program chip fitted.
 - Check that the system program chip is correctly inserted.
 - Check that all LEDs within the computer are lit and that the communications LED (D6) is flashing
 - If not replace system chip.
 - Check the display cable for damage.

System Setup

The MG[®]-586 system contains a setup mode that operates through the system display console. The setup mode provides a means of ensuring that the system sensors are correctly positioned and adjusted following system installation or parts replacement.

This procedure assumes that installation of system components, cabling, and hydraulic connections have been successfully completed and checked.

The setup procedure involves only the sensors mounted within the extension reel on the side of the boom.

It is important that each step of this procedure is properly followed for the system to accurately provide load, rated capacity, warnings, and kickout functions.



At all times, observe safe practices.

Make sure that crane capacity limitations are understood, and that the crane capacity plate is followed. Do not exceed manufacturer's specified lifting limitations.

Required Tools

For Setup:

Phillips Screwdrivers

Bubble Level – Accurate to 0.1° at level

For Testing:

Inclinometer – accurate to 0.2°

Measuring tape (100 ft) – fiber-type with tenths of feet

Crane Configuration

Before starting the system setup, position the crane on firm and level ground with the outriggers properly extended and set.

It is recommended that the crane be configured with no stowed or erected jib (bare boom) and reeved with a single part-of-line.

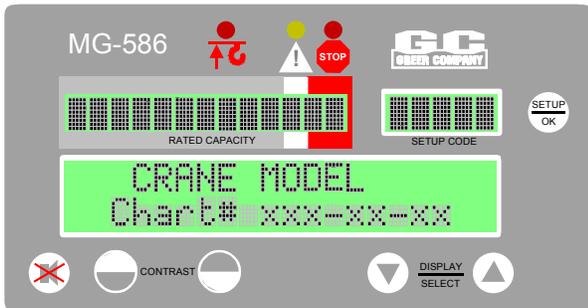
Accessing the Extension Reel Sensors

Remove the cover from the extension reel by loosening and removing the 12 screws around the perimeter of the cover.

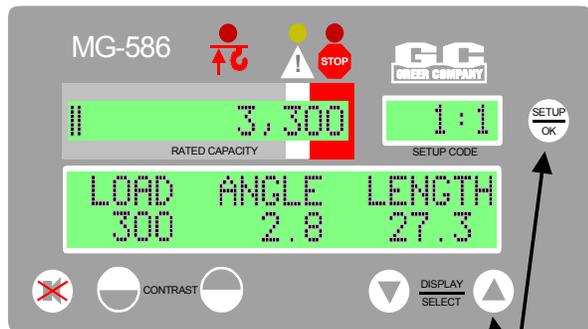
Entering Setup Mode

The display will step through each setup operation, as required by the user. During the setup procedure, the display console should be placed in a position that allows easy viewing while adjustments are being made within the boom extension reel, and allows for operation of the display buttons.

The setup mode is activated by the following procedure:



1. Make sure machine power is OFF.
2. Turn ON machine power.
3. During self-test, check that the correct machine model and capacity chart number is displayed on the console.



Setup Mode
Entry

4. Hold down "Setup" and "up arrow" on the display for 5 seconds at any time to start the self-test.



5. Release the buttons.
6. If the display does not indicate SETUP in the SETUP CODE window, check that the System is in the NORMAL-working mode (NOT the configuration mode) with no error codes.

Extension Cable Guides

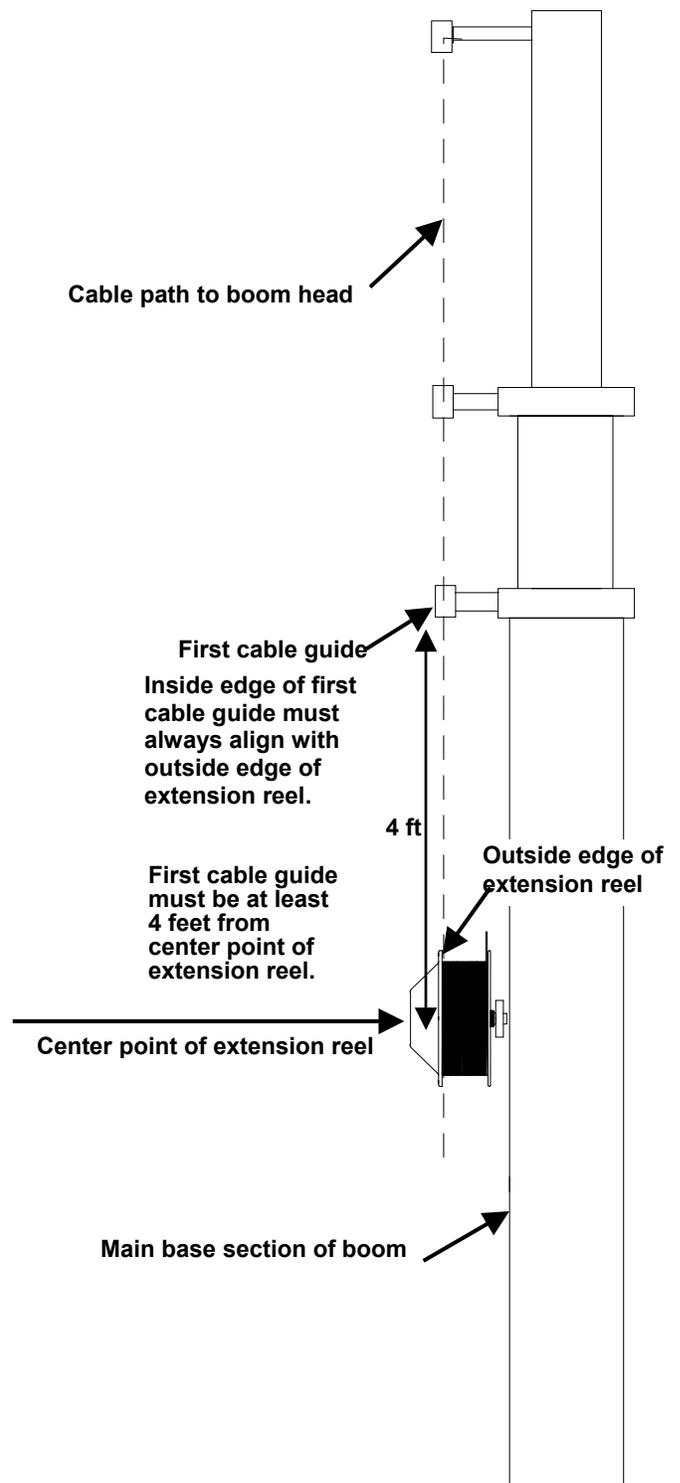
Cable Guides must be used to achieve proper placement of the first roller guide.

Cable Guides maintain the position of the cable, ensuring a controlled path to the boom head.

The distance between the **first** Cable Guide and the Center Point of the Extension Reel must be a **minimum of 4 feet**.

The **inside edge** of the **first** Cable Guide must always align with the **outside edge** of the Extension Reel.

Passage of the cable from the Extension Reel through the Cable Guides to the Tie-Off Post on the boom head may form a straight line parallel to the boom, as shown, or may curve toward the boom depending on the placement of the Cable Guides in the **latter** segments of the crane.



Installing the Reel-Off Cable

Warning: The Reel-Off Cable must be properly pre-tensioned. This procedure keeps the cable taut at all times, with controlled, steady exit from the Extension Reel. Follow the steps below.

Pre-Tension Steps

- 1) Fully retract the boom.
- 2) Slowly rotate the Extension Reel clockwise until a “click” is heard, indicating that the clutch inside the Reel is engaged.
- 3) Turn the Extension Reel counterclockwise for 5 complete rotations.

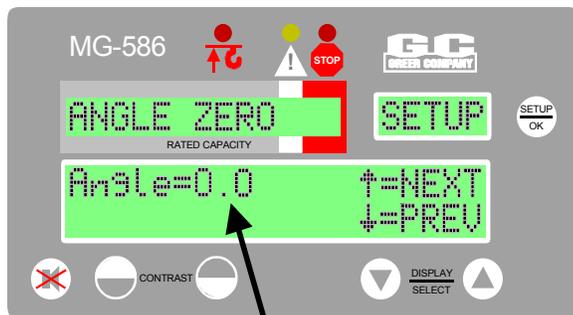
Note: A temporary marker placed on the Extension Reel can facilitate the rotation count.

Pre-Tension is complete.

Boom Angle Sensor Zero

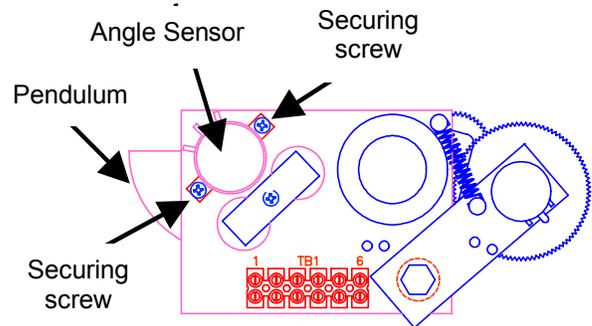
The Boom Angle Sensor is located within the Extension Reel. Remove the extension reel cover by removing all twelve screws in the lid.

The Angle Sensor is factory pre-calibrated and requires no adjustment other than the following mechanical zero setting.



Make sure the boom is perfectly level, then adjust the Angle Sensor inside the Extension Reel to set this reading to "0.0".

1. Fully retract the main boom and use an inclinometer or accurate bubble level to set the boom perfectly level. Make sure that the inclinometer reading is made on the top flat surface of the boom. Take several readings in different places to verify true zero degrees.
2. The console displays the boom angle sensed by the angle sensor inside the extension reel. If the display reads "0.0°," the angle sensor is correctly adjusted. If the display does not read 0.0°, angle sensor adjustment is necessary.



3. To adjust the angle sensor, loosen the two securing screws on either side of the sensor just enough to allow the sensor to be turned by hand. Do not remove the screws and do not put pressure on the terminals exiting the sensor.

Note

Rotating the sensor counterclockwise will increase the angle displayed. Rotating clockwise will reduce the angle displayed. Only fine adjustments are required.

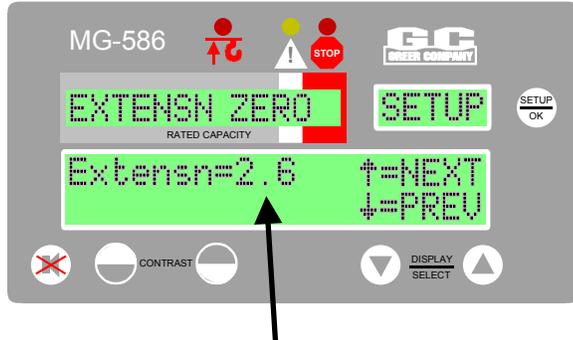
Do not touch the pendulum hanging behind the sensor assembly during adjustment.

4. When 0.0° is showing on the display, carefully tighten the two screws and check that the display still reads 0.0°.
5. Before continuing, it is recommended that the angle be checked against an accurate inclinometer. Boom up to a high angle, and using an inclinometer, check that the displayed angle matches the inclinometer reading within 0.2°.
6. When finished, press ▲ to continue to the next setup step.

Boom Extension Sensor Zero

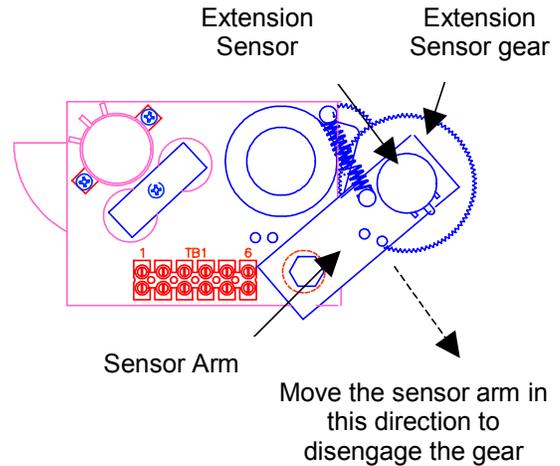
Warning: The EXTENSION SENSOR CLUTCH MUST BE ENGAGED PRIOR TO EXTENSION ZERO ADJUSTMENT (see page 36).

The Extension Sensor must be mechanically adjusted for zero setting. The Boom Extension Sensor is located within the Extension Reel.



Make sure the boom is fully retracted, then adjust the Extension Sensor inside the Extension Reel to set this reading to "0.0".

1. Fully retract the main boom and check that all boom sections are properly retracted.
2. The console displays the boom extension sensed by the extension sensor inside the extension reel. If the display reads "0.0", the extension sensor is correctly adjusted. If the display does not read 0.0°, extension sensor adjustment is necessary.
3. Mechanically adjust the extension sensor clutch until the display reads zero (0.0). To do this, disengage the main gear wheel connected to the extension sensor by pulling the sensor arm in the direction shown.

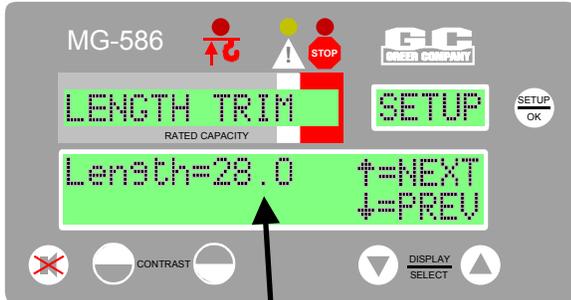


4. Rotate the gear clockwise until the sensors clutch detent starts to click. At the next click, stop rotating the gear.
5. Rotate the gear back (counterclockwise) about half a turn to set the display to exactly 0.0, then carefully release the sensor arm ensuring the display stays at 0.0 as the gears re-engage.
6. Press ▲ to continue to next setup step.

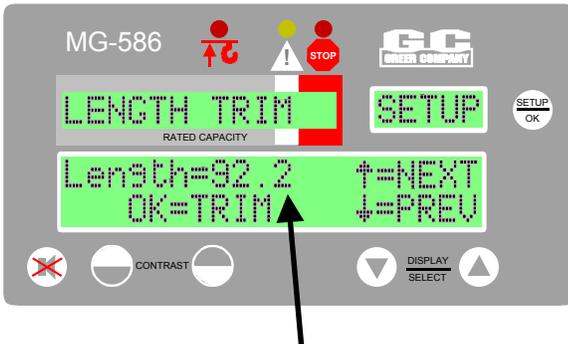
Boom Length Trim

The system is factory pre-calibrated for Extension and Length. A trim function is provided to allow for mechanical tolerances of the Extension Reel drum.

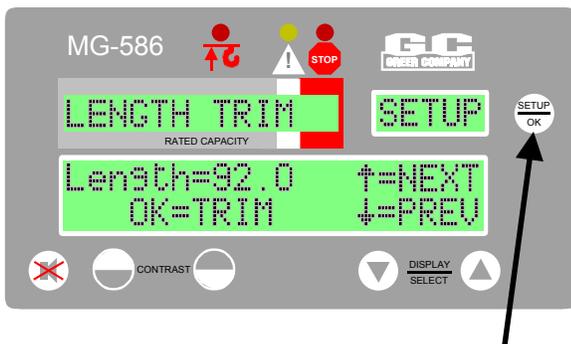
With the boom still fully retracted, check that the displayed length is the same as the specified retracted length for the crane.



With the boom fully retracted, the displayed length should be the same as the specified retracted length for the crane.



With the boom fully extended, the displayed length should be the same as the specified fully extended length for the crane.

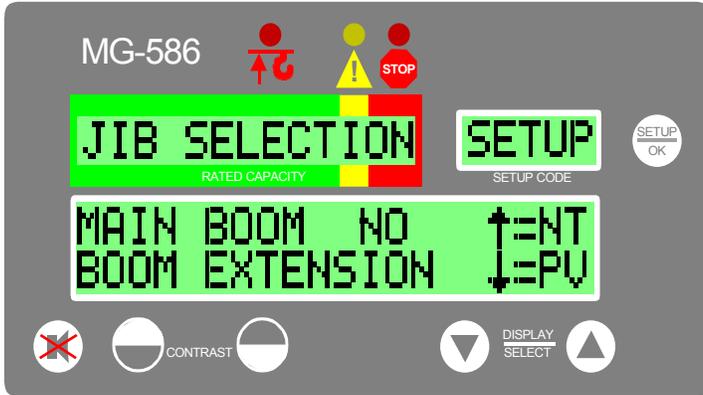


To make the length match the specified maximum length of the crane, press OK.

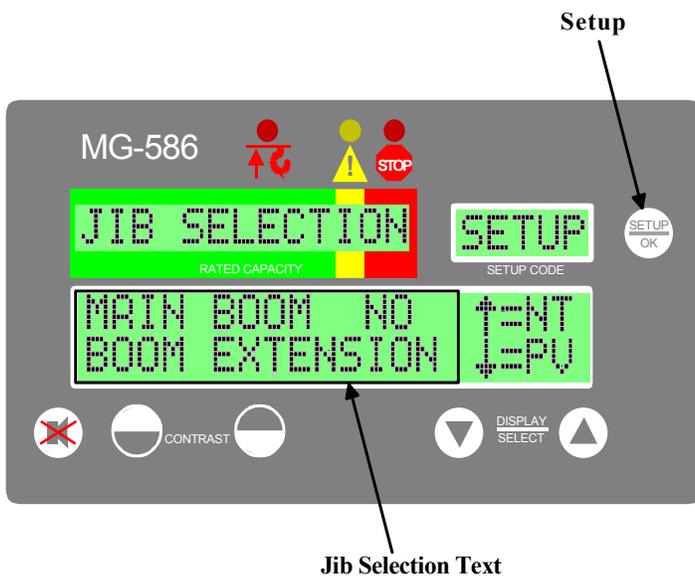
1. Boom up to 60 degrees and then telescope the boom out to fully extended. Make sure that the boom goes out all of the way to fully extended.
2. Check that the displayed length is the same as the specified maximum boom length for the crane.
3. If the displayed length does not match the maximum boom length specified for the crane, press the **SETUP/OK** button. The system will automatically correct the length.
4. If the displayed length does not match the maximum boom length specified for the crane, press the **SETUP/OK** button. The system will automatically correct the length.

Jib Selection Setup (Interlock)

The displayed selection text differs for each model of crane; therefore, the displayed text may not exactly match the text in the images below. For clarification or for more details, please contact the Greer Company.

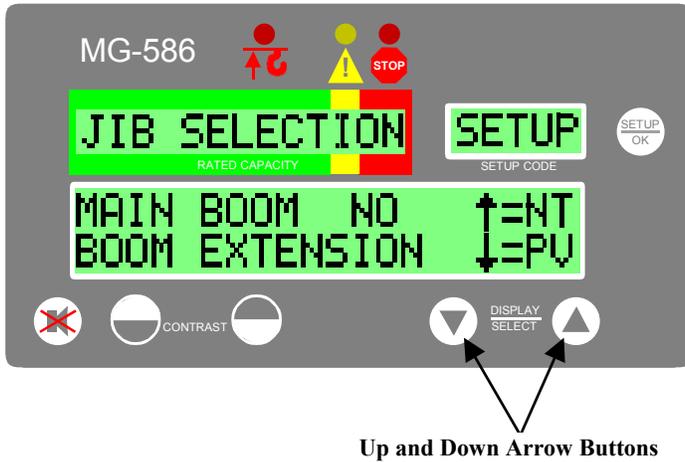


1. Go to the JIB SELECTION screen.

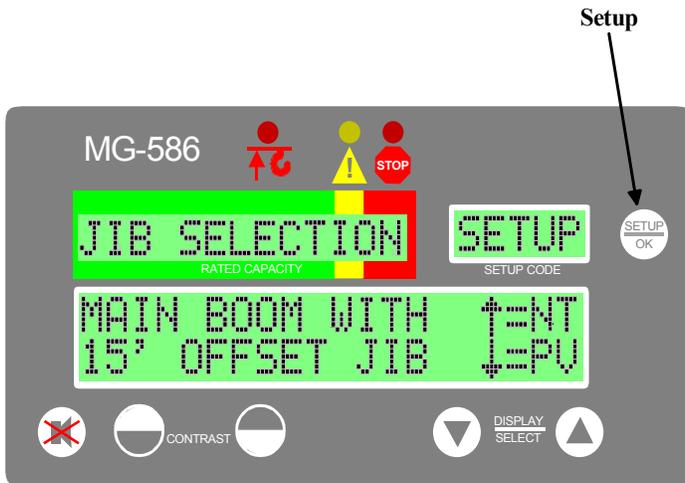


2. Press the SETUP button to activate the Jib Selection Mode. Current jib selection text will flash or blink on the display.

Jib Selection Setup (Interlock) continued



3. Use the UP and DOWN ARROW buttons to scroll through the available jib selections. Stop at the desired jib selection.



4. Press the SETUP button to select and lock-in the new jib selection. As soon as the selection is locked in, the selection text will stop flashing.

Completion

1. *When Setup is complete, press the UP ARROW button to exit the Setup Mode.*
2. *Replace the boom extension reel cover, ensuring that all 12 screws are fitted and evenly tightened.*



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MicroGuard[®] 586 Operation/Setup Manual
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