

Greer Company *Crane Systems*

MicroGuard® 500R Computer

Training Manual

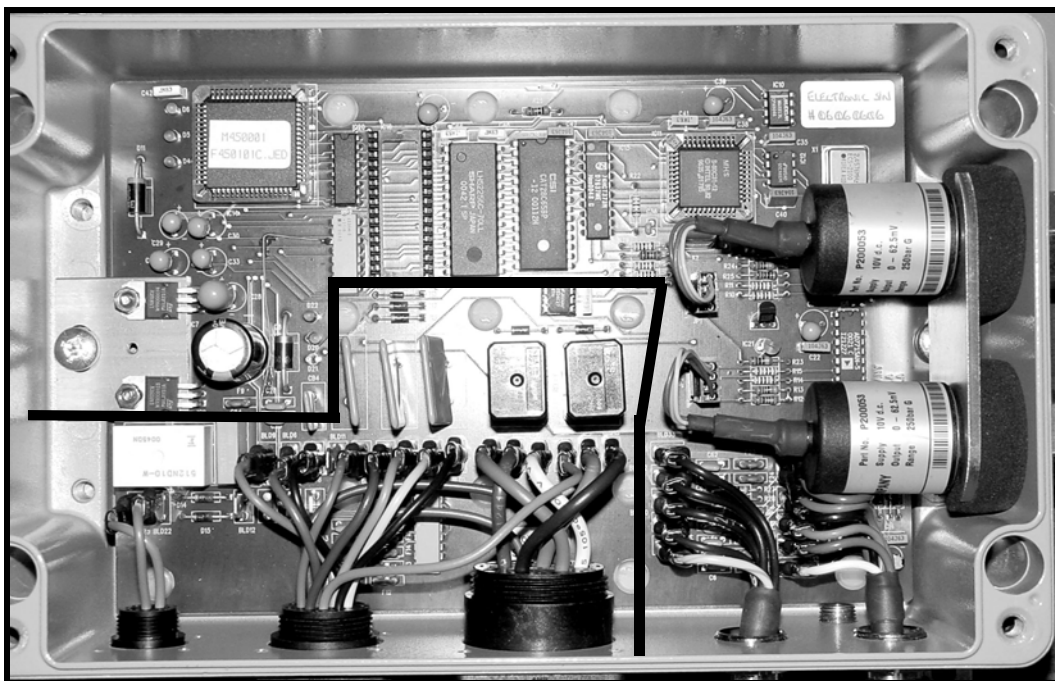
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The MicroGuard[®] 500R Computer

With the introduction of the MG[®] 500R Computer, there was a major change in the interaction between the Greer computer and the electrical system of the crane. Besides monitoring crane load functions, the MG[®] 500R Computer is responsible for routing the main electrical current for the computer, as well as supplying the electrical circuitry for the crane.

The photograph below shows the added Terex-RO components. Anything above or outside of the heavy black line is considered the load moment function and is addressed in the Greer Company Maintenance and Setup Manual (Part No. W458200 Rev. B 01/14/02).



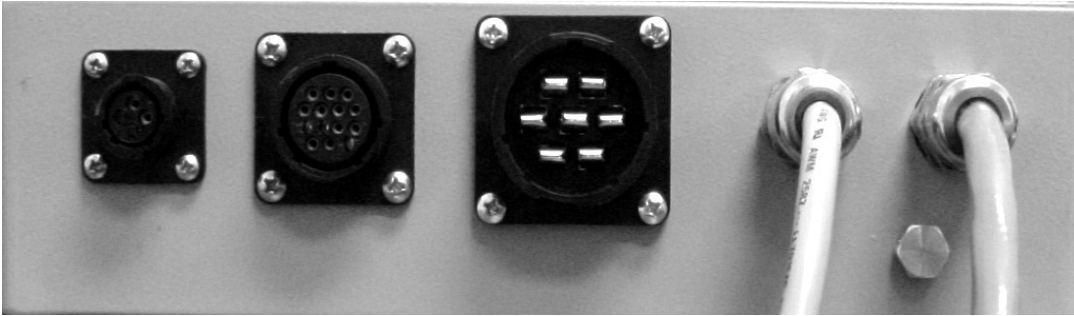
MicroGuard[®] 500R Computer Assembly

This publication contains schematic information, as well as troubleshooting material for the MicroGuard[®] 500R Computer Assembly. Please read this material carefully before undertaking any maintenance or troubleshooting tasks on this system.

Warning: Proper maintenance and troubleshooting procedures for electrostatic devices must be utilized or the system components may be damaged.

The MicroGuard® 500R Computer continued

The following pages address the MicroGuard® 500R system parts and function. The purpose of this system is to ensure that no power reaches the crane or load moment functions until the PTO is engaged in preparation for crane operation. The picture below identifies the wiring of system components.



Display Harness Reel Drum Harness

CAB Plug Operation

The cab plug supplies the main power to the computer and crane wiring. The circuit incorporates Relay # 4, located inside the computer enclosure. Relay # 4 is a power relay designed to control the main current flow from the battery to the computer and from the crane electronics through a wiring panel.

The **power for the coil** in Relay # 4 is supplied by ignition power when the truck ignition switch is turned on. The ground side of the coil is attached to the PTO ground switch and will not allow the relay to function until the PTO on the crane is engaged. When this ground connection is made, the coil on the relay pulls the contacts closed and supplies battery power to the system. The relay will make a clicking sound as it engages, indicating that the coil has pulled the contacts closed, which will then activate the PTO light in the truck cab, indicating that the system is powering up.

Cab Wiring Harness Legend

- Pin# 1 The **black wire** is connected to the engine fuel shut-off solenoid and is routed through the shutdown relay to ignition power.
- Pin# 2 The **grey wire** is connected to power for the PTO light. When the circuit is powered, it will cause the PTO light to glow in the cab.
- Pin# 3 The **red wire** in terminal position #3 is connected to a battery source. As always, the power should be fused at the source even though the power is directed to the computer module through a “resettable “circuit breaker on the terminal board. This is a direct power connection, which is then directed to position BLD17 on the circuit board.

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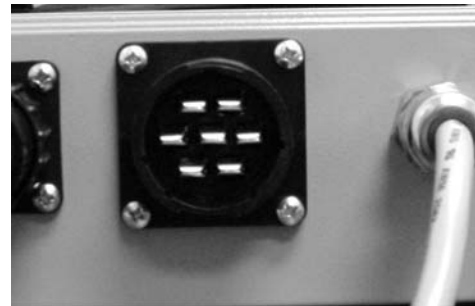
Pin# 4 The **blue** wire is the ignition power that usually provides power to the fuel solenoid. The wire is never “hot” unless the key is on. This wire also supplies the power for the coil in relay# 3.

Pin# 5 The **white** wire is the completion of the “power on” circuit. This wire is most often connected to the ground switch on the shift cover of the PTO. When the PTO is engaged, the ground is then passed on to the ground side of the power relay coil, becoming the main power supply for the computer.

Pin# 6 The **red** wire is power from the Start/Stop switch at the operator display console. When the switch is pushed in the start direction, current is supplied to the truck starter solenoid to start the truck.

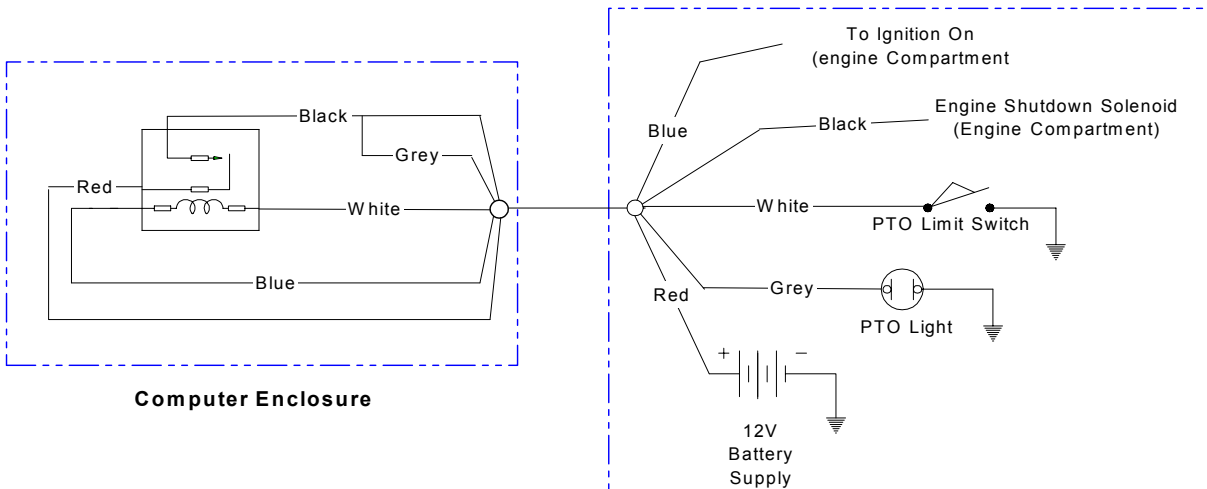
Pin# 7 The **brown** wire is the power signal sent to the chassis warning horn, activated by pushing the operator warning horn device at the operator display console.

Terminal	Color/Terminal	Function
1	Black/Bld15	Fuel Solenoid
2	Grey/Bld16	PTO Light
3	Red/Bld17	Power (Battery Source)
4	Blue/Bld18	Ignition Power
5	White/Bld19	PTO Ground
**6	Red/NA	Engine Start (from Crane Console)
**7	Brown/NA	Signal Horn (From Crane Console)



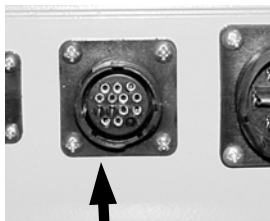
Bottom View of Computer

** These two connections are wiring junctions between the CAB and Console receptacles. There is no connection to the computer board assembly.



Console Wiring Harness Plug

The power for all of the previously mentioned functions is supplied from the terminal connections in the computer enclosure as listed in the Color/Terminal column in the table below.



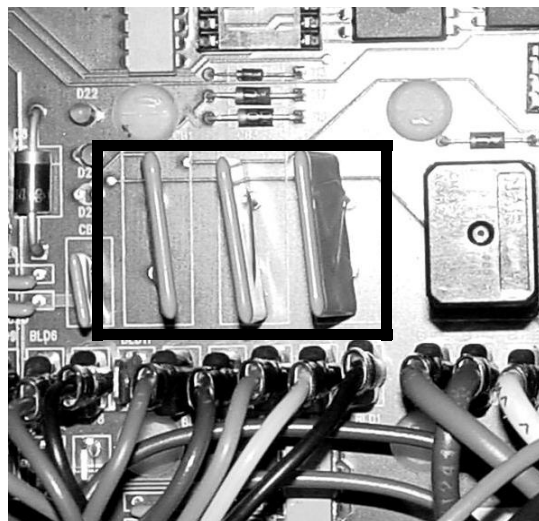
Console Plug

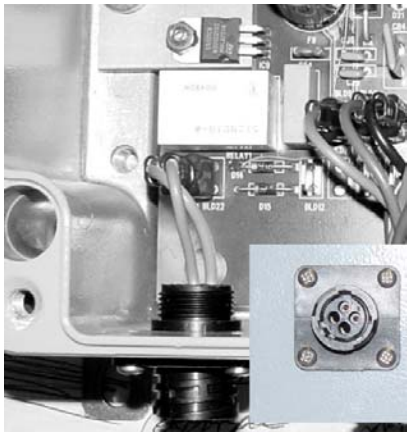
Terminal Number	Function	Color of Wire/ Terminal#
1	Engine Start/Stop	Black/Bld1
2	Engine Stop	Green/Bld2
3	O/R Limit Switches	Brown/Bld3
4	Signal Device	Yellow/Bld4
5	2 Spd. Winch	Orange/Bld5
6	Angle Switch	Red/Bld6
7	Aux. OR Switch	Grey/Bld7
8	Signal Limit Switch	Black/Bld8
9	Limit Switch Power	Blue/Bld9

Circuit Breaker Protection

The main power signal supplied from the main power relay is divided up into a series of three self-resetting circuit breakers on the board. These circuit breakers work when a short circuit in a wire causes the power signal to go to ground, thus heating up the circuit breaker. It would then go again into the working mode when it cooled off. In the case of a function that loses and then regains power intermittently, any of the power wires supplied to the console or FKO could be suspect for a short. CB1 and CB2 are for console options, and CB3 is for the FKO circuit.

If the short circuit is so severe that the circuit breaker has to be replaced, the unit must be returned to the factory for repair.



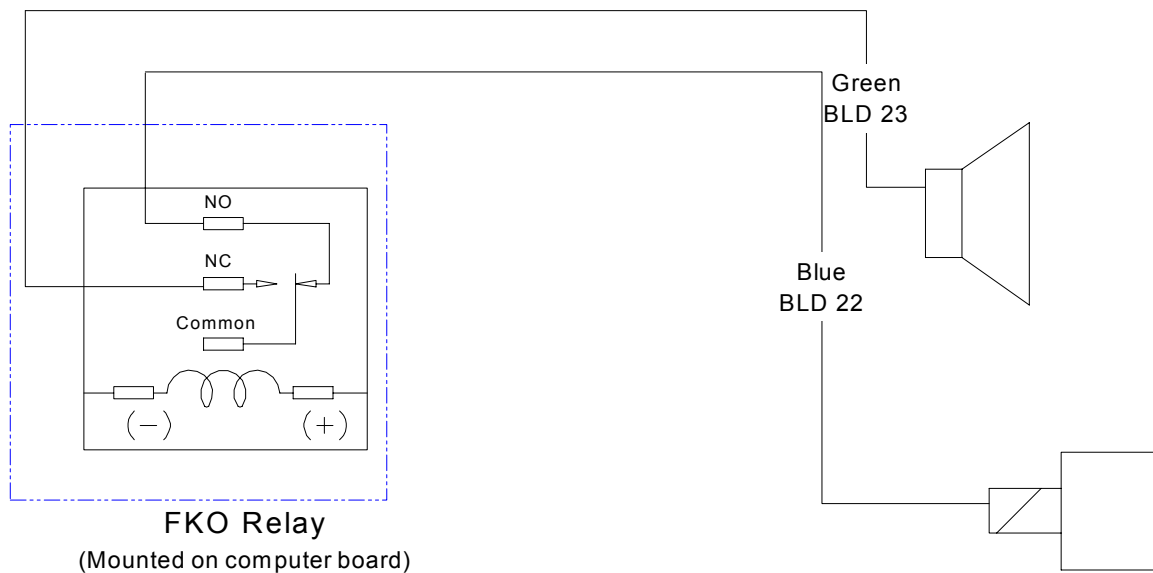


ATB Plug and Connections

Anti 2-Block and Function Kick-Out Plug

Terminal	ColorWire/ Terminal Connection	Function
1	Blue/BLD22	FKO Solenoid
2	Green/BLD23	Warning Horn

The Anti 2-Block function is associated with the ATB plug and is located on the left side of the computer enclosure, as shown in the above illustration. This plug contains 2 wires: a **green** wire that connects to the warning horn, located on the crane console, and a **blue** wire that is connected to the function kick-out solenoid. The resulting output signals are a result of the feeds from the FKO relay. When the signal from the extension reel indicates a 2-Block condition, the FKO relay switches the condition; the currents between the **FKO solenoid** and the **warning horn** are then reversed. The schematic below shows the following circuit.



Grouped Error Codes

The MicroGuard® 586 Display used in conjunction with the MicroGuard® 500R Computer has the capability of producing Grouped Error Codes for use as a troubleshooting tool and guide. The error codes assist in pinpointing problem areas.

There are four basic groups of fault codes:

- Group A** is designed for all analog sensor inputs. These functions must operate within a specific range of output; if not within the expected range as called for in the program instructions, the computer will produce a fault code "A XXX." When the fault code is compared to the error code chart, a specific sensor will be identified for checking.
- Group B** monitors internal voltage feeds, such as the ATB Input/Output circuit, and transducer inputs.
- Group C** monitors the computer memory modules. The only part of this group that would be user serviceable is the Executive Program Chip, which is changeable.
- Group D** refers to Load Chart (or Duty Chart) as it applies to specific sensor inputs. If one of the analog sensors is producing signals that are out of the specific voltage criteria, the computer will not be able to find a specific load chart to match this criteria. This code is usually accompanied by an analog or "A" code.

When an error is detected, the display will first emit a warning on the screen as viewed in this graphic .

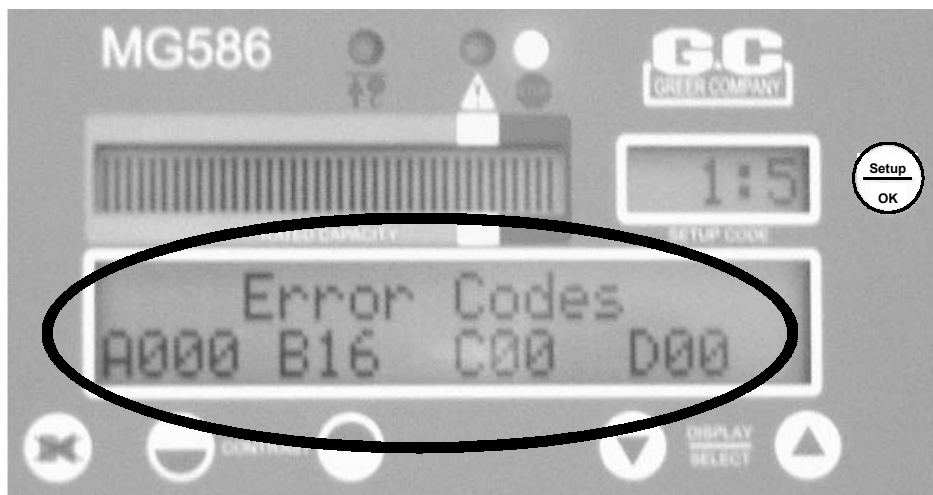


Grouped Error Codes cont.

When the warning occurs, press the Up arrow button to display the specific problem in words. It may read: **“Extension Sensor,”** or **“Check FKO”** as shown here.



Most of the time an error can be located and defined by using the above definitions, however, a more complete definition may be required for diagnosis. In this case, press the “SETUP” button on the display. The codes will appear on the screen by group with a code number to define the fault. Refer to the 586 Repair Manual for proper voltages and testing.



The MicroGuard® 586 Display Console showing the four error code groups

For definition of these codes, refer to the chart on the following page.

Grouped Error Codes continued

Group A Fault Codes	
A1	TXO Piston Side Pressure Out of Range
A2	TX1 Rod Side Pressure Out of Range
A4	Extension Sensor Ain2, Out of Range
A8	Boom Angle Sensor, AIN3, Out of Range`
Group B Fault Codes	
B1	ADC1 (Piston Pressure) Not Responding
B2	ADC2 (Rod Pressure) Not Responding
B8	Bad ATB Feed
B16	Bad FKO Feed
Group C Faults	
C1	Bad Executive EPROM Checksum
C2	Bad Duty ROM Checksum
C4	Bad RAM Test
C16	Bad Serial EEPROM Test
Group D Faults	
D1	No Duty Found
D2	No Duty Because of Bad Extension Match

