

BRODERSON MG586

SERVICE MANUAL



TABLE OF CONTENTS

Section 1: Overview and Operation

Introduction.....	4
System Description.....	4
System Self-Test	5
Operator's Display Console	6
Warning/Alarm Indicators.....	6
Display Windows	7
Push Buttons	8
System Maintenance	9
Crane Configuration and System Setup.....	10
Testing the Two-Block Warning and Function Kick-Out	10
Load Test.....	11

Section 2: Calibration

Why Calibration is Important.....	12
Required Tools	13
Identifying the System Configuration	13
A240700 and A240709 Reeling Drums.....	13
A240634 and A240635	14
Computer Assembly	14
Calibration Instructions for Different Configurations	15
For Systems with the A240700 & A240709 Reeling Drums.....	15
Replacing the Reeling Drum	16
For Systems with the A240634 and A240635 Reeling Drums	16
Replacing the Reeling Drum	17
Pre-Tensioning the Reeling Drum	17
Installing the Anti-Two-Block Cable.....	17
Adjusting the Extension Sensor	18
Adjusting the Angle Sensor	18
Entering Calibration Mode	20
Angle Zero Routine	20
Extension Zero Routine.....	21
Angle Span Routine	21
Length Trim Routine	22
Rodside Offset Routine	22
After the Calibration Routine	23

Section 3: Troubleshooting

Computer Troubleshooting	24
Grouped Error Codes.....	24
Group “A” Faults	26
Group “B” Faults	26
Group “C” Faults	26
Group “D” Faults	26
System Fault Messages.....	27
Computer Unit Layout.....	28
Flash Models	28
(Legacy Models Only)	29
Computer Internal Status Indicators	29
Power Indicator States and Actions.....	30
Communication Indicator.....	30
Replacing the Computer	31
Removing the Computer	31
Installing the Computer	31
Start-Up Problems	31
Reeling Drum Voltage Checks.....	32
For A240634 and A240635 Reeling Drums.....	32
For A240700 and A240709 Reeling Drums.....	33
A240711 Light Bar Wiring.....	34

Section 1: Overview and Operation

Introduction

The MG 586 System is designed for use as an aid to crane operation.

NOTE: Do not use this system in place of a properly trained operator who is knowledgeable in safety guidelines, crane capacity information, and the crane manufacturer's specifications.

This manual describes the operation of the MG 586 System. Please read, understand, and follow the contents and instructions contained within this manual.

System Description

The System includes:

- Computer
- Display Console
- Reeling Drum
- Supporting sensors

The System is designed to:

- Calculate and display load weight
- Calculate and display Maximum Capacity
- Calculate and display Actual Load relative to the Maximum Rated Capacity
- Display code configuration numbers
- Warn of approaching overload for each crane configuration
- Warn of approaching Two-Block condition for each crane configuration

Computer Assembly: The computer consists of the grey box and attached pressure sensors. The computer uses the pressure sensors readings, along with the Angle and Length sensors, to determine the Actual Load, Load relative to Maximum Capacity, warn of approaching overloads, detect Two-Block conditions, and the Angle and Length of the boom.

Reeling Drum Assembly: This assembly measures the extended length of the telescoping sections of the boom and enables calculation of load radius, load weight, and load relative to Maximum Capacity.

Reeling Drum Cable: The cable allows the Extension Sensor to measure the extension of the boom. The cable also provides power and a path for the Two-Block signal. It connects to the Reeling Drum Assembly.

Boom Angle Sensor: This sensor is housed in the Reeling Drum Assembly and measures the angle of the boom using a potentiometer/pendulum assembly.

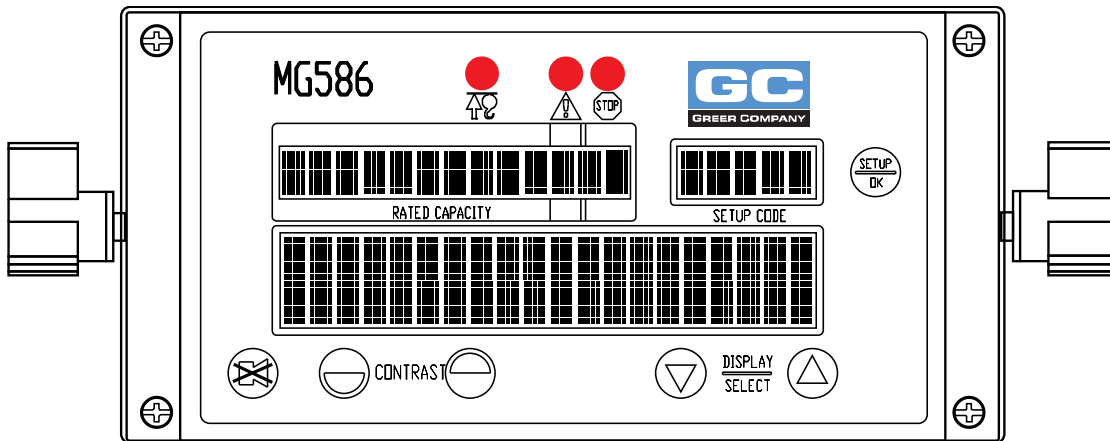
Extension Sensor: The sensor is housed in the Reeling Drum Assembly and uses the Reeling Drum Cable to measure the extension of the boom.

Display Console: The MG 586 display provides the operator with the Actual Load and Load relative to Maximum Capacity, as well as visual and audible alarms when capacity limits are approached or exceeded, or if a Two-Block condition is encountered.

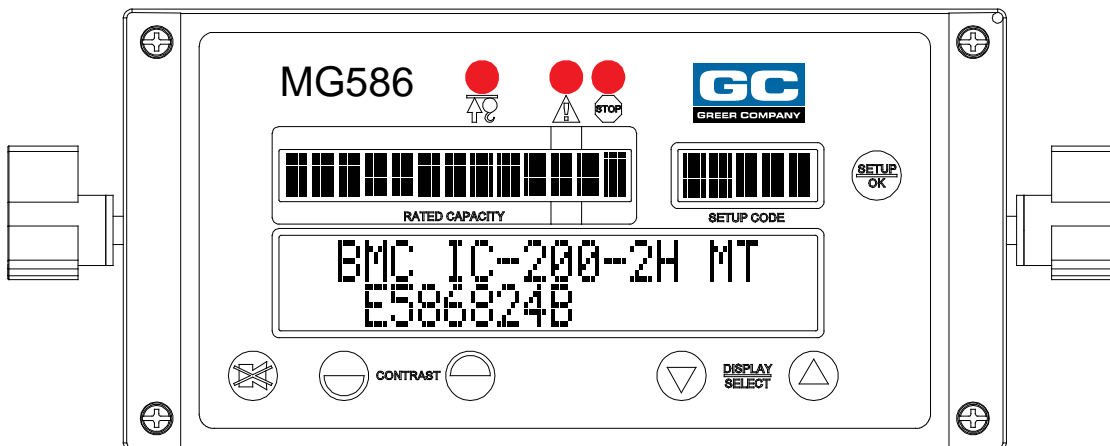
System Self-Test

At power-on, the System will execute a brief self-test.

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



The Operator's Display Console will display the crane model and E-file number with revision for the current configuration.

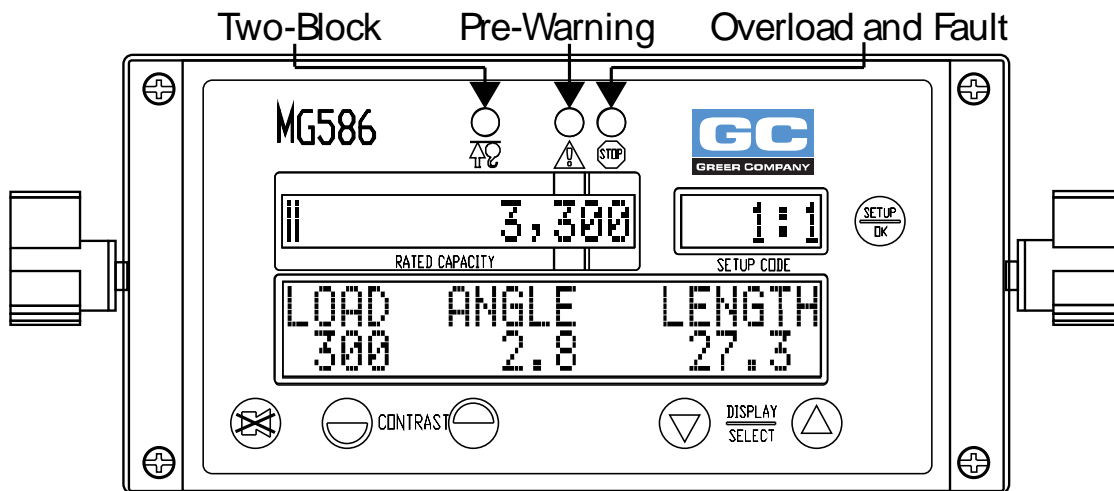


NOTE: This message is crane dependent.

Ensure the crane model and duty file match the machine.

Operator's Display Console

Warning/Alarm Indicators



The **RED** "Two-Block" indicator will illuminate, and the alarm will sound when a Two-Block condition occurs. The screen will display the warning message "WARNING! TWO-BLOCKING" alerting the operator to the condition. The system will cause a function kick-out, disabling the Winch Up, Boom Extend, Boom Down, and Swing functions.

NOTE: Swing functions may not be disabled on some crane models.

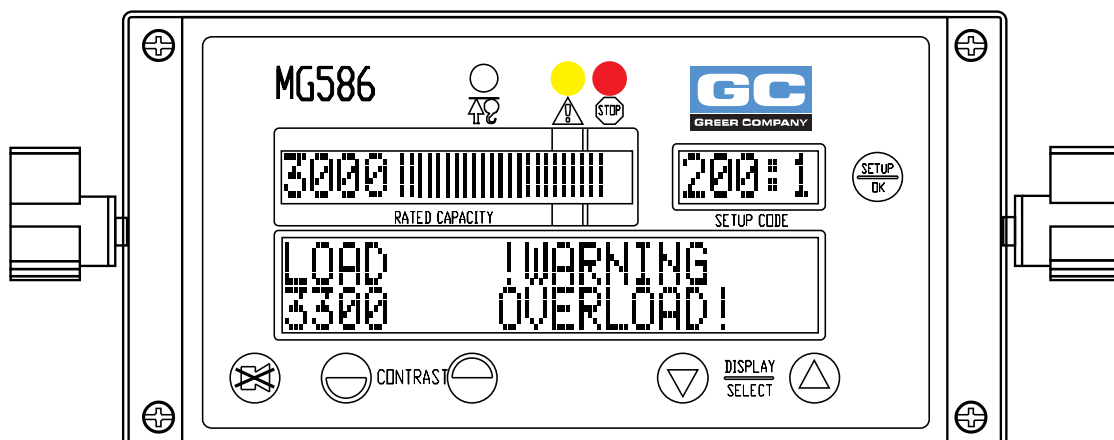
The **YELLOW** indicator will illuminate when the hook load reaches 90% of the rated Maximum Capacity and an alarm will sound. The screen will display "Pre-Alarm Condition".

The **RED** indicator will illuminate when 100% of Maximum Capacity is reached. The screen will indicate "Overload" and the function kick-out will disable Winch Up, Boom Extend, Boom Down, and Swing functions.

NOTE: Swing functions may not be disabled on some crane models.

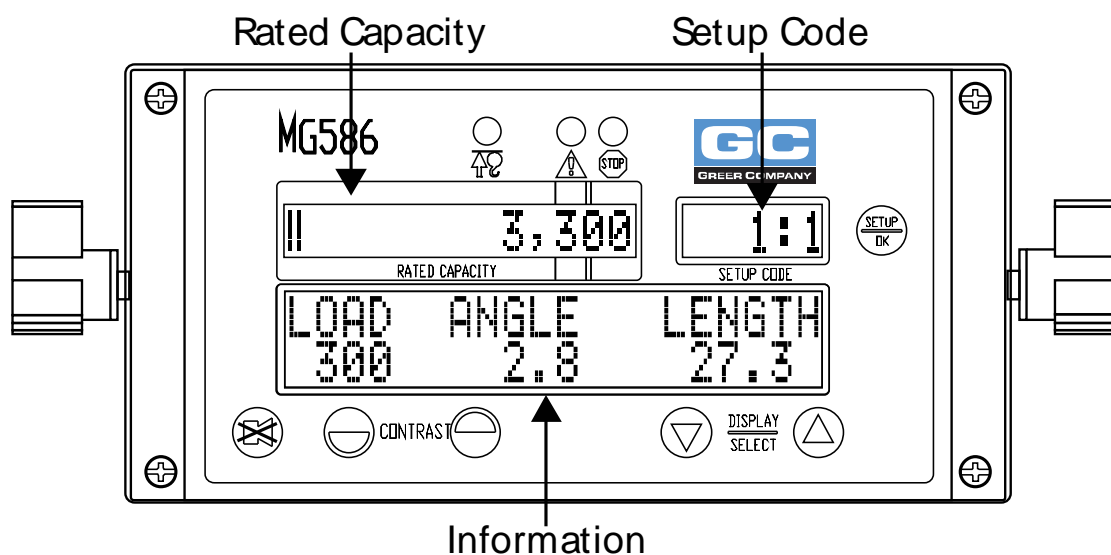
The **RED** "Two Block", **YELLOW** "Pre-Alarm Condition" and **RED** "Overload" will illuminate if the 12 volts from the crane outrigger signal is not received while in the outrigger configuration. Check crane outrigger switch and contact Broderson.

A BOOM TOPPED warning is normal below 3 degrees



Operator's Display Console

Display Windows



The current Rated Capacity is displayed in the “Rated Capacity” window. The Actual Load relative to the Maximum Rated Capacity is displayed as a bar graph which moves to the right as the load increases

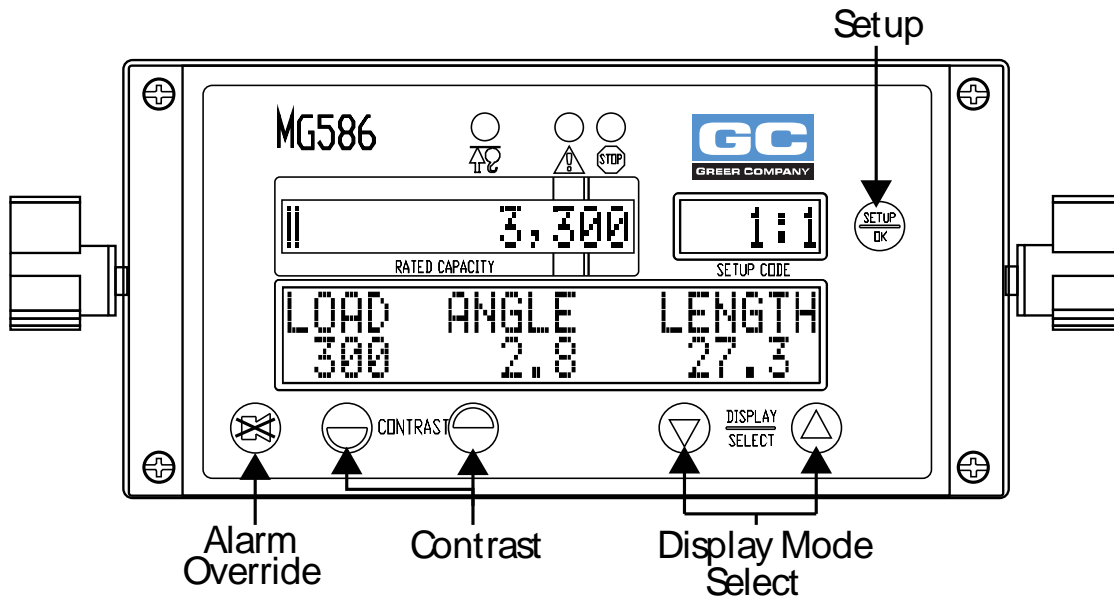
The “Information” window can display Actual Load, Load Radius, Boom Angle and Boom Length.

The display defaults to indicating Actual Load, Load Radius, and Boom Angle. Pressing the **Up Arrow** button will toggle Boom Angle with Boom Length. When a Jib is erected, the display defaults to Boom Load, Boom Angle, and Boom Length. Pressing the **Up Arrow** button will toggle Boom Length with Boom Angle.

Any warnings or alarms will display in this window. If the System has any internal faults, it will display **“!WARNING! SYSTEM FAULT”** in the Information window. To view the specific fault messages, press the **Up Arrow** or **Down Arrow** buttons.

Operator's Display Console

Push Buttons



The **Setup** button allows the operator to configure the System to match the current setup of the crane. The items will be shown as a number, and a verbal description in the information window. Setup codes are present for:

- Crane chassis configuration, rubber or outriggers
- Boom configuration
- Stowed jib attachments; if no stowed options are available, this code will not appear
- Number of parts of line. **NOTE:** *If an erected jib or searcher hook is selected, this option will not be available.*

The **Alarm Override** button disables the audible warning. It also overrides the function kick-out for the current alarm condition, by pressing and holding the **Alarm Override** button. Hold the button for 8-10 seconds to mute the alarm. Continue to hold the button to override the alarm.

The **Contrast** buttons are used to adjust the brightness of the display area.

The **Display Mode/Select** buttons are used to switch between different display formats showing different combinations of boom angle, boom length, and radius. They are also used as **Up Arrow** or **Down Arrow** buttons to scroll through menu selections.

System Maintenance

Perform the following check on the System prior to each shift or crane operation.

Reeling Drum Cable

- Inspect the Reeling Drum Cable for damage.
- Fully extend and retract the boom. Ensure the Reeling Drum Cable extends and retracts without sagging or erratic movements.
- Check the cable for physical damage.

Pressure Sensor Hose Connections

- Ensure 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.

WARNING!

Do not check for hydraulic leaks with hands. If a mist of hydraulic oil is noticed around a line or component, use cardboard or other material to check for location of the leak. High pressure fluid leaking from small holes can be almost invisible, yet have enough force to penetrate skin. If injured by escaping fluid, see a doctor at once. Serious reaction or infection can occur.

Anti-Two-Block

- Ensure the Anti-Two-Block parts are undamaged and correctly connected.
- Ensure the Anti-Two-Block switch is secure on its mounting.
- Ensure all the electrical cable and connectors are free from damage and correctly connected.

Reel-to-Computer Cable

- Ensure the cable is free from damage. If this cable has been damaged in any way, it may need to be replaced. Contact your Service Representative for more information.

Crane Configuration and System Setup

Overview

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 duty file and installed in the crane's computer prior to shipment.

WARNING!

ENSURE THE CONFIGURATION CODE NUMBER IN THE SETUP CODE WINDOW IDENTIFIES THE CORRECT CONFIGURATION FOR THE CURRENT OPERATION. IF IN DOUBT, SELECT THE CODE AGAIN FOLLOWING THE STEPS OUTLINED IN THE SECTION ON CRANE OPTIONS AND SETUP CODES.

Testing the Two-Block Warning and Function Kick-Out

Use this test procedure to ensure the Anti-Two-Block warning signals and the function kick-out are working properly. Ensure no pre-existing alarm conditions are active when performing this test.

WARNING!

BEFORE PERFORMING THIS TEST, POWER THE CRANE OFF AND BACK ON TO ENSURE THERE IS NOT AN EXISTING TWO-BLOCK WARNING OR FUNCTION KICK-OUT. DO NOT PRESS THE ALARM OVERRIDE BUTTON TO DISABLE THE AUDIBLE ALARM DURING THIS TEST. DO NOT WINCH THE HOOK BLOCK INTO THE BOOM TIP, IN CASE THE SYSTEM DOES NOT CAUSE A FUNCTION KICK-OUT.

1. Ensure power to the crane has been removed. Place the Anti-Two-Block switch in the tripped position. Wedge, clamp, tie, or otherwise immobilize the switch in the tripped position.
2. Power up the crane.
3. Ensure winch up, boom down, boom extend, and swing left and right motions are disabled. Audible and visual alarms on the Operator's Display should become active.
4. Remove power to the crane.
5. Return the Anti-Two-Block switch to the normal position.
6. Start the crane.

Crane Configuration and System Setup

Load Test

Performing a load test is the best method to identify a possible problem in the System. The accuracy of the load test is dependent upon accurate operation of all sensors and correct crane configuration.

It is recommended to perform a load test monthly.

WARNING!

ENSURE THE CONFIGURATION CODE NUMBER IN THE SETUP CODE WINDOW IDENTIFIES THE CORRECT CONFIGURATION FOR THE CURRENT OPERATION. IF IN DOUBT, SELECT THE CODE AGAIN FOLLOWING THE STEPS OUTLINED IN THE SECTION ON CRANE OPTIONS AND SETUP CODES.

1. Select a weight at 20% of Maximum Rated Capacity for the current configuration.
2. Calculate the weight of the total load, including the slings and hook block.
3. Lift the weight and record the Load displayed on the Operator's Display Console. The Load must read 0-10% higher than the total load. For example: If lifting 5000lbs, the acceptable range for the Load is 5000-5500lbs. It is never acceptable for the display to indicate less than the total load.

WARNING!

A LOAD OUTSIDE OF THIS RANGE MAY INDICATE A SENSOR PROBLEM. CONTACT YOUR SERVICE REPRESENTATIVE.

Section 2: Calibration

Why Calibration is Important

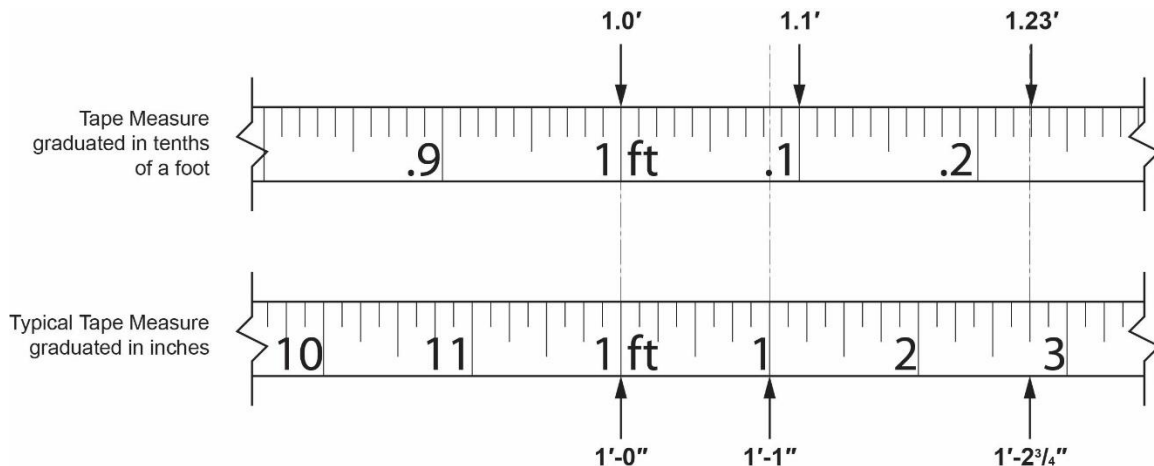
The pressure sensors are calibrated during production. It is necessary to zero and span the angle and extension sensors so the computer can measure the length and angle of the boom and calculate load. The System is calibrated using the Operator's Display Console. The calibration procedure ensures the sensors, cables, and hydraulic connections are correctly installed and adjusted.

WARNING!

OBSERVE SAFE PRACTICES AT ALL TIMES. ENSURE THE CRANE CAPACITY LIMITATIONS ARE UNDERSTOOD AND THE CRANE CAPACITY PLATE IS FOLLOWED. DO NOT EXCEED THE MANUFACTURER'S SPECIFIED LIFTING LIMITATIONS.

Required Tools

- 1/4" nut driver or T15 Torx driver
- Digital level calibrated and accurate to 0.1°
- 100' measuring tape - fiber type graduated in tenths of feet
- Digital volt/Ohm meter capable of measuring to three decimal places



NOTE: The computer calculates measurements in feet and tenths of a foot.

Identifying the System Configuration

A240700 and A240709 Reeling Drums

The A240700 and A240709 Reeling Drum Assemblies are used on cranes with boom spans of 35 feet or less. The reel provides storage for the Reeling Drum Cable and the angle and length sensors.

The Reeling Drum Cable carries the Anti-Two-Block signal back to the Reeling Drum Assembly.

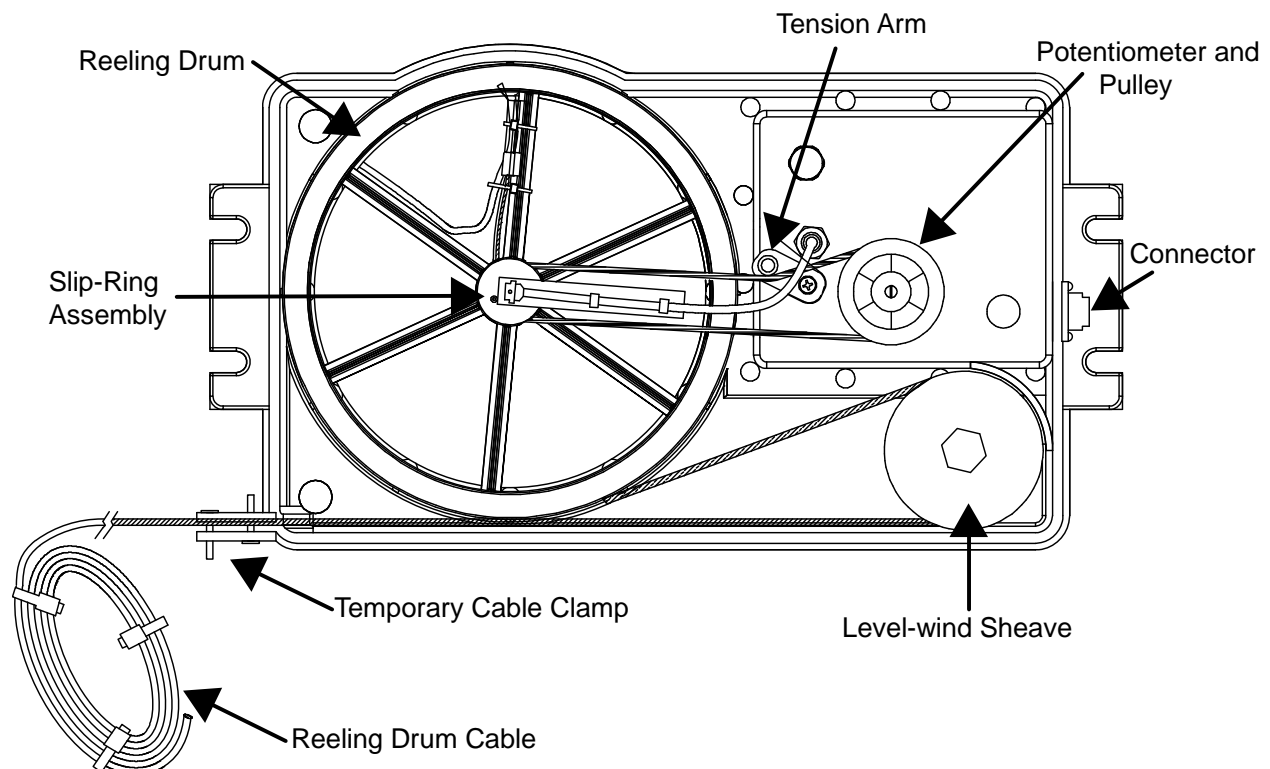
The cable must be stored on the Reeling Drum in a single layer to preserve the accuracy of the length measurement. The levelwind sheave ensures the Reeling Drum Cable is stored in a single layer.

The angle and length sensors are housed in a sealed enclosure inside the Reeling Drum Assembly to protect them from the elements.

NOTE: Do NOT remove the Temporary Cable Clamp until the cable is connected to the crane. If removed early, the cable can snap back into the housing and damage the unit.

- Pre-2009 Reeling Drums have trim pots on the sensor baseplate inside the housing.
- Post-2009 Reeling Drums do not have trim pots on the sensor baseplate inside the housing.

NOTE: To avoid removing the protective cover, refer to the part number sticker on the side of the unit and contact Greer with the Serial Number.



A240634 and A240635 Reeling Drums

All cranes IC200 and larger are equipped with a 90-foot span Reeling Drum. This Reeling Drum is 14" in diameter and is installed on the side of the boom. The reel provides storage for the Reeling Drum Cable and the angle and length sensors.

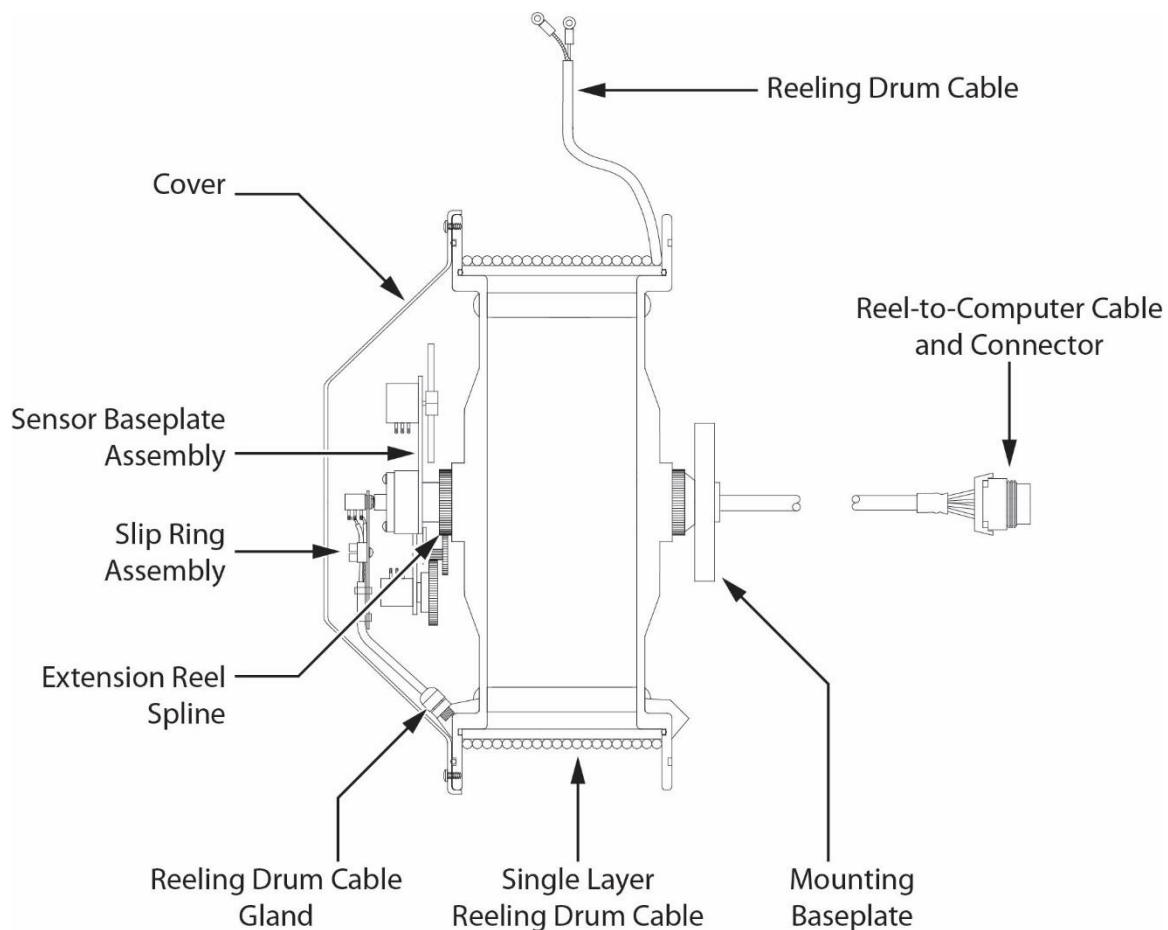
The Reeling Drum Cable carries the Anti-Two-Block signal back to the Reeling Drum Assembly.

The cable must be stored on the Reeling Drum in a single layer to preserve the accuracy of the length measurement.

The Reeling Drum also houses the angle and length sensors.

- Pre-2009 Reeling Drums have trim pots on the sensor baseplate inside the housing.
- Post-2009 Reeling Drums do not have trim pots on the sensor baseplate inside the housing.

NOTE: Remove the cover to view the sensor baseplate inside the Reeling Drum housing.



Computer Assembly: The computer consists of the grey box and attached pressure sensors. The computer uses the pressure sensors readings, along with the Angle and Length sensors to determine:

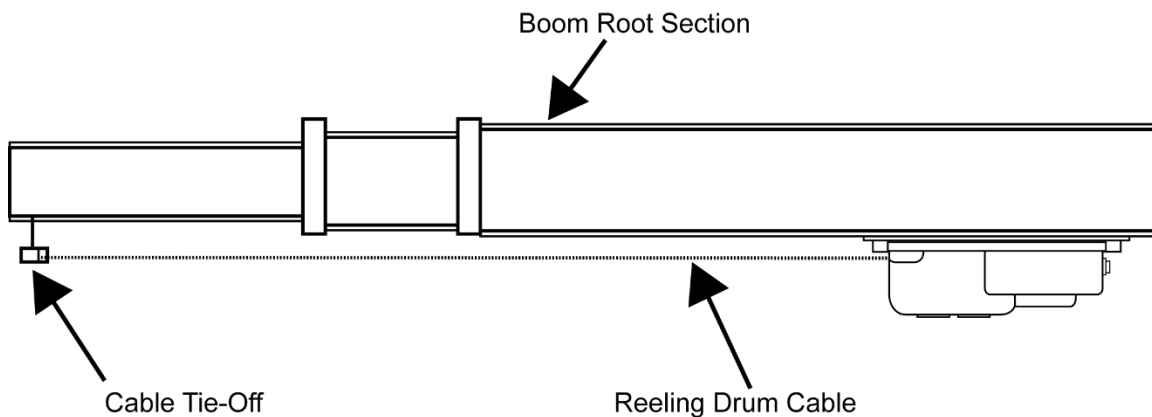
- Load
- Load relative to Maximum Capacity
- Warn of approaching overloads
- Detect approaching Two-Block conditions
- Angle and Length of the boom.

Chipped computers – Will have a part number that begins with A4506xx.

Flash computers – Will have a part number that begins with A4507xx or A4508xx.

Calibration Instructions for Different Configurations

For Systems with the A240700 or A240709 Reeling Drums



Replacing the Reeling Drum

1. Position the crane on firm, level ground with outriggers properly extended and set.
2. Fully retract the boom.
3. Place the digital level on the boom and adjust the boom until the digital level reads 0.0°.
4. Remove the Reeling Drum Cable from the tie-off and remove the 4 bolts from the existing Reeling Drum. Remove the Reeling Drum from the boom.
5. Install the new Reeling Drum using the existing mounting holes.

NOTE: Do NOT remove the Temporary Cable Clamp until the cable is connected to the crane. If removed early, the cable can snap back into the housing and damage the unit.

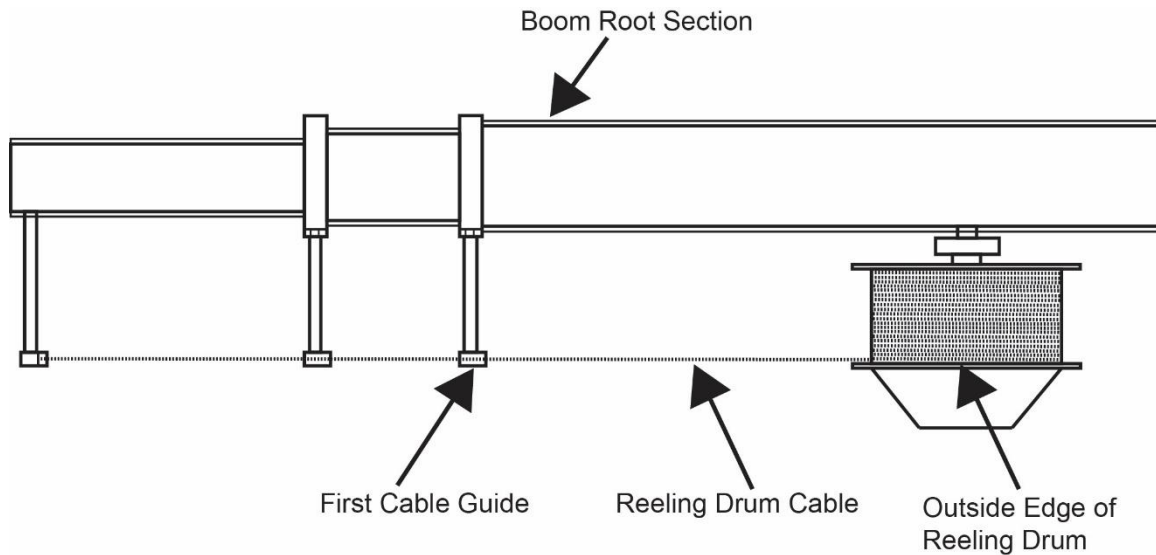
6. Pull the Reeling Drum cable out and attach the loop to the Cable Tie-Off.
7. Remove the Temporary Cable Clamp.
8. The Reeling Drum is pre-tensioned and is ready for calibration.
 - a. For a **Chipped Computer**, a new Reeling Drum may be incompatible with older software. To check software compatibility, contact the BMC Parts Department at (913) 888-0606 with the Crane Serial Number and the System Chip number.

- b. Obtain the system chip number in one of the two the two following ways:
 - i. Turn the key to “ON” and watch the Greer Display. Under the BMC crane model designation, the System Chip number will be displayed as D586xxx.
 - ii. If the crane or computer is inoperable, remove the cover from the Greer Computer box located on the turret. The System Chip number is on the label for the chip as shown in the following picture.



- iii. Proceed to “Entering Calibration Mode.”
- c. For a **Flash Computer**, verify your current software revision. There are no known incompatibilities at the time of writing. To view the software version, turn the key to “ON” and watch the Greer Display. Under the BMC crane model designation, the software file name and revision will be displayed, such as E586xxx.
- d. Refer to **Entering Calibration Mode**.

For Systems with the A240634 and A240635 Reeling Drums



Replacing the Reeling Drum

1. Position the crane on firm, level ground with outriggers properly extended and set.
2. Fully retract the boom.
3. Place the digital level on the boom and adjust the boom until the digital level reads 0.0°.
4. Remove the existing Reeling Drum Cable from the tie-off and remove the Reeling Drum from the boom.
5. Install the new Reeling Drum using the existing hardware and mounting location.

Pre-Tensioning the Reeling Drum

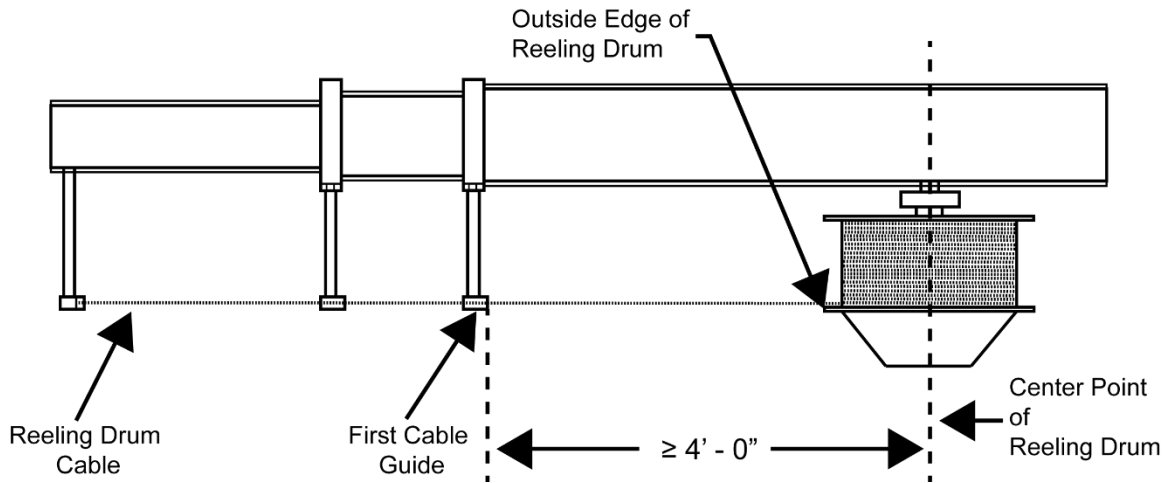
1. With the boom fully retracted and the new Reeling Drum installed, slowly rotate the Reeling Drum clockwise until a “click” is heard.
2. Slowly rotate the Reeling Drum counterclockwise five (5) complete rotations.

NOTE: A temporary marker can be placed on the Reeling Drum to help facilitate the rotation count.

3. Pre-Tensioning of the Reeling Drum is now complete.

Installing the Anti-Two-Block cable

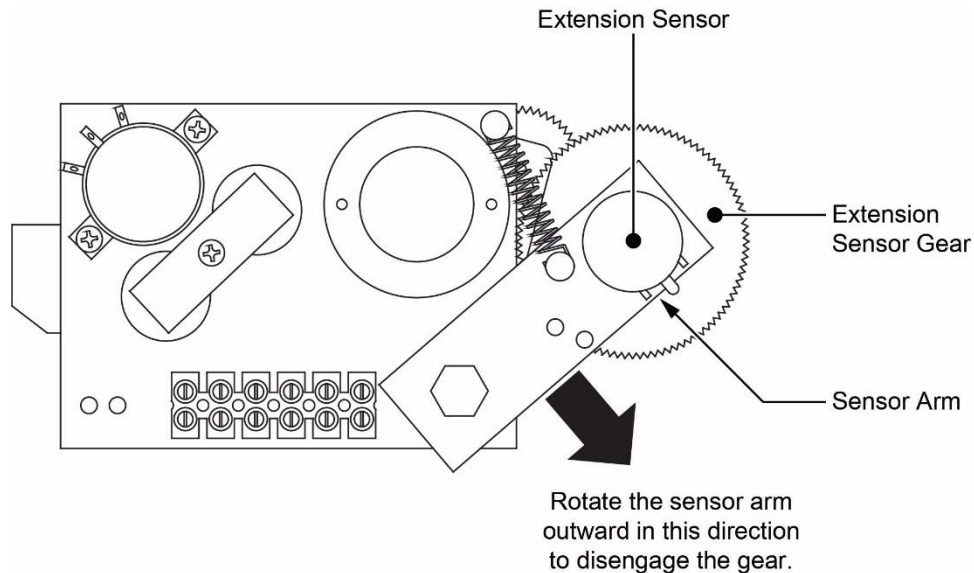
1. Before attaching the new Reeling Drum Cable to the tie-off post, ensure the existing cable guides achieve proper placement of the first cable wrap.
2. Ensure the distance between the First Cable Guide is at least 4' from the center point of the Reeling Drum. The inside edge of the First Cable Guide must align with the outside edge of the Reeling Drum.



NOTE: The Reeling Drum Cable path to the boom head through the cable guides to the tie-off post may follow a straight line parallel to the boom, as shown. Alternatively, the Reeling Drum Cable may curve toward the boom depending on the placement of the cable guides in the latter segments of the boom.

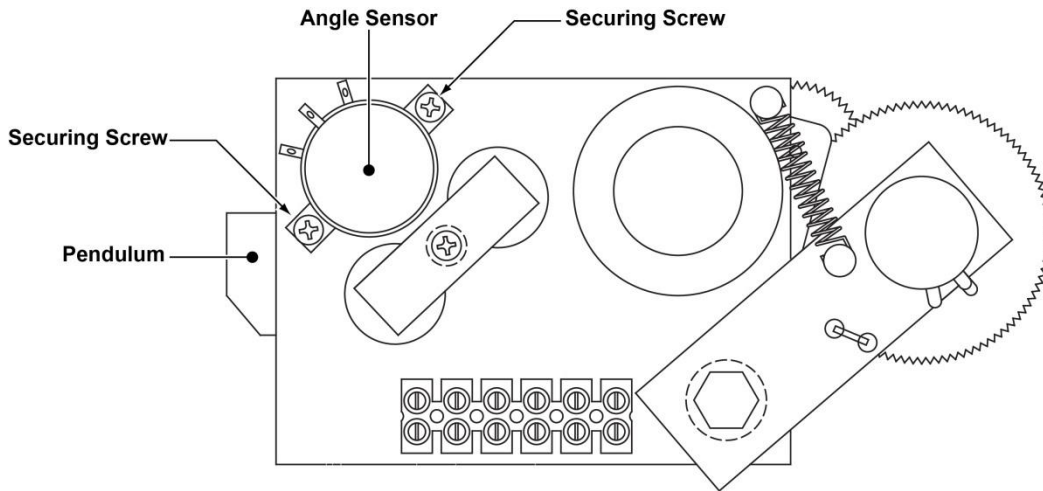
Adjusting the Extension Sensor

1. With the boom at 0°, push the extension sensor arm down to disengage the gear.



2. While holding the gear in this position, rotate the extension sensor clockwise until the end of the potentiometer travel is reached.
3. Rotate the sensor a 1/2-turn counter-clockwise to establish the proper starting point. **NOTE:** Confirm by checking the voltage. Refer to **Reeling Drum Voltage Checks**.

Adjusting the Angle Sensor



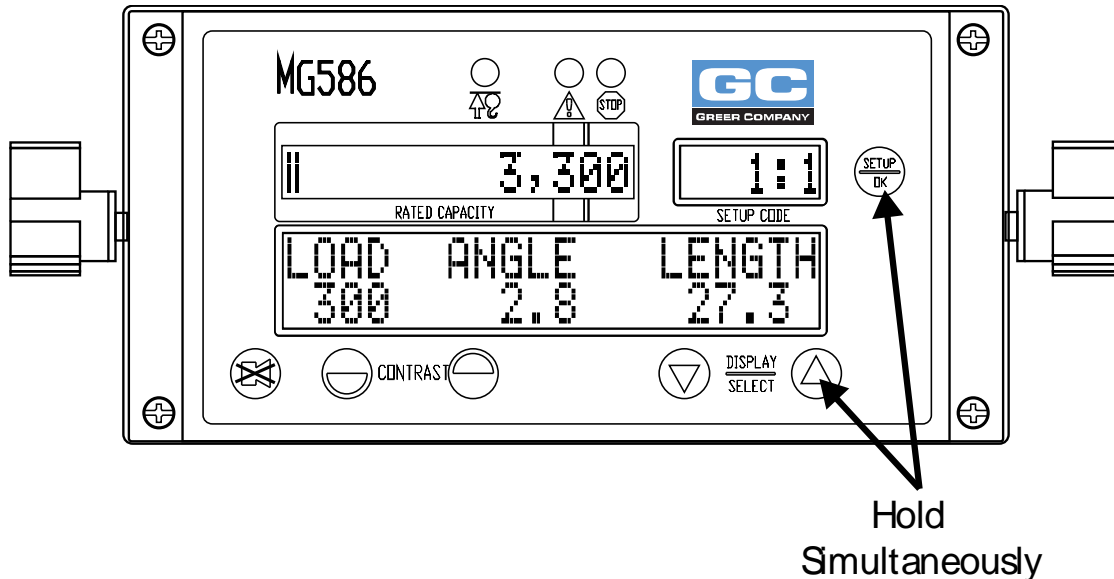
1. With the boom at 0.0°, check the voltage of the angle sensor. Refer to **Reeling Drum Voltage Checks (For A240634 and A240635 or A240700 and Reeling Drums)**.
2. If the voltage is incorrect, loosen the securing screws and rotate the angle sensor until the desired voltage reading is attained.
3. The Reeling Drum is pre-tensioned and is ready for calibration.
 - a. For a **Chipped Computer**, a new Reeling Drum may be incompatible with older software. To check software compatibility, contact the BMC Parts Department at (913) 888-0606 with the Crane Serial Number and the System Chip number.
 - b. Obtain the system chip number in one of the two the two following ways:
 - i. Turn the key to “ON” and watch the Greer Display. Under the BMC crane model designation, the System Chip number will be displayed as D586xxx.
 - ii. If the crane or computer is inoperable, remove the cover from the Greer Computer box located on the turret. The System Chip number is on the label for the chip as shown in the following picture.



- iii. Proceed to “Entering Calibration Mode.”
4. For a **Flash Computer**, verify your current software revision. There are no known incompatibilities at the time of writing. To view the software version, turn the key to “ON” and watch the Greer Display. Under the BMC crane model designation, the software file name and revision will be displayed, such as E586xxx.
5. Proceed to **Entering Calibration Mode**.

Entering Calibration Mode

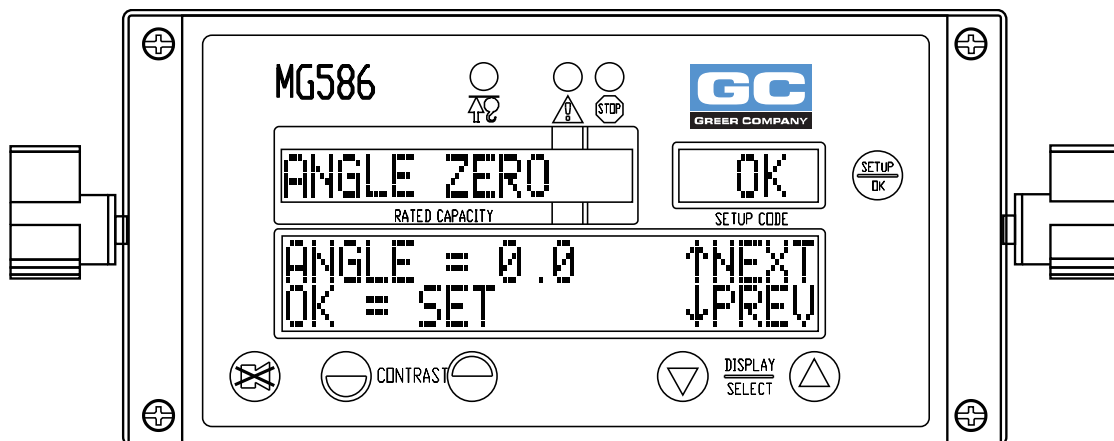
1. Ensure the duty file and crane model match the machine. Cycle power to the system to view the information during the System Self-Test. See page 5 for more information.
2. Ensure the boom is fully retracted and set to 0°. Use a calibrated digital level.
3. Turn the System on and go through the operator setup. Ensure all options on the machine are shown in the operator setup.
4. Enter the Calibration Mode by pressing and holding the **Up Arrow** and **Setup** buttons simultaneously for 8-10 seconds or until the screen appears in Calibration Mode.



5. "Angle Zero" will appear in the Rated Capacity window.

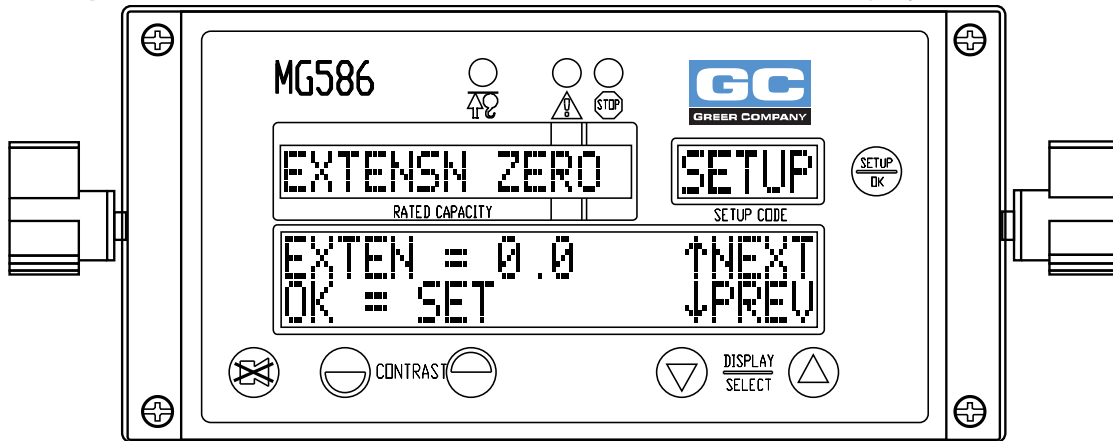
Angle Zero Routine

6. The Information window will read "Angle = X.X" and "OK = SET".
7. Press the **Setup** button to set the Angle Zero. "Angle = 0.0" will be displayed. The Angle Zero routine is complete.



Extension Zero Routine

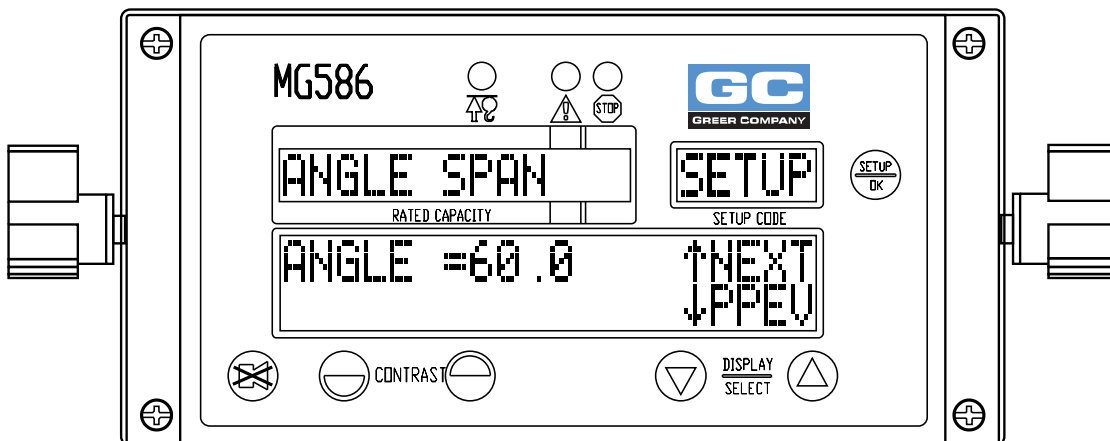
8. Press the **Up Arrow** button to access the “ExtensnZero” routine. This allows the length sensor to be calibrated. Ensure the boom is completely retracted.
9. The Rated Capacity window will display “EXTENSN ZERO”. The Information window will display “Exten = (XX.X)” and “OK = SET”.
10. Press the **Setup** button will set the Extension Zero. “Exten = 0.0” will be displayed.



11. The Extension Zero routine is now complete.

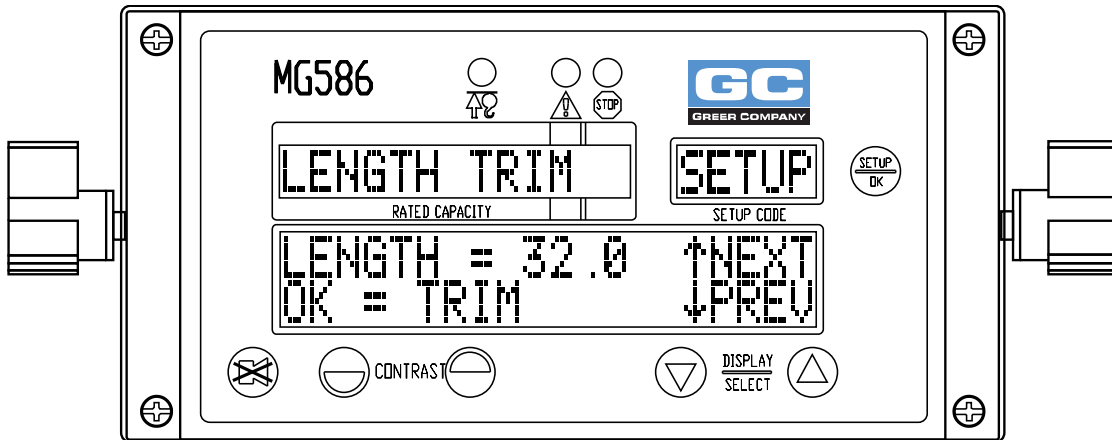
Angle Span Routine

12. Press the **Up Arrow** to access the “ANGLE SPAN” routine.
13. Raise the boom to exactly 60.0° as shown with the calibrated digital level. With the boom at exactly 60.0°, press the **Setup** button and the lower window will display “ANGLE = 60.0”. The Angle Span routine is now complete.



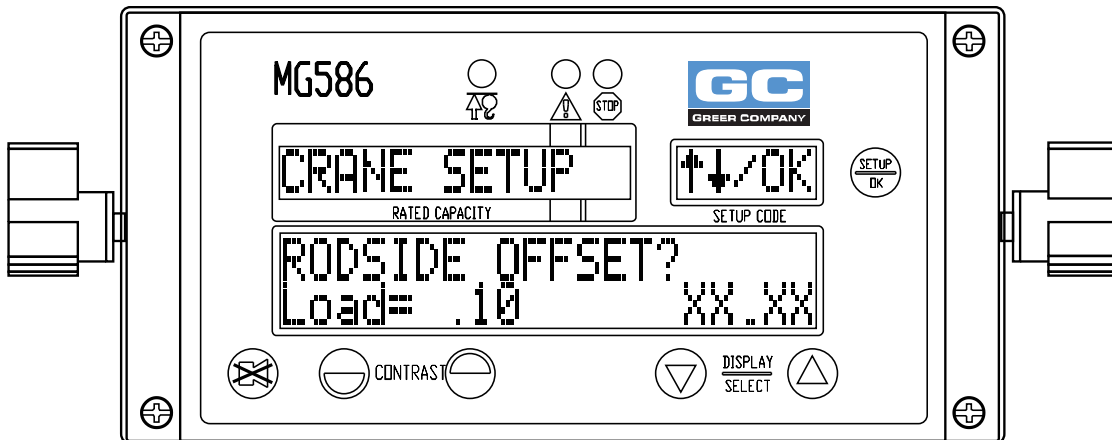
Length Trim Routine

14. Press the **Up Arrow** button to access the “LENGTH TRIM” routine. The Information window will read “Length = X.X” (Retracted length).
15. Fully extend the boom until you hear the cylinder bottom out. The lower window will display “OK = TRIM”.
16. Press the **Setup** button and the “Length = XX.X” value will change to display the proper boom length. The Length Trim routine is now complete.



Rodside Offset Routine

17. Press the **Up Arrow** button to access the “RODSIDE OFFSET” routine. The number in the lower right corner will likely read “0”.



18. Press and hold the **Up Arrow** button until the display shows the default setting of 0.0. Press the **Setup** button again to return to the main operating screen.

After the Calibration Routine

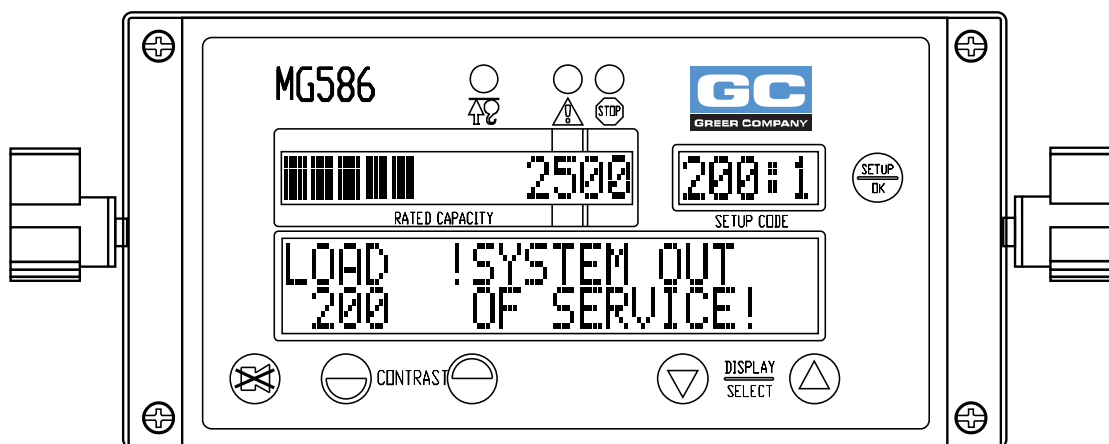
19. Set up the machine and attach a tape measure, graduated in tenths of a foot, to the centerline of rotation.
20. With the boom horizontal and fully retracted, measure the load radius with the empty hook hanging and compare to what is displayed on the Operator's Display Console. The display should be within +0.5 ft.
21. Repeat the test at full extension and record the results. The hook weight should read about the same as shown on the crane capacity chart. **NOTE:** *Hook weight varies with crane model and parts of line.*
22. Raise the boom to 60° and measure the radius with the boom fully retracted and fully extended. The display should be within +0.5 ft. The hook weight should read about the same as shown on the crane capacity chart. **NOTE:** *Hook weight varies with crane model and parts of line.*
23. Place the machine on outriggers.
24. Attach a known weight between 500lbs and 1000lbs. Check and read the load at full extension between 45° and 60°. The display should indicate the weight of the load, load handling equipment, and hook weight within 0-10% over the actual load.
25. If the machine does not pass these tests, do not place the machine back into service. Contact BMC and Greer for further instructions.

Section 3: Troubleshooting

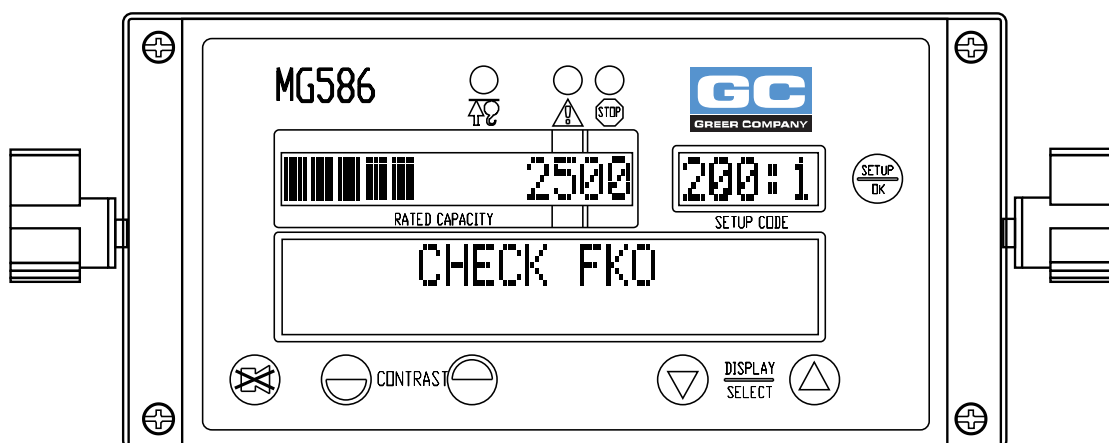
Troubleshooting and Error Codes

Grouped Error Codes

The MG586 display used in conjunction with the Greer computer can produce grouped error codes for use as a troubleshooting guide. When an error is detected, the Information window will display “SYSTEM OUT OF SERVICE”.



Press the **Up Arrow** button to display the specific error code.

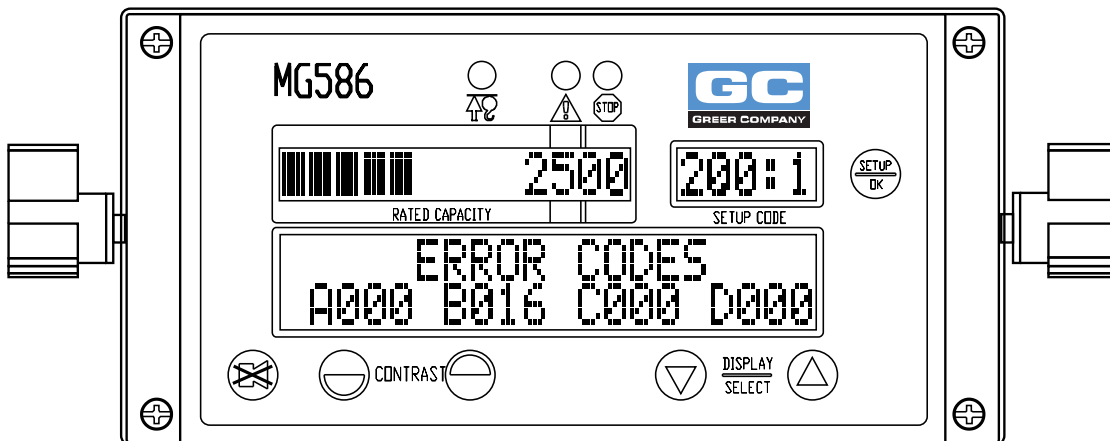


Troubleshooting and Error Codes

Grouped Error Codes

Many times the error can be located using the general definition. However, a more detailed code definition may be required for diagnosis. Press the **Up Arrow** button to display the specific error code and then press the SETUP button on the display.

The codes will appear on the screen with a code number to define the specific fault.



Troubleshooting and Error Codes

Group “A” Faults

General Definition: Group “A” faults are for all analog sensor inputs. These sensors must operate within a specific output range, if a sensor is not within the specified output range, the computer will produce a fault code “AXXX”. This fault code will identify a specific sensor for checking.

Code	Cause	Procedure
A001	Piston Pressure Transducer out of range	Replace the computer if no obvious faults
A002	Rod Pressure Transducer out of range	Replace the computer if no obvious faults
A004	Extension sensor out of range	Adjust and calibrate extension sensor
A008	Angle sensor out of range	Adjust and calibrate angle sensor

Group “B” Faults

General Definition: Group “B” monitors internal voltage feeds, such as the ATB Input/Output circuit and the pressure sensor inputs.

Code	Cause	Procedure
B001	Piston pressure not responding	Replace computer
B002	Rod side pressure not responding	Replace computer
B008	Bad ATB feed	Check ATB cable system for shorts
B016	Bad FKO feed	Check crane power and FKO fuse

Group “C” Faults

General Definition: Group “C” monitors the computer memory modules. The only serviceable part is the Executive Program Chip.

Code	Cause	Procedure
C001	Bad Duty File	Reload duty file or replace ERPOM
C002	Bad Duty ROM Checksum	Reload duty file
C004	Bad ram test	Replace computer
C016	Bad Serial EEROM test	Replace computer

Group “D” Faults

General Definition: Group “D” refers to Load Chart, or Duty Chart, in relation to specific sensor inputs. If an analog sensor is producing a signal out of the specified range, the computer will not be able to find a load chart to match these criteria. This code is usually accompanied by an analog or “A” code.

Code	Cause	Procedure
D001	No Duty Found	Check analog inputs and calibration
D002	No duty because of bad extension match	Check analog inputs and calibration

Troubleshooting and Error Codes

System Fault Messages

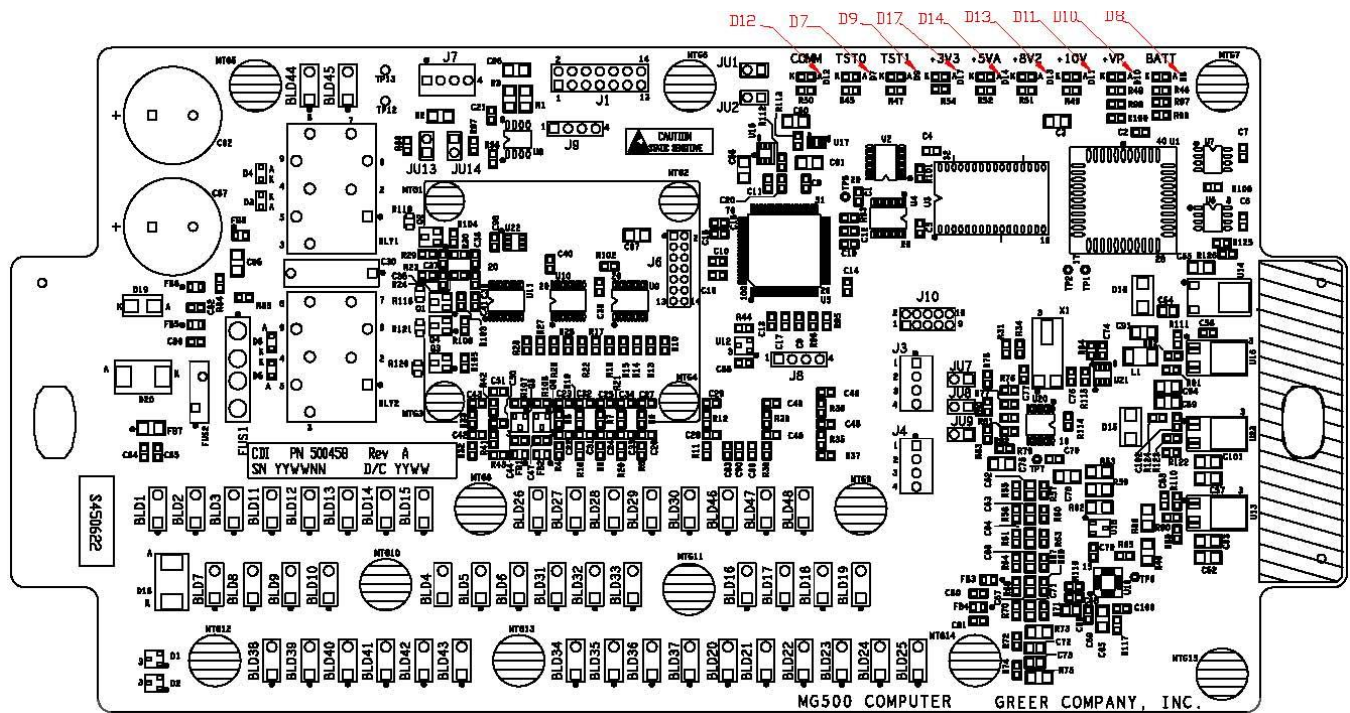
When the System detects a fault, the red warning LED illuminate and the message, "WARNING: SYSTEM FAULT" will flash on the display. When a more serious fault is detected, the message, "SYSTEM OUT OF SERVICE" will flash.

To determine the fault, press the **Up Arrow** or **Down Arrow** button. The information window will display the related fault message. This message will appear for up to 20 seconds before the display returns to its normal display mode. If the **Up Arrow** or **Down Arrow** button is pressed before the 20 seconds have elapsed, the display will automatically return to its normal display mode.

Fault Message	Corrective Action
Re-select Crane Setup	This message indicates there is an error in the crane setup selection, or there is an internal computer fault. Re-select the correct crane setup code, the error should correct itself. If not, replace the computer. Refer to Replacing the Computer .
Check Extension	This message indicates a problem with the Boom Extension Sensor. <ol style="list-style-type: none">1. Inspect the cabling and connections from the computer to the Reeling Drum.2. Inspect the Reeling Drum Cable for damage.3. Remove the Reeling Drum cover to verify operation of the Reeling Drum. Refer to Reeling Drum Voltage Checks.
Check Angle	This message indicates a problem with the boom angle sensor. <ol style="list-style-type: none">1. Inspect the cabling and connections from the computer to the Reeling Drum.2. Removed the Reeling Drum cover and verify operation of the Reeling Drum. Refer to Reeling Drum Voltage Checks.
Check ATB Wiring	This message indicates an Anti-Two-Block wiring problem, usually due to an electrical short to the boom or a damaged Reeling Drum Cable. <ol style="list-style-type: none">1. Inspect the cabling and connections from the computer to the Reeling Drum.2. Inspect the Reeling Drum Cable from the Reeling Drum to boom tip and the Anti-Two-Block switch connections.3. Verify electrical signals for the Two-Block drive and signal within the Reeling Drum. Refer to Reeling Drum Voltage Checks.
Check FKO	This message indicates a Function Kick-Out wiring problem. This is usually caused by a fuse or crane circuit breaker failure. Remove the computer unit lid and check the 10A fuse.
Replace the Computer	This message indicates an internal fault in the computer. During normal operation, all LEDs will be illuminated with the COMM indicator blinking. If not, contact Technical Support for assistance. Refer to Computer Unit Layout .

Computer Unit Layout

Flash Models



The computer unit contains a row of LED indicators for checking computer operation. During normal operation, all LEDs will be illuminated with the COMM indicator blinking. If not, please contact technical support for assistance. Use the following chart and preceding images for LED location.

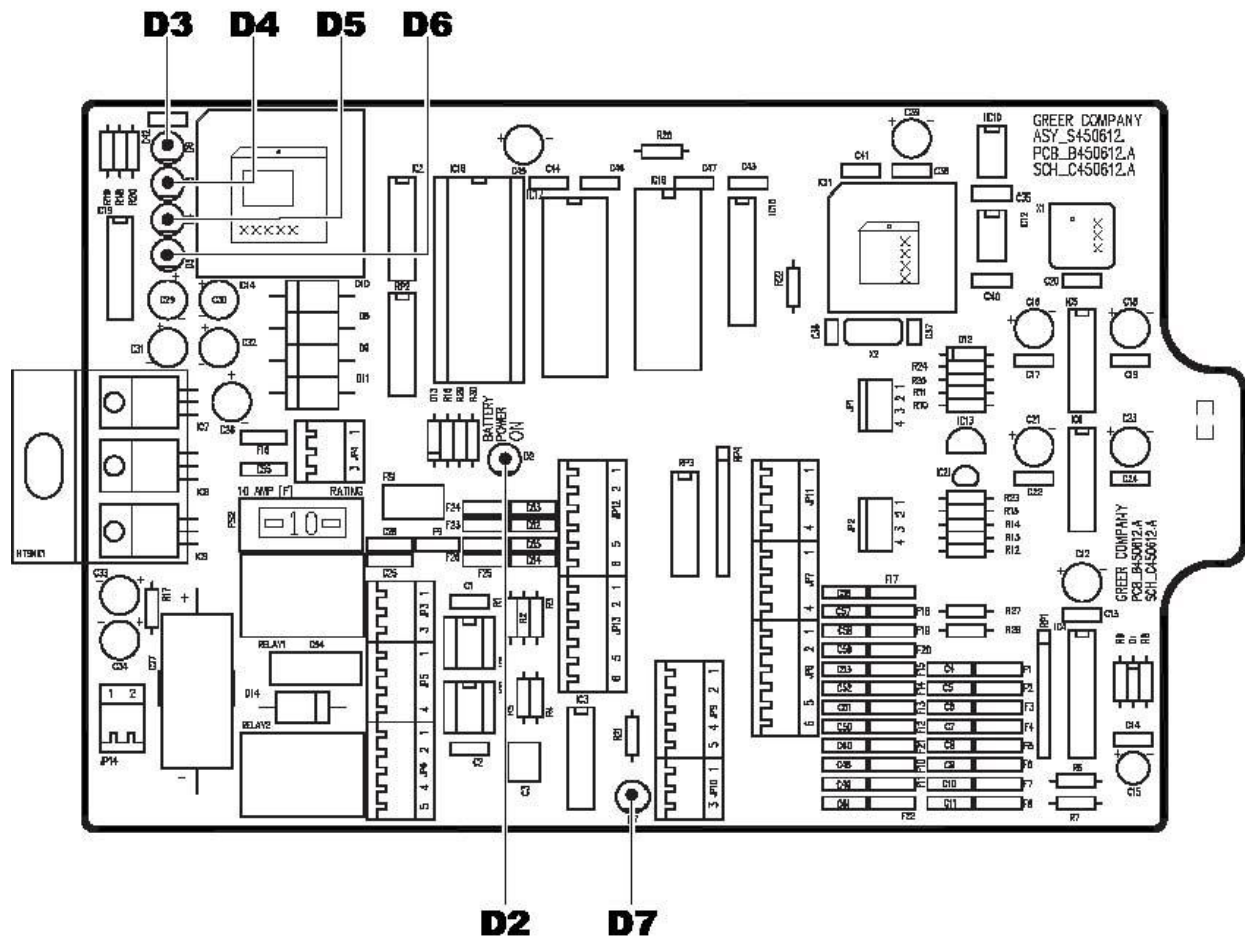
LED Indicator	Function
D7	Communication Indicator TST0
D8	Battery Power_POS
D9	Communication Indicator TST1
D10	+VP
D11	+10V
D12	COMM (Communication Indicator)
D13	+8V2
D14	+5V
D17	+3V3

Computer Troubleshooting (Chipped Models Only)

Computer Internal Status Indicators

The computer unit contains six LED indicators to aid in troubleshooting. There are five power supply indicators (D2 through D6), and one communication indicator (D7). All the indicators are bright green LEDs.

All indicators should be illuminated at the same brightness level except the communications indicator. A missing or dimly lit indicator indicates a power supply problem. **NOTE:** *The communications indicator should blink steadily.*



LED Indicator	Function
D2	Battery Power
D3	+5V Analog Power
D4	+5V Digital Power
D5	+10V Relay Drive Power
D6	Protected Machine Power
D7	Communication Indicator

Computer Internal Status Indicators (Cont.)

Power Indicator States and Actions

Power Indicator State	Corrective Action
All indicators OFF	Check power.
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 communication with the display console and the running state of the computer program. Observe the Communication indicator and the display console at power ON and through the self-test. Then use the following chart to help decide the course of action.

Communication Indicator at Power ON	ACTION
From the moment 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.	The computer is not running. Check the 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 (Legacy computers only). If not successful, replace the computer.
From the moment the system power is applied the COMM indicator does not illuminate. The display console, which never goes to normal continuously reads "No Communication with MicroGuard"	Communication with the display has not been made. Is the display console connected? Check the connector and cabling to the display console.
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.	This is the normal operation of the communication between the computer and display console.

Replacing the Computer

Removing the Computer

1. Lower the boom until the boom lift cylinder is completely retracted.
2. Disconnect the battery cables.
3. Relieve hydraulic pressure by cycling the control valve with the crane off. Then disconnect the hydraulic connections at the computer unit.
4. Disconnect electrical connectors at the computer unit.
5. Remove the hardware securing the computer to the side of the turret.

WARNING!

THE HYDRAULIC HOSES CONNECT DIRECTLY TO THE BOOM LIFT CYLINDER. DO NOT OPERATE THE CRANE UNLESS THE COMPUTER HAS BEEN PROPERLY REPLACED OR THE HYDRAULIC CONNECTIONS ARE PROPERLY CAPPED.

Installing the Computer

NOTE: The new computer must have the proper program pre-installed or flashed by an authorized technician. An incorrect program will cause incorrect geometry and load readings.

1. Secure the computer unit to the side of the turret with the mounting hardware.
2. Ensure the electrical connections face downward.
3. Connect the electrical connectors.
4. Remove the protective caps from the hydraulic ports.
5. Connect the base-side pressure (green band) hose to the piston pressure port.
6. Connect the rod-side pressure (red band) hose to the rod pressure port.
7. Bleed air out of hydraulic lines prior to operation. See the BMC Operation and Maintenance Manual for detailed instructions and safety precautions.
8. To calibrate the new computer unit, refer to **Section 2: Calibration**.

Start-Up Problems

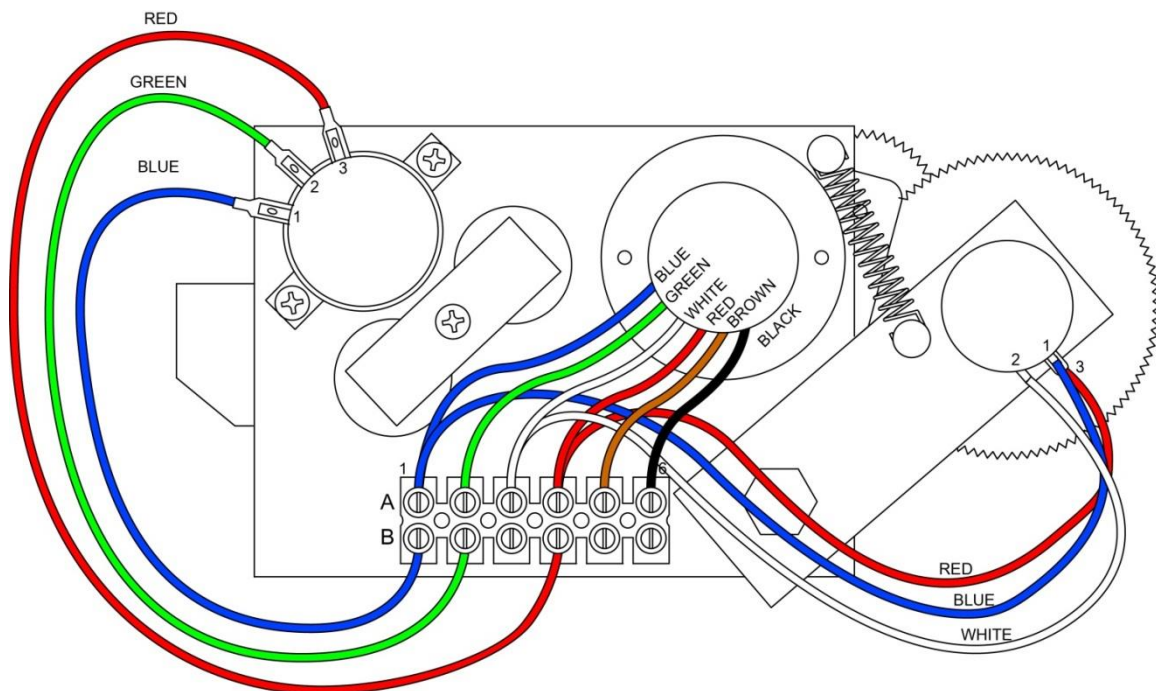
Condition	Corrective Action
The display unit illuminates, flashes and alarms, the computer makes a buzzing sound.	<ul style="list-style-type: none">- Check the system ground.
During calibration, it is not possible to adjust the angle sensor. The display shows dashed lines“---“.	<ul style="list-style-type: none">- Ensure the Reeling Drum is correctly installed.- Make sure the Reeling Drum signal cable is correctly connected to the computer unit.- Check the Reeling Drum voltages, refer to Reeling Drum Voltage Checks.
A few seconds after power up, the display shows “No communications with MicroGuard®” in the load display window.	<ul style="list-style-type: none">- Computer is possibly not running.- Ensure all LEDs within the computer are lit and the communications LED (D12) is flashing. If not, replace the system chip (Legacy Only). Or Reflash the duty file.- Check the display cable for damage.

Reeling Drum Voltage Checks

For A240634 and A240635 Reeling Drums

If problems occur with the Two-Block alarm, angle sensor, or extension sensor; the following chart details checks to perform within the Reeling Drum. Follow the action column before measuring voltages at the specified points in the voltmeter connection columns. Measure all voltages with a digital voltmeter set to DC volts.

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
EXTENSION SENSOR OUTPUT	0 ft. FULL RETRACTED	0.15V	0.35V	TB1/3 – WHITE	TB1/1 - BLUE
TWO-BLOCK DRIVE	A2B SWITCH DOWN	5.5V	7.5V	TB1/6 - BLACK	TB1/1 - BLUE
	A2B SWITCH UP	9.5V	10.5V	TB1/6 - BLACK	TB1/1 - BLUE
TWO-BLOCK SIGNAL	A2B SWITCH DOWN	5.5V	7.5V	TB1/5 - BROWN	TB1/1 BLUE
	A2B SWITCH UP	0V	2V	TB1/5 - BROWN	TB1/1 - BLUE



Reeling Drum Voltage Checks

For A240700 and A240709 Reeling Drums

Sometimes voltage signals from the sensors need to be measured as indicated by error code retrieval. The voltage signals on the A240700 Reeling Drum cannot be measured from inside the Reeling Drum Assembly. Check the voltages at the appropriate blades in the computer.

NOTE: Ensure the boom is fully retracted and the angle is at 0° before checking the voltages. Always use the blue system ground wire for the negative lead on the voltage meter when checking sensor voltages and drive voltages.

SIGNAL	BOOM POSITION/ ACTION	VOLTAGE		VOLTMETER CONNECTION	
		MIN	MAX	CHIPPED COMPUTER	FLASH COMPUTER
SENSOR DRIVE	-	+4.7V	+5.3V	JP8-5	BLD 24 Red
ANGLE SENSOR OUTPUT	0 degrees	0.4V	0.6V	JP8-3	BLD 22 Green
EXTENSION SENSOR OUTPUT	0 ft. FULL RETRACTED	0.15V	0.35V	JP8-2	BLD 21 White
TWO-BLOCK DRIVE	A2B SWITCH DOWN	5.5V	7.5V	JP8-1	BLD 20 Black
	A2B SWITCH UP	9.5V	10.5V		
TWO-BLOCK SIGNAL	A2B SWITCH DOWN	5.5V	7.5V	JP8-4	BLD 23 Orange
	A2B SWITCH UP	0V	2V		
SYSTEM GROUND				JP8-6	BLD 25 Blue

A240711 - LIGHT BAR WIRING - BRODERSON

Connections listed are for Blade computer:

Blue Wire	+VP Depending on availability, can be any one of BLD6, BLD30 or BLD33	
Black Wire	0V Depending on availability, can be any one of BLD15, BLD17 or BLD48	
Brown Wire	LAMP 0 DRIVE (DOUT0)	BLD4
Grey and White Wires	LAMP 1 DRIVE (DOUT1)	BLD5

The function of each wire is as follows:

Blue:	Power for Light bar
Black:	0V (GND)
Brown:	Sinking input, Yellow segment
White:	Sinking input, Red segment
Grey:	Sinking input, Audible Alarm

REVISION	DATE ISSUED	DESCRIPTION OF CHANGE(S)	REVISED BY	ER
3	7/11/2019	Updated reeling drum part numbers and added Light Bar Wiring	WHS	19-0702



11135 South James • Jenks, OK 74037
Phone: (918) 298-8300
Fax: (918) 298-8301

www.dovertwg.com

Greer Company is a part of TWG.

As a leader in product innovation, Greer Company is committed to the ongoing improvement of its equipment.
We reserve the right to make changes to our products without notice.

©2019 TWG. All rights reserved.