

# MicroGuard<sup>®</sup> 586 Retrofit

Rated Capacity Indicator System



Operation



Consider Yourself Warned.™



# Contents

Introduction.....	1
System Components.....	1
Boom Angle Sensor.....	1
Extension Sensor.....	1
Pressure Transducers.....	1
Anti Two Block (ATB).....	1
Display.....	2
Function Kick-Out.....	2
Operator Console.....	3
Warning/Alarm Indicators.....	3
Display Windows.....	3
Push Buttons.....	4
Operation.....	5
System Self-Test.....	5
Configuration Selection.....	6
Normal Operation.....	7
Approaching Overload.....	8
Maximum Capacity and Overload.....	8
Two-Block Warning.....	9
Alarm Override.....	9
Adjusting the Contrast.....	10



# Introduction

The MicroGuard 586 Retrofit Rated Capacity Indicator System (hereinafter referred to as the “system”) is intended to aid the crane operator by continuously monitoring the load and warning of an approach to an overload or two-block condition. Crane functions are monitored by means of high accuracy sensors. The system continuously compares the load suspended below the boom head with the crane capacity chart stored in the computer memory. At approach to overload, the system warns by means of audible and visual alarms. The system can be configured to cause function kickout by sending a signal to function disconnect solenoids.

## System Components

- MicroGuard Display Console
- Computer Unit
- Pressure Transducers
- Extension Reel with length and angle sensors
- Anti Two-Block (ATB) switches
- Cables

## Boom Angle Sensor

Boom angle is measured by means of a high accuracy potentiometer/pendulum assembly that is damped to prevent over swing. It provides a voltage proportional to boom angle. The boom angle sensor is mounted inside the cable extension reel assembly.

## Extension Sensor

The extension sensor provides an increasing voltage proportional to the extension of the boom. A cable attached to the boom head provides a low current electrical path for the ATB signal.

## Pressure Transducers

Two pressure transducers measure the pressure in the boom hoist cylinder. The resultant Total Moment signal is processed to provide a continuous display of the load suspended below the point of lift.

## Anti Two Block (ATB)

A switch monitors the approach of the hookblock or overhaul ball to the boom head. The switch is held in the normal position until the hookblock or overhaul ball raises a weight that is mounted around the hoist rope. When the weight is raised, it causes the switch to operate. The resultant signal is sent to the computer via the extension reel causing the ATB alarm to operate and function kick-out to occur.

## Display

The operator is provided with a continuous display of:

- Rated Load
- Actual Load
- Bar Graph showing Percentage of Rated Load
- Radius of the Load
- Boom Angle
- Main Boom Length

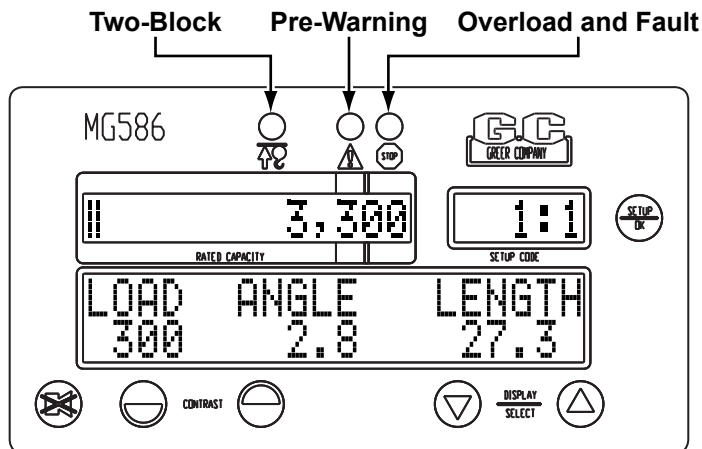
On-screen messages provide the operator with visual warnings of conditions that occur during operation of the system.

## Function Kick-Out

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

# Operator Console

## Warning/Alarm Indicators

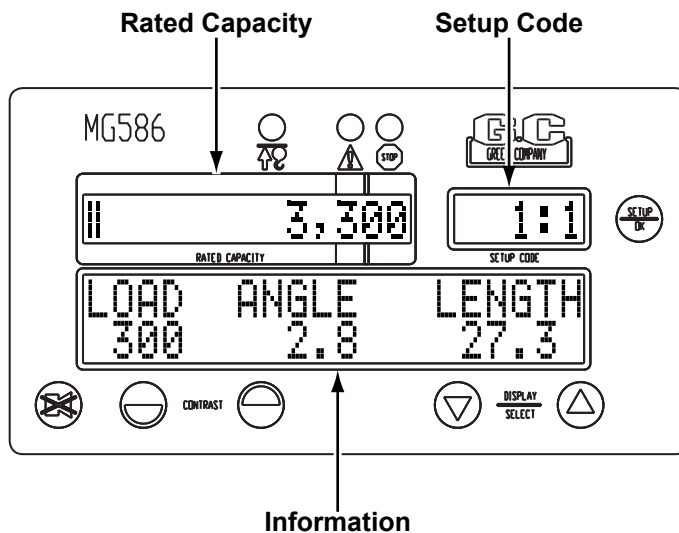


The red two-block lamp will illuminate when a two-block condition occurs (see “Two-Block Warning” on page 9).

The yellow pre-warning lamp will illuminate at 90% of rated capacity (see “Approaching Overload” on page 8).

When the load reaches or exceeds 100% of rated capacity, the red overload warning lamp will illuminate along with the yellow pre-warning lamp (see “Maximum Capacity and Overload” on page 8).

## Display Windows



The current rated capacity for the crane in the current configuration will be displayed in the rated capacity window as well as the percent of rated capacity shown as a meter which progresses to the right as the load increases (see “Normal Operation” on page 7).

The setup codes are shown in the setup code window, as well as the parts-of-line, and the stowed jib option if available (see “Configuration Selection” on page 6).

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 displayed in this window. If the system has any internal faults, it will display “!WARNING! SYSTEM FAULT” in the information window. The specific fault messages can be viewed by pressing the **UP ARROW** or **DOWN ARROW** key (see “System Fault Messages” on page A-???)

## Push Buttons

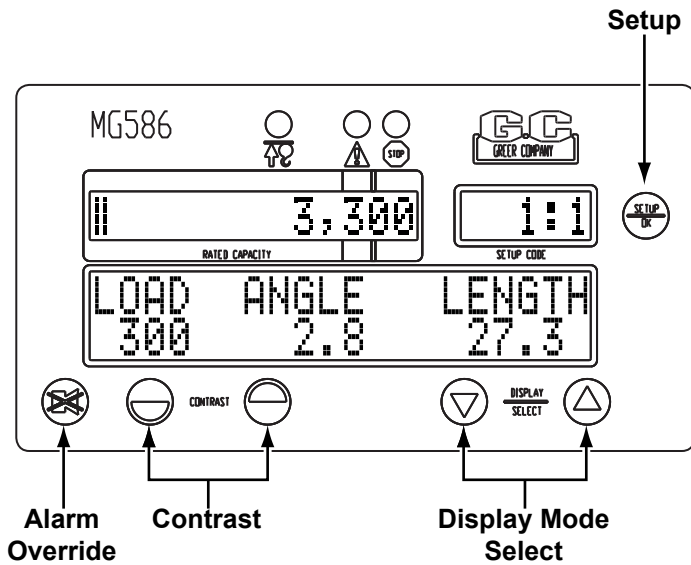
The **SETUP** key enables the operator to configure the system to match the actual setup of the crane. Codes are present for:

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

The **ALARM OVERRIDE** key is used to disable the audible warning and to override the function kick-out for the current alarm condition.

The **CONTRAST** keys are used to adjust the lightness or darkness of the display area.

The **DISPLAY MODE/SELECT** keys are used to switch to different display formats showing various combinations of boom angle, boom length, and radius. They can also be used as an **UP ARROW** or **DOWN ARROW** key to scroll through menu selections.

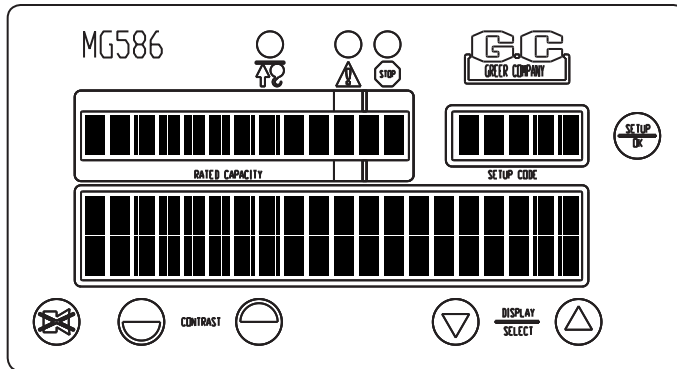




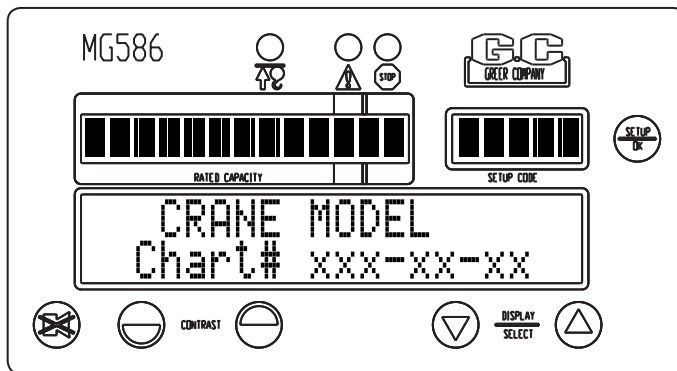
# Operation

## System Self-Test

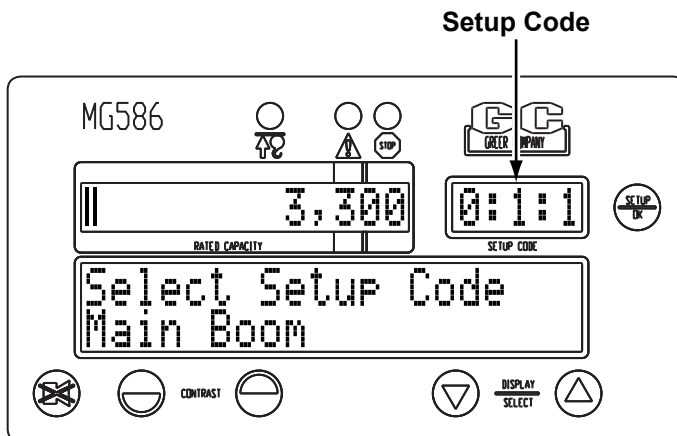
When the system is turned on, it goes through a brief self-testing process.



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



The information display will then show the crane model and capacity chart number for the system configured.



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. Refer to "Configuration Selection" on page 6 for code setup instructions.

## Configuration Selection

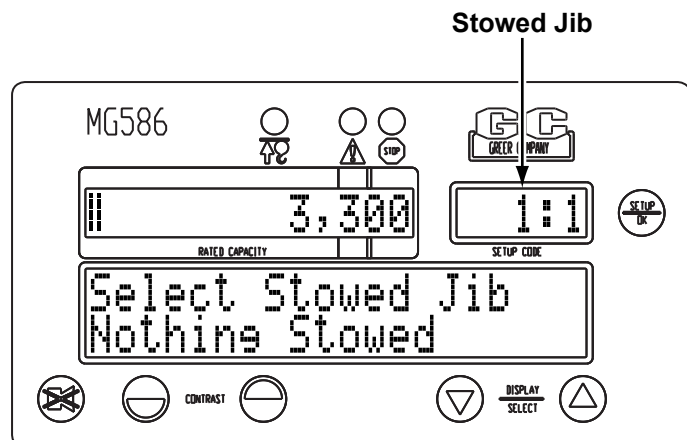
Configuration selection is required upon system power up; however, it can also be entered anytime by pressing the **SETUP** key.

The first stage 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 and the jib description is displayed in the information window.

To select a different stowed jib, press the **UP ARROW** or **DOWN ARROW** key to display the desired option and press the **SETUP/OK** key to continue.

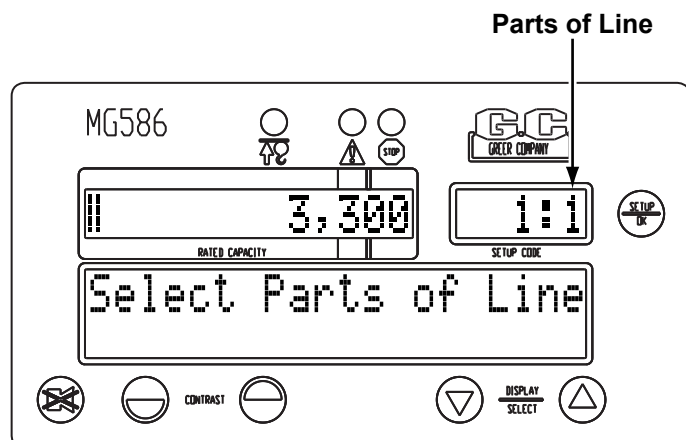


The current number of parts-of-line is now flashing.

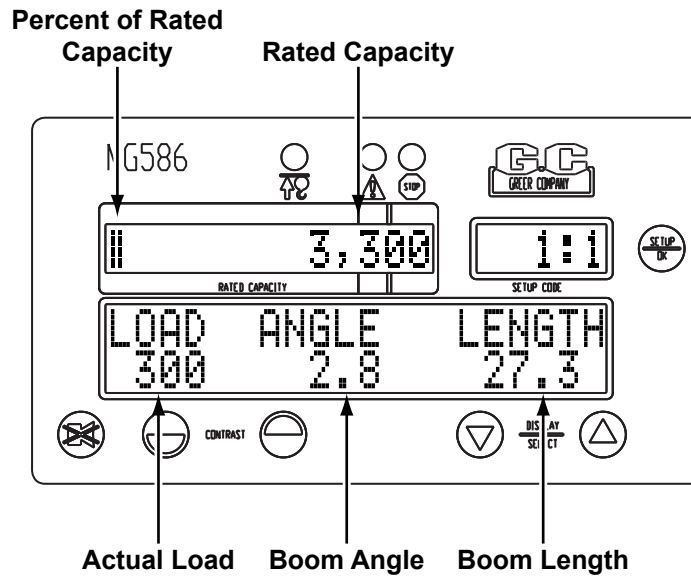
To change the parts-of-line, press the **UP ARROW** or **DOWN ARROW** key to select the desired number and press the **SETUP/OK** key to continue.

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 one [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



**Percent of rated capacity** indicates how near the operation is to full capacity and overload. The percent of rated capacity meter progresses to the right as the percentage increases. As long as the meter remains within the normal (green-bordered) zone, the percent of rated capacity is within normal operating limits. When the percent of rated capacity exceeds 60%, the rated capacity text will move to the left (see “Approaching Overload” on page 8).

**Rated capacity** is the heaviest load that the crane can lift in the current crane position and configuration. This value may be limited by the number of parts-of-line selected.

The **actual load** appears in the information window under the word “LOAD”. The actual load includes the weight of the load plus the weight of everything hanging below the boom tip (hook block, etc.).

The **boom angle** appears in the information window under the word “ANGLE”. This shows the current angle of the boom in degrees and tenths of a degree. Depending on the operation, the “ANGLE” display will change to “RADIUS”, in which case the radius from the centerline of rotation to the center of the suspended load will be shown in feet and tenths of a foot.

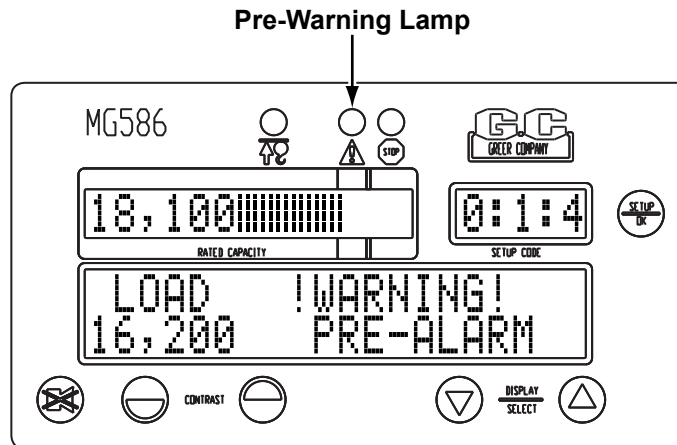
The **boom length** is displayed in the information window under the word “LENGTH”. This shows the current length of the boom in feet and tenths of a foot. By pressing the **UP ARROW** or **DOWN ARROW** key, the display can be changed to show “ANGLE” or “RADIUS”.

If the system has any internal faults, it will display “!WARNING! SYSTEM FAULT” in the information window. The specific fault messages can be viewed by pressing the **UP ARROW** or **DOWN ARROW** key (see “System Fault Messages” in the Troubleshooting Manual W450589).

### **!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” ON PAGE 6.**

## Approaching Overload

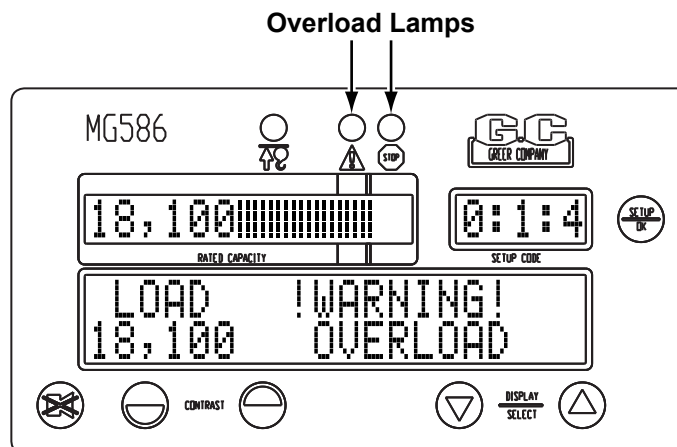


The system continuously monitors the weight of the load suspended below the boom head. The system compares this information with rated capacity data stored within the computer.

When the rated capacity of the configuration reaches 90%, the percent of rated capacity meter progresses from the normal (green-bordered) zone into the caution (yellow-bordered) zone.

A pre-warning lamp will illuminate and an audible alarm will beep continuously. The message “!WARNING! – PRE-ALARM” will flash in the information window.

## Maximum Capacity and Overload

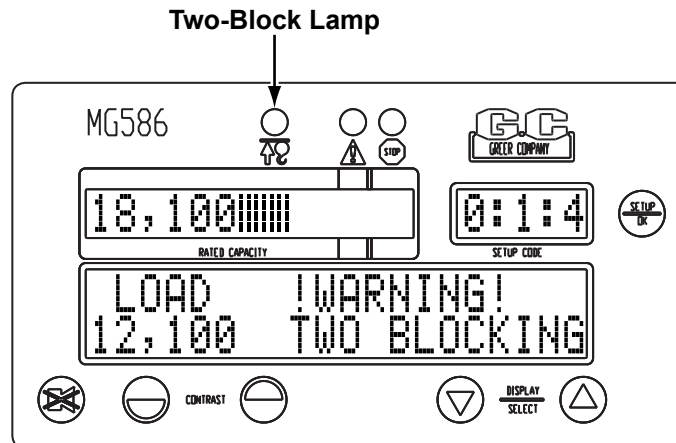


When the rated capacity of the crane reaches 100%, the percent of rated capacity meter moves from the caution (yellow-bordered) zone into the warning (red-bordered) zone.

The overload lamps will illuminate and an alarm will sound continuously. The message “!WARNING! – OVERLOAD” will flash in the information window.

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.

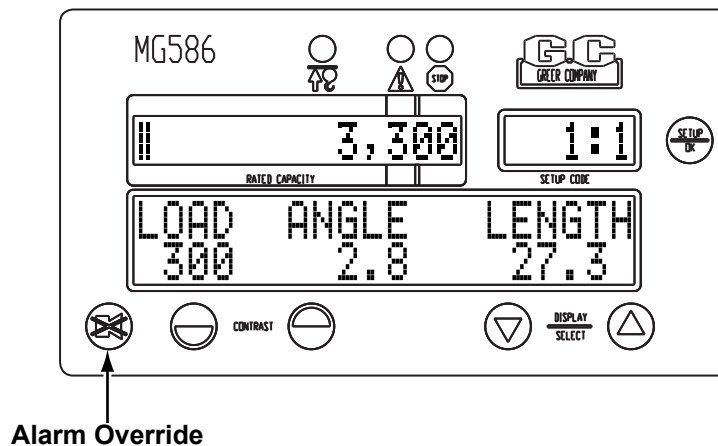
## Two-Block Warning



If the hook block is on a collision course with the head machinery at the end of the boom, the two-block lamp will illuminate and an audible alarm will sound continuously. The message: “!WARNING! TWO BLOCKING” will appear in the information window.

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.

## Alarm Override



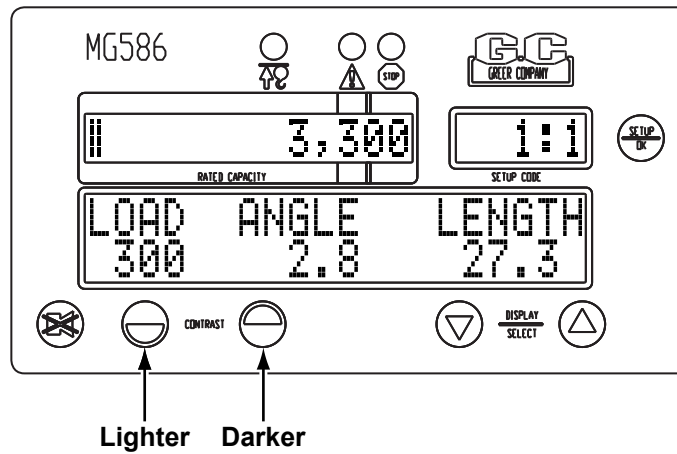
The alarm override button is used to temporarily disable current audible alarm conditions and to disable the automatic motion cutout. The audible alarm will sound again following any subsequent overload or two-block conditions, or any other alarm conditions.

To disable the audible alarm, press the **ALARM OVERRIDE** key. Continue to hold the button down for five (5) seconds to cancel any existing motion cuts. The **ALARM OVERRIDE** key must be held down to continue overriding the motion cut.

### ⚠WARNING

**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.**

## Adjusting the Contrast



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

Use the **CONTRAST** keys to lighten or darken the display as required.

**COMMENTS?**  
**SUGGESTIONS?**  
**CORRECTIONS?**

Send your feedback to:

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Please include your name, company, and crane type.



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W450587 06/08  
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